

#69-F-32

W.P.'s 10-69/13-68

H.W.Y. #417

ALIGN'TS 1 AND 2

SITES A, B, AND C

## MEMORANDUM

To: Mr. M. R. Ernesaks,  
Functional Planning Engr.,  
Eastern Region,  
Kingston, Ontario.

FROM: Foundation Section,  
Materials & Testing Office,  
Room 107, Lab. Bldg.

ATTENTION:

DATE: September 9, 1969.. ....

OUR FILE REF.

IN REPLY TO

SEP 18 1969

SUBJECT:

PRELIMINARY FOUNDATION REPORT  
For  
Proposed Structure Sites Along  
Hwy. 417 (Ottawa Extension)  
Ottawa East - City Limits  
Westerly to Walkely Road  
Alternate Alignments (Lines 1 & 2)  
District No. 9 (Ottawa)  
W.J. 69-F-32 W.P.'s 10-69/13-68

Attached, we are forwarding to you, our Preliminary Foundation Investigation Report pertaining to the above sites. Presented in this report are the results of the investigation, together with our general comments pertaining to the suitability of the approaches and recommendations regarding structure foundations at various crossings.

We believe that the information contained therein will prove adequate for your immediate use. Should you require further data, or clarification of the report, please feel free to contact this Office.

AGS/ia  
Attach.

cc: Messrs. M. R. Ernesaks (2)

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PRELIMINARY FOUNDATION REPORT  
For  
Proposed Structure Sites Along  
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W.J. 69-F-32

1. INTRODUCTION:

The Foundation Section was requested to provide preliminary subsoil information at the proposed structure crossings along Hwy. #417, namely, between the Ottawa Queensway (at Nicholas Street) easterly to the eastern city limits of Ottawa. This portion of the proposed highway is approximately 5 1/2 miles in length. The request was contained in a memo from the Eastern Regional Functional Planning Section (Mr. M.R. Ernesaks, Regional Functional Planning Engineer), dated May 15, 1969. An investigation was subsequently carried out by this Section to determine the subsoil conditions at various structure locations.

In this report that portion of proposed Hwy. #417, located between the Eastern City Limits of Ottawa, Westerly to Walkely Road will be discussed. Two alternate alignments, designated Lines 1 and 2, are being considered within this region. Proposed Structure Sites A, B<sub>1</sub> and C were investigated along Line 1, while A<sub>1</sub> and B and C (common to both alignments) were investigated along Line 2. This report presents preliminary information on the subsoil and groundwater conditions encountered at the above crossings, together with recommendations pertaining to foundation design and stability and settlement of approach embankments.

Preliminary Foundation Reports will also be submitted, in due course, on the other sections of the alignment, namely, between Walkely Road westerly to the Ottawa Queensway.

## 2. DESCRIPTION OF THE SITES AND GEOLOGY:

The portion of proposed Hwy. #417 encompassed in this report is located within the most easterly limits of the City of Ottawa, bounded by Hawthorne Road on the east and Walkely Road on the west. The terrain is gently undulating in relief, between about elevations 273 and 280. The land is basically being utilized for farming purposes; there are, however, numerous heavily timbered areas.

This portion of the alignment is situated in the physiographic region known as the "Ottawa Valley Clay Plains". The predominant stratum in this area is composed of silty clay interrupted periodically by ridges of rock or sand. The clay was deposited in the Champlain Sea, which inundated the area during the Pleistocene Period; this marine clay is known to be sensitive. The thickness of this stratum generally varies from 20 to 60 feet. The clay is underlain by a morainic glacial till deposit which, in turn, is followed by shale and limestone bedrock of the Meaford-Dundas Formation of the Ordovician Period.

## 3. FIELD AND LABORATORY WORK:

One or more detailed sampled boreholes were put down at each of the crossings, during the course of the investigation, by a conventional diamond drill rig adapted for soil sampling purposes.

Samples of the surficial and glacial till deposits were obtained, at specified intervals, in a 2" O.D. split-spoon sampler, which was hammered into the soil in accordance with the specifications for the Standard Penetration Test. The cohesive overburden was sampled with 2" I.D. Shelby tubes. In addition, field vane tests were carried out to determine the undrained shear strength of the clay stratum. Bedrock was proven in all the boreholes by obtaining AXT size rock core samples.

3. FIELD AND LABORATORY WORK:(cont'd.)...

The groundwater level conditions across the site were determined by installing sealed piezometers in three of the boreholes. This information was supplemented by recording the water level in the open holes at the remaining boring locations, during the period of the investigation.

The locations and elevations of all the borings were surveyed in the field by personnel from the Kingston Regional Engineering Surveys Section, and are shown on Drawing #69-F-32A. All the elevations given in this report are referenced to a Geodetic Origin. The subsoil conditions encountered at the boring locations, are shown on the Record of Borelog sheets located in Appendix I; a stratigraphical profile along alternate alignments #1 and 2 has been inferred from this data and shown on Drawing #69-F-32B.

The results of the laboratory testing carried out on selected samples are shown on the borelog sheets, as well as on Figures No. 1 to 4, inclusive, all of which are located in the Appendix of this report.

4. SUBSOIL AND BEDROCK CONDITIONS:

4.1) General

In the vicinity of Walkely and Conroy Roads (Sites B, B<sub>1</sub> and C) the predominant stratum is composed of a soft to firm clay, which is between 29 and 36 feet thick. This stratum is overlain by thin (1 to 3 feet thick) surficial deposits composed primarily of topsoil and silty sand. The cohesive deposit is underlain by competent, basically cohesive, glacial till followed, in turn, by shale bedrock.

In the vicinity of Hawthorne Road (Sites A and A<sub>1</sub>), however, the glacial till protrudes to within 3 feet of ground surface. In this area the competent deposit ranges between 2 to 3 feet in thickness. Again the glacial till is directly underlain by shale bedrock.

4. SUBSOIL AND BEDROCK CONDITIONS:

4.1) General: (cont'd.)

From ground surface downwards, the various soil types encountered are described as follows:

4.2) Clay to Silty Clay (Sensitive):

The surficial deposits across the area are quite variable ranging from a thin veneer of topsoil to granular roadway fill. The thickness of this cover, however, never exceeds 3 feet.

Underlying the surficial deposits, in the most westerly portion of the area being studied (encompassing Sites B, B<sub>1</sub> and C), is a stratum composed of a sensitive marine clay to silty clay, with a trace of sand. The thickness of the cohesive soil varies from 28.5 feet at site #B to 36 feet at Site #C. The upper 6 to 9 feet of the stratum has been desiccated. The deposit is basically grey in colour; there are, however, numerous reddish-brown laminations throughout. Random partings and seams of silt, up to 1/4 inch thick, were encountered within the deposit; the frequency of these zones generally increases with depth. Grain-size distribution curves, obtained on samples from the stratum, are plotted on Figure #1.

Atterberg limit tests were carried out on representative samples of the clay; the results of this testing, which are given on the Borelog Sheets, are also summarized on the Plasticity Chart, Figure #3. The results indicate that the liquid and plastic limits vary from 43 to 79 (average 70) and 22 to 29 (average 26), respectively. From these values, it is inferred that the stratum is inorganic with the plasticity being typically in the intermediate to high range. The natural moisture content ranges from 57 to 72 percent; these values correspond to liquidity indices between 0.7 and 1.4 (average 0.9).

The field and laboratory undrained shear strength results are plotted on the Record of Borelog sheets. This testing indicates that the undrained shear strength of the lower portion of the stratum varies from 450 to 1,000 p.s.f.

#### 4. SUBSOIL AND BEDROCK CONDITIONS:

##### 4.2 Clay to Silty Clay (Sensitive): (cont'd.)

The undrained shear strength in the upper desiccated zone, however, ranges from 1,200 p.s.f. to in excess of 2,000 p.s.f. Based on these values it is estimated from the consistency of the upper desiccated zone is in the stiff to very stiff range, while in the lower more normally consolidated zone the consistency varies from soft to firm.

The consolidation characteristics of the stratum were determined by carrying out a series of laboratory consolidation tests, the results of which are shown as Void Ratio vs. Pressure Plots of Figure #4. The results of this testing indicate that the clay is preconsolidated in excess of existing overburden pressure by approximately 4,000 p.s.f., in the upper desiccated portion of the stratum. Below this zone, however, the preconsolidation varies between 1,000 and 2,000 p.s.f. The relatively high values given for the initial void ratio ( $e_0$ ) and the compression index ( $C_c$ ) are within the normal range for such values obtained from laboratory consolidation testing on sensitive "Leda Clay".

##### 4.3) Glacial Till (Clayey Silt, Sand and Gravel)

A glacial till deposit underlies i) the aforementioned clay stratum encountered at Sites #B, B<sub>1</sub> and C, and ii) the thin surficial deposits present at Sites #A and A<sub>1</sub>. The thickness of the glacial till varies from 2 feet at BH #1, Site A, to 14 feet at Site #C. The matrix of the till is generally cohesive - ie. a clayey silt binding sand and gravel. There are, however, random zones within the deposit where the material is basically granular (silt, sand and gravel), such areas are non-cohesive in nature. The range in the grain-size gradation of this subsoil is indicated by the grading curves plotted on Figure #2.

Atterberg limit tests, carried out on the more cohesive portions of the glacial till, are plotted on the Borelog sheets and summarized on Figure #3. The results indicate that such values are representative of an inorganic subsoil of low plasticity.

4. SUBSOIL AND BEDROCK CONDITIONS:

4.3) Glacial Till (Clayey Silt, Sand and Gravel): cont'd.

The natural water content varies, in random fashion, from 5 percent above the plastic limit to 6 percent below.

Standard penetration resistance tests were carried out within this deposit, the results are plotted on the Record of Borelog Sheets. This testing gave 'N' values which vary from 11 blows/ft. to 90 blows/9 inches, averaging about 55 blows/ft. Based on these results it is estimated that the consistency of the more cohesive portions of the deposit range from very stiff to hard. The relative density of the non-cohesive portions is considered to vary from compact to very dense.

4.4 BEDROCK:

Bedrock was proven at all the boring locations by obtaining between 8.5 and 18.5 feet of AXT rock core. The surface of the bedrock was found to vary from elevation 277 (Site #A) to 228 (Site #C); indicating the bedrock dips towards the west.

The bedrock is basically composed of grey shale with interbeds of shaly limestone and limestone. In general, bedrock is sound throughout; however, some signs of fracturing and jointing were observed in the upper 2 to 5 feet at all the boring locations.

5. GROUNDWATER CONDITIONS:

Groundwater level observations have been carried out during the period of the investigation in: i) sealed piezometers installed in some of the boreholes, and ii) the open holes at the remaining boring locations. The observations are recorded on the Borelog Sheets and summarized on Drawing No. 69-F-32B. The results of the measurements indicate that the piezometric groundwater level, within the surficial deposits and underlying clay (where it exists) varies from a few inches to 6 feet below existing ground surface, corresponding to elevations between 269 and 278.

5. GROUNDWATER CONDITIONS: (cont'd.)...

A piezometer, installed in the glacial till at Site #B<sub>1</sub>, indicated that the piezometric groundwater level, within this deposit, was at a depth of 13 feet below ground surface. This is some 7 feet below the level recorded in the piezometer installed within the overlying clay stratum. Based on this information it is inferred that some downward drainage is occurring, through the relatively impervious clay stratum into the underlying more pervious glacial till, at those locations where this subsoil sequence exists.

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General

Proposed Hwy. #417, Ottawa Extension, will be a 4-lane divided highway incorporating a median. The discussion presented herein is applicable for that portion of the proposed highway traversing between the Eastern City Limits of Ottawa (Hawthorne Road) westerly to Walkely Road. Two possible alignments, designated as Line #1 and 2, are being considered:

A structure is proposed at the following crossings located along the Hwy. #417 alignments..

- i) Re-located Hwy. #31
- ii) C.N.R. Railway
- iii) Walkely Road

At this stage only preliminary design information is available for these crossings. This data is contained on an un-numbered profile provided by the Eastern Region Functional Planning Section (dated August 5, 1969.) Based on this information, however, preliminary recommendations pertaining to structure foundations, as well as stability of approach fills, will be given in the sub-sections to follow.

A comparison of the merits of the alternate alignments will be given in Section 7 of this report.

6. DISCUSSION AND RECOMMENDATIONS: (cont'd.)...

6.2) Underpass Structure - Relocated Hwy.#31

Line #1 - Site A (BH's #1 and 2)

Line #2 - Site A<sub>1</sub>

It is understood that the profile grade of Hwy. #417 will be approximately 4 to 5 feet above existing ground level, no matter which of the alignments is adopted. The associated approach fills for relocated Hwy.#31, would be of the order 22 to 23 feet.

The subsoil and bedrock sequence encountered at the alternate sites were very similar - ie. a competent glacial till deposit, between 2 and 8 feet in thickness, directly overlies bedrock. This being the case, the foundation recommendations presented in the table to follow, will be applicable to both alternate alignments.

# FOUNDATION RECOMMENDATIONS

Underpass Structure - Hwy. #417 and Relocated Hwy. #31

Site No.	Approx. Exist. Ground Elev. (Approx. Grade of Hwy. #417)	R E C O M M E N D A T I O N S		REMARKS
		<u>STRUCTURE</u>	<u>EMBANKMENTS</u> Height of Fill Proposed = 22'	
<u>Line 1</u>				
Site A-BH #1	280 ±	<u>Piers:</u>  Spread Footings within Glacial till or to surface of bedrock, allowable bearing pressure up to 5 t.s.f. and 10 t.s.f., respectively.	No stability problems for Standard 2:1 slopes, settlements negligible.	Pier footing excavations will probably be carried out below the ground water level, within a relatively impermeable material. No major dewateri problems anticipated.
Site A-BH #2	(284 ±)			
<u>Line 2</u>				
Site A1	273 ± (277 ±)	<u>Abutments:</u>  Spread footings founded on compacted granular fill, within approach fills, allowable bearing pressure 2 t.s.f. - or alternatively end-bearing piles driven to bedrock (for tip elevation see Borelog Sheets attached) - designed for max. capacity of the pile section chosen.		

6. DISCUSSION AND RECOMMENDATIONS: cont'd....

6.3) Overhead Structure - C.N.R. Railway

Line #1 - Site B<sub>1</sub>.

Line #2 - Site B.

An overhead structure is to carry proposed Hwy. #417, across the existing single line Canadian National Railway track at the alternate locations shown on Drawing 69-F-32A. It is understood that the structure will have a span length of approximately 170 feet. Further, the maximum profile grade of Hwy. #417, in the vicinity of the crossing, will be at about elevation 302. At this grade the associated approach fills along Hwy. #417, will have a maximum height of 28 feet and 26 feet in the longitudinal and transverse directions, respectively. Provisions are being allowed for a future second track.

The predominant deposit encountered along both alternate alignments as far as foundation considerations are concerned is the soft to firm clay. The thickness and strength-compressibility characteristics of this stratum are also similar, therefore, the foundation recommendations given for one can be applied to the other. The recommendations are presented in tabular form as follows:

cont'd./11

# FOUNDATION RECOMMENDATIONS

-Overhead Structure- C.N.R. & Hwy. # 417.

Alignment #1 ( Site B<sub>1</sub> ) & Alignment #2 ( Site B )

Approx. Elev. of Tracks (Approv. Grade of Hwy. #417)	R E C O M M E N D A T I O N S		REMARKS
	<u>STRUCTURE</u>	<u>EMBANKMENTS</u>	
		(Height-Longitudinal Direction - 28') (Height-Transverse Direction - 26')	
274 ± ( 302 ± )	<u>Piers &amp; Abutments:</u> End-bearing Piles driven to bedrock - estimated tip elev.'s Site 'B' - 233 Site 'B <sub>1</sub> ' - 231 -designed for max. capacity of the pile section chosen at pier locations. (Note: Capacity of piles supporting abutments may have to be reduced in order to allow for negative skin frictional effects)	<u>Stability:</u> 1) Fills up to 22' (with 2:1 slopes) will be stable. 2) Fills in excess of 22' will require berms in all directions. A mid-height berm of 45' will be required for a fill height of 28' (in longitudinal direction). (F.S. ≥ 1.3) <u>Probable Consolidation Settlement:</u> 1) 22' fill (2:1 slope) 1' in 2 years 2 1/2' in 40 years (max.) 2) 26' fill with a berm length of 20' at mid-height (transverse direction) 1 1/2' in 2 years 3 1/2' in 40 years (max.)	Consideration should be given to constructing the approach fills prior to construction of the structure foundations in order to minimize the post construction settlements. Consideration should also be given to lengthening the structure (multi- span) thus limiting the heights of fill. This would i) reduce the magnitude of the settlements. ii) eliminate the necessity for berms. and iii) Minimize post- construction maintenance costs

6. DISCUSSION AND RECOMMENDATIONS: cont'd.....

6.4 Underpass Structure - Walkely Road  
Site 'C Applicable to Both Alignments.

Based on preliminary information it is understood that the profile grade of Hwy. #417, in the vicinity of the aforementioned structure, will be between elevations 276 and 279 - ie. in a shallow cut approximately 2 to 4 feet in depth. The maximum profile grade of Walkely Road, will be about elevation 300. Under these conditions the maximum heights of the approach embankments, along Walkely Road, will be of the order of 21 and 19 feet in the longitudinal and transverse directions, respectively. The proposed span length of this structure is about 280 feet.

The predominant subsoil stratum across the site is composed of a firm clay to silty clay, approximately 36 feet thick. Foundation recommendations are again presented in tabular form.

# FOUNDATION RECOMMENDATIONS

Underpass Structure - Hwy. #417 & Walkely Road (Site 'C')

Approx. Exist Ground Elev. (Approx. Grade of Hwy. #417)	R E C O M M E N D A T I O N S		<u>REMARKS</u>
	<u>STRUCTURE</u>	<u>EMBANKMENTS</u>  (Height - Longitudinal Direction - 21') (Height - Transverse Direction - 19')	
281 ±  (278 ±)	<u>Piers &amp; Abutments:</u>  End-bearing piles driven to bedrock - estimated tip elev. 228 ±  - designed for max. capacity of the pile section chosen.	<u>Stability:</u>  Fills, of the height contemplated will be stable (F.S. ≥ 1.3)  <u>Probable Consolidation Settlement</u> 26' fill (2:1 slope) 3" to 6" in 1 year 6" to 12" in 5 years (max.)	

7. CONCLUSIONS:

As discussed in Section 6), the subsoil sequence and their related engineering properties, are similar at the corresponding sites along the two alternate alignments; namely at

- i) Site A (Line 1) and Site A<sub>1</sub> (Line 2) - Proposed Hwy. #31 crossing.
- and ii) Site B<sub>1</sub> (Line 1) and Site B (Line 2) - Proposed C.N.R. overhead crossing.

It is considered, neither of the two alternate alignments would provide a distinct advantage, from a foundation point of view, over the other. It would be feasible, therefore, to adopt either of the alternate alignments, with the final choice being dependent on factors, such as economic and other related considerations.

It should be noted that this report is of a preliminary nature. A complete foundation investigation will be required at all the structure sites, when design details become available.

8. MISCELLANEOUS:

The field work was performed during the periods of May 21st to June 6th, 1969, under the immediate supervision of Mr. D. Phelps, Project Foundation Engineer.

This report was written by Mr. B. T. Darch, Senior Foundation Engineer.

The entire project was carried out under the general supervision of Mr. M. Devata, Supervising Foundation Engineer, who reviewed this report.

Equipment was owned and operated by the F.E. Johnston Diamond Drilling Co. Ltd., Ottawa, Ontario.

September, 1969.

APPENDIX I.

DEPARTMENT OF HIGHWAYS- ONTARIO  
MATERIALS & TESTING OFFICE

## RECORD OF BOREHOLE No 1- SITE 'A' FOUNDATION SECTION

JOB 69-F-32 LOCATION See Drawing 69-F-32A ORIGINATED BY BTD  
 W.P. 10-69 BORING DATE June 4, 1969 COMPILED BY BTD  
 DATUM Geodetic BOREHOLE TYPE Washboring - NX, AX Casing - AXT-RC CHECKED BY LL

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE	LIQUID LIMIT	PLASTIC LIMIT	WATER CONTENT	BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	WATER CONTENT	WATER CONTENT	WATER CONTENT		
279.9	Ground Level										
0.0	Clayey silt topsoil	1	SS	6							
277.1		2	CS	-							
2.8	Fractured	3	AXT	69%							
	Shally limestone bedrock with interbedded shale and limestone	4	AXT	100%							
	Grey	5	AXT	100%							
266.8	Sound										
13.1	End of Borehole										

CLAYEY SILT WITH SAND & A TRACE OF GRAVEL (GLACIAL TILL) (GREY) VERY STIFF

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DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & TESTING OFFICE

## RECORD OF BOREHOLE No. 2 - SITE 'A' FOUNDATION SECTION

JOB 69-F-32

LOCATION

See Drawing 69-F-32A

ORIGINATED BY

BTD

W.P. 13-68

BORING DATE

May 21 &amp; 26, 1969

COMPILED BY

BTD

DATUM Geodetic

BOREHOLE TYPE

Washboring - NX, AX Casing - AXT-RC

CHECKED BY

H.K.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT — $w_L$ PLASTIC LIMIT — $w_p$ WATER CONTENT — $w$		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT.	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH, P.S.F.		$w_0$ — $w_1$ WATER CONTENT %			
280.0	Ground Level											
0.0	Sand, some gravel		1	SS	16							GRISA, SL. CL.
277.0	Roadway Fill (Brown) Compact											
3.0	Clayey silt with sand & some gravel (Glacial Till)		2	SS	57							
268.8	(Shale fragments below el. 271) (Grey) Hard			3	SS	90/9"	270					
11.2	Fractured		4	AXT	83%							
	Shale bedrock, interbeds of shaly limestone and limestone (Grey)			5	AXT	87%						
			6	AXT	100%	260						
			7	AXT	100%							
250.2	Sound					250						
29.8	End of Borehole											Piez. tip el. 250.2

DEPARTMENT OF HIGHWAYS- ONTARIO  
MATERIALS & TESTING OFFICE

## RECORD OF BOREHOLE SITE 'A1'

FOUNDATION SECTION

JOB 69-F-32 LOCATION See Drawing 69-F-32A ORIGINATED BY BTD  
 W.P. 13-68 BORING DATE June 5 & 6, 1969 COMPILED BY BTD  
 DATUM Geodetic BOREHOLE TYPE Washboring - BX, AX Casing - AXT-RC CHECKED BY *h*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT — W <sub>L</sub> PLASTIC LIMIT — W <sub>P</sub> WATER CONTENT — W	BULK DENSITY Y	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT					
272.9	Ground Level									
0.0	Clayey silt topsoil		1	SS	3	270				WL in open BH at GL.
1.0	Clayey silt, with sand & gravel (Glacial Till) (fragments of shale below el. 267) (Grey)		2	SS	11					33 32 28 7
263.9	Very stiff.		3	AXT	87%					
9.0	Fractured		4	AXT	52%	260				
255.6	Shale Bedrock, with interbeds of shaly limestone. (Grey) (Sound)		5	AXT	100%					
17.3	End of Borehole					250				

# RECORD OF BOREHOLE SITE 'B'

FOUNDATION SECTION

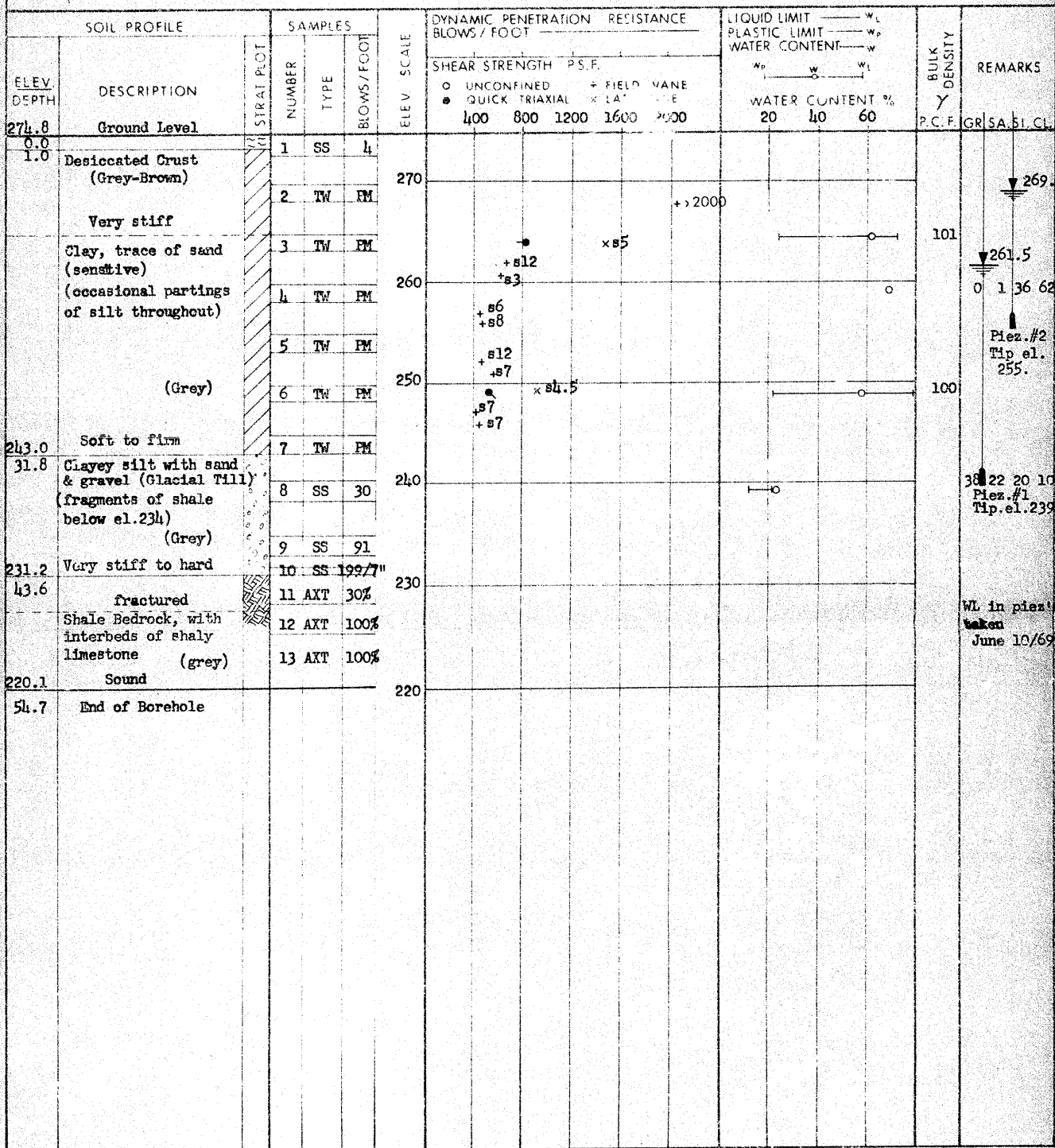
JOB 69-F-32 LOCATION See Drawing 69-F-32A ORIGINATED BY BTD  
W.P. 13-68 BORING DATE May 30, June 2 & 3, 1969 COMPILED BY BTD  
DATUM Geodetic BOREHOLE TYPE Washboring - NX,BX,AX Casing - AXT-RC CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT — $w_L$ PLASTIC LIMIT — $w_p$ WATER CONTENT — $w$		BULK DENSITY $\gamma$ P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P.S.F.		WATER CONTENT %				
							$\circ$ UNCONFINED $\bullet$ QUICK TRIAXIAL	+ FIELD VANE $\times$ LAB VANE	$w_p$ — $w$ — $w_L$				
277.8	Ground Level					400	800	1200	1600	2000	20	40	60
0.0	Silty sand, trace of gr. & org. matter (brown)		1	SS	2								
274.8	Desiccated crust (grey brown)		2	TW	PM								
3.0	Very stiff to stiff		3	TW	PM								
	Clay, trace of sand (sensitive)		4	TW	PM								
	occasional layers of clayey silt up to 2" thick below el. 251		5	TW	PM								
	(Grey)		6	TW	PM								
246.3	Firm		7	TW	PM								
31.5	Het. mix. of clay, silt, sand & gravel (Glacial Till)		8	TW	PM								
	(fragments of shale below el. 238) (Grey)		9	SS	23								
	Very stiff to hard or Compact to very dense		10	SS	21								
233.3	fractured		11	SS	71								
44.5	Shale Bedrock, with interbeds of shaly limestone. (Grey)		12	AXT	80%								
			13	AXT	100%								
223.2	Sound		14	AXT	100%								
54.6	End of Borehole												

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & TESTING OFFICERECORD OF BOREHOLE SITE 'B<sub>1</sub>'

FOUNDATION SECTION

JOB 69-F-32 LOCATION See Drawing 69-F-32A ORIGINATED BY BTB  
 W.P. 13-68 BORING DATE June 2 & 3, 1969 COMPILED BY BTB  
 DATUM Geodetic BOREHOLE TYPE Washboring - NX,BX,AX Casing - AXT-Rc CHECKED BY AK



DEPARTMENT OF HIGHWAYS- ONTARIO  
MATERIALS & TESTING OFFICE

## RECORD OF BOREHOLE SITE 'C'

FOUNDATION SECTION

JOB 69-F-32

LOCATION

See Drawing 69-F-32A

ORIGINATED BY BTB

W.P. 13-68

BORING DATE

May 20, 21 &amp; 22, 1969

COMPILED BY BTB

DATUM Geddetic

BOREHOLE TYPE

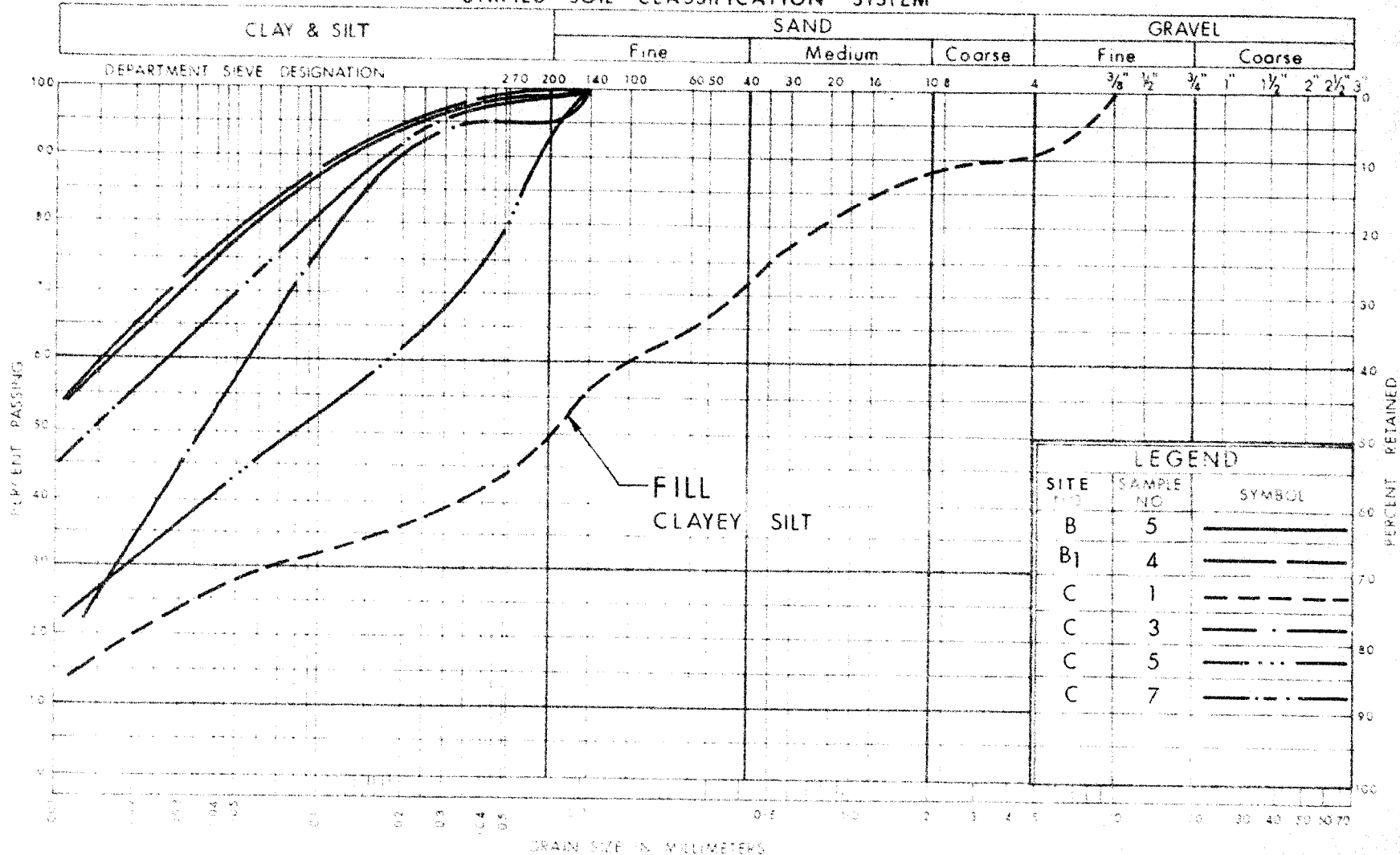
Washboring - NX, BX AX Casing - AXT-RC

CHECKED BY

JR.

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — $w_L$ PLASTIC LIMIT — $w_p$ WATER CONTENT — $w$			BULK DENSITY Y P.C.F.	REMARKS		
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	SHEAR STRENGTH P.S.F.					WATER CONTENT %						
						O UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE					20 40 60						
						400	800	1200	1600	2000							
280.3	Ground Level		1	SS	6	280									9 43 28 20	275 June 10/69	
277.3	Fill		2	SS	7												
3.0	Desiccated Crust (Grey-Brown)		3	TW	PM	270				x s2.5					98	0 5 64 31	
	Very stiff to stiff		4	TW	PM					+ s4 + s2							
	Clay to silty clay, trace of sand (sensitive)		5	TW	PM	260				+ s26 + s14 s6					110	0 7 64 30	
	(occasional partings & seams of silt up to 1/4" thick throughout)		6	TW	PM					+ s5.5 + s7							Piez. tip el. 256.4
	(Grey)		7	TW	PM	250				+ s4 + s9					99	0 1 44 55	
	Firm		8	TW	PM					+ s26 + s31							
241.2			9	TW	PM	240											
39.1	Het. mix. of clay, silt, sand & gravel (Glacial Till) (fragments of shale below el. 233) (Grey)		10	SS	18											27	41 26 6
	Stiff to hard or Compact to very dense		11	SS	13											17	47 30 6
228.3			12	SS	24												
52.0	Fractured Shale Bedrock, with interbeds of shale limestone (Grey)		13	SS	67												
			14	SS	62												
			15	AXT	84%												
218.8	Sound		16	AXT	100%	220											
61.5	End of Borehole				210												

# UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

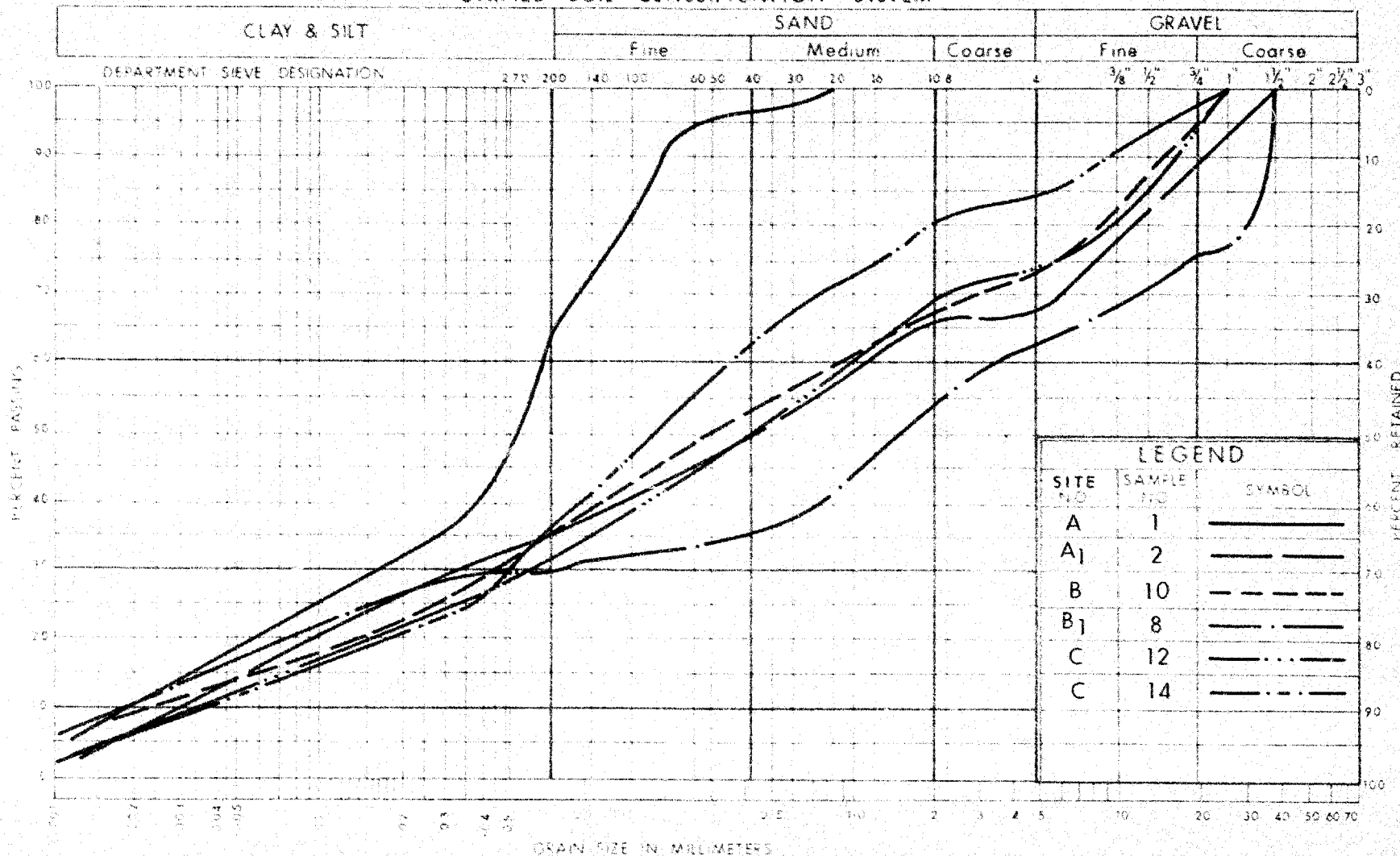
GRAIN SIZE DISTRIBUTION  
CLAY TO SILTY CLAY  
(Sensitive)

WP No 13-68 & 10-69

USE NO 69-F-32

Fig. No. 1

# UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

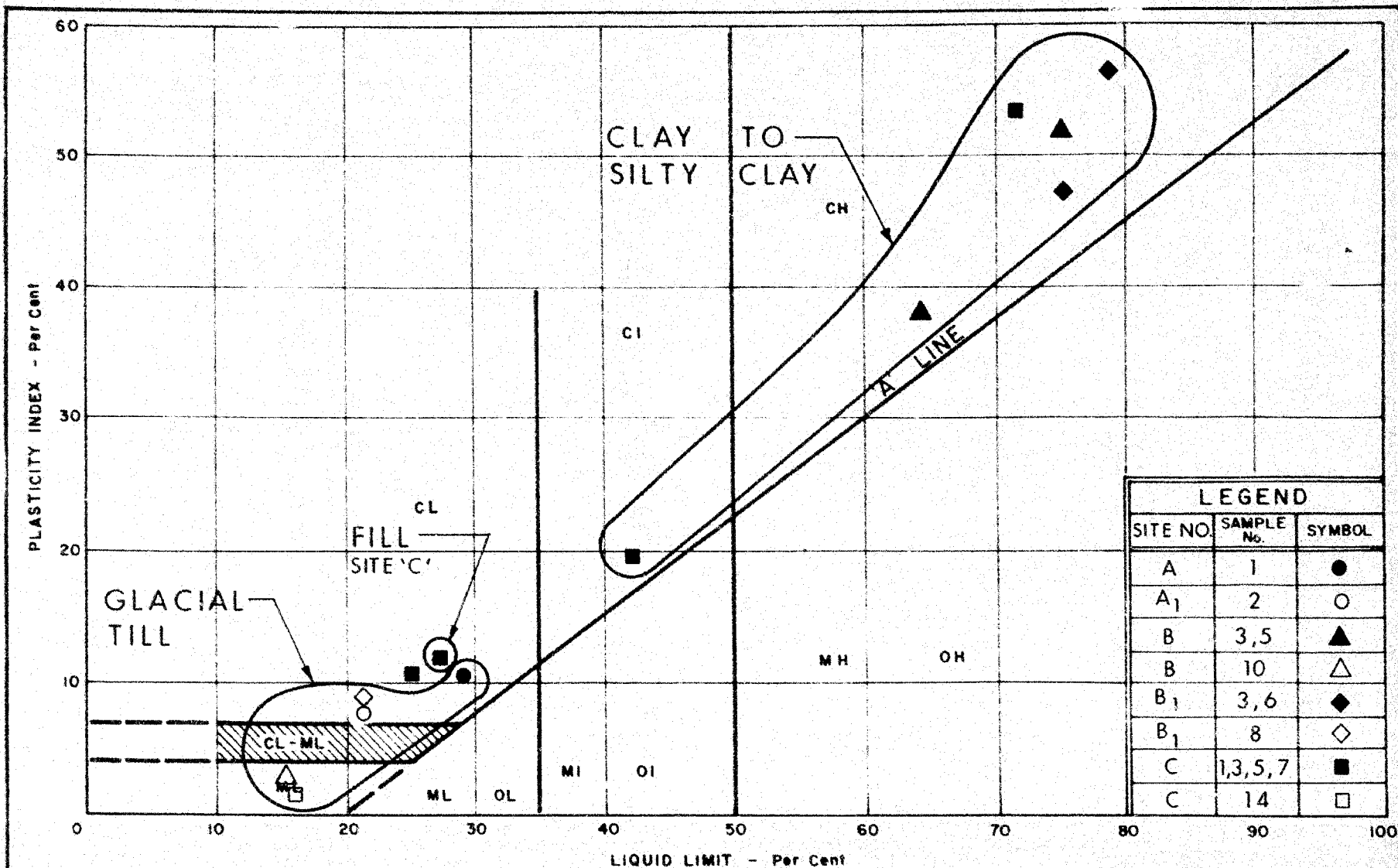
## GRAIN SIZE DISTRIBUTION GLACIAL TILL

HETEROGENEOUS MIXTURE OF CLAY, SILT, SAND & GRAVEL

W.P. No. 13-68 & 10-69

JOB No. 69-F-32

Fig. No. 2



DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

## PLASTICITY CHART

WP. No. 13-68 & 10-69

JOB No. 69-F-32

Fig. No. 3

# VOID RATIO - PRESSURE CURVES

JOB NO. 69 - F - 32

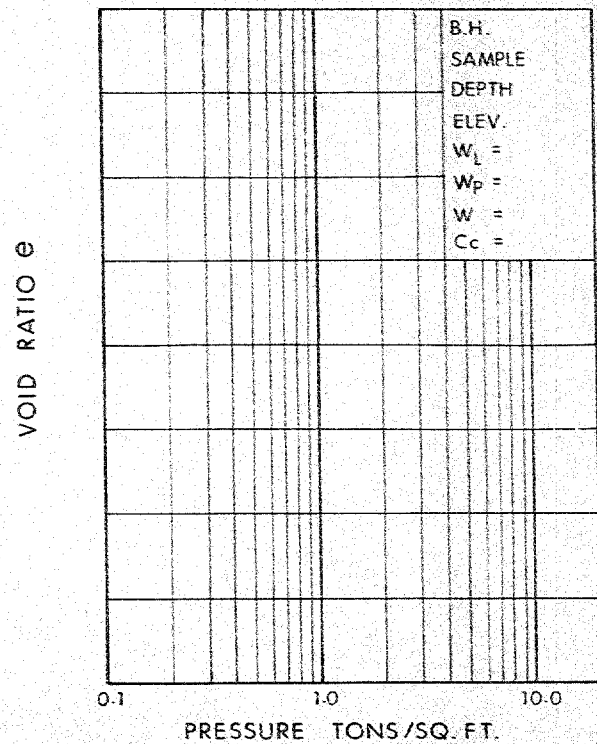
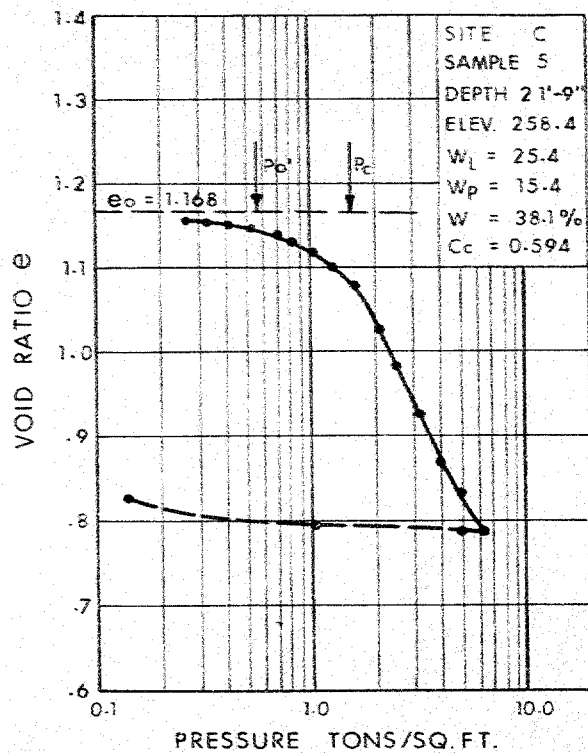
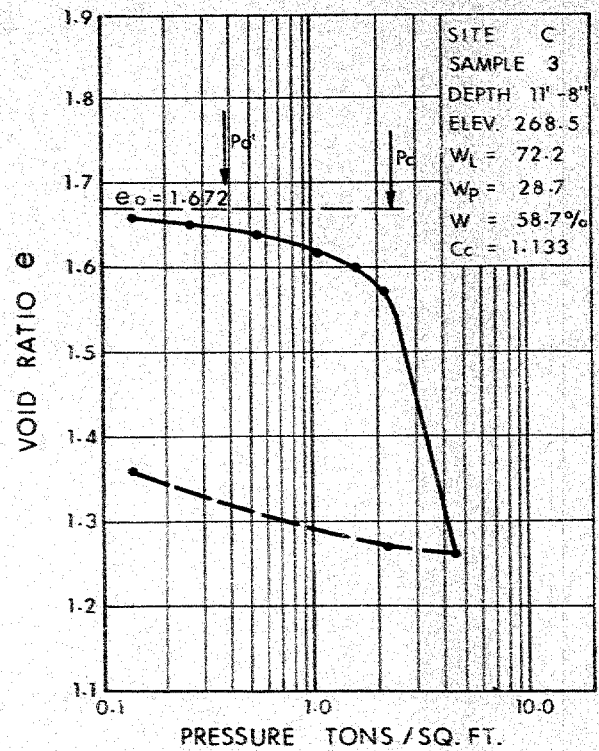
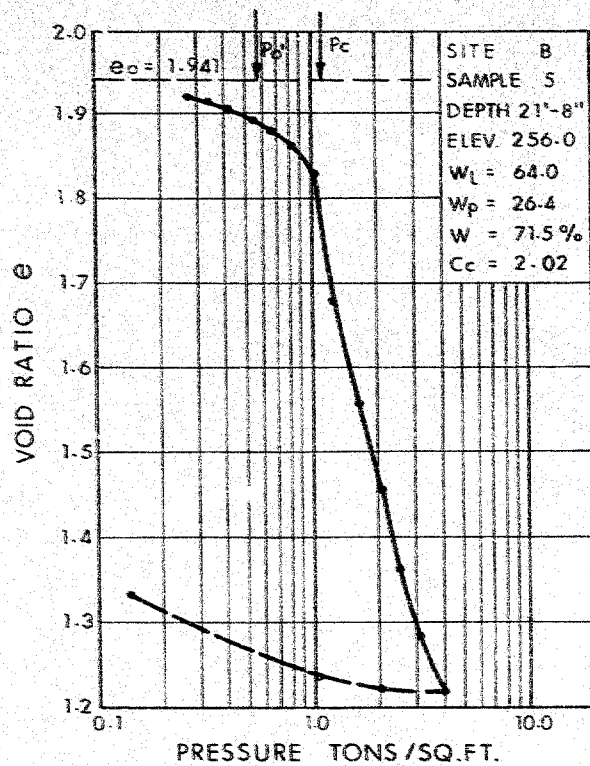


FIG. 4

## ABBREVIATIONS USED IN THIS REPORT

### PENETRATION RESISTANCE

STANDARD PENETRATION RESISTANCE 'N' :- 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>'N' BLOWS / FT.</u>	<u>c LB. / SQ. FT.</u>	<u>DENSENESS</u>	<u>'N' BLOWS / FT.</u>
VERY SOFT	0 - 2	0 - 250	VERY LOOSE	0 - 4
SOFT	2 - 4	250 - 500	LOOSE	4 - 10
FIRM	4 - 8	500 - 1000	COMPACT	10 - 30
STIFF	8 - 15	1000 - 2000	DENSE	30 - 50
VERY STIFF	15 - 30	2000 - 4000	VERY DENSE	> 50
HARD	> 30	> 4000		

### TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.B.	SCRAPER BUCKET SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE
S.T.	SLOTTED TUBE SAMPLE		
	P.H.	SAMPLE ADVANCED HYDRAULICALLY	
	P.M.	SAMPLE ADVANCED MANUALLY	

### SOIL TESTS

Q <sub>u</sub>	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Q <sub>cu</sub>	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Q <sub>d</sub>	DRAINED TRIAXIAL	S	SENSITIVITY

# ABBREVIATIONS USED IN THIS REPORT

## SOIL PROPERTIES

$\gamma$	UNIT WEIGHT OF SOIL (BULK DENSITY)
$\gamma_s$	UNIT WEIGHT OF SOLID PARTICLES
$\gamma_w$	UNIT WEIGHT OF WATER
$\gamma_d$	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
$\gamma'$	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
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
$\tau_f$	SHEAR STRENGTH
$c'$	EFFECTIVE COHESION INTERCEPT
$\phi'$	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
$c_u$	APPARENT COHESION
$\phi_u$	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
$\mu$	COEFFICIENT OF FRICTION
$S_f$	SENSITIVITY

## GENERAL

$\pi$	= 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e a$ OR $\ln a$	NATURAL LOGARITHM OF a
$\log_{10} a$ OR $\log a$	LOGARITHM OF a 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
$\sigma$	NORMAL STRESS
$\sigma'$	NORMAL EFFECTIVE STRESS ( $\bar{\sigma}$ IS ALSO USED)
$\tau$	SHEAR STRESS
$\epsilon$	LINEAR STRAIN
$\gamma$	SHEAR STRAIN
$\nu$	POISSON'S RATIO ( $\mu$ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
$\eta$	COEFFICIENT OF VISCOSITY

## EARTH PRESSURE

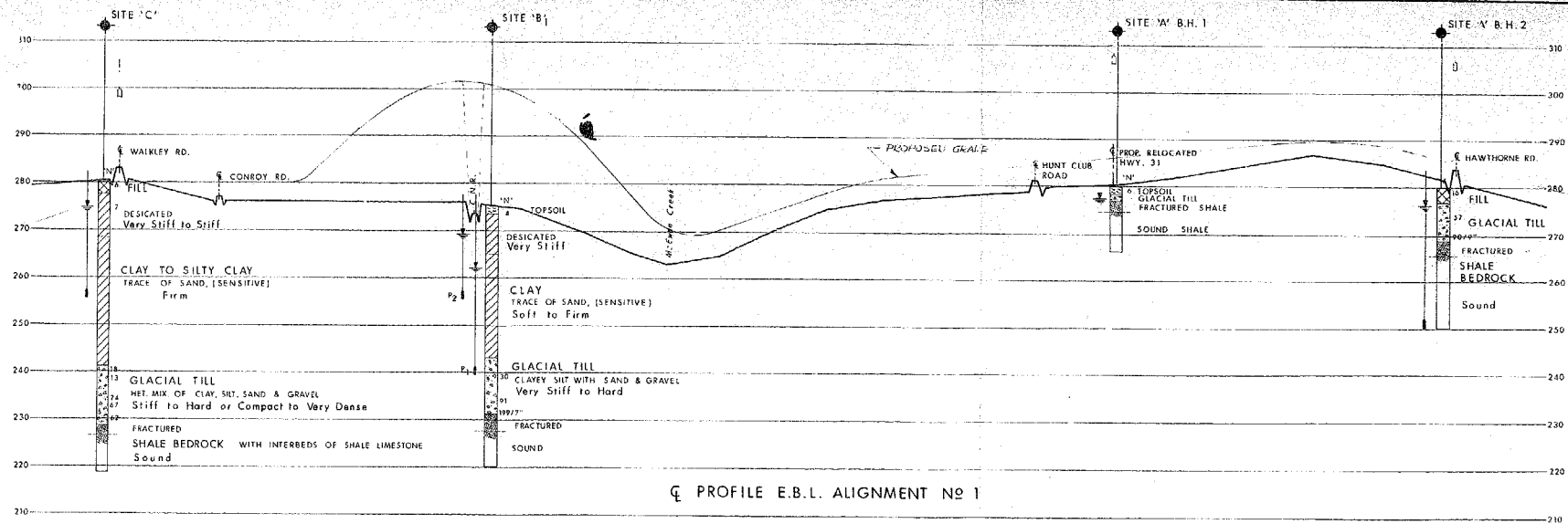
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
$\delta$	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
$K_0$	COEFFICIENT OF EARTH PRESSURE AT REST

## FOUNDATIONS

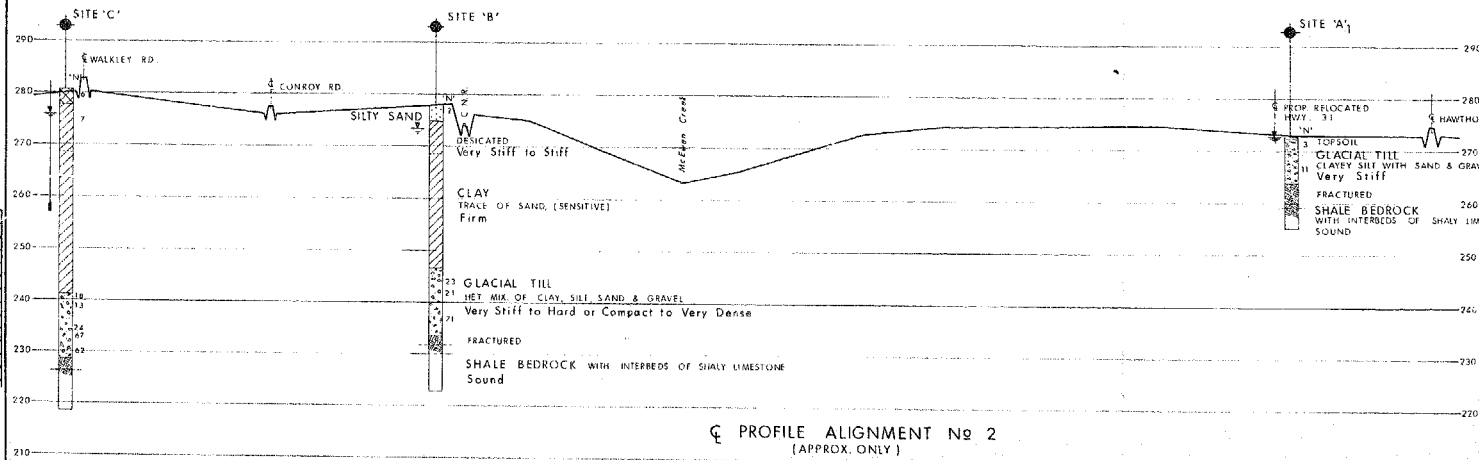
B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
$k_s$	MODULUS OF SUBGRADE REACTION

## SLOPES

H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
$\beta$	ANGLE OF SLOPE TO HORIZONTAL



PRINT RECORD  
NO. 101 DATE



**NOTE**  
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

REVISION	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS - ONTARIO  
MATERIALS & TESTING OFFICE - FOUNDATION SECTION  
PRELIMINARY INVESTIGATION

**SITES A, B & C - OTTAWA**

KING'S HIGHWAY NO. 417 ALIGNMENTS 1 & 2 DIST. NO. 9  
CO. CARLETON CITY OF OTTAWA  
TWP. GLOUCESTER LGY. CON.

**PROFILES & SOIL STRATIGRAPHY**

SUBNO. B.T.D. CHECKED: WP. NO. 12-58 & 10-60  
CHAWA G.F. CHECKED: JOB NO. 69-F-32  
DATE: Aug. 12, 1969 SITE NO. 69-F-32B  
APPROVED: [Signature] ENGINEERING NO.

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

MEMORANDUM

TO: FILE

FROM: Bridge Section,  
Kingston, Ontario.

ATTENTION:

DATE: January 13, 1972.

OUR FILE REF.

IN REPLY TO

SUBJECT:

NOTE ON MEETING AT EASTERN REGION OFFICES  
ON JANUARY 12, 1972

Revised Schedule Dates and Estimates to be included  
in Agreements to be concluded with the Consultants  
for W.P. 13-68 and W.P. 10-69

Present at the meeting:

S. J. Markiewicz	Systems Design - Kingston
R. Shannon	Systems Design - Head Office
R. Forrest	Reg. Schedule Co-ordinator - Kingston
I. Williams	Functional Planning - Kingston
G. Costello	Engineering Surveys - Kingston
T. C. Kingsland	Bridge Planning - Kingston

W.P. 13-68:

Revisions due to changes in the northern section of Highway 417 are:

- 1) Possible shift of line at C.P.R. Overhead, N.B.L. structure - W.P. 13-68-07 - due to proximity of hydro tower.
- 2) Shift of line between Innes Road and Ottawa Queensway and link up to Eastern Parkway, resulting in one extra overpass structure on Highway 417 W.B.L. at Eastern Parkway S.B.L. The number allocated to this new structure will be W.P. 13-68-08. Because of this shift the locations and alignment of the structures over the Ottawa Queensway (W.P. 13-68-02 & -03) are altered.

The program is affected as far as the structures are concerned because the previous program dates were based on all Foundation field work being completed by this date, whereas now new lines have to be run and additional field work carried out.

W.P. 13-68: (Cont'd)

The following revised dates were suggested:

- New line run by February 2, 1972
- Additional Foundation field work by February 16
- Revised Site Plan date - March 1
- Revised Foundation Report date - April 26
- Revised Preliminary Bridge Drawing date - June 14
- Revised Bridge Design Completion date - Sept. 27

The results of talks between De Leuw, Cather and Ontario Hydro with regard to the tower at the C.P.R. Overhead were not yet known but it was assumed that a decision would be made this week.

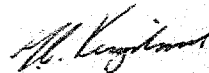
W.P. 10-69:

On this section of Highway 417 the sideroad lines for Hunt Club Road and Walkley Road have only just been finalized and have yet to be run in the field. Therefore, it is possible that, as for W.P. 13-68, further field work will have to be carried out at the structure locations when the sideroad lines have been run.

The following revised dates were suggested for W.P. 10-69:

- New lines run by February 9, 1972
- Additional Foundation field work by February 23
- Revised Site Plan date - March 8
- Revised Foundation Report date - May 3
- Revised Preliminary Bridge Drawing date - June 23
- Revised Bridge Design Completion date - October 4

Revised Pre-Contract Engineering dates for W.P. 13-68- & 10-69 will be circulated shortly by Mr. R. Forrest.



T. C. Kingsland  
Regional Bridge Planning Engineer

TCK/hl

c.c. -

/A. G. Stermac - Att. M. Devata

R. Forrest

C. S. Grebski - Att. K. Bassi

MINUTES OF MEETING HELD AT 3:00 P.M. ON JANUARY 6, 1972  
AT THE STRUCTURAL OFFICE, WEST BUILDING, DOWNSVIEW

Present: C.S. Grebski, Structural Office  
M. Devata, Foundation Office  
K.G. Bassi, Structural Office

69-F-32

1. C.N.R. Overhead Structures, 2.2 Miles S. of Innes Road, W.P. 10-69-030 and 10-69-040. Hwy. 417, District #9, Ottawa.

M.M. Dillon's proposal to use a closed-type structure was discussed. Mr. Bassi was of the opinion that such a structure would be acceptable if there was no differential settlement under all loading conditions between the piled footings and the soil underlying the steel strut. If there was any differential settlement, the steel strut would have to support the overlying soil and the railway loading. For a strut to support these loads, it would have to be quite massive.

Mr. Devata said that with the footing piles driven to bedrock, there would be settlement under the struts.

It was generally agreed that a closed-type structure as shown on Dillon's sketch SK-1 was not suitable at this location. Mr. Devata, however, agreed to analyse the closed abutment for slip circle failure. Mr. Grebski said that if the slip circle analysis showed the backfill to be unstable, that would eliminate the closed-type structure. However, if there was no stability problem, a meeting should be arranged with the consultant to discuss the problems associated with the differential settlement.

-----Action by M.Devata

2. Structure at the crossing of Hwy. #417 E.B.L. and Re-aligned Ramsay Ck. - Base Line Road Complex. W.P. 34-66-10, District #9, Ottawa.

Mr. Devata briefly explained the two schemes to relocate Base Line Road under the existing Hwy. #417 E.B.L. Structure over Ramsay Creek. Scheme 2 had been selected by others as it resulted in a better alignment of Base Line Road. The Structural Office agreed to review the design of existing Piers #2 and #3 in view of the additional horizontal and vertical loads imposed on these piers by the proposed roadway fill. ----- Action by K.G. Bassi

3. C.N.R. and Township Road Overhead - W.B. Lanes,  
W.P. 37-66-18, Site 31-294, Hwy.417, District #9, Ottawa.

The Structural and Grading Drawings at this crossing were reviewed in view of the letter from C.N.R. enclosed with Mr. Kingsland's memo of December 29, 1971. It was felt that Mr. Kingsland had adequately answered C.N.R. objections.

Mr. Devata could foresee no problems as the sensitive clay was to be removed and replaced with granular material. He did not think that the forward battered piles penetrating into the clay beyond the limits of subexcavation would create any problem.

It was agreed that the stations showing the limits of subexcavation and the forward toes of slopes should be shown on the grading drawings.----- Action by T.C.Kingsland



K.G. Bassi,  
Reg. Structural Design Engineer.

KGB:sr

c.c. C.S. Grebski  
M. Devata ✓  
T.C. Kingsland

MINUTES OF MEETINGHIGHWAY 417D.T.C. W.P. 10-69

69-F-32

DATE: November 2, 1971

PLACE: M.M. Dillon Ottawa Office Board Room

PURPOSE: To discuss scheduling of foundations investigations by D.T.C. forces.

PRESENT: T.C. Kingsland - Regional Bridge Planning Engr., DTC, Kingston  
M. Devata - Foundation Engr., D.T.C., Downsview  
J.H. Kearney, Project Manager, M.M. Dillon Ltd.  
B.P. Dowsley, Head Structural Dept., M.M.Dillon Ltd.

POINTS DISCUSSED:

1. It was agreed that DTC will place one hole at each structure location as soon as possible. The results from this drilling will be given to M.M.Dillon by about November 11th. M.M.Dillon will then establish the final location for all holes by November 16th. By that date the probable type of structure will be decided.
2. It was agreed that T.C. Kingsland should meet with M.M. Dillon about November 15th to discuss probable structure types.
3. T.C. Kingsland will forward to M.M. Dillon typical structures already built on 417.
4. It was noted that base plans are now being prepared by DTC Photogrammetry Section at a scale of 1"=40'. These will likely be ready by mid-December.
5. D.T. Surveys will produce the bridge site plans; probably in the third or fourth week of November.
6. T.C. Kingsland will arrange to have DTC Survey Party Chief in to see M.M. Dillon to get the location of the side roads i.e. Walkley Road and Hunt Club Road.

Distribution:

A.J. Percy - 1 copy  
T.C. Kingsland, D.T.C. - 1 copy  
M. Devata, D.T.C. - 1 copy  
M.M. Dillon - 2 copies

## DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

## MEMORANDUM

FILE  
R / W  
TO: Mr. A.G. Boucher,  
Mr. T.C. Kingsland,  
Mr. S.J. Markiewicz,  
Mr. A.J. Percy,  
Mr. L. Timson,  
Mr. J.W. Walker

FROM: Right-of-Way Branch,  
Kingston, Ontario.

ATTENTION:

DATE: October 18th, 1971.

OUR FILE REF.

IN REPLY TO

SUBJECT:

W.P. 13-68 and W.P. 10-69,  
Ramsayville Road to Ottawa Queensway,  
Hwy. 417, Gloucester Twp. & City of Ottawa

69-F-32

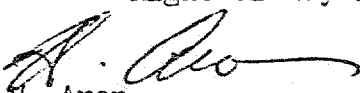
As you know, these are most urgent projects for which steps must be taken to prevent all avoidable delays.

Poor public relations can produce delays and other complications but poor public relations are avoidable.

To this end, I must ask you to stress with your own staff and any personnel providing services for you, including consultants, the need for good public relations.

The following are points which need to be observed:

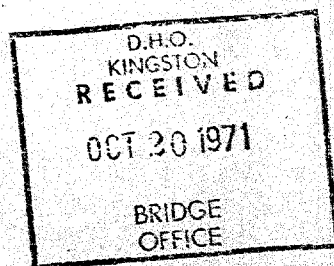
1. While permissions to enter will be secured from all property owners by the Right-of-Way Branch, it is the responsibility of each field crew to contact the owner, or tenant, of any lands upon which operations are to be carried out prior to the start of such operations. The nature and extent of these operations are to be explained at that time.
2. In those cases where equipment is to be taken into or across such lands, the wishes of those concerned are to be respected. (i.e. some owners specify routes to be followed, etc.).
3. Any holes dug in properties are to be filled in and left in a neat and tidy condition.
4. Steel fence posts must be planted beside all iron bars driven into agricultural lands so that such points may be readily seen at all times.
5. There may arise cases in which damage is unavoidable. The details of these cases are to be reported immediately, in writing, to the Right-of-Way Branch.

  
H. Aron  
RIGHT-OF-WAY MANAGER  
HA/mr

c.c:- J.L. Caldwell  
H.E. Forsyth

Copy made for: (TCK/hl: 21/10/71)

✓ Mr. M. Devata



## MEMORANDUM

69-F-32

TO: Mr. A. G. Stermac,  
Principal Foundation Engineer,  
Materials & Testing Office,  
Downsview, Ontario.

FROM: Materials & Testing Office,  
Kingston, Ontario.

ATTENTION:

DATE: April 16, 1970.

OUR FILE REF.

IN REPLY TO

SUBJECT: Hwy. 417, W.P. 13-68 and 10-69,  
Ramsayville to Ottawa Queensway,  
District 8, Kingston.

Functional Planning Section, Kingston Region,  
have requested that a study be made on the effect a depressed  
freeway would have on the surrounding land and buildings  
between Riverside Drive and Walkley Road.

In view of the nature of this problem, we would  
appreciate your section commenting directly to Planning on  
this aspect of their request. The Functional Planning  
Section will submit a profile, showing a proposed gradeline,  
to your office in the next week or so.

We will supply the remaining information requested  
on the attached memorandum.

*A. M. Batten*  
A. M. Batten,  
Senior Soils Supervisor.

JEG/AMB/jtk

c.c. G. A. Wrong  
A. J. Percy  
H. A. Meyer

## MEMORANDUM

SOILS	<input checked="" type="checkbox"/>	NOTE & FILE
ADP	<input type="checkbox"/>	NOTE & RETURN
CONC	<input type="checkbox"/>	RETURN WITH COMMENTS
AGTR	<input type="checkbox"/>	DISCUSS WITH ME
LAR	<input type="checkbox"/>	PLEASE ANSWER
	<input type="checkbox"/>	INVESTIGATE & REPORT
	<input type="checkbox"/>	TAKI APPROPRIATE ACTION

TO: Mr. J. E. Gruspier,  
Regional Materials Engineer,  
Kingston, Ontario.

FROM: Functional Planning Section,  
Kingston, Ontario.

ATTENTION: Mr. M. Batten

DATE: April 10, 1970.

OUR FILE REF.

IN REPLY TO

SUBJECT: W. P. 13-68 & 10-69, Hwy. 417, Ramsayville to Ottawa  
Queensway, District 9 - Ottawa


Further to our conversation of April 8th, 1970, enclosed are 1" = 200' and 1" = 400' mosaics showing our tentative line for the above-mentioned freeway. Could you please arrange to provide us with preliminary soils information for the section of freeway between Baseline Road and a point just north of the Ottawa Queensway. These limits are marked on the mosaics.

Unfortunately, at this time we cannot provide you with a preliminary grade for this scheme, however, as soon as a preliminary grade is available we will send you a copy. For the purposes of preliminary soils investigations, it is recommended that you use the grade shown in the Preliminary Foundations reports for the urban section of Highway 417 as a guide.

The report should indicate whether or not cut materials would be available for fill and what problems can be expected in handling the materials. A study should also be made on the effect a depressed freeway would have on the surrounding land and buildings, in view of the high water table in the area. It is desirable, from our point of view, to depress the freeway between Riverside Drive and Walkley Road as this will permit better intersections with the sideroads, allow a better crossing of the C.N.R. tracks between Alta Vista and Riverside, and also reduce noise levels on adjacent properties.

Could you please supply us with your preliminary report by June 5th, 1970. Your co-operation in this regard would be appreciated.

IW/AJP/mjh

  
A. J. Percy,  
Project Planning Engineer.

c. c. R. Forrest



Hwy. 401 & Keele St.,  
Downsview 464, Ontario.

Tel. 248-3282

(Area Code 416)

DEPARTMENT OF HIGHWAYS  
Materials and Testing Office

June 19, 1969

69-F-32

McRostie, Seto, Genest & Associates Ltd.,  
Consulting Engineers,  
373 Bell Street,  
Ottawa, Ontario.

Attention: Mr. A. Seto, P. Eng.

Dear Sir:

As agreed at a meeting between yourself and our Mr. B. T. Darch, held in your Ottawa Office on May 28, 1969, we are pleased to enclose a copy of our field logs for the borings put down at Sites A, A1, A2, B, B1, and C. These sites are located between Hawthorne Rd. and Wakely Rd. on the eastern outskirts of Ottawa. Borehole logs are presently being prepared on those sites west of Wakely Rd. As discussed, these will be made available to you in due course.

Mr. M. Devata, Supervising Foundation Engineer, and the writer will be in Ottawa the week of June 23rd, at which time we will contact you with regard to further co-ordination in the areas of mutual interest.

If we can be of any further assistance, please contact this Office.

Yours very truly,

*M. Devata*

BTD/MdeF  
Encls.

cc: Foundations Files  
Gen. Files

M. Devata,  
SUPERVISING FOUNDATION ENGR.  
For:  
A. G. Stermac,  
PRINCIPAL FOUNDATION ENGR.

MEMORANDUM

To: Mr. C.R. Robertson,  
Chairman,  
Ottawa Freeway Technical Advisory  
Committee.

FROM: Functional Planning Section,  
Kingston, Ontario.

ATTENTION:

DATE: May 15, 1969.

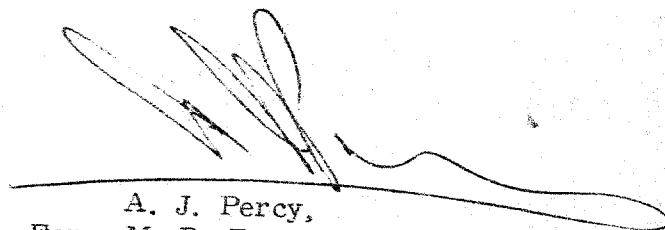
OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 13-68 and W.P. 10-69, Hwy. 417,  
Southeast Freeway, District 9 - Ottawa

69-F-32  
33  
34

This is to advise that the Foundation Section will carry out preliminary foundation investigations at the proposed structure locations on the above projects. It is expected that this work will commence on or about May 20th, 1969.



A. J. Percy,  
For: M. R. Ernesaks,  
Regional Functional Planning Engineer.

AJP/mjh

c. c. S. J. Markiewicz  
T. H. Dobbin  
M. Seymour  
K. G. McLean  
D. B. Buchanan & F. S. Marshall  
N. H. Orr  
A. Stermac ✓  
A. G. Boucher  
G. Scott

It is expected that the pavement design will consist of 12" of hot-mix over 6"-9" of G.B.C. Class 'A'. Our suggestions particularly in clay and silty soils will require additional depths of treatment, such as excavation to 3' and backfill with 6" G.B.C. Class 'A' and 30" of sandy borrow.

For your information.

H. A. Meyer

For J. H. Carter,  
Senior Soils Supervisor.

WAM/tek

1. E. Callaghan	0.0.
2. J. Harkins	0.0.
3. C. Stearns	0.0.
4. A. Wong	0.0.

Materials & Testing Office,  
Kingston, Ontario.

Mr. M. H. Krasinski,  
Regional Planning Branch,  
Kingston, Ontario.

May 1, 1970.

Mr. A. J. Percy.

Your memo dated April 10/70.

69-F-32

Mr. W. P. 13-68 & 10-69,  
Hemlockville to Ottawa Greenway,  
District 9, Ottawa.

Following have been issued:  
Preliminary Foundation Investigation reports for the

- W.1. 69-F-34 - Ottawa Greenway to Alta Vista Drive.
- W.1. 69-F-33 - Alta Vista Drive to Walkely Road.
- W.1. 69-F-32 - Walkely Rd. to Hawthorne Rd.
- W.1. 68-F-23 - Branch of McEwen Creek 1500' West of Baseline Road.

These foundation reports indicate the general subsoil  
conditions for these two projects.

We have previously indicated to you our comments about  
the out materials consisting of silt, clay, sandy silt and the  
clayey silt with sand and gravel with some bouldery sections.  
It is noted that the fill out sections consist of hard  
clayey silt with sand and gravel with some bouldery sections.  
Excavations in the fill sections are generally below the apparent  
ground water level. Although these fill materials are suitable  
for fill purposes, it is pointed out that excavation will be  
difficult and expensive and boulders will have to be removed.

Earth borrow could be acquired from the fill area in  
the vicinity of Hawthorne Road but the high water table and  
difficulty of excavation would likely discourage a contractor  
from the use of this fill material. It is more likely that the  
borrow will consist of silt fine sand located 3 - 4 miles  
east of Hemlockville or sand and gravel located at South Gloucester  
along Hwy. 31.

Gravel base course material will likely consist of  
G.B.C. Class 'A' only which will be acquired from quarries located  
at an average haul distance of approximately 7 miles.

THE REGIONAL MUNICIPALITY OF  
OTTAWA-CARLETON

233 Gilmour St., Ottawa 4, Ont., 237 7770

Roads Department

LA MUNICIPALITÉ RÉGIONALE  
D'OTTAWA-CARLETON

233 rue Gilmour, Ottawa 4, Ont., 237 7770

Département de la Voirie

May 20th, 1969.

69-F-32

Mr. C.R. Robertson,  
District Engineer,  
Ontario Department of Highways,  
530 Tremblay Road,  
Ottawa, Ontario.

Dear Sir:-

Re: Southeast Freeway - Highway 417

I am in receipt of a copy of the memorandum sent to you from Mr. A.J. Percy, in which he advises that the Ontario Department of Highways' Foundation Section will carry out preliminary foundation investigations at the proposed structure locations commencing on or about May 20th, 1969.

It is understood that this investigation will commence in the area in the vicinity of Highway 31 and the proposed Freeway route. I would request that we be advised a little more specifically as to the locations where these investigations will be carried out on a weekly or monthly basis, so that our Field Engineers may, if you will so permit, visit the various sites.

Yours truly,

  
G. Netherall,  
Roads Commissioner.

NHO:jd

INDEX	NOTE & FILE
MAINT.	DISCUSS WITH ME
DESIGN	PLEASE ANSWER
SERVICES	NOTE & RETURN TO ME
ACCOUNTS	INVESTIGATE & REPORT
STUD.	TAKEN APPROPRIATE ACTION
SIGNS & PERMITS	URGENT GET SUPPLY BEFORE MAILING



BOARD OF CONTROL

279-71

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CITY OF OTTAWA  
CANADA

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SECRETARY  
R. J. GORMAN, B.COM.

May 21st, 1969.

Mr. J.L. Forster,  
Regional Functional Planning Engineer,  
Ontario Department of Highways,  
Postal Bag 4000,  
Kingston, Ontario.

Dear Sir:

Re: South Ottawa Area - Soil Study

The Board has received a report of Stage I of the Study from Messrs. McRostie, Seto, Genest & Associates regarding a soil study of the South Ottawa Area. The Consultants have indicated, and the Board of Control has agreed, that it would be worthwhile if they were permitted to co-operate with your Department in the collection of soils data in this area, since your Department will be undertaking soils tests in connection with the Southeast Freeway Alignment, and co-operation between the City of Ottawa, through its Soils Consultants and your Department, would result in more efficient gathering of data at no additional cost to the City.

The Board has been pleased, therefore, to authorize Messrs. McRostie, Seto, Genest & Associates to co-operate with your Department in the collection of soils data in the area bounded by the railway on the north, Hawthorne Road on the east, the City limits on the south, and Albion Road on the west.

It would be appreciated if your Department would co-operate in this proposal. The Consultants have been advised of the Board's authority to co-operate with your Department in this matter.

Yours truly,

*R. J. Gorman*  
R. J. Gorman, per *sa*  
Secretary,  
Board of Control.

RJG/dh  
c.c. Mr. R.W. Borrowman

DEPARTMENT OF HIGHWAYS ONTARIO  
MEMORANDUM

69-F-32

To: Mr. A. G. Stermac,  
Principal Foundation Engineer,  
Downsview, Ontario.

From: Functional Planning Section,  
Kingston, Ontario.

ATTENTION:

DATE: May 30, 1969.

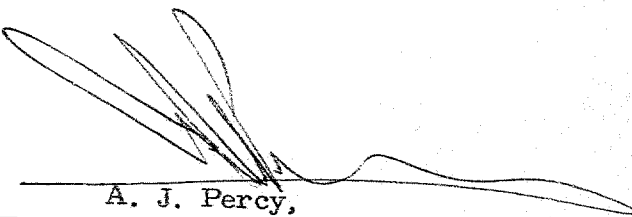
OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 13-68 & 10-69, Hwy. 417, Southeast Freeway,  
District 9 - Ottawa

Attached is a letter from Mr. G. Wetherall, Road Commissioner  
for the Regional Municipality of Ottawa-Carleton.

It would be appreciated if you would contact Mr. Wetherall to advise  
if site visits by his engineering staff would be permissable and the  
schedule of the drilling program.



For: A. J. Percy,  
M. R. Ernesaks,  
Regional Functional Planning Engineer.

AJP/mjh  
Att.

c. c. C. R. Robertson