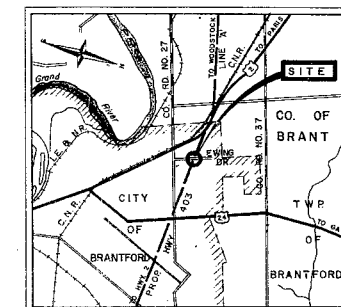
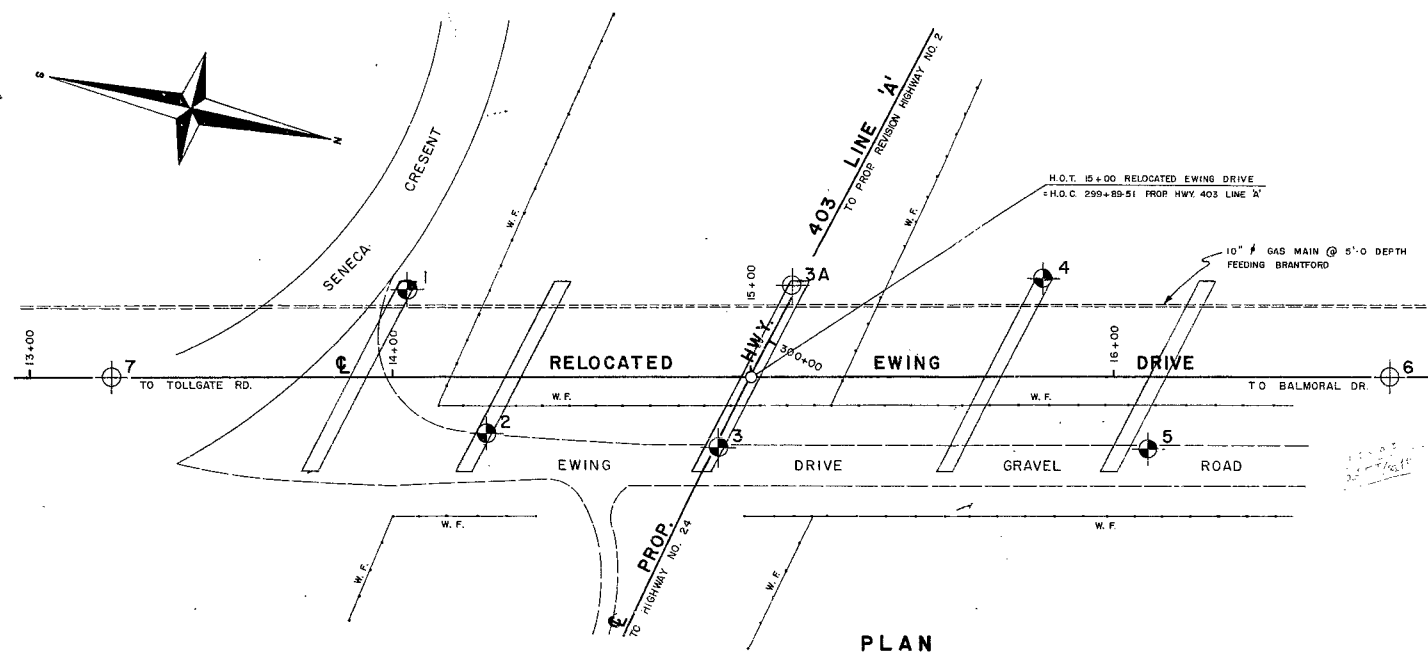


61-F-71

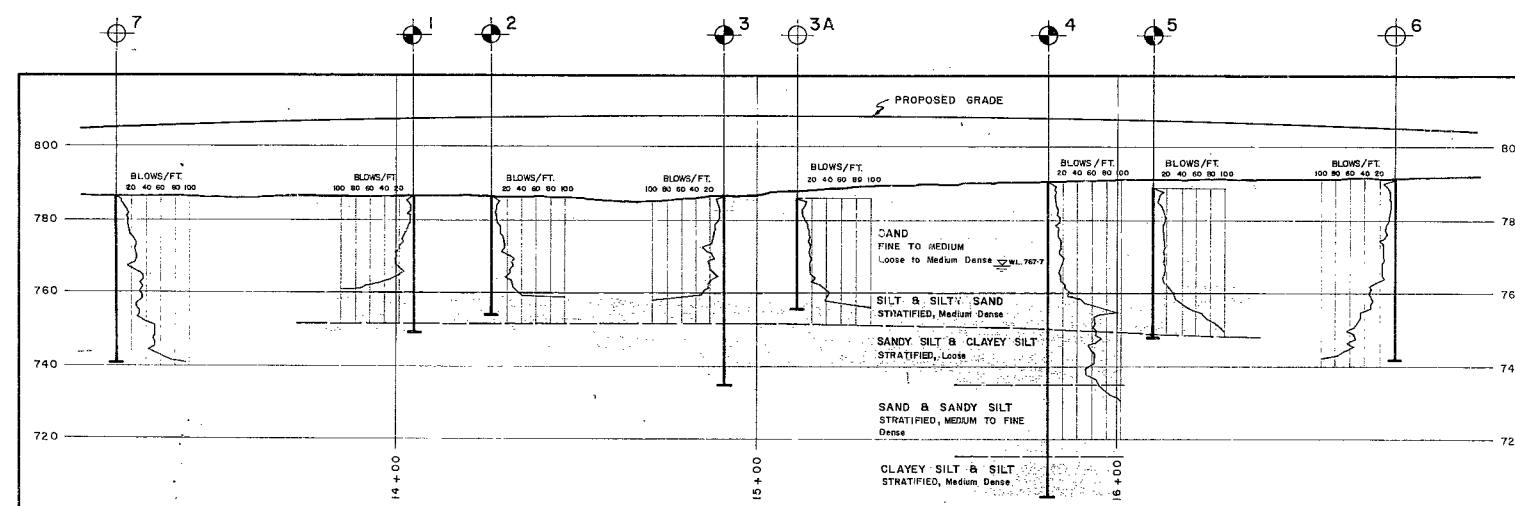
W.P. # 152-60

HWY. # 403

EWING DRIVE
RELOCATION.



KEY PLAN
SCALE: 1 inch = 1 mile



PROFILE

LEGEND			
	BORE & PENETRATION HOLE		
	BORE HOLE		
NO.	ELEVATION	STATION	OFFSET
1	786.8	14+04	24' LT.
2	786.9	14+26	15' RT.
3	786.8	14+90	19' RT.
3A	786.0	15+11	25' LT.
4	790.7	15+80	27' LT.
5	789.1	16+09	20' RT.
6	791.4	16+75	€
7	786.6	13+23	€

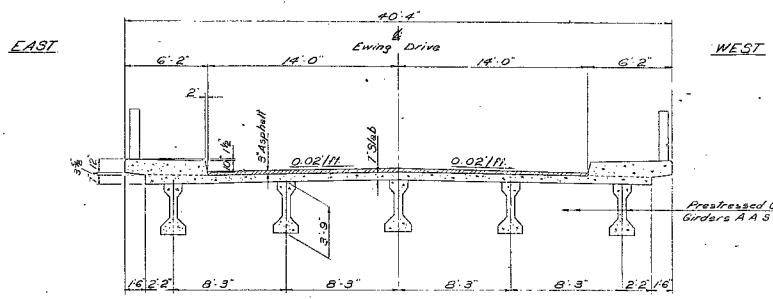
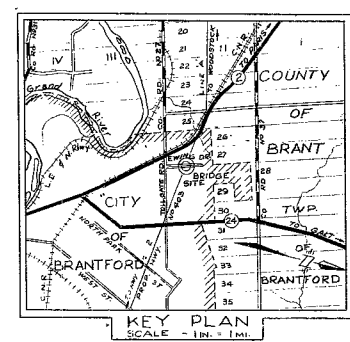
NOTE: Blows/Ft. obtained from Dynamic Cone Penetration Tests

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION

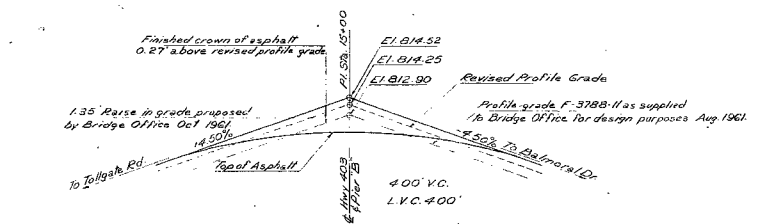
RELOCATED EWING DRIVE
AND
PROPOSED HIGHWAY NO. 403
LINE A

ORIGINATED I. HOLUBEC	DISTRICT NO. 4	DATE 9 AUGUST 1961
DRAWN D. MUMFORD	W.P. NO. 52-60	JOB NO. 61-F-71
CHECKED <i>[Signature]</i>	SCALE	DRAWING NO.
APPROVED <i>[Signature]</i>	1 inch = 20 feet	61-F-71A

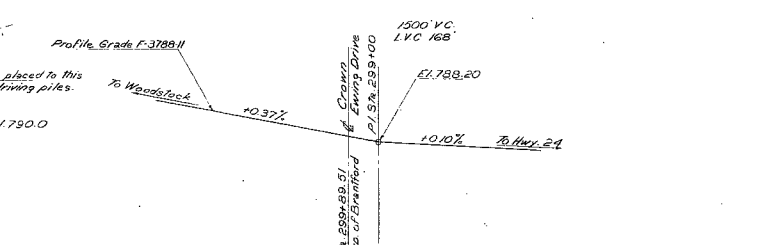
SHEET No.	TOTAL SHEETS
1	1



TYPICAL DECK SECTION
Scale: 3/8" = 1'-0"



PROFILE-EWING DRIVE
N.T.S.



PROFILE-HWY 403
N.T.S.

SKREW DATA
28° 7' 15"

Sw.	0.4713326
Co.	0.8915555
Tan.	0.5394177
Sec.	1.1338440

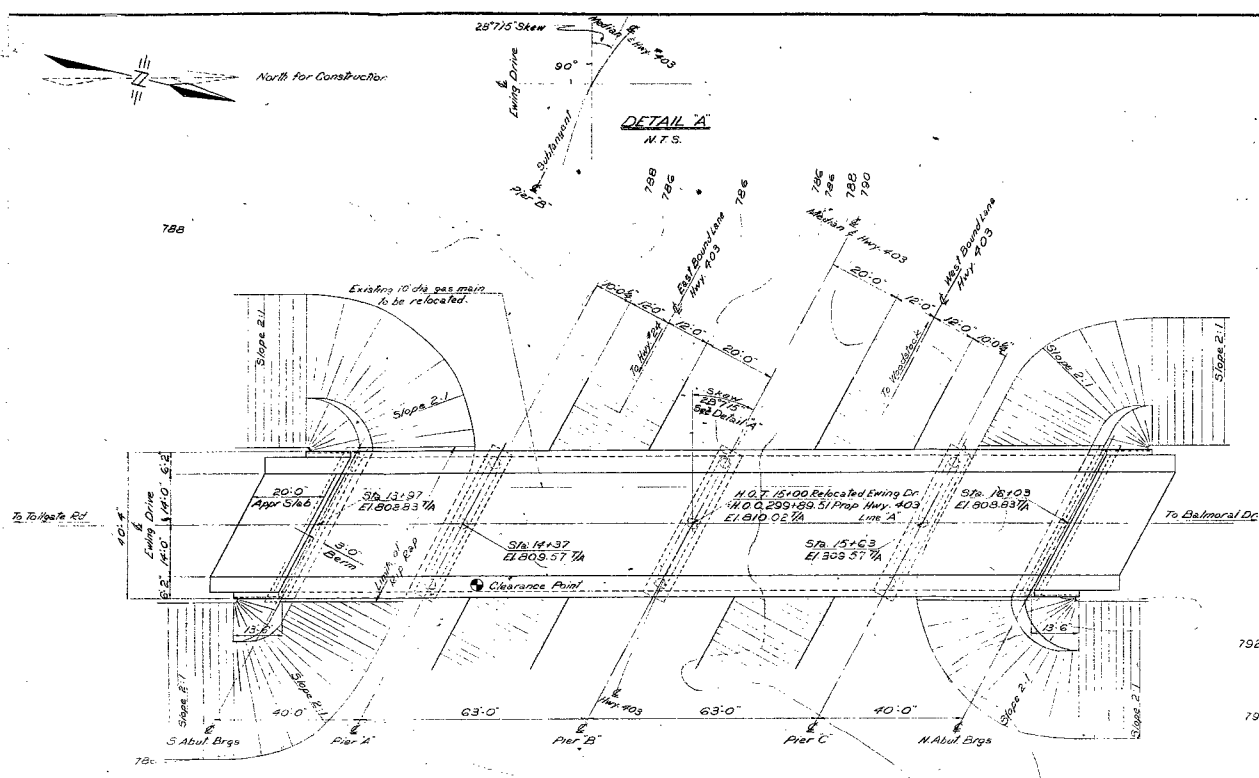
HWY 403 LINE A HORIZONTAL CURVE DATA

Δ	5° 51' 10"
D	0° 30' 40"
R	11439.16
T	385.42
L	770.56
E	6° 48'
Tangent Runout	200'
Sta. B.C.	292+24.00
Sta. E.C.	299+94.56

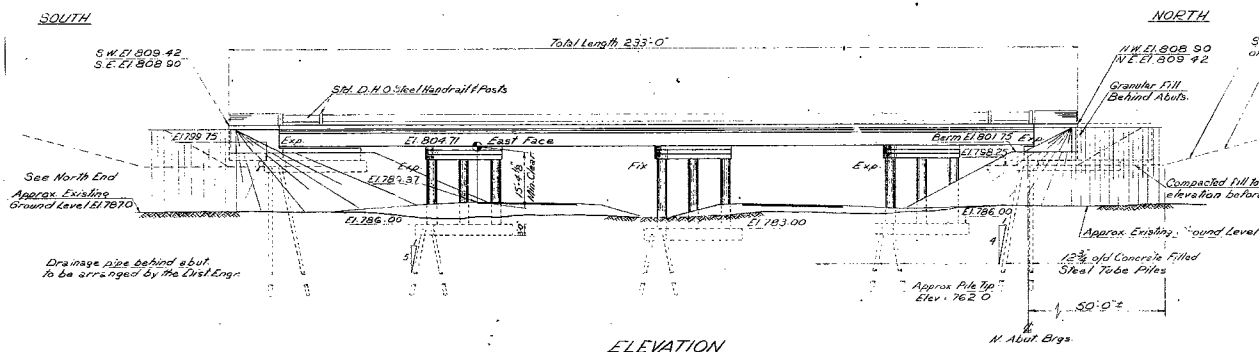
NOTE: ASSUMPTIONS

- The finished grade at the profile control point of Hwy 403 is 0.5' above the profile grade as shown on profile F-3788-II.
- Full superlevation of 0.0211/ft. is obtained by revolving the travel lanes of Hwy 403 about the edges of pavement adjacent to the median in the length of the tangent runout of 200 ft.

TYPICAL SECTION - HWY 403 ON HORIZONTAL CURVE
N.T.S.



PLAN
Scale: 1" = 20'-0"



ELEVATION
Scale: 1" = 20'-0"

61-F-71
Sob

REVISIONS			
DATE	BY	DESCRIPTION	

DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION			
EWING DRIVE UNDERPASS			
0.3 MILES WEST OF HWY #24			
KING'S HIGHWAY No. 403		DIST. No. 4	
CO. Brant		LOT 27 CON. II	
TWP. Brantford			
PLAN & ELEVATION (PRELIMINARY)			
APPROVED	DESIGN ENGINEER	SITE No. F-3982-1	W.P. No. 132-60
DESIGN W.B.A.	CHECK	CONTRACT No.	
DRAWING F.V.W.	CHECK W.S.A.	DRAWING No.	D-4930-PI
DATE OCT. 1961	LOADING	DATE	

Mr. A. H. Toye,
Bridge Engineer.
Materials & Research Section,
(Foundations Office).

August 17, 1961.

D.H.C. FOUNDATION INVESTIGATION
REPORT
W.J. 61-F-71 -- W.F. 152-60.

attention: Mr. S. McCoshie.

Re: Relocated Swing Drive and the Proposed
King's Hwy. No. 403 Line 'A', Brantford.
District #4.

Accompanying this memo, is our detailed foundation
report on the subsoil conditions existing at the above site.

We believe you will find the conclusions and recom-
mendations summarized in the report, adequate for your future
design work.

If, however, further clarification is required,
please feel free to contact our Office.

AGS/Adaf
Attach.

A. G. Sterns
A. G. Sterns,
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. A. H. Toye (2)
H. A. Tregaskes
H. D. McMillan
I. C. Campbell
J. C. Thatcher
J. Roy
T. J. Kovich
J. E. Crispier
R. R. Saint
F. Norman
A. Watt

Foundations Office ✓
Gen. Files.

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 - 4.2 Fine to Medium Sand.
 - 4.3 Stratified Fine Sandy Silt to Clayey Silt.
 - 4.4 Stratified Clayey Silt.
 5. GROUND WATER OBSERVATIONS:
 6. DISCUSSION AND RECOMMENDATIONS:
 7. SUMMARY:
 8. MISCELLANEOUS:
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Foundation Investigation

at
Relocated Ewing Drive and The
Proposed King's Hwy. No. 403
Line 'A' Brantford.
W.P. 152-60 -- W.J. 61-F-71
District #4

1. INTRODUCTION:

It is proposed to construct a structure, flyover, where the relocated Ewing Drive crosses proposed Hwy. #403, Line 'A'. The site of the proposed structure is located in the north western section of the City of Brantford where Ewing Drive crosses the abandoned C. N. R. bed.

An investigation was carried out by this section for the purpose of determining the soil properties in order to decide on the type of foundation for the four-span structure. Results and the discussions of the field investigation, as well as conclusions and recommendations for the future design work, are contained in this report.

2. DESCRIPTION OF SITE AND GEOLOGY:

The proposed structure is parallel to, and west of the present Ewing Drive and crosses the proposed Hwy. No. 403 which is situated on the abandoned C. N. R. railway bed. In the vicinity of this abandoned railway and existing roads, Ewing Drive and Seneca Cres., the underlying subsoil appears to have been unevenly compacted. Due to this variable compaction the subsoil

2. DESCRIPTION OF SITE AND GEOLOGY: (Cont'd.) ...

has variable relative densities.

The area in the vicinity of the crossing has a flat topography and is well drained. The ground is covered with weeds.

The site lies in the northern extremity of the Norfolk Sand Plain. This Sand Plain is a large deltaic deposit laid down by glacial melt waters which drained into glacial lakes Whittlesey and Warren.

The Norfolk Sand Plain consists of sand and silt beds up to 75 ft. deep with an average depth of 30 ft. The sand plain is usually underlain by silt and clay strata.

3. FIELD INVESTIGATION PROCEDURE:

Five sampled boreholes with dynamic cone penetration tests adjacent to each and three additional dynamic cone penetration tests at other locations were carried out at this site. The densities of the cohesionless materials were determined by means of Standard Penetration Tests. Samples recovered in the Split Spoon were used for classification purposes.

In B.H. No. 4 the casing was left in position for 24 hours after the completion of drilling. During this period the water level had stabilized itself at elevation 767.7. In B.H.'s No. 1 and 2 cave-ins were observed at this elevation after the removal of casing. In view of these facts it is

Cont'd. /3 ...

3. FIELD INVESTIGATION PROCEDURE: (Cont'd.) ...

assumed that the water table over the whole site is at elevation 767.7.

Samples were visually examined and classified at the site.

The locations and elevations of boreholes are shown on site plan, Drawing 61-F-71A.

4. SUBSOIL CONDITIONS:

4.1 General.

The stratigraphy of the soil at the site was found to be uniform, the top 25 to 30 ft. being fine to medium sands of medium relative density and the underlying soil being fine sandy silts to clayey silts of medium dense to dense relative density.

The detailed description of the soil types encountered in the borings are shown in Appendix I of this report. The estimated stratigraphical profile of Drawing No. 61-F-71A is based on this information.

The subsoil consists of the following strata:

- (i) Fine to medium sand
- (ii) Stratified fine sandy silt to clayey silt
- (iii) Stratified clayey silt

4.2 Fine to medium sand.

The stratum of fine to medium sand extends to depths of 25 ft. in B.H. No. 1 to 30 ft. in B.H. No. 5. The relative

Cont'd. /4 ...

4. SUBSOIL CONDITIONS: (Cont'd.) ...

4.2 Fine to medium sand. (Cont'd.) ...

density of this stratum is medium dense and increases with depth except for a decrease between 15 and 20 ft.

B.H.'s No. 1, 2, 3 and 5 were located on roads and the first 1 ft. was sandy gravelly base course. B.H. No. 4 was located on a field with a topsoil cover of $\frac{1}{2}$ ft. Oxidization of soil was found to a depth of 5 ft.

4.3 Stratified fine sandy silt to clayey silt.

Stratified fine sandy silt to clayey silt underlying the sands was found in all boreholes. A thickness of 50 ft. of this stratum, to elevation 714.0, was established in B.H. No. 4. The stratifications vary from fine sand and silty fine sand ($\frac{1}{2}$ " to 2" thick) to sandy silt and clayey silt ($\frac{1}{8}$ " to $\frac{1}{2}$ " thick). The average density of this material was found to be medium at B.H.'s No. 1, 2, 3, and 5 and loose in B.H. No. 4.

The recorded Standard Penetration values varied from a maximum of 100 blows/ft. in B.H. No. 1 to a minimum of 6 blows/ft. in B.H. No. 4.

4.4 Stratified Clayey Silt.

This stratum was found in B.H. No. 4 from 75.0' to 86.5' which was the end of the borehole. This material consists of stratifications of grey clayey silt ($\frac{1}{4}$ " to 1" thick) and grey silty clay ($\frac{1}{4}$ " to 1" thick). This stratified material is very stiff with Standard Penetration Resistance of 28 and 17 blows/ft.

5. GROUND WATER OBSERVATIONS:

Ground water level was established in B.H. No. 4 by leaving casing in the borehole for 24 hours after drilling. The water level was found to be steady at 23 ft., elevation 767.7. Also cave-ins in B.H.'s No. 1 and 2 occurred at this elevation substantiating this ground water elevation.

6. DISCUSSION AND RECOMMENDATIONS:

Two alternative foundation designs are proposed:

- (a) Spread Footings
- (b) Pile Foundation

(a) Spread Footings.

In the case of spread footings, a structure with simply supported spans with provision for jacking in the event of excessive settlement is recommended. With this type of foundation a safe maximum load of $1\frac{1}{2}$ tons per square foot can be employed. The subsoil being sand, the settlement will occur during construction.

The footings of the piers should be placed 5 ft. below the ground surface, at approximate elevation of 782.0', to provide for frost protection. The footings for the abutments may be placed on granular fill in the approaches, compacted to 100% modified proctor density, extending at least 10 ft. horizontally from the sides of the footing. The fill should be constructed with 2:1 slopes.

All grading work at the structure location apart from

(a) Spread Footings. (Cont'd.) ...

final trimming, should be completed before any footing excavation is carried out. Fill should be placed at 100% modified proctor density to the full height of the profile grade for a distance of at least 50 ft. behind the abutments, then re-excavated for the footings.

(b) Pile Foundation.

As an alternative, the structure may be supported by 12"Ø tube (displacement) piles. It is estimated that a safe bearing load of 35 tons per pile may be achieved at a depth of 25 ft. over most of the site. In the west half of the two most northerly footings, however, it may be necessary to drive some piles to a greater depth (possibly 50 ft.) because of the less dense subsoil. Pile driving in the field should be controlled by the use of the Hiley Formula to determine the exact depth for each pile for a design load of 35 Tons.

The subsoil being sand, no stability or settlement problems are expected on the approach embankments.

Ground water was located at an elevation of 767.7' and it should not present any problems during construction.

Note: A 10"Ø gas main was found 10' west of, and running parallel to, relocated Ewing Drive. This gas main will have to be relocated before any construction.

7. SUMMARY:

The site of the proposed structure is located on the Norfolk Sand Plain. In this area the deltaic fine to medium sand is 25 ft. to 30 ft. thick. This is underlain by

7. SUMMARY: (Cont'd.) ...

stratified fine sandy silt and clayey silt.

Two alternative foundation designs are presented in this report. Spread footings with a maximum load of 1½ tons per square foot and tube (displacement) pile foundation with an estimated safe bearing load of 35 tons per pile achieved at a depth of 25 ft. In the event of the use of spread footings, the fill for the approaches must be completed before any construction on the footings is started.

The ground water level being at 767.7', no water problems in construction are anticipated.

The subsoil being fine to medium sand, no stability problems for the approaches are anticipated.

8. MISCELLANEOUS:

The field work was carried out from July 25 to August 1, 1961, by the Dominion Soil Investigations Ltd., using BX casing and a diamond core drill adapted for soil testing. The work was supervised by I. Holubec for the Ontario Department of Highways.

REPORT PREPARED BY: *I. Holubec*
I. Holubec,
Project Foundation Engineer

August 1961.

REPORT APPROVED BY: *A. G. Stermac*
A. G. Stermac,
Supervising Foundation Engr.

APPENDIX I.

SUMMARY OF FIELD & LABORATORY TESTS

JOB 61-F-71

W.P. 152-60

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS/FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
1	S1	2.5'-4'	Sand, fine to medium.	3						
	S2	5.5'-7'	- " -	4						
	S3	10'-11.5'	- " -	10						
	S4	15'-16.5'	- " -	41						
	S5	20'-21.5'	- " -	39						
	S6	25'-26.5'	Fine sandy silt, stratified.	100						
	S7	30'-31.5'	- " -	83						
	S8	35'-36.5'	- " -	35						
2	S1	3'-4.5'	Sand, fine to medium.	3						
	S2	6'-7.5'	- " -	8						
	S3	10'-11.5'	- " -	13						
	S4	15'-16.5'	- " -	23						
	S5	20'-21.5'	- " -	14						
	S6	25'-26.5'	Fine sandy silt, stratified.	37						
	S7	30'-31.5'	- " -	40						

SUMMARY OF FIELD & LABORATORY TESTS

JOB 61-F-71

W.P. 152-60

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
3	S1	3'-4.5'	Sand, fine to medium.	8						
	S2	6'-7.5'	- " -	9						
	S3	10'-11.5'	- " -	9						
	S4	15'-16.5'	- " -	11						
	S5	20'-21.5'	- " -	4						
	S6	25'-26.5'	Fine sandy silt, stratified.	11						
	S7	30'-31.5'	Fine sandy silt to clayey silt stratified.	49						
	S8	35'-36.5'	Fine sandy silt, stratified.	40						
	S9	40'-41.5'	Fine sandy silt to clayey silt, stratified.	20						
	S10	45'-46.5'	Silty fine sand, stratified.	38						
	S11	50'-51.5'	- " -	59						
3A	core penetration only									
4	S1	3'-4.5'	Sand, fine to medium.	10						
	S2	6'-7.5'	- " -	11						
	S3	10'-11.5'	- " -	11						
	S4	15'-16.5'	- " -	15						
	S5	21.5'-23'	- " -	2						

SUMMARY OF FIELD & LABORATORY TESTS

 JOB 61-F-71

 W.P. 152-60

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS/FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
4	S6	25'-26.5'	Sand, fine to medium.	4						
	S7	30'-31.5'	Fine sandy silt to clayey silt, stratified.	11						
	S8	35'-36.5'	Fine sandy silt, stratified.	14						
	S9	40'-41.5'	- " -	8						
	S10	45'-46.5'	Fine sandy silt to clayey silt, stratified.	6						
	S11	50'-51.5'	Silty fine sand.	11						
	S12	55'-56.5'	- " -	9						
	S13	60'-61.5'	- " -	40						
	S14	65'-66.5'	- " - , stratified.	24						
	S15	70'-71.5'	- " - , stratified.	59						
	S16	75.5'-77'	Clayey silt, stratified.	28						
	S17	85'-86.5'	Silty clayey, stratified.	17						
5	S1	5'-6.5'	Sand, fine to medium.	8						
	S2	10'-11.5'	- " -	12						
	S3	15'-16.5'	- " -	19						
	S4	20'-21.5'	- " -	26						
	S5	25'-26.5'	- " -	22						

SUMMARY OF FIELD & LABORATORY TESTS

JOB 61-F-71
W.P. 152-60

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS/FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
5	S6	30'-31.5'	Fine sandy silt, stratified.	30						
	S7	35'-36.5'	- " -	33						
	S8	40'-41.5'	- " -	22						
6-7	cone penetration only									
			S denotes split spoon sample.							

DEPARTMENT OF HIGHWAYS - ONTARIO

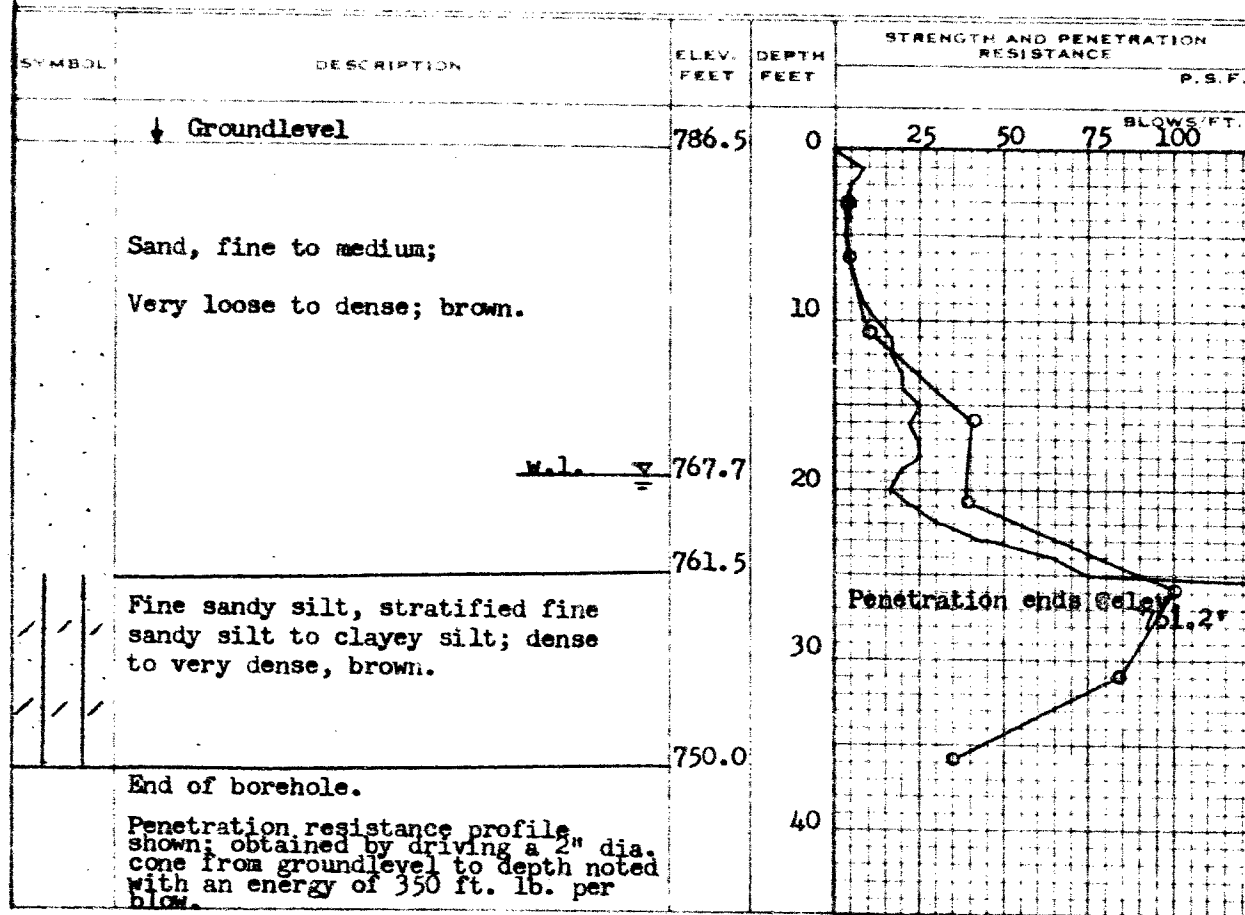
MATERIALS AND RESEARCH SECTION

W.P. 152-60 BORE HOLE NO. 1
 JOB 61-F-71 STATION 14+04 (24' It.)
 DATUM 786.5' COMPILED BY B.K.
 BORING DATE July 25/61. CHECKED BY I.H.

2" DIA. SPLIT TUBE
 2" SHELBY TUBE
 2" SPLIT TUBE
 2" DIA. CONE
 2" SHELBY
 CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) — O
 VANE TEST (C) AND SENSITIVITY (S) — +
 NATURAL MOISTURE AND LIQUIDITY INDEX — LI
 LIQUID LIMIT — X
 PLASTIC LIMIT —



CONSISTENCY	SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT		
	S1	-
	S2	-
	S3	-
	S4	-
	S5	-
	S6	-
	S7	-
	S8	-

DEPARTMENT OF HIGHWAYS - ONTARIO

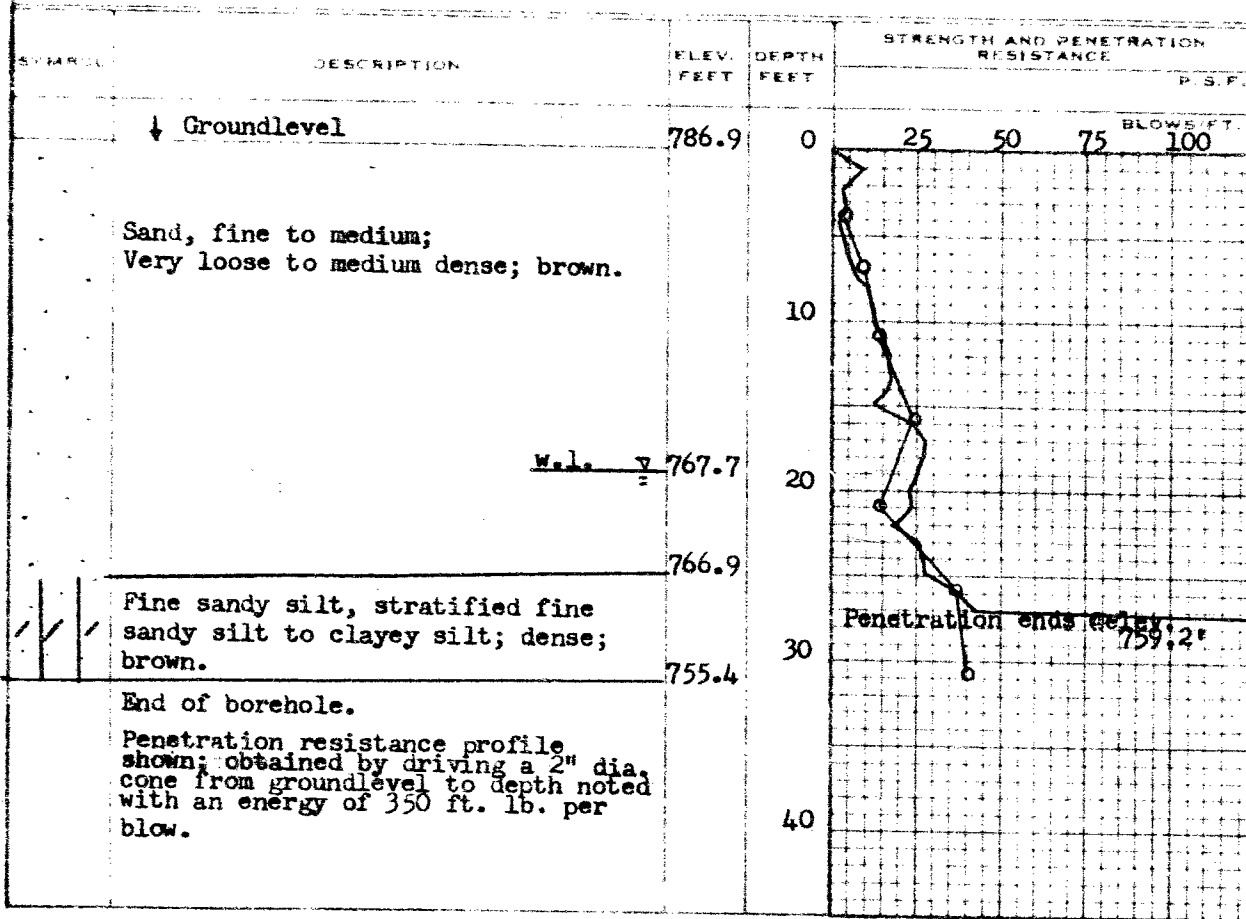
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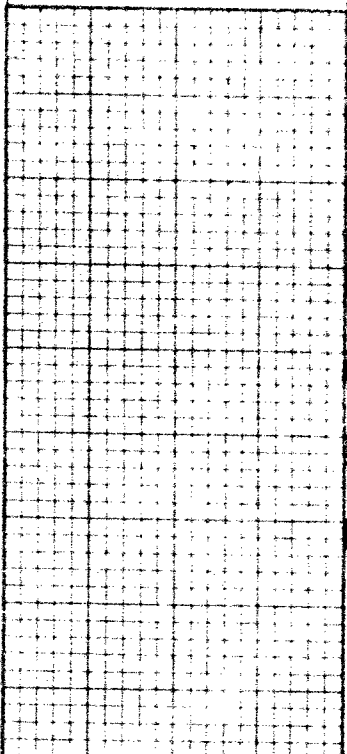
W.P. 152-60 BORE HOLE NO. 2
 JOB 61-F-71 STATION 14+26 (15' Rt.)
 DATUM 786.9' COMPILED BY B.K.
 BORING DATE July 26/61. CHECKED BY I.H.

2" DIA. SPLIT TUBE
 2" SHELBY TUBE
 2" SPLIT TUBE
 2" DIA. CONE
 2" SHELBY
 CASING

LEGEND

1/2 UNCONFINED COMPRESSION (QU) O
 VANE TEST (C) AND SENSITIVITY (S) +
 NATURAL MOISTURE AND LIQUIDITY INDEX LI
 LIQUID LIMIT X
 PLASTIC LIMIT



CONSISTENCY		SAMPLE	NATURAL UNIT WT G.C.F.
MOIST. CONTENT - % DRY WT.			
		S1	-
		S2	-
		S3	-
		S4	-
		S5	-
		S6	-
		S7	-

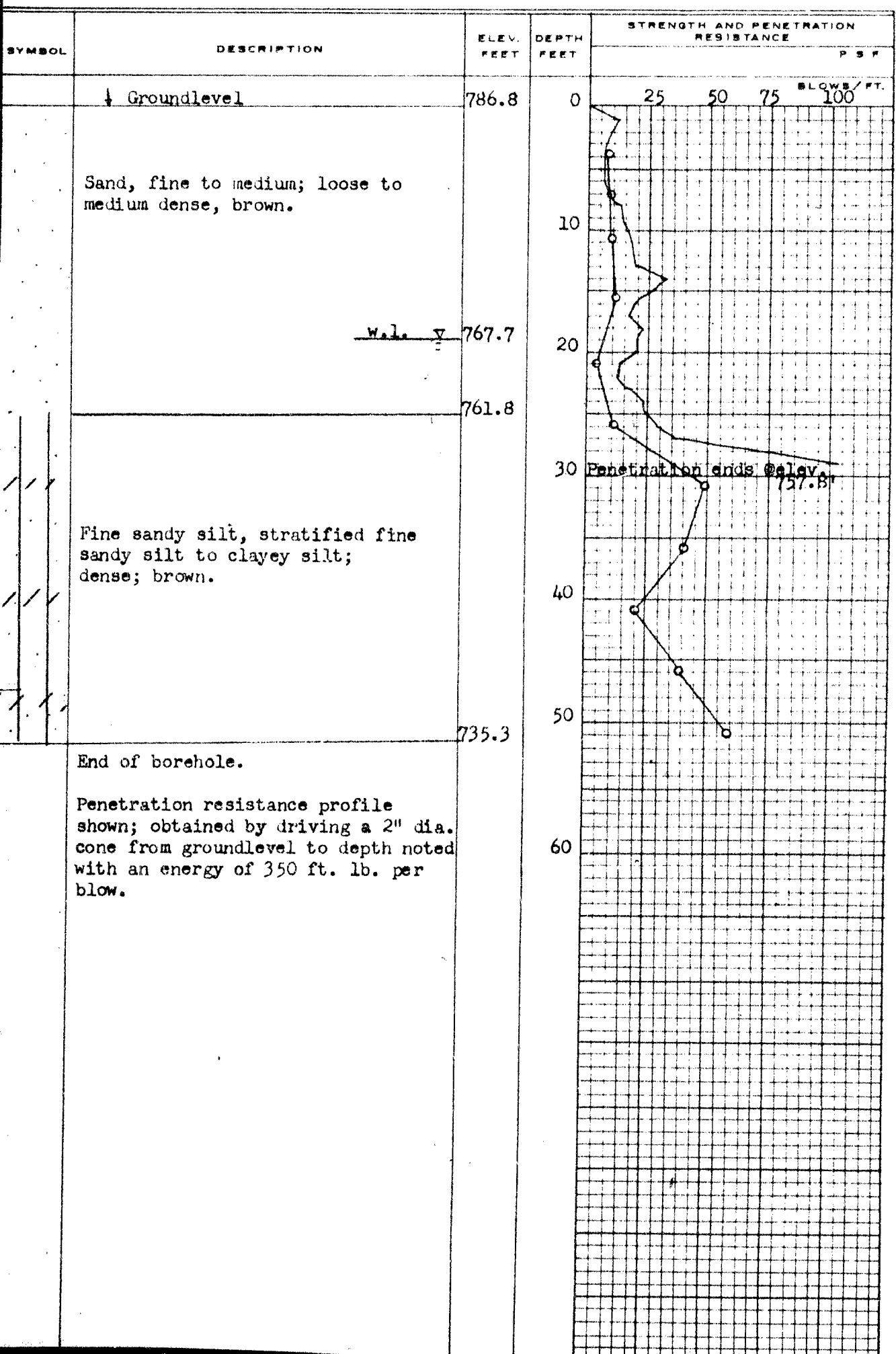
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 152-60 BORE HOLE NO. 3
JOB 61-F-71 STATION 14+90 (19' Rt.)
DATUM 786.8' COMPILED BY B.K.
BORING DATE July 27/61 CHECKED BY I.H.

2" DIA SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) O
VANE TEST (C) AND SENSITIVITY (S) +S
NATURAL MOISTURE AND LIQUIDITY INDEX LI
LIQUID LIMIT X
PLASTIC LIMIT -



CONSISTENCY	SAMPLE	NATURAL UNIT WT. R C F.
MOIST. CONTENT - % DRY WT.		
	S1	-
	S2	-
	S3	-
	S4	-
	S5	-
	S6	-
	S7	-
	S8	-
	S9	-
	S10	-
	S11	-

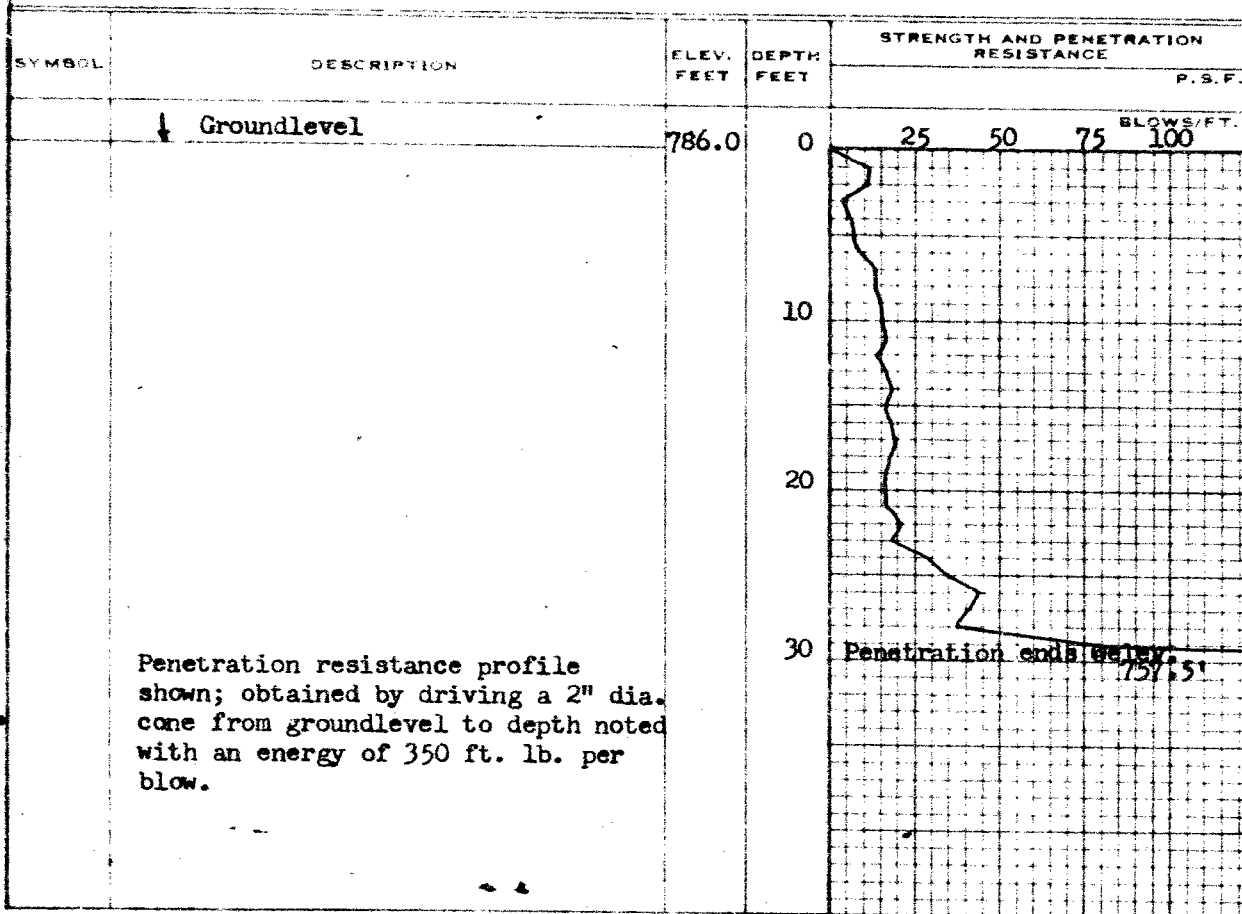
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 152-60 BORE HOLE NO. 3A
JOB 61-F-71 STATION 15411 (25' Lt.)
DATUM 786.0' COMPILED BY B.K.
BORING DATE July 27/61. CHECKED BY I.H.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Q_u) — 0
VANE TEST (C) AND SENSITIVITY (S) — +
NATURAL MOISTURE AND — LI
LIQUIDITY INDEX — 2
LIQUID LIMIT — —
PLASTIC LIMIT — —

[illegible]

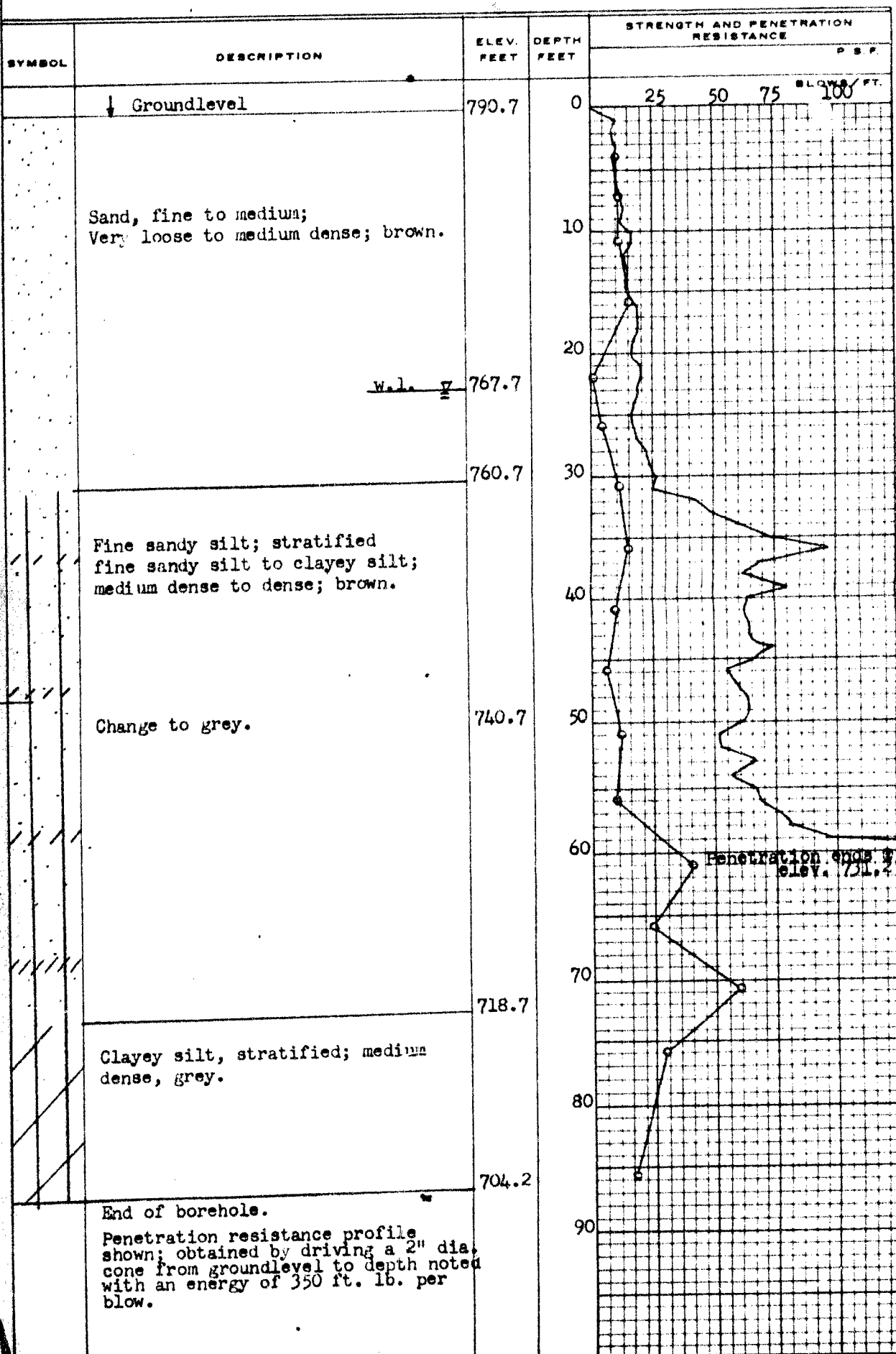
DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS AND RESEARCH SECTION

W.P. 152-60 BORE HOLE NO. 4
 JOB 61-F-71 STATION 15/80 (27' Lt.)
 DATUM 790.7' COMPILED BY B.K.
 BORING DATE July 28/61 CHECKED BY I.H.

2" DIA SPLIT TUBE
 2" SHELBY TUBE
 2" SPLIT TUBE
 2" DIA CONE
 2" SHELBY
 CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) 0
 VANE TEST (C) AND SENSITIVITY (S) +s
 NATURAL MOISTURE AND LIQUIDITY INDEX LI
 LIQUID LIMIT x
 PLASTIC LIMIT 10



CONSISTENCY		SAMPLE	NATURAL UNIT WT. P. C. F.
MOIST. CONTENT - % DRY WT.			
		S1	-
		S2	-
		S3	-
		S4	-
		S5	-
		S6	-
		S7	-
		S8	-
		S9	-
		S10	-
		S11	-
		S12	-
		S13	-
		S14	-
		S15	-
		S16	-
		S17	-

DEPARTMENT OF HIGHWAYS - ONTARIO

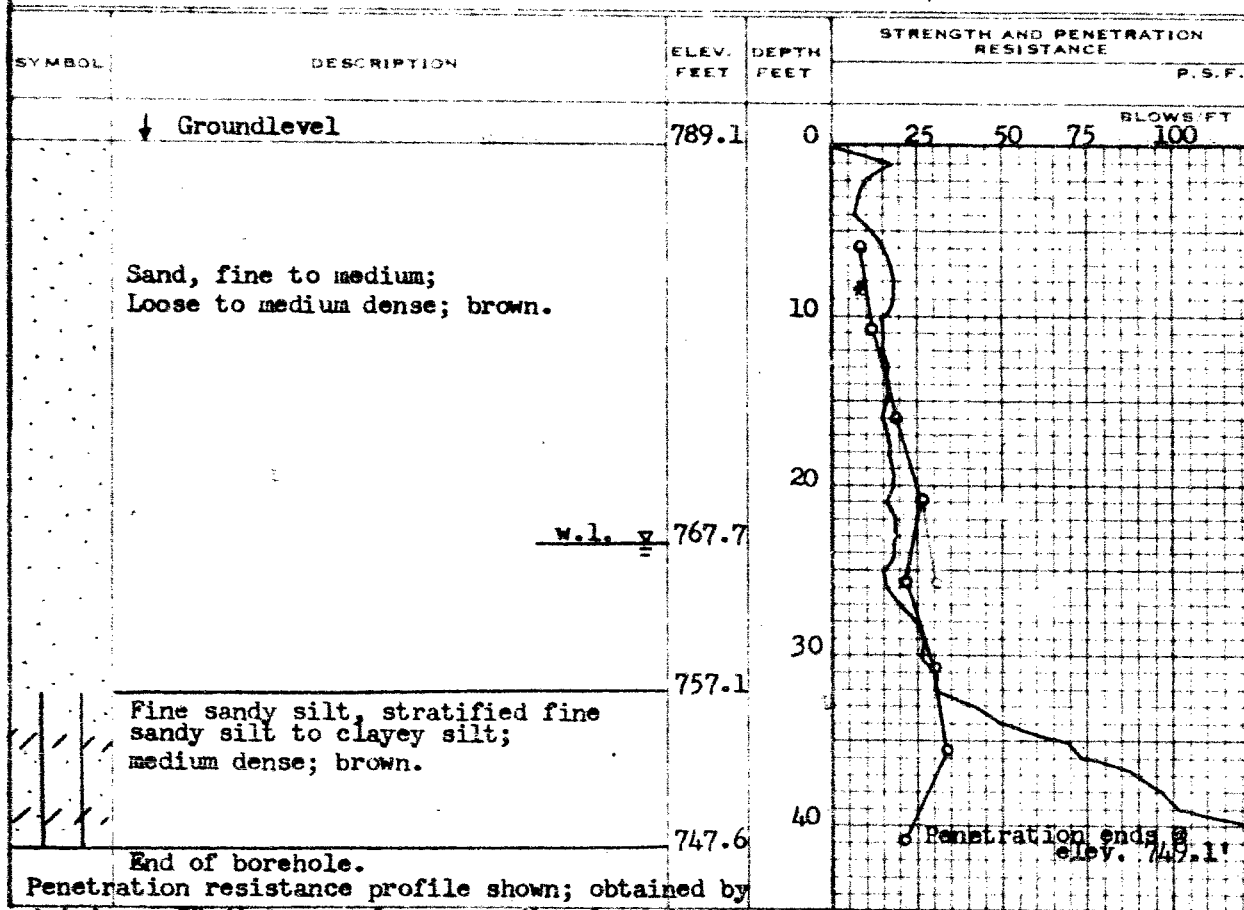
MATERIALS AND RESEARCH SECTION

W.F. 152-60 BORE HOLE NO. 5
 JOB 61-F-71 STATION 16+09 (20' Rt.)
 DATUM 789.1' COMPILED BY B.K.
 BORING DATE July 31/61 CHECKED BY I.H.

2" DIA. SPLIT TUBE
 2" SHELBY TUBE
 2" SPLIT TUBE
 2" DIA. CONE
 2" SHELBY
 CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Q_u)
 VANE TEST (C) AND SENSITIVITY (S)
 NATURAL MOISTURE AND LIQUIDITY INDEX
 LIQUID LIMIT
 PLASTIC LIMIT



CONSISTENCY	SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.		
	S1	-
	S2	-
	S3	-
	S4	-
	S5	-
	S6	-
	S7	-
	S8	-

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

W.P. 152-60 BORE HOLE NO. 6
JOB 61-F-71 STATION 16775
DATUM 791.4' COMPILED BY B.K.
BORING DATE Aug. 1/61 CHECKED BY I.H.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CORE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu)	0
VANE TEST (C) AND SENSITIVITY (S)---	+5
NATURAL MOISTURE AND	LI
LIQUIDITY INDEX -----	x
LIQUID LIMIT -----	0
PLASTIC LIMIT -----	0

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE	
				P. S. F.	
	↓ Groundlevel	791.4	0	25	50 75 100
			10		
			20		
			30		
			40		
			50	Penetration ends Elev. 742.4	

Penetration resistance profile shown; obtained by driving a 2" dia. cone from groundlevel to depth noted with an energy of 350 ft. lb. per blow.

[illegible]

W.F. 152-60 BORE HOLE NO. 7
JOB 61-F-71 STATION 13+23.8
DATUM 786.6' COMPILED BY B.K.
BORING DATE Aug. 1/61 CHECKED BY I.H.

2" DIA. SP. TUBE
2" SHELBY TUB
2" SPLIT TUB
2" DIA. CONC.
2" SHELBY
CASING

1/2 UNCONFINED COMPRESSION (QU)	0
VANE TEST (C) AND SENSITIVITY (S)	+8
NATURAL MOISTURE AND	
LIQUIDITY INDEX	21
LIQUID LIMIT	
PLASTIC LIMIT	0

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE	
				F. S. F.	
	↓ Groundlevel	786.6	0	25	50 75 100
			10		
			20		
			30		
			40		
			50		

Penetration resistance profile shown; obtained by driving a 2" dia. cone from groundlevel to depth noted with an energy of 350 ft. lb. per blow.

Penetration ends elev. 740.6

[illegible]

Mr. A. M. Toye,
Bridge Engineer.

September 26, 1961.

ADDITIONAL INFORMATION -

Materials & Research Section,
(Foundations Office).

Attention: Mr. Chris. Bassi.

Re: Relocated Ewing Drive and the Proposed
King's Hwy. No. 403, Line 'A', Brantford.
District #4.

In response to your verbal inquiry about the above-mentioned bridge, we are submitting the following additional information for your consideration:-

In case spread footings for either the abutments or piers, or both, are used, stage construction is recommended. A minimum necessary period of 3 months is recommended to be allowed to elapse between the completion of the approach fill construction and the start of the bridge footings construction.

If spread footings for abutments are used, great care should be taken to assure that the required fill compaction is achieved. It should be specified that the approach fill be constructed in such a manner that 100% of density as per present D.H.O. practice is achieved. In the special provisions, it should be specified that every layer in the immediate abutment footing area (this area should be shown on drawing), be tested for density by the D.H.O. supervising personnel. Any failure to comply with this requirement could have very serious consequences.

If the above recommendations are followed and the necessary requirements fulfilled, a semi-continuous design can be chosen.

For the piers, a safe load of 1.5 T/sq.ft., as outlined in the report, can be used, while for the abutment footings, this load can be increased to 2.0 T/sq.ft.

cont'd. /2 ...

If granular material is available and reasonably priced, its use in the area, as specified earlier, is preferred because the required density can be more easily obtained and the material is less susceptible to various unfavourable influences, thus making it easier for the contractor and the supervising personnel.

If piles are chosen, the type, depth and allowable loads, as outlined in the report, should be used for design purposes.

We believe that this memo will answer your questions. However, we feel that some further consultations will be required when the design reaches a more advanced stage. Please feel free to call on our Office whenever additional information, or explanation is required.

AGS/MdeF

A. G. Stermac
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Mr. B. Davis

Foundations Office
Gen. Files.

Mr. A. M. Toye,
Bridge Engineer.
Materials & Research Section,
(Foundations Office).

September 26, 1961.

ADDITIONAL INFORMATION -
(W.P. 152-60) - W.J. 61-F-71

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cont'd. /2 ...

[Handwritten initials: J/K]

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AGS/MdeF

A. G. Sternac
A. G. Sternac,
PRINCIPAL FOUNDATION ENGINEER

cc: Mr. B. Davis

Foundations Office
Gen. Files. ✓