



ONTARIO

DEPARTMENT OF HIGHWAYS

Memo to Mr. H. Lamont Date March 4, 1955.  
Bridge Engineer. Subject Foundation Investigation  
From Mr. F. C. Brownridge, Mat. Laboratory. Q.E.W. at Junction of Highway #2.

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Attached are two copies of the report for the subsurface soil investigations for the proposed structure and approaches.

Your attention is directed especially to the data concerning the following:

- (1) The structure foundations due to probable uneven settlement should be supported on bedrock for the proposed rigid frame structure.
- (2) Short concrete columns are suggested between the footings and bedrock for the above purpose.
- (3) The portion of the approach fill south of Station 7+80 will be over a swamp area where peat to a depth of 26 feet was found in borehole 7. A similar depth of peat was also found in borehole 5 which seems to indicate a fault in the bedrock in this vicinity.
- (4) Further investigation is required to determine the limits of the deep peat unless the line can be diverted.
- (5) Treatment of this deep peat will definitely be required for normal construction to proceed.

FCB:OD

  
F. C. Brownridge  
Materials & Research Engineer.

cc: Mr. J. Walter  
Mr. R. E. Richardson  
Mr. G. Farantatos.

1 COPY FORWARDED TO L. LOCH

# INDEX

	<u>Page</u>
Introduction	1
Procedure	1
Soil Conditions	1
Analysis of Results and Recommendations	2
Conclusion	4
Appendix I	

Report on  
Foundation Investigation  
for  
The Bridge Footings and Approaches  
of  
The Proposed Structure  
at  
The Intersection of Highway #2  
and Queen Elizabeth Highway

Copies to: Mr. H. Lamont  
Bridge Engineer (2)

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Project P-54-8

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File (1)

## Introduction

An overpass bridge and a cloverleaf system are proposed at the intersection of the Queen Elizabeth Highway and Highway #2, near the navigation channel between Lake Ontario and Hamilton Bay.

A subsoil investigation was therefore carried out at the above site to determine the nature and characteristics of the soil so that the most suitable foundation method for the bridge, and the best solution for the slope stability of the approaches could be adopted.

## Procedure

The investigation started on the 8th of June and terminated on the 14th of August 1954.

Altogether fourteen boreholes were made; four of which were made in connection with the bridge footing; the other ten boreholes were made with respect to the stability of the approaches.

Cone penetration tests were first made close to each of the boreholes so that a preliminary idea of the underlying soil could be secured before actual boring and sampling was started.

The location and elevation of the penetration holes and boreholes, together with the encountered strata, are shown in Plan No. F-54-8A and Appendix I. The cross-section along various boreholes are shown in Appendix II.

## Soil Conditions

For the bridge foundation on the north side of Highway No. 2, boreholes No. 3 and 12 indicate that a layer of light to medium clay extending to the ground surface overlies the bedrock, which was found to exist between the depths of 12.6' and 9.3' respectively. The unconfined compressive strength of this material varies from 2,000 pounds per square foot to 5,000 pounds per square foot.

Soil Conditions (Cont.)

On the south side of Highway #2, boreholes No. 4 and 11 show that the soil consists of sandy loam and sandy clay overlying bedrock which was found to exist between the depths of 12.0' and 12.2' respectively.

The soil conditions on the approaches to the bridge structure were investigated by boreholes No. 5,6,7,8,9,10,13, and 14. Boreholes made on the south approach of the Queen Elizabeth Highway, show that soil condition here is rather irregular. The profile of the bedrock along the proposed line "B" is found to drop at about station 7+80 for about 24 feet. Swamp exists on one side of this line as shown in plan No. F-54-8A. In the swamp is a 26 foot layer of peat which is very compressible and with a water content as high as 200 per cent.

ANALYSIS OF TEST RESULTS AND RECOMMENDATIONS(a) Bridge Structure

Boreholes No. 3,4,11 and 12 provide necessary information for the design of the footings of the bridge. This data has already been given to Mr. L. Lock of the Bridge Office.

Consolidation tests reveal that the probable settlement on the north abutment is about 3.5 inches. For the south abutment the settlement was computed to be only one-half inch. The proposed structure being a rigid frame, the three inches of differential settlement will be excessive. Since bedrock is found at about 7 feet below the proposed footing elevation, it is advisable that the foundations be carried down to bedrock. Laboratory tests made on rock core samples show that 10 tons per square foot allowable bearing capacity may be adopted for the bedrock.

The wing walls of the bridge could either be founded on the clay stratum or bedrock. If they are founded on the clay stratum a joint connection should be constructed, allowing the wing wall to slide along the abutment.

(a) Bridge Structure (Cont.)

An possible foundation method for the whole structure would be by short auger holes to bedrock, filled with concrete. These would then act as short concrete piles.

(b) Approach Embankments

A major proportion of the south approach is founded on swamp with the underlying soil being peat.

The cohesion value of this material is only 140 pounds per square foot which is too low to be determined with any reliability. Slope stability calculations show that for this peat material a fill of 7 feet on a 1:3 slope would give a safety factor of 1.2 against sliding.

A fill as high as 14 feet could be constructed on this type of material if a berm 80 ft. wide and 7 ft. high is used. The cohesion value of the peat will increase with time as the material will consolidate with time. Two years or more would have to elapse before the remaining 6 feet of fill could be safely placed. A period of five to six years after completion of the embankment would elapse before settlement would be sufficiently complete to allow the placing of a permanent surface. In the interval temporary surfaces which can be repaired to relieve differential settlement would be required. It is suggested that the peat be subexcavated and backfilled with granular material, or other suitable material.

The peat could possibly be stabilized by the installation of a system of vertical sand drains. If it is desired to use this method a design can be prepared showing the required spacing and depths together with the working platform.

The possibility of diverting the location to miss the swamp should be investigated also. If this cannot be done further boring should be made to determine the extent of the peat deposit to the south.

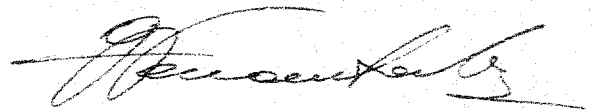
Conclusion

On account of the compressibility of the clay on the north approach, it is recommended that the structure should be founded on bedrock.

The peat occurring on the south approach should be removed or stabilized with sand piles, if construction is to proceed at a normal pace, and without excessive settlement

F. C. Brownridge  
Materials & Research Engineer

Per:



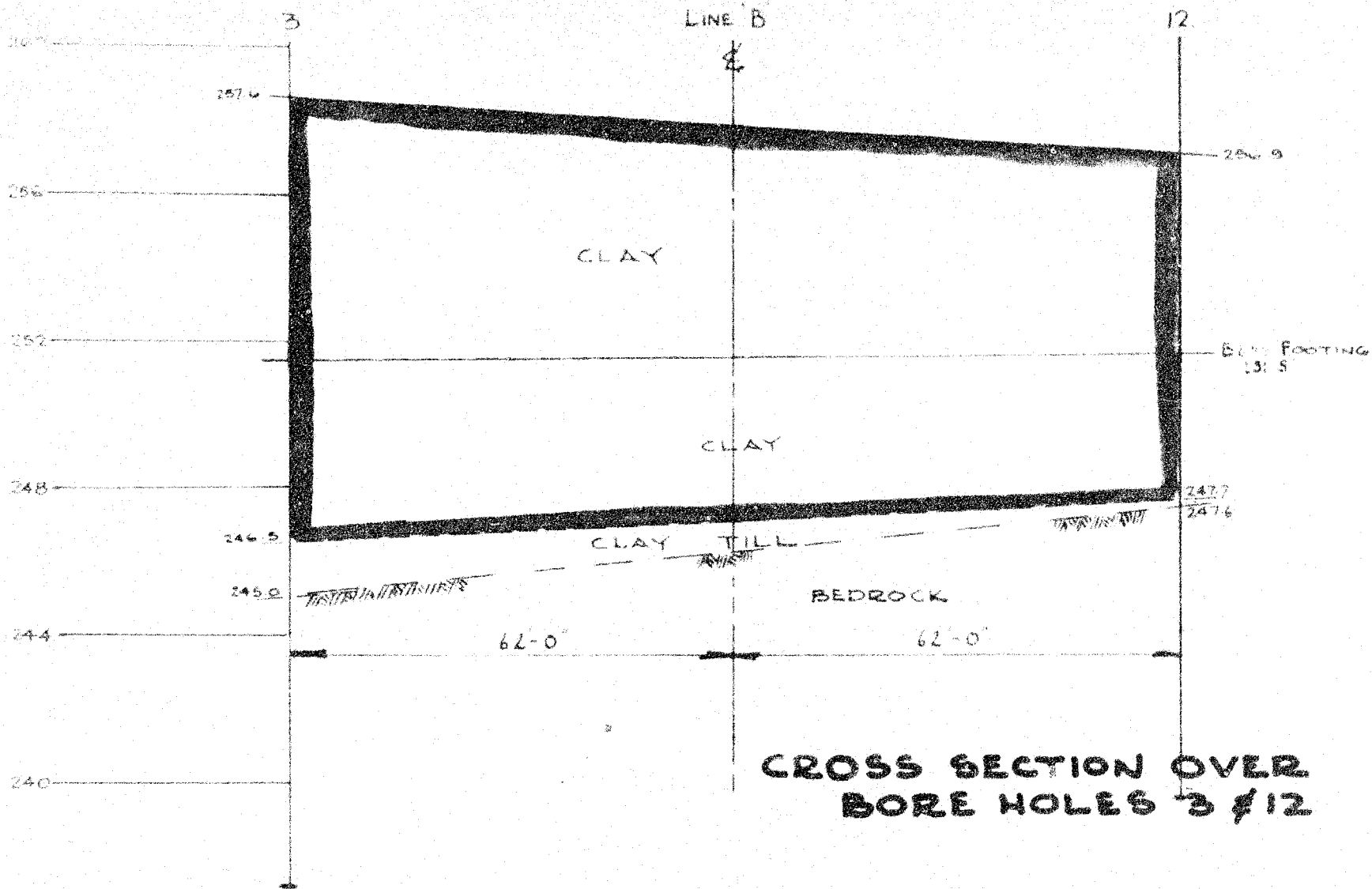
(G. Farantatos)

GF:OD







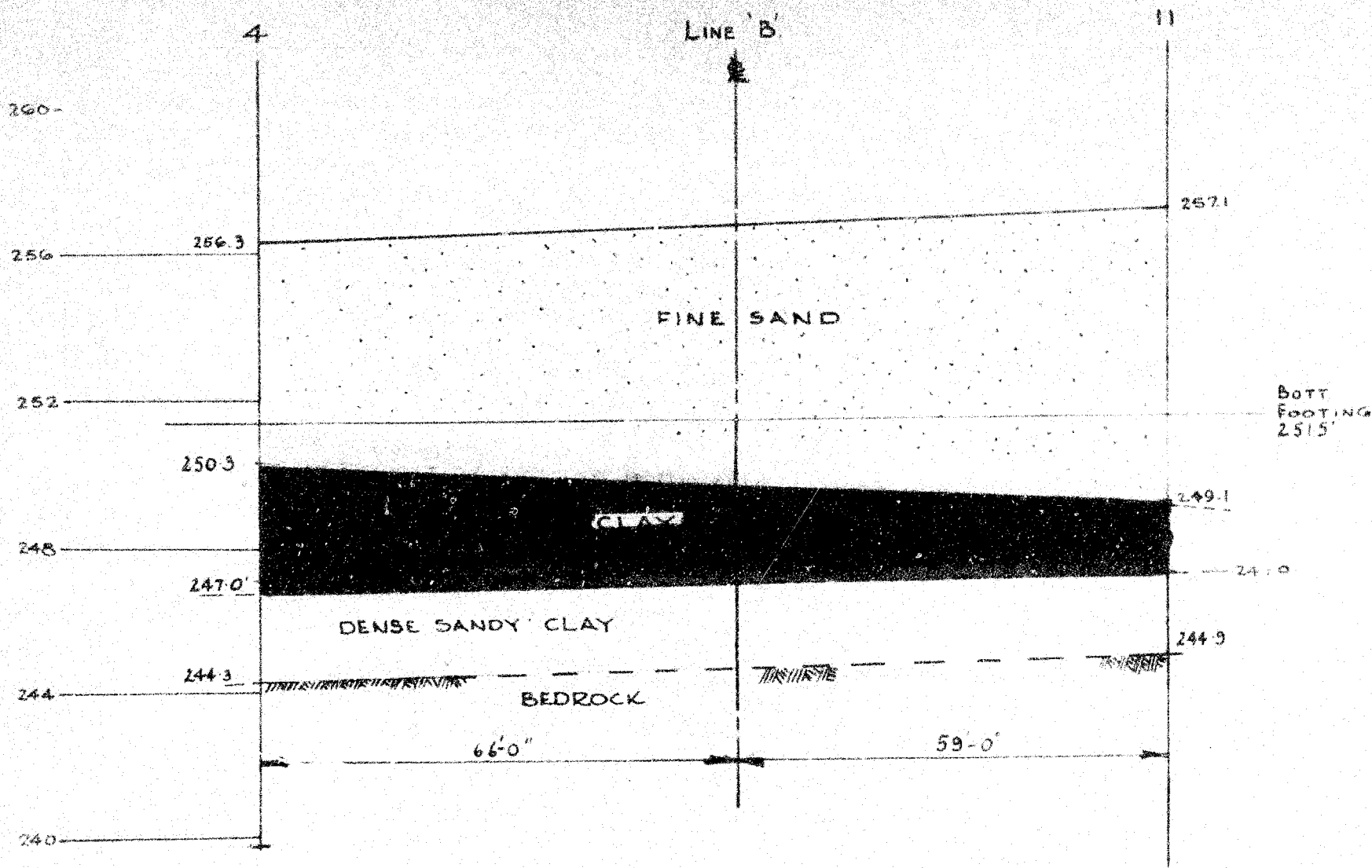


**CROSS SECTION OVER  
BORE HOLES 3 & 12**

SCALE

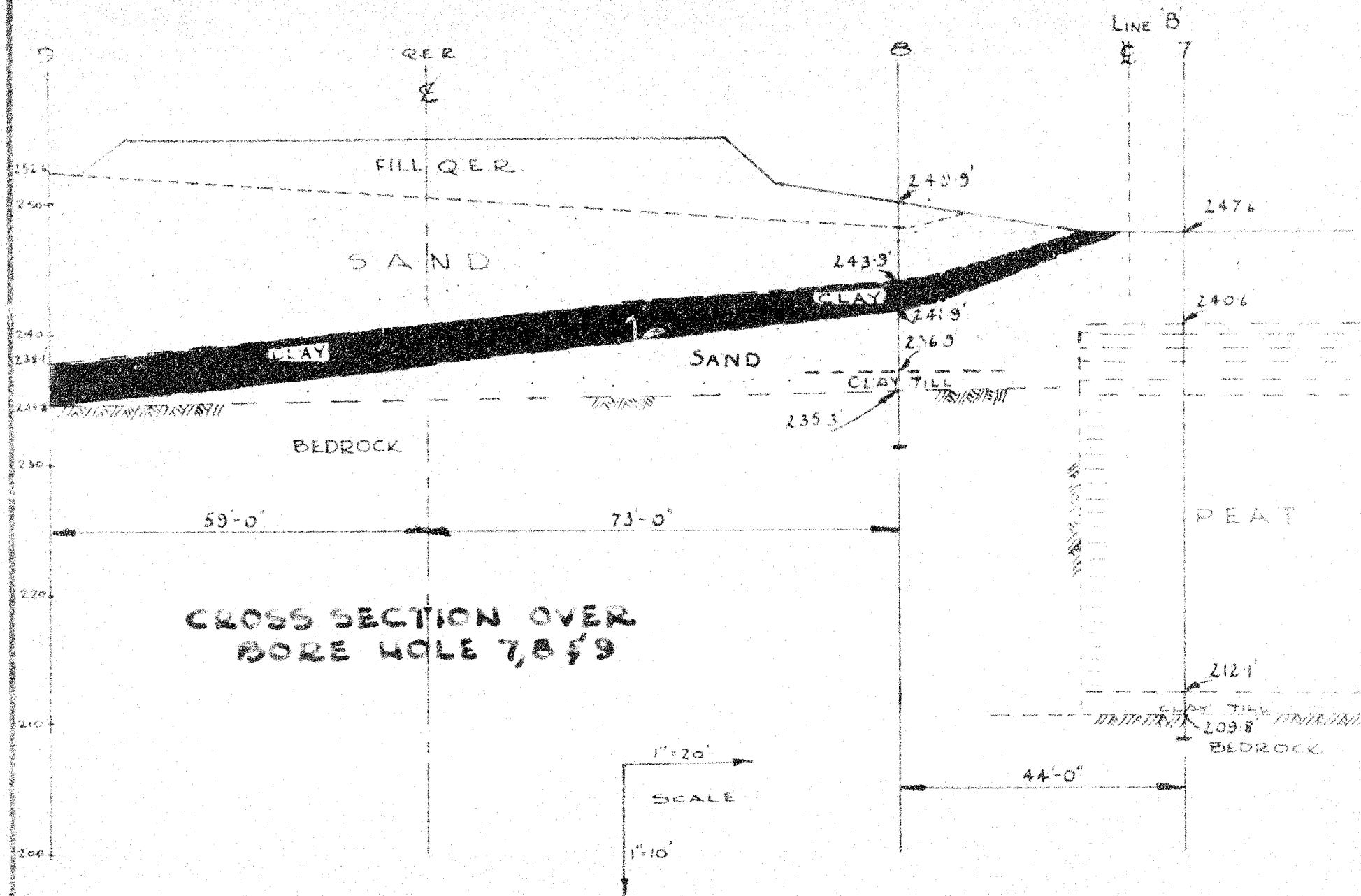
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VERTICAL 1" = 4'

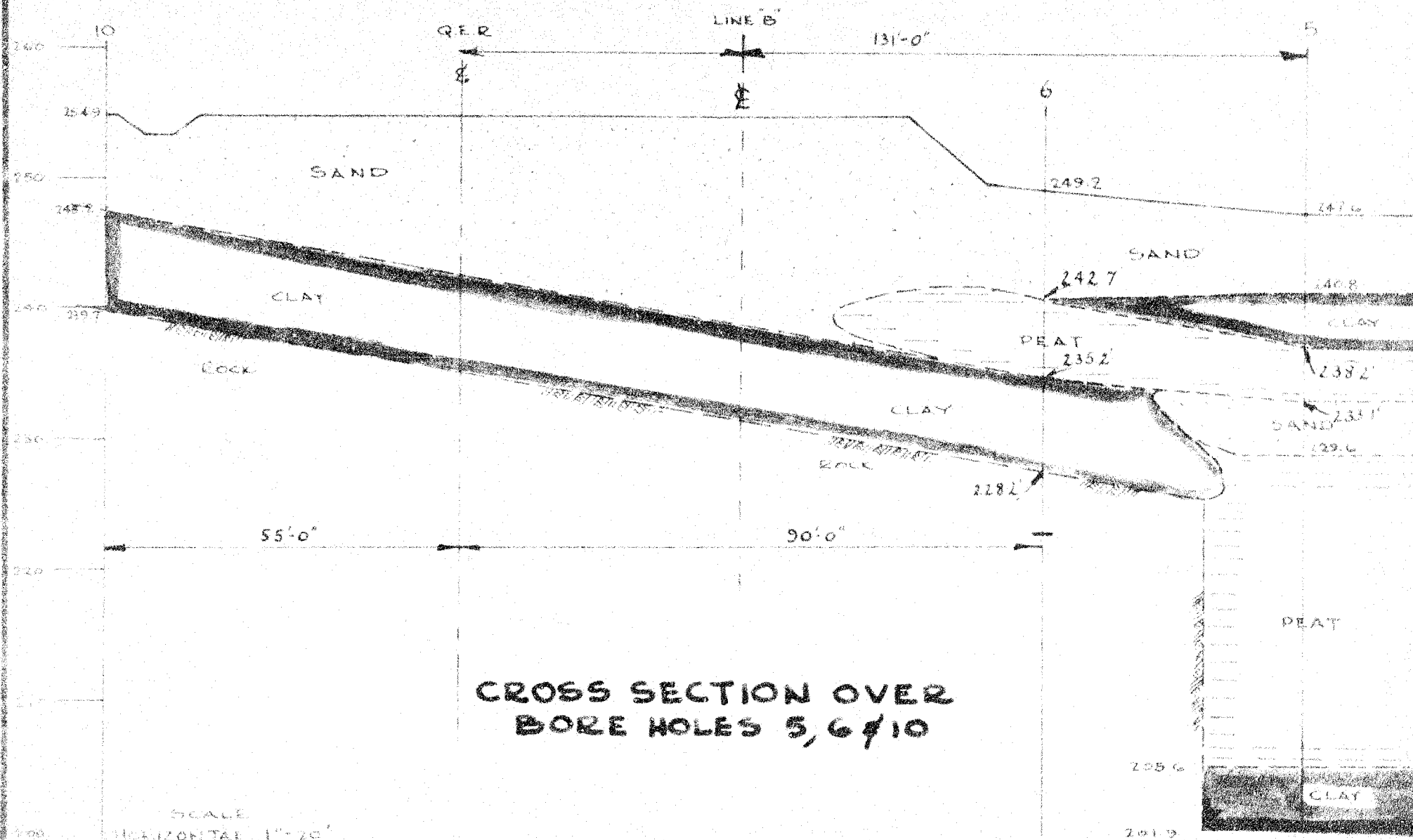
F 54-88



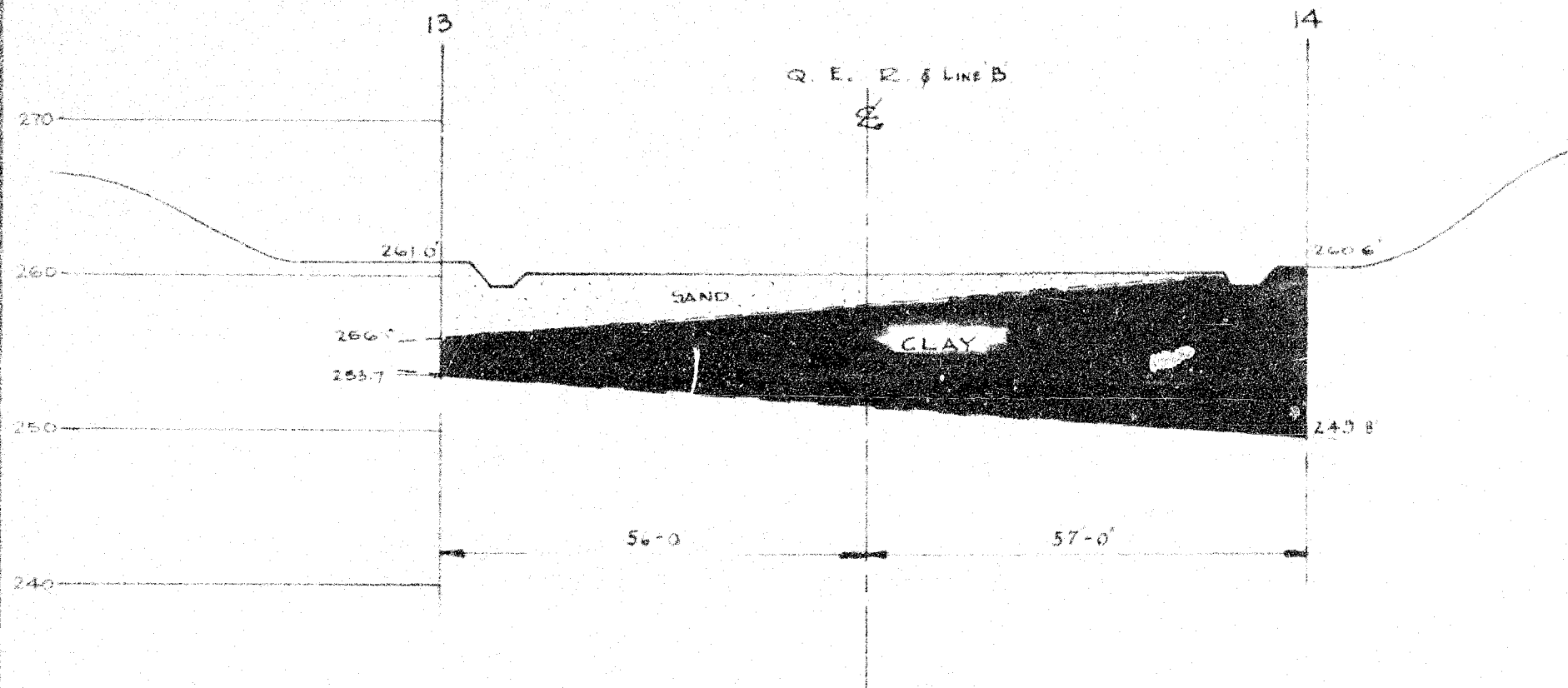
**CROSS SECTION  
OVER BORE HOLES 4/11**

SCALE  
HORIZONTAL 1" = 20'  
VERTICAL 1" = 4'





F 54-8E



**CROSS SECTION  
OVER BORE HOLES 13 & 14**

SCALE  
HORIZONTAL 1" = 20'  
VERTICAL 1" = 10'

54-F-8

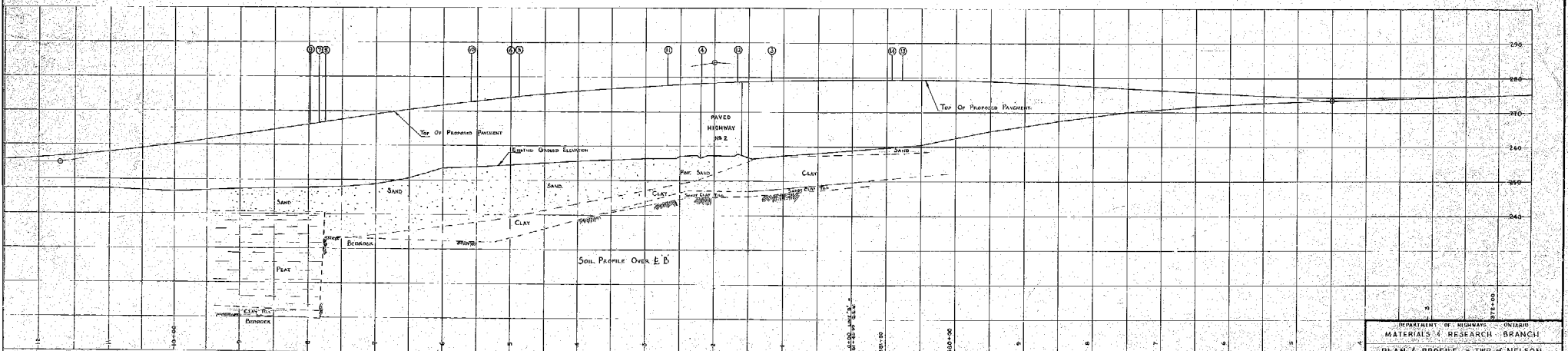
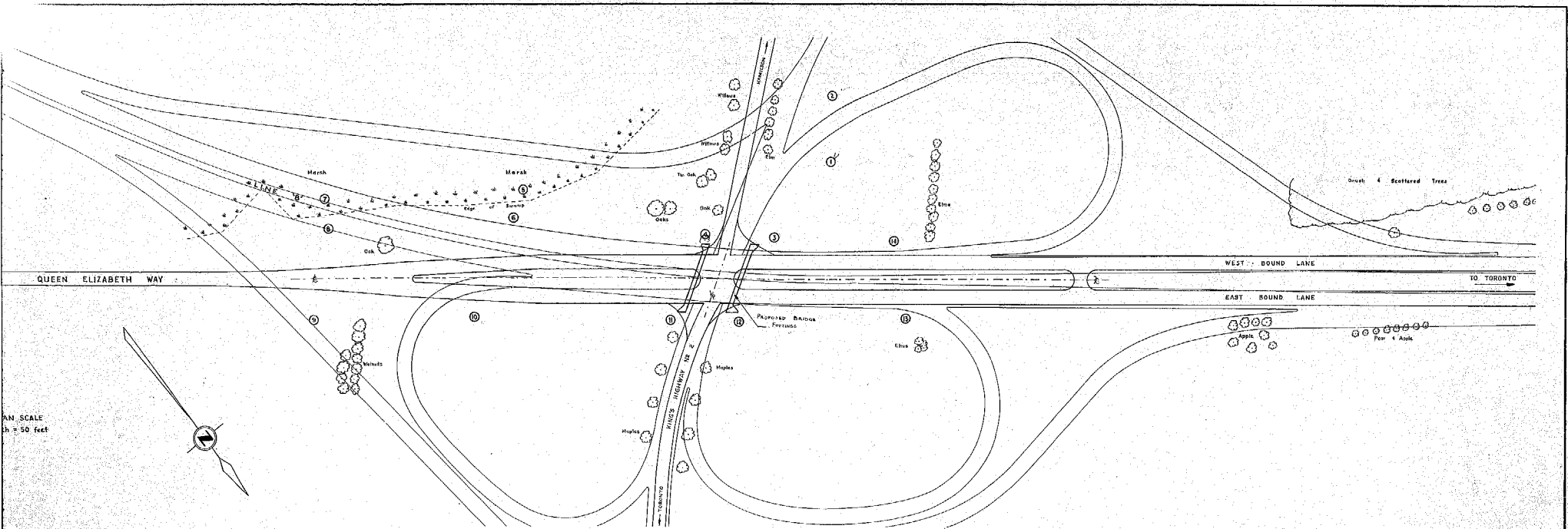
HWY. 2 &

Q.E.W.

30M5-46







Q.E.W. LINE 'B' PROFILE

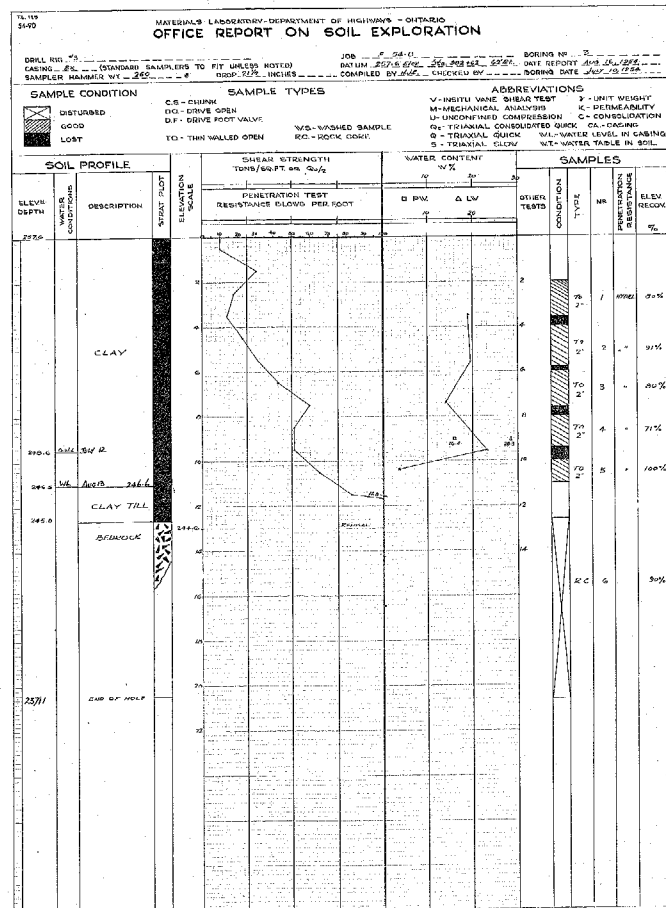
Scale - Vert. 1 inch = 10 feet  
Hor. 1 inch = 50 feet

DESIGNED BY	DR. J. H. M. & S. J. M. & S. J. M.
CHECKED BY	DR. J. H. M. & S. J. M. & S. J. M.
DATE	Aug 31/54

DEPARTMENT OF HIGHWAYS - ONTARIO	
MATERIALS & RESEARCH BRANCH	
PLAN & PROFILE - TWP. 4 NELSON	
Q.E.W. OVERPASS at HWY. NO. 2	
SCALE	As Shown
DESIGNED BY	DR. J. H. M. & S. J. M. & S. J. M.
CHECKED BY	DR. J. H. M. & S. J. M. & S. J. M.
DATE	Aug 31/54
DRAWN BY	H. D. Reed
APPROVED BY	DR. J. H. M. & S. J. M. & S. J. M.
DATE	Aug 31/54

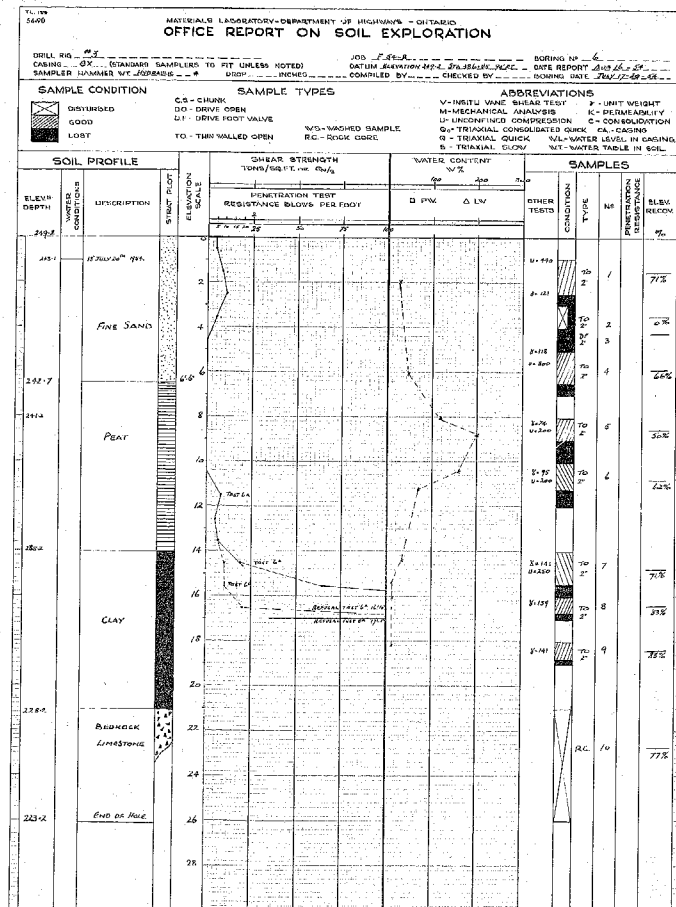
2

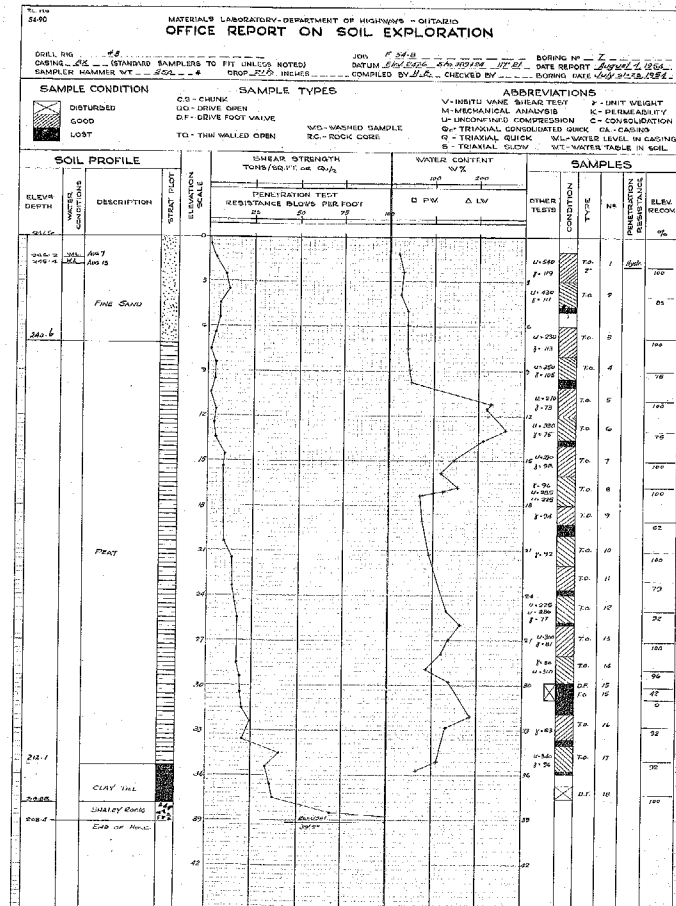
MATERIALS LABORATORY - DEPARTMENT OF HIGHWAYS - ONTARIO											
OFFICE REPORT ON SOIL EXPLORATION											
DRILL NO. <u>2</u> CASING <u>STANDARD SAMPLERS TO FIT UNLESS NOTED</u> SAMPLED DEPT. <u>25</u> <u>INCHES</u>		JOB <u>F.S.D. 2</u> DATUM <u>SEA LEVEL AT BRISBANE, ONT. AC.</u> COMPILED BY <u>W.C.L.</u> CHECKED BY <u>W.C.L.</u>		BORING NO. <u>1</u> DATE REPORT <u>APRIL 1958</u> BORING DEPT. <u>25</u> <u>INCHES</u>							
<b>SAMPLE CONDITION</b> DISTURBED <input checked="" type="checkbox"/> GOOD <input type="checkbox"/> LOST <input type="checkbox"/>		<b>SAMPLE TYPES</b> C.S. - CHURN D.S. - DRIVE OPEN D.P. - DRIVE FOOT VALVE T.O. - THIN WALLED OPEN		<b>ABBREVIATIONS</b> V - INSITU VANE SHEAR TEST M - MECHANICAL ANALYSIS U - UNCONFINED COMPRESSION Q - TRIAXIAL CONSOLIDATED QUICK Q <sub>u</sub> - TRIAXIAL QUICK S - TRIAXIAL SLOW P - UNIT WEIGHT K - PERMEABILITY C - CONSOLIDATION CA - CASINGS WL - WATER LEVEL IN CASING WT - WATER TABLE IN SOIL							
<b>SOIL PROFILE</b>		<b>SHEAR STRENGTH</b> TORSION TEST - $\tau$ vs. $\sigma_v$		<b>WATER CONTENT</b> % W		<b>SAMPLES</b>					
ELEV. DEPTH	DESCRIPTION	ELEVATION SCALE	PENETRATION TEST		D.P.W. & L.V.		OTHER TESTS	CONDITION	TYPE	NO.	ELEV. RECOVER
			RESISTANCE BLOWS PER FOOT		%						
255.0		255.0	20	60	10	10					
	FINE SAND										
250.0		250.0									
	CLAY										
247.5		247.5									
	CLAY FILL										
240.0		240.0									
	CLAY FILL										
238.0		238.0									
	CLAY FILL										
235.0		235.0									
	CLAY FILL										
230.0		230.0									
	CLAY FILL										
225.0		225.0									
	CLAY FILL										
220.0		220.0									
	CLAY FILL										
215.0		215.0									
	CLAY FILL										
210.0		210.0									
	CLAY FILL										
205.0		205.0									
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195.0		195.0									
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190.0		190.0									
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180.0		180.0									
	CLAY FILL										
175.0		175.0									
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170.0		170.0									
	CLAY FILL										
165.0		165.0									
	CLAY FILL										
160.0		160.0									
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150.0		150.0									
	CLAY FILL										
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135.0		135.0									
	CLAY FILL										
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	CLAY FILL										
125.0		125.0									
	CLAY FILL										
120.0		120.0									
	CLAY FILL										
115.0		115.0									
	CLAY FILL										
110.0		110.0									
	CLAY FILL										
105.0		105.0									
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100.0		100.0									
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90.0		90.0									
	CLAY FILL										
85.0		85.0									
	CLAY FILL										
80.0		80.0									
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75.0		75.0									
	CLAY FILL										
70.0		70.0									
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65.0		65.0									
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60.0		60.0									
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55.0		55.0									
	CLAY FILL										
50.0		50.0									
	CLAY FILL										
45.0		45.0									
	CLAY FILL										
40.0		40.0									
	CLAY FILL										
35.0		35.0									
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30.0		30.0									
	CLAY FILL										
25.0		25.0									
	CLAY FILL										
20.0		20.0									
	CLAY FILL										
15.0		15.0									
	CLAY FILL										
10.0		10.0									
	CLAY FILL										
5.0		5.0									
	CLAY FILL										
0.0		0.0									
	CLAY FILL										




MATERIALS LABORATORY DEPARTMENT OF HIGHWAYS - CHICAGO									
OFFICE REPORT ON SOIL EXPLORATION									
ROLL NO. <u>25</u>		JOB <u>F-15-2</u>		BORING NO. <u>4</u>					
CHISEL <u>25</u> STANDARD SAMPLER TO FIT UNLESS NOTED		DATE <u>11/16/31</u>		DATE REPORT <u>Aug 17 - 1931</u>					
SAMPLER HAMMER WT. <u>140</u>		DROPPED <u>25</u> FEET		COMPILED BY <u>W. H. H. H.</u>		BORING DATE <u>Aug 17 - 1931</u>			
<b>SAMPLE CONDITION</b>		<b>SAMPLE TYPES</b>		<b>ABBREVIATIONS</b>					
☐ DISTURBED ☐ GOOD ☐ LOOSE		C.S. - CHUNK D.C. - DRIVE CORE D.F. - DRIVE FOOT VALUE TO - TWIN VALLED DOWN		V - INSITU VANE SHEAR TEST M - MECHANICAL ANALYSIS U - UNCONFINED COMPRESSION D - TRIAXIAL CONSOLIDATED QUICK Q - TRIAXIAL QUICK S - TRIAXIAL SLOW W - UNIT WEIGHT K - PERMEABILITY C - CONSOLIDATION CA - CASING WL - WATER LEVEL IN CASING WT - WATER TABLE IN SOIL					
<b>SOIL PROFILE</b>		<b>WATER CONTENT</b>		<b>SAMPLES</b>					
ELEV. DEPTH	WATER CONTENT	DESCRIPTION	STRETCH	WATER CONTENT	OTHER TESTS	TYPE	NR	ELEV. DEPTH	WATER CONTENT
226.8		FINE SAND							
220.8		SANDY CLAY							
215.8		DENSE SANDY CLAY							
214.0		ROCK							
214.0		END OF HOLE							

MATERIALS LABORATORY - DEPARTMENT OF HIGHWAYS - ONTARIO											
OFFICE REPORT ON SOIL EXPLORATION											
DRILL NO. <u>10</u> CASING <u>20</u> (STANDARD SAMPLERS TO FIT UNLESS NOTED) SAMPLER NUMBER <u>WT</u>			JOB <u>10-50-8</u> DATUM <u>Surface of Ground</u> COMPLETED BY <u>---</u>			BORING NO. <u>5</u> DATE REPORT <u>Jan 10, 1958</u> NO. OF PAGES <u>---</u>			CHECKED BY <u>---</u>		
SAMPLE CONDITION			SAMPLE TYPES			ABBREVIATIONS					
DISTURBED GOOD LOST			C.S. - CHUNK D.O. - DRIVE OPEN D.T. - DRIVE FOOT VALVE T.O. - TWIN VALLED OPEN			V - IN-SITU VANE SHEAR TEST M - MECHANICAL ANALYSIS U - UNCONSOLIDATED COMPRESSION G - TRIAXIAL CONSOLIDATED QUICK Q - TRIAXIAL QUICK S - TRIAXIAL SLOW 3 - UNIT WEIGHT K - PERMEABILITY C - CONSOLIDATION O - CORING W/L - WATER LEVEL IN CASING W/T - WATER TABLE IN SOIL					
SOIL PROFILE			SHEAR STRENGTH TONS/FOOT <sup>2</sup> OR KG/CM <sup>2</sup>		WATER CONTENT %		SAMPLES				
ELEV. DEPTH	DESCRIPTION	STRAIN PLANT RELATION SCALE	PENETRATION TEST RESISTANCE BLOWS PER FOOT		G.P.W.	A.L.V.	OTHER TESTS	TYPE	NO.	CONTRASTANCE	ELEV. REMARK
240.6	1" SURF										
240.2	SAND								1	87%	
238.7	CLAY								2	75%	
235.1	PEAT								3	71%	
233.1	SAND								4	75%	
227.6	PEAT								5	80%	
									6	50%	
									7	0%	
									8	30%	
									9	42%	
									10	71%	
226.4	CLAY								11	12%	
221.9	END OF BORE								12	100%	





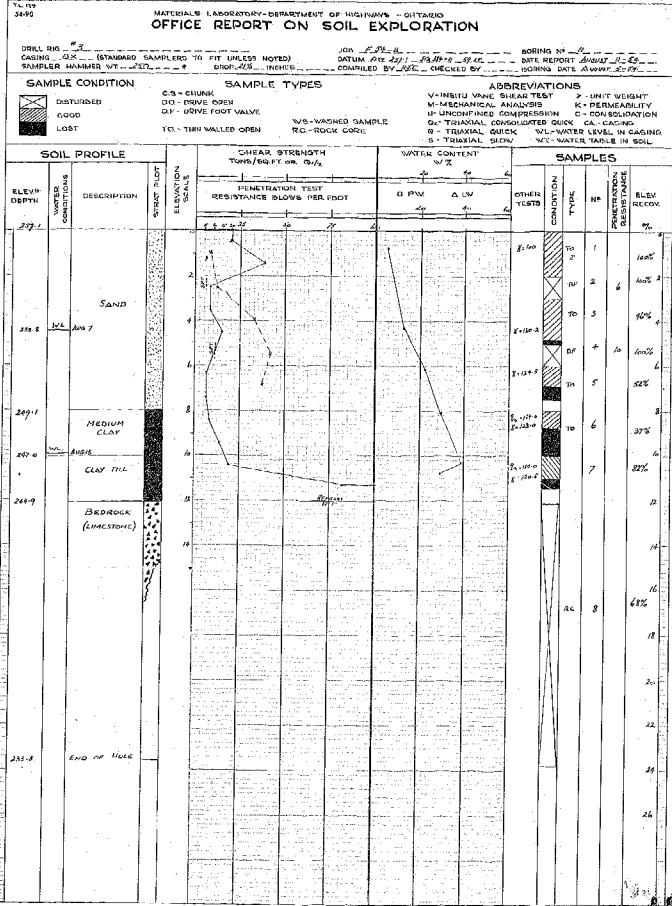


SAMPLE CONDITION		SAMPLE TYPES		ABBREVIATIONS	
	DISTURBED	C.S. - CHUNK		V - VISITS	W - UNIT WEIGHT
	GOOD	D.O. - DRIVE OPEN		M - MECHANICAL ANALYSIS	K - PERMEABILITY
		D.P. - DRIVE FOOT VALVE		U - UNCONFINED COMPRESSION	C - CONSOLIDATION
	LOST	T.G. - THIN WALLED OPEN	W/S - WASHED SAMPLE	Q - TRIAXIAL CONSOLIDATED QUICK	AL - CASING
			R.C. - ROCK CORE	B - TRIAXIAL	W - WATER LOSS IN EACH
				T - TRIAXIAL	S.G. - W. WATER LOSS IN SOIL

[illegible]

[illegible]

<small>U.S. GEOLOGICAL SURVEY</small> <b>OFFICE REPORT ON SOIL EXPLORATION</b>										
<small>DRILL NO. <u>23</u></small> <small>CASING <u>AS</u> (STANDARD SAMPLED TO FIT INCHES NOTED)</small> <small>SAMPLE HAMMER <u>WT</u> <u>200</u> <u>GR</u></small>		<small>JOB <u>23A-2</u></small> <small>NATURAL <u>23A-2</u> <u>23A-2</u> <u>23A-2</u></small> <small>COMPILED BY <u>23A</u></small>		<small>BORING IN <u>23</u></small> <small>DATE REPORT <u>23A</u></small> <small>BOHRING DATE</small>						
SAMPLE CONDITION		SAMPLE TYPES		ABBREVIATIONS						
<small>DI</small> - DISTURBED <small>GO</small> - GOOD <small>LO</small> - LOOSE		<small>CS</small> - CHUNK <small>DO</small> - DRIVE OPEN <small>DF</small> - DRIVE FOOT VALVE <small>TO</small> - TURN VALLED OPEN		<small>WS</small> - WASHED SAMPLE <small>RC</small> - ROCK CORE		<small>V</small> - VIBRO WIRE SHEAR TEST <small>M</small> - MECHANICAL ANALYSIS <small>U</small> - UNCONFINED COMPRESSION <small>Q</small> - TRIAXIAL CONSOLIDATED QUICK <small>RS</small> - TRIAXIAL QUICK <small>S</small> - TRIAXIAL SLOW <small>W</small> - UNIT WEIGHT <small>K</small> - PERMEABILITY <small>C</small> - CONSOLIDATION <small>CA</small> - CHANG <small>WL</small> - WATER LEVEL IN CASING <small>WTC</small> - WATER TABLE IN GORE				
SOIL PROFILE		SHEAR STRENGTH		WATER CONTENT		SAMPLES				
ELEV. (FT.)	NOTES	DESCRIPTION	STRET FOOT ELEVATION	RESISTANCE BLOWS PER FOOT	U (PW)	A (LV)	OTHER TESTS	CONDITION	NO	ELEV. (FT.)
218.5		SAND	218.5				1-123	TD	1	218.5
							2-275	TD	2	218.5
							3-243	TD	3	218.5
243.0	243.0						4-210	TD	4	243.0
243.0	243.0	CLAY	243.0				5-210	TD	5	243.0
243.0	243.0						6-210	TD	6	243.0
243.0	243.0	CLAY TH	243.0				7-210	TD	7	243.0
243.0	243.0						8-210	TD	8	243.0
243.0	243.0	CLAY TH	243.0				9-210	TD	9	243.0
243.0	243.0						10-210	TD	10	243.0
243.0	243.0	CLAY TH	243.0				11-210	TD	11	243.0
243.0	243.0						12-210	TD	12	243.0
243.0	243.0	CLAY TH	243.0				13-210	TD	13	243.0
243.0	243.0						14-210	TD	14	243.0
243.0	243.0	CLAY TH	243.0				15-210	TD	15	243.0
243.0	243.0						16-210	TD	16	243.0
243.0	243.0	CLAY TH	243.0				17-210	TD	17	243.0
243.0	243.0						18-210	TD	18	243.0
243.0	243.0	CLAY TH	243.0				19-210	TD	19	243.0
243.0	243.0						20-210	TD	20	243.0
243.0	243.0	CLAY TH	243.0				21-210	TD	21	243.0
243.0	243.0						22-210	TD	22	243.0
243.0	243.0	CLAY TH	243.0				23-210	TD	23	243.0
243.0	243.0						24-210	TD	24	243.0
243.0	243.0	CLAY TH	243.0				25-210	TD	25	243.0
243.0	243.0						26-210	TD	26	243.0
243.0	243.0	CLAY TH	243.0				27-210	TD	27	243.0
243.0	243.0						28-210	TD	28	243.0
243.0	243.0	CLAY TH	243.0				29-210	TD	29	243.0
243.0	243.0						30-210	TD	30	243.0
243.0	243.0	CLAY TH	243.0				31-210	TD	31	243.0
243.0	243.0						32-210	TD	32	243.0
243.0	243.0	CLAY TH	243.0				33-210	TD	33	243.0
243.0	243.0						34-210	TD	34	243.0
243.0	243.0	CLAY TH	243.0				35-210	TD	35	243.0
243.0	243.0						36-210	TD	36	243.0
243.0	243.0	CLAY TH	243.0				37-210	TD	37	243.0
243.0	243.0						38-210	TD	38	243.0
243.0	243.0	CLAY TH	243.0				39-210	TD	39	243.0
243.0	243.0						40-210	TD	40	243.0
243.0	243.0	CLAY TH	243.0				41-210	TD	41	243.0
243.0	243.0						42-210	TD	42	243.0
243.0	243.0	CLAY TH	243.0				43-210	TD	43	243.0
243.0	243.0						44-210	TD	44	243.0
243.0	243.0	CLAY TH	243.0				45-210	TD	45	243.0
243.0	243.0						46-210	TD	46	243.0
243.0	243.0	CLAY TH	243.0				47-210	TD	47	243.0
243.0	243.0						48-210	TD	48	243.0
243.0	243.0	CLAY TH	243.0				49-210	TD	49	243.0
243.0	243.0						50-210	TD	50	243.0
243.0	243.0	CLAY TH	243.0				51-210	TD	51	243.0
243.0	243.0						52-210	TD	52	243.0
243.0	243.0	CLAY TH	243.0				53-210	TD	53	243.0
243.0	243.0						54-210	TD	54	243.0
243.0	243.0	CLAY TH	243.0				55-210	TD	55	243.0
243.0	243.0						56-210	TD	56	243.0
243.0	243.0	CLAY TH	243.0				57-210	TD	57	243.0
243.0	243.0						58-210	TD	58	243.0
243.0	243.0	CLAY TH	243.0				59-210	TD	59	243.0
243.0	243.0						60-210	TD	60	243.0
243.0	243.0	CLAY TH	243.0				61-210	TD	61	243.0
243.0	243.0						62-210	TD	62	243.0
243.0	243.0	CLAY TH	243.0				63-210	TD	63	243.0
243.0	243.0						64-210	TD	64	243.0
243.0	243.0	CLAY TH	243.0				65-210	TD	65	243.0
243.0	243.0						66-210	TD	66	243.0
243.0	243.0	CLAY TH	243.0				67-210	TD	67	243.0
243.0	243.0						68-210	TD	68	243.0
243.0	243.0	CLAY TH	243.0				69-210	TD	69	243.0
243.0	243.0						70-210	TD	70	243.0
243.0	243.0	CLAY TH	243.0				71-210	TD	71	243.0
243.0	243.0						72-210	TD	72	243.0
243.0	243.0	CLAY TH	243.0				73-210	TD	73	243.0
243.0	243.0						74-210	TD	74	243.0
243.0	243.0	CLAY TH	243.0				75-210	TD	75	243.0
243.0	243.0						76-210	TD	76	243.0
243.0	243.0	CLAY TH	243.0				77-210	TD	77	243.0
243.0	243.0						78-210	TD	78	243.0
243.0	243.0	CLAY TH	243.0				79-210	TD	79	243.0
243.0	243.0						80-210	TD	80	243.0
243.0	243.0	CLAY TH	243.0				81-210	TD	81	243.0
243.0	243.0						82-210	TD	82	243.0
243.0	243.0	CLAY TH	243.0				83-210	TD	83	243.0
243.0	243.0						84-210	TD	84	243.0
243.0	243.0	CLAY TH	243.0				85-210	TD	85	243.0
243.0	243.0						86-210	TD	86	243.0
243.0	243.0	CLAY TH	243.0				87-210	TD	87	243.0
243.0	243.0						88-210	TD	88	243.0
243.0	243.0	CLAY TH	243.0				89-210	TD	89	243.0
243.0	243.0						90-210	TD	90	243.0
243.0	243.0	CLAY TH	243.0				91-210	TD	91	243.0
243.0	243.0						92-210	TD	92	243.0
243.0	243.0	CLAY TH	243.0				93-210	TD	93	243.0
243.0	243.0						94-210	TD	94	243.0
243.0	243.0	CLAY TH	243.0				95-210	TD	95	243.0
243.0	243.0						96-210	TD	96	243.0
243.0	243.0	CLAY TH	243.0				97-210	TD	97	243.0
243.0	243.0						98-210	TD	98	243.0
243.0	243.0	CLAY TH	243.0				99-210	TD	99	243.0
243.0	243.0						100-210	TD	100	243.0



TO: CONDITION OF ORIGINAL DOCUMENTS

MATERIALS LABORATORY DEPARTMENT OF HIGHWAYS - ONTARIO																																																																																				
OFFICE REPORT ON SOIL EXPLORATION																																																																																				
DRILL NO. <u>3-100</u>		JOB NO. <u>100</u>		BORING NO. <u>100</u>		DATE REPORT <u>10/10/50</u>		DATE <u>10/10/50</u>																																																																												
OPER. <u>THOMAS</u>		SAMPLERS TO FIT (SEE NOTE)		DAILY <u>10/10/50</u>		CHECKED BY <u>10/10/50</u>		DOING DATE <u>10/10/50</u>																																																																												
SAMPLER HAMMER WT. <u>14</u>		DROP <u>25</u> INCHES		COMPILED BY <u>10/10/50</u>																																																																																
<b>SAMPLE CONDITION</b> <input checked="" type="checkbox"/> DISTURBED <input type="checkbox"/> GOOD <input type="checkbox"/> LOST		<b>SAMPLE TYPES</b> CS - CHUNK DO - DRIVE OPEN DF - DRIVE FOOT VALVE TO - TYPED VALUED OPEN		WS - WASHED SAMPLE RC - ROCK CORE		<b>ABBREVIATIONS</b> V - VENTURI VANE SHEAR TEST M - MECHANICAL ANALYSIS U - UNCONFINED COMPRESSION Q - TRIAXIAL COMPRESSION TEST Q - TRIAXIAL QUICK Q - TRIAXIAL SLOW W - UNIT WEIGHT K - PERMEABILITY C - CONSOLIDATION CL - CASING WL - WATER LEVEL IN CASING WT - WATER TABLE IN SOIL																																																																														
<table border="1"> <thead> <tr> <th colspan="3">SOIL PROFILE</th> <th colspan="2">SHEAR STRENGTH</th> <th colspan="2">WATER CONTENT</th> <th colspan="3">SAMPLES</th> </tr> <tr> <th>ELEV. DEPTH</th> <th>UNSAT. CONDITIONS</th> <th>DESCRIPTION</th> <th>STRET. PLAT. ELEVATION SCALE</th> <th>PENETRATION TEST</th> <th>RESISTANCE BLVD. PER FOOT</th> <th>D. PW</th> <th>Δ LV</th> <th>OTHER TESTS</th> <th>CONDTN</th> <th>TYPE</th> <th>NR</th> <th>ELEV. RECON</th> </tr> </thead> <tbody> <tr> <td>26.0</td> <td></td> <td>SAND</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td>10%</td> </tr> <tr> <td>26.0</td> <td></td> <td>CLAY</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td> <td>10%</td> </tr> <tr> <td>26.0</td> <td></td> <td>CLAY</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>3</td> <td>10%</td> </tr> <tr> <td>26.0</td> <td></td> <td>CLAY</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>4</td> <td>10%</td> </tr> </tbody> </table>										SOIL PROFILE			SHEAR STRENGTH		WATER CONTENT		SAMPLES			ELEV. DEPTH	UNSAT. CONDITIONS	DESCRIPTION	STRET. PLAT. ELEVATION SCALE	PENETRATION TEST	RESISTANCE BLVD. PER FOOT	D. PW	Δ LV	OTHER TESTS	CONDTN	TYPE	NR	ELEV. RECON	26.0		SAND									1	10%	26.0		CLAY									2	10%	26.0		CLAY									3	10%	26.0		CLAY									4	10%
SOIL PROFILE			SHEAR STRENGTH		WATER CONTENT		SAMPLES																																																																													
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26.0		SAND									1	10%																																																																								
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<small>TL 109 3490</small> <b>MATERIALS LABORATORY - DEPARTMENT OF HIGHWAYS - ONTARIO</b> <b>OFFICE REPORT ON SOIL EXPLORATION</b>										
<small>DRAWING NO. 3 (revised)</small> <small>CASING: STANDARD SAMPLERS TO FIT (UNLESS NOTED)</small> <small>SAMPLER NUMBER: 101</small>			<small>JOB: 101-1</small> <small>DATUM: 101-1</small> <small>CONTROLLER: BY: 101-1</small>			<small>BORING NO. 101-1</small> <small>DATE REPORT: 101-1</small> <small>DRAWING DATE: 101-1</small>				
SAMPLE CONDITION		SAMPLE TYPES		ABBREVIATIONS						
<input type="checkbox"/> DISTURBED <input type="checkbox"/> GOOD <input type="checkbox"/> LOST	<small>C.S. - CHURN</small> <small>D.O. - DRIVE DOWN</small> <small>D.V. - DRIVE FOOT VALVE</small> <small>TO - TURN VALVED DOWN</small>	<small>W/S - WASHED SAMPLE</small> <small>IC - 100% CODE</small>	<small>V - 100% VANE SHEAR TEST</small> <small>M - MECHANICAL ANALYSIS</small> <small>U - UNCONFINED COMPRESSION</small> <small>Q - TRIAXIAL CONSOLIDATED QUICK</small> <small>Q - TRIAXIAL SLOW</small>	<small>W - UNIT WEIGHT</small> <small>K - PERMEABILITY</small> <small>C - CONSOLIDATION</small> <small>CA - CASING</small> <small>W - WATER LEVEL IN CASING</small> <small>W - WATER TABLE IN SOIL</small>						
SOIL PROFILE		PENETRATION TEST		WATER CONTENT		SAMPLES				
ELEV. DEPTH	DESCRIPTION	SPREAD PLAT	RESISTANCE BLOW PER FOOT	W. %	Δ LV	OTHER TESTS	TYPE	NO.	ELEV. BEGON	
26.4	Grey Medium CLAY		0					1	26.4	
2								2	25.2	
4								3	24.8	
6								4	24.4	
8								5	24.0	
24.1	End of Hole									