

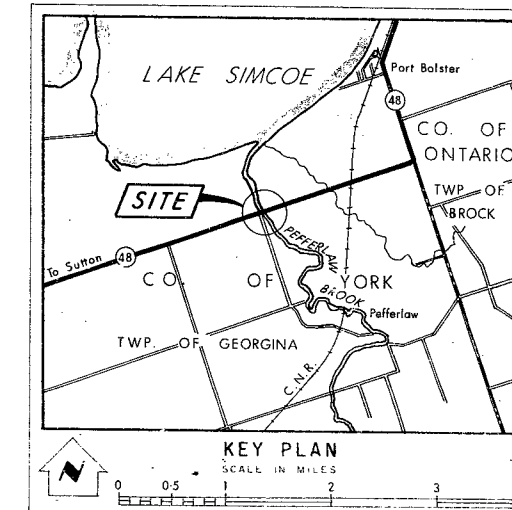
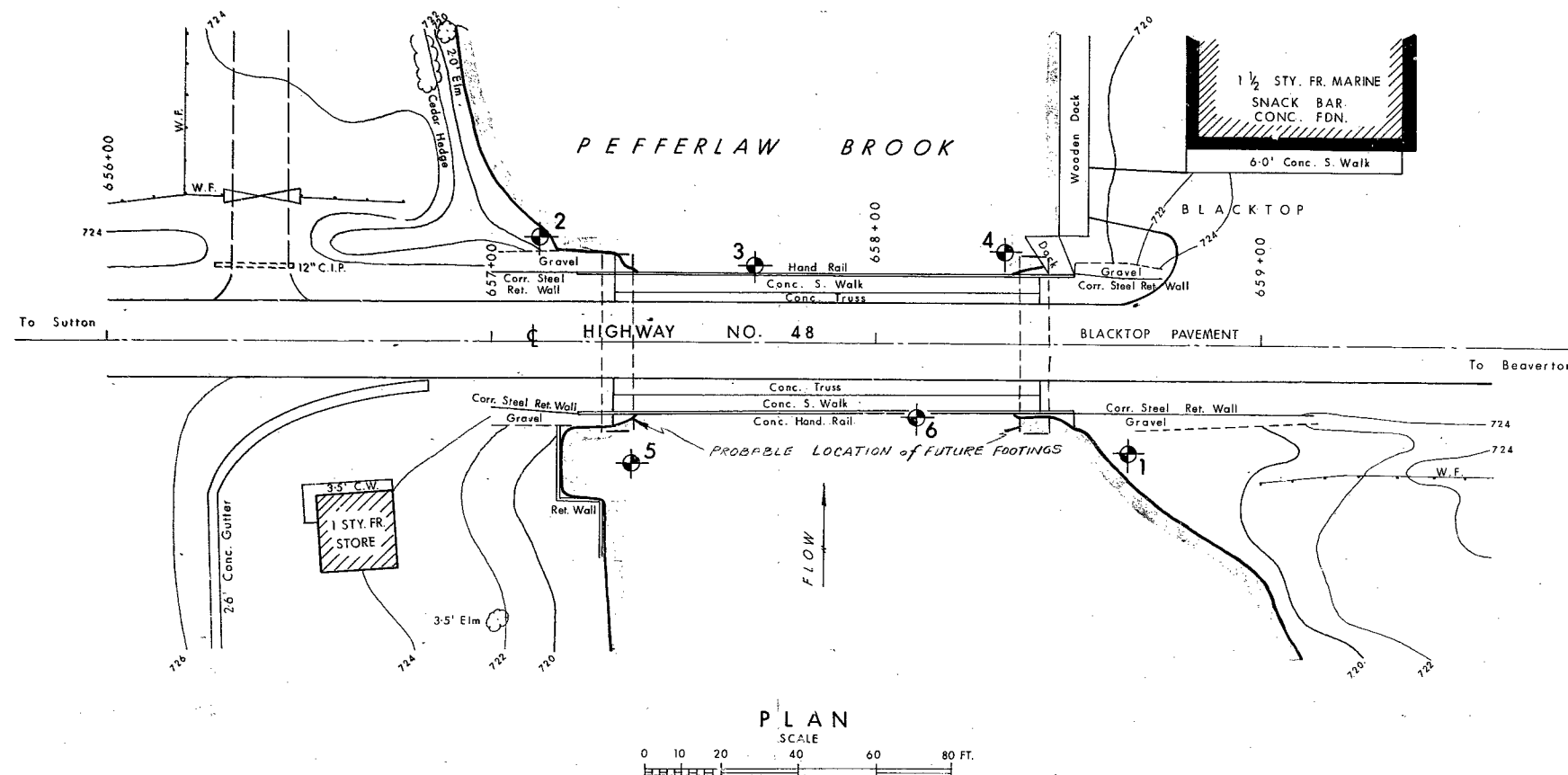
64-F-87

W.P.# 260-63

Hwy. # 48 E

PEFFERLAW

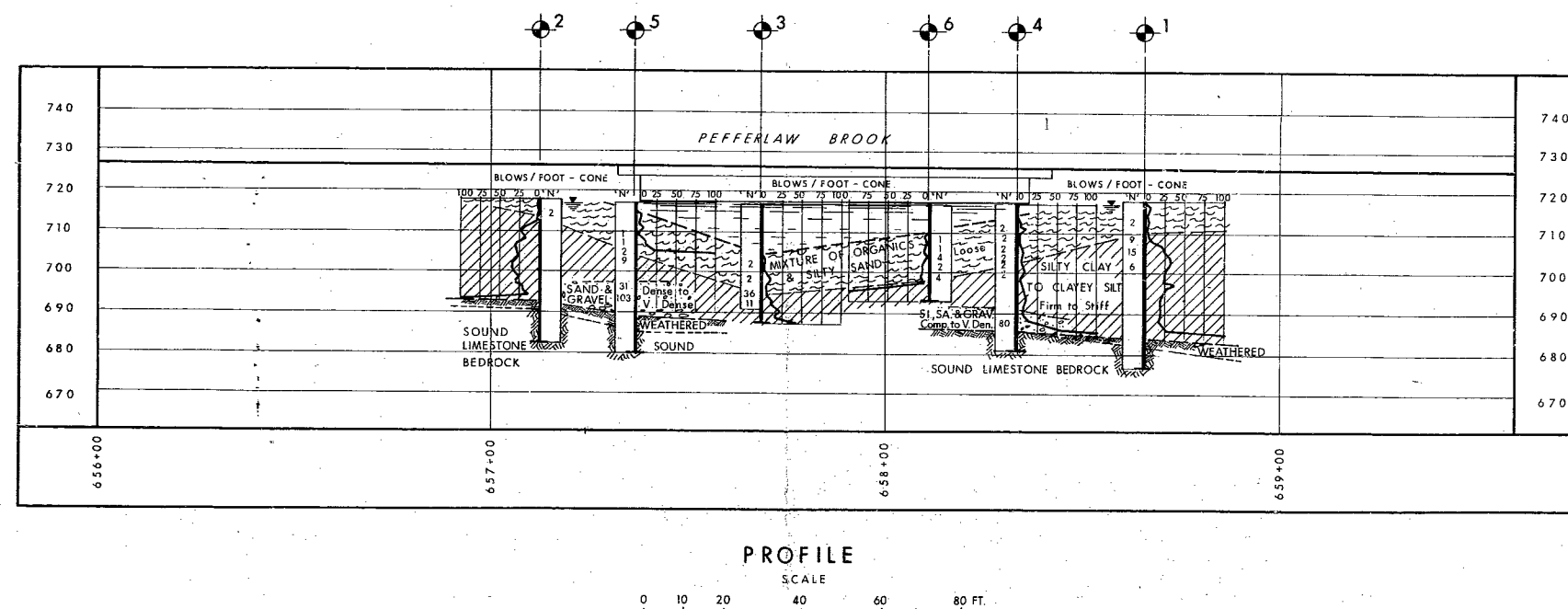
BRIDGE



LEGEND			
	Bore Hole		
	Cone Penetration Hole		
	Bore & Cone Penetration Hole		
	Water Levels established at time of field investigation, Oct. 7, 1964		

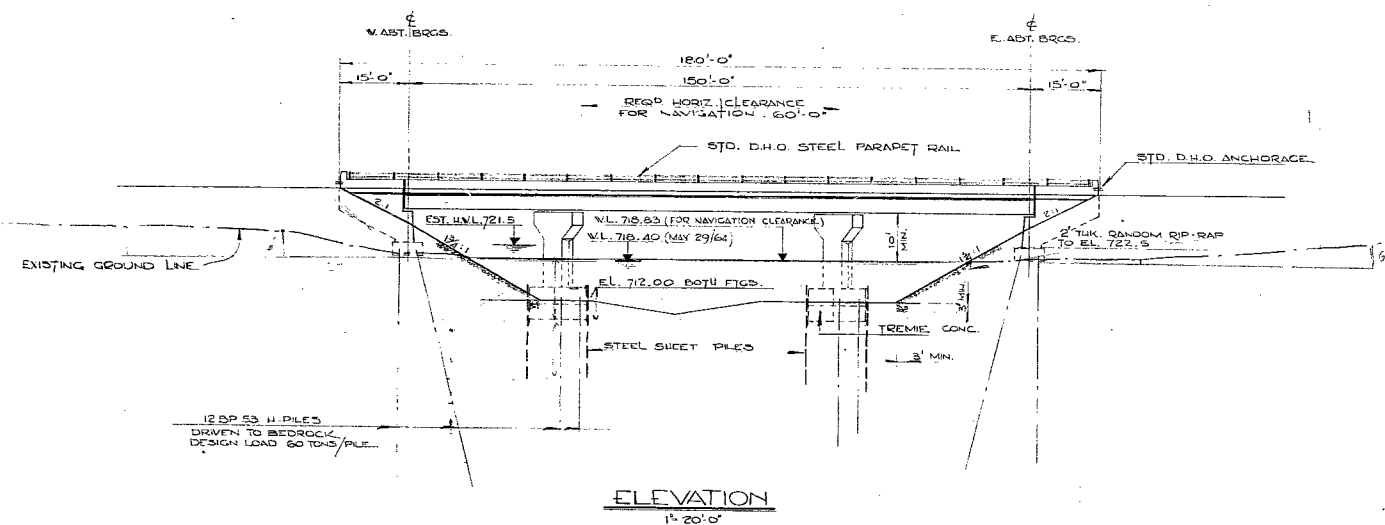
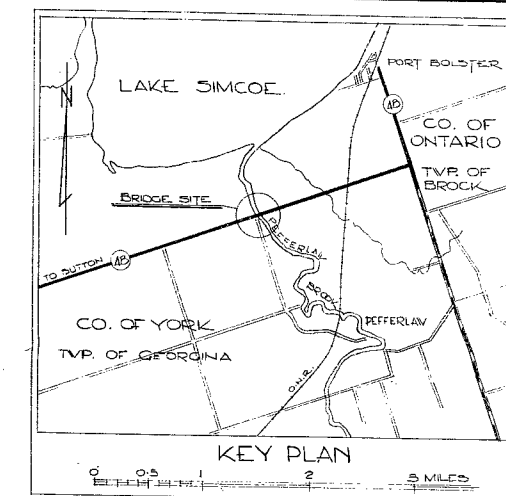
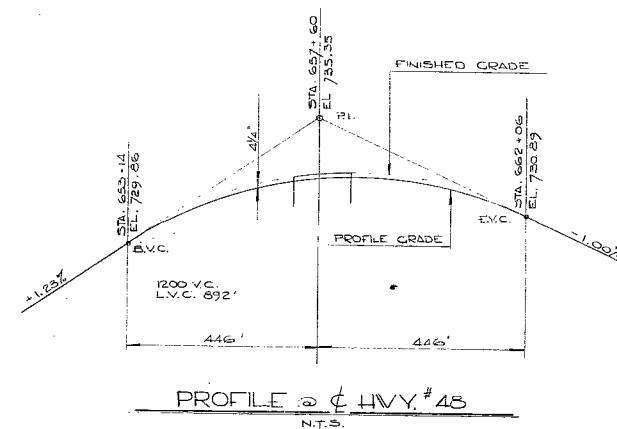
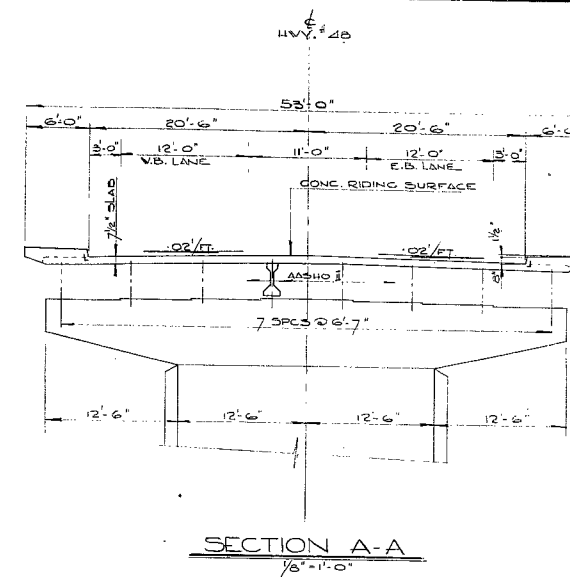
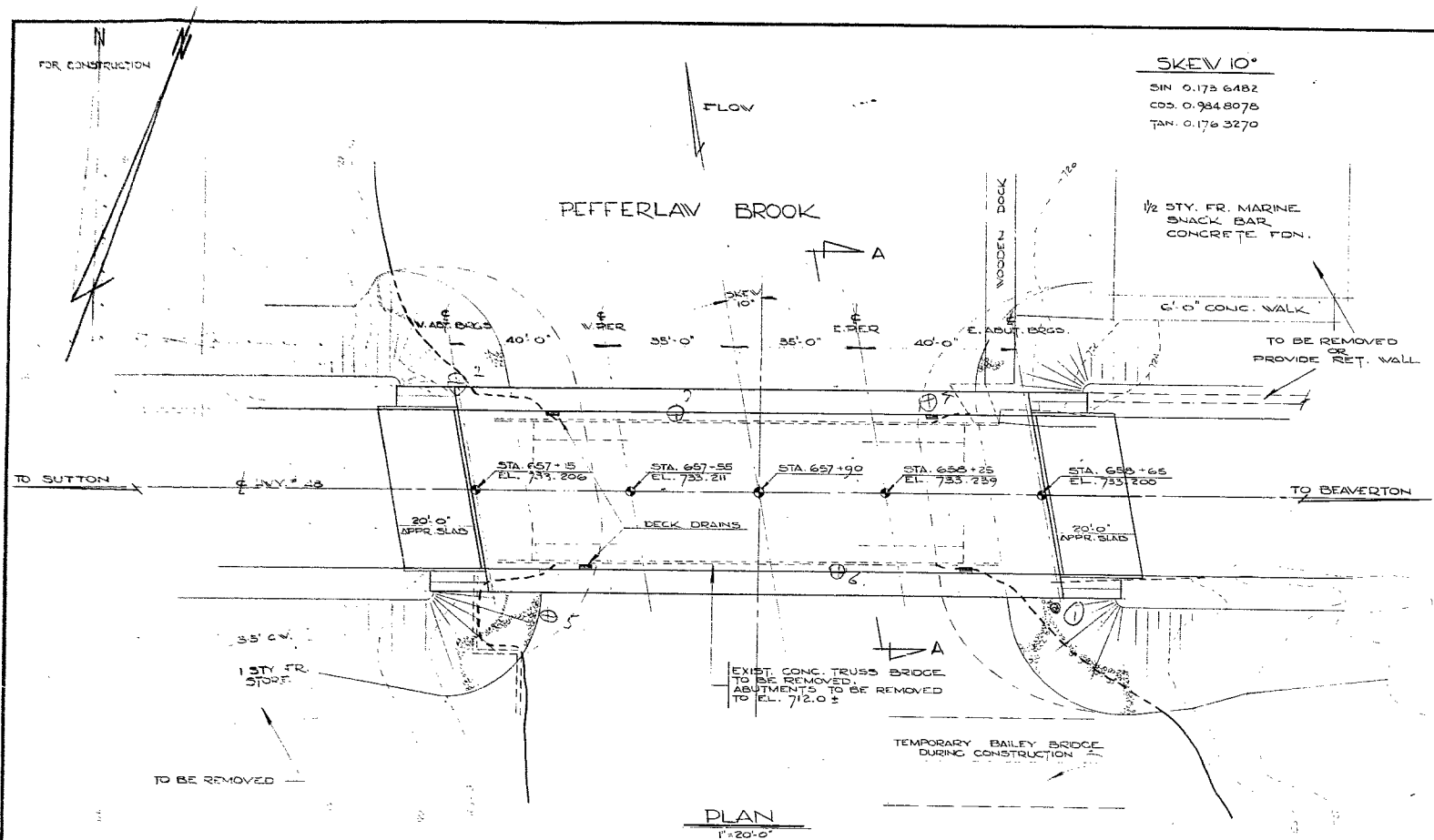
NO.	ELEVATION	STATION	OFFSET
1	717.5	658+66	28' RT.
2	717.5	657+12	27' LT.
3	717.0	657+69	20' LT.
4	717.0	658+34	23' LT.
5	717.0	657+37	31' RT.
6	717.0	658+11	20' RT.

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.



REVISIONS	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS - ONTARIO			
MATERIALS & RESEARCH DIVISION - FOUNDATION SECTION			
PEPPERLAW BROOK			
KING'S HIGHWAY NO. 48		DIST. NO. 6	
CO. YORK			
TWP. GEORGINA		LOT 21 CON. VI & VII	
BORE HOLE LOCATIONS & SOIL STRATA			
SUBM'D V.K.	CHECKED V.K.	W.P. NO. 260-63	M.B.R. DRAWING NO.
DRAWN J.C.	CHECKED J.C.	JOB NO. 64-F-87	64-F-87A
DATE NOV. 5, 1964	SITE NO.		BRIDGE DRAWING NO.
APPROVED A.B. Thomas	CONT. NO.		



B.M. ELEV. 727.283
GEODETIC DATUM

12" IN SOUTH FACE OF SOUTH TRUSS
PEPPERLAW BRIDGE, 9 FEET EAST
OF 1/2 MI. END, 12 INCHES ABOVE SIDEWALK.

64-F-87

REVISIONS		
DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION			
PEPPERLAW BROOK BRIDGE 1/2 MI. N. OF PEPPERLAW			
KING'S HIGHWAY No. 48		DIST. No. 6	
CO. YORK		CON. VI & VII	
TWP. GEORGINA		LOT 21	
PRELIMINARY			
APPROVED		SITE No. 37-5 W.P. No. 260-63	
DESIGN	K.Z.S.	CHECK	CONTRACT No.
DRAWING	W.V.	CHECK	DRAWING No.
DATE	AUG. 66	LOADING	D-5645-P2

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. M. Toye,
Bridge Engineer,
Bridge Division.

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

Attention: Mr. S. McCombie

DATE: December 11, 1964

OUR FILE REF.

IN REPLY TO

SUBJECT:

FOUNDATION INVESTIGATION REPORT

For
New Structure at Pefferlaw Brook and
Hwy. 48, Approximately 7 Miles East
of Sutton E. Limits -- District #6.
W.J. 64-F-87 -- W.P. 260-613

Attached, we are forwarding to you, our detailed foundation investigation report on the subsoil conditions existing at the above structure site.

We believe that you will find the factual data and recommendations contained therein, adequate for your future design requirements. Should further information be required, please do not hesitate to contact our Office.

KYL/MdeF
Attach.

cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
H. D. McMillan
G. K. Hunter (2)
J. C. Thatcher
T. J. Kovich
A. Watt

if ho
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

Foundations Office ✓
Gen. Files

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 2. DESCRIPTION OF SITE.
 3. DESCRIPTION OF FIELD & LABORATORY WORK.
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 - 4.2) Heterogeneous Mixture of Silty Sand and Organics.
 - 4.3) Clayey Silt to Silty Clay.
 - 4.4) Silty Sand and Gravel.
 - 4.5) Bedrock.
 5. GROUND WATER CONDITIONS.
 6. DISCUSSION AND RECOMMENDATIONS.
 7. SUMMARY.
 8. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION REPORT

For

New Structure at Pepperlaw Brook and
Hwy. 48, Approximately 7 Miles East
of Sutton E. Limits -- District #6.

W.J. 64-F-87 -- W.P. 260-63

1. INTRODUCTION:

A request was received from Mr. J. Curtis, Regional Bridge Location Engineer, in a memo dated September 24, 1964, for a foundation investigation to be carried out at the above-mentioned site. At this location the existing structure will be demolished and replaced with a new, wider structure. An investigation was subsequently carried out by this Section in order to determine the subsoil conditions existing at the site.

Presented in this report are the results of this investigation, together with our recommendations pertaining to the structure foundations and approach fills.

2. DESCRIPTION OF SITE:

The Pepperlaw Brook flows in a general south-north direction and discharges into Lake Simcoe. At the proposed site the brook is about 100 ft. wide and approximately 12 ft. deep. Hwy. 48 crosses the brook by means of a single-span concrete bridge. Protection against scour is provided by means of steel sheet piling.

The site is located in the physiographic region referred to as the "Simcoe Lowlands".

cont'd. /2 ...

3. DESCRIPTION OF FIELD AND LABORATORY WORK:

The field work for this investigation was carried out by means of conventional diamond drilling equipment adapted for soil sampling purposes. Four boreholes (B.H. No's 1, 2, 4, & 5) with accompanying dynamic cone penetration tests, were put down at the proposed abutment locations. These borings were taken to bedrock which was proved by core drilling. In addition to the above-mentioned work, two shallow boreholes (B.H. No's 3 and 6) and one dynamic cone penetration test were put down in the brook in order to obtain information pertaining to falsework support and depth of past scour.

A detailed log for each borehole is given on the Record of Boreholes following the text of this report. The locations and elevations of all the boreholes, together with a section of the inferred soil stratigraphy across the site, are given on Dwg. No. 64-F-87A.

Samples were visually examined and identified in the field as well as in the laboratory. Tests were carried out in the laboratory on a selection of both disturbed and undisturbed samples to determine:

- i) Natural Moisture Contents.
- ii) Organic Contents.
- iii) Bulk Densities.
- iv) Atterberg Limits.
- v) Grain Size Distributions.
- vi) Undrained Shear Strengths.

Laboratory and field test results have been summarized and are included under Appendix I of this report.

4. SUBSOIL CONDITIONS:

4.1) General:

Subsoil at the site was generally found to consist of about 4 - 13 ft. of a mixture of sand and organics followed by approximately 7 - 22 ft. of clayey silt to silty clay underlain by limestone bedrock.

The boundaries of various deposits are shown on the appended borelog sheets. The estimated stratigraphical profile of Dwg. 64-F-87A is based upon this information.

From ground level downward, the different soil types are as follows:

4.2) Heterogeneous Mixture of Silty Sand and Organics:

A deposit consisting of a dark grey heterogeneous mixture of silty sand and organics was encountered immediately below ground surface and brook water in all the boreholes. It varied in thickness from 4 ft. in B.H. No. 2 to 13 ft. in B. H. No. 6. The samples from the stratum revealed that the organic content generally decreases with depth. Standard Penetration tests carried out in this deposit indicate that it is generally very loose.

4.3) Clayey Silt to Silty Clay:

Underlying the organic layer, a deposit of clayey silt to silty clay was encountered extending down to elev. 692 - 684. The lower boundaries of this deposit were not determined in B.H. No's 3 and 6 since these boreholes were carried out to determine the possible scour depth in the brook. The depth of the layer varies from a minimum of 7 ft. in B.H. No. 5 to a maximum of 22 ft. in B.H. No. 1.

cont'd. /4 ...

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

4.3) Clayey Silt to Silty Clay: (cont'd.) ...

The Atterberg limits and moisture contents of the deposit are as follows:

Liquid Limit	(W _L %)	--	22% - 64%
Plastic Limit	(W _p %)	--	16% - 28%
Moisture Content	(W%)	--	19% - 46%

The undrained shear strength of the deposit as determined from field vane tests, was found to vary from a low of 640 p.s.f. to a maximum of over 2,000 p.s.f., whereas the results of the laboratory tests were found to vary randomly from 475 p.s.f. to 3,260 p.s.f. These results indicate that the deposit is essentially very stiff to soft, generally the strength decreasing with depth.

4.4) Silty Sand and Gravel:

A stratum of dense to very dense silty sand and gravel was encountered beneath the clay deposit in B.H. No's 4 and 5 only, immediately above the bedrock. The thickness is only 6 ft. in B.H. No. 4, whereas in B.H. No. 5, this layer is 9 feet. In B.H. No. 5, this deposit contains boulders up to 18" in size below elev. 691.0.

4.5) Bedrock:

Limestone bedrock was established by drilling 5 to 10 ft. of AXT core in B.H. No's 1, 2, 4 and 5. The bedrock was contacted between elev. 692.5 and elev. 684.0. This is some 25 to 33 feet below ground surface. The limestone bedrock is generally sound except in the upper 2 to 4 ft. where it is weathered and partially fractured.

cont'd. /5 ...

5. GROUND WATER CONDITIONS:

The ground water level, as measured in open boreholes (B.H. No's 1 and 2) during the course of the field work, was found to be at elev. 717.0 which corresponds to the brook water level. No artesian water was observed in any of the boreholes during the progress of the field investigation.

6. DISCUSSION AND RECOMMENDATIONS:

The structure site is located at approximate chainage 685+00, Hwy. 48 and Pepperlaw Brook, some 7 miles east of Sutton E. Limits. At this location the existing structure is 100 ft. long and 28 ft. wide. The existing structure is generally in a poor condition. It is proposed to widen the present Hwy. 48 in this vicinity to meet the current D.H.O. standards. In view of this, a new, wider (approximately 40 ft.) and 100-ft. span is proposed at this location.

The subsoil at the site generally consists of 4 to 13 ft. of loose sand and organics followed by clayey silt to silty clay, underlain by limestone bedrock. The bedrock contact is established between elev. 692.5 and elev. 684.0.

Structure Foundations -

Due to the presence of organic deposits in the upper portion of the subsoil, adequate bearing capacity cannot be achieved for an economical spread footing design. The new structure should therefore be supported on end-bearing piles driven to bedrock. Design loads to be used are dependent on the pile section selected and may be 75 tons per pile in the case of 12 BP 73 steel H-piles. Footing bases

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

Structure Foundations - (cont'd.) ...

should be formed on a 12" granular pad or a suitable working slab. Since the excavations for the structure footings will be carried out below the brook water level, a dewatering scheme will be necessary. If steel sheeting is used as a means of scour protection, this may be incorporated in the dewatering scheme. In such a case, the steel sheeting should be driven a minimum of 2 ft. into the clay stratum.

Approach Fills:

It is understood that the new approaches will be some 6 ft. higher than the existing ones. Because of the presence of organic deposits below the natural ground surface, some measures are required to ensure the stability of the approach fill extensions. It is recommended that all organic material be removed within the limits of the proposed extensions for a minimum distance of 50 ft. behind the abutments. The approach fill extensions can be constructed with 2:1 standard side slopes.

7. SUMMARY:

A new 100-ft. single-span, wider structure is proposed to replace the existing bridge at the crossing of Pepperlaw Brook and Hwy. 48.

The subsoil at the site mainly consists of a mixture of sand and organics, followed by clayey silt to silty clay underlain by limestone bedrock.

It is recommended that the new structure be supported on end-bearing piles driven to bedrock. A safe load of 75 tons may be

cont'd. /7 ...

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

used for design purposes in the case of 12 BP 73 steel H-piles.

Dewatering may present some problems since excavations will be carried out below brook water level.

Standard 2:1 side slopes may be used for the approach fill extensions, provided that certain measures are taken which are outlined in Chapter V, "Discussion and Recommendations".

8. MISCELLANEOUS:

The field work, performed during the period September 29 to October 7, 1964, together with the preparation of this report, was undertaken by Mr. V. Korlu, Project Foundation Engineer. The investigation was carried out under the general supervision of Mr. M. Devata, Senior Foundation Engineer, who reviewed this report.

Equipment used was owned and operated by Dominion Soil Investigation, Limited, Toronto.

December 1964

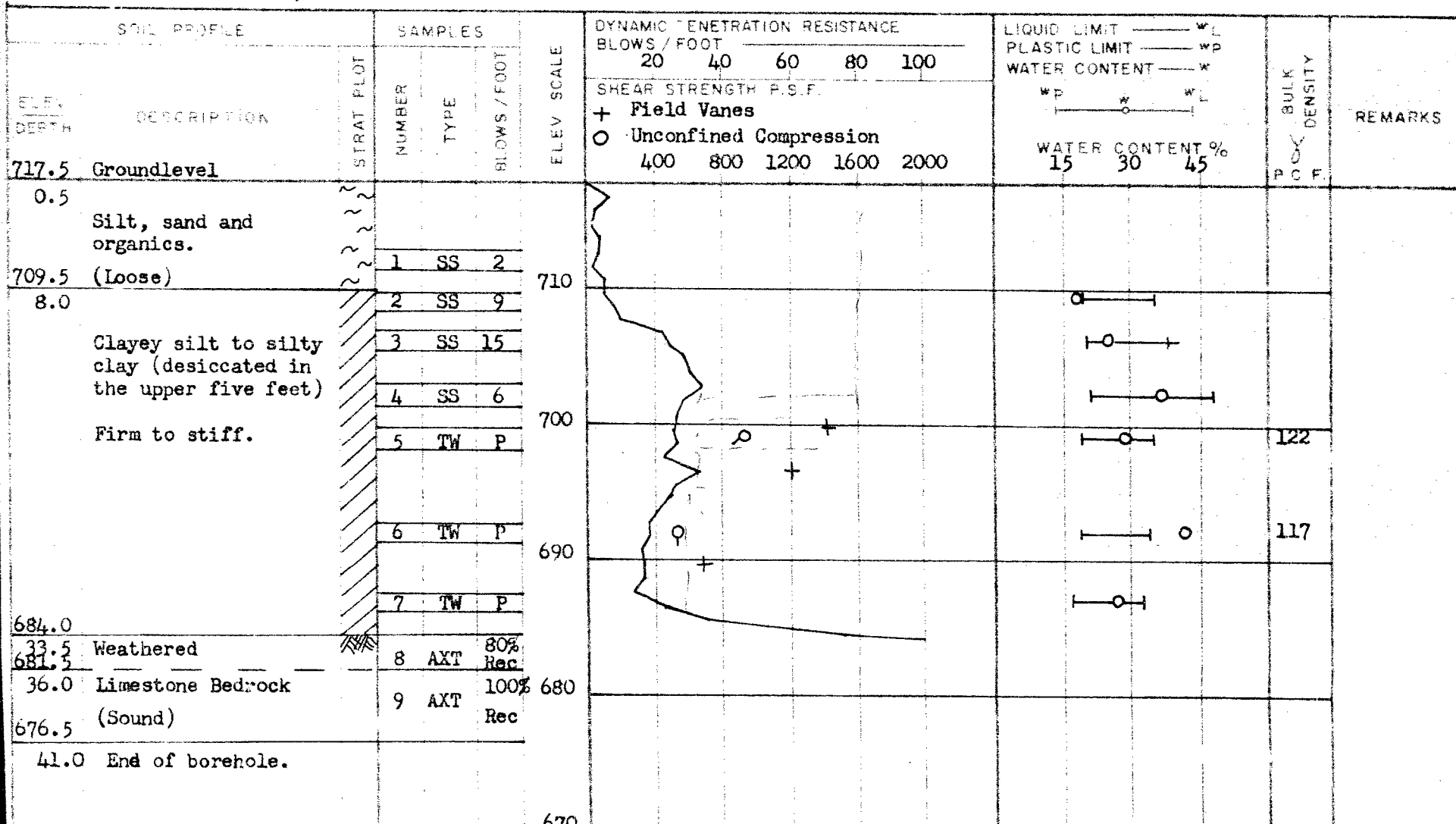
APPENDIX I.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

JOB 64-P-87LOCATION Sta. 658/66 28' Rt. Hwy. 48ORIGINATED BY V.K.W.P. 260-63BORING DATE Sept. 29, 1964.COMPILED BY V.K.DATUM GeodeticBOREHOLE TYPE Drive & Wash NX Casing.CHECKED BY M.D.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

JOB 64-F-87

LOCATION Sta. 657+12 27' Lt. Hwy. 48

W. P. 260-63

BORING DATE Sept. 30, 1964.

DATUM Geodetic

BOREHOLE TYPE Drive & Wash NX Casing

FOUNDATION SECTION

ORIGINATED BY V.K.

COMPILED BY V.K.

CHECKED BY _____ M.D.

SOIL PROFILE		SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	Liquid Limit ——— W _L Plastic Limit ——— W _P Water Content ——— W	BULK DENSITY POUNDS PER CUBIC FOOT	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		20 40 60 80 100	SHEAR STRENGTH P.S.F. + Field Vane ○ Unconfined Compression		
717.5	Groundlevel								
0.5	Mixture of Organics & silty sand (Loose)	~~~~~	1	SS	2				22% Organic
4.0	Clayey silt to silty clay. (Firm to v. stiff)		2	TW	P			125	
			3	TW	P			130	
			4	TW	P			127	
			5	TW	P			124	
			6	TW	P			110	
			7	TW	P			110	
			8	TW	P			119	
692.5			Weathered Limestone Bedrock (Sound)		9		AXT	80% Rec	
682.5	End of borehole.		10	AXT	100% Rec				
35.0									

FOUNDATION SECTION

CHECKED BY M.D.

SOIL PROFILE		SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— W _L		BULK DENSITY	REMARKS
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	20 40 60 80 100	PLASTIC LIMIT ——— W _P	WATER CONTENT ——— W		
						SHEAR STRENGTH P.S.F.		WATER CONTENT %			
						+ Field Vane					
						○ Unconfined Compression					
						400 800 1200 1600 2000					
717.0	Waterlevel										
	Water				710						
704.5											
12.5	Mixture of organics and silty sand. (Loose)	1	SS	2	700						
		2	SS	2							
694.0											
23.0	Clayey silt with occasional gravel.	3	SS	36							
690.5		4	SS	11	690						
26.5	End of borehole.										
					680						
					670						

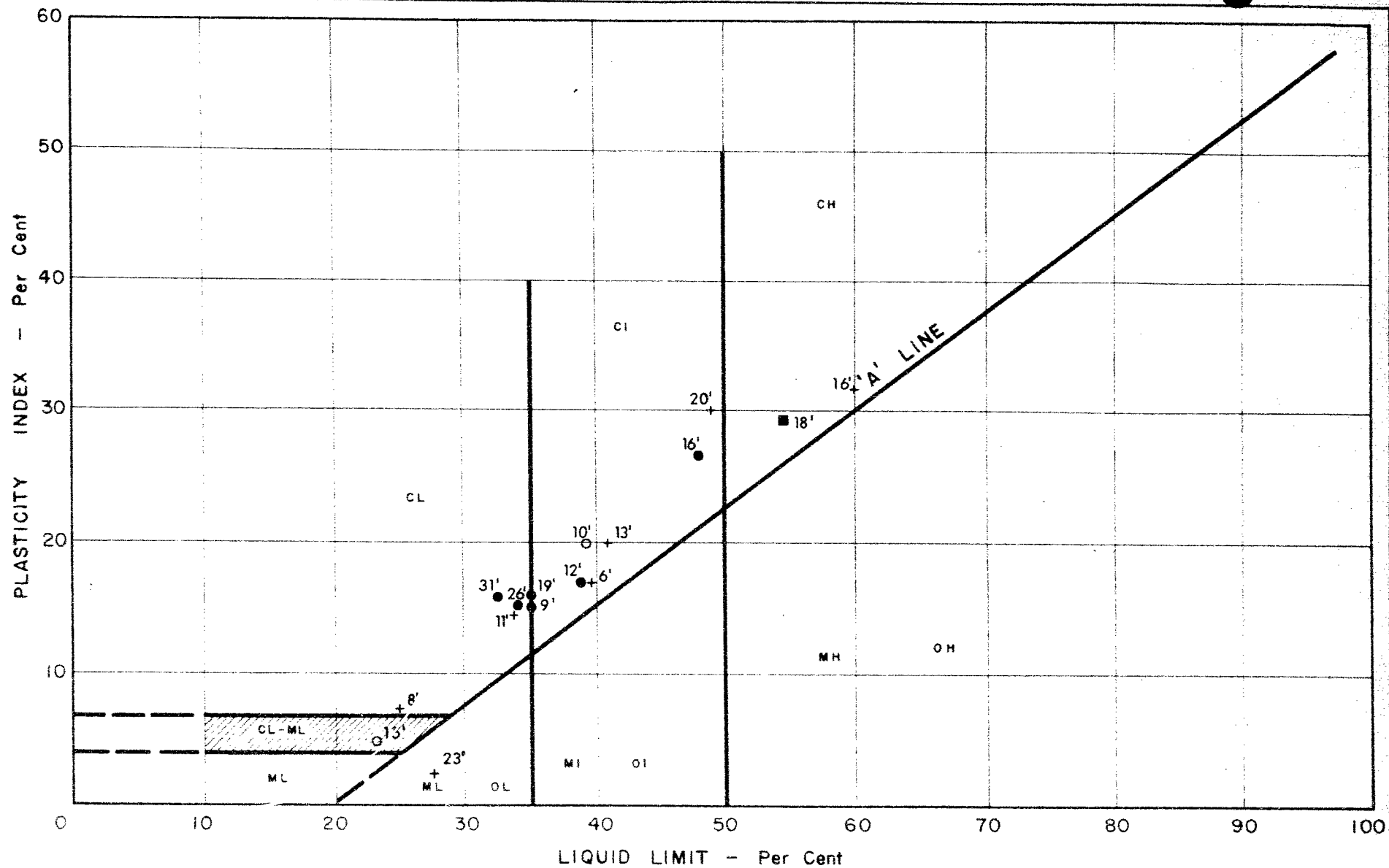
CHECKED BY M.D.

SOIL PROFILE		SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE	LQUID LIMIT ——— WL	BULK DENSITY	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE		BLOWS / FOOT	BLOWS / FOOT		
							WATER CONTENT ——— W		
							WP ——— WL		

FOUNDATION SECTION

CHECKED BY M.D.

SOIL PROFILE			SAMPLES			ELFV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LQUID LIMIT ——— WL	PLASTIC LIMIT ——— WP	WATER CONTENT ——— W	BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PILOT	NUMBER	TYPE	BLOWS / FOOT		20 40 60 80 100					
717.0	Waterlevel	---										
715.0	Water	---										
2.0	Mixture of organics and silty sand.	~ ~ ~										
	(Loose)	~ ~ ~	1	SS	1	710						
		~ ~ ~	2	SS	1							
		~ ~ ~	3	SS	2							
703.5		~ ~ ~	4	SS	9							
13.5	Silty clay to clayey silt.	/ / /	5	TW	P							
698.0	(Stiff)	/ / /	6	TW	P	700						
19.0	Sand and gravel. Dense to v. dense.	. . .	7	SS	31							
		. . .	8	SS	103							
689.0	with boulders	. . .	9	AXT	20% Rec	690						
28.0	Weathered	/ / /										
685.0		/ / /										
32.0	Limestone Bedrock	/ / /	10	AXT	100% Rec	680						
680.0		/ / /										
37.0	End of borehole.	/ / /				670						



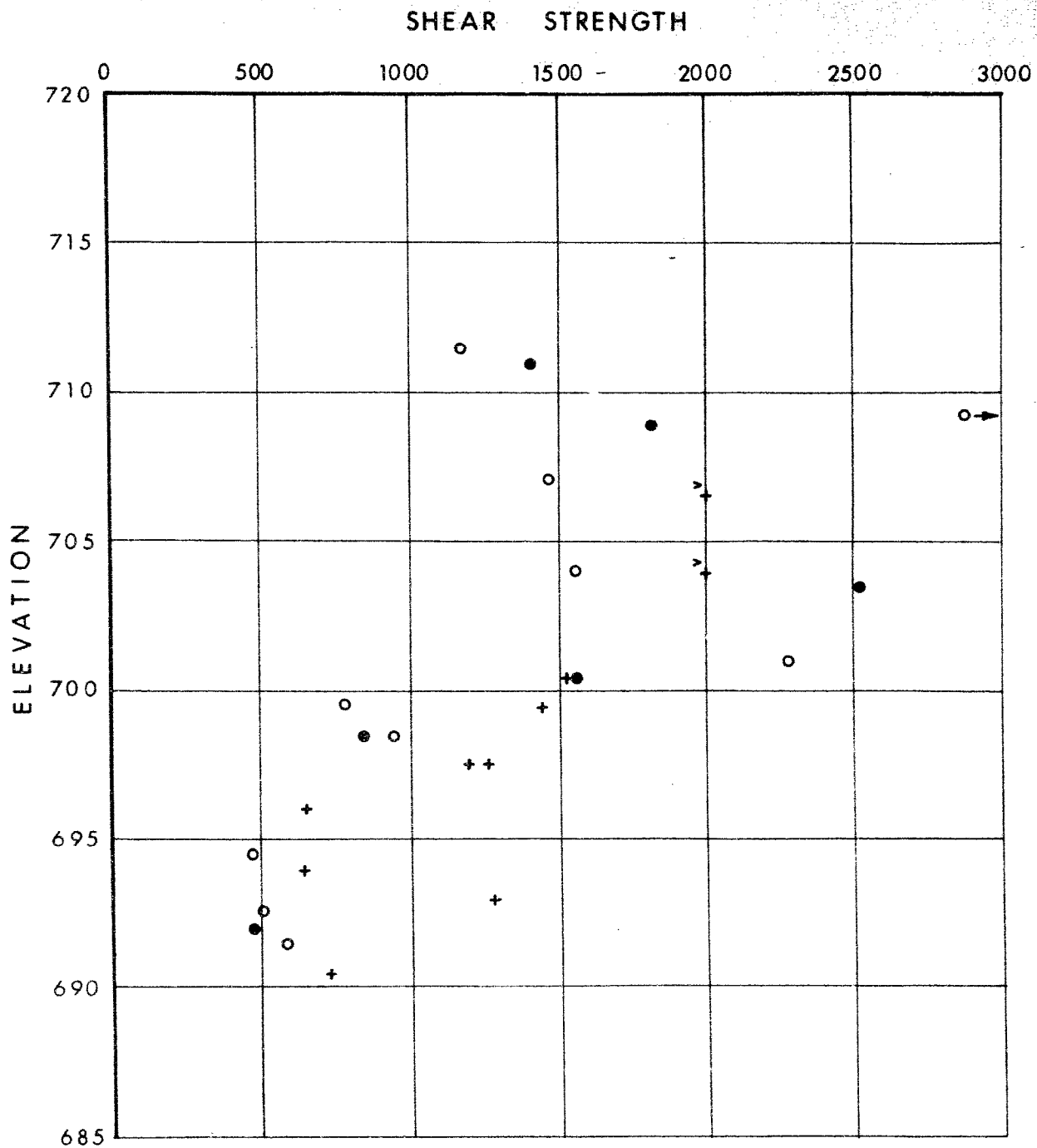
NOTES

- - B. H. N° 1
- + - B. H. N° 2
- - B. H. N° 4
- - B. H. N° 5

DEPARTMENT OF HIGHWAYS - ONTARIO
 MATERIALS & RESEARCH DIVISION
 PLASTICITY CHART

Job No. 64 - F - 87 W.P. No. 260 - 63

Location PEPPERLAW BROOK & HWY. N° 48



LEGEND

- - TRIAXIAL
- - UNCONFINED COMPRESSION
- + - VANE TEST

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

Qu	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Qcu	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Qd	DRAINED TRIAXIAL	S	SENSITIVITY

ABBREVIATIONS USED IN THIS REPORT

SOIL PROPERTIES

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

GENERAL

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

EARTH PRESSURE

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

FOUNDATIONS

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

SLOPES

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

MEMORANDUM

File 64-F-87

To: Mr. A. G. Stermac,
Principal Foundation Engineer,
Room 107, Lab. Bldg.

FROM: Bridge Division,
Downsview, Ontario.

DATE: September 18, 1964.

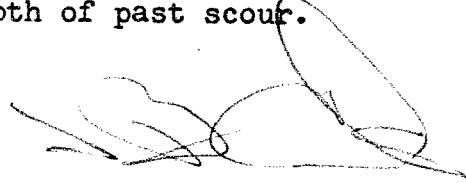
OUR FILE REF.

IN REPLY TO

SUBJECT: Pefferlaw Brook Bridge
Hwy. 48 - Dist. 6
7.1 Miles East of Sutton E. Limits
W.P. 260-63; Bridge Site 38-5 37-005

Would you kindly arrange to have a foundation investigation carried out at this site.

Probable footing locations are indicated on the attached plan. In order to set final grade we must know if falsework can be supported on or in the river bed. Would you then take at least one boring in the river bed which might help determine both falsework feasibility and depth of past scour.



JBC/sp

J. B. Curtis,
Regional Bridge Location Engineer.

cc. R. Fitzgibbon
N. D. Smith
C. R. Hopkins

- 1) Called Mr D.R. ³⁵²⁴Brohm and informed the investigation will commence on Tuesday 23-9-64.
- 2) Called Mr. T. C. ³⁵²⁴Leach and informed about the field investigation.
- 3) Called Mr. ³⁵²⁴Leach and informed about the field investigation.
- 4) Keen into the field work on 29m Sept/64.

M. DeBata
Sept 29/64.

MEMORANDUM

64-F-87

TO: Mr. A.G. Stermac,
Principal Foundation Engineer,
Room 107, Lab. Building.

FROM: Bridge Division,
Downsview, Ontario.

DATE: September 24, 1964.

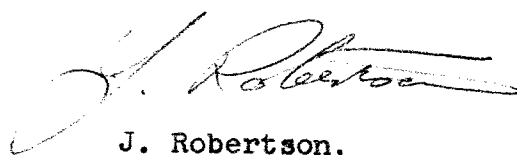
OUR FILE REF.

IN REPLY TO

SUBJECT: Pefferlaw Brook Bridge
Highway 48 District #6,
7.1 Miles East of Suttan E. Limits
W.P. 260-63 Bridge Site # 38-5. 37-005

Please find enclosed drawing # E-4285-1 marked
in red showing the probable location of future footings for
the above mentioned structure. This drawing is an addition
to the information issued when the foundation investigation
was requested on September 18, 1964.

JR/kd



J. Robertson,
for J.B. Curtis,
Regional Bridge Location Engineer.

Mr. W. S. Melinyshyn,
Regional Bridge Location Engr.,
Bridge Division, Admin. Bldg.

Attn: Mr. J. C. McAllister

Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

September 6, 1966

Pefferlaw Brook Bridge,
Highway 48, District 6,

-- W.P. 260-63 --

We have reviewed your Preliminary Drawing No. 5645-P2 for the above structure, and have the following observations to make:

1) The drawing shows no limits of excavation for the organic material as recommended in our Report No. W.J. 64-F-37 of December 11, 1964.

2) We would also recommend that all organic material between the abutment and the back face of the sheeting for both pier footings, should be removed and replaced with suitable granular material.

If these recommendations are carried out, no stability problems are anticipated.

AD/WdeP

M. Devata

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

cc: Foundations Office
Gen. Files

MEMORANDUM

TO:

Mr. A. G. Stermac,
Principal Foundation Engineer,
Room 107, Lab. Building.

FROM:

Bridge Division,
Downsview, Ontario

DATE:

August 29, 1966

OUR FILE REF.

IN REPLY TO

SUBJECT:

Pefferlaw Brook Bridge,
Highway 48, District 6
W.P. 260-63

Herewith is one print of our drawing D-5645-P2 for your approval and comments.

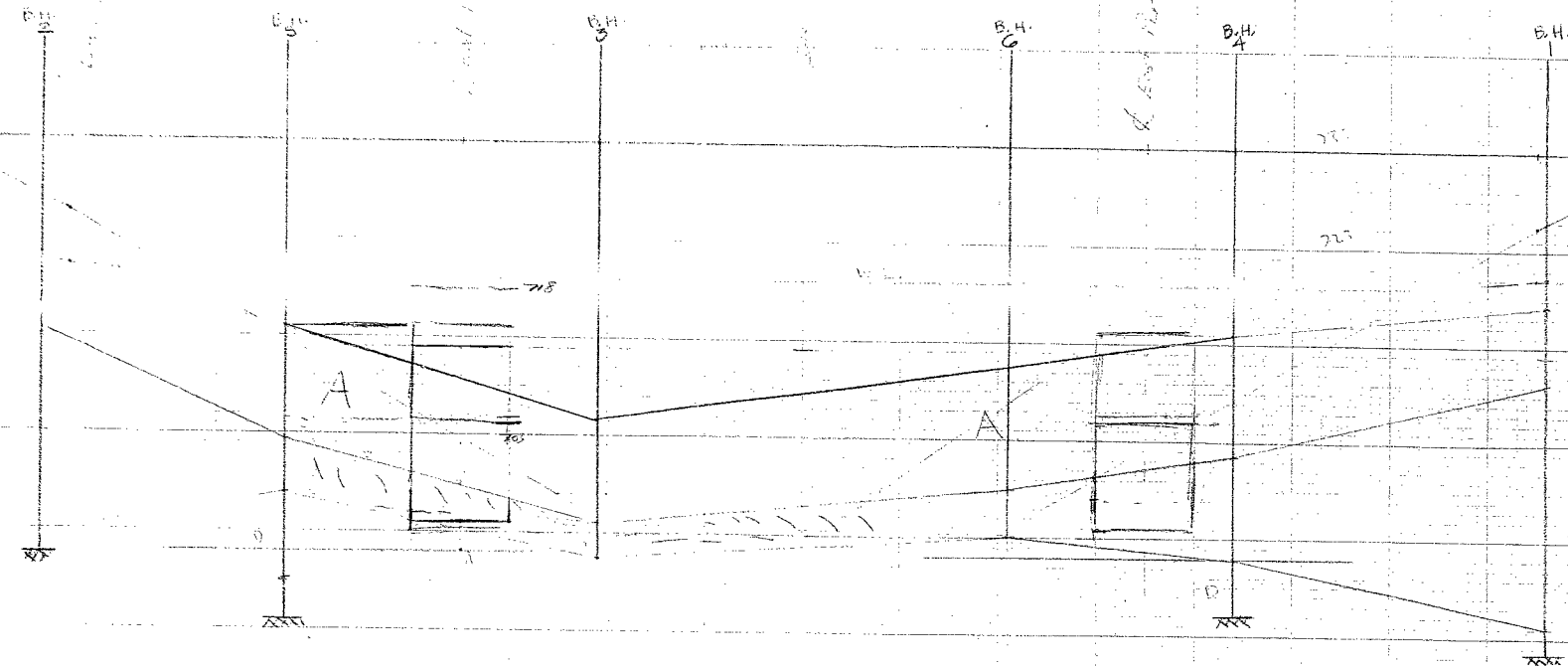
Please note that the grade has been raised seven feet (7'-0") over the existing grade.



JCMcA/pr
Attach.

J. C. McAllister,
for W. S. Melinyshyn,
Regional Bridge Location Engineer

Existing Ground Line



LEGEND

- A = Mixture of silty sand & organics
- B = Clayey silt with occasional gravel
- C = Silty clay to clayey silt
- D = Sand and gravel