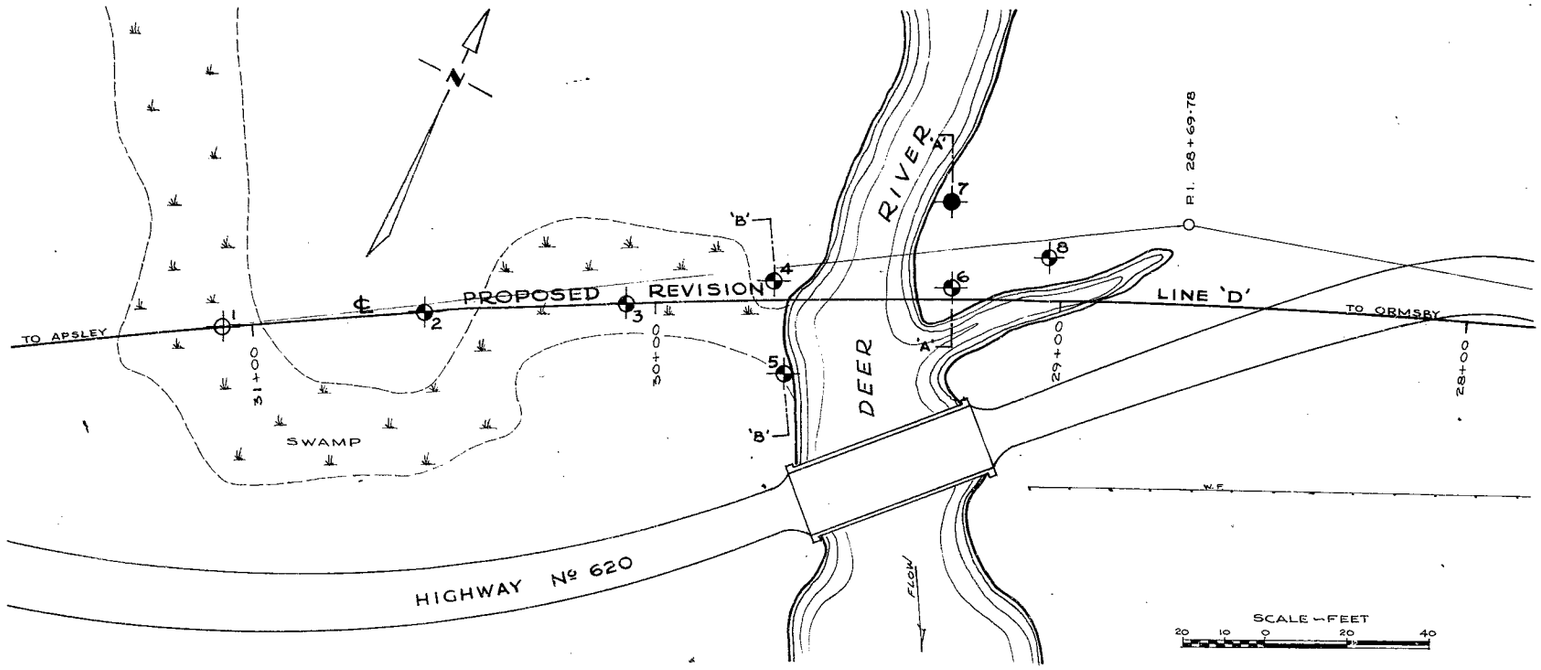
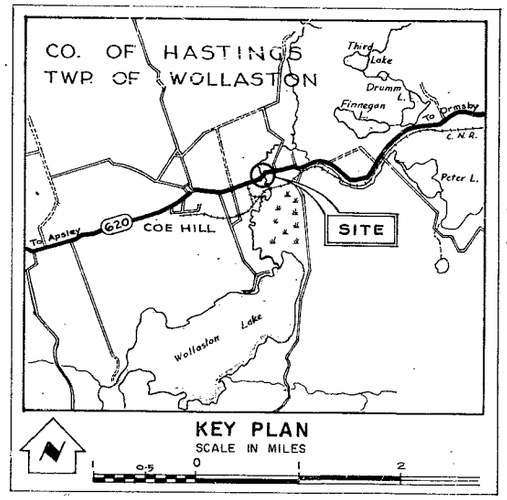
#
62-F-88
W.P # 186-62
#
HWY 620
DEER RIVER



PLAN

SCALE - FEET
20 10 0 20 40

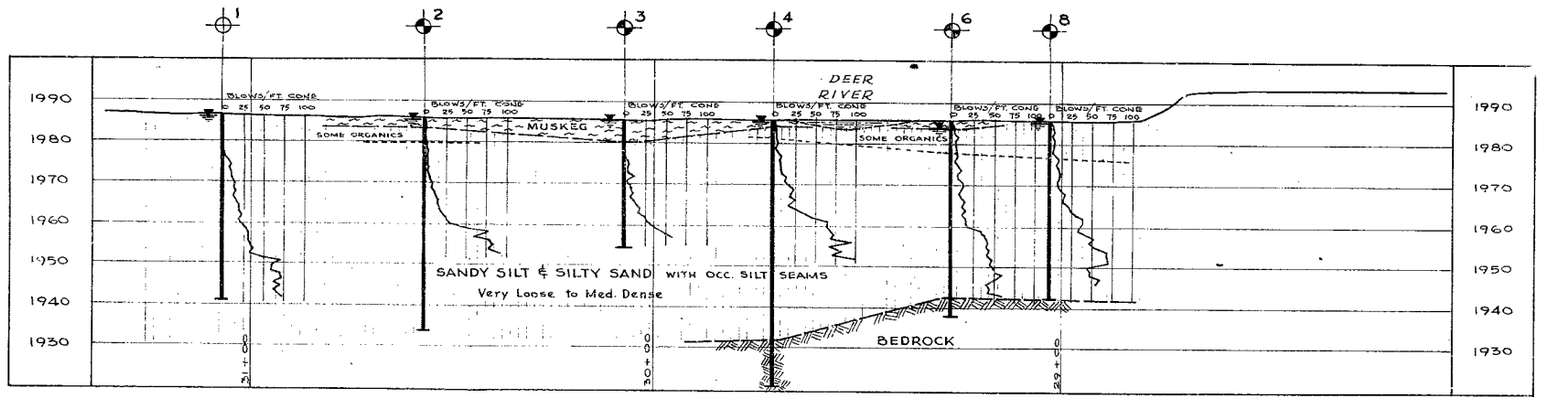


KEY PLAN
SCALE IN MILES
1 0·5 0 1 2

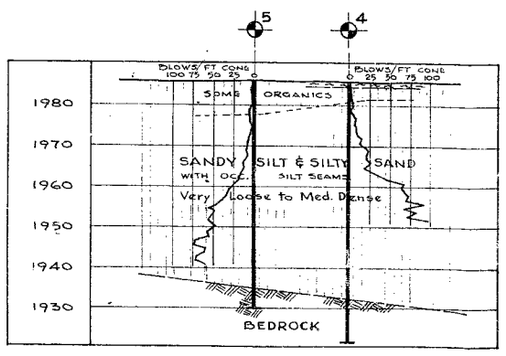
LEGEND

- Bore Hole
- Cone Penetration Hole
- Bore & Cone Penetration Hole
- Water Levels established at time of field investigation - July 1962

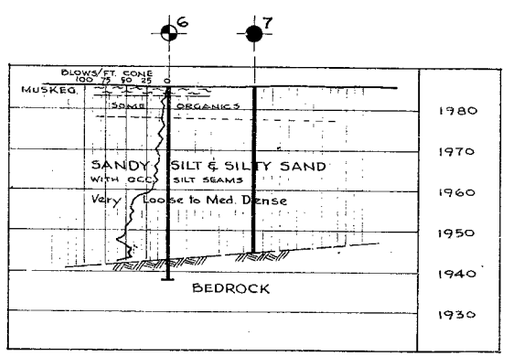
NO.	ELEVATION	STATION	OFFSET
1	1988	31+07	℄
2	1987	30+57	℄
3	1986	30+07	℄
4	1986	29+70	5' RT.
5	1986	29+68	18' LT.
6	1986	29+27	3' RT.
7	1986	29+27	24' RT.
8	1986	29+03	11' RT.



LINE 'D' PROFILE



B-B



A-A

SCALE FOR PROFILE AND SECTIONS
20 10 0 20 40 60 Feet
HORIZONTAL and VERTICAL

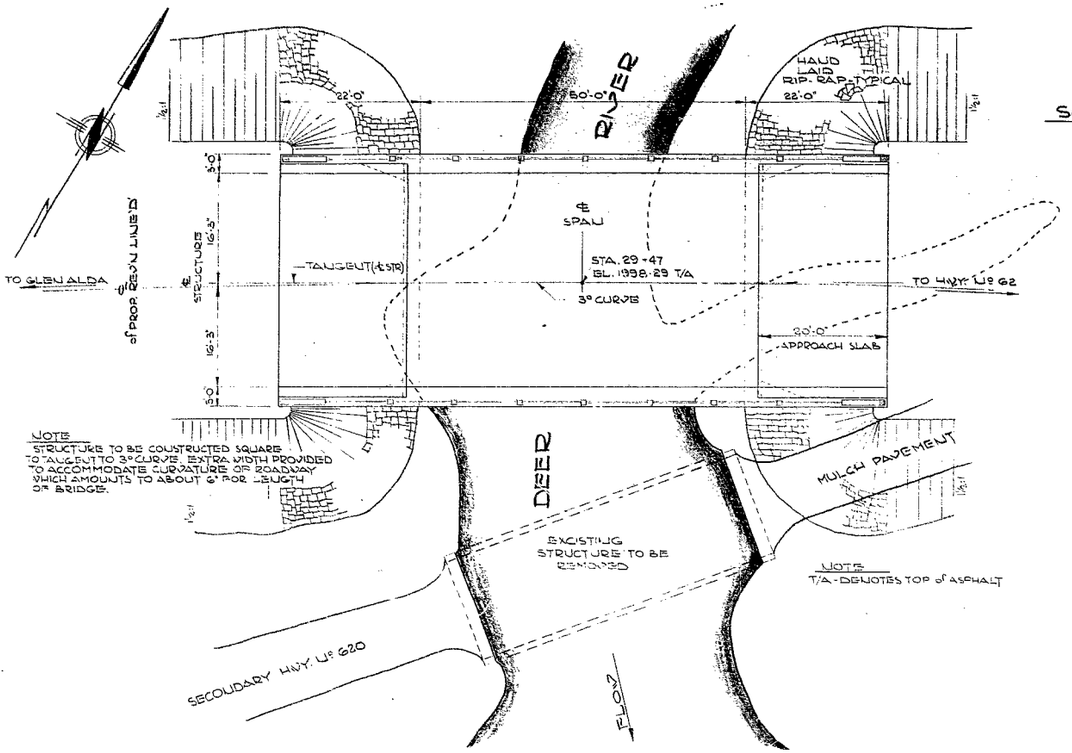
- NOTE -

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.

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION

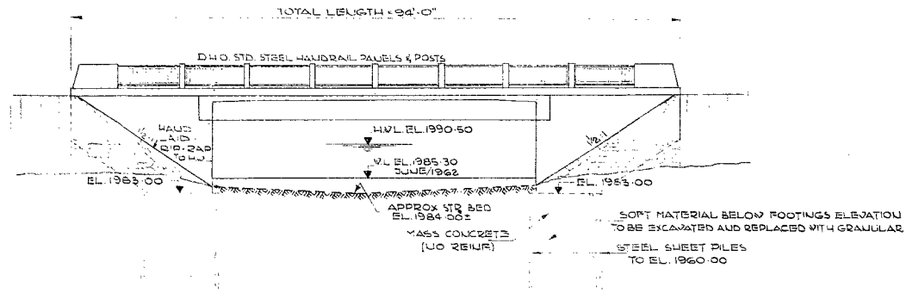
DEER RIVER AND HIGHWAY Nº 620 LINE 'D'

ORIGINATED G. Cherrington	DISTRICT NO. 8	DATE 23 August 1962
DRAWN H. D. Reed	W.P. NO. 186-62	JOB NO. 62-F-88
CHECKED GC	CONTRACT NO.	DRAWING NO. 62-F-88 A
APPROVED		



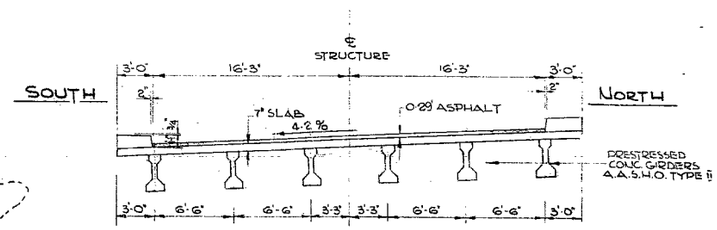
PLAN

SCALE: 1" = 10'-0"



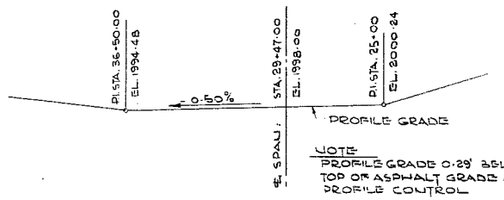
ELEVATION

SCALE: 1" = 10'-0"



TYPICAL DECK SECTION

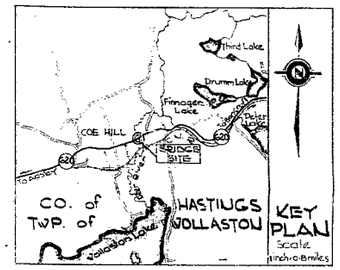
SCALE: 3/16" = 1'-0"



NOTE
PROFILE GRADE 0.28' BELOW TOP OF ASPHALT GRADE AT PROFILE CONTROL

PROFILE of PROPOSED REVISION of SECONDARY HWY. No. 620 LINE "D"

N.T.S.



Final

PRINT RECORD		
No.	FOR	DATE

REVISIONS		
DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE DIVISION

DEER RIVER BRIDGE at COE HILL

KING'S HIGHWAY No. 620 — DIST. No. 10
CO. HASTINGS
TWP. WOLLASTON — LOT 13 — CON. 1X

PRELIMINARY PLAN

APPROVED ... BRIDGE ENGINEER				SITE No. 12-236	W.P. No. 186-62
DESIGN	J.L.K.	CHECK	-	CONTRACT Nos.	
DRAWING	E.A.	CHECK	J.L.K.		
DATE	1962	LOADING	1-20 S-16	DRAWING No.	D-5133-P1

W.P. 186-62.

Mr. A. M. Toye,
Bridge Engineer.
Materials & Research Division,
(Foundation Section)

August 14, 1962.

D.H.O. FOUNDATION INVESTIGATION REPORT.
W.P. 186-62 -- W.J. 62-F-88.

Attention: Mr. S. McCombie.

Re: Proposed Structure - 1/2 Mi. E. of Coe Hill,
Sec. Hwy. #620, Sta. 29+00 - Sta. 30+00,
District #10.

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

We believe you will find the factual data and recommendations contained therein, adequate for your future design work. Should further information be required, please feel free to contact our Office.

KYL/MdeF
Attach.
cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
H. D. McMillan
J. Ford
W. G. Wigle
J. E. Gruspier
T. J. Kovich
J. Roy
E. R. Saint
F. Norman
A. Watt
Foundations Office ✓
Gen. Files.

K. Y. Lo,
SUPERVISING FOUNDATION ENGR.
For:

A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

TABLE OF CONTENTS

FOUNDATION INVESTIGATION

For

Proposed Structure - 1/2 Mi. E. of Coe Hill,
Sec. Hwy. #620, Station 29+00 - Station 30+00,
W.J. 62-F-88 - District #10 - W.P. 186-62.

1. INTRODUCTION:

A request dated June 5, 1962, for a foundation investigation at the site of a proposed new bridge at Deer River and relocated Hwy. #620, Line 'D' was received from the Bridge Location Section.

A field investigation to determine the subsoil conditions at the site of the proposed structure, was carried out by this Section.

Presented in this report are the results of this investigation, together with the recommendations pertaining to the design of the structure foundations.

2. DESCRIPTION OF SITE:

The proposed site is located at the eastern limit of the Town of Coe Hill.

The site is located in the bottom of an old spillway which has been confined to a fairly narrow trough due to outcroppings of metamorphic rock which rise to the east and west of the site.

Physiographically, the area is located on the Canadian Shield.

In detail, the area can be described as numerous outcrops of metamorphosed rock with the low areas being covered by a thin blanket of non-cohesive material.

cont'd. /2 ...

3. FIELD AND LABORATORY WORK:

The field work consisted of eight boreholes and six dynamic cone penetration tests.

Samples were recovered at required depths by means of a 2" O.D. split-spoon sampler. The dimensions of the split-spoon sampler and the energy used in driving it, conform to the requirements of the Standard Penetration Test. Driving energy to advance the 2-inch cone was 350 ft.-lbs. per blow.

AXT rock core samples were obtained in B.H.'s 4, 5 & 6.

The locations and elevations of all boreholes are shown on Dwg. 62-F-88A which accompanies this report.

4. SUBSOIL CONDITIONS:

4.1) General:

Stratigraphy at the site was found to be generally uniform. Detailed descriptions of the soil types encountered in each boring are given in Appendix I of this report. The estimated stratigraphical profile of Dwg. 62-F-88A is based upon this information.

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

4.2) Muskeg:

A surface layer of muskeg was found to exist over most of the site. In general, the depth of the muskeg was only about 2' thick, while in the vicinity of B.H. #3 the deposit

cont'd. /3 ...

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

4.2) Muskeg: (cont'd.) ...

extends to a maximum depth of 7 ft. This disparity was due to the fact that B.H. #3 was situated in a swampy depression containing greater depths of muskeg than the surrounding higher ground.

4.3) Sandy Silt & Silty Sand with Occasional Silt Seams:

This deposit varies between 40 and 50' in thickness and consisted of a heterogeneous mixture of silty sand, sandy silt and silt.

'N' values in the top 20 ft. were of the order of 2 - 3 blows/ft. which would classify the material as very loose.

Below this depth the 'N' values were of the order of 20 blows/ft. which would classify the material as medium dense.

4.4) Bedrock:

The bedrock was found to be between 43' and 54' below the ground surface, (el. 1932 - el. 1943 - el. 1953).

B.H.'s 4, 5, 6, 7 & 8 were advanced to the rock contact. In B.H. #4, 10' of rock core (in AXT size) was taken with 100% recovery; 5' of core was taken in B.H.'s 5, 6 & 8 with 100% recovery in each.

The bedrock was found to be a sound metamorphic gneiss.

5. GROUND WATER CONDITIONS:

In all boreholes, the ground water was found to be very close to the ground surface. Due to the permeable nature of the subsoil, the ground water elevations were found to coincide with the water elevation of Deer River.

cont'd. /4 ...

5. GROUND WATER CONDITIONS: (cont'd.) ...

The ground water elevations taken at the time of the investigation are shown on the borehole logs and Dwg. 62-F-88A.

6. DISCUSSION AND RECOMMENDATIONS:

It is proposed to construct a one-span structure to carry the relocated Hwy.#620 over the Deer River.

The soil profile at the site consists of 2 ft. to 7 ft. of muskeg overlying 40 - 50 ft. of sandy silt to silty fine sand. This material is underlain by bedrock.

Because of the estimated low bearing capacity of the loose sandy subsoil, it is recommended that the structure be supported on a piled foundation. For 12" Ø timber piles - (treated if not completely below the lowest established water level), a design load of 20 tons per pile may be used, provided the piles are driven to an estimated elev. 1955.0. If larger bearing loads are required, it is recommended that the structure be supported on end bearing piles driven to practical refusal. For 12¾" O.D. steel tube piles driven to the bedrock, a design load of 60 tons/pile may be used.

A dewatering scheme will be necessary as excavations will be carried out below creek or water table levels.

Protection against scour will be necessary for the abutment footings. If sheeting is used, it is recommended that it be driven to as far a distance below the excavation bottom equalling the height of the water above the excavation bottom.

cont'd. /5 ...

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

The entire site investigated is generally covered with 2 ft. to 7 ft. of muskeg. It is recommended that this organic material should be subexcavated as per D.H.O. Standards and backfilled with acceptable earth material prior to the construction of the approaches.

No approach fill stability problems are anticipated provided they are constructed with side slopes 2:1.

7. SUMMARY:

Subsoil at the site consists of sandy deposits underlain by bedrock. The sandy subsoil is overlain by a thin layer of muskeg.

Because of the loose nature of the upper layer, piled footings are recommended for the structure. For 12" Ø timber piles driven to an estimated elev. 1955.0, a safe design load of 20 tons/pile may be used. If larger loads are required, steel tube piles driven to bedrock, may be used with a safe design load of 60 T/pile.

A dewatering scheme will be necessary as excavations will be carried out below creek or ground water levels.

If sheeting is used for scour protection, it may be incorporated into a scheme for dewatering.

It is recommended that all the organic material - (muskeg) should be removed as per D.H.O. Standards and backfilled with suitable earth material prior to the construction of the structure and approaches.

Approach fill stability problems are not anticipated for the proposed 2:1 side slopes.

cont'd. /6 ...

8. MISCELLANEOUS:

The field work, performed during the period from July 17 to August 2, 1962, together with the preparation of this report, was undertaken by Mr. G. G. Cherrington. The investigation was carried out under the general supervision of Mr. M. Devata, who reviewed this report.

August 1962.

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 :-

CONSISTENCY	'N' BLOWS / FT.	c LB. / SQ. FT.	DENSENESS	'N' BLOWS / FT.
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 INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF EFFECTIVE STRESS $\tau_f = c' + \sigma' \tan \phi'$
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF TOTAL STRESS $\tau_f = c_u + \sigma \tan \phi$
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 (YOUNGS 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_o	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

cc: Foundations Office (Rm. 110)

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

Attention: Mr. John Curtis.

Mr. A. G. Stermac,
Principal Foundation Engr.,
Materials & Research Division.

September 21, 1962.

Re: Deer River & Hwy. No. 620, Line 'D',
W.P. 186-62 -- W.J. 62-F-88, Dist. #10.

We have reviewed the Preliminary Plan D-5133-P1 for the above mentioned structure and would like to make the following comment:

In our memo of September 7, 1962, it was suggested that a bearing pressure of 3.0 T/sq.ft. can be used for spread footing if sheet piles are driven to elev. 1960' and made an integral part of the footing. We assume that this detail is being taken care of and is shown on another drawing. However, if this is not the case, we would suggest that it be clearly pointed out on all the drawings dealing with footings.

A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

AGS/MdeF

cc: Foundations Office
Gen. Files.

Mr. A. M. Toye,
Bridge Engineer.

Attention: Mr. John Curtis

Mr. A. G. Stermac,
Principal Foundation Engr.,
Materials & Research Division.

September 7, 1962.

Re: Deer River & Hwy. No. 620, Line 'D',
W.P. 186-62 -- W.J. 62-F-88, Dist. #10.

As discussed over the telephone today, still another alternative for the footing design can be considered - i.e. - driving of steel sheet piling to elev. 1960', leaving it in the ground, and also making it part of the footing. Spread footings with an allowable bearing pressure of up to 3.0 T/sq.ft. can be used.

This proposal is based on the fact that by utilizing the sheeting as part of the footing, the latter can be considered as a deep footing with the seat of stresses below elev. 1960'. The material at this depth being much denser, no stability problem should arise.

It is also believed that whatever settlements occur, they will take place during construction due to the predominantly granular character of the subsoil.

AGS/MdeF

A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Foundations Office
Gen. Files.

62-F-86

DOWN KINR 16 NOV 8/62 12:10P

K Y LO MATERIALS AND RESEARCH

RE DEER RIVER STRUCTURE WP 186-62

THIS IS TO CONFIRM OUR TELEPHONE CONVERSATION OF NOV 7/62 RE YOUR RECOMMENDATIONS FOR THE TREATMENT OF ~~SCOPIES~~ SLOPES FOR THE ABOVE WORK PROJECT AS FOLLOWS

1. SLOPES OF APPROACH FILL 1 1/2 :1

2. REMOVAL OF STRIPPING FULL WIDTH OF APPROACH FILLS

G H BOOTH ROAD DESIGN

CAM

APPENDIX I.

FORM OB ML-126 REV 961

OFFICE REPORT ON SOIL EXPLORATION

61-4391

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

JOB 62-F-88 LOCATION Coe Hill, Sta. 31+07 ℄ Line "D" ORIGINATED BY G.C.

W.P 186-62 BORING DATE July 16, 1962. COMPILED BY B.K.

DATUM Geodetic BOREHOLE TYPE Dynamic Cone Penetration. CHECKED BY G.C.

SOIL PROFILE			SAMPLES				DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100	LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_P WATER CONTENT ——— w			REMARKS
ELEV. / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	SHEAR STRENGTH P.S.F.	w_P w w_L WATER CONTENT %	BULK DENSITY P.C.F.		
1988 0.0	Ground Surface										▽ W.L. 1987.5
	Probably sandy silt and silty fine sand.					1980					
						1970					
						1960					
						1950					
1943 45	End of cone penetration.					1940					

FORM 08-ML-126 REV 1961

81-4391

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 62-F-88 LOCATION Coe Hill, Sta. 30/57 ℄ Line "D" ORIGINATED BY G.C.

W.P 186-62 BORING DATE July 17, 1962. COMPILED BY B.K.

DATUM Geodetic BOREHOLE TYPE Wash Boring CHECKED BY G.C.

ELEV. / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS / FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 / SHEAR STRENGTH P.S.F	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w / w_D w w_L / WATER CONTENT %	BULK DENSITY γ P.C.F.	REMARKS
1987 0.0	Groundlevel									
1985 2.0	Muskeg									▽ W.L. 1985.7
1981.0 6.0	Mixed silt and fine sand with some organics. Very loose.		1	SS	2					
			2	SS	2	1980				
			3	SS	2					
	Sandy silt & silty fine sand with occasional silt seams.		4	SS	2					
			5	SS	5	1970				
	Very loose to dense.		6	SS	5					
			7	SS	9	1960				
			8	SS	15					
			9	SS	15	1950				
			10	SS	39					
			11	SS	37	1940				
1935.5			12	SS	24					
51.5	End of borehole.									

FORM 08 - ML - 126 REV (65)

OFFICE REPORT ON SOIL EXPLORATION

61-4391

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO 3

FOUNDATION SECTION

JOB 62-F-88 LOCATION Coe Hill, Sta. 30+07 ℄ Line "D". ORIGINATED BY G.C.

W.P 186-62 BORING DATE July 20, 1962. COMPILED BY B.K.

DATUM Geodetic BOREHOLE TYPE Wash Boring CHECKED BY G.C.

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS / FOOT	ELEV SCALE
1986	Groundlevel					
0.0	Muskeg		1	SS	P	
	Very loose to loose.		2	SS	3	1980
1979.0			3	SS	5	
7.0	Sandy silt and silty fine sand with occasional silt seams.		4	SS	5	
			5	SS	3	
	Very loose to med. dense.		6	SS	6	1970
			7	SS	6	
			8	SS	10	1960
1954.5			9	SS	13	
31.5	End of borehole.					1950

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT 20 40 60 80 100
SHEAR STRENGTH P.S.F.

LIQUID LIMIT ——— w_L
PLASTIC LIMIT ——— w_P
WATER CONTENT ——— w
w_P w w_L
WATER CONTENT %

BULK DENSITY P.C.F.

REMARKS

W.L. 1986

FORM OB-ML-26 REV 1961 — OFFICE REPORT ON SOIL EXPLORATION

61-4391

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

JOB 62-F-88 — LOCATION Coe Hill, Sta. 29+70 Line "D" 5' Rt. of ℄ — ORIGINATED BY C.C.

W.P 186-62 — BORING DATE July 24, 1962. — COMPILED BY B.K.

DATUM Geodetic — BOREHOLE TYPE Wash Boring. — CHECKED BY C.C.

ELEV. / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV SCALE
1986	Groundlevel					
1.0	Muskeg					
1982	mixed silt & fine sand with some organics.		1	SS	1	
4.0			2	SS	2	1980
			3	SS	0	
	Sandy silt & silty fine sand with occasional silt seams.		4	SS	3	1970
	Very loose to med. dense.		5	SS	3	
			6	SS	5	1960
			7	SS	7	
			8	SS	32	1950
			9	SS	22	
			10	SS	27	1940
			11	SS	26	
1932						
54	Bedrock (Hornfels gneiss)		12	RC		1930
			13	RC		
1921						1920
65	End of borehole.					

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT — 20 40 60 80 100
SHEAR STRENGTH P.S.F.

LIQUID LIMIT ——— w_L
PLASTIC LIMIT ——— w_P
WATER CONTENT ——— w
w_P w w_L
WATER CONTENT %

BULK DENSITY γ P.C.F.

REMARKS

W.L. 1985.5

Sank under weight of rods.

83% Recovery

93% Recovery

FORM OB-MI-126 REV 65 OFFICE REPORT ON SOIL EXPLORATION

51-4391

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

JOB 62-F-88 LOCATION Coe Hill Sta. 29+68 Line "D" 18' Lt. of ℄ ORIGINATED BY G.C.

W.P. 180-62 BORING DATE July 27, 1962. COMPILED BY B.R.

DATUM Geodetic BOREHOLE TYPE Wash Boring CHECKED BY G.C.

SOIL PROFILE			SAMPLES				DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 SHEAR STRENGTH P.S.F.	LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w w_P w w_L WATER CONTENT %	BULK DENSITY P.C.F.	REMARKS
ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE				
1986	Groundlevel									
0.0	Sandy silt & silty fine sand with some organics.									W.L. 1985.5
1978	Very Loose		1	SS	1	1980				
8.0			2	SS	1					
	Sandy silt and silty fine sand with occasional silt seams.					1970				
			3	SS	10					
	Very loose to med. dense.					1960				
			4	SS	21					
			5	SS	19	1950				
			6	SS	23					
1935.2						1940				
50.8	Bedrock (Hornfels gneiss)		7	RC						100% Recovery
1930.2						1930				
55.8	End of borehole.									

FORM 08-ML-126 REV 1961 OFFICE REPORT ON SOIL EXPLORATION

61-4391

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 6

FOUNDATION SECTION

JOB 62-F-88 LOCATION Coe Hill Sta. 29+27 Line "D" 3' Rt. of ℄ ORIGINATED BY G.C.

W.P. 186-62 BORING DATE July 30, 1962. COMPILED BY B.K.

DATUM Geodetic BOREHOLE TYPE Wash Boring CHECKED BY G.C.

ELEV. / DEPTH	SOIL PROFILE DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 / SHEAR STRENGTH P.S.F.	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w / WATER CONTENT %	BULK DENSITY P.C.F.	REMARKS
1986	Groundlevel									
0.0 1984	Muskeg									▽ W.L. 1984
2.0	Sandy silt & silty fine sand with some organics.		1	SS	5					
1979	Very Loose.		2	SS	1	1980				
7.0	Sandy silt & silty fine sand with occasional silt seams. Veryloose to med. dense.		3	SS	2					
			4	SS	3	1970				
			5	SS	9					Sample lost.
			6	SS	17	1960				
			7	SS	13					
			8	SS	14	1950				
1943										
43	Bedrock (Hornfels gneiss)		9	RC		1940				100% Recovery
1938										
48	End of borehole.									

FORM OB-ML-126 REV 1961 OFFICE REPORT ON SOIL EXPLORATION

81-4391

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 7

FOUNDATION SECTION

JOB 62-F-88 LOCATION Coe Hill Sta. 29/27 Line "D" 24' Rt. of ℄ ORIGINATED BY G.C.

W.P. 186-62 BORING DATE Aug. 1, 1962. COMPILED BY B.K.

DATUM Geodetic BOREHOLE TYPE Wash Boring CHECKED BY G.C.

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 / SHEAR STRENGTH P.S.F.	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w / WATER CONTENT %	BULK DENSITY γ P.C.F.	REMARKS
1986	Groundlevel									
0.0	Sandy silt & silty fine sand with some Organics.									▽ W.L. 1985
1978	Very loose.		1	SS	2	1980				
8.0	Sandy silt & silty fine sand with occasional silt seams. Loose to med. dense.		2	SS	6					
			3	SS	6	1970				
			4	SS	5					
						1960				
			5	SS	21					
						1950				
1945			6	SS	29					
41	End of borehole. (Bedrock assumed)					1940				

91-4391

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION

RECORD OF BOREHOLE NO. 8

FOUNDATION SECTION

JOB 62-F-88 LOCATION Coe Hill Sta. 29+03 Line "D" 11' Rt. of ℄ ORIGINATED BY G.C.

W.P 186-62 BORING DATE Aug. 2, 1962. COMPILED BY B.K.

DATUM Geodetic BOREHOLE TYPE Wash Boring. CHECKED BY G.C.

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 / SHEAR STRENGTH P.S.F.	LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w / WATER CONTENT %	BULK DENSITY γ P.C.F.	REMARKS
1986	Groundlevel									
0.0	Sandy silt & silty fine sand with some organics. Very loose.		1	SS	1	1980				▽ W.L. 1984
			2	SS	4					
1975										
11.0	Sandy silt & silty fine sand. Very loose (probably increasing to med. dense)		3	SS	1	1970				
			4	SS	4	1960				
						1950				
1942.5										
43.5	End of borehole. (Bedrock Assumed)					1940				