

MEMORANDUM

TO: Mr. B. E. Davis,  
Bridge Engineer,  
Bridge Division,  
Admin. Bldg.

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

Attention: Mr. S. McCombie

DATE: February 28, 1968

OUR FILE REF.

IN REPLY TO

FEB 29 1968

SUBJECT:

FOUNDATION INVESTIGATION REPORT  
For  
Proposed New Structure at Crossing  
Of  
Hurd's Creek and Hwy. 512  
District No. 10 (Bancroft)  
W.J. 68-F-7 -- W.P. 268-66-02

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

We believe that the factual data and recommendations contained therein, will prove adequate for your design requirements. Should additional information be required, please feel free to contact our Office.

AGS/MdeF  
Attach.

cc: Messrs. B. E. Davis (2)  
H. A. Tregaskes  
D. W. Farren  
S. J. Markiewicz  
J. E. Callaghan  
G. Scott  
J. E. Gruspier  
B. A. Singh

Foundations Files  
Gen. Files

*A. G. Stermac*  
A. G. Stermac  
PRINCIPAL FOUNDATION ENGINEER

## TABLE OF CONTENTS

1. INTRODUCTION.
  2. DESCRIPTION OF SITE.
  3. FIELD WORK.
  4. LABORATORY TESTING.
  5. SOIL TYPES AND SOIL CONDITIONS:
    - 5.1) General.
    - 5.2) Sand with some Gravel.
    - 5.3) Bedrock.
  6. GROUNDWATER.
  7. DISCUSSION AND RECOMMENDATIONS.
  8. SUMMARY.
  9. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION REPORT  
For  
Proposed New Structure at Crossing  
Of  
Hurd's Creek and Hwy. 512  
District No. 10 (Banercft)  
W.J. 68-F-7      --      W.P. 268-66-02

---

1. INTRODUCTION:

The Foundation Section was requested to carry out a foundation investigation at the above site. The request was contained in a memorandum dated December 12, 1967, from Mr. G. Scott, Regional Bridge Location Engineer.

A field investigation was subsequently carried out by this Section to determine the subsoil conditions existing at the site of the proposed crossing.

Presented in this report are the results of our field and laboratory investigations, together with our recommendations pertaining to the foundations of the new structure.

2. DESCRIPTION OF SITE:

The site is located about five miles west of Eganville on secondary Hwy. #512. The new structure will span the creek approximately 400 feet south of the existing bridge. The creek flows in a northerly direction. No creek diversion is contemplated at this site. The topography is flat to gently rolling. Farming is the main land use in this area. No houses are situated in the immediate vicinity of the above crossing. The creek is relatively shallow at the site.

3. FIELD WORK:

A total of six boreholes was carried out during the course of the field work. Drilling equipment consisted of a conventional diamond drill adapted for soil sampling purposes.

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

'Disturbed' samples were recovered at required depths by means of a split-spoon driven into the soil by means of a 140-lb. hammer imparting an energy of 350 ft.-lbs. per blow according to the specifications of the Standard Penetration test. All samples were visually examined in the field before being transported to the laboratory.

The locations and elevations of all the boreholes were surveyed by personnel from the Kingston Region Engineering Surveys Section, and are shown on Drawing 68-F-7A, together with the estimated stratigraphical profiles in the Appendix of this report.

4. LABORATORY TESTING:

All samples were subjected to a careful visual inspection in the laboratory. Laboratory tests were then taken on selected representative samples to determine:

- i) Natural Water Content
- ii) Grain-Size Distribution

The results of these tests are summarized and plotted on the Record of Borelog sheets contained in the Appendix of this report.

5. SOIL TYPES AND SOIL CONDITIONS:

5.1) General:

Subsoil conditions over the site area were found to be generally uniform. One main soil type was encountered, namely, sand with some gravel and traces of silt.

5.2) Sand with some Gravel:

The thickness of this deposit ranged between 5.2 feet and 12.5 feet, or from the bottom of the creek to the top of the bedrock. 'N' values from the Standard Penetration tests

5. SOIL TYPES AND SOIL CONDITIONS: (cont'd.) ...

5.2) Sand with some Gravel: (cont'd.) ...

varied from 14 to 48 blows per foot, indicating a compact to very dense relative density. The moisture content varied between 9.8% and 19.3%. The average grain-size distribution is as follows: gravel 16%, sand 63%, and 21% of silt and clay size particles.

5.3) Bedrock:

One borehole, namely B.H. #2, was proven for five feet with a 95% recovery. The bedrock was granite gneiss. The probable bedrock elevations for the other boreholes were obtained by driving NX casing and recording the depth at which the 350-lb. hammer bounced. The elevation of the bedrock on the east abutment was level at elevation 703.8, while on the west side, the elevation varied from 707.2 to 711.1 from south to north, respectively.

6. GROUNDWATER:

All six borings were carried out on top of the ice so the water level is the top of the ice, namely, elevation 717.8.

7. DISCUSSION AND RECOMMENDATIONS:

It is proposed to construct a single-span structure, approximately 400 feet south of the existing bridge over Hurd's Creek. The proposed profile grade is about 16 ft. above the river bed.

Subsoil at the site consists of 5 to 9 feet of very dense sand with gravel and silt overlying granite gneiss bedrock. Two alternatives for the new structure foundations are suggested:

cont'd. /4 ...

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

(1) The entire structure may be supported on spread footings placed within the sound bedrock. A key of minimum depth 12 inches is recommended. A safe load of up to 20 t.s.f. may be assumed for design purposes in this case.

A dewatering scheme will be required to ensure that footings are poured in the dry, since the overburden is of a highly permeable nature. It should be borne in mind, however, that driving of steel sheeting through the overburden for temporary or permanent protection purposes, will be very difficult. Dewatering can be achieved either by:

- (1) Wellpoints
- (2) Protective Sheeting
- (3) Over-excavating

(2) As an alternative, the new structure may be supported on spread footings placed within rock fill approach embankments, with sufficient cover for frost protection. In this case, all surface organic deposits must be removed prior to placing the rock fill which should be constructed to full height, then re-excavated for the bridge footings. A safe load of 2 t.s.f. may be assumed for design purposes. This scheme has the main advantage that no dewatering scheme is required. The structure, however, will be slightly longer than for Scheme (1) and should be simply supported. It is an essential requirement of this scheme that the new fill and the stream bed be protected completely against scour or other eroding agencies. The rock fill should extend behind the new footings for a minimum distance of 30 feet, and may be constructed with side and forward slopes of 1-1/2 horizontal to 1 vertical. If this scheme is considered, any proposals should be reviewed by the Hydrology Section.

For the proposed approaches, no stability problems are anticipated, provided that embankments are constructed with 2:1 slopes, or as outlined in Scheme (2).

8. SUMMARY:

A foundation investigation at the site of the crossing of Hurd's Creek and Hwy. #512, is reported.

Subsoil consists of a deposit of sand with some gravel and traces of silt and clay overlying the bedrock.

Two alternatives for the new structure foundations are recommended, namely, the entire structure be supported on spread footings placed within the sound bedrock, or the new structure be supported on spread footings placed within rock fill approach embankments. A dewatering scheme is required for the first alternative. For further details, refer to Section 8 and subsections 1 and 2.

No stability problems are anticipated for the proposed embankments.

9. MISCELLANEOUS:

The field work for this report was carried out during the period February 5 to 7, 1968, under the supervision of Mr. A. M. Seppala, Project Foundation Engineer, who also wrote this report.

Equipment was owned and operated by Canadian Longyear Limited.

Mr. K. G. Selby, Supervising Foundation Engineer, reviewed this report.

February 1968.

ALBERTA /

---



DEPARTMENT OF HIGHWAYS - ONTARIO

## RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

MATERIALS &amp; TESTING DIVISION

JOB 68-F-7

LOCATION Sta. 392 + 19 @ 15' o/s Rt.

ORIGINATED BY AMS

W P 268-66-02

BORING DATE Feb. 5, 7, 1968

COMPILED BY \_\_\_\_\_ AMS

DATUM Geodetic

BOREHOLE TYPE NX Casing and Washbore

CHECKED BY                     

SOIL PROFILE			SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT ——— W <sub>L</sub> PLASTIC LIMIT ——— W <sub>P</sub> WATER CONTENT ——— W <sub>P</sub> W <sub>P</sub> ——— W <sub>L</sub> WATER CONTENT % 10 20 30	BULK DENSITY P C F	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS / FOOT					
717.8	Water Level									Gr. Sa. Si. Cl.
715.3	Ground Level									
2.0	Sand, some gravel traces of silt and clay		1	SS	35	710				19 60 (21)
	Dense		2	SS	38					12 66 (22)
703.3	End of Borehole									
14.0	Probable Bedrock					700				

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS &amp; TESTING DIVISION

## RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 68-F-7 LOCATION Sta. 392 + 00 @ 22' o/s Lt. ORIGINATED BY AMS  
W P 268-66-02 BORING DATE Feb. 6, 1968 COMPILED BY AMS  
DATUM Geodetic BOREHOLE TYPE NX Casing and AXT Rock Core CHECKED BY AMS

SOIL PROFILE			SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT			LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W			BULK DENSITY P C F	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P S F			WP	W	WL		
717.8	Water Level													
716.3	Ground Level													
1.5	Sand, some gravel, traces of silt and clay.													
711.1			1	SS	23/11"									
6.7	Granite Gneiss		2	AXT	Rec	710								
706.1	Bedrock			RC	90%									
11.7	End of Borehole					700								

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS &amp; TESTING DIVISION

JOB 68-F-7

LOCATION Sta. 392 + 31 @ 15' o/s Lt.

ORIGINATED BY AMS

W P 268-66-02

BORING DATE Feb. 6, 1968

COMPILED BY AMS

DATUM Geodetic

BOREHOLE TYPE NX Casing and Washbore

CHECKED BY                     

SOIL PROFILE			SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	SHEAR STRENGTH P S F	LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W WP ——— W ——— WL WATER CONTENT % 10 20 30	BULK DENSITY PCF	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS / FOOT						
717.8	Water Level										
716.3	Ground Level										
1.9	Sand, some gravel, traces of silt and clay.		1	SS	14	710					
			2	SS	48						
703.8											
14.0	End of Borehole Probable Bedrock					700					

DEPARTMENT OF HIGHWAYS - ONTARIO

## RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

MATERIALS &amp; TESTING DIVISION

JOB 68-F-7

LOCATION Sta. 391 + 90 @ 15' o/s Rt.

ORIGINATED BY AMS

W P 268-66-02

BORING DATE Feb. 7, 1968

COMPILED BY AMS

DATUM Geodetic

BOREHOLE TYPE NX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT _____ W <sub>L</sub>		BULK DENSITY  P C F	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	SHEAR STRENGTH P. S. F.			PLASTIC LIMIT _____ W <sub>P</sub> WATER CONTENT _____ W W <sub>P</sub> — W — W <sub>L</sub> WATER CONTENT %			
717.8	Water Level												
716.3	Ground Level												
1.5	Sand, some gravel, traces of silt and clay.					710							
707.2													
10.6	End of Borehole Probable Bedrock					700							

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

# RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

JOB 68-F-7 LOCATION Sta. 391 + 92 Ø ORIGINATED BY AMS  
W P 268-66-02 BORING DATE Feb. 7, 1968 COMPILED BY AMS  
DATUM Geodetic BOREHOLE TYPE NX Casing CHECKED BY

SOIL PROFILE		SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— W <sub>L</sub>		BULK DENSITY	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE		BLOWS / FOOT	SHEAR STRENGTH P S F	PLASTIC LIMIT ——— W <sub>P</sub>	WATER CONTENT ——— W		
717.8	Water Level										
715.8	Ground Level										
2.0	Sand, some gravel, traces of silt and clay				710						
707.2											
10.6	End of Borehole Probable Bedrock				700						

DEPARTMENT OF HIGHWAYS - ONTARIO

## MATERIALS &amp; TESTING DIVISION

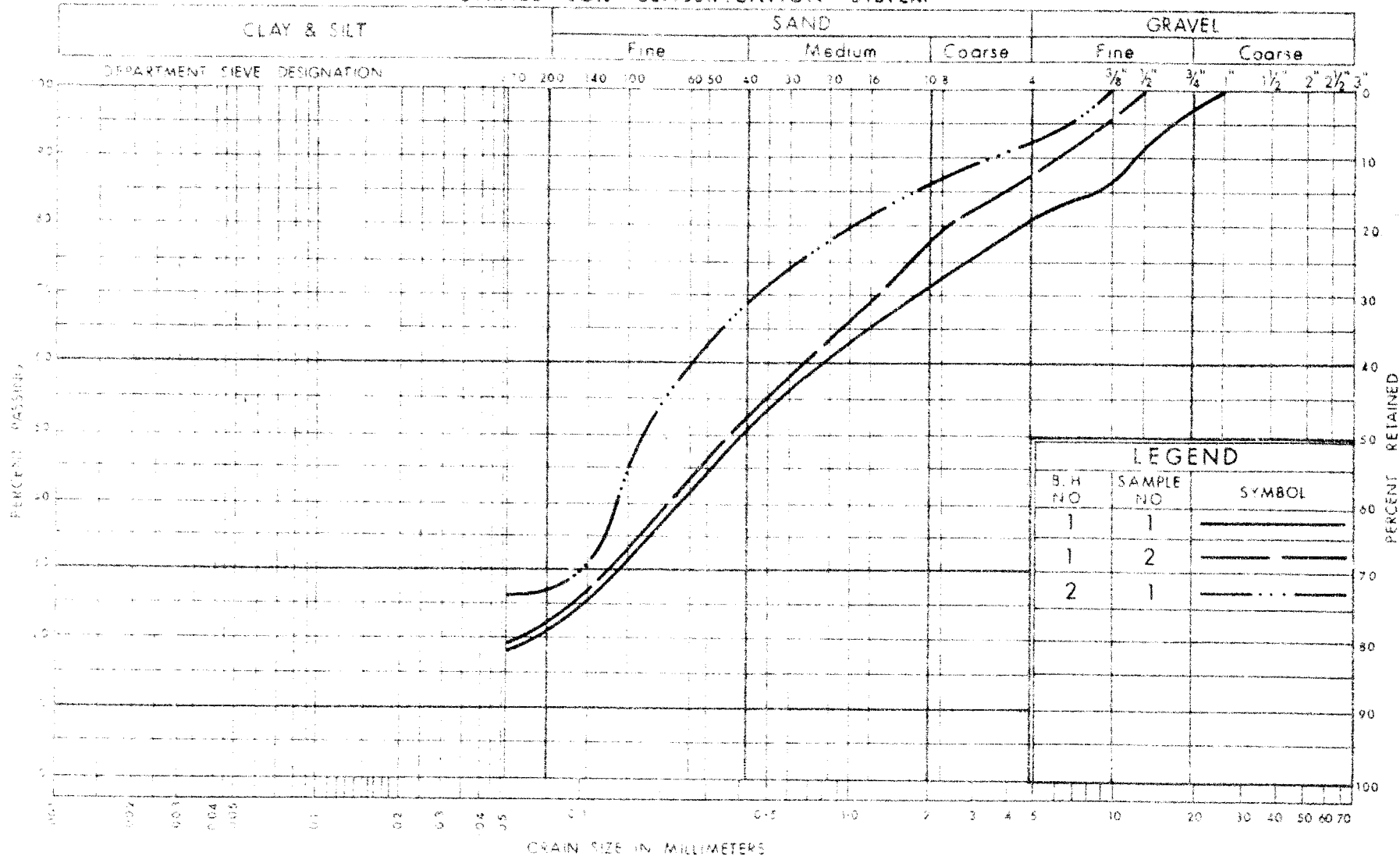
## RECORD OF BOREHOLE NO. 6

FOUNDATION SECTION

JOB 68-F-7 LOCATION Sta. 391 + 95 @ 12' o/s Lt. ORIGINATED BY AMS  
 W P 268-66-02 BORING DATE Feb. 7, 1968 COMPILED BY AMS  
 DATUM Geodetic BOREHOLE TYPE NX Casing CHECKED BY LL

SOIL PROFILE		SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT ——— *L PLASTIC LIMIT ——— *P WATER CONTENT ——— *W	BULK DENSITY PCF	REMARKS
ELEV DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P S F	<div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div> WATER CONTENT %		
717.8	Water Level								
716.3	Ground Level								
1.5	Sand, some gravel, trace of silt and clay.				710				
710.0									
7.8	End of Borehole Probable Bedrock				700				

# UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

## GRAIN SIZE DISTRIBUTION

W.P. No. 268-66-02

JOB No. 68 - F - 7

## 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>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

SS	SPLIT SPOON	TW	THINWALL OPEN
WS	WASHED SAMPLE	TP	THINWALL PISTON
SB	SCRAPER BUCKET SAMPLE	OS	OESTERBERG SAMPLE
AS	AUGER SAMPLE	FS	FOIL SAMPLE
CS	CHUNK SAMPLE	RC	ROCK CORE
ST	SLOTTED TUBE SAMPLE		
	PH	SAMPLE ADVANCED HYDRAULICALLY	
	PM	SAMPLE ADVANCED MANUALLY	

### SOIL TESTS

QU	UNCONFINED COMPRESSION	LV	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	FV	FIELD VANE
QCU	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
QD	DRAINED TRIAXIAL	S	SENSITIVITY



# ABBREVIATIONS USED IN THIS REPORT

## SOIL PROPERTIES

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

## GENERAL

$\pi$	$\approx 3.1416$
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e \sigma$ OR $\ln \sigma$	NATURAL LOGARITHM OF $\sigma$
$\log_{10} \sigma$ OR $\log \sigma$	LOGARITHM OF $\sigma$ TO BASE 10
t	TIME
g	ACCELERATION DUE TO GRAVITY
V	VOLUME
W	WEIGHT
M	MOMENT
F	FACTOR OF SAFETY

## STRESS AND STRAIN

u	PORE PRESSURE
$\sigma$	NORMAL STRESS
$\bar{\sigma}$	NORMAL EFFECTIVE STRESS ( $\bar{\sigma}$ IS ALSO USED)
$\tau$	SHEAR STRESS
$\epsilon$	LINEAR STRAIN
$\gamma$	SHEAR STRAIN
$\nu$	POISSON'S RATIO ( $\mu$ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
$\eta$	COEFFICIENT OF VISCOSITY

## EARTH PRESSURE

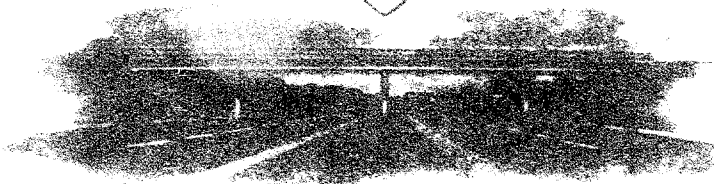
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
$\delta$	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
$K_c$	COEFFICIENT OF EARTH PRESSURE AT REST

## FOUNDATIONS

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

## SLOPES

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



401 & Keele Street  
Downsview, Ontario

DEPARTMENT OF HIGHWAYS

January 31, 1968

Canadian Longyear Limited  
35 Brydon Drive  
Rosedale, Ontario

Dear Sirs:

This is to confirm our request of January 26, 1968 for the supply of a diamond drill together with all necessary equipment, as specified under the terms of our Contract Agreement, at Killaloe, Ontario on January 28, 1968. Thereafter at Eganville, Ontario.

These projects bear Job Number 68-F-6 (Killaloe)  
(68-F-7) (Eganville)

Yours truly,

*H. G. Selby*

KGS:mt

H. G. Selby  
Supervising Foundation Engineer  
for: A. G. Stermac  
Principal Foundation Engineer

cc: H. Konings  
Foundation Files  
General File

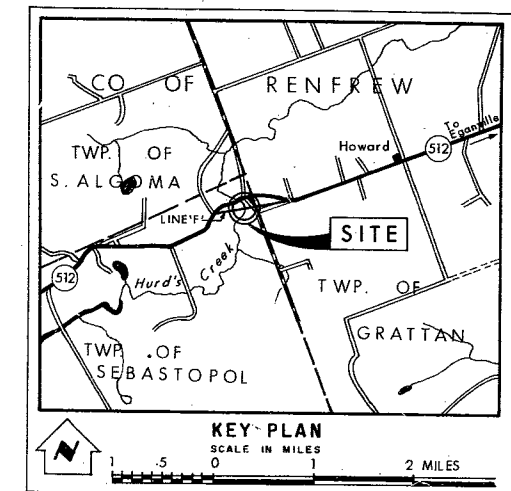
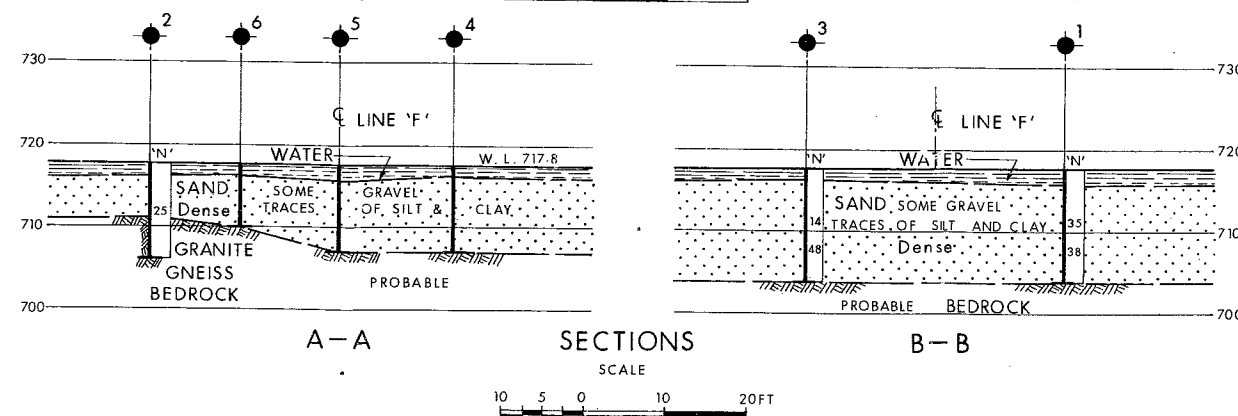
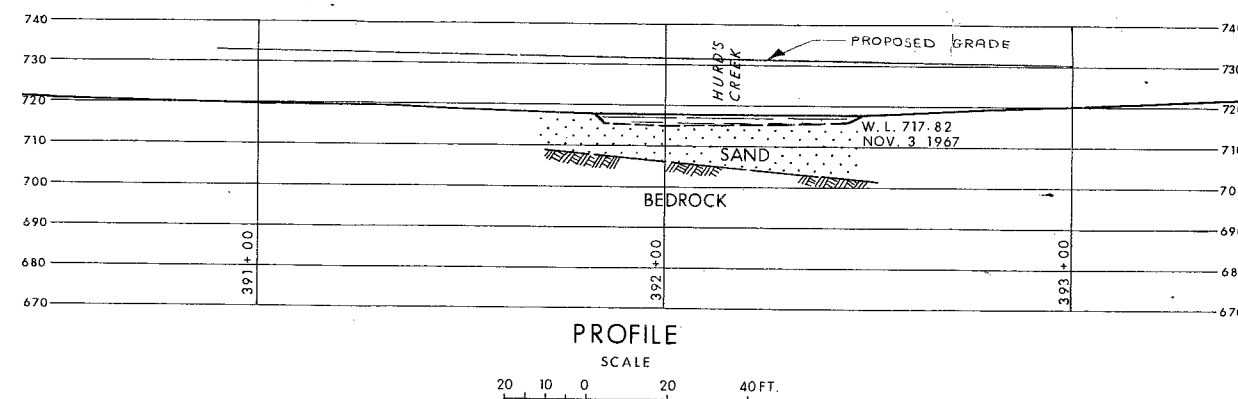
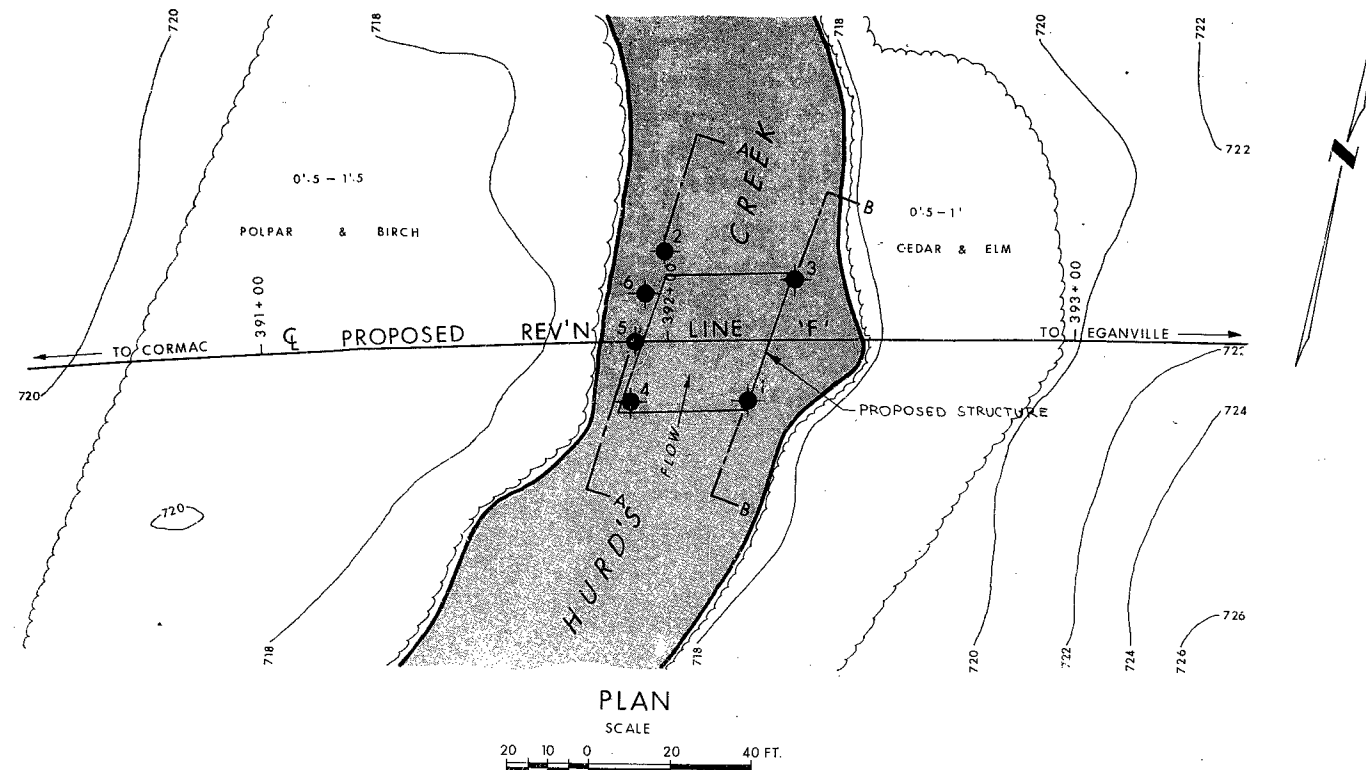
DEFECTS IN NEGATIVE DUE TO  
CONDITION OF ORIGINAL DOCUMENT

#68-F-7

W.P. #268-66-02

HWY #512 LINE 'F'

HURD'S CREEK



LEGEND			
	Bore Hole		
	Cone Penetration Hole		
	Bore & Cone Penetration Hole		
	Water Levels established at time of field investigation, Feb. 1968		
NO.	ELEVATION	STATION	OFFSET
1	717.8	392 + 19	15' RT.
2	717.8	392 + 00	22' LT.
3	717.8	392 + 31	15' LT.
4	717.8	391 + 90	15' RT.
5	717.8	391 + 92	CL
6	717.8	391 + 95	12' LT.

**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 & TESTING DIVISION - FOUNDATION SECTION

**HURD'S CREEK**

KING'S HIGHWAY NO. 512 LINE 'F' DIST. NO. 10  
CO. RENFREW  
TWP. SEBASTOPOL LOT 34 CON. XIV

**BORE HOLE LOCATIONS & SOIL STRATA**

SUB'D. A. S.	CHECKED	W.P. NO. 268-66-02	M.B.T. DRAWING NO.
DRAWN G. P.	CHECKED	JOB NO. 68-F-7	68-F-7A
DATE FEB. 22 1968	SITE NO.	BRIDGE DRAWING NO.	
APPROVED	CONT. NO.		

REF. NO. E-4656-1