

70-F-53	36-66-12	Hwy. 417 & Co. Rd. 100	31G-64
W.O.	W.P.	LOCATION	GEOCRES NO.

• DATA ON FILE IN SOIL MECHANICS SECTION

REFER TO: Contract 72-196

REMARKS

GEOCRES

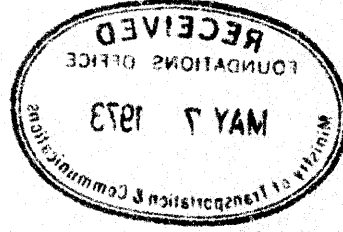
INDEXING CARD FOR REPORTS NOT MICROFILMED

G1-20 AUG. 74

1973 MAY 7 PM 2:01

70-11-05-9

15800



0

OTTA DOWN 7 MAY 7/73 2:10 P VR

DIST CONSTRUCTION ENGR

RE: HWY 34 UNDERPASS CONTRACT 72-196

THIS IS TO CONFIRM OUR DISCUSSION FOR CONTRACT 72-196 DATED MAY 3/73.
THE FOUNDATIONS OFFICE HAS NO OBJECTION TO COMMENCING THE CONSTRUCTION
AHEAD OF SCHEDULE.

P PAYER SR FOUNDATION ENGR DESIGN SERVICES SR

LN

T
E
L
E
T
Y
P
E

T
E
L
E
T
Y
P
E

FIELD RECONNAISSANCE REPORT
REQUIRED BY FOUNDATION SECTION
FOR

FF-69
SEPT. 1968

W.P. NO. 36-66-12 HIGHWAY NO. 417 DISTRICT 9 SITE PLAN NO. E-4694-1 PROFILE NO. _____
RIVER CROSSING ☐ GRADE SEPERATION ☒ R.R.X. ☐ OTHER (SPECIFY) _____
ALTERNATE SCHEME (IF ANY) _____

EXISTING SITE CONDITIONS

DESCRIPTION:

TOPOGRAPHY: HILLY ☐ ROLLING ☐ VALLEY ☐ GULLIED ☐ FLAT ☒
VEGETATION: TREES ☐ BRUSH ☐ GRASS ☒ SWAMP ☐ FARM CROPS ☐ CLEARED ☒
SNOW COVER: 0"-6" ☐ 6"-12" ☐ >12" ☐
ROCK OUTCROP (SPECIFY LOCATIONS) Surface boulders

UNDERGROUND UTILITIES: UTILITY COMPANY TELEPHONE NO. FOR DEFINITE LOCATION
1 Bell Telephone

2 _____

3 _____

4 _____

5 _____

EXISTING STRUCTURE(S):

FOUNDATIONS: SPREAD FOUNDATIONS ☐ SIZE _____ ELEVATION(S) _____
PILES ☐ TYPE _____ LENGTH(S) _____
DESIGN LOAD _____ T.S.F. _____ TONS/PILE _____
CONDITION OF STRUCTURE _____

APPROACHES: CUT ☐ FILL ☐ SIDE SLOPES _____
BERMS YES ☐ NO ☐

OTHER OBSERVATIONS (USE BACK OF SHEET TO DESCRIBE ANY FAILURES IN AREA, PAST PERFORMANCE OF EXISTING APPROACHES & STRUCTURE, ETC.)

ACCESSIBILITY

IS STRUCTURE LOCATED ON D.H.O. RIGHT OF WAY? YES ☐ NO ☒ IF NO,
HAS PERMISSION BEEN OBTAINED TO ENTER PROPERTY? YES ☐ NO ☐ IF NO,
PROPERTY OWNER(S):

	NAME	ADDRESS	TELEPHONE NO.
1	<u>Contact Property Section, Eastern Region</u>		
2			
3			
4			

WHO WILL OBTAIN NECESSARY PERMISSION? Property Section, Eastern Region

HAS SITE BEEN SURVEYED & STAKED? YES ☒ NO ☐ IF YES, DATE OF MOST RECENT SURVEY May 1970

WILL CLEARING BE NECESSARY TO ENTER SITE AREA? YES ☐ NO ☒

IS SITE ACCESSIBLE TO WHEELED VEHICLES? YES ☒ NO ☐

IF RIVER CROSSING:

WILL A RAFT BE NECESSARY? YES ☐ NO ☐ IF YES, GIVE MAX. DEPTH OF WATER _____ FT.

CURRENT: SWIFT ☐ MODERATE ☐ SLOW ☐

DRILLING OPERATIONS

NEAREST SOURCE OF WATER (GIVE HAULING DISTANCE, IF KNOWN) 3.8 mi. south of site-Rigaud River Bridge
ADDITIONAL INVESTIGATION REQUIRED FOR THE FOLLOWING PURPOSES: Hwy. 34

ALTERNATE SCHEME: YES ☐ NO ☐ IF YES, SPECIFY _____

HYDROLOGIC REASONS: YES ☐ NO ☐ IF YES, SPECIFY (SCOUR, ETC.) _____

REMARKS

NEAREST AVAILABLE ACCOMODATION: Alexandria - Glen Motel or White Rock Motel

OTHER COMMENTS: _____

DATE June 15, 1970
Planning

REGIONAL BRIDGE LOCATION ENGINEER _____

W. H. Hynes

MEMORANDUM

To: Mr. A. G. Stermac,
Principal Foundation Engineer,
Laboratory Building,
Downsview, Ontario.

From: Bridge Section,
Kingston, Ontario.

ATTENTION:

DATE: June 15, 1970.

Our File Ref.

IN REPLY TO

SUBJECT: W.P. 36-66-12, Site 31-293,
County Road 10C Underpass,
Highway 417, District 9-Ottawa

70-110-53

We are sending you herewith two prints of Bridge Site Plan E-4694-1 on which we have marked the proposed location of the above structure. Also enclosed are two copies of your Field Reconnaissance Report.

We would be pleased if you will make arrangements for the necessary foundation investigation and to have your report, the scheduled date for which is August 20, 1970.



T. C. Kingsland
Regional Bridge Planning Engineer

TCK/hl
Encls.

c. c. (with encl.)
Bridge Office Files Section (Mr. S. McCombie)
c. c. Mr. R. Forrest

Department of Highways Ontario

Copy for the information of

Mr. A. Stermac

Mr. T.C. Kingsland.

Reg. Bridge Planning Engineer,
Kingston Regional Office,
Kingston, Ontario

C.S. Grabski,
Bridge Office

November 12, 1970

Co. Rd. 10C Underpass
(Future Interchange)
0.9 Mi. North of McCrimmon
W.P. 36-66-12, Site No. 31-293
Highway 417, District No. 9

70-11053

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-6888-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$176,000. This cost includes tender, materials, engineering and sundry construction.

Any comments or revisions you may have should be submitted within three weeks.

C.S. Grabski,
Bridge Design Engineer

CSG:rd

Attach.

c.c. B. Davis

A. Stermac (2)

J. Anderson

R. Forrest

Copy for the information of M. DEVATA

~~G. Martens,~~
Asst. Construction Engineer,
Construction Branch,
2nd Floor, Central Bldg.

Structural Office,
West Building,
DOWNSVIEW.

June 21st, 1973.

Co. Rd. 10C U'Pass,
Contract 72-196,
W.P.36-66-12, Site 31-293,
Highway 417, District 9.

70-11-053

We were recently advised that the pier footing including the column dowels for this structure has been built 6" off from the centre line of Co. Road #10C. We have investigated various possible schemes to utilize the footing as constructed. The schemes investigated and our comments are as follows:-

Scheme 1 This scheme assumes that the single column pier is built in the centre of the offset footing and the deck is built in its proper location. With this scheme, the deck is subjected to additional torque, the pier is subjected to additional moment, the abutment bearings are subjected to additional load, and the abutments are subjected to additional transverse moments. As this scheme requires extensive modifications to the design, it was considered to be impractical. Also, with this scheme, the foundation bearing pressures exceeded the permissible values.

Scheme 2 This scheme assumes that the existing column dowels are cut off and new dowels installed in the correct location. The single column pier would then be in the correct location and only the footing would be subjected to additional transverse moments. It was found that the foundation bearing pressures increased from 10 kips/ft² to 11.4 kips/ft².

The Foundation Report had recommended a bearing pressure of 8 kips/ft² but during the design stage the Foundation Office reluctantly allowed the design bearing pressure to be increased to 10 kips/ft². The further increase to 11.4 kips/ft² was discussed with Mr. Devata who felt that the 10 kips/ft² bearing pressure was very liberal to start with. Also, in view of the fact that when the pier footing was excavated the ground water was 1 ft. above the bottom of the footing elevation, the foundation material was very likely loosened to some extent. He could not, therefore, recommend any further increase in the bearing pressure. This scheme was not pursued any further.

June 21/73

Scheme 3 This scheme is the same as scheme 2 but in order to reduce the bearing pressure it calls for a 2 ft. extension on one side of the existing footing. (See attached sketch).

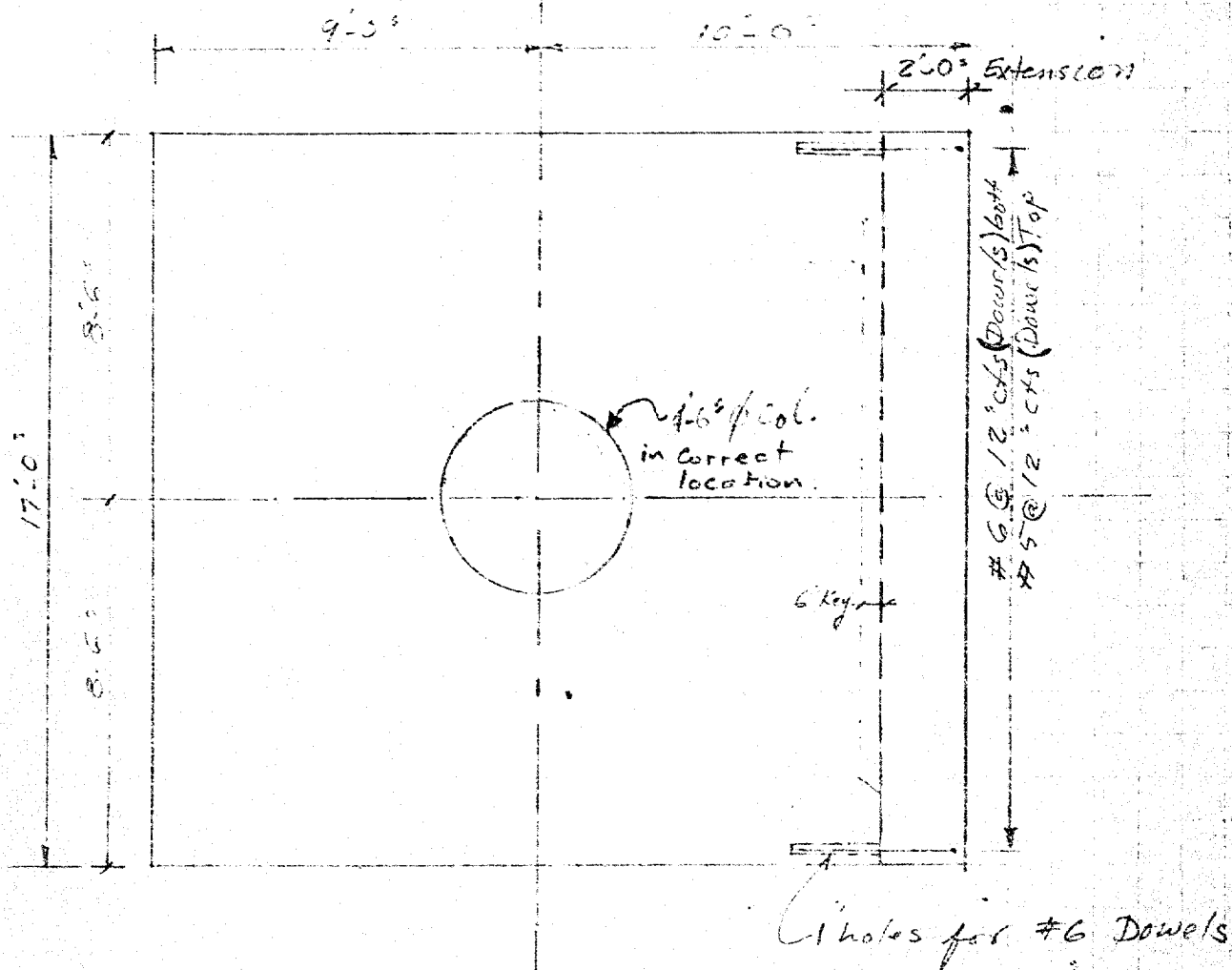
This scheme as shown is theoretically feasible and acceptable but there could be some problems in implementing it. The bottom of the existing footing could suffer damage during the drilling for the bottom dowels or the existing steel could interfere with the drilling. Also, grouting the dowels in a horizontal position could be unsatisfactory. Even if the footing could be extended successfully there is always some risk in that the extension may not act "integral" with the existing footing. We understand that the cost of completely removing the existing footing and rebuilding it in the correct location is about \$1,500.00 more than the cost to rehabilitate the existing footing. It is our feeling that for a \$1,500.00 saving it is not worth taking a chance on a structure costing about \$194,000.00. We would therefore recommend that the existing footing be removed and rebuilt in the correct location.



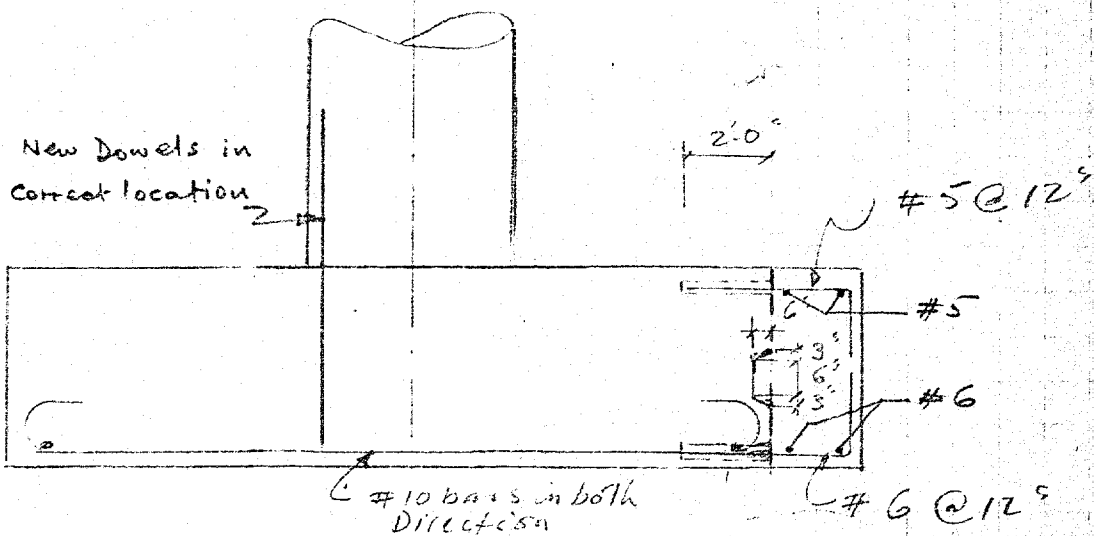
K. G. Bassi,
Reg. Structural Design Engineer.

KGB:dp

cc. A. E. McKim
M. Devata
C. S. Grebski,



Co. #10C



MEMORANDUM

To: Mr. B. R. Davis,
Bridge Engineer,
Bridge Office,
Admin. Bldg.

From: Foundation Section,
Materials & Testing Office,
Room 107, Lab. Bldg.

ATTENTION: Mr. S. McCombie

DATE: August 14, 1970

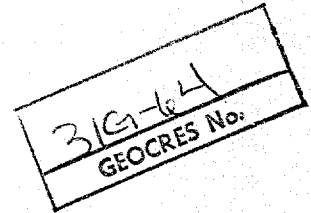
OUR FILE REF.

IN REPLY TO

AUG 19 1970

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For
Underpass Structure at the
Crossing of Proposed Hwy. #417
And County Rd. #10C
Lochiel and Caledonia Townships
Glengarry and Prescott Counties
District No. 9 (Ottawa)
W.O. 70-11053 - W.P. 36-66-12



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. R. Davis
H. A. Tregaskes
D. W. Farren
S. J. Markiewicz
J. E. Callaghan
T. C. Kingsland (2)
M. R. Ernesaks (2)
J. E. Gruspier
B. A. Singh

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

Foundations Files
Gen. Files

TABLE OF CONTENTS

1. INTRODUCTION
2. DESCRIPTION OF THE SITE AND GEOLOGY
3. FIELD AND LABORATORY WORK
4. SUBSOIL AND BEDROCK CONDITIONS
 - 4.1) General
 - 4.2) Topsoil
 - 4.3) Heterogeneous Mixture of Clay, Silt, Sand,
and Gravel (Glacial Till)
5. GROUNDWATER CONDITIONS
6. DISCUSSION AND RECOMMENDATIONS
 - 6.1) General
 - 6.2) Structure Foundations
 - 6.2.1) Centre Pier Foundation
 - 6.2.2) Abutment Foundations
 - 6.2.3) Differential Settlement Between
Structure Elements
 - 6.3) Approach Embankments
7. MISCELLANEOUS

FOUNDATION INVESTIGATION REPORT
For
Underpass Structure at the
Crossing of Proposed Hwy. #417
and County Rd. #10C
Lochiel and Caledonia Townships
Glengarry and Prescott Counties
District No. 9 (Ottawa)
W.O. 70-11053 -- W.P. 36-66-12

1. INTRODUCTION:

The Foundation Section was requested to carry out an investigation at the above mentioned crossing of proposed Hwy. #417. The request was contained in a memo from the Eastern Region Bridge Section (Mr. T. C. Kingsland, Regional Bridge Planning Engineer) dated June 15, 1970. An investigation was subsequently carried out by this section.

This report contains the factual results obtained from this investigation, together with recommendations pertaining to the foundations of the proposed structure, as well as the stability and settlement of the associated earth fill embankments.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The site under investigation is located on County Road 10C approximately 1 mile north of the hamlet of McCrimmon, located on Hwy. #34.

In the vicinity of the crossing, County Rd. 10C is generally level with the surrounding terrain and is unpaved. Along the west edge of the road right-of-way, there is a hydro line. On the surface of the fields adjacent to the roadway, there are

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

many scattered boulders ranging in size from a few inches to several feet. The surrounding terrain, which is farmland and woodland is flat to gently undulating in relief. About 400 yards to the north-east, the ground surface slopes gently downward to a broad flat plain.

Physiographically, the site is on the northern boundary of the region known as the "Glengarry Till Plains". The area is characterized by a bouldery glacial till deposit, which is underlain by limestone bedrock of the Trenton and Black River Groups, Ordovician Period.

3. FIELD AND LABORATORY WORK:

Six sampled boreholes, three of which were accompanied by dynamic cone penetration tests, were put down in the course of the field investigation. The borings were advanced by means of conventional diamond drill rigs adapted for soil sampling purposes.

Samples of the overburden deposits were obtained in a 2" O.D. split spoon sampler, which was hammered into the subsoil in accordance with the specifications for the Standard Penetration Test. The same method was used to advance the dynamic cone penetration tests.

The locations and elevations of all the borings were surveyed in the field by personnel from the Eastern Region Engineering Surveys Section. They are shown on Drawing No. W. O.

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

70-11053A, together with the estimated stratigraphical profile along the centre line of the re-aligned county road. All elevations are referenced to a geodetic datum.

All the samples were subjected to a careful visual examination in the field and subsequently in the laboratory. In addition, certain selected samples were subjected to the following laboratory tests:

Natural Moisture Content
Grain Size Distribution
Atterberg Limits

The results of the laboratory testing are plotted on the Record of Borelog sheets and Figure #1, all of which are contained in the Appendix of this report.

4. SUBSOIL AND BEDROCK CONDITIONS:

4.1) General:

An extensive bouldery glacial till was encountered at this site. It is believed that this deposit is underlain by limestone bedrock.

The boundaries of the subsoil, as determined in the boreholes, are shown on the accompanying borehole sheets. The stratigraphical profile, shown on Drawing No. W.O. 70-11053A, is inferred from this boring data.

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

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

4.2) Topsoil:

Across the site, there is 1 to 2 feet of sandy topsoil, which contains some gravel and boulders.

4.3) Heterogeneous Mixture of Clay, Silt, Sand & Gravel (Glacial Till):

The topsoil is underlain by a deposit of glacial till. The glacial till was not penetrated in any of the borings; however, it was proven to a depth of 64 feet in borehole #3.

The glacial till is granular in nature, consisting mainly of sand and silt with gravel and a trace of clay. Throughout this deposit, there are numerous granite and limestone boulders, up to 1 foot in size. Grain size distribution curves for samples of this deposit, obtained with 2" O.D. sampling equipment, are illustrated, in envelope form, on Figure #1.

The Standard Penetration Tests, carried out within the glacial till deposit, are plotted on the Record of Borelog Sheets. This testing gave values consistently greater than 50 blows/ft. Based on these results, it is estimated that the relative density of the glacial till is very dense.

5. GROUNDWATER CONDITIONS:

During the period of the investigation, groundwater level observations were carried out in six open boreholes. The groundwater level in the overburden was at a depth of 4 to 14 feet below the existing ground surface. These depths correspond to elevations between 240 and 247.

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General:

It is proposed to construct a two span underpass structure at the crossing of Hwy. #417 and County Road 100. The structure will be 34 feet wide and approximately 246 feet long. In the vicinity of the structure, the county road will have a profile grade between elevations 267 and 269. The associated approach fills will, therefore, have a maximum height of approximately 15 feet.

In the area of the site, there is a competent deposit of very dense glacial till.

6.2) Structure Foundations:

6.2.1) Centre Pier Foundation: (refer to BH's #3 & 4)

The pier can be founded on a spread footing because of the competent nature of the overburden deposits in this area. For frost-protection purposes, it is recommended that at least 4 feet of cover be provided from the base of the footing. An allowable bearing value of up to 4 t.s.f. can be used in the design of the footing.

At the time of the investigation the groundwater level at the pier location was approximately 5 feet below ground level-- i.e., at about elevation 247. In order to eliminate any major dewatering problems, it is recommended that the footing be founded above this elevation. Any surface run-off into the excavation could be handled by conventional techniques (such as pumping from sumps).

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

6.2) Structure Foundations: (cont'd.)...

6.2.2) Abutment Foundations: (refer to BH's 1,2,5,6)

The proposed abutments may be supported on spread footings perched within the approach fills. The material, below the tops of the footings, should consist of well compacted G.B.C. Clas 'A' material, and should extend to a horizontal distance of at least 10 feet from the footing edges in the plane of the footing tops. This portion of the fill should be constructed with side slopes no steeper than 2:1. The remainder of the fill should be completed to about profile grade for a distance of about 50 feet behind the abutments before re-excavating for the abutment footings. An allowable bearing value of 2.5 t.s.f. may be used in footing design.

6.2.3) Differential Settlement Between Structure Elements:

The maximum differential settlement would take place between the pier and the abutments founded on spread footings; however, this settlement would be negligible.

6.3) Approach Embankments:

The approach fills would be of the order of 15 feet in height. No stability problems are anticipated for embankments of this height, if constructed of properly compacted fill with standard 2:1 slopes.

The settlement induced in the foundation subsoil by the approach fill surcharge loading is expected to be negligible.

7. MISCELLANEOUS:

The field work, performed during the period of July 3 to 13, 1970, was supervised by Mr. A. R. Newman, Student Technician (field). The equipment was owned and operated by F. E. Johnston Drilling Co. Ltd.

The preparation of this report was undertaken by Mr. F. A. Patterson, Student Technician (field).

The investigation was carried out under the general supervision of Mr. M. Devata, Supervising Foundation Engineer, who reviewed this report.

AUGUST 1970

APPENDIX

OVERSIZED DRAWINGS

Record of Borehole #1

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 70-11053 LOCATION Hwy. 417 & Co. Rd. 10C; Sta. 101 + 86 o/s 20' Lt. Ø ORIGINATED BY AN
 W.P. 36-66-12 BORING DATE July 8-9, 1970 COMPILED BY FP
 DATUM Geodetic BOREHOLE TYPE BX Casing CHECKED BY Lo

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w				BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P.S.F.					w_p — w — w_L WATER CONTENT % 20 40 60					
253.8	Ground Level																
0.0	Sandy Topsoil																
1.0	Het.mix. of silt,sand, gravel & trace of clay with numerous granite & limestone boulders up to 1' thick (Glacial Till) Very Dense Brown		1	SS	81	250										12 45 38 5 ▼ 242.5 WL in open BH July 13, 3 48 48 1	
			2	SS	120												
			3	SS	116												
			4	SS	150												
			5	SS	104	240											
			6	SS	106												
			7	SS	174												
			8	SS	200	230											
227.5				9	SS	200											
26.3	End of Borehole																
						220											

242.5

WL in open
BH July 13, 70
3 48 48 1

14 50 35 1

OVERSIZED DRAWINGS

Record of B.H. #3

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

FOUNDATION SECTION

JOB	70-11053	LOCATION	Hwy. 417 & Co. Rd. 10C; Sta. 100 + 61 o/s 22' Lt. C	ORIGINATED BY	AN
W.P.	36-66-12	BORING DATE	July 9, 10, 1970	COMPILED BY	FP
DATUM	Geodetic	BOREHOLE TYPE	NX, BX Casing	CHECKED BY	10

[illegible]

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 5

FOUNDATION SECTION

JOB 70-11053 LOCATION Hwy. 417 & Co. Rd. 10C; Sta. 99 + 47 o/s 10' Rt. 0 ORIGINATED BY AN
W.P. 36-66-12 BORING DATE July 10-13, 1970 COMPILED BY FP
DATUM Geodetic BOREHOLE TYPE BX Casing; Cone Test CHECKED BY [Signature]

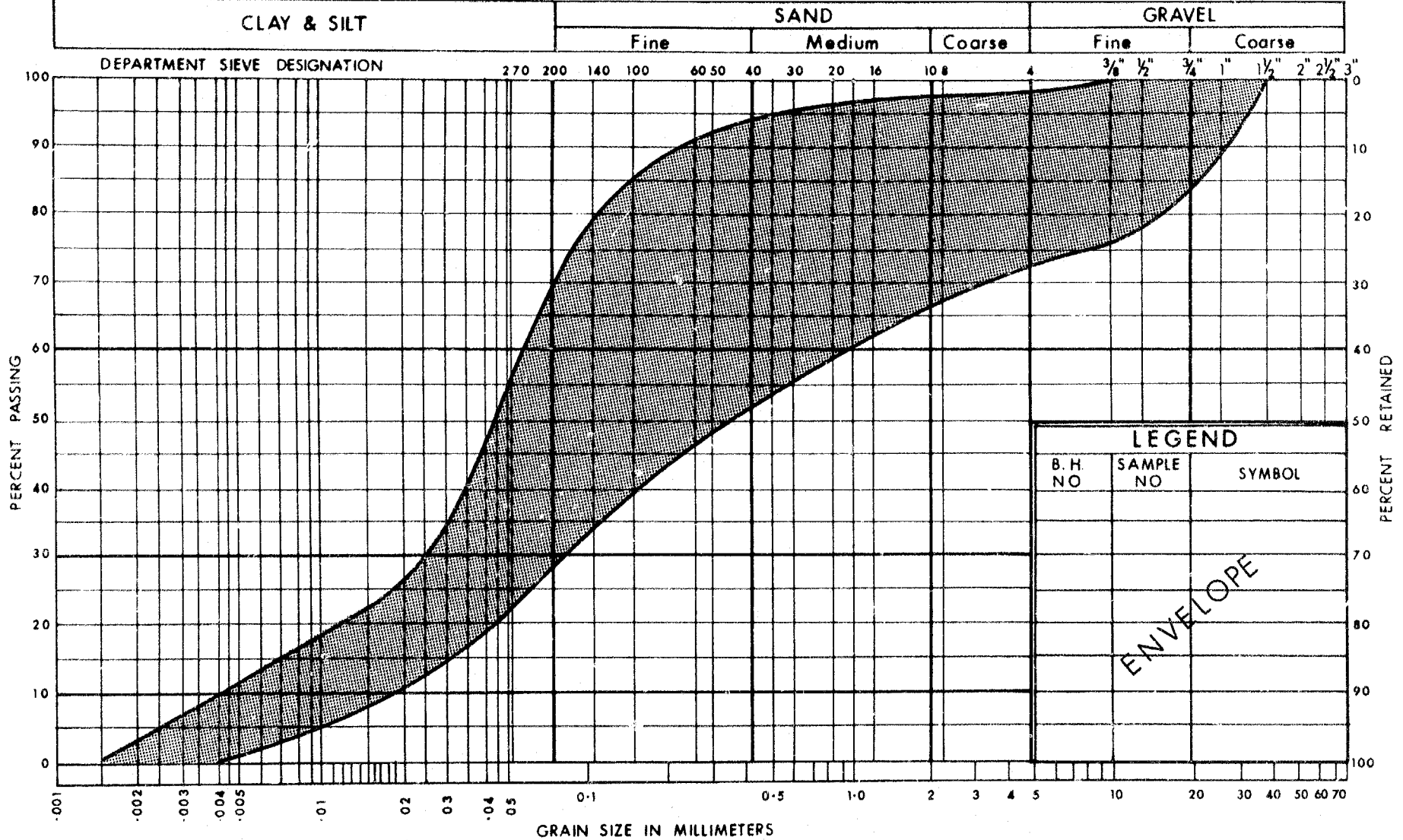
SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT					WATER CONTENT %				
							20	40	60	80	100	20	40	60		
251.2	Ground Level						SHEAR STRENGTH P.S.F.					w_p ——— w ——— w_L WATER CONTENT %				
0.0	Sandy Topsoil					250										
1.5	Het. mix. of silt, sand, gravel & trace of clay with numerous granite & limestone boulders up to 1' thick (Glacial Till)		1	SS	245											
			2	SS	90											
			3	SS	111											
			4	SS	108	240										
			5	SS	76											
			6	SS	100											
			7	SS	122											
			8	SS	210	230										
			9	SS	201											
225.3	Brown		10	SS	250											
25.9	End of Borehole					220										

FOUNDATION SECTION

JOB	70-11053	LOCATION	Hwy. 417 & Co. Rd. 10C; Sta. 99+41 o/s 20' Lt. 0	ORIGINATED BY	AN
W.P.	36-66-12	BORING DATE	July 13, 1970	COMPILED BY	AN
DATUM	Geodetic	BOREHOLE TYPE	BX Casing; Cone Test	CHECKED BY	SO

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— w_L		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	RESISTANCE	PLASTIC LIMIT ——— w_p	WATER CONTENT ——— w		
						SHEAR STRENGTH P.S.F.		WATER CONTENT %				
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE		w_p ——— w ——— w_L 20 40 60				
						400 800 1200 1600 2000		20 40 60				
250.8	Ground Level											
0.0	Sandy Topsoil											
1.0	Het. mix. of silt, sand, gravel & trace of clay with numerous granite & limestone boulders (glacial Till)		1	SS	87	250						
			2	SS	200							
			3	SS	131							
240.0	Very Dense Brown		4	SS	160/6"	240						
10.8	End of Borehole					230						

UNIFIED SOIL CLASSIFICATION SYSTEM



LEGEND		
B.H. NO	SAMPLE NO	SYMBOL
ENVELOPE		



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

GRAIN SIZE DISTRIBUTION GLACIAL TILL

HET. MIXTURE OF SILT, SAND AND GRAVEL TRACE OF CLAY FIG NO. 1

W.P. No. 36-66-12

JOB No: 70-11053

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
$\bar{\sigma}$	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

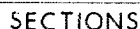
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_0	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

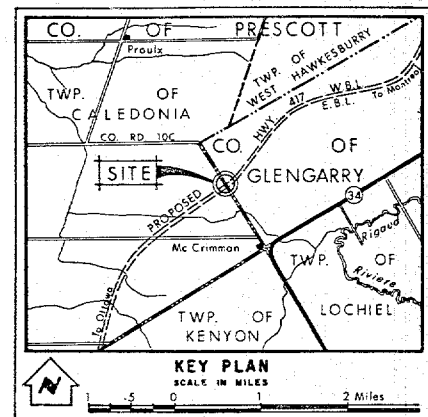
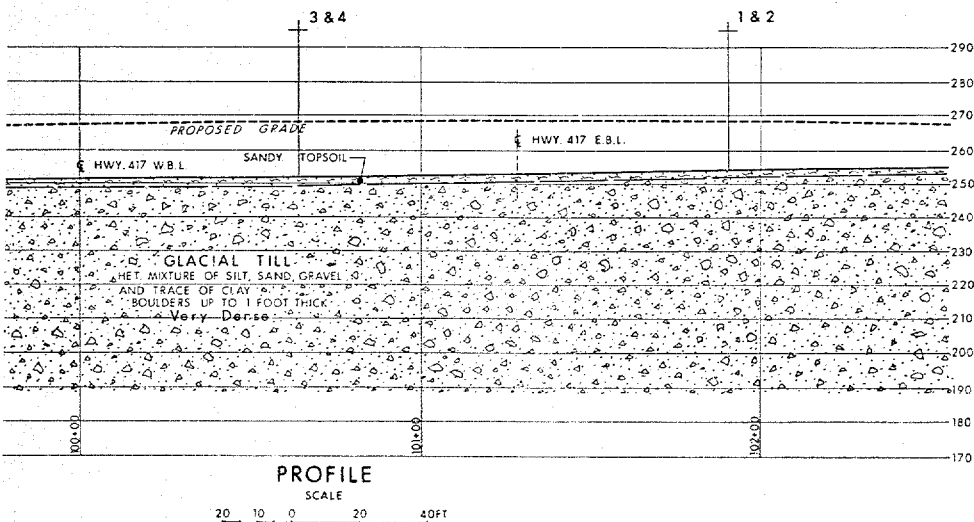
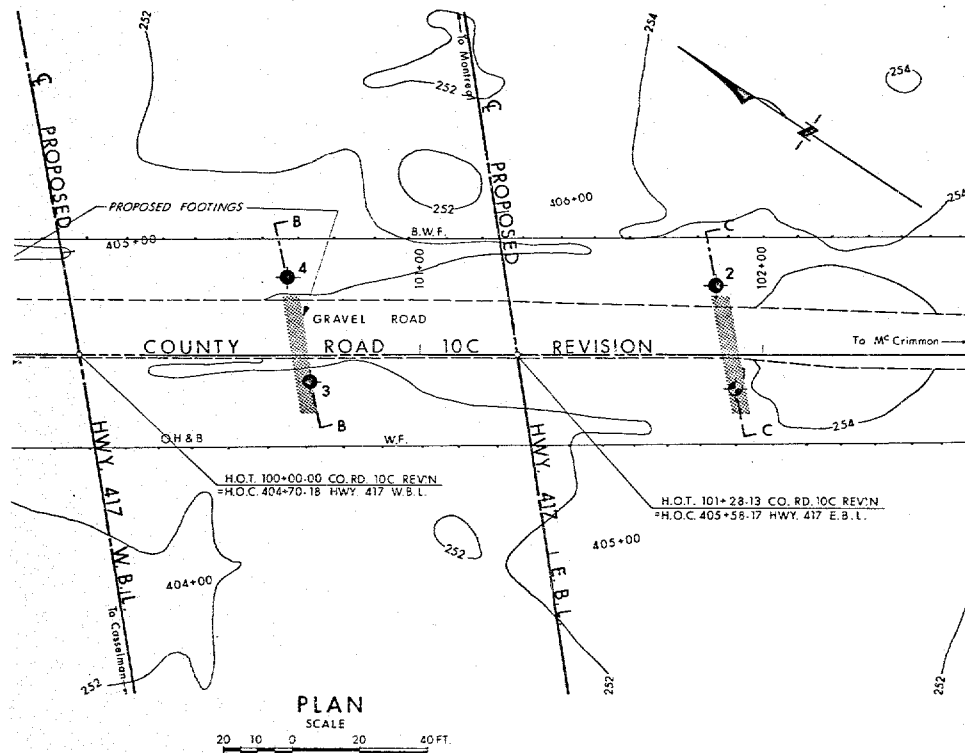
B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

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



NO.	FOR	DATE
1	FOR	DATE
2	FOR	DATE
3	FOR	DATE
4	FOR	DATE
5	FOR	DATE
6	FOR	DATE
7	FOR	DATE
8	FOR	DATE
9	FOR	DATE
10	FOR	DATE
11	FOR	DATE
12	FOR	DATE
13	FOR	DATE
14	FOR	DATE
15	FOR	DATE
16	FOR	DATE
17	FOR	DATE
18	FOR	DATE
19	FOR	DATE
20	FOR	DATE
21	FOR	DATE
22	FOR	DATE
23	FOR	DATE
24	FOR	DATE
25	FOR	DATE
26	FOR	DATE
27	FOR	DATE
28	FOR	DATE
29	FOR	DATE
30	FOR	DATE
31	FOR	DATE
32	FOR	DATE
33	FOR	DATE
34	FOR	DATE
35	FOR	DATE
36	FOR	DATE
37	FOR	DATE
38	FOR	DATE
39	FOR	DATE
40	FOR	DATE
41	FOR	DATE
42	FOR	DATE
43	FOR	DATE
44	FOR	DATE
45	FOR	DATE
46	FOR	DATE
47	FOR	DATE
48	FOR	DATE
49	FOR	DATE
50	FOR	DATE
51	FOR	DATE
52	FOR	DATE
53	FOR	DATE
54	FOR	DATE
55	FOR	DATE
56	FOR	DATE
57	FOR	DATE
58	FOR	DATE
59	FOR	DATE
60	FOR	DATE
61	FOR	DATE
62	FOR	DATE
63	FOR	DATE
64	FOR	DATE
65	FOR	DATE
66	FOR	DATE
67	FOR	DATE
68	FOR	DATE
69	FOR	DATE
70	FOR	DATE
71	FOR	DATE
72	FOR	DATE
73	FOR	DATE
74	FOR	DATE
75	FOR	DATE
76	FOR	DATE
77	FOR	DATE
78	FOR	DATE
79	FOR	DATE
80	FOR	DATE
81	FOR	DATE
82	FOR	DATE
83	FOR	DATE
84	FOR	DATE
85	FOR	DATE
86	FOR	DATE
87	FOR	DATE
88	FOR	DATE
89	FOR	DATE
90	FOR	DATE
91	FOR	DATE
92	FOR	DATE
93	FOR	DATE
94	FOR	DATE
95	FOR	DATE
96	FOR	DATE
97	FOR	DATE
98	FOR	DATE
99	FOR	DATE
100	FOR	DATE



LEGEND			
	Bore Hole		
	Cone Penetration Hole		
	Bore & Cone Penetration Hole		
	Water Levels established at time of field investigation. July, 1970		

NO.	ELEVATION	STATION	OFFSET
1	254.0	101+92	10' RT.
2	253.8	101+86	20' LT.
3	251.8	100+67	8' RT.
4	251.5	100+61	22' LT.
5	251.2	99+47	10' RT.
6	250.8	99+41	20' 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.

DEPARTMENT OF HIGHWAYS - ONTARIO MATERIALS & TESTING OFFICE - FOUNDATION SECTION			
COUNTY ROAD 10C			
KING'S HIGHWAY NO. 417 E.B.L. & W.B.L.		DIST. NO. 9	
CO. GLENGARRY and PRESCOTT			
TWP'S LOCHIEL & CALEDONIA LOT 38 & Gore CON. IX & VII			
BORE HOLE LOCATIONS & SOIL STRATA			
SUNW.D. A. N.	CHECKED <input checked="" type="checkbox"/>	W.P. NO. 30-05-12	M.S.T. DRAWING NO.
DRAWN <input checked="" type="checkbox"/>	CHECKED <input checked="" type="checkbox"/>	JOB NO. 70-11053	70-11053A
DATE Aug. 13, 1970	SITE NO.	BRIDGE DRAWING NO.	
APPROVED <input checked="" type="checkbox"/>	CONT. NO.		

FIELD RECONNAISSANCE REPORT
REQUIRED BY FOUNDATION SECTION
FOR

FF-69
SEPT. 1968

W.P. NO. 36-66-12 HIGHWAY NO. 417 DISTRICT 9 SITE PLAN NO. E-4694-1 PROFILE NO. _____
RIVER CROSSING ☐ GRADE SEPERATION ☒ R.R.X. ☐ OTHER (SPECIFY) _____
ALTERNATE SCHEME (IF ANY) _____

EXISTING SITE CONDITIONS

DESCRIPTION:

TOPOGRAPHY: HILLY ☐ ROLLING ☐ VALLEY ☐ GULLIED ☐ FLAT ☒
VEGETATION: TREES ☐ BRUSH ☐ GRASS ☒ SWAMP ☐ FARM CROPS ☐ CLEARED ☒
SNOW COVER: 0"-6" ☐ 6"-12" ☐ >12" ☐
ROCK OUTCROP (SPECIFY LOCATIONS) Surface boulders

UNDERGROUND UTILITIES: UTILITY COMPANY TELEPHONE NO. FOR DEFINITE LOCATION

1 Bell Telephone

2 _____

3 _____

4 _____

5 _____

EXISTING STRUCTURE(S):

FOUNDATIONS: SPREAD FOUNDATIONS ☐ SIZE _____ ELEVATION(S) _____
PILES ☐ TYPE _____ LENGTH(S) _____
DESIGN LOAD _____ T.S.F. _____ TONS/PILE _____
CONDITION OF STRUCTURE _____

APPROACHES: CUT ☐ FILL ☐ SIDE SLOPES _____
BERMS YES ☐ NO ☐

OTHER OBSERVATIONS (USE BACK OF SHEET TO DESCRIBE ANY FAILURES IN AREA, PAST PERFORMANCE OF EXISTING APPROACHES & STRUCTURE, ETC.)

ACCESSIBILITY

IS STRUCTURE LOCATED ON D.H.O. RIGHT OF WAY? YES ☐ NO ☒ IF NO,
HAS PERMISSION BEEN OBTAINED TO ENTER PROPERTY? YES ☐ NO ☐ IF NO,
PROPERTY OWNER(S):

NAME

ADDRESS

TELEPHONE NO.

1 Contact Property Section, Eastern Region

2 _____

3 _____

4 _____

WHO WILL OBTAIN NECESSARY PERMISSION? Property Section, Eastern Region

HAS SITE BEEN SURVEYED & STAKED? YES ☒ NO ☐ IF YES, DATE OF MOST RECENT SURVEY May 1970

WILL CLEARING BE NECESSARY TO ENTER SITE AREA? YES ☐ NO ☒

IS SITE ACCESSIBLE TO WHEELED VEHICLES? YES ☒ NO ☐

IF RIVER CROSSING:

WILL A RAFT BE NECESSARY? YES ☐ NO ☐ IF YES, GIVE MAX. DEPTH OF WATER _____ FT.

CURRENT: SWIFT ☐ MODERATE ☐ SLOW ☐

DRILLING OPERATIONS

NEAREST SOURCE OF WATER (GIVE HAULING DISTANCE, IF KNOWN) 3.8 mi. south of site-Rigaud River Bridge
ADDITIONAL INVESTIGATION REQUIRED FOR THE FOLLOWING PURPOSES: Hwy. 34

ALTERNATE SCHEME: YES ☐ NO ☐ IF YES, SPECIFY _____

HYDROLOGIC REASONS: YES ☐ NO ☐ IF YES, SPECIFY (SCOUR, ETC.) _____

REMARKS

NEAREST AVAILABLE ACCOMODATION: Alexandria - Glen Motel or White Rock Motel

OTHER COMMENTS: _____

DATE June 15, 1970

REGIONAL BRIDGE LOCATION ENGINEER Planning

U. Henglin

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. C. S. Grebski,
Bridge Design Engineer,
Bridge Office,
Admin. Bldg.

From: Foundation Section,
Materials & Testing Office,
Room 107, Lab. Bldg.

ATTENTION:

DATE: November 19, 1970

OUR FILE REF.

IN REPLY TO

SUBJECT:

Underpass Structure at the Crossing of
Proposed Hwy. #417 and County Road #10C
District No. 9 (Ottawa)
W.O. 70-11053 -- W.P. 36-66-12

We have reviewed the Preliminary Bridge Plan Drawing No. D-6383-P1 for the above mentioned structure and submit the following comments:

- i) The proposed abutments should be founded at the following elevations:

North Abutment	:	Elev. 249.0
South Abutment	:	Elev. 251.0

- ii) The centre pier is located below the groundwater in the granular glacial till deposit. In order to simplify dewatering of the excavation for the centre pier, it is suggested that the cuts for Hwy. #417 be completed to the profile grade before construction of the centre pier foundations. Further lowering of the groundwater may be achieved by constructing a perimeter drainage ditch around the footing base of the centre pier. The invert of the ditch should extend at least 2 ft. below the proposed footing level. The water collected in this ditch should be gravity drained to a sump from which it can be pumped away.

MD/MJeP

cc: Messrs. S. McCombie
T. C. Kingsland
Foundations Files ✓
Gen. Files

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

Copy also sent to S. J. Markiewicz

MEMORANDUM

AGS

TO: Mr. M. Devata,
Supervising Foundation Engineer,
Foundation Office,
Room 107, Lab. Bldg.

FROM: A.A. Witecki,
Bridge Office

ATTENTION:

DATE: December 11, 1970

OUR FILE REF.

IN REPLY TO

SUBJECT: Underpass Structure at the
Crossing of Proposed Hwy. #417
and County Rd. #10C
W.P. 36-66-12, Site No. 31-293
District No. 9 (Ottawa)

This will confirm our agreement concluded in our discussion on December 10, 1970, that the allowable bearing pressure should be limited as follows:

1. For abutment footings - 4 t.s.f.
2. For centre pier footing - 5 t.s.f.

There was also a suggestion from the Foundation Section that the centre pier footing should be placed on 9" thick working concrete slab to maintain as far as possible undisturbed soil under this foundation. This working slab should considerably reduce the tendency of loosening the soil materials due to water buoyancy before the final foundation for pier support are placed.


A. Witecki,
Bridge Project Engineer

AW:rd

MEMORANDUM

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

FROM: C.S. Grebski,
Bridge Office

ATTENTION:

DATE: February 17, 1971

OUR FILE REF.

IN REPLY TO

SUBJECT: Co. Rd. 10C Underpass (Future Interchange)
0.9 Mi. North of McCrimmon
W.P. 36-66-12, Site No. 31-293
Highway 417, District No. 9

70-11-853

Attached herewith we are submitting the final
bridge drawings which show the foundation design for
this structure.

Kindly give us your comments at your earliest
convenience.



C.S. Grebski,
Bridge Design Engineer

CSG:rd

Attach.

c.c. Foundation Office

19 FEB 71

NO COMMENTS

L. K. B.

dlr
3/1/71

M. Dwyer
19/2 Feb/71

OVERSIZED DRAWINGS

General Layout
Foundation "

DOCUMENT MICROFILMING IDENTIFICATION

61-30 SEPT. 1976

GEOCREs No. 316-64
DIST. 9 REGION EASTERN
W.P. No. 36-66-12
CONT. No. 72-196
W.O. No. 70-F-53
STR. SITE No. 31-293
HWY. No. 417
LOCATION HWY. 417 AND CO. RD. 10C

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 4

REMARKS: DOCUMENTS TO BE UNFOLDED
BEFORE MICROFILMED

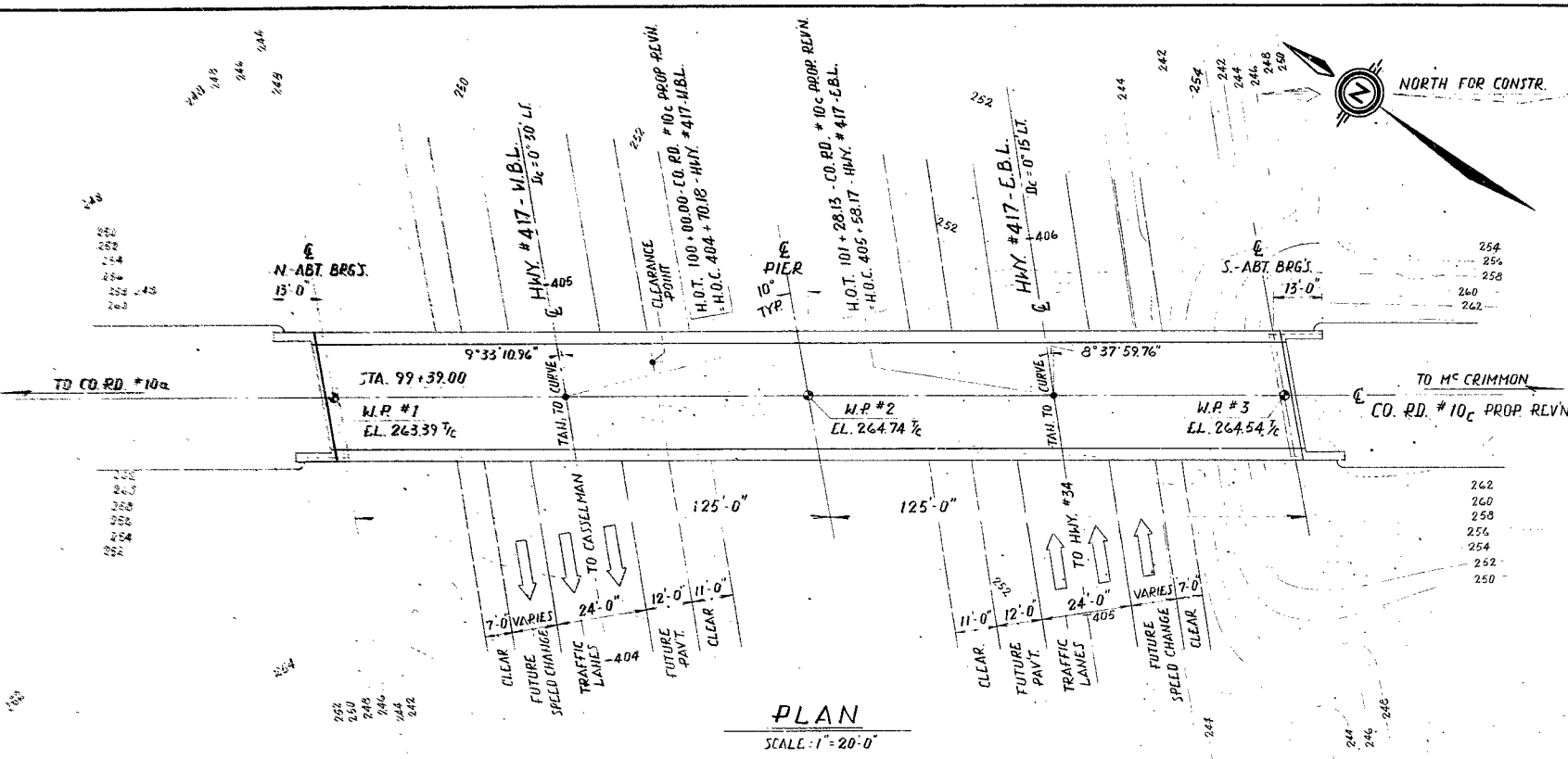
31-64
GEOCRETS

DEPARTMENT OF HIGHWAYS-ONTARIO				RECORD OF BOREHOLE No. 1				FOUNDATION SECTION							
MATERIALS & TESTING OFFICE															
JOB 70-11053				LOCATION Hwy. 117 & Co. Rd. 100 Sta. 101 + 92 o/s 10' Rt. #				ORIGINATED BY AM							
W.P. 36-66-12				BORING DATE July 3, 6, 7, 8, 1970				COMPILED BY FP							
DATUM Geodetic				BOREHOLE TYPE NX, BY Casing; Cone Test				CHECKED BY							
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT PLASTIC LIMIT WATER CONTENT				BULK DENSITY		REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. NO.	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	20 40 60 80 100	20 40 60	20 40 60	20 40 60	20 40 60	20 40 60	20 40 60	20 40 60	20 40 60
250.0	Ground Level		1	SS	120/10"										
0.0	Sandy topsoil		2	SS	52										
1.3			3	SS	66										
	Het. mix. of silt, sand, gravel and trace of clay with numerous granite and limestone boulders up to 1' thick (glacial till)		4	SS	180										13 44 38 5
			5	SS	150										2h0.2
	Very Dense Brown		6	SS	80/9"										WL in open BH July 15/70
			7	SS	100/4"										20 43 36 1
	Grey		8	SS	250										
			9	SS	195/4"										
			10	SS	230										
			11	SS	152										27 38 33 2
			12	SS	300										
199.4															
54.6	End of Borehole														

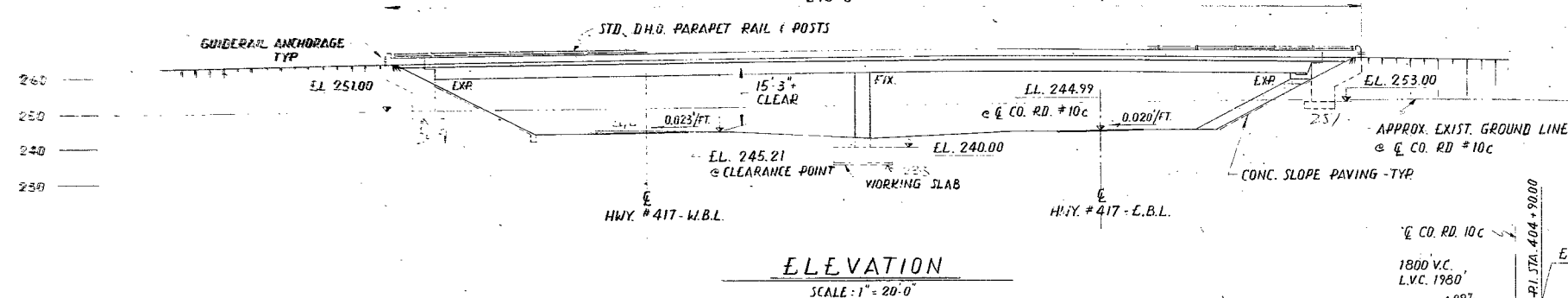
316-64
GEOS No.

DEPARTMENT OF HIGHWAYS-ONTARIO MATERIALS & TESTING OFFICE				RECORD OF BOREHOLE No. 3				FOUNDATION SECTION			
JOB 70-11053		LOCATION Hwy. 417 & Co. Rd. 100; Sta. 100+67; o/s 8' Rt. 8		ORIGINATED BY AN				COMPILED BY AN			
W.P. 26-66-12		BORING DATE July 3, 6, 1970		CHECKED BY							
DATUM Geodetic		BOREHOLE TYPE No. BX, AX Casing									
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT		REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. LOT	NUMBER	TYPE	SCALE	SHEAR STRENGTH P.S.F.	PLASTIC LIMIT	WATER CONTENT			
251.8	Ground Level		1	SS	9	250					
0.0	Sandy Topsoil		2	SS	62						
2.0	Het. mix. of silt, sand, gravel & trace of clay with numerous granite & limestone boulders up to 1' thick (Glacial Till)		3	SS	75						
	Very Dense		4	SS	100						
	Brown		5	SS	200						
			6	SS	30/27						
	Grey		7	SS	20/7						
187.9	End of Borehole										
63.9											

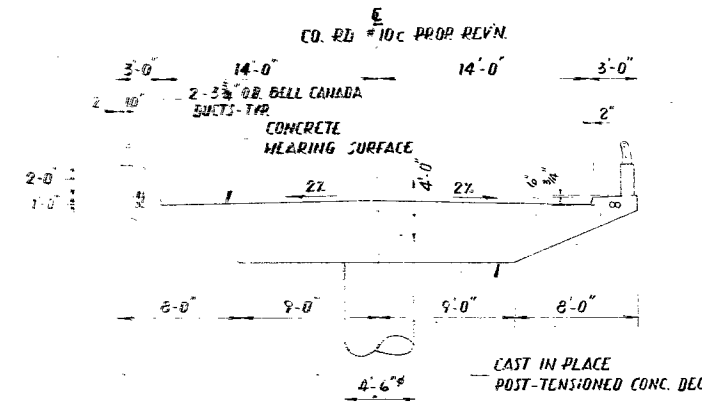
20
15-5 % STRAIN AT FAILURE
10



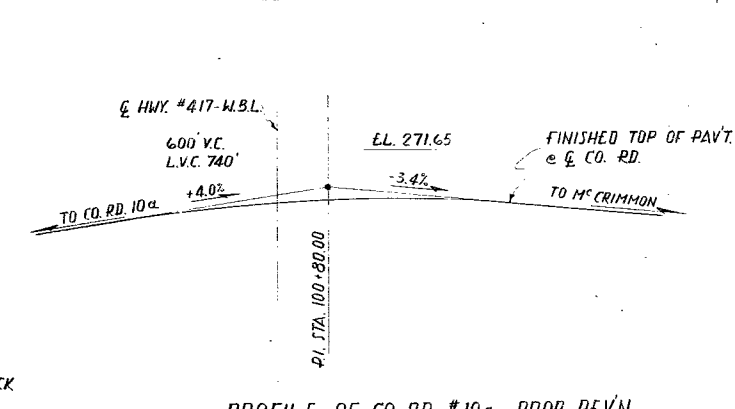
PLAN
SCALE: 1" = 20'-0"



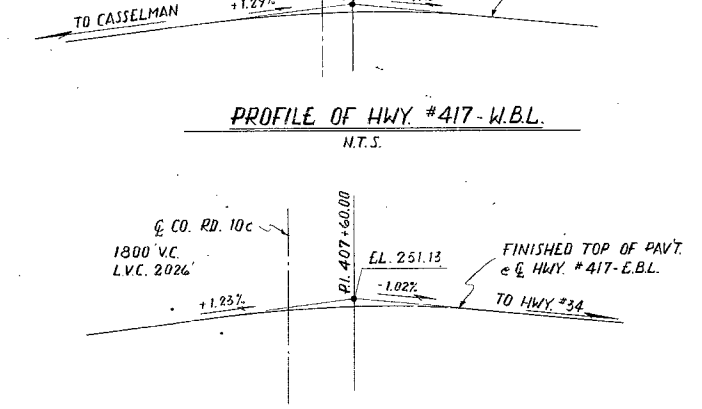
ELEVATION
SCALE: 1" = 20'-0"



TYP. DECK SECTION
SCALE: 3/16" = 1'-0"



PROFILE OF CO. RD. #10c PROP. REVN.
N.T.S.



PROFILE OF HWY. #417-W.B.L.
N.T.S.

PROFILE OF HWY. #417-E.B.L.
N.T.S.

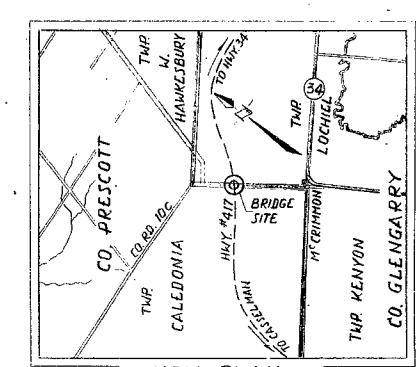
REFERENCE BENCH MARK
B.M. 251.34
GEODETIC DATUM
N. & W. IN N. ROOT OF 1.5 ELM
3810 RT. OF 403 + 9700 W.B.L.

SKEW DATA - 10°
SIN. - 0.173648
COS. - 0.984808
TAN. - 0.176327
SEC. - 1.015427

NOTES
• W.P. DENOTES WORKING POINT.
• 1/2 DENOTES TOP OF CONCRETE WEARING SURFACE.

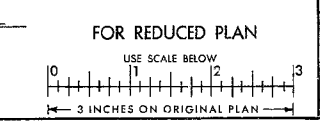
- LIST OF DRAWINGS
- D-6888-1 GENERAL LAYOUT
 - 2 BORE HOLE LOCATIONS & SOIL STRATA
 - 3 FOUNDATION LAYOUT
 - 4 ABUTMENTS & PIERS
 - 5 DECK DETAILS & BEARINGS
 - 6 PRESTRESSING DETAILS
 - 7 DECK REINFORCEMENT I
 - 8 DECK REINFORCEMENT II
 - 9 PARAPET WALL DETAILS
 - 10 STANDARD STEEL PARAPET RAIL
 - 11 DETAILS OF CONC. SLOPE PAVING
 - 12 STANDARD DETAILS I
 - D-6888-13 STANDARD DETAILS II

NOTES
CLASS OF CONCRETE
DECK, CURBS & PARAPET WALLS 5000 P.S.I.
PIER COLUMN 5000 P.S.I.
REMAINDER 3000 P.S.I.
CLEAR COVER ON REINF. STEEL
FOOTINGS & ABUTMENTS - 3"
PIER COLUMN & CURBS - 2"
TOP OF DECK - 2", BOT. - 1 1/2"
PARAPET WALLS - 1 1/2"
CONSTRUCTION NOTES
THE CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS TO THE SPECIFIED ELEVATIONS WITH A TOLERANCE OF ± 1/8".
NO CONCRETE SHALL BE PLACED ABOVE THE ABUTMENT BEARING SEATS UNTIL THE CONCRETE IN THE DECK HAS BEEN PLACED, STRESSED & GROUTED.



KEY PLAN
SCALE: 1 IN. = 1 MI.

REVISIONS		DATE		BY		DESCRIPTION	
DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION 70-11-05-3							
CO. RD. 10c U'PASS (FUTURE INTERCH) 0.9 MILE NORTH OF M'CRIMMON							
KING'S HIGHWAY No. 417				DIST. No. 9			
CO. GLENGARRY & PRESCOTT				TWP. LOCHIEL & CALEDONIA			
LOT 38 & GORE				CON. IX & VII			
GENERAL LAYOUT							
APPROVED		BRIDGE ENGINEER		SITE No. 31-293		W.P. No. 36-66-12	
DESIGN G.A.		CHECK G.A.		CONTRACT No.			
DRAWING A.A.		CHECK G.A.		DRAWING No.		D-6888-1	
DATE FEB/71		LOADING HS20-44					



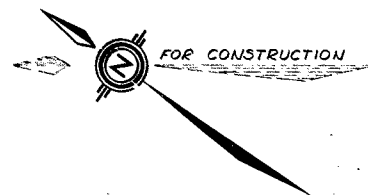
N. ABUT. BRGS.

125'-0"

PIER

125'-0"

S. ABUT. BRGS.



10° SKEN TYP.

2

W.P. #2

W.P. #3

3'-2" 5'-4" 8'-6"

FOUNDATION LAYOUT

SCALE: $\frac{1}{4}" = 1'-0"$

NOTE:

BOTTOM & SIDES OF ABUTMENTS & PIER FOOTINGS TO BE POURED AGAINST UNDISTURBED GROUND.

318-64
GEODESIC No.

PRINT RECORD

ABUT. BRGS.

EL. 251.00 N. ABUT.
EL. 253.00 S. ABUT.

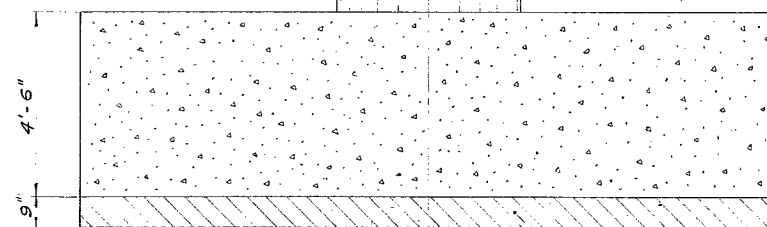
ROUGH SURFACE

2'-0"

1 $\frac{1}{2}" = 1'-0"$

PIER

EL. 240.00

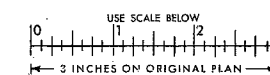


CONC. WORKING SLAB

2 $\frac{1}{2}" = 1'-0"$



FOR REDUCED PLAN



REVISIONS	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE OFFICE	
70-11-05-3	
CO. RD. 10c U'PASS (FUTURE INTERCH.)	
0.9 MILE NORTH OF M ^c CRIMMON	
KING'S HIGHWAY No. 417	DIST. No. 9
CO. GLENGARRY & PRESCOTT	
TWP. LOCHIEL & CALEDONIA LOT 38 & 60RE CON. IX & VII	
FOUNDATION LAYOUT	
APPROVED	SITE No. 31-293 W.P. No. 36-66-12
DESIGN G.A. CHECK	CONTRACT No.
DRAWING B.S. CHECK G.A.	DRAWING No. D-6888-3
DATE FEB. 1971	LOADING HS20-44