

FIELD RECONNAISSANCE REPORT
REQUIRED BY FOUNDATION SECTION
FOR

FF-69
SEPT. 1968

W.P. NO. 36-66-11 HIGHWAY NO. 417 DISTRICT 9 SITE PLAN NO. E-4695-1 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) _____ None

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) 5.3 mi. east & south of site - Rigaud

ADDITIONAL INVESTIGATION REQUIRED FOR THE FOLLOWING PURPOSES: River Bridge at 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: _____

* Bell cable has been staked out.

DATE June 15, 1970

REGIONAL BRIDGE LOCATION ENGINEER _____

Planning

R. H. Hays

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.

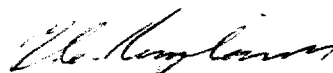
IN REPLY TO

SUBJECT: W.P. 36-66-11, Site 27-218,
Township Road Underpass,
Highway 417, District 9-Ottawa

70-110-52

We are sending you herewith two prints of Bridge Site Plan E-4695-1 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

MEMORANDUM

316-63

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

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

ATTENTION: Mr. S. McCo die

DATE: August 4, 1970

OUR FILE REF.

IN REPLY TO

AUG 12 1970

SUBJECT:

CONT 72-196

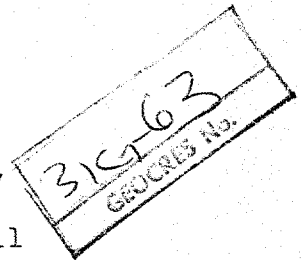
FOUNDATION INVESTIGATION REPORT

For

Underpass Structure at the
Crossing of Proposed Hwy. #417
And Township Rd.

Caledonia Township - Prescott County
District No. 9 (Ottawa)

W.O. 70-11052 -- W.P. 36-66-11



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 do not hesitate 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

Foundations Files
Gen. Files ✓

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

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FOUNDATION INVESTIGATION REPORT
For
Underpass Structure at the
Crossing of Proposed Hwy. #417
and Township Rd.
Caledonia Township - Prescott County
District No. 9 (Ottawa)
W.O. 70-11052 -- W.P. 36-66-11

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 a township road approximately 3 miles west of the hamlet of McCrimmon, located on Hwy. #34.

In the vicinity of the crossing, the roadbed is level with the surrounding terrain and is unpaved. There is a ditch on either side of the road; along most of the north edge of the road right-of-way there is a stone fence 3 to 4 feet high and about 5 feet wide. In addition, there is a buried Bell Telephone cable located on the north edge of the roadway. The surrounding terrain, which is farmland, is flat to gently undulating in relief.

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

3. FIELD AND LABORATORY WORK:

Eight sampled boreholes, all 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. Bedrock was proven in 4 of the 8 boreholes by obtaining AXT size rock samples.

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. 70-11052A, together with the estimated stratigraphical profile along the centre-line of the re-aligned township road. All elevations were 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:

Across the site, the overburden deposits vary in thickness between 6 and 10 feet, and are underlain by limestone bedrock.

The boundaries of the various deposits, as determined in the boreholes, are shown on the accompanying borehole sheets. The stratigraphical profile, shown on Drawing No. W.O. 70-11052A, is inferred from this boring data:

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

4.2) Topsoil:

Across the site there is about 2 feet of sandy topsoil, which contains some gravel.

4.3) Clay (Desiccated):

In the centre and western section, a thin crust (1 to 4 feet thick) of very stiff desiccated clay was encountered. The Atterberg limit tests, performed on this deposit, indicate that the material is essentially inorganic with a plasticity that varies from intermediate to high. These results are shown on the Record of Borelog sheets in the Appendix of this report.

4.4) Heterogeneous Mixture of Clay, Silt, Sand And Gravel (Glacial Till):

The topsoil and desiccated clay, where encountered, are underlain by a deposit of glacial till, which varies from 4 to 6 feet in thickness.

The glacial till is composed mainly of sand, silt and gravel with some clay. Within this deposit, the occasional boulder was encountered. Grain-size distribution curves for samples of this deposit, obtained with 2" O.D. sampling equipment, are illustrated, in envelope form, on Figure #1.

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

4.4) Heterogeneous Mixture of Clay, Silt, Sand and Gravel (Glacial Till):
(cont'd.)...

The Standard Penetration Tests, carried out within the glacial till deposit, are plotted on the Record of Borelog Sheets. This testing gave 'N' values which vary from 10 to 104 blows/ft. Based on these values, the relative density of the glacial till ranges from compact to very dense.

4.5) Limestone Bedrock:

The overburden deposits are directly underlain by bedrock, which was proven in 5 of the 8 boreholes, by obtaining from 6 to 13 feet of AXT size rock core samples. Over the site, the bedrock surface was found to vary between elevations 226 and 232 (6 to 10 feet below ground surface).

The bedrock is composed of limestone which contains numerous irregular seams and interbeds of black shale which are up to $\frac{1}{2}$ inch in thickness.

The upper 3 to 5 feet of the bedrock often has open joints and fractures; below this zone, the bedrock is sound, as indicated by the relatively high percentage of core recovery.

5. GROUNDWATER CONDITIONS:

During the period of the investigation, groundwater level observations were carried out in the eight open boreholes. The groundwater level in the overburden was at a depth of 4 to 7 feet below the existing ground surface. These depths correspond to elevations between 230 and 233.

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General:

It is proposed to construct a two span underpass structure at the crossing of Hwy. #417 and the above mentioned township road in the Township of Caledonia, County of Prescott. The structure will be 32 feet wide and approximately 216 feet long. In the vicinity of the structure, the township road will have a profile grade between elevations 257 and 258. The associated approach fills will, therefore, have a maximum height of approximately 21 feet.

In the immediate area, limestone bedrock is encountered beneath thin surficial deposits composed of competent glacial till and very stiff desiccated clay.

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. The footing, therefore, may be located in the glacial till, i.e. at or below elevation 231. An allowable bearing value of up to 3 t.s.f. can be used in the design of the footing.

Alternatively, the footing may be carried down to bedrock(at or below elevation 228) in which case, an allowable bearing value of up to 10 t.s.f. can be used. Any shattered material at the surface of the bedrock should be stripped prior to placement of the footing.

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

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

6.2.1) Centre Pier Foundation: (cont'd.)...

At the location of the pier foundation, the groundwater level is about 5 feet below ground level, ie. at about elevation 231. The footing will be located at or below this elevation, and thus groundwater seepage into the excavation may occur. Any groundwater seepage or surface run-off into the excavation could be handled by conventional techniques (such as pumping from sumps).

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

The proposed abutments may be constructed within the approach fills; two alternative methods are given for the foundation support of the abutments:

i) The 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. Class '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.

ii) The abutments for the structure may be supported on end-bearing piles driven to bedrock. The approximate tip elevations would range between elevations 226 to 228 at the west abutment and would be at about elevation 231 at the east abutment. The allowable loads would depend on the pile section chosen (e.g. 12BP74 steel H piles may be designed for 95 tons/pile). No bouldery or rock fill should be used in areas in which piles are to be driven.

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

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

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 20 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 June 29 to July 2, 1970 was supervised by Mr. F. A. Patterson, Student Technician (field). The equipment used was owned and operated by F. E. Johnston Drilling Co. Ltd.

The preparation of this report was undertaken by Mr. F. A. Patterson.

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

JULY 1970

APPENDIX

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 70-11052 LOCATION Hwy. 417 & Twp. Rd., Sta. 101 + 76 o/s 32' Rt. 0 ORIGINATED BY FP
 W.P. 36-66-11 BORING DATE July 2, 1970 COMPILED BY FP
 DATUM Geodetic BOREHOLE TYPE Washboring-NX, AX Casing; AXT Rock Core; Cone 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		SHEAR STRENGTH P.S.F.					WATER CONTENT %				
						20	40	60	80	100						
238.7	Ground Level															
236.9	Sandy Topsoil		1	SS	11											
1.8	Het mix. of si. sa. grav.		2	SS	9											
	trace of clay (Glacial		3	SS	104											
232.6	Till) Comp. to V. Dense		4	SS	50/78"											
6.1	Fractured Zone		5	AXT	60%											
			6	AXT	80%											
			7	AXT	85%											
	Limestone bedrock with		8	AXT	90%											
	irregular shale seams		9	AXT	95%											
	up to 1/2" thick.															
220.1	Sound		10	AXT	100%											
18.6	End of Borehole															

8 50 37 5
 39 33 23 5
 ▼ 231.0
 in open BH
 July 3/70

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 70-11052 LOCATION Hwy. 417 & Twp. Rd. Sta. 101+80, o/s 15' Lt. ORIGINATED BY FP
W.P. 36-66-11 BORING DATE July 2, 1970 COMPILED BY FP
DATUM Geodetic BOREHOLE TYPE NX casing; cone CHECKED BY AK

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W		BULK DENSITY Y P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS/FOOT	RESISTANCE	WATER CONTENT %			
239.7	Ground Level											
237.7	Sandy topsoil		1	SS	10							
2.0	Het. mix. silt, sa		2	SS	31							
	gr. trace of clay		3	SS	41							
231.7	(glacial till)		4	SS	65							
	compact to v. dens											
8.0	End of borehole											
	Probably bedrock											

210
220

Borehole dry
(July 2/70)

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 70-11052 LOCATION Hwy. 417 & Twp. Rd.; Sta 100 + 62, o/s 28' Rt. ORIGINATED BY FP
W.P. 36-66-11 BORING DATE June 29, 1970 COMPILED BY FP
DATUM Geodetic BOREHOLE TYPE Washboring; NX AX casings; AXT rock core CHECKED BY [Signature]
cone

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	20	40	60	80	100	w_p	w	w_L	
236.3	Ground Level															
233.8	Sandy topsoil		1	SS	10											
231.3	Clay (dessicated)		2	SS	15											
229.3	v. stiff		3	SS	20											
225.9	Het. mix. of silt, sa. with some clay (glacial) compact to v. dense		4	SS	32											
225.9			5	SS	102											
225.9			6	SS	7025"											
225.9	fractured zone		7	AXT	80%											
219.5	Limestone bedrock with irregular shale seams up to 1" thick		8	AXT	95%											
16.8	End of borehole															

231.6 in.
open BH
on July 1
1970
6 33 35 26
0 28 61 11

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

FOUNDATION SECTION

JOB 70-11052 LOCATION Hwy.417 & Twp.Rd.; Sta. 100 + 66 o/s 20' Lt. Ø ORIGINATED BY FP
 W.P. 36-66-11 BORING DATE July 1, 1970 COMPILED BY FP
 DATUM Geodetic BOREHOLE TYPE Washboring-NX,AX Casings; AXT RockCore; Cone CHECKED BY ML

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 %		P.C.F.	GR. SA. SI. CL.
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE		w_p ——— w ——— w_L			
							400 800 1200 1600 2000		20 40 60			
237.6	Ground Level											
235.6	Sandy Topsoil		1	SS	18							
2.0	Clay(desic.) Very Stiff		2	TM	PM							
3.5	Het. mix. of si. sa. & gr. trace of clay (glacial Till)		3	SS	49							
			4	SS	73							
228.5	Very dense		5	SS	97							
			6	AXT	33%							
9.1	Fractured Zone		7	AXT	100%							
	Limestone Bedrock with irregular shale seams up to 1/2" thick.		8	AXT	90%							
217.5	Sound											
20.1	End of Borehole											

in open BH
July 3/70
232.8
28 41 25 6

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 5

FOUNDATION SECTION

JOB 70-11052 LOCATION Hwy. 417 & Twp. Rd.; Sta. 99 + 50 o/s 26' Rt. 0 ORIGINATED BY FP
W.P. 36-66-11 BORING DATE June 29, 30, 1970 COMPILED BY FP
DATUM Geodetic BOREHOLE TYPE Washboring, NX, AX Casing; AXT Rock Core; Cone CHECKED BY SL

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		20	40	60	80	100	w_p	w	w_L		
235.5	Ground Level															
233.8	Sandy Topsoil		1	SS	10											
1.7	Clay (desiccated)		2	SS	19											
231.5	Very Stiff															
4.0	Het. mix. si. sa. grav. some clay (glac. Till)		3	SS	65											
228.0	Very Dense		4	SS	210											
7.5	Fractured Zone		5	AXT	60%											
	Limestone Bedrock with irregular shale seams up to 1/2" thick.		6	AXT	80%											
214.8	Sound		7	AXT	100%											
20.7	End of Borehole															

in open BH
▼ 231.5
July 1/70
21 19 40 20
32 38 24 6

DEPARTMENT OF HIGHWAYS- ONTARIO

MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 6

FOUNDATION SECTION

JOB 70-11052

LOCATION Hwy. 417 & Twp. Rd.; Sta. 99 + 54 o/s 20' Lt. Ø

ORIGINATED BY FP

W.P. 36-66-11

BORING DATE July 1, 1970

COMPILED BY FP

DATUM Geodetic

BOREHOLE TYPE NX Casing; Cone

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w _L PLASTIC LIMIT — w _p WATER CONTENT — w			BULK DENSITY Y	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT 20 40 60 80 100					SHEAR STRENGTH P.S.F. w _p — w — w _L				
234.7	Ground Level														P.C.F.	GR. SA. SI. CL.
232.7	Sandy Topsoil	?	1	SS	9											
2.0	Clay (desiccated)															
229.7	Very stiff		2	SS	18	230									129.5	230.7
5.0	Het. mix. silt, sa., grav. some clay, some boulders		3	SS	53											in open BH
225.7	(glac. till) Dense-V. Dense		4	SS	42											July 1/70
9.0	End of Borehole Probably Bedrock					220										

FOUNDATION SECTION

JOB 70-11052 LOCATION Hwy. 417 & Twp. Rd; Sta. 98 + 00 o/s 24' Rt. 0 ORIGINATED BY FP
W.P. 36-66-11 BORING DATE June 30, July 1, 1970 COMPILED BY FP
DATUM Geodetic BOREHOLE TYPE NX Casing; Cone CHECKED BY SA

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT PLASTIC LIMIT WATER CONTENT		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	WATER CONTENT %	W _p	W _L		
234.4	Ground Level											
232.4	Sandy Topsoil		1	SS	5							
2.0	Clay (desiccated)		2	SS	33	230						
228.4	Hard		3	SS	34							
6.0	Glacial Till. V.Dense		4	SS	189							
225.6												
8.8	End of Borehole Probably Bedrock					220						

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 8

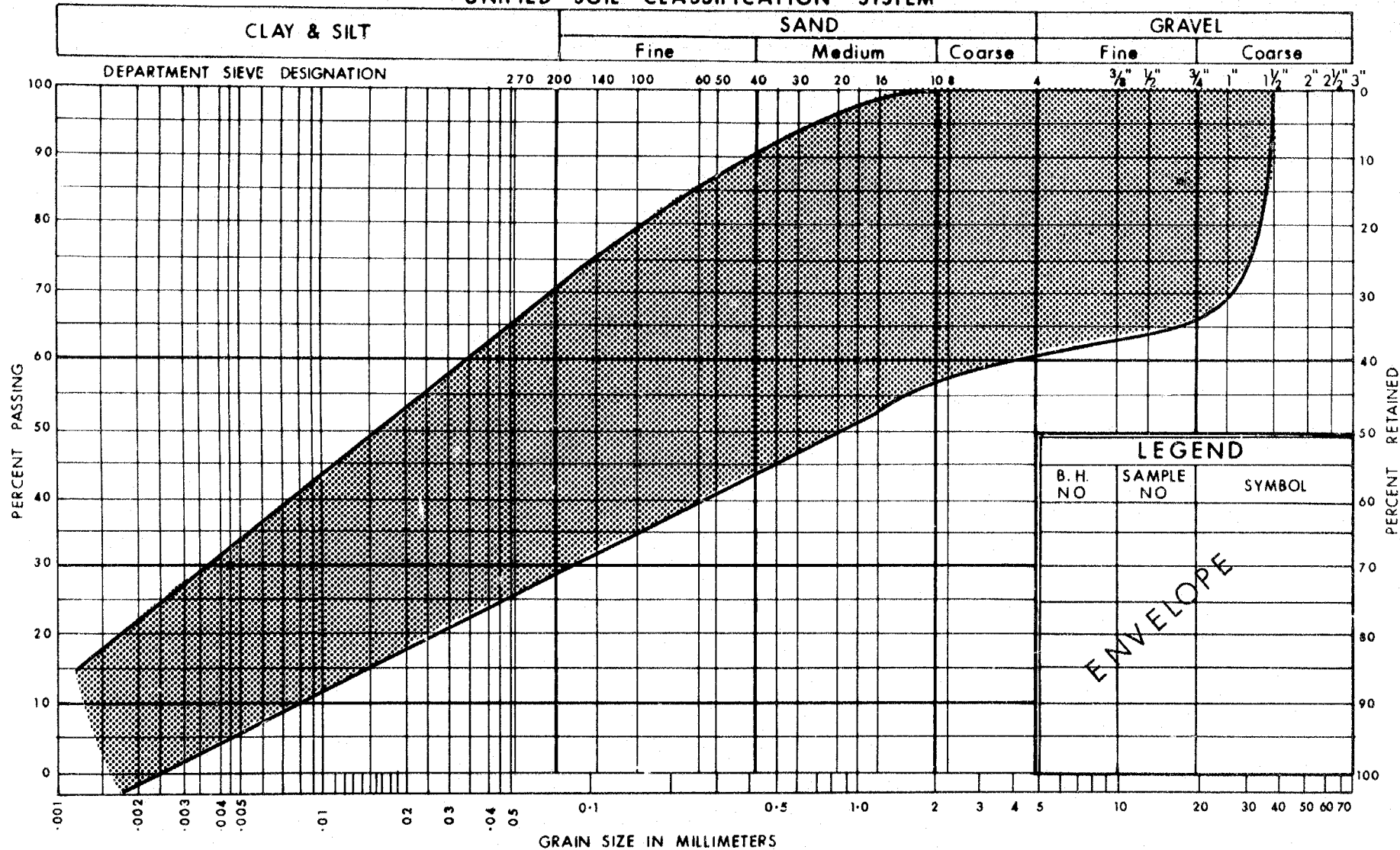
FOUNDATION SECTION

JOB 70-11052 LOCATION Hwy. 417 & Twp.Rd.; Sta. 103 + 30; o/s 15' Lt. ORIGINATED BY FP
 W.P. 36-66-11 BORING DATE July 2, 1970 COMPILED BY FP
 DATUM Geodetic BOREHOLE TYPE NX Casing; Cone 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			w_p — w — w_L		
							SHEAR STRENGTH P.S.F.									
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE									
							400 800 1200 1600 2000					20 40 60				
241.1	Ground Level															
239.1	Sandy Topsoil		1	SS	11	240										
2.0	Het. mix. silt, sa., grav. some clay & boulders		2	SS	12											
235.1	(glac. till) Comp. - V. Dense		3	SS	90											
6.0	End of Borehole Probably Bedrock															
						230										
							</									

Borehole dry
July 2/70

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF HIGHWAYS
**MATERIALS and
TESTING
DIVISION**

GRAIN SIZE DISTRIBUTION GLACIAL TILL

HET. MIX. OF SILT, SAND & GRAVEL, TRACE OF CLAY

W.P. No. 36-66-11

JOB No. 70-11052

FIG. NO. 1

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

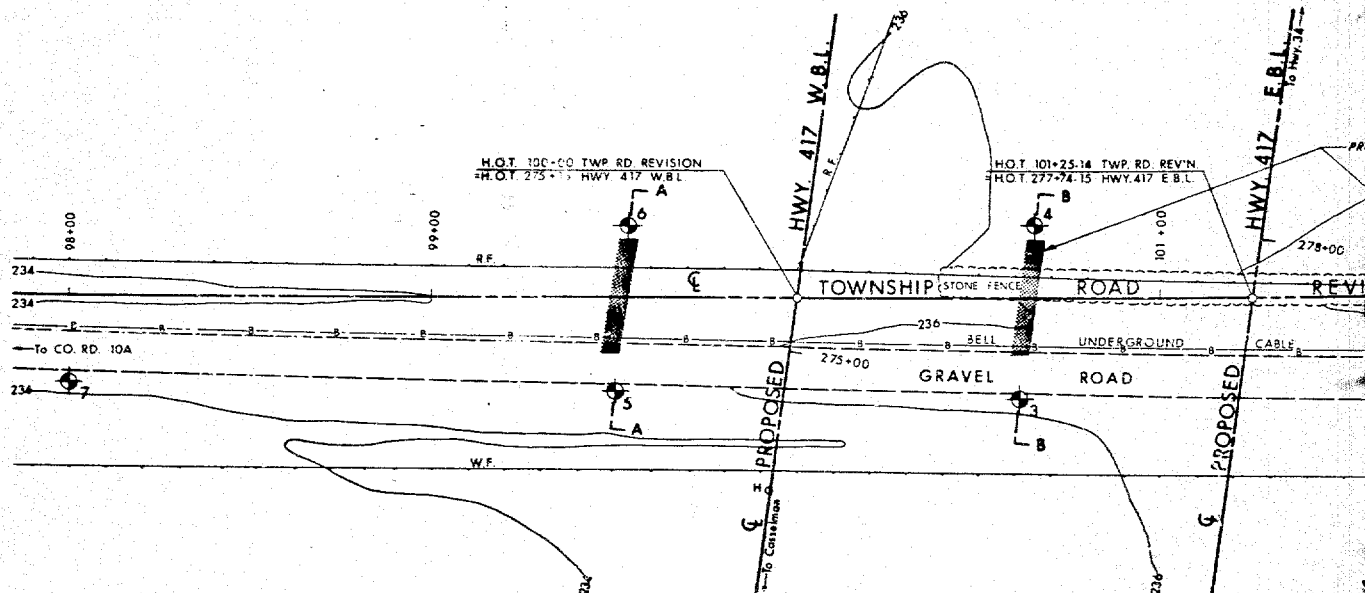
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_0	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

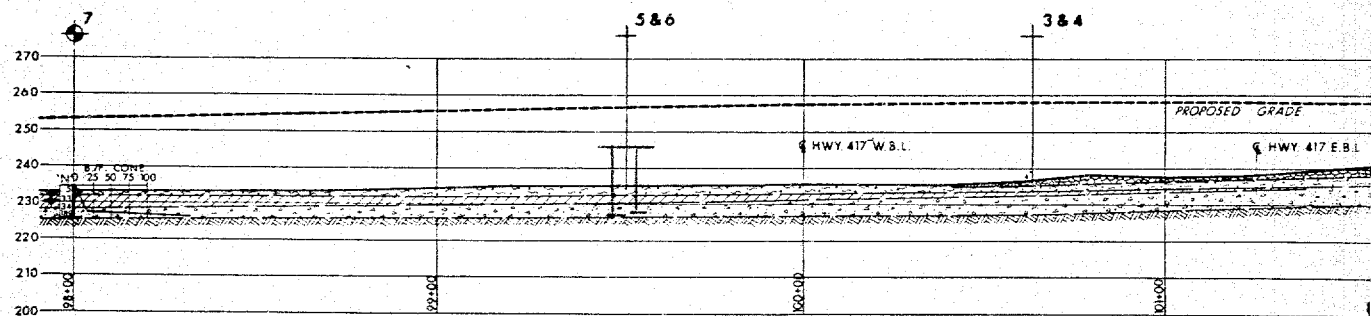
B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

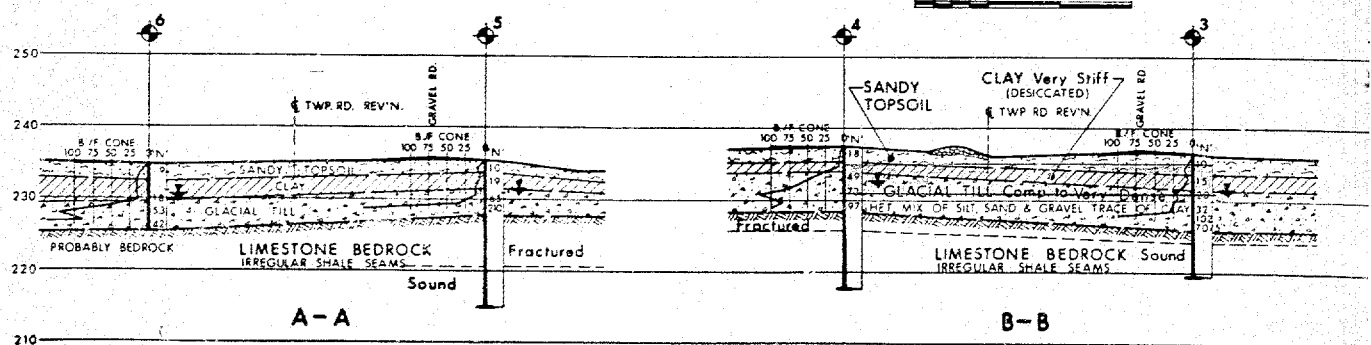
H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
β	ANGLE OF SLOPE TO HORIZONTAL



PLAN
SCALE
20 10 0 20 40 FT.

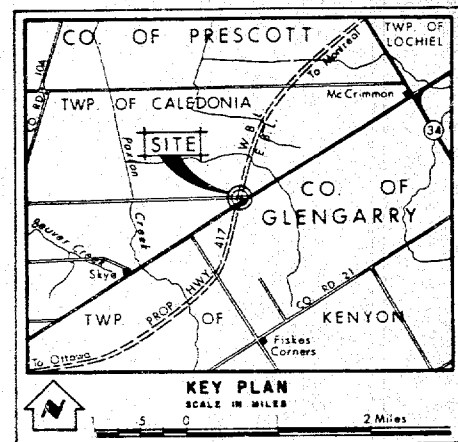
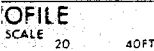
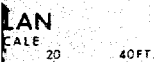






PROFILE
SCALE
20 10 0 20 40 FT.



SECTIONS
SCALE
10 5 0 10 20 FT.

WT. RECORD
FOR DATE



LEGEND			
	Bore Hole		
	Cone Penetration Hole		
	Bore & Cone Penetration Hole		
	Water Levels established at time of field investigation, July, 1970		
	Bore Holes 2 & 8 Dry		

- 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.

[illegible]

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE - FOUNDATION SECTION

TOWNSHIP ROAD

KING'S HIGHWAY NO. Prop 417 W.B.L. & E.B.L. DIST. NO. 9
CO. PRESCOTT

CO. PRESOTT
TWP. CALEDONIA LOT 3 CON. VIII & IX

BORE HOLE LOCATIONS & SOIL STRATA

DESIGNER F.P.	CHECKED <i>[initials]</i>	W.P. NO. 30-00-11	U.S.T. DRAWING NO. 70-11052A
DRAWN <i>[initials]</i>	CHECKED <i>[initials]</i>	JOB NO. 70-11052	
DATE Aug 5, 1970	SITE NO.	BRIDGE DRAWING NO.	
APPROVED <i>[signature]</i>	CONT NO.		

Department of Highways Ontario

Copy for the information of

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

Mr. T.C. Kingsland,
Reg. Bridge Planning Engineer,
Kingston Regional Office,
Kingston, Ontario

Bridge Office,
Downsview

September 29, 1970

Township Road Underpass
3.2 Miles East of County Road 21
W.P. 36-66-11, Site 27-218
Highway 417, District No. 9

70-110-52

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-6882-P for the above-mentioned structure.

The estimated cost of the proposed structure is \$150,000. This cost includes tender, materials, engineering and sundry construction.

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

CSG:rd

C.S. Grebski,
Bridge Design Engineer

Attach.

c.c. S. McCombie
A. Stermac (2)
J. Anderson
R. Forrest

21. Comments

M. Devata

5/11 Oct/70

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.

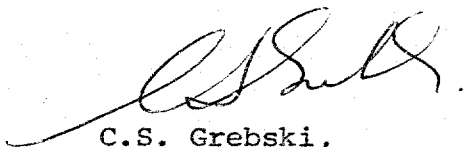
IN REPLY TO

SUBJECT: Township Rd. Underpass
3.2 Miles East of County Rd. 21
W.P. 36-66-11, Site No. 27-218
Highway 417, District No. 9

70-11-052

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

A. L. B. I

25 Feb 71
SK

No comments
J. M. Levata
19th Feb/71

SUMMARY OF PILE DRIVING RECORDS

W.O. 70-11052 W.P. 36-66-11 CONT. 72-196 DIST. 9

SITE UNDERPASS STRUCTURE AT THE CROSSING OF PROD. HWY# 417 & TWP. RD.

DATE DRIVEN AUG. 16-17/73 WEIGHT OF ANVIL 600 lb

HAMMER TYPE DELMAG D-12 WEIGHT 6700 lb ENERGY 26 800 FT/lb.

[illegible]

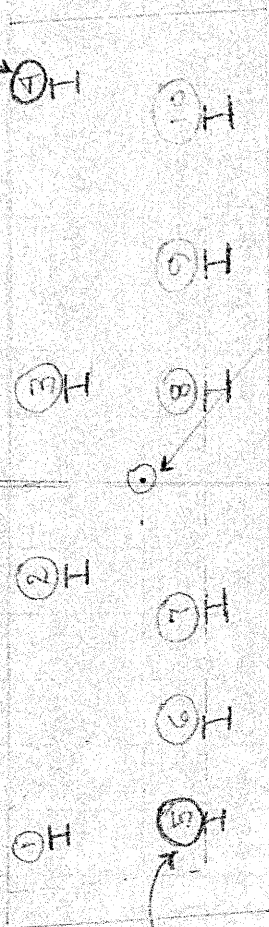
TOWN SHIP Pt Under Pass

WEST DEPARTMENT - FOOTING

70 - F - 52

N
→

TEST PILE



TEST PILE

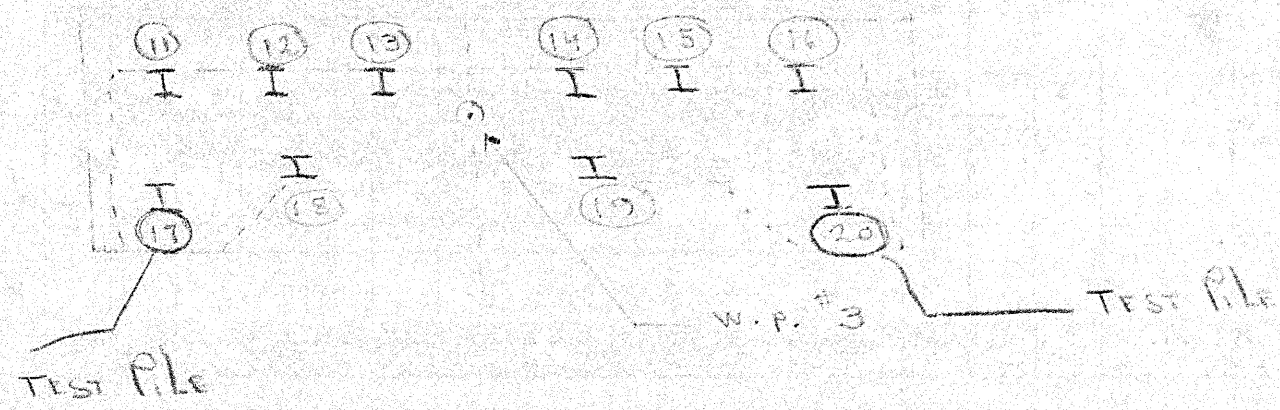
H.P. - 12 X 53

226-228

TEST PILE

70-F-52

100



4

>

MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-11052 SITE HWY 417 BOREHOLE No. 1 GROUND ELEVATION 238.7

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALTANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	0'-2'	1	angular	100			slight	Nil	quick		Earthy	Brown	Nil	firm	Topsoil with some gravel	
2	2'-4'	1/2"			85	15	slight	Nil	med		gray brown mottled	↓	↓		Glacial till, Sand, some clay, trace of gravel	
3	4'-5 1/2'	1/2"			70	30		slight	med		mottled brown	Nil			Glacial till; Sand, trace gravel, bond by clay	
4	5 1/2'-6 1/2'	3"													Chips of bedrock, bond by trace of glacial till	

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-11052 SITE Hwy 417 BOREHOLE No. 2 GROUND ELEVATION 239.3

SAMPLE NO.	DEPTH	GRAIN SIZE DISTRIBUTION			DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE										
				GRAVEL	SAND	SILT & CLAY								
1	0-2'				100		Nd	Nd	Quick	earthy brown			Sandy topsoil	
2	2'-4'	3"	angular	50	40	10			earthy trace of organics	mottled brown	inter.		Glacial Till, sand and boulder chips, trace of clay & trace of organics	
3	4'-6'	1"	"	20	75	5			earthy trace of organics	"	"		" fine of organics	
4	6'-8'	3"	"										Glacial Till,	

NOTES:- VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS -- ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT <u>76-11052</u>		SITE <u>HWY 417</u>		BOREHOLE No. <u>3</u>		GROUND ELEVATION <u>236.3</u>										
SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION			DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL		
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL											SAND	SILT & CLAY
1	0'-2'				100				Quick		earthy brown & black	Nil		Sandy topsoil - trace of silty clay		
2	2'-4'				20	80	mod	mod			light brown	Nil	Soft to stiff	Brown clay (silty clay) with some sand (partly desiccated)		
3	4'-6'				20	80					light brown dark brown grey			Brown-grey mottled clay with some sand (partly desiccated)		
4	6'-8'				20	80			Nil		earthy dull grey	↓	stiff	Dull grey desiccated clay		
5	8'-8'7"				30	70					earthy mottled grey-brown	↓		Grey silty clay with brown sand seams		
6	8'7"-9'1"	3"	angular	80	10	10						Inter		Bedrock chips bond by sand and clay (glacial till)		
7	10'-10'5"											Inter		Rock chips		

NOTES:- VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT <u>70-11052</u>		SITE <u> Hwy 417 </u>		BOREHOLE No. <u>4</u>		GROUND ELEVATION <u>237.6</u>											
SAMPLE NO.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UN-DRAINED C.S.R. STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL	
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE													
				GRAVEL	SAND	SILT & CLAY											
1	0-2'																
2	2'-28'	2 1/2"	angular	40	50	10											
3	3'-5'	2"	angular	40	55	5	low	med	mod		earth organic	mottled grey brown	med				
4	5'-7'									"							" with some decomposed gravel.
5	7'-9'	3"	angular	60	35	5				"							Glacial till, sand, gravel and chips from bedrock

NOTES:- VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT <u>70-11052</u>		SITE <u>Hwy 417</u>		BOREHOLE No. <u>5</u>		GROUND ELEVATION <u>235.5</u>									
SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION			DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL	
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE											
				GRAVEL	SAND	SILT & CLAY									
1	0'-2'				100					Dark grey	black	Med		Black topsoil with some roots	
2	2'-4'				30	70				dull grey and red	Med	firm to stiff	Grey and red clay (desiccated)		
3	4'-6'				90	70				dull grey		stiff	Grey desiccated clay with brown sand		
4	6'-7'	2"	angular	30	50	20				medium grey & black	slight		Glacial till; sand, gravel (boulder chips) bound by some clay		
5	73"-15'												bedrock (broken by bi-cane bit)		

NOTES:- VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-11052 SITE Hwy 417 BOREHOLE No. 6 GROUND ELEVATION 234.7

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINING	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	0-2				100						earthy	nil		brown sandy topsoil		
2	3-5				5	95							Stiff	grey silty clay		
3	5-7	1 1/2"	sub-rounded	40	50	10						grey brown mottled		Glacial till. sand, gravel (boulder chips), trace of clay		
4	7-9	2"		60	35	5						"		"		

NOTES:— VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-11052 SITE Hwy 417 BOREHOLE No. 7 GROUND ELEVATION 239.4

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION			DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE										
				GRAVEL SAND SILT & CLAY										
1	0-2'								organ				brown sandy topsoil organic	
2	3'-5'								↓				dark brown sand - base clay, st organic	
3	5'-7'								✓	11				
4	7'-8'3"	1"	org						organ	mottled grey brown			Some Glacial till, sand, gravel some clay chips from bedrock	

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-11052 SITE Hwy 417 BOREHOLE No. 8 GROUND ELEVATION 241.1

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	0-2'				100			Quick		earthy	brn	Nil		Sandy topsoil		
2	2-4'	2'	angular	25	55	20		Mid		earthy trace organics	mottled brown	Inter		Glacial till, sand band by clay and boulder chips (trace of organics)		
3	4-6'									11				less clay than ss #2		

NOTES:— VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:—

OVERSIZED DRAWINGS

Township Rd. underpass

General Layout

Footing Layout: reinforcement

70-1-11

W.O.

31-11-11

W.P.

WY. 417 & 412. 1A.

LOCATION

31-11-11

GEOCRES NO.

● DATA ON FILE IN SOIL MECHANICS SECTION

REFER TO:

Contract 725190

REMARKS

GEOCRES

INDEXING CARD FOR REPORTS NOT MICROFILMED

GI-20

AUG. 74

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 316-63

DIST. 9 REGION EASTERN

W.P. No. 36-66-11

CONT. No. 72-196

W. O. No. 70-P-62

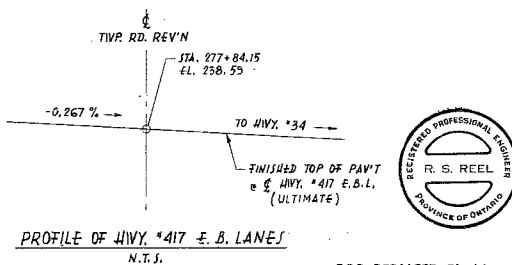
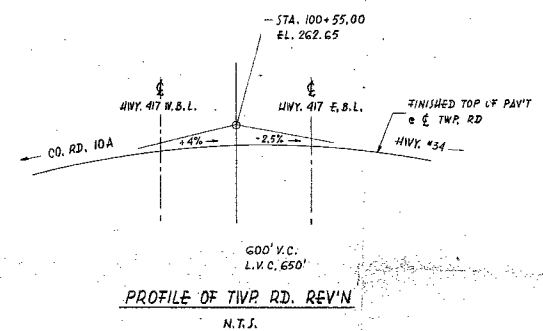
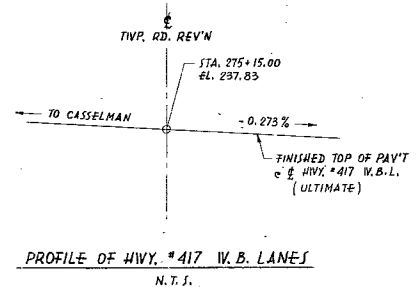
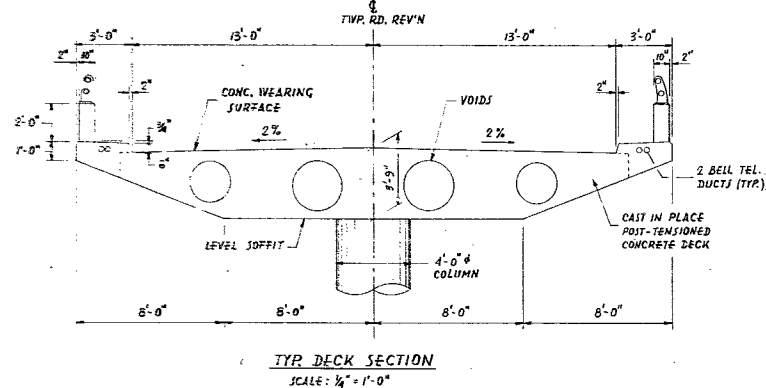
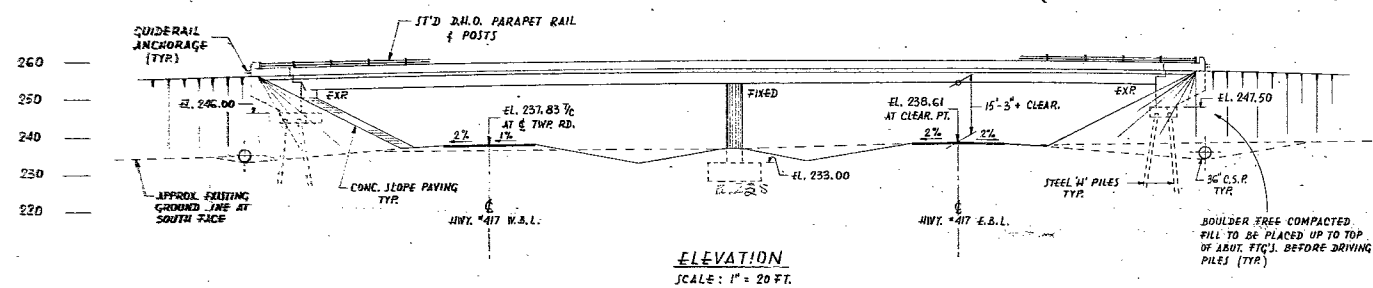
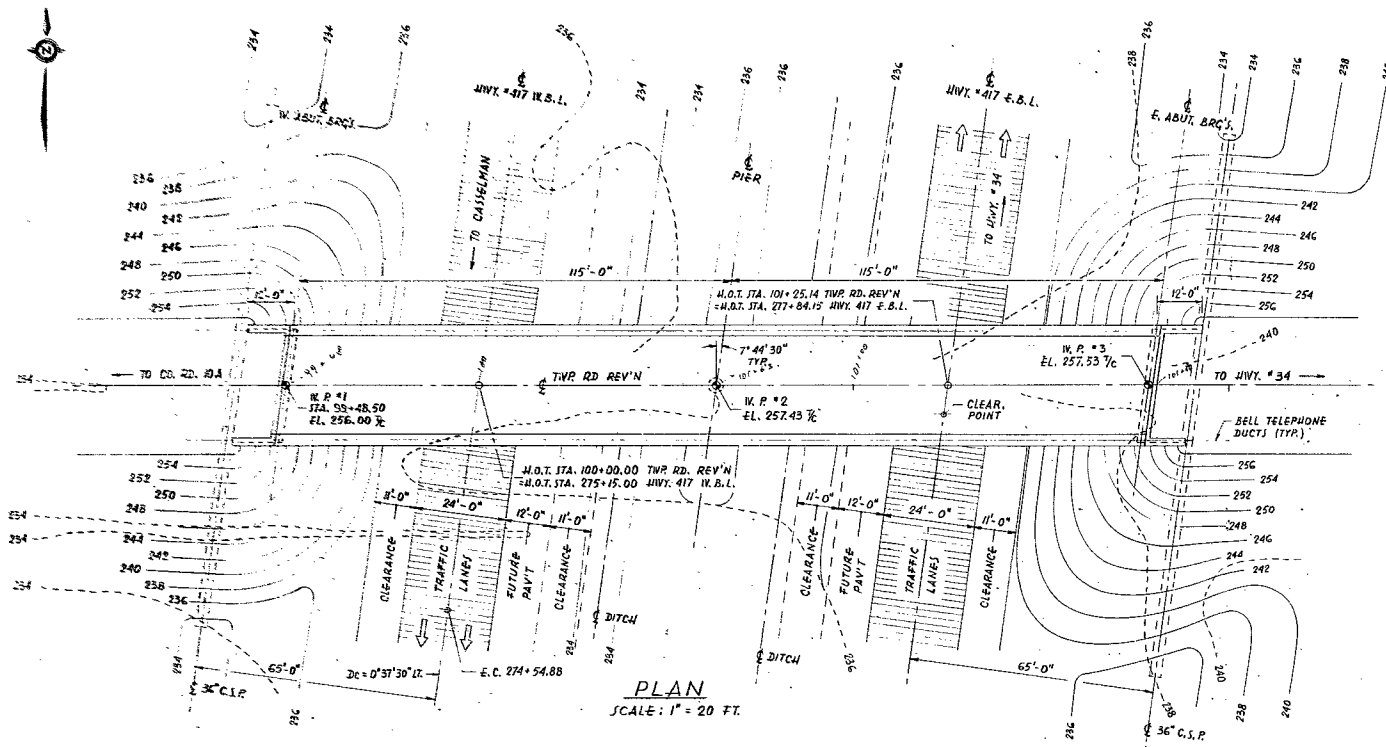
STR. SITE No. 27-218

HWY. No. 417

LOCATION HWY. 417 AND TWP.
ROAD

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 2

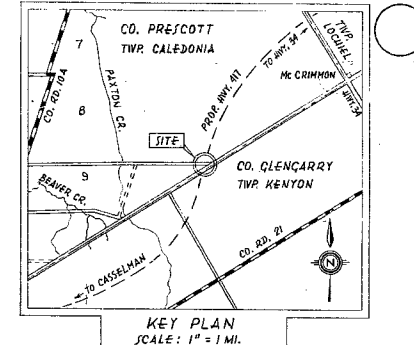
REMARKS: DOCUMENTS TO BE UNFOLDED
BEFORE MICROFILMED



SKEW DATA 7° 44' 30"
SIN. 0.1347068
COS. 0.9908855
TAN. 0.1359459
SEC. 1.0091983

NOTES:
• W.P. DENOTES WORKING POINT.
• 7/8" DENOTES TOP OF CONCRETE WEARING SURFACE.

- LIST OF DRAWINGS**
- D-6882-1 GENERAL LAYOUT
 - 2 BORE HOLE LOCATIONS & SOIL STRATA
 - 3 FOOTING LAYOUT & REINFORCEMENT
 - 4 ABUTMENTS & BEARINGS
 - 5 DECK DETAILS
 - 6 CABLE DETAILS
 - 7 DECK REINFORCEMENT
 - 8 PARAPET WALL DETAILS
 - 9 STANDARD STEEL PARAPET RAIL
 - 10 DETAILS OF CONC. SLOPE PAVING
 - 11 STANDARD DETAILS I
 - 12 STANDARD DETAILS II



REFERENCE BENCH MARK
B. M. ELEV. 241.21
GEODETIC DATUM
N. & W. IN ROOT OF 1-8' ELM 234.0
RT 274+31 W.B.L.

NOTES:
CLASS OF CONCRETE
DECK, CURBS, PARAPET WALLS & COLUMN — 5000 P.S.I.
REMAINDER — 3000 P.S.I.
CLEAR COVER ON REINF.
FOOTINGS & ABUTMENTS — 3"
COLUMN — 2"
PARAPET WALLS — 1 1/2"
DECK TOP & CURBS — 2"
DECK BOTTOM — 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 DECK HAS BEEN STRESSED AND CROUTED.

REVISIONS	DATE	BY	DESCRIPTION

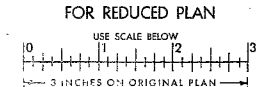
DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE OFFICE

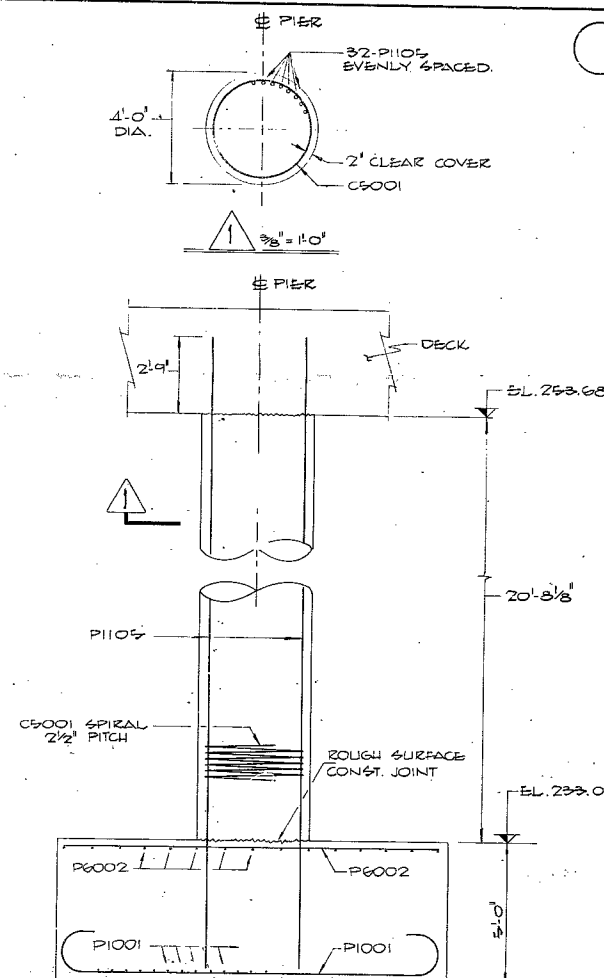
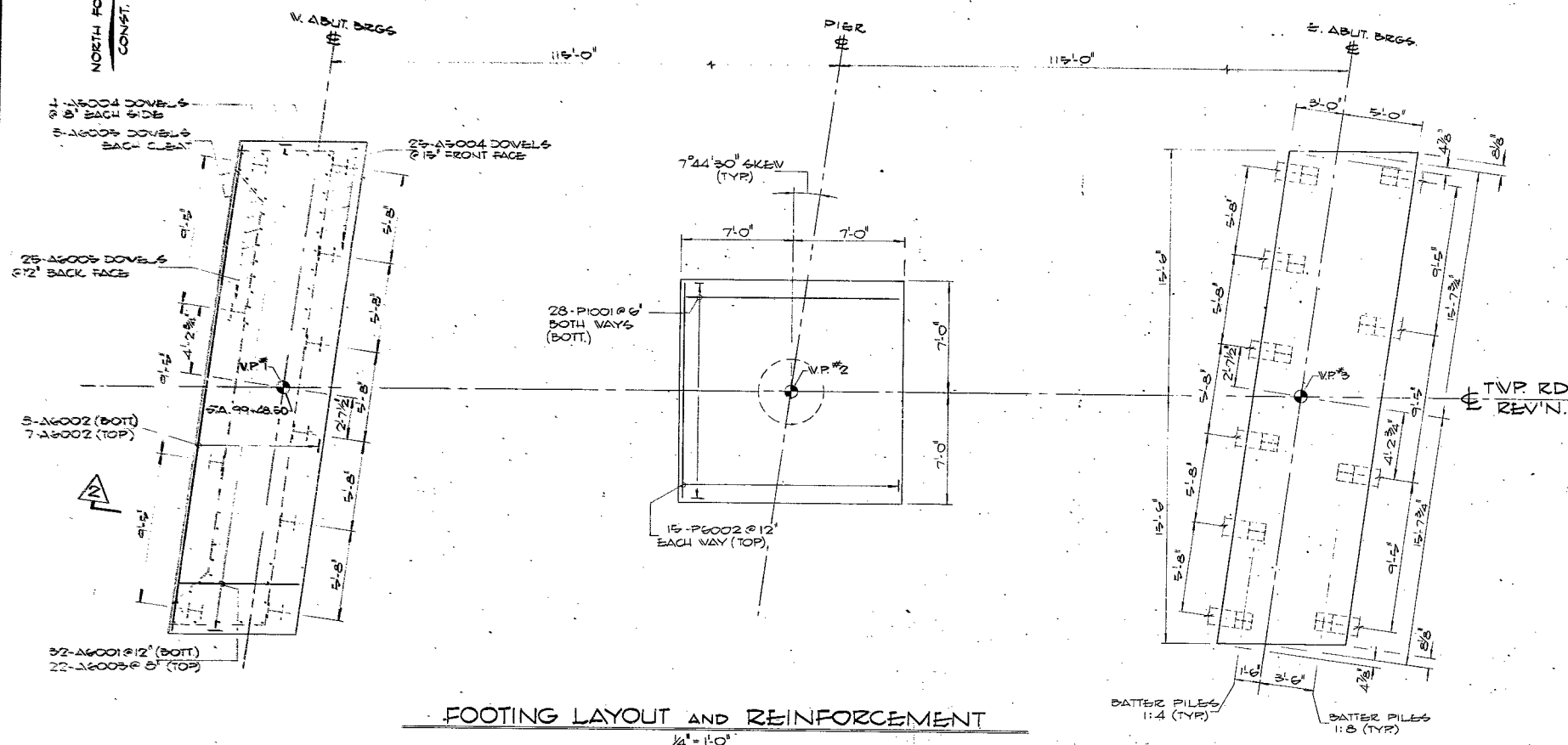
TOWNSHIP RD. UNDERPASS
3.2 MILES EAST OF COUNTY RD. 21

KING'S HIGHWAY No. 417 DIST. No. 9
CO. PRESCOTT
TWP. CALEDONIA LOT 3 CON. VIII & IX

GENERAL LAYOUT
SITE No. 27-218 W.P. No. 36-66-11

DESIGN	R.S.R.	CHECK	R.S.R.	CONTRACT	No.
DRAWING	R.K.	CHECK	R.S.R.	DRAWING	No.
DATE	FEB. 1971	LOADING	4520-44	D-6882-1	





NOTES:

- SPACING OF PILES TO BE MEASURED AT UNDERSIDE OF FOOTING.
- PILES TO BE DRIVEN TO BEDROCK.
- DIMENSIONS, REINF. & PILE LAYOUT SIMILAR FOR BOTH ABUTMENT FOOTINGS, EXCEPT AS SHOWN.

ELEV. OF PIER
3/8" = 1'-0"

31-11-05
GERRARD NO. 105

REVISIONS	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE OFFICE

71-11-052

TOWNSHIP RD. UNDERPASS

3.2 MILES EAST OF COUNTY RD. 21

KING'S HIGHWAY No. 417

DIST. No. 9

CD. PRESCOTT

TWP. CALEDONIA

LOT 3

CON. VII: 1X

FOOTING LAYOUT & REINFORCEMENT

APPROVED	BRIDGE ENGINEER	CONTRACT	NO.
DESIGN	R.S.R.	CHECK	27-218
DRAWING	G.T.	CHECK	36-6611
DATE	FEB. 71	LOADING	11/20/44
			D-6882-3

PILES SUPPLIED				
LOCATION	BATTER	NUMBER	TYPE	LENGTH
WEST ABUT.	1:4	6	12 BP 53	24'-0"
	1:8	4	12 BP 53	24'-0"
EAST ABUT.	1:4	6	12 BP 53	18'-0"
	1:8	4	12 BP 53	18'-0"

DESIGN LOAD = 70 TONS/PILE

FOR REDUCED PLAN
USE SCALE BELOW
10 1 2 3
3 INCHES ON ORIGINAL PLAN



PRINT RECORD	No.	FOR	DATE

