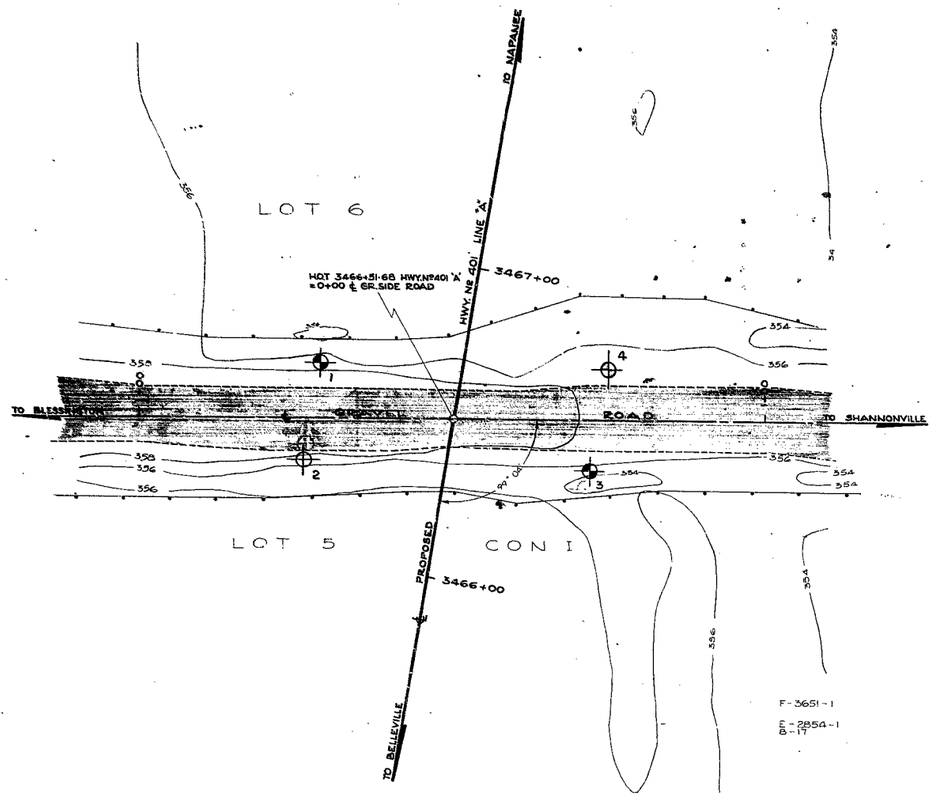
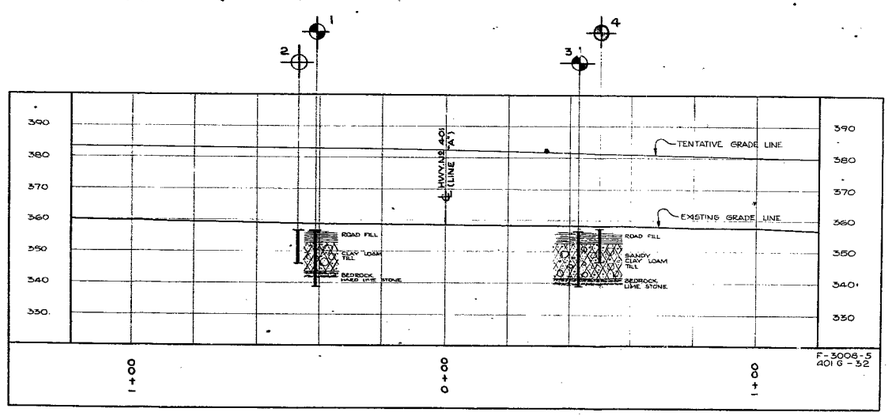
57-F-43
W.P. # 46-57
Hwy. # 401 &
Gravel Rd.
Con. # 1
1.75 miles N. of
Shannonville



PLAN SCALE 1 IN = 20 FT



PROFILE SCALE HOR 1 IN = 20 FT VER 1 IN = 20 FT

LEGEND

BORE HOLE

PENETRATION HOLE

BORE & PENETRATION HOLE

HOLE NO.	ELEVATION	STATION	DISTANCE FROM ℄
1	356·5'	3466+62'	45' LT.
2	356·5'	3466+30'	45' LT.
3	356·5'	3466+42'	45' RT.
4	357·0'	3466+75'	45' RT.

— NOTE —

THE BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN ESTABLISHED ONLY AT BORE HOLE LOCATIONS. BETWEEN BORE HOLES THE BOUNDARIES ARE ASSUMED FROM GEOLOGICAL EVIDENCE AND MAY BE SUBJECT TO CONSIDERABLE ERROR.

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH SECTION - DOWNSVIEW

SHANNONVILLE SIDE ROAD PROPOSED CROSSING 1.75 MILES N. OF SHANNONVILLE

SHOWING POSITION & ELEVATION OF HOLES

HWY. NO. 401	W.P. 46-57	DIV. NO.
CO. HASTINGS		
TWP. TYENDINAGA	LOT. 5 & 6	CON. I

SCALE AS SHOWN	SUBMITTED BY	DATE 3 JAN. 1958
DRAWN BY R.E.F.	APPROVED BY	DRAWING NO F-57-43A

cc: Foundation Section

Mr. A. Toye,

Bridge Engineer.

Materials & Research Section.

February 5, 1958.

Re: Hwy. #401 and Gravel Road between Lots 5 & 6, Twp. of Tyendinaga.
W.P. 46-57 W.J. F 57-43

We are forwarding herewith two copies of the above mentioned Foundation Report. This project appeared on the original schedule which has since been superseded. As we have completed the field work, this report is being submitted for your future use.

The subsoil consists primarily of a fairly dense till over bedrock, and spread footing foundations will be satisfactory.

F. C. Brownridge,
MATERIALS & RESEARCH ENGR.
Per:
A. Rutka
(A. Rutka,
Principal Soils Engineer)

AR/MMcF
Attach.

cc: Messrs. A. Toye
C. Trzgaskes
D. G. Ramsay
L. E. Walker
A. Watt
P. Narrow

Foundation Section

File

FOUNDATION REPORT

on

New bridge at Highway 401 and gravel road crossing
(between Lots 5 & 6 in Concession I, 1.75 miles north
of Shannonville, Township of Tyendinaga.

Plan No. F-3651-1
Station No. 3466/52

Distribution:

Mr. A. Toye Bridge Engineer	(2)
Mr. H. Tregaskes Construction Engineer	(1)
Mr. D. G. Ramsay Design Engineer	(1)
Mr. L. E. Walker Dist.Eng. Kingston	(1)
Mr. A. Watt Water Resources Commission	(1)
Mr. P. Harrow Dept. of Mines	(1)
Foundation Section	)1(
FILE	(1)

W.P. 46-57
W.O. F-57-43

INTRODUCTION:

A subsoil investigation was carried out to determine the bearing values of layers for supporting the foundations of the proposed structure.

The location is about 1.75 miles north of Shannonville where the new highway No. 401 crosses the gravel road between lots 5 & 6 (Con. I) in Township of Tyendinaga, (Station 3466+52, profile No. F-3008-5).

The work started on Oct. 29, 1957, and was completed on Nov. 4, 1957.

PROCEDURE:

The subsoil explorations were carried out by means of a skidmounted coredrill machine. In the course of investigations two boreholes with dynamic cone penetration tests and two separate dynamic cone penetration tests were made.

The locations of the boreholes are shown on drawing F-57-43A, and their elevations on log sheets under Appendix I.

SUBSOIL FINDINGS AND ANALYSIS:

The site is till plain overlying a limestone plain. At neighbouring areas some of the till layer has been stripped and bedrock exposed. At this particular site the till layer was found to be quite shallow.

The explorations revealed the following subsoil condition. From the ground level down to elevation 352.5 ft. the soil was fill material underlying this fill material was a layer of gravelly sandy clay till which extended from elevation 352.5 ft. down to elevations 343.3 ft. and 341.7 ft. (boreholes No. 1 and 3), where the bedrock was encountered. The layer is fairly uniform sandy clay loam till. The samples extracted were tested in the laboratory. From the test results the soil matrix is about 36% clay and silt, 32% sand combined with 32% of gravel. The liquid limit is about 14.5 %, plastic limit 10.5% and moisture content about 7.5%, and density of 140 p.c.f.

SUBSOIL FINDINGS AND ANALYSIS (Cont'd.)

No reliable unconfined compression tests could be performed. The standard penetration tests made during sampling registered about 45 blows per foot penetration.

The bedrock was drilled and core samples extracted. From these samples the bedrock proved to be limestone.

CONCLUSIONS AND RECOMMENDATIONS

From the above discussion it will follow that:

1. The site is located in an area which is identified by limestone plain overlain by mostly shallow till layer. In many places in the area the limestone layer is actually exposed.

2. The proposed structure could be supported on spread footings placed at elevation about 350 ft. Here the layer can provide a bearing value of 2 T.s.f. For higher bearing values the footings should be placed below this elevation i.e. 2.5 T.s.f. at elevation 348 ft. and some 10 - 15 T.s.f. at bedrock elevation ± 341.7 ft.

3. The approach fills to the structure do not present any stability problem.

V. Korlu

Foundation Engineer

APPENDIX I

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

3466+62 (45' LT.)

DRILL RIG 54-1 OPERATION BORE & PENET'N JOB F-57-43 W.P. 46-57 BORING 1 STA.

CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT DEC. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 19.5" INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 29 OCT. 1957

ABBREVIATIONS

V - INSITU VANE SHEAR TEST; Q - TRIAXIAL QUICK; K - PERMIABILITY; M - MECHANICAL ANALYSIS; S - TRIAXIAL SLOW; C - CONSOLIDATION; U - UNCONFINED COMPRESSION; W.L. - WATER LEVEL IN CASING; CA. - CASING; Q_c - TRIAXIAL CONSOLIDATED QUICK; W.T. - WATER TABLE IN SOIL; γ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK; D.O. - DRIVE OPEN; D.F. - DRIVE FOOT VALVE; T.O. - THIN WALLED OPEN; S.S. - SLEEVE SAMPLE; P.S. - PISTON SAMPLE; W.S. - WASHED SAMPLE; R.C. - ROCK CORE

SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE: ELEVATION / DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT
356.5'		GROUND LEVEL	
1.5 / 352.5' / 4.0'	W.L.	ROAD FILL	
6.5	W.L. @ 352.5'	CLAY LOAM TILL	
11.5 / 343.3' / 13.2'		BEDROCK HARD LIMESTONE,	
16.5 / 338.5' / 18.0'		END OF BOREHOLE	
21.5			

ELEVATION SCALE: 355, 350, 345, 340, 335

SHEAR STRENGTH IN LBS. PER SQ. FT. * — * : 1000, 2000, 3000, 4000

WATER CONTENT W % — 0 - NAT. □ - P.W. △ - L.W. : 10, 20, 30, 40

PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)

D. CONE. PEN. X------X------X STAND. PEN. •——•——• : 50, 100, 150, 200

REFUSAL AT ELEV. 346.5' HAMMER BOUNCING

BX CASING SHOE

CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
						356.5
13						1.5
23						
12						
11						
24						
32						350.5
15	γ-139.7 p.c.f.		T.O.	1	45	79
27						6.5
51						
216			R.C.			
						11.5
						343.3
			AX T. R.C.	2		100
						16.5

TL-129 (REV. 56) H.D.R.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

3466+30 (45' LT.)

DRILL RIG 54-1 OPERATION PENETRATION JOB F-57-43 W.P. 46-57 BORING 2 STA.

CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT DEC. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 19.5 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 31 OCT. 1957

ABBREVIATIONS

V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Q_c - TRIAXIAL CONSOLIDATED QUICK
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
C - CONSOLIDATION
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL
K - PERMIABILITY
CA - CASING
γ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK
D.O. - DRIVE OPEN
D.F. - DRIVE FOOT VALVE
T.O. - THIN WALLED OPEN
S.S. - SLEEVE SAMPLE
P.S. - PISTON SAMPLE
W.S. - WASHED SAMPLE
R.C. - ROCK CORE

SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE						SAMPLES					
ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	WATER CONTENT W% — O - NAT. □ - P.W. Δ - L.W. PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW) D. CONE PEN. X------X------X STAND. PEN. ●——●——● (50, 100, 150, 200)	CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
356.5'		GROUND LEVEL									
1.5				355							
6.5				350							
10.5				345	REFUSAL AT ELEV. 346.1' HAMMER BOUNCING.						

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

3466+42 (45' RT)

DRILL RIG 54-1 OPERATION BORE & PENET'N JOB F-57-43 W.P. 46-57 BORING 3 STA.

CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT DEC. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 19.5 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 31 OCT. 1957

ABBREVIATIONS

V - INSITU VANE SHEAR TEST; M - MECHANICAL ANALYSIS; U - UNCONFINED COMPRESSION; Q_c TRIAXIAL CONSOLIDATED QUICK; Q - TRIAXIAL QUICK; S - TRIAXIAL SLOW; W.L. - WATER LEVEL IN CASING; W.T. - WATER TABLE IN SOIL; K - PERMIABILITY; C - CONSOLIDATION; CA. - CASING; γ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK; D.O. - DRIVE OPEN; D.F. - DRIVE FOOT VALVE; T.O. - THIN WALLED OPEN; S.S. - SLEEVE SAMPLE; P.S. - PISTON SAMPLE; W.S. - WASHED SAMPLE; R.C. - ROCK CORE

SAMPLE CONDITION

D - DISTURBED; F - FAIR; G - GOOD; L - LOST

SHEAR STRENGTH IN LBS. PER SQ. FT. 1000 2000 3000 4000

WATER CONTENT W % 10 20 30 40 — O - NAT. □ - P.W. Δ - L.W.

PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)

D. CONE PEN. X---X---X 50 100 STAND. PEN. •—•—• 150 200

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
356.5'		GROUND LEVEL									356.5'
1.5		ROAD FILL		355	41 106 16 11 40						1.5
352.5' 4.0'	W.L.										351.5'
6.5	W.L. @ 352.5'	SANDY CLAY LOAM TILL		350	21 47	γ-149.0 p.c.f.		S.S.	1	29	100 6.5
					118						348.5'
					103	γ-139.0 p.c.f.		S.S.	2	47	100
11.5				345	232 1.50						11.5
341.7' 14.8'		BEDROCK LIME STONE			BX CASING S.HOE						341.7'
16.5				340				RC	3		100 16.5
338.8 17.7'		END OF BOREHOLE									
21.5				335							21.5

REFUSAL AT ELEV. 347.5' HAMMER BOUNCING.

TL-129 (REV. 56) H.D.R.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

3466+75 (45' RT.)

DRILL RIG 54-1 OPERATION PENETRATION JOB F-57-43 W.P. 46-57 BORING 4 STA. ———

CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT DEC 1957

SAMPLER HAMMER WT. 250 LBS. DROP 19.5" INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 31 OCT. 1957

ABBREVIATIONS

V - INSITU VANE SHEAR TEST; Q - TRIAXIAL QUICK; K - PERMIABILITY; M - MECHANICAL ANALYSIS; S - TRIAXIAL SLOW; C - CONSOLIDATION; U - UNCONFINED COMPRESSION; W.L - WATER LEVEL IN CASING; CA. - CASING; Q_C - TRIAXIAL CONSOLIDATED QUICK; W.T. - WATER TABLE IN SOIL; γ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK; D.O. - DRIVE OPEN; D.F. - DRIVE FOOT VALVE; T.O. - THIN WALLED OPEN; S.S. - SLEEVE SAMPLE; P.S. - PISTON SAMPLE; W.S. - WASHED SAMPLE; R.C. - ROCK CORE

SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE						SAMPLES					
ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE	WATER CONTENT W % ——— O - NAT. □ - P.W. Δ - L.W. PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW) D. CONE PEN. X-------X-------X STAND. PEN. •———•———• (50, 100, 150, 200)	CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
357'		GROUND LEVEL									
2				355							
7				350							
12				345							

REFUSAL AT ELEV. 347.7'
HAMMER BOUNCING.