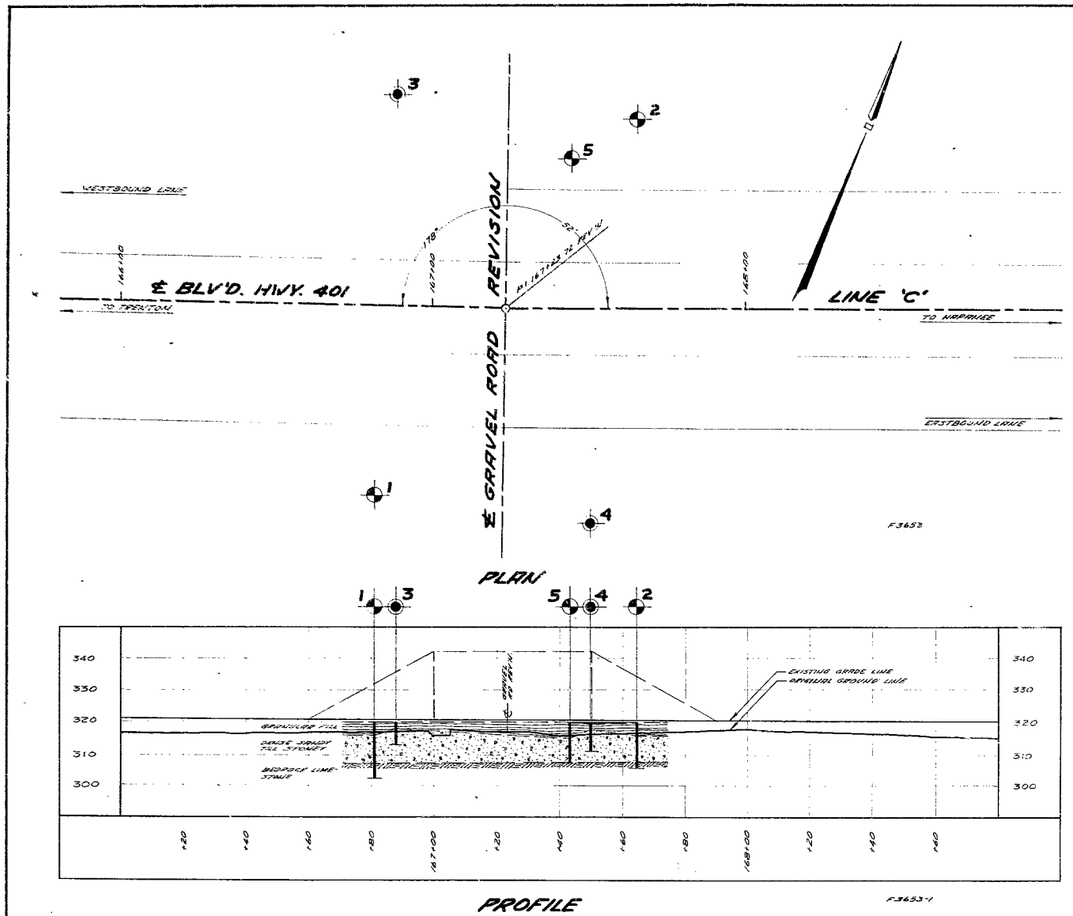
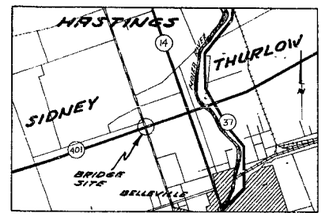
59-F-49
W.P. # 68-59
Hwy. # 401
CROSSING
REV. GRAVEL RD.
BELLEVILLE





KEY PLAN
SCALE 1 IN = 1 MI

LEGEND

CORE HOLE

POWER AUGER HOLE

BORE & PENETRATION HOLE

HOLE NO	ELEVATION	STATION	DISTANCE FROM ℄
1	320.0	166+82	60' RT.
2	320.0	167+65	60' LT.
3	320.0	166+88	67' LT
4	320.0	167+50	68' RT
5	320.0	167+49	48' 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 & RESEARCH SECTION

GRAVEL ROAD PROPOSED CROSSING

SHOWING POSITIONS & ELEVATIONS OF HOLES

HWY. 401 LINE 'C' DISTRICT 8 COUNTY HASTINGS
TOWNSHIP SIDNEY & THURLOW ... LOT 38 & 1 CON II
LOCATION AT BELLEVILLE

DRAWN BY: T. MELLOPS	CHECKED BY:	W.P. 48-59
DATE 26 JAN. 60	APPROVED BY:	DRAWING NO. F59-49A
SCALE 1 IN = 20 FT.		

cc: Mr. A. M. Toye (2nd copy)

Mr. A. M. Toye,
Bridge Engineer.
Materials & Research Section.

February 5, 1960.
D.H.O. FOUNDATION INVESTIGATION
W.P. 68-59 -- W.J. F 59-49.

Attention: Mr. S. McCombie.

Re: Existing Hwy. 401 & Revised Gravel Road Crossing at Belleville.

We have completed a subsoil investigation at the above noted structure location where existing Hwy. 401 underpasses the gravel road revision at Belleville. Presented herein are the borehole logs as well as the location plan and subsoil profile as defined by the 5 borings shown in the accompanying Drawing No. F-59-49A.

Subsoil at the site consists of a layer of granular fill material, 2 ft. to 4 ft. in thickness, overlying a 8 ft. to 9 ft. thick stratum of dense sandy till with stones, underlain by limestone bedrock. The sandy till contains predominantly medium to coarse sand with gravel and stones of various sizes. It exists in a dense state of packing and has an average penetration resistance of 50 throughout the stratum. Bedrock is composed of limestone of the Trenton Series, is of sound quality and shows no sign of weathering or fracture. Ground water table was encountered at approx. Elev. 313' (approx. 7 ft. below existing ground surface) during the boring period.

Simple spread footings founded in the dense clay till are recommended. In view of the dense nature of the till, footings need only be placed at sufficient depth below the existing ground surface for protection against frost penetration. The recommended

cont'd. /2 ...

footing placement elevation is at 313' or below. For footings typically 7' to 10' in width, a safe allowable bearing pressure of 2 1/2 t.s.f. can be used for design. Settlement, consequent upon application of this bearing pressure will be of the order of one inch. If a bearing pressure greater than 2 1/2 t.s.f. is desired for design, footings can be placed directly on the bedrock surface at approximately Elev. 307' (approx. 13 ft. below existing ground surface). To place footings on the bedrock surface will involve excavations through approx. 13 ft. of granular material. It appears that placing footings on the bedrock surface will necessitate shoring as well as sump pumping operations during footing excavations.

If footings are founded at the recommended placement elevation of 313' or slightly below, even if ground water seepage does occur during footing excavations, seepage will be local and of minor quantities, only.

The proposed grade line of the gravel road revision does not present any approach fill stability problem.

If we can be of further assistance in the foundation design of this structure, please contact our office.

AKL/MdeF
Encls.

cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
D. G. Ramsay
H. J. Ford
T. A. Sharpe
J. E. Gruspier
A. Watt
Foundation Office
Gen. Files.

L. G. Soderman,
PRINCIPAL SOILS & FOUNDATIONS ENGR.
per:

AK Loh

(A. K. Loh,
FOUNDATION PROJECT ENGR.)

APPENDIX I.

FORM OB—ML—222
FEB 59
1M-58-5569

SUMMARY OF FIELD & LABORATORY TESTS

JOB F59-49
W.P. 68-59

HOLE NO	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS FT	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
1	RC	13'-18'	Bedrock - limestone	-	-	-	-	-	-	
2	RC	12.2'-14.2'	Bedrock - limestone	-	-	-	-	-	-	
3										(Auger holes
4										(
5	S1	5.5-7'	Dense sandy till, stoney.	750	-	-	-	-	-	
	S2	7'-9'	"	50	-	-	-	-	-	
	S3	9'-11'	"	37	-	-	-	-	-	
	S4	11'-12'	"	>100	-	-	-	-	-	

S denotes split spoon sample
RC denotes Rock core.

FORM OB-MIL-126 (REV. 1959.)—58-5691

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS AND RESEARCH SECTION

W.P. 68-59 BORE HOLE NO. 1

JOB F59-49 STATION See drawing

DATUM Elev. 320.0' COMPILED BY B.K.

BORING DATE May 8/59 CHECKED BY I.J.L. & A.L.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) ○
VANE TEST (C) AND SENSITIVITY (S) +
NATURAL MOISTURE AND LIQUIDITY INDEX LI ×
LIQUID LIMIT —o—
PLASTIC LIMIT —|—

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET
	↓ Ground level	320.0	0
	Granular fill	316.0	
	Dense sandy till, stoney.		10
		307.0	
	Bedrock Limestone	302.0	20
	Penetration resistance profile shown; obtained by driving a 2" dia cone from ground surface to depth noted with an energy of 350 ft. lb. per blow.		30
			40

STRENGTH AND PENETRATION RESISTANCE P.S.F.

50 100 150 200 BLOWS/FT.

Refusal at Elev. 307.0'

CONSISTENCY

MOIST. CONTENT - % DRY WT.

SAMPLE: R.C.

NATURAL UNIT WT. P.C.F.: -

FORM OB-ML-126 (REV. 1959.)—58-5691

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS AND RESEARCH SECTION

W.P. 68-59 BORE HOLE NO. 2

JOB F59-49 STATION See drawing

DATUM Elev. 320.0' COMPILED BY B.K.

BORING DATE May 8/59 CHECKED BY I.J.J. & A.L.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu)
VANE TEST (C) AND SENSITIVITY (S)
NATURAL MOISTURE AND LIQUIDITY INDEX
LIQUID LIMIT
PLASTIC LIMIT

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET
	↓Ground level	320.0	0
	Granular fill	316.0	
	Dense sandy till, stoney.	308.0	10
	Bedrock limestone	306.0	
	End of borehole		20
	Penetration resistance profile shown, obtained by driving a 2" dia. cone from ground level to depth noted with an energy of 350 ft. lb. per blow.		30
			40

STRENGTH AND PENETRATION RESISTANCE P.S.F.

50 100 150 200 BLOWS/FT.

Refusal at Elev. 308.0'

CONSISTENCY

MOIST. CONTENT - % DRY WT.

SAMPLE: RC

NATURAL UNIT WT. P.C.F.: -

FORM CS-M-420 (REV. 1959.) 58-5077

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS AND RESEARCH SECTION

W.P. 68-59 BORE HOLE NO. 3

JOB F59-49 STATION See drawing

DATUM Elev. 320.0' COMPILED BY B.K.

BORING DATE May 8/60 CHECKED BY A.L.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) O
VANE TEST (C) AND SENSITIVITY (S) +S
NATURAL MOISTURE AND LIQUIDITY INDEX LI X
LIQUID LIMIT
PLASTIC LIMIT

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET
	↓ Ground level	320.0	0
	Granular fill	318.0	
	Sandy till, stoney	313.0	
	End of Augerhole-refusal		

STRENGTH AND PENETRATION RESISTANCE
P.S.F.
BLOWS/FT.

0 10 20 30 40

CONSISTENCY
MOIST. CONTENT - % DRY WT.

SAMPLE

NATURAL UNIT WT. P.C.F.

FORM OB-ML-126 (REV. 1959.)—58-5691

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS AND RESEARCH SECTION

W.P. 68-59 BORE HOLE NO. 4

JOB F59-49 STATION See drawing

DATUM Elev. 320.0' COMPILED BY B.K.

BORING DATE May /60 CHECKED BY A.L.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu)
VANE TEST (C) AND SENSITIVITY (S)
NATURAL MOISTURE AND LIQUIDITY INDEX
LIQUID LIMIT
PLASTIC LIMIT

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET
	↓ Groundlevel	320.0	
	Topsoil	318.5	
	Granular fill	318.0	
	Sandy till, stoney.		
		311.0	
	End of Augerhole- Refusal		

STRENGTH AND PENETRATION RESISTANCE
P.S.F.
BLOWS/FT.
0
10
20
30
40

CONSISTENCY
MOIST. CONTENT - % DRY WT.

SAMPLE

NATURAL UNIT WT. P.C.F

FORM OB-ML-126 (REV. 1959.)—58-5691

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS AND RESEARCH SECTION

W.P. 68-59 BORE HOLE NO. 5

JOB F59-49 STATION See drawing

DATUM Elev. 320' COMPILED BY B.K.

BORING DATE Jan. 18/60 CHECKED BY A.L.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) O
VANE TEST (C) AND SENSITIVITY (S) +S
NATURAL MOISTURE AND LIQUIDITY INDEX LI X
LIQUID LIMIT
PLASTIC LIMIT

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET
	↓ Ground level	320.0	0
	Granular fill	315.0	
	W.L. ▽ Dense sandy till, stoney.	313.0	10
		307.5	
	Bedrock		
	End of hole		
	Penetration resistance profile shown obtained by driving a 2" dia. cone from ground level to depth noted with an energy of 350 ft. lb. per blow.		

STRENGTH AND PENETRATION RESISTANCE P.S.F.

BLOWS/FT. 50 100 150 200

0 10 20 30 40

Penetration ends at elev. 307.5'

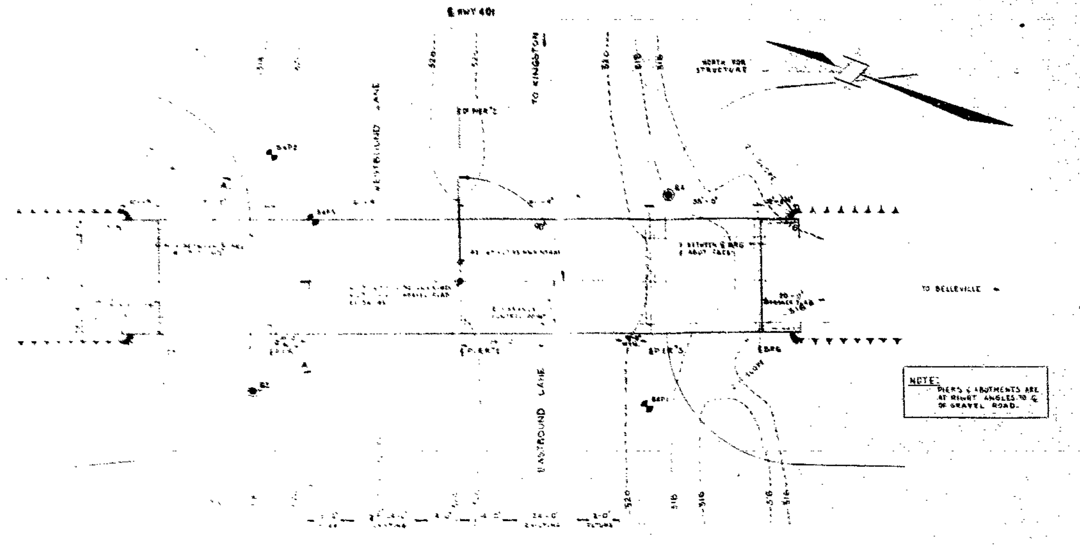
CONSISTENCY

MOIST. CONTENT - % DRY WT.

SAMPLE

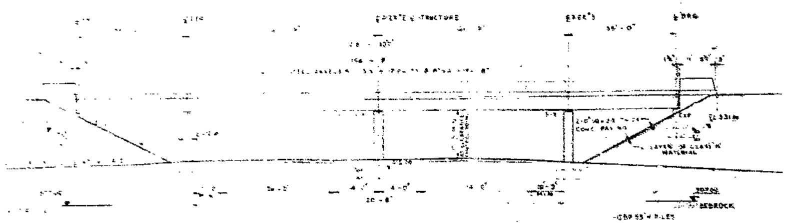
S1
S2
S3
S4

NATURAL UNIT WT. P.C.F.

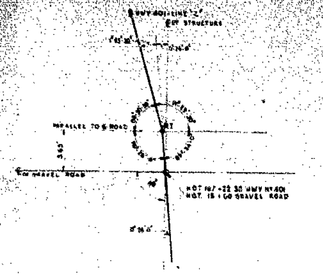


NOTE:
PIERS & ABUTMENTS ARE AT RIGHT ANGLES TO ℄ OF GRAVEL ROAD.

PLAN

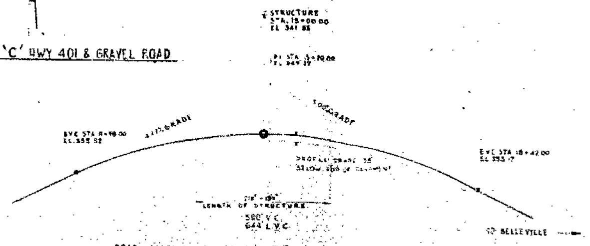


ELEVATION



INTERSECTION OF LINE 'C' HWY 401 & GRAVEL ROAD

GEODETIC DATUM
CUT CROSS ON S.E. CORNER OF CONCRETE CULVERT OF ℄ RD. OF STA. 186+05. B.M. EL. 318.71



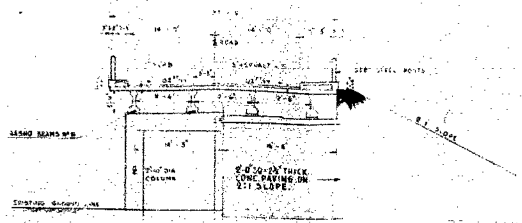
ROAD ALLOWANCE BETWEEN THE TWPS. OF SIDNEY & THURLOW

TOP OF PAVEMENT ELEVATIONS

PROPOSED PROFILE OF SIDNEY STREET

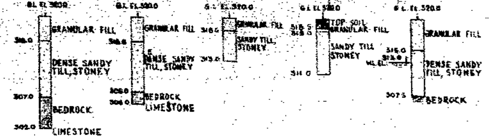
NOT TO SCALE

NOTE: ALL ELEVATIONS ON PROFILE DWG. F 3653-1 ARE TO BE LOWERED 1.00

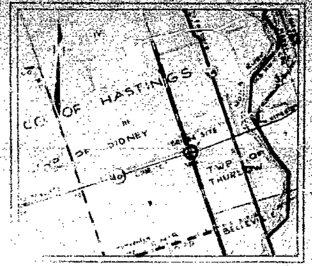


SECTION A-A

SCALE 1" TO 10'0"



BORE HOLE DATA



KEY PLAN

NOTES:

[illegible]

STRENGTH AT 28 DAYS: BEAMS 5000 P.S.I.; ELSEWHERE 3000 P.S.I.

[illegible]

W.P. 68-59

DEPARTMENT OF HIGHWAYS:-ONTARIO-

BRIDGE OFFICE: - TORONTO

SIDNEY STREET BRIDGE

0.7 MILES WEST OF HWY. 14

THE KING'S HIGHWAY NO. 401 — DIST. NO. [illegible]

CO. HASTINGS

TWP. SIDNEY & THURLOW — LOT [illegible] — CON. [illegible]

PRELIMINARY GENERAL PLAN

APPROVED

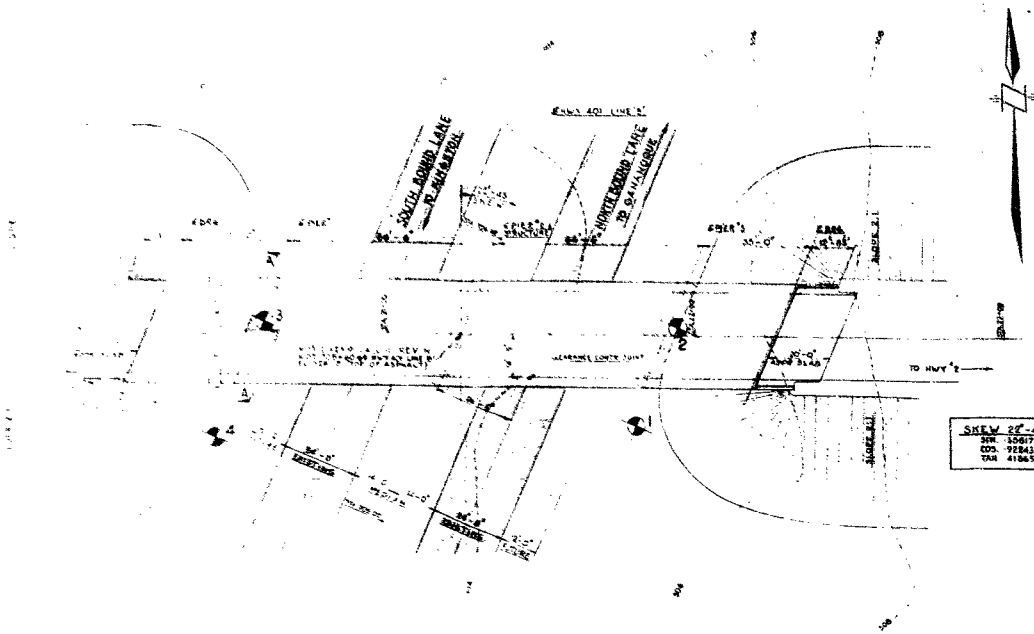
L.A.W.

B.M.S.

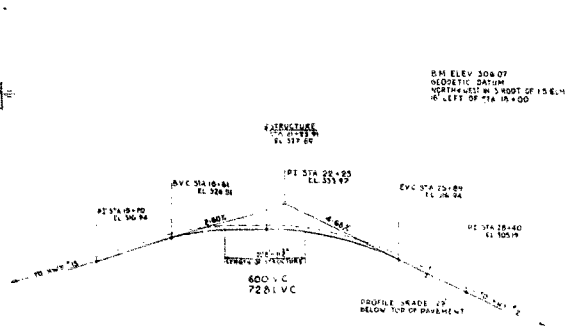
K.R.G.

D 4868 - D1

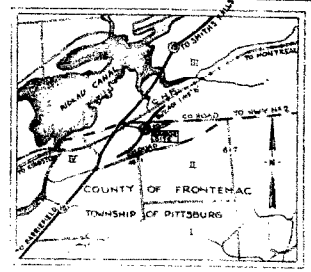
DEFECTS IN NEGATIVE DUE TO CONDITION OF ORIGINAL DOCUMENT



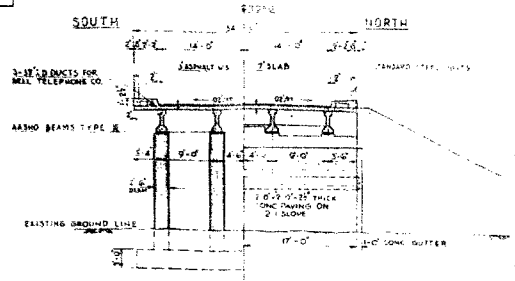
PLAN
SCALE 1"=20'-0"



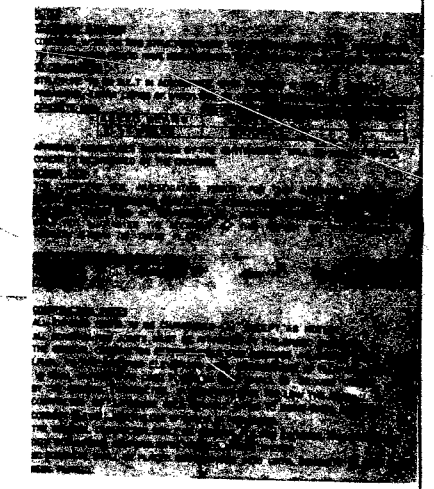
PROPOSED PROFILE OF KINGSTON MILLS ROAD
NOT TO SCALE

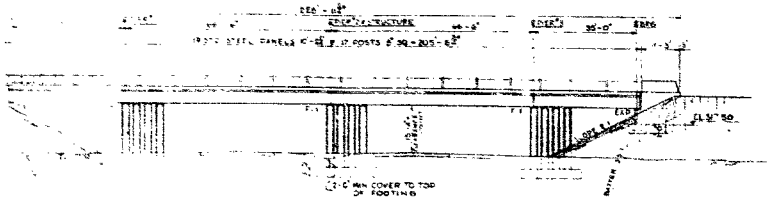


KEY PLAN
SCALE 1" = 1 MILE



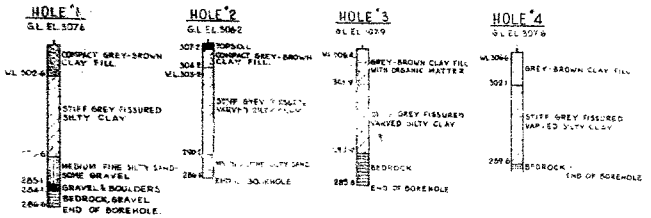
SECTION A-A
SCALE 1"=10'-0"





ELEVATION
SCALE 1"=20'-0"

BORE & PENETRATION HOLE



BORE HOLE DATA
SCALE 1" TO 20'-0" VERT.

REFERENCE PLANS
E 3659-1
12 B 20
F 3549-13
F 4096
DA 961

REVISIONS		
DATE	BY	DESCRIPTION

Foundations Sect (2)

DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE DIVISION

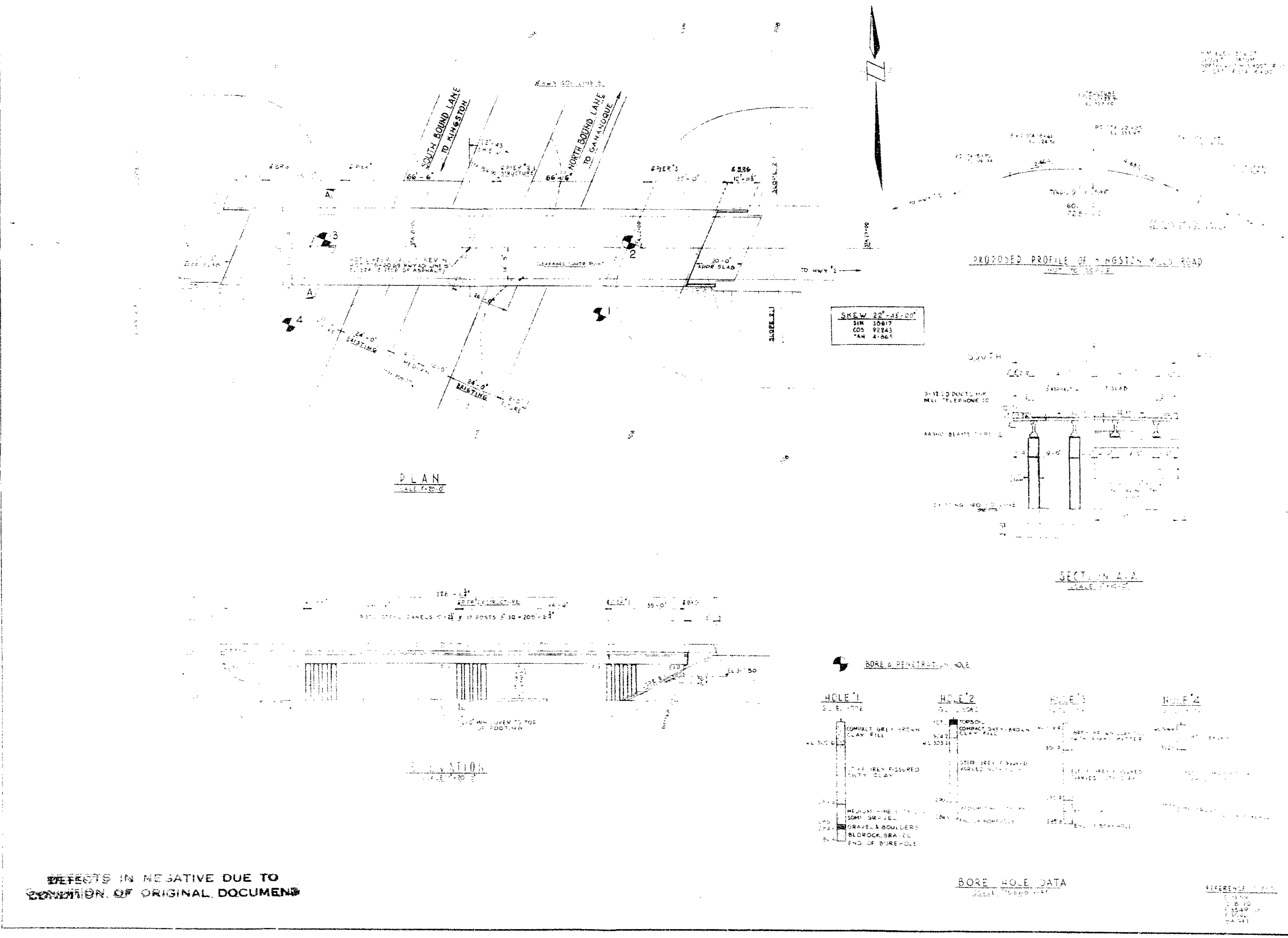
UNDERPASS AT KINGSTON MILLS ROAD
0.8 MILES EAST OF HWY 15

KING'S HIGHWAY No. 401 DIST. No. 8
CO. FRONTENAC PITTSBURG TWP BR No. 3
TWP. PITTSBURG LOT 1 CON. II

PRELIMINARY - GENERAL PLAN

APPROVED				SITE No.		W.P. No. 161-59
DESIGN	B.S.R.	CHECK	A.L.C.	CONTRACT Nos.		
DRAWING	B.M.S.	CHECK	A.L.C.			
DATE	1962 APRIL	LOADING	H20 S16	DRAWING No.	D5052 - P1	

SHEET No 1 | TOTAL SHEETS



NOTES

TO DISTRICT ENGINEER

CONCRETE WORK ON THIS STRUCTURE MUST NOT BE COMMENCED UNTIL BENCHMARKS TO FIX CONTROL POINTS HAVE BEEN ERECTED AND CHECKED BY THE DISTRICT ENGINEER.

TO CONTRACTOR

STRUCTURE TO BE BUILT IN ACCORDANCE WITH FORM No 9 AND THE SPECIAL PROVISIONS, EXTRA COPIES OF WHICH MAY BE OBTAINED FROM THE DISTRICT ENGINEER.

CONCRETE MIX

	[illegible]	[illegible]	[illegible]
A.A.S.H.O. BEAMS	4000 P.S.I.		[illegible]
ELSEWHERE	3000 P.S.I.		[illegible]

APPROVED ADMIXTURES SUPPLIED BY THE CONTRACTOR WILL BE ADDED TO ALL CONCRETE AS SPECIFIED BY THE ENGINEER.

BORING DATA

THE COMPLETE SOIL INVESTIGATION REPORT FOR THIS STRUCTURE [illegible] AT THE BRIDGE OFFICE AND FOUNDATION OFFICE, [illegible] REGIONAL OFFICE AND AT THE [illegible] DISTRICT OFFICE [illegible] DOES NOT GUARANTEE THE ACCURACY OF THIS REPORT OR THE ABRIDGED VERSION SHOWN ON THESE PLANS.

[illegible]

CONSTRUCTION NOTES

ALL EXPOSED EDGES TO BE CHAMFERED ¾" EXCEPT AS NOTED.

ALL CONSTRUCTION JOINTS MUST BE APPROVED BY THE BRIDGE ENGINEER.

THE GENERAL CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BRIDGE SEATS LEVEL TO THE SPECIFIED ELEVATIONS WITH A TOLERANCE OF PLUS OR MINUS ⅛ INCH. IF THEY ARE CAST TOO HIGH THEY SHALL BE GROUND DOWN BY THE GENERAL CONTRACTOR. IF THEY ARE CAST TOO LOW THE GENERAL CONTRACTOR SHALL PROVIDE FULL BEARING SHIMS TO BRING THEM UP TO THE CORRECT ELEVATIONS. THE USE OF GROUT IS PROHIBITED.

THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE DECK ELEVATIONS CONFORM WITH THE ELEVATIONS SHOWN.

NO CONCRETE SHALL BE PLACED ABOVE BRIDGE SEAT UNTIL CONCRETE [illegible] BEEN PLACED.

REVISION	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE DIVISION

KING'S HIGHWAY No 401 DIST No 5

TWP PITTSBURGH LOT 1 CON

APPROVED BRIDGE ENGINEER				SITE No.	
DESIGN		CHECK		CONTRACT No	
DRAWING		CHECK			
DATE		LOADING	H 20 S 16	DRAWING No	