

DOCUMENT IDENTIFICATION

U.S. G.S. 1976

GEOCRES No. 30M 15-30

DIST. 6 REGION CENTRAL

W.P. No. 44-71-11

CONT. No. 77-133

W. O. No. 73-11004

STR. SITE No. _____

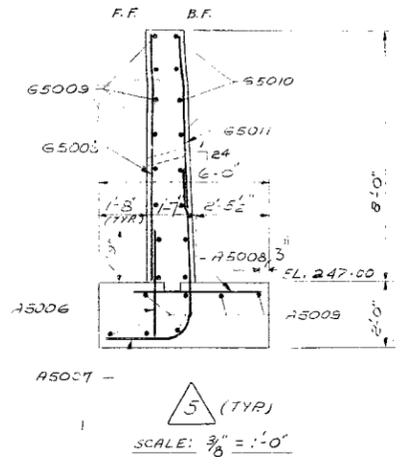
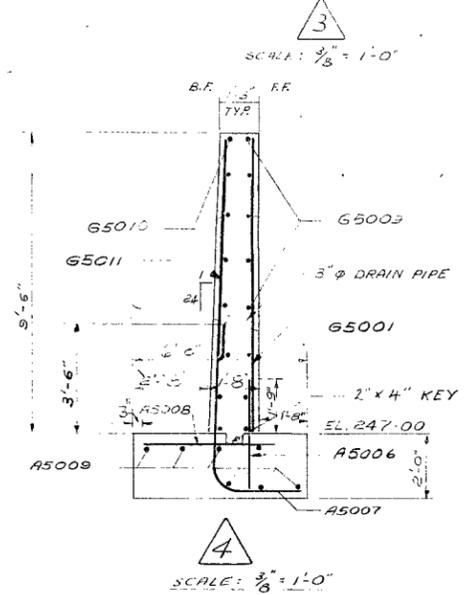
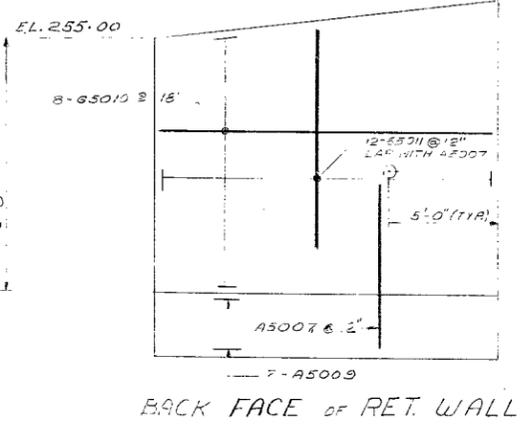
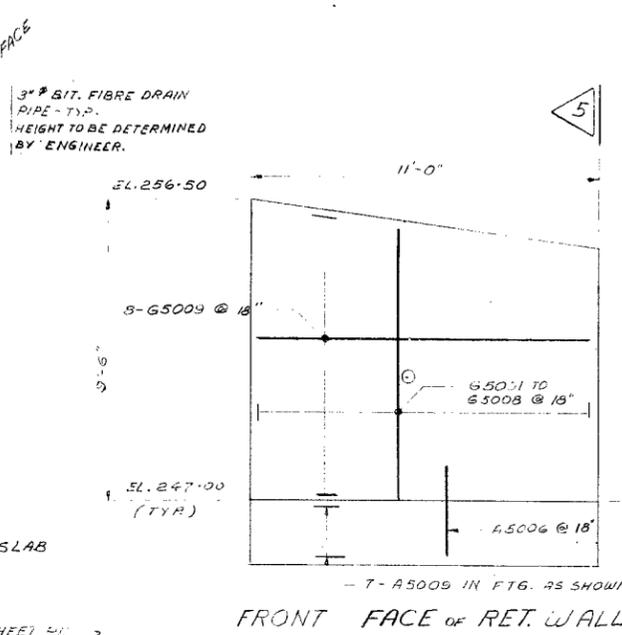
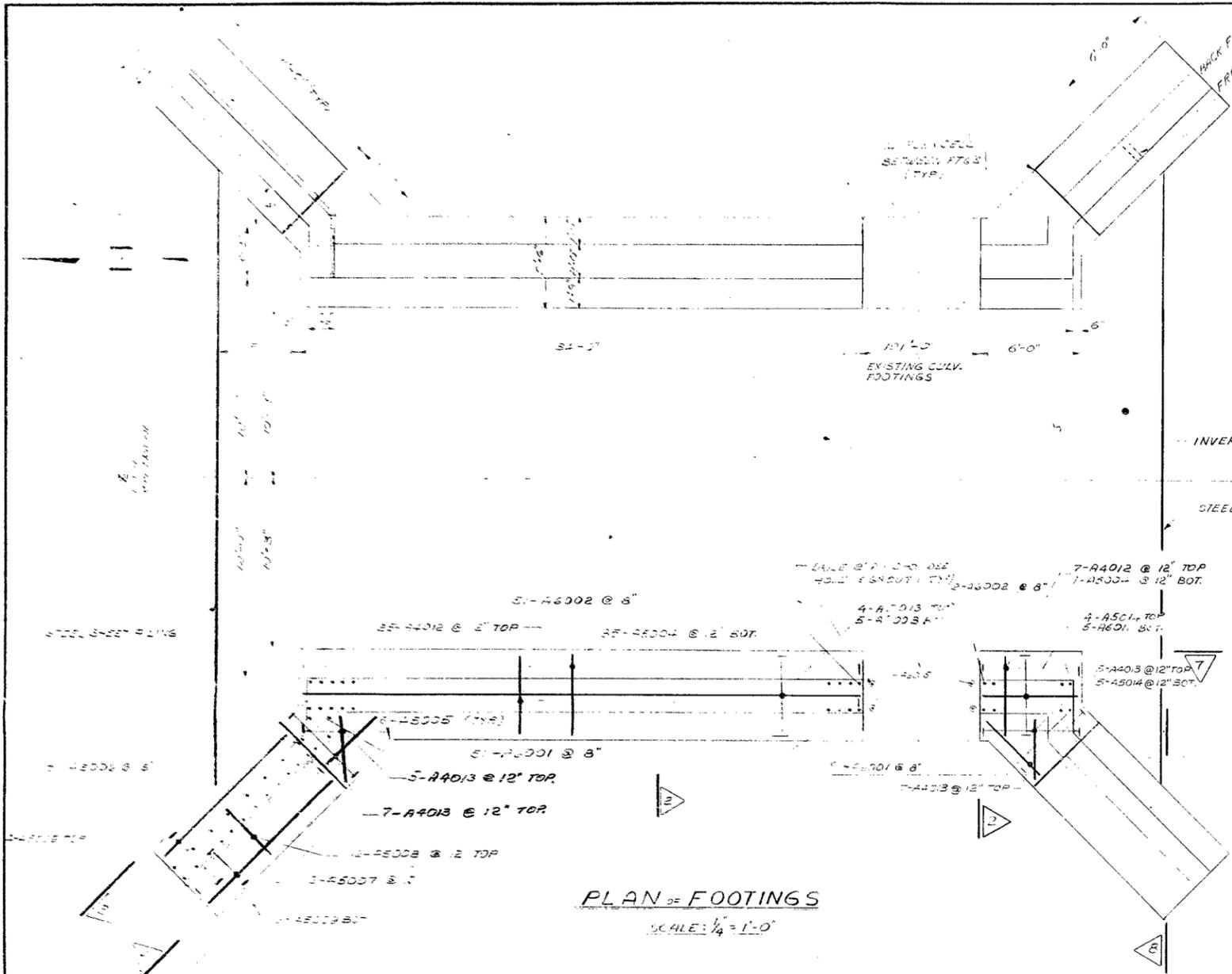
HWY. No. _____

LOCATION WIDENING OF HARMONY

CREEK ARCH CULVERT AT HWY 401

OVER-OR OPENINGS TO BE INCLUDED IN THE REPORT 3

REMARKS _____



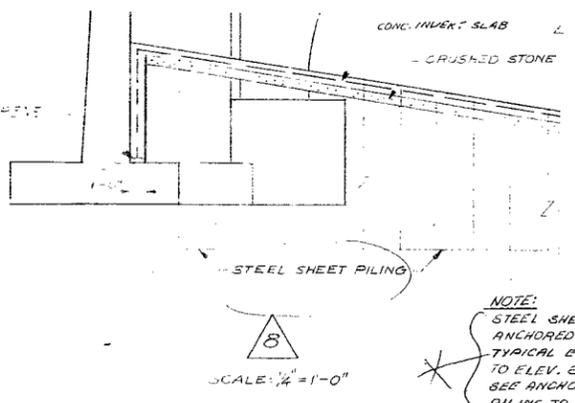
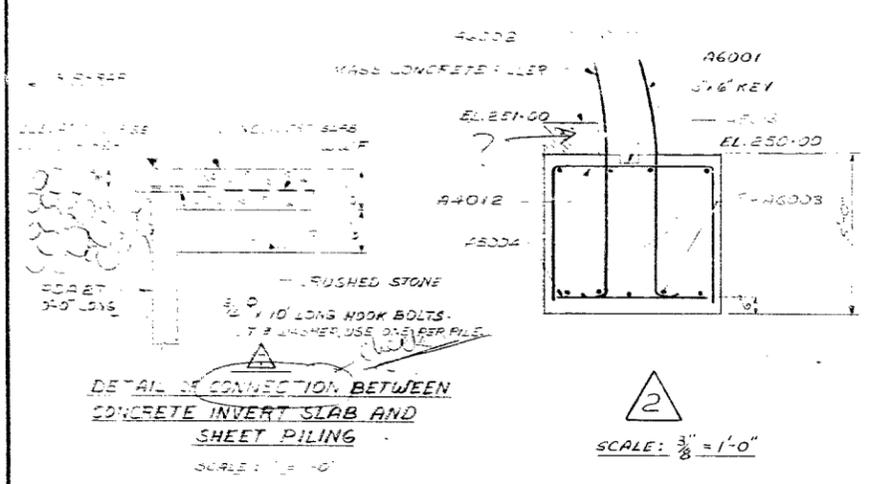
LEGEND:
B.F. = BACK FACE
F.F. = FRONT FACE

30M15-30

PLAN OF FOOTINGS

STEEL SHEET PILING

SECTION	LENGTH	PCS.	WEIGHT
NORTH	PDA27	9'-0"	30 9439'
SOUTH	PDA27	9'-0"	30 9439'
TOTAL WEIGHT			LoS. = 18878.0
			TONS = 9.44



NOTE:
STEEL SHEET PILING TO BE ANCHORED TO CONC. SLAB TYPICAL EACH END DRIVE TO ELEV. 243.00.
SEE ANCHORAGE DETAIL 17.
PILING TO BE TYPE PDA27, OR EQUAL.



REVISIONS		DATE		BY		DESCRIPTION	

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO

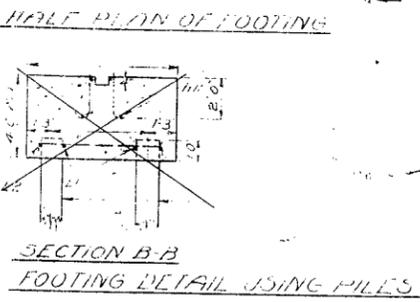
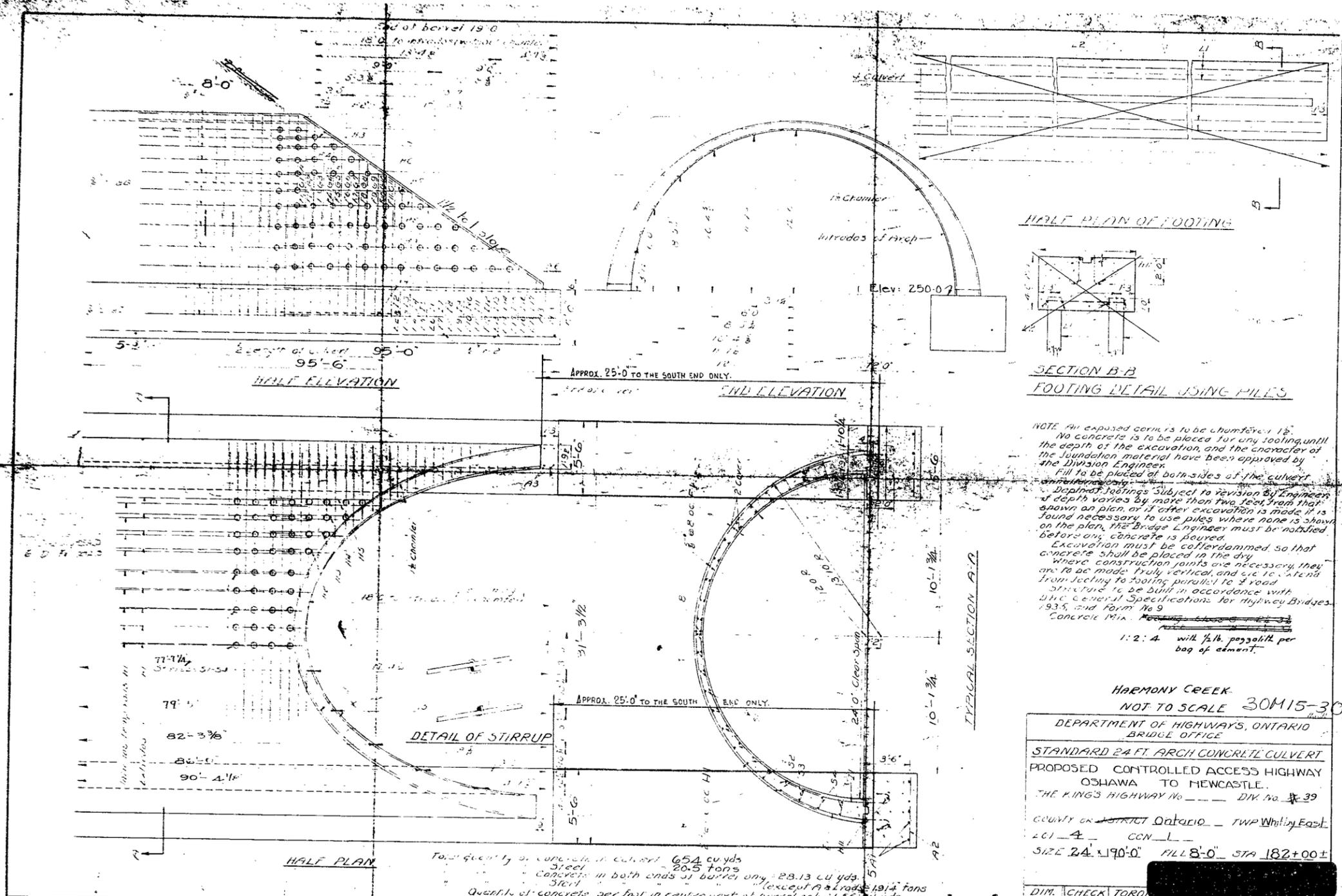
30M15-30

WIDENING OF EXISTING ARCH
HARMONY CREEK

KING'S HIGHWAY No. 401 DIST. No. 6
CO. ONTARIO
CITY OF OSHAWA LOT 4 CON. I

FOOTINGS & RETAINING WALLS

APPROVED	SUBMITTAL ENGINEER	CONTRACT No.	
DESIGN	CHECK	W.P. No.	44-71-11
DRAWING	CHECK	LOADING	
DATE			SITE No. 22-182 SHEET 2

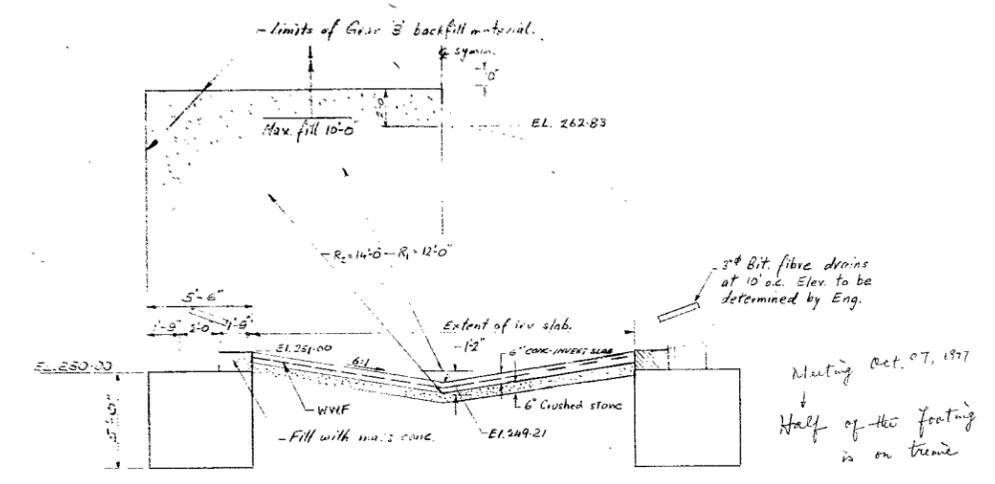
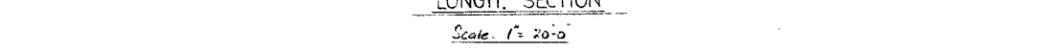
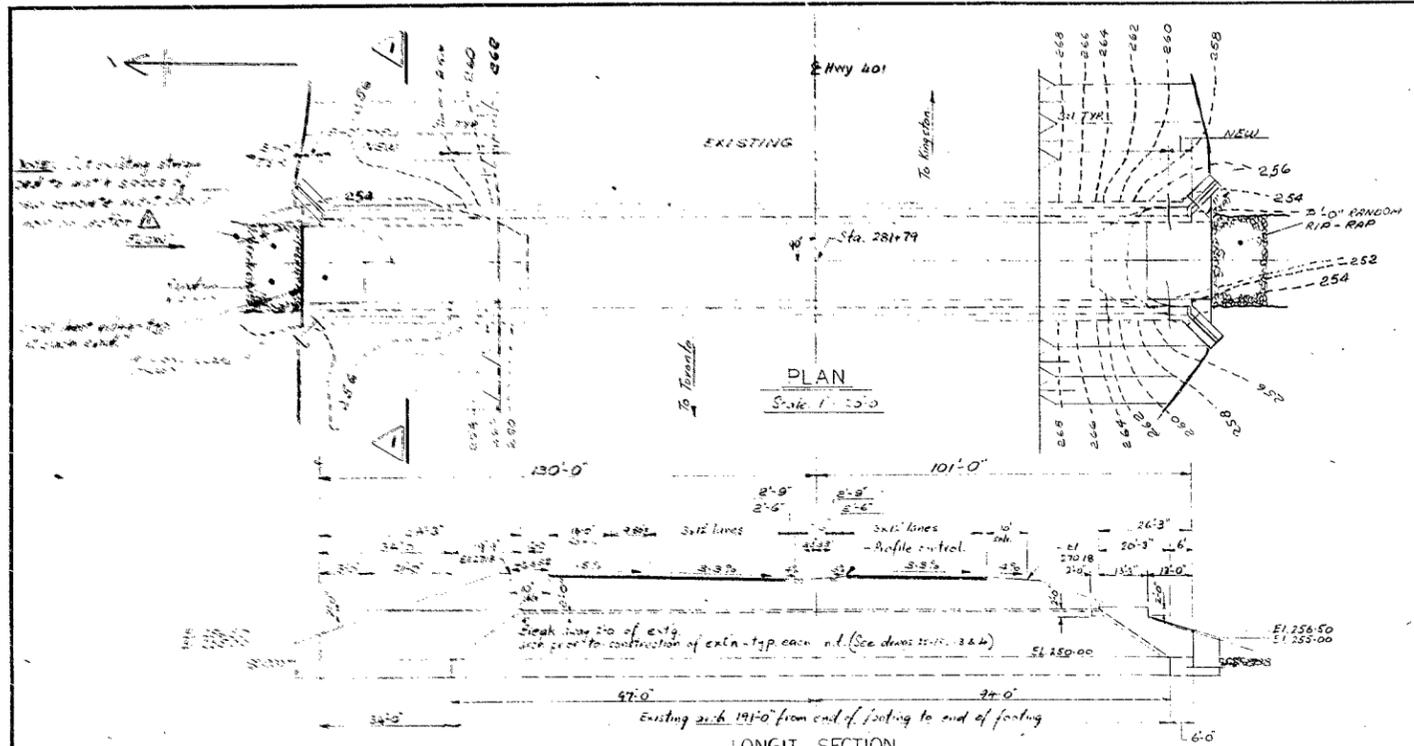


NOTE: All exposed corners to be chamfered 1/2".
 No concrete is to be placed for any footing until the depth of the excavation, and the character of the foundation material have been approved by the Division Engineer.
 Fill to be placed on both sides of the culvert chamber only.
 Detailed Footings Subject to revision by Engineer if depth varies by more than two feet from that shown on plan, or if after excavation is made it is found necessary to use piles where none is shown on the plan, the Bridge Engineer must be notified before any concrete is poured.
 Excavation must be cofferdammed so that concrete shall be placed in the dry.
 Where construction joints are necessary, they are to be made truly vertical, and 4" to 6" stems from footing to footing parallel to road.
 Structure to be built in accordance with the General Specifications for Highway Bridges, 1935, and Form No 9.
 Concrete Mix: ~~1:2:4~~ 1:2:4 with 1/2 lb. pozzolith per bag of cement.

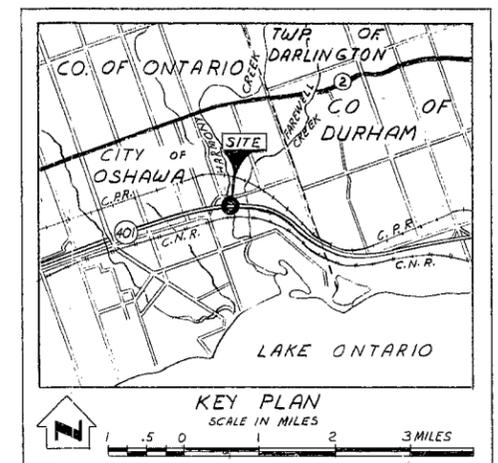
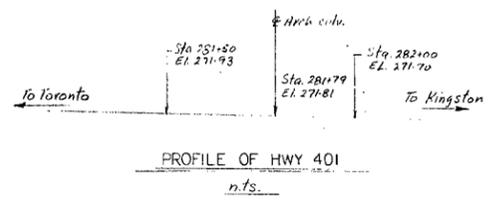
HARMONY CREEK
 NOT TO SCALE 30M15-30
 DEPARTMENT OF HIGHWAYS, ONTARIO
 BRIDGE OFFICE
 STANDARD 24 FT. ARCH CONCRETE CULVERT
 PROPOSED CONTROLLED ACCESS HIGHWAY
 OSHAWA TO NEWCASTLE
 THE KING'S HIGHWAY No. --- DIK No. 39
 COUNTY OR DISTRICT Ontario --- TWP. Whiting East
 C.C. 4 --- C.C. 1
 SIZE 24' x 19'-0" FILL 8'-0" STA 182+00±
 DIM. CHECK TORONTO
 DAVIS, L.G.T. April 20/50 DRAWING No. 3124-1
 D 4-26-1 STD. No. BD 13-5

Quantity of concrete in culvert 654 cu yds
 Steel 20.5 tons
 Concrete in both ends of barrel only 28.13 cu yds (except A-A roads 191.4 tons steel)
 Quantity of concrete per foot in centre part of barrel only 1.56 cu yds

DWG No. BD-13-5-3



NOTE:
CONCRETE INVERT SLAB TO EXTEND 5' BEYOND ENDS OF EXTENSIONS, THROUGHOUT NEW AND EXISTING ARCH. LENGTH 241'-0" REINFORCE WITH 6"X6" W.W.F.



CONCRETE QUANTITIES.

1. CONCRETE IN ARCH FTG'S	C.Y.	81.0
2. " " RET. WALL FTG'S	C.Y.	20.0
3. " " ARCH'S	C.Y.	110.0
4. " " RET. WALLS	C.Y.	20.0
5. " " INVERT SLAB	C.Y.	106.0
6. MASS CONC. FILLER	C.Y.	6.0

NOTES:
 - Class of concrete 3000 p.s.i.
 - Clear cover to extrados steel and footing steel: 3"
 - Clear cover to intrados steel: 2"
 - TRAFFIC PROTECTION - FOR REQUIREMENT SEE GRADING DRAWINGS.
 - Demolition of 2'-0" at ends of existing arch, to expose longitudinal reinforcing steel, to be done using light (max. 17 lbs) jack hammers to avoid cracking extg. arch.
 - Backfill operation shall progress simultaneously on both sides of the arch. The difference in working levels of backfill between either side (east or west) shall not exceed 12".

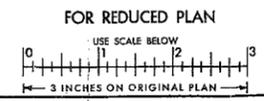
FINALIZED
 JAN. 20/75
 Heall Thornton

- LIST OF DRAWINGS:
- 22-182-1 General Plan
 - 2 Footings and Retaining Walls.
 - 3 Arch Reinforcing - H. Extension.
 - 4 Arch Reinforcing - S. Extension.
 - 5 Standard Details.

PRINT RECORD

No.	FOR	DATE

REVISIONS		DATE		BY		DESCRIPTION	
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS ONTARIO							
WIDENING OF EXISTING HARMONY CK. ARCH.							
KING'S HIGHWAY No. 401				DIST. No. 6			
CO. ONTARIO							
TWP. WHITBY E.				LOT CON.			
= GENERAL PLAN =							
APPROVED				CONTRACT No.			
DESIGN HBS				STRUCTURAL ENGINEER			
DRAWING HBS				CHECK SM			
DATE DEC. 1974				LOADING HS20-44			
				W.P. No. 44-71-11			
				SITE No. 22-182 SHEET 1			



30415-30

DOCUMENT MICROFILMING IDENTIFICATION

G.I-30 SEPT 1976

GEOCREs No. 30M15-30

DIST. 6 REGION Central

W.P. No. 44-71-11

CONT. No. 77-133

W. O. No. 73-11004

STR. SITE No. _____

HWY. No. _____

LOCATION Widening of Harmony
Creek Arch Culvert at Hwy 401

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 3

REMARKS: documents to be unfolded
before microfilming

FOUNDATION INVESTIGATION REPORT

For

Proposed Widening of Harmony
Creek Arch Culvert, at Hwy. #401
Town of Oshawa, County of Ontario
District #6 Toronto
W.O. 73-11004 W.P. 44-71-11

1. INTRODUCTION

A request for a foundation investigation at the site of the proposed widening of the Harmony Creek Arch Culvert ^{at} Highway #401, was received from Mr. G. C. E. Burkhardt, Regional Structural Planning Engineer, in a memorandum dated November 9, 1972.

Following this request, a field investigation was carried out by the Foundation Section to determine the sub-soil conditions existing at the site. This report contains the results of this investigation and our recommendations pertaining to the design of the proposed foundations.

2. DESCRIPTION OF SITE

The site of the proposed arch widening is located in the Town of Oshawa, at the intersection of Harmony Creek and Highway #401. The proposed 25 feet widening will be on the south end of the culvert. The surrounding area on both sides of the creek is flat. Geologically, the site is part of the physiographic region known as the Iroquois Plain.

3. FIELD AND LABORATORY INVESTIGATION PROCEDURES

A total of two sampled boreholes and four cone penetration tests was carried out during the course of the field work. Boring was achieved by means of a continuous flight hollow stem auger machine adapted for soil sampling purposes.

During the field work, disturbed samples were obtained by means of a split-spoon sampler; the energy used in driving it, conformed to the requirements of the Standard Penetration Test.

Dynamic Cone Penetration Tests were carried out adjacent to each borehole and in two other locations. Driving energy to advance the cone was 350 ft. lbs. per blow. A rock core was obtained in one borehole.

The locations and elevations of the borings are shown on Drawing No. 73-11004A which accompanies this report.

All samples were visually examined and classified at the site as well as in the laboratory. Following this inspection laboratory tests were carried out on selected samples to determine the following physical properties: -

Atterberg Limits
Moisture Content
Grain Size Distribution

4. SOIL TYPES AND SOIL CONDITIONS

4.1 General

The subsoil consisted of a stratum of clayey silt with sand underlain by a sand and gravel deposit with some, to traces of silt and clay (glacial till), which in turn was underlain by some boulders and shale bedrock. The estimated stratigraphical profile shown on Drawing 73-11004A is based upon this information. From ground level downwards, the various soil types are as follows: -

4.2 Clayey Silt with Sand and Traces of gravel:

This material was encountered in both boreholes, to a depth of 8 feet in B.H. #1, and to a depth of 10.5 feet in B.H. #3, the latter having a silty sand layer between 7 feet and 9 feet depth. Reference should be made to the Record of Borehole sheets for the lower boundary elevations.

The chief constituents were silt and clay with sand and some, to traces of gravel. The percentage of silt and clay varied between 32% and 54% and the percentages of sand and gravel varied randomly between 33% to 66% and 0 to 35% respectively. The silty sand layer in B.H. #3 consisted of 66% sand and 34% silt and clay.

Physical properties as determined from laboratory tests, are as follows:

Natural Moisture Content: 22% to 31%
Liquid Limit : 21% to 28%
Plastic Limit : 13% to 20%

The consistency may be described as firm to very stiff.

4.3 Sand and Gravel with some, to traces of silt and clay (Glacial till)

This material was encountered in both boreholes. The thickness varies from 14.5 ft. to 16 ft. Reference should be made to the Record of Borehole sheets for the lower boundary elevations.

The chief constituents are sand and gravel with some, to traces of silt and clay. The percentage of gravel varied from 18% to 59%, the percentage of sand varied between 37% and 50% and the percentage of silt and clay varied from 4% to 35%.

The moisture content varied from 5% to 10%.

The denseness may be described as very dense.

4.4 Shale Bedrock

This material was encountered in both boreholes at el. 231.4 +. The rock was cored in B.H. #1 and was found to be sound shale bedrock.

5. GROUNDWATER CONDITIONS:

Groundwater in the borings was found to be at el. 251.0 which corresponded with the level of water in the creek. Sub-artesian water was also encountered in B.H. #1 at el. 243 + with a head to el. 254 some three feet higher than the creek level.

6. DISCUSSION AND RECOMMENDATIONS:

It is proposed to widen Highway #401 25 feet on the south side, which necessitates lengthening the Harmony Creek Culvert by 25 feet to the south. The extension will be of the same cross-section as the existing culvert and can be founded on either spread footings or piles: -

1. Spread Footings

Footings should be placed at el 246.0 assuming a maximum bearing pressure of 4 t.s.f. Footings should be contained within a sheet pile cofferdam driven to el. 243.0 to provide against possible blowout due to artesian water at el. 243.0 and should be cut off at top of footing level at completion of construction. The sheeting will also ensure maximum mobilisation of passive earth pressure to resist the horizontal thrust induced by the arch. Friction on horizontal planes below the footings may be based on a coefficient of 0.65.

2. Piled Foundations

As an alternative piled foundations may be constructed. Steel H piles are considered to be the most suitable and should be fitted with standard flange plates and driven to bedrock. The design load can be the maximum allowable for the particular section chosen. All lateral forces should be taken by battered piles including the backfill stage. Pile caps should be founded at el. 246 and should be enclosed within a cofferdam as in (1).

Because of the thickness of sheet piling around the joint between the new and existing footings and because of differential movement, it will be necessary to construct a flexible joint between the new and existing structures.

The field work was carried out during the period of April 10 - 11, 1973, under the supervision of Mr. M. J. Young, Engineer, who also prepared this report.

Equipment was owned and operated by Master Soil Investigation Ltd., Toronto.

This report was reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

M. J. Young

M. J. Young, P. Eng.



K. G. Selby

K. G. Selby, P. Eng.,
Supervising Foundations Eng.

MY/js

June 26, 1973.

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE NO 1

FOUNDATIONS OFFICE

JOB 73-11004 LOCATION Co-ords. 15,947,336 N; 1,177,950 E.
 W.P. 44-71-11 BORING DATE April 10, 1973
 DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger and Cone

ORIGINATED BY MY
 COMPILED BY MY
 CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w $w_p \quad w \quad w_L$ WATER CONTENT %	BULK DENSITY γ	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT						SCHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE
256.4	Ground Level										
0.0	Clayey silt with sand, traces of gravel. Stiff to Very Stiff		1	SS	18	250		○		0 57 37 6	
248.4			2	SS	28						9 40 40 13
8.0	Sand and gravel with some silt & clay. (Glacial Till) Very Dense		3	SS	68	240		○		33 45 (22) 26 49 (25)	
			4	SS	100/8"						150/8"
			5	SS	100/4"						
			6	SS	100/8"						
			7	SS	100/8"			○		59 37 (4)	
			8	SS	82						
232.4	Boulder										
231.4	Shale Bedrock			RC		230					
25.0			9	BXL	100%						
226.9	Sound										
29.5	End of Borehole										

OFFICE REPORT SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 2

JOB 73-11004

LOCATION Co-ords. 15,947,363 N; 1,177,954 E.

ORIGINATED BY MY

W.P. 44-71-11

BORING DATE April 11, 1973

COMPILED BY MY

DATUM Geodetic

BOREHOLE TYPE Dynamic Cone Test

CHECKED BY *[Signature]*

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT w_L			BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT	BLOWS / FOOT					PLASTIC LIMIT w_p			
						20	40	60	80	100	WATER CONTENT w				
						SHEAR STRENGTH P.S.F.					w_p w w_L ———— w ———— WATER CONTENT %				
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
256.2	Ground Level														
0.0	Probably clayey silt with sand														
248.4															
7.8	Probably sand and gravel.														
245.3															
10.9	End of Cone Test														
	<i>Probably silty sand, gravel</i>														

OFFICE REPORT SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 3

JOB 73-11004 LOCATION Co-ords. 15,947,324 N; 1,177,995 E. ORIGINATED BY MY
 W.P. 44-71-11 BORING DATE April 4, 1973 COMPILED BY MY
 DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger and Cone CHECKED BY [Signature]

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT			BULK DENSITY	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.				WATER CONTENT %					
						○ UNCONFINED + FIELD VANE				10 20 30					
						● QUICK TRIAXIAL × LAB VANE									
256.5	Ground Level														
0.0	Clayey silt with sand, traces to some gravel. Firm to Very Stiff		1	SS	1										2 44 47 7
			2	SS	6										0 66 29 5
			3	SS	7										35 33 22 10
246.0			4	SS	30										
10.5	Sand & gravel with some silt & traces of clay. (Glacial Till) Dense to Very Dense		5	SS	100/8"										18 47 31 1
			6	SS	100/11"										30 50 (20)
			7	SS	32										
			8	SS	100										
231.5															
25.0	Probable boulder or bedrock End of Borehole														

OFFICE REPORT SOIL EXPLORATION

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE NO 4

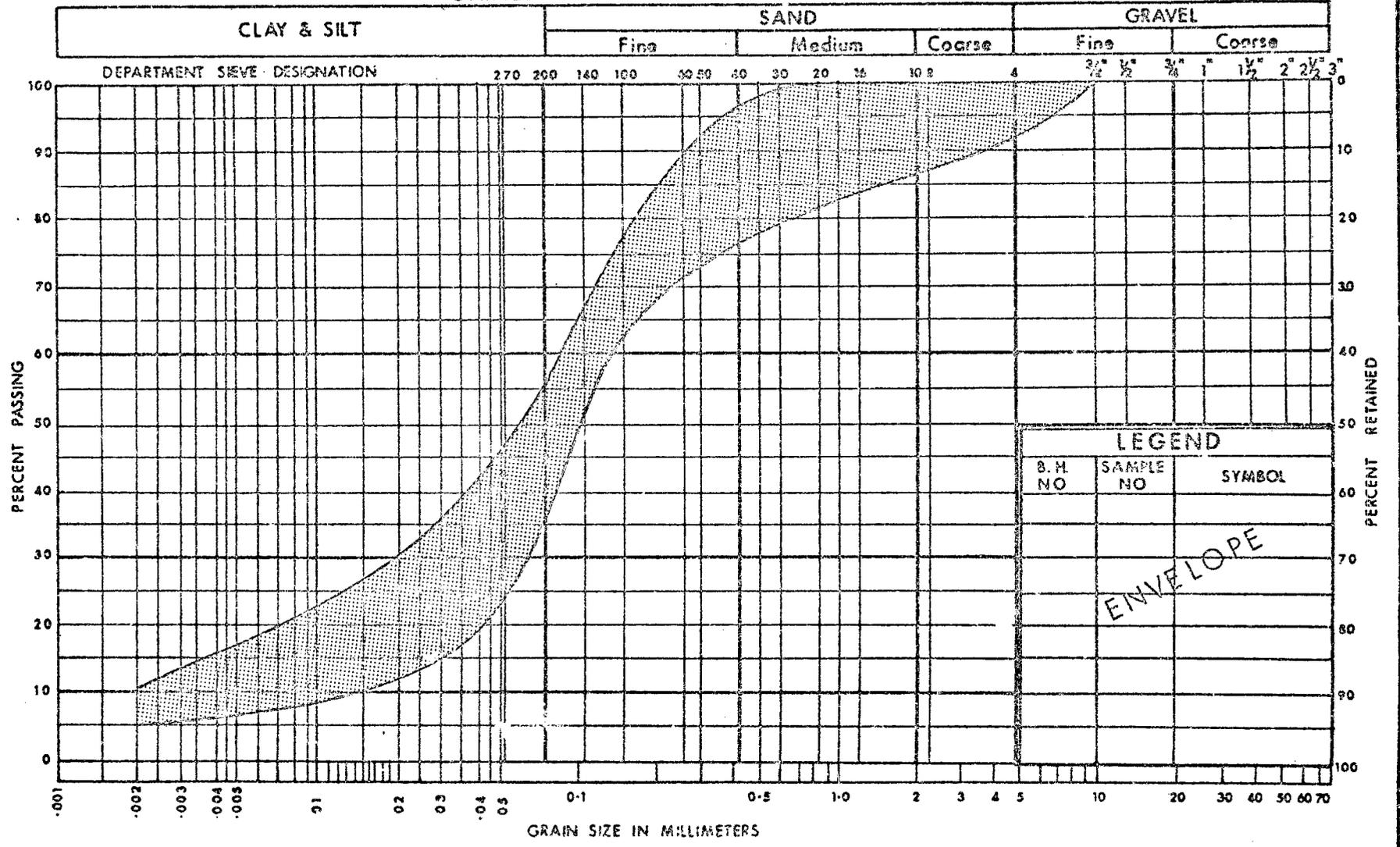
FOUNDATIONS OFFICE

JOB 73-11004 LOCATION Co-ords. 15,947,343 N; 1,177,995 E. ORIGINATED BY MY
 W.P. 44-71-11 BORING DATE April 11, 1973 COMPILED BY MY
 DATUM Geodetic BOREHOLE TYPE Cone Test CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w $w_p \quad w \quad w_L$ WATER CONTENT %	BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT					
256.9	Ground Level									
0.0	Probably clayey silt sith sand.					250				
246.4										
10.5	End of Cone Test						150/6"			

OFFICE REPORT SOIL EXPLORATION

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
DESIGN SERVICES BRANCH



GRAIN SIZE DISTRIBUTION

CLAYEY SILT

WITH SAND, TRACES OF GRAVEL

W.P. No. 44-71-11
JOB No. 73-11004
FIG. NO. 1

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. G.C.E. Burkhardt, (2) FROM: Soil Mechanics Section,
Regional Structural Planning Engineer, Geotechnical Office,
Central Region, Toronto. West Bldg., Downsview.

ATTENTION: DATE: August 9th, 1974.

OUR FILE REF. IN REPLY TO

SUBJECT: RE: FOUNDATION INVESTIGATION REPORT
For
Proposed Widening of Harmony
Creek Arch Culvert, at Hwy. #401,
Town of Oshawa, County of Ontario,
District #6 Toronto.
W.O. 73-11004 W.P. 44-71-11.

Drawing No. 73-11004B and Borehole Log Sheets
Nos. 5 to 8 for the above project have now been completed.

The subsoil conditions on the north side are
similar to those existing on the south side of Hwy. 401. The
recommendations made in our Foundation Report 73-11004 for
the extension to the south are also applicable for the proposed
extension to the north.

Would you therefore, add the attached information
to Report 73-11004 to form part of this Report.


W. Greskow,
For: K.G. Selby,
Supervising Engineer.

WG/mj
Attach*

c.c. E.J. Orr
B.R. Davis
A. Rutka
R.S. Pillar
H. Greenland
B.J. Giroux
D. Gunter
G.A. Wrong
P. Lewycky

Files
Documents

DESIGN SERVICES BRANCH

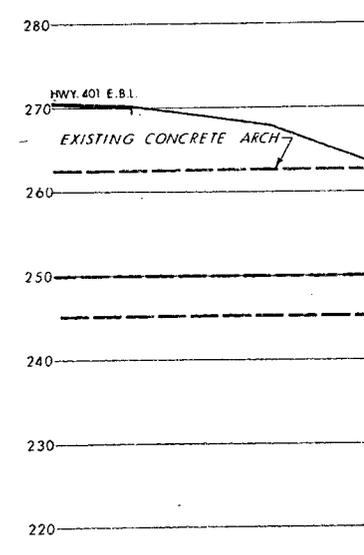
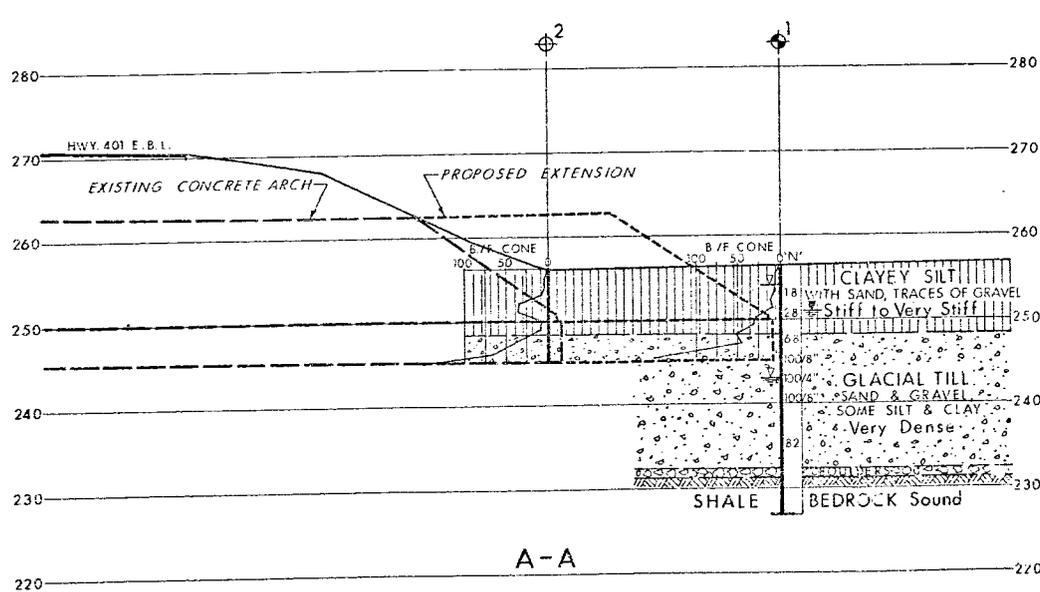
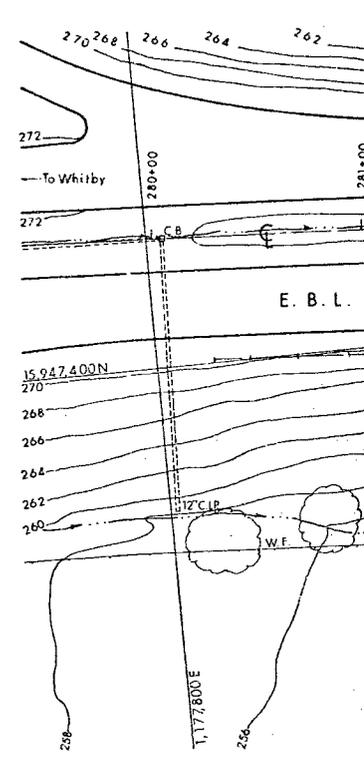
RECORD OF BOREHOLE NO 6

FOUNDATIONS OFFICE

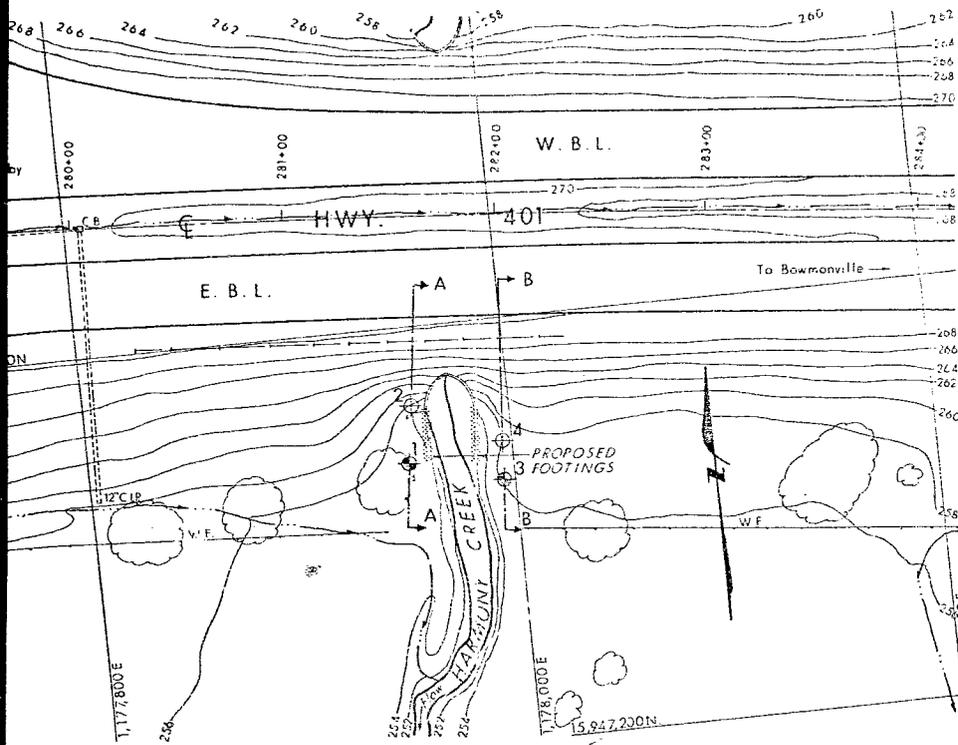
JOB 73-11004B LOCATION Co-ords. 15,947,584 N; 1,178,013 E. ORIGINATED BY PK
 W.P. 44-71-11 BORING DATE May 29-30, 1974 COMPILED BY WG
 DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger & Cone CHECKED BY _____

SOIL PROFILE		SAMPLES			ft./m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	LIQUID LIMIT — w _L PLASTIC LIMIT — w _p WATER CONTENT — w w _p — w — w _L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE					
78.18 0.0	0.0	Ground Level							
76.05 2.13	2.13	Sand, traces of organics Compact	1	SS	13				
	2.13		2	SS	10				
	2.13	Sand & gravel with some silt and traces of clay shale fragments (Glacial Till) dense v. dense	3	SS	54				
	2.13		4	SS	42				
	2.13		5	SS	98				
	2.13		6	SS	107				
	2.13		7	SS	100				
70.26 7.92	7.92	Boulders, cobbles	8	SS	107				
	7.92	End of Borehole							

OFFICE REPORT OF SOIL EXPLORATION



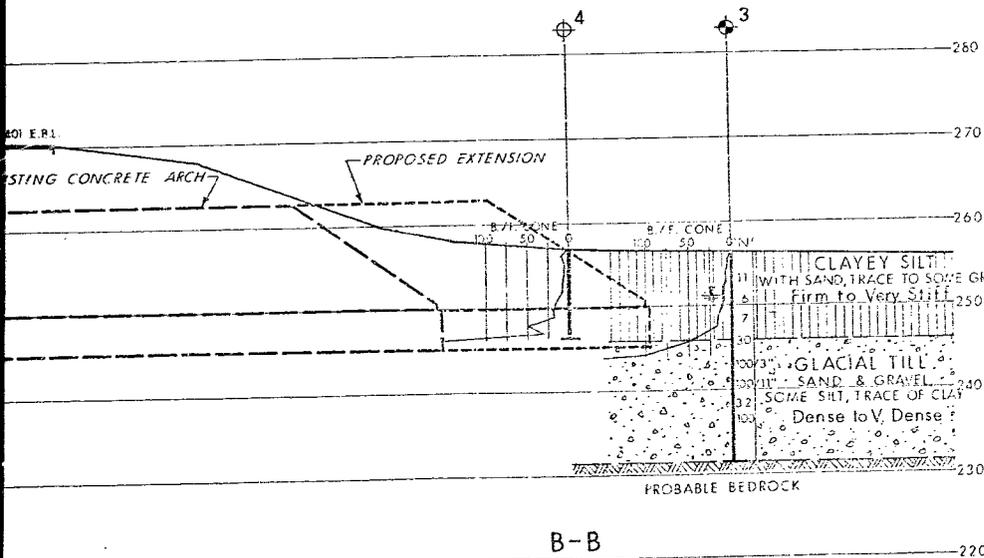
SECTIONS
SCALE 10 0 10 20 FT



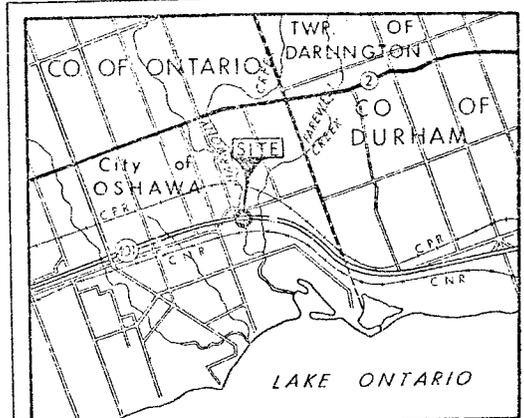
PLAN

SCALE

40 20 0 40 80 FT.

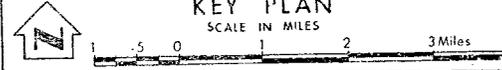


B-B



KEY PLAN

SCALE IN MILES



LEGEND

- Bore Hole
- Cone Penetration Test
- Bore Hole & Cone Test
- Water Levels established at time of field investigation, April, 1973
- Head Arterial Water Encountered

NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	256.4	15,947,336	1,177,950
2	256.2	15,947,363	1,177,954
3	256.5	15,947,324	1,177,995
4	256.9	15,947,343	1,177,995

— NOTE —

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO
DESIGN SERVICES BRANCH—FOUNDATIONS OFFICE

HARMONY CREEK

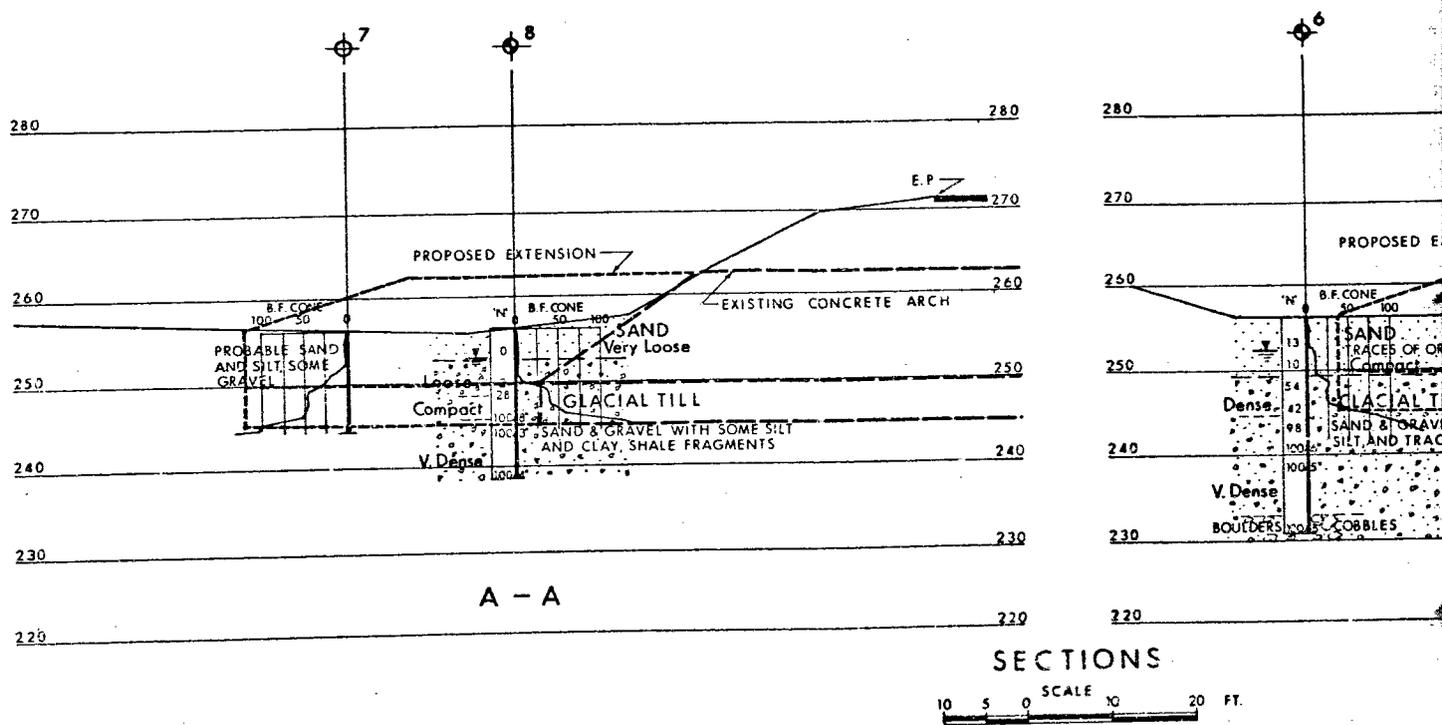
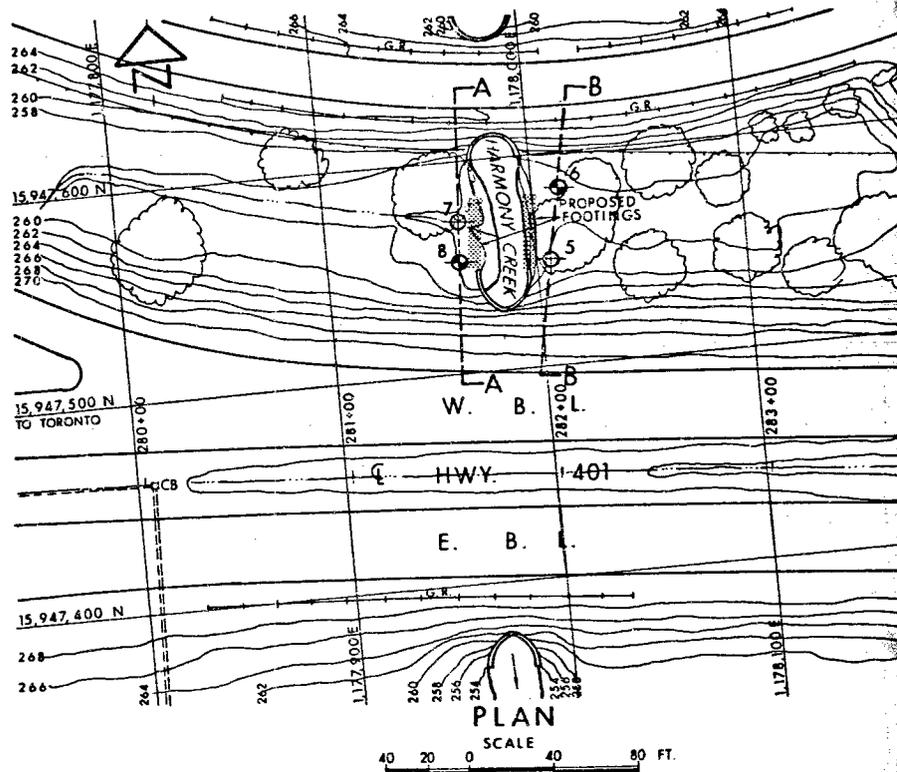
HIGHWAY NO. 401 DIST. NO. 6
CO. ONTARIO City of OSHAWA
TWP. LOT CON.

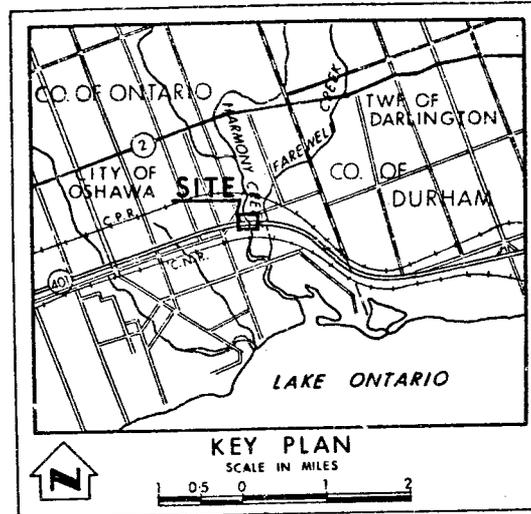
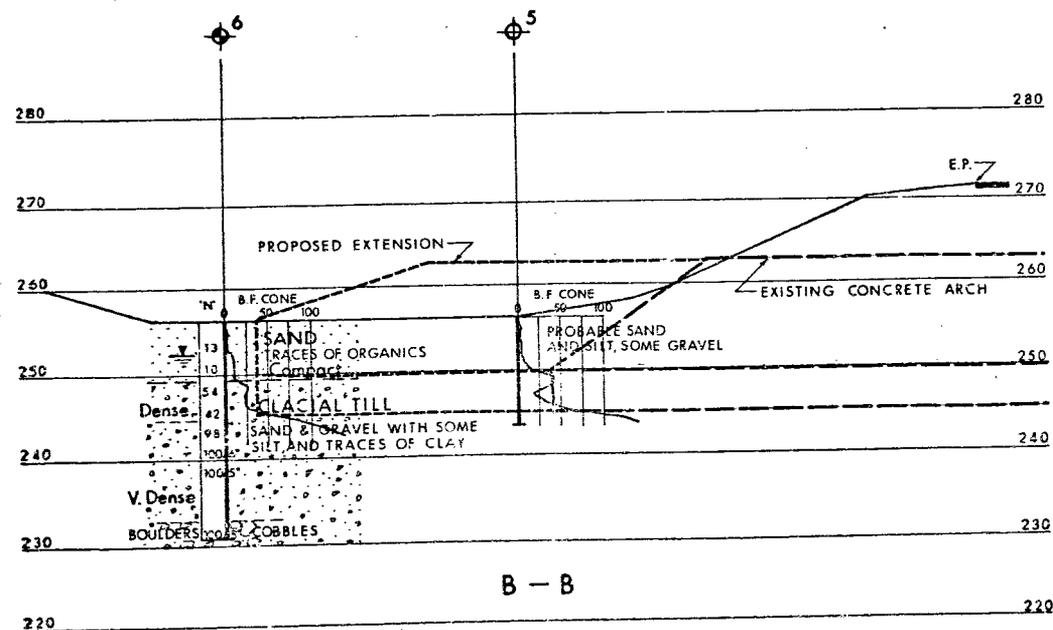
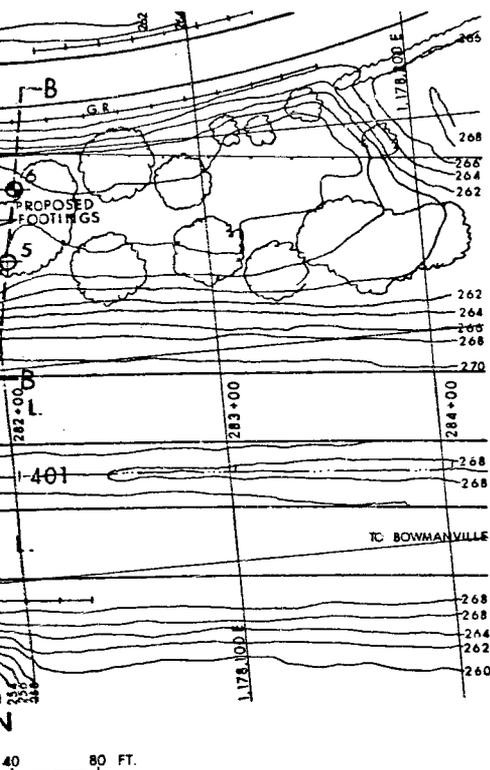
BORE HOLE LOCATIONS & SOIL STRATA

SUBMD M. Y. CHECKED	WF NO. 44-71-11	DRAWING NO.
DRAWN BY CHECKED	WD NO. 73-11004	73-11004 A
DATE June 15, 1973	SITE NO.	BRIDGE DRAWING NO.
APPROVED BY	CONT. NO.	
PRINCIPAL FOUNDATION ENGINEER		



REF NO. B-4-19





LEGEND

- Bore Hole
- Cone Penetration Test
- Bore Hole & Cone Test
- Water Levels established at time of field investigation, MAY 1974

NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
5	256-1	15,947,550	1,178,006
6	256-5	15,947,584	1,178,013
7	256-5	15,947,572	1,177,964
8	256-4	15,947,552	1,177,963

NOTE:

The complete foundation investigation report for this structure may be examined at the Structural Office and Foundations Office, Downsview, and at the TORONTO District Office.

NOTE

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

REVISIONS		DESCRIPTION
DATE	BY	

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO
GEOTECHNICAL OFFICE—SOIL MECHANICS SECTION

HARMONY CREEK

HIGHWAY NO. 401 DIST. NO. 6
CO. OF ONTARIO CITY OF OSHAWA
TWP. _____ LOT _____ CON _____

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D P. K.	CHECKED <input checked="" type="checkbox"/>	WP NO. <u>44-71-11</u>	DRAWING NO.
DRAWN O. J.	CHECKED <input checked="" type="checkbox"/>	WO NO. <u>73-11004</u>	73-11004B
DATE <u>10 JULY 1974</u>	SITE NO.	BRIDGE DRAWING NO.	
APPROVED <u>[Signature]</u>	CONT. NO.		

Mr. C.S. Grebski,
Structural Design Engineer,
Structural Office,
West Building, Downsview.

Soil Mechanics Section,
Geotechnical Office,
West Building, Downsview.

January 21st, 1975.

your memo January 2/75.

Widening of Existing Arch, Harmony Creek,
Highway 401, W.P. 44-71-11, Site 22-182,
District #6, Toronto.

A meeting was held on January 17th, 1975 in our Section to discuss the dewatering requirements and intermediate conditions for backfilling on either side of the concrete arch during construction.

Those present were:

W.M. McFarlane - Structural Design Section
H.S. Bawcutt - Structural Design Section
M. Devata - Soil Mechanics Section

It was concluded that due to the very dense subsoil conditions at or below the footing formation level, it will be extremely difficult to drive the steel sheeting to a sufficient depth to prevent 'boiling' of the foundation base material.

Conditions are such that it will be necessary to place a concrete foundation seal underwater to resist any possible uplift. Mr. McFarlane agreed that necessary revisions will be incorporated in the contract documents so that the Contractor is aware of these conditions. The Designer has already taken into consideration the intermediate case of backfilling on either side of the concrete arch and the structure elements will be safe during construction for this condition.

This Section will update the foundation drawings and the originals will be submitted to your office very soon.

M. Devata,
Supervising Engineer.

MD/ma

c.c. W.M. McFarlane
H.S. Bawcutt
Files
Documents

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. C. G. E. Burkhardt
Regional Structural Planning Engineer
Central Region - Toronto

FROM: Soil Mechanics Section
Downsview

ATTENTION: W. W. Kulmatickas

DATE: June 21, 1974

OUR FILE REF.

IN REPLY TO

SUBJECT:

Widening of Hwy. 401 (North Side)
Harmony Creek Arch.
Hwy. 401
District #6 --- Toronto
W.P. 74-11022 -- W.P. 44-71-11
73-11004 ✓

We have completed the field work on the North Side of Hwy. 401 for the above project.

The Subsoil conditions on the north side are similar to those existing on the south side of Hwy. 401 and contained in our Foundation Report 73-11004. The recommendations made in our report 73-11004 for the extension on the south side are applicable for the proposed extension on the north side also.

Borelog Sheets for the additional boreholes put down at this location and a revised foundation drawing will be forwarded to you in due course as an addendum to our report.

This letter should be attached to Foundation Report 73-11004 and forms part of it.

A. Prakash

A. Prakash
Senior Engineer

AP:mt

c.c; E. J. Orr
B. R. Davis
A. Rutka
R. S. Pillar
H. Greeland
B. J. Giroux
D. Gunter
G. A. Wrong
P. Lewycky

for: K. G. Selby
Supervising Engineer

Files ✓ *Carr's*
Documents

PLASTICITY CHART

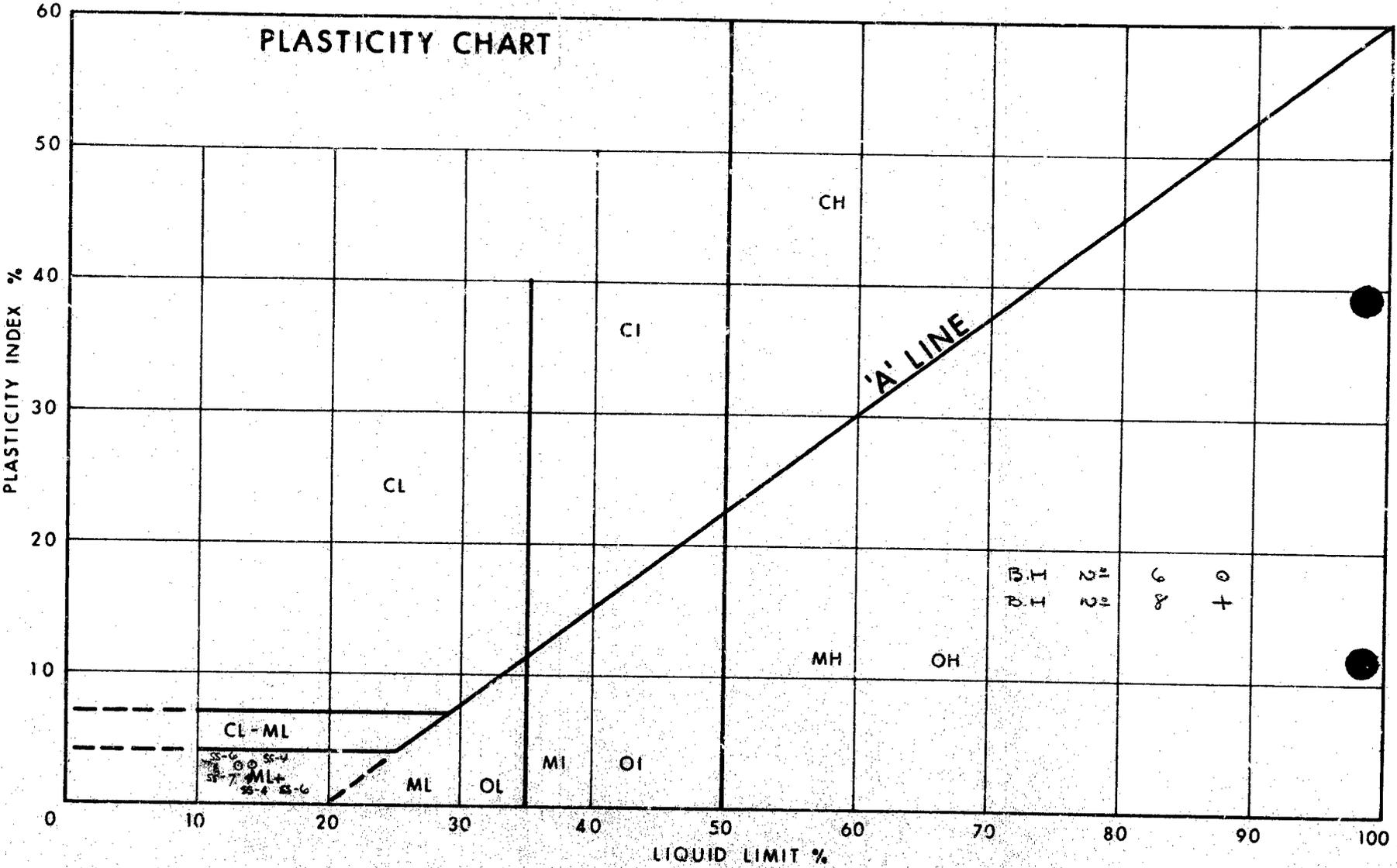


FIG.