

U-122 SER 1076

DOCUMENT AND SITE IDENTIFICATION

GEOCRES No. 304 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-ALL DRAINAGE TO BE INCLUDED IN THE REPORT 3

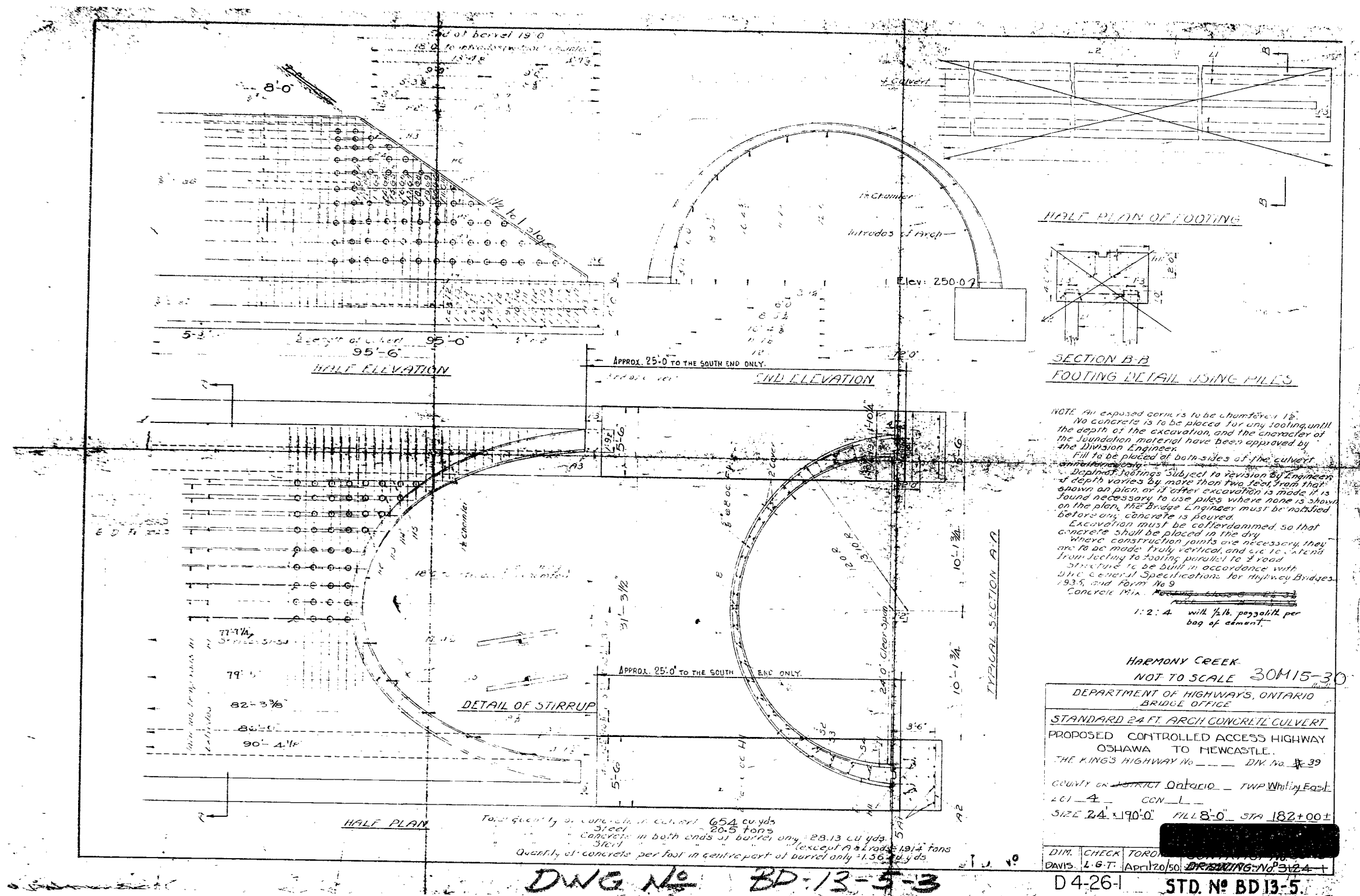
REMARKS \_\_\_\_\_

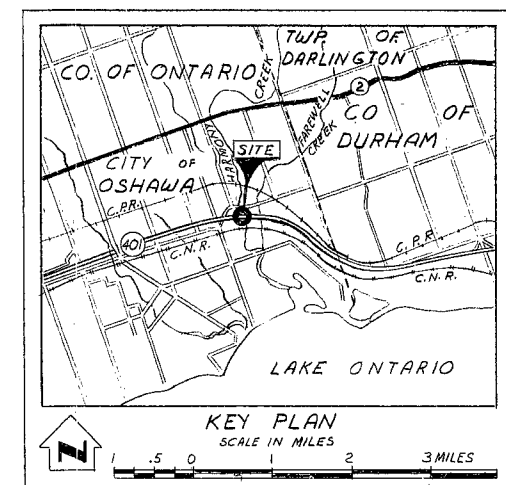
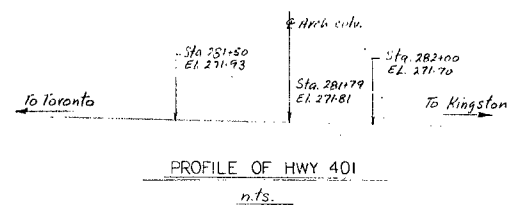
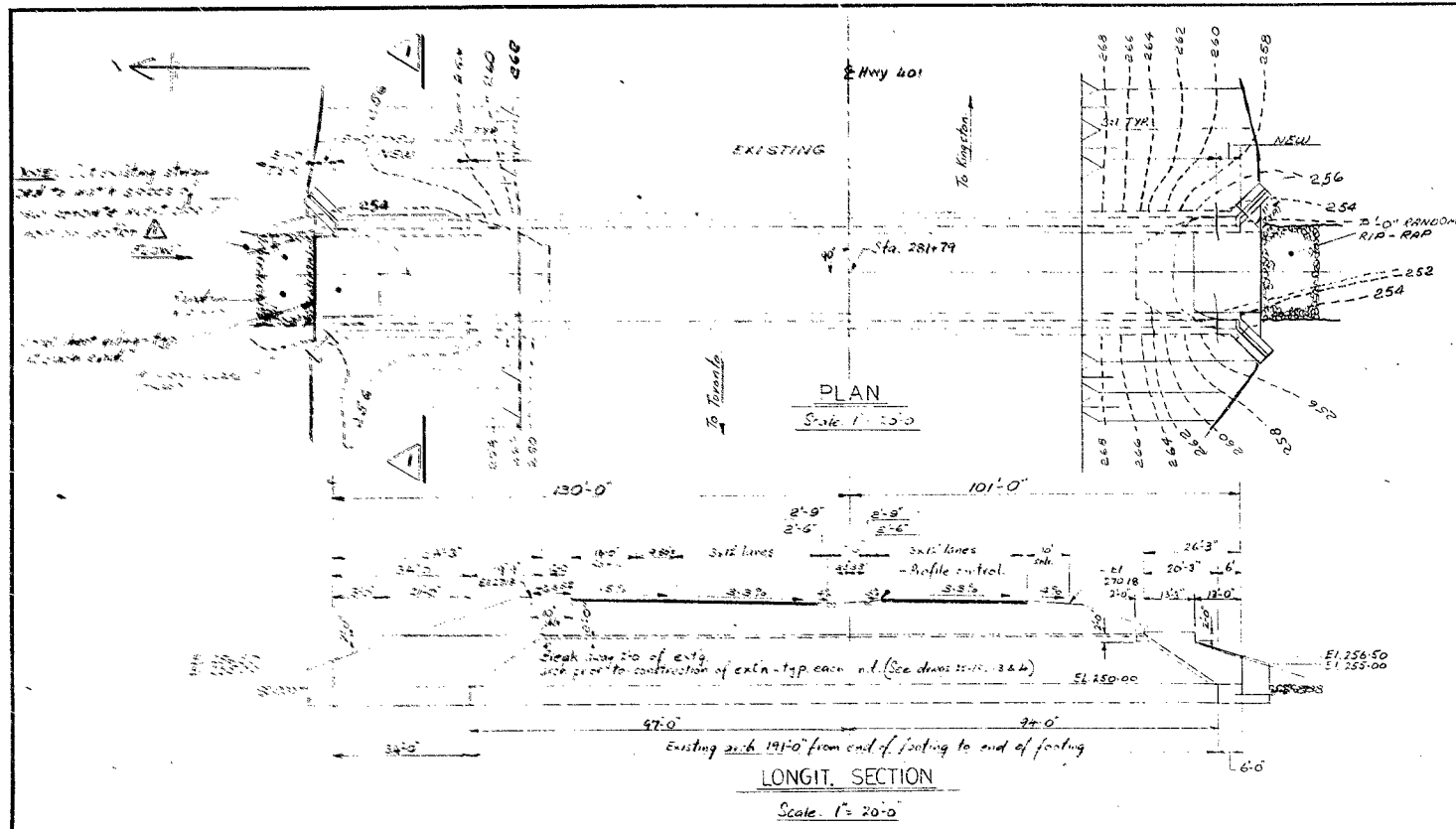
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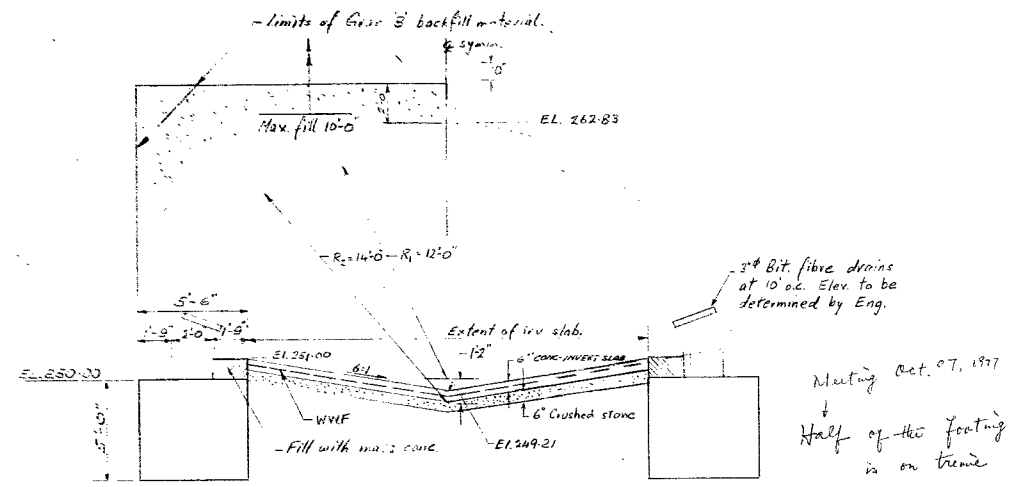


**CONCRETE QUANTITIES.**

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 psi.
- Clear cover to extrados steel and footing steel 3".
- Clear cover to intrados steel 2".
- TRAFFIC PROTECTION - FOR REQUIREMENT SEE GRADING DRAWINGS.
- Demolition of 5'-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".



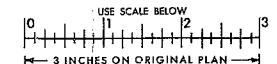
**NOTE:**  
CONCRETE INVERT SLAB TO EXTEND 5' BEYOND ENDS OF EXTENSIONS, THROUGHOUT NEW AND EXISTING ARCH. LENGTH 241'-0" REINFORCE WITH 6"x6" W.W.F.

FINALIZED  
JAN. 20/75  
Hull 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.

**FOR REDUCED PLAN**



REVISIONS	
DATE	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 H.B.	CHECK G.M.
DRAWING H.B.	CHECK P.E.
DATE DEC. 1974	LOADING H.S.20-44
W.P. No.	44-71-11
SITE No.	22-182 SHEET 1

30415-30

DOCUMENT MICROFILMING IDENTIFICATION

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

G.I-30 SEP 1976

# 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 <sup>rough</sup> 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

FOUNDATIONS OFFICE

## RECORD OF BOREHOLE NO 1

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 MY

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 $\gamma$	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT					
256.4	Ground Level									
0.0	Clayey silt with sand, traces of gravel.		1	SS	18					0 57 37 6
248.4	Stiff to Very Stiff		2	SS	28					9 40 40 13
8.0	Sand and gravel with some silt & clay. (Glacial Till)		3	SS	68					33 45 (22)
			4	SS	100/8"					26 49 (25)
			5	SS	100/4"					
			6	SS	100/4"					
			7	SS	100/8"					59 37 (4)
	Very Dense		8	SS	82					
232.4	Boulder									
231.4	Shale Bedrock		9	RC	100%					
25.0	Sound									
226.9	End of Borehole									
29.5										



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 *OM*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100	LIQUID LIMIT ——— PLASTIC LIMIT ——— WATER CONTENT ——— W <sub>p</sub> ——— W <sub>L</sub> ——— WATER CONTENT % 10 20 30	BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT					
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
246.0			3	SS	7					35 33 22 10
10.5	Sand & gravel with some silt & traces of clay. (Glacial Till) Dense to Very Dense		4	SS	30					18 47 31 1
			5	SS	100/6"					30 50 (20)
			6	SS	100/11"					
			7	SS	32					
			8	SS	100					
231.5										
25.0	Probable boulder or bedrock End of Borehole					230				

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

## RECORD OF BOREHOLE NO 4

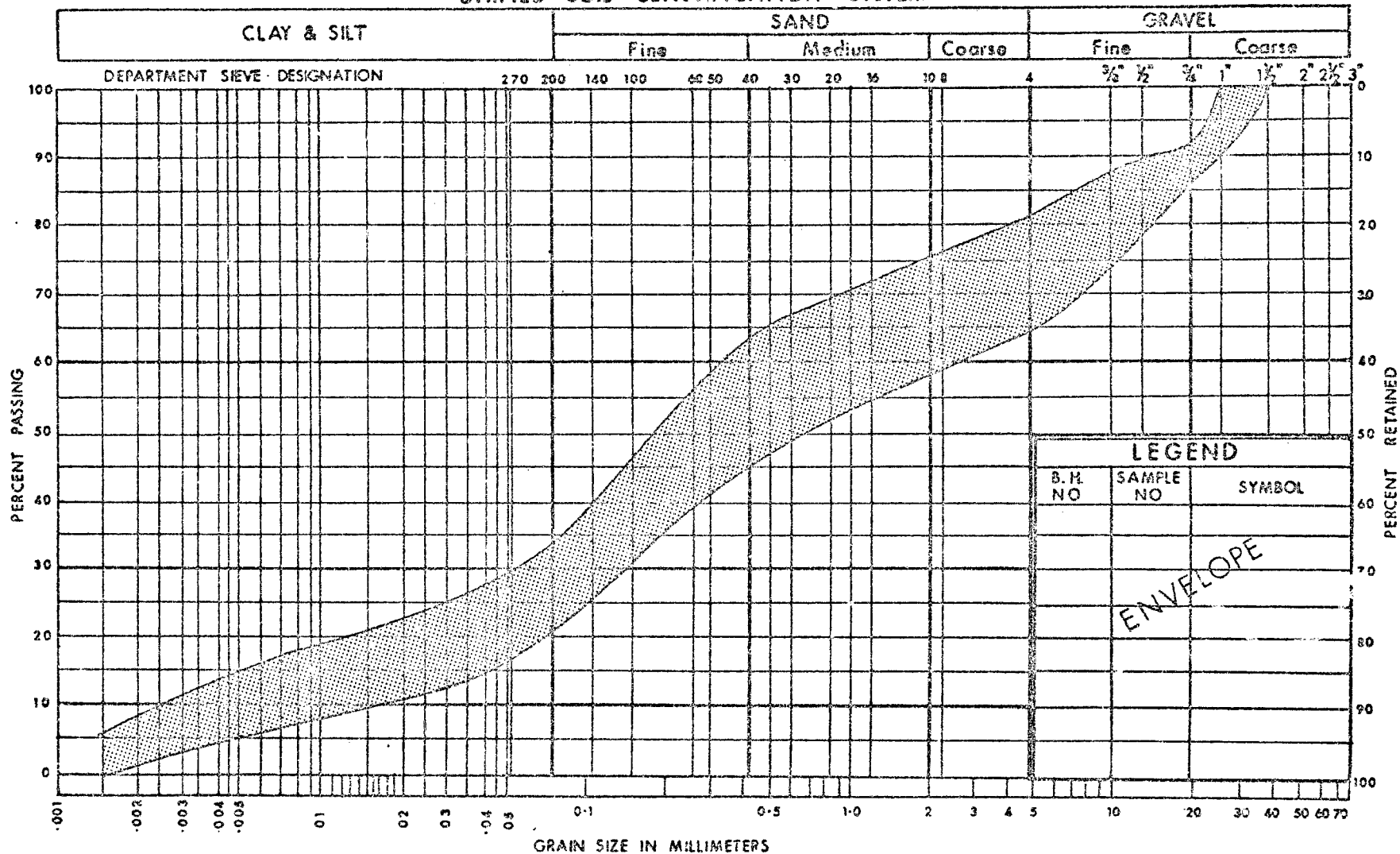
JOB 73-11004 LOCATION Co-ords. 15,947,343 N; 1,177,995 E. ORIGINATED BY MY  
 W.P. 44-71-11 BORING DATE April 11, 1973 COMPILED BY MY  
 DATUM Geodetic BOREHOLE TYPE Cone Test CHECKED BY AK

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 $W$ $W_P \rightarrow W \rightarrow W_L$ WATER CONTENT %	BULK DENSITY $\gamma$	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT					
256.9	Ground Level									P.C.F. GR.SA.SI.CL.
0.0	Probably clayey silt sith sand.					250				
246.4										
10.5	End of Cone Test						150/6"			





# UNIFIED SOIL CLASSIFICATION SYSTEM



DESIGN SERVICES  
BRANCH

## GRAIN SIZE DISTRIBUTION

GLACIAL TILL

SAND & GRAVEL, SOME SILT & CLAY

W.P. No. 44-71-11

JOB No. 73-11004

FIG. NO. 2

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


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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

FOUNDATIONS OFFICE

## RECORD OF BOREHOLE NO 6

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		STRAT. PLOT	SAMPLES		ft/m	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — $w_L$		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION		NUMBER	TYPE			BLOWS/FOOT	BLOWS / FOOT	(0.3 m)	PLASTIC LIMIT — $w_p$		
m.	ft.						20	40	60	80	100	
							SHEAR STRENGTH P.S.F. kPa		WATER CONTENT %		$\gamma$	
							○ UNCONFINED + FIELD VANE		$w_p$ — $w$ — $w_L$			
							● QUICK TRIAXIAL × LAB VANE		20 40 60		P.C.F.	GR. SA. SI. CL.
78.18	256.5	Ground Level										
0.0	0.0	Sand, traces of organics	1	SS	13							Elev. 252.8
76.05	249.5	Compact	2	SS	10	250						77.05
2.13	7.0	Sand & gravel with some silt — dense	3	SS	54	76.20						42 34 17 7
		and traces of clay v. dense	4	SS	42							30 47 18 5
		shale fragments (Glacial Till)	5	SS	98	240						8 42 41 9
			6	SS	100	73.15						22 47 24 7
70.26	230.5	Boulders, cobbles	7	SS	100	230						
7.92	26.0	End of Borehole				70.10						

## RECORD OF BOREHOLE NO 7

JOB 73-11004B LOCATION Co-ords. 15,947,572 N; 1,177,964 E.  
W.P. 44-71-11 BORING DATE May 30, 1974  
DATUM \_\_\_\_\_ BOREHOLE TYPE Cone Test

ORIGINATED BY PK  
COMPILED BY WG  
CHECKED BY           

SOIL PROFILE		SAMPLES			ELEV. SCALE ft./m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. ○ 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 %	BULK DENSITY $\gamma$ P.C.F. GR. SA. SI. CL.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE					
m. 78.18	256.5	Ground Level							
0.0	0.0	Probable sand and silt some gravel				250 76.2			
74.4	244.2								
3.8	12.3	End of Cone Test				240 73.2	140/142		

20  
15  $\phi$  5 % STRAIN AT FAILURE  
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

## RECORD OF BOREHOLE NO 8

JOB 73-11004B

LOCATION Co-ords. 15,947,552 N; 1,177,963 E.

ORIGINATED BY PK

W.P. 44-71-11

BORING DATE May 30, 1974

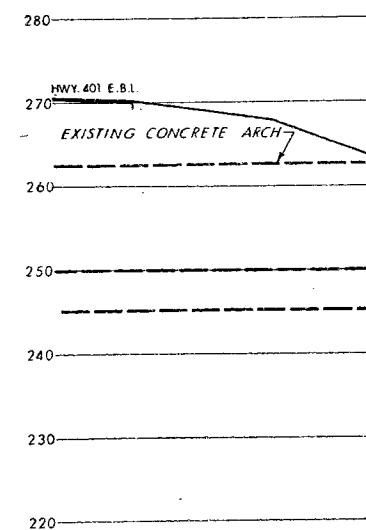
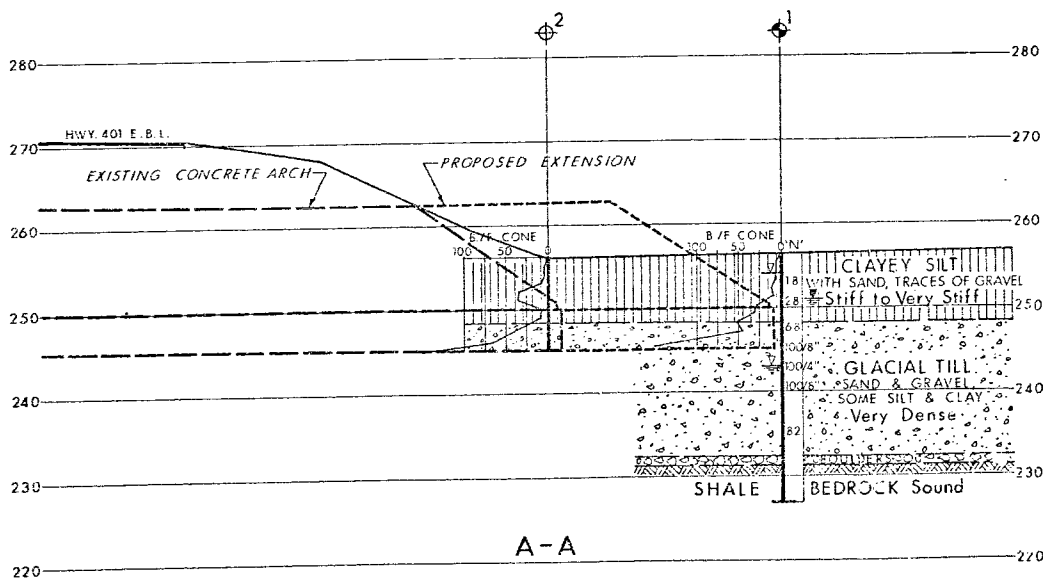
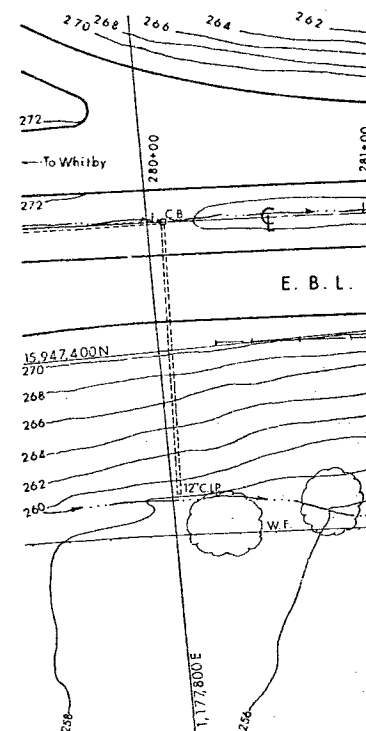
COMPILED BY WG

DATUM

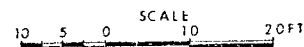
BOREHOLE TYPE Hollow Stem Auger and Cone Test

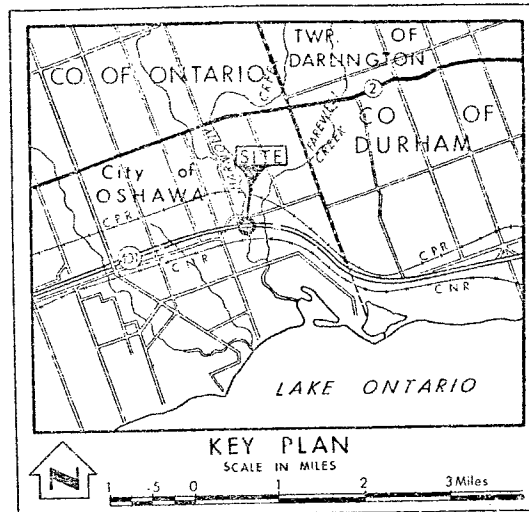
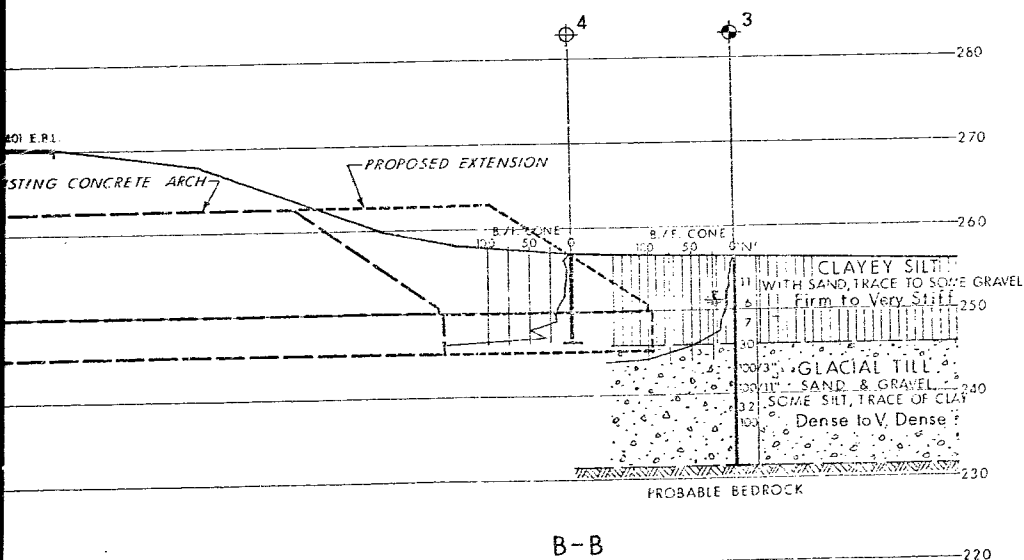
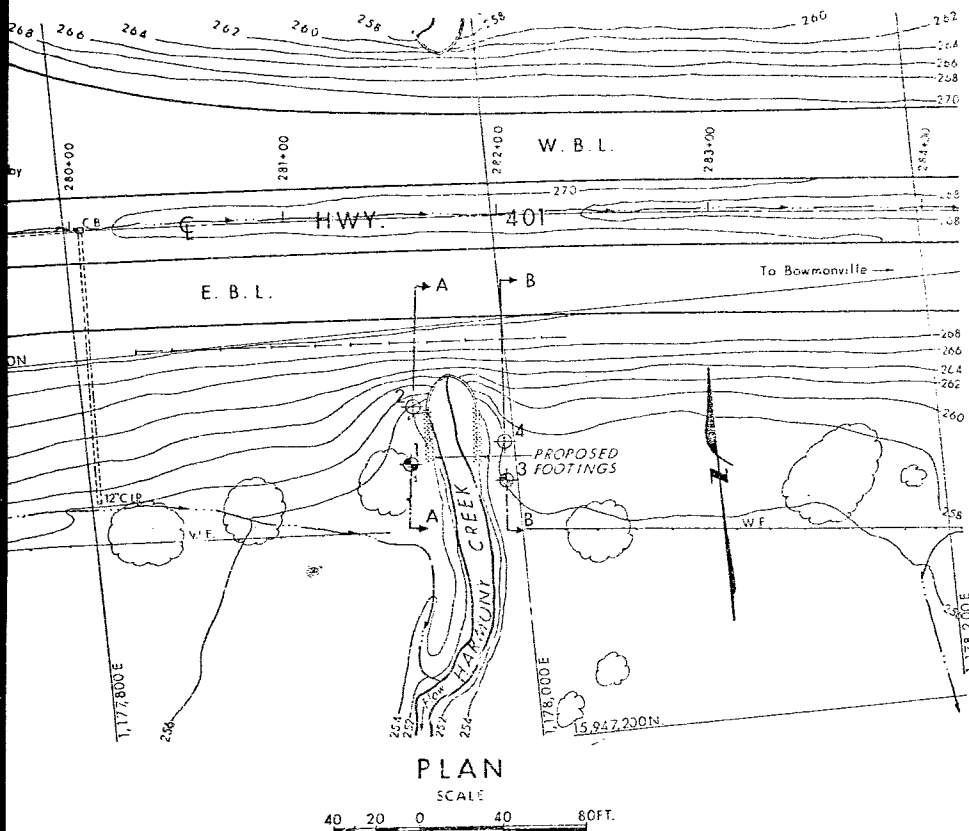
CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT $w_L$			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)			PLASTIC LIMIT $w_p$	WATER CONTENT $w$	WATER CONTENT %		
m. 78.15 0.0 77.08 1.07	ft. 256.4 0.0 252.9 3.5											
	Ground Level											
	Sand		1	SS	0							
	Very loose		2	SS	2	250						
			3	SS	20	76.2						
	Sand & gravel loose		4	SS	100	8"						
	with some loose		5	SS	100	3"						
	silt & clay coarser											
	shale fragments -											
	(Glacial Till)											
	cobbles very											
	boulders dense		6	SS	100	4"						
72.72	238.6					240						
5.43	17.8					73.15						
	End of Borehole											
						230						
						70.1						



SECTIONS





LEGEND			
	Bore Hole		
	Cone Penetration Test		
	Bore Hole & Cone Test		
	Water Levels established at time of field investigation, April 1973		
	Head Arresion 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

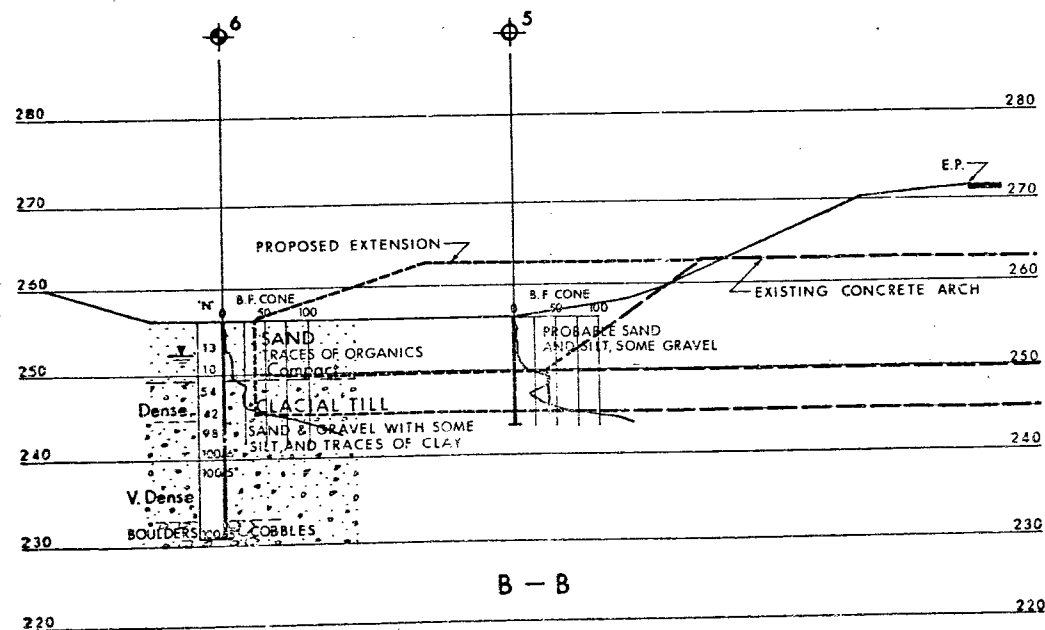
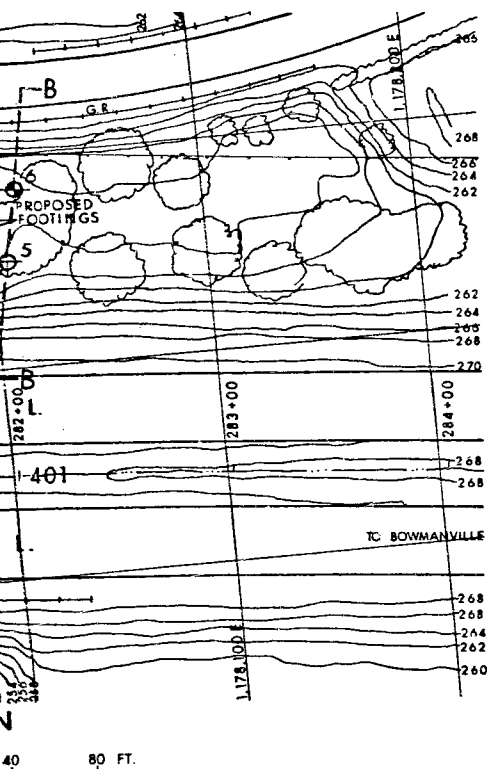
SUBMD M.Y. CHECKED	WF NO. 44-71-11	DRAWING NO.
DRAWN BY CHECKED	WO NO 73-11004	73-11004A
DATE June 15, 1973	SITE NO.	BRIDGE DRAWING NO.
APPROVED	CONT. NO.	
PRINCIPAL FOUNDATION ENGINEER		



REF NO. B-4-19

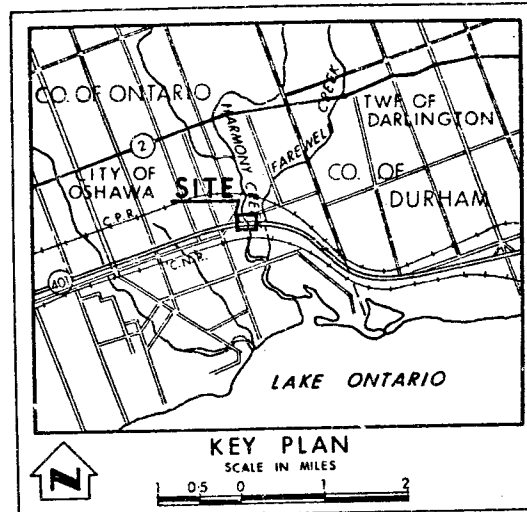






ONS

10 20 FT.



### 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	DATE	BY	DESCRIPTION

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

SUBMD P. K.	CHECKED	WP NO. 44-71-11	DRAWING NO.
DRAWN O. J.	CHECKED	WO NO 73-11004	73-11004B
DATE 10 JULY 1974	SITE NO.	BRIDGE DRAWING NO.	
APPROVED	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

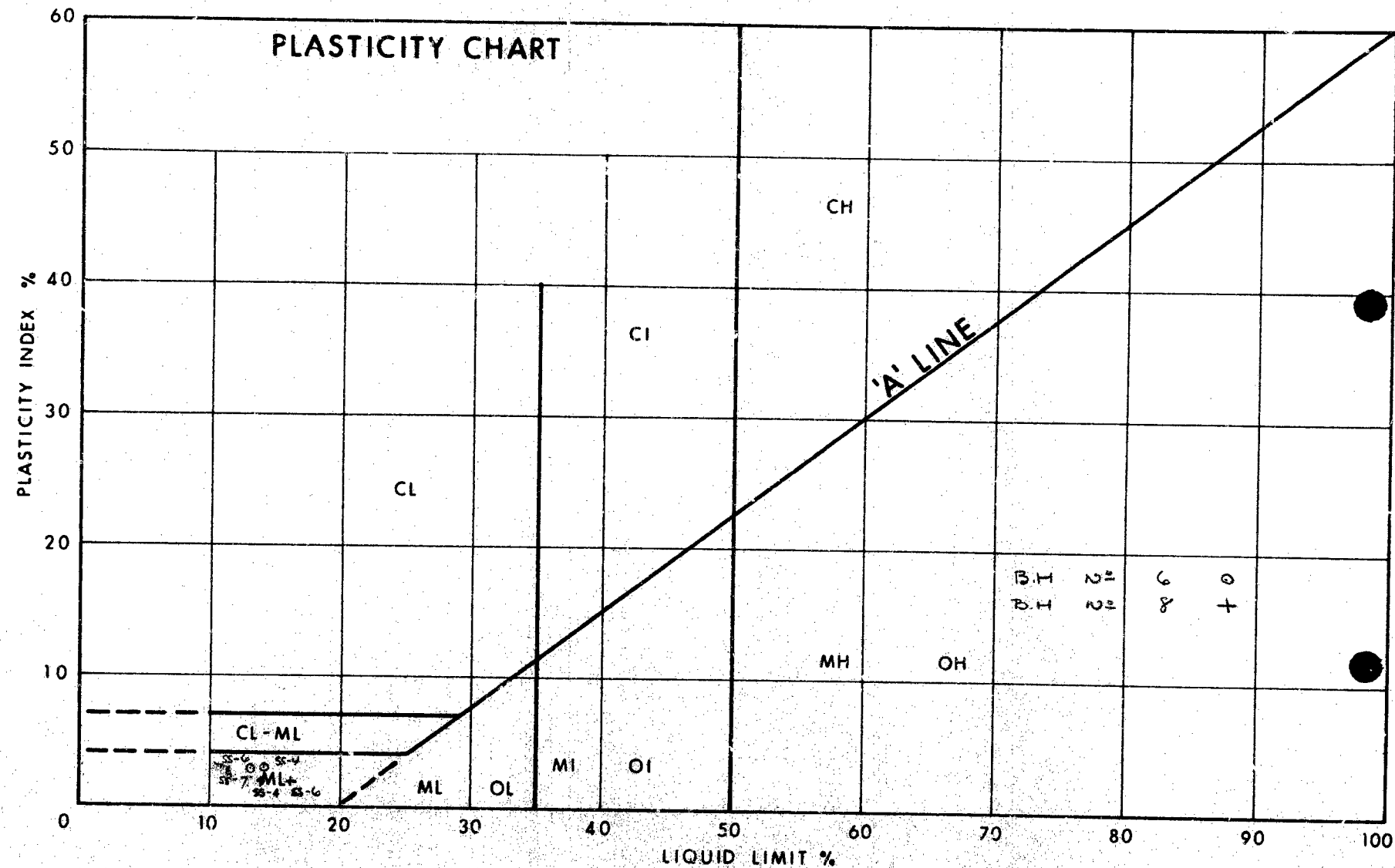


FIG.

W.O. 7A-11022