GEOCRES No. 30 H 15 - 37

DIST. 6 REGION CENTRAL

W.P. No. 44-71-18

CONT. No. 77-133

W. O. No.

STR. SITE No. 22-320

HWY. No.

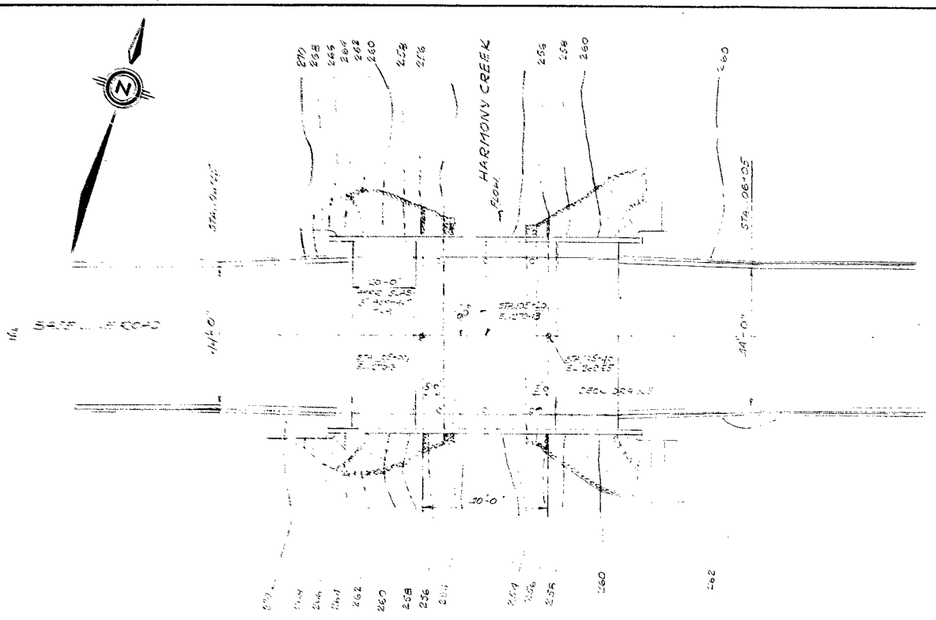
LOCATION BRIDGE AT HARMONY CREEK AND BASELINE RD.

OVERALL DRAWING IS IN FILE, SEE THIS FOLIO PAGE 3

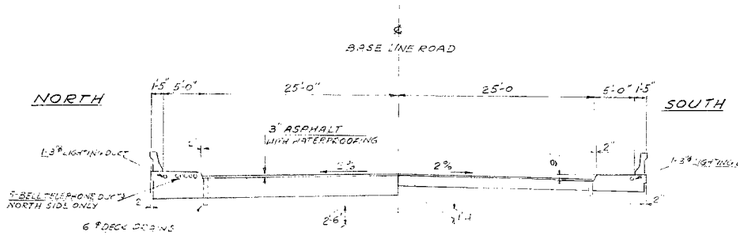
REMARKS:

30H15-37

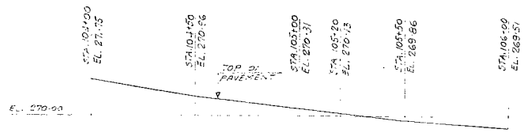
CONT No WP No 44-71-18	
HARMONY CREEK AND RELOCATED BASELINE RD. BRIDGE AT OSHAWA BASELINE ROAD, DISTRICT 7 GENERAL PLAN	SHEET



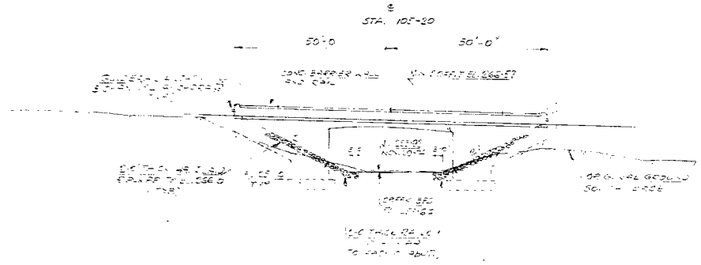
PLAN
1" = 10'-0"



CROSS SECTION
⅛" = 1'-0"



PROFILE OF BASE LINE ROAD AT ℄
1" = 30'-0"



ELEVATION
1" = 20'-0"

DHO PRECISE BM 414-69
EL. 264.66

CONCRETE BRIDGE CARRYING HWY. #401 OVER FARWELL CREEK BEING 1.85 MILES EAST OF INTERCHANGE NO. 70 (JCT. OF HWY. #401 AND SIMCOE ST.) AT OSHAWA, 0.45 MILES EAST OF INTERCHANGE NO. 73 (JCT. OF HWY. #401 AND HARMONY ROAD) AND 0.2 MILES WEST OF MILE POST 256. TABLET IS SET HORIZONTALLY IN EAST FACE OF EAST CONCRETE ABUTMENT, BEING 0.7 FEET SOUTH OF NORTH-EAST CORNER, 1.9 FEET BELOW TOP AND 32 FEET SOUTH OF CENTERLINE OF HWY. #401

CONSTRUCTION NOTES

GRANULAR BACKFILL BEHIND ABUTMENTS SHALL BE PLACED SIMULTANEOUSLY, LEVEL WITH A TOLERANCE OF ± 2 FT.

THE BOTTOM AND SIDES OF FOOTINGS SHALL BE POURED AGAINST UNDISTURBED GROUND. FALSE WORK SUPPORTING THE WING WALLS SHALL NOT BE REMOVED UNTIL CONCRETE IN THE DECK SLAB HAS ATTAINED A MINIMUM STRENGTH OF 3000 PSI

LIST OF DRAWINGS

REINFORCING STEEL GRADE

GRADE 60 EXCEPT WHERE NOTED

GENERAL NOTES

CLASS OF CONCRETE

FOOTINGS & APPROACH SLABS	– 30 MPa
REMAINDER	– 4000 PSI

CLEAR COVER ON REINFORCING STEEL

FOOTINGS, ABUTMENTS AND WINGWALLS	– 3"
SIDEWALLS AND APPROACH SLABS	– 2
BARRIER WALLS	– 1½
DECK – 2" TOP, 1½ BOTTOM	

CONCRETE QUANTITIES

CONCRETE IN STRUCTURE	528 CU. YD
CONCRETE IN BARRIER WALLS	17 CU. YD.
CONCRETE IN APPROACH SLABS	65 CU. YD.

RECEIVED
ROUTE & STRUCTURAL OFFICE
OCT 07 1976
SOIL MECHANICS
MINISTRY OF TRANSPORTATION & COMMUNICATIONS

FOR REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

REVISIONS	DATE	BY	DESCRIPTION

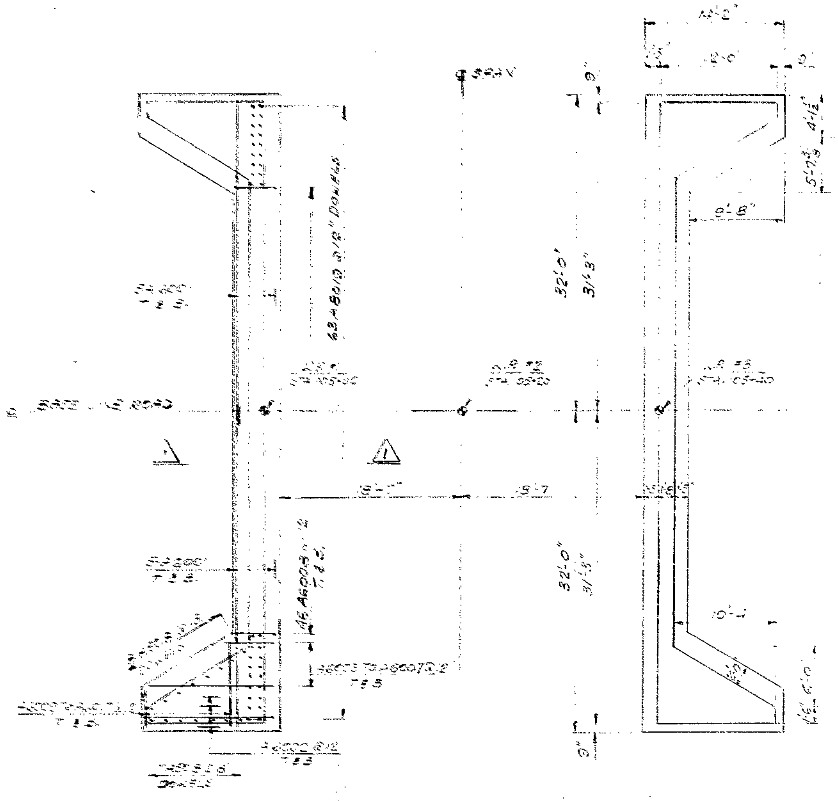
DESIGN		CHECK WM	LOADING H S 20-44	DATE MAY '76
DRAWING G.P.		CHECK WM	SITE No 22-320	DWG 1

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS ONTARIO 68-BW-15 4-75

TRANSLATION INVITED

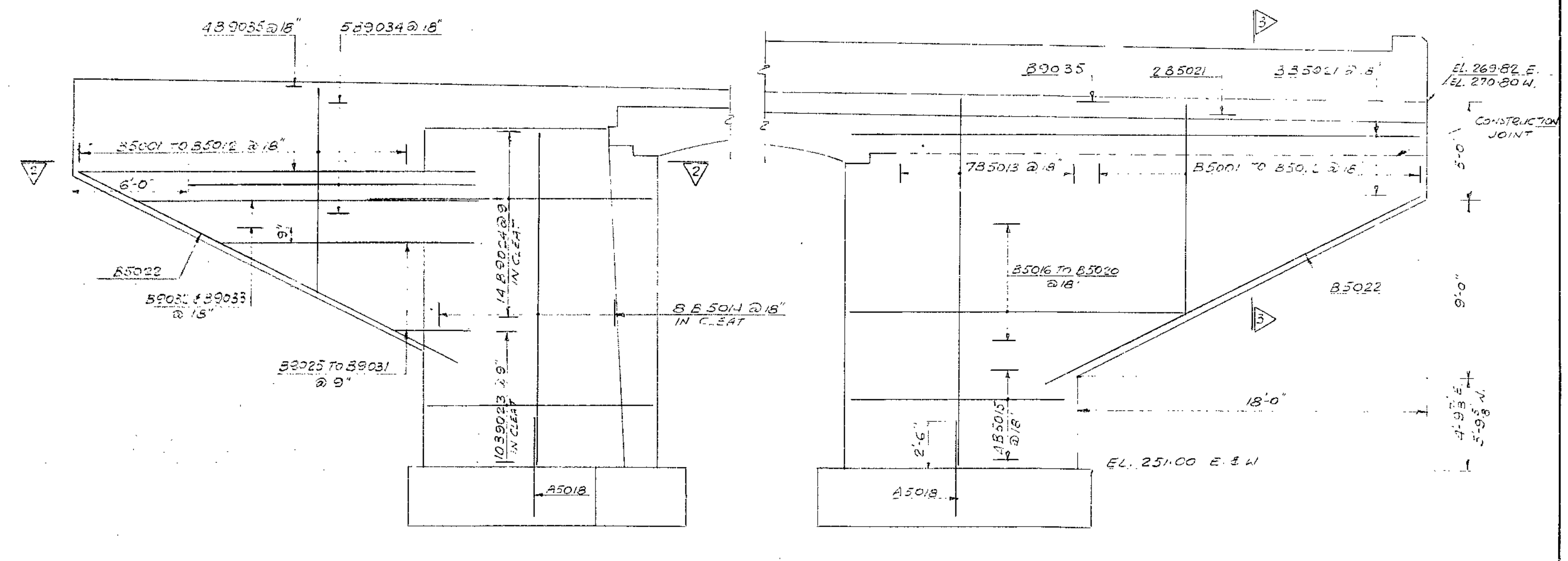
30M15-37

CONT No		SHEET
WP No 44-71-18		
HARMONY CREEK AND RELOCATED BASELINE RD. BRIDGE AT OSHAWA BASELINE ROAD, DISTRICT 7 FOOTINGS AND WINGWALLS		



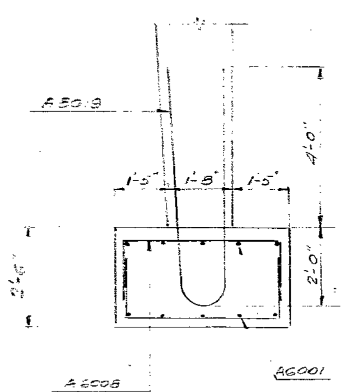
FOOTING PLAN

1/8" = 1'-0"



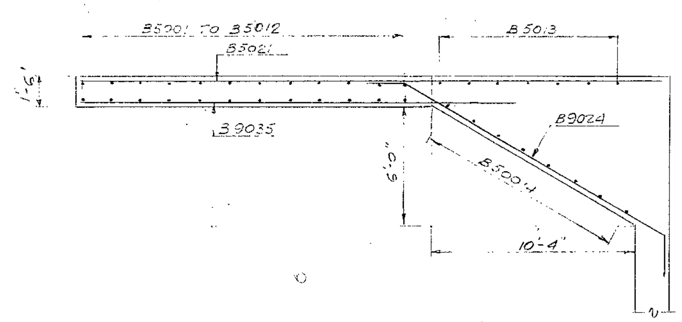
WINGWALLS

1/4" = 1'-0"



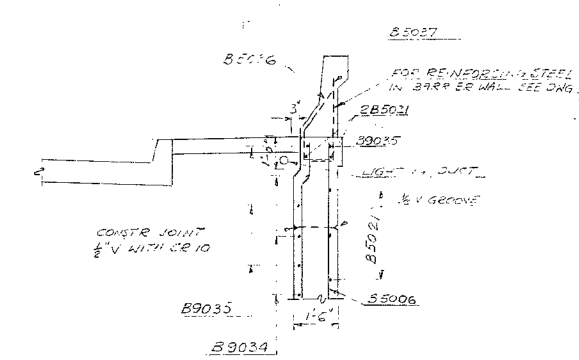
1

1/2" = 1'-0"



2

1/4" = 1'-0"



3

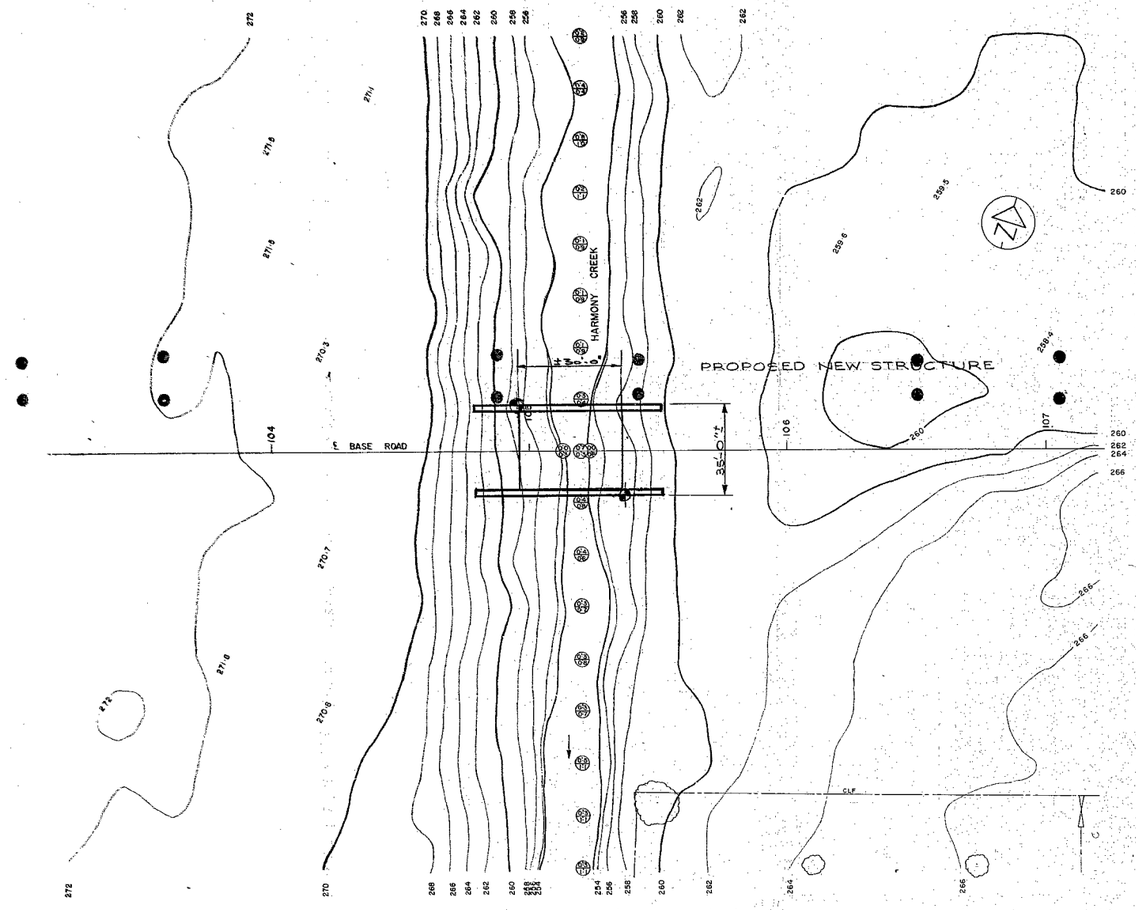
3/8" = 1'-0"

FOR REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

REVISIONS DATE	BY	DESCRIPTION	
DESIGN	CHECK WM	LOADING HS20-44	DATE SEP. 76
DRAWING G.P.	CHECK WM	SITE No 22-320	DWG 3

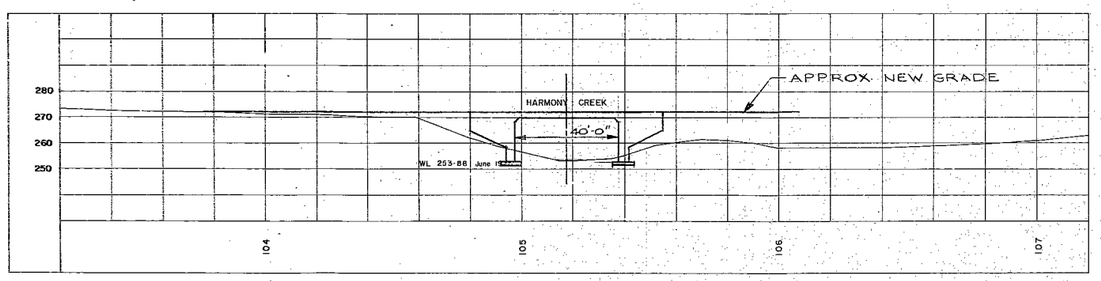
E-5425-1

GEO TWP EAST WHITBY
CITY OSHAWA
REG MUN DURHAM
LOT 4 CON 1



PLAN
10' 0 20'

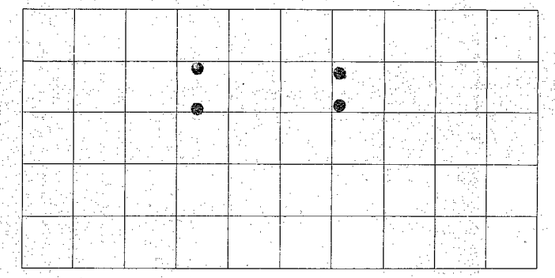
SOUNDINGS TO GRAVEL
water
gravel & sand

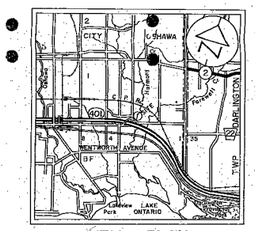


PROFILE OF BASE RD
10' 0 20'

DHO PRECISE BM 414-69
EL. 264·660

Concrete bridge carrying Hwy. # 401 over Farewell Creek being 1·85 miles east of interchange No. 70 (jct. of Hwy. # 401 and Simcoe St.) at Oshawa, 0·45 miles east of interchange No. 72 (jct. of Hwy. # 401 and Harmony Road) and 0·2 miles west of Mile Post 256. Tablet is set horizontally in east face of east concrete abutment, being 0·7 feet south of north-east corner, 1·4 feet below top and 52 feet south of centreline of Hwy. # 401.





KEY PLAN
0·5mi 0 10mi

DATE	REVISIONS & ADDITIONS

MINISTRY OF TRANSPORTATION & COMMUNICATIONS
ENGINEERING SERVICES OFFICE
ENGINEERING SURVEYS SECTION

BRIDGE SITE PLAN

PROPOSED CROSSING
AT
HARMONY CREEK
AND
BASE ROAD

LOT 4 CON 1
GEO TWP E. WHITBY REG MUN DURHAM

SCALE	DISTRICT	REGION
AS SHOWN	6 – TORONTO	CENTRAL
STUDY PLAN	PROFILE	PLAN 8-4-19
Date of Survey JUNE 1975	Date of Plan JULY 1975	SITE
WO		PLAN E-5425-1
WP 44-71-05		

SEP 30 1975

18

E-5425-1

DOCUMENT MICROFILMING IDENTIFICATION

GI-30 SEPT 1976

GEOCRES No. 30M15-37

DIST. 6 REGION Central

W.P. No. 44-71-18

CONT. No. 77-133

W. O. No.

STR. SITE No. 22-320

HWY. No.

LOCATION Bridge at Harmony Creek and Baseline Road

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 3

REMARKS: documents to be unfolded before microfilming

FOUNDATION INVESTIGATION REPORT

For

Proposed Bridge at Harmony Creek
and Baseline Road crossing at Oshawa
Regional Municipality of Durham
Twp. of Whitby, Con. 1, Lot 4 Dist. 6
W.P. 44-71-18 Site 22-320

1. INTRODUCTION

It is proposed to extend the existing Baseline Road eastward across the Harmony Creek by constructing a new bridge at the eastern portion of the city of Oshawa. At the request of G.C.E. Burkhardt, Regional Structural Planning Engineer (memo dated Sept. 29, 1975), Soil Mechanics Section carried out a subsoil investigation at this site. This report contains the results of this investigation and our recommendations pertaining to the design of the structure foundations and embankment stability.

2. DESCRIPTION OF SITE AND GEOLOGY

The site is located in the eastern portion of City of Oshawa and half a mile north of Hwy. 401. The topography of the terrain in the vicinity is generally flat to undulating. The site is in the physiographic region known as "Iroquois Plain".

3. FIELD AND LABORATORY WORK

A total of four sampled boreholes with adjacent cone penetration tests were carried out during the course of the field work. Boring was done by means of a C.M.E. Bombardier mounted auger machine adapted for soil sampling purposes. Disturbed samples of the subsoil were recovered at required depths in a 2" O.D. split-spoon sampler, which was hammered into the soil in accordance with the specifications for the Standard Penetration tests. The same method was used to advance the dynamic cone penetration tests. Bedrock was proven in two of the borings by obtaining BXL size rock core samples.

The locations and elevations of all the borings, which were

surveyed in the field by personnel from the Central Region Engineering Surveys, are shown on Drawing No. 447118-A, together with estimated stratigraphical sections across the site.

All samples were visually examined and identified in the field and subsequently in the laboratory. Following this, laboratory testing was carried out on selected representative samples to determine the various physical properties, namely,

Atterberg Limits
Natural Moisture Content
Grain-Size distribution

The results of the laboratory testing are plotted on the Record of Borelog sheets and summarized on Figs.1&2, all contained in the appendix of this report.

4. SUBSOIL AND BEDROCK CONDITIONS

(4.1) General

The subsoil in the area is mainly cohesive glacial till extending to bedrock. The flat area of the creek banks are covered with 3 to 5 ft. fill material and the material is very similar in composition to that of glacial till but with some organic inclusions. The bedrock was found to be shale at approximate elevation 233.0.

(4.2) Fill Material

Fill material having a total depth of 3 to 5 ft. was observed in all boreholes immediately below the ground surface on both sides of creek where the ground is generally flat. The material is very similar to the natural overburden (Glacial) consisting of a cohesive mixture of clayey silt, sand and gravel. The 'N' value of 6 to 23 blows/ft. indicates that the fill material was subjected to moderate degree of compaction.

(4.3) Glacial Till (Het.Mixture of Clayey Silt,Sand and Gravel)

This natural deposit was observed immediately below the fill material and generally composed of clayey silt with some sand and

gravel. The cohesive glacial till has a thickness of 17.5 to 19.5 ft. and is very stiff to hard, as indicated by 'N' values ranging from 19 to over 100 blows per foot. Grain size distribution curves for samples of the cohesive layer are plotted on Figure 2.

Atterberg limit testing was performed on samples of the cohesive material. The results, which are shown on the borelog sheets and on the Plasticity Chart (Fig. 1) are tabulated below:

	Range
Liquid Limit %	16-26
Plastic Limit %	9-18
Natural Moisture Content %	7-15

Based on these values it is estimated that the cohesive deposit is inorganic and of low plasticity.

(4.4) Shale Bedrock

The overburden is underlain by shale bedrock. The bedrock was proven in B.H.'s 2 and 3 by obtaining BXL size rock core samples. At the other two boreholes the bedrock surface was contacted by augering down to refusal. The surface of the bedrock was found to vary between elevations 233.0 and 234.3. The upper 0.5 to 1.0 ft. of the bedrock is some what weathered; below this depth, however, the bedrock is relatively sound, as evidenced by the high percentage of rock core recovery.

5. GROUNDWATER CONDITIONS

The groundwater level conditions across the site, during the period of the investigation (November, 1975) were observed by [illegible]ing readings in the open boreholes. The results of the readings are [illegible]n the borelog sheets, as well as on Drawing No. 447118-A.

The observations indicate that the groundwater level varies between elevations 253.8 to 254.5. These levels agree closely with the level of the

water in Harmony Creek, elevation 253.9 (November, 1975).

6. DISCUSSION AND RECOMMENDATIONS

(6.1) General

It is planned to extend Baseline Road eastward across the Harmony Creek at this location. The crossing will be by means of a 40 ft. wide rigid frame single span structure.

The subsoil at the site consists of cohesive glacial till, a heterogeneous mixture of clayey silt, sand and gravel in very stiff to hard state. On the flat portion of the creek banks the upper 3 to 5 ft. of the layer is fill material in a firm to very stiff state. The overburden is underlain by shale bedrock.

(6.2) Foundations

The proposed single space rigid frame structure abutments can be founded on spread footings. The creek bottom at the structure crossing is about elevation 252.5 ft. The cohesive glacial till is competent for support of spread footing type foundations. It is recommended that the proposed abutment foundations can be located at or below elevation 251.0, using a safe design load of 2.5 t.s.f. for foundation support. In all cases a minimum cover of 4 ft. to the underside of the footing should be provided for frost protection requirements. Alternatively the abutments can be supported on end bearing piles driven to bedrock. The bedrock surface at the site varies between elevation 233.0 and 234.3 ft. The choice of type of foundation will be decided upon economical and other considerations.

The foundation excavations will extend below the creek water level. Since the cohesive subsoil is relatively impervious, no major dewatering problems are anticipated. Any seepage into the excavations could be controlled by using conventional techniques such as pumping from sumps.

If the structure is designed as rigid frame, then a coefficient of earth pressure at rest (Ko) of 0.5 should be assumed for the granular material placed behind the wall when designing the wall sections. However, if some movement of the top of the wall is permitted, then a coefficient of active earth pressure (Ka) of 0.33 can be used. In all cases, the design should incorporate the full effect of the surcharge located above the walls.

(6.3) Approach Embankments

The proposed grade of the new Baseline Road at this crossing is at elevation 272.0 ft. This indicates that a max. of 10-12 ft. high approach fill will be required on the east side. The subsoil is competent and no stability problems are anticipated, if approach slopes are maintained with 2 horizontal and 1 vertical.

7. MISCELLANEOUS

The field work, performed during November 20-21, 1975, was carried out under the supervision of Mr. V. Korlu, Project Engineer, who also prepared this report. The equipment was owned and operated by Johnston Co. of Toronto.

This project was carried out under the general supervison of Mr. M. Devata, Supervising Engineer, who also reviewed this report.

V. Korlu, P. Eng.
Project Engineer

M. Devata, P. Eng.
Supervising Engineer

REGISTERED PROFESSIONAL ENGINEER
CIVIL
V. KORLU
PROVINCE OF ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS – ONTARIO

ENGINEERING SERVICES BRANCH – GEOTECHNICAL OFFICE – SOIL MECHANICS SECTION

RECORD OF BOREHOLE No 1

WP 44-71-18 LOCATION Sta. 104 + 95 15' Lt. ORIGINATED BY VK

DIST 6 HWY 401 BORING DATE November 20, 1975 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE CME (5.1) M.V.H.S. CHECKED BY [illegible]

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	'N' VALUES	GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH: o UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE	LIQUID LIMIT w_L, PLASTIC LIMIT w_P, WATER CONTENT w (w_P — w — w_L) / WATER CONTENT % (10 20 30)	UNIT WEIGHT γ	REMARKS % GR SA SI CL
257.7	Ground Level									
0.0	Fill material Clayey silt, sand and gravel, trace of orgs.		1	SS	10			o—H	Org. 0.9%	21 44 27 8
252.7										
5.0	Glacial Till Het. mix of clayey silt, sand & gravel		2	SS	22	250				
			3	SS	50			o—H		15 44 34 7
			4	SS	47	240				
	Very Stiff to Hard		5	SS	136			o—H		12 51 32 5
234.2			6	SS	112					
23.5	End of Borehole Probable Bedrock					230				

20
15 ◇ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS – ONTARIO

ENGINEERING SERVICES BRANCH – GEOTECHNICAL OFFICE – SOIL MECHANICS SECTION

RECORD OF BOREHOLE No 2

WP 44-71-18 LOCATION Sta. 105 + 35 15' Lt. ORIGINATED BY VK

DIST 6 HWY 401 BORING DATE November 20, 1975 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE CME (5.1) M.V.H.S. CHECKED BY N.T.

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	'N' VALUES	GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) SHEAR STRENGTH: o 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 % (10 20 30)	UNIT WEIGHT γ	REMARKS % GR SA SI CL
255.5	Ground Level									
0.0 / 251.5	Fill matl., clayey silt, sand & gravel, trace of organics.		1	SS	23			o ⊢—⊣	Org. 12.9%	8 25 47 20
4.0	Glacial Till Het. mix. of clayey silt, sand & gravel		2	SS	26	250				
			3	SS	44			o ⊢—⊣		9 44 33 14
	Very Stiff to Hard		4	SS	89	240				
234.0			5	SS	100/6"			o ⊢—⊣		0 48 43 9
21.5 / 229.0	~~weathered~~ sound Shale Bedrock		6	RC BXL	Rec 95%	230				
26.5	End of Borehole					220				

20
15 ◇ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS – ONTARIO

ENGINEERING SERVICES BRANCH - GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE Nº 3

WP 44-71-18 LOCATION Sta. 104 + 95 15' Rt ORIGINATED BY VK

DIST 6 HWY 401 BORING DATE November 19, 1975 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE CME (5.1) M.V.H.S. CHECKED BY G.J.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' VALUES	GROUND WATER ELEV
258.0	Ground Level					
0.0 / 252.5	Fill mat'l., clayey silt, sand & gravel, trace of organics.		1	SS	6	
			2	SS	28	
5.5	Glacial Till					
	Het.mix. of clayey		3	SS	77	
	silt, sand & gravel		4	SS	84	
			5	SS	117	
	Very Stiff to Hard					
233.0						
25.0	weathered sound			RC	Rec	
228.0	Shale Bedrock		6	BXL	95%	
30.0	End of Borehole					

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100
SHEAR STRENGTH
o 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 %
10 20 30

UNIT WEIGHT γ

REMARKS

	% GR	SA	SI	CL
Org. 13.1%	3	40	49	8
	9	43	37	11
	7	47	37	9

15 20 5 10 % STRAIN AT FAILURE

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS – ONTARIO

ENGINEERING SERVICES BRANCH – GEOTECHNICAL OFFICE – SOIL MECHANICS SECTION

RECORD OF BOREHOLE No 4

WP 44-71-18 LOCATION Sta. 105 + 35 15' Rt. ORIGINATED BY VK

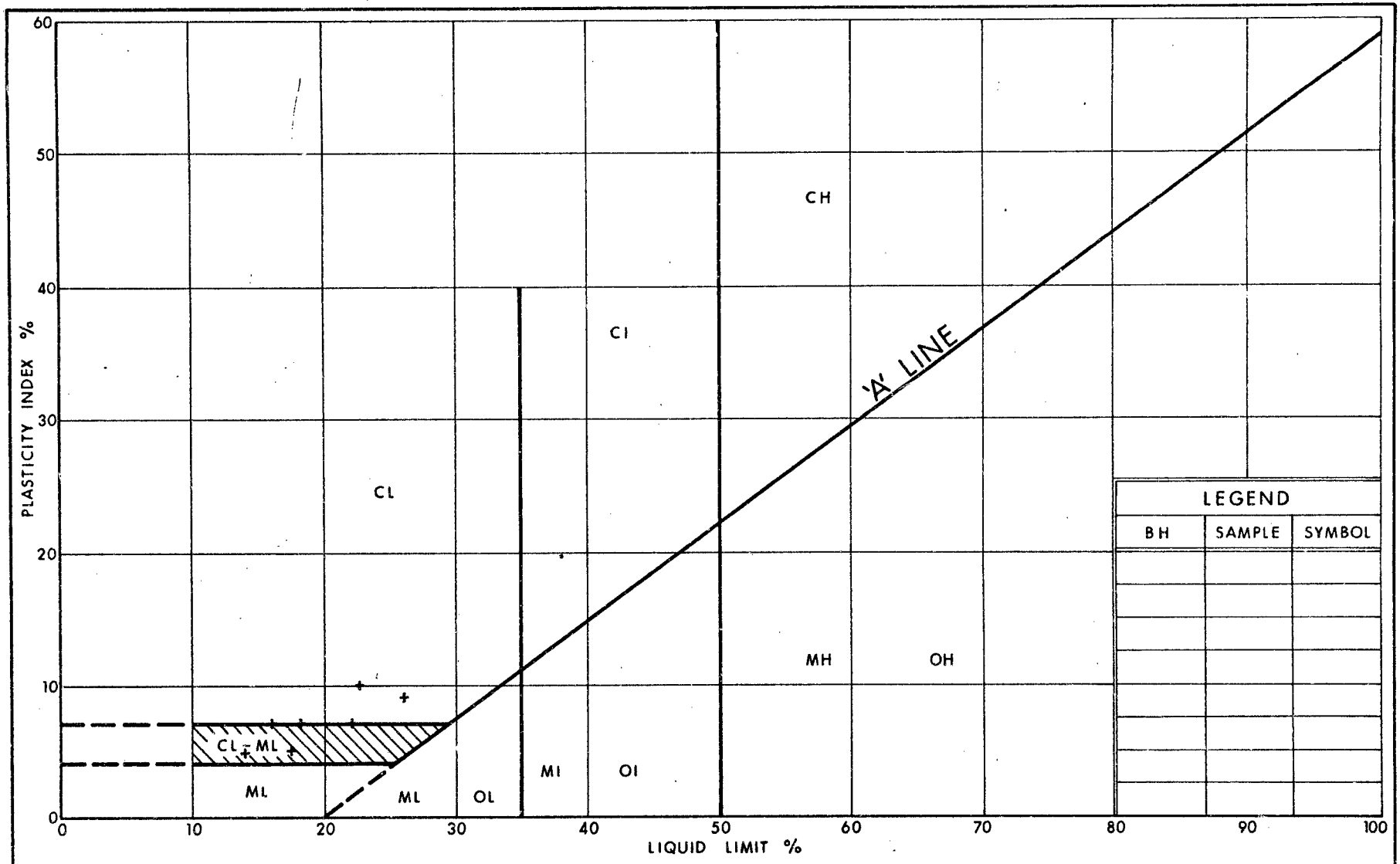
DIST 6 HWY 401 BORING DATE November 21, 1975 COMPILED BY VK

DATUM Geodetic BOREHOLE TYPE CME (5.1) M.V.H.S. CHECKED BY N.S.

ELEV / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES 'N' VALUES	GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w (w_P — w — w_L) / WATER CONTENT % (10 20 30)	UNIT WEIGHT γ	REMARKS % GR SA SI CL
255.3	Ground Level									
0.0 / 252.3	Fill mat'l., clayey silt, sand & gravel, trace of organics.									
3.0	Glacial Till		1	SS	24					14 38 35 13
			2	SS	19	250				
	Het.mix.of clayey silt, sand & gravel		3	SS	60					9 45 35 11
	Very Stiff to Hard		4	SS	84	240				
234.3			5	SS	115					0 55 37 8
21.0	End of Borehole Probable Bedrock					230				

20
15 ◇ 5 % STRAIN AT FAILURE
10

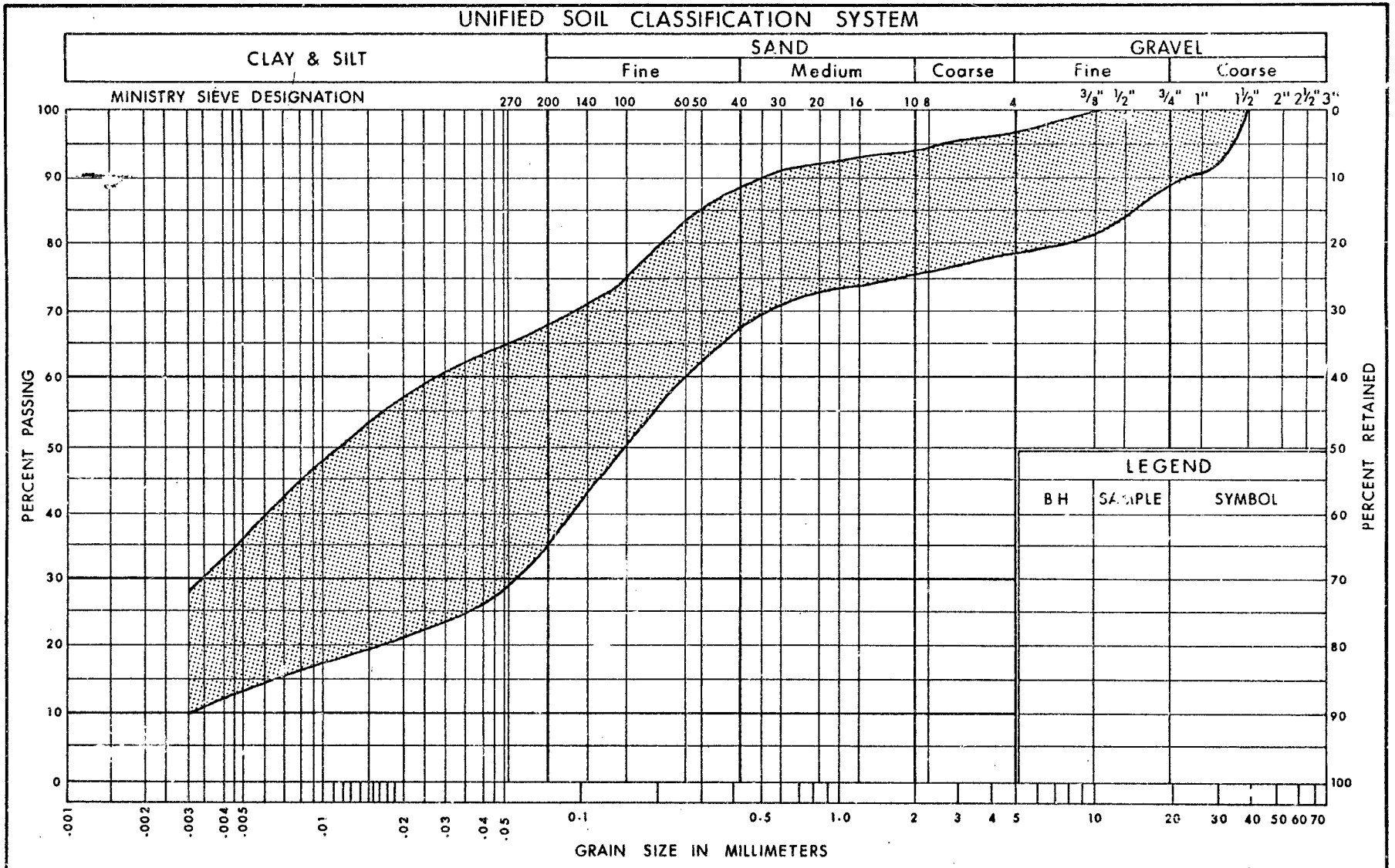
OFFICE REPORT ON SOIL EXPLORATION



Ministry of Transportation and Communications
Ontario
ENGINEERING SERVICES BRANCH

PLASTICITY CHART
GLACIAL TILL
HET. MIX. OF CLAYEY SILT, SAND & GRAVEL

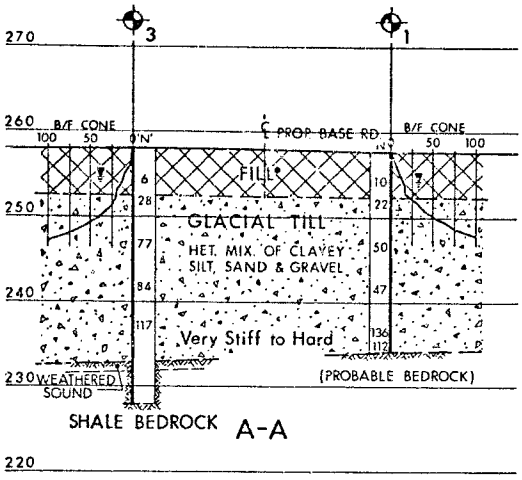
FIG No 1
W P 44-71-18



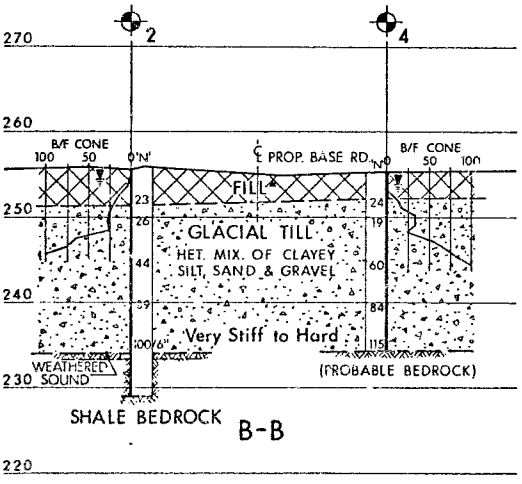
Ministry of Transportation and Communications
Ontario
ENGINEERING SERVICES BRANCH

GRAIN SIZE DISTRIBUTION
GLACIAL TILL
HET. MIX. OF CLAYEY SILT, SAND & GRAVEL

FIG No 2
W P 44-71-18



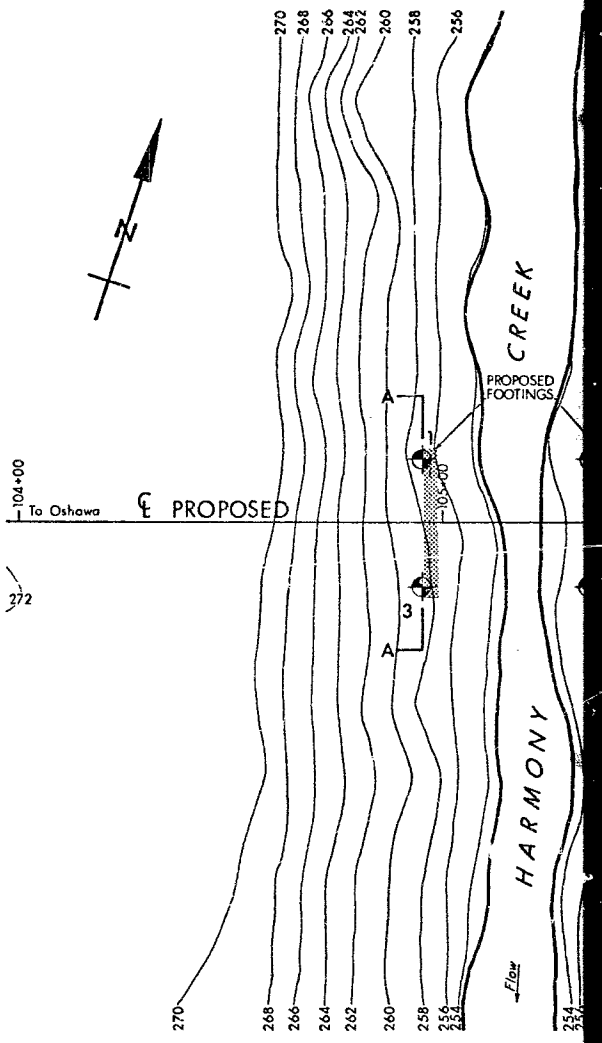
A-A



B-B

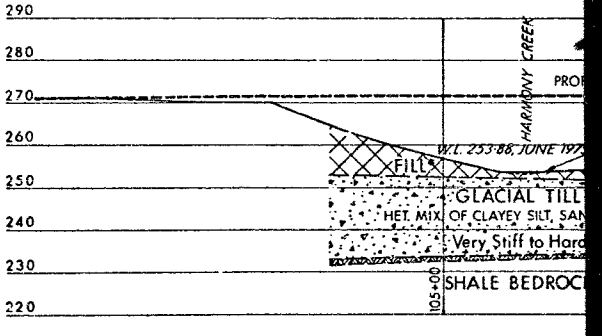
SECTIONS

10 5 0 SCALE 10 20 FT.



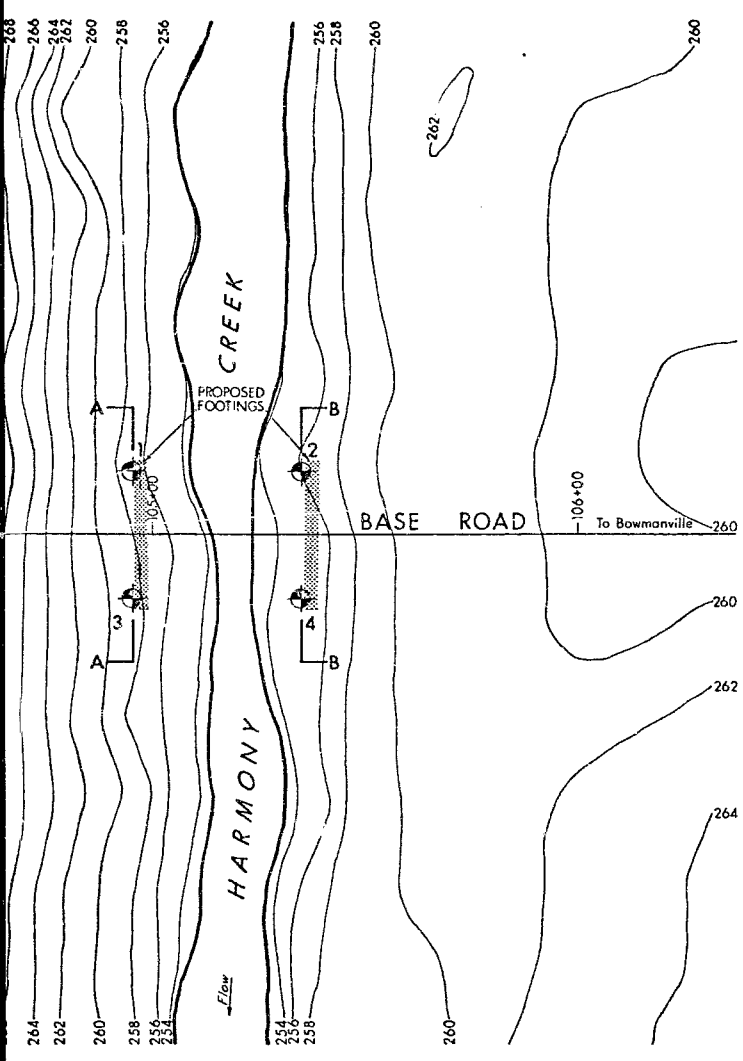
PLAN

20 10 0 SCALE 20



PROFILE

20 10 0 SCALE 20



PLAN
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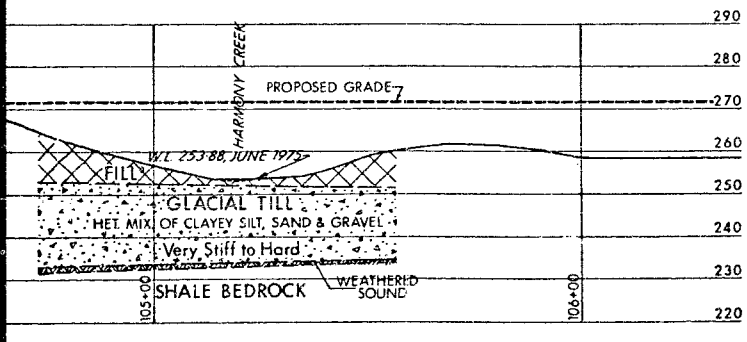

PROFILE
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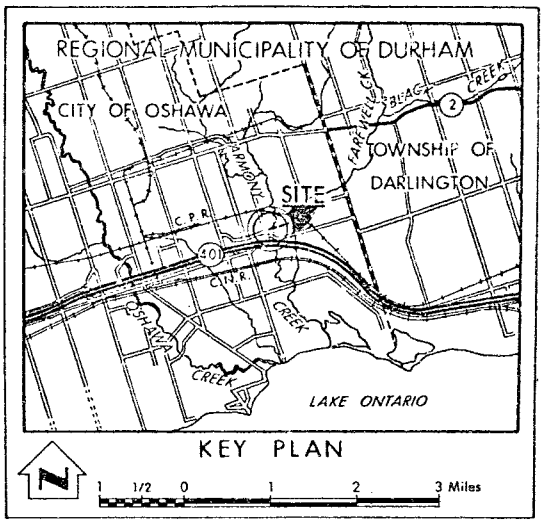

KEY PLAN

*FILL MATERIAL
(CLAYEY SILT, SAND & GRAVEL. TRACE OF ORGANICS.)

LEGEND

- Bore Hole
- Dynamic Cone Penetration Resistance Test B/F CONE - Blows/Ft. Cone Test (350 ft. lbs. energy/blow)
- Bore Hole & Cone Test
- Water Levels established at time of field investigation, NOV. 1975.

NO.	ELEVATION	STATION	OFFSET
1	257·7	104+95	15' LT.
2	255·5	105+35	15' LT.
3	258·0	104+95	15' RT.
4	256·3	105+35	15' RT.

REGISTERED PROFESSIONAL ENGINEER — CIVIL — V. KORLU — PROVINCE OF ONTARIO

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

NOTE FOR CONTRACT DOCUMENT
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.

REVISIONS			
DATE	BY	DESCRIPTION	

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO
ENGINEERING SERVICES BRANCH - GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

HARMONY CREEK

HIGHWAY NO ℄ (PROP.) BASE ROAD DIST. NO 6
REGIONAL MUNICIPALITY OF DURHAM
CITY OF OSHAWA LOT 4 CON 1

BORE HOLE LOCATIONS & SOIL STRATA

SUBMD V. K.	CHECKED	WP NO 44-71-18	DRAWING NO 447118-A
DRAWN N.T.	CHECKED	W O NO	
DATE January 15, 1976		SITE NO 22-320	BRIDGE DRAWING NO
APPROVED		CONT NO	

REF. NO. E-5425-1 June, 1975

Ministry of Transportation and Communications
Ontario

Memorandum

To: Dr. J. E. Heffernan,
Head, Programming Office,
West Tower.

From: G.C.E. Burkhardt,
Structural Planning Office,
3501 Dufferin Street,

Attention: Mr. E. Howard:

Date: January 20th, 1976.

Our File Ref.

In Reply to

Subject:

Removing of Existing and Erecting a new Structure at Baseline Road and Harmony Creek Approx. 400 ft. north of Hwy. #401 in Oshawa, Lot 4, Con. 1, Site Baseline Road, District 7. (Unit #6)

In conjunction with the widening of Hwy. #401, it is necessary to relocate Baseline Road approximately 400 feet northwards. The existing 24'-0"ø barrel arch culvert which carries at present Baseline Road over Harmony Creek will be demolished and a new structure erected at the above indicated site.

To prevent the flooding of the surrounding urban area, Hydrological calculation indicated that a bridge with approximately 40 ft. clear opening would be required at this site.

The estimated construction price:

a) Structure $100,000

b) Demolishing of existing culvert $10,000.

Would you please assign a W.P. number for this project.

W. Kulmatickas,
Structural Planning Engineer,
for:
G.C.E. Burkhardt,
REG. STRUCTURAL PLANNING ENG.

WK:Vk
c.c. R. Fitzgibbon
J. Anderson
C. Mirza

File with 44-71-05

MINUTES OF MEETING

Date: October 22, 1975.

Location: Systems Design Branch Boardroom

Those in Attendance:

D.M. MacDonald, District #6 (Construction Engineer)
R.S. Illingworth, District #6 (Engineering Office Supervisor)
I. Tremain, District #6 (Construction Supervisor)
K.S. Selby, Geotechnical Office
R.A. Verscheure, Contract Control Office
D. McCune, Structural Office
S.P. Wilson, Quality Control Office
G. Kunzelmann, Analysis Office
S. Martins, Construction Office
D.J. Zander, Policy and Procedures Office
C.S. Rust, Policy and Procedures Office

The purpose of the meeting was to discuss the various design features, proposed methods of tendering and problem areas associated with the construction of the concrete median barrier.

The meeting was opened by C. Rust with a brief description of the proposed types of concrete barrier systems and available construction techniques.

Types of concrete barrier systems:

1. Without median lighting -
   (a) homogenous run with a 150 mm top throughout

2. With median lighting -
   (a) homogenous run with 350 mm top throughout
   (b) hetrogenous run with 150 mm top being transitioned to a 350 mm top at light pole locations

Types of construction methods available to contractors:

1. slipforming
2. cast-in-place
3. precast

On W.P. 44-71-05 (Highway 401 through Oshawa) a homogenous run with a 350 mm top will be used. The precast option will, therefore, not be made available to the contractor. However, on future contracts all of the above options will be made available.

I. Tremain suggested that, when the options are made available, tender quantities should be calculated on the narrowest design (150 mm). Those in attendance generally agreed.

The different construction methods and applications will be defined under the general conditions and standard specifications. There will

be a new material specification required for the precast concrete barrier. Existing material specifications should already cover the materials required for slipformed and cast-in-place barriers.

Areas of Conflict

It was brought to the attention of the meeting, by C. Rust, that there is an area of conflict with trucks pulling off onto the median shoulder for emergencies, and hitting light poles and overhead signs in the median. This conflict exists because of the combination of 4% crossfall, which slopes the truck toward the median, and the ability of a truck to pull up close to the barrier system.

The following solutions to this problem were then put forth:

a) accept the conflict between the truck and light poles and overhead signs;

b) use shoulder lighting;

c) increase the width of the barrier at the light pole and overhead sign location;

d) reverse the crossfall of the pavement;

e) re-design overhead sign truss.

D. Zander pointed out that his proposal would be to accept the conflict at light poles because it seems to be the most feasible solution at present. D. MacDonald seemed a little hesitant about accepting this proposal.

To eliminate the conflict with overhead signs, D. Zander proposed that a combination of a narrower overhead sign truss with a widened concrete barrier would be the most workable solution. Those in attendance generally agreed.

D. McCune added that if a new truss was to be developed, it probably would not be available in time for application on W.P. 44-71-05.

The District stated that signing for W.P. 44-71-05 might be accomplished by shoulder and bridge installations, thus eliminating the need for overhead signs.

D. Zander plans to follow up this idea with Mr. W. Roters of Central Region.

C. Rust described the placement of manholes and catchbasins as presenting another problem area. If manholes and catchbasins are placed as with curb and gutter, the adjustment of the frame and grate, when resurfacing, will be difficult.

D. Zander informed the meeting that moving the manhole and catchbasins out five inches, with slight dishing around the inlet, would eliminate this problem.

C. Rust then prompted a discussion on the use of T-connections (staggered system) instead of the standard adjacent manhole-catchbasin arrangement.

The District pointed out that with the standard manhole-catchbasin arrangement, the compaction betweem the installation would be difficult. They also noted that the construction procedure for installing the two different systems would not vary. For these reasons the District preferred the staggered system over the adjacent manhole-catchbasin arrangement.

Resolutions

During the meeting the following design features were agreed upon:

a) 3000 p.s.i. concrete to be used for the concrete barrier, as per S. Wilson.

b) 40:1 tapes to piers, light poles and overhead signs, as per standard drawing.

c) at piers location the barrier will be split into two 150 mm barriers. An approved granular material will be placed in between the barrier and capped with 2 inches of asphalt to prevent water infiltration.

d) The footing and barrier section required to mount light poles and overhead signs should be cast in place.

e) For curing a white pigmented membrane, curing compound will be used accordingly to present specifications.

f) On W.P. 44-71-05 a concrete barrier with a 350 mm top will be used. The construction options that will be made available are slipformed or cast-in-place. If the contractor wishes to use the wider concrete barrier (350 mm) on future contracts, he must give ample notice to this Ministry to facilitate the layout of systems influenced by this choice of barrier. He will also assume the cost for the additional material.

g) A T-connection to the main sewer run (which will be offset to one side of the concrete barrier) will be used for W.P. 44-71-05. Under future contracts, where there is no median lighting, the main sewer will run directly under the concrete barrier with inlets from either side.

Action by:

D. McCune	- Review the need for a footing on stepped median as well as the maximum depth allowed without a footing. The spacing of expansion and contractor joints will also be established by this office.
D. McCune	- Review the possibilities for a narrower overhead sign truss.
D. Zander	- Develop the necessary standards for the concrete median barrier and forward the same to different sections for comment.
D. Zander	- contact the precast industries to discuss the development of a precast concrete median barrier system.
R. Verscheure	- Prepare the necessary specifications and supply the Standards Section with a copy.
G. Kunzelmann	- Establish the item description and corresponding documents.
D. Zander	- Check out the possibility of using a more economical electrical conduit for P.V.C.

The meeting adjourned at 12:10 p.m.

CR/db

C. Rust,
Secretary.