

DOCUMENT IDENTIFICATION

GEOCRES No. 30 H 15 - 32

DIST. 6 REGION CENTRAL

W.P. No. 44-71-10

CONT. No. 77-133

W. O. No. 73-11052

STR. SITE No. 22-180

HWY. No. _____

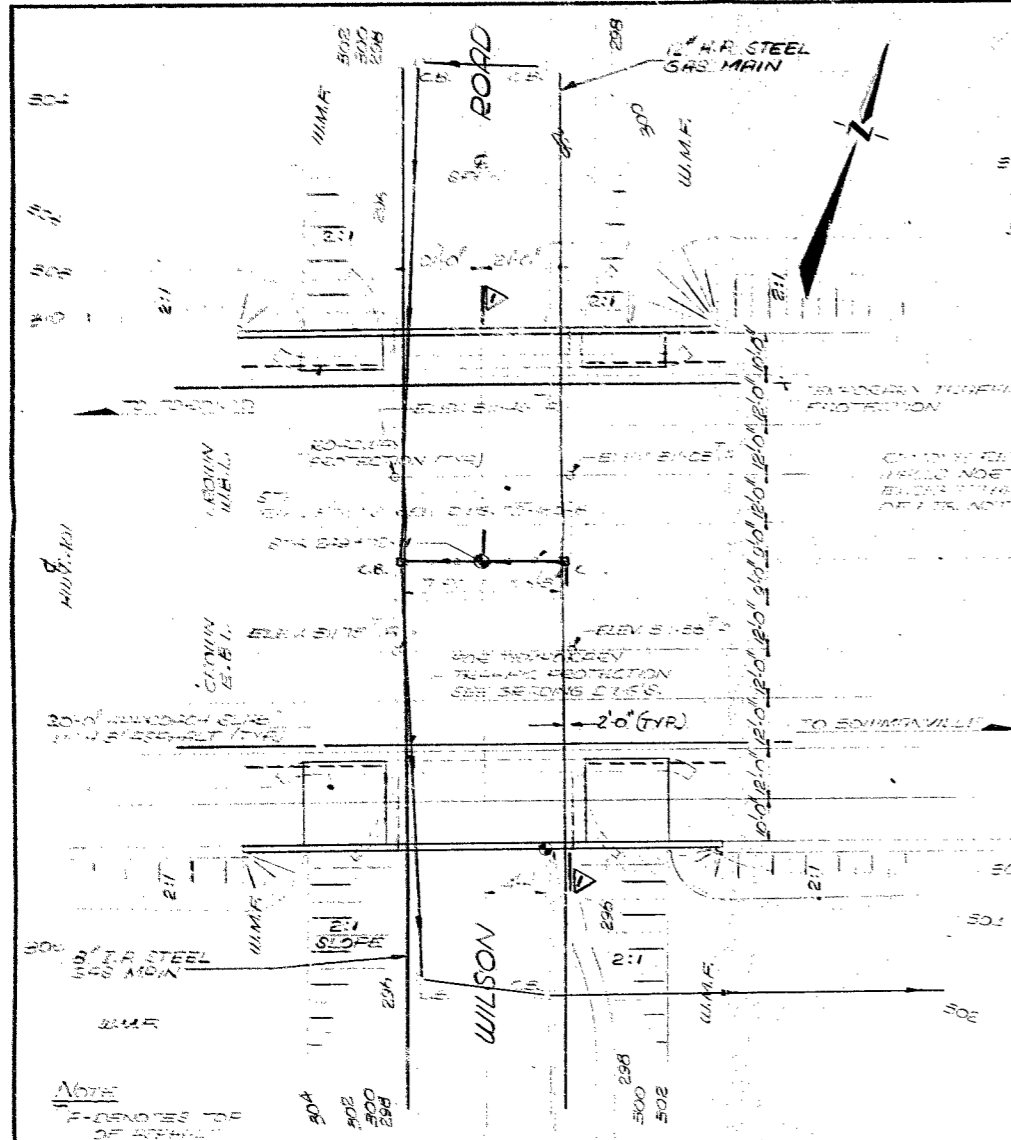
LOCATION WIDENING OF EXISTING

OVERPASS STRUCTURE AT HWY 401

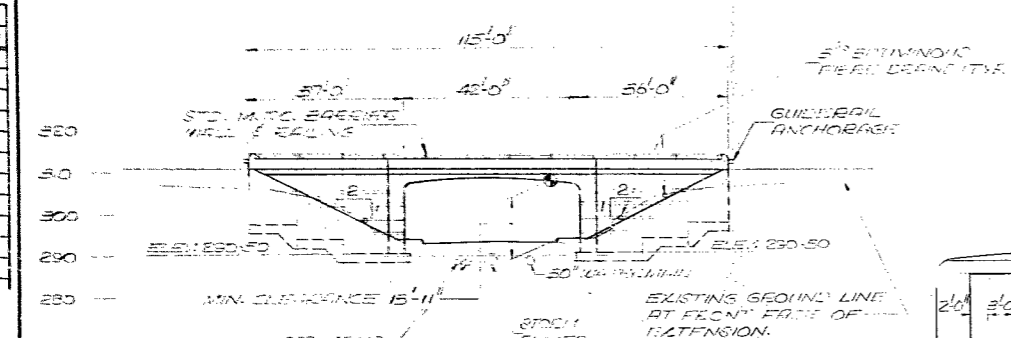
AND WILSON RD.

OVERPASS OR STRUCTURE TO BE INCLUDED WITH THIS REPORT. 4

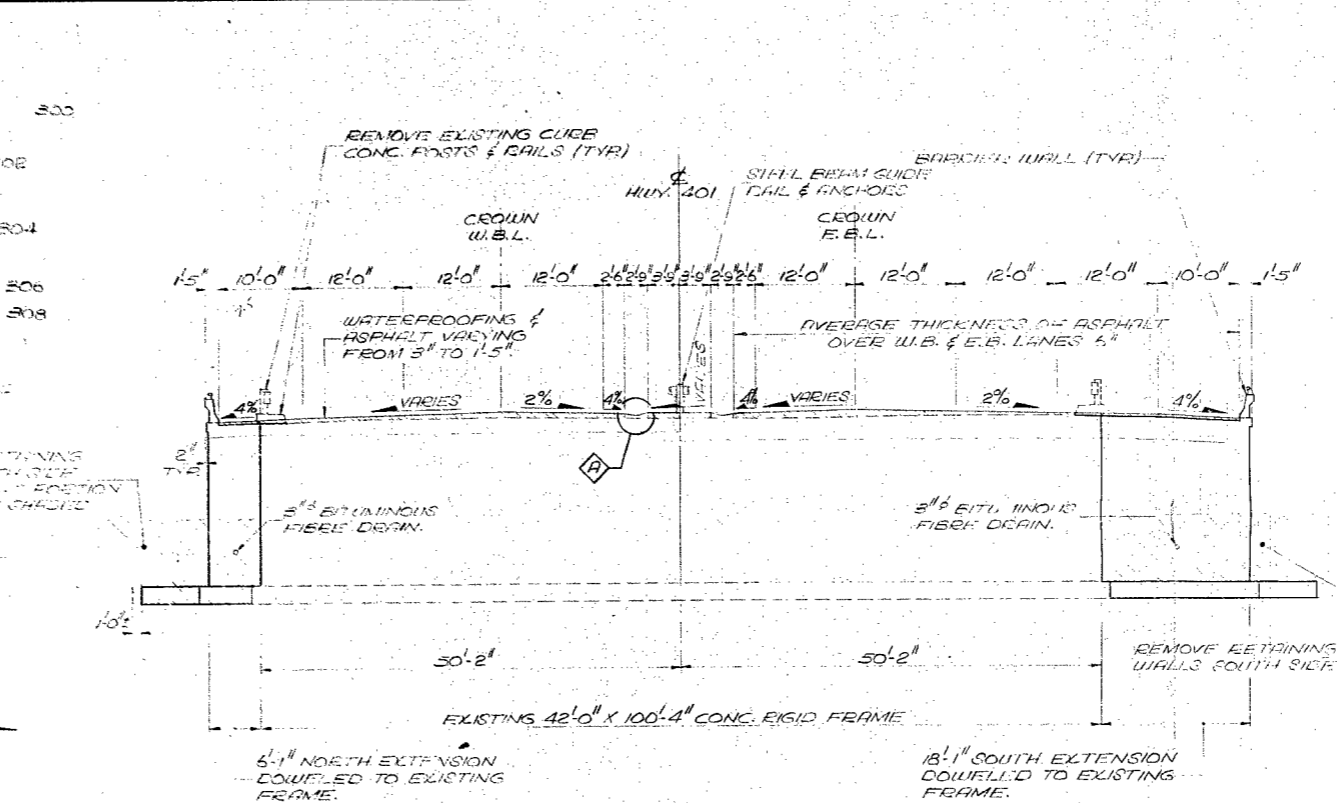
REMARKS: _____



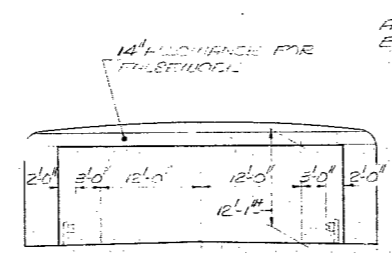
PLAN
SCALE 1" = 20'-0"



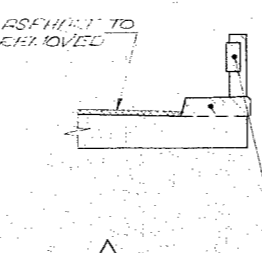
ELEVATION
SCALE 1" = 20'-0"



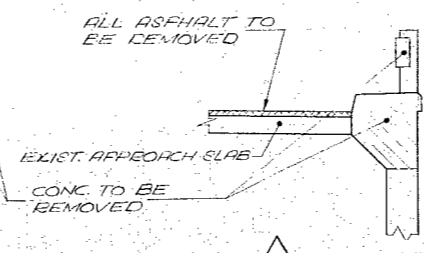
HALF ELEVATION EXIST. STRUCTURE
SCALE 1" = 10'-0"



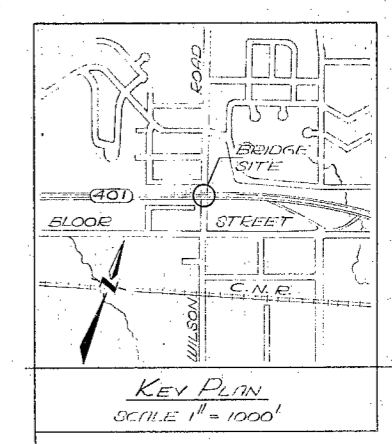
CONSTRUCTION CLEARANCE
SCALE 1" = 20'-0"



2
SCALE 1/4" = 1'-0"



3
SCALE 1/4" = 1'-0"



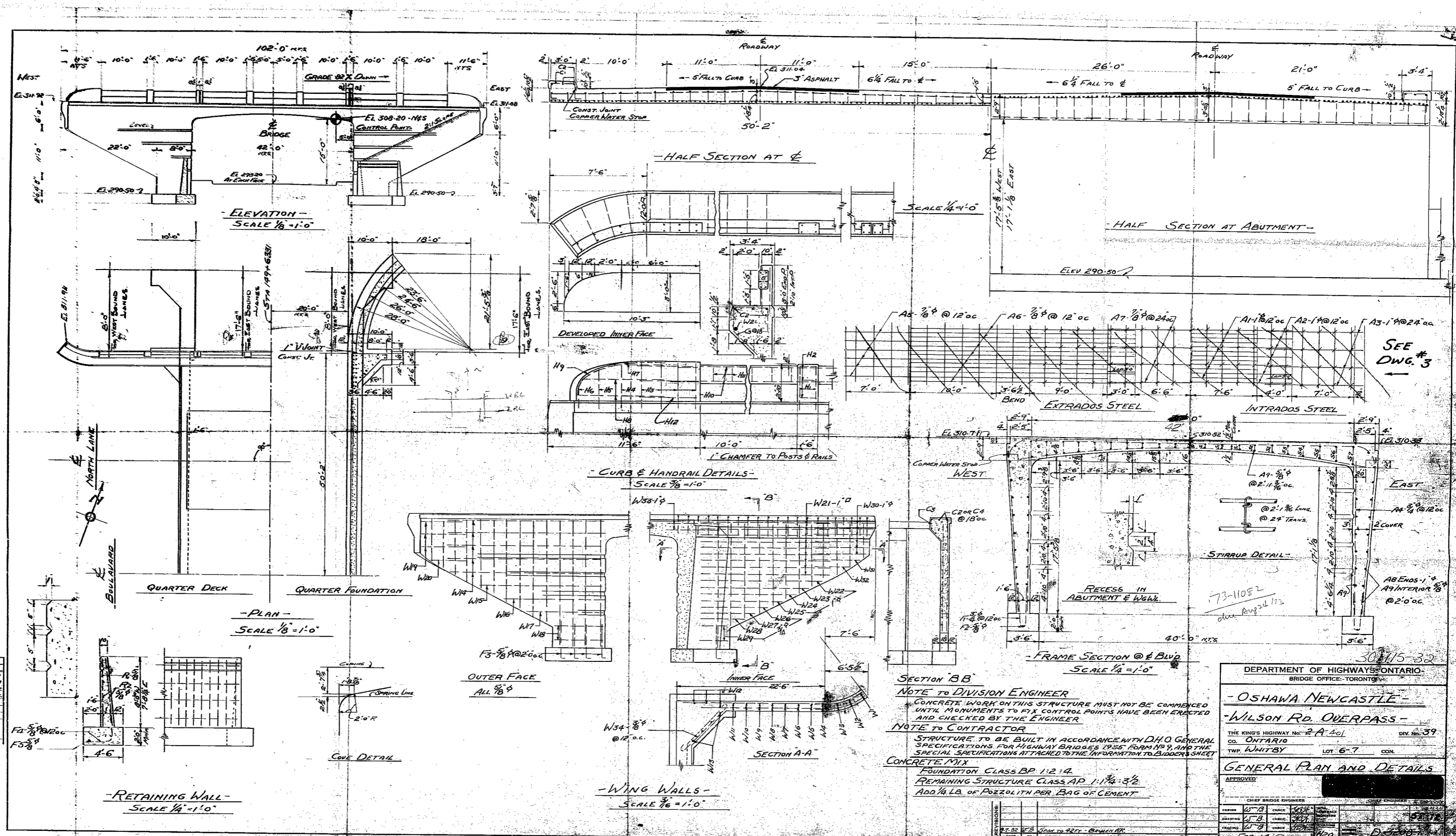
- GENERAL NOTES**
- CLASS OF CONCRETE:
FOOTINGS 3,000 P.S.I.
REINFORCED 4,000 P.S.I.
- CLEAR COVRS ON REINFORCING STEEL
- FOOTINGS, ABUTMENTS & RETAINING WALLS - 3" DECK - TOP 2" BOTTOM 1 1/2"
- BARRIER WALLS - 1 1/2" AND /OR AS NOTED ON DRAWINGS
- CONSTRUCTION NOTES**
- BACKFILL TO BE PLACED BEHIND ABUTMENTS BEFORE REMOVING FALSEWORK
 - FOR DETAILS OF EXIST. STRUCTURE SEE DWG. 22-180
 - DIMENSIONS OF EXIST. STRUCTURE MUST BE CHECKED IN FIELD BY THE CONTRACTOR
 - SPAN LENGTH, HEIGHT & CURVATURE OF DECK SOFFIT OF PROPOSED WIDENING SHALL MATCH THOSE OF EXIST. STRUCTURE

- LIST OF DRAWINGS**
- 22-180-1 GENERAL PLAN
 - 2 BORE HOLE LOCATION & SOIL STRATA
 - 3 FOOTING LAYOUT & RETAINING WALLS
 - 4 FRAME
 - 5 CONCRETE BARRIER WALL
 - 6 DETAILS OF 9" HIGH STEEL RAILINGS
 - 7 20 FT. APPROACH SLAB
 - 8 STANDARD DETAILS

REVISIONS	DATE	BY	DESCRIPTION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS ONTARIO			
30MIS-32			
WILSON RD. OVERPASS			
KING'S HIGHWAY No. 401		DIST. No. 6	
CO. ONTARIO			
TWP. CITY OF OSHAWA		LOT	CON.
GENERAL PLAN			
APPROVED		CONTRACT No.	
DESIGN J.D.B.		W.P. No. 44-71-10	
DRAWING E.O.N.		SITE No. 22-180 SHEET 1	
DATE APRIL 74		LOADING 1020-44	





DEPARTMENT OF HIGHWAYS, ONTARIO
BRIDGE OFFICE - TORONTO

- OSHAWA NEWCASTLE -
- WILSON RD. OVERPASS -

THE KING'S HIGHWAY No. 2A-401
CO. ONTARIO
TWP. WHITBY LOT 6-7 CON.

DIV. No. 39

GENERAL PLAN AND DETAILS

APPROVED: [Signature]

CHIEF BRIDGE ENGINEER: [Signature]

CHIEF ENGINEER: [Signature]

DATE: FEB. 14, 57

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 30M15-32

DIST. 6 REGION Central

W.P. No. 44-71-10

CONT. No. 77-133

W. O. No. 73-11052

STR. SITE No. 22-180

HWY. No. _____

LOCATION Widening of Existing
Overpass Structure at Hwy 401
and Wilson Road

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 4

REMARKS: documents to be unfolded
before microfilming

FOUNDATION INVESTIGATION REPORT

For

Proposed Widening of Existing
Overpass Structure at the Crossing
of Hwy. #401 and Wilson Road, City
of Oshawa, County of Ontario
District #6 (Toronto) Site #22-179
M.C. 75-11052 M.P. 44-71-10

1. INTRODUCTION

The Foundations Office was requested to carry out a subsurface investigation at the crossing of Hwy. #401 and Wilson Road in the City of Oshawa, County of Ontario. This investigation is related with the proposed widening of the Wilson Road overpass structure to accommodate six-lane traffic on Hwy. #401. The request was contained in a memo to this office from Mr. G.C.E. Burkhardt, Regional Structural Planning Engineer, Central Region, dated December 11, 1972. Subsequently, this office carried out an investigation to determine the subsoil and groundwater conditions at this site.

This report presents the factual information obtained from this investigation together with recommendations pertaining to the design of the foundation widening and the stability considerations associated with the approach embankments.

2. DESCRIPTION OF SITE

The site under investigation is located at the crossing of Hwy. #401 and Wilson Road in the City of Oshawa, County of Ontario. This area is flat to undulating in relief between elevations 296 and 318, with the exception of Hwy. #401 which is carried on an embankment approximately 10 feet above the surrounding terrain. This area has been developed for residential and commercial purposes.

Physiographically, the site is located within the region known as "Iroquois Plain". This region was inundated in late Pleistocene times by a body of water, known as Lake Iroquois. Across Ontario County, the Iroquois Plain has a fairly constant pattern of drumlins and clay plains. The old shoreline of Lake Iroquois is marked by cliffs cut in the till plain or gravel bars across the valleys.

5. FIELD AND LABORATORY WORK

Four sampled boreholes and four dynamic cone penetration tests were put down at this site. The borings were advanced by means of a continuous flight auger machine adopted for soil sampling purposes.

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 Test. The same method was used

to advance the dynamic cone penetration tests.

The locations and elevations of all the borings were surveyed in the field by personnel from this Office; they are shown on Drawing No. 73-11052A, 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 Contents

Grain-Size Distributions

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

4. SUBSOIL CONDITIONS

4.1) General

The predominant stratum at the site is a heterogeneous mixture of silt, sand and gravel, and traces of clay of glacial origin, which is found underlying a thin layer of fill material or topsoil cover. Its thickness ranges from 25 to 28 feet. Underlying the glacial till is a deposit of sand with some silt and traces of gravel.

The boundaries of the various deposits are shown on the accompanying Record of Borehole sheets. The stratigraphical sections shown on Drawing No. 73-11052A have been inferred from this data. From ground surface downward, the various deposits are discussed in detail in the subsections to follow.

4.2) Fill Material

Fill material was encountered at B.Hs. #3 and #4. Its thickness varies from 5 (B.H. #4) to 6 (B.H. #3) feet. The fill material is a brown clayey silt to silt with some sand and gravel and traces of organics. It is believed that it is the backfill material to the footing excavation for the wing-walls of the existing bridge. The standard Penetration Testing carried out within the fill material gave 'N' values ranging from 2 to 25 blows per foot with the lower values being dominant. Based on these values, it is estimated that the fill material was not well compacted.

4.3) Heterogeneous Mixture of Silt, Sand, Gravel and Traces of Clay (Glacial Till)

Directly beneath the fill material where it exists, or a thin topsoil cover (approximately 8 inches thick) elsewhere, is the predominant stratum. It is a heterogeneous

mixture of silt, sand, gravel and traces of clay (Glacial till). Numerous zones consisting of a heterogeneous mixture of clayey silt, sand and gravel, were present throughout this deposit at B.Hs. #1 and #2. Only occasional cohesive zones were found at B.Hs. #3 and #4. At B.H. #2, a thin layer (3 feet) of silty clay with traces of sand was found within the lower portion of this stratum. The thickness of the glacial till ranges from 25 feet (B.H. #4) to 28 feet (B.H. #1). The grain size distribution curves for samples of this stratum are plotted in envelope form on Figure No. 1.

Standard Penetration Testing was carried out within this stratum. The results gave 'N' values ranging from 6 blows per foot to 100 blows for 6 inches. The lower 'N' values are, however, confined to the upper 6 feet of the glacial till deposit at B.H. #3. The relative density of the glacial till is generally from compact to very dense.

4.4) Sand with some Silt and Traces of Gravel

This granular deposit was encountered at all boring locations underlying the glacial till stratum. It was not fully penetrated at either of the boring locations. The grain size distribution curves for samples of this

granular deposit are plotted on Figure #2. Standard Penetration Testing was carried out within this stratum. The results, which are plotted on the Record of Borehole sheets gave 'N' values ranging from 56 to more than 100 blows/foot. It is estimated that the relative density of this granular deposit is very dense.

5. GROUNDWATER CONDITIONS

The groundwater conditions across the site during the period of the investigation (July, 1973) were observed by taking water level readings in the open boreholes. These readings are plotted on the Record of Borehole sheets and Drawing No. 73-11052A. The observations indicated that the groundwater level in the open boreholes varies between elevations 289 and 292, corresponding to levels of from 3 to 6 feet below the existing ground surface.

6. DISCUSSIONS AND RECOMMENDATIONS

6.1) General

It is proposed to widen the existing overpass structure at the crossing of Hwy. #401 and Wilson Road in the City of Oshawa as part of the planned widening of Hwy. #401 in this area. This construction will require that the

south and north side of the existing overpass structure be widened by respectively 17.5 feet and 8 feet.

The existing bridge, which was constructed some 30 years ago, is a 100 foot-wide single span (42 feet) rigid frame structure. According to available information, this structure is supported on spread footings founded on elevation 288.5. The profile grade of Hwy. #401, in the vicinity of the crossing is at approximately elevation 311. It is understood that this grade is to be maintained. The approaches are up to 18 feet above the existing grade of Wilson Avenue.

Visual observations indicate that the structure and the approaches are performing satisfactorily.

The subsoil at the site consists of up to 28 feet of very dense glacial till, underlain by a deposit of sand with some silt and traces of gravel.

The recommendations pertaining to the design of the footing extensions and the stability considerations associated with the approach embankments widening will be discussed in the subsections to follow.

6.2) Foundations - Abutment Extensions

The proposed abutment extensions may be founded on spread footings located within the very dense glacial

till deposit at the same founding elevation of the existing abutments (288.5). At localized areas within the proposed abutment extension, backfill material to the excavation for the existing abutments and the wing-walls may extend below the above-mentioned founding elevation. If such is the case, it is recommended that the fill material be completely sub-excavated. The sub-excavation so formed should then be brought up to footing foundation level by placing mass concrete. Spread footings founded as recommended may be designed using an allowable bearing values of up to 3.5 t.s.f.

The base of the footing excavations will be below the groundwater level recorded during the period of the field investigation (July, 1973). Groundwater seepage into the excavations can be anticipated. The subsoil is of glacial origin and the matrix contains some clay binder. It is believed that the seepage can be handled by employing ordinary pumping methods.

Settlement of the subsoil induced due to the footing pressure will be elastic in nature. This settlement should not exceed one half of an inch and should take place during or immediately following the construction period. In order to accommodate any possible differential settlements between the existing abutment footing and the extension, it is recommended that an expansion joint be provided between these two elements.

The rigid walls of the extended portion of the abutments should be designed using a coefficient of earth pressure at rest (E_0) of 0.5 for the granular backfill material placed behind the walls.

In determining the lateral resistance of the footings, a coefficient of friction of 0.7 between the rough concrete surface and the granular glacial till may be used.

In order to relieve the buildup of excess hydrostatic pressure behind the abutment extensions suitable drainage measures should be provided. Backfill behind the wall should be carried out in accordance with current M.T.C. practices.

6.3) Approach Embankments

The approach embankments will be widened in order to accommodate 6-lane traffic on Hwy. #401. The widened portions of the fills will be stable provided that:

- i) 2:1 slopes are employed, and
- ii) the topsoil along the slopes of the existing embankment be stripped and the new fill be properly keyed to the existing embankment in accordance with current M.T.C. Standard No. DP-414.

The foundation subsoil is competent, therefore no long term settlement is anticipated due to the induced loads of the approach fills. However, compacted fill material may settle due to its own weight. For estimating purposes, it may be assumed that the new fill will settle as much as $\frac{1}{2}$ per cent of the total height. It is believed that the majority of this settlement will take place shortly after the placement of the fill.

7. MISCELLANEOUS

The field work was carried out between July 16-19, 1973, under the supervision of Mr. C. S. Poon, Project Foundations Engineer, who also prepared this report.

Drilling equipment used was owned and operated by Dominion Soil Investigation Ltd., Toronto.

This project was carried out under the general supervision of Mr. H. Devata, Supervising Foundations Engineer, who reviewed this report.

P. Payer
for C. S. Poon, P. Eng.



H. Devata
for H. Devata, P. Eng.

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 1

JOB 73-11052

LOCATION Co-ords. 15,947,106 N; 1,174,817 E.

ORIGINATED BY CSP

W.P. 44-71-10

BORING DATE July 16, 1973

COMPILED BY CSP

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY *[Signature]*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F.				WATER CONTENT %				
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE				w_p — w — w_L 10 20 30				
294.6	Ground Level														GR.S.A.S .CL.
0.0	Topsoil														
0.7															
	Het.mix.of silt,sand & gravel, trace of clay		1	SS	34	290							○	—	251.1
	(Glacial Till)		2	SS	135								○	—	
	(with numerous zones of clayey silt,sand and gravel).		3	SS	165								○	—	
	Grey Very Dense		4	SS	125.9"	280									28 36 26 10
			5	SS	170								○		
			6	SS	156										
			7	SS	150	270							○	—	
266.6															
28.0	Sand with some gravel & traces of silt.		8	SS	114										
259.3	Grey Very Dense		9	SS	100.7"	260							○		35 54 (11)
35.3	End of Borehole														
						250									

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE NO 2

FOUNDATIONS OFFICE

JOB 73-11052

LOCATION Co-ords. 15,946,962 N; 1,174,866 E.

ORIGINATED BY CSP

W.P. 44-71-10

BORING DATE July 18, 1973

COMPILED BY CSP

DATUM Geodetic

BOREHOLE TYPE Auger

 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 — w — w_L			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE						WATER CONTENT % 10 20 30				
295.1	Ground Level																
0.0	Topsoil																
0.7	Het. mix. of silt, sand & gravel, trace of clay (Glacial Till) (with numerous zones of clayey silt, sand and gravel) Grey Very Dense		1	SS	105	290								○	—		
			2	SS	92									○			
			3	SS	50 1/2"	bouncing								○	—		
			4	SS	168 1/2"									○			
			5	SS	160 1/2"									○	—		
			6	SS	170 1/2"												
270.1						270											
25.0	Silty clay, traces of sand & gravel.		7	SS	139									○	—		
267.1																	
28.0	Sand with some silt and traces of gravel.		8	SS	56									○			
260.1	Grey Very Dense																
35.0	End of Borehole					260											

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 3

JOB 73-11052

LOCATION Co-ords. 15,946,955 N; 1,174,820 E.

ORIGINATED BY CSP

W.P. 44-71-10

BORING DATE July 18, 1973

COMPILED BY CSP

DATUM Geodetic

BOREHOLE TYPE Auger

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 — w — w_L WATER CONTENT % 10 20 30			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE							
294.8	Ground Level													
0.0	Fill Material													
288.8	Clayey silt, some sand & gravel, traces of organics. Brown-Grey firm to stiff		1	SS	10	290								
6.0	(Glacial Till)		2	SS	7									
			3	SS	6									
	Het. mix. of sand, silt & gravel		4	SS	37	280								
	(with occ. zones of clayey silt, sand & gravel)		5	SS	148									
			6	SS	126									
	Grey		7	SS	145	270								
262.8	Loose to Very Dense		8	SS	100/5"									
32.0	Sand with some silt and traces of gravel					260								
258.3	Grey Very Dense		9	SS	160									
36.5	End of Borehole					250								

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 4

JOB 73-11052

LOCATION Co-ords. 15,947,091 N; 1,174,777 E.

ORIGINATED BY CSP

W.P. 44-71-10

BORING DATE July 19, 1973

COMPILED BY CSP

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY *ML*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F.					w_p	w	w_L		
294.6	Ground Level						O UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE					WATER CONTENT % 10 20 30				
0.0	Fill Material		1	SS	11	290										291.8
289.6	Clayey silt, some sand & gravel. Brown Firm to Stiff															
5.0	(Glacial Till)		2	SS	25											9 51 29 11
	Het. mix. of sand, gravel and silt		3	SS	34											
			4	SS	60											
			5	SS	80	280										57 39 (4)
	(with occ. zones of clayey silt, sand and gravel)		6	SS	110											
			7	SS	87											46 41 (13)
	Grey		8	SS	102	270										
264.6	Compact to Very Dense															
30.0	Sand with some silt & traces of gravel.		9	SS	82	260										3 66 24 7
258.1	Grey Very Dense		10	SS	136											
36.5	End of Borehole					250										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 1A, 2A, 3A & 4A

JOB 73-11052

LOCATION See Below

ORIGINATED BY C.S.P.

W.P. 44-71-10

BORING DATE July 19, 1973

COMPILED BY C.S.P.

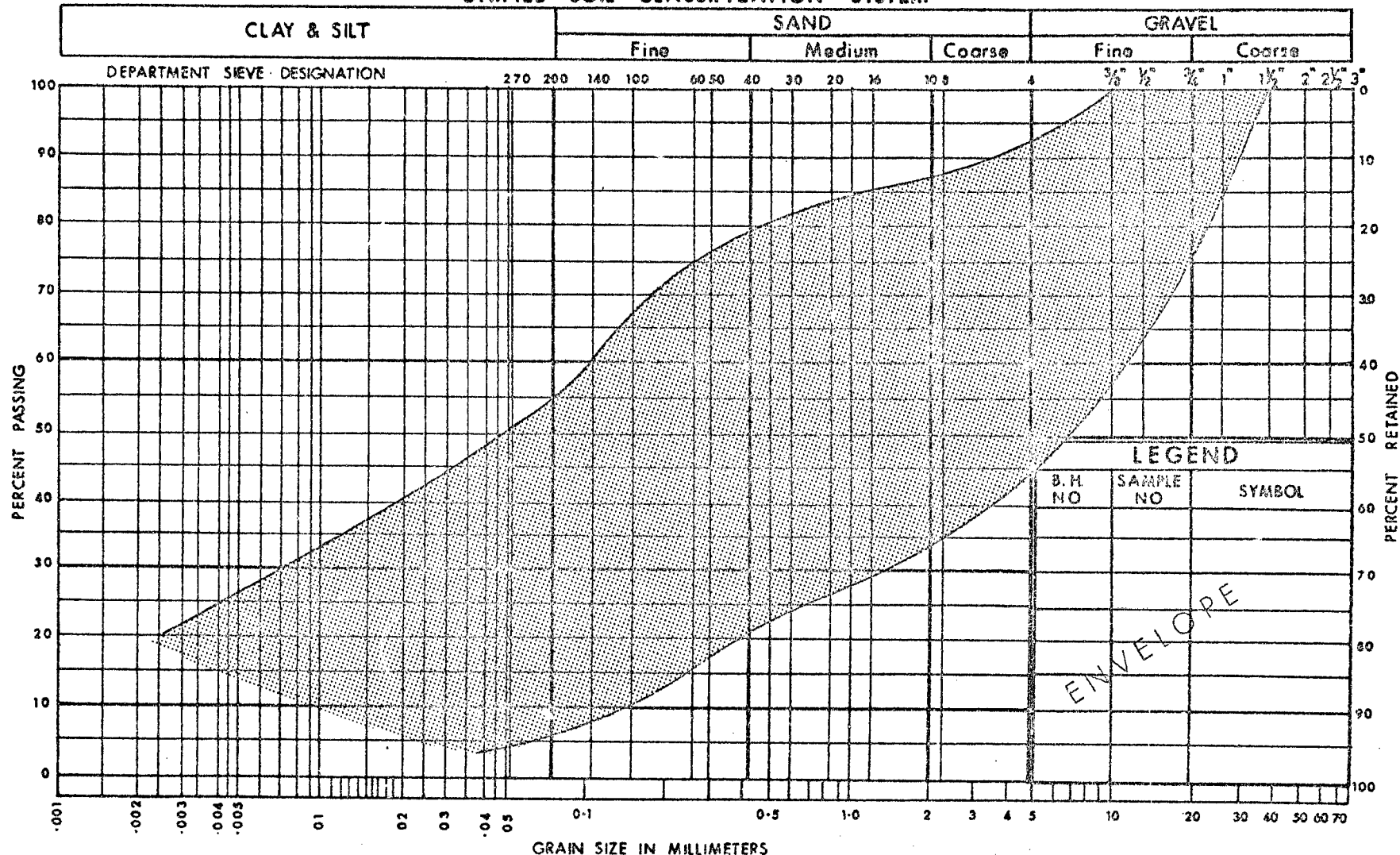
DATUM Geodetic

BOREHOLE TYPE Cone Tests

CHECKED BY J.H.

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	20	40	60	80	100	PLASTIC LIMIT W_P		
						SHEAR STRENGTH P.S.F.					WATER CONTENT %				
						<input type="radio"/> UNCONFINED + FIELD VANE <input checked="" type="radio"/> QUICK TRIAXIAL x LAB VANE					W_P — W — W_L		P.C.F. GR. SA. SI. CL.		
CONE TEST 1A															
Co-ords. 15,947,096 N; 1,174,813 E															
294.4	Ground Level														
0.0	Probably Fill Material														
289.4						290									
288.4	Probably Glacial Till														
6.0	End of Cone Test														
CONE TEST 2A															
Co-ord. 15,946,975 N; 1,174,853 E															
294.3	Ground Level														
0.0	Probably Fill Material														
288.3						290									
287.3	Probably Glacial Till														
7.0	End of Cone Test														
CONE TEST 3A															
Co-ord. 15,946,968 N; 1,174,813 E															
294.3	Ground Level														
0.0	Probably Fill Material														
290.3						290									
289.3	Probably Glacial Till														
5.0	End of Cone Test														
CONE TEST 4A															
Co-ord. 15,947,082 N; 1,174,780 E															
294.3	Ground Level														
0.0	Probably Fill Material														
289.3						290									
288.3	Probably Glacial Till														
6.0	End of Cone Test														

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT
OF
TRANSPORTATION AND COMMUNICATIONS

DESIGN SERVICES
BRANCH

GRAIN SIZE DISTRIBUTION
GLACIAL TILL
HET. MIXTURE OF SILT, SAND & GRAVEL, TRACES OF CLAY

W.P. No. 44-71-10
JOB No. 73-11052
FIG. 1

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT

SAND

GRAVEL

Fine

Medium

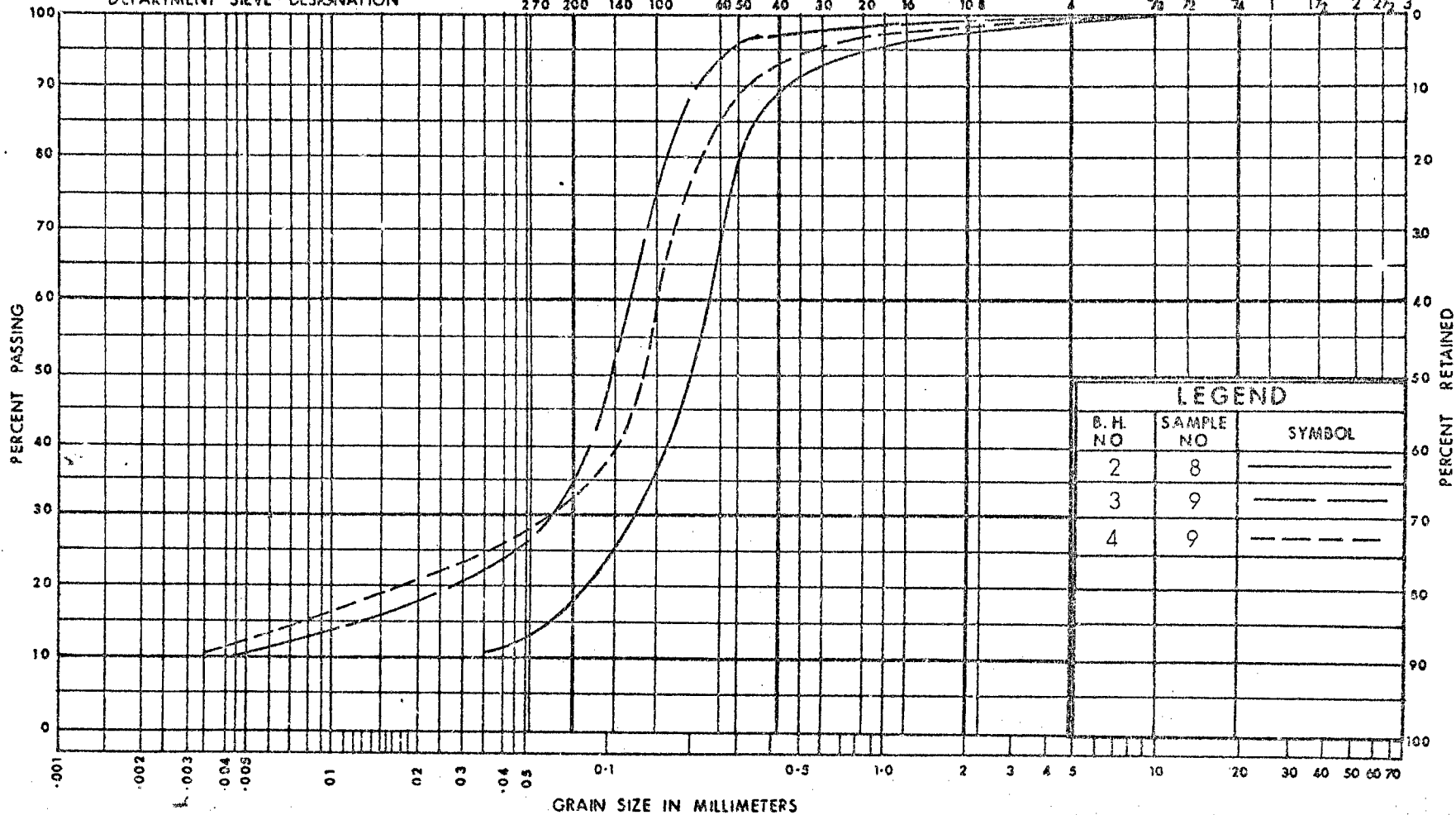
Coarse

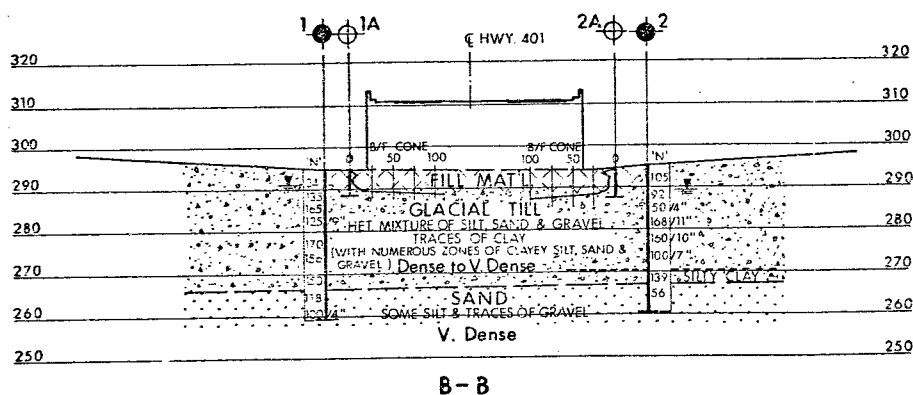
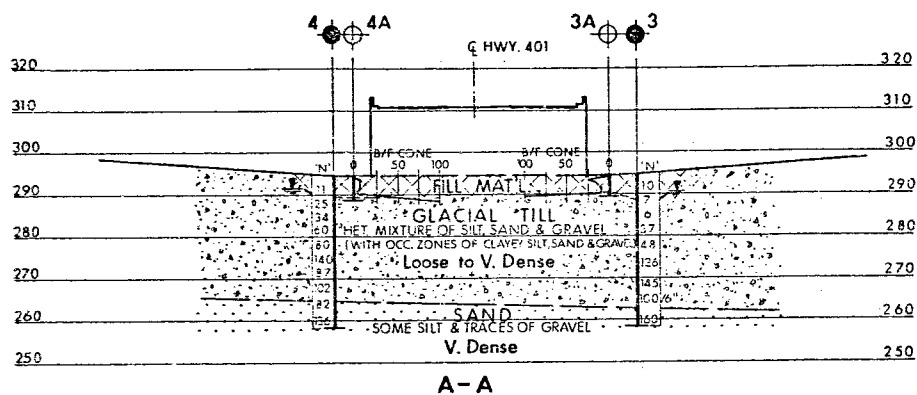
Fine

Coarse

DEPARTMENT SIEVE DESIGNATION

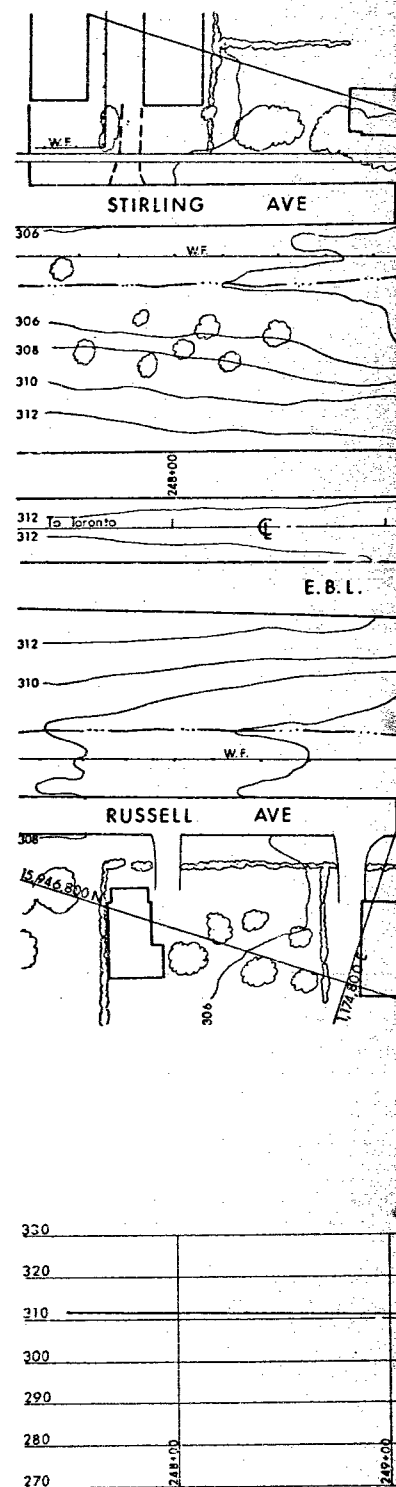
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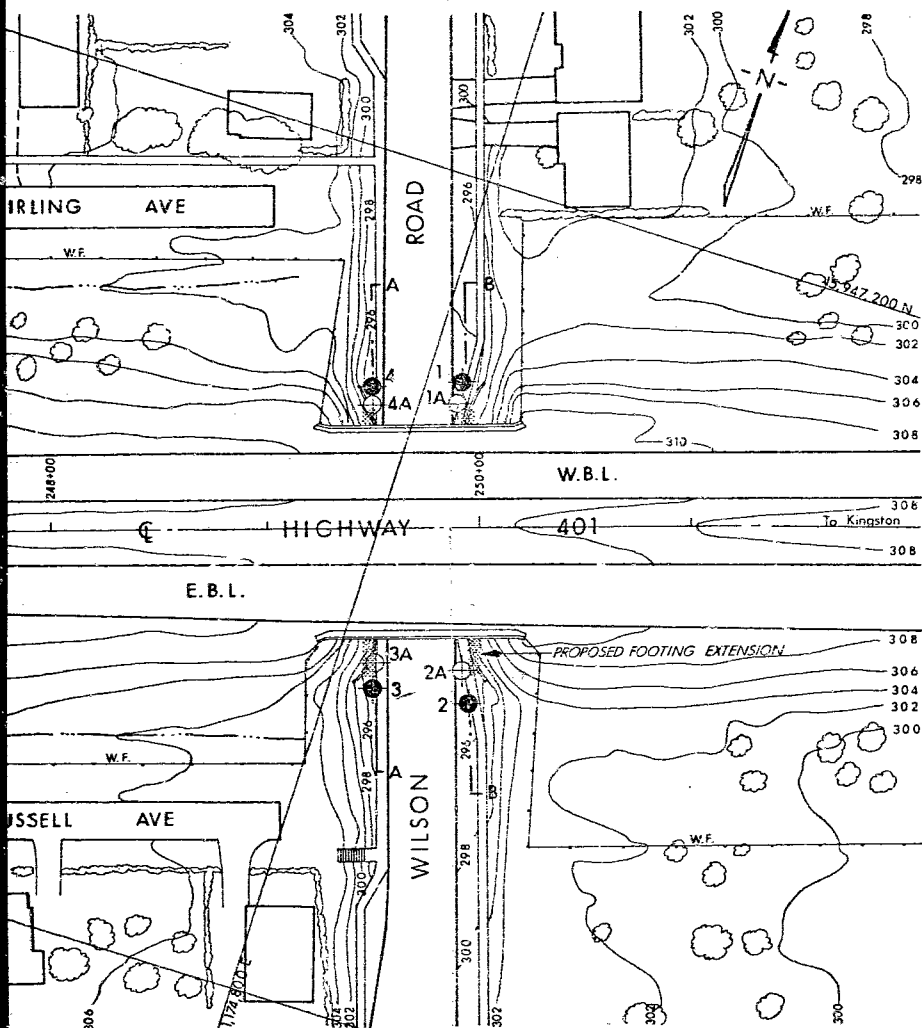


SECTIONS

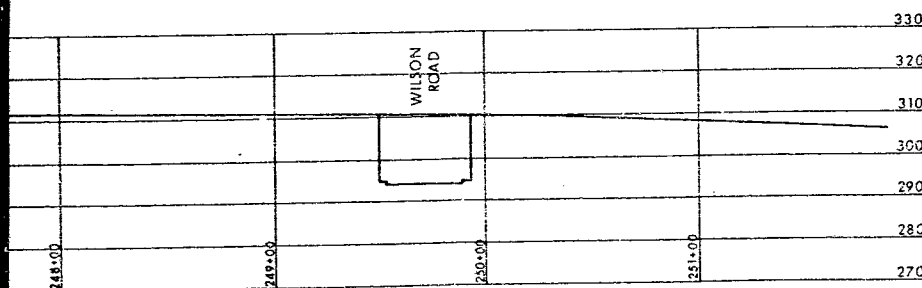
VERT. 20 10 0 SCALE 20 40 FT.
HORIZ. 40 20 0 40 60



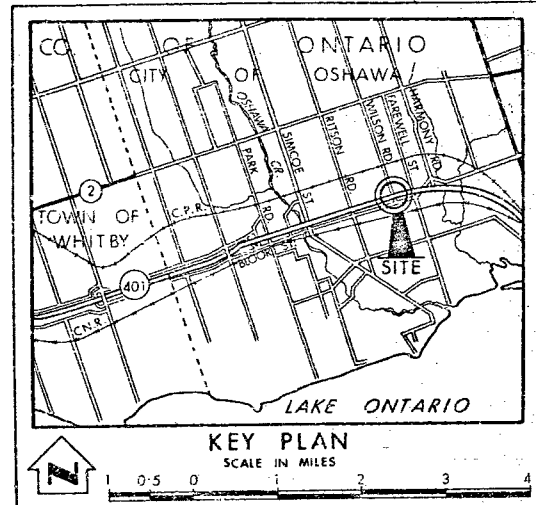
VERT.
HORIZ.



PLAN
40 20 0 SCALE 40 80 FT.



PROFILE
VERT. 20 10 0 SCALE 20 40 FT.
HORIZ. 40 20 0 SCALE 40 80



LEGEND

- Bore Hole
- Cone Penetration Test
- Bore Hole & Cone Test
- Water Levels established at time of field investigation. JULY 1973

NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	294.6	15,947,106	1,174,817
1A	294.4	15,947,096	1,174,818
2	295.1	15,946,962	1,174,866
2A	294.3	15,946,975	1,174,858
3	294.8	15,946,955	1,174,820
3A	294.3	15,946,968	1,174,818
4	294.6	15,947,091	1,174,777
4A	294.3	15,947,082	1,174,780

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

WILSON ROAD

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

BORE HOLE LOCATIONS & SOIL STRATA

SUBMD. C.P. CHECKED <input checked="" type="checkbox"/>	WP. NO. 44-71-10	DRAWING NO.
DRAWN S.O. CHECKED <input checked="" type="checkbox"/>	WD. NO. 73-11052	73-11052A
DATE 15 AUG. 1973	SITE NO.	BRIDGE DRAWING NO.
APPROVED	CONT. NO.	
PRINCIPAL FOUNDATION ENGINEER		

