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GEOCRES No. 30M15-8

DIST. 6 REGION Central

W.P. No. 44-71-12

CONT. No. 77-133

W. O. No. 72-11128

STR. SITE No. 22-183

HWY. No. _____

LOCATION Widening of the Bridge
Structure at the Crossing of Hwy 401
and Farewell Creek

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 4

REMARKS: documents to be unfolded
before microfilming

FOUNDATION INVESTIGATION REPORT
For
Proposed Widening of the Bridge
Structure at the Crossing of Hwy. 401
And Farewell Creek (Site No. 22-183)
Township of Whitby, County of Ontario
District No. 6 (Toronto)
W.O. 72-11128 -- W.P. 44-71-12

1. INTRODUCTION:

In order accommodate six lane traffic, it is proposed to widen Hwy. 401 from the Rouge River, County of Ontario, easterly to the City of Oshawa. As part of this reconstruction the existing bridge structure at the crossing of Hwy. 401 and Farewell Creek, in the Township of Whitby, County of Ontario, will be widened in both the southerly and northerly direction.

The Foundations Office was requested, in a memo from Mr. G.C.E. Burkhardt, Regional Structural Planning Engineer, dated November 17, 1972, to carry out a subsurface investigation at the above-mentioned site. Subsequently, an investigation was carried out by this Office to determine the subsoil, bedrock and groundwater conditions at this site.

This report contains the results of the investigation, together with recommendations pertaining to the foundations for the widening of the existing bridge structure, as well as the stability and settlement considerations associated with the approach embankments.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The site is situated at the crossing of Hwy. 401 and Farewell Creek in the Township of Whitby. It is about 1 mile east of the City of Oshawa.

The area is flat to undulating in relief between elevations 255 and 258. The southerly flowing Farewell Creek traverses this region. The creek channel is approximately 25 to 30 feet wide and 10 feet deep. At the time of the investigation there was approximately 4 to 5 feet of water in the creek (surface water level 251.7).

This region is physiographically referred to as the "Iroquois Plain." The old shoreline of glacial Lake Iroquois is well marked by gravel bars, off-shore deposits of sands and the rest of it is a "mosaic" of till plains, drumlins, and silty lacustrine deposits. The overburden deposits are underlain by shale bedrock of the Lorraine formation, Ordovician Period.

3. FIELD AND LABORATORY WORK:

Six sampled boreholes, each accompanied by a dynamic cone penetration test, were put down at this site. The borings were advanced by means of a C.M.E. auger machine adapted for soil sampling.

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. Bedrock was proven in three of the borings by obtaining up to 11.5 feet of BX size rock core. At the remaining boring locations the surface of the bedrock was encountered and proven using conventional sampling procedures.

The locations and elevations of all the borings were surveyed in the field by personnel from the Foundations Office; they are shown on Drawing No. 72-11128A, 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 Figures 1, 2 and 3, all contained in the Appendix of this report.

4. SUBSOIL AND BEDROCK CONDITIONS:

4.1) General:

The surficial stratum across the site is composed of a 7 to 10 feet thick loose to very dense silty sand with a trace to some gravel. Along the approaches to the existing structure the granular stratum is overlain by up to 7 feet of basically granular fill. The parent granular stratum is underlain by a 4.5 to 6 foot thick stiff to hard clayey silt which is generally followed by a 4.5 to 6 foot thick compact to very dense silty sand deposit of similar composition to the surficial stratum. The overburden is underlain by a weathered transitionally changing to sound shale bedrock.

The boundaries of the various deposits are shown on the accompanying borelog sheets. The stratigraphical sections shown on Drawing No. 72-11128A has been inferred from this boring data.

From ground surface downward, the various soil types and bedrock encountered are as follows.

4.2) Fill - Silty Sand with a Trace to Some Gravel:

Four of the borings were put down through the approaches to the existing structure. Between 4.5 and 7 feet of fill, composed of a silty sand with gravel and occasional organic matter, was encountered at these locations. Random seams of clayey silt are also present within the fill.

Standard penetration resistance testing, carried out in the fill, gave 'N' values which ranged from 12 to 47 blows/ft. Based on this testing it is estimated that the fill has been subjected to an acceptable degree of compactive effort.

4.3) Silty Sand with Some Gravel:

The parent surficial stratum across the site is composed of a loose to very dense (4 to 59 blows/ft.) silty sand with a trace to some gravel and occasional organic inclusions in the upper 2 to 3 feet. The thickness of this stratum varies from 7 to 10 feet. Grain-size distribution curves, for samples from the stratum are plotted on Figure #1 in Appendix I.

4.4) Clayey Silt with Some Sand and a Trace of Gravel:

The parent granular stratum is underlain by a stiff to hard ('N' values 7 to 57 blows/ft.) clayey silt with some sand and a trace of gravel. The thickness of this deposit ranges from 4 to 9 feet. Grain-size distribution curves for samples of the cohesive material 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. 3) are tabulated below:

	<u>Range</u>
Liquid Limit %	16 - 25
Plastic Limit %	12 - 15
Natural Moisture Content %	10 - 14

Based on these values it is estimated that the cohesive deposit is inorganic and of low plasticity. The natural moisture content is typically below the plastic limit.

4.5) Silty Sand with Some Gravel (Lower Deposit):

The cohesive stratum is underlain by a compact to very dense ('N' values 17 blows/ft. to 100 blows for 4 inches) silty sand with some gravel. The thickness of this deposit, which is of similar composition to that of the parent granular stratum, ranges from 4.5 to 6 feet. An exception to this pattern occurs along the east bank of Farewell Creek (refer to B.H.'s #1A and 3). Here the lower granular deposit is absent - i.e., the clayey silt stratum extends down to the surface of the bedrock.

4.6) Shale Bedrock:

The overburden is underlain by shale bedrock. The bedrock was proven in B.H.'s #1, 2 and 4 by obtaining between 6.5 and 11.5 feet of BX size rock core samples. At the remaining boring locations the upper weathered portion of the bedrock was proven using conventional sampling techniques. The surface of the bedrock was found to vary between elevations 234 and 238.5. In general, it increases in elevation in an easterly direction. The upper 1.5 to 3.5 feet of the bedrock is in a weathered condition; 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 1972), were observed by taking readings in the open boreholes. The results of the readings are shown on the borelog sheets, as well as on Drawing No. 72-11128A.

The observations indicate that the groundwater level varies between elevations 251.5 to 253.5, corresponding to depths below existing ground surface of from 1 to 9 feet. These levels agree closely with the level of the water in Farewell Creek (elevation 251.7, November 1973).

6. EXISTING STRUCTURE:

The existing bridge at the crossing of Hwy. #401 and Farewell Creek, which was constructed in 1950, is a 100 foot wide single span (40 feet) rigid frame structure. The abutments are founded on spread footings located at about elevation 247.5. Fills were placed to form the approaches to the structure; the maximum fill height was 9 feet.

This structure has performed satisfactorily without any visible signs of distress.

7. DISCUSSION AND RECOMMENDATIONS:

7.1) General:

In order to accommodate six lane traffic it is proposed to widen Hwy. #401 from the Rouge River, County of Ontario, easterly to the City of Oshawa. As part of this reconstruction the existing structure at the crossing of Hwy. #401 and Farewell Creek, in the Township of Whitby, County of Ontario, will be widened by about 13 feet in both the southerly and northerly direction. It is understood that the existing profile grade of Hwy. #401 will be maintained at about elevation 266. The maximum height of the widened portions of the approach fills will be about 12 feet above the existing ground surface.

The surficial deposit across the site is composed of a 7 to 10 feet thick loose to very dense silty sand with some gravel which is underlain by a 4.5 to 6 feet thick stiff to hard clayey silt. In some areas the cohesive stratum is underlain by a 4.5 to 6 feet thick compact to very dense silty sand with some gravel. The overburden is underlain by a weathered changing to sound bedrock.

7.2) Foundations - Abutment Extensions:

If the abutment extensions are founded at the same elevation as the existing abutments (elevation 247.5) they will be located in the lower portion of the surficial loose to dense silty sand stratum. Such extensions could be supported on spread footings ~~designing~~ using an allowable bearing value of 1.5 t.s.f. At least 4 feet of earth cover should be provided to the underside of the footings for frost protection purposes. Further, the subsoil, in the vicinity of the extensions, should be protected against the scour action of Farewell Creek. This could be accomplished by using rip rap, the size and placement of which should conform to current M.T.C. practices.

The footing extension excavations will extend up to 5 feet below the groundwater level in the area. Since the granular stratum is relatively pervious groundwater seepage can be expected into the excavations. Further, the base may boil due to the unbalanced hydrostatic groundwater pressure existing in this stratum. A positive dewatering scheme will, therefore, be required. One possibility would be to carry out the excavation from within a cofferdam composed of interlocking steel sheet piling. The piling should be driven to a depth below the base of the excavation equal to the unbalanced hydrostatic water pressure head existing above the base of the excavation.

The foundation subsoil will settle due to the imposed pressure provided by the footing extensions. Computations carried out have indicated that this settlement will be of the order of 1 to 1-1/2 inches. The major portion of this settlement should occur within a period of three months following the construction period. A construction joint should be provided between the existing and extension portions of the abutments in order to allow for this differential settlement.

If the aforementioned allowable bearing pressure is too low, or if the differential settlement expected between the extended and existing portions of the abutments could not be tolerated, then consideration should be given to founding the extensions on end-bearing piles driven to bedrock. For estimating purposes the pile tips can be assumed to be located at the following elevations.

<u>Abutment Extension</u>	<u>Estimated Pile Tip Elevation</u>	<u>Refer to</u>
East Abut. - South End	234.5	B.H. #1
East Abut. - North End	238	B.H. #3
West Abut. - South End	234	B.H. #2
West Abut. - North End	235.5	B.H. #4

The piles could be designed for the ultimate capacity of the pile section chosen; e.g., 12BP74 steel H-piles could be designed for 95 tons/pile.

The rigid walls of the extended portion of the abutments should be designed using a coefficient of earth pressure at rest (K_0) of 0.5 for the granular fill material placed behind the walls.

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.

7.3) Widened Approach Embankments:

The existing approach embankments are to be widened by about 13 feet in both a northerly and southerly direction; up to 12 feet of fill will have to be placed to accomplish this. No stability problems are anticipated provided i) standard 2:1 slopes are employed and ii) the widened portion of the embankment is keyed into the existing embankment. With regard to ii) it is recommended that the topsoil, along the existing bank, be stripped and the new fill "keyed" into the existing slope in accordance with current M.T.C. practices.

The subsoil, beneath the widened portion of the approach embankments, will settle due to the imposed loading; this settlement should be of the order 1 to 1-1/2 inches. The major portion of this settlement should be realized within three months following the fill placement. Further, the differential settlement between the existing and widened portions of the embankments should be of the same order of magnitude.

8. MISCELLANEOUS:

The field work, performed during the period of November 24 to December 1, 1972, was carried out under the immediate supervision of Mr. V. Korlu, Project Foundations Engineer, who also prepared this report.

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

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

V. Korlu
V. Korlu, P. Eng.



M. Devata
M. Devata, P. Eng.

VK/ao

March 13, 1973.

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 1

JOB 72-11128

LOCATION 15,947,240 N. 1,179,025 E.

ORIGINATED BY V.R.

W.P. 44-71-12

BORING DATE November 24, 1972

COMPILED BY G.P.

DATUM Geodetic

BOREHOLE TYPE Auger, BXL Rock Core & Cone Test

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	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS/FOOT		20	40	60	80	100	w_p	w	w_L		
252.8	Ground Level															
0.0	Silty sand, some gravel.		1	SS	31	250										251.8
244.8			2	SS	7											23 62 (15)
8.0	Clayey silt, some sand & occ. gravel.		3	SS	10											
240.3	Stiff to Very Stiff		4	SS	39	240										
12.5			5	SS	17											
234.3	Loose to Dense		6	SS	100/7"											
232.8	Weathered		7	BXL rock core	100% Rec	230										
20.0	Shale Bedrock		8	BXL rock core	100% Rec											
222.8	Sound															
30.0	End of Borehole					220										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 2

JOB 72-11128

LOCATION 15,947,245 N., 1,178,986 E.

ORIGINATED BY V.V.

W.P. 44-71-12

BORING DATE November 27, 1972

COMPILED BY O.B.

DATUM Geodetic

BOREHOLE TYPE Auger, BIL Rock Core, & Cone Test

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		20	40	60	80	100	w_p	w	w_L	
252.6	Ground Level														
0.0	Silty sand, trace to some gravel		1	SS	23	250									251.6
			2	SS	15										9 77 12 2
242.6			3	SS	7										
10.0	Clayey silt, some sand & occasional gravel.		4	SS	16	240									9 38 38 15
238.6	Very Stiff		5	SS	28										28 62 (10)
14.0	Compact to Very Dense		6	SS	100/4"										
234.1	Weathered														
232.6	Shale Bedrock		7	BIL R.C.	100/4"	230									
20.0	Sound														
227.6	End of Borehole														
25.0															
						220									

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 2A

JOB 72-11128

LOCATION 15,947,250 N., 1, 178,957 E.

ORIGINATED BY W.

W.P. 44-72-12

BORING DATE November 28, 1972

COMPILED BY G.P.DATUM GeodeticBOREHOLE TYPE Auger & Cone TestCHECKED BY G.P.

SOIL PROFILE			SAMPLES			ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT w_L		BULK DENSITY	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT		20	40	60	80	100	PLASTIC LIMIT w_p		
261.1	Ground Level													
0.0	Fill, Silty sand, some gravel, occ. layers of clayey silt		1	SS	16	260								
253.9	Compact		2	SS	28									
7.2	Silty sand with gravel.		3	SS	6	250								
245.6			4	SS	10									
15.5	Clayey silt, some sand and occ. gravel.		5	SS	22									
239.6	Very Stiff		6	SS	30									
21.5			7	SS	39	240								
235.1	Loose to Dense													
234.6	Weathered Shale		8	SS	95									
26.5	End of Borehole					230								

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 3

JOB 72-11128

LOCATION 15,947,364 N., 1, 179,030 E.

ORIGINATED BY V.K.

W.P. 44-72-12

BORING DATE November 29, 1972

COMPILED BY G.P.

DATUM Geodetic

BOREHOLE TYPE Auger & Cone Test

CHECKED BY G.R.

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		20	40	60	80	100	w_p	w	w_L		
260.6	Ground Level															
0.0	Fill, silty sand, some gravel.		1	SS	15	260										
254.6	Compact		2	SS	12											
6.0	Silty sand, trace to some gravel.		3	SS	22	250										
246.6	Compact to Dense		4	SS	32											
14.0	Grey Clayey silt, some sand & occasional gravel.		5	SS	23											
238.6	Very Stiff.		6	SS	21	240										
22.0	Weathered Shale		7	SS	185	230										
235.6	End of Borehole															
25.0																

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 4

JOB 72-11128

LOCATION 15,947,384 N., 1, 178,957 E.

ORIGINATED BY V.K.

W.P. 44-72-12

BORING DATE November 30, 1972

COMPILED BY G.P.

DATUM Geodetic

BOREHOLE TYPE Auger BXL Rock Core & Cone Test

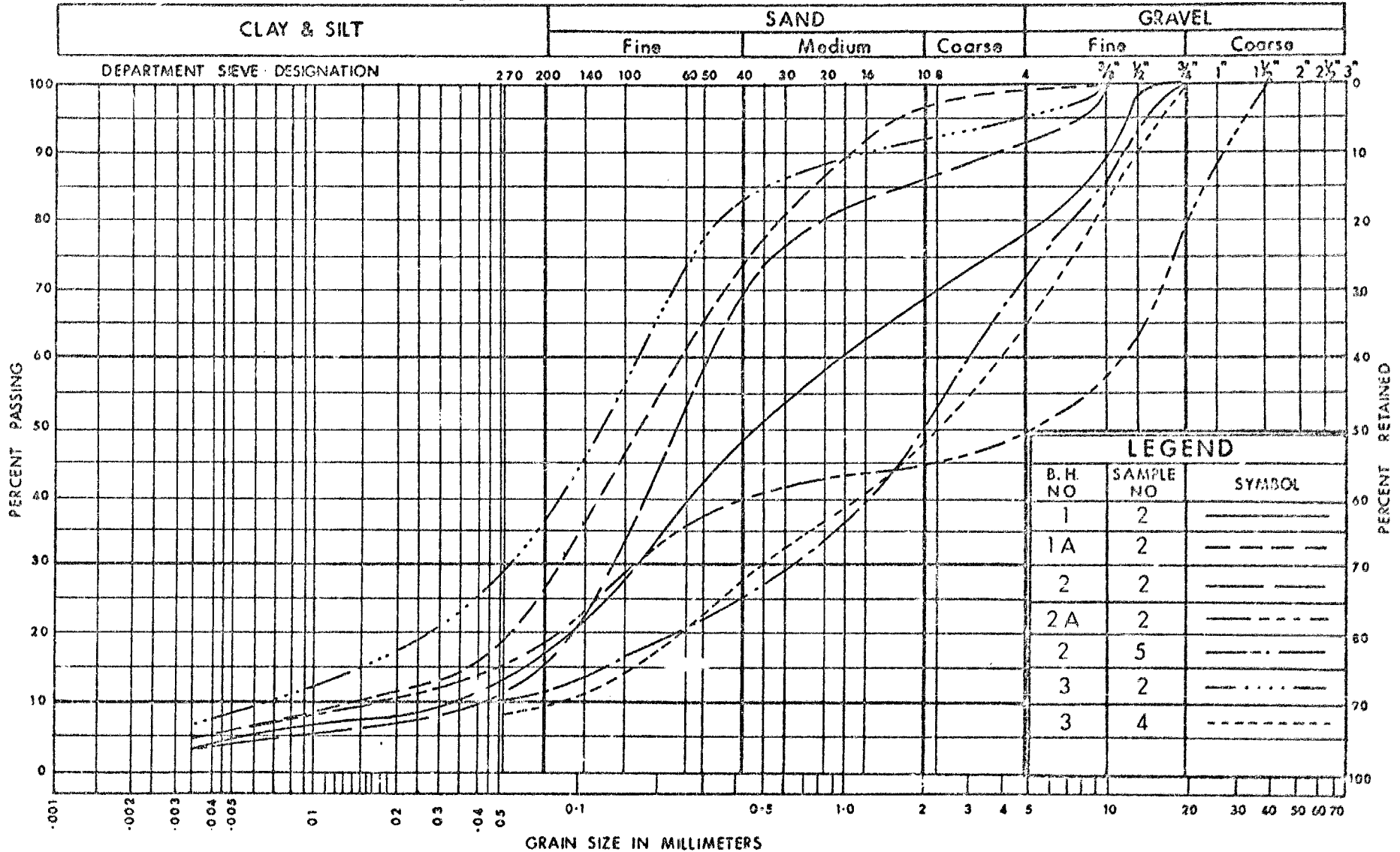
CHECKED BY *JK*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL * LAB VANE 400 800 1200 1600 2000	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					
261.7	Ground Level									
0.0	Fill, silty sand, some gravel.		1	SS	47	260				
24.9	Compact		2	SS	12					
5.8	Silty sand, some gravel & trace of organics.		3	SS	5					
246.7			4	SS	17	250				
15.0	Clayey silt, some sand & occasional gravel.		5	SS	7					
241.7	Firm to Stiff		6	SS	15					
20.0	Loose to Dense		7	SS	31	240				
235.7	Weathered		8	SS	115/6"					
26.0			9	BXL R.C.	100% Rec.	230				
27.0	Sound Shale Bedrock		10	BXL R.C.	100% REC					
225.7										
36.0	End of Borehole					220				

2.61 Organ.
253.7

100/1"

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT
OF
TRANSPORTATION AND COMMUNICATIONS



DESIGN SERVICES
BRANCH

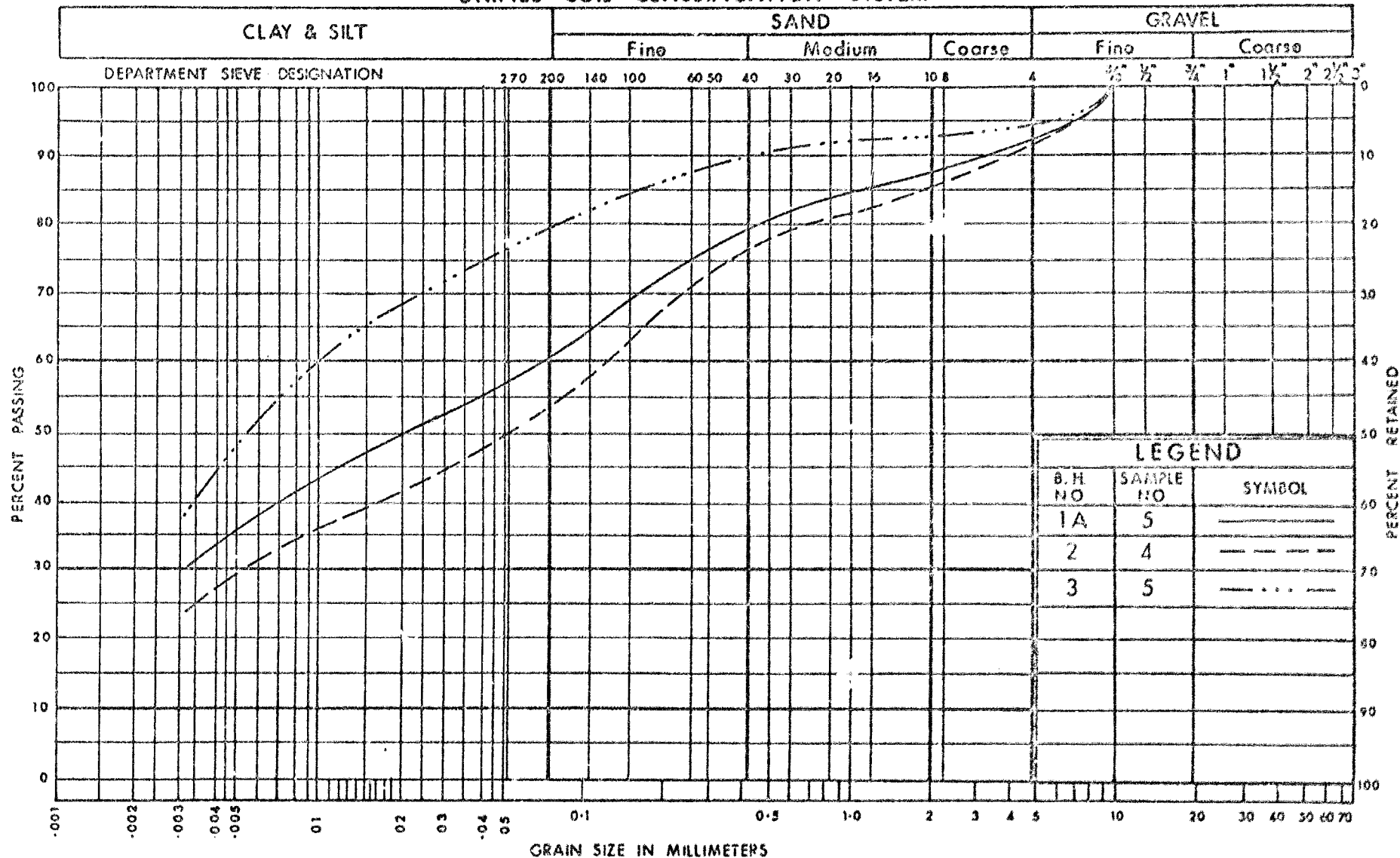
GRAIN SIZE DISTRIBUTION
SILTY SAND
TRACE TO SOME GRAVEL

W.P. No. 44-71-12

JOB No. 72-11128

FIG. 1

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT
OF
TRANSPORTATION AND COMMUNICATIONS



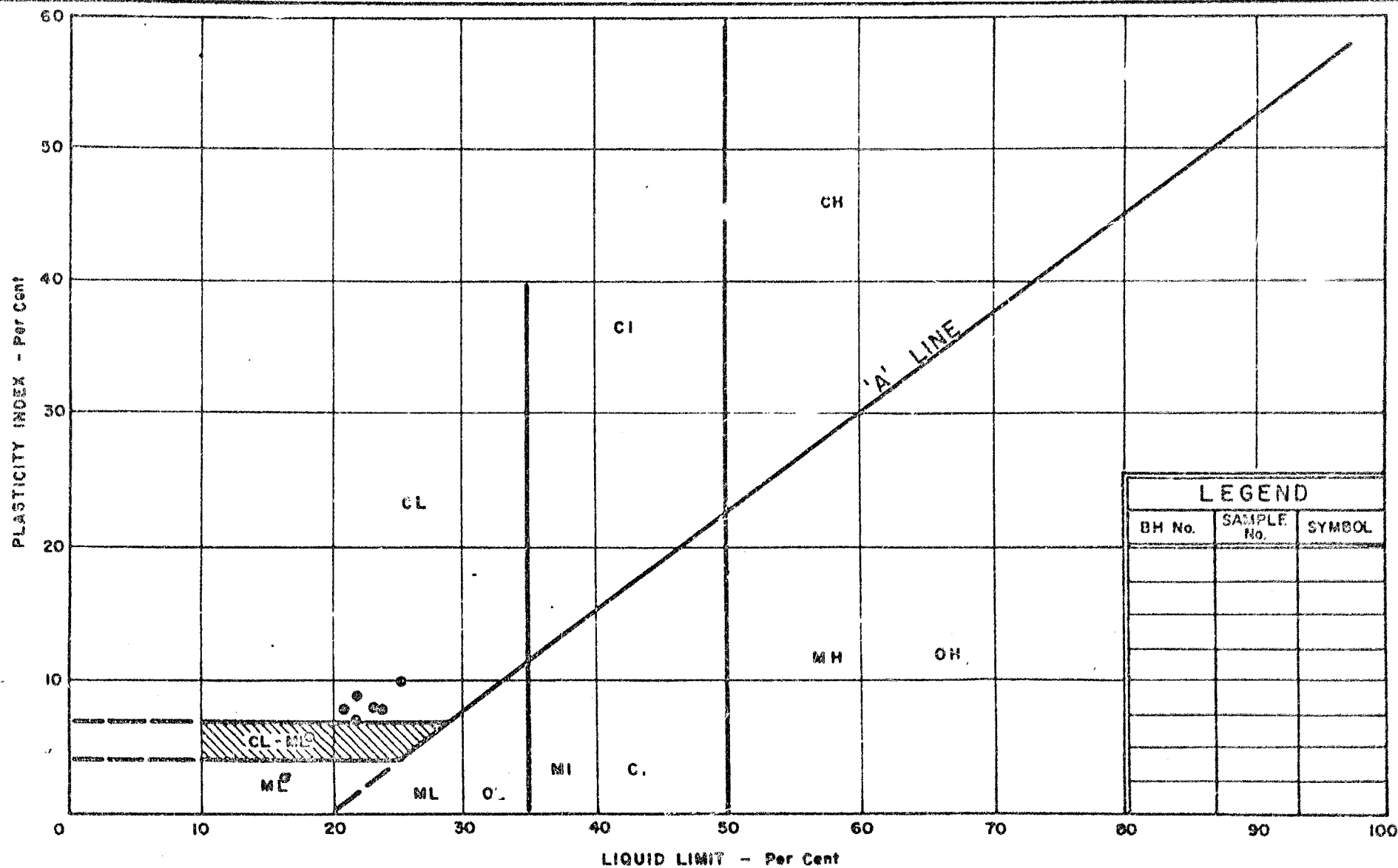
DESIGN SERVICES
BRANCH

GRAIN SIZE DISTRIBUTION
CLAYEY SILT
SOME SAND & GRAVEL

W.P. No. 44-71-12

JOB No. 72-11128

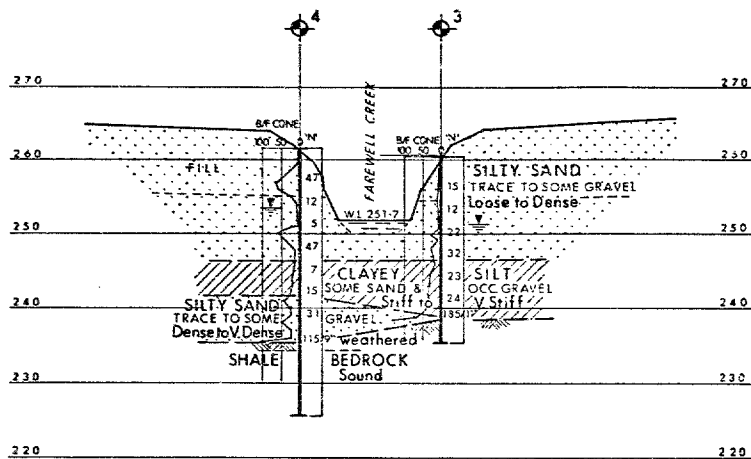
FIG. 2



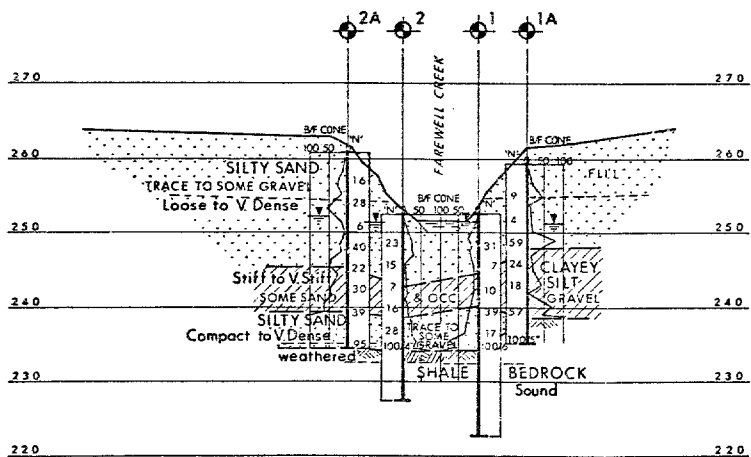
DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

PLASTICITY CHART CLAYEY SILT SOME SAND & GRAVEL

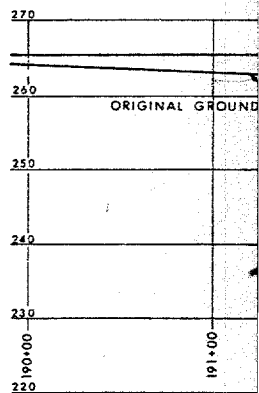
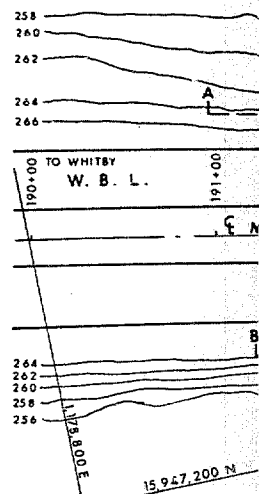
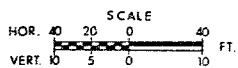
WP. No. 44-71-12
JOB No. 72-11128
FIG. 3

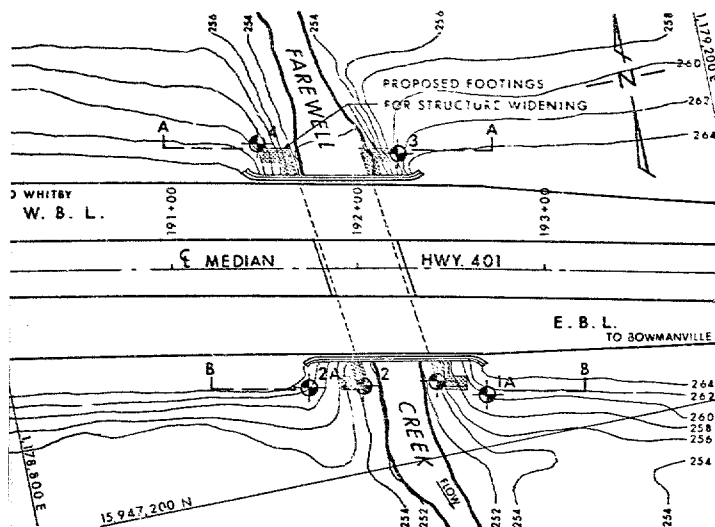


A - A

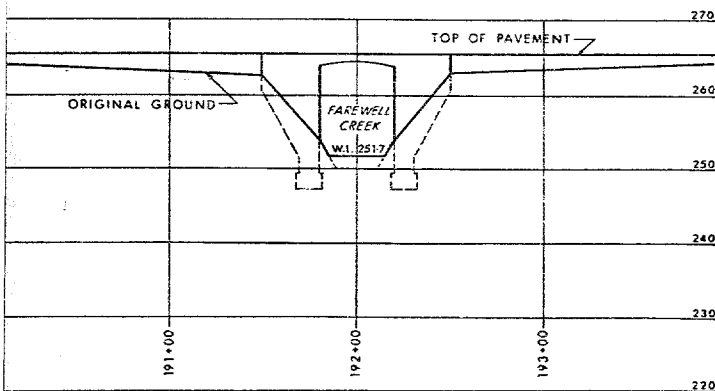


B - B
SECTIONS





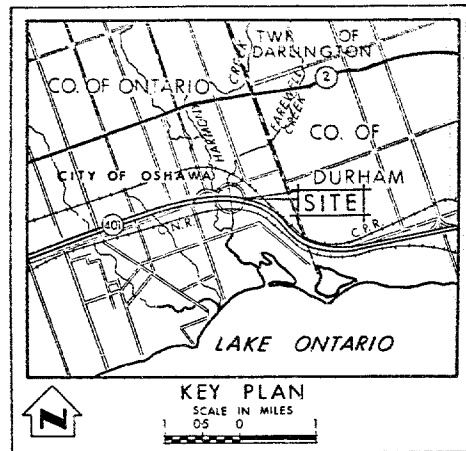
PLAN
SCALE
40 20 0 40 FT.



PROFILE
SCALE
HOR. 40 20 0 40 FT.
VERT. 10 5 0 10



REF. NO. B-4-20



LEGEND			
	Bore Hole		
	Cone Penetration Test		
	Bore Hole & Cone Test		
	Water Levels established at time of field investigation. Nov 1972		
NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	252.8	15,947,240	1,179,025
1A	259.4	15,947,227	1,180,050
2	252.6	15,947,245	1,178,965
2A	261.1	15,947,250	1,178,957
3	260.6	15,947,364	1,179,030
4	261.7	15,947,384	1,178,957

— 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

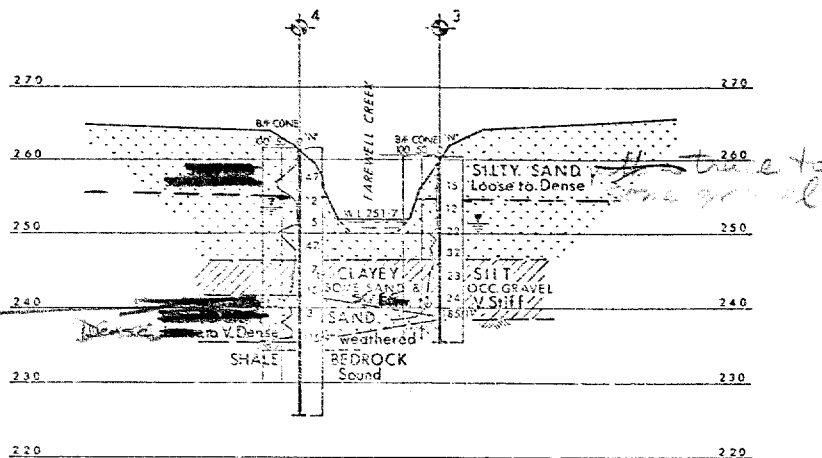
FAREWELL CREEK

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

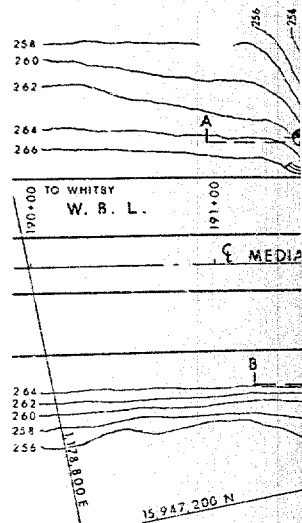
BORE HOLE LOCATIONS & SOIL STRATA

SUBMD V.K.	CHECKED <u> </u>	WP NO. <u>44-71-12</u>	DRAWING NO. <u>72-11128A</u>
DRAWN O.L.J.	CHECKED <u> </u>	WO NO. <u>72-11128</u>	
DATE <u>15 FEB. 1972</u>		SITE NO. <u>22-183</u>	BRIDGE DRAWING NO. <u> </u>
APPROVED <u> </u>		CONT. NO. <u> </u>	

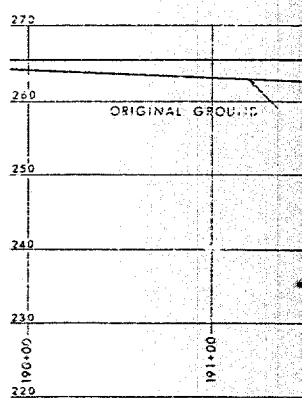
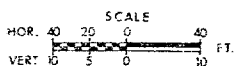
*Silty Sand,
with trace
to some
gravel*



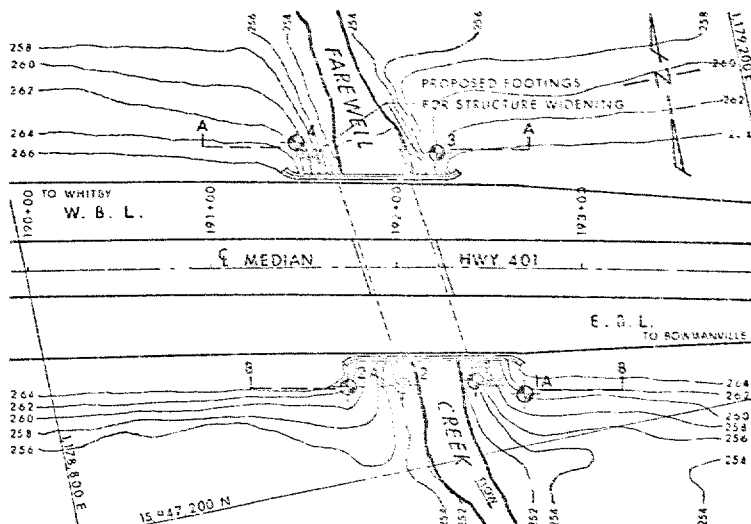
A - A



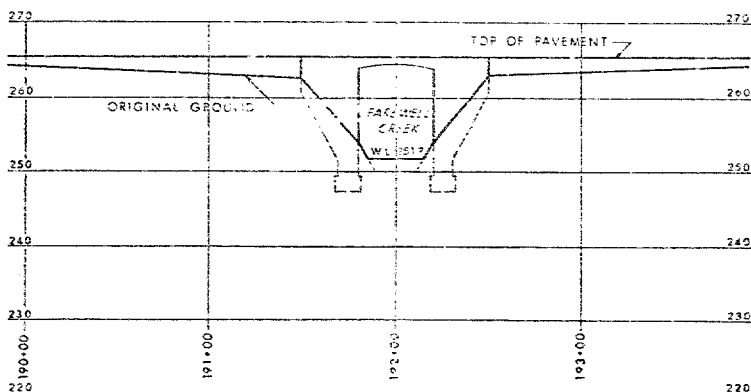
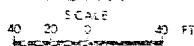
B - B
SECTIONS



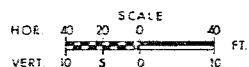
HOR
VERT



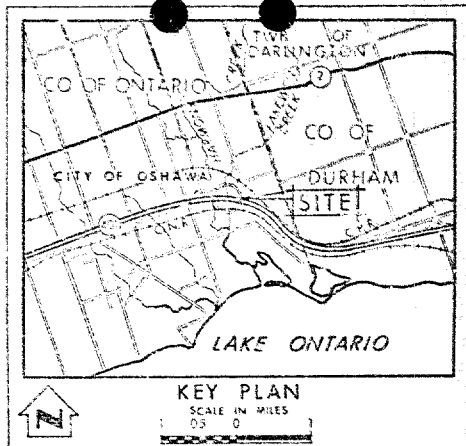
PLAN



PROFILE



REF. NO. B-4-20



KEY PLAN

SCALE IN MILES
0 0.5 1

LEGEND

- Bore Hole
- Cone Penetration Test
- Bore Hole & Cone Test
- Water Levels established at time of field investigation - Nov 1972

NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	252.8	15,942,240	1,179,025
1A	259.4	15,947,227	1,180,050
2	252.5	15,947,245	1,178,986
2A	261.7	15,947,257	1,178,957
3	260.6	15,947,344	1,179,010
4	261.7	15,947,364	1,178,957

NOTE

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

REV.	DATE	BY	DESCRIPTION

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

FAREWELL CREEK

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

BORE HOLE LOCATIONS & SOIL STRATA

SUBMIT V.K.	CHECKED BY	WP NO. 44-71-12	DRAWING NO.
DRAWN BY	CHECKED BY	WO NO. 72-11128	72-11128A
DATE 15 FEB 1973	SITE NO. 22-183	BRIDGE DRAWING NO.	
APPROVED	SIGNATURE	CONT NO.	

DOCUMENT WORK SHEET IDENTIFICATION

GEOCRES No. 30M15-8

DIST. 6 REGION Central

W.P. No. 44-71-12

CONT. No. 77-133

W. O. No. 72-11128

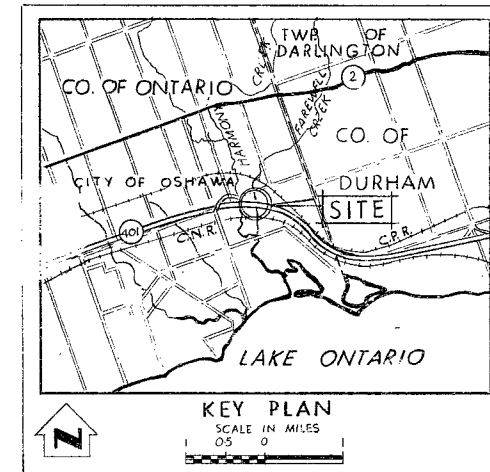
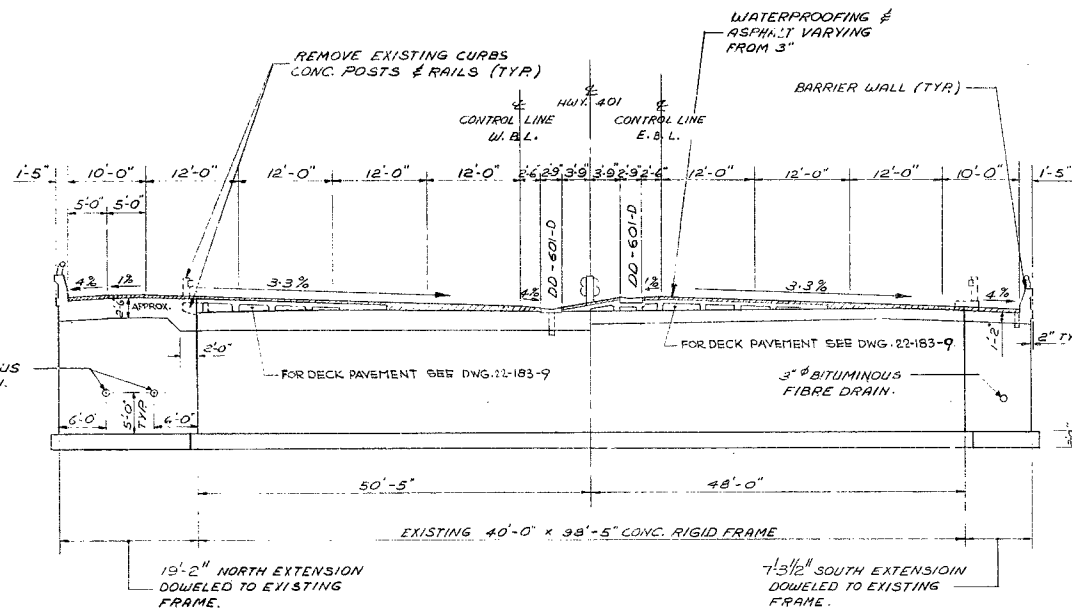
STR. SITE No. 22-183

HWY. No. _____

LOCATION Widening of the Bridge
Structure at the Crossing of
Hwy. 401 & Farewell Creek

OVERALL DESIGN TO BE INCLUDED WITH THE REPORT X

REMARKS: _____



NOTES:

CLASS OF CONCRETE

FOOTINGS, CONCRETE LINING AND	
APPROACH SLABS	3000 P.S.I.
REMAINDER	4000 P.S.I.

CLEAR COVER TO REINFORCING STEEL

DECK TOP 2" BIT. 1 1/2", BARRIER WALLS 1 1/2"
LEGS AND RETAINING WALLS AND FOOTINGS - 3"
AND/OR AS NOTED ON DRAWINGS.

CONSTRUCTION NOTES

- EXISTING TIE RAILS AND BRIMING BRUITSMENTS
SHALL BE REMOVED AND REASSEMBLED.
- FOR DETAIL OF EXISTING STRUCTURES SEE
DWG. C-3123.
- DIMENSIONS OF EXISTING STRUCTURE MUST BE
CHECKED IN FIELD BY THE CONTRACTOR.
- EXISTING MATERIALS AND DIMENSIONS OF DECK
SUPPORT OF PROPOSED WIDENINGS SHALL MATCH
THOSE OF EXISTING STRUCTURES.

LIST OF DEFILLINGS

- 22 - 183 - 1 GENERAL PLAN
- 2 BORR: HOLE LOCATION & SOIL STRATA
- 3 FACING LAYOUT
- 4 FRAME
- 5 RETAINING WALLS
- 6 CONCRETE BARRIER WALL
- 7 STEEL PARAPET BAILING
- 8 20 FT. APPROACH SLAB
- 9 DECK PAVEMENT
- 10 STANDARD DETAILS
- 11 R.R. DO II

REVISIONS			
	DATE	BY	DESCRIPTION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO

30M/5-8

WIDENING OF EXISTING FAREWELL CREEK
AND HIGHWAY #401 BRIDGE

KING'S HIGHWAY No. 401 DIST. No. 6

CO. ONTARIO

TWP. CITY OF OSHAWA LOT 3 CON. B.F.

GENERAL PLAN

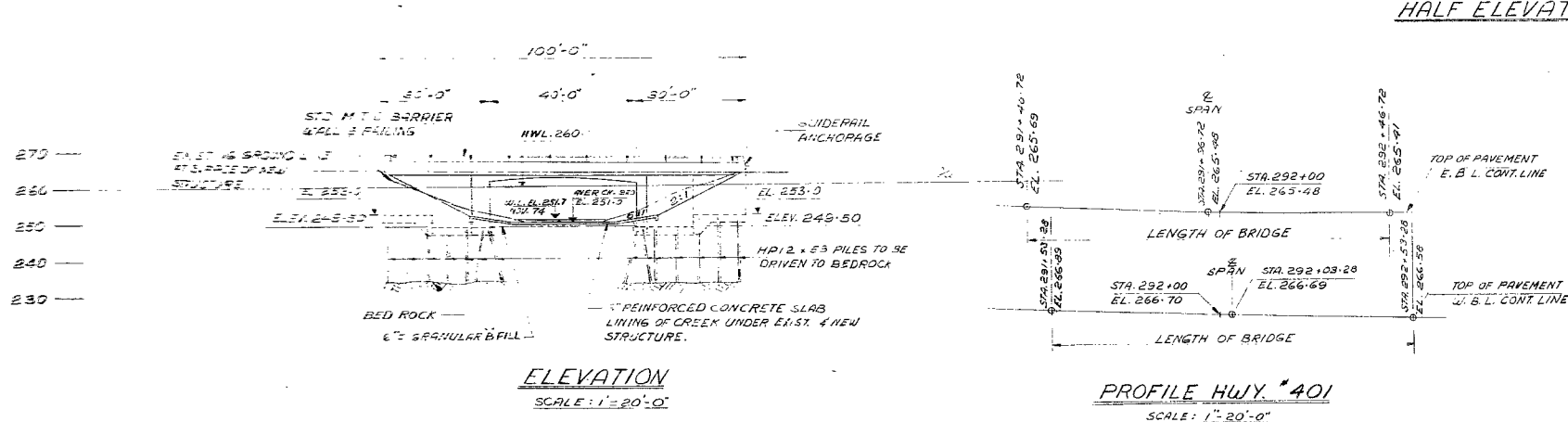
APPROVED _____	CONTRACT No. _____
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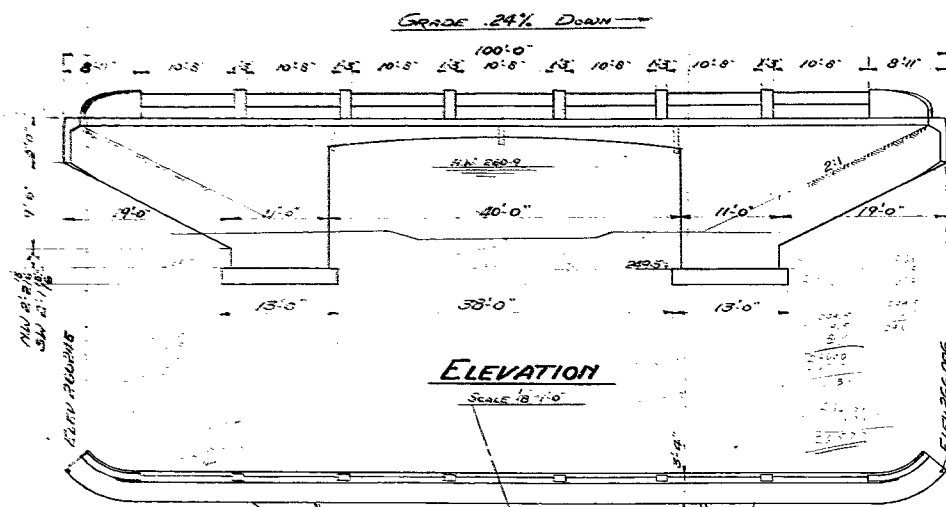
STRUCTURAL ENGINEER				W.P. No.	44-71-12
DESIGN	<i>E. M. L.</i>	CHECK	<i>J. P.</i>		

DRAWING	J. A.	CHECK	5/92	SITE No.	22-183	SHEET	
---------	-------	-------	------	----------	--------	-------	--

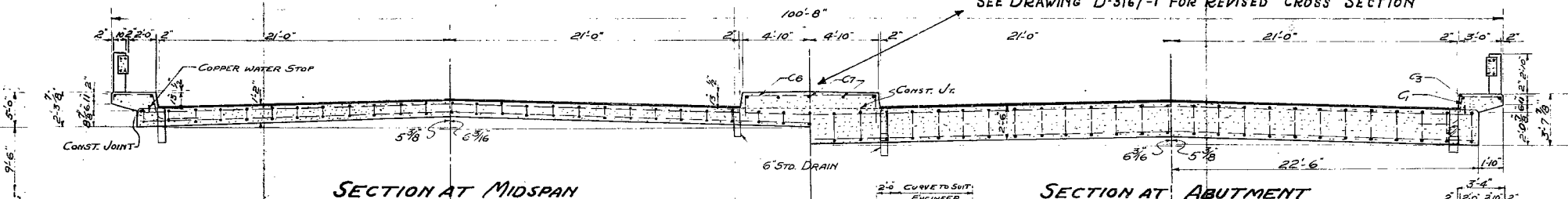


FOR REDUCED PLAN



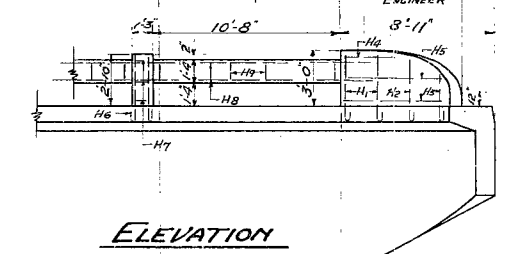


ELEVATION
SCALE 1/8"=1'-0"

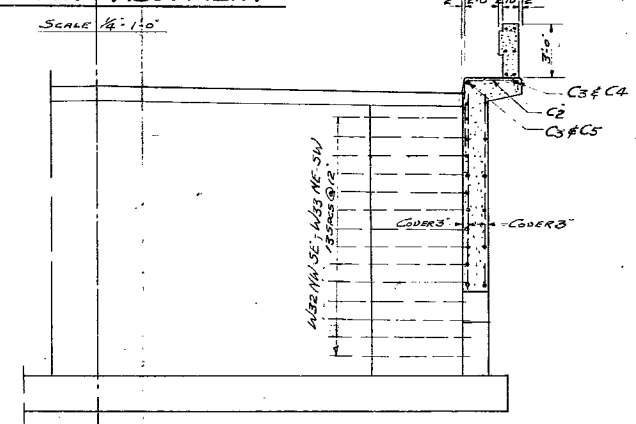


SECTION AT MIDSPAN
SCALE 1/4"=1'-0"

SECTION AT ABUTMENT
SCALE 1/4"=1'-0"

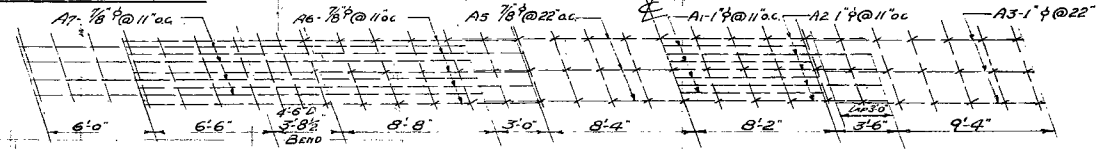


ELEVATION
SCALE 1/4"=1'-0"



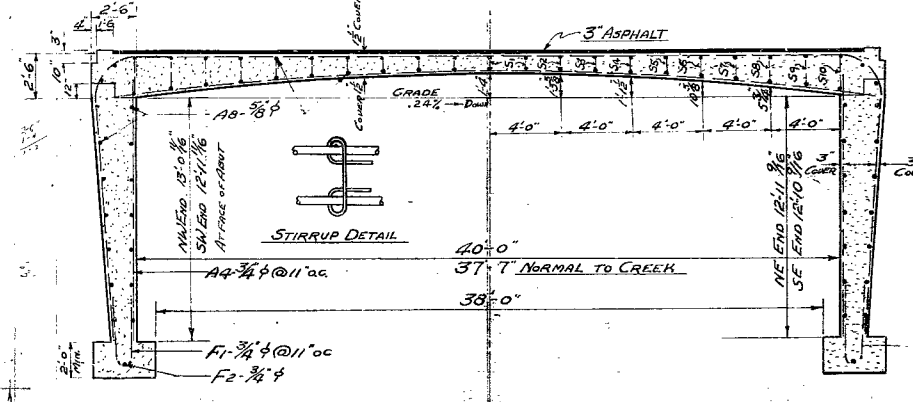
END VIEW WITH
W.W. SECTION

PLAN
CURB & HR DETAIL

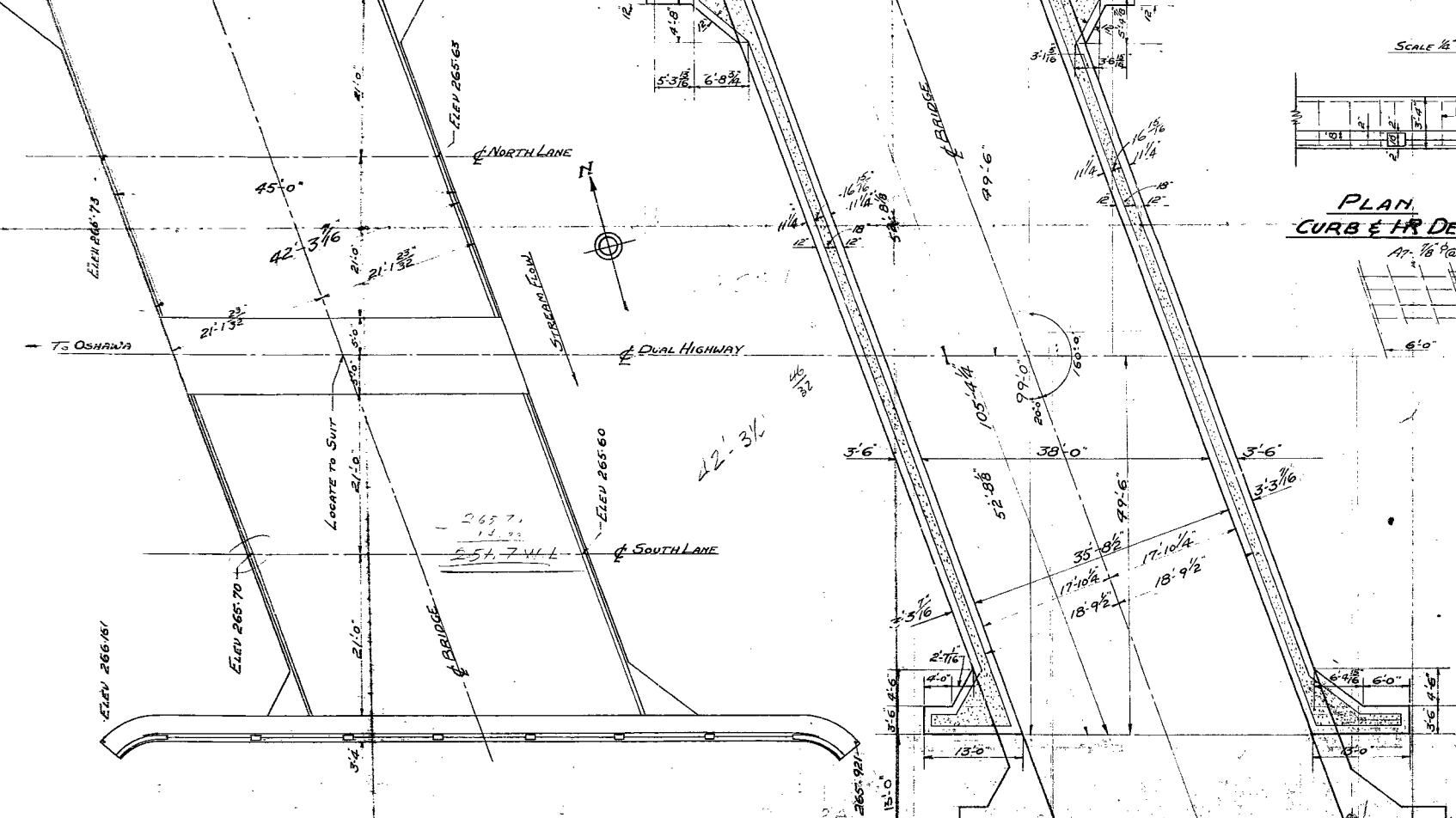


EXTRADOS STEEL

INTRADOS STEEL



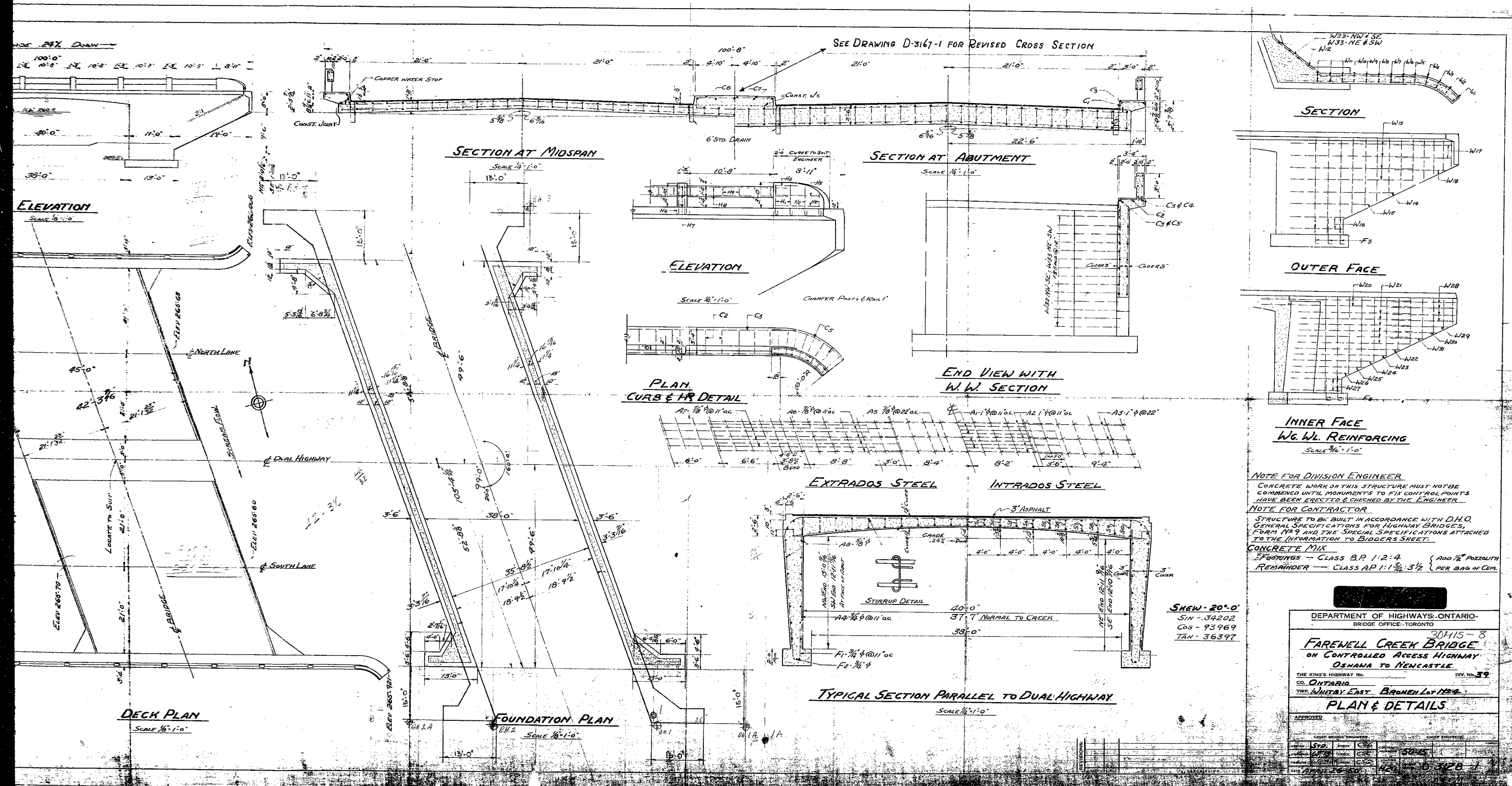
TYPICAL SECTION PARALLEL TO DUAL HIGHWAY
SCALE 1/4"=1'-0"



DECK PLAN
SCALE 1/8"=1'-0"

FOUNDATION PLAN
SCALE 1/8"=1'-0"

SHEW-20'-0"
SIN-34202
COS-93969
TAN-36397



DEPARTMENT OF HIGHWAYS-ONTARIO	
BRIDGE OFFICE-TORONTO	
304115 - 8	
FAREWELL CREEK BRIDGE ON CONTROLLED ACCESS HIGHWAY <u>OSMANA TO NEWCASTLE</u>	
THE KING'S HIGHWAY No.	DIV. NO. 39
CO. ONTARIO	
TWP. WHITBY EAST BROWN LOT 1 & 2	
PLAN & DETAILS	
APPROVED _____	
CHIEF ENGINEER	CHIEF ENGINEER
CHECKED BY S.D.B. DESAI DATE APR 11 1984 TIME 12:00 PM	CHECKED BY J.C.S. DATE MAY 11 1984 TIME 12:00 PM