

G-1-33 SEPT 1979

GEOCRES No. 31F-81DIST 9 REGION EasternW.P. No. 2-67-03CONT. No. 79-28

W. O. No. _____

STR. SITE No. 29-159HWY. No. 17NLOCATION CPR Overhead Structure
Hwy. 17N (Pembroke By-pass)OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 4REMARKS: documents to be unfolded
before microfilming

FOUNDATION INVESTIGATION REPORT
FOR
C.P.R. OVERHEAD STRUCTURE
HWY. 17N (PEMBROKE BY-PASS)
LOT 27, CON. 1 TWP. OF WESTMEATH
COUNTY OF RENFREW DISTRICT 9 (OTTAWA)
SITE 29-159 W.P. 2-67-03

1. INTRODUCTION

A preliminary investigation was carried out in November and December 1974 to select an appropriate crossing of C.P.R. and Hwy. 17N. Subsequently an additional investigation was carried out to determine the subsoil condition for the preliminary alternatives of Lines 'T' and 'Z' in July, 1975 and the results were submitted in a memo dated July 29, 1975.

The Soil Mechanics Section was requested to carry out a foundation investigation for the finalized alignment of Hwy. 17N (Line 'A') and C.P.R. crossing. The request was received from Mr. T.C. Kingsland, Regional Structural Planning Engineer, Kingston Region, in a memorandum dated Sept. 15, 1975.

Subsequently, a field investigation was carried out during the period of October 6-8, 1975, under the supervision of Mr. H.D. Reed, Technician, Geotechnical Office.

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

2. SITE DESCRIPTION

The site is located some 5 miles southeast of Pembroke and approx. 3/4 of a mile south of a C.N.R. subway, at mileage 86.86, Chalk River Sub-division. At this location the Kathmae siding tracks run parallel to the C.P.R. tracks.

Topographically the area in general is fairly flat and bush covered, with bedrock outcroppings throughout and localized swamps in the general vicinity.

Physiographically this region is known as the Ottawa Valley Clay Plains.

3. FIELD INVESTIGATION PROCEDURES

A total of 10 augered boreholes and 6 dynamic cone penetration tests was carried out by means of a hollow stem auger (B-56) muskeg vehicle mounted machine with diamond drilling capabilities.

At boreholes 2,4,7 and 10 bedrock was proven by obtaining BX rock core samples. The remaining boreholes were augered to bedrock surface. The boreholes were placed to determine the bedrock profile along the proposed footings as marked out on the 'E' plan. (E-5266-1) Elevations and locations of all the boreholes were taken by Mr. Ron Denison, Surveyor with Engineering Surveys, Kingston Region, and are shown on drawing 26703-A attached to this report.

During the field work, disturbed samples were obtained by standard split spoon sampling methods. All samples were visually examined in the field as well as in the

laboratory. Following this inspection, testing was carried out to determine the following physical characteristics of the overburden:

- a. grain size distribution
- b. atterberg limits

The results of the tests are plotted on record of borehole sheets in the appendix of the report.

4. SUBSOIL AND BEDROCK CONDITIONS

4.1 General

Overburden in general consists of a black organic material encountered at all boreholes over a deposit of grey silt in some locations and mottled clayey silt in others, overlying a granular deposit above the bedrock.

4.2 Overburden

Black organic material overlies the site area and is on the average 1 ft. thick except at boreholes 7 and 8 which were placed in the ditch on the east side of the tracks, where it was some 2 ft. to 3 ft. deep. This organic material is generally fibrous, mixed with decayed vegetation and some silt and sand.

Silt was encountered in boreholes 3 and 10 only, underlying the organic material and consists of a $1\frac{1}{2}$ ft. to 2 ft. pocket or layer of compact, dry, grey silt.

Clayey silt was encountered in five boreholes (2, 5, 6, 7 and 8) underlying the organic material and in general consisted of a $1\frac{1}{2}$ ft. layer of soft to firm grey-brown mottled clayey silt.

Granular deposit was found in all boreholes overlying the bedrock and mainly consists of a 1½ ft. to 8 ft. deposit of loose to compact ('N' values 8-23 blows per ft.), grey silty sand, some gravel and a trace of clay. However in boreholes 1,9 and 10 this deposit was 1 ft. to 2 ft. thick and generally dense to very dense ('N' values 40-79 blows per ft.), consisting of a reddish brown sand with a trace of gravel and some rock fragments.

4.3 Bedrock (Gneiss)

Bedrock was encountered very close to the surface in eight boreholes, ranging from 1 ft. to 6 ft. below the ground surface (elev. 454 to 458) and in boreholes 7 and 8 at the east pier location the bedrock was found to be 12 ft. below the ground level (elev. 445 ±). The bedrock core samples were inspected in the laboratory by Mr. Bern Glassford, Geologist, and was found to be a hard, grey gneiss, medium textured bedrock and generally sound.

Refer to the subsoil and bedrock details on the record of borehole sheets in the appendix of the report as well as the geologist diamond drill record (Fig 2).

5. GROUNDWATER CONDITIONS

Groundwater levels were observed in five of the ten boreholes during the field investigation and were found to be 1 ft. to 2 ft. below ground level, between elevations 456.6, and 457.1.

6. DISCUSSION AND RECOMMENDATIONS

6.1 General

It is proposed to build a 3 span (70' each span)

structure where Hwy. 17N crosses existing C.P.R. tracks. The present ground elevation ranges from 457.3 to 461.0 and the proposed grade of Hwy. 17 (Line 'A') at this crossing being at elevation 492 \pm . The existing C.P.R. tracks are located on a small embankment (3 to 5 ft. high) the tracks being at elevation 463 \pm . This places the approach embankments some 30 to 35 ft. high.

6.2 Approach Embankments

In order to ensure the stability of the approaches in the vicinity of the structure it is recommended that the surficial organic deposit as well as any clayey silt deposits that may be encountered should be excavated to its full depth within the full base width of the proposed embankment. The excavation should extend for a minimum distance of 100' behind the abutments in the longitudinal direction and backfilled with a granular type material.

On site observations revealed the presence of bedrock at or very near the ground surface for some 200 ft. behind the abutments. The embankments for the approaches can be constructed with acceptable earth material using 2:1 slopes. No settlement problem are anticipated since the soft compressible organic and cohesive material will be removed prior to construction of the approach embankments.

6.3 Foundation Considerations

Abutments

Perched abutments can be placed within the fill and supported on spread footings founded on a well compacted granular pad. (As per Fig. 1 in appendix of report) An allowable pressure of 2.5 t.s.f. may be used for design.

As an alternative the abutments may be supported on end bearing piles driven through the fill to bedrock.

The maximum allowable capacity for pile section chosen may be used for design purposes. No bouldery fill should be placed in the area where piles are to be driven.

West Pier

The bedrock at this location is covered by 3 ft. to 6 ft. of overburden. The West Pier can be supported on spread footings founded on bedrock. A design load of 20 t.s.f. may be used.

East Pier

The overburden consists of up to 4 ft. of organics and clayey silt over a 7 ft. to 8 ft. loose to compact sand deposit. Such deposits will not provide adequate bearing capacity for the pier foundations. It is therefore recommended that the proposed East Pier be founded on bedrock. A design load of 20 t.s.f. may be used.

The excavation will extend below the prevailing groundwater level. Due to the pervious nature of the sand deposit, seepage into the excavation can be anticipated. For this reason and for the protection of the C.P.R. tracks it may be desirable to use sheeted excavation techniques.

As an alternative the piers may be supported on concrete caissons extended to the bedrock. The same caissons may be continued to act as pier columns. This would obviate any excavation close to the tracks and consequently eliminate any track protection requirements. An allowable load of 200 tons per caisson for a 36 inch diameter caisson may be used for design purposes. For resisting any lateral thrust the caissons can be socketed into the rock, this aspect can be reviewed further during design process.

7. MISCELLANEOUS

The drilling equipment used was owned and operated by Atcost Soil Drilling Inc. under the supervision of Mr. H.D. Reed, Technician, Geotechnical Office.

This report was prepared by Mr. H.D. Reed and reviewed by Mr. M. Devata, Supervising Engineer.



A handwritten signature in cursive script, reading "H.D. Reed".

H.D. Reed
Technician

A handwritten signature in cursive script, reading "M. Devata".

M. Devata
Supervising Engineer

WP 2-67-03 LOCATION Co-Ords. 629,400 N 862,371 E ORIGINATED BY HR
DIST 9 HWY 17N BORING DATE Oct 7/75 Dynamic Cone COMPILED BY MK
DATUM Geodetic BOREHOLE TYPE 3 1/2" Hollow Stem; penetration test CHECKED BY [Signature]

SOIL PROFILE		SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w	UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		'N' VALUES	20 40 60 80 100 SHEAR STRENGTH . ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE		
458.8	Ground Level								
0.0	Black Org. Mat'l	{ }							
456.8		{ }							
2.0	Red-Brown Sand	. . .	1	SS	40				7 75 (18)
455.3	Dense	/ \ / \							W.L. not
3.5	End of Borehole Probable bedrock								Observed
						450			

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

WP 2-67-03
DIST 9 HWY 17N
DATUM Geodetic

LOCATION Co-Ords. 629,380 N 862,365 E
BORING DATE Oct 7/75 Cone
BOREHOLE TYPE 3 1/2" H.S. Augers; BX Casing; BXL Core; Test

ORIGINATED BY HR
COMPILED BY MK
CHECKED BY HR

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT		LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20 40 60 80 100	SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	w_p — w — w_L	WATER CONTENT % 10 20 30		
458.6	Ground Elev.											
0.0	Black Organic Material											
456.1	2.5 Grey-Brown Mottled Clayey Silt Soft to Firm		1	SS	5							
454.2	4.4 Black Org. Sand											
4.9	Gneiss Bedrock Sound		2	RC BXL	REC 100%							
448.5						450						
10.1	End of Borehole					440						

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE NO 3

WP 2-67-03

LOCATION Co-Ords. 629,423 N 862,336 E

ORIGINATED BY HR

DIST 9 HWY 17N

BORING DATE Oct. 7/75

COMPILED BY MK

DATUM Geodetic

BOREHOLE TYPE 3 1/2" H.S. Auger, Cone Test

CHECKED BY LR

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	W_P	W	W_L	
460.7	Ground Elev.					460									
459.7	Black Org. Mat'l														
1.0	Grey Silt Compact														
457.7															
3.0	Gr-Brown Silty Sand Some gravel, Trace Clay, Dense		1	SS	45										
453.3	Bedrock		2	SS	48										
6.4	End of Borehole														
						450									

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

RECORD OF BOREHOLE NO 4

WP 2-67-03 LOCATION Co-Ords. 629,405 N 862,404 E ORIGINATED BY HR
 DIST 9 HWY 17N BORING DATE Oct. 7/75 COMPILED BY MK
 DATUM Geodetic BOREHOLE TYPE 3 1/2" H.S. Auger, BX Casing, BXL Core CHECKED BY HR

SOIL PROFILE			SAMPLES			GROUND WATER	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_f	w	w_L		
458.0	Ground Elev.					ELEV										GR SA SI CL
0.0	Black Org. Mat'l															
456.9	Black Org. Mat'l															
1.1	Gneiss Bedrock Sound		1	RC BXL	100% REC											W.L. Not Observed
451.7	End of Borehole															
6.3																
						450										
						440										

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

RECORD OF BOREHOLE NO 5

WP 2-67-03 LOCATION Co-Ords. 629,362 N 862,433 E ORIGINATED BY HR
DIST 9 HWY 17N BORING DATE Oct 7/75 COMPILED BY MK
DATUM Geodetic BOREHOLE TYPE 3 1/2" Hollow Stem Auger, Cone Test CHECKED BY HR

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x 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 Y	REMARKS % GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES					
458.5	Ground Elev.									
459.0	Black Org. Mat'l									
459.2	Mott. Clayey Silt	Firm	1	SS	6					
456.2										
2.3	Grey Silty Sand									
454.7	End of Borehole									
3.8	Probable Bedrock									
						450				

RECORD OF BOREHOLE NO 6

WP 2-67-03 LOCATION Co-Ords. 629,383 N 862,414 E ORIGINATED BY HR
 DIST 9 HWY 17N BORING DATE Oct 7/75 COMPILED BY JK
 DATUM GEODETIC BOREHOLE TYPE 3 1/2" Hollow Stem Auger CHECKED BY CL

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	w_p	w	w_L		
458.6	Ground Elev.															
457.6	Black Org. Mat'l															
1.0	Mottled Clayey Silt															
456.1																
2.5																
454.1	Grey Silty Sand															
4.5	End of Borehole Probable Bedrock															
						450										

RECORD OF BOREHOLE NO 7

WP 2-67-03 LOCATION Co-Ords. 629,390N 862,473 E ORIGINATED BY HR
 DIST 9 HWY 17N BORING DATE Oct 7/75 COMPILED BY MK
 DATUM Geodetic BOREHOLE TYPE H.S. Auger, BX Casing, BXL Core CHECKED BY SL

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	W_P	W	W_L		
457.3	Ground Elev.															
0.0	Black Organic Material															
454.3																
3.0	Mottled Clayey Silt															
453.1	Soft to firm		1	SS	5											
4.2	Grey Silty Sand with gravel, Trace of clay loose to compact		2	SS	23	450										36 35 28 1
			3	SS	8											38 25 32 4
445.4																
11.9	Gneiss Bedrock Sound		4	RC BXL	100% REC											
440.2																
17.1	End of Borehole Bedrock					440										

RECORD OF BOREHOLE NO 8

WP 2-67-03
DIST 9 HWY 17N
DATUM Geodetic

LOCATION Co-Ords. 629,344 N 862,501 E
BORING DATE Oct 8/75
BOREHOLE TYPE Hollow Stem Auger, Cone Test

ORIGINATED BY HR
COMPILED BY MK
CHECKED BY LR

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x 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
ELEV DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES					
457.3	Ground Elev.									
0.0	Black Organic Material									
454.3										
3.0	Grey Clayey Silt		1	SS	9					
452.8										
4.5	Grey silty sand Some gravel, trace of clay compact		2	SS	11	450				20 49 27 4
			3	SS	15					
444.8			4	SS	20/6"		Refusal			
12.5	End of Borehole Probable bedrock					440				

WP 2-67-03 LOCATION Co-Ord's. 629,307 N 862,539 E ORIGINATED BY HR
DIST 9 HWY 17N BORING DATE Oct 8/75 COMPILED BY MK
DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger; Cone Test CHECKED BY HR

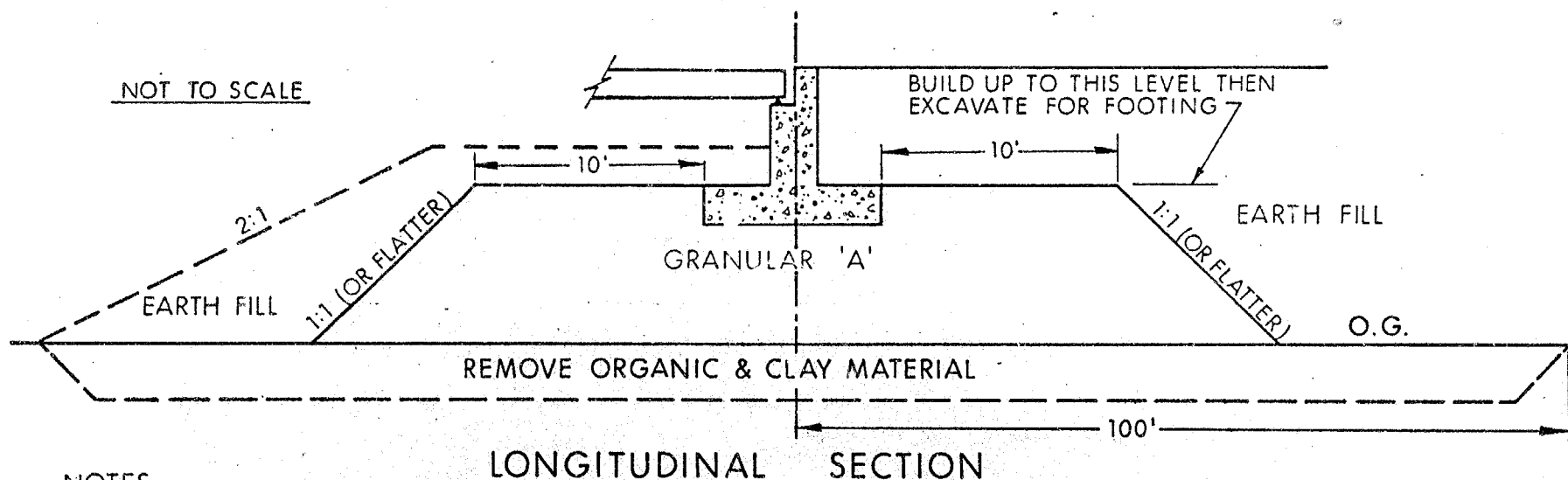
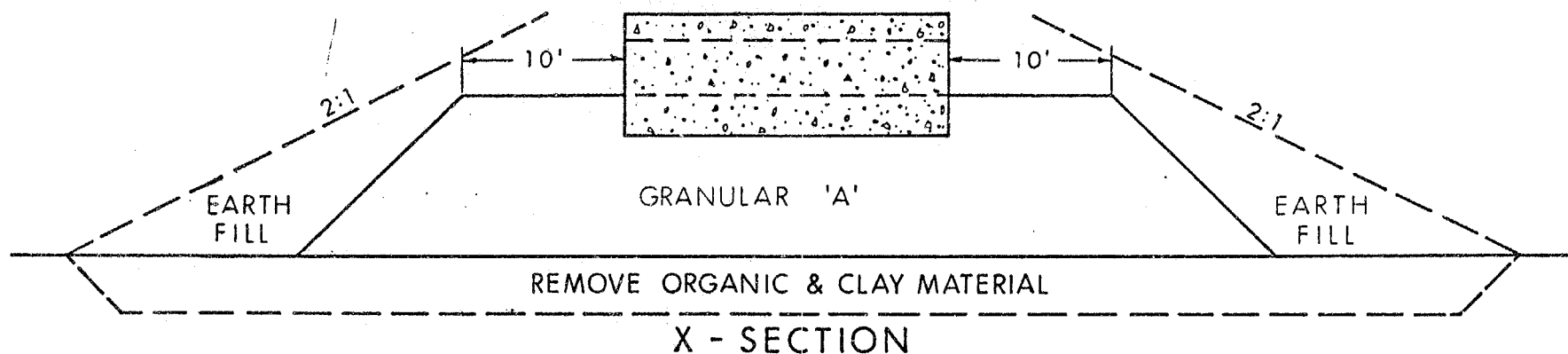
20
15 ϕ 5 % STRAIN AT FAILURE
10

RECORD OF BOREHOLE NO 10

WP 2-67-03 LOCATION Co-Ords. 629,322 N 862,567 E ORIGINATED BY HR
 DIST 9 HWY 17N BORING DATE Oct 8/75 COMPILED BY MK
 DATUM Geodetic BOREHOLE TYPE H.S. Auger, BX Casing, BXL Core CHECKED BY HR

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES		20 40 60 80 100					w_p — w — w_L				
							SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT %				
461.0	Ground Elev.					ELEV										
460.5	Black Org. Mat'l					460										
459.0	Grey Silt															
457.7	Sand, Some rock fragments, very dense		1	SS	79/	9"									27 61 (12)	
451.7	Gneiss Bedrock Sound		2	RC BXL	100% REC										W.L. Not Observed	
9.3	End of Borehole					450										

ABUTMENT ON COMPACTED FILL SHOWING GRANULAR 'A' CORE



NOTES

- 1 - REMOVE ORGANIC & CLAY SUBSOIL UNDER AREA OF EMBANKMENT
- 2 - PLACE GRANULAR 'A' TO TOP OF FOOTING LEVEL, COMPACTED ACCORDING TO CURRENT M.T.C. STANDARDS.
- 3 - EXCAVATE COMPACTED GRANULAR 'A' MATERIAL FOR FOOTING.



DIAMOND DRILL RECORD

DIP

90°

PROPERTY W.P. 2-67-03
LOCATION Pembroke Vicinity
LATITUDE _____
DEPARTURE _____
BEARING _____

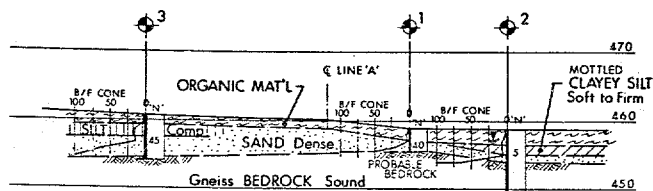
TOTAL FOOTAGE _____

HOLE NO. _____ SHEET NO. _____

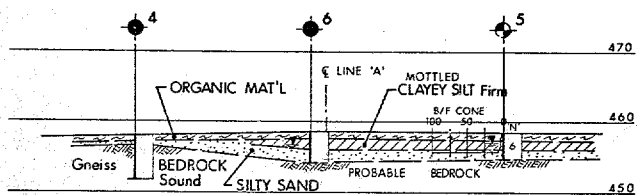
FOOTAGE		FORMATION	SAMPLE NUMBER	REMARKS
FROM	TO			
4'11"	8'5"	HOLE #2 Gneiss, grey colour, medium texture, hard		lineation 30° high % biotite mica
8'5"	9'4"	Pegmatitic vein, pink colour, med. to fine texture		chiefly feldspar, quartz and hornblende minerals
1'11"	6'3"	HOLE #4 Gneiss, grey colour, medium texture, hard		high % biotite mica lineation 30°
11'11"	17'11"	HOLE #7 Gneiss, dark grey colour, medium texture, hard		lineation at 45° vertical joint 14' - 15'
3'3"	9'3"	HOLE #10 Gneiss, grey colour, medium texture, hard		lineation at 45°

DATE OF EXAMINATION October 21, 1975

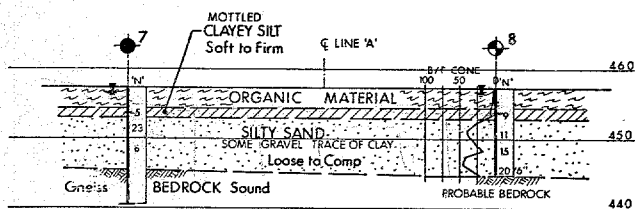
B. K. Glassford



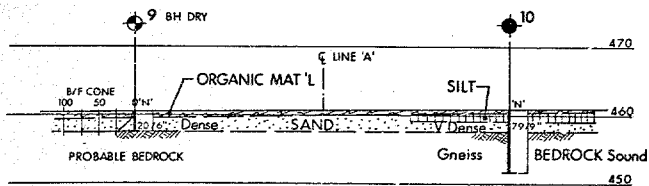
A-A



B-B



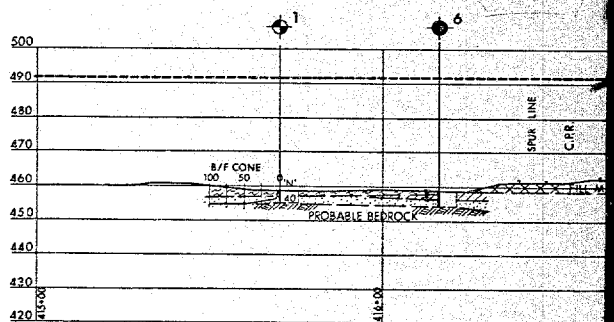
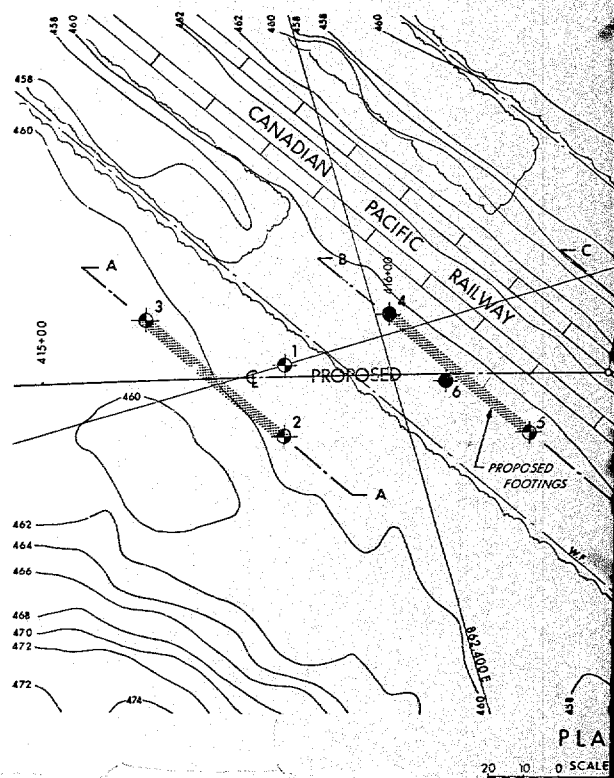
C-C



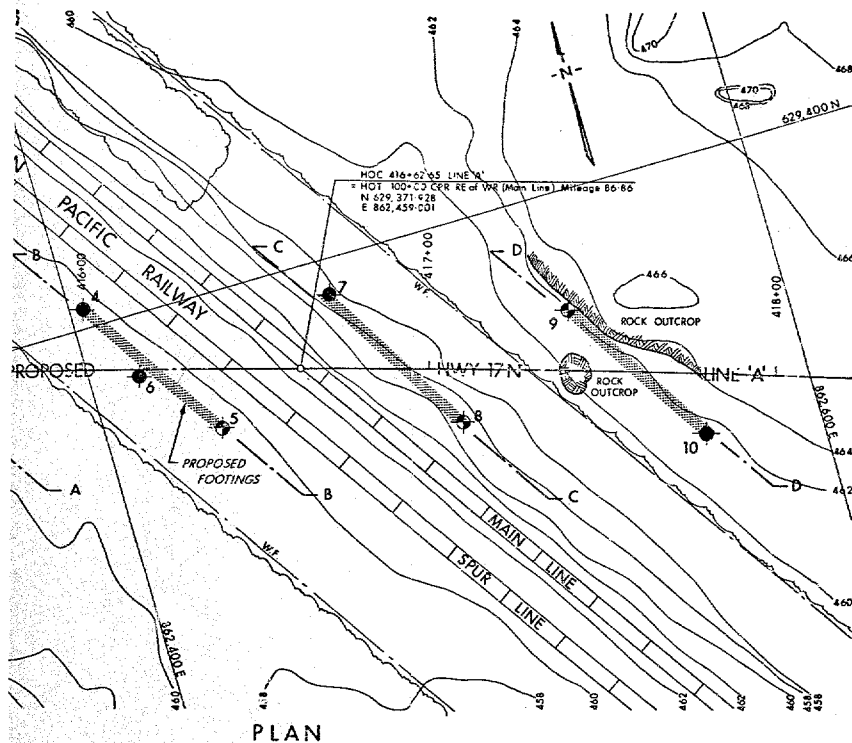
D-D

SECTIONS

10 5 0 SCALE 10 20 FT.



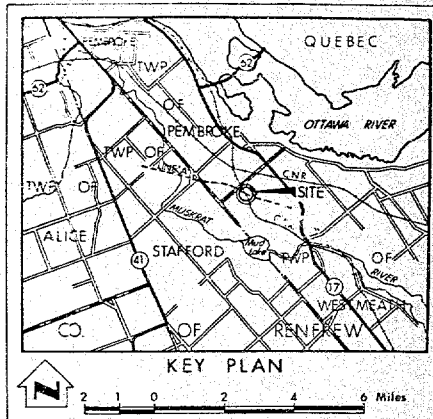
10 5 0 SCALE 10 20 FT.



PLAN
20 10 0 SCALE 20 40 FT.

NOTE

WL NOT OBSERVED IN
BH'S 1, 3, 4 & 10



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, OCT. 1975

NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	458.8	629,400	862,371
2	458.6	629,380	862,365
3	460.7	629,423	862,336
4	458.0	629,405	862,404
5	458.5	629,362	862,433
6	458.6	629,383	862,414
7	457.3	629,390	862,473
8	457.3	629,344	862,501
9	460.5	629,367	862,539
10	461.0	629,322	862,567

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 OTTAWA District Office.

DATE	BY	DESCRIPTION

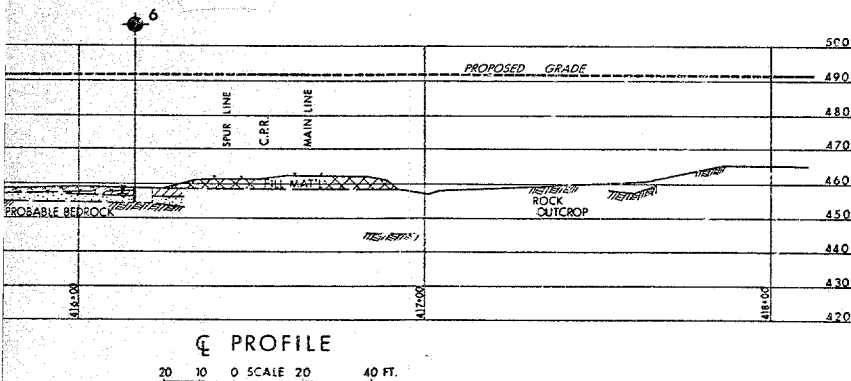
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO
ENGINEERING SERVICES BRANCH—GEOTECHNICAL OFFICE—SOIL MECHANICS SECTION

CANADIAN PACIFIC RAILWAY

HIGHWAY NO. 17 N LINE 'A' DIST. NO. 9
CO. RENFREW
TWP. WESTMEATH LOT. 27 CON. 1

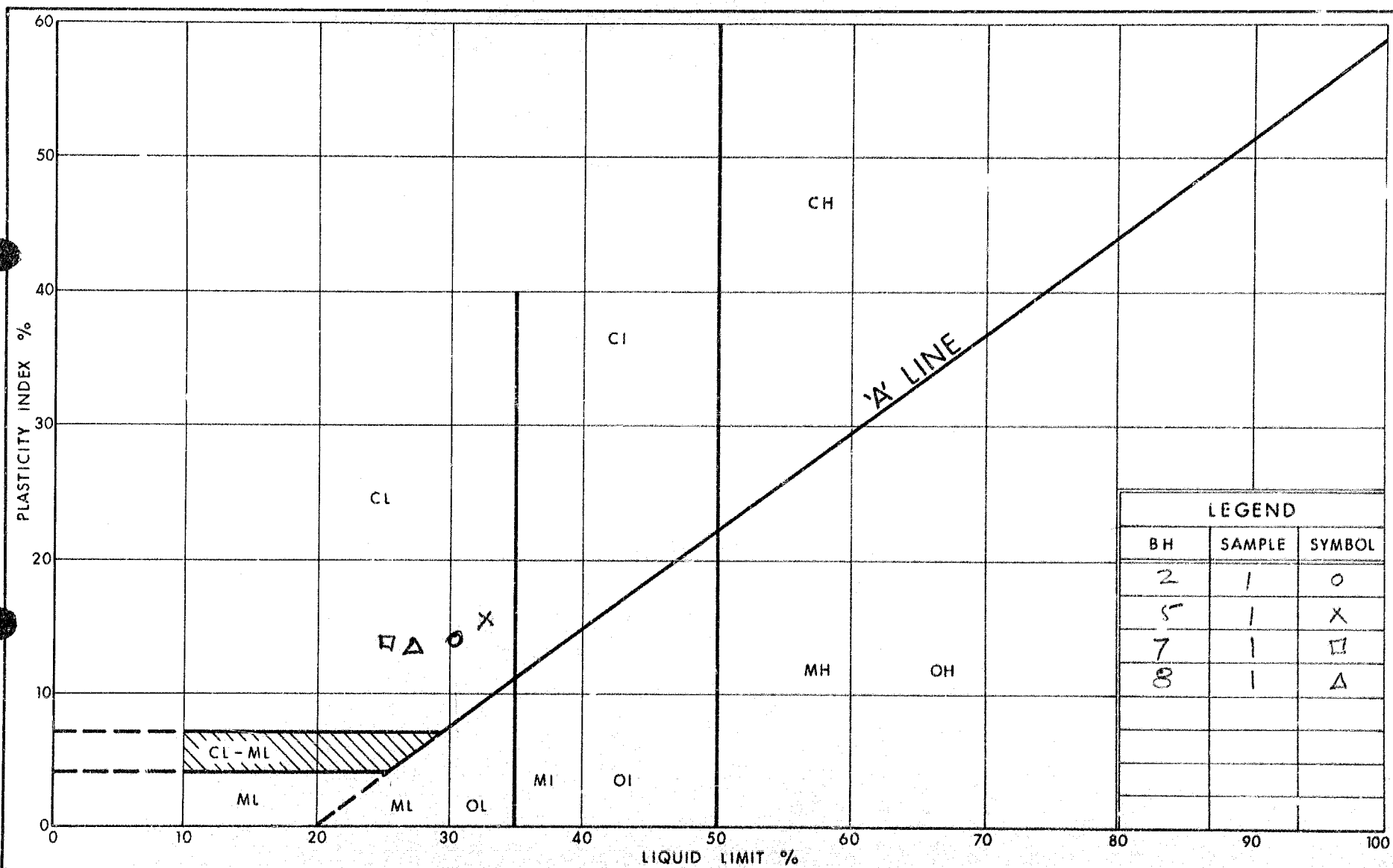
BORE HOLE LOCATIONS & SOIL STRATA

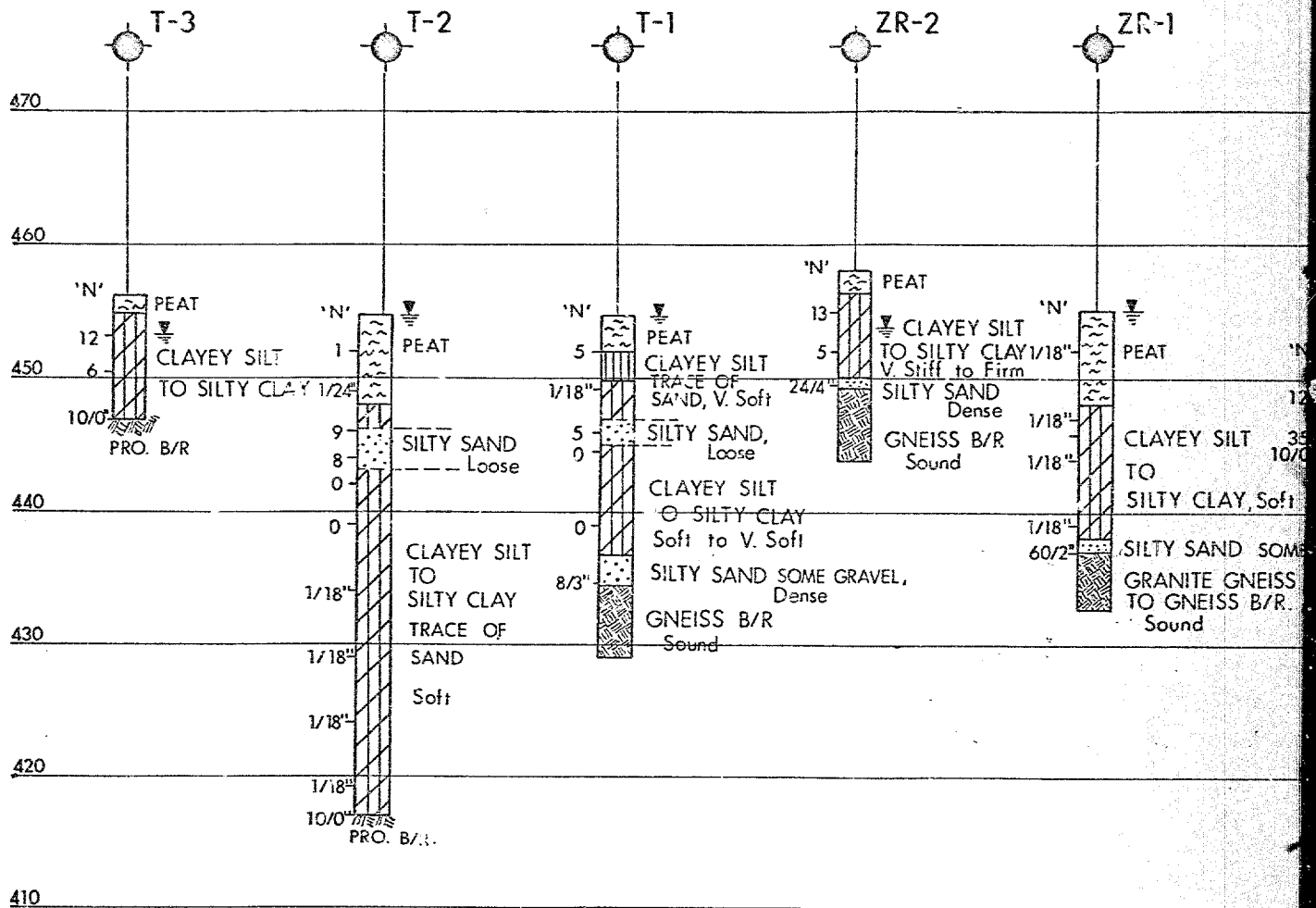
SUBMIT H.R. CHECKED <input checked="" type="checkbox"/>	WP NO. 2-67-03	DRAWING NO.
DRAWN S.D. CHECKED <input checked="" type="checkbox"/>	WO NO.	26703-A
DATE 3 DEC 1975	SITE NO. 29-159	BRIDGE DRAWING NO.
APPROVED	CONT. NO.	



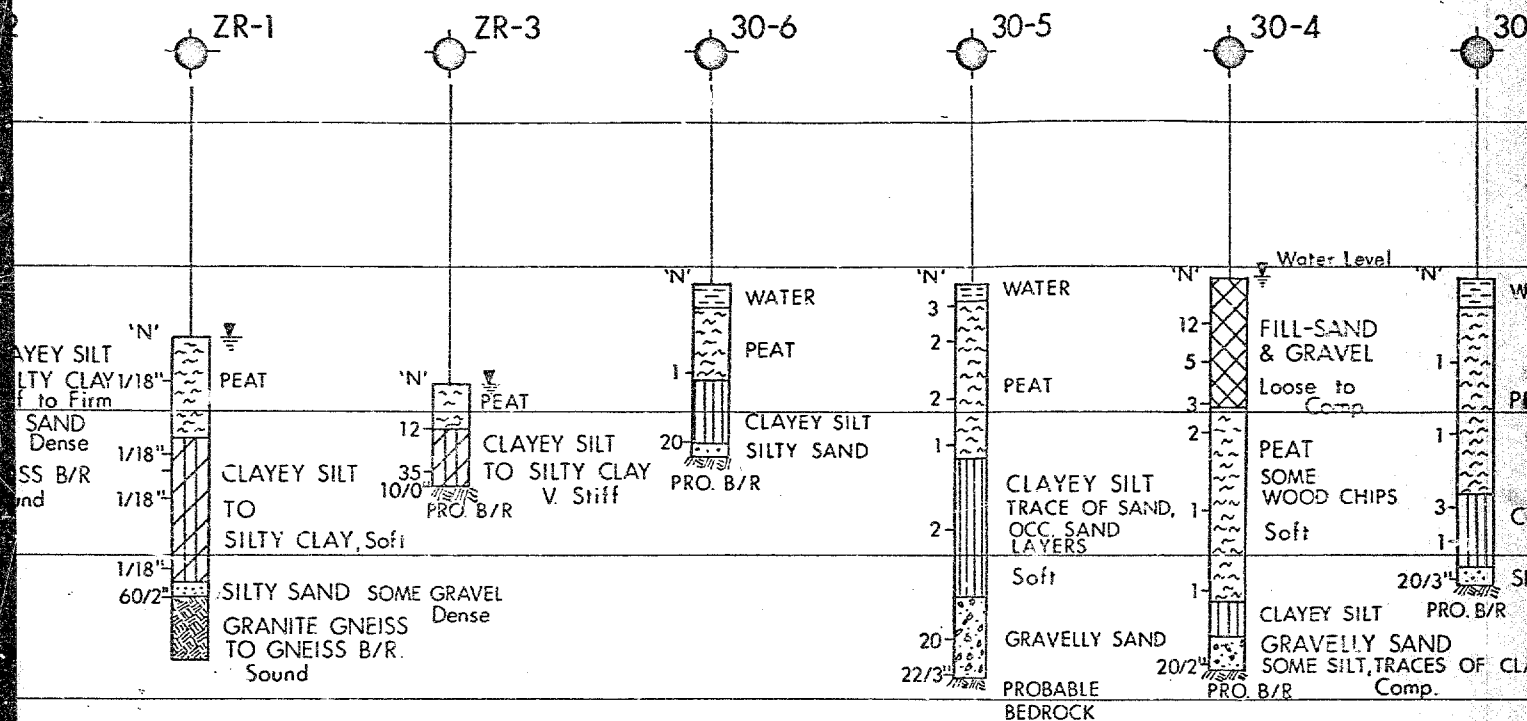
PROFILE

20 10 0 SCALE 20 40 FT.





BORE
SCALE



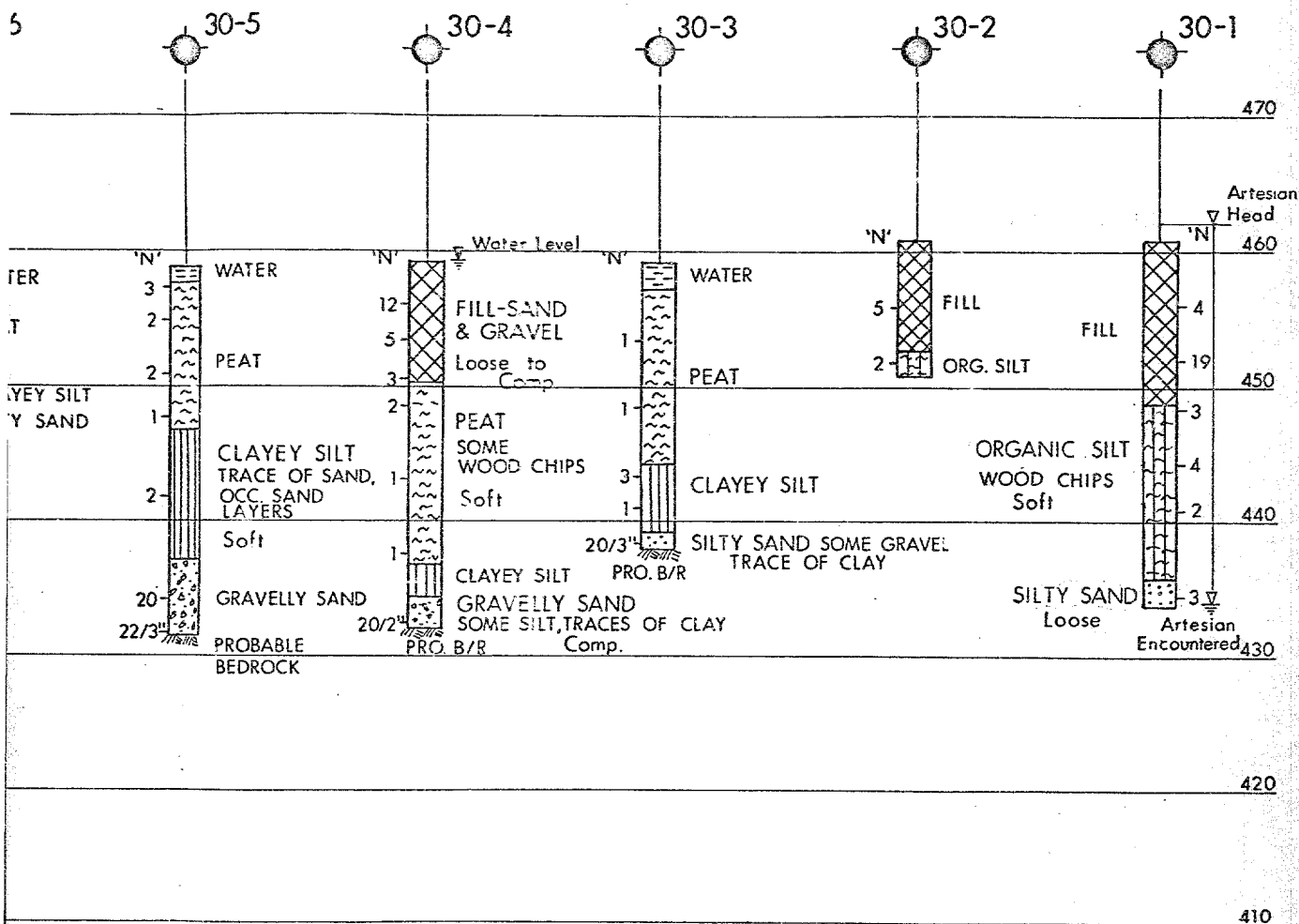
BORE HOLES

SCALE 1" = 10'

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

ENGINEERING
SERVICES BRANCH
SOIL MECHANICS SECTION

DATE 15 AUG, 1975



MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ENGINEERING
SERVICES BRANCH
SOIL MECHANICS SECTION

PRELIMINARY INVESTIGATION
HWY. 17N & C.P.R. OVERHEAD STRUCTURE
(PEMBROKE BYPASS)

DATE 15 AUG, 1975

W.P. NO. 1-67-01

DRAWING NO. 73-11042G

DOCUMENT INFORMATION AND IDENTIFICATION

GEOCRES No. 31 F - 81

DIST 9 REGION EASTERN

W.P. No. 2-67-03

CONT. No. 79-28

W. O. No. _____

STR. SITE No 29-159

HWY. No. 17N

LOCATION CPR OVERHEAD STRUCTURE

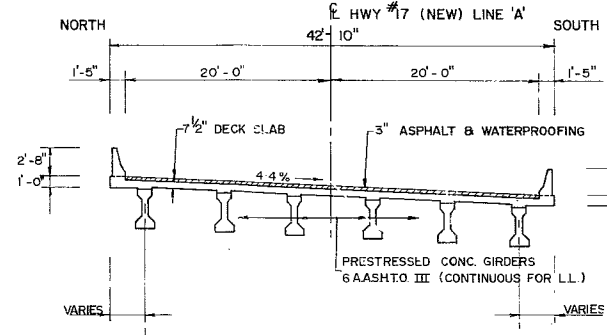
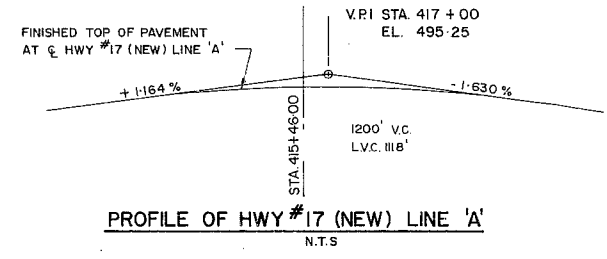
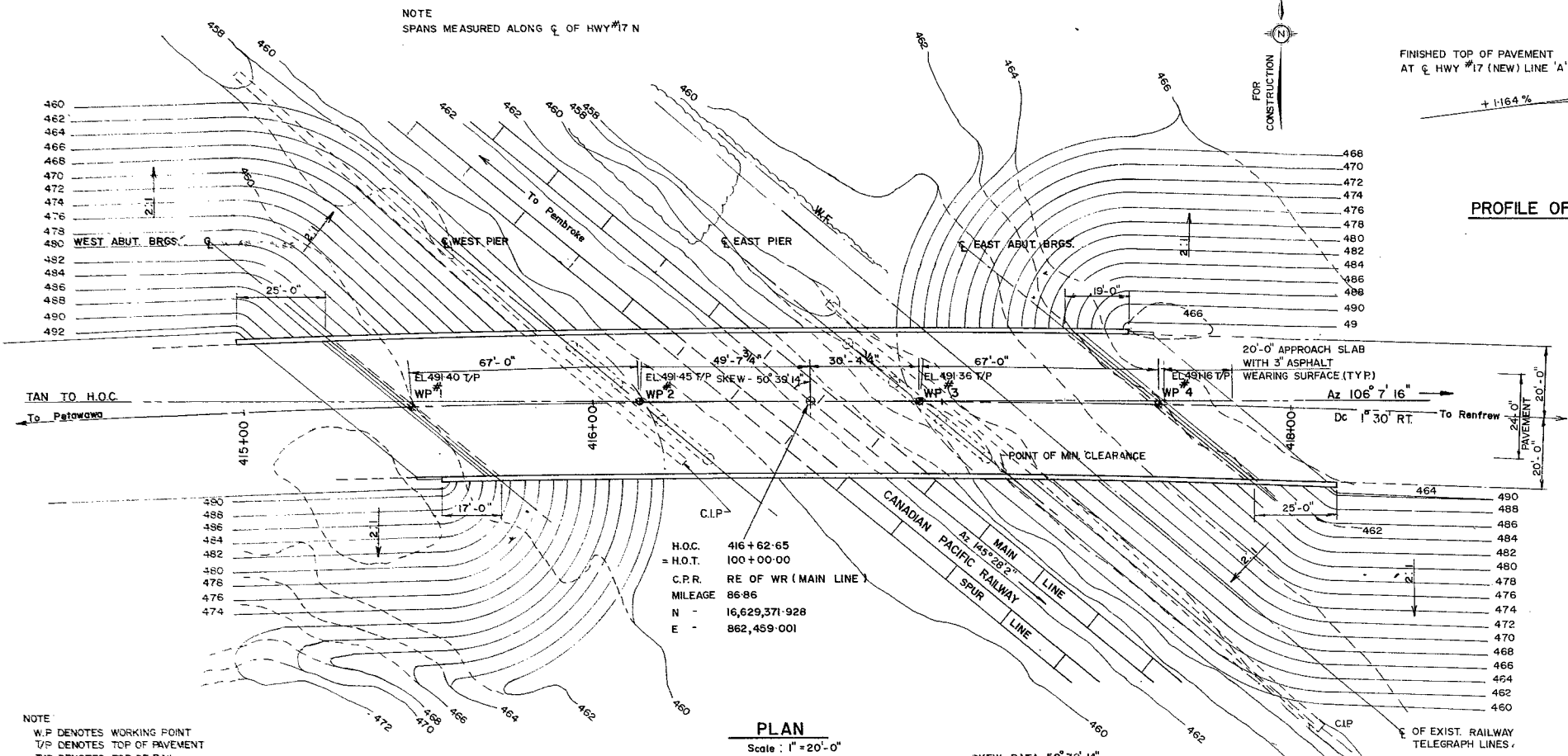
HWY 17N (PEMBROKE BY-PASS)

OVERHEAD SPANNING TO BE INDICATED ON THE REPORT 4

REMARKS: _____

31F-81

DIST No 9	
CONT No	
WP No 2-67-03	
C.P.R. OVERHEAD APPR. 5.0 ML. EAST OF HWY #41 GENERAL LAYOUT	
J.L. RICHARDS & ASSOCIATES LIMITED CONSULTING ENGINEERS AND PLANNERS OTTAWA CANADA	



- LIST OF DRAWINGS
- 29-159: 1. GENERAL LAYOUT
 2. BOREHOLE LOCATION & SOIL STRATA
 3. FOUNDATION LAYOUT & REINFORCEMENT
 4. WEST ABUTMENT
 5. EAST ABUTMENT
 6. WING WALLS
 7. PIERS
 8. PRESTRESSED GIRDERS & BEARINGS
 9. DECK
 10. CONCRETE BARRIER WALL (2'-8" HIGH)
 11. STEEL RAILING (SINGLE TUBE)
 12. 20' APPROACH SLAB
 13. TRACK PROTECTION & STANDARD DETAILS I
 14. STANDARD DETAILS II
 15. AS CONSTRUCTED ELEVATIONS & DIMENSIONS

CONCRETE QUANTITIES

CONCRETE QUANTITIES ARE LISTED BELOW FOR THE APPROPRIATE CONCRETE LUMP SUM TENDER ITEMS:

	C.Y.	P.S.I.
CONCRETE IN PIERS	210	4000
CONCRETE IN WING WALLS & ABUTMENTS	329	3000
CONCRETE IN DECK AND DIAPHRAGMS	302	4000
CONCRETE IN BARRIER WALLS	39	4000
CONCRETE IN APPROACH SLABS (N.I.C.)	50	3000

B.M. 460-55
GEODETIC DATUM
N & W IN NW CORNER OF 0.8' POP.
103' RT 416+64 (LINE 'A')

NOTES:

CLASS OF CONCRETE

DECK, BARRIER WALLS & PIERS	4000 P.S.I.
PRESTRESSED GIRDERS	5000 P.S.I.
REMAINDER (INCLUDING PIER FTG'S)	3000 P.S.I.

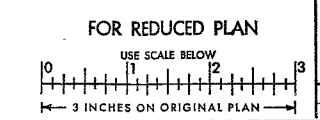
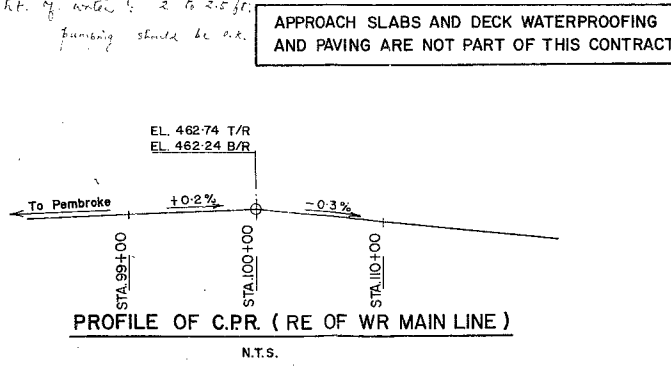
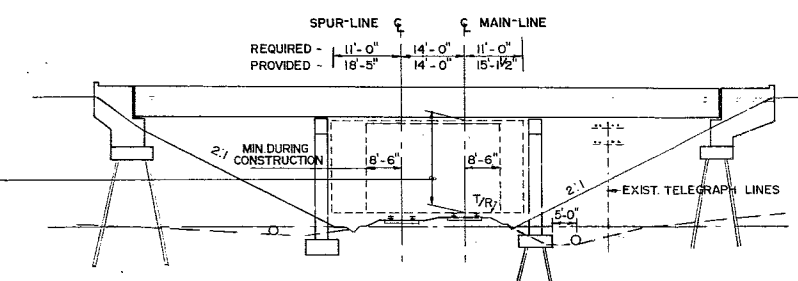
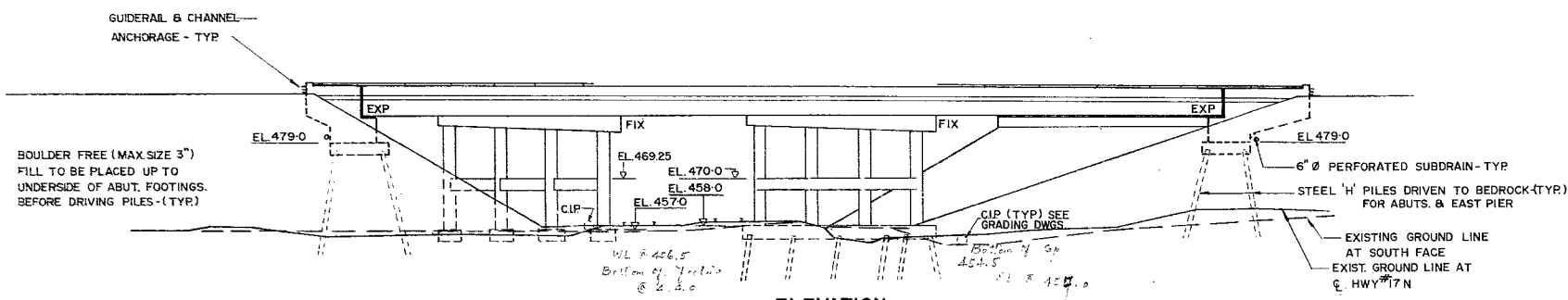
CLEAR COVER TO REIN. STEEL

FOOTINGS, ABUTMENTS & PIER COL'S	3"
PIER CAPS & CRASH BEAMS	2"
DECK	2" TOP, 1 1/2" BOT.
DIAPHRAGMS & BARRIER WALLS	1 1/2"
APPROACH SLABS	2"

CONSTRUCTION NOTES

THE CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS DEAD LEVEL TO THE SPECIFIED ELEVATIONS WITH A TOLERANCE OF ±1/8". NO CONCRETE SHALL BE PLACED ABOVE THE ABUTMENT BEARING SEATS UNTIL THE CONCRETE IN THE DECK HAS BEEN PLACED.

REIN. STEEL - SHALL BE C.S.A. G30 SERIES
GRADE 60 - PIER COL'S & DECK
GRADE 50 - REMAINDER



DATE	BY	DESCRIPTION
DESIGN	LJM	CHECK GAC
DRAWING	ARM	CHECK LJM
SITE No 29-159		10W6 I
J.L.R. No. 77-4727-SI		

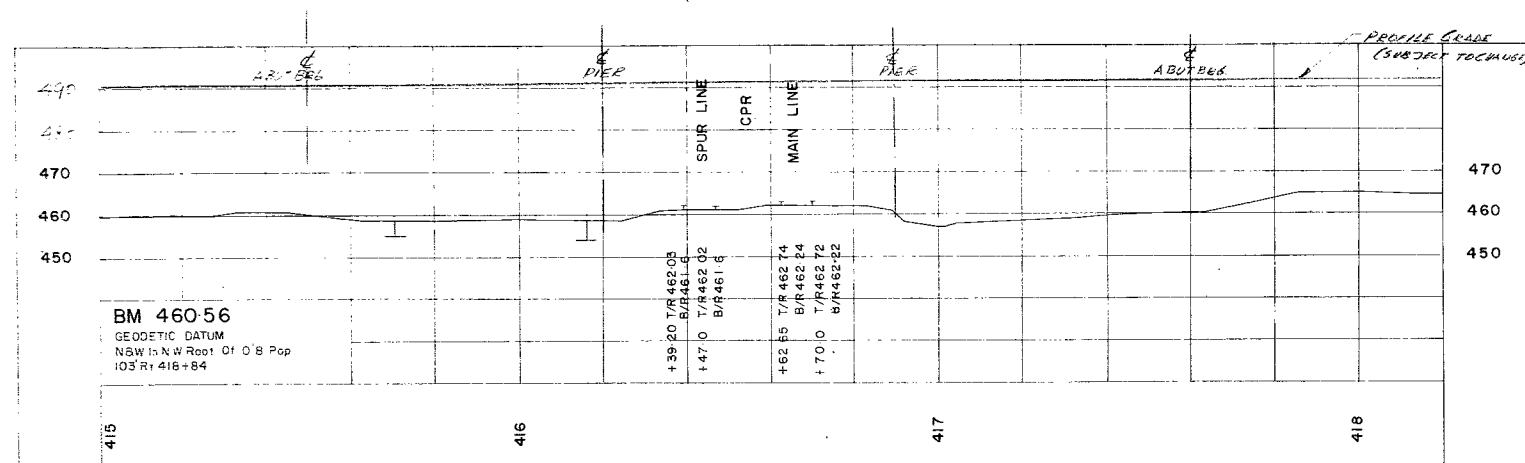
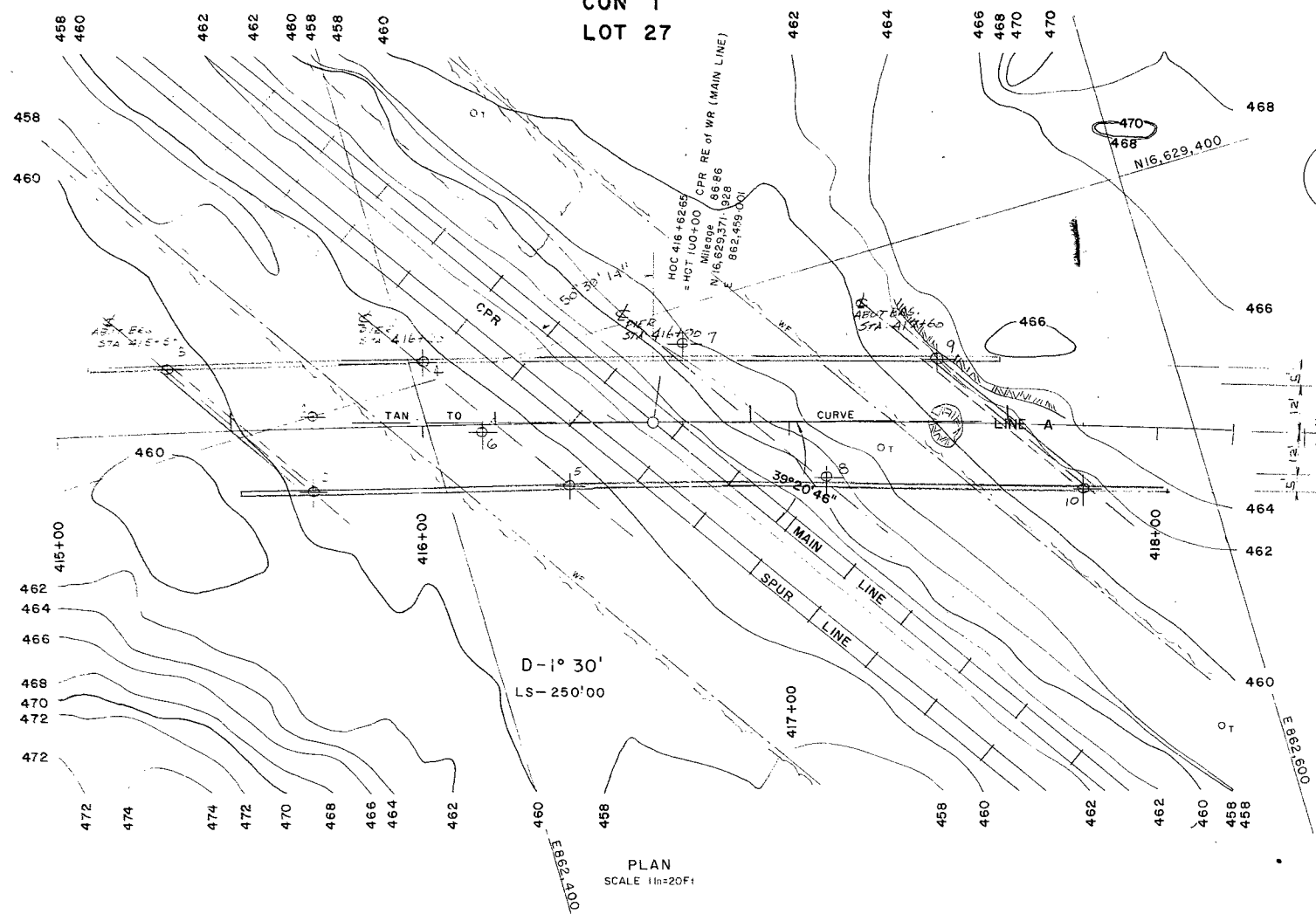


E-2500-1

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, OTTAWA, ONT.

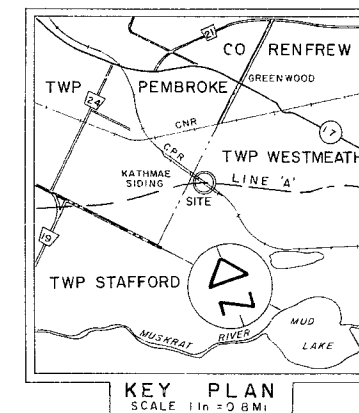
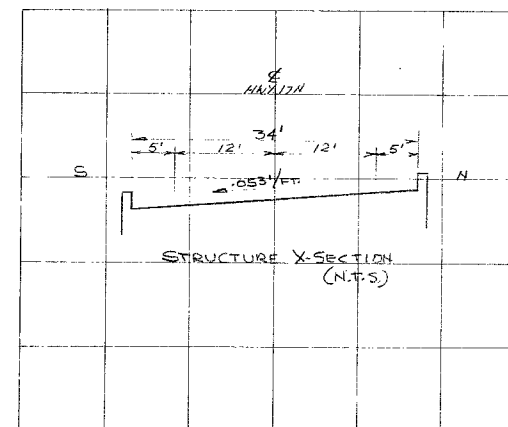
E-2500-1

CO RENFREW
TWP WESTMEATH
CON 1
LOT 27



PROFILE

HOR
SCALE 1 in = 20 Ft
VERT



WP 10-67-01
STR WP2-67-03

317-81

DATE	REVISIONS	BY	CH'KD
SEP 1975	1		
SPRINT SHOWING LOCATION OF PROPOSED STRUCTURE AS SUBMITTED FOR FOUNDATION INVESTIGATIONS			

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO
ENGINEERING SERVICES BRANCH ENGINEERING PLANS OFFICE

BRIDGE SITE

PROPOSED CROSSING

AT
CANADIAN PACIFIC RAILWAY

AND

PROPOSED HIGHWAY 17 NEW LINE 'A'
MILEAGE 86+86 CHALK RIVER SUBDIVISION

LOT 27 CO RENFREW
TWP WESTMEATH

SCALE	DISTRICT	REGION
AS SHOWN	9 OTTAWA	EASTERN
WP 10-67-01	Date of Survey - AUG 1975 Plan - SEPT 1975	SITE 29-153
SURVEY BY: Chief of Party - E BEEMER Supervisor - C M BAKER		DRAWN BY: Draftsman - P TRENHAILE Supervisor - G LALANDE
CHECKED BY: Draftsman - D JOHNSON Supervisor - G LALANDE		PLAN E-5266-1

317-81

E-2500-1

E-2500-1

31F-81

DIST No 9
CONT No
WP No 2-67-03

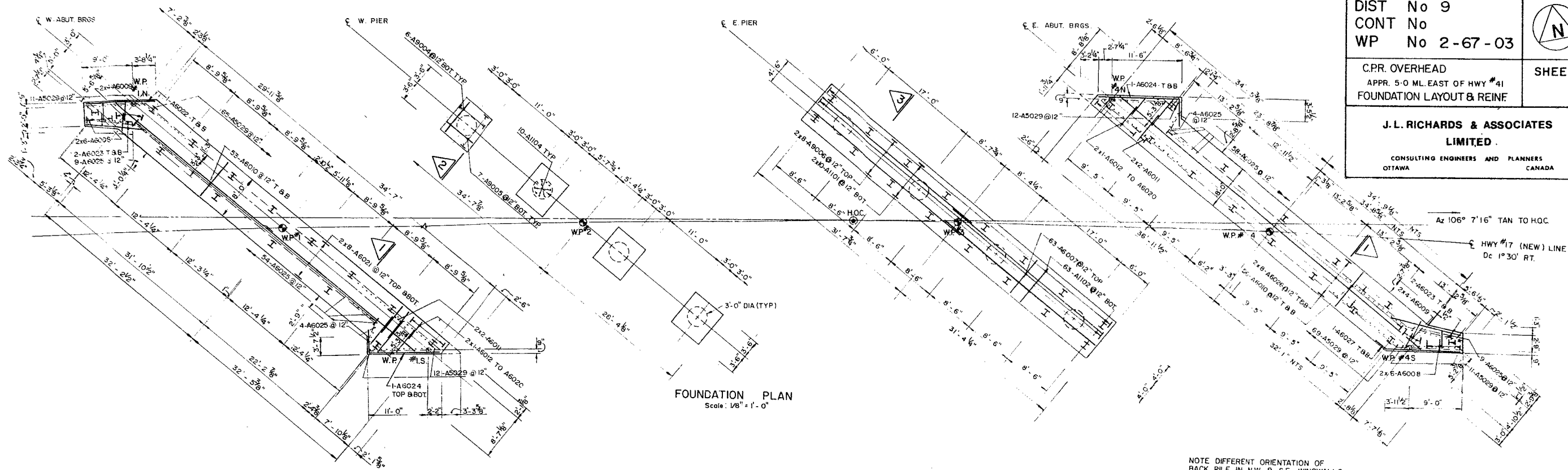


C.P.R. OVERHEAD
APPR. 5.0 ML. EAST OF HWY #41
FOUNDATION LAYOUT & REIN.

SHEET

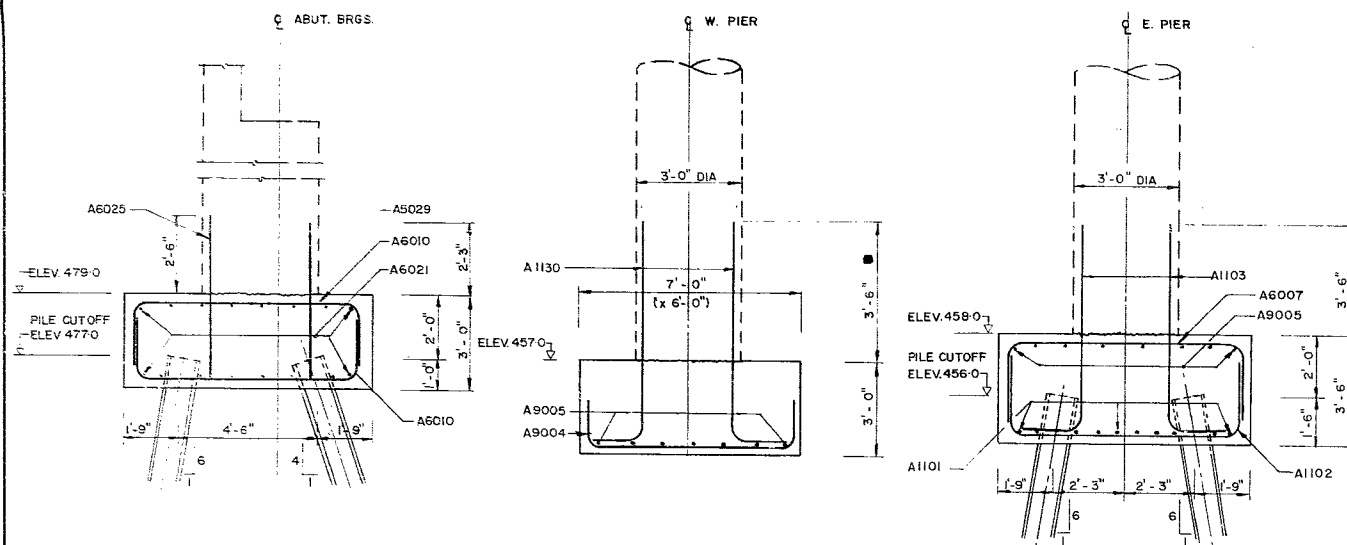
**J.L. RICHARDS & ASSOCIATES
LIMITED**

CONSULTING ENGINEERS AND PLANNERS
OTTAWA CANADA



FOUNDATION PLAN
Scale: 1/8" = 1'-0"

NOTE DIFFERENT ORIENTATION OF
BACK PILE IN NW & SE. WINGWALLS



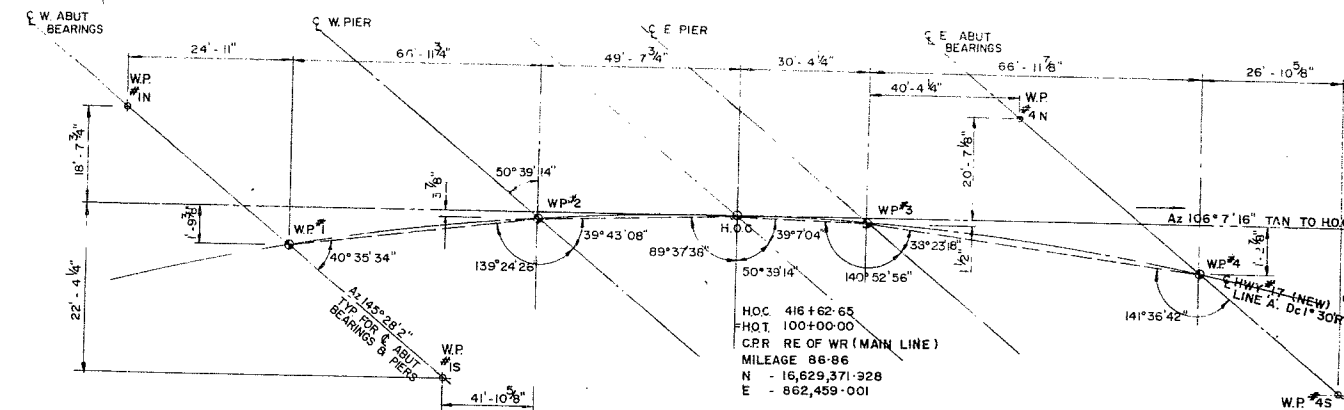
1
Scale: 3/8" = 1'-0"

2
Scale: 3/8" = 1'-0"

3
Scale: 3/8" = 1'-0"

LOCATION	No	TYPE	LENGTH
W. ABUT.	14	12HP53	25'
E. PIER	16	12HP53	13'
E. ABUT.	14	12HP53	22'

NOTES:
SPACING OF PILES TO BE MEASURED AT
UNDERSIDE OF FOOTINGS
PILES TO BE DRIVEN TO BEDROCK
W. PIER FOOTING TO BE PLACED ON SOUND BEDROCK

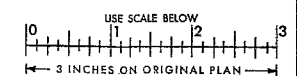


LOCATION OF WORKING POINTS
N.T.S.

WORKING POINT COORDINATES

LOCATION	PT.	N	E
WEST ABUTMENT	WP#1	16,629,429.136	862,328.201
	WP#2	16,629,402.603	862,346.458
	WP#3	16,629,375.872	862,364.892
WEST PIER	WP#4	16,629,385.404	862,411.213
H.O.C. HWY. = H.O.T. RLY.	H.O.C.	16,629,371.928	862,459.001
EAST PIER	WP#5	16,629,363.385	862,488.124
	WP#6	16,629,372.085	862,532.642
EAST ABUTMENT	WP#7	16,629,343.707	862,552.170
	WP#8	16,629,315.068	862,571.878

FOR REDUCED PLAN



REVISIONS	DATE	BY	DESCRIPTION
DESIGN	LJM	CHECK GAC	LOADING HS 20-44
DRAWING	G.F.	CHECK LJM	SITE No 29-159



J.L.R. No 77-4727-S3

