cc: Foundations Office

~~23-65-65.~~ WP 6-60-1

Mr. A. G. Toye,
Bridge Engineer.
Materials & Research Section,
(Foundations Office).

August 10, 1961.
D.H.O. FOUNDATION INVESTIGATION REPORT.
W.J. 60-F-69 -- W.P. 6-60.

Attention: Mr. A. McBride.

Re: M.C.R. Overpass @ Hwy. 18,
Amherstburg, Bridge Office
[illegible] 1 of 3, District #1.

Submitted herewith is our detailed foundation report on the existing subsoil conditions at the above site.

We believe the conclusions and recommendations summarized in the report are self-explanatory and should prove adequate for your future design work.

If we can be of further assistance in connection with this project, please feel free to call on our Office.

AGS/Mcd
Attach.

L. G. Soderman,
PRINCIPAL FOUNDATION ENGR.
per

A G Stermac

(A. G. Stermac,
SUPERVISING FOUNDATION ENGR.)

cc: Messrs. A. G. Toye (2)
[illegible]
E. C. McMillan
A. Cater
C. J. Howell
T. J. Kovich
J. Roy
J. S. Grumpter
[illegible] Saint
F. Norman
[illegible] Watt
Foundations Office
Gen. Files.

TABLE OF CONTENTS

Foundation Investigation

at

M.C.R. Overpass & Hwy. 18,
Amherstburg, Bridge Office
M. 1 of 3,
W.P. 6-60 - W.J. 60-F-69,
District #1.

1. INTRODUCTION:

A field investigation was carried out to determine the subsoil conditions at the proposed extension of an M.C.R. overpass on Hwy. 18 in the town of Amherstburg. The existing rigid frame structure, at present supported by spread footings, is to be extended some 35.0' to the east to accommodate a proposed revision line for Hwy. 18.

2. DESCRIPTION OF SITE AND GEOLOGY:

The approach embankments of the existing bridge are 16.0' high on the south and 20.0' high on the north. A gas line runs parallel to the centre line along the west shoulder of Hwy. 18. A drainage ditch carrying waste water from the chemical plant situated east of the site crosses under the railway tracks by means of a 3.0' diameter pipe. Physiographically the bridge site lies within the Essex clay plain which consists of a silty clay containing dispersed gravel, lying on top of the limestone bedrock.

Cont'd. /2 ...

3. FIELD AND LABORATORY INVESTIGATION:

The field work consisted two auger bore holes taken down to refusal at 55.0' in the silty clay. The positions of these boreholes are shown on Plan #60-F-69A. Disturbed samples were obtained in the very stiff to hard clay by using a standard split spoon sampler. Where the clay was soft undisturbed samples were obtained by using 2.0" I.D. shelby Tubes.

All samples were visually identified in the field and then transferred to the laboratory where routine index property and shear strength tests were carried out. The results of all these tests are given in the log sheets accompanying this report.

4. SUBSOIL CONDITIONS:

4.1 General.

The soil at the site consists of a silty clay with dispersed gravel. The top 15.0' of this clay is brown in colour and is oxidized and desiccated. Below this clay at 55.0' is thought to be bedrock.

4.2 Silty Clay with Dispersed Gravel.

This silty clay with dispersed gravel was proved to a depth of 55.0'. It has a hard upper crust 15.0' in thickness. Beneath this the colour changes from brown to grey and the clay becomes softer.

Cont'd. /3 ...

4. SUBSOIL CONDITIONS: (Cont'd.) ...

Average Atterberg limits for this material are L.L. 21.9%, P.L. 12.8% and M/C is 15.5%. Undrained shear strength tests indicate it to have a minimum shear strength of 1700 lbs./ft. at a depth of 30.0'. An average unit weight is 140 lbs./cu. ft. It was impossible to advance the auger beyond 55.0' in both boreholes. An attempt to drive a split spoon at this depth resulted in the hammer bouncing indicating contact with bedrock or a large boulder. Well records in the immediate vicinity show bedrock to be of the order of 50.0' below the surface.

5. GROUND WATER CONDITIONS:

The water level in each borehole measured at the time of the investigation was 20.0' below ground surface at an elevation 581.0'.

6. DISCUSSIONS AND RECOMMENDATIONS:

Due to the inaccessibility of the site the boreholes were placed about 50' from the proposed extension. However as the subsoil conditions were found to be similar in each borehole we are assuming that similar conditions exist at the proposed footing locations.

According to Bridge Office Plan M. 1 of 3 the existing structure rests on spread footings on the silty clay at an elevation of 579.0'. The extension may also be placed on

Cont'd. /4 ...

6. DISCUSSIONS AND RECOMMENDATIONS: (Cont'd.) ...

spread footings at this elevation with a maximum safe bearing load of 2.0T/sq. ft. Considering that the silty clay is very dense 140/lbs./cu. ft. and the liquidity index is of the order of 0.30, settlement should be small and within tolerable limits.

Dewatering should not be a problem and whatever water seeps into the excavation may be removed by the use of a sump pump. However to prevent swelling and softening of the clay at the base of the excavation a thin layer of concrete should be poured immediately after the excavation is brought down to footing elevation.

7. SUMMARY:

7.1 The subsoil at the site consists of a 55.0' stratum of very stiff to hard silty clay with dispersed gravel. Beneath this is thought to be the limestone bedrock.

7.2 Spread footings with a maximum load of 2.0'T/sq. ft. may be placed in the silty clay at an elevation of 579.0', which is the assumed formation level of the existing footings.

7.3 Dewatering should not be a problem and any water that seeps into the excavation may be removed by the use of a sump pump.

Cont'd. /5 ...

7. SUMMARY: (Cont'd.) ...

7.4 A concrete working slab should be poured to prevent swelling of the silty clay immediately after the excavation has been brought down to the required footing elevation.

8. MISCELLANEOUS:

The field work was carried out by the Johnston Drilling Co. Ltd., using a Penn Auger Drill. The field work was supervised for the Department of Highways by A. K. Loh, and carried out in July 1960.

REPORT PREPARED BY: .....
T. F. Widdis,
Project Fdn. Engr.

August 1961.

REPORT APPROVED BY: .....
A. G. Stermac,
Supervising Fdn. Engr.

APPENDIX I.

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-F-69
W.P. 6-60

OLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS FT	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
1	S1	5'-6.5'	Silty clay with sand. Hard. Brown.	31	12.8	-	-	-	-	
	S2	10'-11'	Same as S. 1.	32	13.2	-	-	-	140.0	
	S3	15'-15.5'	Same as S. 1.							
	S3	15.5'-16.5'	Silty clay with fine to medium gravel. Hard. Grey.	33	11.8	-	-	-	-	
	T4	20'-21.5'	Same as S. 3.	P	13.6	13.7	24.2	3640	139	
	T5	25'-26.5'	Silty clay with fine to medium gravel. Very stiff. Grey.	P	15.4	13.5	22.8	2590	137	
	VANE	28'		-	-	-	-	>2000	-	
	T6	30'-31.5'	Same as S. 6. Stiff. Grey.	P	15.6	14.2	23.8	1680	135	
	T7	35'-36.5'	Silty clay with fine to medium gravel. Very stiff. Grey.	P	8.4	-	-	-	149	
	T8	40'-41.5'	Same as T. 7.	P	20.2	-	-	-	132	
	S9	45'-46.5'	Same as T. 7.	23	13.9	-	-	-	-	
	T10	50'-51.5'	Same as T. 7. Hard.	54	-	-	-	-	-	
	S11	53'-54.5'	Coarse gravel with some clay and silt. Very dense.	52	9.4	-	-	-	-	

SUMMARY OF FIELD & LABORATORY TESTS

JOB 60-F-69
W.P. 6-60

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	PENET'N RESIST. BLOWS/FT.	MOIST. CONT. %	PLASTIC LIMIT %	LIQUID LIMIT %	SHEAR STRENGTH p.s.f.	UNIT WEIGHT p.c.f.	REMARKS
2	S1	5'-6.5'	Clay with sand. Hard. Brown.	48	11.7	-	-	-	-	
	S2	10'-11.5'	Same as S. 1.	37	12.6	-	-	-	147	
		15.0-15.5	Same as S. 1.							
	S3	15'-16.5'	Silty clay with sand and fine to medium gravel. Hard. Grey.	54	12.9	-	-	-	-	
	T4	18'-19.5'	Silty clay with fine to medium gravel. Hard. Grey.	P	12.7	12.2	22.2	>4600	141.0	
	T5	23'-24.5'	Same as T. 4.	P	14.6	13.6	23.8	2530	136.0	
	T6	28'-29.5'	Same as T. 4.	P	16.3	14.0	22.2	2000	137.2	
	T7	33'-34.5'	Silty clay with fine to medium gravel. Stiff. Grey.	P	17.8	12.0	22.4	1730	136.0	
	T8	38'-39.5'	Same as T. 7.	P	14.7	11.5	18.7	2830	143.0	
	S9	43'-44.5'	Same as T. 7.	20	13.2	-	-	-	143.5	
	S10	49'-50.5'	Same as T. 7. Very stiff. Grey.	25	18.9	-	-	-	-	

S denotes split spoon sample

T " shelby tube

FORM OB-ML-126 (REV. 1959.)—59-5008

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS AND RESEARCH SECTION

W.P. 6-60 BORE HOLE NO. 1

JOB 60-F-69 STATION See Plan

DATUM 601.0' COMPILED BY B.K.

BORING DATE Aug. 2/60 CHECKED BY T.F.W.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) O
VANE TEST (C) AND SENSITIVITY (S) +
NATURAL MOISTURE AND LIQUIDITY INDEX LI X
LIQUID LIMIT
PLASTIC LIMIT

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET
	↓ Groundlevel	601.0	0
	Silty clay with sand and fine to coarse gravel. Hard. Brown.	586.0	10
	W.L. ▽	581.0	20
	Silty clay with fine to coarse gravel. Stiff to very stiff. Grey.	546.0	30
	End of borehole.		40
			50
			60
			70
			80

STRENGTH AND PENETRATION RESISTANCE
P.S.F. 1000 2000 3000 4000
BLOWS/FT. 25 50 75 100

CONSISTENCY
MOIST. CONTENT - % DRY WT. 0 10 20 30 40

SAMPLE	NATURAL UNIT WT. P.C.F.
S1	-
S2	140.0
S3	-
T4	139.0
T5	137.0
T6	135.0
T7	149.0
T8	132.0
S9	-
T10	-
S11	-

FORM OB-ML-128 (REV. 1959.)—59-5008

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS AND RESEARCH SECTION

W.P. 6-60 BORE HOLE NO. 2

JOB 60-F-69 STATION See Plan

DATUM 601.0' COMPILED BY B.K.

BORING DATE Aug. 3/60 CHECKED BY T.F.W.

2" DIA. SPLIT TUBE
2" SHELBY TUBE
2" SPLIT TUBE
2" DIA. CONE
2" SHELBY
CASING

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) O
VANE TEST (C) AND SENSITIVITY (S) +%
NATURAL MOISTURE AND LIQUIDITY INDEX LI X
LIQUID LIMIT
PLASTIC LIMIT

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET
	Groundlevel	601.0	0
	Silty clay with sand and fine to medium gravel. Hard. Brown.	586.0	10
	w.l. ▽	581.0	20
	Silty clay with fine to coarse gravel. Stiff to very stiff. Grey.	546.0	50
	End of borehole.		60
			70
			80

STRENGTH AND PENETRATION RESISTANCE
P.S.F. 1000 2000 3000 4000
BLOWS/FT. 25 50 75 100

CONSISTENCY
MOIST. CONTENT - % DRY WT. 0 10 20 30

SAMPLE	NATURAL UNIT WT. P.C.F.
S1	-
S2	147.0
S3	-
T4	141.0
T5	136.0
T6	137.2
T7	136.0
T8	143.0
S9	143.5
S10	-

OFFICE LOCATION —
DOWNSVIEW AVE.,
KEELE ST. — HIGHWAY 401
TORONTO, ONTARIO.

ONTARIO
DEPARTMENT OF HIGHWAYS

POSTAL ADDRESS —
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS,
TORONTO 5, ONTARIO.

Bridge Division,
July 14, 1961.

MEMORANDUM TO:

Mr. A. Stermac,
Foundations Office Engineer,
Department of Highways,
Room 107, Lab. Bldg.,
Downsview, Ontario.

RE: W.P. 6-60,
Amherstburg - M.R. Overpass,
Hwy. #18 - District #1.

We are sending herewith a print of Bridge Site Plan with the proposed widening of the structure marked in red.

Please make arrangements for a soil investigation of this site.

We have also enclosed a print of plan M1 showing the existing bridge construction. You will note that 4 concrete struts connect the footings of the north and south abutments. These control the drainage arrangements through the bridge and we would be pleased if you will arrange to locate the top of each strut in the vicinity of the existing drain in such a manner that the as constructed elevation of the strut could be established.

Mr. H. Orlando, Project Engineer informs me that he will have a survey crew in this area around the end of this month and Mr. Jerry Stepleton, the party chief could co-operate in establishing the elevations.

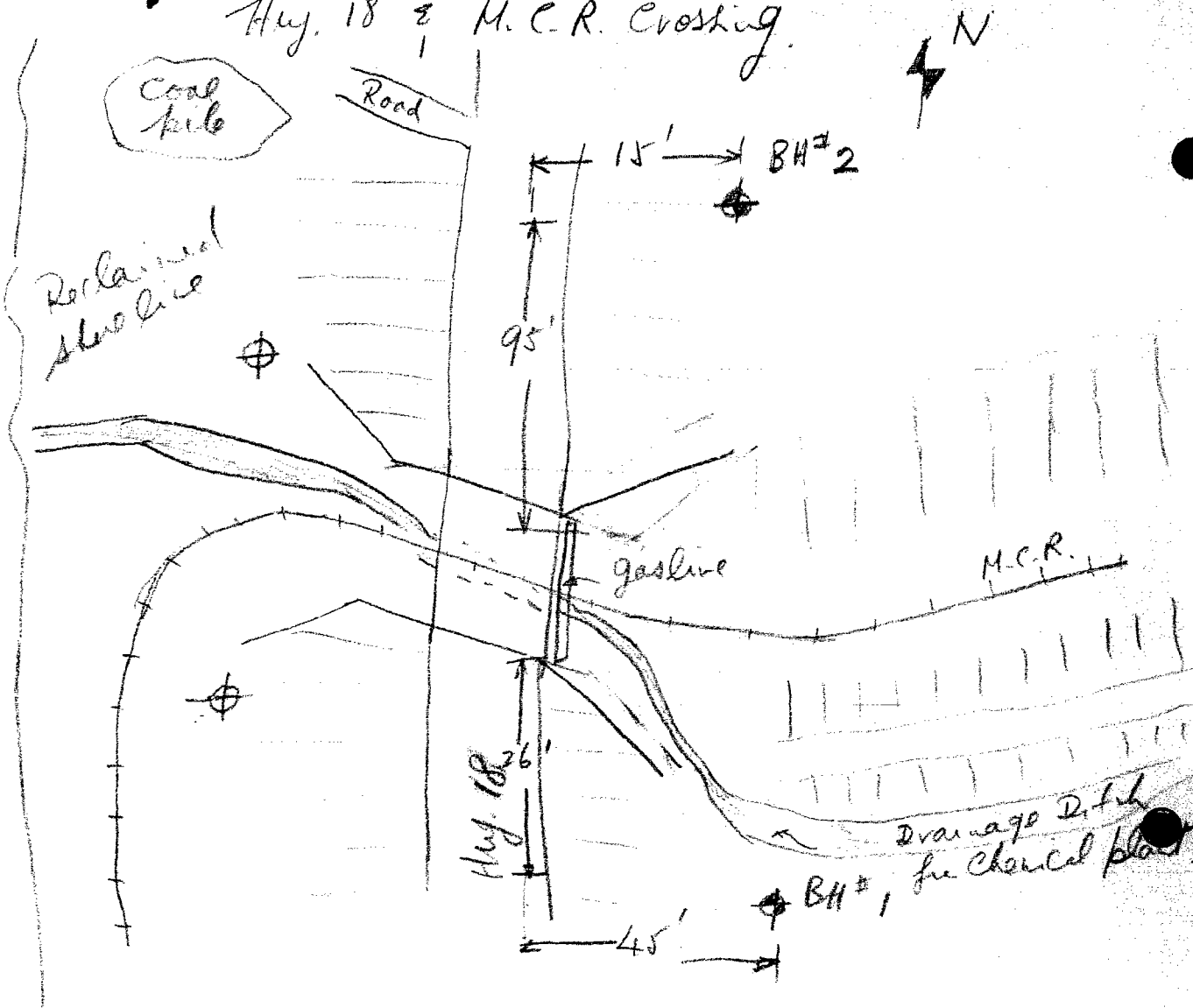
Gavin Scott

GS/eh
c.c. S. McCombie
N.D. Smith
R. Fitzgibbon

Gavin Scott,
Bridge Location Engineer.

W.P 6-60 60-F-69

Hwy. 18 & M.C.R. Crossing



Diagramatic sketch of Site showing locations of boreholes

⊕ B.Hs carried out in July 1960

⊕ Borings to be carried out

Grade elevation of Hy 18 @ bridge - 608.3

Top of rail of M.C.R. @ this B.H. 584.4

OVER

FORM OB-ML-231
MAY 1959

DEPT. OF HIGHWAYS ONTARIO
MATERIALS & RESEARCH SECTION

Field Boring Log

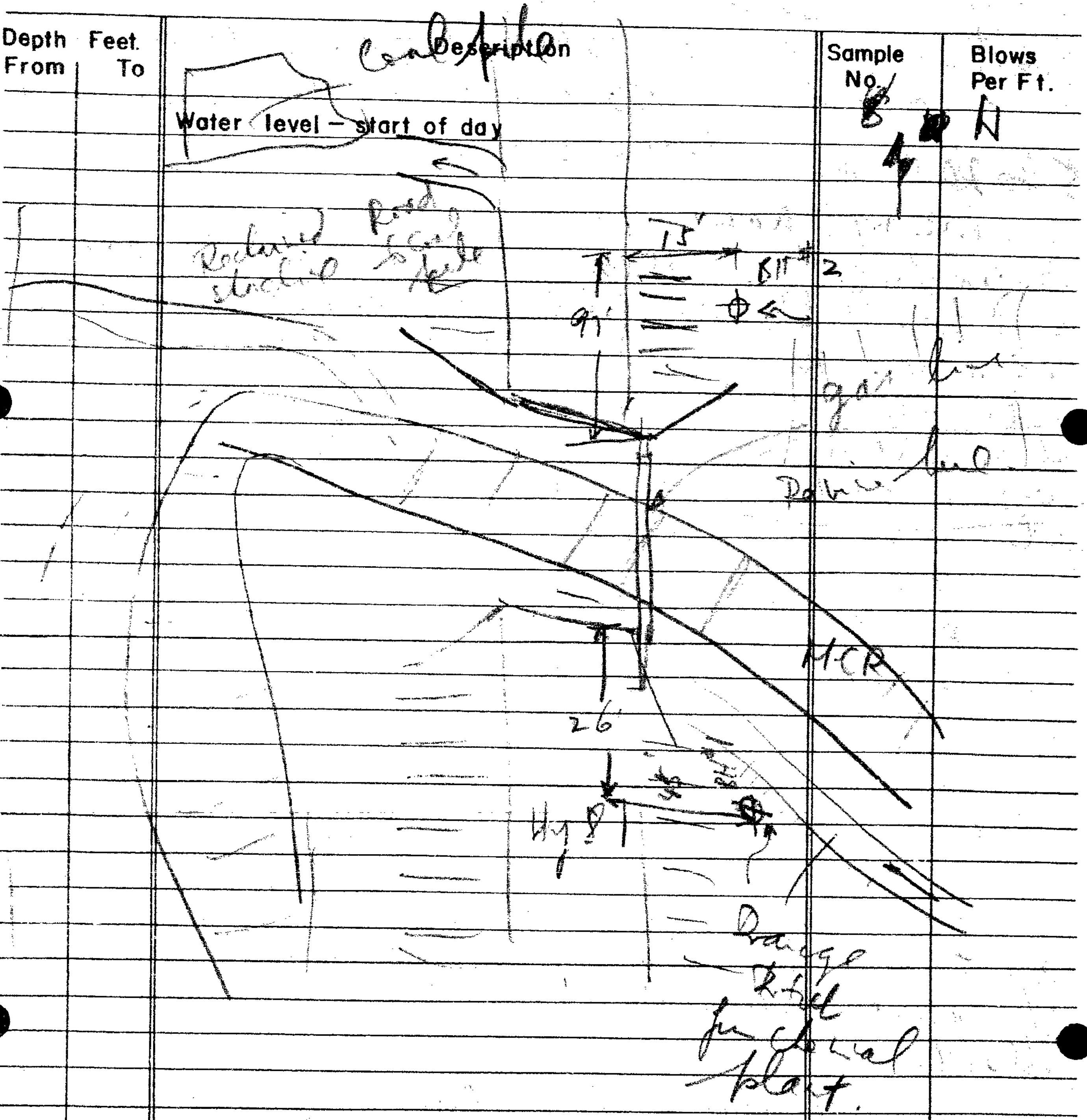
Date
Job No. W.P. 6-60
W.P. No.
Location M.C.R. & Hwy. 18 Crossing

Driller
Hours Work
Hours Delay
Footage

Borehole No. ______ Elevation ______ Height Datum Above Ground ______

Remarks:

Depth Feet. From	To	Description	Sample No.	Blows Per Ft.
		Water level – start of day		



Water level – end of day

60-F-69

W.R. 6-60 U.C.R. & Hwy 18

The site investigated is along a channel to the shoreline of the Detroit River. The existing structure crossing [illegible] at a skew angle. Fill height is of the order of 25-30 ft. on the river side and 15 to 20 ft. on the other side. [illegible] cont. rigid frame appears to be founded on spread footings. No vegetation observed. Gas line runs parallel to the highway along the shoulder on the west side. Bushes are seen along the shore. A fairly undesirable grade between the existing bridge and [illegible] is apparent. A drainage ditch carrying waste from the chemical plant east of the old [illegible] crosses underneath [illegible] (3 ft. dia.)

At 3 locations attempts were made to put down a pile on the west side but due to the [illegible] of [illegible] boulders on the shore line progress could not be achieved [illegible] by augering. Diamond drill for WEST SIDE.

[illegible] The topography is rolling with the [illegible] and the drainage ditch forming some sort of ravine between the [illegible] Hwy 18 & the chemical plant.

Geological formation - Lake Erie Cliff of till material

W.P. 6-60   60-F-69

Soil Conditions

The site is covered by very stiff clay overlying bedrock. The upper 15 ft. of the clay has been desiccated and oxidized resulting in its present dried-out and brownish appearance. The material exists in a very stiff condition with shear strength estimated to be well above 2000 p.s.f. Spread footing [illegible] for the bridge would be the most suitable type of foundation. At both borehole locations (B.H. 1 & 2) refusal to augering was met at a depth of 55 ft. (Elev. 546). This could be boulders or bedrock. According to available well records in the vicinity of Amherstburg, bedrock contact in the order of 50 ft depth has been encountered. In view of the fact that the site is along the shoreline of Detroit River it does not appear to be warranted that Borehole 1 & 2 would give sufficient data for the foundation design. 2 borings on the east side adjacent to the shoreline is taken to be necessary. A diamond drill equipped with core barrel will be necessary to advance through the overlaid material of rock & boulders.

G.K.L.

cc: Foundations Office (Rm. 110

Mr. A. M. Toye,

Bridge Engineer.

Materials & Research Division,

(Foundation Section)

Attention: Mr. G. Scott.

August 31, 1962.

REVIEW OF PRELIMINARY PLAN

D 4976 - P2.

Re: W.P. 6-60,
N.Y.C.R. Overhead,
near Amherstburg,
Hwy. #18,
Chatham, District #1.

We have reviewed the Preliminary Plan D 4976-P2 for the subject structure, and submit the following comments:

The drawing shows the north abutment to be supported within the approach fill on 10 BP at 42 H-piles, 12 feet in length. We feel that this is not a satisfactory arrangement because of the fact that the clay subsoil in that area becomes increasingly soft with depth, and there is every possibility that some of the piles would penetrate a soft zone. We are of the opinion that a spread footing type foundation should be used to support the abutment in question. This may be placed either in original ground or on well-compacted granular fill material.

If you have any further queries in connection with this matter, please contact this Office.

KGS/MdeF

cc: Foundations Office
Gen. Files.

K. G. Selby,
SR. FOUNDATION ENGR.
For:

A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

RECEIVED

To: Mr. A. Stermac, Principal Foundation Engineer, Room 107, Lab. Bldg.

From: C. S. Grebski

Date: February 27, 1964.

Our File Ref.

In reply to

Subject: N.Y.C.R. Overhead, Approx. 0.5 Mi. N. of Amherstburg, W.P. 6-60 Site No. 6-121, Hwy. #18 Dist. #1.

60-F-69

Attached herewith is one copy of the new preliminary plan for this structure (D 5457-P).

The soil report allows two tons per square foot on spread footings; however, due to our long centre span we would like to increase this to three tons by going deeper. Can this be done?

Also would you recommend a pile type, allowable load and approximate length at the abutments? We have indicated 12 BP 53 piles however timber or tube piles may be more suitable.

We would appreciate an early reply on these questions.

C. S. Grebski,
Sr. Bridge Project Engineer.

CSG:go
c.c. G. Scott
B. Davis

A discussion with C. S. Grebski followed and a site field work has been arranged with Dominion Soils to determine bedrock

sgh 2/2/64.

cc: Foundations Office (Rm. 110)

Materials and Research Division

March 2, 1964

Dominion Soil Investigation, Ltd.,
77 Crockford Blvd.,
Scarborough, Ontario.

Attention: Mr. A. Ponga

Re: W.P. 6-60 , Hwy. 18, New York Central Rly.,
Amherstburg, District No. 1, Chatham, Ont.

Dear Sir:

Please consider this your authority to carry out an additional investigation at the above site, as discussed between our Mr. A. G. Steenac and your Mr. K. King.

It is understood that a qualified Soils Engineer will be in charge of the field work at all times.

Ten copies of the factual data should be submitted to the Foundation Section as soon as possible.

Charges for the work performed will be in accordance with your Schedule of Rates, dated February 17, 1962, and invoice to be addressed to the attention of the undersigned.

Yours very truly,

A. Rutka

A. Rutka,
MATERIALS & RESEARCH ENGINEER

RDS/MMcF

cc: Messrs. S. McCombie
A. Gater
F. C. Brown
J. Roy
N. D. Smith (2)
H. Konings
Foundations Office ✓
Gen. Files (2)

cc: Foundations Office (Rm. 110)

Mr. A. M. Toye,
Bridge Engineer,
Bridge Division.

Attention: Mr. J. McCombie

Foundation Section,
Materials & Research Div.,
Room 107, Lab. Bldg.

March 18, 1964

ADDITIONAL SOIL INVESTIGATION REPORT BY:
Dominion Soil Investigation Limited.
Hwy. #18 - New York Central Railway -
Amherstburg, District #1, Chatham, Ont.
W.P. 6-60

Attached, we are sending you the report containing the additional information about the depth to bedrock at the above-mentioned site.

Because of a certain ambiguity regarding the location and elevations of the new boreholes, we checked with the Consultant and obtained the following information:

The boreholes are within a foot or two of the ones carried out by the D.H.C. (Foundation Report W.J. 60-F-69) and shown on Drawing 60-F-69A, and therefore the same elevations apply.

A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

AGS/MdeF
Attach.
cc: Messrs. A. M. Toye (2)
H. A. Tregaskes
H. D. McMillan
A. Cater
F. C. Brown
J. Roy
A. Watt

Foundations Office
Gen. Files

DOMINION SOIL INVESTIGATION LIMITED
77 CROCKFORD BOULEVARD SCARBOROUGH, ONTARIO TELEPHONE 421-2567

BRANCH
QUEENS AVENUE
LONDON, ONTARIO
TELEPHONE GE. 3-3851

FOUNDATION ENGINEERS

P.O. BOX 933
SAULT STE. MARIE
ONTARIO
TELEPHONE AL. 4-2615

Scarborough, Ontario,
March 13th, 1964.

DEPARTMENT OF HIGHWAYS,
Materials and Research Division,
Downsview, Ontario.

Att'n: Mr. A. Rutka,
Materials & Research Engineer.

RE: HWY. #18 - NEW YORK CENTRAL
RAILWAY - AMHERSTBURG
DISTRICT #1, CHATHAM, ONT.
W.P. 6-60 - OUR REF: 4-2-25

R E P O R T

Gentlemen:

The soil investigation has been completed at the above site in accordance with your letter of authorization of March 2nd, 1964. The purpose of the testing was to obtain cores from the bedrock.

The field work was carried out on March 6th and 7th, 1964. We located the two boreholes as close as possible to those shown on a drawing (No. 60-F-69A dated July 3rd, 1961) provided to us by scaling off the dimensions from readily recognizable reference points.

.... 2

The procedure consisted of augering to the bedrock elevation and coring with Axt core barrel.

The bedrock is nearly horizontal at the site. Herewith the results:

B.H. No.		Depth		
1	-	0 - 57'	-	Overburden
		57' - 62'	-	First run - 100% recovery.
		62' - 67'	-	Second run - " "
2	-	0 - 56'	-	Overburden
		56' - 57'	-	First run - 100% recovery.
		57' - 58'	-	Second run - " "
		58' - 59'	-	Third run - " "
		59' - 60'	-	Fourth run - " "
		60' - 61'	-	Fifth run - " "

THE BOREHOLE KEPT CAVING IN AT 56 FEET DEPTH WHICH NECESSITATED THE CORING IN ONE FOOT RUNS.

The bedrock is limestone of good quality.

We trust that the foregoing will meet with your requirements but should you have any further questions in this regard, please do not hesitate to contact us.

Yours very truly,

DOMINION SOIL INVESTIGATION LIMITED,

L. S. Rolko

L.S. Rolko, P.Eng., A.M. ASCE.

LSR/oed

REGISTERED PROFESSIONAL ENGINEER
L.S. ROLKO
PROVINCE OF ONTARIO

DOMINION SOIL INVESTIGATION LIMITED
77 CROCKFORD BOULEVARD SCARBOROUGH, ONTARIO TELEPHONE 421-2567

BRANCH
QUEENS AVENUE
LONDON, ONTARIO
TELEPHONE GE. 3-3851

FOUNDATION ENGINEERS

P.O. BOX 933
SAULT STE. MARIE
ONTARIO
TELEPHONE AL. 4-2615

March 16th, 1964.

DEPARTMENT OF HIGHWAYS,
Materials & Research Division,
Downsview, Ont.

Re: Soil Investigation at site - Highway #18 -
New York Central Railway - Amherstburg, Ont.
W.P. 6-60 - Our Reference No. 4-2-25

Gentlemen:

We take pleasure in enclosing ten copies of our report on the above-mentioned project and will be glad to answer any questions arising from this work. We are also returning your Drawings Nos. D-5457-P and 60-F-69A.

Core samples will be retained for a period of three months and thereafter disposed of unless otherwise instructed.

We thank you for having given us this opportunity to be of service to you.

Yours very truly,

DOMINION SOIL INVESTIGATION LIMITED,

L. S. Rolko

LSR/oed

L.S.Rolko, P.Eng., A.M. ASCE,
D I R E C T O R.

ENCLS.

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. Stermac,
Principal Foundation Engineer,
Room 107, Lab. Bldg.

From: Bridge Division,
Downsview, Ontario.

Date: May 28, 1964.

Our File Ref.

In reply to

Subject: W.P. 6-60 Site No. 6-121
N.Y.C.R. Overhead
Highway 18 - District #1

60-T-63

We are sending to you herewith two prints of Preliminary Plan D 5457-P1 of the above structure.

Would you please let us have your written comments.

N. Zoltay.

NZ/es

N. Zoltay,
for G. Scott,
Regional Bridge Location Engineer.

cc. S. McCombie
cc. G. Scott
cc. N. D. Smith

cc: Foundations Office (Fm. 110)

Mr. S. McCombie,
Bridge Planning Engr.,
Bridge Division.

Attention: Mr. N. Zoltay

Foundation Section,
Materials & Research Div.,
Room 107, Lab. Bldg.

June 19, 1964

N.Y.C.R. Overhead, Hwy. #18,
Review of Preliminary Plan D-5457-P1
W.P. 6-60 -- W.J. 60-F-69

We have reviewed the Preliminary Plan for the above-mentioned proposed structure.

The designer appears to have followed the recommendations implied in the foundation report.

K. G. Selby

KGS/MdeF

cc: Foundations Office
Gen. Files

K. G. Selby,
SENIOR FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

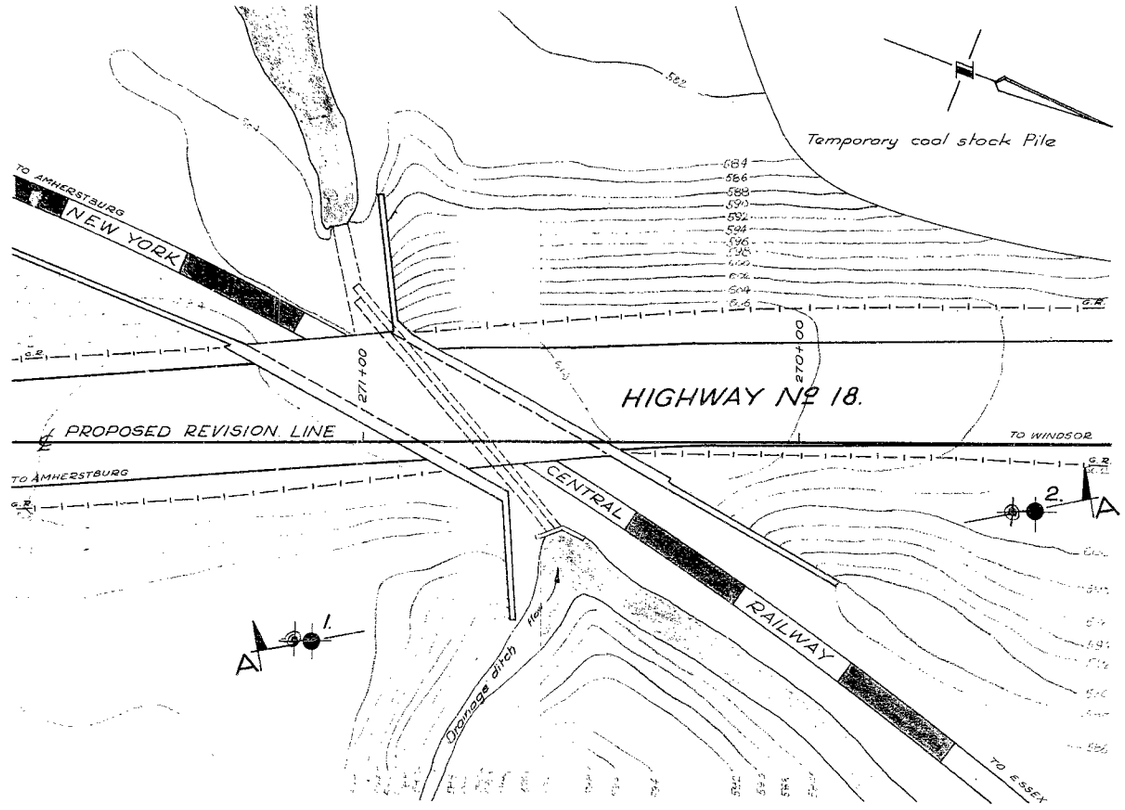
#60-F-69

W.P. # 6-60

Hwy. # 18 &

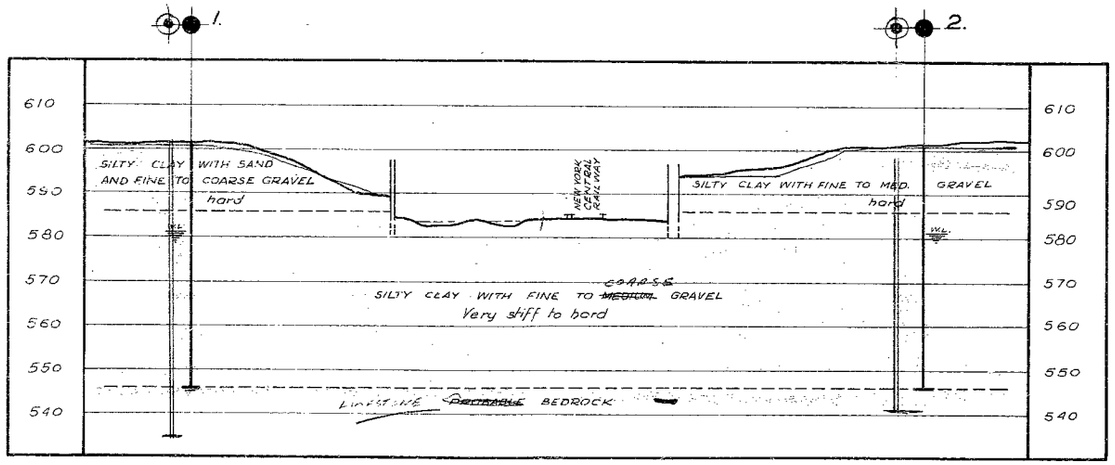
N.C.R. Overpass

Amherstburg



PLAN

SCALE 1inch=20 ft.



A —— A

SCALE 1inch = 20 feet

LEGEND			
BORE HOLE			
HOLE	ELEVATION	STATION	OFFSET
1	601·0	271+11	45' LT.
2	601·0	269+45	15' LT.

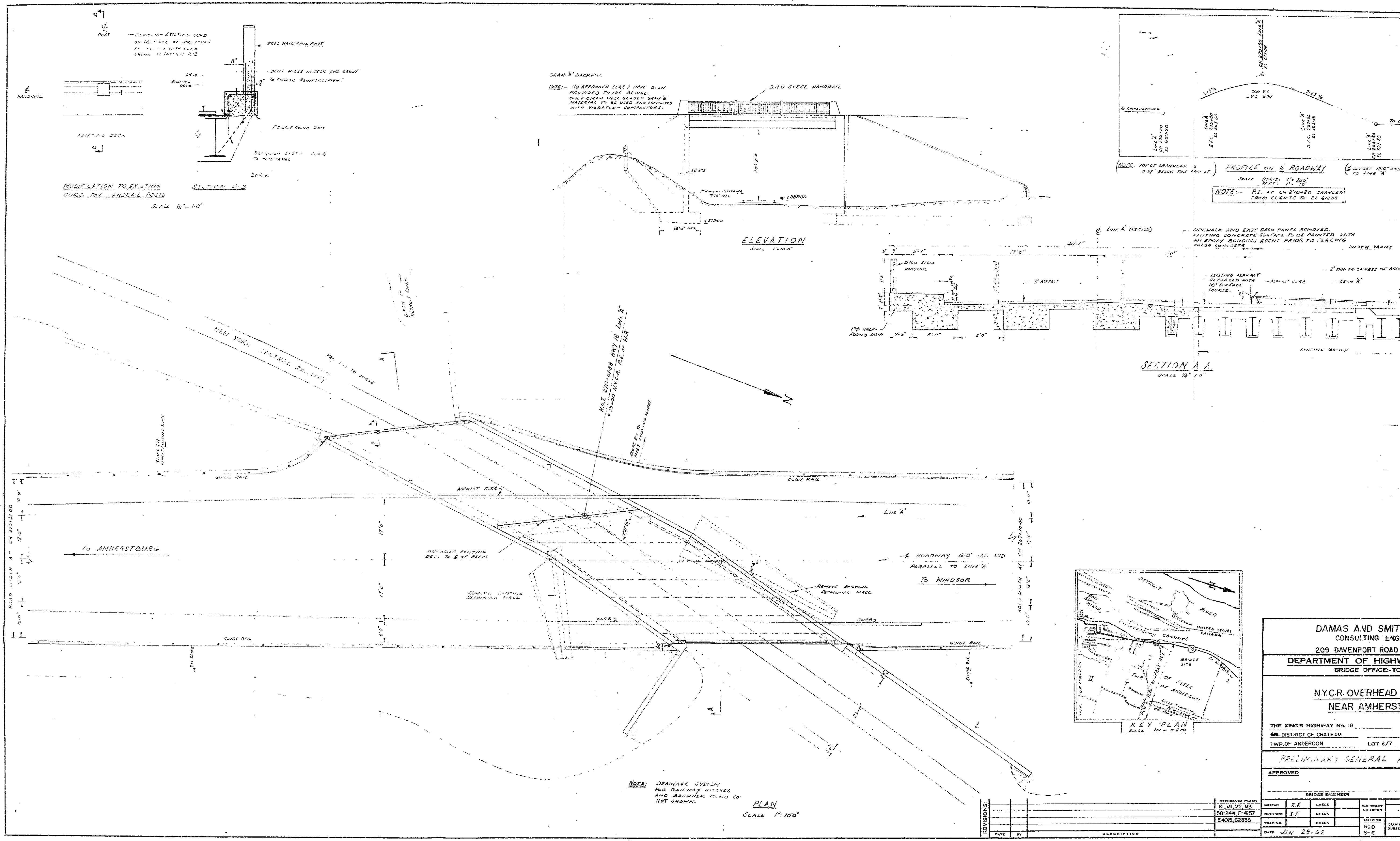
DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH SECTION

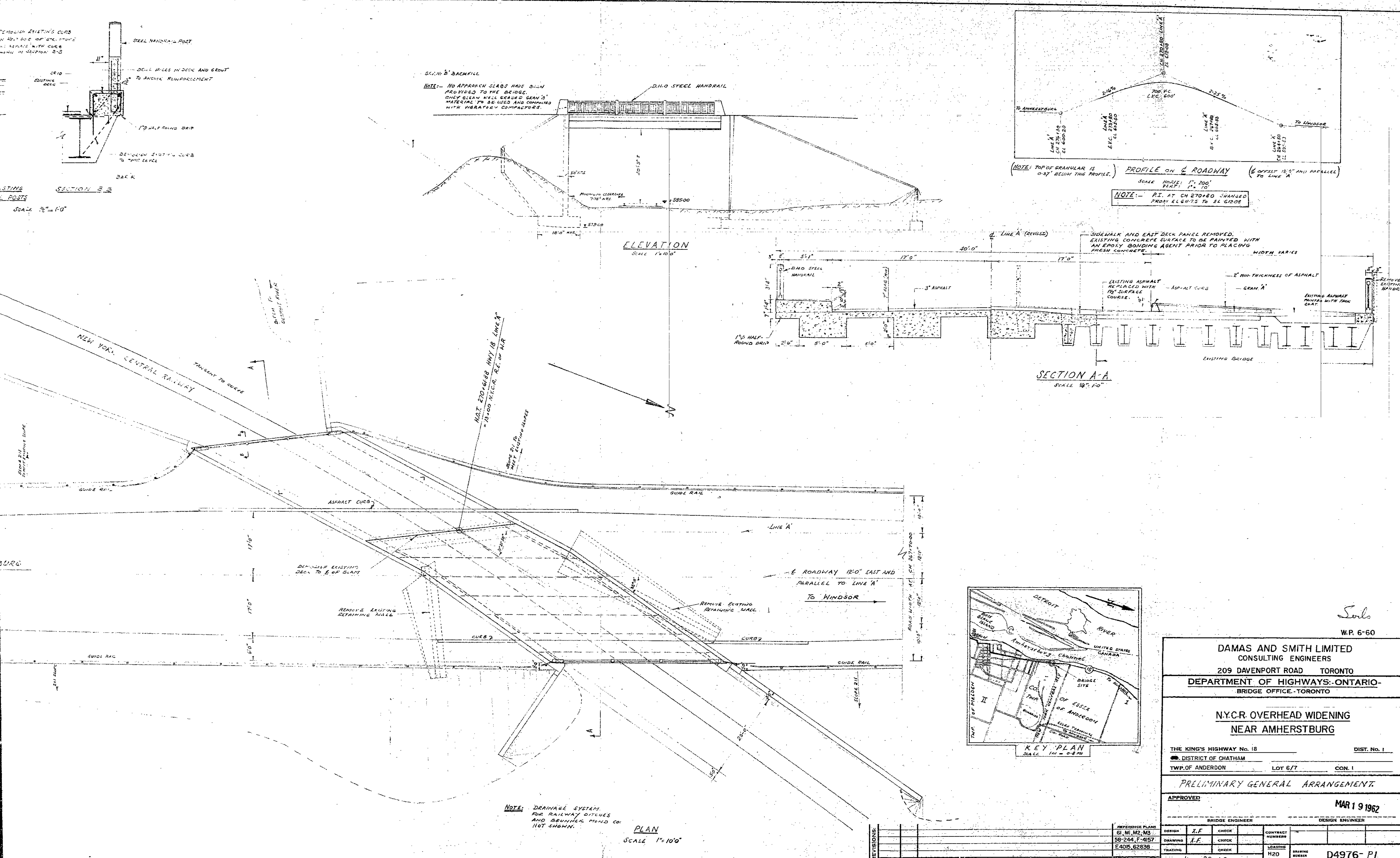
NEW YORK CENTRAL RAILWAY AND HIGHWAY Nº 18

PROPOSED REVISION LINE

ORIGINATED T. WIDDIS	DISTRICT NO. 1.	DATE 31 JULY 1961.
DRAWN	W.P. NO. 6-60	JOB NO. 60-F-69
CHECKED	SCALE 1inch = 20 feet	DRAWING NO. 60-F-69A
APPROVED		



MODIFICATION TO EXISTING CURB FOR HANDRAIL POSTS
SECTION B-B
SCALE ½" = 1'-0"
STEEL HANDRAIL POST
NOTE:- NO APPROACH SLABS HAVE BEEN PROVIDED TO THE BRIDGE. ONLY CLEAN WELL GRADED GRAN 'B' MATERIAL TO BE USED AND COMPACTED WITH VIBRATORY COMPACTORS.
D.H.O STEEL HANDRAIL
ELEVATION
SCALE 1"=10'-0"
PROFILE ON ℄ ROADWAY
NOTE:- P.I. AT CH 270+80 CHANGED
To AMHERSTBURG
SECTION A A
EXISTING BRIDGE
3" ASPHALT
NEW YORK CENTRAL RAILWAY
GUIDE RAIL
ASPHALT CURB
LINE 'A'
To AMHERSTBURG
℄ ROADWAY 12'-0" EAST AND PARALLEL TO LINE 'A'
To WINDSOR
REMOVE EXISTING RETAINING WALL
DEMOLISH EXISTING DECK TO ℄ OF BEAM
CURB
NOTE: DRAINAGE SYSTEM FOR RAILWAY DITCHES AND BRUNNER MOND CO NOT SHOWN.
PLAN
SCALE 1"=10'-0"
DETROIT
RIVER
UNITED STATES
CANADA
BRIDGE SITE
KEY PLAN
DAMAS AND SMIT
CONSULTING ENG
209 DAVENPORT ROAD
DEPARTMENT OF HIGHW
BRIDGE OFFICE:-TO
N.Y.C.R. OVERHEAD
NEAR AMHERST
THE KING'S HIGHWAY No. 18
DISTRICT OF CHATHAM
TWP. OF ANDERDON
LOT 6/7
PRELIMINARY GENERAL
APPROVED
BRIDGE ENGINEER
DESIGN X.F.
DRAWING X.F.
DATE JAN 29-62
REFERENCE PLANS
61, M1, M2, M3
58-244, F-4157
E405, 62836
REVISIONS
DATE
BY
DESCRIPTION



W.P. 6-60

DAMAS AND SMITH LIMITED
CONSULTING ENGINEERS
209 DAVENPORT ROAD TORONTO

DEPARTMENT OF HIGHWAYS:-ONTARIO-
BRIDGE OFFICE.-TORONTO

N.Y.C.R. OVERHEAD WIDENING
NEAR AMHERSTBURG

THE KING'S HIGHWAY No. 18 — DIST. No. 1
DISTRICT OF CHATHAM
TWP. OF ANDERDON — LOT 6/7 — CON. 1

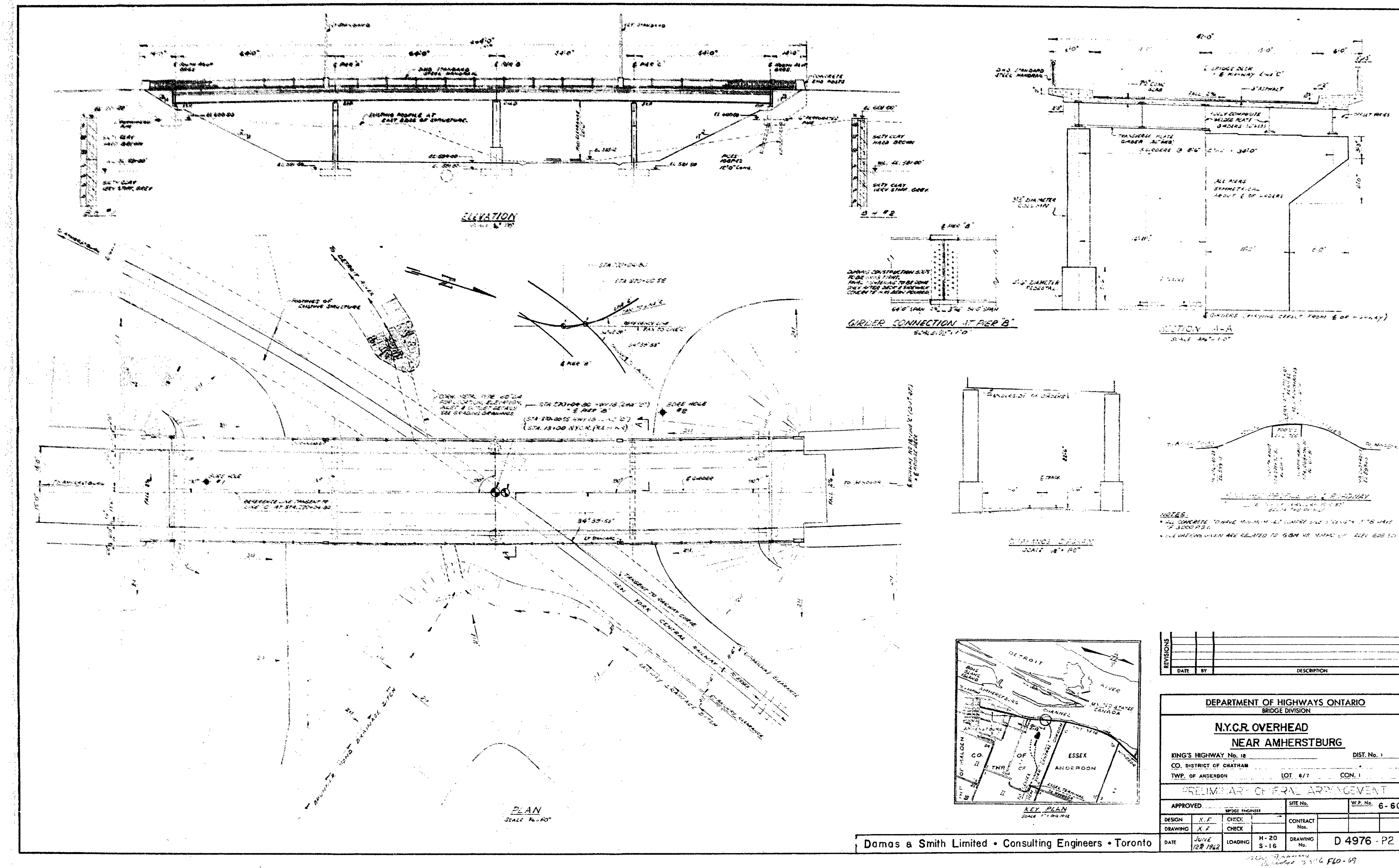
PRELIMINARY GENERAL ARRANGEMENT.

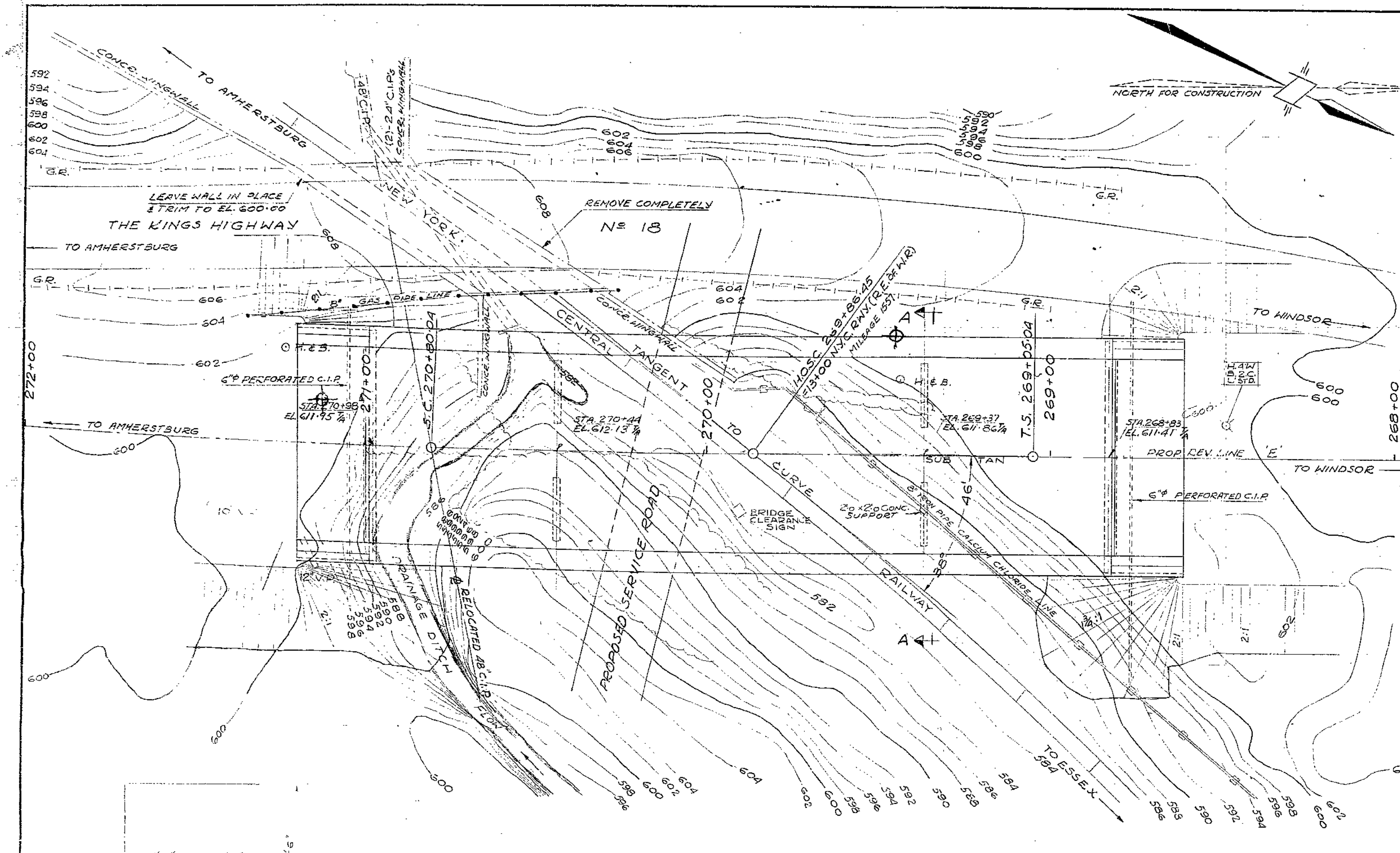
APPROVED — MAR 19 1962

BRIDGE ENGINEER — DESIGN ENGINEER

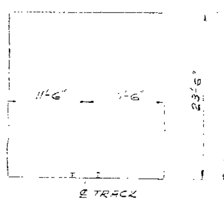
REVISIONS: DATE	BY	DESCRIPTION	REFERENCE PLANS
			61, M1, M2, M3
			58-244, F-4157
			E4015, 62838

DESIGN	X.F.	CHECK		CONTRACT NUMBERS	
DRAWING	X.F.	CHECK			
TRACING		CHECK		LOADING H20 S-16	DRAWING NUMBER D4976-P1
DATE	JAN 29-62				

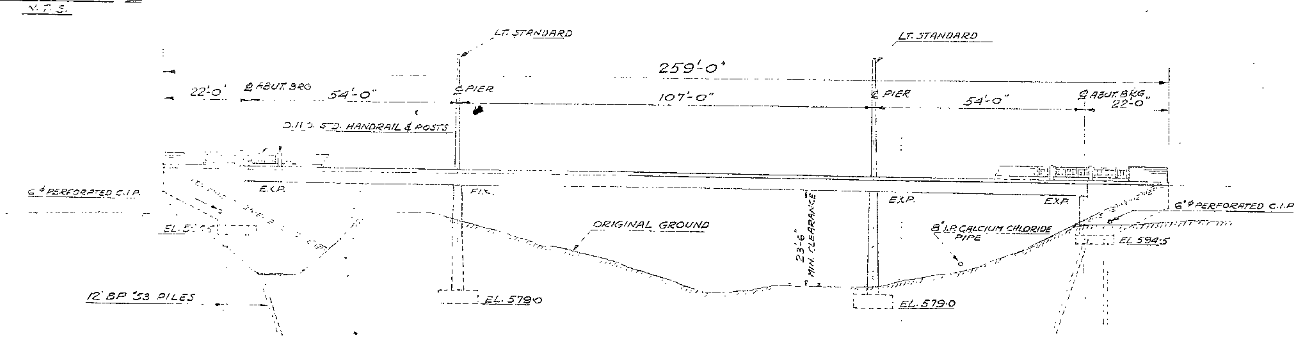

ELEVATION
GIRDER CONNECTION AT PIER "B"
SECTION A-A
CLEARANCE DIAGRAM
NOTES:
PLAN
KEY PLAN
DETROIT
RIVER
BOIS BLANC ISLAND
AMHERSTBURG
CHANNEL
UNITED STATES
CANADA
ESSEX
ANDERDON
NEW YORK CENTRAL RAILWAY
REVISIONS
DATE
BY
DESCRIPTION
DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE DIVISION
N.Y.C.R. OVERHEAD
NEAR AMHERSTBURG
KING'S HIGHWAY No. 18
DIST. No. 1
CO. DISTRICT OF CHATHAM
TWP. OF ANDERDON
LOT 6/7
CON. 1
PRELIMINARY GENERAL ARRANGEMENT
APPROVED
BRIDGE ENGINEER
SITE No.
W.P. No. 6-60
DESIGN X.F.
CHECK
DRAWING X.F.
CHECK
CONTRACT Nos.
DATE June 12th 1962
LOADING H-20 S-16
DRAWING No. D 4976 - P2
Damas & Smith Limited • Consulting Engineers • Toronto
F60-69



PLAN
SCALE: 1" = 20'-0"



CLEARANCE DIAGRAM
N.T.S.



B.M. EL. 599·03
GEODETIC ORIGIN
TOP OF S.W. CORN. OF CONC. STEP OF PURIFICATION PLANT.
37'0 LT. OF STA. 264+97

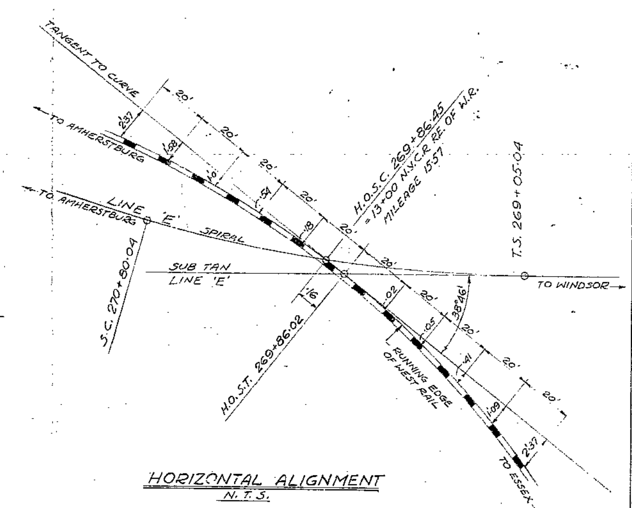
EAST ELEVATION
SCALE: 1" = 20'-0"

CURVE DATA

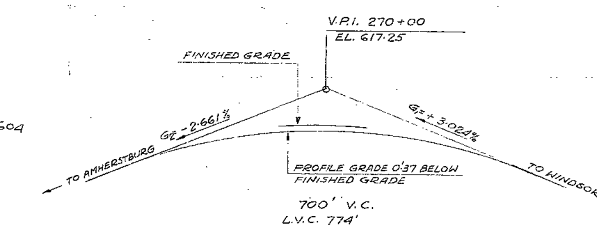
Δ	=	11° 24'
Δc	=	7° 54'
D	=	2° 00' RT.
R	=	2864·79
Lc	=	395·00
Es	=	14·71

SPIRAL DATA

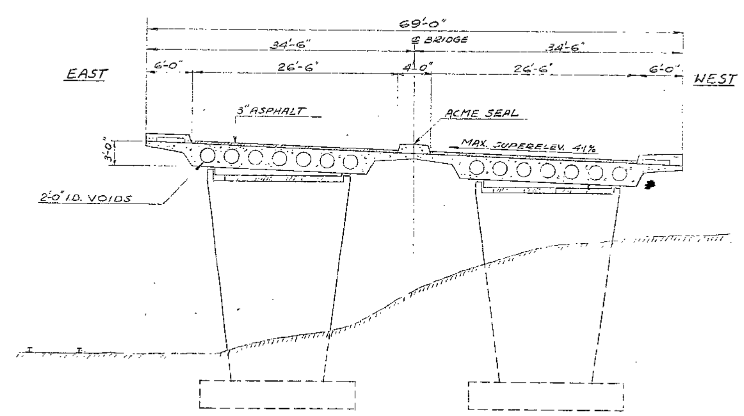
θs	1° 45'
Ls	175·00
Ts	373·49



HORIZONTAL ALIGNMENT
N.T.S.



VERTICAL ALIGNMENT
N.T.S.



SECTION A-A
SCALE: 1" = 10'-0"

NOTES

TO CONTRACTOR
STRUCTURE TO BE BUILT IN ACCORDANCE WITH FORM "9 AND THE SPECIAL PROVISIONS, EXTRA COPIES OF WICH MAY BE OBTAINED FROM THE ENGINEER

CONCRETE MIX

	MIN. STRENGTH AT 28 DAYS
DECK & SIDEWALK	5000 P.S.I.
ELSEWHERE	3000 P.S.I.

APPROVED ADMIXTURES SUPPLIED BY THE CONTRACTOR WILL BE ADDED TO ALL CONCRETE AS SPECIFIED BY THE ENGINEER

CLEAR COVER ON REINFORCING STEEL

FOOTINGS	3"	OR AS NOTED
PIERS & ABUTMENTS	3"	
DECK & ENDPOSTS	1½"	

CONSTRUCTION NOTES
ALL EXPOSED EDGES TO BE CHAMFERED 1"×1" EXCEPT AS NOTED
ALL CONSTRUCTION JOINTS MUST BE APPROVED BY THE ENGINEER.
NO CONCRETE SHALL BE PLACED ABOVE THE BRIDGE SEAT UNTIL CONCRETE IN THE DECK HAS BEEN PLACED, STRESSED AND GROUTED
ALL VOIDING TUBES TO BE INTERNALLY BRACED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

REFERENCE DRAWINGS

SURVEY PLANS

PLAN	2-B-44
PROFILE	C-244-6
SITE PLAN	E 4312-1
RLWY. CROSSING PLAN	G 3015

LIST OF DRAWINGS

REVISIONS		
DATE	BY	DESCRIPTION

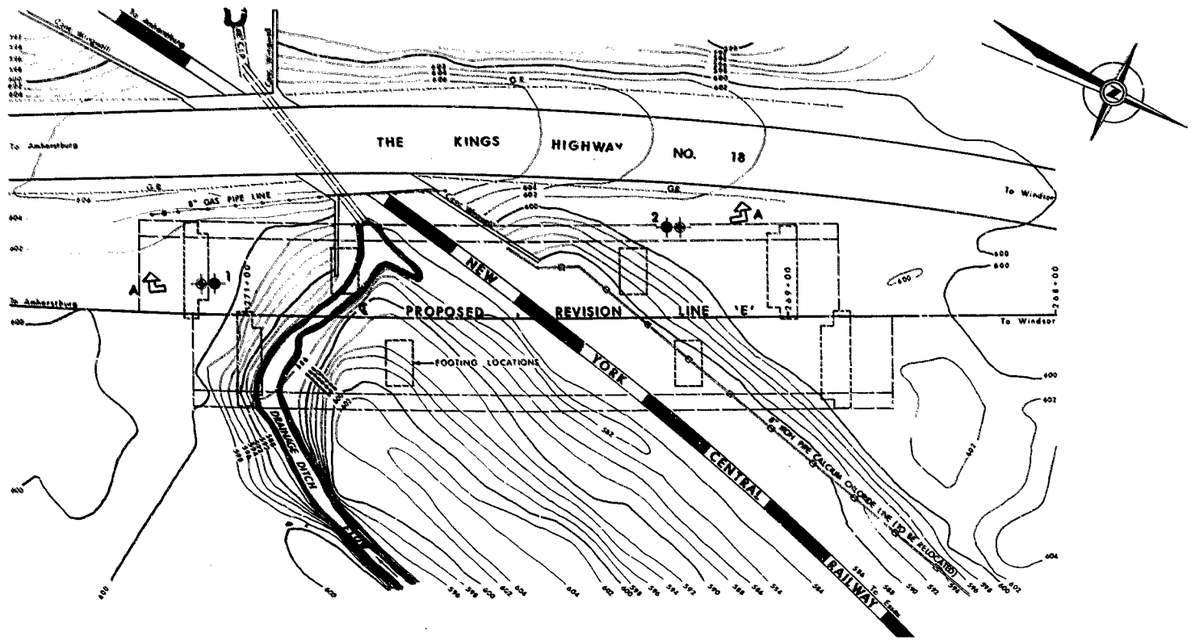
DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE DIVISION

N.Y.C.R. OVERHEAD
APPROX. 0·5 MI. N. OF AMHERSTBURG

KING'S HIGHWAY No. 18 DIST. No. 1
CO. ESSEX
TWP. ANDERSON LOT 6 & 7 CON. I

PRELIMINARY

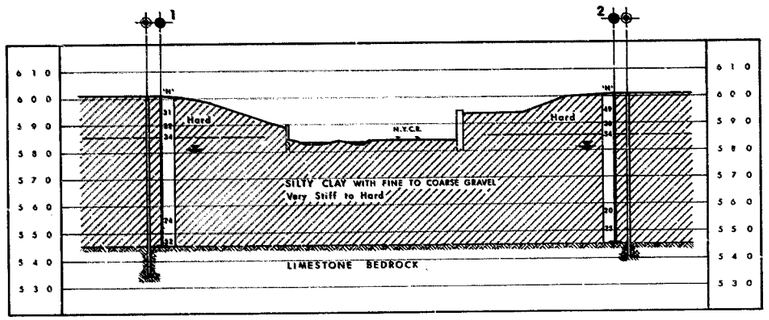
APPROVED	BRIDGE ENGINEER			SITE No. 6-121	W.P. No. 6-60
DESIGN	L.N.F.	CHECK	A.K.	CONTRACT Nos.	
DRAWING	G.P.	CHECK	A.K.	DRAWING No.	D-5457-P
DATE	FEB. 1964	LOADING	H20 S16		



PLAN

SCALE

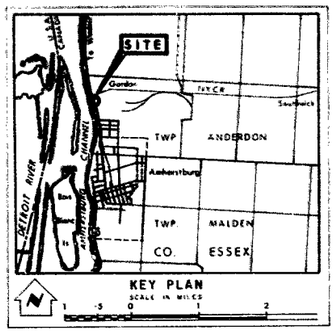
20 10 0 20 40



SECTION A-A

SCALE

20 10 0 20 40



LEGEND

- Bore Hole
- Cone Penetration Hole
- Bore & Cone Penetration Hole
- Water Levels established at time of field investigation. (July 1961)
- Dominion Soil investigation done on March 6 & 7, 1964 to core the bedrock, near as possible to DHO holes.

NO.	ELEVATION	STATION	OFFSET
1	601·0	271+11	11' RT.
2	601·0	269+45	33 RT.

- NOTE -

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

PRINT RECORD		
NO	FOR	DATE

REVISIONS			
DATE	BY	DESCRIPTION	
10 Aug 64	D.M.	DRAWING REVISED & REDRAWN - LINE 'E' REVISION & STATIONS	

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH DIVISION - FOUNDATION SECTION

NEW YORK CENTRAL RAILWAY

KING'S HIGHWAY NO. 18 LINE 'E' REVISION DIST. NO. 1

CO. ESSEX

TWP. ANDERDON LOT 6 & 7 CON. I

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D T. W.	CHECKED C.W.	W.P. NO. 6-60	M & R DRAWING NO. 60-F-69 A
DRAWN D.M.	CHECKED J.R.	JOB NO. 60-F-69	
DATE 12 AUG. 1964		SITE NO.	BRIDGE DRAWING NO.
APPROVED		CONT. NO.	

REF. NO. D-5457-2

40J3-1