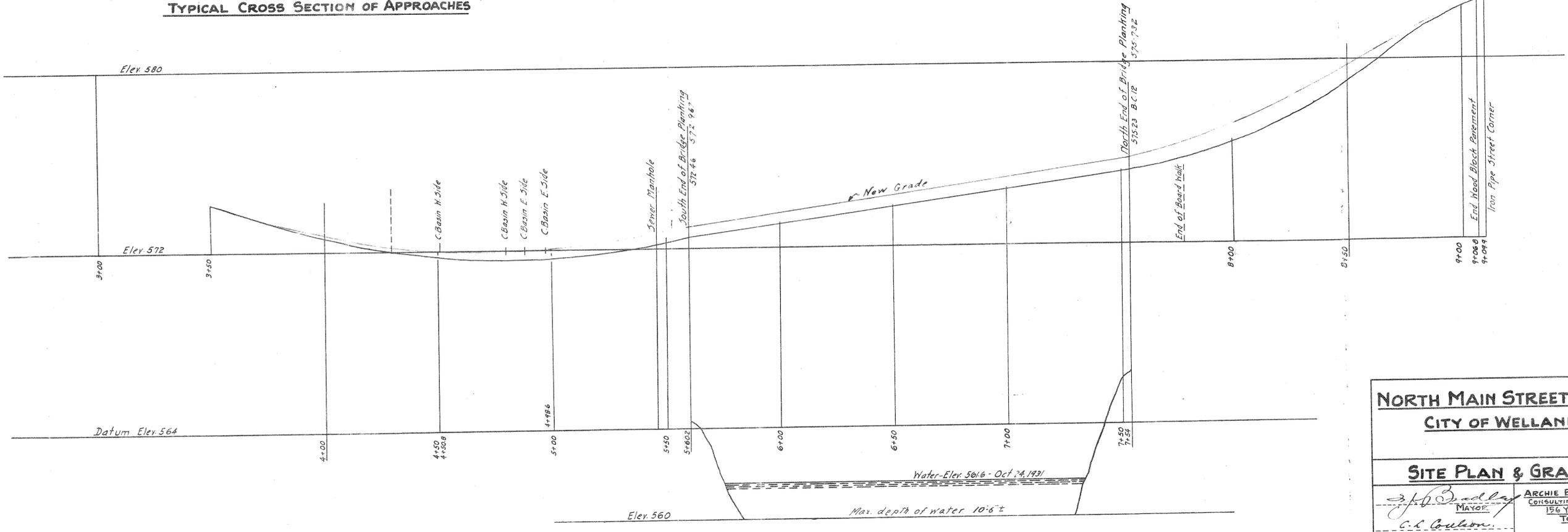
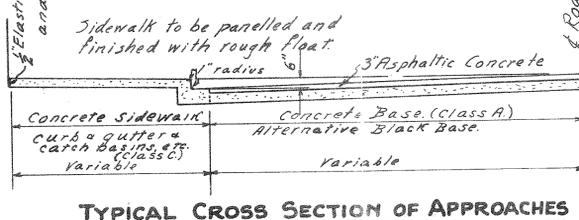
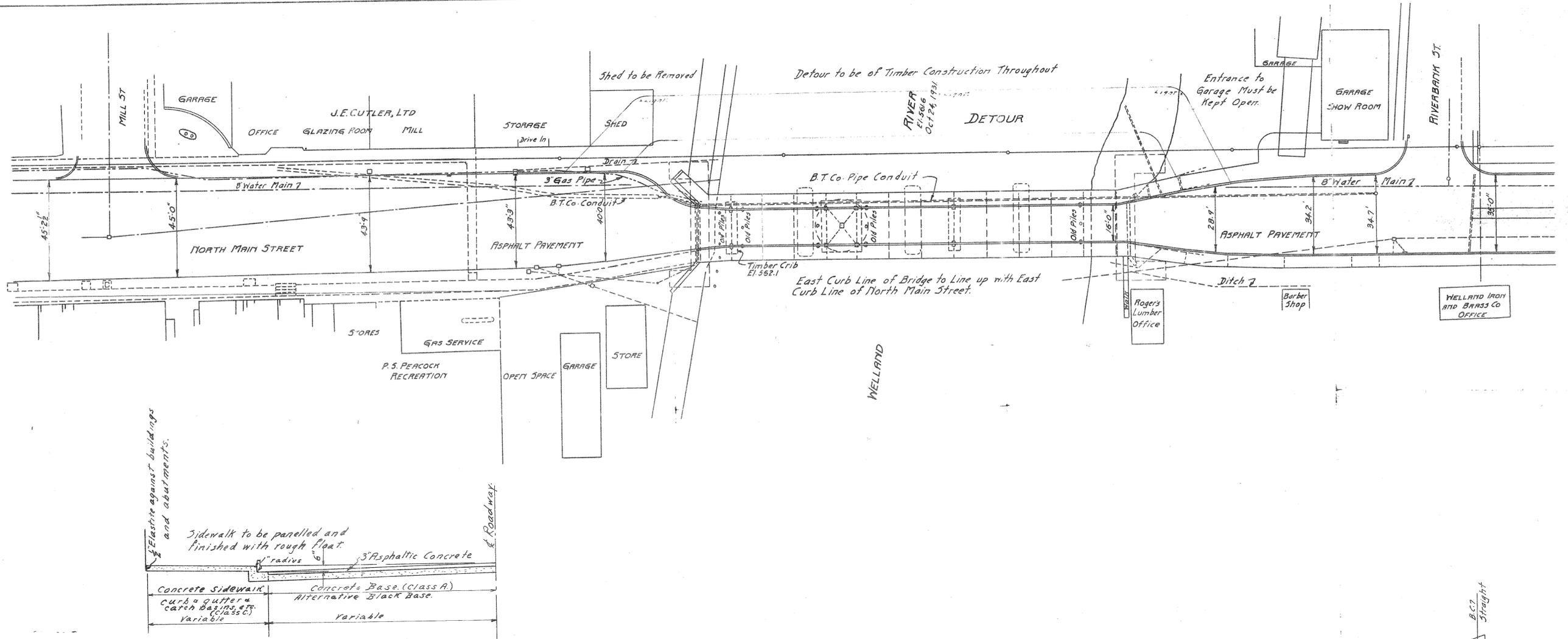
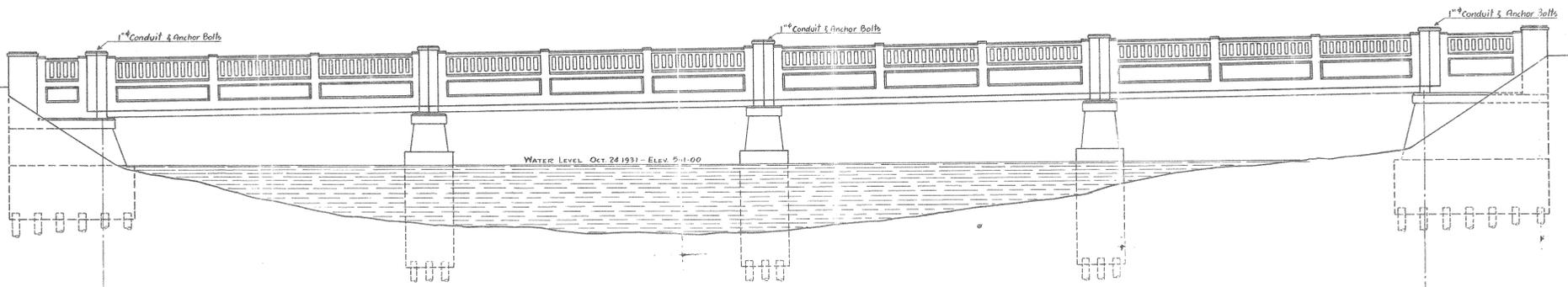


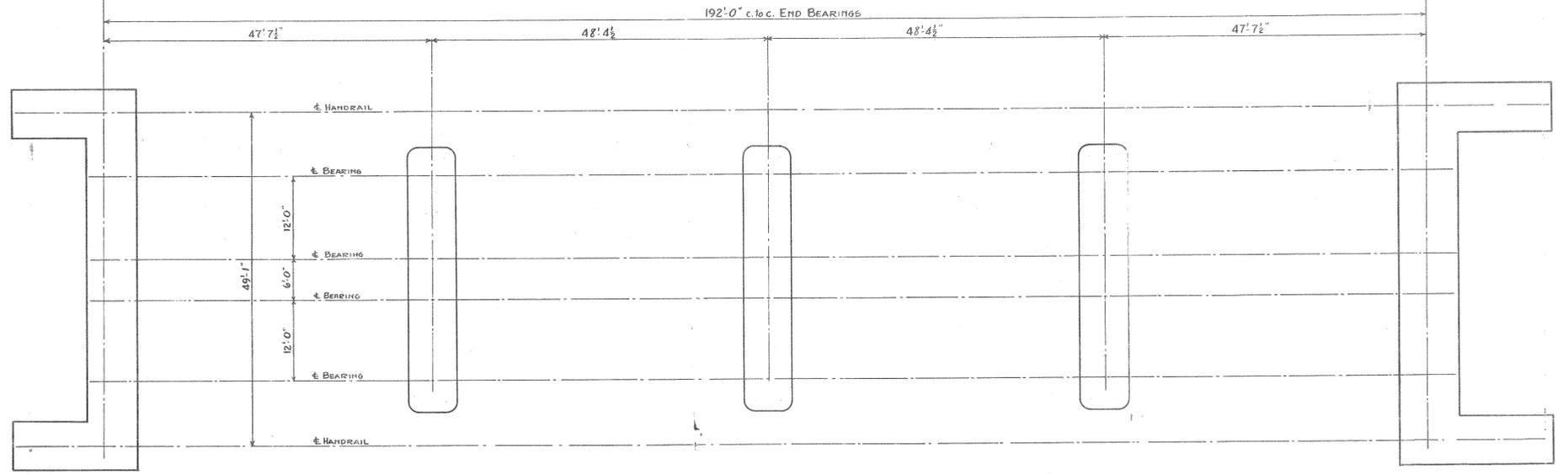
## APPENDIX A – EXISTING STRUCTURAL DRAWINGS



<b>NORTH MAIN STREET BRIDGE</b> CITY OF WELLAND	
<b>SITE PLAN &amp; GRADES</b>	
<i>J.F. Bradley</i> MAYOR	ARCHIE B. CREALOCK CONSULTING ENGINEER 156 YONGE STREET TORONTO
<i>C.L. Coulson</i> CITY ENGINEER	<i>Archie B. Crealock</i> CONSULTING ENGINEER
Date - November 20 <sup>th</sup> 1931	
DRAWING NO <b>3110-1</b>	



**EAST ELEVATION**



**FOUNDATION PLAN**

**SPECIFICATIONS.**

Ontario Railway and Municipal Board "Standard Specifications for Bridges, Viaducts, Trestles or Other Structures" 1930

**LOADING - CLASS I**

UNIFORM - Sidewalk 70 pounds per Square Foot  
 Roadway 100 " " " "  
 CONCENTRATED Roadway One 20 ton Truck or  
 Four 15 ton Trucks

**NORTH MAIN STREET BRIDGE  
 CITY OF WELLAND  
 REINFORCED CONCRETE DESIGN**

**PLAN & ELEVATION**

*W. B. Dudley*  
 MAYOR

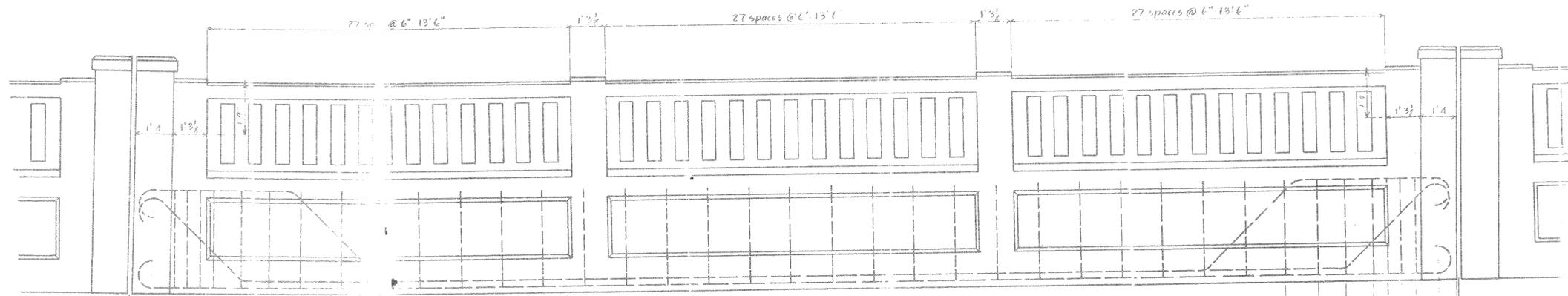
*C. L. Wilson*  
 CITY ENGINEER

*Archie B. Crealock*  
 CONSULTING ENGINEER

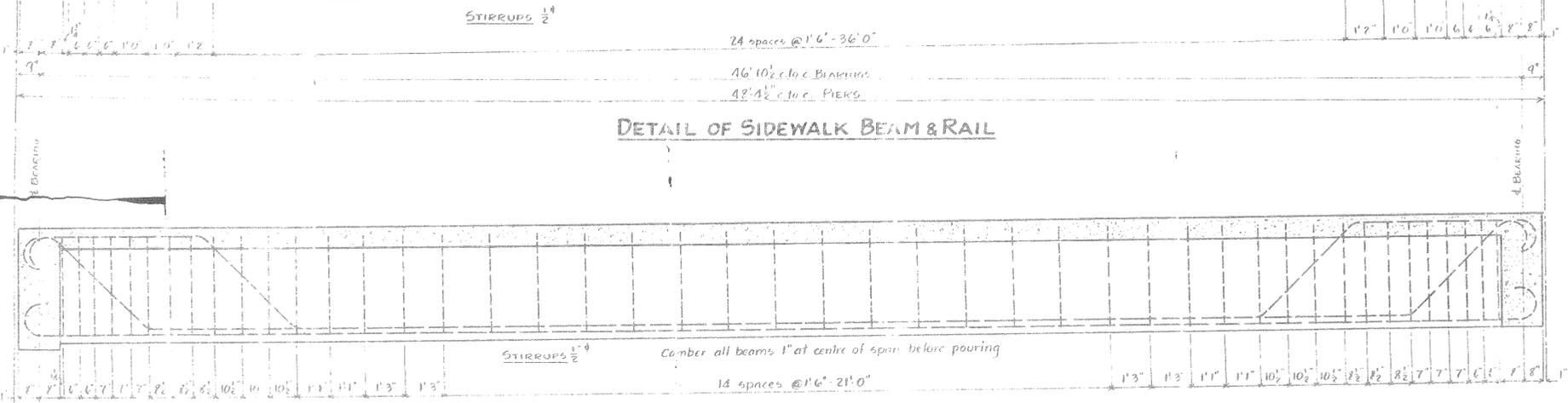
ARCHIE B. CREALOCK  
 CONSULTING ENGINEER  
 156 YONGE STREET  
 TORONTO

DATE - NOVEMBER 20<sup>th</sup> 1931

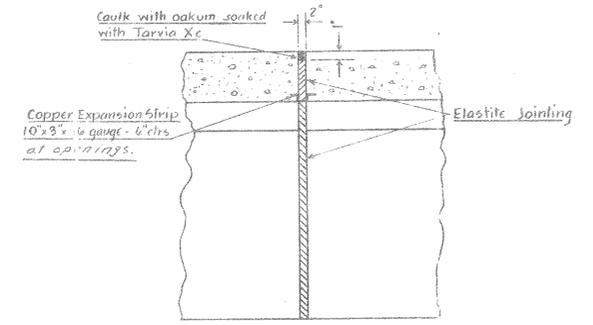
Draw 3



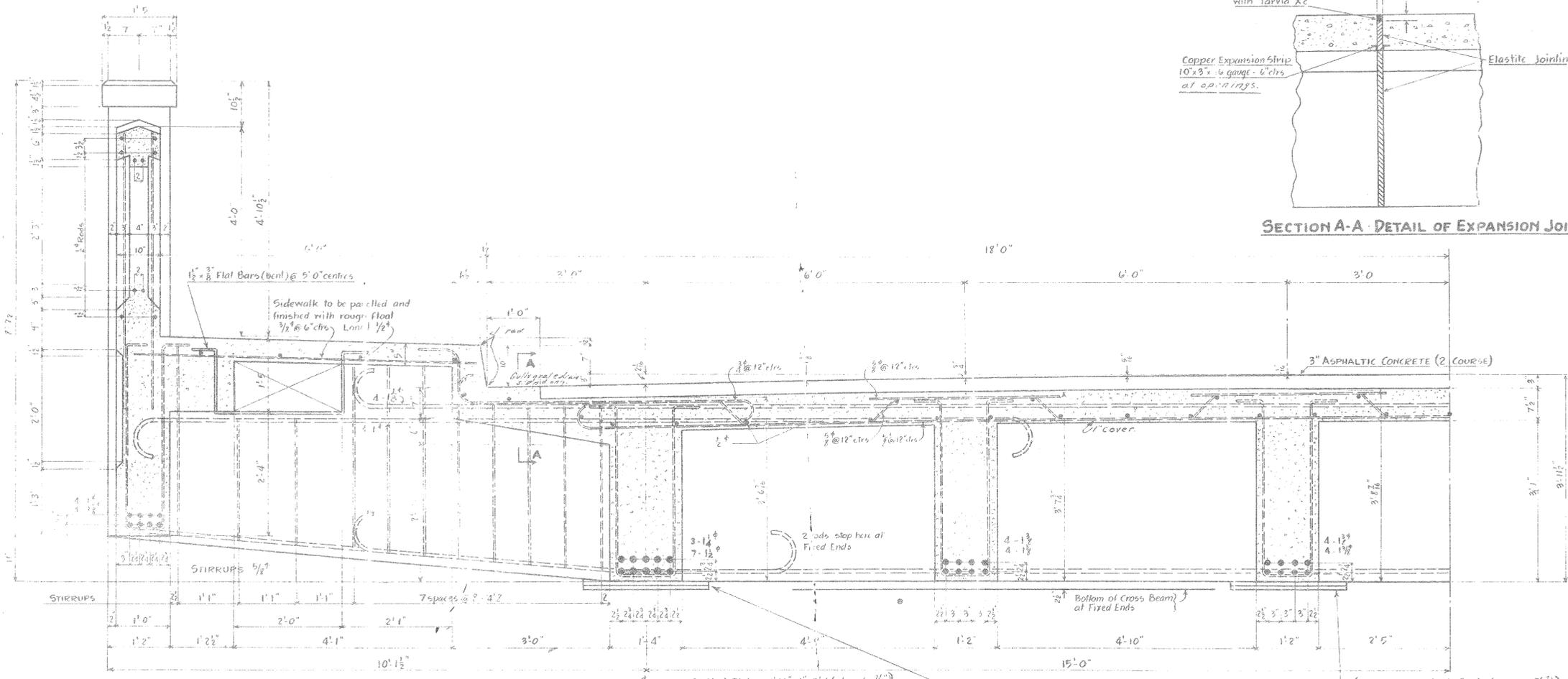
DETAIL OF SIDEWALK BEAM & RAIL



DETAIL OF INNER BEAMS



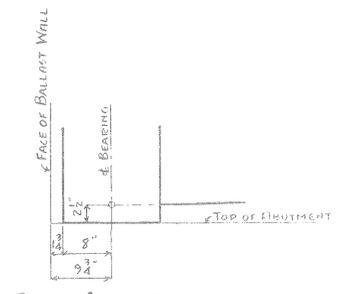
SECTION A-A - DETAIL OF EXPANSION JOINT



HALF CROSS SECTION

- AT N & S PIERS
- 2 - Steel Plates - 1'-10" x 1" x 2'-4" (plane to 1/8")
  - 2 - Hard Brass Plates - 1'-10" - 1/4" x 2'-4"
  - 1 - Hard Brass Plate - 3'-10" - 1/4" x 2'-4"
  - 1 - Steel Plate - 3'-10" - 1" x 2'-4" (plane to 7/16")
  - 1 - piece Steel Lead - 3'-11" - 1/8" x 2'-5"

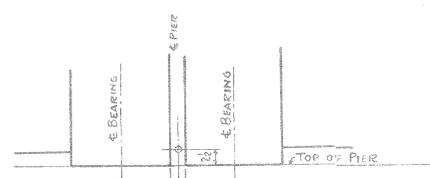
- AT N & S PIERS
- 2 - Steel Plates 1'-10" x 1" x 2'-2" (plane to 7/16")
  - 2 - Hard Brass Plates 1'-10" - 1/4" x 2'-2"
  - 1 - Hard Brass Plate 3'-10" x 1/4" x 2'-2"
  - 1 - Steel Plate - 3'-10" - 1" x 2'-2" (plane to 7/16")
  - 1 - piece Steel Lead - 3'-11" - 1/8" x 2'-3"



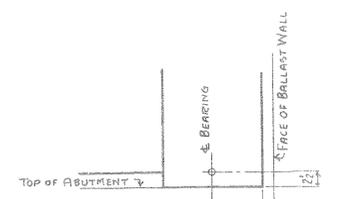
SOUTH ABUTMENT



NORTH & SOUTH PIERS



CENTRE PIER



NORTH ABUTMENT

- CONCRETE
- Handrail - Class F
  - Balance - Class G

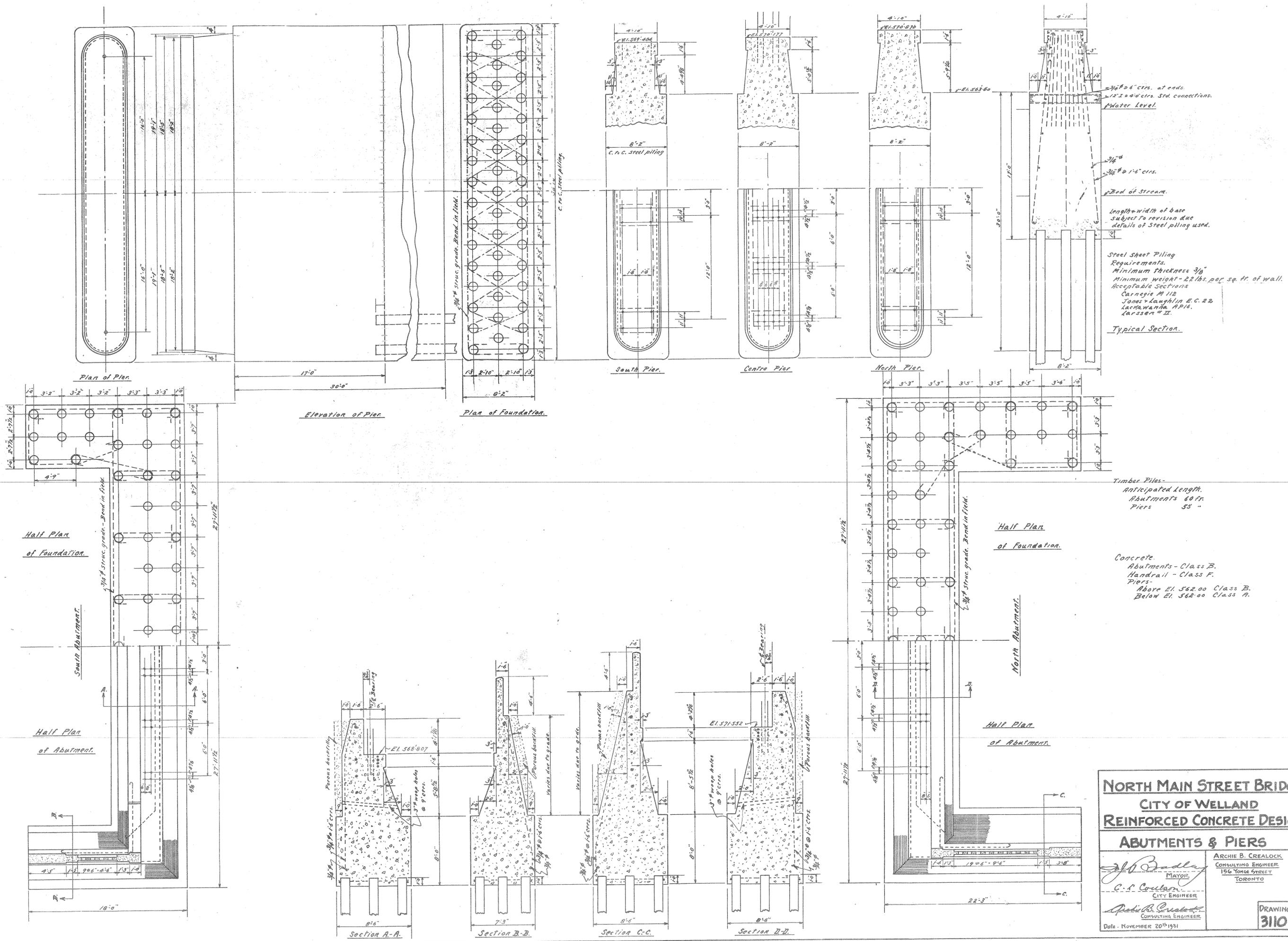
**NORTH MAIN STREET BRIDGE**  
**CITY OF WELLAND**  
**REINFORCED CONCRETE DESIGN**  
**SUPERSTRUCTURE DETAILS**

*Archie B. Crealock*  
 ARCHIE B. CREALOCK  
 CONSULTING ENGINEER  
 156 YONGE STREET  
 TORONTO

*Archie B. Crealock*  
 ARCHIE B. CREALOCK  
 CONSULTING ENGINEER

Date - NOVEMBER 20<sup>th</sup> 1931

DRAWING NO  
**3110-3**



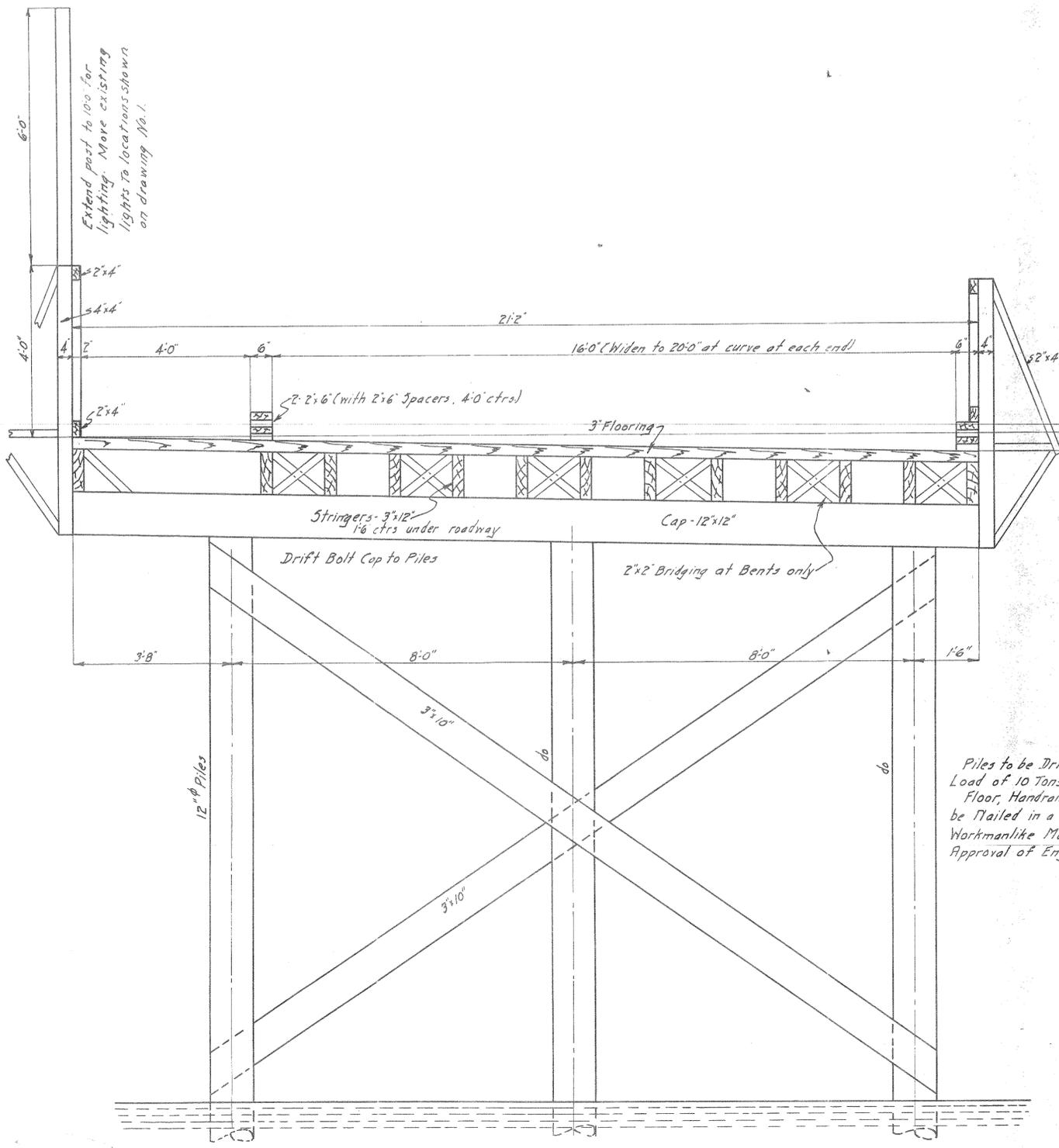
**NORTH MAIN STREET BRIDGE**  
 CITY OF WELLAND  
**REINFORCED CONCRETE DESIGN**  
**ABUTMENTS & PIERS**

*John Badley*  
 MAYOR  
 C. F. Coulter  
 CITY ENGINEER

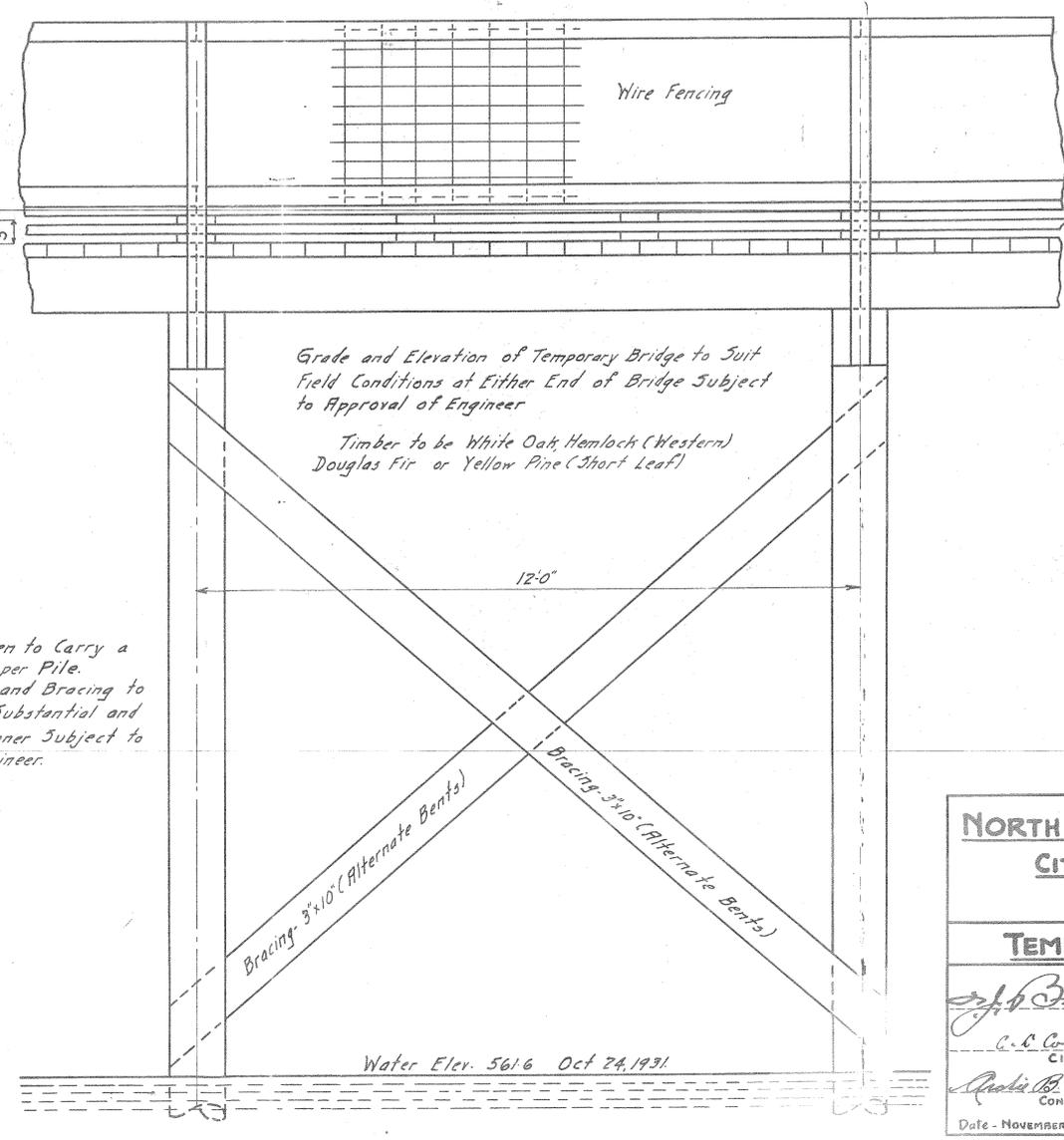
*Archib. Crealock*  
 CONSULTING ENGINEER  
 156 YONGE STREET  
 TORONTO

DATE: NOVEMBER 20<sup>th</sup> 1931

DRAWING NO. **310-4**



Piles to be Driven to Carry a Load of 10 Tons per Pile. Floor, Handrail and Bracing to be Nailed in a Substantial and Workmanlike Manner Subject to Approval of Engineer.



<b>NORTH MAIN STREET BRIDGE</b>	
<b>CITY OF WELLAND</b>	
<b>TEMPORARY BRIDGE</b>	
 J. B. Bradley MAYOR	ARCHIE B. CREALOCK CONSULTING ENGINEER 196 YONGE STREET TORONTO
 A. B. Crealock CITY ENGINEER	 ARCHIE B. CREALOCK CONSULTING ENGINEER
Date - November 20 <sup>th</sup> 1931	DRAWING No. 3110-5

**REGIONAL MUNICIPALITY OF NIAGARA**

**CONTRACT RN 73 - 9**

**NIAGARA STREET STRUCTURE  
OVER THE  
WELLAND RIVER**

'AS CONSTRUCTED'

J. E. CAMPBELL  
CHAIRMAN



C. H. EIDT P. ENG.  
DIRECTOR OF ENGINEERING

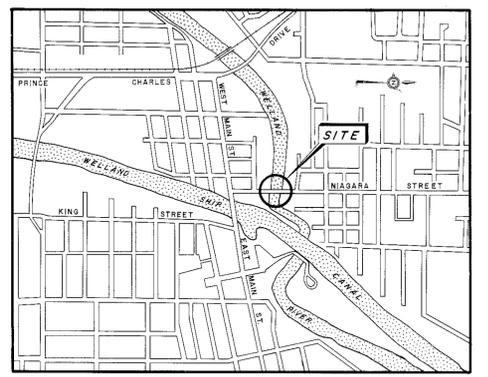
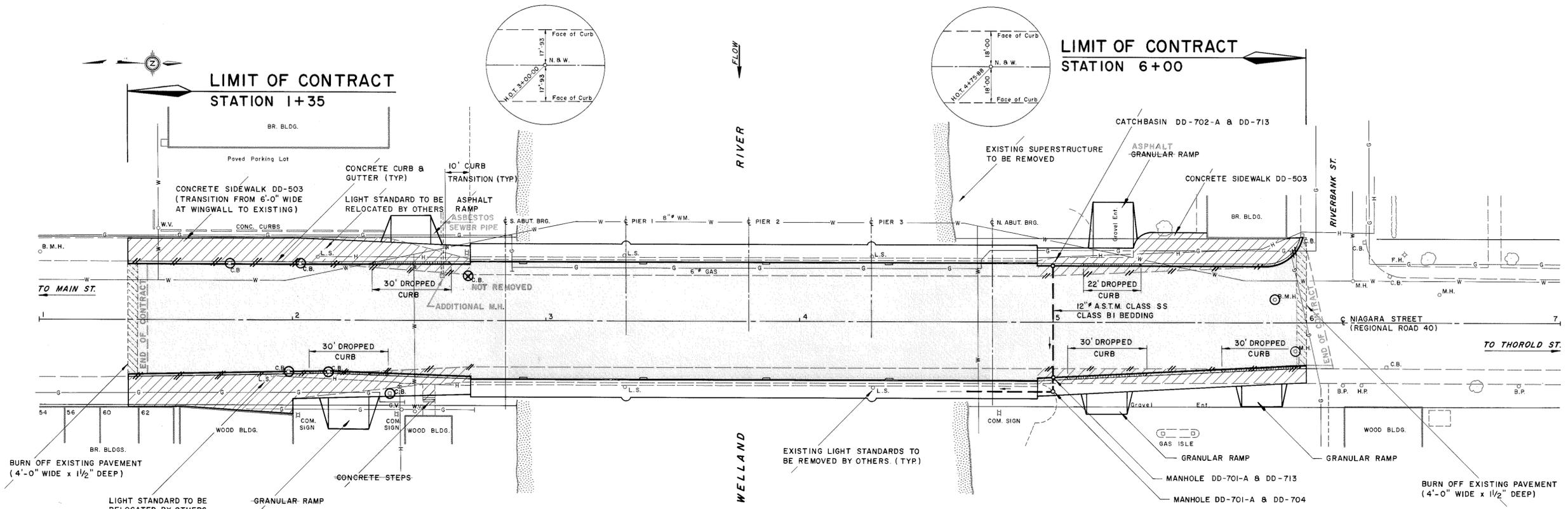
**McCORMICK, RANKIN & ASSOCIATES LIMITED**

A004  
WELLAND

A004

A004

NO.	REVISIONS	APPD.	DATE



CITY OF WELLAND

PLAN

- REMOVALS**
- CURB & GUTTER
  - SIDEWALK
- LEGEND**
- ADJUST EXISTING CATCHBASIN OR MANHOLE
  - REMOVE EXISTING CATCHBASIN

- WATERSHED AREA 337 SQUARE MILES
- DESIGN FLOOD FREQUENCY 50 YEARS
- SPECIAL FEATURES AT SITE (DAMS, ICE, SCOUR, DRIFT, SLIDING BANKS, ETC.) SIPHON UNDER WELLAND CANAL IMMEDIATELY DOWNSTREAM

- (A) EXISTING STRUCTURES AT SITE, UPSTREAM AND DOWNSTREAM (GIVE LOCATION, TOTAL SPAN, HEIGHT ABOVE NORMAL HIGH WATER, NET AREA FOR FLOW AT N.H.W., ESTIMATED AGE)

LOCATION	SITE	UPSTREAM	DOWNSTREAM
TOTAL SPAN	200	250	
HEIGHT ABOVE N.W.L.	11.0	11.5	

- (B) REASON FOR CHANGE IN HEIGHT OR SPAN OF PROPOSED STRUCTURE FROM THAT OF EXISTING STRUCTURE NO CHANGE

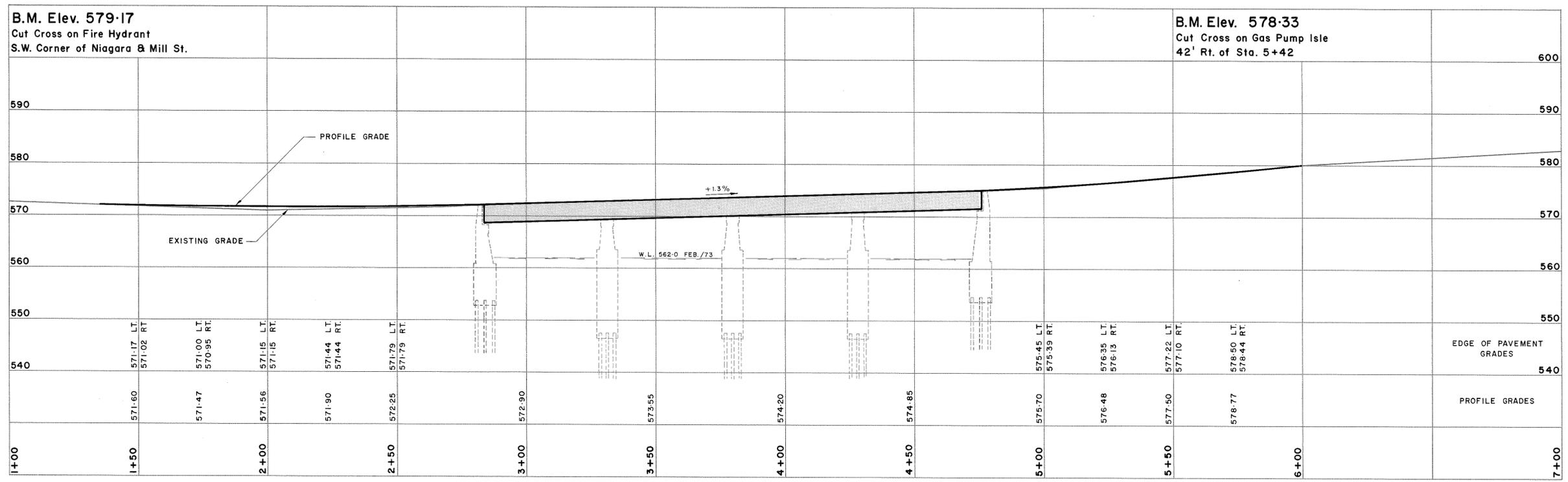
- INFORMATION ON EXTREME FLOODING AT SITE OBTAINED FROM NIAGARA PENINSULA CONSERVATION AUTHORITY AND REFLECTS HIGHEST WATER ELEVATION TO BE 573.6 (CONSERVATION AUTHORITY DATUM) 569.6 (GEODETIC DATUM)

- IS IT LIKELY THAT STREAM BED WILL BE LOWERED NO
- IS STRUCTURE ON A MUNICIPAL DRAIN NO
- DESIGN LOADING HS20-44 PLUS 3 INCHES ASPHALT
- (A) NAVIGATION CLEARANCES REQUIRED, IF ANY
- (B) RAILWAY CLEARANCES REQUIRED, IF ANY
- (C) REQUIREMENTS OF OTHER AGENCIES

- FINAL SUBMISSION
- HAS APPROVAL BEEN OBTAINED FROM FEDERAL MINISTRY OF TRANSPORT (N.W.P. ACT) CANADIAN TRANSPORT COMMISSION RAILWAY COMPANIES

- APPROX. VOLUME OF CONCRETE \_\_\_\_\_ CU. YD.
- WEIGHT OF REINFORCEMENT \_\_\_\_\_ TONS
- WEIGHT OF STRUCTURAL STEEL \_\_\_\_\_ TONS
- LENGTH OF PRESTRESSED BEAMS \_\_\_\_\_ LIN. FT.
- LENGTH OF PIPE CULVERT \_\_\_\_\_ LIN. FT.

'AS CONSTRUCTED'



PROFILE



REGIONAL MUNICIPALITY OF NIAGARA

**NIAGARA STREET STRUCTURE**  
OVER WELLAND RIVER

CITY OF WELLAND SITE No. 68

**SITE PLAN & PROFILE**

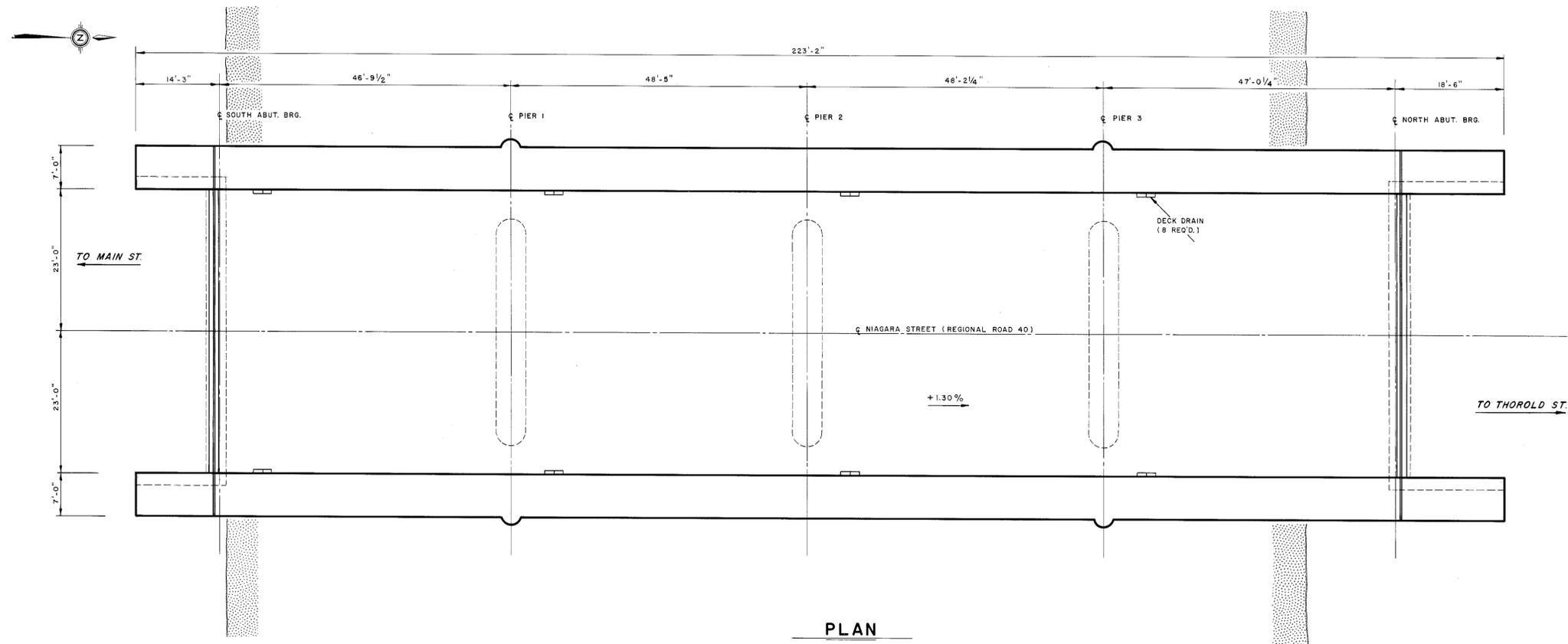
DESIGNED	J. W. T	CHECKED	R. D. N.
DRAWN	R. M. T.	DATE	APRIL, 1973
CONTRACT NUMBER	RN 73 - 9	DRAWING NUMBER	694 - I

**MCCORMICK, RANKIN & ASSOCIATES**  
CONSULTING ENGINEERS  
PORT CREDIT OTTAWA ST. CATHARINES

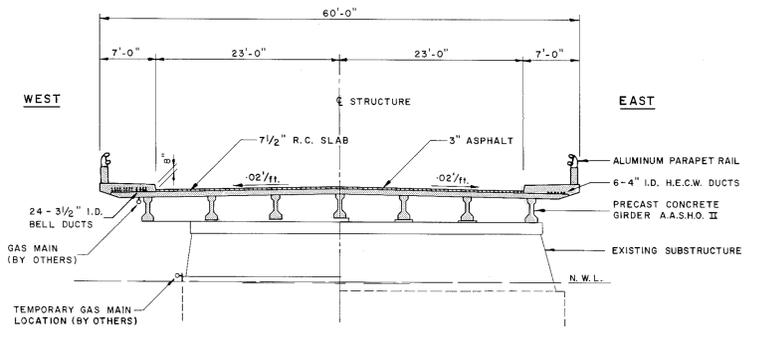
SHEET 1 OF 11

A004

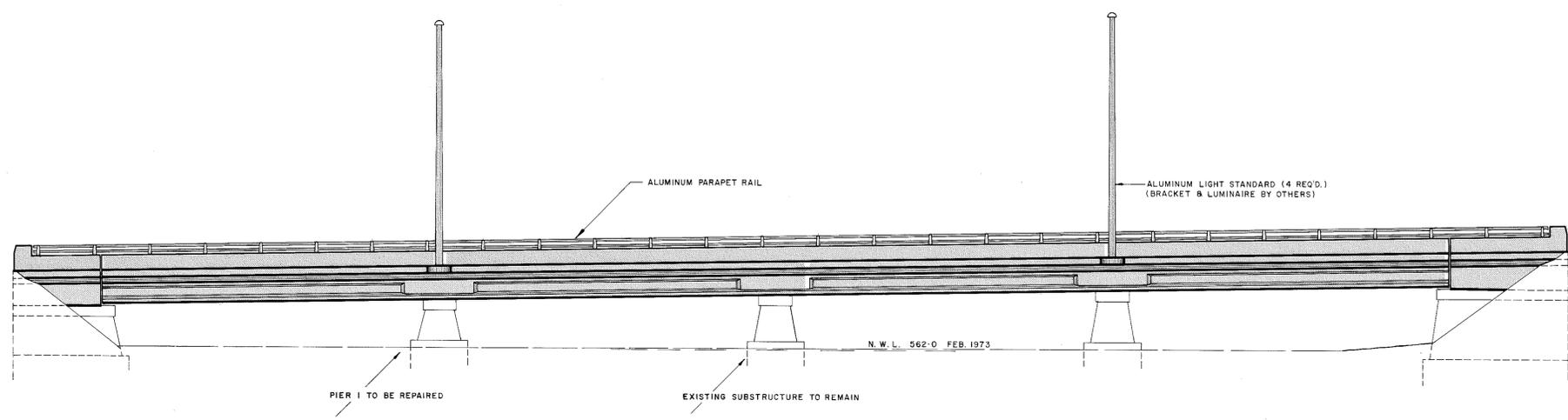
NO.	REVISIONS	APPD.	DATE



**PLAN**



**TYPICAL SECTION**  
AT PIER      AT ABUTMENT



**ELEVATION**

**GENERAL NOTES**

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH M.T.C. FORM 9 AND THE SPECIAL PROVISIONS.
- CLASS OF CONCRETE  
 PRESTRESSED CONCRETE GIRDERS      5000 P. S. I.  
 DECK, SIDEWALK & PARAPET WALLS      4000 P. S. I.  
 ALL OTHER      3000 P. S. I.
- CLEAR COVER ON REINFORCING STEEL  
 ABUTMENTS      3"  
 PIER CAPS, S.W. & PARAPET WALLS      2"  
 DECK      1" BOT. 1 1/2" TOP
- STRUCTURE DESIGNED FOR HS 20-44 LOADING & 3" WEARING SURFACE.
- BRIDGE DECK TO BE WATERPROOFED IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
- EXISTING BRIDGE DRAWINGS MAY BE EXAMINED AT THE OFFICE OF THE CONSULTING ENGINEER.

**LIST OF DRAWINGS**

- SITE PLAN & PROFILE
- GENERAL ARRANGEMENT
- ABUTMENTS, WINGWALLS & PIER CAPS
- PRESTRESSED CONCRETE GIRDERS
- DECK, DIAPHRAGMS & SCREED ELEVATIONS
- EXPANSION JOINT & DECK DRAIN DETAILS
- SIDEWALK, PARAPET WALLS & RAILS
- ELECTRICAL DETAILS
- REINFORCING STEEL SCHEDULE
- STANDARDS
- STANDARDS

'AS CONSTRUCTED'

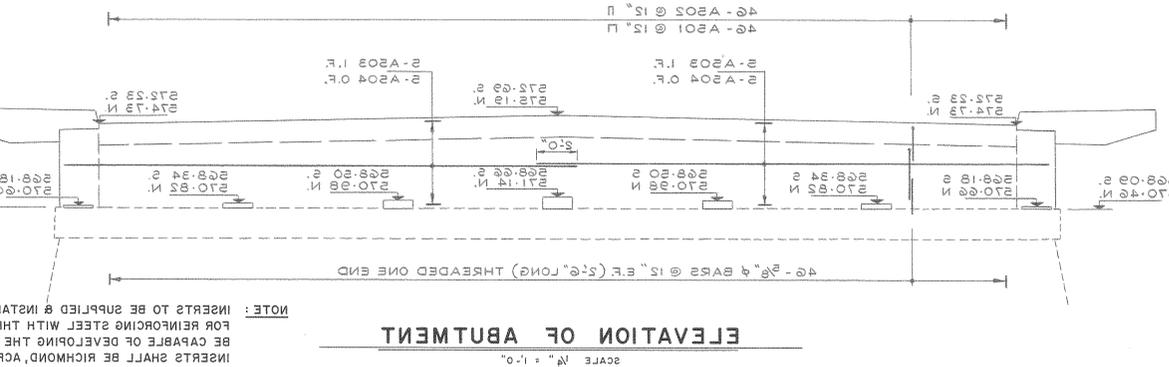
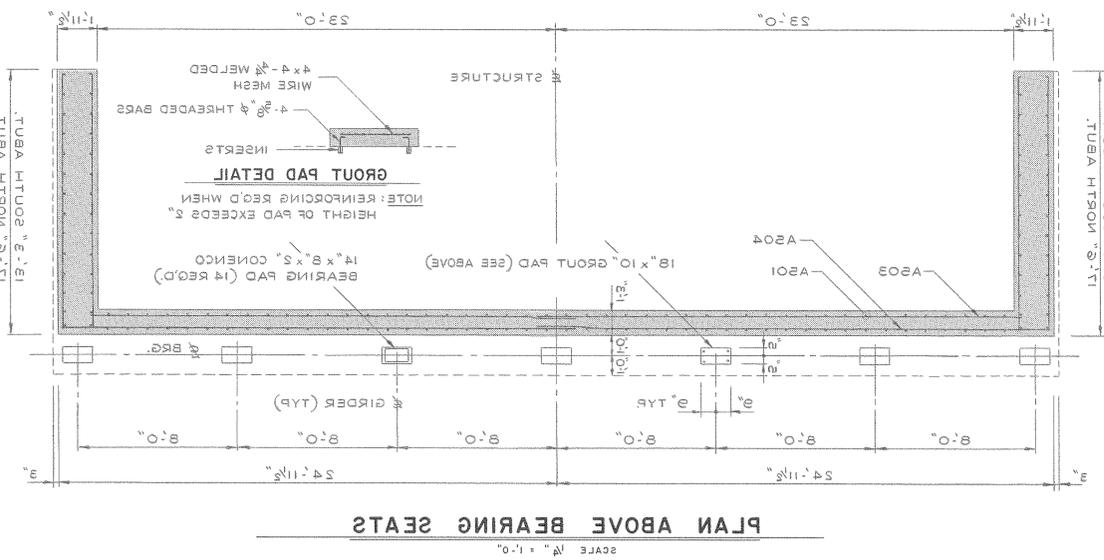
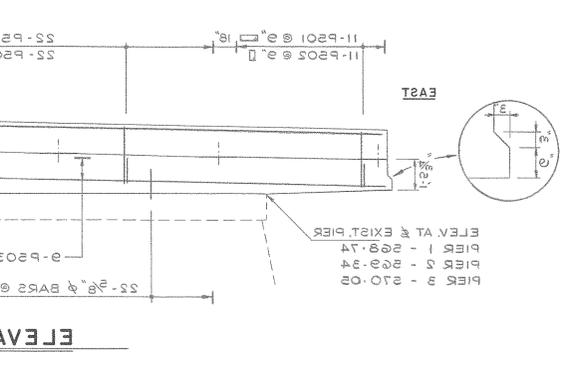
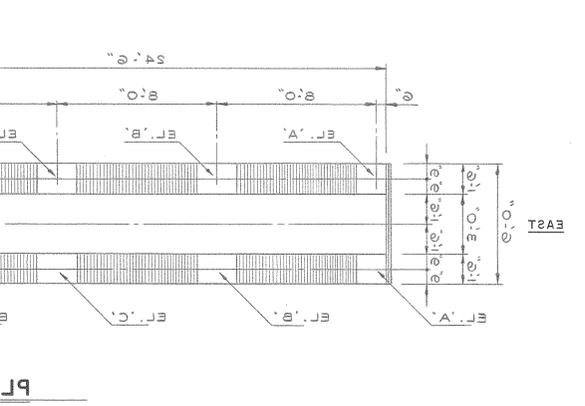
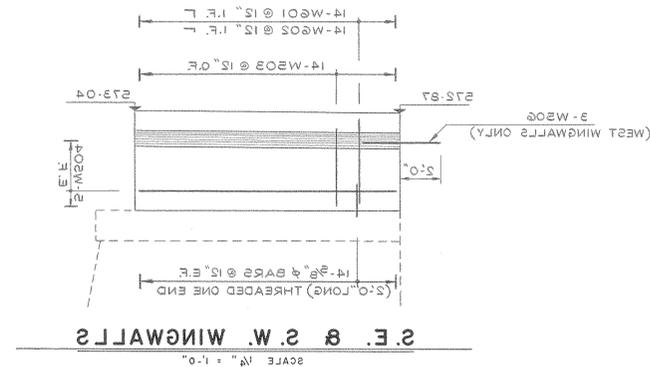
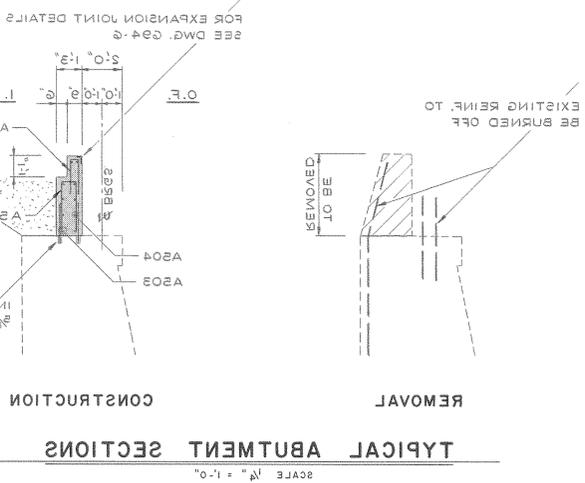
REGIONAL MUNICIPALITY OF NIAGARA  
**NIAGARA STREET STRUCTURE**  
 OVER WELLAND RIVER  
 CITY OF WELLAND      SITE No. 68

GENERAL ARRANGEMENT			
SCALES	HORIZ. 1" = 10'-0"	DESIGNED J. W. T.	CHECKED R. D. N.
	VERT.	DRAWN R. M. T.	DATE APRIL, 1973
		CONTRACT NUMBER RN 73-9	DRAWING NUMBER 694-2

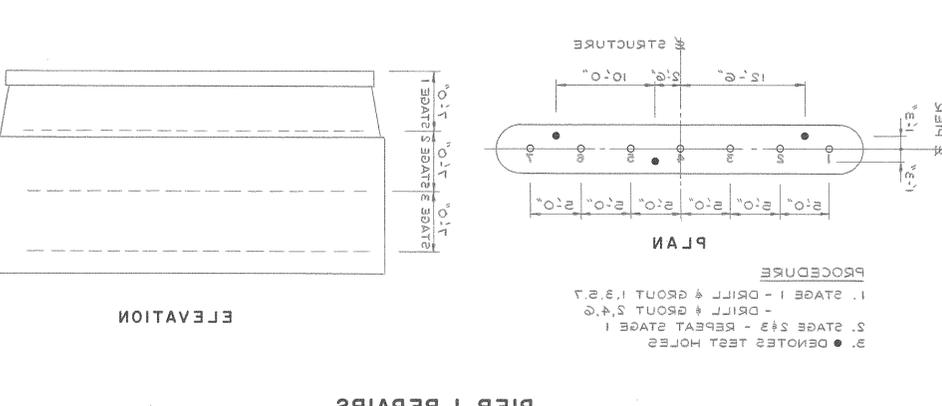
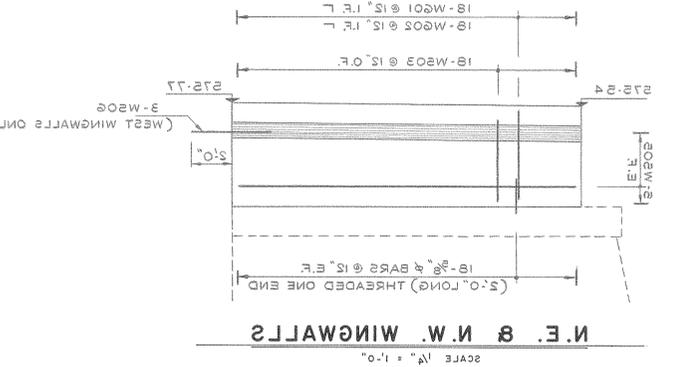
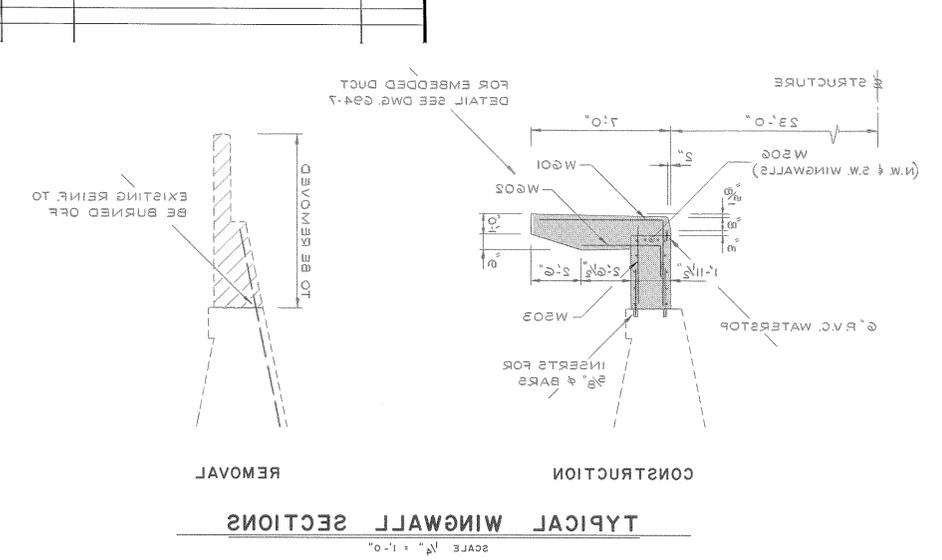
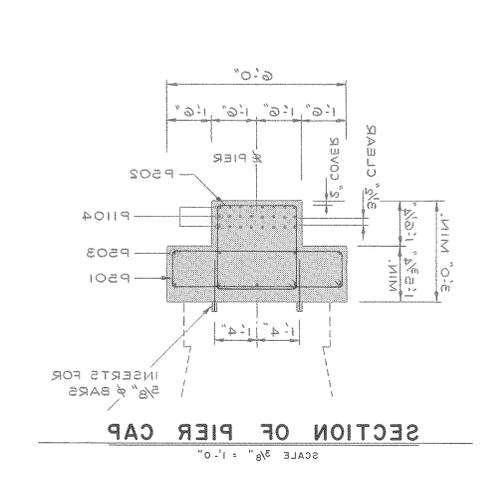
**MCCORMICK, RANKIN & ASSOCIATES**  
 CONSULTING ENGINEERS  
 PORT CREDIT      OTTAWA      ST. CATHARINES



SHEET 2 OF 11



PIER	E.L. 'A'	E.L. 'B'	E.L. 'C'	E.L. 'D'
1 SOUTH	270.40	270.88	270.75	270.88
1 NORTH	270.46	270.78	270.94	270.94
2 SOUTH	271.03	271.35	271.51	271.51
2 NORTH	271.09	271.41	271.57	271.57
3 SOUTH	271.66	271.82	271.98	272.14
3 NORTH	271.72	272.88	272.04	272.20



NOTE: AN INVESTIGATION OF THE ADEQUACY OF THE EXISTING SUBSTRUCTURE HAS BEEN CARRIED OUT BY GORRIS ASSOCIATES. THIS REPORT IS AVAILABLE AT THE OFFICE OF THE CONSULTING ENGINEER FOR REVIEW.



McCormick, Rankin & Associates  
CONSULTING ENGINEERS  
FORT CREDIT, ILLINOIS  
ST. CATHARINES 06 SHEET

DESIGNED BY: J.W. LUCK  
DRAWN BY: R.M.T.  
DATE: APRIL 1973

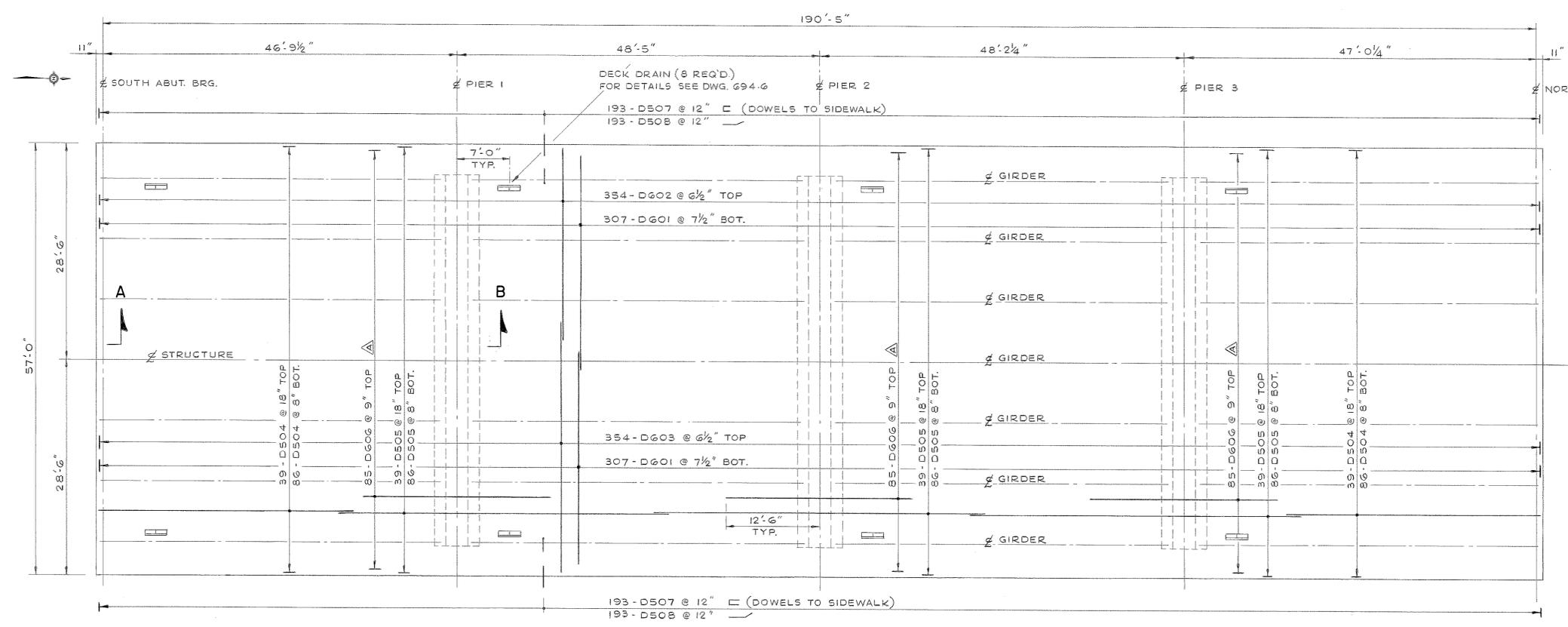
REGIONAL MUNICIPALITY OF NIAGARA  
NIAGARA STREET STRUCTURE  
OVER WELAND RIVER  
CITY OF WELAND  
SITE NO. 88

ABUTMENTS, WINGWALLS & PIER CAPS

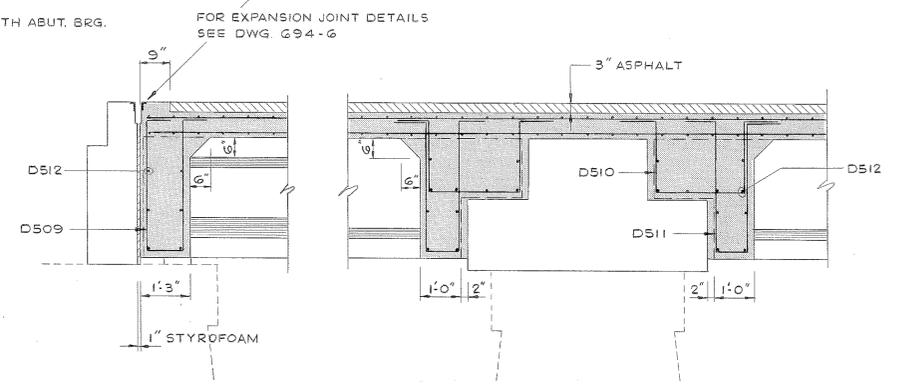


NO.	REVISIONS	APPD.	DATE
Δ	D606 TOP LAYER INSERTS FOR GAS MAIN	J.W.T.	24/E/73

4004

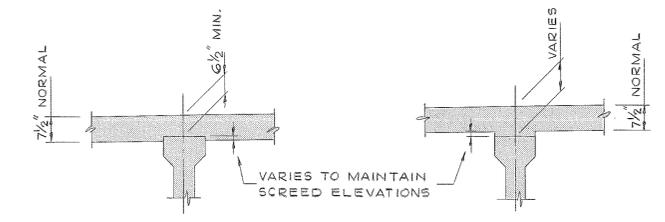


**DECK PLAN**  
SCALE 1/8" = 1'-0"

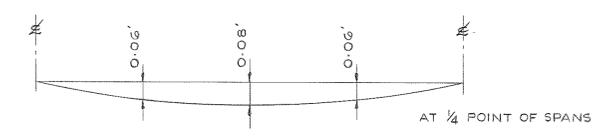


**SECTION 'A'**  
SCALE 1/2" = 1'-0"

**SECTION 'B'**  
SCALE 1/2" = 1'-0"

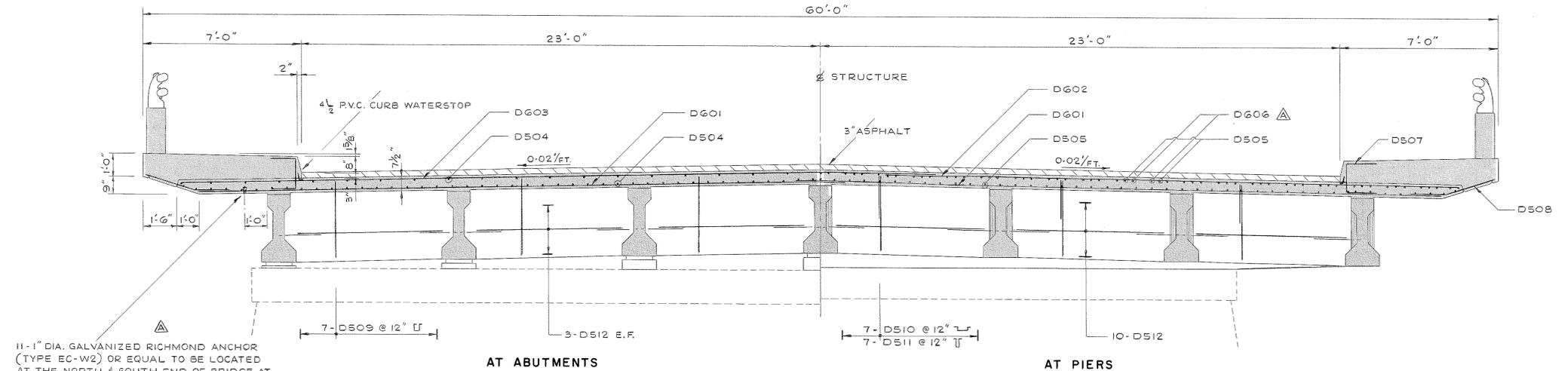


**METHOD OF OBTAINING SCREED ELEVATIONS**  
N.T.S.



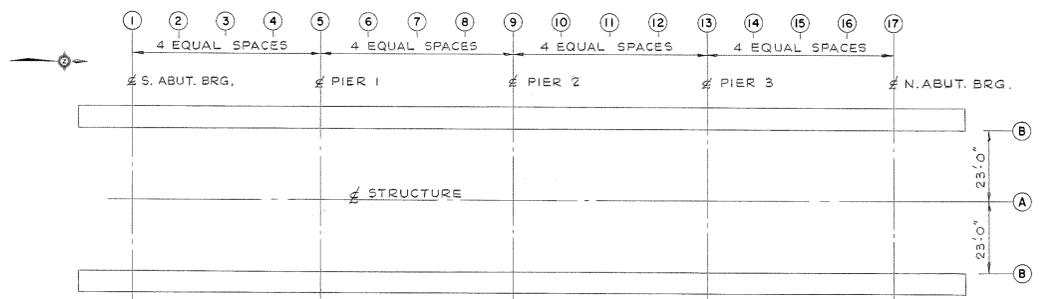
**DEAD LOAD DEFLECTION DIAGRAM**  
N.T.S.

**NOTE:**  
1. FOR EMBEDDED DUCTS IN SIDEWALKS SEE DWG. 694-7.



**TYPICAL CROSS SECTION**  
SCALE 3/8" = 1'-0"

11-1" DIA. GALVANIZED RICHMOND ANCHOR (TYPE EC-W2) OR EQUAL TO BE LOCATED AT THE NORTH & SOUTH END OF BRIDGE AT ABUTMENTS. MAXIMUM SPACING TO BE 20'-0"



**KEY PLAN FOR SCREED ELEVATIONS**  
N.T.S.

		SCREED ELEVATIONS (TOP OF CONCRETE)																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
A		572.45	572.66	572.83	572.96	573.06	573.28	573.46	573.60	573.69	573.91	574.09	574.23	574.32	574.53	574.70	574.83	574.93
B		571.99	572.20	572.37	572.50	572.60	572.82	573.00	573.14	573.23	573.45	573.63	573.77	573.86	574.07	574.24	574.37	574.47

**NOTE:** DEAD LOAD DEFLECTION HAS BEEN INCLUDED IN THE ABOVE TABLE.



'AS CONSTRUCTED'

**REGIONAL MUNICIPALITY OF NIAGARA**

**NIAGARA STREET STRUCTURE**  
OVER WELLAND RIVER

CITY OF WELLAND SITE No. 68

**DECK, DIAPHRAGMS & SCREED ELEVATIONS**

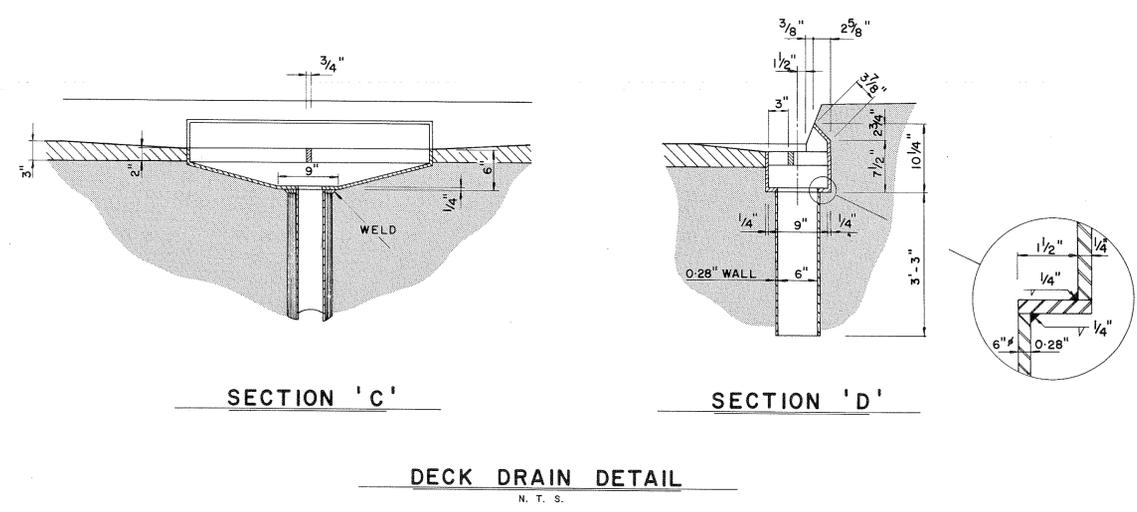
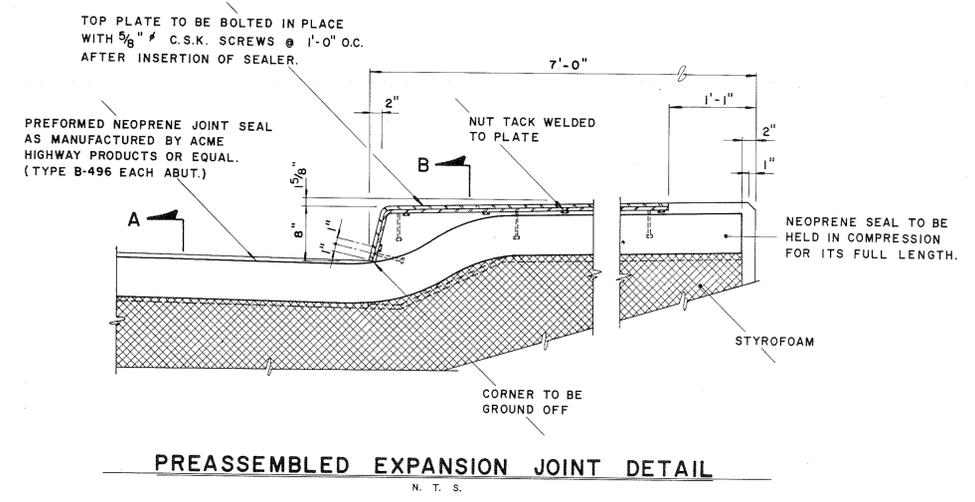
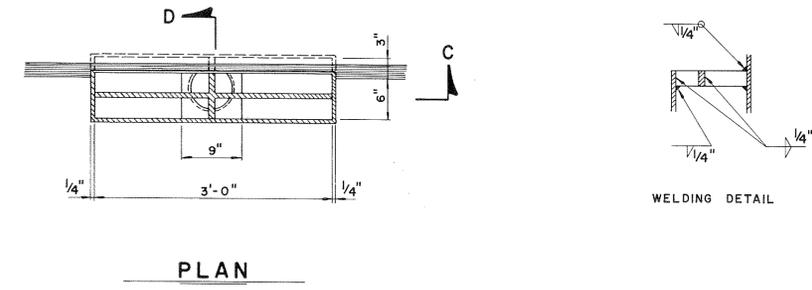
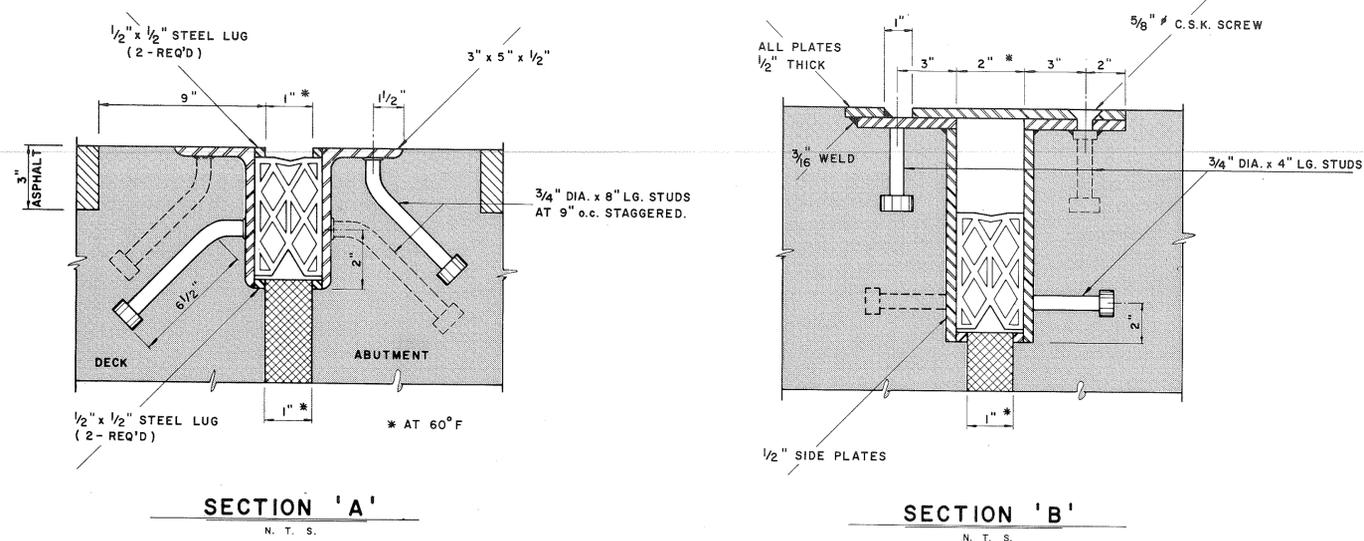
SCALES	HORIZ. AS SHOWN	DESIGNED J. W. T.	CHECKED R. D. N.
	VERT.	DRAWN R. M. T.	DATE APRIL, 1973
		CONTRACT NUMBER RN 73-9	DRAWING NUMBER 694-5

**MCCORMICK, RANKIN & ASSOCIATES**  
LIMITED  
CONSULTING ENGINEERS  
PORT CREDIT OTTAWA ST. CATHARINES

SHEET 5 OF 11

A004

NO.	REVISIONS	APPD.	DATE



- NOTE:**
- ALL STRUCTURAL STEEL SHALL BE SUPPLIED IN ACCORDANCE WITH C.S.A. 640-4 AND SHALL BE GALVANIZED IN ACCORDANCE WITH A.S.T.M. A123. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION.
  - CONTRACTOR TO SUBMIT SHOP DRAWINGS OF THE PREASSEMBLED EXPANSION JOINTS, CURB EXPANSION JOINTS AND DECK DRAINS TO THE ENGINEER FOR APPROVAL.
  - EXPANSION JOINT TO BE PRE-ASSEMBLED IN THE SHOP. PRE-ASSEMBLY ON THE SITE IS NOT ACCEPTABLE.

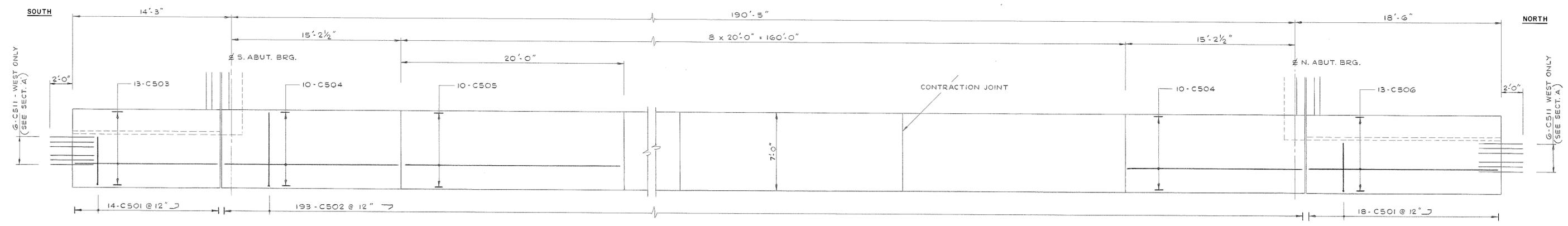
'AS CONSTRUCTED'

REGIONAL MUNICIPALITY OF NIAGARA			
NIAGARA STREET STRUCTURE OVER WELAND RIVER			
CITY OF WELAND		SITE No. 68	
EXPANSION JOINT & DECK DRAIN DETAILS			
SCALES	HORIZ. AS SHOWN	DESIGNED J. W. T.	CHECKED R. D. N.
	VERT.	DRAWN R. M. T.	DATE APRIL, 1973
CONTRACT NUMBER RN 73-9		DRAWING NUMBER 694-6	
McCormick, Rankin & Associates LIMITED CONSULTING ENGINEERS			SHEET 6 OF 11
PORT CREDIT	OTTAWA	ST. CATHARINES	

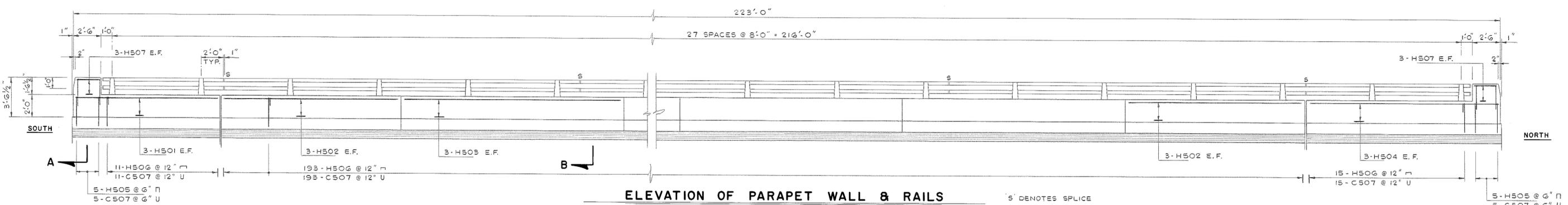


A004

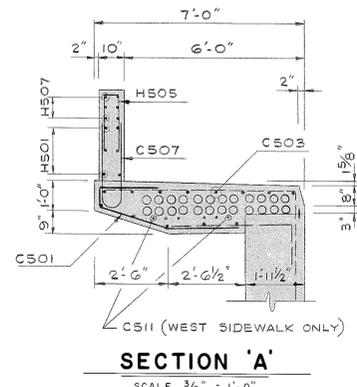
NO.	REVISIONS	APPD.	DATE



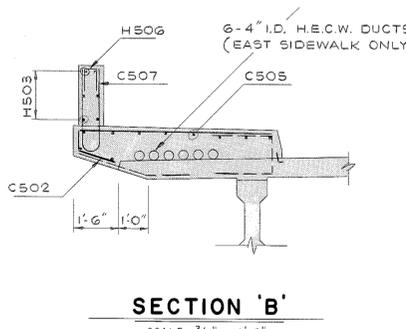
**PLAN OF SIDEWALK REINFORCING**  
SCALE 1/4" = 1'-0"



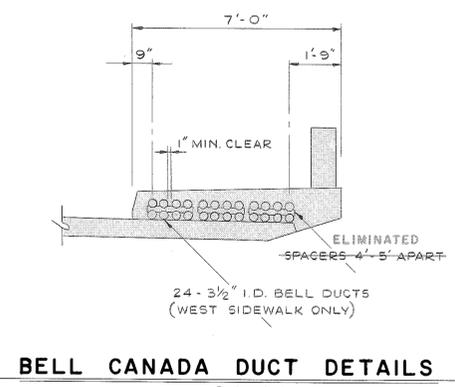
**ELEVATION OF PARAPET WALL & RAILS**  
SCALE 1/4" = 1'-0"



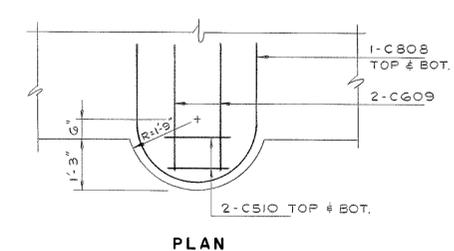
**SECTION 'A'**  
SCALE 3/8" = 1'-0"



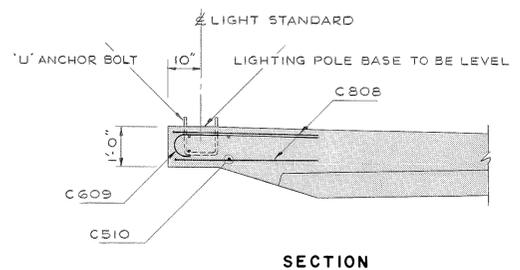
**SECTION 'B'**  
SCALE 3/8" = 1'-0"



**BELL CANADA DUCT DETAILS**  
SCALE 3/8" = 1'-0"



**PLAN**



**SECTION LIGHTING POLE BASE**  
SCALE 1/2" = 1'-0"  
(FOR LOCATION SEE DWG. 694 - 2)

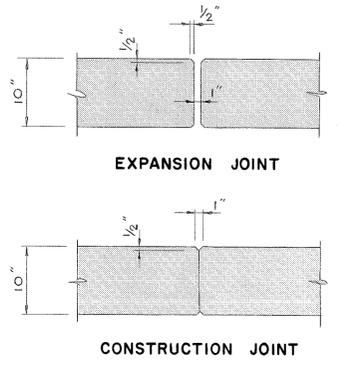
ALUMINUM PARAPET RAIL BILL OF MATERIALS		
QUANTITY	DESCRIPTION	PART No.
56	POSTS	6-210
56	ANCHORAGE INSERTS	ACROW RICHMOND DGR-1
24	STANDARD RAIL LENGTHS-3'-11"	95720
4	NON STD. RAIL LENGTHS-11'-0"	
4	NON STD. RAIL LENGTHS-14'-11"	95721
28	SLEEVES WITH 3/8" x 1/2" SCREW	
112	RAIL TO POST FASTENING	5/8" x 1 3/4" BOLT, NUT & WASHER
8	RAIL PLUGS	739-C

NOTE: ALL PART NUMBERS REFER TO ALCAN RAILING SYSTEMS.

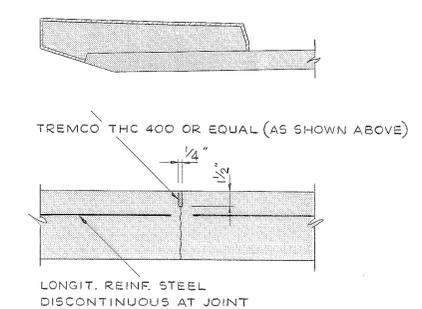
**GENERAL NOTES**

- CONTRACTOR TO SUBMIT SHOP DRAWINGS OF THE PARAPET RAIL TO THE ENGINEER FOR APPROVAL.
- ALL RAILS AND POSTS ARE DESIGNED TO CONFORM TO THE NEW AASHTO INT. 1 (64) LOADINGS. RAILS MUST BE CONTINUOUS OVER A MINIMUM OF THREE BAYS.
- THE UNDERSIDE OF THE POST BASE SHALL BE PAINTED WITH CASO BITUMINOUS PAINT BY THE INSTALLER. THE MINIMUM THICKNESS SHALL BE 20 MILS.
- PARAPET RAIL ANCHORAGE SHALL BE ACROW RICHMOND TYPE DGR-1 OR EQUAL. HI-TENSILE BOLTS AND ROUND WASHERS SHALL BE HOT DIPPED GALVANIZED TO SPECIFICATIONS ASTM-A 153-61, AND ARE TO BE GIVEN A LIBERAL COATING OF WHITE NON-STAINING GREASE.
- ALL POSTS TO BE SET VERTICAL.

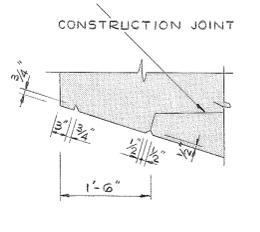
'AS CONSTRUCTED'



**PARAPET WALL JOINT DETAILS**  
SCALE 1" = 1'-0"



**SIDEWALK CONSTRUCTION JOINT DETAIL**  
N. T. S.



**DRIP DETAIL**  
SCALE 3/4" = 1'-0"

REGIONAL MUNICIPALITY OF NIAGARA

**NIAGARA STREET STRUCTURE**  
OVER WELLAND RIVER

CITY OF WELLAND SITE No. 68

**SIDEWALK, PARAPET WALL & RAILS**

SCALE	HORIZ. AS SHOWN	DESIGNED J. W. T.	CHECKED R. D. N.
	VERT.	DRAWN R. M. T.	DATE APRIL, 1973
		CONTRACT NUMBER RN 73-9	DRAWING NUMBER 694-7

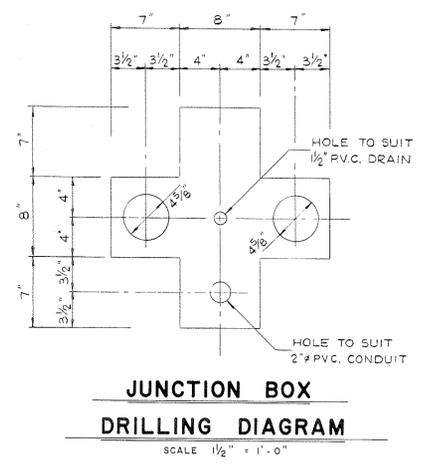
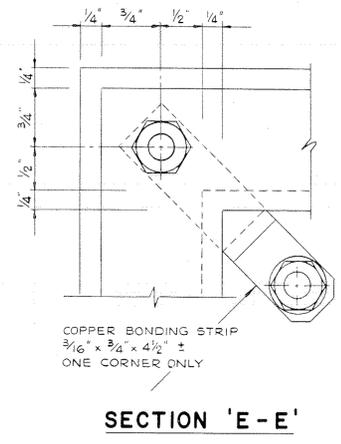
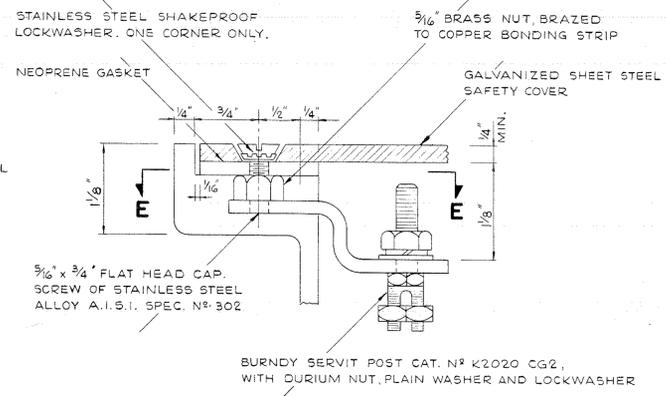
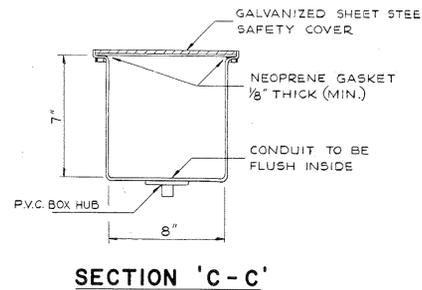
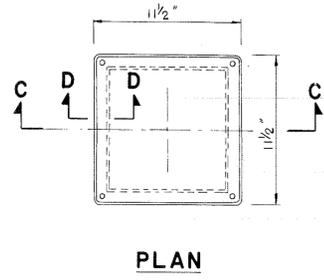
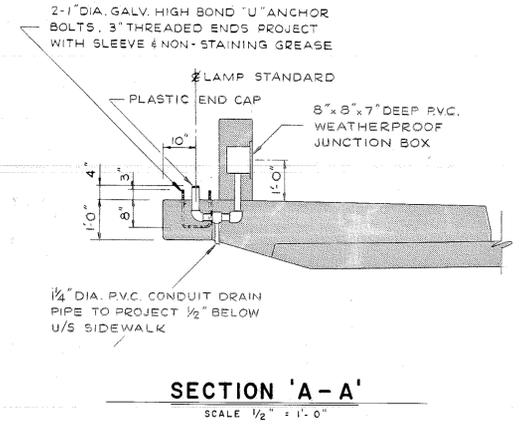
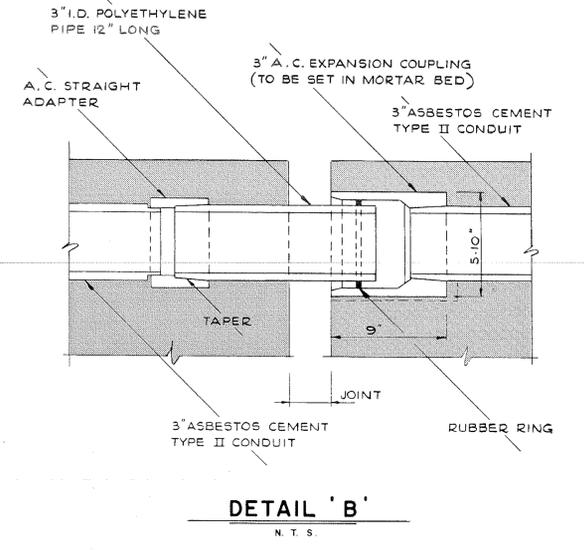
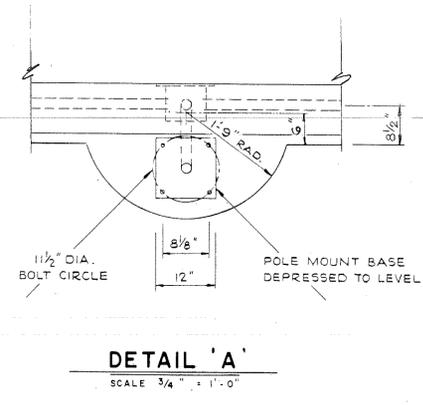
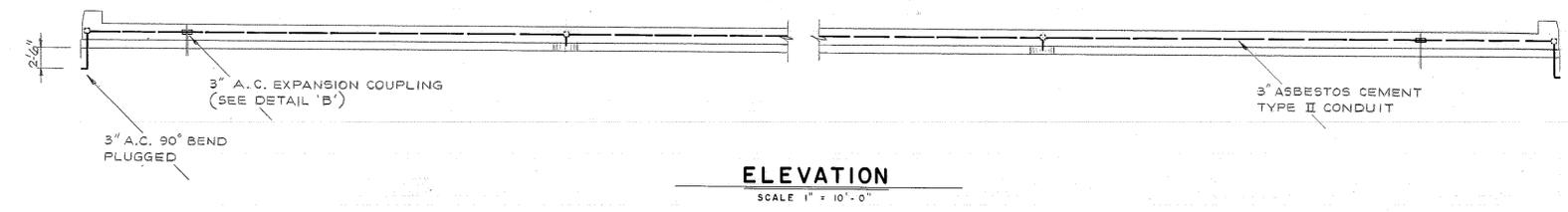
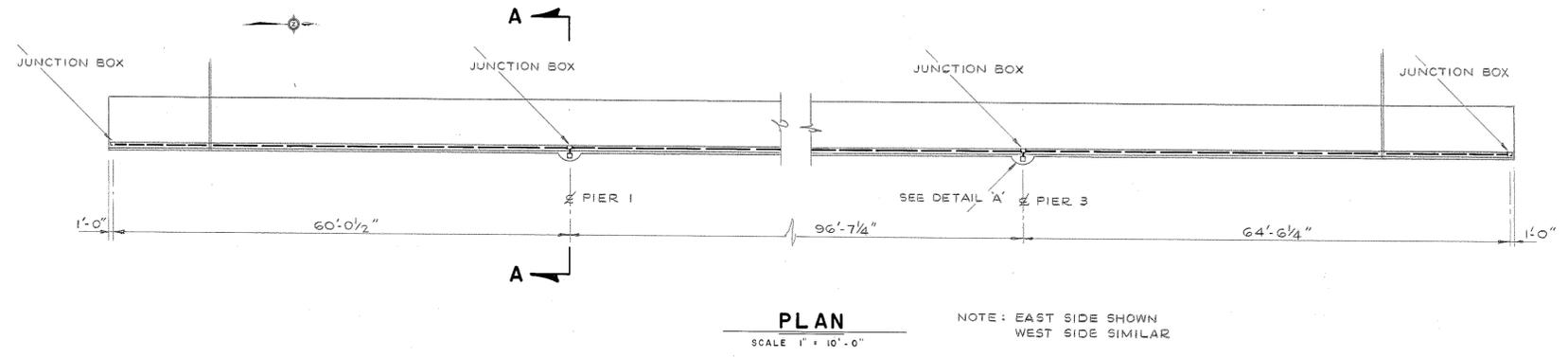
**MCCORMICK, RANKIN & ASSOCIATES**  
LIMITED  
CONSULTING ENGINEERS  
PORT CREDIT OTTAWA ST. CATHARINES

SHEET 7 OF 11



A004

NO.	REVISIONS	APPD.	DATE



**RIGID P.V.C. JUNCTION BOX**  
N. T. S.

'AS CONSTRUCTED'

REGIONAL MUNICIPALITY OF NIAGARA			
NIAGARA STREET STRUCTURE OVER WELLAND RIVER			
CITY OF WELLAND		SITE No. 68	
ELECTRICAL DETAILS			
SCALES	HORIZ. AS SHOWN	DESIGNED J. W. T.	CHECKED R. D. N.
	VERT.	DRAWN R. M. T.	DATE APRIL, 1973
		CONTRACT NUMBER RN 73-9	DRAWING NUMBER 694-8
McCORMICK, RANKIN & ASSOCIATES LIMITED CONSULTING ENGINEERS PORT CREDIT OTTAWA ST. CATHARINES			SHEET 8 OF 11



A004

MARK	NO. BARS	SIZE	LENGTH	TYPE	A	B	C	D	E	F	G	H	J	K	L	M	O	R	SHAPE	LOCATION
<b>ABUTMENTS</b>																				
A501	92	5	6'-9"	17		2'-11"	11"	2'-11"												VERT.
A502	92	5	4'-5"	17		2'-0"	5"	2'-0"												VERT.
A503	20	5	24'-3"	STR																HORIZ. I.F.
A504	20	5	25'-9"	STR																HORIZ. O.F.
	184	3/8"	Ø BARS (THREADED ONE END)					2'-6"	LONG											
<b>WINGWALLS</b>																				
W601	64	6	11'-1"	17		4'-5"	6'-8"	—												VERT. I.F.
W602	64	6	6'-3"	17		2'-0"	4'-3"	—												VERT. I.F.
W503	64	5	4'-3"	STR																VERT. O.F.
W504	20	5	12'-9"	STR																HORIZ. E.F. SE. & S.W.
W505	20	5	17'-0"	STR																HORIZ. E.F. N.E. & N.W.
W506	6	5	4'-0"	STR																ENDS OF BELL DUCTS
	64	3/8"	Ø BARS (THREADED ONE END)					2'-0"	LONG											
<b>PIER CAPS</b>																				
P501	132	5	14'-8"	T1	6"	5'-8"	1'-2"	5'-8"	1'-2"	6"										STIRRUPS
P502	132	5	11'-8"	T1	6"	2'-8"	2'-8"	2'-8"	2'-8"	6"										STIRRUPS
P503	84	5	25'-6"	STR																LONGIT.
P1104	72	11	48'-6"	STR																LONGIT.
	132	3/8"	Ø BARS (THREADED ONE END)					2'-0"	LONG											
<b>DECK &amp; DIAPHRAGMS</b>																				
D601	614	6	25'-6"	STR																TRANSVERSE BOT.
D602	354	6	25'-4"	STR																TRANSVERSE TOP
D603	354	6	33'-4"	STR																TRANSVERSE TOP
D504	250	5	34'-0"	STR																LONGIT. TOP & BOT.
D505	375	5	44'-0"	STR																LONGIT. TOP & BOT.
D606	255	6	25'-0"	STR																LONGIT. BOT. OVER PIERS
D507	386	5	5'-3"	17		2'-0"	1'-3"	2'-0"												DOWELS TO S/W
D508	386	5	4'-8"	19		2'-5"	2'-3"	—				9"	2'-3 1/2"		4'-6 1/2"					DOWELS TO S/W
D509	84	5	9'-1"	S5	9"	3'-4"	11"	3'-4"												STIRRUPS ABUT. DIAPH.
D510	252	5	7'-6"	S4	9"	1'-10"	2'-4"	1'-10"												STIRRUPS PIER DIAPH.
D511	252	5	9'-0"	S4	9"	3'-4"	10"	3'-4"												do.
D512	432	5	6'-2"	STR																TRANSV. IN DIAPH.
<b>SIDEWALKS</b>																				
C501	64	5	7'-5"	13G	—	2'-3"	2'-5"	9"	2'-0"	—		2'-3 1/2"	9"							TRANSVERSE
C502	386	5	8'-6"	1G	—	6'-6"	9"	1'-3"				4 1/2"	1'-2 1/4"							TRANSVERSE
C503	26	5	12'-9"	STR																LONGIT.
C504	40	5	14'-9"	STR																do.
C505	160	5	19'-6"	STR																do.
C506	26	5	17'-0"	STR																do.
C507	458	5	5'-3"	S11								2'-6"					7"			DOWELS TO PARAPET WALL
C808	8	8	9'-5 3/4"	10	2'-3"	4'-11 3/4"	2'-3"											1'-7"		LIGHTING POLE BASE
C609	8	6	4'-5"	1	8"	3'-9"														do.
C510	16	5	1'-6"	STR																do.
C511	12	5	4'-0"	STR																ENDS OF BELL DUCTS

MARK	NO. BARS	SIZE	LENGTH	TYPE	A	B	C	D	E	F	G	H	J	K	L	M	O	R	SHAPE	LOCATION
<b>PARAPET WALLS</b>																				
H501	12	5	12'-9"	STR																HORIZ. E.F.
H502	24	5	14'-9"	STR																do.
H503	96	5	19'-6"	STR																do.
H504	12	5	17'-0"	STR																do.
H505	20	5	5'-7"	17		2'-6"	7"	2'-6"												VERT. TIES
H506	438	5	2'-7"	17		1'-0"	7"	1'-0"												do.
H507	24	5	2'-2"	STR																HORIZ. END POSTS

NOTES:-  
 BENDING DETAILS AND NOTES ARE AS OUTLINED IN THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCING CONCRETE STRUCTURES" (A.C.I. 315-65) AS ISSUED BY THE AMERICAN CONCRETE INSTITUTE WITH THE FOLLOWING EXCEPTIONS AND ADDITIONS:-  
 7. (REVISED AS FOLLOWS)  
 NO ALLOWANCE FOR BEND CURVATURE HAS BEEN MADE EXCEPT FOR STANDARD HOOK AND RADIUS IN EXCESS OF SAME. ALLOWANCE FOR BAR EXTENSION DUE TO BENDING (CREEP) SHALL BE MADE BY THE FABRICATOR.  
 8. SPACERS TO BE PROVIDED WITH ALL SPIRALS AS SPECIFIED IN A.C.I. 315-65  
 9. WEIGHT OF SPIRALS AND SPACERS NOT INCLUDED IN THE BOX MARKED "WEIGHT OF STEEL" IN THE TITLE BLOCK.  
 10. WEIGHT OF REINFORCING IN GROUT PADS NOT INCLUDED.

ALL STEEL TO BE HARD GRADE & HIGH BOND EXCEPT AS NOTED.

**BREAKDOWN OF REINFORCING STEEL WEIGHTS**

ABUTMENTS	1.30 TONS
WINGWALLS	1.36 TONS
PIER CAPS	11.95 TONS
DECK & DIAPHRAGMS	52.52 TONS
SIDEWALKS	5.72 TONS
PARAPET WALLS	2.02 TONS
<b>TOTAL</b>	<b>74.87 TONS</b>

'AS CONSTRUCTED'

**REGIONAL MUNICIPALITY OF NIAGARA**

**NIAGARA STREET STRUCTURE**  
OVER WELLAND RIVER

CITY OF WELLAND SITE No. 68

**REINFORCING STEEL SCHEDULE**

SCALES	HORIZ.	DESIGNED	J. W. T.	CHECKED	R. D. N.
	VERT.	DRAWN	R. M. T.	DATE	APRIL, 1973
			CONTRACT NUMBER	DRAWING NUMBER	
			RN 73-9	694-9	

**MCCORMICK, RANKIN & ASSOCIATES**  
LIMITED  
CONSULTING ENGINEERS

SHEET OF

NO.	REVISIONS	APPD.	DATE

No. DD-701-A  
Date Aug. 26/71 Rev. 2

DEPTH (ft.)	0	1	2	3	4	5	6	7	8	9
4	1.33	1.37	1.40	1.43	1.46	1.49	1.52	1.55	1.58	1.61
5	1.64	1.67	1.70	1.73	1.76	1.79	1.82	1.85	1.89	1.92
6	1.95	1.98	2.01	2.04	2.07	2.10	2.13	2.16	2.19	2.22
7	2.25	2.28	2.31	2.34	2.37	2.40	2.43	2.46	2.49	2.53
8	2.56	2.59	2.62	2.65	2.68	2.71	2.74	2.77	2.80	2.83
9	2.86	2.90	2.93	2.96	2.99	3.02	3.05	3.08	3.11	3.14
10	3.17	3.20	3.23	3.26	3.29	3.32	3.35	3.38	3.42	3.45
11	3.48	3.51	3.54	3.57	3.60	3.63	3.66	3.69	3.72	3.75
12	3.78									

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO  
**2' x 2' CATCH BASIN**  
DEPTH 12' MAX.

Drawn by S.S., Traced by S.S., Checked by E.G., Passed by R.A.C. APPROVED Director Systems Design Branch

No. DD-702-A  
Date Aug. 17/72 Rev. 1

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO  
**2' x 2' CATCH BASIN**  
DEPTH 12' MAX.

Drawn by S.S., Traced by S.S., Checked by E.G., Passed by R.A.C. APPROVED Director Systems Design Branch

No. DD-713  
Date April 20/72 Rev. 1

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO  
**DEPRESSED CATCH BASIN FRAME AND GRATE**

Drawn by S.S., Traced by S.S., Checked by E.G., Passed by R.A.C. APPROVED Director Systems Design Branch

No. DD-704  
Date Nov. 29/70 Rev. 2

DEPARTMENT OF HIGHWAYS-ONTARIO  
**MANHOLE COVER**

APPROVED  
Date: JUNE 21/58  
Road Design Engineer

No. DD-823  
Date Aug. 1/72 Rev. 4

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO  
**BEDDING FOR CONCRETE, CLAY OR ASBESTOS CEMENT PIPE SEWERS & CULVERTS**

Drawn by S.S., Traced by S.S., Checked by E.G., Passed by R.A.C. APPROVED Director Systems Design Branch

REGIONAL MUNICIPALITY OF NIAGARA  
**NIAGARA STREET STRUCTURE**  
OVER WELLAND RIVER  
CITY OF WELLAND SITE No. 68

STANDARDS

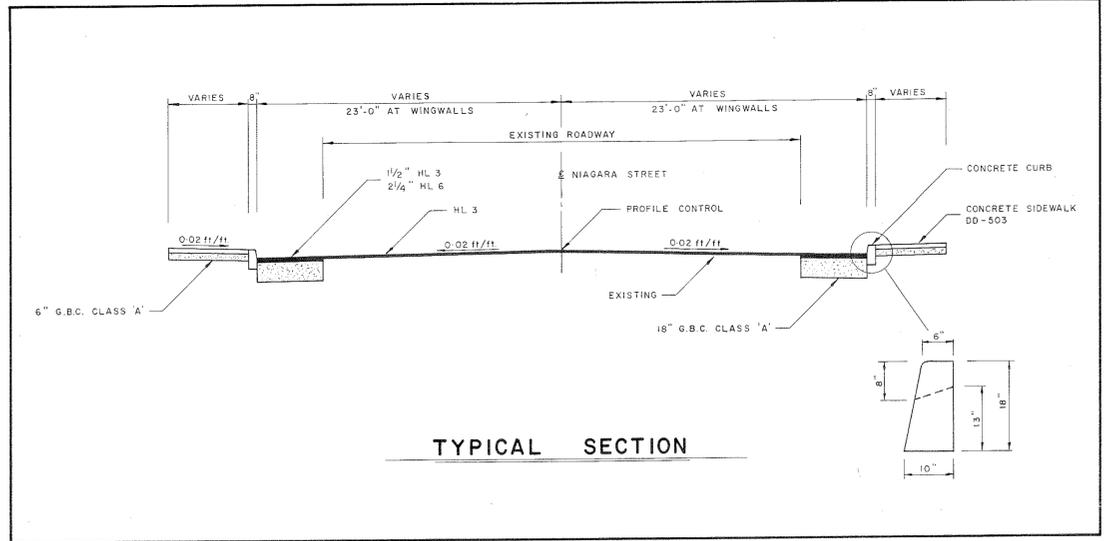
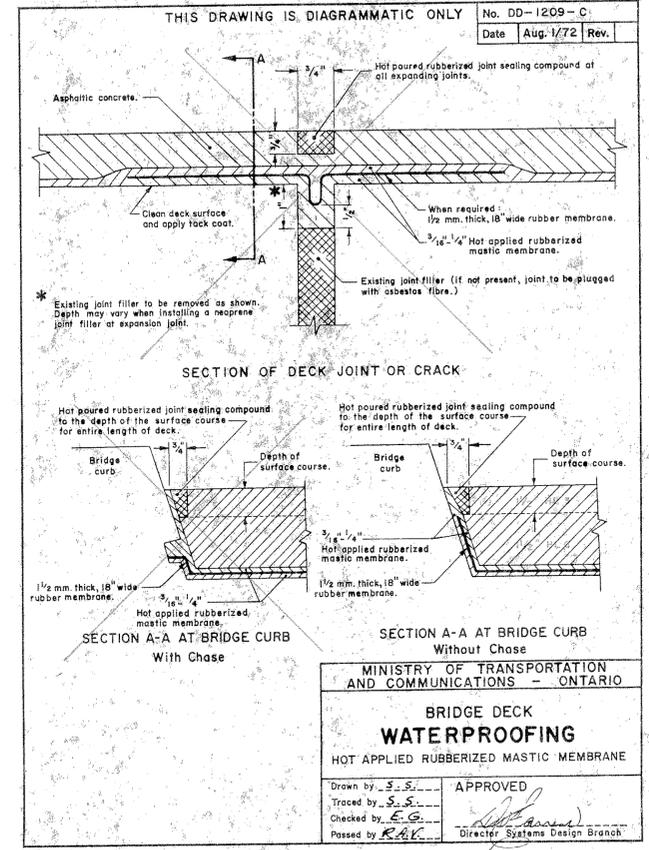
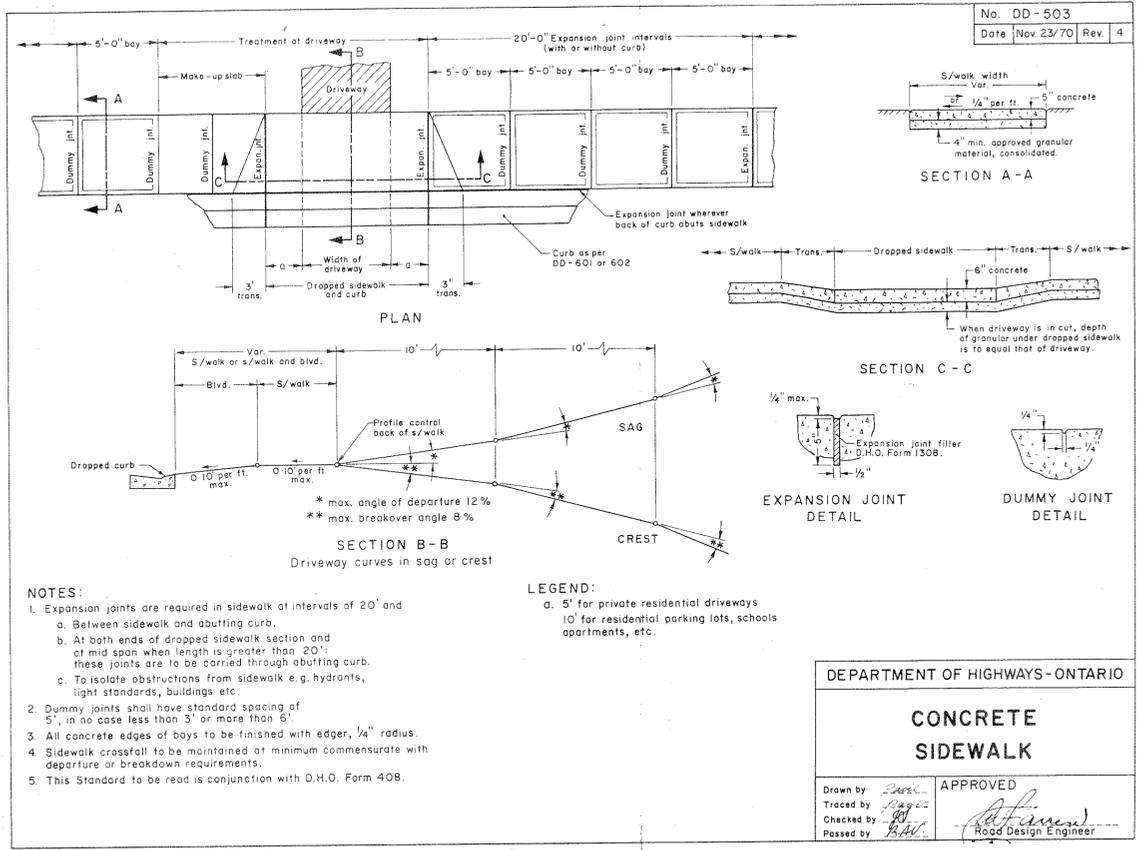
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	VERT.	DRAWN	R. M. T.	DATE	APRIL, 1973
		CONTRACT NUMBER	RN 73-9	DRAWING NUMBER	694-10

McCORMICK, RANKIN & ASSOCIATES  
CONSULTING ENGINEERS  
OTTAWA ST. CATHARINES

10 OF 11

NO.	REVISIONS	APPD.	DATE

11004



REGIONAL MUNICIPALITY OF NIAGARA			
NIAGARA STREET STRUCTURE OVER WELLAND RIVER			
CITY OF WELLAND		SITE No. 68	
STANDARDS			
SCALES	HORIZ.	DESIGNED J. W. T.	CHECKED R. D. N.
	VERT.	DRAWN R. M. T.	DATE APRIL, 1973
		CONTRACT NUMBER RN 73-9	DRAWING NUMBER 694-11
McCORMICK, RANKIN & ASSOCIATES LIMITED CONSULTING ENGINEERS PORT CREDIT OTTAWA			SHEET 11 OF 11