

# **APPENDIX MR-2022**

## **RECORD DRAWINGS**

**RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY (RMTA)**

RMTA BRIDGES 6, 13, 48, 55  
RMTA Box Culverts 1827 and 1831

(NOTE: Additional sheets of the As-built Plans are Available upon Request to the Engineer)



**RMTA**  
**System Map**





# RICHMOND EXPRESSWAY SYSTEM

Scale: 0 1000 2000 3000ft.

48 - Bridge Number  
RMTA Facilities Shown in Red



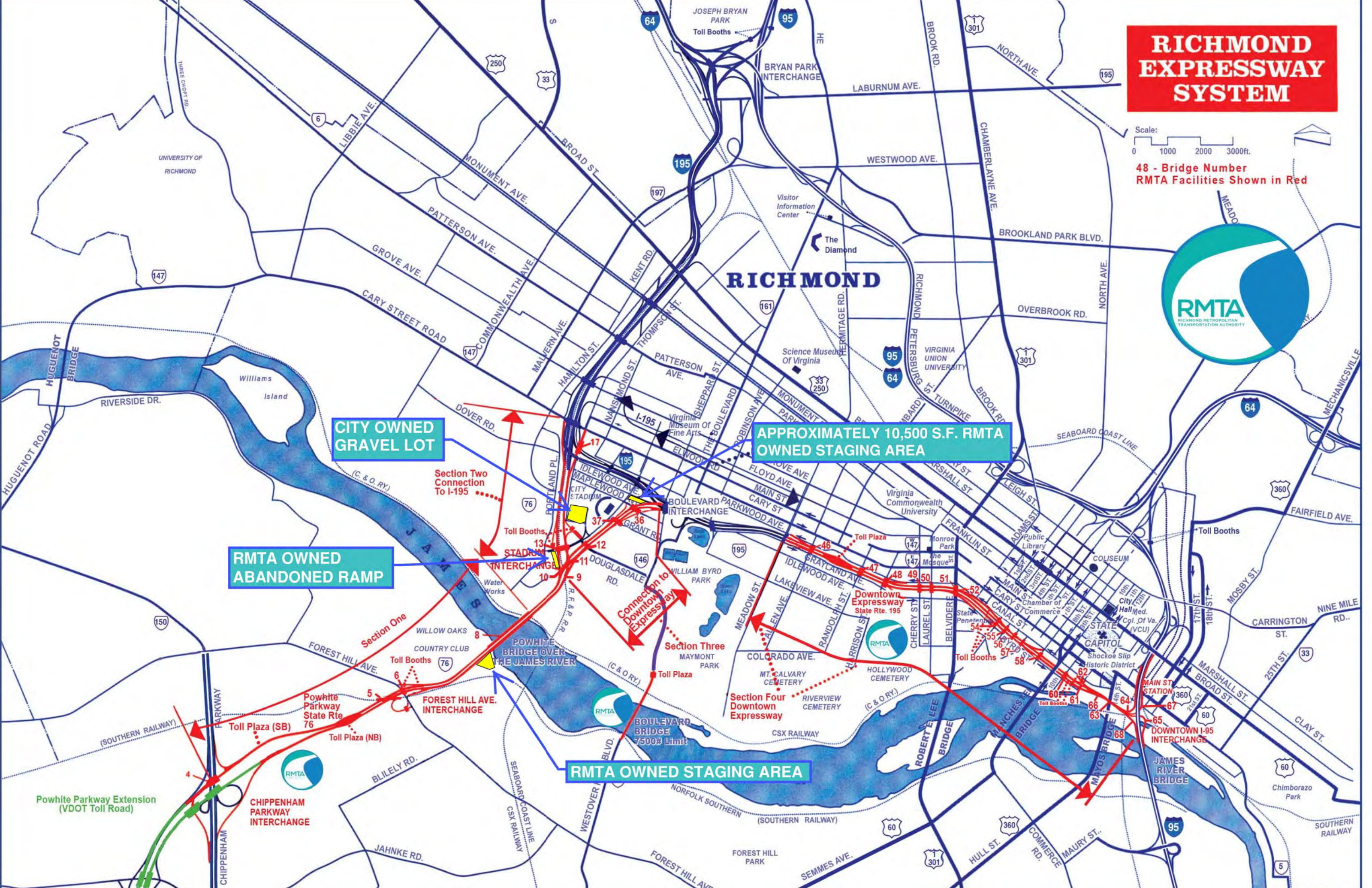
## RICHMOND

CITY OWNED GRAVEL LOT

APPROXIMATELY 10,500 S.F. RMTA OWNED STAGING AREA

RMTA OWNED ABANDONED RAMP

RMTA OWNED STAGING AREA



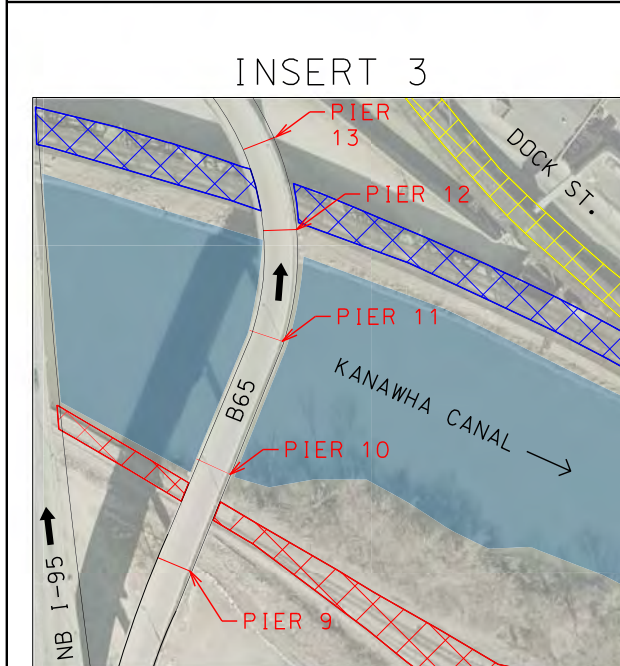
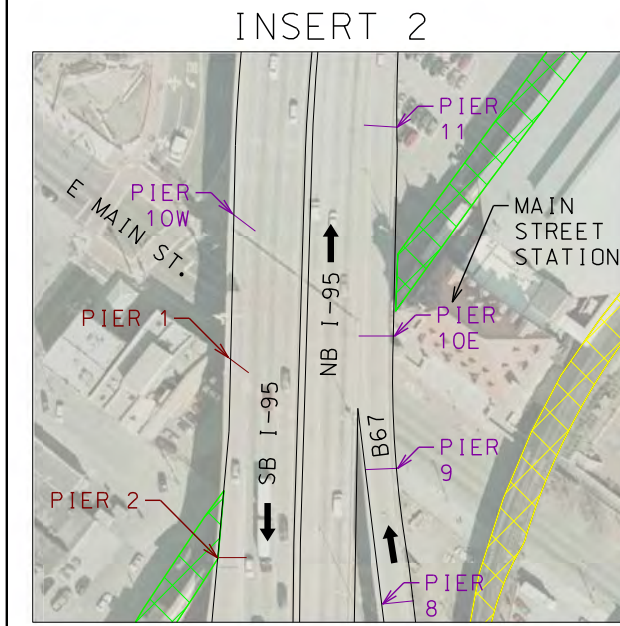
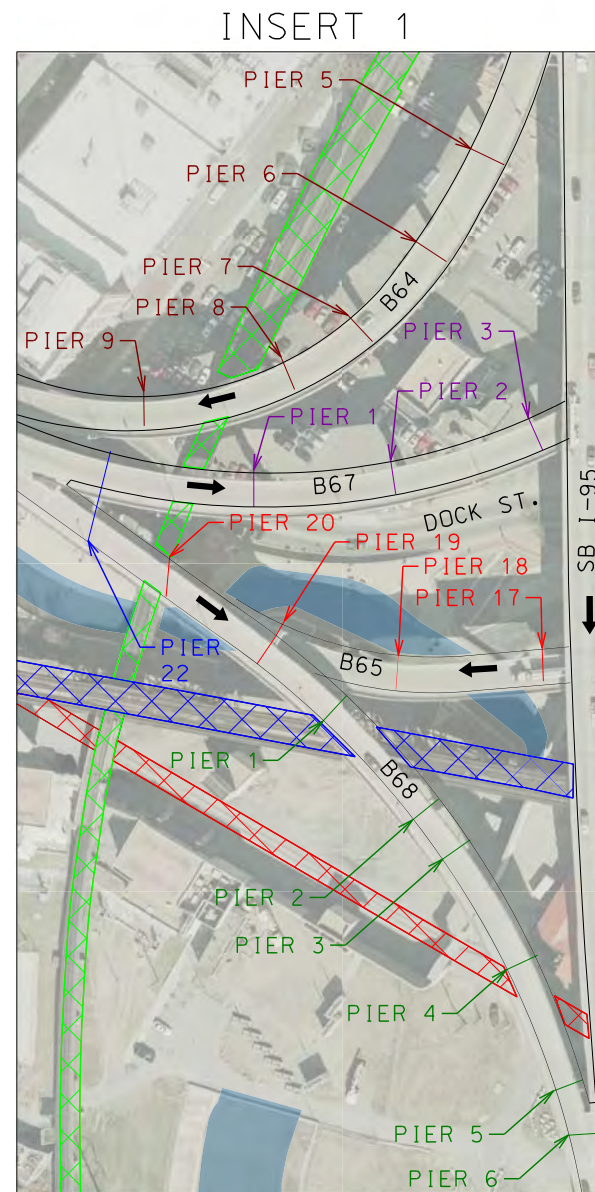
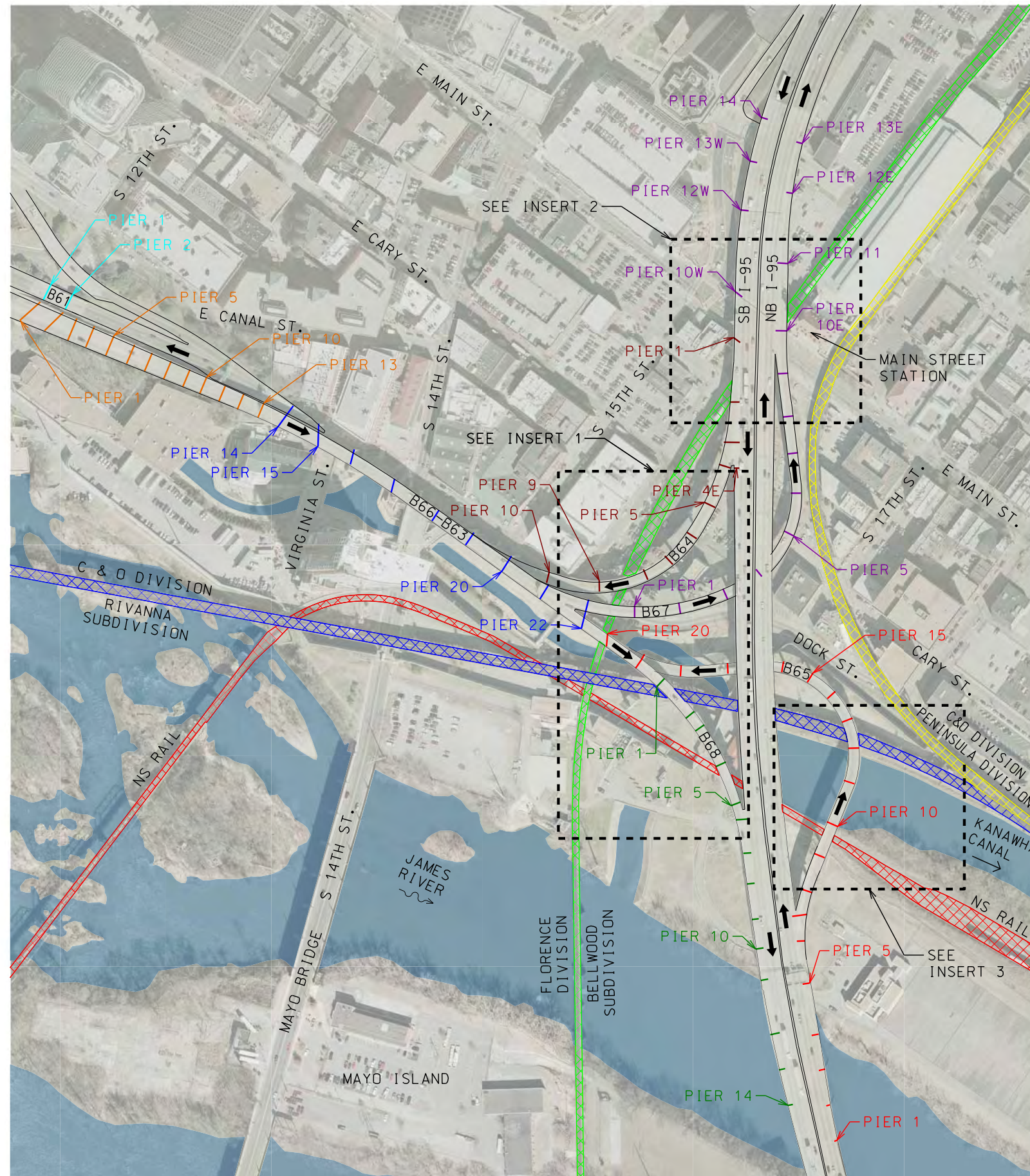




## **I-95 Ramps Pier Location Exhibit**







**LEGEND:**

<span style="color: blue;">█</span>	BRIDGE 63
<span style="color: darkred;">█</span>	BRIDGE 64
<span style="color: red;">█</span>	BRIDGE 65
<span style="color: orange;">█</span>	BRIDGE 66
<span style="color: purple;">█</span>	BRIDGE 67
<span style="color: green;">█</span>	BRIDGE 68
<span style="color: red;">▨</span>	N&S RAILROAD
<span style="color: green;">▨</span>	CSX RAILROAD
<span style="color: blue;">▨</span>	CSX RAILROAD
<span style="color: yellow;">▨</span>	CSX RAILROAD

- NOTES:**
- 1) PIER NUMBERS BASED ON AS-BUILT DRAWINGS FROM CONTRACTS C-10 AND C-11.
  - 2) RAILROAD LIMITS AND PIER LOCATIONS BASED ON AERIAL PHOTOGRAPHY.
  - 3) THIS EXHIBIT IS FOR REFERENCE ONLY. REFER TO AS-BUILT DRAWINGS FOR EXACT PIER LOCATIONS.
  - 4) BRIDGE 63 IS ON BOTTOM, BRIDGE 66 IS ON TOP.

**RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY**

	<b>I-95 RAMPS PIER LOCATION EXHIBIT</b>			
	2900 S. QUINCY STREET, SUITE 200 ARLINGTON, VIRGINIA (703) 824-6100			
Scale:	Date:	Contract No.:	Sheet:	
N.T.S.	MAY 2015	MR-2015	1 OF 1	





# **Bridge 6**

**(Forest Hill Avenue over Powhite Parkway - VA State Rte. 76)**

**Record Set Plans**





RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	151	188

CURVE DATA:  $D = 5^{\circ}00'$   
 $R = 1145.92'$

**GENERAL NOTES:**

**ROADWAY:** Two 27'-0" Clear roadways. One 5'-0" sidewalk. One 1'-6" curb.  
**CAPACITY:** Dead Load- Includes 15 lbs. per sq. ft. for future wearing surface. Live Loads- HS20-44 loading and B.P.R. modified for military vehicles.  
**SPECIFICATIONS:** GENERAL - Virginia Department of Highways Road and Bridge Specifications, 1970  
 DESIGN - A.A.S.H.O. Standard Specifications for Highway Bridges, 1961, modified by Special Design Provisions.  
 WELDING - 1969 Standard Specifications for Welded Highway and Railway Bridges of the American Welding Society.

**CONTRACT SPECIAL PROVISIONS**

Specifications and Contract Special Provisions referred to above are necessary to make these plans complete.

**DATUM:** CITY OF RICHMOND  
**TEMPERATURE:** The normal temperature referred to on the plan is 68°F. The temperature range for movement is 0°F, to 120°F.  
**DIMENSIONS:** All dimensions are measured horizontally and vertically unless otherwise noted.  
**EXCAVATION:** Excavation below subgrade and cut slope template shall be classified as Structure Excavation. All excavation above these limits shall be classified as Regular Excavation and is not included in the Structural Quantities.  
**FOUNDATIONS:** Footings shall rest on firm material. Foundation material shall be kept dry and special attention is called to Section 401.05 of the General Specifications, and to the Contract Special Provisions, concerning preparation of foundations for footings.  
**CONCRETE NOTES:** Concrete in superstructure shall be Class A4. All other concrete shall be Class A-3. All exposed edges and corners shall have a 3/4" chamfer or fillet unless otherwise noted. Care in the method of vibration, the use of low-slump concrete, and/or other means shall be employed to prevent downgrade movement of newly placed slab concrete. (When gradient is over 2%)  
 Finishing concrete surfaces: See the Standard Architectural Detail Sheets and the Contract Special Provisions for types and details.  
 All reinforcing steel shall conform to A.S.T.M. A615, Grade 40. All reinf. bar dimensions on the detailed drawings are to be to the centers of bars unless otherwise noted. Clear distance between reinforcing steel and face of concrete shall be as noted on the plans. All bar laps shall be 30 diameters of the smaller diameter bar unless otherwise noted.  
**STEEL NOTES:** Structural steel shall conform to A.S.T.M. Specification A36 except as noted.  
 All field connections shall be made with high strength bolts. High strength bolts shall be 7/8" diameter unless otherwise noted and shall conform to A.S.T.M. Specification A325.

**BENCH MARK:** See Reference Ties and Field Control Data sheet in highway plans.  
 F-17 (Copper Weld Rod) Elevation 139.03  
 F-18 (Copper Weld Rod) Elevation 141.18

**BORINGS:** Indicates location of 2 1/2" φ cased hole boring.

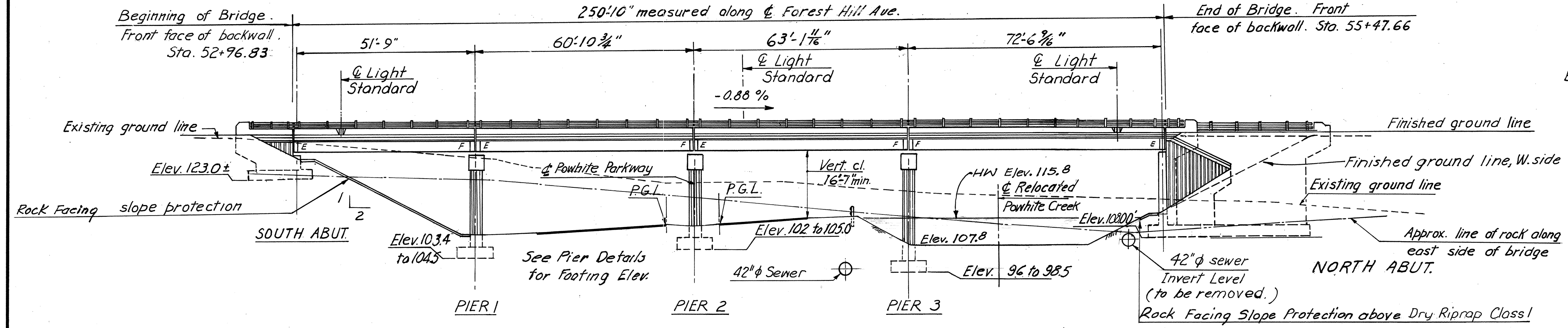
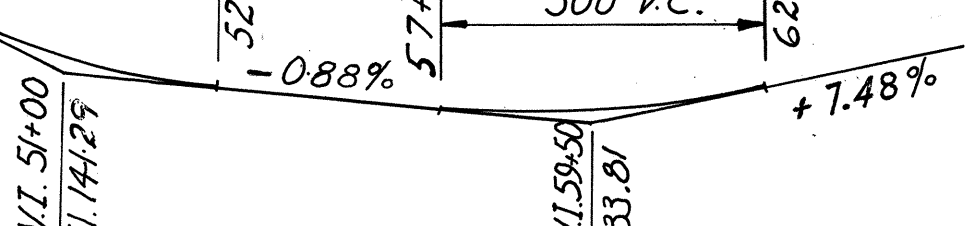
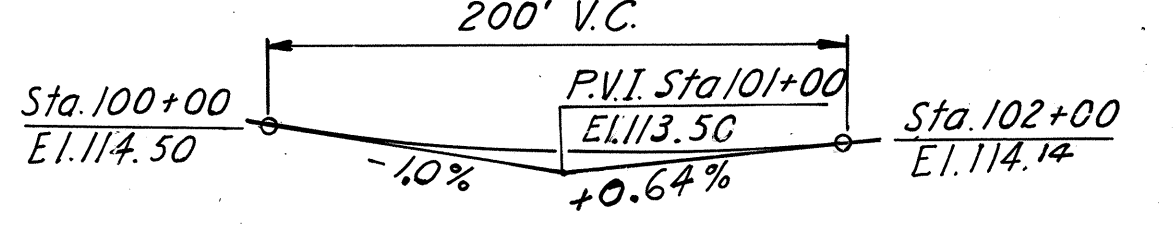
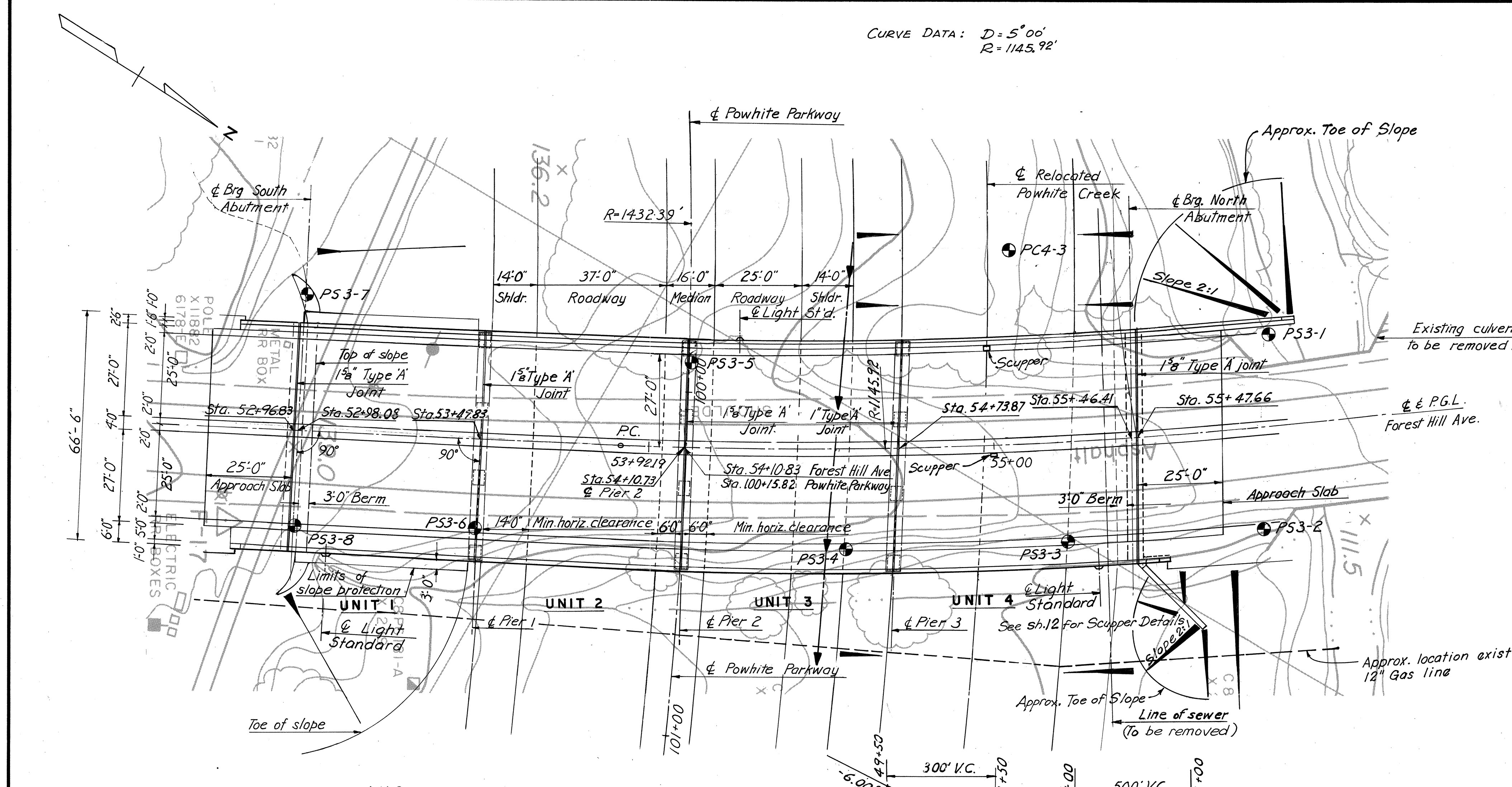
**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 POWHITE PARKWAY

**FOREST HILL AVENUE OVER**  
**POWHITE PARKWAY**  
 BRIDGE B-06  
**GENERAL PLAN & ELEVATION**

HAYES, SEAY, MATTERN & MATTERN  
 Associate Engineers  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 General Consultants

SCALE: **AS SHOWN**  
 CONTRACT NO.: **C-2**  
 SHEET NO. **1** OF **18**

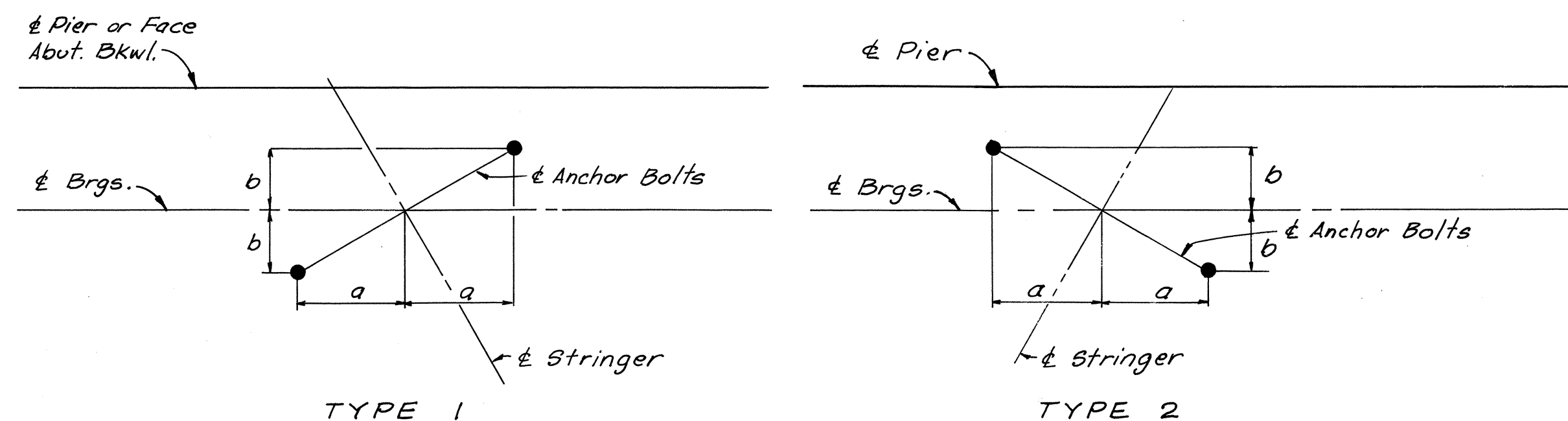
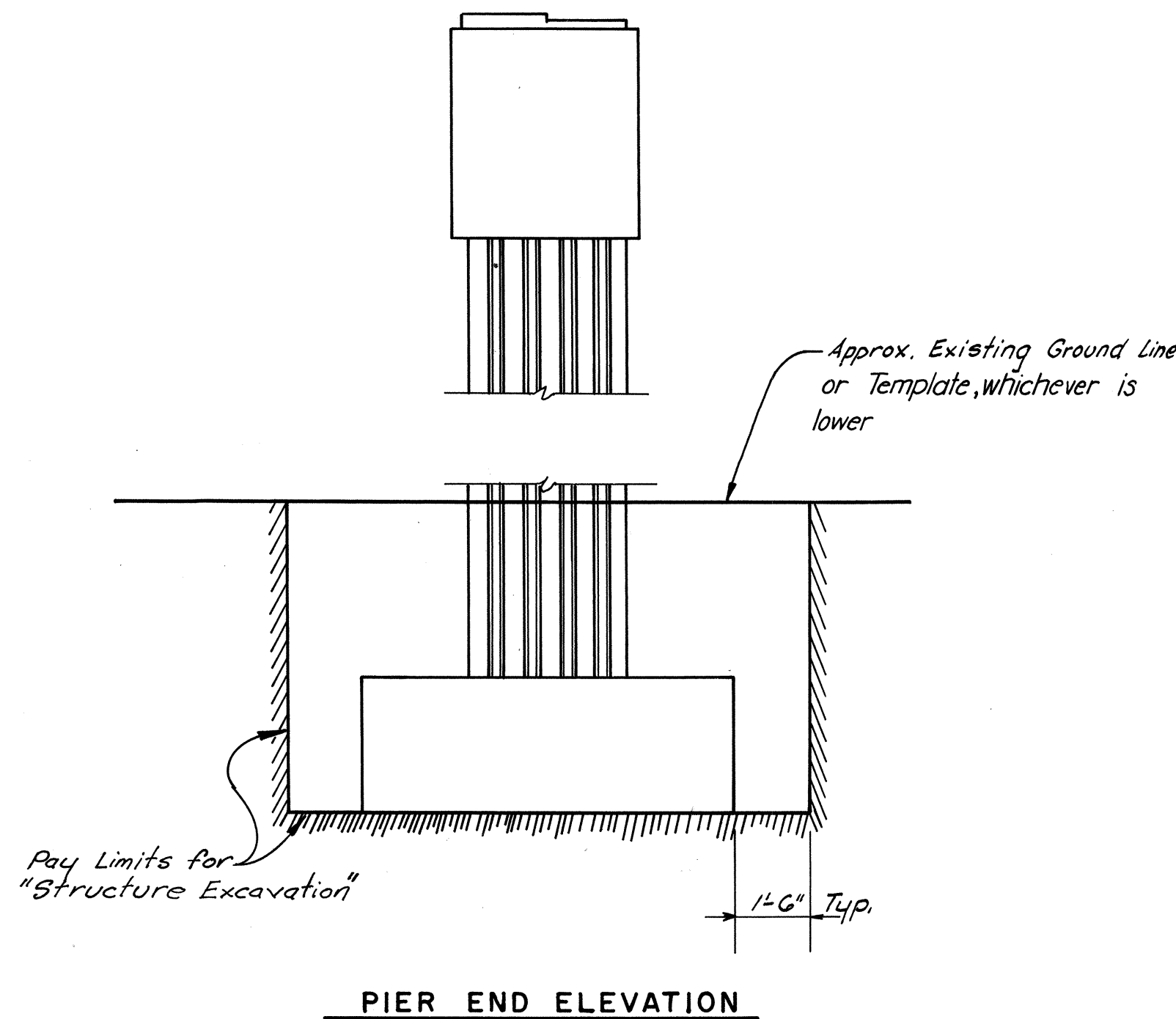
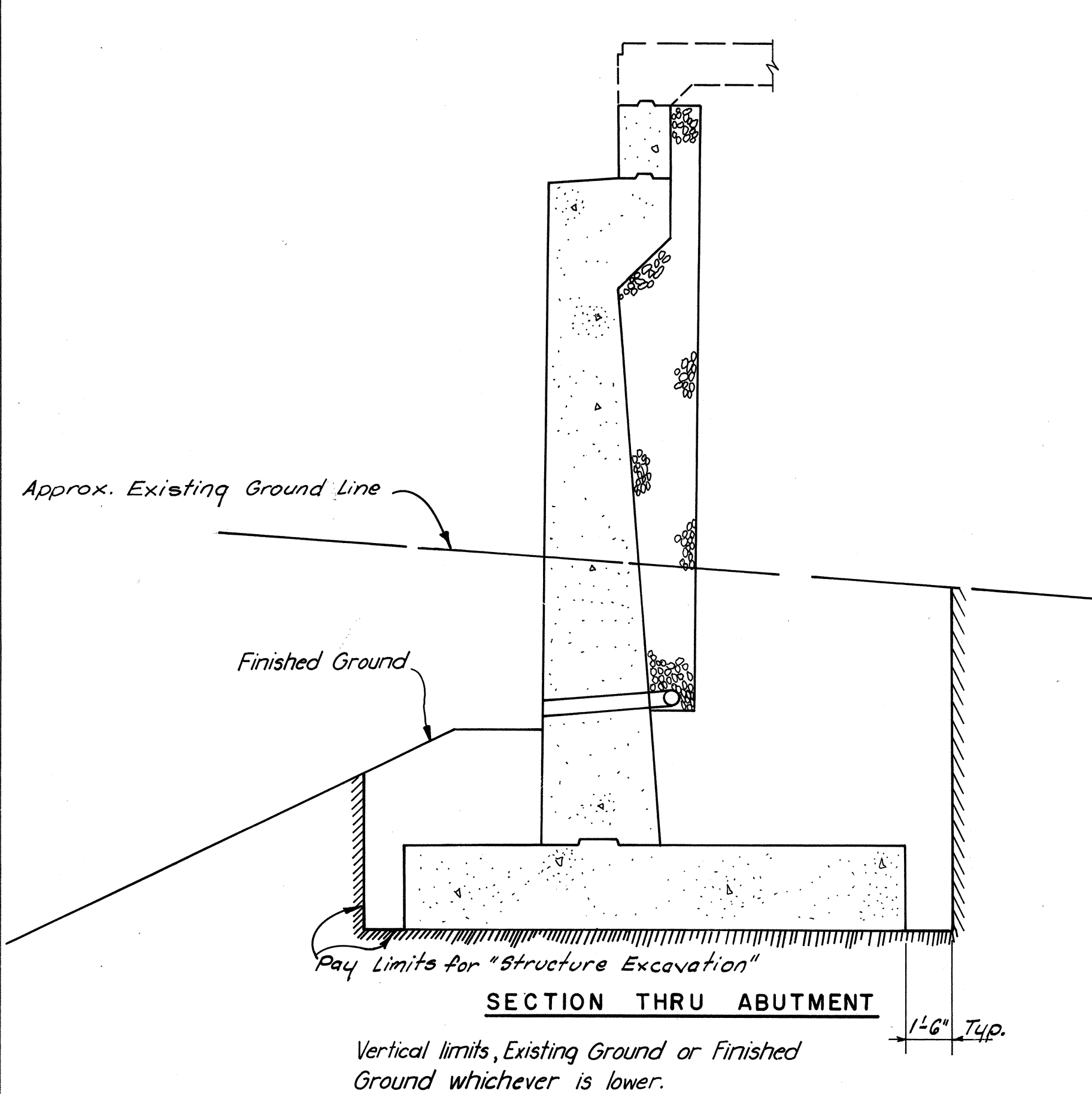


**ELEVATION**  
Scale 1" = 20'-0"

INDEX		
NO.	DESCRIPTION	
1	General Plan and Elevation	10 Typ Transverse Section
2	Quantities and Misc. Details	11 Deck Plans
3	South Abutment Details	12 Scupper Details
4	North Abutment Details	13 Electrical Detail
5	North Abutment Details (1)	14 Joint Details
6	North Abutment Details (2)	15 Conduit Installation Details
7	Pier 1 Details	16 Utility Support Det. At Bridge Abut.
8	Pier 2 & 3 Details	17 Approach Slab and Slope Pro Det.
9	Framing Plan	18 Boring Logs
10	Typ Transverse Section	51 Standard Shoe Details
11	Deck Plans	53 Standard Alum. Rail Det. (2 Rail)
12	Scupper Details	57 Standard Architectural Details
13	Electrical Detail	58 Standard Architectural Details
14	Joint Details	
15	Conduit Installation Details	

BY	DATE				
MADE	JLN	2-68			
CHECKED	THN	2-68	1	As Built	JRC 3-73
IN CHARGE	RHW				
			NO.	REVISION	BY DATE





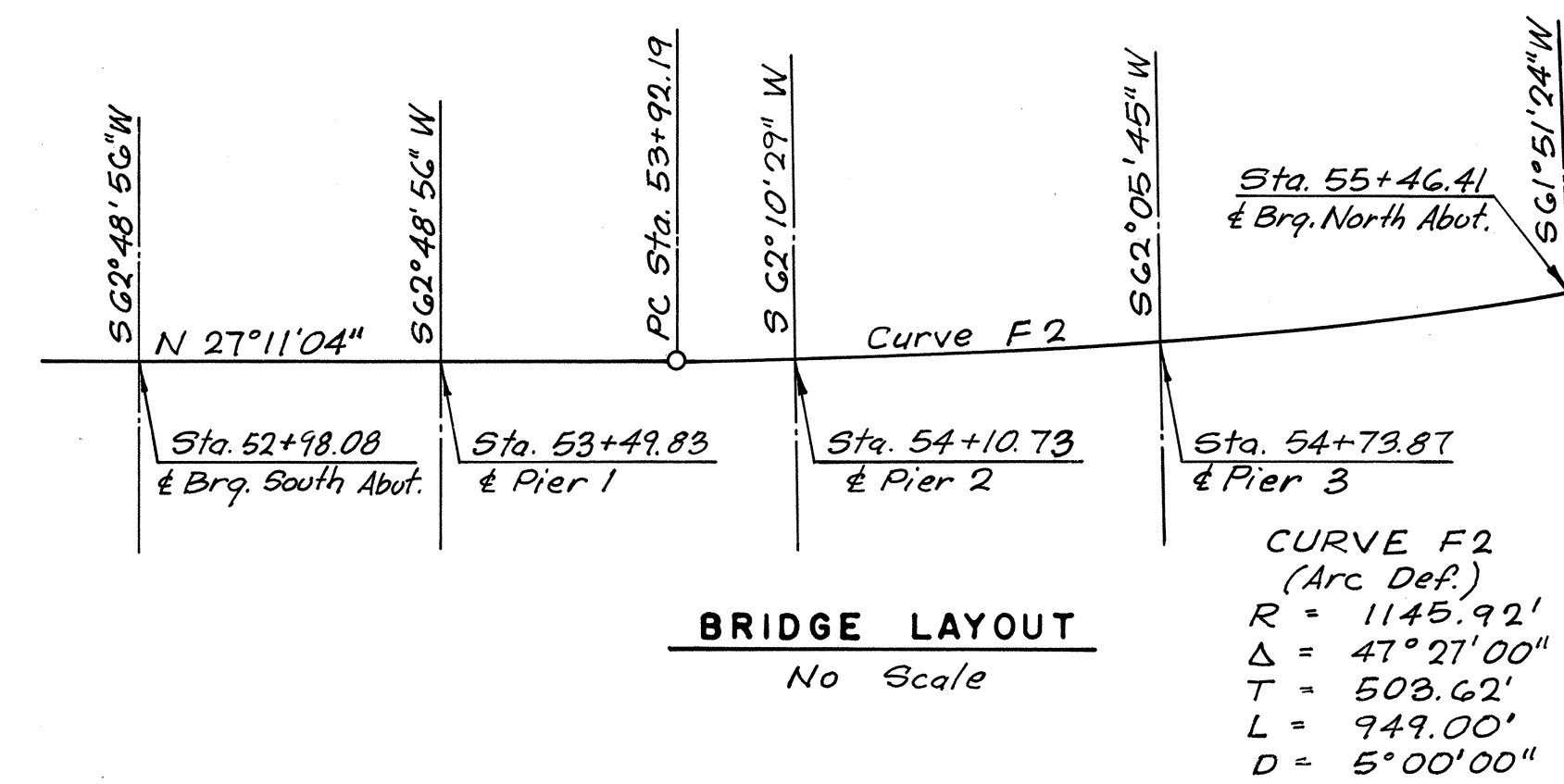
Substructure	Stringer	Type	"a"	"b"
S. ABUT.	S1 - S10	1	8 1/4"	0
PIER 1	S1 - S10	1	8	0
	S11 - S20	1	8 1/4"	0
PIER 2	S11 - S20	2	8	1 1/16"
	S21 - S30	1	8 1/4"	1/4"
PIER 3	S21 - S24	1	8 1/16"	1/4"
	S25 - S30	1	8	1/4"
	S31 - S36	1	7 13/16"	3/4"
	S37 - S40	1	8	1 1/16"
N. ABUT.	S31 - S34	1	8 3/16"	15/16"
	S35	1	8 1/4"	7/8"
	S36 - S40	1	8 1/4"	1 1/16"

ANCHOR BOLT SETTING DIAGRAMS

ESTIMATED QUANTITIES

	Structure Excavation	Concrete (a)	Reinforcing Steel	Structural Steel	Aluminum Br. Railing (2 Rail)	Gas Main 12" #	Conduit 5" # VEPCO	Conduit 4" # Telephone	Parous Backfill	Rock Face Slope Protection	Asphalt Damp-proofing	Underdrain 6" # Pipe	Conc. A-3 Br. Appr. Slab
	C.Y.	C.Y.	Lbs.	Lbs.	L.F.	L.F.	L.F.	L.F.	C.Y.	S.Y.	S.Y.	L.F.	C.Y.
Superstructure	—	535.2 (b)	120,415	498,775	501.0	305.0	606.0	1,830.0	—	—	—	—	—
South Abutment	389	194.4	7,066	—	27.0	—	—	—	32	438	97	122	—
Pier 1	102	90.5	27,970	—	—	—	—	—	—	—	—	—	—
Pier 2	165.6	94.6	26,700	—	—	—	—	—	—	—	—	—	—
Pier 3	158.4	100.5	29,849	—	—	—	—	—	—	—	—	—	—
North Abutment	577	518.2	37,909	—	46.0	—	—	—	103	146	309	132	—
Approach Slabs	—	—	35,687	—	—	—	—	—	—	—	—	—	166
Total	1,392	998.2 (a) 535.2 (b)	283,596	498,775	574.0 (c)	305.0	606.0	1,830.0	135	584	406	254	166

(a) Class A3, unless noted.  
 (b) Class A4  
 (c) Includes that portion on abutments and wingwalls.



AS BUILT

RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM  
 POWHITE PARKWAY

FOREST HILL AVENUE OVER  
 POWHITE PARKWAY  
 BRIDGE B-06

QUANTITIES AND MISC. DETAILS

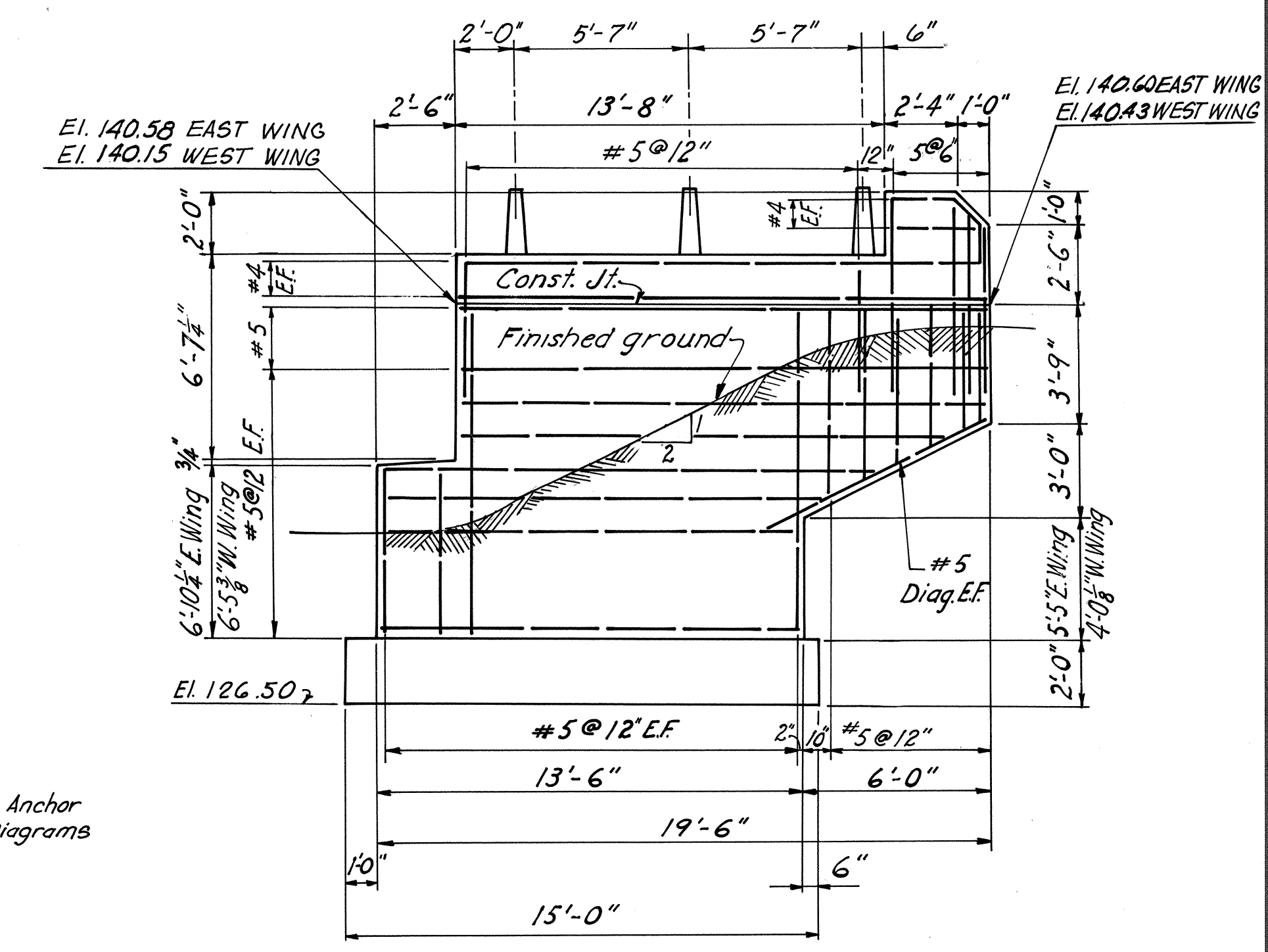
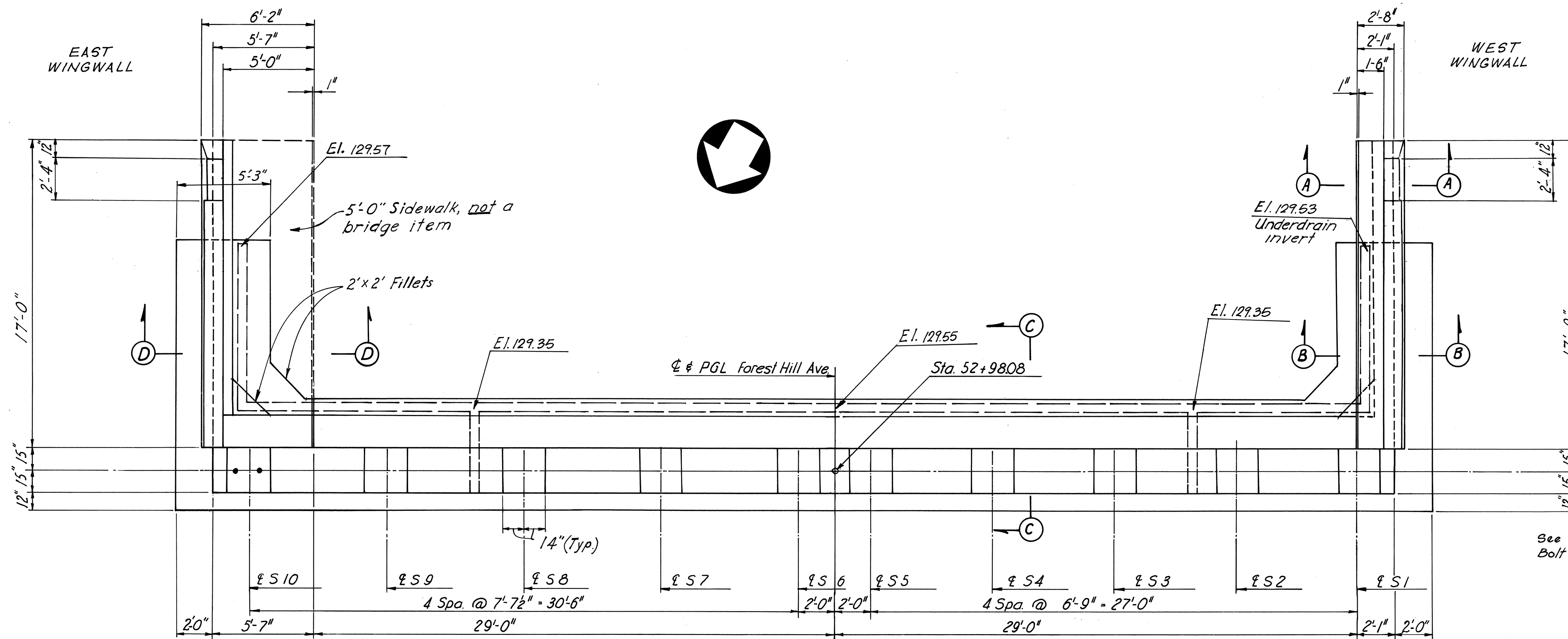
HAYES, SEAY, MATTERN & MATTERN  
 Associate Engineers

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 General Consultants

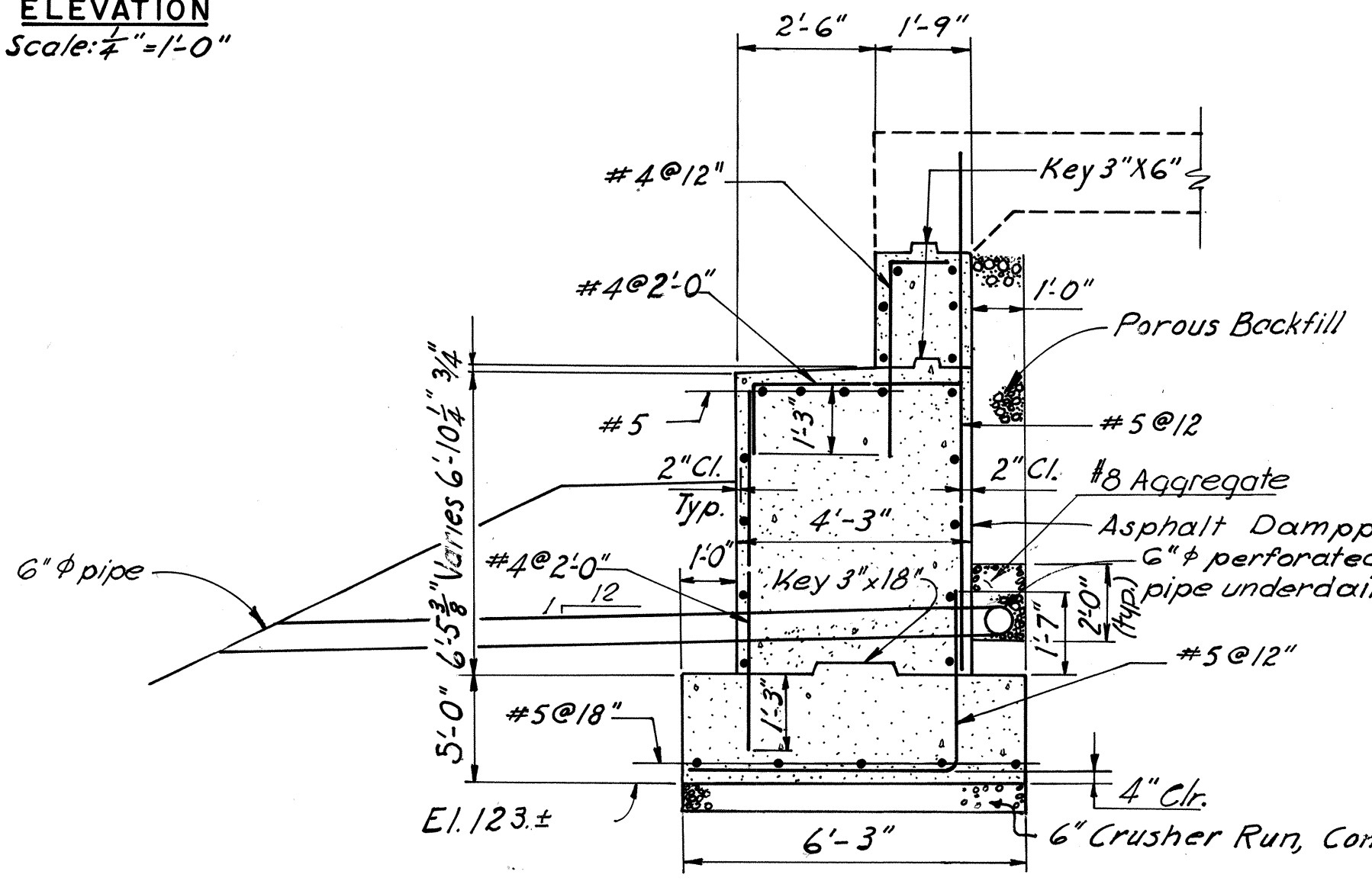
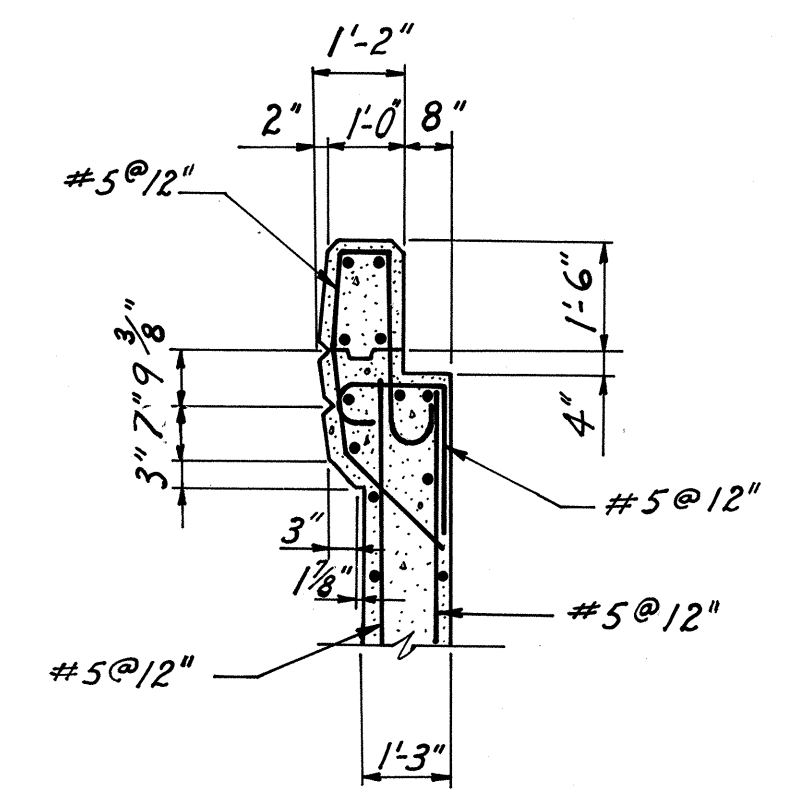
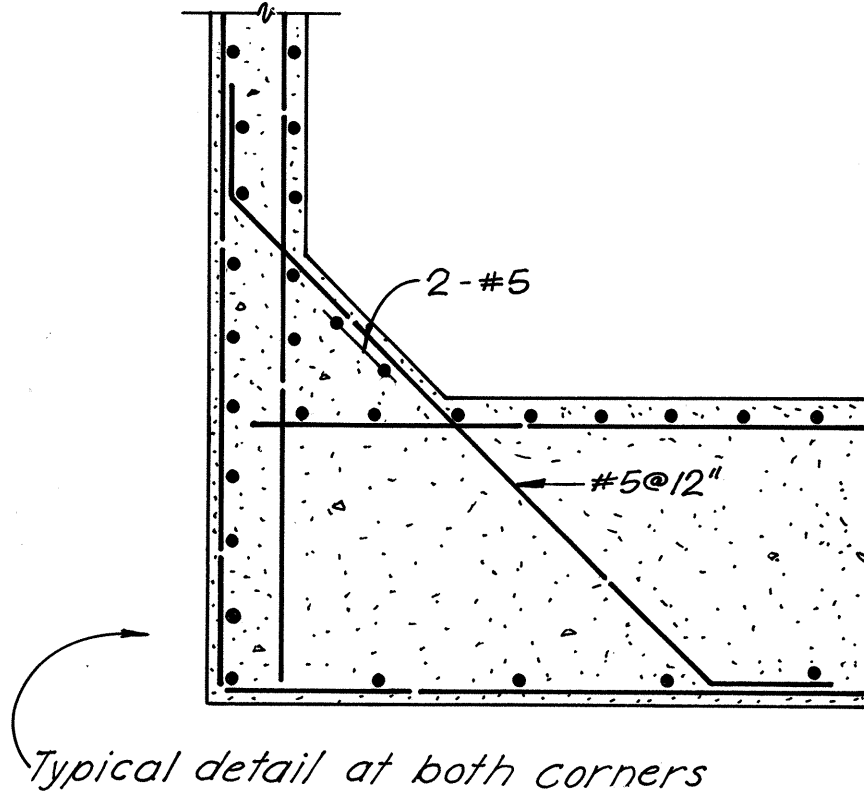
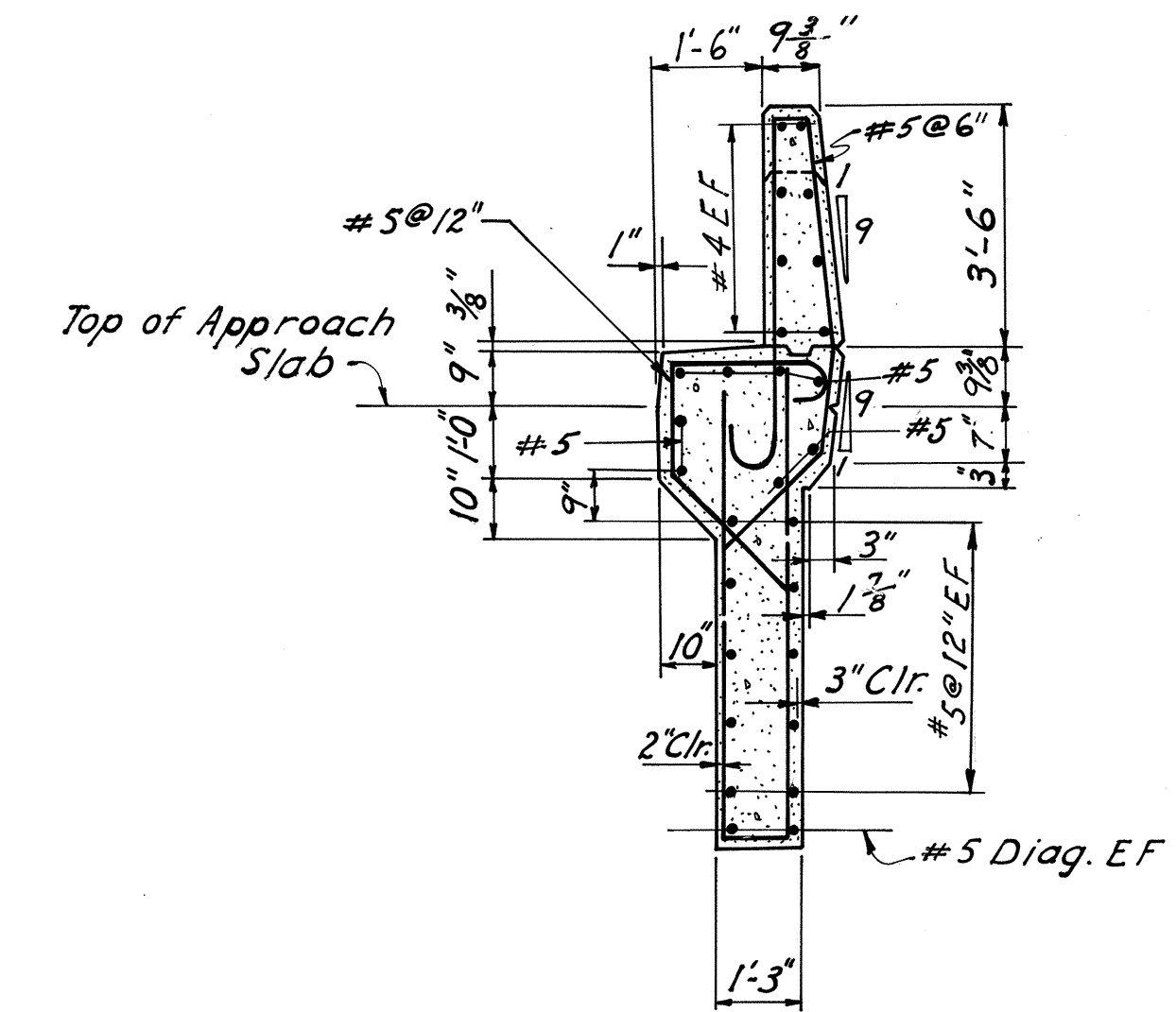
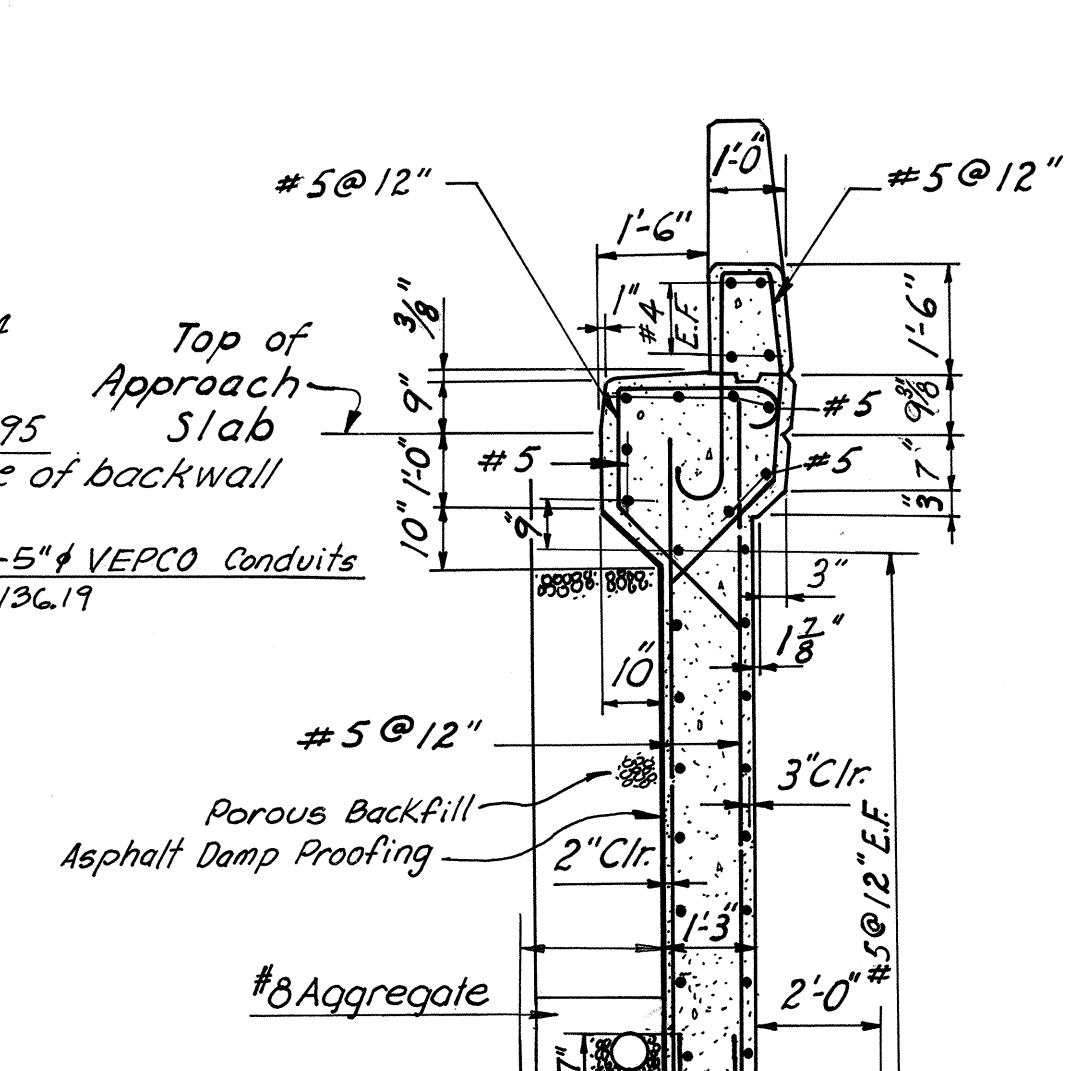
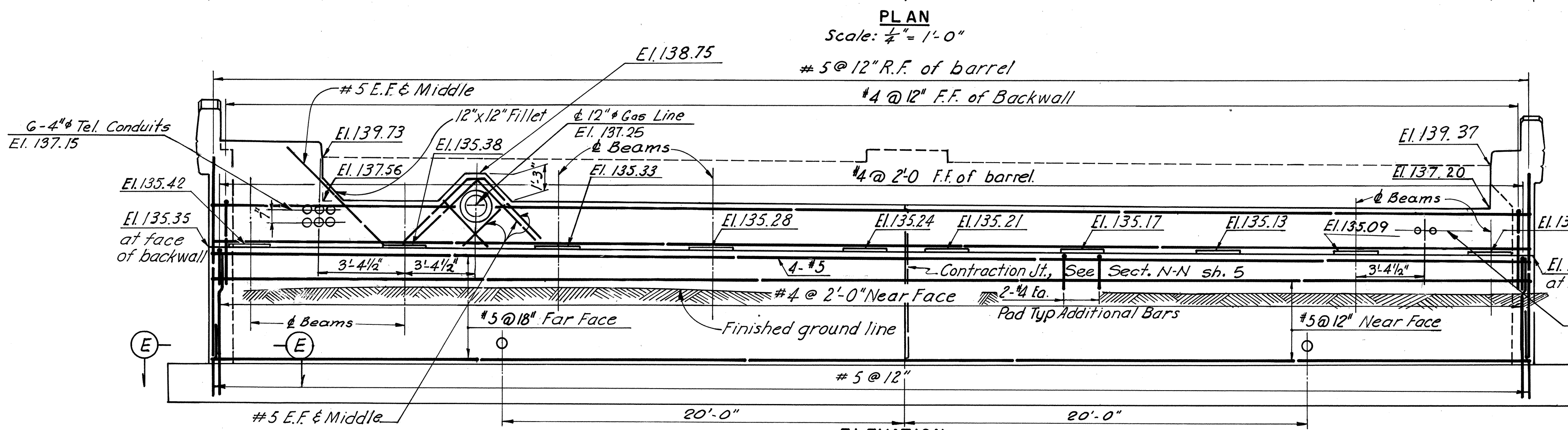
SCALE: NO SCALE  
 CONTRACT NO.: 2  
 SHEET NO. 2 OF 18

BY	DATE				
MADE	R.S.S. A.J.P.	2-68	2	As Built	JRC 3-73
CHECKED	T.H.N.	2-68	1	General	J.G.V. 10-70
IN CHARGE	R.H.W.			REVISION	BY DATE

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	153	188



See 9h. 2 for Anchor Bolt Setting Diagrams



Footings should be founded at the elevation shown on Plans unless otherwise directed by the Engineer due to conditions at the site during construction. In such cases, the Engineer will determine the extent of redesign necessary and will advise the Contractor before construction begins.

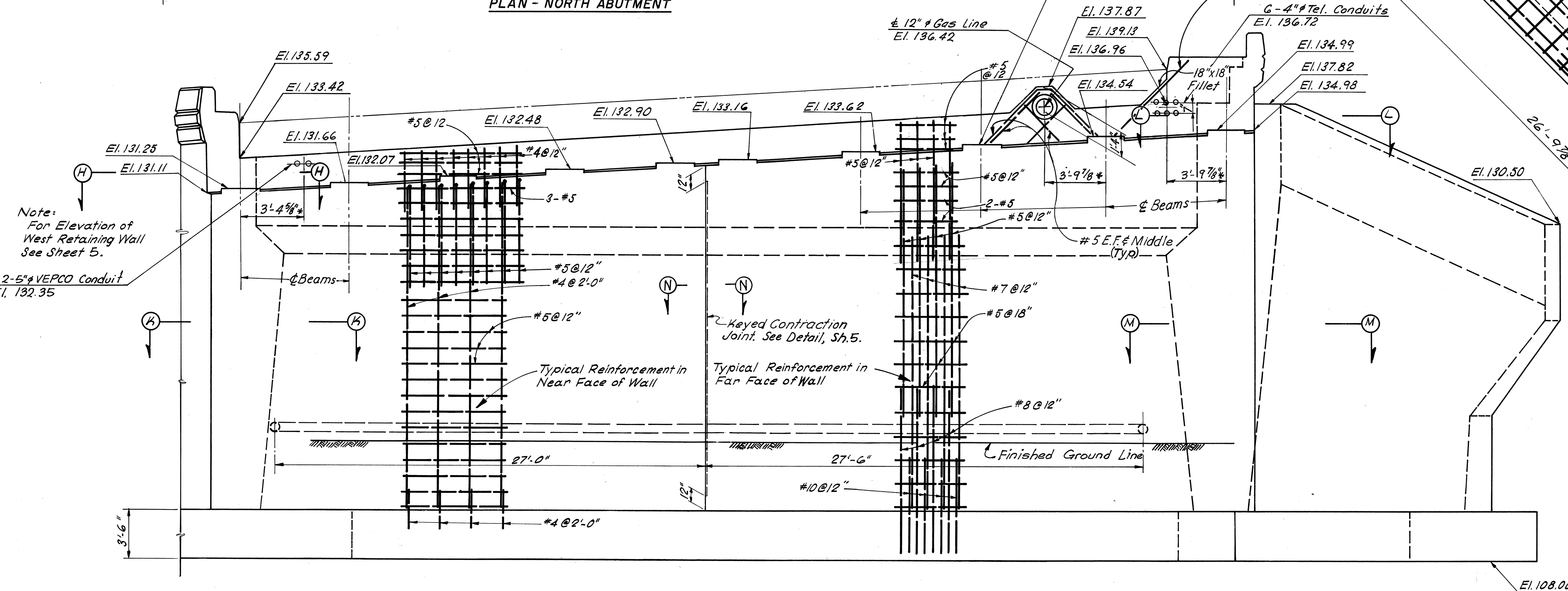
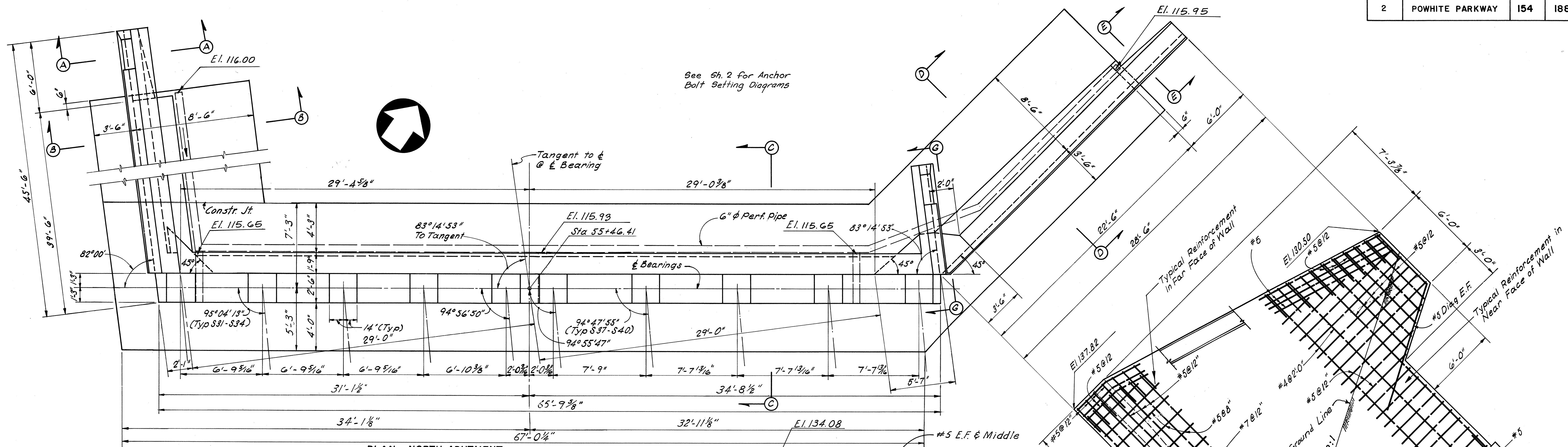
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM POWHITE PARKWAY	
FOREST HILL AVENUE OVER POWHITE PARKWAY BRIDGE B-06 SOUTH ABUTMENT DETAILS	
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: AS SHOWN
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO. 2 SHEET NO. 3 OF 18

BY	DATE	NO.	REVISION	BY	DATE
MADE	JLN 2-68	2	As Built	JRC	3-73
CHECKED	THN 2-68	1	Backwall	J.L.M.	5-13-68
IN CHARGE	RLW				



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	154	188



**ELEVATION - NORTH ABUTMENT**  
 \*Dimensions projected forward to face of backwall.

Note:  
 For Elevation of West Retaining Wall See Sheet 5.

MADE	BY	DATE	NO.	REVISION	BY	DATE
JLN	JLN	2-68	2	As Built	JRC	3-73
THN	THN	2-68	1	Backwall	J.L.N.	5-13-68
RHW	RHW					

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 POWHITE PARKWAY

**FOREST HILL AVENUE OVER**  
**POWHITE PARKWAY**  
 BRIDGE B-06

**NORTH ABUTMENT DETAILS**

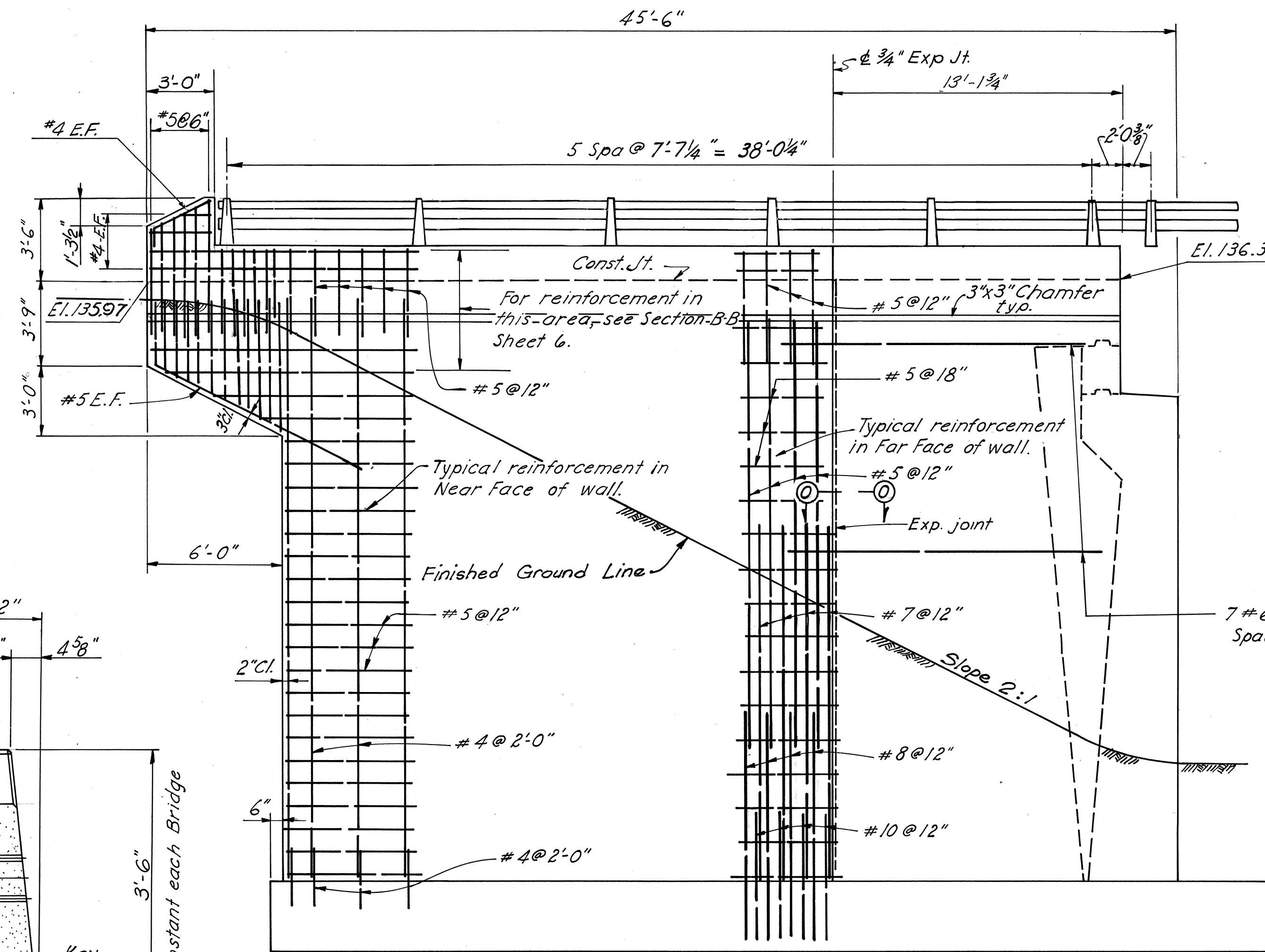
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 Associate Engineers

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 General Consultants

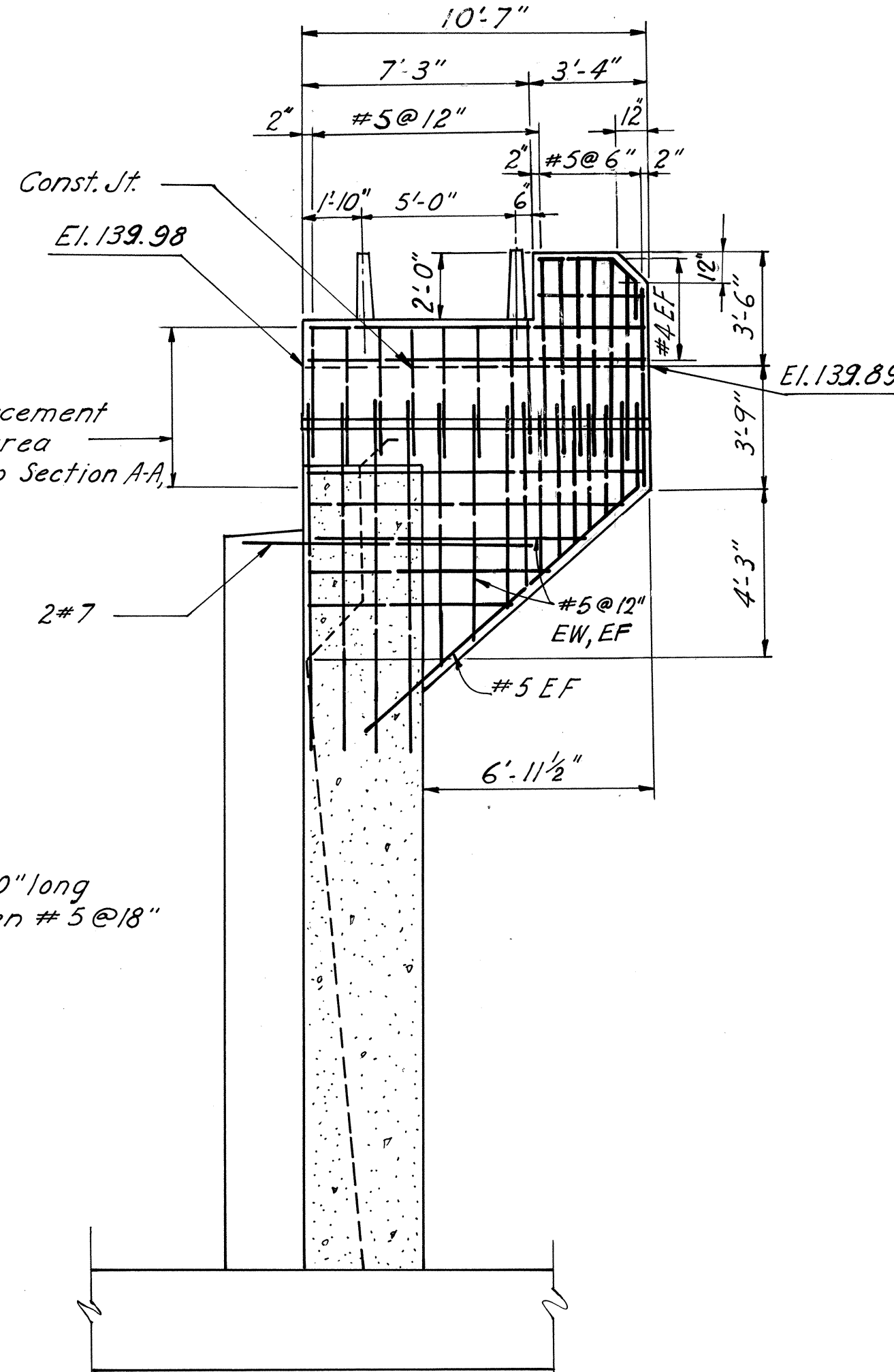
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 CONTRACT NO.: 2  
 SHEET NO. 4 OF 18



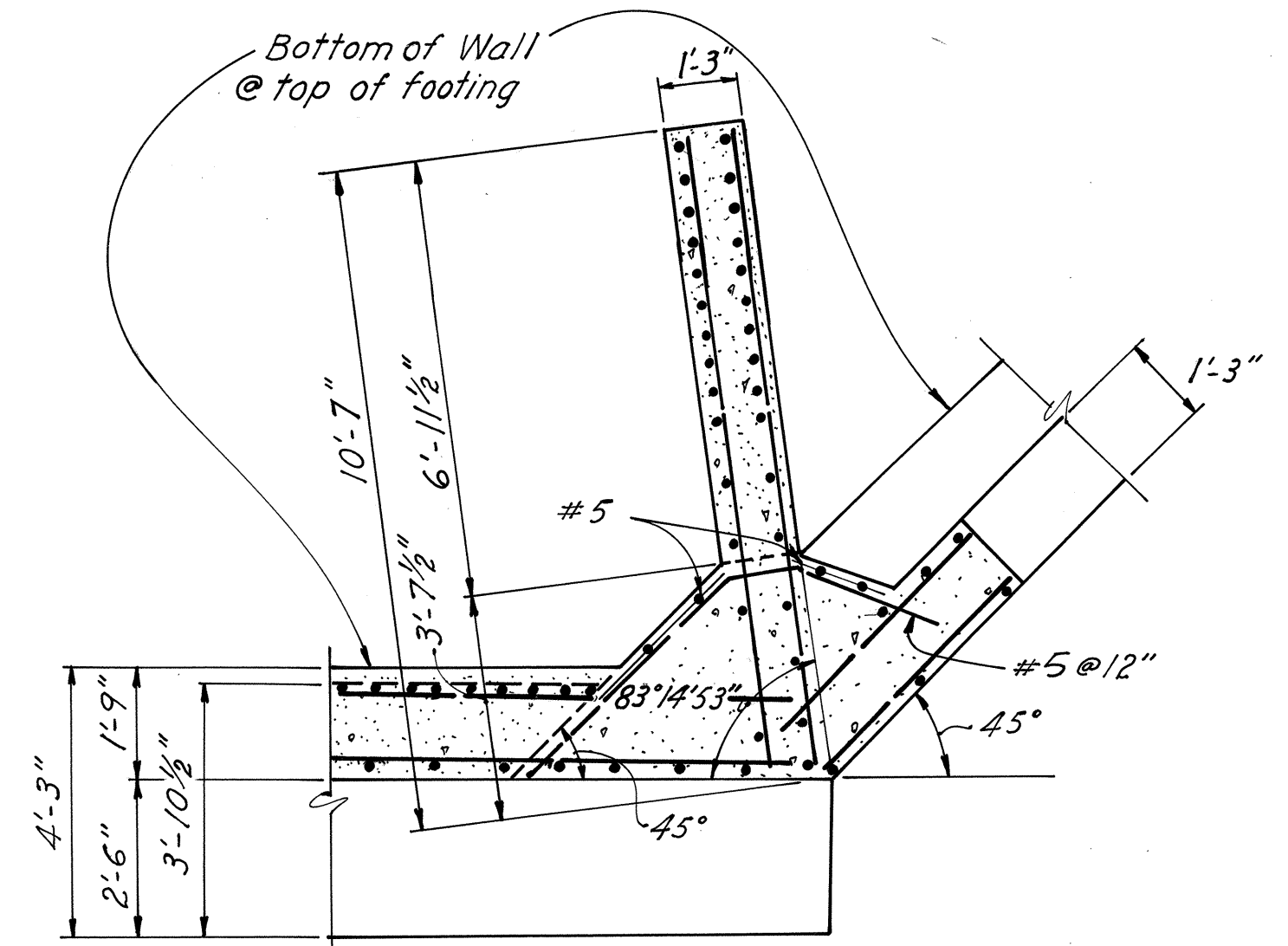
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	155	188



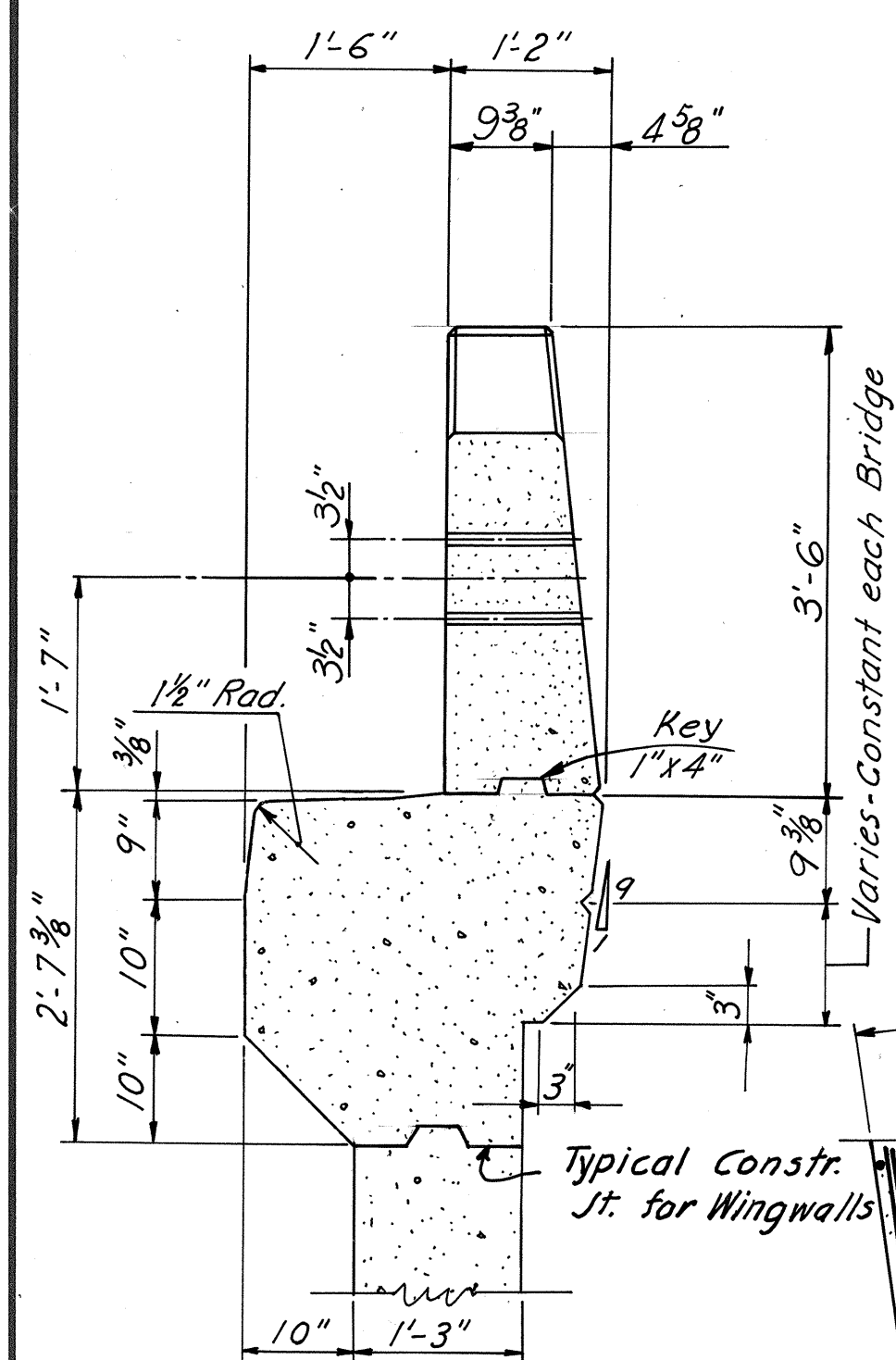
**ELEVATION — WEST RETAINING WALL  
NORTH ABUTMENT**  
Scale: 1/4" = 1'-0"



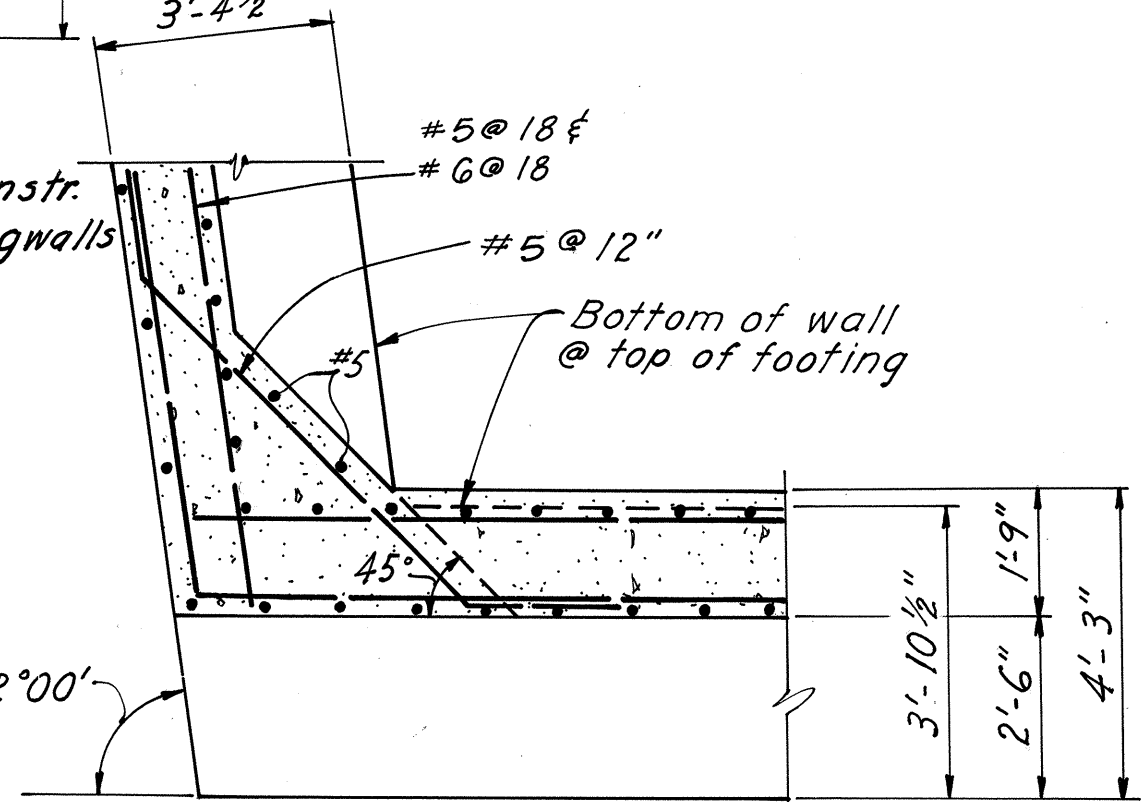
**SECTION G-G**  
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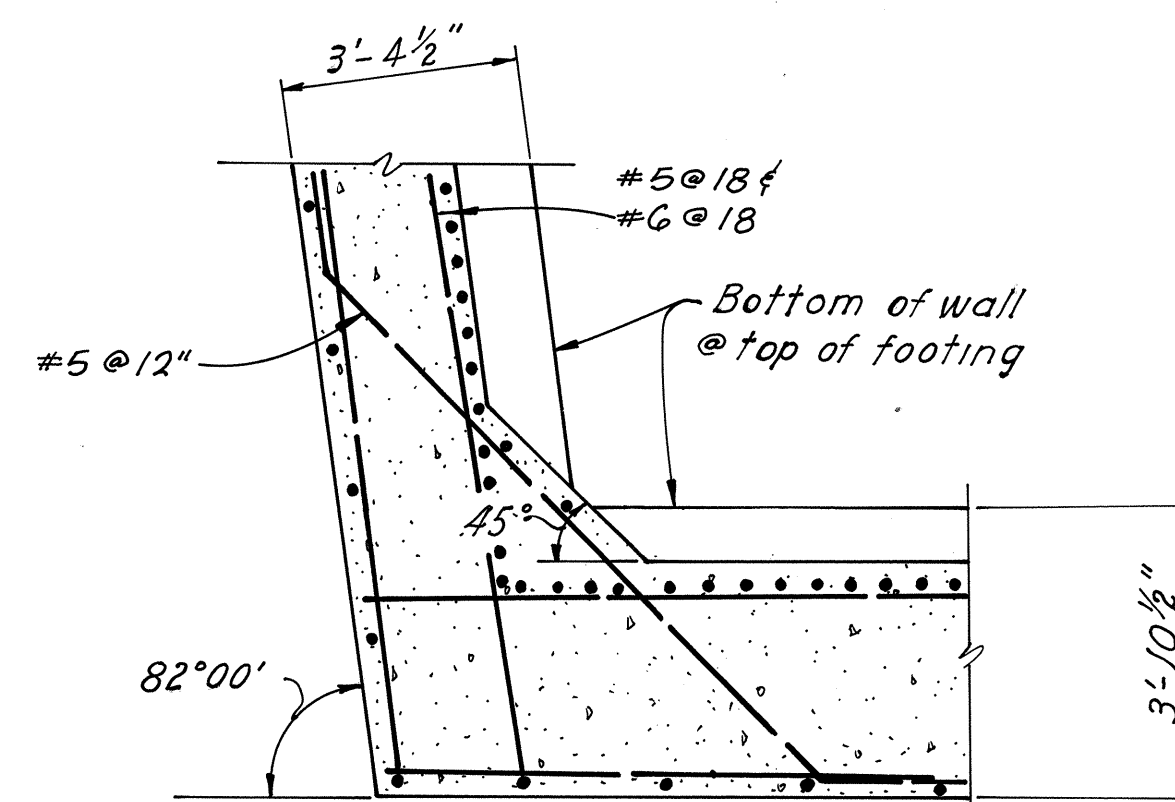
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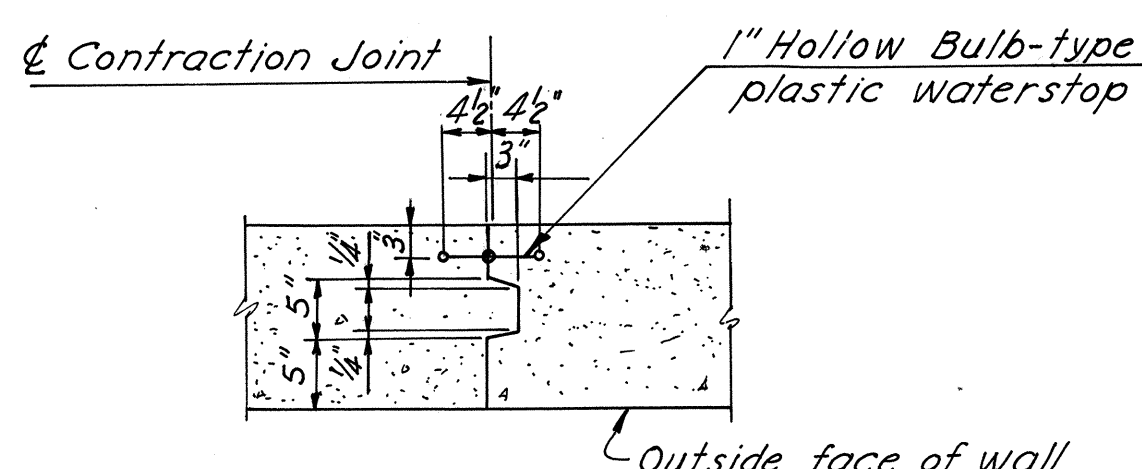
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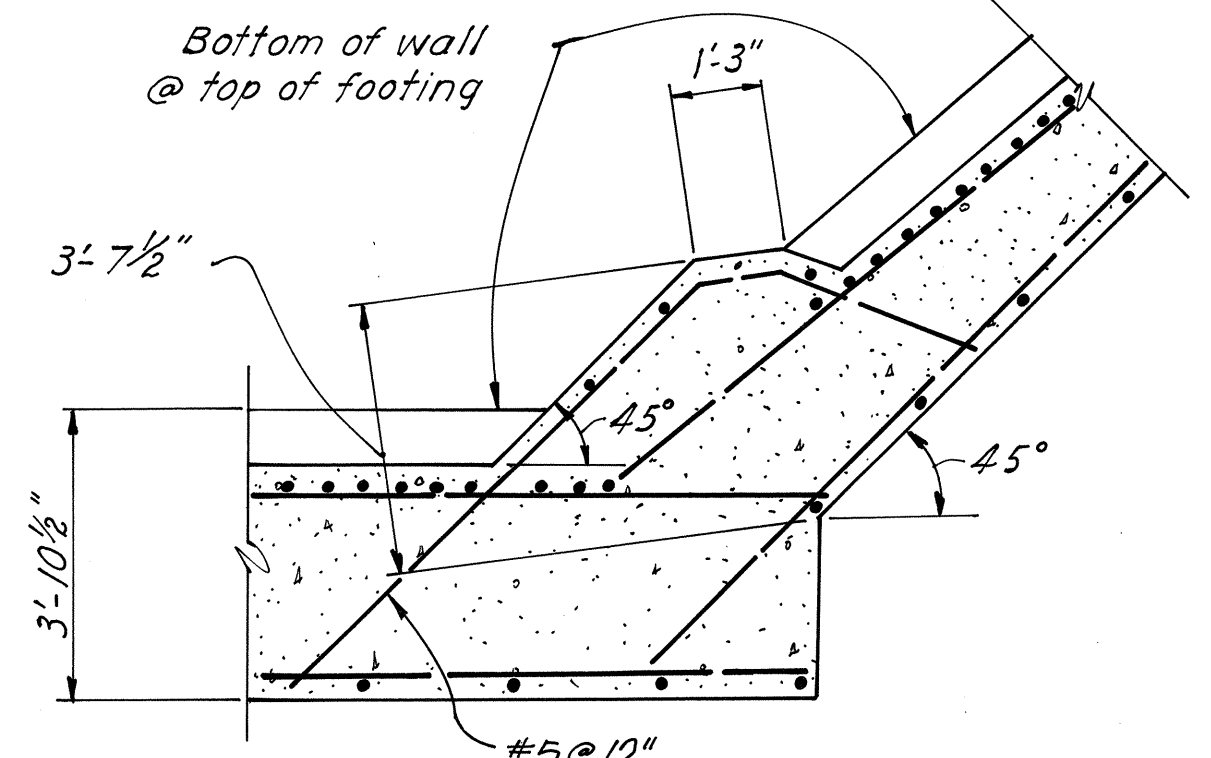
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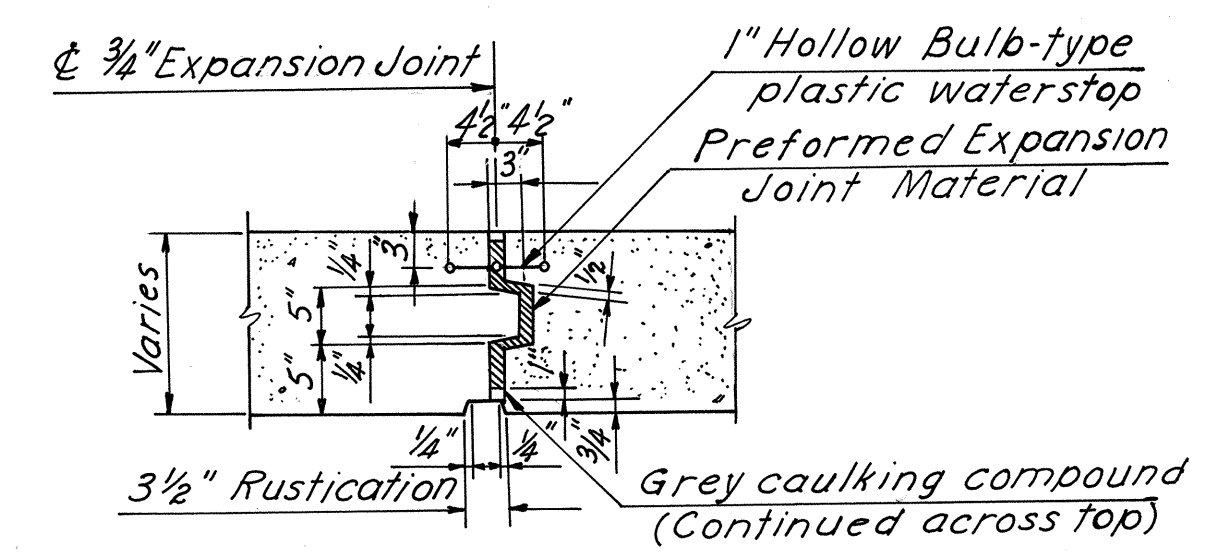
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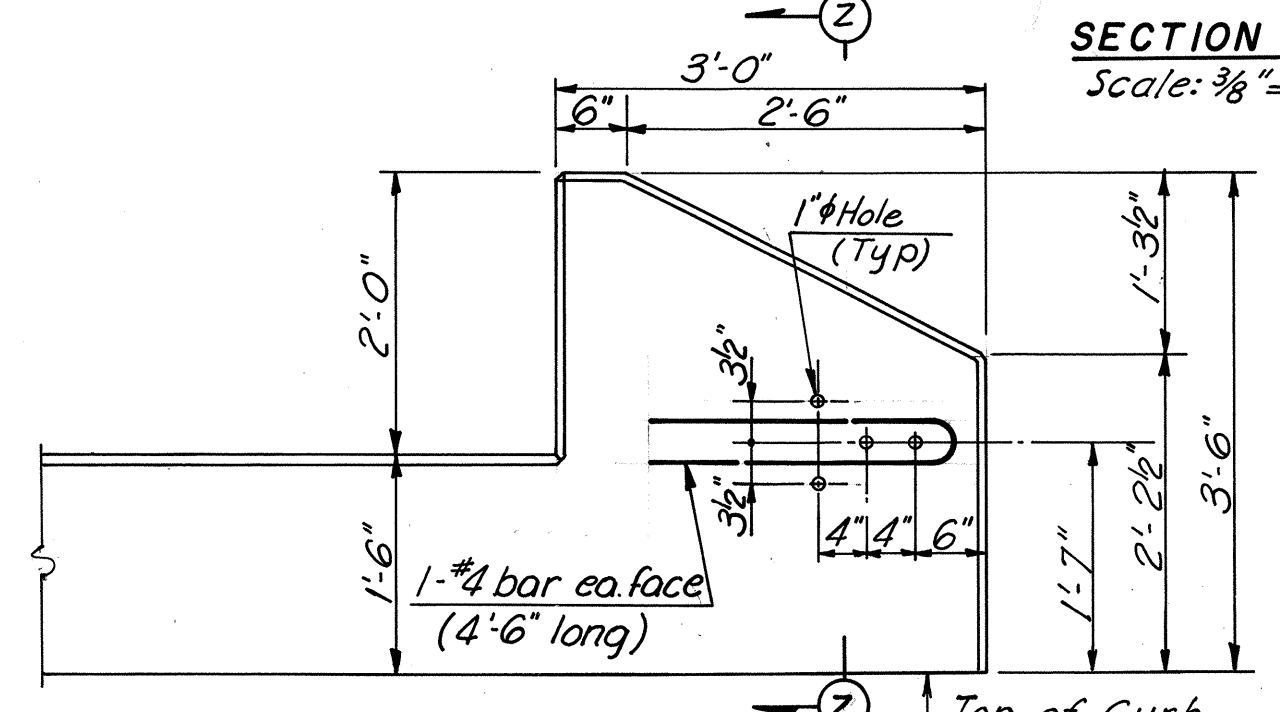
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Scale: 3/4" = 1'-0"



**SECTION M-M**  
Scale: 3/8" = 1'-0"



**SECTION O-O**  
Scale: 3/4" = 1'-0"



**ELEVATION OF INSIDE FACE WEST WALL L**  
Scale: 3/4" = 1'-0"

BY	DATE				
MADE	JLN	2-68			
CHECKED	THN	2-68	1 As Built	JRC	3-73
IN CHARGE	RHW				
NO.	REVISION	BY	DATE		

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY**

**FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06  
NORTH ABUTMENT DETAILS (1)**

HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers

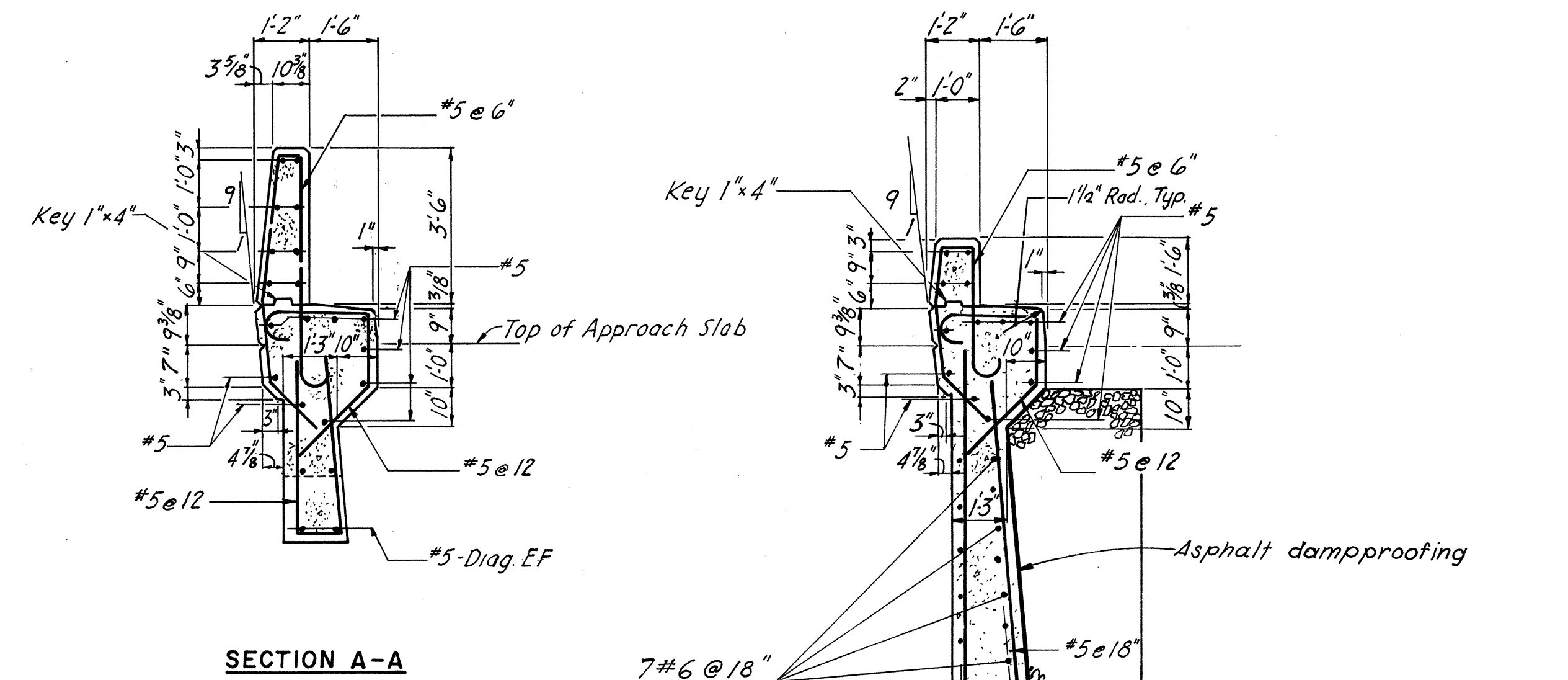
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

SCALE: AS SHOWN

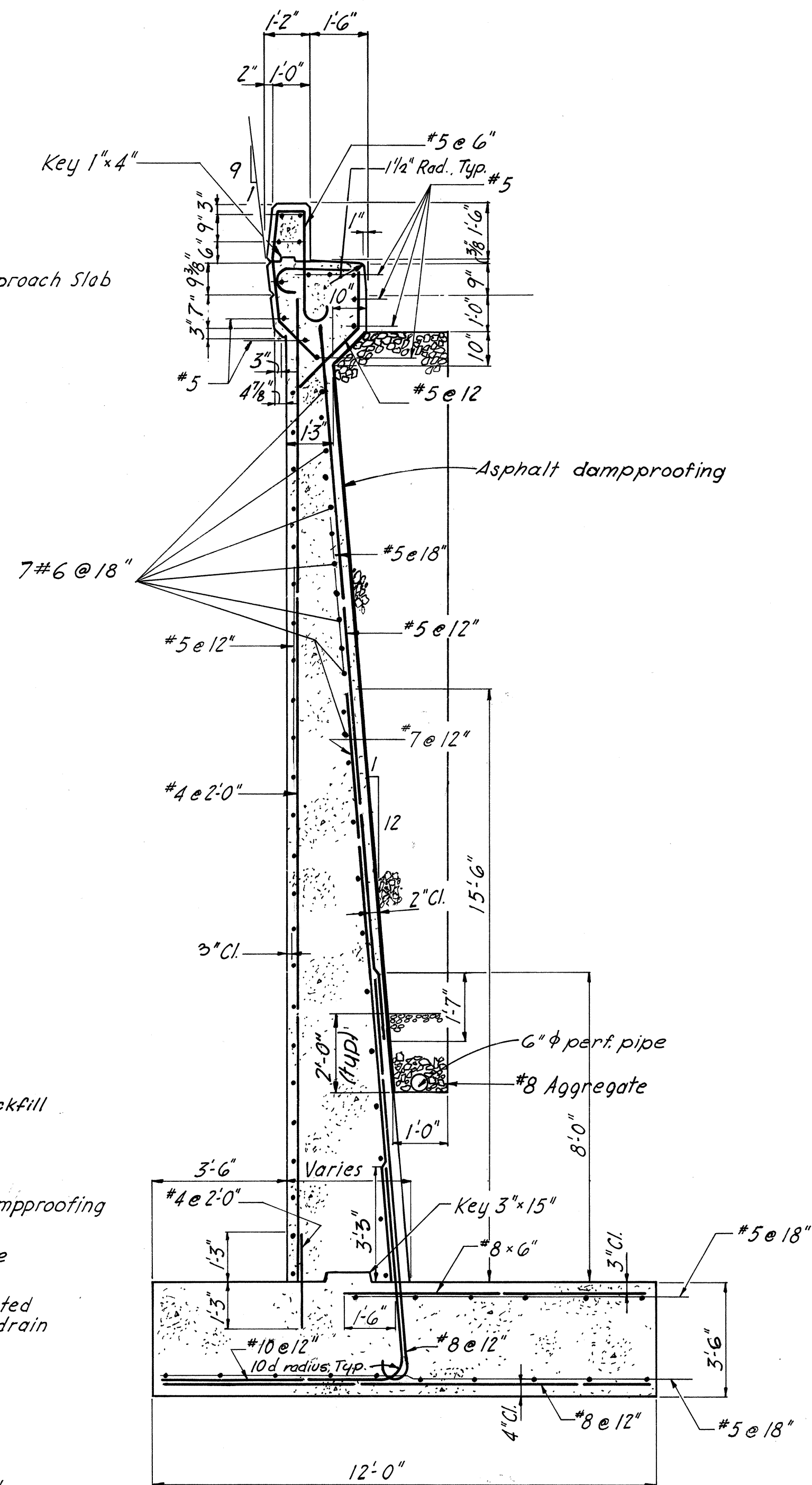
CONTRACT NO.: 2

SHEET NO. 5 OF 18

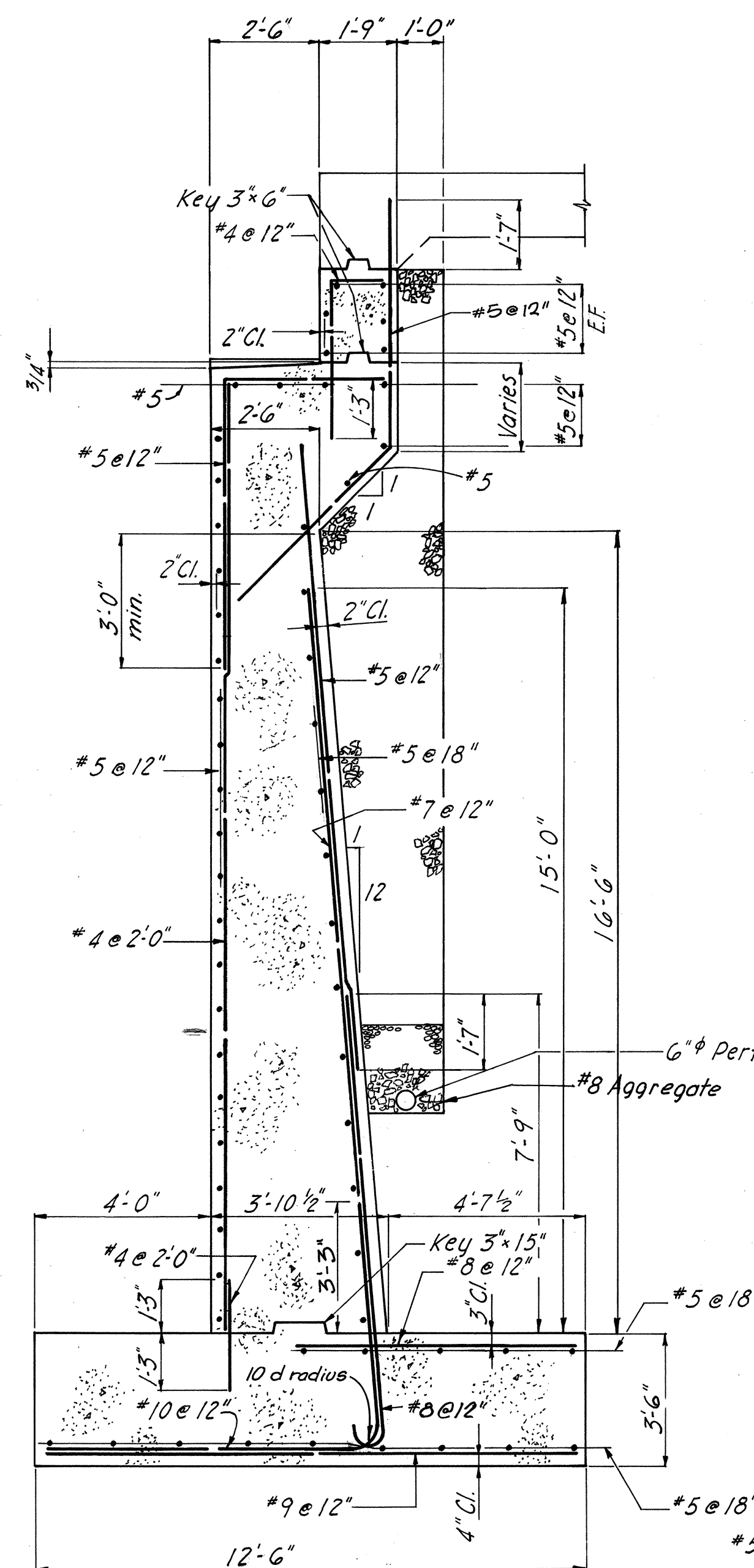
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	156	188



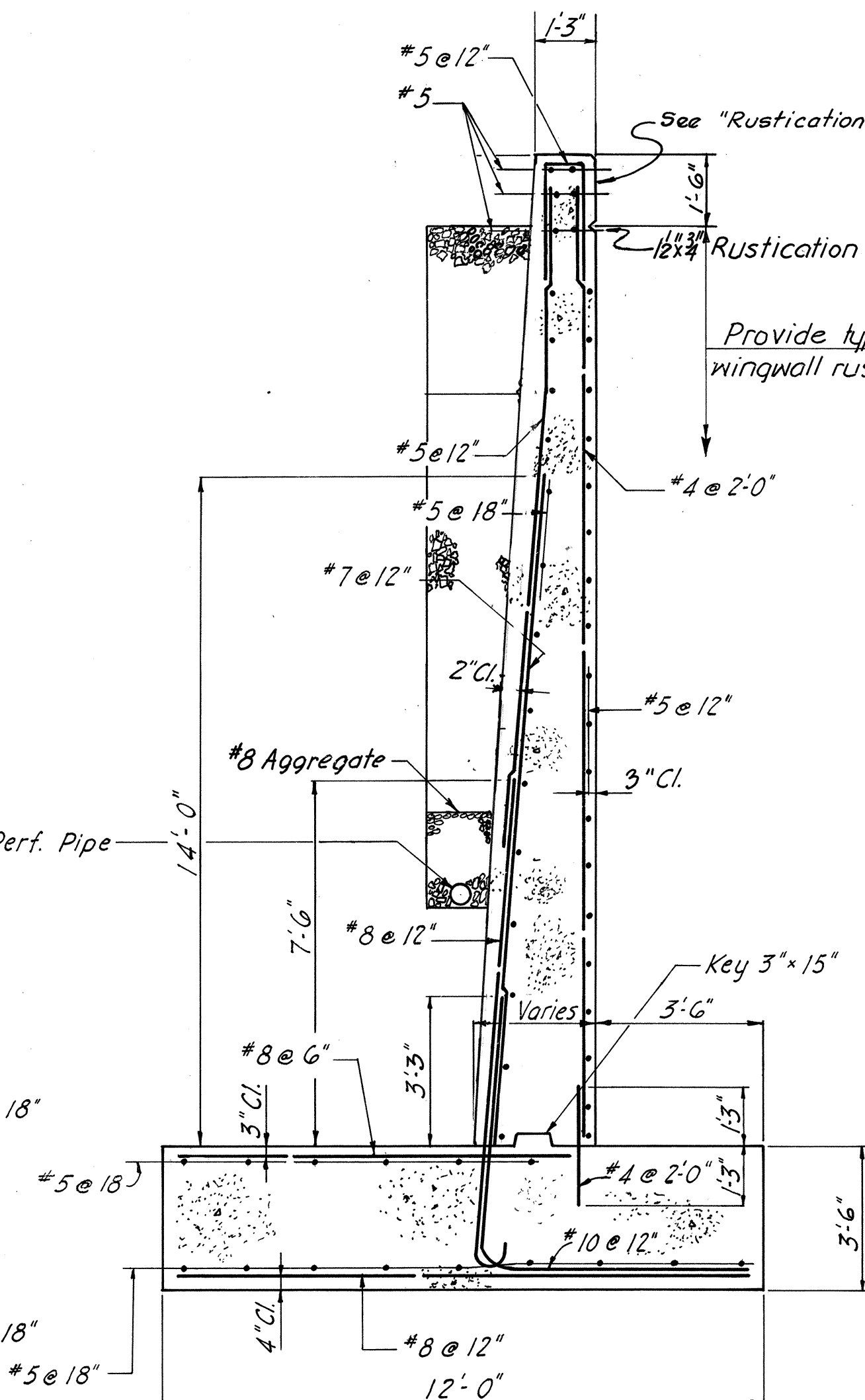
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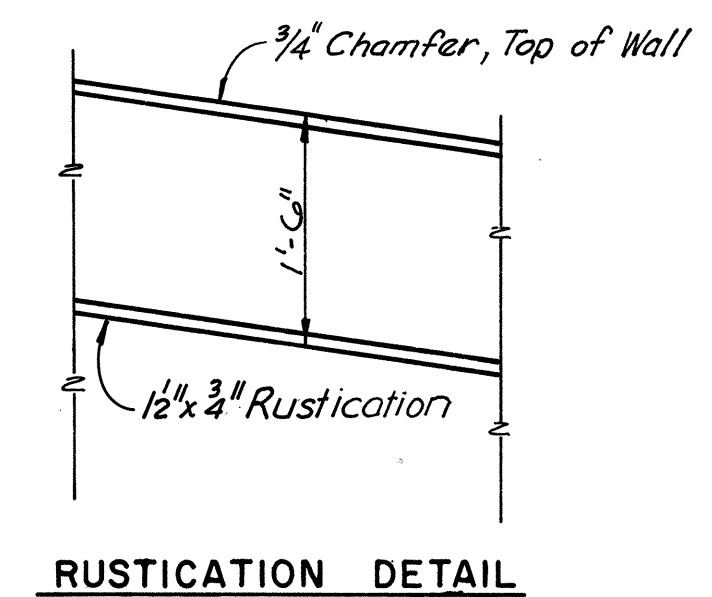
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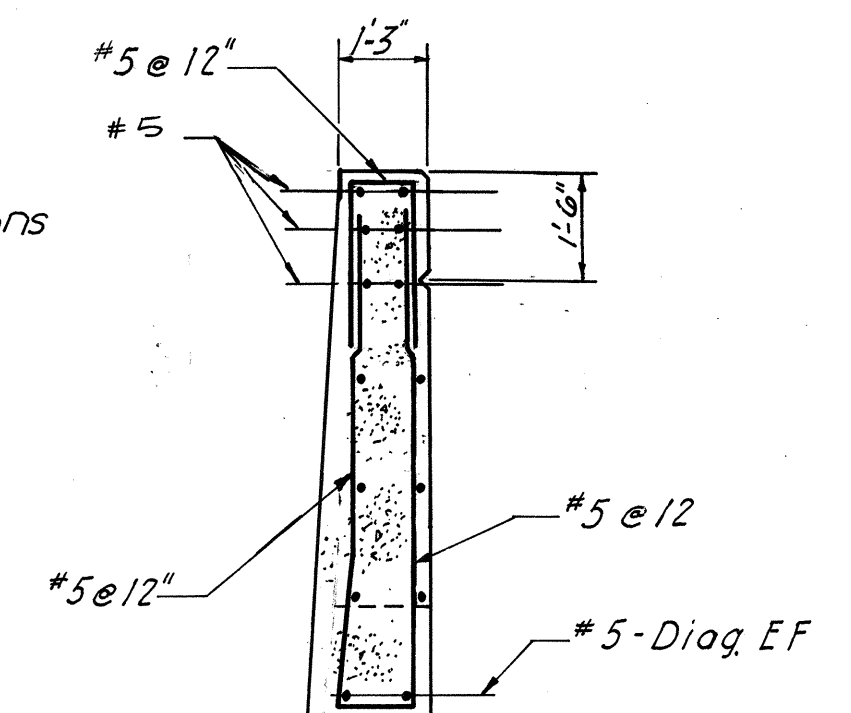
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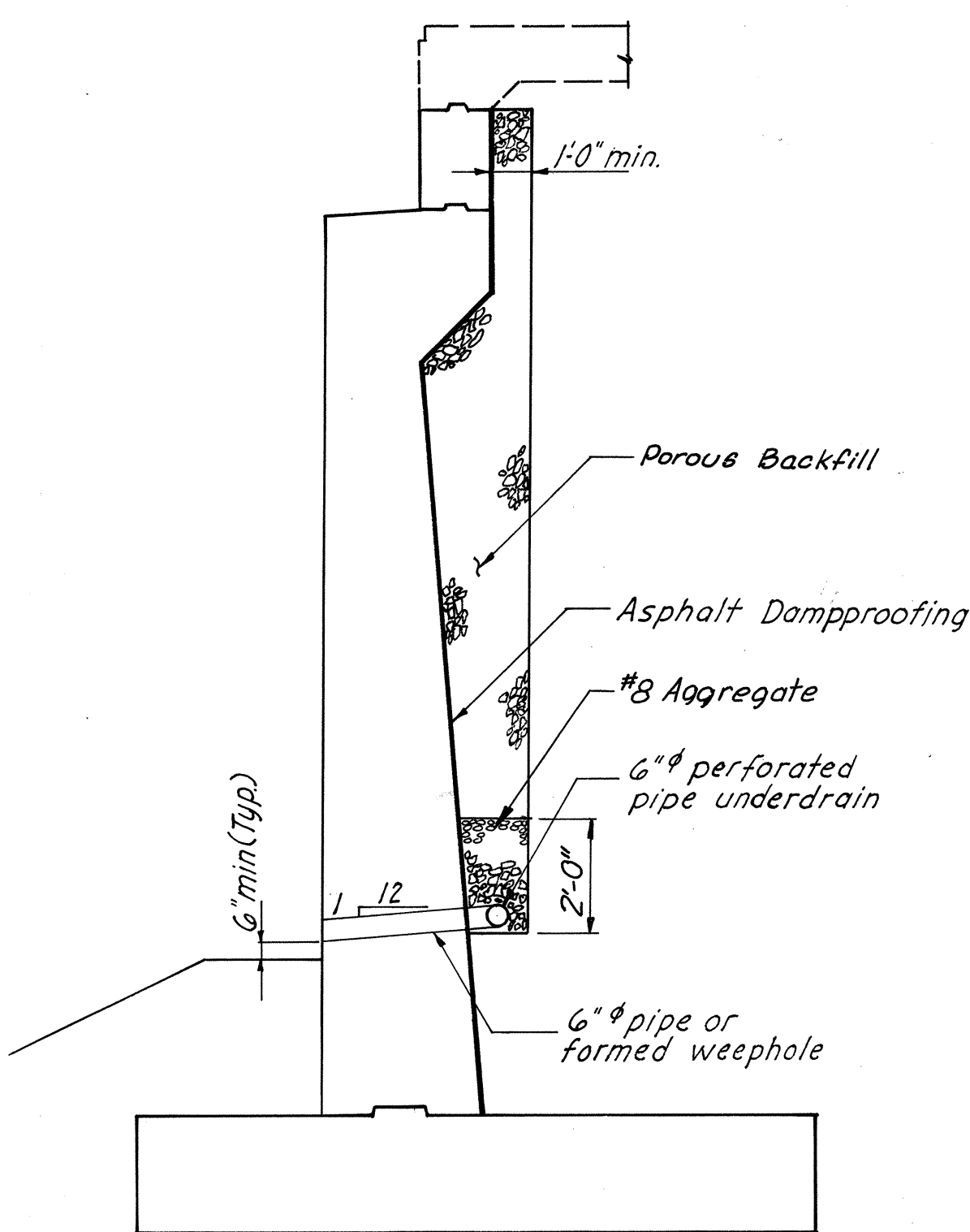
**SECTION D-D**



**RUSTICATION DETAIL**



**SECTION E-E**



**DRAINAGE DETAILS**

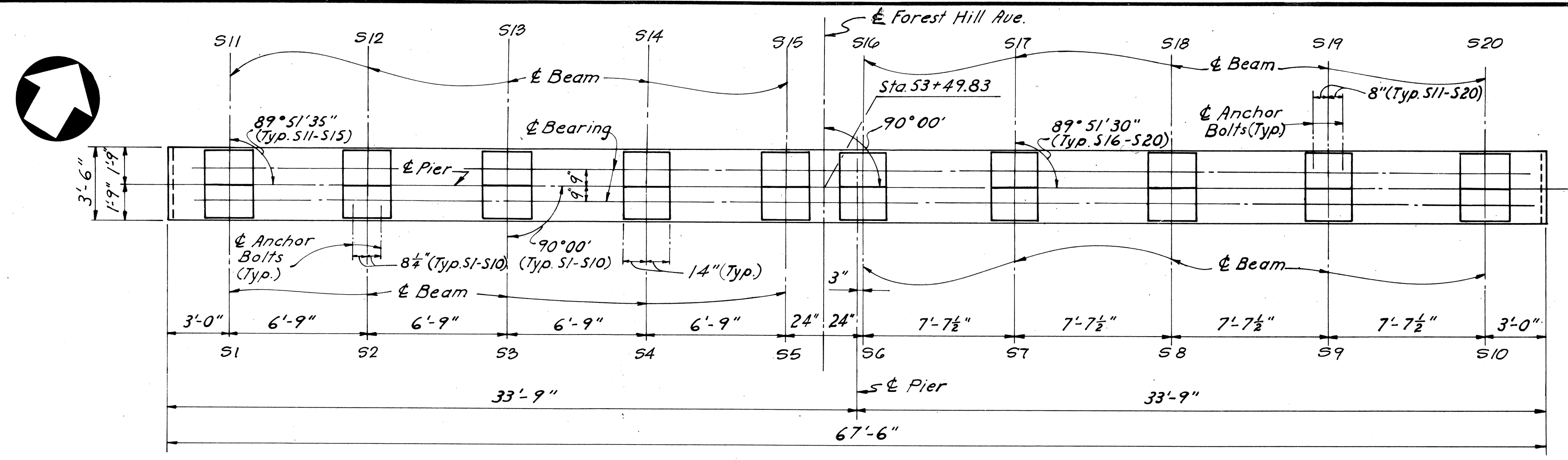
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RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM POWHITE PARKWAY	
FOREST HILL AVENUE OVER POWHITE PARKWAY BRIDGE B-06 <b>NORTH ABUTMENT DETAILS (2)</b>	
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: 3/8" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO. 2 SHEET NO. 6 OF 18

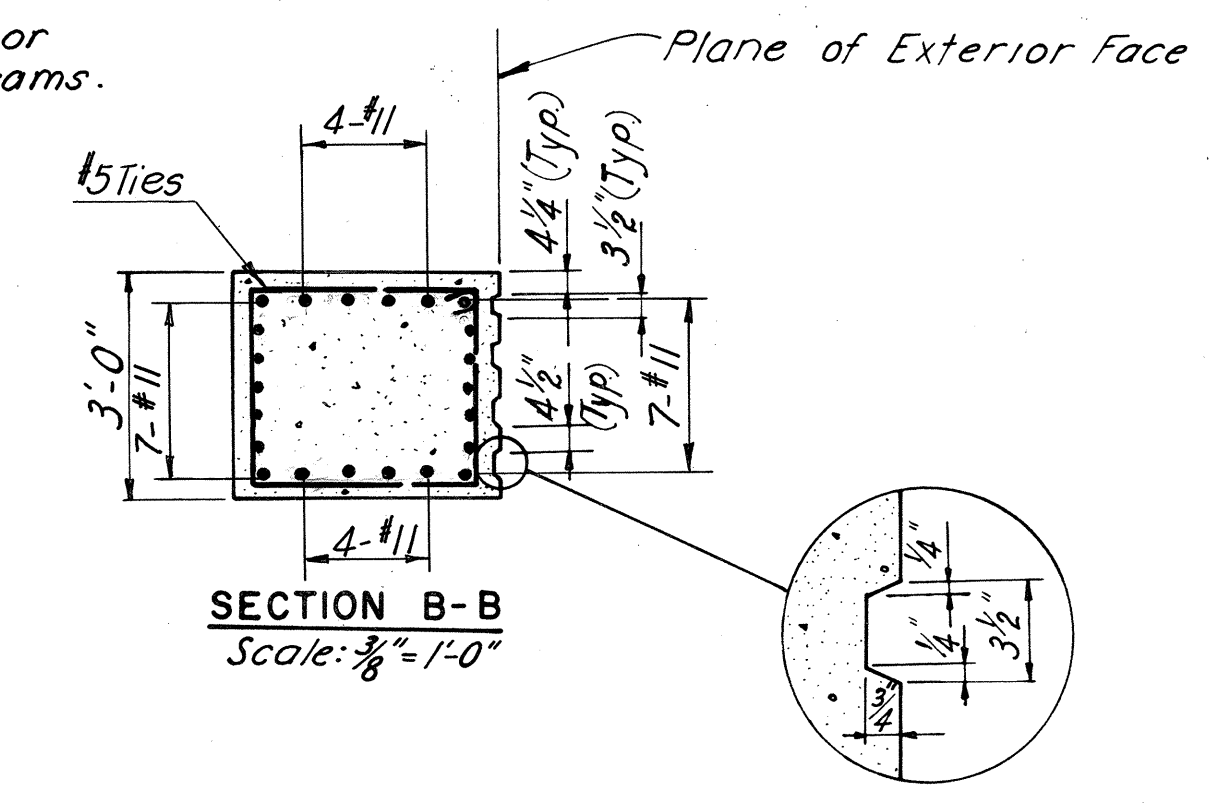
BY	DATE				
MADE	JLN 2-68	2	As Built	JRC	3-73
CHECKED	T.H.N. 2-68	1	Del. backwall dim.	E.F.	5-68
IN CHARGE	RHW				
		NO.	REVISION	BY	DATE



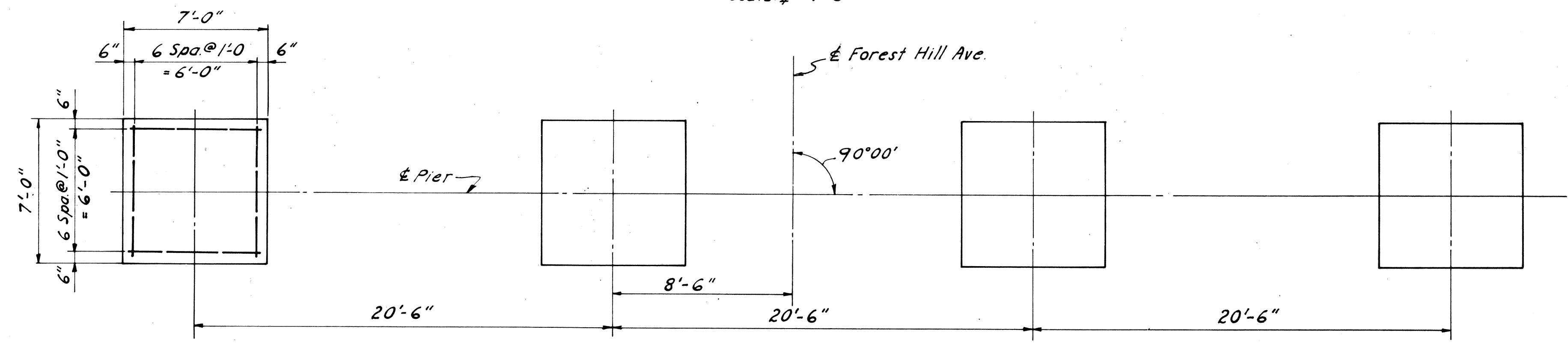
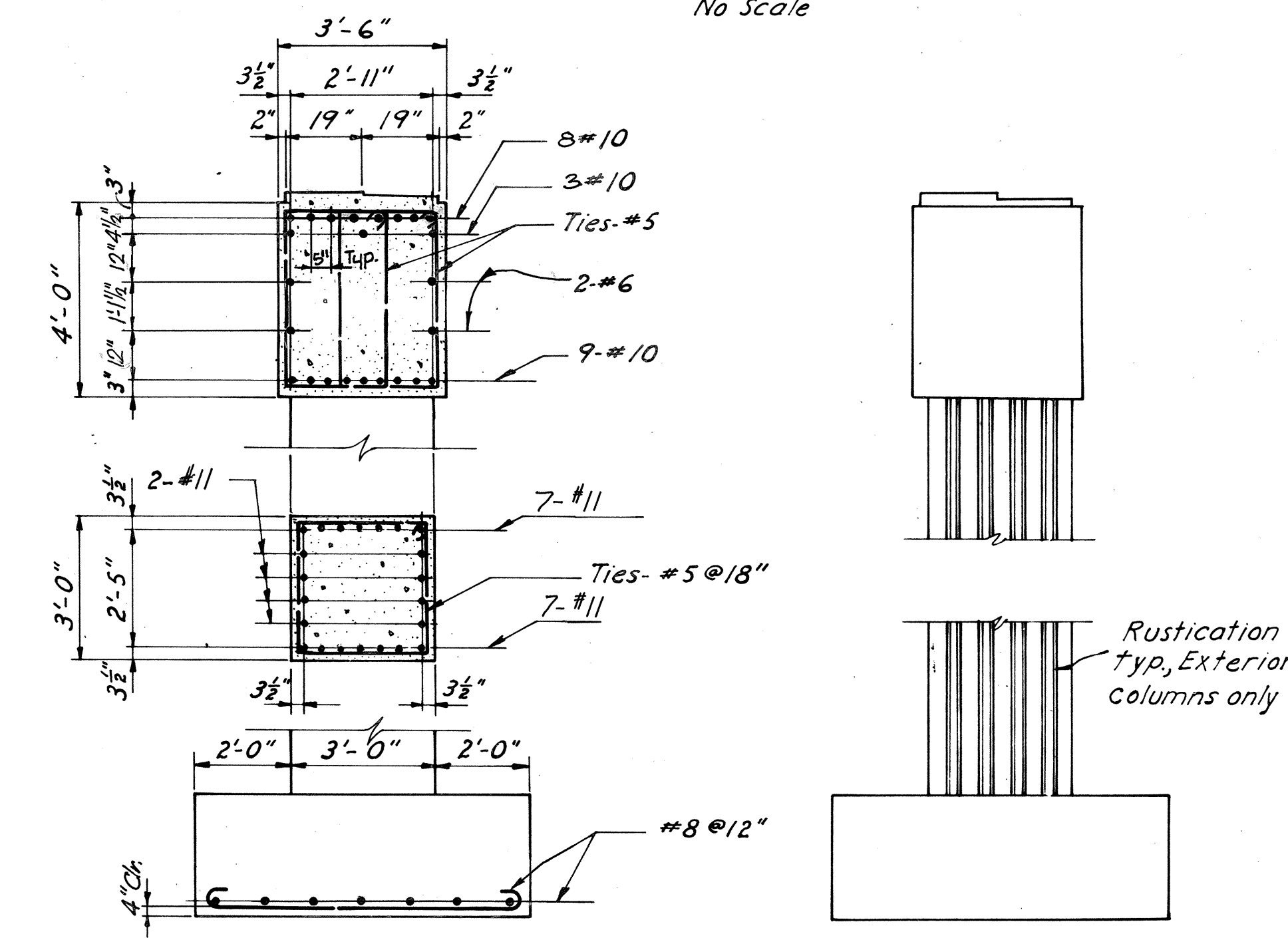
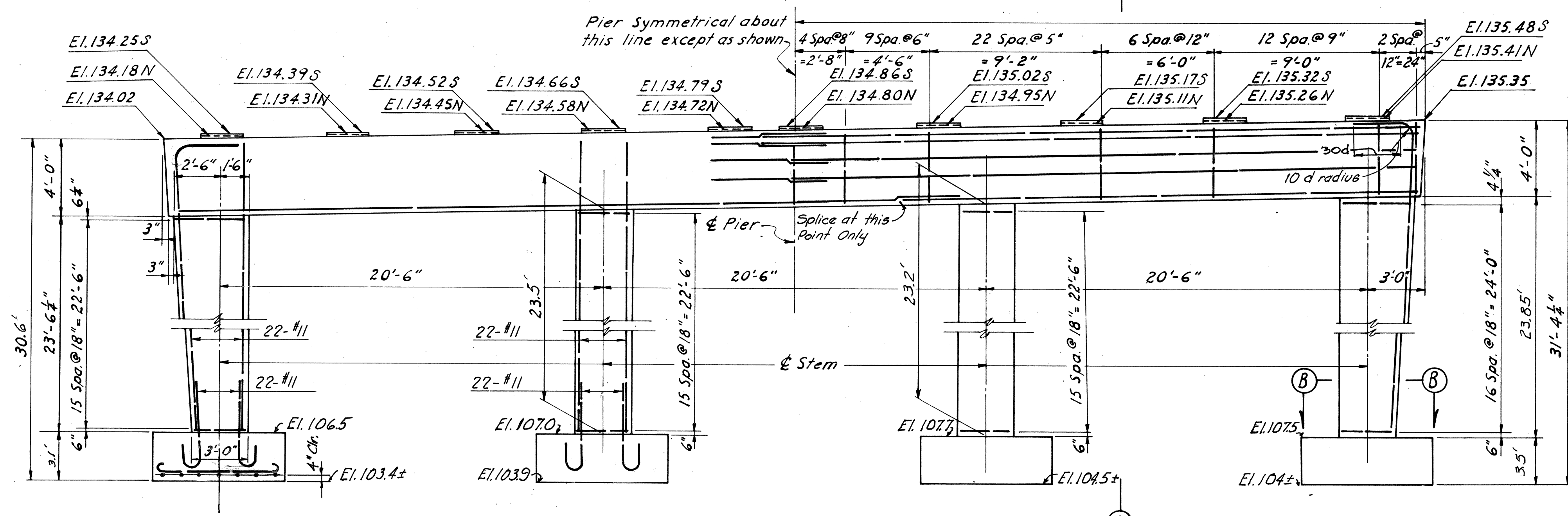
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	157	188



NOTE: See sh. 2 for Anchor Bolt Setting Diagrams.



RUSTICATION DETAILS  
No Scale



NOTE: All pier footing elevations are approximate only and may be varied to suit field conditions as directed by the Engineer. Vertical shaft reinforcing shall not be cut until these elevations are established. Where elevations change more than 2 ft., redesign will be required.

BY	DATE	NO.	REVISION	BY	DATE
MADE	JLN 2-68				
CHECKED	THN 2-68	1	As Built	JRC	3-73
IN CHARGE	RHW				

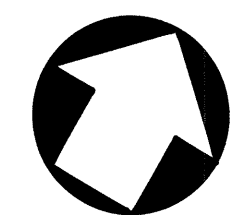
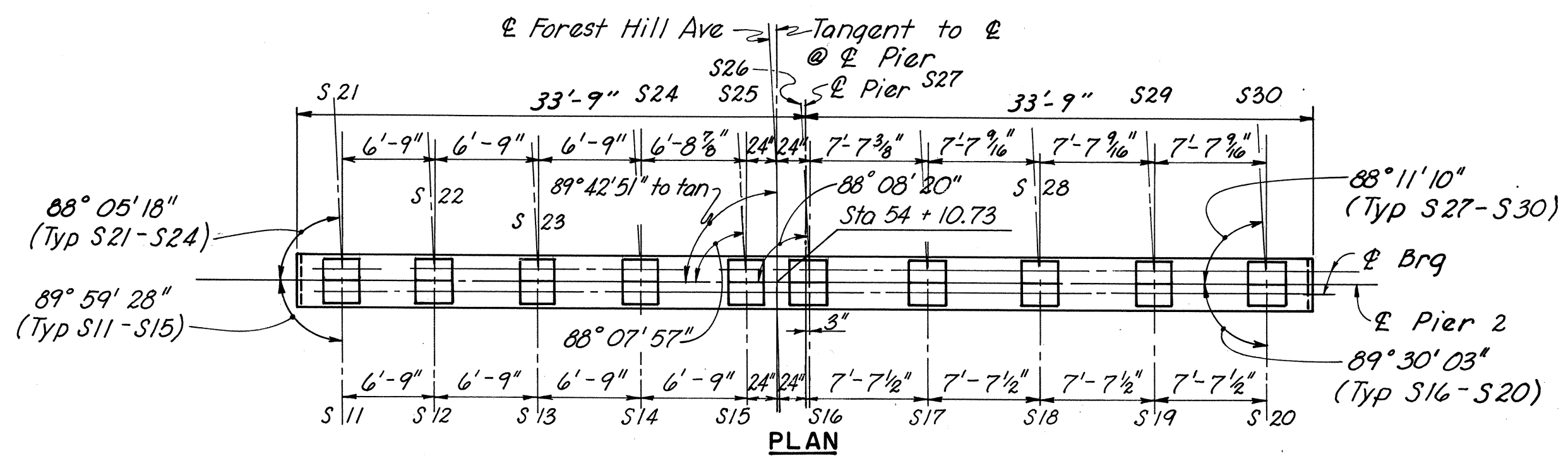
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY  
FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06  
**PIER I DETAILS**

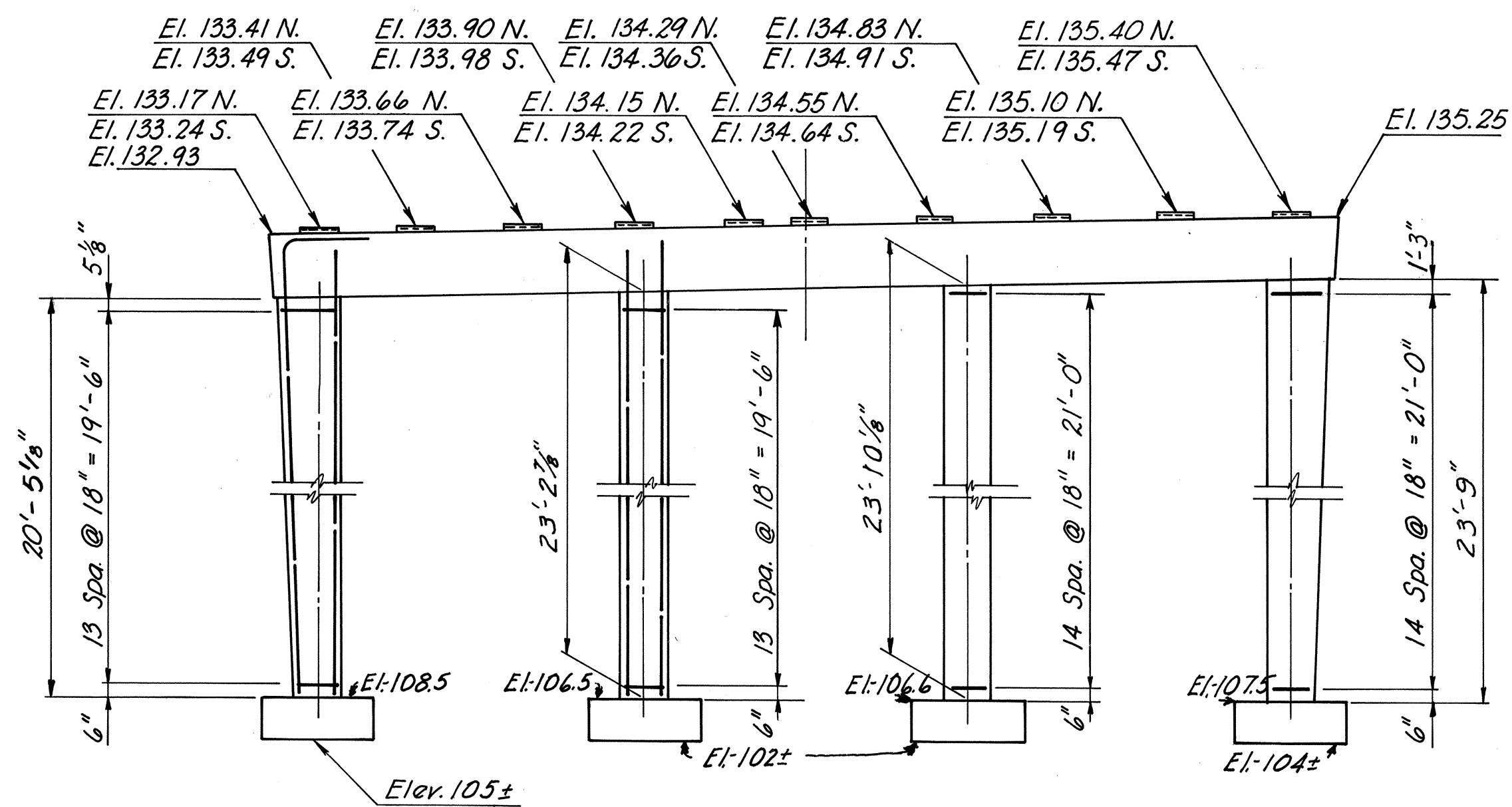
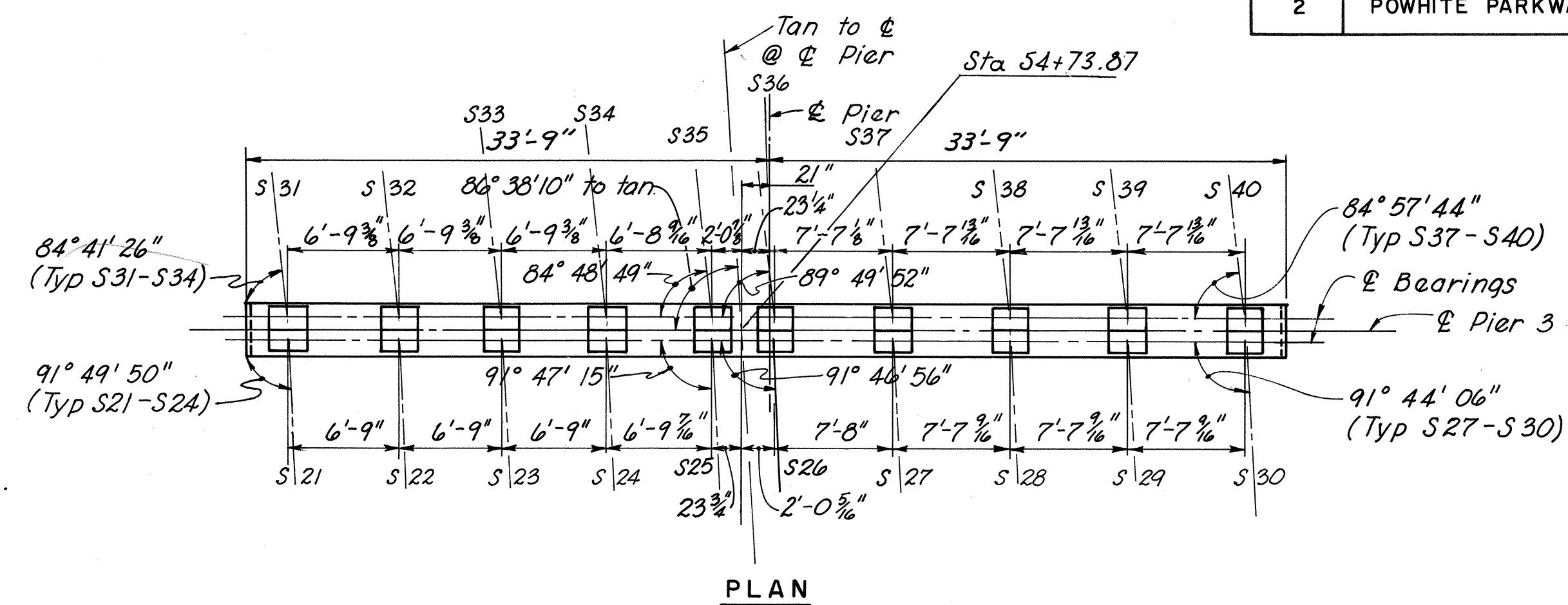
HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

SCALE: AS SHOWN  
CONTRACT NO.: 2  
SHEET NO. 7 OF 18

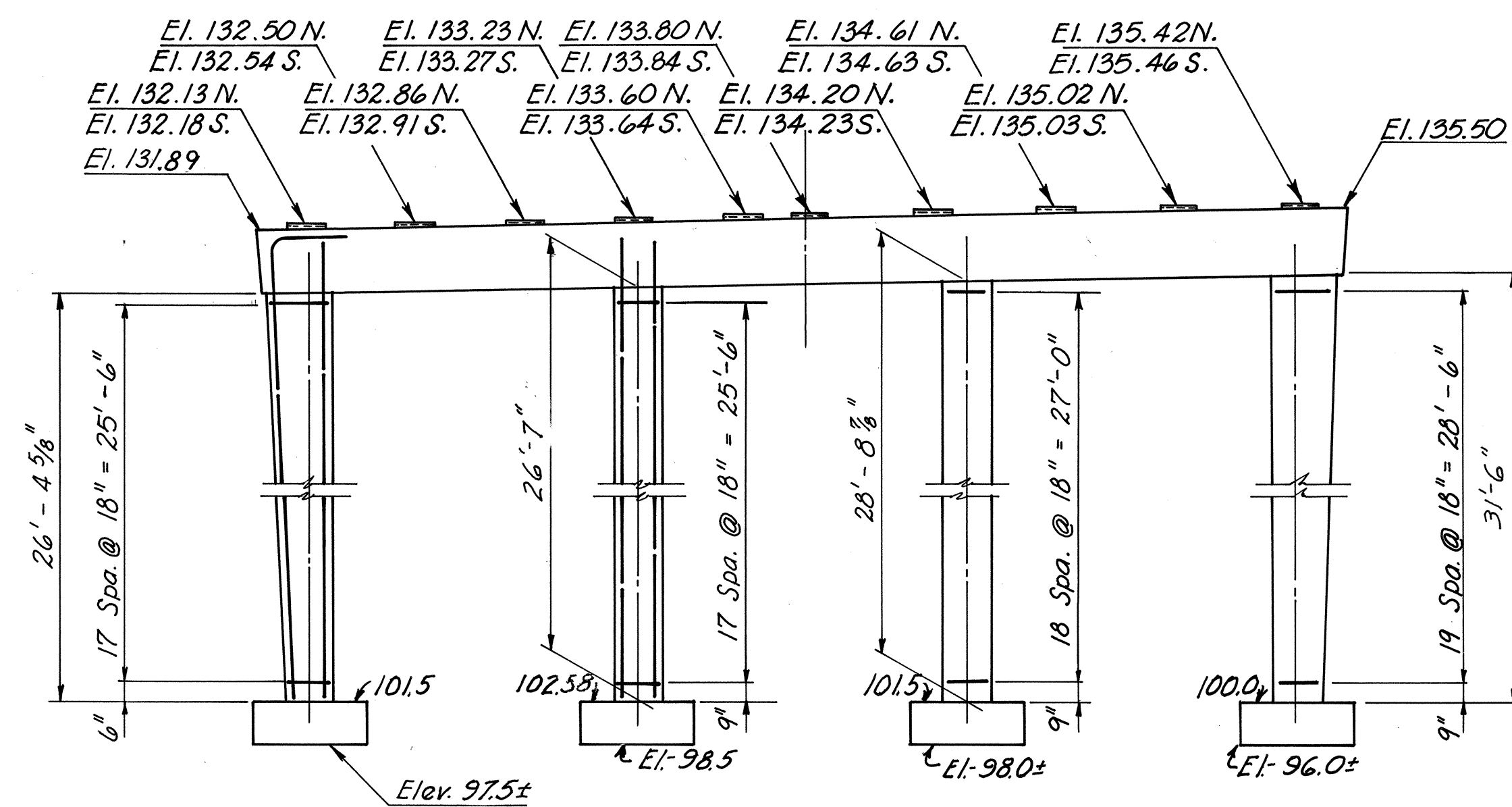
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	158	188



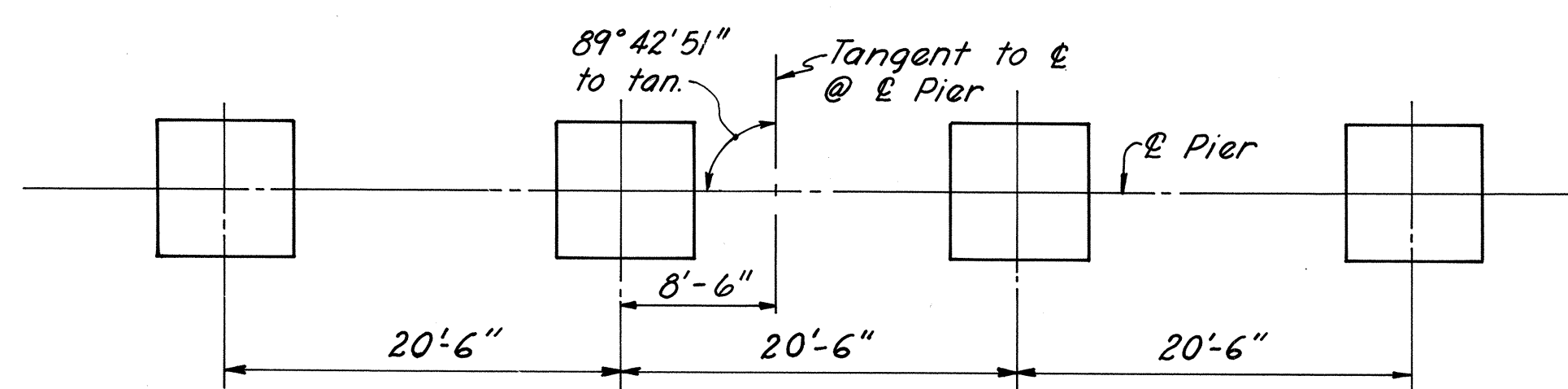
NOTE: See sh. 2 for Anchor Bolt Setting Diagrams.



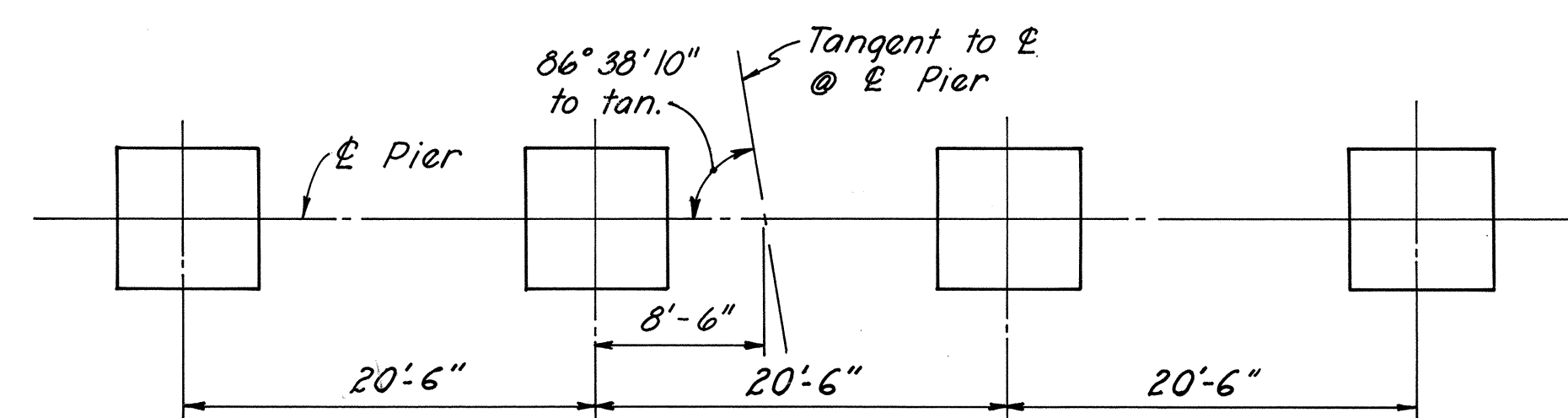
ELEVATION - PIER 2



ELEVATION - PIER 3



FOOTING PLAN



FOOTING PLAN

**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY

FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06

**PIERS 2 & 3 DETAILS**

HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

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

CONTRACT NO.: 2

SHEET NO. 8 OF 18

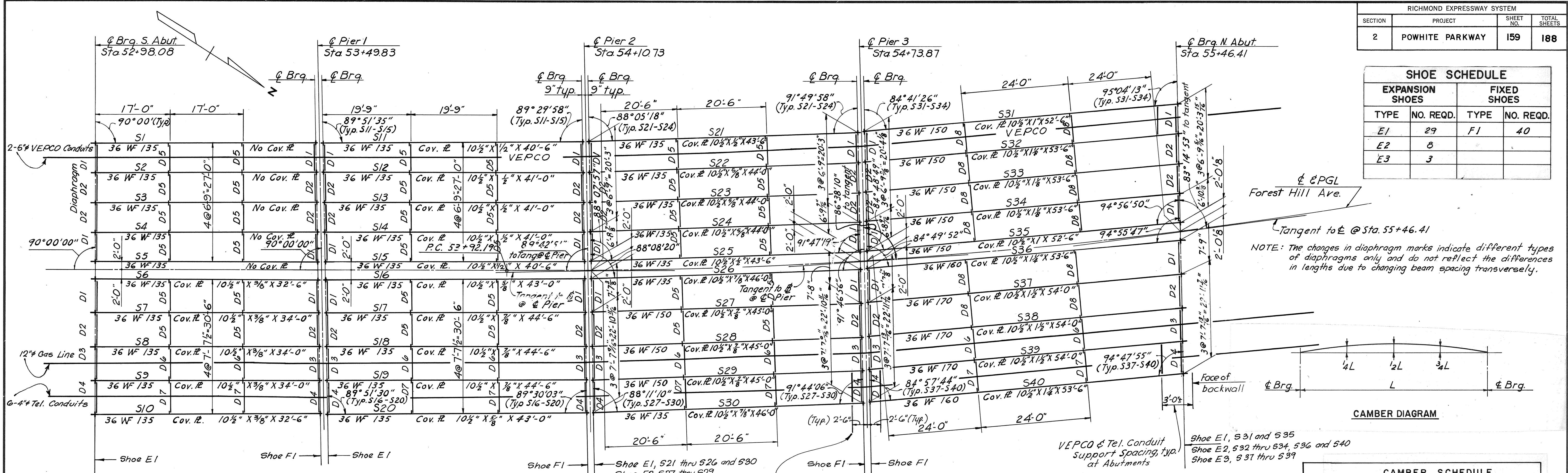
BY	DATE	REVISION	BY	DATE
MADE	JLN 2-68			
CHECKED	THN 2-68	1 As Built	JRC	3-73
IN CHARGE	RHW			

Note: For dimensions, reinforcement and details not shown, see Pier 1, Sheet 7



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	159	188

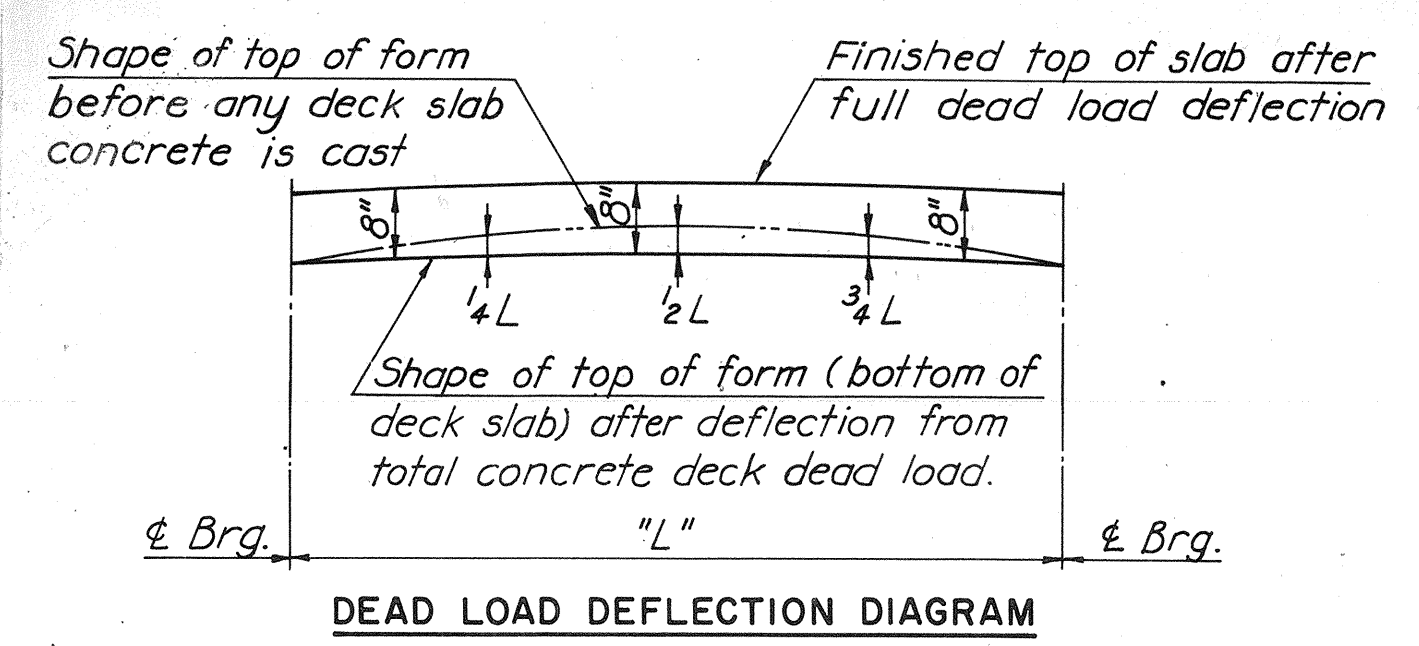
SHOE SCHEDULE			
EXPANSION SHOES		FIXED SHOES	
TYPE	NO. REQD.	TYPE	NO. REQD.
E1	29	F1	40
E2	8		
E3	3		



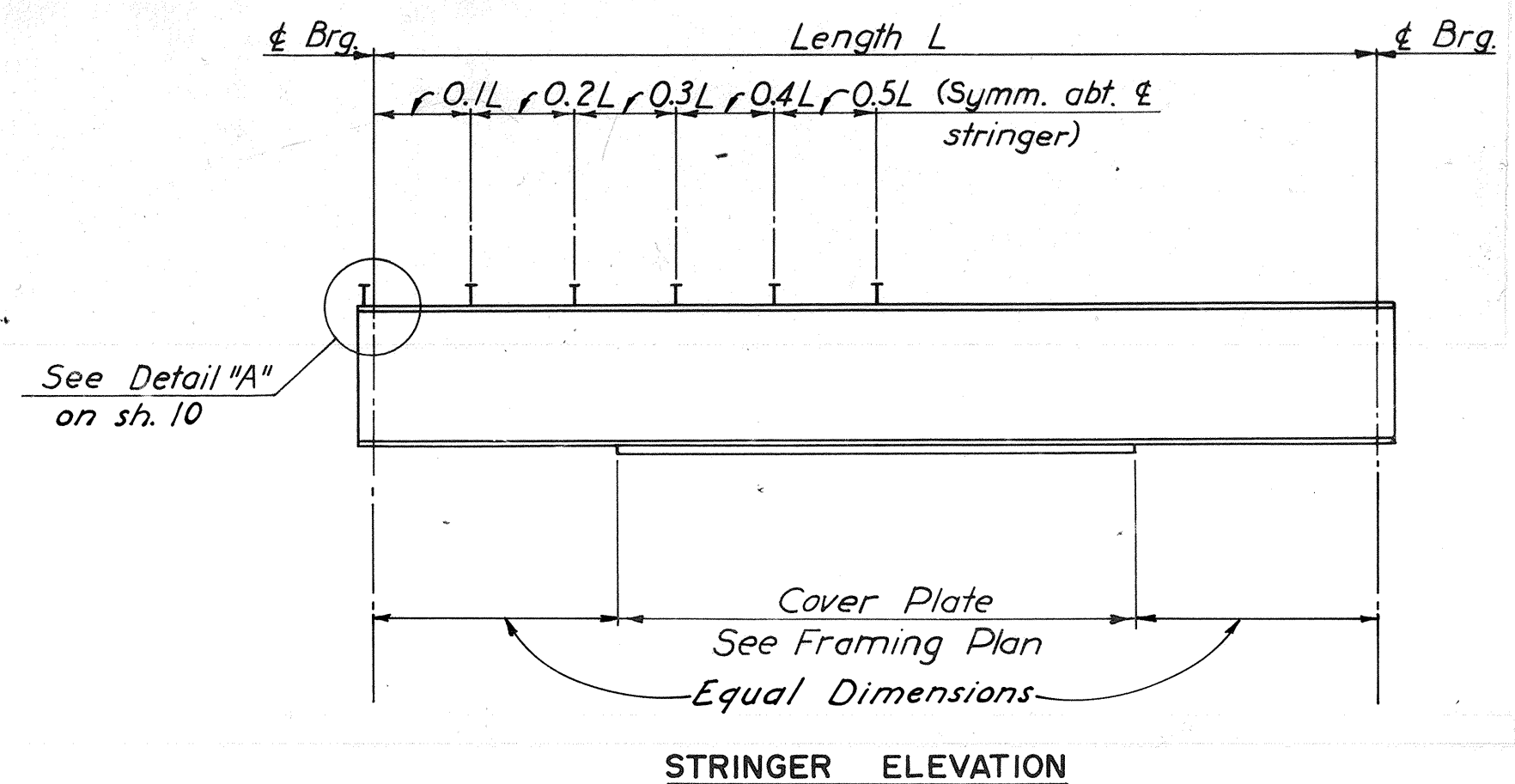
CAMBER DIAGRAM

CAMBER SCHEDULE							
STR.	1/4L	1/2L	3/4L	STR.	1/4L	1/2L	3/4L
S1-S5	3/8	9/16	3/4				
S2-S4	1/16	1/8	1/4				
S6-S10	1/2	3/4	1				
S11-S15	3/4	1 1/8	1 1/2				
S16-S20	1 1/8	1 3/8	1 7/8				
S21-S25	1 1/2	1 5/8	2 1/8				
S26-S30	1 5/8	2 1/8	2 3/8				
S31-S35	2 1/8	2 3/8	2 7/8				
S36-S40	2 3/8	2 7/8	3 1/8				
S37-S39	1 1/2	1 7/8	2 1/8				

**NOTE TO FABRICATOR:**  
 The above stringers shall be fabricated with an upward camber amounting to the tabulated value. This will provide approximate compensation for deflection under full dead load and for conformity with finished grade. Dimensions are in inches.



STRINGER SCHEDULE						
STR.	LENGTH € BRG. TO € BRG.	SHEAR STUD SPACING				
		0.1L	0.2L	0.3L	0.4L	0.5L
S1-S10	51'-0"	6"	7"	8"	10"	12 1/2"
S11	59'-0 7/8"	7"	8"	9 1/2"	11 1/2"	14 1/2"
S12	59'-1 3/8"	6 1/2"	7 1/2"	9"	11"	14"
S13	59'-2 1/8"	6 1/2"	7 1/2"	9"	11"	14"
S14	59'-3 1/8"	6 1/2"	7 1/2"	9"	11"	14"
S15	59'-4 1/8"	7"	8"	9 1/2"	11 1/2"	14 1/2"
S16	59'-5 1/8"	6"	7"	8 1/2"	10 1/2"	13 1/2"
S17	59'-6 1/8"	5 1/2"	6 1/2"	8"	10"	12 1/2"
S18	59'-7 1/8"	5 1/2"	6 1/2"	8"	10"	12 1/2"
S19	59'-8 1/8"	5 1/2"	6 1/2"	8"	10"	12 1/2"
S20	59'-9 1/8"	6"	7"	8 1/2"	10 1/2"	13 1/2"
S21	61'-7 1/8"	7"	8"	9 1/2"	11 1/2"	14 1/2"
S22	61'-7 1/4"	6 1/2"	7 1/2"	9"	11"	14"
S23	61'-7 3/8"	6 1/2"	7 1/2"	9"	11"	14"
S24	61'-7 1/2"	6 1/2"	7 1/2"	9"	11"	14"
S25	61'-7 3/4"	7"	8"	9 1/2"	11 1/2"	14 1/2"
S26	61'-7 3/8"	6"	7"	8 1/2"	10 1/2"	13 1/2"
S27	61'-7 3/4"	5 1/2"	6 1/2"	8"	10"	12 1/2"



STRINGER SCHEDULE						
STR.	LENGTH € BRG. TO € BRG.	SHEAR STUD SPACING				
		0.1L	0.2L	0.3L	0.4L	0.5L
S28	61'-7 1/8"	5 1/2"	6 1/2"	8"	10"	12 1/2"
S29	61'-8"	5 1/2"	6 1/2"	8"	10"	12 1/2"
S30	61'-8 1/8"	6"	7"	8 1/2"	10 1/2"	13 1/2"
S31	71'-8 1/8"	7"	8"	9 1/2"	11 1/2"	15"
S32	71'-8 3/8"	6 1/2"	7 1/2"	9"	11"	14"
S33	71'-8 3/4"	6 1/2"	7 1/2"	9"	11"	14"
S34	71'-9 1/8"	6 1/2"	7 1/2"	9"	11"	14"
S35	71'-9 1/4"	7"	8"	9 1/2"	11 1/2"	15"
S36	71'-9 3/8"	6"	7"	9"	10 1/2"	13 1/2"
S37	71'-9 3/4"	5 1/2"	6 1/2"	8"	10"	12 1/2"
S38	71'-10 1/8"	5 1/2"	6 1/2"	8"	10"	12 1/2"
S39	71'-10 1/4"	5 1/2"	6 1/2"	8"	10"	12 1/2"
S40	71'-11 1/8"	6"	7"	9"	10 1/2"	13 1/2"

Those stringers having a total camber of less than 1" are not required to be shop cambered, but should be turned so that any mill tolerance deviation from straightness will be in the direction shown by the Camber diagram above.

DEFLECTION SCHEDULE					
STR.	1/4L	1/2L	STR.	1/4L	1/2L
S1-S5	3/8	9/16	S36-S40	1 1/8	1 1/2
S6-S10	1/16	5/8			
S11-S15	3/8	7/8			
S16-S20	1/16	15/16			
S21-S25	3/4	1 1/8			
S26-S30	1/16	1			
S31-S35	1	1 1/16			

**NOTE TO CONTRACTOR:**  
 The above deflections are those anticipated to occur in the stringer upon placement of the total concrete deck dead load. In practice, the stringers in place are not likely to have the exact camber to compensate for these deflections during construction. The residual amounts shall be provided for by adjusting forms to vary the thickness of the concrete bolter between the bottom of the slab and the top of stringers, without alteration of the slab thickness.

BY	DATE	NO.	REVISION	BY	DATE
MADE	DEK. 10-67	2	As Built	JRC	3-73
CHECKED	THN 2-68	1	Conduit Support Sp.	J.L.N.	5-12-68
IN CHARGE	RHW				

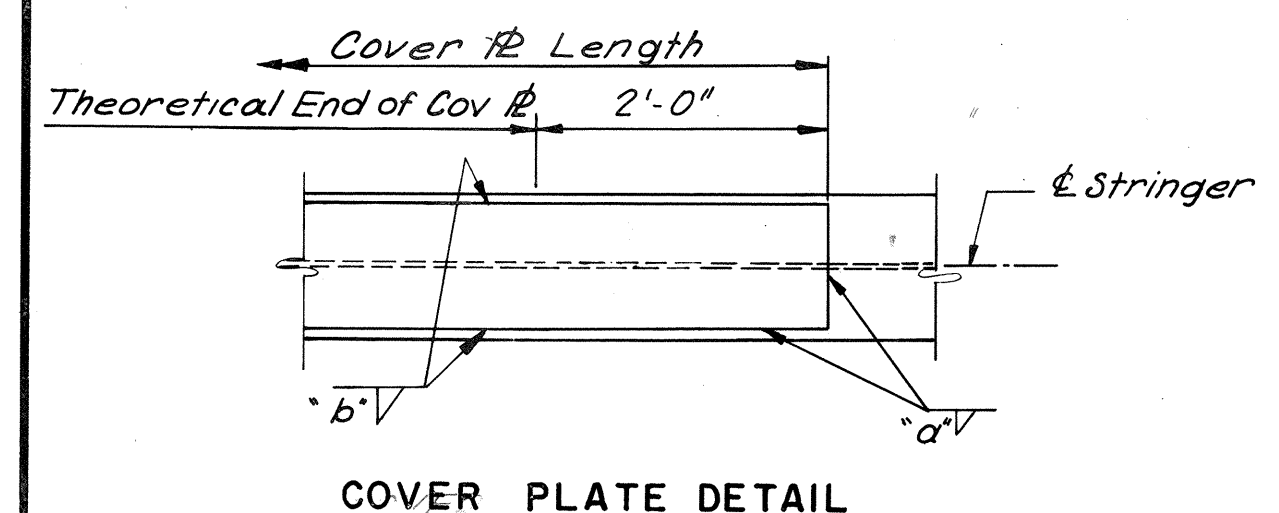
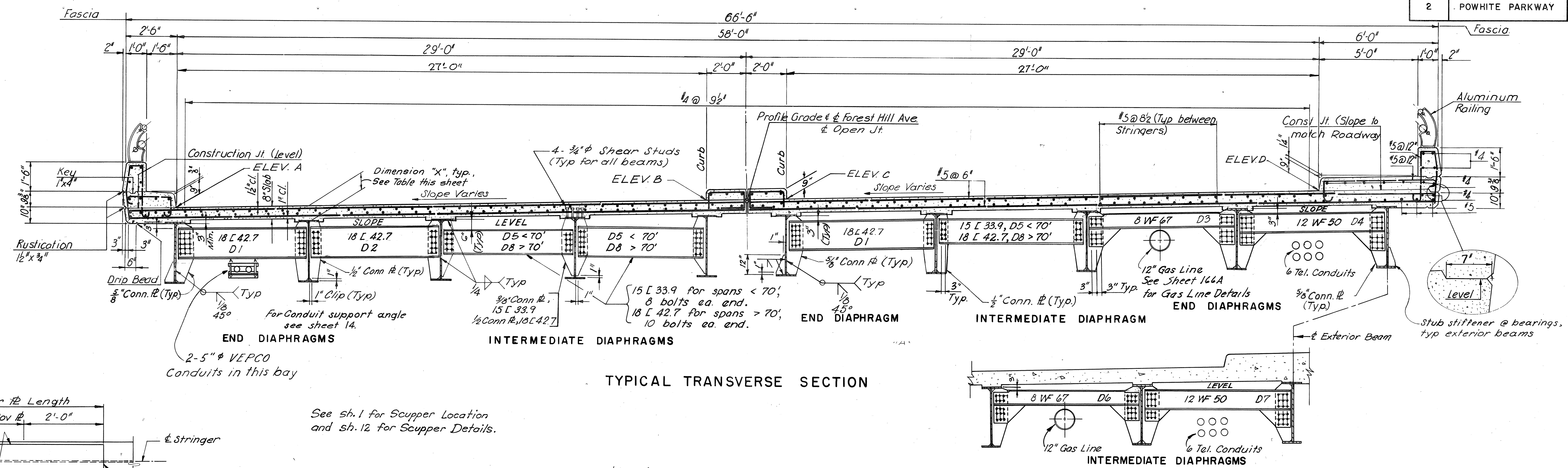
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM  
 POWHITE PARKWAY  
 FOREST HILL AVENUE OVER  
 POWHITE PARKWAY  
 BRIDGE B06  
**FRAMING PLAN**

HAYES, SEAY, MATTERN & MATTERN  
 Associate Engineers  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 General Consultants

SCALE: AS SHOWN  
 CONTRACT NO.: 2  
 SHEET NO. 9 OF 18



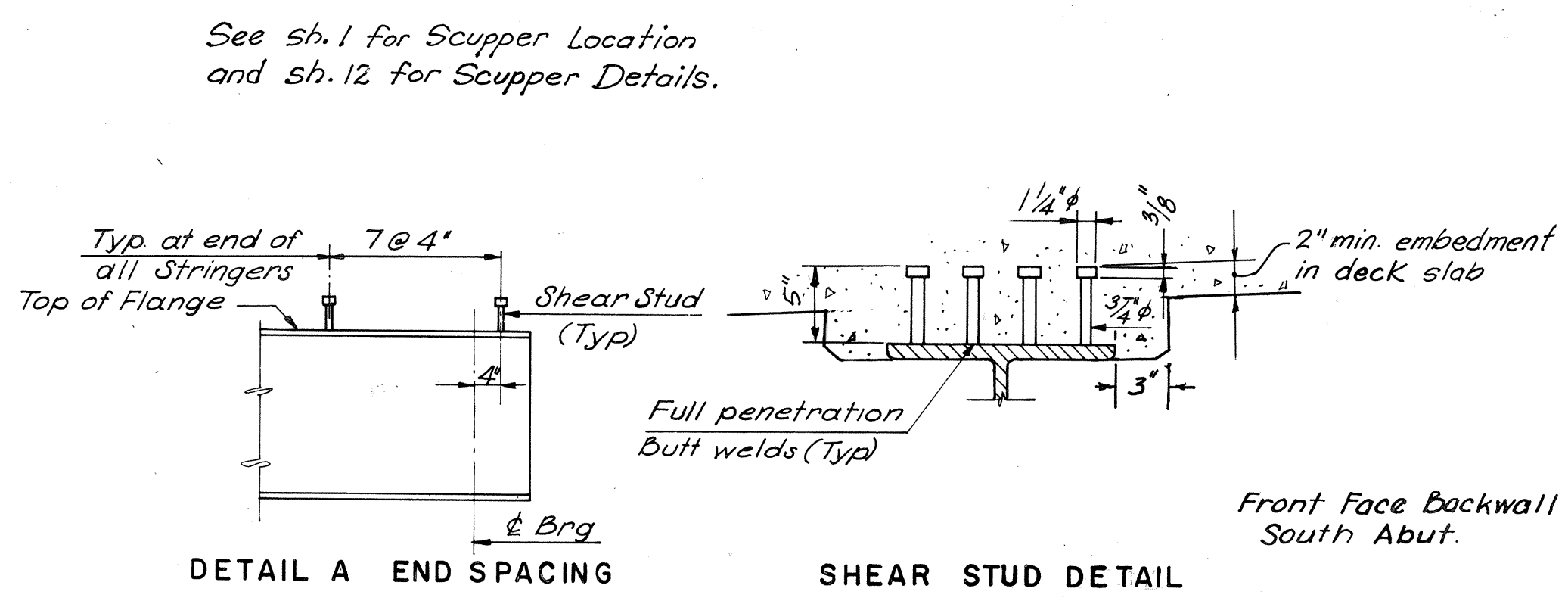


No Cover # Required for Str S1 Thru S5

**WELD SIZES**

STR.	WELD SIZES	
	"a"	"b"
S6 Thru S10	5/16	5/16
S11 Thru S15	5/16	5/16
S16 Thru S20	3/8	5/16
S21 Thru S25	5/16	5/16
S26 Thru S30	3/8	5/16
S31 Thru S35	1/2	5/16
S36 Thru S40	5/8	3/8

See "FRAMING PLAN" sh. 9 For Stringer Designation



Note: Three 7/8" φ Studs May be Substituted at the Same Longitudinal Spacing For Four 3/4" φ Studs. Stud Rows Shall be placed parallel to the Main Deck Reinforcement.

**DIMENSION "X"**

STRINGER	DIMENSION "X"
S1-S26	10 3/16"
S27-S29	10 1/16"
S30	10 3/16"
S31-S35	10 3/16"
S36	10"
S37-S39	9 7/8"
S40	10"

Dimension "X" is from Top of Stringer Flange to Top of Slab.

**GUTTER LINE ELEVATIONS**

STATION	ELEV. A	ELEV. B	ELEV. C	ELEV. D	STATION	ELEV. A	ELEV. B	ELEV. C	ELEV. D
52 + 70.0	139.83	139.80	139.79	139.76	54 + 70.0	136.53	137.93	138.14	139.54
80	139.67	139.70	139.71	139.75	72.21				139.54
90	139.50	139.61	139.63	139.74	73.75			138.11	
96.83	139.39	139.55	139.57	139.73	73.94		137.90		
53 + 00.0	139.34	139.52	139.54	139.72	75.62	136.43			
10	139.17	139.42	139.46	139.71	80	136.36	137.84	138.05	139.53
20	139.01	139.33	139.38	139.70	90	136.20	137.74	137.97	139.52
30	138.84	139.24	139.30	139.69	55 + 00.0	136.03	137.65	137.89	139.51
40	138.68	139.14	139.21	139.68	10	135.94	137.56	137.80	139.42
49.83	138.51	139.05	139.13	139.67	20	135.85	137.47	137.71	139.33
50	138.51	139.05	139.13	139.67	30	135.77	137.39	137.63	139.25
60	138.35	138.96	139.05	139.66	40	135.68	137.30	137.54	139.16
70	138.18	138.86	138.96	139.65	43.07				139.13
80	138.02	138.77	138.88	139.64	46.18			137.51	
90	137.85	138.68	138.80	139.63	46.65		137.24		
54 + 00.0	137.68	138.58	138.72	139.62	49.94	135.59			
10	137.52	138.49	138.63	139.61	50	135.59	137.21	137.45	139.07
10.59				139.61	60	135.50	137.12	137.36	138.96
10.72			138.62		70	135.41	137.03	137.27	138.89
10.74		138.48							
10.88	137.50								
20	137.35	138.40	138.55	139.59					
30	137.19	138.30	138.47	139.58					
40	137.02	138.21	138.39	139.57					
50	136.86	138.12	138.30	139.56					
60	136.69	138.02	138.22	139.55					

⊕ Pier 3

⊕ Brg. North Abut.

**AS BUILT**

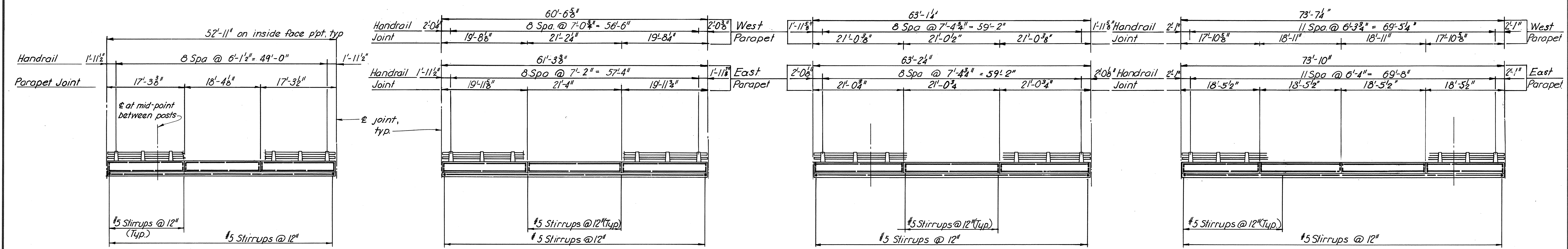
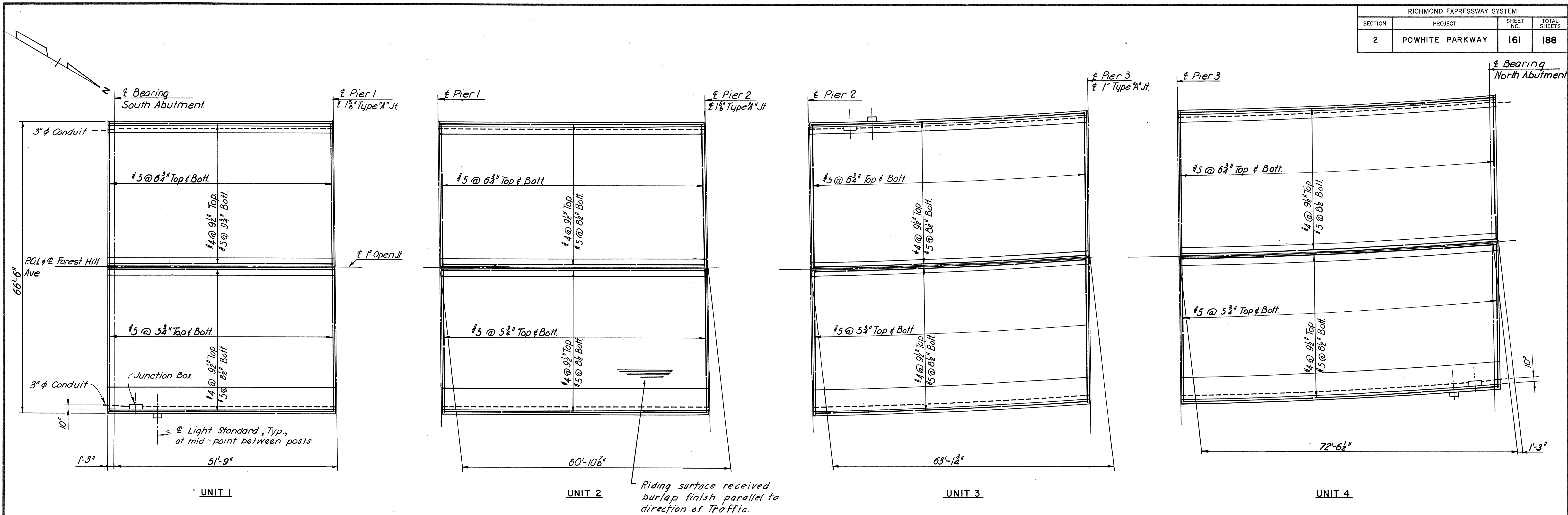
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**RICHMOND EXPRESSWAY SYSTEM**  
 POWHITE PARKWAY  
 FOREST HILL AVENUE OVER  
 POWHITE PARKWAY  
 BRIDGE B-06  
**TYPICAL TRANSVERSE SECTION**

HAYES, SEAY, MATTERN & MATTERN  
 Associate Engineers  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 General Consultants

SCALE: AS SHOWN  
 CONTRACT NO.: 2  
 SHEET NO. 10 OF 18

BY	DATE	NO.	REVISION	BY	DATE
MADE	JDB RSS	2-68	2 As Built	JRC	5-73
CHECKED	THN	2-68	1 General	JGV	10-70
IN CHARGE	RHW				

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	161	188



CURB AND PARAPET ELEVATION

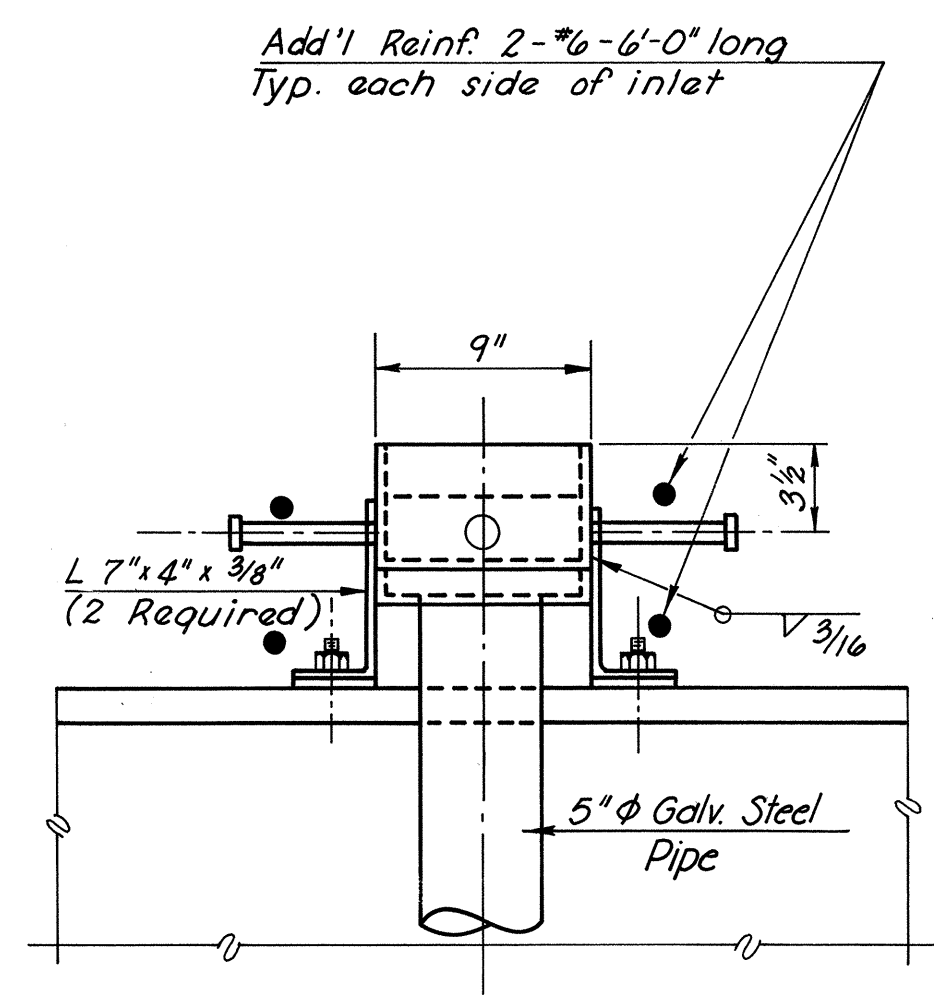
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY  
FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06  
**DECK PLANS**  
HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants  
SCALE: 3/32" = 1'-0"  
CONTRACT NO.: 2  
SHEET NO. 11 OF 18

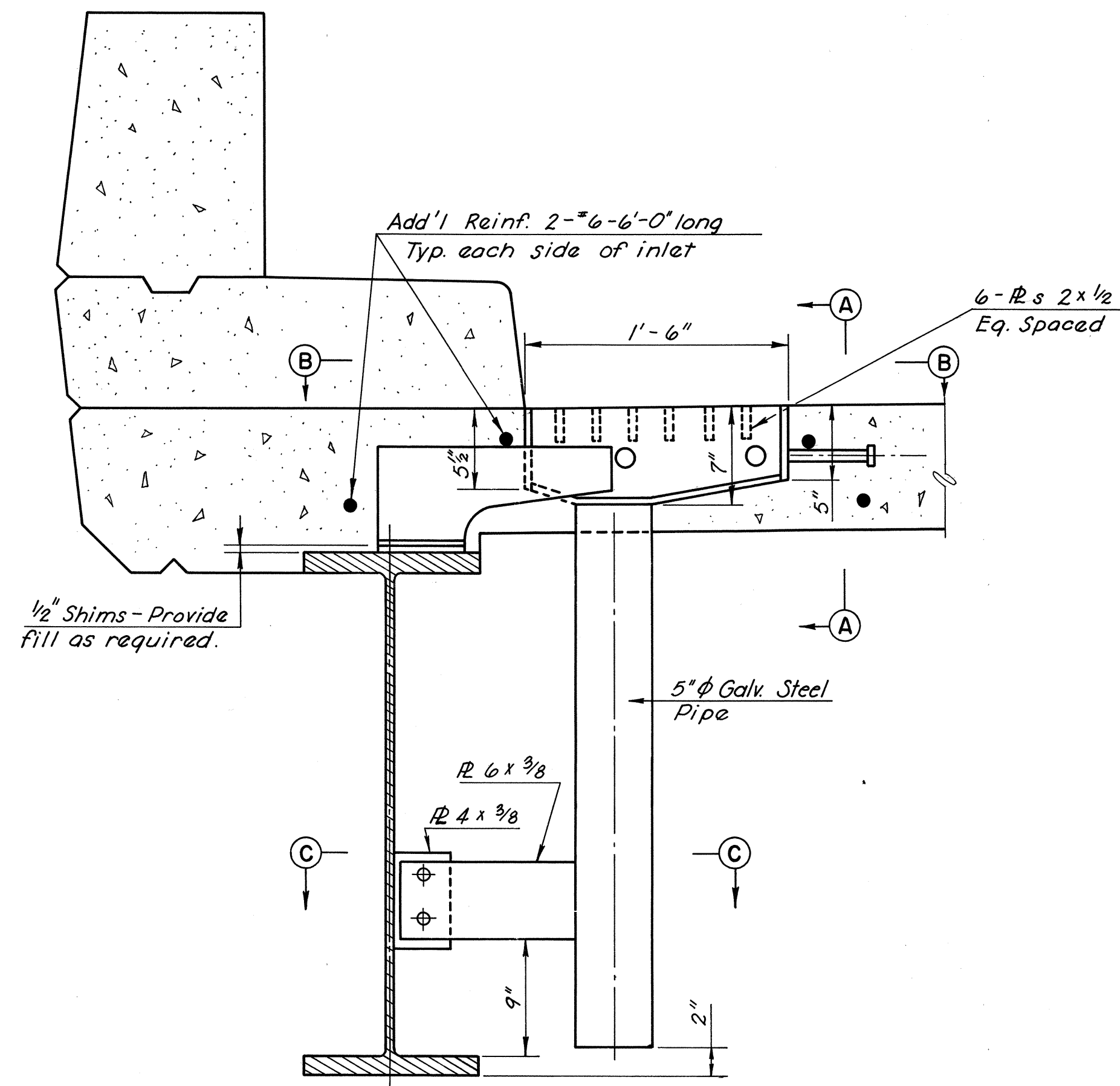
BY	DATE				
MADE	EF	11-67			
CHECKED	THN	2-68	J As Built	JRC	3-73
IN CHARGE	RHW				



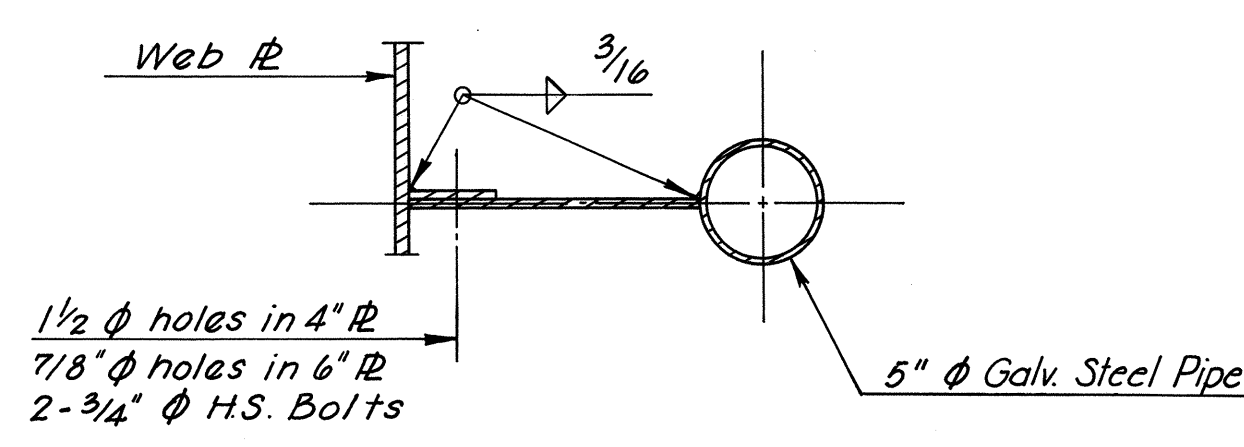
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	162	188



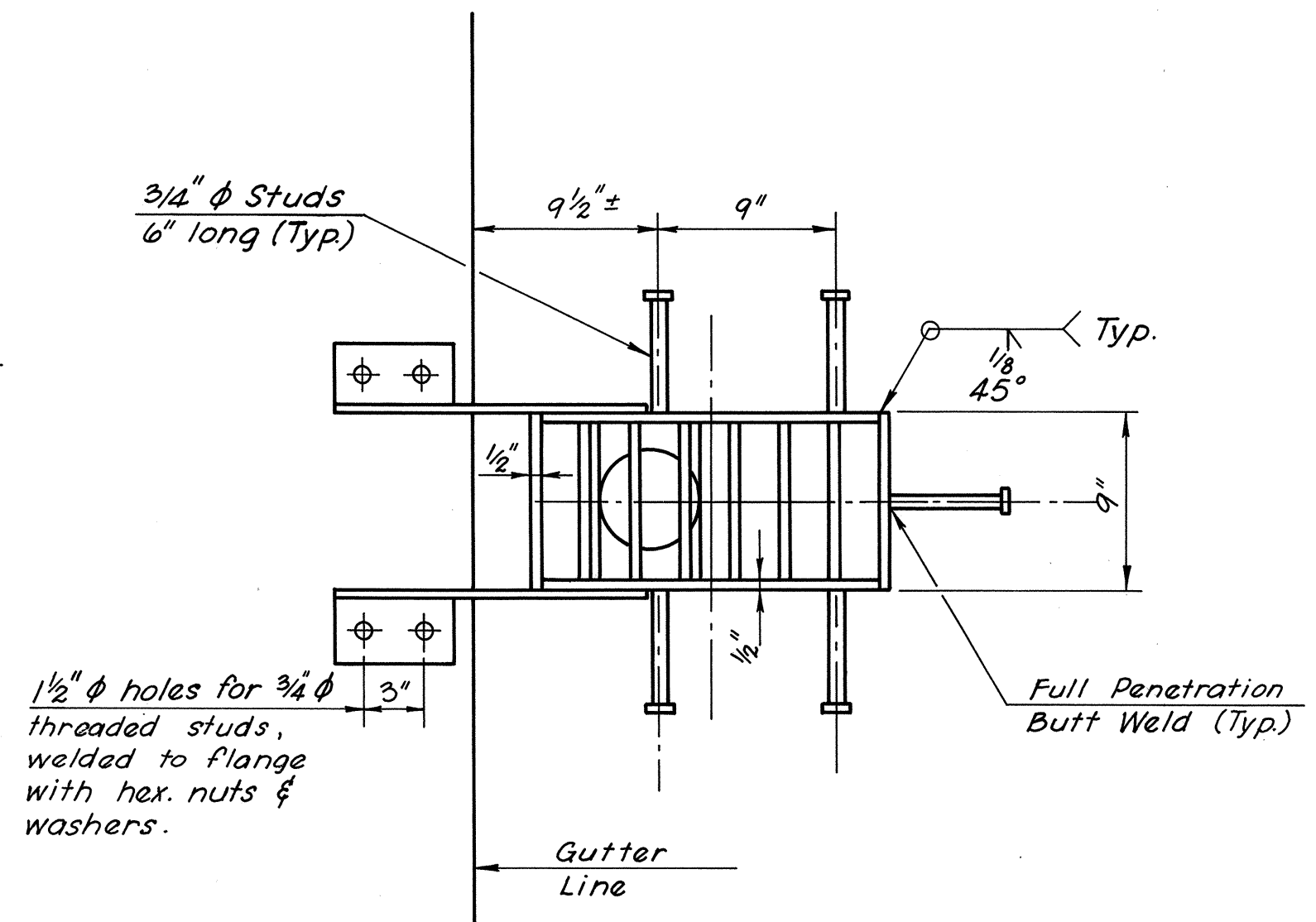
SECTION A - A



DRAINAGE SCUPPER  
2 Required



SECTION C - C



SECTION B - B

**NOTES**

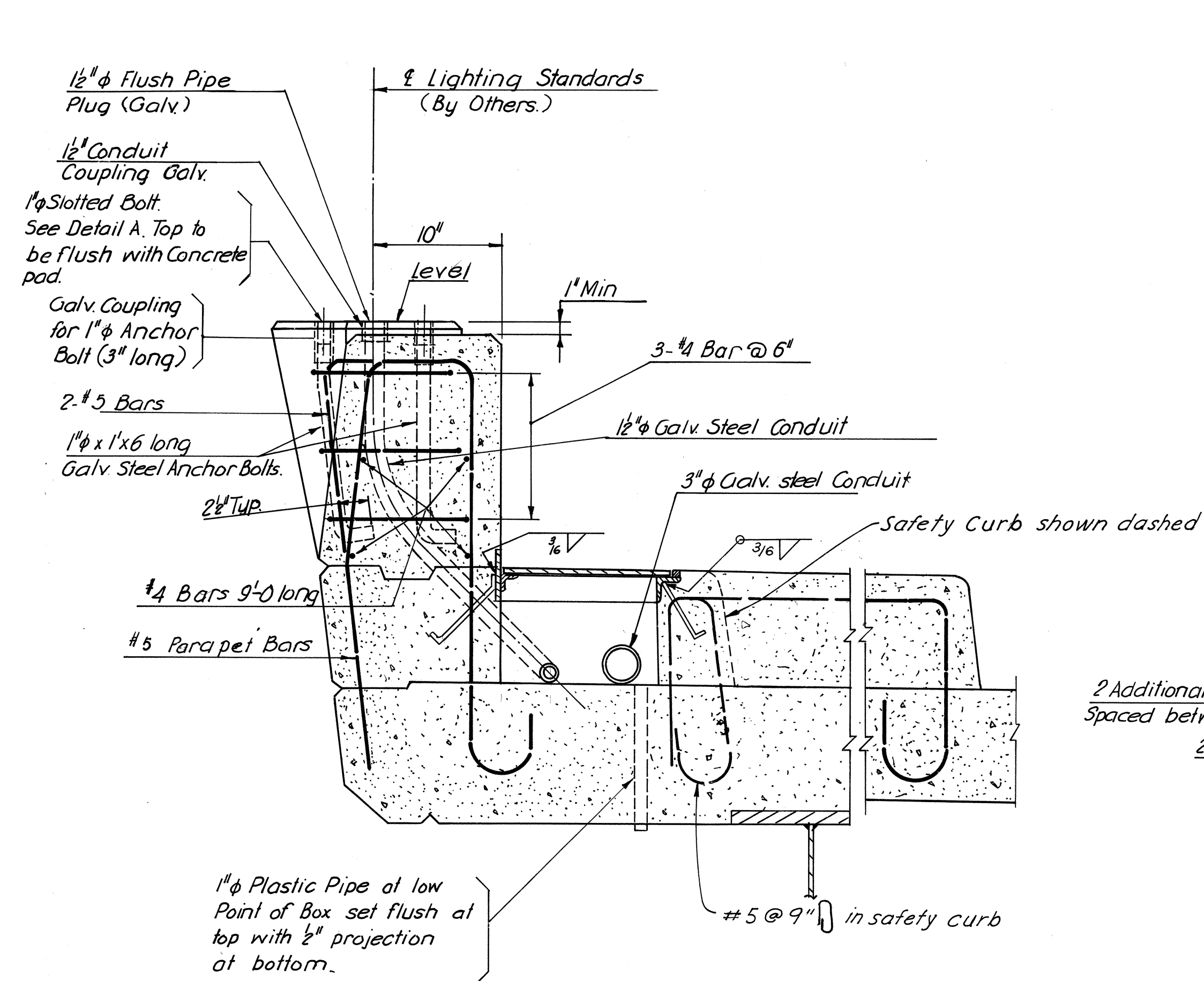
For General Notes, see sheet No. 1  
 For location of scuppers, see sheet No. 1  
 Scuppers are to be fabricated from 1/2" thick plates conforming to A.S.T.M. A36  
 Galvanized Steel Pipe to be in accordance with A.S.T.M. A333 - Grade 9.  
 All drainage metalwork shall be hot-dip galvanized after fabrication in accordance with the following specifications:  
 Scuppers - A.S.T.M. A123  
 Pipe - A.S.T.M. A53  
 Cost of all drainage metalwork to be included in the bid price for "Structural Steel"  
 Cut normal Deck Reinf. at scupper as required.

**AS BUILT**

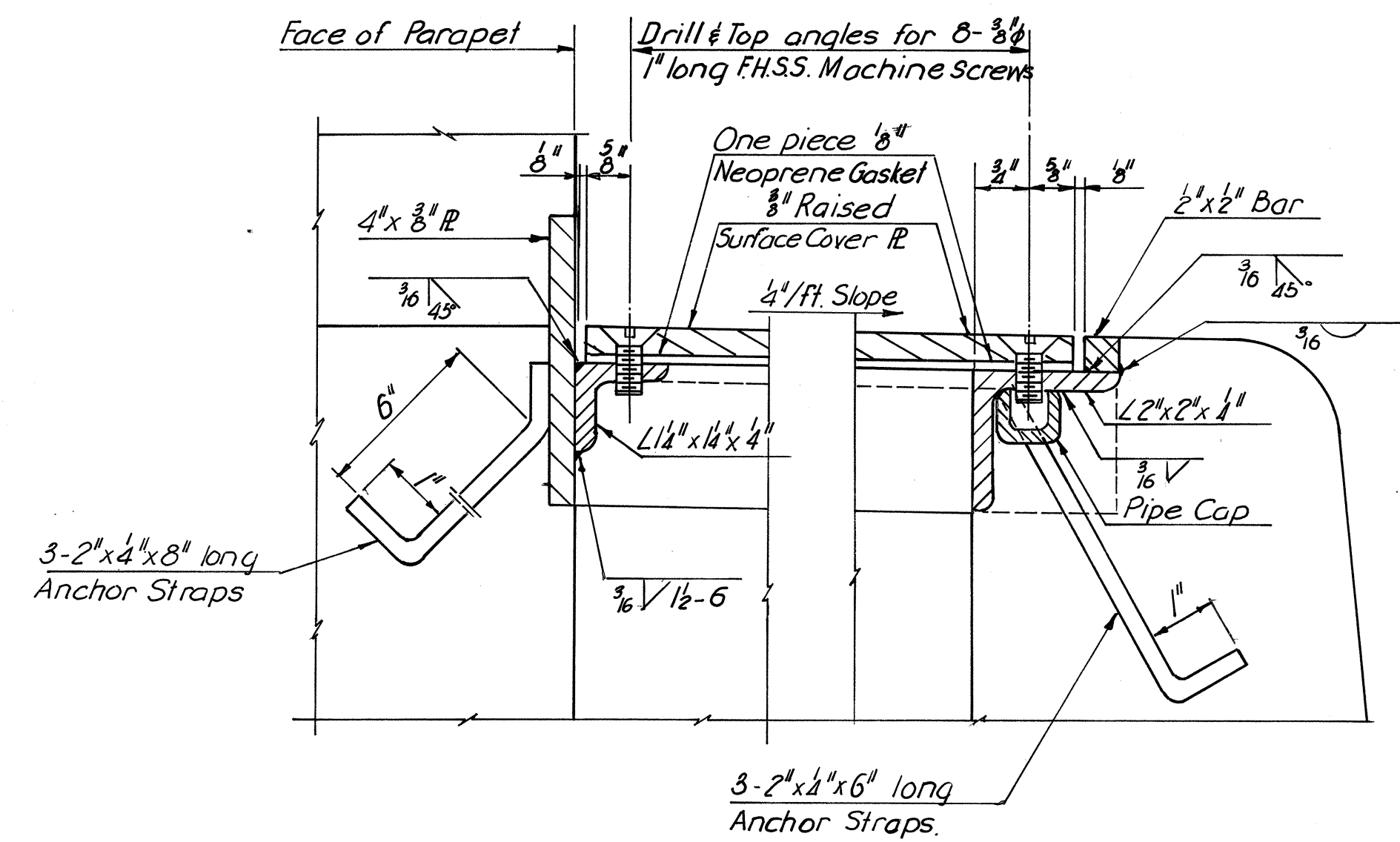
RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM POWHITE PARKWAY	
FOREST HILL AVENUE OVER POWHITE PARKWAY BRIDGE B-06	
SCUPPER DETAILS	
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: 1/2" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO.: 2
	SHEET NO. 12 OF 18

BY	DATE				
MADE	SCH 2-68	2	As Built	JRC	3-73
CHECKED	RHW 2-68	1	General	J.G.V.	10-70
IN CHARGE	RHW		NO. REVISION	BY	DATE

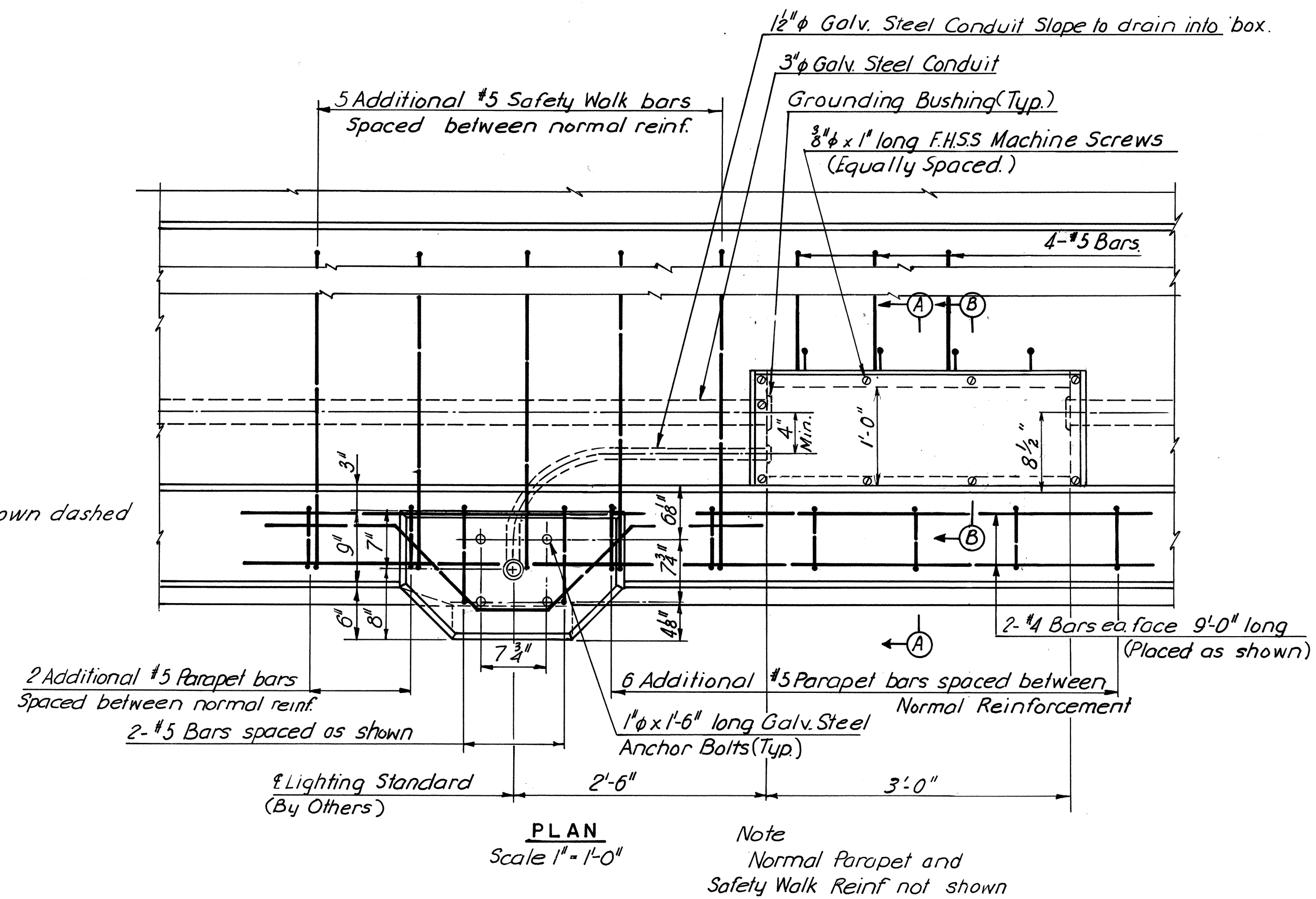
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	163	188



SECTION A-A  
Scale 1/2" = 1'-0"

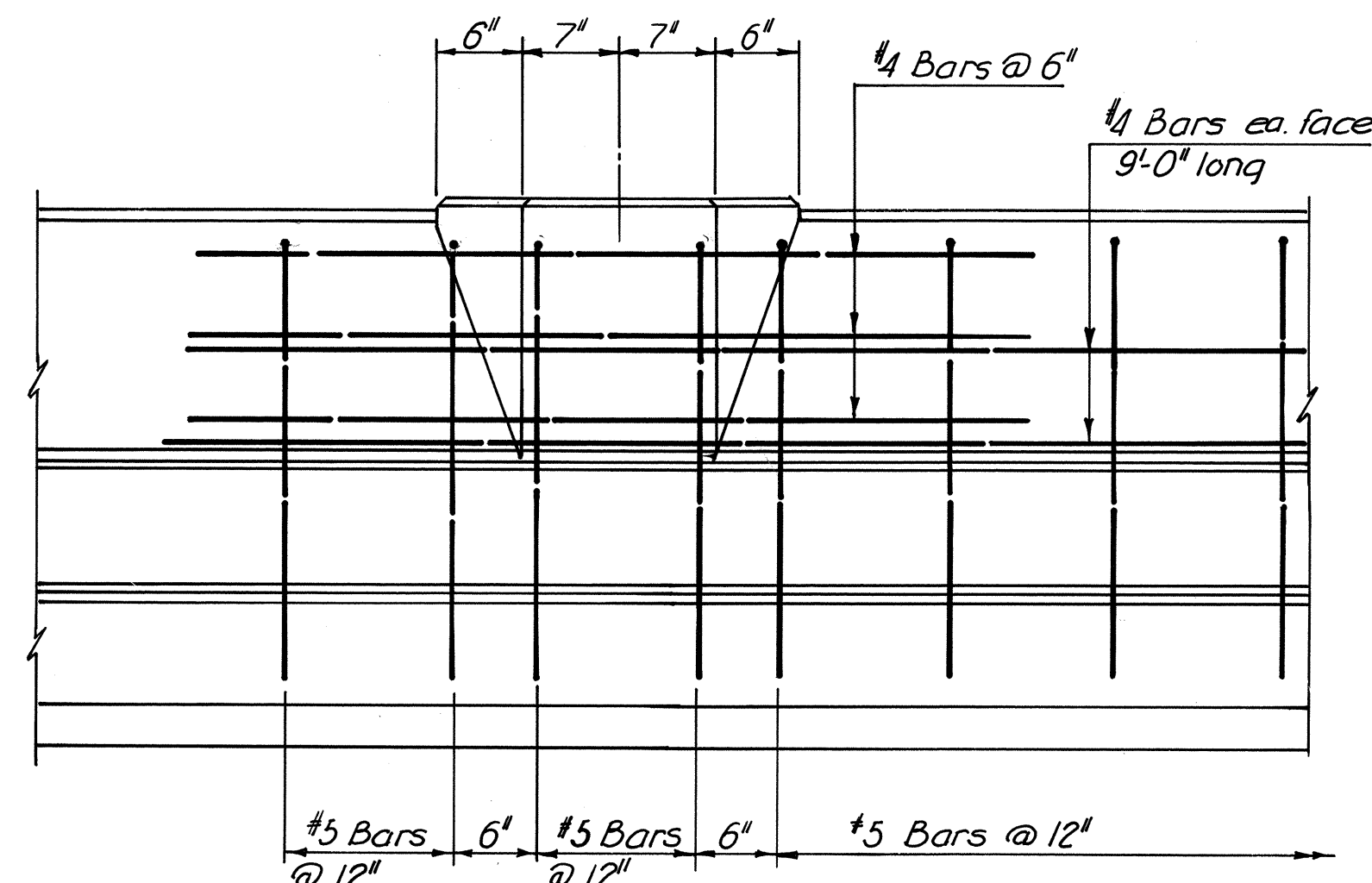


SECTION B-B  
Half Size

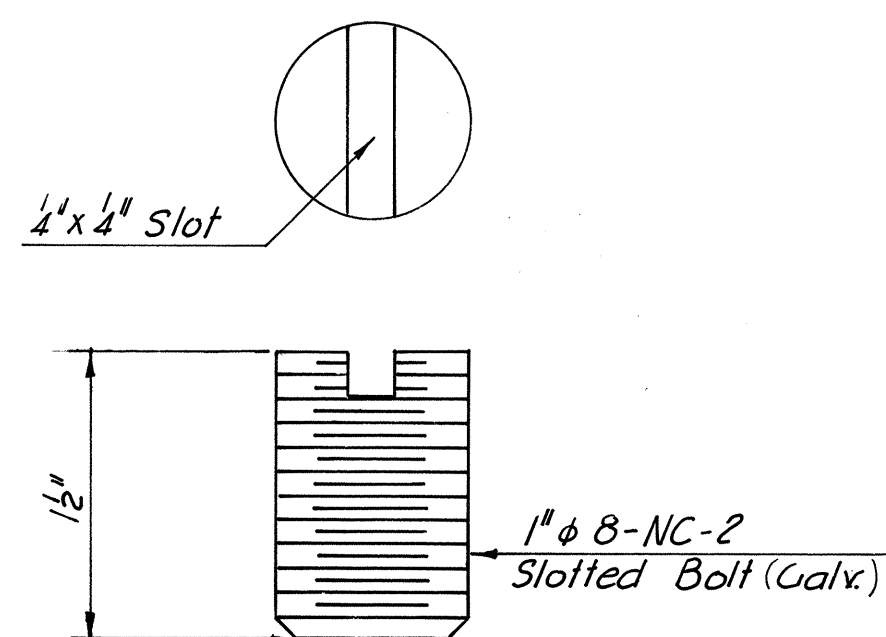


PLAN  
Scale 1" = 1'-0"

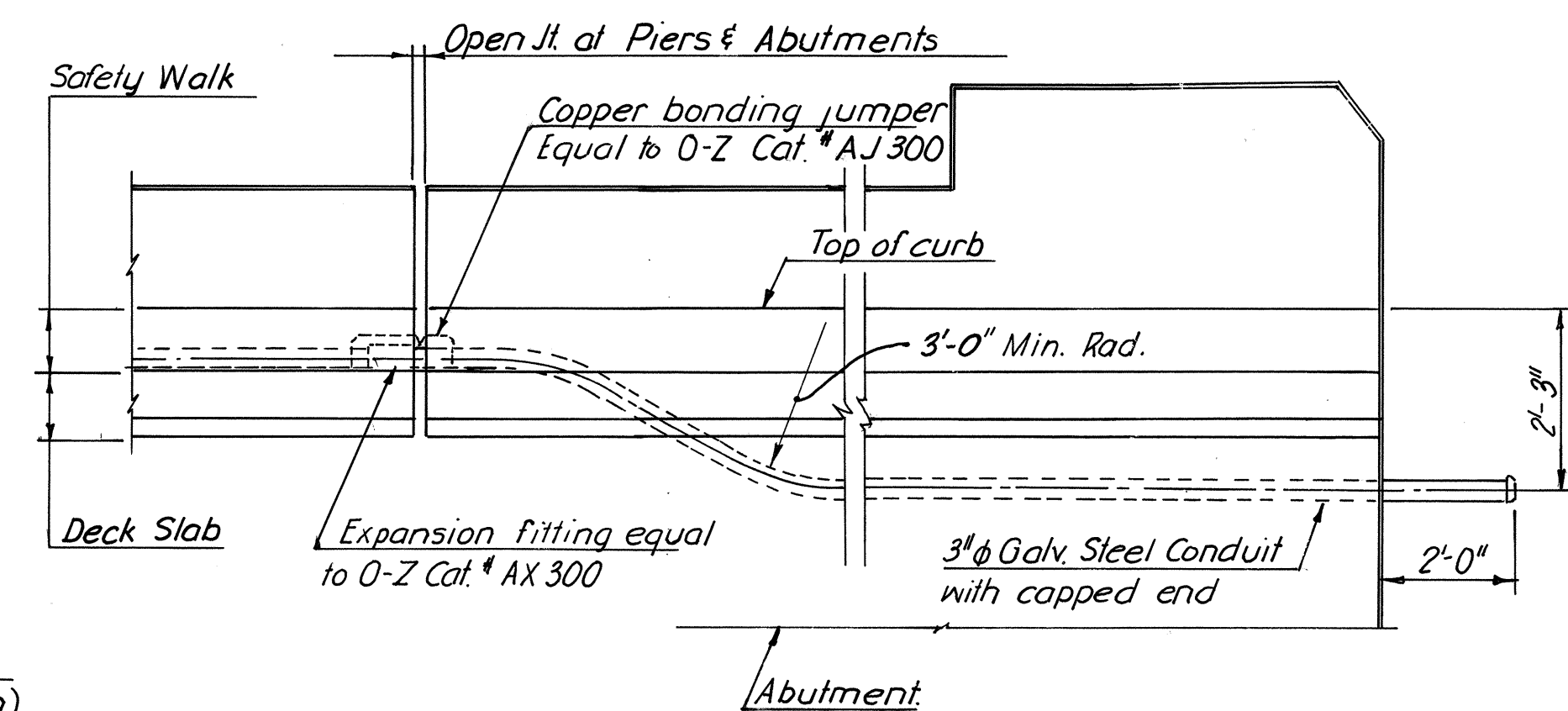
Note  
Normal Parapet and  
Safety Walk Reinf not shown



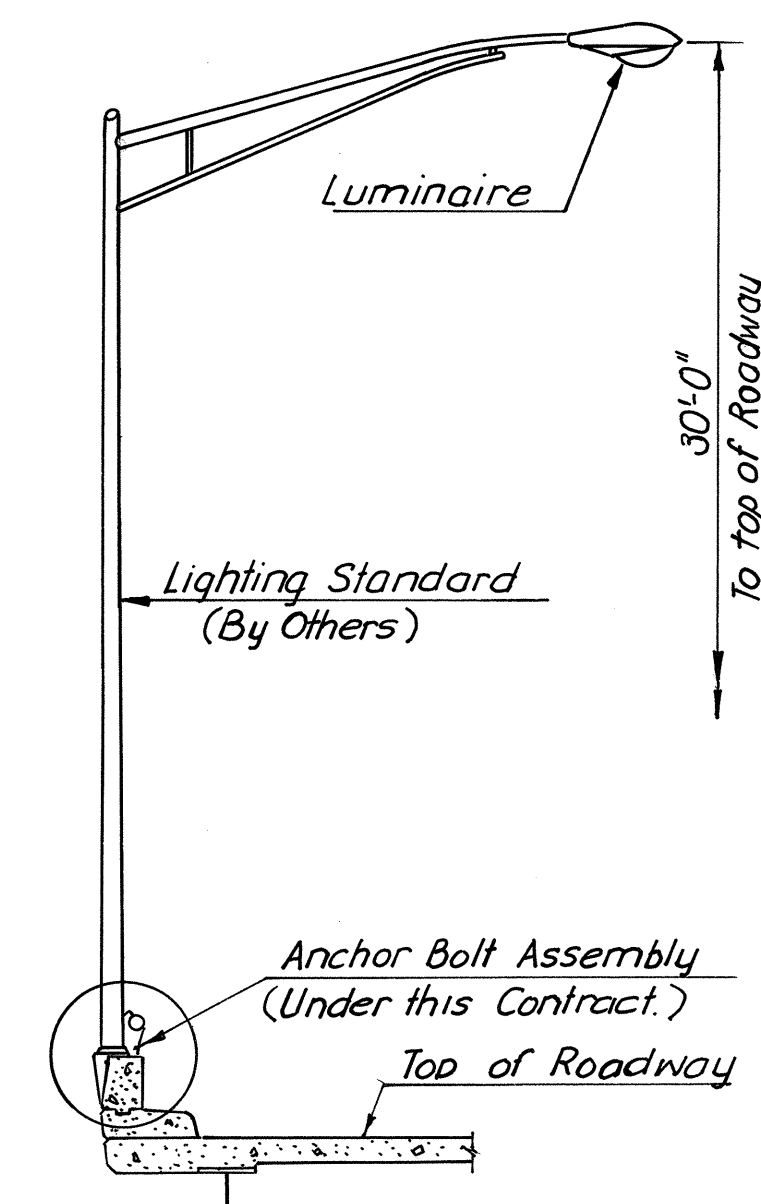
ELEVATION  
Scale 1" = 1'-0"



DETAIL A  
Full Size



TYPICAL CONDUIT INSTALLATION AT EXPANSION JOINTS  
No Scale



TYPICAL FUTURE LIGHTING STANDARD INSTALLATION  
No Scale

NOTES:

- All conduits shall be terminated in Junction Box with grounding bushings equal to O-Z Type 16B
- Anchor bolt assembly shall conform to ASTM A307 and shall be hot dipped galvanized after fabrication in accordance with ASTM A153
- Junction Box, frame and cover shall be hot galvanized after fabrication in accordance with ASTM A123
- The cost of furnishing and installing frames and covers for Junction boxes and anchor bolt assemblies (for future lighting standards) shall be included in the lump sum price bid for the item "Structural Steel" for the bridge structure
- Slotted bolts and flush pipe plugs shall have threads painted with Graphite Grease at assembly

**AS BUILT**

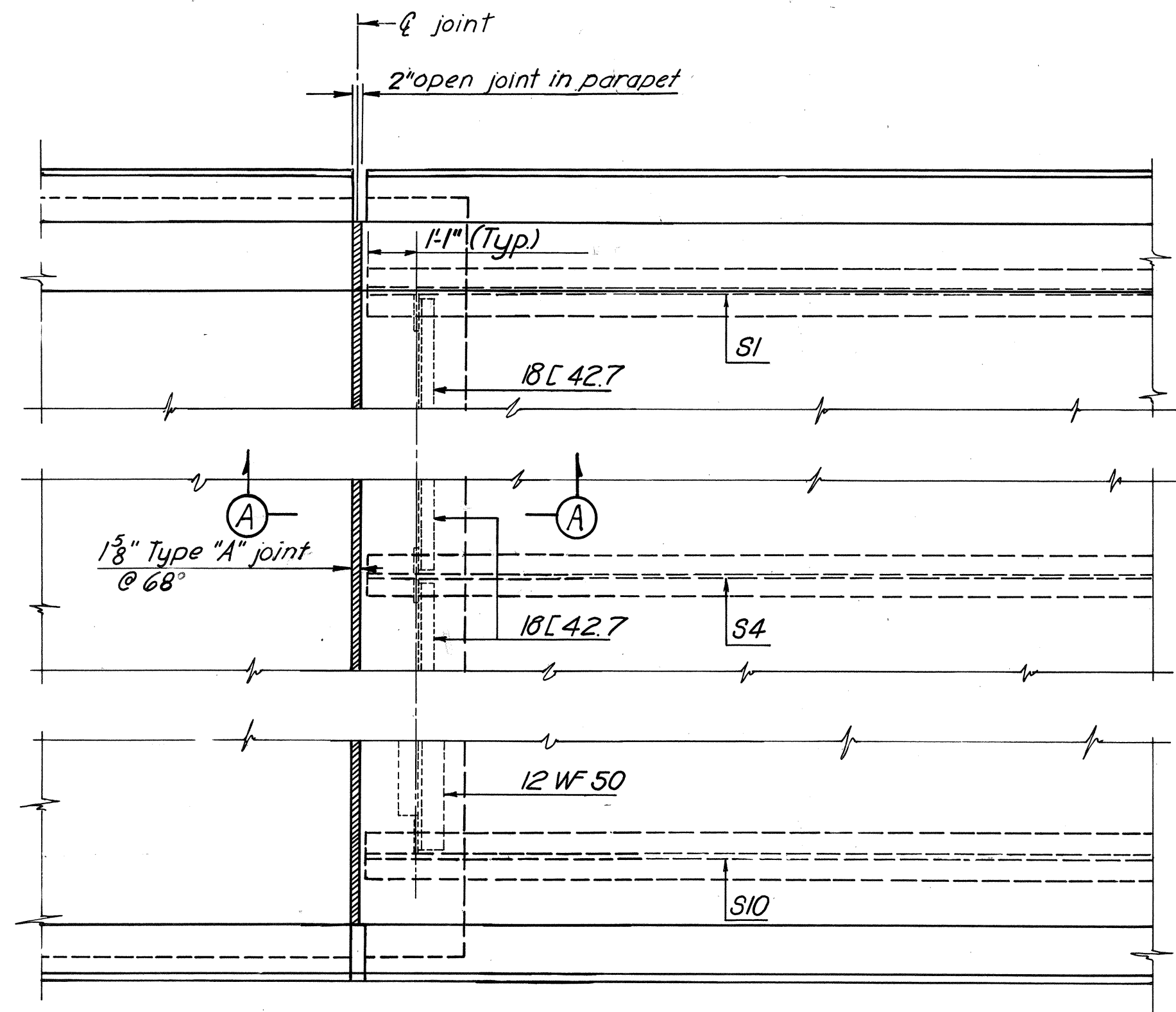
RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY  
FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06  
**ELECTRICAL DETAILS**

HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers  
CONTRACT NO.: 2  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants  
SCALE: AS SHOWN  
SHEET NO. 13 OF 18

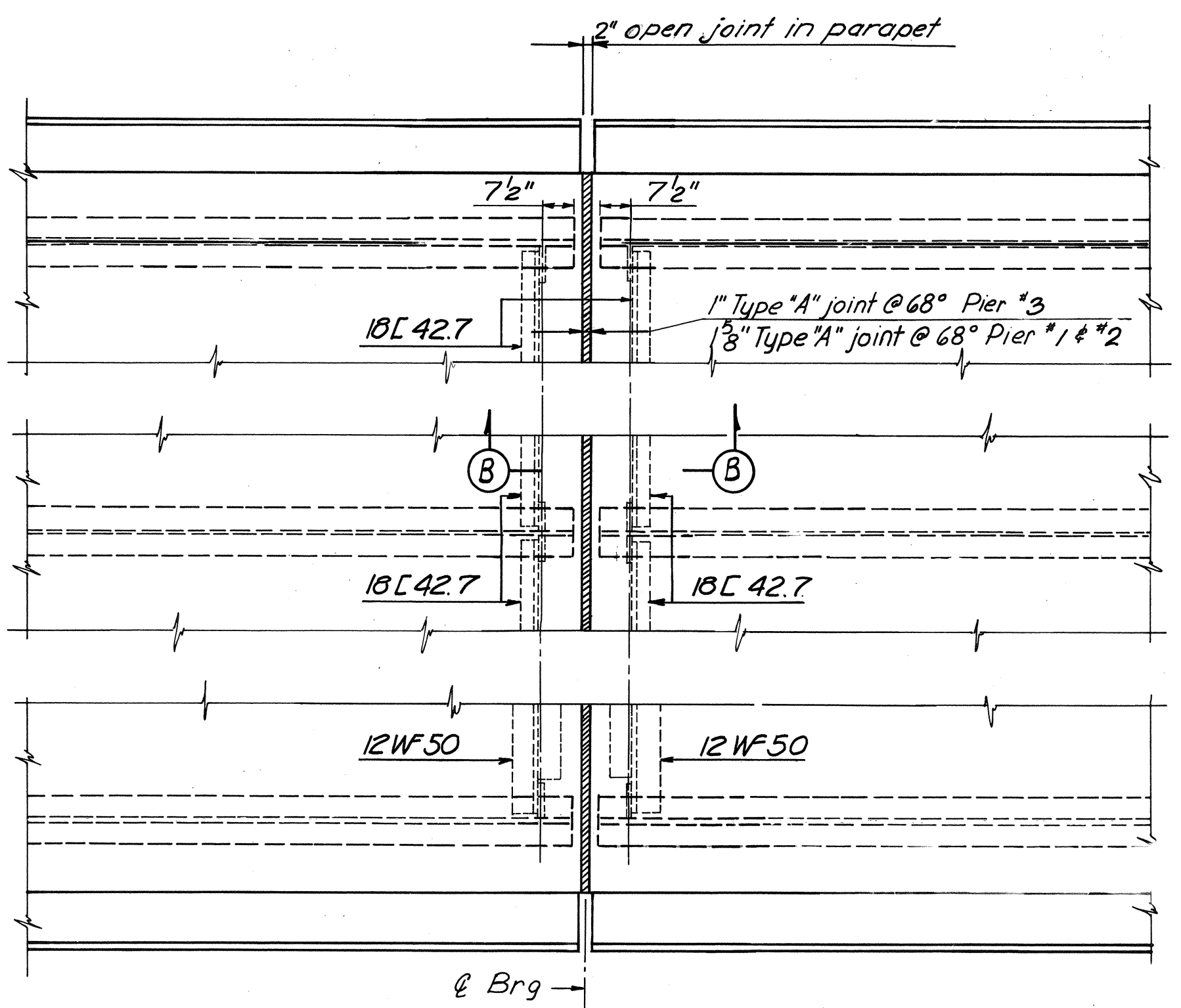
BY	DATE				
MADE	EF	11-67			
CHECKED	R.H.W.	2-68	1	As Built	JRC 3-73
IN CHARGE	R.H.W.				



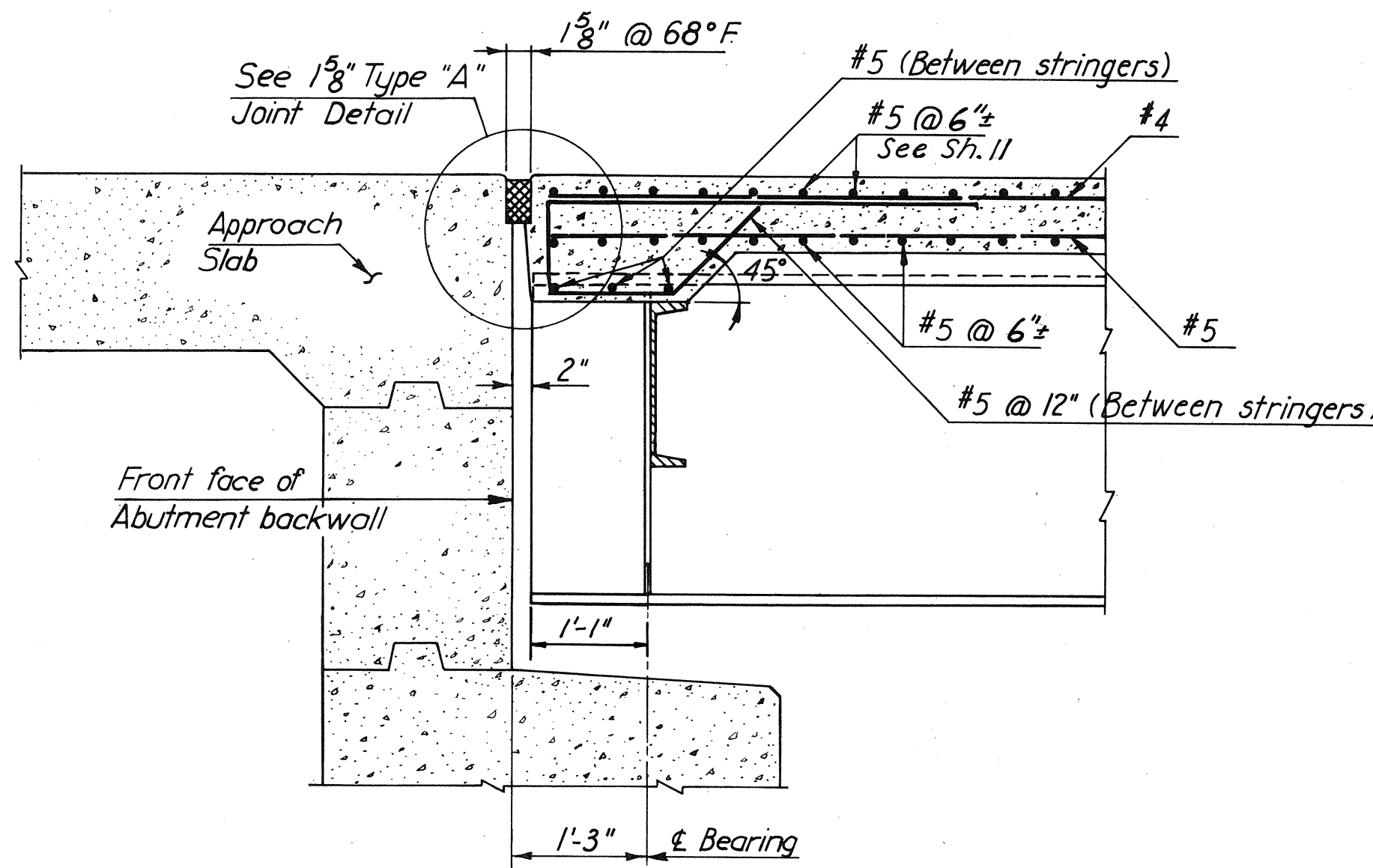
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	164	188



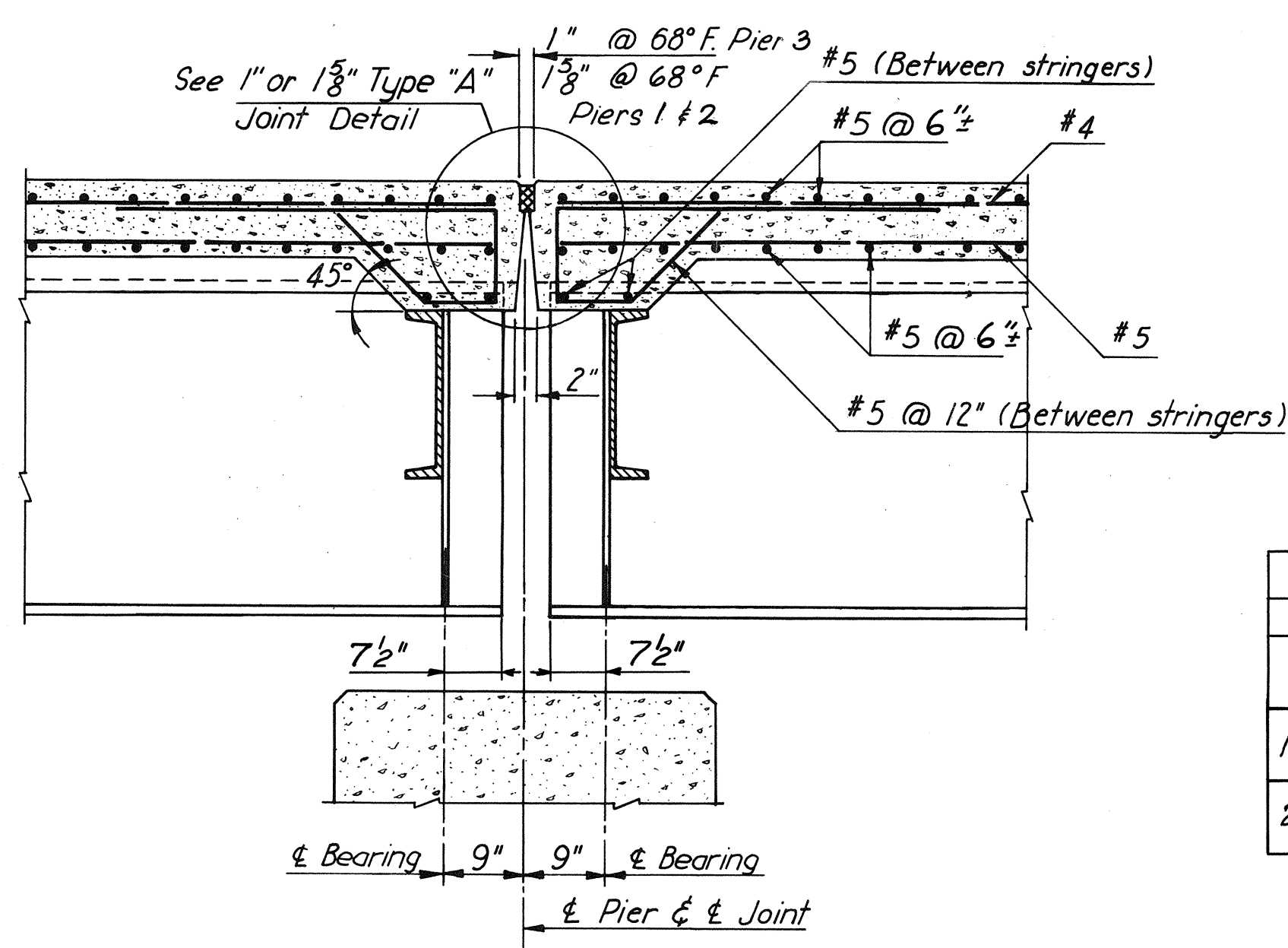
**PLAN - JOINT AT SOUTH ABUTMENT**  
Scale: 3/8" = 1'-0"  
(North Abutment Similar)



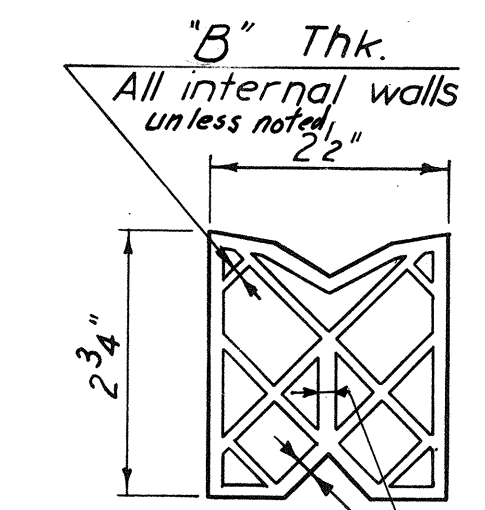
**PLAN - JOINT AT PIER**  
Scale: 3/8" = 1'-0"



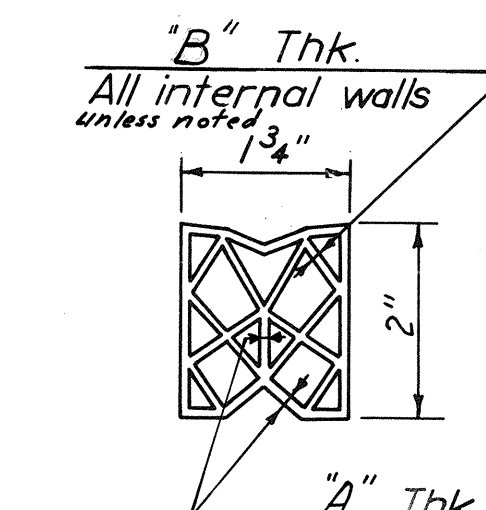
**SECTION A-A**  
Scale: 3/4" = 1'-0"



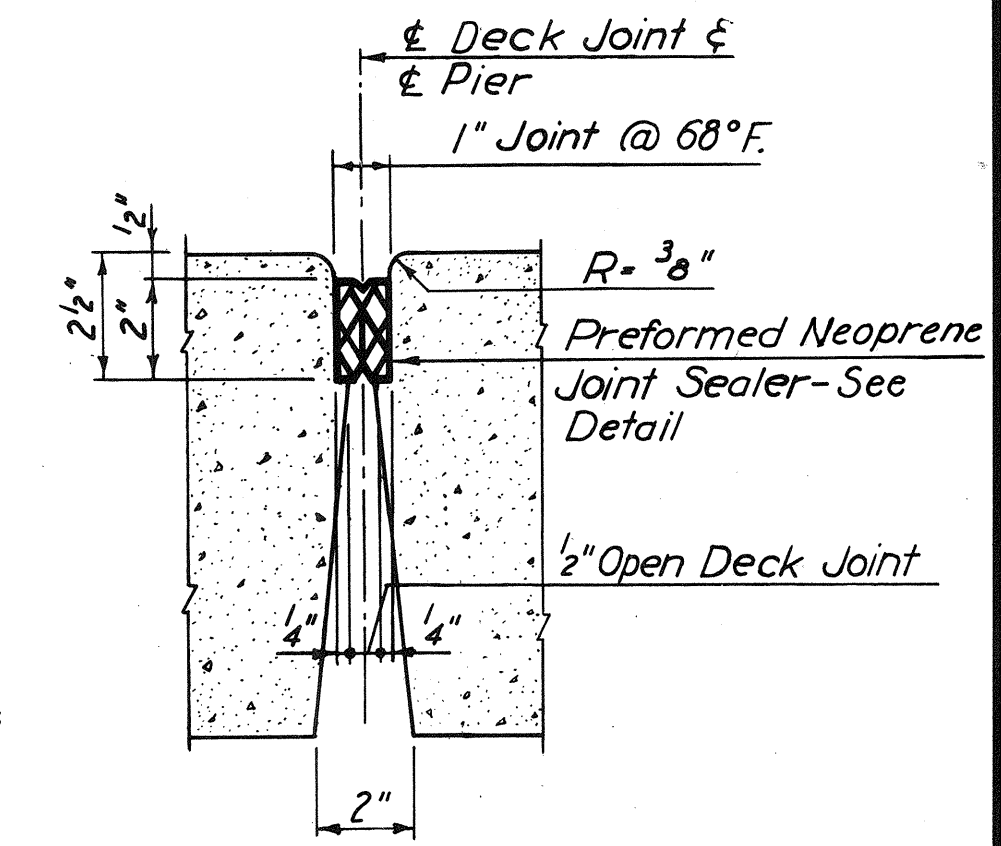
**SECTION B-B**  
Scale: 3/4" = 1'-0"



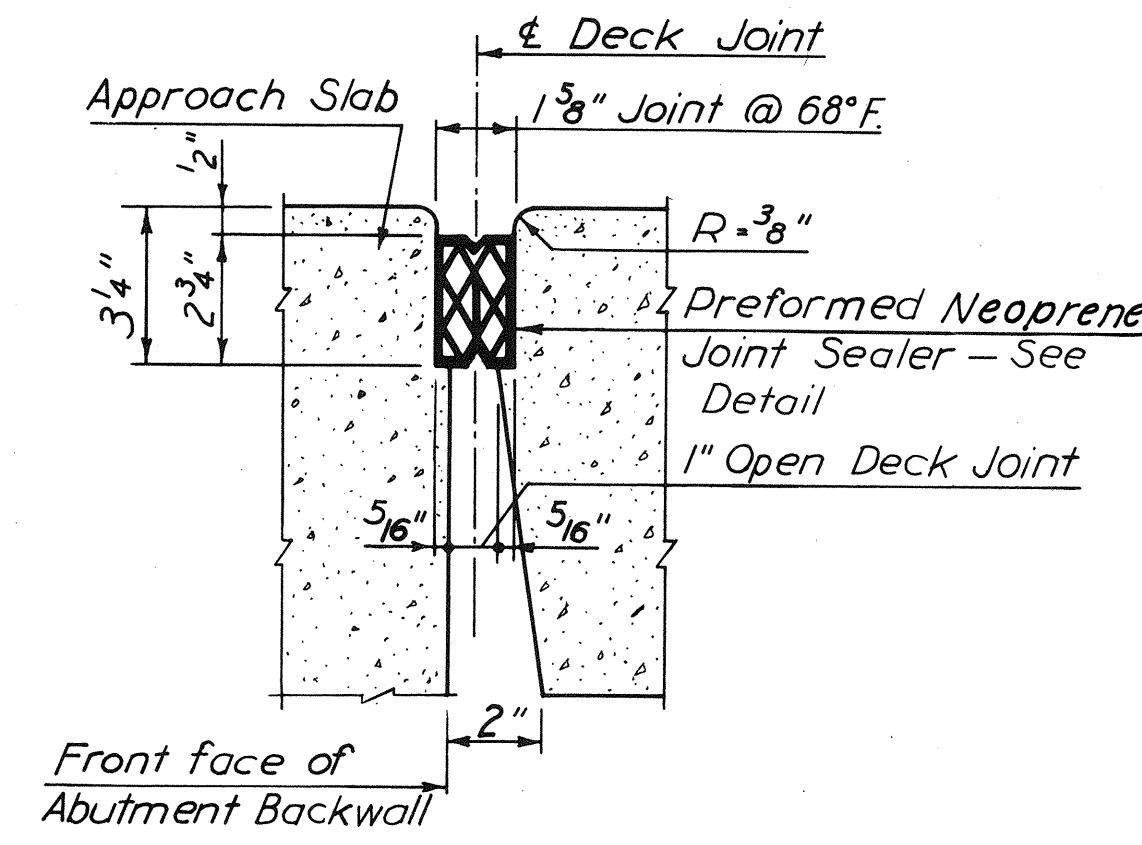
**"B" Thk.**  
All internal walls unless noted  
2 1/2"  
2 3/4"  
**"A" Thk.**  
All external walls & center rib  
**PREFORMED NEOPRENE JOINT SEALER**  
FOR 1 5/8" TYPE "A" JOINT  
Scale: Half size



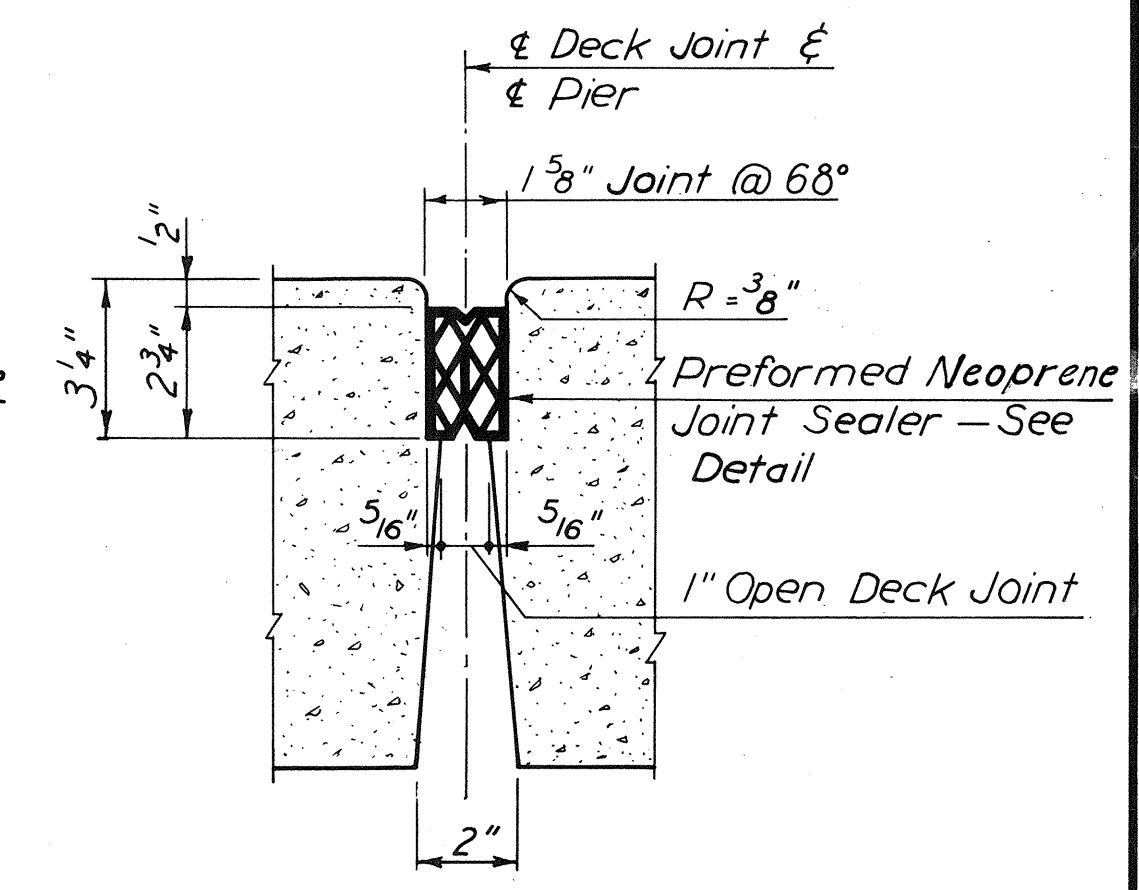
**"B" Thk.**  
All internal walls unless noted  
1 3/4"  
2"  
**"A" Thk.**  
All external walls & center rib  
**PREFORMED NEOPRENE JOINT SEALER**  
FOR 1" TYPE "A" JOINT  
Scale: Half size



**1" TYPE "A" JOINT**  
Scale: 3/4" = 1'-0"  
@ Pier 3

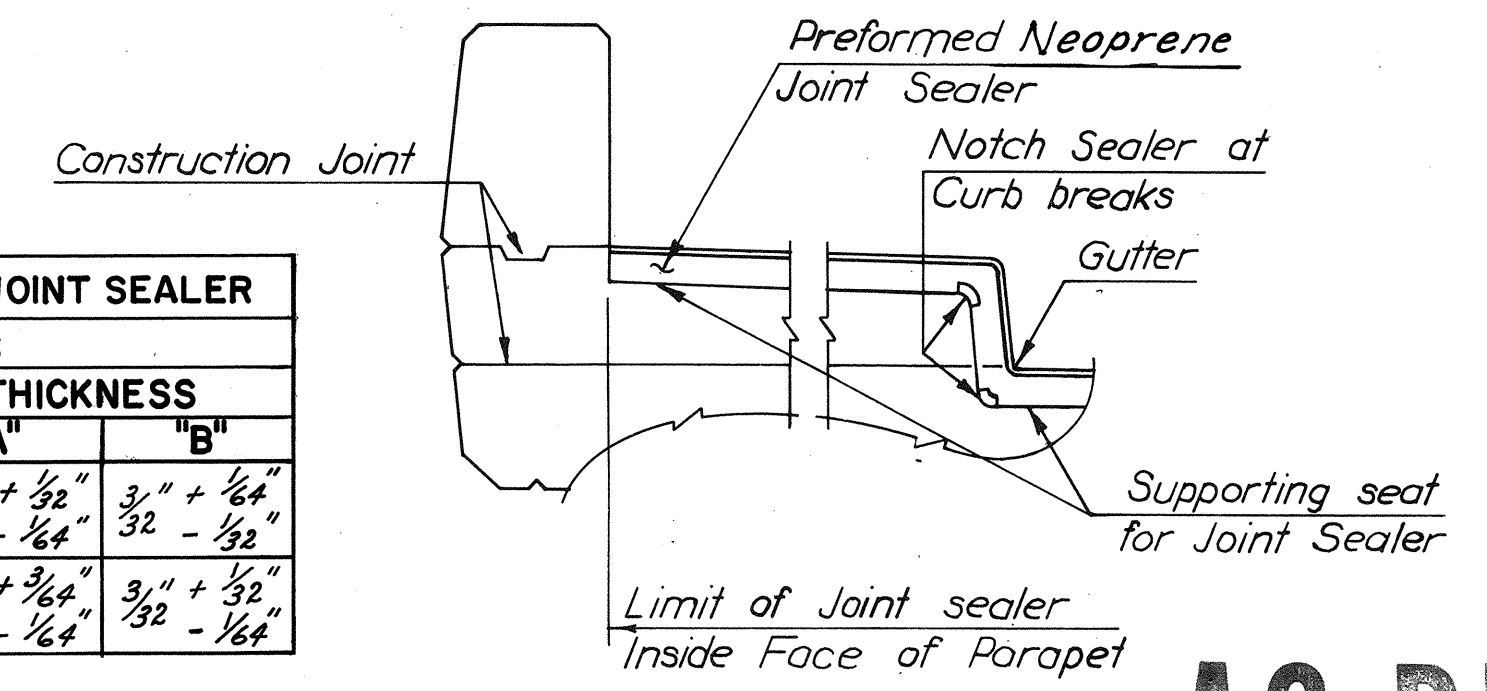


**1 5/8" TYPE "A" JOINT**  
Scale: 3/4" = 1'-0"  
@ Abutments



**1 5/8" TYPE "A" JOINT**  
Scale: 3/4" = 1'-0"  
@ Piers 1 & 2

PREFORMED NEOPRENE JOINT SEALER TOLERANCES			
WIDTH	HEIGHT	THICKNESS	
		"A"	"B"
1 3/4" + 3/16" - 0"	2" ± 1/8"	1/8" + 1/32" - 1/64"	3/32" + 1/64" - 1/32"
2 1/2" + 1/4" - 0"	2 3/4" ± 1/8"	3/16" + 3/64" - 1/64"	3/32" + 1/32" - 1/64"



**TREATMENT OF TYPE "A" JOINT AT CURB**  
No Scale

**AS BUILT**

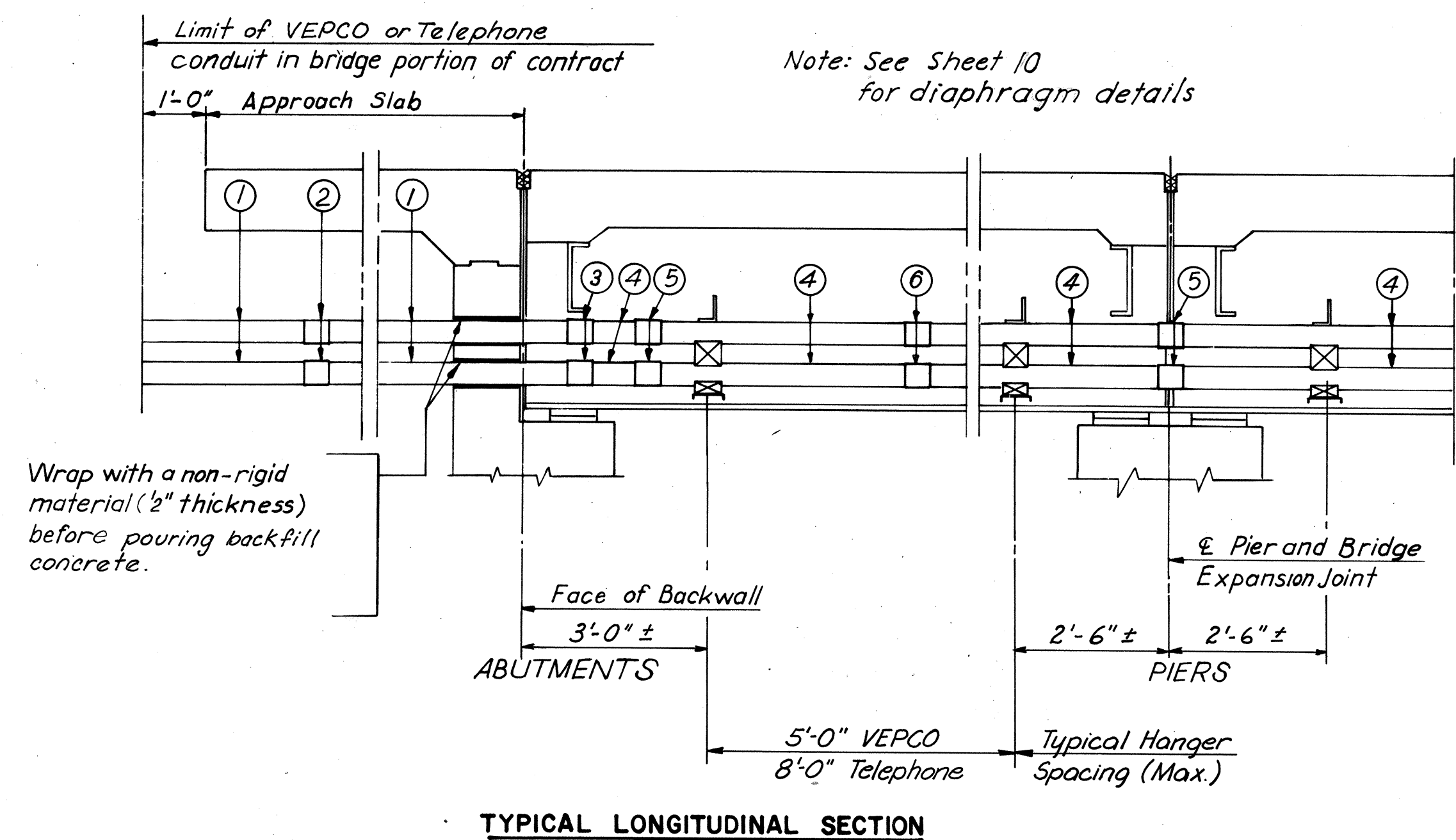
**NOTE TO CONTRACTOR:**  
It is absolutely essential that the openings for the preformed neoprene sealers be accurately formed and constructed to smooth, straight lines. The size of the opening shall be adjusted to allow for anticipated dead load rotation of the ends of the slab and for the temperature at the time of construction.

BY	DATE				
MADE	T.E.M.	10-7-67			
CHECKED	RHW	2-68	1	As Built	JRC 3-73
IN CHARGE	RHW		NO.	REVISION	BY DATE

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
POWHITE PARKWAY  
FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06  
**JOINT DETAILS**

HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

SCALE: **AS SHOWN**  
CONTRACT NO. 2  
SHEET NO. 14 OF 18

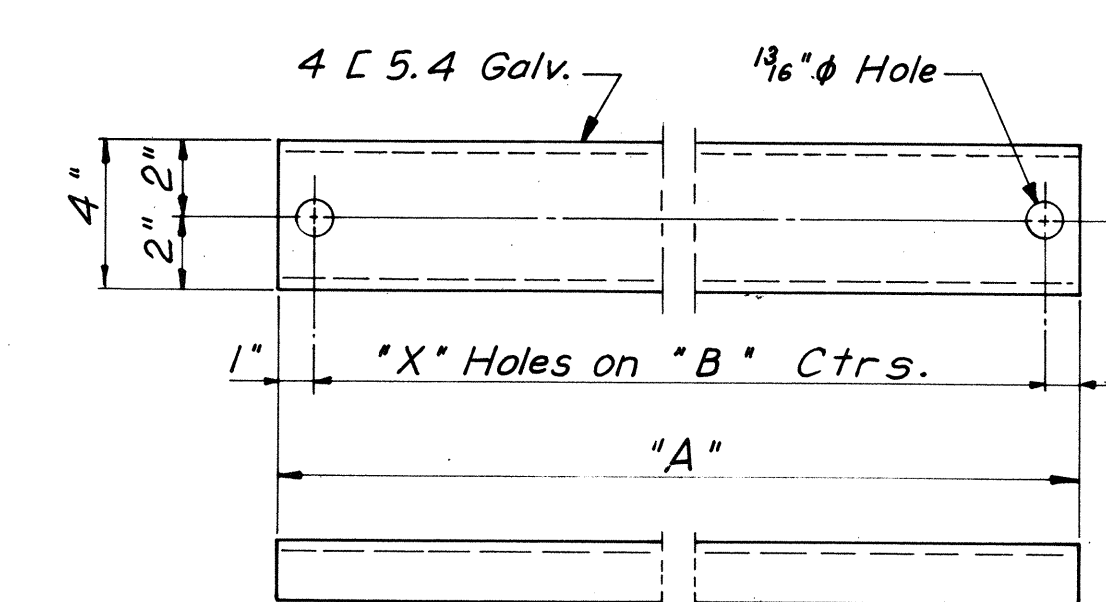
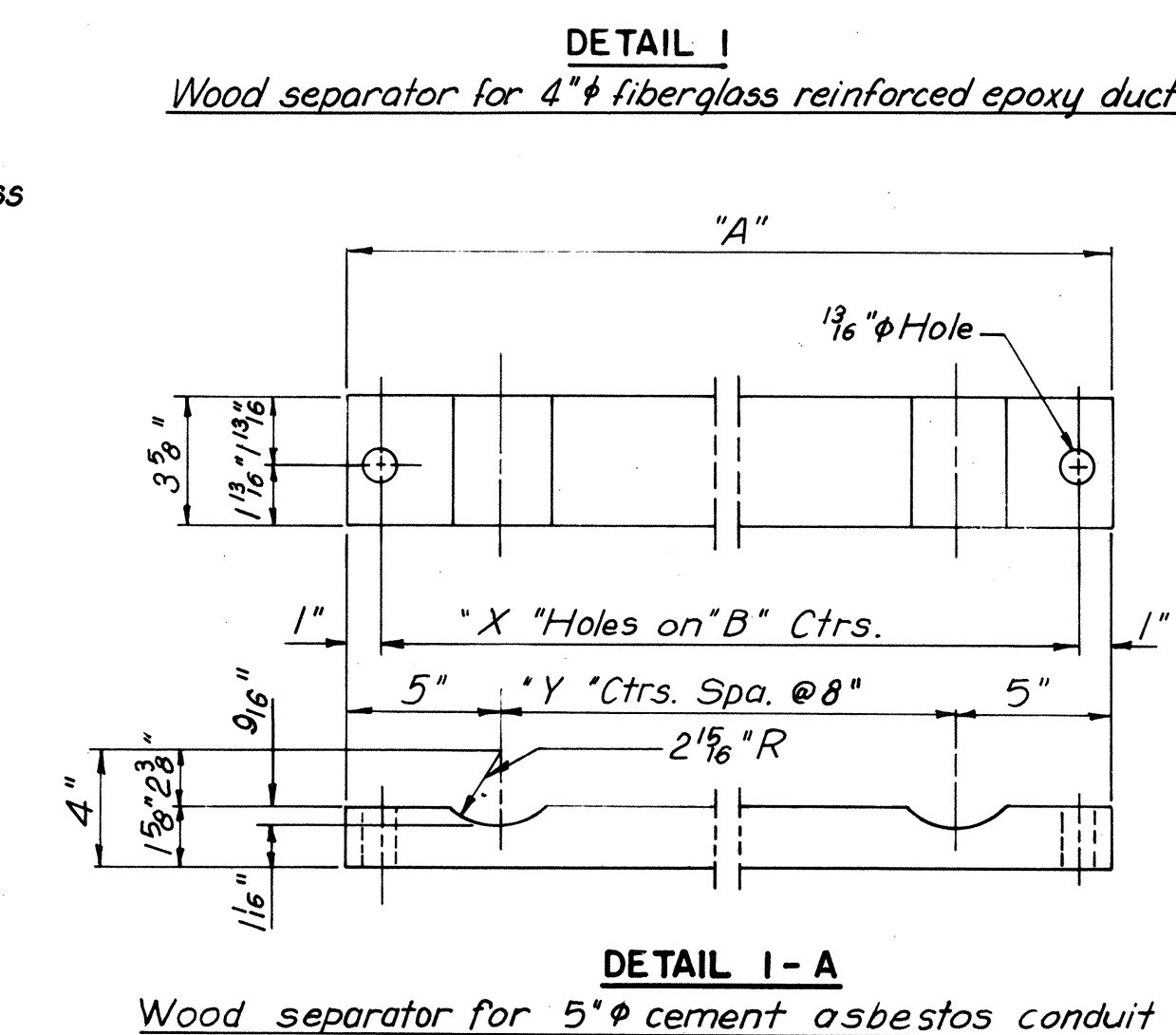
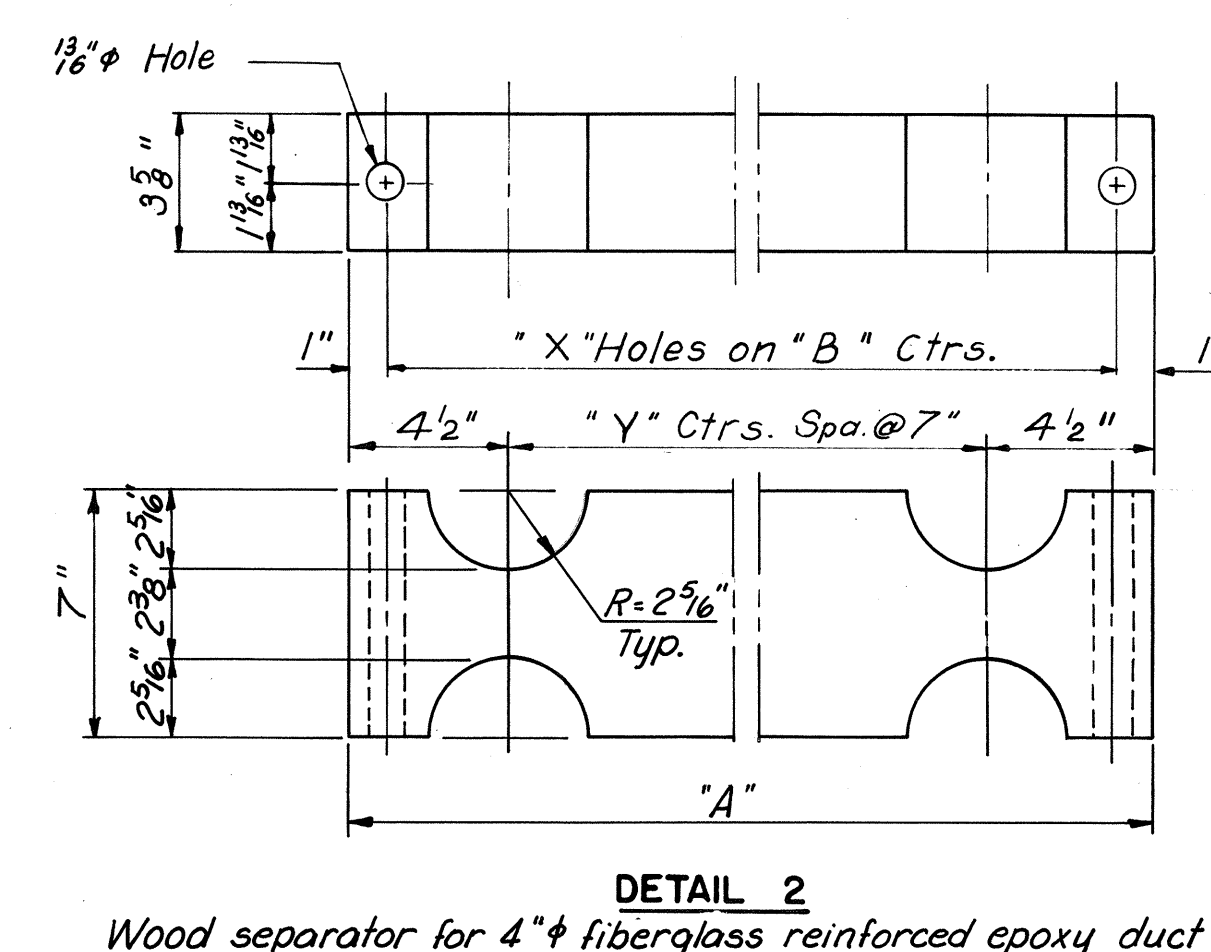
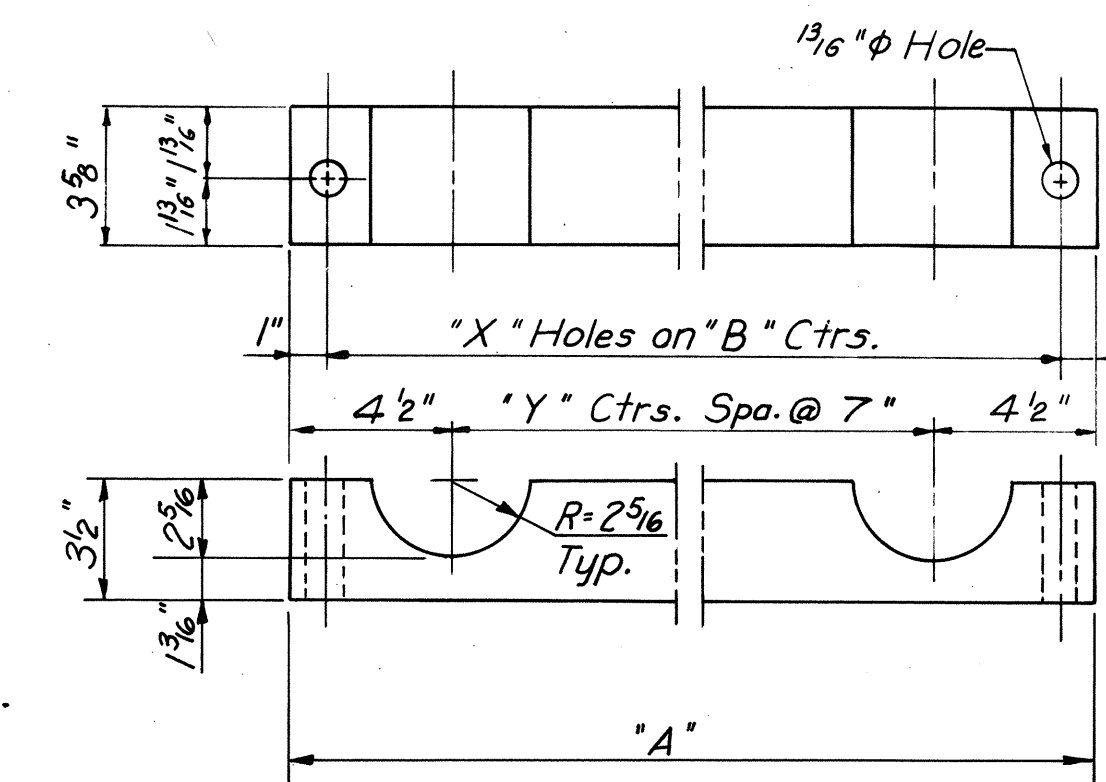


**VEPCO**

- ① Galvanized steel pipe
- ② Pipe coupling
- ③ Straight adaptor to connect galvanized steel pipe to cement asbestos conduit.
- ④ Heavy wall cement asbestos conduit.
- ⑤ Heavy wall cement asbestos conduit expansion coupling.
- ⑥ Heavy wall cement asbestos or plastic tapered coupling.

**TELEPHONE**

- ① Galvanized steel pipe
- ② Pipe coupling
- ③ Straight adaptor to connect galv. steel pipe to fiberglass reinforced epoxy duct
- ④ Fiberglass reinforced epoxy duct, 2 layer construction (4 pass) with nominal wall thickness of .066 inch
- ⑤ Expansion coupling for fiberglass reinforced epoxy duct
- ⑥ Coupling for fiberglass reinforced epoxy duct



**NOTES:**

Select conduit lengths so that coupling locations do not coincide with hanger locations. Inside edge of all conduit ends shall be chamfered.

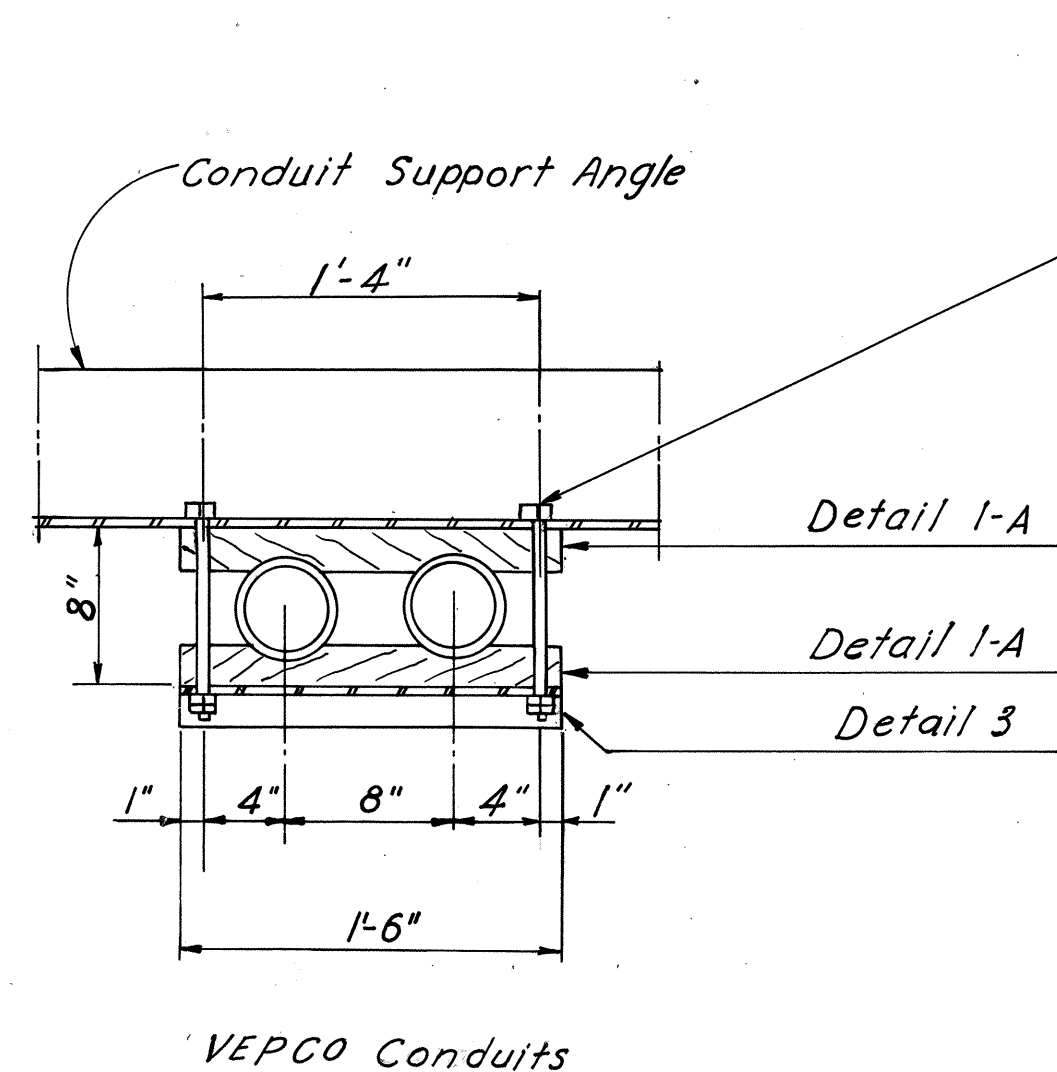
Fittings, in accordance with manufacturers' recommendations, shall be used when joining conduits at field-cut joints.

Splicing of steel pipe by welding will not be permitted. Threaded couplings must be used.

Pipe and hardware to be galvanized in accordance with provisions of AASHTO M 111 (ASTM A123) Specifications.

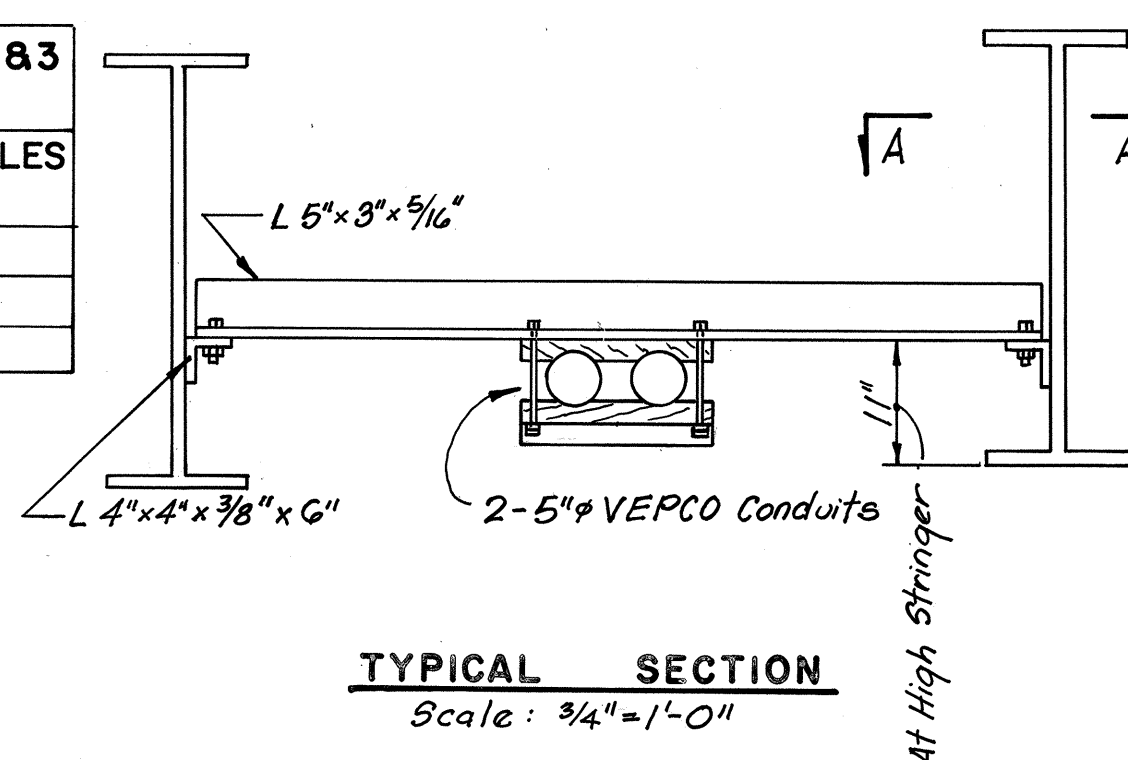
Nuts on all hanger bolts or rods are to be tightened to a snug assembly only and locked. Threads are to be crimped.

Wood separators shall be made from treated Southern Yellow Pine, Douglas Fir or Western Larch. Treatment to be in accordance with Virginia Department of Highways Road and Bridge Specifications, 1970.



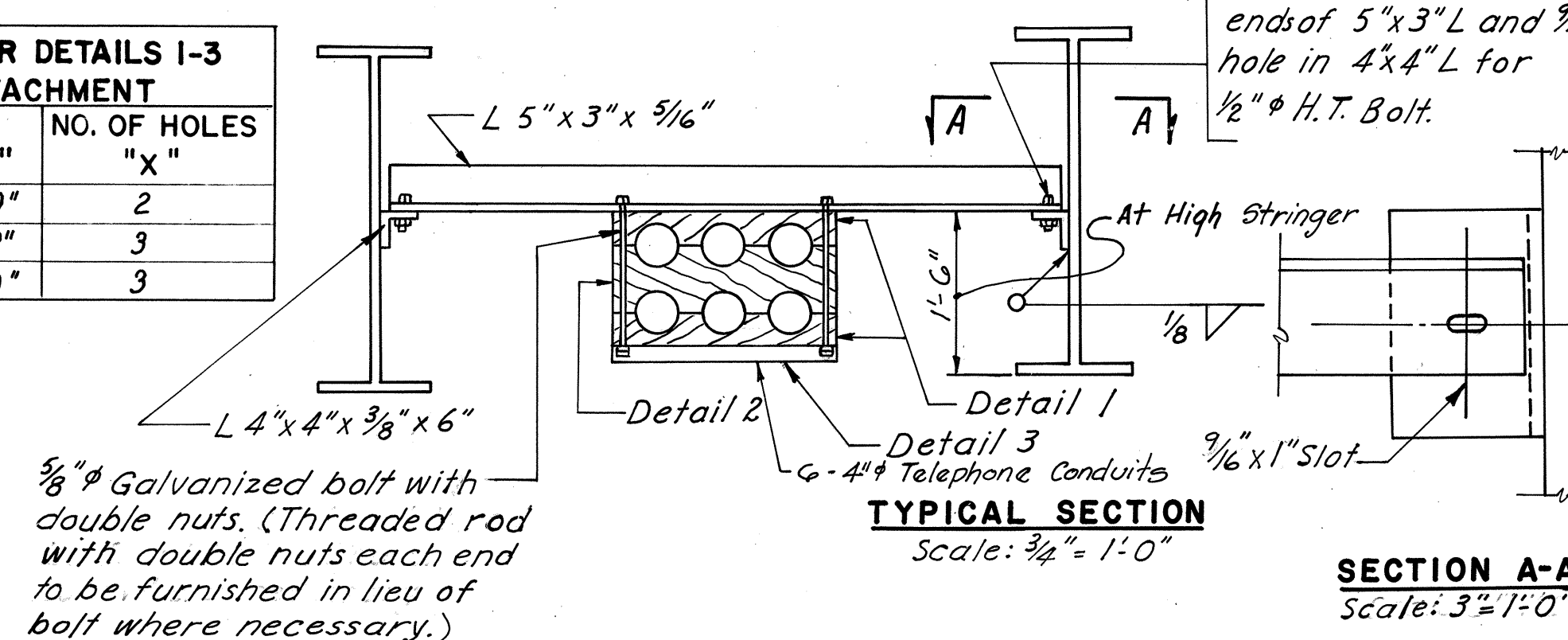
**BASIC ATTACHMENT DETAILS FOR 5" CEMENT ASBESTOS CONDUITS**

NO. OF COND. WIDE "Y"	"A"	"B"	NO. OF HOLES "X"
2	1'-6"	1'-4"	2
4	2'-10"	1'-4"	3
6	4'-2"	2'-0"	3



**BASIC ATTACHMENT DETAILS FOR 4" FIBERGLASS REINFORCED EPOXY DUCTS**

NO. OF COND. WIDE "Y"	"A"	"B"	NO. OF HOLES "X"
3	1'-11"	1'-9"	2
4	2'-6"	1'-2"	3
6	3'-8"	1'-9"	3



**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY

FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06

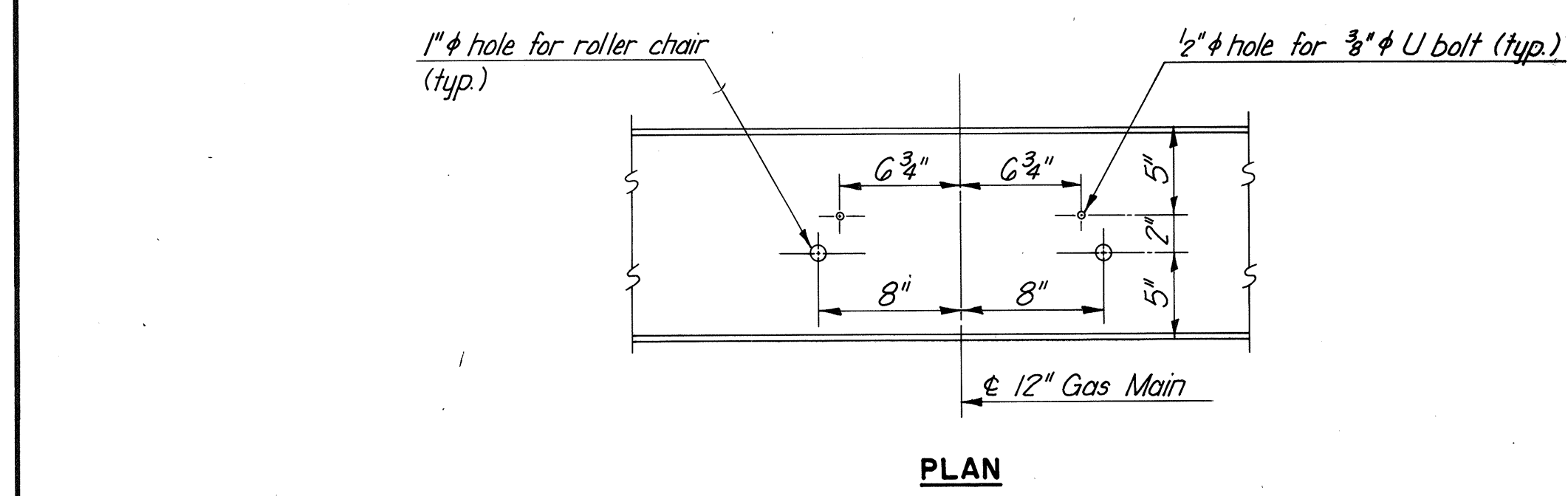
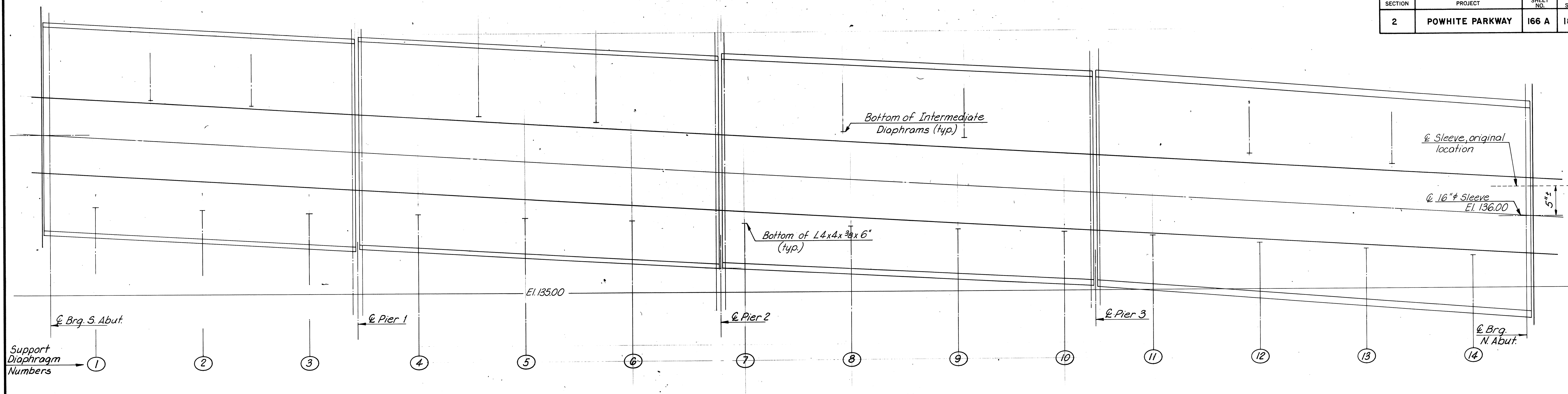
**CONDUIT INSTALLATION DETAILS**

HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: AS SHOWN
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO.: 2
	SHEET NO. 15 OF 18

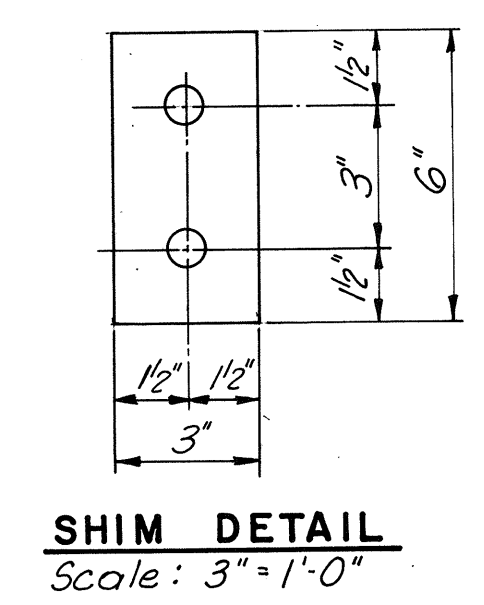
BY	DATE	3	As Built	JRC	3-73
MADE	A.P.	11-67	2	General	H.B.W.
CHECKED	A.B.P.	11-67	1	Support Spc.	J.L.N. 5-13-68
IN CHARGE	R.H.W.				



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	166 A	188

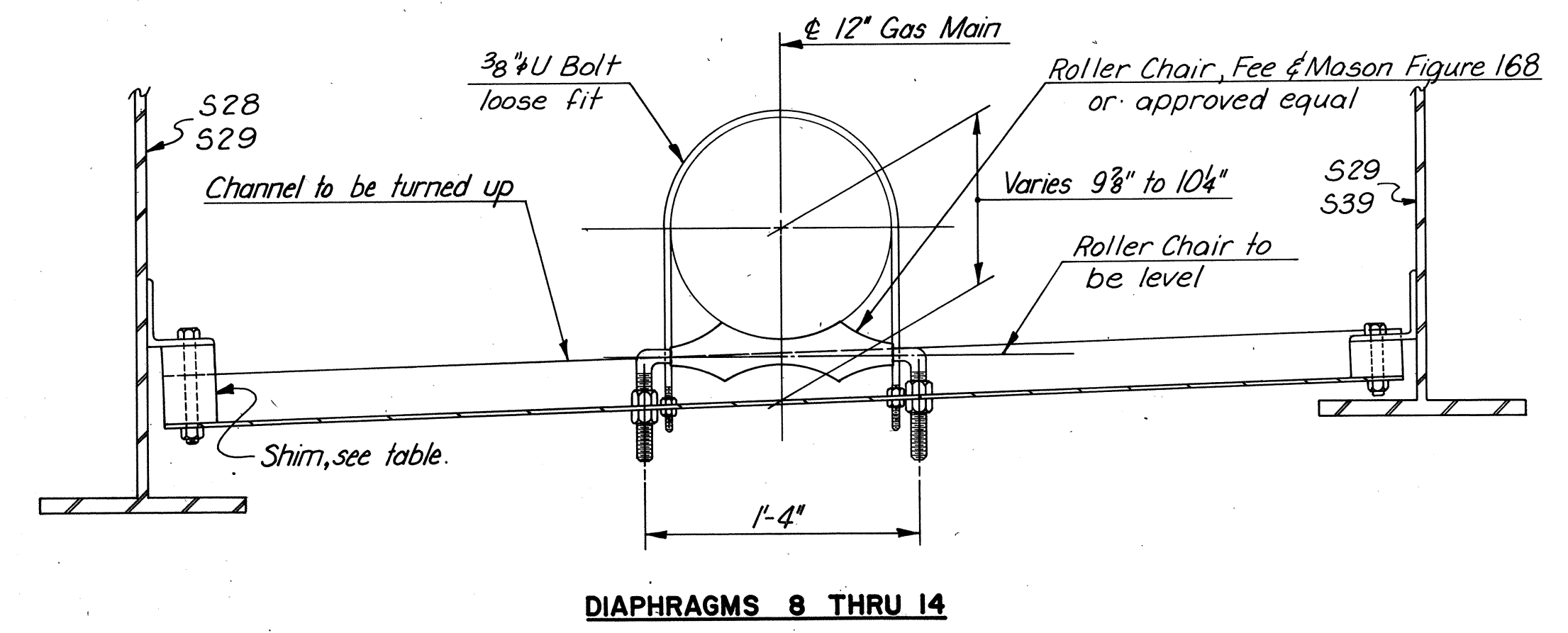
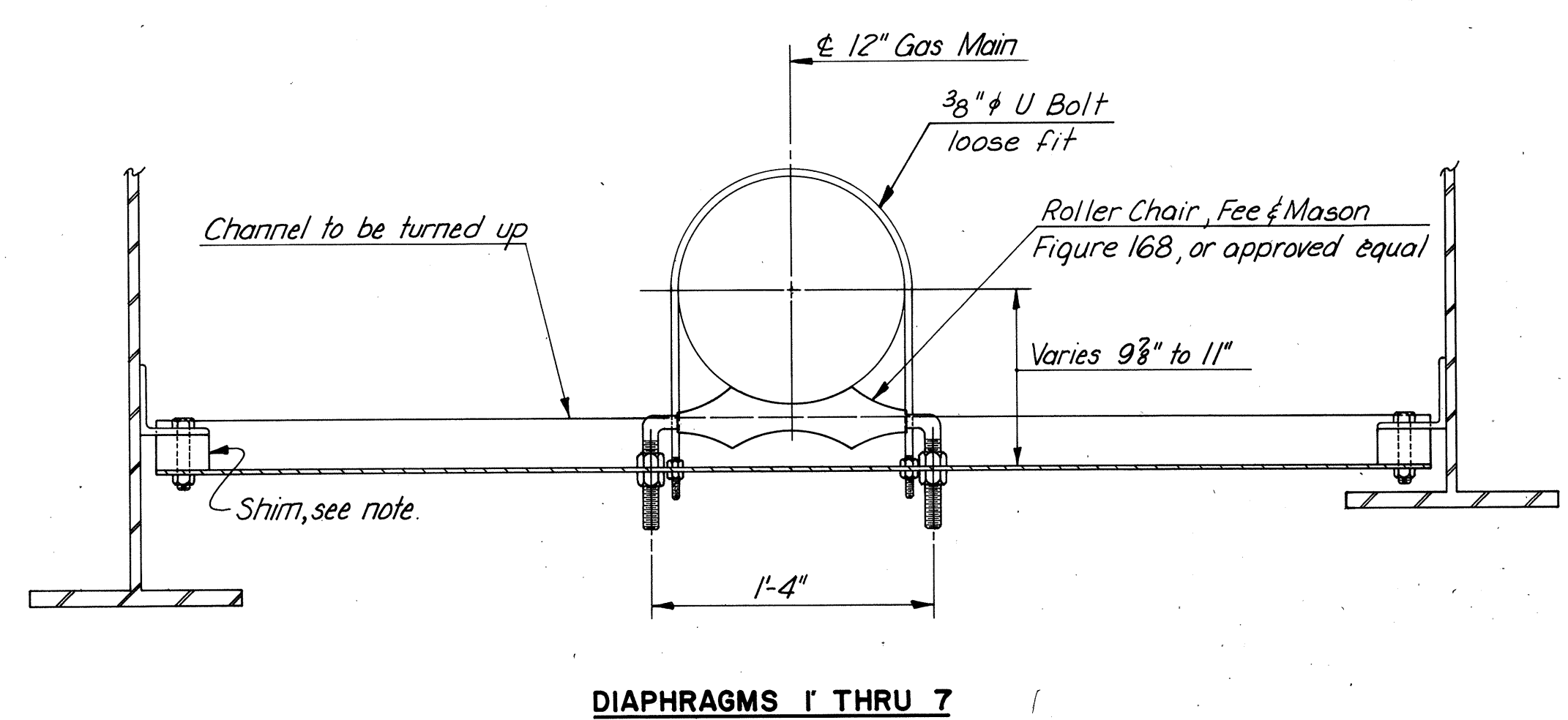


**GAS MAIN PROFILE**  
Scale: 1/8" = 1'-0" Horiz.  
1/2" = 1'-0" Vert.



**SHIM DETAIL**  
Scale: 3" = 1'-0"

**NOTE:**  
No shims required on diaphragms 1 thru 4.  
1" shims required on diaphragms 5 and 6.  
2" shims required on diaphragm 7.



**GAS MAIN SUPPORT DIAPHRAGMS**  
Scale: 1/2" = 1'-0"

SHIM TABLE		
SUPPORT DIAPH. NO.	STRINGER	SHIM THICKNESS
8	S28	3"
	S29	2"
9	S28	3 1/2"
	S29	2"
10	S28	4 1/2"
	S29	2"
11, 12 & 13	S38	4 1/2"
	S39	2"
14	S38	3 1/2"
	S39	2"

**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM

FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06

**GAS MAIN SUPPORT DETAILS  
AND PROFILE**

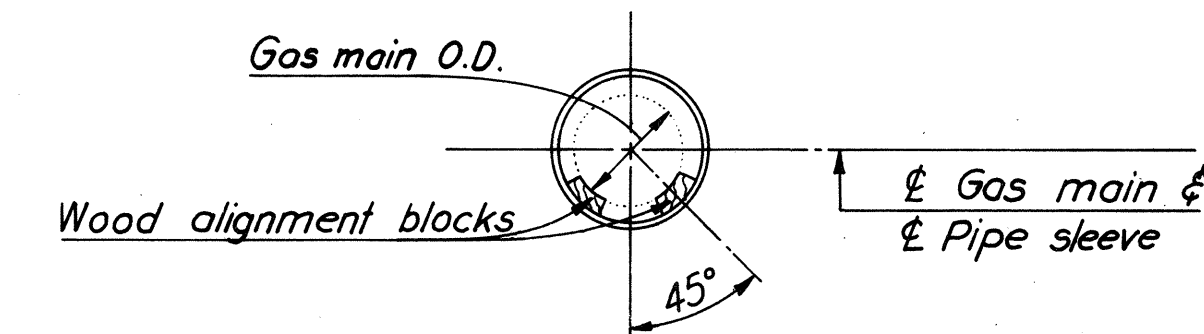
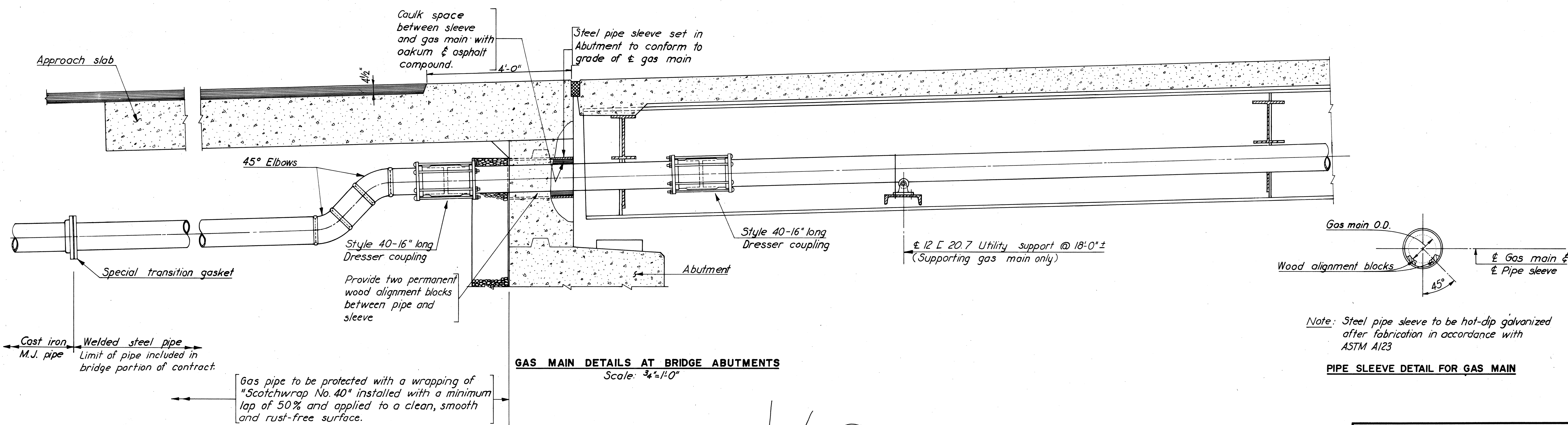
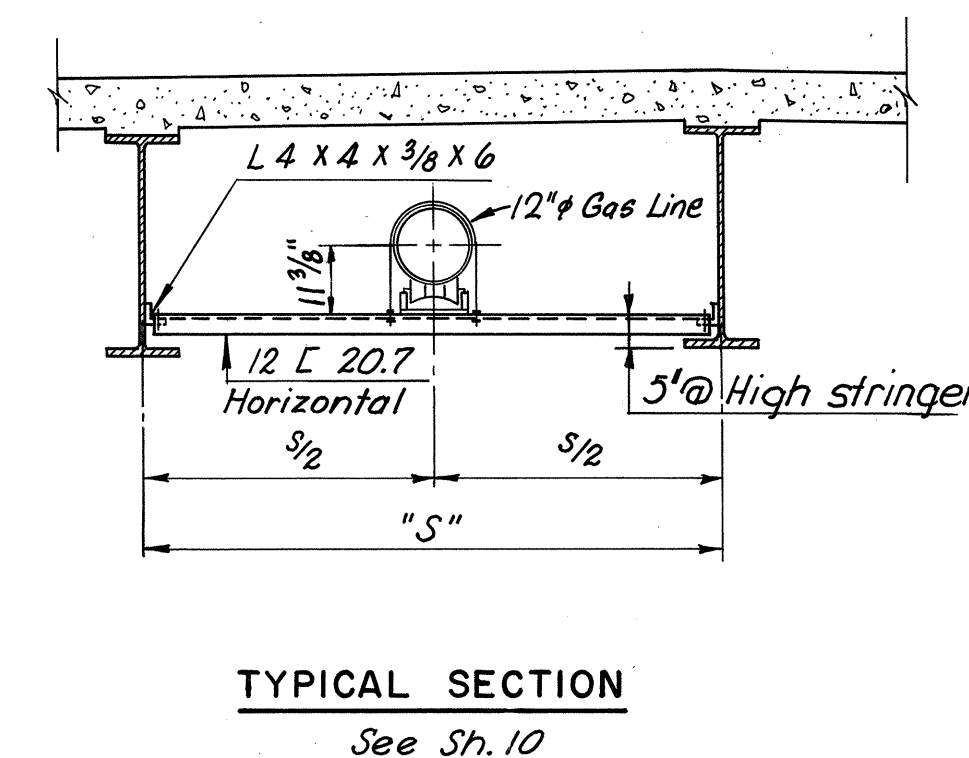
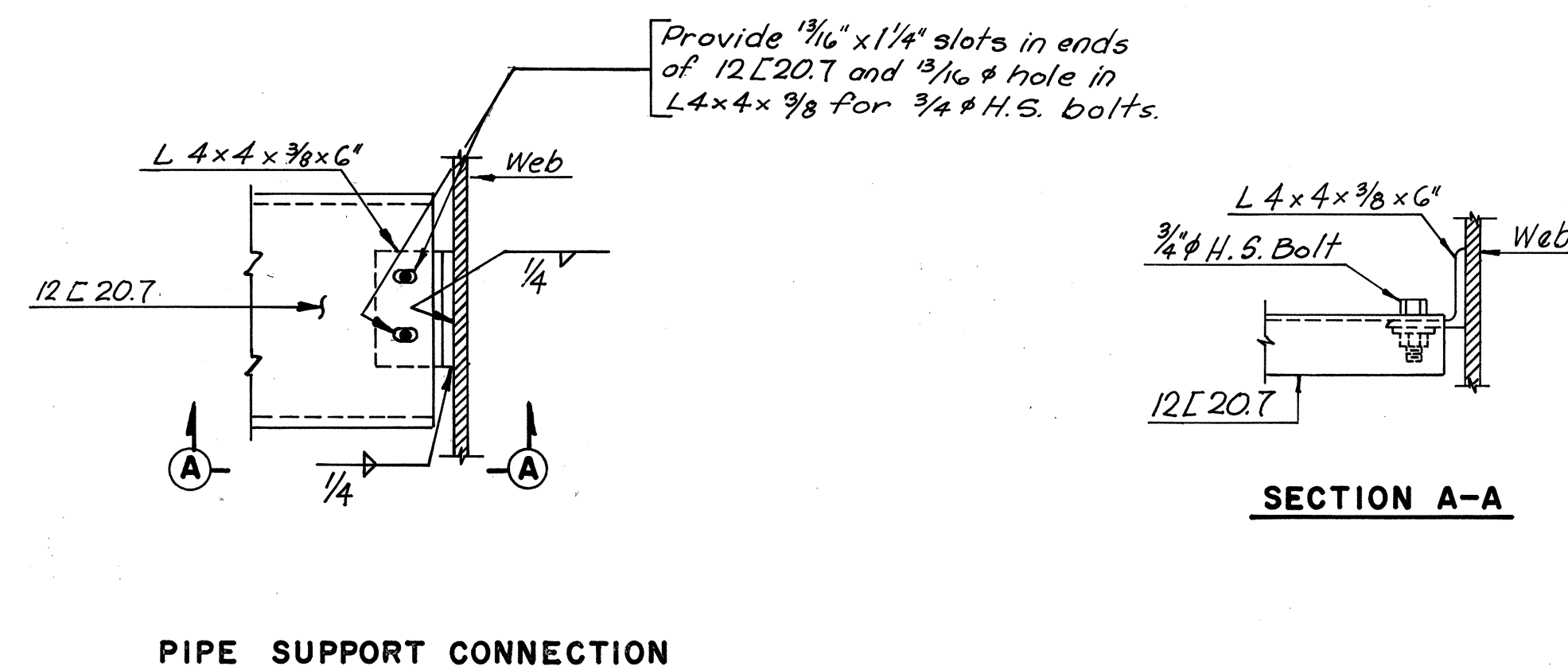
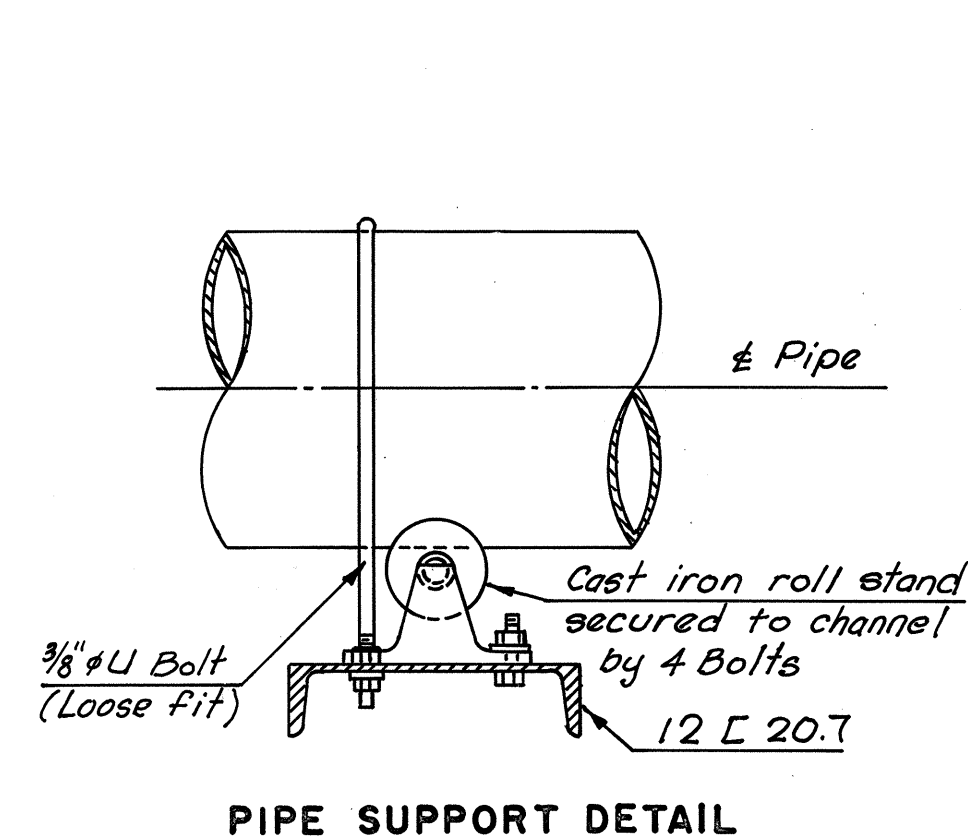
SCALE: AS SHOWN  
CONTRACT NO.: 2  
SHEET NO. 166 A OF 188

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

BY	DATE				
MADE	JBW JGV	5-72			
CHECKED	TEM	5-72	As Built	JRC	3-73
IN CHARGE	PRY				



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	166	188



Note: Steel pipe sleeve to be hot-dip galvanized after fabrication in accordance with ASTM A123

VOID

SEE SHEET # 166A  
# 16A of 18

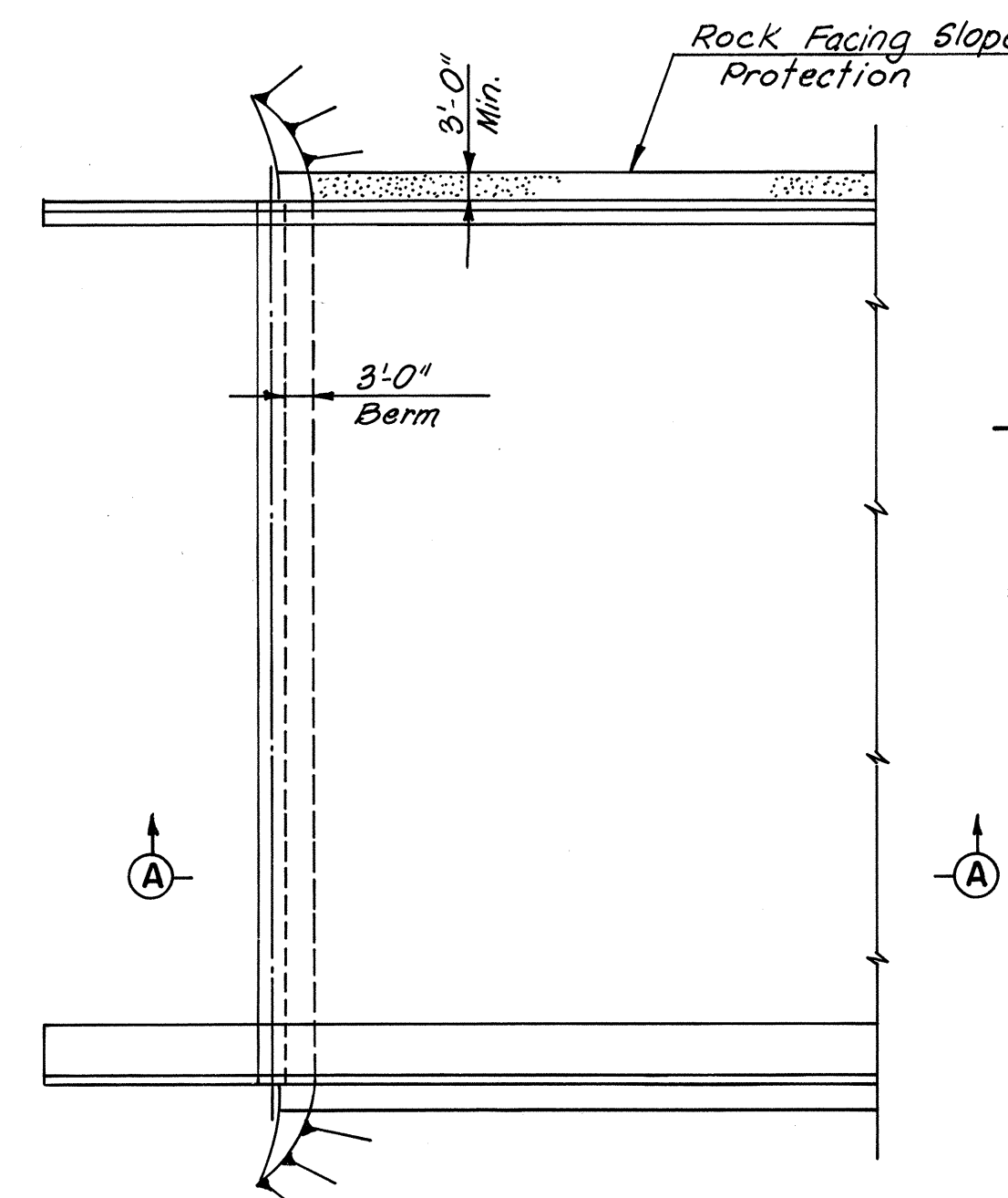
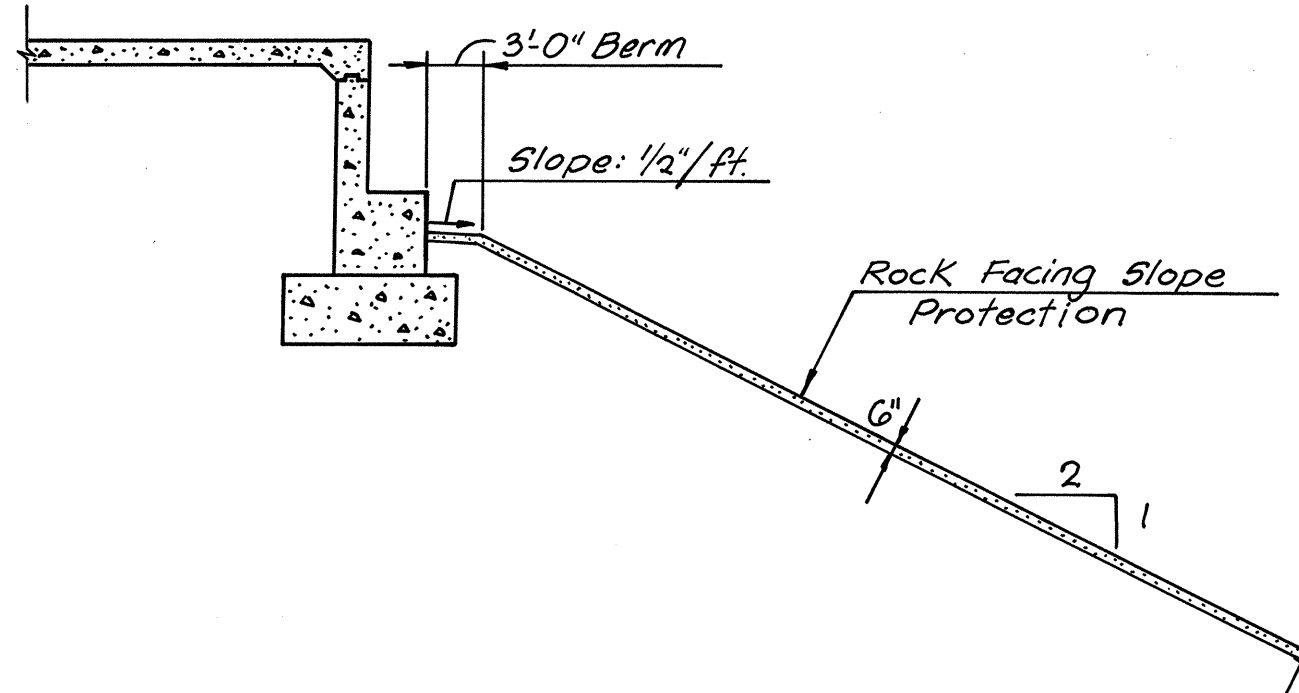
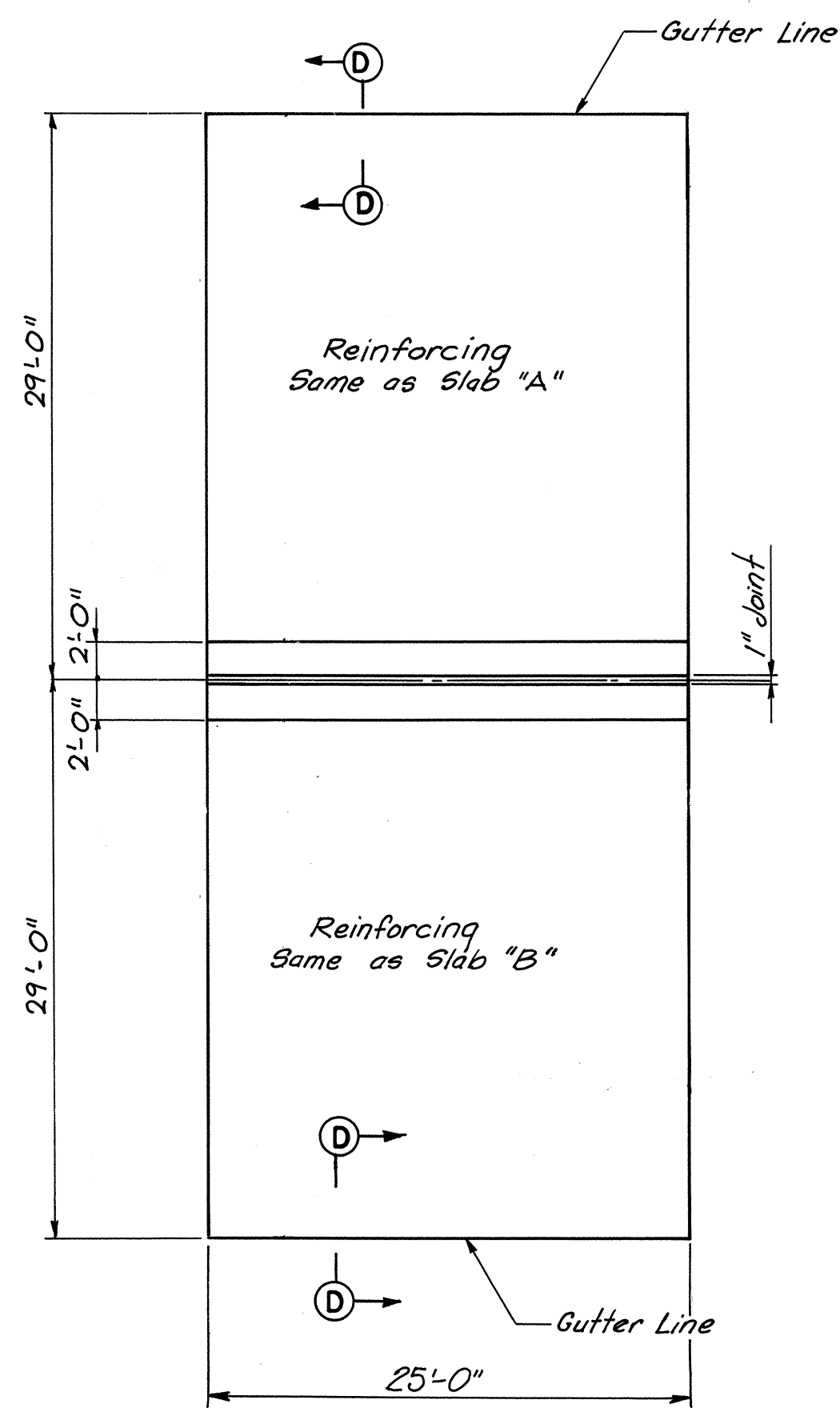
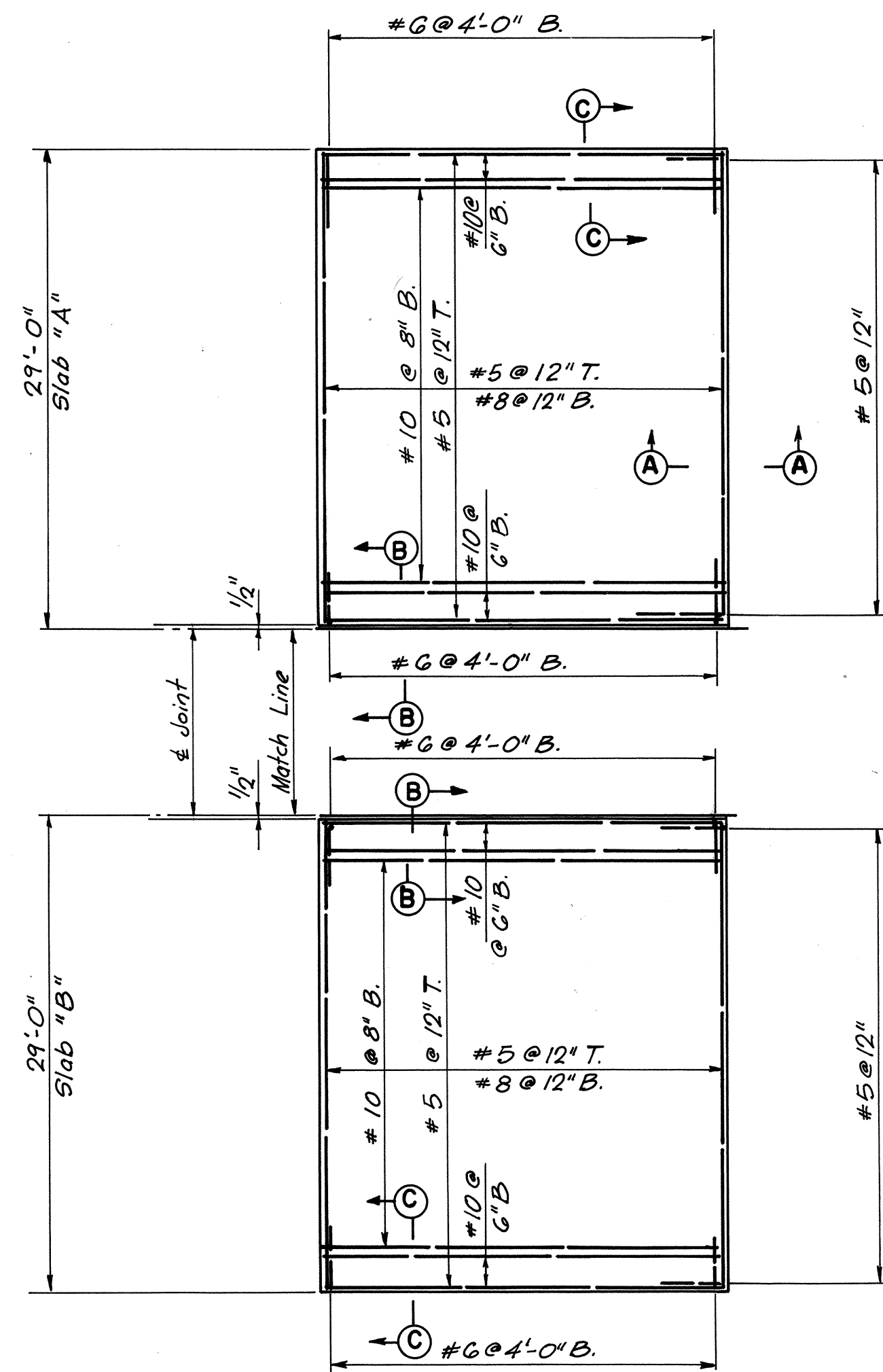
BY	DATE				
MADE	EVR	11-16-67			
CHECKED	RHW	2-68			
IN CHARGE	RHW		NO.	REVISION	BY DATE

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
POWHITE PARKWAY  
FOREST HILL AVENUE OVER  
POWHITE PARKWAY  
BRIDGE B-06  
**UTILITY SUPPORT DETAILS**  
**AT BRIDGE ABUTMENTS**

HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers  
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

SCALE: AS SHOWN  
CONTRACT NO.: 2  
SHEET NO. 16 OF 18

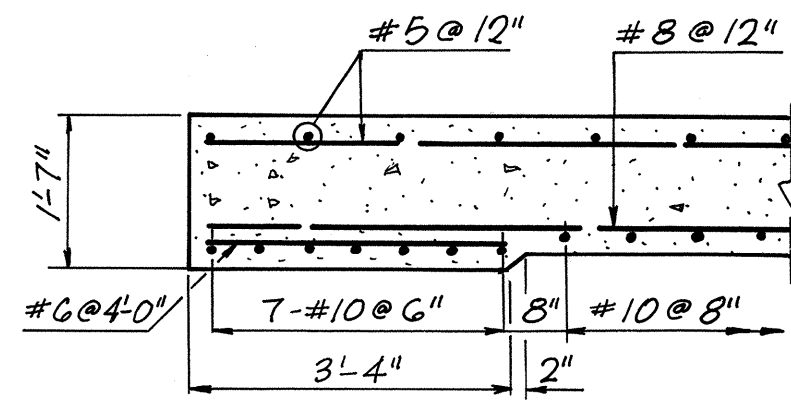
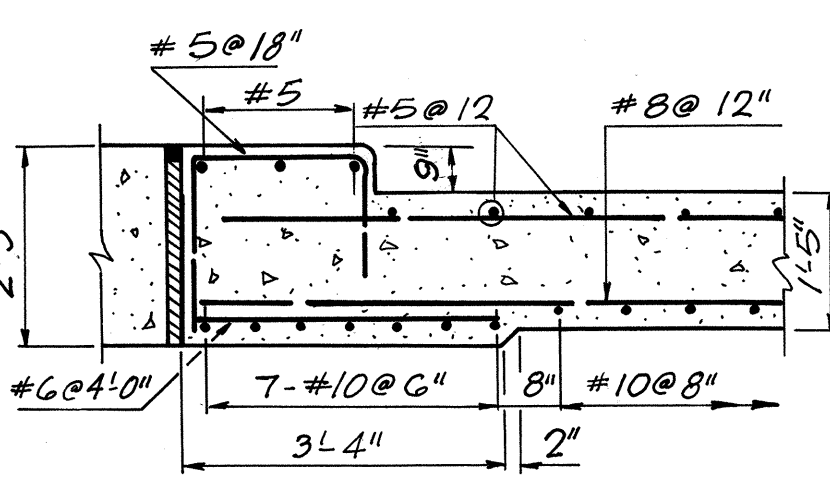
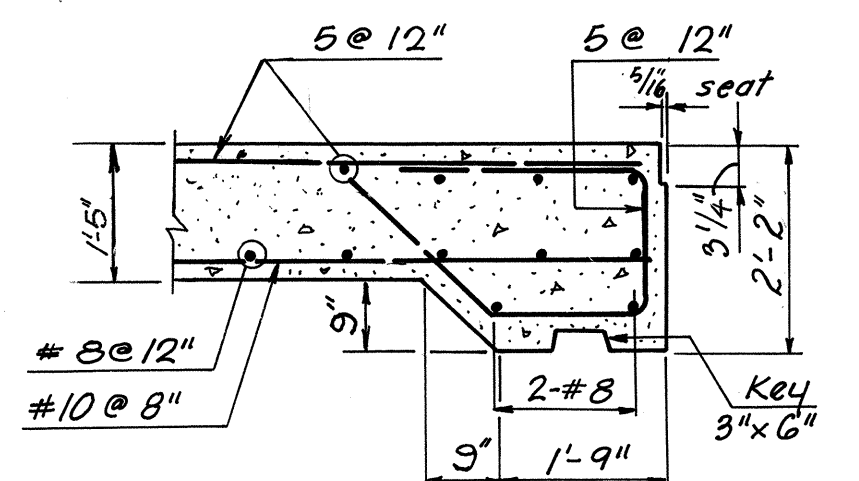
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	167	188



**NOTES:**  
 The Item "Rock Facing Slope Protection" shall include the excavation of, or the placing and compaction of any embankment material necessary to bring the surface of protected slopes to the finished elevations shown.

**SOUTH APPROACH SLAB**  
 No Scale

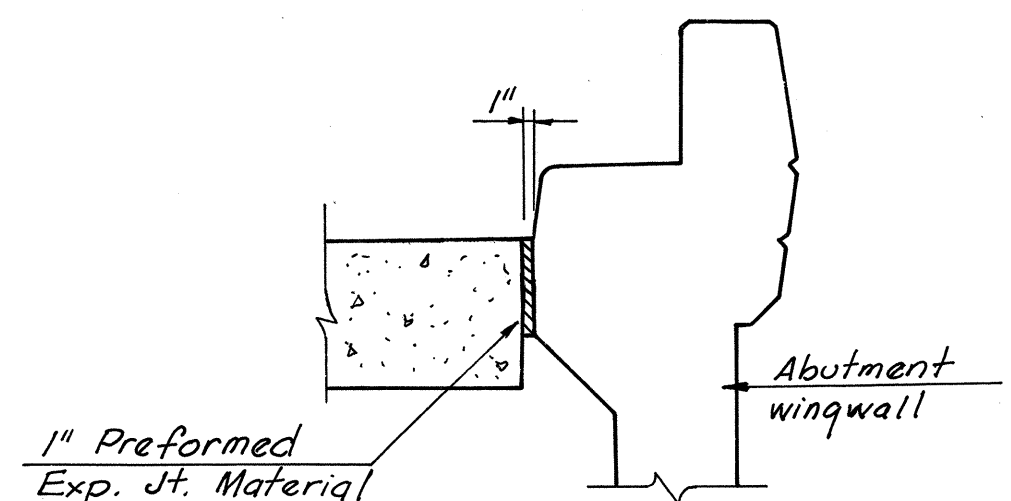
**NORTH APPROACH SLAB**  
 No Scale



**SECTION A-A**  
 Scale: 1/2"=1'-0"

**SECTION B-B**  
 Scale: 1/2"=1'-0"

**SECTION C-C**  
 Scale: 1/2"=1'-0"



**SECTION D-D**  
 Scale: 1/2"=1'-0"

BY	DATE				
MADE	AJP 2-68	2	As Built	JRC	3-73
CHECKED	RHW 2-68	1	Approach Slab	J.L.N.	5-13-68
IN CHARGE	RHW	NO.	REVISION	BY	DATE

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 POWHITE PARKWAY  
 FOREST HILL AVENUE OVER  
 POWHITE PARKWAY  
 BRIDGE B-06  
**APPROACH SLAB AND**  
**SLOPE PROTECTION DETAILS**

HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: AS SHOWN
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO. 2
	SHEET NO. 17 OF 18

## **Bridge 13**

**(Douglasdale Road over I-195 Connector / Powhite Parkway - VA State Rte. 76  
and CSX Railroad)**

**Record Set Plans**





RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
4	BELTLINE EXPRESSWAY	118	155

**GENERAL NOTES**

**ROADWAY:** One 28'-0" clear roadway. Two 5'-0" sidewalks.  
**CAPACITY:** Dead Load includes 15 lbs. per sq. ft. for future wearing surface.  
 Live Loads - HS20-44 loading.

**SPECIFICATIONS:**  
**GENERAL:** Virginia Department of Highway Road and Bridge Specifications 1970.  
**DESIGN:** A.A.S.H.O. Standard Specifications for Highway Bridges 1961, modified by Special Design Provisions.  
**WELDING:** 1969 Standard Specifications for Welded Highway and Railway Bridges of the American Welding Society.

**CONTRACT SPECIAL PROVISIONS**  
 Specifications and Contract Special Provisions referred to above are necessary to make these plans complete.

**DATUM:** City of Richmond  
**TEMPERATURE:** The normal temperature referred to on the plan is 68°F. The temperature range for movement is 0°F to 120°F.

**DIMENSIONS:** All dimensions are measured horizontally and vertically unless otherwise noted.

**EXCAVATION:** Excavation below subgrade and cut slope template shall be classified as Structure Excavation. All excavation above these limits shall be classified as Regular Excavation and is not included in the Structural Quantities.

**FOUNDATIONS:** Footings shall rest on firm material. Foundation material shall be dry and special attention is called to Section 401.05 of General Specifications and to the Contract Special Provisions, concerning preparation of foundations for footings.

**CONCRETE NOTES:**  
 Concrete in superstructure shall be Class A4. All other concrete shall be Class A3. All exposed edges and corners shall have a 1" chamfer or fillet unless otherwise noted. Care in the method of vibration, the use of low-slump concrete, and other means shall be employed to prevent downgrade movement of newly placed slab concrete.  
**Finishing Concrete Surfaces:** See the Standard Architectural Detail Sheets and the Contract Special Provisions for types and details.

All reinforcing steel shall conform to A.S.T.M. A615, Grade 40. All reinforcing bar dimensions on the detailed drawings are to centers of bars unless otherwise noted. Clear distance between reinforcing steel and face of concrete shall be as noted on the plans. All bar laps shall be 30 diameters of the smaller diameter bar unless otherwise noted.

**STEEL NOTES:**  
 Structural steel shall conform to A.S.T.M. Specification A36, except as noted. All field connections shall be made with high strength bolts. High strength bolts shall be 7/8" diameter unless otherwise noted and shall conform to A.S.T.M. Specification A325.

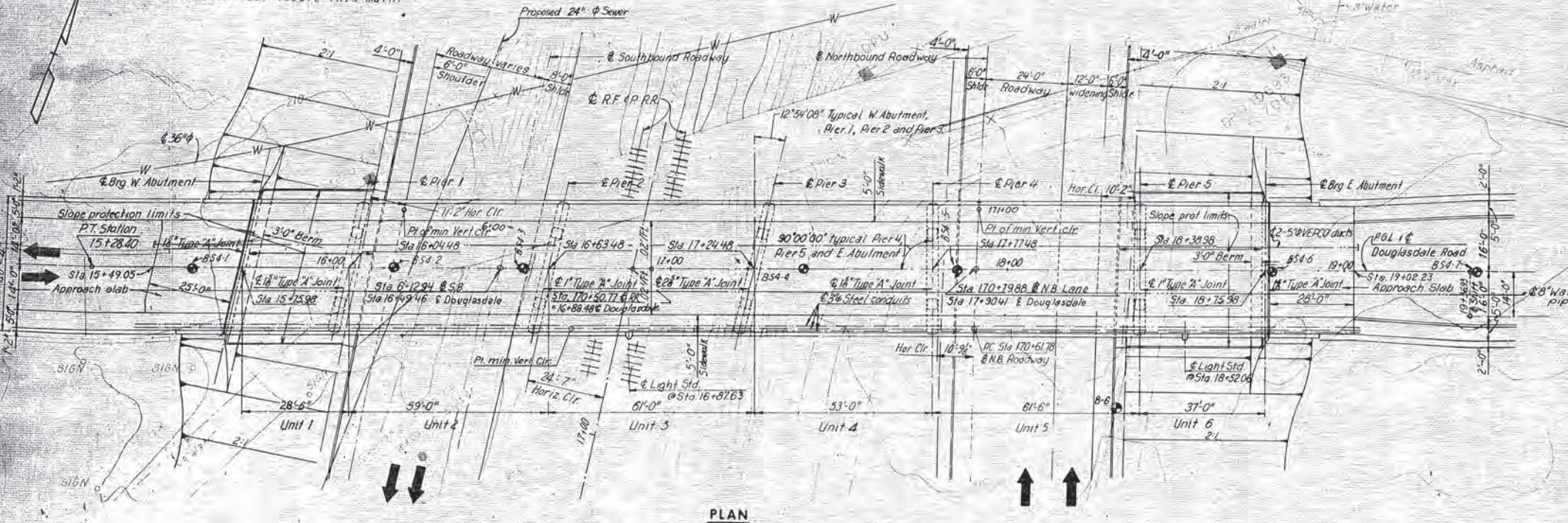
**BENCH MARK:** A-16 Copperweld rod N.W. of R.R. Bridge on Douglasdale. Elev. 213.60

⊙ Boring, denotes 2 1/4" Cased hole

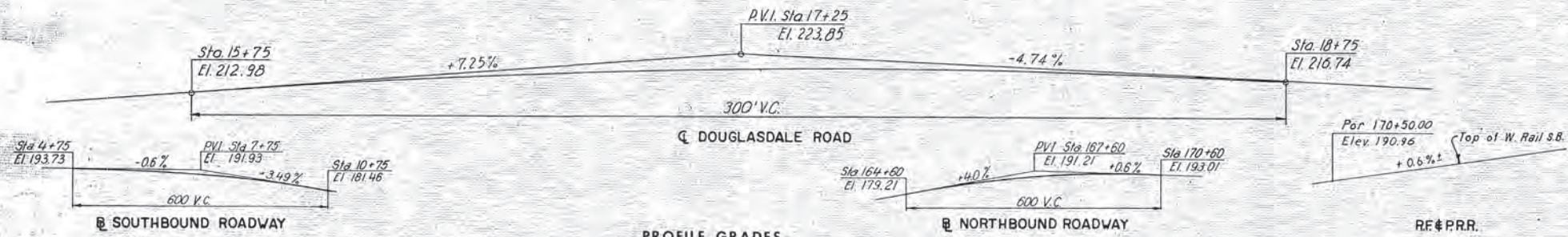
**INDEX**

Sheet	Description
1	GENERAL PLAN AND ELEVATION
2	WEST ABUTMENT
3	EAST ABUTMENT
4	PIERS 1, 2 AND 3
5	PIERS 4 AND 5
6	FRAMING PLAN
7	DECK PLAN
8	FRAMING DETAILS
9	JOINT DETAILS
10	APPROACH SLAB AND SLOPE PROTECTION DETAILS
11	BORING LOGS
12	BORING LOGS
13	STANDARD SHOE DETAILS
14	STANDARD ALUMINUM RAILING DETAILS
15	STANDARD ELECTRICAL DETAILS
16	STANDARD ARCHITECTURAL DETAILS
17	STANDARD UTILITY SUPPORT DETAILS AT BR. ABUTS.
18	STANDARD CONDUIT INSTALLATION DETAILS

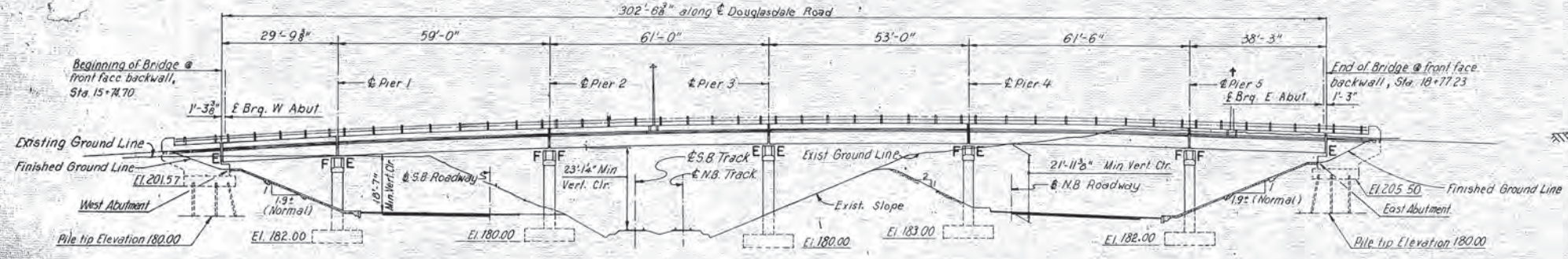
Note: The 36" Water Main location is approximate. Before beginning construction contractor must locate this main.



**PLAN**



**PROFILE GRADES**



**ELEVATION**

**ESTIMATED QUANTITIES**

**LIMITS OF EXCAVATION**

	Struct. Excav. Cu. Yds.	Concrete (a) Cu. Yds.	Reinf. Steel lbs.	Str. Stl. Mild Carbon lbs.	Aluminum Railing (2-rails) Lin. Ft.	Porous Backfill Cu. Yds.	Underdrain Dia. Pipe Lin. Ft.	Steel Piles 10" Dia. Lin. Ft.	Con. Slab St. Prot. Sq. Yds.	Asphalt temp-proofing Sq. Yds.	Approach Slab Conc. (a) Cu. Yds.	Metal Conduit Lin. Ft.	Conduit 5" Dia V.P.C. Lin. Ft.	Water Main 8" Dia Lin. Ft.	Junction Box lbs.
Superstructure	—	464.8(b)	87,170	333,000	650	—	—	—	—	—	—	7,914	704	358	360
West Abutment	130	80.0	13,500	—	—	5.2	50	307	193.3	27	40.4	—	—	—	—
Pier 1	185	65.1	10,220	—	—	—	—	—	—	—	—	—	—	—	—
Pier 2	119	67.5	11,120	—	—	—	—	—	—	—	—	—	—	—	—
Pier 3	204	67.9	11,400	—	—	—	—	—	—	—	—	—	—	—	—
Pier 4	171	66.4	10,740	—	—	—	—	—	—	—	—	—	—	—	—
Pier 5	156	66.6	10,690	—	—	—	—	—	—	—	—	—	—	—	—
East Abutment	126	77.5	13,100	—	—	4.8	29	358	239.7	25	39.4	—	—	—	—
<b>TOTAL</b>	<b>1091</b>	<b>464.8(b)</b> <b>491.0</b>	<b>167,940</b>	<b>333,000</b>	<b>650</b>	<b>10</b>	<b>99</b>	<b>665</b>	<b>433</b>	<b>52</b>	<b>79.8</b>	<b>7,914</b>	<b>704</b>	<b>358</b>	<b>360</b>

**CURVE DATA**

Northbound Roadway  
 P.I. = Sta. 173+60.82  
 Δ = 17°47'52"  
 D = 3°00'00"  
 T/A = 299.04'  
 L = 593.26'  
 R = 1,909.86'

Note: Pile Tip Elevations shown estimated.

(a) Class A3, unless noted  
 (b) Class A4  
 \* Frame and Cover only.

BY	DATE	3	Profile Grade	P.S.	4-0-71
MADE	JV	3-4-68	2	General	J.G.V. 10-70
CHECKED	MAA	3-6-68	1	General Revisions	R.L.M. 5-7-68
IN CHARGE	FKD	NO.	REVISION	BY	DATE

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 BELTLINE EXPRESSWAY  
 BRIDGE NO. 13  
 DOUGLASDALE ROAD OVER  
 BELTLINE EXPRESSWAY AND R.F.P.R.R.  
**GENERAL PLAN AND ELEVATION**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 consulting engineers  
 NEW YORK ALEXANDRIA KANSAS CITY

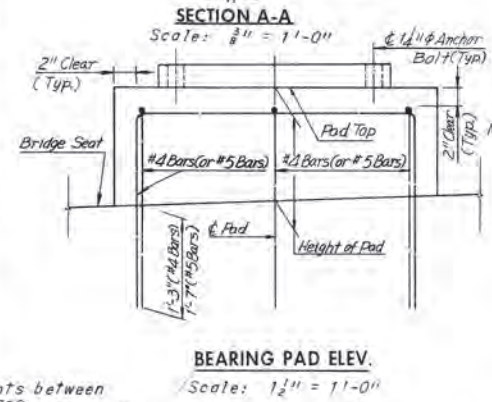
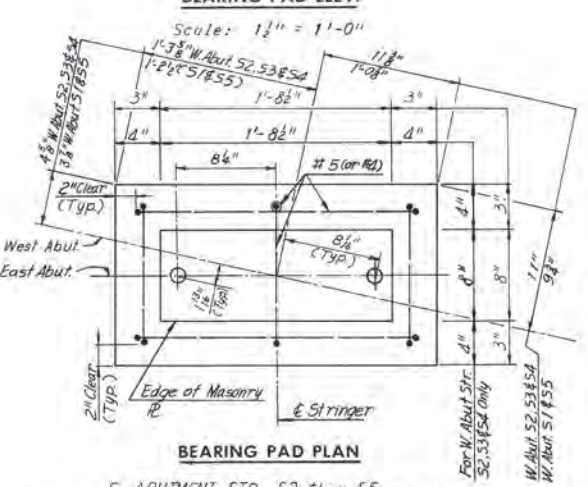
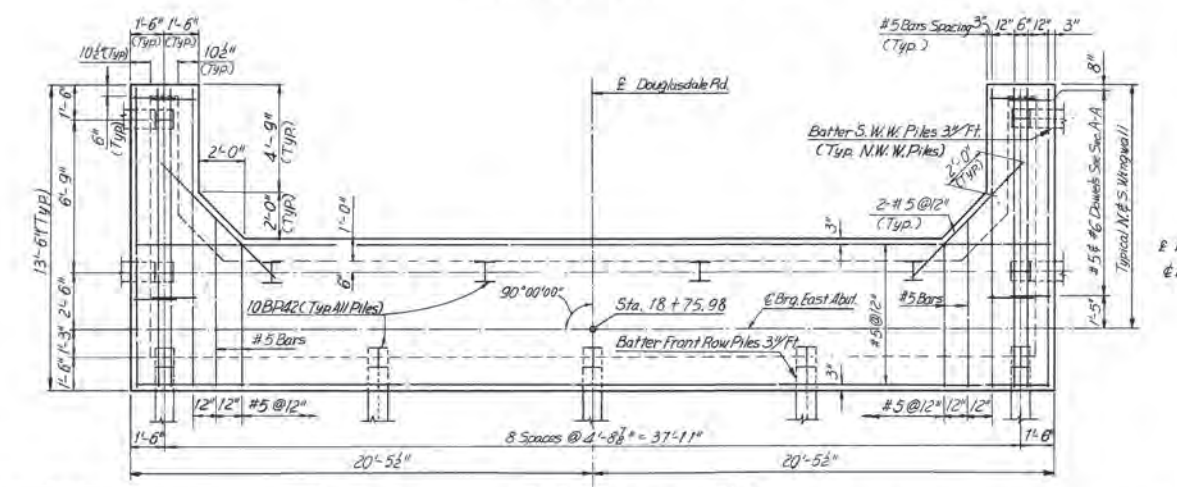
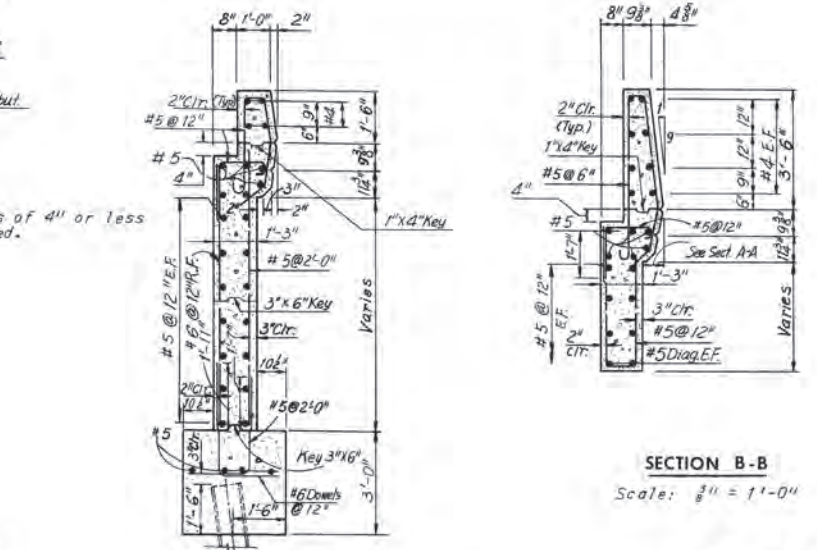
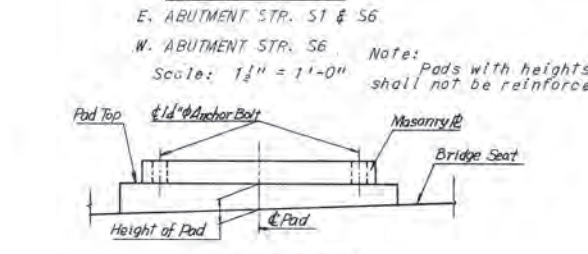
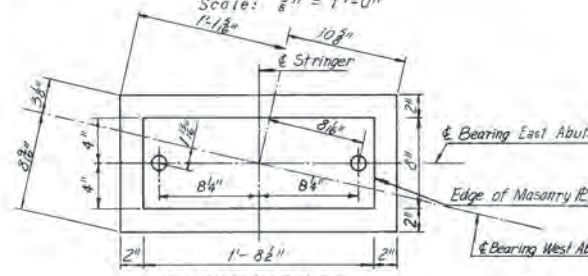
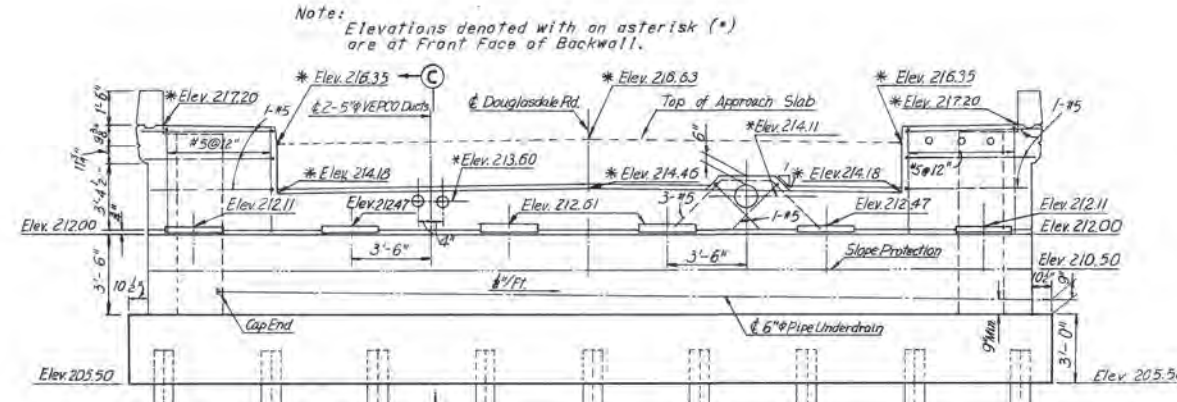
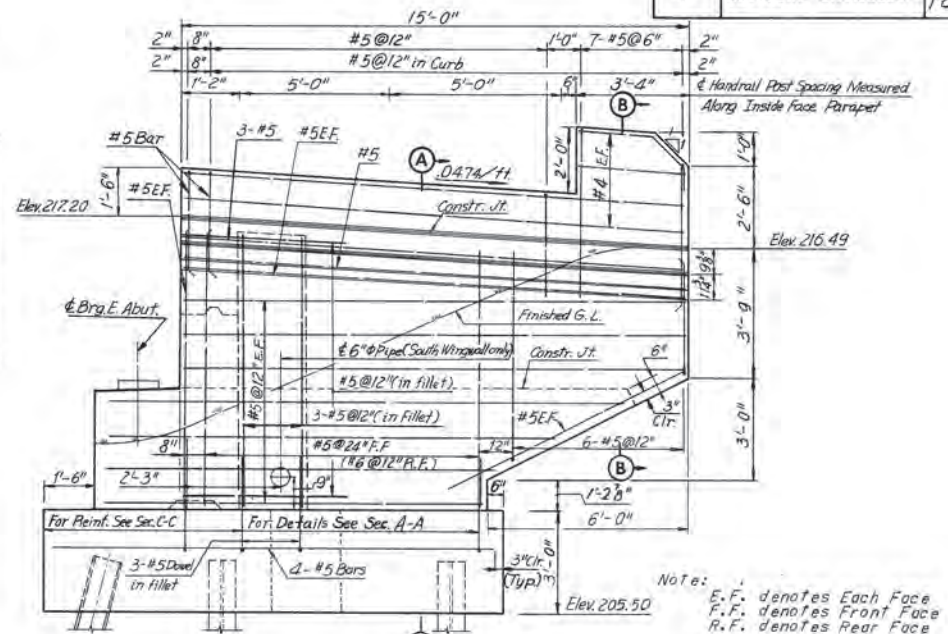
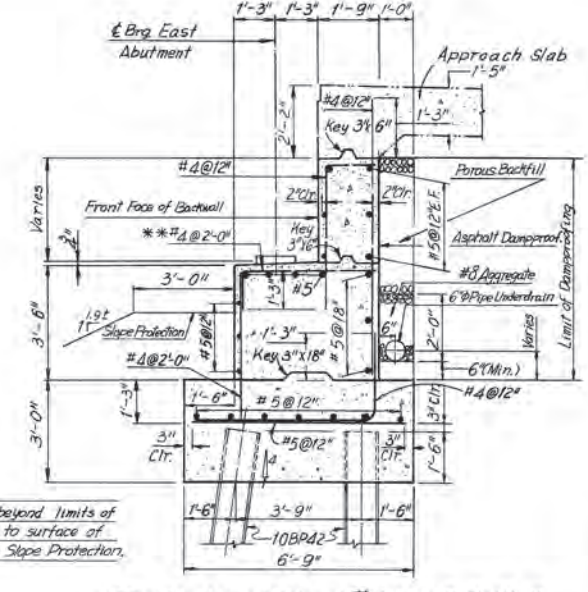
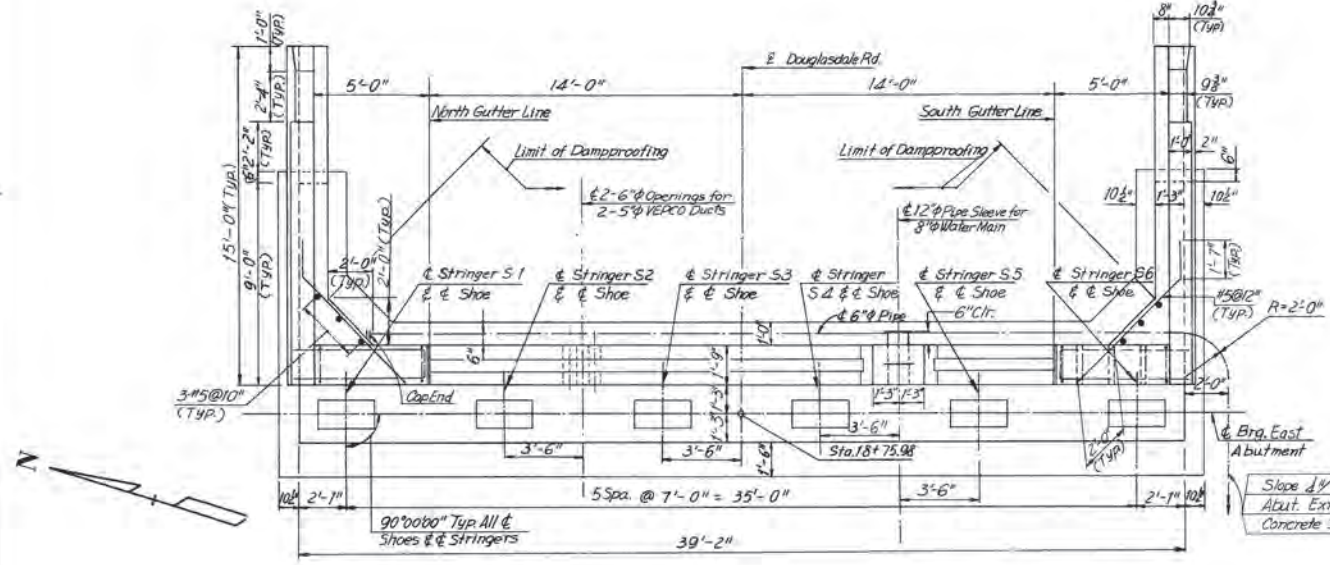
SCALE: 1" = 20'  
 CONTRACT NO. 4  
 SHEET NO. 1 OF 12







RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
4	BELTLINE EXPRESSWAY	120	155



**AS BUILT**

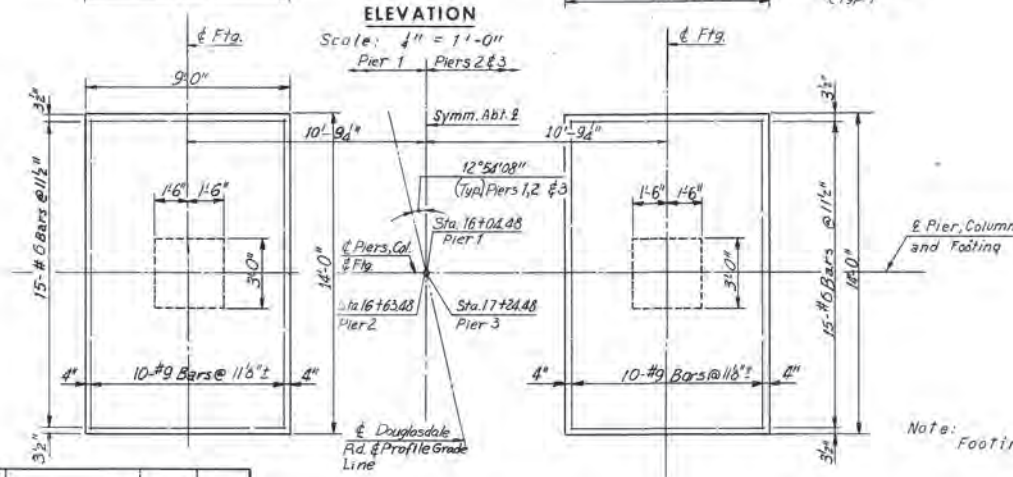
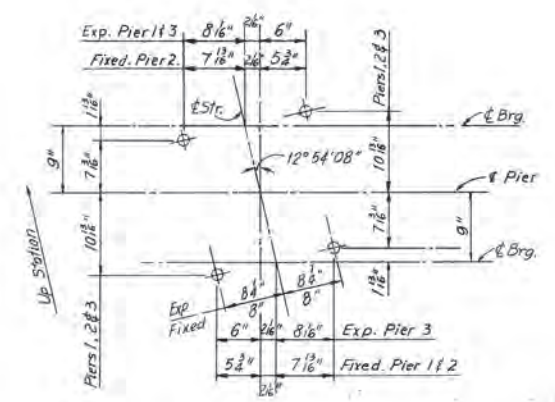
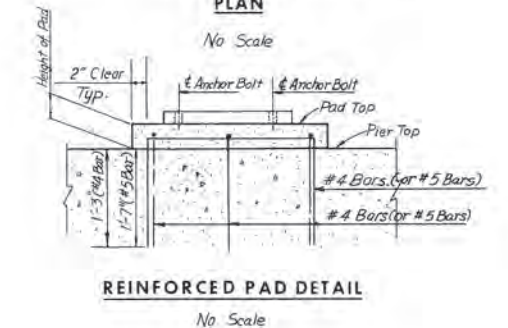
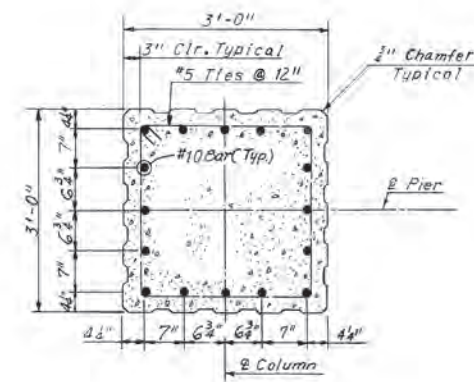
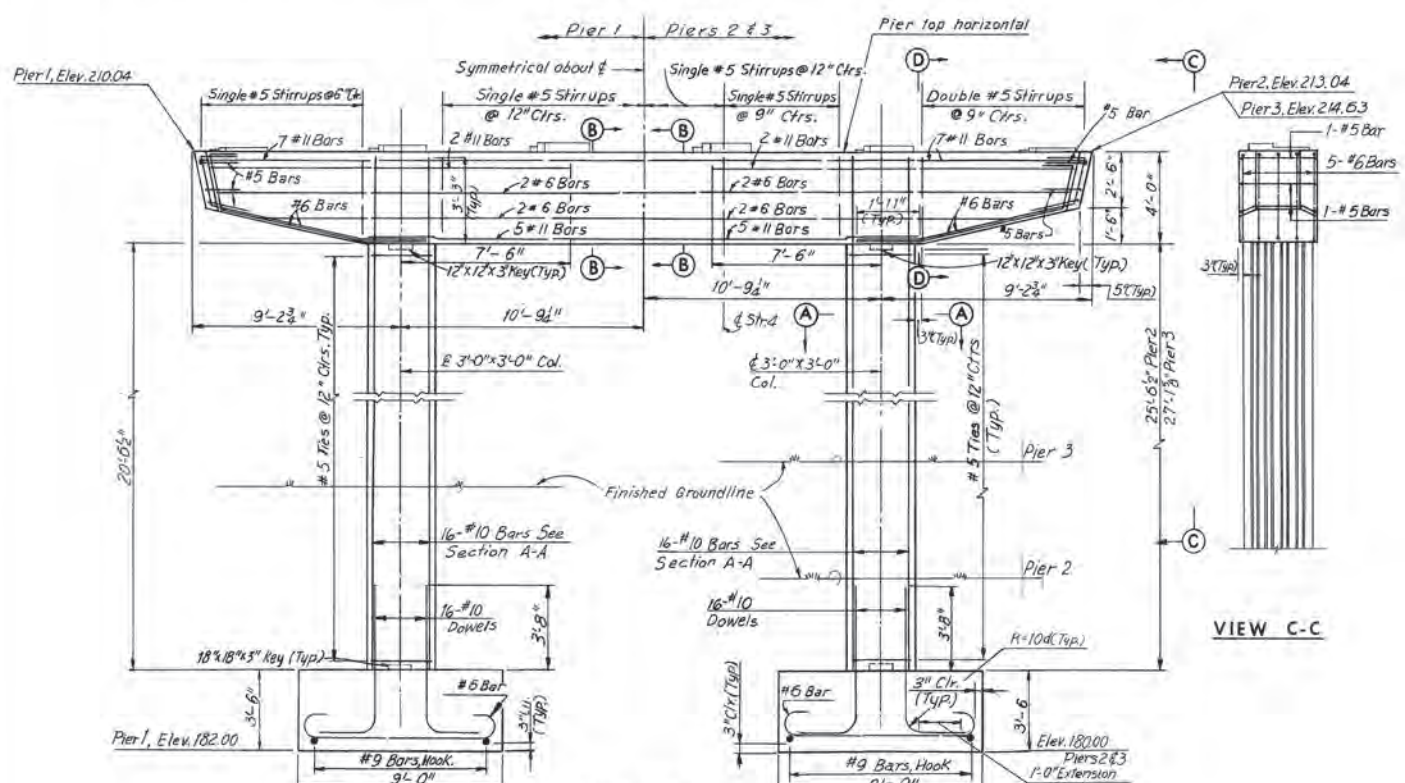
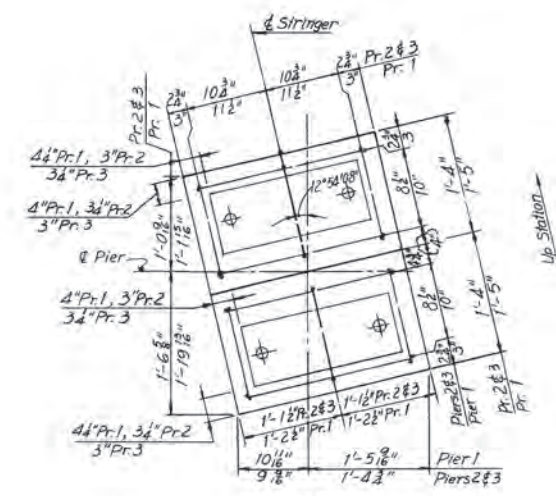
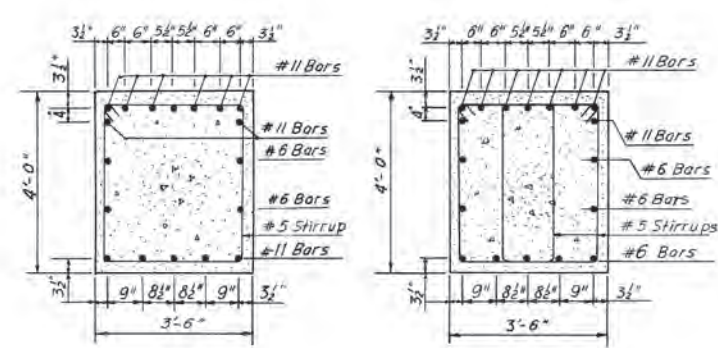
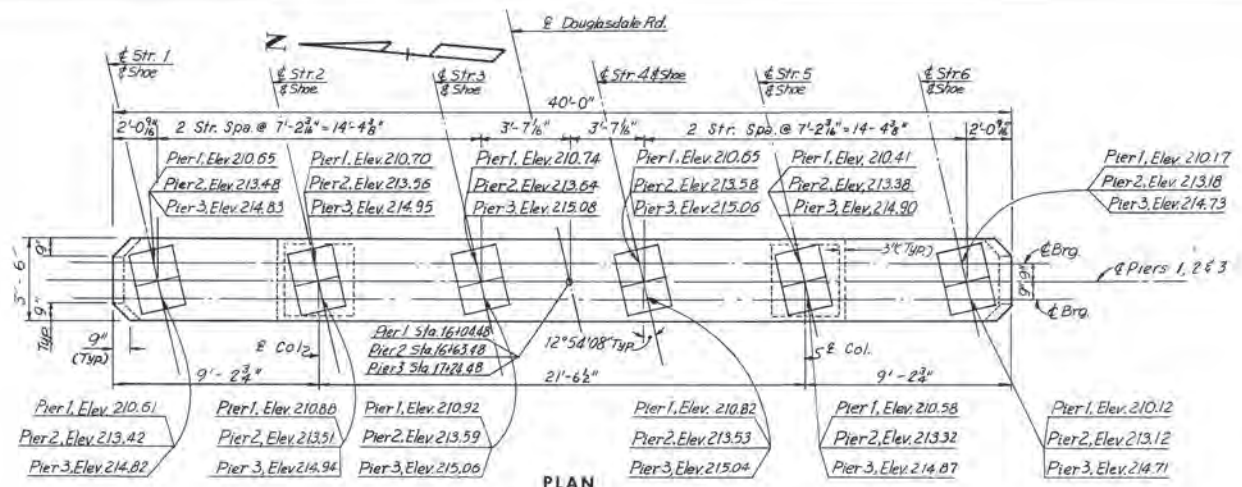
Notes: For Handrail Details see Sheet S3.  
For additional details of 8" Water pipe see Sheet S3.  
For standard details of 5" VEPCO ducts see Sheet S11.

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
BELTLINE EXPRESSWAY  
BRIDGE NO 13  
DOUGLASDALE ROAD OVER  
BELTLINE EXPRESSWAY AND R.F.&P.R.R.  
EAST ABUTMENT

BY	DATE	3	As Built	R.H	2-2-77	
MADE	A.H.H	2-9-48	2	Profile Grade	P.S	4-7-71
CHECKED	M.H.H	3-6-68	1	General Revisions	M.H.H	3-12-68
IN CHARGE	F.K.D					
NO.	REVISION	BY	DATE			

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS NEW YORK ALEXANDRIA KANSAS CITY	SCALE: As Noted CONTRACT NO: 4 SHEET NO: 3 OF 12
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Note:  
Pads with heights of 4" or less shall not be reinforced.  
Pads with heights between 4" and 6" use #4 bar.  
Pads with heights between 8" and 12" use #5 bar.

Notes:  
For shoe details see Sheet 51.  
For Framing Plan see Sheet 6.

BY	DATE				
MADE	M.A.A	9-29-67	2	As Built	RH. 2-2-73
CHECKED	33W	3-6-69	1	Profile Grade	P.S. 4-7-71
IN CHARGE	FKD			NO. REVISION	BY DATE

**FOOTING PLAN**  
Scale: 1/4" = 1'-0"

Note: Footing elevations are exact.

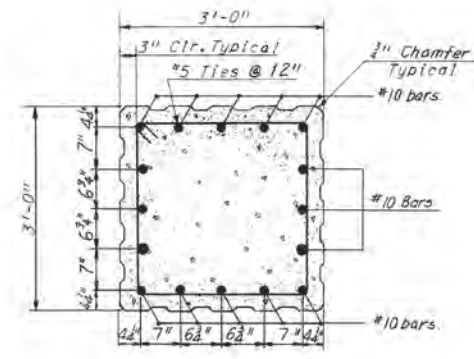
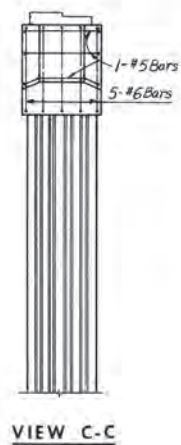
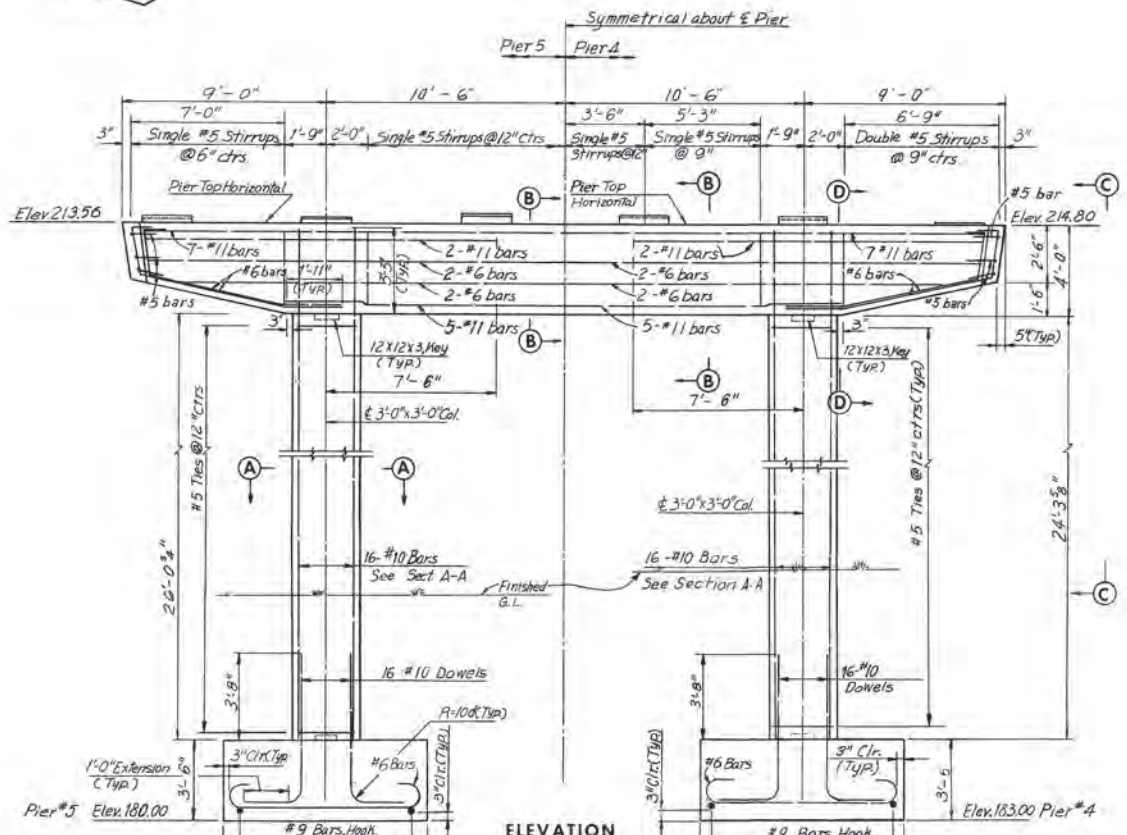
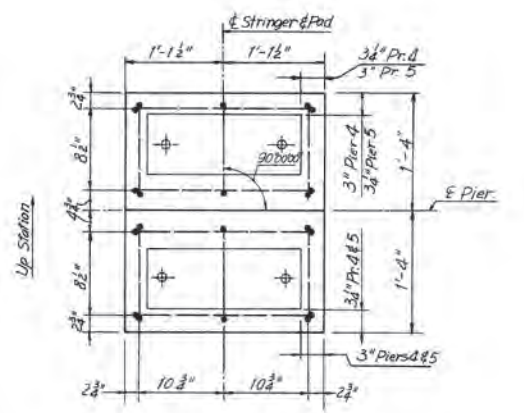
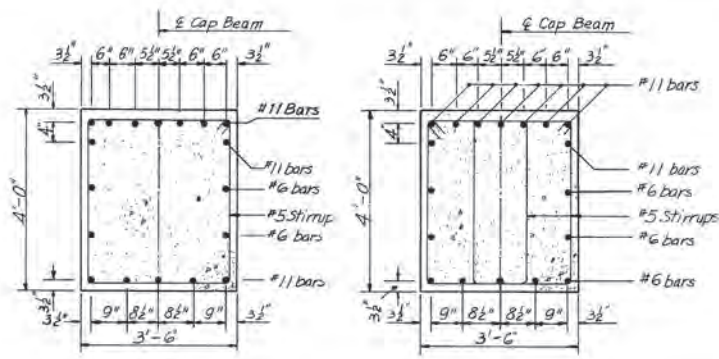
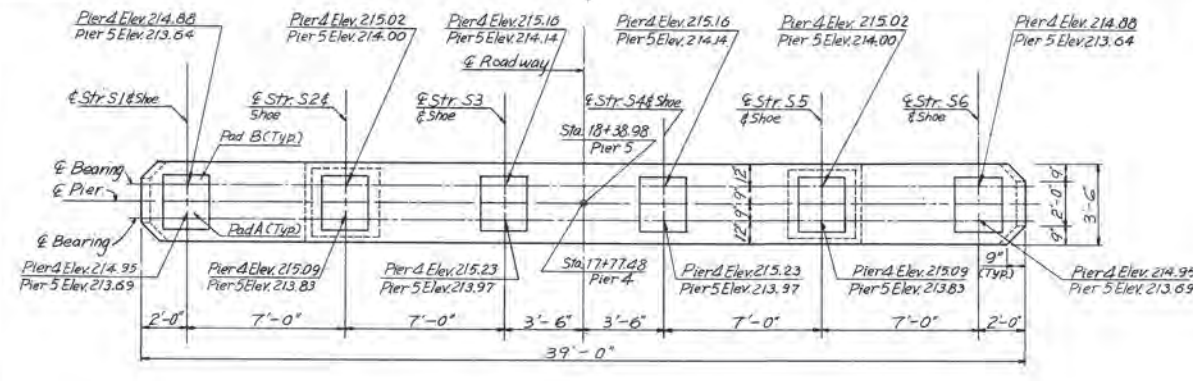
**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
BELTLINE EXPRESSWAY  
BRIDGE NO 13  
DOUGLASDALE ROAD OVER  
BELTLINE EXPRESSWAY AND R.F.&P.R.R.  
PIERS 1, 2 AND 3

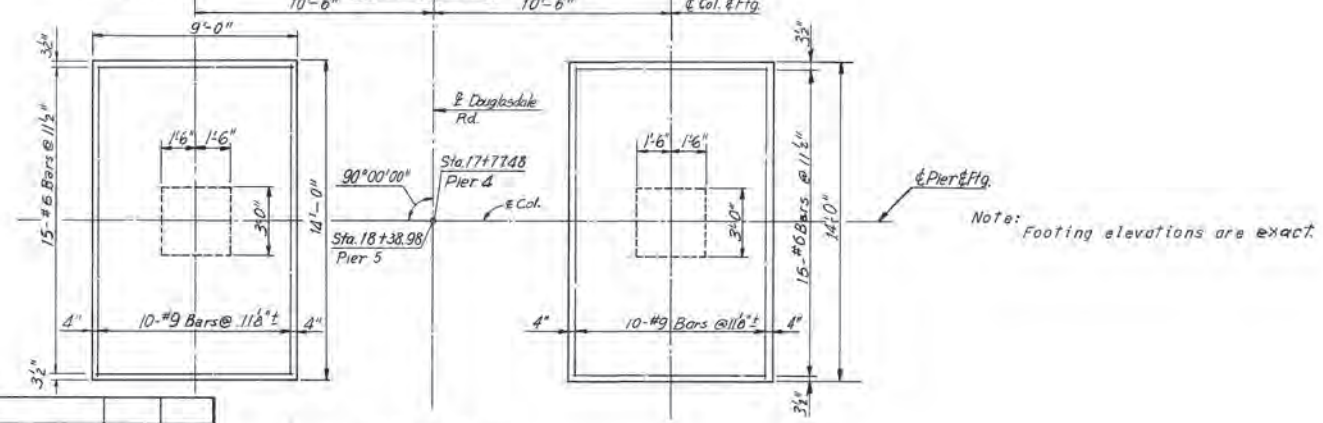
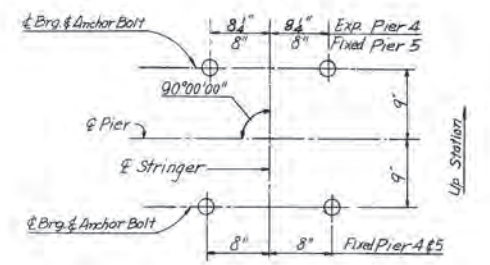
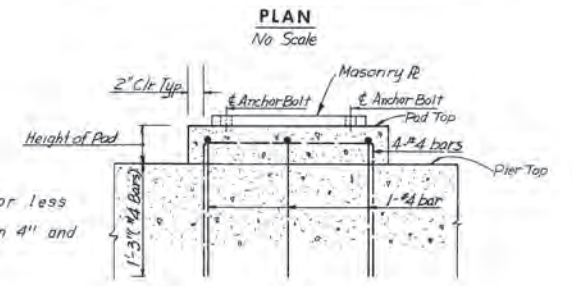
HOWARD, NEEDLES, TAMMEN & BERGENDOFF consulting engineers NEW YORK ALEXANDRIA KANSAS CITY	SCALE: As Noted CONTRACT NO.: 4 SHEET NO.: 4 OF 12
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RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
4	BELTLINE EXPRESSWAY	122	155



Note: pads with heights of 4" or less shall not be reinforced. Pads with heights between 4" and 8" use #4 bar.



**AS BUILT**

Notes:  
For shoe details see Sheet S1.  
For Framing Plan see Sheet 6.

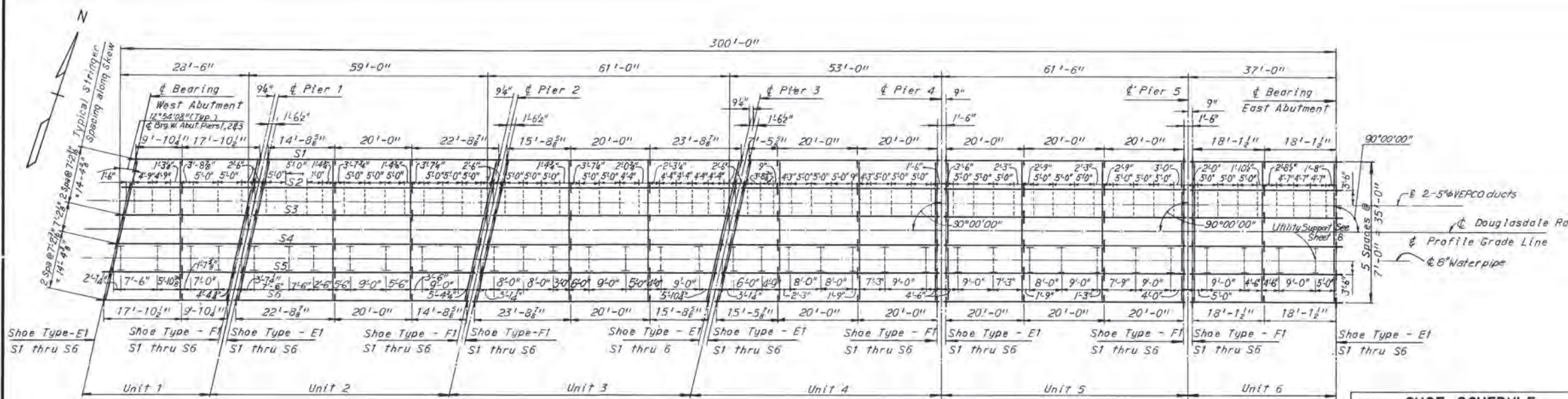
NO.	REVISION	BY	DATE
1	Profile Grade	P.S.	4-7-71
2	As Built	R.H.	2-2-73

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
BELTLINE EXPRESSWAY  
BRIDGE NO 13  
DOUGLASDALE ROAD OVER  
BELTLINE EXPRESSWAY AND R.F.&P.R.  
PIERS 4 AND 5

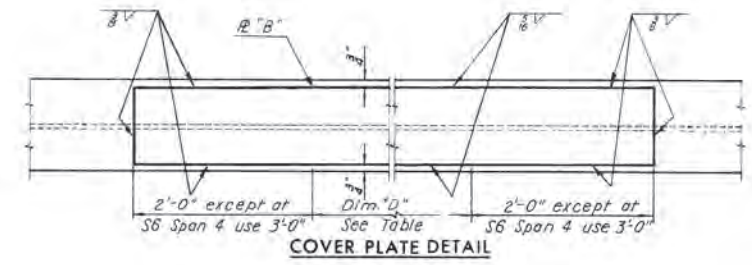
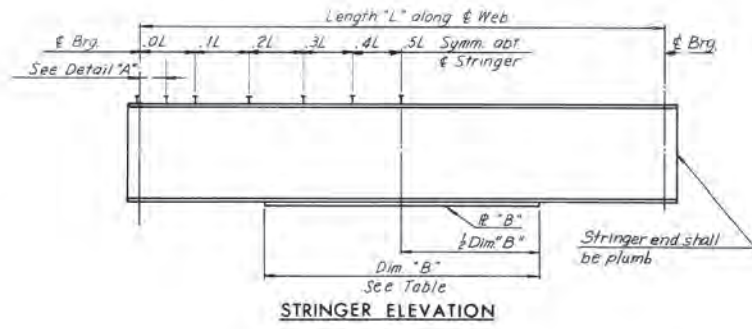
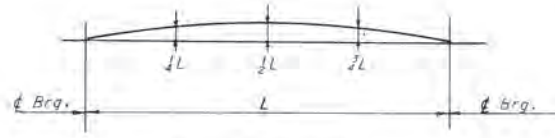
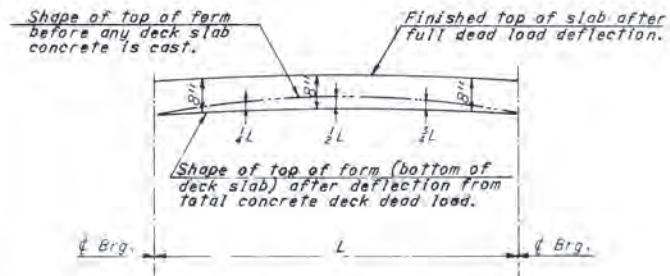
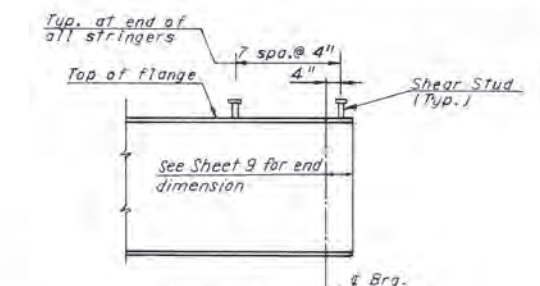
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: As Noted  
CONTRACT NO. 4  
SHEET NO. 5 OF 12





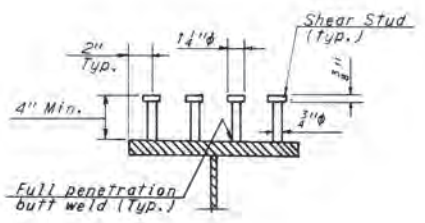
SHOE SCHEDULE			
EXPANSION SHOES		FIXED SHOES	
TYPE	NO. REQD.	TYPE	NO. REQD.
E1	36	F1	36



\*...Spacing begins at the termination of 7spaces of 4" ctrs.

DEAD LOAD DEFLECTION SCHEDULE												
STRINGER	UNIT 1		UNIT 2		UNIT 3		UNIT 4		UNIT 5		UNIT 6	
	1/4L	1/2L	1/4L	1/2L	1/4L	1/2L	1/4L	1/2L	1/4L	1/2L	1/4L	1/2L
S1	1/8"	1/4"	5/16"	1/4"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"
S2	1/8"	1/4"	9/16"	1/2"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"
S3	1/8"	1/4"	9/16"	1/2"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"
S4	1/8"	1/4"	9/16"	1/2"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"
S5	1/8"	1/4"	9/16"	1/2"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"
S6	1/8"	1/4"	9/16"	1/2"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"	1/8"	1/4"

UNIT	STRINGER	LENGTH "L"	STRINGER SIZE	R "B"	DIM. "B"	DIM. "D"	SHEAR STUD SPACING					CAMBER SCHEDULE		
							.OL-.1L	.1L-.2L	.2L-.3L	.3L-.4L	.4L-.5L	1/4L	1/2L	3/4L
1	S1 & S6	27'-8 1/2"	36 WF 135	—	—	—	9 1/2"	11"	13 1/2"	16 1/2"	22"	7 1/8"	7 1/8"	7 1/8"
	S2 & S5	27'-8 1/2"	33 WF 118	—	—	—	9 1/2"	11"	13 1/2"	16 1/2"	22"	7 1/8"	7 1/8"	7 1/8"
	S3 & S4	27'-8 1/2"	33 WF 118	—	—	—	9 1/2"	11"	13 1/2"	16 1/2"	22"	7 1/8"	7 1/8"	7 1/8"
2	S1 & S6	57'-5 1/2"	36 WF 135	10 1/2 x 2 1/2	43'-2"	39'-2"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
	S2 & S5	57'-5 1/2"	36 WF 135	10 1/2 x 2 1/2	43'-2"	39'-2"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
	S3 & S4	57'-5 1/2"	36 WF 135	10 1/2 x 2 1/2	43'-2"	39'-2"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
3	S1 & S6	59'-5 1/2"	36 WF 135	10 1/2 x 2 1/2	44'-8"	40'-8"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
	S2 & S5	59'-5 1/2"	36 WF 135	10 1/2 x 2 1/2	44'-8"	40'-8"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
	S3 & S4	59'-5 1/2"	36 WF 135	10 1/2 x 2 1/2	44'-8"	40'-8"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
4	S1	47'-5 1/2"	36 WF 135	10 1/2 x 2 1/2	35'-8"	31'-8"	8"	9"	11"	14"	18 1/2"	1 3/8"	1 3/8"	1 3/8"
	S2	49'-0 1/2"	36 WF 135	10 1/2 x 2 1/2	36'-10"	32'-10"	8"	9"	11"	14"	18 1/2"	1 3/8"	1 3/8"	1 3/8"
	S3	50'-8 1/2"	36 WF 135	10 1/2 x 2 1/2	38'-1"	34'-1"	8"	9"	11"	14"	18 1/2"	1 3/8"	1 3/8"	1 3/8"
5	S1 & S6	60'-0"	36 WF 135	10 1/2 x 2 1/2	45'-0"	41'-0"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
	S2 & S5	60'-0"	36 WF 135	10 1/2 x 2 1/2	45'-0"	41'-0"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
	S3 & S4	60'-0"	36 WF 135	10 1/2 x 2 1/2	45'-0"	41'-0"	8"	9 1/2"	11 1/2"	14"	18 1/2"	2 3/8"	3 1/8"	2 3/8"
6	S1 & S6	36'-3"	36 WF 135	—	—	—	9 1/2"	11"	13 1/2"	16 1/2"	22"	8"	8"	8"
	S2 & S5	36'-3"	33 WF 118	—	—	—	9 1/2"	11"	13 1/2"	16 1/2"	22"	8"	8"	8"
	S3 & S4	36'-3"	33 WF 118	—	—	—	9 1/2"	11"	13 1/2"	16 1/2"	22"	8"	8"	8"



**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM  
 BELTLINE EXPRESSWAY  
 BRIDGE NO 13  
 DOUGLASDALE ROAD OVER  
 BELTLINE EXPRESSWAY AND R.F.&P.R.R.  
**FRAMING PLAN**

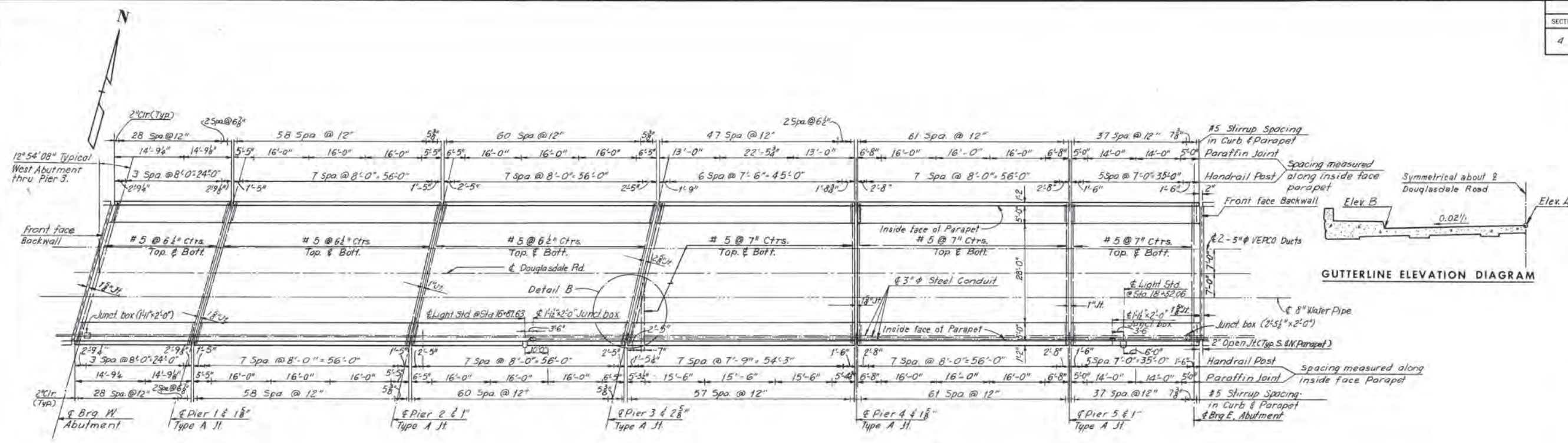
BY	DATE	NO.	REVISION	BY	DATE
A.H.H.	11-20-67	2	General	P.S.	4-7-71
S.S.W.	2-8-68	1	General Revisions	MAH	3-12-68
FKD					

Note: Stringers having a total camber of less than 1" are not required to be shop cambered, but should be turned so that any mill tolerance deviation from straightness will be in the direction shown by the Camber diagram.  
 If stringers are not cambered distance top of stringers to top of slab will vary along the stringer in accordance with the offset dimensions shown in the Camber diagram, and with a minimum distance as shown in cross-section on Sheet 7.



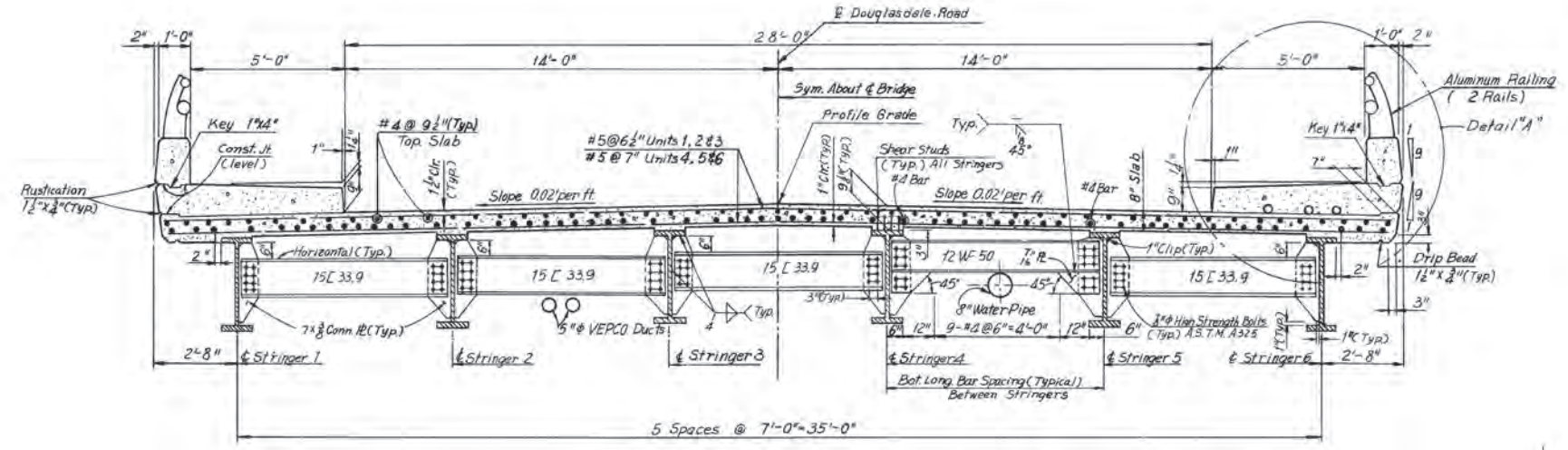
TABLE OF ELEVATIONS

STATION	ELEV. A	ELEV. B
15+50.00	211.17	210.89
60.00	211.89	211.61
70.00	212.62	212.34
71.49	—	212.45
74.70	212.96	—
77.91	—	212.92
80.00	213.34	213.06
90.00	214.03	213.75
16+00.00	214.67	214.39
01.28	—	214.47
04.48	214.95	—
07.69	—	214.86
10.00	215.28	215.00
20.00	215.84	215.56
30.00	216.37	216.09
40.00	216.85	216.57
50.00	217.30	217.02
60.00	217.70	217.42
60.28	—	217.43
63.48	217.83	—
66.69	—	217.67
70.00	218.07	217.79
80.00	218.40	218.12
90.00	218.68	218.40
17+00.00	218.93	218.65
10.00	219.13	218.85
20.00	219.30	219.02
21.28	—	219.03
24.48	219.36	—
27.69	—	219.12
30.00	219.42	219.14
40.00	219.51	219.23
50.00	219.55	219.27
60.00	219.56	219.28
70.00	219.52	219.24
77.48	219.47	219.19
80.00	219.45	219.17
90.00	219.33	219.05
18+00.00	219.18	218.90
10.00	218.99	218.71
20.00	218.75	218.47
30.00	218.48	218.20
38.98	218.20	217.92
40.00	218.16	217.88
50.00	217.81	217.53
60.00	217.42	217.14
70.00	216.97	216.69
77.23	216.63	216.35
80.00	216.50	216.22
90.00	216.03	215.75
19+00.00	215.55	215.27

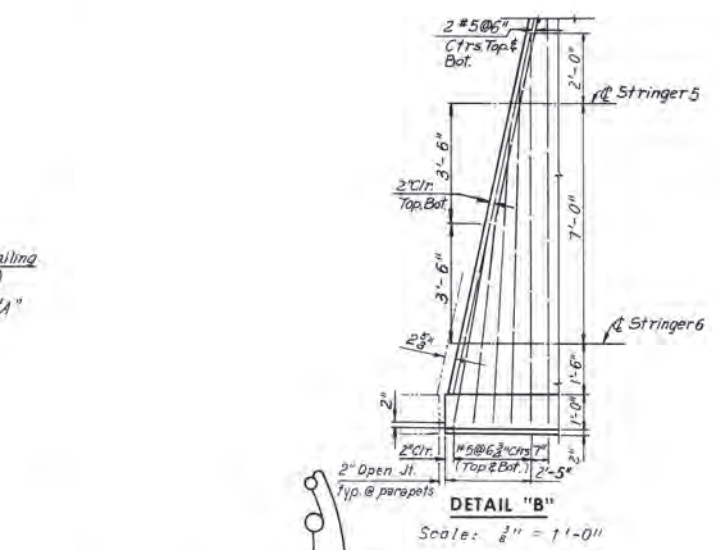


DECK PLAN  
Scale: 1/8" = 1'-0"

Note: For reinforcing steel at joints see Sheet 9 joint details.



TYPICAL CROSS SECTION INTERMEDIATE DIAPHRAGM  
Scale: 3/8" = 1'-0"



DETAIL "A"  
Scale: 1/2" = 1'-0"

Notes:  
For Superstructure Quantities see Sheet 1.  
For Framing and Utility support details see Sheet 8.  
For Joint details see Sheet 9.  
For Lighting details see Sheet 5d.  
For details of transmission ducts see Sheet 5d.

BY	DATE	3	As Builts	R.H.	2-5-73
MADE	AHH 10-7-67	2	Profile Grade	L.B.P.	4-6-71
CHECKED	SSN 2-8-67	1	General Revisions	MHH	3-12-68
IN CHARGE	FKD	NO.	REVISION	BY	DATE

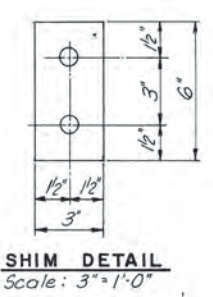
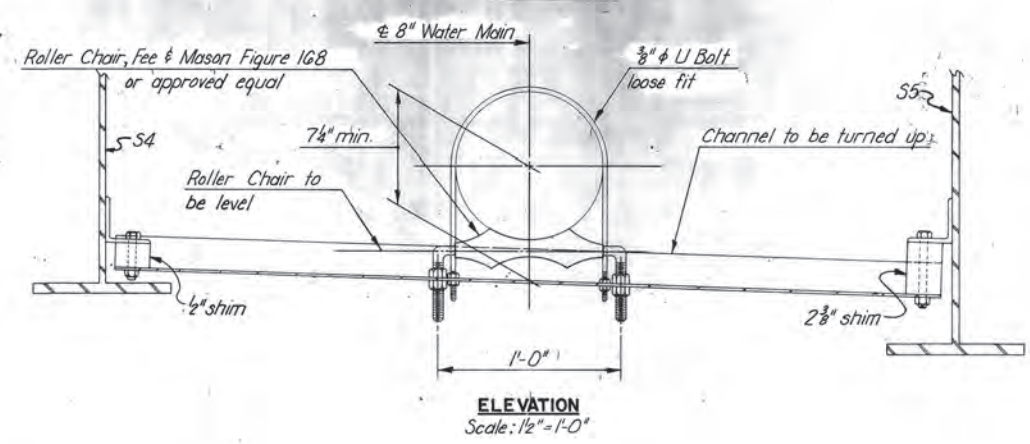
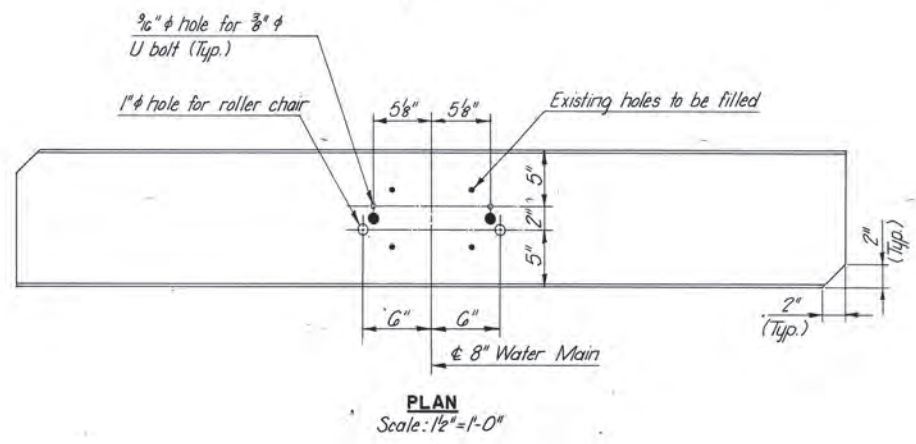
RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
BELTLINE EXPRESSWAY  
BRIDGE NO 13  
DOUGLASDALE ROAD OVER  
BELTLINE EXPRESSWAY AND R.F.&P.R.  
DECK PLAN

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS NEW YORK ALEXANDRIA KANSAS CITY	SCALE: As Noted CONTRACT NO. 4 SHEET NO. 7 OF 12
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RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
4	BELTLINE EXPRESSWAY	1257	1

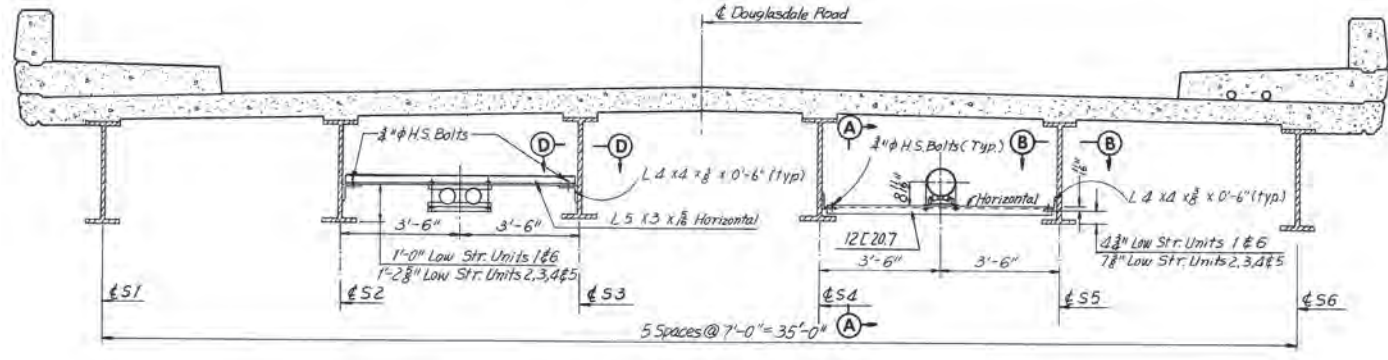


AS BUILT

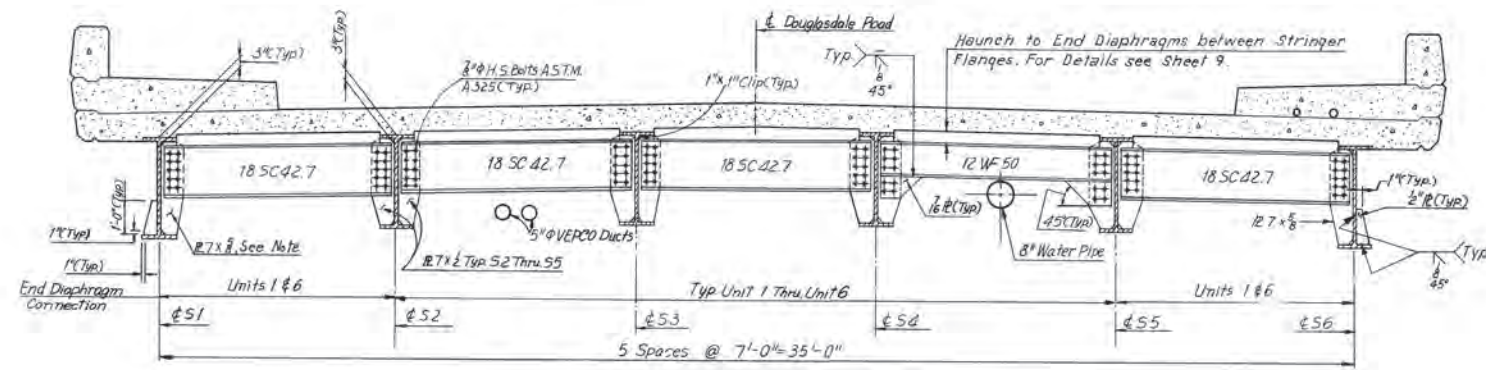
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BRIDGE NO. 13 DOUGLASDALE ROAD OVER BELTLINE EXPRESSWAY AND R.F. & P. R.R. WATER MAIN SUPPORT DIAPHRAGMS UNITS 1 & 6	
SCALE: AS SHOWN	CONTRACT NO. 4
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	SHEET NO. 8A OF 12

MADE	BY	DATE			
CHECKED			1	As Built	RH 2-5-73
IN CHARGE			NO.	REVISION	BY DATE

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
4	BELTLINE EXPRESSWAY	125	155

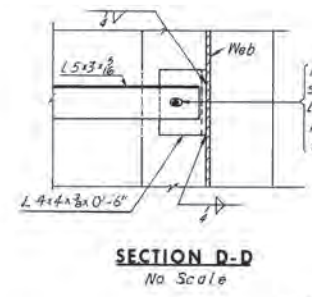
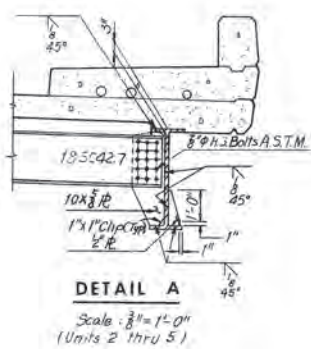
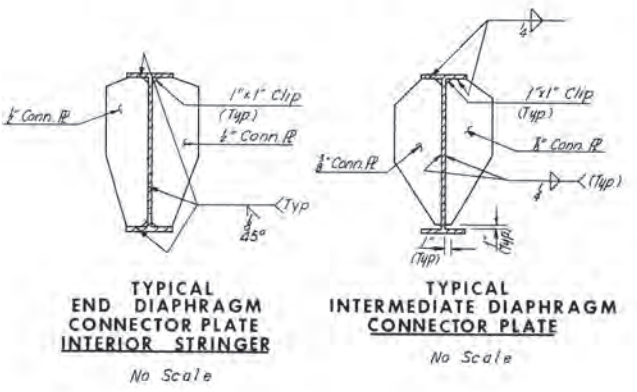


**UTILITY SUPPORTS**  
**TYPICAL SECTION BETWEEN DIAPHRAGMS**  
 Scale: 3/8" = 1'-0"

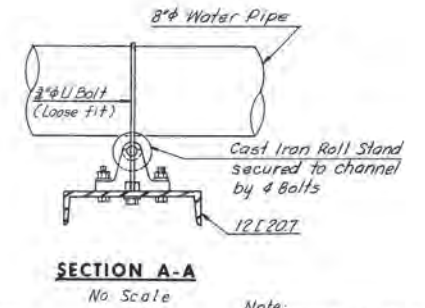


**CROSS SECTION**  
**END DIAPHRAGMS**  
 Scale: 3/8" = 1'-0" Note: For intermediate diaphragms see Sheet 7.

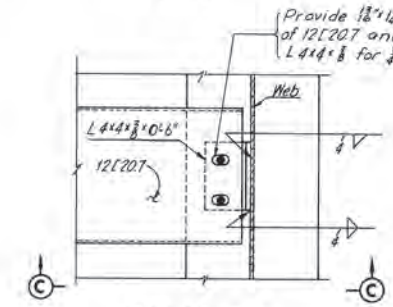
Note: End diaphragms and connections shown above are typical for all units with the following exceptions:  
 7"x8" Bearing and connection plates on exterior stringers with 2 rows of 5 bolts as shown for Units 1 and 6, to be replaced by 10"x8" plate with 3 rows of 5 bolts for Units 2 through 5, see Detail A below.



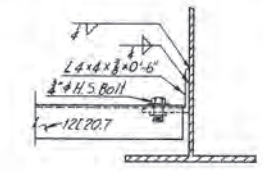
**SECTION D-D**  
 No Scale



**SECTION A-A**  
 No Scale

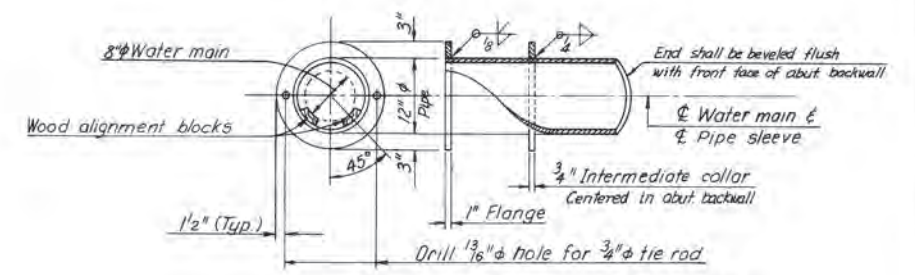


**SECTION B-B**  
 No Scale



**SECTION C-C**  
 No Scale

Note: For spacing of utility supports see Framing Plan Sheet 6.



Note: Steel pipe sleeve to be hot-dip galvanized after fabrication in accordance with ASTM A123

**PIPE SLEEVE DETAIL FOR WATER MAIN**  
 No Scale

Note: For location and additional sleeve dimensions of 8\"/>

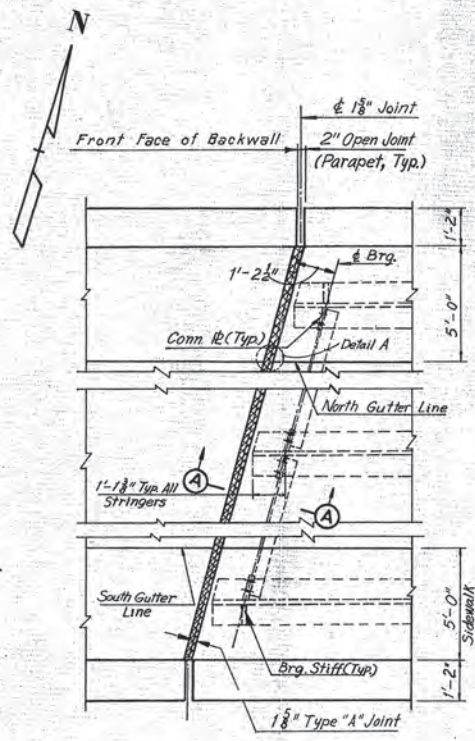
BY	DATE	NO.	REVISION	BY	DATE
AMH	11-27-67	2	As Built	RH	2-5-73
SSW	2-14-68	1	General Revisions	MHH	3-12-68
FKD					

**AS BUILT**

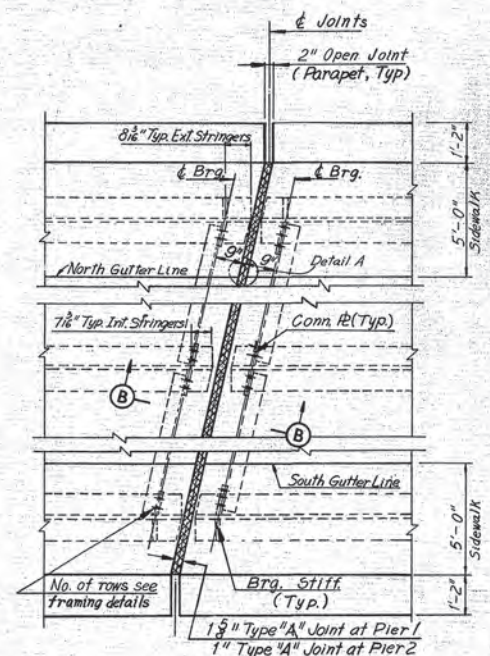
**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 BELTLINE EXPRESSWAY  
 BRIDGE NO. 13  
 DOUGLASDALE ROAD OVER  
 BELTLINE EXPRESSWAY AND R.F.&P.R.R.  
**FRAMING DETAILS**

SCALE: As Noted  
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 consulting engineers  
 NEW YORK ALEXANDRIA KANSAS CITY  
 CONTRACT NO. 4  
 SHEET NO. 8 OF 12

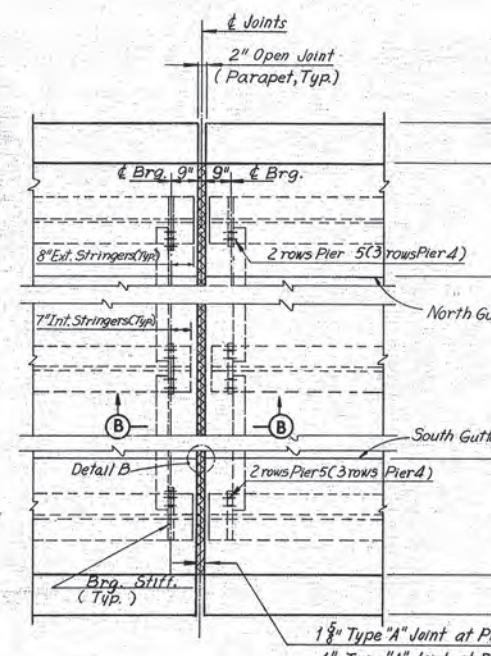




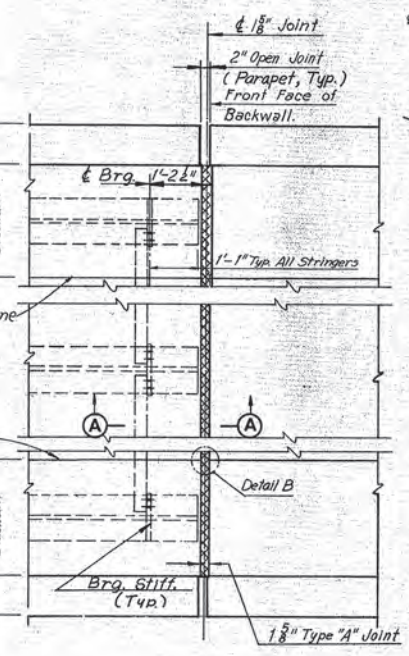
**PLAN - JOINT AT WEST ABUTMENT**  
Scale: 3/8" = 1'-0"



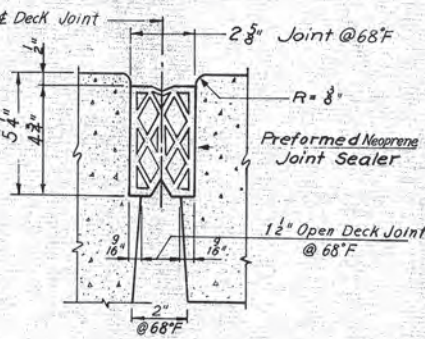
**PLAN - JOINT AT PIERS 1, 2 AND 3**  
Scale: 3/8" = 1'-0"



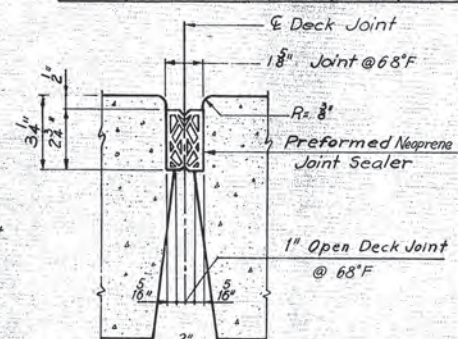
**PLAN - JOINT AT PIERS 4 AND 5**  
Scale: 3/8" = 1'-0"



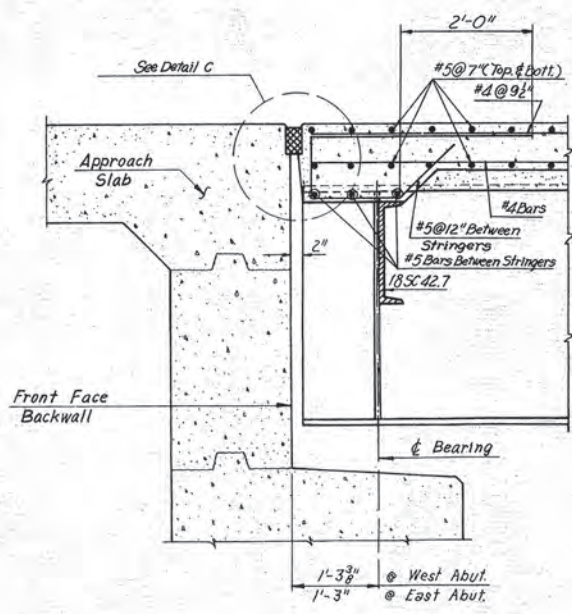
**PLAN - JOINT AT EAST ABUTMENT**  
Scale: 3/8" = 1'-0"



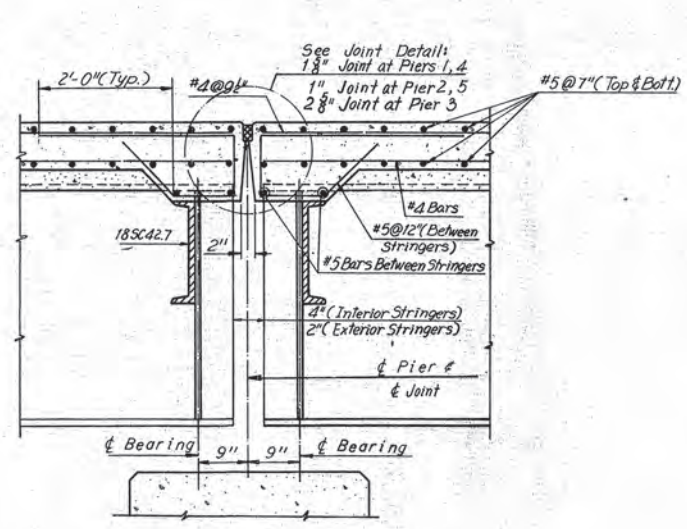
**PREFORMED NEOPRENE JOINT SEALER FOR 2 1/2" TYPE "A" JOINT**



**PREFORMED NEOPRENE JOINT SEALER FOR 1 1/2" TYPE "A" JOINT**

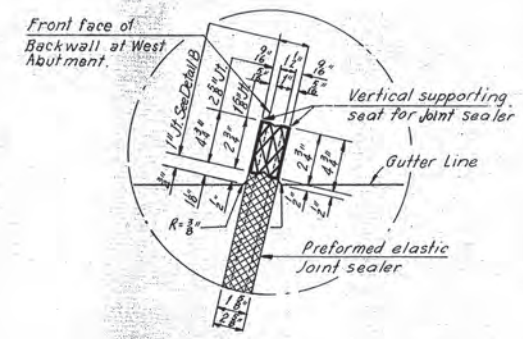


**SECTION A-A**  
Scale: 3/4" = 1'-0"

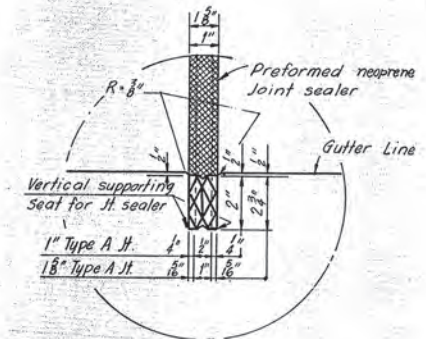


**SECTION B-B**  
Scale: 3/4" = 1'-0"

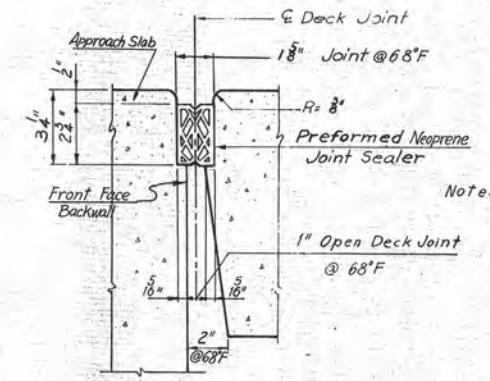
Note: End of stringer and connection ps shall be plumb



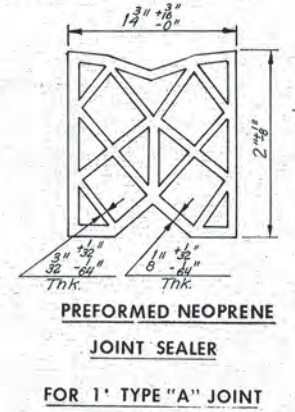
**DETAIL A**



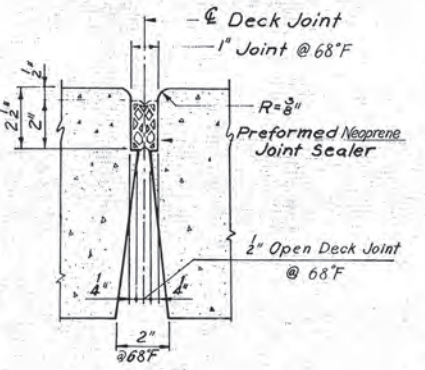
**DETAIL B**



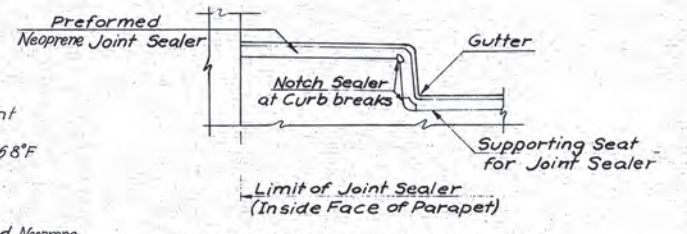
**DETAIL C**  
No Scale



**FOR 1" TYPE "A" JOINT**



**FOR 1" TYPE "A" JOINT**



**TREATMENT OF TYPE "A" JOINT AT CURB**

Note: All horizontal dimensions shown above are normal to & Joint.

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
BELTLINE EXPRESSWAY  
BRIDGE NO 13  
DOUGLASDALE ROAD OVER  
BELTLINE EXPRESSWAY AND R.F.&P.R.R.  
JOINT DETAILS

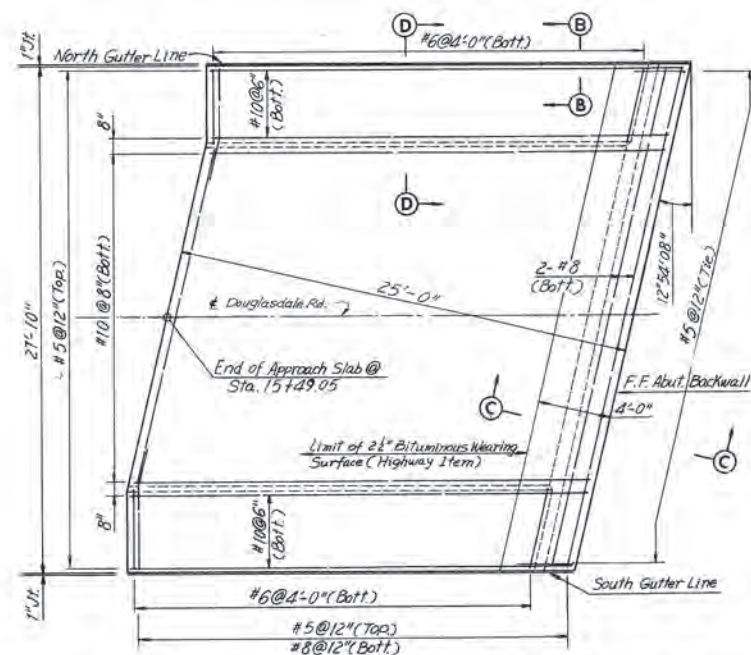
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY  
SCALE: As Noted  
CONTRACT NO: 4  
SHEET NO. 9 OF 12

Note: It is absolutely essential that the openings for the preformed neoprene joint sealers be accurately formed and constructed to smooth, straight lines. The size of the opening shall be adjusted to allow for anticipated dead load rotation of the ends of the slab and for the temperature of the time of construction.

BY	DATE				
MADE	A.H.H. 11-10-67				
CHECKED	M.A.A. 2-21-68				
IN CHARGE	FKD	NO.	REVISION	BY	DATE

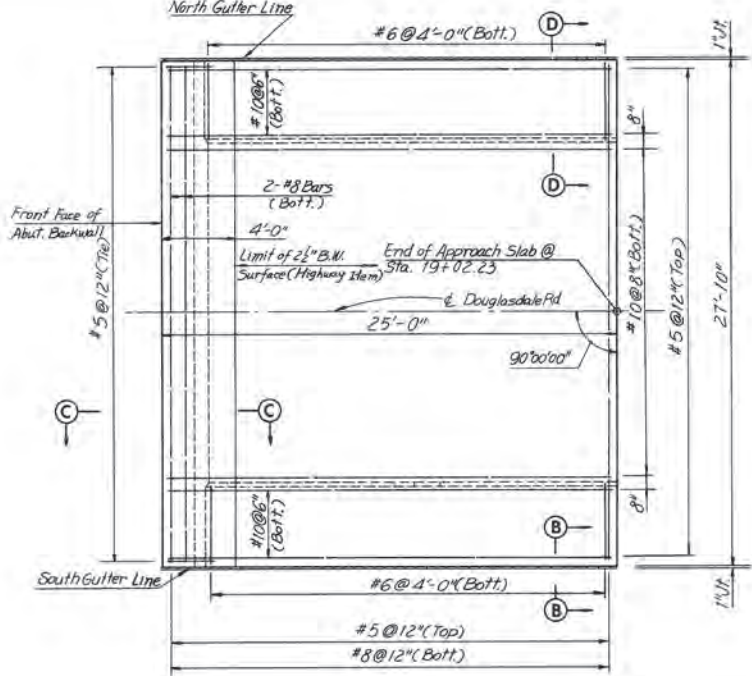


RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
4	BELTLINE EXPRESSWAY	127	155

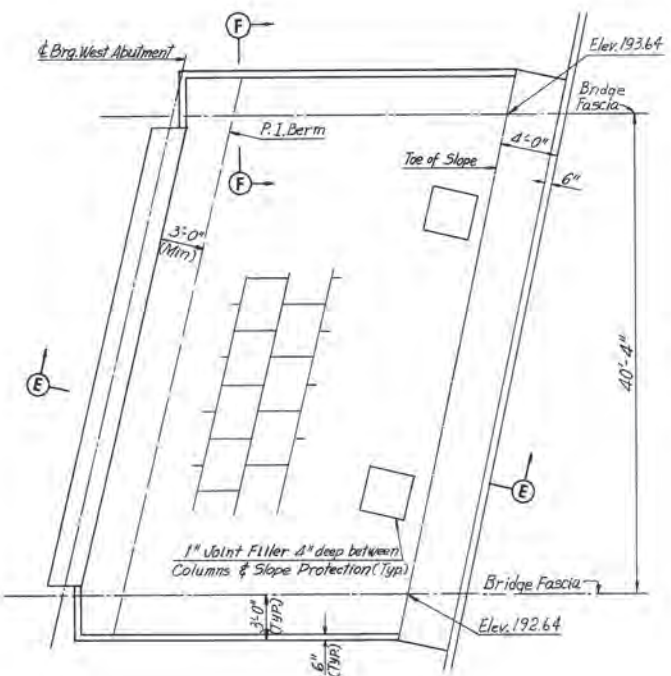


Note: All transverse bars shall be placed parallel to Front Face of Abutment Backwall. All reinforcing bars shall be 2" clear.

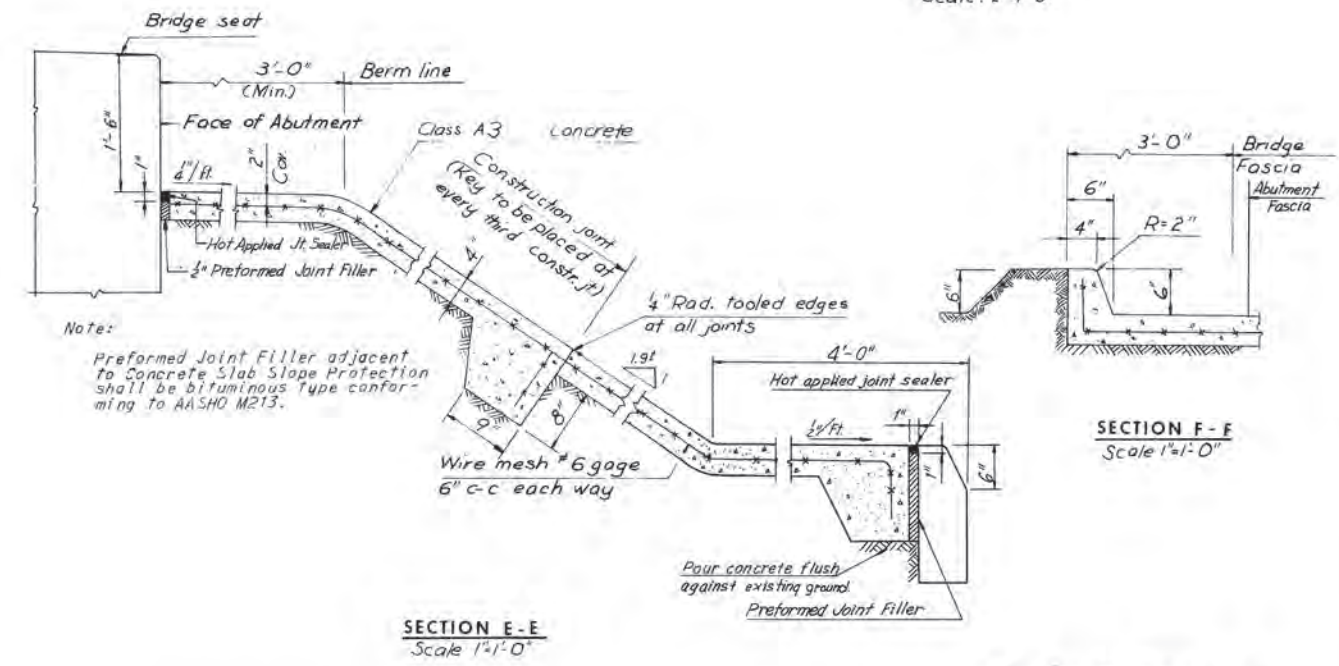
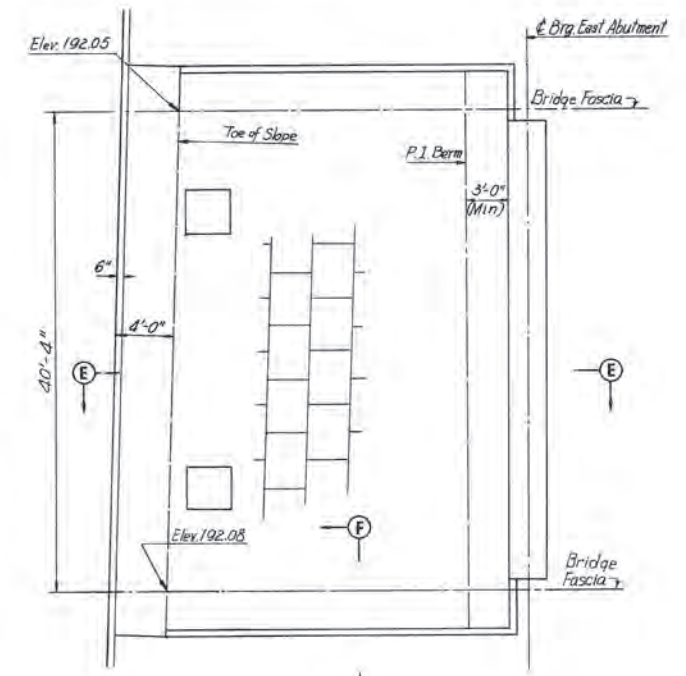
**WEST APPROACH SLAB**  
Scale: 1" = 5'-0"



**EAST APPROACH SLAB**  
Scale: 1" = 5'-0"



**PLAN SLOPE PROTECTION**  
No Scale



**SLOPE PROTECTION NOTE**

The item "Cast-in-place Concrete Slab Slope Protection" shall include excavation or placing and compaction of embankment material necessary to bring the surface of the paved slopes to the finished elevations shown on the plans.

Cast-in-place "Concrete Slab Slope Protection" shall be paid for at the contract unit price per square yard. This price shall include the concrete slab with wire mesh, joint filler, and embankment preparation. The slab shall be constructed in 4'-0" x 4'-0" panels, placed in horizontal courses, alternate panels being poured in a staggered pattern with adjacent panels poured later. The slab shall be Class A3 concrete of such consistency that it can be placed without the use of top forms. The surface shall be finished with a wood float.

Reinforcing shall consist of 6x6 - 6/16 wire mesh positioned at the center of the slab. Mesh shall be continuous through construction joints.

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
BELTLINE EXPRESSWAY  
BRIDGE NO 13  
DOUGLASDALE ROAD OVER  
BELTLINE EXPRESSWAY AND R.F.&P.R.R.  
APPROACH SLAB AND  
SLOPE PROTECTION DETAILS

HOWARD, NEEDLES, TAMMEN & BERGENDOFF consulting engineers NEW YORK ALEXANDRIA KANSAS CITY	SCALE: As Noted CONTRACT NO.: 4 SHEET NO. 10 OF 12
---	--

BY	DATE	NO.	REVISION	BY	DATE
MADE	G.C.C. 10-9-67	2	As Built	RH	2-5-71
CHECKED	S.S.N. 2-15-68	1	Profile Grade	PS	4-7-71
IN CHARGE	FKD				





# **Bridge 48**

**(Harrison Street over Downtown Expressway - Rte. 195)**

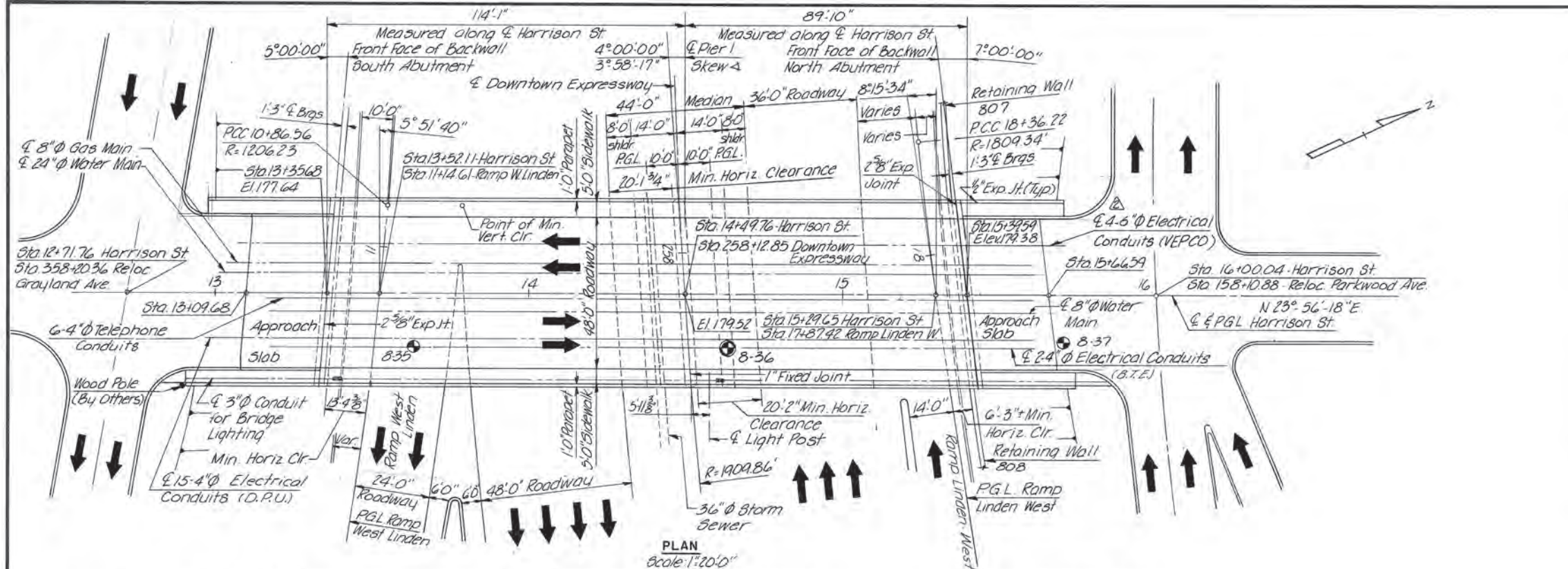
**Record Set Plans**







RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	196	



**GENERAL NOTES:**

**ROADWAY:** One 48'-0" clear roadway. Two 5'-0" sidewalks.

**CAPACITY:** Dead Load - Includes 15 lbs. per sq. foot for future wearing surface. Live Load - HS20-44 and B.P.R. modified for military vehicles.

**SPECIFICATIONS:** GENERAL - Virginia Department of Highways Road and Bridge Specifications, 1970. DESIGN - A.A.S.H.O. Standard Specifications for Highway Bridges, 1973. WELDING - 1972 Structural Welding Code of the American Welding Society.

**CONTRACT SPECIAL PROVISIONS:** Specifications and Contract Special Provisions referred to above are necessary to make these plans complete.

**DATUM:** U.S.C. and G.S. (Sea Level, 1929 General Adjustment).

**TEMPERATURE:** The normal temperature referred to on the plans is 60° F. The temperature range for movement is 0° F to 120° F.

**DIMENSIONS:** All dimensions are measured horizontally and vertically unless otherwise noted.

**EXCAVATION:** Excavation below subgrade and cut slope template shall be classified as Structure Excavation. All excavation above these limits shall be classified as Regular Excavation and is not included in the Structural Quantities.

**FOUNDATIONS:** Footings shall rest on firm material. Foundation material shall be kept dry and special attention is called to section 401.05 of the General Specifications, and to the Contract Special Provisions, concerning preparation of foundations for footings.

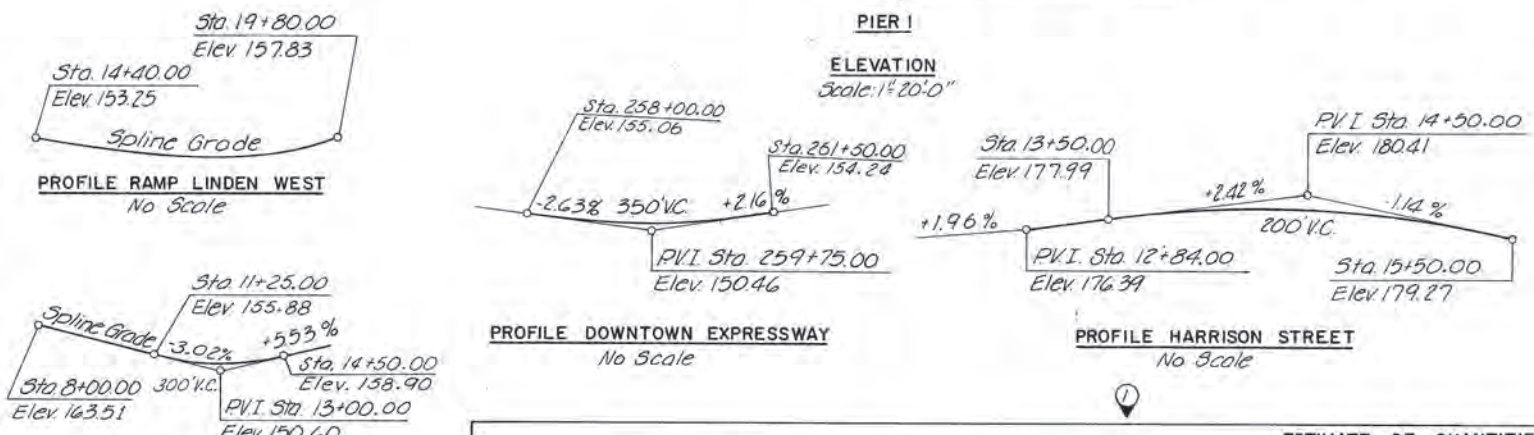
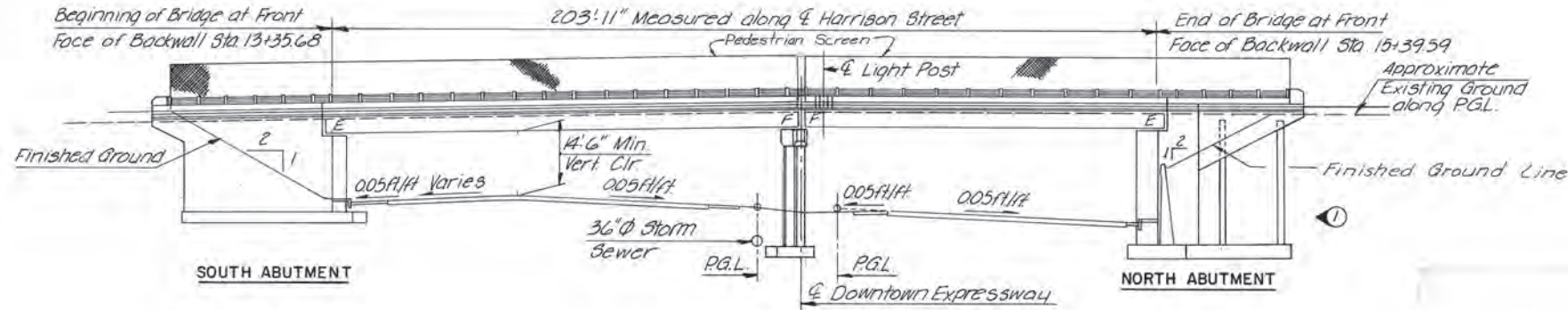
**CONCRETE NOTES:** Concrete in the superstructure shall be Class A4. All other concrete shall be Class A3. All exposed edges and corners shall have a 3" chamfer or fillet unless otherwise noted. Care in the method of vibration, the use of low slump concrete and/or other means shall be employed to prevent downward movement of newly placed slab concrete (when gradient is over 2%). Finishing concrete surfaces. See the Standard Architectural Detail Sheets and the Contract Special Provisions for types and details.

**STEEL NOTES:** All reinforcing steel shall conform to ASTM Specification A615 Grade 40. All reinforcing bar dimensions on the detailed plans are to centers of bars unless otherwise noted. Clear distance between reinforcing steel and face of concrete shall be as noted on the plans. All bar laps shall be 30 diameters of the smaller diameter bar unless otherwise noted.

**BENCH MARK:** C-34 Monument in walk on the East side of Harrison Street between Parkwood Avenue and Cary Street. Elev. 179.381.

**NOTES:** Top of Pavement Elevations of ends of deck along P.G.L. are given on the plan. Remaining pavement elevations are given on Sheet 11. The cost of furnishing and installing 2" and 3" galvanized steel conduit shall be included in the bid price for the item "Metal Conduit".

Indicates 2" cased hole boring.



INDEX	SHEET
GENERAL PLAN AND ELEVATION	1
SOUTH ABUTMENT DETAILS	2-4a
NORTH ABUTMENT DETAILS	5-7a
PIER DETAILS	8
FRAMING PLAN	9
STRINGER DETAILS	10
DECK PLAN AND CROSS SECTION	11
JOINT DETAILS	12
UTILITY DETAILS	13
APPROACH SLAB DETAILS	14
BORING LOGS	15
STANDARD SHOE DETAILS	S1
STANDARD ALUMINIUM RAILING DETAILS	S3
STANDARD ELECTRICAL DETAILS	S4
STANDARD ARCHITECTURAL DETAILS	S7-S8
STANDARD CONDUIT INSTALLATION DETAILS	S10
STANDARD UTILITY DETAILS	S11
LIMITS OF EXCAVATION AND BACKFILL	S13

**AS BUILT**

	ESTIMATE OF QUANTITIES																		
	STRUCTURE EXCAVATION	CONCRETE			STRUCTURAL STEEL	REINFORCING STEEL	POROUS BACKFILL	ALUMINUM BR. RAILING (2 RAIL) L.F.	ASPHALT DAMPPROOFING S.Y.	UNDERDRAIN 6" Ø PIPE L.F.	WATERMAIN 24" Ø PIPE L.F.	WATERMAIN 8" Ø PIPE L.F.	GAS MAIN 8" Ø PIPE L.F.	CONDUITS (VEPCO) 6" Ø L.F.	CONDUIT 4" Ø TELEPHONE L.F.	CONDUIT 4" Ø DPU B BTE L.F.	STEEL PILES 10 BP42 L.F.	PIE CONDUIT 3" Ø L.F.	PEDESTRIAN SCREEN L.F.
SUPERSTRUCTURE		437.12			470,378	92,871	408			249	259.5	255	1,024	1,556	34.00		249	408	
SOUTH ABUTMENT	1250		512.94			51,897	75	280	144								478.4	81	
NORTH ABUTMENT	2100		626.94			91,112	132	58	63								512.3	64	
PIER I	606		282.20			31,883													
APPROACH SLABS				116.12		40,377													
TOTAL	3956	437.12	1422.08	116.12	470,378	308,140	259.1	541	580	207	249	259.5	255	1,024	1,556	34.00	990.7	249	553

DESIGNED	PRM/C	10/73	AS BUILT	HMK
DRAWN	RPC	11/73	Rev. No. 2 Quantity Revised	R.R.L. 12/97
CHECKED	DER	11/73	No. Abut. (Re. 3rd Qty.)	DGT 1/12/74
IN CHARGE	L.J.H.			PRM/C 12/12/73

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

STRUCTURE B48  
 HARRISON STREET OVER  
 DOWNTOWN EXPRESSWAY

**GENERAL PLAN AND ELEVATION**

SCALE: AS SHOWN  
 DATE: Nov 29, 1973

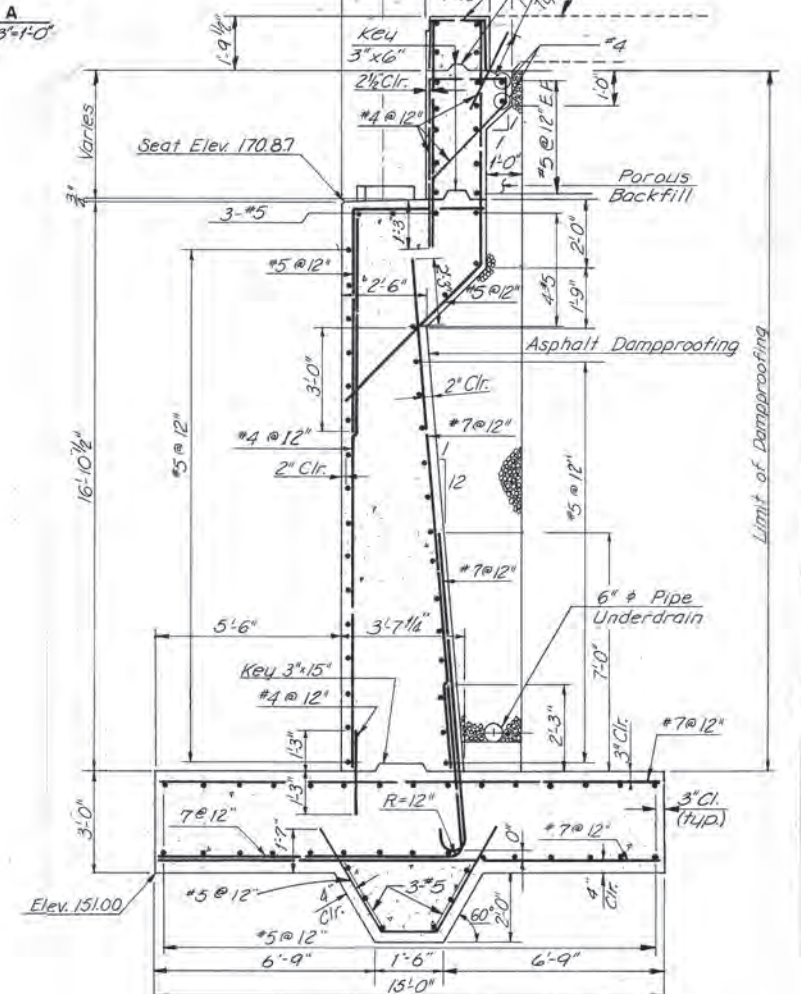
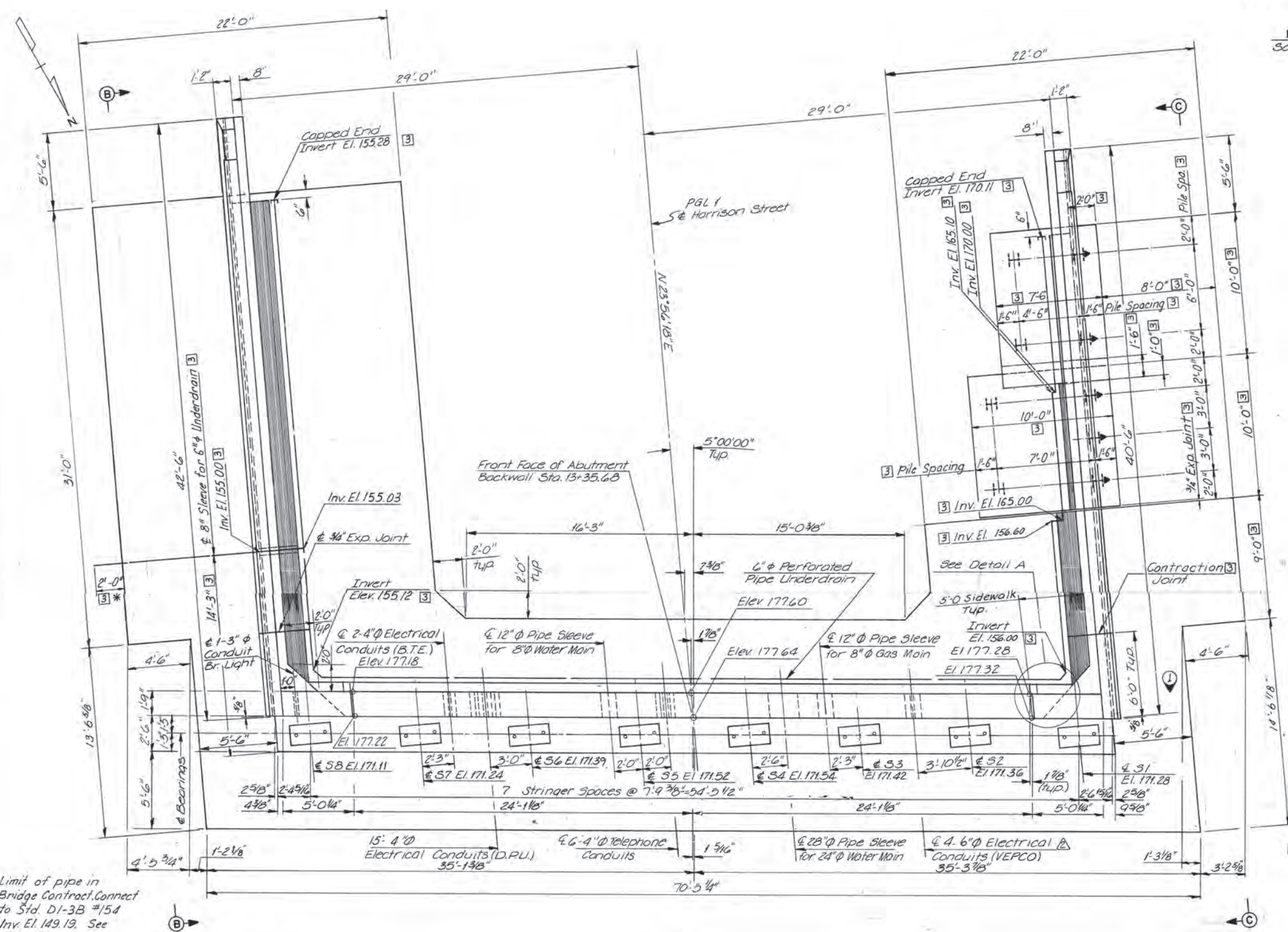
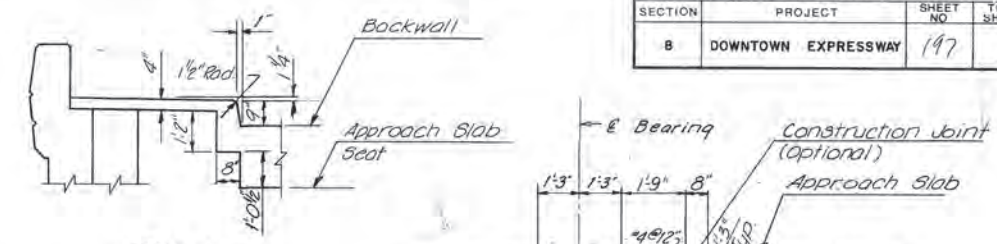
SHEET 1 OF 15

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 Alexandria, Virginia

**HNTB**



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
B	DOWNTOWN EXPRESSWAY	197	



Notes:  
 For General Notes, see Sheet No. 1.  
 For Abutment Elevation and Notes, see Sheet No. 3.  
 For Wingwall Details, see Sheet No. 4.  
 Wingwall Dimensions given are along the front face of the Wingwall.  
 For Deck Joint Details, see Sheet No. 11.

**Pile Notes**  
 All piles shall be 10BP42 driven to refusal.  
 H Denotes vertical piles.  
 ↯ Denotes piles battered 3:12 in the direction shown.  
 Pile spacing shown is given at bottom of footing.

3) \* Limit of pipe in Bridge Contract. Connect to Std. DI-3B #154 Invt. El. 149.19. See Rdwy Plans.

**PLAN**  
 Scale: 1/4"=1'-0"

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

STRUCTURE B48  
 HARRISON STREET OVER  
 DOWNTOWN EXPRESSWAY  
 SOUTH ABUTMENT

SCALE: As Shown  
 DATE: Nov 29, 1973

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 Alexandria, Virginia

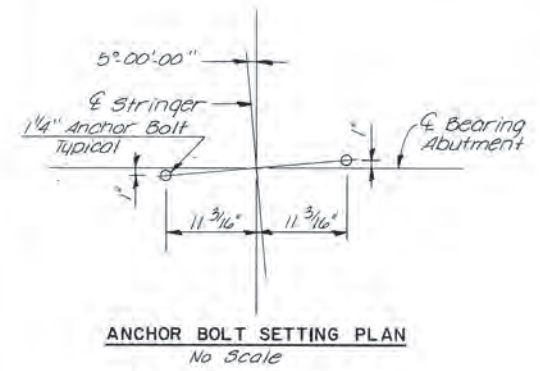
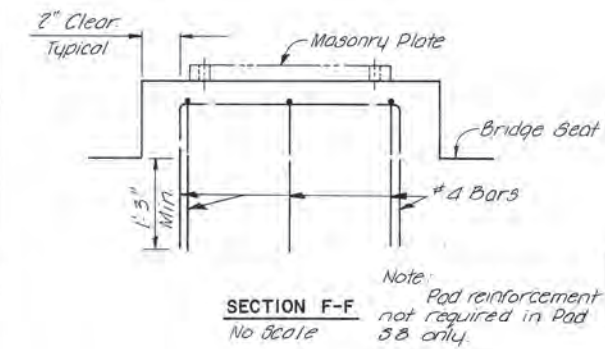
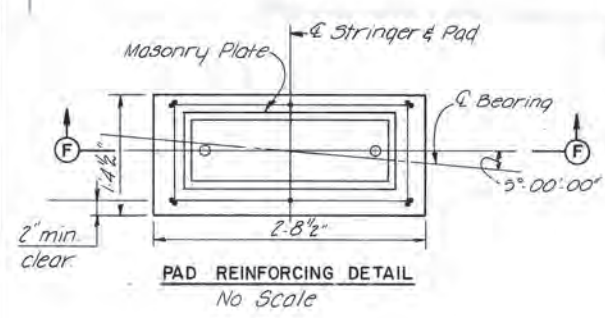
**HNTB**

SHEET 2 OF 15

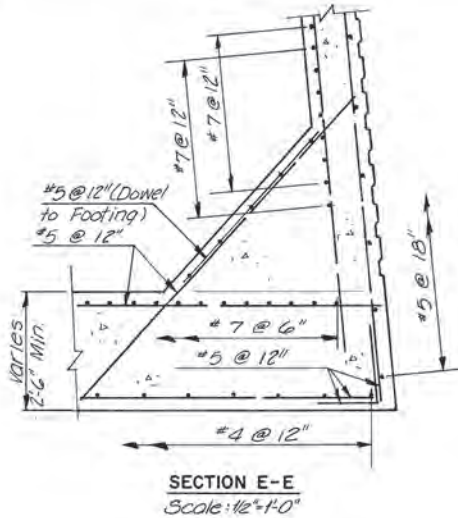
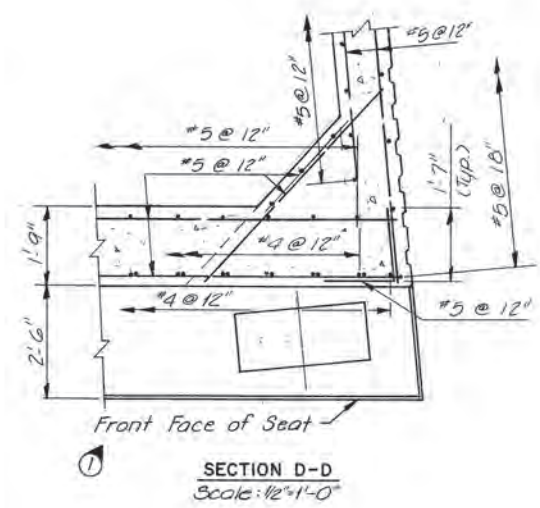
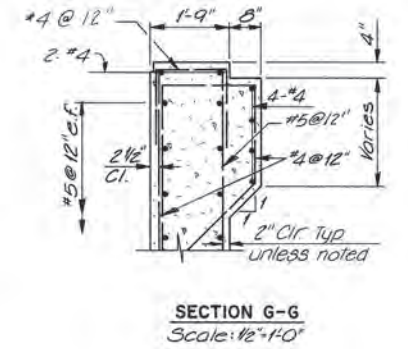
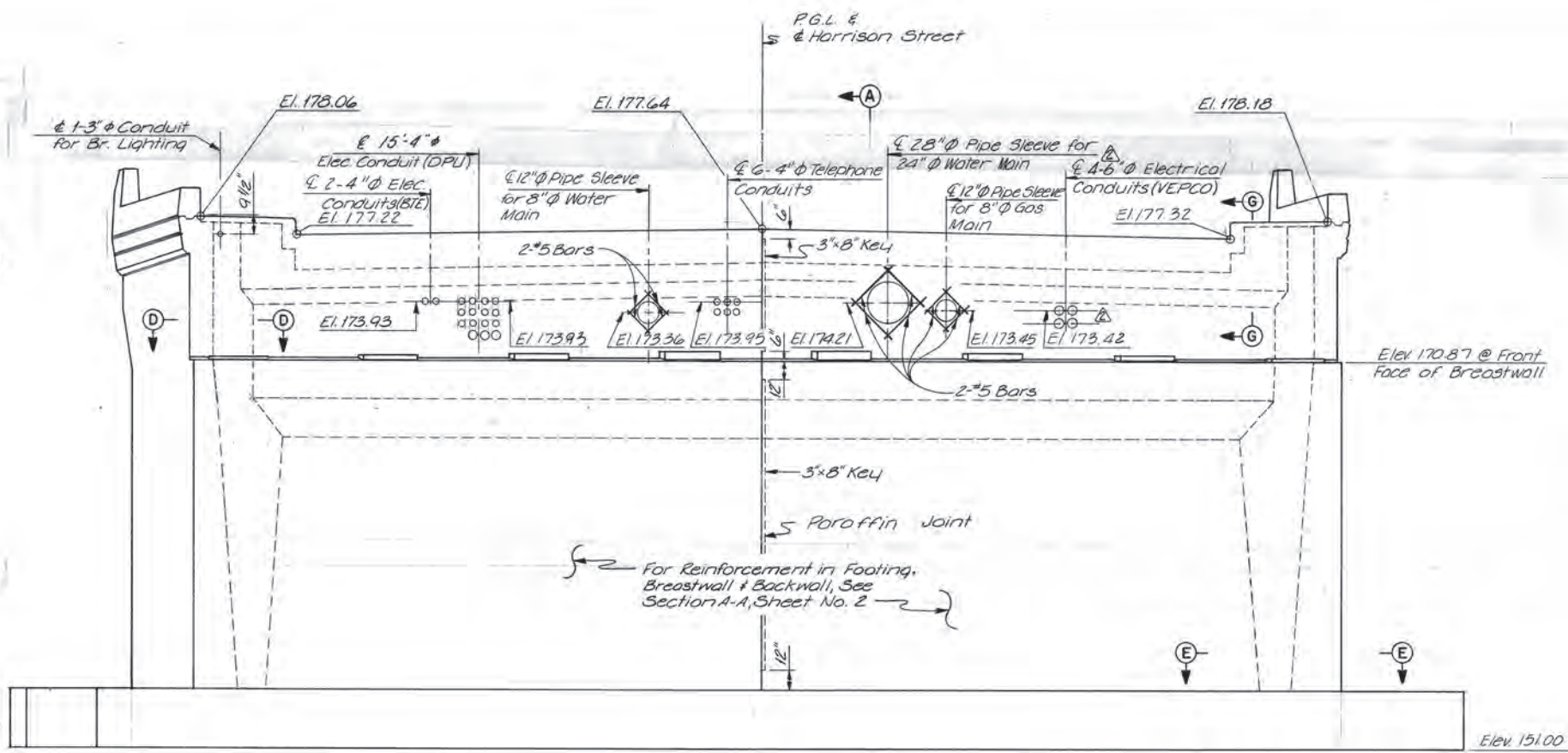
DESIGNED	PRM	11/73	3	AS BUILT	HMW	
DRAWN	RPC	11/73		SW Wingwall & Footings	EJM	12-9-74
CHECKED	F.R.B.	11/73	1	Inv. Elevations rev. Conduits	DGT	11-12-74
IN CHARGE	LJH			Dim. Moved, Note Add	PRM	12-12-73
				NO. REVISION	BY	DATE



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	198	



**Foundation Note:**  
Footings elevations are approximate only and may be varied to suit field conditions as directed by the Engineer. Vertical Breastwall reinforcing shall not be cut until these elevations are established. Where these elevations differ from the elevations shown on the plans, the Engineer shall determine the extent of redesign required and will advise the Contractor before construction begins.  
South Abutment footings are designed for an allowable bearing capacity of 2 tons per square foot.



**Notes:**  
For General Notes, see Sheet No. 1  
For Framing Plan, see Sheet No. 10  
For Bearing Details, see Sheet No. 31  
For Approach Slab Details, see Sheet No. 14  
For Architectural Treatments and Paraffin Joint Details, see Sheet No. 5B  
For Abutment Plan, see Sheet No. 2  
For Wingwall Details, see Sheet No. 4  
All bar spacings shown are maximum e.f. denotes each face  
Elevations are at the front face of the Abutment Backwall unless otherwise noted.

DESIGNED	PRM <sup>c</sup>	11-73			
DRAWN	RPC	11-73	Rev. No. VEPCO Conduits	DGT	11-12-74
CHECKED	FRB	11-73	1 Callout Added, Note Chg	PRMc	12-12-73
IN CHARGE	LJH	NO.	REVISION	BY	DATE

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

STRUCTURE B48  
HARRISON STREET OVER  
DOWNTOWN EXPRESSWAY  
SOUTH ABUTMENT

SCALE *As Shown*  
DATE *Nov. 29, 1973*

SHEET 3 OF 15

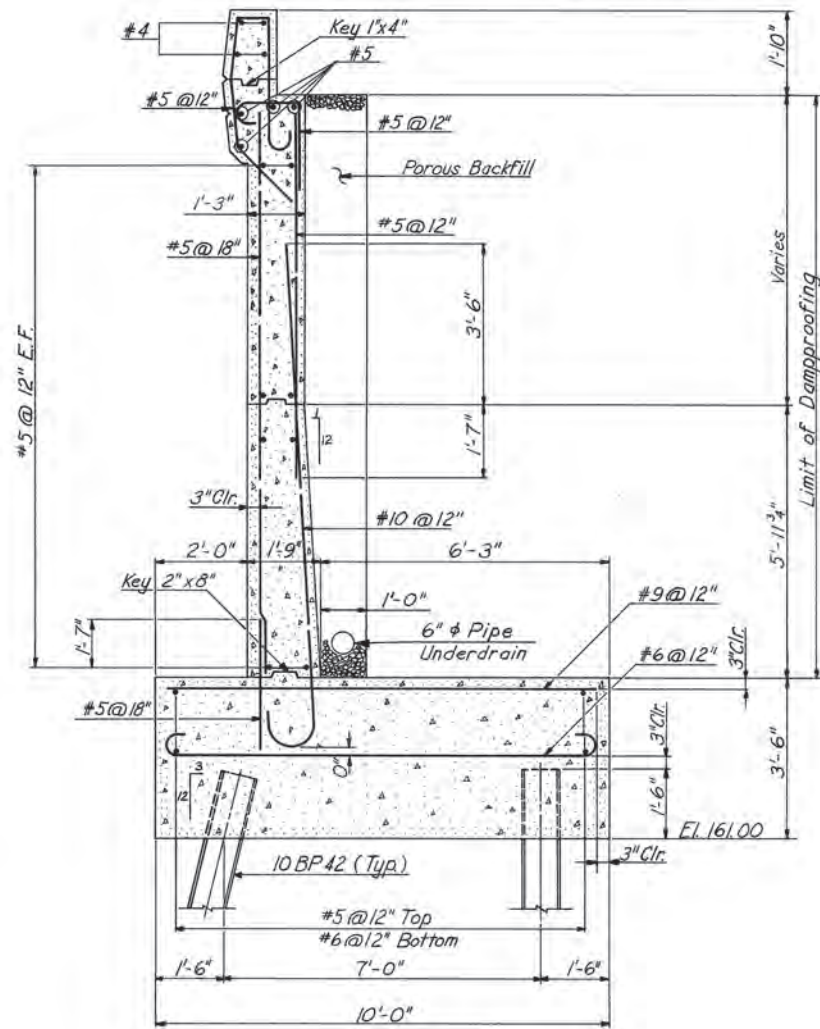
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
Alexandria, Virginia

**HNTB**

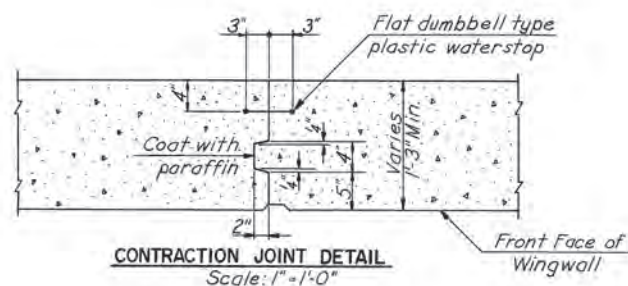


RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	199a	

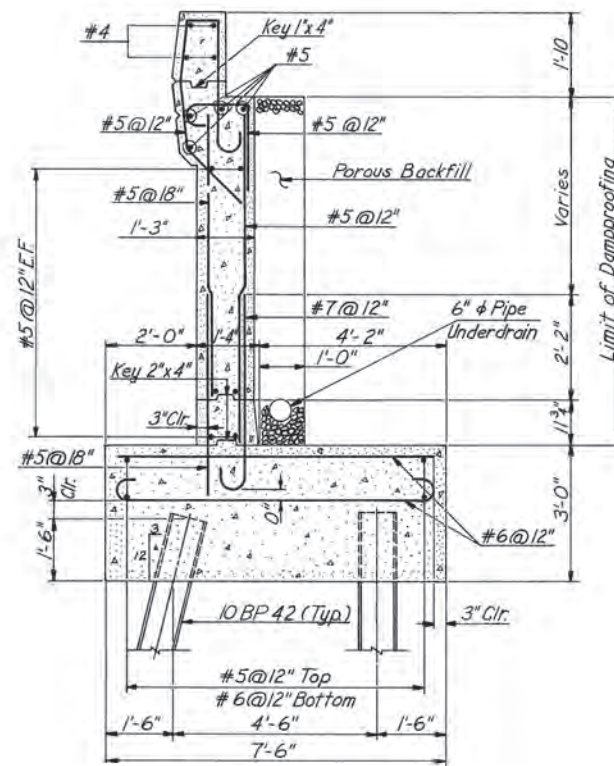
Note:  
For parapet dimensions not shown,  
see Section J-J, Sheet 4.



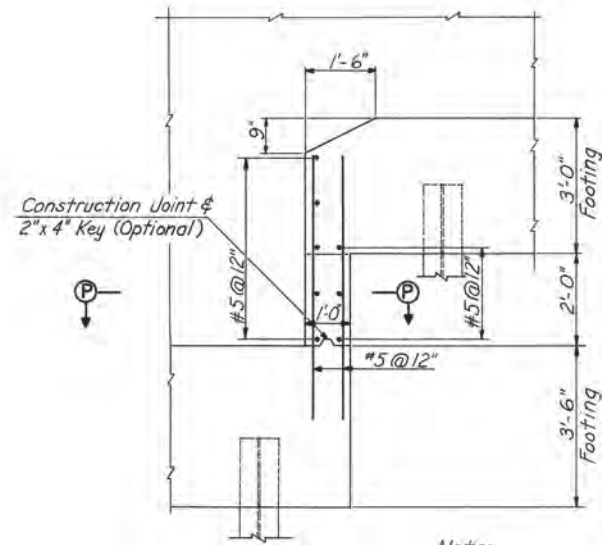
SECTION L-L  
Scale: 1/2" = 1'-0"



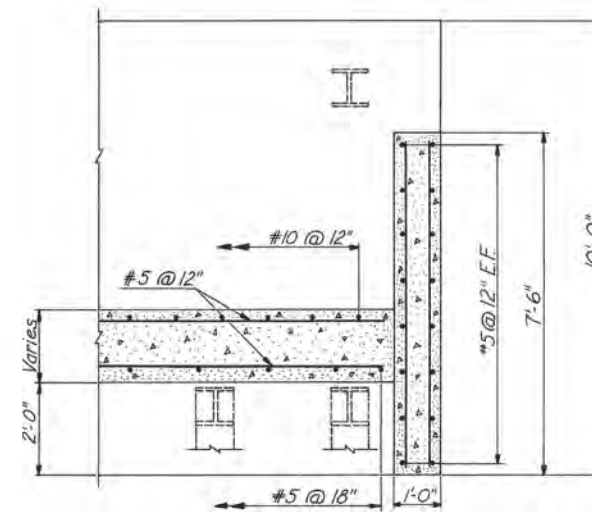
CONTRACTION JOINT DETAIL  
Scale: 1" = 1'-0"



SECTION M-M  
Scale: 1/2" = 1'-0"



DETAIL N  
Scale: 1/2" = 1'-0"  
Note: Reinforcing steel in footings not shown.



SECTION P-P  
Scale: 1/2" = 1'-0"

Note:  
For location of Section L-L  
& M-M and Detail N, see Sheet 4.

**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY

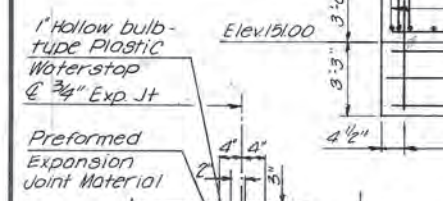
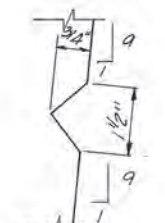
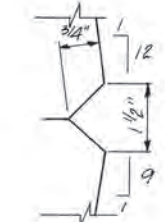
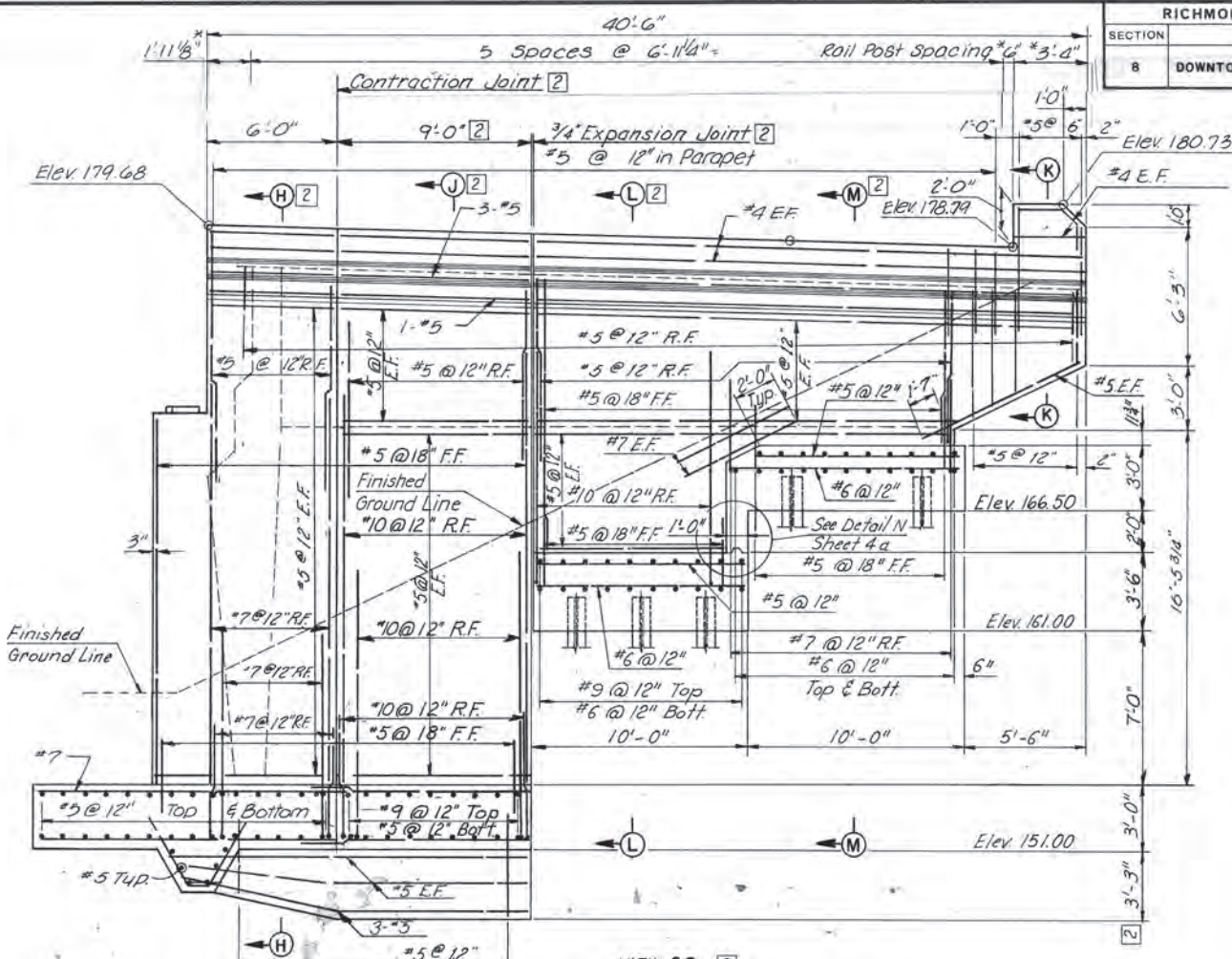
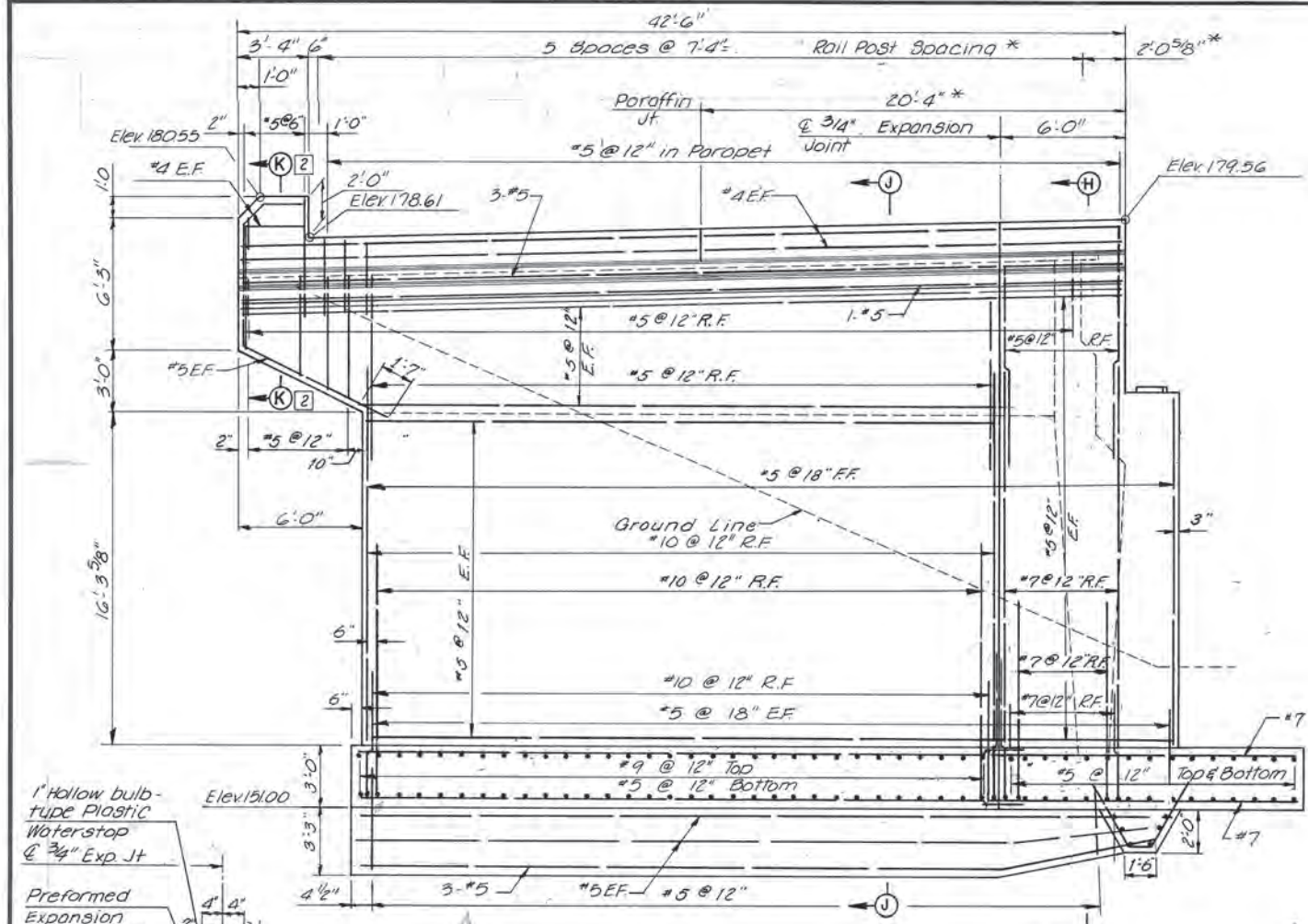
STRUCTURE B 48  
HARRISON STREET OVER  
DOWNTOWN EXPRESSWAY  
SOUTH ABUTMENT

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY  
SCALE: As Shown  
CONTRACT NO.:  
SHEET NO. 4a OF 15

BY	DATE				
MADE	EJM	12-74			
CHECKED	L.B.P.	12-74	1	New Sheet	EJM 12-9-74
IN CHARGE	PRY				



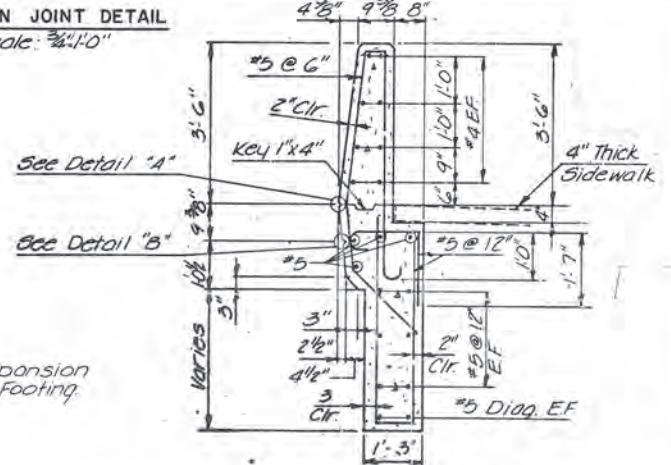
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	199	



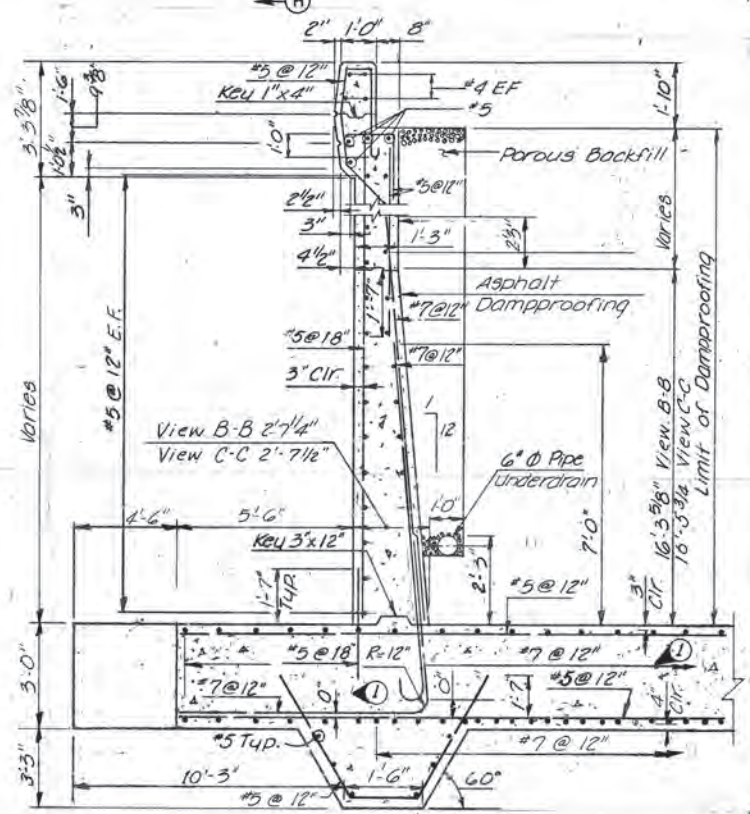
VIEW B-B Scale: 1/4"=1'-0"



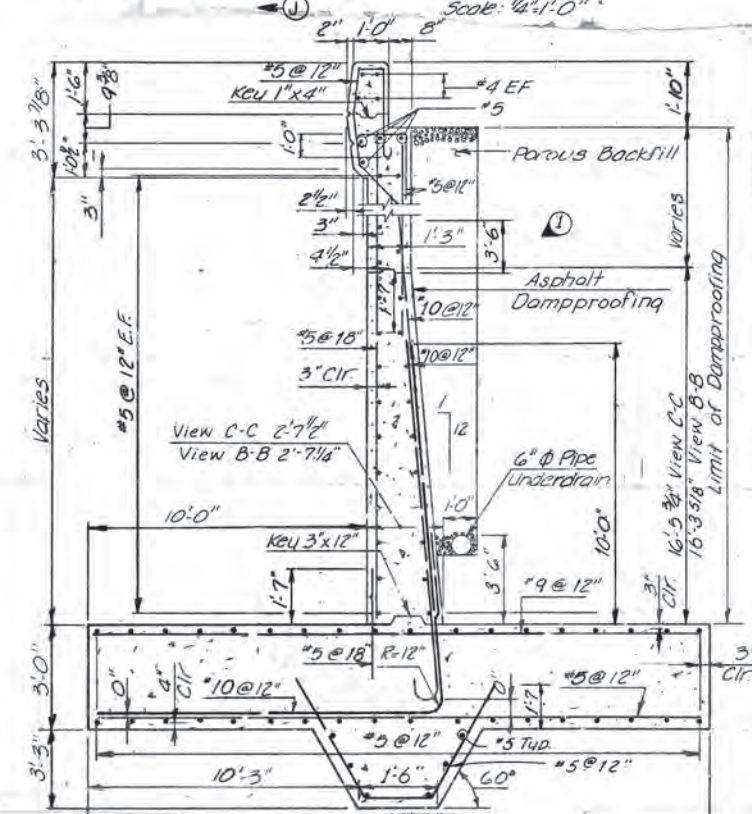
EXPANSION JOINT DETAIL Scale: 3/8"=1'-0"



SECTION K-K Scale: 1/8"=1'-0"



SECTION H-H No Scale



SECTION J-J No Scale

Note:  
 For General Notes, see Sheet No. 1.  
 For Abutment Plan, see Sheet No. 2.  
 Bar spacings shown are maximum.  
 \* Indicates dimension is along inside face of Parapet. All other dimensions are along the front face of the Wing Wall.  
 [2] For Contraction Joint Detail, Section L-L, Section M-M and Detail N, see Sheet 4a.

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

STRUCTURE B 48  
 HARRISON STREET OVER  
 DOWNTOWN EXPRESSWAY  
 SOUTH ABUTMENT

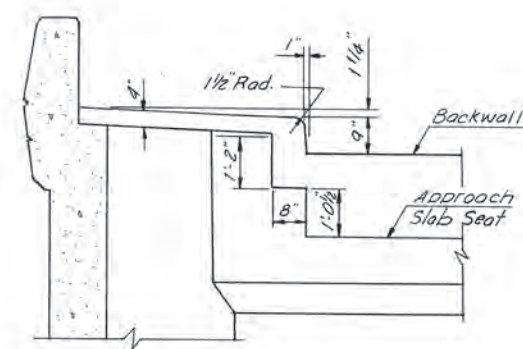
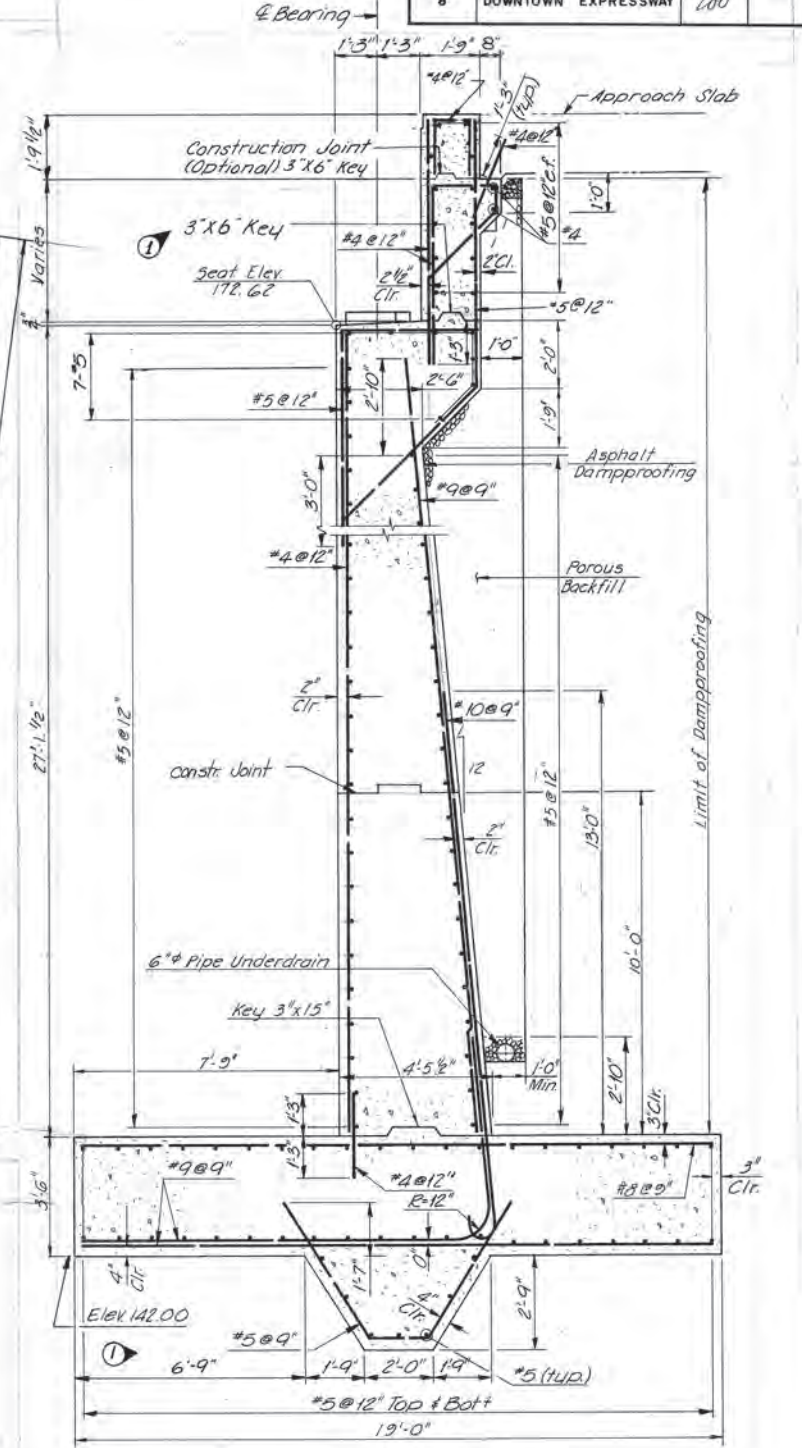
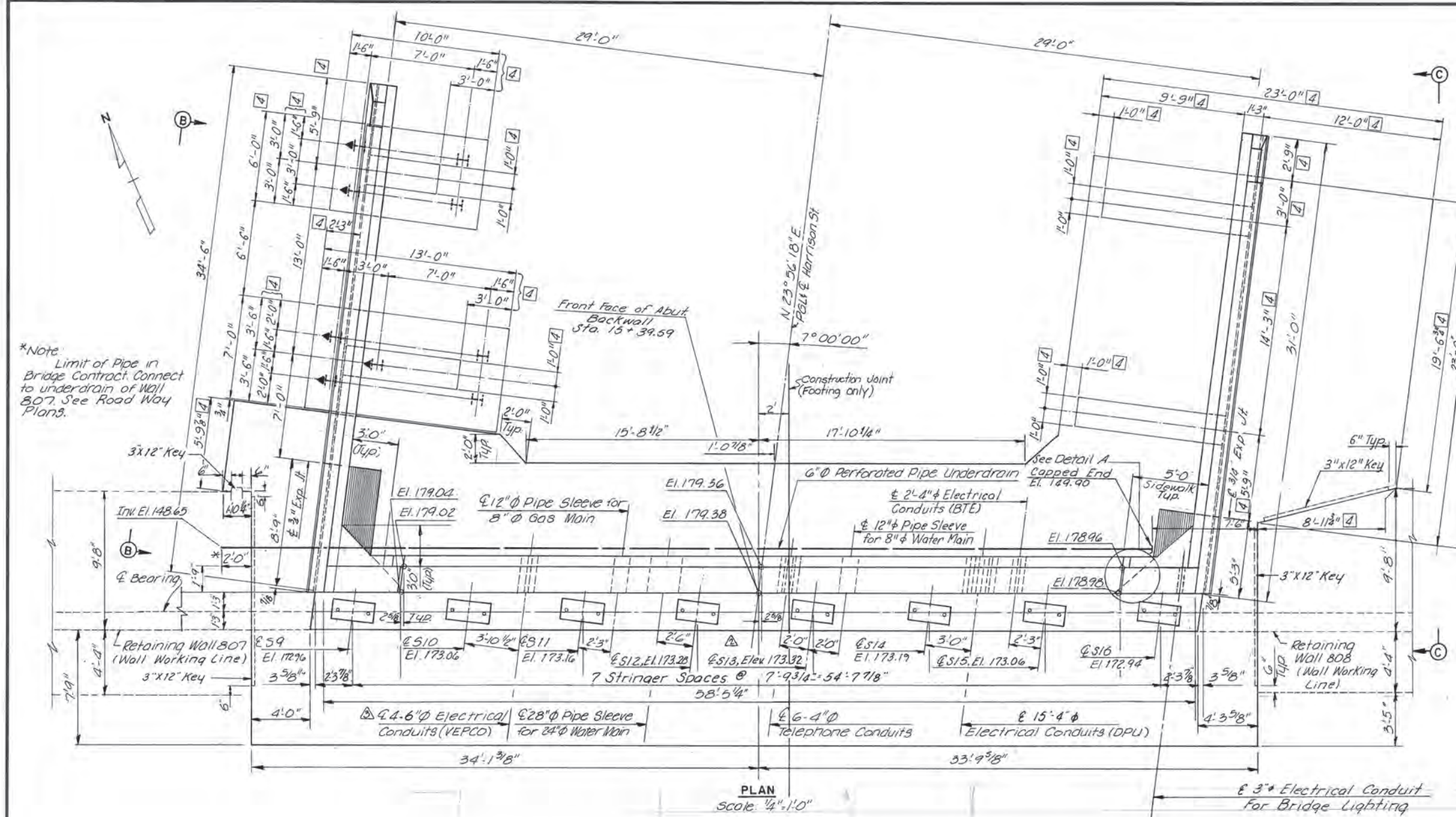
SCALE As Shown  
 DATE Nov 29, 1973  
 SHEET 4 OF 15

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 Alexandria, Virginia  
**HNTB**

DESIGNED	PRMC	11-73			
DRAWN	EPC	11-73	2	View C-C revised for pile footings	NLB, 12-9-74
CHECKED	FRB	11-73	1	Bar chg., Dim. Added	PRMC, 12-12-73
IN CHARGE	L.J.H.				
		NO.	REVISION	BY	DATE



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	200	



**Pile Notes:**  
 All piles shall be 10BP42 driven to refusal.  
 H Denotes vertical piles  
 ← Denotes piles battered 3:12 in the direction shown.  
 Pile spacing shown is given at bottom of footing.

**Notes:**  
 For General Notes, See Sheet 1  
 For Abutment Elevation and Notes see Sheet 6.  
 For Wingwall Details, see Sheet 7.  
 Wingwall Dimensions given are along the front face of the Wingwalls.  
 For Details of Retaining Walls 807 and 808, see Roadway Plans.  
 For Deck Joint Details, see Sheet 11.

		AS BUILT	HMW
DESIGNED	D.E.R. 11/73	1	N.L.B. 12-9-74
DRAWN	R.R.C. 11/73	2	D.G.T. 11-12-74
CHECKED	P.R.M.C. 11/73	1	T.E.M. 6-5-74
IN CHARGE	L.J.H.		P.R.M.C. 12-12-73
	NO.	REVISION	BY DATE

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

STRUCTURE B48  
 HARRISON STREET OVER  
 DOWNTOWN EXPRESSWAY  
 NORTH ABUTMENT

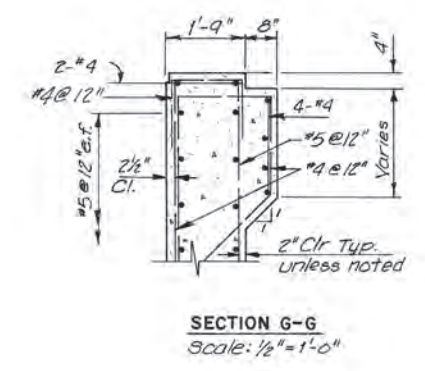
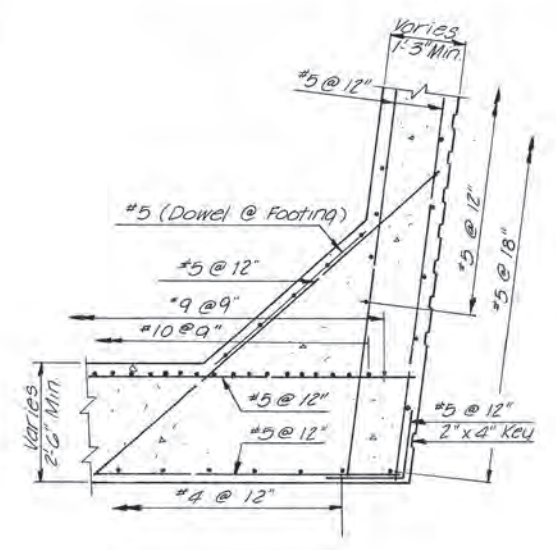
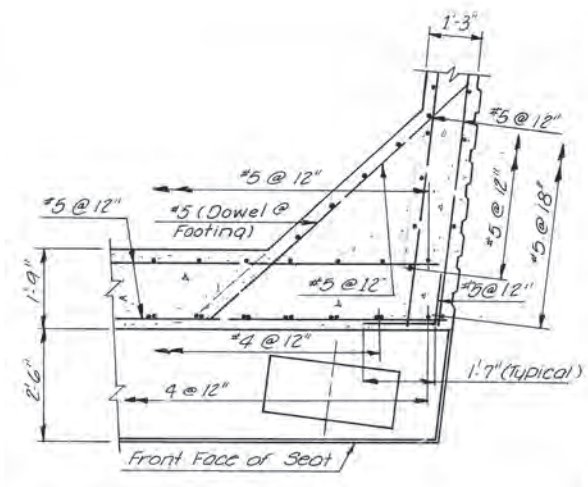
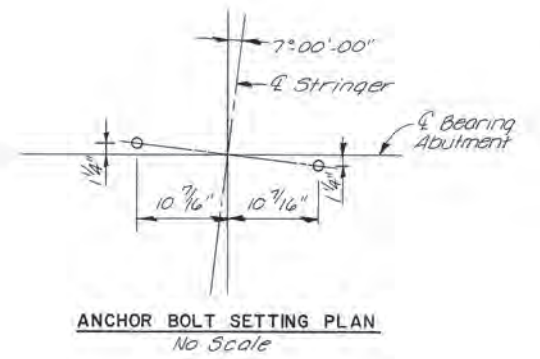
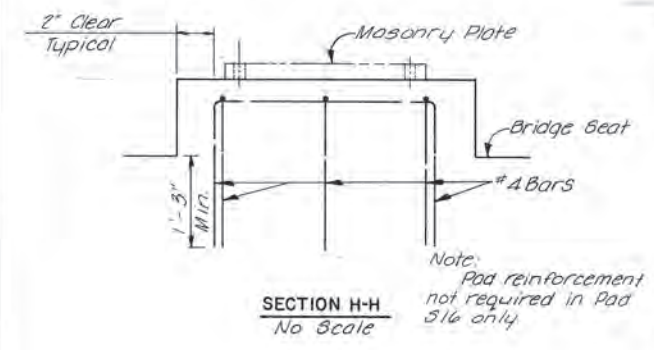
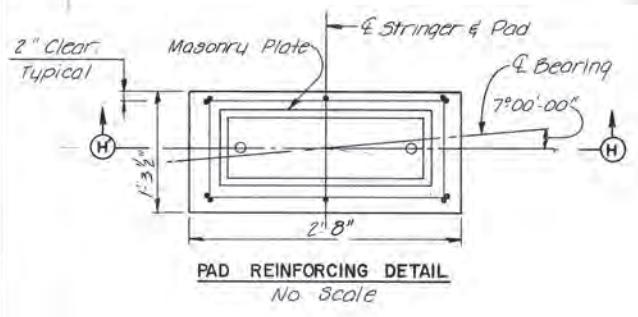
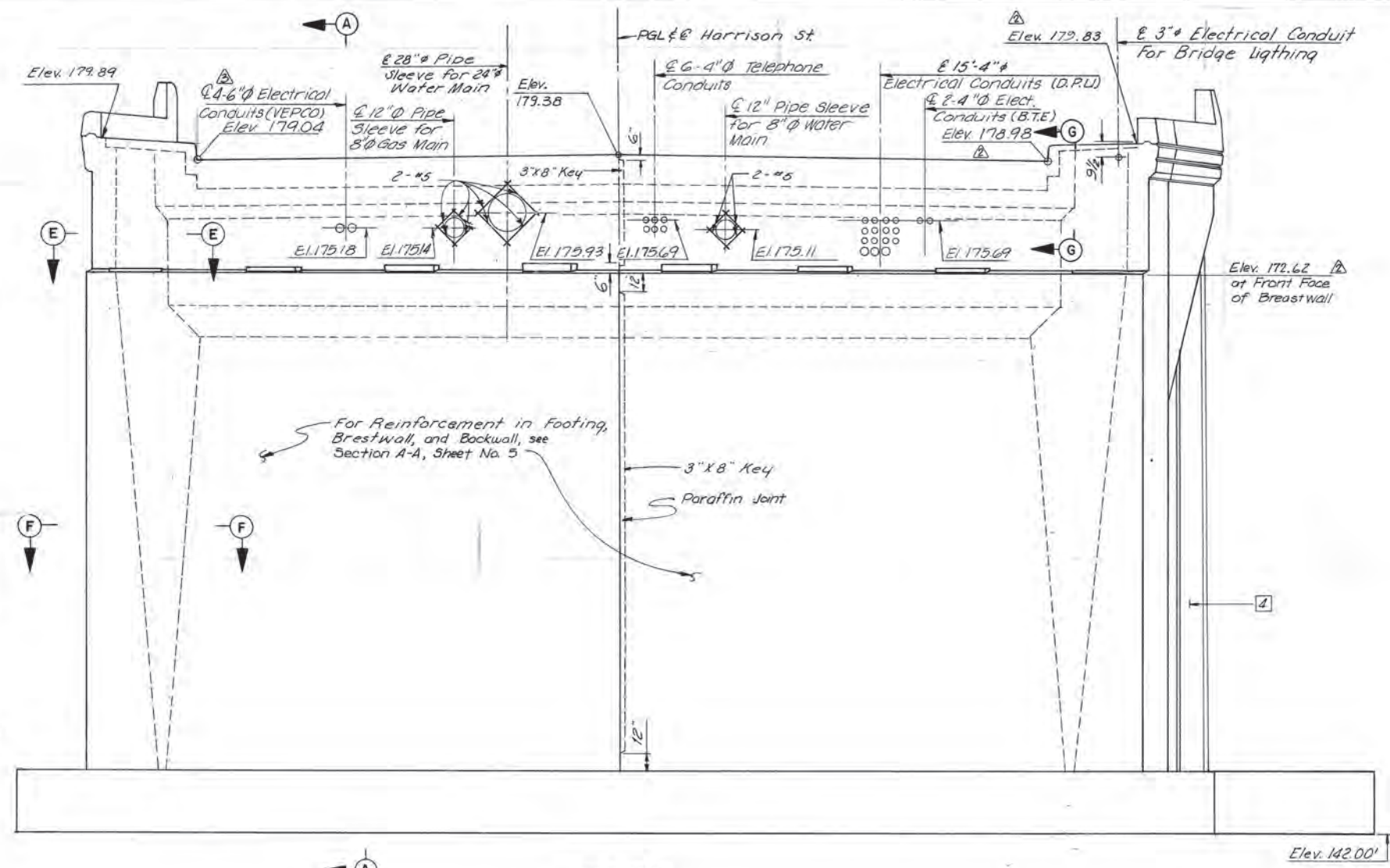
SCALE: AS SHOWN  
 DATE: Nov. 29, 1973

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 Alexandria, Virginia

SHEET 5 OF 15  
**HNTB**



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
B	DOWNTOWN EXPRESSWAY	201	



ELEVATION  
Scale: 1/4"=1'-0"

SECTION E-E  
Scale: 1/2"=1'-0"

SECTION F-F  
Scale: 1/2"=1'-0"

Notes:  
 For General Notes, see Sheet No. 1.  
 For Framing Plan, see Sheet No. 10.  
 For Bearing Details, see Sheet No. 31.  
 For Approach Slab Details, see Sheet No. 14.  
 For Architectural Treatment and Paraffin Joint Details, see Sheet No. 38.  
 For Abutment Plan, see Sheet No. 5.  
 For Wingwall Details, see Sheet No. 7.  
 All bar spacings shown are maximum.  
 E.F. denotes Each Face.  
 Elevations shown at Front Face of Backwall, unless noted.

Foundation Notes:  
 Footing elevations are approximate only and may be varied to suit field conditions as directed by Engineer.  
 Vertical Breastwall reinforcing shall not be cut until these elevations are established. Where these elevations differ from the elevations shown on the plan, the Engineer shall determine the extent of redesign required and will advise the Contractor before construction begins.  
 South Abutment footings are designed for an allowable bearing capacity of three (3) tons per square foot.

**AS BUILT**

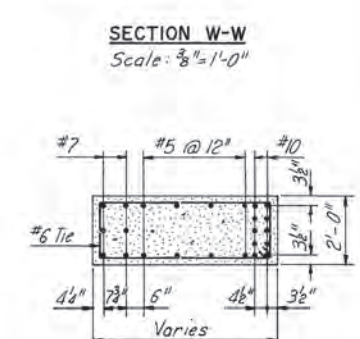
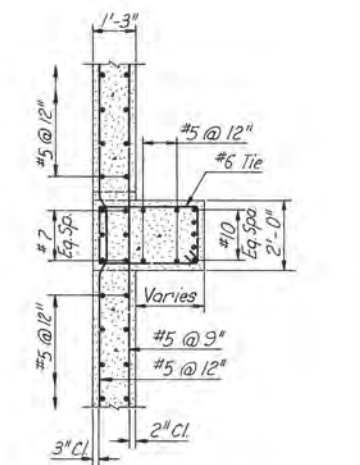
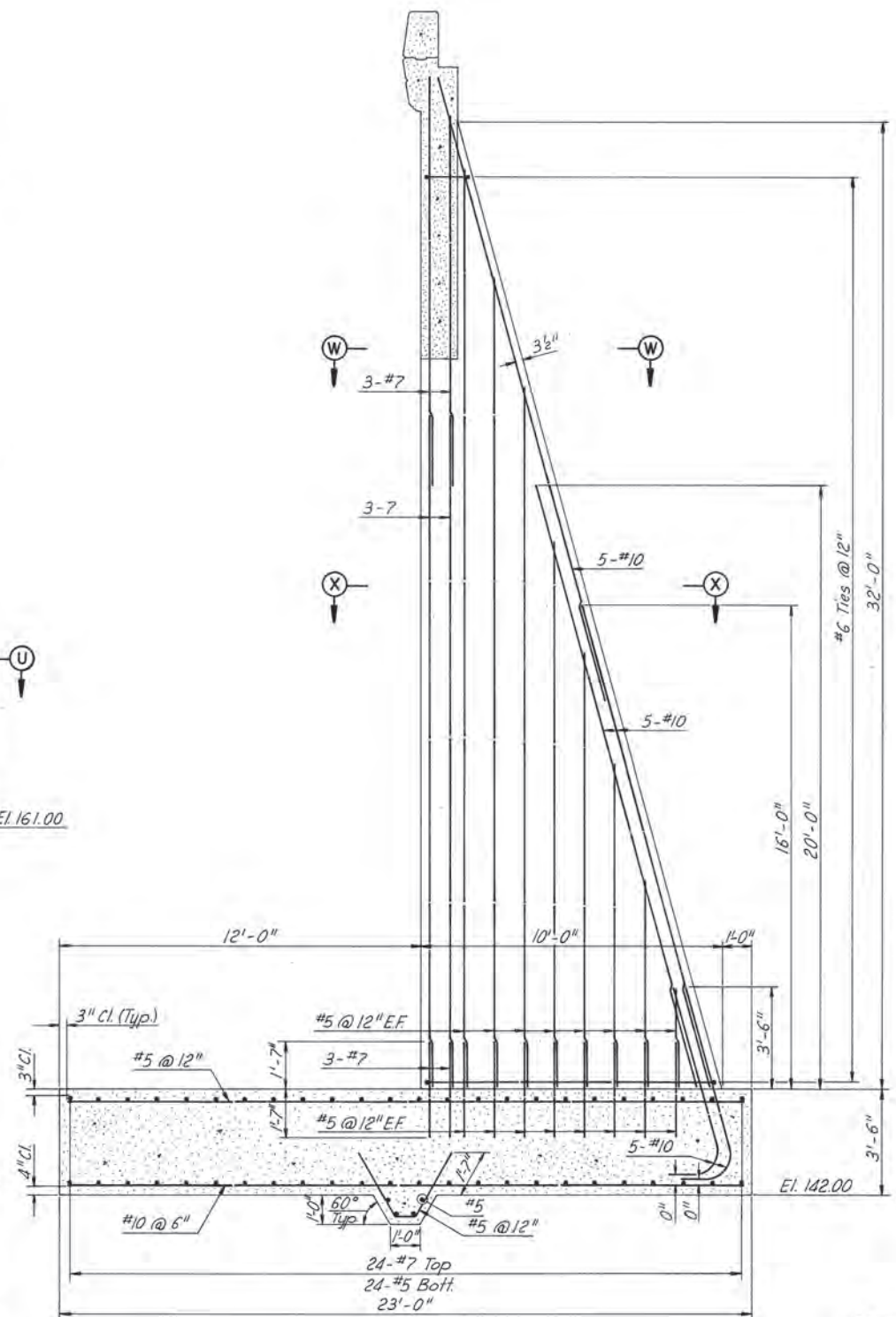
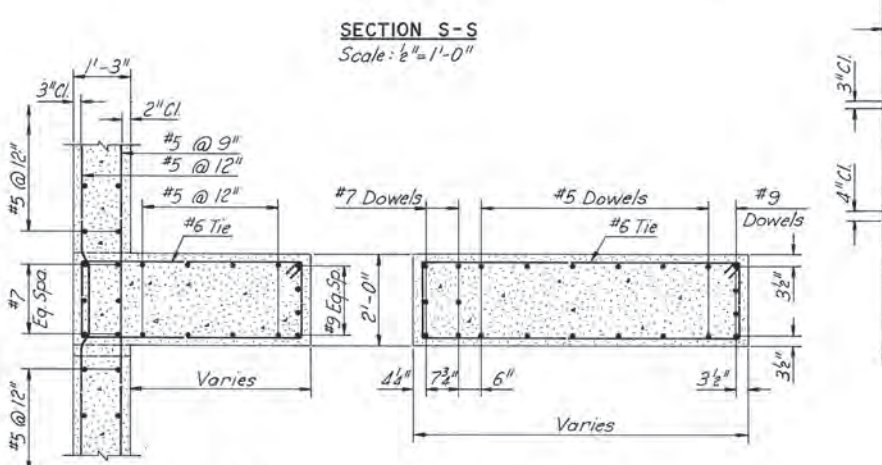
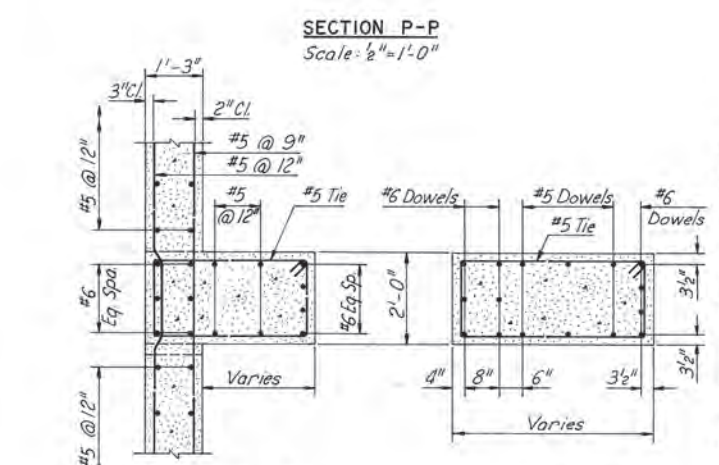
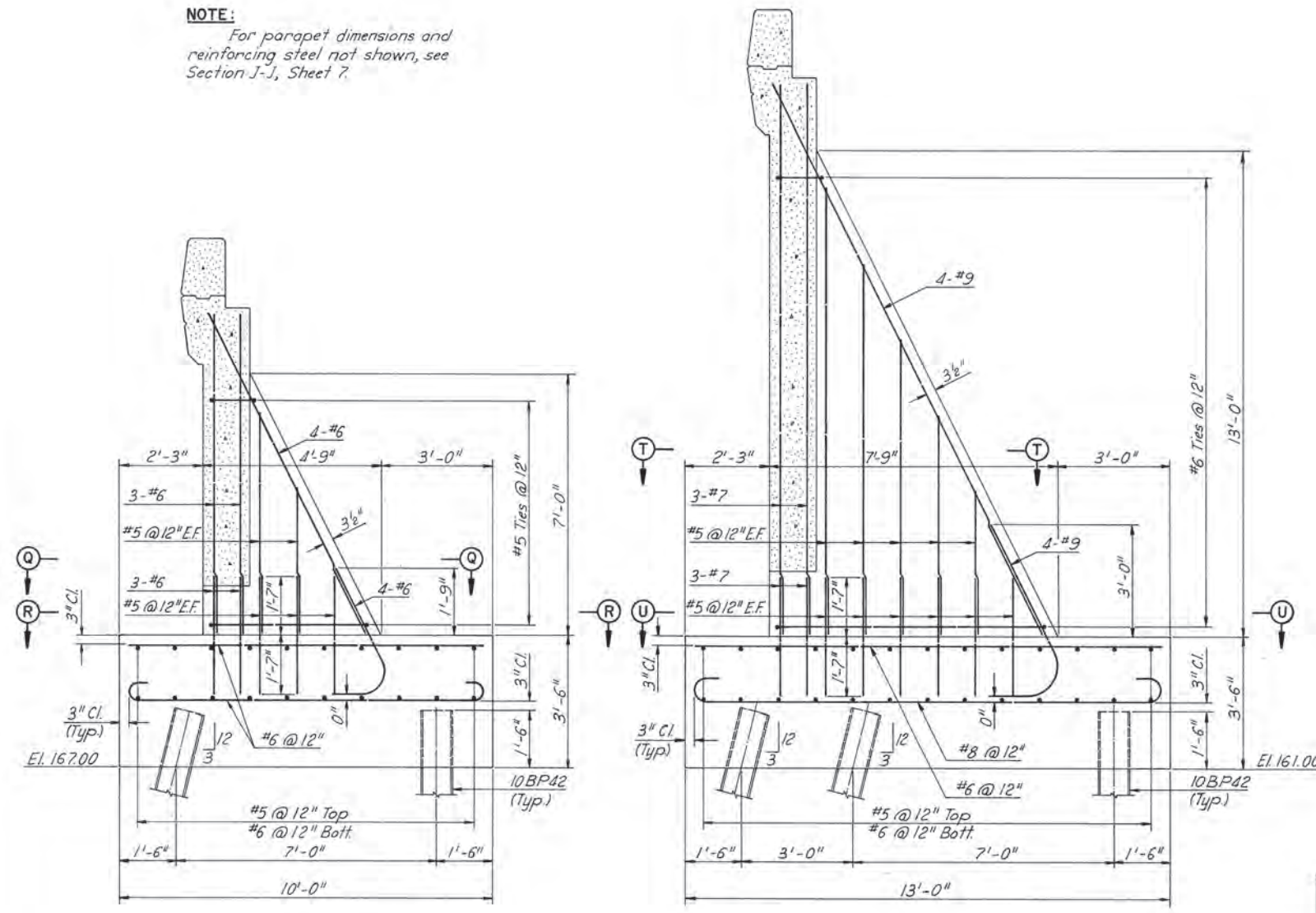
RICHMOND METROPOLITAN AUTHORITY	
RICHMOND EXPRESSWAY SYSTEM	
DOWNTOWN EXPRESSWAY	
STRUCTURE B 48	
HARRISON STREET OVER	
DOWNTOWN EXPRESSWAY	
NORTH ABUTMENT	
SCALE As Shown	SHEET 6 OF 15
DATE Nov. 29, 1973	
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS Alexandria, Virginia	
HNTB	

DESIGNED	DRAWN	CHECKED	IN CHARGE	NO.	REVISION	BY	DATE
DER	PJG	PRMc	LJH	1	Wingwall Rev.	NLB	12-9-74
				2	Rev. No. VEPCO Conduits	DGT	11-12-74
				1	Breastwal Elev.	TEM	6-4-74
				1	Note Changed	PRMc	12-12-73



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	202a	

**NOTE:**  
For parapet dimensions and reinforcing steel not shown, see Section J-J, Sheet 7.



**NOTE:**  
For location of Sections P-P, S-S and V-V, see Sheet 7.

**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM

STRUCTURE B48  
HARRISON STREET OVER  
DOWNTOWN EXPRESSWAY  
NORTH ABUTMENT

SCALE: As Shown

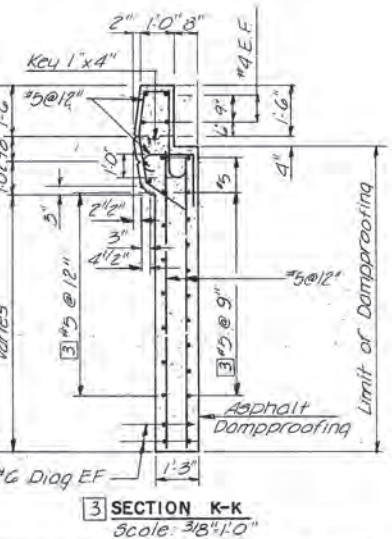
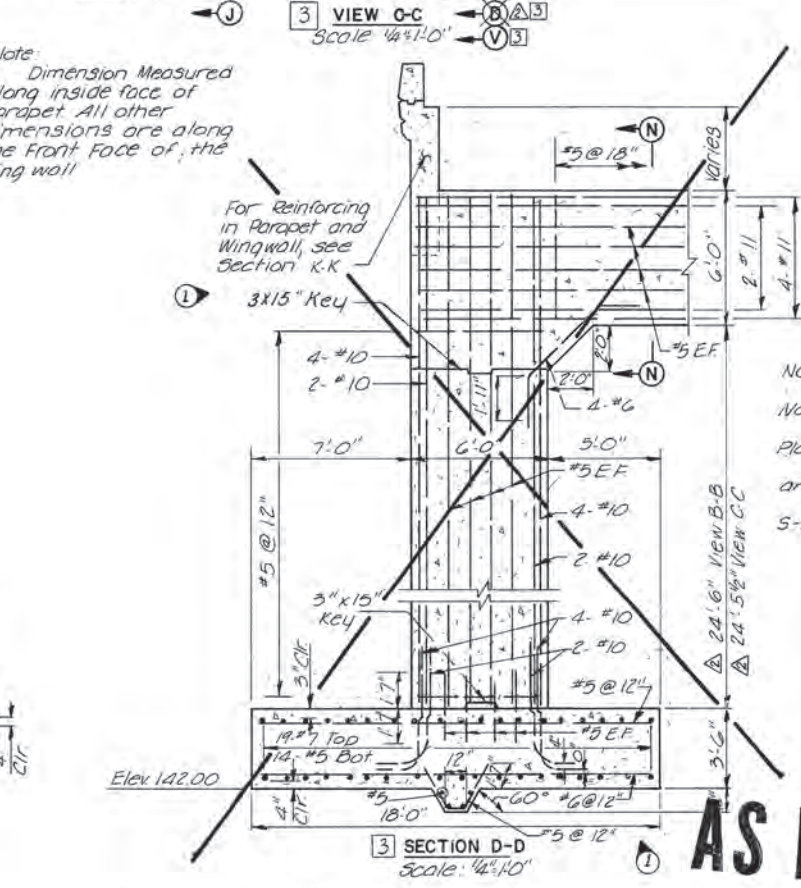
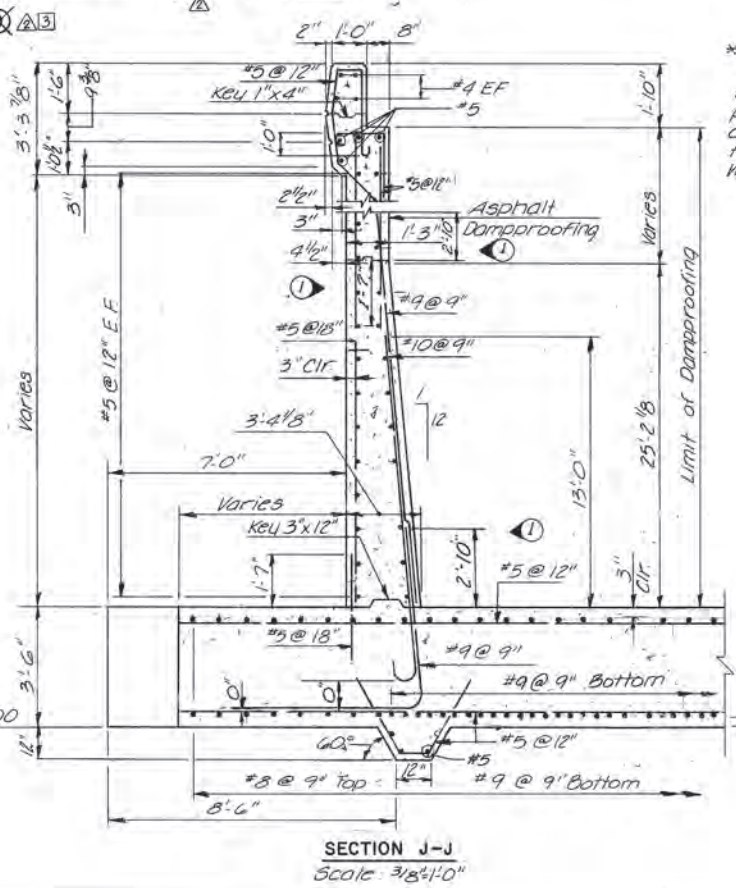
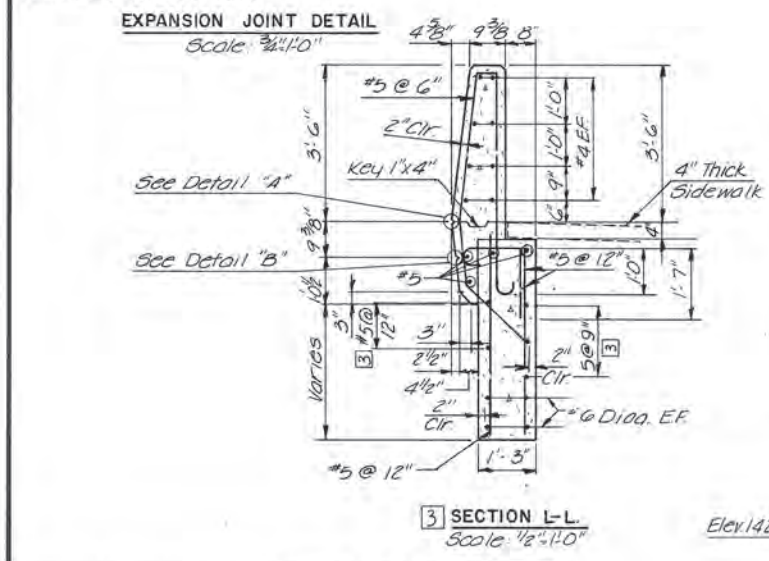
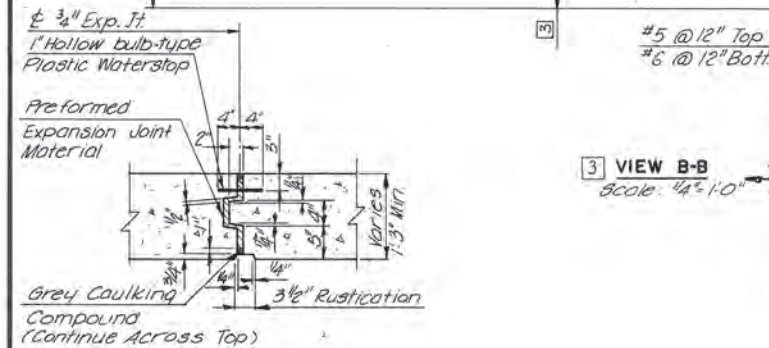
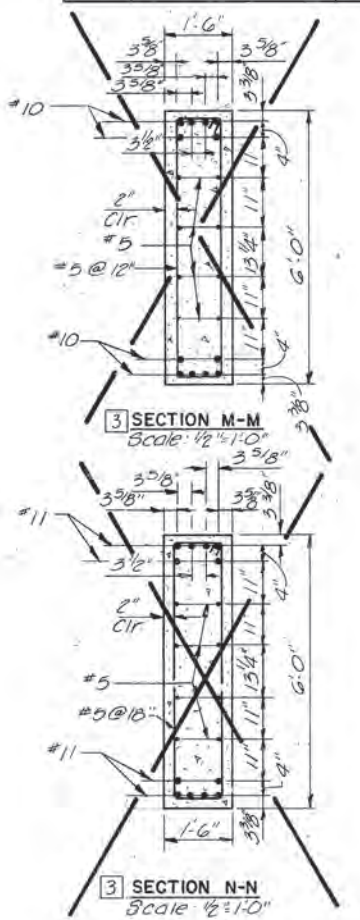
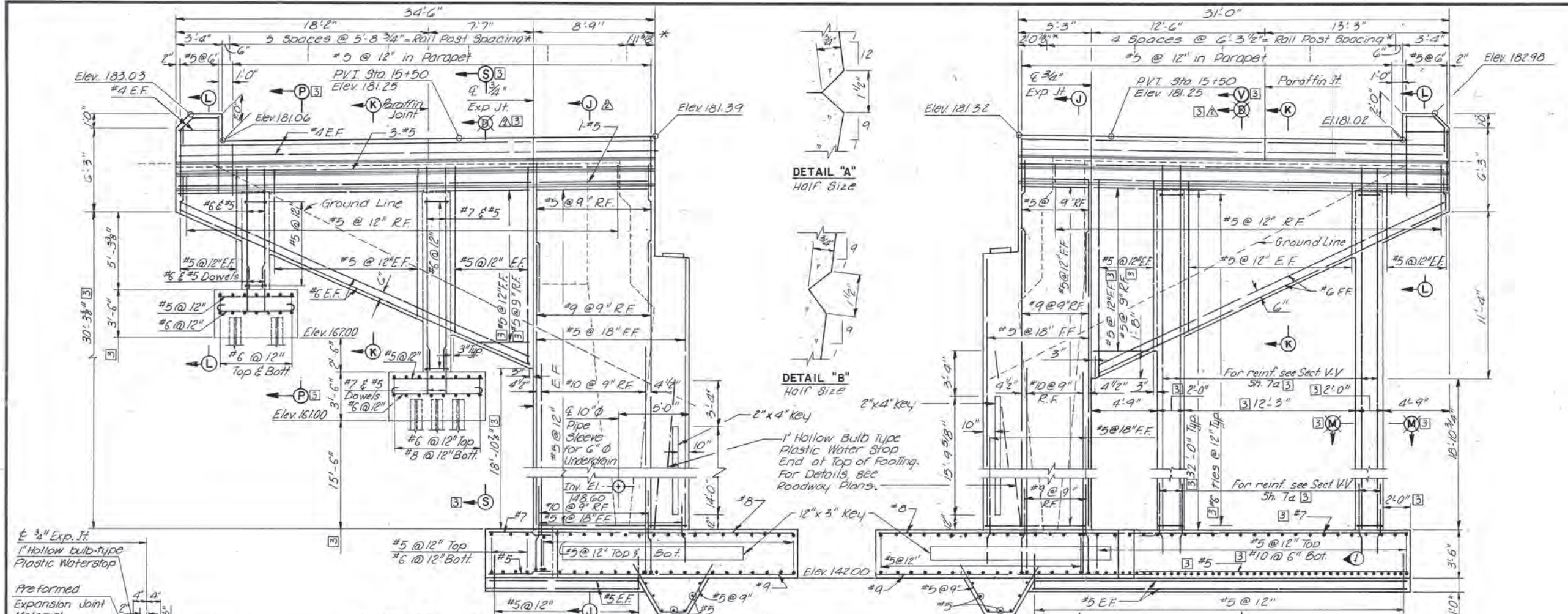
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

CONTRACT NO. \_\_\_\_\_  
SHEET NO. 7a OF 15

BY	DATE			
MADE	N.L.B. 12-74			
CHECKED	L.B.P. 12-74	1	New Sheet	N.L.B. 12-97
IN CHARGE	PRY	NO.	REVISION	BY DATE



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	202	



Notes  
 For General Notes, see Sheet No. 1  
 For Abutment Plan, see Sheet No. 5  
 All bar spacings are maximum.  
 For Sections P-P, S-S, & V-V, see Sheet 7.

\*Note  
 Dimension measured along inside face of parapet. All other dimensions are along the front face of the wing wall.

**AS BUILT**

DESIGNED	DER.	11/73	3	Sect. D-D, M-M & N-N Deleted	N.L.B.	12-974
DRAWN	RPC	11/73	2	Dim View B-B, C-C, Sect. K-K & L-L Revised	TEM	6-4-74
CHECKED	PRM	11/73	1	Dim, C.L. Added, Re-Sht. Chg.	PRM	12-12-78
IN CHARGE	L.J.H.					

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

STRUCTURE B48  
 HARRISON STREET OVER  
 DOWNTOWN EXPRESSWAY  
 NORTH ABUTMENT

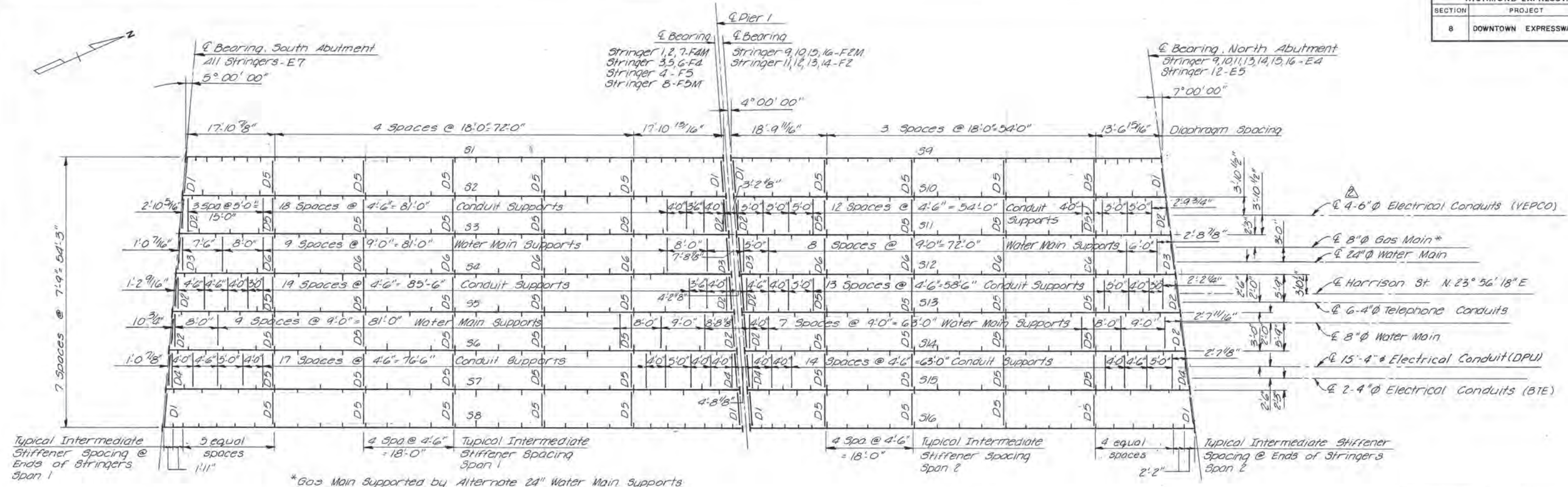
SCALE AS SHOWN	DATE Nov 29, 1973	SHEET 7 OF 15
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS Alexandria, Virginia		HNTB



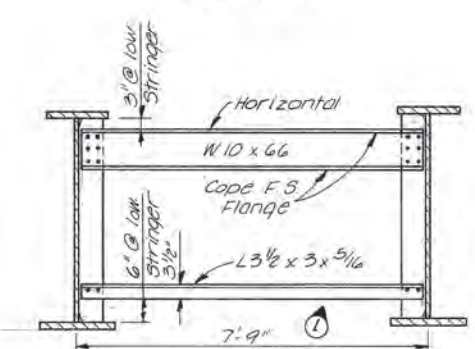
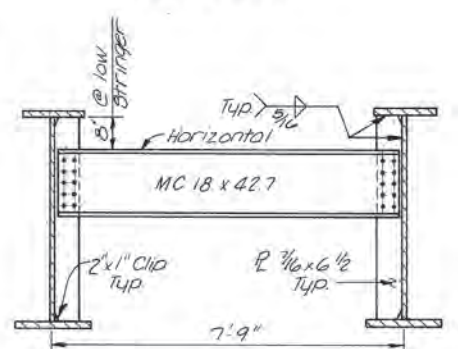
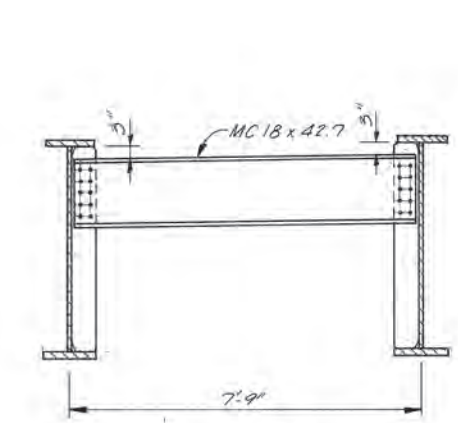
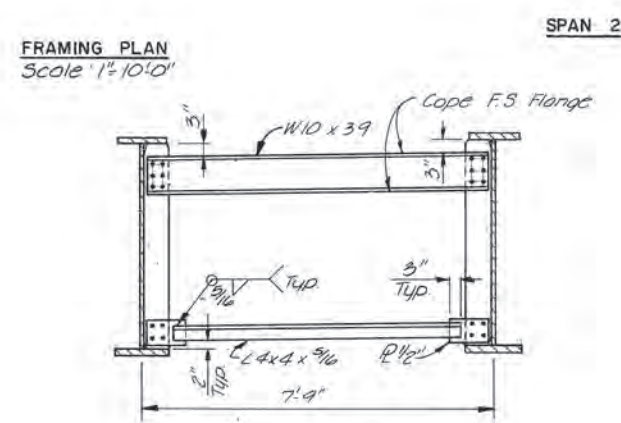
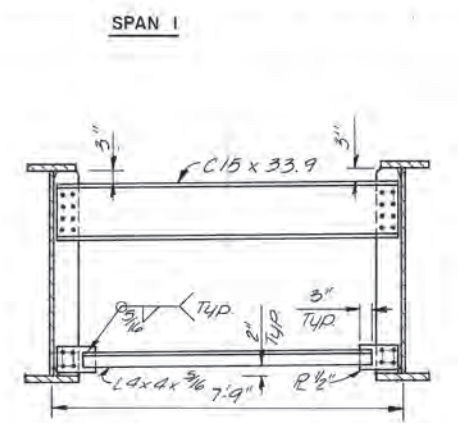
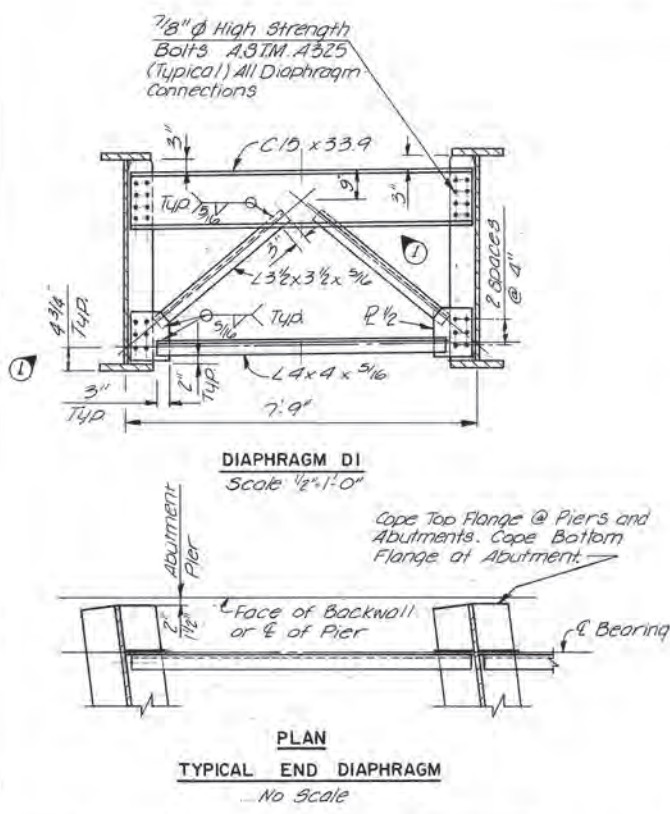




RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	204	



Bearing Type	No. Required
E4	7
E5	1
E7	8
F2	4
F4	3
F5	1
F2M	4
F4M	3
F5M	1



Note:  
 For General Notes, see Sheet 1.  
 For typical Cross-Section and Deck Plan, see Sheet 11.  
 For Stringer Details, see Sheet 10.  
 For Utility Support Details, see Sheets S-10, S-11, & 13.  
 For details of Shoes, see S-1.  
 All Bolts spaced at 3" centers unless otherwise noted.

**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

STRUCTURE B 48  
 HARRISON STREET OVER  
 DOWNTOWN EXPRESSWAY

**FRAMING PLAN**

SCALE As Shown  
 DATE Nov. 29, 1975

SHEET 9 OF 15

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 Alexandria, Virginia

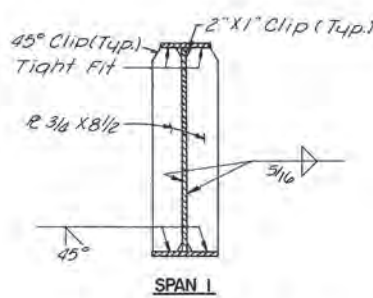
**HNTB**

DESIGNED	PRM	10/73			
DRAWN	RPC	10/73	REV. NO. VEPCO CONDUITS	DGT	11/27/74
CHECKED	L.J.H.	11/73	1 Dim. Note Added, L. Rev.	PRM	12/12/73
IN CHARGE	L.J.H.	NO.	REVISION	BY	DATE

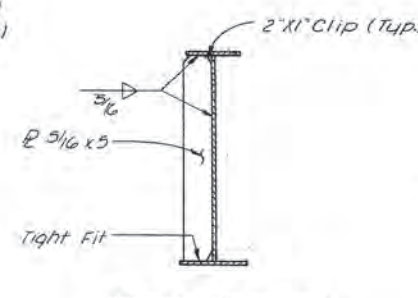
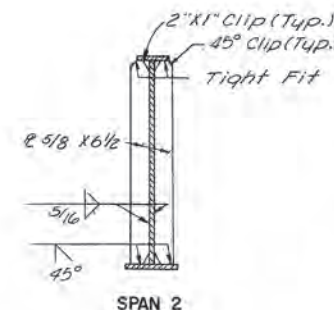


RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
B	DOWNTOWN EXPRESSWAY	205	

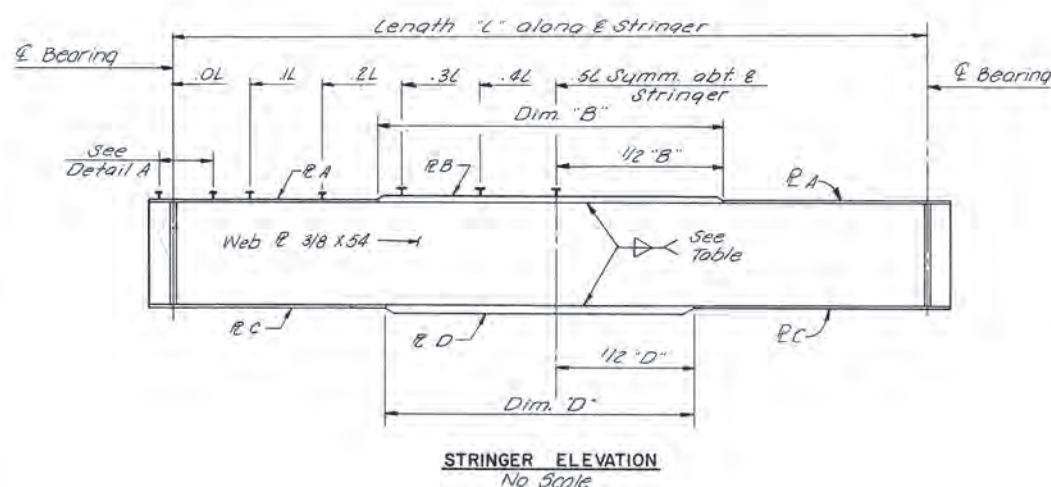
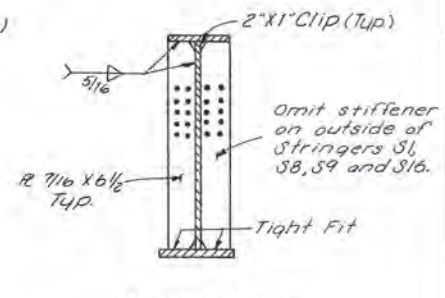
STRINGER	LENGTH "L"	EA	EB	DIM. B	EC	DIM. D	ED	MAX SHEAR STUD SPACING				
								0.0L-0.1L	0.1L-0.2L	0.2L-0.3L	0.3L-0.4L	0.4L-0.5L
								S1	107'-9 1/4"	7/8 X 14	1 1/8 X 14	66'-0"
S2	109'-0 5/8"	1 X 14	1 5/8 X 14	60'-0"	1 3/8 X 18	60'-0"	2 1/8 X 18	18"	20"	23"	24"	24"
S3	110'-2 5/16"	1 3/8 X 14	1 7/8 X 14	58'-0"	1 3/4 X 18	54'-0"	2 3/8 X 18	18"	20"	23"	24"	24"
S4	111'-5 9/8"	1 3/4 X 14	2 1/8 X 14	46'-0"	1 7/8 X 18	54'-0"	2 1/2 X 18	18"	20"	24"	24"	24"
S5	112'-8 1/4"	1 1/2 X 14	1 7/8 X 14	58'-0"	1 3/4 X 18	54'-0"	2 3/8 X 18	18"	20"	23"	24"	24"
S6	113'-10 7/8"	1 3/8 X 14	2 X 14	54'-0"	1 7/8 X 18	54'-0"	2 3/8 X 18	18"	20"	23"	24"	24"
S7	115'-1 1/2"	1 3/8 X 14	1 7/8 X 14	58'-0"	1 7/8 X 18	54'-0"	2 3/8 X 18	18"	20"	23"	24"	24"
S8	116'-4 1/8"	1 1/2 X 14	2 X 14	54'-0"	2 X 18	54'-0"	2 1/2 X 18	15"	17"	21"	24"	24"
S9	86'-4 5/8"	3/4 X 12			7/8 X 14	56'-0"	1 3/4 X 14	17"	18"	20"	22"	24"
S10	86'-9 7/16"	3/4 X 12			7/8 X 14	52'-0"	1 5/8 X 14	17"	20"	22"	24"	24"
S11	87'-2 1/2"	3/4 X 12	1 1/8 X 12	38'-0"	1 X 14	54'-0"	1 7/8 X 14	19"	20"	22"	24"	24"
S12	87'-7 3/8"	3/4 X 12	1 1/4 X 12	56'-0"	1 1/8 X 14	54'-0"	2 X 14	19"	20"	22"	24"	24"
S13	88'-0 9/16"	3/4 X 12	1 X 12	38'-0"	7/8 X 14	58'-0"	1 3/4 X 14	19"	20"	22"	24"	24"
S14	88'-5 1/4"	3/4 X 12	1 1/8 X 12	38'-0"	7/8 X 14	58'-0"	1 3/4 X 14	19"	20"	22"	24"	24"
S15	88'-10 1/8"	3/4 X 12	1 X 12	40'-0"	7/8 X 14	58'-0"	1 3/4 X 14	17"	20"	22"	24"	24"
S16	89'-3 1/16"	3/4 X 12	1 X 12	42'-0"	1 X 14	56'-0"	1 7/8 X 14	16"	18"	20"	22"	24"



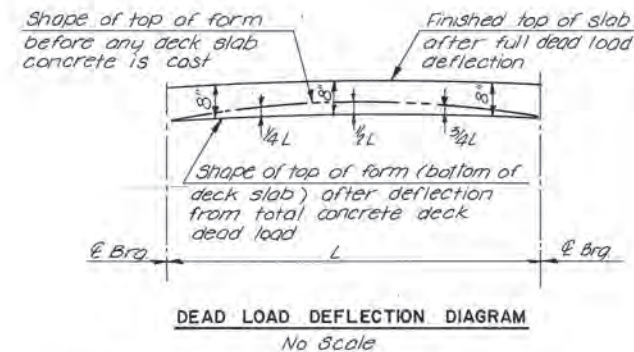
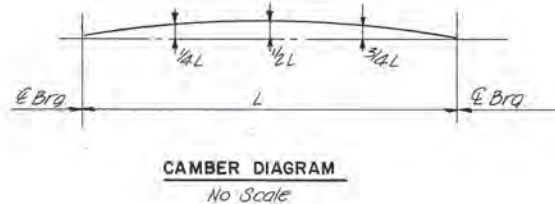
BEARING STIFFENER  
Scale: 1/2"=1'-0"



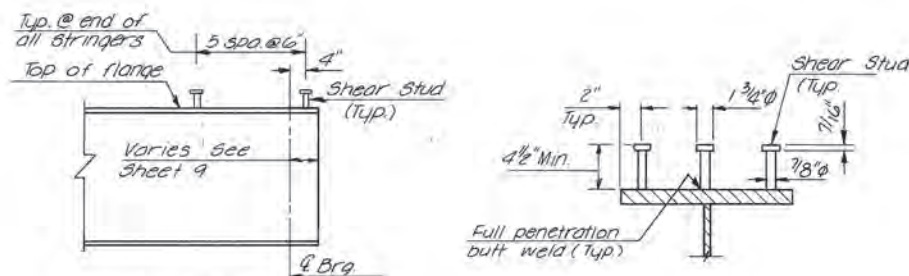
INTERMEDIATE STIFFENERS  
Scale: 1/2"=1'-0"



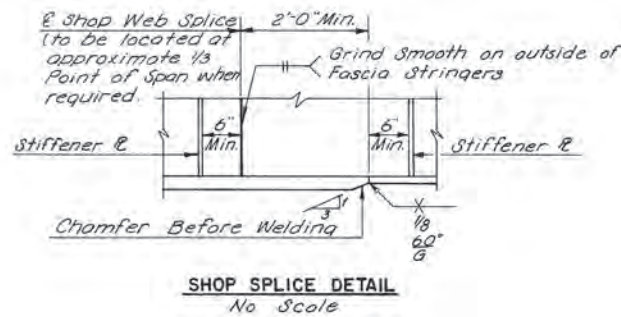
Flange To Web Connection	
Flange Thickness	Size of Fillet Weld
1 1/2" or less	5/16"
1 5/8" to 2 1/4"	3/8"
2 3/8" or more	1/2"



NOTE TO FABRICATOR:  
The above deflections are those anticipated to occur in the stringer upon placement of the total concrete deck load. In practice, the stringers in place, are not likely to have the exact camber to compensate for these deflections during construction. The residual amounts shall be provided for by adjusting forms to vary the thickness of the concrete bolster between the bottom of the slab and the top of the stringer, without alteration of the slab thickness.



Note: Shear stud spacing shown is maximum spacing.



SPAN	STRINGER	D.L. DEFLECTION		CAMBER	SCHEDULE		
		1/4 L	3/4 L		1/2 L	1/4 L	1/2 L
1	S1	1 9/16"	2 1/2"	4 9/16"	6 1/4"	4 9/8"	
	S2	1 5/8"	2 1/4"	4 7/16"	6 1/16"	4 1/2"	
	S3	1 9/16"	2 1/8"	4 5/8"	6 3/8"	4 3/4"	
	S4	1 9/16"	2 3/16"	4 13/16"	6 5/8"	4 7/8"	
	S5	1 11/16"	2 5/16"	4 13/16"	6 5/8"	4 15/16"	
	S6	1 11/16"	2 5/16"	5"	6 13/16"	5 1/16"	
2	S7	1 3/4"	2 7/16"	5 1/16"	7"	5 3/16"	
	S8	2 1/8"	2 15/16"	5 1/16"	7 3/16"	5 7/16"	
	S9	1 5/16"	2 13/16"	3 1/16"	4 1/8"	3"	
	S10	1 3/16"	1 5/8"	2 15/16"	4"	2 15/16"	
	S11	1 1/16"	1 7/16"	3"	4"	3"	
	S12	1"	1 3/8"	3"	4 1/16"	3"	
	S13	1 1/8"	1 9/16"	3 1/16"	4 1/8"	3"	
	S14	1 1/16"	1 1/2"	3 1/16"	4 3/16"	3 1/16"	
	S15	1 1/8"	1 9/16"	3 1/8"	4 3/16"	3 1/8"	
	S16	1 5/16"	1 7/8"	3 1/16"	4 5/16"	3 1/16"	

Note: For general notes, see Sheet 1. For Framing Plan, see Sheet 9. Ends of Stringers and bearing stiffeners shall be plumb under full dead load.

# AS BUILT

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY

STRUCTURE B48  
HARRISON STREET OVER  
DOWNTOWN EXPRESSWAY  
STRINGER DETAILS

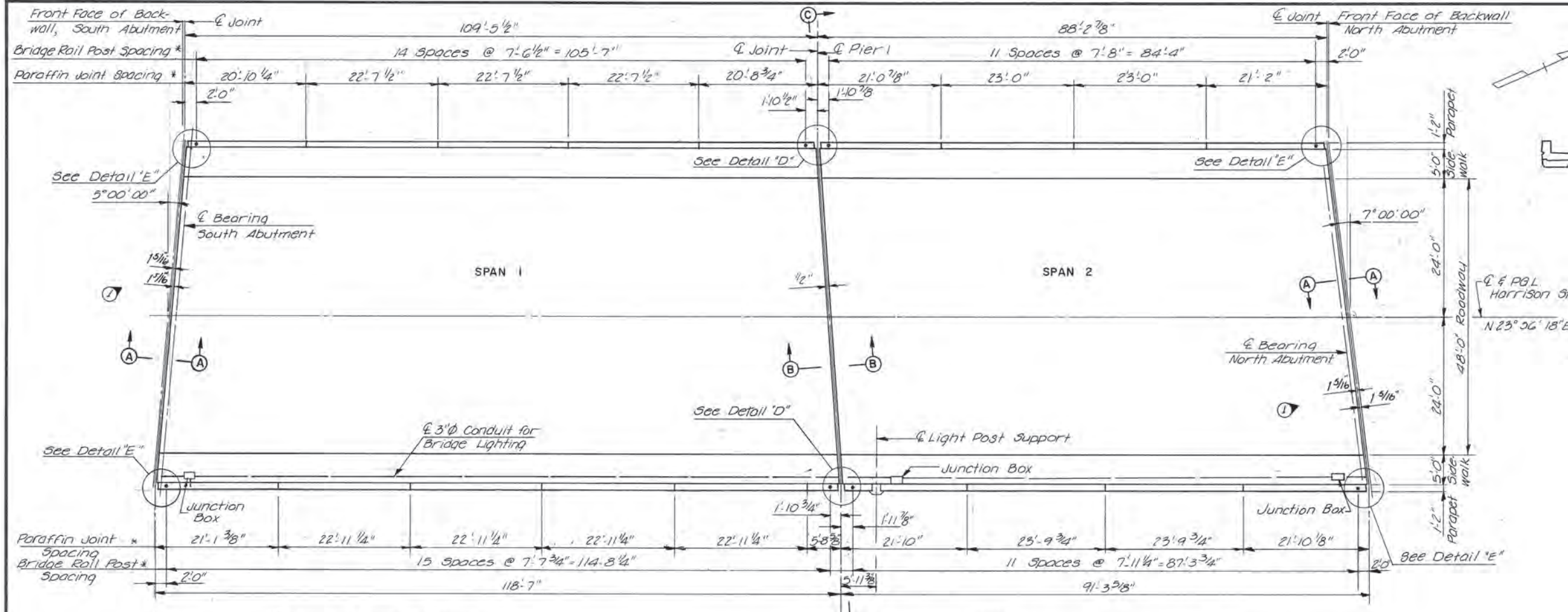
SCALE As Shown  
DATE Nov 29, 1973  
SHEET 10 OF 15

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
Alexandria, Virginia  
HNTB

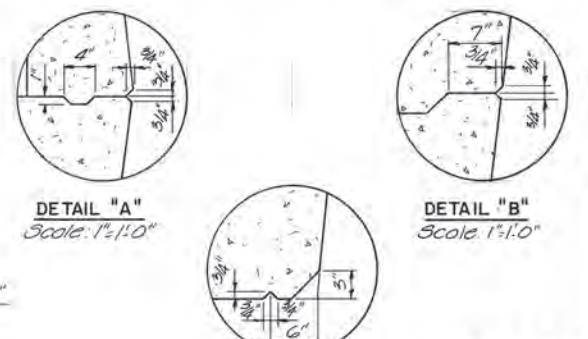
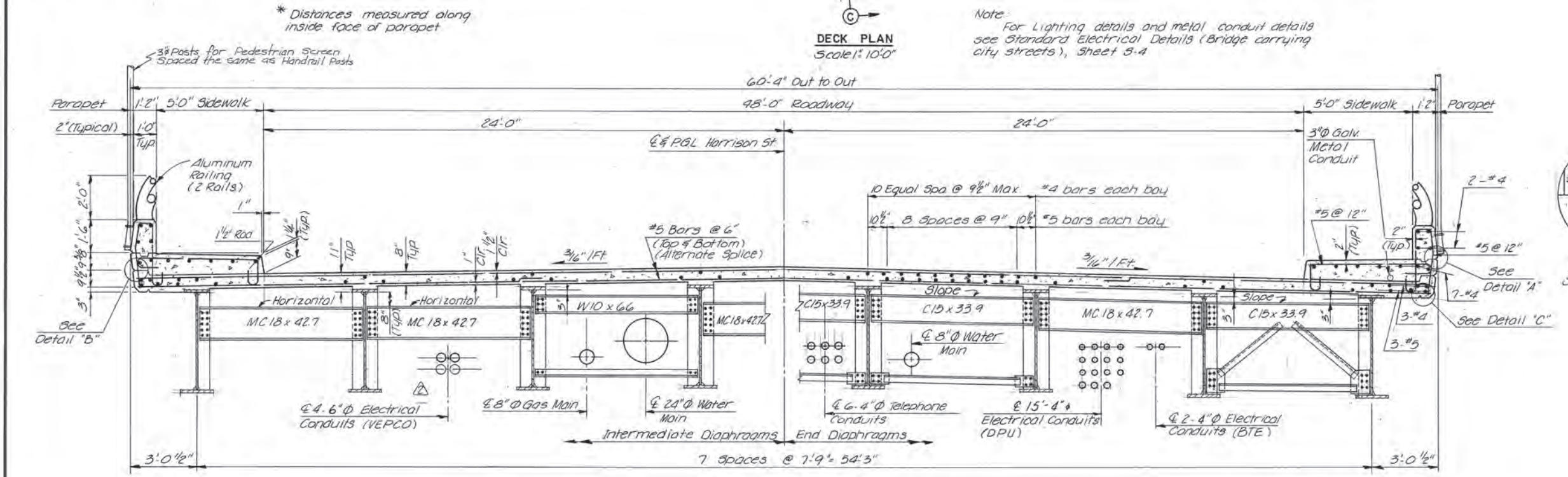
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DRAWN	R.J.G.	11/73			
CHECKED	L.J.H.	11/73	1	Dim Chg, Def, Table Added	PRM 12-12-73
IN CHARGE	L.J.H.		NO.	REVISION	BY DATE



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
B	DOWNTOWN EXPRESSWAY	206	



GUTTERLINE ELEVATIONS			
STATION	ELEV. A	ELEV. B	ELEV. C
13+33.58		177.59	177.22
13+35.68	177.27	177.64	177.27
13+37.78	177.32	177.69	
13+40	177.38	177.75	177.38
13+50	177.62	177.99	177.62
13+60	177.85	178.22	177.85
13+70	178.07	178.44	178.07
13+80	178.26	178.63	178.26
13+90	178.44	178.81	178.44
14+00	178.60	178.97	178.60
14+10	178.75	179.12	178.75
14+20	178.88	179.25	178.88
14+30	178.98	179.35	178.98
14+40	179.07	179.44	179.07
14+48.08	179.13	179.50	
14+49.76	179.15	179.52	179.15
14+50	179.15	179.52	179.15
14+51.44		179.53	179.16
14+60	179.21	179.58	179.21
14+70	179.24	179.61	179.24
14+80	179.26	179.63	179.26
14+90	179.26	179.63	179.26
15+00	179.25	179.62	179.25
15+10	179.21	179.58	179.21
15+20	179.16	179.53	179.16
15+30	179.09	179.46	179.09
15+36.64	179.04	179.41	
15+39.59	179.01	179.38	179.01
15+40	179.00	179.37	179.00
15+42.54		179.35	178.98



**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY**

STRUCTURE B48  
HARRISON STREET OVER  
DOWNTOWN EXPRESSWAY  
**DECK PLAN AND CROSS SECTION**

SCALE: As Shown  
DATE: Nov. 29, 1973  
SHEET 11 OF 15

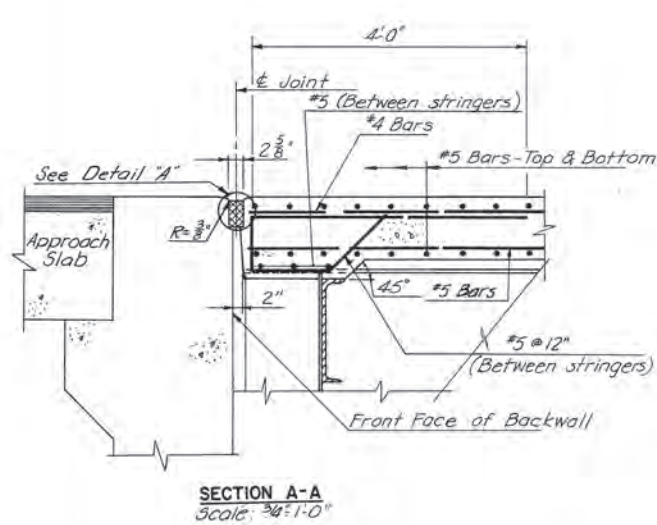
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS Alexandria, Virginia **HNTB**

DESIGNED	PRM/C	10/73	AS BUILT	HMM
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CHECKED	L.J.H.	11/73	1 Dim. Changed	PRM/C 12-12-73
IN CHARGE	L.J.H.	NO.	REVISION	BY DATE

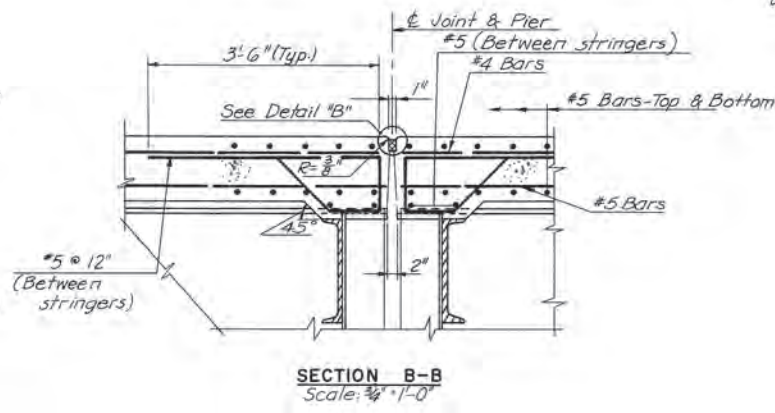
Note: For general notes, see Sheet 1. For Sections A-A, B-B, C-C and Details 'D', 'E' see Sheet 12. For Framing Plan, see Sheet 9. For Joint Details, see Sheet 12. For Bridge Rolling Details, see Sheet 3-3.



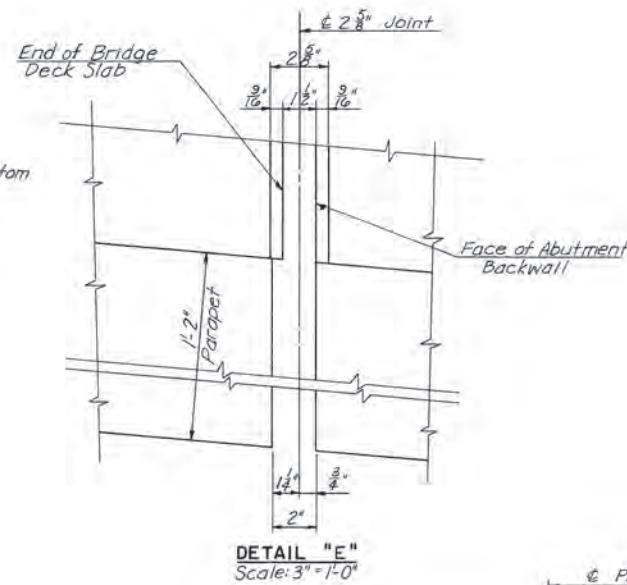
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	207	



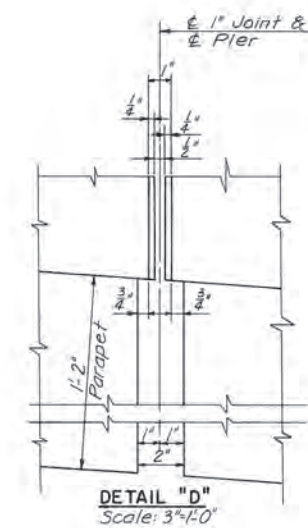
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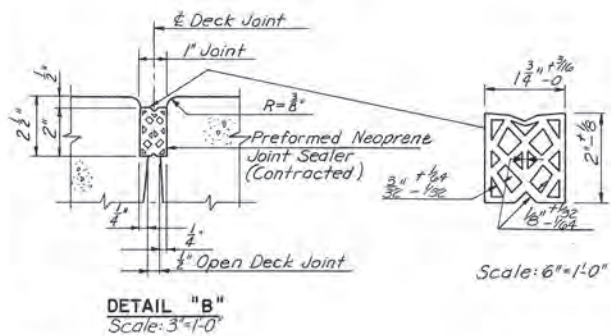
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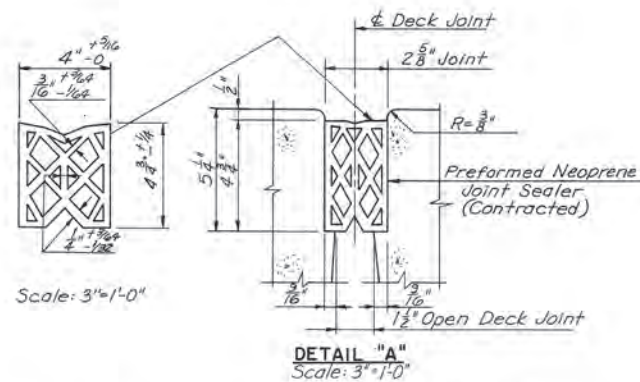
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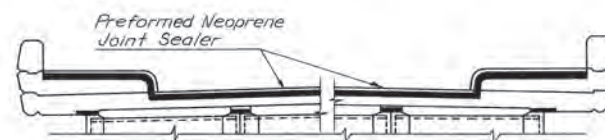
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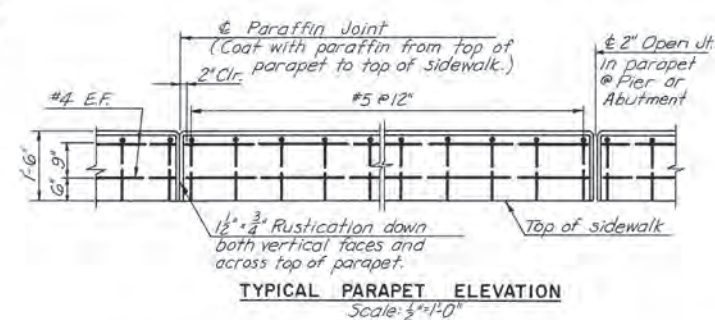
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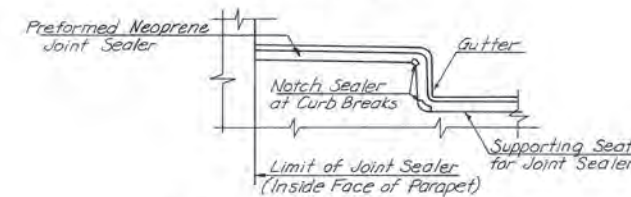
DETAIL "A"  
Scale: 3"=1'-0"



SECTION C-C  
Scale: 1/2"=1'-0"



TYPICAL PARAPET ELEVATION  
Scale: 1/2"=1'-0"



TREATMENT OF JOINT AT CURB  
No Scale

NOTES:  
For Typical Deck Cross Section see Sheet 11  
For Rolling Details see Sheet 53  
For General Notes see Sheet 1  
For Framing Plan see Sheet 9  
For Light Post Support Details see Sheet 54

**AS BUILT**

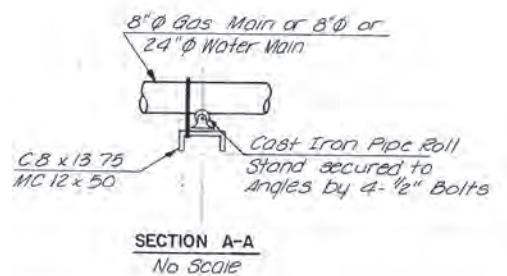
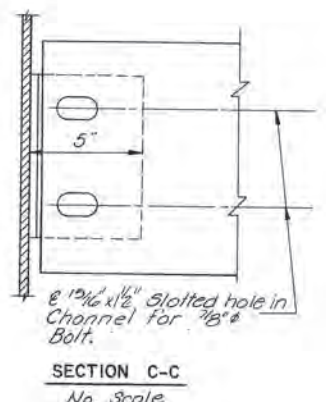
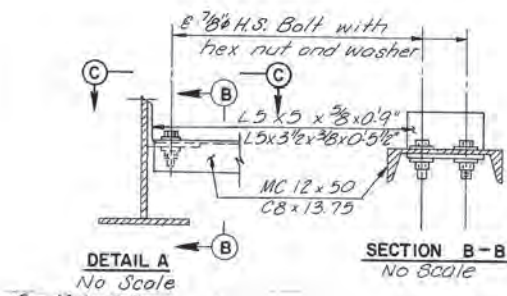
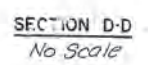
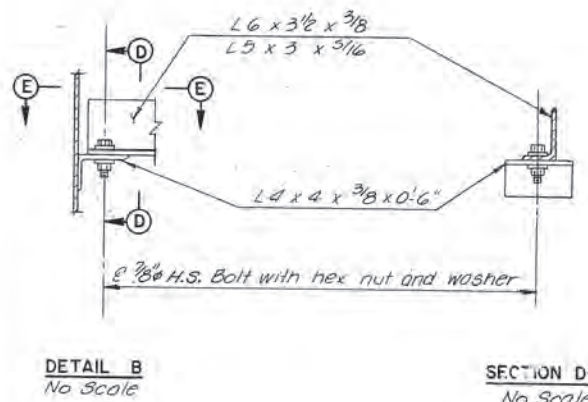
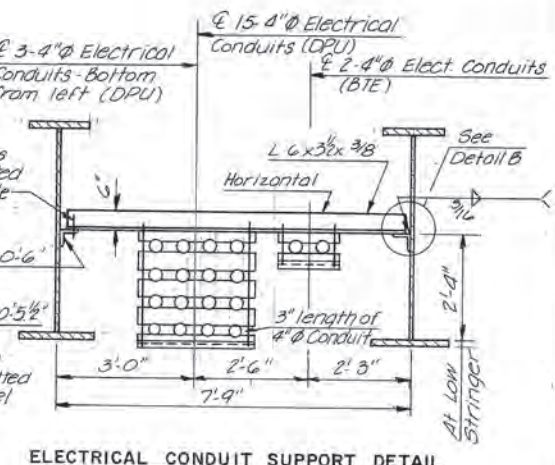
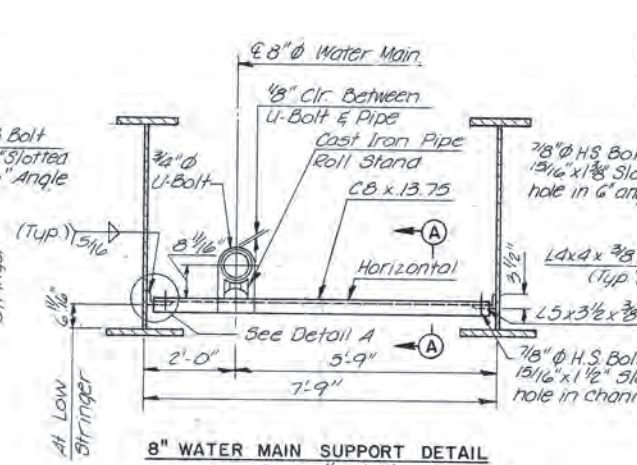
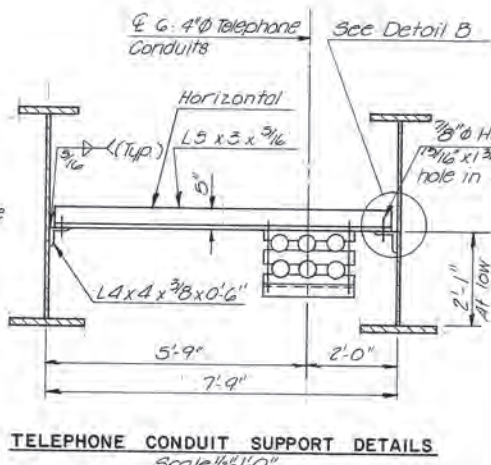
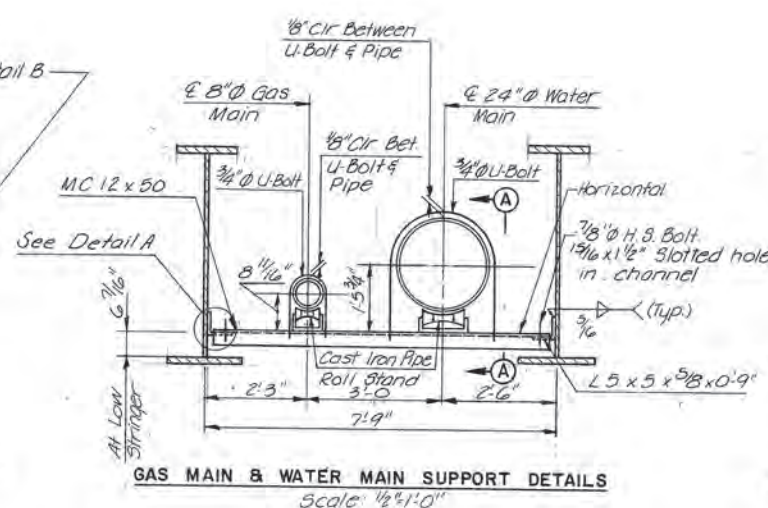
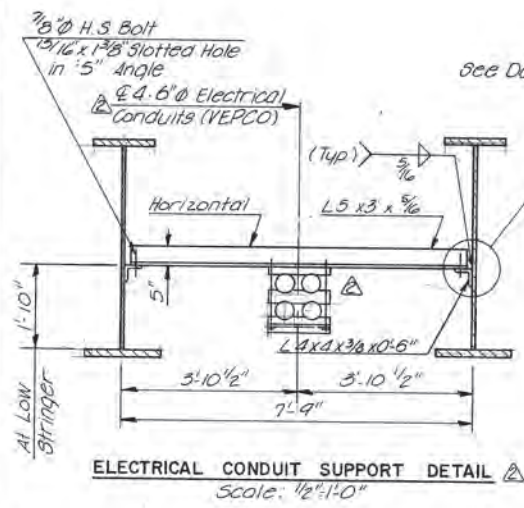
RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM DOWNTOWN EXPRESSWAY	
STRUCTURE B48 HARRISON STREET OVER DOWNTOWN EXPRESSWAY JOINT DETAILS	
DATE Nov. 29, 1973	SCALE: As Shown
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO. 8 SHEET NO. 18 OF 19

Note to Contractor:  
It is absolutely essential that the openings for the preformed neoprene joint sealers be accurately formed to smooth, straight lines. The size of the opening shall be adjusted to allow for anticipated dead load rotation of the ends of the slab and for the temperature at the time of construction.

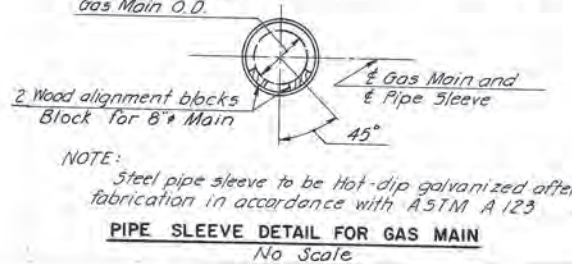
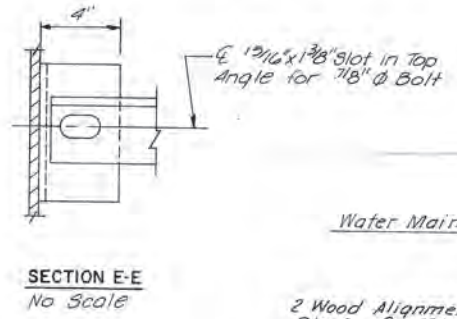
BY	DATE				
MADE	F.B.C.	7-67			
CHECKED	W.E.O.	9-67			
IN CHARGE	W.E.O.				
	NO.	REVISION	BY	DATE	



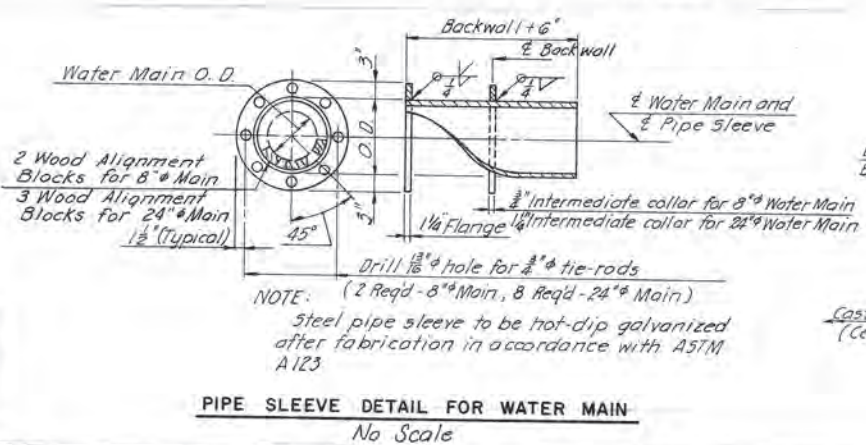
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	208	



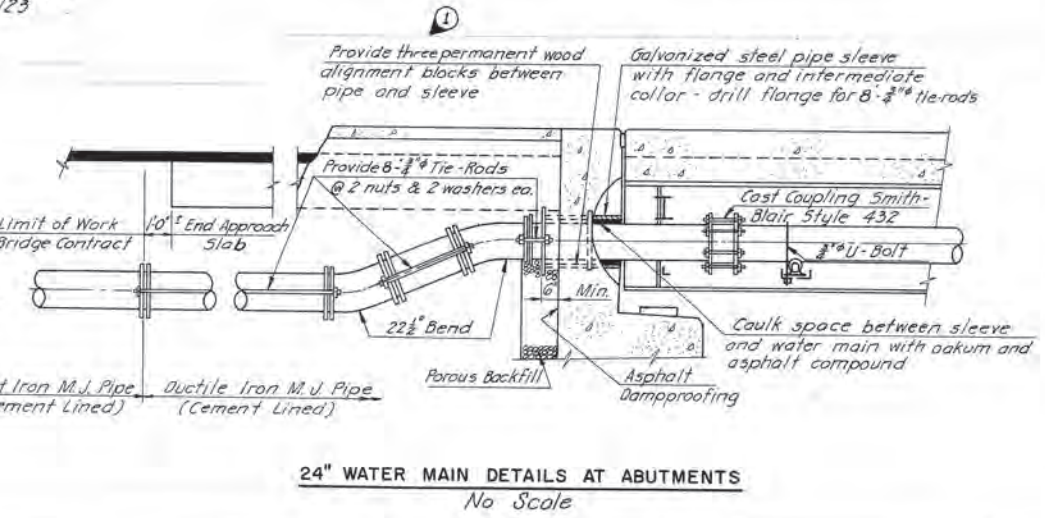
Notes:  
For General Notes, see Sheet No. 1  
For Location and spacing of Utility supports, see Sheet No. 9  
For Conduit Installation Details, see Sheet No. 10  
For Gas and Water Main Details at Abutments, see Sheet No. 11



NOTE:  
Steel pipe sleeve to be Hot-dip galvanized after fabrication in accordance with ASTM A 123



NOTE:  
(2 Req'd - 8" Main, 8 Req'd - 24" Main)  
Steel pipe sleeve to be hot-dip galvanized after fabrication in accordance with ASTM A 123



**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

STRUCTURE B 48  
HARRISON STREET OVER  
DOWNTOWN EXPRESSWAY  
UTILITY DETAILS

SCALE: AS SHOWN  
DATE: Nov 29, 1973

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
Alexandria, Virginia

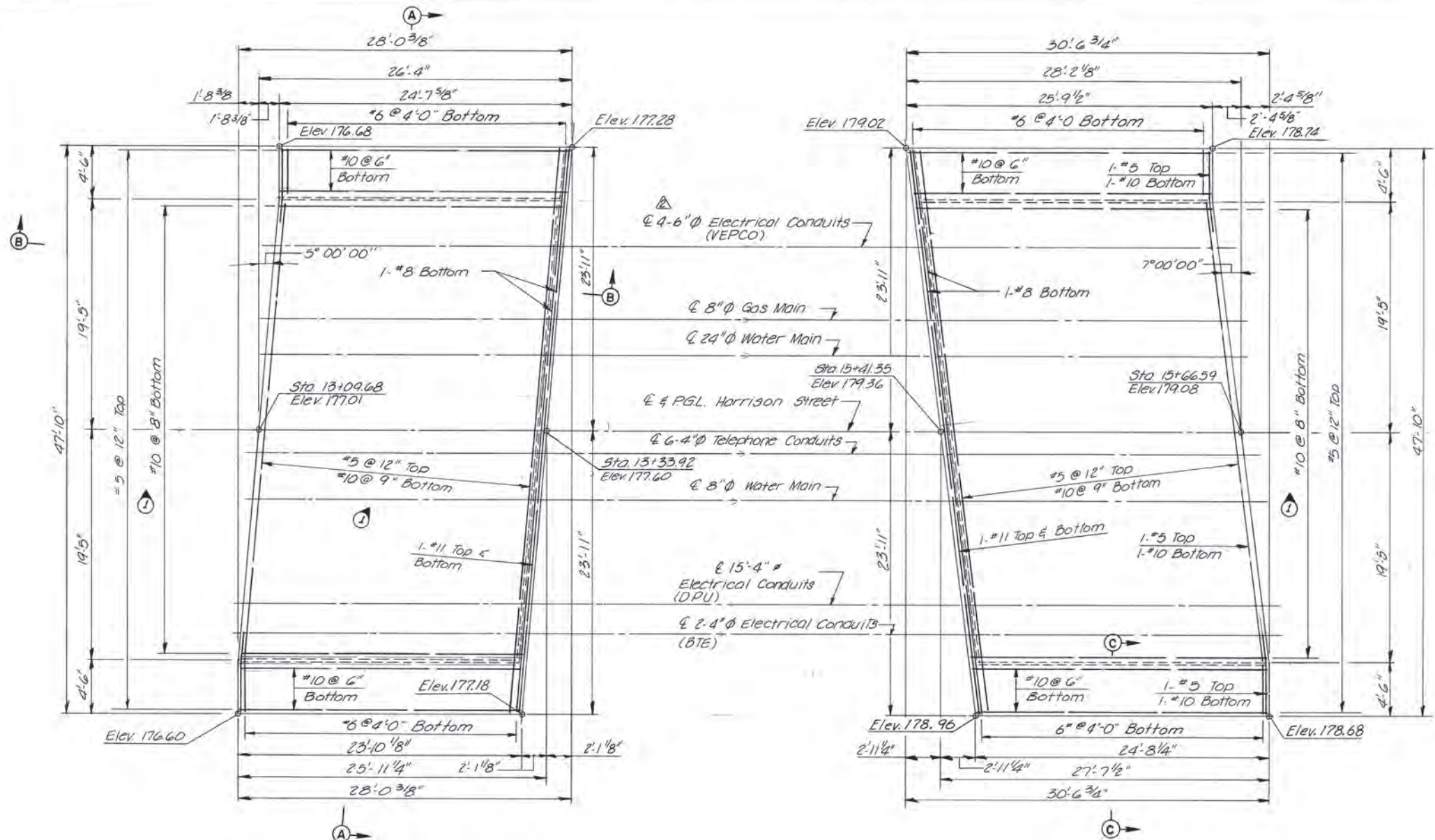
**HNTB**

SHEET 13 OF 15

DESIGNED	PRM	11/73	Rev. No. VEPCO Conduits	DGT	11/274
DRAWN	RPC	11/73	1 Note Changed	PRM	12/273
CHECKED	FRB	11/73			
IN CHARGE	L.J.H.				
NO.		REVISION		BY	DATE

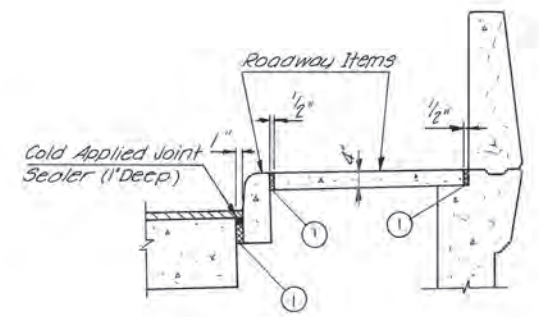


RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
8	DOWNTOWN EXPRESSWAY	209	



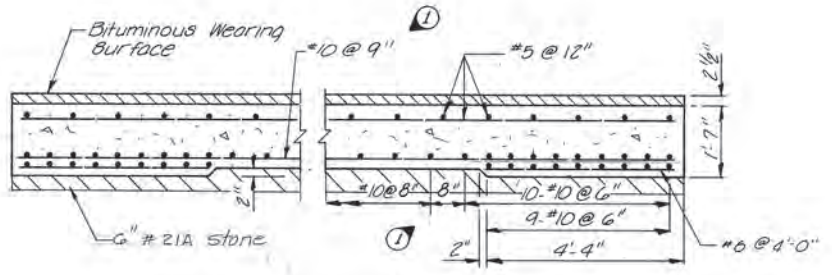
PLAN - SOUTH ABUTMENT  
Scale: 3/16" = 1'-0"

PLAN - NORTH ABUTMENT  
Scale: 3/16" = 1'-0"

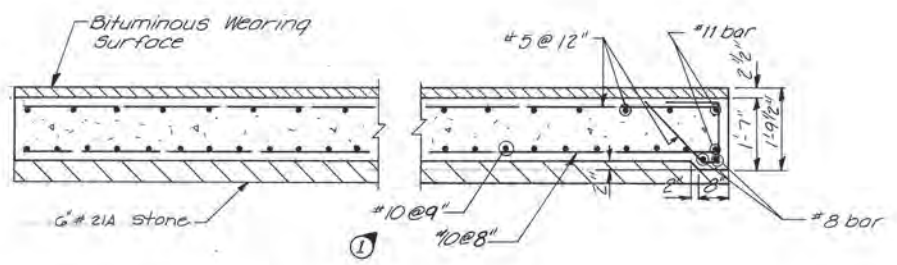


① = Preformed Joint Filler

SECTION C-C  
Scale: 1/2" = 1'-0"



SECTION A-A  
Scale: 1/2" = 1'-0"



SECTION B-B  
Scale: 1/2" = 1'-0"

Note:  
For general notes, see Sheet 1  
Elevations are given at top of  
Bituminous Wearing Surface.

# AS BUILT

RICHMOND METROPOLITAN AUTHORITY	
RICHMOND EXPRESSWAY SYSTEM	
DOWNTOWN EXPRESSWAY	
STRUCTURE B48	
HARRISON STREET OVER	
DOWNTOWN EXPRESSWAY	
APPROACH SLABS	
SCALE AS SHOWN	SHEET 14 OF 15
DATE Nov 29, 1973	
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS Alexandria, Virginia	
HNTB	

DESIGNED	DATE	BY	NO.	REVISION	BY	DATE
FRB	10/73			AS BUILT	HMW	
RPC	10/73			Rev. No. Vepco Conduits	DGT	11/27/74
L.J.H.	11/73			Re: Steel Change	PRMc	12-12-73
L.J.H.						



# **Bridge 55**

**(3<sup>rd</sup> Street over Downtown Expressway - Rte. 195)**

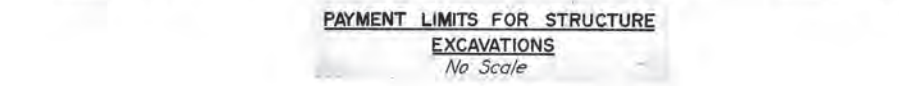
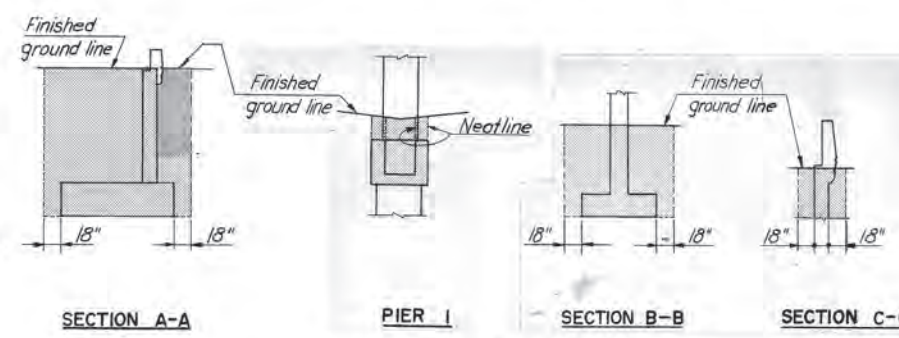
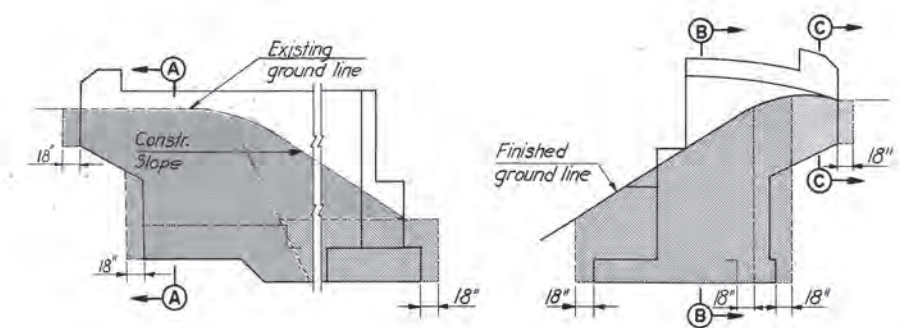
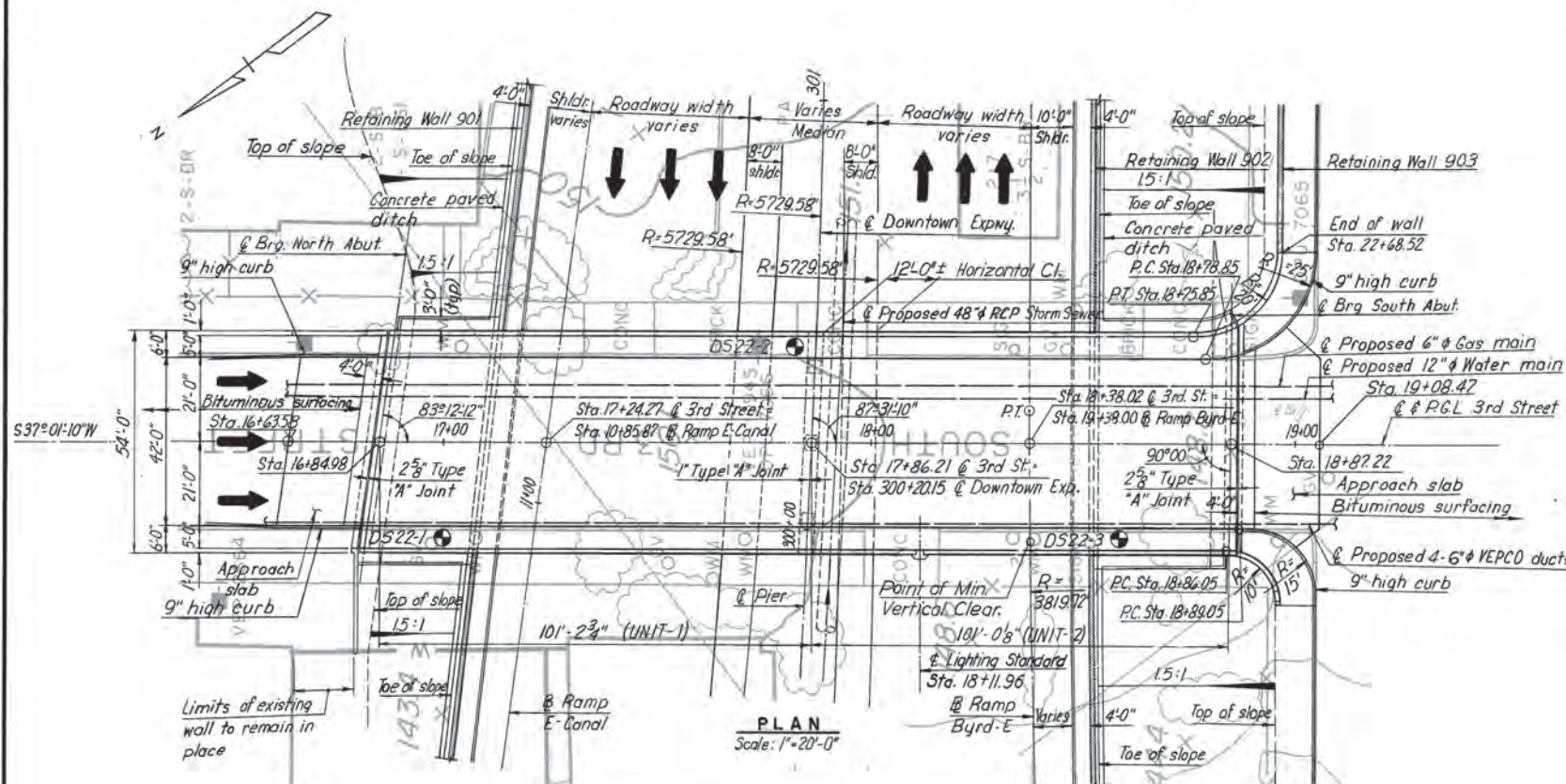
**Record Set Plans**



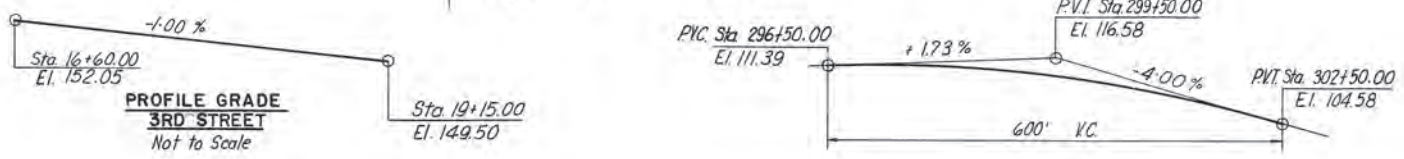




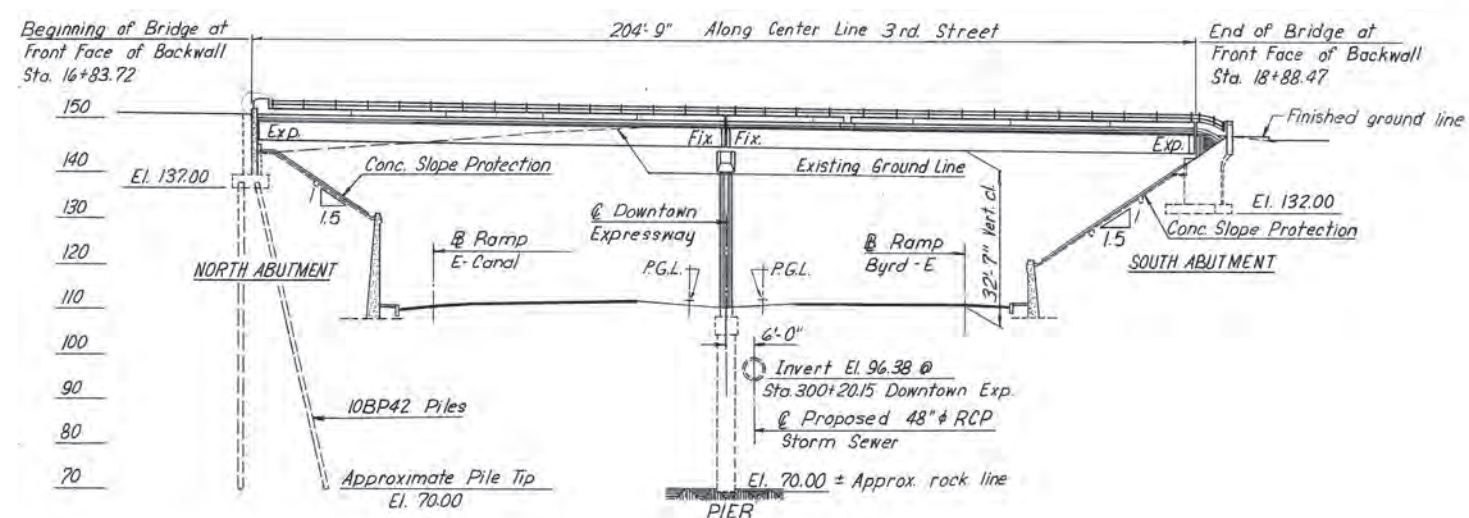
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	139	



**PAYMENT LIMITS FOR STRUCTURE EXCAVATIONS**  
No Scale



INDEX	
NO.	DESCRIPTION
1	General Plan and Elevation
2	General Notes and Quantities
3	North Abutment
4	North Abutment Details (1)
5	North Abutment Details (2)
6	North Abutment Details (3)
7	South Abutment
8	South Abutment Details (1)
9	South Abutment Details (2)
10	Pier
11	Framing Plan
12	Cross Section and Utility Details
13	Deck Plans
14	Joint Details
15	Approach Slabs and Slope Protection
16	Boring Logs
S1	Standard Shoe Details
S3	Standard Aluminum Railing Details (2 Rails)
S4	Standard Electrical Details (Bridges Carrying City Streets)
S7	Standard Architectural Details
S8	Standard Architectural Details
S9	Standard Architectural Details
S10	Standard Conduit Installation Details
S11	Standard Utility Support Details at Bridge Abutments



**BORINGS:** ● Indicates location of 2 1/2" cased hole boring. For boring data, see Boring Logs sheet.  
**NOTE:** For General Notes and Quantities, see next sheet.

BY	DATE				
MADE	T.E.M.	1-1-68	2	As Built	TEM 6-77
CHECKED	A.B.P.	3-6-68	1	Ret. Wall Deleted	H.M.M. 4-15-76
IN CHARGE	P.R.Y.				
NO.	REVISION	BY	DATE		

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**GENERAL PLAN AND ELEVATION**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: AS SHOWN  
CONTRACT NO.: 9  
SHEET NO. 1 OF 16

AS BUILT



**GENERAL NOTES**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	140	

**ROADWAY:** One 42'-0" clear roadway. Two 5'0" sidewalks.  
**CAPACITY:** Dead Load-Includes 15 lbs. per sq.ft. for future wearing surface.  
 Live Loads-HS20-44 loading and B.P.R. modified for military vehicles.

**SPECIFICATIONS:**  
 GENERAL-Virginia Department of Highway Road and Bridge Specifications, 1970.  
 DESIGN-A.A.S.H.O. Standard Specifications for Highway Bridges, 1961, modified by Special Design Provisions.  
 WELDING-1969 Standard Specifications for Welded Highway and Railway Bridges of the American Welding Society.

**CONTRACT SPECIAL PROVISIONS**

Specifications and Contract Special Provisions referred to above are necessary to make these plans complete.

**DATUM:** CITY OF RICHMOND

**TEMPERATURE:** The normal temperature referred to on the plan is 60°F. The temperature range for movement is 0°F to 120°F.

**DIMENSIONS:** All dimensions are measured horizontally and vertically unless otherwise noted.

**EXCAVATION:** Excavation below subgrade and cut slope template shall be classified as Structure Excavation. All excavation above these limits shall be classified as Regular Excavation and is not included in the Structural Quantities.

**FOUNDATIONS:** Footings shall rest on firm material. Foundation material shall be kept dry and special attention is called to Sections 401.05 and 401.06 of the General Specifications and to the Contract Special Provisions concerning preparation of foundations for footings.

**CONCRETE NOTES:** Concrete in superstructure shall be Class A4. All other concrete shall be Class A3. All exposed edges and corners shall have a 3/4" chamfer or fillet unless otherwise noted. Care in the method of vibration, the use of low-slump concrete, and/or other means shall be employed to prevent downgrade movement of newly placed slab concrete (when gradient is over 2%).

Finishing Concrete Surfaces: See the Standard Architectural Details sheets and the Contract Special Provisions for types and details.

All reinforcing steel shall conform to ASTM A615 Grade 40. All reinforcing bar dimensions on the detailed drawings are to centers of bars unless otherwise noted. Clear distance between reinforcing steel and face of concrete shall be as noted on the plans. All bar laps shall be 30 diameters of the smaller diameter bar unless otherwise noted.

**STEEL NOTES:** Structural steel shall conform to A.S.T.M. Specification A36 except as noted. All field connections shall be made with high strength bolts. High strength bolts shall be 7/8" diameter unless otherwise noted and shall conform to A.S.T.M. Specifications A325.

**BENCH MARKS:** See Reference Ties and Field Control Data sheet in highway plans.

C-46 Plug, corner Byrd St. and S. 3rd St., Elev. 149.69  
 C-47 Plug, corner E. Canal St. and S. 3rd St., Elev. 152.70

**FINAL QUANTITIES**

	STRUCTURE EXCAVATION C.Y.	CONCRETE CLASS A3 C.Y.	CONCRETE CLASS A3 BR. APPR. SLABS C.Y.	CONCRETE CLASS A4 C.Y.	REINFORCING STEEL LBS.	STRUCTURAL STEEL LBS.	ALUMINUM BR. RAILING (2 RAILS) L.F.	DRILLED HOLES FOR CAISSONS 4" Ø L.F.	POROUS BACKFILL C.Y.	STEEL PILES IOBP42 L.F.	CONC. SLAB SLOPE PROTECTION S.Y.	DAMP-PROOFING S.Y.	UNDERDRAIN 6" Ø L.F.	GAS MAIN 6" Ø L.F.	WATER MAIN 12" Ø L.F.	CONDUIT 6" Ø VEPCO L.F.	METAL CONDUIT 3" Ø L.F.
SUPERSTRUCTURE				384.39	84,396	418,496	409.9							251	249	997	1278
NORTH ABUTMENT	299	175.67			12,201		22.7		29	2134	178.68	111	129				
PIER 1	38	140.94			39,985			95.3									
SOUTH ABUTMENT	623	209.43			16,751		28.9		41		246.75	118	90				
APPROACH SLABS			100.37		22,618												
TOTAL	960	526.04	100.37	384.39	175,951	418,496	461.5	95.3	70	2134	425.43	229	219	251	249	997	1278

MADE	BY	DATE			
	EVR	3-68			
CHECKED	L.B.P.	12-68	1	As Built	TEM 6-77
IN CHARGE	PRY		NO.	REVISION	BY DATE

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**

**GENERAL NOTES AND QUANTITIES**

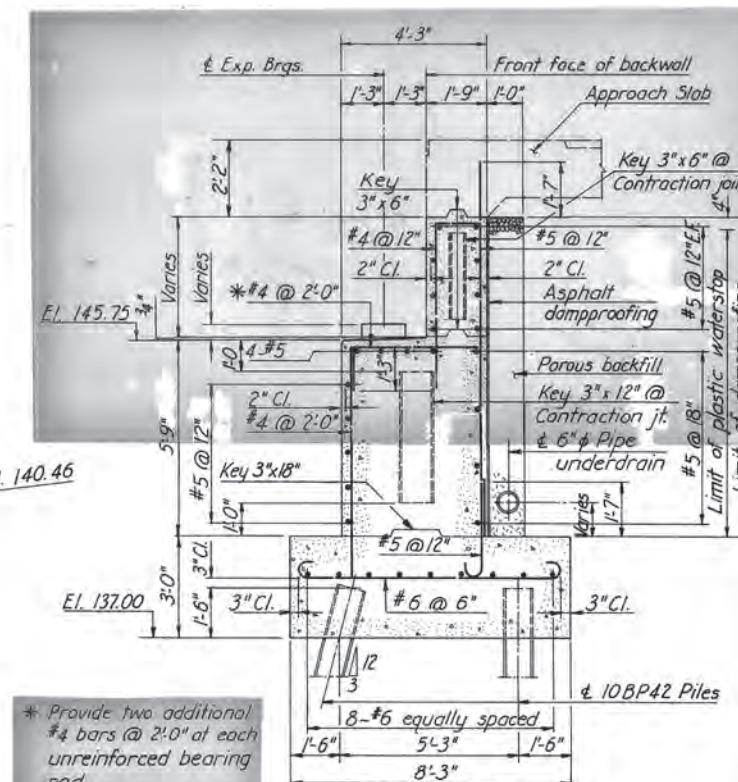
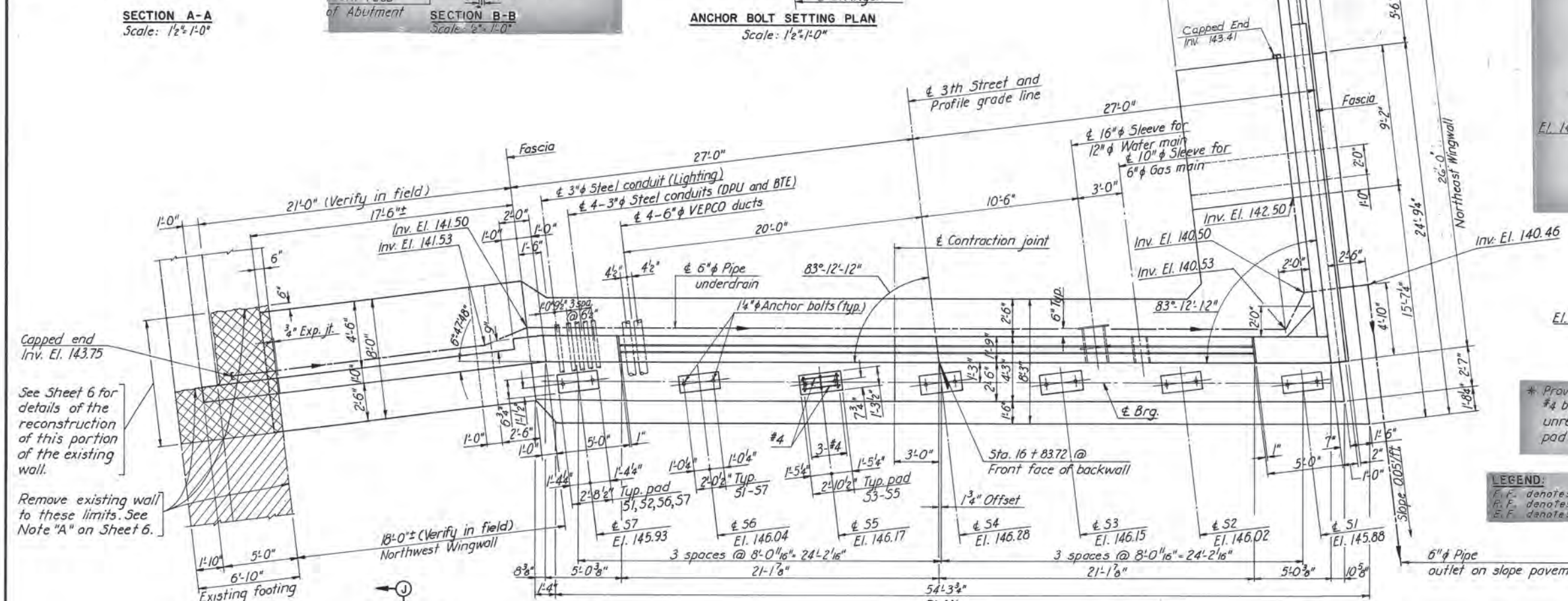
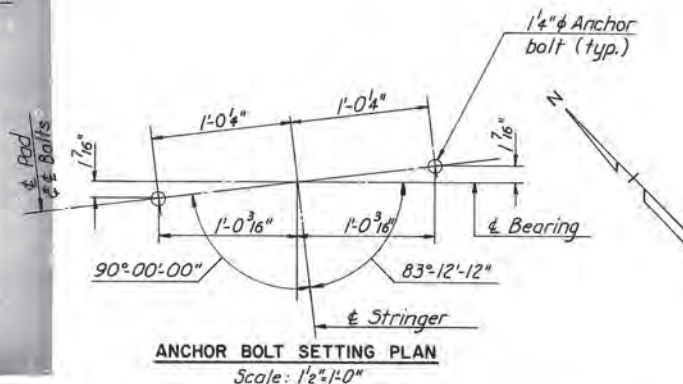
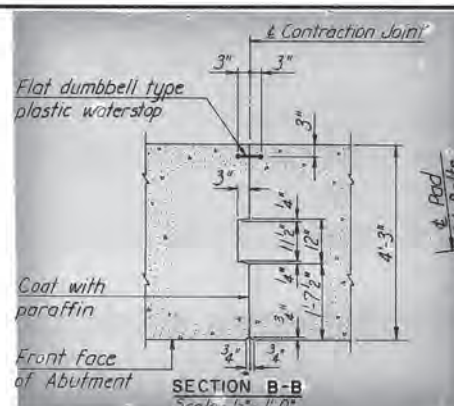
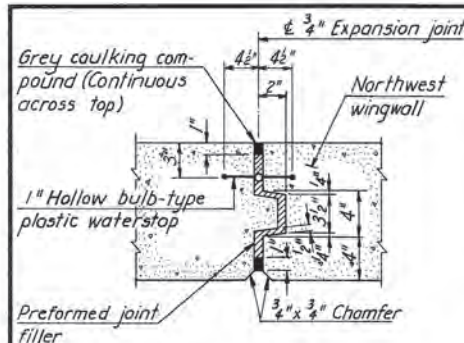
HOWARD, NEEDLES, TAMMEN & BERGENDORFF  
 consulting engineers  
 NEW YORK ALEXANDRIA KANSAS CITY

SCALE: AS SHOWN  
 CONTRACT NO. 9  
 SHEET NO. 2 OF 16

AS BUILT



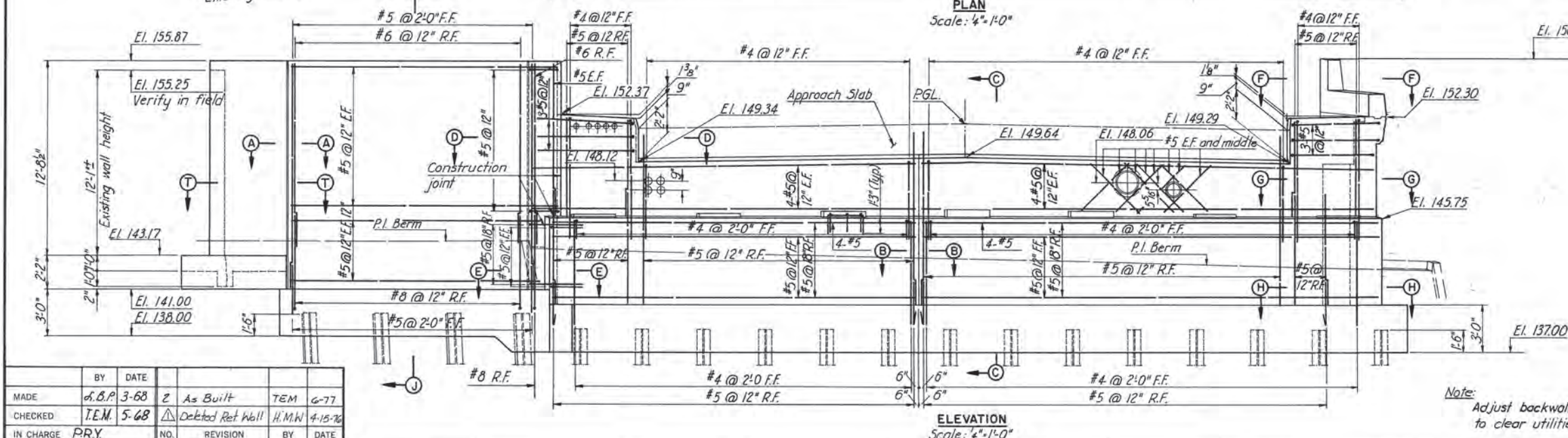
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	141	



LEGEND:  
F.F. denotes Front Face  
R.F. denotes Rear Face  
E.F. denotes Each Face

NOTES:  
For anchor bolts and treatment of pads, see Standard Shoe Details sheet.  
For architectural treatment of abutment wingwalls, see Standard Architectural Details sheets.  
For railing details, see Standard Aluminum Railing (2 Rails) sheet.  
For treatment of ducts and piping thru abutment backwall, see Standard Electrical Details (Bridges Carrying City Streets), Standard Conduit Installation Details and Standard Utility Support Details at Bridge Abutments.  
For Sections D-D and E-E, View F-F, Sections G-G, H-H and J-J, see North Abutment Details (1) sheet.  
For Section T-T, see North Abutment Details (3) sheet.

FOUNDATION NOTES:  
Footings shall be founded at the elevation shown on the Plans unless otherwise directed by the Engineer due to conditions at the site during construction. In such cases, the Engineer will determine the extent of redesign necessary and will advise the Contractor before construction begins.  
All piles shall be 10BP42 Steel Piles (Design Capacity = 45 tons).



BY	DATE	NO.	REVISION	BY	DATE
MADE	A.B.P. 3-68	2	As Built	TEM	6-77
CHECKED	T.E.M. 5-68	1	Omitted Ret Wall	H.M.W.	4-15-76
IN CHARGE	PRY.				

Note: Adjust backwall reinforcing as required to clear utilities.  
**AS BUILT**

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**NORTH ABUTMENT**

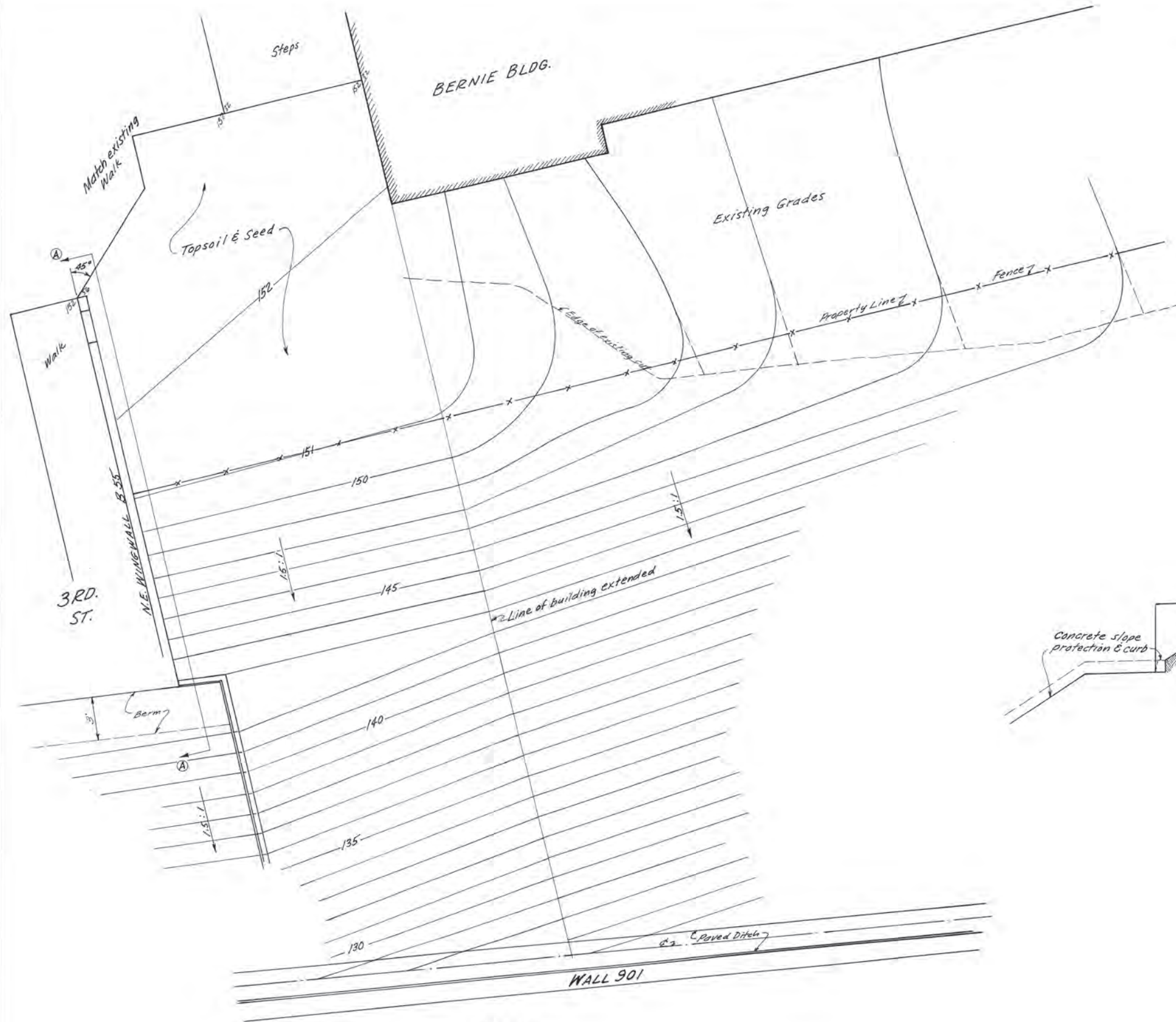
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: AS SHOWN  
CONTRACT NO.: 9  
SHEET NO.: 3 OF 16

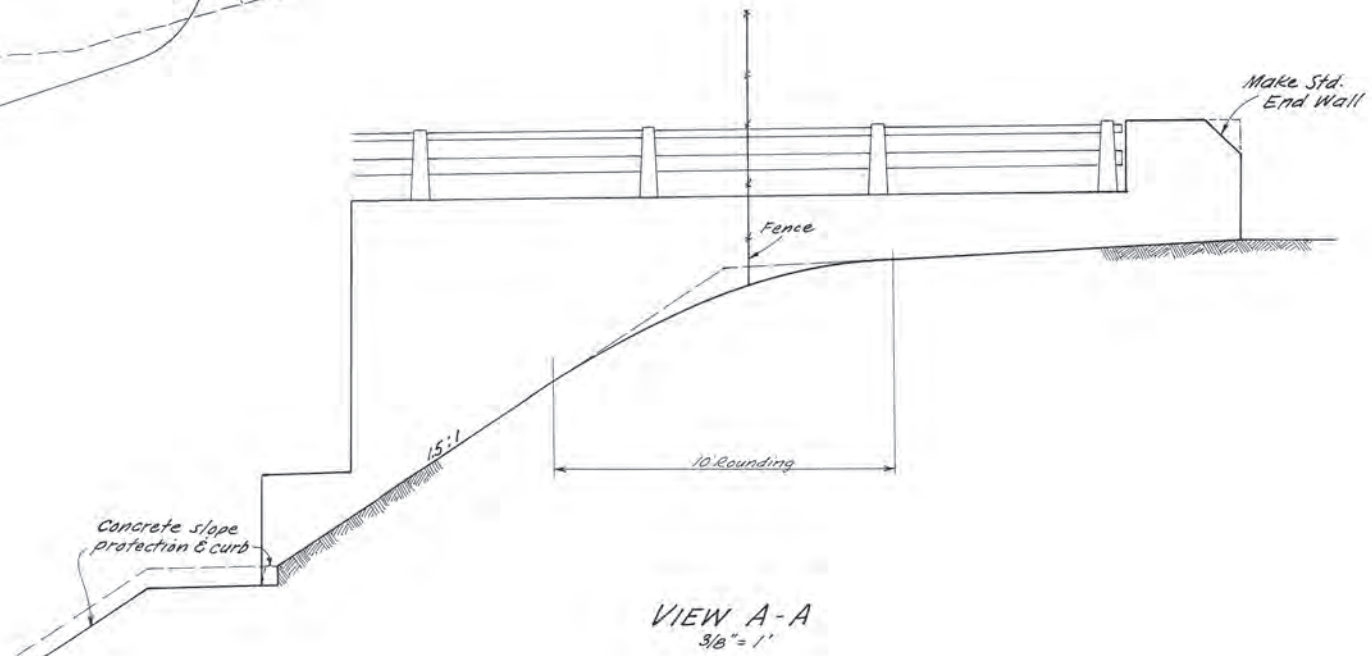








PLAN  
1" = 4'



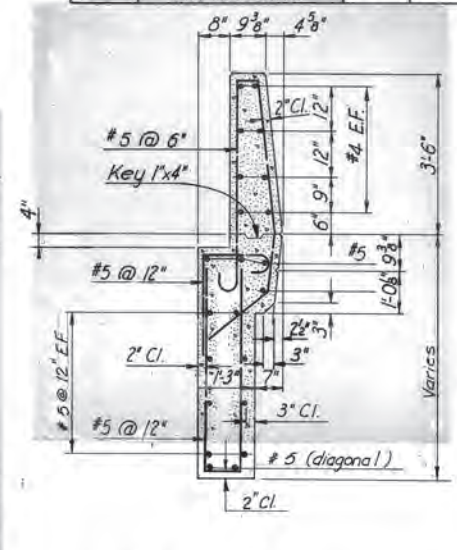
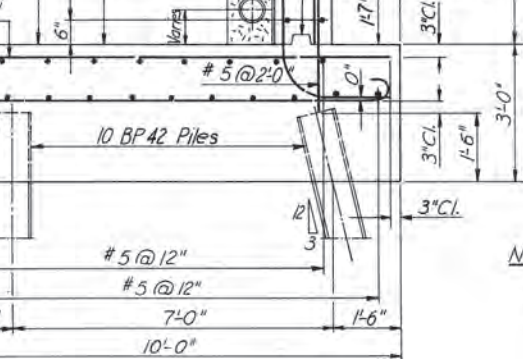
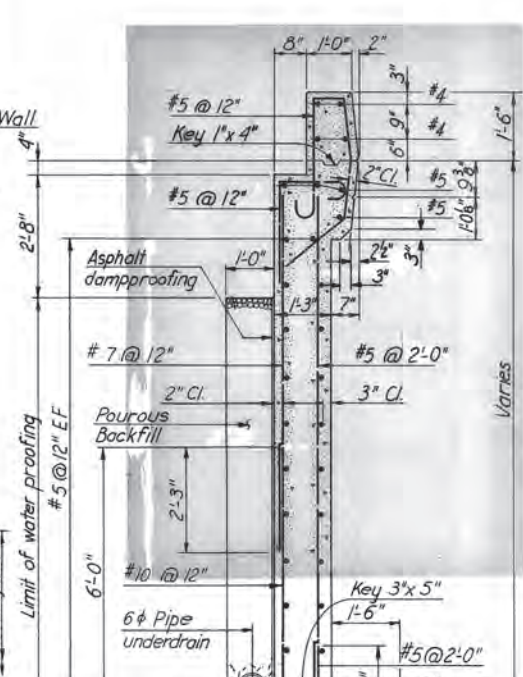
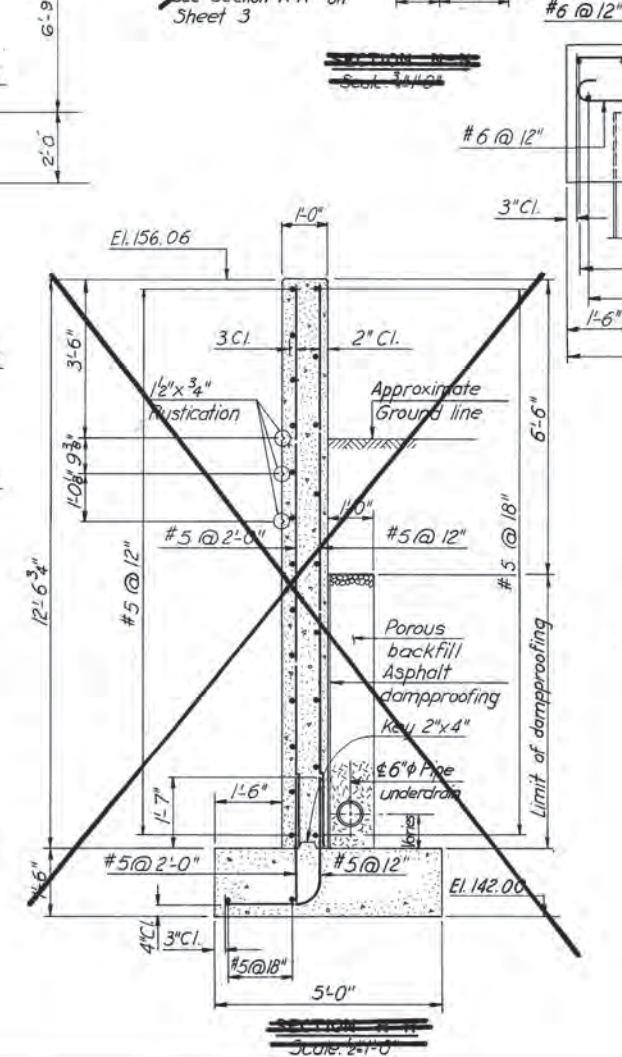
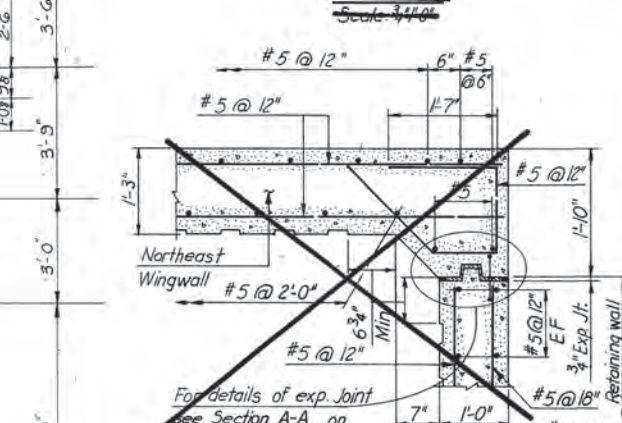
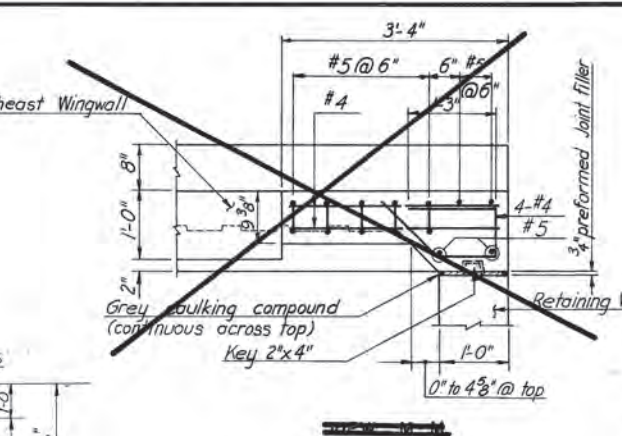
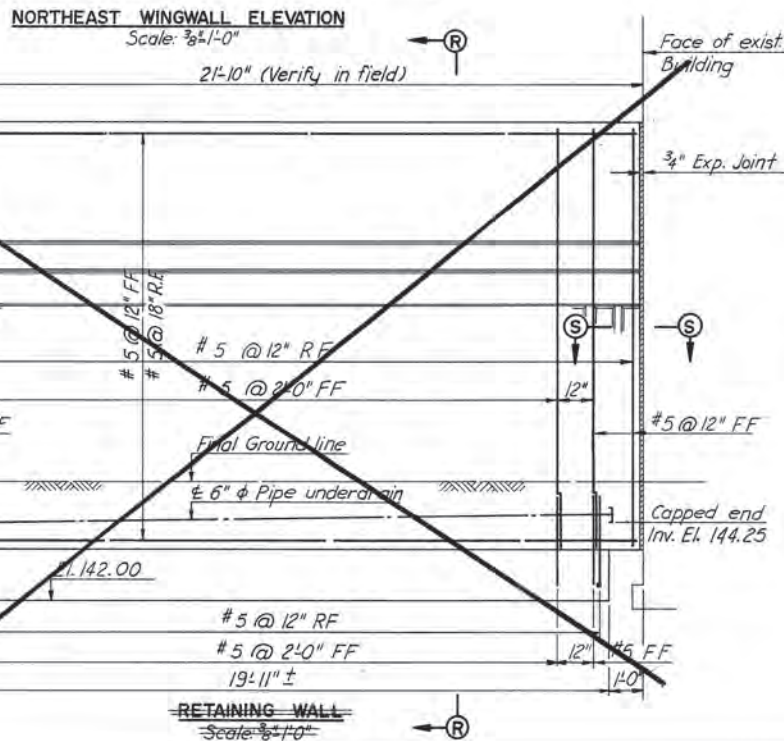
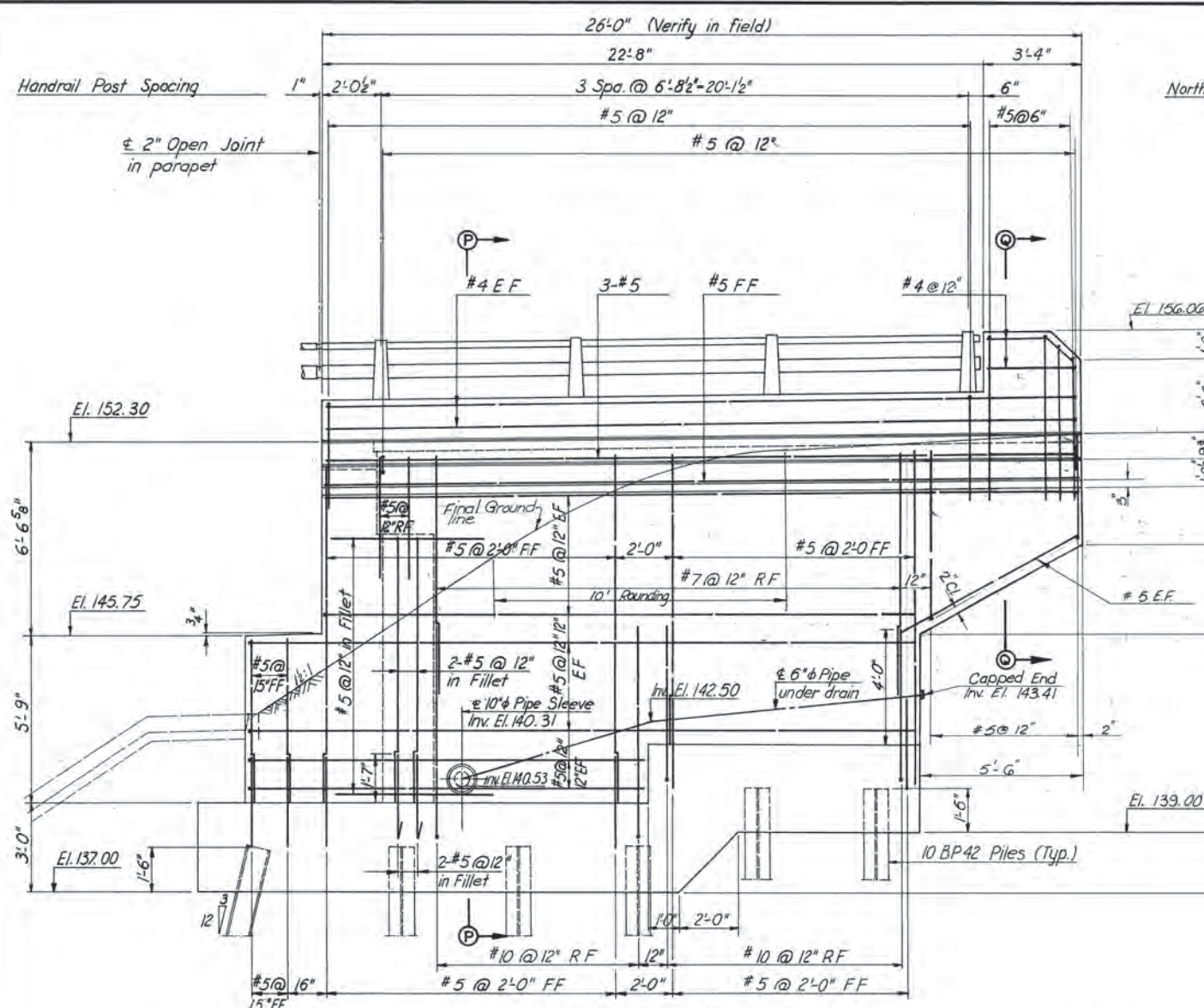
VIEW A-A  
3/8" = 1'

AS BUILT

RICHMOND METROPOLITAN AUTHORITY  
 GRADING PLAN  
 BERNIE BUILDING  
 CONTRACT 9 DOWNTOWN EXPRESSWAY  
 March 8, 1976 Scale: As Shown  
**HNTB**  
 HOWARD NEEDLES TAMMEN & BERGENDOFF  
 Richmond - Alexandria, Virginia



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	143	



Note: Section thru wall and footing at El. 139.00 similar to Section P-P.

MADE	BY	DATE	NO.	REVISION	BY	DATE
	AP/BR	3-68	2	As Built	TEM	6-77
	T.E.M.	5-68	1	Deleted Ref. Wall	H.M.W.	4-15-76
	DRY					

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**NORTH ABUTMENT DETAILS (2)**

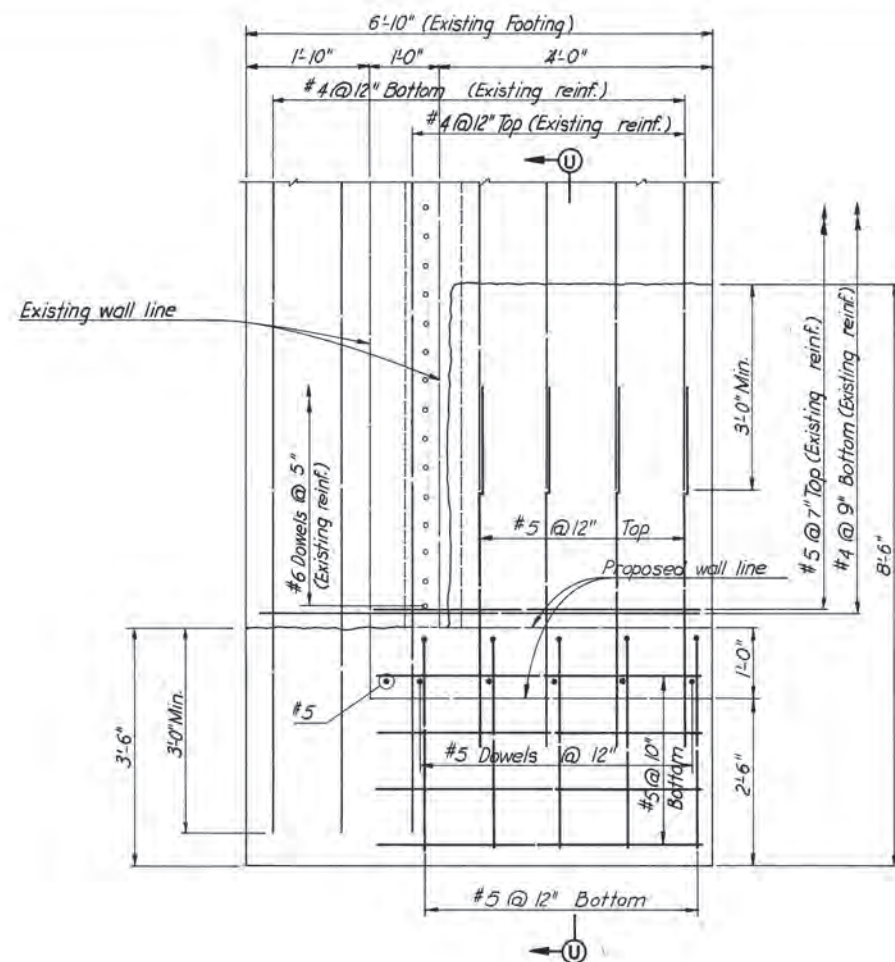
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 NEW YORK ALEXANDRIA KANSAS CITY

SCALE: AS SHOWN  
 CONTRACT NO.: 9  
 SHEET NO. 5 OF 16

AS BUILT



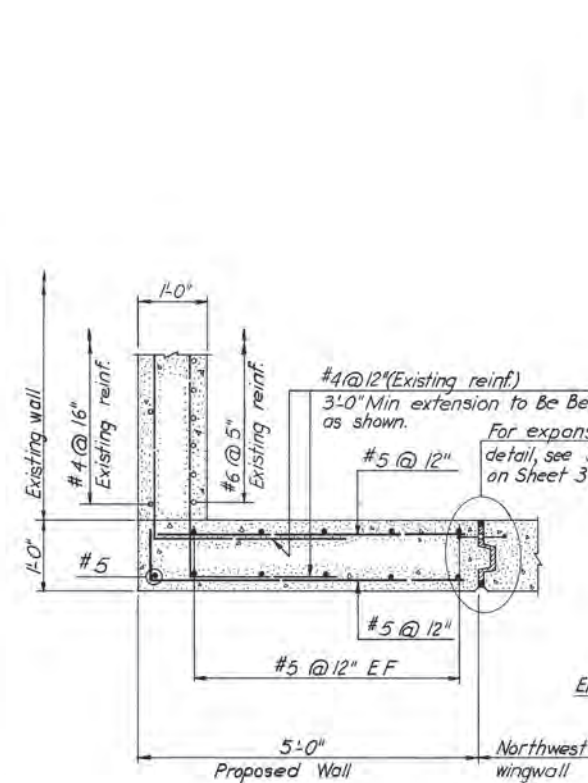
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	144	



**FOOTING PLAN**  
Scale: 3/4"=1'-0"

**Note "A"**

The footing and stem of the existing wall shall be removed to the limits shown. The stem shall be carefully cut to prevent an uneven jagged edge on the resulting end of the cast stone finish. The existing reinforcing shall be left extending a minimum of 3 feet beyond the cut lines and shall be thoroughly cleaned of all adhering particles of concrete and rust.

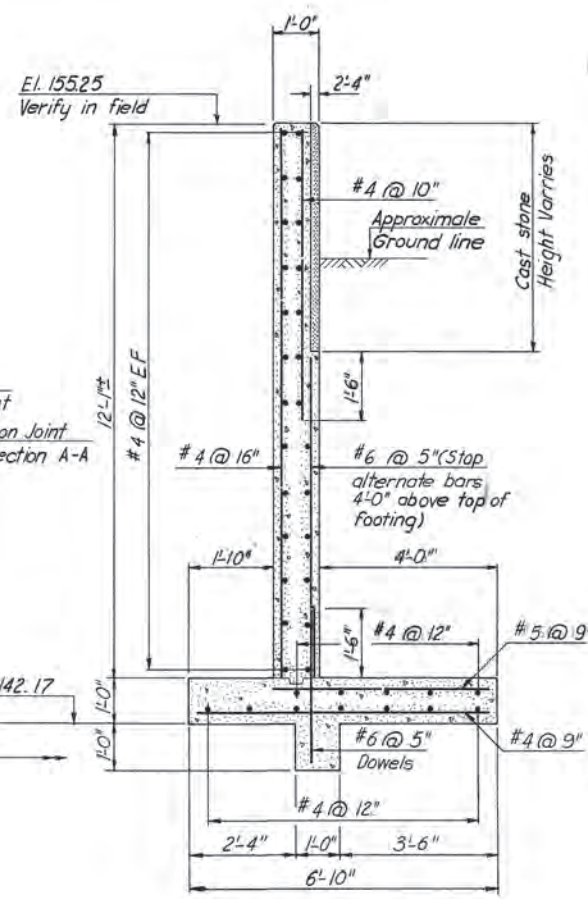


**SECTION T-T**  
Scale: 3/4"=1'-0"

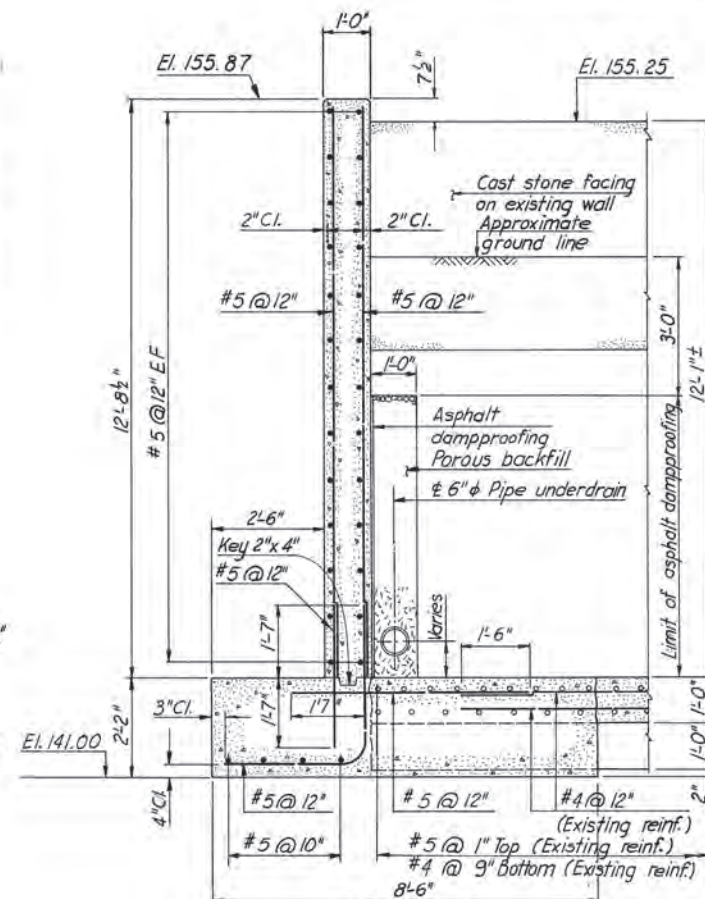
Note:  
For location of Section T-T, see Sheet 3.

**Note:**

All elevations and dimensions of existing wall to be verified in the field.



**SECTION THRU EXISTING WALL**  
Scale: 1/2"=1'-0"



**SECTION U-U**  
Scale: 1/2"=1'-0"

BY	DATE				
MADE	WPE	3-68			
CHECKED	TEM	5-68	1	As Built	TEM 6-77
IN CHARGE	PRY				

AS BUILT

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

BRIDGE B-55  
3<sup>RD</sup> STREET OVER  
DOWNTOWN EXPRESSWAY

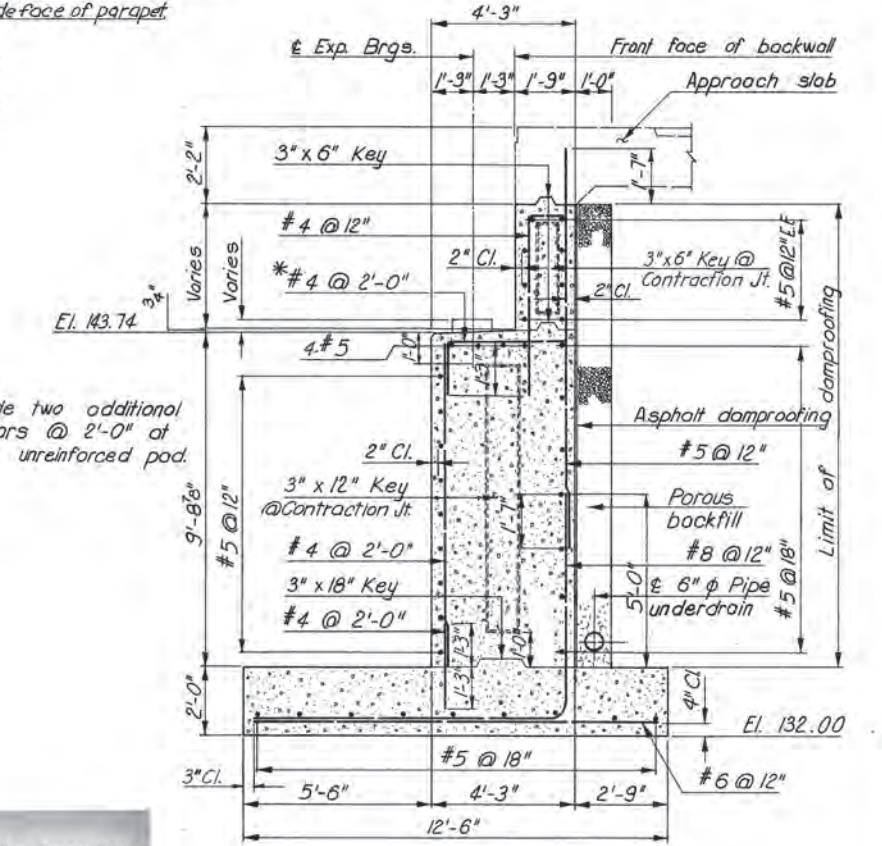
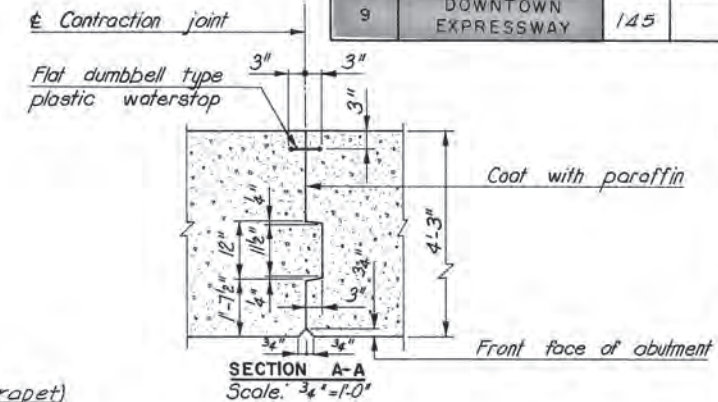
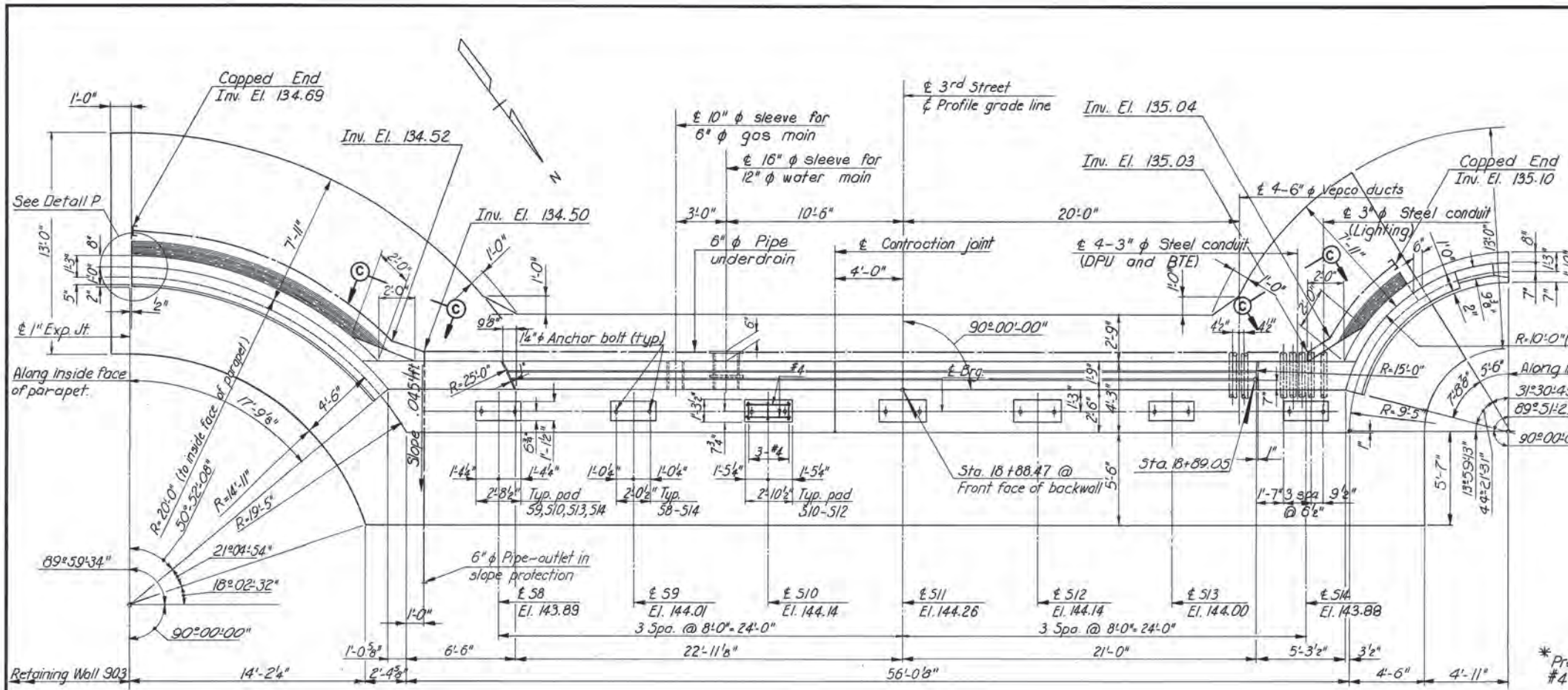
**NORTH ABUTMENT DETAILS (3)**

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NEW YORK ALEXANDRIA KANSAS CITY

SCALE: AS SHOWN  
CONTRACT NO. 9  
SHEET NO. 6 OF 16

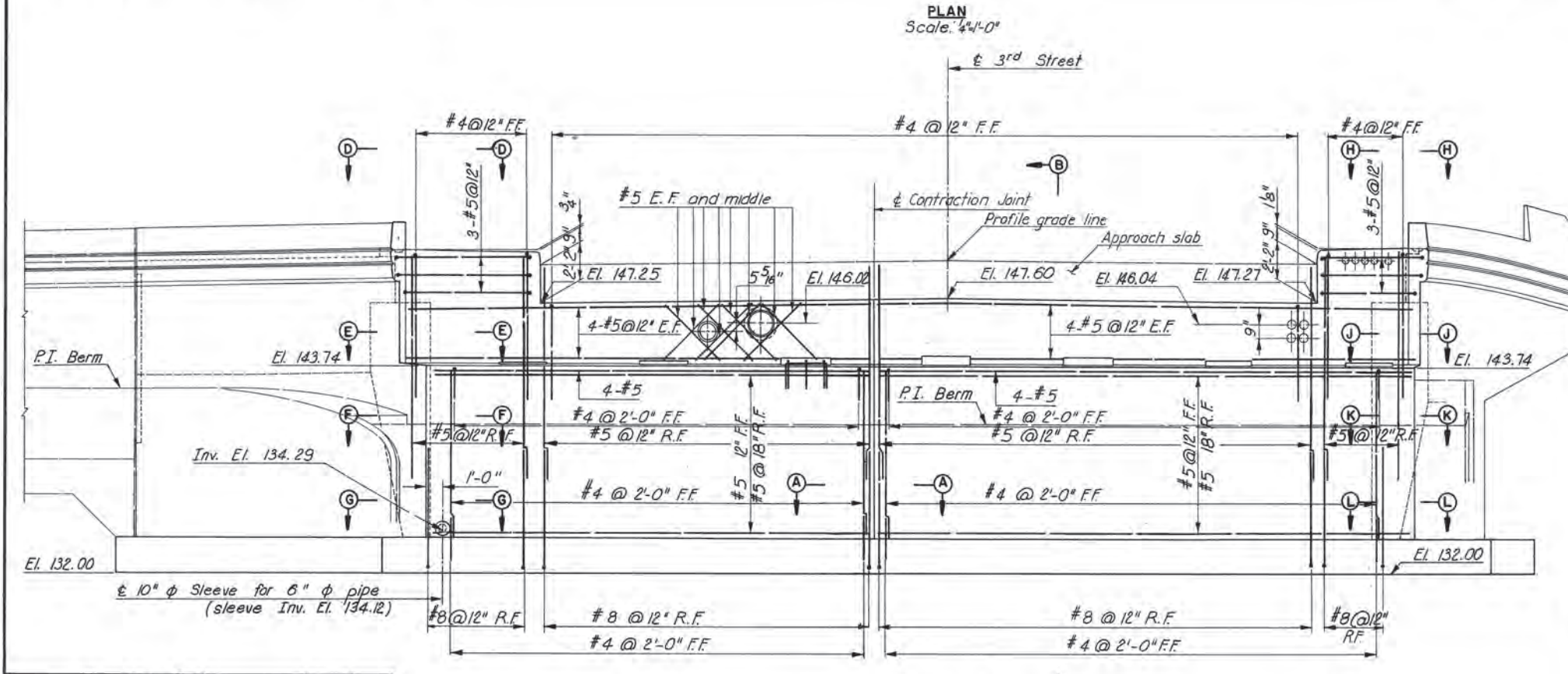


RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	145	



**LEGEND:**  
F.F. denotes Front Face  
R.F. denotes Rear Face  
E.F. denotes Each Face

**NOTES:**  
For anchor bolts and treatment of pads, see Standard Shoe Details sheet.  
For architectural treatment of abutment wingwalls, see Standard Architectural Details sheets.  
For railing details, see Standard Aluminum Railing (2 Rails) sheet.  
For treatment of ducts and piping thru abutment backwall, see Standard Electrical Details (Bridges Carrying City Streets), Standard Conduit Installation Details and Standard Utility Support Details at Bridge Abutments.  
For View C-C, see South Abutment Details (1) sheet.  
For Sections D-D thru L-L and Detail 1, see South Abutment Details (2) sheet.



**FOUNDATION NOTES:**  
Footings shall be founded at the elevation shown on the Plans unless otherwise directed by the Engineer due to conditions of the site during construction. In such cases, the Engineer will determine the extent of redesign necessary and will advise the Contractor before construction begins.  
The foundation is designed for an allowable bearing pressure of 1.5 tons per square foot.

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**SOUTH ABUTMENT**

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consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

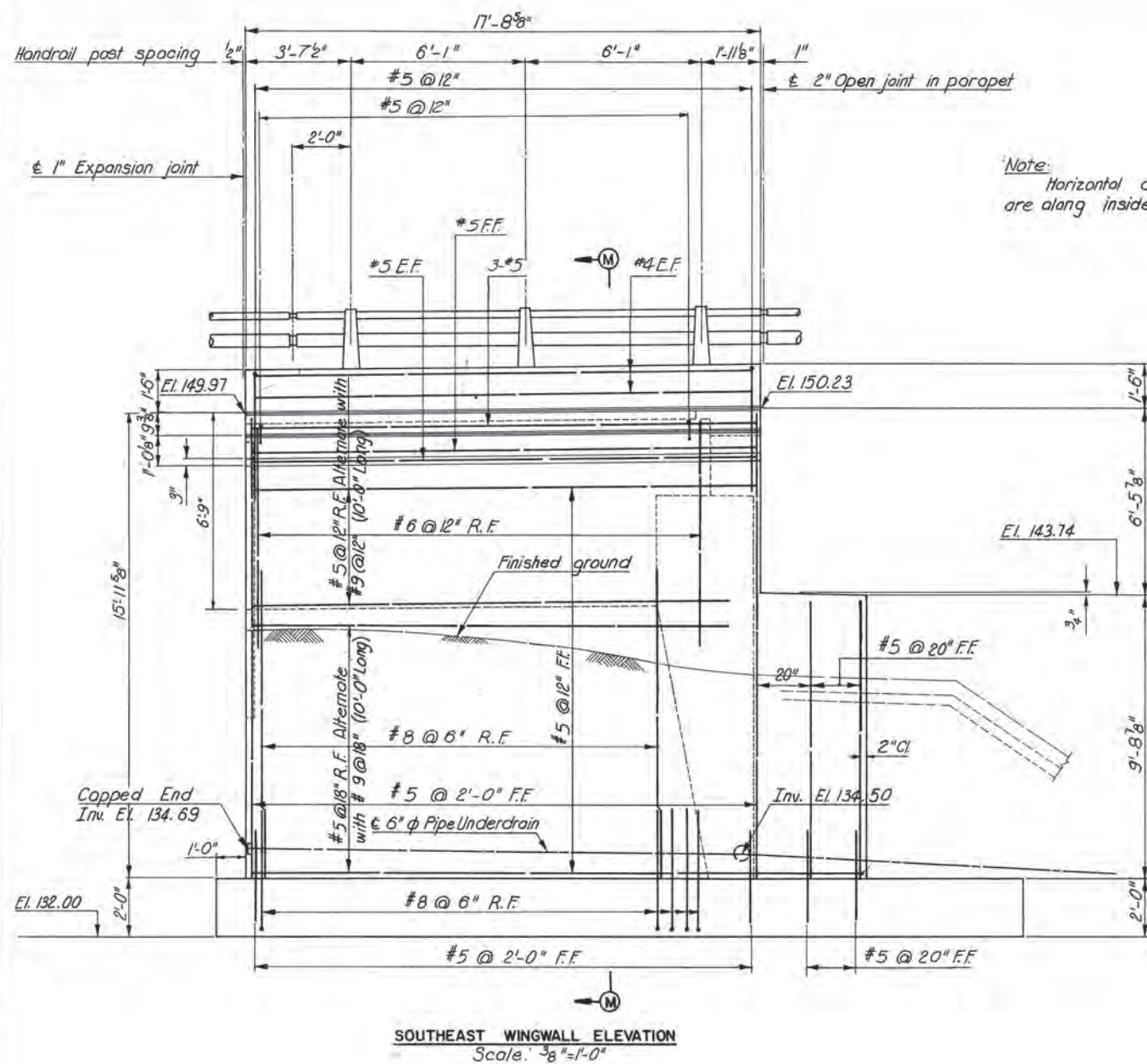
SCALE: AS SHOWN  
CONTRACT NO. 9  
SHEET NO. 7 OF 16

BY	DATE			
MADE	AP/m	10-67		
CHECKED	TEM	5-68	As Built	TEM 6-77
IN CHARGE	P.R.Y.			
	NO.	REVISION	BY	DATE

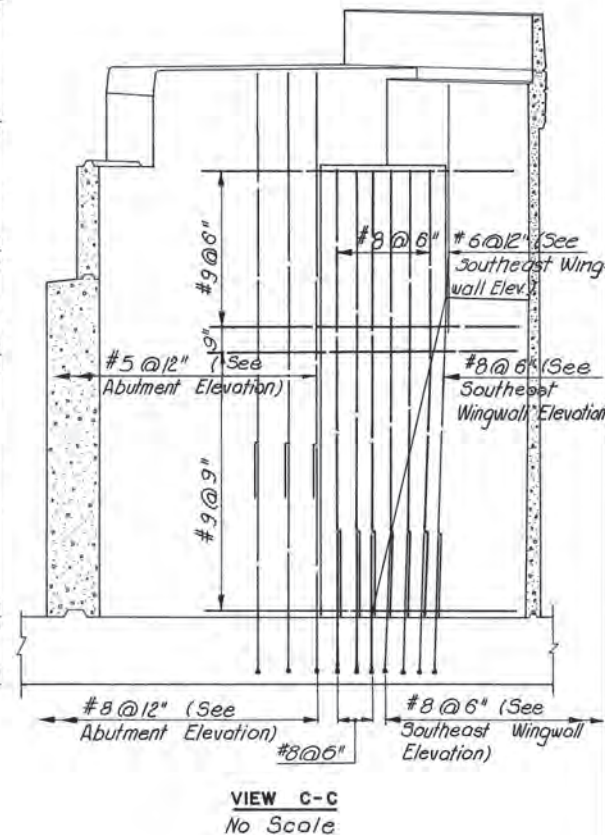
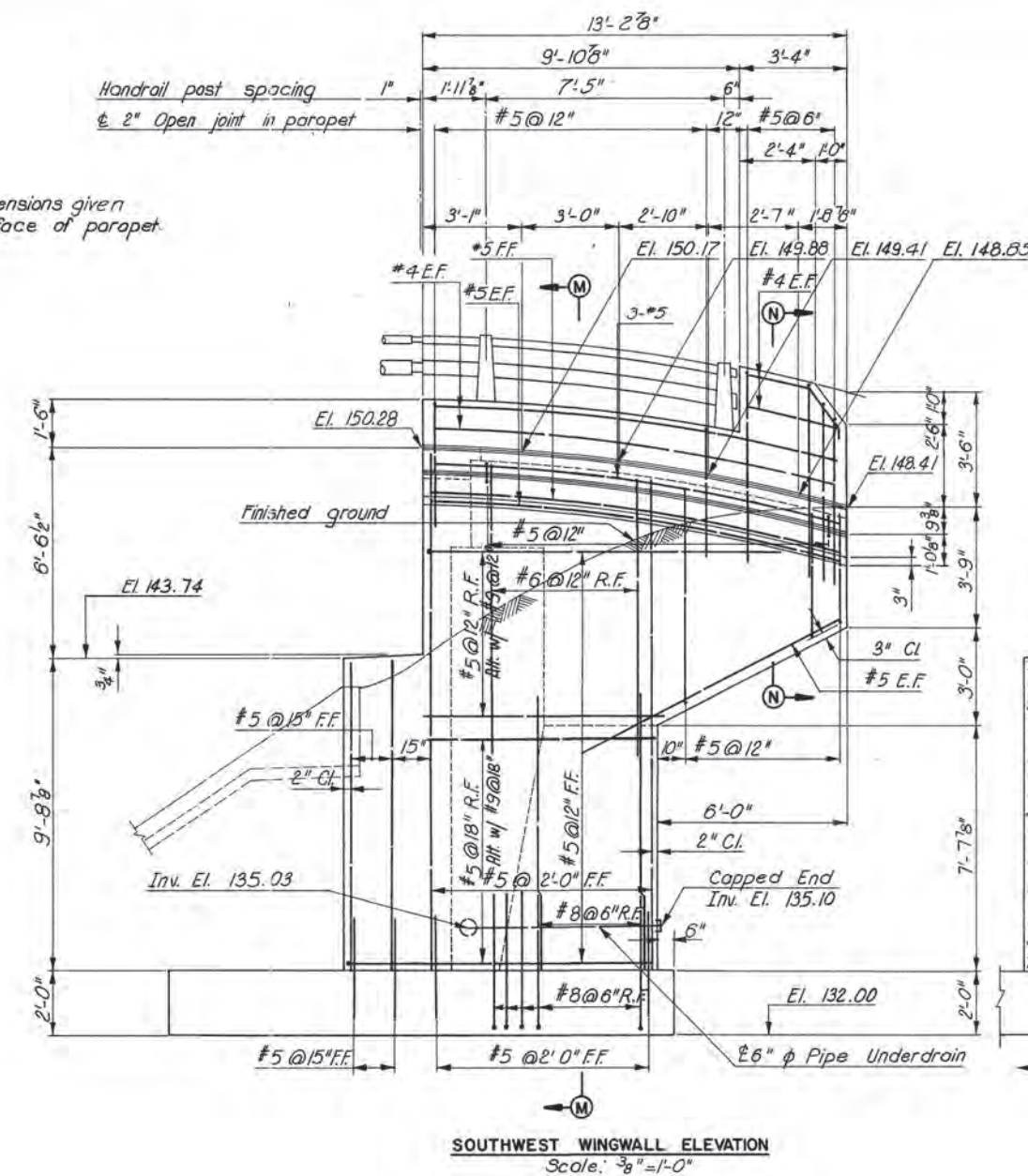
AS BUILT



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
3	DOWNTOWN EXPRESSWAY	146	



Note:  
Horizontal dimensions given are along inside face of parapet.



NOTE:  
For Sections M-M and N-N, see South Abutment Details (2) sheet.

BY	DATE			
MADE	elm	2-68		
CHECKED	TEM	4-68	1	As Built
IN CHARGE	PRY			
			NO.	REVISION
			BY	DATE

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**SOUTH ABUTMENT DETAILS (1)**

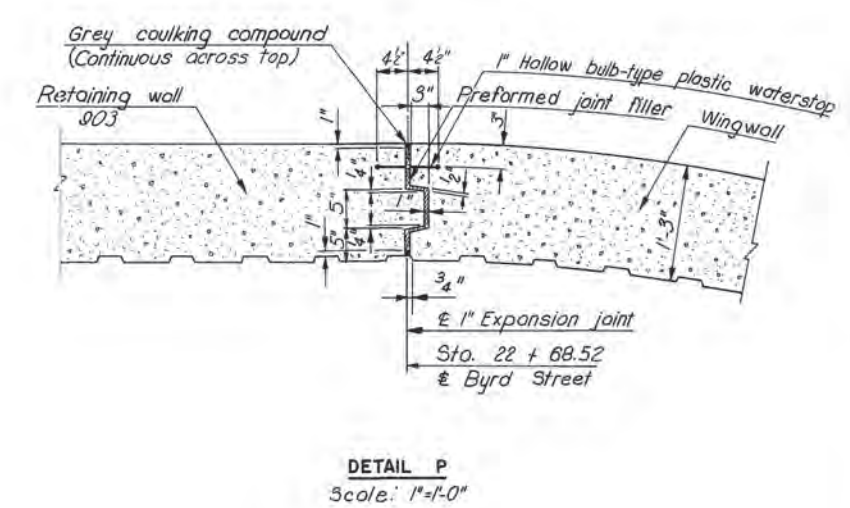
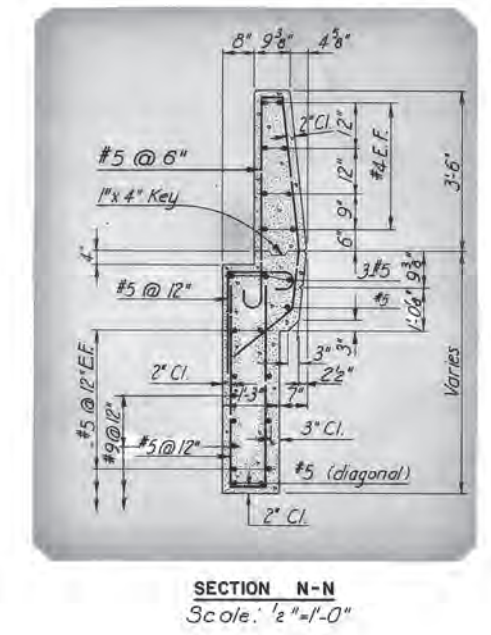
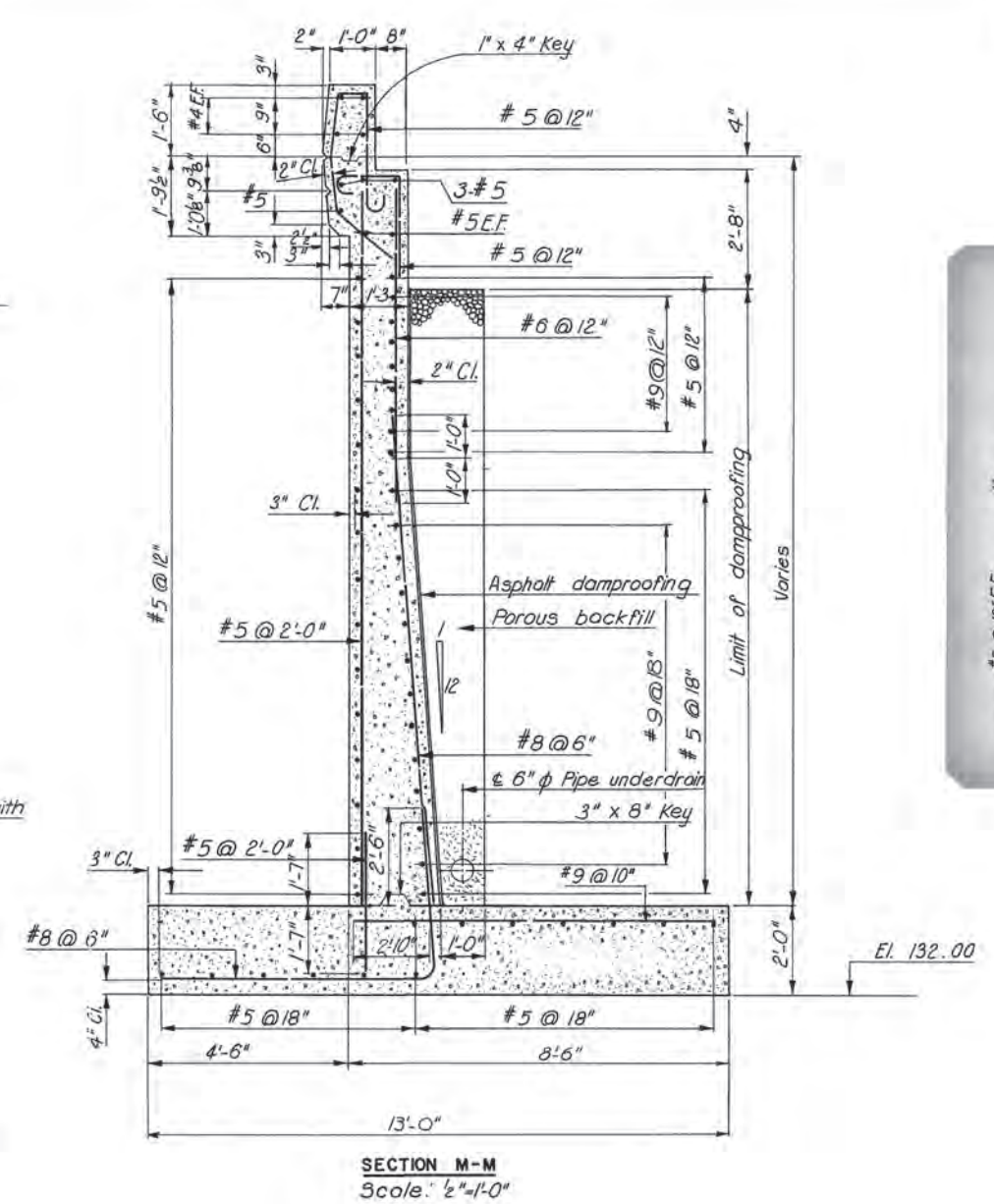
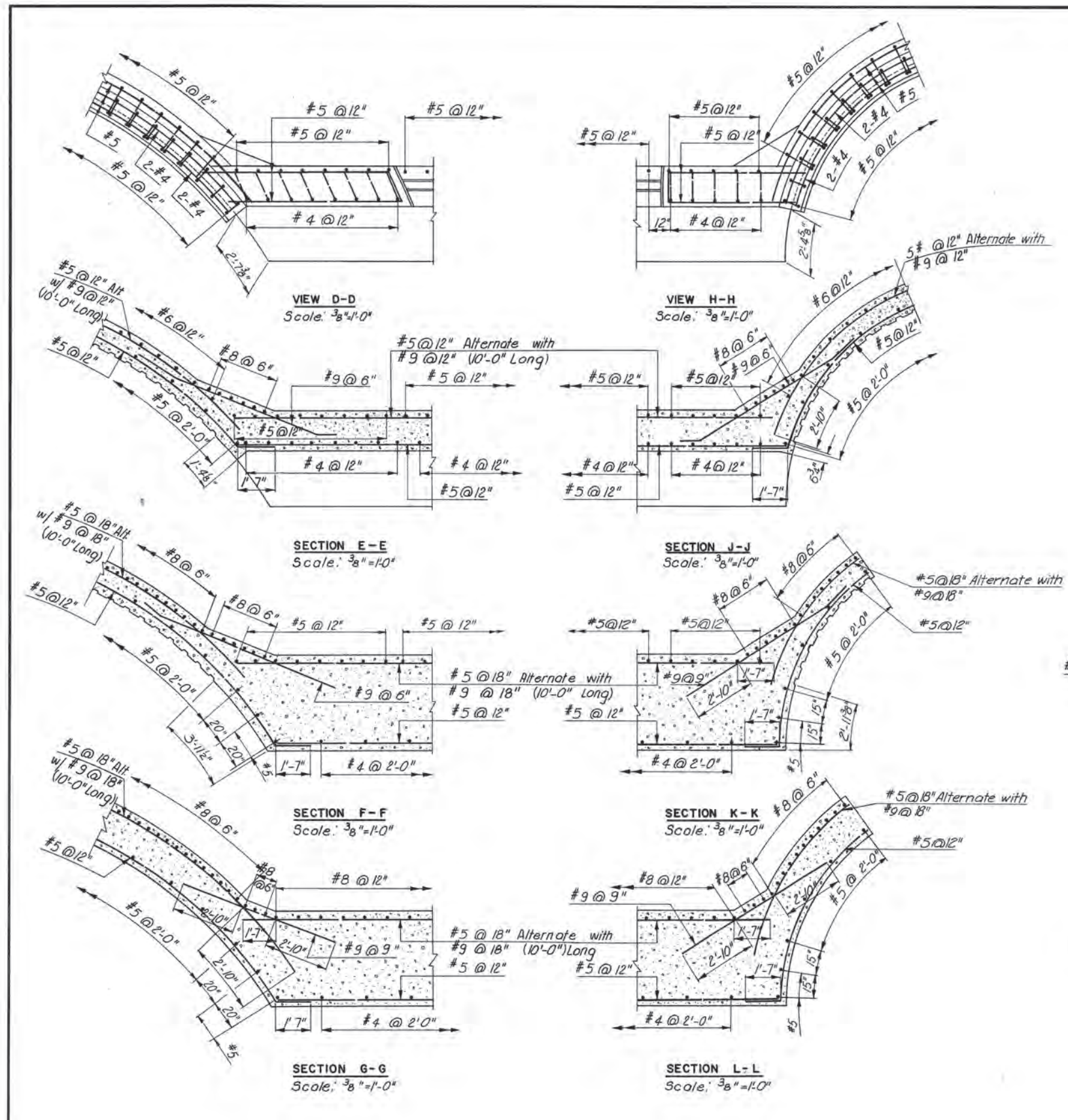
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SCALE: AS SHOWN  
CONTRACT NO. 9  
SHEET NO. 8 OF 16

AS BUILT



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
3	DOWNTOWN EXPRESSWAY	147	



BY	DATE			
MADE	elm	2-68		
CHECKED	T.E.M.	5-68	1 As Built	TEM 6-77
IN CHARGE	PRY			

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3 RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**SOUTH ABUTMENT DETAILS (2)**

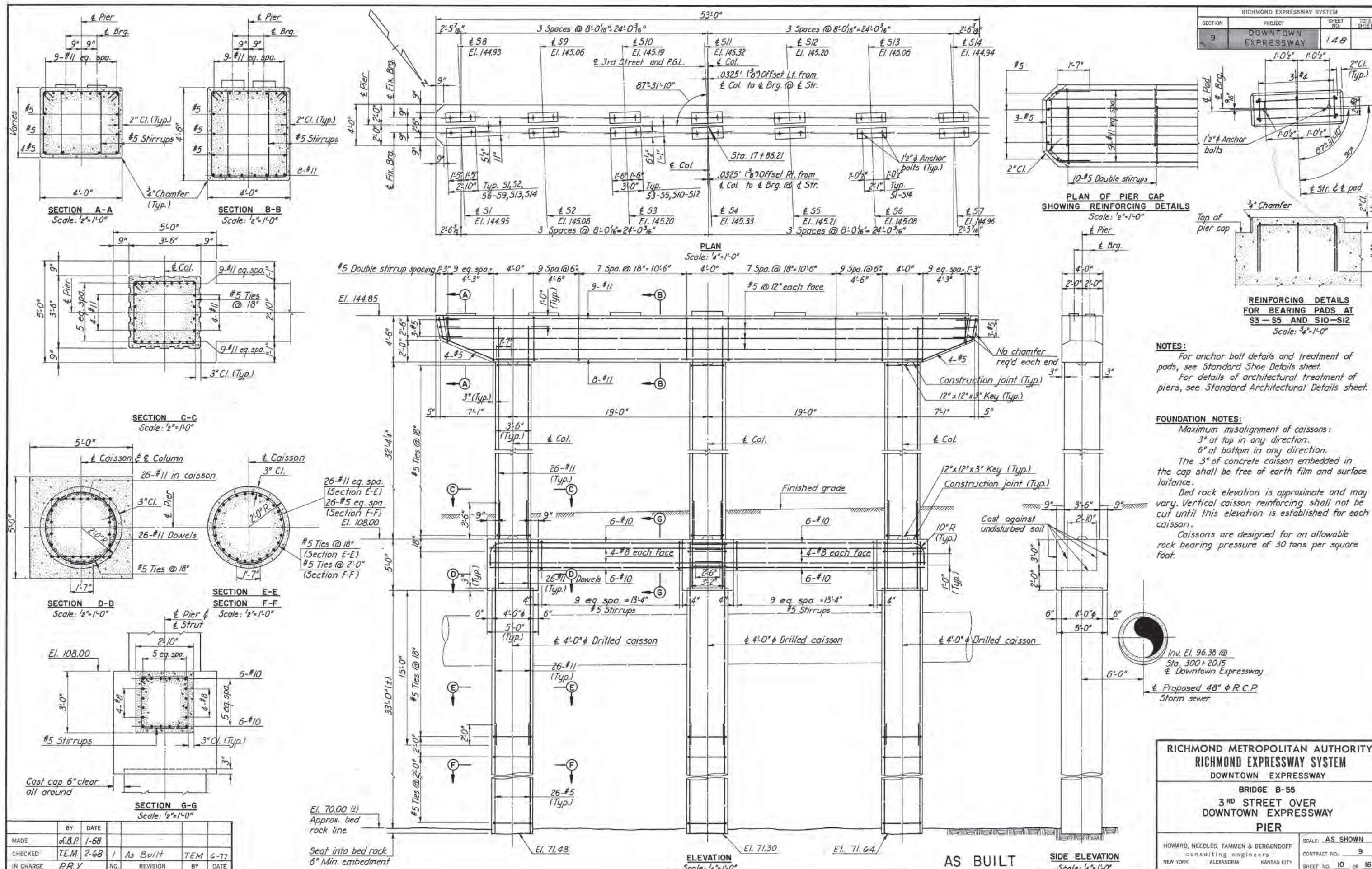
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NEW YORK ALEXANDRIA KANSAS CITY

SCALE: AS SHOWN  
CONTRACT NO. 9  
SHEET NO. 9 OF 16

AS BUILT



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	148	



**NOTES:**  
 For anchor bolt details and treatment of pads, see Standard Shoe Details sheet.  
 For details of architectural treatment of piers, see Standard Architectural Details sheet.

**FOUNDATION NOTES:**  
 Maximum misalignment of caissons:  
 3" at top in any direction.  
 6" at bottom in any direction.  
 The 3" of concrete caisson embedded in the cap shall be free of earth film and surface laitance.  
 Bed rock elevation is approximate and may vary. Vertical caisson reinforcing shall not be cut until this elevation is established for each caisson.  
 Caissons are designed for an allowable rock bearing pressure of 30 tons per square foot.

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**PIER**

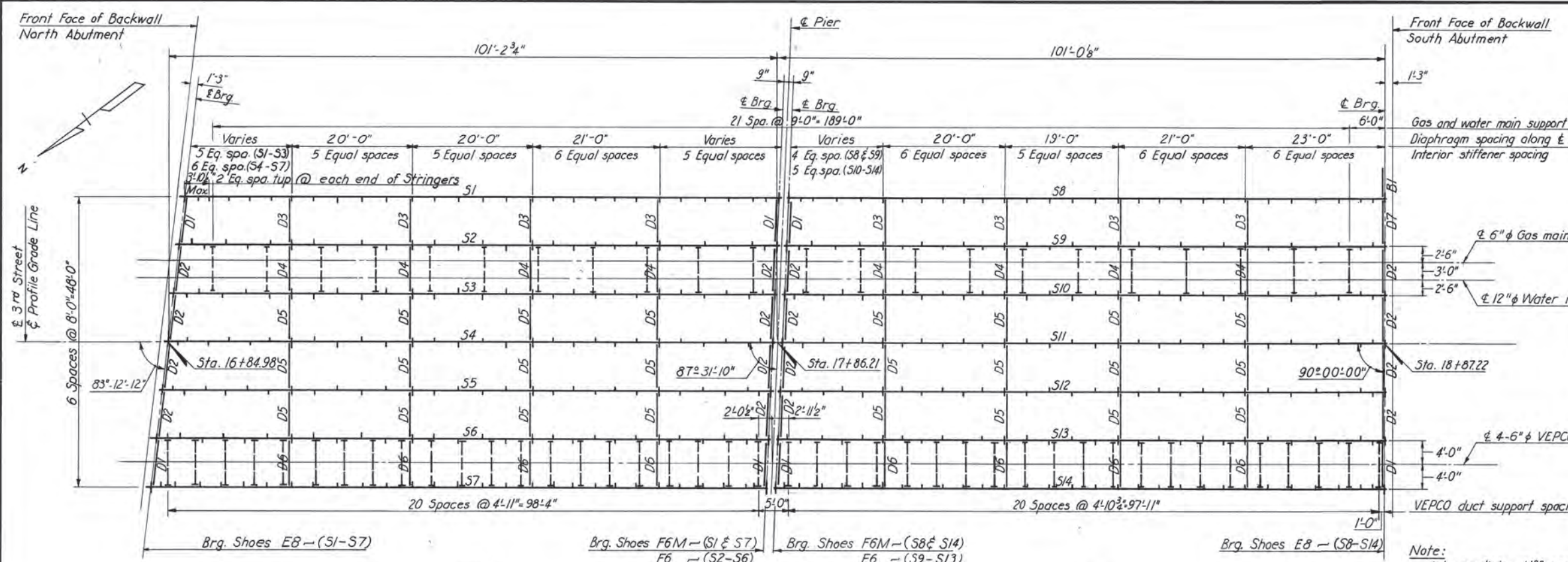
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SCALE: AS SHOWN  
 CONTRACT NO.: 9  
 SHEET NO. 10 OF 16

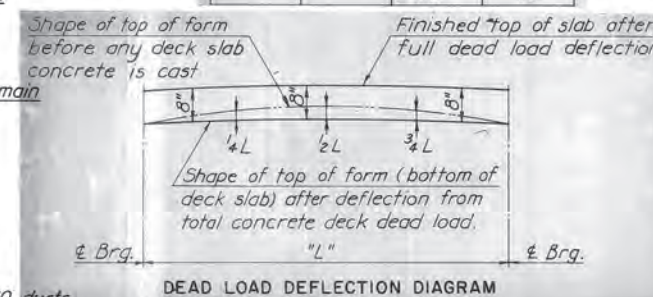
MADE	BY	DATE	NO.	REVISION	BY	DATE
	A.B.P.	1-68				
	T.E.M.	2-68	1	As Built	TEM	6-77
	P.R.Y.					



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	149	



SHOE SCHEDULE			
EXPANSION SHOES		FIXED SHOES	
TYPE	NO. REQD.	TYPE	NO. REQD.
E8	14	F6M	4
		F6	10



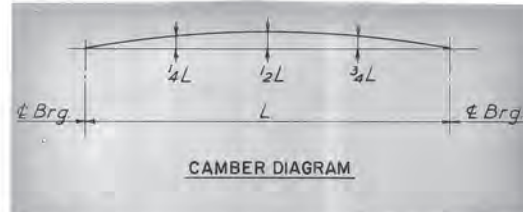
DEFLECTION SCHEDULE					
STR.	1/4L	1/2L	STR.	1/4L	1/2L
S1, S6, S8	3/4L		S2, S3, S9	3/4L	
S11, S12	1/2"	2 1/8"	S10, S13	1/2"	2"
S14			S4, S5, S7	1 5/8"	2 1/8"

Note: Intermediate stiffener spacing along stringers may be varied to clear utility supports.

UNIT 1

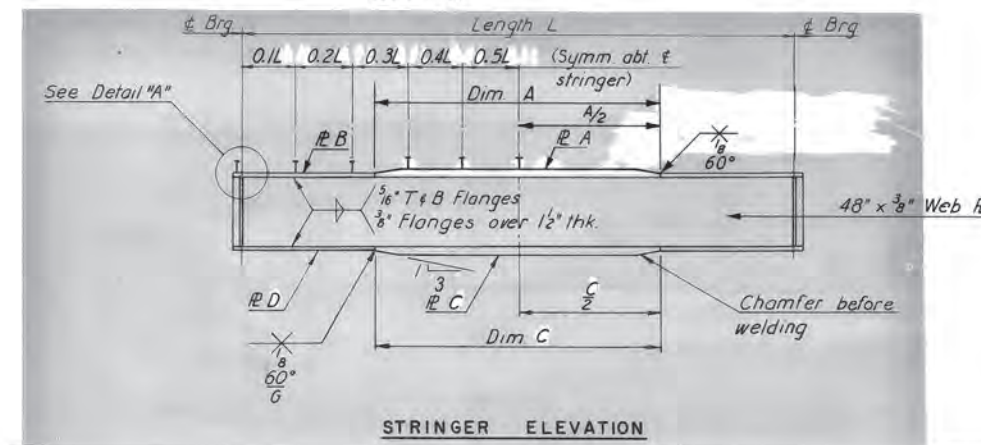
UNIT 2

FRAMING PLAN  
Scale: 1"=10'

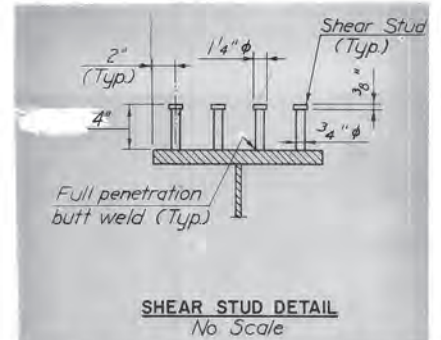
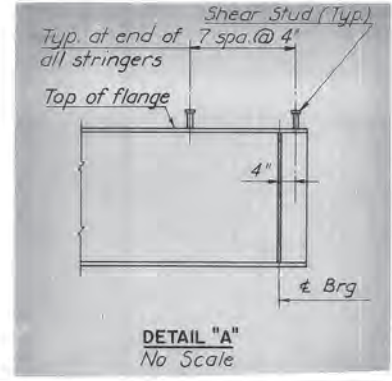


CAMBER SCHEDULE							
STR.	1/4L	1/2L	3/4L	STR.	1/4L	1/2L	3/4L
S1-S3				S4, S5	2"	2 7/8"	2"
S6	2"	2 3/4"	2"	S7			
S8-S14							

NOTE TO FABRICATOR:  
The above stringers shall be fabricated with an upward camber amounting to the tabulated value.  
This will provide approximate compensation for deflection under full dead load and for conformity with finished grade.  
Dimensions are in inches.

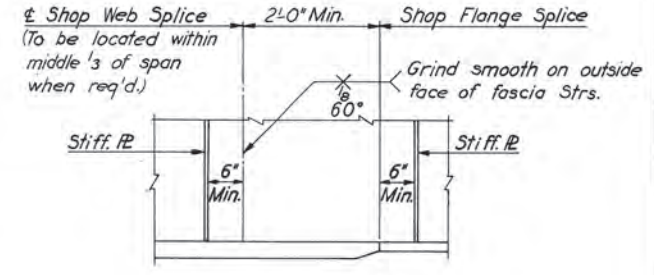


STRINGER SCHEDULE												
STR.	LENGTH ± BRG. TO ± BRG.	R.A	DIM A	R.B	R.C	DIM C	R.D	SHEAR STUD SPACING				
S1	98'-7 7/8"	16 x 1/4	53'-0"	16 x 7/8	20 x 1 7/8	63'-0"	20 x 1 1/4	9"	10 1/2"	13 1/2"	18"	21"
S2	99'-3 3/16"	16 x 1 3/8	57'-0"			64'-0"		10"	11 1/2"	14"	18"	20"
S3	99'-10 1/2"	16 x 1 3/8	57'-0"								18"	20"
S4	100'-5 3/8"	16 x 1 1/4	53'-0"								17 1/2"	19 1/2"
S5	101'-1 1/16"	16 x 1 1/4	53'-0"		20 x 1 7/8	64'-0"	20 x 1 1/4				17 1/2"	19 1/2"
S6	101'-8 5/16"	16 x 1 3/8	59'-0"	16 x 7/8	20 x 2	62'-0"	20 x 1 3/8	10"	11 1/2"	14"	17 1/2"	20"
S7	102'-3 5/8"	16 x 1 1/2	57'-0"	16 x 1	20 x 2 1/8	66'-0"	20 x 1 3/8	9"	10 1/2"	13 1/2"	18 1/2"	22"
S8	99'-2 5/8"	16 x 1/4	53'-0"	16 x 7/8	20 x 1 7/8	63'-0"	20 x 1/4	9"	10 1/2"	13 1/2"	18"	21"
S9	99'-6 13/16"	16 x 1 3/8	57'-0"			64'-0"		10"	11 1/2"	14"	18"	20"
S10	99'-10 15/16"	16 x 1 3/8	57'-0"			64'-0"					18"	20"
S11	100'-3 3/8"	16 x 1 1/4	52'-0"			63'-0"					17 1/2"	19 1/2"
S12	100'-7 1/4"	16 x 1 1/4	52'-0"		20 x 1 7/8	63'-0"	20 x 1/4			14"	17 1/2"	19 1/2"
S13	100'-11 1/16"	16 x 1 3/8	58'-0"	16 x 7/8	20 x 2	61'-0"	20 x 1 3/8	10"	11 1/2"	13 1/2"	18"	20"
S14	101'-3 5/8"	16 x 1 1/2	55'-0"	16 x 1	20 x 2 1/8	65'-0"	20 x 1 3/8	9"	11"	13 1/2"	18 1/2"	22"



SHEAR STUD NOTE:  
Capacity = 3,400 lbs. per stud.  
The contractor may, if he elects, use three 3/4" diameter studs at the same longitudinal spacing in lieu of the four 3/4" diameter studs shown.  
Stud rows shall be placed parallel to the main deck reinforcing.  
Shear stud spacing shown is maximum spacing.

NOTE TO CONTRACTOR:  
The above deflections are those anticipated to occur in the stringer upon placement of the total concrete deck load.  
In practice, the stringers in place are not likely to have the exact camber to compensate for these deflections during construction. The residual amounts shall be provided for by adjusting forms to vary the thickness of the concrete bolster between the bottom of the slab and the top of stringer, without alteration of the slab thickness.



SHOP SPLICE DETAILS  
Scale: 3/4"=1'-0"

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY

BRIDGE B-55  
3RD STREET OVER  
DOWNTOWN EXPRESSWAY  
FRAMING PLAN

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
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NEW YORK ALEXANDRIA KANSAS CITY

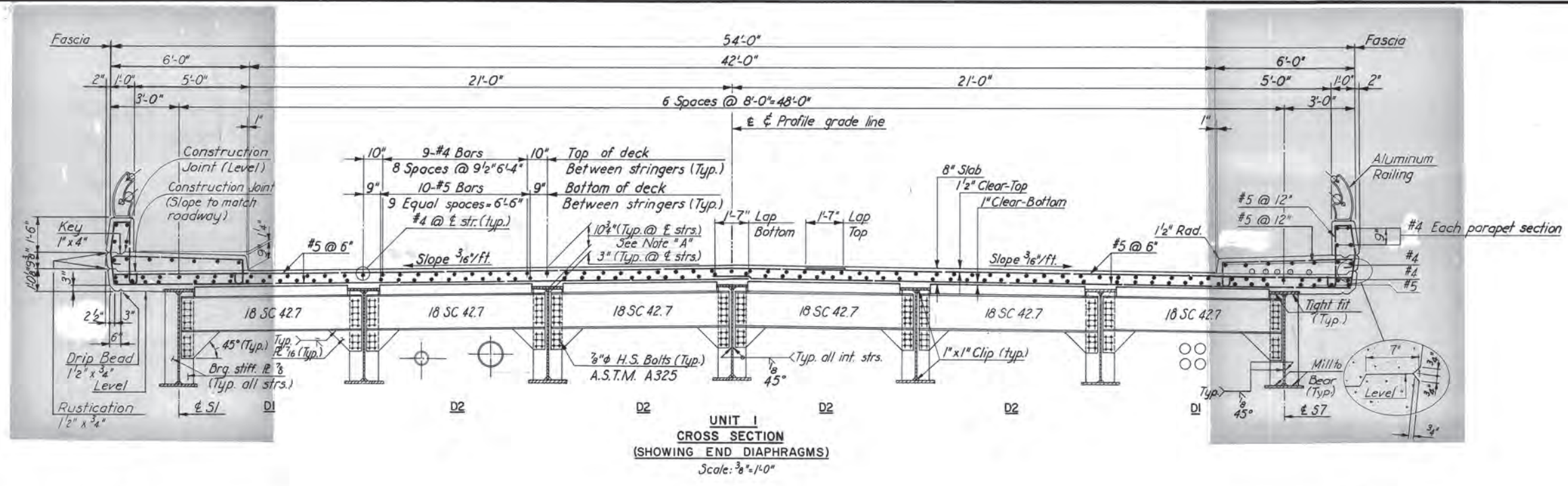
SCALE: AS SHOWN  
CONTRACT NO. 9  
SHEET NO. 11 OF 16

BY	DATE				
MADE	EVR	12-14			
CHECKED	TEM	2-68	1	As Built	TEM 6-77
IN CHARGE	P.R.Y.				
			NO.	REVISION	BY

AS BUILT

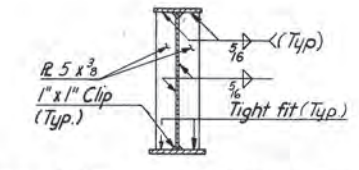
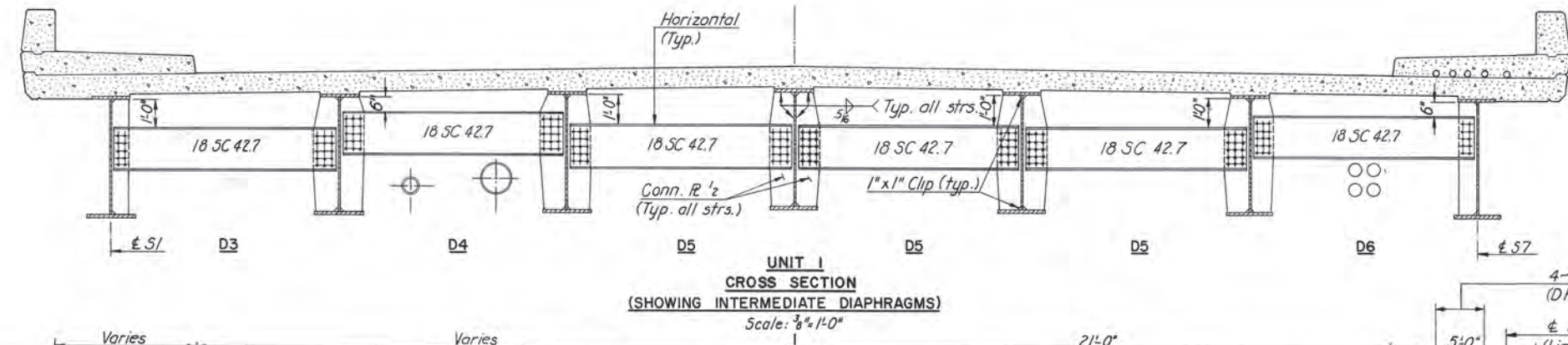


RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	150	

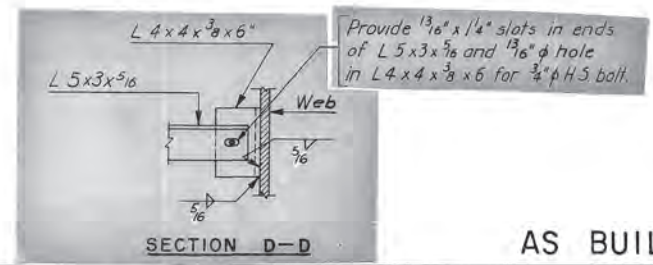
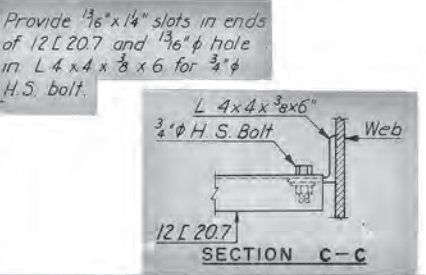
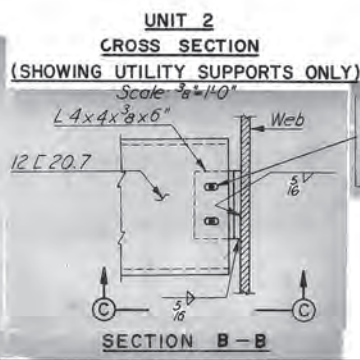
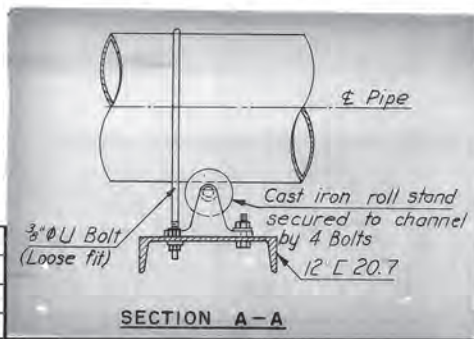
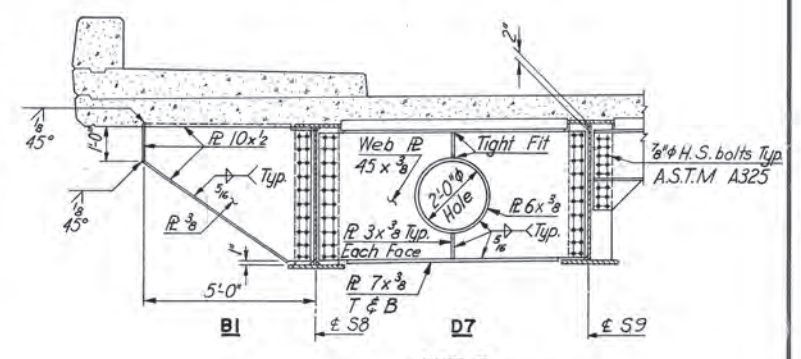
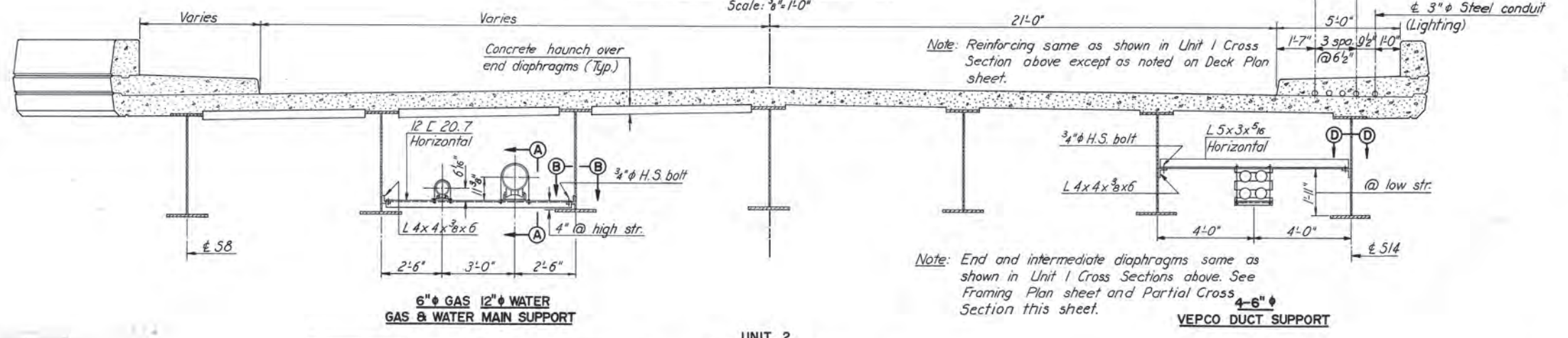


**NOTE "A":**  
Dimension shown is measured from top of web to top of slab at the intersection of the centerline of stringer and the centerline of bearing. At exterior stringers this is measured to the cross slope extended. This dimension may be varied between bearings as required to care for variation in camber, except that no portion of the stringer flange may fall within the 8" slab.

**NOTES:**  
For spacing and location of utility supports and diaphragms, see Framing Plan sheet.  
For Basic Attachment Details for cement asbestos conduit, see Standard Conduit Installation Details sheet.  
For details showing gas and water mains thru abutments, see Standard Utility Support Details At Bridge Abutments sheet.



Note: Stiffener shall be welded to compression flange and have a tight fit to the tension flange.



BY	DATE				
MADE	L.B.P.	10-67			
CHECKED	TEM.	2-68	1	As Built	TEM 6-77
IN CHARGE	P.R.Y.		NO.	REVISION	BY DATE

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

BRIDGE B-55  
3RD STREET OVER  
DOWNTOWN EXPRESSWAY

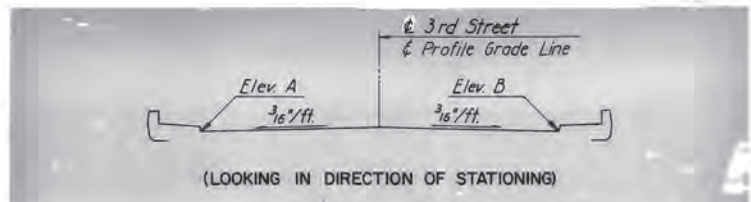
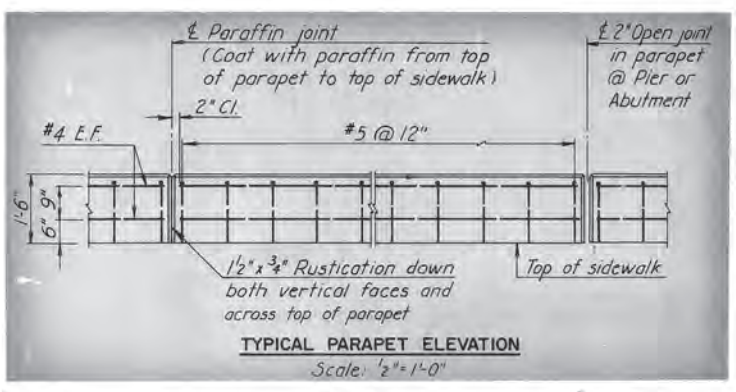
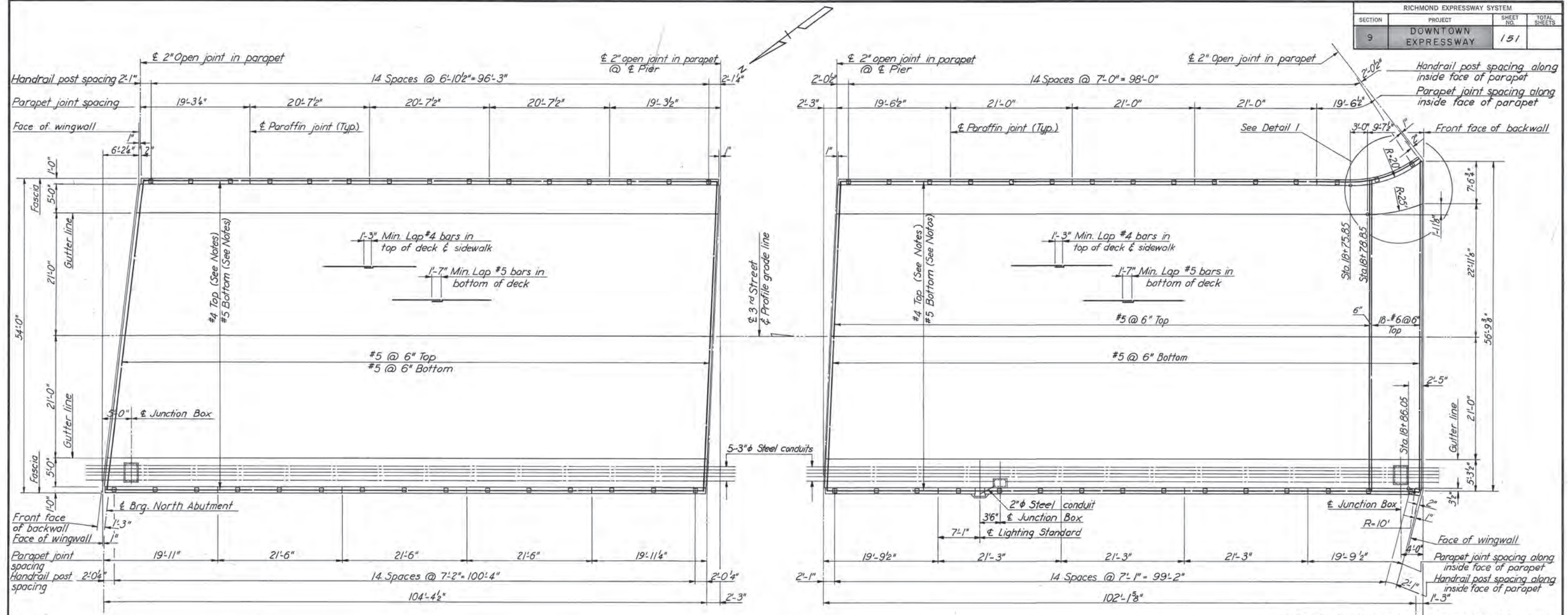
**CROSS SECTION AND UTILITY DETAILS**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

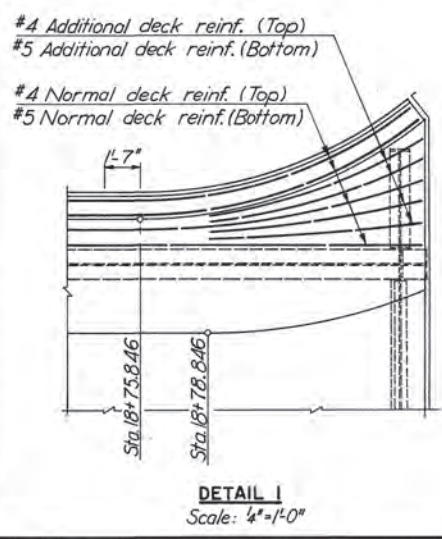
SCALE: AS SHOWN  
CONTRACT NO.: 9  
SHEET NO. 12 OF 16

AS BUILT





STATION	ELEV. A	ELEV. B	STATION	ELEV. A	ELEV. B
16+60	—	—	+85.30	—	150.47
+70	151.62*	151.95*	+86.21	—	150.79
+80	151.52*	151.85	+87.12	150.45	—
+81.23	—	—	+90	150.42	150.75
+83.72	—	151.81	+88.00	150.32	150.65
+86.23	151.46	—	+10	150.22	150.55
+90	151.42	151.75	+20	150.12	150.45
+7+00	151.32	151.65	+30	150.02	150.35
+10	151.22	151.55	+40	149.92	150.25
+20	151.12	151.45	+50	149.82	150.15
+30	151.02	151.35	+60	149.72	150.05
+40	150.92	151.25	+70	149.62	149.95
+50	150.82	151.15	+80	149.51	149.85
+60	150.72	151.05	+88.47	149.42	149.77
+70	150.62	150.95	+90	149.40	149.75
+80	150.52	150.85	+99.00	149.27*	149.65*
			+08.47	—	149.57*



**NOTES:**

- For location and spacing of deck, parapet and sidewalk reinforcing, see Cross Section and Utility Details sheet.
- For location and spacing of reinforcing in haunch over end diaphragms, see Joint Details sheet.
- For lighting standard base, junction box details and additional reinforcing, see Standard Electrical Details sheet S4.

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**DECK PLANS**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: AS SHOWN  
CONTRACT NO.: 9  
SHEET NO. 13 OF 16

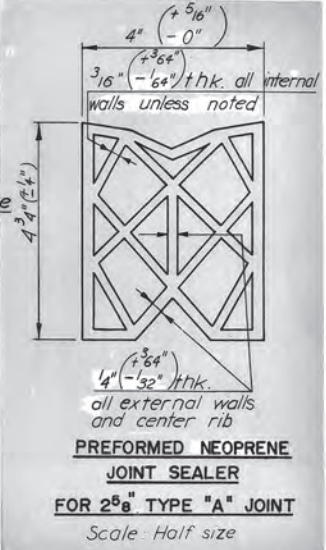
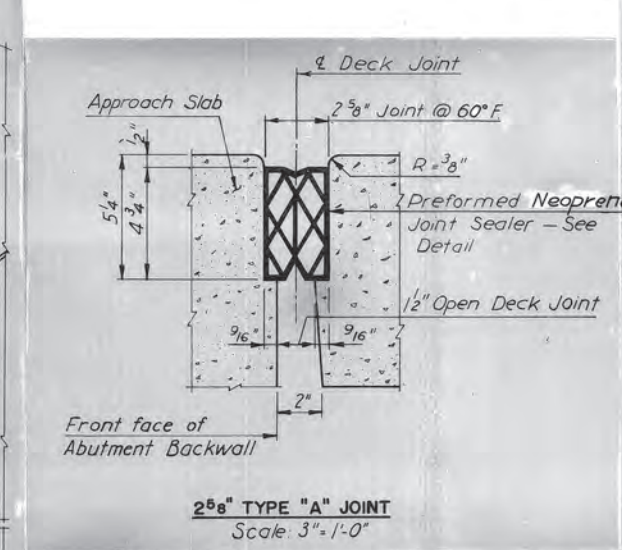
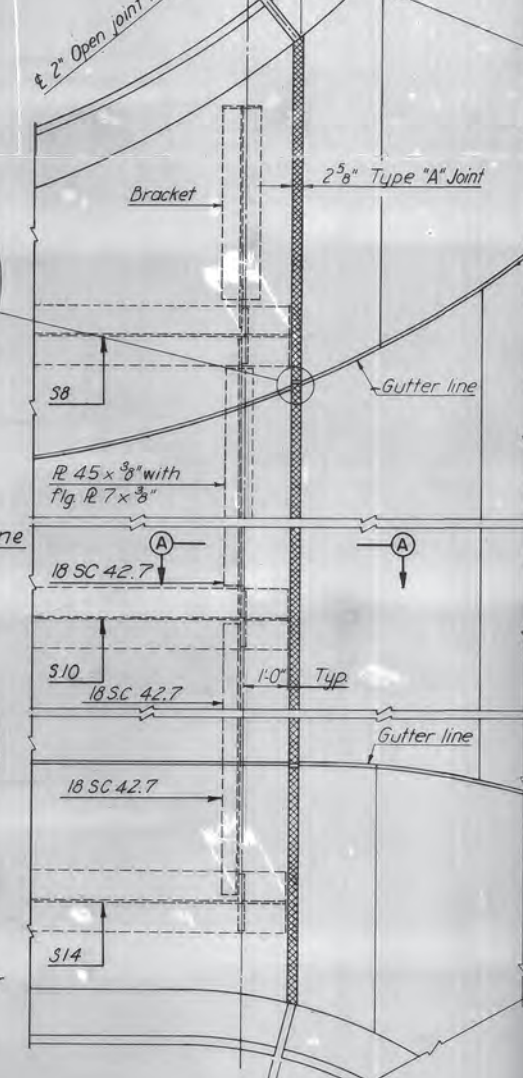
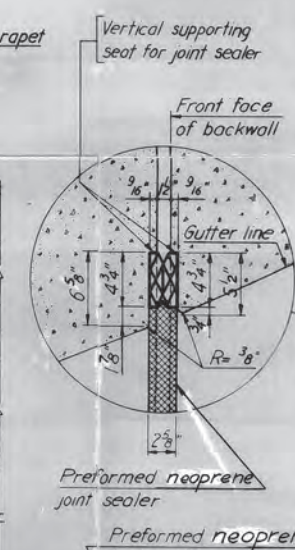
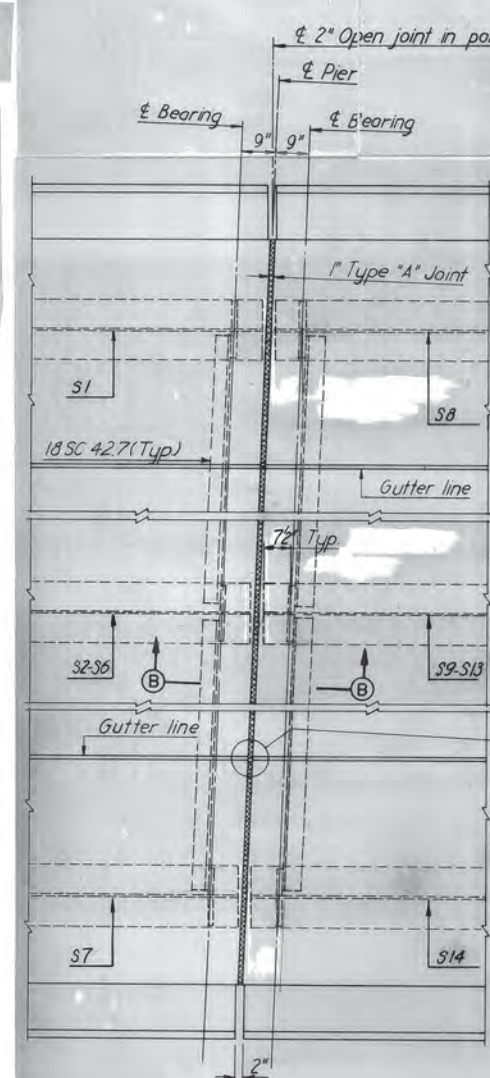
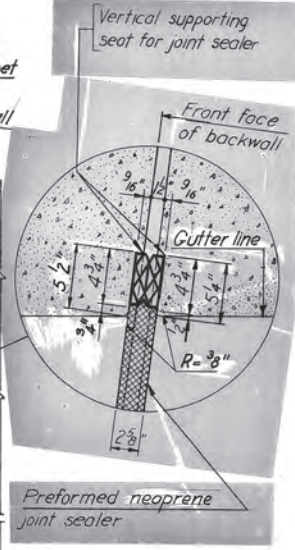
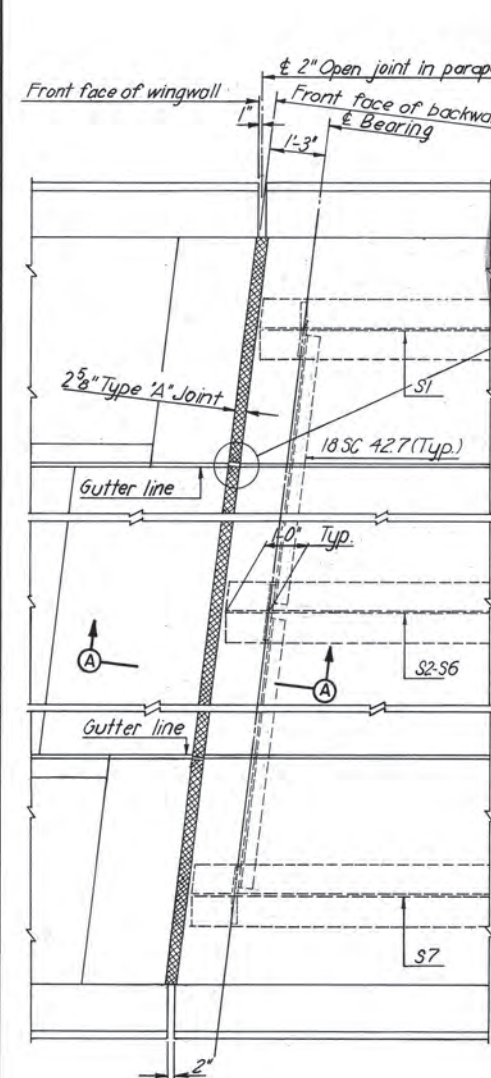
BY	DATE				
MADE	JBM	9-67			
CHECKED	TEM	2-68	1	As Built	TEM 6-77
IN CHARGE	PRY				

\* Elevations shown are given at top of bituminous surfacing.

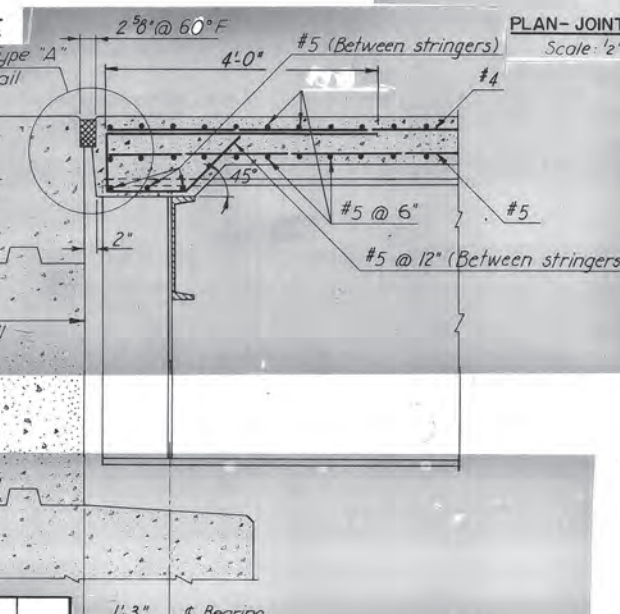
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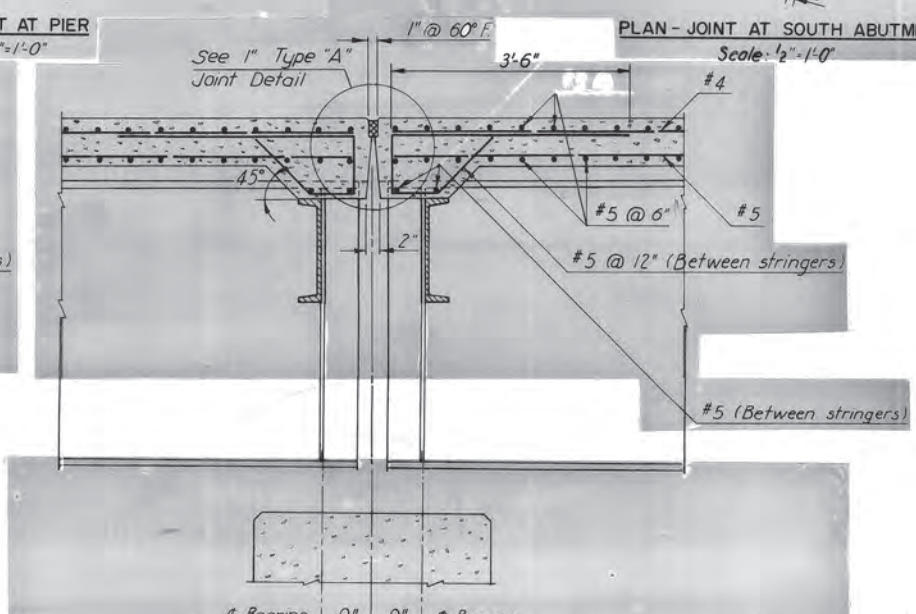
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	152	



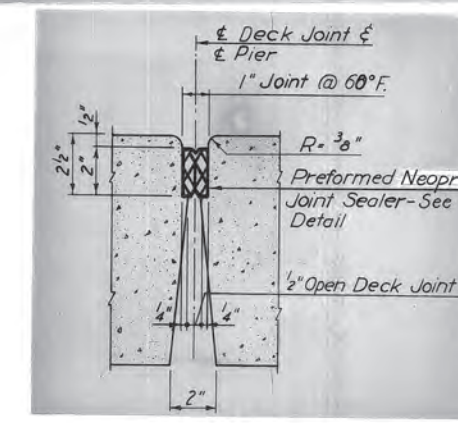
PLAN-JOINT AT NORTH ABUTMENT  
Scale: 1/2"=1'-0"



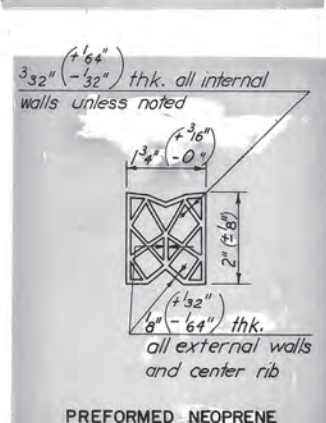
PLAN-JOINT AT PIER  
Scale: 1/2"=1'-0"



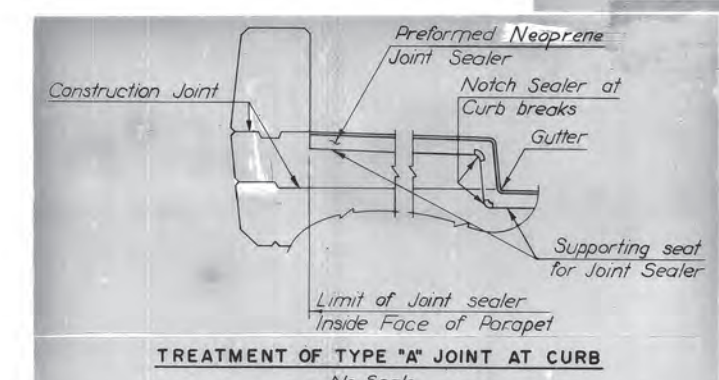
PLAN-JOINT AT SOUTH ABUTMENT  
Scale: 1/2"=1'-0"



1" TYPE "A" JOINT  
Scale: 3/4"=1'-0"



PREFORMED NEOPRENE JOINT SEALER FOR 1" TYPE "A" JOINT  
Scale: Half size



TREATMENT OF TYPE "A" JOINT AT CURB  
No Scale

**NOTE TO CONTRACTOR:**  
It is absolutely essential that the openings for the preformed Neoprene joint sealers be accurately formed and constructed to smooth, straight lines. The size of the opening shall be adjusted to allow for anticipated dead load rotation of the ends of the slab and for the temperature at the time of construction.

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY  
BRIDGE B-55  
3RD STREET OVER  
DOWNTOWN EXPRESSWAY  
JOINT DETAILS

MADE	BY	DATE			
	DLA	1-68			
CHECKED	AS BUILT	3-68	TEM	6-77	
IN CHARGE	PRK				

SECTION A-A  
Scale: 3/4"=1'-0"

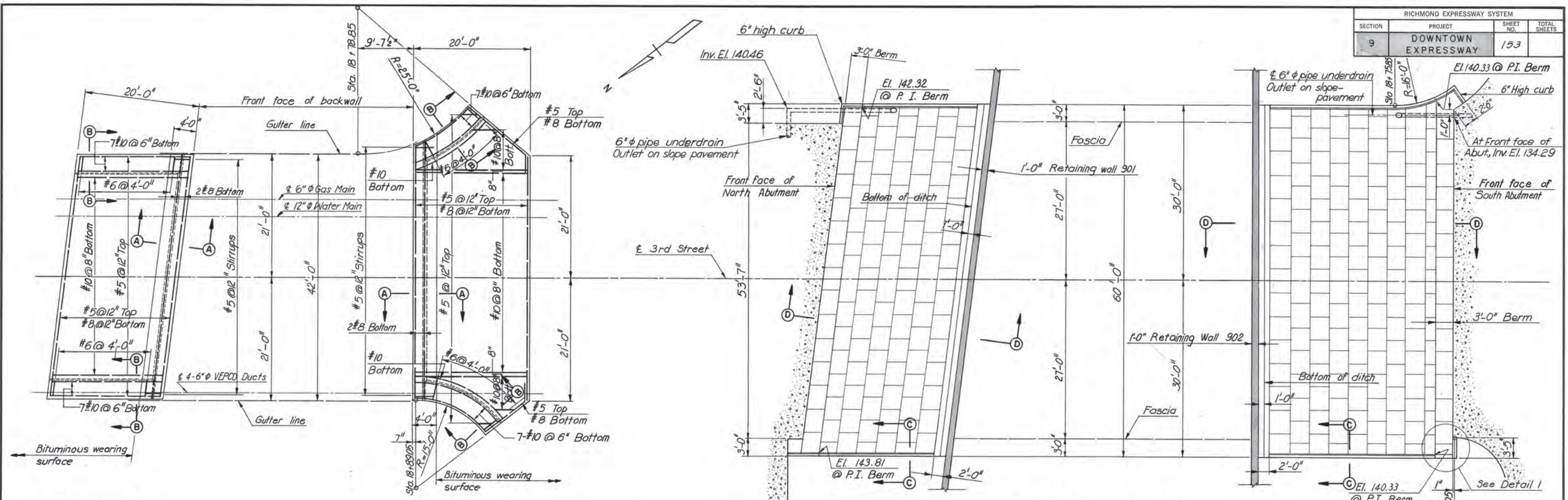
SECTION B-B  
Scale: 3/4"=1'-0"

AS BUILT

HOWARD, NEEDLES, TAMMEN & BERGENDOFF consulting engineers NEW YORK ALEXANDRIA KANSAS CITY	SCALE: AS SHOWN CONTRACT NO.: 9 SHEET NO. 14 OF 16
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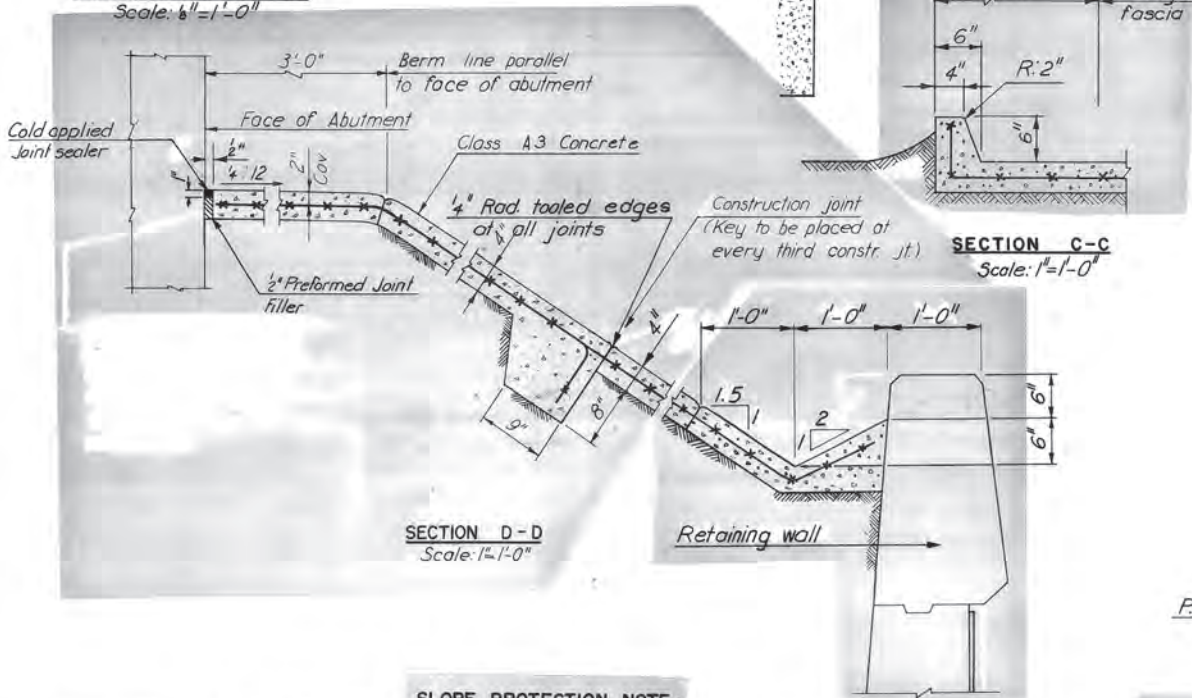
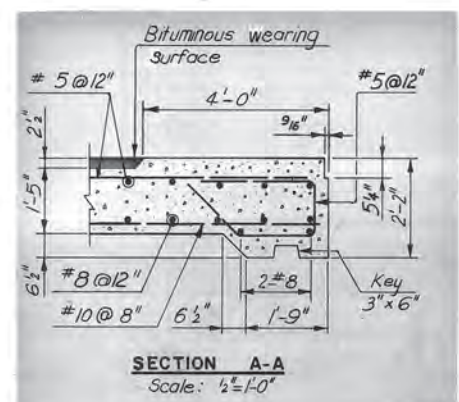
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
9	DOWNTOWN EXPRESSWAY	153	



**NORTH APPROACH SLAB**  
Scale: 1/8" = 1'-0"

**SOUTH APPROACH SLAB**  
Scale: 1/8" = 1'-0"

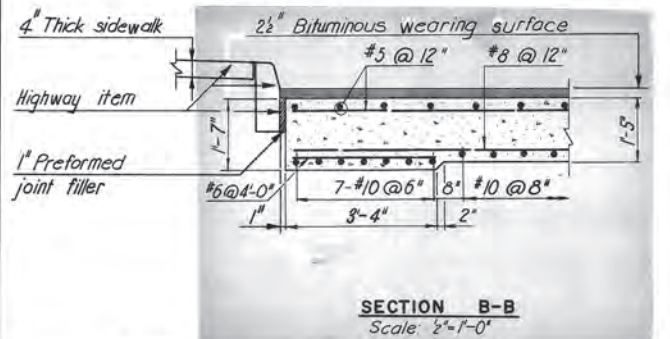
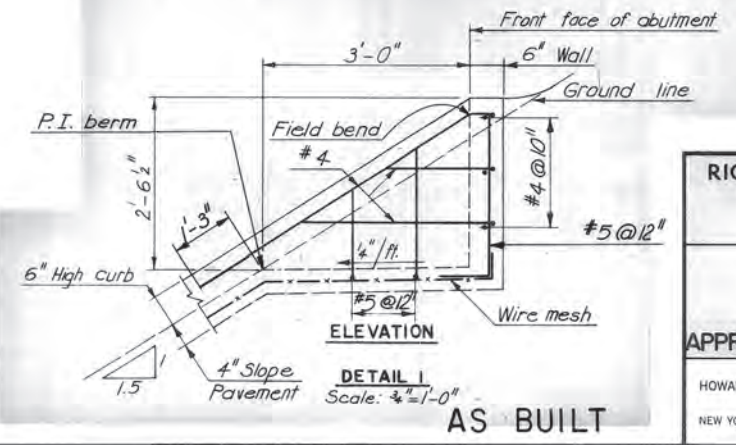
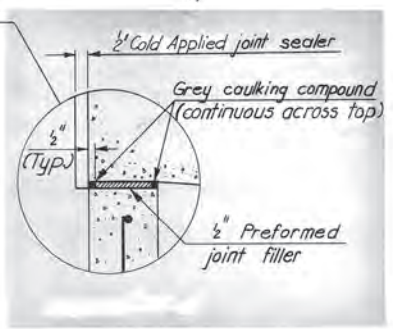
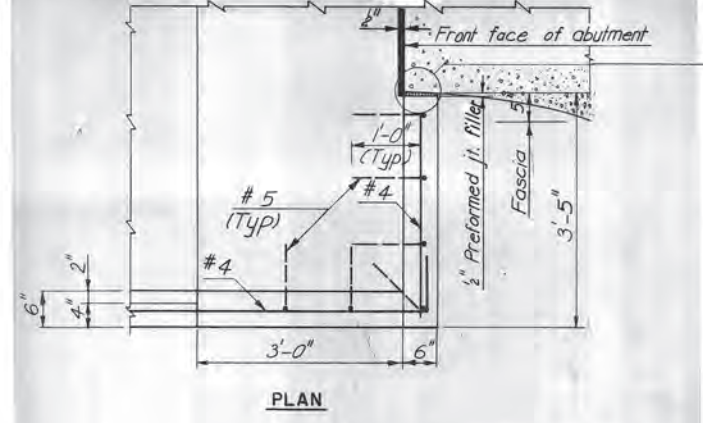
**PLAN OF SLOPE PROTECTION**  
Scale: 1/8" = 1'-0"



**SLOPE PROTECTION NOTE:**

The item "Cast-in-Place Concrete Slab Slope Protection" shall include the excavation of, or the placing and compaction of any embankment material necessary to bring the surface of the paved slopes to the finished elevations shown on the plans. "Cast-in-Place Concrete Slab Slope Protection" shall be paid for at the contract unit price per square yard, which price shall include the concrete slab including wire mesh and joint filler.

The slab shall be constructed in 4'-0" x 4'-0" panels, placed in horizontal courses, alternate panels being poured in a staggered pattern with adjacent panels poured later. The slab shall be Class A3 concrete of such consistency that it can be placed without the use of top forms. The surface shall be finished with a wood float. Reinforcing shall consist of wire mesh No. 6 gage, 6" c.c. each way, placed at the center of the slab, and continuous through construction joints.



BY	DATE			
MADE	elmv	12-67		
CHECKED	TEM	2-68	1	As Built
IN CHARGE	PRK			
NO.	REVISION	BY	DATE	
		TEM	6-77	

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

**BRIDGE B-55**  
**3RD STREET OVER**  
**DOWNTOWN EXPRESSWAY**  
**APPROACH SLABS AND SLOPE PROTECTION**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: AS SHOWN  
CONTRACT NO.: 9  
SHEET NO. 15 OF 16



**RCBC 1827 Plans**

**4 @ 14'X10'**

**(Under Forest Hill Ave Off Ramp)**





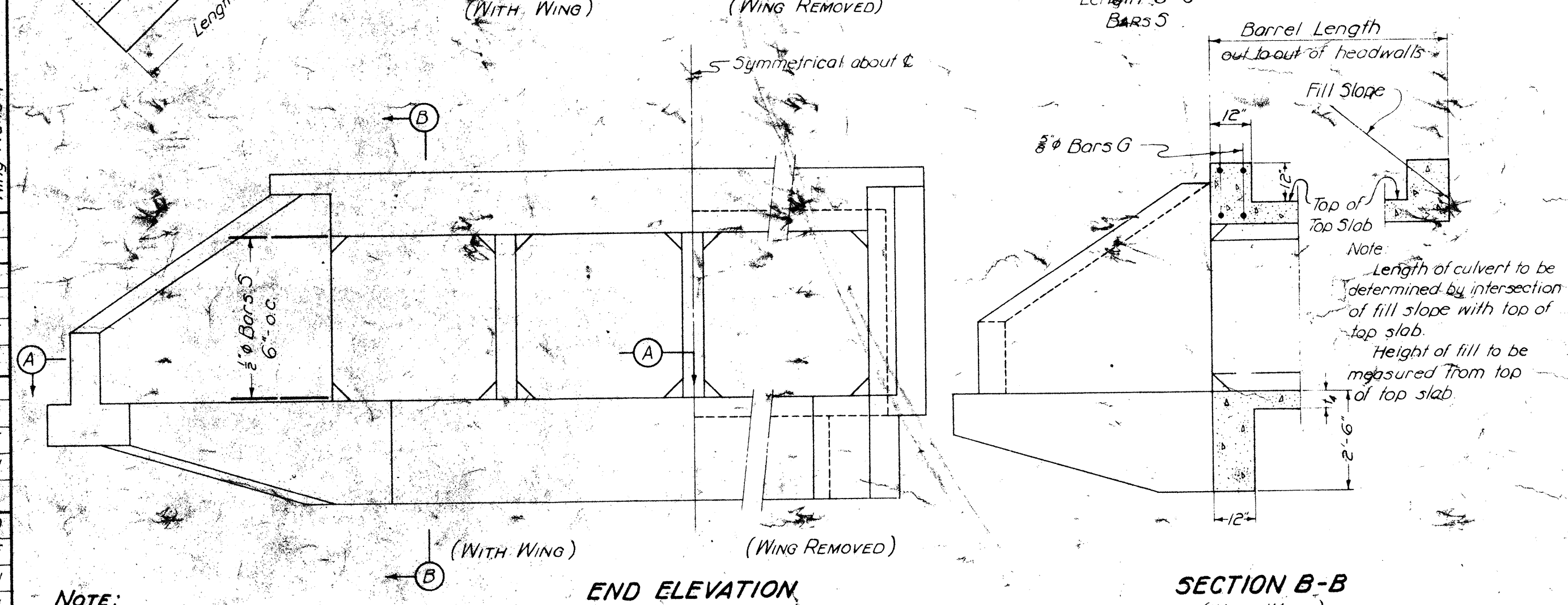
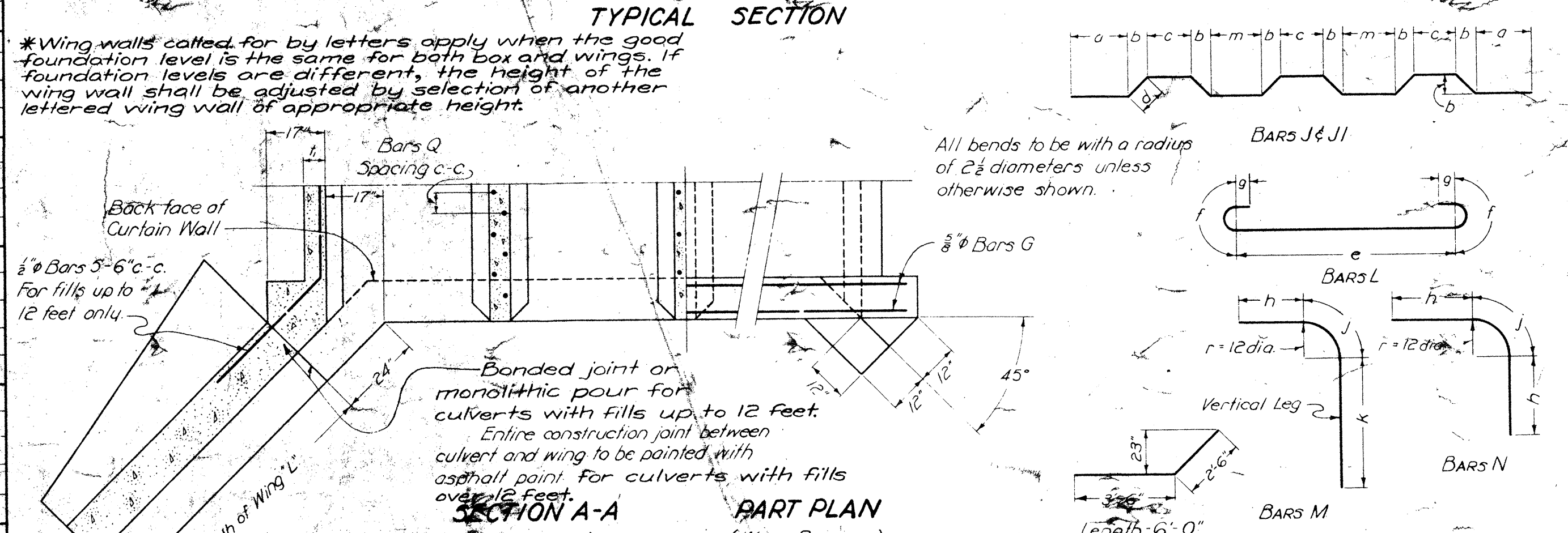
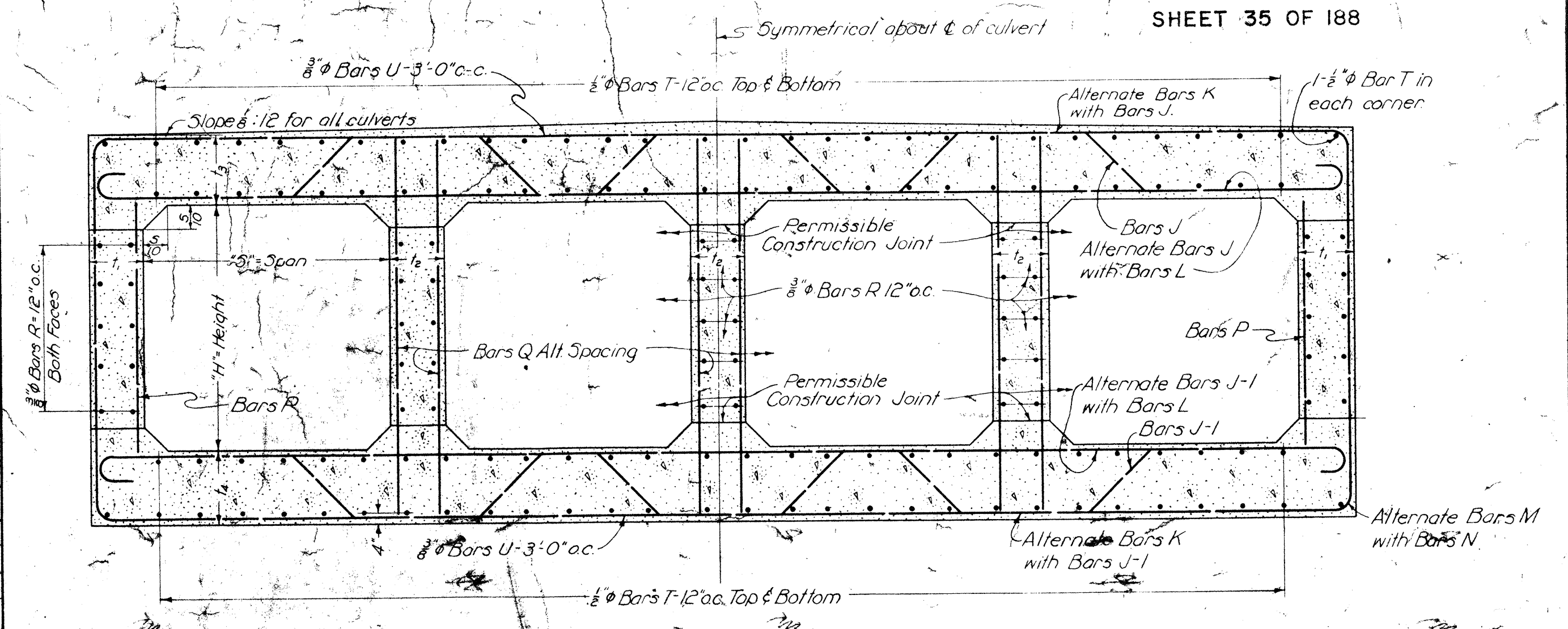


FOR FILLS UP TO 12 FEET  
REINFORCING STEEL (See Note for Bars U)

Table with columns for Dimensions (3' to 12' span, 3' to 12' height), Reinforcing Steel (Bars J, J-1, K, L, M, N, P, Q, R, S, G), and Quantities (Barrel, 2 Hd walls, Wing Walls). Rows correspond to different span and height combinations.

FOR FILLS FROM 12 FEET TO 25 FEET  
REINFORCING STEEL (See Note for Bars U)

Table with columns for Dimensions (3' to 12' span, 3' to 12' height), Reinforcing Steel (Bars J, J-1, K, L, M, N, P, Q, R, S, G), and Quantities (Barrel, 2 Hd walls, Wing Walls). Rows correspond to different span and height combinations.



NOTE: Capacity 20'-516' Loading; designed in accordance with AASHTO Standard Specifications for Highway Bridges, 1953. Construction joints shall be constructed and loaded in strict accordance with the current Road and Bridge Specifications, 1966. Barrels more than 35' in length shall be poured in sections by providing construction joints in vertical planes at intervals not exceeding 25' between joints nor more than 30' from ends of barrels. Materials and construction shall be in accordance with Virginia Department of Highways Road and Bridge Specifications, 1954. All concrete shall be Class A2. For modification of above details for skewed culverts see PLAN BC-3. For details of wing walls see PLAN BC-W for fills with 1 1/2:1 slope and PLAN BC-WI for fills with 2:1 slope. Bars R and T shall lap 30 diameters of splices. At construction joints first placed bars shall project 30 diameters beyond the joint. Bars U are straight and shall be four times the span width (S) in length. Bars over 40' in length may be fabricated in two parts and lapped 30 diameters at splices; quantities shown on plans shall not be modified to allow for splice laps. Bars G, R, P and Q are straight. The centers of main reinforcing bars shall be 2" from the face of the concrete except when the concrete is exposed to all water. The thickness of walls and slabs exposed to soil water shall be increased to cover the bars not less than 3" and estimated quantity of concrete shall be revised accordingly.

Submitted for Approval: J. N. Clary, BRIDGE ENGINEER  
Recommended for Approval: M. O. Shuler, ASSISTANT CHIEF ENGINEER  
Approved: J. N. Clary, DEPUTY COMMISSIONER AND CHIEF ENGINEER

STANDARD QUADRUPLE BOX CULVERT FOR FILLS FROM 0 TO 25 FEET

Revised: Sept. 3, 1966  
Revised: Sept. 30, 1960  
Revised: March 6, 1957

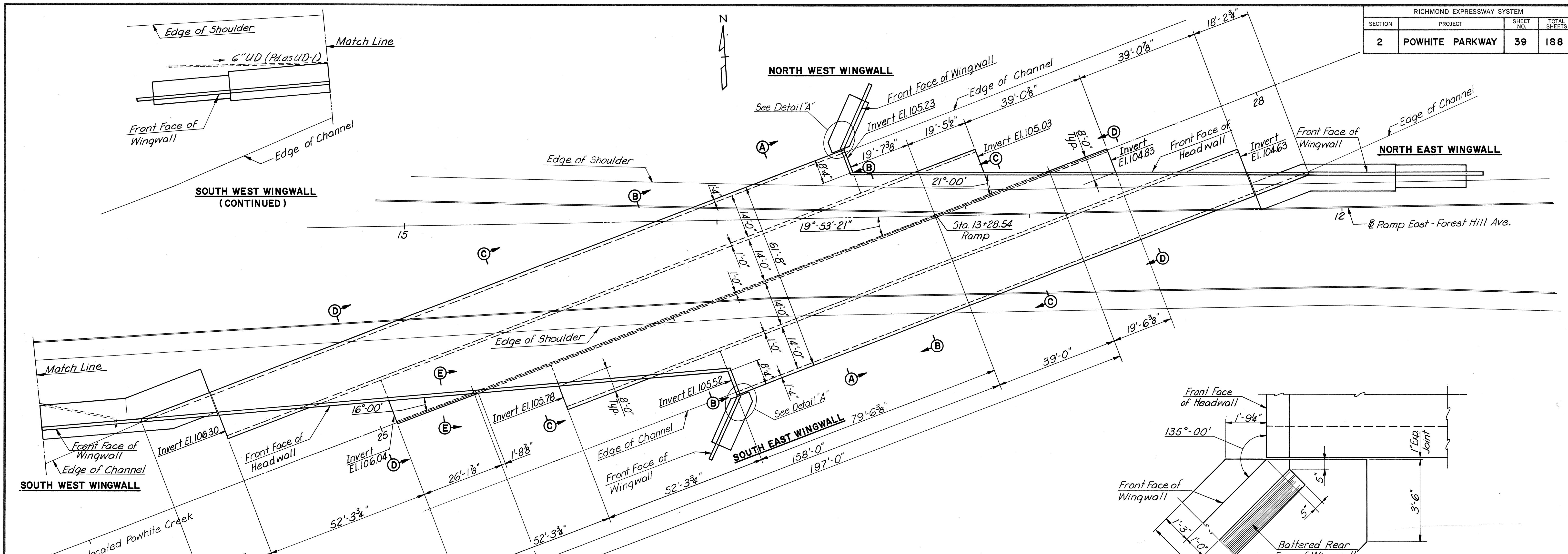
BC-4A



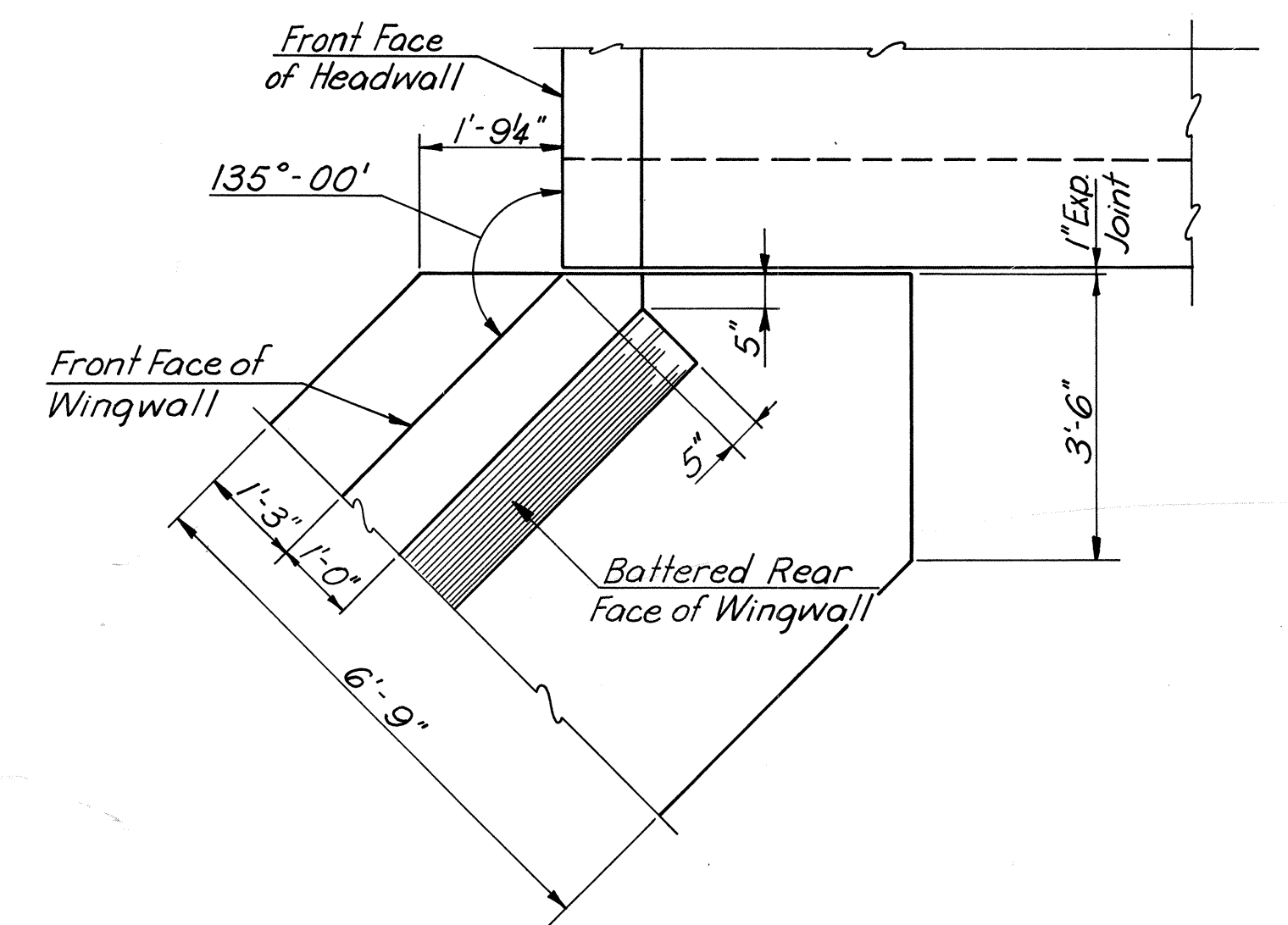




RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	39	188



**PLAN**  
Scale: 1" = 15'



**DETAIL "A"**  
Scale: 1/2" = 1'-0"

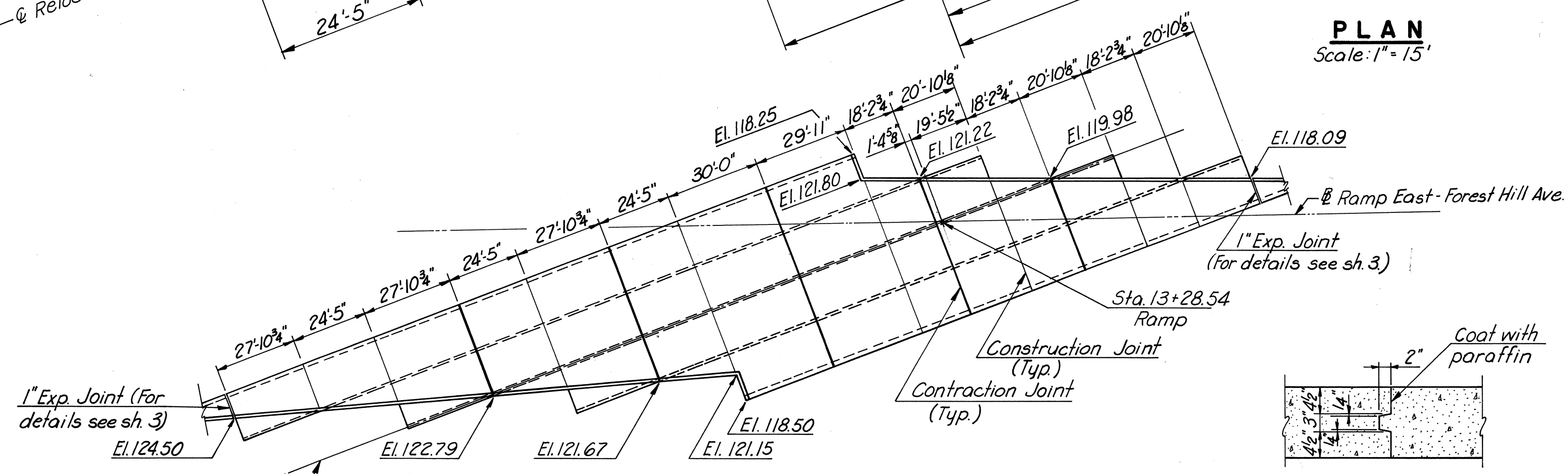
**NOTES:**  
For Sections see sheet 2.  
All Concrete shall be Class A3.  
All Reinforcing Steel shall conform to ASTM A615, grade 40.

QUANTITIES	
Class A3 Concrete	2475 C.Y.
Reinforcing Steel	313,859 lbs
Minor Structure Excavation	6660 C.Y.
Asphalt Dampproofing	280 S.Y.
Porous Backfill	140 C.Y.
Box Culvert Bedding	760 Tons

**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
**POWHITE PARKWAY**  
**14' x 10' QUADRUPLE BOX CULVERT**  
**STRUCTURE C-7**  
**PLAN**

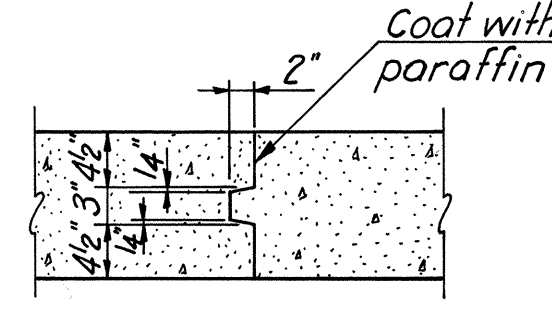
**AS BUILT**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF consulting engineers NEW YORK ALEXANDRIA KANSAS CITY	SCALE: As Shown CONTRACT NO.: 2 SHEET NO. 39 OF 188
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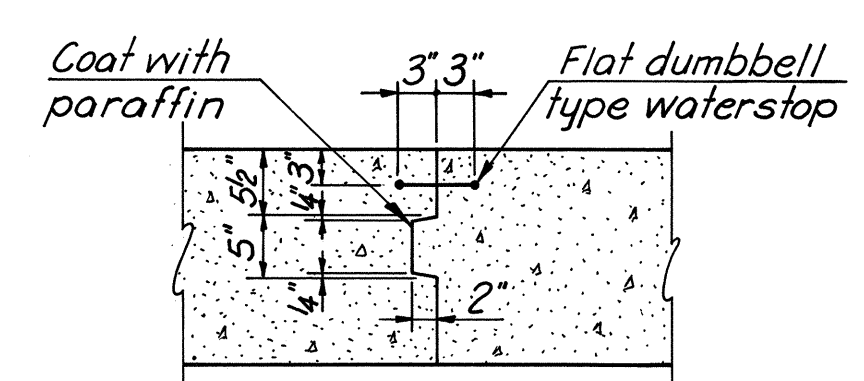


**NOTE:**  
Elevations given on Joint Layout are top of headwall elevations.

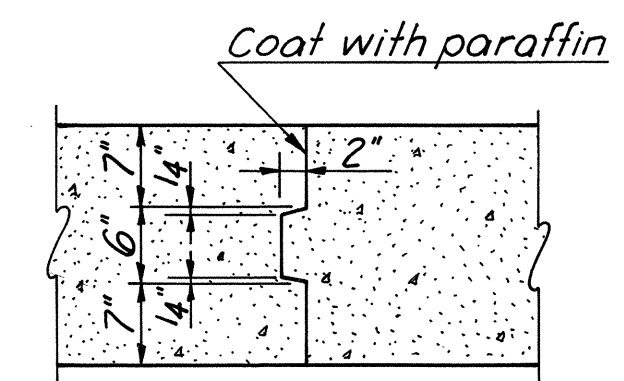
**JOINT LAYOUT**  
Scale: 1" = 30'



**INTERIOR WALLS**

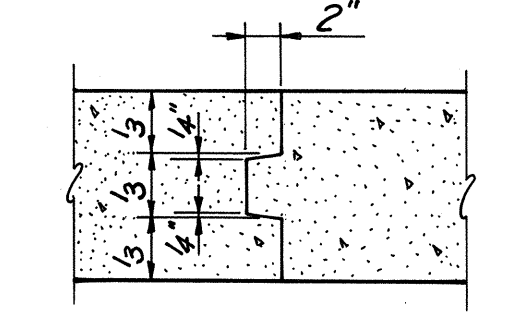


**TOP SLAB & EXTERIOR WALLS**



**BOTTOM SLAB**

**CONTRACTION JOINT DETAILS**  
No Scale

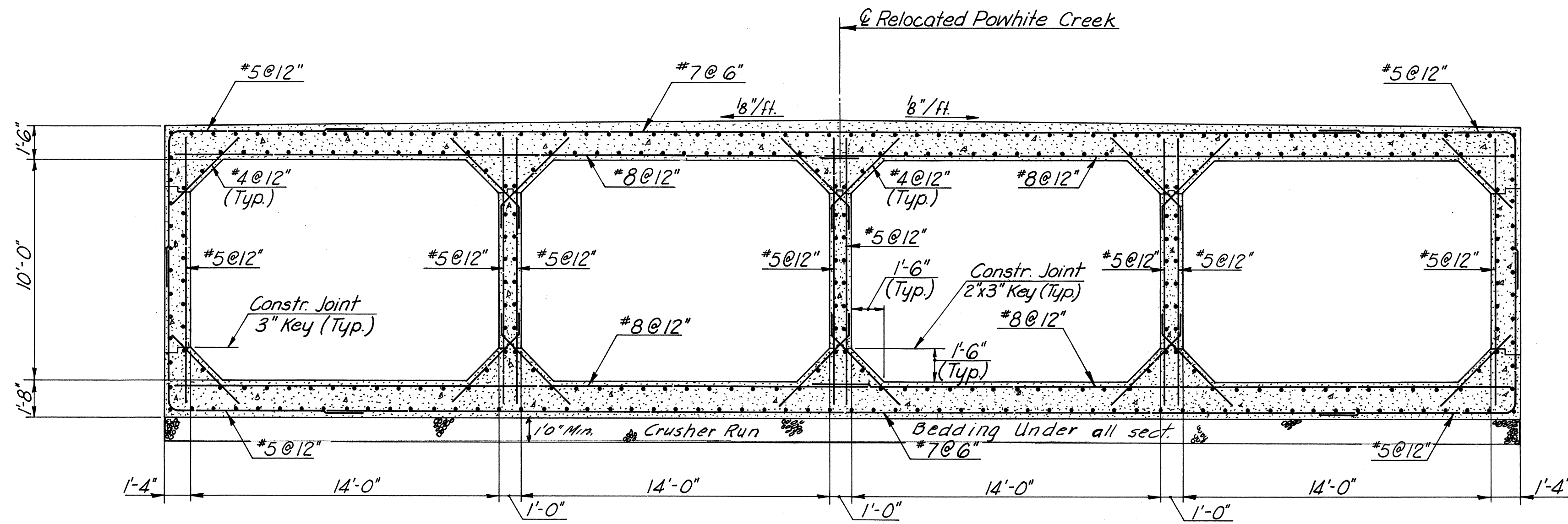


**CONSTRUCTION JOINT DETAIL**  
No Scale

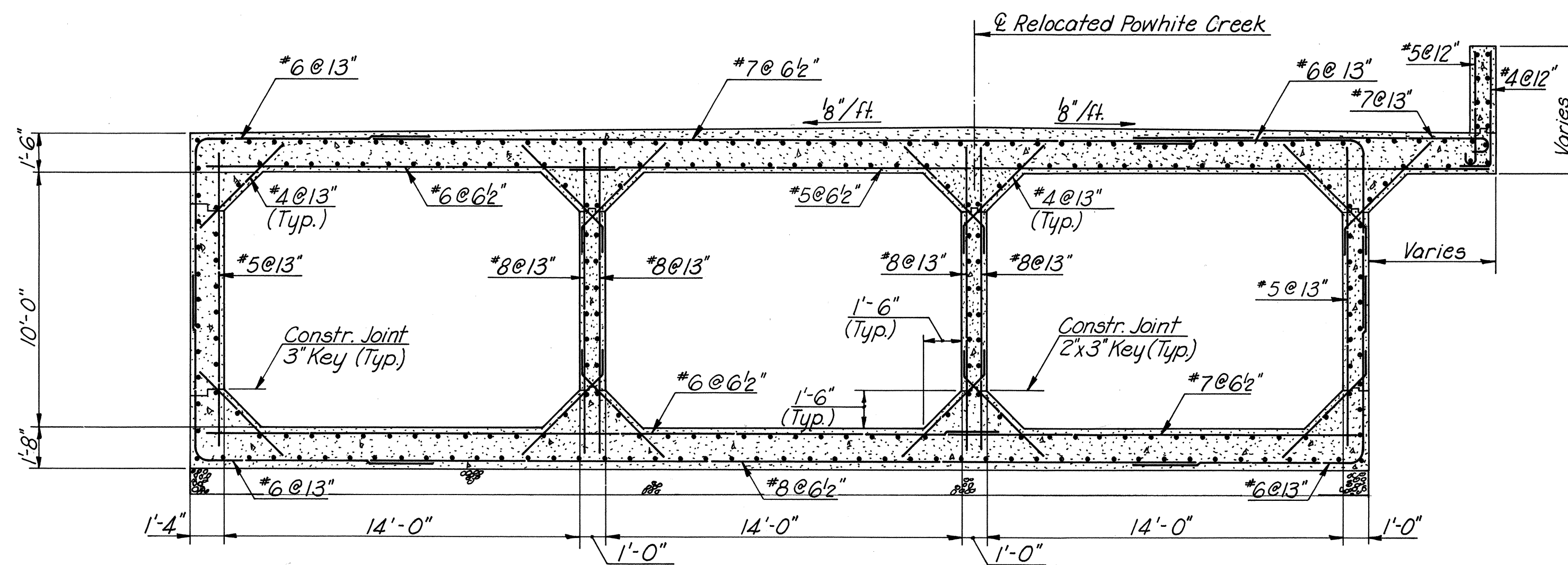
BY	DATE	NO.	REVISION	BY	DATE
MADE	HBW 9-70				
CHECKED	JVB 9-70	1	As Built	JRC	6-73
IN CHARGE	PRY				



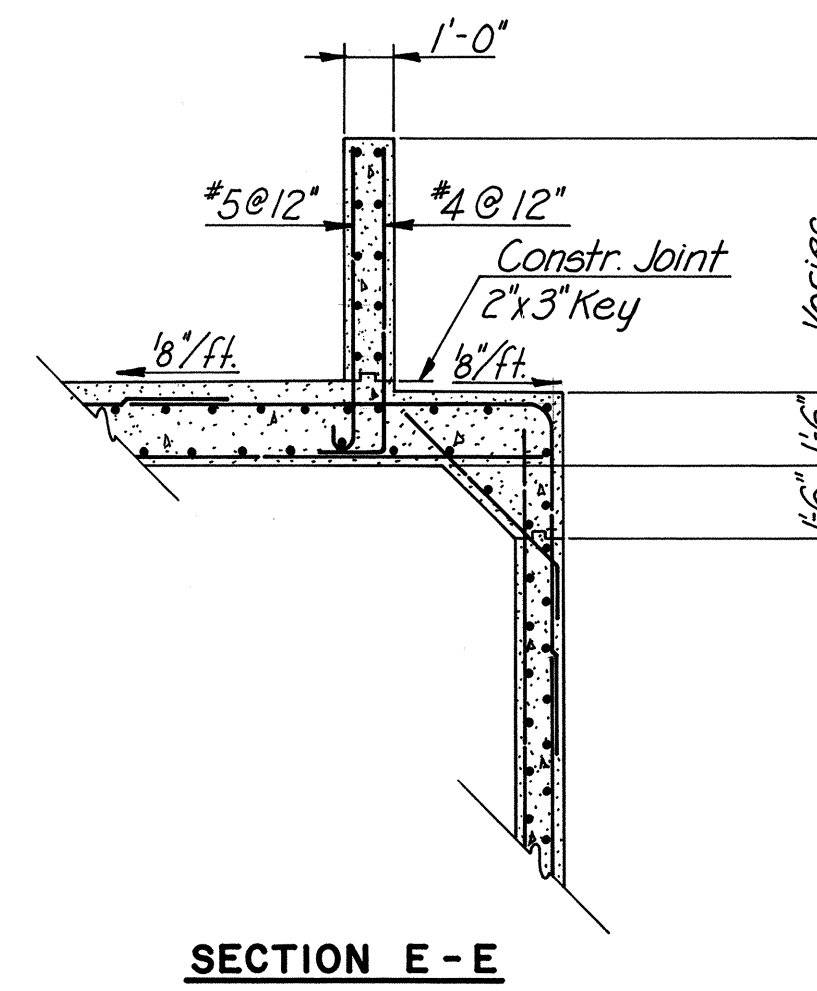
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	40	188



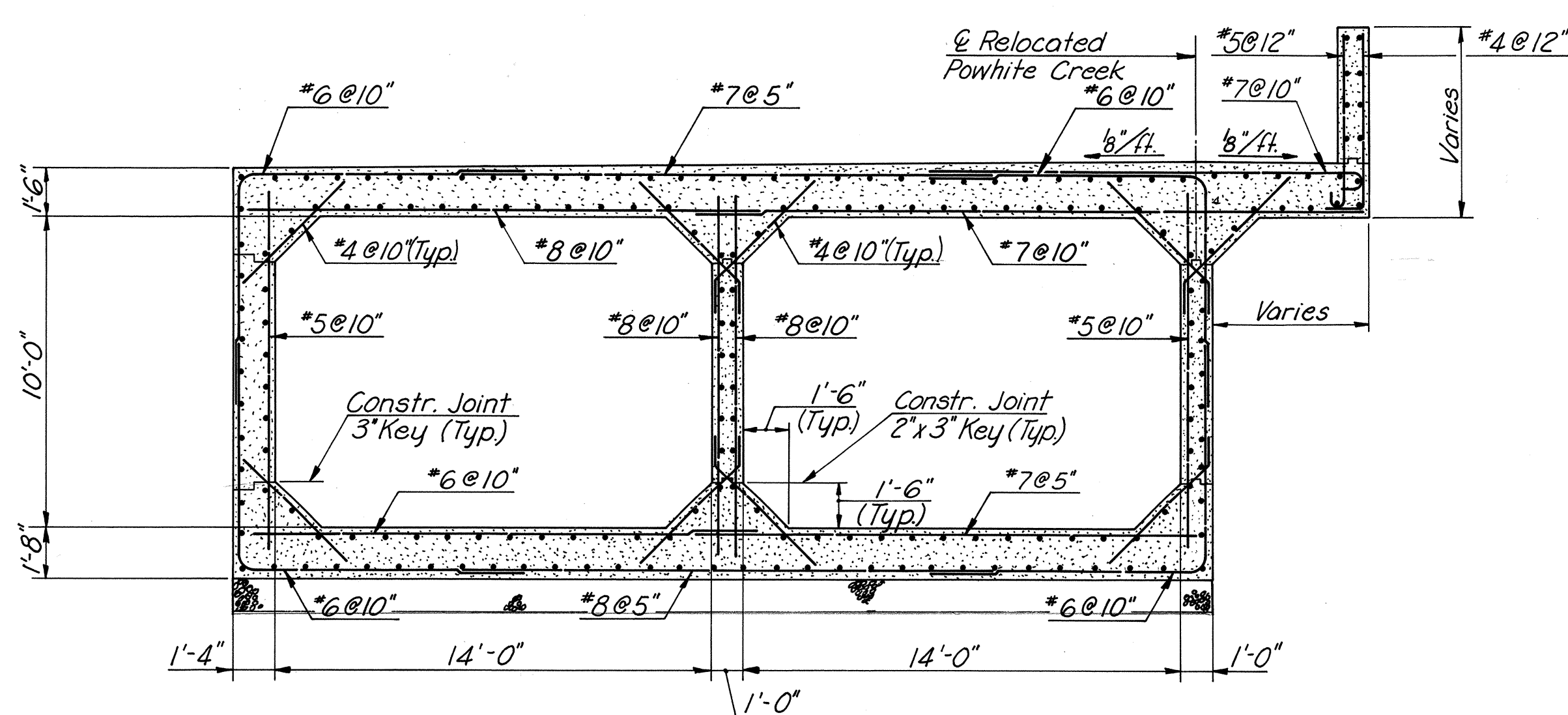
SECTION A - A



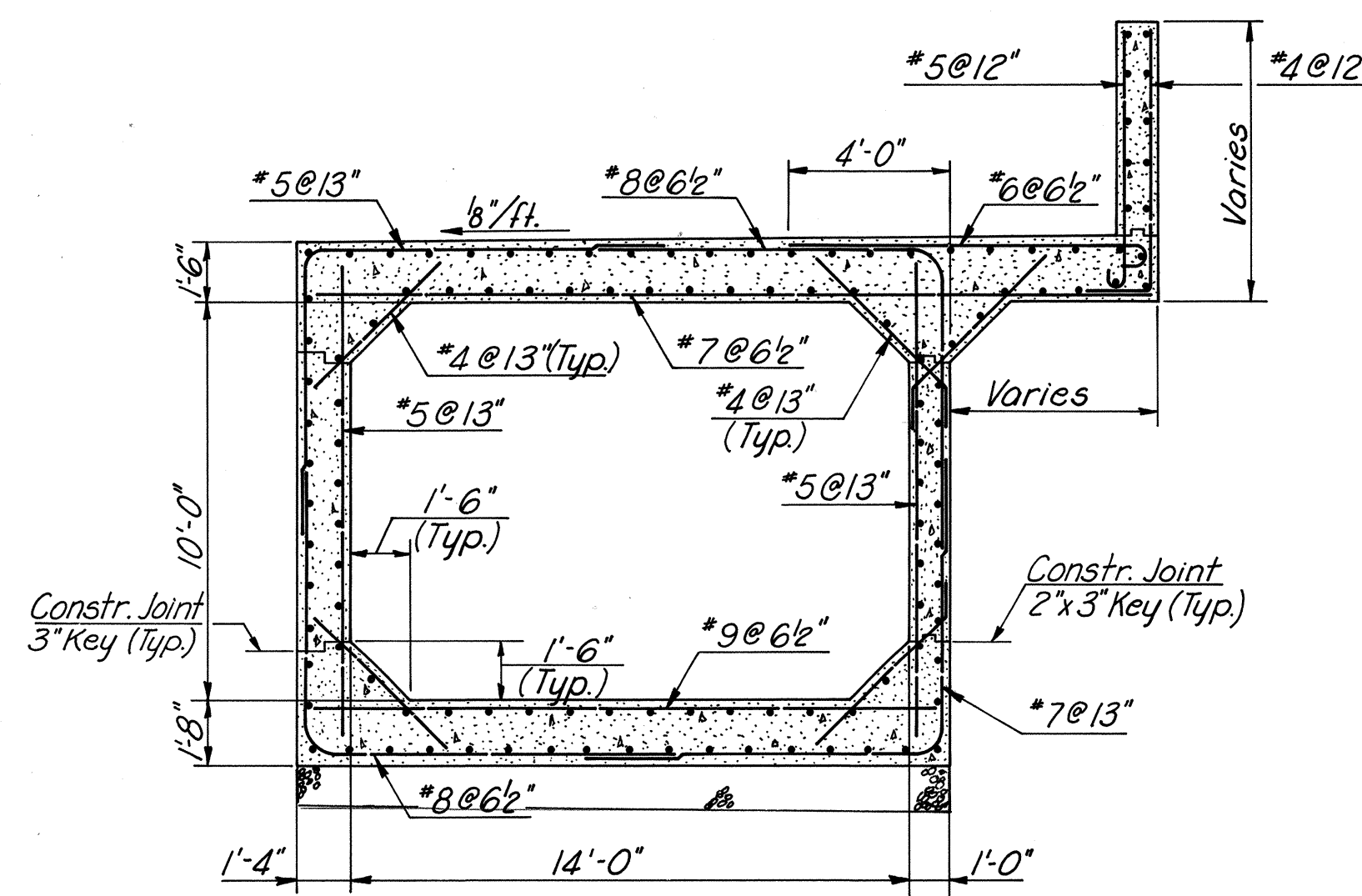
SECTION B - B



SECTION E - E



SECTION C - C



SECTION D - D

**NOTES:**  
 Laps shall be 30d.  
 Longitudinal bars shall be #4 spaced at approximately 12".  
 Corner bars shall have 12d radius bends.  
 Hooks shall have standard dimensions.  
 All bars shall have a min. of 2" from center of bar to face of concrete except that bars in the bottom of bottom slab to be 3" from center of bar to face of concrete.  
 For location of Sections see sheet 1.

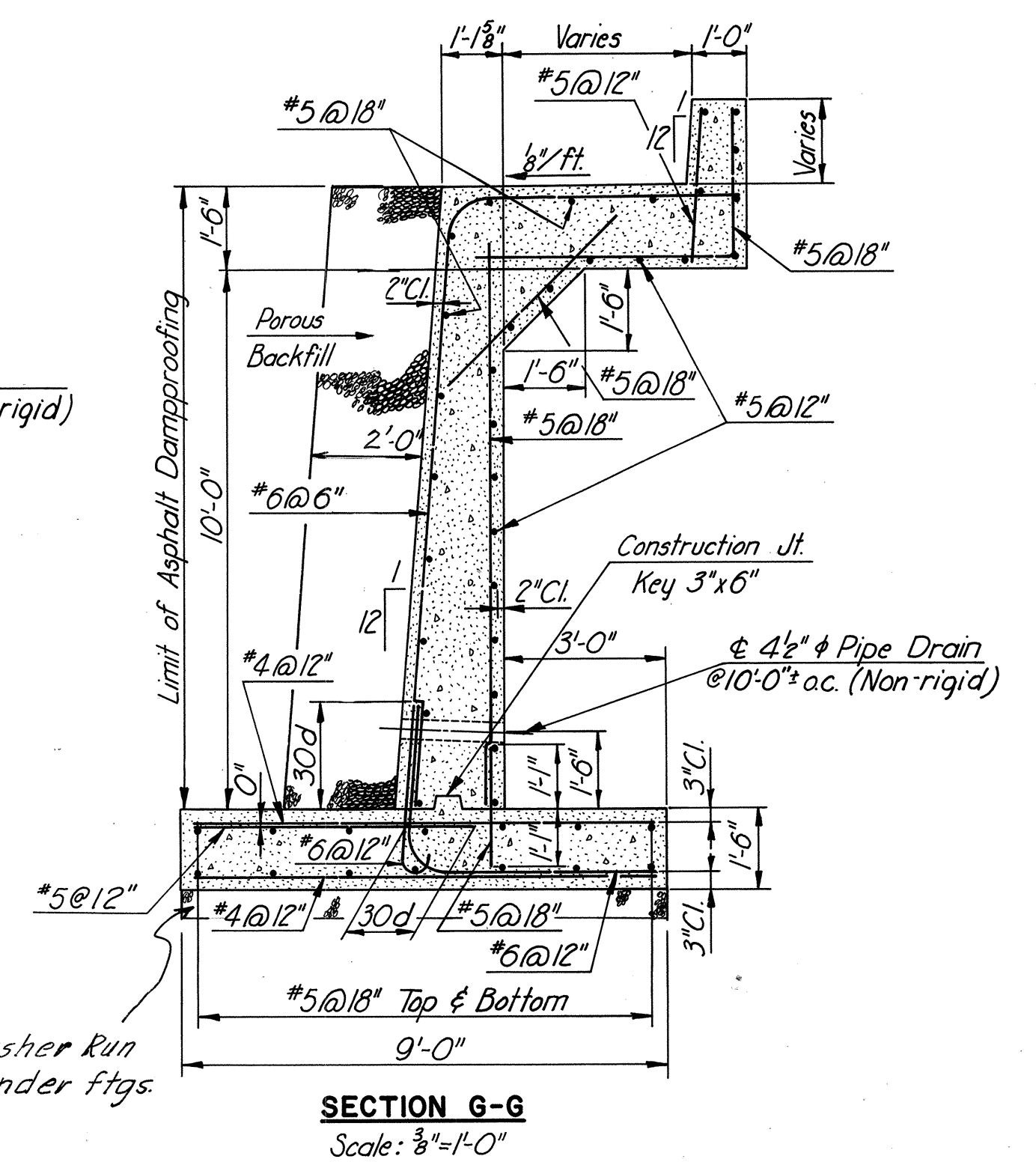
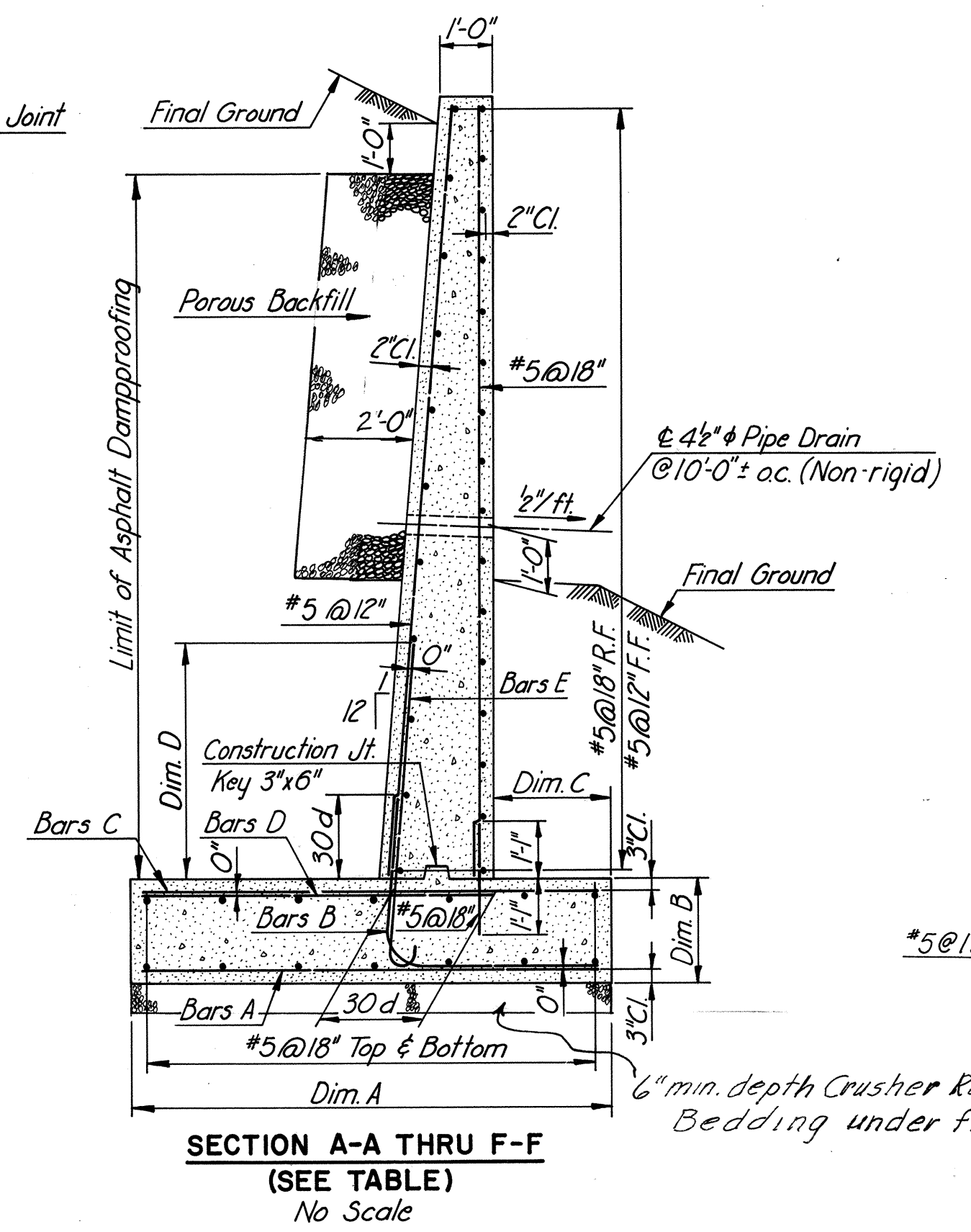
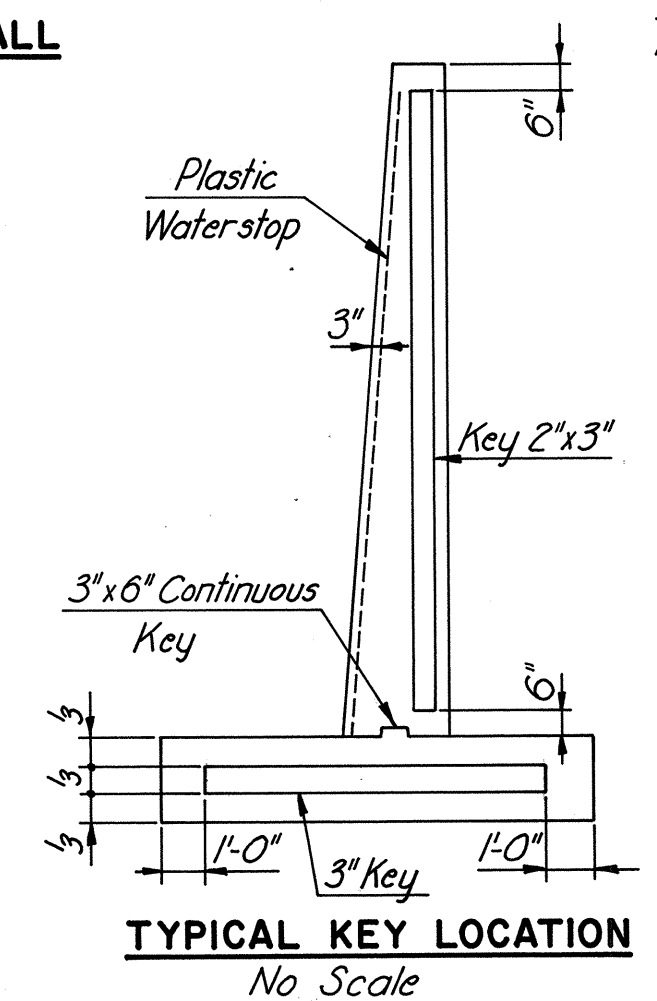
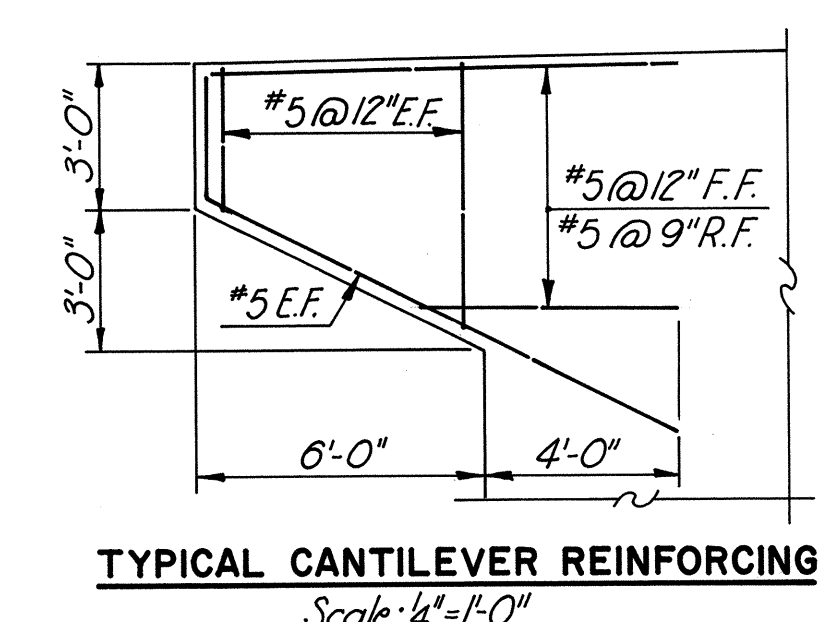
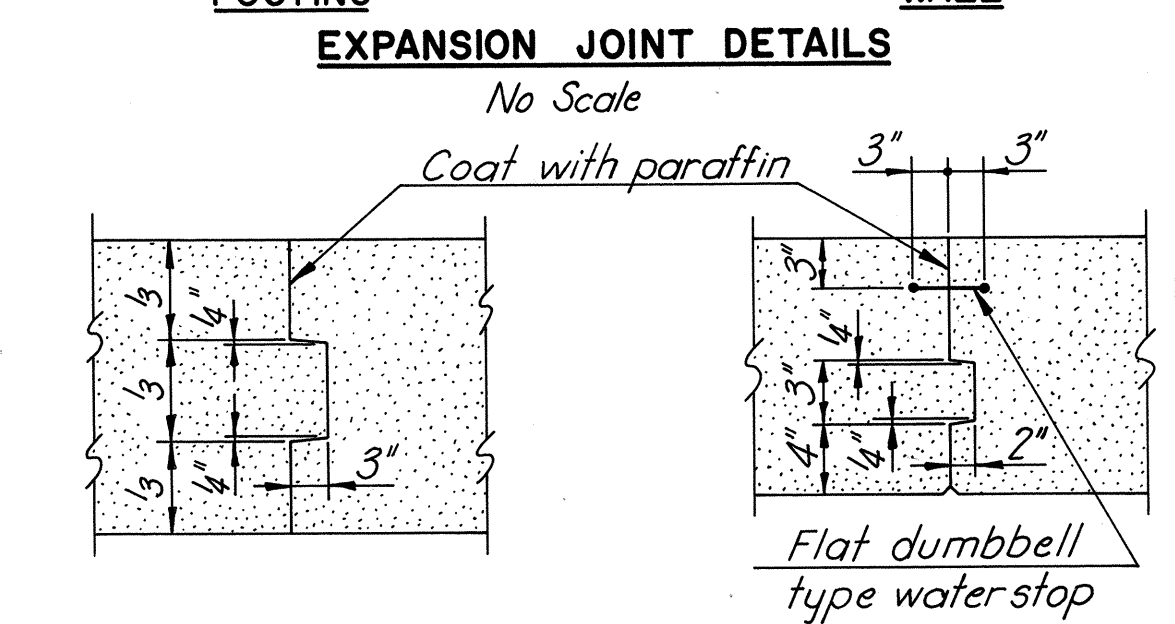
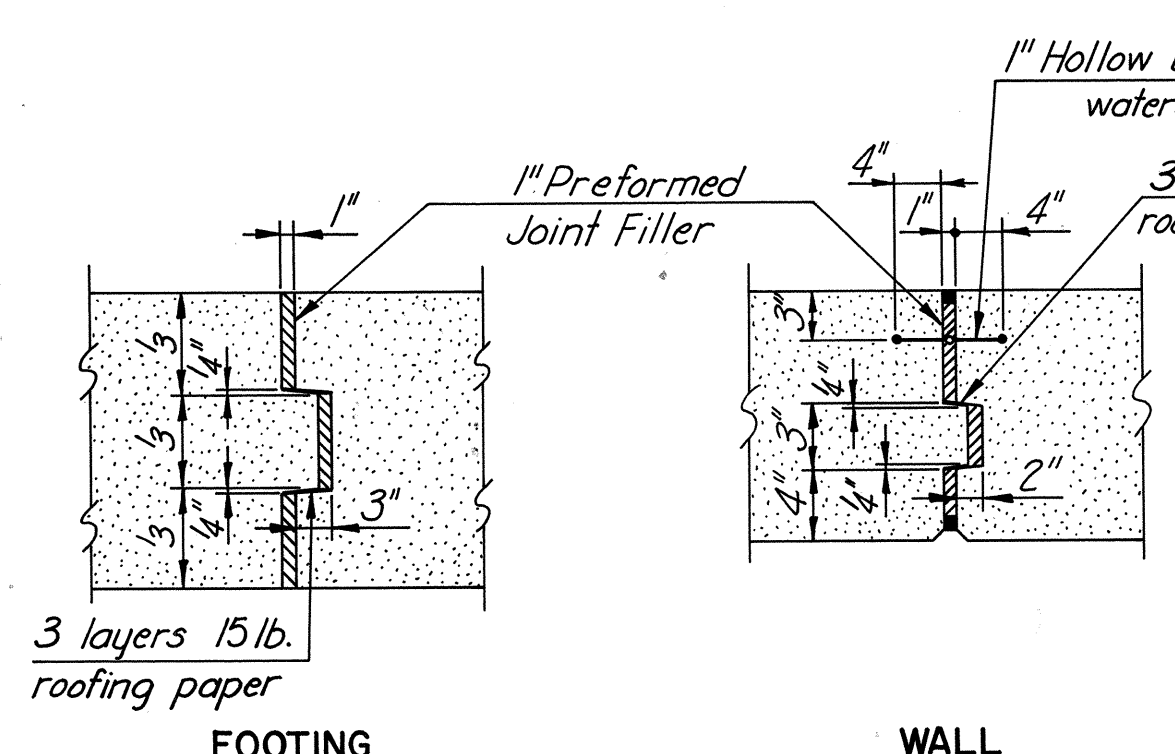
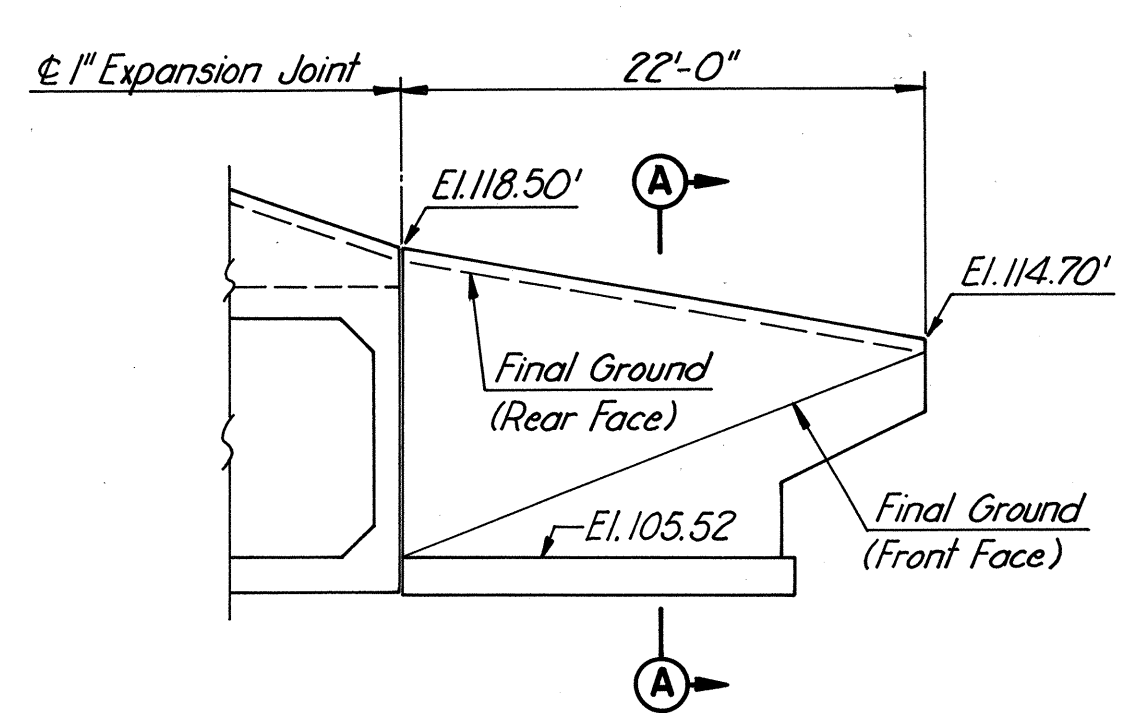
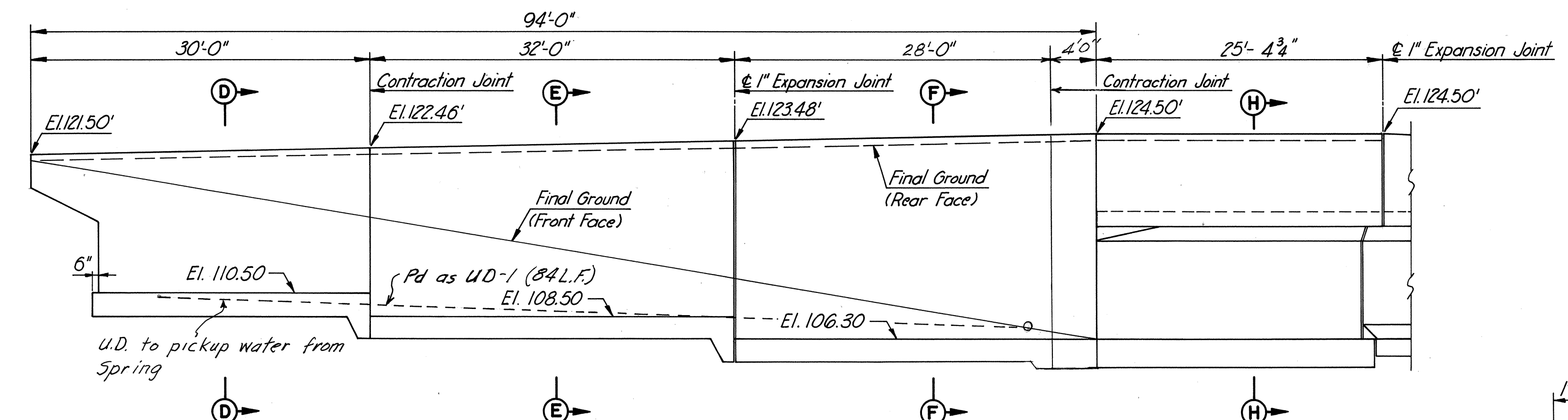
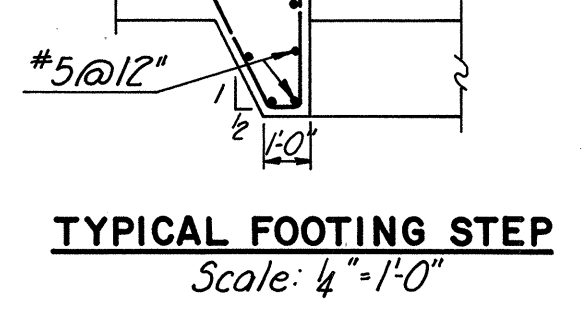
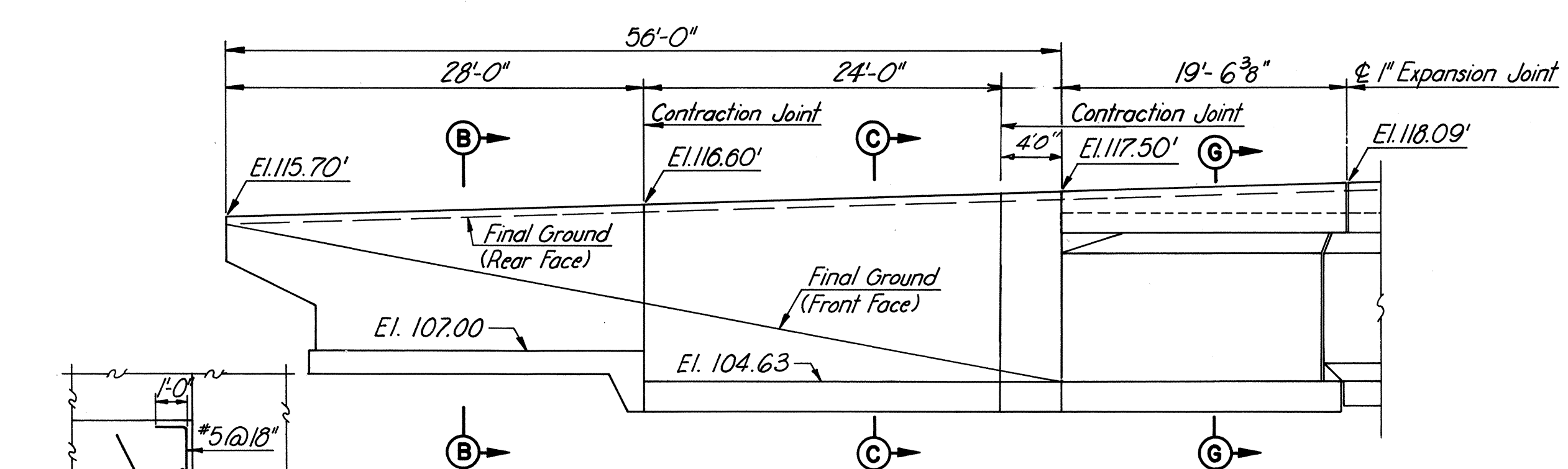
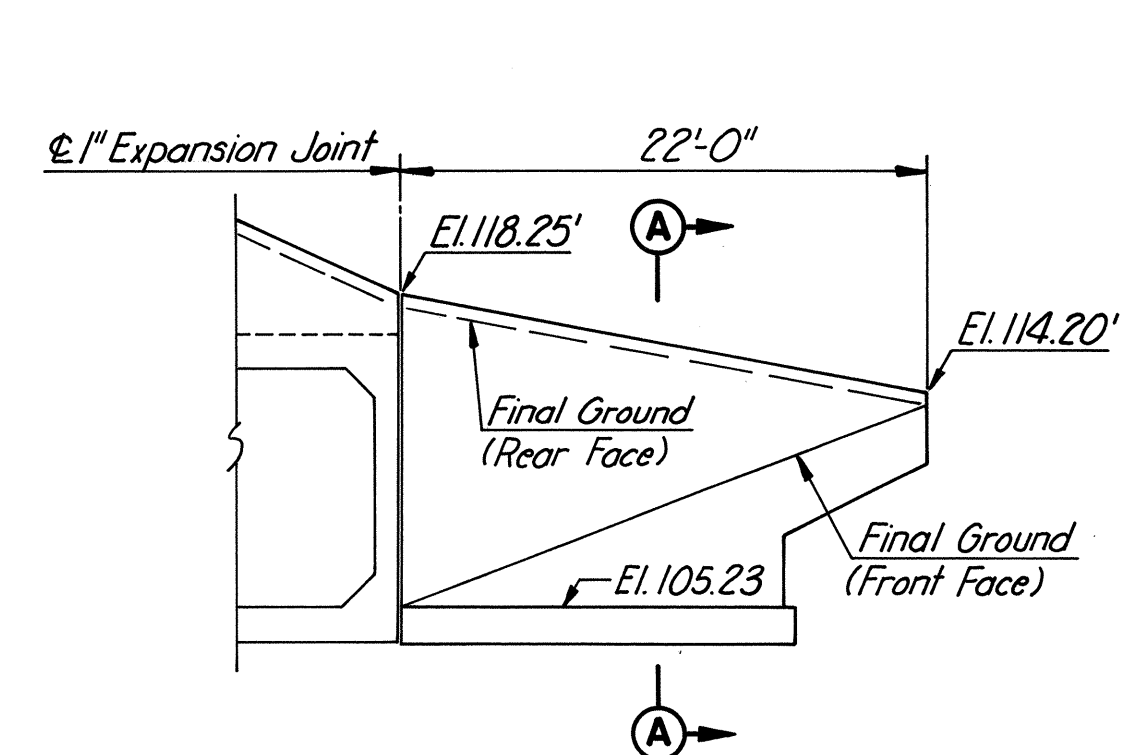
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM  
 POWHITE PARKWAY  
 14' x 10' QUADRUPLE BOX CULVERT  
 STRUCTURE C-7  
 SECTIONS

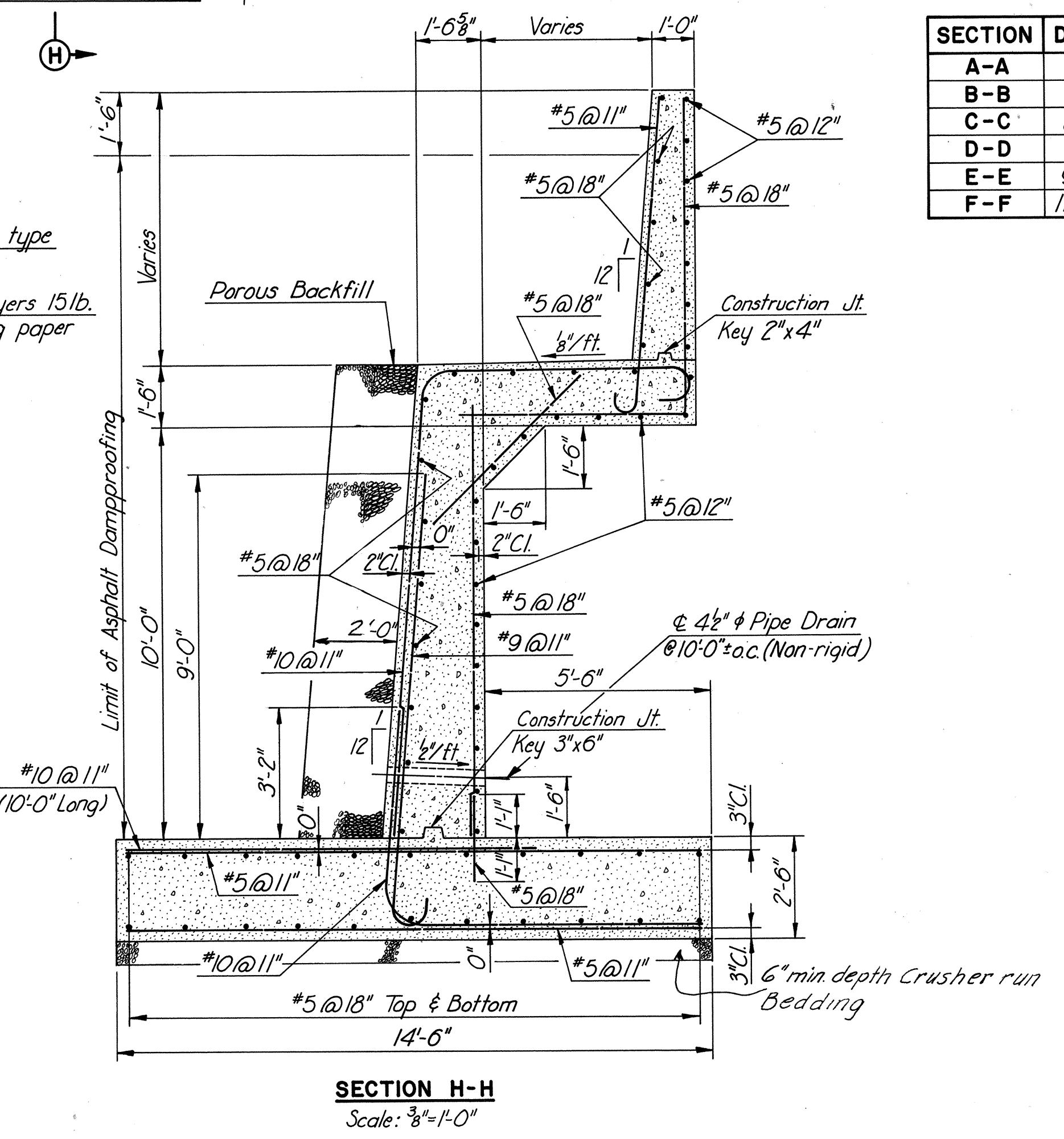
MADE	BY	DATE	NO.	REVISION	BY	DATE
HBW	9-70					
JVB	10-70	1	As Built	JRC	6-73	
PRY						

HOWARD, NEEDLES, TAMMEN & BERGENDOFF consulting engineers NEW YORK ALEXANDRIA KANSAS CITY	SCALE: 1/4" = 1'-0" CONTRACT NO.: 2 SHEET NO. 40 OF 188
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SECTION	DIM. A	DIM. B	DIM. C	DIM. D	BAR A	BAR B	BAR C	BAR D	BAR E
A-A	6'-9"	1'-6"	1'-3"	—	#5 @ 24"	#5 @ 12"	#5 @ 12"	—	—
B-B	7'-3"	1'-6"	2'-3"	—	#5 @ 24"	#5 @ 12"	#5 @ 12"	—	—
C-C	8'-6"	1'-6"	2'-6"	—	#5 @ 24"	#5 @ 12"	#5 @ 12"	#5 @ 12"	—
D-D	7'-3"	1'-6"	1'-6"	—	#5 @ 24"	#6 @ 12"	#7 @ 12"	—	—
E-E	9'-3"	2'-0"	2'-3"	4'-6"	#5 @ 24"	#5 @ 12"	#5 @ 12"	#6 @ 12"	#5 @ 12"
F-F	11'-0"	2'-0"	3'-0"	8'-3"	#5 @ 12"	#5 @ 12"	#6 @ 12"	#8 @ 12"	#7 @ 12"



For "NOTES" see sheet 1.

**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY  
14' x 10' QUADRUPLE BOX CULVERT  
STRUCTURE C-7  
WINGWALL DETAILS

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: As Shown  
CONTRACT NO.: 2  
SHEET NO. 41 OF 188

MADE	JGV	9-70			
CHECKED	JVB	9-70	1	As Built	JRC 6-73
IN CHARGE	P.R.Y.				
BY		DATE		REVISION	BY
					DATE







**RCBC 1831 Plans**

**4 @ 10'X12'**

**(Under Powhite Parkway between POW-N and POW-S Toll Plazas)**







**INDEX OF SHEETS**

SHEET NO.	TITLE
1	COVER SHEET
2	GENERAL NOTES AND LEGEND
3-4	GEOMETRIC LAYOUT AND REFERENCES
5	SUMMARY OF EARTHWORK
6	TYPICAL ROADWAY SECTIONS
7-9	EXISTING CONDITIONS PLANS
10	SITE PLAN - POWHITE CREEK RELOCATION
11	GRADING PLAN - POWHITE CREEK RELOCATION
12-14	PAVING, DRAINAGE & GRADING PLANS
15	PROFILE & TYPICAL SECTION, STREAM RELOCATION
16	ROADWAY PROFILE
17	STORM DRAIN PROFILES & DETAILS
18-22	CHANNEL RELOCATION SEQUENCE AND PROTECTION OF STREAM FLOW PLANS
23-25	EROSION & SEDIMENT CONTROL PLANS
26-27	NOTES & DETAILS, SEDIMENT CONTROL AND PROTECTION OF STREAM FLOW
28	SUGGESTED CULVERT INSTALLATION SEQUENCE
29-30	PLAN AND PROFILE, GABION RETAINING WALL
31-32	GABION RETAINING WALL DETAILS & SECTIONS
33-34	GENERAL PLAN, ELEVATION & DETAILS, QUAD 10' X 12' BOX CULVERT EXTENSION
35	GENERAL PLAN, ELEVATION & DETAILS, TRIPLE 6' X 5' BOX CULVERT EXTENSION
36-37	PLANTING PLAN, NOTES & DETAILS
38-39	SANITARY SEWER AND WATER RELOCATIONS
40-42	PAVEMENT MARKING AND SIGNING PLANS

LIMITED ACCESS HIGHWAY

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
	POWHITE PARKWAY EXPRESS TOLL PROGRAM POWHITE CREEK AND PAVING PROJECT	1	

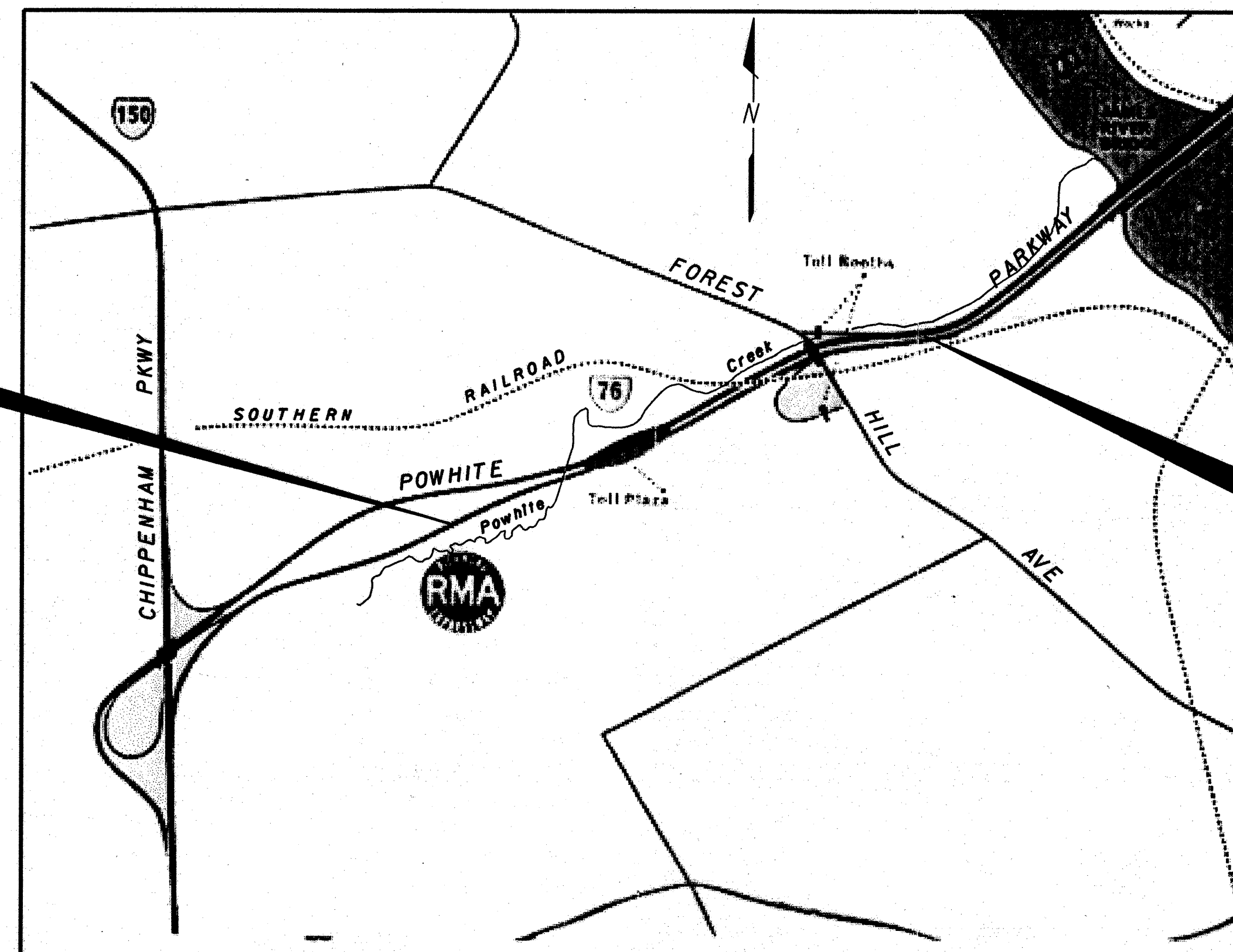
**CONFORMED SET**

**RICHMOND  
METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
**EXPRESS TOLL PROGRAM**

**EAST OF CHIPPENHAM PARKWAY  
TO FOREST HILL AVE.**  
**POWHITE CREEK AND PAVING PROJECT**

ADDENDUM NO. 2: MARCH 25, 2004  
SHEETS - 1, 4, 5, 10, 12, 14, 17, 29,  
30, 31, 32, 40, 41, 42

ADDENDUM NO. 3: APRIL 1, 2004  
SHEETS - 1, 6, 11, 12, 13, 14, 16, 18,  
23, 27, 28, 33, 38, 39, 40, 41, 42



**LIMIT OF CONSTRUCTION  
STA. 600+00, B/L CONSTR.  
POWHITE PARKWAY NB**

**LIMIT OF CONSTRUCTION  
STA. 310+00, B/L CONSTR.  
POWHITE PARKWAY SB**

**CONTRACTOR SHALL NOTIFY  
"MISS UTILITY" @ 800-552-7001  
48 HOURS IN ADVANCE OF  
ANY EXCAVATION ACTIVITY**



SUBMITTED BY	
3-4-04	<i>Laura M. Mehel</i>
Date	LAURA M. MEHEL No. 034707 PROFESSIONAL ENGINEER

RECOMMENDED BY	
3-5-04	<i>John B. Bay</i>
Date	GENERAL MANAGER, RICHMOND METROPOLITAN AUTHORITY

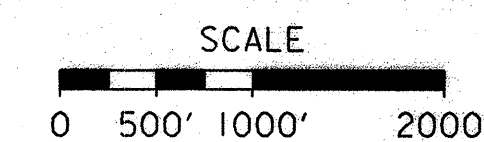
Plans Revised	
Sheet No.	Date

**CONVENTIONAL SIGNS**

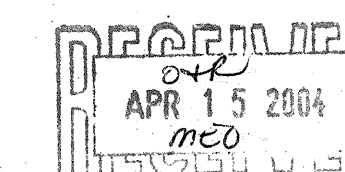
STATE LINE	LEVEES OR EMBANKMENT	
COUNTY LINE	BRIDGES	
CITY/TOWN OR VILLAGE	CULVERTS	
RIGHT OF WAY LINE	DROP INLET	
FENCE LINE	POWER POLES	
UNFENCED PROPERTY LINE	TELEPHONE OR TELEGRAPH POLES	
FENCED PROPERTY LINE	TELEPHONE OR TELEGRAPH LINES	
WATER LINE	HEDGE	
SANITARY SEWER LINE	TREES	
GAS LINE	HEAVY WOODS	
ELECTRIC UNDERGROUND CABLE	GROUND ELEVATION	
TRAVELED WAY	GRADE ELEVATION	
GUARD RAIL		
RETAINING WALL		
RAILROADS		
BASE OR SURVEY LINE		

FOR ADDITIONAL SYMBOLS AND SIGNS, SEE LEGEND ON SHEET 2.

**LOCATION MAP**



**CONTRACT PCPP - 2004**



**HNTB  
CORPORATION**  
9175 GUILFORD ROAD, SUITE 100  
COLUMBIA, MARYLAND 21046  
(301) 543-1000

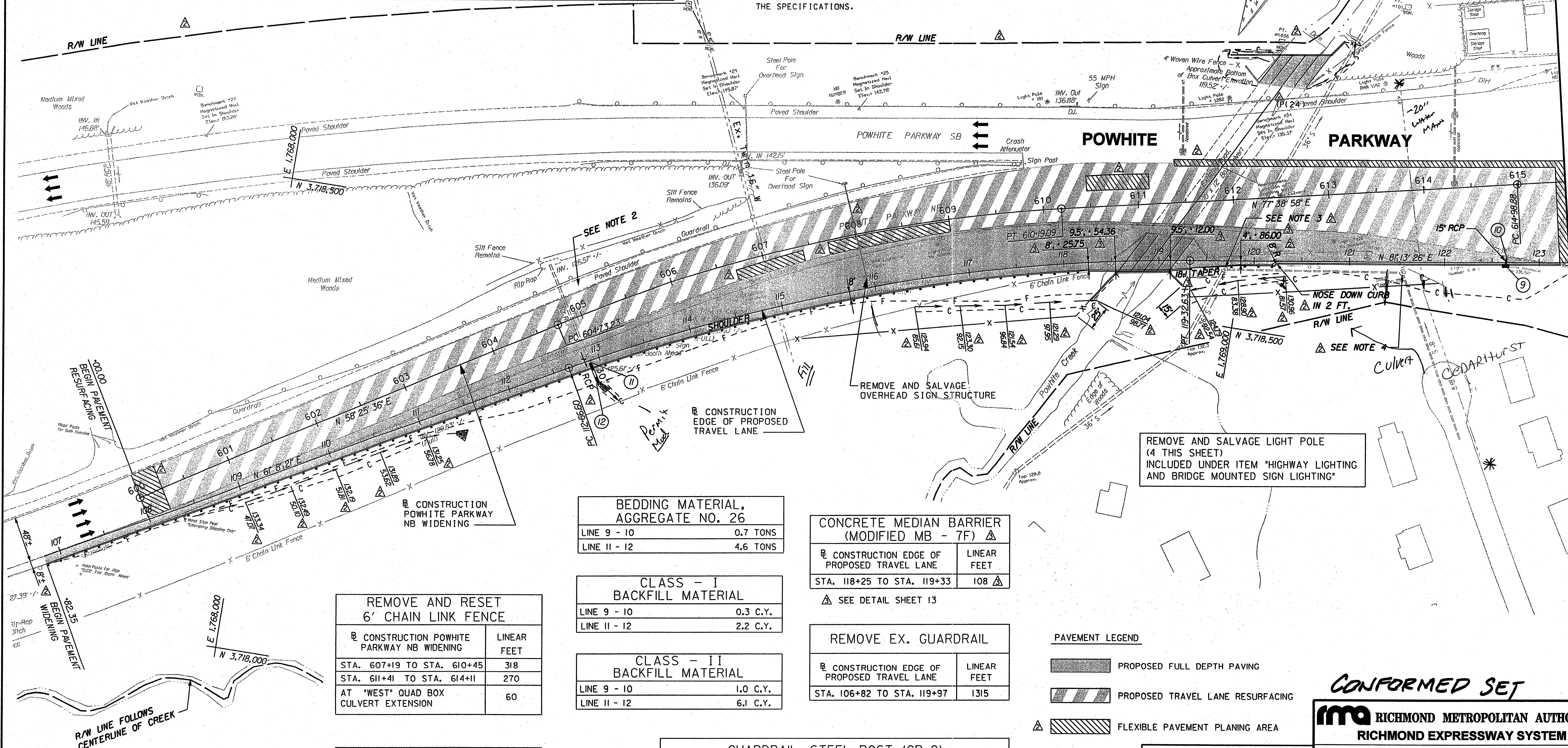
SUPERVISED BY *L.M.M.*  
DESIGNED BY *T.A.C.*  
CADD OPERATOR *J.A.I.*  
REVISED BY



DRAINAGE TABULATIONS								
STR. No.	LINE	LOCATION	DESCRIPTION	INV. TO INV.	TOP	'D' OR 'H'	COVER	REMARKS
9		STA 122+65, @ CONST. EDGE OF PROPOSED TRAVEL LANE	STANDARD DROP INLET		132.07'	4.23'		STD. NO. DI-3A
	9 - 10		6' - 15" RCP	127.90' - 127.84'			2.98'	
10		122+65, 3.75' LT	EX. INLET		129.93'			SEE NOTE 1
11		112+88, 50.68' RT	EX. END OF PIPE		133.82'	8.21'		
	11 - 12		23' - 30" RCP	125.61' - 125.41'			5.52'	
12		112+89, 73.32' RT	STANDARD CONC. END SECTION					END SECTION STD. NO. ES-1 BEGIN RIPRAP DITCH

NOTES:

1. MODIFY EX. INLET AS FOLLOWS: REMOVE TOP SLAB AND WALLS DOWN TO ELEV. 129.93. CONSTRUCT CONC. CAP PER DETAIL ON SHEET 17.
2. INSIDE SHOULDER SHALL BE RESURFACED AS SHOWN ON THE TYPICAL SECTIONS.
3. MODIFY EX. SEWER MANHOLE. TO RAISE TOP OF COVER TO PROPOSED ELEV. 133.00. SEE SECTION 520 OF THE SPECIFICATIONS.
4. MODIFY EX. SEWER MANHOLE. TO LOWER TOP OF COVER TO PROPOSED ELEV. 136.87. SEE SECTION 520 OF THE SPECIFICATIONS.
5. PROVIDE RUMBLE STRIP ON OUTSIDE SHOULDER FROM STA. 106+85 TO STA. 120+15.
6. PROVIDE RUMBLE STRIP ON INSIDE SHOULDER FROM STA. 600+00 TO STA. 609+00.



MATCHLINE - SEE SHEET 13

BEDDING MATERIAL, AGGREGATE NO. 26	
LINE 9 - 10	0.7 TONS
LINE 11 - 12	4.6 TONS

CLASS - I BACKFILL MATERIAL	
LINE 9 - 10	0.3 C.Y.
LINE 11 - 12	2.2 C.Y.

CLASS - II BACKFILL MATERIAL	
LINE 9 - 10	1.0 C.Y.
LINE 11 - 12	6.1 C.Y.

CONCRETE MEDIAN BARRIER (MODIFIED MB - 7F)	
CONSTRUCTION EDGE OF PROPOSED TRAVEL LANE	LINEAR FEET
STA. 118+25 TO STA. 119+33	108

SEE DETAIL SHEET 13

REMOVE EX. GUARDRAIL	
CONSTRUCTION EDGE OF PROPOSED TRAVEL LANE	LINEAR FEET
STA. 106+82 TO STA. 119+97	1315

REMOVE AND RESET 6' CHAIN LINK FENCE	
CONSTRUCTION POWHITE PARKWAY NB WIDENING	LINEAR FEET
STA. 607+19 TO STA. 610+45	318
STA. 611+41 TO STA. 614+11	270
AT "WEST" QUAD BOX CULVERT EXTENSION	60

CURB AND GUTTER (CG-6)	
CONSTRUCTION EDGE OF PROPOSED TRAVEL LANE	LINEAR FEET
STA. 120+19 TO STA. 123+23	104

GUARDRAIL, STEEL POST (GR-2)		
CONSTRUCTION EDGE OF PROPOSED TRAVEL LANE	LINEAR FEET	END TREATMENT
STA. 106+83 TO STA. 118+34	1101	MEET EX. / GR-FOA-2, TYPE I
STA. 119+33 TO STA. 120+19	61	GR-FOA-2, TYPE II / GR-II

REMOVE AND SALVAGE LIGHT POLE (4 THIS SHEET) INCLUDED UNDER ITEM "HIGHWAY LIGHTING AND BRIDGE MOUNTED SIGN LIGHTING"

PAVEMENT LEGEND

	PROPOSED FULL DEPTH PAVING
	PROPOSED TRAVEL LANE RESURFACING
	FLEXIBLE PAVEMENT PLANING AREA

**CONFORMED SET**  
**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**

**HNTB CORPORATION**  
 9175 GUILFORD ROAD, SUITE 100  
 COLUMBIA, MARYLAND 21046  
 (301) 543-1000

**POWHITE CREEK AND PAVING PROJECT**  
 PAVEMENT, GRADING & DRAINAGE PLAN  
 STA. 600+00 TO STA. 615+50,  
 POWHITE PARKWAY NB WIDENING

Scale: 1" = 50'  
 Date: 3/3/04  
 Contract No: PCPP-2004  
 Sheet: 12 of 42

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ADDENDUM NO.	DATE
ADDENDUM NO. 3	APR. 1, 2004
ADDENDUM NO. 2	MAR. 25, 2004

REVISIONS



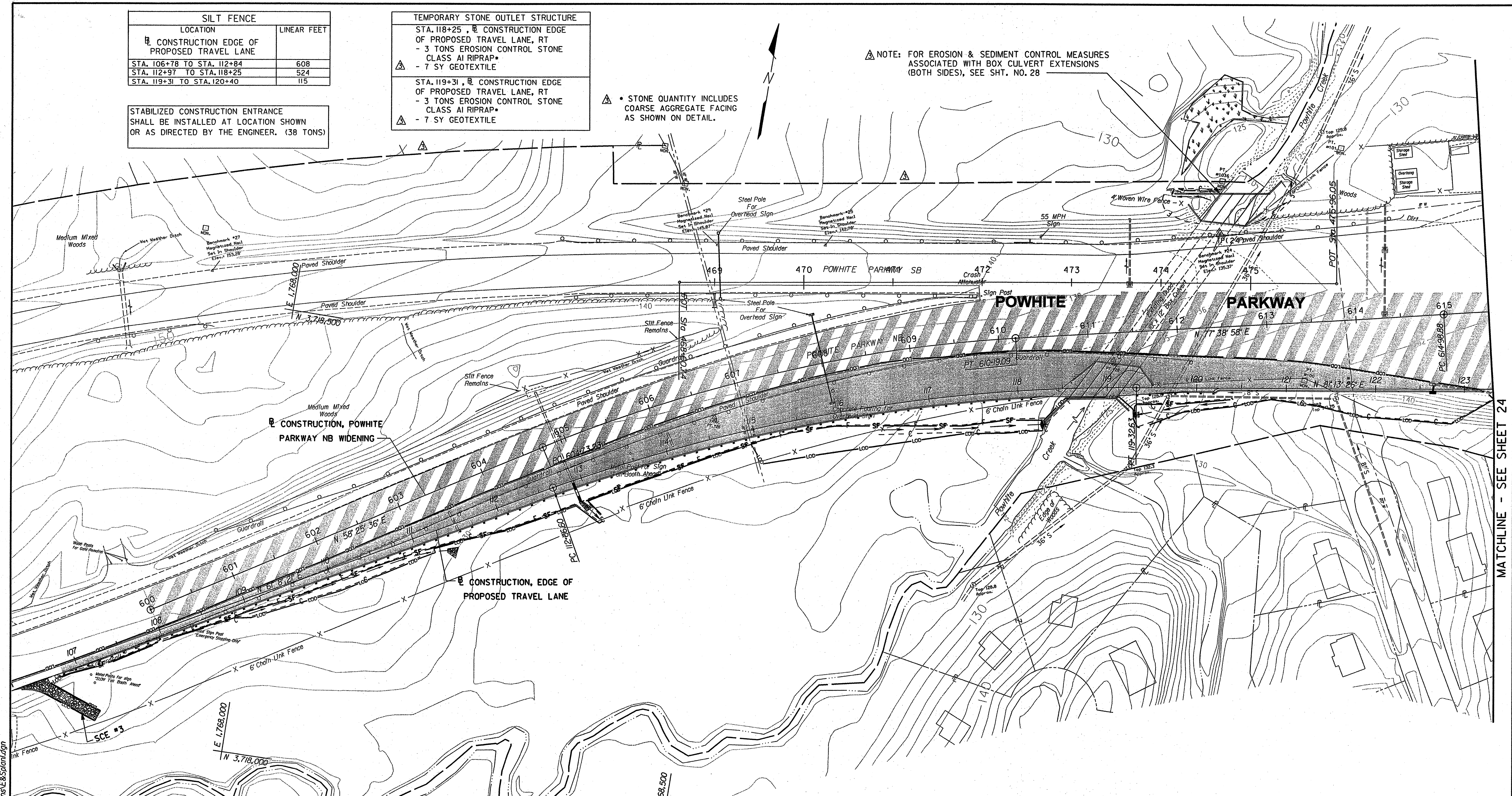
SILT FENCE	
LOCATION	LINEAR FEET
CONSTRUCTION EDGE OF PROPOSED TRAVEL LANE	
STA. 106+78 TO STA. 112+84	608
STA. 112+97 TO STA. 118+25	524
STA. 119+31 TO STA. 120+40	115

STABILIZED CONSTRUCTION ENTRANCE SHALL BE INSTALLED AT LOCATION SHOWN OR AS DIRECTED BY THE ENGINEER. (38 TONS)

TEMPORARY STONE OUTLET STRUCTURE	
STA. 118+25, CONSTRUCTION EDGE OF PROPOSED TRAVEL LANE, RT	- 3 TONS EROSION CONTROL STONE CLASS A1 RIPRAP - 7 SY GEOTEXTILE
STA. 119+31, CONSTRUCTION EDGE OF PROPOSED TRAVEL LANE, RT	- 3 TONS EROSION CONTROL STONE CLASS A1 RIPRAP - 7 SY GEOTEXTILE

• STONE QUANTITY INCLUDES COARSE AGGREGATE FACING AS SHOWN ON DETAIL.

NOTE: FOR EROSION & SEDIMENT CONTROL MEASURES ASSOCIATED WITH BOX CULVERT EXTENSIONS (BOTH SIDES), SEE SH. NO. 28



MATCHLINE - SEE SHEET 24

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ADDENDUM NO. 3: APR. 1, 2004
REVISIONS

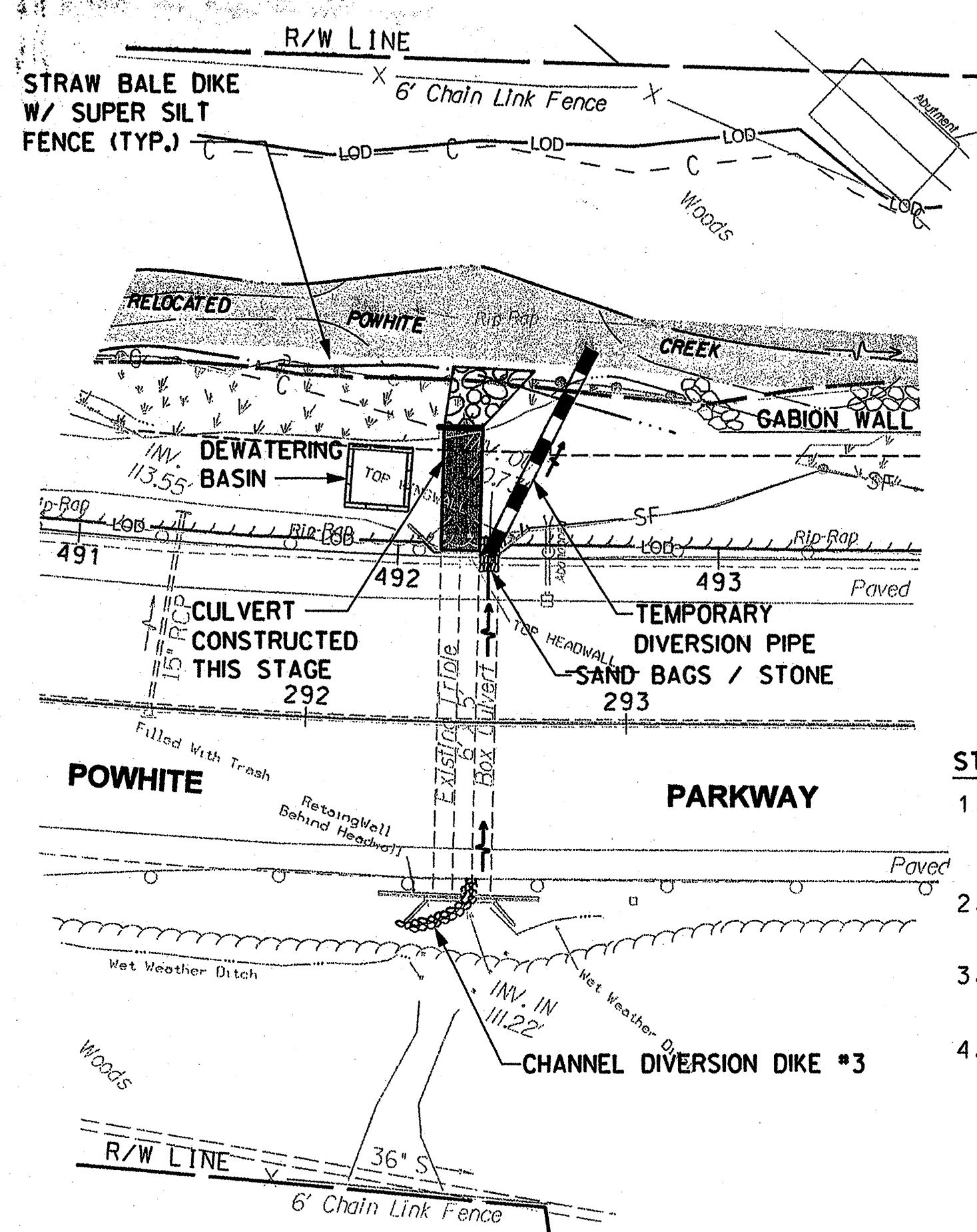
**HNTB CORPORATION**  
 9175 GUILFORD ROAD, SUITE 100  
 COLUMBIA, MARYLAND 21046  
 (301) 543-1000

**RM** RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM

**POWHITE CREEK AND PAVING PROJECT**  
 EROSION & SEDIMENT CONTROL PLAN  
 STA. 600+00 TO STA. 615+50,  
 POWHITE PARKWAY NB WIDENING

Scale: 1" = 50'	Date: 3/3/04	Contract No.:	Sheet:
		PCPP-2004	23 of 42





DEWATERING BASIN	
STA 491+93, LT (20' x 20')	
- 0.5 TONS AGGREGATE NO. 26	
- 1.5 TONS EROSION CONTROL STONE, CL. AI	
- 77 LF STRAW BALE DIKE	
- 49 SY GEOTEXTILE FABRIC	

CHANNEL DIVERSION DIKE	
LOCATION	LINEAR FEET
STA. 492+00 TO STA. 492+25, RT	32
@ STA. 492+29	12

**STAGE I**

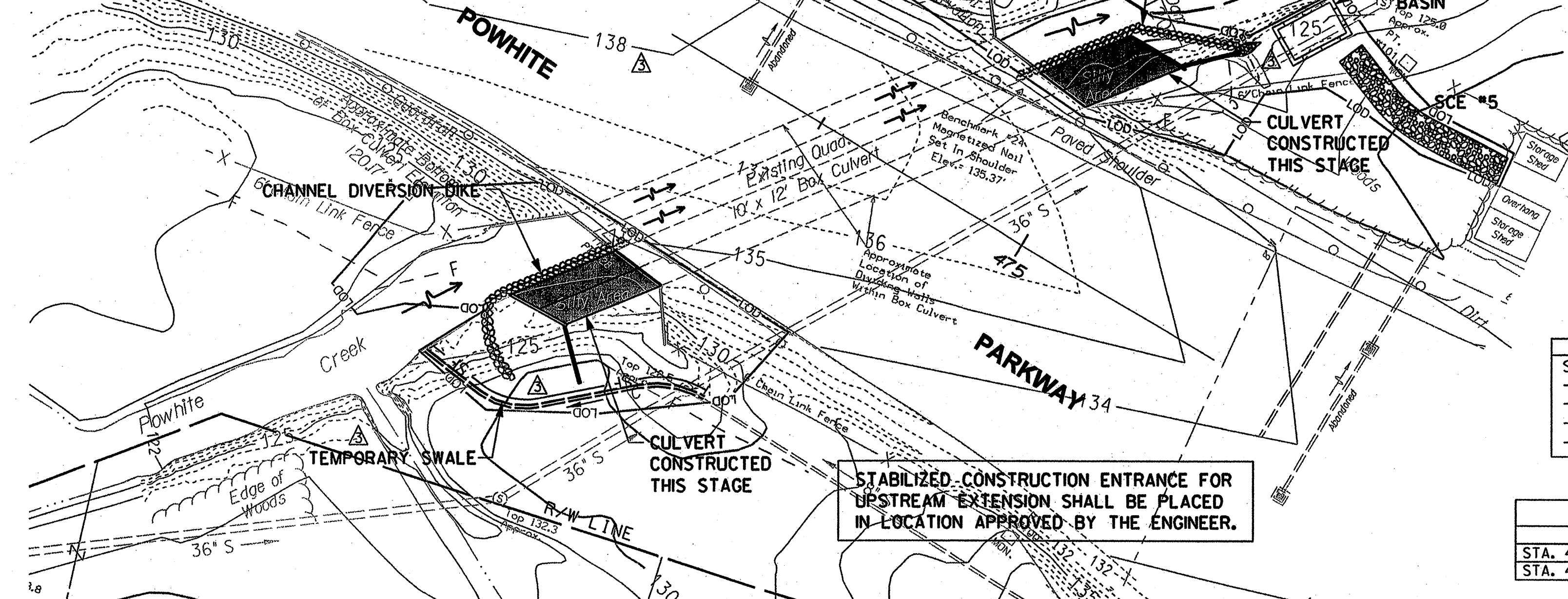
1. INSTALL CHANNEL DIVERSION DIKE & TEMP DIVERSION PIPE TO DIVERT FLOWS. INSTALL DEWATERING BASIN.
2. REMOVE PORTION OF EXISTING HEADWALL AS REQUIRED TO PERFORM EXTENSION.
3. CONSTRUCT PORTION OF CULVERT AND HEADWALL AS SHOWN.
4. STABILIZE THE OUTFALL WITH RIPRAP.

**STAGE I**

1. INSTALL CHANNEL DIVERSION DIKES TO DIVERT FLOW AS SHOWN. INSTALL DEWATERING BASIN.
2. CONSTRUCT TEMPORARY SWALE TO CHANNEL SURFACE RUN-OFF AROUND CULVERT EXTENSION SITE.
3. PLACE SILT FENCE AND TEMPORARY STONE OUTLET STRUCTURE AS SHOWN ON THE PLAN.
4. REMOVE PORTION OF EXISTING HEADWALL AS REQUIRED TO PERFORM EXTENSIONS.
5. CONSTRUCT PORTIONS OF CULVERT AND HEADWALL AS SHOWN.

SILT FENCE	
LOCATION	LINEAR FEET
STA. 473+07 TO STA. 474+17, RT	127

TEMPORARY SWALE A-2	
LOCATION	LINEAR FEET
STA. 473+07 TO STA. 474+17, RT	127

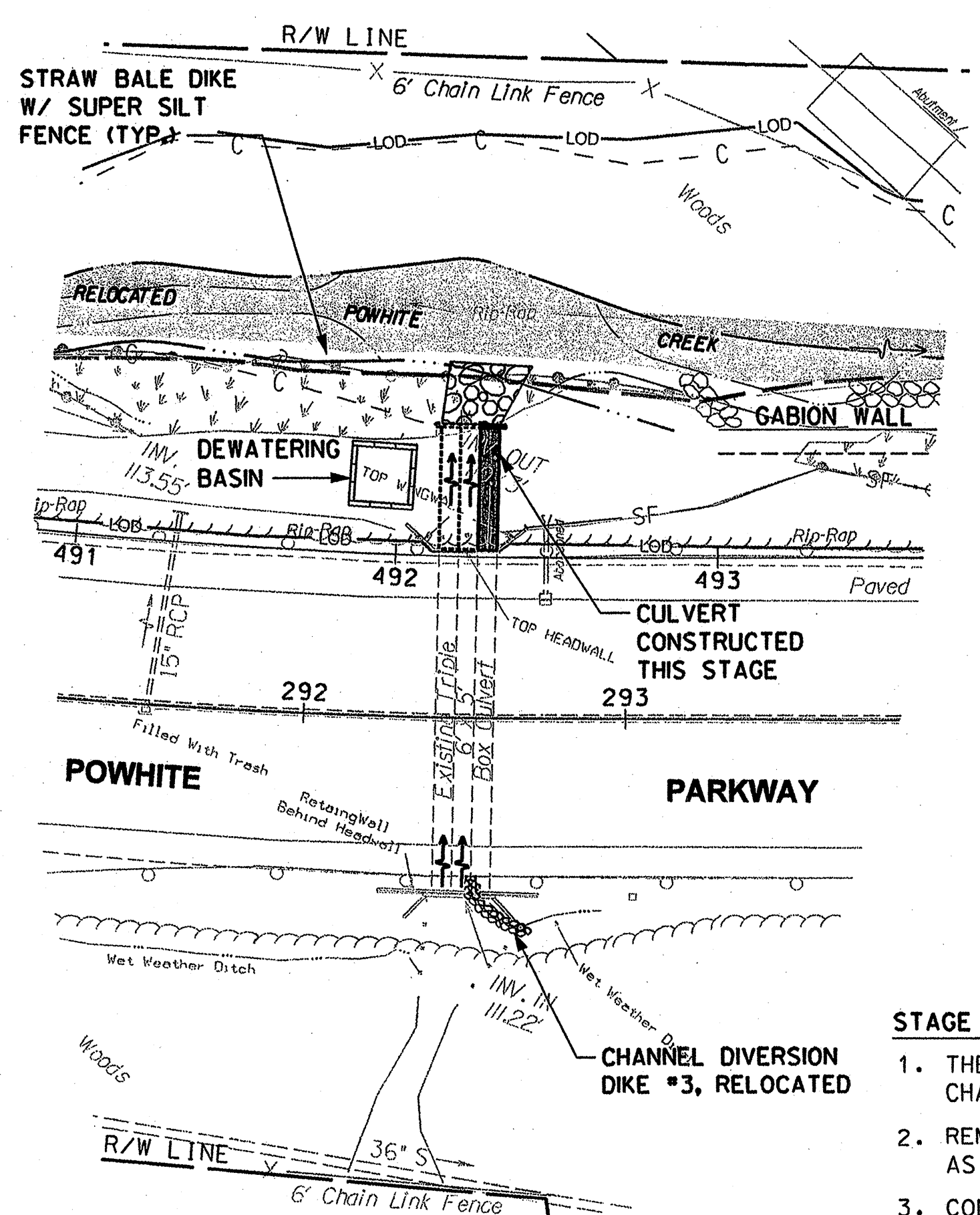


STABILIZED CONSTRUCTION ENTRANCE FROM EDGE OF RMA PARKING LOT (#5)	
- 41 TONS	
- 1 WASH RACK REQUIRED FOR UPSTREAM EXTENSION	
- 45 TONS	
(RE-USE WASH RACK)	

TEMPORARY STONE OUTLET STRUCTURE	
STA. 475+42, LT	
- 3 TONS EROSION CONTROL STONE CLASS AI RIPRAP	
- 7 SY GEOTEXTILE	

DEWATERING BASIN	
STA 475+59, LT (29' x 19')	
- 0.5 TONS AGGREGATE NO. 26	
- 1.5 TONS EROSION CONTROL STONE, CL. AI	
- 93 LF STRAW BALE DIKE	
- 67 SY GEOTEXTILE FABRIC	

CHANNEL DIVERSION DIKE	
LOCATION	LINEAR FEET
STA. 474+17 TO STA. 474+62, RT	101
STA. 474+17 TO STA. 474+51, LT	104



RELOCATED CHANNEL DIVERSION DIKE	
LOCATION	LINEAR FEET
STA. 492+25 TO STA. 492+42, RT	29

**STAGE II**

1. THE FLOW AS SHOWN BY RELOCATING THE CHANNEL DIVERSION DIKE.
2. REMOVE REMAINING PORTION OF EXISTING HEADWALL AS REQUIRED.
3. CONSTRUCT REMAINING PORTION OF BOX CULVERT & PLACE RIPRAP AS SHOWN ON PLAN.
4. STARTING AT THE DOWNSTREAM LIMIT, REMOVE TEMPORARY DIVERSION DEVICES. STABILIZE ALL DISTURBED AREAS.

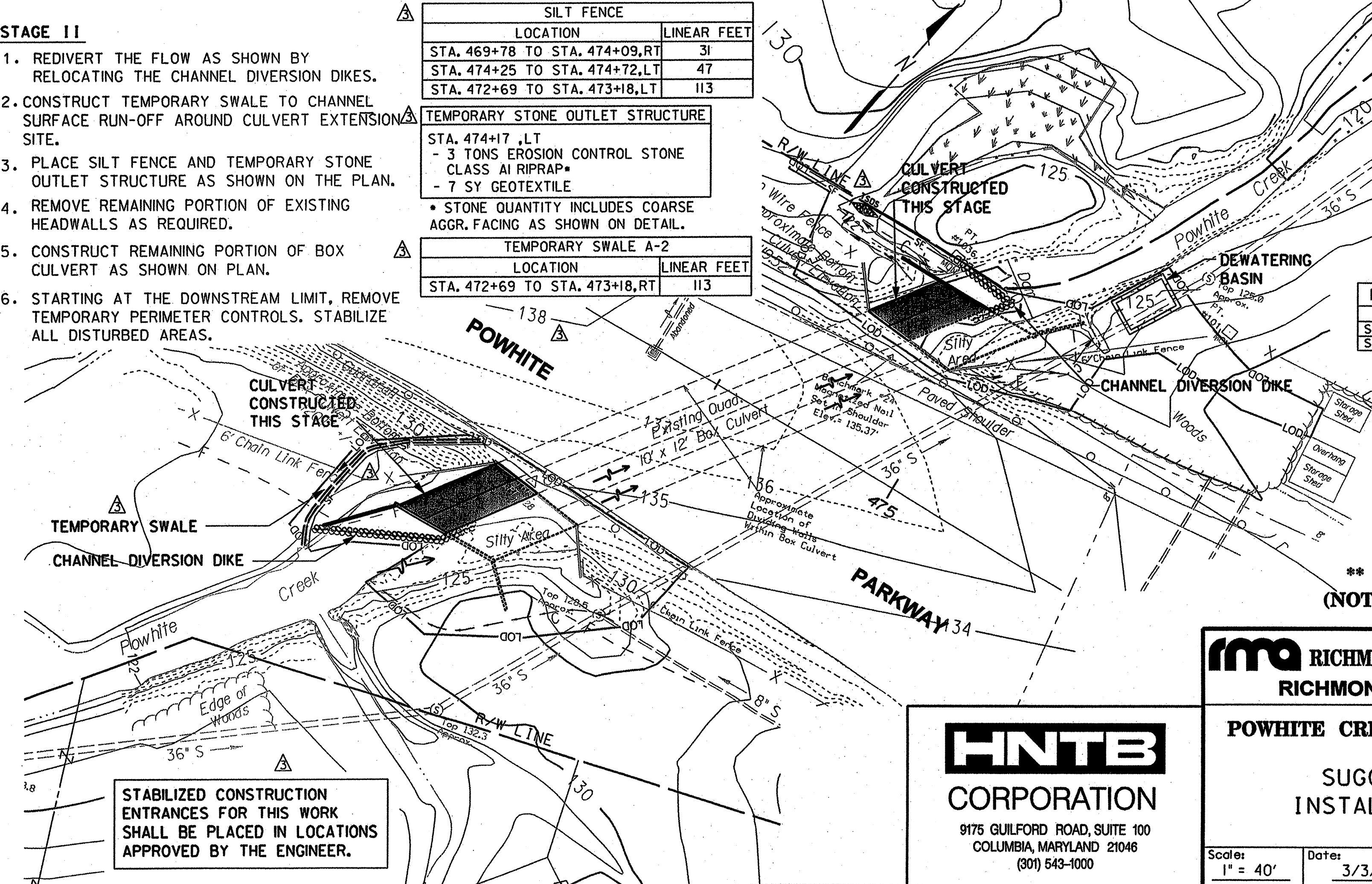
**STAGE II**

1. REDIVERT THE FLOW AS SHOWN BY RELOCATING THE CHANNEL DIVERSION DIKES.
2. CONSTRUCT TEMPORARY SWALE TO CHANNEL SURFACE RUN-OFF AROUND CULVERT EXTENSION SITE.
3. PLACE SILT FENCE AND TEMPORARY STONE OUTLET STRUCTURE AS SHOWN ON THE PLAN.
4. REMOVE REMAINING PORTION OF EXISTING HEADWALLS AS REQUIRED.
5. CONSTRUCT REMAINING PORTION OF BOX CULVERT AS SHOWN ON PLAN.
6. STARTING AT THE DOWNSTREAM LIMIT, REMOVE TEMPORARY PERIMETER CONTROLS. STABILIZE ALL DISTURBED AREAS.

SILT FENCE	
LOCATION	LINEAR FEET
STA. 469+78 TO STA. 474+09, RT	31
STA. 474+25 TO STA. 474+72, LT	47
STA. 472+69 TO STA. 473+18, LT	113

TEMPORARY STONE OUTLET STRUCTURE	
STA. 474+17, LT	
- 3 TONS EROSION CONTROL STONE CLASS AI RIPRAP	
- 7 SY GEOTEXTILE	

TEMPORARY SWALE A-2	
LOCATION	LINEAR FEET
STA. 472+69 TO STA. 473+18, RT	113



STABILIZED CONSTRUCTION ENTRANCE	
- 90 TONS	
(RE-USE WASH RACK FROM SCE #5)	

RELOCATED CHANNEL DIVERSION DIKE	
LOCATION	LINEAR FEET
STA. 473+84 TO STA. 474+25, RT	83
STA. 473+90 TO STA. 474+25, LT	51

**\*\* ISSUED FOR BID \*\*  
(NOT FOR CONSTRUCTION)**

**RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM**

**POWHITE CREEK AND PAVING PROJECT**

**SUGGESTED CULVERT  
INSTALLATION SEQUENCE**

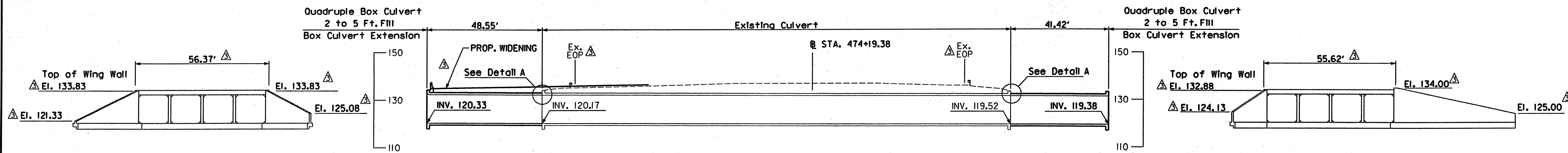
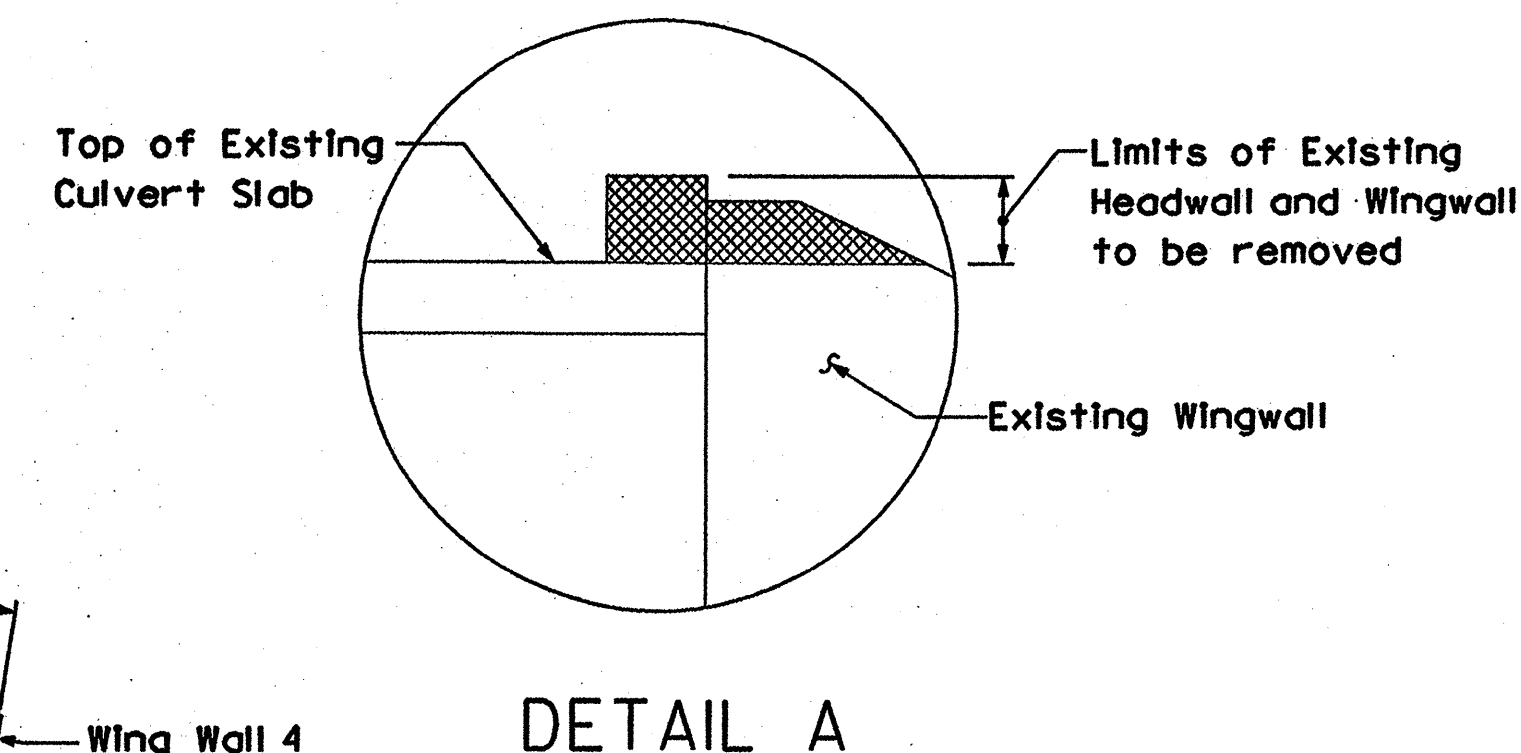
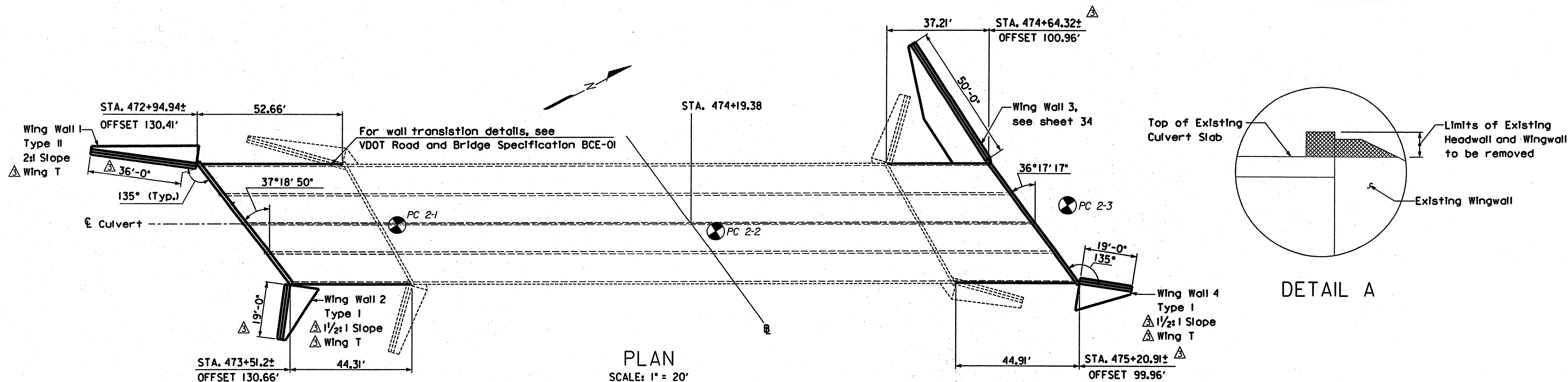
**HNTB  
CORPORATION**

9175 GUILFORD ROAD, SUITE 100  
COLUMBIA, MARYLAND 21046  
(301) 543-1000

Scale: 1" = 40' Date: 3/3/04 Contract No.: PCPP-2004 Sheet: 28 of 42

ADDENDUM NO. 3: APR. 1, 2004  
REVISIONS





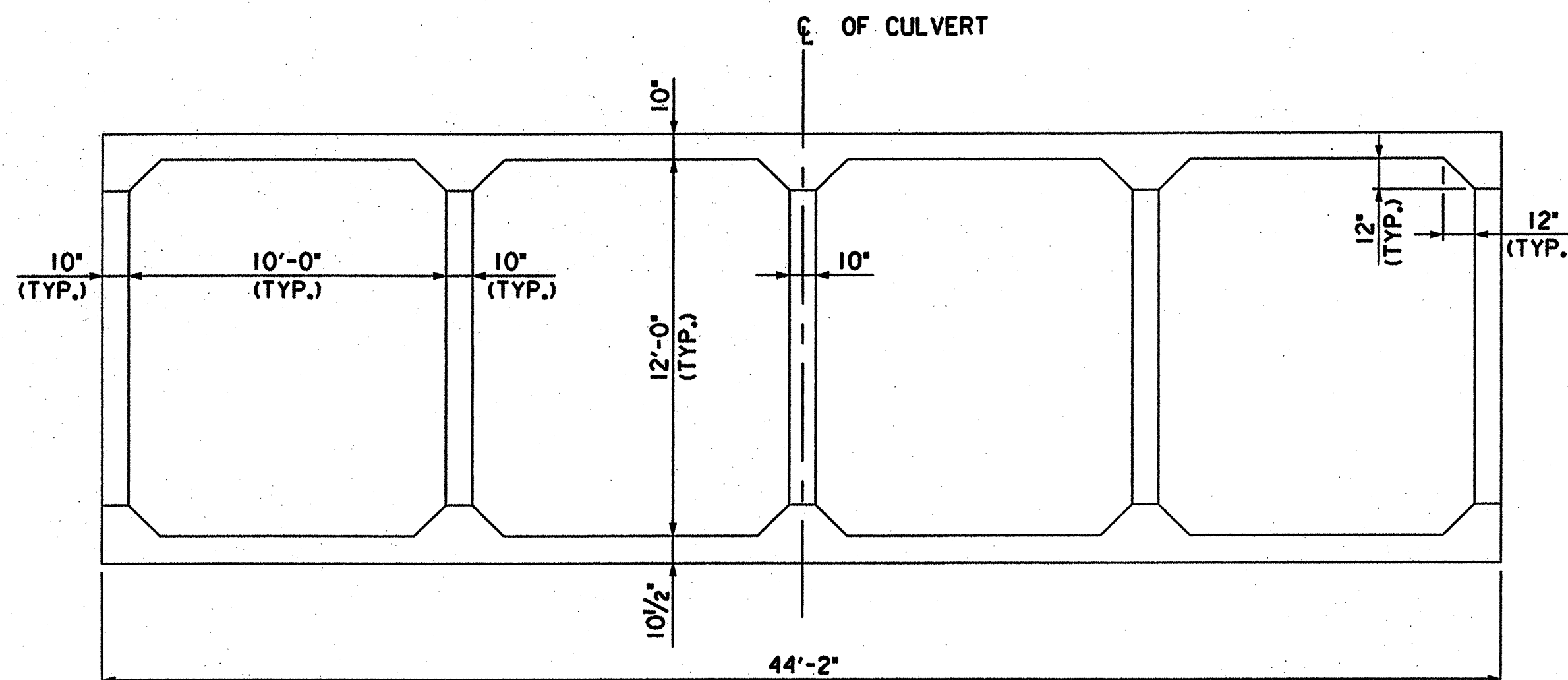
ELEVATION @ CULVERT C-C  
SCALE: 1" = 20'

Notes:

1. Box Culvert Extension materials and construction shall be in accordance with VDOT Road and Bridge Standards, BC0-5 10'x12'.
2. Wingwall materials and construction shall be in accordance with VDOT Road and Bridge Standards, BCW-II and BCW-22.
3. Contractor shall field verify all dimensions pertaining to existing box culvert.

Estimated Quantities  
Box Culvert Extension

Minor Structural Excavation	690 C.Y.
Concrete Class A4	390 C.Y.
Reinforcing Steel	72,850 LBS.
Class II Backfill	287 C.Y.
Bedding Material, Agg #26	630 TONS



TYPICAL EXISTING SECTION

Wing	Estimated Quantities Wing Wall	
	Concrete Cu. yd.	Reinforcing Steel Lbs.
1	22	1,953
2	17	1,150
3	56	5,281
4	17	1,150

**\*\* ISSUED FOR BID \*\***  
**(NOT FOR CONSTRUCTION)**

**RM** RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM

**POWHITE CREEK AND PAVING PROJECT**  
VDOT CULVERT NO. 1831  
QUADRUPLE BOX CULVERT EXTENSION  
PLAN & ELEVATION

Scale: AS SHOWN Date: 3/3/04 Contract No.: PCPP-2004 Sheet: 33 of 42

**HNTB**  
CORPORATION

9175 GUILFORD ROAD, SUITE 100  
COLUMBIA, MARYLAND 21046  
(301) 543-1000

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ADDENDUM NO. 3: APR. 25, 2004
REVISIONS