

# **APPENDIX PC-2016**

## **RECORD DRAWINGS**

RMTA BRIDGES Boulevard, 5, 12, 36, 37

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



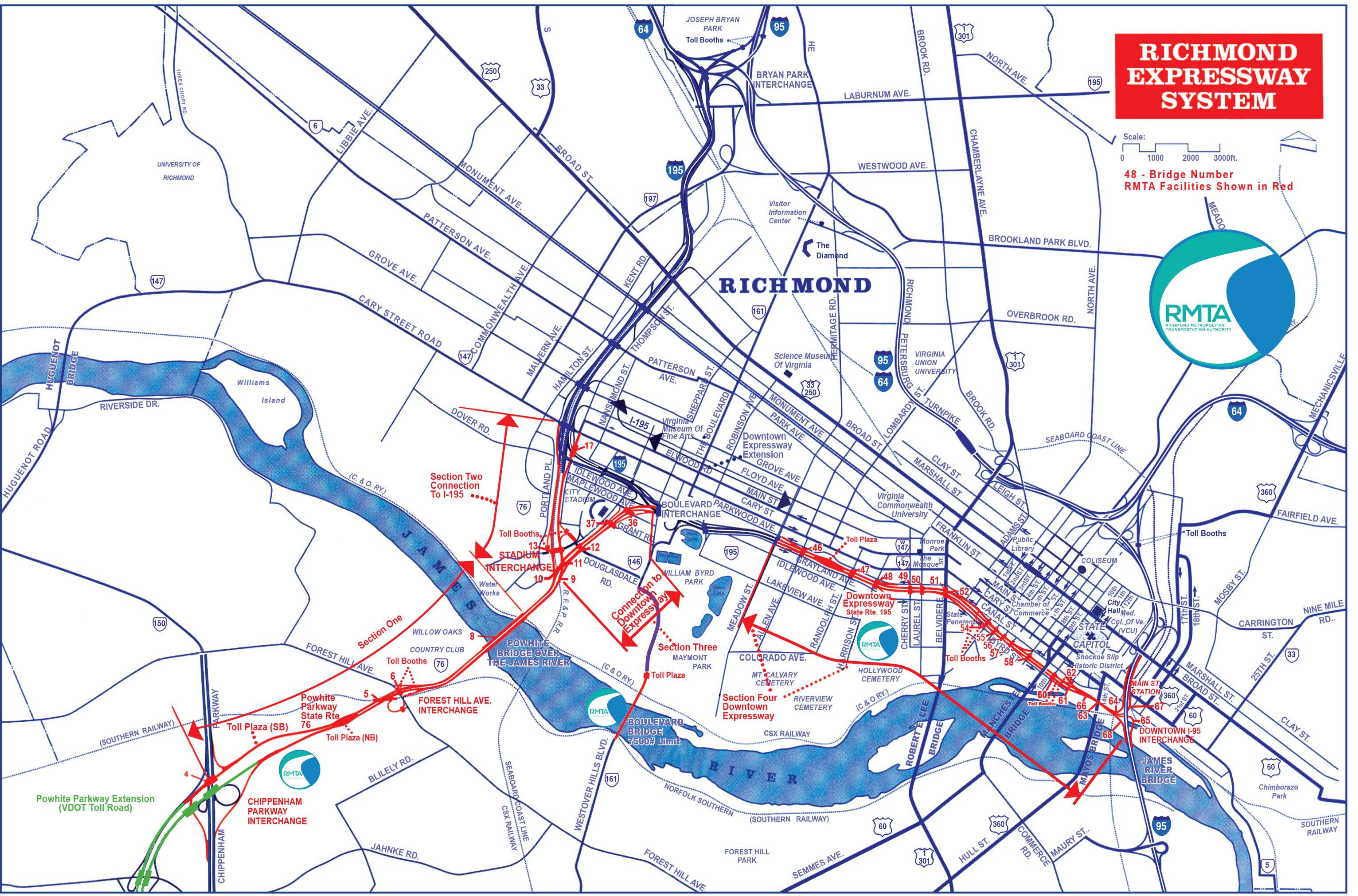
**RMTA**  
**System Map**



# RICHMOND EXPRESSWAY SYSTEM

Scale: 0 1000 2000 3000ft.

48 - Bridge Number  
RMTA Facilities Shown in Red





# **Boulevard Bridge**

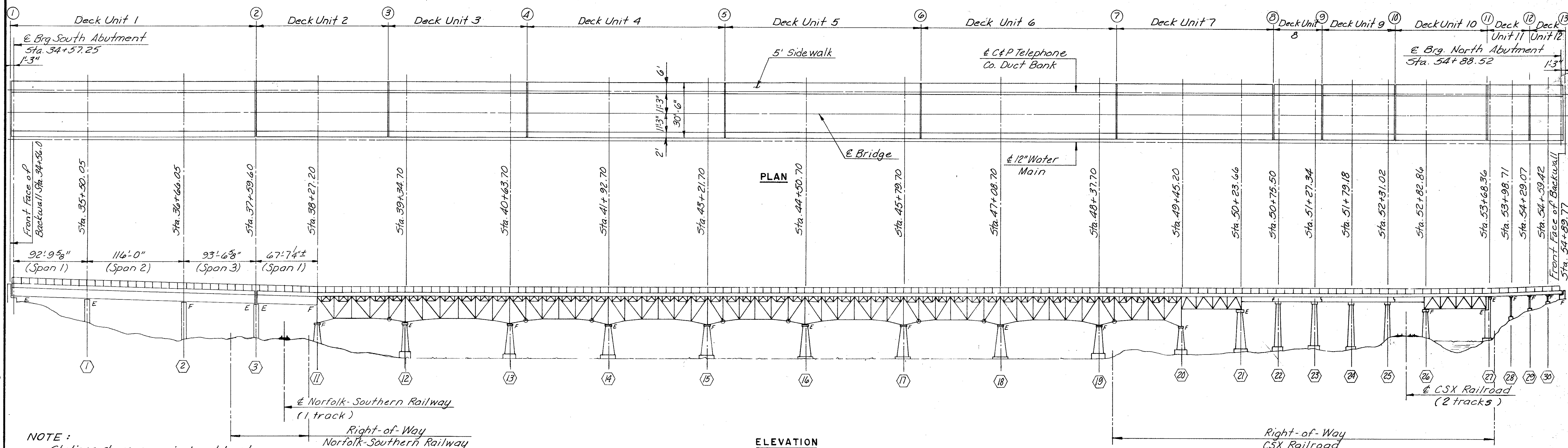
**(VA State Rte. 161 – Westover Hills Blvd.)**

**Partial Record Set of Plans**





RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
C-17B	Boulevard Bridge Rehab	35(1)	



**NOTE:**  
Stations shown approximate and based on surveyed deck joint station. The Contractor is to verify all pertinent dimensions and elevations prior to the fabrication of any structural steel.

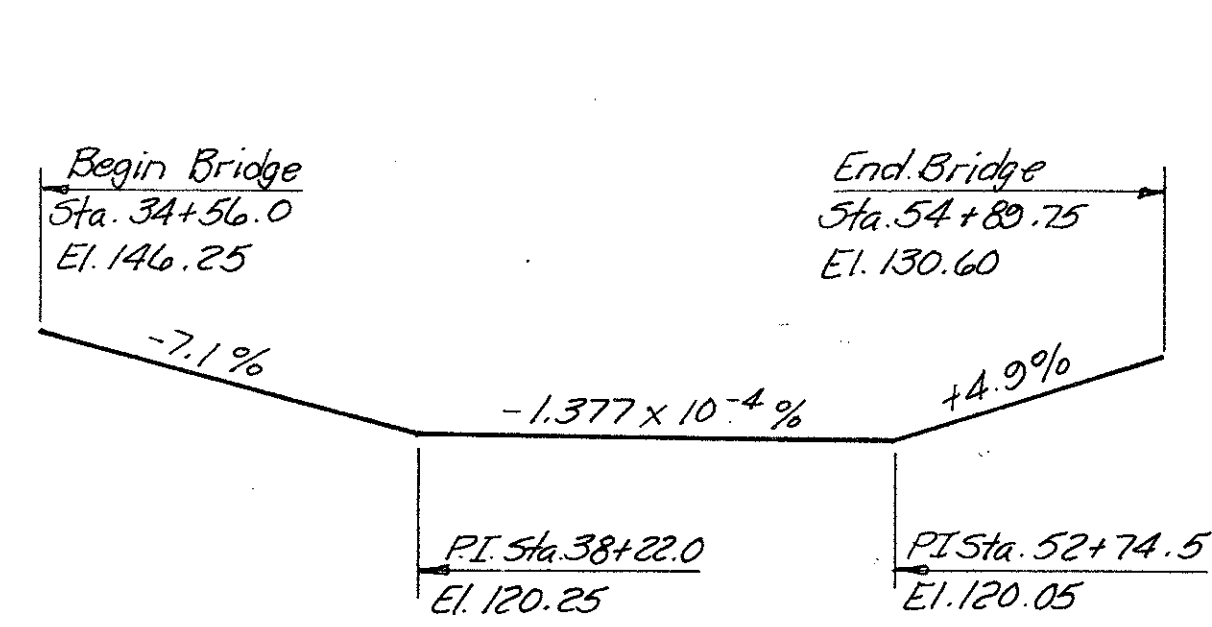
**ELEVATION**

**INDEX**

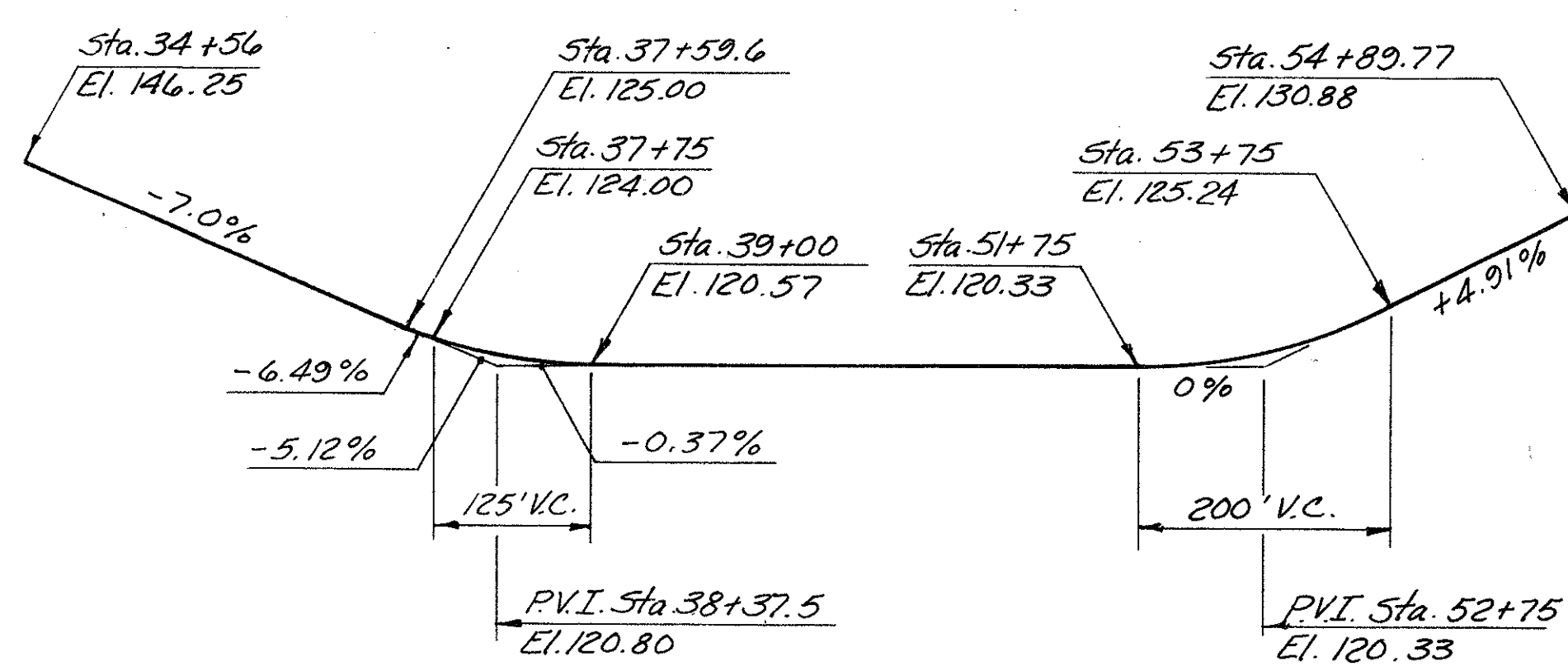
- 1 GENERAL PLAN, ELEVATION AND INDEX
- 2 GENERAL NOTES AND QUANTITIES
- 3 GRADING AND SLOPE PROTECTION AT SOUTH ABUTMENT
- 4 NORTH ABUTMENT SLOPE PROTECTION DETAILS
- 5 & 6 SOUTH ABUTMENT DETAILS
- 7 NORTH ABUTMENT DETAILS
- 8 PIER 1
- 9 PIER 2
- 10 PIER 3
- 11-15 GIRDER DETAILS
- 16 TYPICAL CROSS SECTION
- 17 KEY PLAN, LIGHTING LAYOUT PLAN AND CONCRETE PLACEMENT PLAN
- 18-25 DECK UNIT 1 THROUGH 12 REINFORCING PLANS
- 26 SIDEWALK DETAILS (DELETED)
- 27 EXPANSION JOINT DETAILS
- 28 PREFORMED ELASTOMERIC JOINT SEALER DETAILS
- 29 ELASTOMERIC EXPANSION DAM DETAILS
- 30 SIDEWALK RAILING DETAILS
- 31 TRAFFIC RAILING DETAIL
- 32 TELEPHONE CONDUIT SYSTEM
- 33 WATER MAIN INSTALLATION DETAILS
- 34 BRIDGE LIGHTING SYSTEM
- 35 APPROACH SLAB DETAILS
- 36 SOUTH ABUTMENT DRAINAGE APRON REPAIR AND MODIFICATIONS

**37 & 38 BAR LIST**

**LEGEND:**  
① Joint Number  
① Pier Number



**APPROXIMATE EXISTING PROFILE GRADE**  
Profile grade shown is based on surveyed elevation along the  $\ell$  of the existing bridge. The contractor is to verify all elevations prior to construction.



**PROPOSED PROFILE GRADE**

**NOTE:**  
LOAD RESTRICTIONS ARE CURRENTLY IN EFFECT ON THE EXISTING BRIDGE. CONSTRUCTION EQUIPMENT WEIGHING IN EXCESS OF 8 TONS SHOULD NOT BE PERMITTED ON THE BRIDGE.



BY	DATE	NO.	REVISION	BY	DATE
MADE	H.H. 2-92				
CHECKED	T.E.M. 3-92				
IN CHARGE					

**RECORD DRAWING**

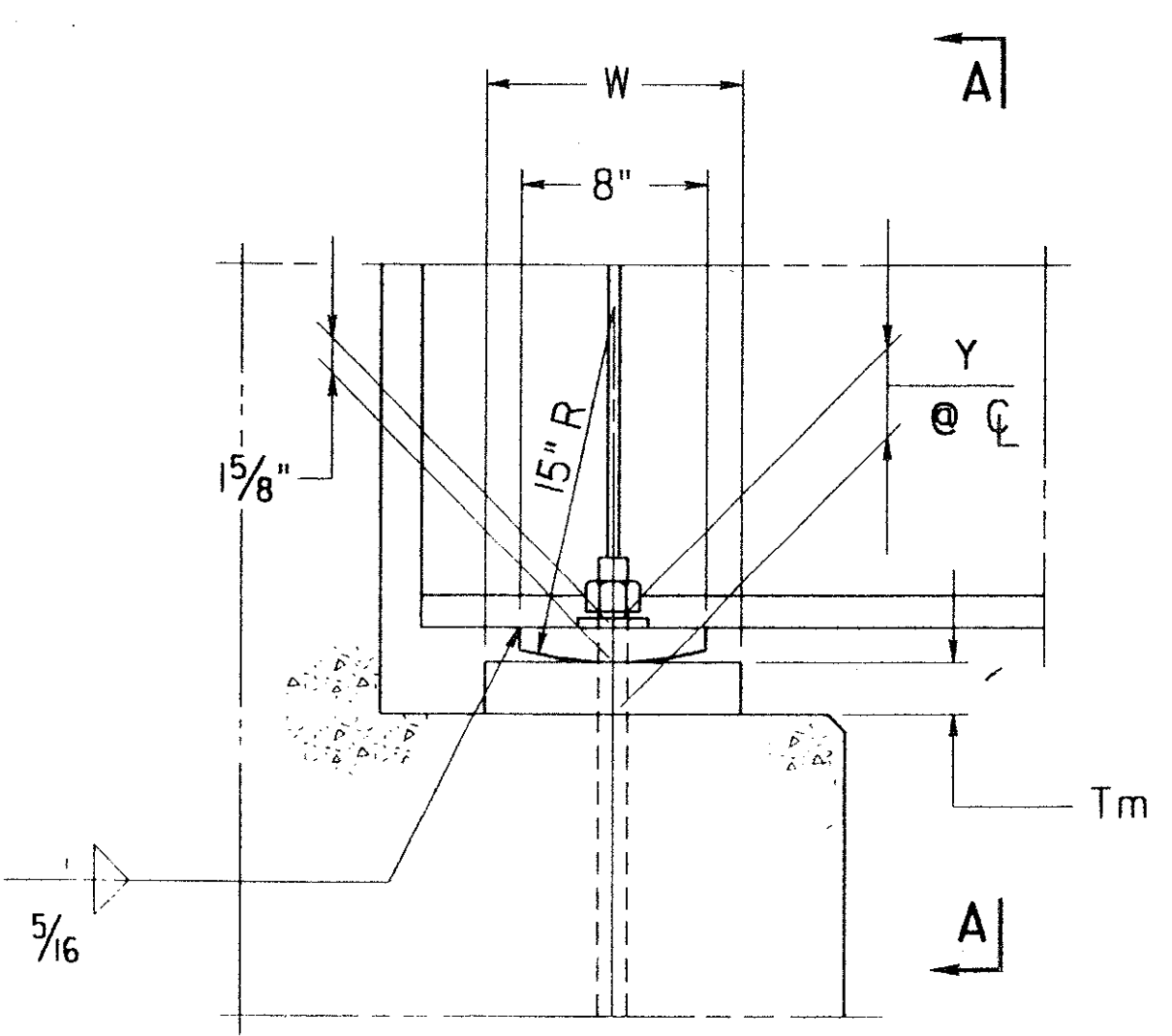
**RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM**

**BOULEVARD BRIDGE REHABILITATION  
DECK REPLACEMENT**

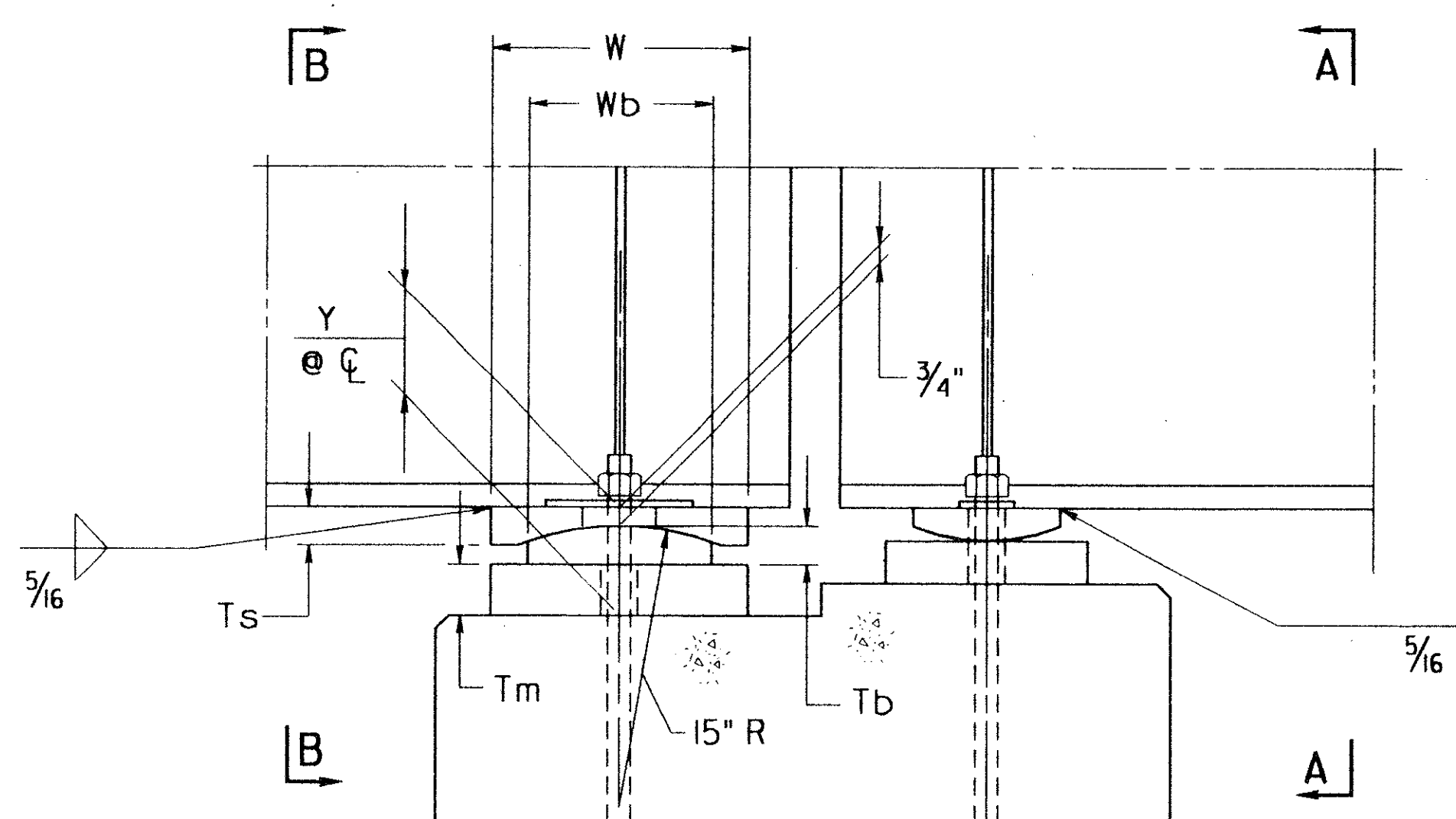
**GENERAL PLAN, ELEVATIONS  
AND INDEX**

SCALE: No. Scale  
CONTRACT NO. C-17B  
SHEET NO. 1 OF 38

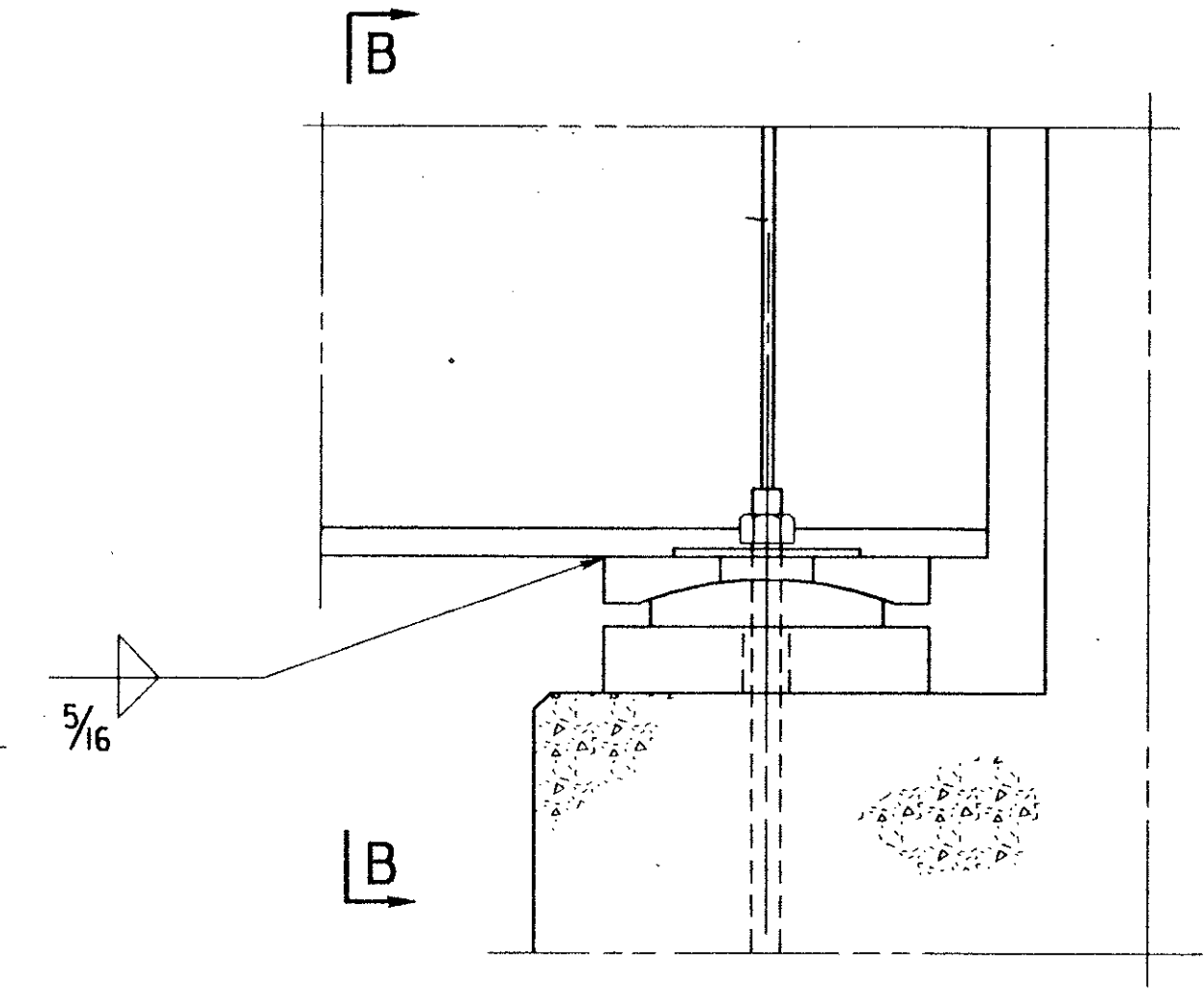
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants



FIXED BEARING ABUTMENT ELEVATION

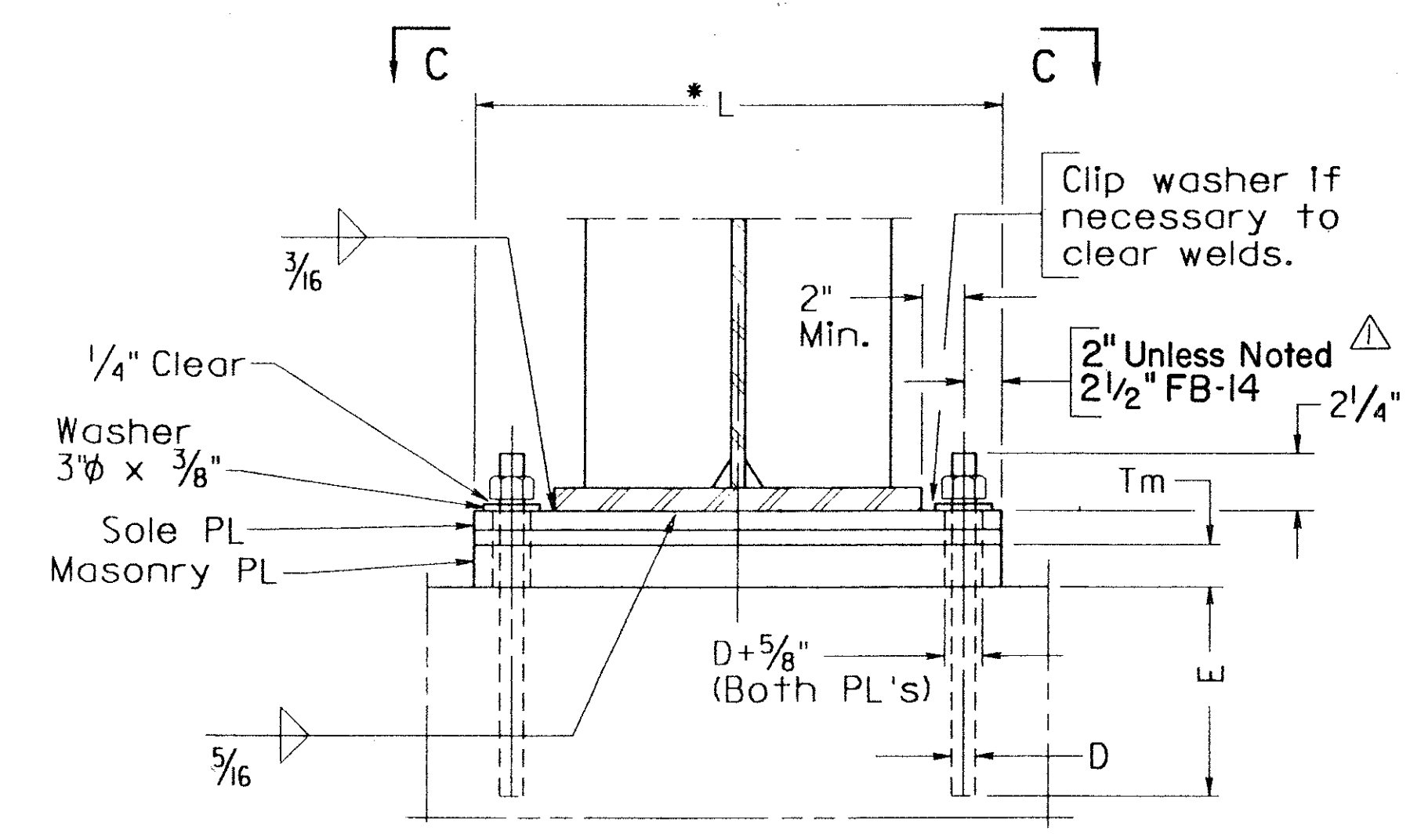


EXP. BEARING FIXED BEARING PIER ELEVATION

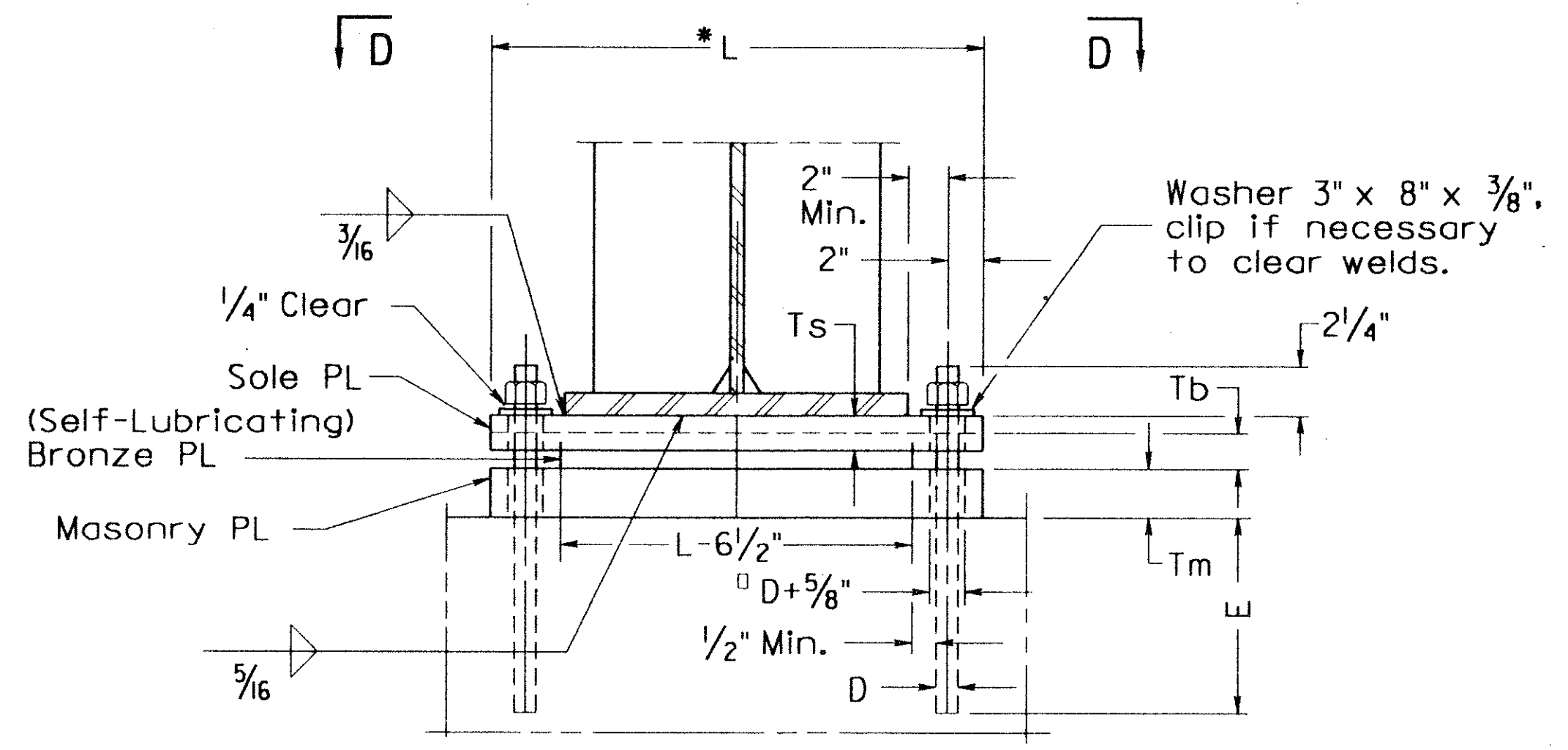


EXP. BEARING ABUTMENT ELEVATION

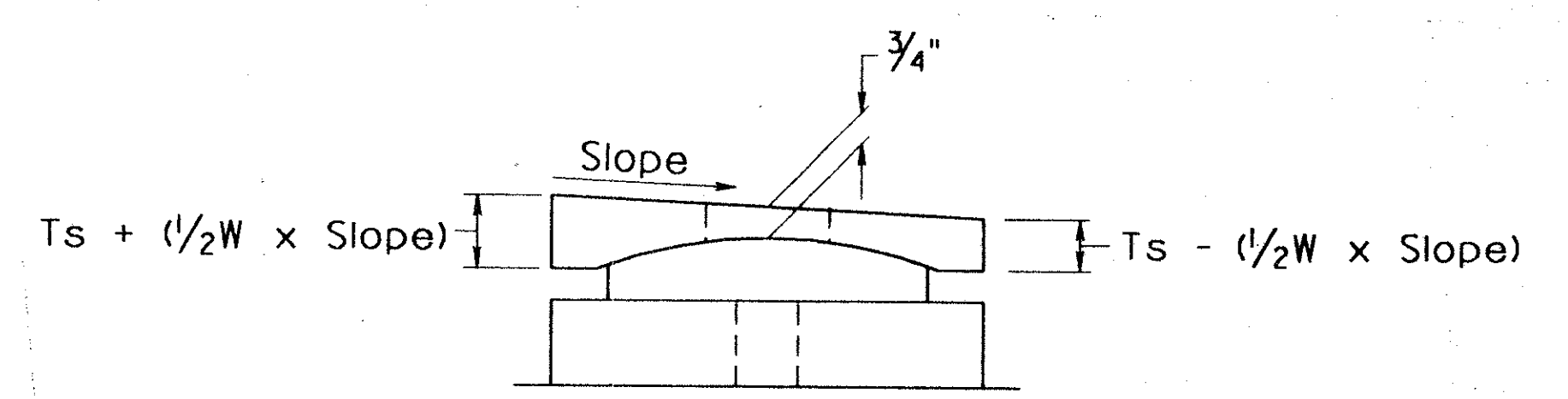
NOTES:  
 Design is based on AASHTO M183(ASTM A36) steel stresses.  
 Fill slots and holes in masonry plate around anchor bolts with a nonhardening caulking compound or elastic joint sealer.  
 Bearing details are satisfactory for the earthquake requirement for Zone II.  
 For expansion bearing, bevel sole plate to match grade if grade exceeds 1%. For fixed bearing, bevel sole plate if grade exceeds 3%.  
 Bearing stiffeners shown are omitted if rolled beam is used.  
 Radius may be machined to compensate for grade.  
 Bearing shall be set so that at 60°F it is at the midpoint of its movement.  
 For expansion bearings, 15" Radius tolerances: Sole PL -0", +.01" Bronze PL -.01", +0"



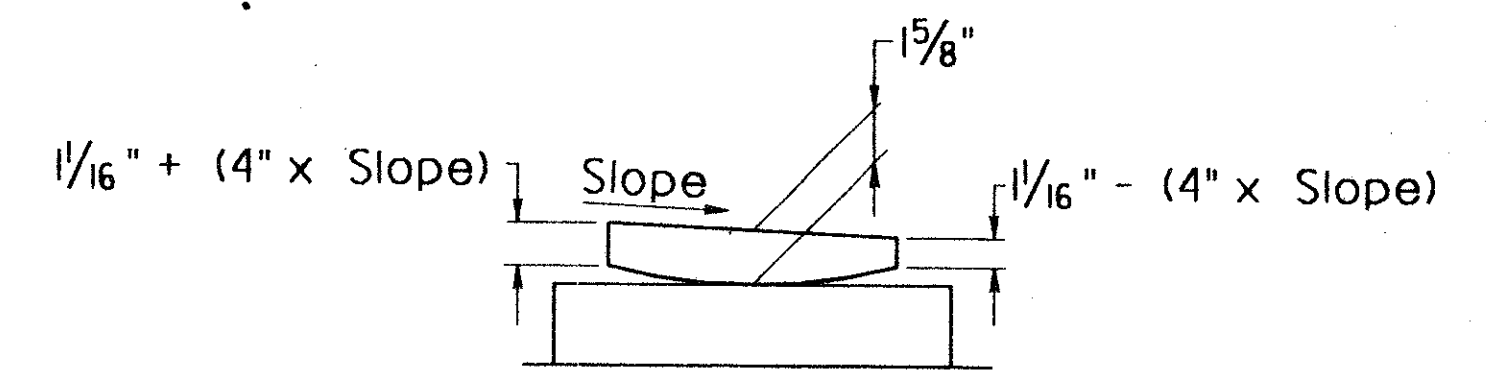
SECTION A-A



SECTION B-B <sup>□</sup> Masonry PL only



PART DETAIL OF EXPANSION BEARING (Showing beveled sole plate)



PART DETAIL OF FIXED BEARING (Showing beveled sole plate)

\* Min. = Flange + 8" or L whichever is greater.

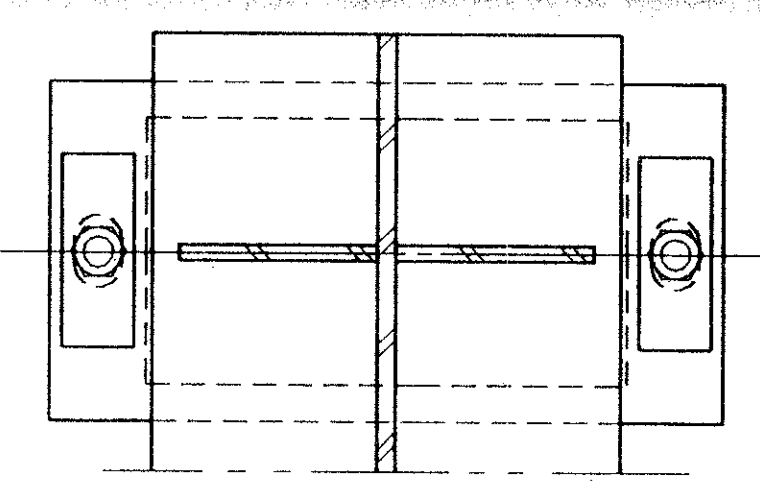
SOLE PLATE SLOTS	
Δm	Size
1	1 7/8 x 2 7/8
1/2	2 1/8 x 3 5/8
2	2 1/8 x 4 1/8

Slotted holes in sole plate may be drilled or machine burned.

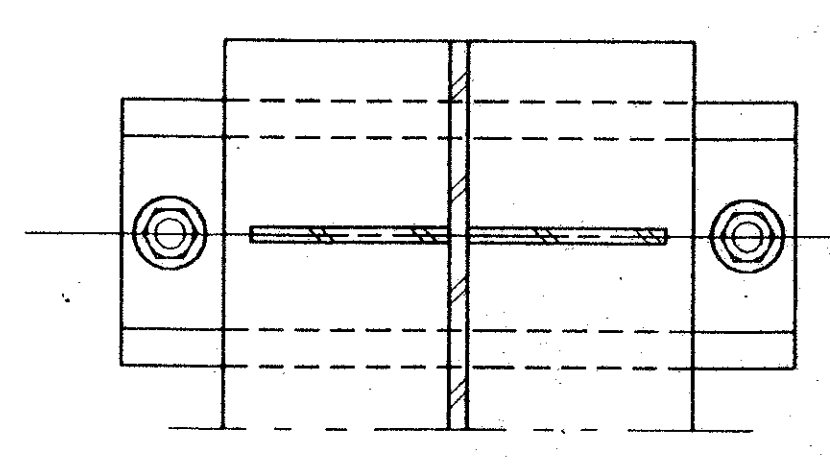
DESIGNATION TABLE					
Span	Abut.	Pier	Type	Y	Tm
1	South	1	EB-2	4 1/2"	2 1/4"
1		1	EB-7	6 1/4"	3"
1		2	FB-14	4 1/8"	2 1/2"
1		3	EB-2	4 1/2"	2 1/4"
2		3	EB-2	4 1/2"	2 1/4"
	North		EB-1	4 1/4"	2"

DATA TABLE									
Reaction	Type	L	W	Wb	Ts	Tb	D	E	Δm
120k	EB-1	20	10 1/2	8	1 1/2	1 1/2	1 1/4	12	1
140k	FB-8	20	8	—	—	—	1 1/4	12	—
180k	EB-2	22	12	9 1/2	1 3/4	1 1/2	1 1/4	12	1
	FB-9	22	9	—	—	—	1 1/4	12	—
220k	EB-3	24	12 1/2	10	1 3/4	1 3/4	1 1/2	15	1 1/2
	FB-10	24	10	—	—	—	1 1/2	15	—
260k	EB-4	26	13 1/2	11	2	2	1 1/2	15	1 1/2
	FB-11	26	10	—	—	—	1 1/2	15	—
300k	EB-5	28	14	11	2	2	1 1/2	15	2
	FB-12	28	11	—	—	—	1 1/2	15	—
340k	EB-6	30	14 1/2	11 1/2	2 1/4	2 1/4	1 1/2	15	2
	FB-13	30	12	—	—	—	1 1/2	15	—
400k	EB-7	32	15 1/2	12 1/2	2 1/2	2 1/2	1 1/2	15	2
	FB-14	32	13	—	—	—	1 1/4	15	—

Dimensions Ts, Tb and Y are measured at C of bearing.



SECTION D-D



SECTION C-C

MADE	TAL	2-92	Rev Sect. A-A	TEM	9-29-92
CHECKED	TEM	2-92	Rev Data Table	TEM	9-29-92
IN CHARGE					

RECORD DRAWING

RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM

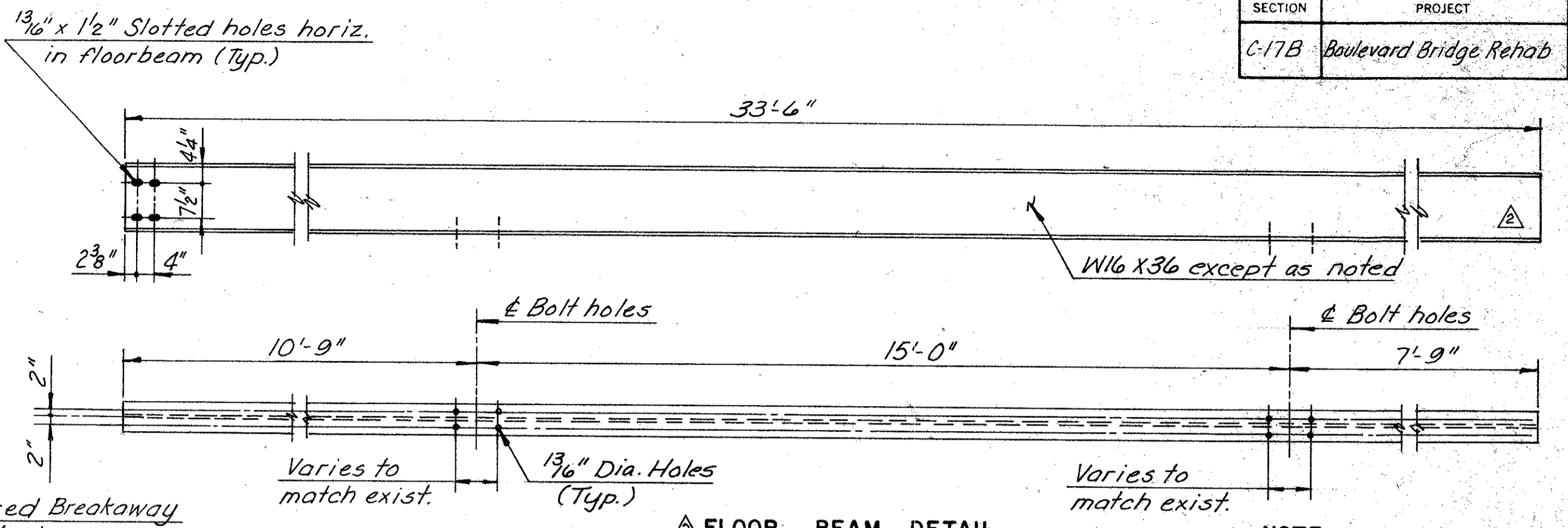
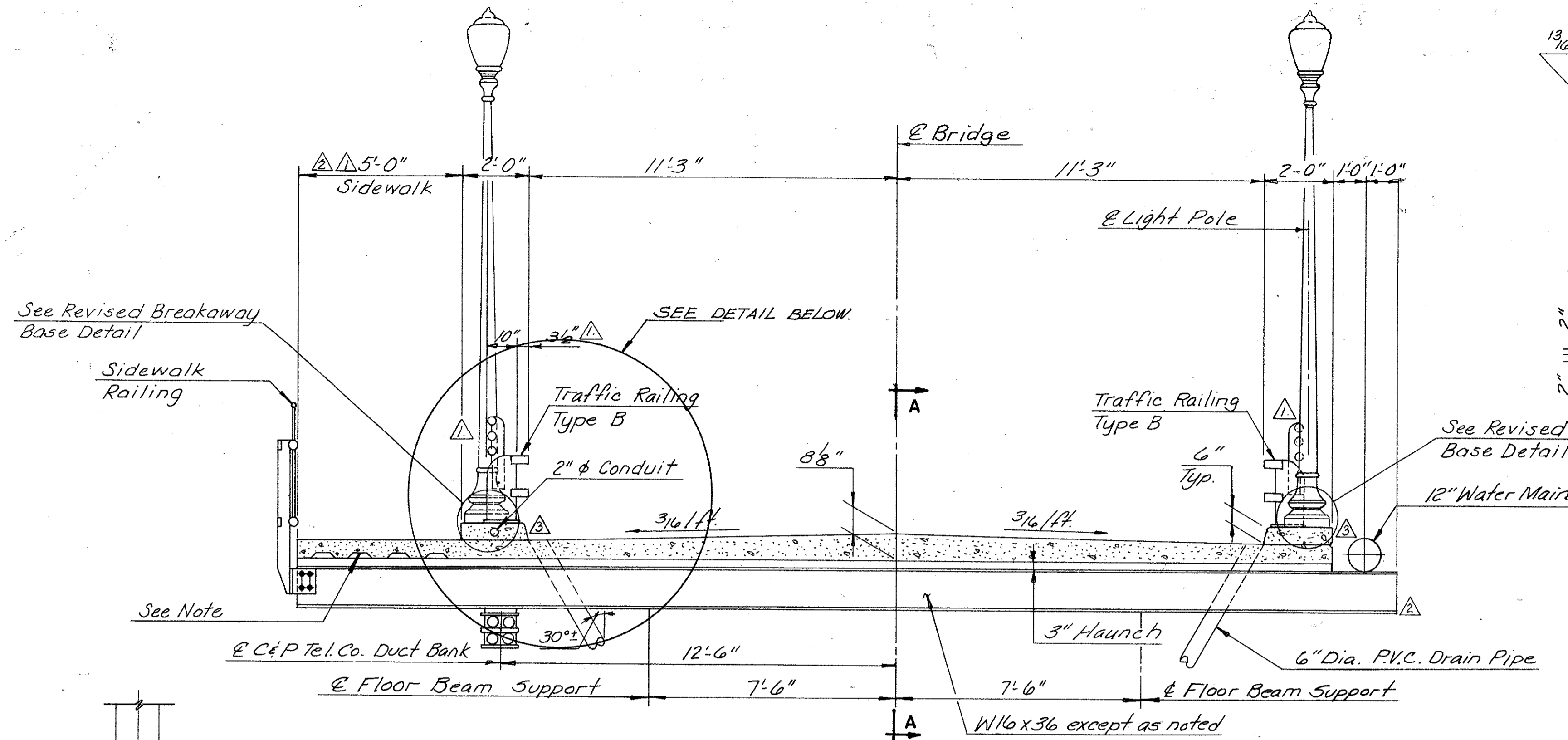
BOULEVARD BRIDGE REHABILITATION  
 DECK REPLACEMENT

BEARING DETAILS

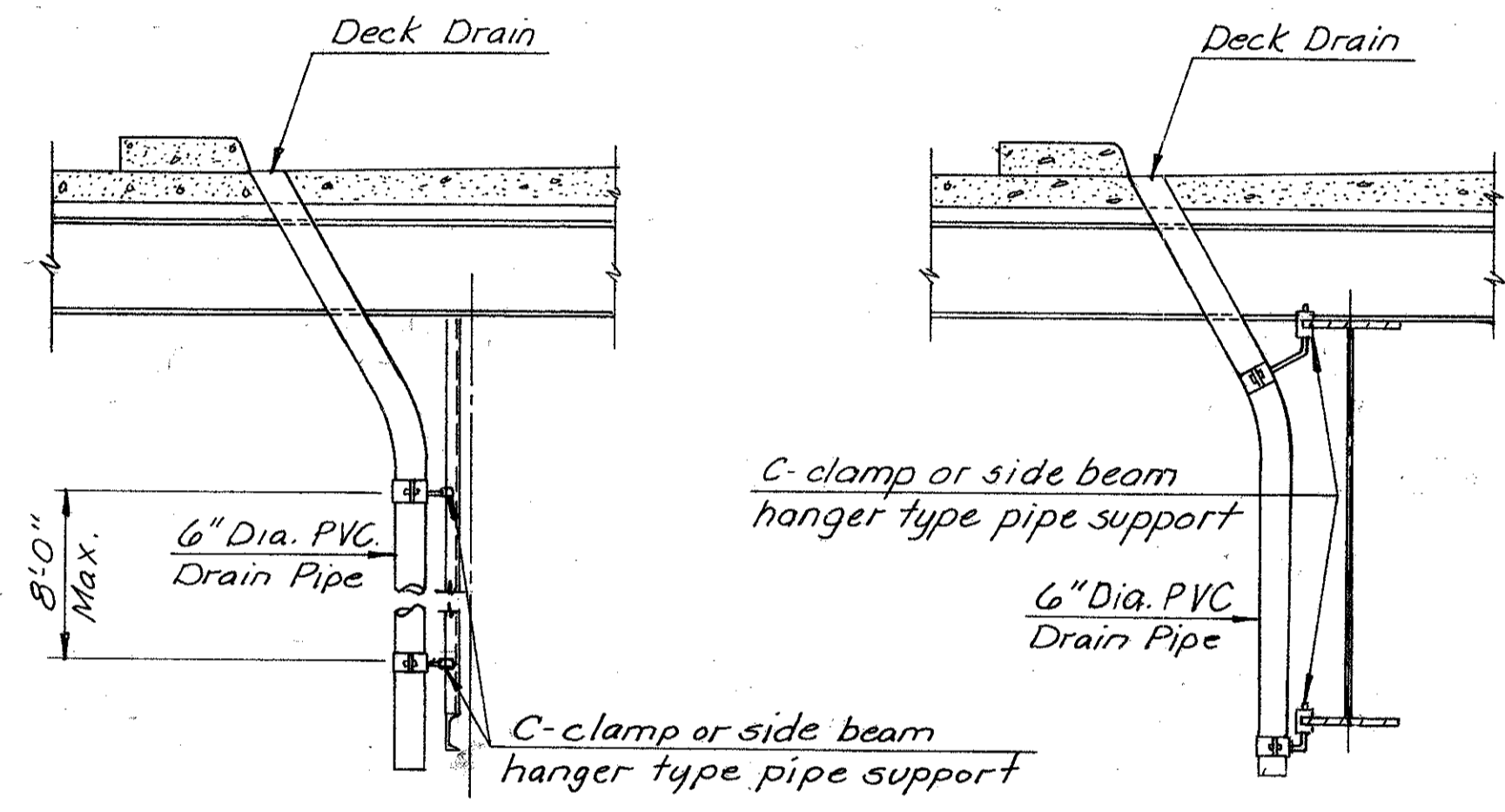
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 consulting engineers  
 Alexandria, Virginia

SCALE: No Scale  
 CONTRACT NO. C-17B  
 SHEET NO. 14 of 38

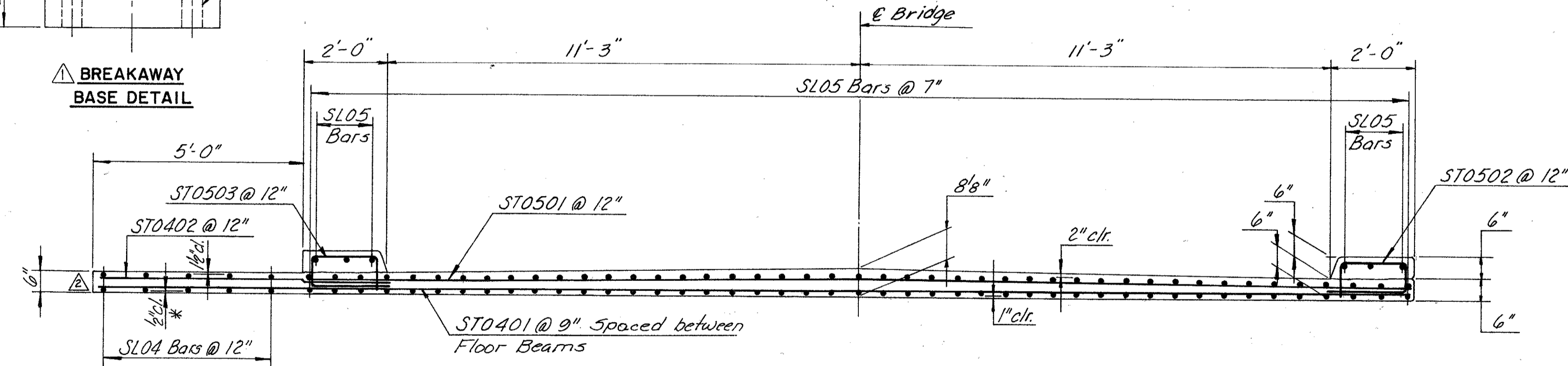
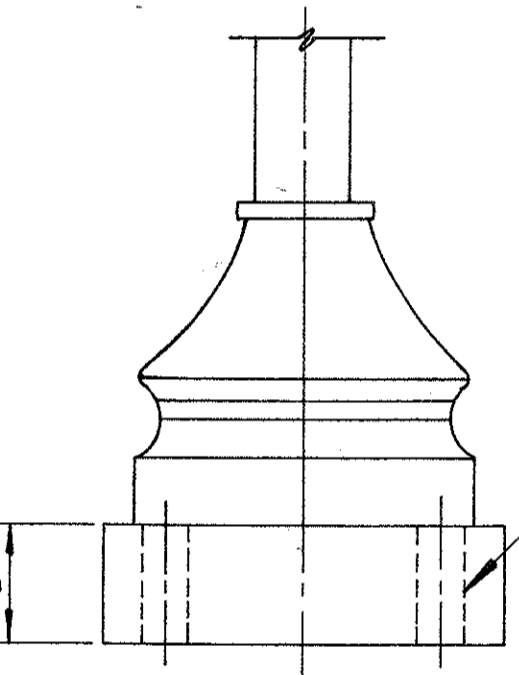
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
C-17B	Boulevard Bridge Rehab	35(16)	



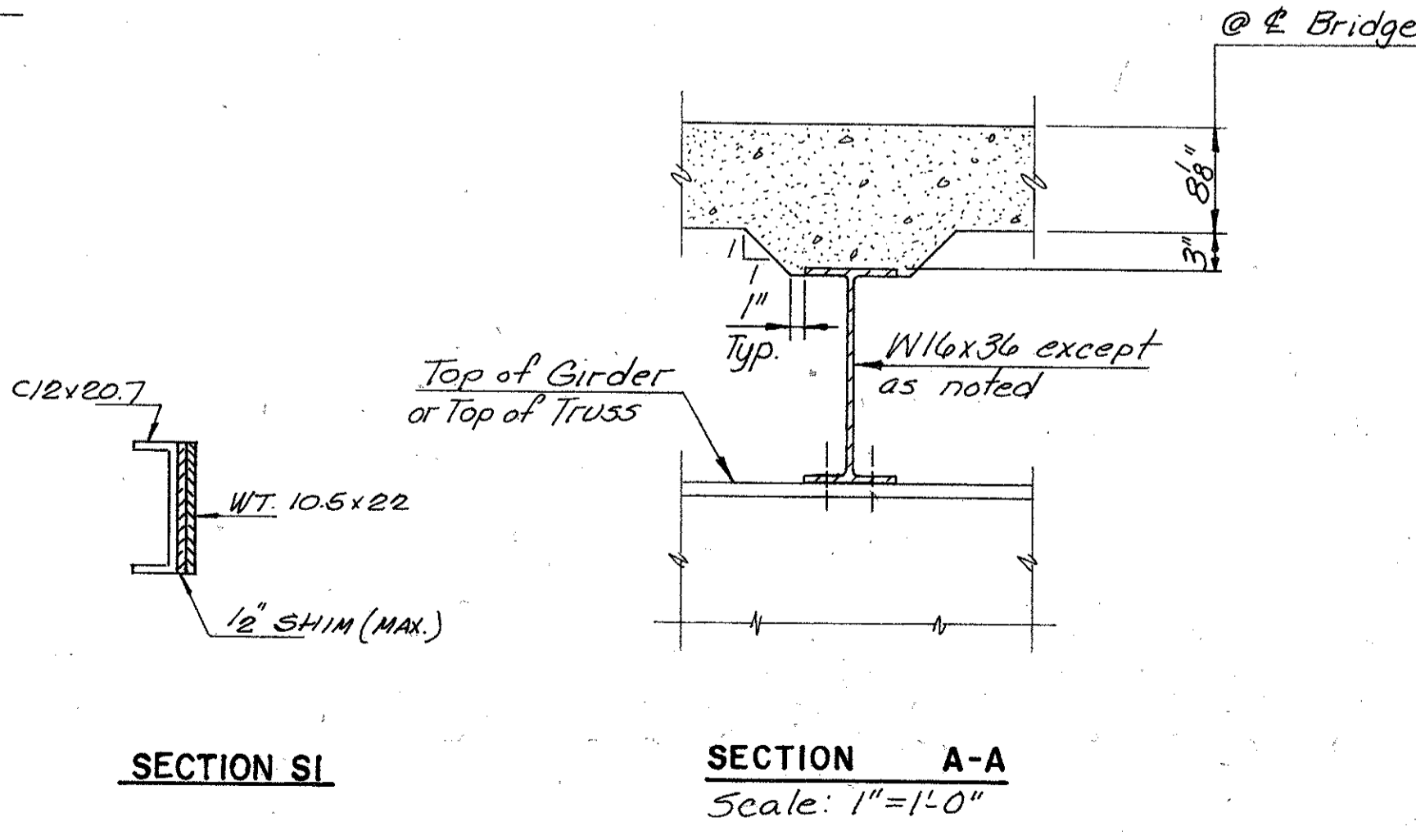
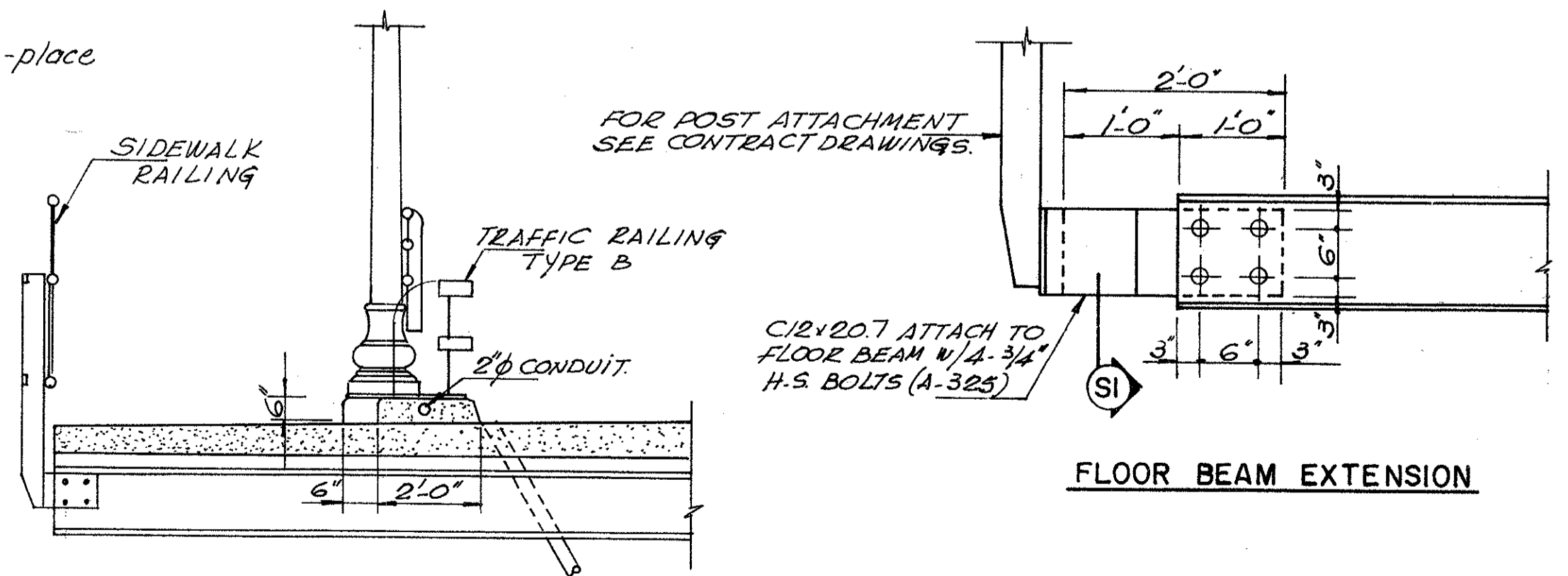
**NOTE:**  
Approximately 70 Floor Beams are to be installed under this contract. Consisting of approximately:  
52 - W16 x 36  
5 - W18 x 35  
4 - W21 x 44  
9 - W24 x 55



Location	Deck Drain Spacing
UNIT 1 (Span 1) (Span 2) (Span 3)	10 Spa. @ 9'-0" 12 Spa. @ 9'-8" 10 Spa. @ 9'-0"
UNIT 2 (Span 1)	No Drains
TRUSS UNITS (Piers 11 thru 20) (Piers 20 - 21)	Spaces @ 21'-6" 1 <sup>st</sup> & 4 <sup>th</sup> - Spaced @ 16'-9 3/4" 2 <sup>nd</sup> & 3 <sup>rd</sup> - Spaced @ 22'-5"
GIRDER UNITS (Piers 21 thru 25) (Piers 25 - 26)	13 Spa. @ 20'-0" No Drains
TRUSS UNIT (Piers 26 - 27)	4 Spa. @ 21'-4 1/2"
(Pier 27 thru N. Abutment)	13 Spa. @ 9'-4"



**NOTE:**  
Optional stay-in-place deck forms. Minimum sidewalk concrete thickness above corrugations shall not be less than 5". Combined weight of concrete and stay-in-place forms cannot exceed the weight of a 6" concrete slab.  
\* 1/2" cl. (Bott.) used at sidewalk only if stay-in-place forms are used. Provide 1" cl. if stay-in-place forms are not used.



NO.	REVISION	BY	DATE
1	Rev. Lighting Conduit	TEM	11-16-92
2	Rev. Sidewalk Flrbm.	TEM	9-29-92
3	Revised Lighting	TEM	7-92
4	Add. Railing	TEM	7-92
5	Revised Dim.	TEM	7-92

**NEW LIGHT POLE BASE**  
DETAIL WEST SIDE, EAST SIDE SIMILAR

**RECORD DRAWING**

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

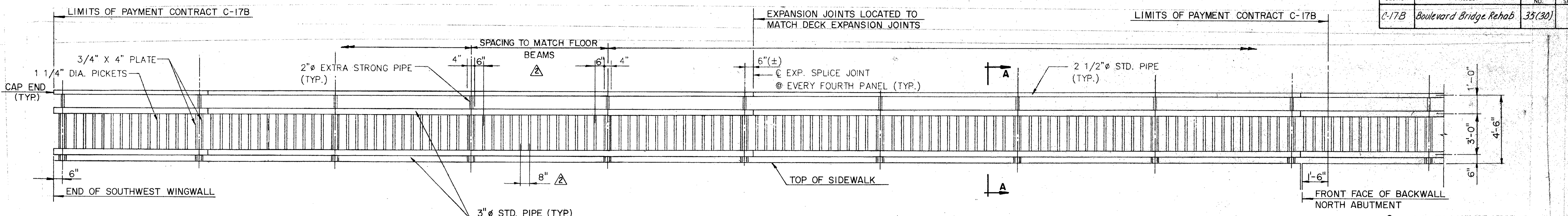
**BOULEVARD BRIDGE REHABILITATION**  
**DECK REPLACEMENT**

**TYPICAL CROSS SECTION**

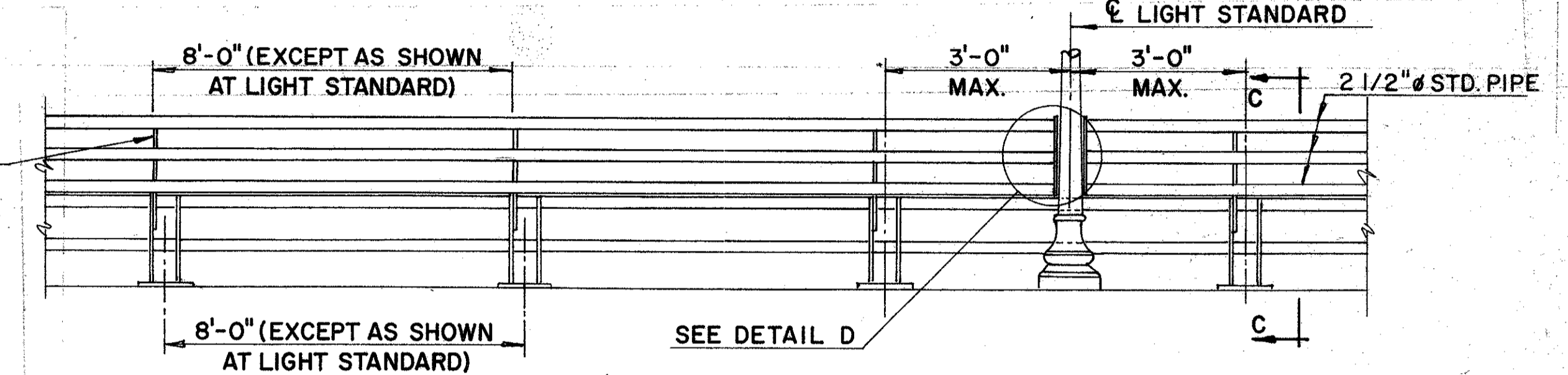
HOWARD, NEEDLES, TAMMEN & BERGENSON  
consulting engineers  
Alexandria, Virginia

SCALE: As Shown  
CONTRACT NO. C-17B  
SHEET NO. 16 OF 38

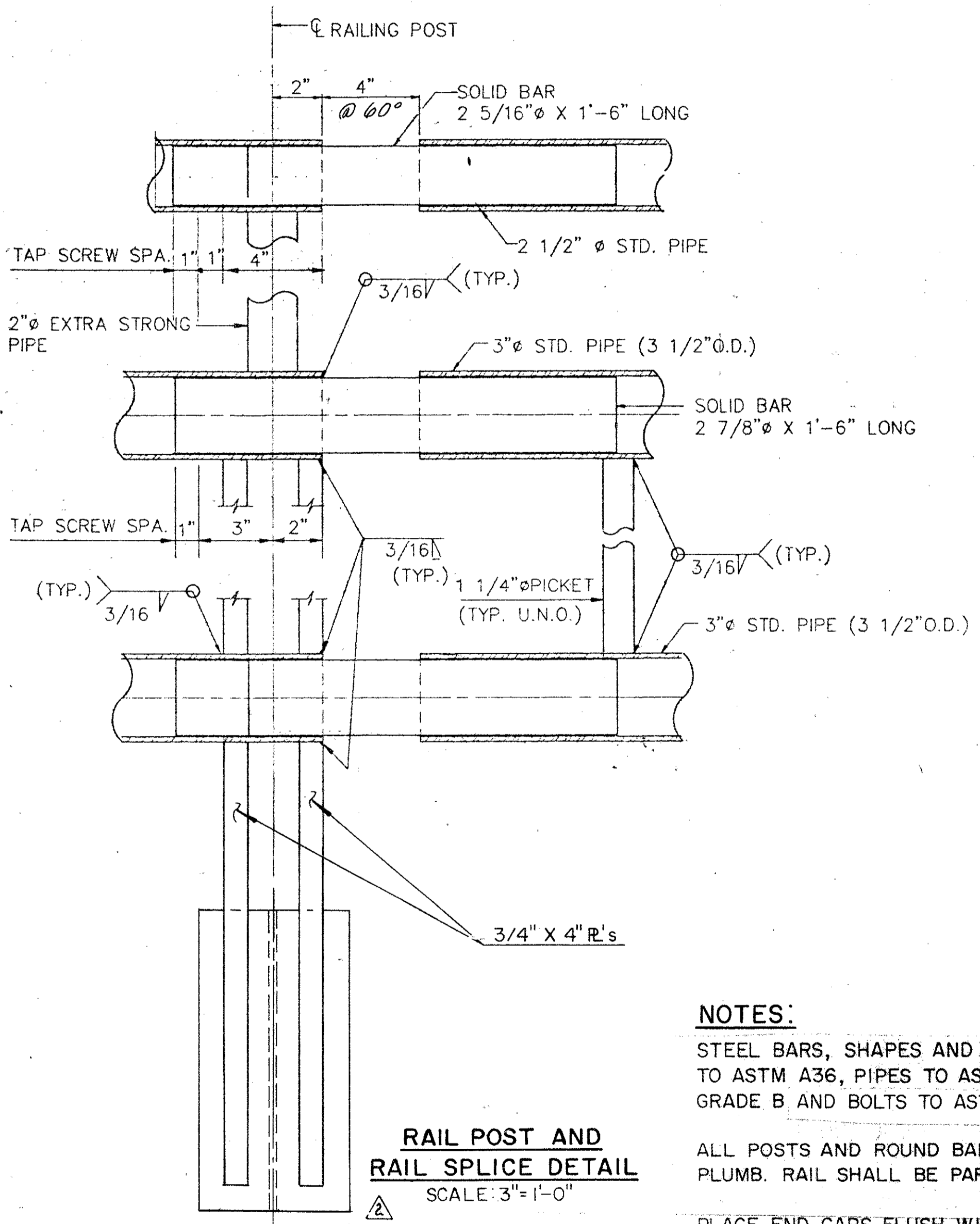
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
C-17B	Boulevard Bridge Rehab	35(30)	



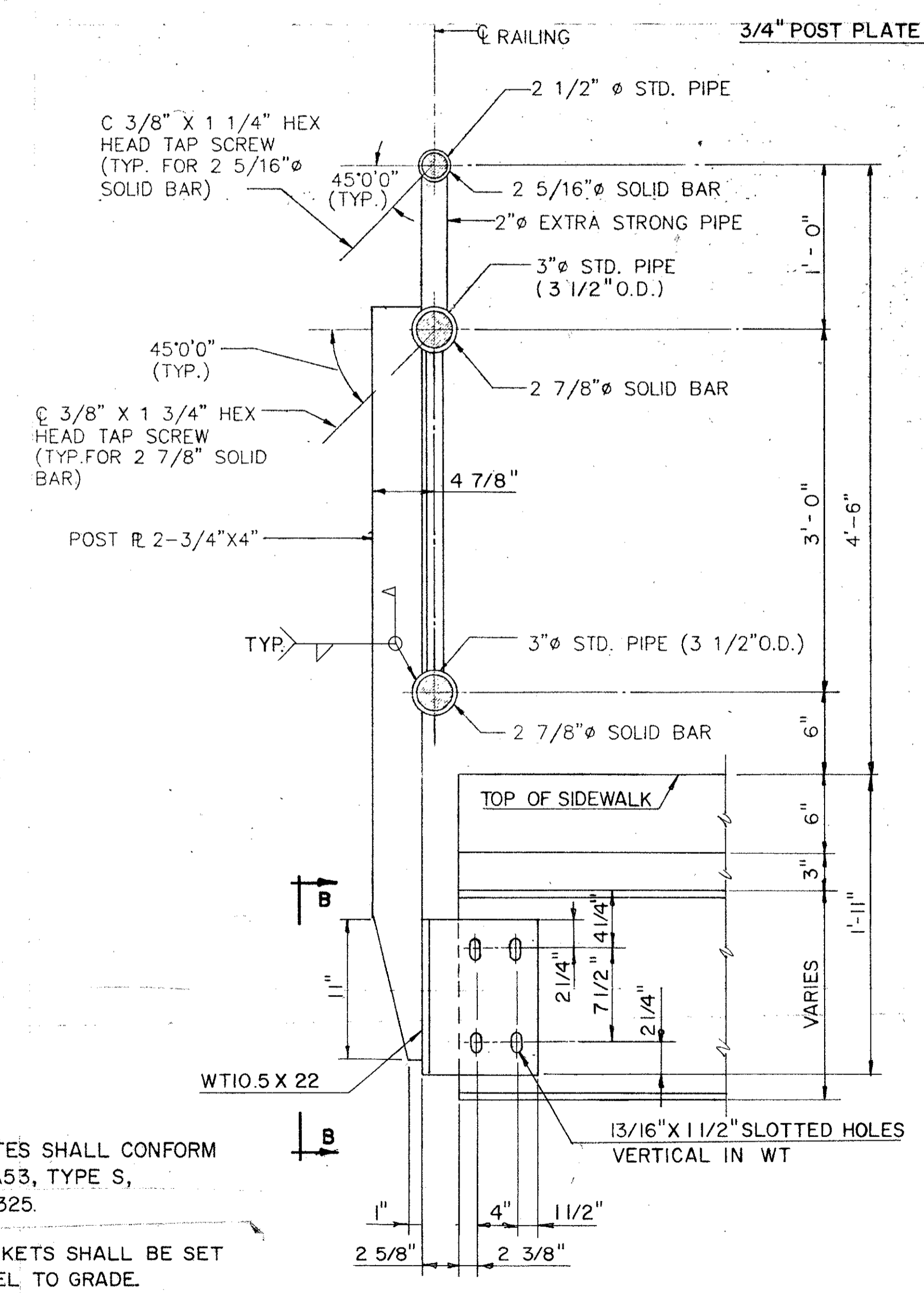
**ELEVATION SIDEWALK RAILING**



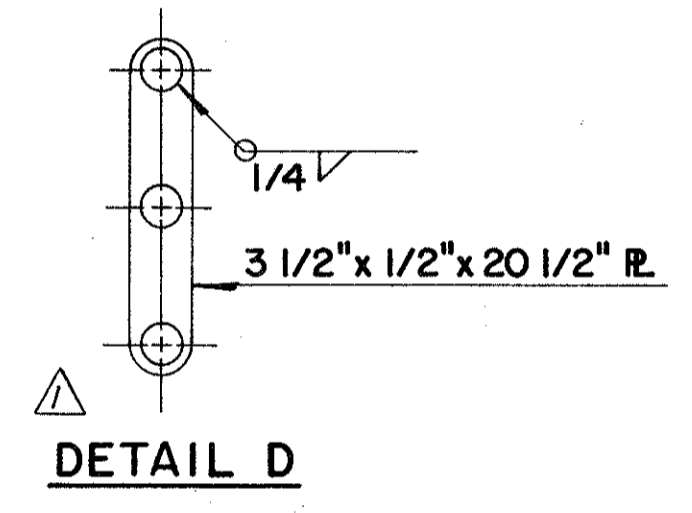
**TYPICAL ELEVATION TRAFFIC RAILING**



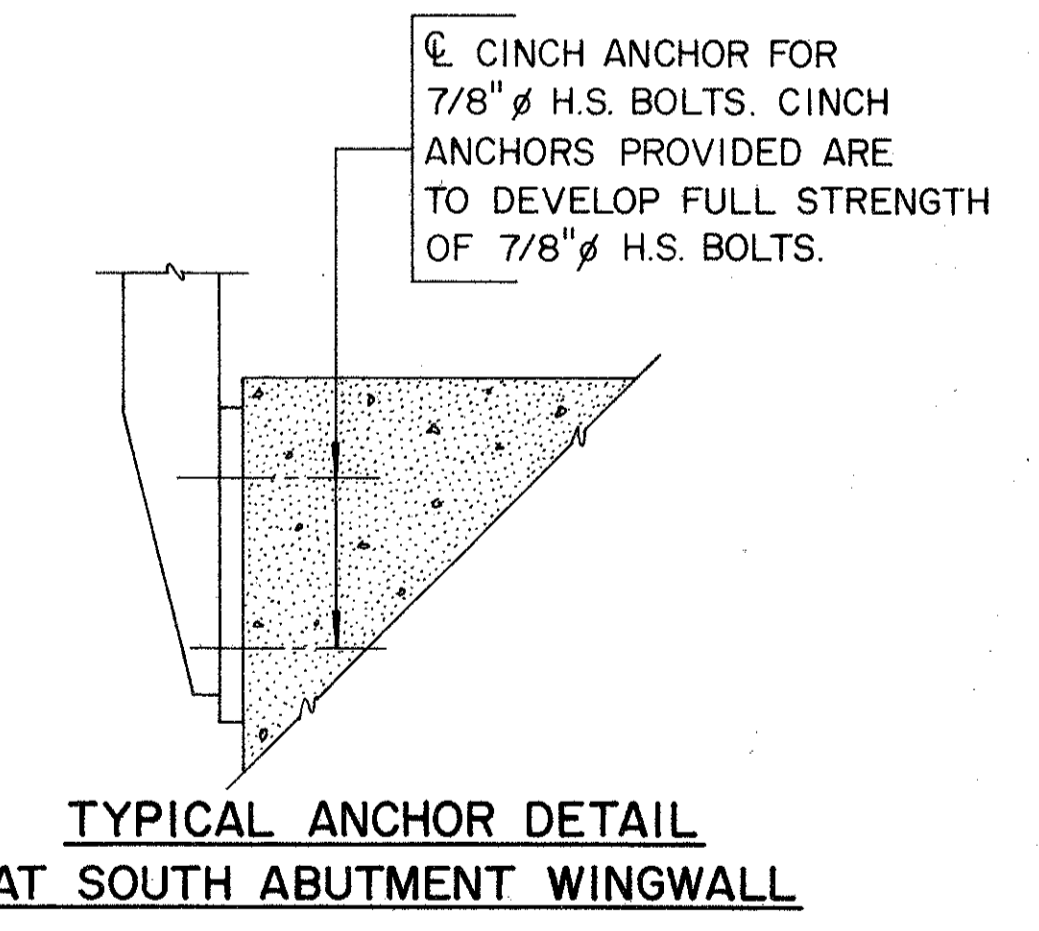
**RAIL POST AND RAIL SPLICE DETAIL**  
SCALE: 3"=1'-0"



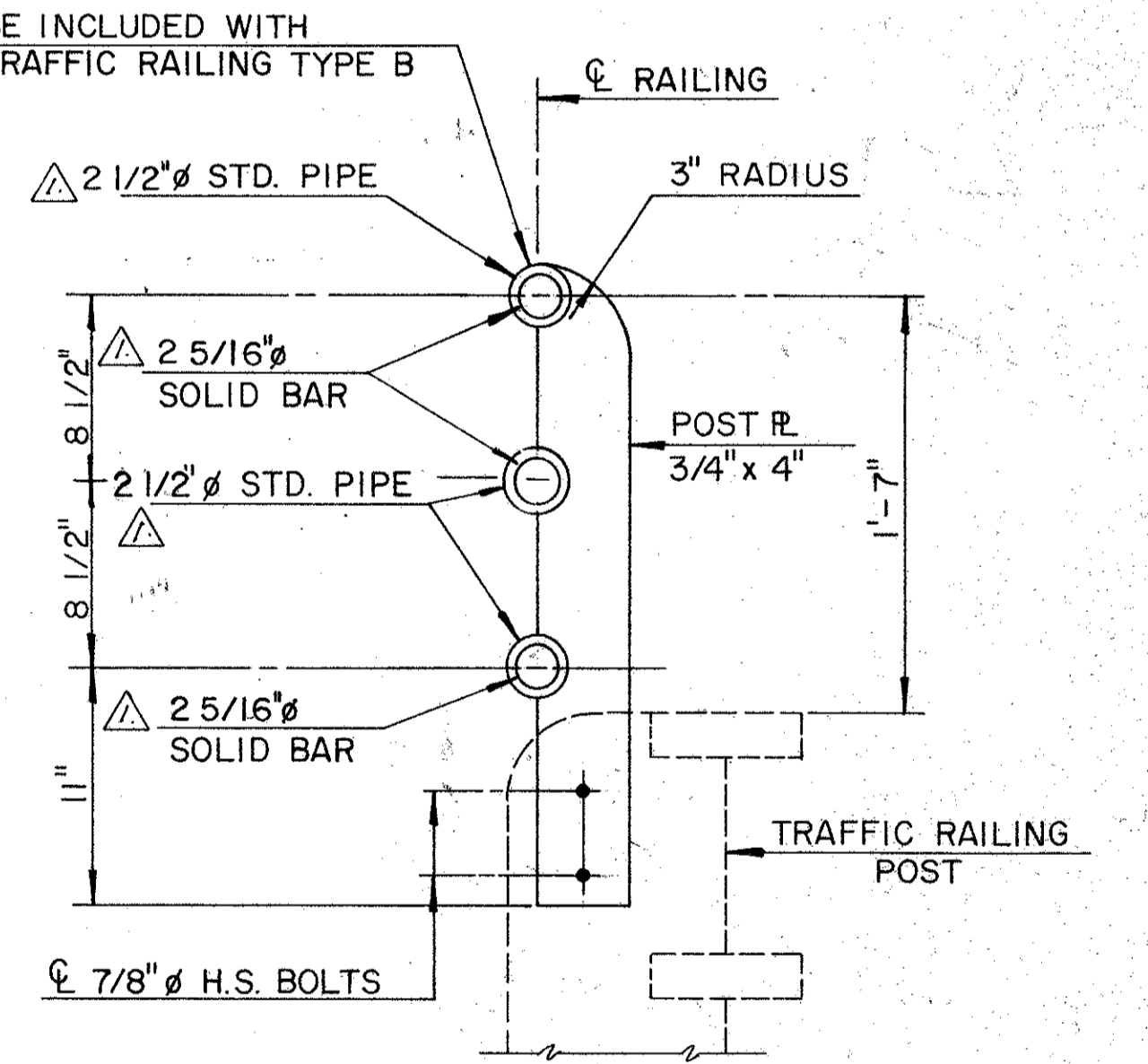
**SECTION A-A**  
SCALE: 1 1/2"=1'-0"



**DETAIL D**



**TYPICAL ANCHOR DETAIL AT SOUTH ABUTMENT WINGWALL**



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

**NOTES:**  
 STEEL BARS, SHAPES AND PLATES SHALL CONFORM TO ASTM A36, PIPES TO ASTM A53, TYPE S, GRADE B AND BOLTS TO ASTM A325.  
 ALL POSTS AND ROUND BAR PICKETS SHALL BE SET PLUMB. RAIL SHALL BE PARALLEL TO GRADE.  
 PLACE END CAPS FLUSH WITH RAILS.  
 EXTRA STRONG PIPE SHALL MEET THE REQUIREMENTS OF ASTM A53, TYPE S, GRADE B.  
 RAILPOST, RAILS, PICKETS AND ALL ACCESSORIES SHALL BE PAINTED FLAT BLACK.

NO.	REVISION	BY	DATE
1	Rev. Elev. & Rail Post Detail	TEM	9-29-92
2	Rev. Sect A-A View 8-8	TEM	9-29-92
3	Added Detail D	TEM	7-92
4	Revised Typ. Elev. Traffic Rail	TEM	7-92
5	Section CC	TEM	7-92

**RECORD DRAWING**

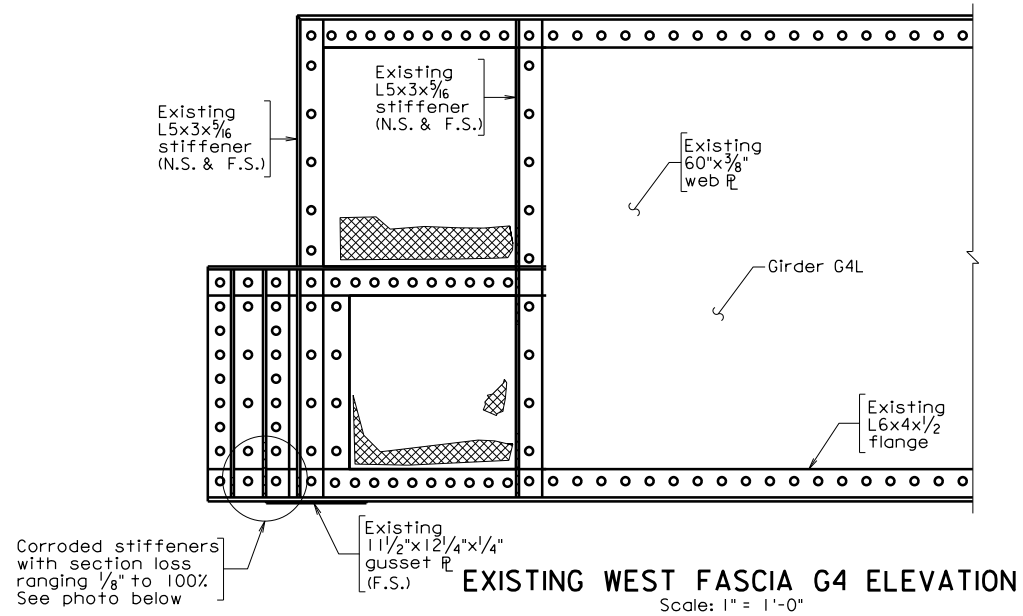
**RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM**

**BOULEVARD BRIDGE REHABILITATION  
DECK REPLACEMENT**

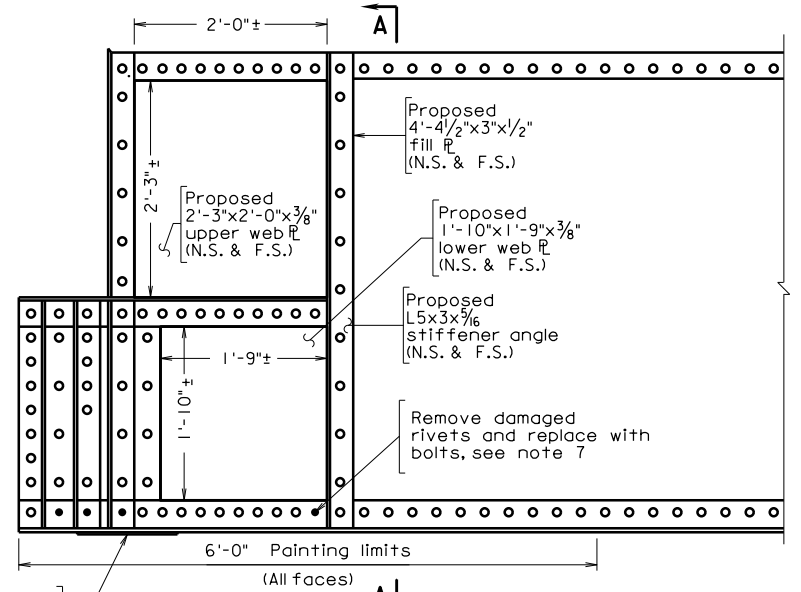
**SIDEWALK RAILING DETAILS**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
Alexandria, Virginia

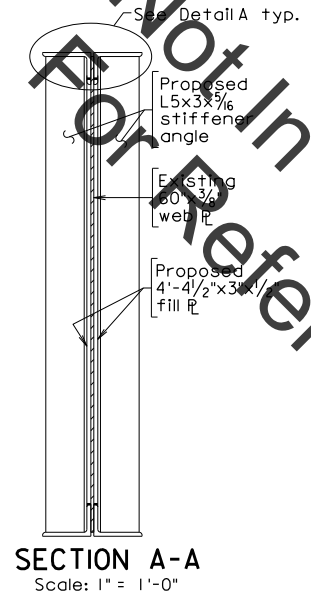
SCALE: As Shown  
 CONTRACT NO: C-17B  
 SHEET NO. 30 OF 38



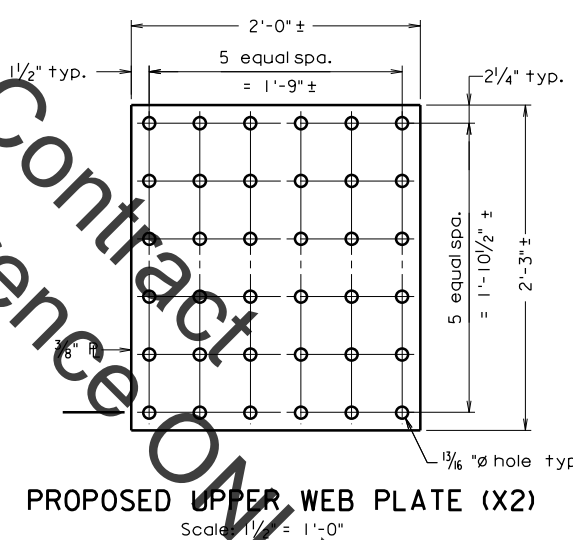
**EXISTING WEST FASCIA G4 ELEVATION**  
Scale: 1" = 1'-0"



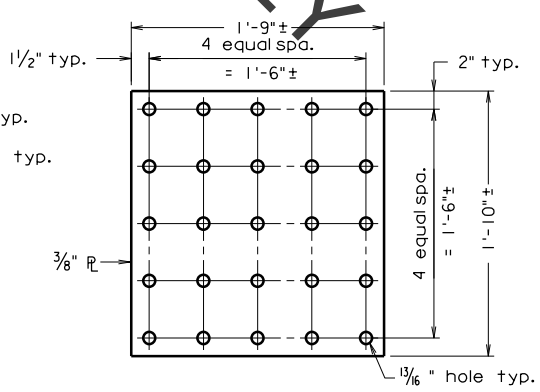
**PROPOSED WEST FASCIA G4 ELEVATION**  
Scale: 1" = 1'-0"



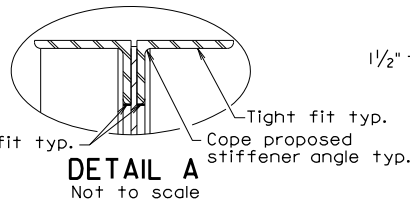
**SECTION A-A**  
Scale: 1" = 1'-0"



**PROPOSED UPPER WEB PLATE (X2)**  
Scale: 1 1/2" = 1'-0"



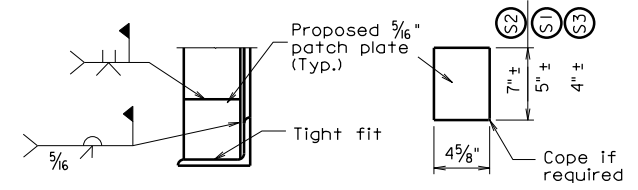
**PROPOSED LOWER WEB PLATE (X2)**  
Scale: 1 1/2" = 1'-0"



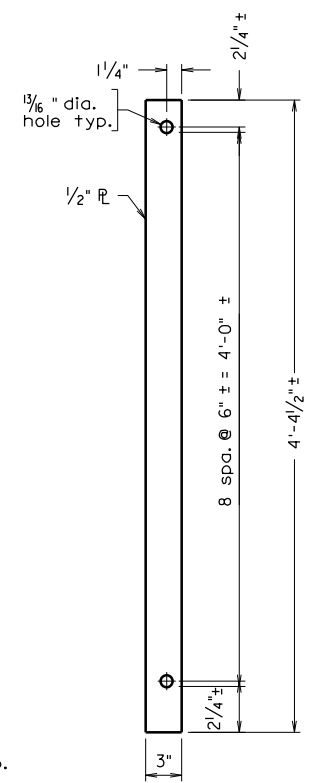
**DETAIL A**  
Not to scale



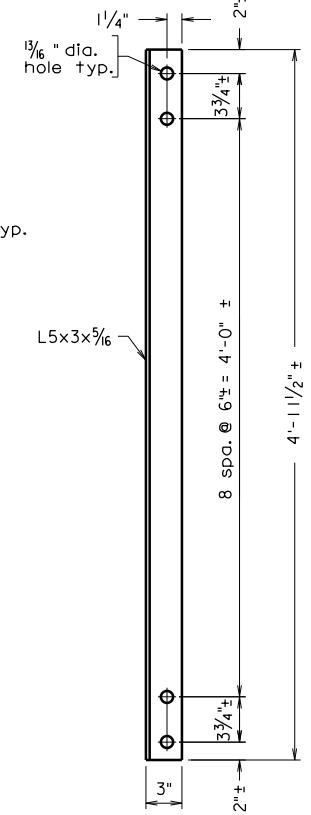
**FASCIA STIFFENERS EXISTING CONDITION**  
Partial sections shown. Rivets omitted for clarity  
Scale: 1/2" = 1'-0"



**PROPOSED STIFFENER PATCH REPAIR DETAILS**  
Scale: 1/2" = 1'-0"



**PROPOSED FILL PLATE (X2)**  
Scale: 1 1/2" = 1'-0"



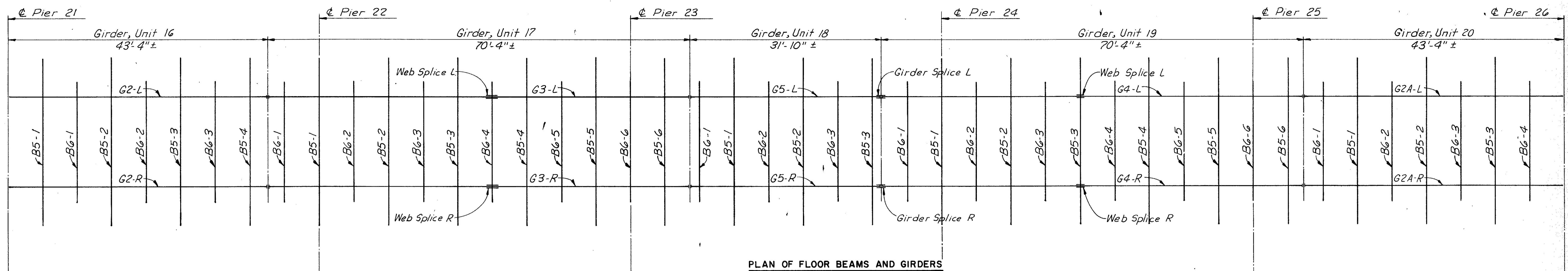
**PROPOSED STIFFENER ANGLE (X2)**  
Scale: 1 1/2" = 1'-0"

- Notes:
1. Work shall be completed in accordance with the Virginia Department of Transportation Road and Bridge Specification, issued 2007, current supplemental specifications, contract special provisions, and contract.
  2. All work shall be completed in accordance with the Construction Agreement between CSX Transportation and RMTA. The Contractor shall abide and perform all work in accordance with Schedule 1.
  3. Contractor shall field verify all dimensions and existing plate sizes prior to fabrication.
  4. All existing structural steels Fy = 30 ksi, Fu = 60 ksi. All new structural steel shall be AASHTO M270, grade 36 and shop primed.
  5. All repair welding shall be performed in accordance with AASHTO/AWS 2010 Bridge Welding Code, 6th Edition. Only 60 or 70 series electrodes shall be used.
  6. The existing plate to be removed shall be cut by the carbon arc process or other method approved. All rough plate edges and weld metal that remain shall be ground smooth.
  7. 3/4" diameter A325 high strength bolts shall be used. Threads are to be excluded from plates.
  8. Paint primer shall be applied to all areas to be covered by retrofit plates and angles.
  9. Contractor shall be required to apply a three coat epoxy-urethane system to all new structural steel and to areas of existing structural steel where existing paint coatings are damaged during repair work. Surface preparation shall meet SSPC-SP1, SP2 and SP3. Type and color of coating shall be approved by the Engineer.
  10. Rivets at location of existing vertical stiffener angle shall be removed as shown and replaced with new A325 bolts. The location and spacing of these bolts in the proposed fill plates and stiffener angles shall be to ensure their alignment with existing holes in the girder web.
  11. Traffic shall be removed from the girder location during the time of retrofit work.
  12. Caulk shall be added around the perimeter of all repairs to ensure no water will infiltrate the area.

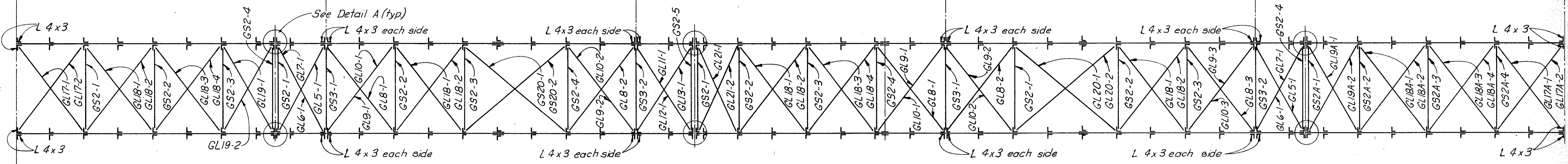
- Reference: Boulevard Bridge as built plans.
- Legend:  
 - Near side  
 - Far side  
 - Section loss
- Suggested Sequence of Construction:  
 In general, the sequence of construction is as indicated below. Deviation from the sequence of construction shown is acceptable upon review and approval by the Engineer.
1. Obtain all approvals from CSX Transportation and Engineer.
  2. Schedule Railroad Crossover.
  3. Remove traffic from girder.
  4. Clean and prime repair area of existing web.
  5. Drill 1/8" holes in existing web for proposed lower web plates.
  6. Install proposed lower web plates. Bolt in place.
  7. Drill 1/8" holes in existing web for proposed upper web plates.
  8. Install proposed upper web plates. Bolt in place.
  9. Remove rivets in existing stiffener angles. Remove stiffener angle.
  10. Clean and prime repair area under existing stiffener angles.
  11. Install proposed fill plates and stiffener angles. Bolt in place.
  12. Remove damaged rivets, prepare faying surfaces and replace with A325 bolts.
  13. Remove and replace portions of damaged stiffeners.
  14. Prepare, paint and caulk repair area.

RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY			
BOULEVARD BRIDGE			
WEST FASCIA G4 NORTH OF PIER 25, UNIT 19			
SECTION LOSS RETROFIT			
<b>HNTB</b>		HNTB CORPORATION ARCHITECTS ENGINEERS & PLANNERS ARLINGTON, VIRGINIA	
SCALE AS NOTED	DATE 2015	SHEET 1	OF 1
PLAN NO. A	PROJECT MR 2015	FILE NO.	SHEET NO. SP-1-5

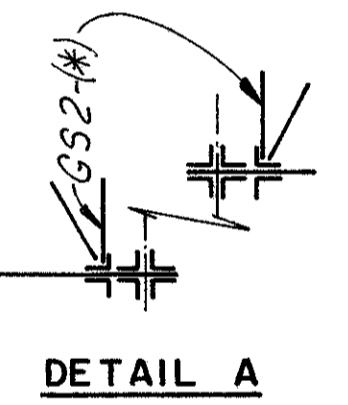
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS



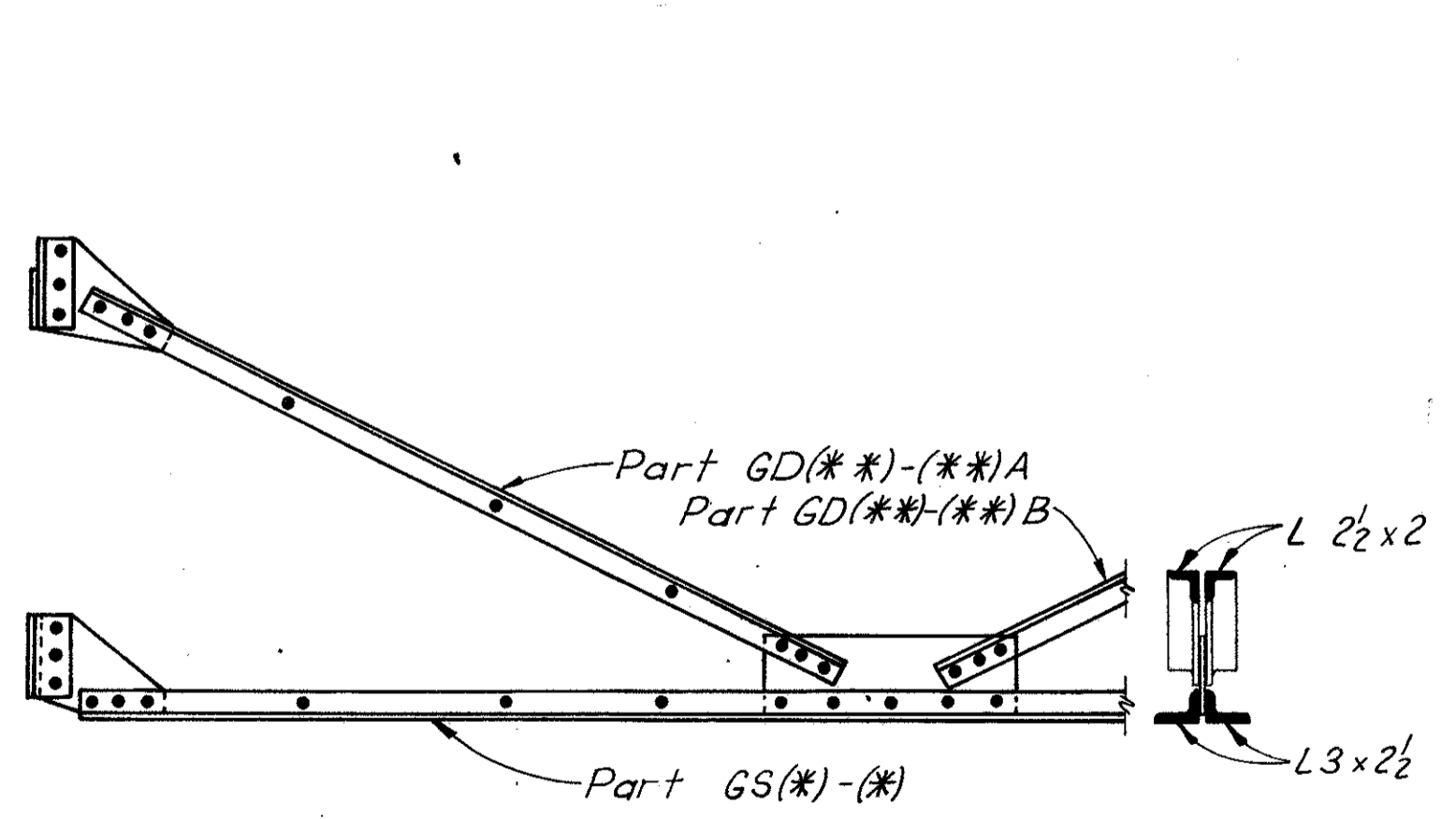
PLAN OF FLOOR BEAMS AND GIRDERS



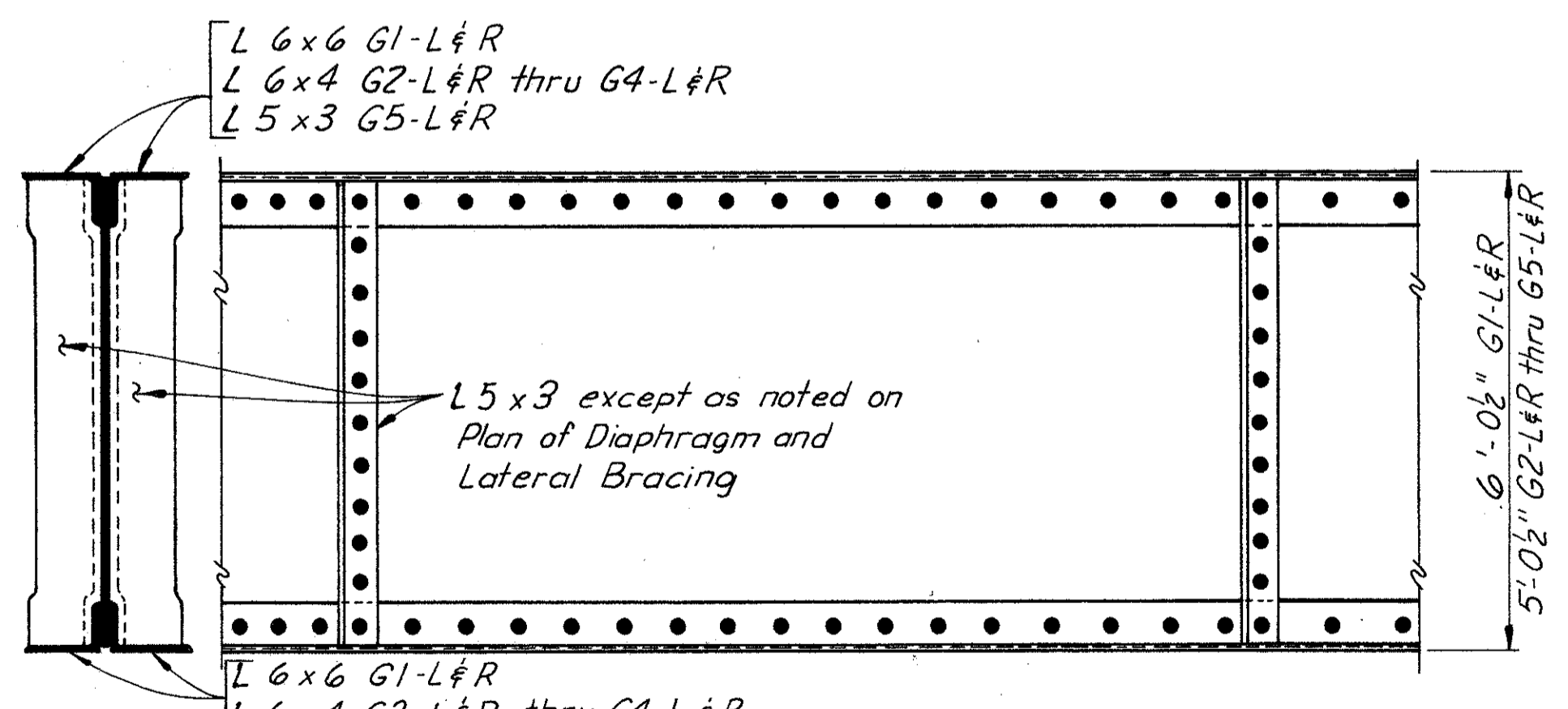
PLAN OF DIAPHRAGMS AND LATERAL BRACING



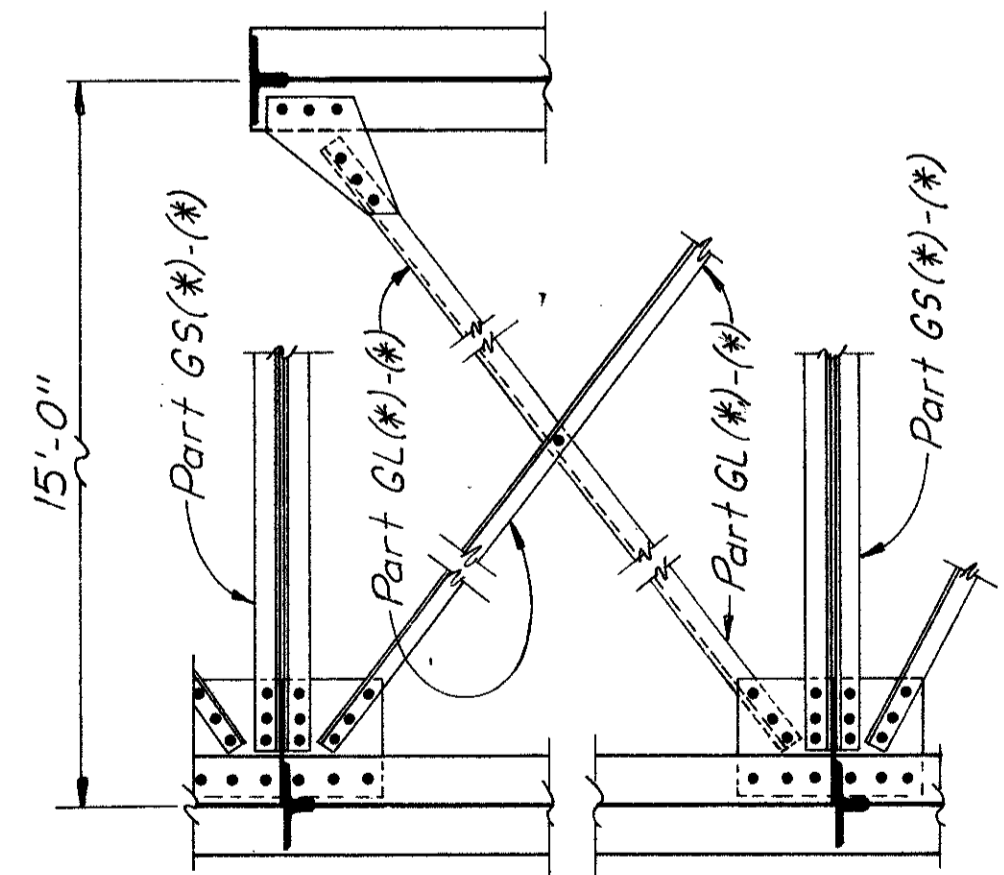
DETAIL A



TYPICAL DIAPHRAGM DETAIL GS2 AND GS3



TYPICAL GIRDER DETAIL G2 THRU G5



TYPICAL LATERAL BRACING DETAIL

\* See Lateral Bracing & Diaphragm Plan for identification.  
 \*\* Same identification as Part GS. Only the bottom chord of the diaphragm is listed in the tables. Necessary repair to the diagonals will be listed in the remarks column for the bottom chord.

Notes:  
 For Typical Floor Beam Detail, see Layout Units 1 thru 5.

BY	DATE				
MADE	T.E.M.	1-72			
CHECKED	H.B.W.	3-72			
IN CHARGE	P.R.Y.		NO.	REVISION	BY DATE

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

**BOULEVARD BRIDGE OVER**  
**JAMES RIVER**

LAYOUT UNITS 16 THRU 20

SCALE: No Scale  
 CONTRACT NO.:  
 SHEET NO. 29 OF

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 General Consultants

P A R T		R E M A R K S	
		G I R D E R, U N I T 16	
GDR	G2 - L		
	G2 - R		
	B5 - 1		
	B5 - 2		
	B5 - 3		
	B5 - 4		
	B6 - 1		
	B6 - 2		
	B6 - 3		
	GL17-1		
	GL17-2		
	GL18-1		
	GL18-2		
	GL18-3		
GL18-4			
GL19-1			
GL19-2			
GS2 - 1			
GS2 - 2			
GS2 - 3			
GS2 - 4			
		G I R D E R, U N I T 17	
GIRDERS	G3 - L		
	G3 - R		
Web Splice	Web Splice L		
	Web Splice R		
FLOOR BEAMS	B5 - 1		
	B5 - 2		
	B5 - 3		
	B5 - 4		
	B5 - 5		
	B5 - 6		
	B6 - 1		
	B6 - 2		
	B6 - 3		
	B6 - 4		
	B6 - 5		
	B6 - 6		
LATERAL BRACING	GL5-1		
	GL6-1		
	GL7-1		
	GL8-1		
	GL8-2		
	GL9-1		
	GL9-2		
	GL10-1		
	GL10-2		
	GL11-1		
	GL12-1		
	GL13-1		
GL18-1			
GL18-2			
GL20-1			
GL20-2			
DIAPHRAGMS	GS2 - 1		
	GS2 - 2		
	GS2 - 3		
	GS2 - 4		
	GS2 - 5		
	GS3 - 1		
GS3 - 2			
		G I R D E R, U N I T 18	
FLOOR BEAMS	G5 - L		
	G5 - R		
	B5 - 1		
	B5 - 2		
	B5 - 3		
	B6 - 1		
	B6 - 2		
	B6 - 3		
	GL18-1		
	GL18-2		

BY	DATE				
MADE	H.S.	2-72			
CHECKED	T.E.M.	2-72			
IN CHARGE	P.R.Y.				
NO.	REVISION	BY	DATE		

P A R T		R E M A R K S	
		G I R D E R, U N I T 19	
LATERAL BRACING	GL18-3		
	GL18-4		
	GL21-1		
	GL21-2		
	GS2 - 1		
DIAPHRAGMS	GS2 - 2		
	GS2 - 3		
	GS2 - 4		
		G I R D E R, U N I T 20	
GIRDERS	G4 - L		
	G4 - R		
	Girder Splice L		
	Girder Splice R		
Web Splice	Web Splice L		
	Web Splice R		
FLOOR BEAMS	B5 - 1		
	B5 - 2		
	B5 - 3		
	B5 - 4		
	B5 - 5		
	B5 - 6		
	B6 - 1		
	B6 - 2		
	B6 - 3		
	B6 - 4		
	B6 - 5		
	B6 - 6		
LATERAL BRACING	GL5-1		
	GL6-1		
	GL7-1		
	GL8-1		
	GL8-2		
	GL8-3		
	GL9-1		
	GL9-2		
	GL9-3		
	GL10-1		
	GL10-2		
	GL10-3		
GL18-1			
GL18-2			
GL20-1			
GL20-2			
DIAPHRAGMS	GS2 - 1		
	GS2 - 2		
	GS2 - 3		
	GS2 - 4		
	GS3 - 1		
	GS3 - 2		
		G I R D E R, U N I T 20	
FLOOR BEAMS	G2A - L		
	G2A - R		
	B5 - 1		
	B5 - 2		
	B5 - 3		
	B6 - 1		
	B6 - 2		
	B6 - 3		
	GL17A-1		
	GL17A-2		
	GL18A-1		
	GL18A-2		
	GL18A-3		
	GL18A-4		
GL19A-1			
GL19A-2			
DIAPHRAGMS	GS2A-1		
	GS2A-2		
	GS2A-3		
	GS2A-4		

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

**BOULEVARD BRIDGE OVER**  
**JAMES RIVER**

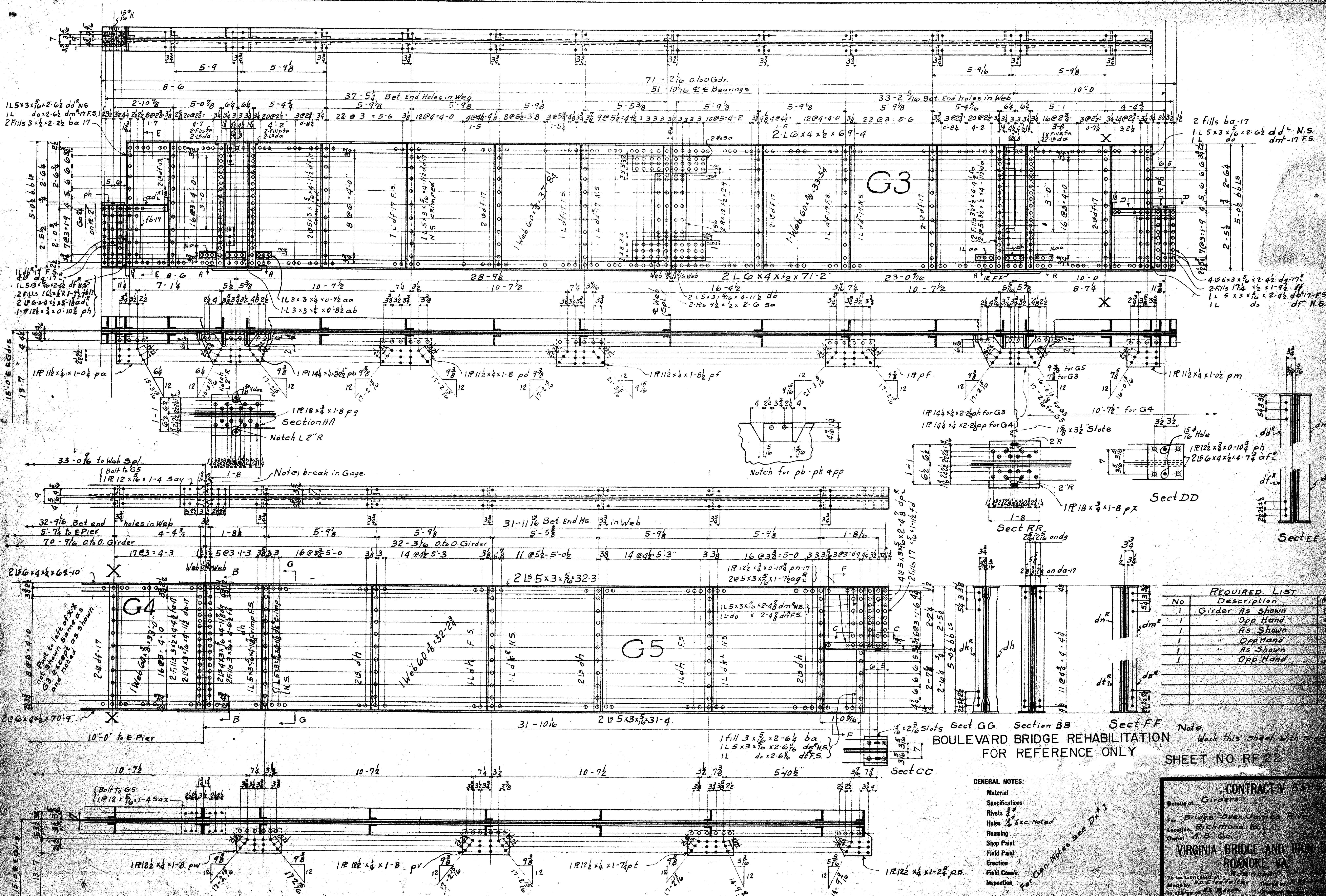
TABLE OF PARTS, UNITS 16 THRU 20

SCALE: *No Scale*

CONTRACT NO. \_\_\_\_\_

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

SHEET NO. **30** OF \_\_\_\_\_



REQUIRED LIST		
No	Description	Qty
1	Girder As Shown	G3
1	" " Opp Hand	G3
1	" " As Shown	G4
1	" " Opp Hand	G4
1	" " As Shown	G5
1	" " Opp Hand	G5

BOULEVARD BRIDGE REHABILITATION  
FOR REFERENCE ONLY  
SHEET NO. RF 22

GENERAL NOTES:

- Material
- Specifications
- Rivets
- Holes 1/2 Exc. Noted
- Reaming
- Shop Paint
- Field Paint
- Erection
- Field Coat's
- Inspection

**CONTRACT V 5585**  
 Details of Girders  
 For Bridge Over James River  
 Location Richmond Va.  
 Owner A. B. Co.  
**VIRGINIA BRIDGE AND IRON**  
**ROANOKE, VA.**

To be fabricated at  
 Made by  
 In charge of  
 Erected by  
 Inspected by

Scale 1" = 1'-0" Sheet No. RF 22



# **Bridge 5**

**(Norfolk Southern Railroad Bridge Over Powhite Parkway)**

**Record Set Plans**



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	132	188

**GENERAL NOTES :**

**SPECIFICATIONS :**  
 A.R.E.A., current.  
 WELDING - 1949 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.  
**LIVE LOAD :**  
 Cooper's E-80  
**IMPACT :**  
 Diesel impact plus rolling effect. Concrete Slab Derailment Impact :  
 $LL \times \frac{LL}{DL + LL}$   
 Structural Steel Derailment Impact :  
 $0.9 \times LL$

**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 with a maximum slump of 2 1/2 inches. 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 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 3/4" diameter unless otherwise noted and shall conform to A.S.T.M. Specification A-325.

**BENCH MARK :**  
 See Reference Ties and Field Control Data sheet in highway plans.  
 F-17 (Copper Weld Rod) Elevation 139.03  
 F-20 (Copper Weld Rod) Elevation 145.80

INDEX	
NO.	DESCRIPTION
1	General Plan and Elevation
2	Quantities and Miscellaneous Det.
3	West Abutment Details
4	West Abutment and Drainage Details
5	East Abutment Details
6	East Abutment Details (I)
7	Pier Details (I)
8	Pier Details (2 & 3)
9	Framing Plan
10	Framing Plan
11	Grider Details
12	Superstructure Details
13	Deck Plans-Units 1 & 2
14	Deck Plans-Units 3 & 4
15	Deck Plans-Unit 5
16	Deck Plans-Unit 6
17	Shoe Details
18	Boring logs
19	Boring logs
20	Standard Aluminum Rail, Det. (Rail)
21	Standard Architectural Details.

Note : See sh. 2 for Slab Elevations and Estimated Quantities.

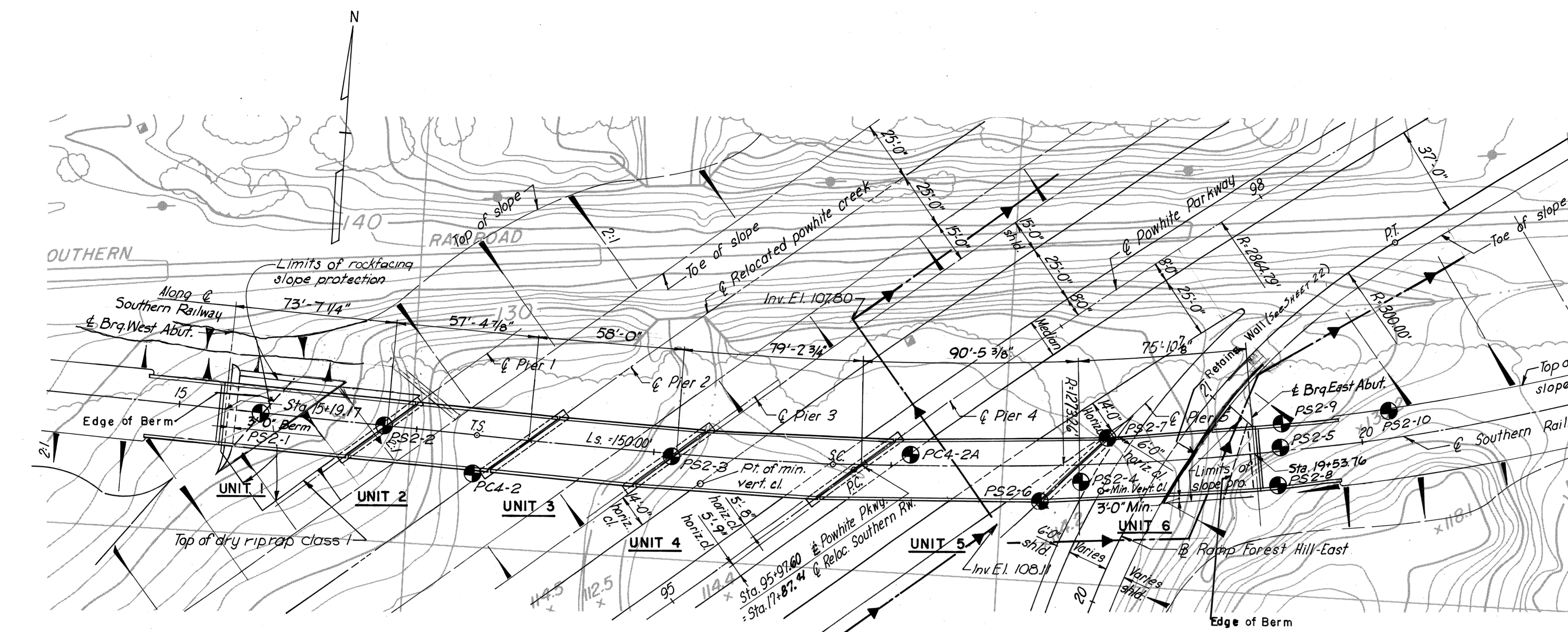
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**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 POWHITE PARKWAY

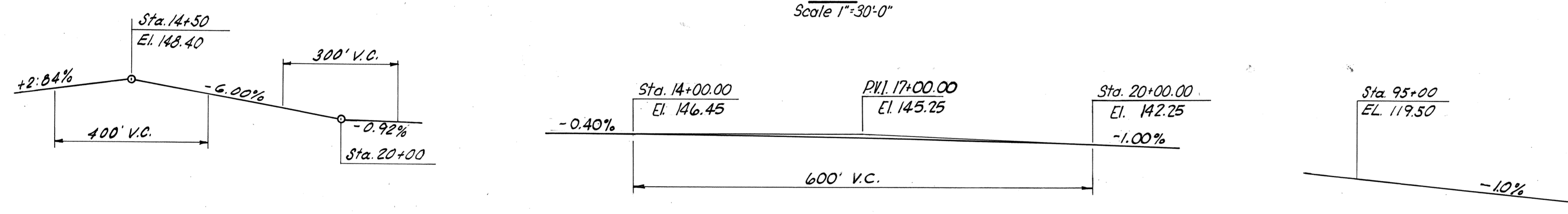
**SOUTHERN RAILWAY OVER**  
**POWHITE PARKWAY**  
 BRIDGE B-05

**GENERAL PLAN & ELEVATION**

HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: AS SHOWN
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO.: C-2
	SHEET NO. 1 OF 19



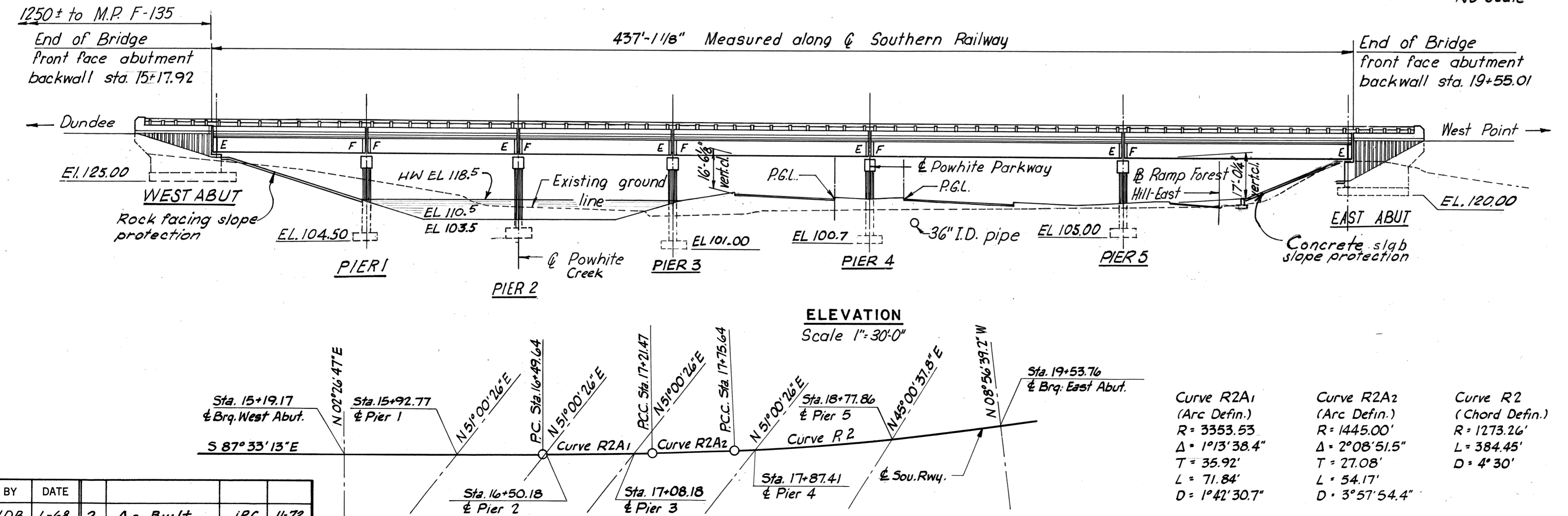
**PLAN**  
 Scale 1"=30'-0"



**PROFILE GRADE**  
**RAMP F-E**  
 No Scale

**PROFILE GRADE**  
**SOUTHERN RAILWAY**  
 No Scale

**PROFILE GRADE**  
**POWHITE PARKWAY**  
 No Scale

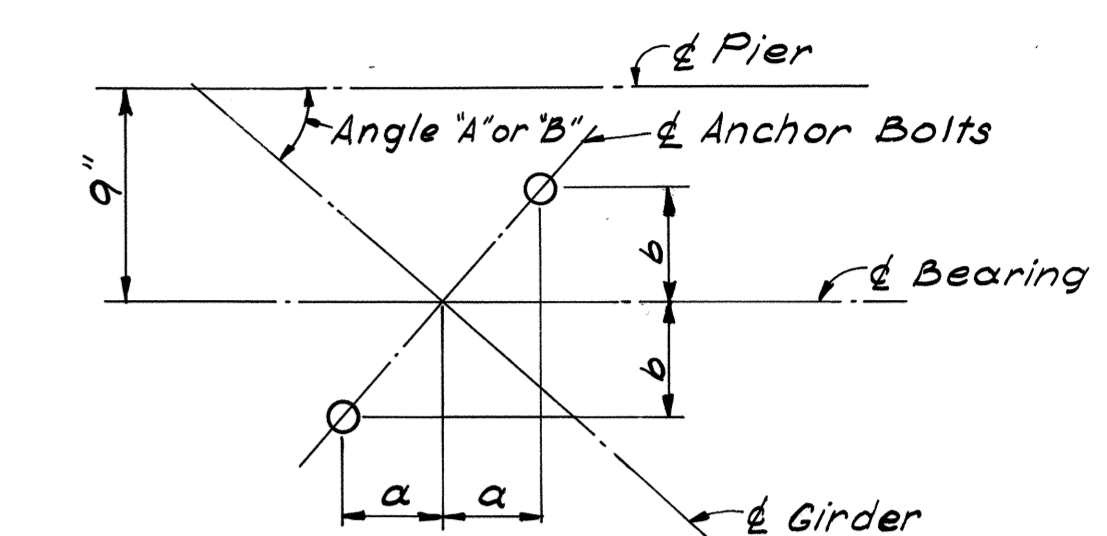
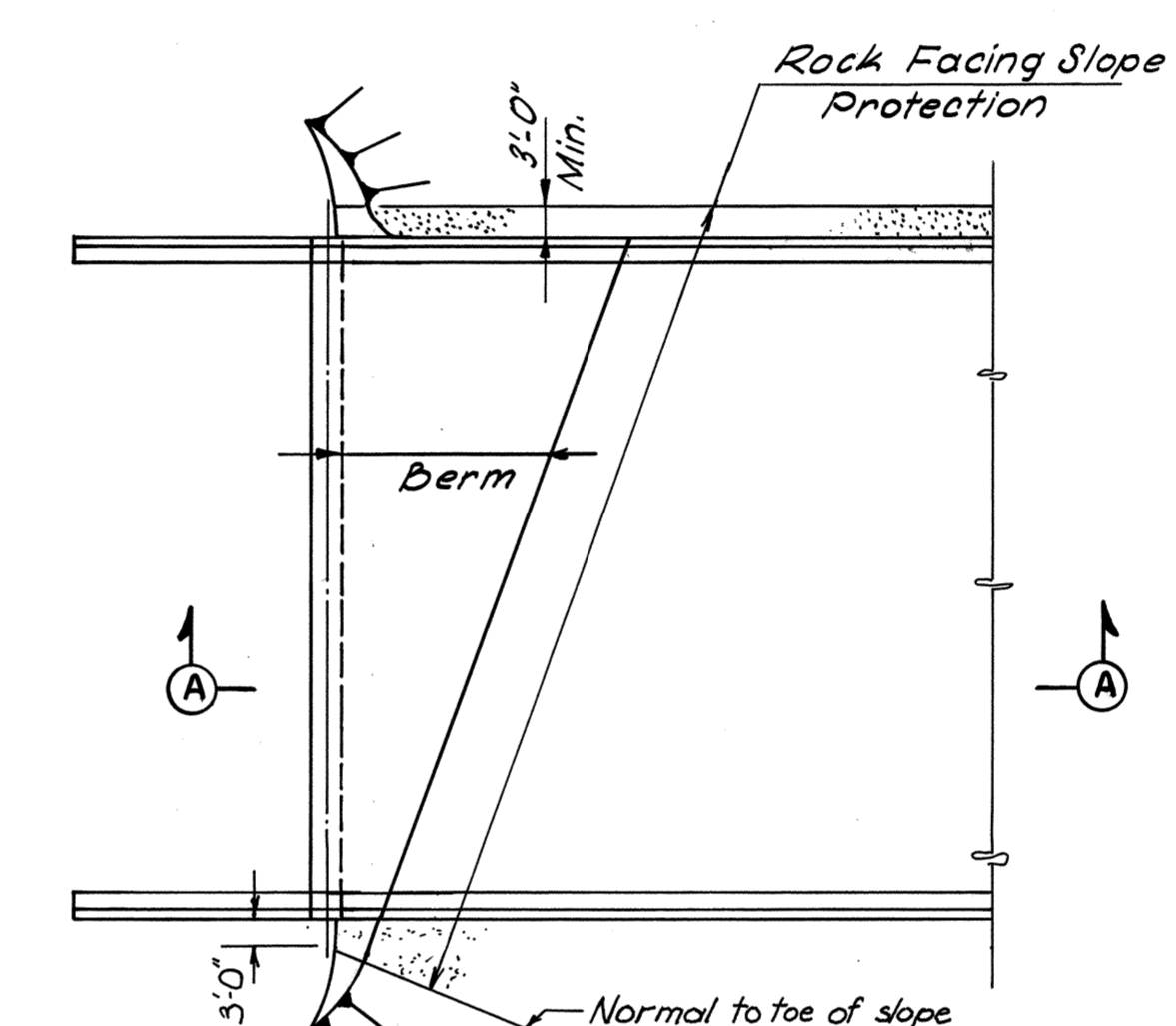
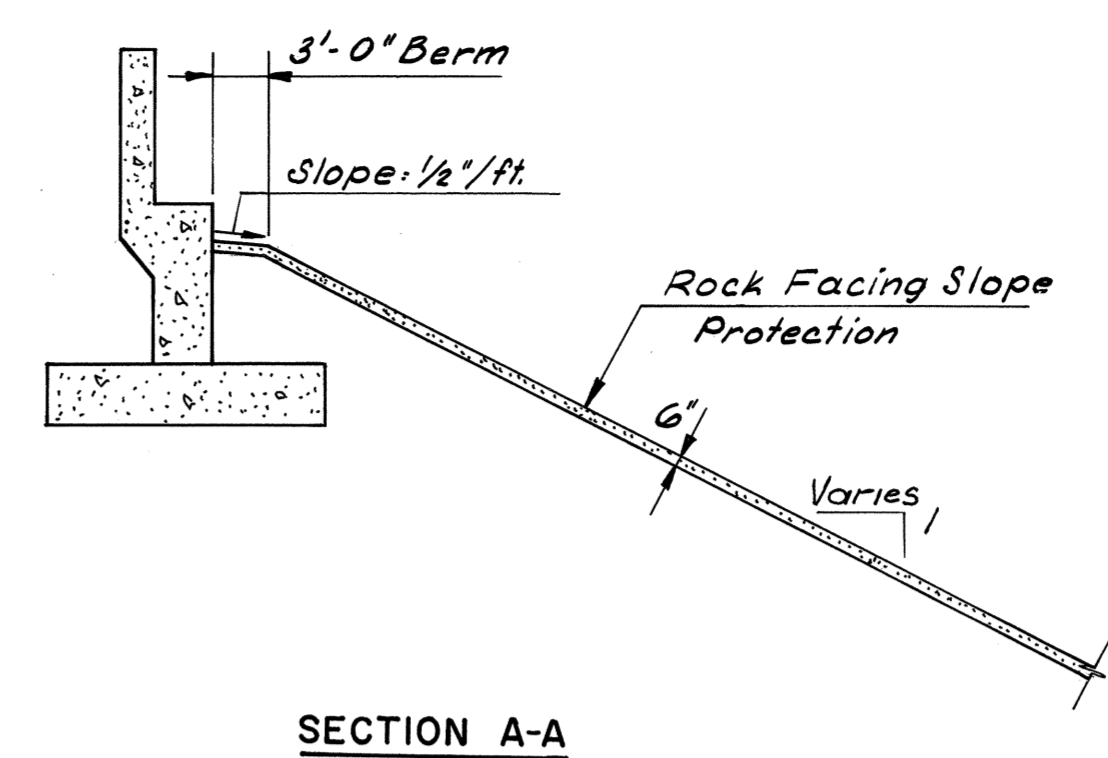
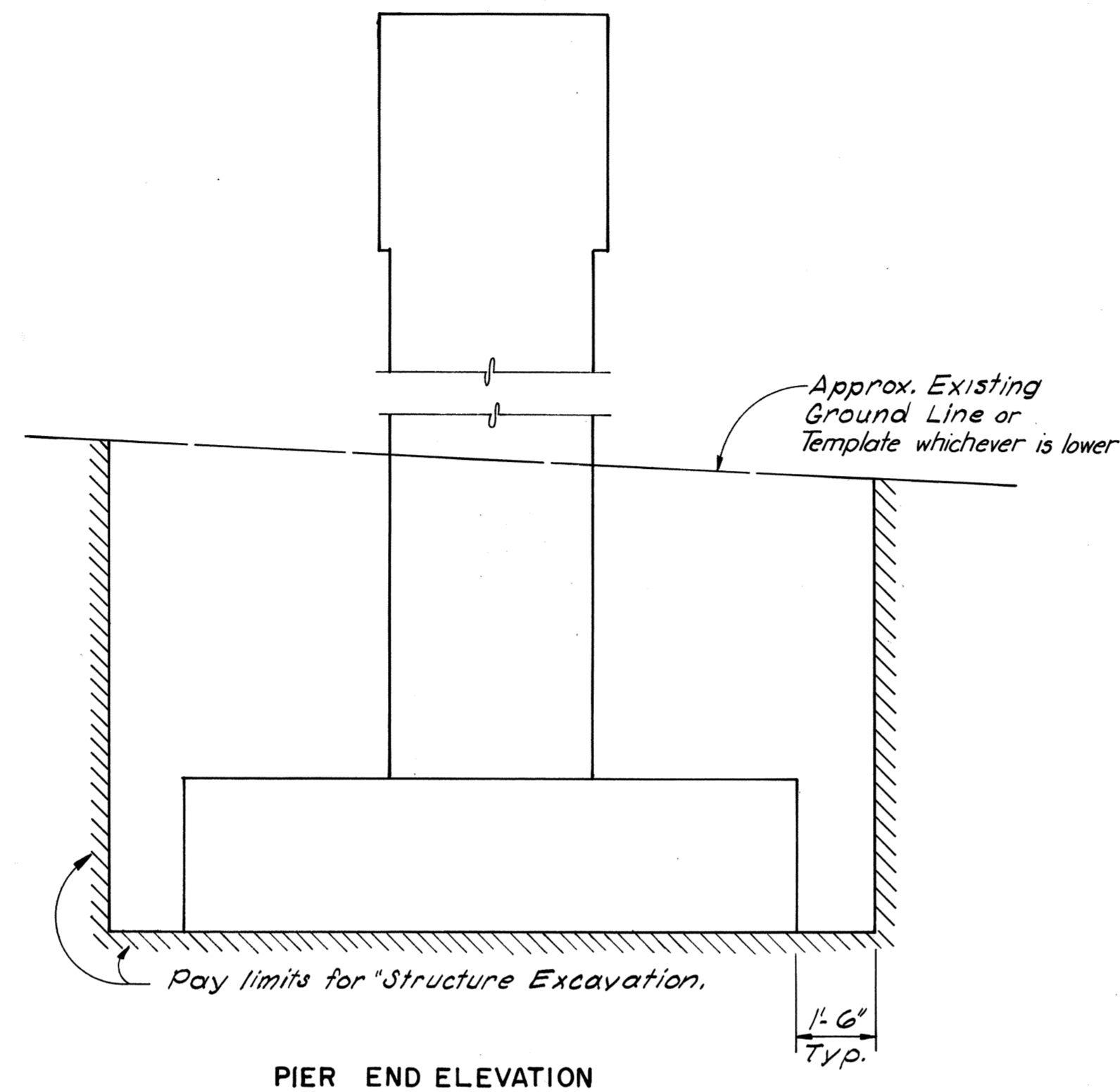
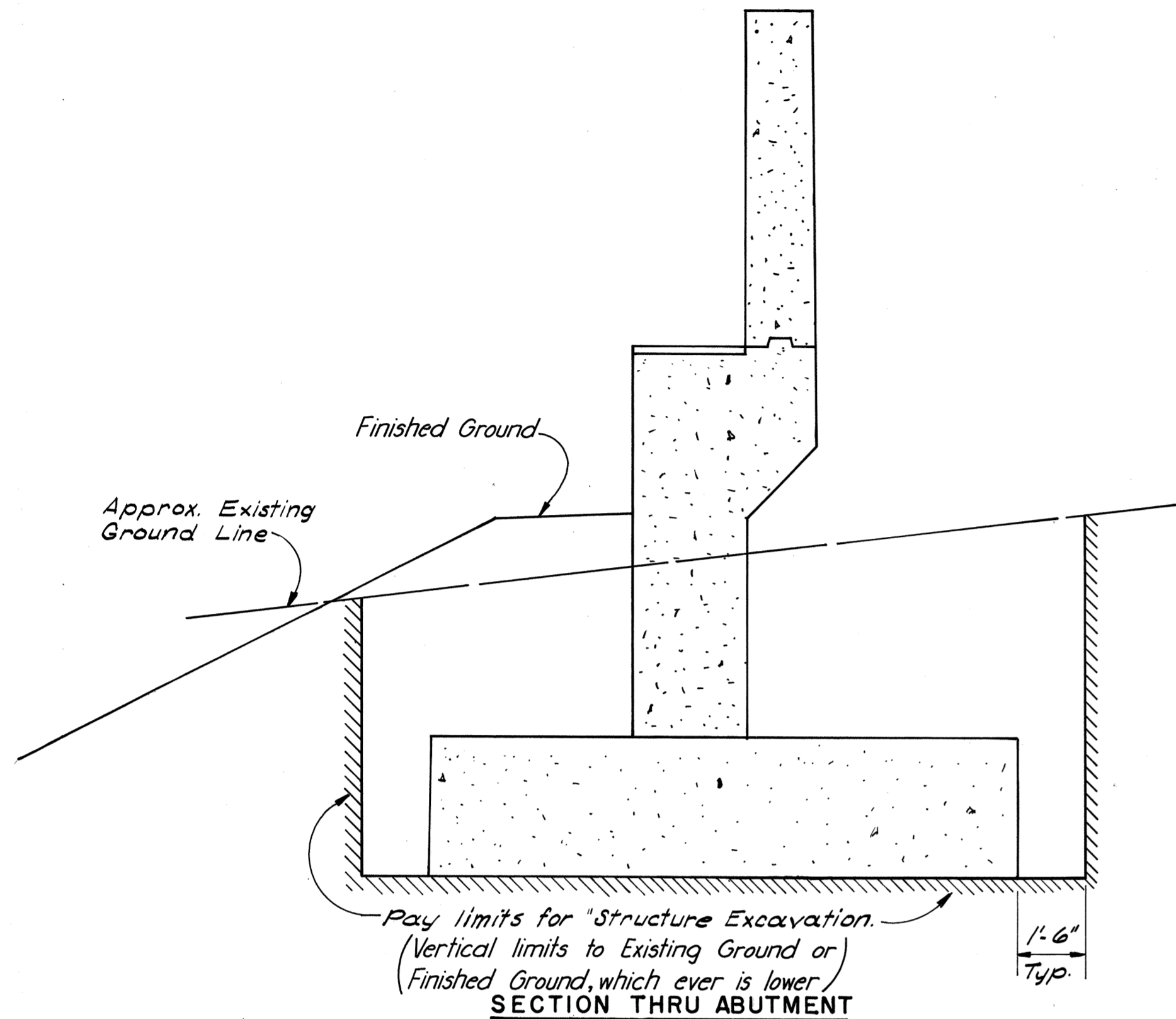


**ELEVATION**  
 Scale 1"=30'-0"

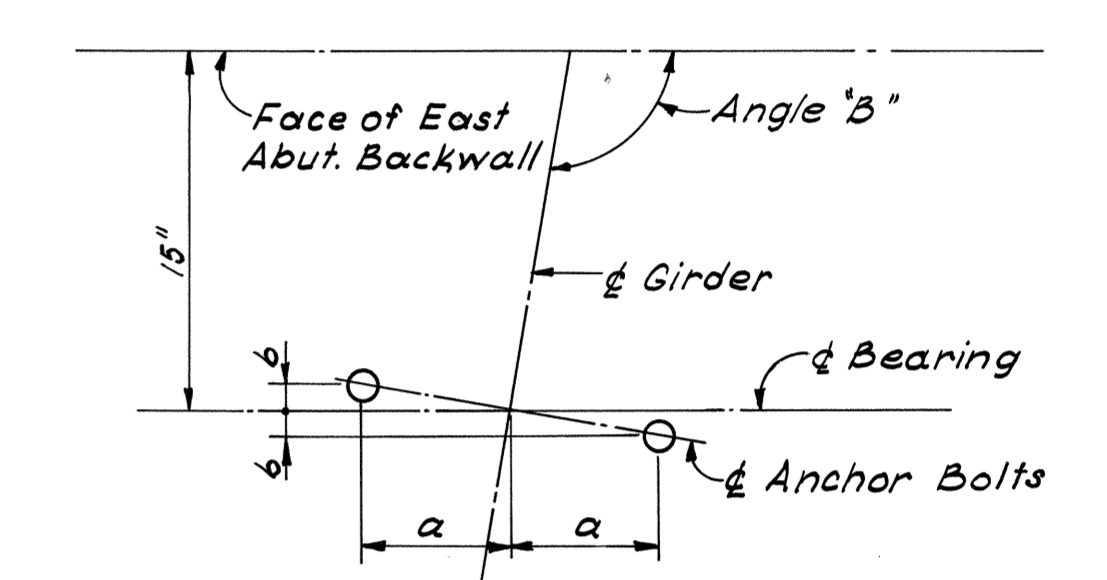
**BRIDGE LAYOUT**  
 No Scale

BY	DATE	NO.	REVISION	BY	DATE
MADE	JDB	1-68	2	As Built	JRC 11-72
CHECKED	JGD	2-68	1	Dim. Unit 6 Brq. E. Abut.	TEM. 6-68
IN CHARGE	JGD				

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	133	188



PIER ANCHOR BOLT SETTING DIAGRAM  
Scale = 1/2" = 1'-0"



EAST ABUTMENT ANCHOR BOLT SETTING DIAGRAM  
Scale = 1/2" = 1'-0"

ESTIMATED QUANTITIES											
	Structure Excavation C.Y.	Concrete (a) C.Y.	Reinforcing Steel Lbs.	Structural Steel Lbs.	Aluminum Br. Railing 1 Rail L.F.	Bridge Drainage System L.S.	Porous Backfill C.Y.	Rock Facing Slope Protec. G" Thick S.Y.	Asphalt Damp proofing S.Y.	Concrete Class A-3 Ret'y. Wall C.Y.	Concrete Slab Slope Protection S.Y.
		(b)			(c)	(d)					
Superstructure		544.88	83,283	1,482,037	1,008	1					
West Abutment	445	225.15	21,598				44	326	102		
Pier 1	304	184.45	40,506								
Pier 2	138	174.28	24,870								
Pier 3	263	203.09	41,816								
Pier 4	498	264.45	31,414								
Pier 5	356	231.15	41,800								
East Abutment	393	241.92	25,359				55		127	17	113
Total	2,397	1,524.49(a) 544.88(b)	310,646	1,482,037	1,008	1	99	326	229	17	113

SLAB ELEVATIONS			
Location	Lt. Curb Elev.	Crown Elev.	Rt. Curb Elev.
Face of Bkwl. West Abut.	143.98	144.10	143.98
± Pier 1	143.50	143.69	143.65
± Pier 2	143.13	143.34	143.30
± Pier 3	142.73	142.94	142.92
± Pier 4	142.13	142.35	142.35
± Pier 5	141.36	141.60	141.60
Face of Bkwl. East Abut.	140.76	140.88	140.76

ANCHOR BOLT SETTING DIMENSIONS					
Girder	Angle "A" or "B"		Girder	Angle "B"	
	a	b		a	b
S1-S16	7 3/8"	8 5/8"	S33	7 3/8"	10 1/4"
S17	7 1/2"	8 1/2"	S34	7 3/8"	10 3/8"
S18-S22	7 1/2"	8 1/8"	S35-S38	7 1/2"	10 3/8"
S23	7 3/8"	8 5/8"	S39	7 3/8"	10 1/8"
S24	7 5/8"	8 5/8"	S40	7 3/8"	10 1/8"
S25	7 3/4"	9"	S41-S46	7 1/2"	9 1/2"
S26	7 1/4"	8 5/8"	S47-S48	7 5/8"	9 1/2"
S27-S31	7 1/4"	8 5/8"			
S32	7 5/8"	8 7/8"			

BY	DATE	NO.	REVISION	BY	DATE
		4	As Built	R.J.H.	11-72
		3	General	J.G.V.	10-70
MADE	JDB 2-68	2	Anchor Bolt set dim.	T.E.M.	6-68
CHECKED	JGD 3-68	1	Quantity	DSB	5-68
IN CHARGE	JGD				

(a) Class A3, Unless noted.  
 (b) Class A4.  
 (c) Includes that portion on abutments & wingwalls.  
 (d) Includes underdrains

AS BUILT

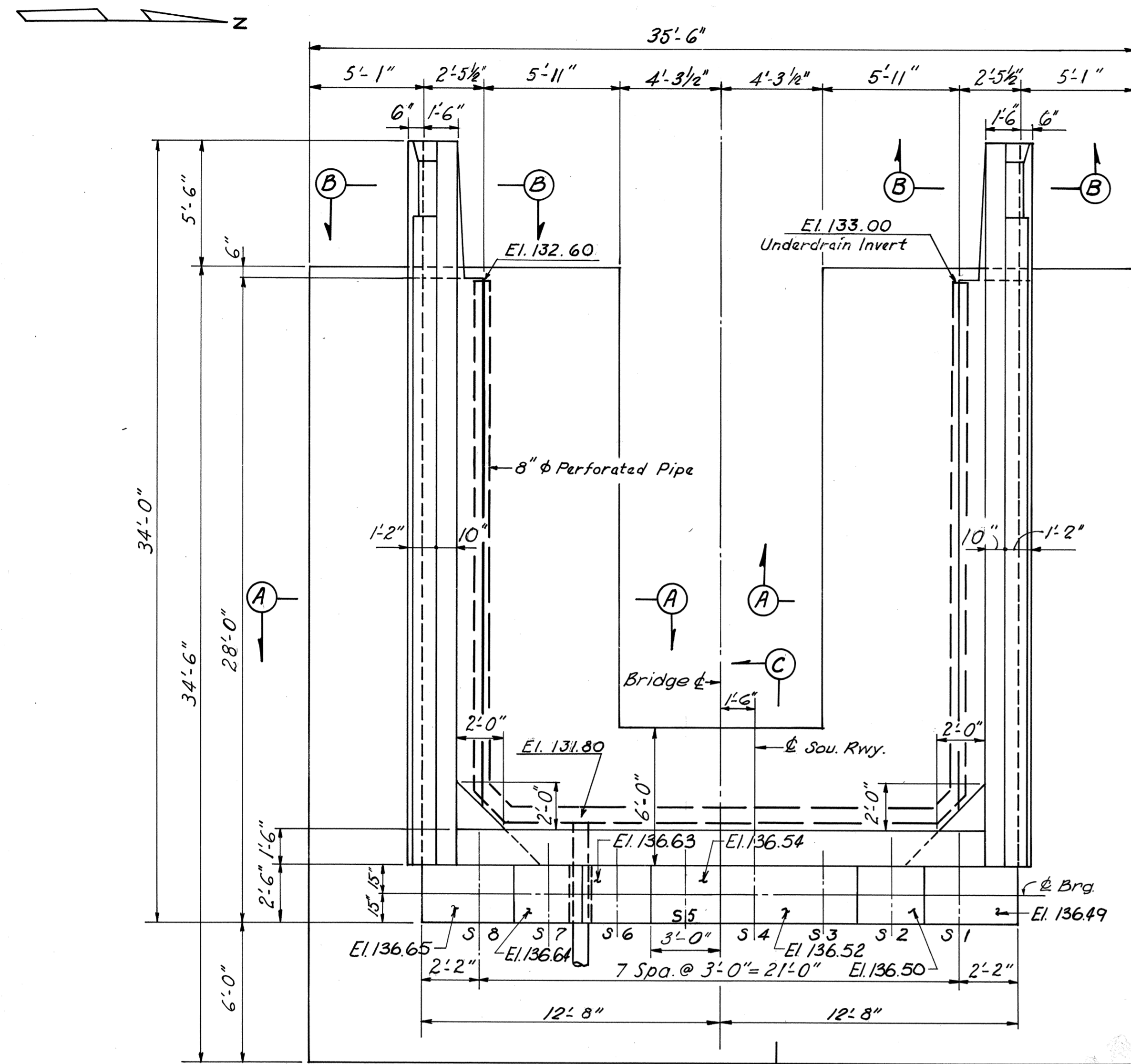
**RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM**

POWHITE PARKWAY  
SOUTHERN RAILWAY OVER  
POWHITE PARKWAY  
BRIDGE B-05

**QUANTITIES & MISC. DETAILS**

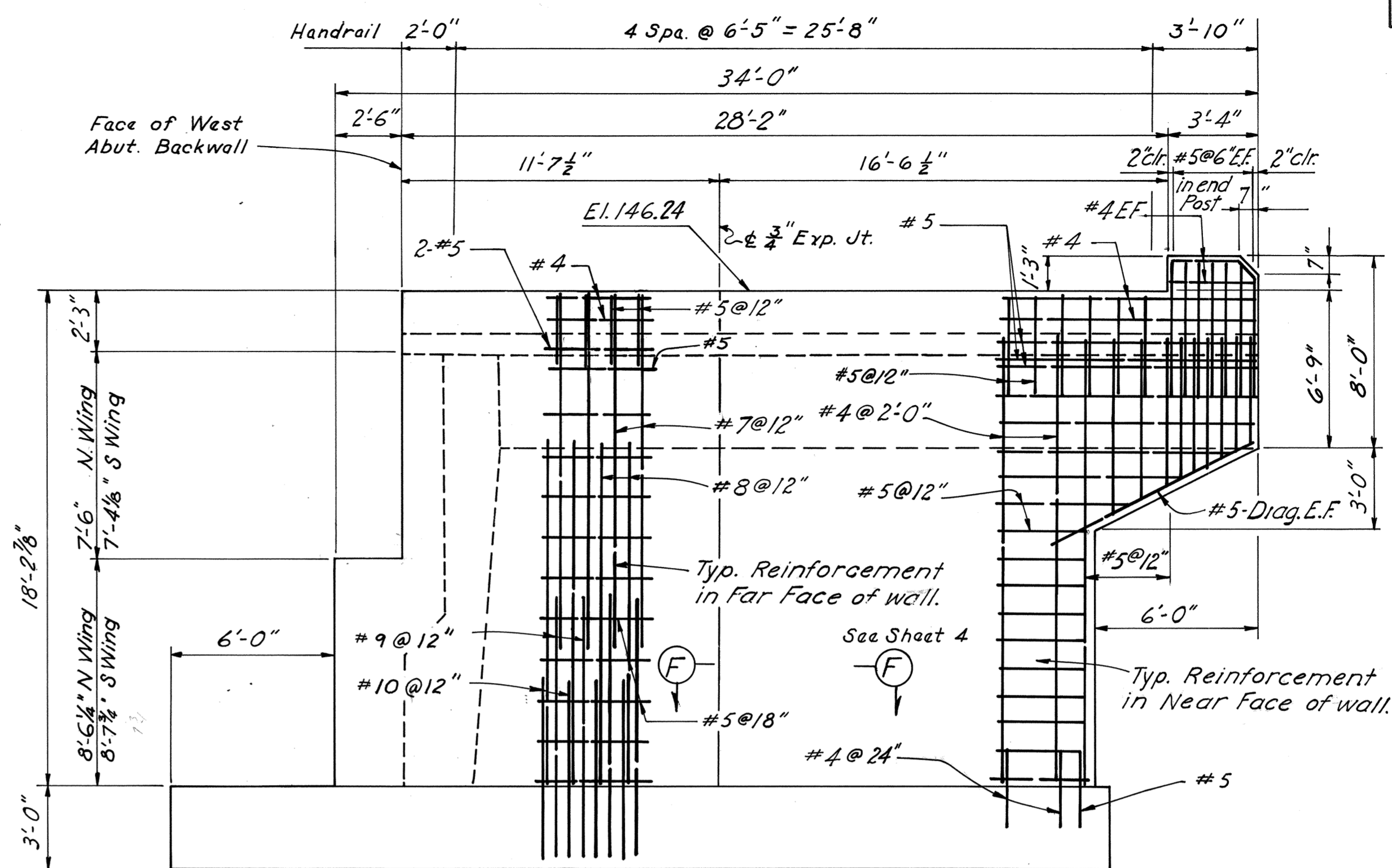
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: AS SHOWN CONTRACT NO.: 2 SHEET NO. 2 OF 19
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	134	188

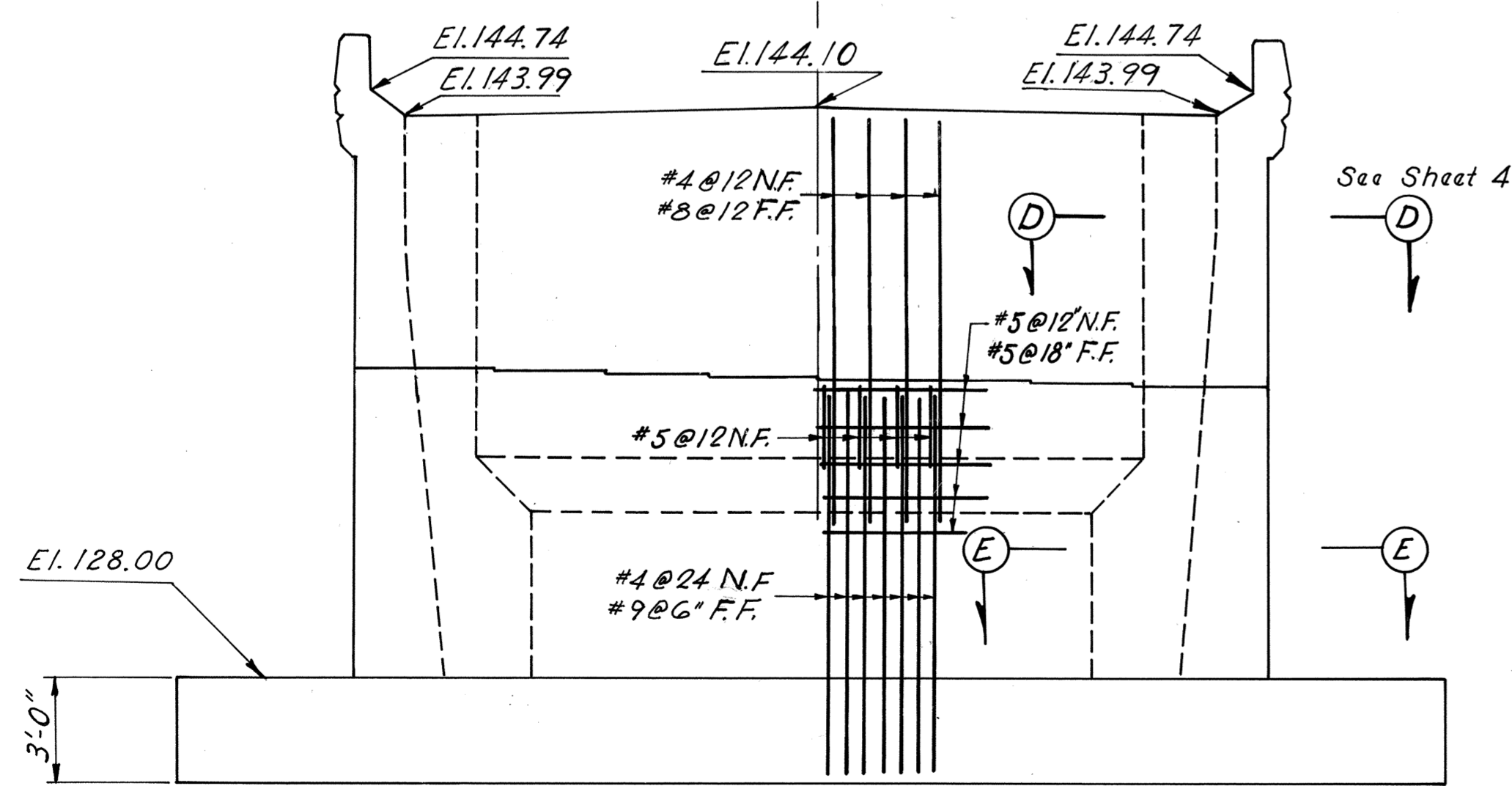


PLAN

See Sheet 4



ELEVATION - NORTH WING WALL - WEST ABUTMENT  
SOUTH WING WALL - OPPOSITE HAND



ELEVATION

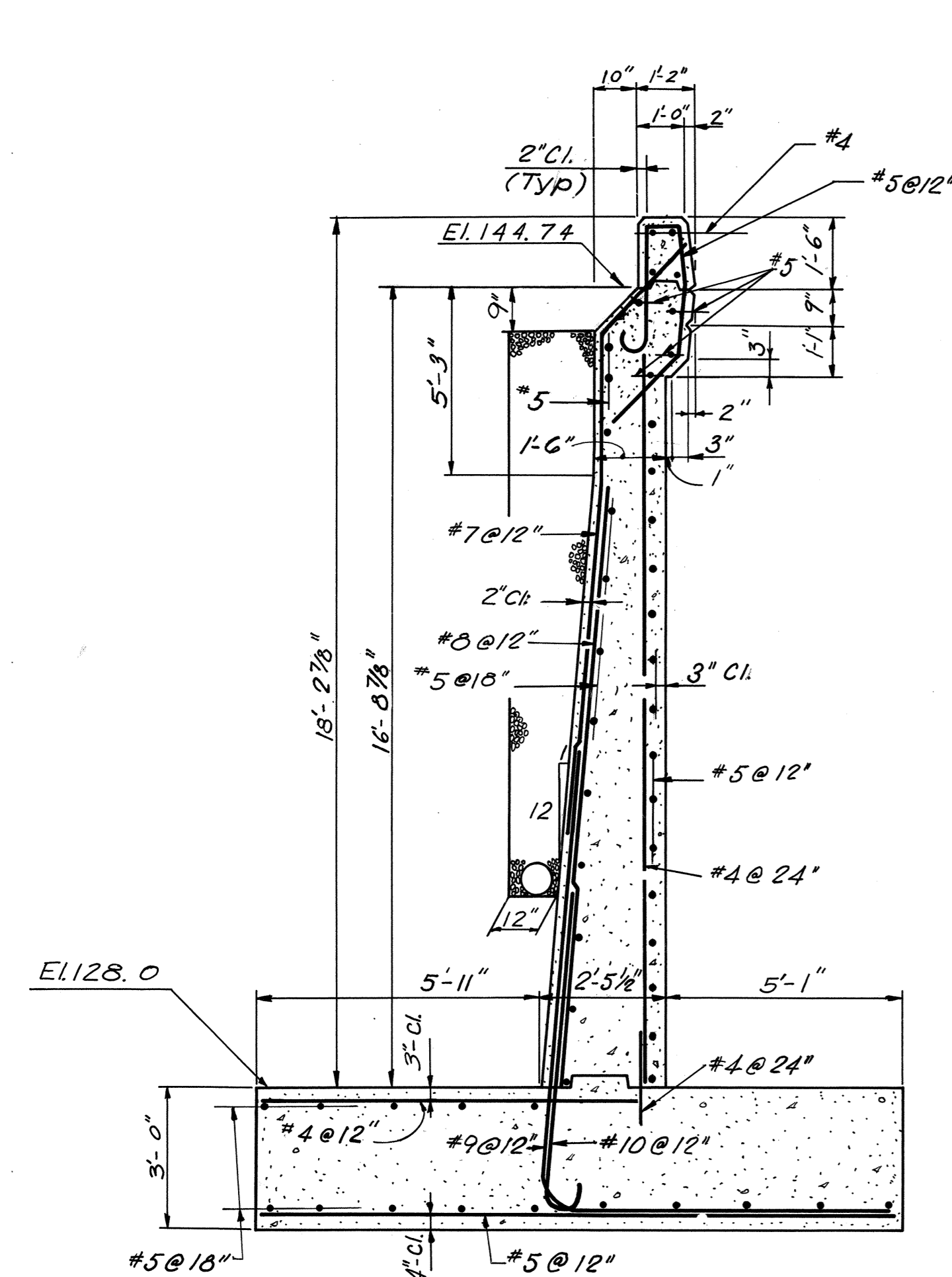
See Sheet 4

BY	DATE	NO.	REVISION	BY	DATE
MADE	WCV	1-68	2	As Built	JRC 11-72
CHECKED	THN	2-68	1	Pod El. and dim.	TEM 6-68
IN CHARGE	JGD				

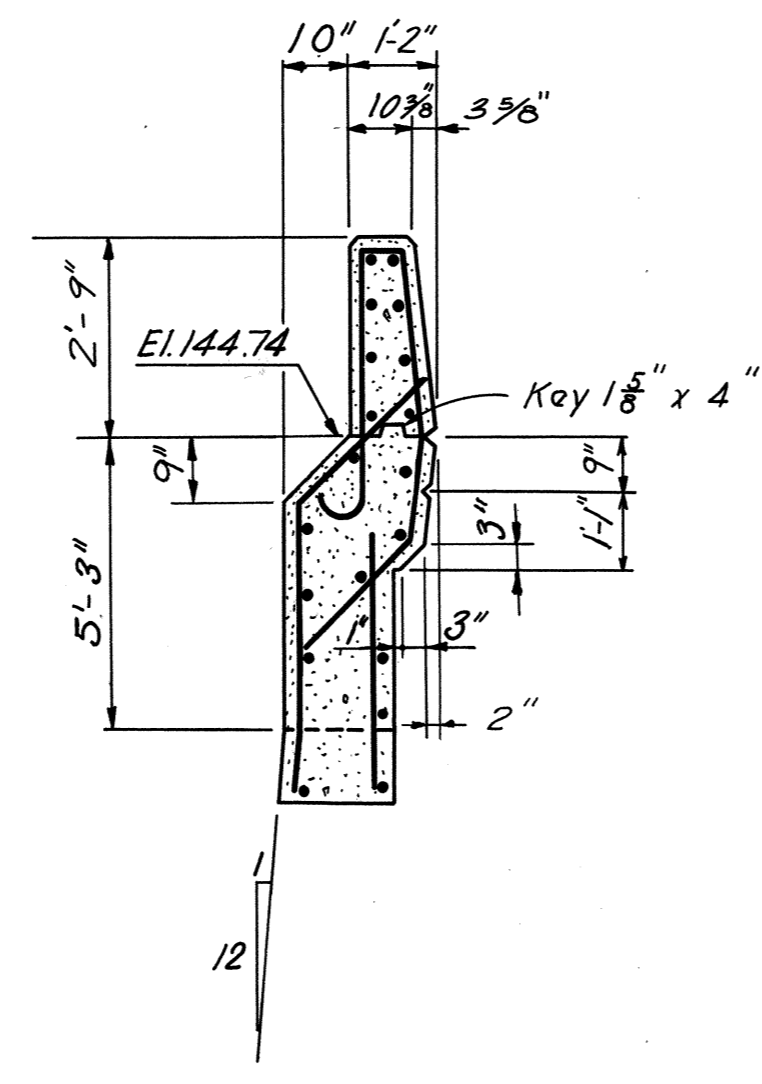
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM POWHITE PARKWAY	
SOUTHERN RAILWAY OVER POWHITE PARKWAY BRIDGE B-05	
<b>WEST ABUTMENT DETAILS</b>	
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: 1/4" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO.: 2
	SHEET NO. 3 OF 19

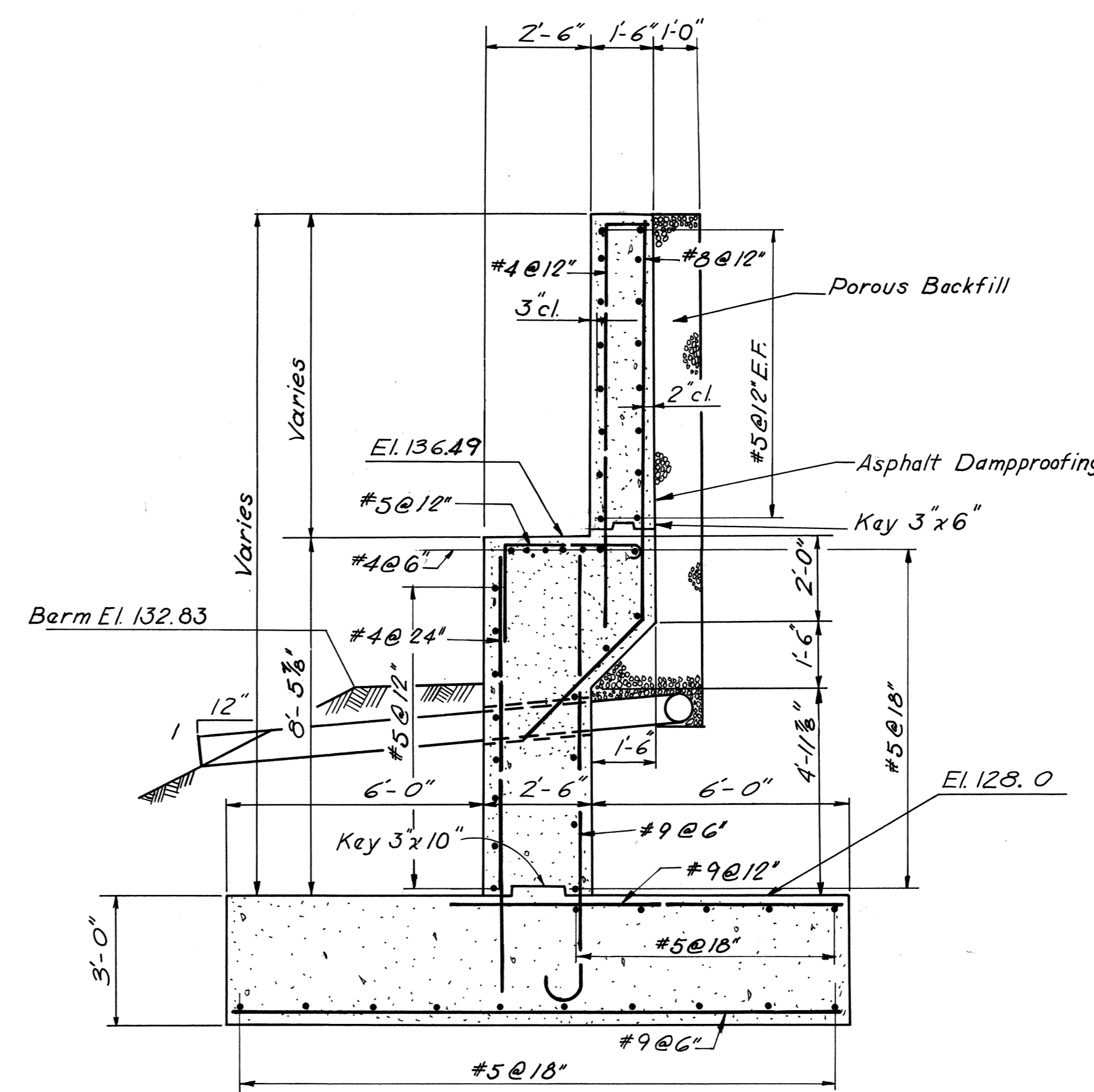
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	135	188



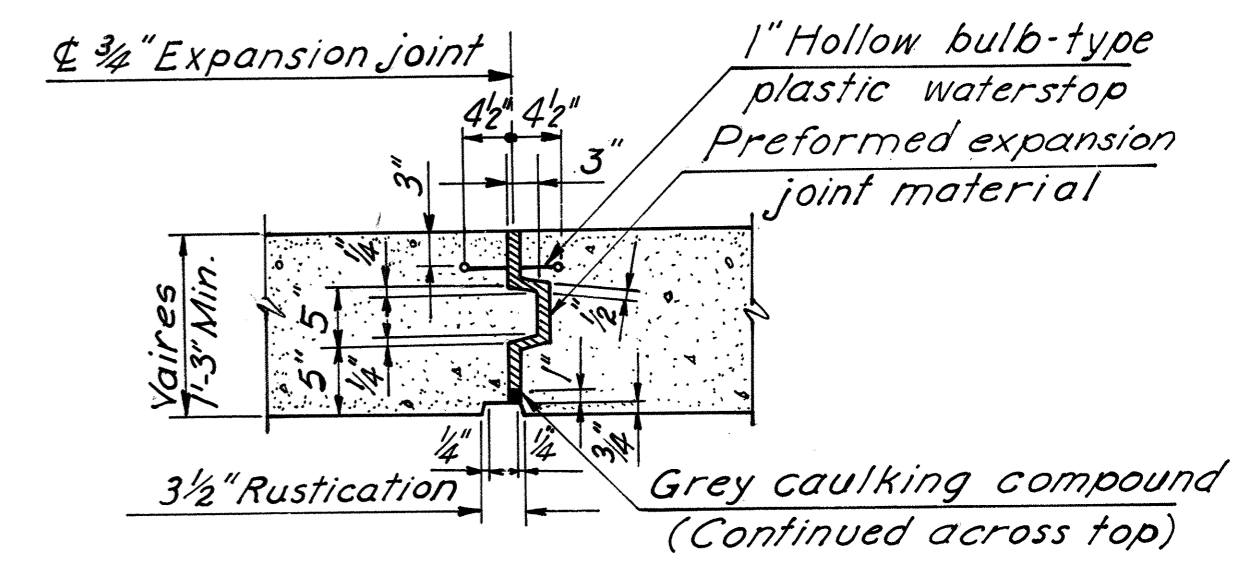
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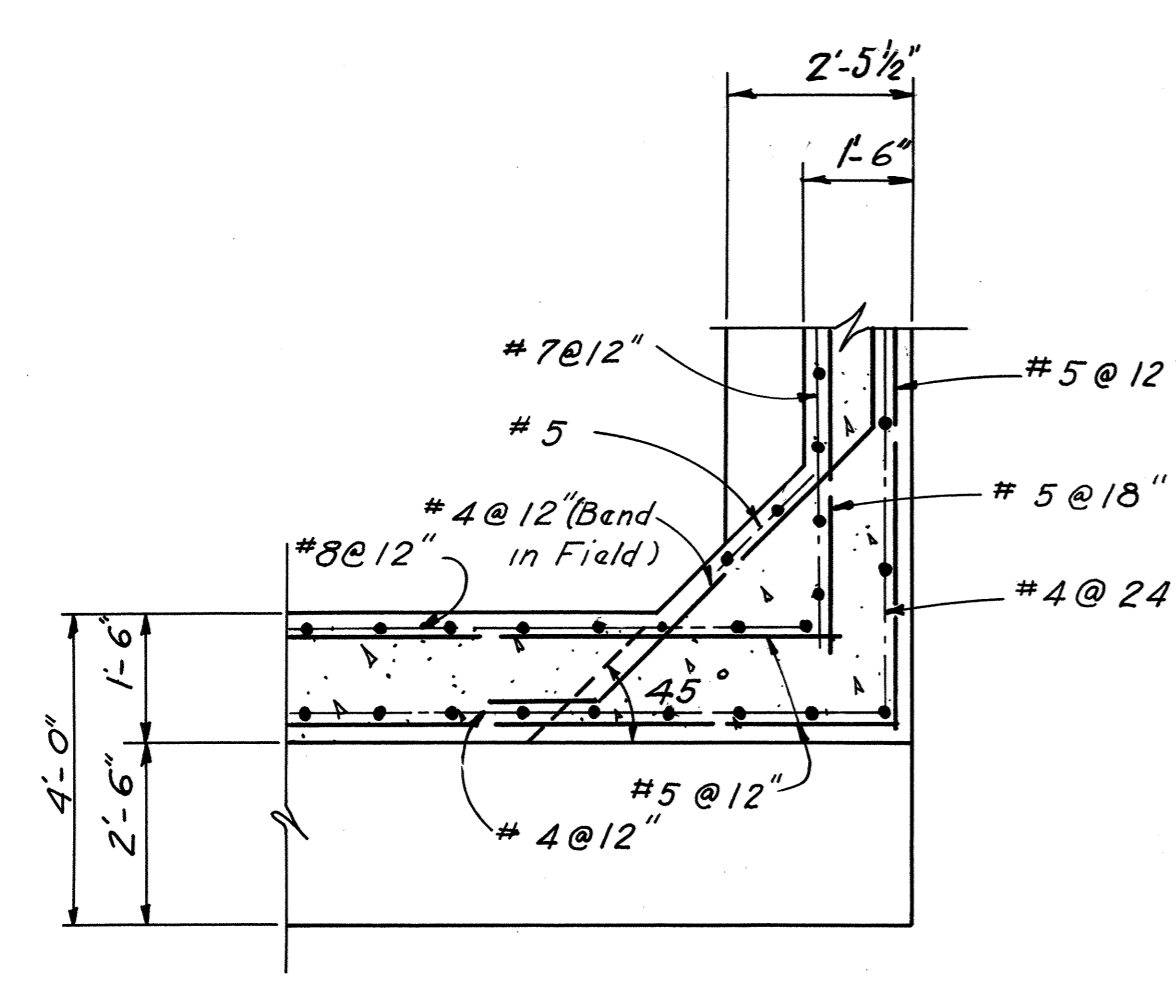
SECTION B-B



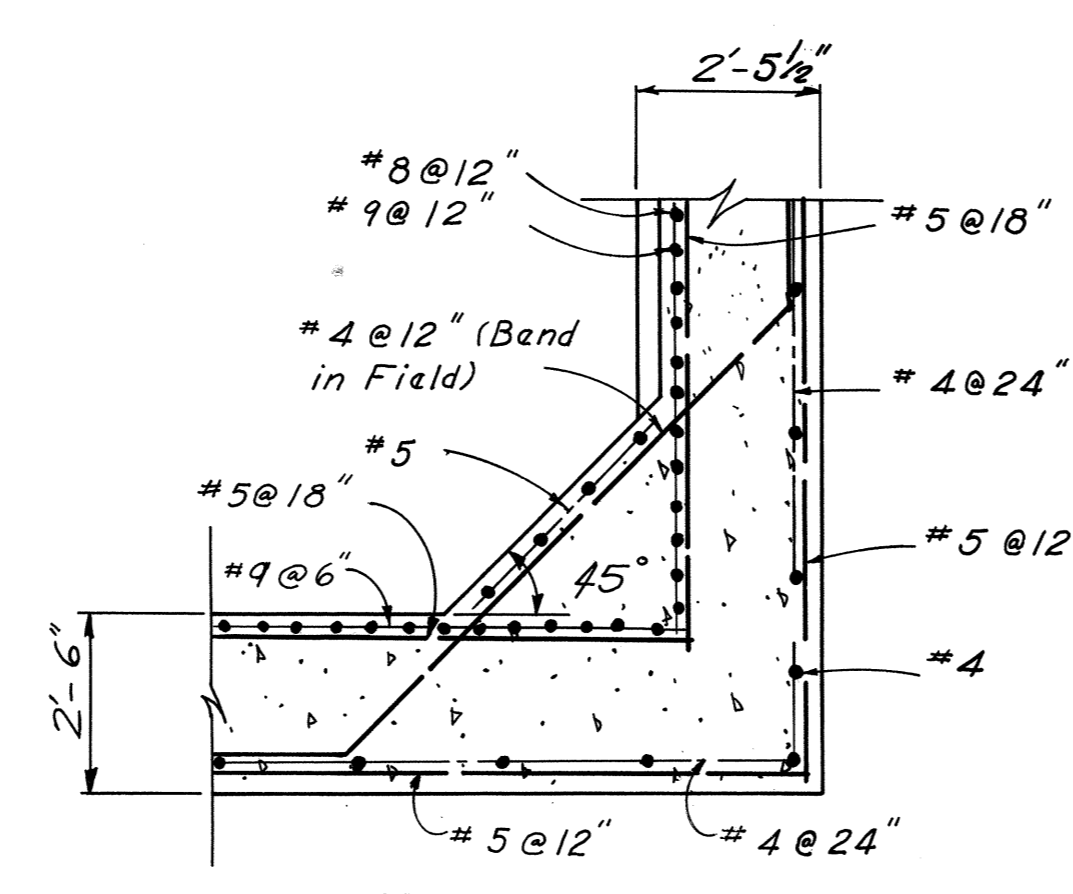
SECTION C-C



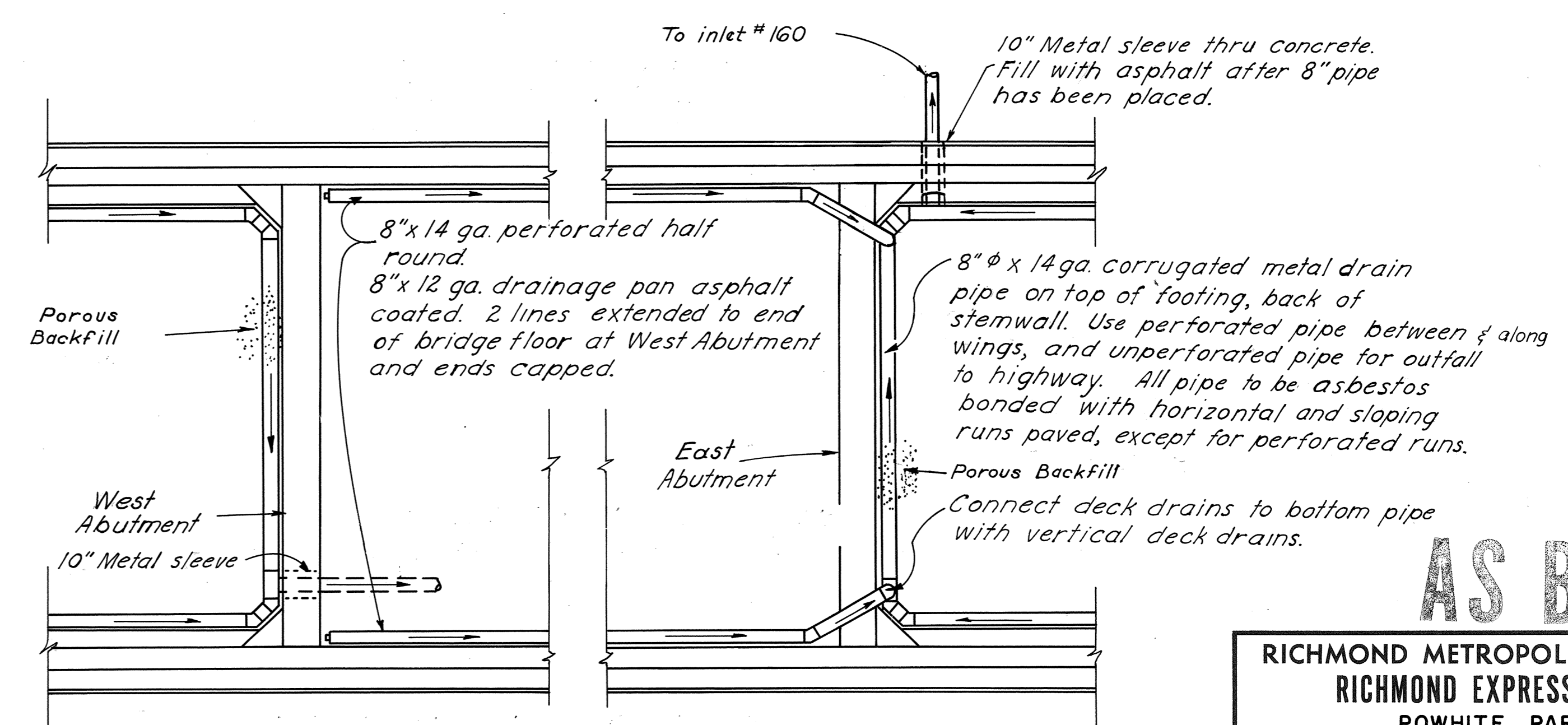
SECTION F-F  
scale: 3/4" = 1'-0"



SECTION D-D



SECTION E-E



DETAILS OF DRAINAGE SYSTEM

**AS BUILT**

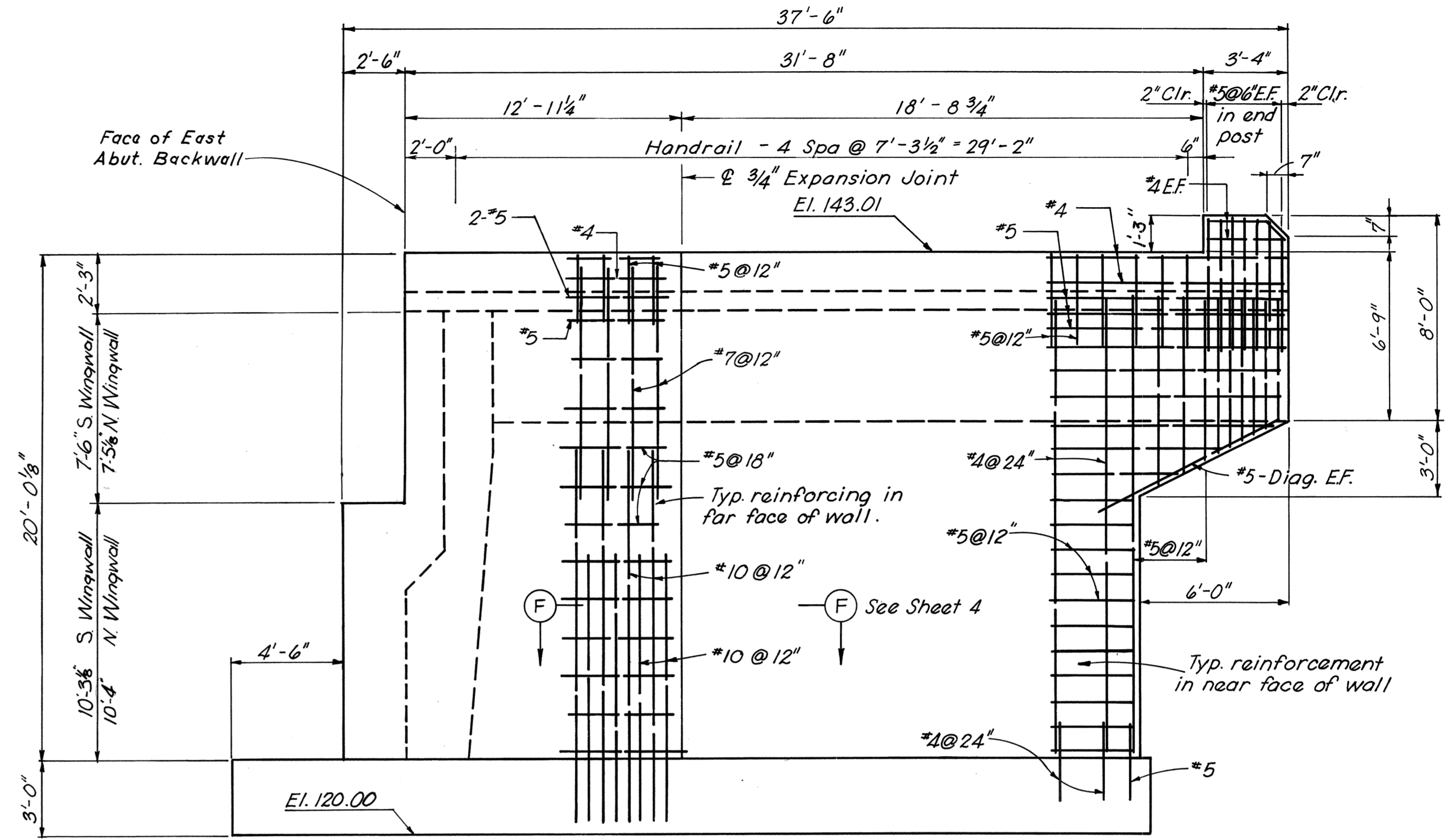
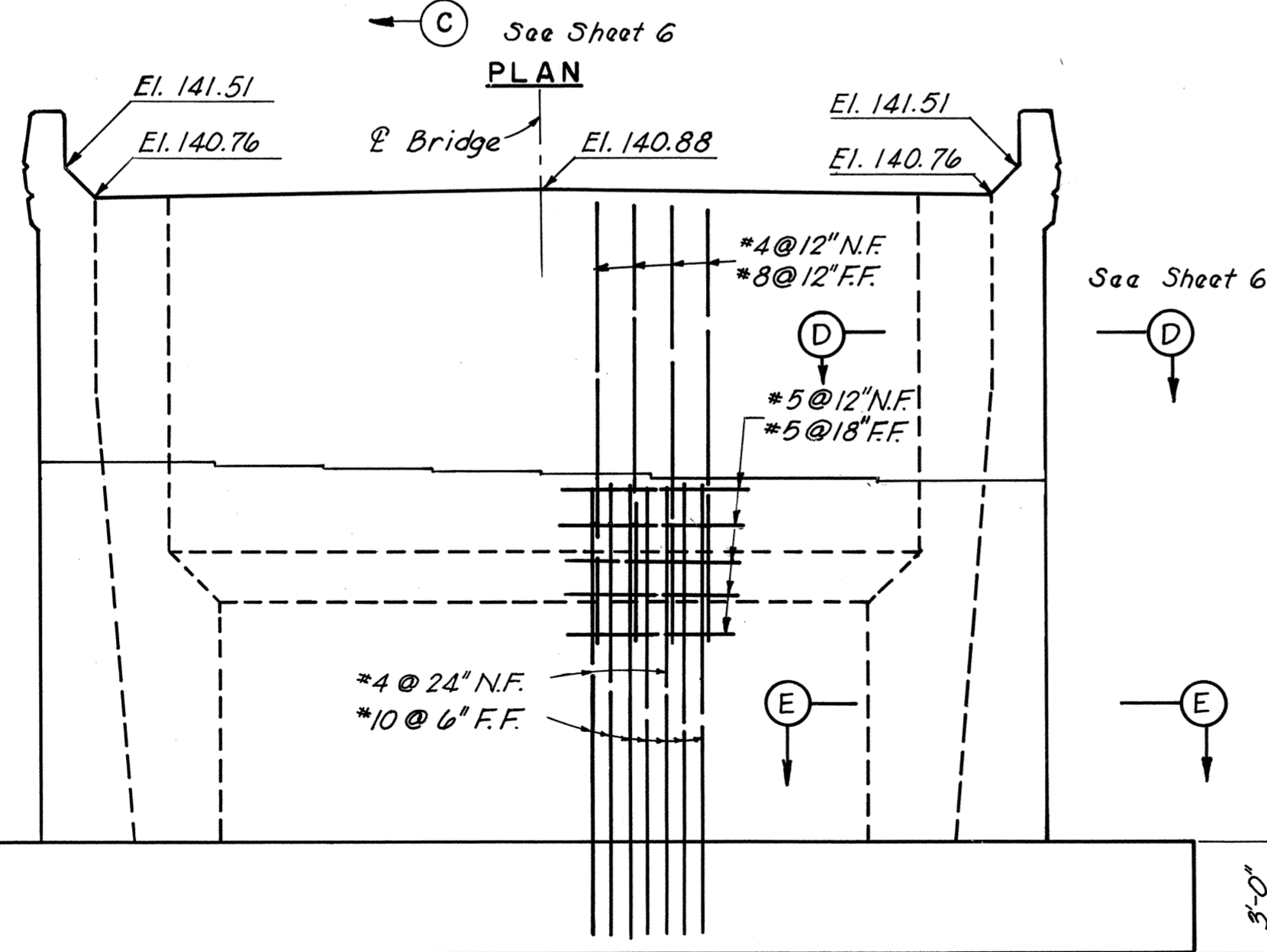
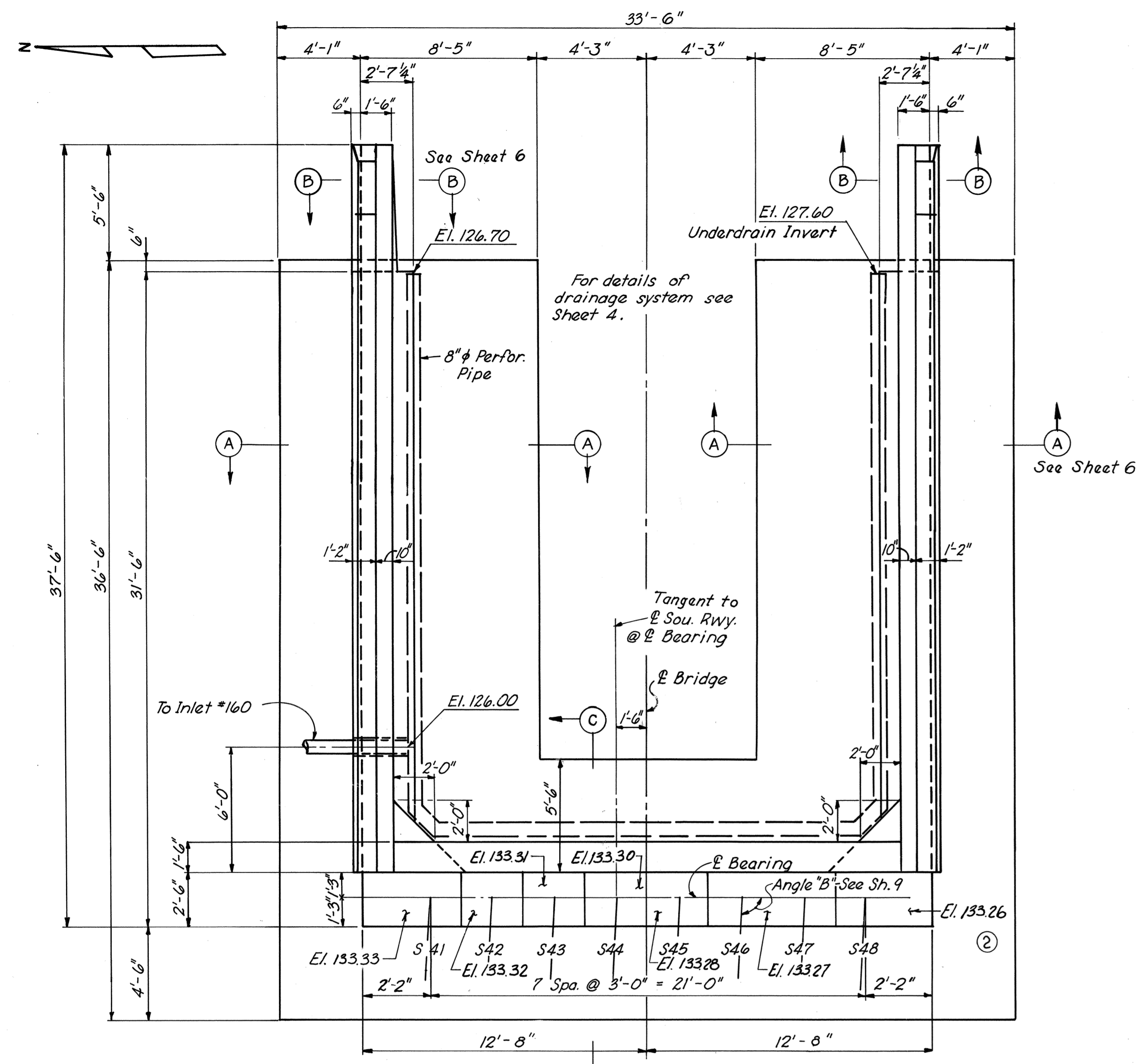
RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY  
SOUTHERN RAILWAY OVER  
POWHITE PARKWAY  
BRIDGE B - 05

**WEST ABUTMENT & DRAINAGE DETAILS**

HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: 3/8" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO.: 2
	SHEET NO. 4 OF 19

BY	DATE	3	As Built	JRC	11-72	
MADE	WCJ	1-68	2	General	J.G.V.	10-70
CHECKED	THN	2-68	1	Pad El # dim.	T.E.M.	6-68
IN CHARGE	J.G.D.					
		NO.	REVISION	BY	DATE	

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	136	188



ELEVATION SOUTH WING WALL - EAST ABUTMENT  
NORTH WING WALL - OPPOSITE HAND

**Note to Contractor**  
 Attention is called to the apparent erratic location of the top of rock in the vicinity of the East Abutment. If, after excavating for the East Abutment, the majority of founding material located at Elevation 120 is rock, all pockets of decomposed material within the limits of the excavation shall be removed and backfilled with Class A3 concrete. Conversely, if the majority of founding material is decomposed rock, areas of projecting bedrock shall be removed to an elevation one foot below the footing elevation and backfilled to the footing elevation with a blanket of well compacted granular material similar in nature to the majority founding material.  
 Any additional excavation required by the above will be paid for at the unit price bid for Structure Excavation. Additional Class A3 concrete required, amounting to 1 cubic yard or more, will be paid for at the unit price bid for Concrete, Class A3, Substructures. No additional payment will be made for backfilling with granular material.

**AS BUILT**

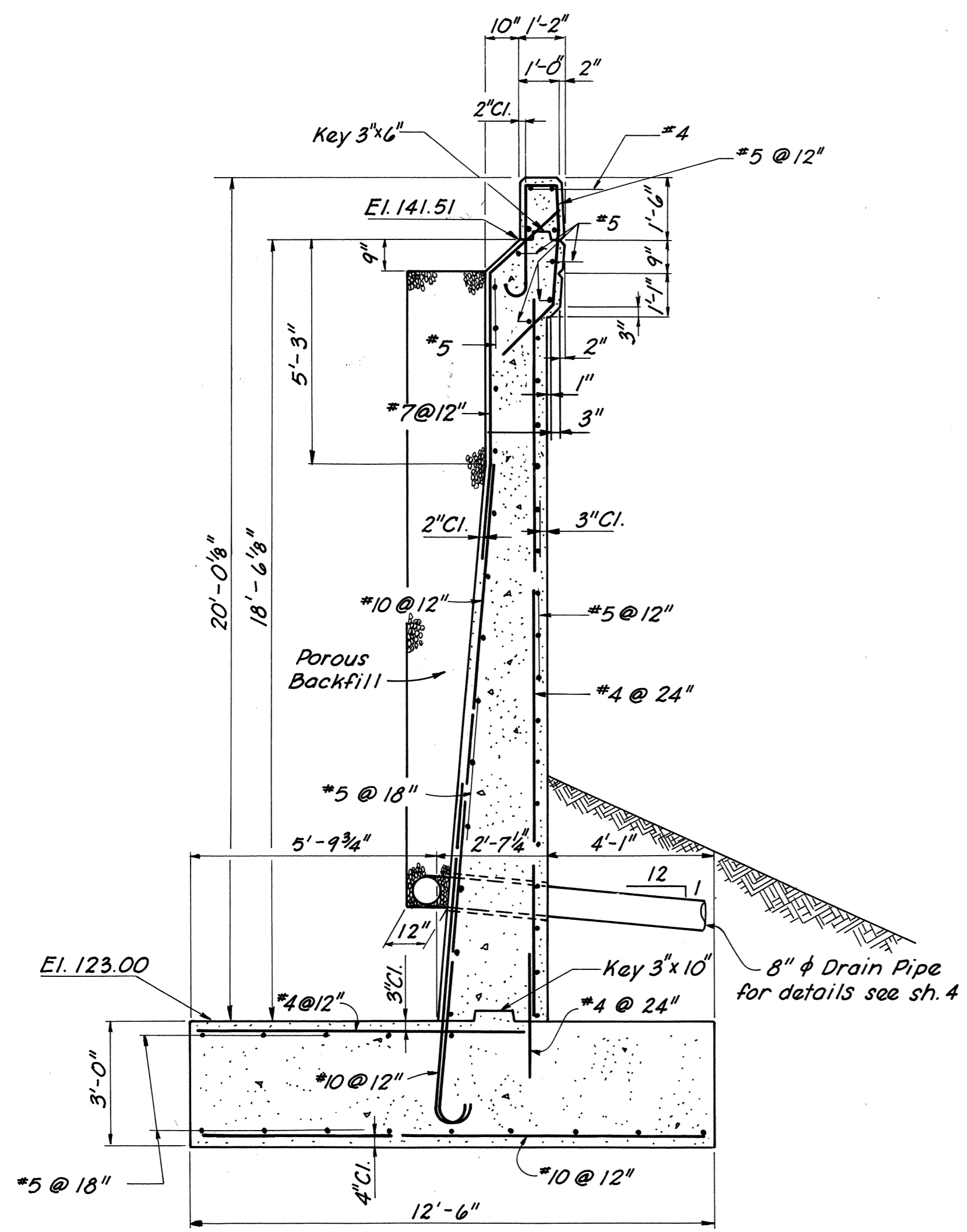
**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
 POWHITE PARKWAY  
 SOUTHERN RAILWAY OVER  
 POWHITE PARKWAY  
 BRIDGE B-05  
**EAST ABUTMENT DETAILS**

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

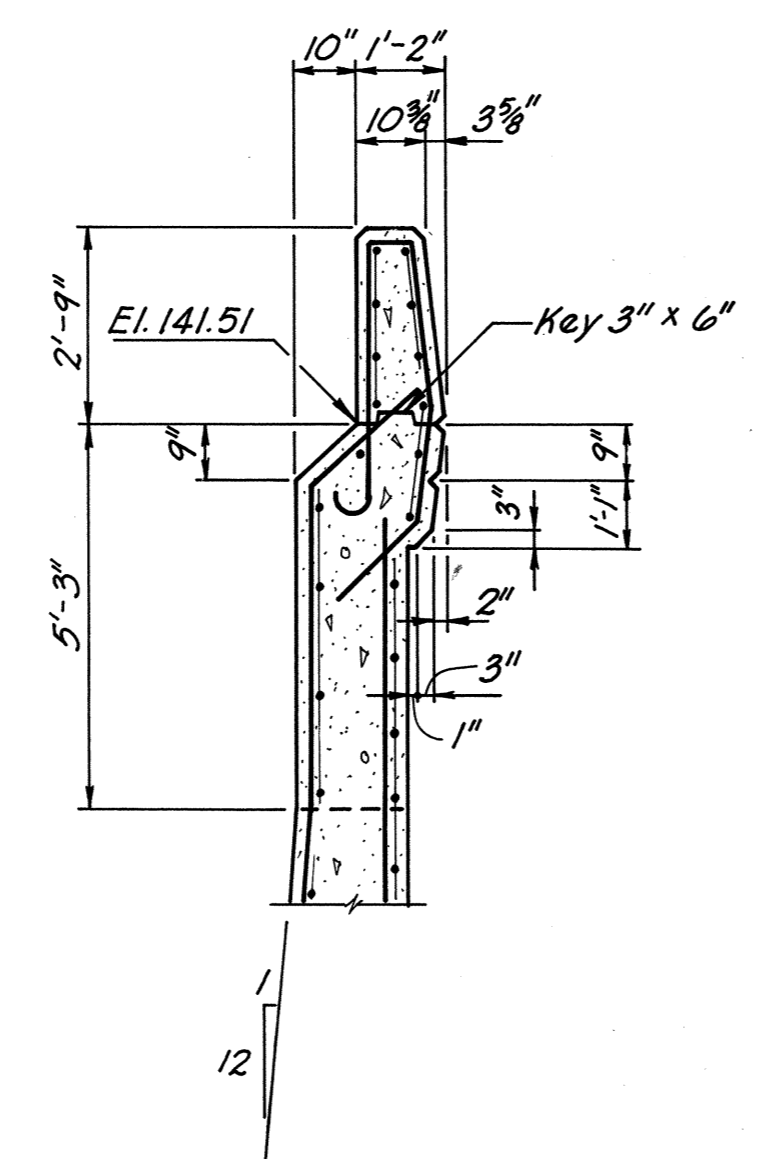
SCALE: 1/4" = 1'-0"  
 CONTRACT NO.: 2  
 SHEET NO. 5 OF 19

BY	DATE	1	Note added	TEM.	4-68
MADE	RLW	3-68	2	Pad El # dim	TEM. 6-68
CHECKED	JGD	3-68	3	As Built	JRC 11-72
IN CHARGE	JGD				

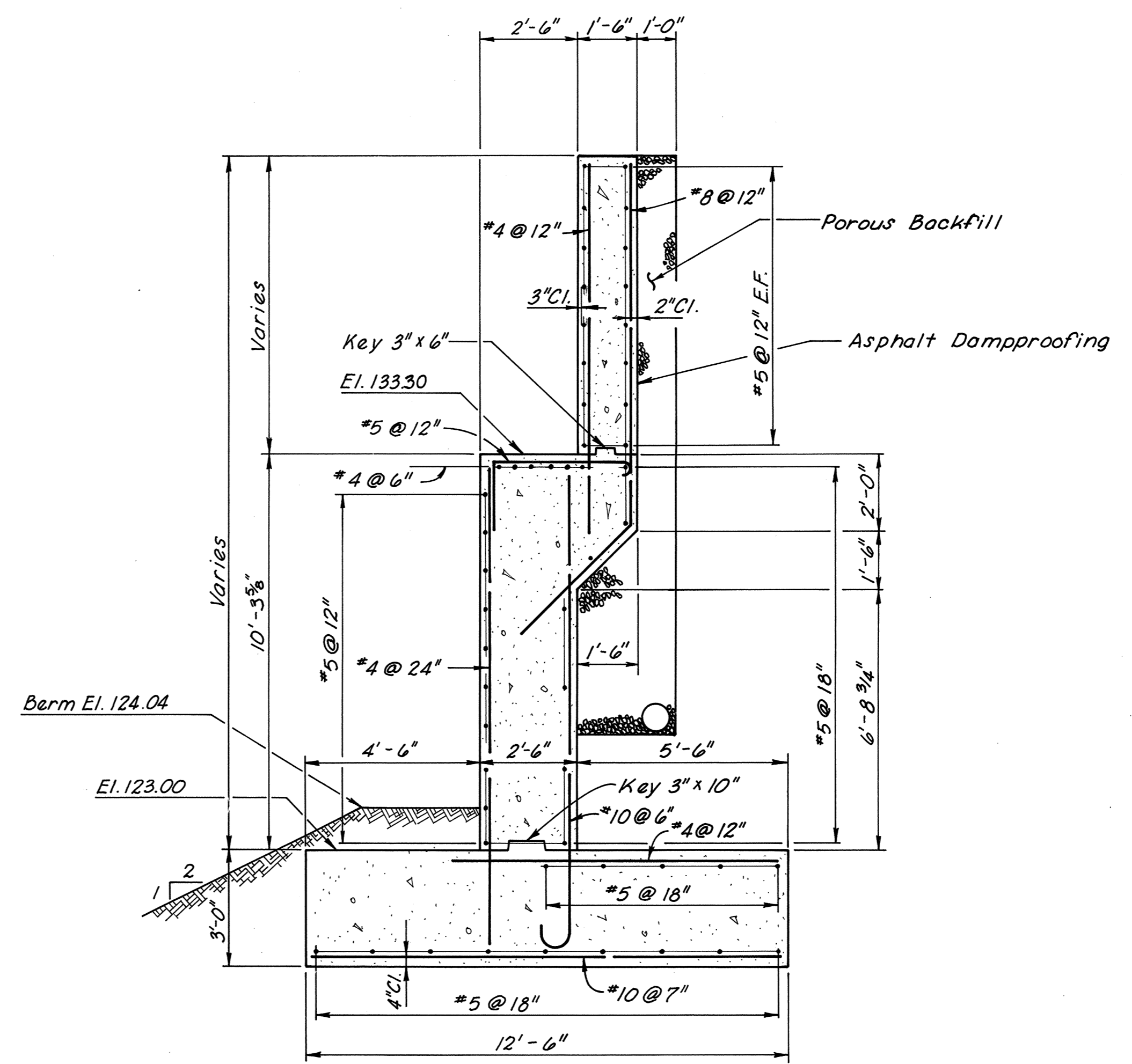
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	137	188



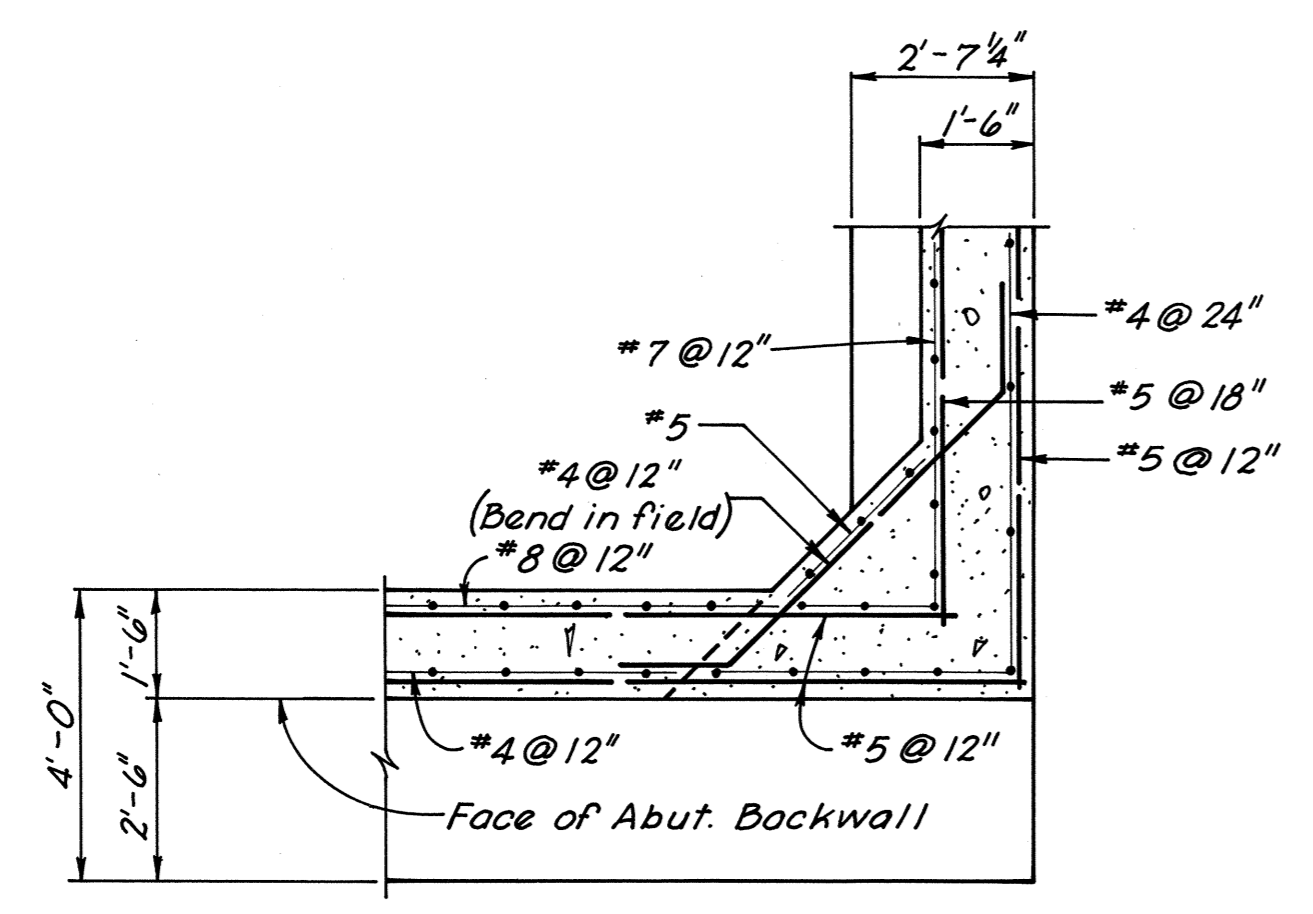
SECTION A - A



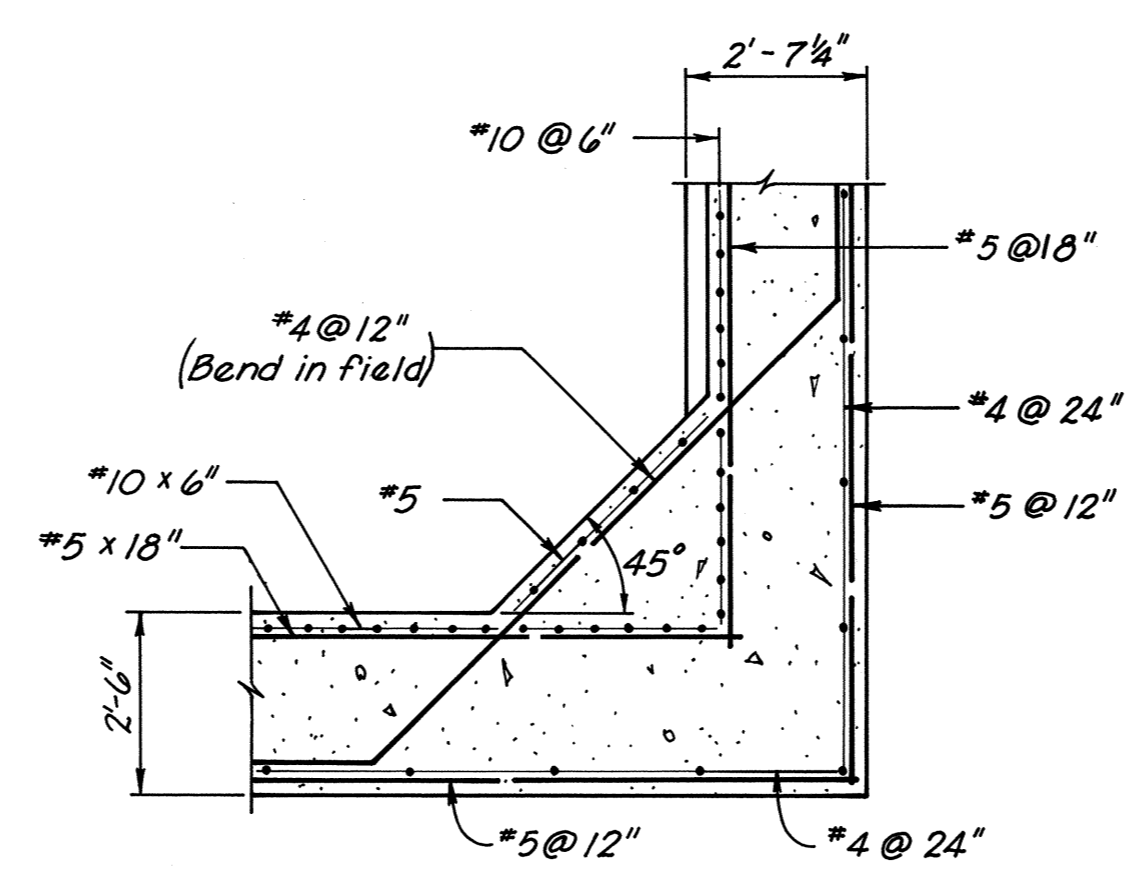
SECTION B - B



SECTION C - C



SECTION D - D



SECTION E - E

BY	DATE	NO.	REVISION	BY	DATE
RLW	3-68	2	As Built	JRC	11-72
JGD	3-68	1	Pad El. & dim.	T.E.M.	6-68

**AS BUILT**

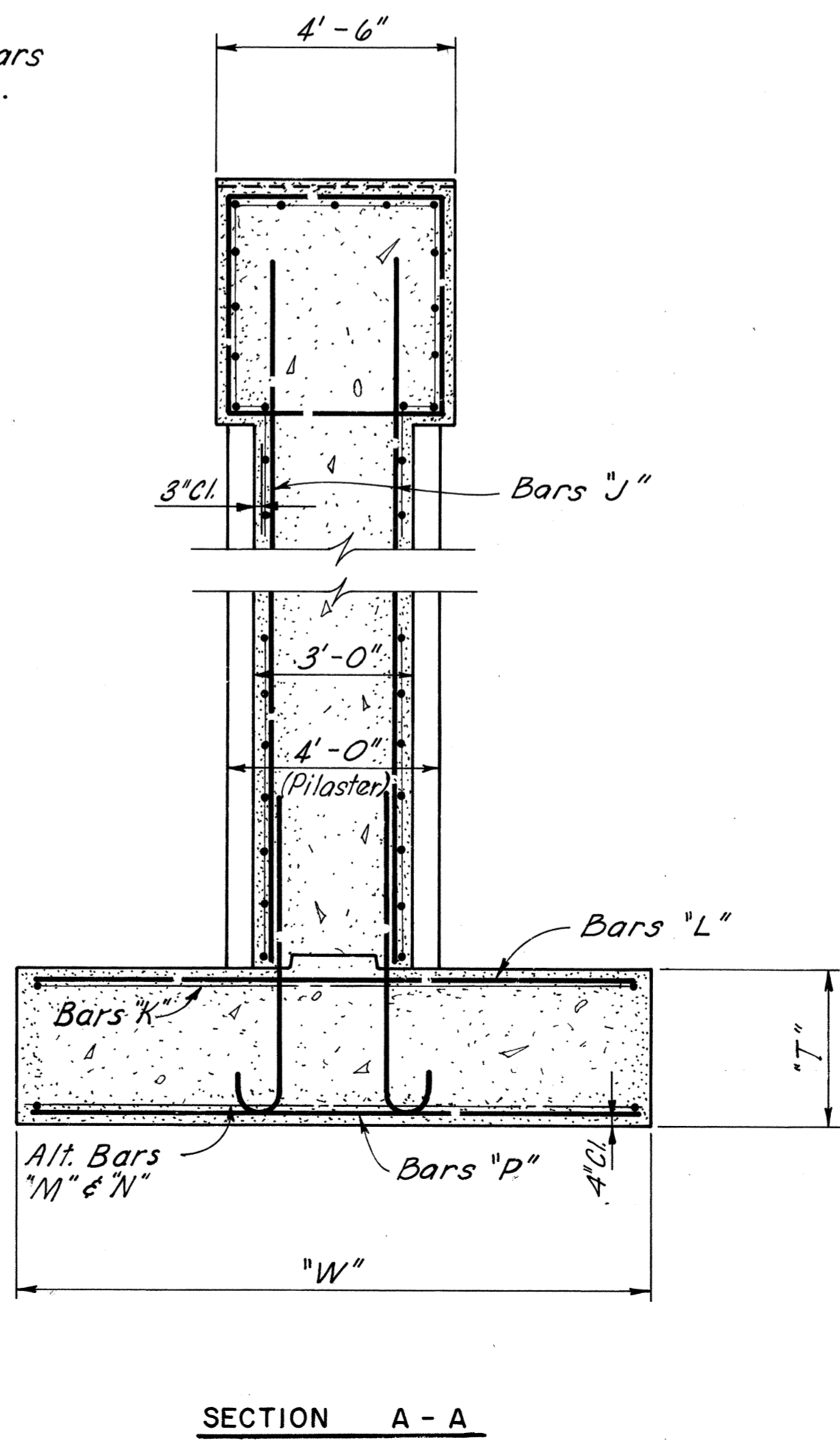
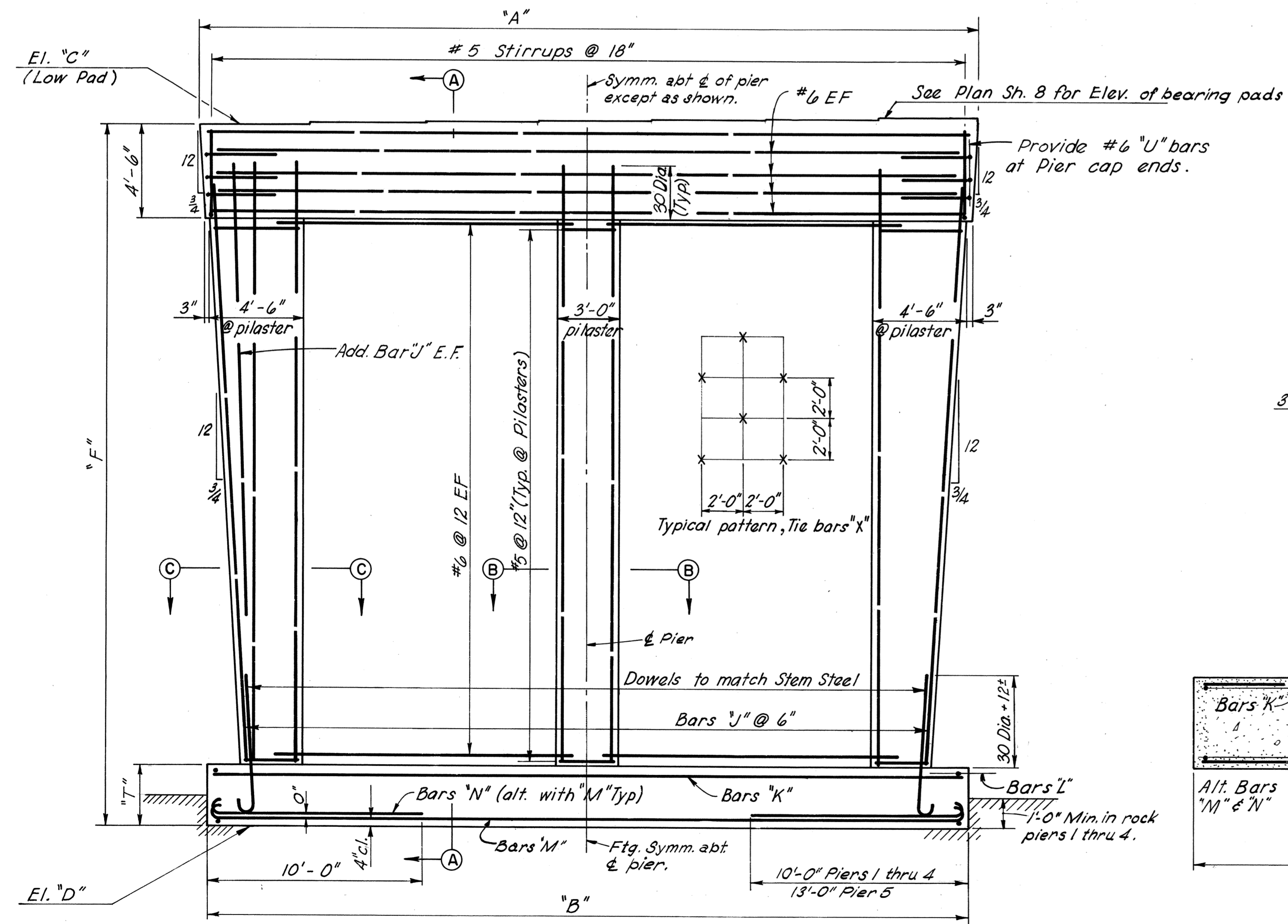
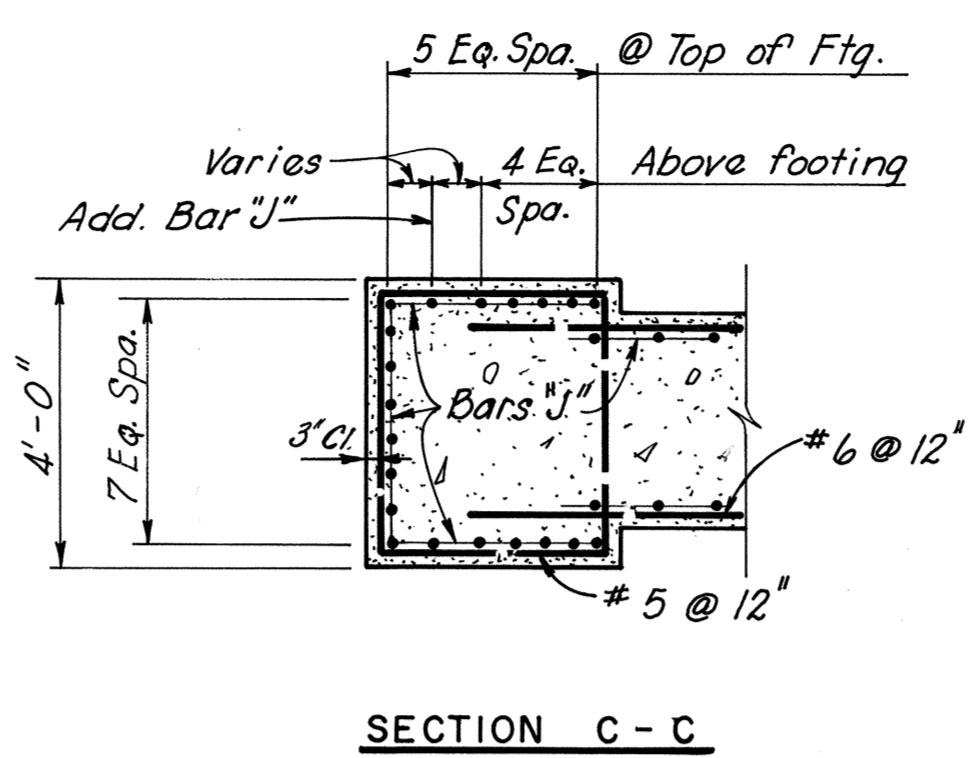
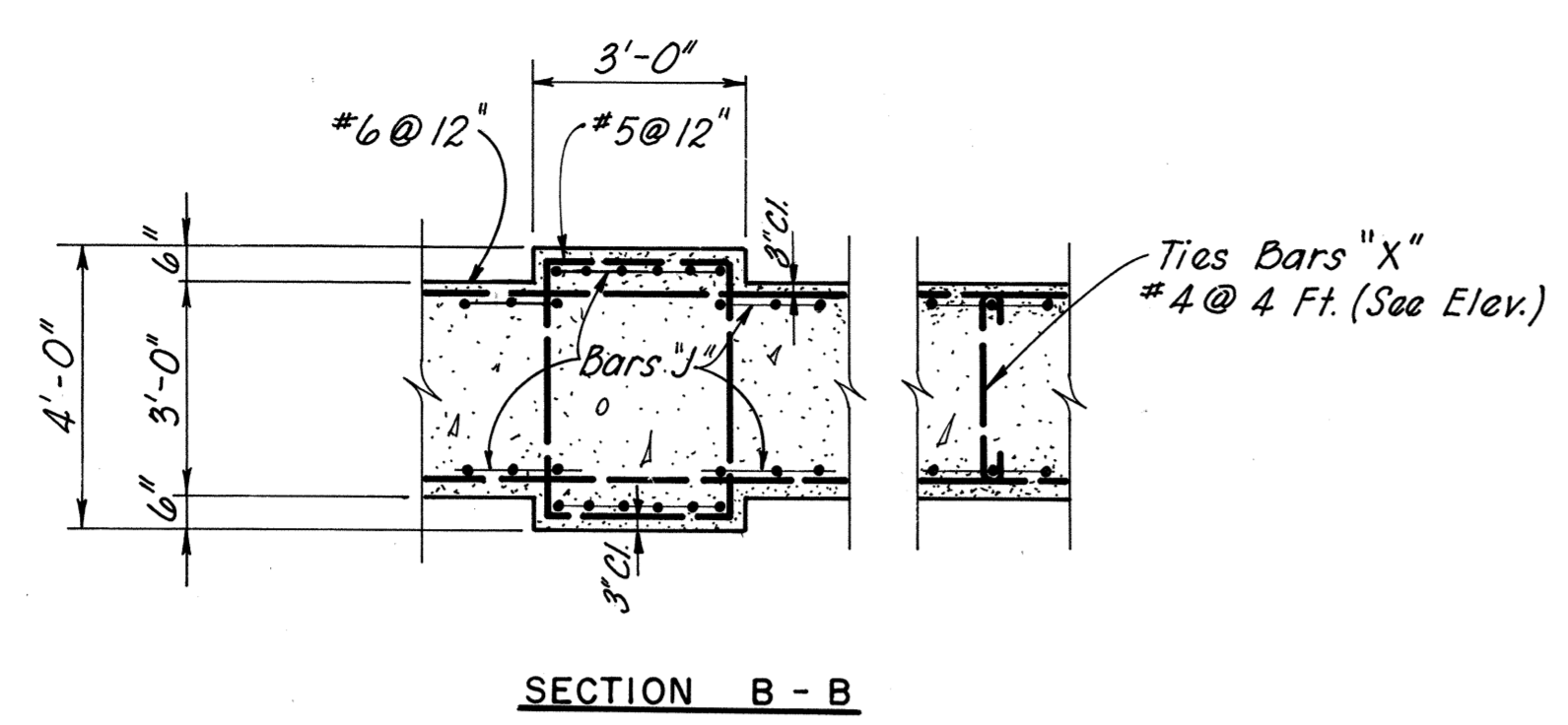
RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY  
SOUTHERN RAILWAY OVER  
POWHITE PARKWAY  
BRIDGE B-05  
**EAST ABUTMENT DETAILS (I)**

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

SCALE: 3/8" = 1'-0"  
CONTRACT NO.: 2  
SHEET NO. 6 OF 19



**Note to Contractor**  
 Attention is called to the apparent erratic location of the top of rock in the vicinity of Pier 5. If, after excavation for Pier 5, the majority of founding material located at Elevation 105 is rock, all pockets of decomposed material within the limits of the excavation shall be removed and backfilled with Class A3 concrete. Conversely, if the majority of founding material is decomposed rock, areas of projecting bedrock shall be removed to an elevation one foot below the footing elevation and backfilled to the footing elevation with a blanket of well compacted granular material similar in nature to the majority founding material.  
 Any additional excavation required by the above will be paid for at the unit price bid for Structure Excavation. Additional Class A3 concrete required, amounting to 1 cubic yard or more, will be paid for at the unit price bid for Concrete, Class A3, Substructures. No additional payment will be made for backfilling with granular material.



PIER	ELEVATION		DIMENSION					ALLOW.
	"C"	"D"	"A"	"B"	"F"	"W"	"T"	
1	136.07	104.5	37'-9"	37'-0"	31.57	12'-0"	3'-6"	7 ton
2	135.52	103.5	37'-9"	37'-0"	32.02	9'-0"	3'-6"	7 ton
3	135.31	101.0	38'-6"	40'-0"	34.31	12'-0"	3'-6"	6 ton
4	134.66	100.7	40'-6"	45'-0"	33.92	17'-0"	4'-3"	4 ton
5	133.87	105.0	39'-0"	45'-0"	28.87	17'-0"	4'-0"	4 ton

PIER	REINFORCING STEEL					
	"J"	"K"	"L"	"M"	"N"	"P"
1	#11	#5@18	#6@12	#6@14	#6@14	#10@6
2	#9	-	-	#6@16	#6@16	#7@7
3	#11	#5@18	#6@12	#8@16	#8@16	#9@8
4	#10	-	-	#6@15	#6@15	#9@8
5	#9	-	-	#9@14	#9@14	#9@7

**NOTE:** 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.

**AS BUILT**

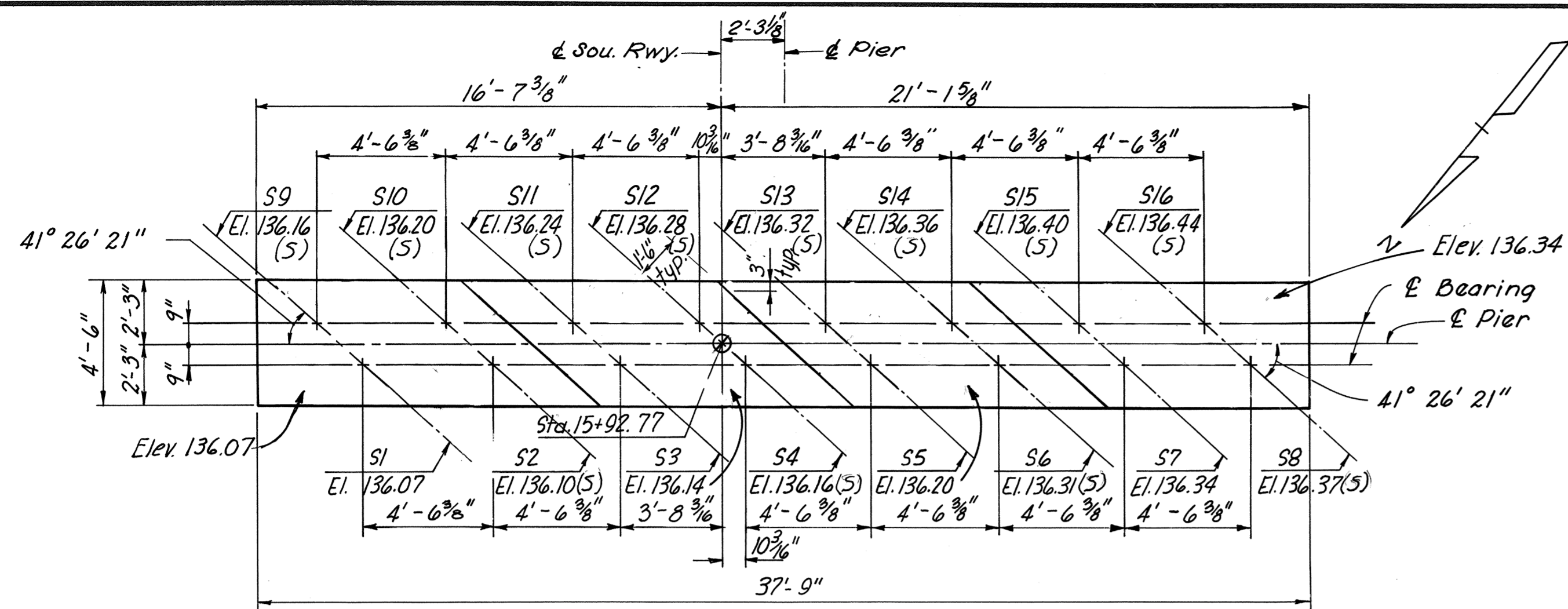
**RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM  
 POWHITE PARKWAY  
 SOUTHERN RAILWAY OVER  
 POWHITE PARKWAY  
 BRIDGE B-05  
 PIER DETAILS**

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

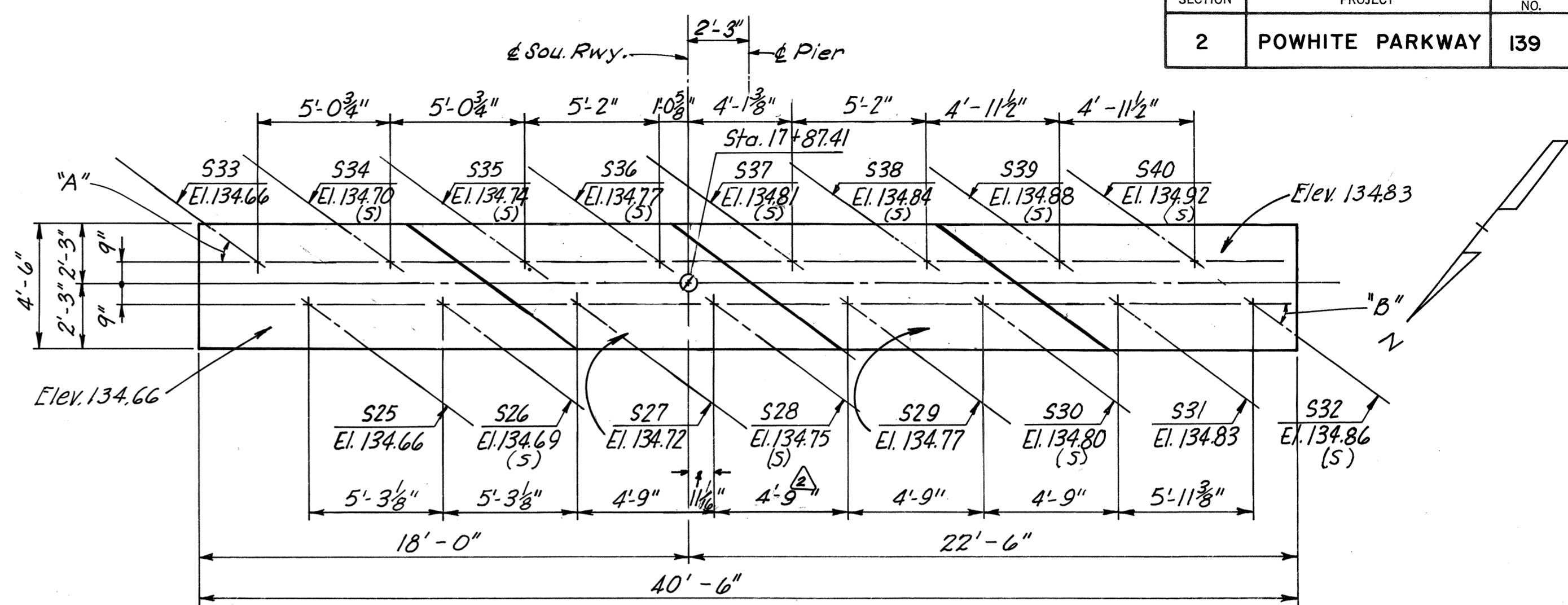
SCALE: 3/8" = 1'-0"  
 CONTRACT NO.: 2  
 SHEET NO. 7 OF 19

BY	DATE	1	Note added	TEM.	4-68
MADE	WCU	1-68	Pad El. & Dim.	TEM.	6-68
CHECKED	THN	2-68	As Built	RH	11-72
IN CHARGE	JGD				

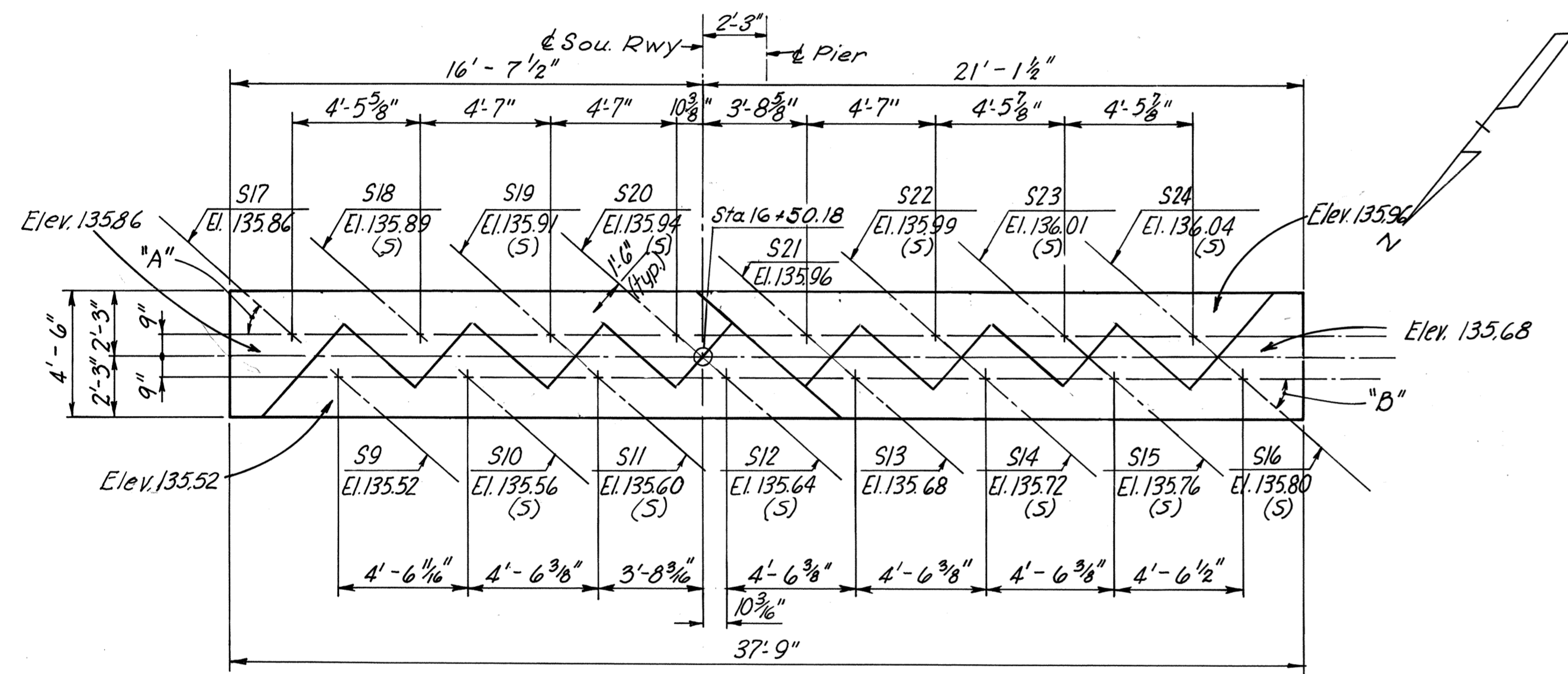
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	139	188



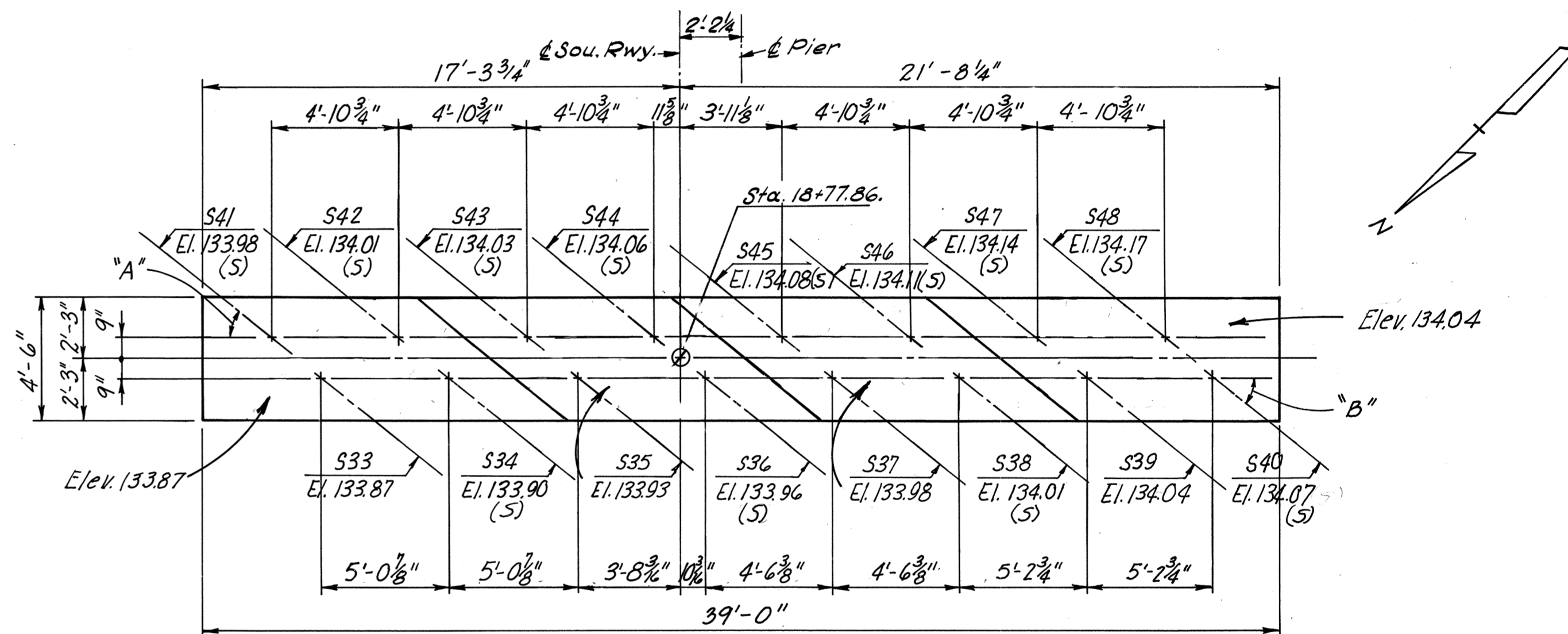
PLAN - PIER 1



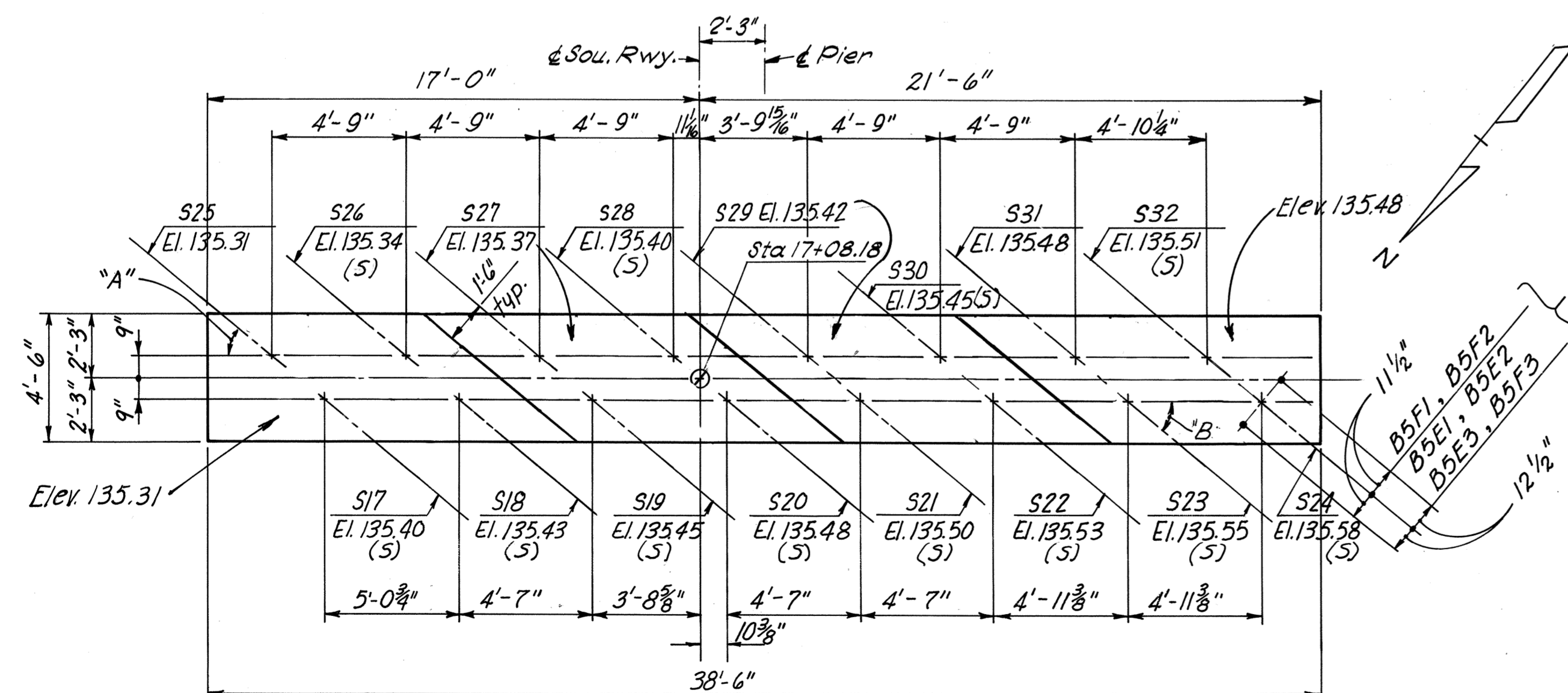
PLAN - PIER 4



PLAN - PIER 2



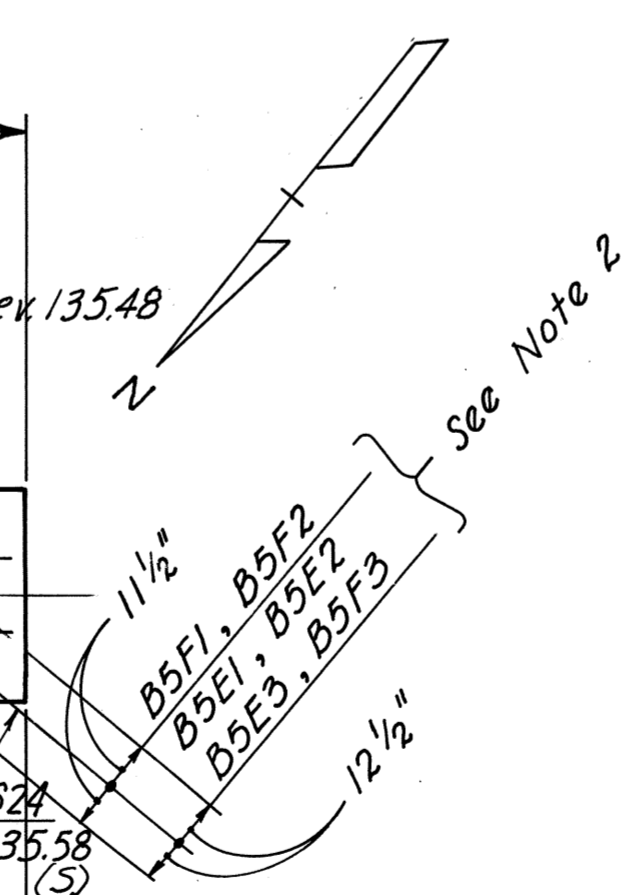
PLAN - PIER 5



PLAN - PIER 3

Notes:

1. For angles "A" or "B" See Sheet 9.
2. For anchor bolt location see Anchor Bolt Setting Dimensions - Sheet 2.
3. (S) = Shimmed to Elevation shown. Shim constructed of single steel plate of required thickness.



See Note 2.

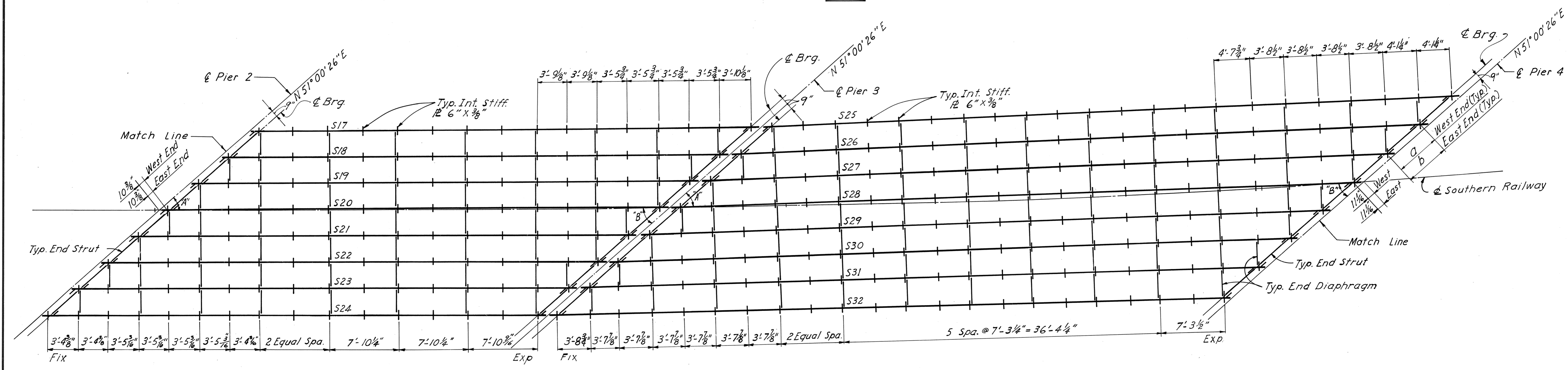
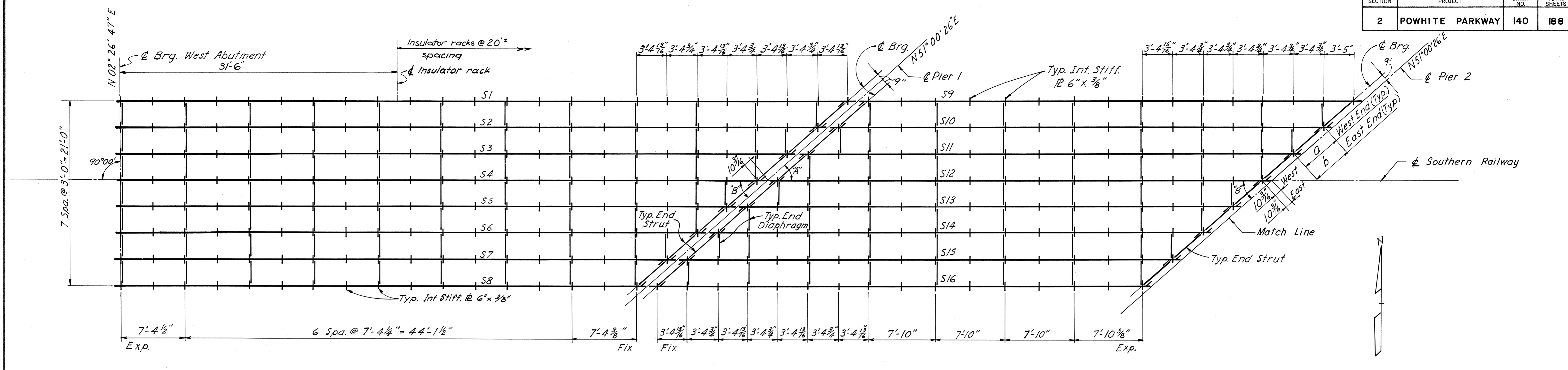
AS BUILT

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY  
SOUTHERN RAILWAY OVER  
POWHITE PARKWAY  
BRIDGE B-05  
PIER DETAILS

SCALE: 1/4" = 1'-0"
CONTRACT NO.: 2
SHEET NO. 8 OF 19

BY	DATE	3	As Built	JRC	11-72
MADE	WCJ	1-68	Dim. Pier #4	JRC	6-77
CHECKED	THN	2-68	1	Pod. El. # dim	TEM. 6-68
IN CHARGE	JGD				

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	140	188



Note:  
 See sh.10 for shoe schedule.  
 See Girder Details, Sheet 11, for dimensions not shown.  
 Int stiff @s to be placed halfway between diaphragm connectors, unless otherwise shown.

# AS BUILT

RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM  
 POWHITE PARKWAY

SOUTHERN RAILWAY OVER  
 POWHITE PARKWAY  
 BRIDGE B-05.

### FRAMING PLAN

HAYES, SEAY, MATTERN & MATTERN  
 Associate Engineers

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 General Consultants

SCALE: 3/16" = 1'-0"  
 CONTRACT NO.: 2  
 SHEET NO. 9 OF 19

GIRDER	ANGLE "A"	ANGLE "B"	GIRDER	ANGLE "A"	ANGLE "B"	GIRDER	ANGLE "A"	ANGLE "B"
S1 Thru S8	90°00'00"	41°26'21"	S25	38°41'28"	38°41'28"	S39	35°52'18"	40°52'07"
S9	41°25'19"	41°25'19"	S26	38°55'32"	38°55'32"	S40	36°14'36"	42°14'24"
S10 Thru S16	41°26'21"	41°26'21"	S27 Thru S31	39°09'45"	39°09'45"	S41 Thru S48	37°45'11"	91°42'28"
S17	40°30'28"	40°30'28"	S32	39°41'14"	39°41'14"			
S18 Thru S22	40°53'59"	40°53'59"	S33	34°56'27"	40°56'15"			
S23	41°12'35"	41°12'35"	S34	35°13'16"	41°13'04"			
S24	41°31'24"	41°31'24"	S35 Thru S38	35°29'58"	41°29'46"			

MADE	H.B.	1-68	2	As BUILT	JRC	11-72
CHECKED	T.H.N.	2-68	1	Diaph. spa.	DSB	6-68
IN CHARGE	JGD					

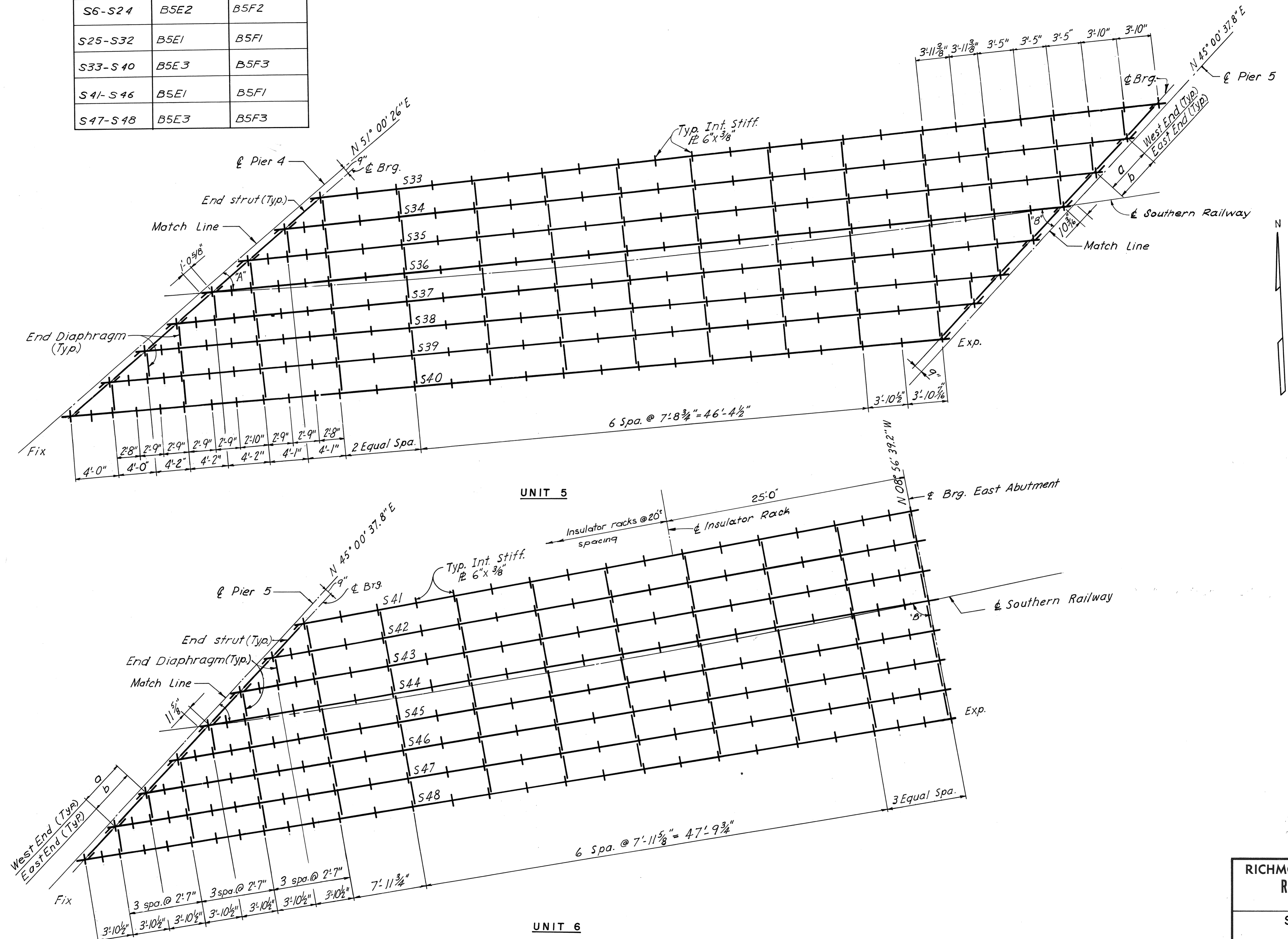
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	141	188

Dimensions given along  $\phi$  Brg.

Location	West $a$	East $b$
S1-S2	3'-0"	4'-6 $\frac{3}{8}$ "
S2-S3	3'-0"	4'-6 $\frac{3}{8}$ "
S3-S4	3'-0"	4'-6 $\frac{3}{8}$ "
S4-S5	3'-0"	4'-6 $\frac{3}{8}$ "
S5-S6	3'-0"	4'-6 $\frac{3}{8}$ "
S6-S7	3'-0"	4'-6 $\frac{3}{8}$ "
S7-S8	3'-0"	4'-6 $\frac{3}{8}$ "
S9-S10	4'-6 $\frac{3}{8}$ "	4'-6 $\frac{1}{8}$ "
S10-S11	4'-6 $\frac{3}{8}$ "	4'-6 $\frac{3}{8}$ "
S11-S12	4'-6 $\frac{3}{8}$ "	4'-6 $\frac{3}{8}$ "
S12-S13	4'-6 $\frac{3}{8}$ "	4'-6 $\frac{3}{8}$ "
S13-S14	4'-6 $\frac{3}{8}$ "	4'-6 $\frac{3}{8}$ "
S14-S15	4'-6 $\frac{3}{8}$ "	4'-6 $\frac{3}{8}$ "
S15-S16	4'-6 $\frac{3}{8}$ "	4'-6 $\frac{1}{2}$ "
S17-S18	4'-5 $\frac{3}{8}$ "	5'-0 $\frac{3}{4}$ "
S18-S19	4'-7"	4'-7"
S19-S20	4'-7"	4'-7"
S20-S21	4'-7"	4'-7"
S21-S22	4'-7"	4'-7"
S22-S23	4'-5 $\frac{7}{8}$ "	4'-11 $\frac{3}{8}$ "
S23-S24	4'-5 $\frac{7}{8}$ "	4'-11 $\frac{3}{8}$ "
S25-S26	4'-9"	5'-3 $\frac{1}{8}$ "
S26-S27	4'-9"	5'-3 $\frac{1}{8}$ "
S27-S28	4'-9"	4'-9"
S28-S29	4'-9"	4'-9"
S29-S30	4'-9"	4'-9"
S30-S31	4'-9"	4'-9"
S31-S32	4'-10 $\frac{1}{4}$ "	5'-11 $\frac{3}{8}$ "
S33-S34	5'-0 $\frac{3}{4}$ "	5'-0 $\frac{3}{8}$ "
S34-S35	5'-0 $\frac{3}{4}$ "	5'-0 $\frac{3}{8}$ "
S35-S36	5'-2"	4'-6 $\frac{3}{8}$ "
S36-S37	5'-2"	4'-6 $\frac{3}{8}$ "
S37-S38	5'-2"	4'-6 $\frac{3}{8}$ "
S38-S39	4'-11 $\frac{1}{2}$ "	5'-2 $\frac{3}{4}$ "
S39-S40	4'-11 $\frac{1}{2}$ "	5'-2 $\frac{3}{4}$ "
S41-S42	4'-10 $\frac{3}{4}$ "	3'-0"
S42-S43	4'-10 $\frac{3}{4}$ "	3'-0"
S43-S44	4'-10 $\frac{3}{4}$ "	3'-0"
S44-S45	4'-10 $\frac{3}{4}$ "	3'-0"
S45-S46	4'-10 $\frac{3}{4}$ "	3'-0"
S46-S47	4'-10 $\frac{3}{4}$ "	3'-0"
S47-S48	4'-10 $\frac{3}{4}$ "	3'-0"

SHOE SCHEDULE

Stringers	Exp. Shoe Type	Fix Shoe Type
S1-S5	B5E1	B5F1
S6-S24	B5E2	B5F2
S25-S32	B5E1	B5F1
S33-S40	B5E3	B5F3
S41-S46	B5E1	B5F1
S47-S48	B5E3	B5F3



**AS BUILT**

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

**SOUTHERN RAILWAY OVER  
POWHITE PARKWAY  
BRIDGE B-05**

**FRAMING PLAN**

HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

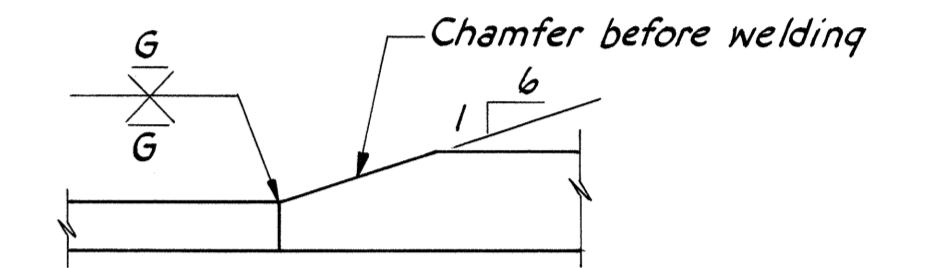
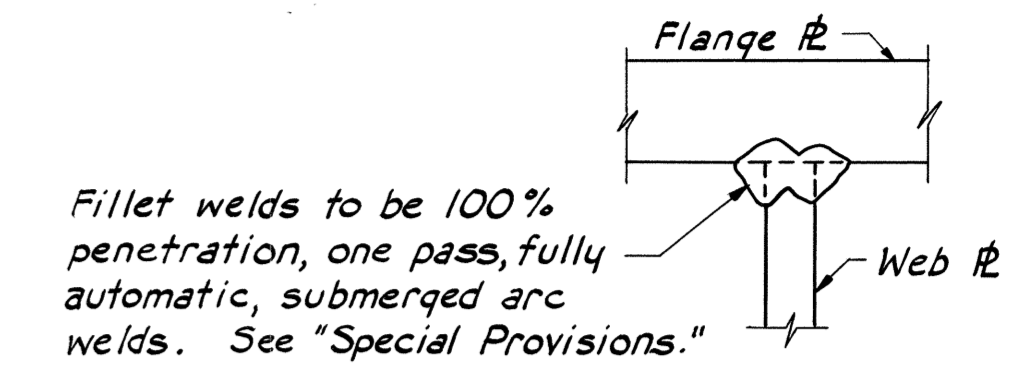
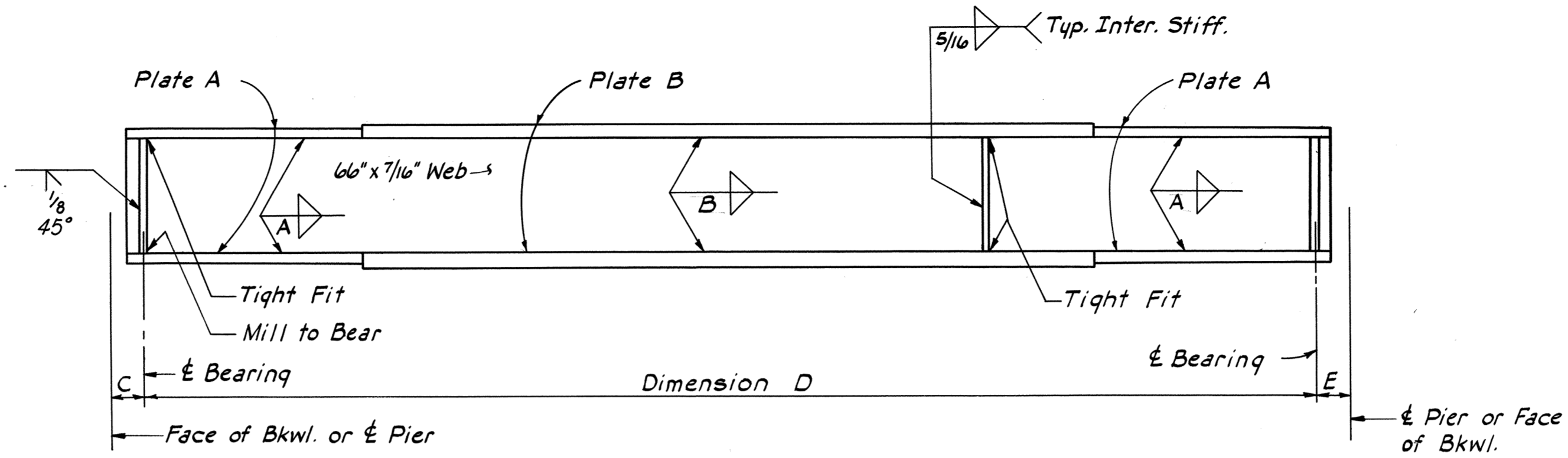
SCALE: 3/16" = 1'-0"

CONTRACT NO.: 2

SHEET NO. 10 OF 19

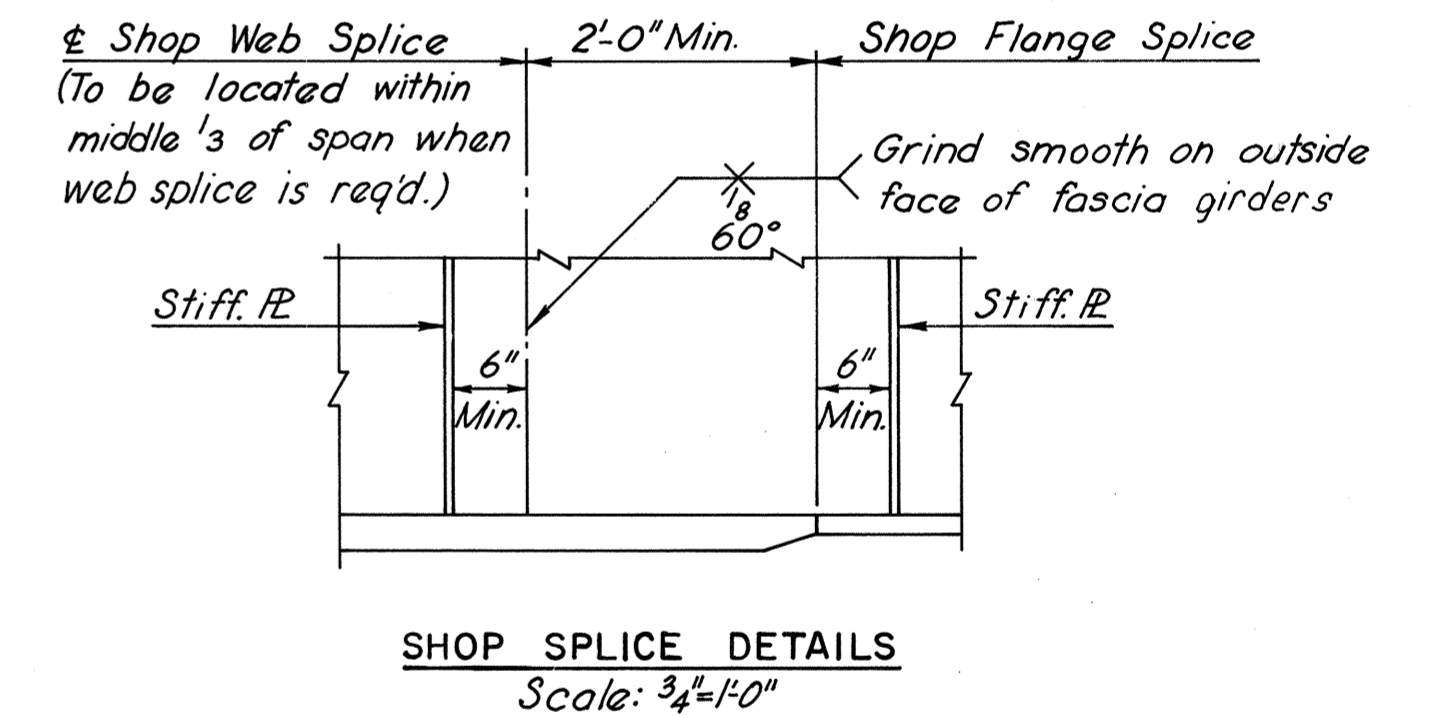
MADE	BY	DATE	NO.	REVISION	BY	DATE
AS BUILT	H.B.	1-68	2		JRC	11-72
CHECKED	T.H.N.	2-68	1	Drawn, spca. & Brg. Dim.	DSB	6-68
IN CHARGE	JGD					

GIRDER SUMMARY										
Girder Mark	PLATE A			PLATE B			Dimension			Brg. Stiff. Size
	Size	Length	Weld A	Size	Length	Weld B	C	D	E	
S1	18"x1 7/8"	16'-9 3/4"	3/8	18"x2 3/4"	51'-0"	1/2	1'-3"	82'-7 7/8"	1'-1 5/8"	8"x1"
S2	18"x1 3/8"	16'-10 5/8"	3/8	18"x2 1/2"	47'-6"	1/2		79'-3 3/8"		
S-3	18"x1 1/2"	15'-1 1/8"	5/16	18"x2 1/4"	47'-6"	3/8		75'-10 5/8"		
S-4	18"x1 1/2"	16'-5 3/4"	5/16	18"x2 3/8"	41'-6"	3/8		72'-5 1/2"		
S5	18"x1 1/4"	14'-9 1/8"	5/16	18"x1 3/8"	41'-6"	3/8		69'-0 3/4"		
S6	18"x1 1/8"	14'-3 3/4"	5/16	18"x1 3/8"	39'-0"	3/8		65'-7 1/8"		
S7	18"x1"	13'-7 3/8"	5/16	18"x1 1/2"	37'-0"	3/8		62'-3 3/8"		
S8	18"x 7/8"	13'-2"	5/16	18"x1 1/4"	34'-6"	5/16	1'-3"	58'-10 3/8"	1'-1 5/8"	8"x1"
S9	18"x 7/8"	14'-0 5/8"	5/16	18"x1 3/8"	29'-0"	5/16	1'-1 5/8"	55'-2 5/8"	1'-1 5/8"	8"x 3/4"
S10-S16	18"x 7/8"	14'-0 1/2"	5/16			5/16	1'-1 5/8"	55'-1 1/8"	1'-1 5/8"	
S17	18"x 7/8"	14'-7"	5/16			5/16	1'-1 7/8"	56'-2 1/4"	1'-1 7/8"	
S18	18"x 7/8"	14'-4 1/2"	5/16			5/16	1'-1 3/4"	55'-8 3/8"	1'-1 3/4"	
S19	18"x 7/8"	14'-4 1/2"	5/16			5/16	1'-1 3/4"	55'-8 3/8"	1'-1 3/4"	
S20	18"x 7/8"	14'-4 3/8"	5/16			5/16	1'-1 3/4"	55'-8 3/8"	1'-1 3/4"	
S21	18"x 7/8"	14'-4 3/8"	5/16			5/16	1'-1 3/4"	55'-8 3/8"	1'-1 3/4"	
S22	18"x 7/8"	14'-4 3/8"	5/16			5/16	1'-1 3/4"	55'-8 3/8"	1'-1 3/4"	
S23	18"x 7/8"	14'-2"	5/16			5/16	1'-1 3/4"	55'-8 3/8"	1'-1 3/4"	
S24	18"x 7/8"	13'-11 1/8"	5/16	18"x1 1/8"	29'-0"	5/16	1'-1 3/4"	55'-0 5/8"	1'-1 3/4"	8"x 3/4"
S25	18"x1 5/8"	16'-3 15/16"	3/8	18"x2 3/8"	47'-0"	1/2	1'-2 3/8"	77'-7 1/8"	1'-2 3/8"	8"x 7/8"
S26	18"x1 5/8"	16'-1 1/2"	3/8	18"x2 3/8"	47'-0"	1/2	1'-2 3/8"	77'-2 3/8"	1'-2 3/8"	8"x 7/8"
S27		15'-11 1/2"	3/8			1/2	1'-2 1/4"	76'-9 5/8"	1'-2 1/4"	
S28		15'-11 1/2"	3/8			1/2	1'-2 1/4"	76'-9 5/8"	1'-2 1/4"	
S29		15'-11 1/2"	3/8			1/2	1'-2 1/4"	76'-9 5/8"	1'-2 1/4"	
S30		15'-11 1/2"	3/8			1/2	1'-2 1/4"	76'-9 5/8"	1'-2 1/4"	
S31		15'-11 1/2"	3/8			1/2	1'-2 1/4"	76'-9 5/8"	1'-2 1/4"	
S32	18"x1 3/8"	15'-5 1/8"	3/8	18"x2 3/8"	47'-0"	1/2	1'-2 3/8"	75'-11 1/8"	1'-2 3/8"	8"x 7/8"
S33	20"x2"	17'-4"	3/8	20"x2 3/8"	54'-0"	1/2	1'-3 3/8"	86'-6 1/2"	1'-1 3/4"	9"x1"
S34		17'-5 3/8"	3/8			1/2	1'-3 5/8"	86'-10 3/8"	1'-1 3/8"	
S35		17'-7 1/2"	3/8			1/2	1'-3 1/2"	87'-2 1/4"	1'-1 5/8"	
S36		18'-0 3/8"	3/8	20"x2 3/8"	54'-0"	1/2	1'-3 1/2"	88'-0"	1'-1 5/8"	9"x1"
S37		16'-11 1/8"	3/8	20"x3"	57'-0"	1/2	1'-3 1/2"	88'-9 3/4"	1'-1 5/8"	
S38		17'-4 5/8"	3/8			1/2	1'-3 1/2"	89'-7 1/2"	1'-1 5/8"	
S39		17'-4 5/8"	3/8			1/2	1'-3 3/8"	89'-9"	1'-1 1/2"	
S40	20"x2"	17'-5 5/8"	3/8	20"x3"	57'-0"	1/2	1'-3 1/2"	89'-10 5/8"	1'-1 5/8"	9"x1"
S41	18"x1 1/8"	14'-2 1/2"	5/16	18"x1 5/8"	36'-6"	1/2	1'-2 7/8"	62'-9 3/8"	1'-3"	8"x1"
S42	18"x1 1/4"	14'-5 1/4"	5/16	18"x1 3/4"	40'-0"	3/8	1'-2 5/8"	66'-8 3/8"	1'-3"	
S43	18"x1 3/8"	14'-8 3/8"	5/16	18"x2"	43'-6"	3/8	1'-2 5/8"	70'-8 1/2"	1'-3"	
S44	18"x1 1/2"	15'-1 7/8"	5/16	18"x2 1/4"	46'-6"	3/8	1'-2 5/8"	74'-8 1/2"	1'-3"	
S45	18"x1 3/4"	16'-7 5/8"	3/8	18"x2 1/2"	47'-6"	1/2	1'-2 5/8"	78'-7 5/8"	1'-3"	
S46	18"x1 7/8"	16'-6 5/8"	3/8	18"x2 3/4"	51'-6"	1/2	1'-2 5/8"	82'-6 1/4"	1'-3"	8"x1"
S47	20"x1 1/8"	17'-7 3/8"	3/8	20"x2 3/4"	53'-6"	1/2	1'-2 5/8"	86'-6 3/4"	1'-3"	9"x1"
S48	20"x2"	17'-10"	3/8	20"x3"	57'-0"	1/2	1'-2 5/8"	90'-6 3/8"	1'-3"	9"x1"



DEAD LOAD DEFLECTION SUMMARY	
Girder Mark	Total Dead Load Defl. @ 1/2 Girder
S1, S2	1/2"
S3	7/16"
S4	3/8"
S5, S6	5/16"
S7, S8	1/4"
S9, S24	3/16"
S25, S32	7/16"
S33, S38	9/16"
S39, S40	5/8"
S41	1/4"
S42	5/16"
S43, S44	3/8"
S45	7/16"
S46	1/2"
S47	9/16"
S48	5/8"

The above deflections are those anticipated to occur in the girder upon placement of the total dead load. The girders shall not be cambered to compensate for this deflection.

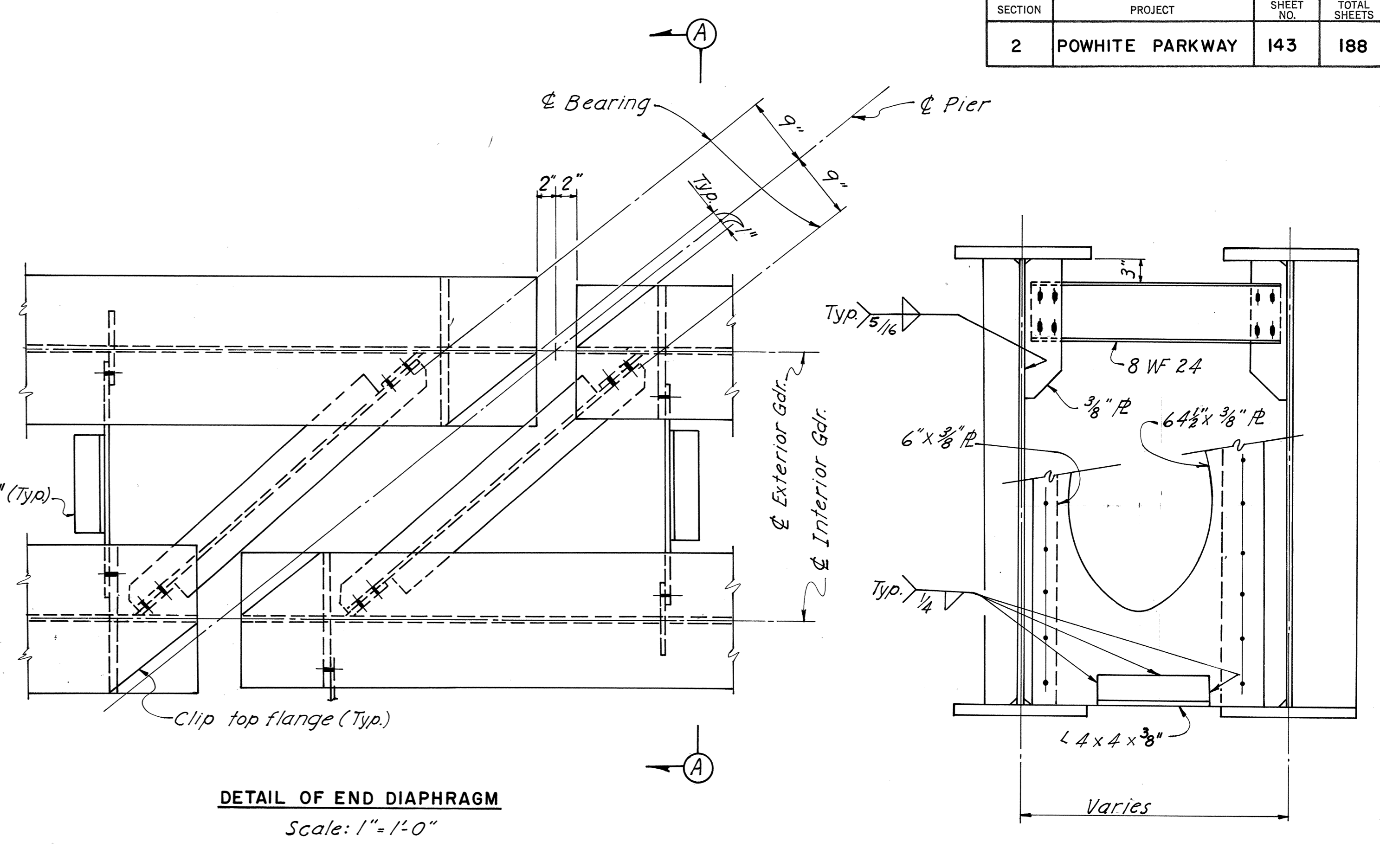
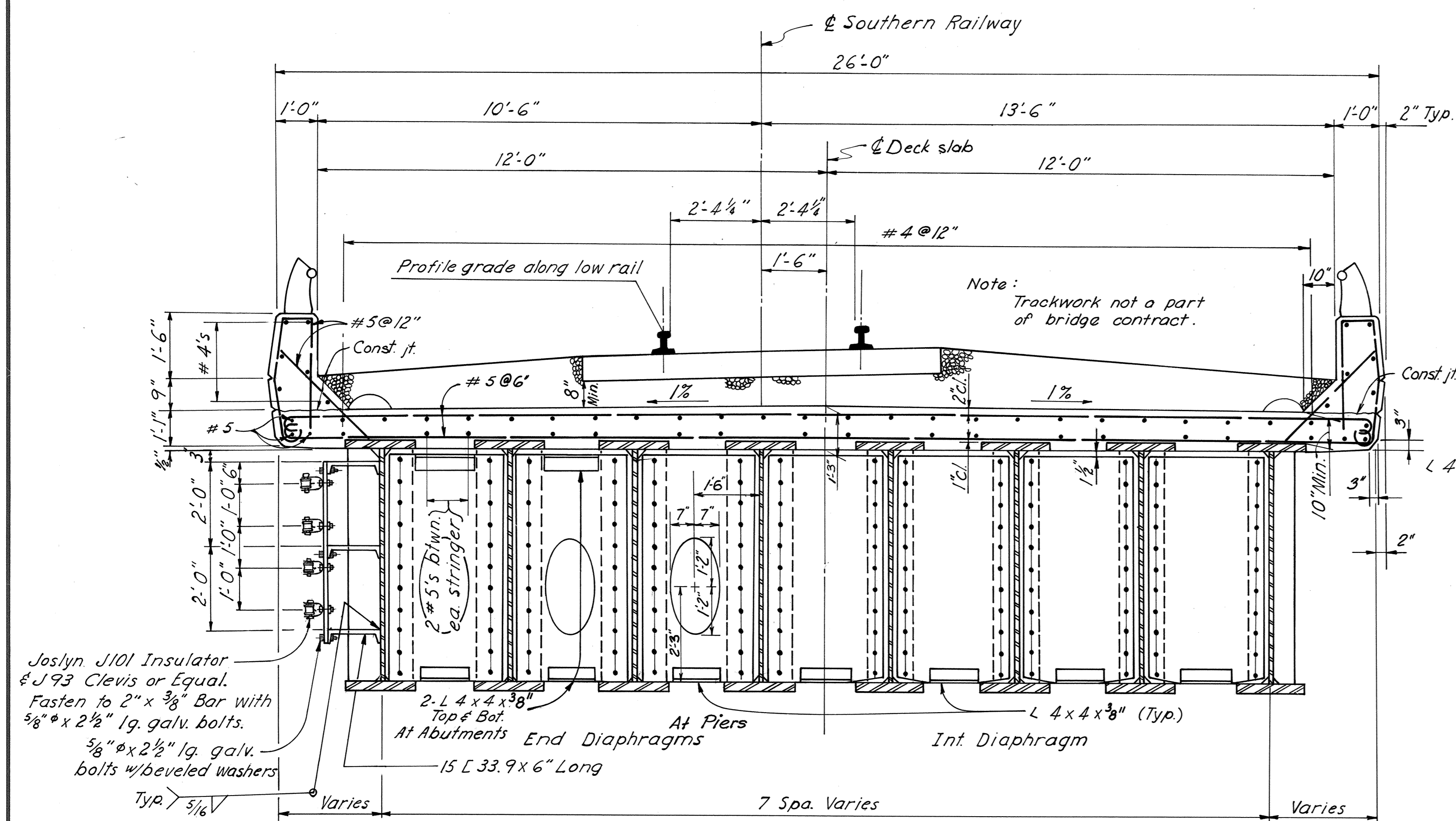


BY	DATE	NO.	REVISION	BY	DATE
MADE	H.B. 1-68	2	As Built	JRC	11-72
CHECKED	THN 2-68	1	Girder Summary	T.E.M.	6-68
IN CHARGE	JGD				

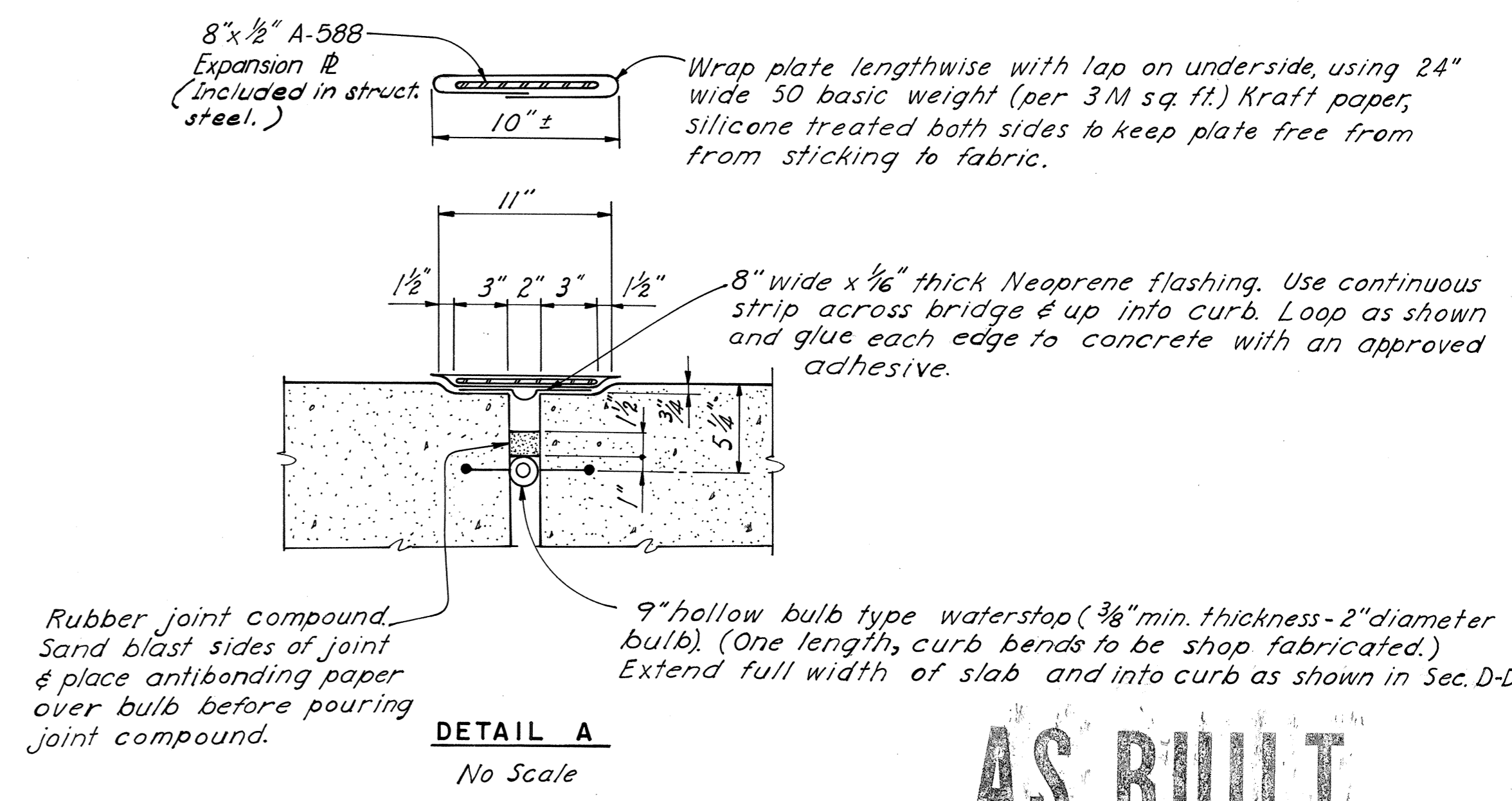
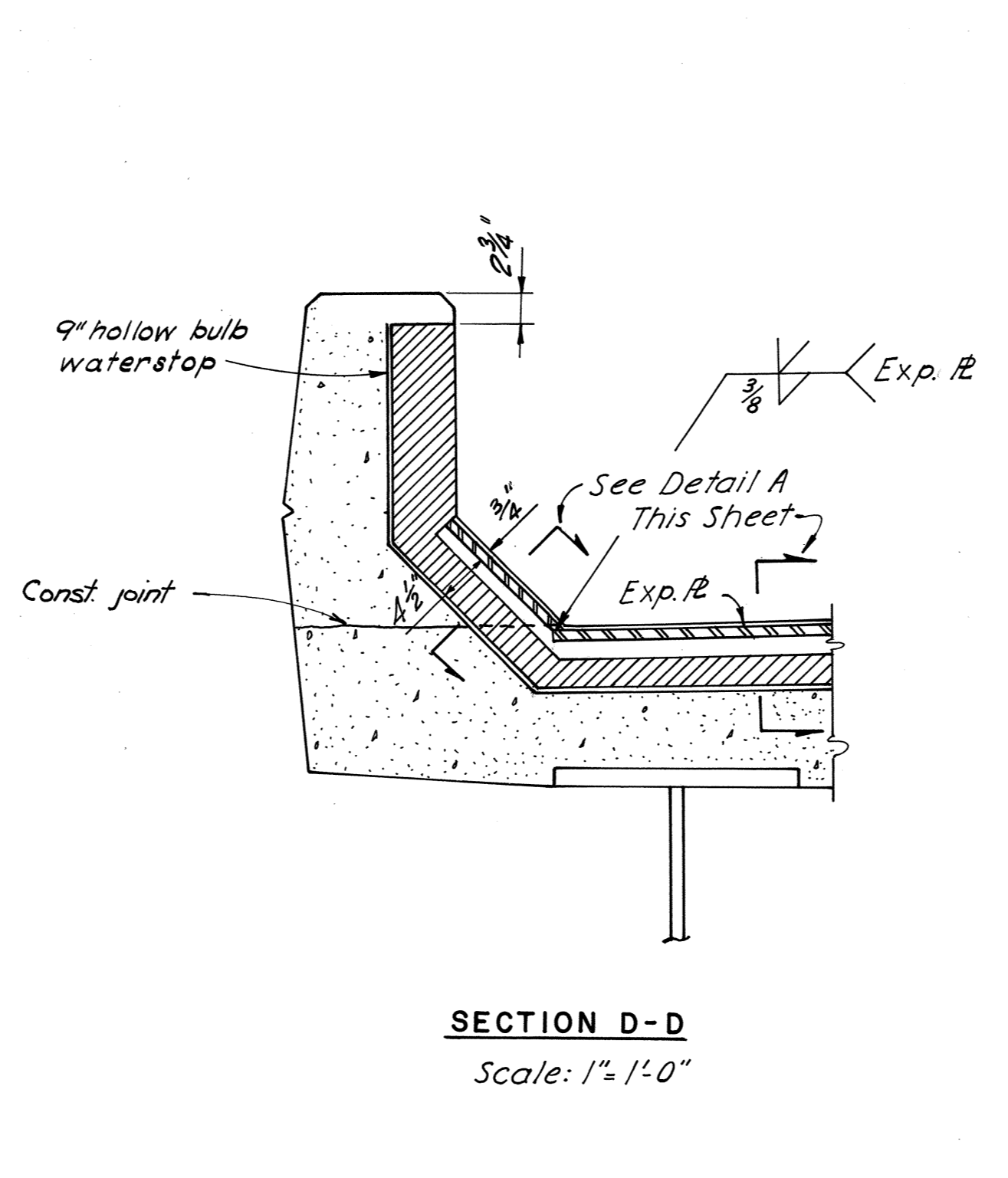
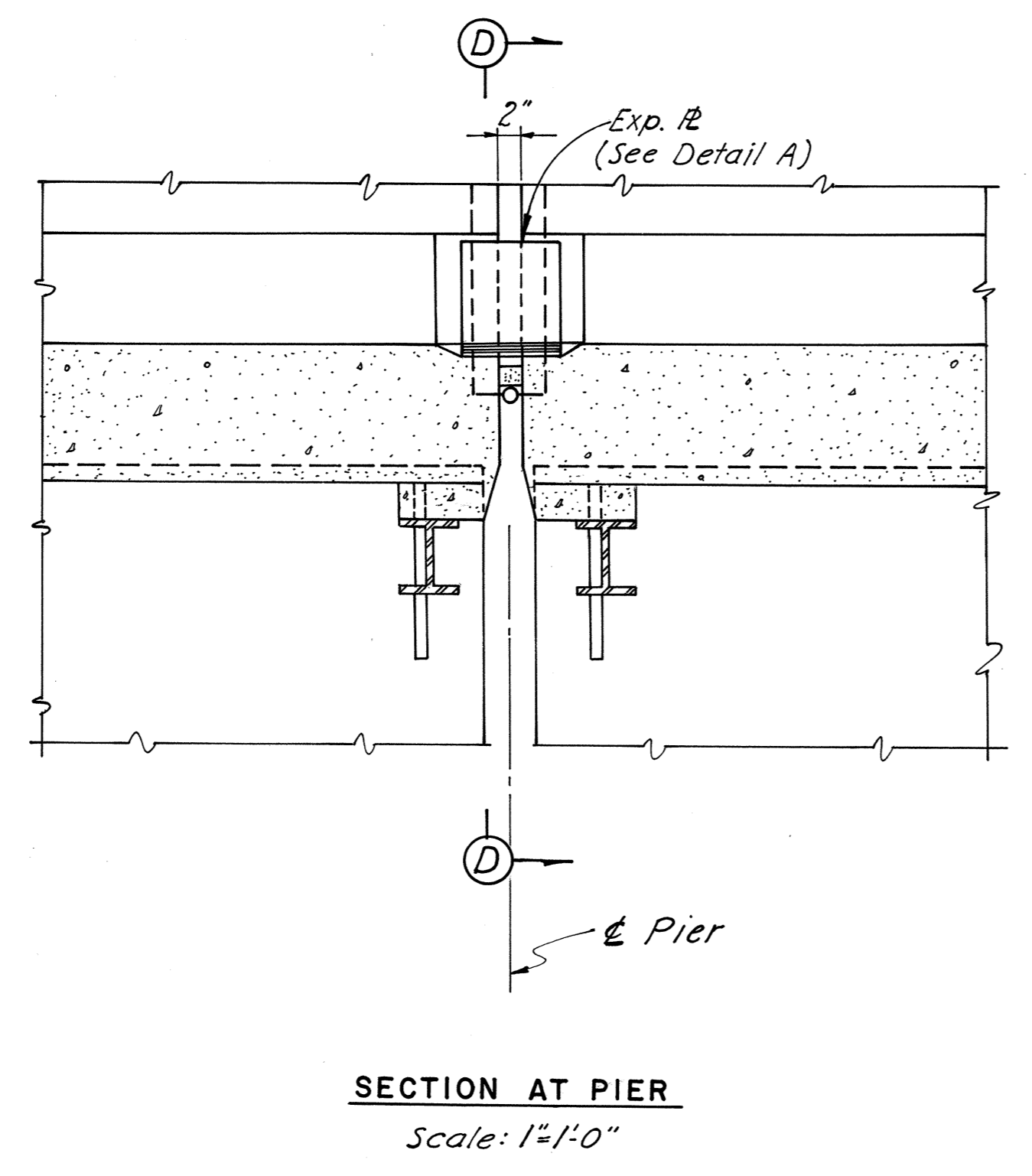
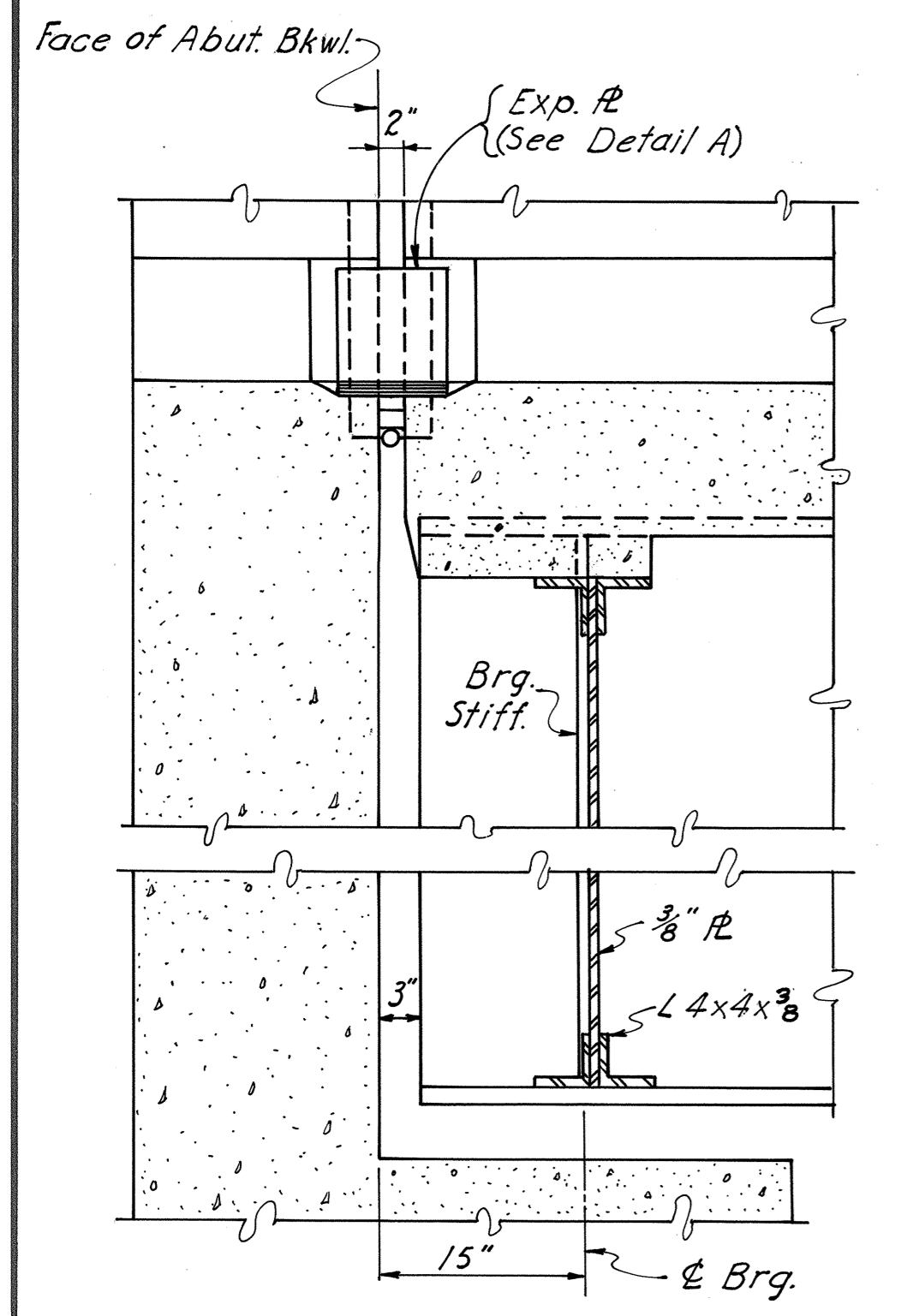
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM POWHITE PARKWAY	
SOUTHERN RAILWAY OVER POWHITE PARKWAY BRIDGE B-05	
<b>GIRDER DETAILS</b>	
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: NO SCALE
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO.: 2
	SHEET NO. 11 OF 19

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	143	188



**NOTE:**  
Space racks 20'-0" apart along girders.  
Fasten high frequency wires to inside of insulators (Max. tension 250 #).



BY	DATE	NO.	REVISION	BY	DATE
As Built	3			JRC	11-72
General	2			JGV	10-70
Encl. diaph & abut.	1			TEM	6-68

**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY

SOUTHERN RAILWAY OVER  
POWHITE PARKWAY  
BRIDGE B-05

**SUPERSTRUCTURE DETAILS**

HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers

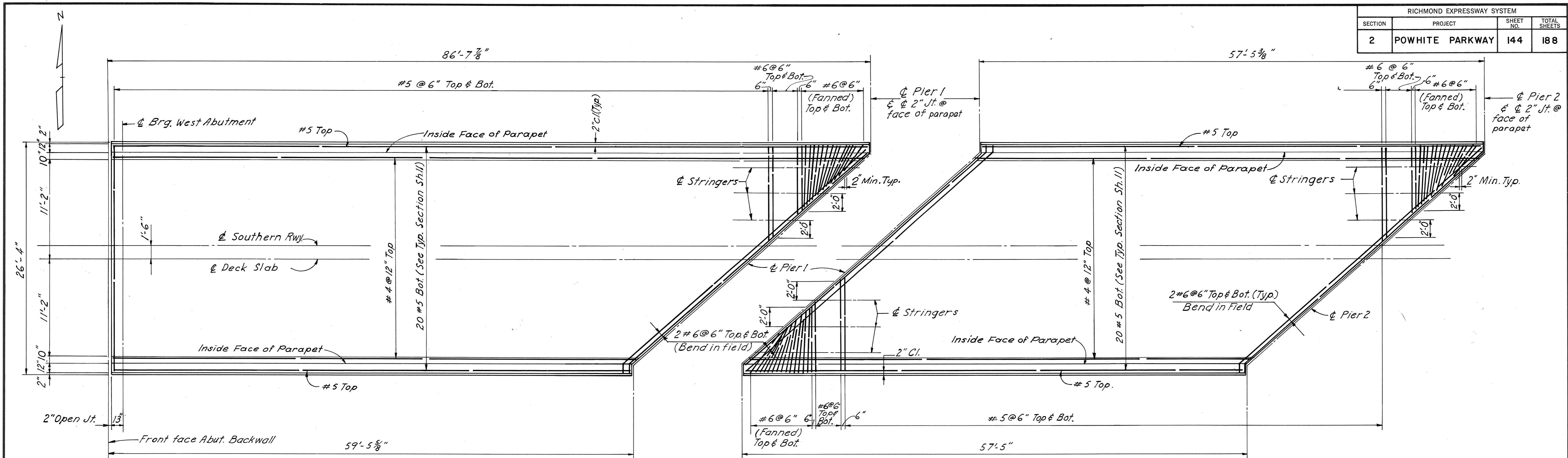
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants

SCALE: AS SHOWN

CONTRACT NO.: 2

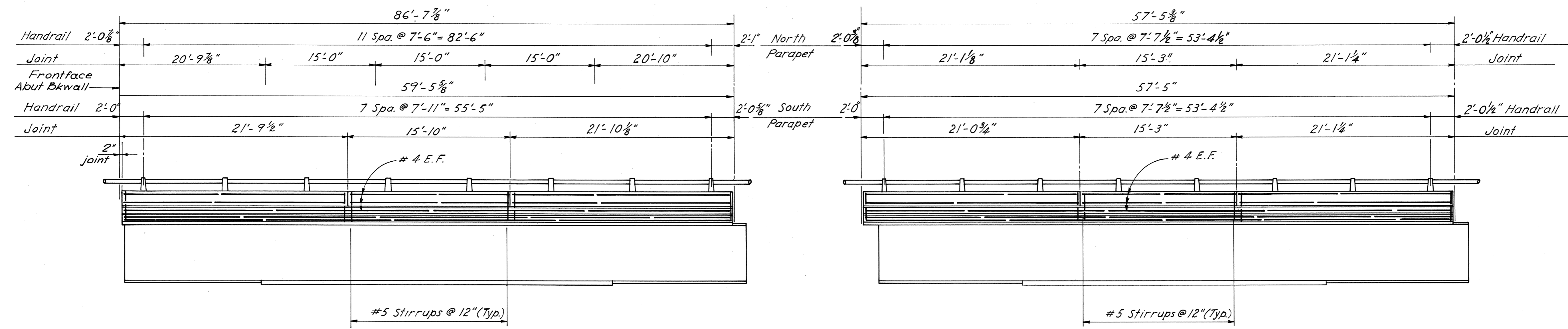
SHEET NO. 12 OF 19

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	144	188



UNIT 1

UNIT 2



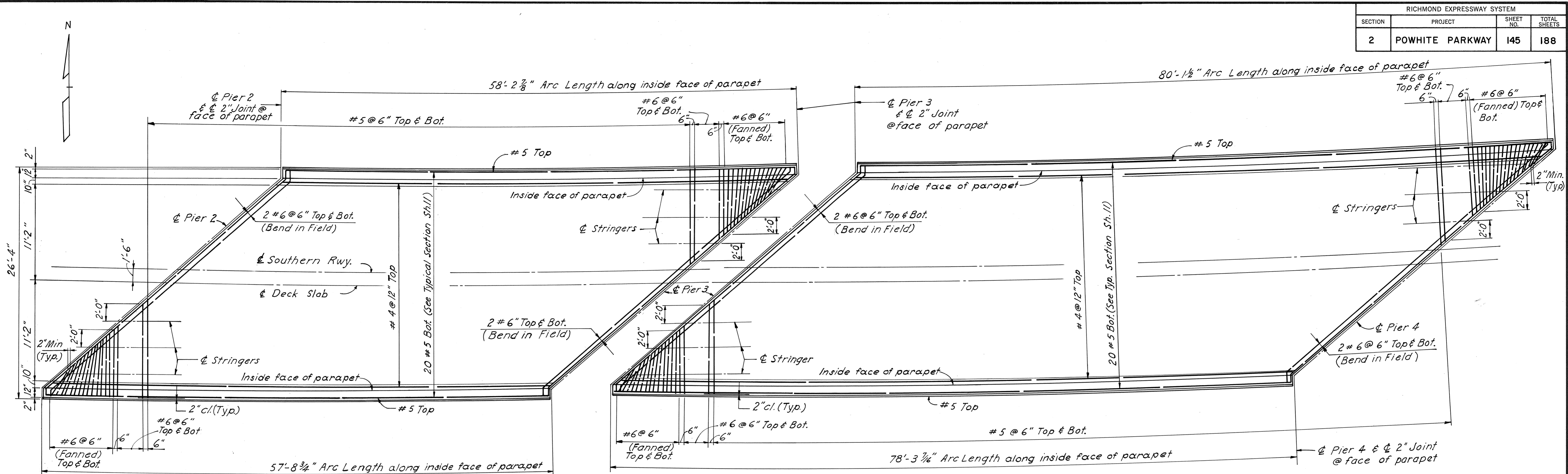
CURB AND PARAPET ELEVATION

**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM POWHITE PARKWAY	
SOUTHERN RAILWAY OVER POWHITE PARKWAY BRIDGE B-05	
DECK PLANS - UNITS 1 & 2	
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: 3/16" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO.: 2
	SHEET NO. 13 OF 19

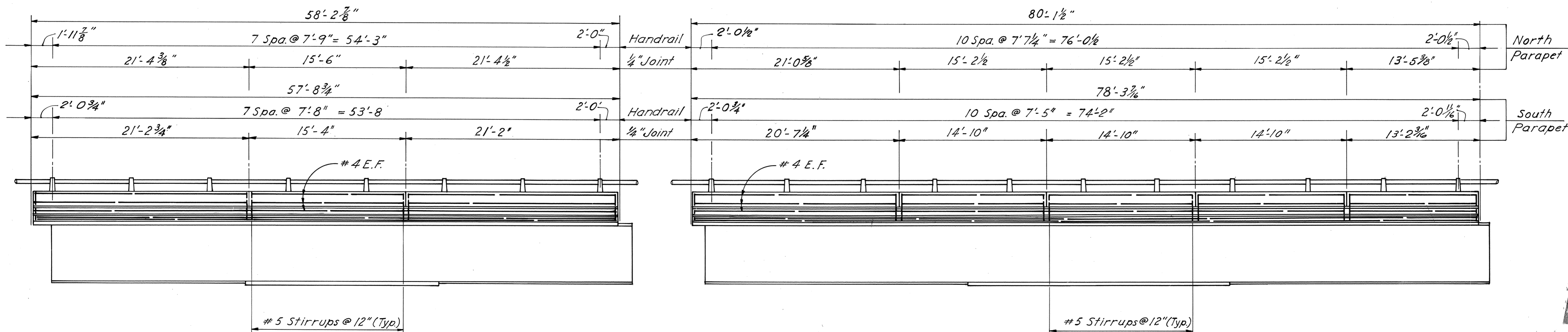
BY	DATE	NO.	REVISION	BY	DATE
MADE	AJP 1-68	2	As Built	JRC	11-72
CHECKED	THN 2-68	1	Deck Slab	T.E.M	6-68
IN CHARGE	JGD				

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	145	188



UNIT 3

UNIT 4



CURB AND PARAPET ELEVATION

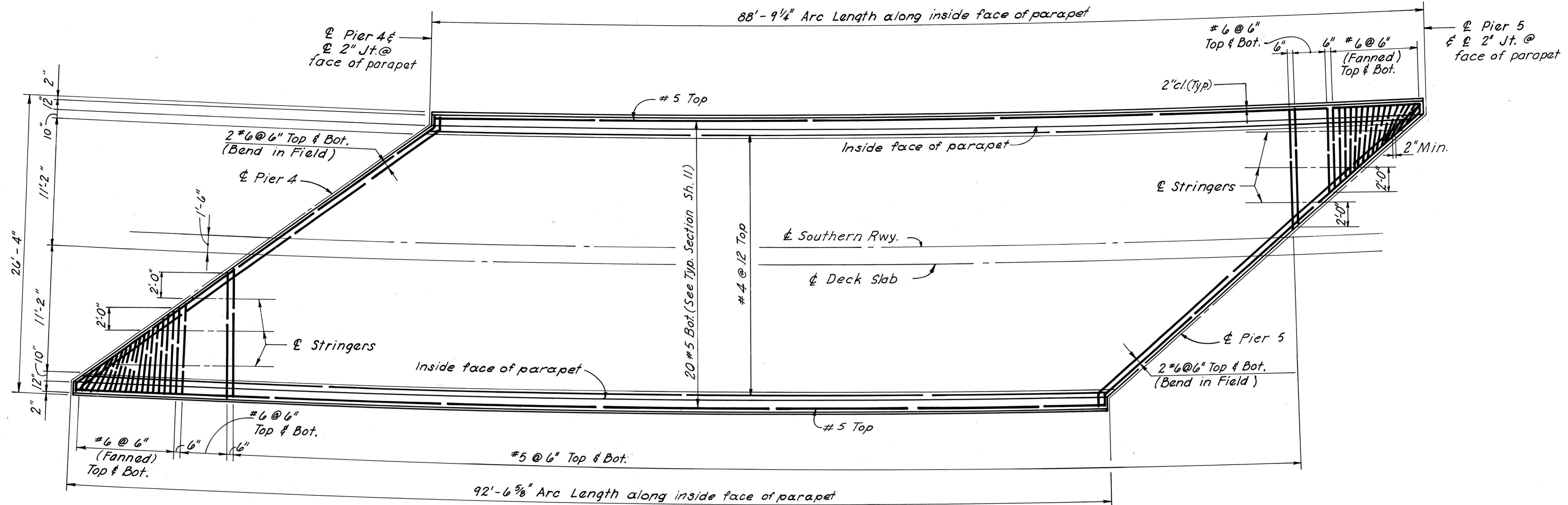
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM POWHITE PARKWAY SOUTHERN RAILWAY OVER POWHITE PARKWAY BRIDGE B-05 <b>DECK PLANS- UNITS 3 &amp; 4</b>	
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: 3/16" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO. 2 SHEET NO. 14 OF 19

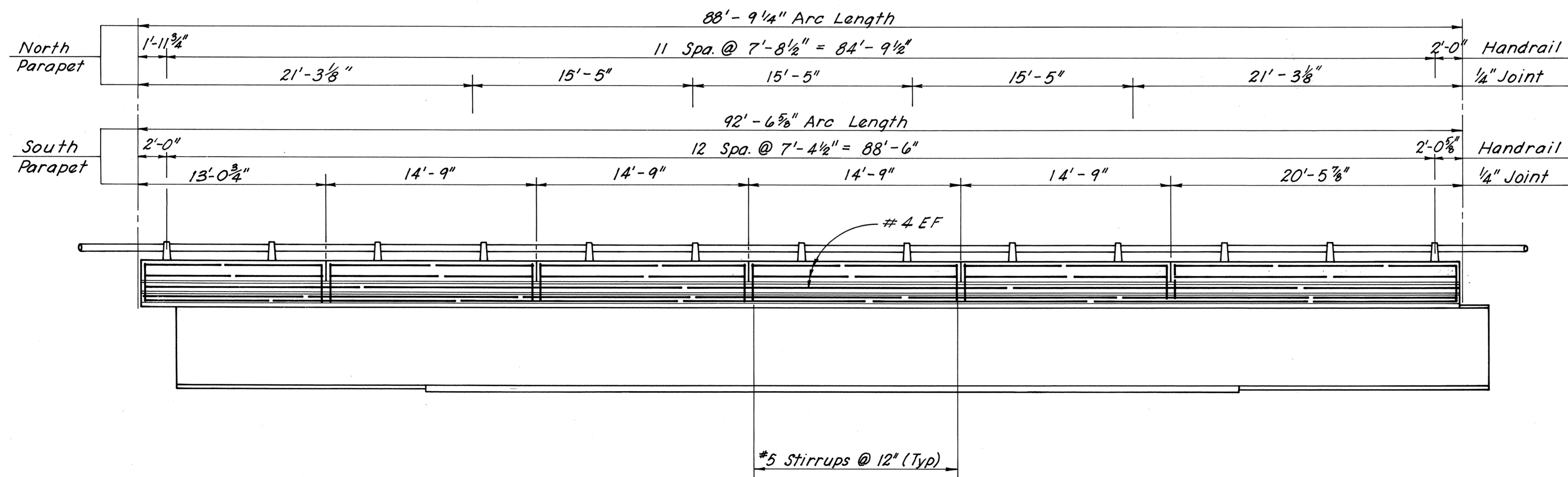
BY	DATE	NO.	REVISION	BY	DATE
MADE	AJP 1-68	2	As Built	JRC	11-72
CHECKED	THN 2-68	1	@ Deck Slab	T.E.M.	6-68
IN CHARGE	JGD				



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	146	188



**UNIT 5**



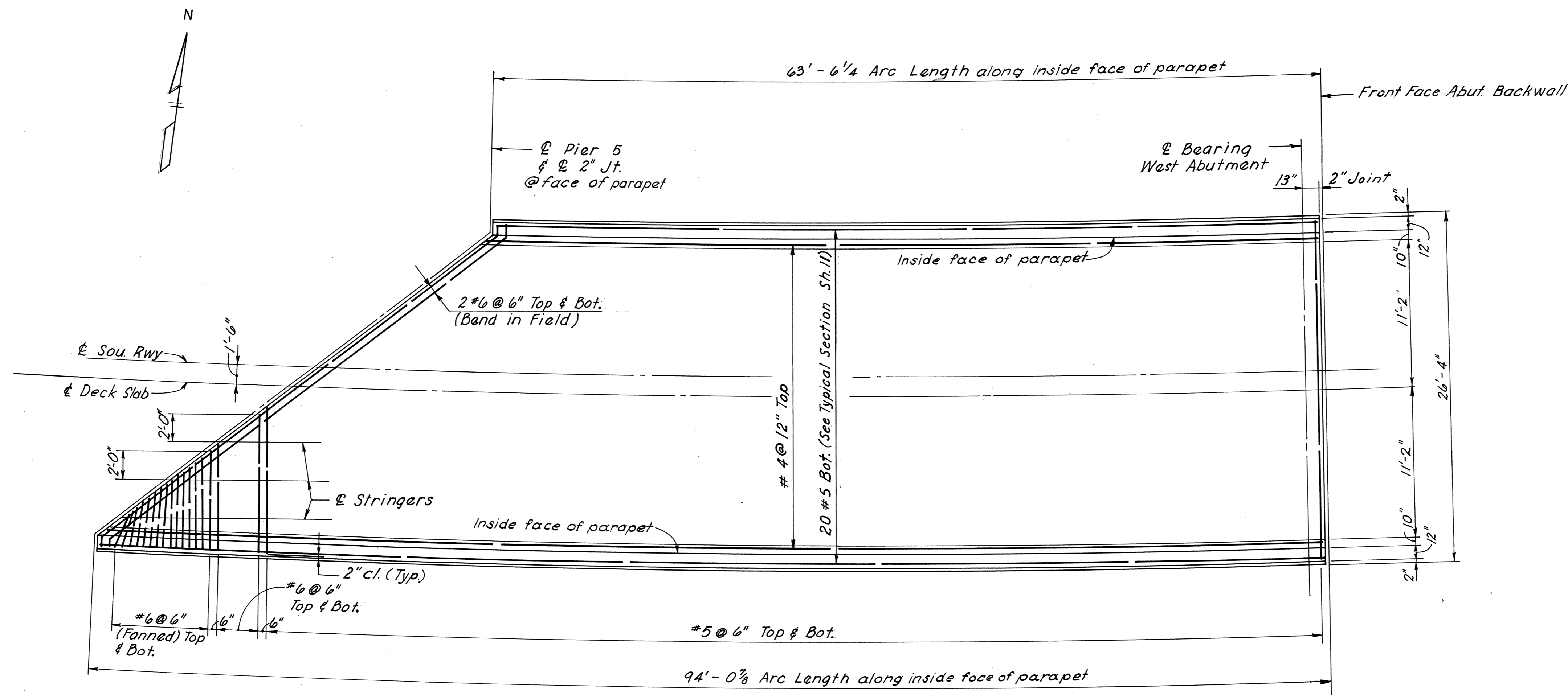
**CURB AND PARAPET ELEVATION**

**AS BUILT**

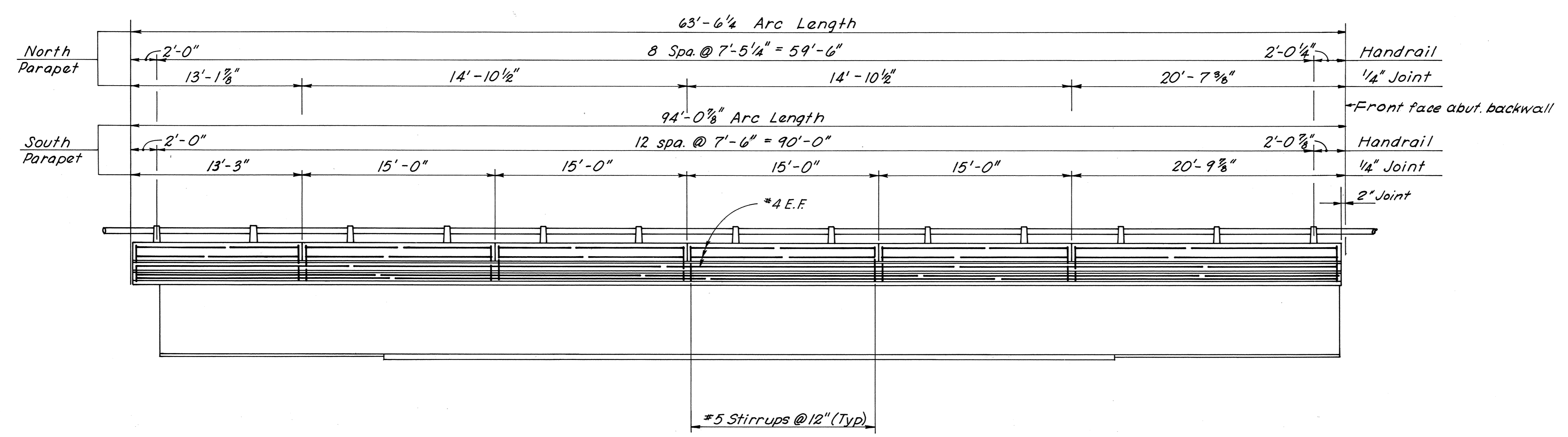
RICHMOND METROPOLITAN AUTHORITY RICHMOND EXPRESSWAY SYSTEM POWHITE PARKWAY	
SOUTHERN RAILWAY OVER POWHITE PARKWAY BRIDGE B-05	
<b>DECK PLANS-UNIT 5</b>	
HAYES, SEAY, MATTERN & MATTERN Associate Engineers	SCALE: 3/16" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF General Consultants	CONTRACT NO. 2 SHEET NO. 15 OF 19

BY	DATE	NO.	REVISION	BY	DATE
MADE	AJP 1-68	2	As Built	JRC	11-72
CHECKED	THN 2-68	1	@ Deck Slab	TEM	6-68
IN CHARGE	JGD				

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
2	POWHITE PARKWAY	147	188



UNIT 6



CURB AND PARAPET ELEVATION

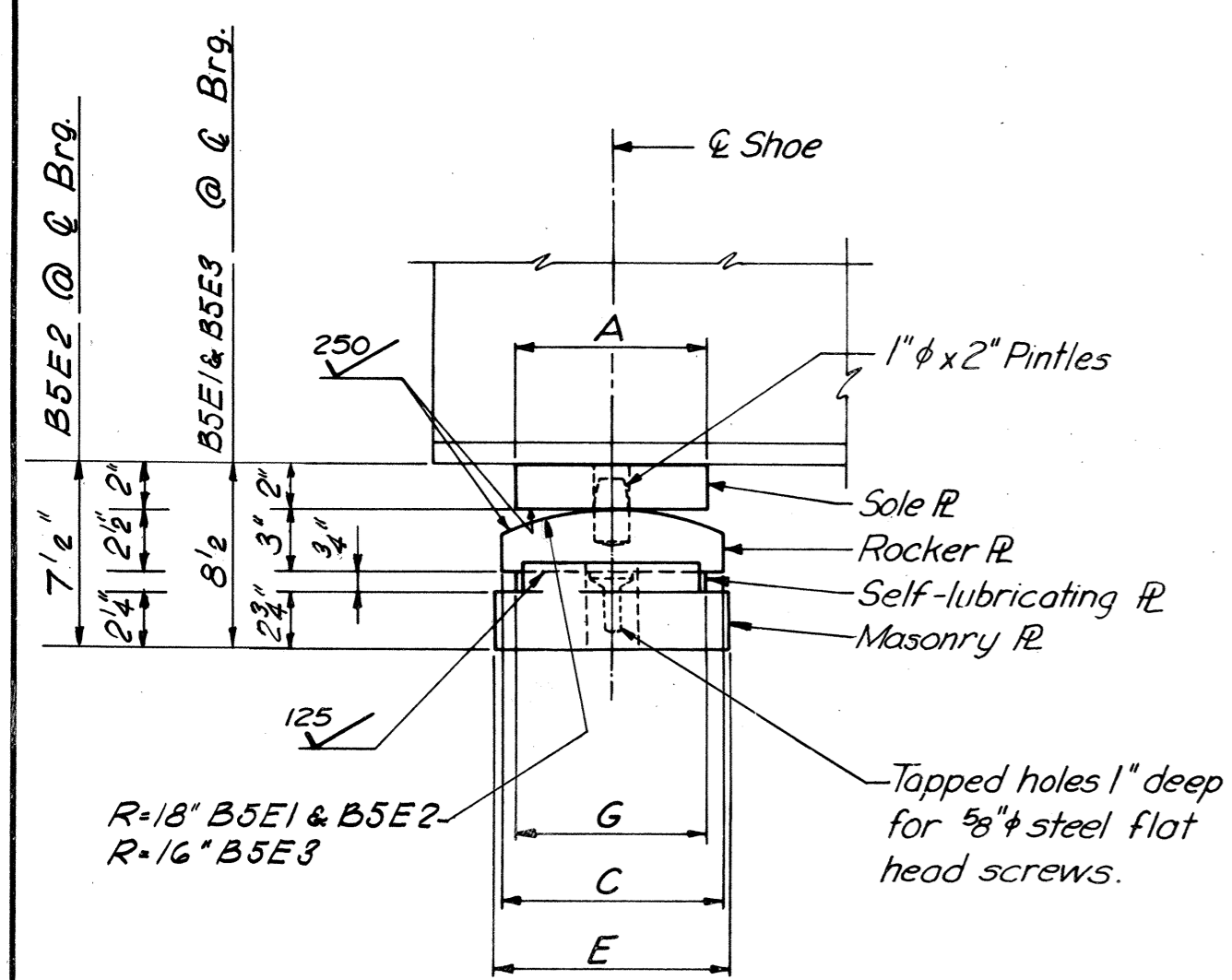
**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
POWHITE PARKWAY  
SOUTHERN RAILWAY OVER  
POWHITE PARKWAY  
BRIDGE B-05  
**DECK PLANS-UNIT 6**

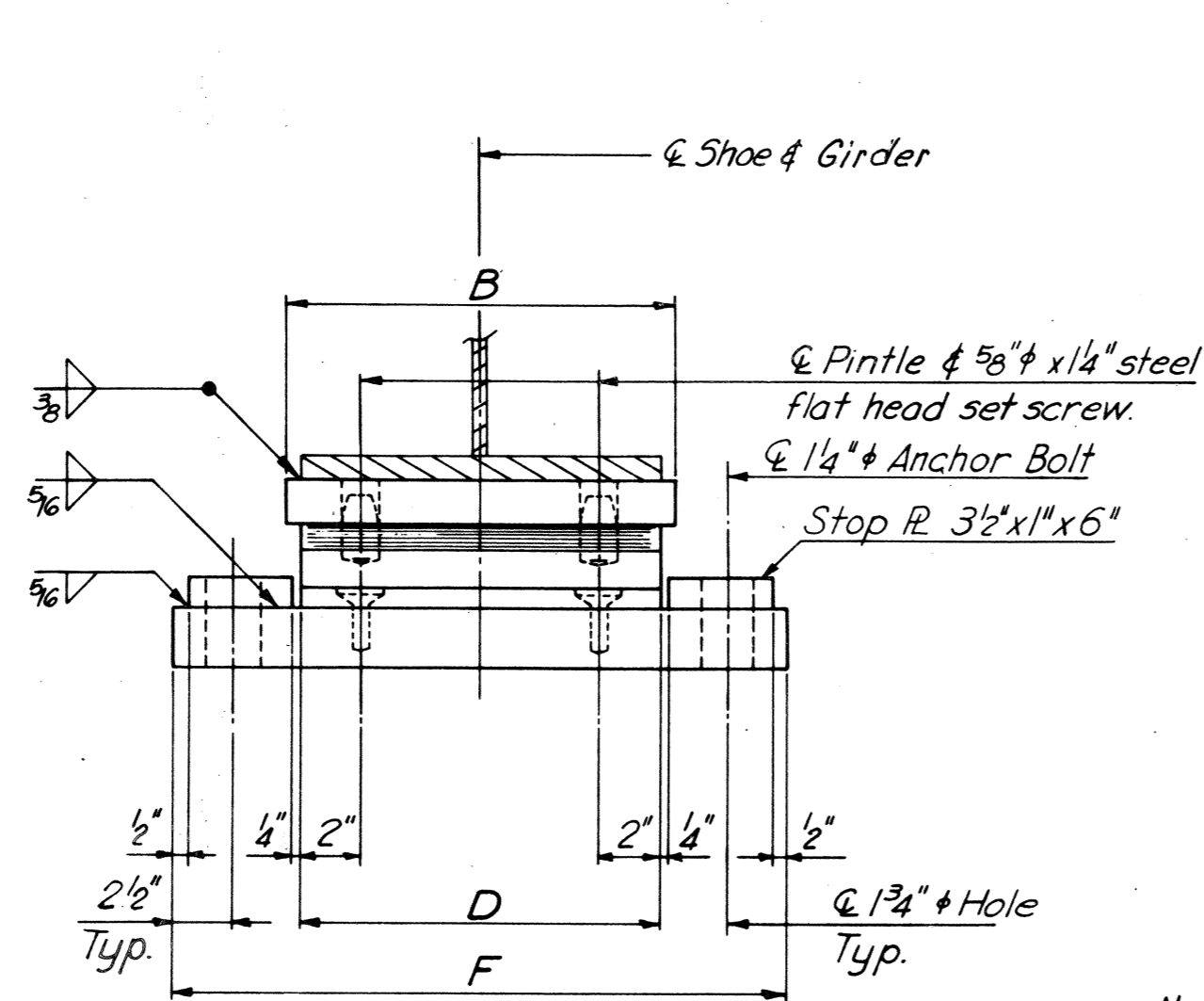
HAYES, SEAY, MATTERN & MATTERN  
Associate Engineers  
CONTRACT NO.: 2  
SCALE: 3/16" = 1'-0"

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
General Consultants  
SHEET NO. 16 OF 19

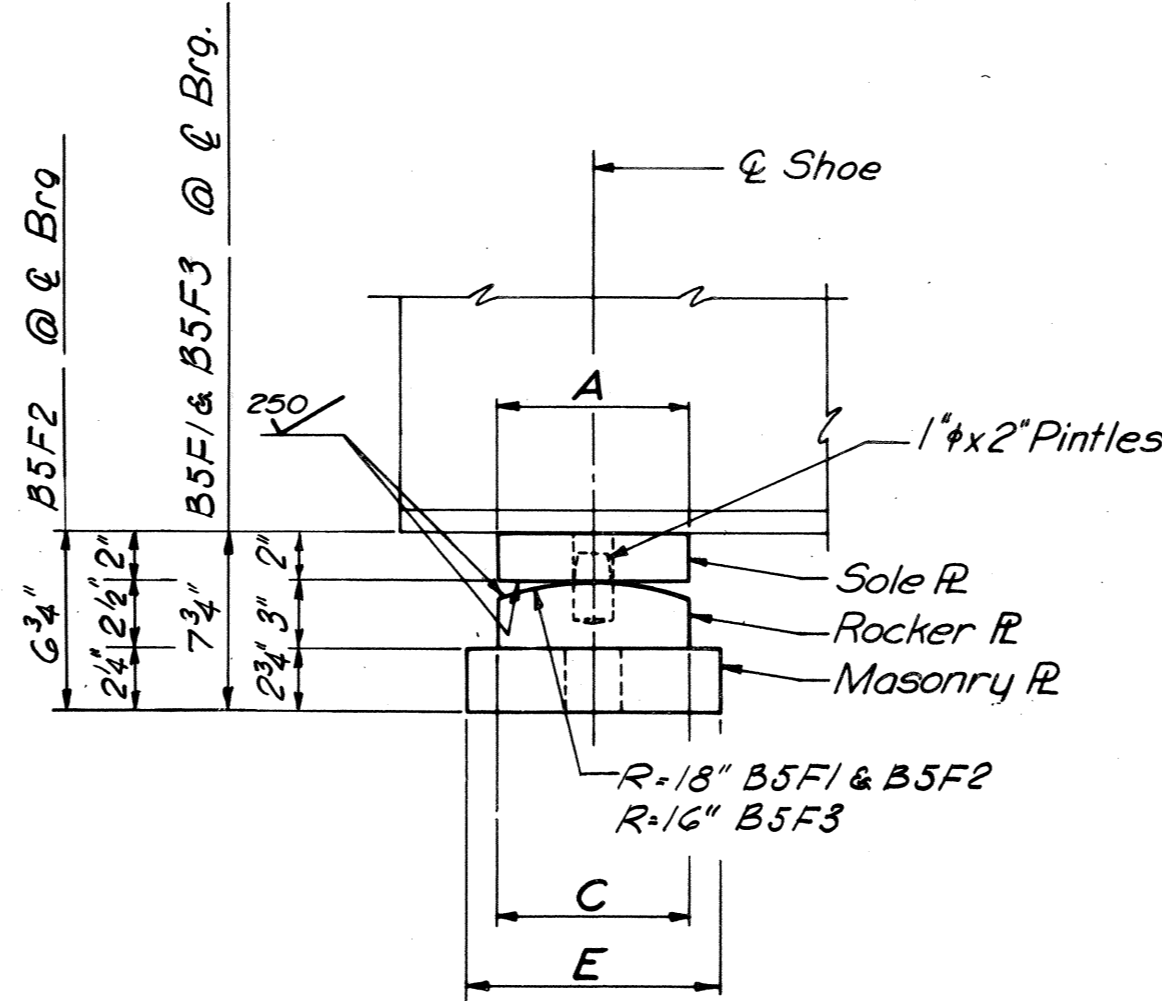
BY	DATE	NO.	REVISION	BY	DATE
MADE	AJP 1-68	2	As Built	R.J.H.	11-72
CHECKED	THN 2-68	1	@ Deck Slab	TEM.	6-68
IN CHARGE	JGD				



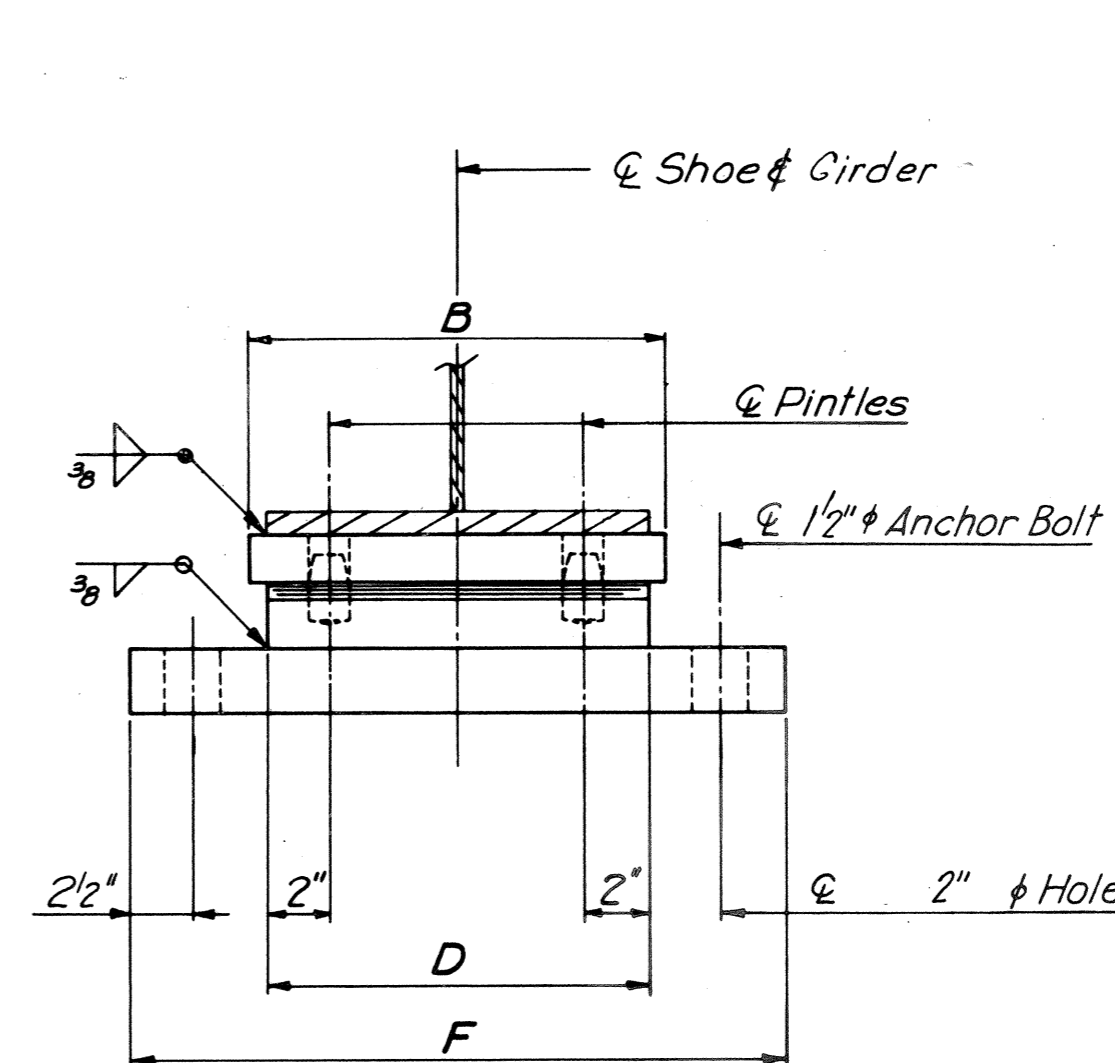
SIDE ELEVATION



END ELEVATION



SIDE ELEVATION

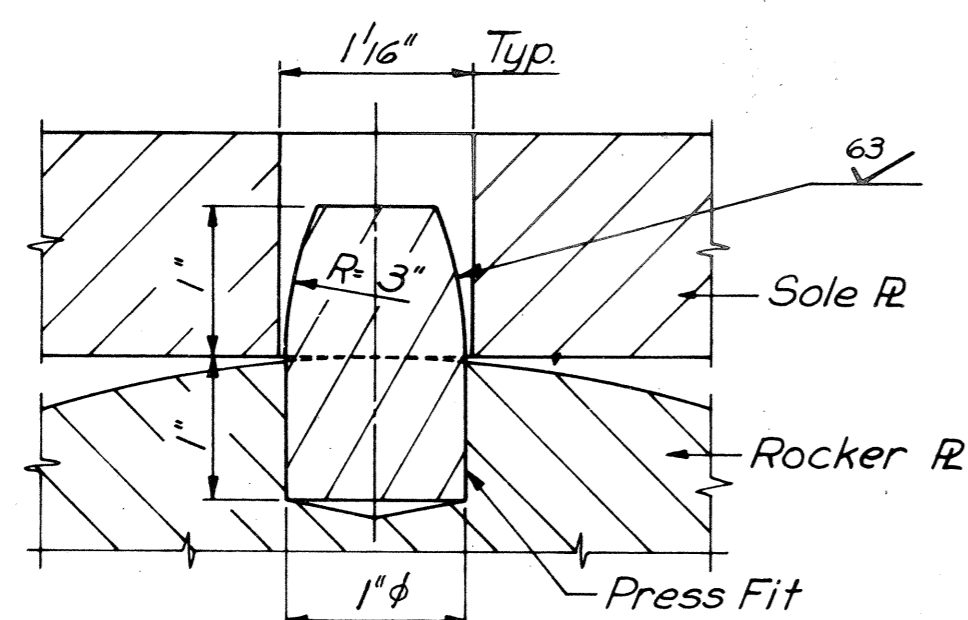


END ELEVATION

Note: Sole R is to be beveled to compensate for grade.

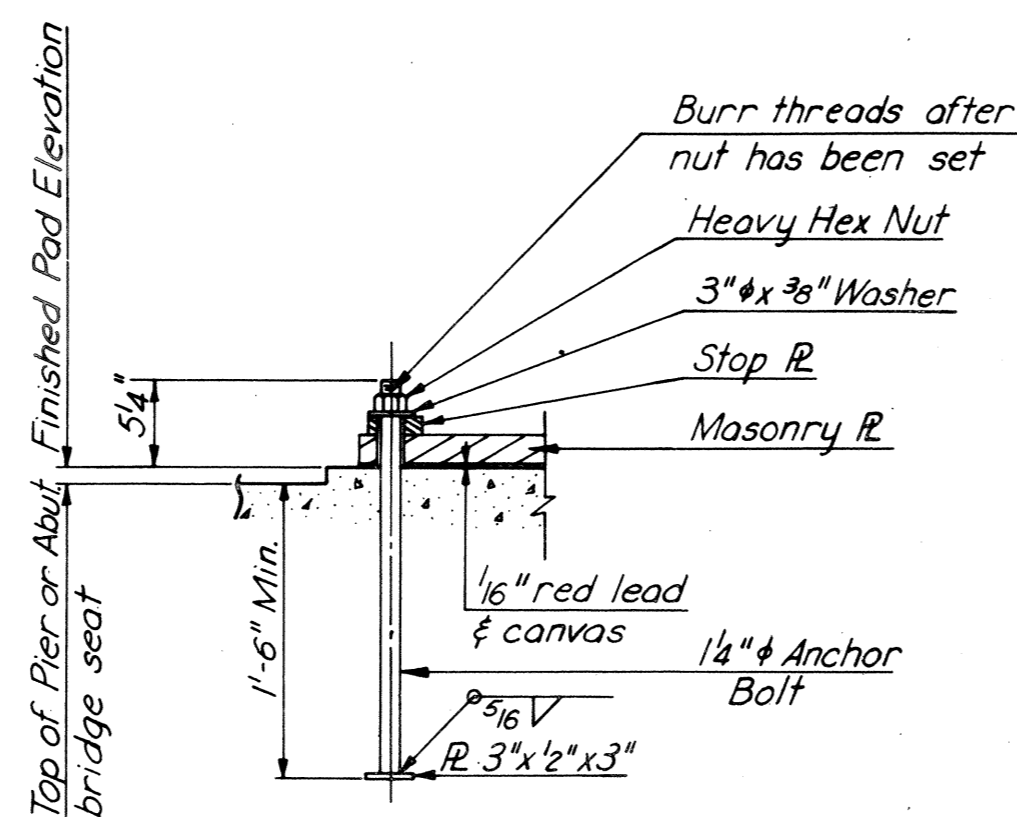
**EXPANSION SHOE**

No Scale



**PINTLE DETAIL**

Scale: 3/4" = 1"



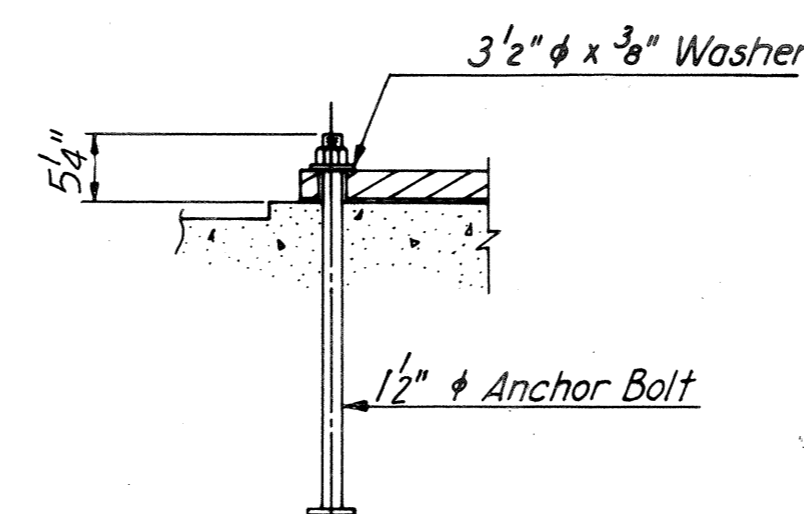
**EXPANSION SHOE**

**ANCHOR BOLT DETAIL**

No Scale

**FIXED SHOE**

No Scale

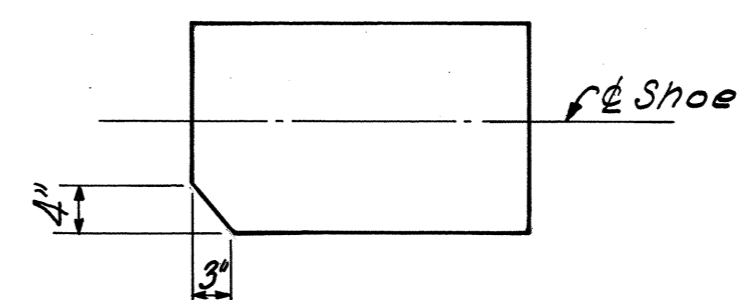


**FIXED SHOE**

Note: Anchor Bolt for Fixed Shoes same as Anchor Bolt for Exp. Shoes except as shown.

**Shoe Notes:**

Top of masonry plates, bottom of rocker plates and top and bottom of sole plates shall be planed, straightened or otherwise treated to secure true plane surfaces. Contact surfaces noted on the plans with finish symbols shall be finished in accordance with the American Standards Association surface roughness requirement as defined in ASA B46.1, Surface Roughness, Waviness and Lay, Part I. The plates comprising the expansion shoes shall be set so as to be truly centered under full dead load at a temperature of 68°F. Concrete pads shall be formed integral with abutment or pier and not less than 1/8" or more than 1/4" above finished elevation. Dress down pads by rubbing, grinding or as otherwise approved by the Engineer, to true level surfaces of the finished elevation. Anchor bolt assemblies shall conform to A.S.T.M. A-307 and shall be hot-dip galvanized conforming to A.S.T.M. A-153. Templates shall be used to accurately set the anchor bolts. Material for shoes (exclusive of self-lubricating plates) shall be high strength low alloy structural steel conforming to A.S.T.M. Specification A-588. Material for self-lubricating plates shall be Leaded Tin Bronze conforming to A.S.T.M. specification B22, alloy D modified to the extent that 1.5 to 2.5 percent lead is allowable. Shoes shall be included with structural steel item for payment.



TYPICAL DETAIL OF MASONRY R  
No Scale

SHOE DIMENSIONS																
EXPANSION SHOES								FIXED SHOES								
TYPE	NO. REQD.	A	B	C	D	E	F	G	TYPE	NO. REQD.	A	B	C	D	E	F
B5E1	19	12"	19"	13 1/2"	17"	17 1/2"	28"	12"	B5F1	19	12"	19"	13 1/2"	17"	17 1/2"	28"
B5E2	19	10"	19"	11 1/2"	17"	14 1/2"	28"	10"	B5F2	19	10"	19"	11 1/2"	17"	14 1/2"	28"
B5E3	10	12"	21"	14"	19"	17 1/2"	30"	12"	B5F3	10	12"	21"	14"	19"	17 1/2"	30"

BY	DATE	3	As Built	R.J.H.	11-72	
MADE	T.E.M.	1-17-68	2	General	J.G.V.	10-70
CHECKED	T.H.N.	2-68	1	Review Comm.	T.E.M.	6-68
IN CHARGE	J.G.D.			NO. REVISION	BY	DATE

**AS BUILT**

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

**SOUTHERN RAILWAY OVER**  
**POWHITE PARKWAY**  
 BRIDGE B-05

**SHOE DETAILS**

HAYES, SEAY, MATTERN & MATTERN  
 Associate Engineers  
 CONTRACT NO. 2  
 SHEET NO. 17 OF 19



# **Bridge 12**

**(Douglasdale Road Over DTE Connector, VA-146)**

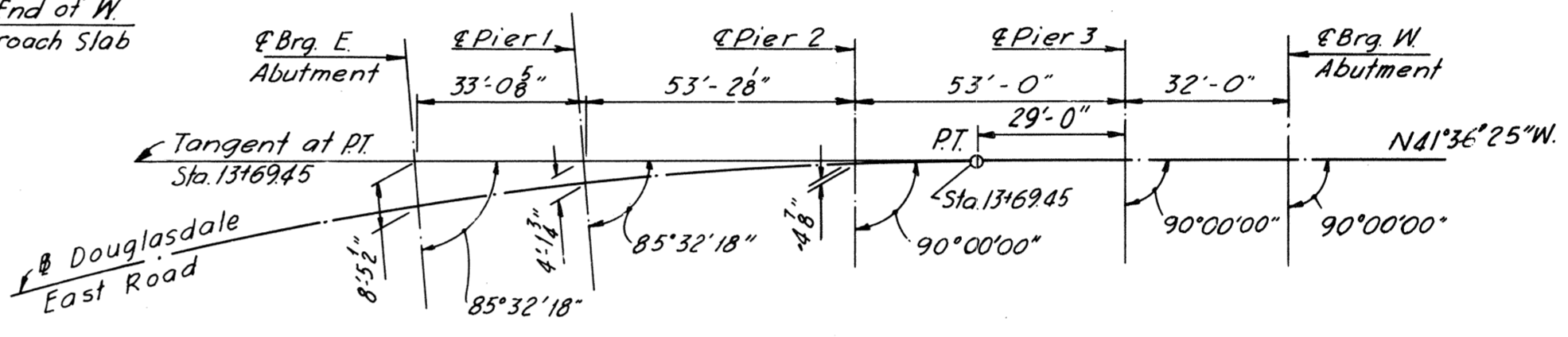
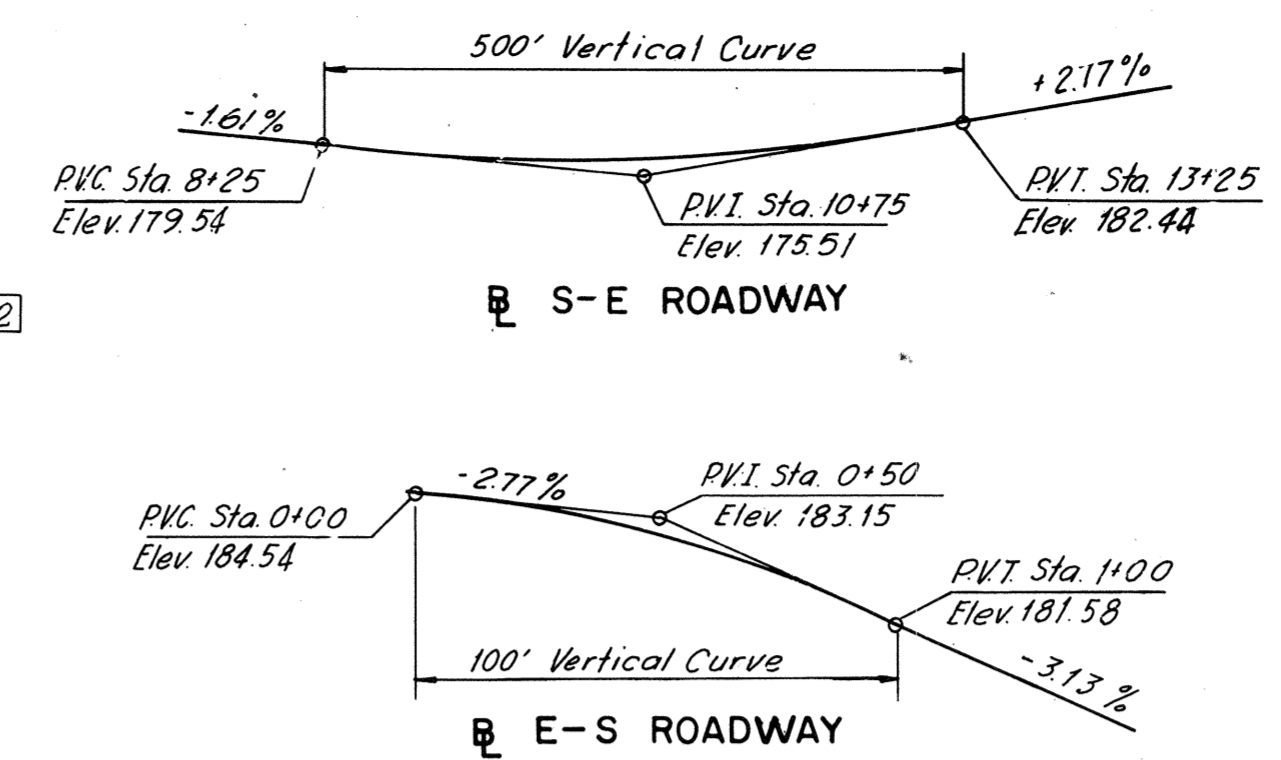
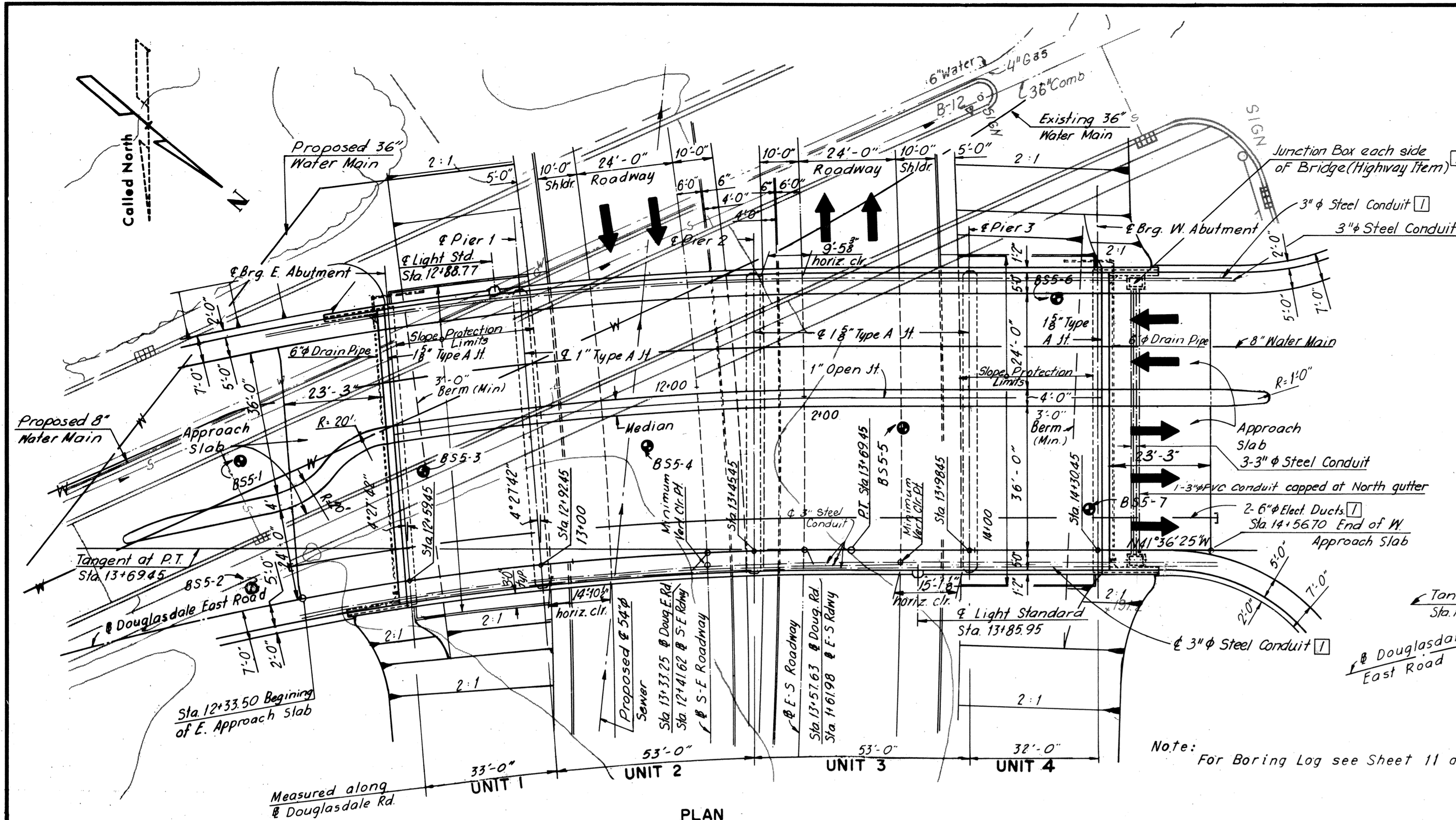
**Record Set Plans**



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	84	

INDEX Sheet

GENERAL PLAN AND ELEVATION	1
EAST ABUTMENT	2
WEST ABUTMENT	3
ABUTMENT DETAILS	4
PIERS	5
FRAMING PLAN	6
FRAMING DETAILS	7
DECK PLAN	8
JOINT DETAILS	9
APPROACH SLAB AND SLOPE PROTECTION DETAILS	10
BORING LOGS	11
BORING LOGS	12
STANDARD SHOE DETAILS	S1
STANDARD ALUMINUM RAILING DETAILS	S3
STANDARD ELECTRICAL DETAILS	S4
STANDARD ARCHITECTURAL DETAILS	S7, S8
STANDARD UTILITY SUPPORT DETAILS AT BR. ABUTS.	S12
STANDARD CONDUIT INSTALLATION DETAILS	S13
LIMITS OF EXCAVATION AND BACKFILL	S13



**CURVE DATA**

Douglasdale East Road

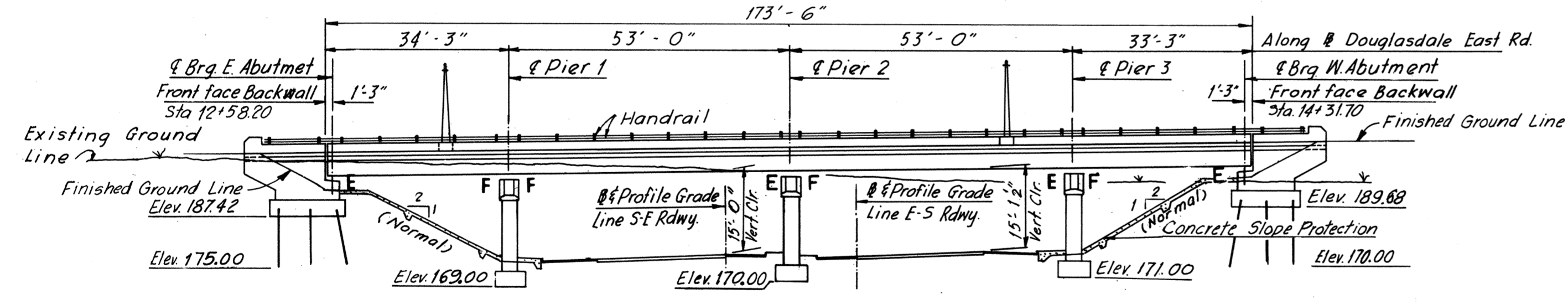
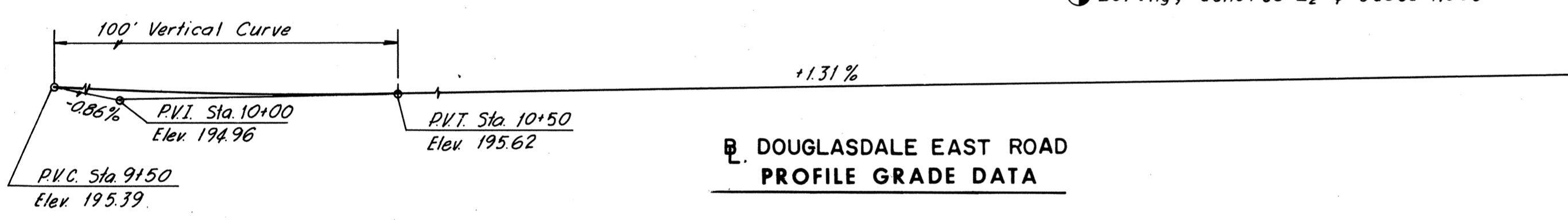
P.I. = Sta. 12+21.35  
 Δ = 24°03'23"  
 D = 8°00'00"  
 T = 152.60'  
 L = 300.70'  
 R = 716.20'

S-E Roadway

P.I. = Sta. 10+68.11  
 Δ = 34°20'58"  
 D = 5°00'00"  
 T = 354.17'  
 L = 686.99'  
 R = 1145.92'

E-S Roadway

P.I. = Sta. 6+43.88  
 Δ = 37°15'41"  
 D = 3°00'00"  
 T = 643.88'  
 L = 1242.04'  
 R = 1909.86'



**ESTIMATED QUANTITIES**

Struc. Excav. Cu. yds.	CONCRETE			Reinf. Steel Lbs.	Str. Stl. Mild Car. Lbs.	Porous Backfill Cu. yds.	Underdrain 6'dia. pipe Lin. ft.	10BP42 Stl. Pile Lin. ft.	Con. Slab Sl. Prot. Sq. yds.	Asphalt Damp prf. Sq. yds.	Metal Conduit Lin. ft.	Conduit 6'dia. VEP. CO Lin. ft.	Water Main 8'dia. Lin. ft.	Aluminum Railing (2-rails) Lin. ft.	PVC Conduit Lin. ft.
	Class A4 Cu. yds.	Class A3 Cu. yds.	Class A3 Appr. Sl. Cu. yds.												
Superstructure		440.0		95,614	326,332						1,539	448	211	403	66
East Abutment	230.8		145.6	7,846		9	92	391.8	357.7	57					
Pier 1	356.6		142.9	16,397											
Pier 2	239.1		132.9	15,882											
Pier 3	313.3		138.4	16,012											
West Abutment	288.5		148.0	7,852		9	96	503.2	358.2	57					
Approach Slabs				147.6	38,885										
TOTAL	1,428.3	440.0	707.8	198,488	326,332	18	188	895.0	715.9	114	1,539	448	211	403	66

**ESTIMATED QUANTITIES NOTES**

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

Notes: The cost of furnishing and installing 2" and 3" galvanized steel conduit shall be included in the bid price for the item "Metal Conduit".

BY	DATE	NO.	REVISION	BY	DATE
J.S.W.	10-25-67	1			
G.C.C.	2-14-68	2			
F.K.D.					

**GENERAL NOTES**

ROADWAY: Two roadways 24'-0" and 36'-0" clear. Two 5'-0" side walks and 4'-0" median with a 1" joint.

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 1969 and 1970-72 Interim Specification, modified by Special Design Provisions.

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: 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 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 1/4" chamfer or fillet unless otherwise noted.

Finishing concrete surfaces: See the Standard Architectural Detail Sheets and the Contract Special Provisions for types and details.

STEEL NOTES:

All reinforcing steel shall be intermediate grade. 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.

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 1/2" diameter unless otherwise noted and shall conform to A.S.T.M. Specification A-325.

BENCH MARK: B-12 Copperweld rod in west end of median on Douglasdale Road. Elev. 192.01

**AS BUILT**

RICHMOND METROPOLITAN AUTHORITY  
 RICHMOND EXPRESSWAY SYSTEM  
 DOWNTOWN EXPRESSWAY

BRIDGE NO. 12  
 DOUGLASDALE EAST ROAD OVER  
 S-E & E-S ROADWAYS

**GENERAL PLAN AND ELEVATION**

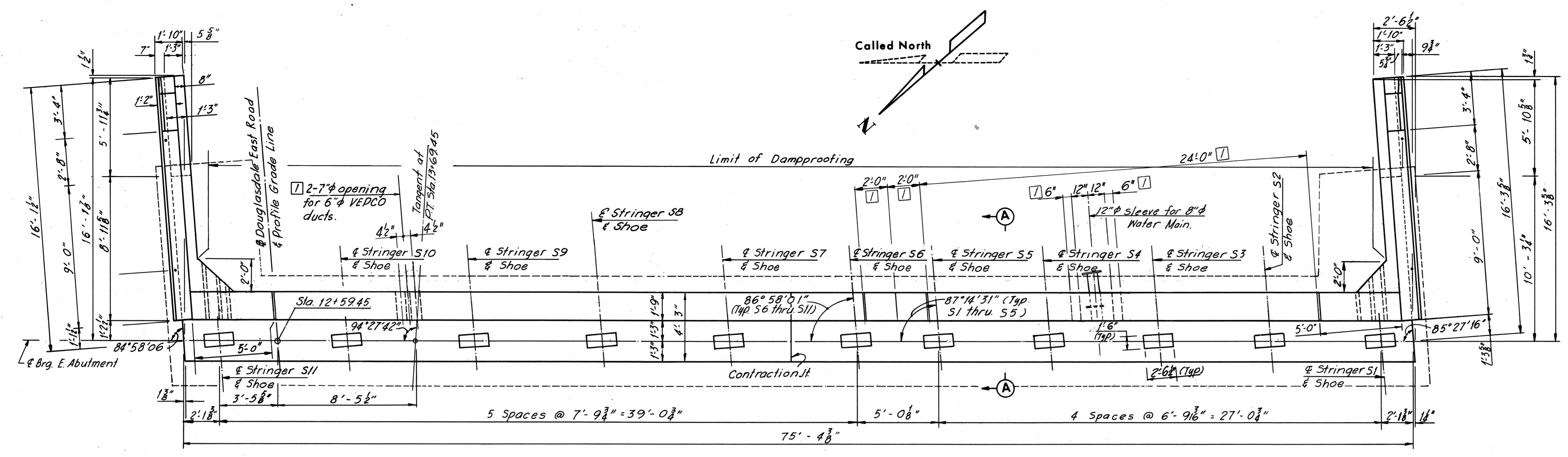
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 consulting engineers  
 NEW YORK ALEXANDRIA KANSAS CITY

SCALE: 1"=20'

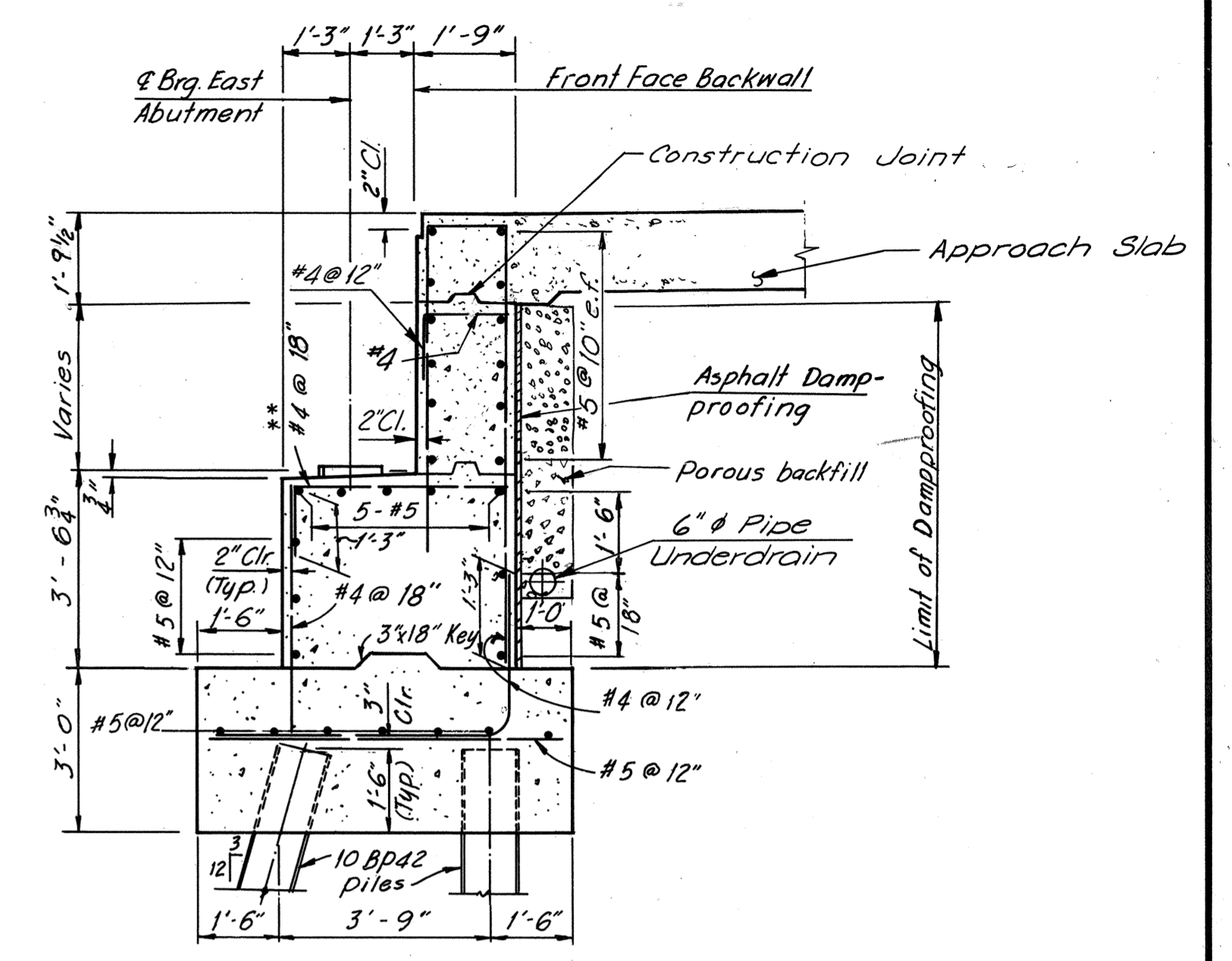
CONTRACT NO.: 7

SHEET NO. 1 OF 12

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	85	

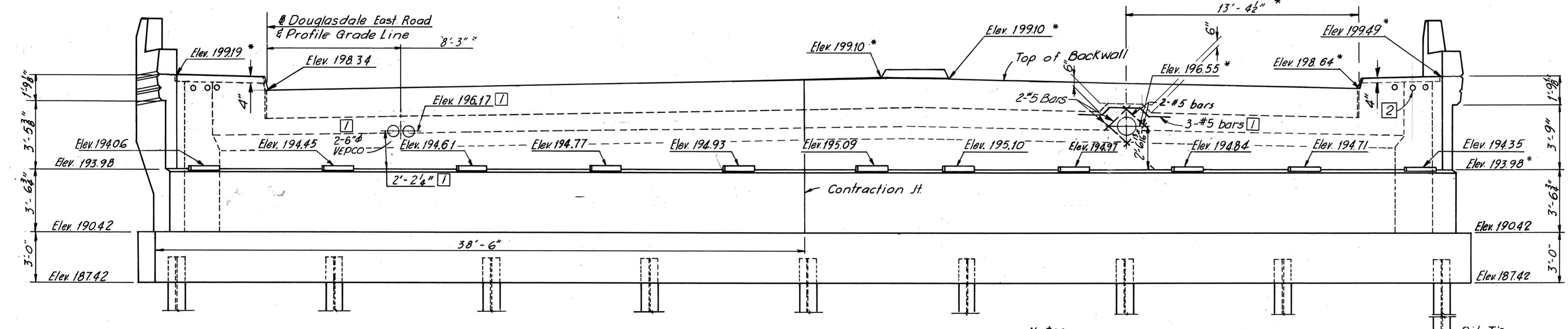


**PLAN**  
Scale: 1/4" = 1'-0"



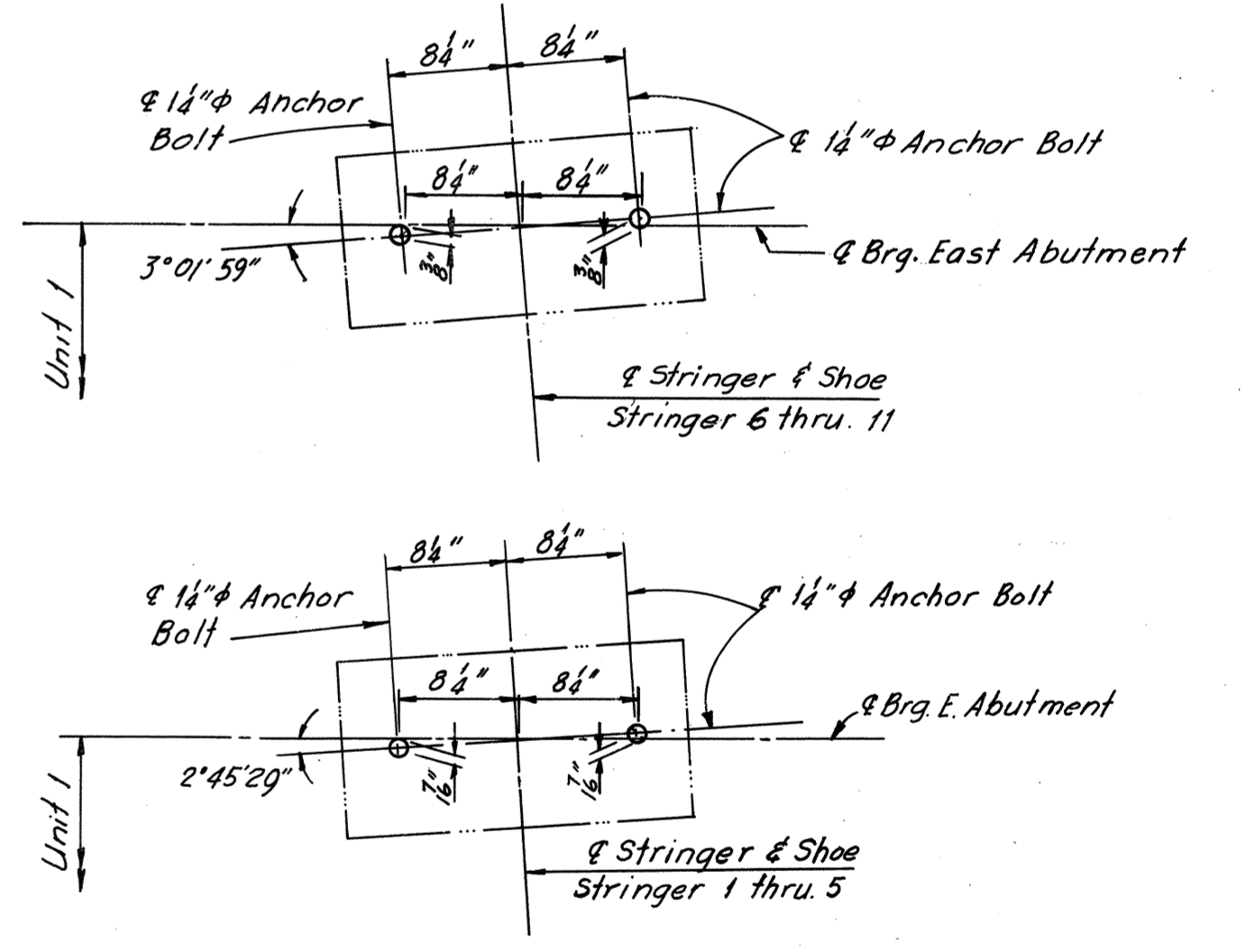
**SECTION A-A**  
Scale: 3/8" = 1'-0"

\*\*Note: Provide two additional #4 bars @ 2'-0" at each unreinforced bearing pad.



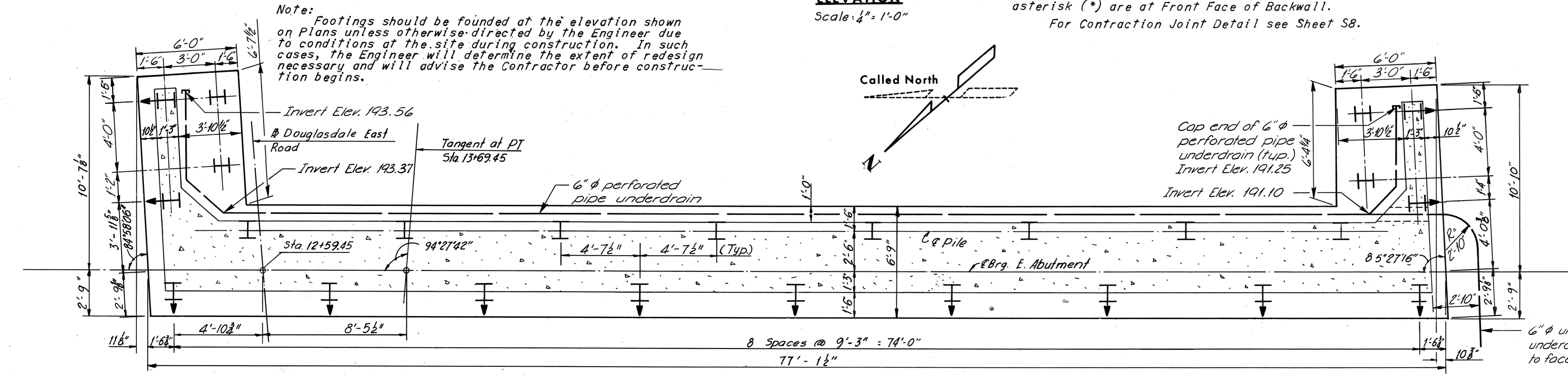
**ELEVATION**  
Scale: 1/4" = 1'-0"

Note: Elevations and dimensions denoted with an asterisk (\*) are at Front Face of Backwall. For Contraction Joint Detail see Sheet B8.



**ANCHOR BOLT SETTING PLAN**  
Scale 1/2" = 1'-0"

Note: All piles shall be 10BP42 Steel Piles (Design capacity = 45 tons). Batter piles 3" per foot where shown. For steel pile details see Sheet 4. For details of 12" sleeve for 8" Water pipe see Sheet 4. For additional details of 8" Water pipe see Sheet 511. For details of 5" VEPDO ducts thru backwall see Sheet 512. For Handrail details see Sheet 53. For Reinforced Bearing Pad Detail see Sheet 3.



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

BY	DATE	REVISION	BY	DATE	NO.	REVISION	BY	DATE
MADE	S.S.M. 11-30-47	1	LBP	1-74	3	As Built	TEM	9-75
CHECKED	G.C.C. 2-12-68				2	Move 3" x 4" Conduit from N. Parapet to S. Parapet	TEM	1-74
IN CHARGE	F.K.D.							

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

**BRIDGE NO. 12**  
**DOUGLASDALE EAST ROAD OVER**  
**S-&E-S ROADWAYS**  
**EAST ABUTMENT**

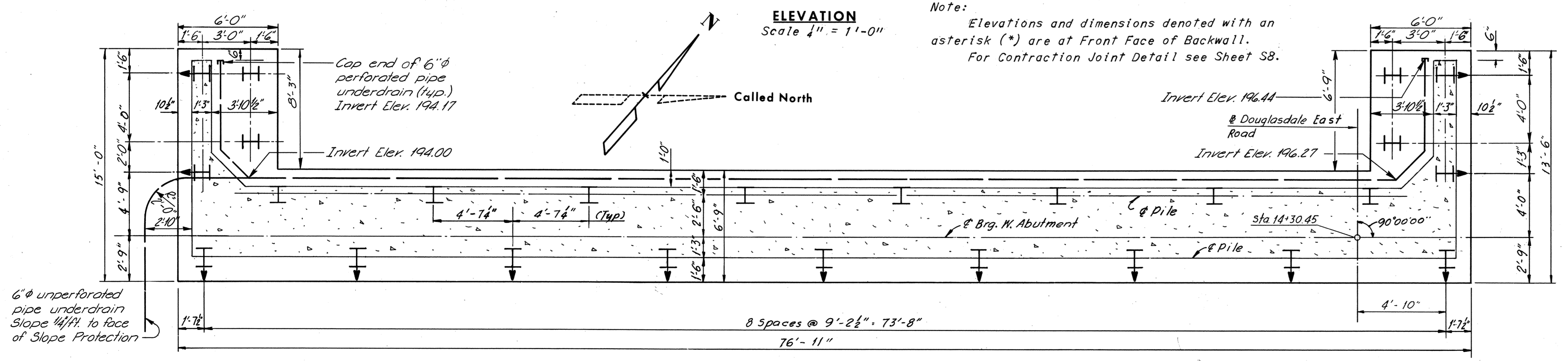
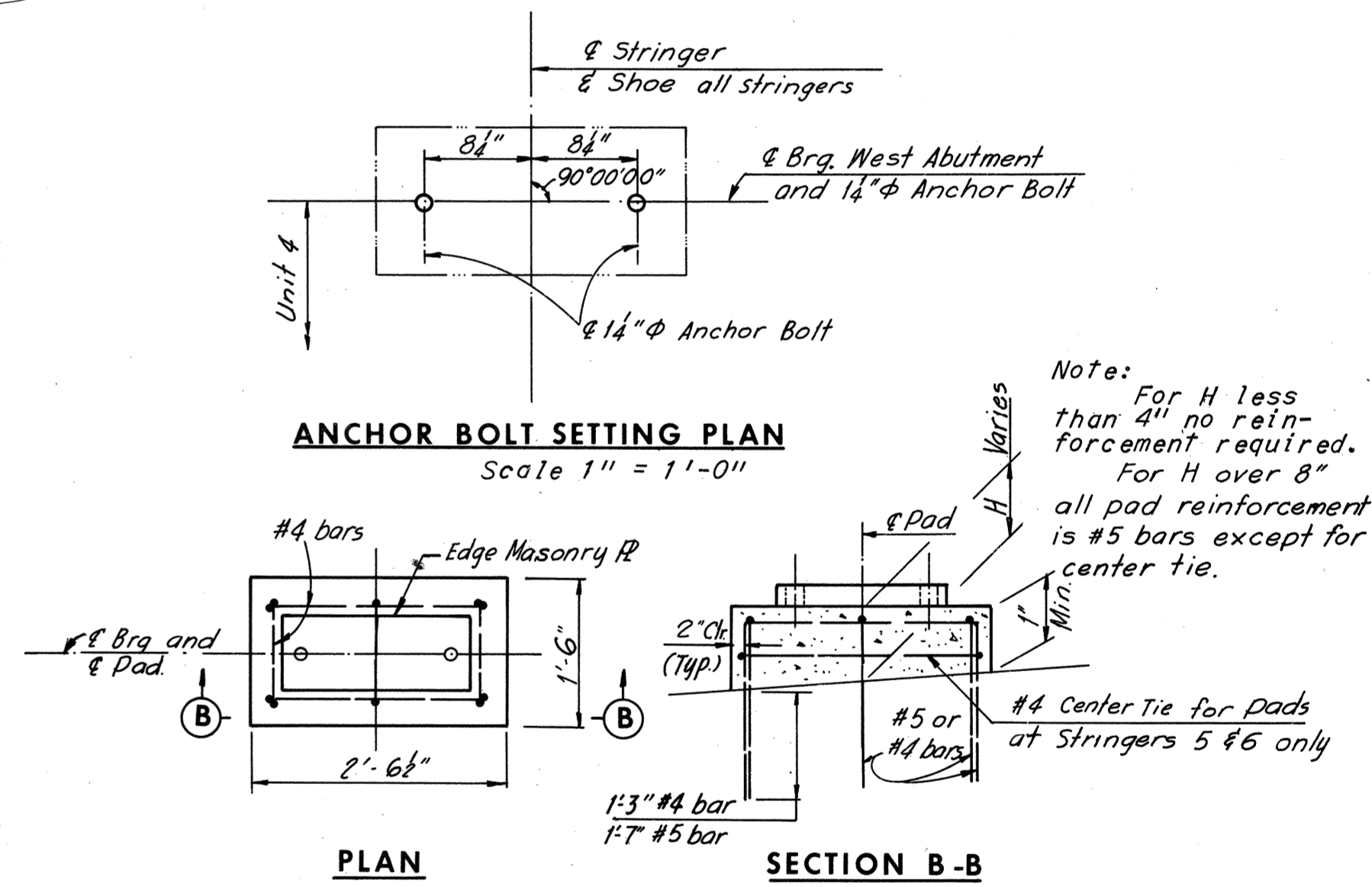
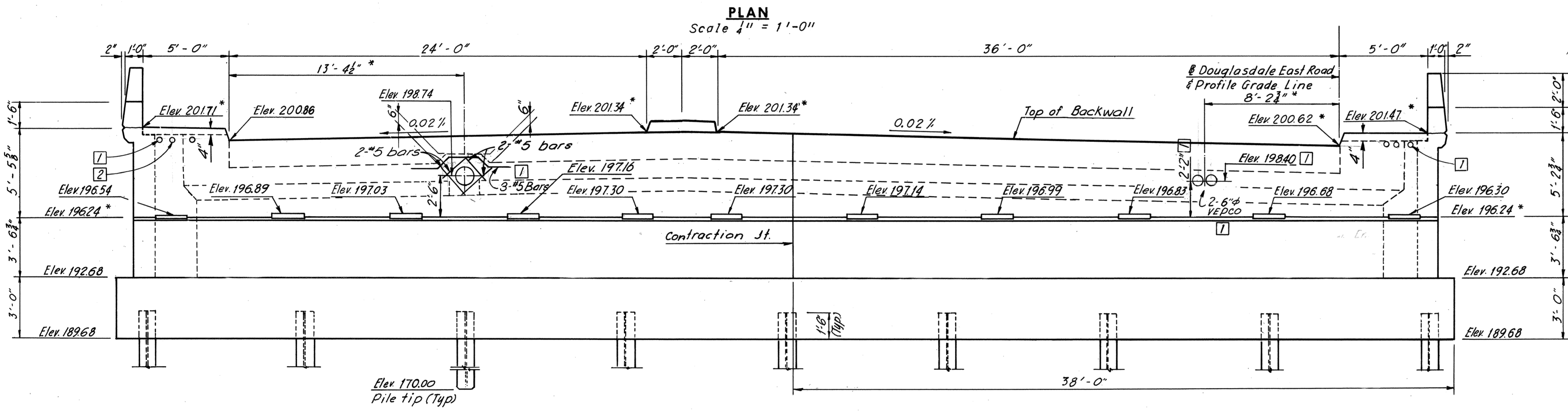
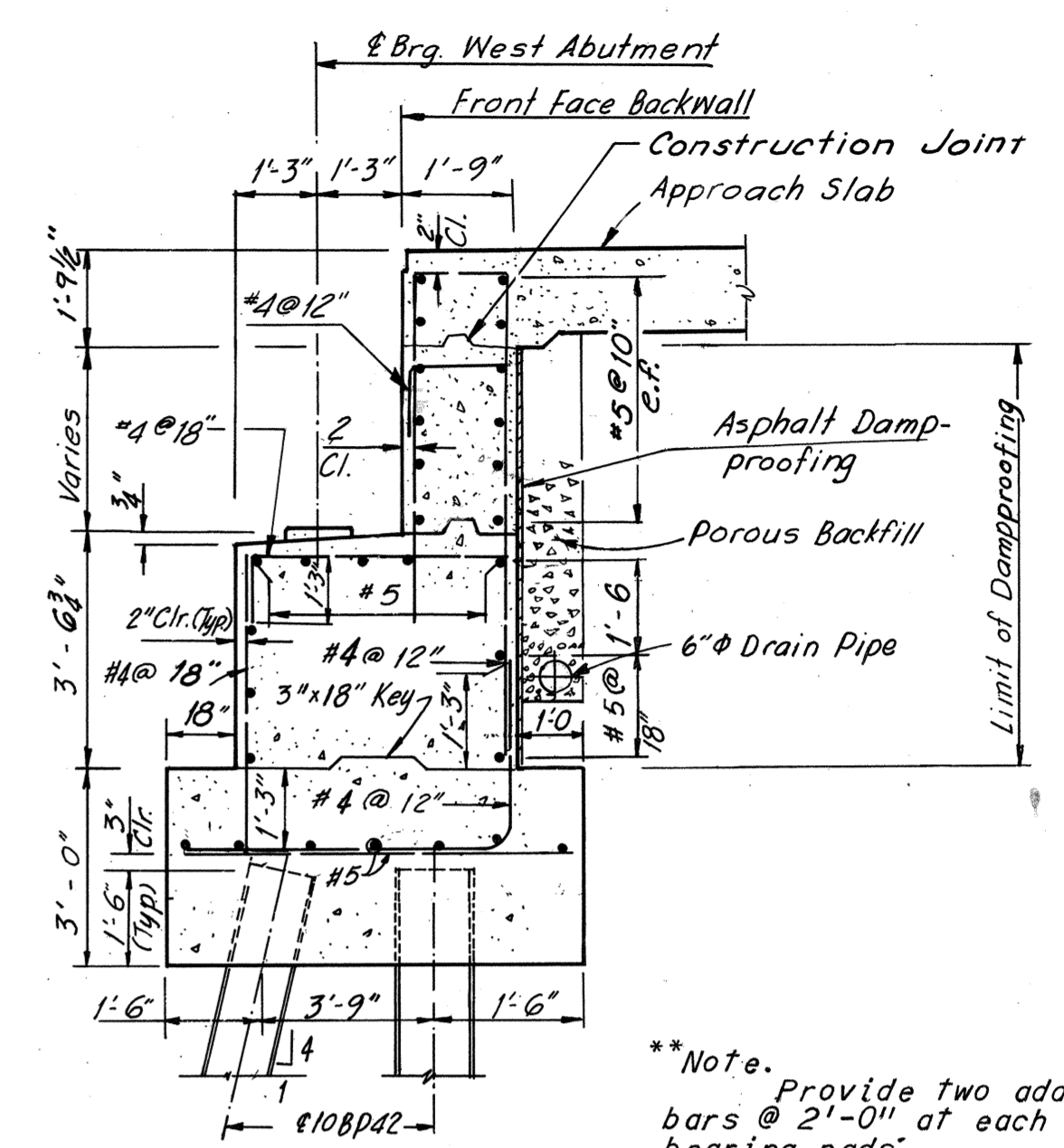
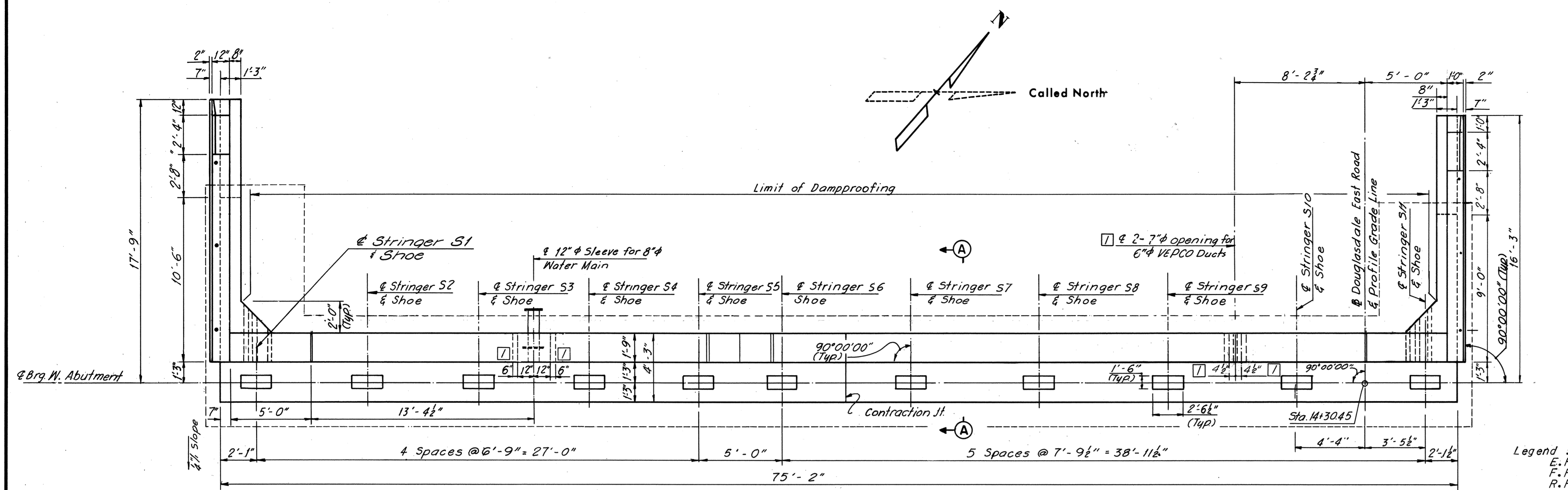
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SCALE: As noted  
CONTRACT NO.: 7  
SHEET NO. 2 of 12

**AS BUILT**



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	86	



**REINFORCED BEARING PAD DETAIL**

Note:  
 All piles shall be 10BP42 Steel Piles (Design capacity = 45 tons).  
 Batter piles 3" per foot where shown.  
 For steel pile details see Sheet 4.  
 For details of 12" sleeve for 8" Water pipe see Sheet 4.  
 For additional details of 8" Water pipe see Sheet 5.11.  
 For details of 5" VEPDO ducts thru backwall see Sheet 5.12.  
 For Handrail details see Sheet 5.3.  
 For "Foundation Note" see Sheet 2.

NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE
				3	As Built	TEM	9-75
				2	Move 3" Conduit from N. Parapet to S. Parapet	TEM	1-74

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

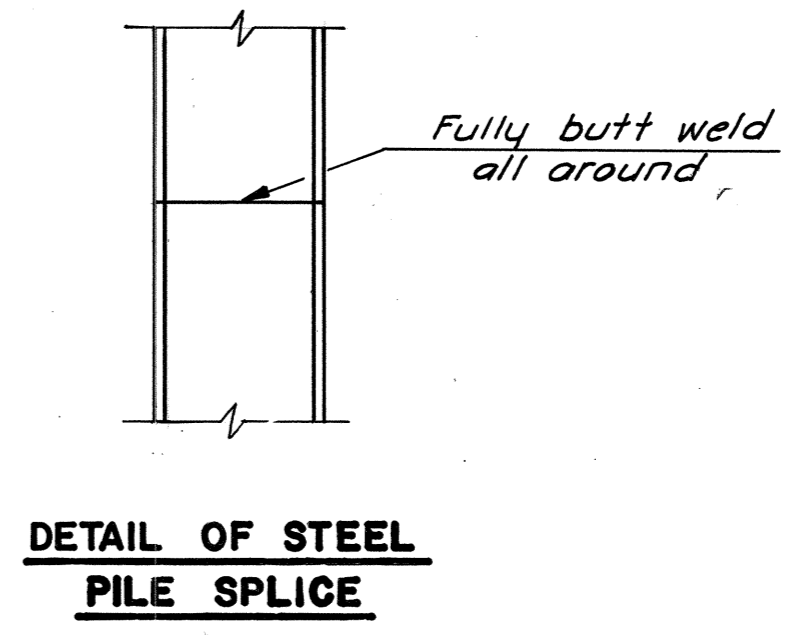
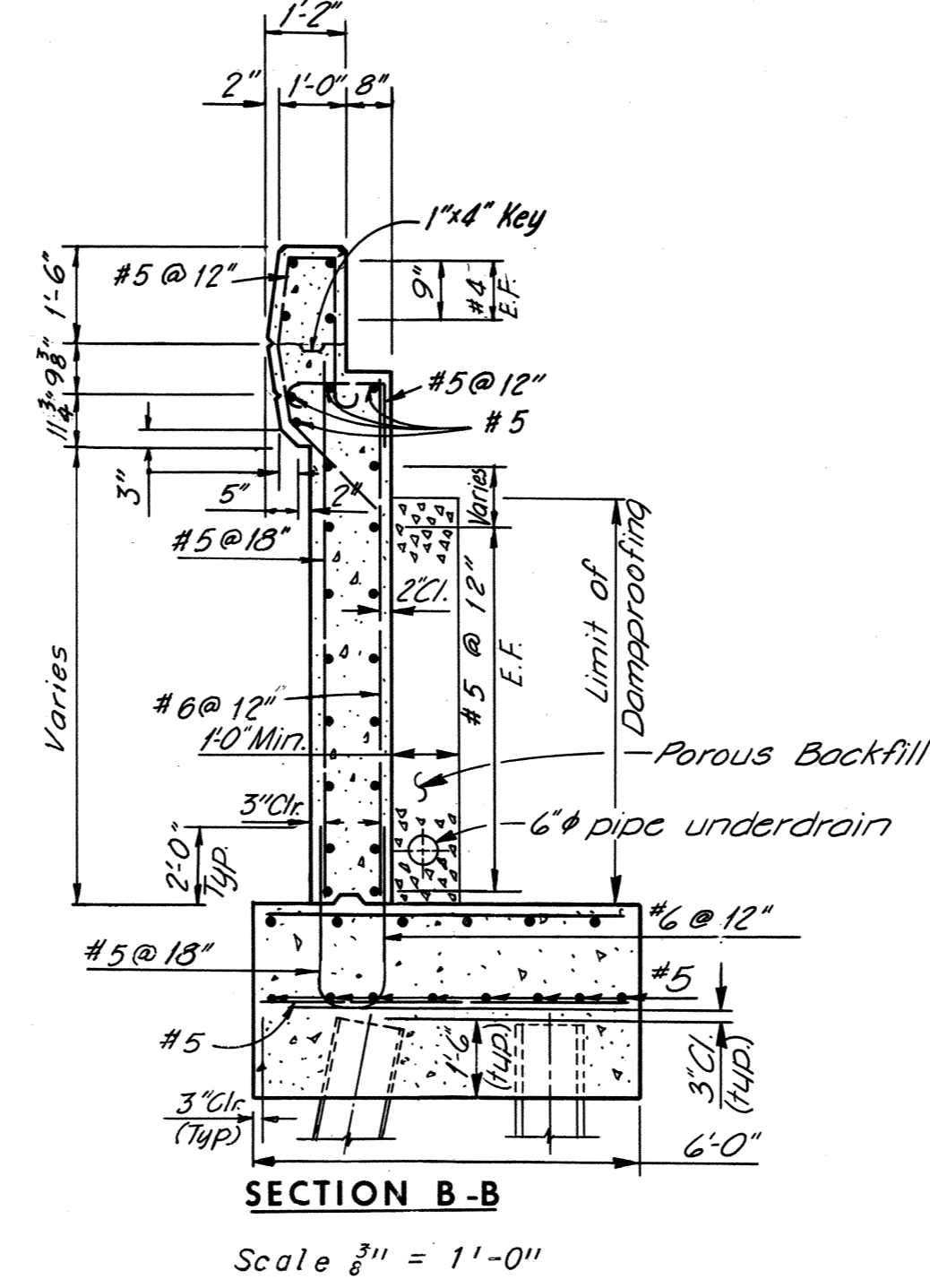
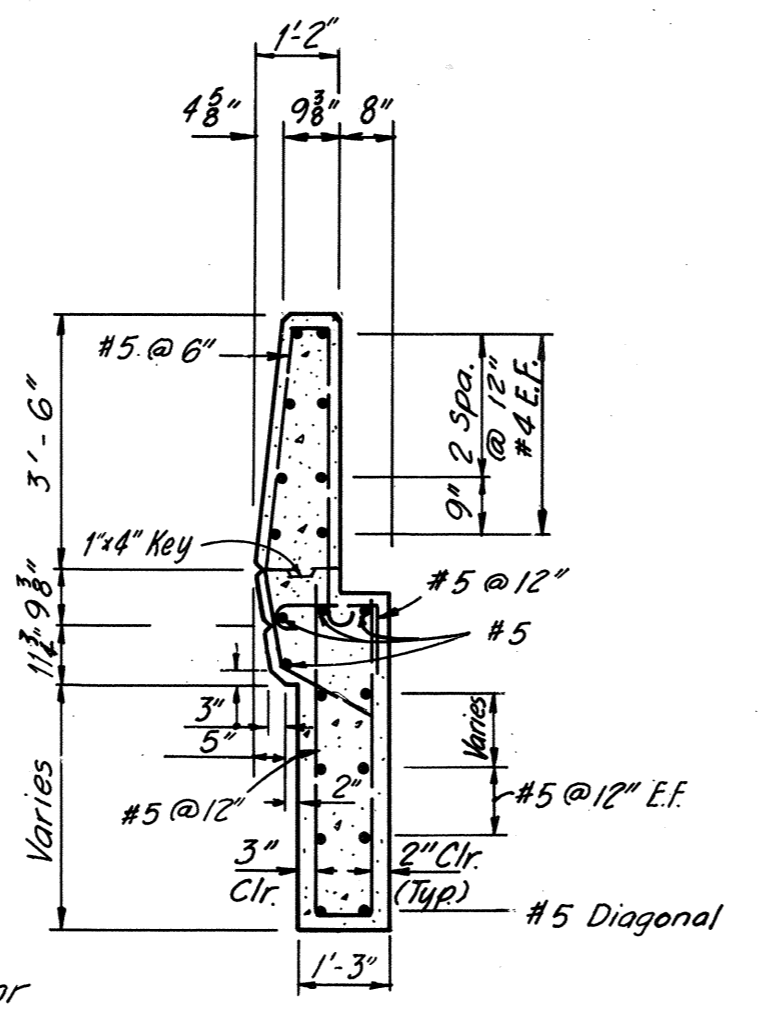
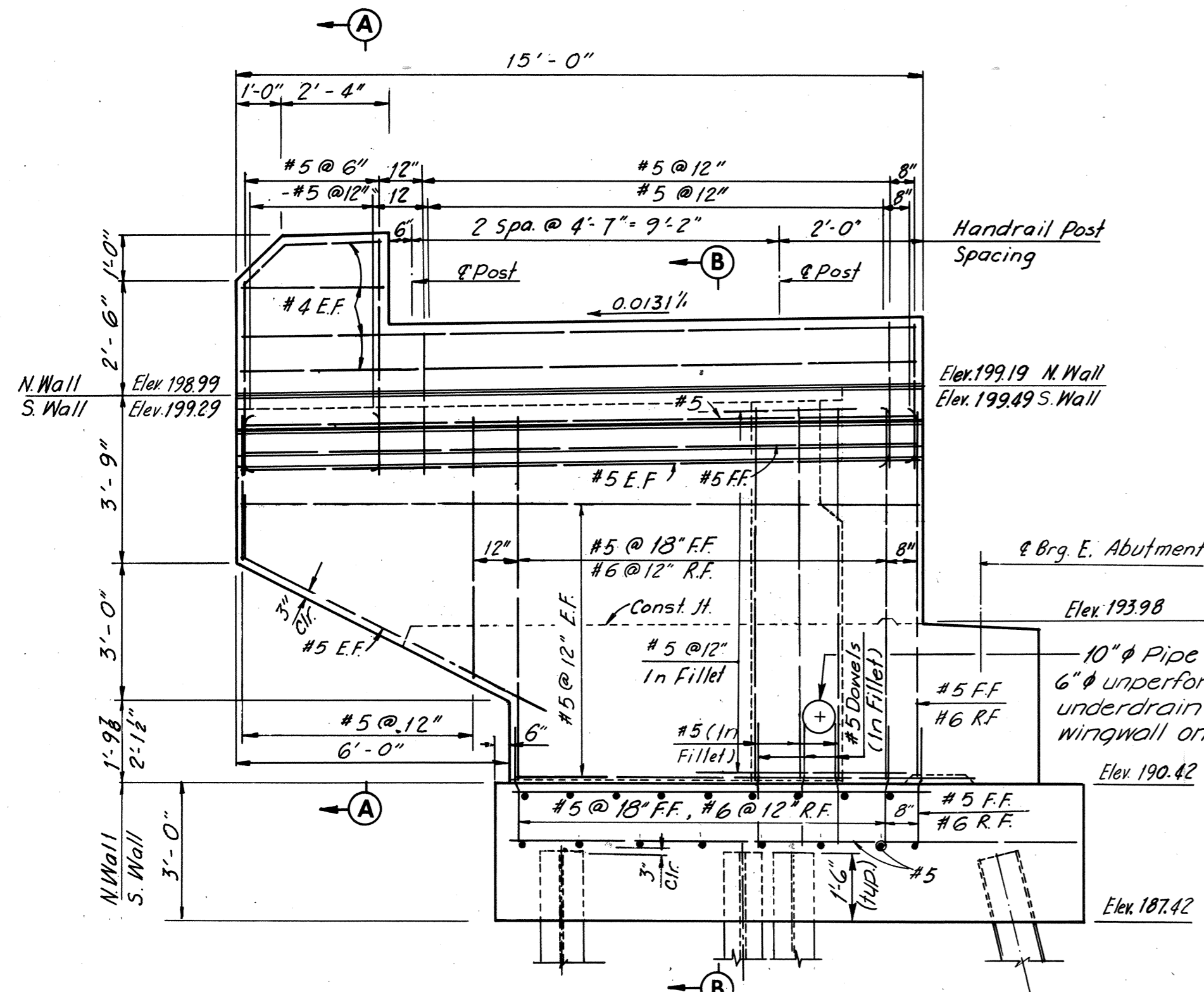
**AS BUILT**

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

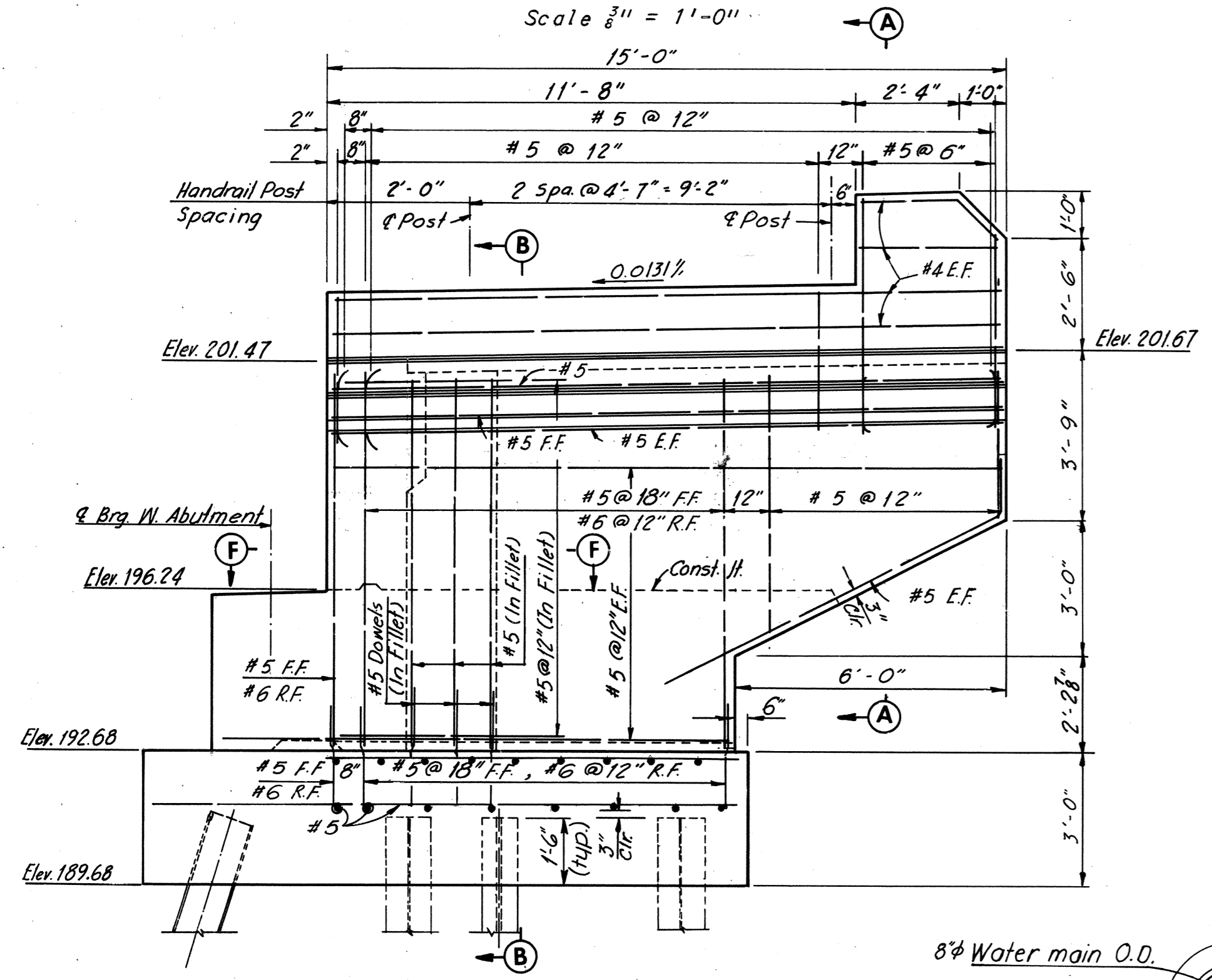
**BRIDGE NO. 12**  
**DOUGLASDALE EAST ROAD OVER**  
**S-E-E-S ROADWAYS**  
**WEST ABUTMENT**

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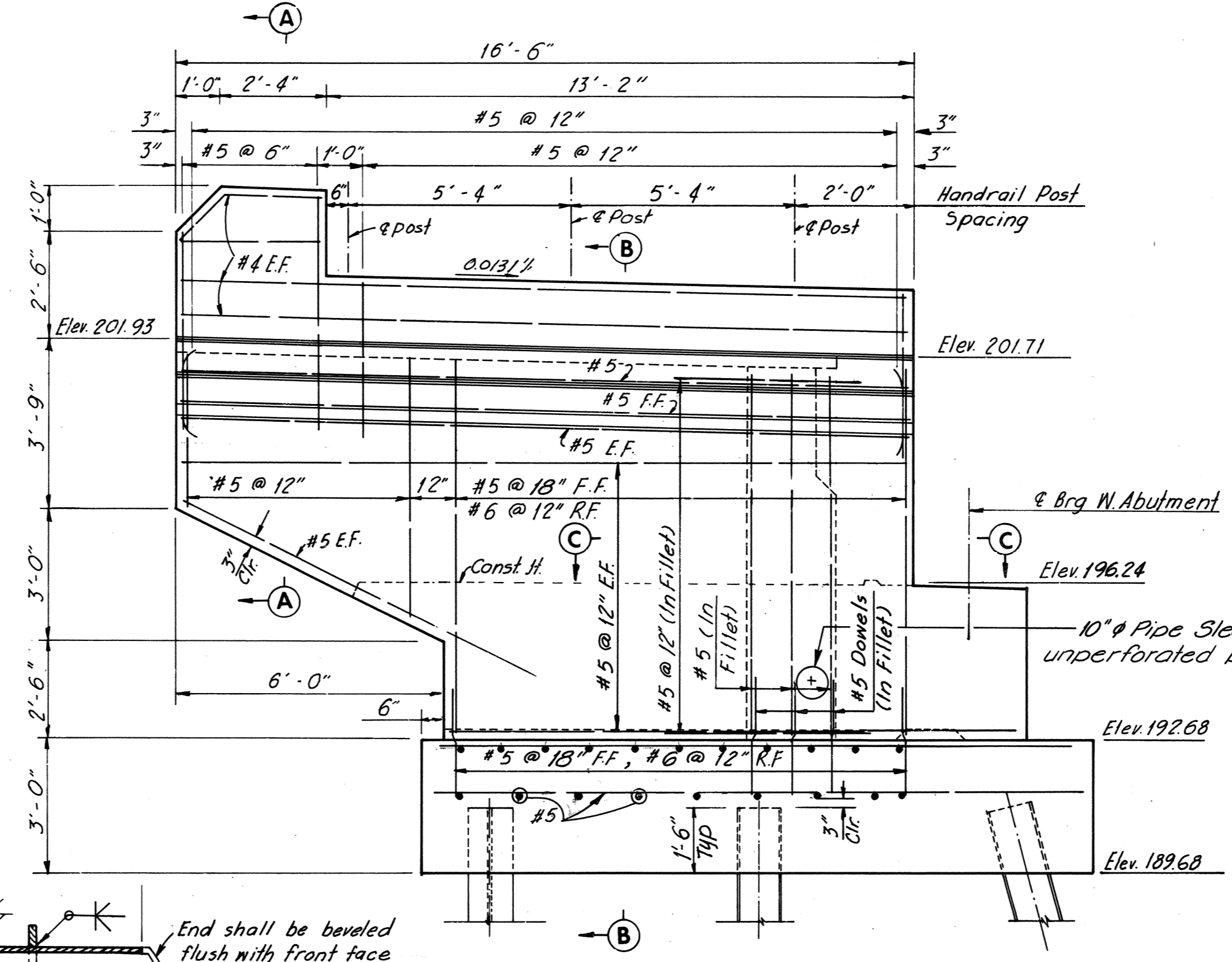
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 CONTRACT NO.: 7  
 SHEET NO. 3 OF 12



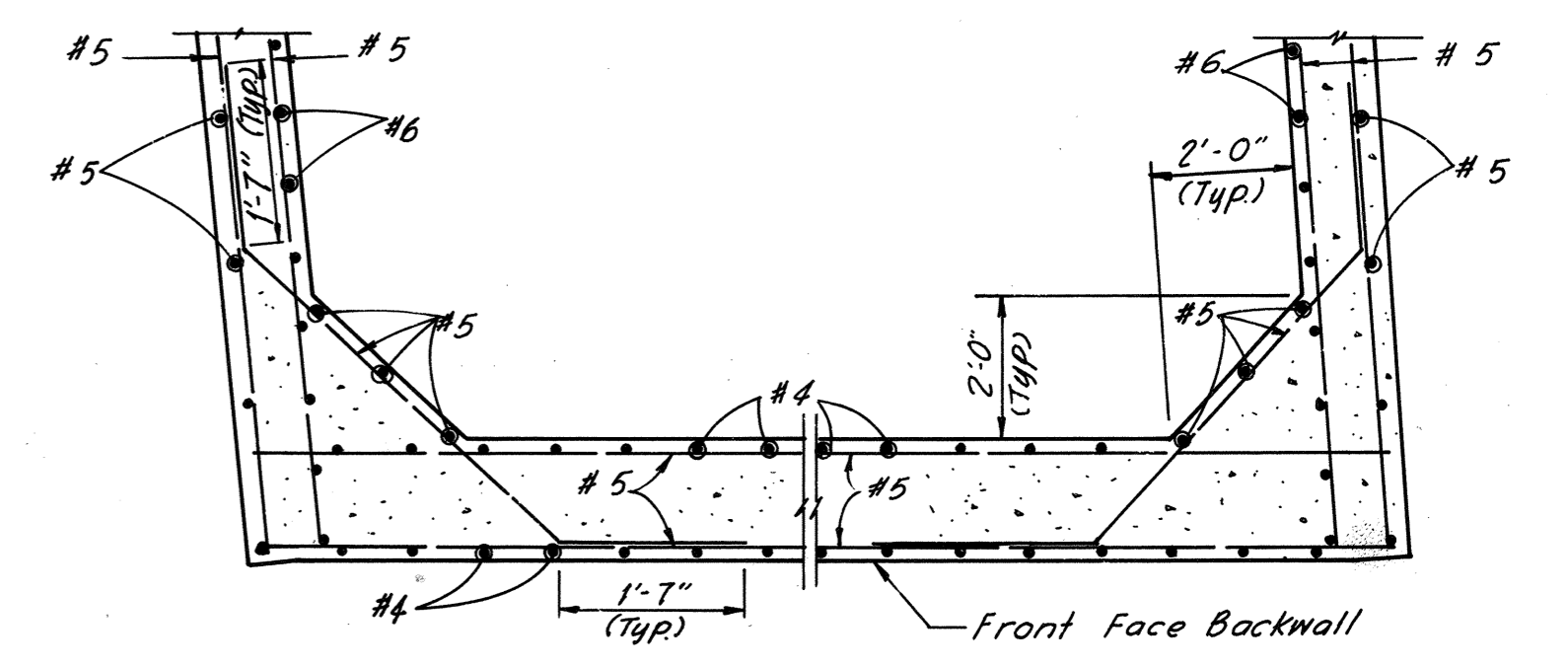
**NORTH WINGWALL EAST ABUTMENT**  
(South Wingwall East Abutment Similar)



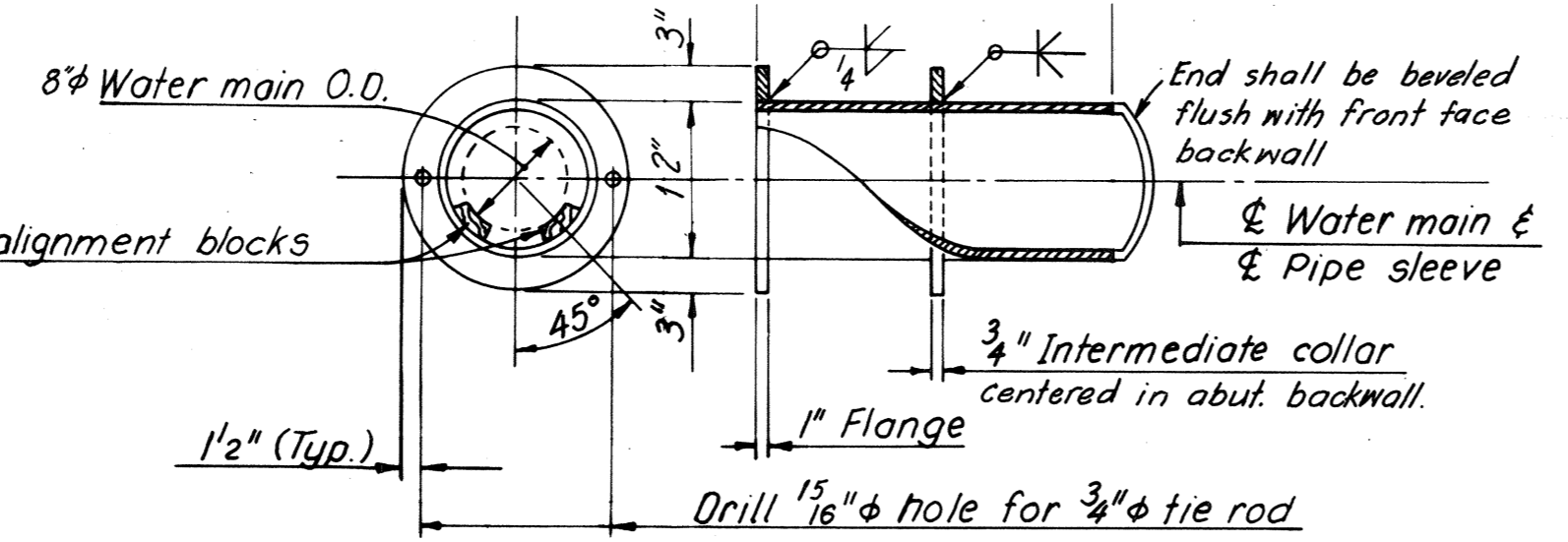
**NORTH WINGWALL WEST ABUTMENT**



**SOUTH WINGWALL WEST ABUTMENT**



**SECTION C-C SECTION F-F**  
Scale 3/8" = 1'-0"  
(Fillets in East Abutment Similar).



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

Notes:  
All piles shall be 10BP42.  
Allowable pile load: 45 tons per pile (10BP42).  
Batter pile 3" per foot where shown.  
For "Foundation Note", see Sheet 2.

Note: Steel pipe sleeve to be hot-dip galvanized after fabrication in accordance with ASTM A123-66.

Note:  
For location and additional pipe sleeve dimensions See Abutment Plan and Sheet S11.

BY	DATE				
MADE	S.S.W	12-8-67			
CHECKED	G.C.C.	2-12-68	As Built		
IN CHARGE	F.K.D.				
NO.	REVISION	BY	DATE		

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

**BRIDGE NO. 12**  
**DOUGLASDALE EAST ROAD OVER**  
**S-E&S ROADWAYS**  
**ABUTMENT DETAILS**

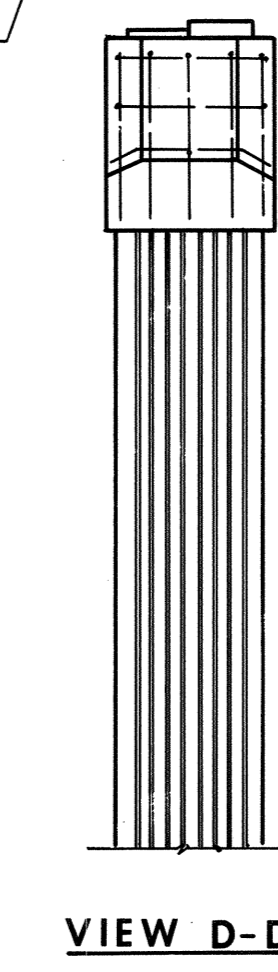
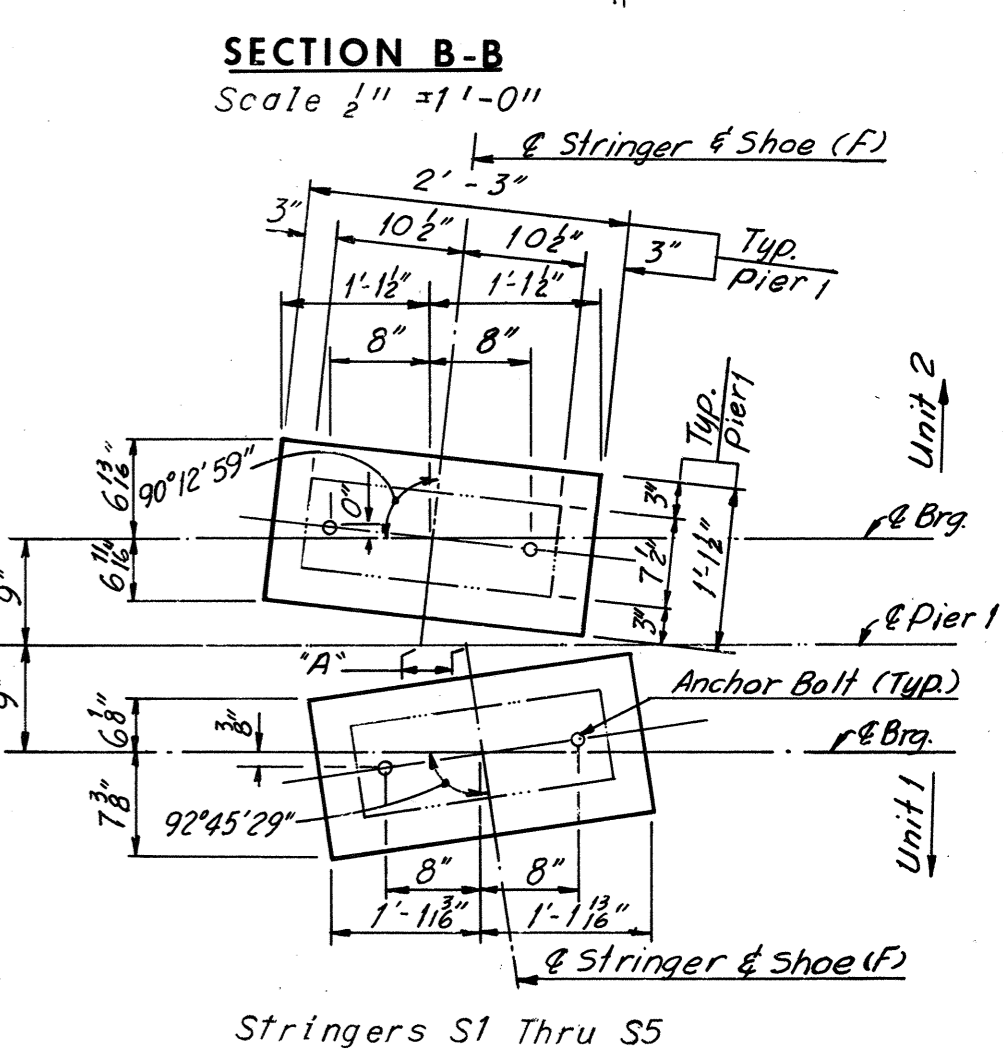
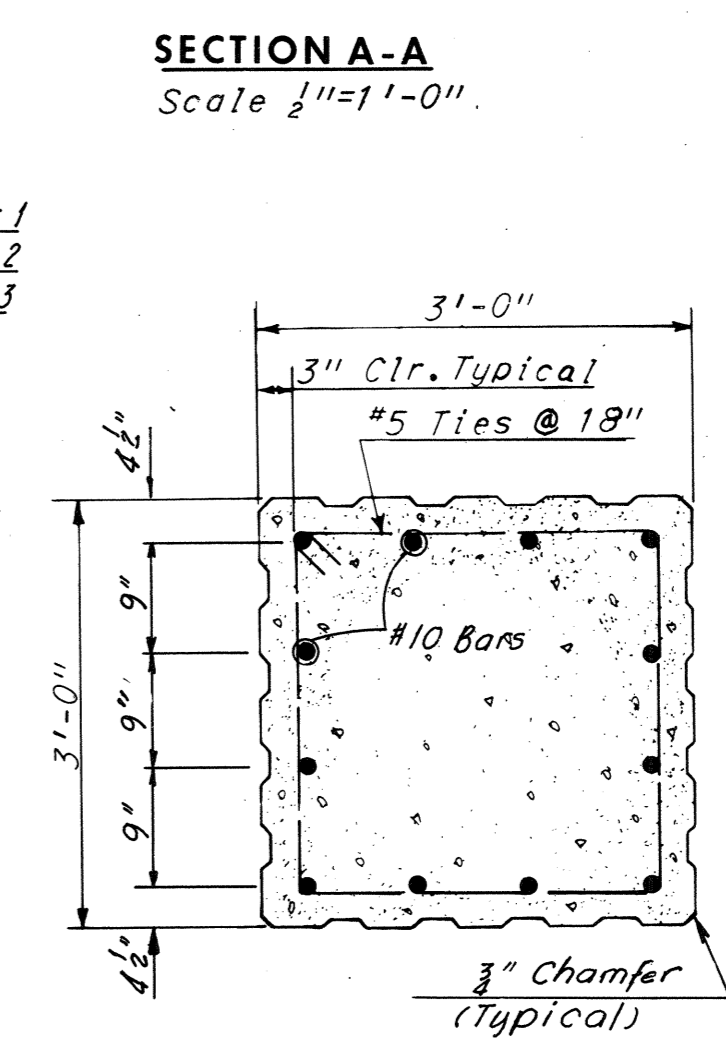
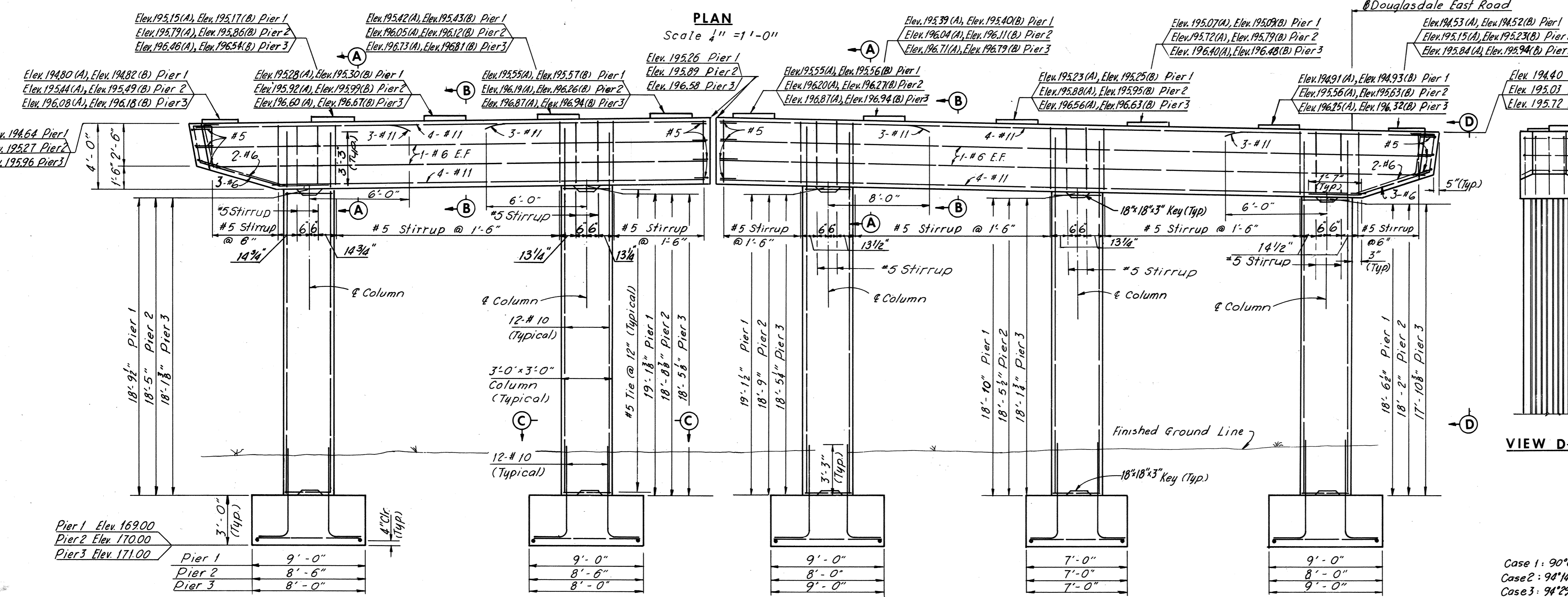
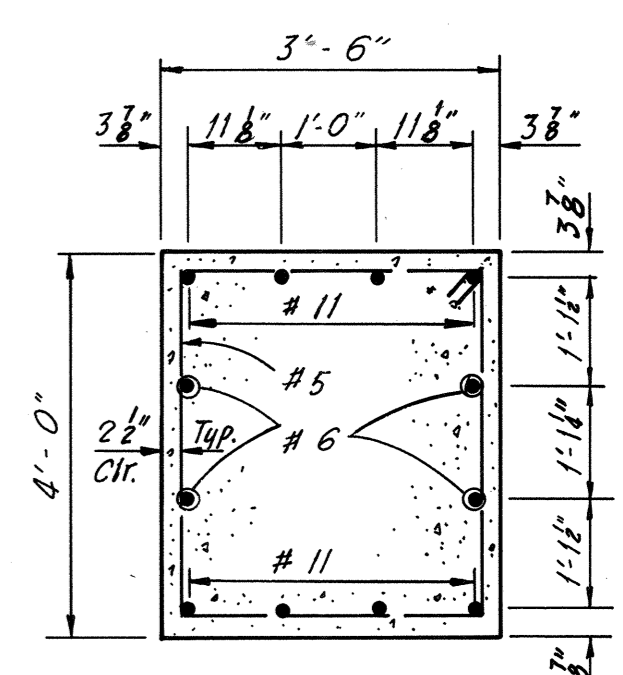
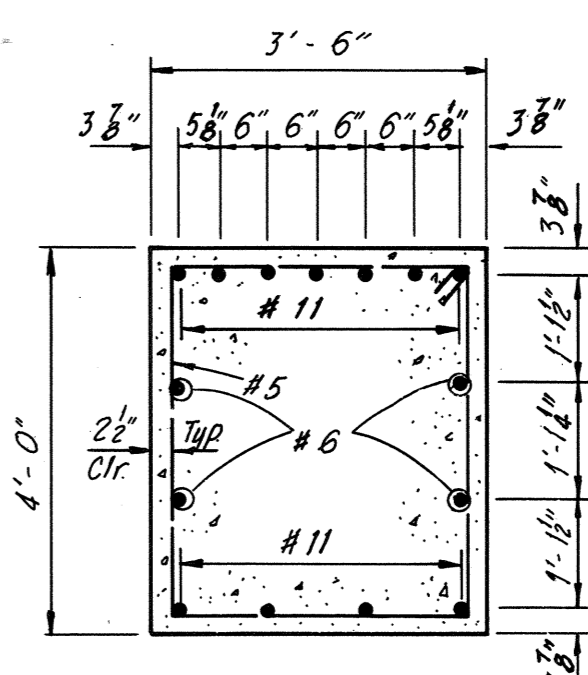
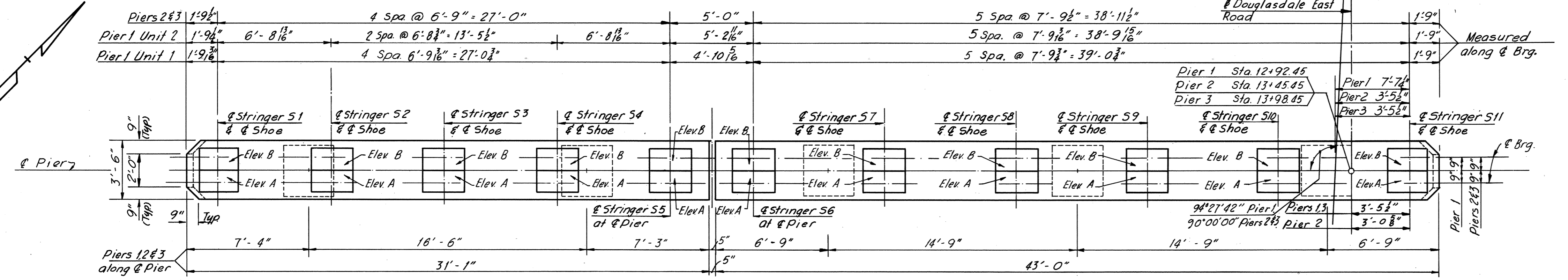
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SCALE: As noted  
CONTRACT NO.: 7  
SHEET NO. 4 OF 12

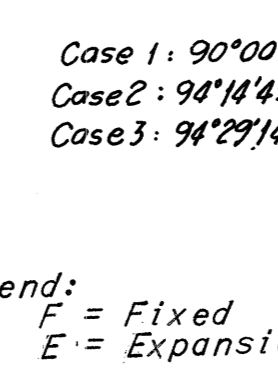
**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	88	

Note:  
Pads shown for Pier 3 only.  
For other pads see Anchor Bolt Setting Plan.



VIEW D-D



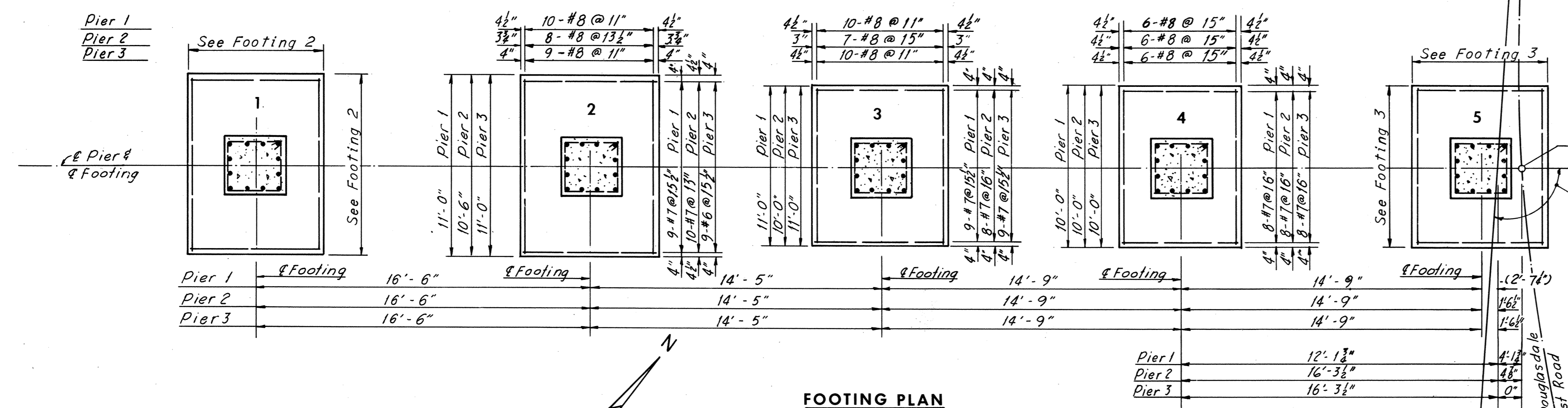
SECTION C-C

ANCHOR BOLT SETTING PLAN

Legend:  
F = Fixed  
E = Expansion

Note:  
Pier foundations are designed for an allowable bearing pressure of 5.0 tons per square foot at Piers 1 & 3.0 tons per square foot at Piers 2 and 3.  
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.

Note:  
For Standard Shoe Details see Sheet 51.  
For Framing Plan see Sheet 6.



Stringer	"A"
S1	0"
S2	3/4"
S3	1 1/2"
S4	1 1/2"
S5	1 3/8"
S6	- 2 1/8"
S7	- 2 1/2"
S8	- 1 1/8"
S9	- 1 1/8"
S10	- 2 1/8"
S11	0"

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

**BRIDGE NO. 12**  
**DOUGLASDALE EAST ROAD OVER**  
**S-E-S ROADWAYS**

**PIERS**

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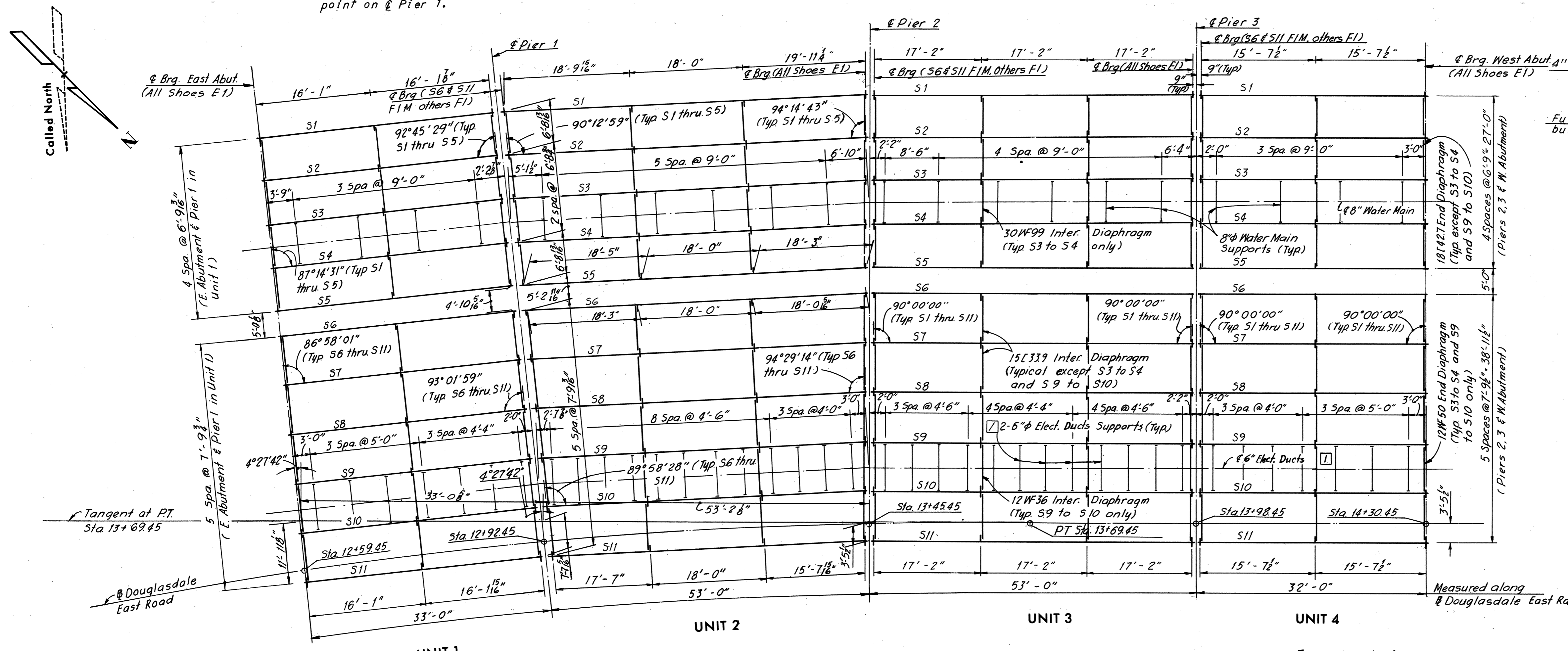
SCALE: *As noted*  
CONTRACT NO.: 7  
SHEET NO. 5 OF 12

MADE	BY	DATE	NO.	REVISION	BY	DATE
	S.S.W.	12-22-67	1	As Built	T.E.M.	9-75
CHECKED	G.C.C.	2-12-68				
IN CHARGE	F.K.D.					

**AS BUILT**

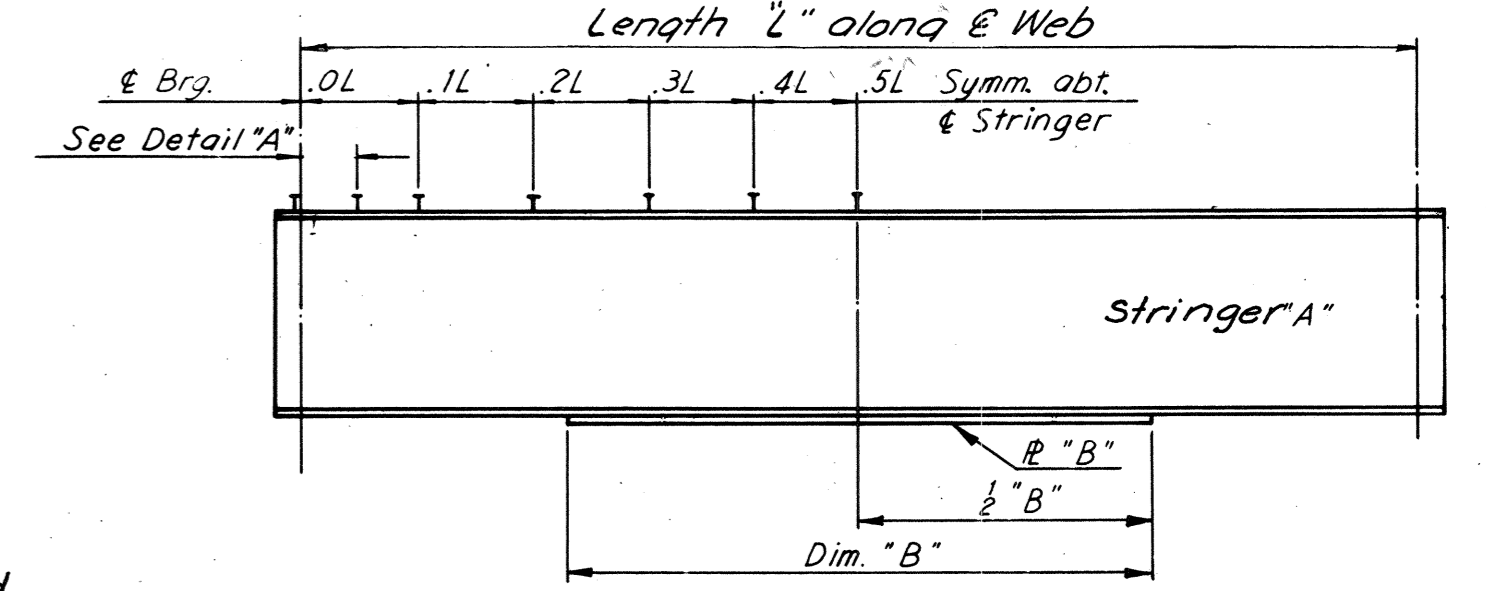
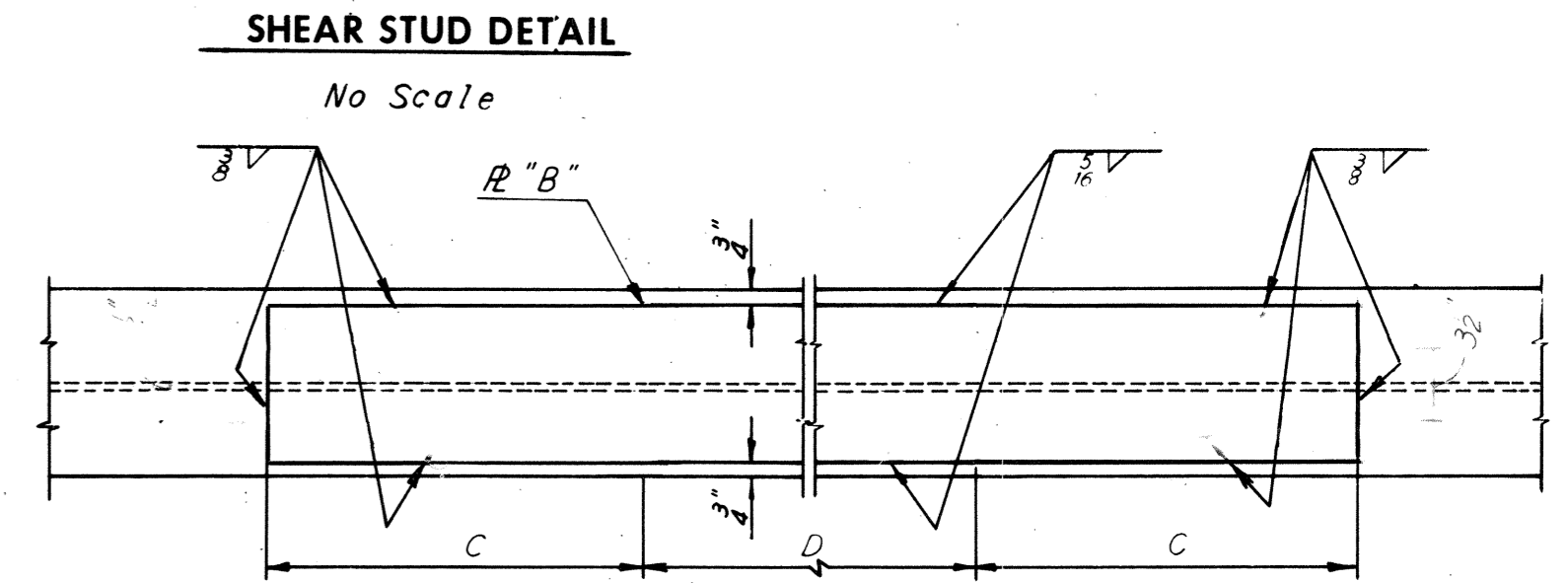
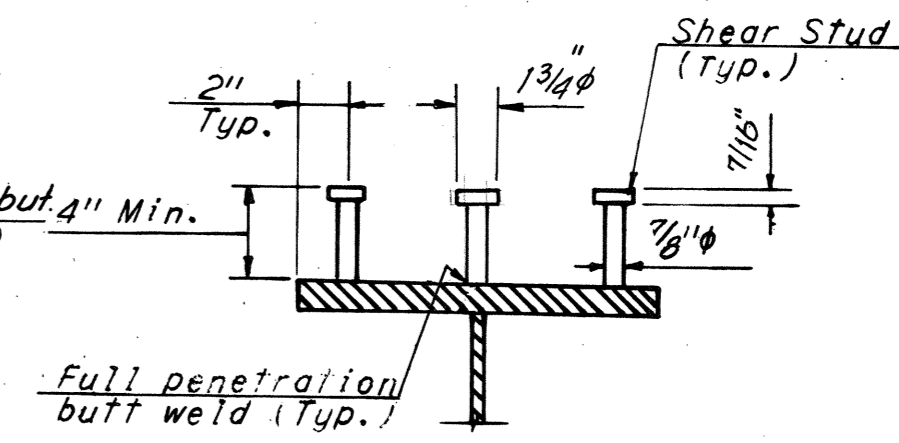
Note: Only @ stringers S1 and S11 meet at a common point on @ Pier 1.

Note: @ of all stringers meet at a common point on @ Pier 2.



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

SHOE SCHEDULE			
EXPANSION SHOES		FIXED SHOES	
TYPE	NO. REQD.	TYPE	NO. REQD.
E1	44	F1	36
		F1M	8



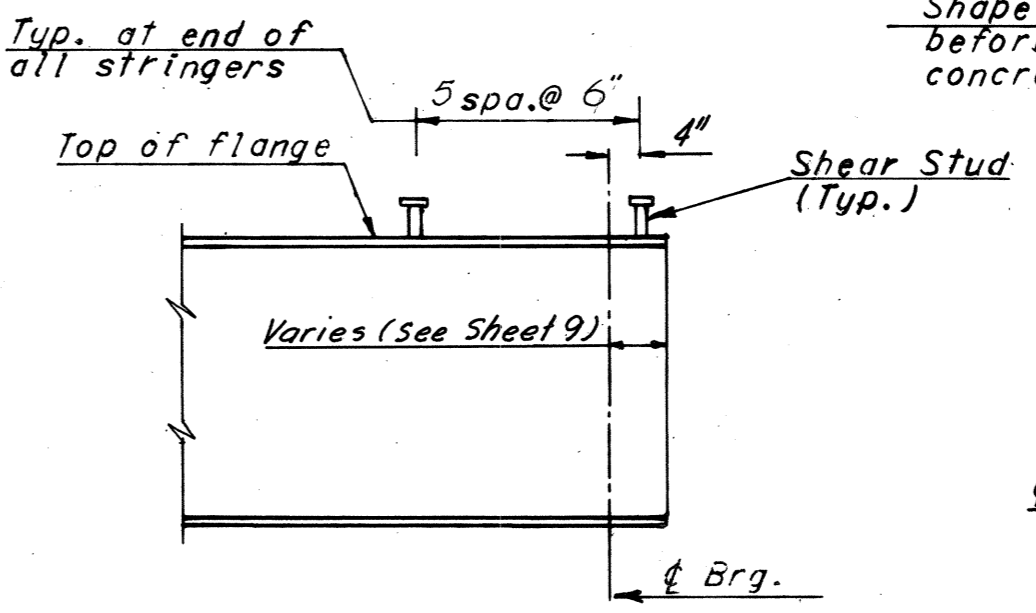
Note: For Structural Steel Quantities see Sheet 1.  
For Standard Shoe details see Sheet S1.  
For Framing details see Sheet 7.

\*Denotes spacing which begins at termination of 5 spaces @ 6".

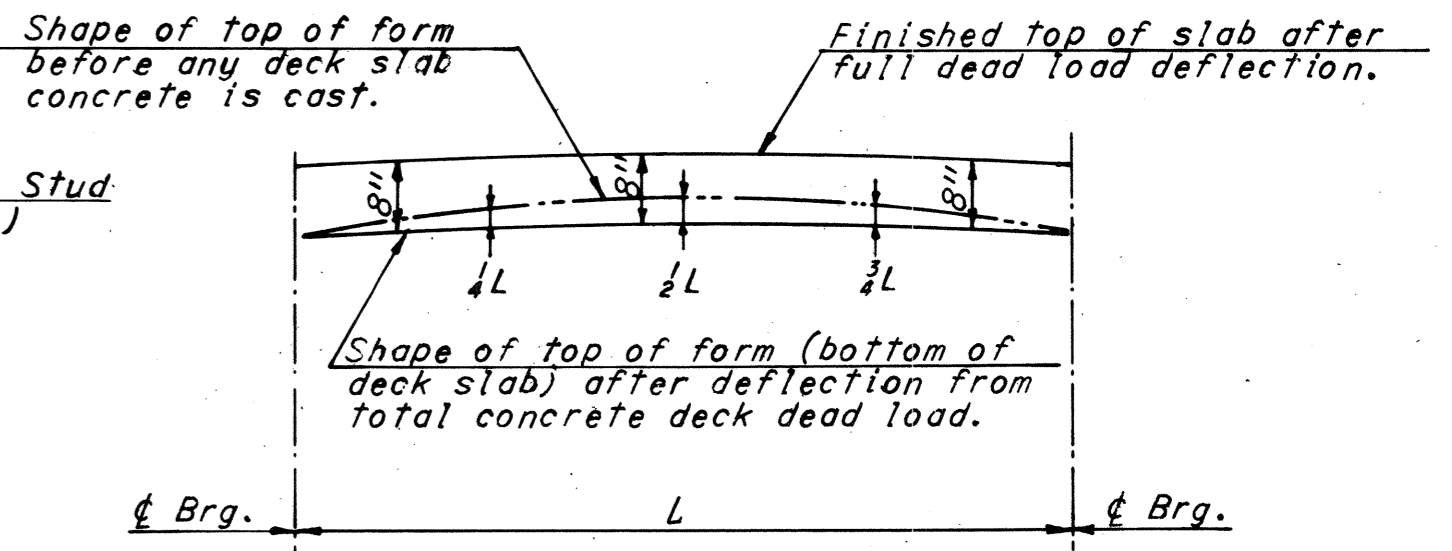
UNIT	STRINGER	LENGTH	STRINGER "A"	R "B"	DIM "B"	C	D	MAX. SHEAR STUD SPACING						
								0.0L-0.1L*	0.1L-0.2L	0.2L-0.3L	0.3L-0.4L	0.4L-0.5L		
								ft	ft	ft	ft	ft		
1	S1	32'-2 1/2"	36 #135					10 1/2"	11"	11'-1"	11'-2"	11'-2"		
	S2ThruS5	32'-2 1/2"	33 #118					8 1/2"	9"	10"	11'-1"	11'-4"		
	S6ThruS10	32'-2 1/2"	33 #118					8 1/2"	9"	10"	11'-1"	11'-4"		
	S11	32'-2 1/2"	36 #135					10 1/2"	11"	11'-1"	11'-2"	11'-2"		
	S1	56'-1'-9 3/8"	36 #135	10 1/2" x 8 1/2"	40'-0"	2'-0"	36'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
2	S2	56'-1'-2 3/8"	33 #118	10 1/2" x 8 1/2"	43'-0"	2'-0"	39'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S3	55'-1'-8 3/8"	33 #118	10 1/2" x 8 1/2"	43'-0"	2'-0"	39'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S4	55'-1'-2 3/8"	33 #118	10 1/2" x 8 1/2"	43'-0"	2'-0"	39'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S5	54'-1'-8 1/8"	33 #118	10 1/2" x 8 1/2"	41'-0"	2'-0"	37'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S6	54'-1'-3 3/8"	33 #118	10 1/2" x 8 1/2"	41'-0"	2'-0"	37'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S7	53'-1'-8 1/8"	33 #118	10 1/2" x 8 1/2"	41'-0"	2'-0"	37'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S8	53'-1'-0 3/8"	33 #118	10 1/2" x 8 1/2"	41'-0"	2'-0"	37'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S9	52'-1'-5 1/8"	33 #118	10 1/2" x 8 1/2"	41'-0"	2'-0"	37'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S10	51'-1'-10 1/8"	33 #118	10 1/2" x 8 1/2"	41'-0"	2'-0"	37'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S11	51'-1'-2 3/8"	36 #150					7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
3	S1 and S11	51'-6"	36 #150					7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
	S2ThruS10	51'-6"	33 #118	10 1/2" x 8 1/2"	39'-0"	2'-0"	35'-0"	7 1/2"	8 1/2"	10"	11'-0"	11'-4"		
4	S1 and S11	31'-3"	36 #135					10 1/2"	11"	11'-1"	11'-2"	11'-2"		
	S2ThruS10	31'-3"	33 #118					8 1/2"	9"	10"	11'-1"	11'-4"		

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.

UNIT	STRINGER	D.I. DEFLECTION			CAMBER SCHEDULE		
		4L	2L	1L	4L	2L	1L
1	S1	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S2S3S4	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S5	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S6	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S7S8S9S10	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
2	S1	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S2	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S3	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S4	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S5	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S6	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S7	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S8	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S9	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S10	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S11	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
3	S1	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S2S3S4	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S5	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S6	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S7S8S9S10	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
4	S1	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S2S3S4	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S5	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S6	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
	S7S8S9S10	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"



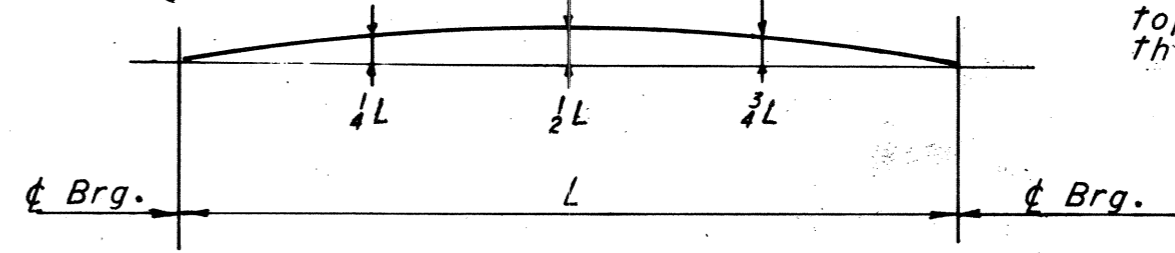
DETAIL A  
No Scale



DEAD LOAD DEFLECTION DIAGRAM  
No Scale

**SHEAR STUD NOTE**  
Stud rows shall be placed parallel to the main deck reinforcing. Shear stud spacing shown is maximum spacing.

**NOTE TO CONTRACTOR**  
Deflections given 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 by adjusting forms to vary the thickness of the concrete haunch between the bottom of the slab and the top of stringer, without altering the slab thickness.



CAMBER DIAGRAM  
No Scale

**NOTE TO FABRICATOR**

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.

**AS BUILT**

BY	DATE			
MADE	S.S.W.	1-4-68		
CHECKED	G.C.C.	2-12-68	5" x VEPKO Conduit changed to 6" x	L.B.P. 1-74
IN CHARGE	F.K.D.			

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

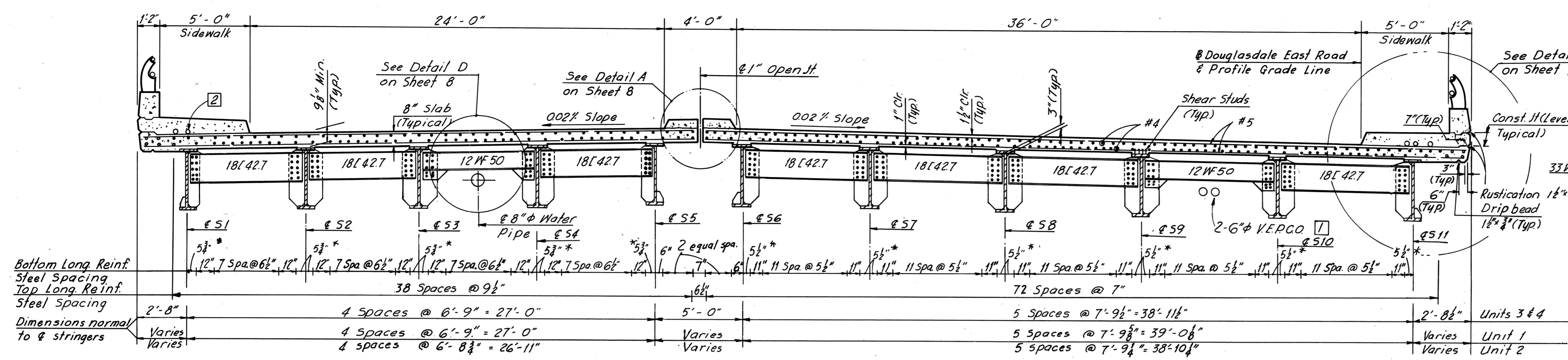
BRIDGE NO. 12  
DOUGLASDALE EAST ROAD OVER  
S-E-&-S ROADWAYS

**FRAMING PLAN**

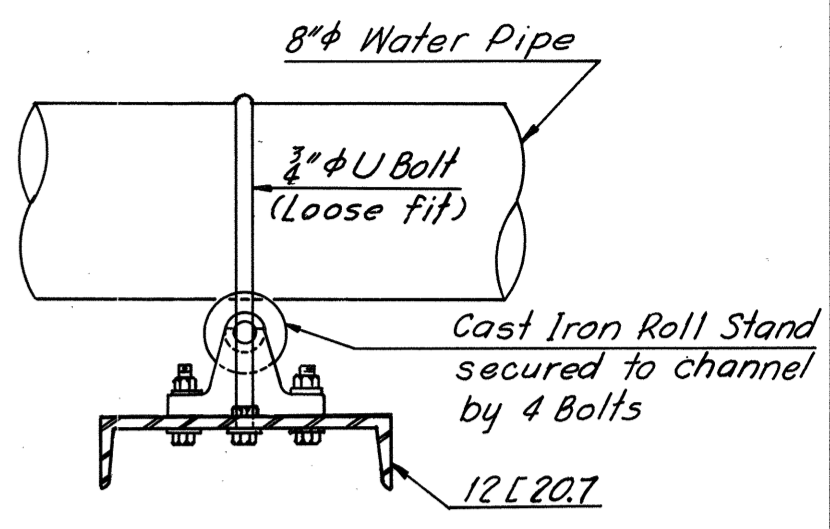
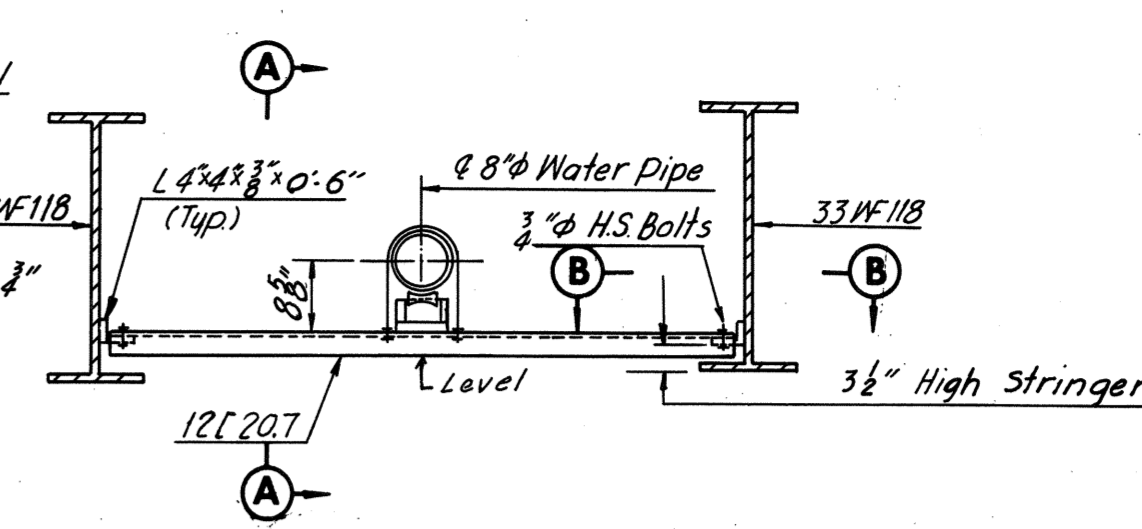
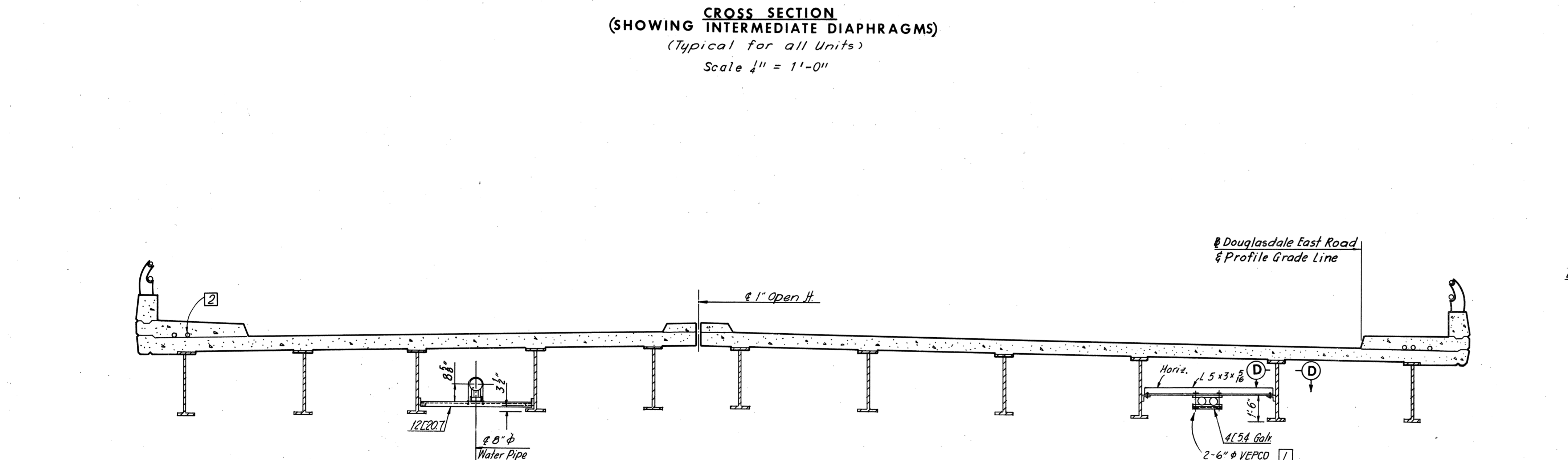
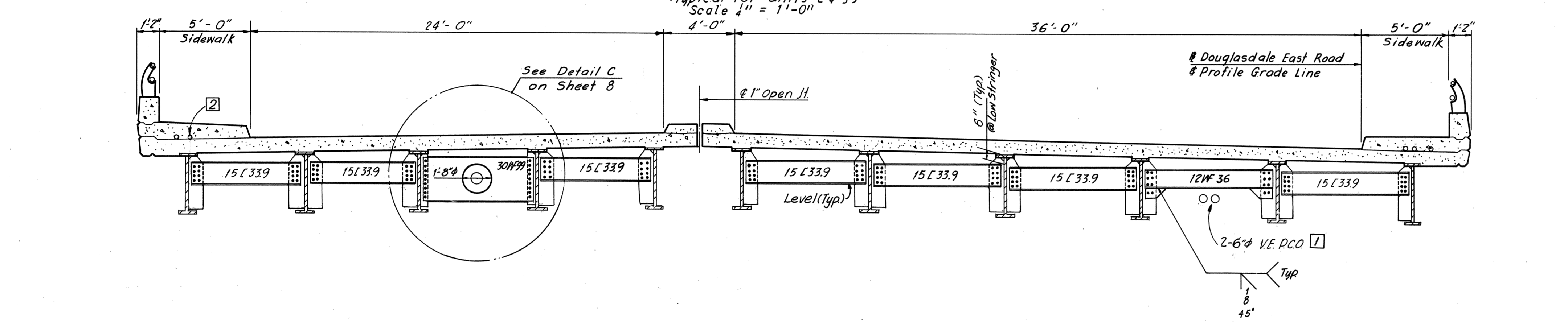
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SCALE: As noted  
CONTRACT NO.: 7  
SHEET NO. 6 OF 12

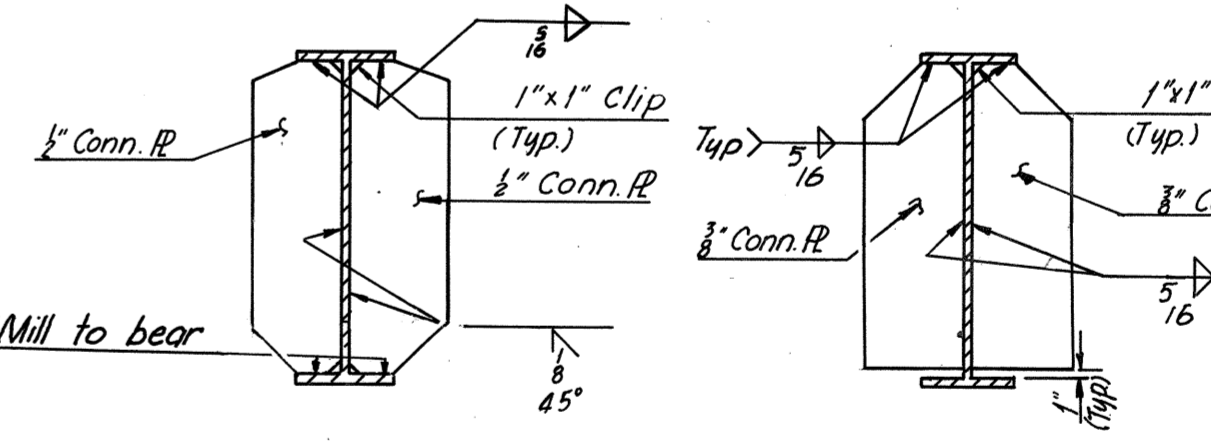
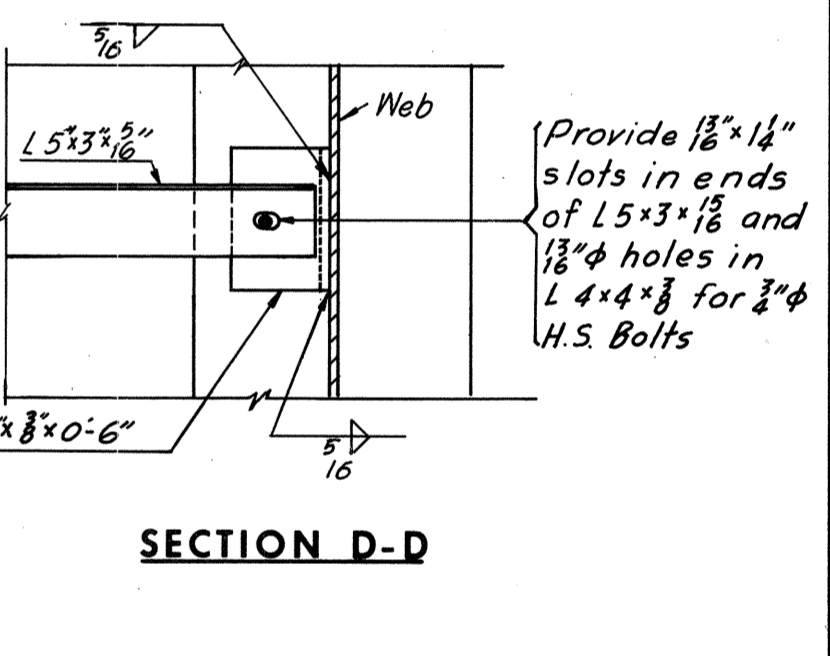
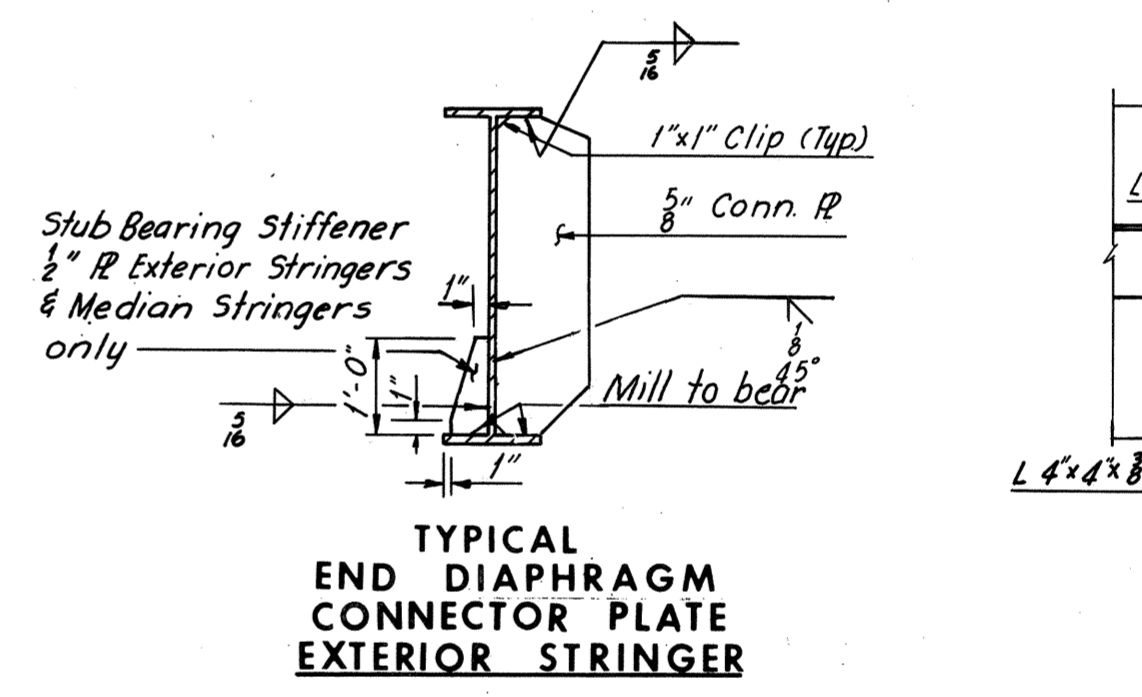
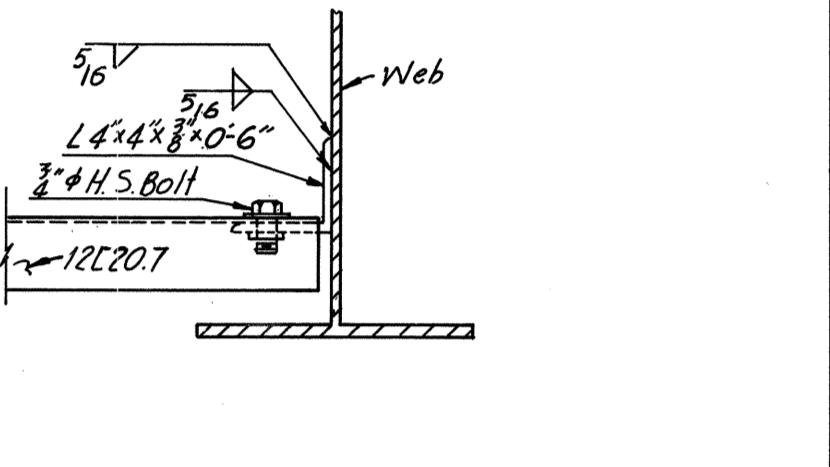
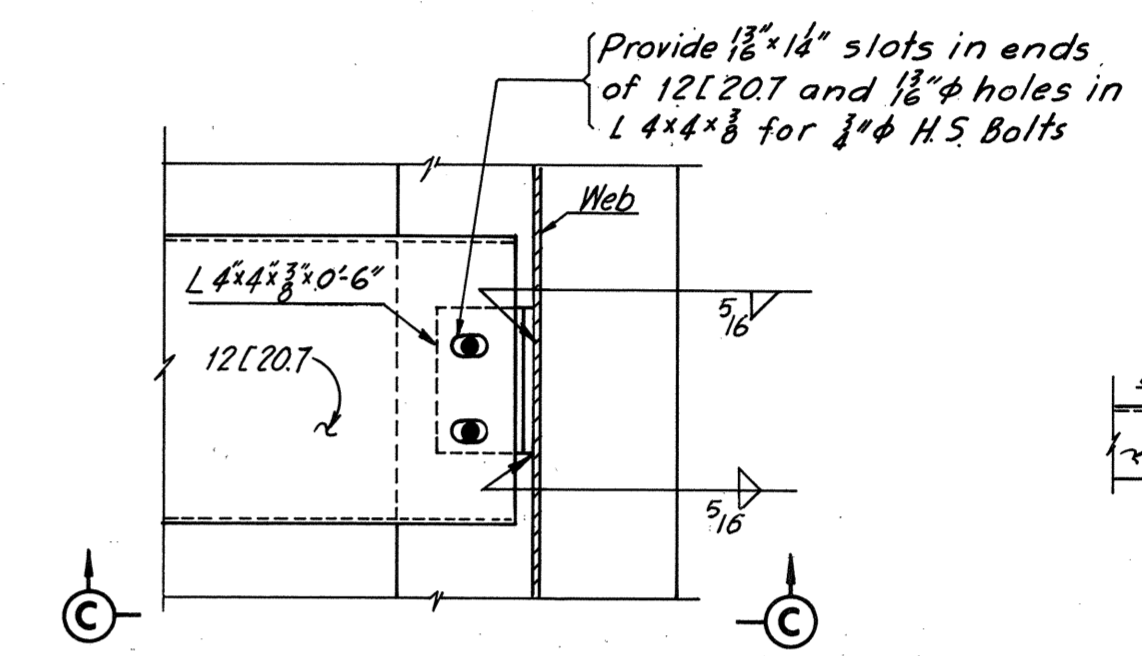
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	90	



\* - Dimensions shown is for Units 3 and 4. Adjust as required for Units 1 and 2.



Note: Provide 1/4" clear between 8" pipe and 3/4" U Bolt.



Notes:  
For Deck Plan see Sheet 8.  
For Framing Plan see Sheet 6.  
For details of sidewalk and median see Sheet 8.

MADE	CHECKED	IN CHARGE	BY	DATE	NO.	REVISION	BY	DATE	NO.	REVISION	BY	DATE
SSW	G.C.C.	F.K.D.	LBP	1-10-68	1	1'-3" Cond. added	LBP	1-74	2	Move 3" Cond. from N. Parapet to S. Parapet	TEM	1-74

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

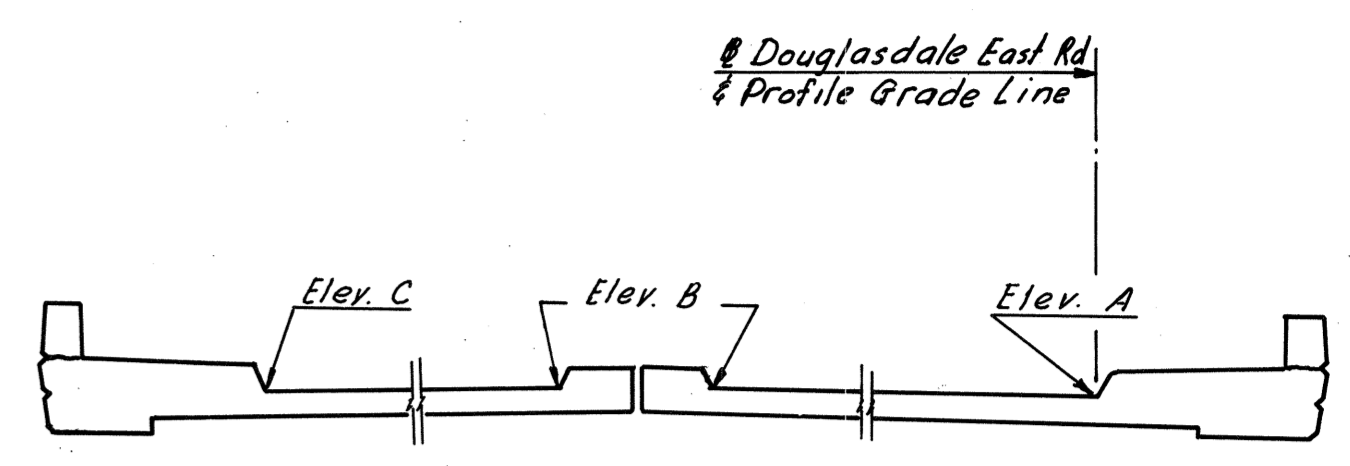
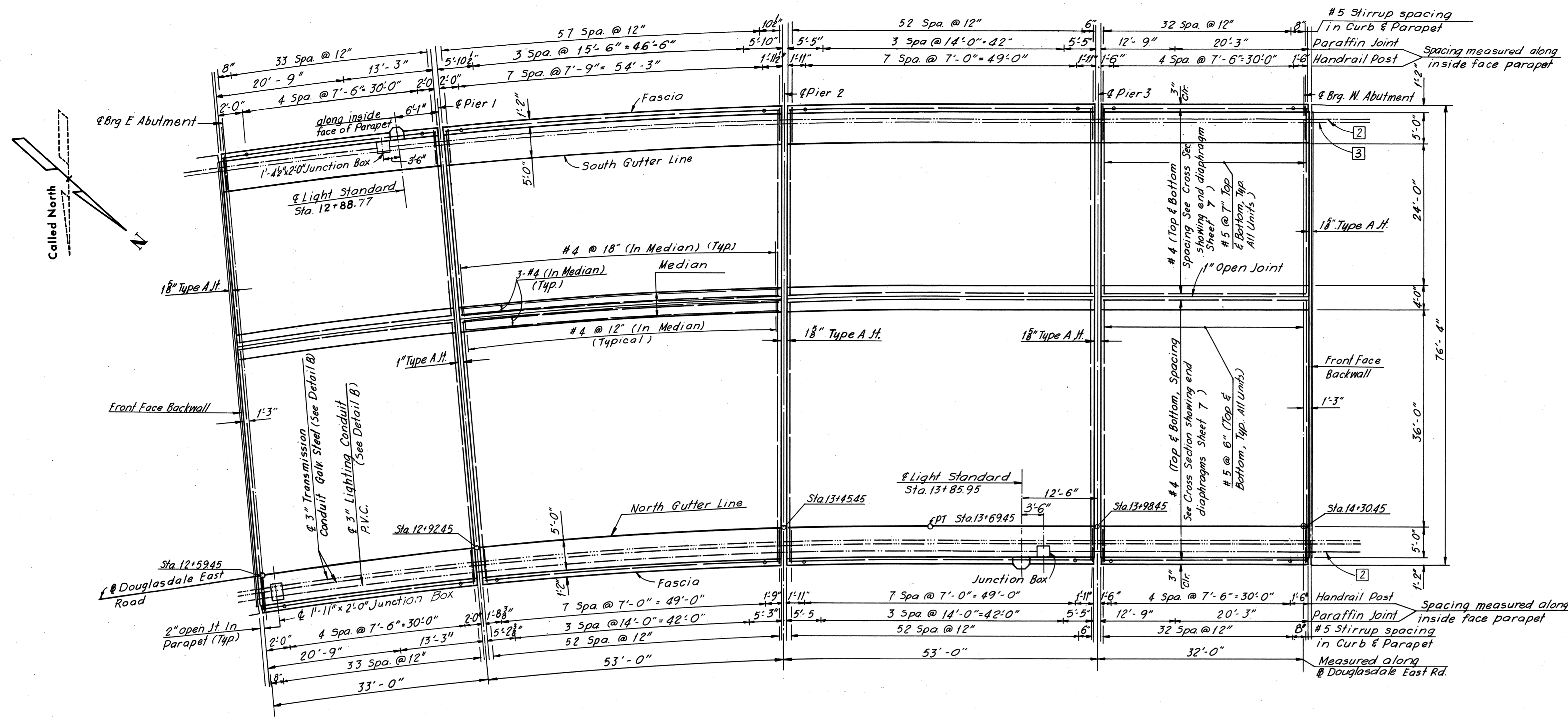
**BRIDGE NO. 12**  
**DOUGLASDALE EAST ROAD OVER**  
**S-E-E-S ROADWAYS**  
**FRAMING DETAILS**

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

SCALE: As noted  
 CONTRACT NO.: 7  
 SHEET NO. 7 OF 12

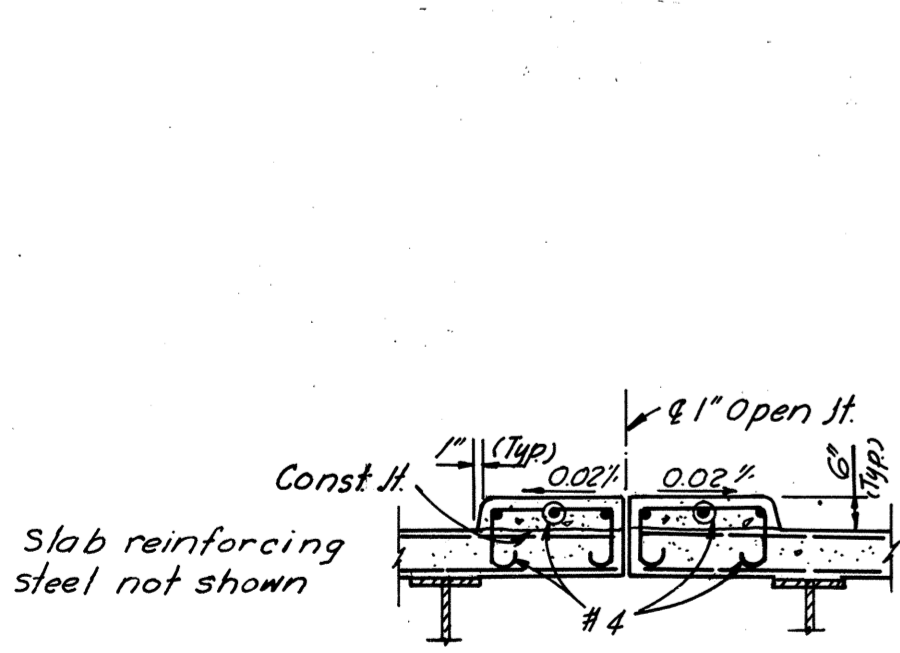
**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	91	

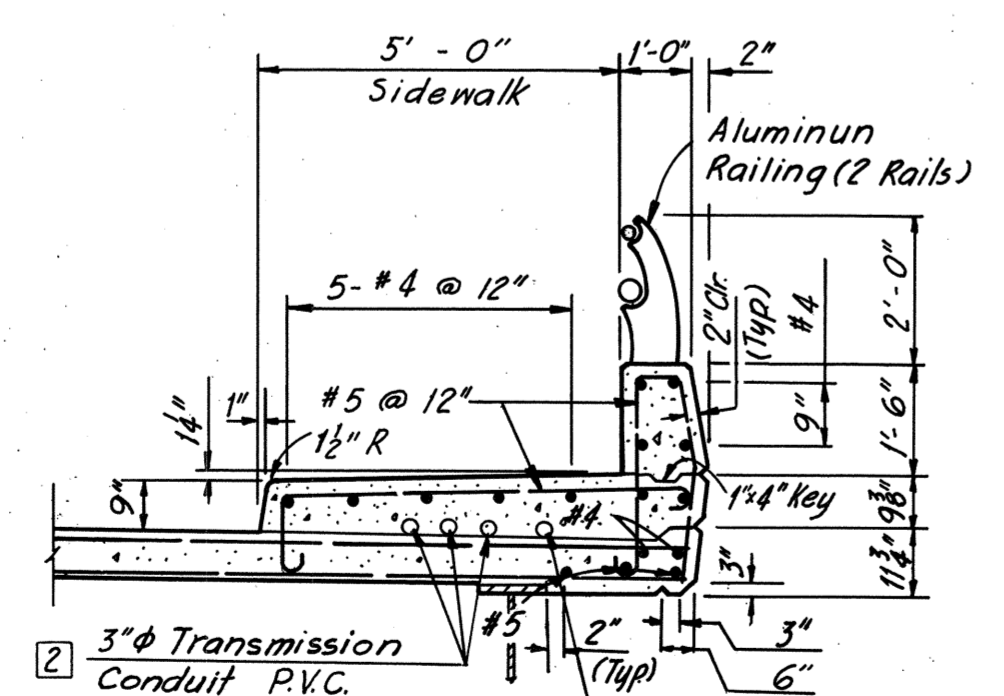


GUTTERLINE ELEVATIONS			
STATION	ELEV A	ELEV B	ELEV C
12+50.00	198.24	198.96	198.48
12+58.20	198.34	—	—
12+59.45	198.36	—	—
12+60.00	198.37	199.09	198.61
12+60.86	—	199.10	—
12+61.14	—	199.10	—
12+62.76	—	—	198.64
12+70.00	198.50	199.22	198.74
12+80.00	198.63	199.35	198.87
12+90.00	198.76	199.48	199.00
12+92.45	198.79	—	—
12+93.47	—	199.52	—
12+93.57	—	199.53	—
12+94.19	—	—	199.05
13+00.00	198.89	199.61	199.13
13+10.00	199.02	199.74	199.26
13+20.00	199.15	199.87	199.39
13+30.00	199.28	200.00	199.52
13+40.00	199.41	200.13	199.65
13+45.45	199.49	—	—
13+46.80	—	200.22	—
13+46.72	—	200.22	—
13+47.42	—	—	199.75
13+50.00	199.55	200.27	199.79
13+60.00	199.68	200.40	199.92
13+70.00	199.81	200.53	200.05
13+80.00	199.94	200.66	200.18
13+90.00	200.07	200.79	200.31
13+98.45	200.18	200.90	200.42
14+00.00	200.20	200.92	200.44
14+10.00	200.33	201.05	200.57
14+20.00	200.46	201.18	200.70
14+30.00	200.59	201.31	200.83
14+30.45	200.60	201.32	200.84
14+31.70	200.62	201.34	200.86
14+40.00	200.72	201.44	200.96

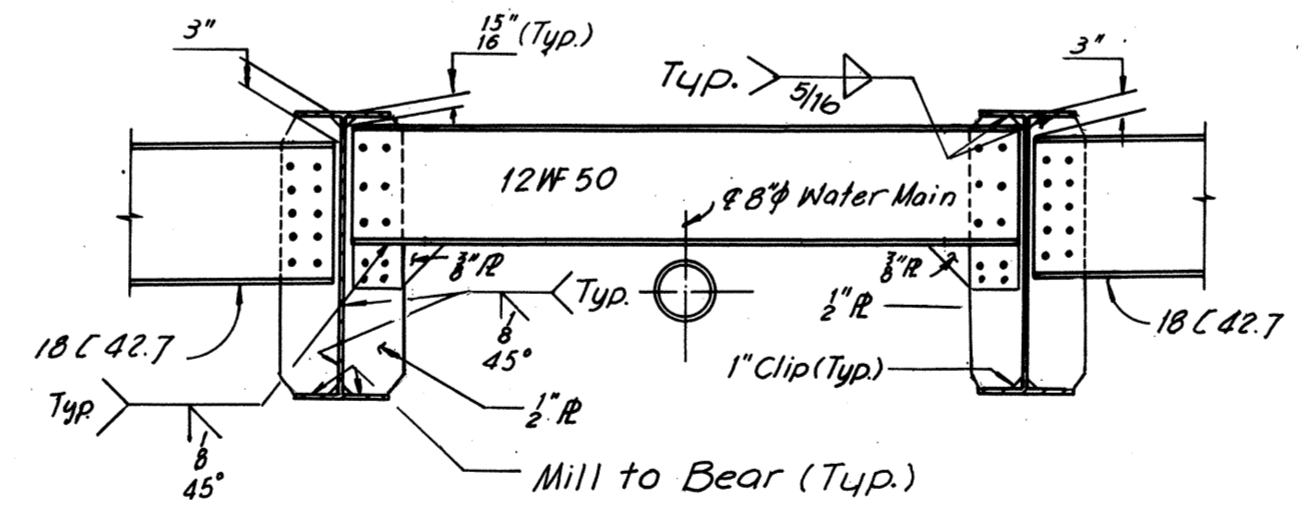
DECK PLAN  
Scale: 3/32" = 1'-0"



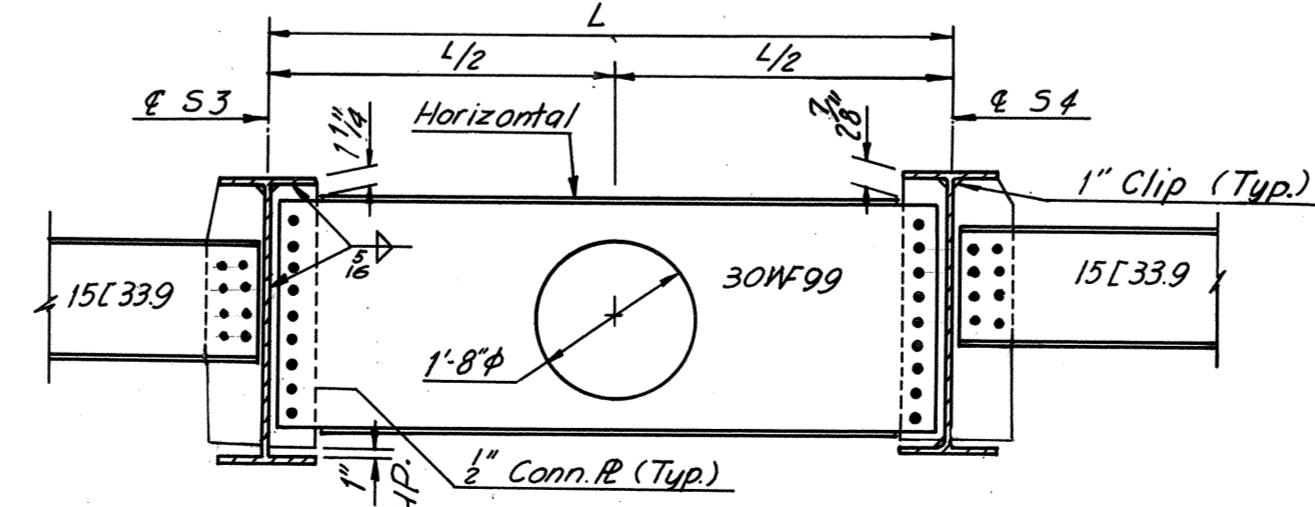
DETAIL A  
Scale: 3/8" = 1'-0"



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



END DIAPHRAGM AT UTILITY BAY  
DETAIL D



INTERMEDIATE DIAPHRAGM AT UTILITY BAY  
DETAIL C  
No Scale

3 Junction Boxes  
each:  
2'-0" x 1'-4 1/2"  
2'-0" x 1'-1 1/2"  
2'-0" x 1'-11"

Note:  
For Superstructure concrete quantities see Sheet 1.  
For Framing Plan see Sheet 6.  
For Framing details see Sheet 7.  
For Joint details see Sheet 9.  
For Standard Lighting details see Sheet 54.  
For Standard handrail (2 rails) details see Sheet 53.

BY	DATE	3	As Built	TEM	9-75
MADE	S.S.W. 11-8-68	2	Move 3" Cond. from 11 to 5, Parapet	TEM	1-74
CHECKED	G.C.C. 2-10-68	1	2 3/4" Cond. extended & 1-3" Cond. added	L.B.P.	1-74
IN CHARGE	F.K.D.	1	General Revisions	S.S.W.	5-14-68
NO.	REVISION	BY	DATE		

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

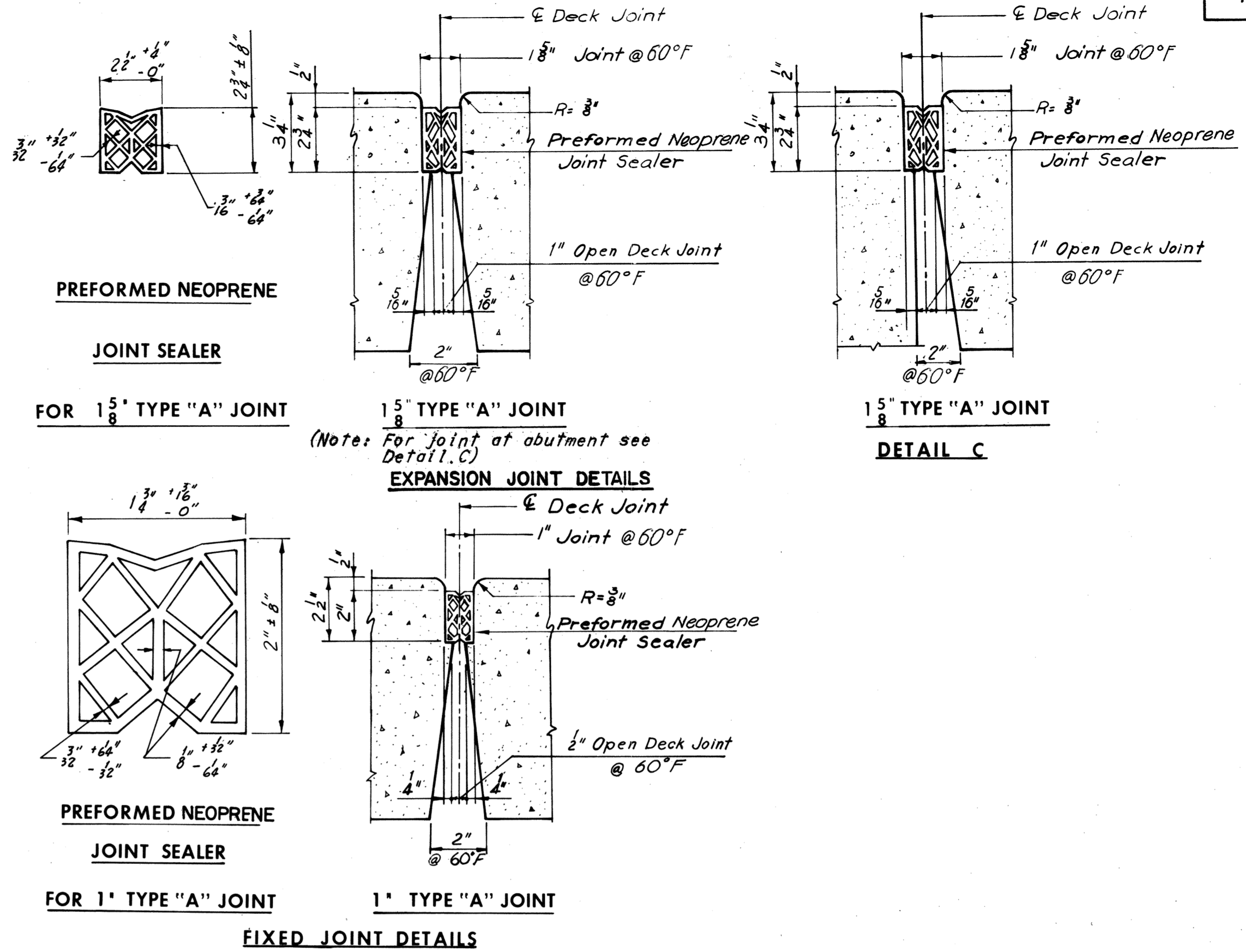
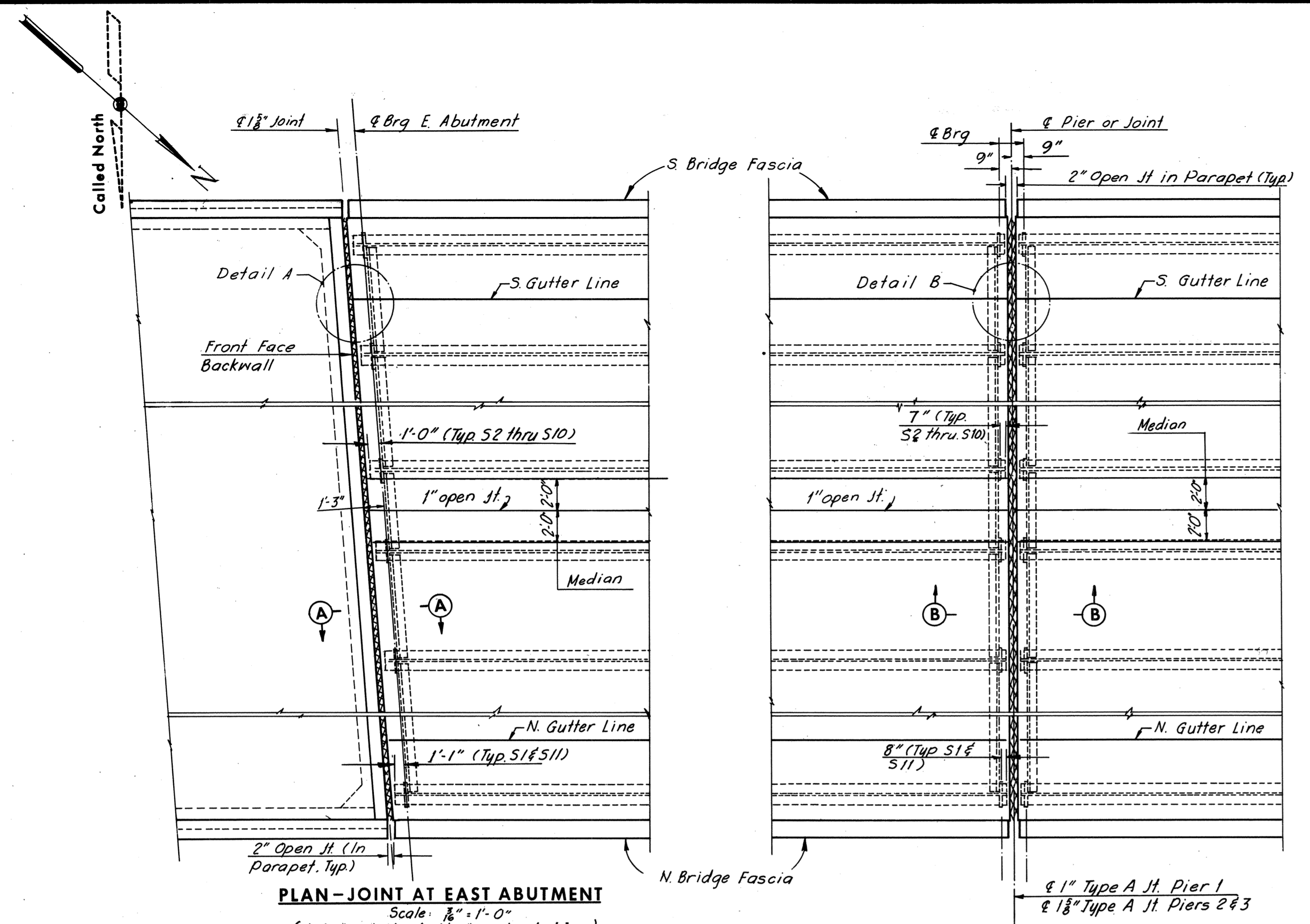
BRIDGE NO. 12  
 DOUGLASDALE EAST ROAD OVER  
 S-E-S ROADWAYS  
 DECK PLAN

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

SCALE: As noted  
 CONTRACT NO. 7  
 SHEET NO. 8 OF 12

**AS BUILT**

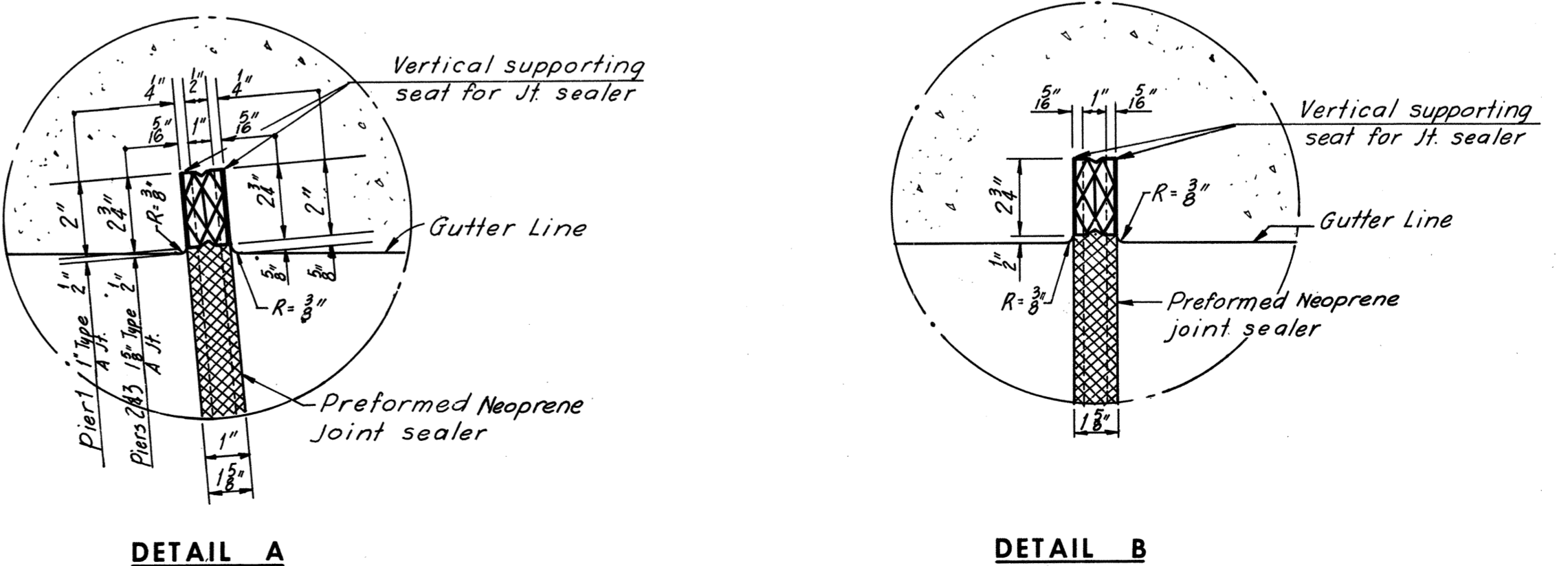
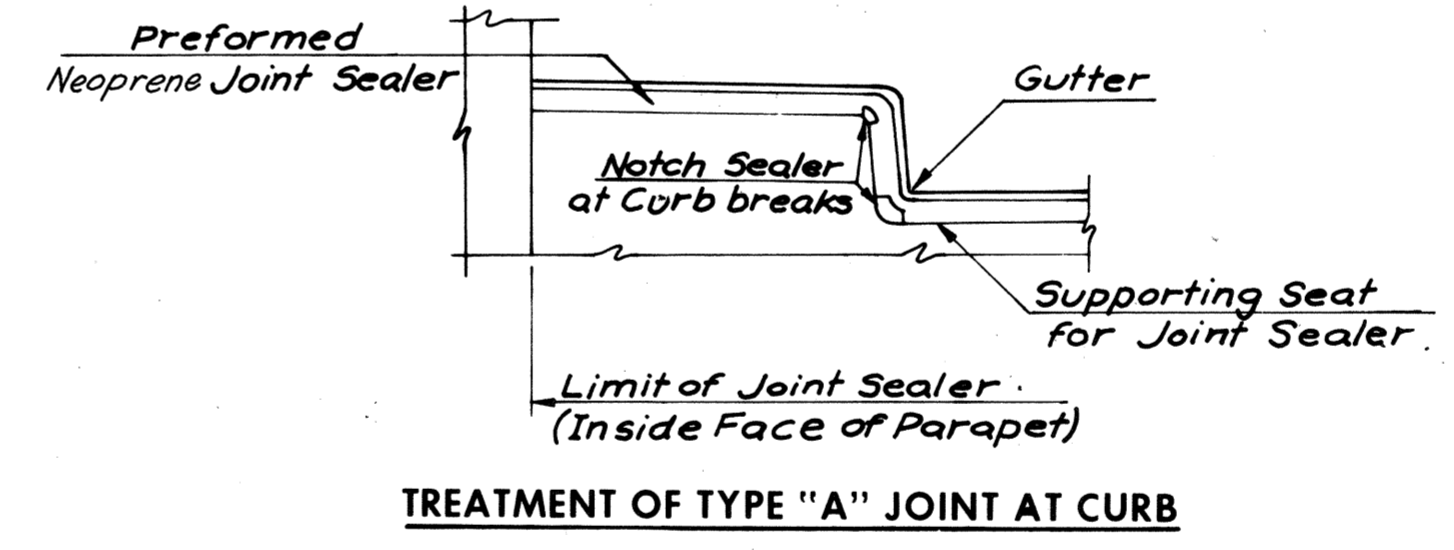
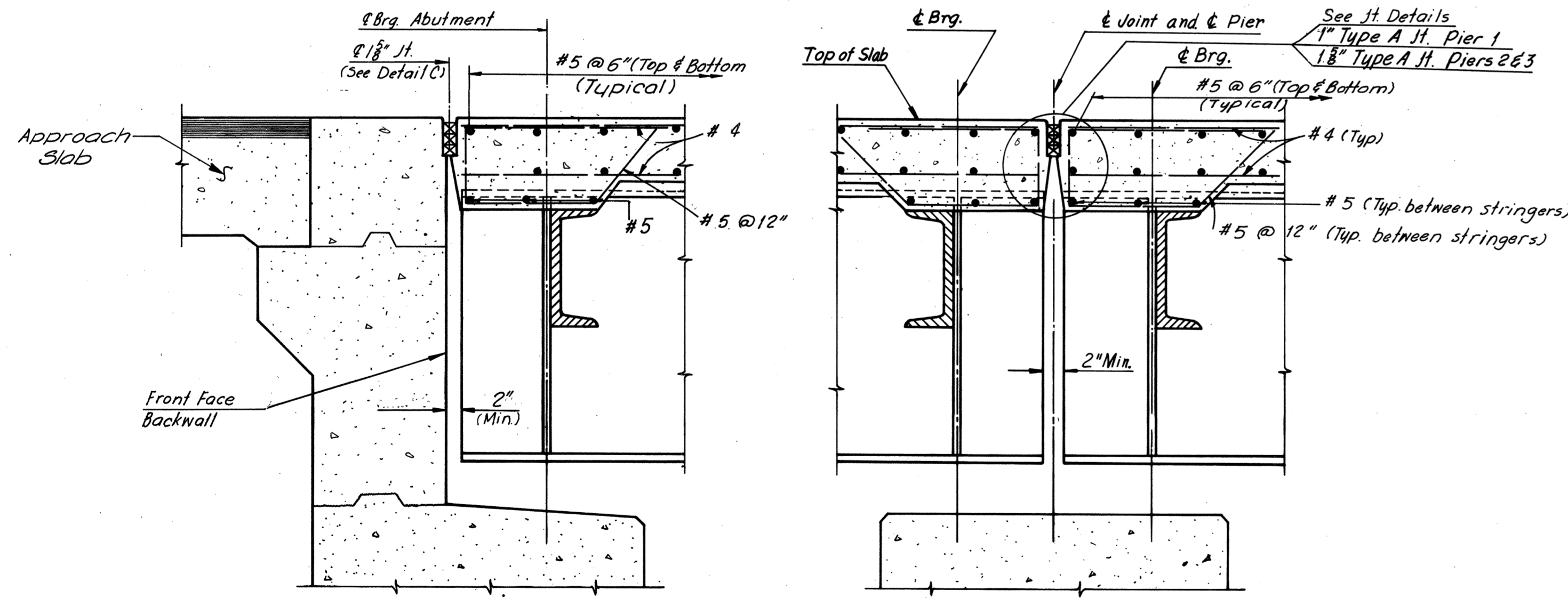
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	92	



Note: All horizontal joint dimensions shown above are normal to  $\epsilon$  joint.

Note: Plan details of joint at Pier 1 and West Abutment are similar to those shown. Bearing stiffeners shall be placed as required.

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 at the time of construction.



Note: End of Stringers and connection plates shall be plumb under full dead load.

BY	DATE				
MADE	S.S.W.	11-6-68			
CHECKED	G.C.C.	2-14-68	As Built		
IN CHARGE	F.K.D.				

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

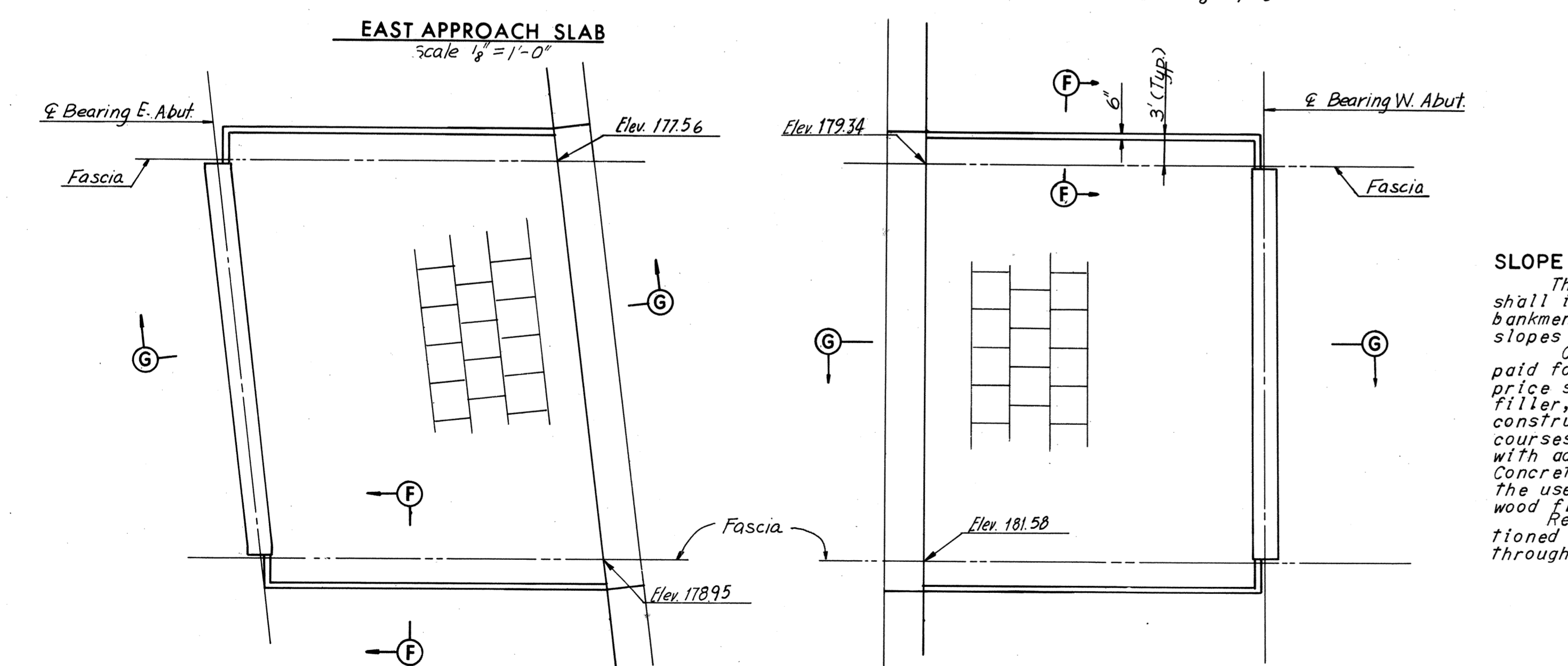
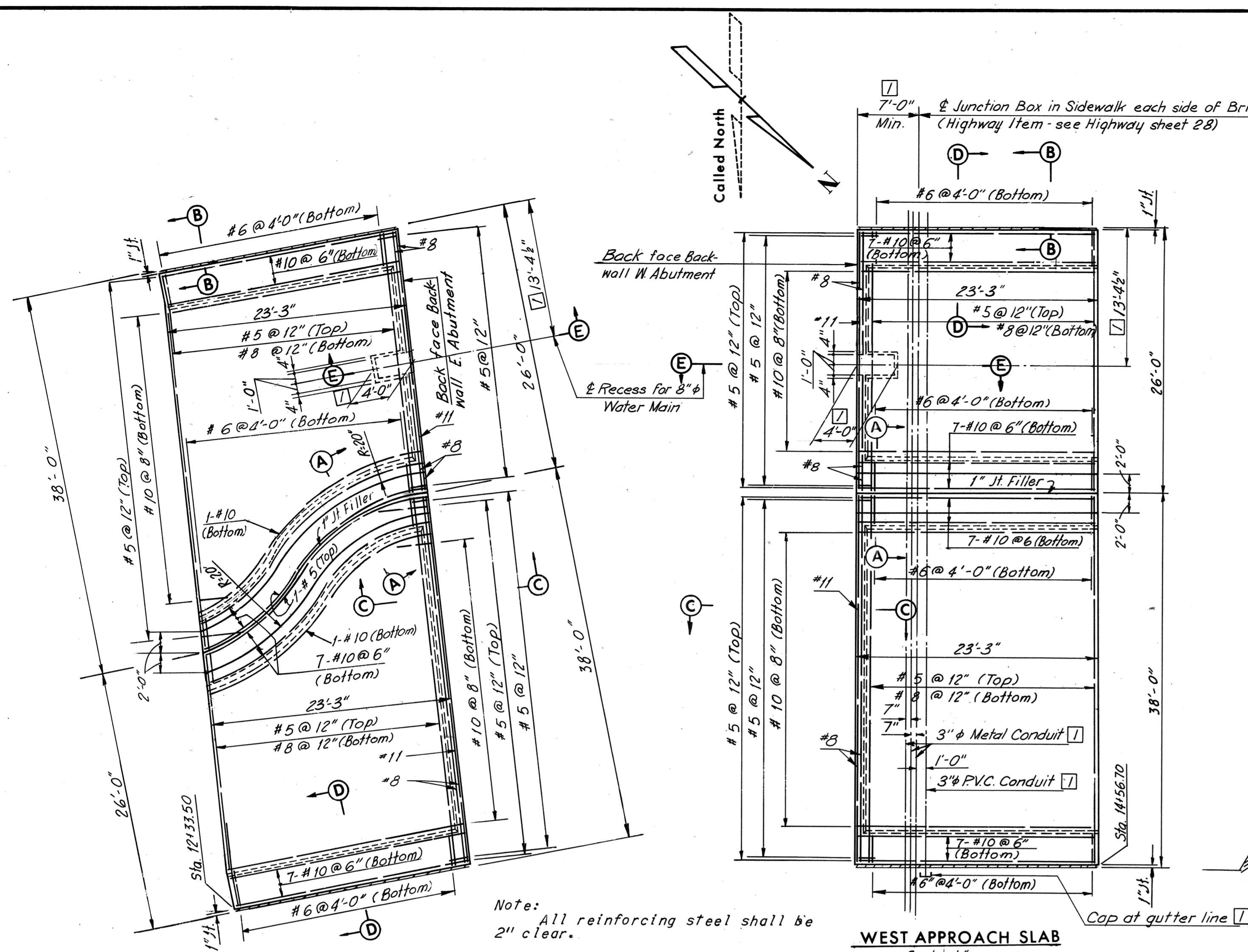
BRIDGE NO. 12  
 DOUGLASDALE EAST ROAD OVER  
 S-E&-S ROADWAYS  
 JOINT DETAILS

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

SCALE: No Scale unless noted  
 CONTRACT NO: 7  
 SHEET NO. 9 OF 12

**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	93	



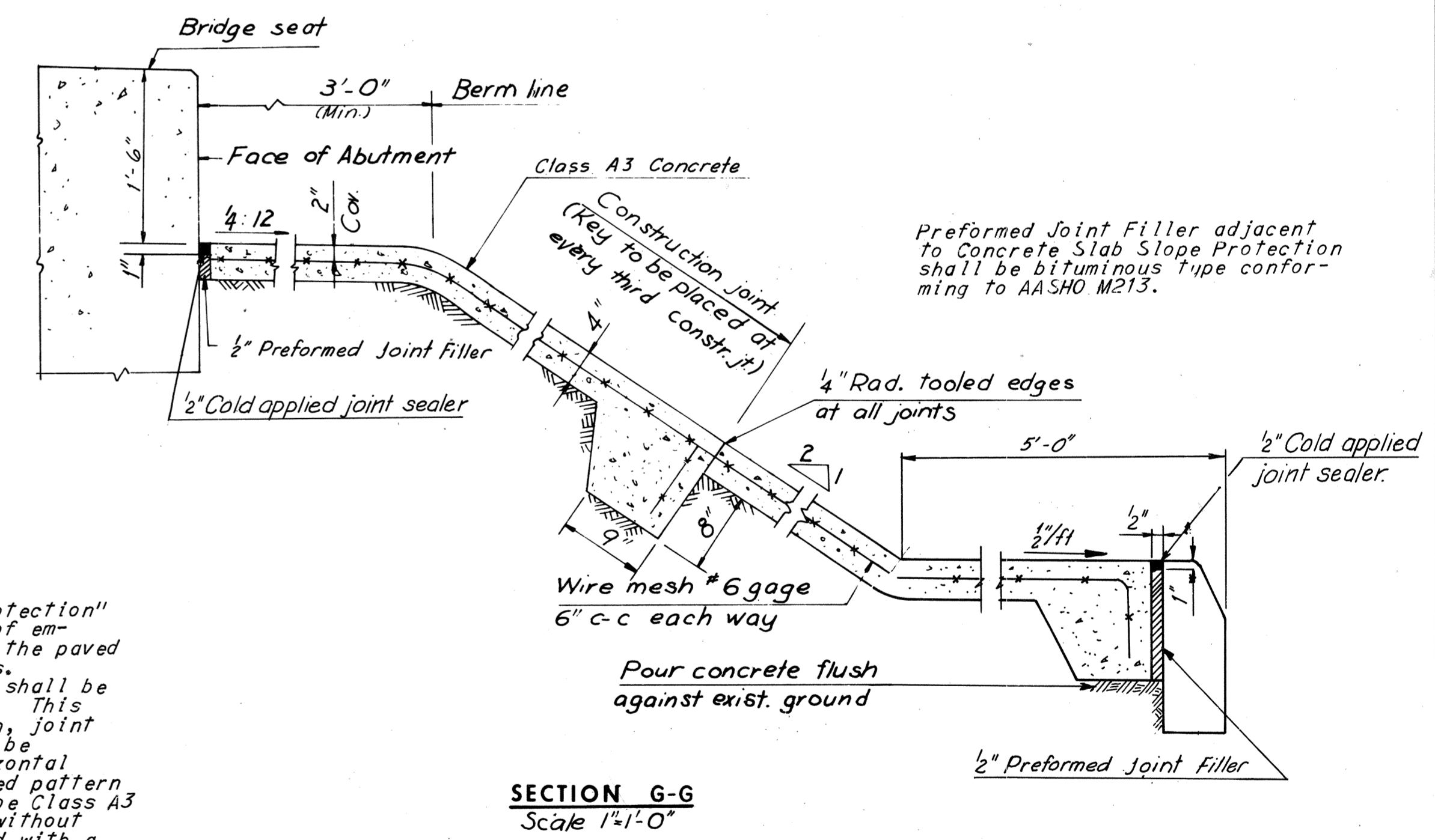
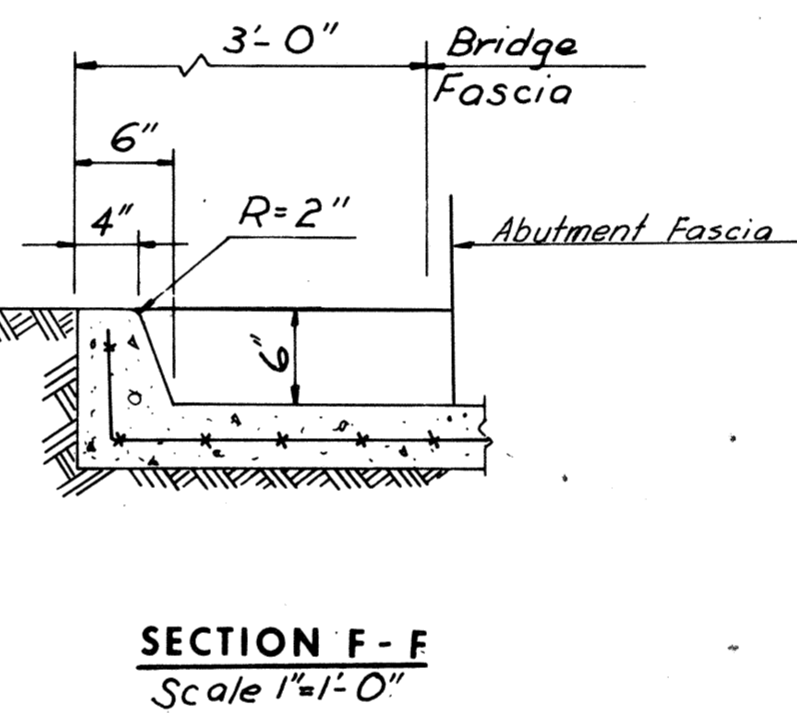
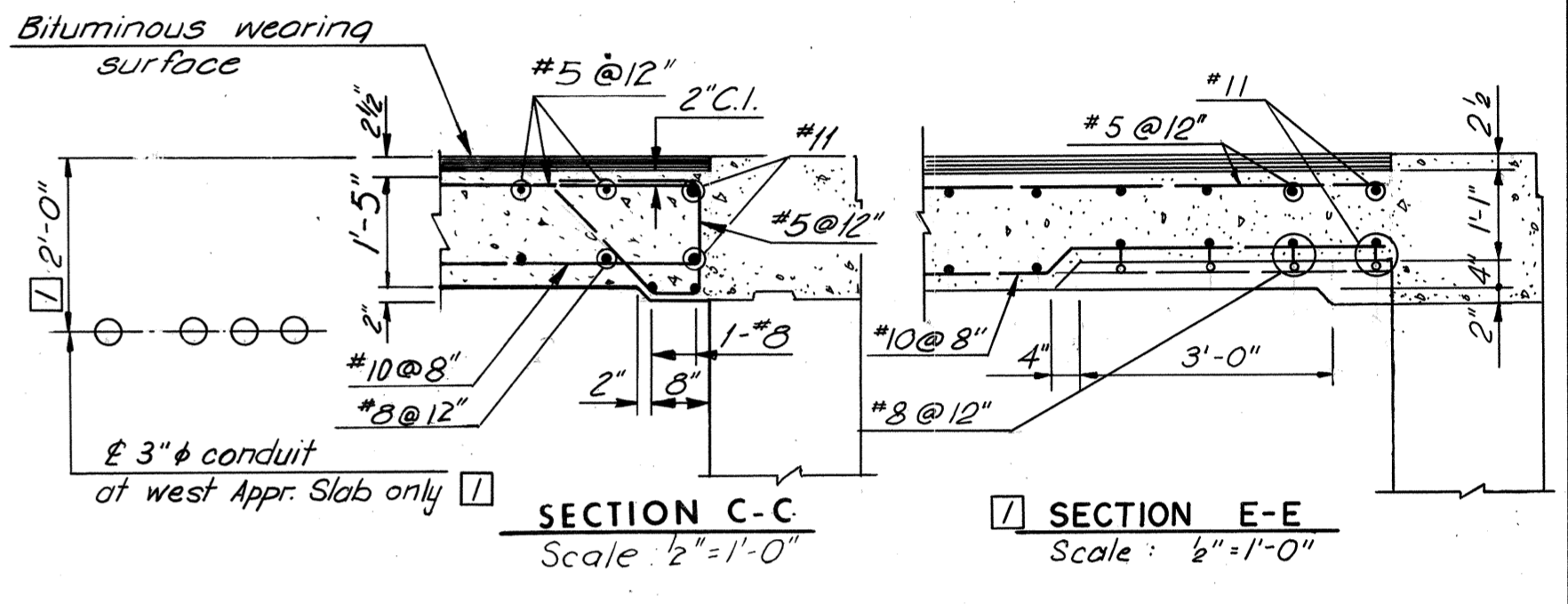
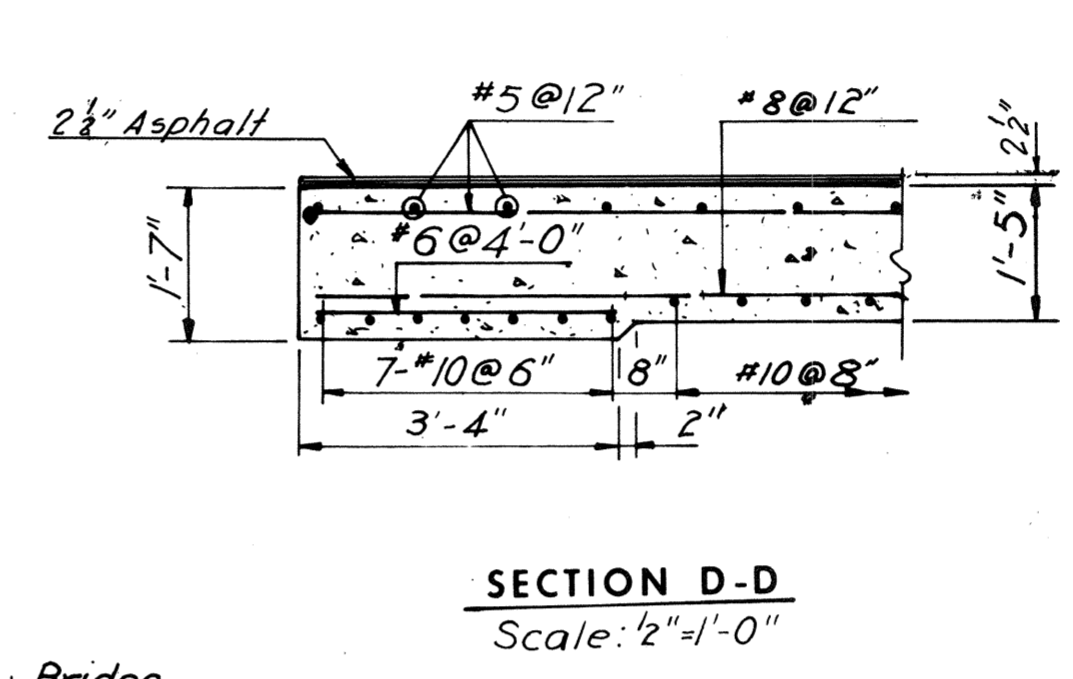
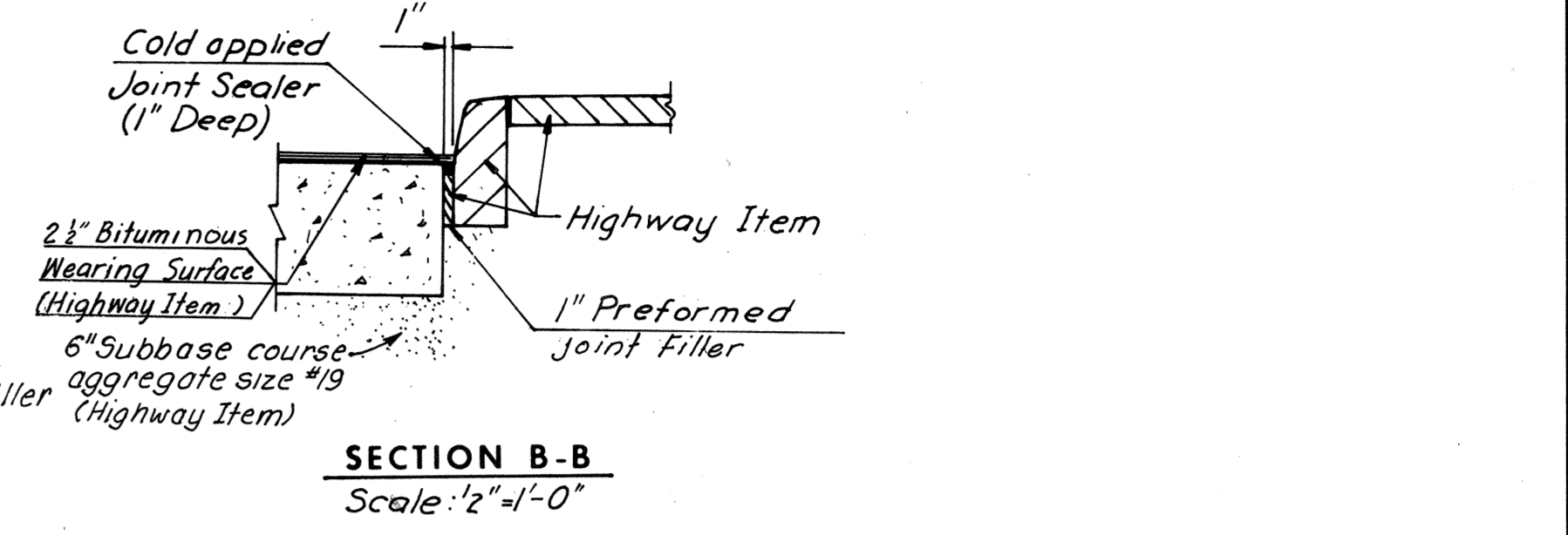
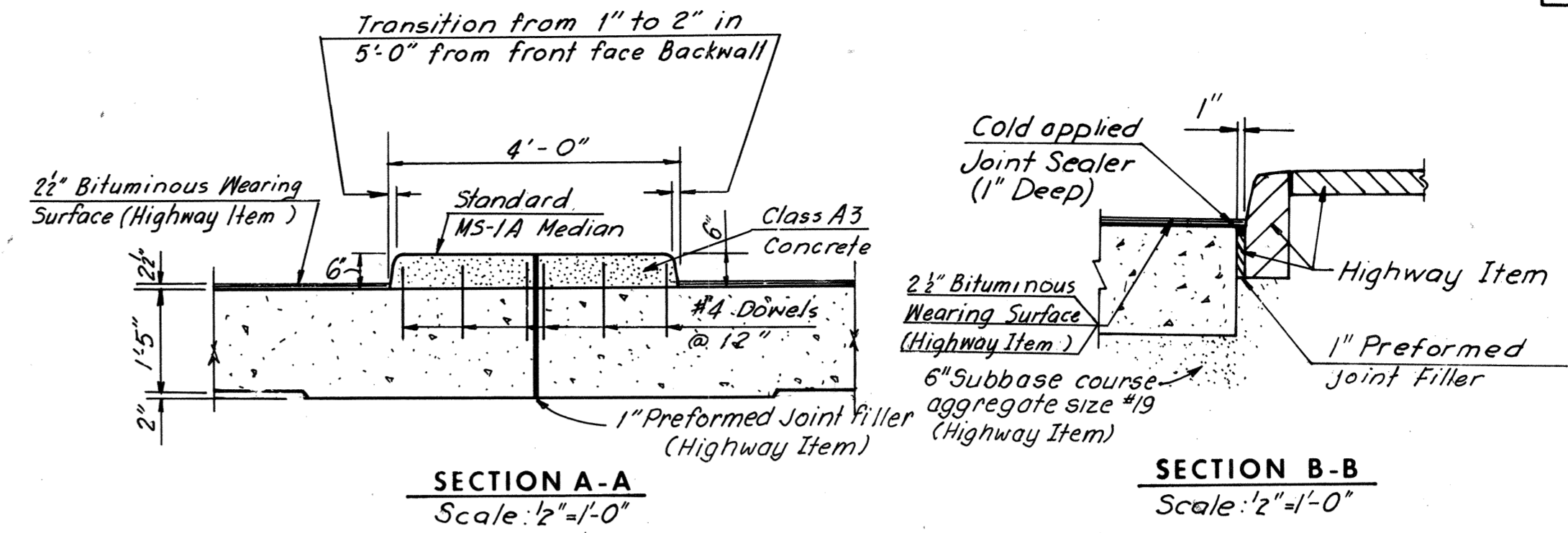
Note: Construction of Slope Protection shall be coordinated with the construction of Guard rail shown on roadway plans.

**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 - 6/6 wire mesh positioned at the center of the slab. Mesh shall be continuous through construction joints.



RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY

BRIDGE NO. 12  
DOUGLASDALE EAST ROAD OVER  
S-E&S ROADWAYS  
APPROACH SLAB AND  
SLOPE PROTECTION DETAILS

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NEW YORK ALEXANDRIA KANSAS CITY

SCALE: As Noted

CONTRACT NO.: 7

SHEET NO. 10 OF 12

**AS BUILT**

BY	DATE	2	As Built	T.E.M.	9-75
MADE	G.C.C.	9.18.47	Recess for water main of E. & W. Appr. Slab & 4" $\phi$ cond. ceiling to W. Appr. Slab	LBP	1-74
CHECKED	S.S.W.	2.22.68			
IN CHARGE	F.K.D.	NO.	REVISION	BY	DATE



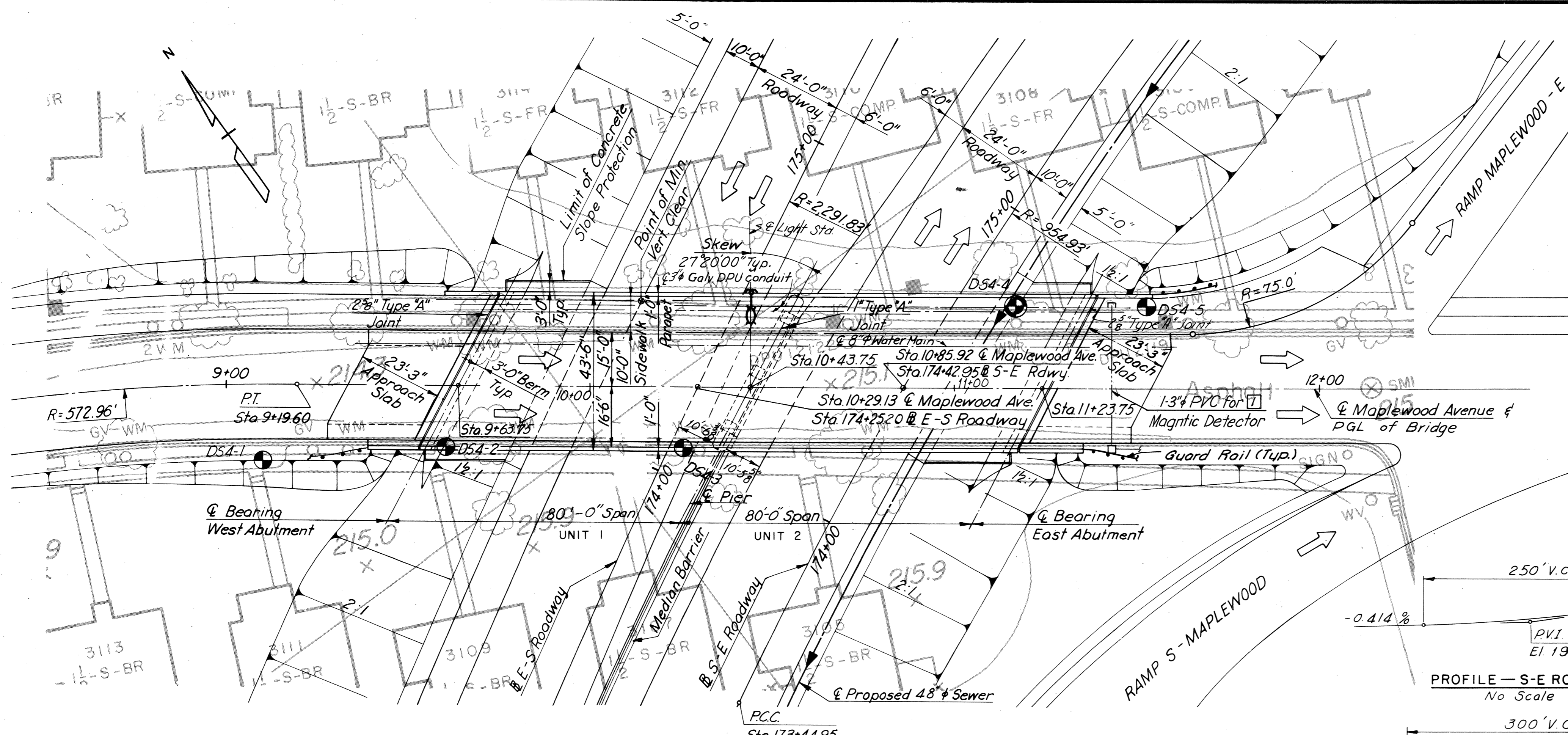
# **Bridge 36**

**(Maplewood Avenue over DTE Connector, VA-146)**

**Record Set Plans**



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	96	



**GENERAL NOTES**

**ROADWAY:** 36'-1" Face of rail to edge of sidewalk.

**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, 1969 and 1970-72 Interim Specifications, modified by Special Design Provisions. 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:** 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. Found. mat'l. shall be kept dry & special attn. is called to Sec. 401.05 of the Gen. Specs. & to the Contract Special Prov. concerning preparation of found. for ftgs.

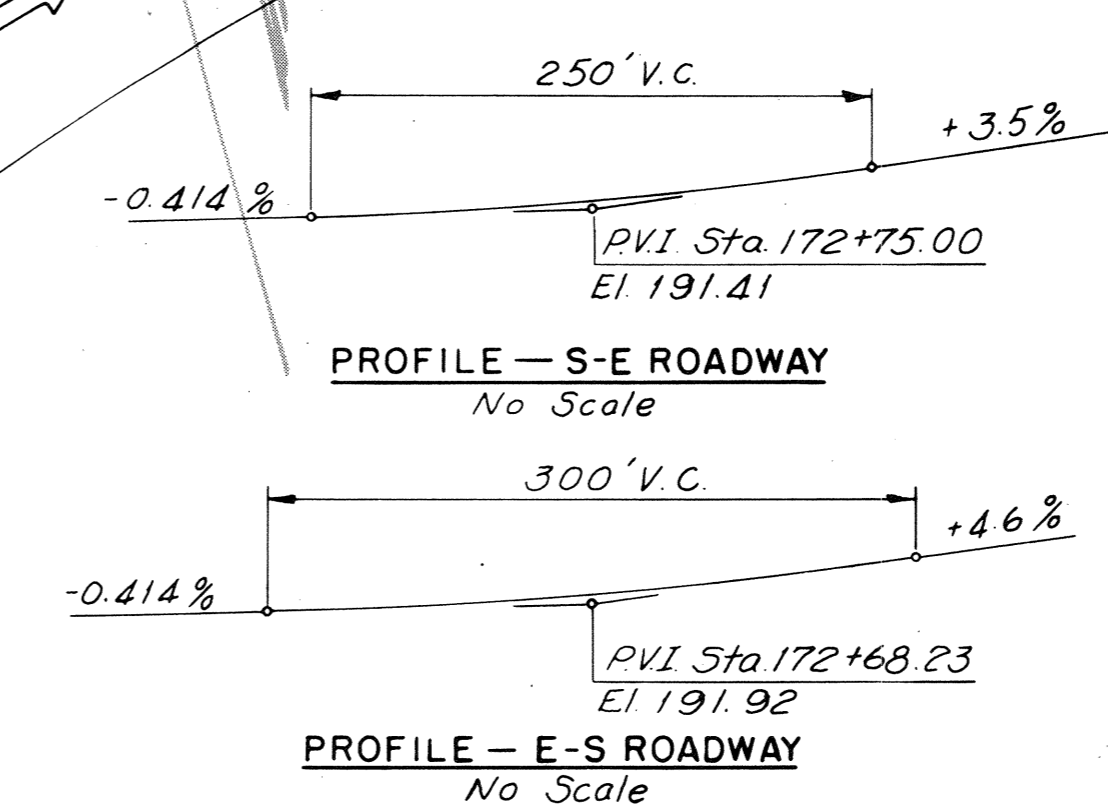
**CONCRETE NOTES:** Concrete in superstructure shall be Class A4. All other concrete shall be Class A3. All exposed edges and corners shall have a 3/8" chamfer or fillet unless otherwise noted. Care in the method of vibration, the use of low-slump concrete, and/or other means shall be employed to prevent 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.

**STEEL NOTES:** Structural steel shall conform to A.S.T.M. Specification A36 except as noted.

**BENCH MARK:** C-11. Copper Weld Rod, South side of Maplewood Ave. of Belmont Ave. Elev. 215.37.

Indicates 2 1/2" φ cased hole boring.  
Indicates 4" φ cased hole boring.



INDEX	
NO.	DESCRIPTION
1	GENERAL PLAN AND ELEVATION
2	WEST ABUTMENT
3	EAST ABUTMENT
4	ABUTMENT DETAILS
5	PIER
6	FRAMING PLAN
7	DECK PLAN AND CROSS SECTION
8	JOINT DETAILS
9	APPROACH SLAB & SLOPE PROTECTION DETAILS
10	BORING LOGS
S1	STANDARD SHOE DETAILS
S3	STANDARD ALUMINUM RAILING DETAILS (2 RAILS)
S4	STANDARD ELECTRICAL DETAILS
S7 TO S9	STANDARD ARCHITECTURAL DETAILS
S11	STANDARD GAS AND WATER MAIN SUPPORT DETAILS
S13	LIMITS OF EXCAVATION AND BACKFILL

**Note:**  
The cost of furnishing and installing 2" φ and 3" φ galvanized steel conduit shall be included in the bid price for the item "Metal Conduit."

	STRUCTURE EXCAVATION	CONCRETE			STRUCTURAL STEEL	ALUMINUM BR. RAILING (2 RAIL) L.F.	POROUS BACKFILL	REINFORCING STEEL	STEEL PILES IOBP 42	CONC. SLAB SLOPE PROT.	ASPHALT DAMPROOFING	UNDERDRAIN 6" φ PIPE	WATER MAIN 8" φ	METAL CONDUIT	3" φ PVC CONDUIT
		CLASS A4 C.Y.	CLASS A3 C.Y.	CLASS A3 APPR. SLABS C.Y.											
SUPERSTRUCTURE		276.2			270,749	32.7		53,067					213	1,176	34
WEST ABUTMENT	218.6		143.0			23	12.3	7,081	864.2	150.2	57	57			
EAST ABUTMENT	454.0		215.0			31.4	43	13,320	1,291.4	133.1	107	60			
PIER	131.4		82.7					12,264	480.2						
APPROACH SLABS				86				22,420							
<b>TOTAL</b>	<b>804.0</b>	<b>276.2</b>	<b>440.7</b>	<b>86</b>	<b>270,749</b>	<b>381.4</b>	<b>55.3</b>	<b>108,152</b>	<b>2,635.8</b>	<b>283.3</b>	<b>164</b>	<b>117</b>	<b>213</b>	<b>1,176</b>	<b>34</b>

MADE	BY	DATE	NO.	REVISION	BY	DATE
LCC	TCY	1-3-68	2	As Built	T.E.M.	9-75
TCY	AGC	3-12-68	1	Add PVC Cond.	TEM	1-31-74

**AS BUILT**

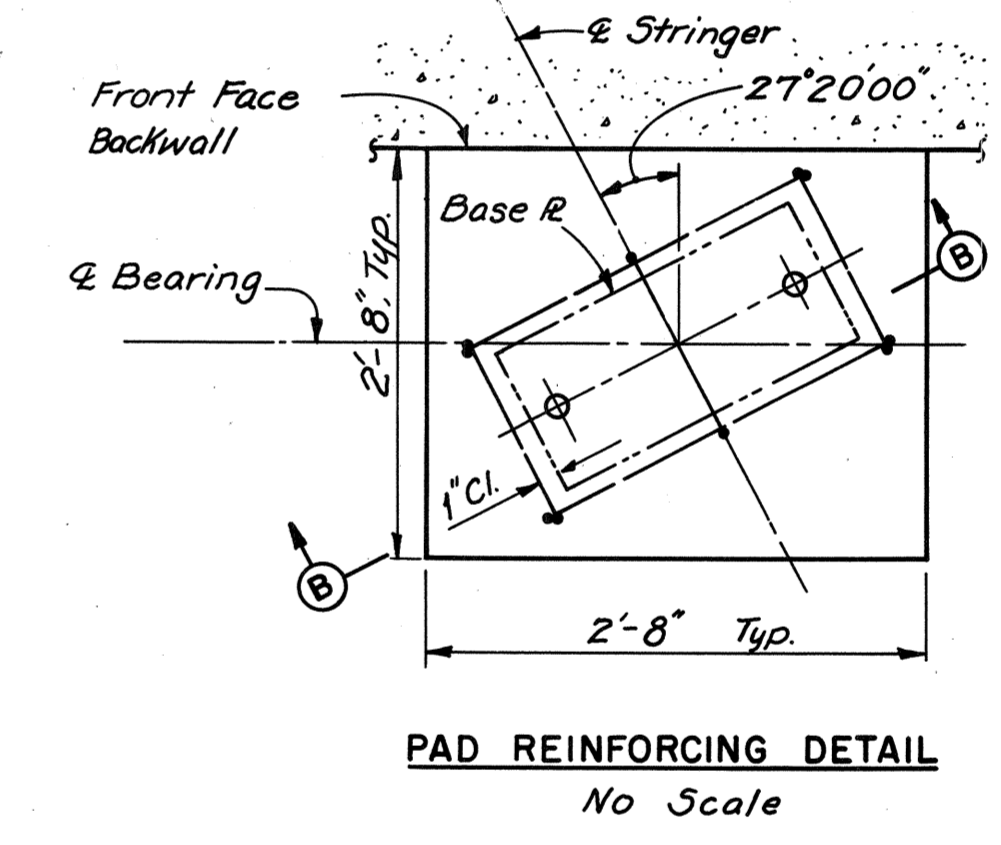
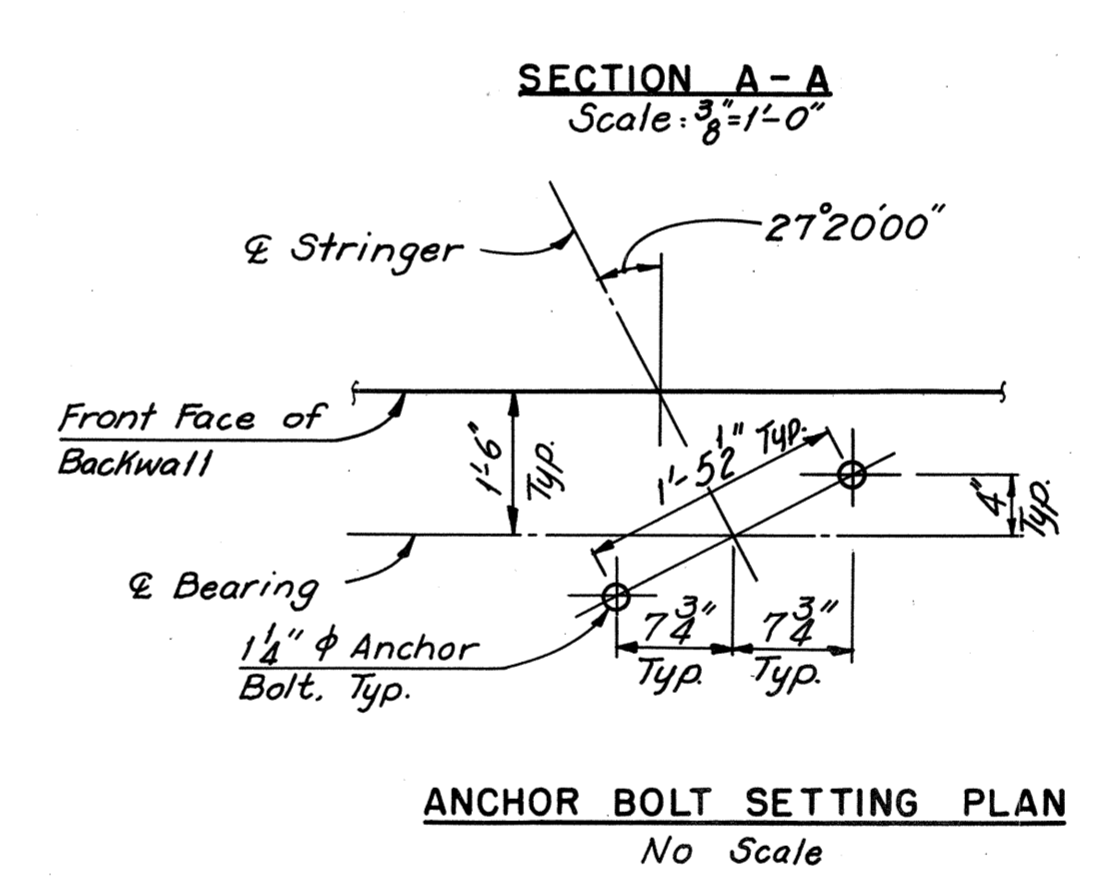
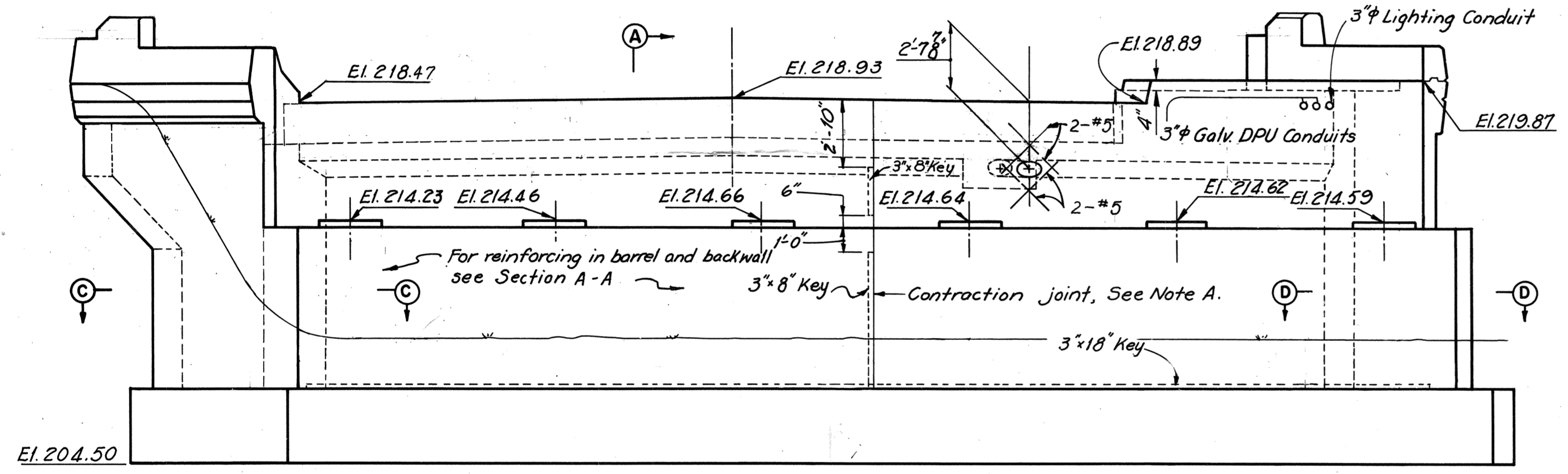
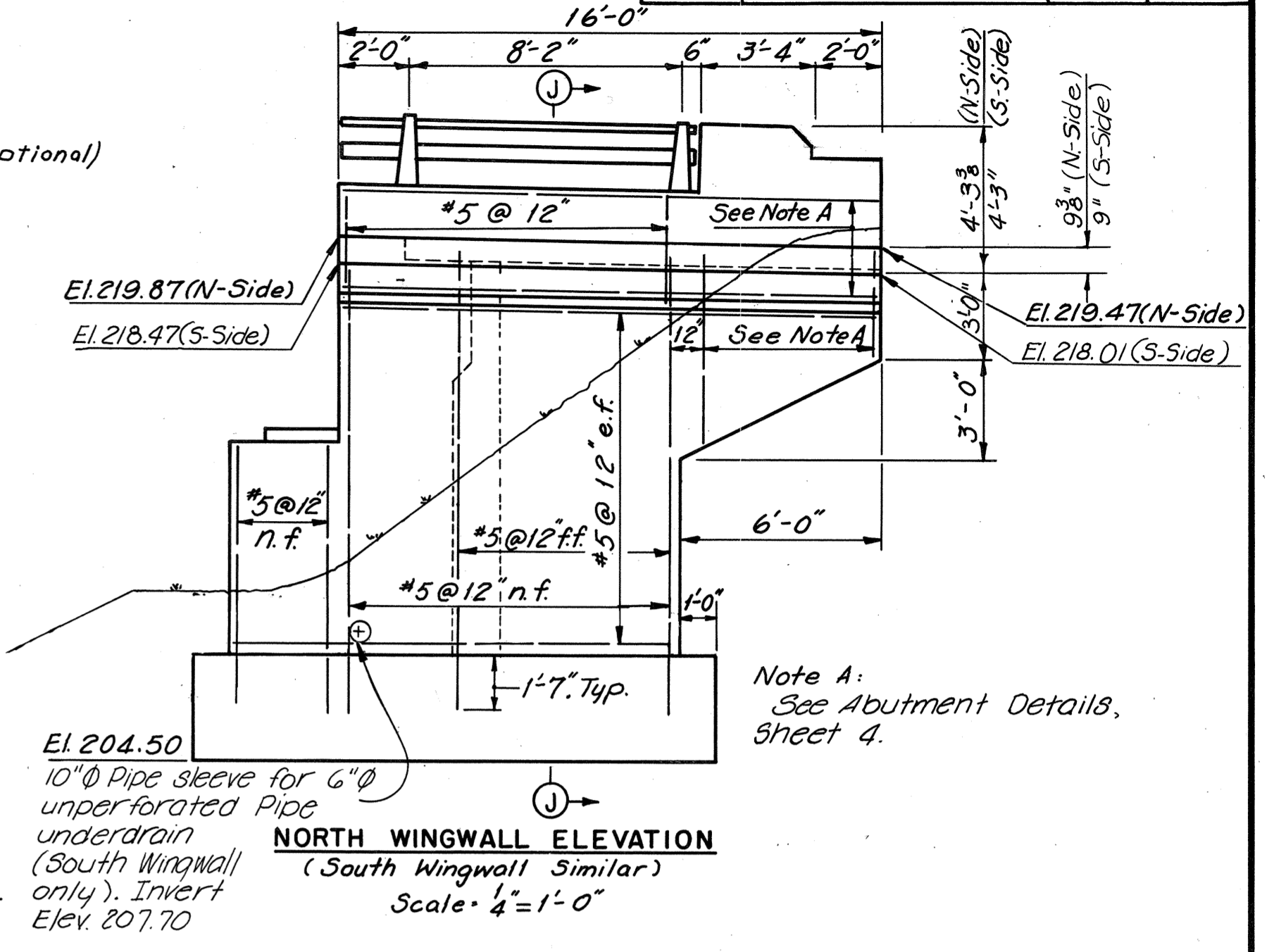
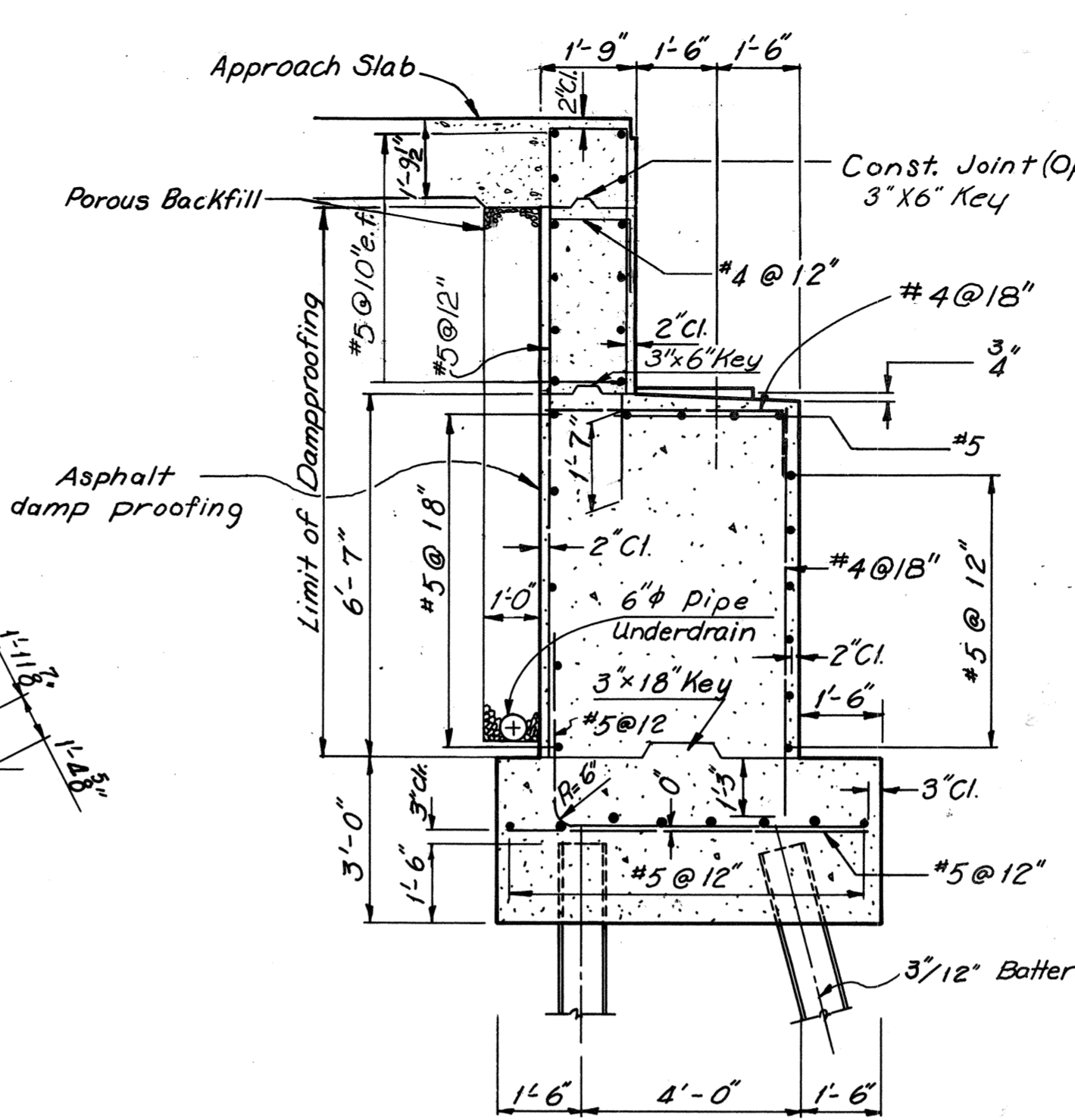
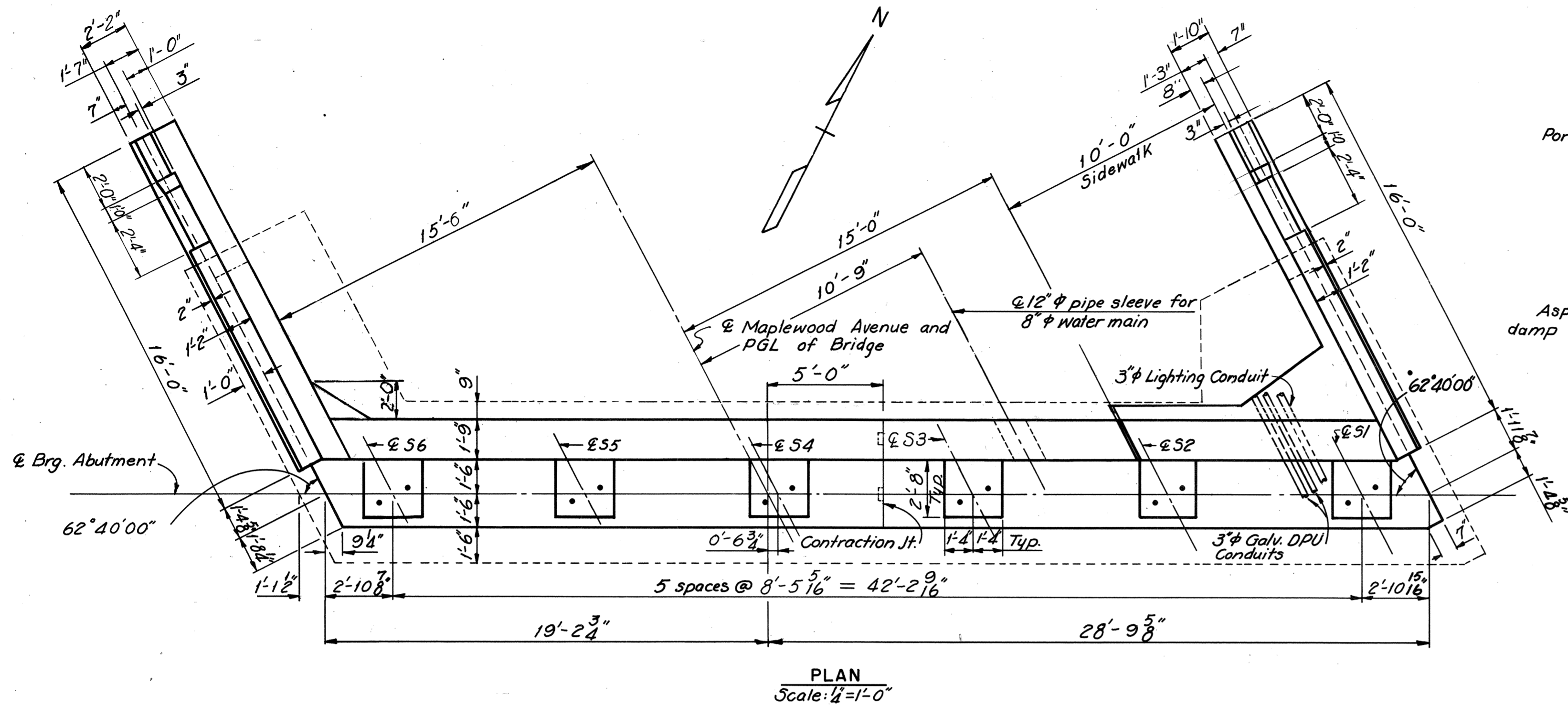
**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
**DOWNTOWN EXPRESSWAY**

**BRIDGE NO. 36**  
**MAPLEWOOD AVENUE OVER**  
**DOWNTOWN EXPRESSWAY**  
**GENERAL PLAN AND ELEVATION**

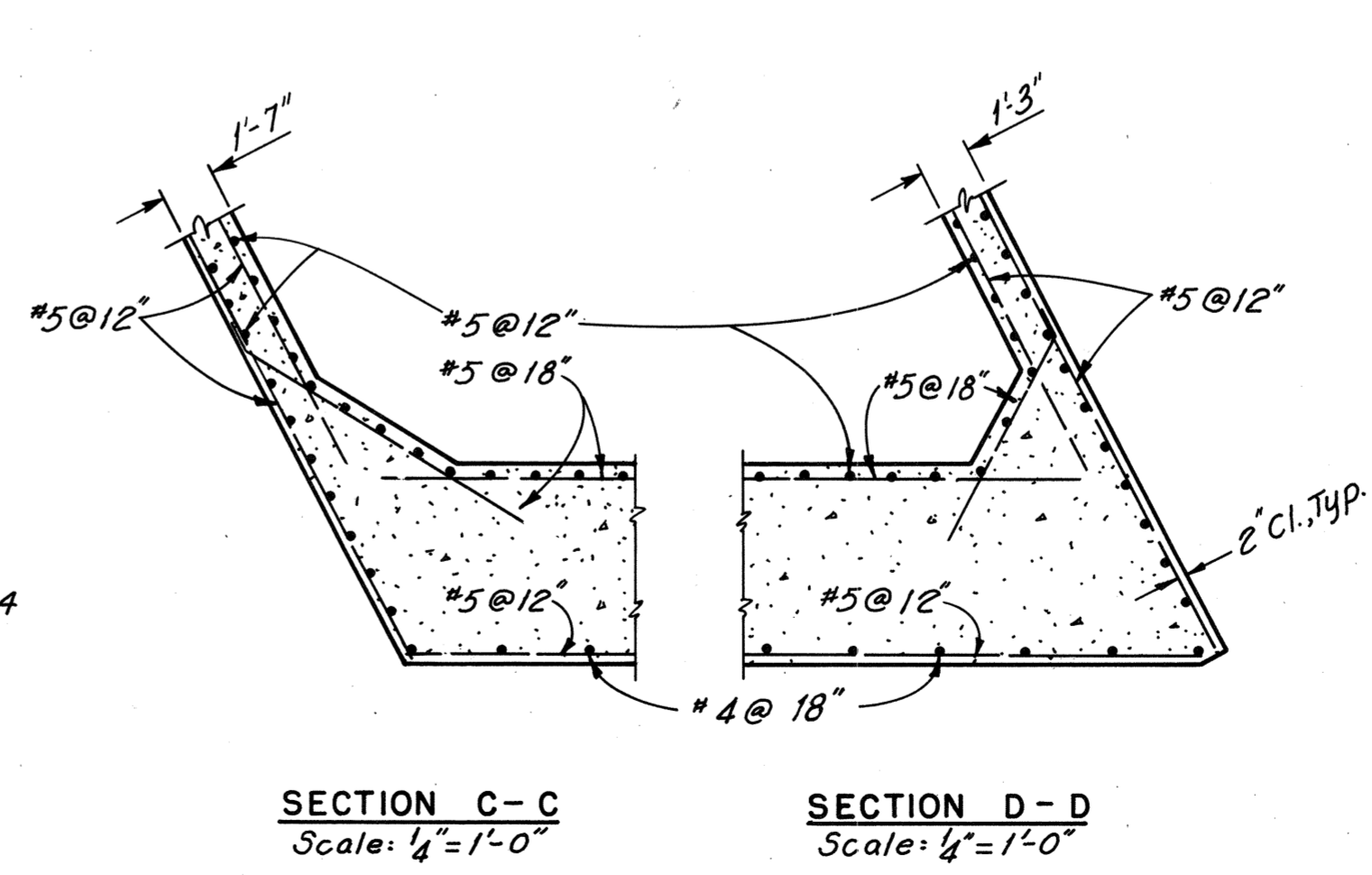
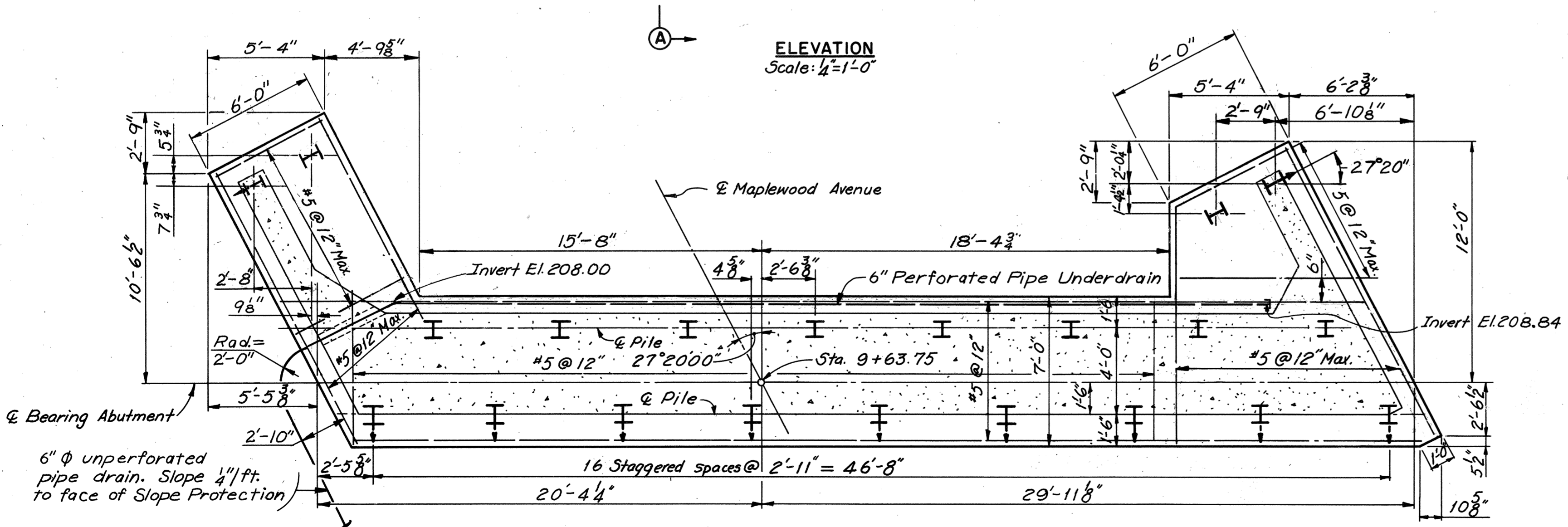
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: 1"=20' UNLESS NOTED  
CONTRACT NO.: 7  
SHEET NO.: 1 OF 10

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	97	



Notes:  
For Section J-J, see Abutment Details Sheet 4. 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.  
All piles shall be 10 BP 42. n.f. denotes near face; f.f. denotes far face and e.f. denotes each face.  
Minimum embedment and splice lengths are: #4 bars: 1'-3" and #5 bars: 1'-7".  
For details of water main pipe sleeve, see Standard Gas and Water Main Support Details Sheet.  
For DPU and Lighting conduit details, see Standard Electrical Details (Bridge Carrying City Street) sheet.  
↓ Denotes pile batter 3 in 12 in direction of arrow.  
Pile design capacity=45 tons.



BY	DATE				
MADE	LCC	1-68			
CHECKED	A.M.	2-68	1	As Built	TEM 9-75
IN CHARGE	R. G. C.				

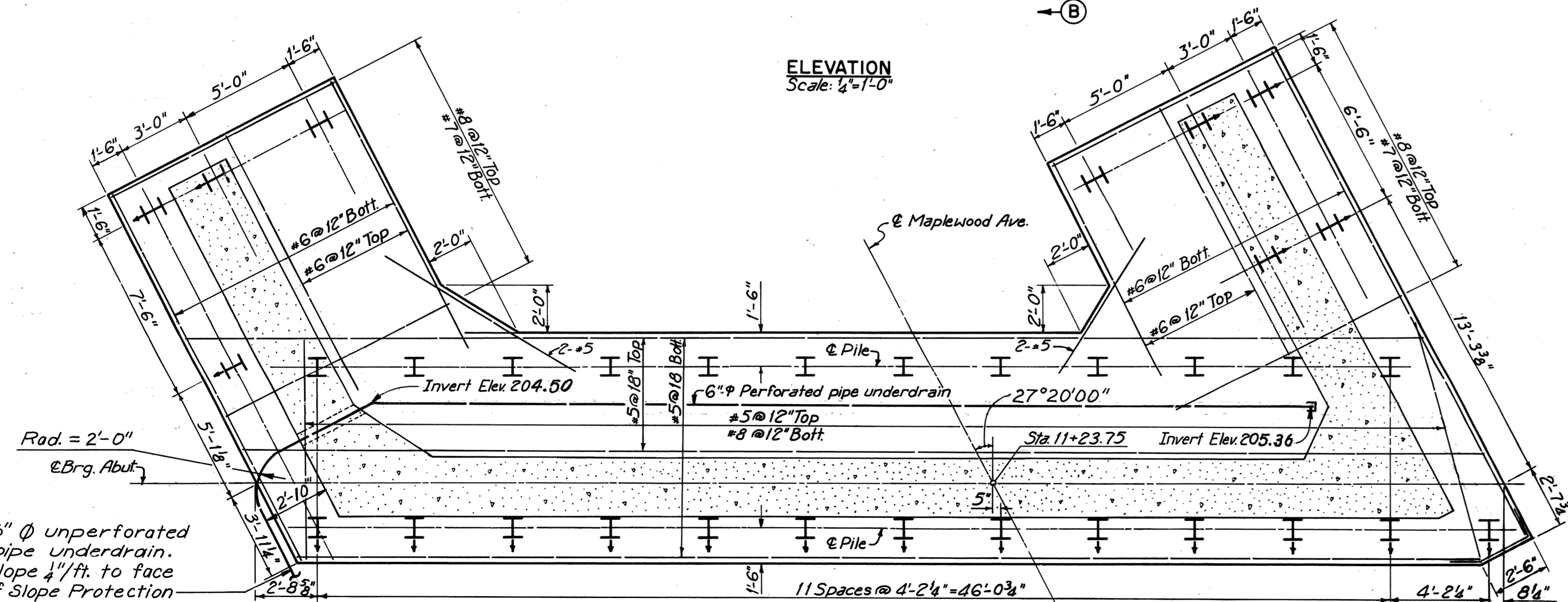
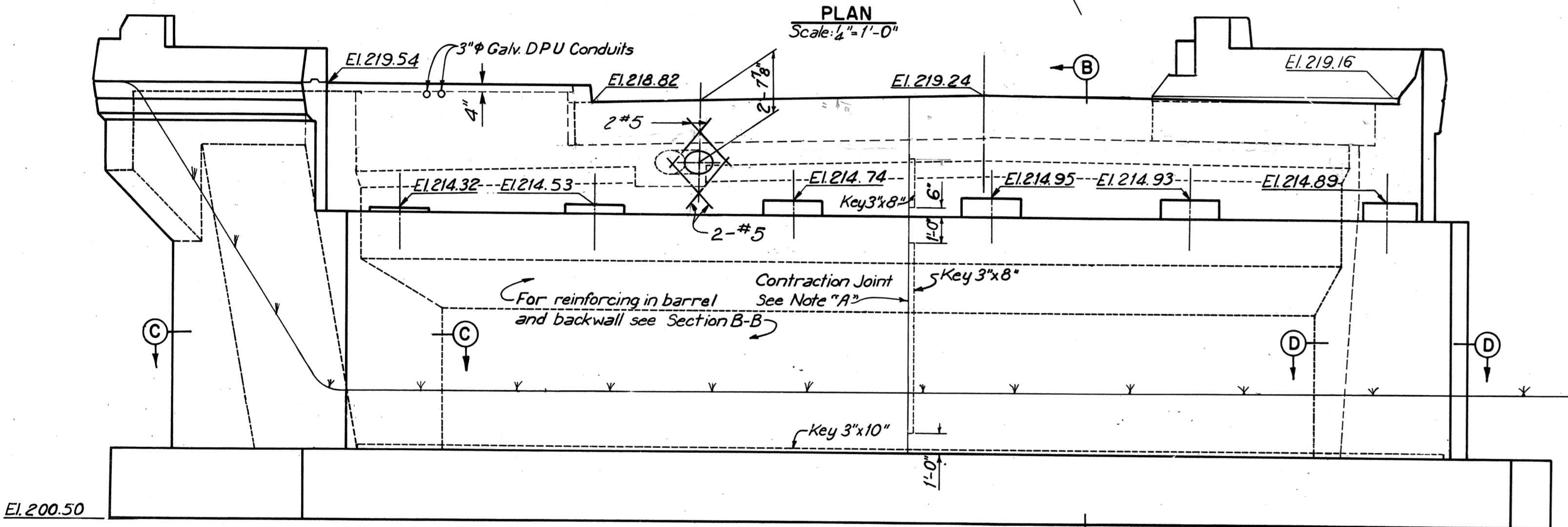
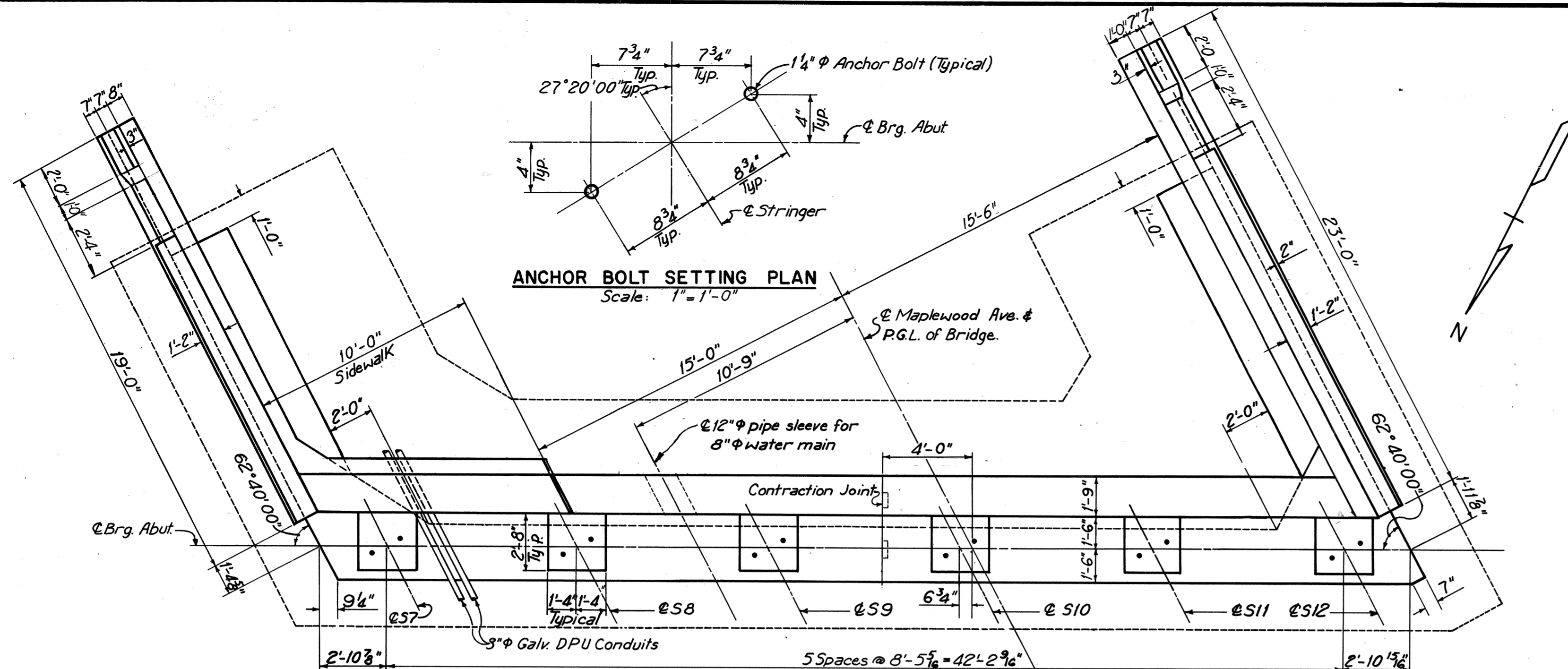
**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
DOWNTOWN EXPRESSWAY

BRIDGE NO. 36  
MAPLEWOOD AVENUE OVER  
DOWNTOWN EXPRESSWAY  
WEST ABUTMENT

SCALE: As Noted  
CONTRACT NO.: 7  
SHEET NO. 2 OF 10

**AS BUILT**

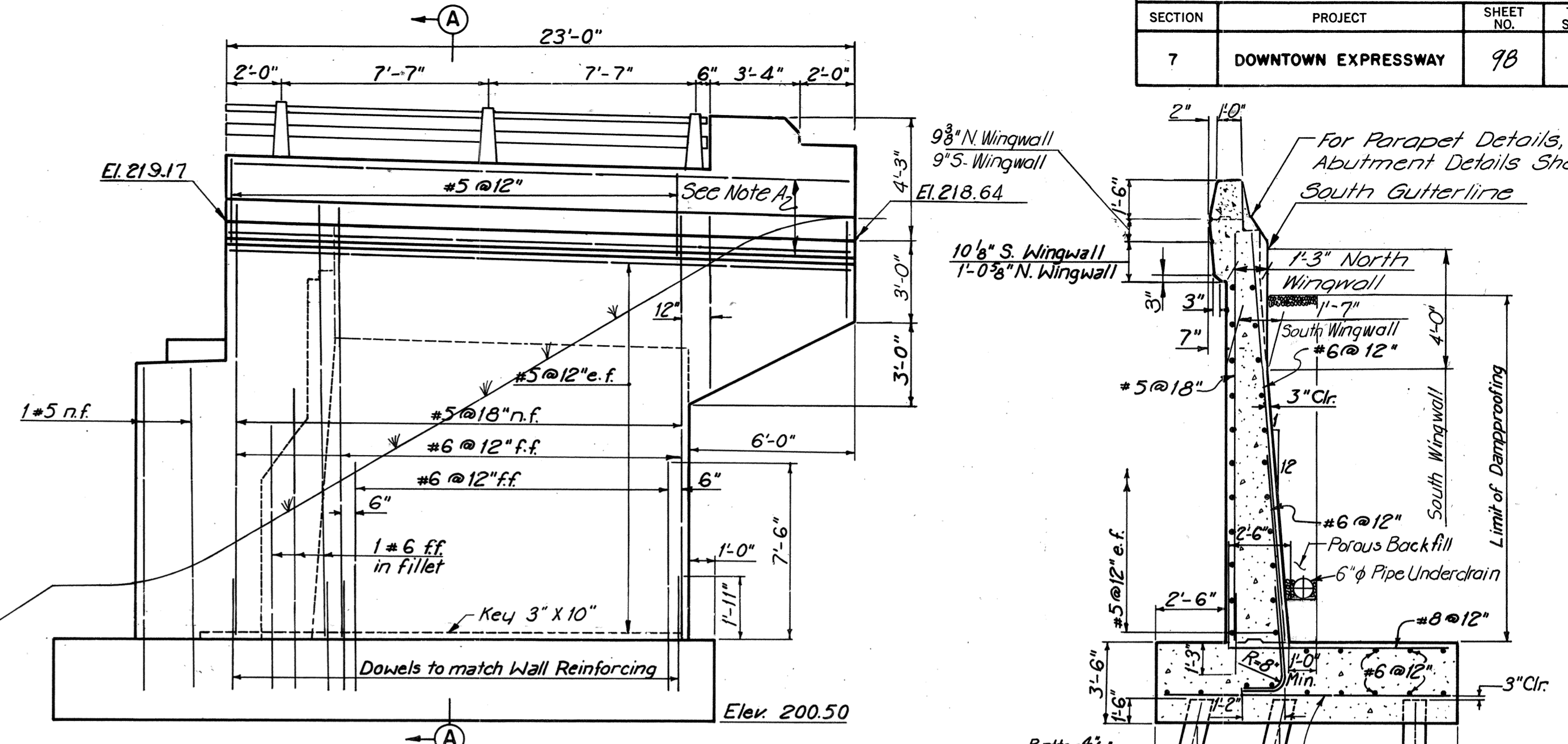
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	98	



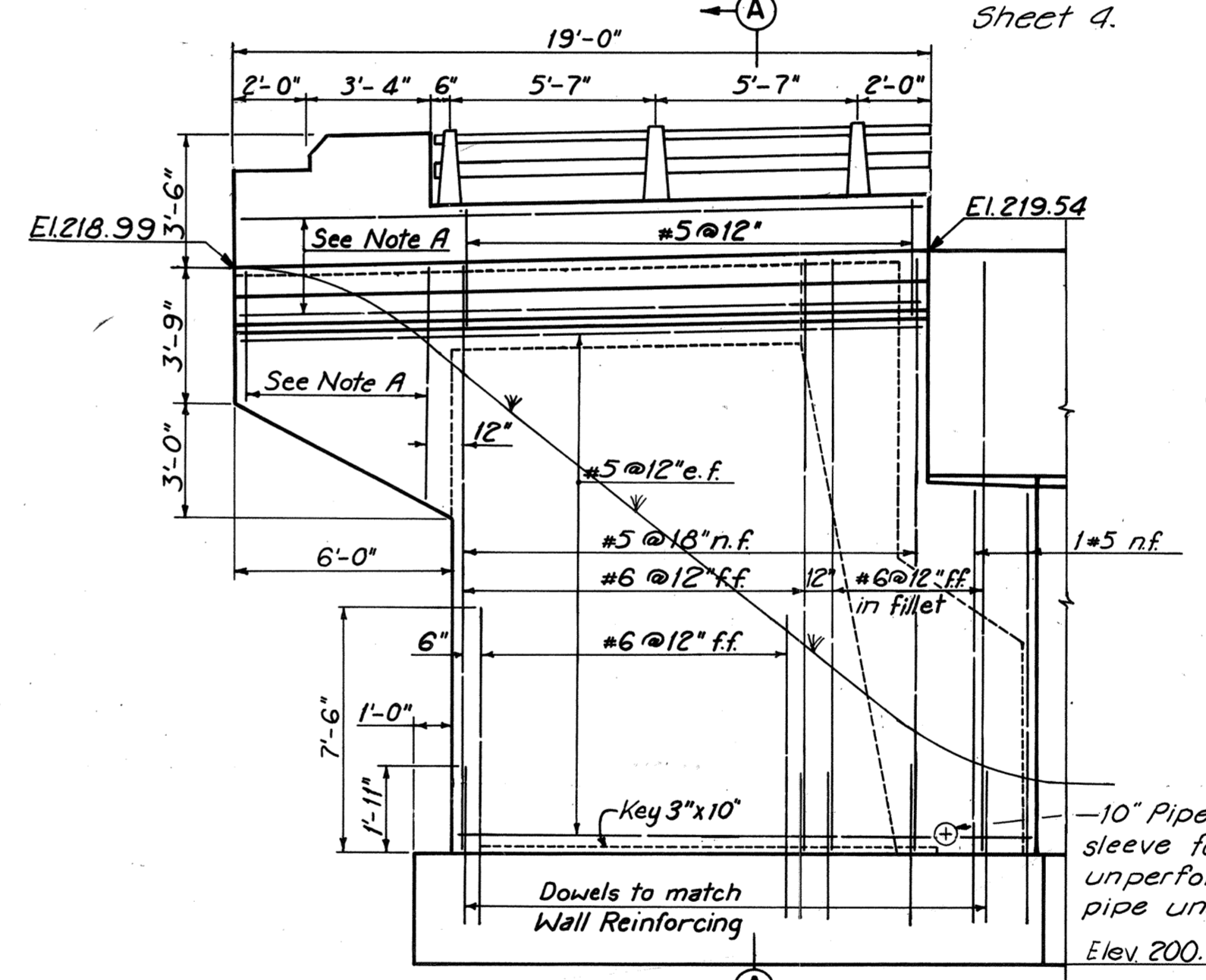
BY	DATE	NO.	REVISION	BY	DATE
MADE	Q.77	1-68			
CHECKED	L.C.C.	2-68	1	As Built	TEM 9-75
IN CHARGE	R. G. C.				

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

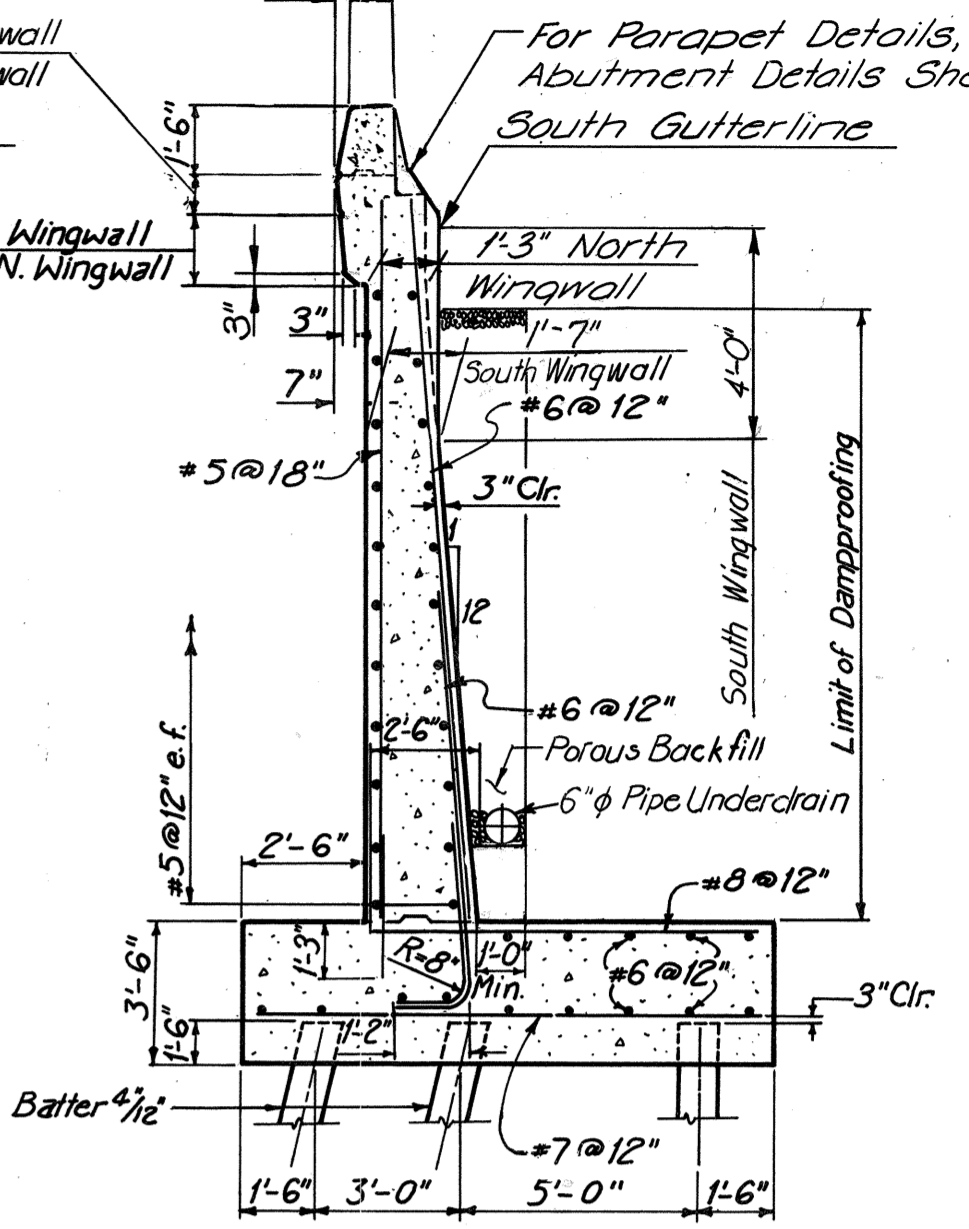
Note:  
Pile design capacity = 45 tons.  
† Denotes pile battered 3 in 12 in direction of arrow.



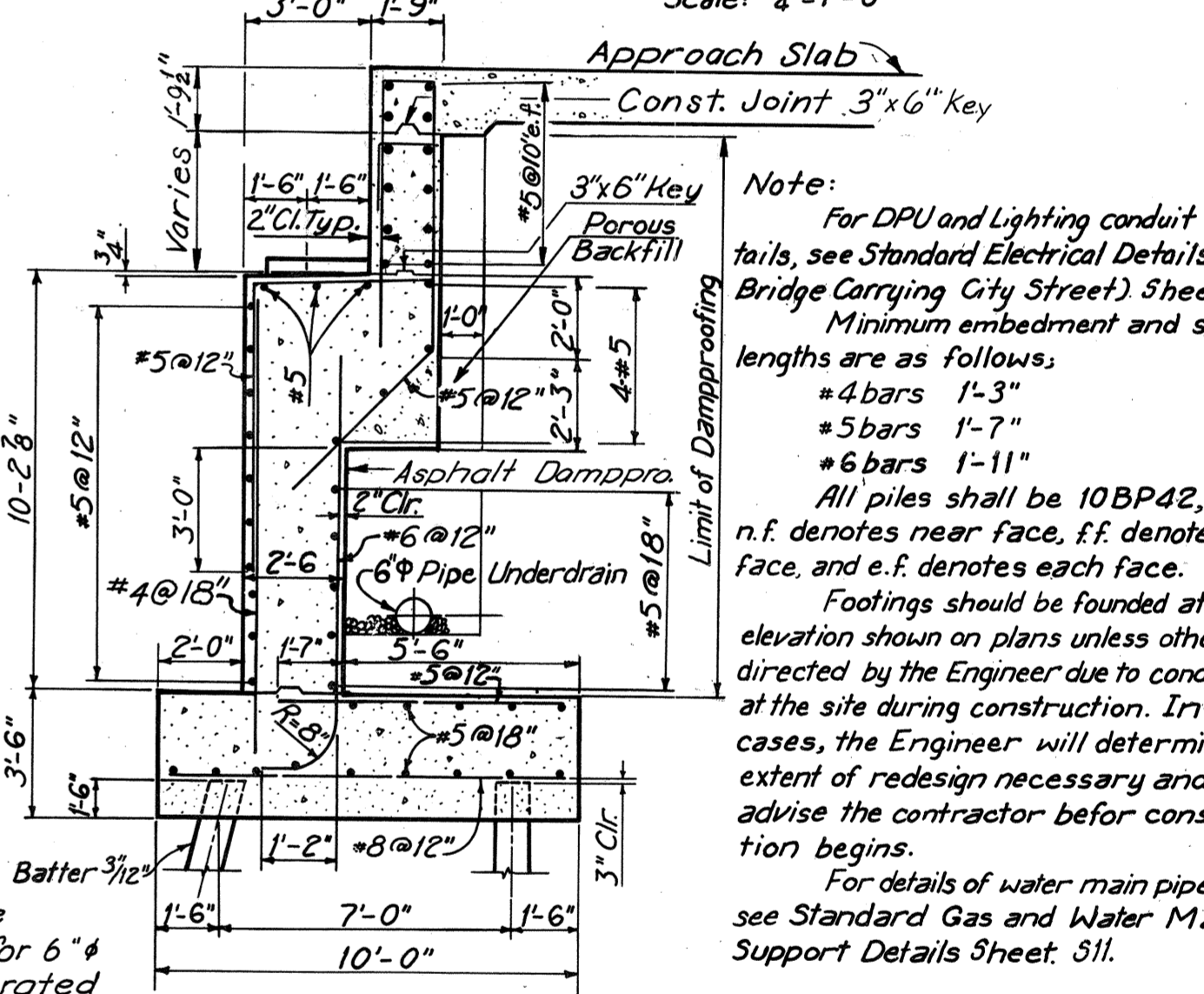
**SOUTH WINGWALL ELEVATION**  
Scale: 1/4"=1'-0"



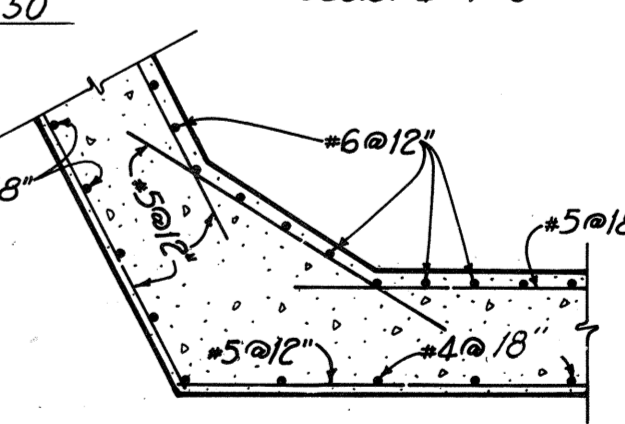
**NORTH WINGWALL ELEVATION**  
Scale: 1/4"=1'-0"



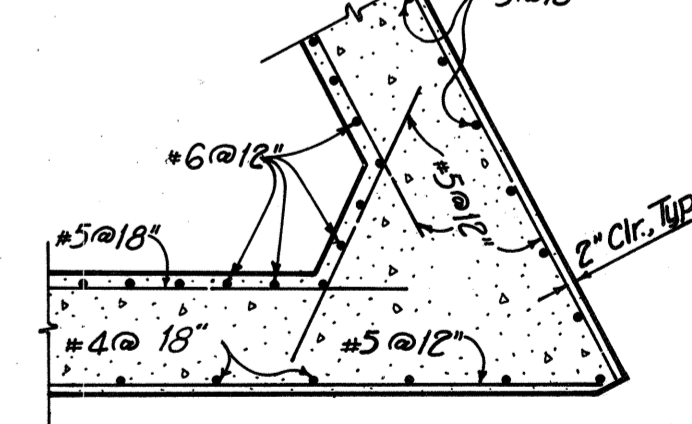
**SECTION A-A**  
Scale: 1/4"=1'-0"



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



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



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

Note "A":  
See Abutment Details,  
Sheet 4.

Note:  
For DPU and Lighting conduit details, see Standard Electrical Details Bridge Carrying City Street) Sheet 84.  
Minimum embedment and splice lengths are as follows:  
#4 bars 1'-3"  
#5 bars 1'-7"  
#6 bars 1'-11"  
All piles shall be 10BP42, n.f. denotes near face, ff denotes far face, and e.f. denotes each face.  
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.  
For details of water main pipe sleeve see Standard Gas and Water Main Support Details Sheet 511.

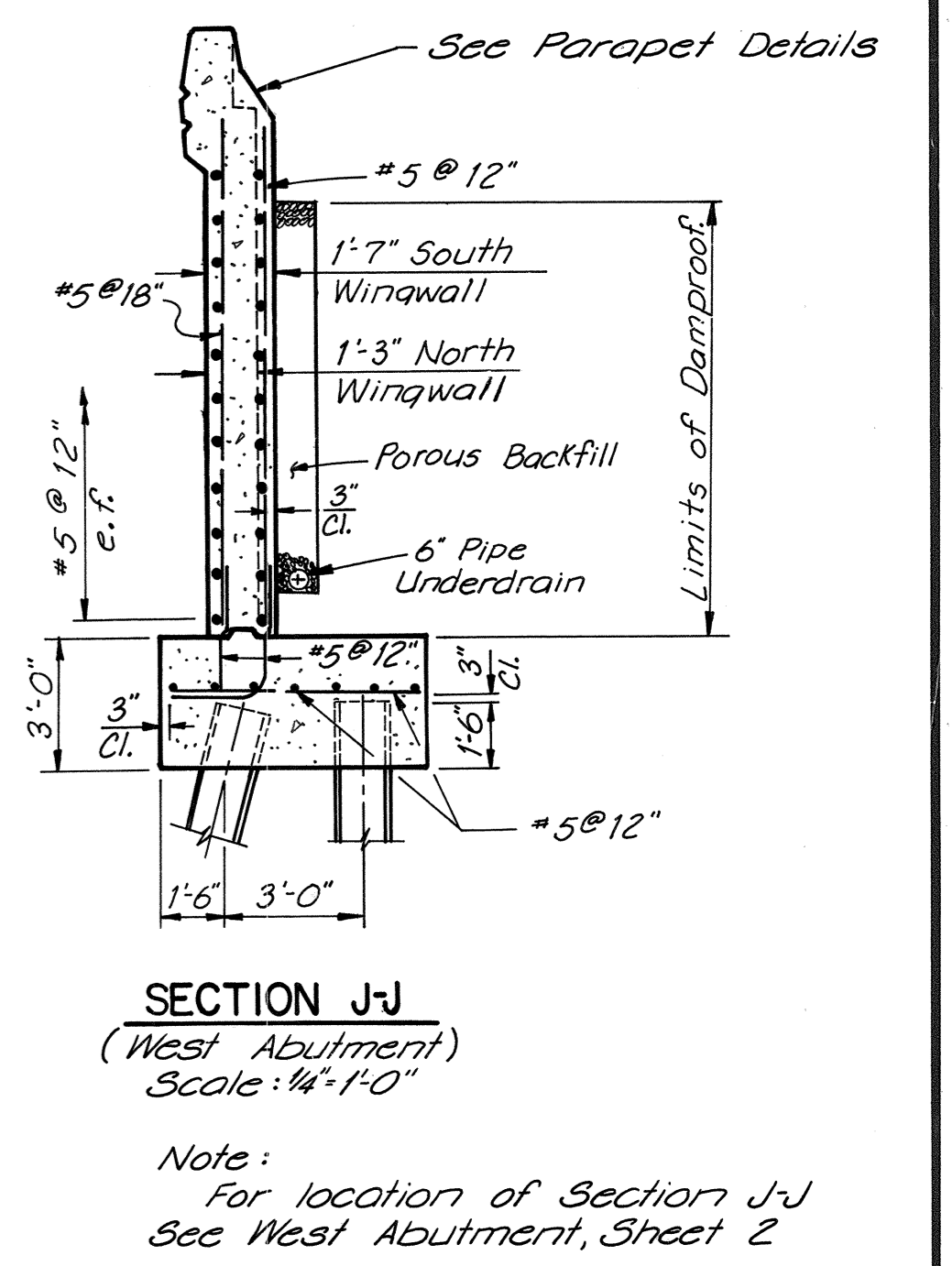
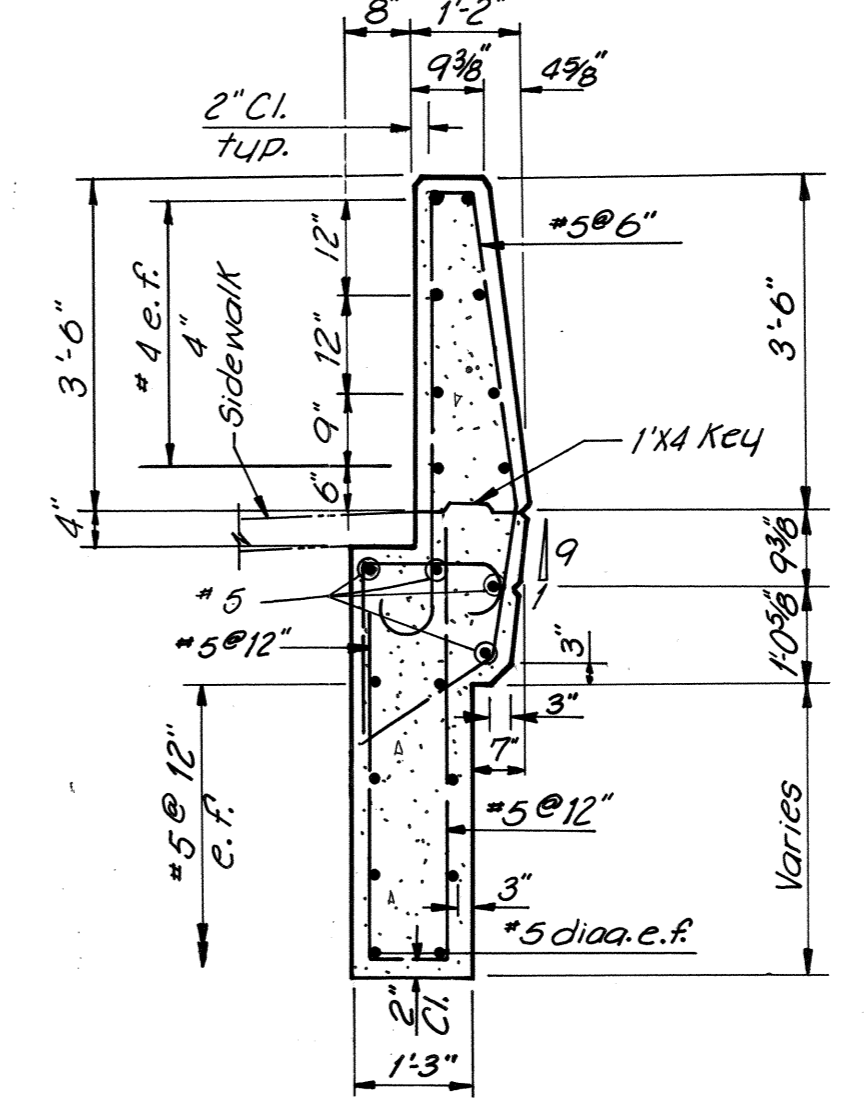
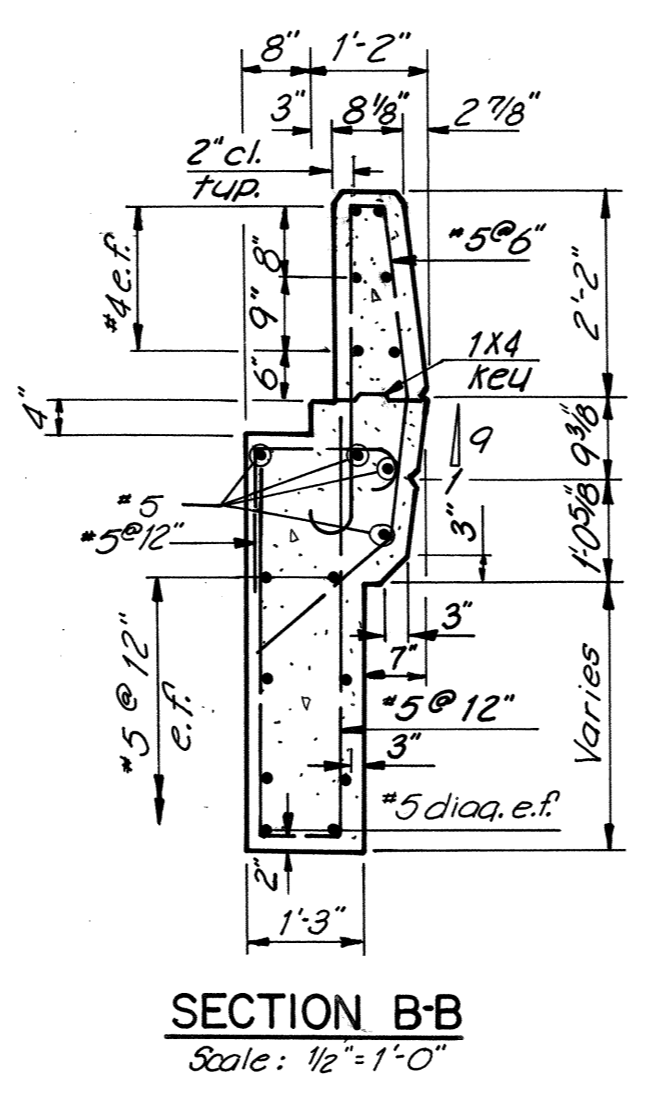
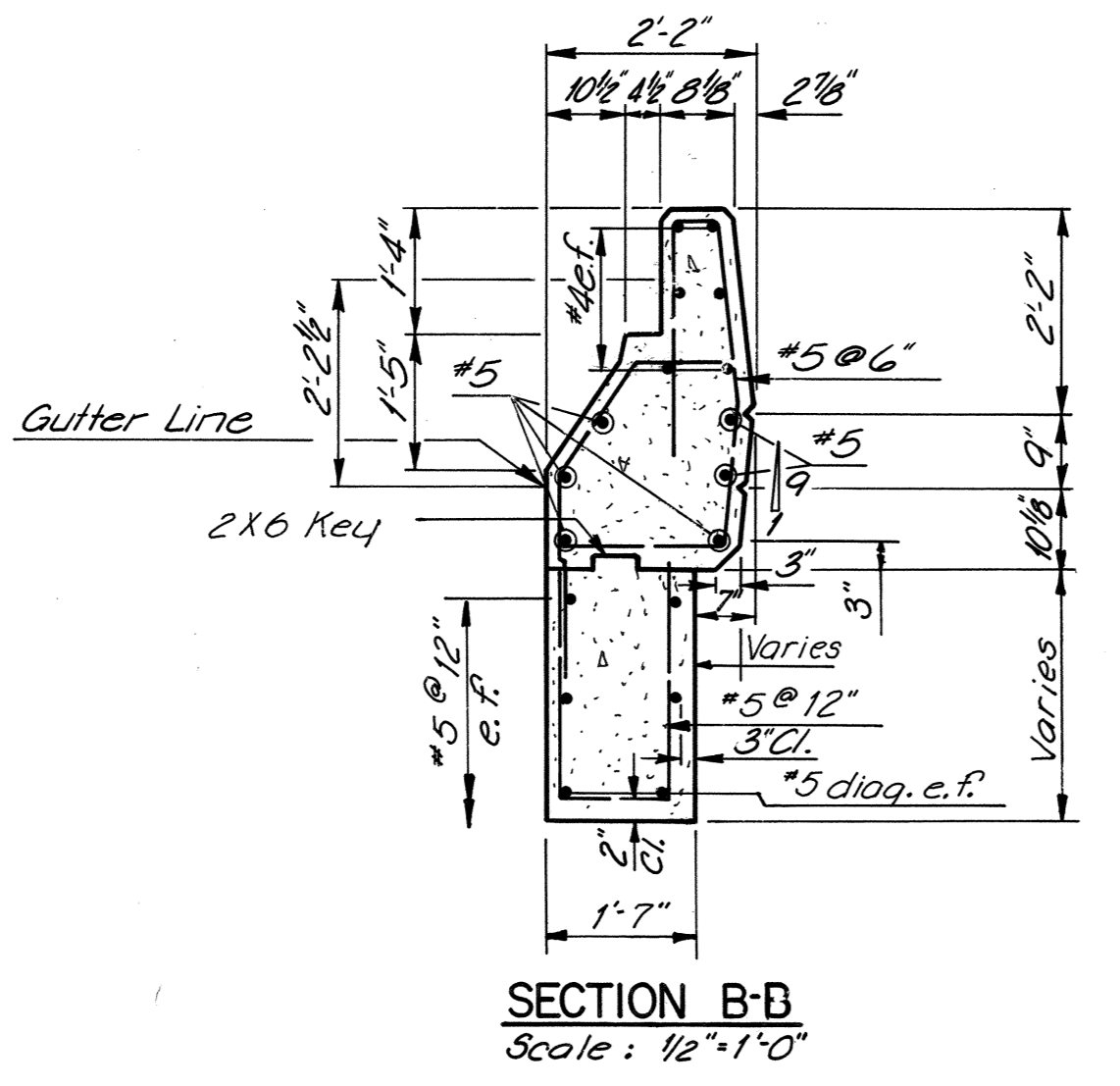
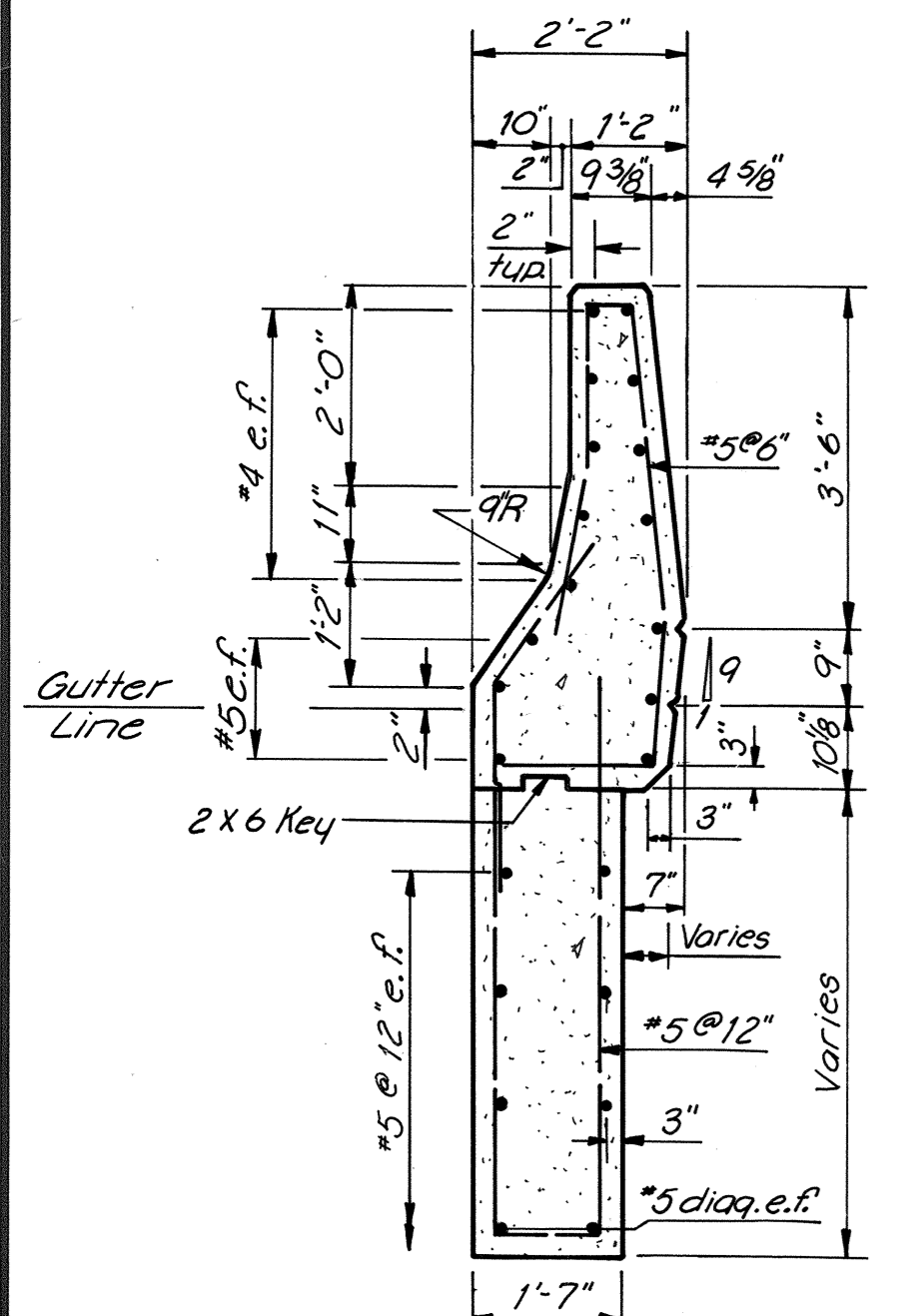
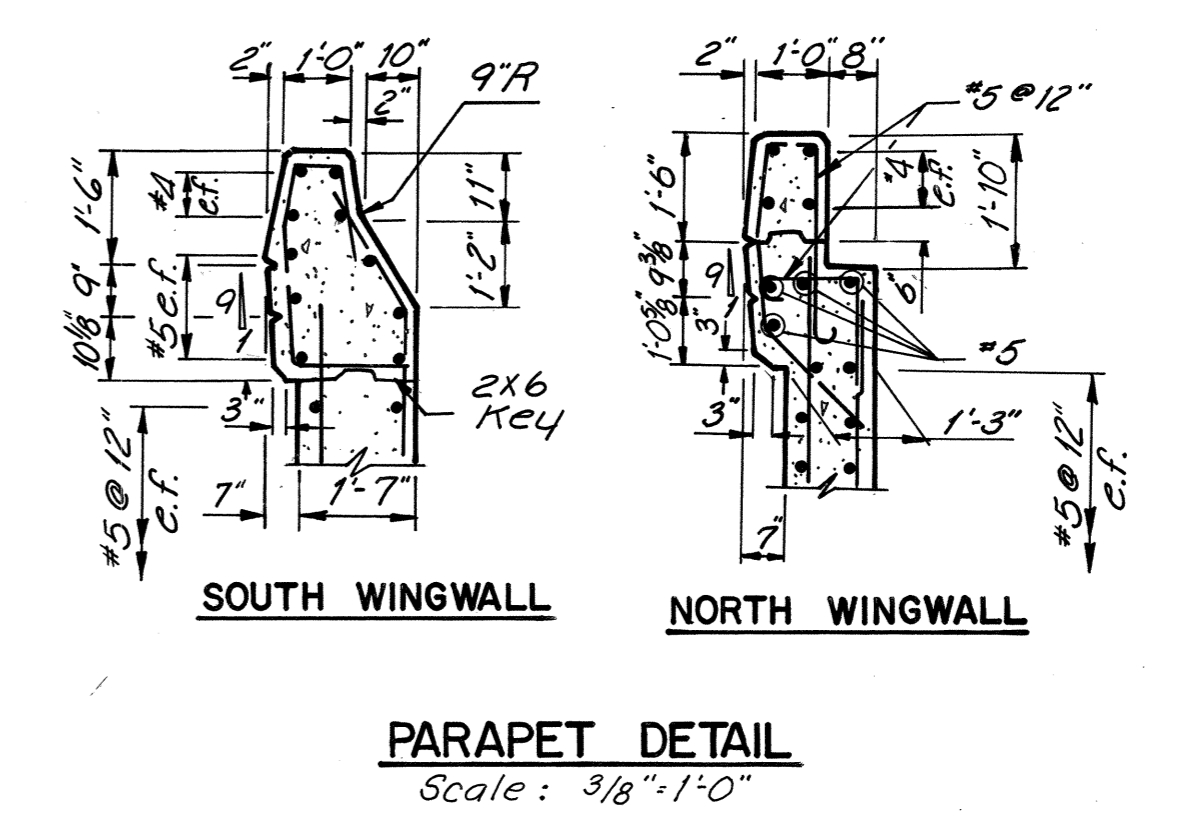
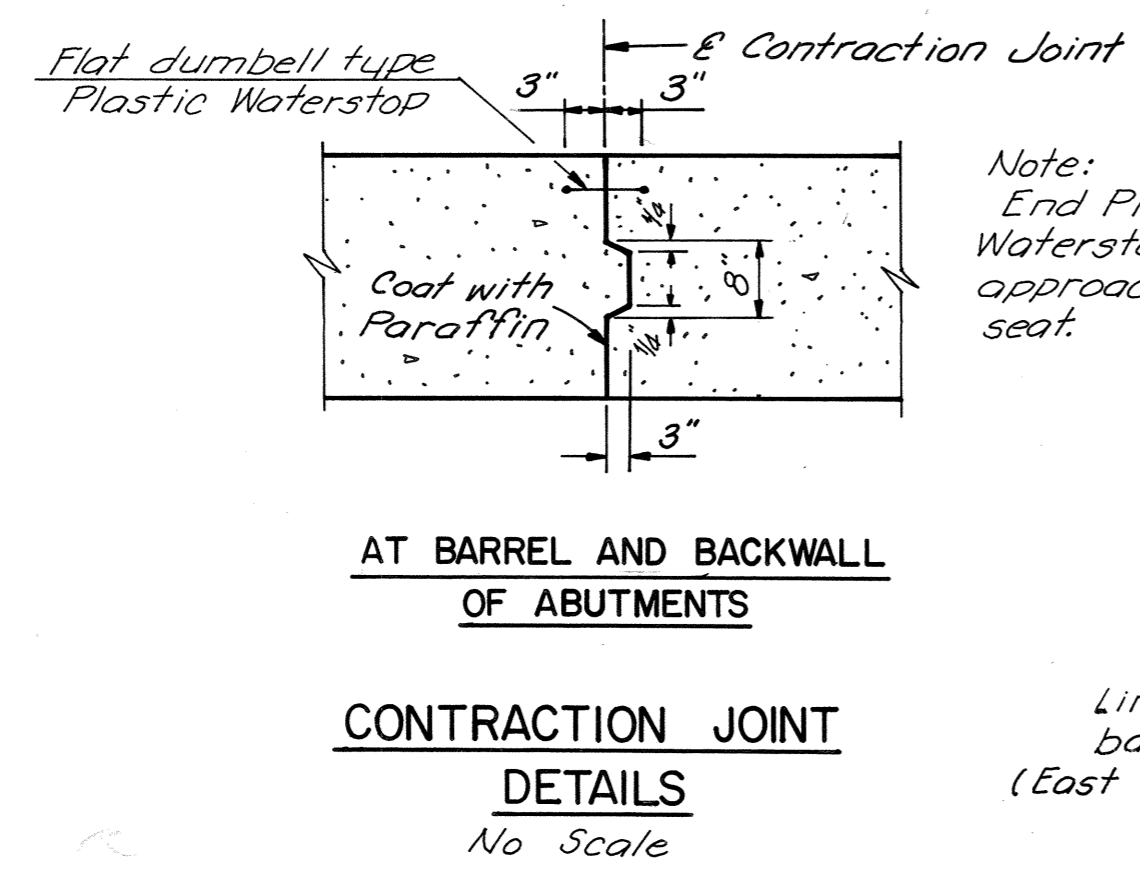
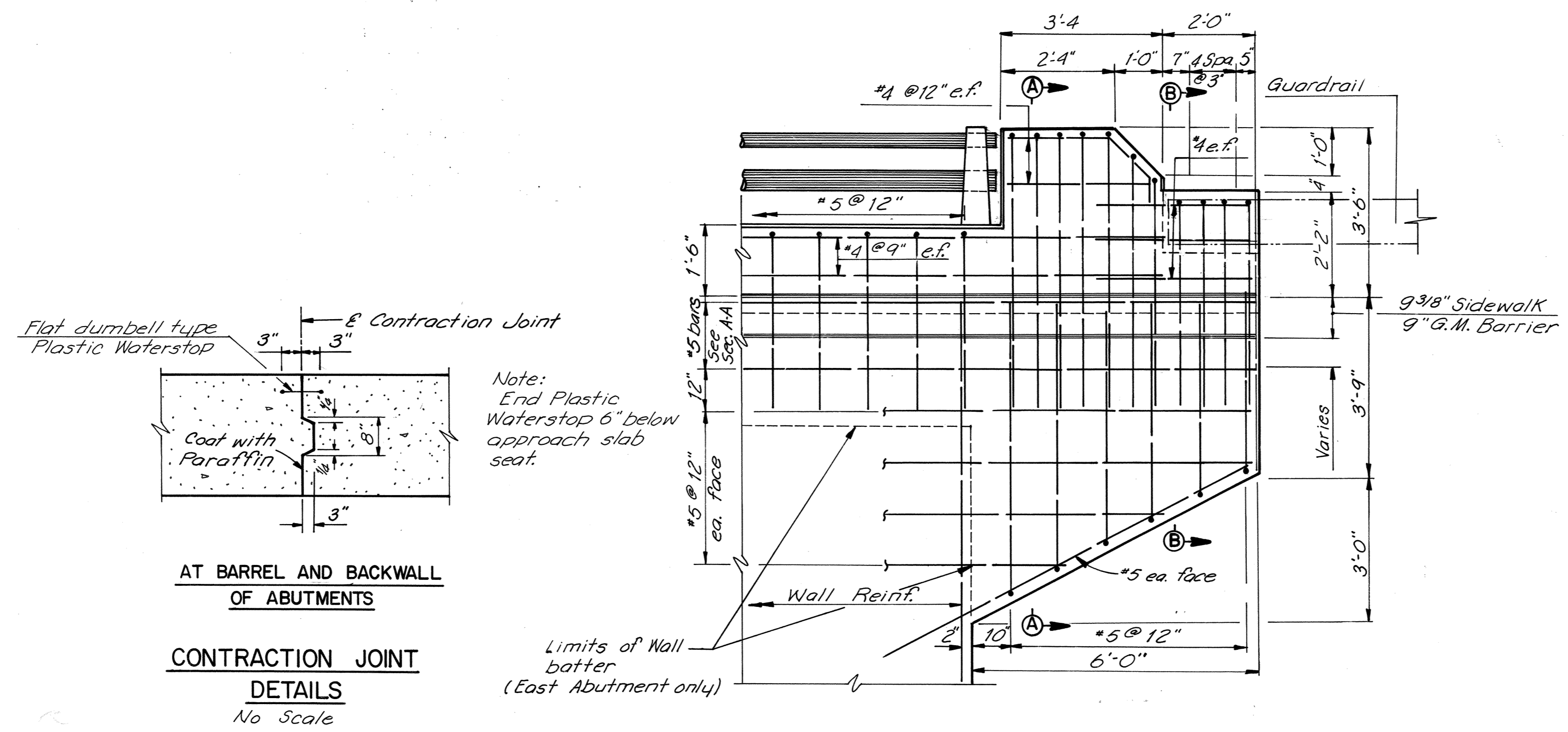
**RICHMOND METROPOLITAN AUTHORITY**  
**RICHMOND EXPRESSWAY SYSTEM**  
**DOWNTOWN EXPRESSWAY**

**BRIDGE NO. 36**  
**MAPLEWOOD AVENUE OVER**  
**DOWNTOWN EXPRESSWAY**  
**EAST ABUTMENT**

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NEW YORK ALEXANDRIA KANSAS CITY

SCALE: As Noted  
CONTRACT NO.: 7  
SHEET NO. 3 OF 10

**AS BUILT**



**SOUTH WINGWALL (WITHOUT SIDEWALK)**

**NORTH WINGWALL (WITH SIDEWALK)**

DESIGNED					
DRAWN					
CHECKED	I	As Built	TEM.	9-75	
IN CHARGE	NO.	REVISION	BY	DATE	

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

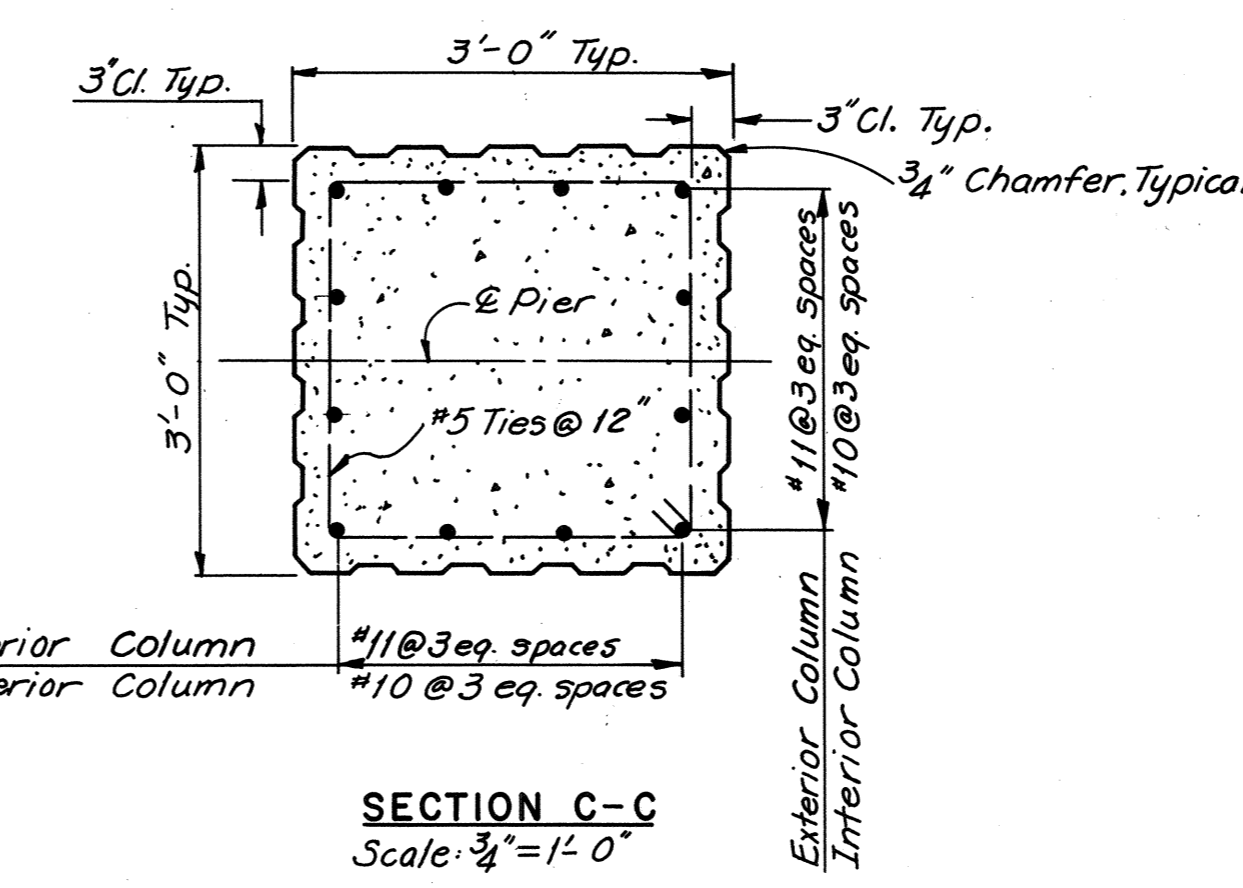
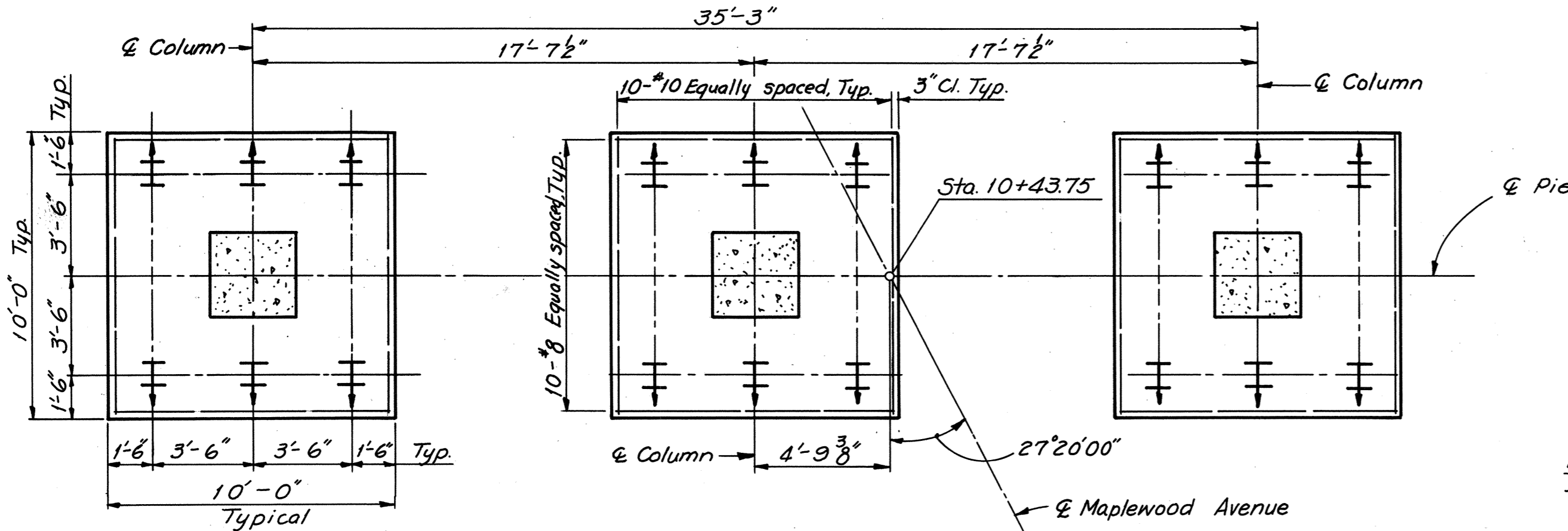
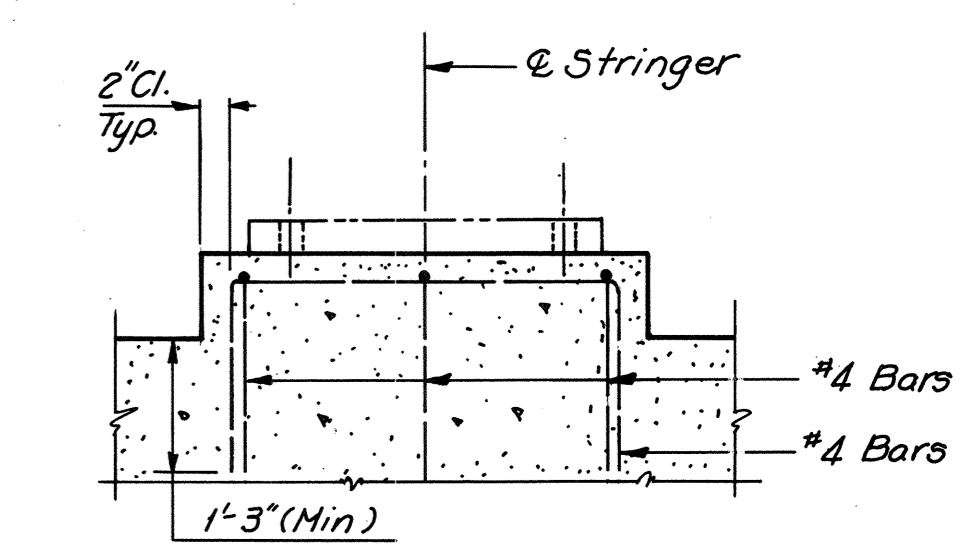
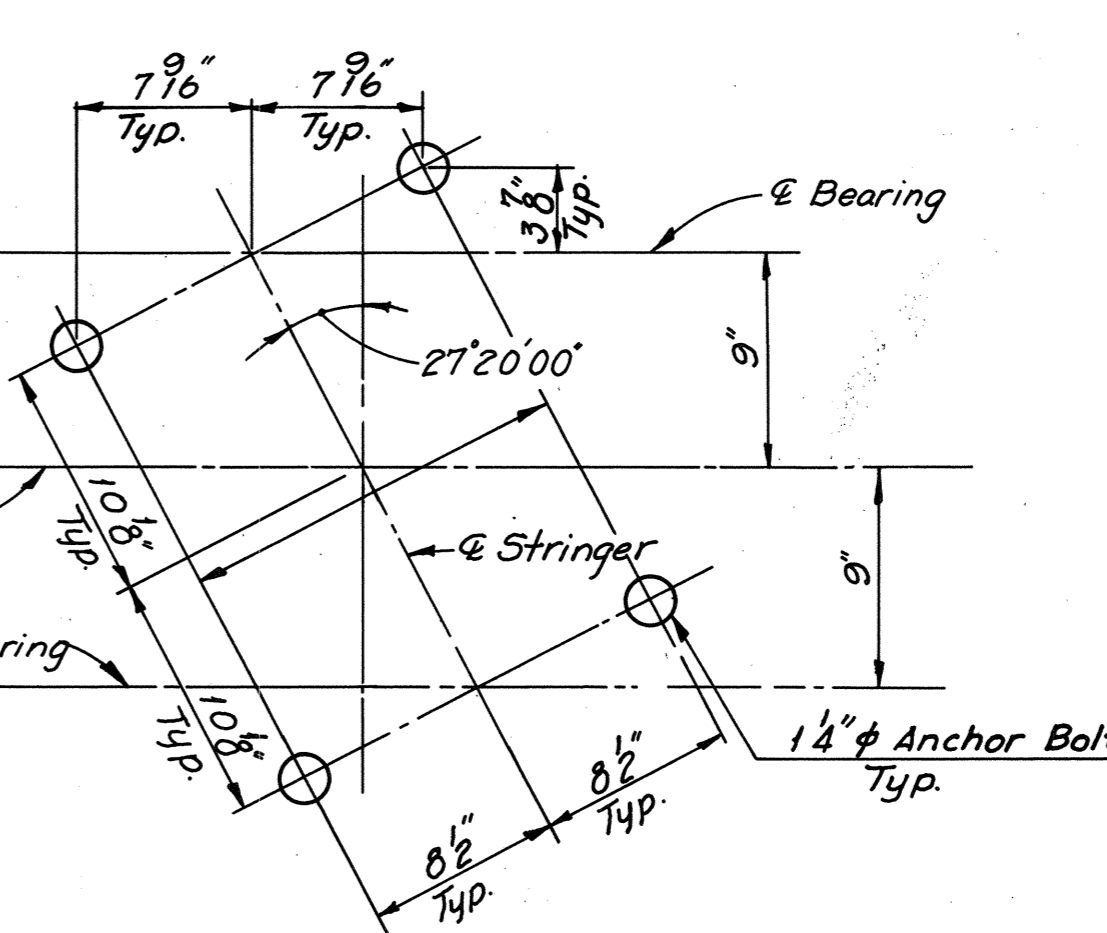
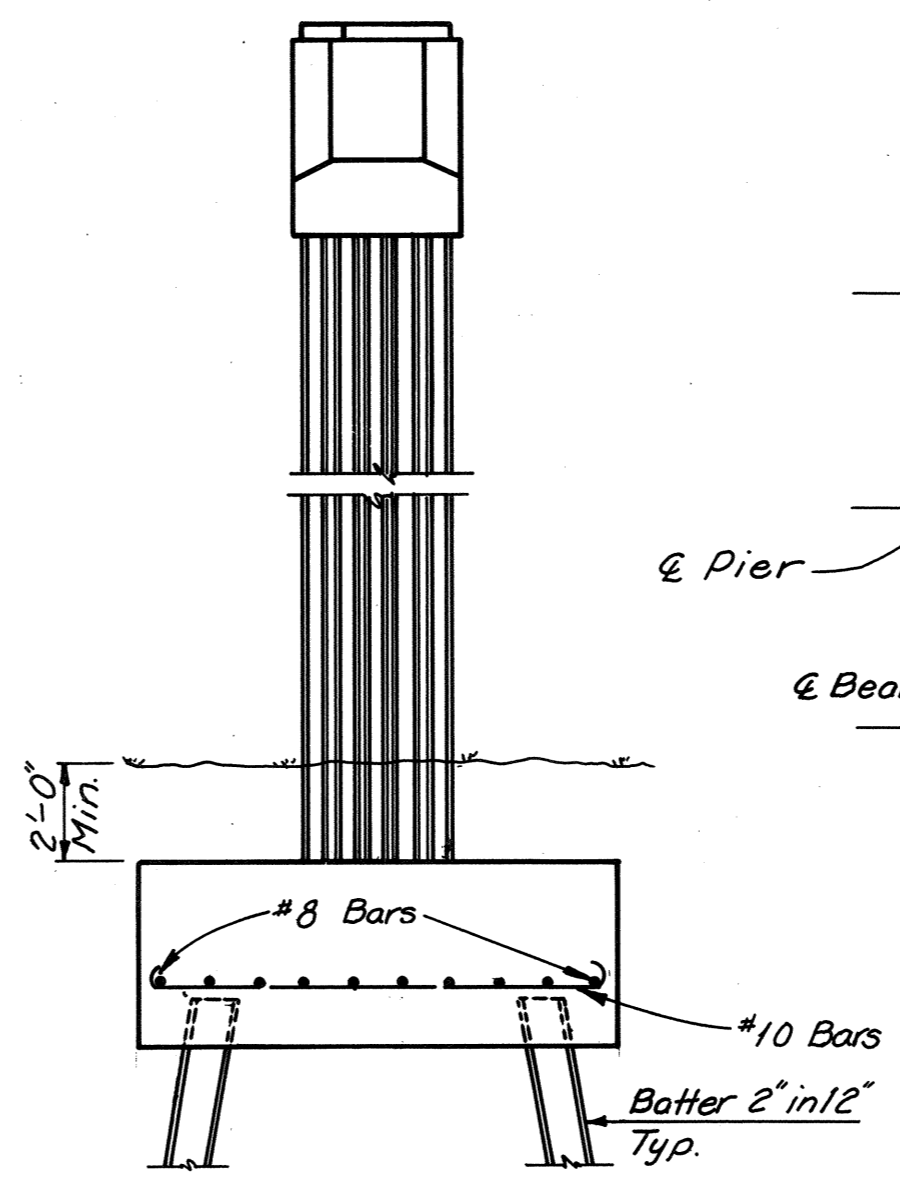
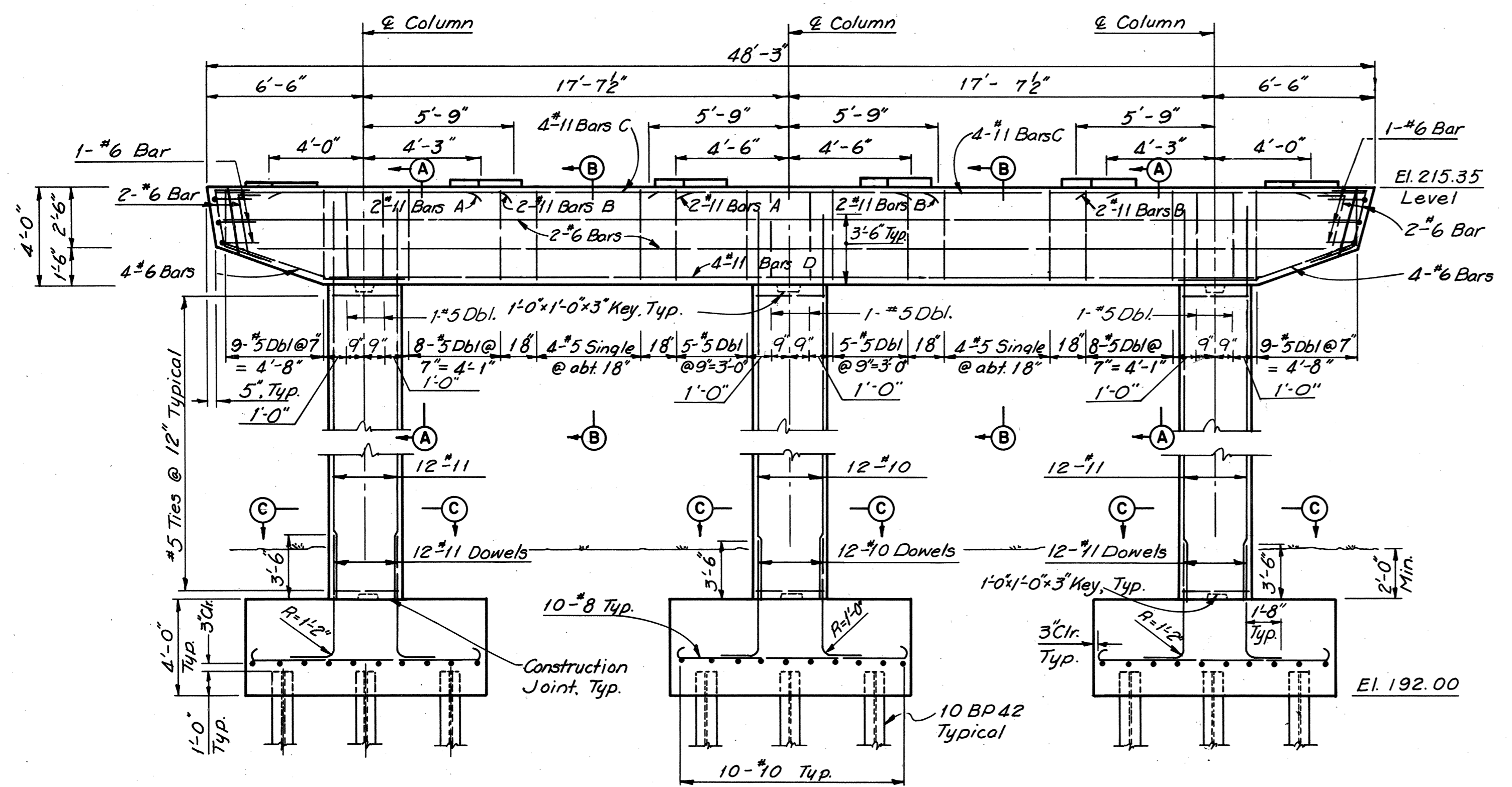
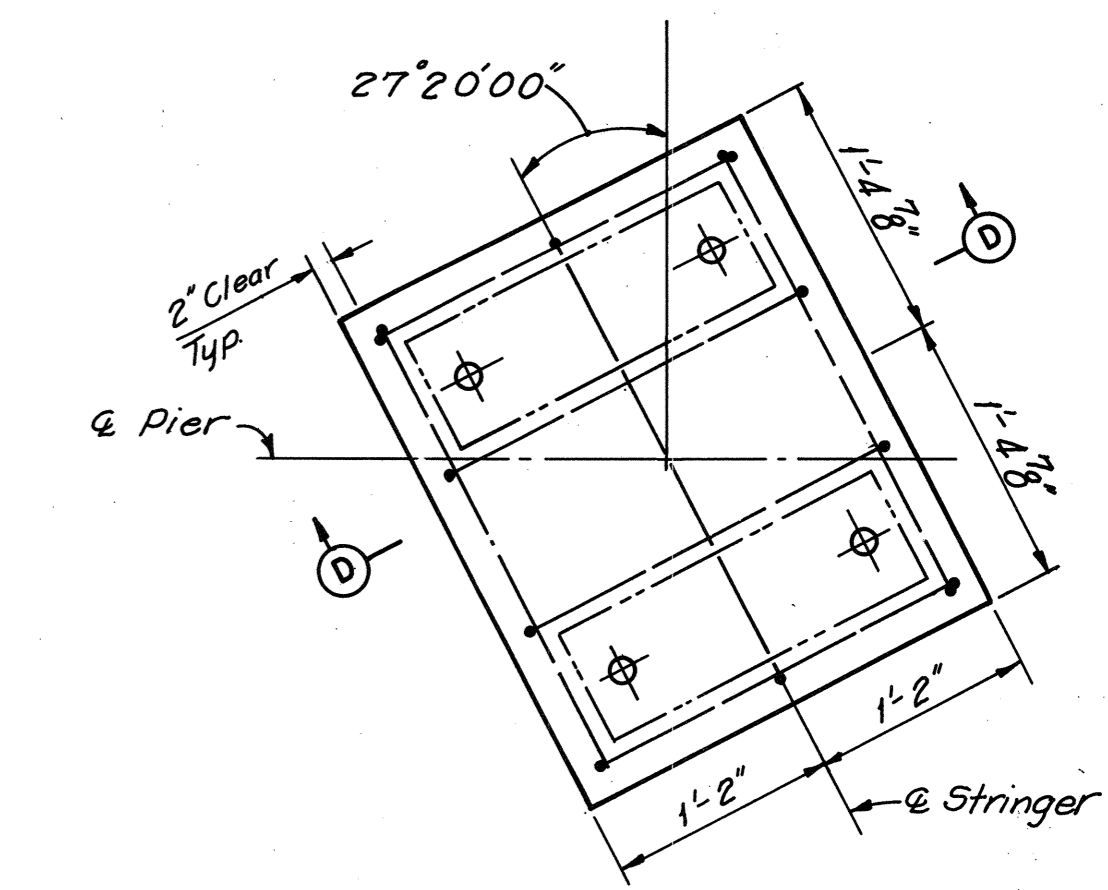
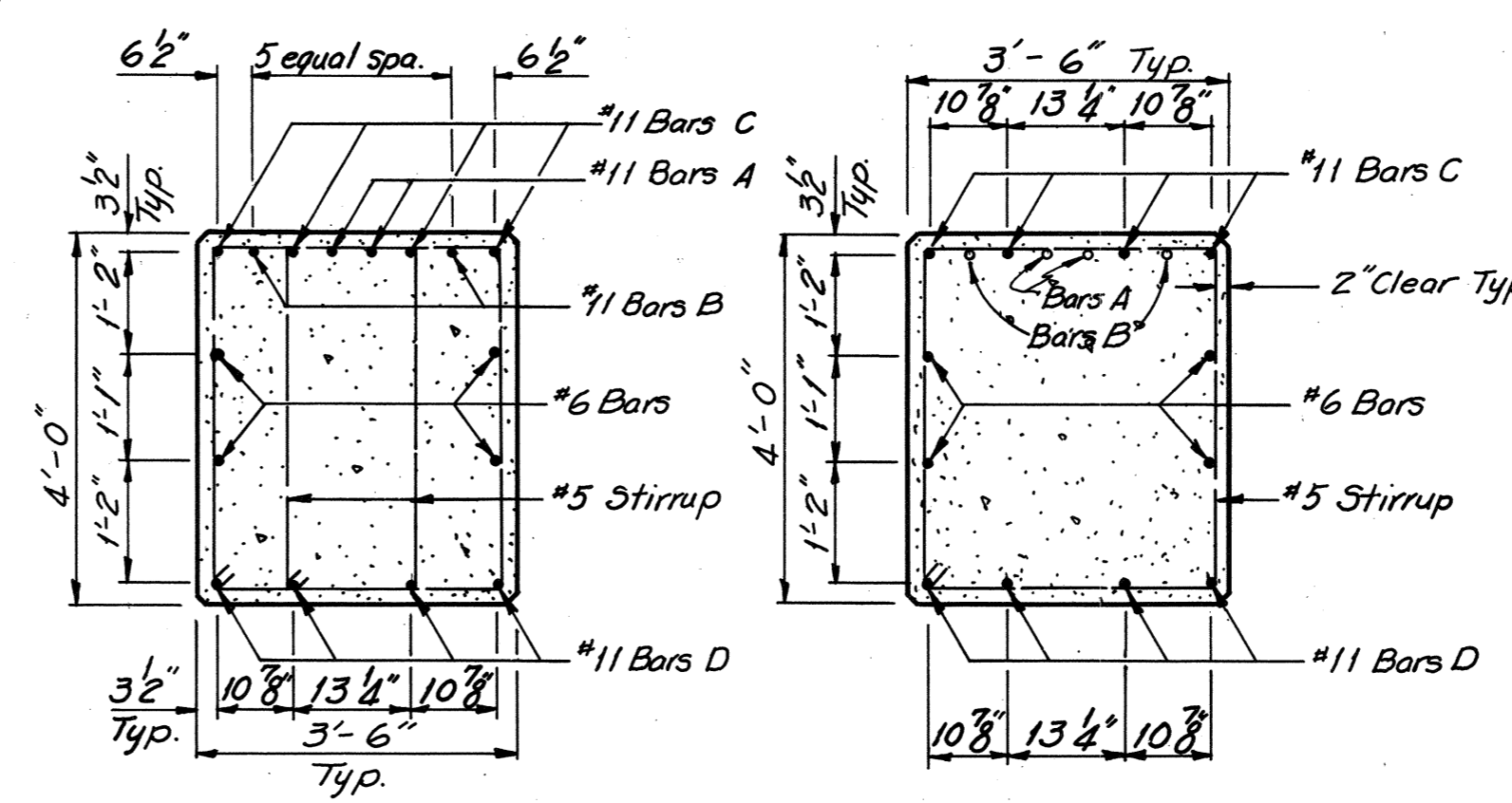
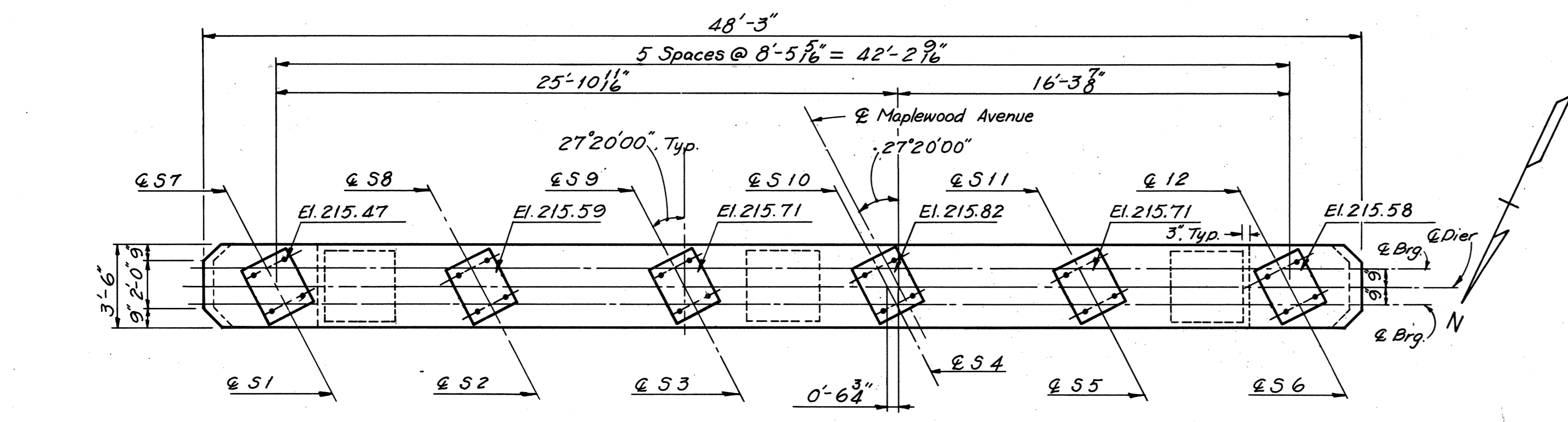
BRIDGE NO. 36  
 NORTHBOUND ROADWAY OVER EAST-SOUTH ROADWAY  
**ABUTMENT DETAILS**

SCALE:  
 CONTRACT No: 7  
 SHEET No. **4** OF **10**

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 consulting engineers  
 NEW YORK ALEXANDRIA KANSAS CITY

**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	100	



Notes:  
 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. All piles shall be 10 BP42 (Des. cap = 45 T.)  
 Pad reinforcing is required in S3 through S5 and S9 through S11 only.

MADE	BY	DATE			
CHECKED	LCC	1-2-68			
IN CHARGE	Q.M.	2-8-68	As Built		
	R. G. C.				
NO.	REVISION	BY	DATE		

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

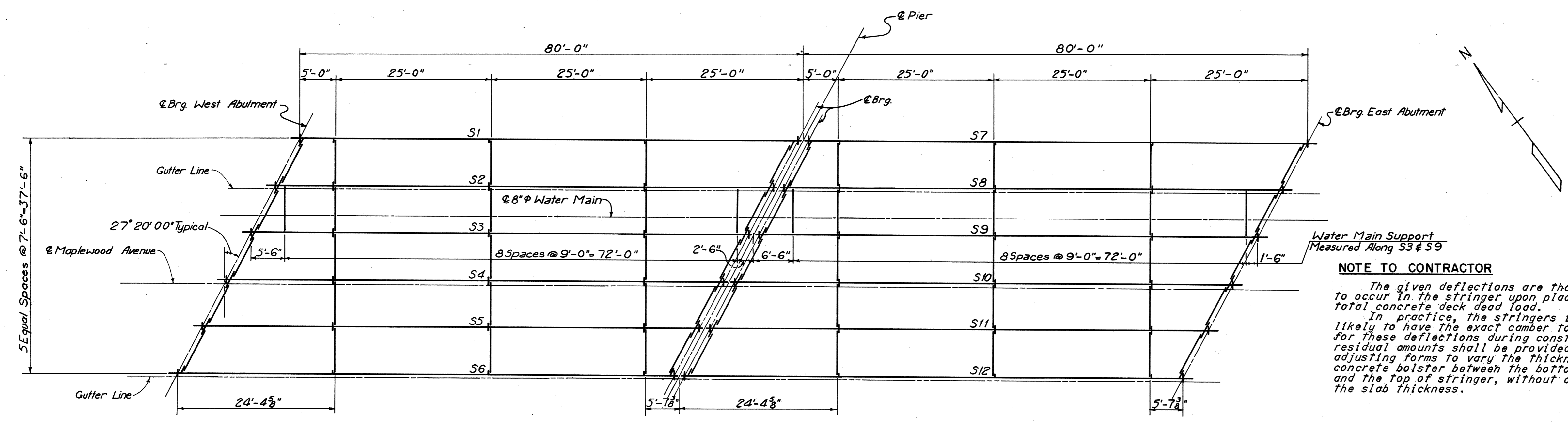
BRIDGE NO. 36  
 MAPLEWOOD AVENUE OVER  
 DOWNTOWN EXPRESSWAY  
 PIER

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 consulting engineers  
 NEW YORK ALEXANDRIA KANSAS CITY

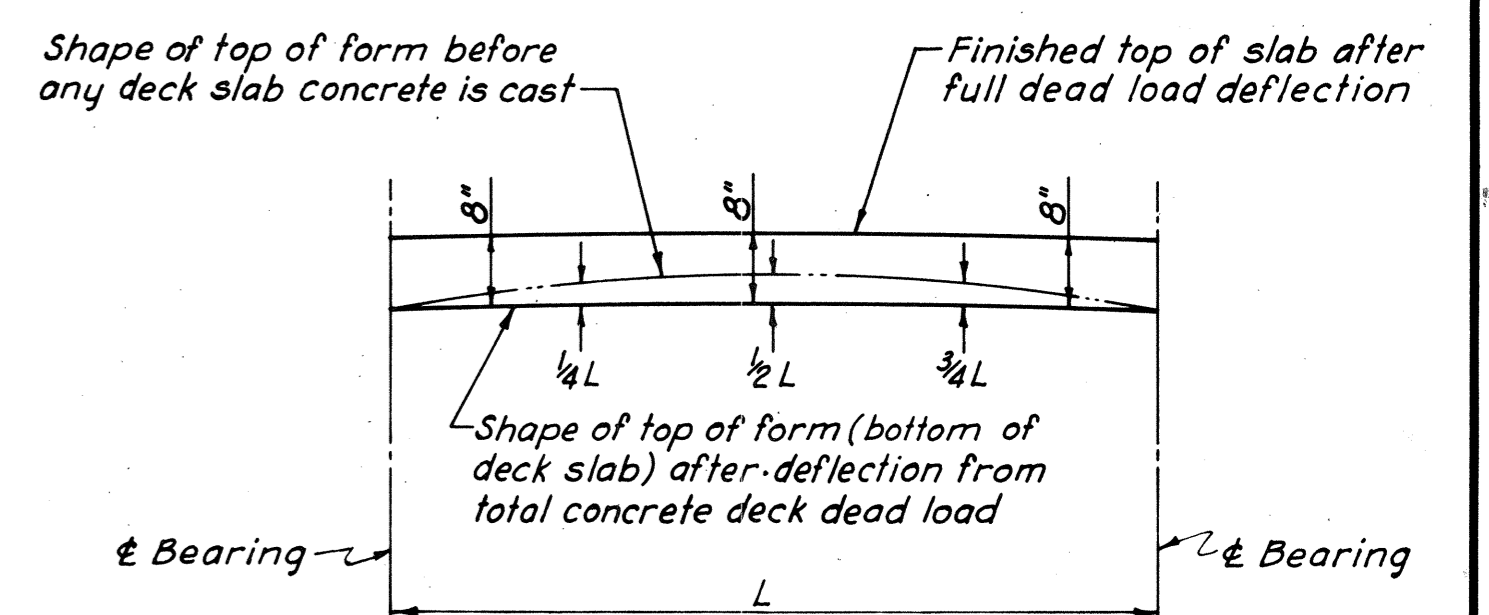
SCALE: As Noted  
 CONTRACT NO.: 7  
 SHEET NO. 5 OF 10

**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	101	



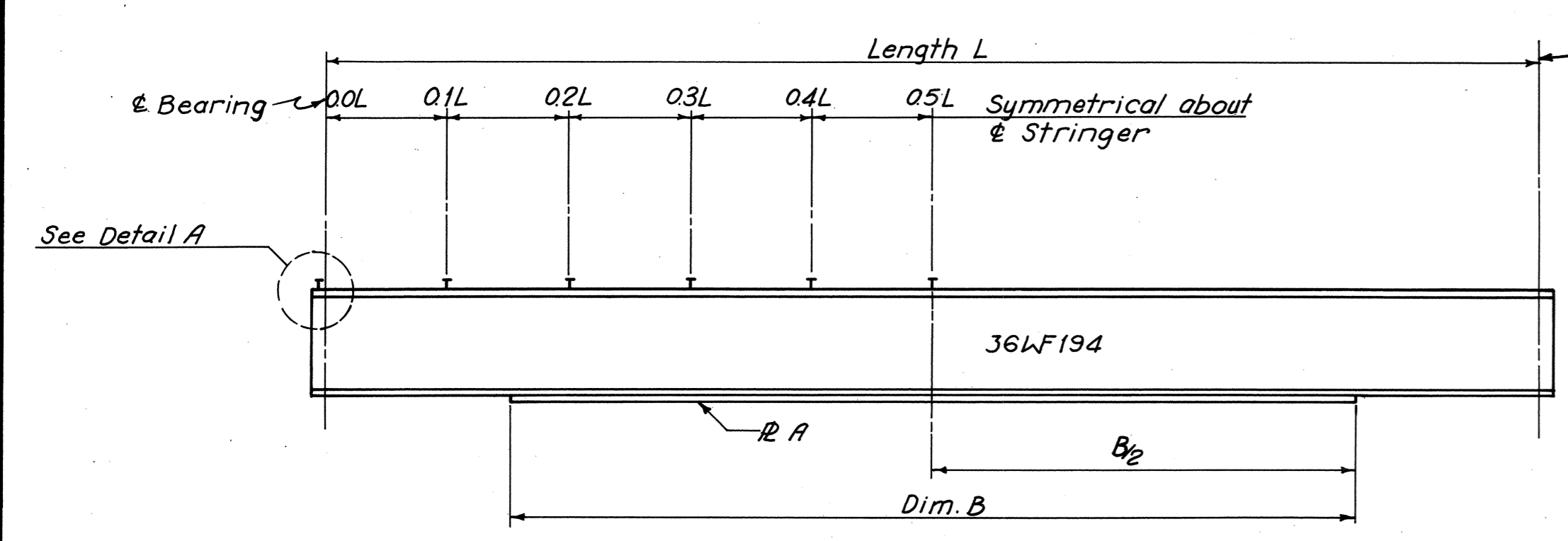
**FRAMING PLAN**  
1" = 10'-0"



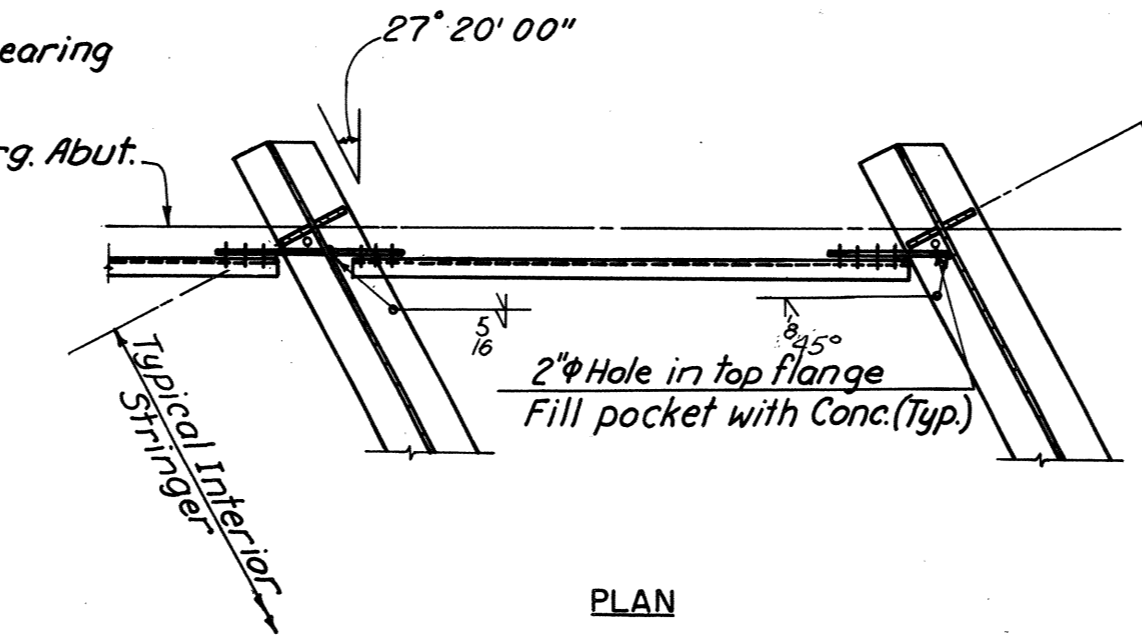
**DEAD LOAD DEFLECTION DIAGRAM**

**NOTE TO CONTRACTOR**  
The given 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 bolster between the bottom of the slab and the top of stringer, without alteration of the slab thickness.

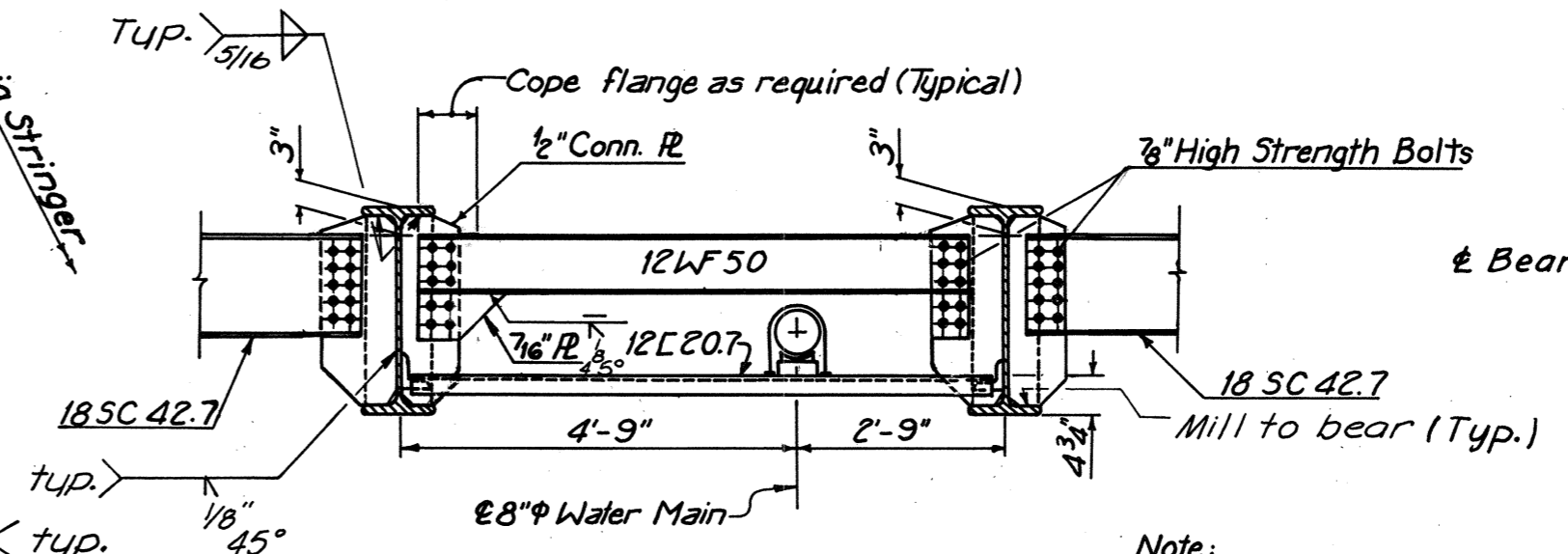
DEFLECTION SCHEDULE		
STRINGER	1/4 L & 3/4 L	1/2 L
S1	1 9/16"	2 1/8"
S2	1 9/16"	1 9/16"
S3, S4 & S5	1 1/4"	1 3/4"
S6	1 3/8"	1 9/16"
S7	1 9/16"	2 1/8"
S8	1 9/16"	1 9/16"
S9, S10 & S11	1 1/4"	1 3/4"
S12	1 3/8"	1 5/8"



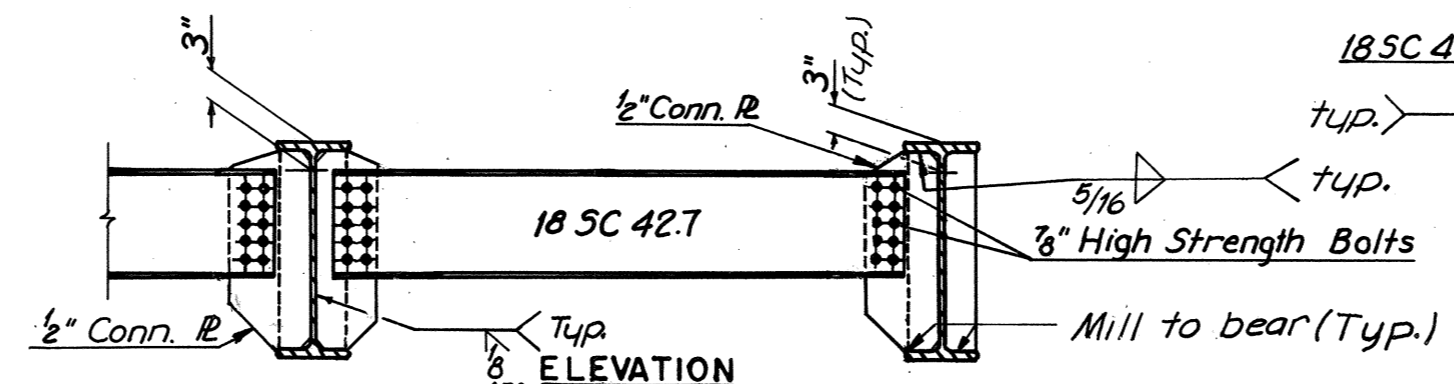
**STRINGER ELEVATION**



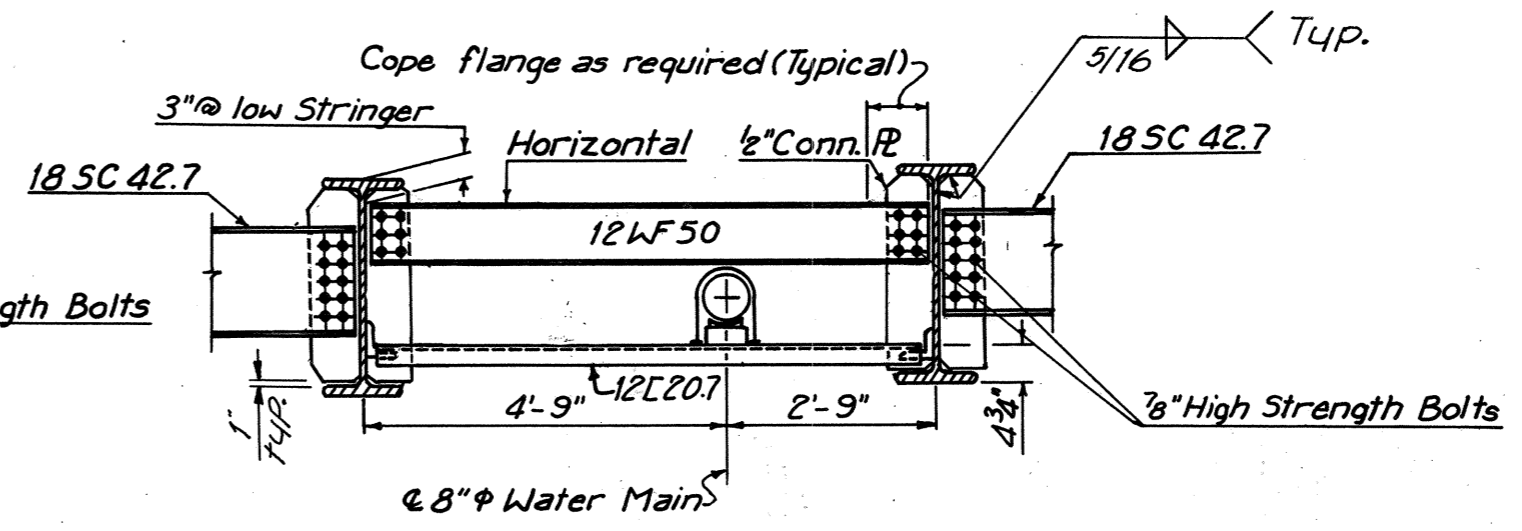
**TYPICAL END DIAPHRAGM DETAILS**  
3/8" = 1'-0"



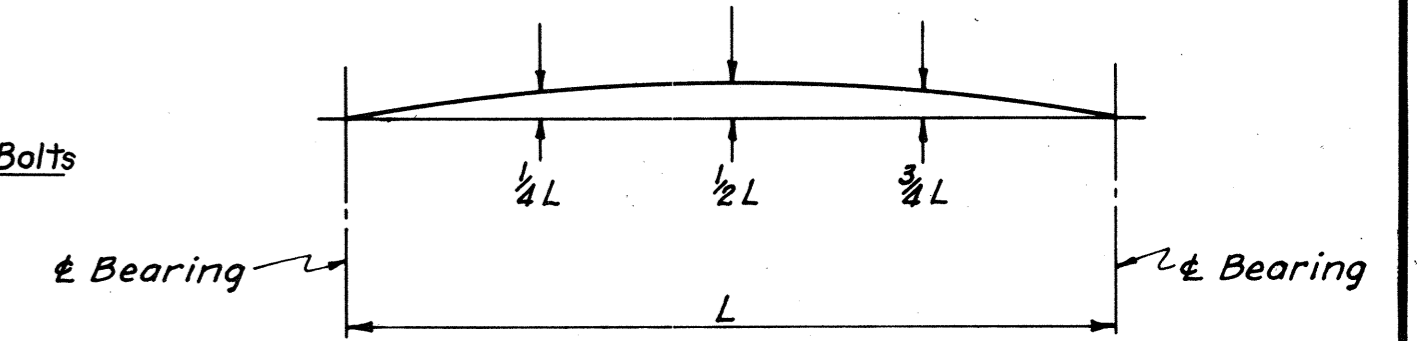
**END DIAPHRAGM DETAILS**  
(Between Stringers S2, S3 & S8, S9)  
Scale: 3/8" = 1'-0"



**TYPICAL INTERMEDIATE DIAPHRAGM**  
3/8" = 1'-0"



**INTERMEDIATE DIAPHRAGM DETAILS**  
(Between Stringers S3, S4 & S8, S9)  
Scale: 3/8" = 1'-0"



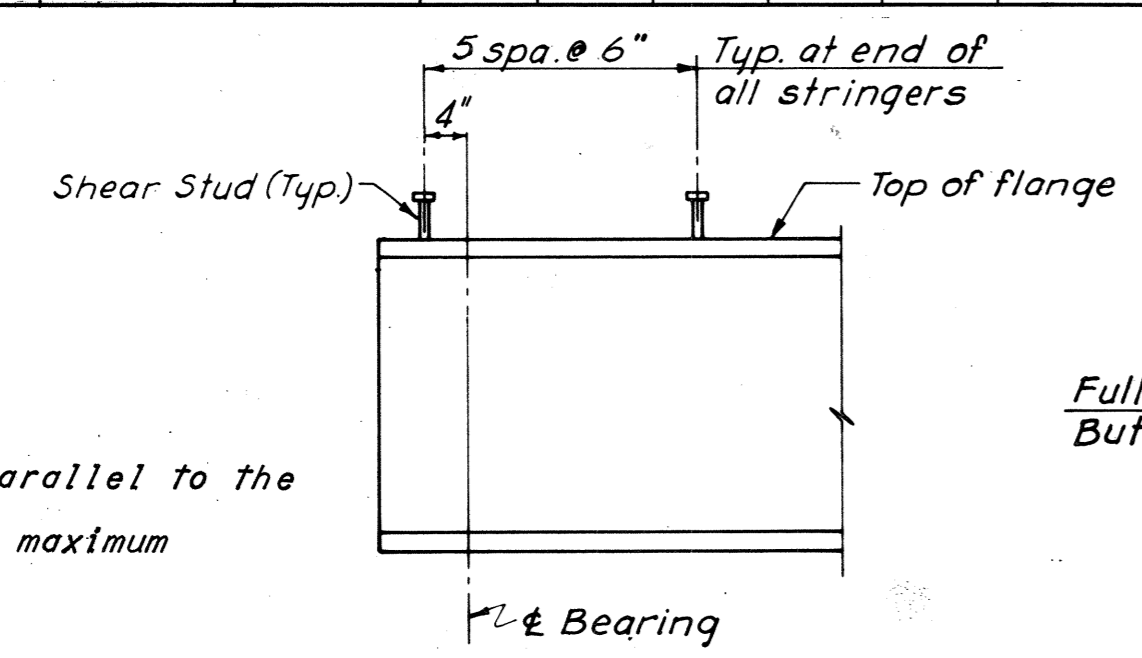
**CAMBER DIAGRAM**

CAMBER SCHEDULE		
STRINGER	1/4 L & 3/4 L	1/2 L
S1	2 1/8"	2 3/8"
S2	1 3/8"	2 9/16"
S3, S4 & S5	1 9/16"	2 11/16"
S6	1 5/8"	2 11/16"
S7	2 1/8"	2 3/8"
S8	1 3/8"	2 9/16"
S9, S10 & S11	1 9/16"	2 11/16"
S12	1 5/8"	2 11/16"

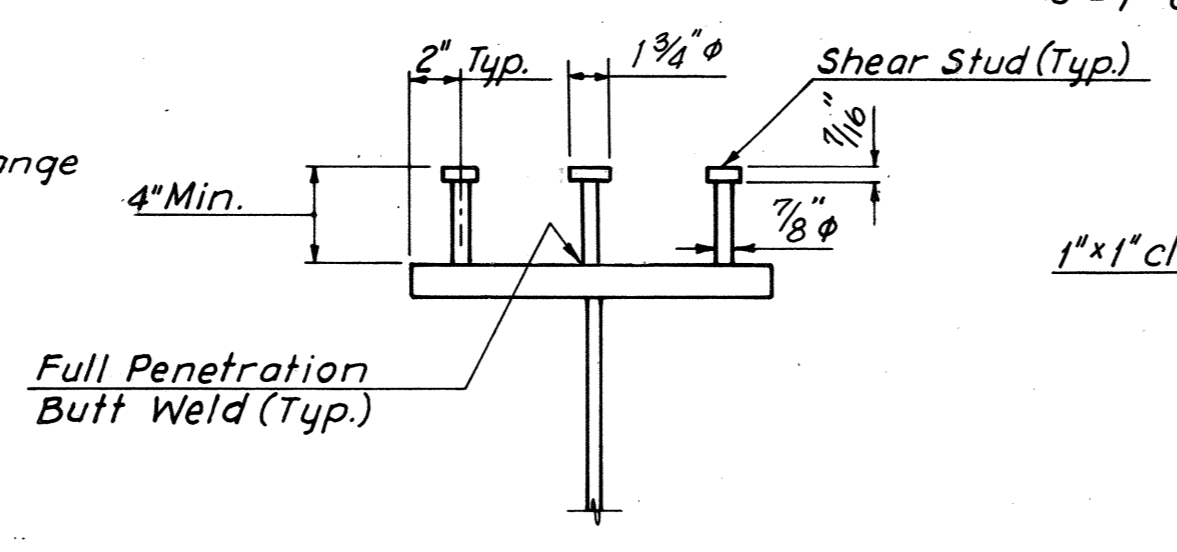
**NOTE TO FABRICATOR**  
The above stringers shall be fabricated with an upward camber amounting to the tabulated value. This will provide approximate compensation for deflection under full dead load and for conformity with finished grade. Dimensions are in inches.

STRINGER SCHEDULE										
STRINGER	LENGTH ¢ BRG. TO ¢ BRG.	R A	DIM. B	SHEAR STUD SPACING					BEARING STIFFENER	SHOE TYPE LT. END RT. END
				0L-1L	1L-2L	2L-3L	3L-4L	4L-5L		
S1	79'-1 7/8"	10 1/2" x 1 5/8"	60'	12"	15"	20"	24"	24"	5" x 5/8"	E3 F12M
S2	79'-1 7/8"	10 1/2" x 2"	68'	8"	9"	11"	14"	18"	5" x 5/8"	E3 F12
S3, S4 & S5	79'-1 7/8"	10 1/2" x 1 5/8"	64'	9"	11"	13"	15"	20"	5" x 5/8"	E3 F12
S6	79'-1 7/8"	10 1/2" x 1 5/8"	64'	9"	11"	13"	15"	20"	5" x 5/8"	E3 F12M
S7	79'-1 7/8"	10 1/2" x 1 5/8"	60'	12"	15"	20"	24"	24"	5" x 5/8"	F12M E3
S8	79'-1 7/8"	10 1/2" x 2"	68'	8"	9"	11"	14"	18"	5" x 5/8"	F12 E3
S9, S10 & S11	79'-1 7/8"	10 1/2" x 1 5/8"	64'	9"	11"	13"	15"	20"	5" x 5/8"	F12 E3
S12	79'-1 7/8"	10 1/2" x 1 5/8"	64'	9"	11"	13"	15"	20"	5" x 5/8"	F12M E3

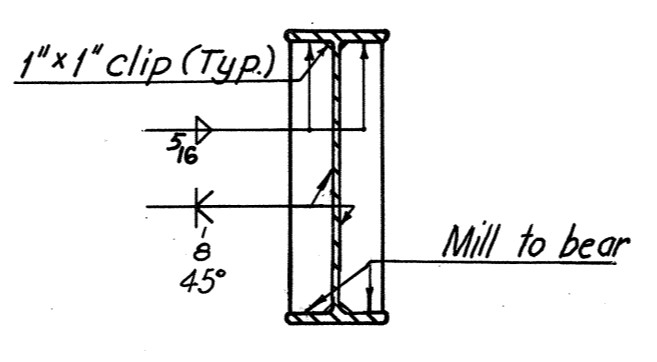
\* Denotes spacing which begins at termination of 5 spaces at 6".



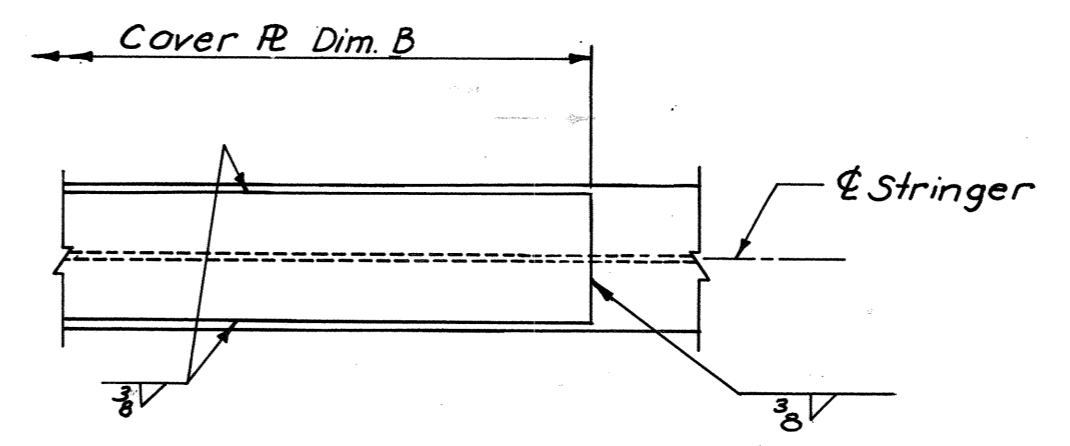
**DETAIL "A"**



**SHEAR STUD DETAIL**



**BEARING STIFFENER**  
1/2" = 1'-0"



**COVER PLATE DETAIL**  
No Scale

**SHEAR STUD NOTES**  
Stud rows shall be placed parallel to the main deck reinforcing. Shear stud spacing shown is maximum spacing.

BY	DATE			
MADE	Q.M. 11-20-67			
CHECKED	LCC 1-22-68	As Built		
IN CHARGE	R.G.C.	NO.	REVISION	BY DATE

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

**BRIDGE NO. 36**  
**MAPLEWOOD AVENUE OVER**  
**DOWNTOWN EXPRESSWAY**  
**FRAMING PLAN**

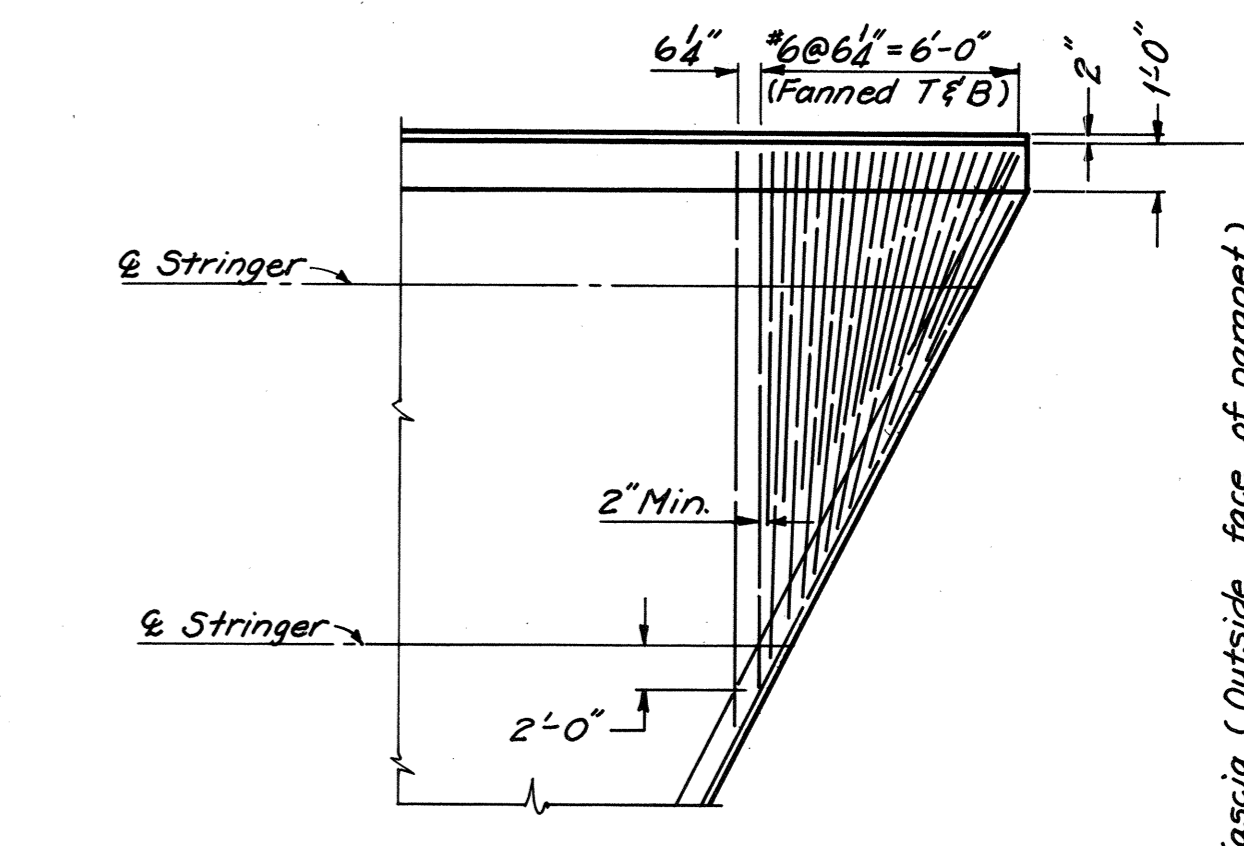
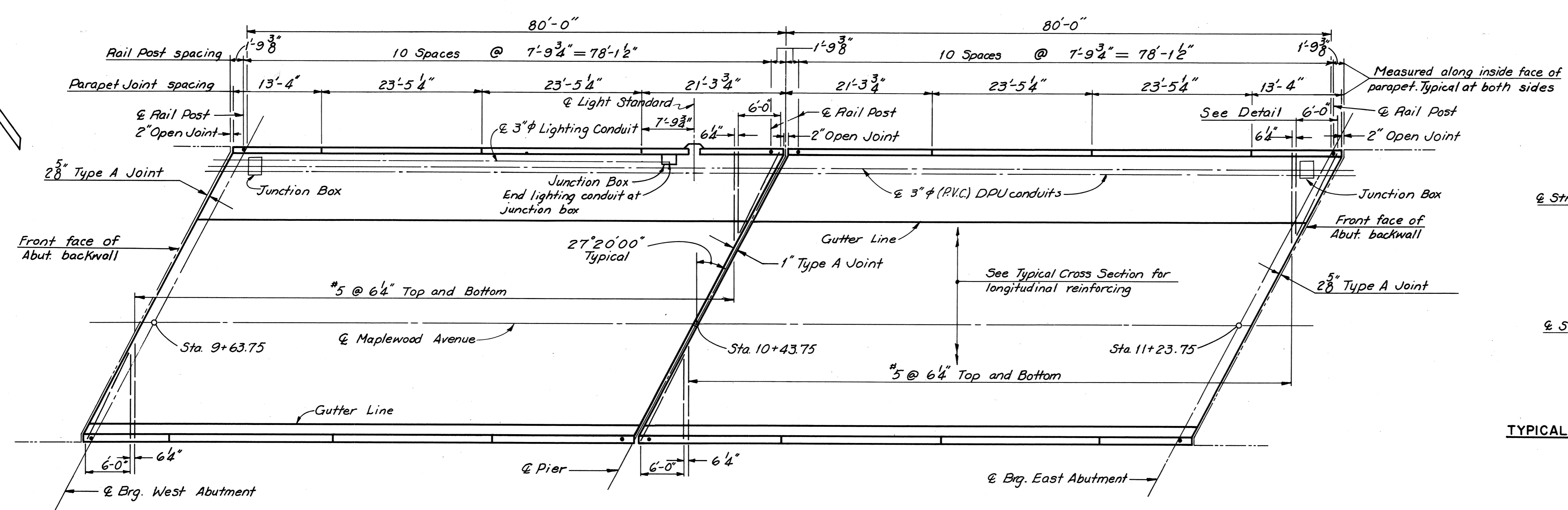
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: As Shown  
CONTRACT NO. 7  
SHEET NO. 6 of 10

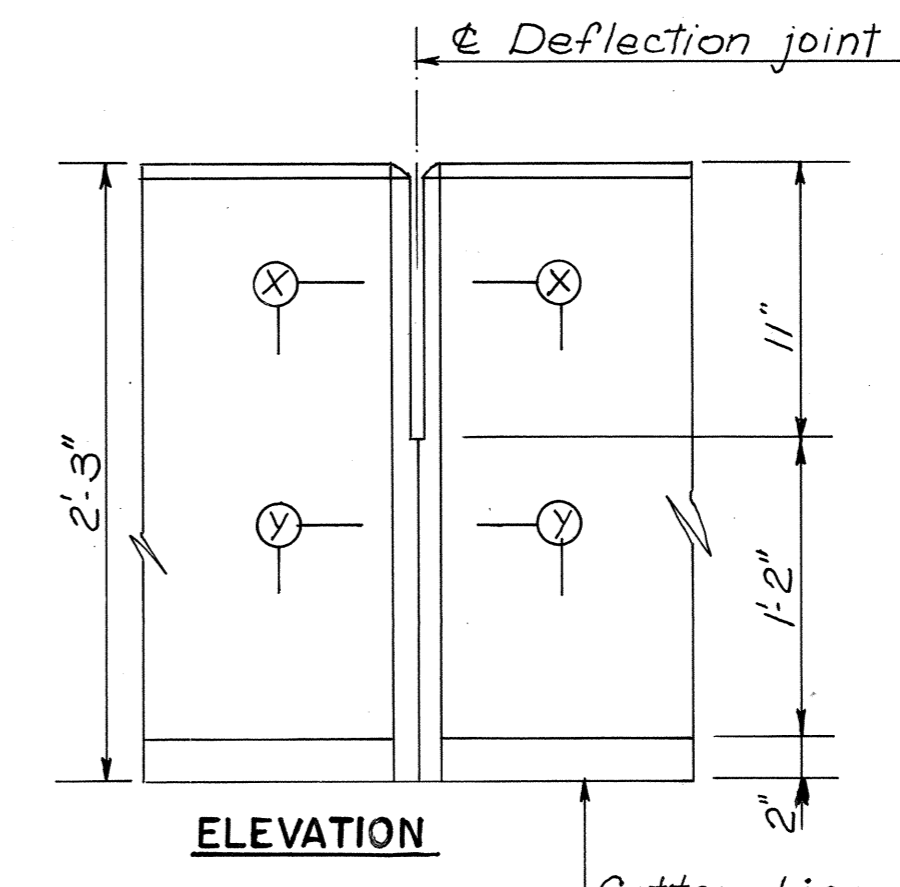
**AS BUILT**



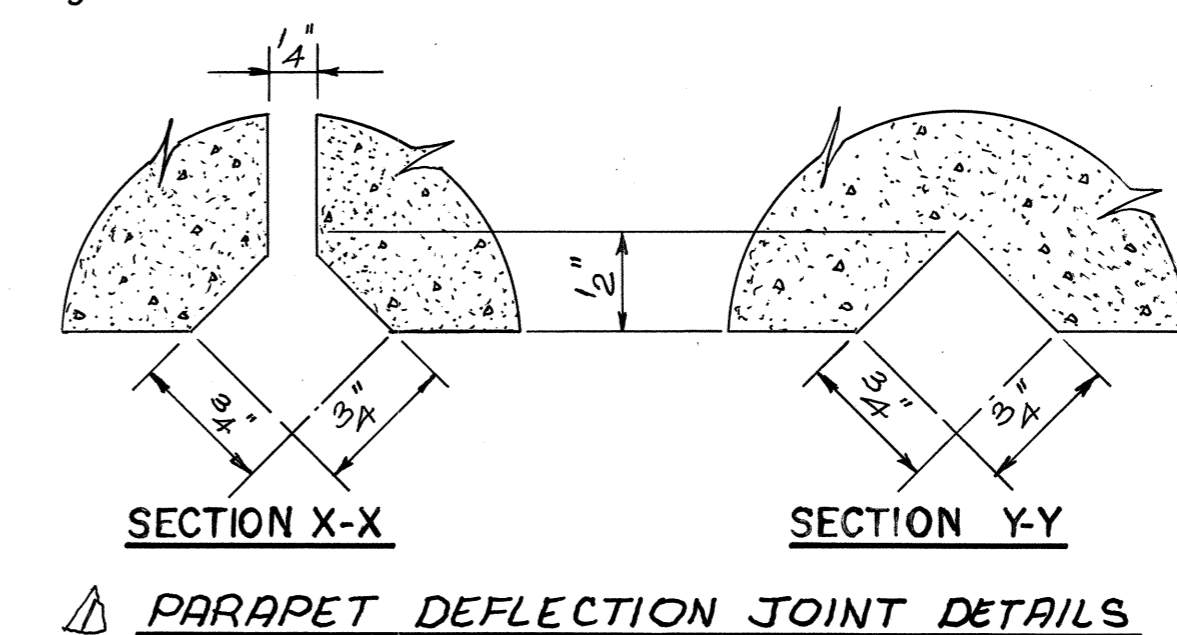
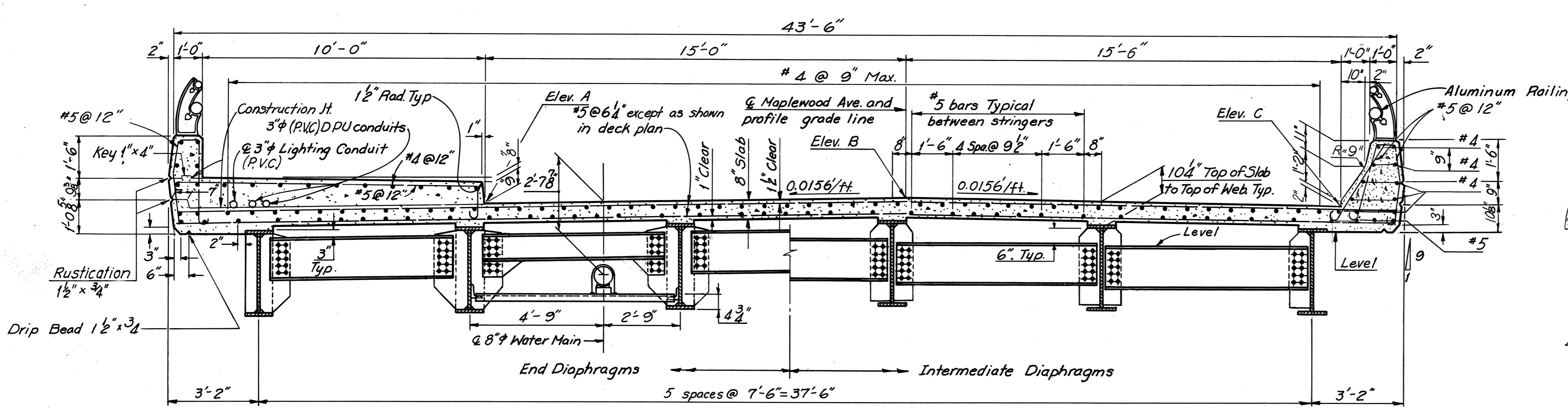
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	102	



3 Junction Boxes  
2 each 2'-0" x 1'-11"  
1 each 2'-0" x 1'-1/2"



ROADWAY ELEVATIONS			
LOCATION	ELEV. A	ELEV. B	ELEV. C
Front Face W. Abut. BKwall	218.89	218.93	218.47
1/4 Point	219.32	219.41	219.00
1/2 Point	219.62	219.76	219.40
3/4 Point	219.80	219.98	219.67
Center Line Pier	219.86	220.08	219.82
1/4 Point	219.78	220.06	219.84
1/2 Point	219.59	219.91	219.74
3/4 Point	219.27	219.64	219.51
Front Face E. Abut. BKwall	218.82	219.24	219.16



Notes:  
Minimum splice length for #4 bar is 1'-3" and #5 bar is 1'-7"  
For details of water main support, see Standard Gas and Water Main Support Details Sheet S11.  
For Lighting details and DPU conduit details, see Standard Electrical Details (Bridge Carrying City Street) Sheet S4.

BY	DATE	REVISION	BY	DATE
MADE	LCC 11-14-67	2	As Built	TEM 9-75
CHECKED	Q.M. 2-9-68	1	PARAPET JOINT ADDED.	T.E.M. 7-74
IN CHARGE	R. G. C.			

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

BRIDGE NO. 36  
MAPLEWOOD AVENUE OVER  
DOWNTOWN EXPRESSWAY

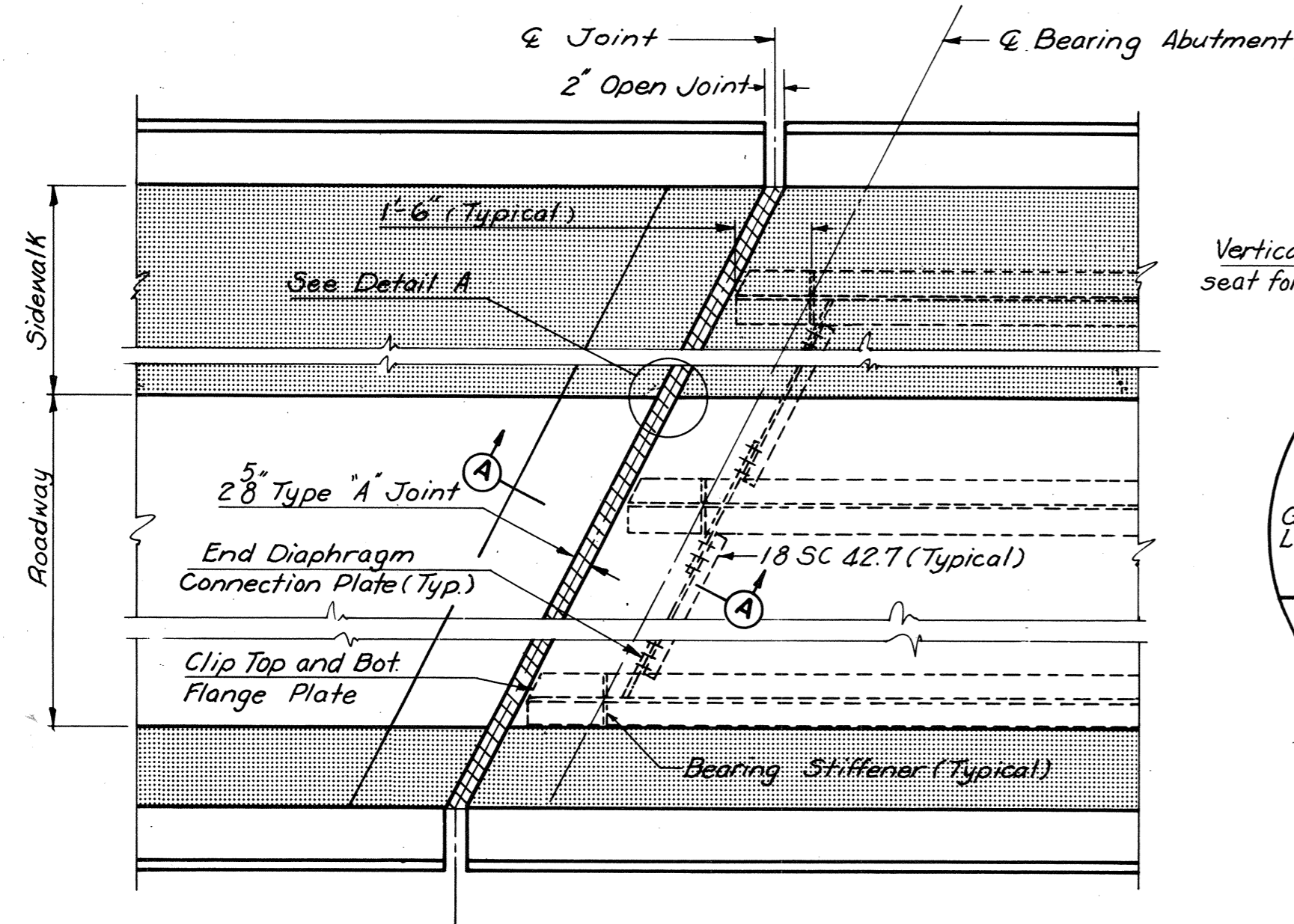
DECK PLAN AND CROSS SECTION

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SCALE: As Noted  
CONTRACT NO. 7  
SHEET NO. 7 OF 10

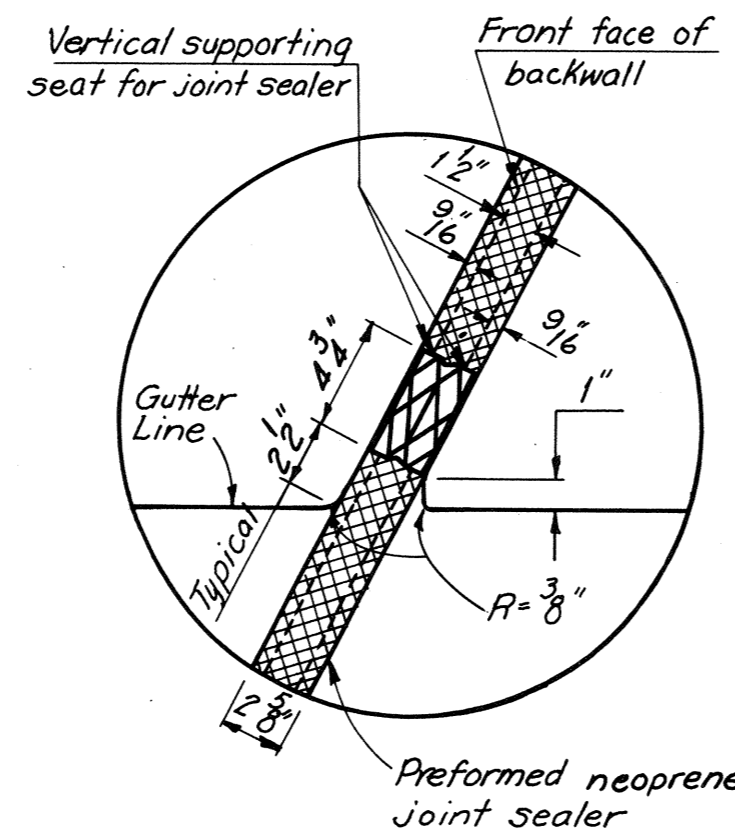
**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	103	

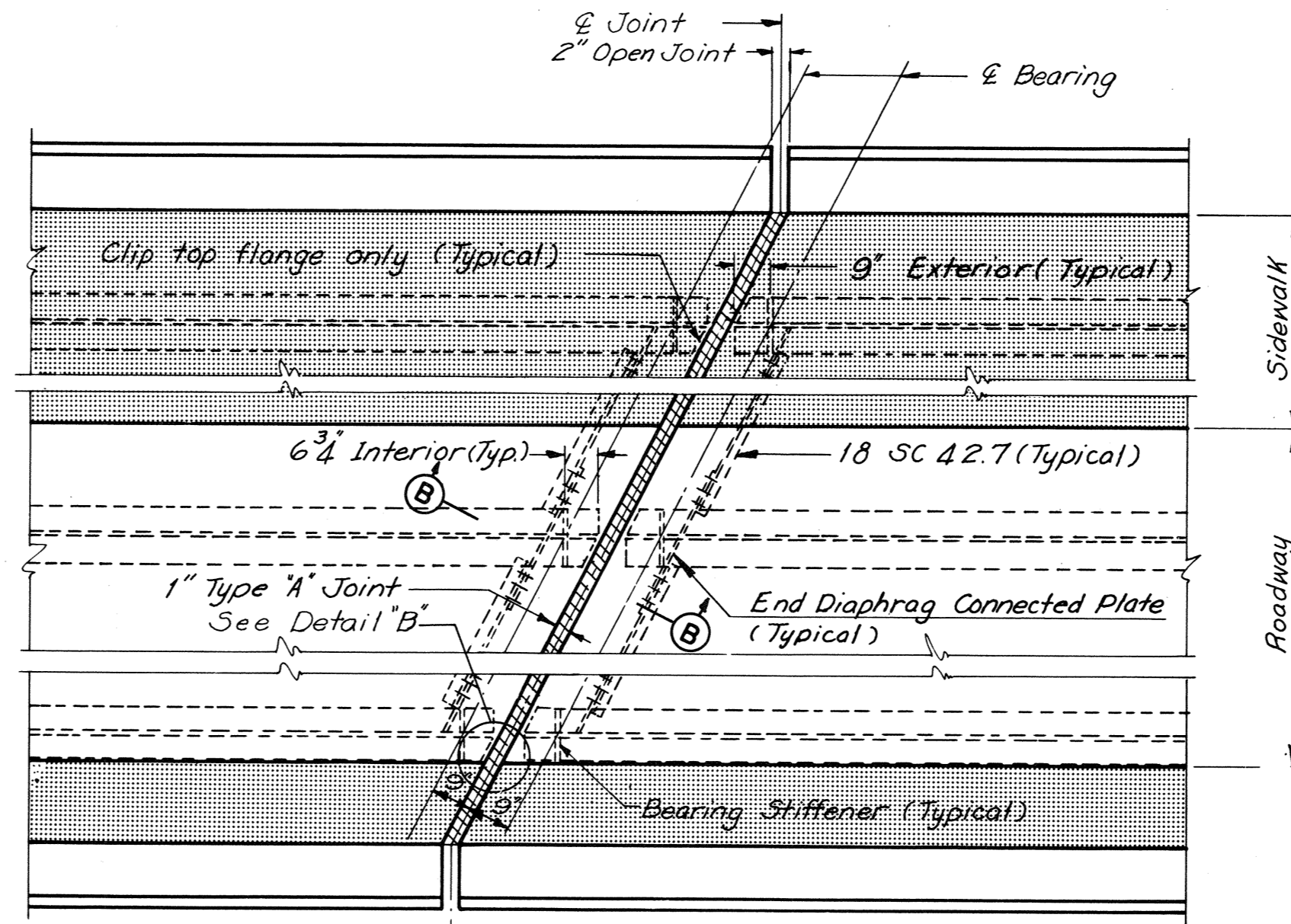


PLAN-JOINT AT WEST ABUTMENT  
No Scale

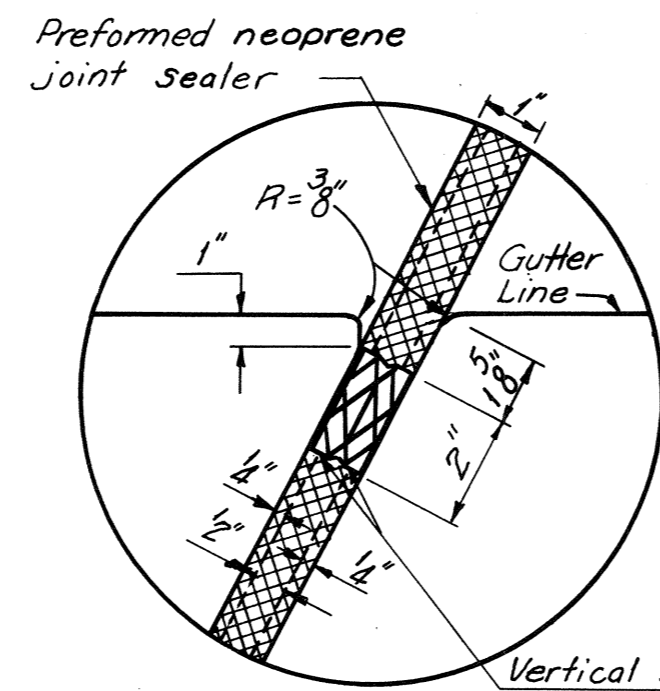
Note: Joint at East Abutment is similar to the one at West Abutment.



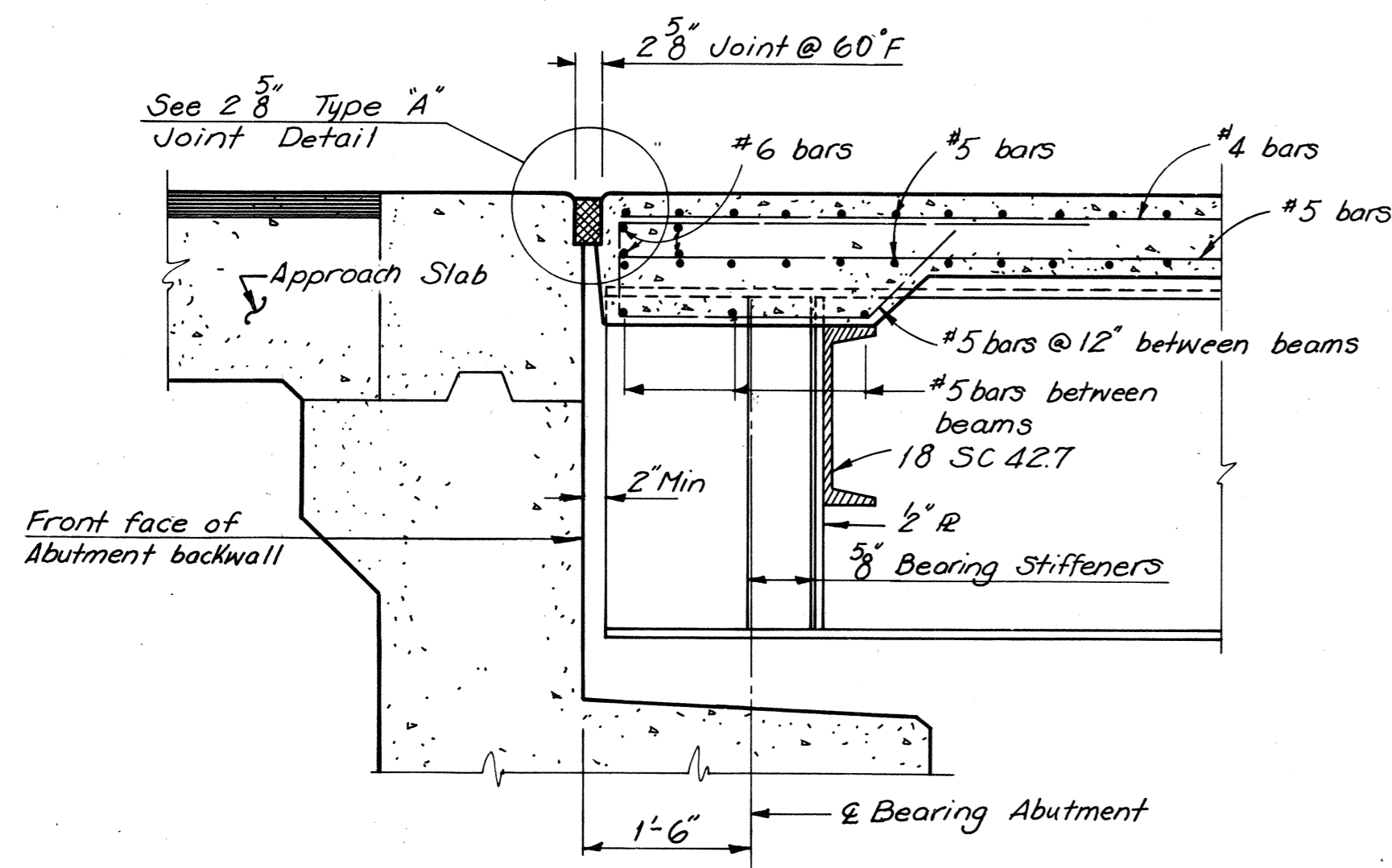
DETAIL "A"  
No Scale



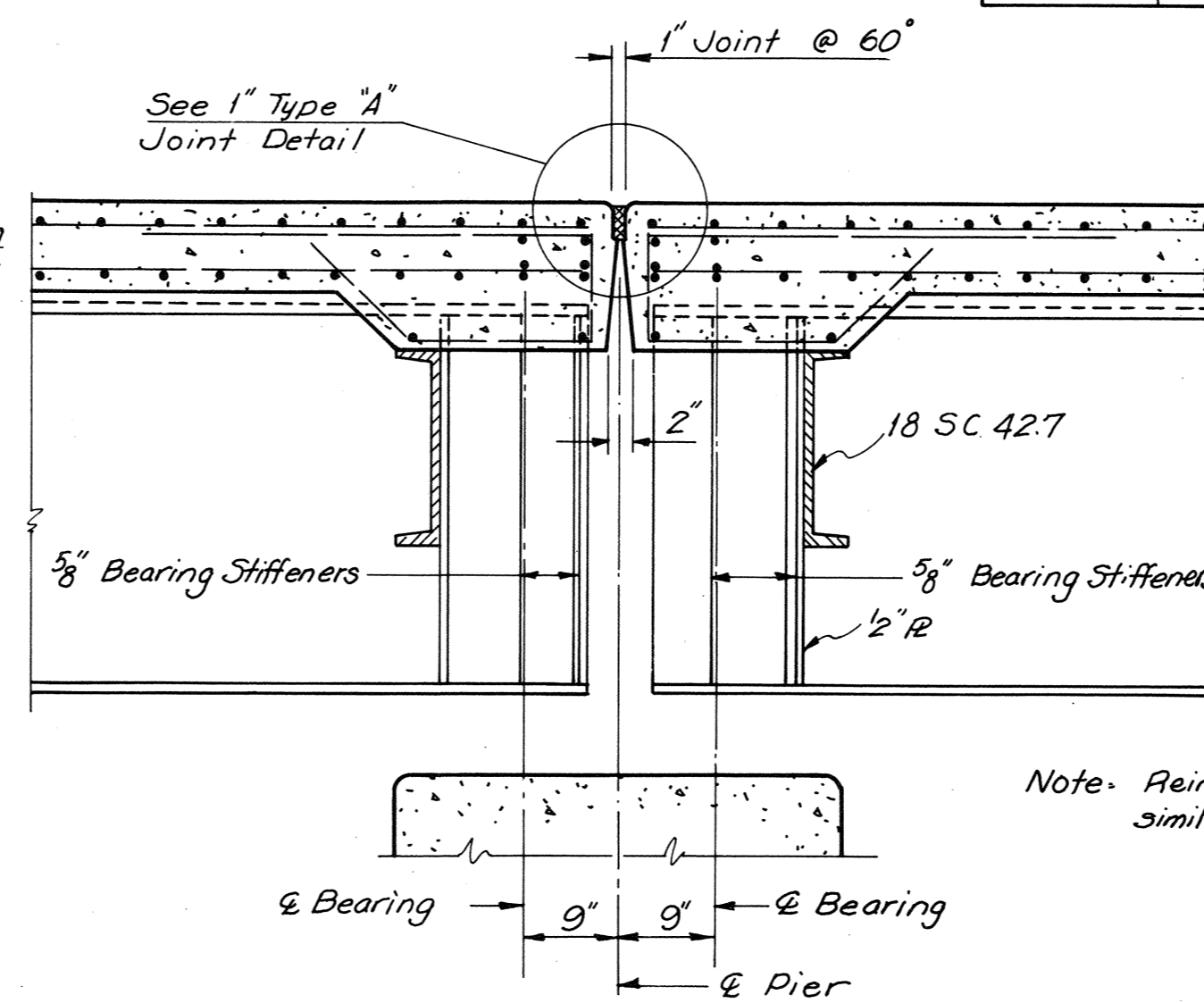
PLAN-JOINT AT PIER  
No Scale



DETAIL "B"  
No Scale

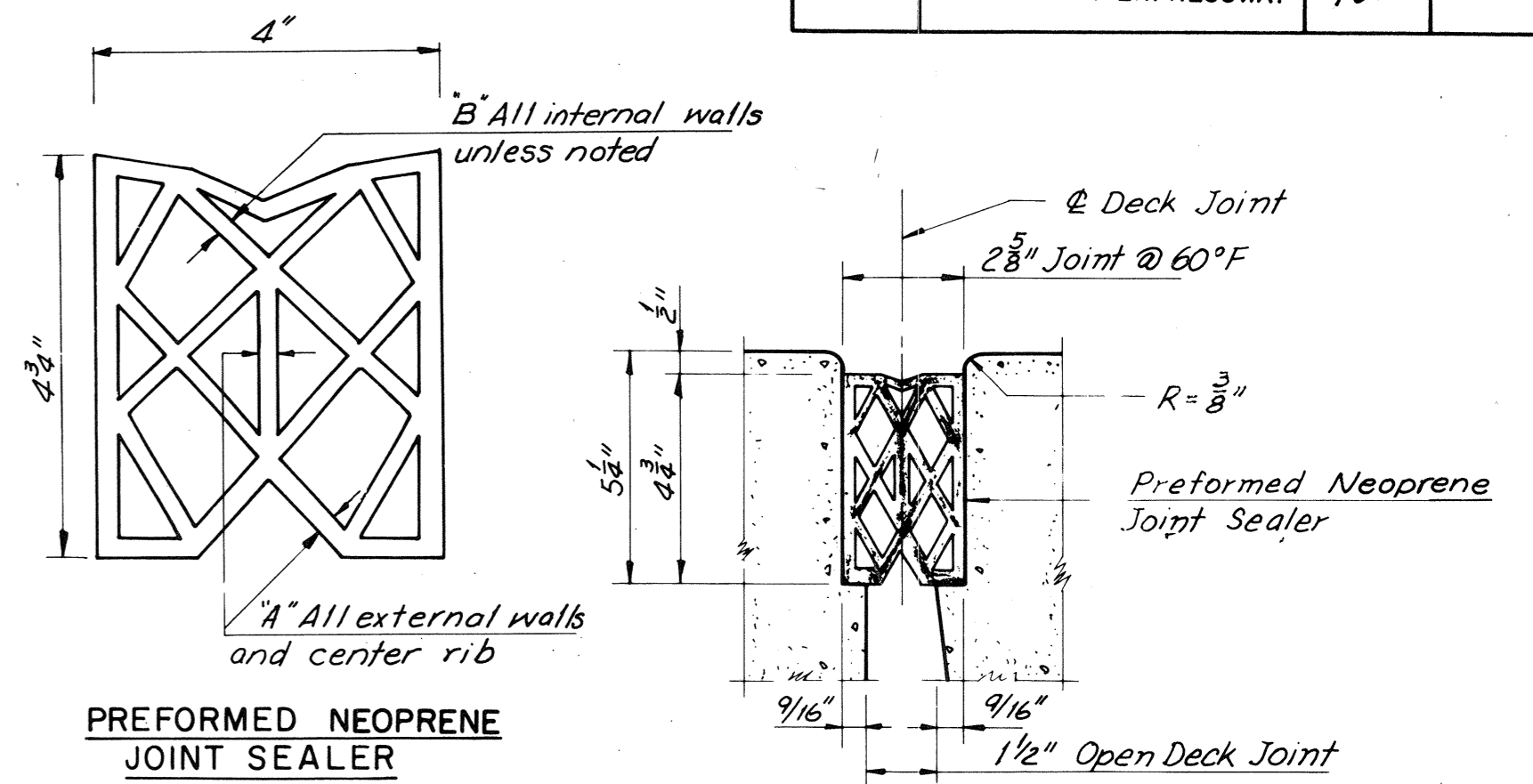


SECTION A-A  
Scale: 3/4" = 1'-0"



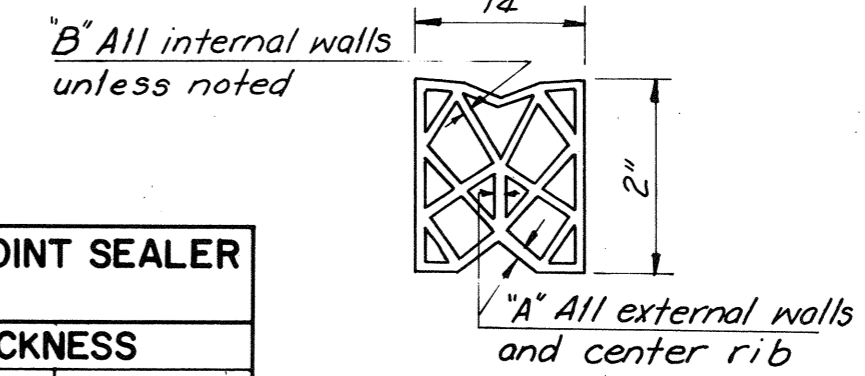
SECTION B-B  
Scale: 3/4" = 1'-0"

Note: Reinforcing steels are similar to Section A-A.

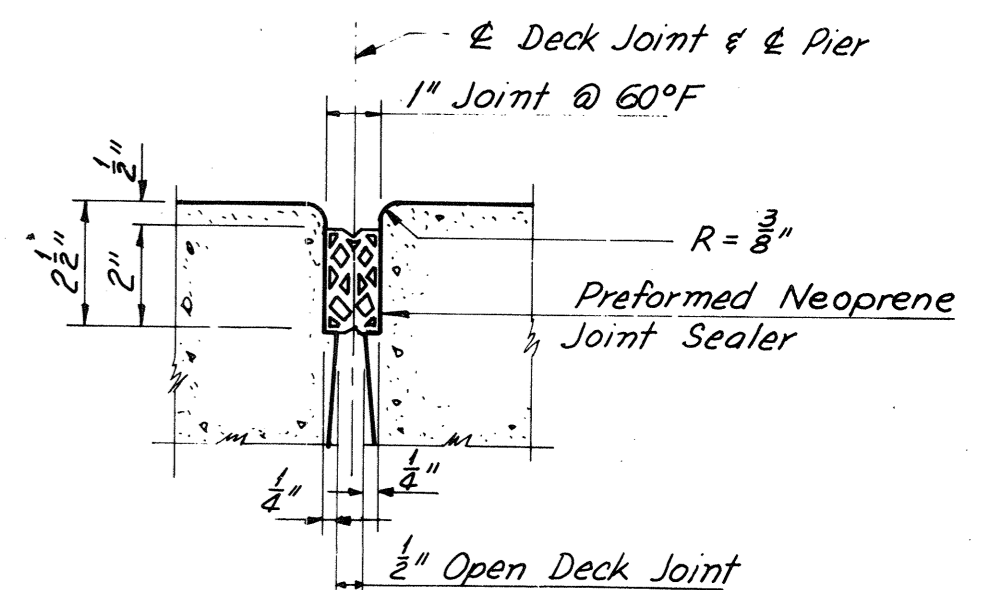


PREFORMED NEOPRENE JOINT SEALER FOR 258" TYPE "A" JOINT  
Scale: Half Size

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

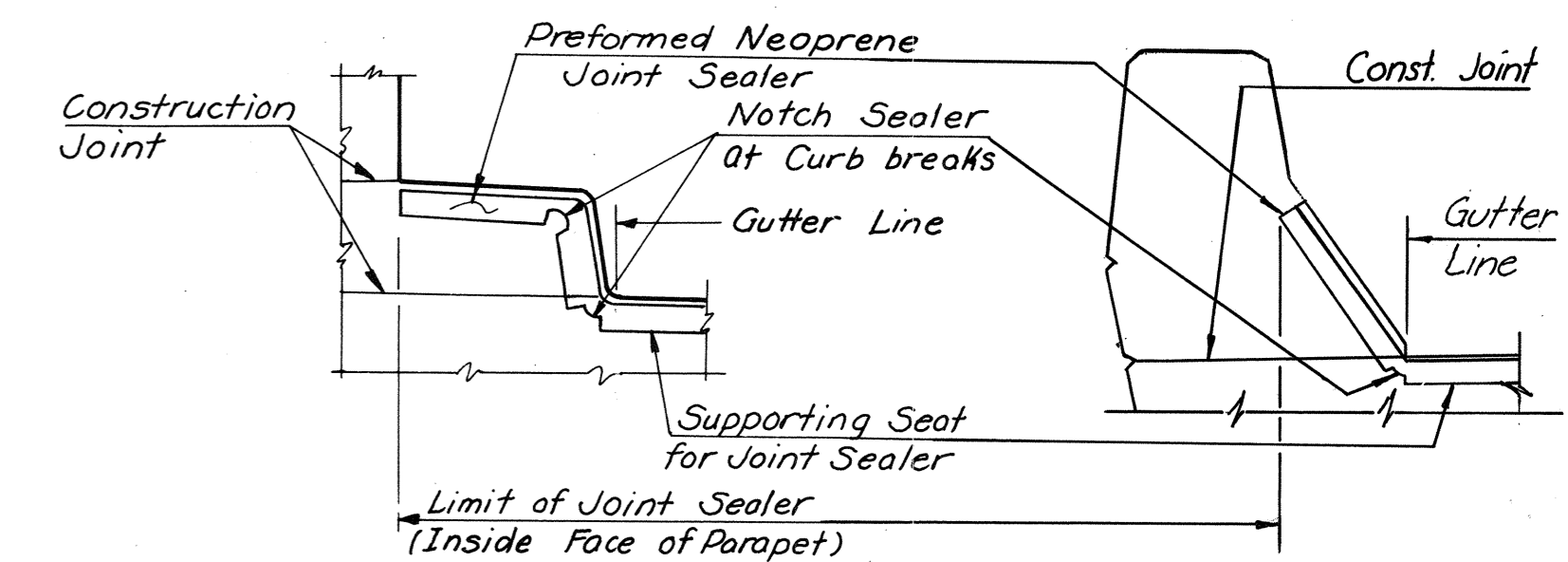


PREFORMED NEOPRENE JOINT SEALER FOR 1" TYPE "A" JOINT  
Scale: Half Size



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

PREFORMED NEOPRENE JOINT SEALER TOLERANCES				
WIDTH	HEIGHT	THICKNESS		
		A	B	
1 3/4" + 3/16" - 0"	2" ± 8"	1/8" + 1/32" - 1/64"	3/32" + 1/64" - 3/32"	
4" + 5/16" - 0"	4 3/4" ± 1/4"	1/4" + 3/64" - 1/32"	3/16" + 3/64" - 1/64"	



TREATMENT OF TYPE "A" JOINT AT CURB  
No Scale

TREATMENT OF TYPE "A" JOINT AT G.M. PARAPET  
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.

**AS BUILT**

BY	DATE				
MADE	LCC	12-5-67			
CHECKED	A.M.	1-22-68	As Built		
IN CHARGE	R. G. C.				
NO.	REVISION	BY	DATE		

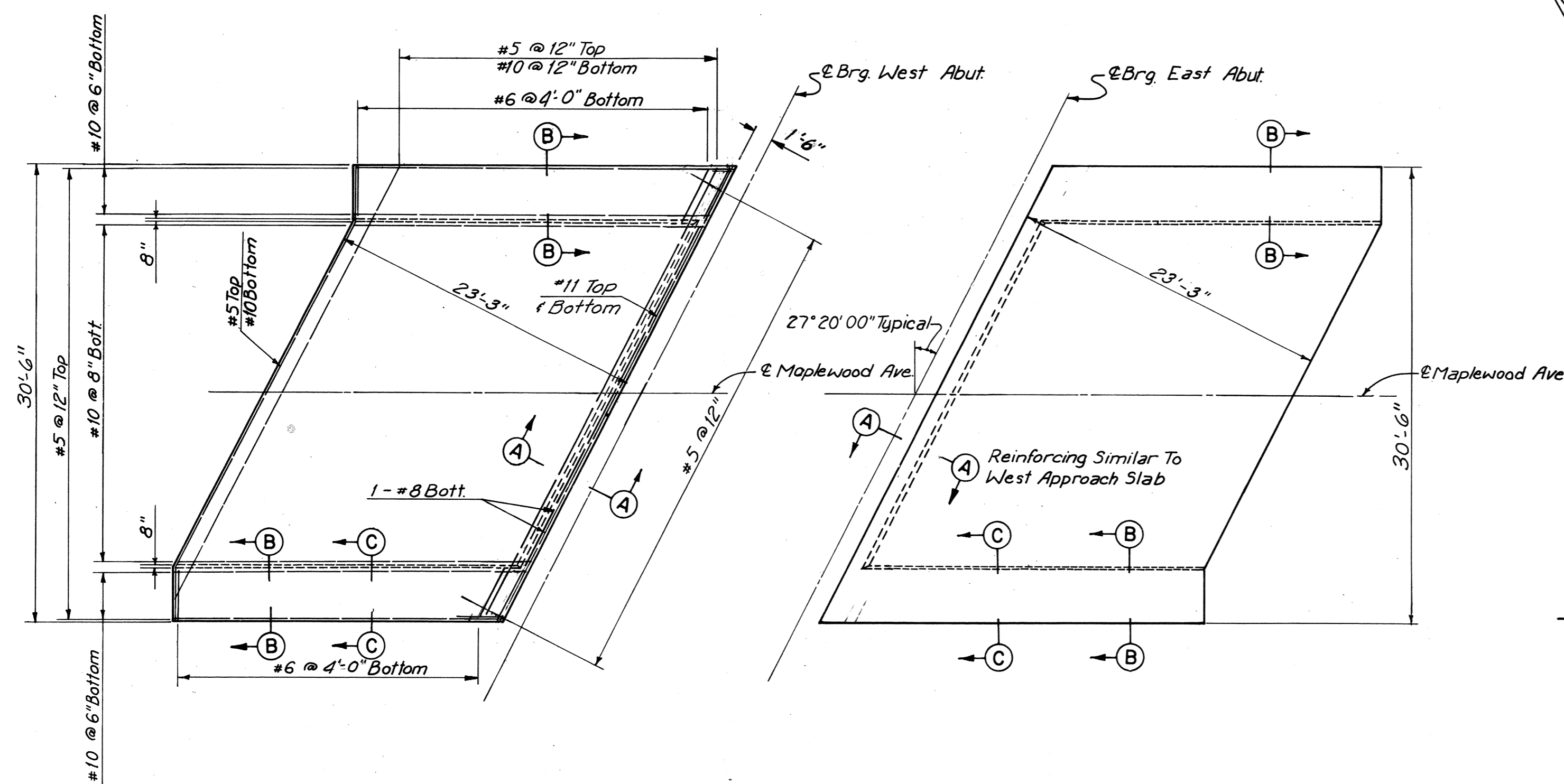
RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY

BRIDGE NO. 36  
MAPLEWOOD AVENUE OVER  
DOWNTOWN EXPRESSWAY  
JOINT DETAILS

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consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

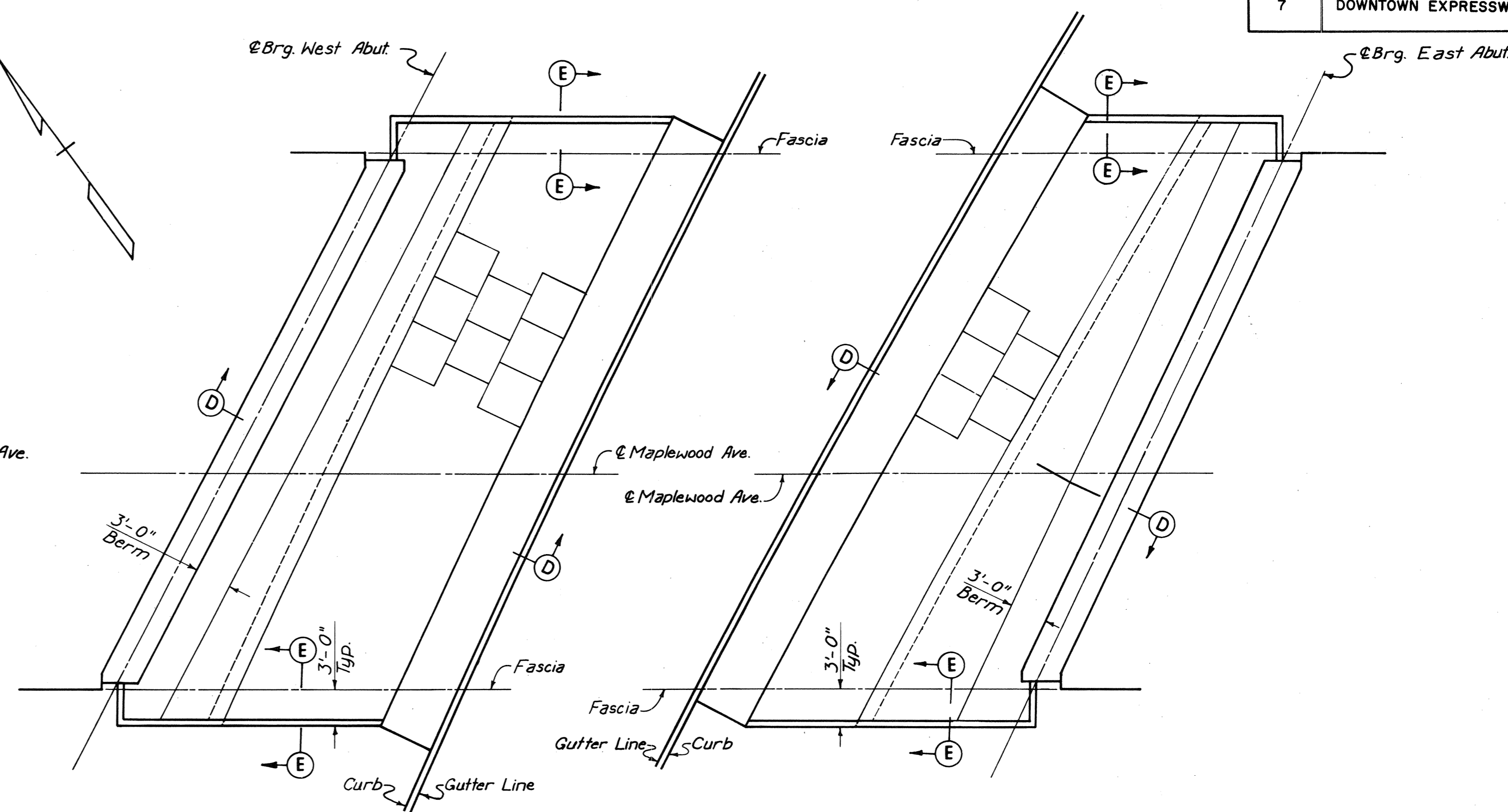
SCALE: As Noted  
CONTRACT NO. 7  
SHEET NO. 8 OF 10

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	104	

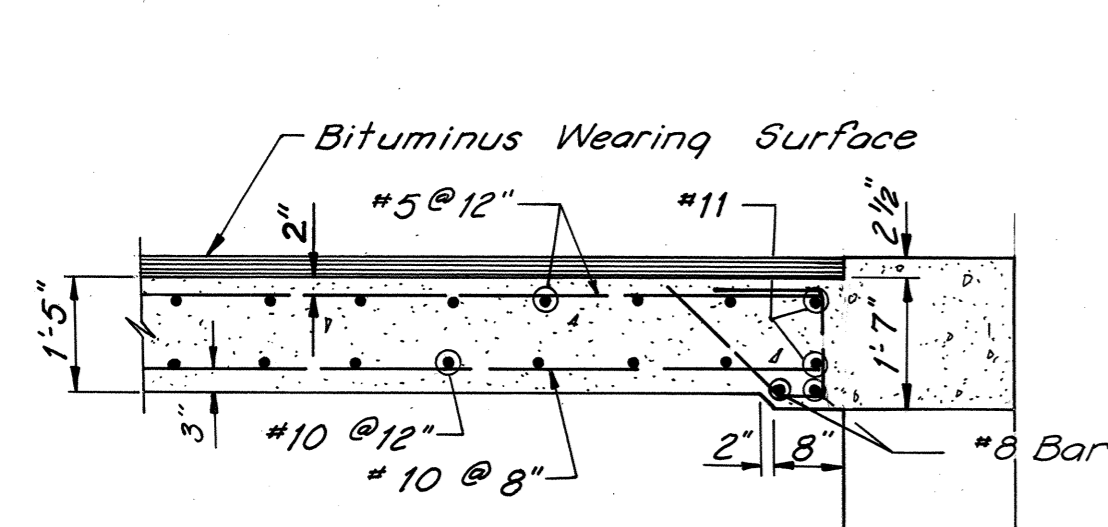


**WEST APPROACH SLAB**  
No Scale

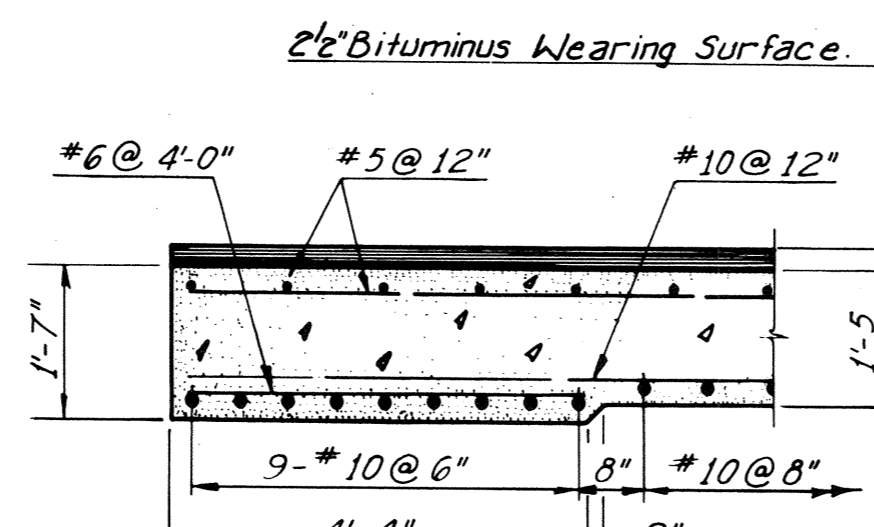
**EAST APPROACH SLAB**  
No Scale



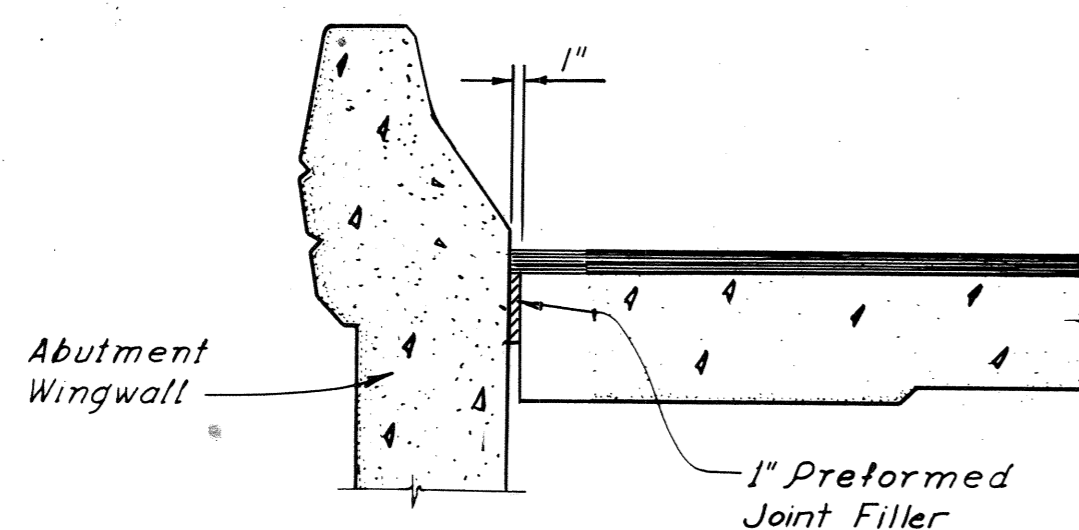
**PLAN OF SLOPE PROTECTION**  
Scale: 1/8" = 1'-0"



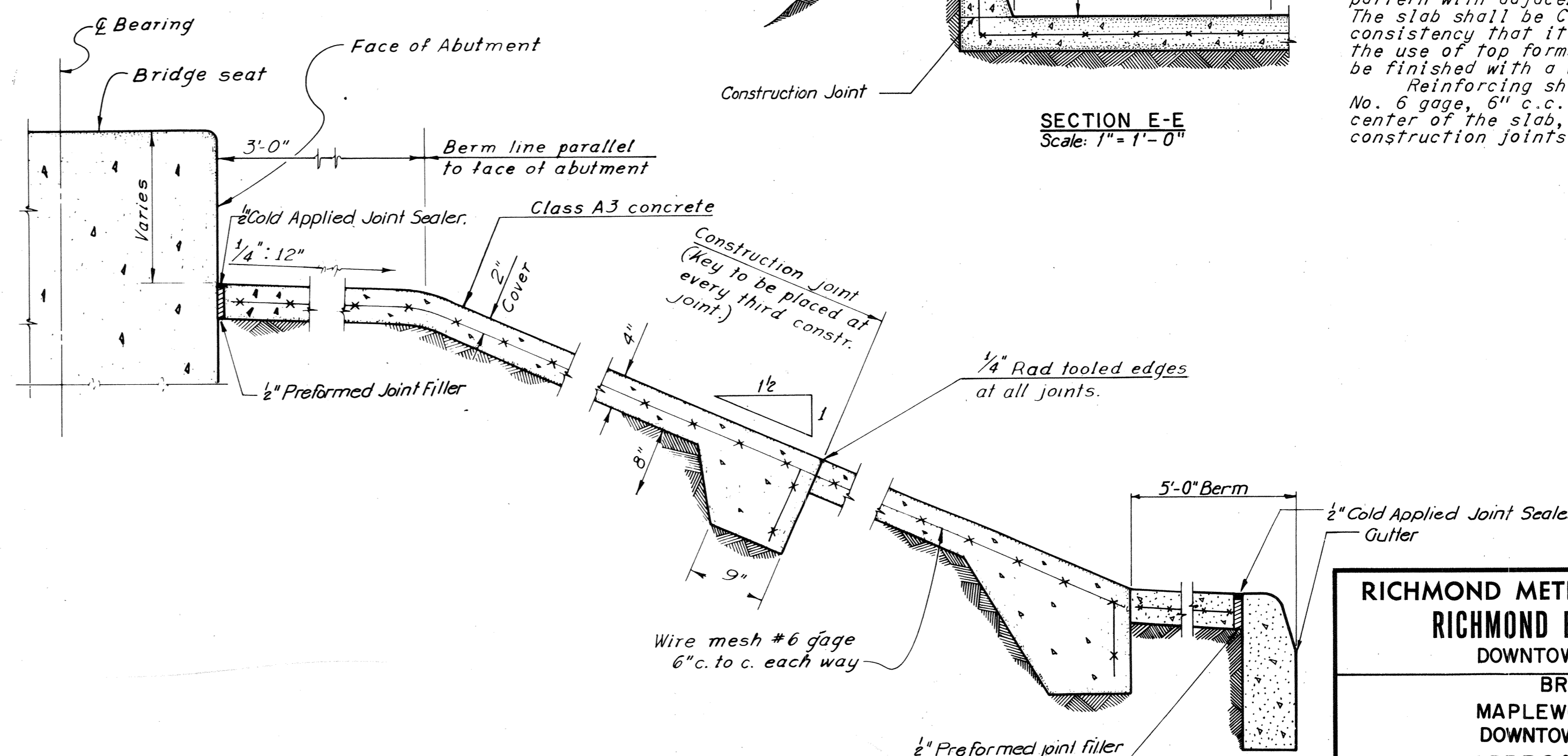
**SECTION A-A**  
Scale: 1/2" = 1'-0"



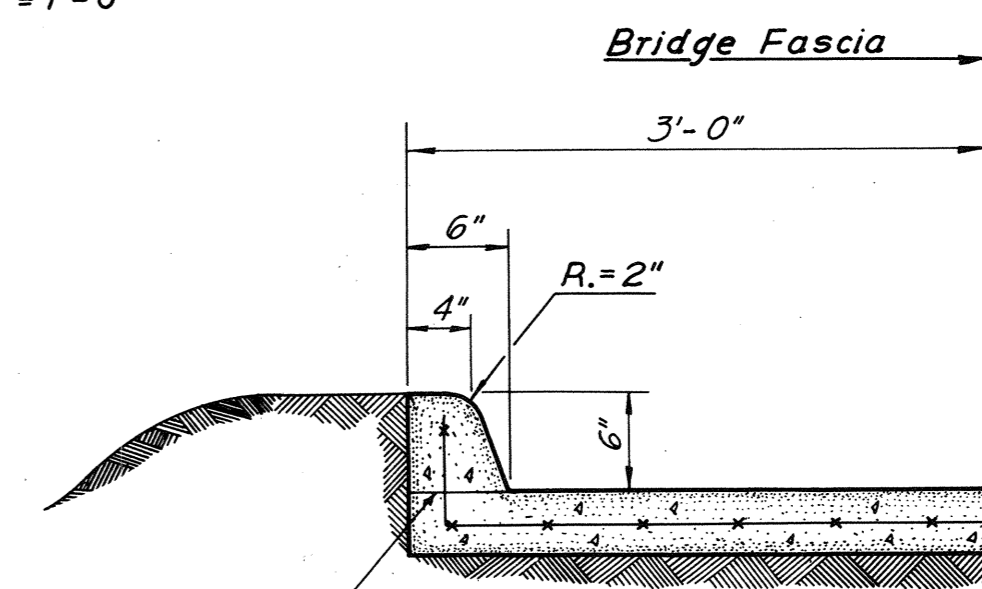
**SECTION B-B**  
Scale: 1/2" = 1'-0"



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



**SECTION D-D**  
Scale 1" = 1'-0"



**SECTION E-E**  
Scale: 1" = 1'-0"

**SLOPE PROTECTION NOTES**

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	A.M. 11-22-67				
CHECKED	L.C.C. 1-68	1	As Built	T.E.M.	9-75
IN CHARGE	R. G. C.				

<b>RICHMOND METROPOLITAN AUTHORITY</b>	
<b>RICHMOND EXPRESSWAY SYSTEM</b>	
DOWNTOWN EXPRESSWAY	
BRIDGE NO. 36	
MAPLEWOOD AVENUE OVER	
DOWNTOWN EXPRESSWAY	
<b>APPROACH SLAB AND</b>	
<b>SLOPE PROTECTION DETAILS</b>	
HOWARD, NEEDLES, TAMMEN & BERGENDOFF consulting engineers NEW YORK ALEXANDRIA KANSAS CITY	SCALE: As Noted CONTRACT NO.: 7 SHEET NO. 9 OF 10

**AS BUILT**



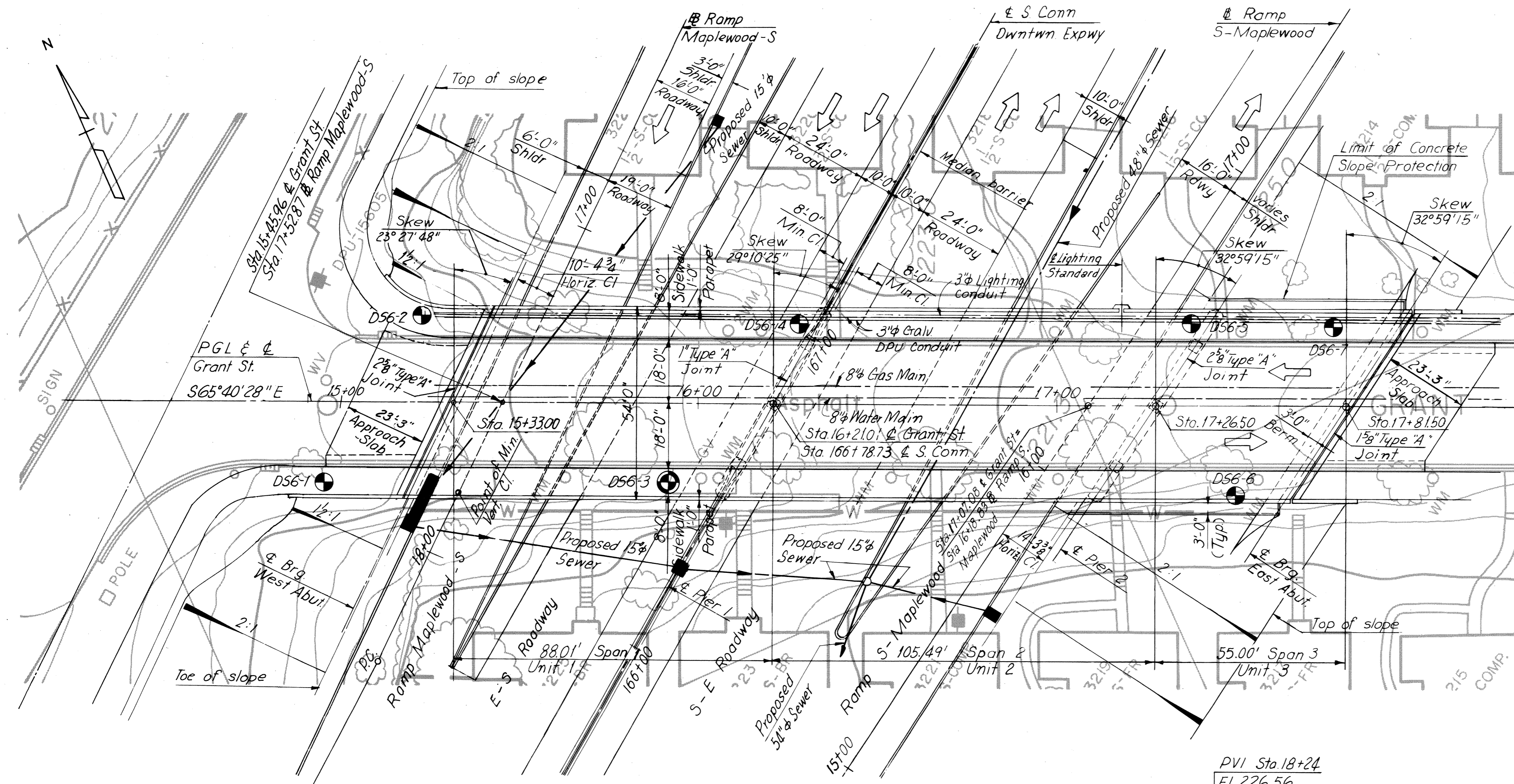
# **Bridge 37**

**(Grant Street Over WB DTE Connector, VA-146)**

**Record Set Plans**



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	106	



**GENERAL NOTES**

**ROADWAY:** One 36'-0" Clear roadway. Two 8'-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, 1969 and 1970-72 Interim Specifications, modified by Special Provision.  
 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:** 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. Found. mat'l. shall be kept dry & special attn. is called to Sec. 401.05 of the Gen. Specs. & to the Contract Special Prov. concerning preparation of found. for ftgs.

**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" 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 be intermediate grade. 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.

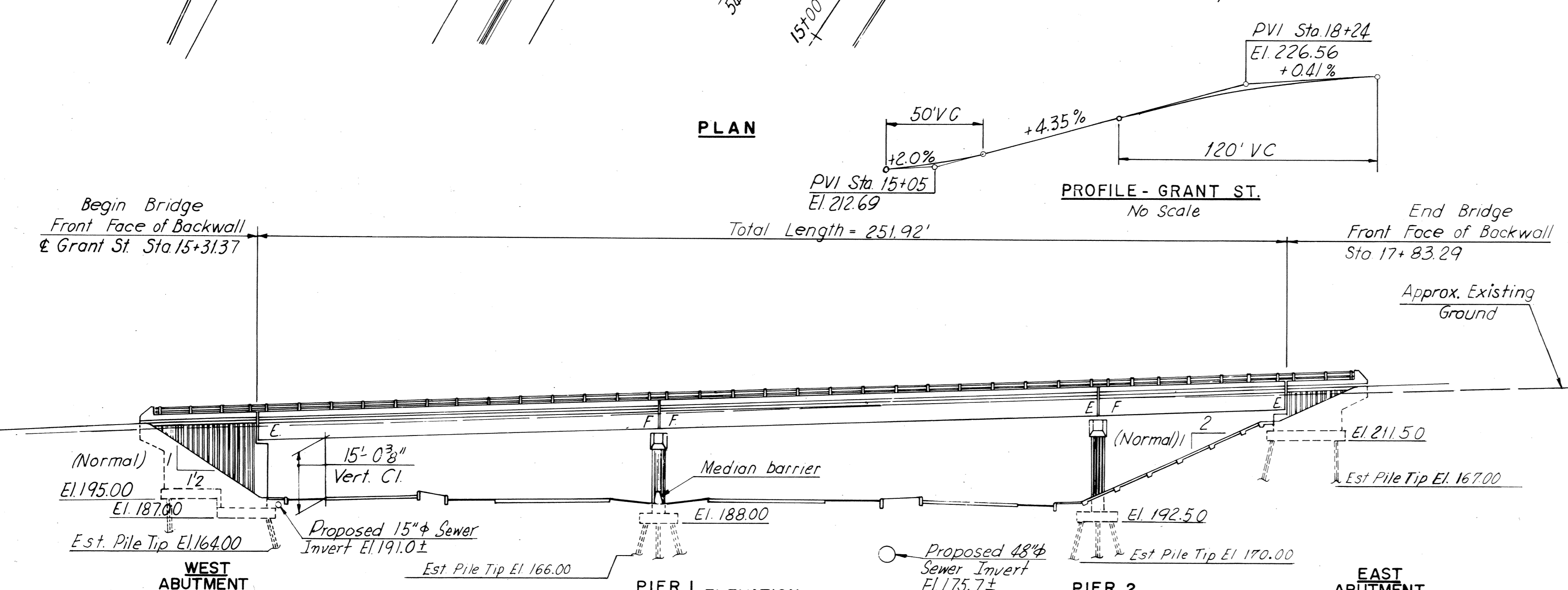
**STEEL NOTES:** Structural steel shall conform to A.S.T.M. Specification A36 except as noted.

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 A-325. All shop welded web splices, flange splices and web to flange welds shall be made by the submerged arc process.

**BENCH MARK:**  
 B-13. Copper Weld Rod, N.E. corner of McCloy and Grant St. Elev. 204.98  
 ⊕ Indicates 2" ⌀ cased hole boring.  
 ⊙ Indicates 4" ⌀ cased hole boring.

PLAN

PROFILE - GRANT ST.  
No Scale



INDEX	
NO	DESCRIPTION
1	GENERAL PLAN AND ELEVATION
2 & 3	WEST ABUTMENT
4	EAST ABUTMENT
5	ABUTMENT DETAILS
6	PIER 1
7	PIER 2
8	FRAMING PLAN
9	DECK PLAN AND CROSS SECTION
10	JOINT DETAILS
11	APPROACH SLAB & SLOPE PROTECTION DETAILS
12 & 13	BORING LOGS
S1	STANDARD SHOE DETAILS
S3	STANDARD ALUMINUM RAILING DETAILS (2 RAIL)
S4	STANDARD ELECTRICAL DETAILS
S7-S9	STANDARD ARCHITECTURAL DETAILS
S11	STANDARD GAS & WATER MAIN SUPPORT DETAILS
S13	LIMITS OF EXCAVATION & BACKFILL

ESTIMATE OF QUANTITIES

	STRUCTURE EXCAVATION C.Y.	CONCRETE			STRUCTURAL STEEL LBS.	ALUMINUM BR RAILING (2 RAIL) L.F.	POROUS BACKFILL C.Y.	REINFORCING STEEL LBS.	STEEL PILES 10 BP 42 L.F.	CONC. SLAB SLOPE PROT S.Y.	ASPHALT DAMP PROOFING S.Y.	UNDER DRAIN 6" PIPE L.F.	GAS MAIN 8" ⌀ L.F.	WATER MAIN 8" ⌀ L.F.	METAL CONDUIT L.F.
		CLASS A4 C.Y.	CLASS A3 C.Y.	CLASS A3 SLAB C.Y.											
SUPERSTRUCTURE		538.6			490,258	504		102,177					312	316	837
WEST ABUTMENT	777.4		395.0			60	130	82,554	1390.7	10.2	226	127			
EAST ABUTMENT	319.7		152.0			25	19	8,107	894.8	439.3	75	90			
PIER 1	131.7		123.2					24,147	561.6						
PIER 2	51.4		92.5					20,668	633.4						
APPROACH SLABS				97				28,426							
TOTAL	1280.2	538.6	762.7	97	490,258	589	149	216,079	3480.5	449.5	301	217	312	316	837

Notes:  
 The cost of furnishing and installing 2" ⌀ and 3" ⌀ galvanized steel conduit shall be included in the bid price for the item, Metal Conduit.

BY	DATE	NO.	REVISION	BY	DATE
MADE	TCY 2/16/68				
CHECKED	ICH 2/29/68	1	As Built	TEM	9-75
IN CHARGE	RGC				

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

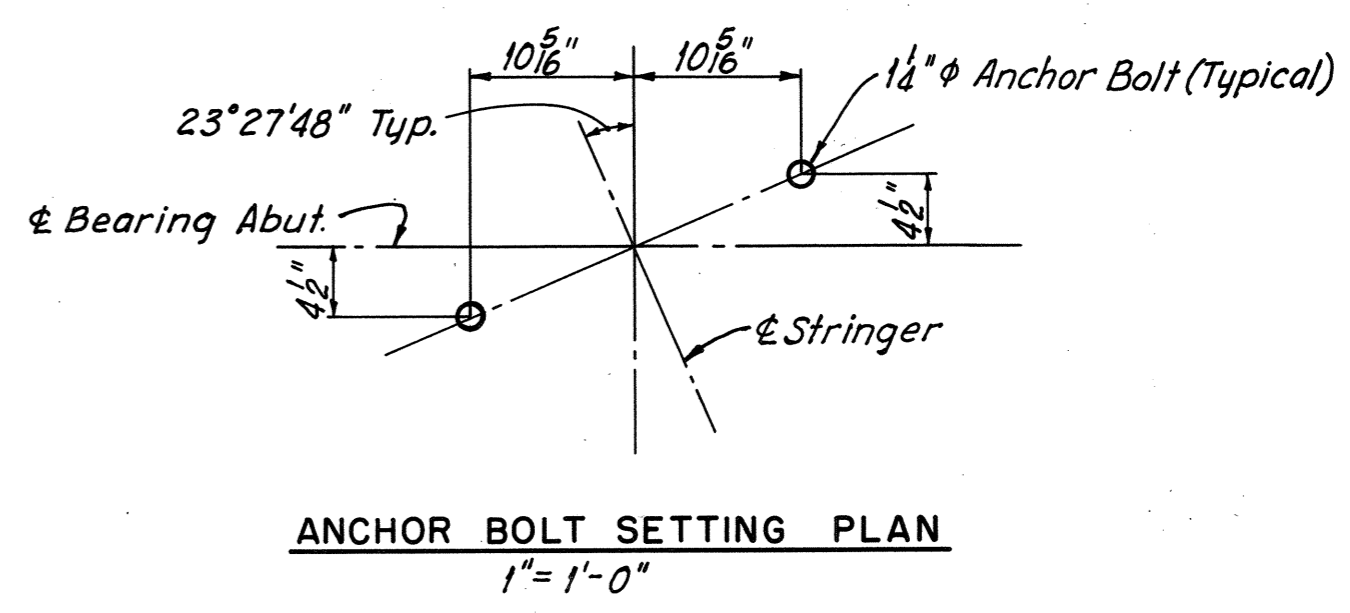
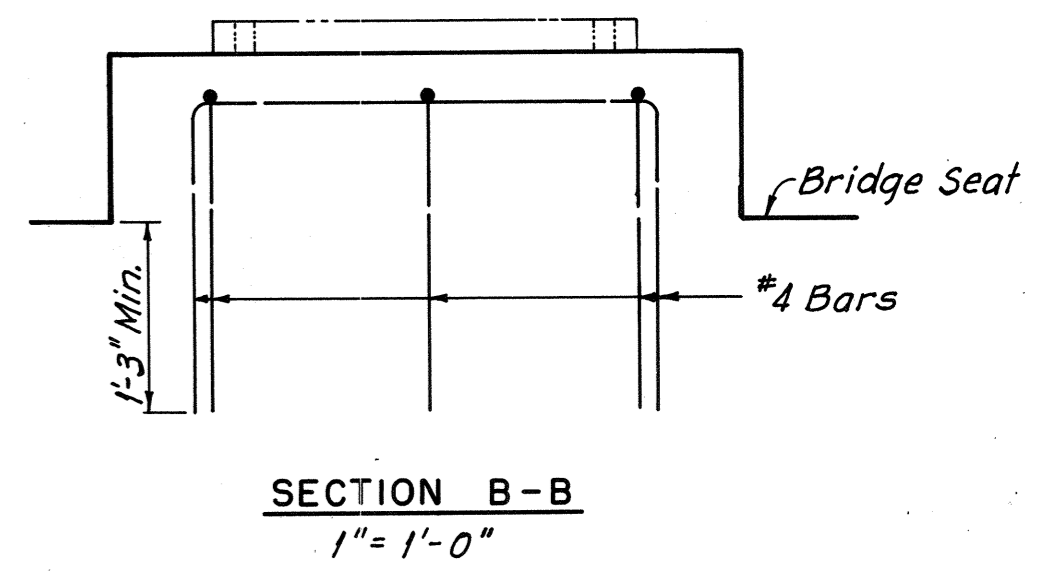
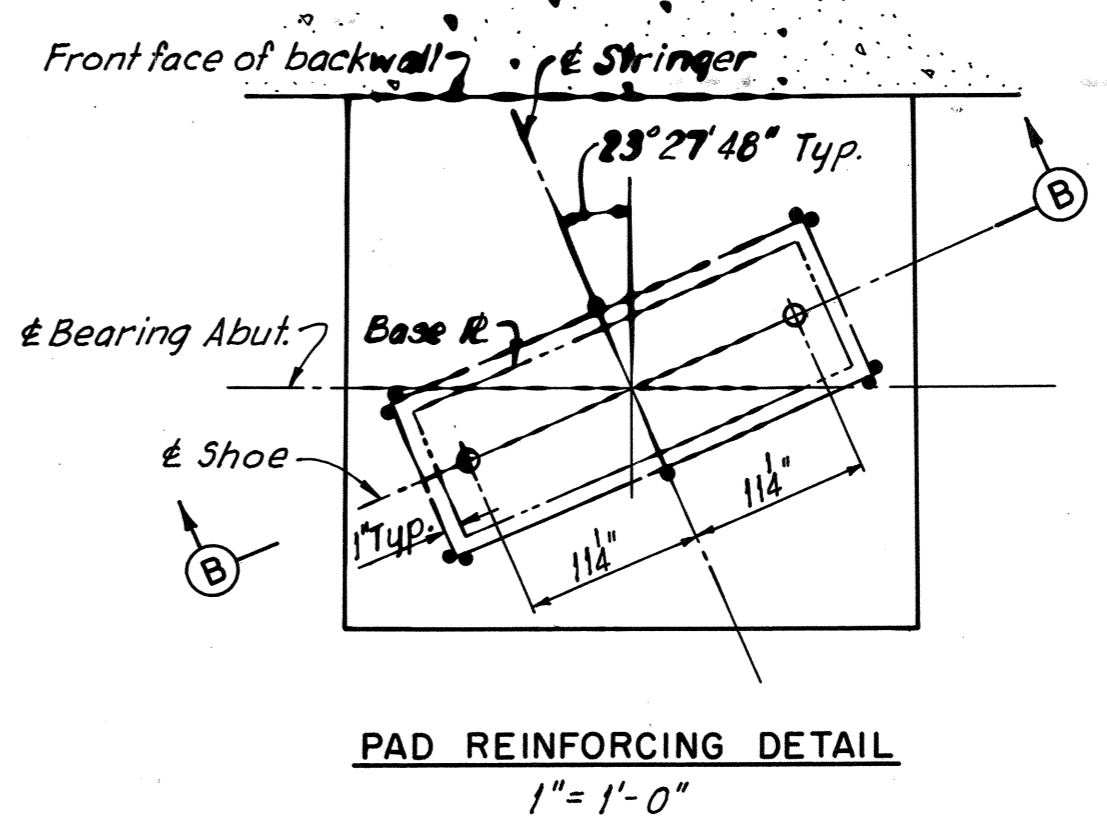
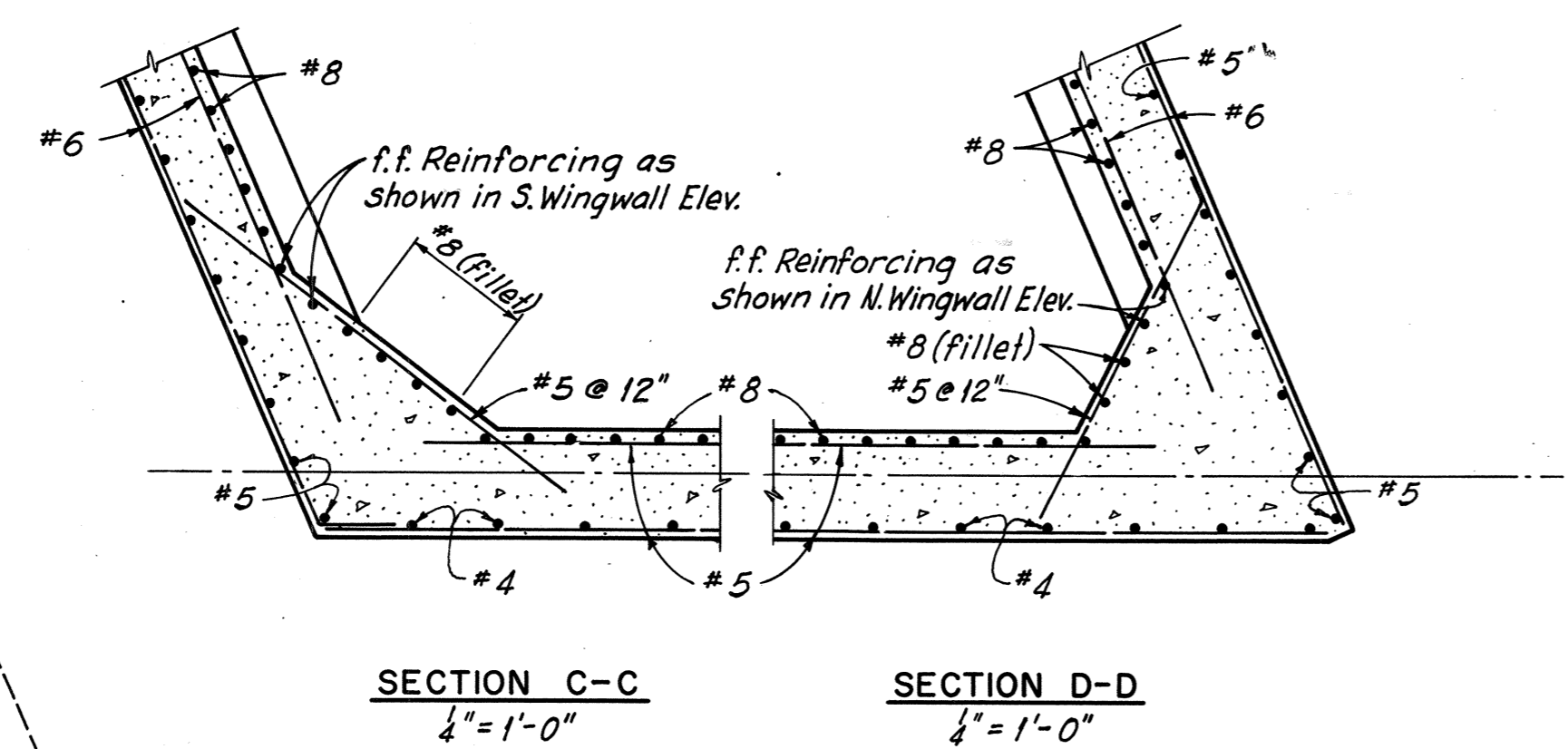
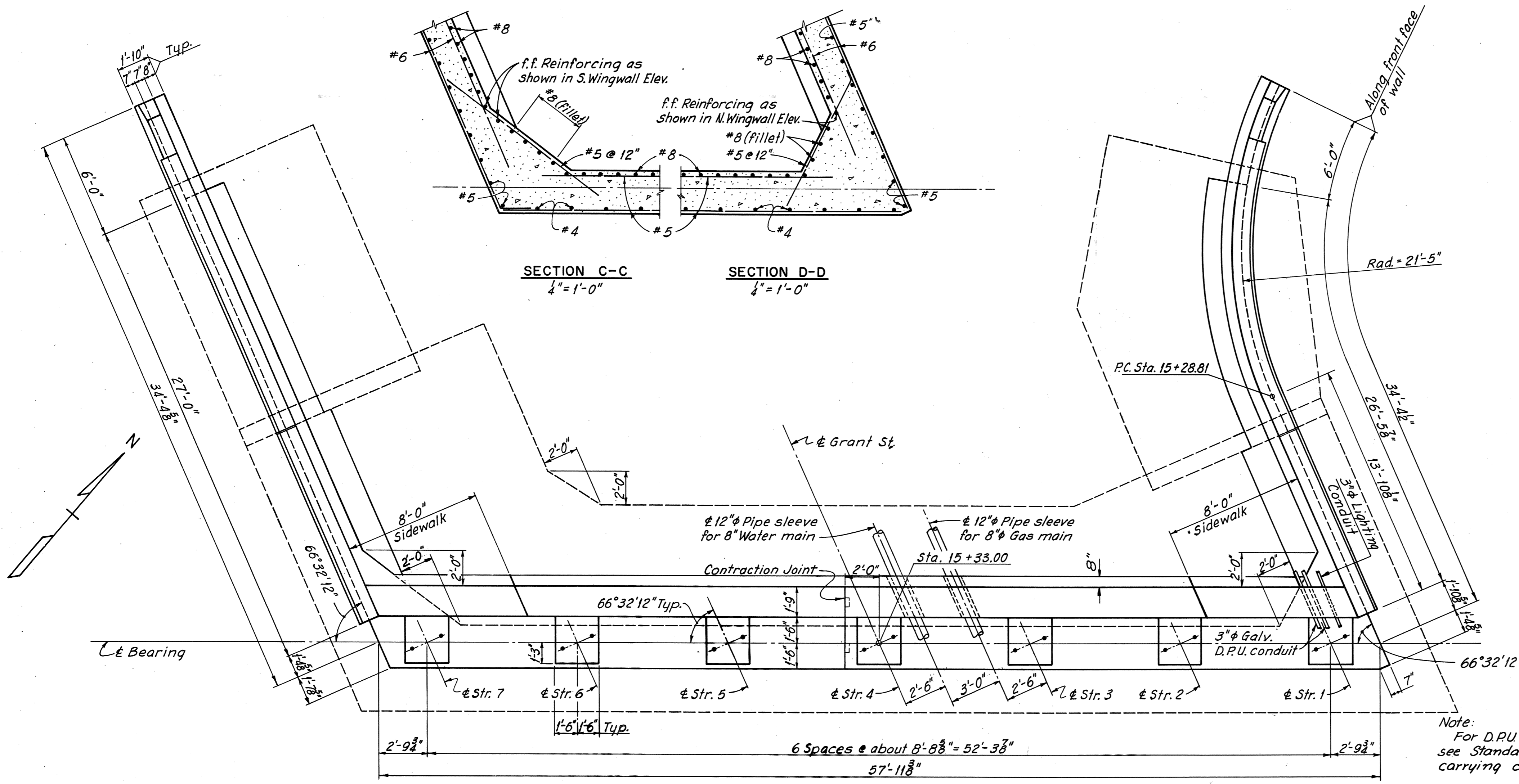
BRIDGE NO. 37  
 GRANT STREET OVER SOUTH CONNECTION DOWNTOWN EXPRESSWAY  
 GENERAL PLAN AND ELEVATION

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

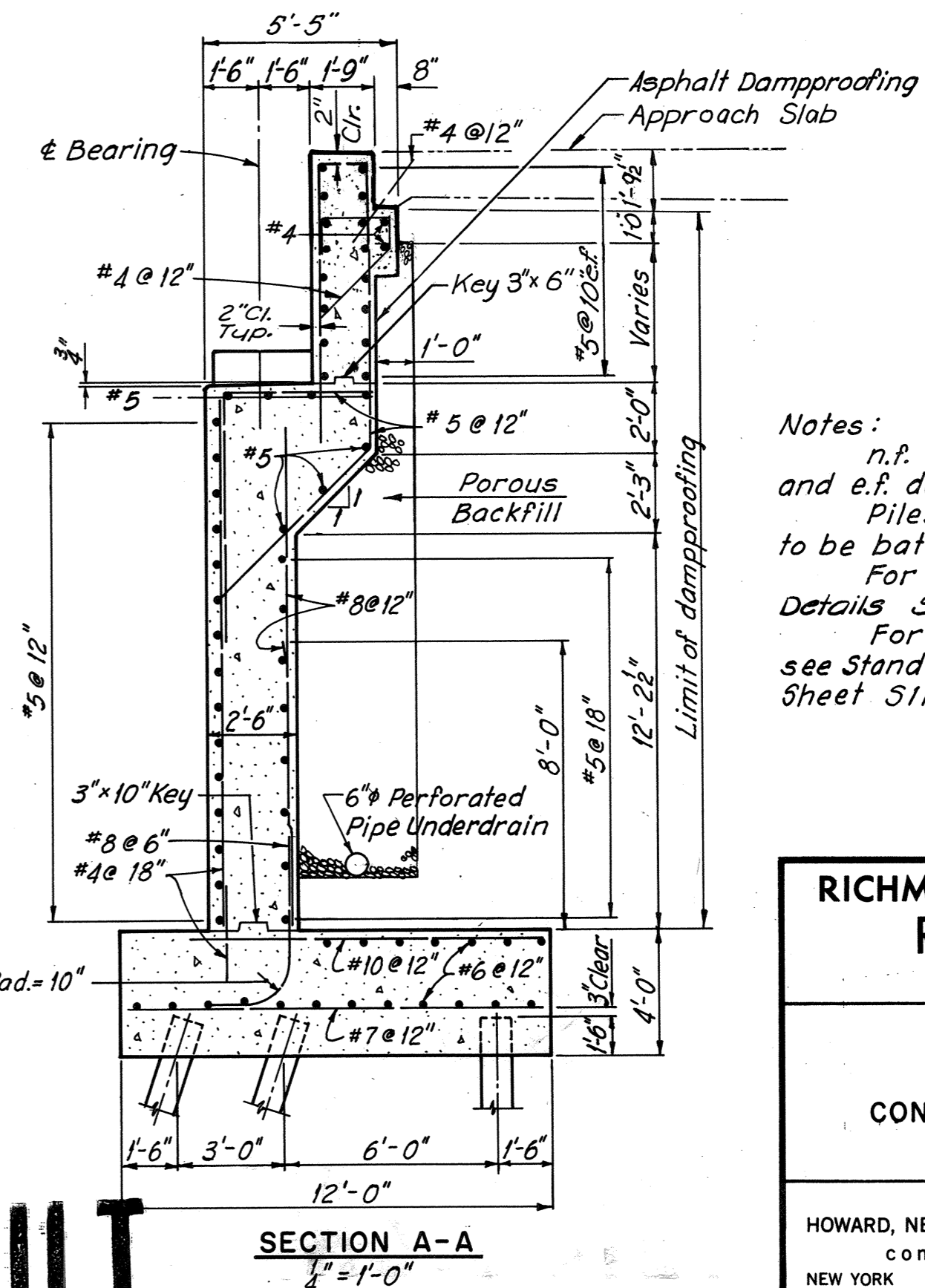
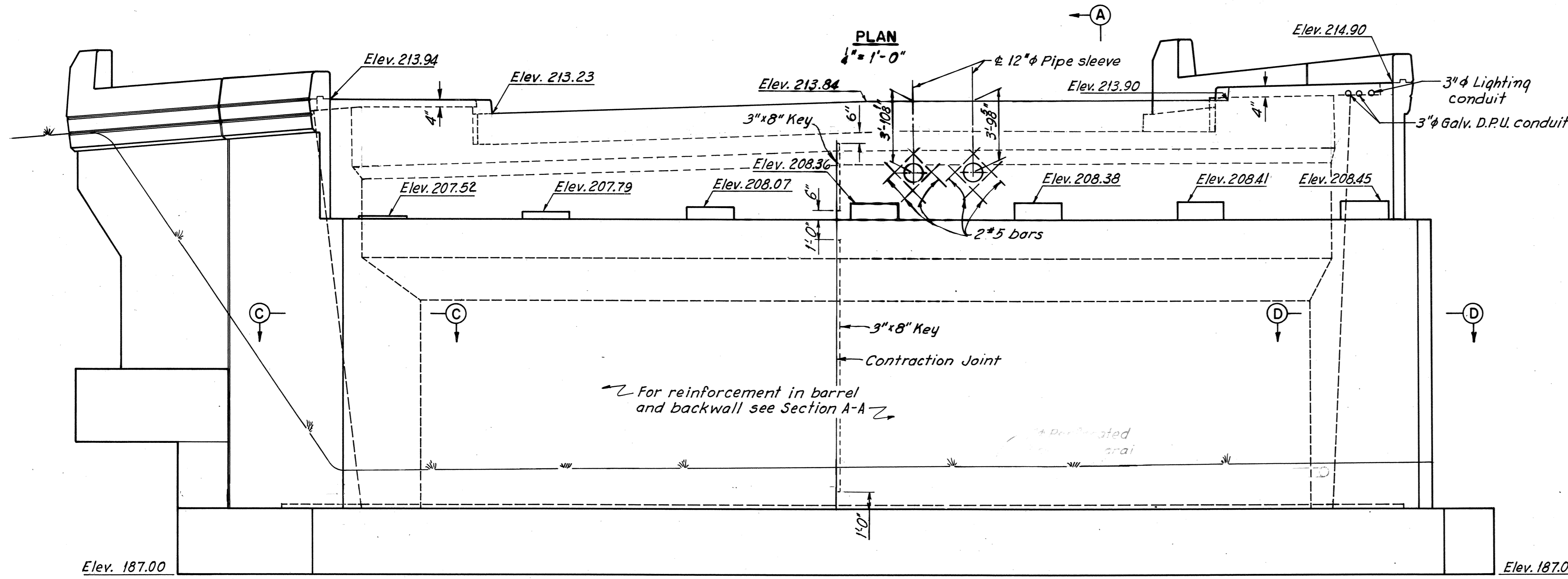
SCALE: 1" = 20'  
 CONTRACT NO. 7  
 SHEET NO. 1 OF 13

**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	107	



Note:  
For D.P.U. and Lighting conduit details see Standard Electrical Details (Bridge carrying city streets) Sheet S4.



Notes:  
n.f. Denotes near face; f.f. denotes far face and e.f. denotes each face.  
Piles shall be 10 BP42. All battered piles to be battered 4 in 12.  
For Contraction joint details see Abutment Details Sheet 5.  
For details of water main pipe sleeve, see Standard Gas and Water Main Support Details Sheet 511.

BY	DATE	REVISION	BY	DATE
GD	1-68			
TCY	2-29-68	1 As Built	TEM	9-75
RGC				

ELEVATION  
1/4" = 1'-0"

Note:  
Piles not shown in Elevation. For pile details see Footing Plan, next sheet.

**AS BUILT**

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

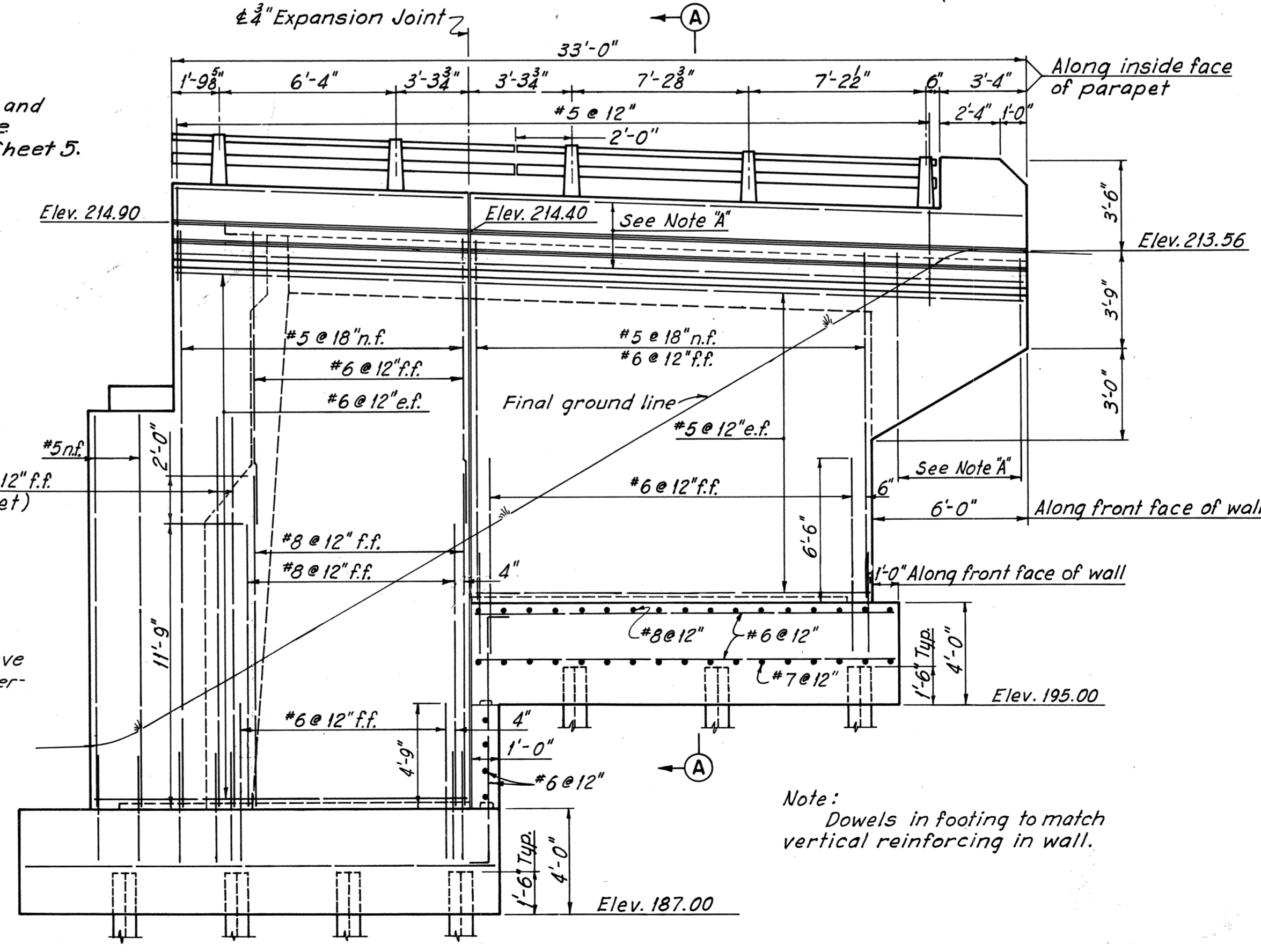
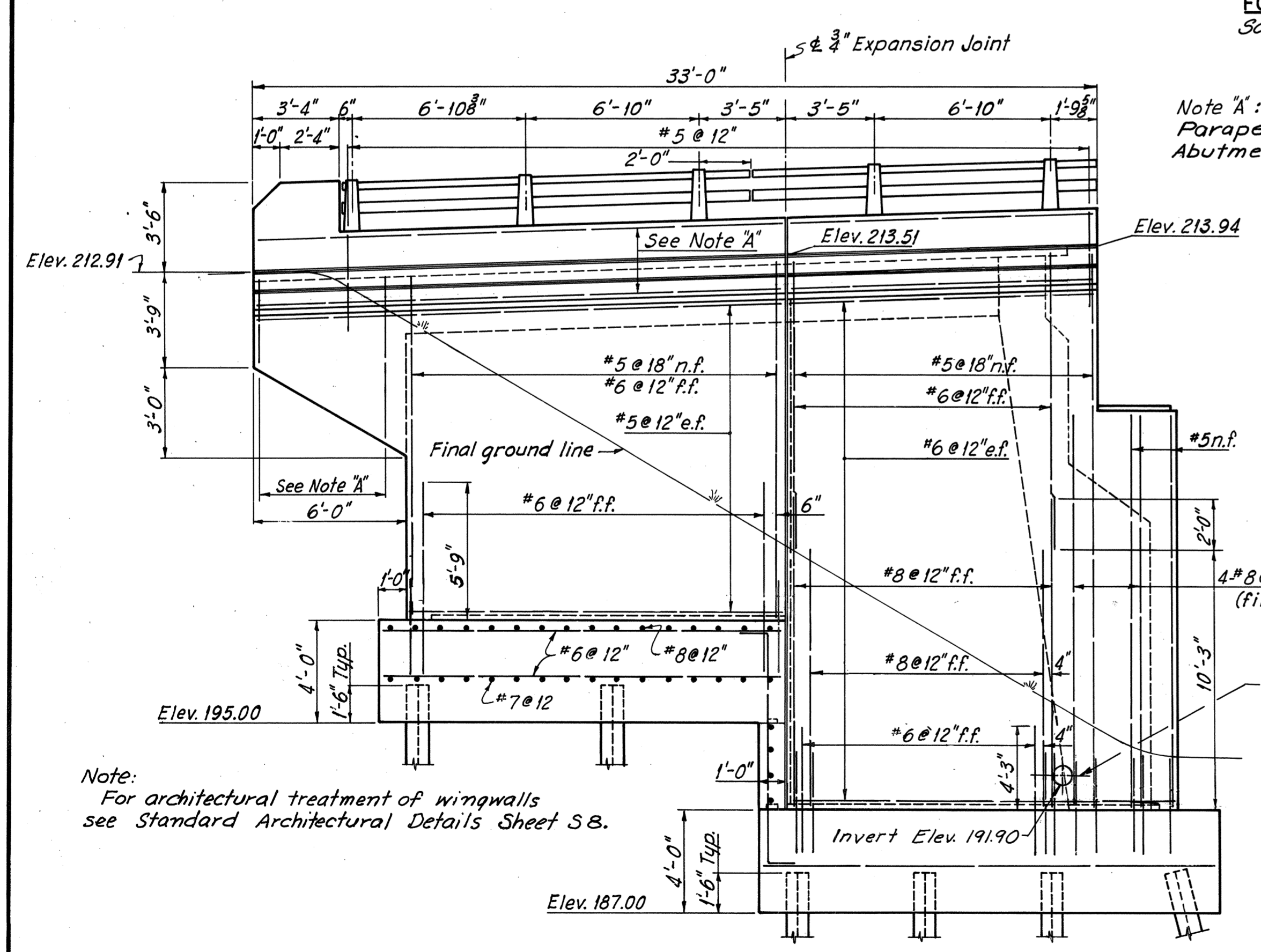
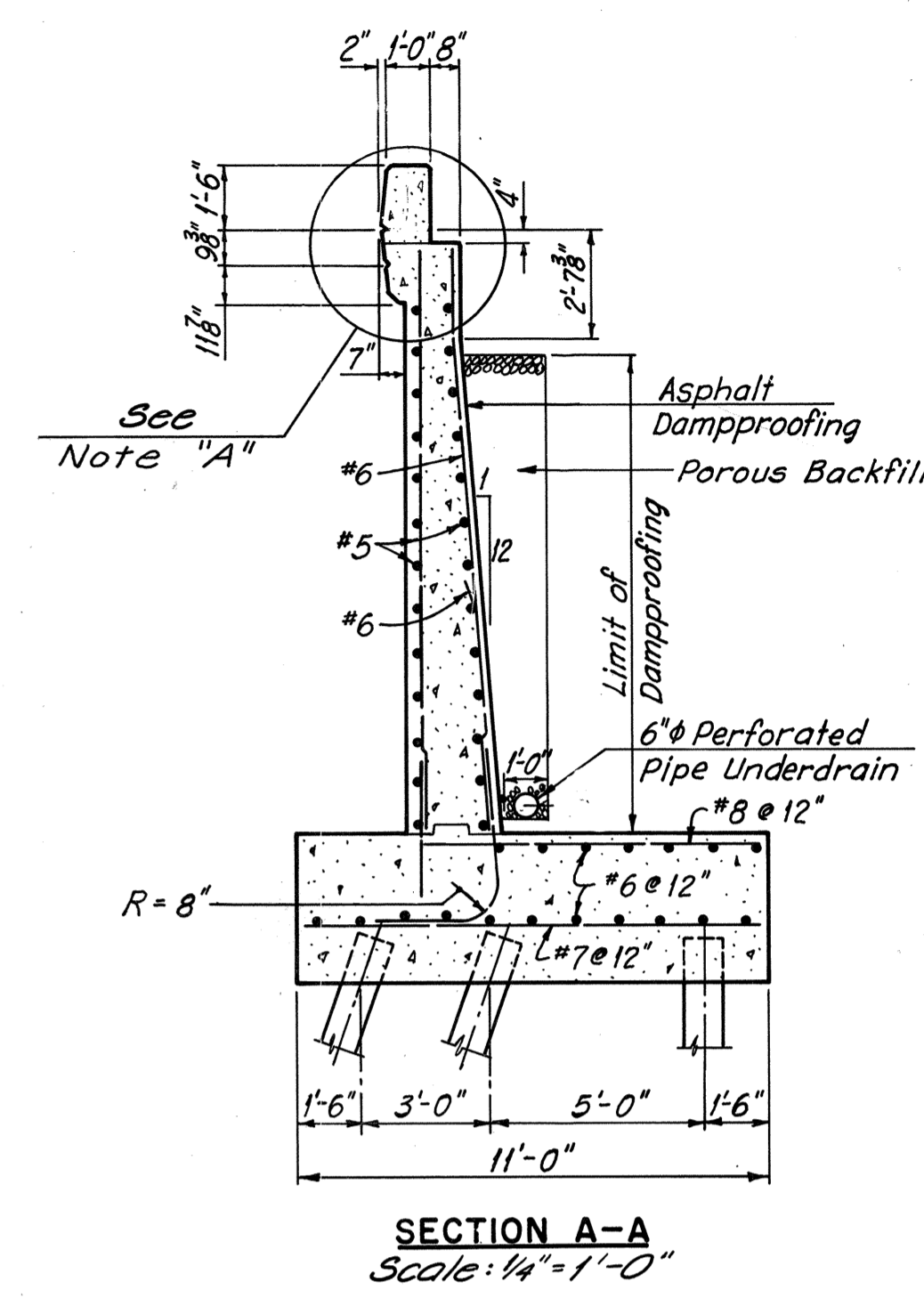
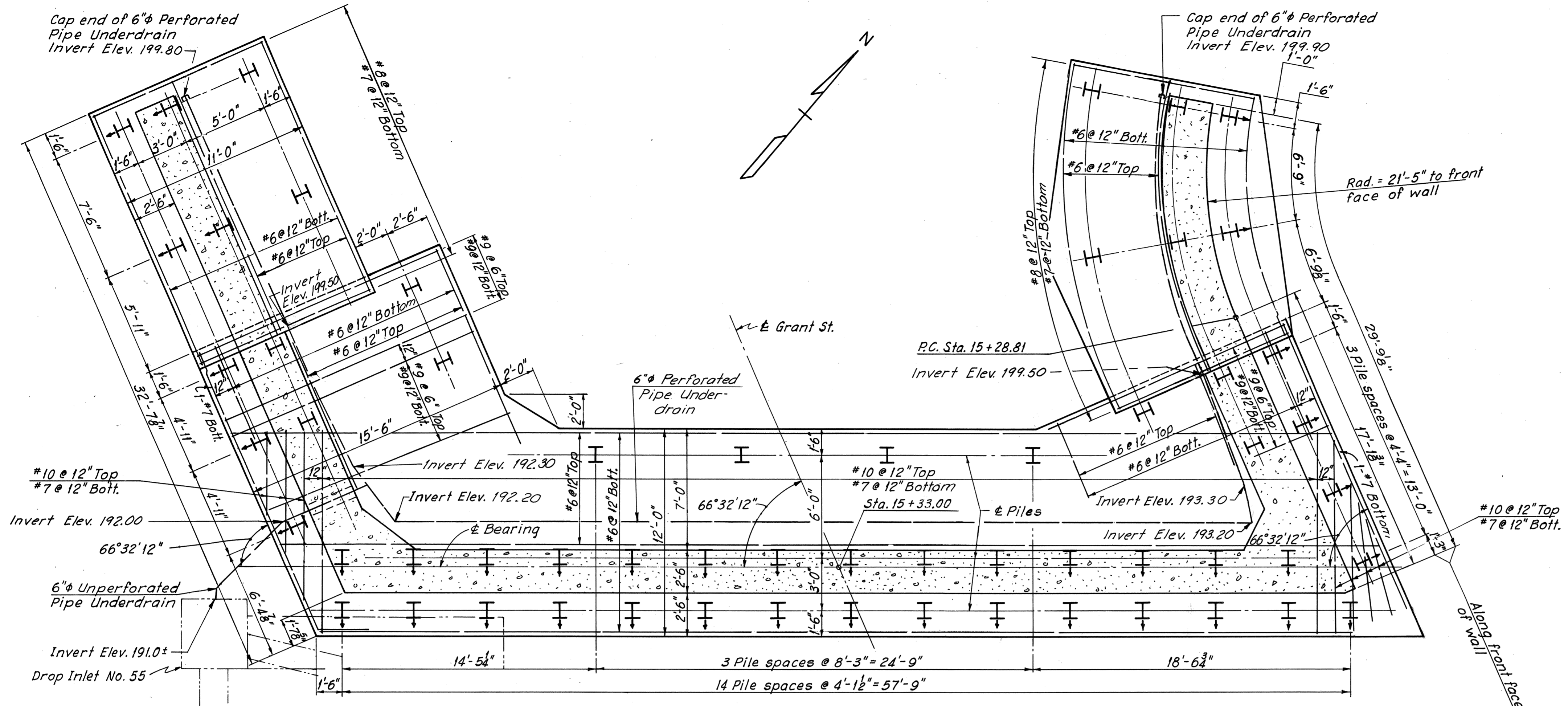
BRIDGE NO. 37  
GRANT STREET OVER SOUTH CONNECTION DOWNTOWN EXPRESSWAY  
WEST ABUTMENT

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

SCALE: As Shown  
CONTRACT NO.: 7  
SHEET NO. 2 OF 13



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	108	



Notes:  
 Footing 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 re-design necessary and will advise the Contractor before construction begins.  
 All piles shall be 10 BP 42 Steel Piles (Design Capacity = 45 tons).  
 † Denotes pile battered 4 in 12 in direction of arrow.

BY	DATE				
MADE	GD	1-68			
CHECKED	TCY	3-1-68	1	As Built	TEM 9-75
IN CHARGE	RGC				
	NO.	REVISION	BY	DATE	

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

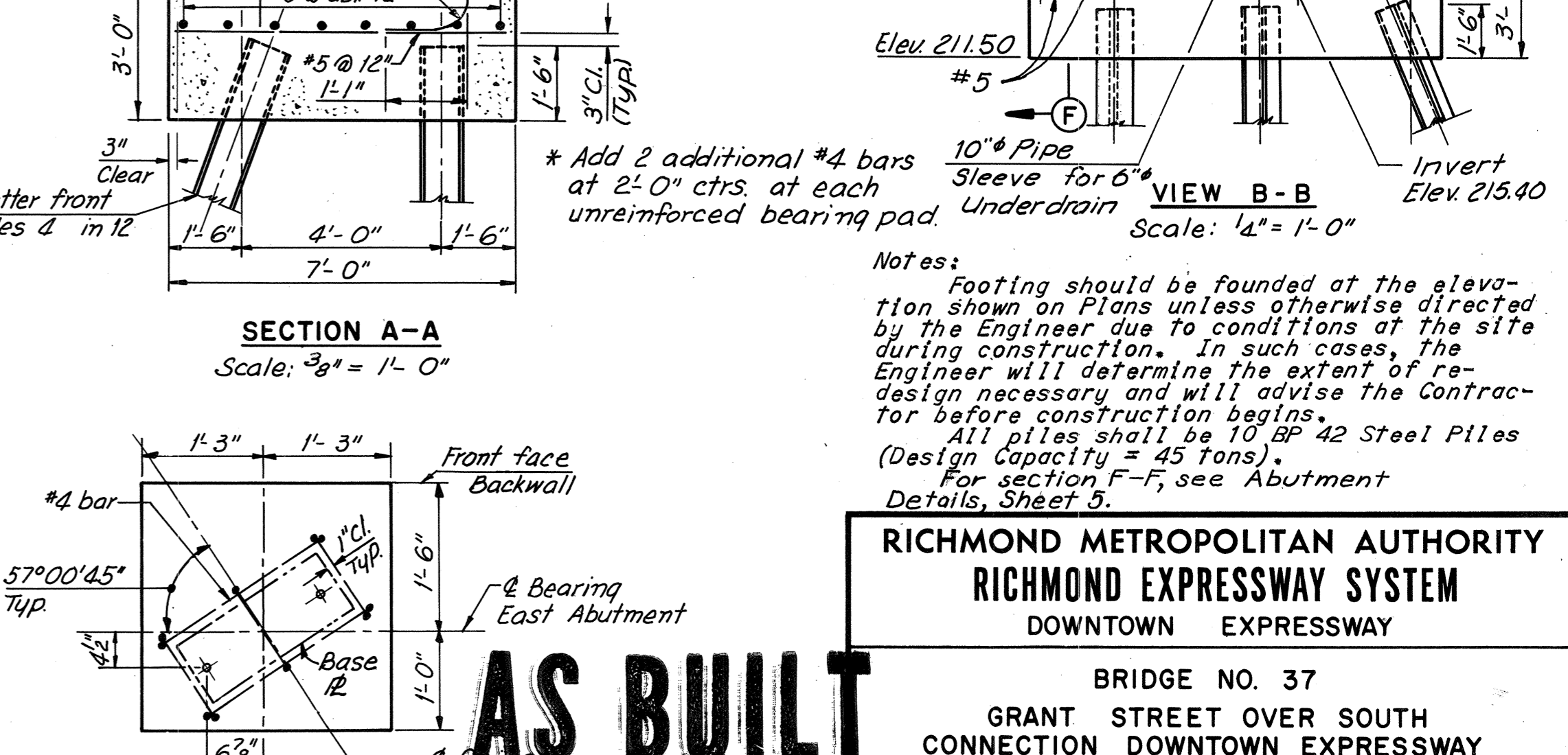
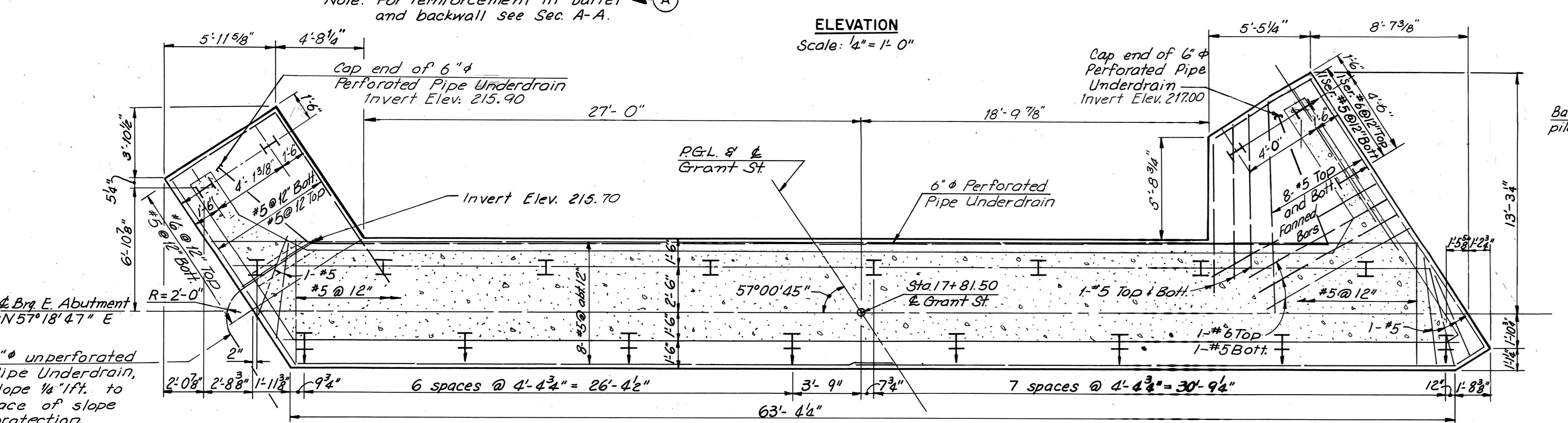
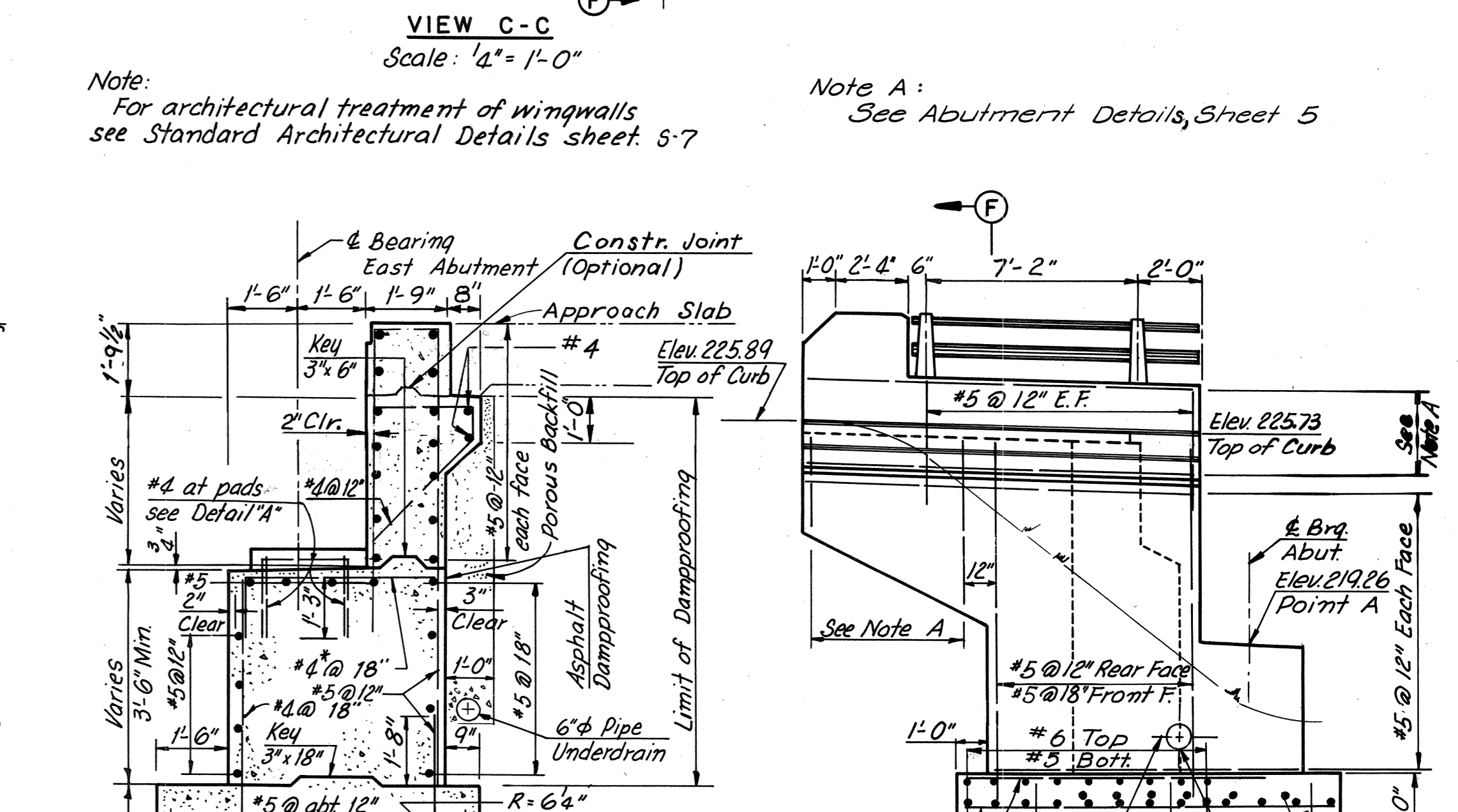
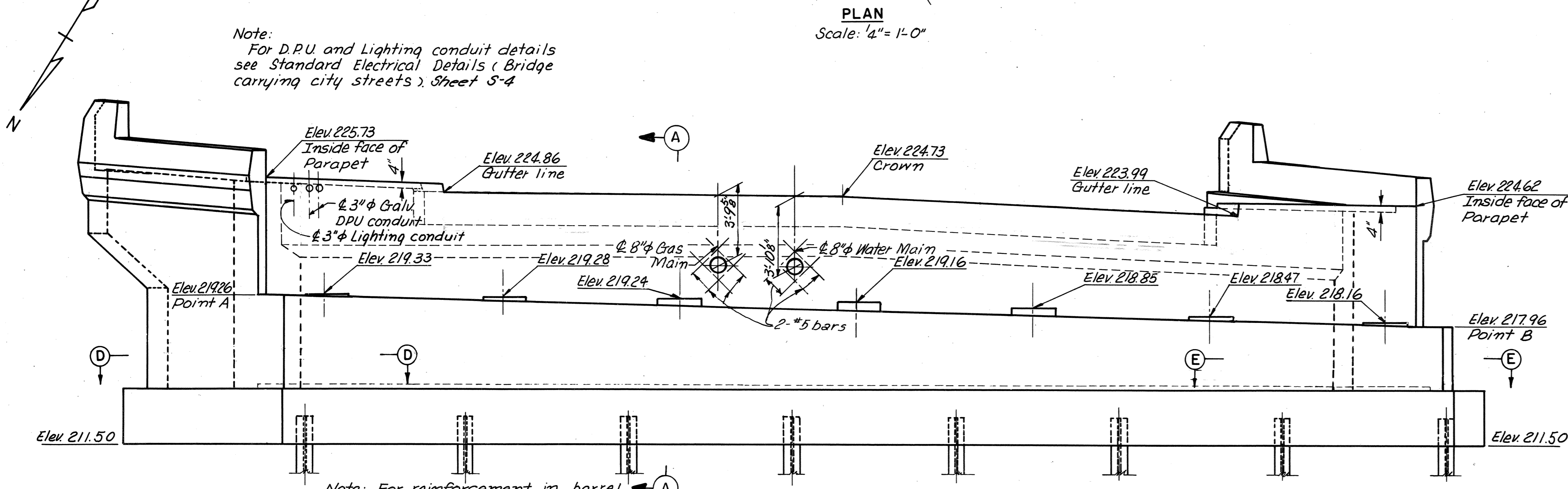
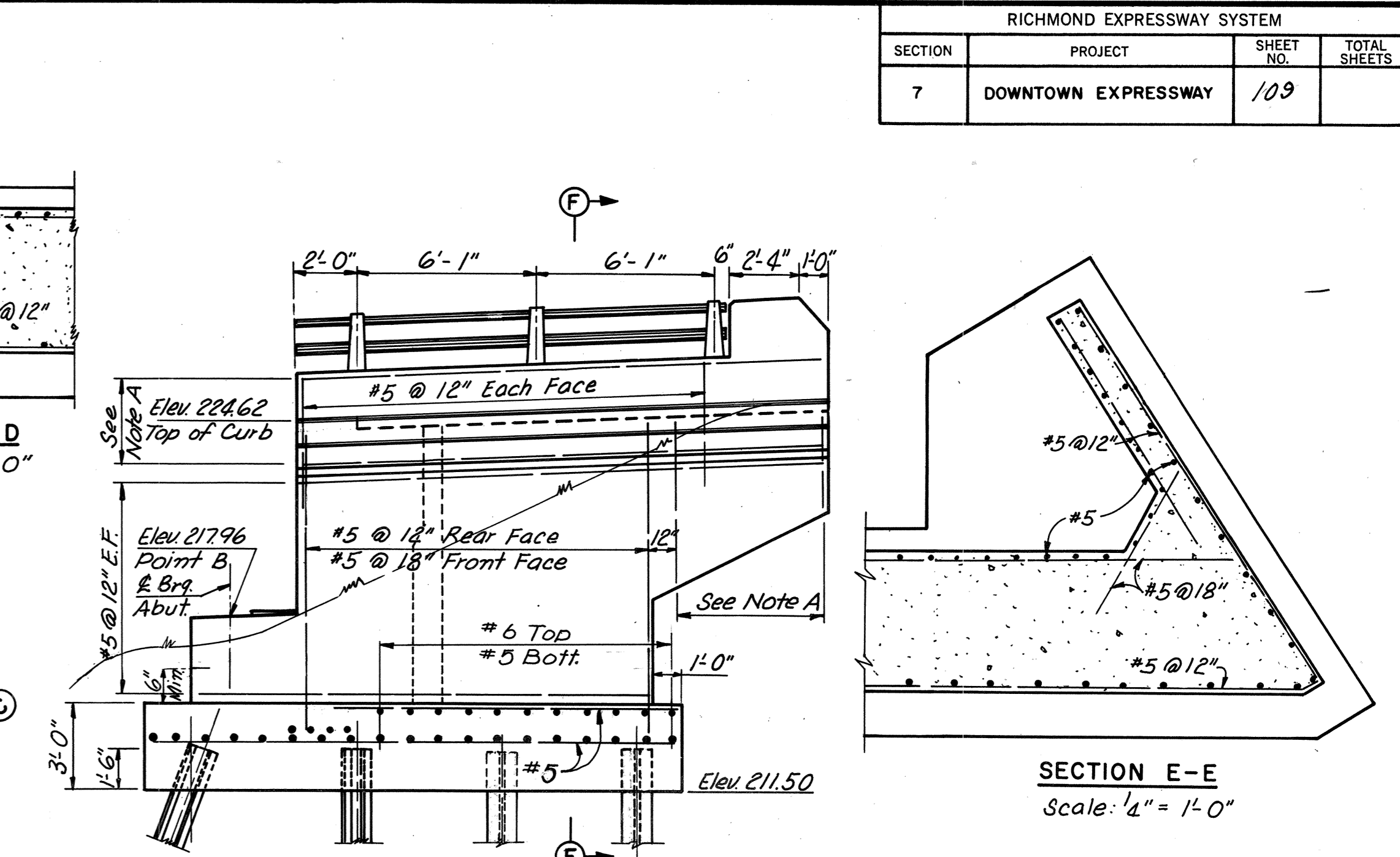
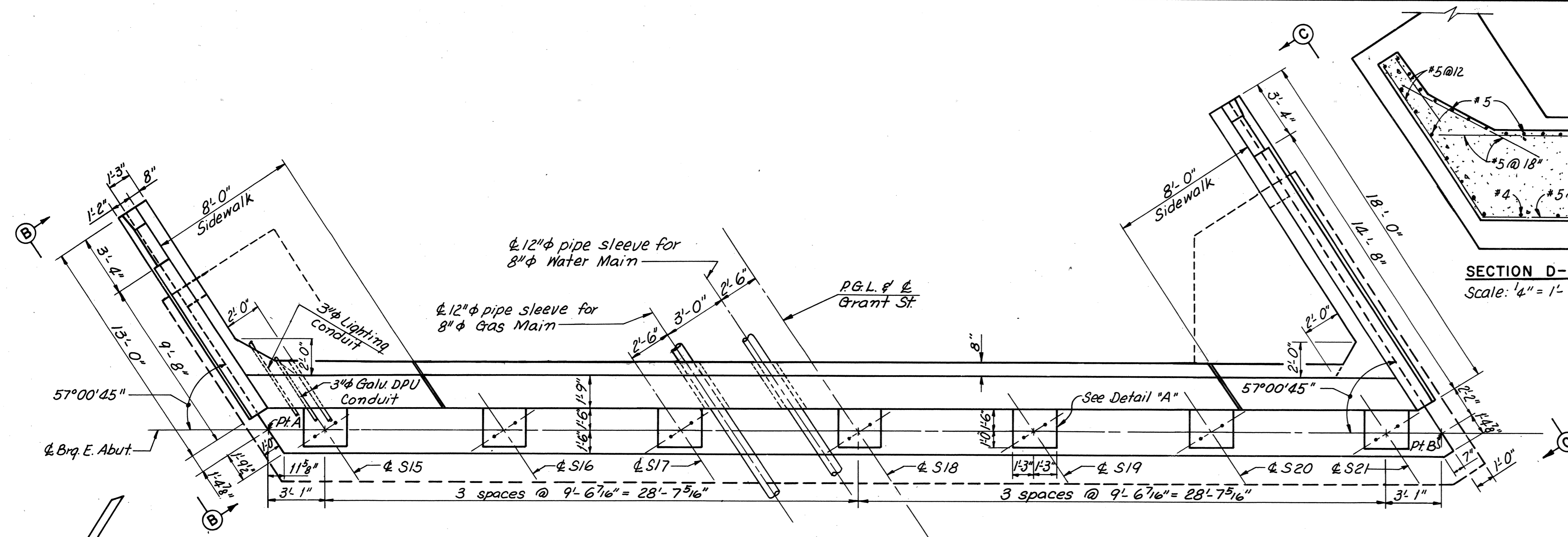
BRIDGE NO. 37  
 GRANT STREET OVER SOUTH  
 CONNECTION DOWNTOWN EXPRESSWAY  
 WEST ABUTMENT

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

SCALE: *as shown*  
 CONTRACT NO.: 7  
 SHEET NO. 3 OF 13

**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	109	



MADE	BY	DATE	NO.	REVISION	BY	DATE
TCY	TCY	2-1-68				
1CH	1CH	2-21-68	1	As Built	TEM	9-75
R. G. C.	R. G. C.					

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

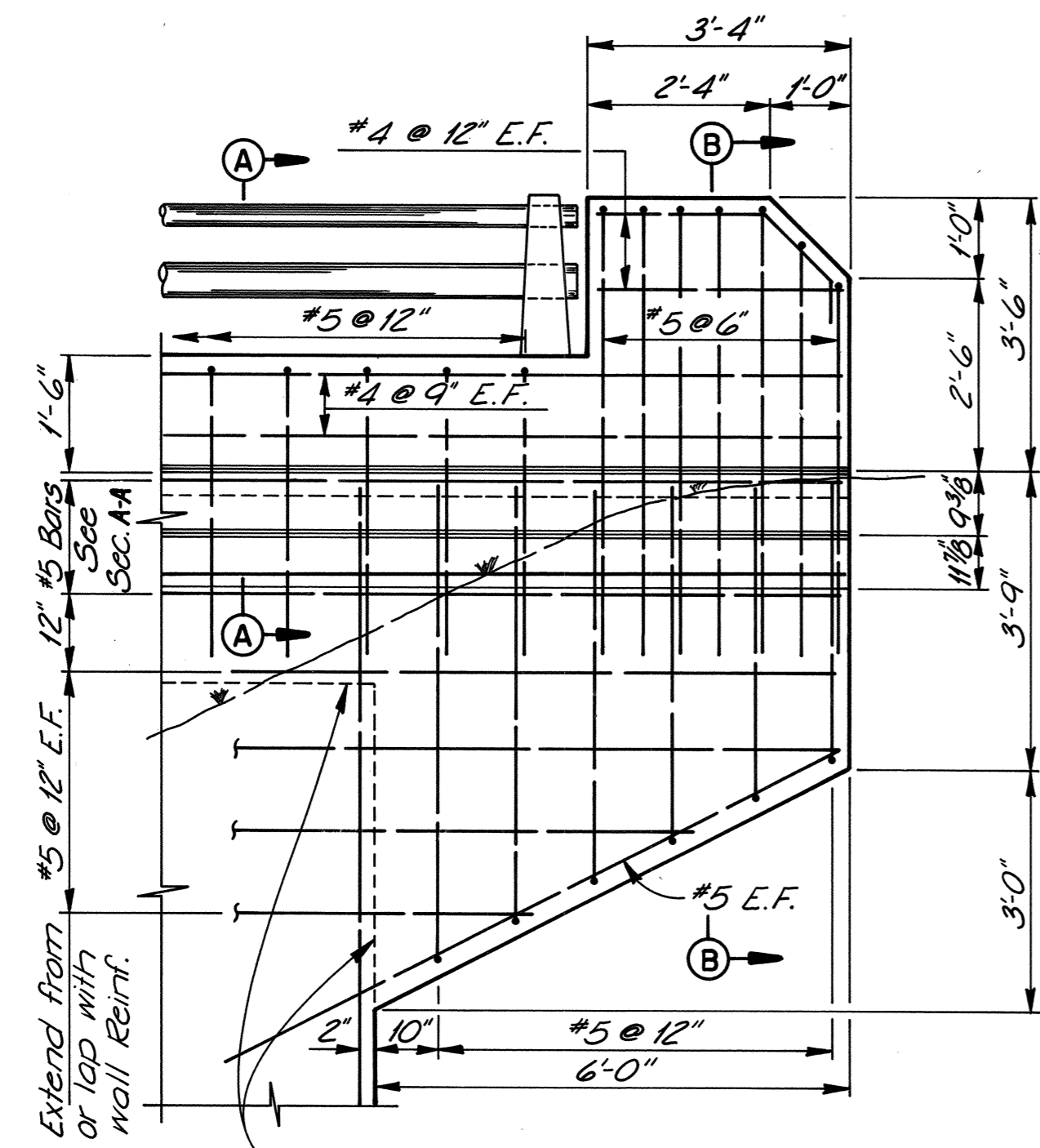
BRIDGE NO. 37  
GRANT STREET OVER SOUTH CONNECTION DOWNTOWN EXPRESSWAY  
**EAST ABUTMENT**

SCALE: AS SHOWN  
CONTRACT NO. 7  
SHEET NO. 4 OF 13

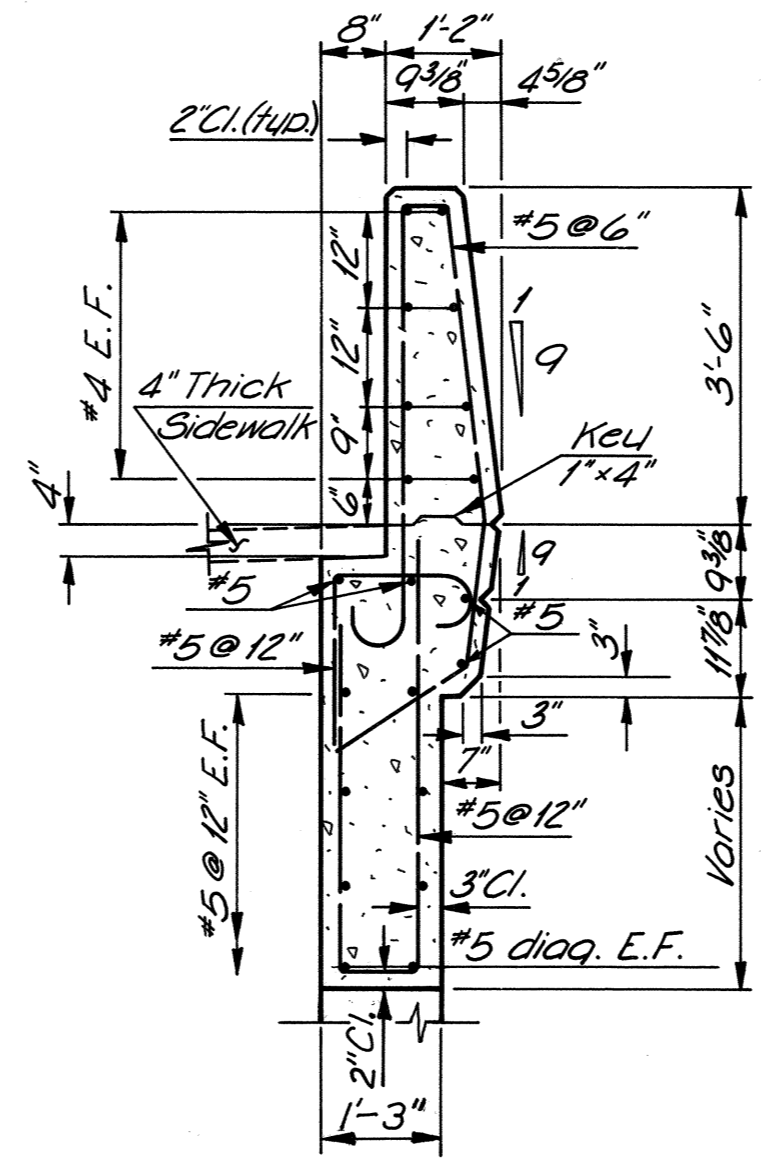
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

**AS BUILT**

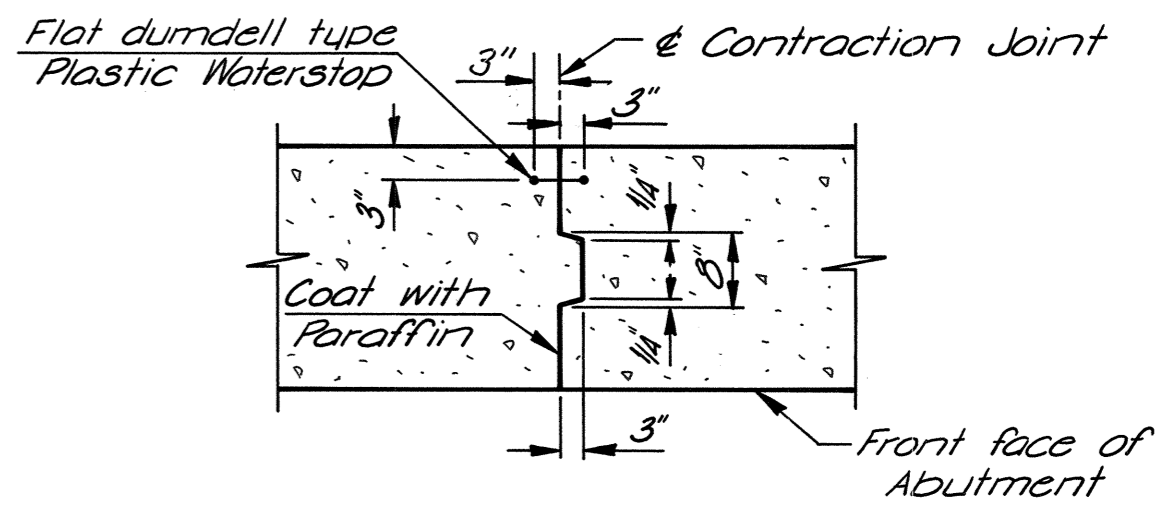
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	110	



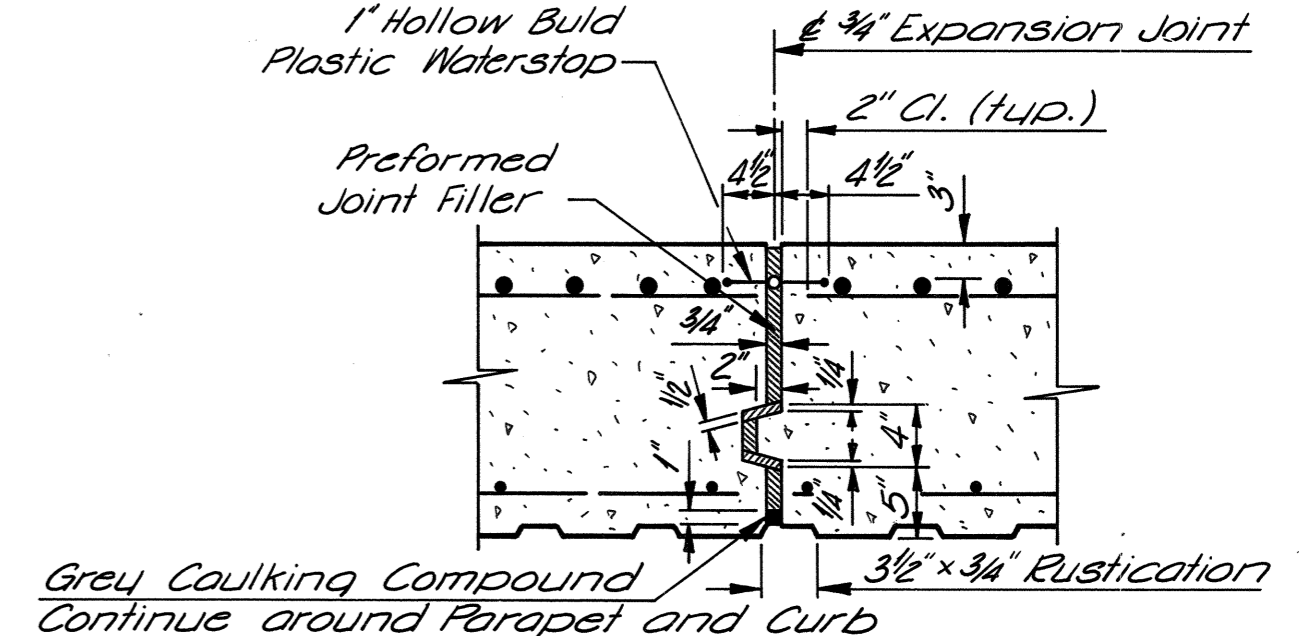
WINGWALL AND PARAPET DETAIL  
Scale: 1/2" = 1'-0"



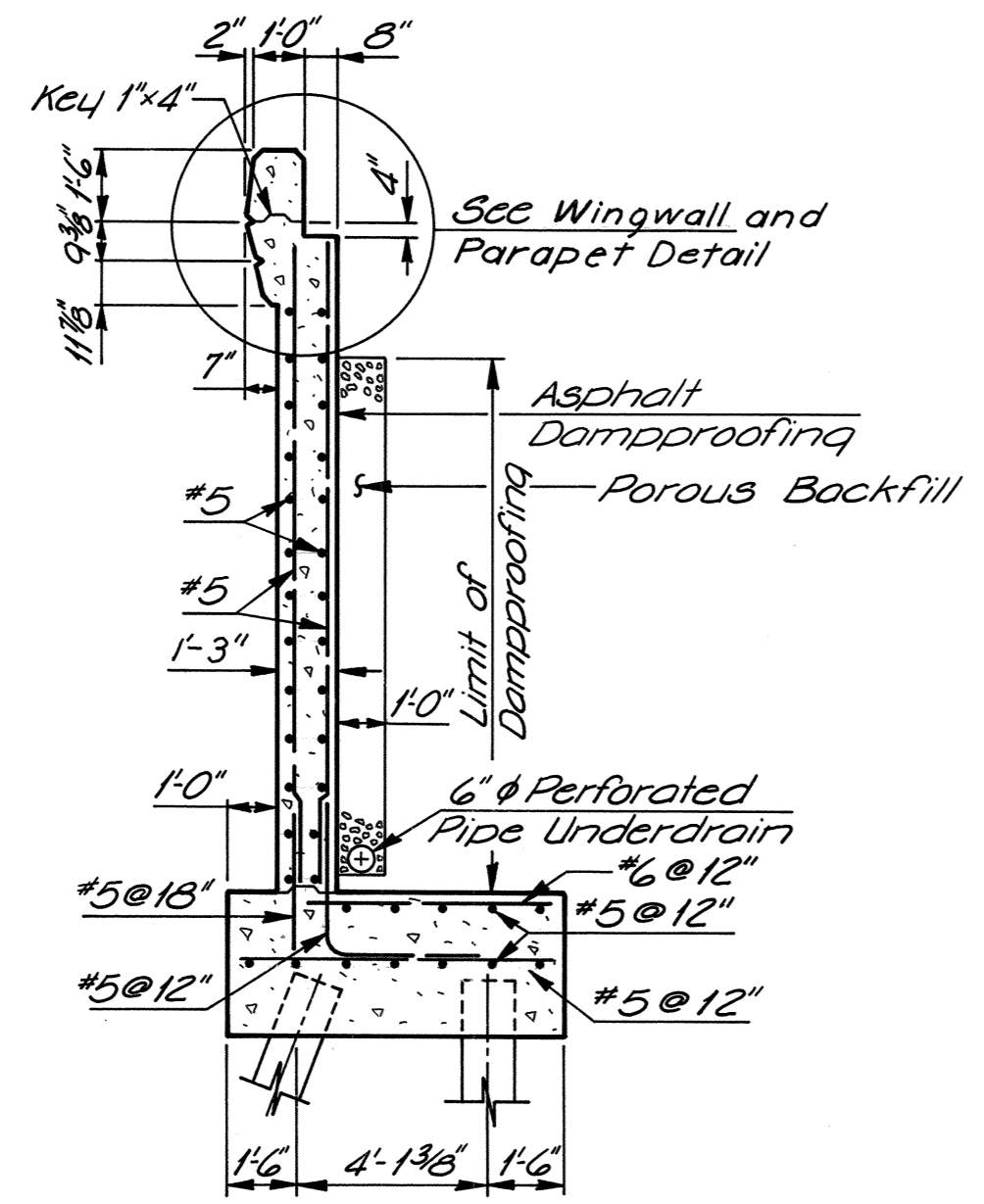
SECTION B-B  
Scale: 1/2" = 1'-0"



CONTRACTION JOINT AT ABUTMENTS  
No Scale

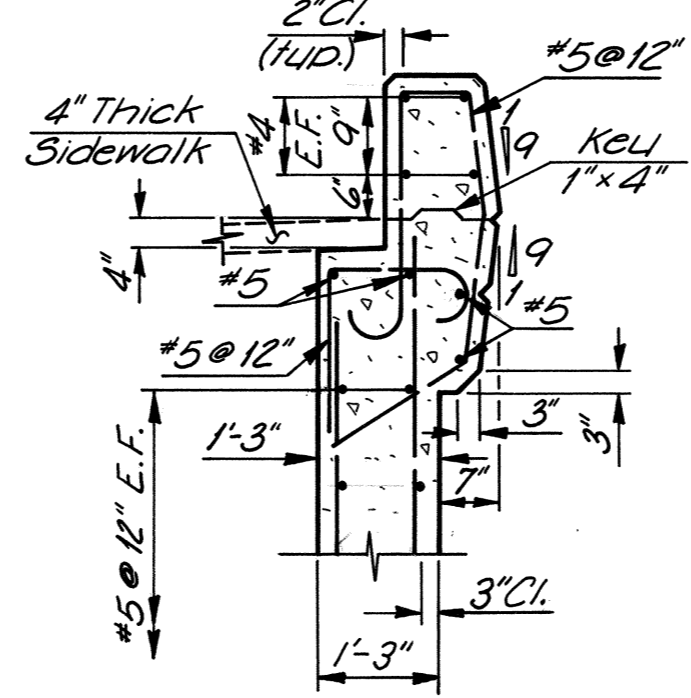


WINGWALL EXPANSION JOINTS  
No Scale



SECTION F-F  
(East Abutment)  
Scale: 1/4" = 1'-0"

Note:  
For location of Section F-F,  
see East Abutment, sheet 4.



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

DESIGNED					
DRAWN					
CHECKED			As Built		
IN CHARGE	NO.	REVISION	BY	DATE	

**AS BUILT**

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

**BRIDGE NO. 37  
GRANT STREET OVER SOUTH  
CONNECTION DOWNTOWN EXPRESSWAY  
ABUTMENT DETAILS**

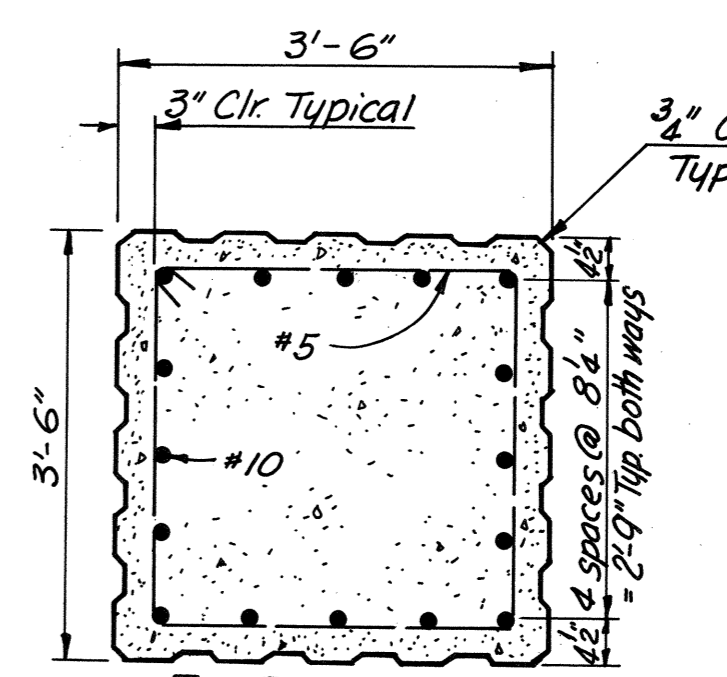
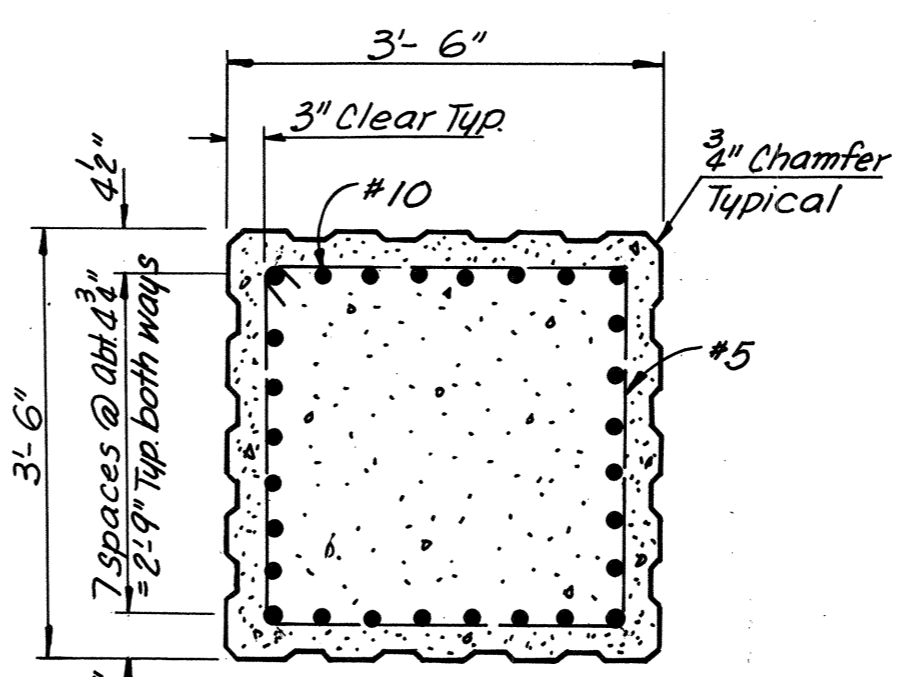
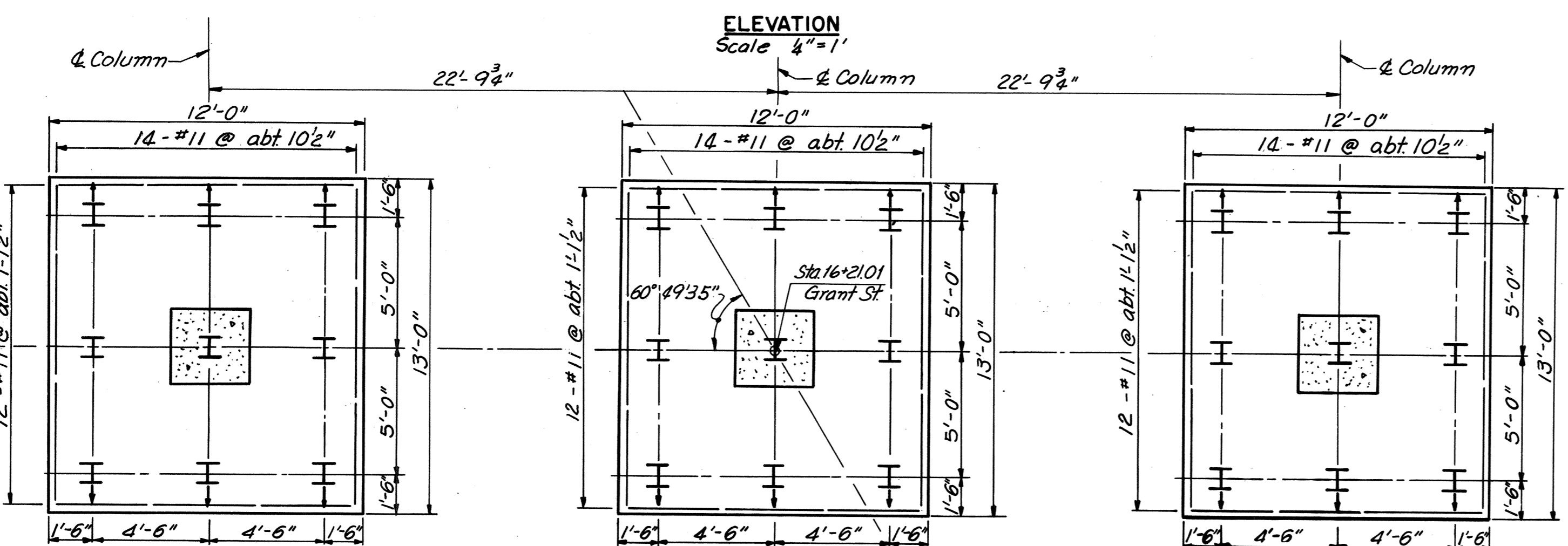
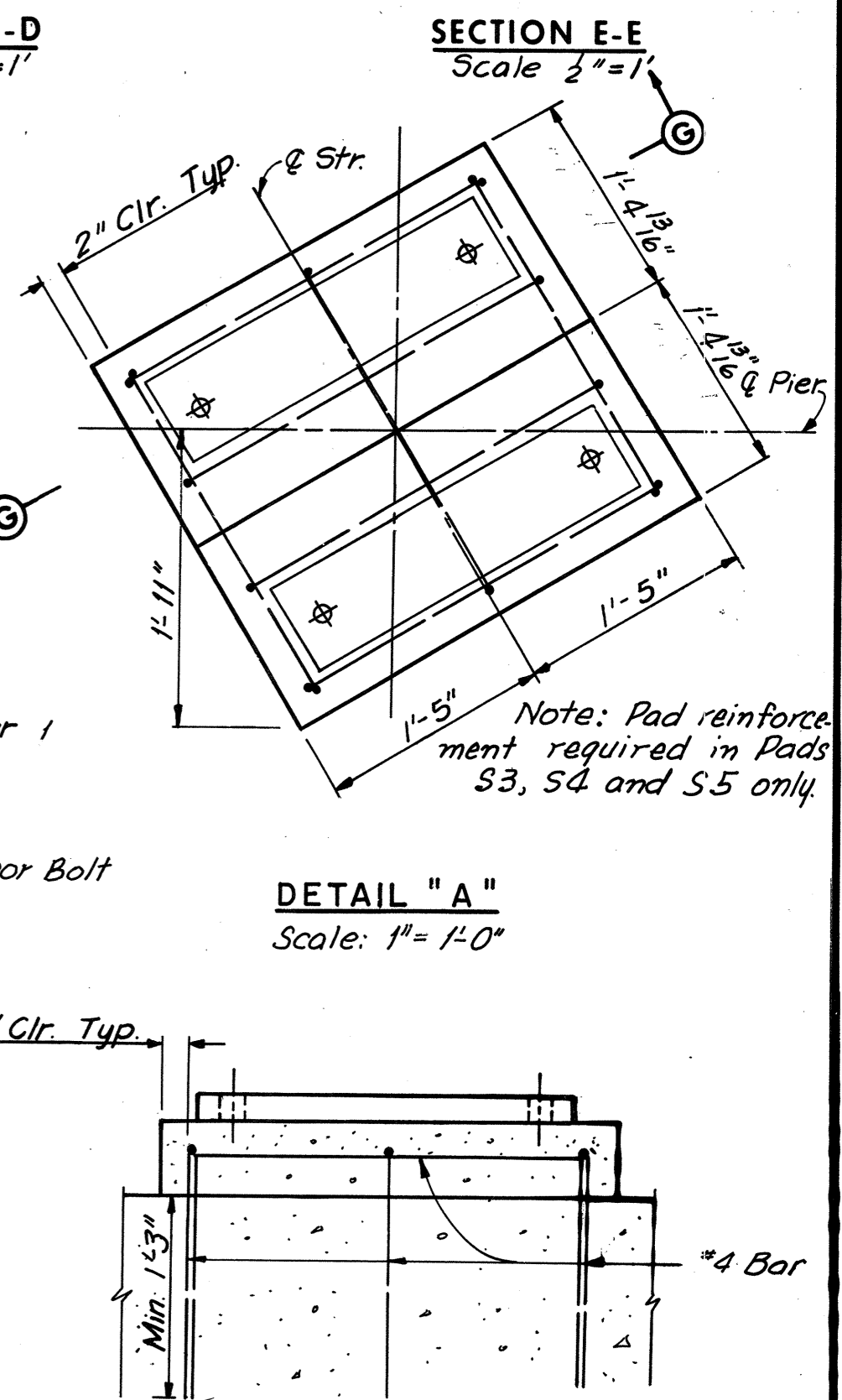
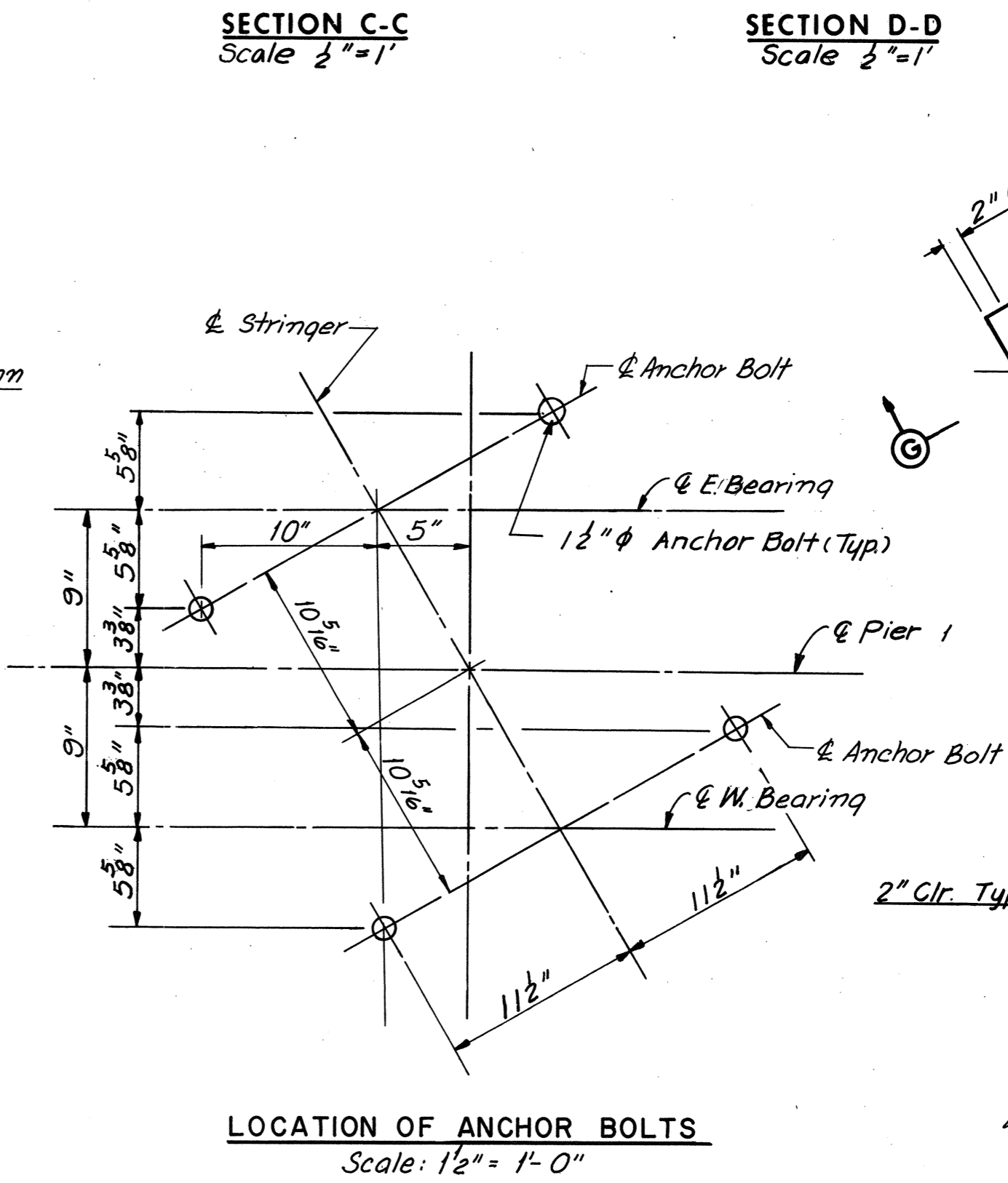
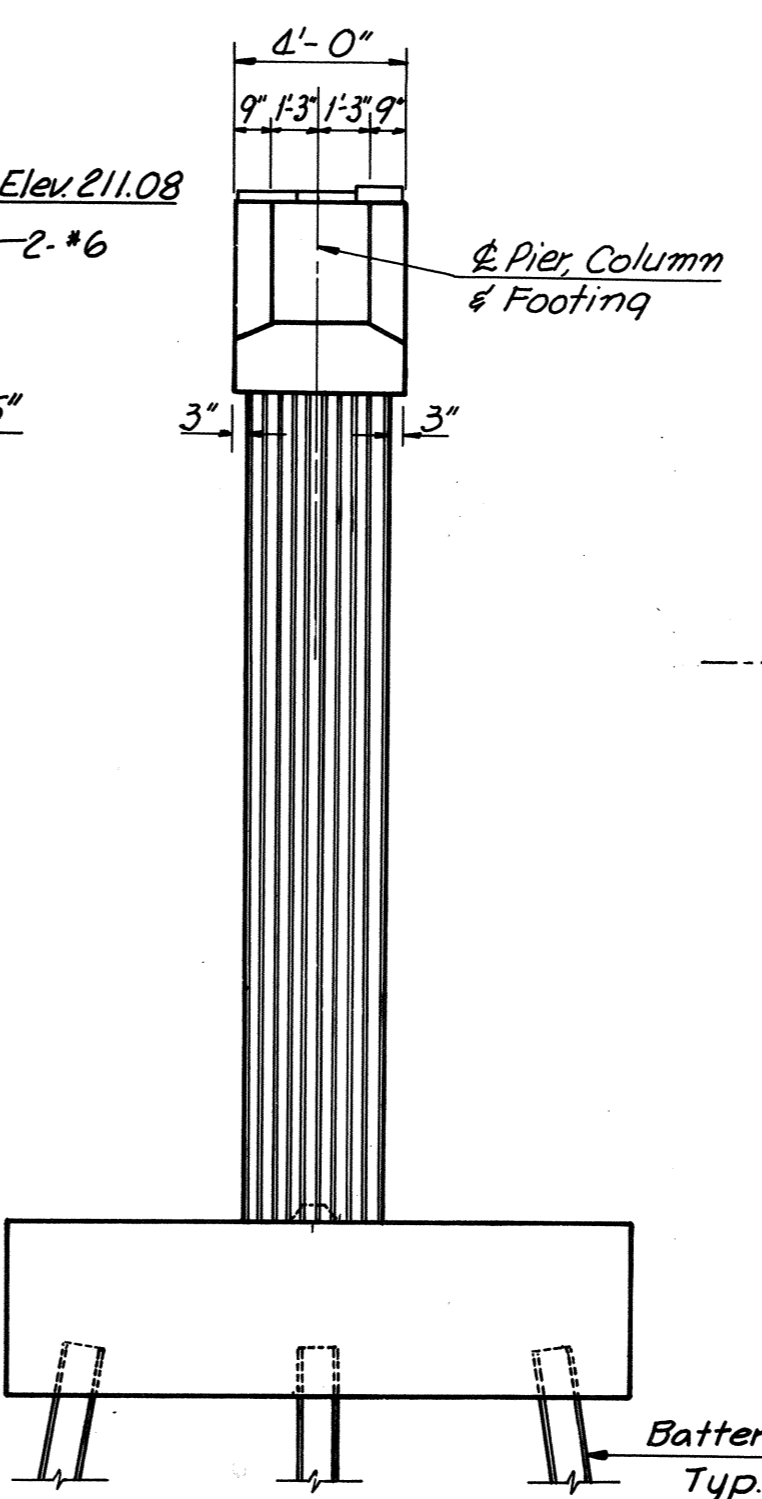
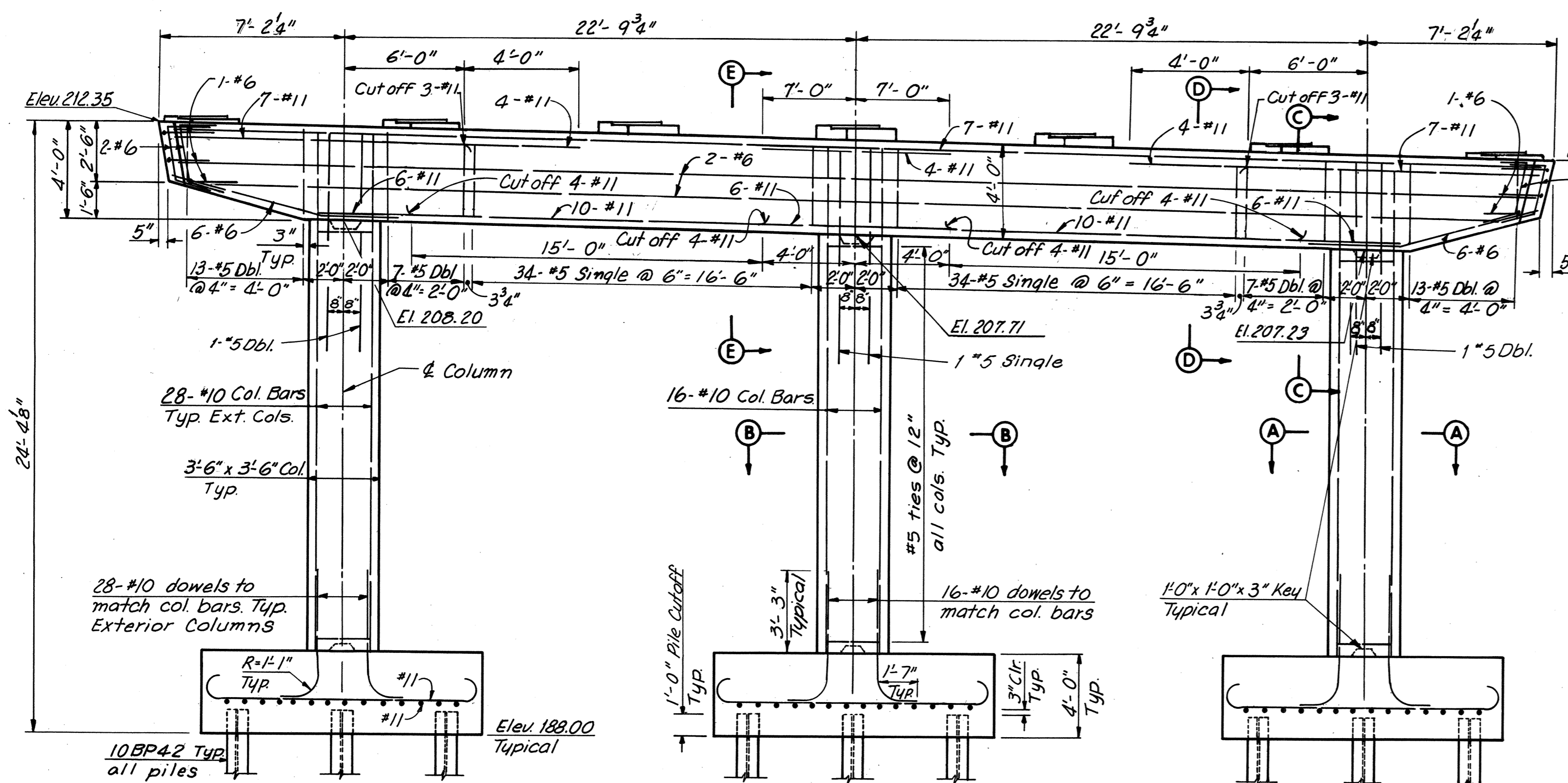
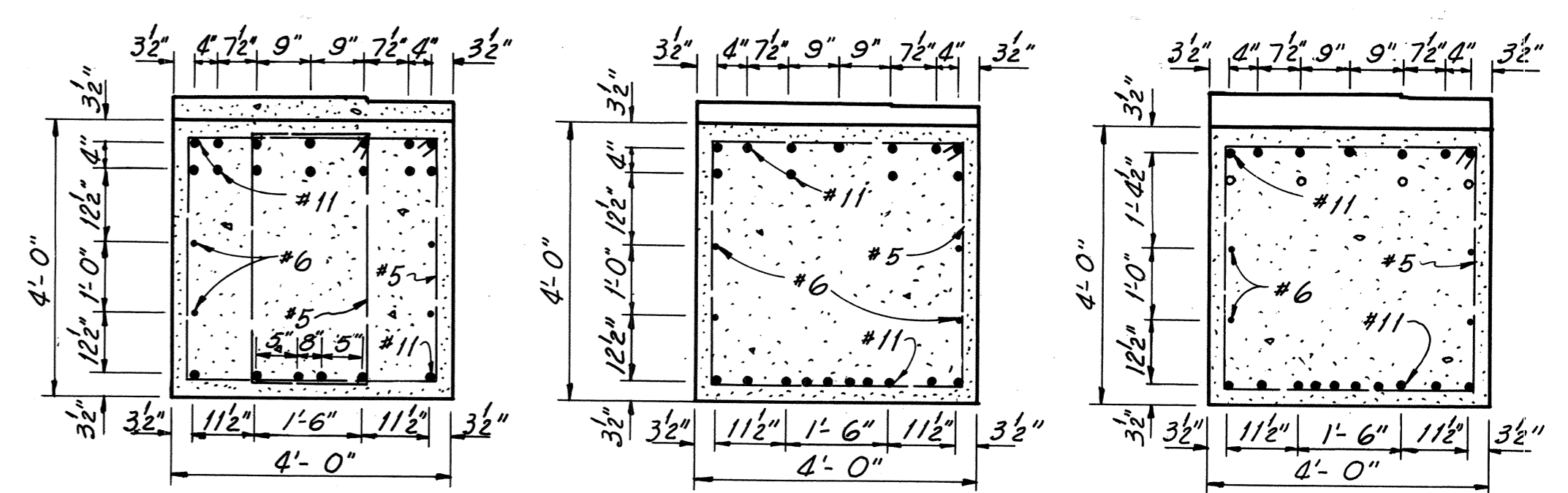
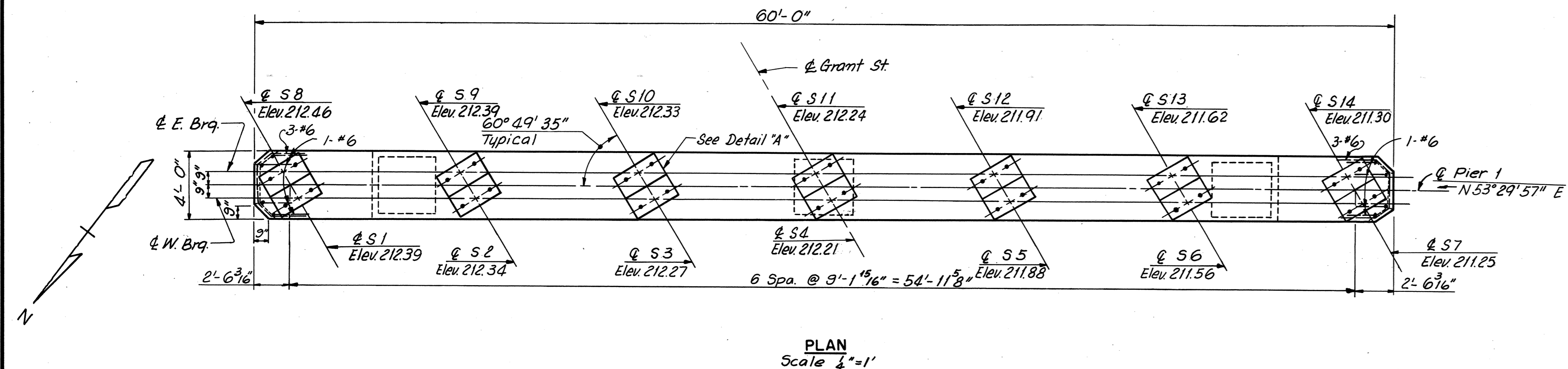
HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: **AS SHOWN**

CONTRACT NO. **7**

SHEET NO. **5** OF **13**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	111	



Notes:  
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 from more than 2 ft., redesign will be required.  
All piles shall be 10 BP 42 Steel Piles (Design Capacity = 45 tons).  
† Denotes pile battered 2 in 12 in direction shown

BY	DATE	NO.	REVISION	BY	DATE
MADE	TCY	1-31-68			
CHECKED	ICH	2-20-68	As Built	TEM	9-75
IN CHARGE	R. G. C.				

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

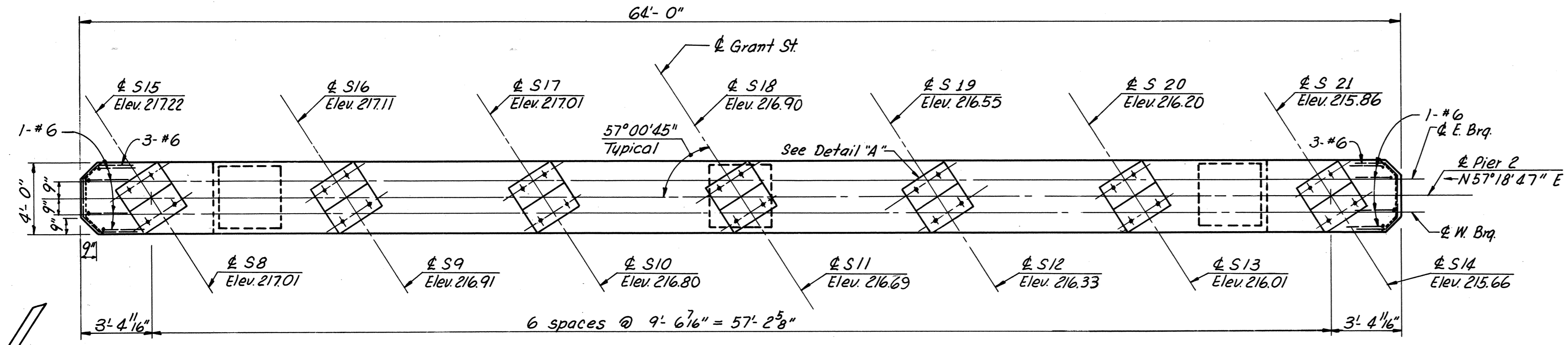
BRIDGE NO. 37  
 GRANT STREET OVER SOUTH  
 CONNECTION DOWNTOWN EXPRESSWAY  
 PIER 1

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

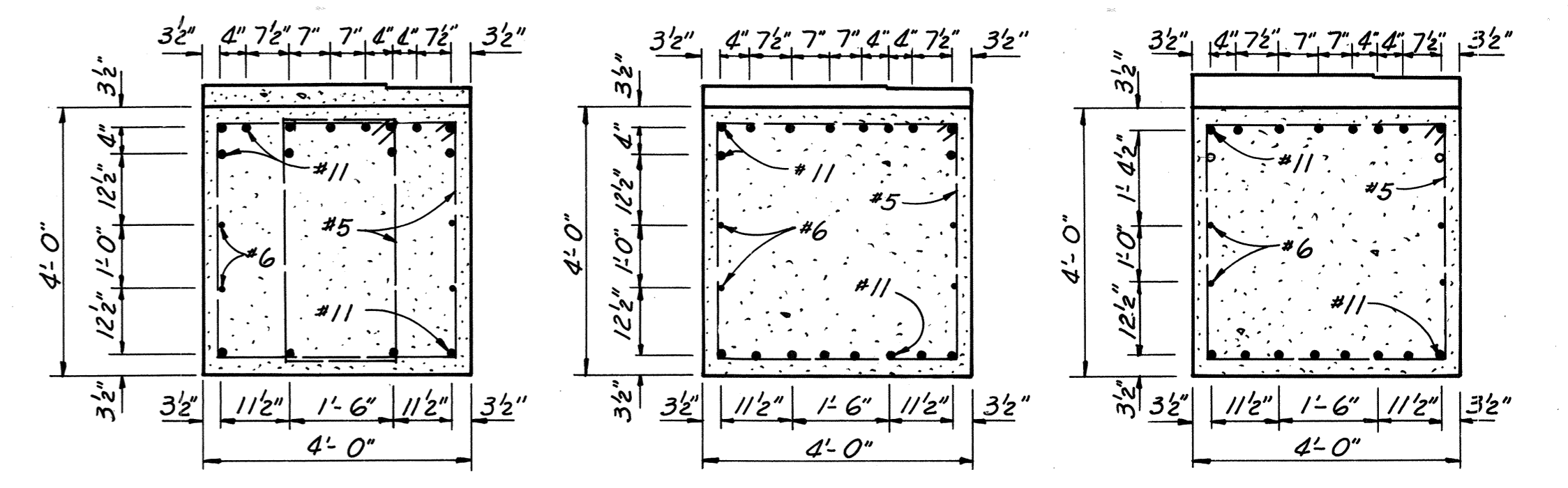
SCALE: As Shown  
 CONTRACT NO.: 7  
 SHEET NO. 6 OF 13

**AS BUILT**

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	112	



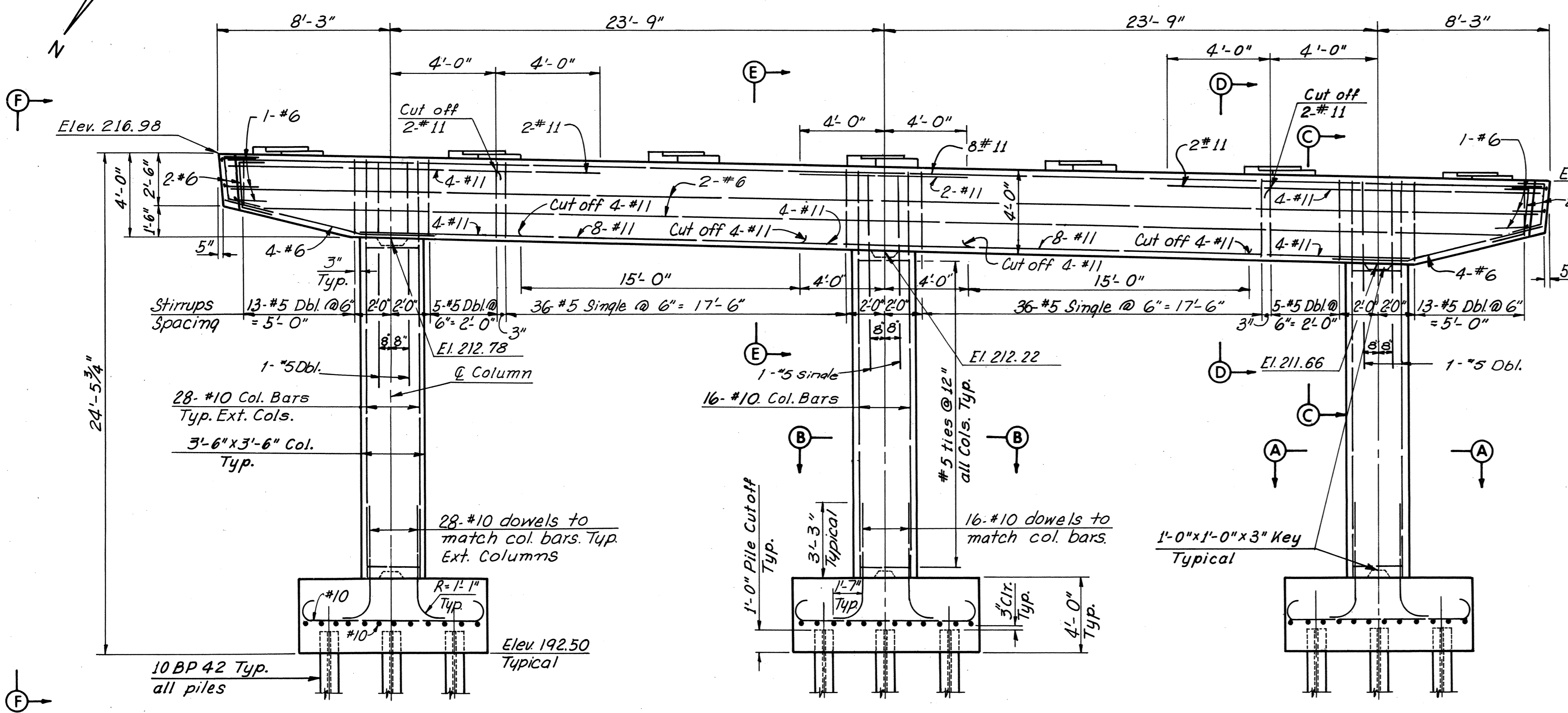
**PLAN**  
Scale: 1/2" = 1'-0"



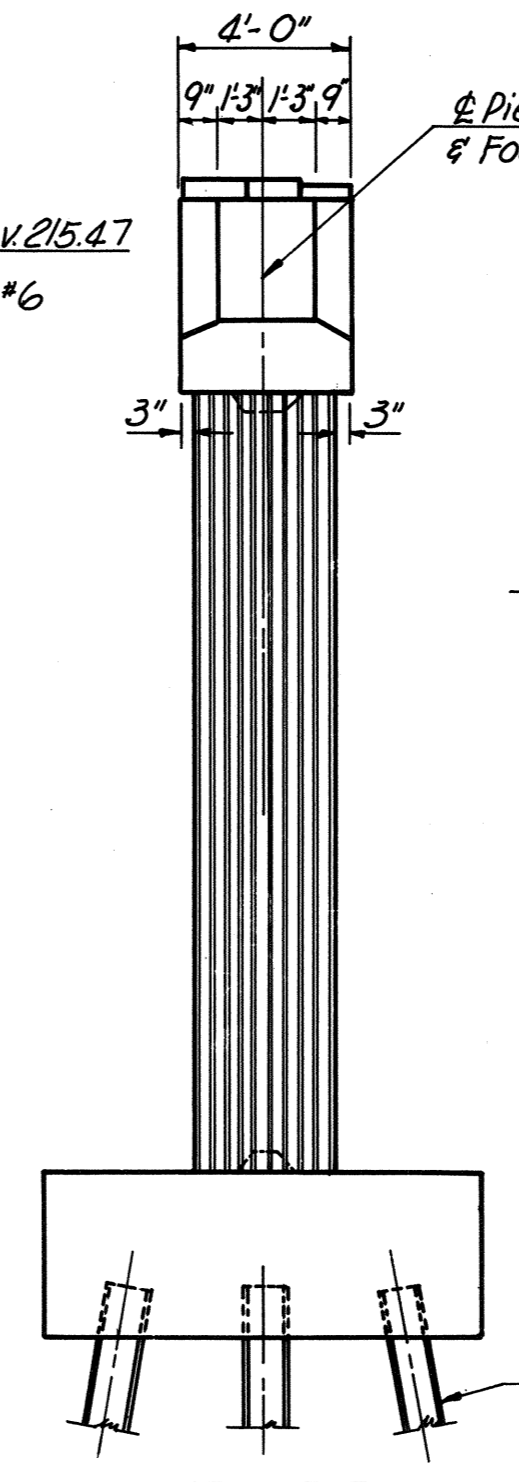
**SECTION C-C**  
Scale: 1/2" = 1'-0"

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

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

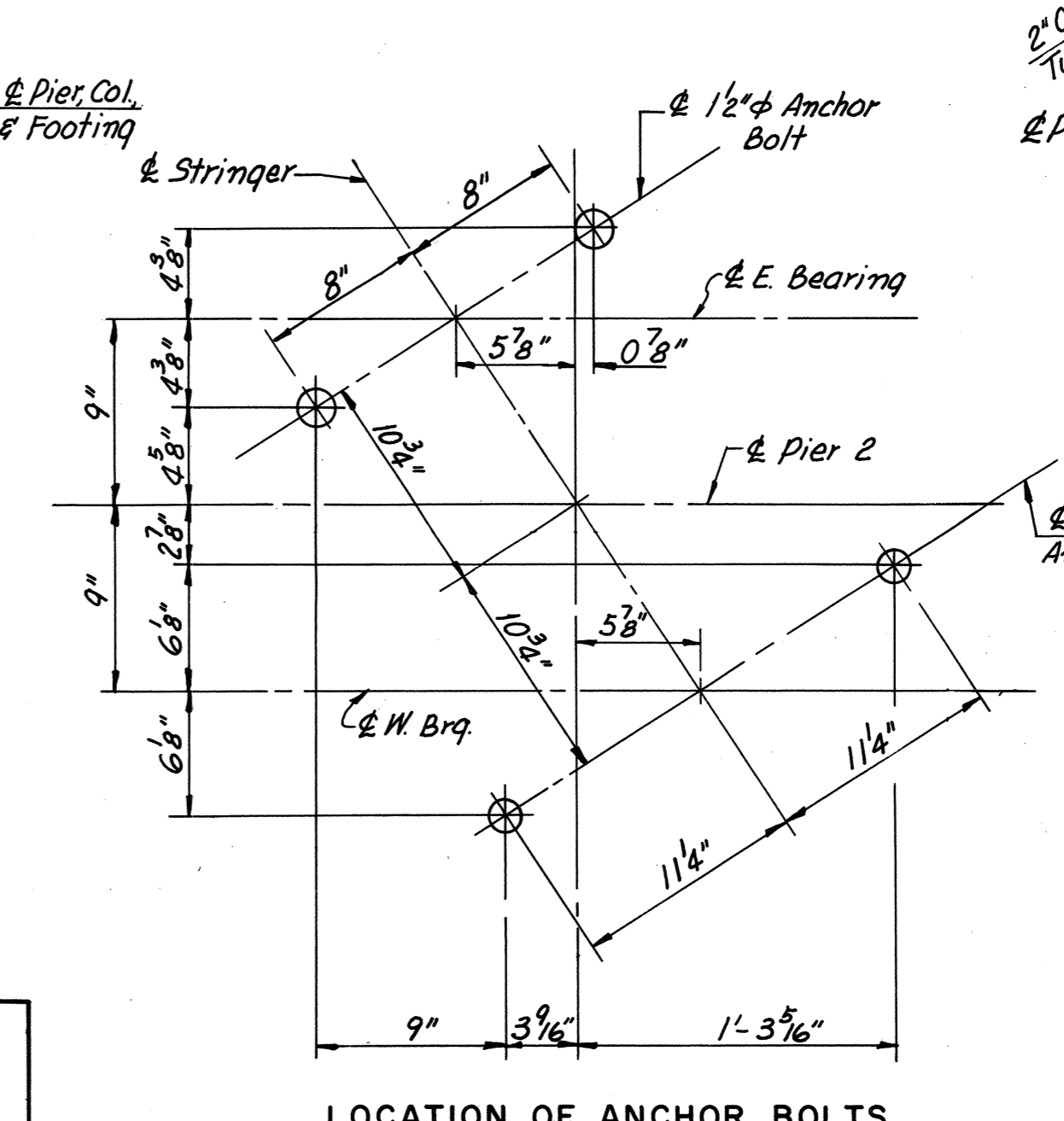


**ELEVATION**  
Scale: 1/4" = 1'-0"

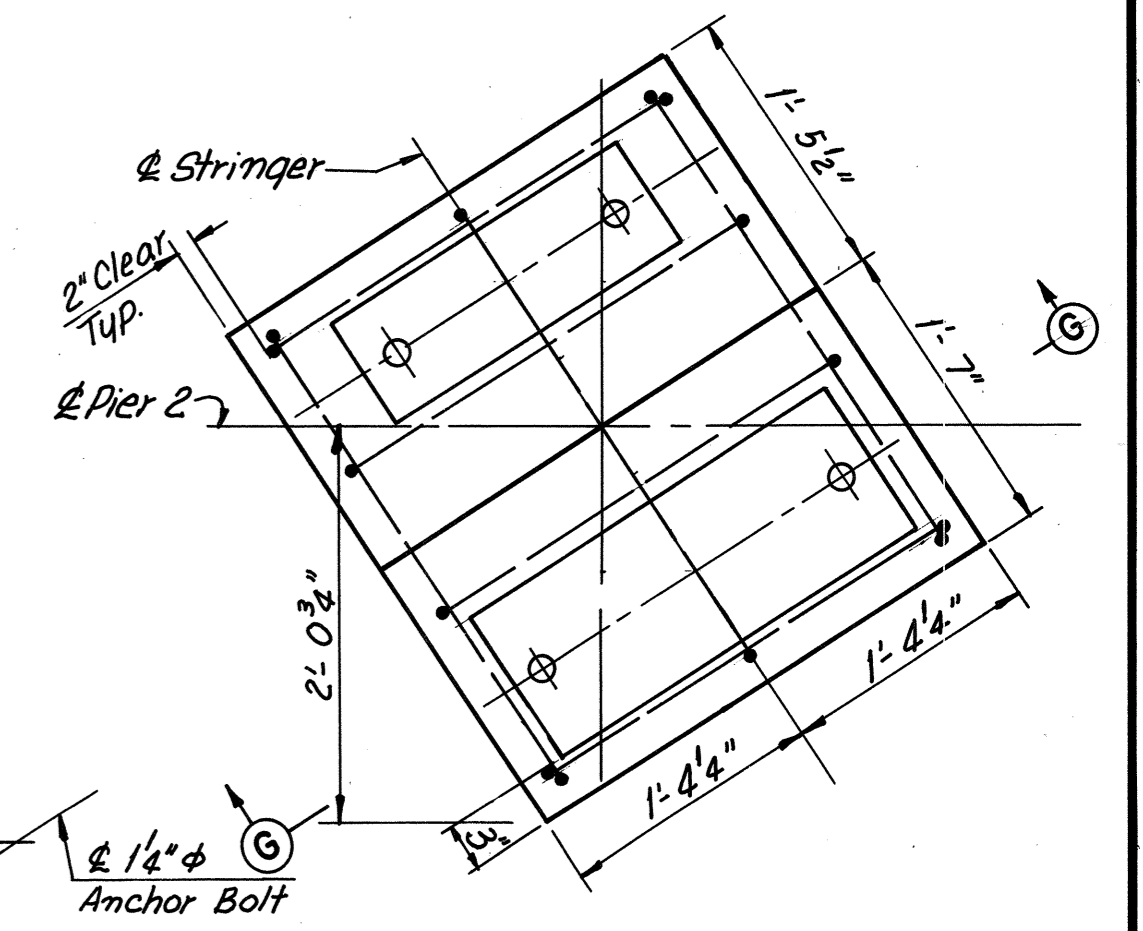


**VIEW F-F**  
Scale: 1/4" = 1'-0"

Note:  
For architectural treatment of columns see Standard Architectural Details sheet ST.

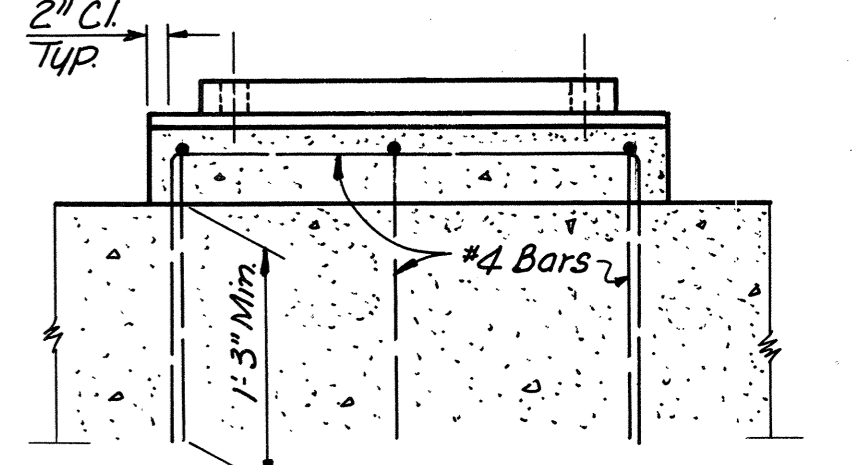


**LOCATION OF ANCHOR BOLTS**  
Scale: 1/2" = 1'-0"



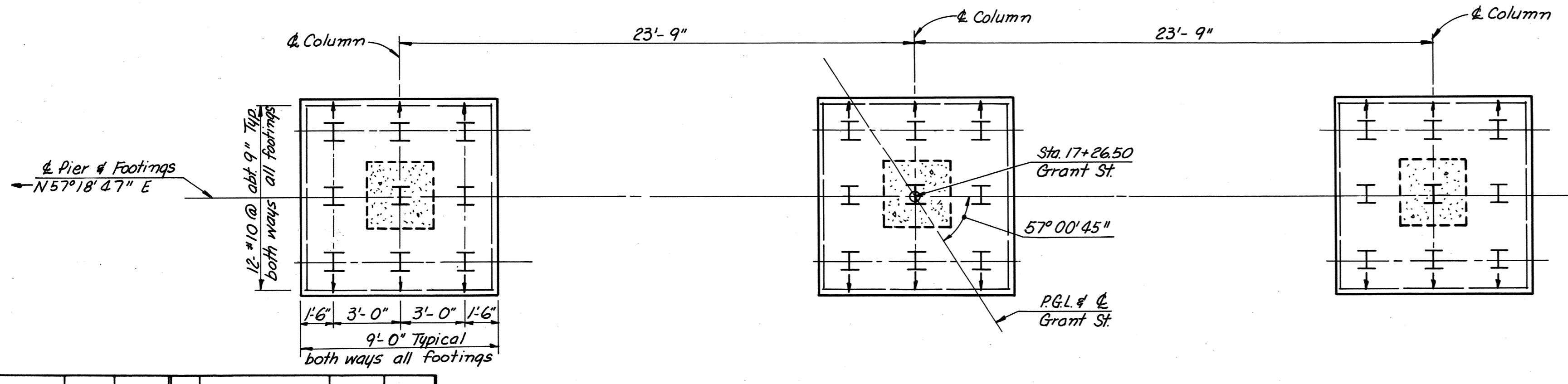
**DETAIL "A"**  
Scale: 1" = 1'-0"

Note: Pad reinforcement required in Pads S10, S11 & S12 only.

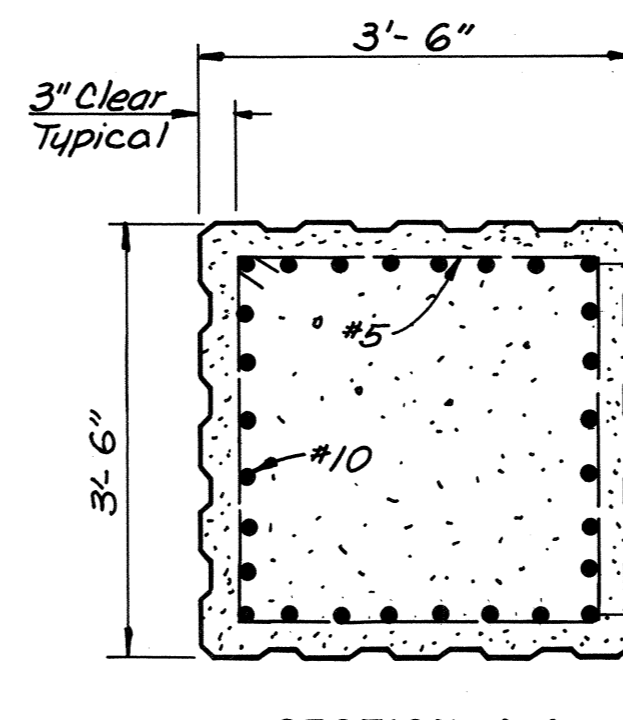


**SECTION G-G**  
Scale: 1" = 1'-0"

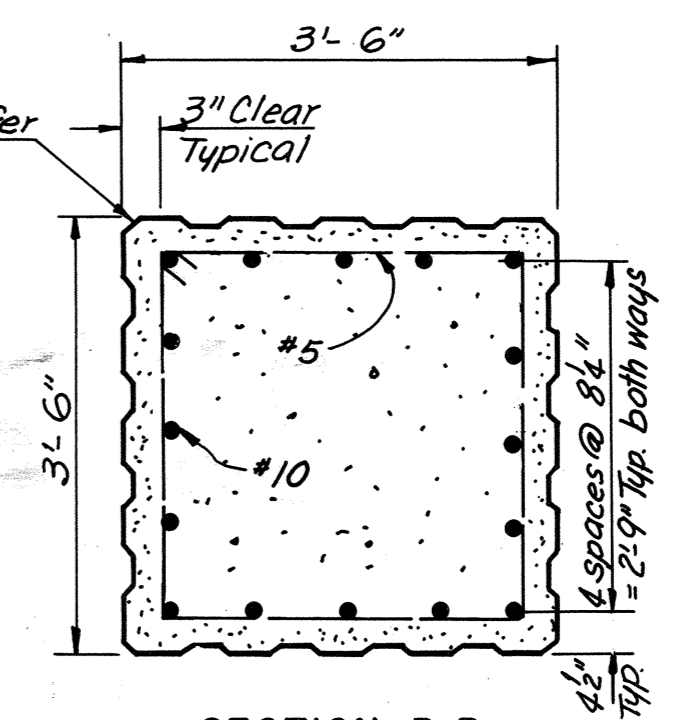
Notes:  
Footing elevations are approximate only and may be varied to suit field conditions as directed by the Engineer. Vertical shaft reinforcing shall not be cut until these elevations are established. Where elevations are more than 2 ft., redesign will be required.  
All piles shall be 10 BP 42 Steel Piles (Design Capacity = 45 tons).  
⌥ Denotes pile battered 2 in 12 in direction of arrow.



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



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



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

**AS BUILT**

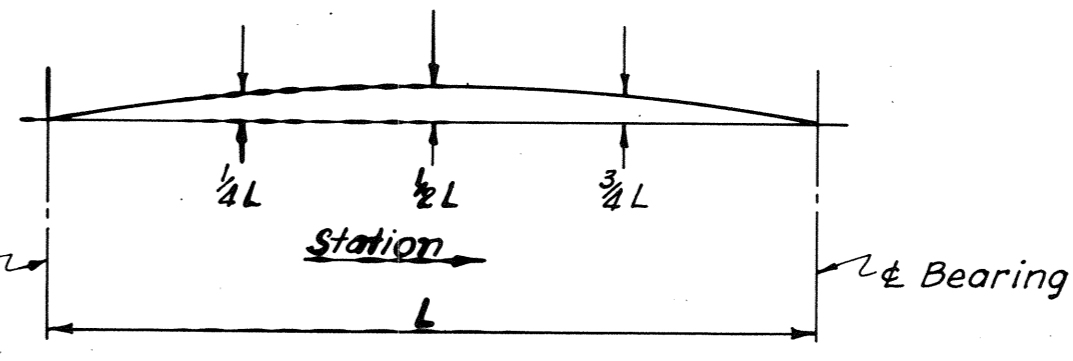
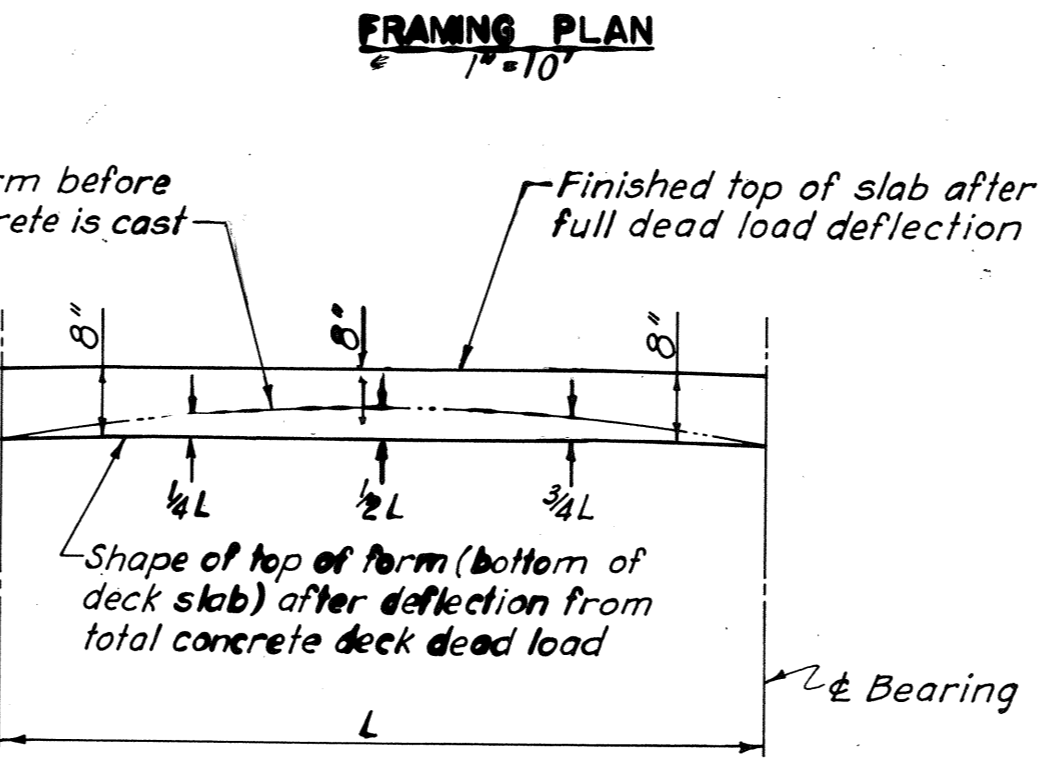
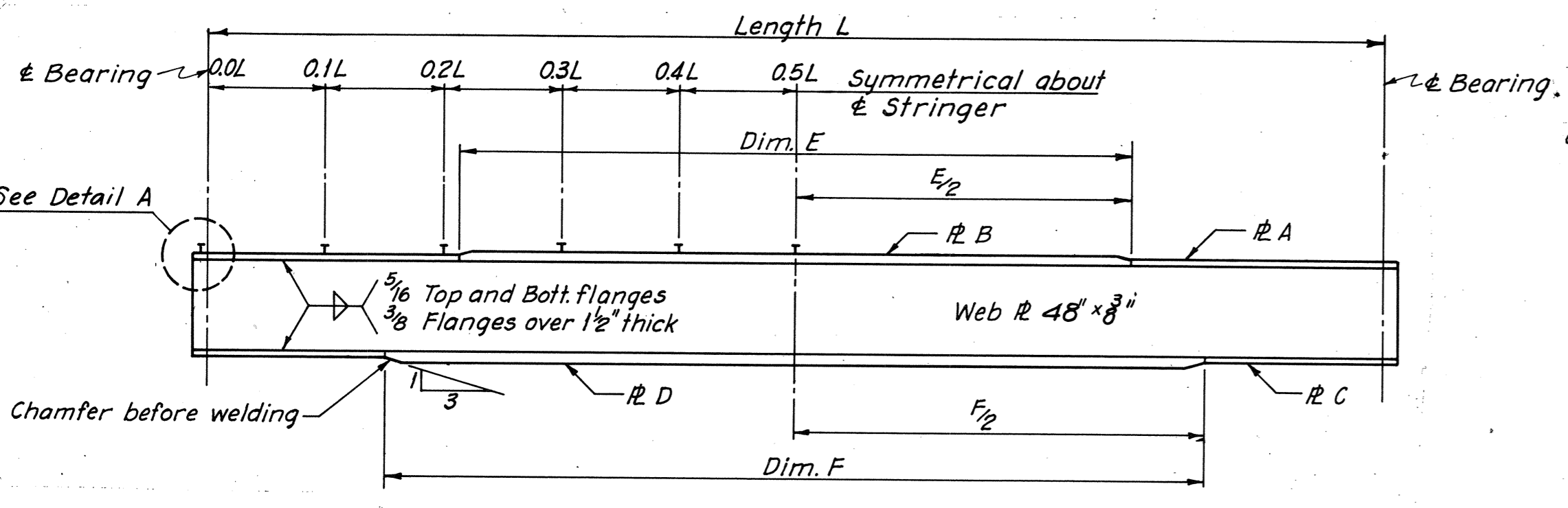
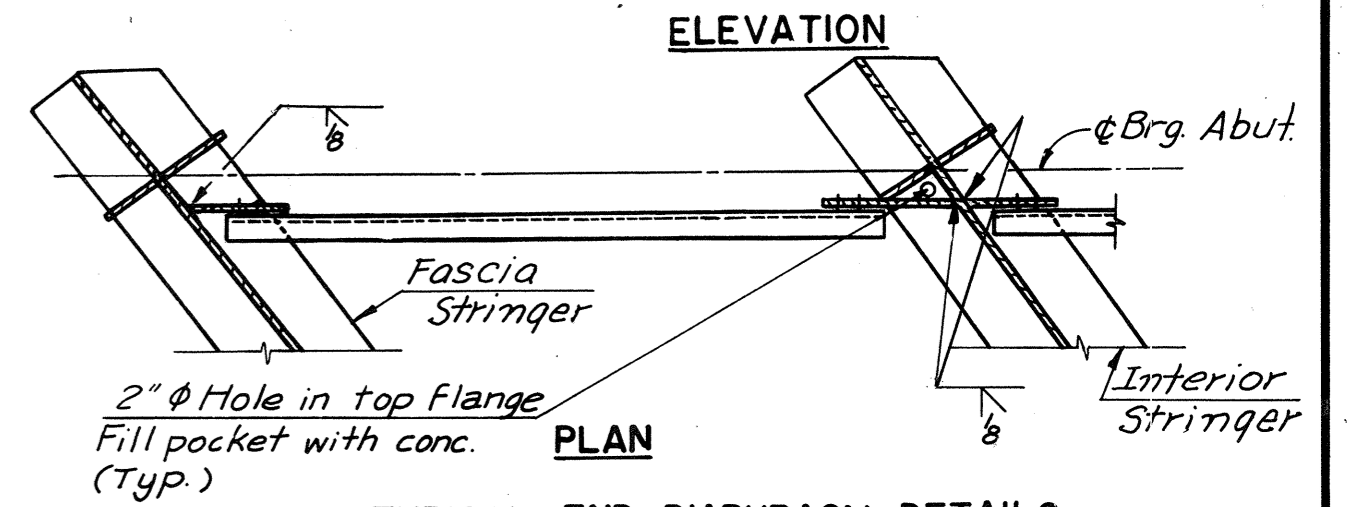
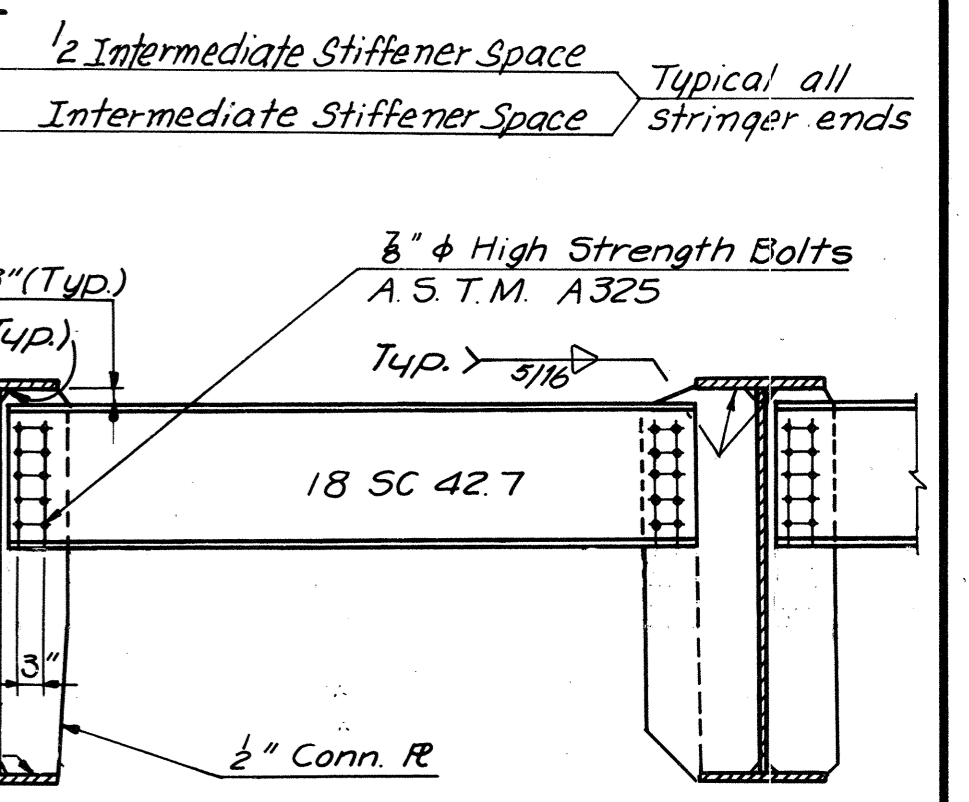
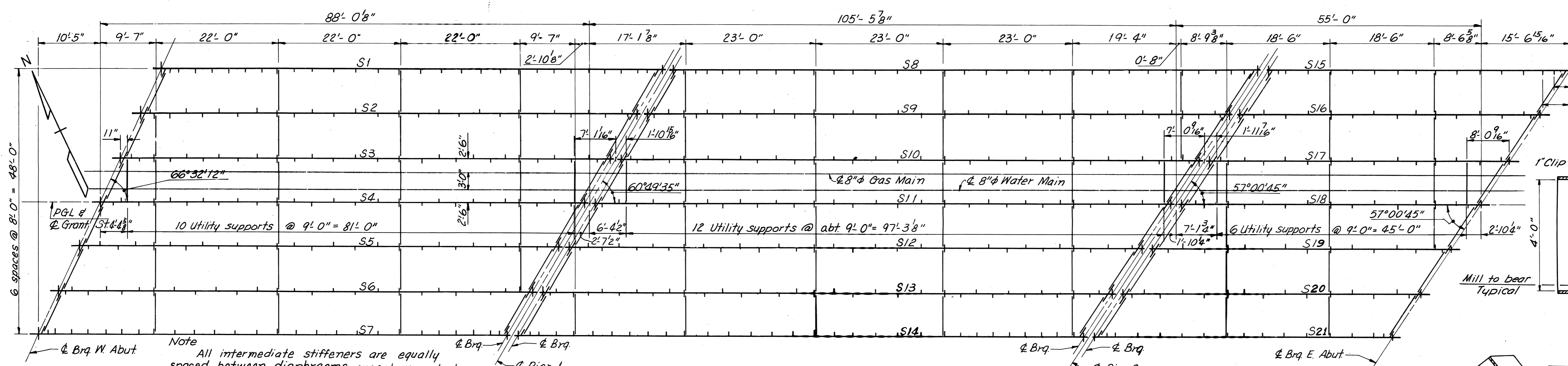
MADE	TCY	1-31-68			
CHECKED	ICH	2-20-68	1	As Built	TEM 9-75
IN CHARGE	R. G. C.				
NO.	REVISION	BY	DATE		

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

BRIDGE NO. 37  
GRANT STREET OVER SOUTH CONNECTION DOWNTOWN EXPRESSWAY  
PIER 2

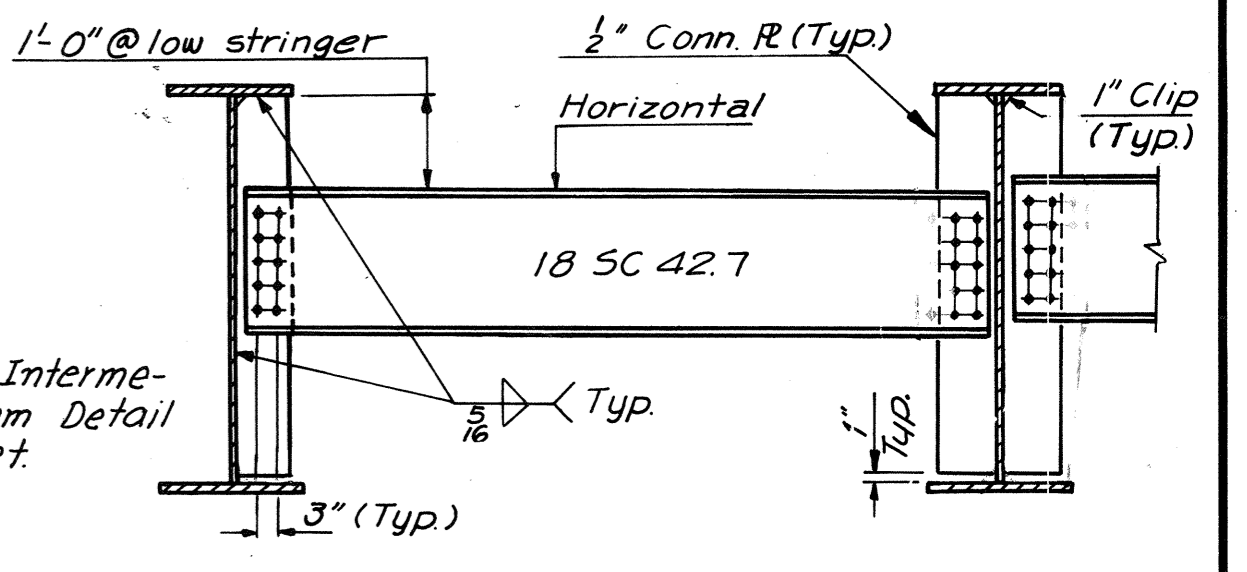
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NEW YORK ALEXANDRIA KANSAS CITY

SCALE: As Shown  
CONTRACT NO. 7  
SHEET NO. 7 OF 13



STR.	1/4 L	1/2 L	3/4 L
S1	1 3/4"	2 1/2"	1 3/4"
S2	1 1/2"	2 1/2"	1 1/2"
S3	1 1/2"	2"	1 1/2"
S4	1 1/4"	1 3/4"	1 1/4"
S5	1 3/8"	1 7/8"	1 3/8"
S6	1 1/4"	1 3/8"	1 1/2"
S7	1 1/2"	1 1/2"	1 1/4"
S8	2 1/2"	3 1/4"	2 1/2"
S9	2 1/2"	3 1/2"	2 1/2"
S10	2 1/2"	2 3/4"	2 1/2"
S11	1 3/8"	2 3/8"	1 3/8"
S12	2"	2 3/4"	2"
S13	2"	2 3/4"	2"
S14	2"	2 3/4"	2"
S15	1"	1 5/8"	1 5/8"
S16	3/4"	1 5/8"	1 1/8"
S17	5/8"	1 1/2"	1 1/2"
S18	1/2"	1 1/2"	1 1/2"
S19	7/16"	1 1/2"	9/16"
S20	3/8"	9/16"	7/16"
S21	7/16"	5/8"	7/16"

Note: See Special Intermediate Diaphragm Detail on next sheet.

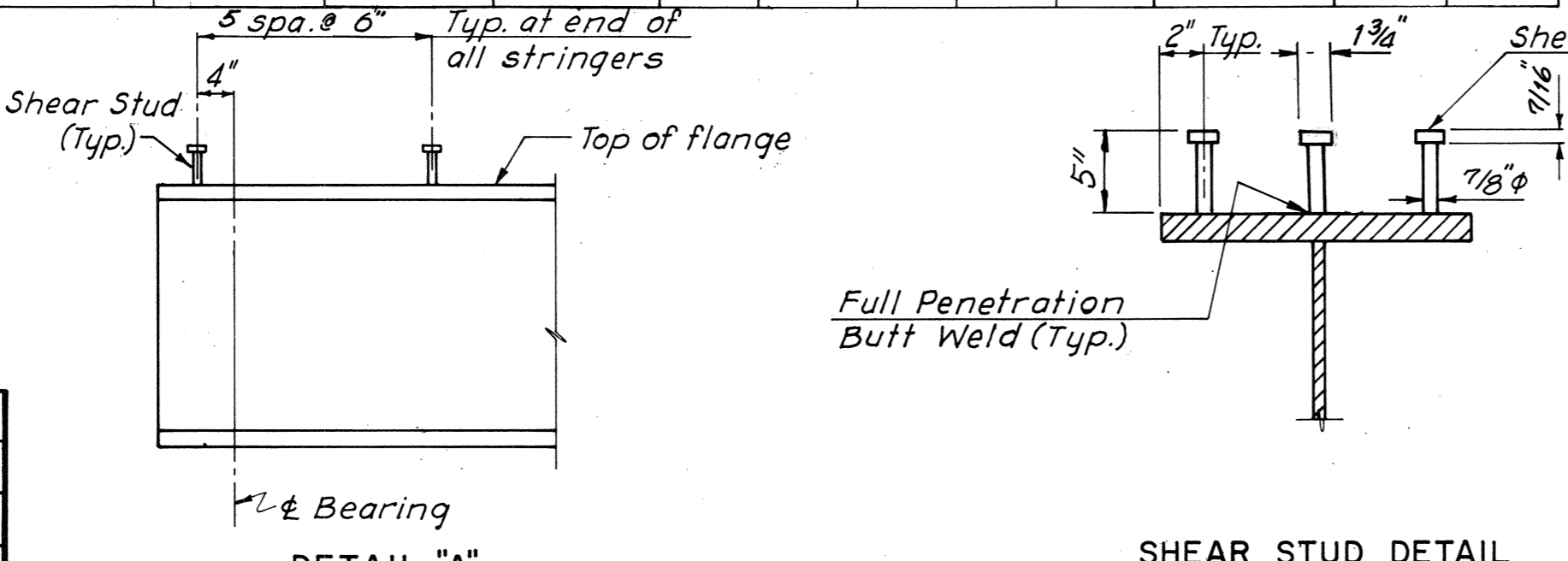


STRINGER	LENGTH C BRG. TO C BRG.	R A	R B	R C	R D	DIM. E	DIM. F	SHEAR STUD SPACING					BEARING STIFFENER	SHOE TYPE	
								0L-1L*	1L-2L	2L-3L	3L-4L	4L-5L		LT. END	RT. END
S1	90'-1 3/8"	16x1 1/4	16x1 1/4	18x1 1/4	18x1 3/4	—	56'-6"	12"	15"	20"	24"	24"	2-7x2	E6	F4M
S2	89'-1 1/16"	16x1 1/4	16x1 1/4	18x1 1/4	18x1 3/4	—	55'-3"	11 1/2"	13 1/2"	16"	19 1/2"	24"	2-7x2	E6	F4
S3	88'-1 3/4"	16x1 1/4	16x1 1/4	18x1 1/4	18x1 3/4	—	54'-8"	11 1/2"	13 1/2"	16"	19 1/2"	24"	2-7x2	E6	F4
S4	87'-1 1/16"	16x1 1/4	16x1 1/4	18x1 1/4	18x1 3/4	—	54'-0"	11 1/2"	13 1/2"	16"	19 1/2"	24"	2-7x2	E6	F4
S5	86'-1 5/16"	16x1 1/4	16x1 1/4	18x1 1/4	18x1 3/4	—	53'-5"	11 1/2"	13 1/2"	16"	19 1/2"	24"	2-7x2	E6	F4
S6	85'-2"	16x1 1/4	16x1 1/4	18x1 1/4	18x1 3/4	—	52'-9"	11 1/2"	13 1/2"	16"	19 1/2"	24"	2-7x2	E6	F4
S7	84'-2 1/2"	16x1 1/4	16x1 1/4	18x1 1/4	18x1 3/4	—	52'-9"	12"	15"	20"	24"	24"	2-7x2	E6	F4M
S8	105'-10 15/16"	16x1 1/4	16x2	18x1 1/4	18x2 1/2	53'-0"	64'-9"	14 1/2"	18"	23 1/2"	24"	24"	2-7x2	F4M	E7
S9	105'-2 1/4"	16x1 1/4	16x1 3/4	18x1 3/4	18x2 1/2	52'-8"	65'-4"	12"	14"	16 1/2"	20 1/2"	24"	2-7x2	F4	E7
S10	104'-5 1/2"	16x1 1/4	16x1 3/4	18x1 3/4	18x2 1/2	52'-3"	64'-10"	12"	14"	16 1/2"	20 1/2"	24"	2-7x2	F4	E7
S11	103'-8 1/2"	16x1 1/4	16x1 3/4	18x1 3/4	18x2 1/2	51'-11"	64'-5"	12"	14"	16 1/2"	20 1/2"	24"	2-7x2	F4	E7
S12	103'-0 8"	16x1 1/4	16x1 3/4	18x1 3/4	18x2 1/2	51'-7"	63'-11"	12"	14"	16 1/2"	20 1/2"	24"	2-7x2	F4	E7
S13	102'-3 3/8"	16x1 1/4	16x1 3/4	18x1 3/4	18x2 1/2	51'-2"	63'-6"	12"	14"	16 1/2"	20 1/2"	24"	2-7x2	F4	E7
S14	101'-6 1/16"	16x1 1/4	16x2	18x1 3/4	18x2 1/2	50'-10"	62'-1"	14 1/2"	18"	23 1/2"	24"	24"	2-7x2	F4M	E7
S15, S21	54'-1 1/4"	12x7/8	12x7/8	12x7/8	12x7/8	—	—	16 1/2"	20 1/2"	24"	24"	24"	2-5x2	F1M	E1
S16 to S20	54'-1 1/4"	12x7/8	12x7/8	12x7/8	12x7/8	—	—	11 1/2"	13"	15 1/2"	19"	24"	2-5x2	F1	E1

\* Denotes spacing which begins at termination of 5 spaces at 6"

**SHEAR STUD NOTE**

Stud rows shall be placed parallel to the main deck reinforcing. Shear stud spacing shown in maximum spacing.



**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 stringer, without alteration of the slab thickness.

**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.

Note: For Gas and Water support details see Standard Sheet S11.

**AS BUILT**

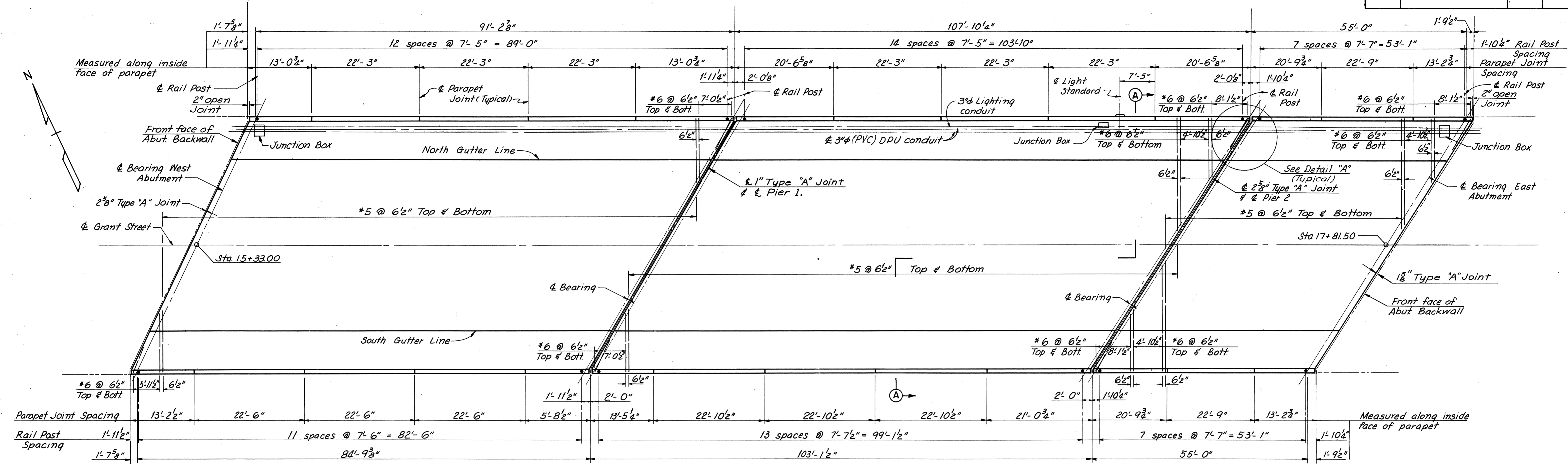
RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY

BRIDGE NO. 37  
GRANT STREET OVER SOUTH  
CONNECTION DOWNTOWN EXPRESSWAY  
FRAMING PLAN

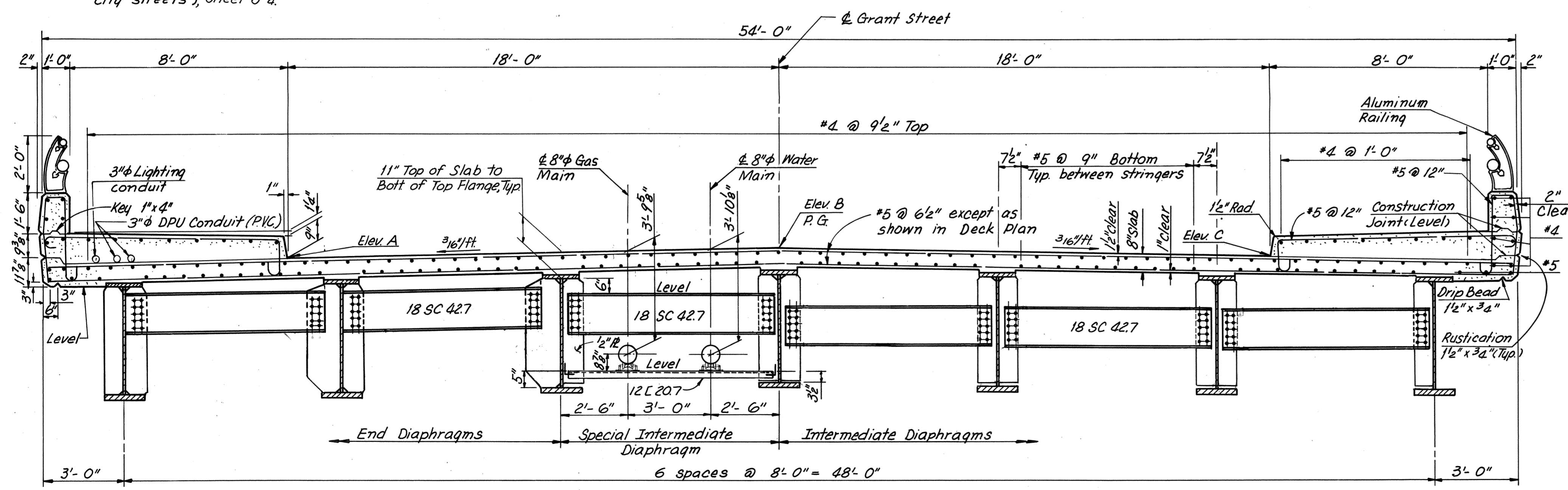
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consulting engineers  
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: As Shown  
CONTRACT NO.: 7  
SHEET NO. 8 OF 13

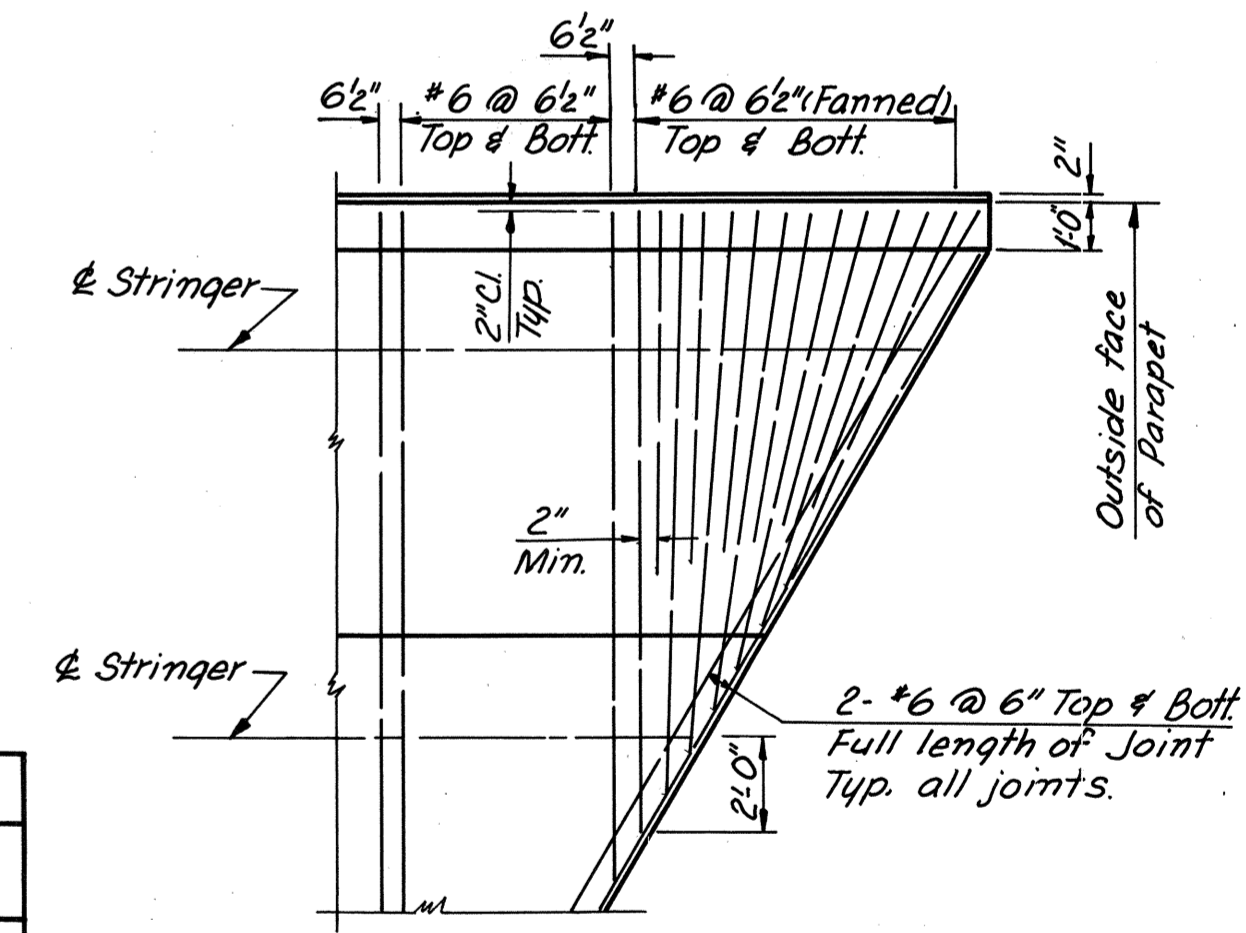
BY	DATE				
MADE	TCY	1-9-68			
CHECKED	ICH	2-21-68	As Built		
IN CHARGE	R. G. C.			BY	DATE



Note:  
For lighting details and D.P.U. conduit details see Standard Electrical Details (Bridge carrying city streets), Sheet 5-4.



3 Junction Boxes  
2 each 2'-0" x 1'-11"  
1 each 2'-0" x 1'-1/2"



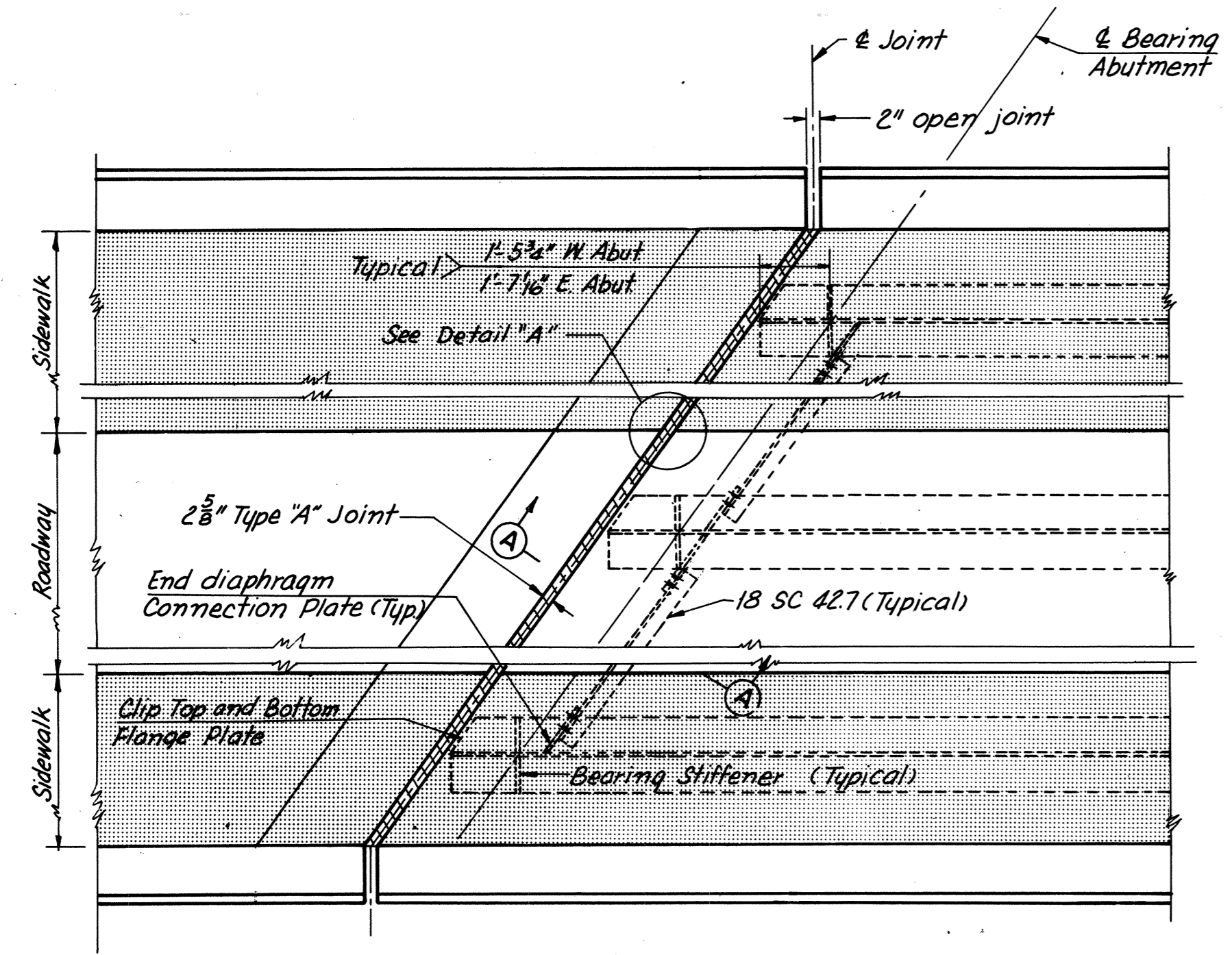
ROADWAY ELEVATIONS			
LOCATION	ELEV. A	ELEV. B	ELEV. C
Front Face W. Abut Backwall	213.90	213.84	213.23
.25 Point	214.89	214.81	214.17
.50 Point	215.89	215.79	215.12
.75 Point	216.89	216.76	216.07
€ Pier 1	217.89	217.73	217.02
.25 Point	219.06	218.88	218.15
.50 Point	220.22	220.03	219.27
.75 Point	221.38	221.17	220.40
€ Pier 2	222.55	222.32	221.53
.25 Point	223.17	222.94	222.15
.50 Point	223.78	223.56	222.77
.75 Point	224.35	224.17	223.38
Front Face E. Abut Backwall	224.86	224.73	223.99

RICHMOND METROPOLITAN AUTHORITY  
RICHMOND EXPRESSWAY SYSTEM  
DOWNTOWN EXPRESSWAY

BRIDGE NO. 37  
GRANT STREET OVER SOUTH CONNECTION DOWNTOWN EXPRESSWAY  
DECK PLAN AND CROSS SECTION

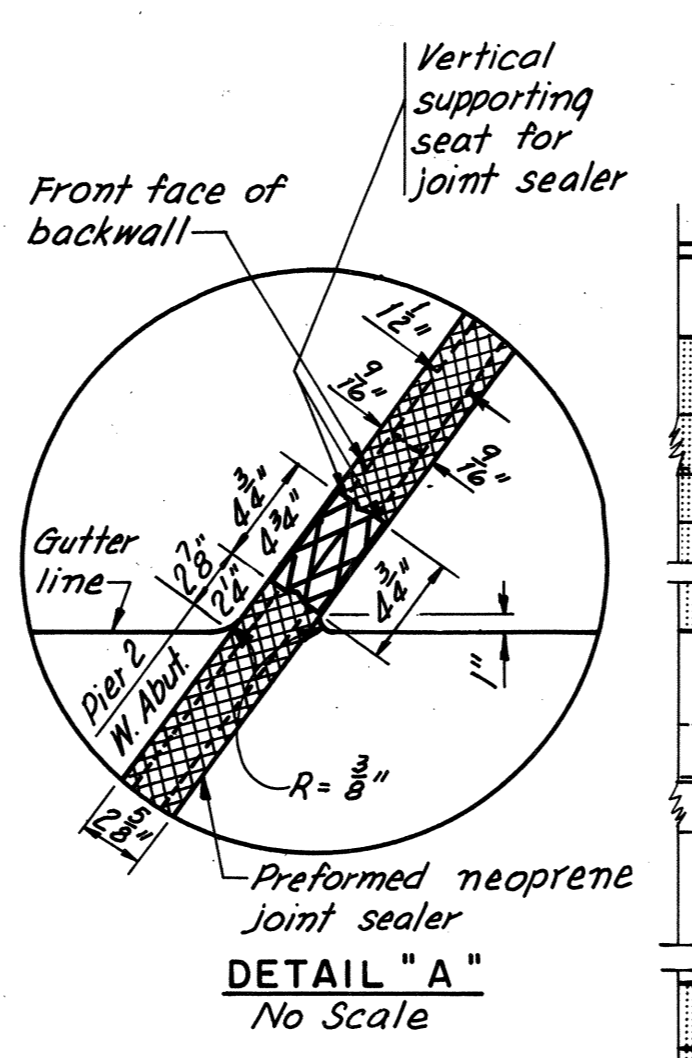
BY	DATE				
MADE	TCY	11-21-67			
CHECKED	ICH	2-9-68	1	As Built	TEM 9-75
IN CHARGE	R.G.C.				

AS BUILT

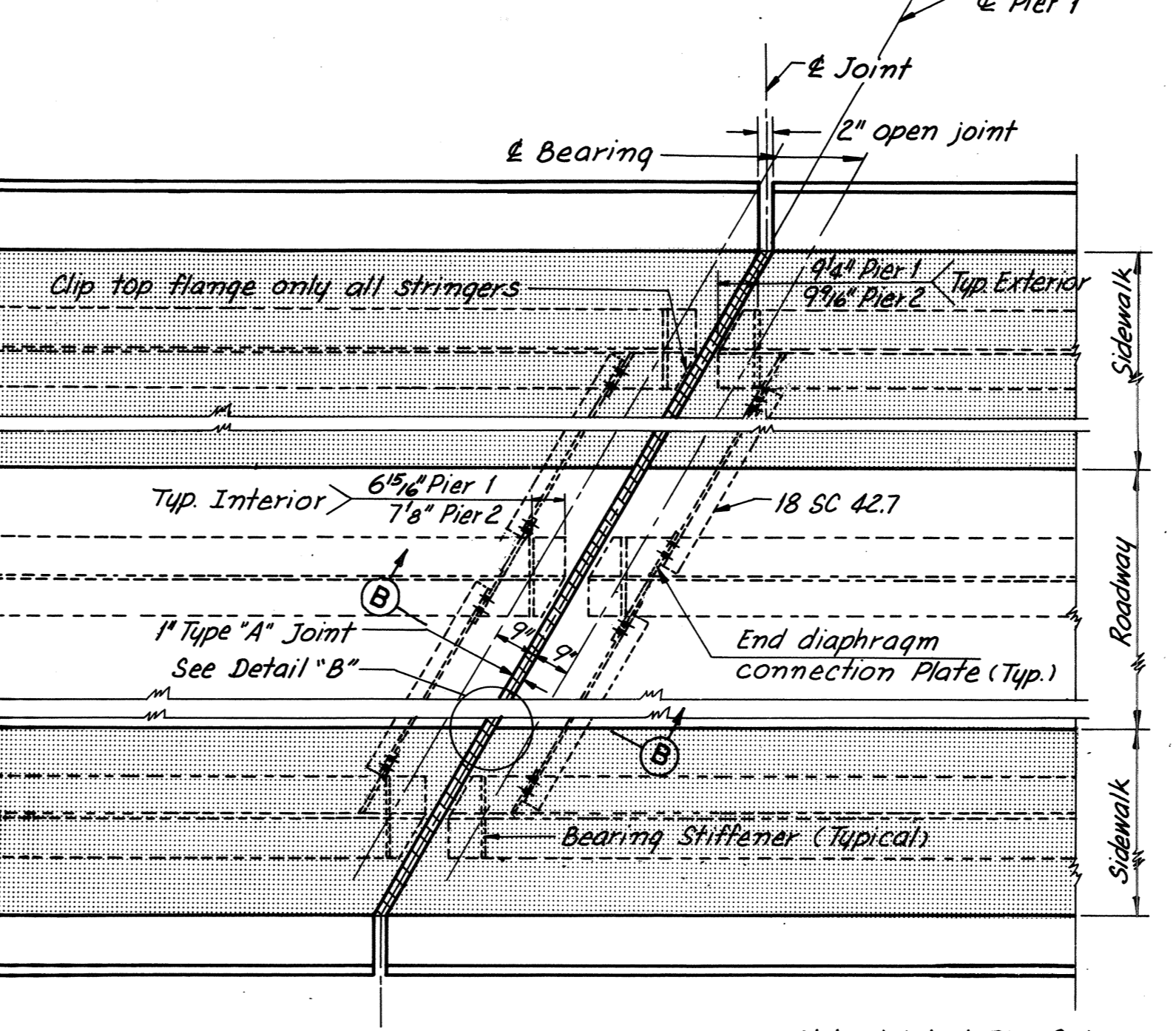


**PLAN-JOINT AT WEST ABUTMENT**  
No Scale

Note: Joint at East Abutment is similar to Joint at West Abutment except with 1 5/8 inch Type 'A' Joint. See Detail 'C' and 1 5/8 inch Type 'A' Joint Detail.

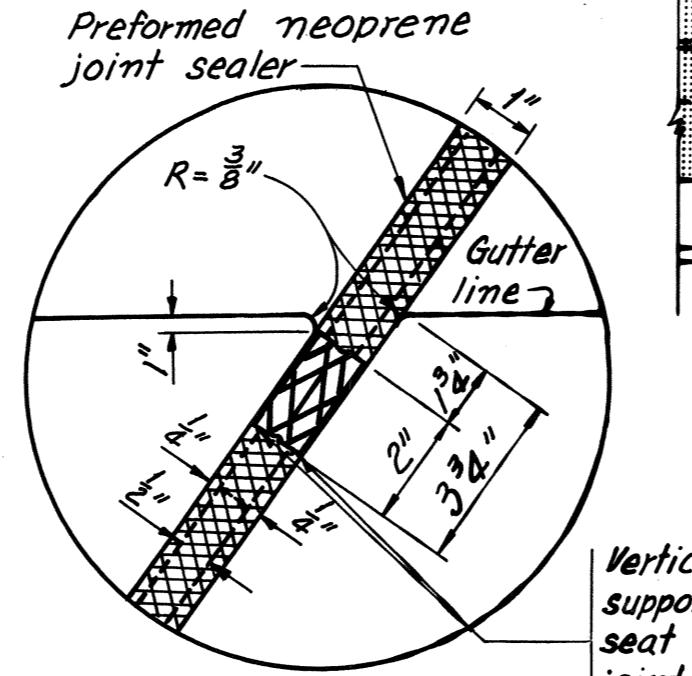


**DETAIL 'A'**  
No Scale

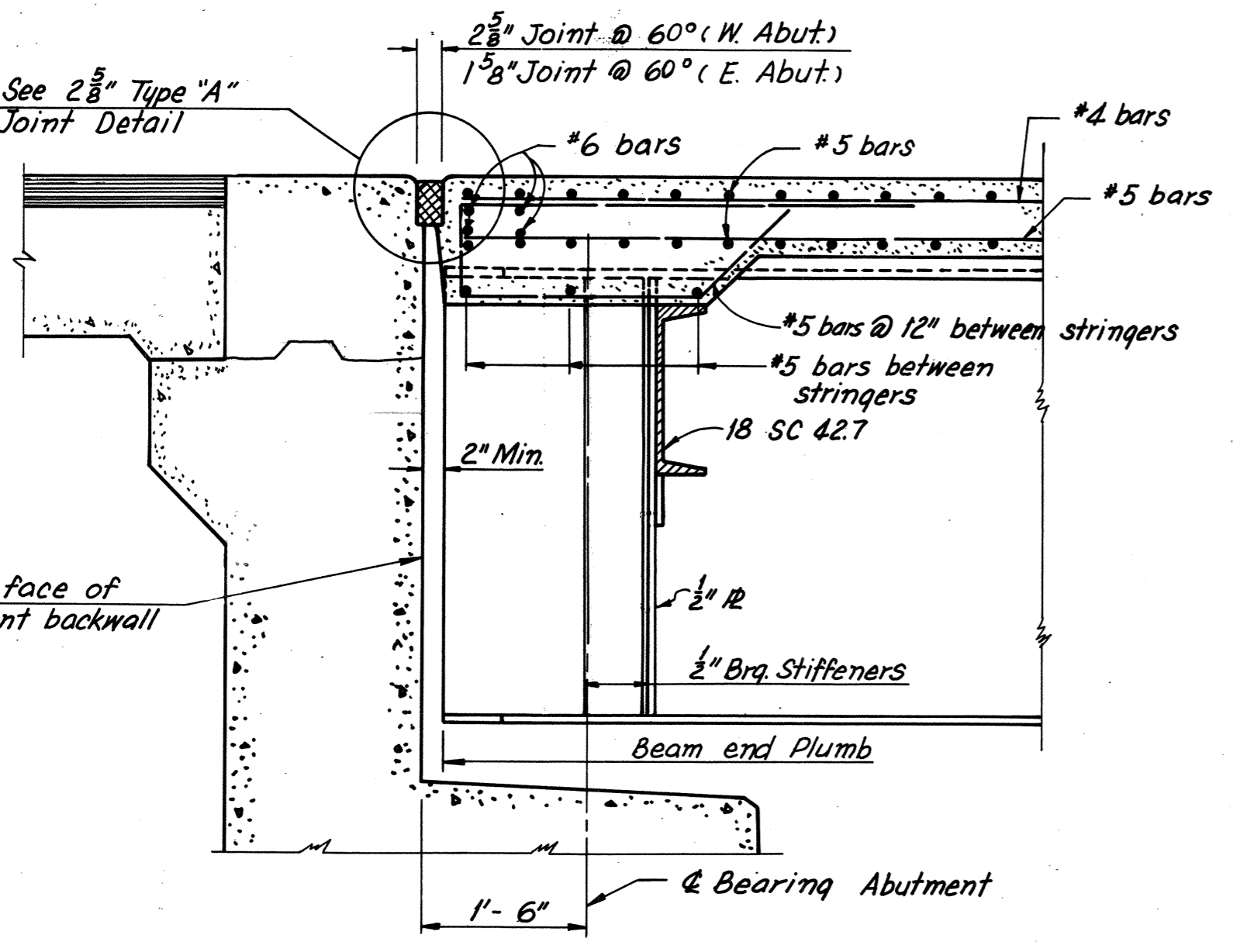


**PLAN-JOINT AT PIER 1**  
No Scale

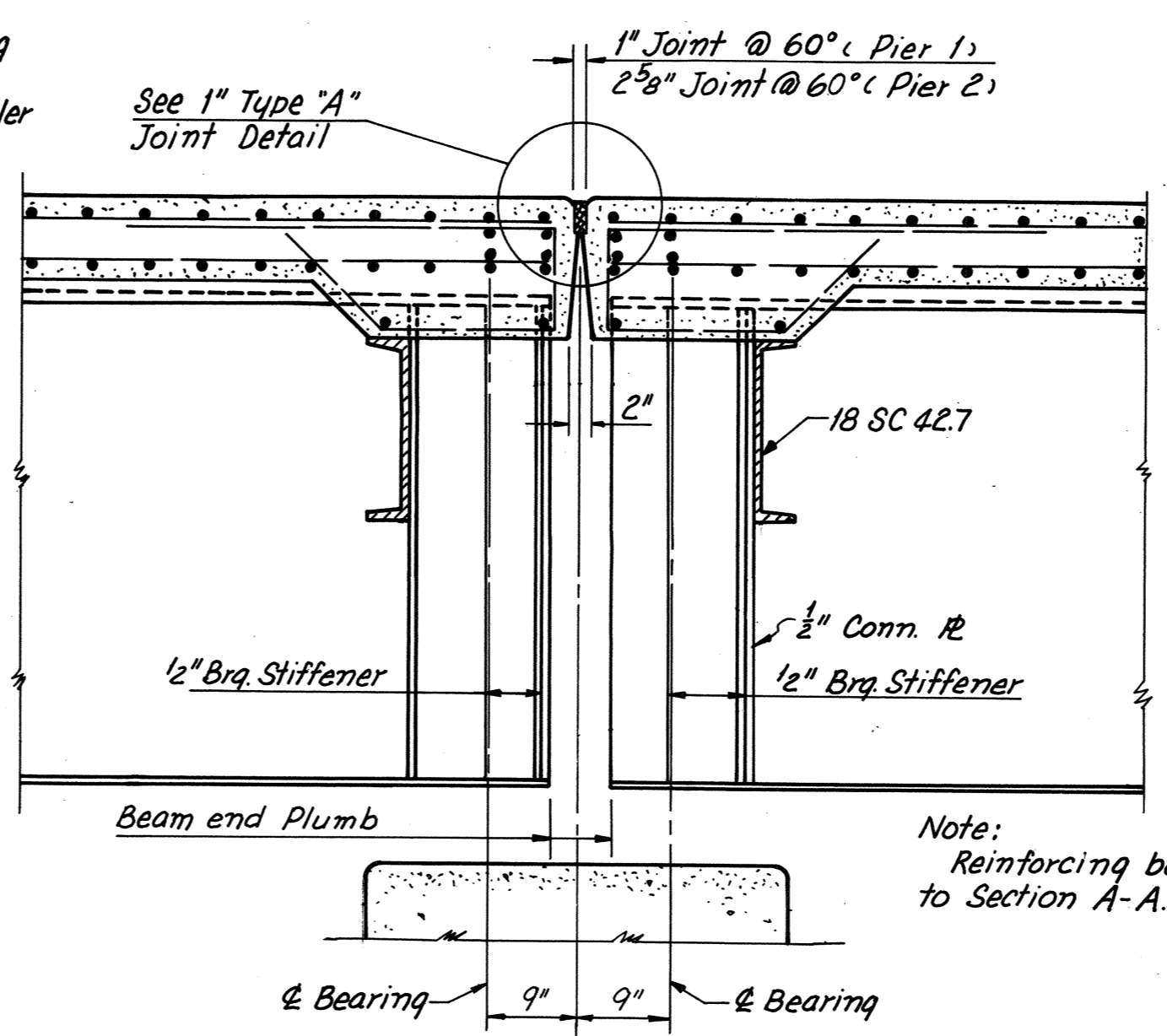
Note: Joint at Pier 2 is similar to Joint at Pier 1 except with 2 5/8 inch Type 'A' Joint.



**DETAIL 'B'**  
No Scale

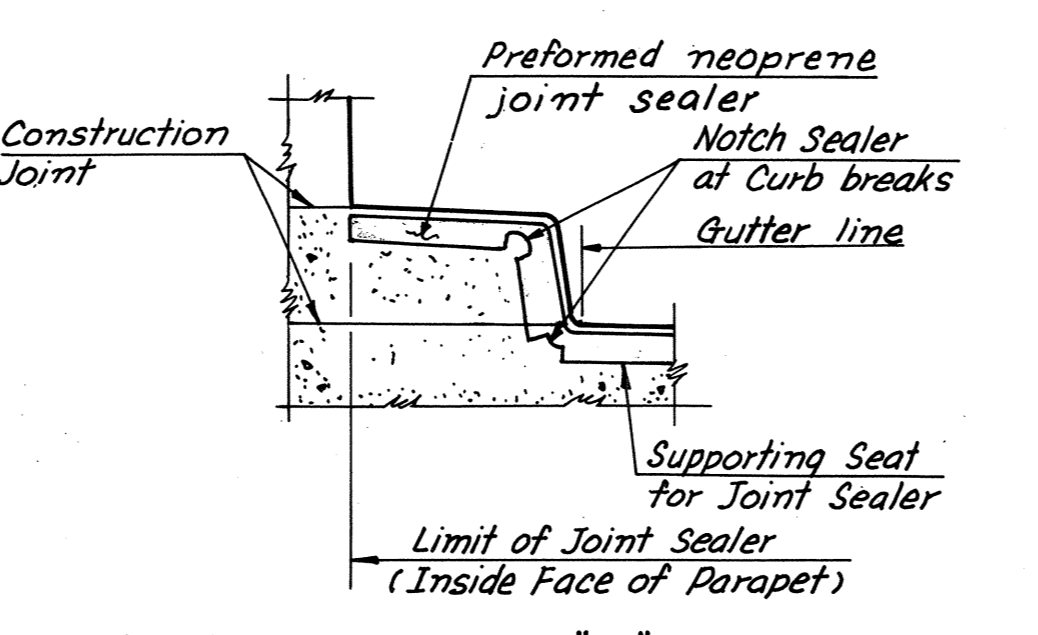


**SECTION A-A**  
Scale: 3/4" = 1'-0"

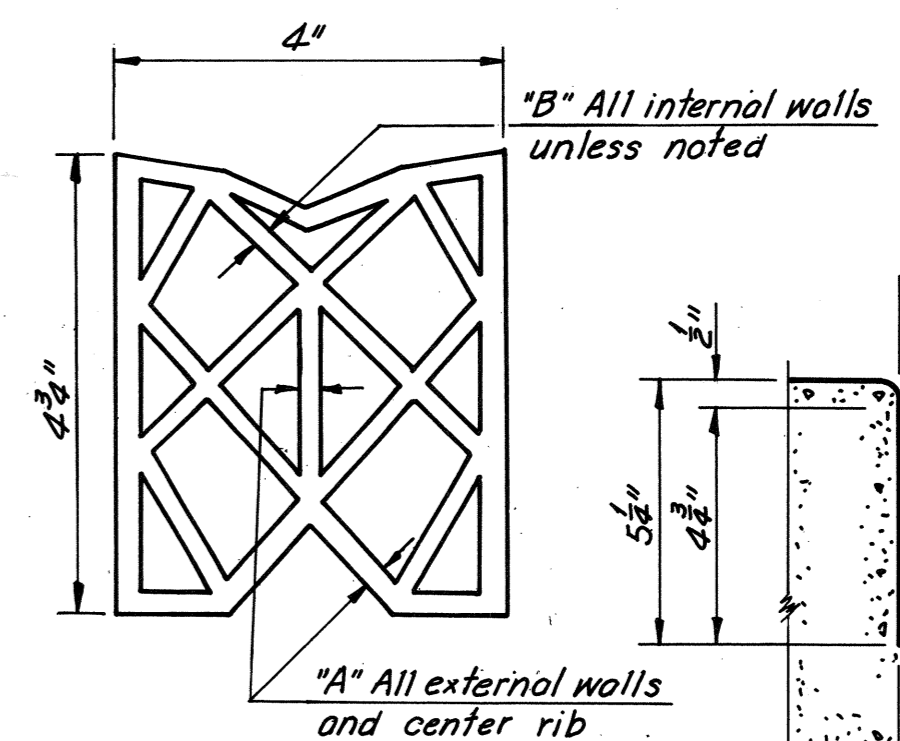


**SECTION B-B**  
Scale: 3/4" = 1'-0"

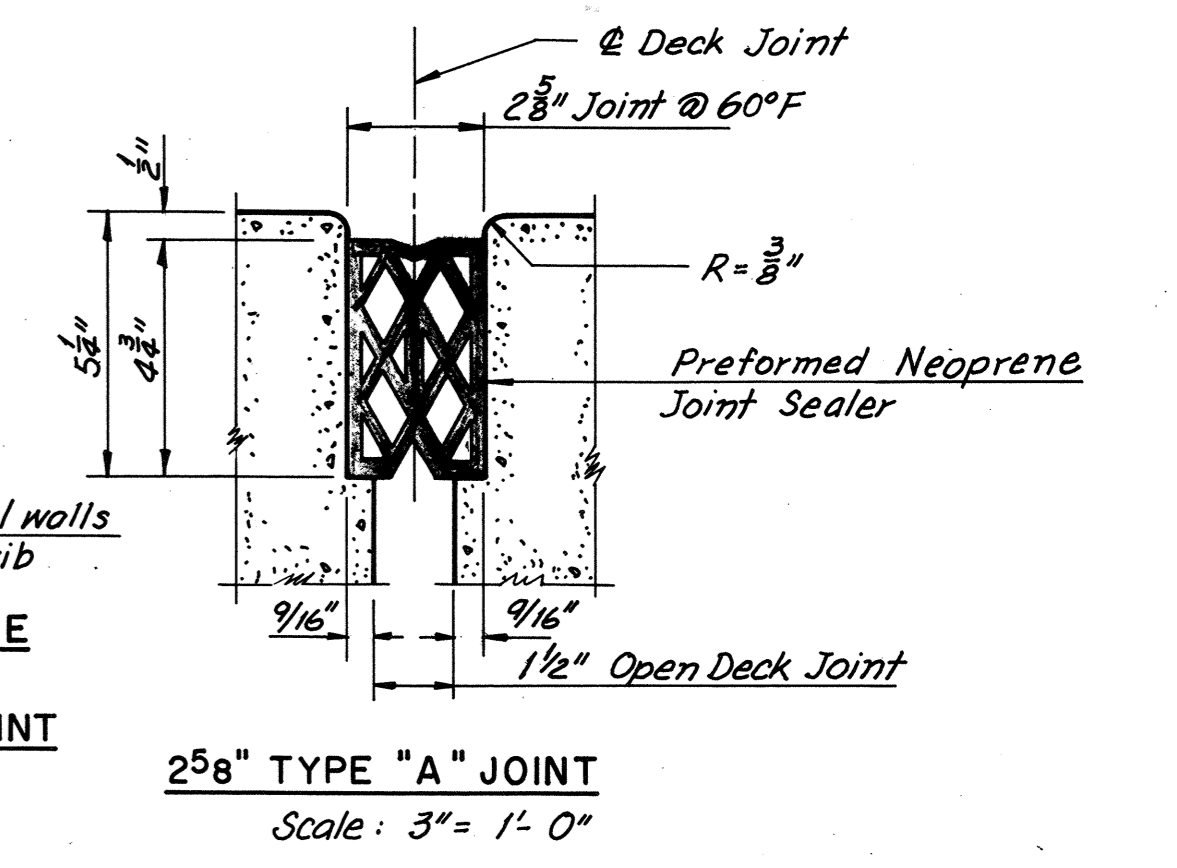
Note: Reinforcing bars are similar to Section A-A.



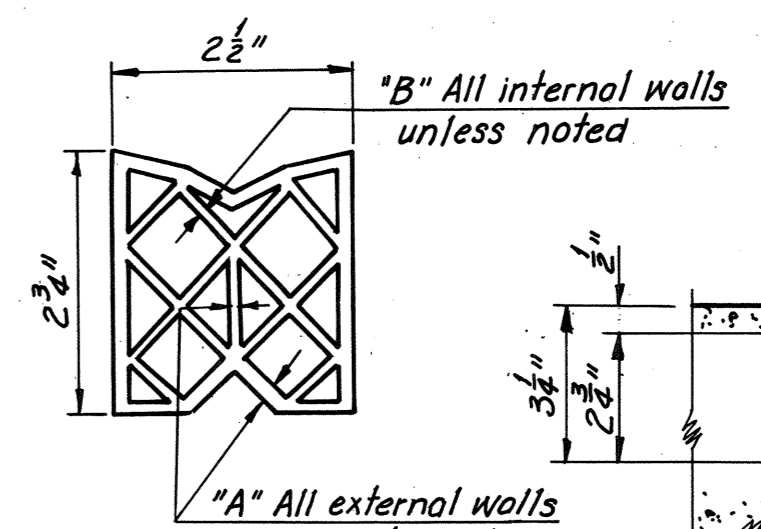
**TREATMENT OF TYPE 'A' JOINT AT CURB**  
No Scale



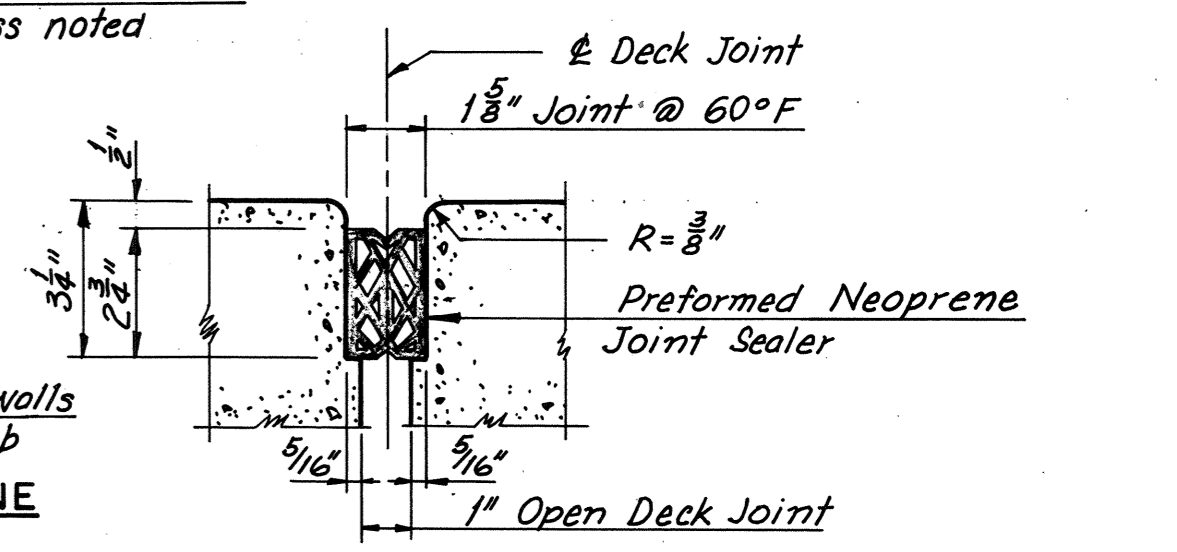
**PREFORMED NEOPRENE JOINT SEALER FOR 2 5/8" TYPE 'A' JOINT**  
Scale: Half Size



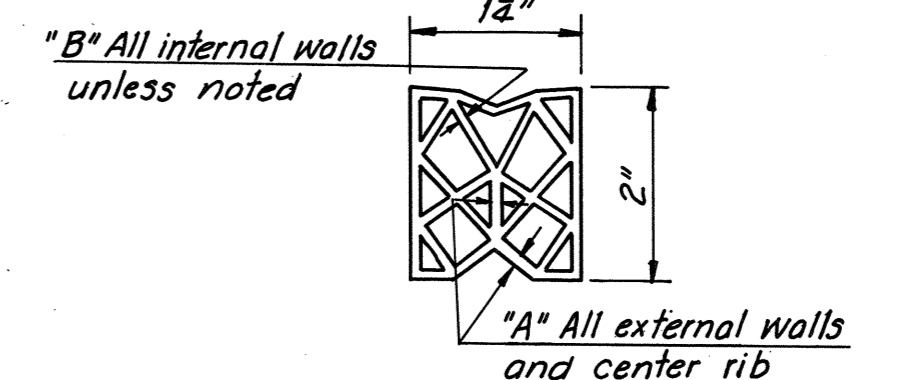
**2 5/8" TYPE 'A' JOINT**  
Scale: 3" = 1'-0"



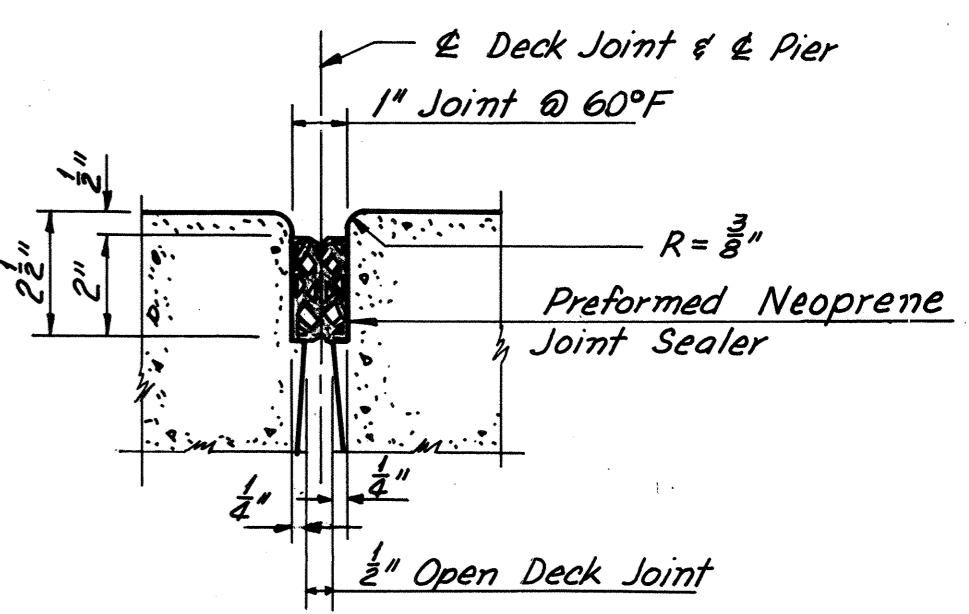
**PREFORMED NEOPRENE JOINT SEALER FOR 1 5/8" TYPE 'A' JOINT**  
Scale: Half Size



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



**PREFORMED NEOPRENE JOINT SEALER FOR 1" TYPE 'A' JOINT**  
Scale: Half Size



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

PREFORMED NEOPRENE JOINT SEALER TOLERANCES				
WIDTH	HEIGHT	THICKNESS		
		A	B	
1 3/8" + 3/16"	2" ± 1/8"	1/8" + 1/32"	3/32" + 6/32"	
- 0"		- 1/32"	- 1/32"	
2 1/2" ± 1/8"	2 3/8" ± 1/8"	3/16" ± 1/32"	3/32" ± 1/32"	
- 0"		- 1/32"	- 1/32"	
4" + 3/16"	4 3/8" ± 1/8"	1/4" ± 1/32"	7/16" ± 1/32"	
- 0"		- 1/32"	- 1/32"	

**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.

**AS BUILT**

MADE	BY	DATE			
	TCY	2-20-68			
CHECKED	N.B.B.	2-21-68	As Built		
IN CHARGE	R.G.C.			BY	DATE

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

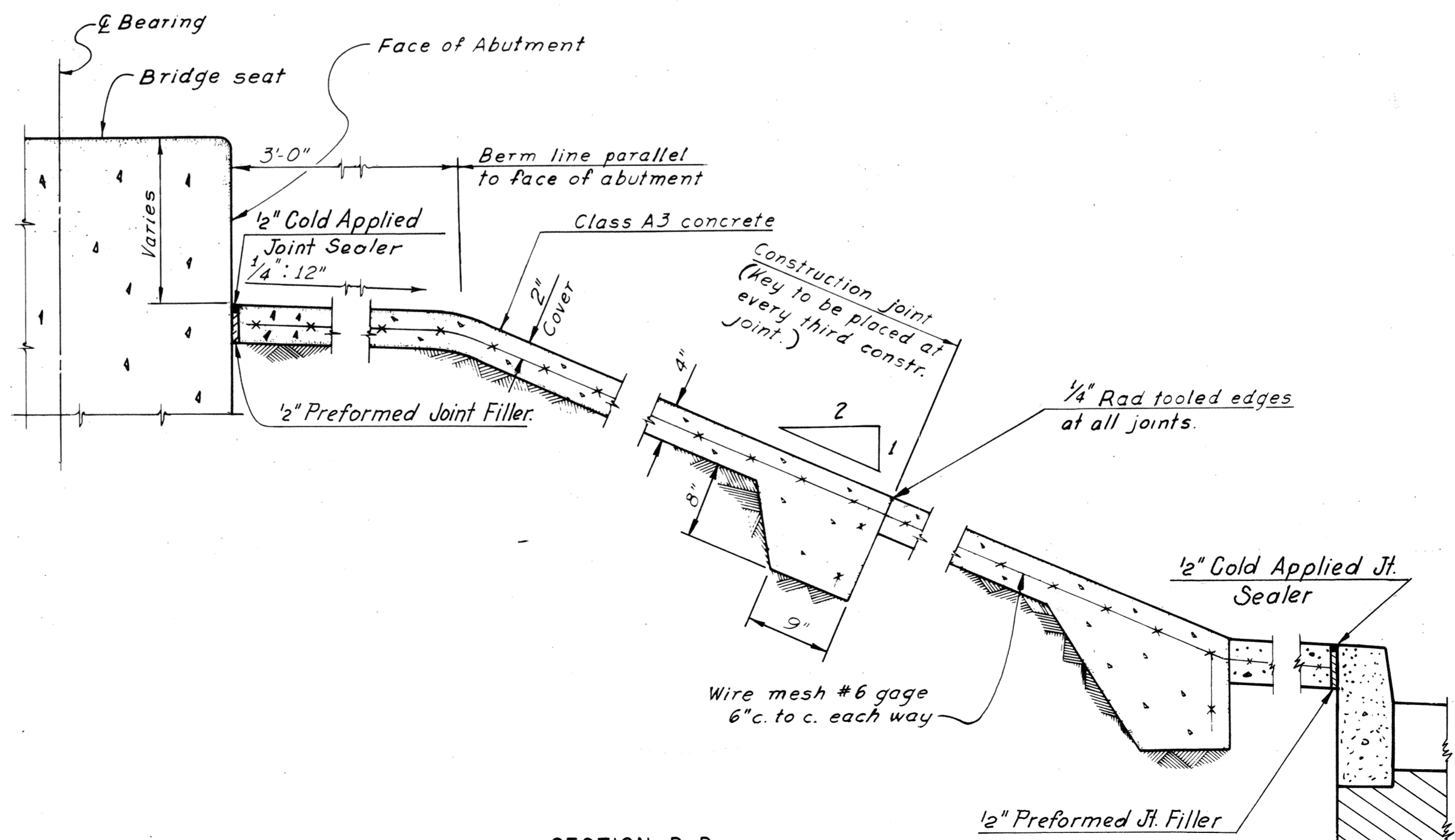
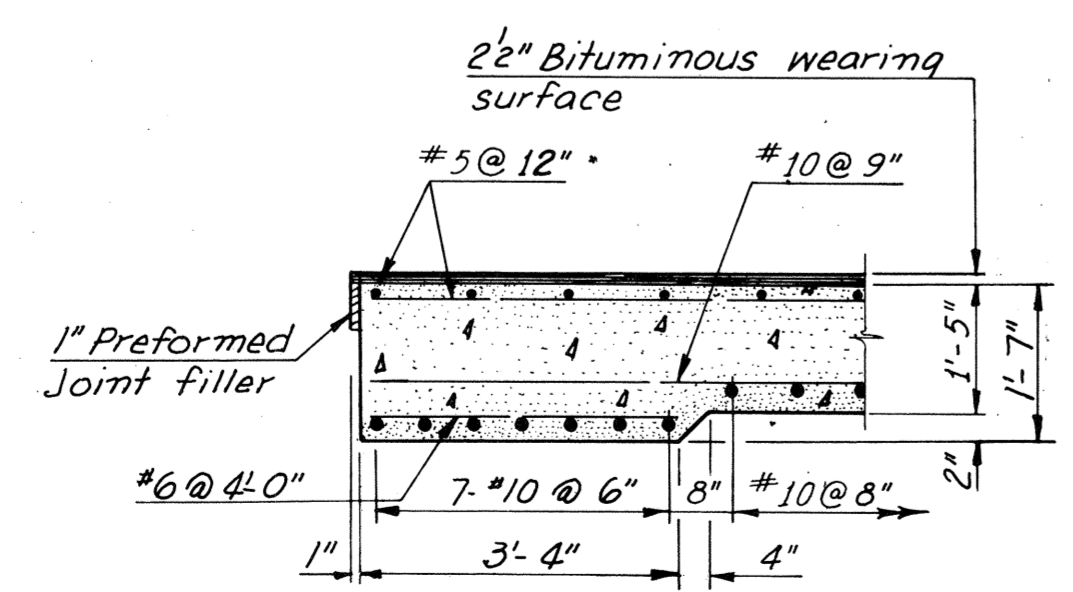
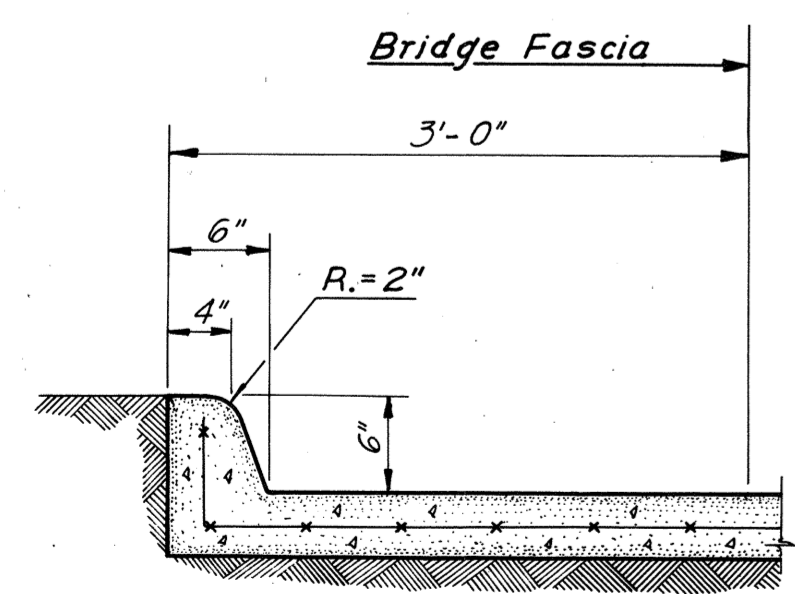
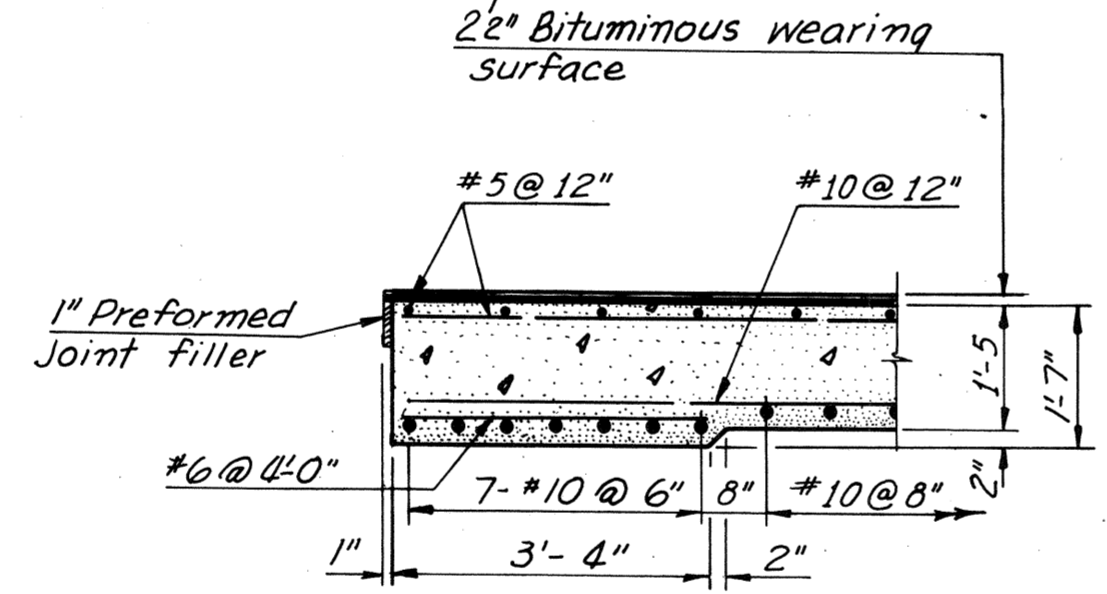
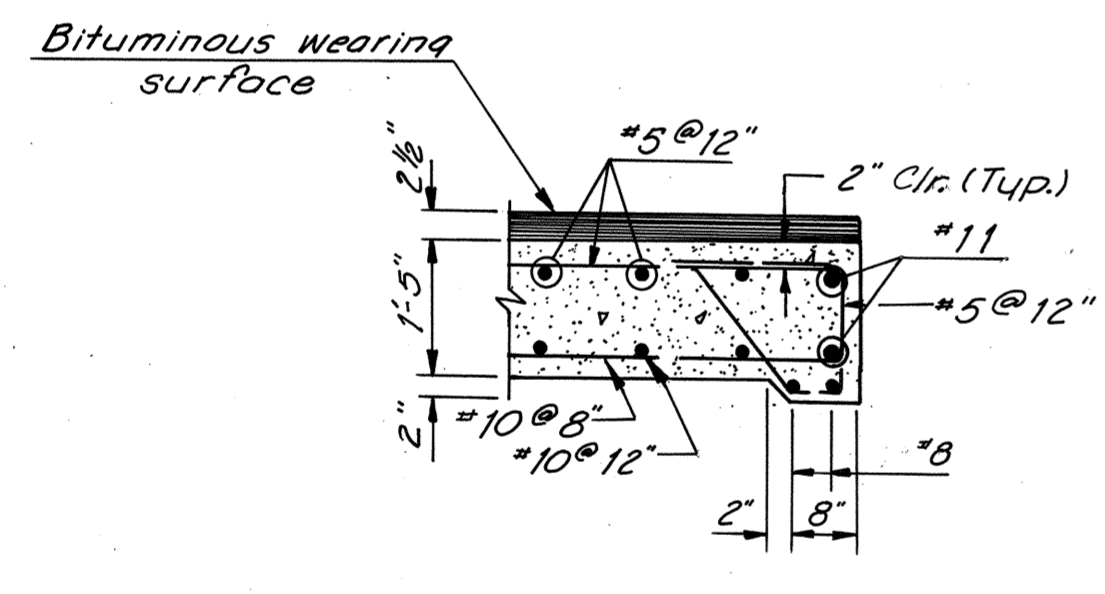
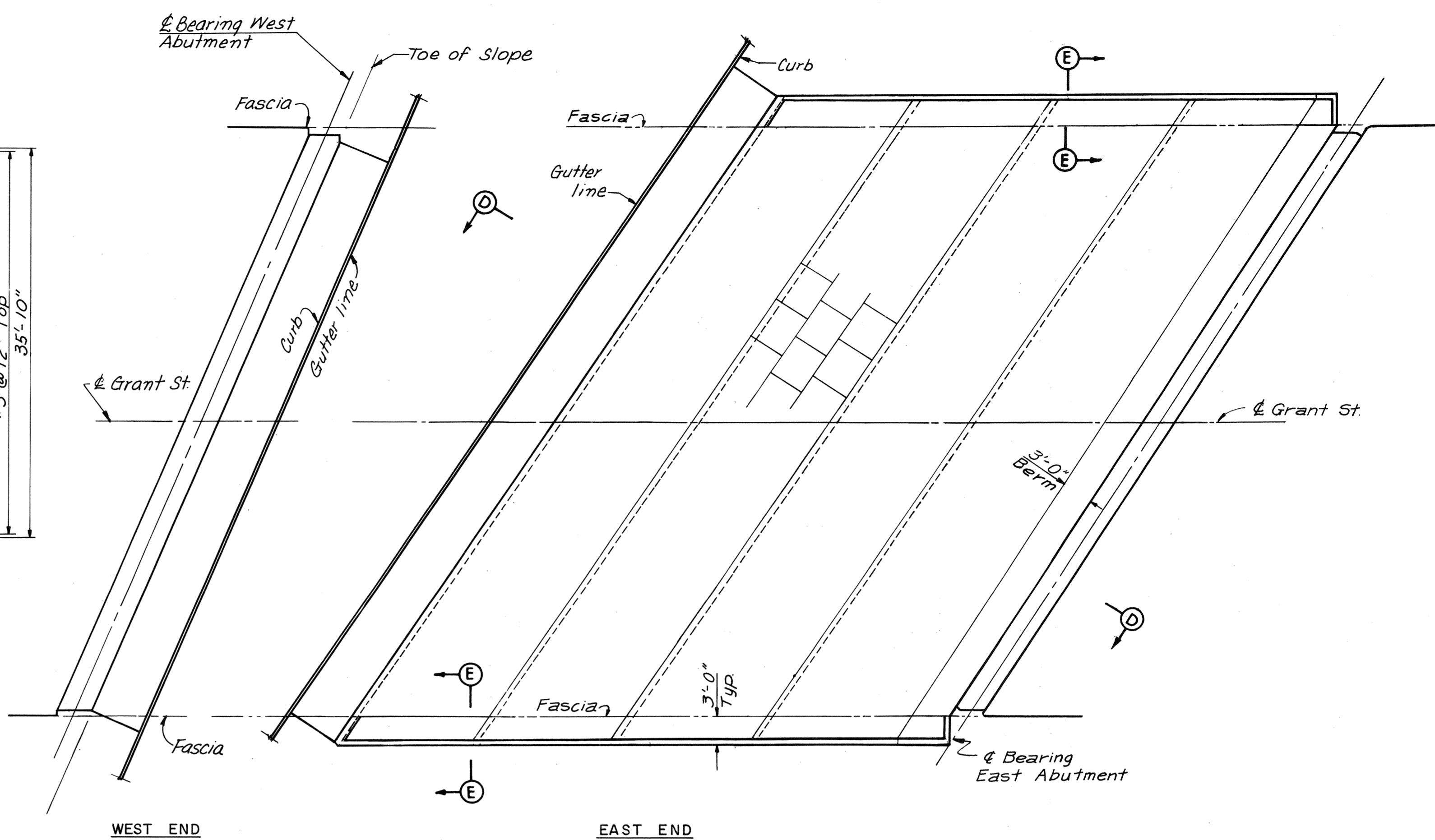
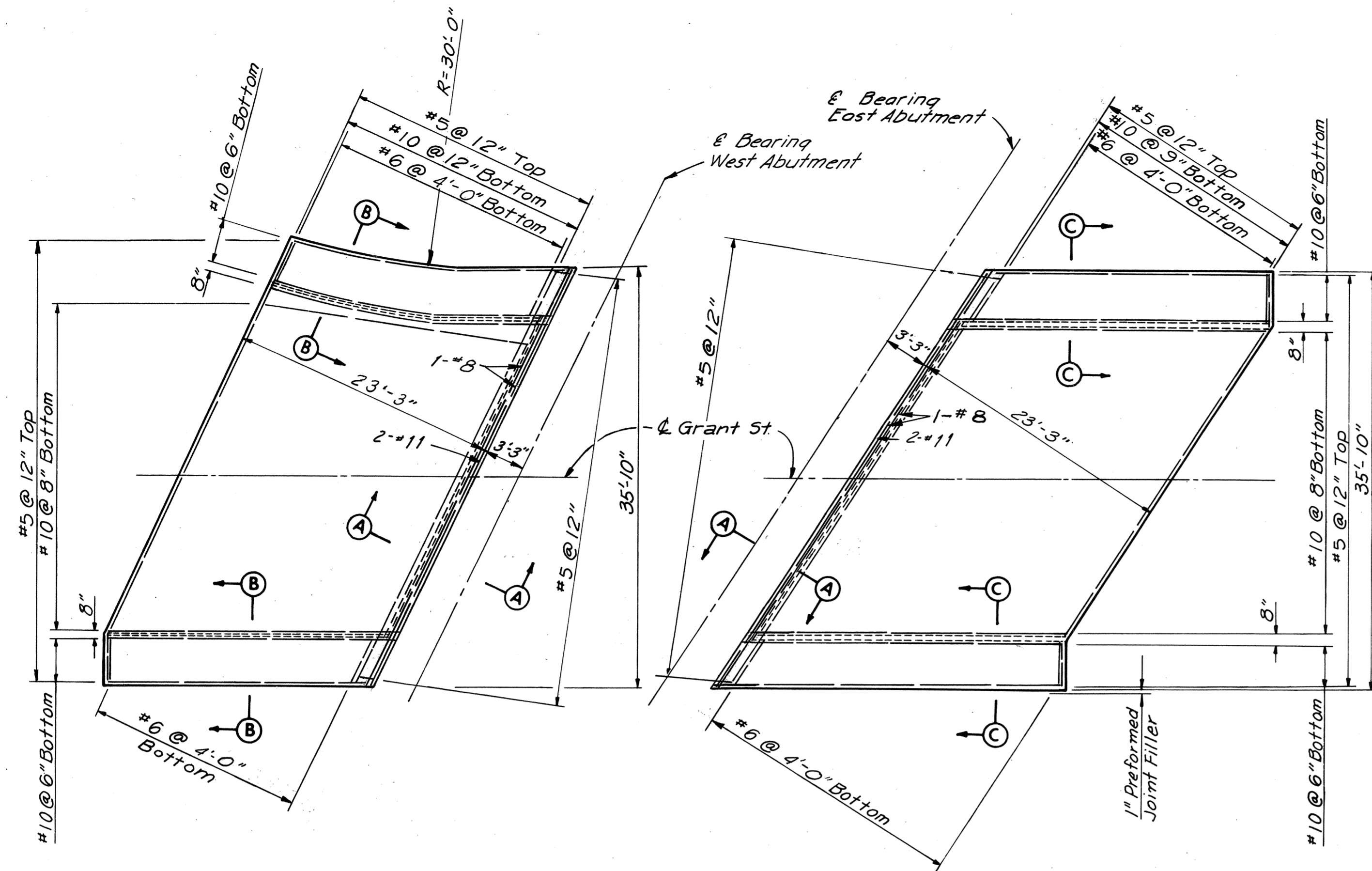
BRIDGE NO. 37  
GRANT STREET OVER SOUTH CONNECTION DOWNTOWN EXPRESSWAY  
JOINT DETAILS

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SCALE: AS SHOWN  
CONTRACT NO. 7  
SHEET NO. 10 OF 13



RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
7	DOWNTOWN EXPRESSWAY	116	



**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.

Note: All reinforcing steel shall be 2" minimum clear from edge of bar to edge of concrete.

**AS BUILT**

MADE	JTC	11-18-67			
CHECKED	TCY	2-6-68	As Built		
IN CHARGE	R. G. C.				

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

BRIDGE NO. 37  
GRANT STREET OVER SOUTH CONNECTION DOWNTOWN EXPRESSWAY  
APPROACH SLAB AND SLOPE PROTECTION DETAILS

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

SCALE: As Shown  
CONTRACT NO.: 7  
SHEET NO. 11 OF 13