

STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
N.H.	T-2591	1	16

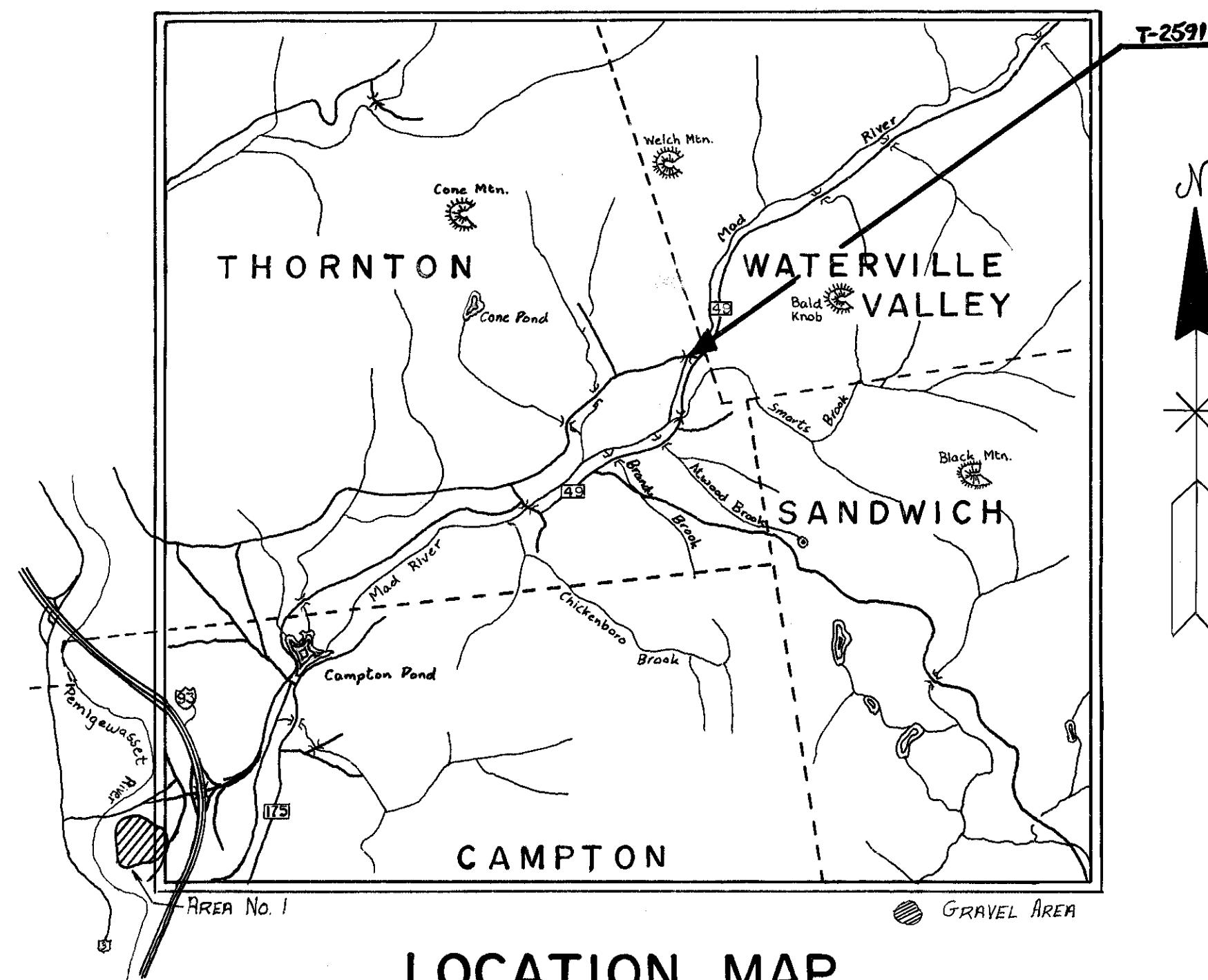
INDEX OF SHEETS

SHEET NO. 1	TITLE PAGE
2-12	BRIDGE PLANS
13	BEAM GUARD RAIL DETAILS
14	ROADWAY PLAN & PROFILE
15	TYPICAL ROADWAY SECTION
16	CROSS SECTIONS
	STANDARD SHEET No. 1, NEW SHEET FEB. 26, 1975

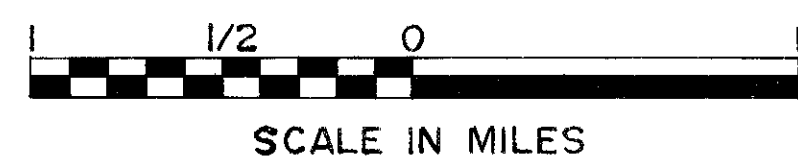
STATE OF NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PLANS OF PROPOSED
TRB-C PROJECT
UPPER MAD RIVER ROAD OVER MAD RIVER
N.H. PROJECT NO. T-2591

THIS PROJECT TO BE CONSTRUCTED IN ACCORDANCE WITH
STANDARD SPECIFICATIONS DATED 1974



LOCATION MAP



TOWN OF THORNTON

COUNTY OF GRAFTON

CONVENTIONAL SIGNS

STATE LINE	-----	ROW LINE	-----
TOWN LINE	-----	SURVEY LINE	-----
FENCE	-----	CULVERT	-----
STONE WALL	-----	POWER POLE	-----
UNFENCED PROPERTY	-----	TELEPHONE POLE	-----
TRAVELED WAY	-----	TELEGRAPH POLE	-----
RAILROAD	-----	JOINT POWER & TEL. POLE	-----
RETAINING WALL	-----	GROUND ELEVATION (LEFT)	-----
SEWER MANHOLE	-----	GRADE ELEVATION (RIGHT)	-----
HYDRANT	-----	SLOPE LINE	-----
LEDGE	-----	CATCH BASIN	-----
BRUSH LINE	-----	DROP INLET	-----
SWAMP	-----	BOUND	-----
PROPERTY PARCEL NO.	-----	CLEARING & GRUBBING AREA	-----

RECOMMENDED FOR APPROVAL: DATE 12-8-76

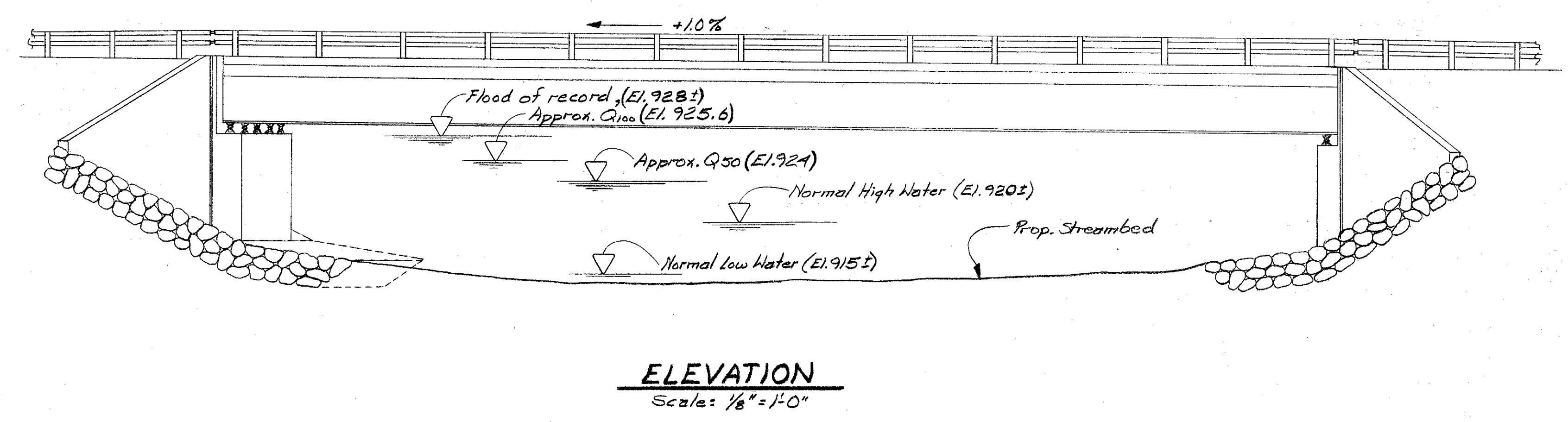
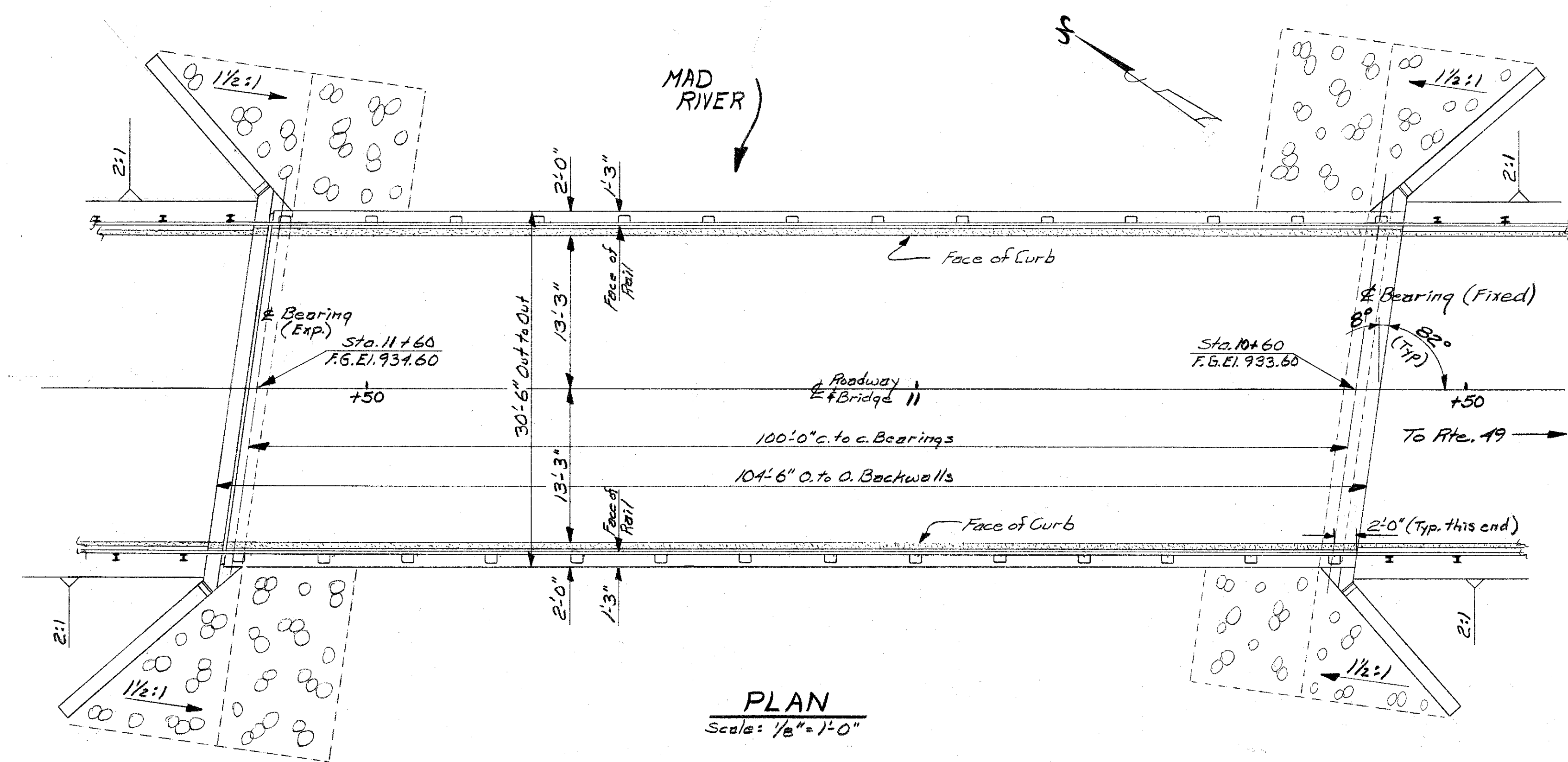
Richard W. Wolf
DEPUTY COMMISSIONER AND CHIEF ENGINEER
APPROVED: *John A. Clements*
COMMISSIONER

Floyd G. Avery
SECONDARY ROAD ENGINEER

DRAWN BY MDW DATE 5-11-76
CHECKED BY N.A. Burt DATE 7-76

PROJ. NO.	SHEET NO.	TOTAL SHEETS
T-2591	1	16

4-7-2-1



SUMMARY OF BRIDGE QUANTITIES			
Item	Description	Quantity	Unit
207.3	Unclassified Channel Excavation	250	C.Y.
209.11	Granular Backfill (Bridge)	760	C.Y.
403.9	Hot Bit Bridge Wearing Course	32.5	Ton
502	Removal of Existing Bridge Structure	1	Unit
504.1	Common Bridge Excavation	900	C.Y.
504.2	Rock Bridge Excavation	50	C.Y.
520.11	Concrete Cl.A, Footings	117.2	C.Y.
520.12	Concrete Cl.A, Above Footings	189.5	C.Y.
520.7	Concrete Bridge Deck (Est. 88 cy.)	1	Unit
533	Membrane Waterproofing	350	S.Y.
534	Water Repellent	7	Gal.
536.11	Epoxy Coating for Concrete	265	S.F.
539.1	Slid Resistant Epoxy Coating for Concrete	32	S.F.
541.4	P.V.C. Waterstop, N.H. Type 4	83	L.F.
541.5	P.V.C. Waterstop, N.H. Type 5	30.8	L.F.
544	Reinforcing Steel	42928	Lbs.
547	Shear Connectors (Est. 740)	1	Unit
550.1	Structural Steel (Est. 94,300)	1	Unit
550.2	Bridge Shoes	1	Unit
560.1	Prefabricated Neoprene Joint Seal	1	Unit
562.1	Polyurethane Sealant	242	C.I.
563.7	Bridge Railing F	207.3	L.F.
565.7	Bridge Approach Rail F	100	L.F.
585.11	Stone Fill, Cl.A (Bridge)	175	C.Y.
609.3	Straight Granite Curb (Bridge)	208.4	L.F.
537	Concrete Sealer	10	Gal.
1000	Temp. Proj. Water Pollution Cont. (Soil Erosion)	*	

SUMMARY OF ROADWAY QUANTITIES			
Item	Description	Quantity	Unit
203.1	Common Excavation	260	C.Y.
214	Fine Grading	1	Unit
304.2	Gravel	290	C.Y.
304.3	Crushed Gravel	95	C.Y.
403.11	Hot Bit, Pavement, Machine Method	115	Ton
585.5	Stone Fill, Cl.E	50	C.Y.
606.140	B.G.R. (Standard Section) BR-140	175.3	L.F.
606.146	B.G.R. (Term. Unit Type F, Mod.) BR-146	4	Units
609.01	Straight Granite Curb A	116	L.F.
643.11	Fertilizer for Initial Application	80	Lbs.
644.33	Slope Seed Type 33 (PLS wt.)	5	Lbs.
644.4	Crownvetch Seed (PLS wt.)	1	Lb.
645.101	Mulch	430	S.Y.
647.1	Humus	50	C.Y.
692	Mobilization	1	Unit
698.3	Field Office (Modified)	1	Unit

* Not a bid item, Item 1000 = \$2000

- Subsidiary Items:**
- | | |
|------------------------|-----|
| 1. 1" # Weepers | 345 |
| 2. Conc. Bonding Agent | 345 |
| 3. Building Paper | 9 |
| 4. 1/2" Cork Filler | 345 |

GENERAL NOTES:
 Design Loading HS-20-44
 Specifications: AASHTO 1973 with interims & NHDWP & H 1974 as amended.
 Removal of Existing Bridge Structure, Item 502 shall include the existing superstructure and all of the abutments and wings necessary to const. the new structure.
 Concrete: Abutments; 3000 psi
 Deck & Backwalls; 4000 psi.
 Reinforcing Steel: Grade 60 except deck shall be Grade 40
 Structural Steels ASTM A-588
 Design Soil Pressure: 3 Tons/ft²

Scale As Noted

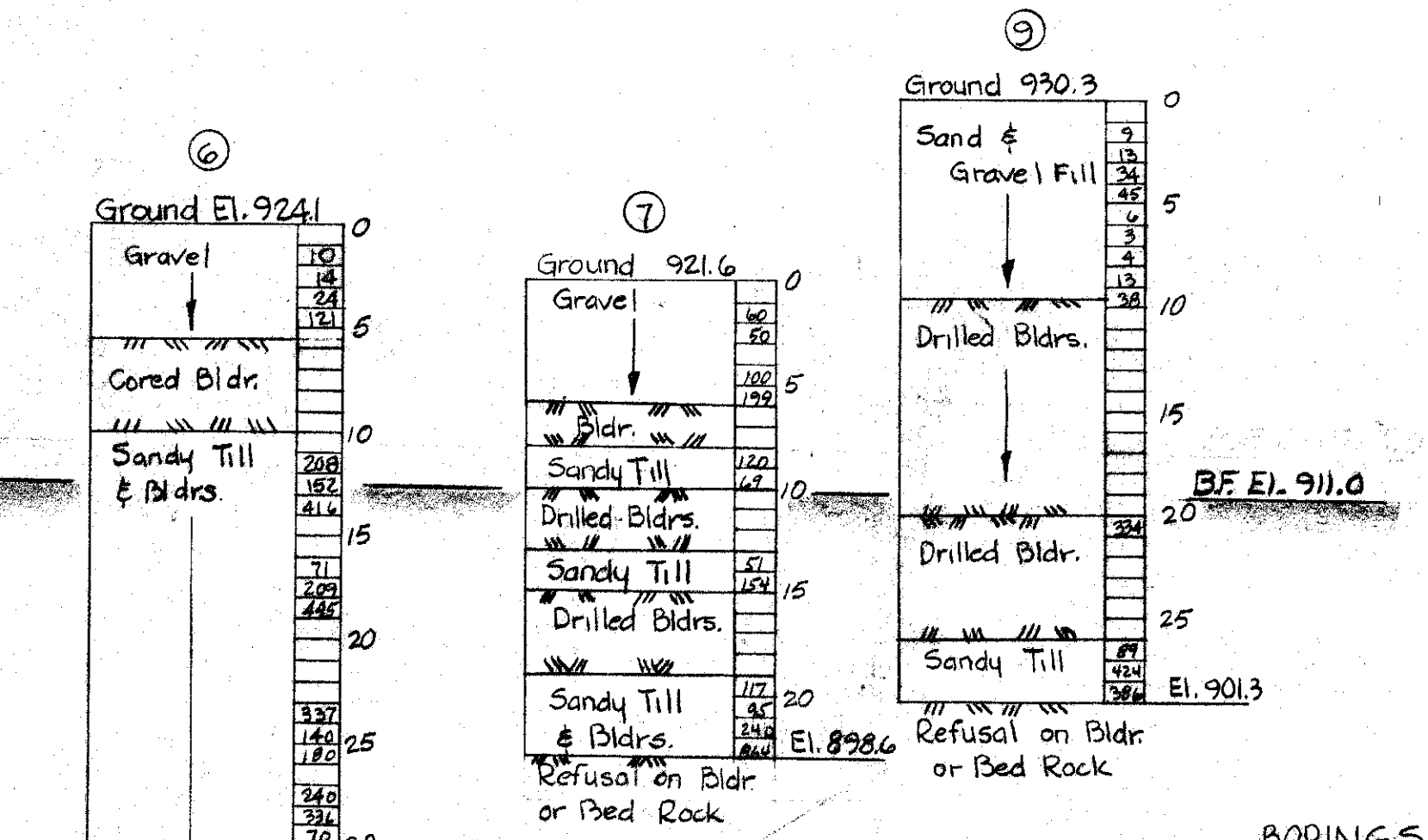
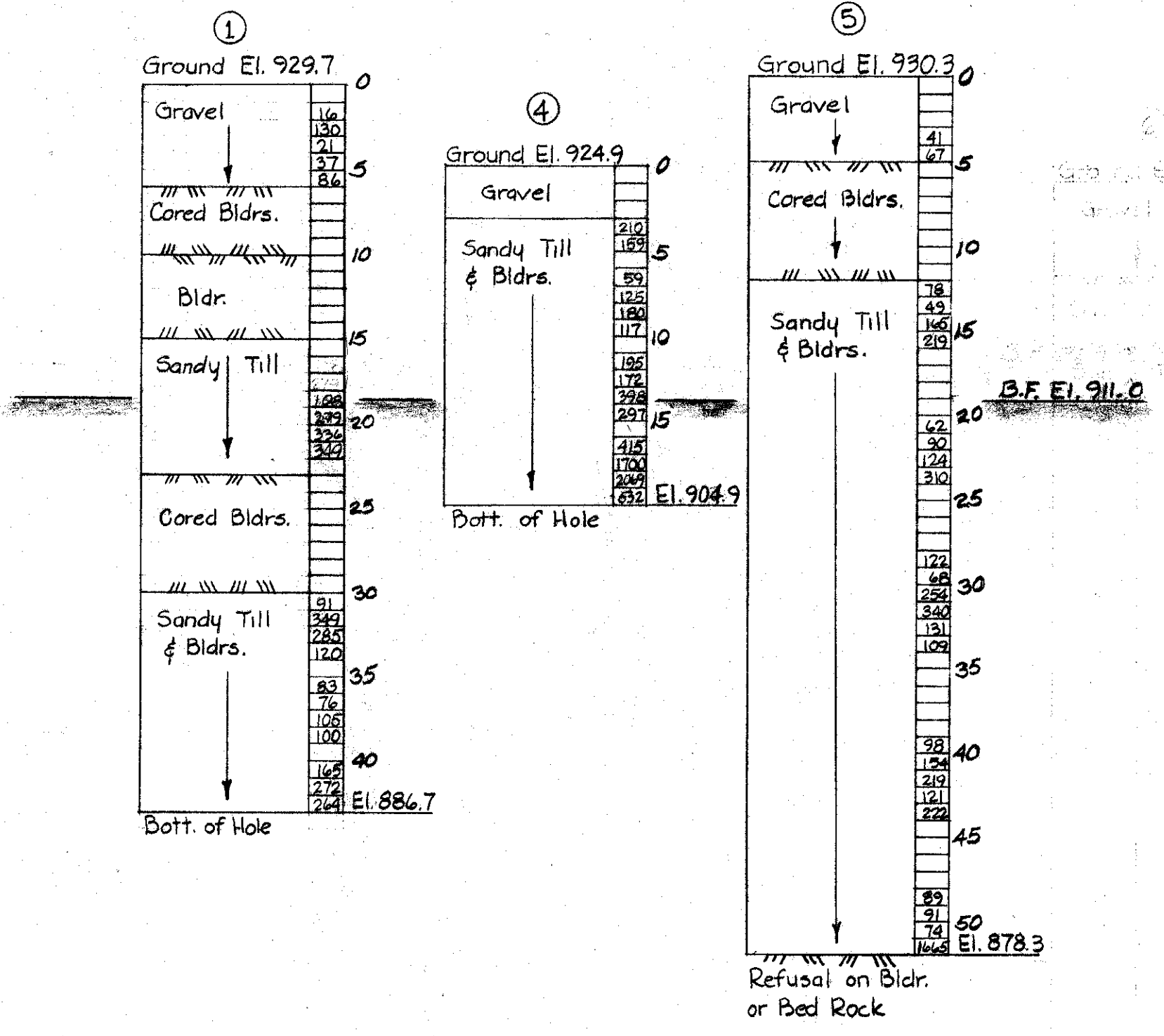
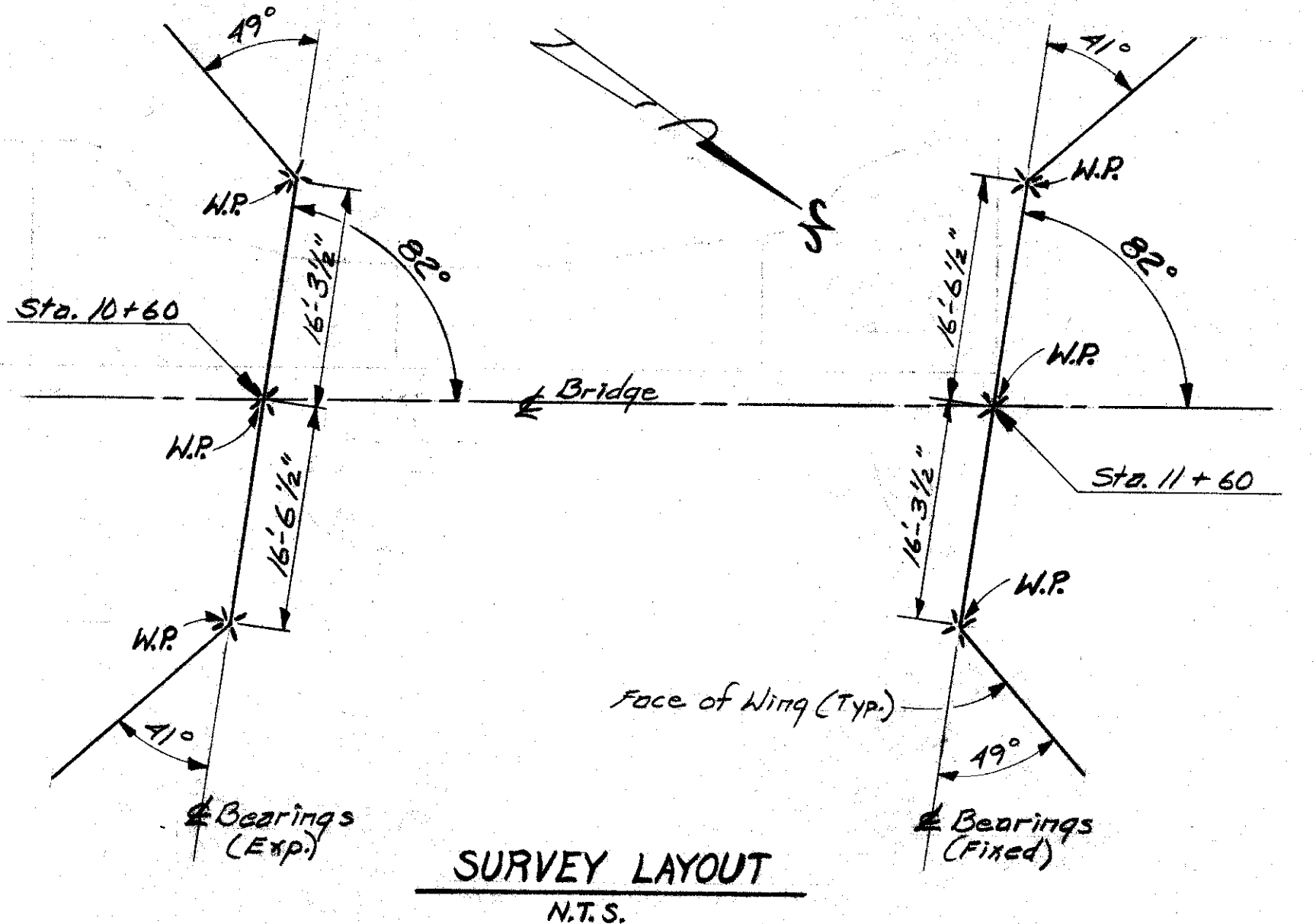
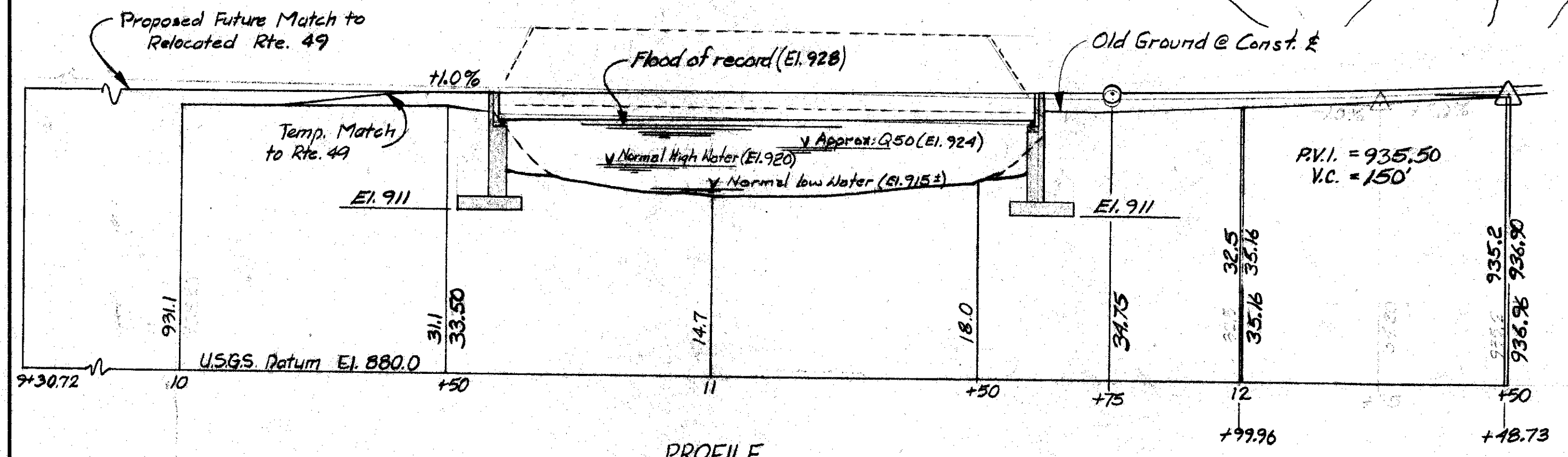
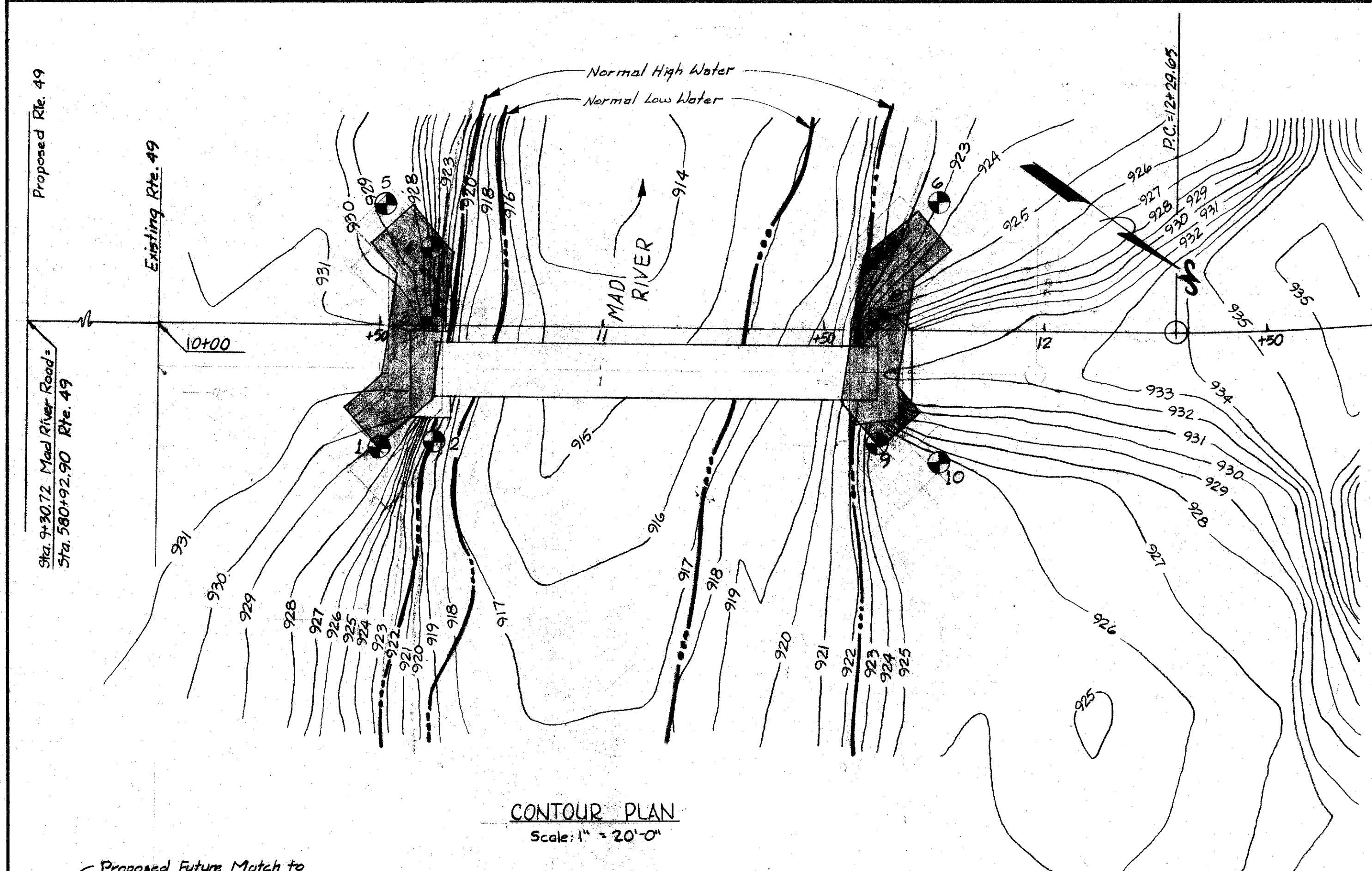
STATE OF NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BRIDGE DIVISION

TOWN: THORNTON DRAWING NO.: 222/180
 PROJECT: UPPER MAD RIVER ROAD OVER MAD RIVER SHEET NO.: T-2591
 LOCATION: UPPER MAD RIVER ROAD OVER MAD RIVER

GENERAL PLAN & ELEVATION

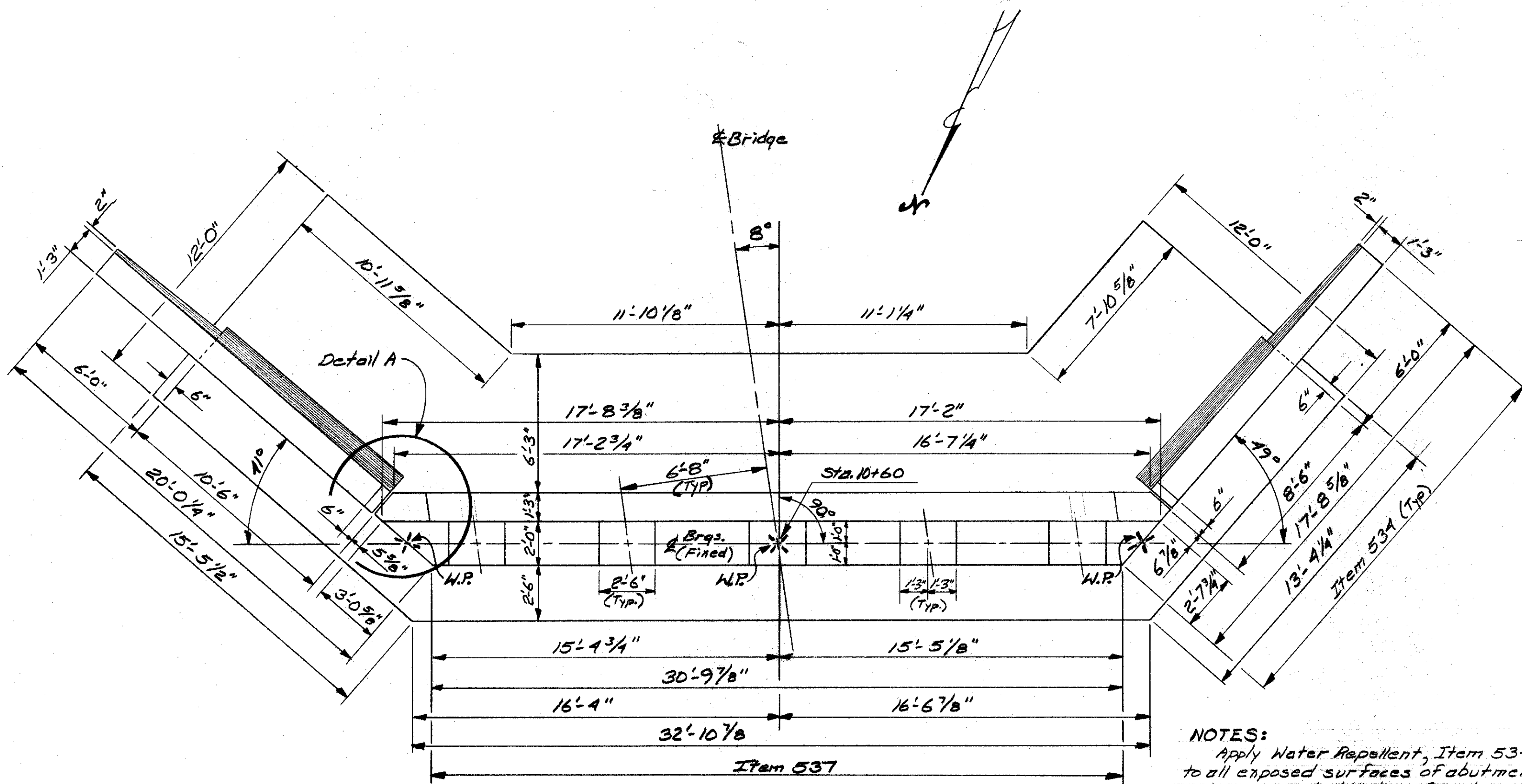
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APPROVED BY: <u>NAB</u>	DATE: <u>7-76</u>	CHECKED BY: <u>MDW</u>	DATE: <u>8-76</u>	DRAWN BY: <u>MDW</u>	DATE: <u>8-76</u>	FILE NUMBER: <u>4-7-2-1</u>

PROJECT NO. T-2591 SHEET NO. 2 TOTAL SHEETS 16



BORING NOTES:
Borings indicated thus \odot were made by the NHDPW #H in July, 1975. Figures in the right hand column indicate the number of blows required to drive a 1 1/2" O.D. A-Rod one foot, using a 140lb. weight falling 30 inches. Borings are for design purposes and show conditions at boring points only, and do not necessarily indicate materials to be encountered during construction.

STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BRIDGE DESIGN DIVISION					
TOWN THORNTON			BRIDGE NO. 222/180		
FEDERAL PROJECT			STATE PROJECT T-2591		
LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER					
Scale as noted					
BORING PLAN					
DESIGNED	WAB	BY	DATE	CHECKED	MDW
DRAWN	WAB & HEP	BY	DATE	CHECKED	MDW
TRACED		BY	DATE	CHECKED	MDW
QUANTITIES	WAB	BY	DATE	CHECKED	MDW
REVISIONS					
REVIEWED BY			PROJ. NO.	SHEET NO.	TOTAL SHEETS
			T-2591	3	18

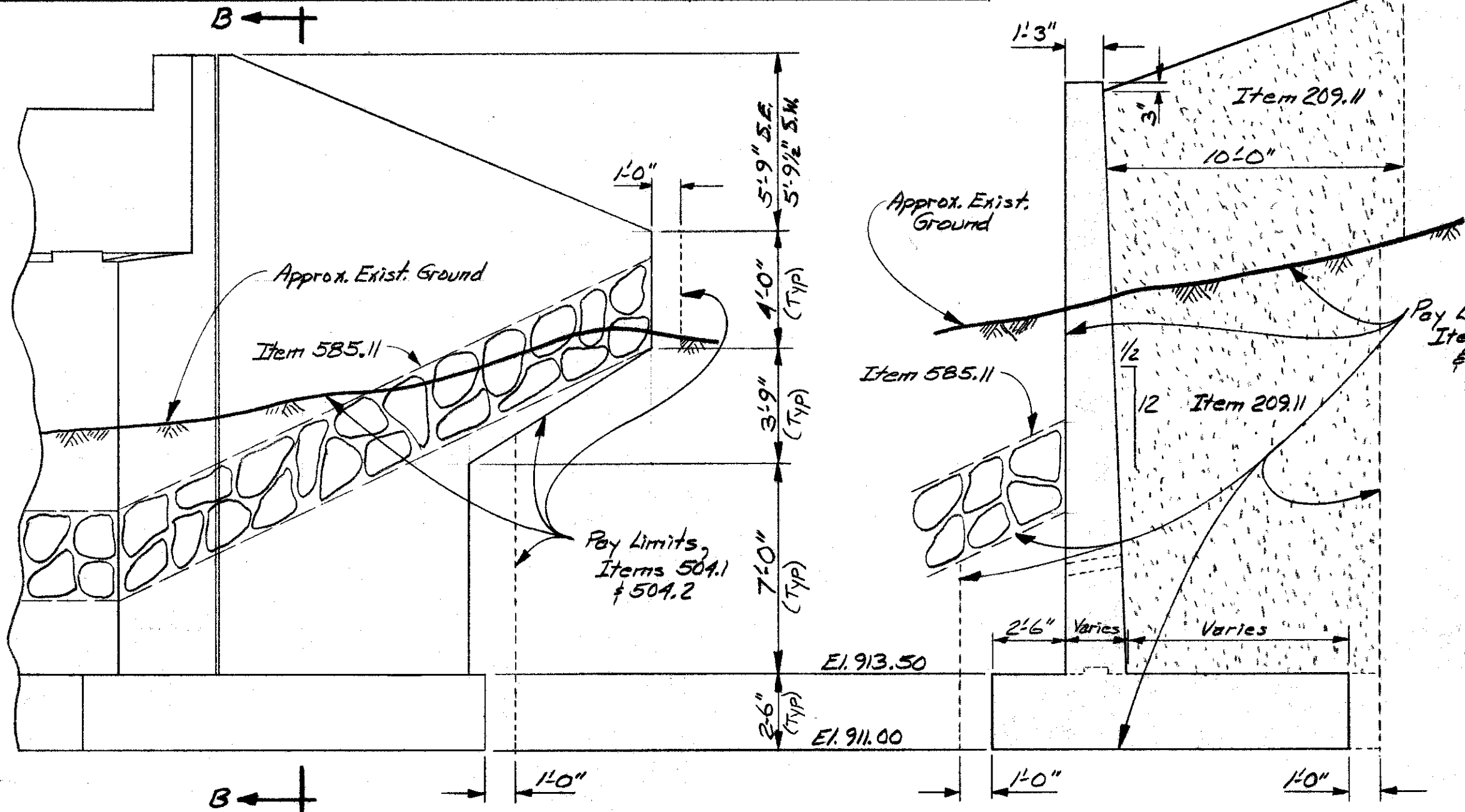


PLAN

NOTES:
 Apply Water Repellant, Item 534, to all exposed surfaces of abutment and wings and 1/2" down fillside.
 All const. joints shall be keyed and a concrete bonding agent used. (subs.)
 Backfill shall be brought to the elev. of the bridge seat and compacted prior to the pouring of the deck or backwall.
 Pour bearing pedestals 1/4" lower than plan elevations and provide galvanized steel shims to attain the specified elevations, subs. to Item 550.2.

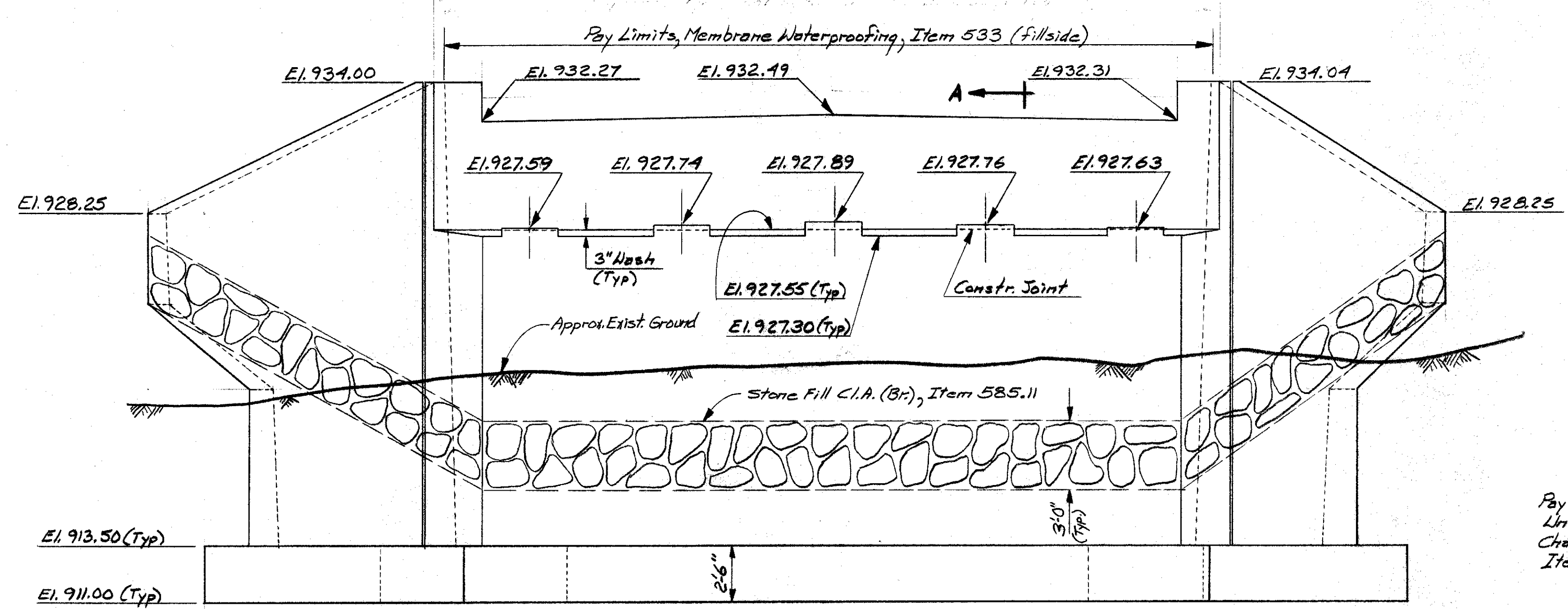
SOUTH ABUTMENT, WING & FOOTING QUANTITIES

Item No.	Description	Quantity	Unit
209.11	Granular Backfill (Br.)	350	C.Y.
504.1	Common Bridge Excavation	400	C.Y.
504.2	Rock Bridge Excavation	22	C.Y.
520.11	Concrete C.I.A., Footings	57.5	C.Y.
520.12	Concrete C.I.A., Above Footings	90.5	C.Y.
533	Membrane Waterproofing	13	S.Y.
534	Water Repellant	2	Gal.
541.4	P.V.C. Waterstop, N.H. Type 4	40.5	L.F.
544	Reinforcing Steel	11044	Lbs.
562.1	Polyurethane Sealant	96	C.F.
537	Concrete Sealer	5.2	Gal.

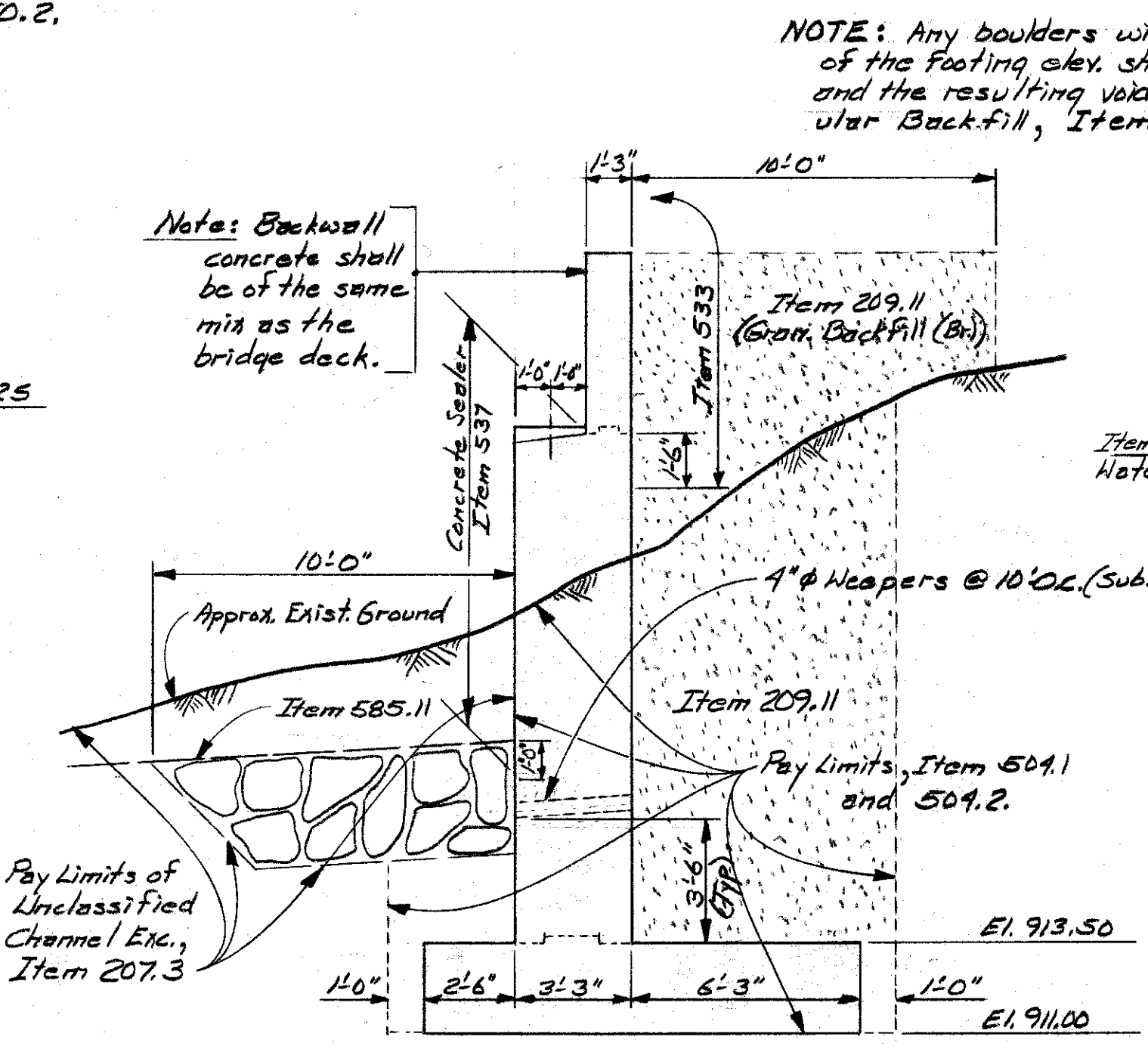


SOUTHWEST WING
 Southeast Wing Similar

SECTION B-B

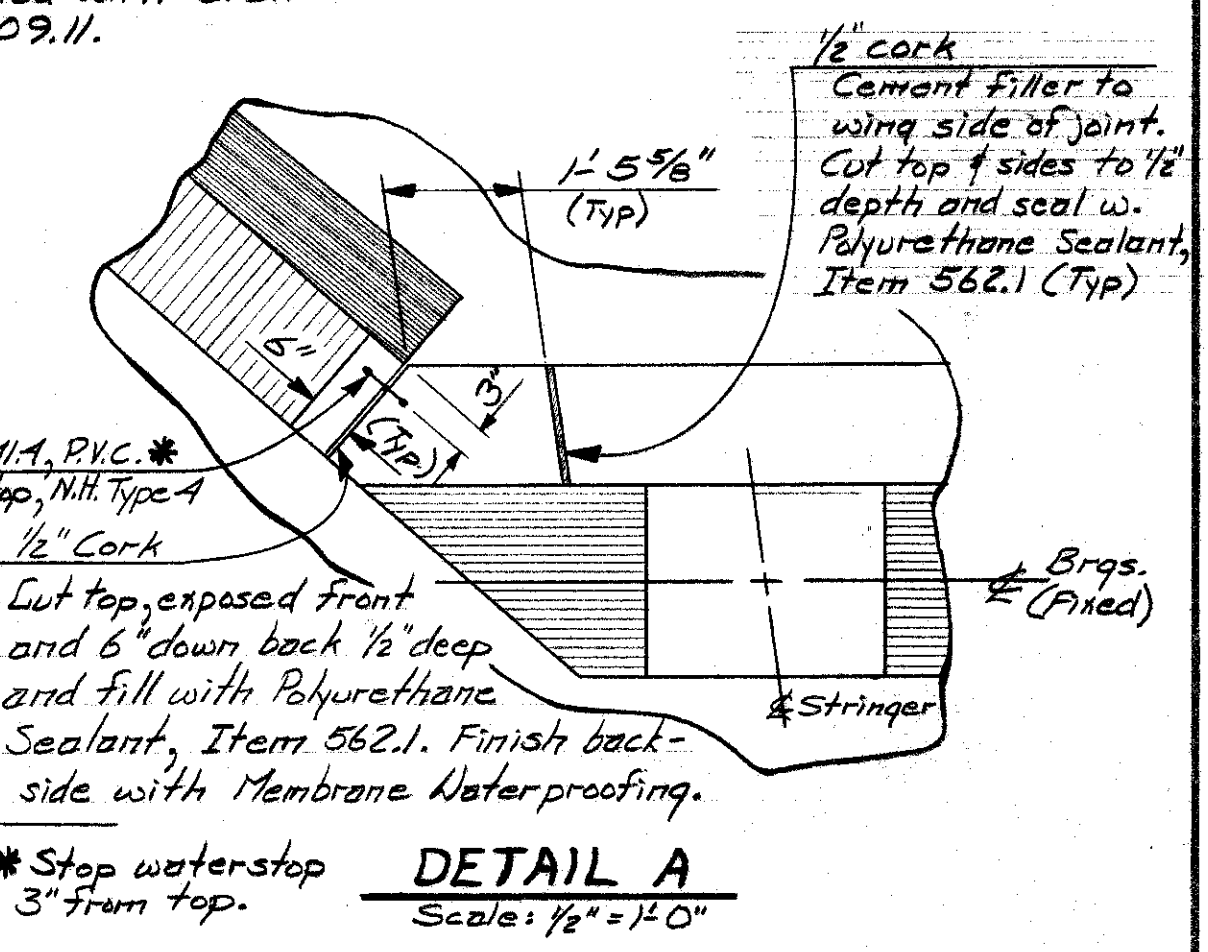


ELEVATION



SECTION A-A

NOTE: Any boulders within one foot of the footing elev. should be excavated and the resulting void filled with Granular Backfill, Item 209.11.



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

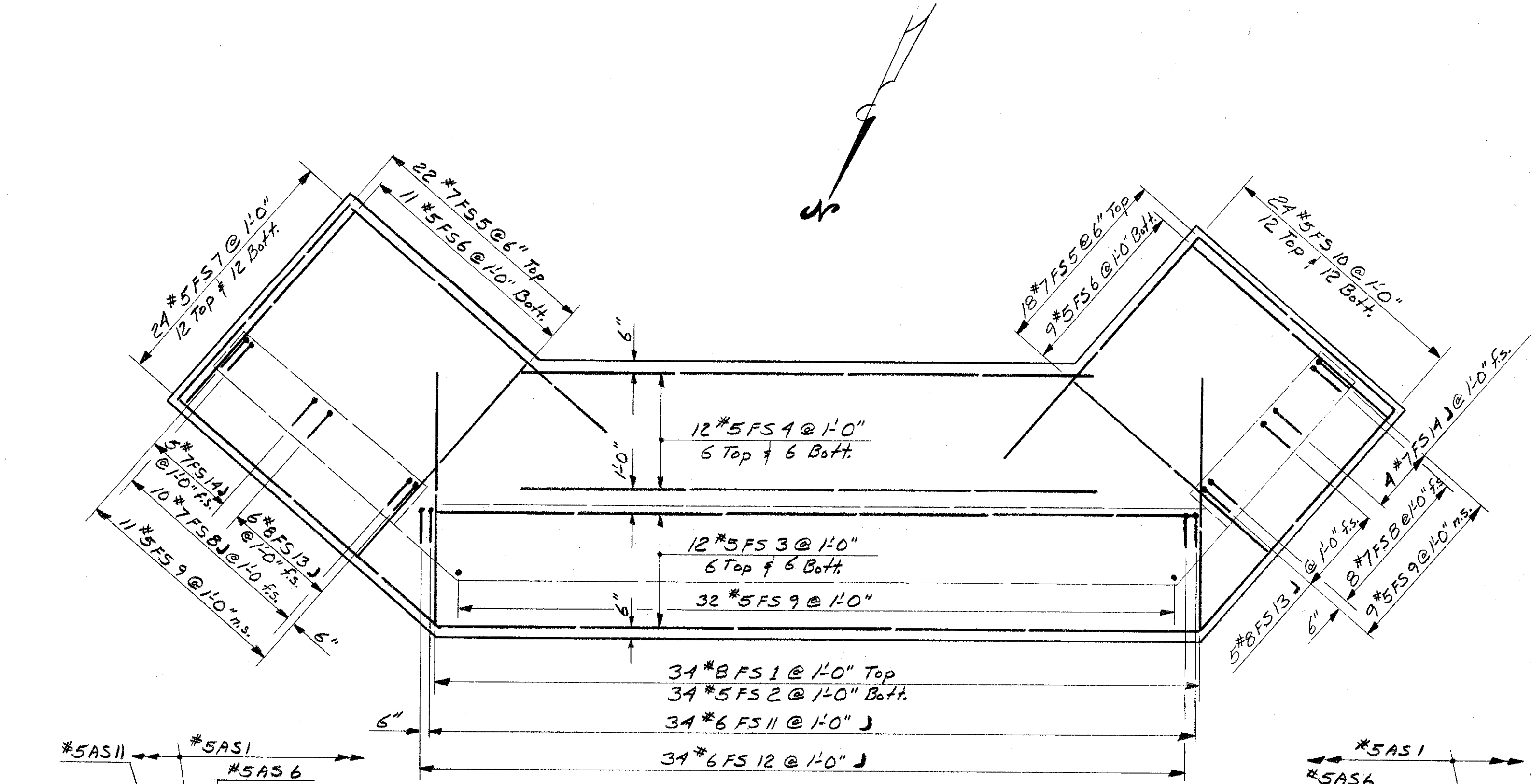
Sheet Scale: 1/4" = 1'-0" except as shown

DESIGNED	BY	DATE	CHECKED	BY	DATE	BRIDGE SHEET NO.
WAB	WAB	5-76	MDW	MDW	8-76	3 OF 11
DRAWN	BY	DATE	CHECKED	BY	DATE	FILE NUMBER
WAB	WAB	5-76	MDW	MDW	8-76	4-7-2-1
TRACED	BY	DATE	CHECKED	BY	DATE	
WAB	WAB	7-76	MDW	MDW	8-76	
QUANTITIES	BY	DATE	CHECKED	BY	DATE	
WAB	WAB	7-76	MDW	MDW	8-76	
REVIEWED BY	PROJ. NO.	SHEET NO.	TOTAL SHEETS			
	7-2591	4	16			

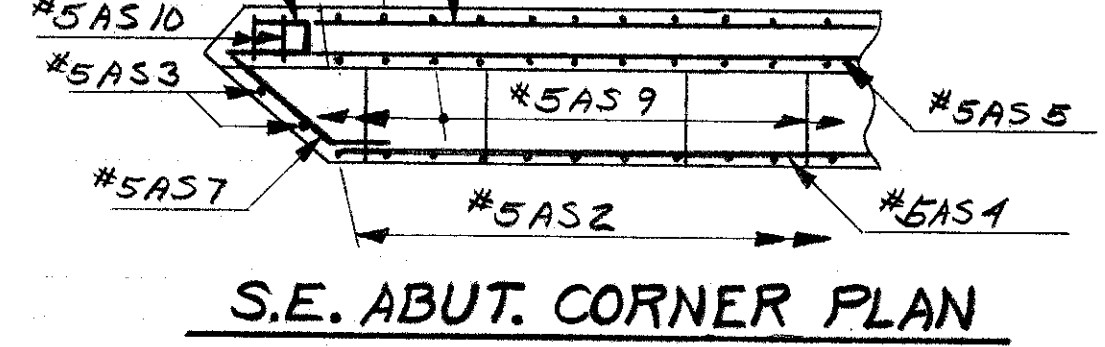
STATE OF NEW HAMPSHIRE
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 BRIDGE DESIGN DIVISION

TOWN THORNTON BRIDGE NO. 222/180
 FEDERAL PROJECT _____ STATE PROJECT 7-2591
 LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER

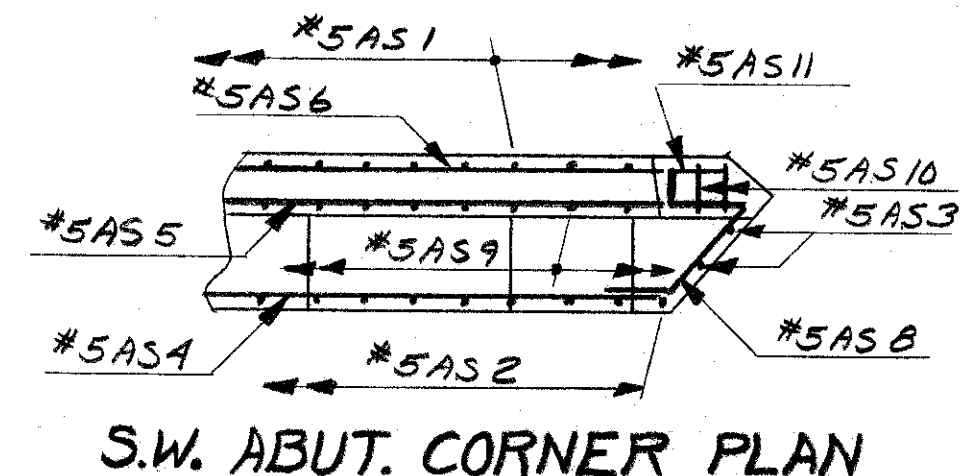
SOUTH ABUTMENT & WING MASONRY



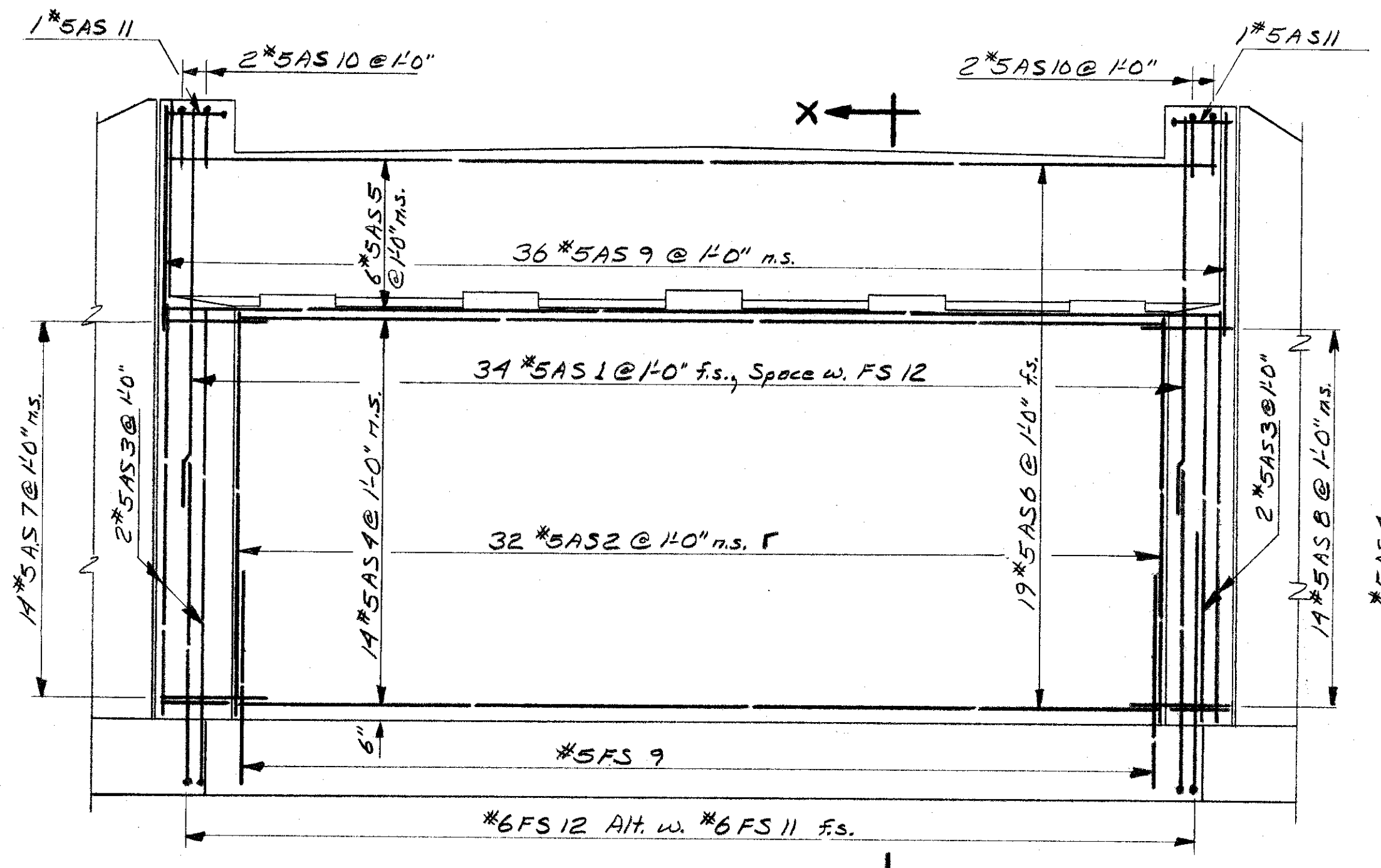
FOOTING PLAN



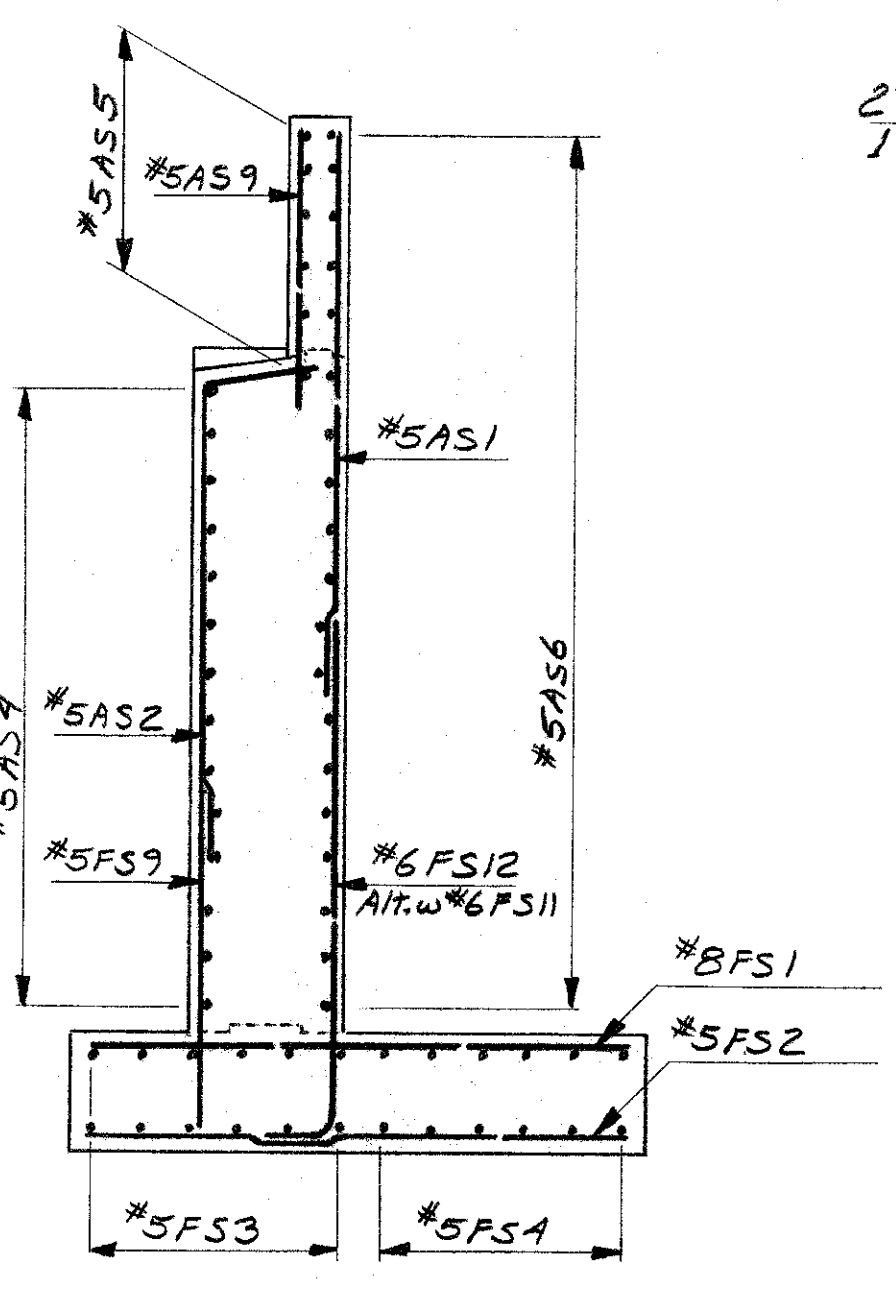
S.E. ABUT. CORNER PLAN



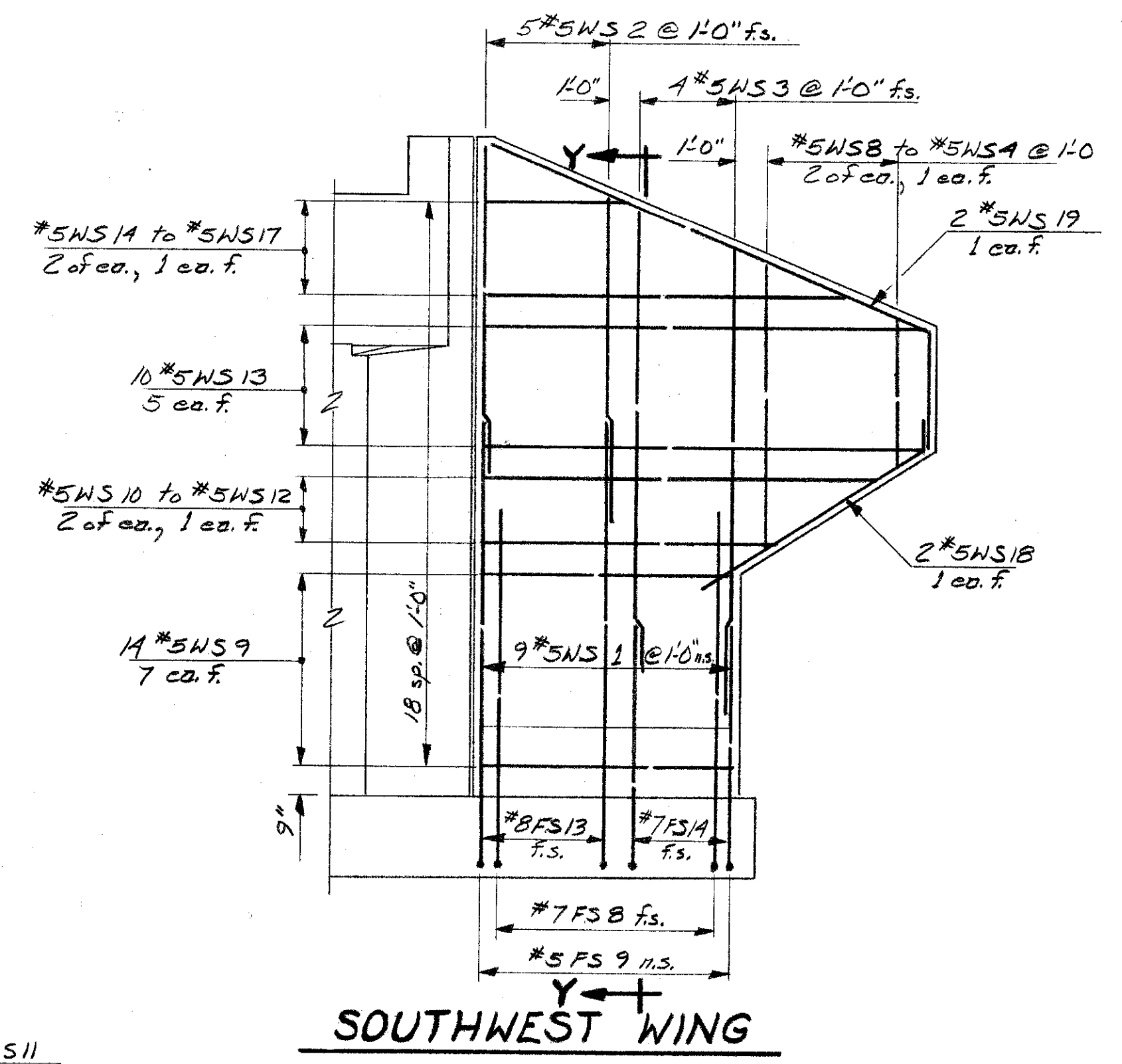
S.W. ABUT. CORNER PLAN



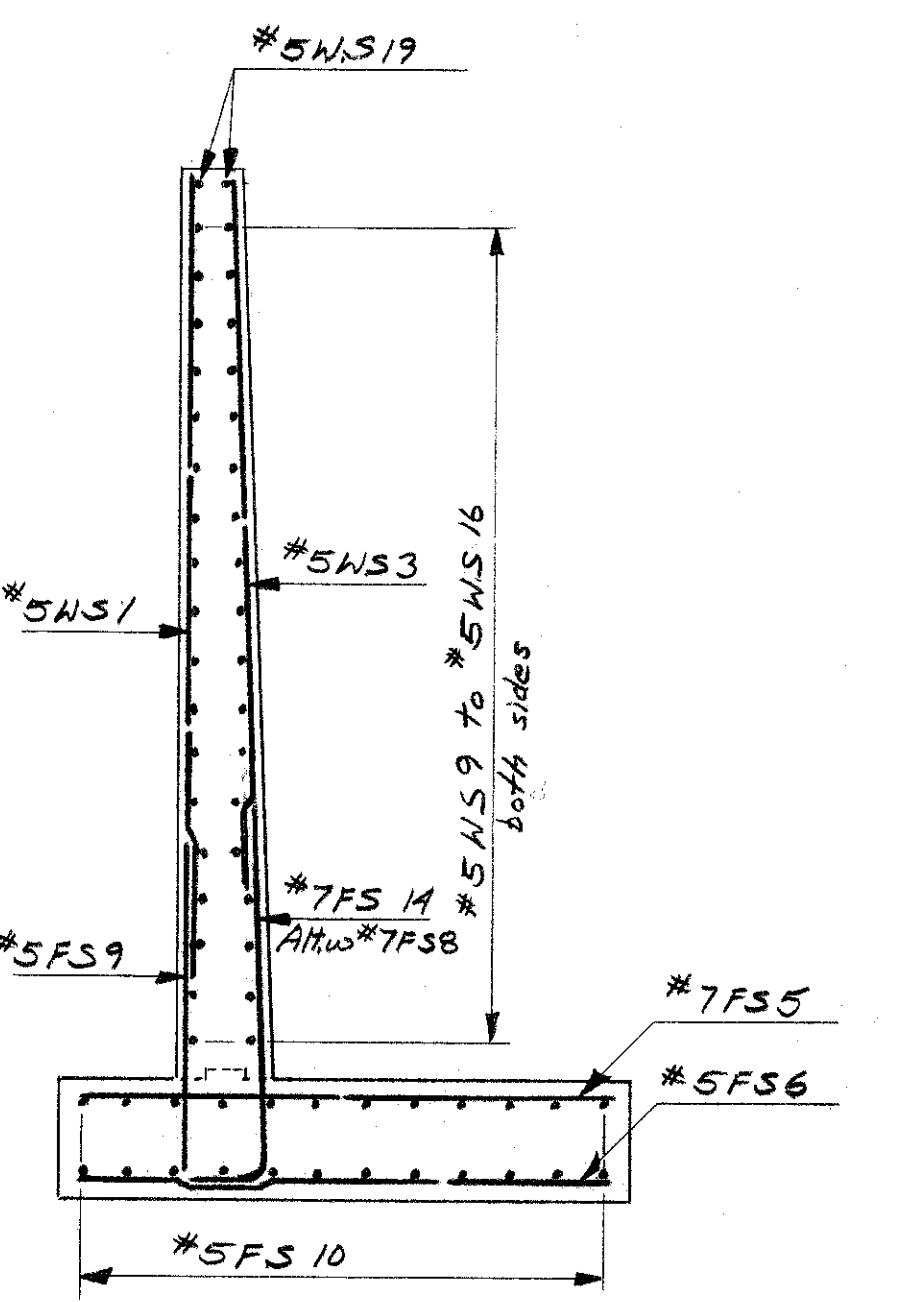
ELEVATION



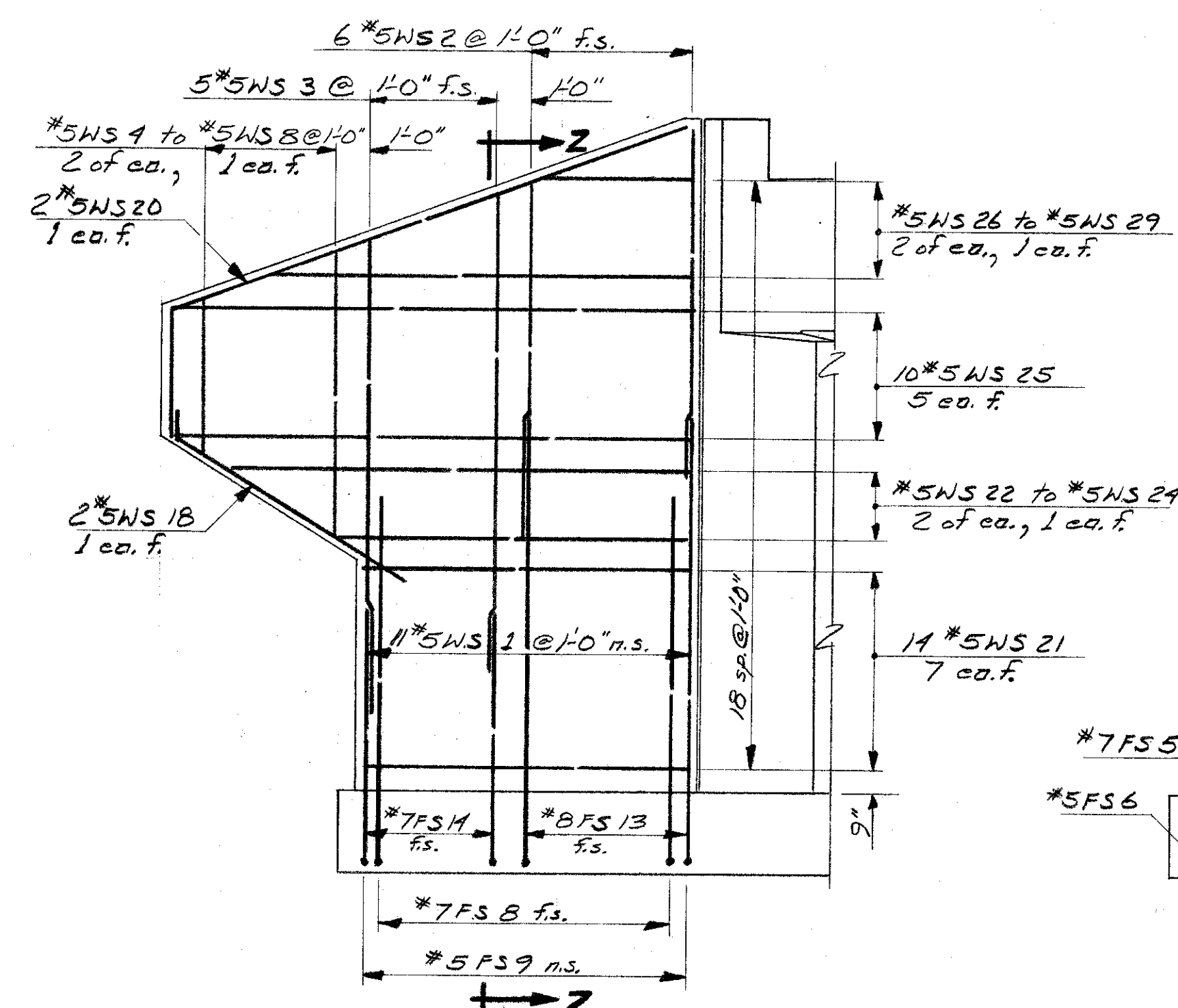
SECTION X-X



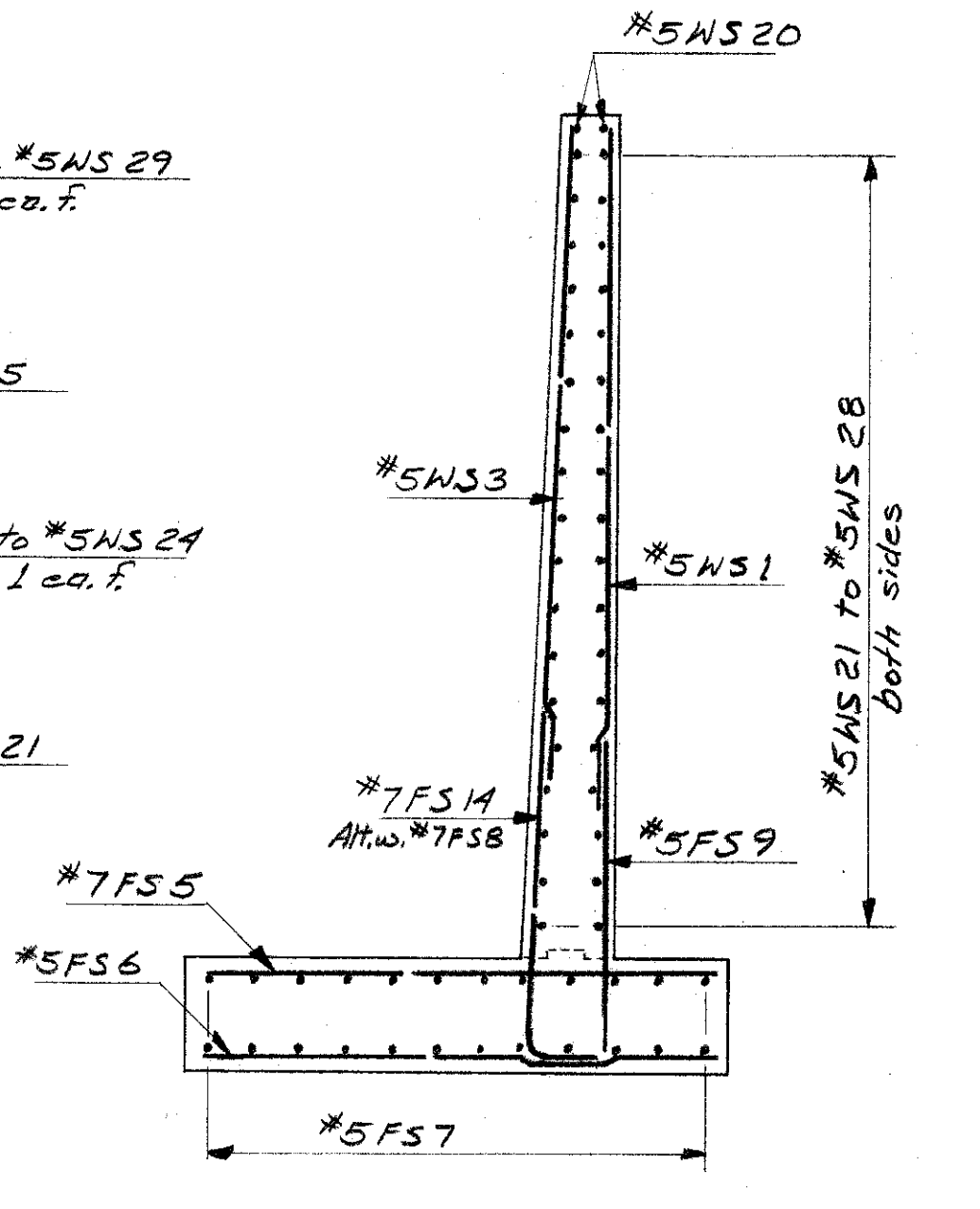
SOUTHWEST WING



SECTION Y-Y



SOUTHEAST WING



SECTION Z-Z

Note: Footing reinforcing to be 3" clear (min).
Above footing reinforcing to be 2" clear (min).

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

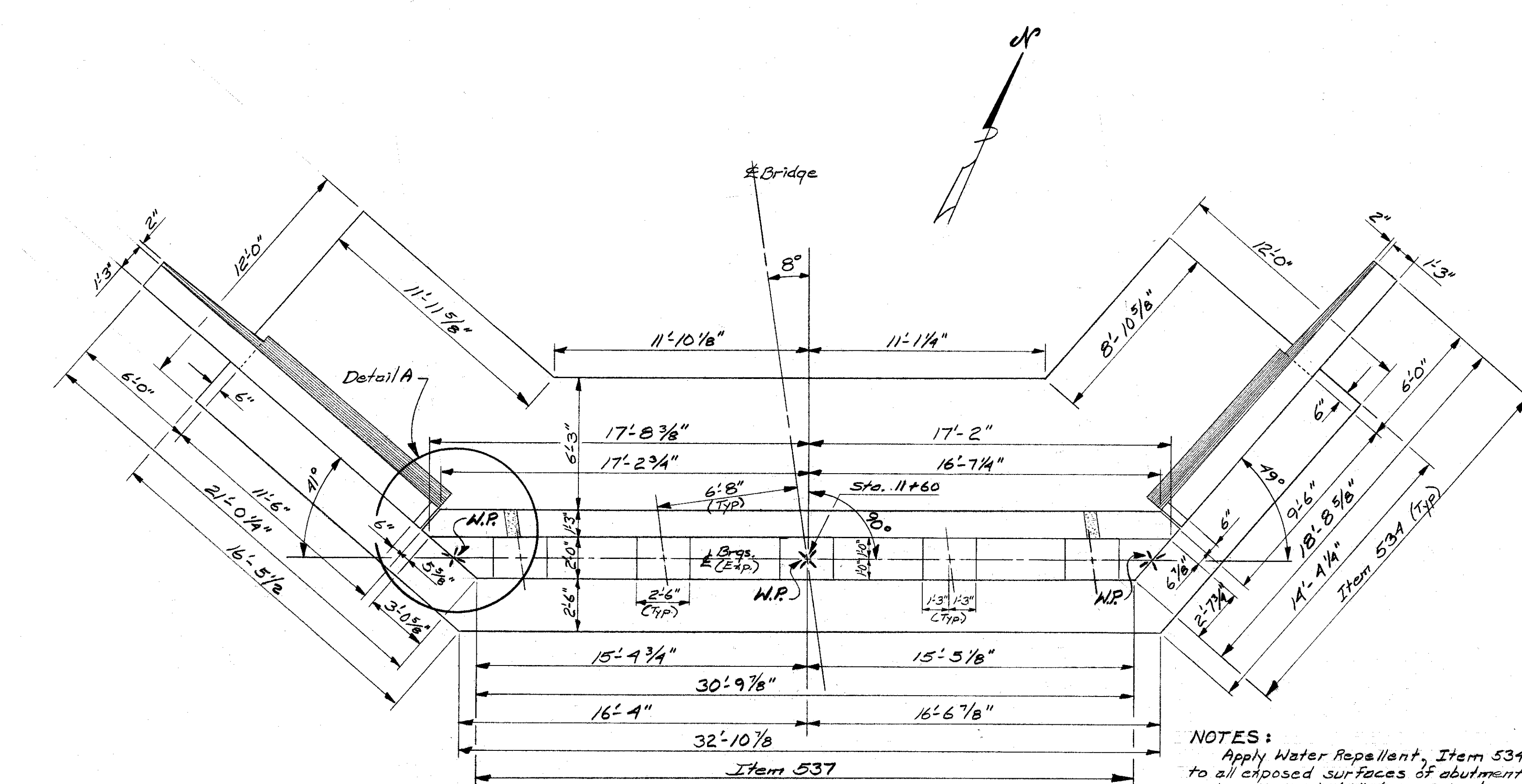
STATE OF NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BRIDGE DESIGN DIVISION

TOWN THORNTON BRIDGE NO. 222/180
FEDERAL PROJECT _____ STATE PROJECT 7-2391
LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER

SOUTH ABUTMENT REINFORCING			
DESIGNED	WAB	DATE	6-76
DRAWN	WAB	DATE	6-76
TRACED	WAB	DATE	7-76
QUANTITIES	WAB	DATE	7-76
CHECKED	MDW	DATE	8-76
CHECKED	MDW	DATE	8-76
CHECKED	MDW	DATE	8-76
CHECKED	MDW	DATE	8-76

BRIDGE SHEET NO. 4 OF 11
FILE NUMBER 4-7-2-1

REVIEWED BY _____ PROJ. NO. 7-2391 SHEET NO. 5 TOTAL SHEETS 16

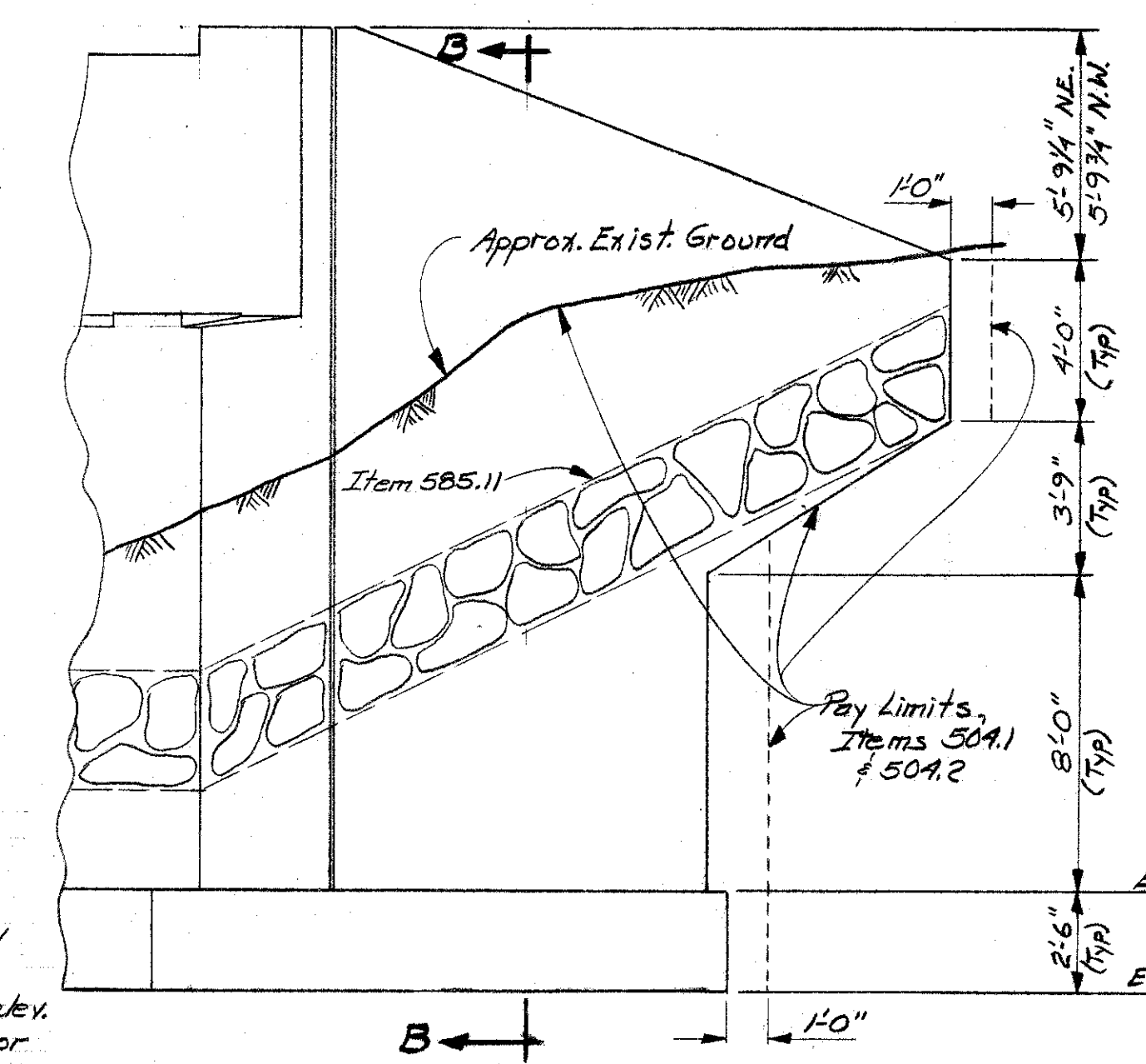


PLAN

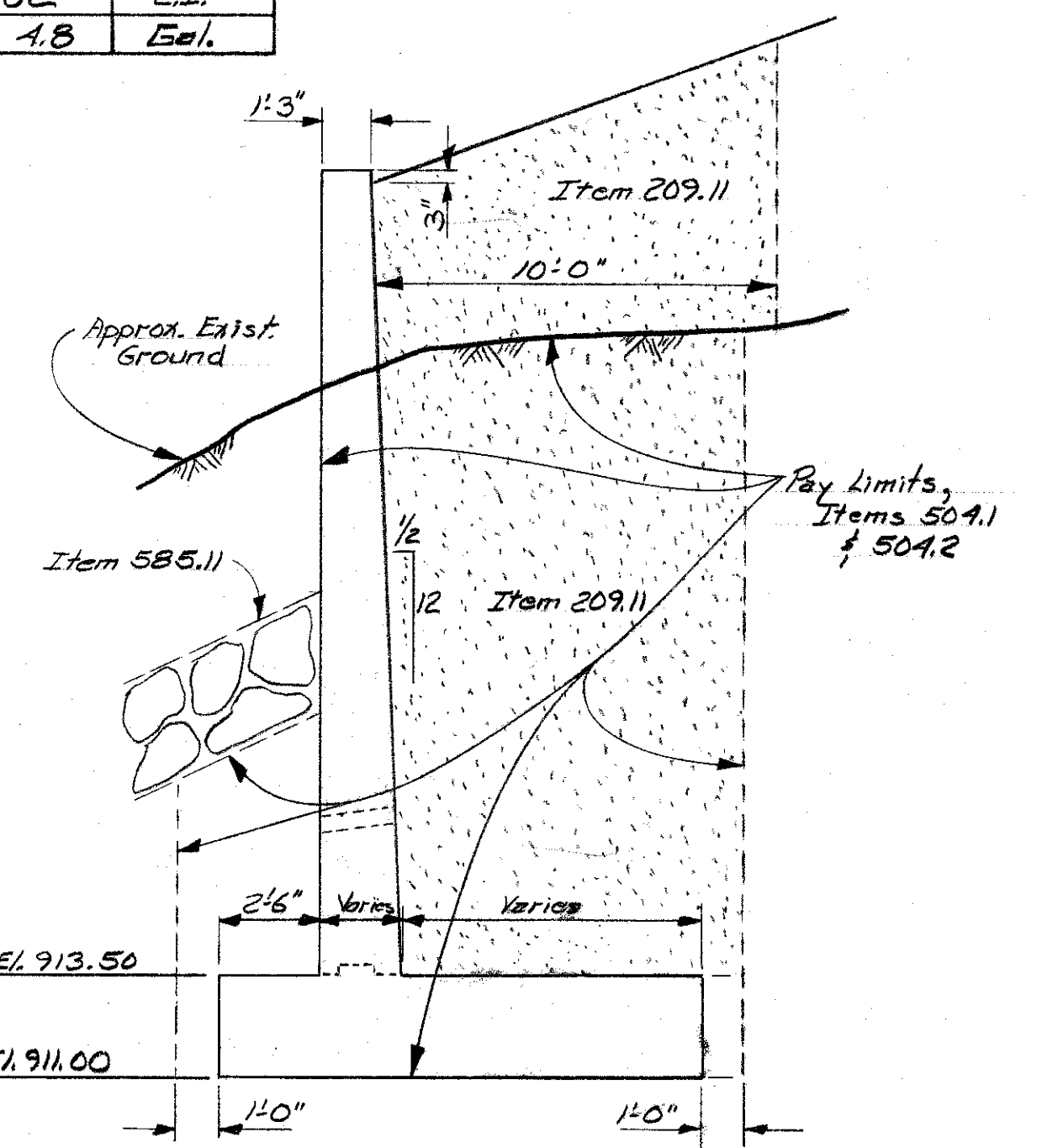
NOTES:
 Apply Water Repellent, Item 534, to all exposed surfaces of abutment and wings and 1'-6" down fillside.
 All const. joints shall be keyed and a concrete bonding agent used. (subs.)
 Backfill shall be brought to the elev. of the bridge seat and compacted prior to the pouring of the deck or backwall.
 Pour bearing pedestals 1/4" lower than plan elevations and provide galvanized steel shims to attain the specified elevations, subs. to Item 550.2.

NORTH ABUTMENT, WING & FOOTING QUANTITIES			
Item No.	Description	Quantity	Unit
209.11	Granular Backfill (Br.)	410	C.Y.
504.1	Common Bridge Excavation	500	C.Y.
504.2	Rock Bridge Excavation	28	C.Y.
520.11	Concrete El. A, Footings	59.7	C.Y.
520.12	Concrete El. A, Above Footings	99	C.Y.
533	Membrane Waterproofing	14	S.Y.
534	Water Repellent	2	Gal.
536.11	Epoxy Coating for Concrete	265	S.F.
541.4	P.V.C. Waterstop, N.H. Type A	42.5	L.F.
544	Reinforcing Steel	11910	Lbs.
562.1	Polyurethane Sealant	102	C.F.
537	Concrete Sealer	4.8	Gal.

FED. ROAD DIV. NO.	STATE	PROJ.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	N.H.				

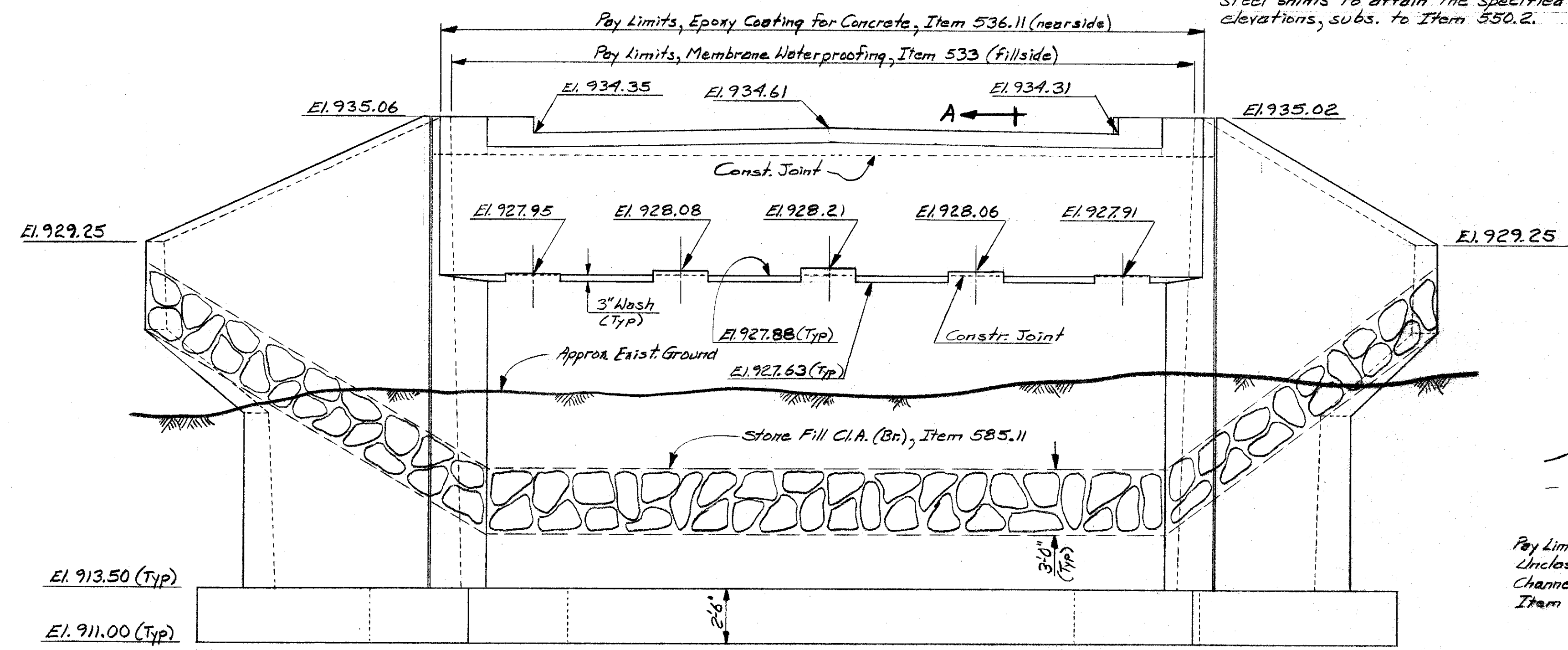


NORTHEAST WING
 Northwest Wing Similar

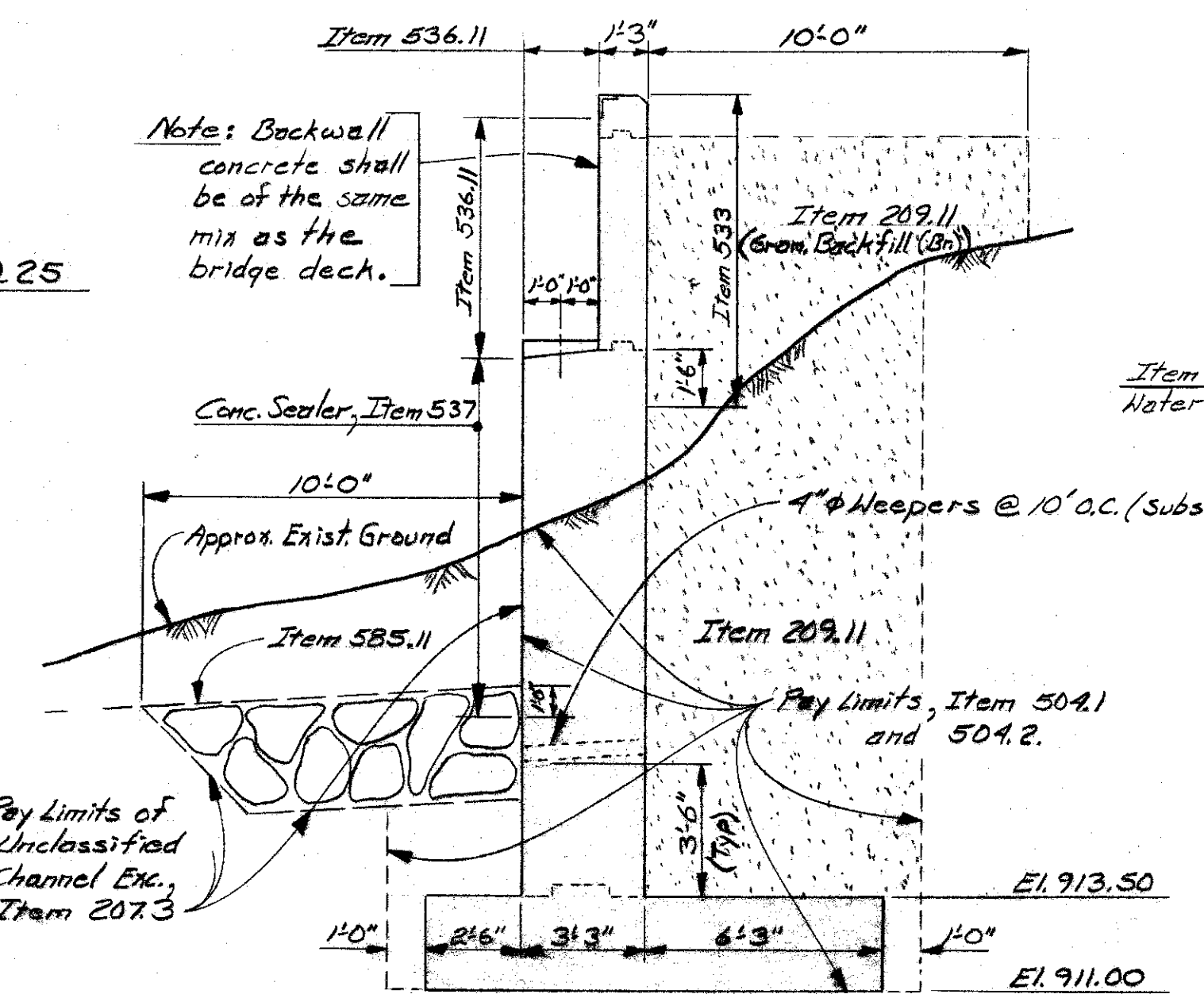


SECTION B-B

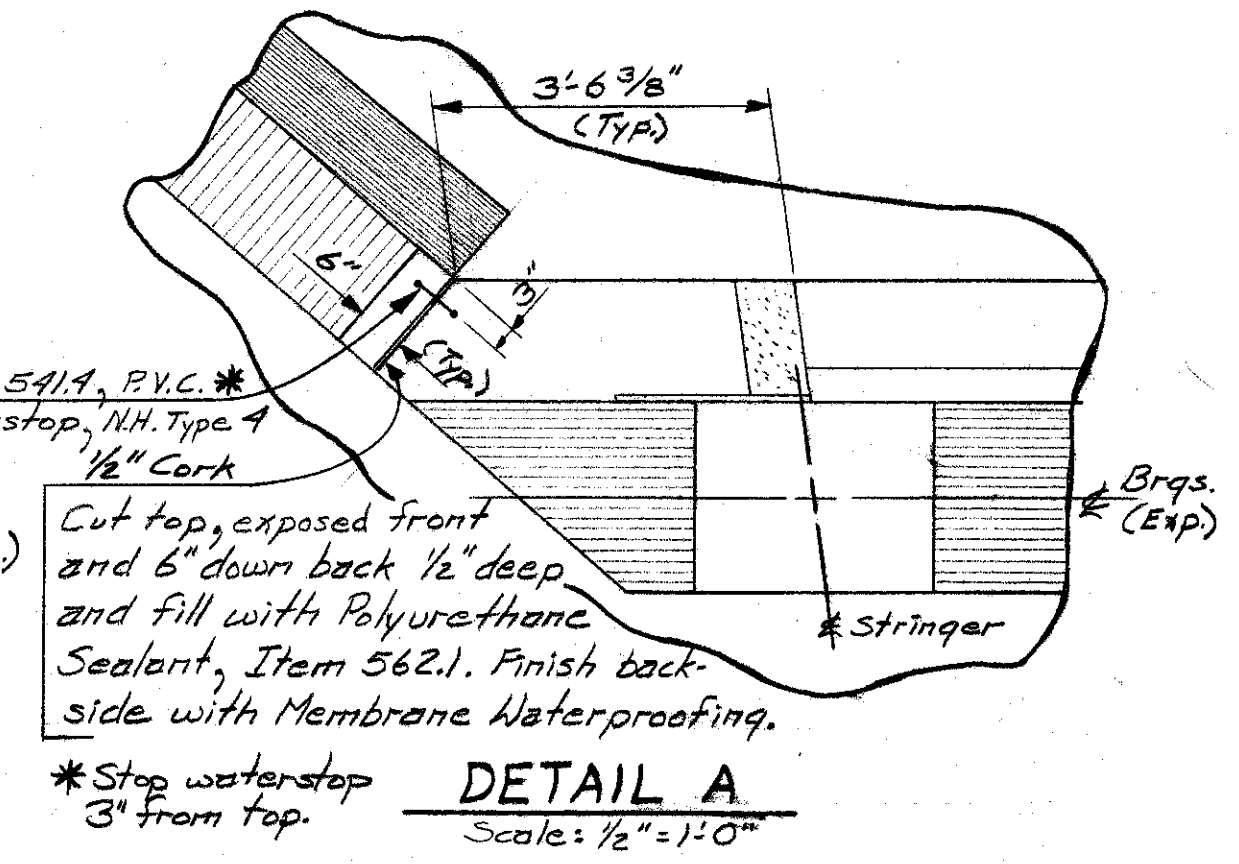
NOTE: Any boulders within one foot of the footing elev. should be excavated and the resulting void filled w. Granular Backfill, Item 209.11



ELEVATION



SECTION A-A



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

Note: Backwall concrete shall be of the same mix as the bridge deck.

Cut top, exposed front and 6" down back 1/2" deep and fill with Polyurethane Sealant, Item 562.1. Finish backside with Membrane Waterproofing.
 * Stop waterstop 3' from top.

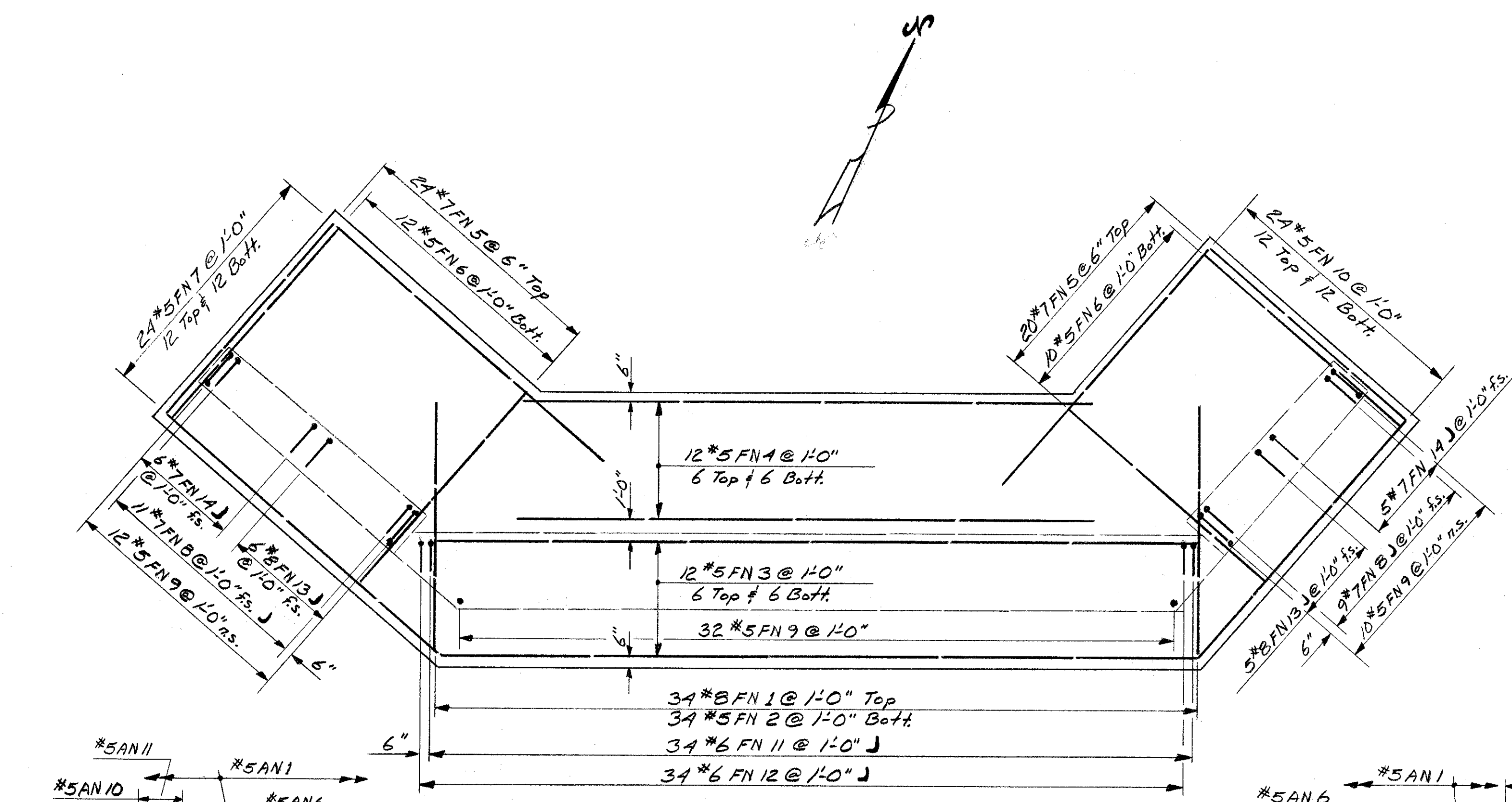
STATE OF NEW HAMPSHIRE
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 BRIDGE DESIGN DIVISION

TOWN THORNTON BRIDGE NO. 222/180
 FEDERAL PROJECT STATE PROJECT T-2591
 LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER

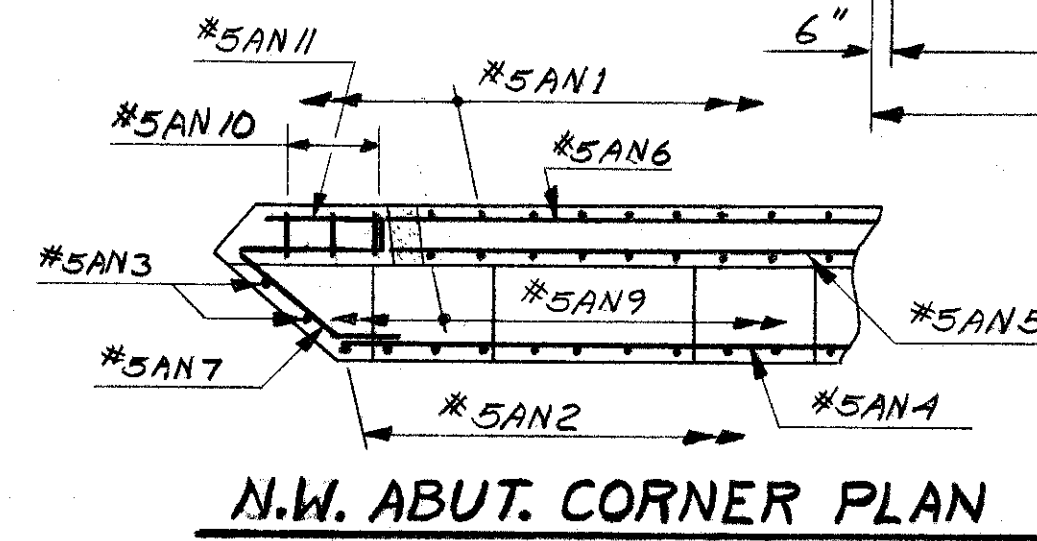
NORTH ABUTMENT & WING MASONRY

DESIGNED	BY	DATE	CHECKED	BY	DATE	BRIDGE SHEET NO.
MDW	MDW	5-76	MDW	MDW	5-76	5 OF 11
DRAWN	MDW	5-76	CHECKED	MDW	5-76	FILE NUMBER
TRACED	MDW	7-76	CHECKED	MDW	8-76	4-7-2-1
QUANTITIES	MDW	7-76	CHECKED	MDW	8-76	

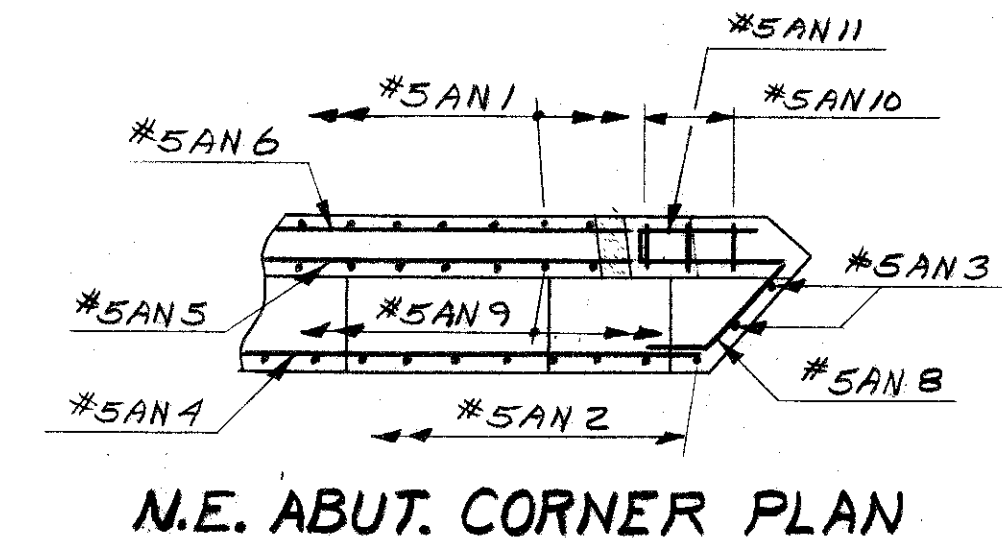
REVISIONS	BY	DATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
			T-2591	6	16



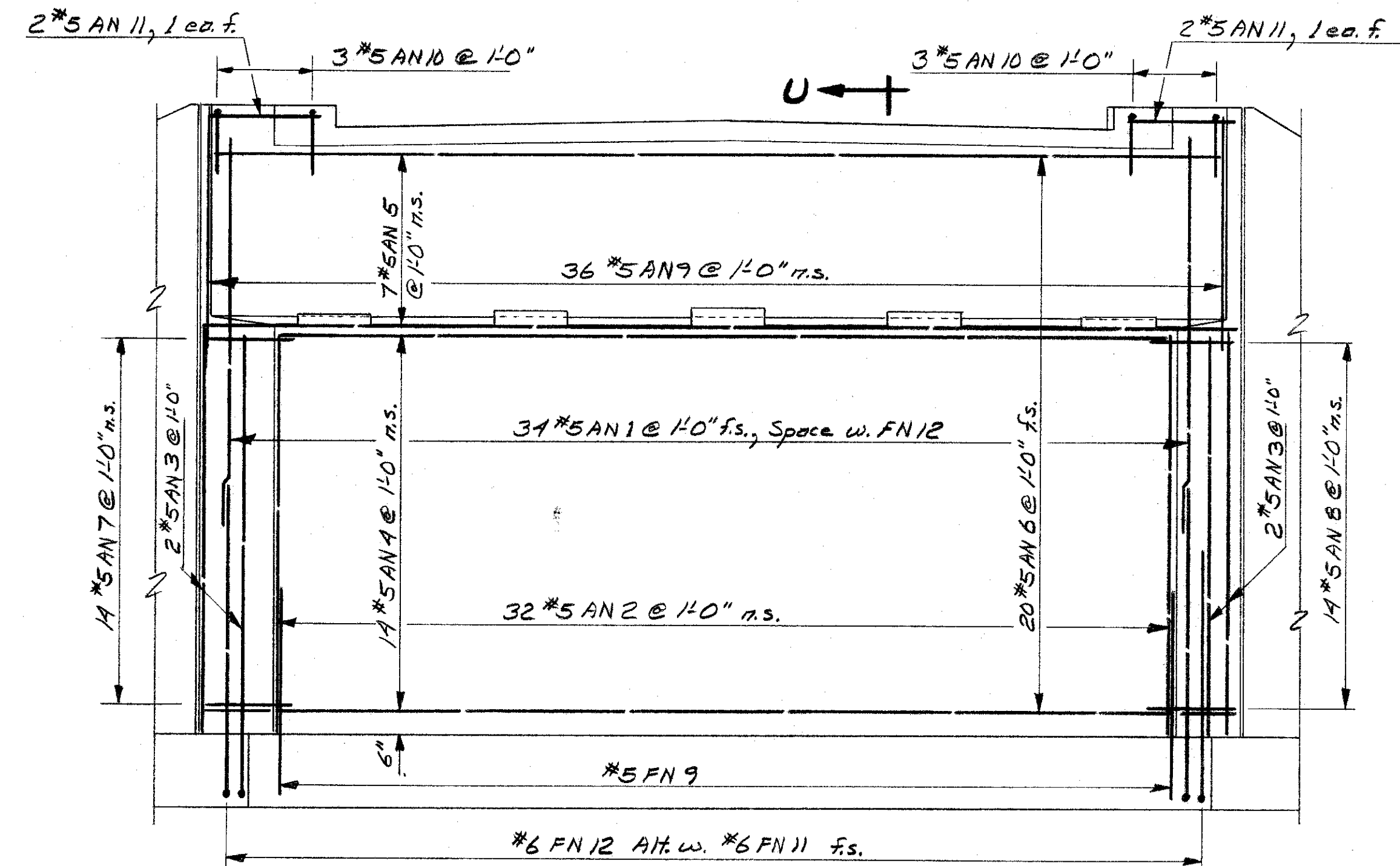
FOOTING PLAN



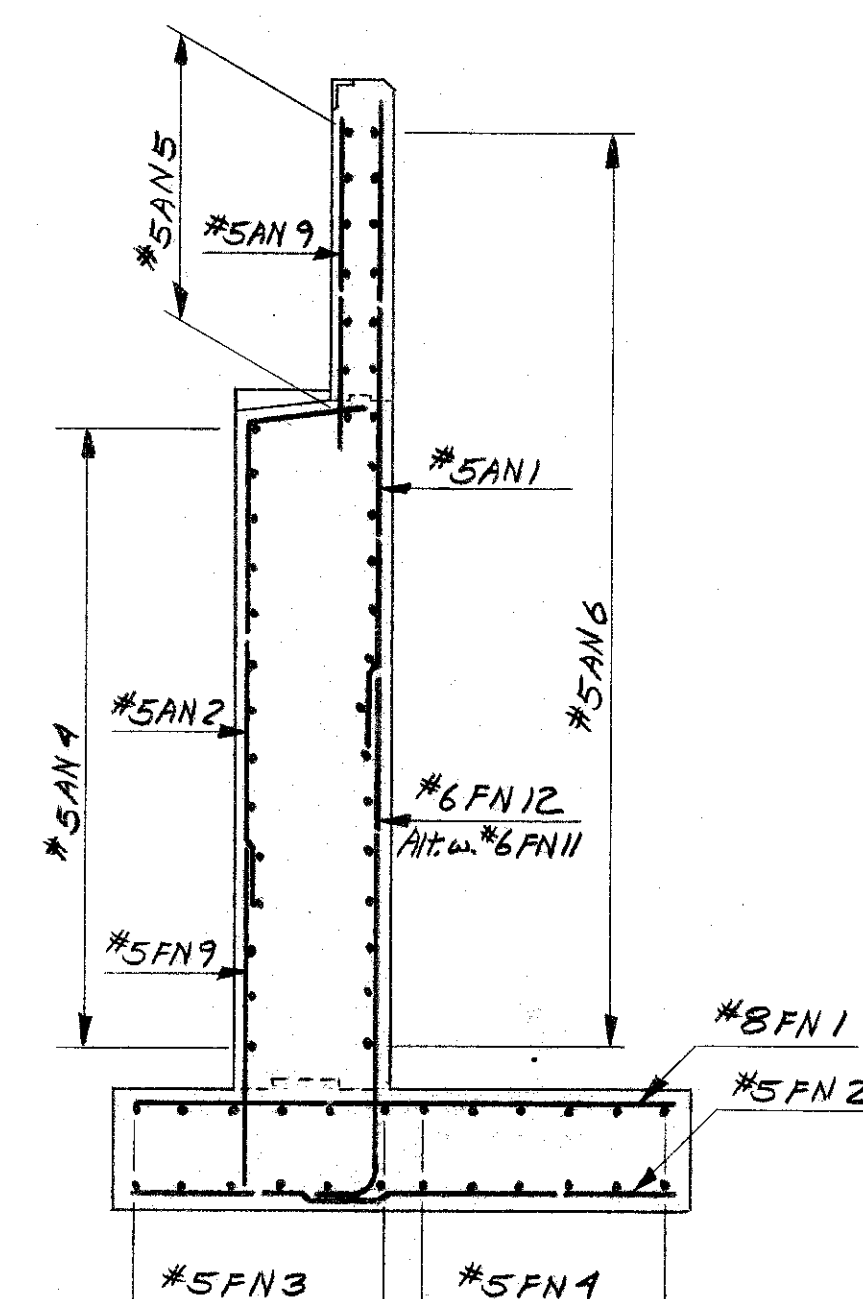
N.W. ABUT. CORNER PLAN



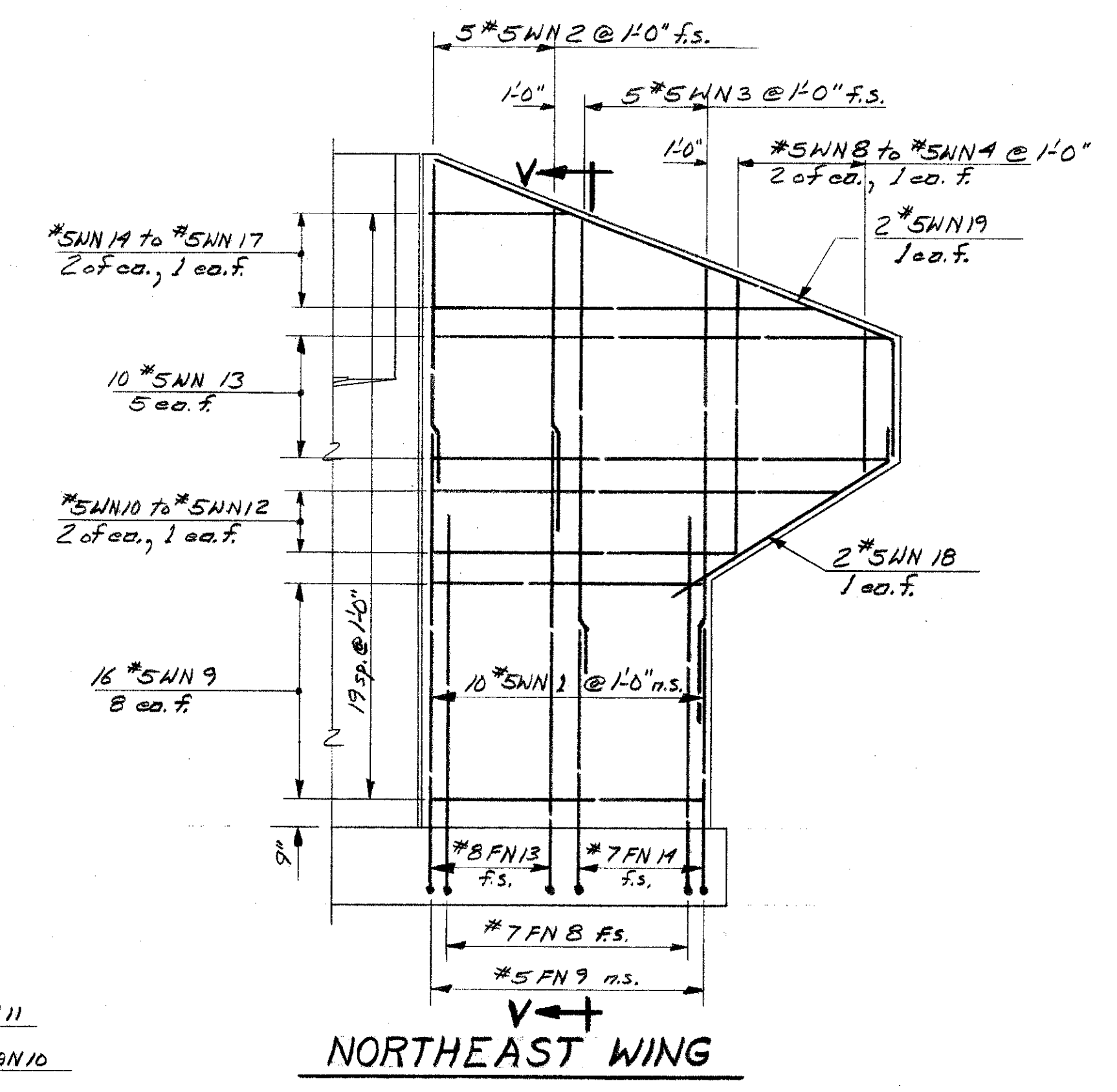
N.E. ABUT. CORNER PLAN



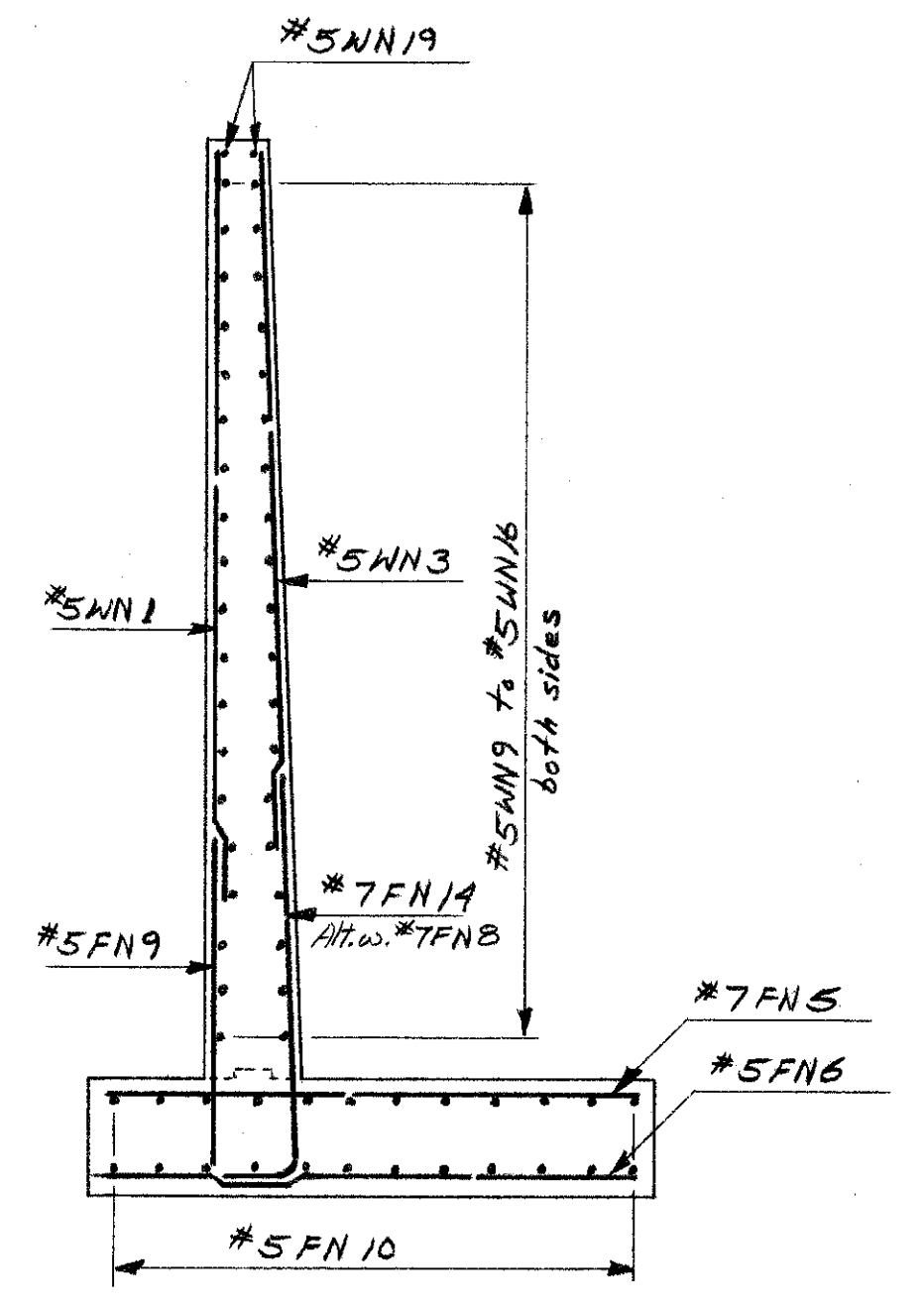
ELEVATION



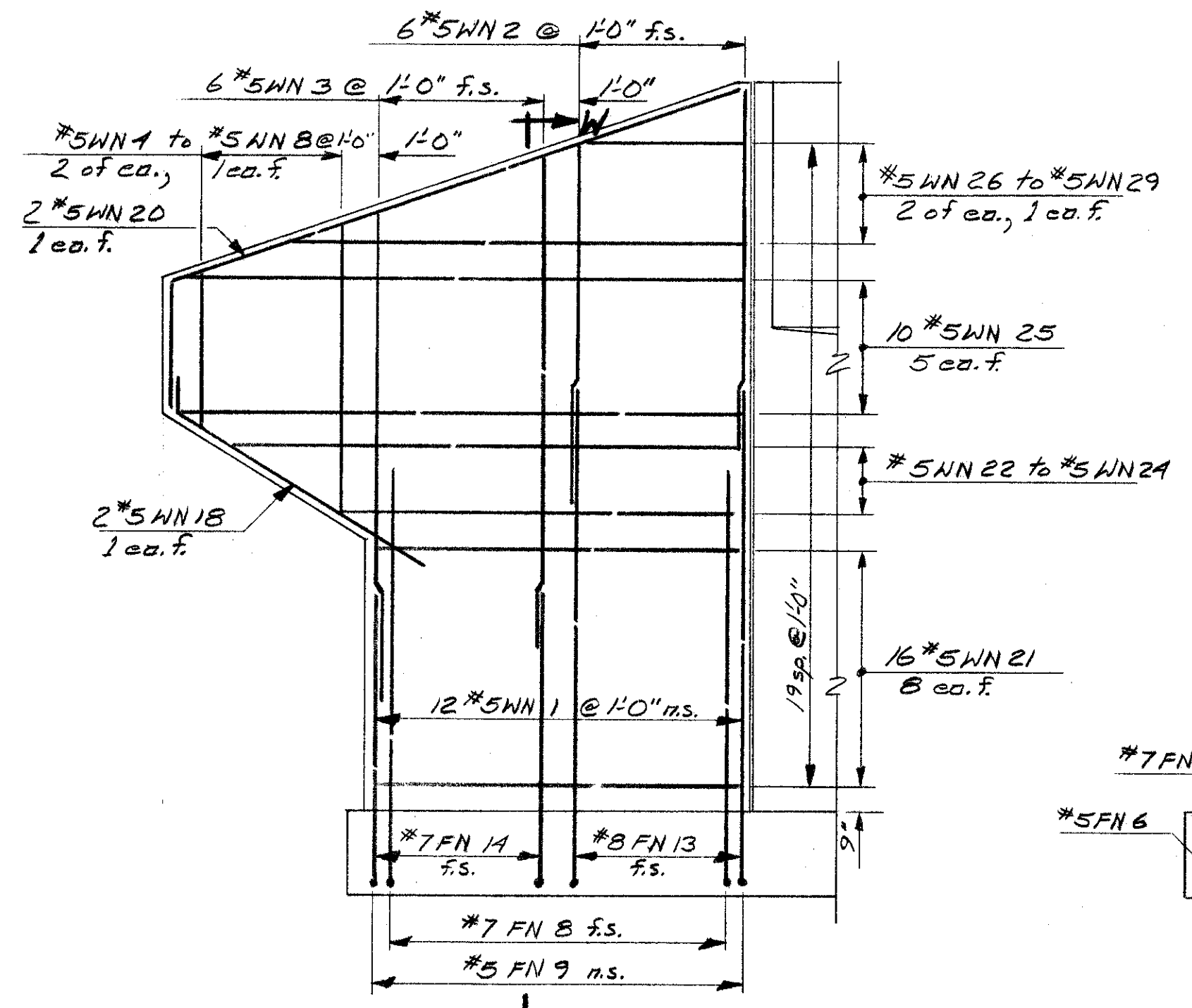
SECTION U-U



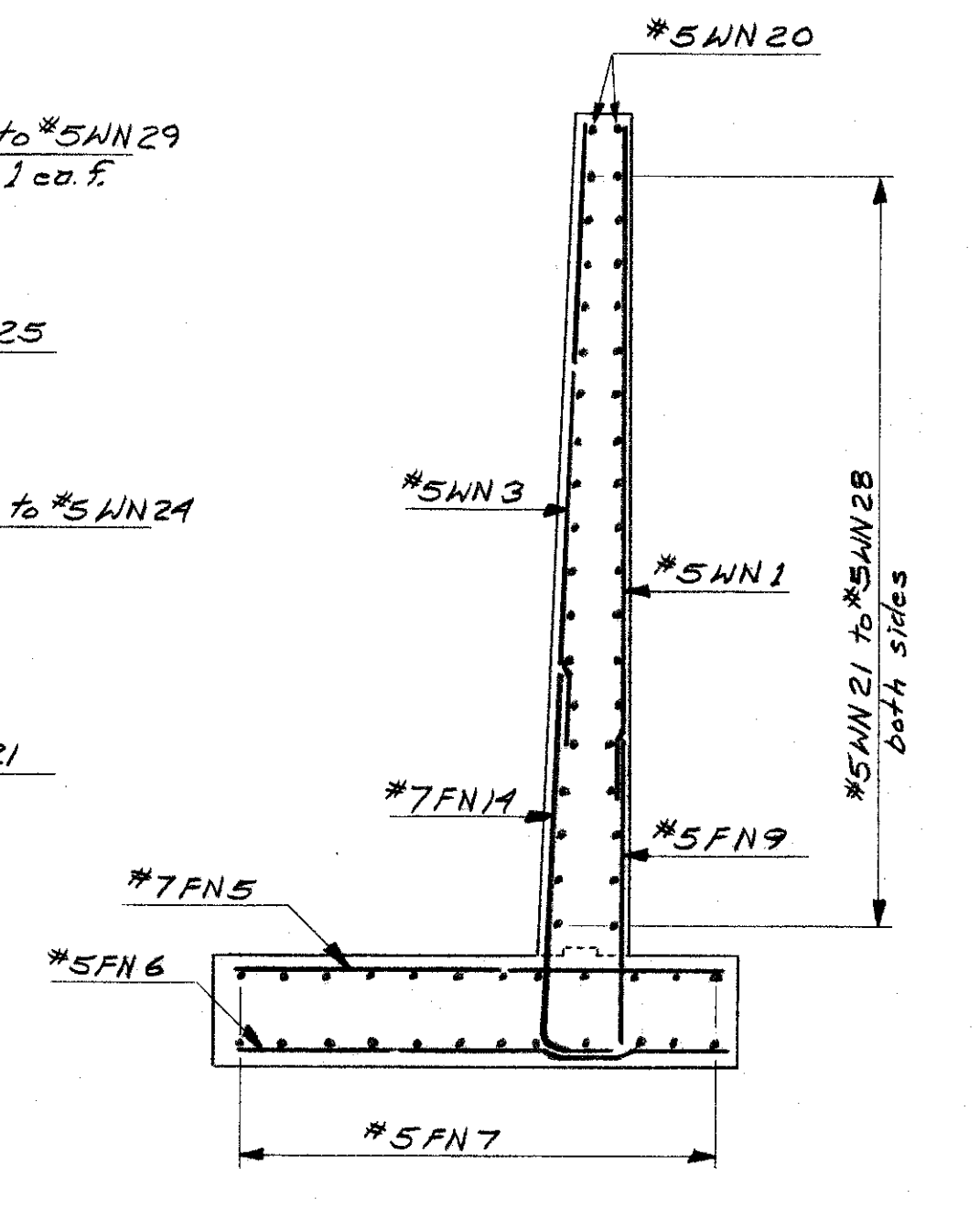
NORTHEAST WING



SECTION V-V



NORTHWEST WING

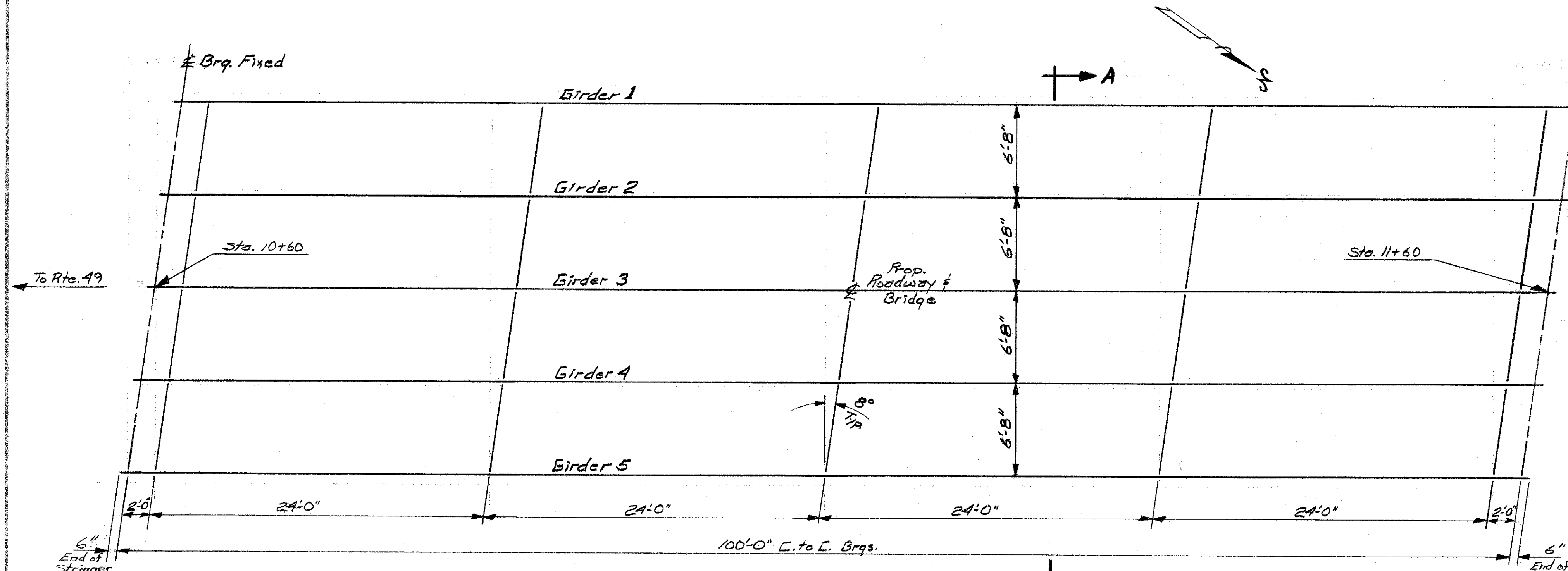


SECTION W-W

Notes: Footing reinforcing to be 3" clear (min).
Above footing reinforcing to be 2" clear (min).

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

STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BRIDGE DESIGN DIVISION					
TOWN <u>THORNTON</u>			BRIDGE NO. <u>222/180</u>		
FEDERAL PROJECT _____			STATE PROJECT <u>T-2591</u>		
LOCATION <u>UPPER MAD RIVER ROAD OVER MAD RIVER</u>					
NORTH ABUTMENT REINFORCING					
DESIGNED	<u>MAB</u>	BY	<u>MAB</u>	DATE	<u>6-76</u>
DRAWN	<u>MAB</u>	CHECKED	<u>MDW</u>	DATE	<u>8-76</u>
TRACED		CHECKED	<u>MDW</u>	DATE	<u>8-76</u>
QUANTITIES	<u>MAB</u>	CHECKED	<u>MDW</u>	DATE	<u>8-76</u>
REVISIONS		BY	DATE	BRIDGE SHEET NO.	
				6 OF 11	
				FILE NUMBER	
				4-7-2-1	
REVIEWED BY _____		PROJ. NO.	SHEET NO.	TOTAL SHEETS	
		<u>T-2591</u>	<u>7</u>	<u>16</u>	



STRUC. ST. NOTES (cont.)

5. The State will shop inspect the fabrication of the struc. steel.

6. The struc. steel fabricator shall arrange for radiographs and magnetic particle inspection of the welds. This cost shall be subs. to Item 550.1, Struc. Steel.

7. The notch toughness requirements of art. 550.2.2 of the N.H. Specs shall apply to the web and tension flanges of the main girders. These members are identified by the symbol (T).

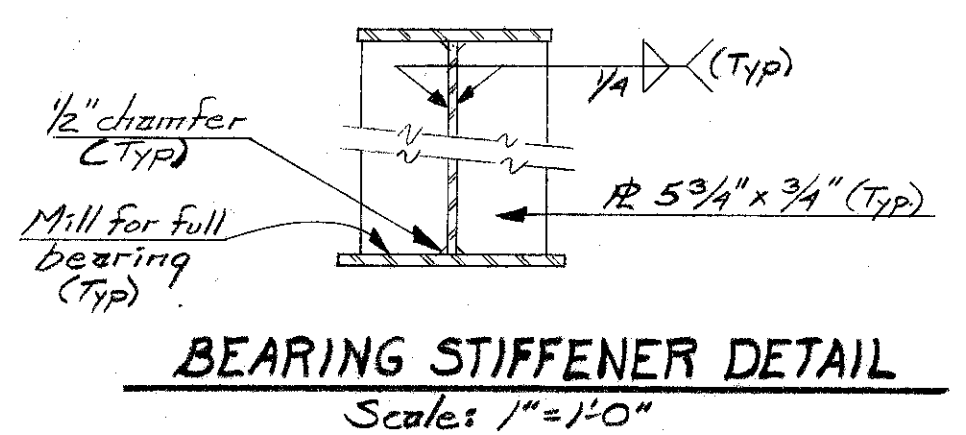
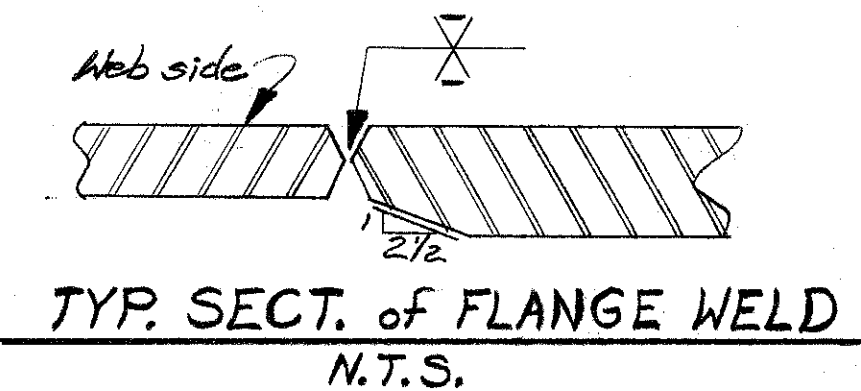
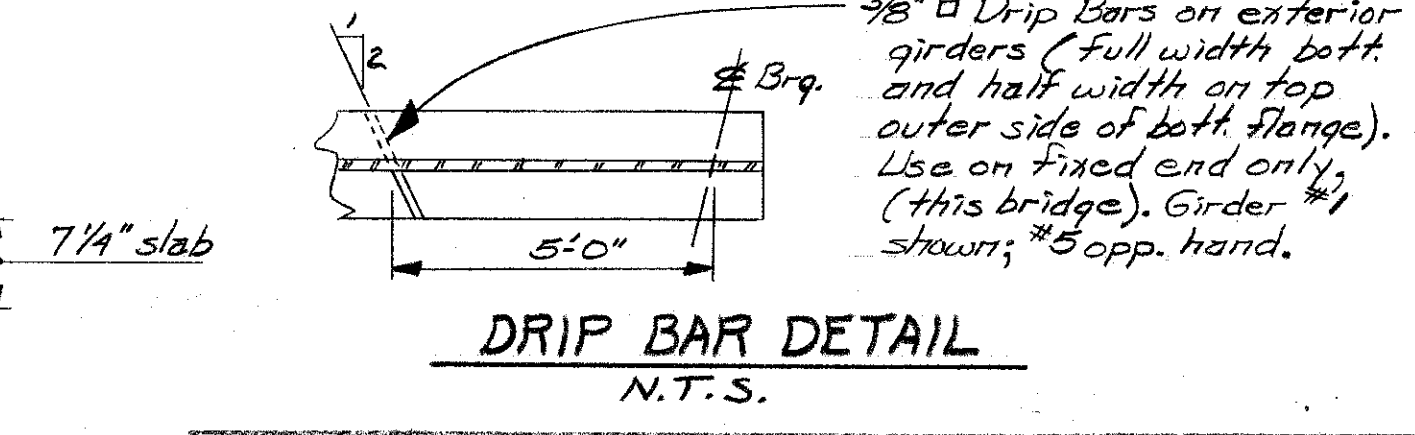
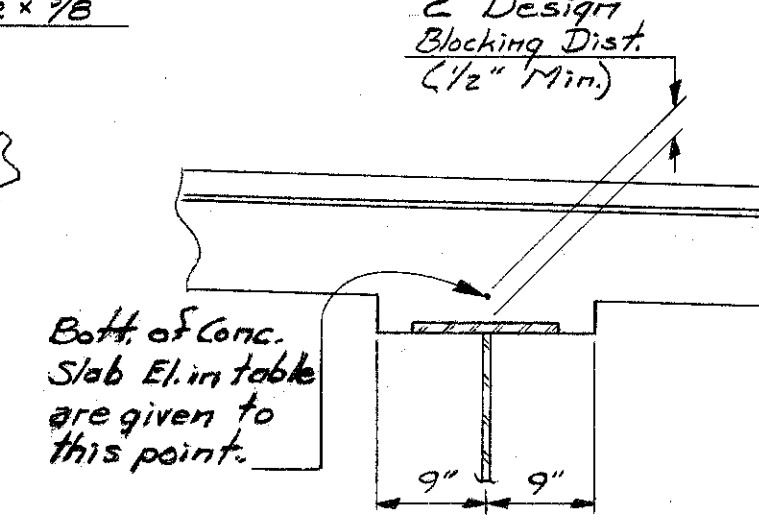
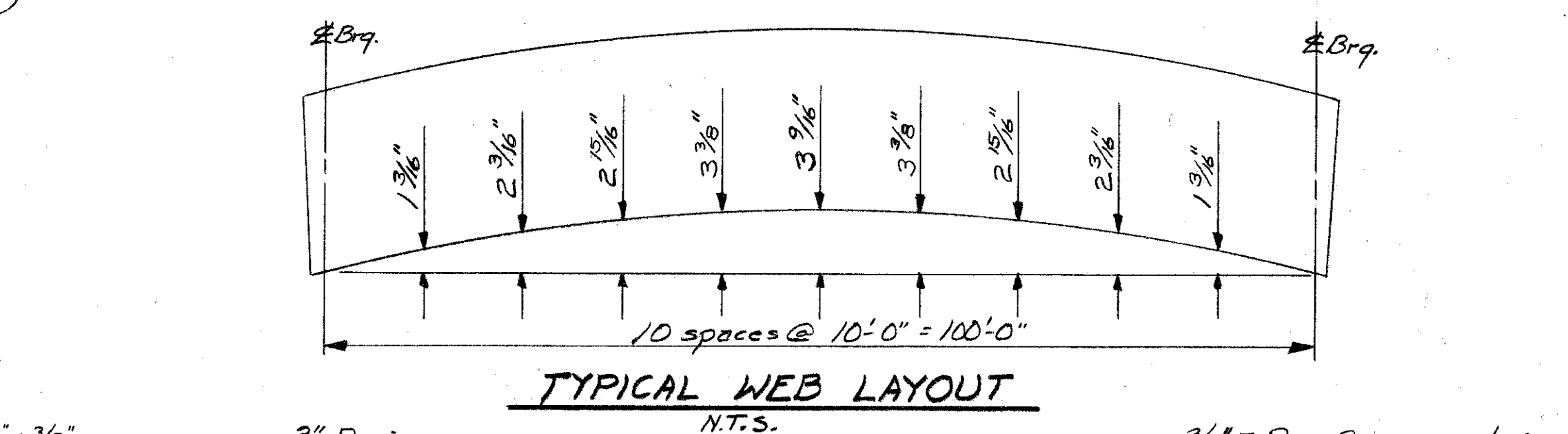
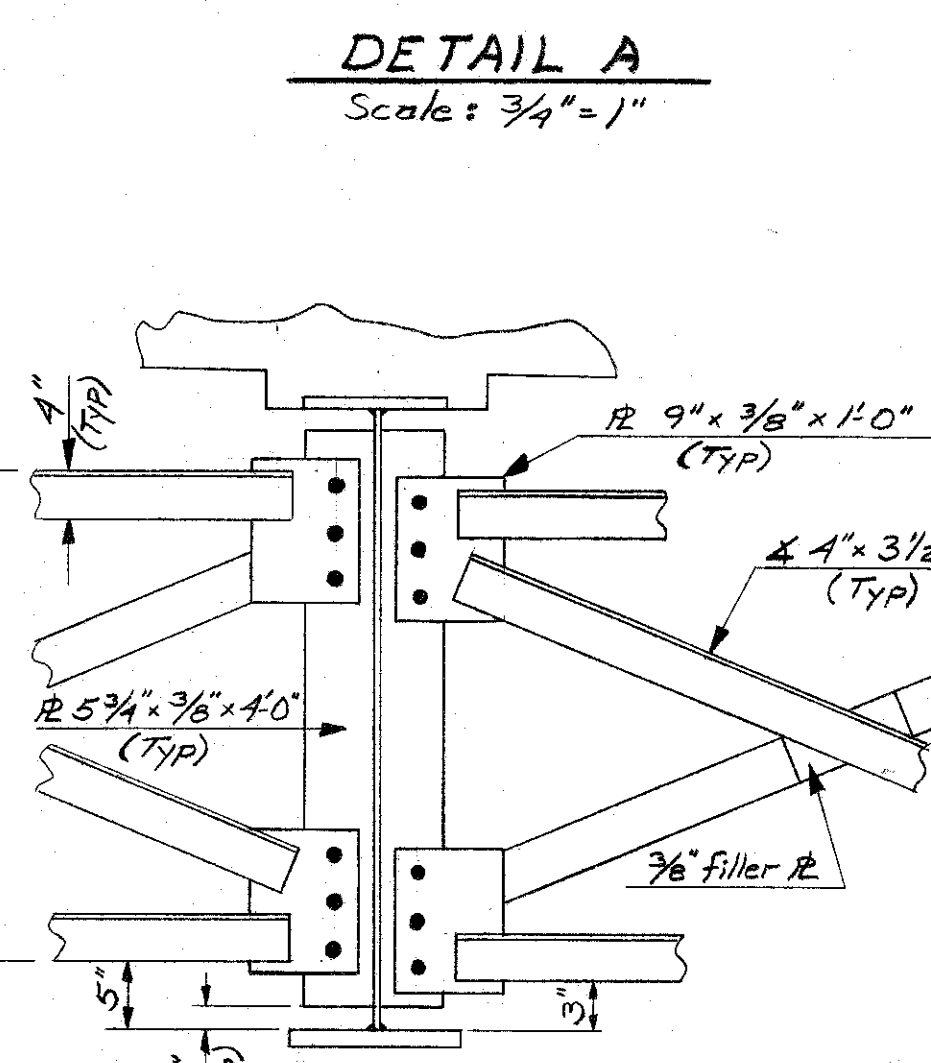
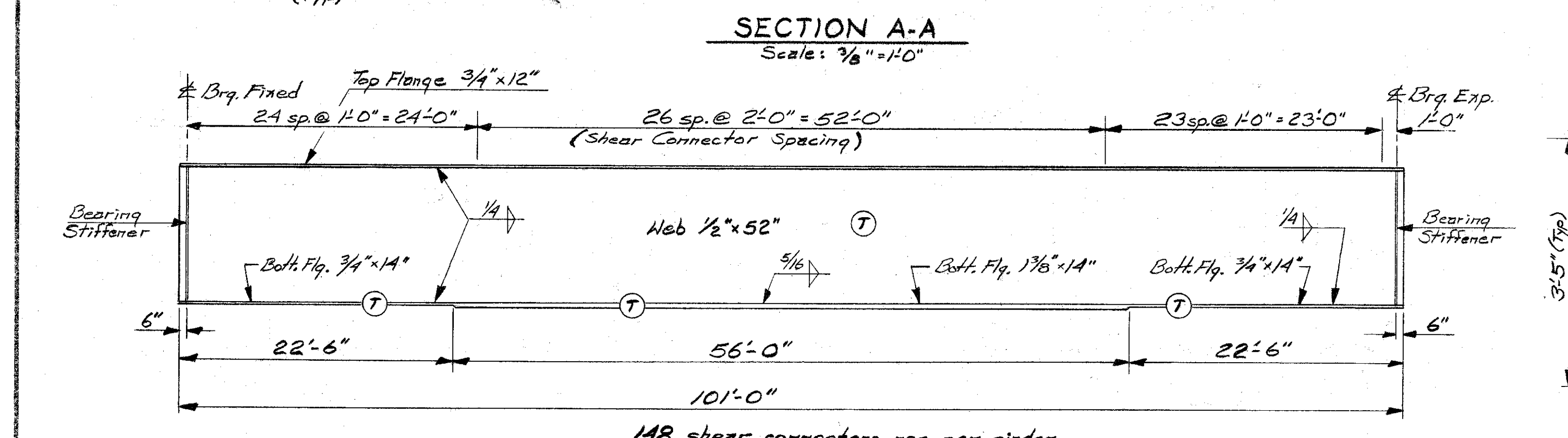
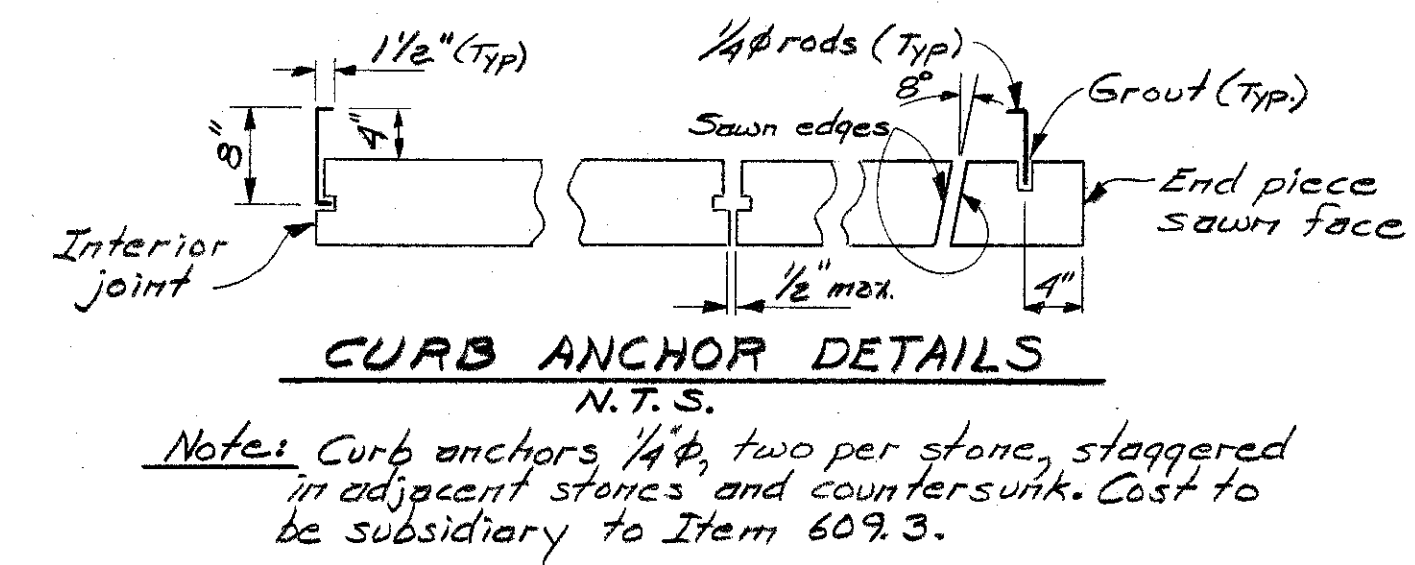
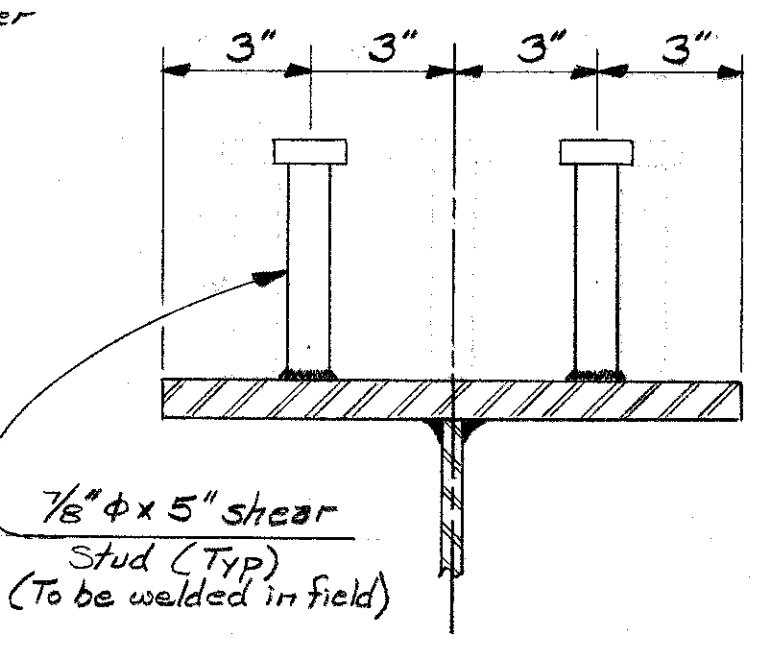
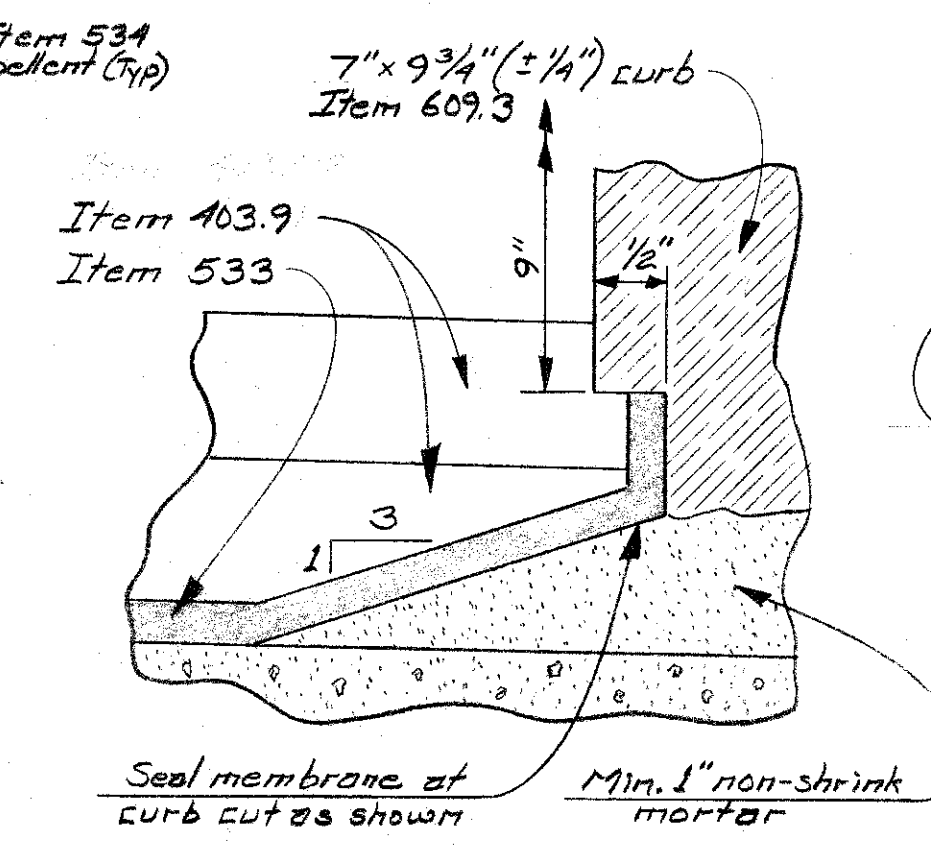
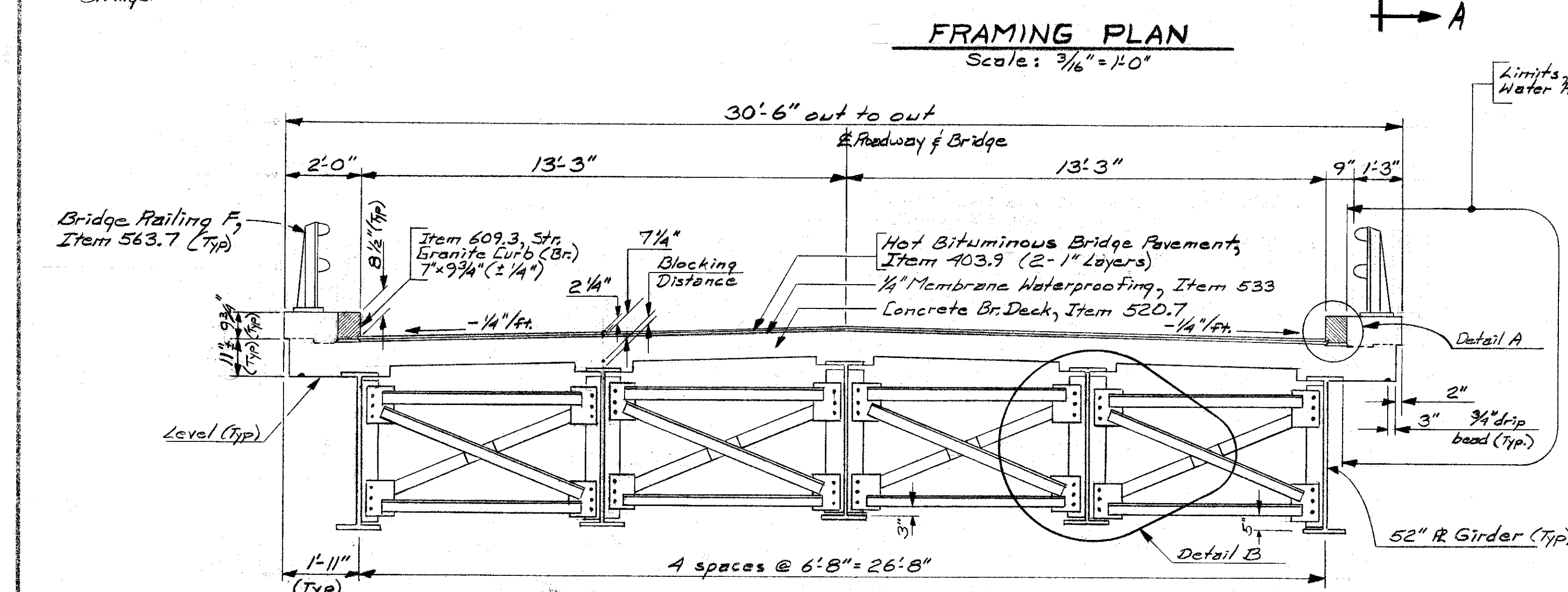
Pt. on Span	Girder 1	Girder 2	Girder 3	Girder 4	Girder 5
Brq. S. Abut.	932.55	932.68	932.81	932.61	932.51
.1 Span	.73	.86	.99	.84	.69
.2 Span	.90	933.03	933.16	933.01	.86
.3 Span	933.05	.18	.31	.16	933.01
.4 Span	.19	.32	.45	.30	.15
.5 Span	.30	.43	.56	.41	.26
.6 Span	.39	.52	.65	.50	.35
.7 Span	.45	.58	.71	.56	.41
.8 Span	.50	.63	.76	.61	.46
.9 Span	.53	.66	.79	.64	.49
Brq. N. Abut.	933.55	933.68	933.81	933.66	933.51

NOTE After the structural steel is erected, but before the deck forms are built, elevations on the top of the flange of the girders are to be obtained at the points indicated in the table above. The difference between the elevations obtained and those shown in the table gives the actual blocking distance from the top of the girder to the bottom of the deck at the E of girder. See haunch detail this sheet. The tabulated elevations assume that only the dead load deflection due to the weight of the structural steel has occurred.

STRUCTURAL STEEL NOTES

- All structural steel shall be ASTM A-588
- All welding shall conform to N.H. specifications as amended.
- The shop drawings shall indicate the method and sequence to be followed in welding the girder components.
- Ends of girders shall be plumb under full dead load deflection.
- Stud shear connectors shall be field welded.

Notes Cont. Above -



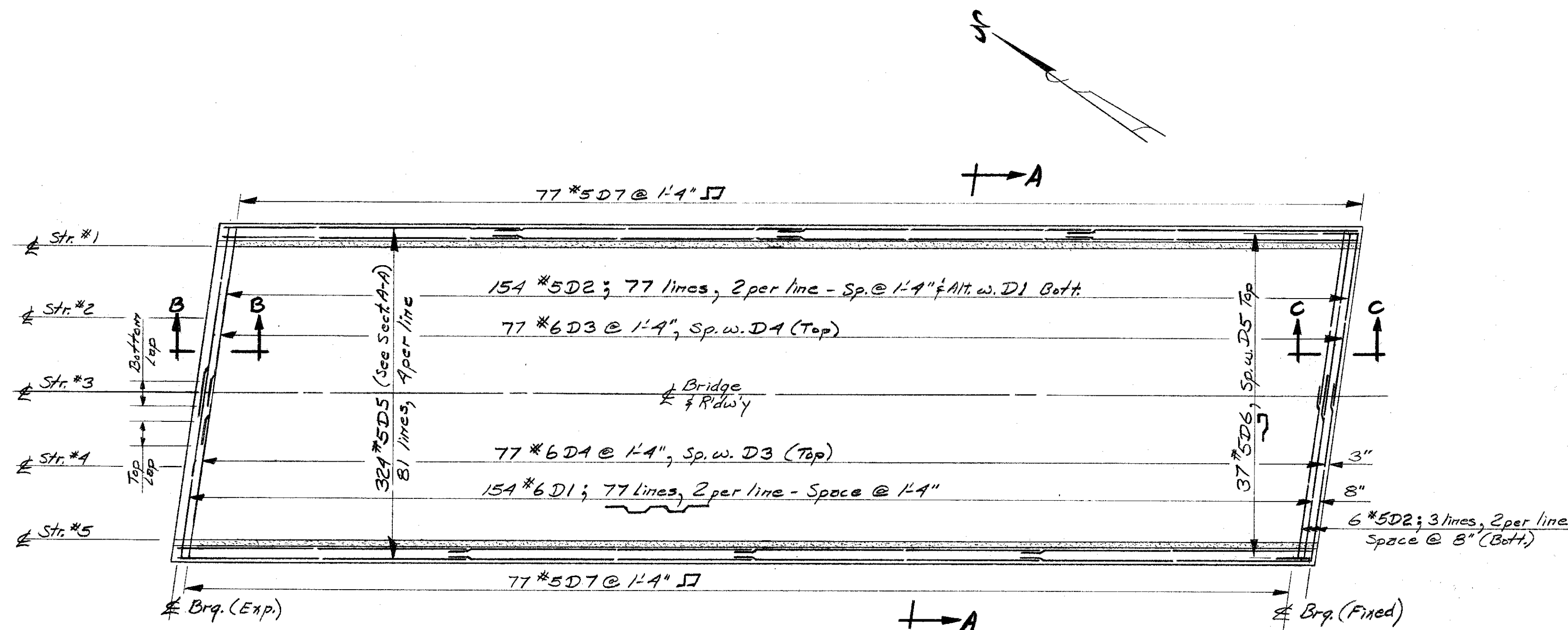
Notes: All field connections to be 7/8 inch diameter bolts (A325). All angle connections to be 1/4 inch fillet welded.

Scale As Noted

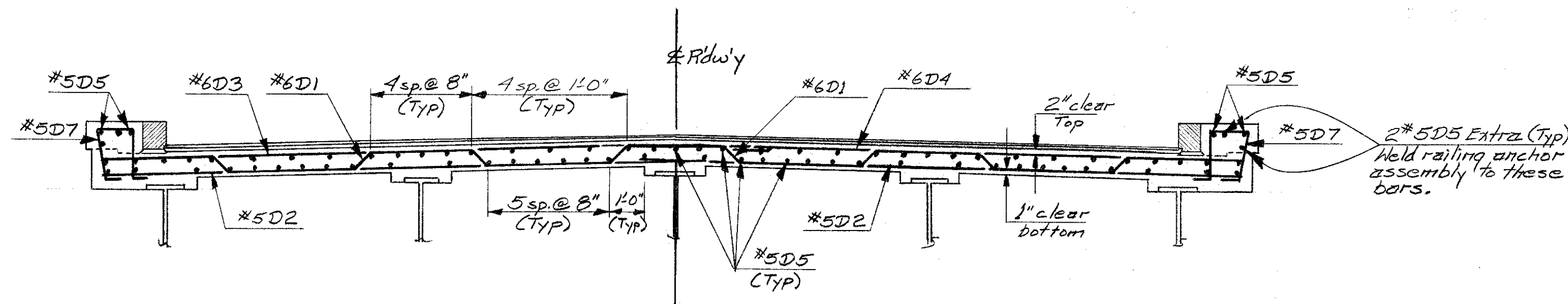
STATE OF NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BRIDGE DESIGN DIVISION

TOWN THORNTON BRIDGE NO. 222/180
FEDERAL PROJECT _____ STATE PROJECT F2591
LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER

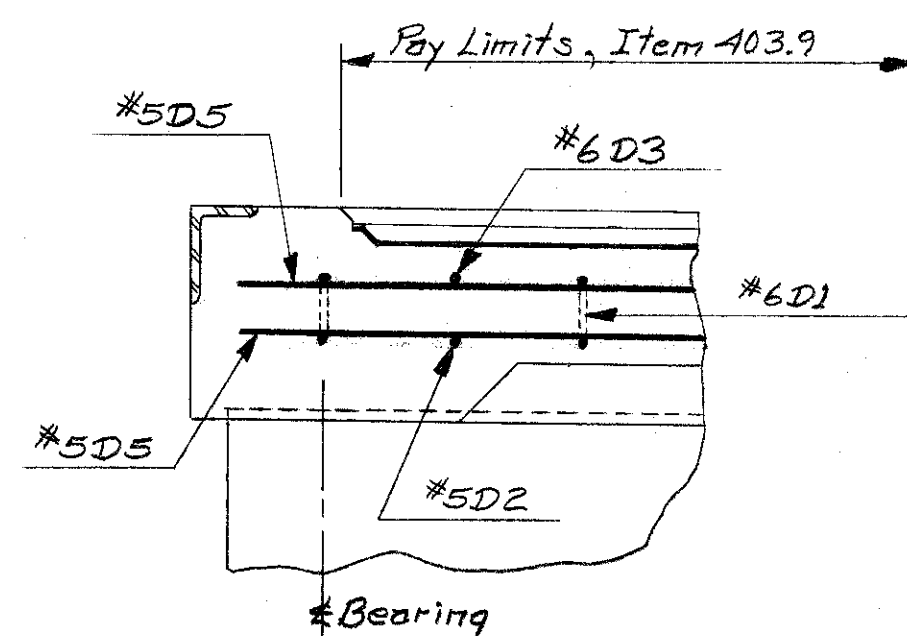
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NAB	NAB	8-76	MDW	MDW	8-76	7 OF 11
DRAWN	NAB	7-76	CHECKED	MDW	8-76	FILE NUMBER
TRACED			CHECKED	MDW	8-76	4-7-2-1
QUANTITIES	NAB	8-76	CHECKED	MDW	8-76	
REVISIONS						
REVIEWED BY			PROJ. NO.	SHEET NO.	TOTAL SHEETS	
			F-2591	8	16	



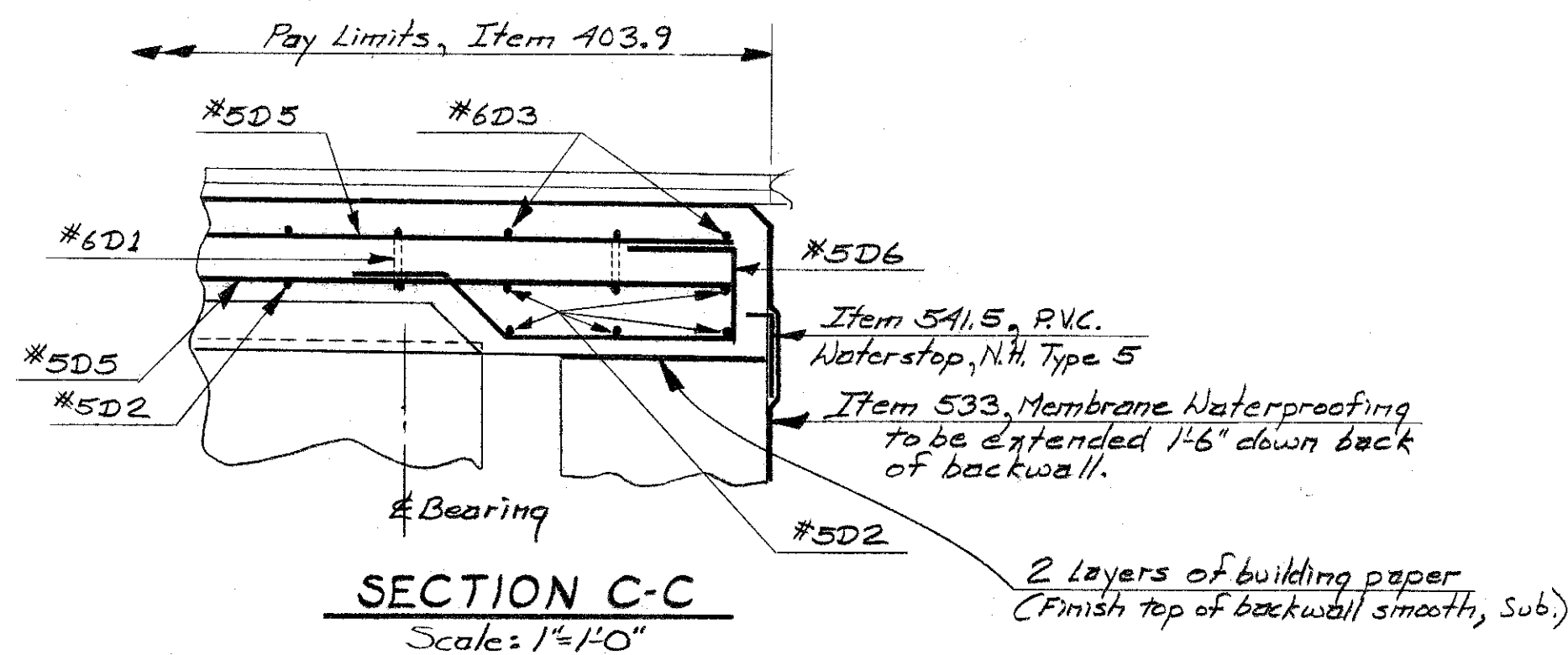
DECK REINFORCING
Scale: 1/8" = 1'-0"



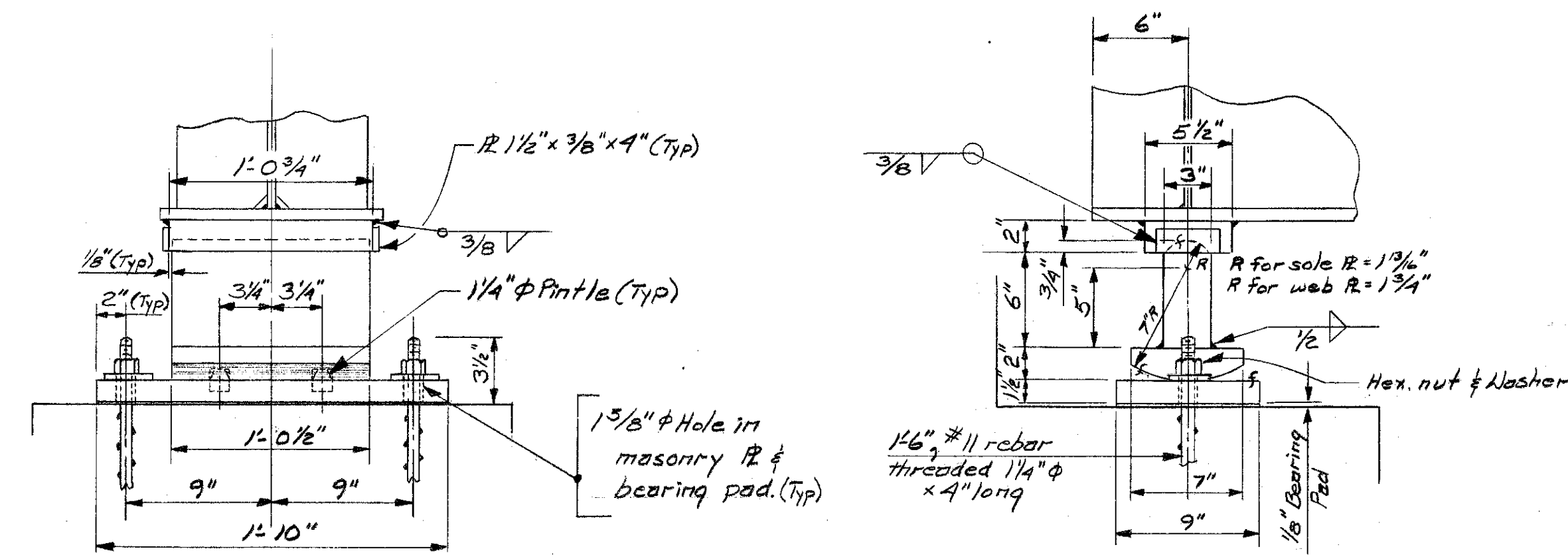
SECTION A-A
Scale: 3/8" = 1'-0"



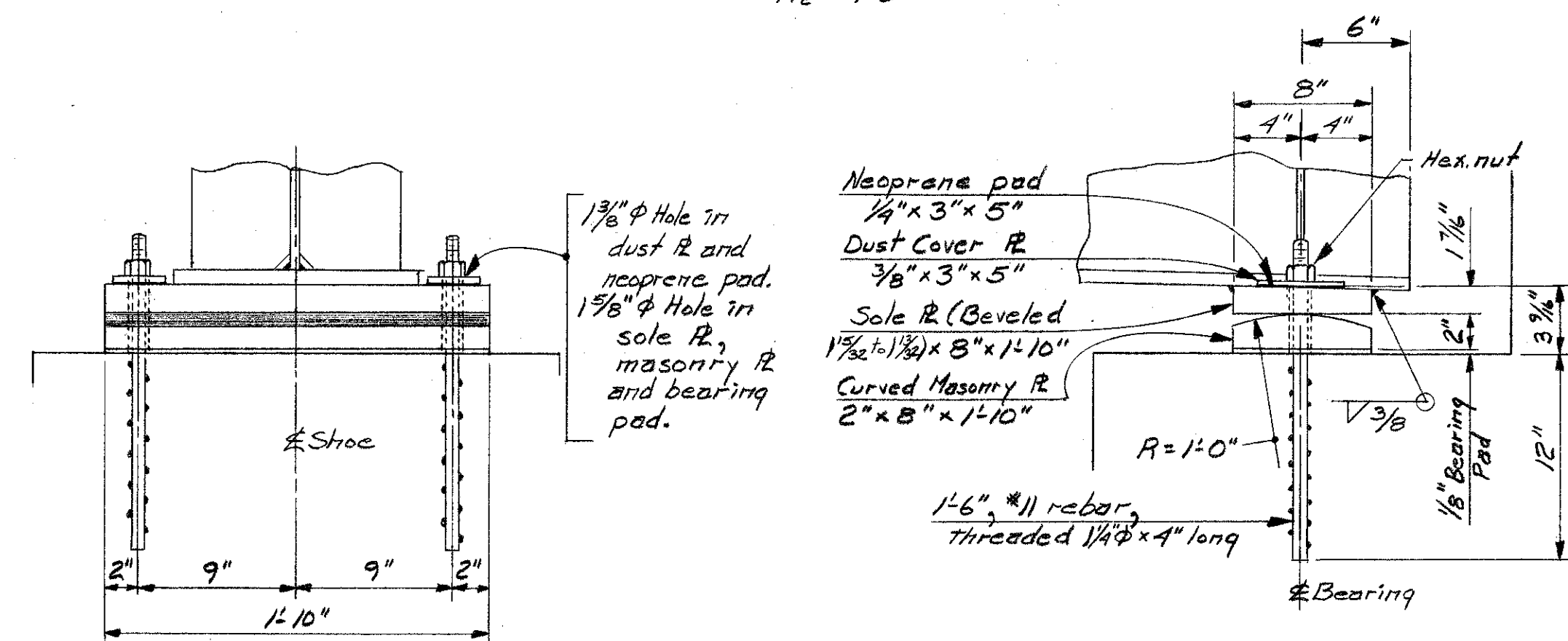
SECTION B-B
Scale: 1" = 1'-0"



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



EXPANSION SHOE
Scale: 1 1/2" = 1'-0"



FIXED SHOE
Scale: 1 1/2" = 1'-0"

Notes: Bridge shoes to be paid for as Item 550.2.
All steel in bridge shoes shall be ASTM A-588, unpainted.

SUPERSTRUCTURE QUANTITIES			
Item No.	Description	Quantity	Unit
403.9	Hot Bituminous Bridge Wearing Course	32.5	Ton
520.7	Concrete Bridge Deck (Est. 88 cu)	1	Unit
533	Membrane Waterproofing	323	S.Y.
534	Water Repellent	3	Gal.
544	Reinforcing Steel	19974	Lbs.
547	Shear Connectors (Est. 740)	1	Unit
550.1	Structural Steel (Est. 94,300*)	1	Unit
550.2	Bridge Shoes	1	Unit
560.1	Pre-fabricated, Neoprene Joint Seal	1	Unit
563.7	Bridge Railing F	207.3	L.F.
609.3	Straight Granite Curb (Bridge)	208.4	L.F.
562.1	Polyurethane Sealant	44	C.I.

Notes: All reinforcing steel to be 2" clear unless otherwise noted.
Two #6 straight bars may be substituted for each #6D1 bent bar at the Contractor's option and expense.

Sheet Scale As Noted

DESIGNED NAB DATE 7-76				CHECKED MDW DATE 8-76				BRIDGE SHEET NO. 9 OF 11	
DRAWN NAB DATE 7-76				CHECKED MDW DATE 8-76				FILE NUMBER	
QUANTITIES NAB DATE 8-76				CHECKED MDW DATE 8-76				4-7-21	
REVISIONS				REVIEWED BY				PROJ. NO. 7-2591 SHEET NO. 10 TOTAL SHEETS 16	

STATE OF NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BRIDGE DESIGN DIVISION

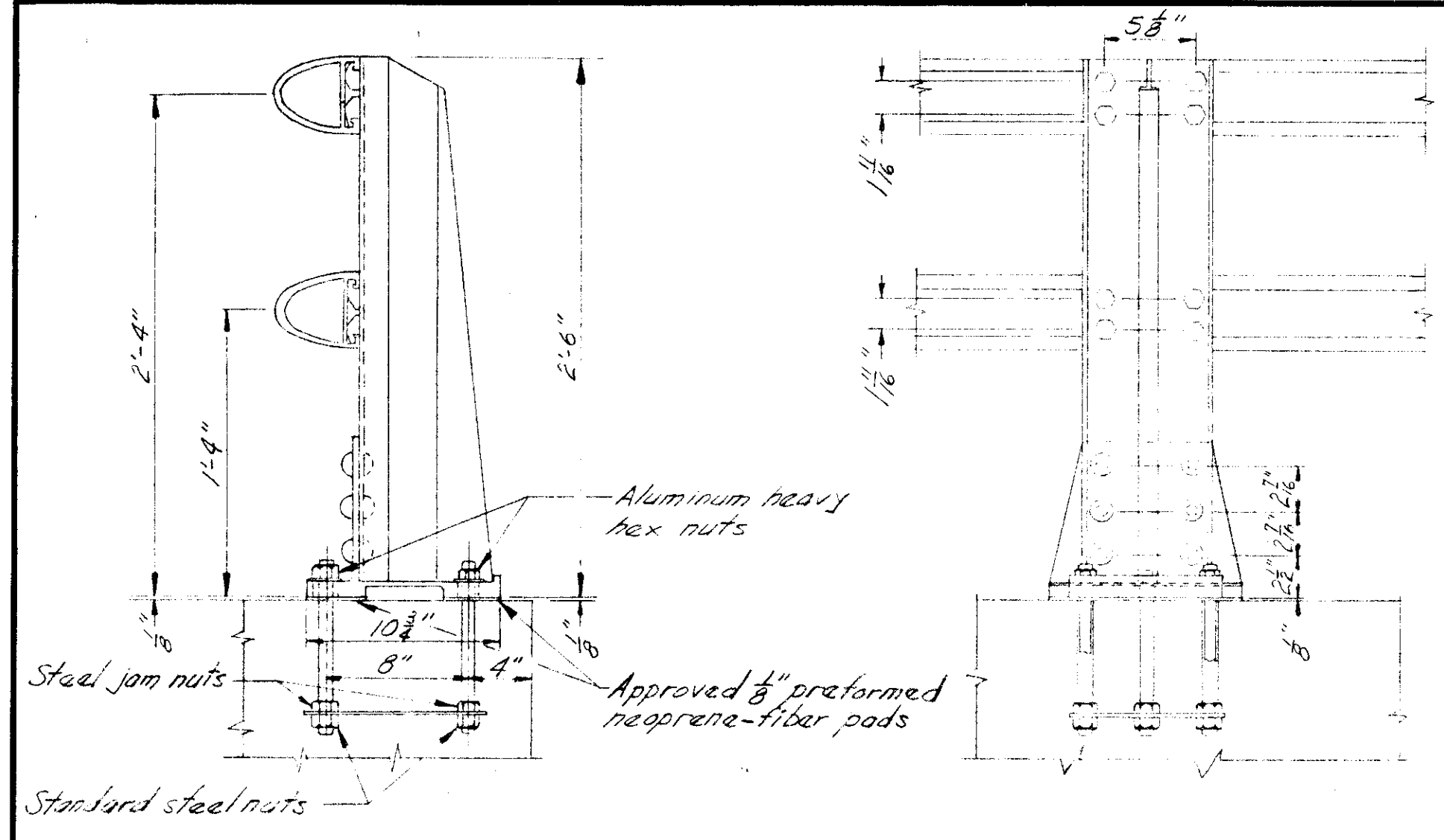
TOWN **THORNTON** BRIDGE NO. **222/180**

FEDERAL PROJECT STATE PROJECT **7-2591**

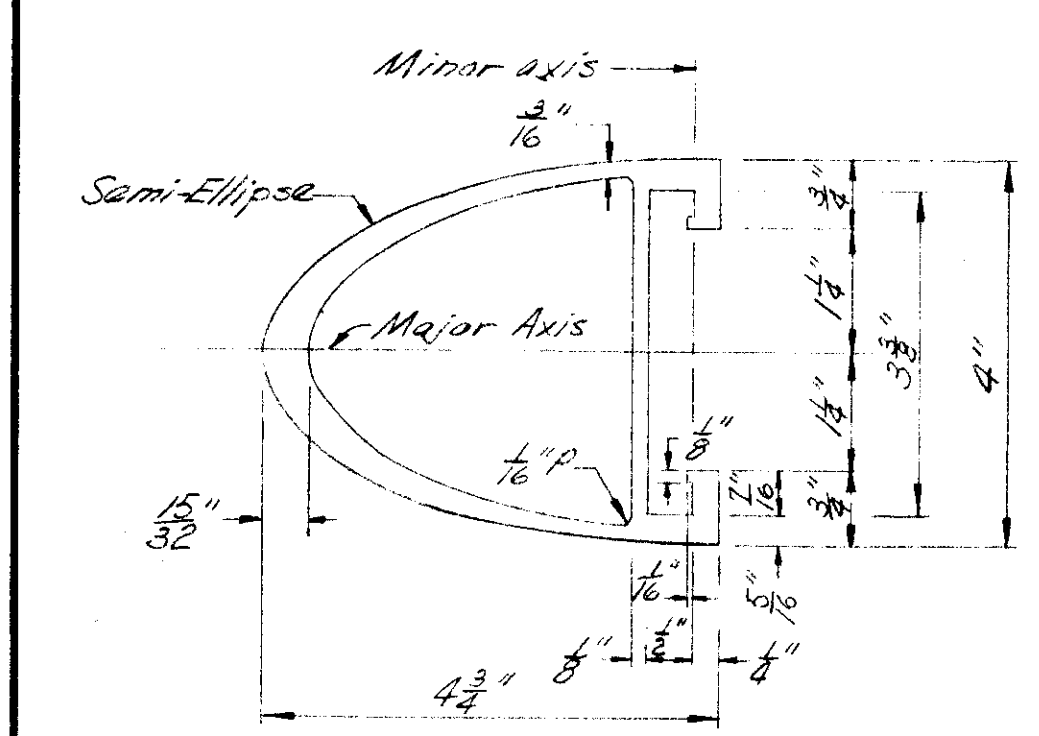
LOCATION **UPPER MAD RIVER ROAD OVER MAD RIVER**

DECK REINFORCING & SHOE DETAILS

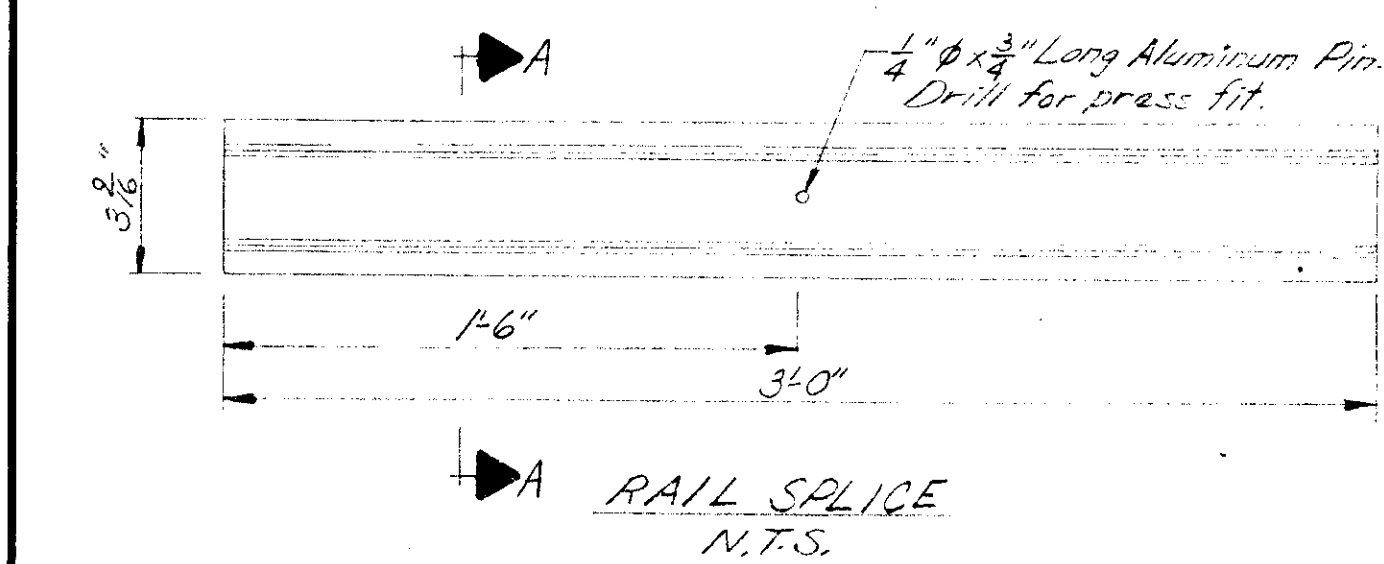
FED. ROAD DIV. NO.	STATE	PROJ.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	N.H.				



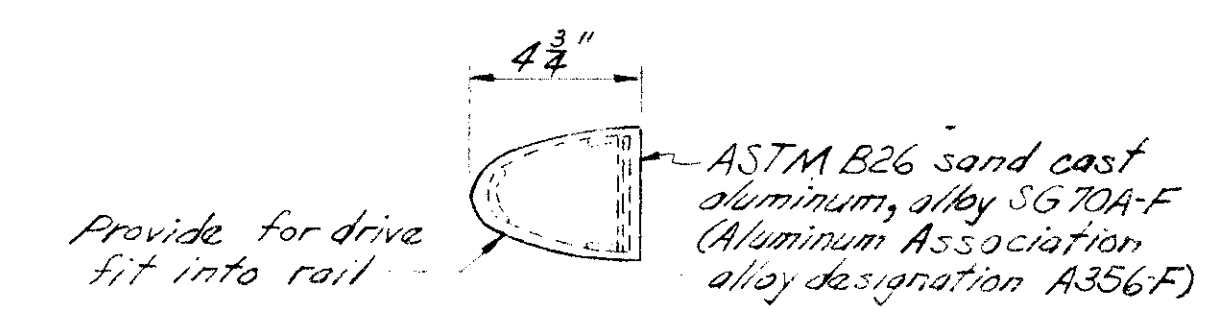
POST ASSEMBLY
Scale: 1/2" = 1'-0"



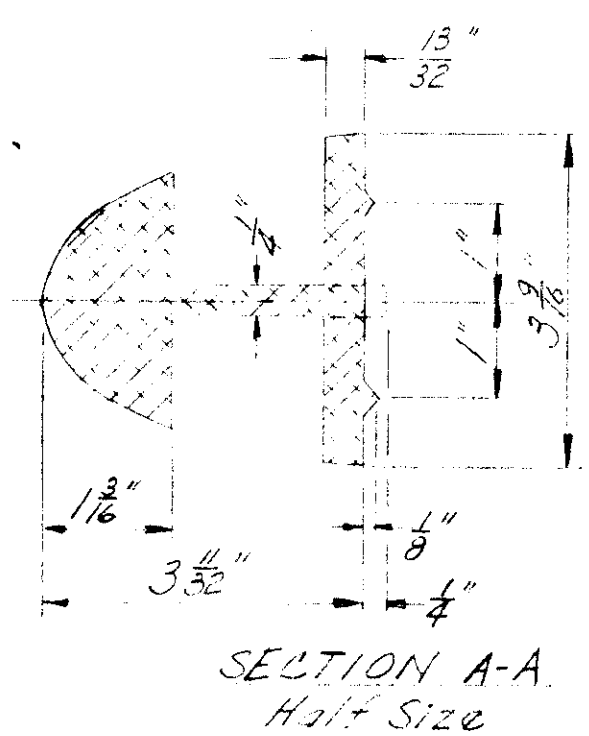
RAIL SECTION
Half Size



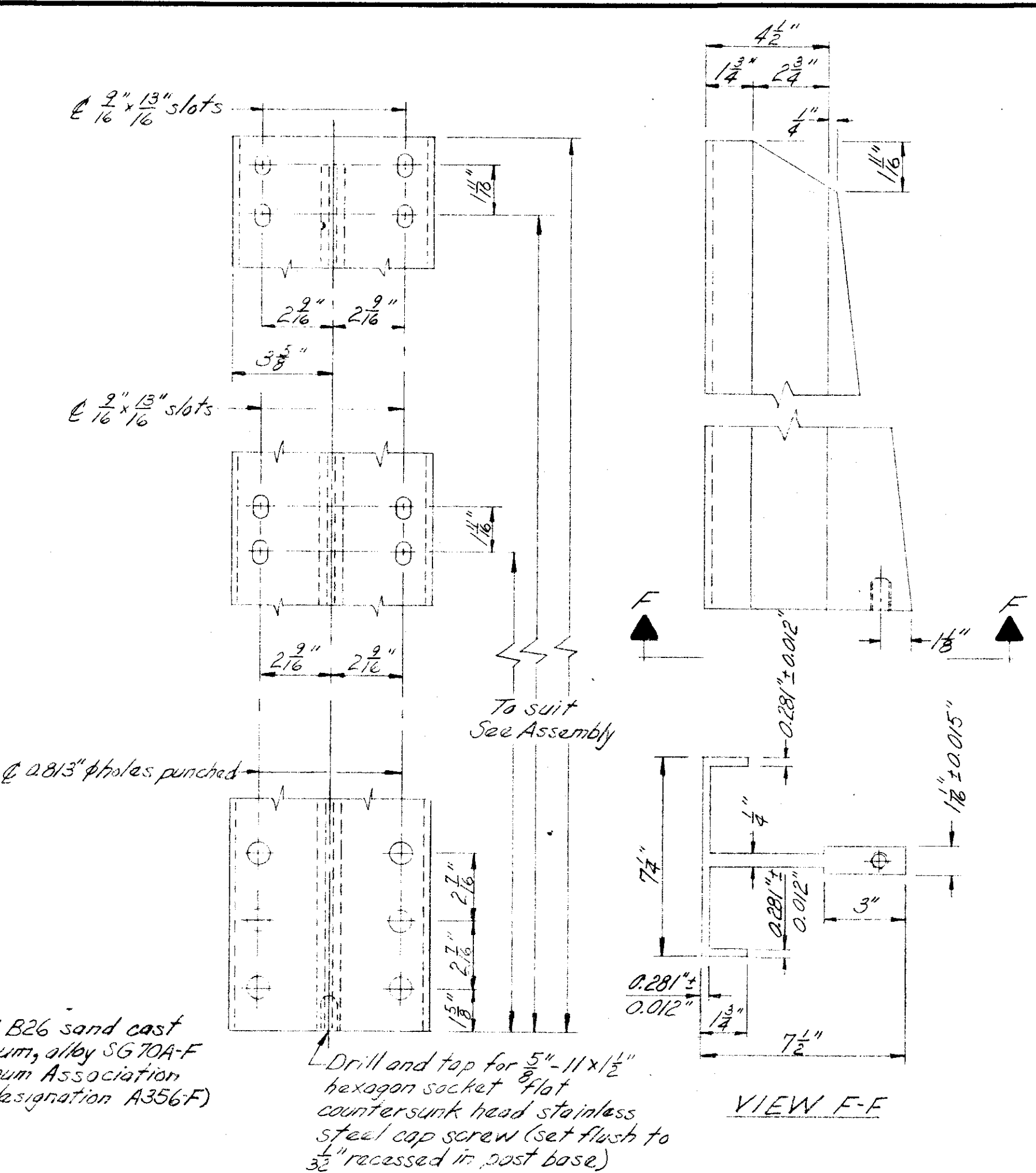
RAIL SPLICE
N.T.S.



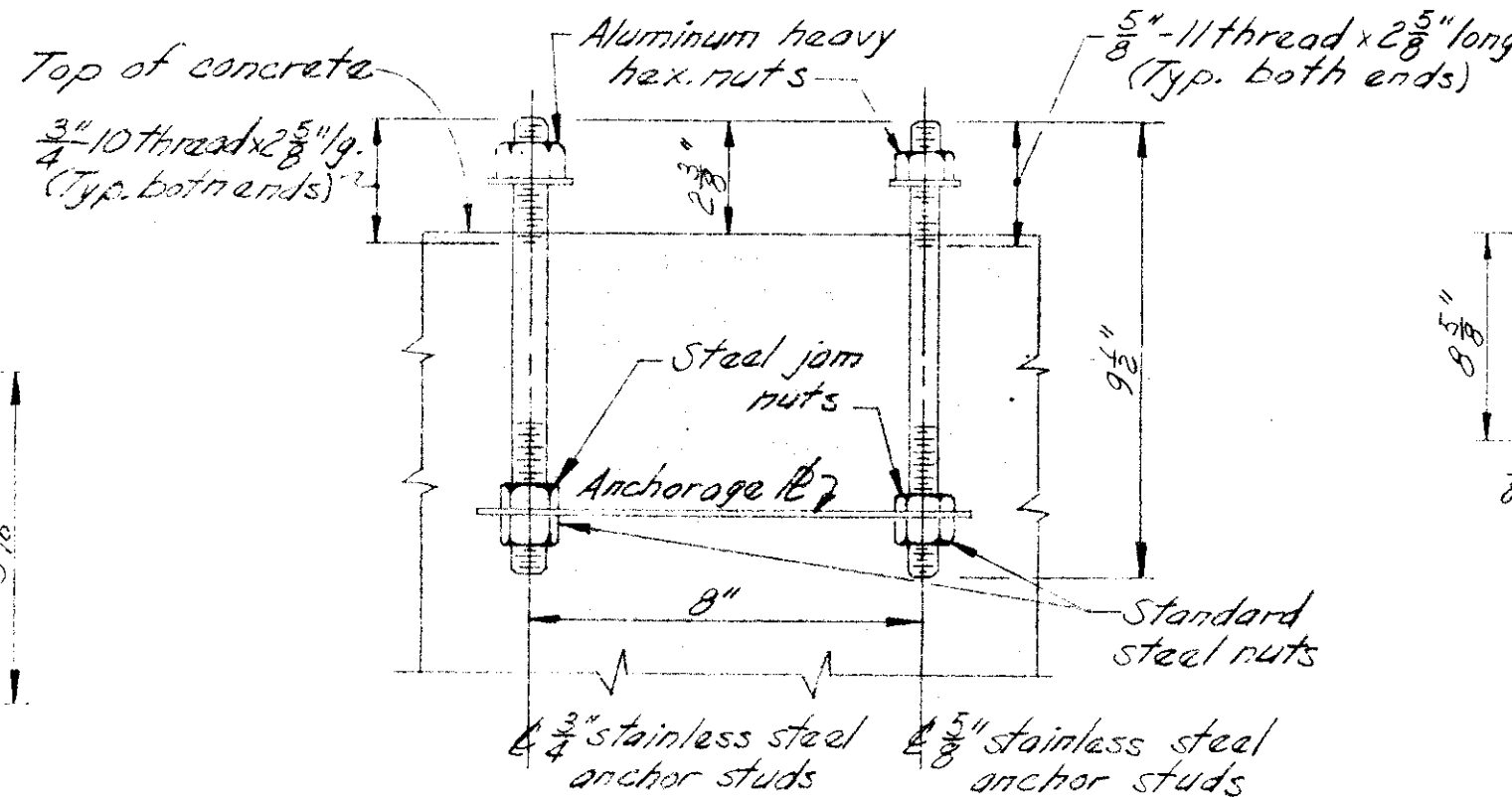
RAIL END CAP
N.T.S.



SECTION A-A
Half Size

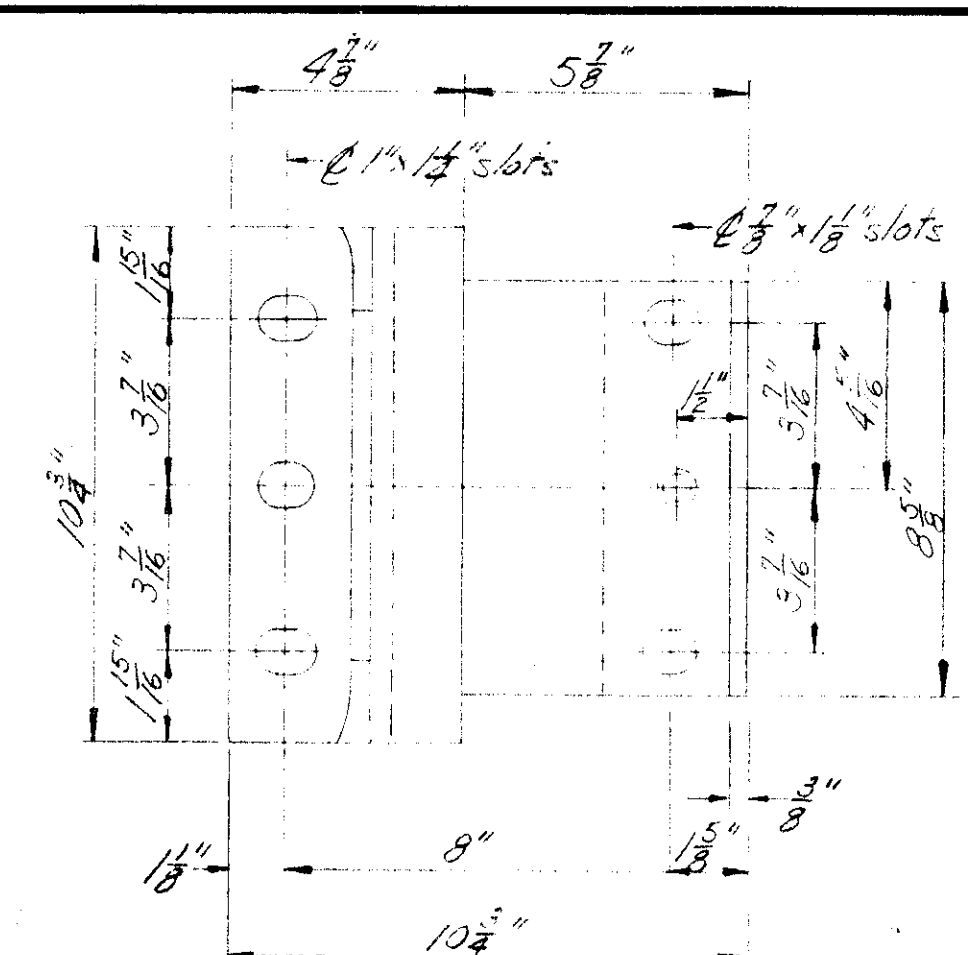


POST DETAILS
Scale: 3/4" = 1'-0"

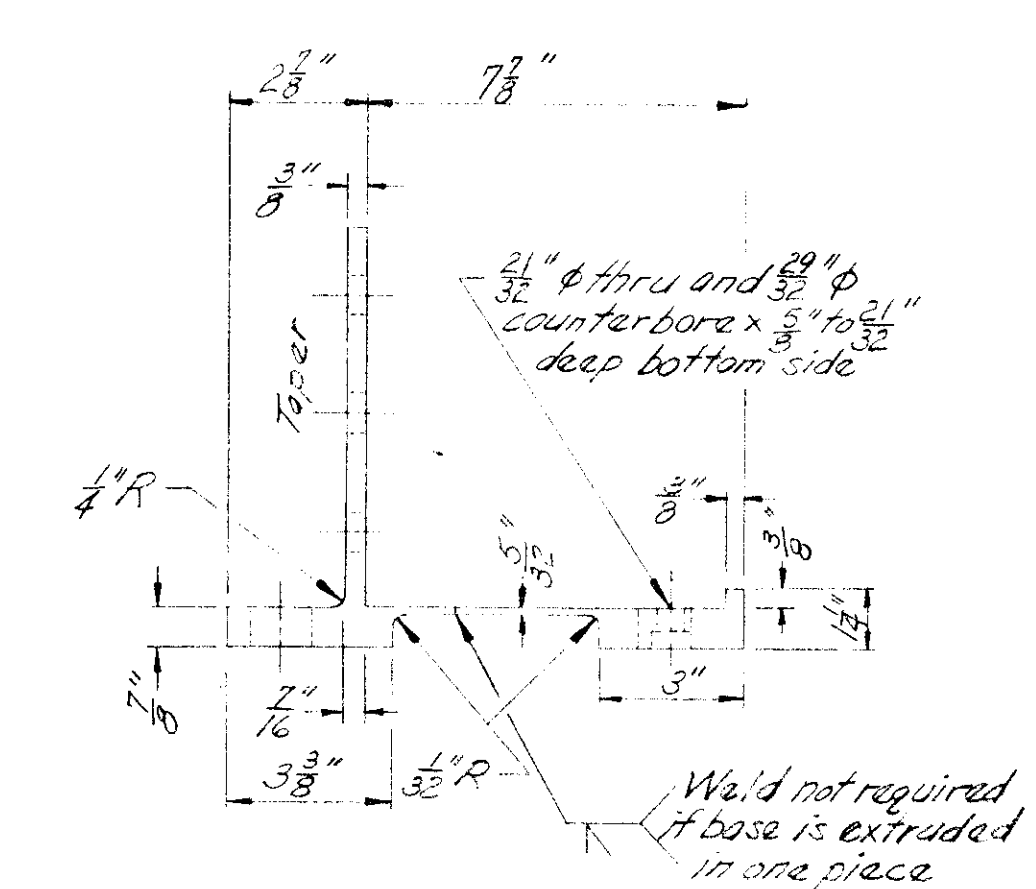


ANCHOR ASSEMBLY
Scale: 3/4" = 1'-0"

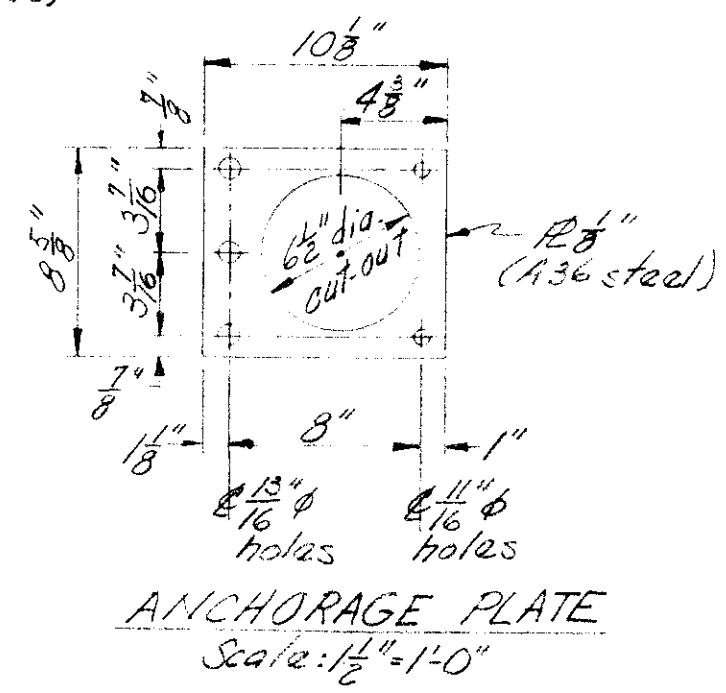
ANCHOR ASSEMBLY NOTES:
 1. 5/8" American standard finished hexagon steel nuts on bottom of anchor assembly, 5/8" American standard finished hexagon steel jam nuts on top of anchor plate.
 2. 5/8" aluminum heavy hexagon nuts on top ends of bolts with class 2B threads, 1 1/2" I.D., 1 1/2" O.D., 3/8" thick aluminum washers under nuts on top. All nuts to comply with American Hexagon ANSI Spec. B19.2. Aluminum heavy hexagon nuts shall have full threads.



RAIL CLAMP BAR
Full Size

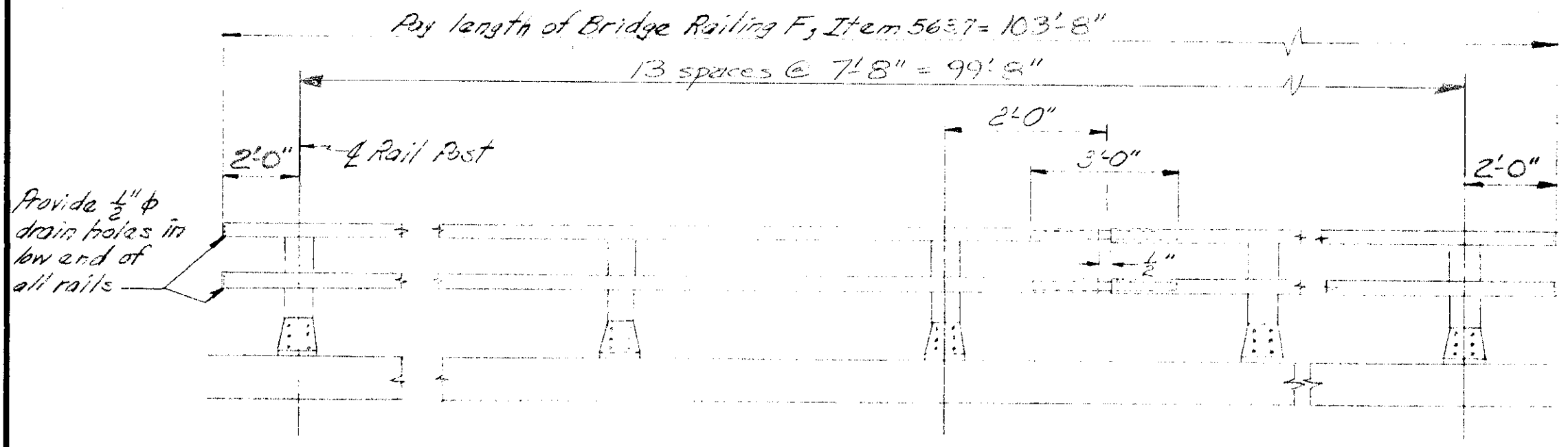


POST BASE DETAILS
Scale: 3/4" = 1'-0"



ANCHORAGE PLATE
Scale: 1/2" = 1'-0"

RAIL NOTES:
 Posts to be normal to finish grade.
 Threads for anchor bolts may be rolled or cut. If cut threads are used, bolt diameter shall not be less than nominal diameter. If rolled threads are used, bolt diameter shall not be less than root diameter of threads.
 Joints in rail length shall be spliced as detailed.
 Ends of tube sections shall be sawed or milled.
 Cut ends to be true and smooth. Posts shall be attached to a minimum of four posts.
 Grind all edges smooth.



RAIL ELEVATION
N.T.S.

This sheet supersedes previous editions of these details, and brings the N.H. details into agreement with the standard bridge rail details proposed in the 1973 report of the A.A.C.T.O.-AREA joint cooperative committee.

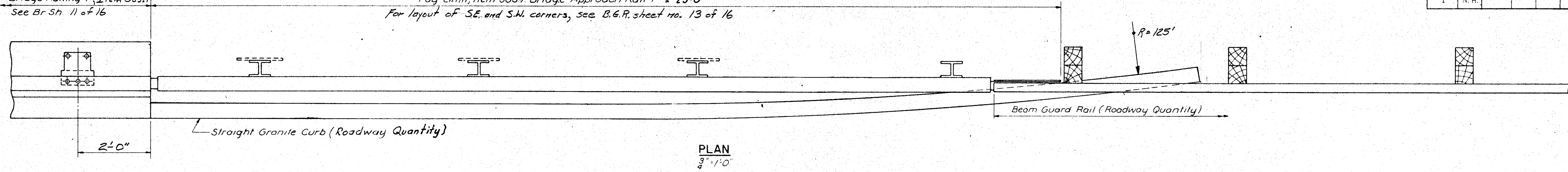
STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BRIDGE DESIGN DIVISION			
TOWN THORNTON	BRIDGE NO. 222/150		
FEDERAL PROJECT	STATE PROJECT F2591		
LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER			

Sheet scale as noted

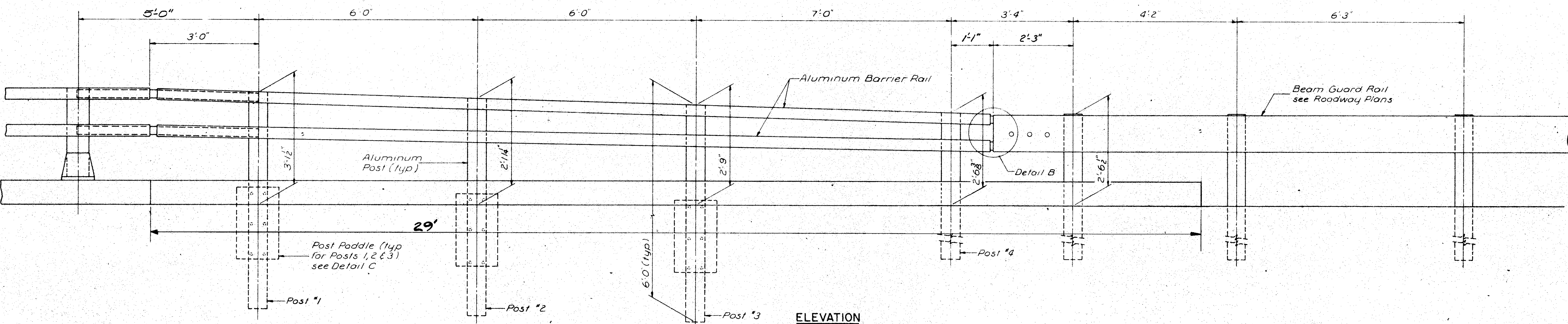
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DESIGNED	BY DATE	CHECKED	BY DATE
DRAWN	JAN 1974	CHECKED	
TRACED		CHECKED	
QUANTITIES		CHECKED	
REVISIONS	BY DATE		
REVIEWED BY	PROJ. NO. F2591	SHEET NO. 11	TOTAL SHEETS 16

Bridge Railing F, Item 563.7
See Br Sh. 11 of 16

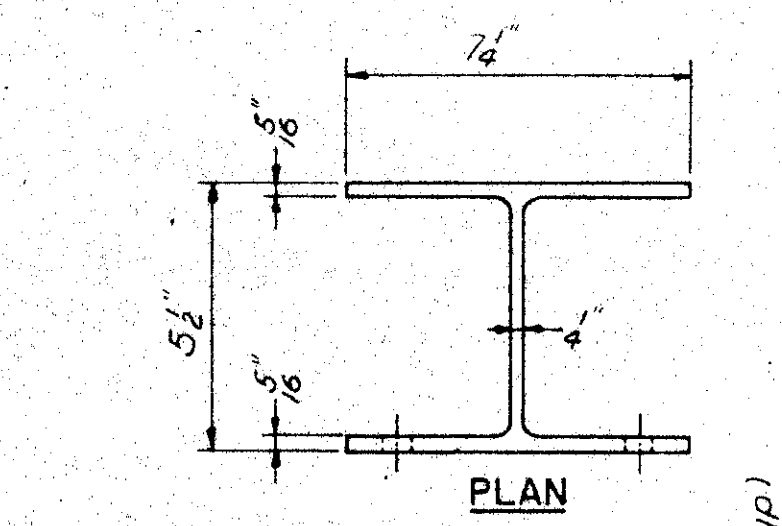
Pay Limit, Item 565.7 Bridge Approach Rail F = 25'-0"
For layout of S.E. and S.W. corners, see B.G.R. sheet no. 13 of 16



PLAN
3'-1'-0"

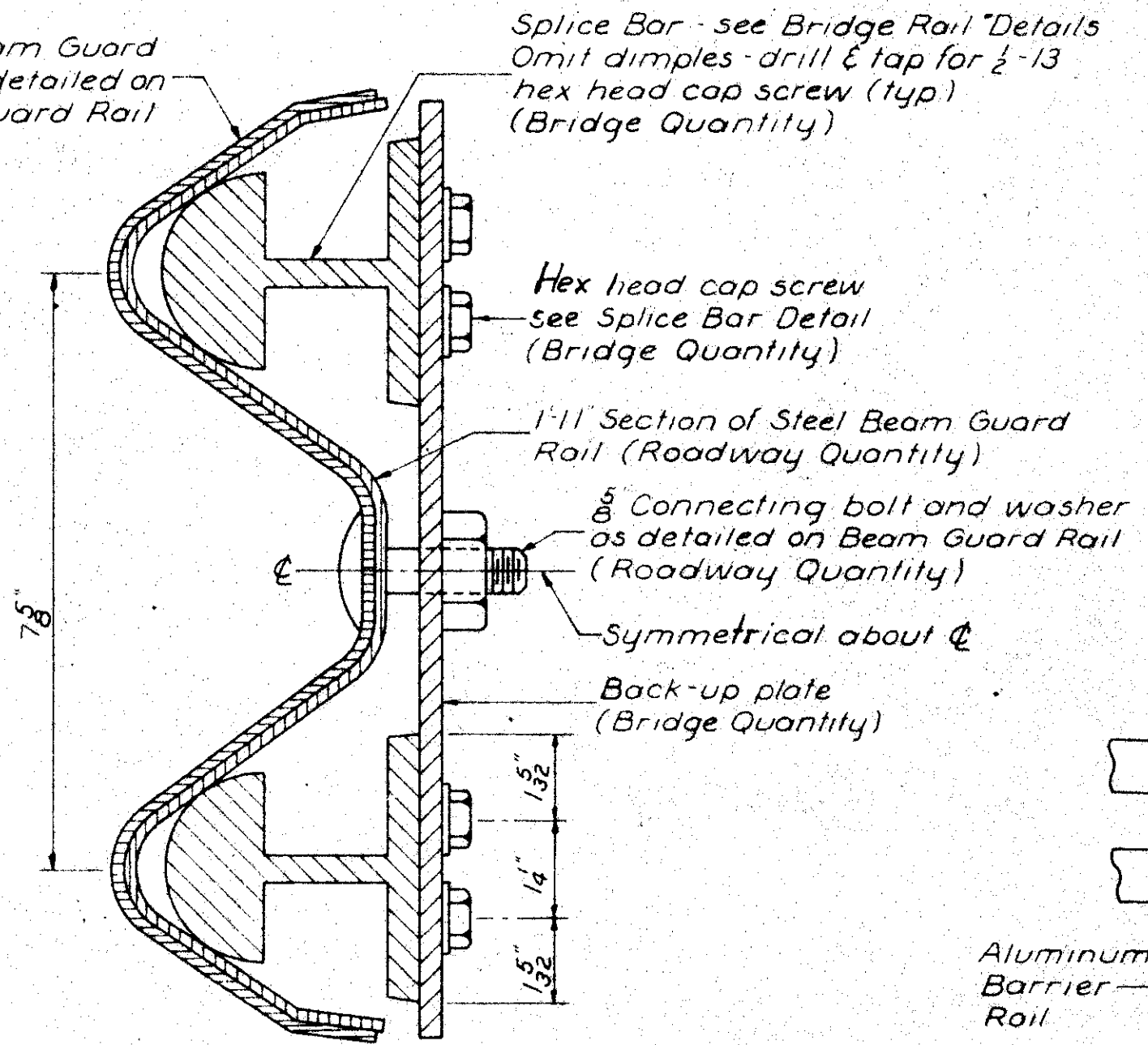


ELEVATION
3'-1'-0"

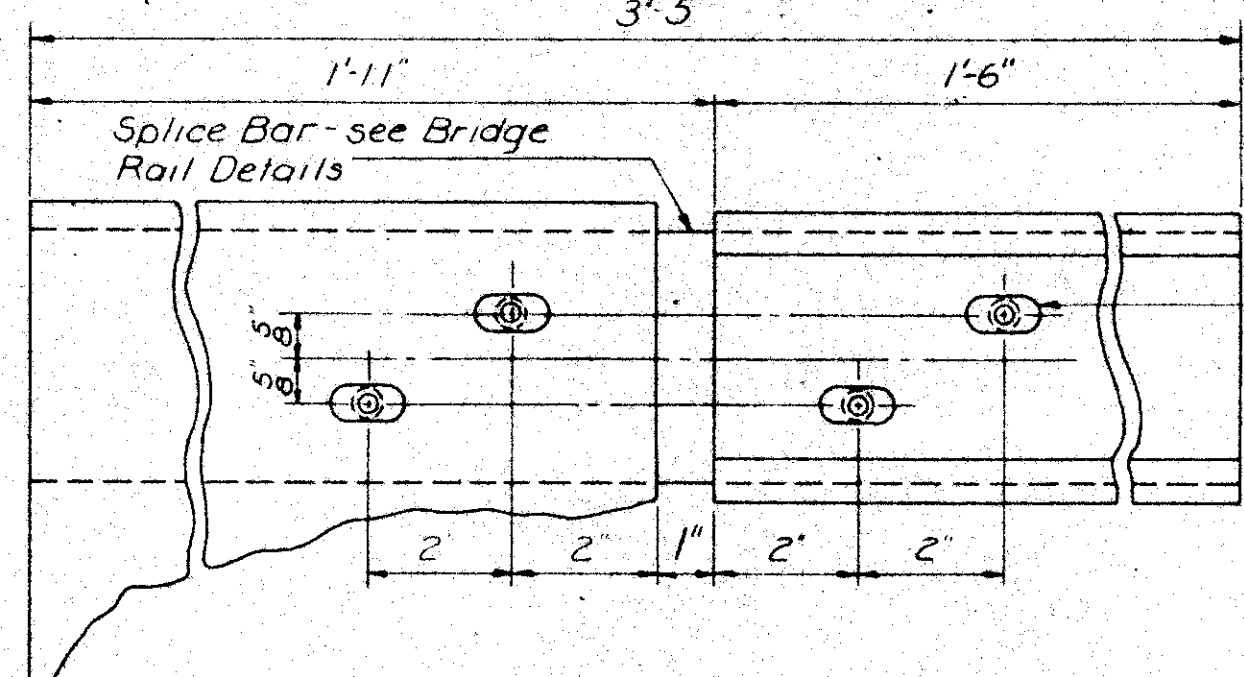


PLAN

Steel Beam Guard Rail as detailed on Beam Guard Rail Sheet.

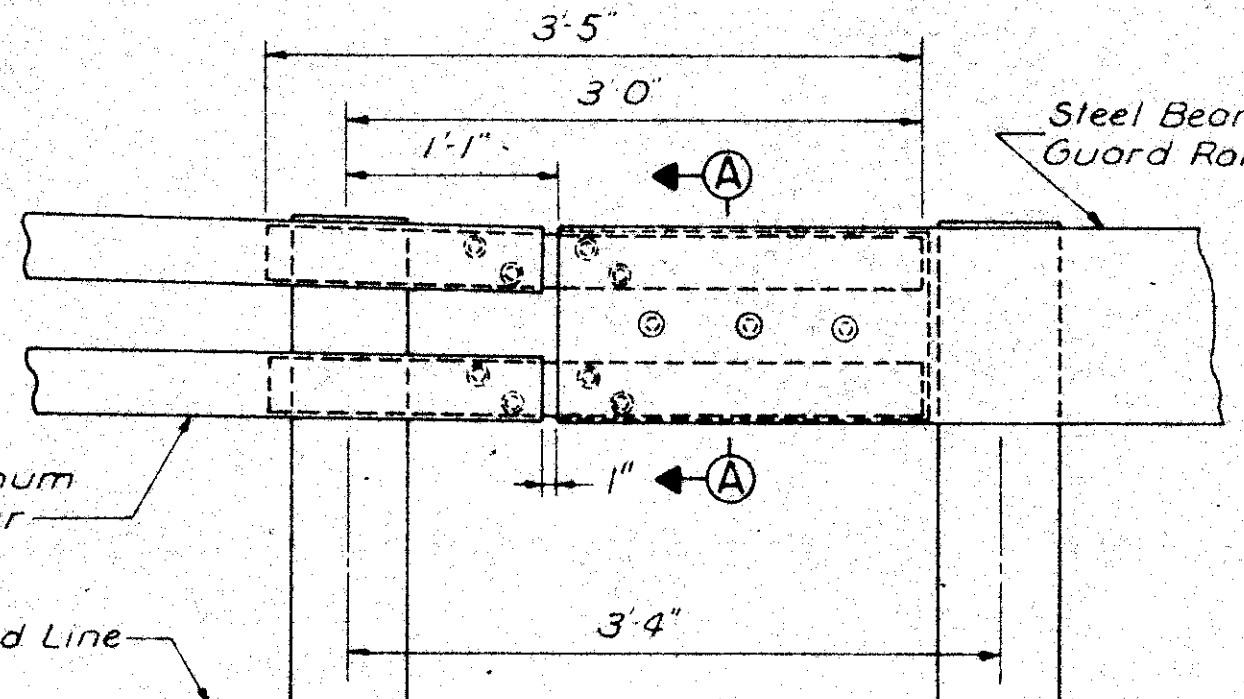


SECTION A-A
Half Scale

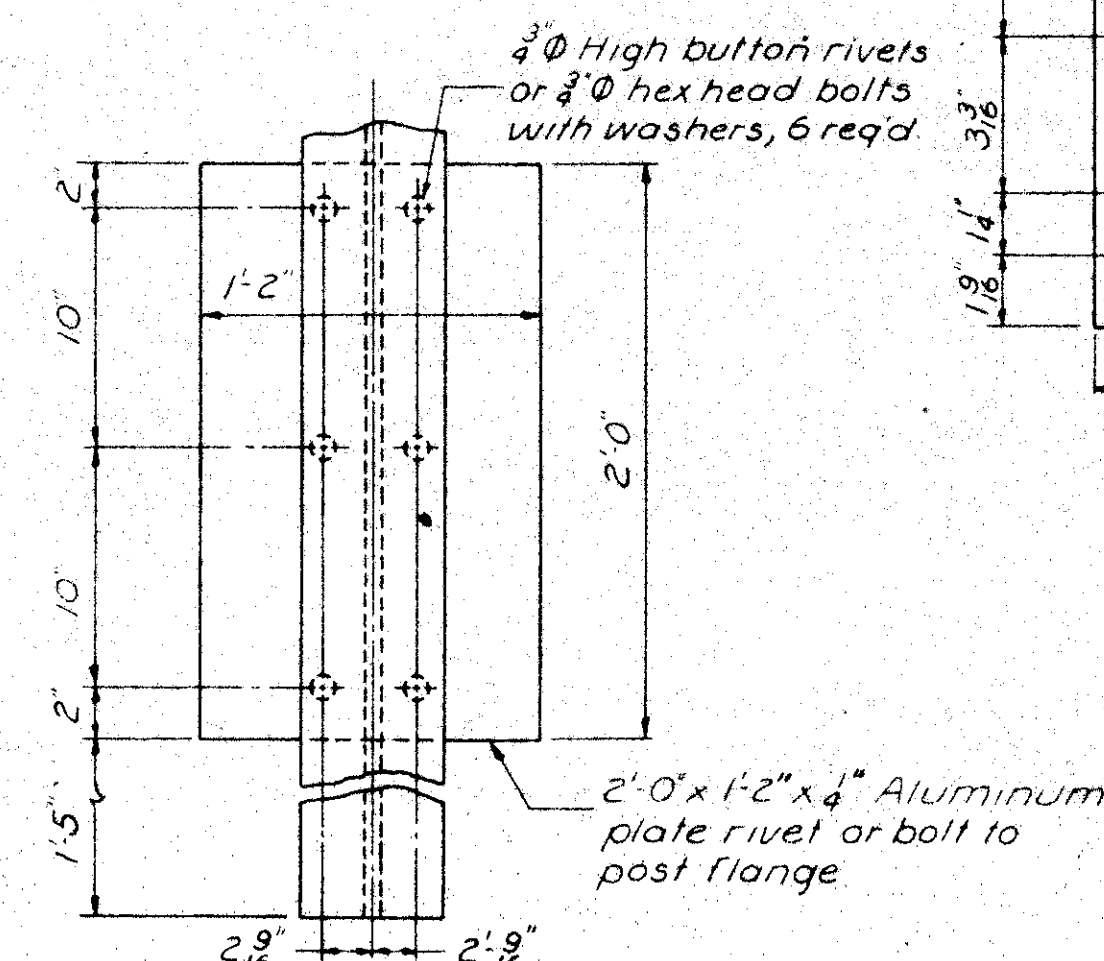


SPLICE BAR DETAIL B
3'-1'-0" (Back View)

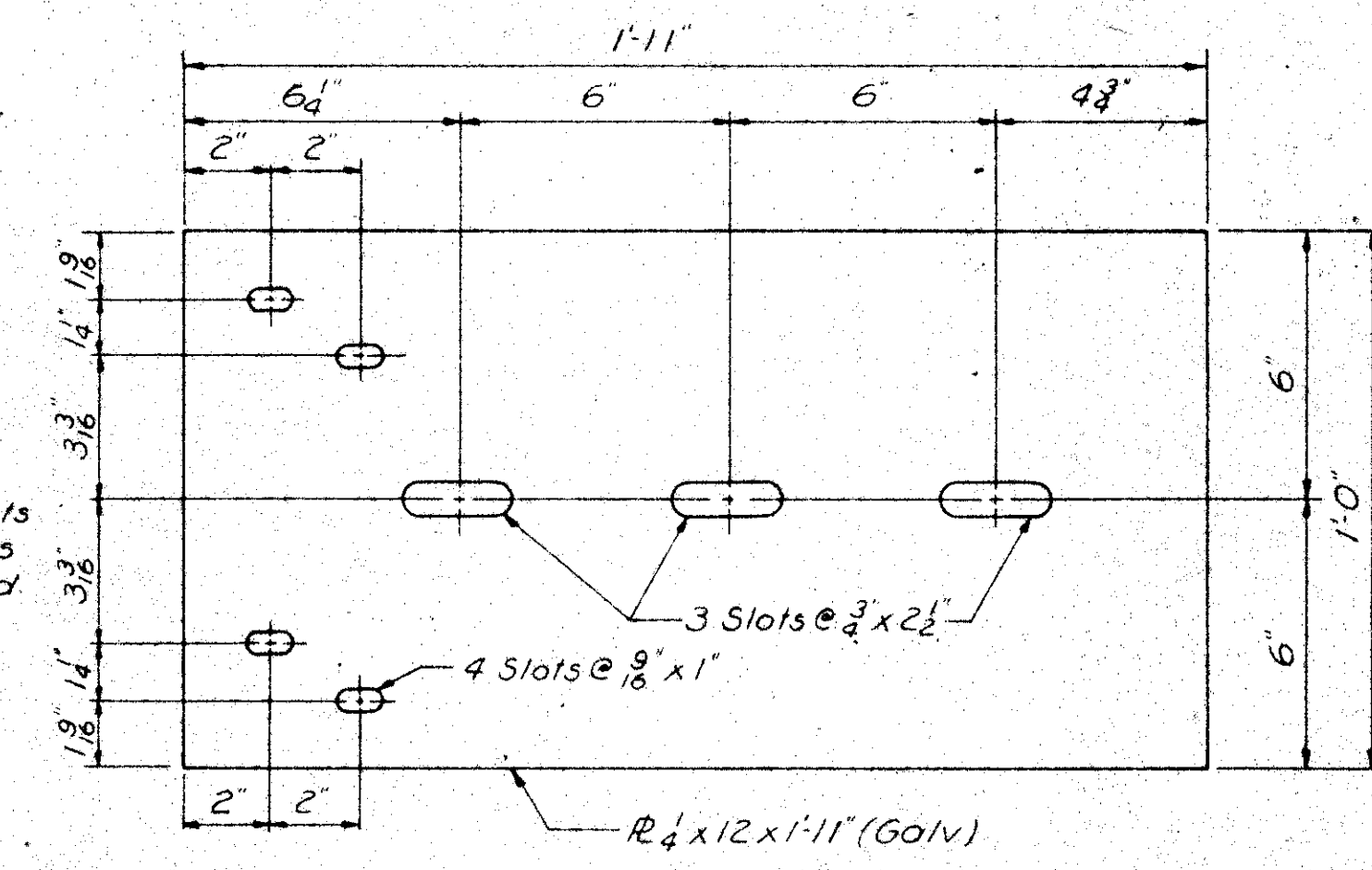
3/8" x 1" Slot in barrier rail and 1/2"-13 thread in splice bar for 1/2"-13 x 1" long stainless steel hex head cap screw with 1/8" od x 3/2" id x 3/2" thick aluminum washer



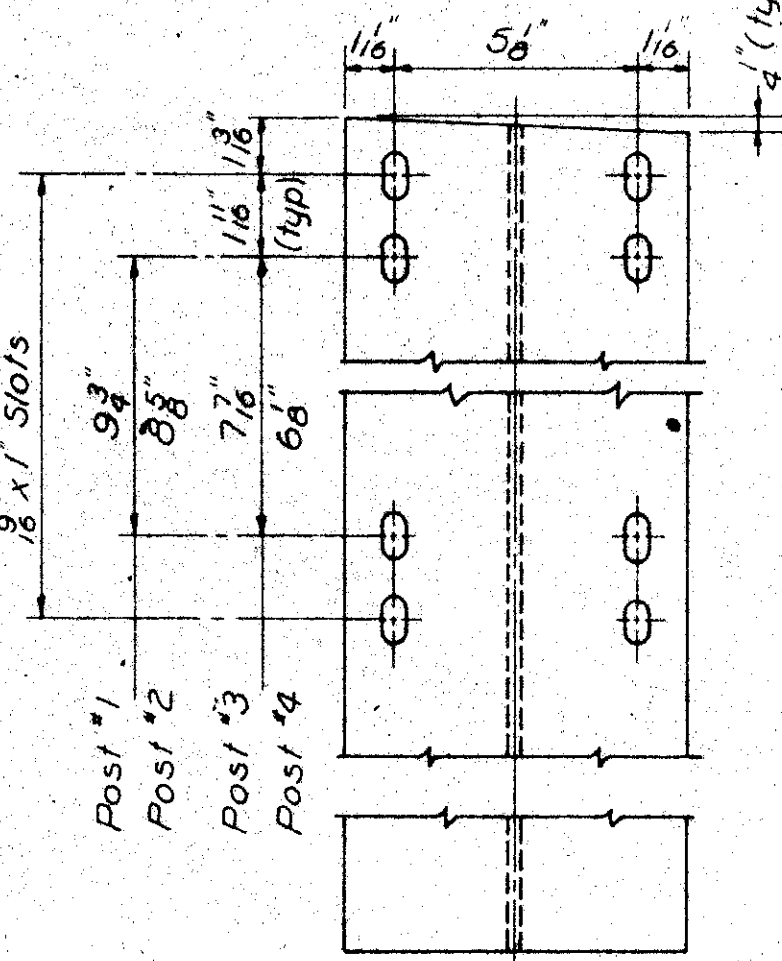
DETAIL B
1'-1'-0"



DETAIL C
1'-1'-0"



BACK-UP PLATE DETAIL
3'-1'-0"



POSTS #1, #2 & #3
FRONT ELEVATION

POST DETAIL
3'-1'-0"

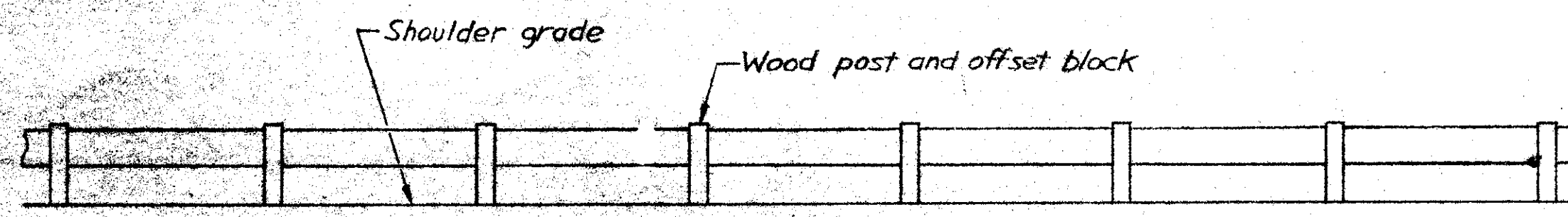
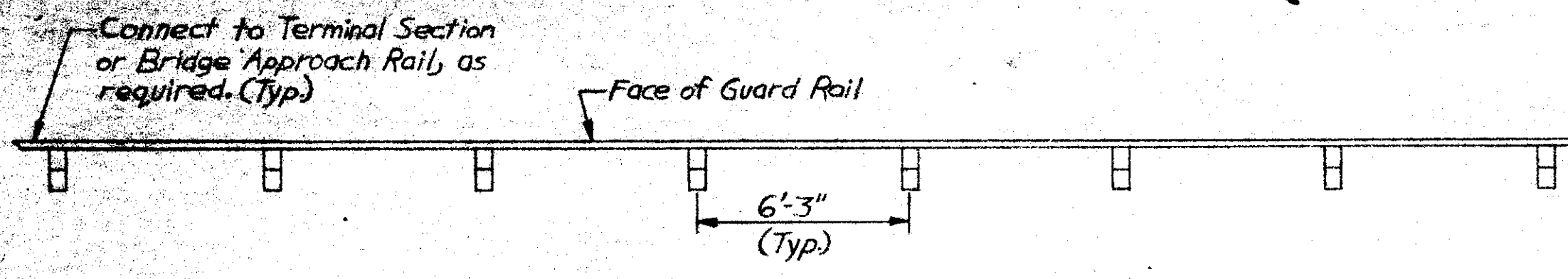
STATE OF NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BRIDGE DESIGN DIVISION

TOWN THORNTON BRIDGE NO. 222/180
FEDERAL PROJECT STATE PROJECT T-2591
LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER

APPROACH RAIL DETAILS

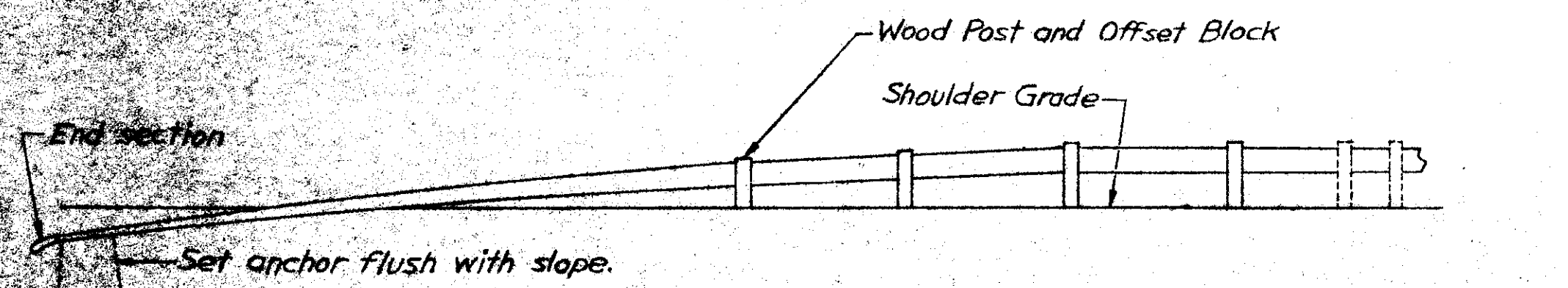
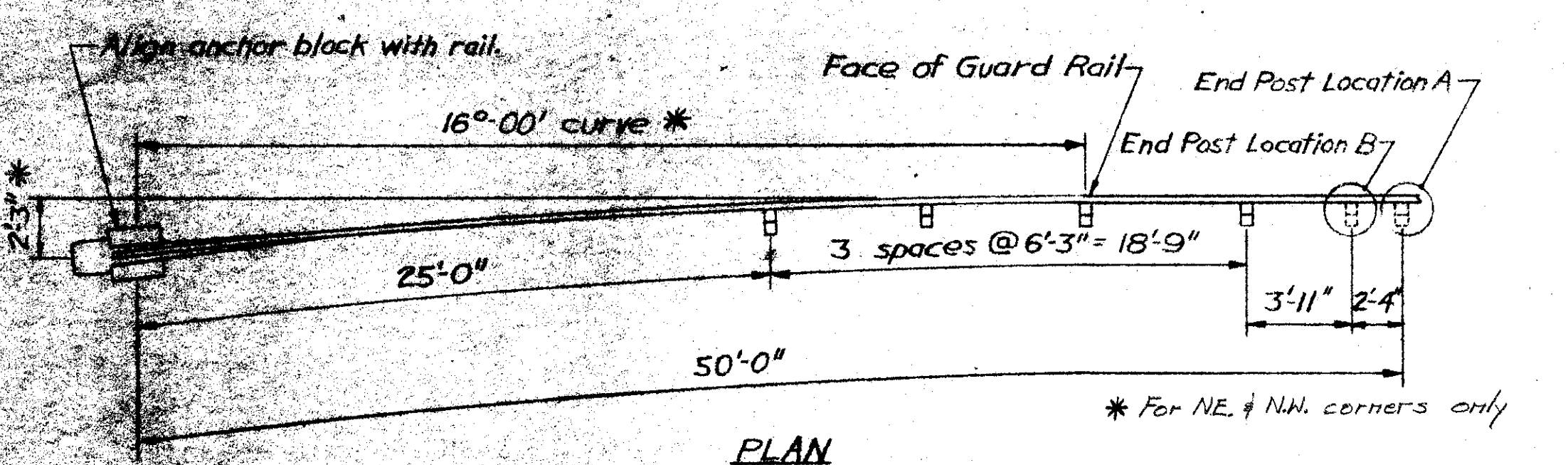
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DRAWN <u>MDW</u>		CHECKED <u>MDW</u>		FILE NUMBER
QUANTITIES <u>LAB</u>	DATE <u>7-76</u>	CHECKED <u>MDW</u>	DATE <u>8-76</u>	<u>1-7-2-1</u>
REVIEWED BY	PROJ. NO. <u>T-2591</u>	SHEET NO. <u>12</u>	TOTAL SHEETS <u>16</u>	

NO.	DESCRIPTION	BY	DATE



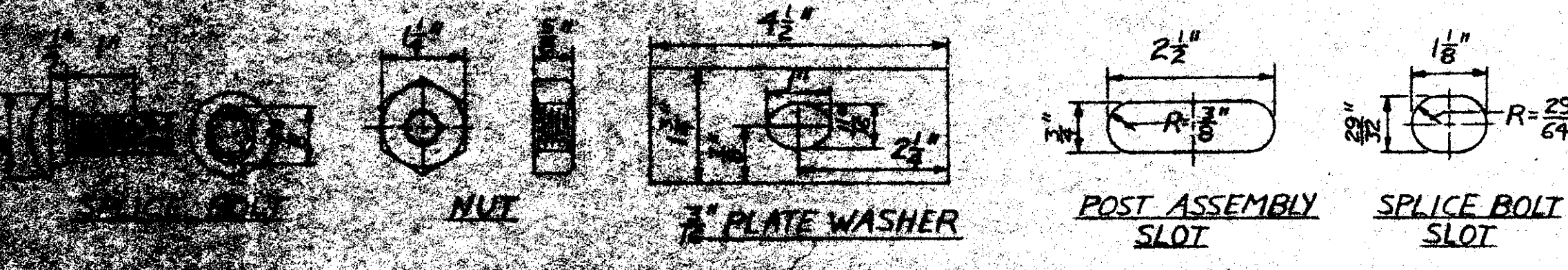
STANDARD SECTION
Scale: $\frac{1}{4}'' = 1'-0''$

Notes: 1. Beam guard rail shall be installed where shown on the Roadway Plan or Rail Layout sheet.
2. Where it is to be connected to bridge approach rail, the end of the beam guard rail shall be modified as shown on the Bridge Approach Rail sheet.
3. Pay items: 606.140, Beam Guard Rail (Standard Section) GR-140
606.143, Beam Guard Rail including Terminal Sections GR-143
4. Payment shall be by the linear foot, from center to center of rail posts.

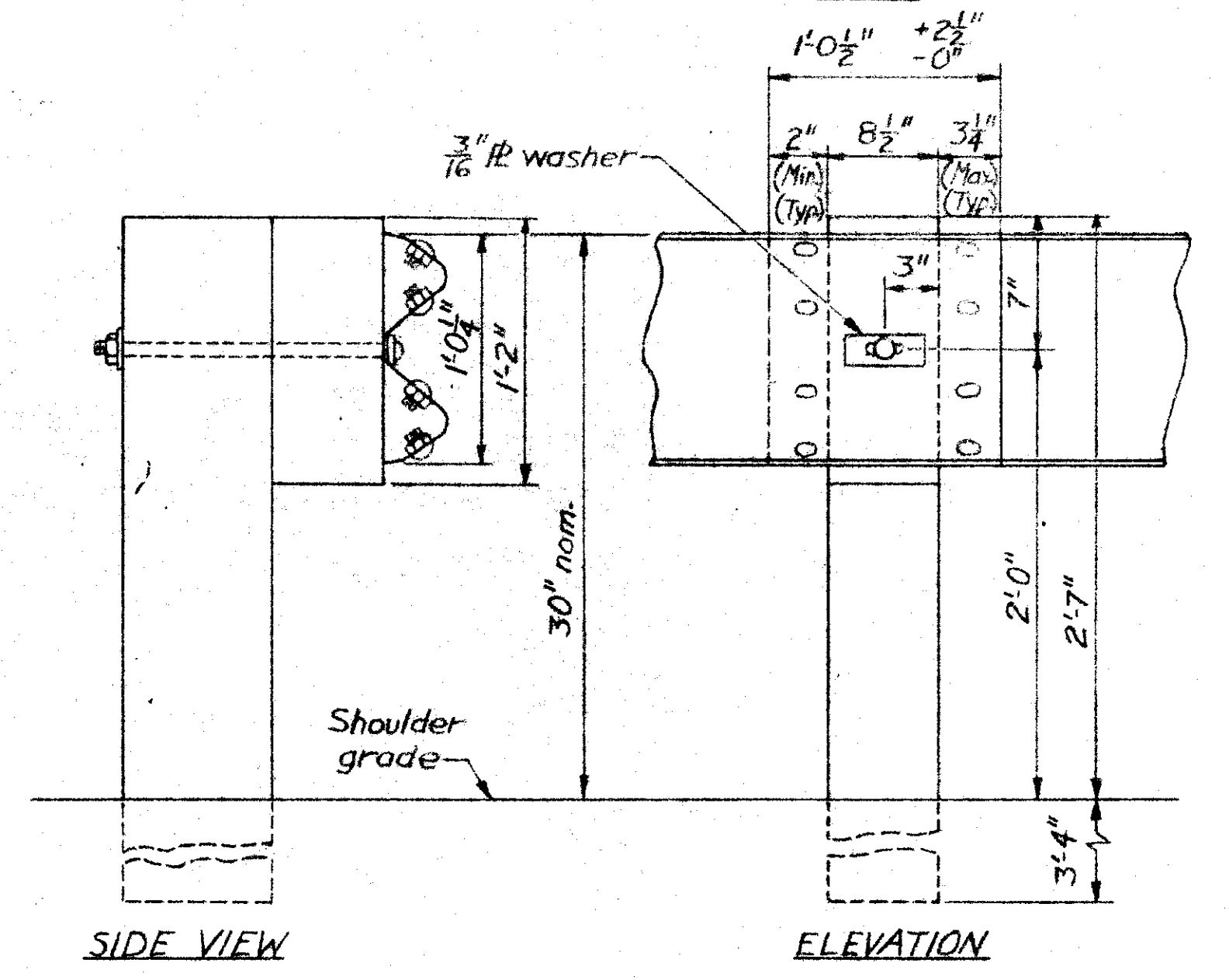
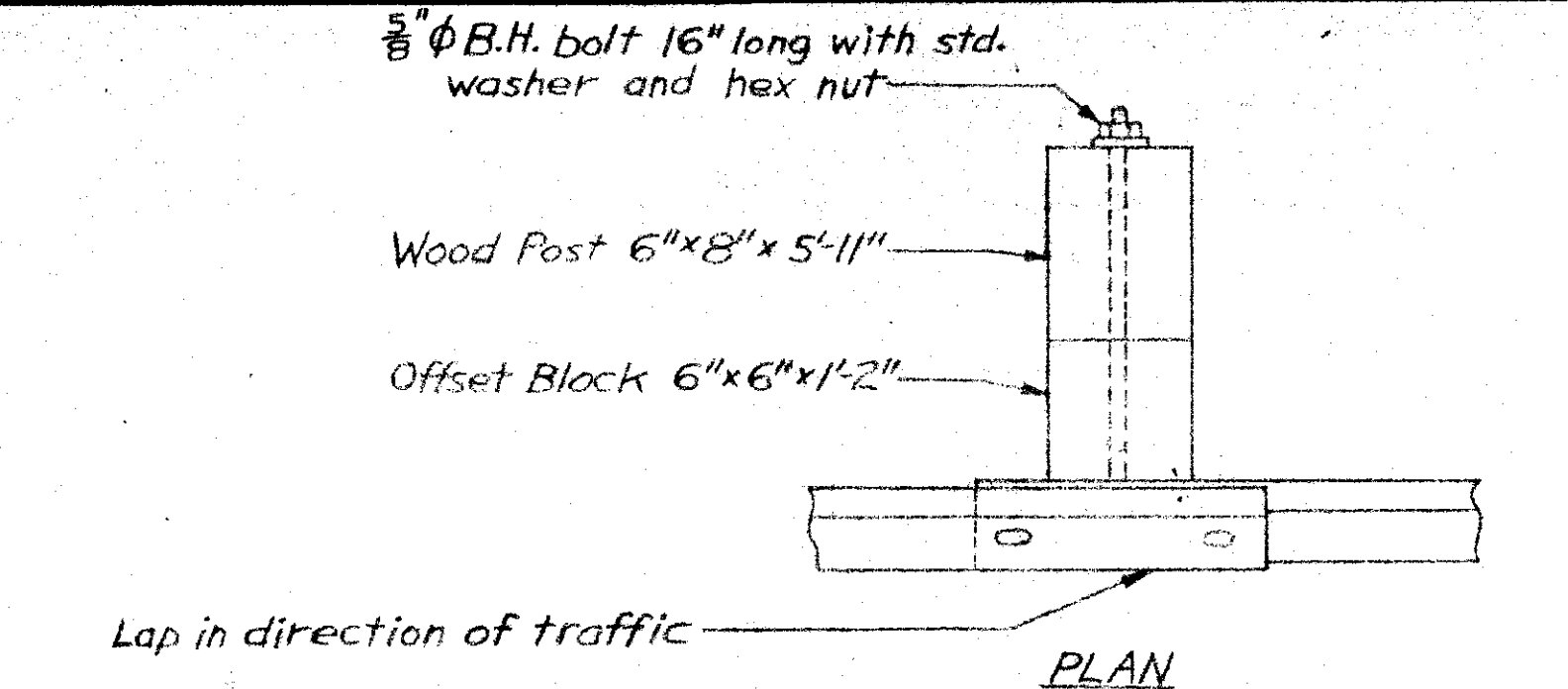


TERMINAL UNIT, TYPE F (MODIFIED)
Scale: $\frac{3}{16}'' = 1'-0''$

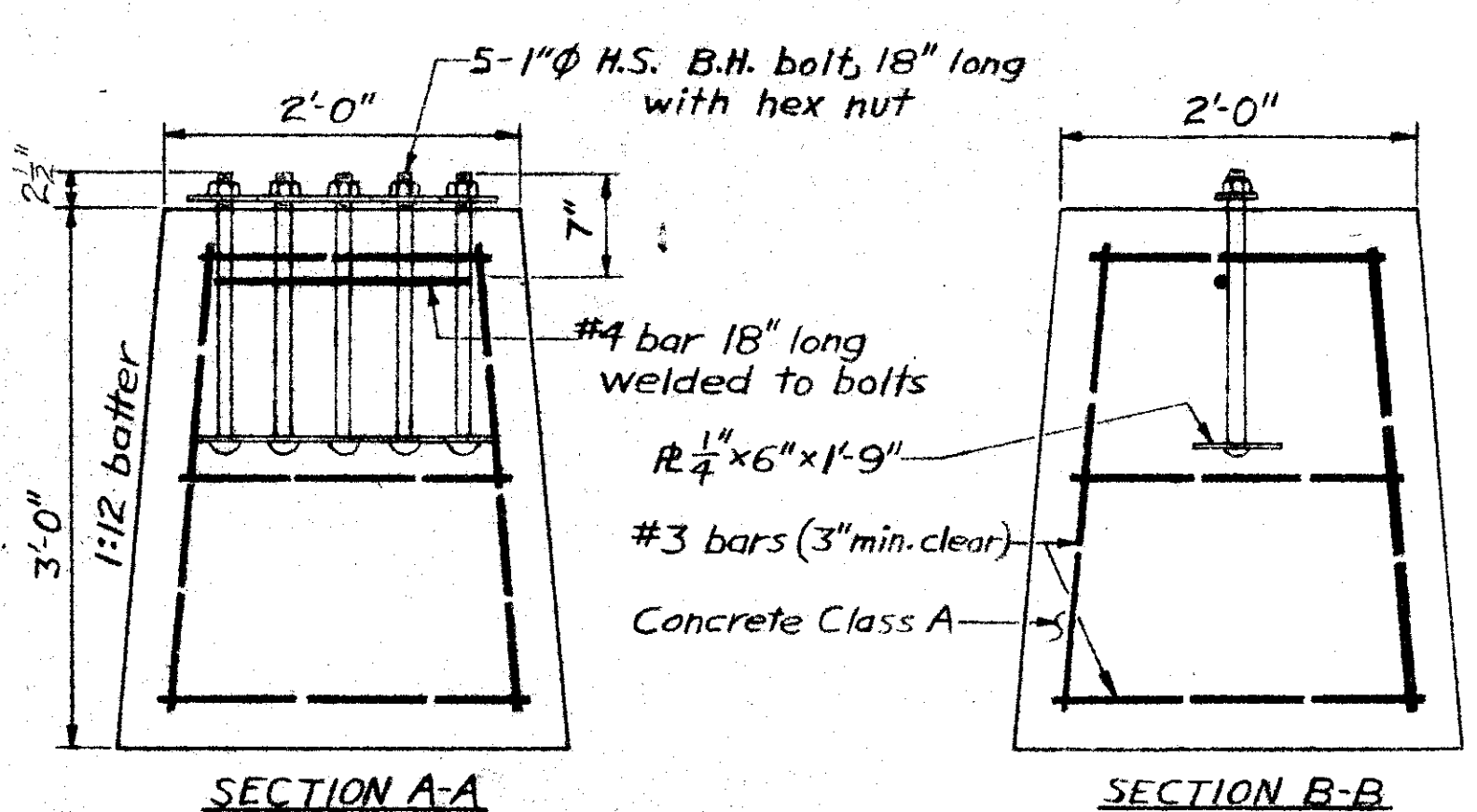
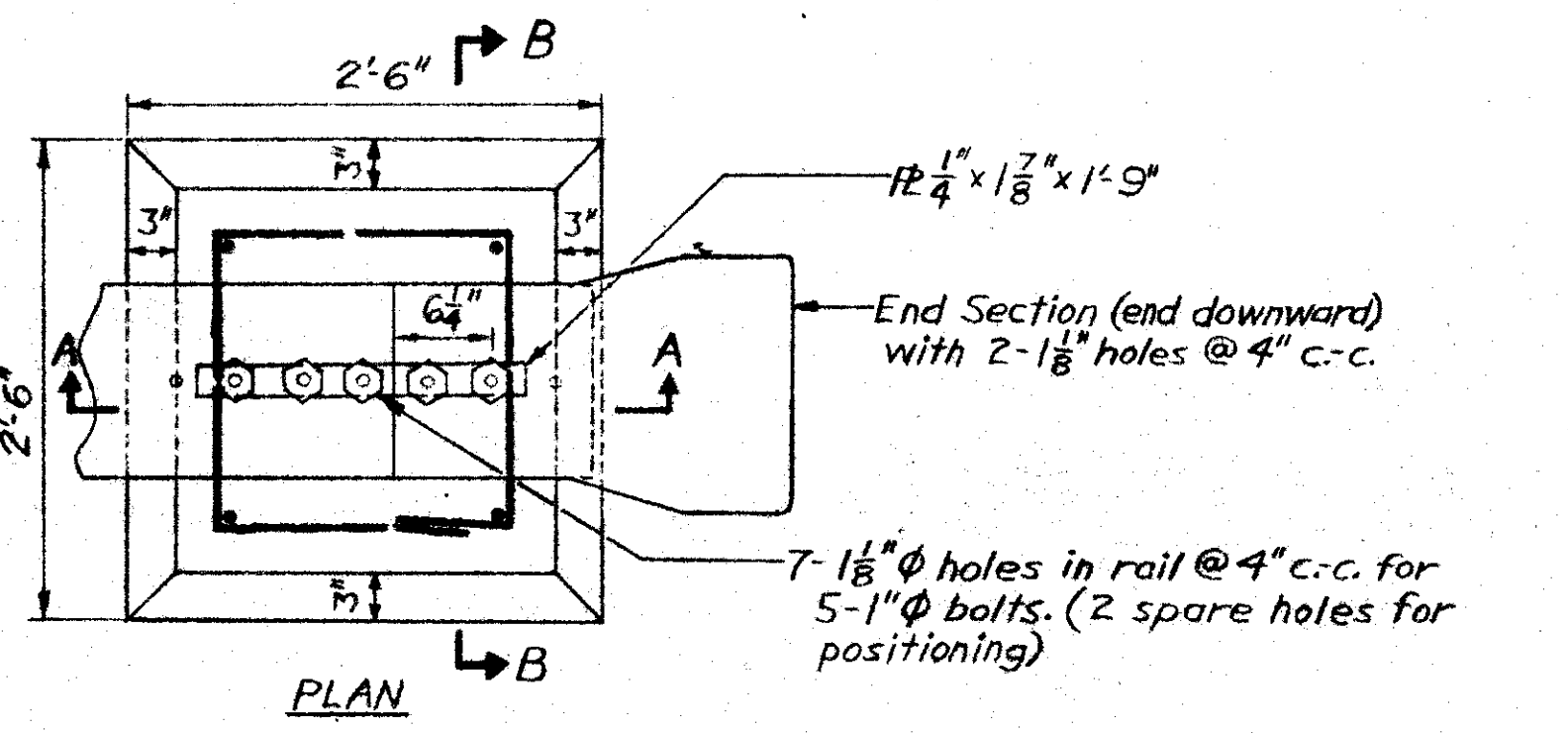
Notes: 1. Terminal units shall be installed where shown on the Roadway Plan or Rail Layout sheet.
2. End rail post to be installed in Location A when Terminal Unit is to be connected to beam guard rail, and in Location B when Terminal Unit is to be connected to bridge approach rail.
3. Payment for Beam Guard Rail (Terminal Unit Type F Modified) GR-1461, Item 606.1461 shall be as a lump sum to include rail, posts, end section, and anchor.



Note: Post bolt similar to splice bolt except for length. All hardware shall be galvanized.

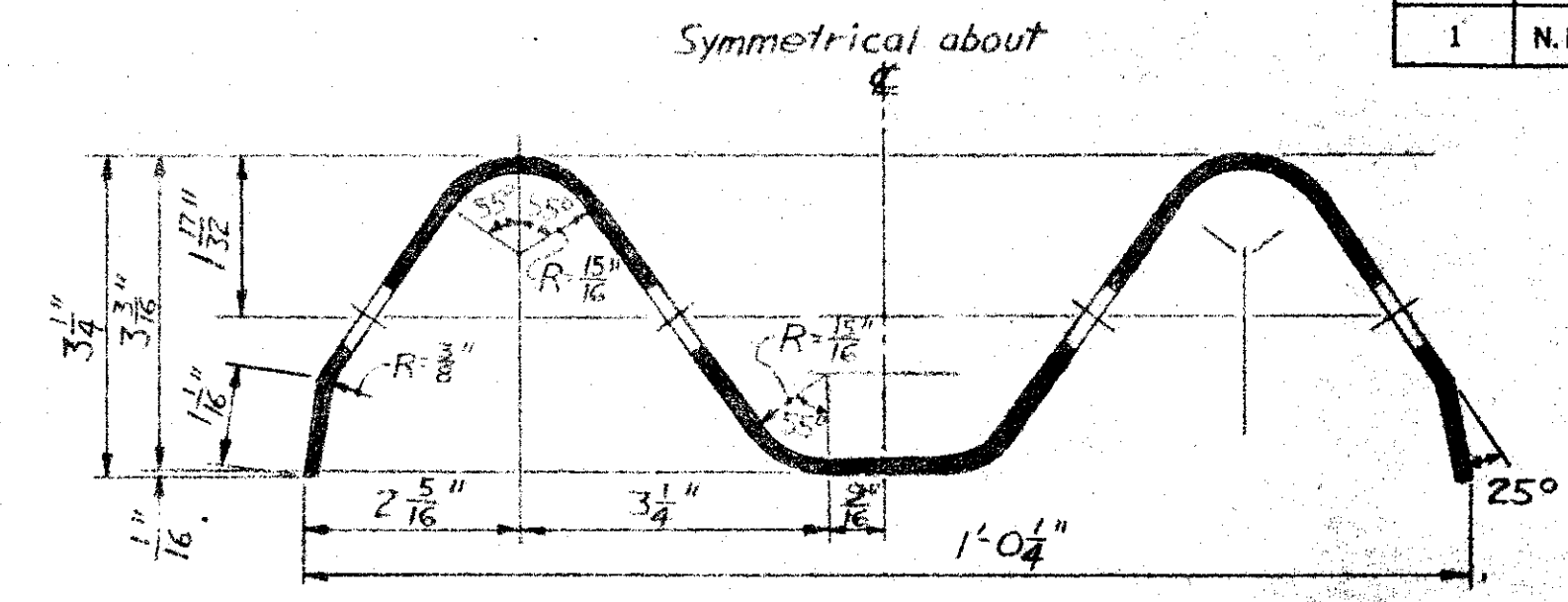


TYPICAL RAIL POST
Scale: $\frac{1}{2}'' = 1'-0''$



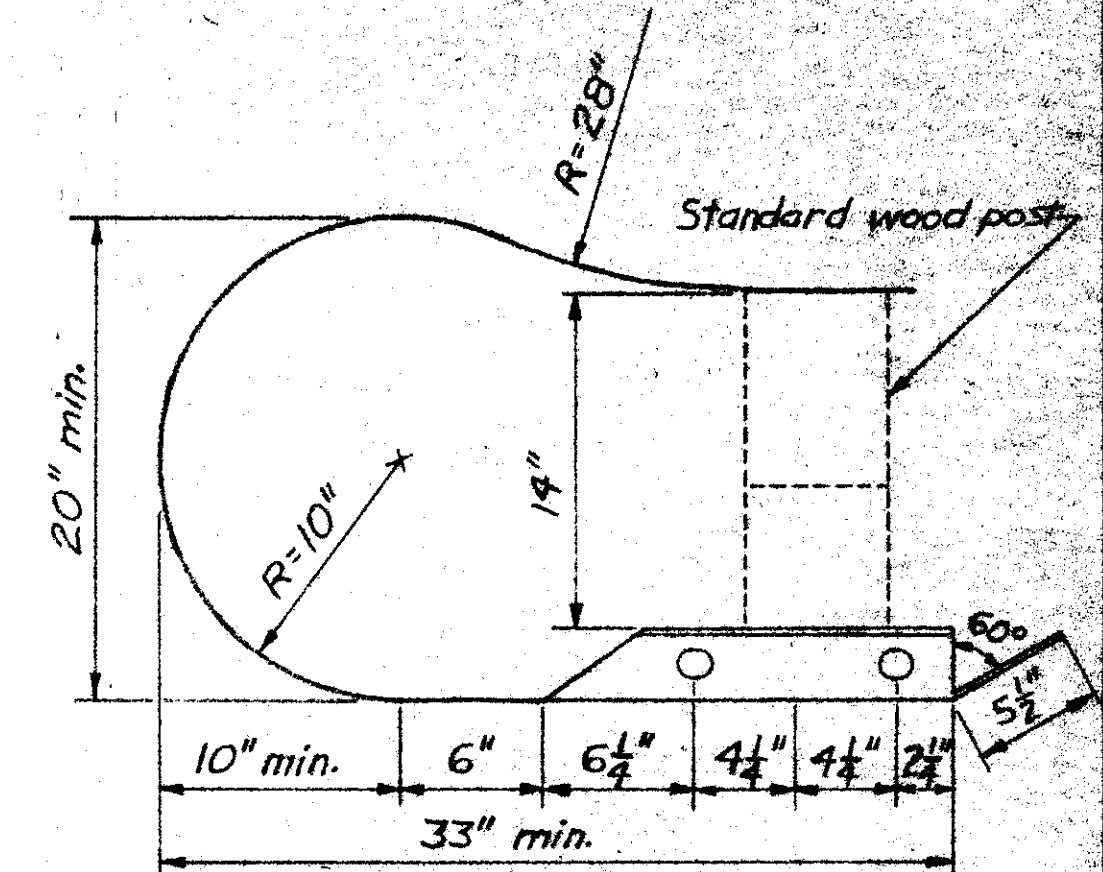
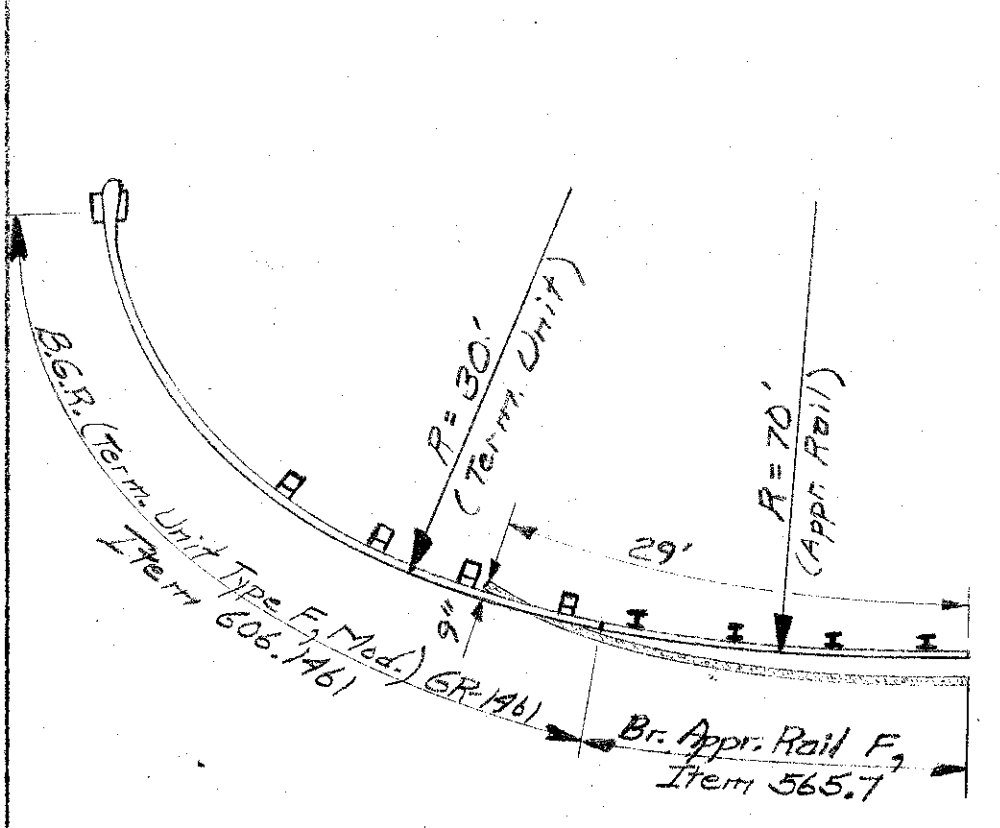
CONCRETE ANCHOR DETAIL
Scale: 1" = 1'-0"

Note: Anchor to be used with Terminal Unit, Type F (Modified)

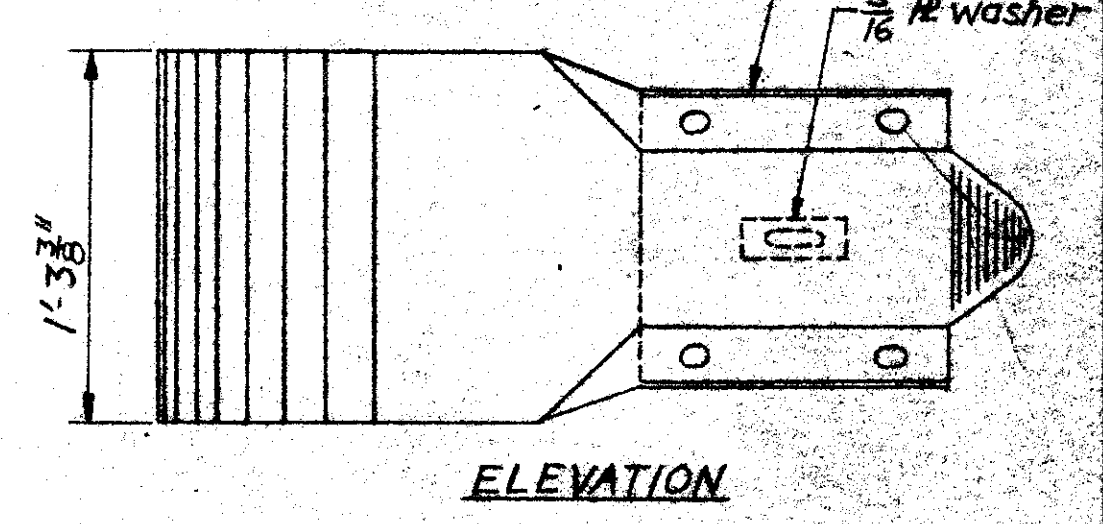


TYPICAL SECTION OF GUARD RAIL
Scale: 6" = 1'-0"

Note: Beam guard rail to be 12 gage. See Hardware Details for slot dimensions.

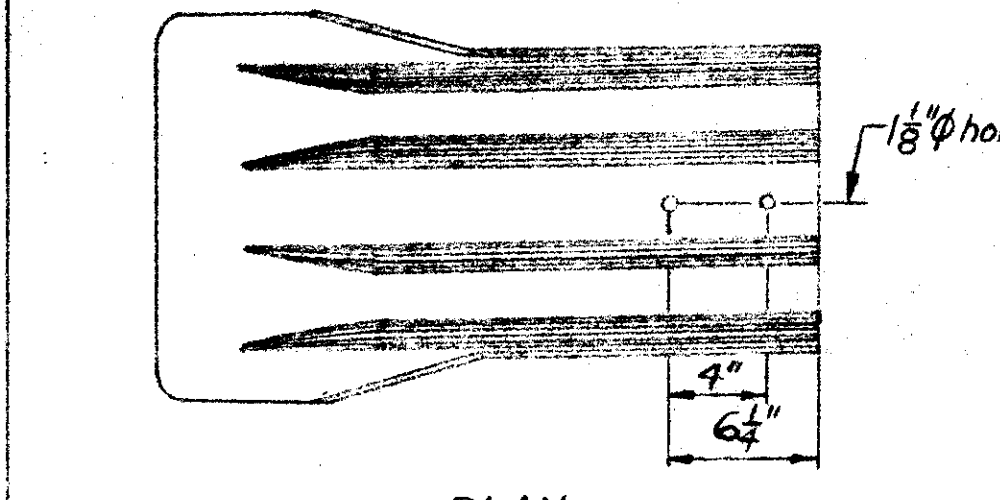
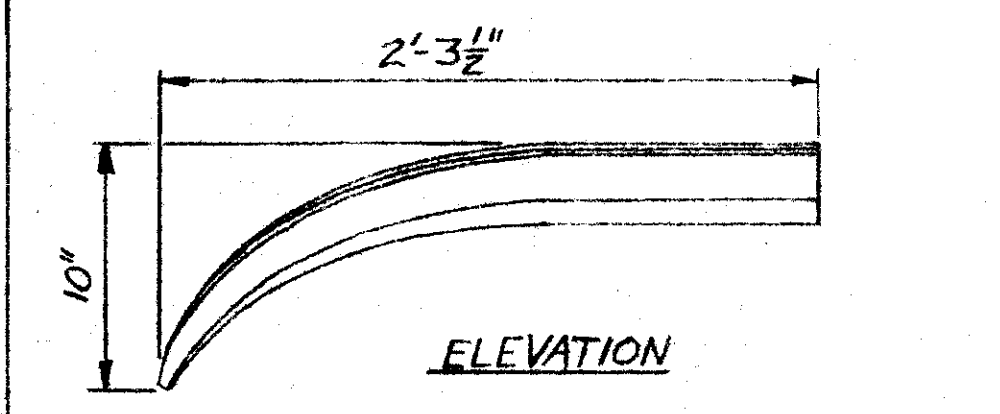


See Hardware Details for slot dimensions.



TERMINAL SECTION
Scale: $\frac{1}{2}'' = 1'-0''$

Note: Terminal section to be used with Beam Guard Rail including Terminal Sections, Item 606.143. Length of terminal section shall not be included in the pay length.



END SECTION
Scale: $\frac{1}{2}'' = 1'-0''$

Note: End section to be used with Terminal Unit, Type F (Modified)

STATE OF NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BRIDGE DESIGN DIVISION

TOWN THORNTON BRIDGE NO. 222/180
FEDERAL PROJECT STATE PROJECT 7-2591
LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER

BEAM GUARD RAIL

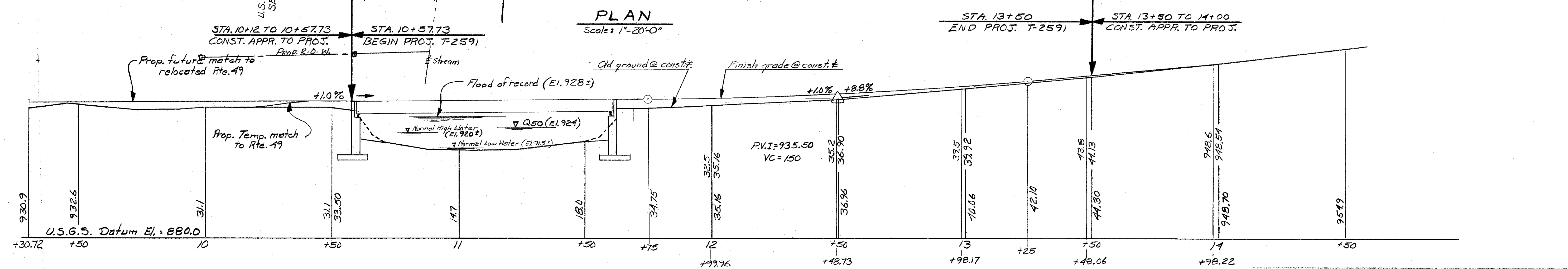
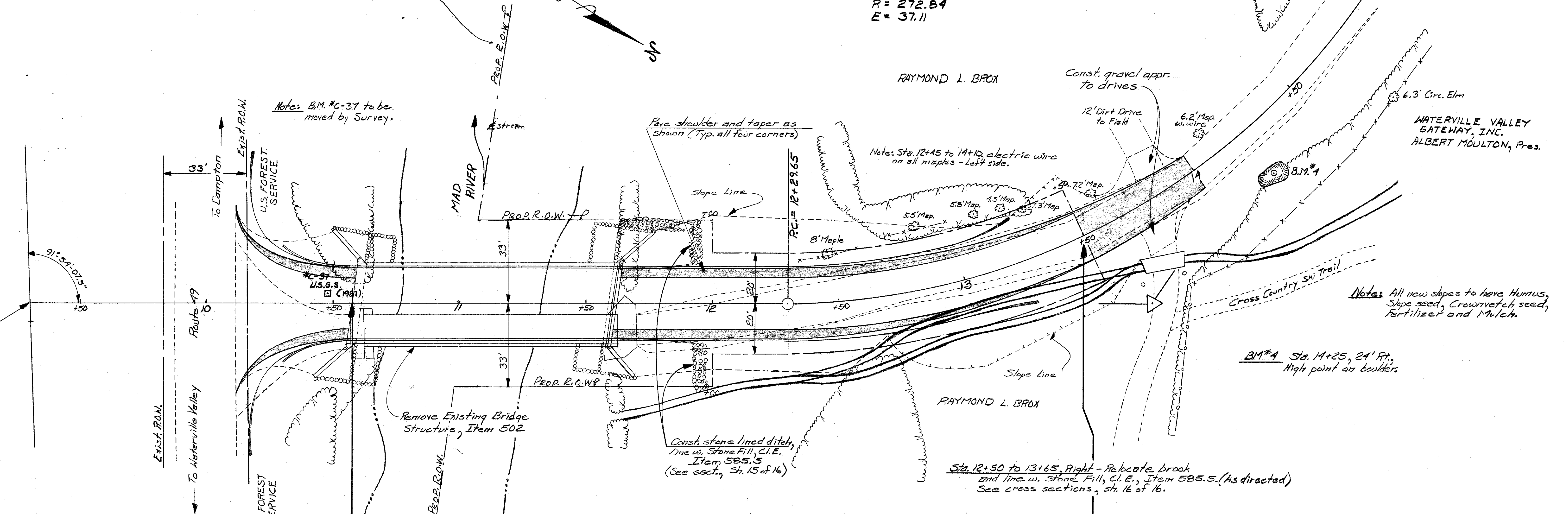
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QUANTITIES	WAB	7-76	MDW	8-74	4-7-2-1
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DESCRIPTION	BY	DATE
REVISIONS		

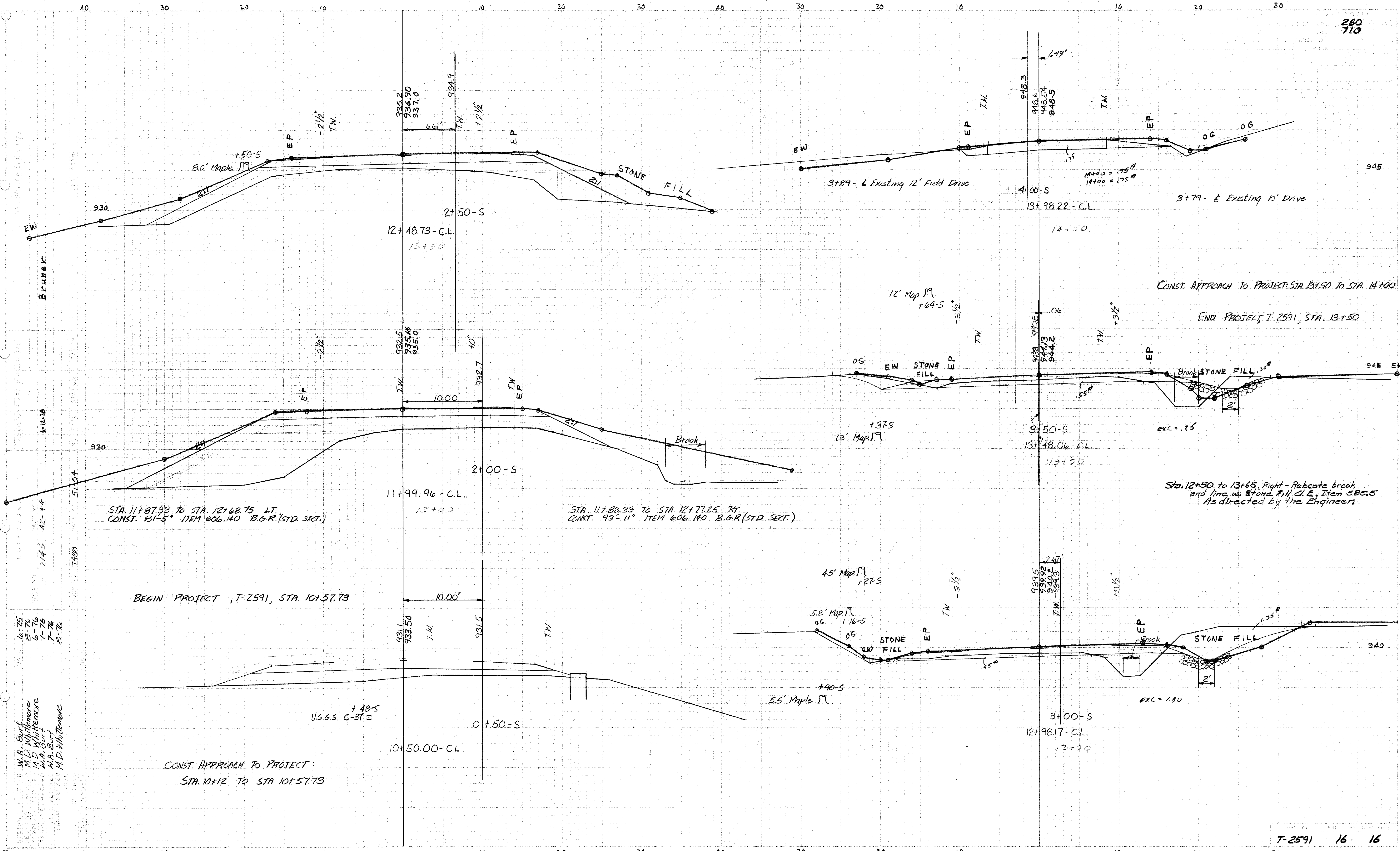
FED. ROAD DIST. NO.	STATE	PROJ.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	N.H.				

$\Delta = 56^{\circ}39'07.5''$
 $D = 21^{\circ}00'$
 $P.I. = 13+76.72$
 $T = 147.07$
 $L = 269.77$
 $R = 272.84$
 $E = 37.11$

FOR R.O.W. LAYOUT PROPOSED FOR THIS PROJECT SEE PROJECT FLH 7-1(3), S-2192-A RDWY SHEETS 10 #11



STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BRIDGE DESIGN DIVISION			
TOWN	THORNTON	BRIDGE NO.	222/180
FEDERAL PROJECT		STATE PROJECT	T-2591
LOCATION UPPER MAD RIVER ROAD OVER MAD RIVER			
PLAN & PROFILE			
DESIGNED BY	WAB	DATE	1-76
DRAWN BY	WAB	DATE	4-76
QUANTITIES BY	WAB	DATE	8-76
CHECKED BY	MDW	DATE	8-76
CHECKED BY	MDW	DATE	8-76
CHECKED BY	MDW	DATE	8-76
REVISIONS			
REVIEWED BY		PROJ. NO.	T-2591
		SHEET NO.	14
		TOTAL SHEETS	16



6-75
 6-76
 6-77
 7-78
 7-79
 8-76
 W.A. Burt
 M.D. Whittemore
 M.D. Whittemore
 W.A. Burt
 W.A. Burt
 M.D. Whittemore
 M.D. Whittemore