STATE OF MONTANA

STATE HIGHWAY COMMISSION

BRIDGE PLANS & QUANTITIES

FEDERAL AID PROJECT NO. F 256(18)

GRASS RANGE - JORDAN

PETROLEUM COUNTY

LIST OF DRAWINGS

SHEET NO.	DWG. NO.	TITLE
1	3305	GENERAL LAYOUT
2	3306	FOOTING PLAN
3	3307	DETAILS OF BENT NO.1 & BENT NO.5
4	3308	DETAILS OF PIERS NO.2, NO.3 & NO.4
5	3309	STEEL BRIDGE RAIL & ADDN'L REIN. STEEL DETAILS
6	R28WC TB SRL 2	STANDARD REINFORCED CONCRETE T-BEAM SPAN

ESTIMATED BRIDGE PLAN QUANTITIES

LOCATION	LENGTH IN FEET	STRUCTURAL STEEL LBS.	REINFORCING STEEL LBS.	*CLASS "A" CONCRETE CU. YDS.	CLASS "AD" CONCRETE CU. YDS.	STEEL BRIDGE RAIL LIN. FT.	**STRUCTURE EXCAVATION CU. YDS.	**UNCLASSIFIED EXCAVATION CU. YDS.
BENT NO. 1			3,842	32.	14.2		210.	
PIER NO. 2		447.	3,360	73.			210.	
PIER NO. 3		447.	3,360	73.			185.	
PIER NO. 4		447.	3,360	73.			110.	720
BENT NO. 5			2,659	14.	14.2		145.	
SUPERSTRUCTURE	184.5	5341.	65,501		246.5	366.0		
TOTAL	184.5	6682.	82,082	265.	274.9	366.0	860.	720

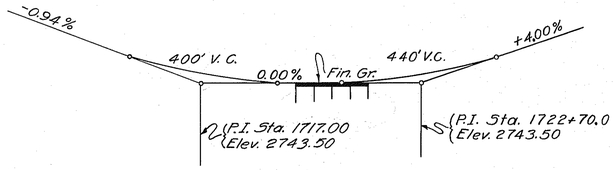
* Includes 5% Swell
** Includes 15% Swell

Made by J.W.A. 4-8-53 Checked by J.R.B. 4-9-53

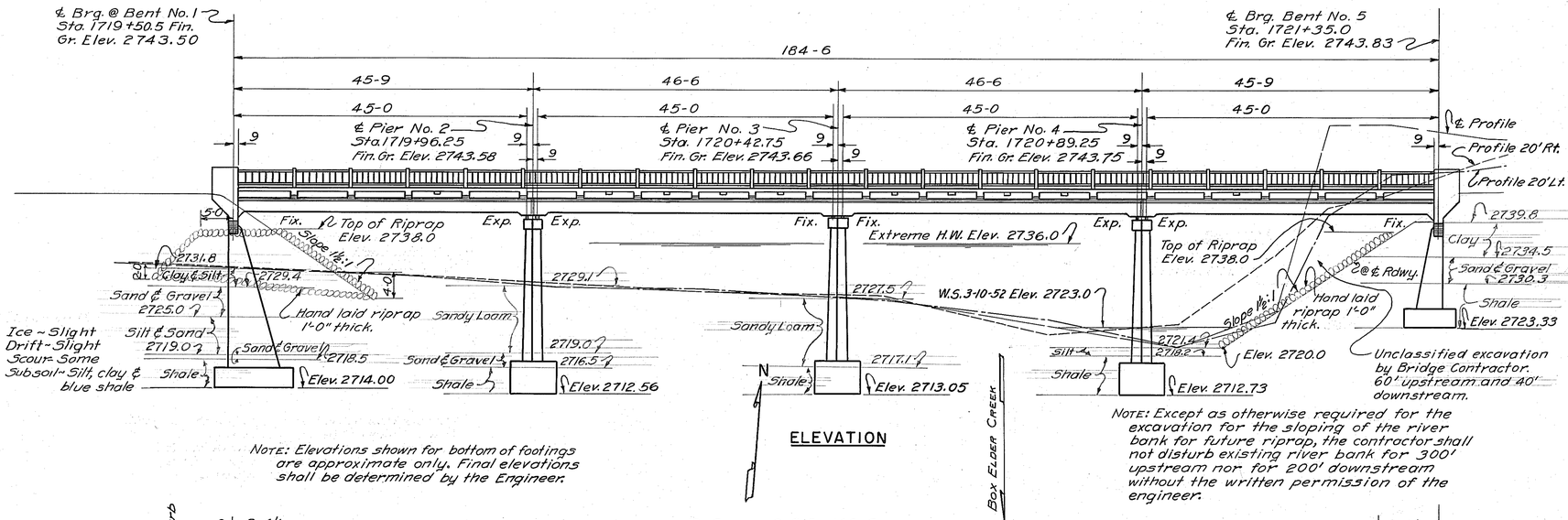
DRAWING NO. 3305Q

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.				

NH 0002(120) B5



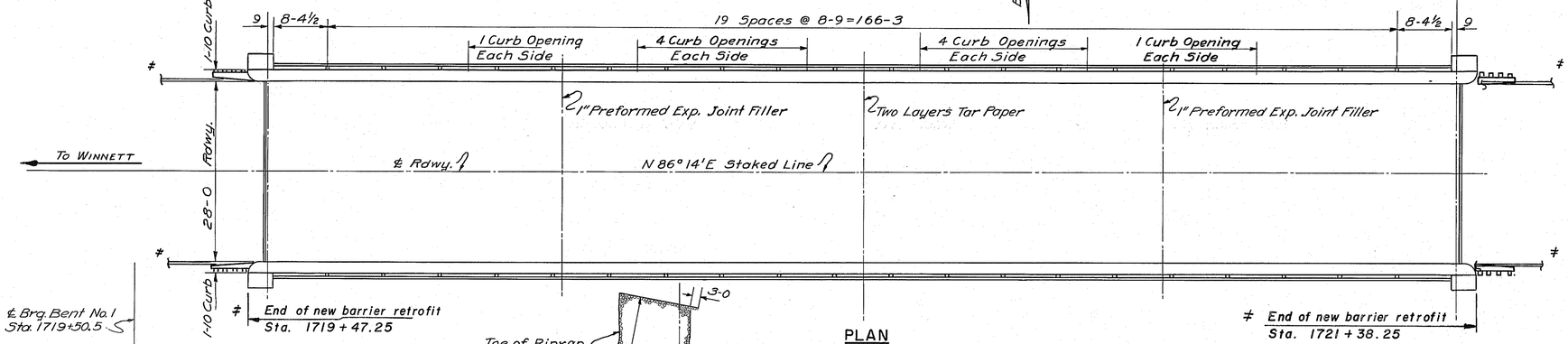
NOTE: Bridge shall be built on a straight line between the elevations shown for the end bents.



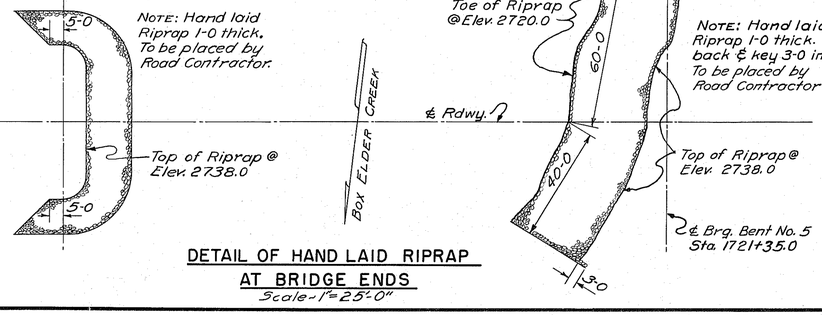
NOTE: Elevations shown for bottom of footings are approximate only. Final elevations shall be determined by the Engineer.

NOTE: Except as otherwise required for the excavation for the sloping of the river bank for future riprap, the contractor shall not disturb existing river bank for 300' upstream nor for 200' downstream without the written permission of the engineer.

ELEVATION



PLAN



DETAIL OF HAND LAID RIPRAP AT BRIDGE ENDS

Scale - 1" = 25'-0"

REFERENCES	
DWG. NO.	DESCRIPTION
3306	FOOTING PLAN
3307	DETAILS OF BENT NO. 1 & BENT NO. 5
3308	DETAILS OF PIERS NO. 2, NO. 3 & NO. 4
3309	STEEL BRIDGE RAIL & ADDN'L. REIN. STEEL DETAILS
R28WC-TB455RL2	STANDARD REINFORCED CONCRETE T BEAM SPAN

≠ THIS CONTRACT: NH 0002(120)

Existing bridge rails to be revised with new cast-in-place barriers. Curb tapers added. For details, see Dwgs. No. 15855 and No. 15856.

NOTES

SPECIFICATIONS:— Montana State Highway Commission Standard Specifications for Road and Bridge Construction, adopted January 1, 1946, and any amendments thereto, and Special Provisions shall govern unless otherwise noted. Design prepared in accordance with Montana 1945 Design Specifications for Highway Structures, Revised March 1, 1946.

LIVE LOAD:— Standard H15-S12 loading.

FINISHED GRADE:— Finished plan grade of bridge is same as profile grade shown on road plans.

CONCRETE:— All concrete of superstructure shall be Class "AD." All concrete in bents and piers shall be Class "A" except as noted on Dwg. No. 3307.

Chamfer all exposed edges of concrete ¾ inches and fillet entrant angles ¾ inches unless otherwise noted.

An air entraining agent shall be added to all concrete except Class "S".

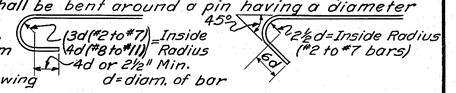
CONSTRUCTION JOINTS:— Construction joints shall be made only at locations shown on the plans or as approved by the engineer. Adequate keys shall be provided at all construction joints as noted on the plans or determined by the engineer.

REINFORCING STEEL:— All reinforcing bars shall be of intermediate grade billet steel. Deformations shall conform to A.S.T.M. Specification A305-49 except as otherwise approved.

Slab bars shall be supported on steel chairs placed sufficiently close together to maintain bars in proper position. All other bars shall be supported on either steel chairs or precast concrete blocks. The unit price bid for reinforcing steel shall include the cost of furnishing and placing chairs, precast blocks, and all other materials used to fasten reinforcing steel in place.

Splicing of main reinforcing bars shall not be permitted except as shown on the plans.

Bends in reinforcing bars shall be made to a radius of not less than four diameters of the bar except for stirrups and tie bars, which shall be bent around a pin having a diameter of not less than two bar diameters. Hooks shall conform to the dimensions shown in the following sketches.



STRUCTURAL STEEL:— For requirements governing structural steels and their fabrication, see the Standard Specifications. To avoid oversight these requirements shall be clearly noted on the shop drawings.

Structural steel shall receive one shop coat of red lead and two field coats consisting of first field or primer coat and one coat of aluminum paint as specified in the Standard Specifications, on all surfaces not in contact with concrete, except as noted in paragraph 45.10(d).

STRUCTURAL STEEL (Method Of Measurement & Payment):— The structural steel shall be paid for at the unit price bid for structural steel and the weight paid for shall be the computed weight as obtained in accordance with the rules and assumptions specified in the Standard Specifications. The computed weight of each shipping unit shall be shown on the shop drawings. This weight may or may not be checked at the time the details are checked.

REINFORCING COVERING:— Minimum covering from surface of concrete to face of any reinforcing bar shall be 2 inches except in slabs, where the minimum covering shall be 1 inch.

FINISHING:— Attention is directed particularly to the requirements of paragraph 49.05(m)(2) of the Standard Specifications for the finishing of concrete floor slab.

PREFORMED EXPANSION JOINT FILLER:— Preformed expansion joint filler shall be Type "A" as specified in the Standard Specifications. Cost of furnishing and placing shall be included in the unit price bid for Class "AD" concrete.

STRUCTURE EXCAVATION:— Only the excavation below Elev. 2721 for Bent No. 1, Piers No. 2, No. 3 & No. 4 and Elev. 2737 for Bent No. 5 need be restricted to the area inside the cofferdams. For note on keying of pier into shale, see Dwg. No. 3308.

WELDS:— All welds shall be continuous fillet shop welds unless otherwise noted. Welds shall be paid for at the unit price bid for structural steel and the weights shall be computed in accordance with the following, ⅜" @ .072 #/ft., ½" @ .128 #/ft., ⅝" @ .287 #/ft.

APPROVAL:— Shop plans shall be approved by the Montana State Highway Department before fabrication is begun.

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER BOX ELDER CREEK
NEAR WINNETT
FEDERAL AID PROJECT NO. F 256(18)
PETROLEUM COUNTY
GENERAL LAYOUT
Scale - 1" = 10'-0"
Except as noted

DESIGNED		
DRAWN	E. C. M.	11-27-52
TRACED	J. W. A.	1-16-53
CHECKED	H. W. K.	3-11-53
REVISED	D. W. C.	11-14-93
REVISED		

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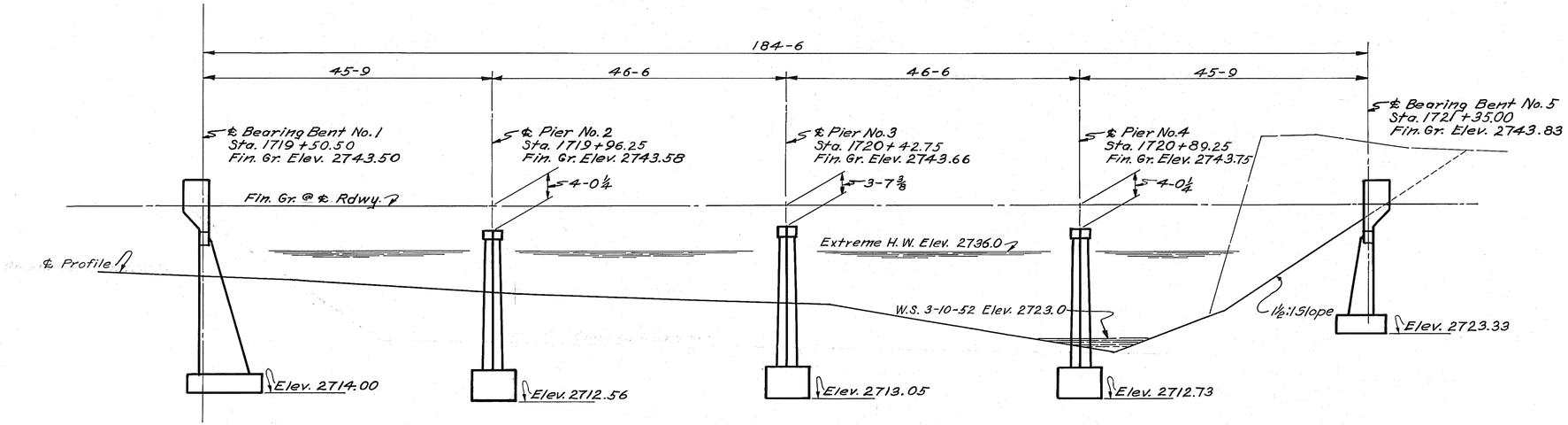
APPROVED BY _____ BRIDGE ENGINEER

STATE PRECONST. NUMBER 1256-18

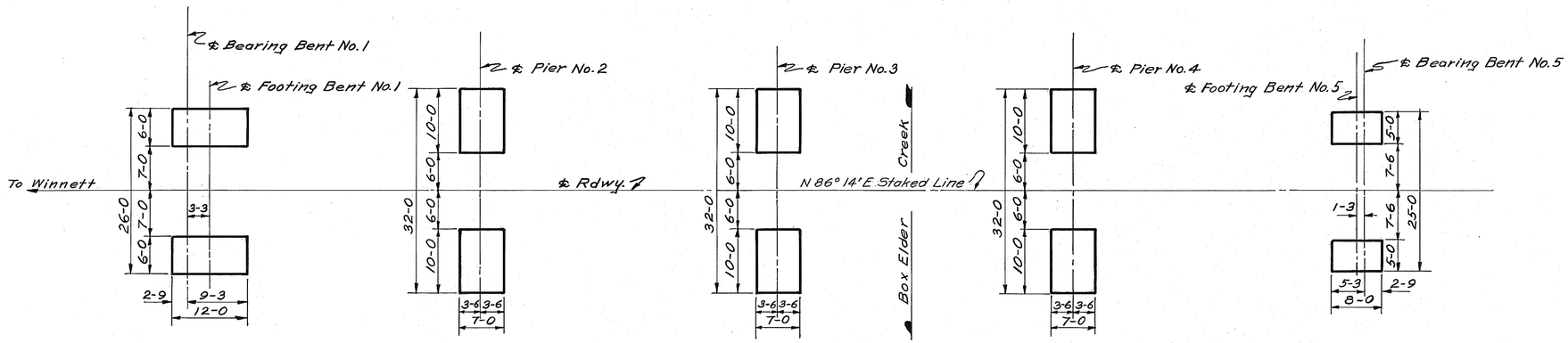
DRAWING NO. 3305

J. R. B.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	F256(18)		2	6



ELEVATION



PLAN OF FOOTINGS

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER BOX ELDER CREEK
NEAR WINNETT
FEDERAL AID PROJECT NO. F 256(18)
PETROLEUM COUNTY

FOOTING PLAN
Scale: 1"=10'-0"

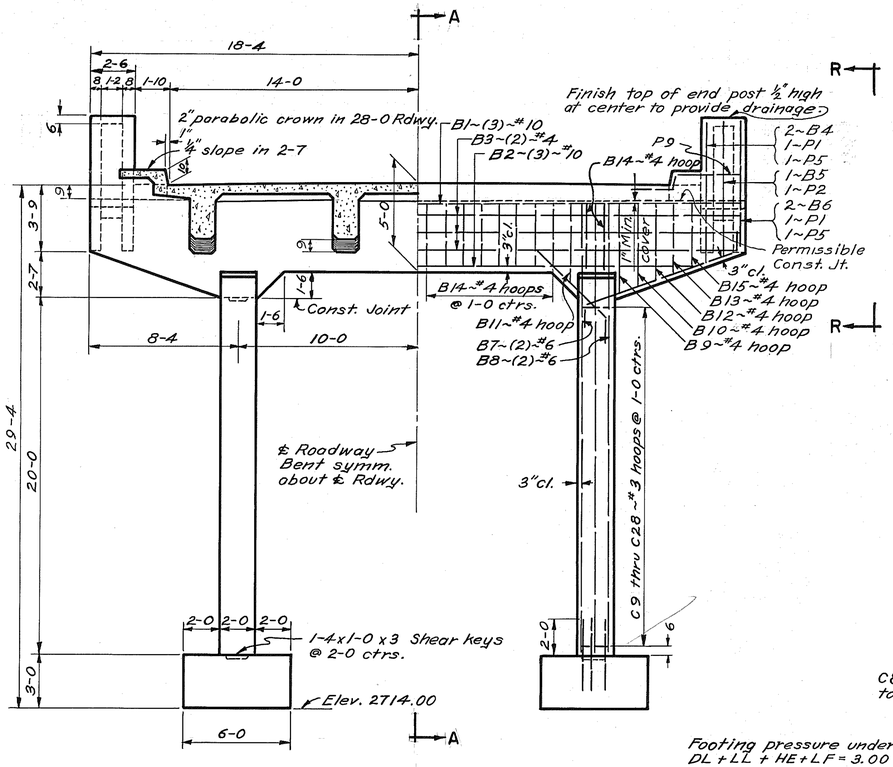
DESIGNED		
DRAWN	E.C.M.	1-3-53
TRACED	F.L.S.	2-9-53
CHECKED	H.H.K.	2-17-53
REVISED		
REVISED		

STATE PRECONST. NUMBER 1256-18

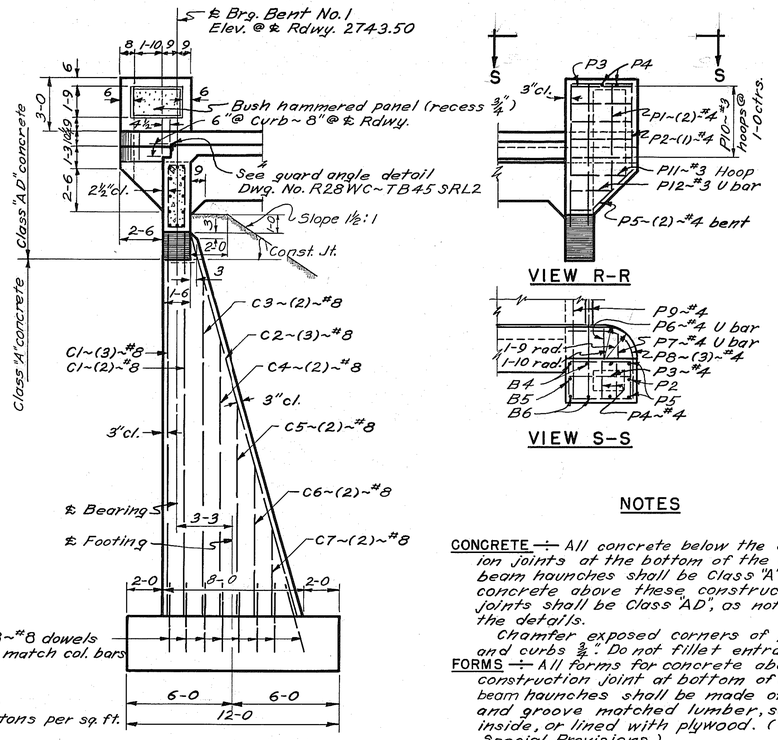
DRAWING NO. 3306

J.R.B.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	F256(18)		3	6



ELEVATION – BENT NO. 1



SECTION A–A

Footing pressure under DL + LL + HE + LF = 3.00 tons per sq. ft.

NOTE: See Dwg. No. 3309 for details of marker and rail connections.

NOTES

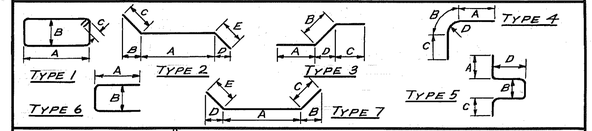
CONCRETE — All concrete below the construction joints at the bottom of the cross beam haunches shall be Class "A". All concrete above these construction joints shall be Class "AD", as noted on the details.

Chamfer exposed corners of posts and curbs 3/4". Do not fillet entrant angles.

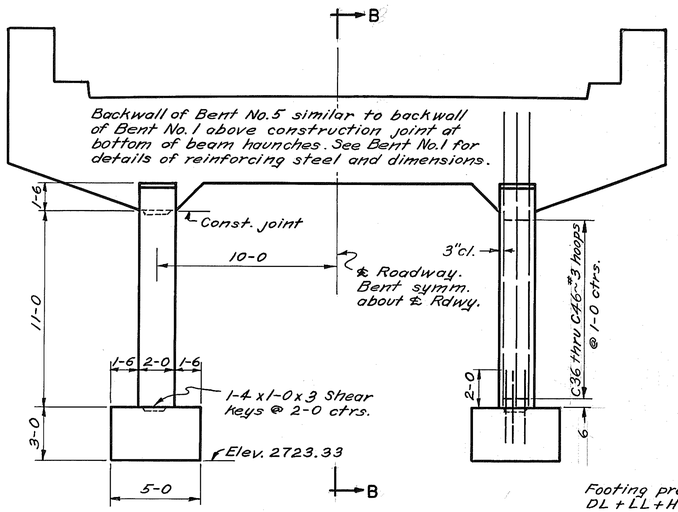
FORMS — All forms for concrete above construction joint at bottom of cross beam haunches shall be made of tongue and groove matched lumber, surfaced inside, or lined with plywood. (See Special Provisions.)

OTHER NOTES — For other notes see Dwg. No. 3305, & No. 3308.

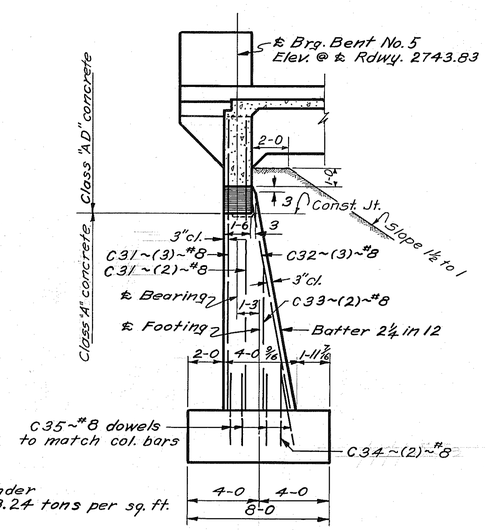
BILL OF REINFORCING STEEL



STRAIGHT BARS				BENT BARS (All dimensions are Out to Out)									
No.	Size	Mark	Length	No.	Size	Mark	Type	Length	A	B	C	D	E	F
REINFORCING STEEL FOR BACKWALL AND POSTS ~ BENT NO. 1 OR BENT NO. 5														
3	#10	B1	36-2	4	#6	B7	2	11-10	9-4	0-4	1-0	0-5	1-6	
3	10	B2	30-6	4	6	B8	2	7-6	6-6	0-8½	1-0			
6	4	B3	36-2	2	4	B9	1	13-6	5-2½	1-2	0-4½			
4	↓	B4	8-0	2	↓	B10	↑	12-9	4-10	↑	↑			
2		B5	7-8			B11		12-10	4-10½					
4		B6	7-4			B12		12-0	4-5½					
4		P1	6-0	2		B13		11-4	4-1½					
2		P2	4-9	20		B14	↓	10-10	3-10½					
2	↓	P3	3-8	2		B15	1	10-8	3-9½	1-2	0-4½			
4	#4	P4	2-2	4		P5	7	9-1	3-4	3-4	4-9	0-8½	1-0	
				2		P6	5	7-2	1-0	1-3½	1-0	1-11		
				2		P7	5	6-8	1-0	1-3½	0-8	1-10		
				6	↓	P8	4	6-10	2-4	2-6	2-0	1-7		
				4	4	P9	3	6-2	1-6	0-10	3-10	0-1		
				10	3	P10	1	12-0	3-7	2-1	0-4			
				2	3	P11	1	11-6	3-4	2-1	0-4			
				2	#3	P12	6	6-9	2-4	2-1				
REINFORCING STEEL FOR COLUMNS & FOOTINGS ~ BENT NO. 1														
10	#8	C1	25-7	2	#3	C9	1	18-7	7-4½	1-7	0-4			
6	↑	C2	21-9	↓	↓	C10		18-0	7-1	↑	↑			
4		C3	18-9			C11		17-5	6-9½					
4		C4	15-4			C12		16-10	6-6					
4		C5	11-11			C13		16-3	6-2½					
4		C6	8-6			C14		15-8	5-11					
4	↓	C7	5-1			C15		15-1	5-7½					
36	#8	C8	4-0			C16		14-6	5-4					
						C17		13-11	5-0½					
						C18		13-4	4-9					
						C19		12-9	4-5½					
						C20		12-2	4-2					
						C21		11-7	3-10½					
						C22		11-0	3-7					
						C23		10-5	3-3½					
						C24		9-10	3-0					
						C25		9-3	2-8½					
						C26		8-8	2-5					
				↓	↓	C27	↓	8-1	2-1½	↑	↑			
				2	#3	C28	1	7-6	1-10	1-7	0-4			
REINFORCING STEEL FOR COLUMNS & FOOTINGS ~ BENT NO. 5														
10	#8	C31	16-7	2	#3	C36	1	10-11	3-6½	1-7	0-4			
6	↑	C32	12-4	↓	↓	C37		10-7	3-4½	↑	↑			
4		C33	8-0			C38		10-2	3-2					
4		C34	4-9			C39		9-10	2-11⅜					
20	#8	C35	4-0			C40		9-5	2-9½					
						C41		9-1	2-7⅛					
						C42		8-8	2-5					
						C43		8-4	2-2⅜					
						C44		7-11	2-0½					
				↓	↓	C45	1	7-7	1-10½	↑	↑			
				2	#3	C46	1	7-2	1-8	1-7	0-4			



ELEVATION – BENT NO. 5



Footing pressure under DL + LL + HE + LF = 3.24 tons per sq. ft.

SECTION B–B

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER BOX ELDER CREEK

NEAR WINNETT

FEDERAL AID PROJECT NO. F 256(18)

PETROLEUM COUNTY

DETAILS OF BENT NO. 1 & BENT NO. 5

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

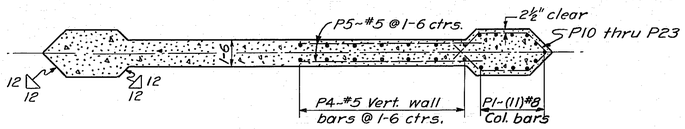
DESIGNED	P.E.P.	12-19-52
DRAWN	H.E.E.	12-29-52
TRACED	F.L.S.	2-5-53
CHECKED	H.W.K.	2-17-53
REVISED		
REVISED		

STATE PRECONST. NUMBER 1256-18

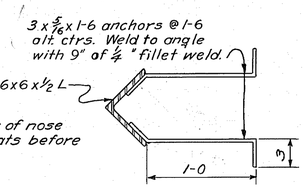
DRAWING NO. 3307

J.R.B.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	F256(18)		4	6

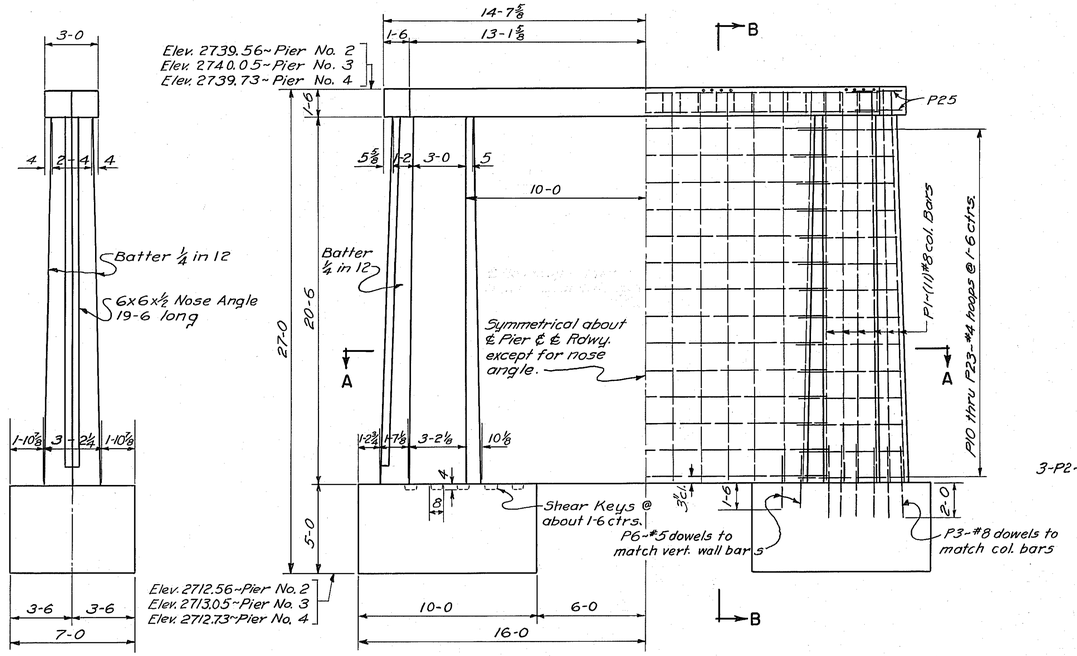


SECTION A-A



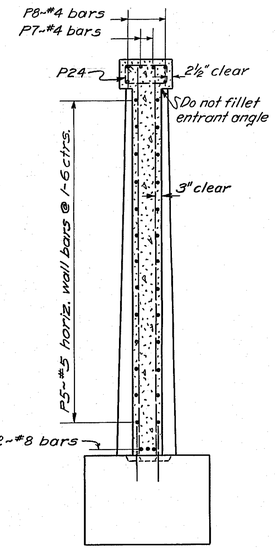
NOTE: Paint exposed sides of nose angles with two field coats before erection.

NOSE ANGLE DETAIL
Scale: 1½"=1'-0"



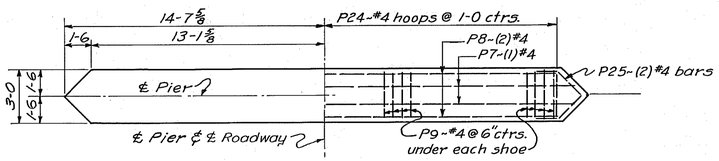
END ELEVATION

ELEVATION PIER NO. 2
(PIERS NO. 3 & NO. 4 SIMILAR)

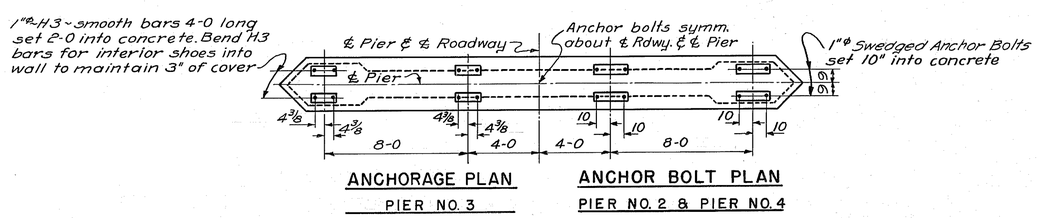


SECTION B-B

Max. Footing Pressure under D.L.+L.L. = 3.3 Tons per sq. ft.



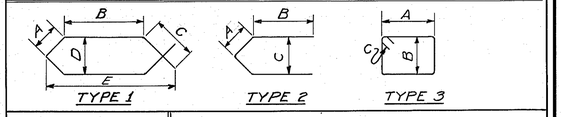
PLAN



ANCHORAGE PLAN
PIER NO. 3

ANCHOR BOLT PLAN
PIER NO. 2 & PIER NO. 4

BILL OF REINFORCING STEEL (FOR ONE PIER ONLY)



STRAIGHT BARS				BENT BARS (All dimensions are Out to Out)									
No.	Size	Mark	Length	No.	Size	Mark	Type	Length	A	B	C	D	E
22	#8	P1	21-6	2	#4	P10	1	15-0	1-11½	3-0	2-6½	2-9	6-2¼
3	8	P2	20-0	↑	↑	P11	↑	14-9	1-11	2-11⅜	2-6	2-8¼	6-1¼
22	8	P3	4-0			P12		14-7	1-10½	2-11½	2-5½	2-7½	6-0¼
26	5	P4	21-6			P13		14-4	1-9⅜	2-11½	2-5	2-6⅜	5-11¼
26	5	P5	20-0			P14		14-2	1-9⅛	2-11⅛	2-4½	2-6	5-10½
8	5	P6	3-0			P15		13-11	1-8⅜	2-11	2-4	2-5⅛	5-9½
2	4	P7	27-10			P16		13-8	1-8	2-10⅜	2-3½	2-4½	5-8½
4	4	P8	26-0			P17		13-6	1-7½	2-10⅜	2-3	2-3¼	5-7½
16	#4	P9	2-6			P18		13-4	1-7	2-10½	2-2½	2-3	5-6½
						P19		13-1	1-6½	2-10¼	2-2	2-2¼	5-5½
						P20		12-11	1-6	2-10	2-1½	2-1⅞	5-4½
						P21		12-9	1-5½	2-10	2-1	2-0⅜	5-3⅜
				↓		P22	↓	12-6	1-5	2-9⅜	2-0½	2-0	5-2⅜
				2		P23	1	12-4	1-4½	2-9½	2-0	1-11½	5-1⅜
				27		P24	3	8-1	2-7	1-1	0-4½		
				4	#4	P25	2	6-4	1-9⅜	1-4	2-7		

NOTES

CONCRETE — All concrete in piers shall be Class "A". Chamfer all exposed corners of piers 1½" and fillet entrant angles 1½" except as otherwise noted.

SETTING OF SHOES — Care shall be taken in placing reinforcing steel so as to clear anchor bolts.

Contractor shall finish concrete under girder shoes slightly high and bush-hammer to exact elevation shown. Shoes shall be placed on three layers of canvas thoroughly swabbed with red lead, as called for in the Standard Specifications.

FORMS — All forms for shafts of piers above top of footings shall be made of tongue and groove matched lumber, surfaced inside or shall be lined with plywood. (See Special Provisions).

SHAFTS — Shafts of piers shall be poured in not more than two continuous runs; other construction joints shall be made only as noted on the plans or as determined by the engineer.

CONSTRUCTION JOINTS — Construction joints shall be made on a true horizontal line at the surfaces of the piers and left rough in the interior with satisfactory shear keys.

NOSE ANGLES — Pier nose angles shall be paid for as structural steel.

PIER BASE — The footings of Piers No. 2, No. 3 & No. 4 shall be keyed into undisturbed shale for a minimum of 1'-6". The footings of Bents No. 1 & No. 5 shall be keyed into shale for a minimum of 1'-0". The excavated area into the shale shall be completely filled with concrete. The quantity of concrete deposited outside of neat lines, because of this requirement, depends upon the contractor's procedure; therefore, it will vary and its cost shall be considered a part of the cost of the concrete inside of neat lines. The quantity of concrete for piers to be paid for shall be the amount only within neat lines shown on the details. If changes in the details of the piers are ordered by the engineer, the quantities will be revised according to the revised details.

OTHER NOTES — For other notes see Dwg. No. 3305.

J.R.B.

DESIGNED	P.E.P.	12-18-52
DRAWN	H.E.E.	12-31-52
TRACED	J.W.A.	2-10-53
CHECKED	H.W.K.	2-17-53
REVISED		
REVISED		

STATE OF MONTANA
STATE HIGHWAY COMMISSION

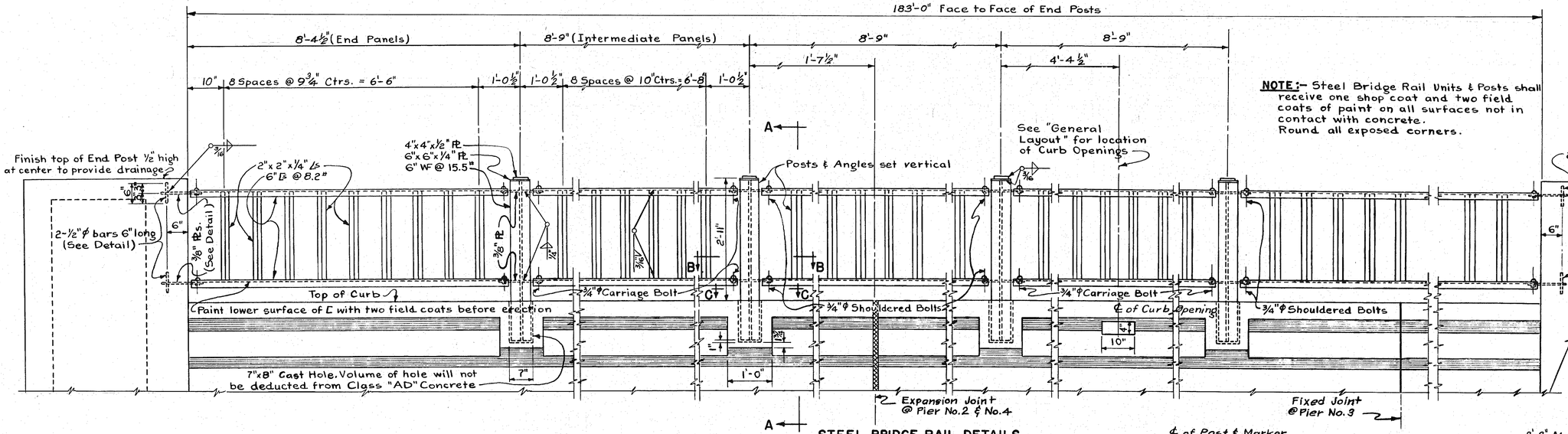
BRIDGE OVER BOX ELDER CREEK
NEAR WINNETT
FEDERAL AID PROJECT NO. F 256(18)
PETROLEUM COUNTY

DETAILS OF PIERS NO. 2, NO. 3 & NO. 4
Scale-¼"=1'-0" except as noted

STATE PRECONST. NUMBER 1256-18

DRAWING NO. 3308

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	F256(18)		5	6

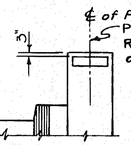


NOTE:- Steel Bridge Rail Units & Posts shall receive one shop coat and two field coats of paint on all surfaces not in contact with concrete. Round all exposed corners.

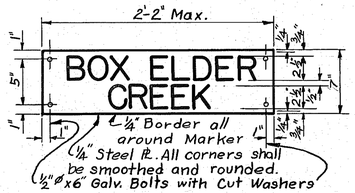
NOTE:- The "Unit Price bid per lineal foot of "Steel Bridge Rail" shall be full payment for all steel rail units and posts complete in place, including grouting, painting and all incidentals pertaining thereto.

STEEL BRIDGE RAIL DETAILS

Scale- ¾" = 1'-0"



RIGHT HAND END POST

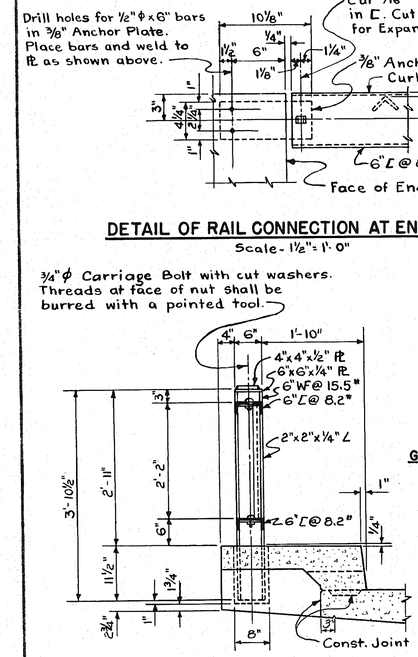


Letters 2½" high made with ⅜" stroke with space of about ½" between letters. For support set 4-½"ϕ x 6" Galv. Bolts in concrete End Post as shown.

PAINTING OF MARKER:- Before paint is applied, plate shall be cleaned with gasoline. One coat of flat white paint and two coats of white enamel shall then be applied over the entire surface of the plate. "Silver Scotchlite" or equivalent reflectorizing material shall then be applied to the entire face of the sign with the special waterproof adhesive recommended by the manufacturers of the reflectorizing material. Lettering and border shall be put on with signwriters lettering black. Cost of "Marker" complete in place shall be included in the unit price bid for Class "AD" Concrete.

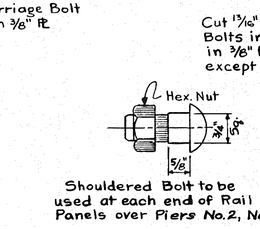
MARKER DETAIL

Scale- 1½" = 1'-0"



DETAIL OF RAIL CONNECTION AT END POSTS

Scale- 1½" = 1'-0"

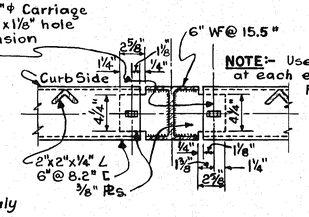


Shouldered Bolt to be used at each end of Rail Panels over Piers No.2, No.3 & No.4 only

SHOULDERED BOLT DETAIL

Scale- 6" = 1'-0"

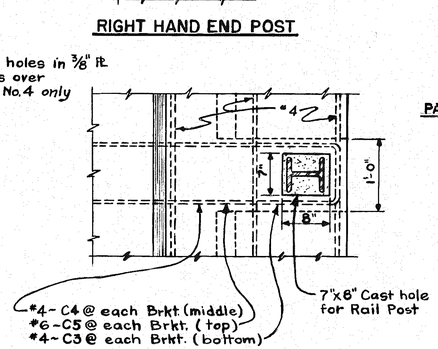
Cut 1⅜16" □ hole for ¾"ϕ Carriage Bolts in ℄. Cut 1⅜16" x 1⅛" hole in ⅜" Pl. for Expansion except as noted.



NOTE:- Use 13/16 x 1½" slotted holes in ⅜" Pl. at each end of Rail Panels over Piers No.2, No.3, & No.4 only

SECTION B-B
TYPICAL RAIL CONNECTION AT INTERMEDIATE POSTS

Scale- 1½" = 1'-0"



SECTION C-C

Scale- 1" = 1'-0"

¾"ϕ Carriage Bolt with cut washers. Threads at face of nut shall be burred with a pointed tool.

SECTION A-A

Scale- ¾" = 1'-0"

GROUTING BRIDGE RAIL POSTS:- After Bridge Rail for entire structure is in place and properly aligned and adjusted, all posts shall be grouted in place using a mortar composed of one part cement and three parts fine aggregate. Care shall be taken to see that entire pocket in which each post is set is completely filled with well tamped mortar, finished at the top with a slight slope away from the steel posts, to prevent formation of water pockets. Top of mortar to be finished as specified for the curb.

PARTIAL BILL OF REINFORCING STEEL

MARK	No. BARS	SIZE	LOCATION
C2	336	#4	Curb
C3	40	#4	Curb~ Post Bracket
C4	40	#4	Curb~ Post Bracket
C5	40	#6	Curb~ Post Bracket
H3	16	#8	Fixed End Shoe

This Bill of Reinforcing Steel shall be used in conjuction with the Bill of Reinforcing Steel shown on R28WC-TB45 SRL2

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER BOX ELDER CREEK
NEAR WINNETT
FEDERAL AID PROJECT NO. F 256(18)
PETROLEUM COUNTY
STEEL BRIDGE RAIL
& ADDN'L REIN. STEEL DETAILS
Scale- As noted

DESIGNED		
DRAWN	H.E.S	4-23-52
TRACED	C.A.M	5-3-52
CHECKED	H.W.K.	2-17-53
REVISED		
REVISED		

STATE PRECONST. NUMBER 1256-18

DRAWING NO. 3309

J.R.B.