ENGINEERING CONSTRUCTION CONTRACTING SECTION
MONTANA DEPARTMENT OF TRANSPORTATION

As-Built Drawings

The following are as-built drawings for the structures. MDT provides them for informational purposes only. They do not include drawings for modifications to the structures, such as joint replacements and guardrail revisions and may not completely represent current conditions. Thus, some of the information contained in these documents may be out of date or not applicable with regard to the advertised project. The contractor should not rely solely on the as-built drawings provided for bidding purposes nor does any data in these files supersede the data in the contract documents.

Made By: F.W.T. 9-29-52 Checked By: J.R.B. 9-29-52 Revised: I.W.H. 7-20-53

STATE OF MONTANA

STATE HIGHWAY COMMISSION

BRIDGE PLANS & QUANTITIES

FED. AID SECONDARY PROJ. NO. S 81(2)

SOMERS—BIGFORK

FLATHEAD COUNTY

LIST OF DRAWINGS

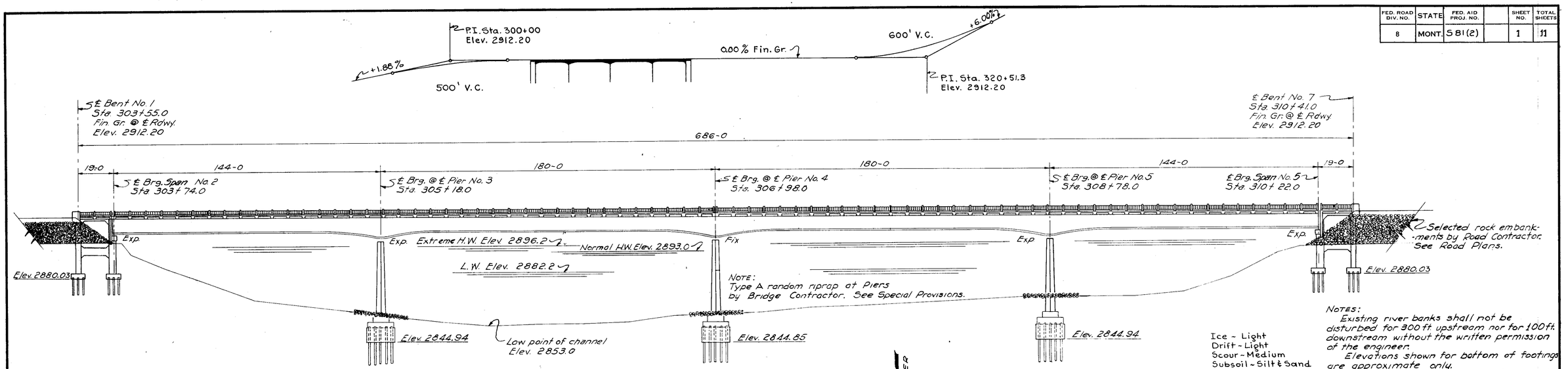
SHEET NO.	DWG. NO.	TITLE
1	3254	GENERAL LAYOUT
2	3255	FOOTING PLAN
3	3256	TOWER SPANS NO.1 & NO.6
4	3257	TOWER SPANS NO.1 & NO.6 REINFORCING DETAILS
5	3258	PIERS NO.3, NO.4 & NO.5
6	3259	GIRDERS
7	3260	GIRDER DETAILS
8	3261	SWAY BRACING
9	3262	DETAILS OF SHOES
10	3263	FLOOR JOINTS & DESIGN INFORMATION
11	3264	BRIDGE RAIL, CAMBER DIAGRAM & SLAB REINFORCING DETAILS

ESTIMATED BRIDGE PLAN QUANTITIES 5% SWELL IN CLASS "A" CONCRETE 15% SWELL IN STRUCTURE EXAVATION

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.	SHORING AND CRIBS LUMP SUM	UNTR. TBR. FOUND. PILES LIN. FT.	TEST PILES L. SUM	TYPE "A" RANDOM RIP RAP CU. YDS.
TOWER SPAN NO.1	19-0	170	11 594	71.3	29.8	34.5	341		1 350		
PIER NO. 3		390	8 846	392.5			465		2 925	LUMP SUM	100
PIER NO.4		390	9 202	427.0			510	LUMP SUM	3 150		100
PIER NO.5		390	8 846	392.5			747		2 925		115
TOWER SPAN NO.6	19-0	170	11 594	71.3	29.8	34.5	240		1 350		
SPANS NO.2,3,4&5	648-0	770 090	70 237		416.4	1 297.67					
TOTAL	686-0	771 600	120 319	1354.6	476.0	1 366.67	2 303	LUMP SUM	11 700	L. SUM	315

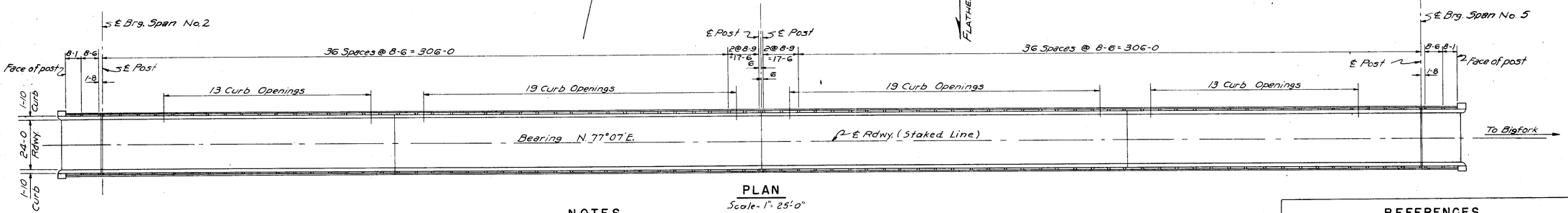
DRAWING NO. 3254Q

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	S 81(2)		1	11



NOTES:
Existing river banks shall not be disturbed for 300 ft. upstream nor for 100 ft. downstream without the written permission of the engineer.
Elevations shown for bottom of footings are approximate only.
Final elevations shall be determined by the engineer.

ELEVATION
Scale - 1" = 25'-0"



PLAN
Scale - 1" = 25'-0"

NOTES

SPECIFICATIONS:- Montana State Highway Commission Standard Specifications for Road and Bridge Construction, adopted Jan. 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.

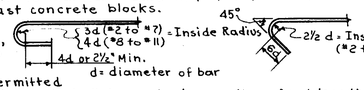
LIVE LOAD:- Standard H15-S12 Loading.

FINISHED GRADE:- Finished Plan Grade of bridge is same as profile grade shown on Road Plans.

CONCRETE:- All concrete in superstructure and as noted on Tower Spans No.1 & No.6 shall be Class "AD". All other concrete in Tower Spans No.1 & No.6 and in Piers No.3, No.4 & No.5 shall be Class "A" except as otherwise noted. An "Air Entraining Agent" shall be added to all concrete except Class "S". Chamfer all exposed edges of concrete ¾ inches and fillet entrant angles ¾ inches unless otherwise noted.

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 Specifications A 305-49 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 steel 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 above sketches, except as otherwise noted.



STRUCTURAL STEEL:- For requirements governing structural steels and their fabrication, see 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 under paragraph 45.10 (d).

STRUCTURAL STEEL (Method of Measurement and 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.

STEEL BRIDGE RAIL:- The price bid per lineal foot for Steel Bridge Rail shall be full payment for Rail Units and Posts complete in place, including grouting, painting and all incidentals pertaining thereto.

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.
In footings of bents and piers the minimum covering shall be 3 inches.

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.

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

PREFORMED EXPANSION JOINT FILLER:- Preformed Expansion Joint Filler material 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.

SETTING OF SHOES:- Rocker Shoes shall be set vertical under full dead load at 60° F. If rockers are not in correct position with final dead load on spans, spans shall be jacked and adjustments made.

REFERENCES

DWG. NO.	DESCRIPTION
3255	FOOTING PLAN
3256	TOWER SPANS NO.1 & NO.6
3257	TOWER SPANS NO.1 & NO.6 REINFORCING DETAILS
3258	PIERS NO.3, NO.4 & NO.5
3259	GIRDERS
3260	GIRDER DETAILS
3261	SWAY BRACING
3262	DETAILS OF SHOES
3263	FLOOR JOINTS & DESIGN INFORMATION
3264	BRIDGE RAIL, CAMBER & SLAB REINFORCING DETAILS

DESIGNED		
DRAWN	P.E.P.	7-9-52
TRACED	A.J.R.	9-10-52
CHECKED	H.W.K.	9-17-52
REVISED		
REVISED		

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK
FED. AID SECONDARY PROJECT NO. S-81(2)
FLATHEAD COUNTY
GENERAL LAYOUT

Scale - As Noted

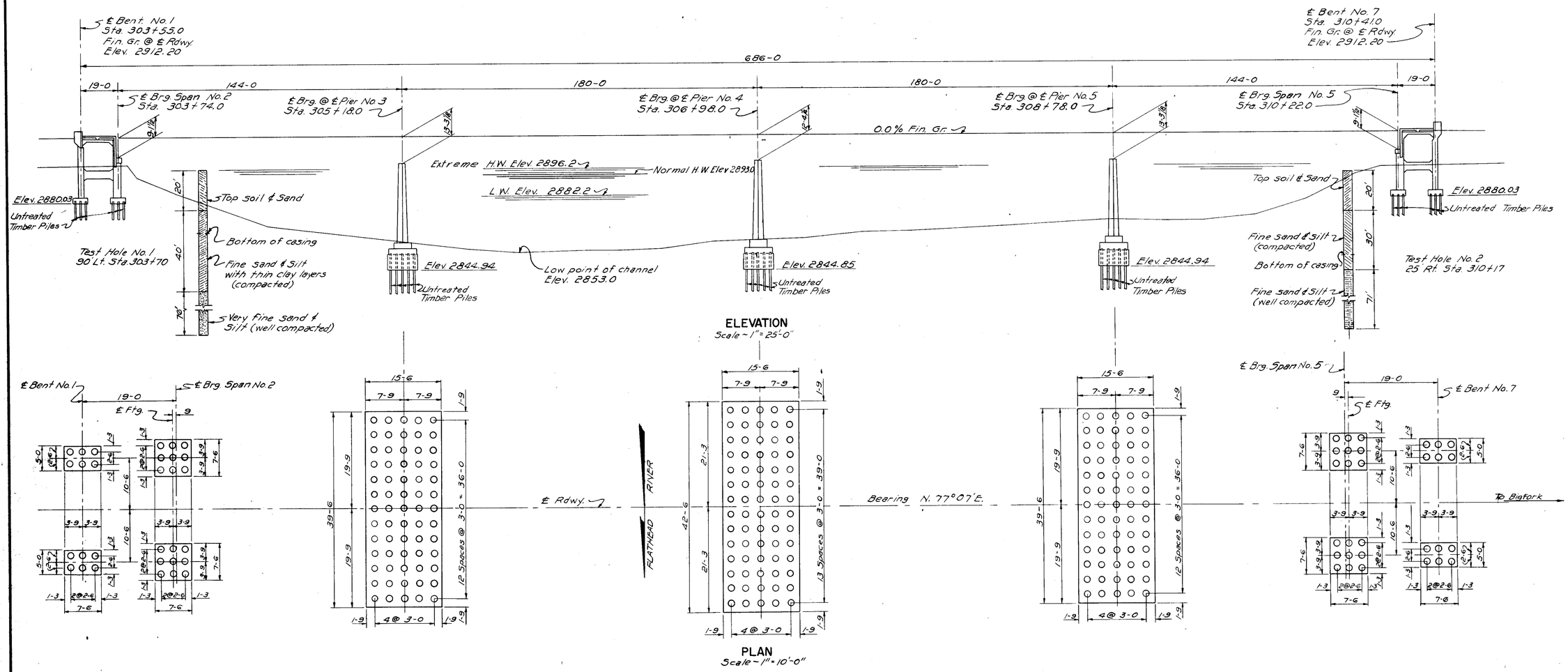
APPROVED BY _____ BRIDGE ENGINEER

STATE PRECONST. NUMBER 3081-02

DRAWING NO. 3254

J.R.E.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	S-81(2)		2	11



NOTES

STRUCTURE EXCAVATION ÷ Only the excavation below Elev. 2893.0 for Tower Spans No. 1 and No. 6 and below Elev. 2860.0 for Piers No. 3 No. 4 and No. 5 need be restricted to the area inside the cofferdams.

TEST PILES ÷ After the excavation has been made to plan grade, One untreated timber test pile shall be driven to practical refusal at each of the following locations ~ Tower Span No. 1, Pier No. 3, Pier No. 4, Pier No. 5 and Tower Span No. 6.

Test Piles shall comply with the requirements of the standard specifications and shall be driven so that the test pile can be utilized as a service pile in the structure. The Lump Sum price bid for "Test Piles" shall constitute full compensation for all materials, Labor, Equipment, Tools, and incidentals necessary to complete the item.

SOILS AND FOUNDATION MATERIALS ÷ Borings were taken by the Montana State Highway Department at the points shown, to obtain information on the subsoil at this bridge site so that a more reasonable conclusion could be reached as to the type and approximate elevation of bottom of foundation that should be used. The State Highway Department's interpretation of the materials encountered from the results of the borings is shown on this sheet.

The State Highway Department does not guarantee that the material which will be encountered in the excavation for the structure will be as listed in the log of borings shown hereon; neither does the State assume any responsibility for any variation or misinterpretation of the classes of materials.

No claim or adjustment in the bid prices for excavation or shoring and cribs will be made if the materials found in the course of excavation do not agree with those shown on this sheet in the log of borings.

Materials shown as sand and gravel may be of varying degrees of compactness or cementation.

OTHER NOTES ÷ For Other Notes see Dwg. No. 3254.

DESIGNED		
DRAWN	R.E.P.	9-3-52
TRACED	A.J.R.	9-9-52
CHECKED	H.W.K.	9-18-52
REVISED	I.W.H.	7-20-53
REVISED		

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER

NEAR BIGFORK

FED. AID SECONDARY PROJECT NO. S-81(2)

FLATHEAD COUNTY

FOOTING PLAN

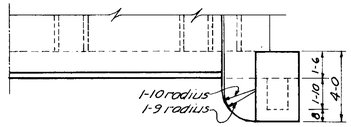
Scale ~ As Noted

STATE PRECONST. NUMBER 3081-02

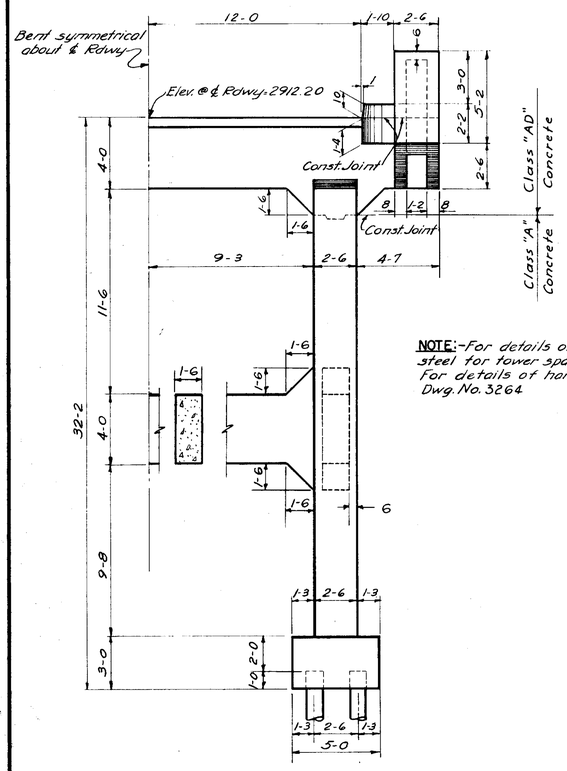
DRAWING NO. 3255

J.R.E.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	381(2)		3	11



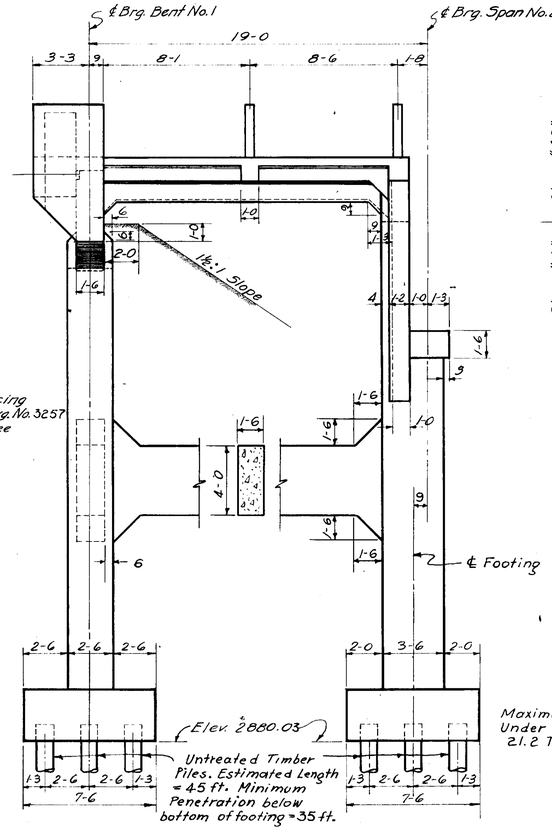
PART PLAN - BENT NO. 1



HALF ELEVATION - BENT NO. 1

Bent No. 7 Similar

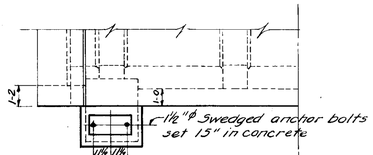
NOTE:- For details of reinforcing steel for tower span see Dwg. No. 3257
For details of handrail see Dwg. No. 3264



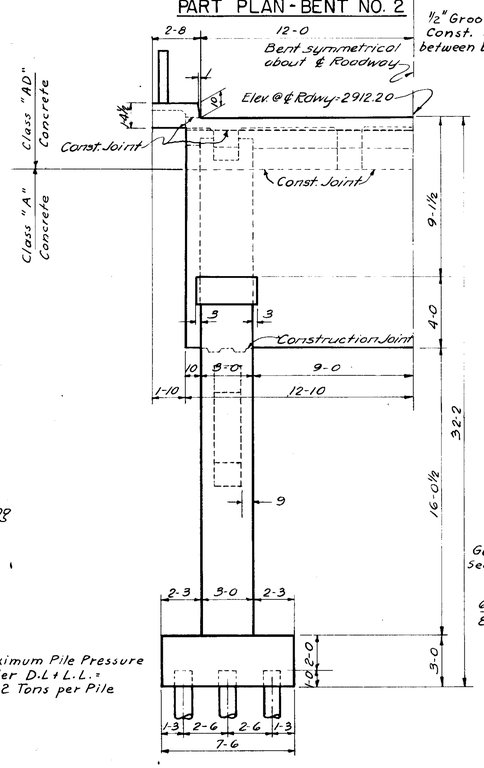
SIDE ELEVATION - TOWER SPAN NO. 1

Tower Span No. 6 Similar

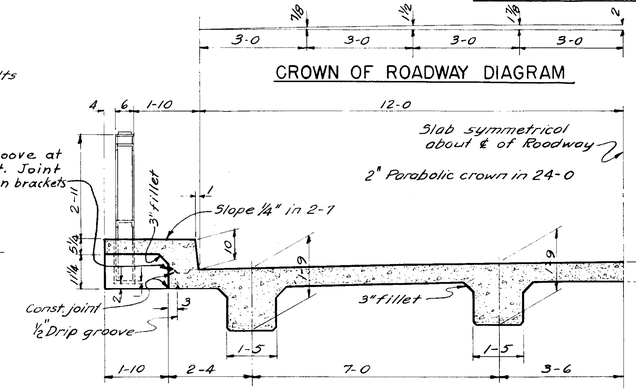
Maximum Pile Pressure Under D.L + L.L. = 21.2 Tons per Pile



PART PLAN - BENT NO. 2

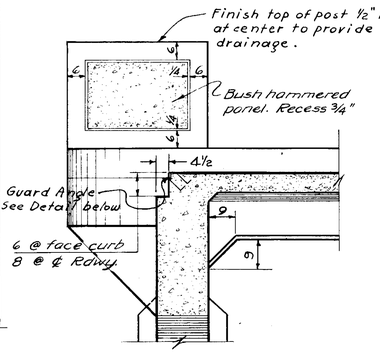


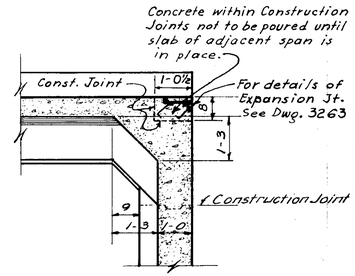
½" Groove at Const. Joint between brackets



HALF SECTION THROUGH TOWER SPAN SLAB

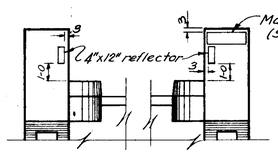
Scale - ½" = 1'-0"





SECTION ON ℄ ROADWAY

Scale - ½" = 1'-0"



ELEVATION - END POSTS



DETAIL OF MARKER

Scale - 1½" = 1'-0"

Sign to be proportioned as above. Letters 2½" high made with ⅜" stroke with space of about ½" between letters.

PAINTING OF MARKER:- Before paint is applied, plates shall be cleaned with gasoline. One coat of flat white paint and two coats of white enamel shall then be applied over entire surface of plate. "Silver Scotchlite" or equivalent reflectorizing material shall then be applied over 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.

NOTES

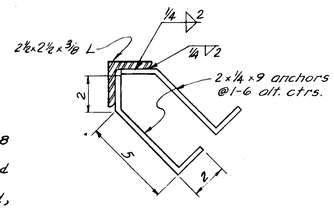
CONCRETE:- Concrete in Tower Spans shall be Class "A" and Class "AD" as noted. The Contractor will be permitted to deposit, for his convenience, all of the footings for Tower Spans No. 1 or No. 6 under water as a seal course if he desires, in which case he shall comply with the requirements and conditions set forth on Dwg. No. 3258

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.

REFLECTOR SIGNALS:- Reflector signals shall be placed at all four corners of the bridge as shown.
Reflector signals shall be 4"x12" "Silver Scotchlite" Delineators or equal. For support set 2-⅜"ø x 6" Galvanized bolts in posts.
Cost of furnishing and placing the signals shall be included in the unit price bid for Class "AD" concrete.

FORMS:- All forms for Tower Spans, above top of footing, shall be made of tongue and groove matched lumber, surfaced inside, or shall be lined with plywood. See Special Provisions.

OTHER NOTES:- For other notes see Dwgs. No. 3254, No. 3255 & No. 3258



GUARD ANGLE DETAIL

Scale - 3" = 1'-0"

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK
FED. AID SECONDARY PROJ. NO. S 81(2)
FLATHEAD COUNTY
TOWER SPANS NO. 1 & NO. 6
Scale - ¼" = 1'-0"
Except as noted.

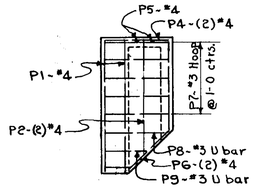
DESIGNED	P.E.P.	6-6-52
DRAWN	H.E.E.	8-20-52
TRACED	P.J.E.	8-30-52
CHECKED	H.W.K.	9-18-52
REVISED		
REVISED		

STATE PRECONST. NUMBER 3081-02

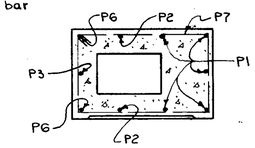
DRAWING NO. 3256

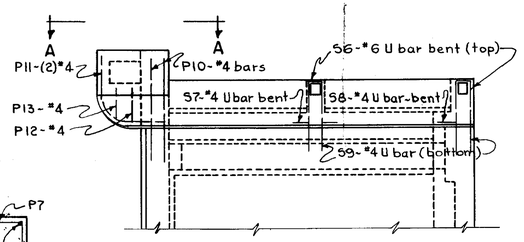
J.R.B.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	S81(2)		4	11



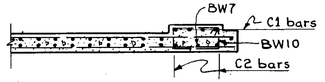
VIEW A-A



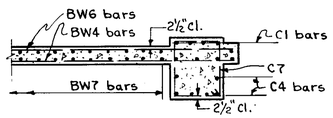


PART PLAN - TOWER SPAN 1

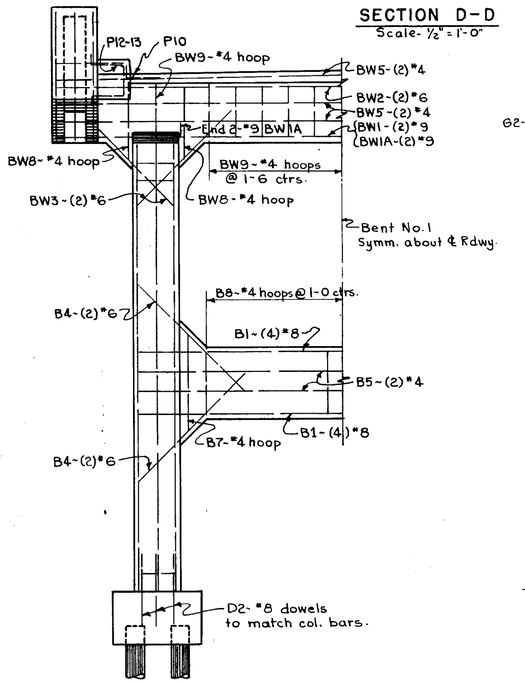
Tower Span No.6 Similar



SECTION B-B



SECTION C-C

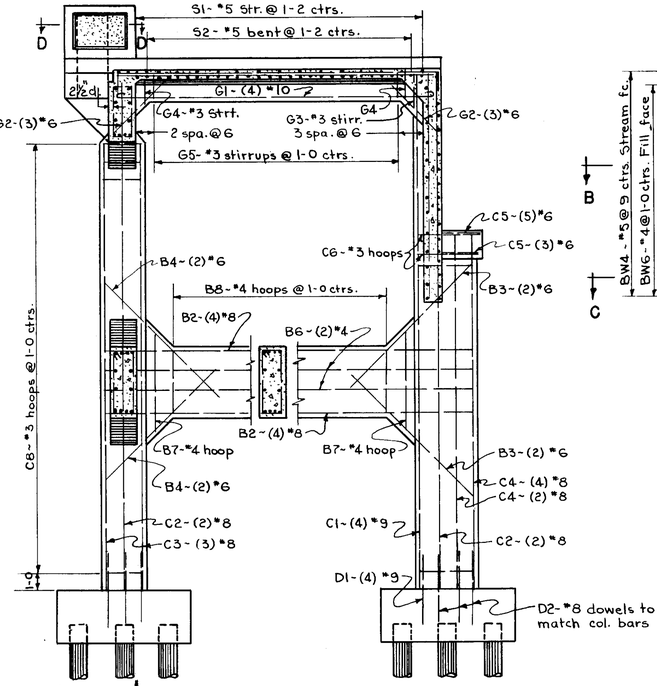


HALF ELEVATION BENT NO.1

Bent No. 7 Similar

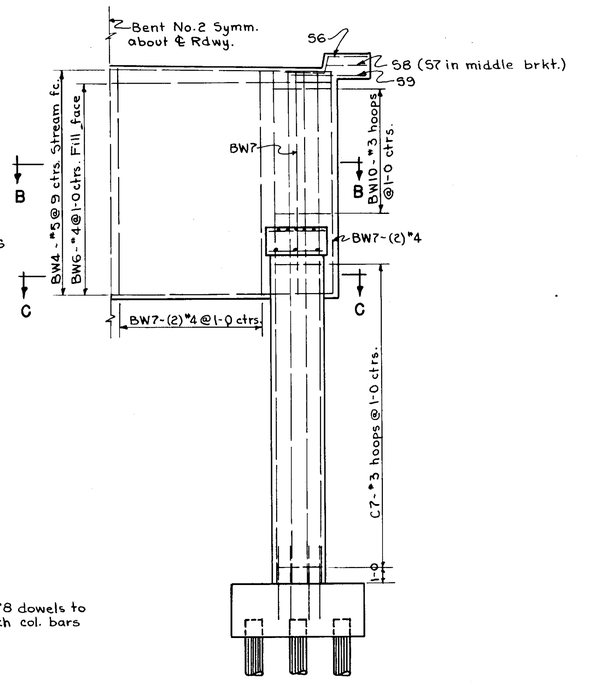
SECTION D-D

Scale- ½" = 1'-0"



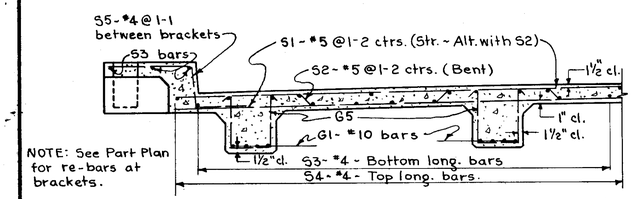
SECTION THROUGH TOWER SPAN NO.1

Tower Span No.6 Similar



HALF ELEVATION BENT NO.2

Bent No.6 Similar

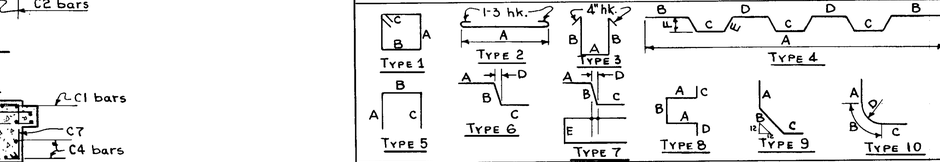


HALF SECTION THROUGH TOWER SPAN SLAB

Scale- ½" = 1'-0"

NOTE: For dimensions and details of Tower Span see Dwg. No. 3256

BILL OF REINFORCING STEEL (For One Tower Span 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	F	G
8	#9	D1	4-0	4	#3	C6	1	13-6	3-4	3-1	4				
32	#8	D2	4-0	36	#3	C7	1	12-0	3-1	2-7	4				
8	#9	C1	28-9	50	#3	C8		9-0	2-1	2-1	4				
8	#8	C2	28-9	6	#4	B7		14-1	5-7	1-1	4½				
12	#8	C3	25-1	43	#4	B8		10-1	3-7	1-1	4½				
12	#8	C4	19-9	4	#4	BW8		11-3	4-2	1-1	4½				
16	#6	C5	2-1	13	#4	BW9	1	8-9	2-11	1-1	4½				
8	#8	B1	23-1	16	#3	BW10	1	8-0	2-7	1-1	4				
16	#8	B2	20-10	16	#10	G1	2	20-10	18-4						
8	#6	B3	9-9	4	#3	G3	3	7-6	1-2	2-3					
16	#6	B4	8-6	8	#3	G4	3	6-6	1-2	1-9					
4	#4	B5	23-1	60	#3	G5	3	4-10	1-2	1-6					
8	#4	B6	20-10	14	#5	S2	4	26-1	25-4	3-7	3-7½	2-10	5½	4	
2	#9	BW1	32-3	19	#4	S4	5	20-0	1-0	18-0	1-0				
2	#6	BW2	32-3	28	#4	S5	6	5-0	2-4	1-2½	1-6	1½			
8	#6	BW3	7-6	4	#6	S6	7	10-10	2-4	1-2½	1-6	1½	9		
18	#5	BW4	25-3	2	#4	S7	8	6-4	2-4½	9	5	5			
6	#4	BW5	32-3	2	#4	S8	8	5-11	2-4½	9	5				
13	#4	BW6	25-3	4	#4	S9	5	8-7	3-11	9	3-11				
42	#4	BW7	12-7	4	#4	P6	9	9-6	4-10	3-6	1-2				
24	#6	G2	4-6	10	#3	P7	1	12-4	3-8	2-2	4				
30	#5	S1	25-3	2	#3	P8	5	9-2	3-6	2-2	3-6				
20	#4	S3	18-0	2	#3	P9	5	7-2	2-6	2-2	2-6				
10	#4	P1	7-3	4	#4	P10	6	6-8	4-0	1-2½	1-6	1½			
4	#4	P2	6-3	4	#4	P11	10	6-11	2-4	2-6	2-1	1-7			
2	#4	P3	4-10	2	#4	P12	8	7-6	1-10	1-10	1-0	1-0			
4	#4	P4	3-8	2	#4	P13	8	7-2	1-8	1-10	1-0	1-0			
4	#4	P5	2-2												
2	#9	BW1A	18-0												

DESIGNED	P.E.P.	6-6-52
DRAWN	H.E.E.	8-22-52
TRACED	C.A.M.	9-12-52
CHECKED	H.W.K.	9-18-52
REVISED		
REVISED		

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK
FED. AID SECONDARY PROJ. NO. S81(2)
FLATHEAD COUNTY
TOWER SPANS NO.1 & NO.6
REINFORCING DETAILS

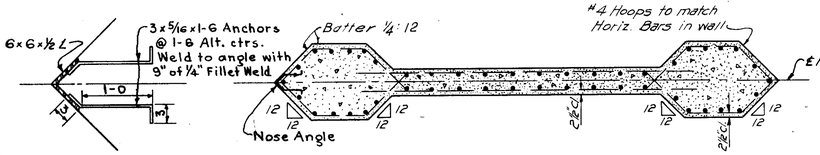
Scale: ¼" = 1'-0" Except as noted

STATE PRECONST. NUMBER 3081-02

DRAWING NO. 3257

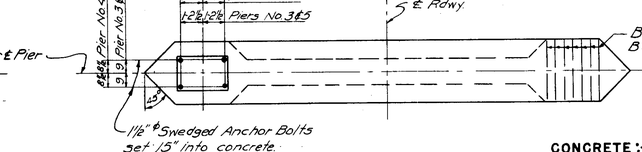
J.K.B.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	S-81(2)		5	11



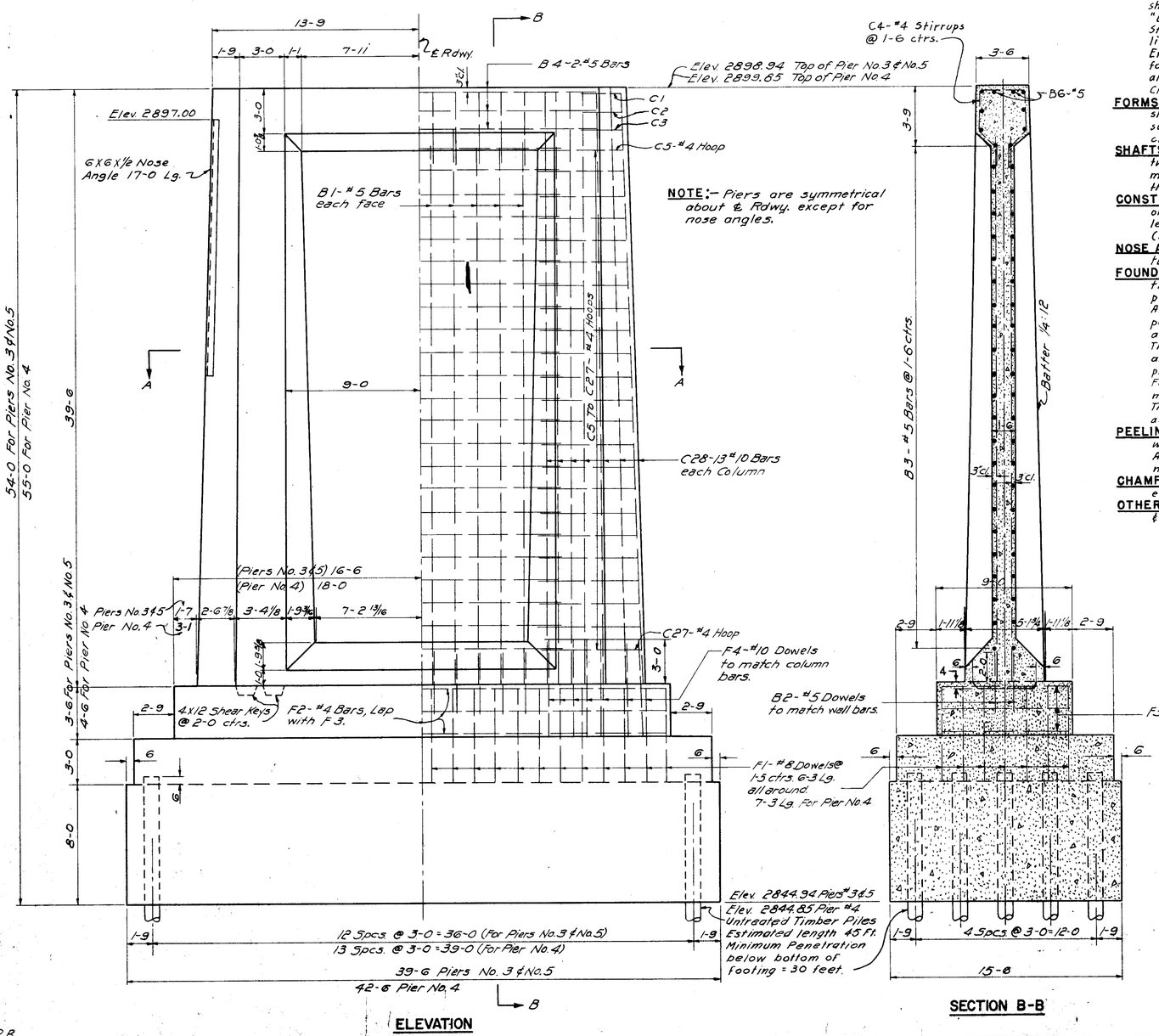
SECTION OF NOSE ANGLE

Scale- 1"=1'-0"



SECTION A-A

PLAN VIEW



ELEVATION

SECTION B-B

NOTES

CONCRETE:- All concrete in piers shall be Class "A". The Contractor will be permitted to deposit for his convenience a portion or all of the pier base under water as a seal course if he desires, in which case he shall use Class "S" concrete for the concrete deposited under water, and he shall place it in accordance with the requirements for "Depositing Concrete Under Water", as called for in the Standard Specifications. Concrete placed outside of neat lines shown on the plans, or neat lines as modified by the Engineer, as well as the change in mix for the seal, will be for the Contractor's convenience, and he shall include all cost connected therewith in the unit price bid for Class "A" concrete.

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 surface of the piers and left rough in the interior with satisfactory shear keys. (See detail of shear key).

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

FOUNDATION PILING:- All foundation piling shall be untreated timber and shall meet the requirements for untreated piling set forth in the Standard Specifications. All piling shall be driven to sustain safely the design load per pile as shown for the respective towers and piers, in accordance with the Standard Specifications. The price bid per lineal foot shall be for piling in place, and payment shall be made only for the actual length of piling left in place below the cut-off. For bidding purposes only, pile lengths have been estimated as noted on the details of towers and piers. The contractor shall determine the required pile lengths, as provided in the Standard Specifications.

PEELING OF PILES:- All piles shall be peeled in accordance with the Standard Specifications soon after cutting. All peeling shall be accomplished by such means as will not damage, destroy or remove any of the sapwood.

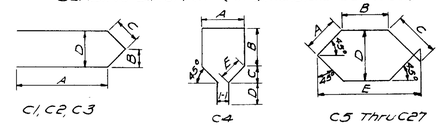
CHAMFER:- Chamfer all exposed corners 1½ inches and fillet entrant angles 1½ inches except as otherwise noted.

OTHER NOTES:- For other notes see Dwg. No. 3254, No. 3255, & No. 3256

MAXIMUM PILE LOAD:-
Pier No. 3 under D.L + Buoy. + L.L. + Wind + 6" Ice at Elev. 2893.0 is 26.3 Tons per pile.
Pier No. 4 under D.L. + Buoy. + L.L + Wind + 6" Ice at Elev. 2893.0 + ½ Long. Force is 27.1 Tons per pile
Pier No. 5 under D.L. + Buoy. + L.L. + Wind + 6" Ice at Elev. 2893.0 is 27.8 Tons per pile.

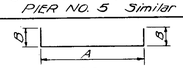
BILL OF REINFORCING STEEL
For Shaft of Pier No.3, Shaft of Piers No.4 & No.5 Similar

BENDING DIAGRAM (All dimensions out to out)



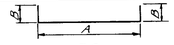
STRAIGHT BARS				BENT BARS									
No.	SIZE	LENGTH	MARK	No.	SIZE	MARK	LENGTH	A	B	C	D	E	F
				2	4	C1	6-9	1-3	1-8	2-1⅞	3-0		
				2	4	C2	6-9	1-3	1-6¼	2-1¾	3-0⅛		
26	#10	39-3	C28	2	4	C3	6-10	1-3	1-6⅛	2-2⅛	3-1		
				10	4	C4	13-7	3-1	2-9	1-¾	1-0	1-6	
20	5	36-0	B1	2	4	C5	16-1	2-3	2-10	2-11⅛	3-2¾	6-6	
20	5	4-0	B2	↑		C6	16-3	2-3½	2-10⅛	3-0	3-3⅛	6-7	
46	5	19-0	B3			C7	16-5	2-4	2-10⅛	3-0⅛	3-4¼	6-7⅛	
6	5	23-9	B4			C8	16-8	2-4½	2-10⅛	3-1	3-5	6-8⅛	
14	4	3-0	B5			C9	16-10	2-5	2-10⅛	3-1⅛	3-5⅜	6-9⅛	
						C10	17-1	2-5½	2-10⅜	3-2	3-6⅛	6-10⅛	
2	#5	26-0	B6			C11	17-4	2-6¼	2-11	3-2⅜	3-7⅛	6-11⅛	
						C12	17-6	2-6⅜	2-11	3-3¼	3-8	7-0⅛	
						C13	17-8	2-7¼	2-11¼	3-3⅜	3-8⅜	7-1⅛	
						C14	17-10	2-7⅜	2-11¼	3-4¼	3-9⅛	7-2	
						C15	18-1	2-8¼	2-11⅛	3-4⅜	3-10⅛	7-3	
						C16	18-3	2-8⅜	2-11⅛	3-5¼	3-11	7-4	
						C17	18-5	2-9¼	2-11⅛	3-5⅜	3-11⅛	7-5	
						C18	18-8	2-9⅜	3-0	3-6¼	4-0⅛	7-5⅜	
						C19	18-10	2-10¼	3-0	3-6⅜	4-1¼	7-6⅛	
						C20	19-0	2-10⅜	3-0⅛	3-7⅛	4-2	7-7⅛	
						C21	19-2	2-11¼	3-0⅛	3-7⅜	4-2⅜	7-8⅛	
						C22	19-6	3-0	3-0⅛	3-8¼	4-3⅛	7-9⅛	
						C23	19-8	3-0⅛	3-0⅜	3-9	4-4⅛	7-10⅛	
						C24	19-10	3-1	3-0⅜	3-9⅛	4-5	7-11	
						C25	20-1	3-1⅛	3-1	3-10	4-5⅜	8-0	
						C26	20-3	3-2	3-1	3-10⅛	4-6¼	8-0⅛	
				2	4	C27	20-5	3-2⅛	3-1⅛	3-11	4-7⅛	8-1	

REINFORCING STEEL IN FOOTING OF PIER NO. 3
PIER NO. 5 Similar



STRAIGHT BARS				BENT BARS (All dimensions out to out)									
NO.	SIZE	LENGTH	MARK	NO.	SIZE	MARK	LENGTH	A	B	C	D	E	F
58	#8	6-3	F1	6	#4	F3	11-6	8-6	1-6				
6	#4	32-6	F2										
26	#10	6-6	F4										

REINFORCING STEEL IN FOOTING OF PIER NO. 4



STRAIGHT BARS				BENT BARS (All dimensions out to out)									
NO.	SIZE	LENGTH	MARK	NO.	SIZE	MARK	LENGTH	A	B	C	D	E	F
62	#8	7-3	F1	6	#4	F3	11-6	8-6	1-6				
6	#4	35-6	F2										
26	#10	7-6	F4										

DESIGNED	P.E.P.	6-2-52
DRAWN	F.M.T.	9-2-52
TRACED	A.J.R.	9-15-52
CHECKED	H.W.K.	9-18-52
REVISED		
REVISED		

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK
FED. AID SECONDARY PROJECT NO. S-81(2)
FLATHEAD COUNTY
PIERS NO.3, NO.4 & NO. 5

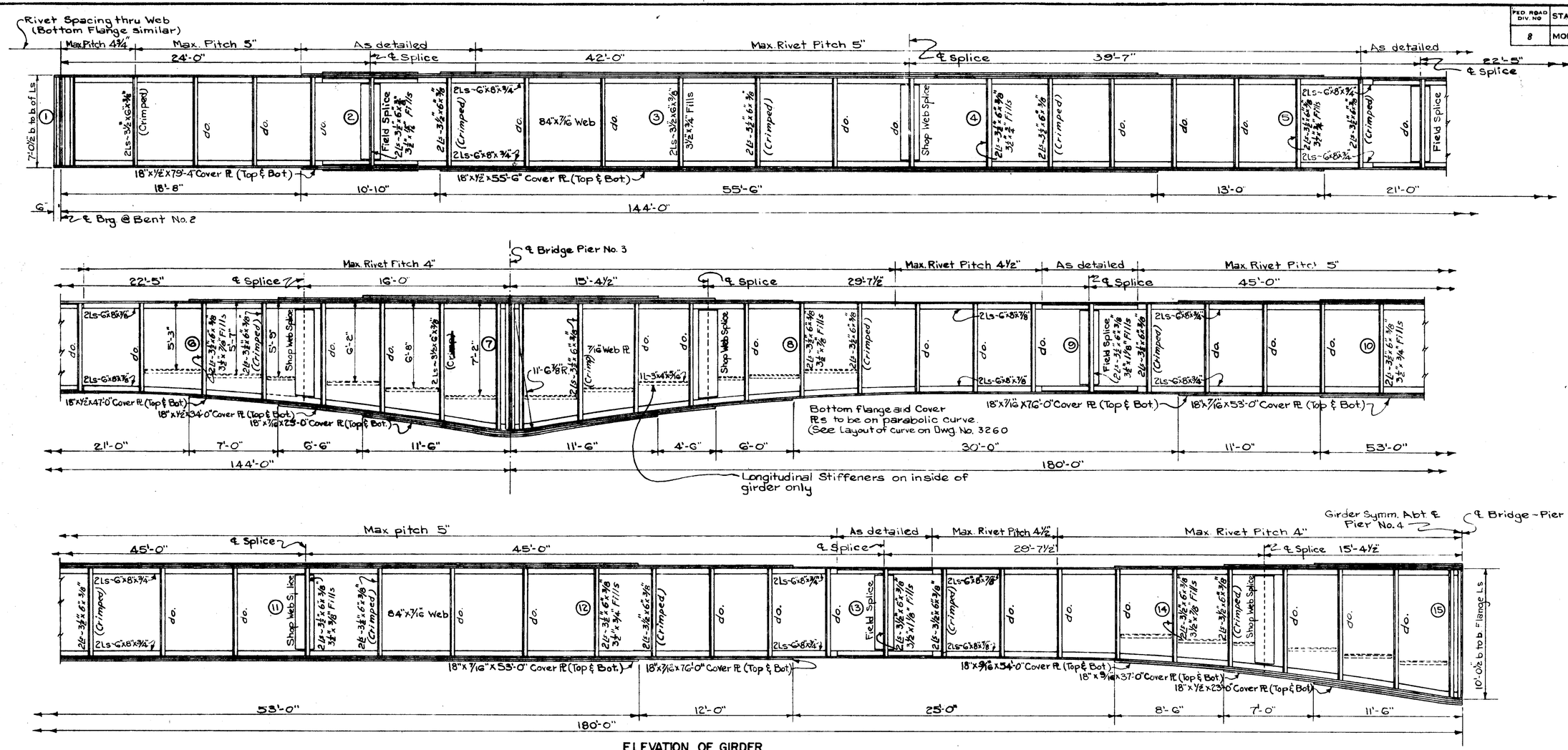
Scale = ¼"=1'-0"

STATE PRECONST. NUMBER 3081-02

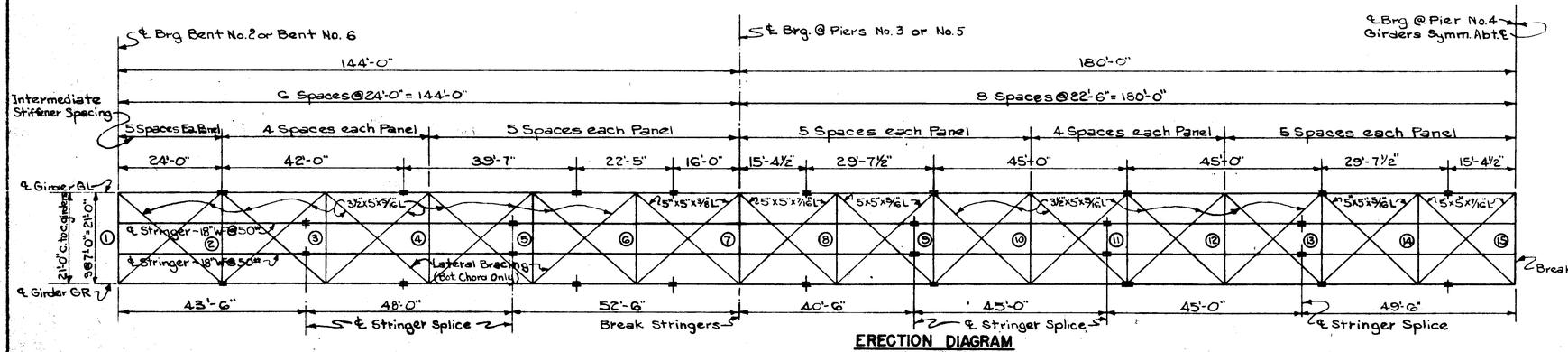
DRAWING NO. 3258

J.R.B.

FED. ROAD DIV. NO	STATE	FED. AID SEC. OR EXTENSION NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	S81(2)		6	



ELEVATION OF GIRDER
Scale ~ ¼" = 1'-0"



ERECTION DIAGRAM
Scale ~ 1" = 15'-0"

NOTES

OTHER NOTES:- For "Other Notes" see Dwg. No's 3254 and 3260
DETAILS:- For "Girder Details" see Dwg. No. 3260

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK

FED. AID SECONDARY PROJ. NO. S81(2)

FLATHEAD COUNTY

GIRDERS

Scale ~ As Noted

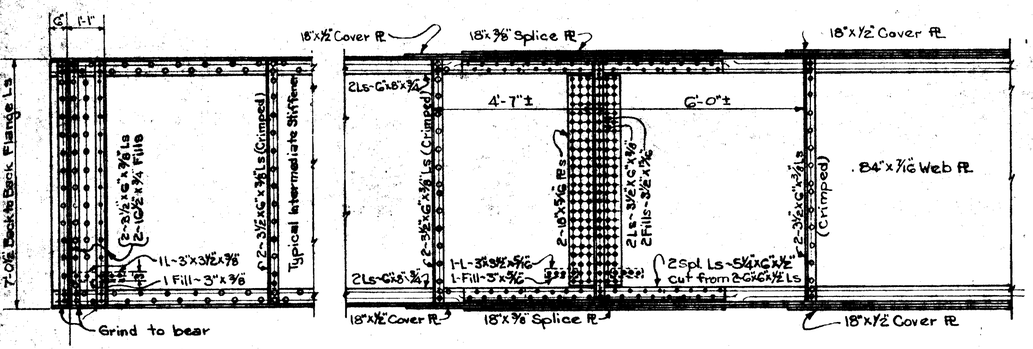
DESIGNED	J.R.B.	5-51
DRAWN	F.E.P.	7-25-51
TRACED	T.H.J.	8-13-51
CHECKED	J.R.B.	9-5-51
REVISED		
REVISED		

STATE PRECONST. NUMBER 3081-02

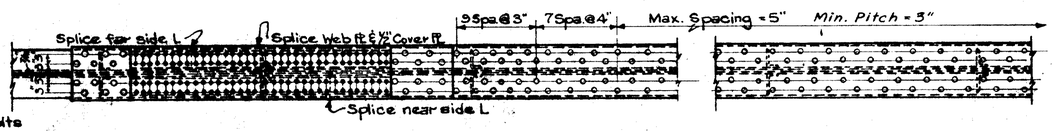
DRAWING NO. 3259

J.R.B.

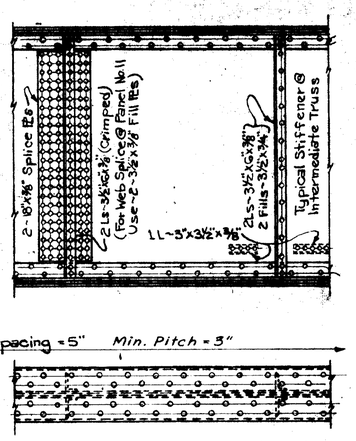
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.		SHEET NO.	TOTAL SHEETS
8	MONT.	S81(2)		7	11



GIRDER DETAIL
BENTS NO.2 & NO.6

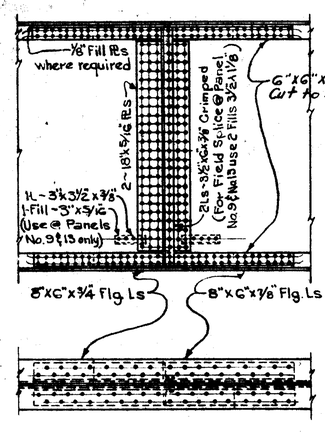


FIELD SPLICE 24 FT. FROM R1

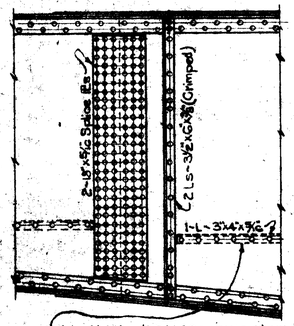


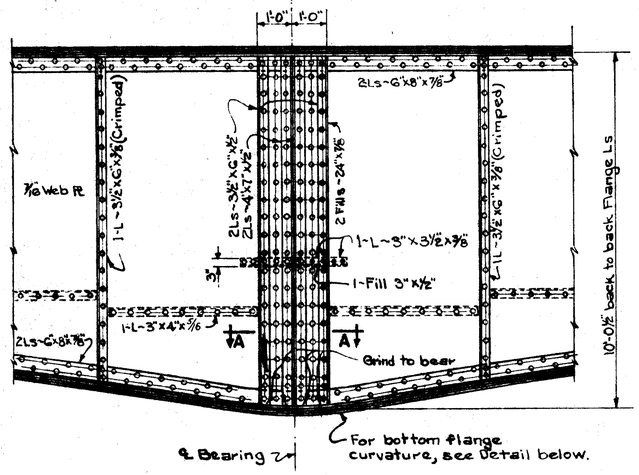
TYPICAL RIVETING
AT ENDS OF COVER PLS

WEB SPLICE
NEAR MIDDLE OF 144'-0" SPANS
(Web Splice at Middle of 180'-0" Spans Similar)



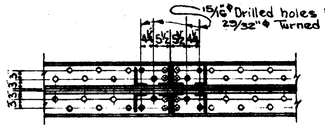
FIELD SPLICE BETWEEN PANELS
NO.5 & NO.6
(Field Splice At Panels No.9 & 13 Similar)



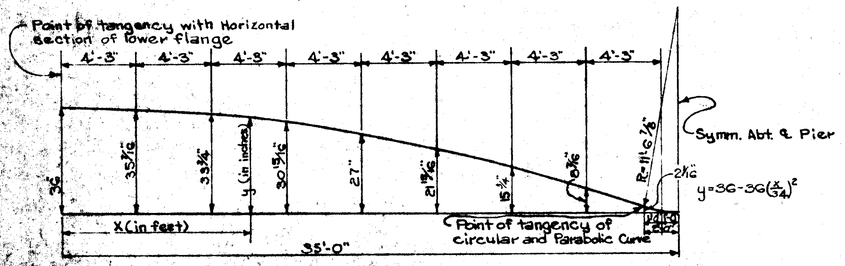


WEB SPLICE NEAR R2 & R3

DETAIL AT PIERS NO.3, 4 & 5



SECTION A-A



DETAIL OF CURVATURE OF BACK OF LOWER FLANGE ANGLE
AT R2, R3 & R4

—NOTES—

RIVETS — ¾" ϕ unless otherwise noted.

REAMING — All field holes in girder splices shall be sub-punched 1/16" ϕ and reamed 1/32" ϕ or drilled in shop, as called for in the Standard Specifications. In reaming field holes in girder splices, the adjacent sections of the girders must be assembled in exact position with sufficient support throughout the entire length to maintain girders in proper position. Where turned bolts are used holes shall be sub-punched 1/16" ϕ and reamed to 25/32" ϕ or drilled for ¾" ϕ turned bolts. For 25/32" ϕ turned bolts sub-punch to 13/16" ϕ and ream to 25/32" ϕ or drill.

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

ERECTION — Girders shall be supported at splice points and at sufficient intervals throughout their entire length, to maintain girders at exact elevation and proper alignment during riveting of field splices.
All splices shall be pinned and bolted in accordance with the Standard Specifications before riveting is begun.

COUNTERSUNK RIVETS — Rivets in outstanding legs of flange angles may be countersunk where necessary to clear stiffener angles.

CAMBER — Girders shall be fabricated and erected with camber as indicated in the diagram on Dwg. No. 3264.

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: ¼" @ .072 #/l, 5/16" @ .128 #/l, ⅜" @ .287 #/l, 7/16" @ .510 #/l, ½" "J" @ .911 #/l, ⅝" "J" @ 1.166 #/l, ¾" "J" @ 1.438 #/l, and 1⅛" "J" @ 2.043 #/l.

STRUCTURAL STEEL (METHOD OF MEASUREMENT AND 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 & 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.

FLOOR MEMBERS — Sway frames shall be set in a plane normal to the grade of the top flange of the main girders. Stringers shall be set with webs vertical.

INTERMEDIATE STIFFENERS — Intermediate stiffener angles shall be crimped except that those carrying sway frames shall not be crimped.

SPLICE ANGLES — Splice angles shall be ground to fit fillet of flange angles.

OTHER NOTES — For other notes, see Drawing Number 3254

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK
FED. AID SECONDARY PROJ. NO. S 81(2)
FLATHEAD COUNTY
GIRDER DETAILS
Scale-½"=1'-0"

DESIGNED	J.R.B.	5-51
DRAWN	P.E.P.	7-30-51
TRACED	T.H.J.	8-17-51
CHECKED	J.R.B.	7-5-51
REVISED		
REVISED		

STATE PRECONST NUMBER 3081-02

DRAWING NO. 3260

J.R.B.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
8	MONT.	S81(2)		8	11

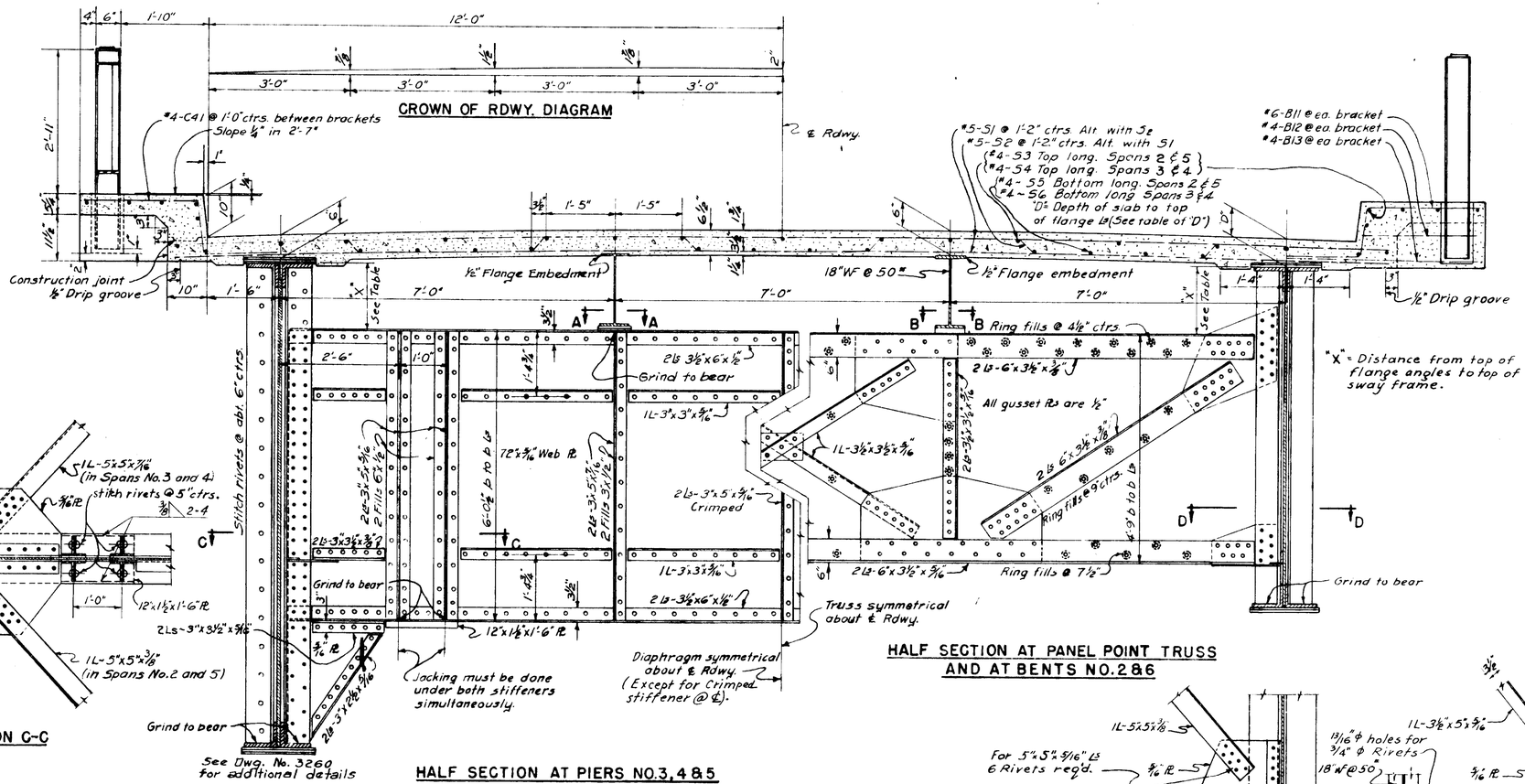


TABLE OF "D"

	Span No. 2											Span No. 3											Symm. about Pier No. 4
GIRDER POINT	R1	.1	.2	.3	.4	.5	.6	.7	.8	.9	R2	.1	.2	.3	.4	.5	.6	.7	.8	.9	R3	
DEPTH OF SLAB "D"	6"	6 3/16"	6 3/16"	7 1/16"	7 1/8"	7 1/16"	6 3/4"	6 3/8"	6 1/16"	7 1/8"	7 7/16"	7 1/4"	6 9/16"	6 7/16"	6 5/16"	7"	6 1/16"	6 7/16"	6 1/16"	7 3/8"	7 3/8"	

TABLE OF "X" DIMENSION

PANEL POINT NO.	1=R1	2	3	4	5	6	7=R2	8	9	10	11	12	13	14	15=R3
DIMENSION "X"	1'-5 9/16"	1'-5 1/8"	1'-4 3/16"	1'-4 3/16"	1'-5 3/16"	1'-4 7/8"	1'-4 1/16"	1'-4 3/4"	1'-5 7/8"	1'-5"	1'-4 3/16"	1'-5"	1'-5 1/8"	1'-4 3/8"	1'-4 1/16"

J.R.B.

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK
FED. AID SECONDARY PROJ. NO. S81(2)

FLATHEAD COUNTY

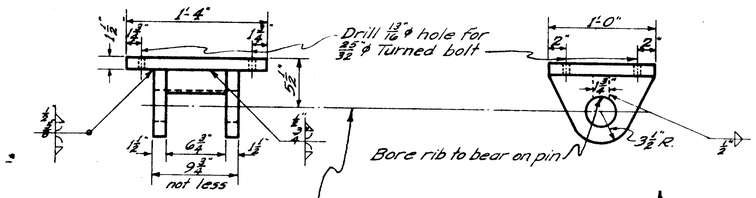
SWAY BRACING
Scale-¾"=1'-0"

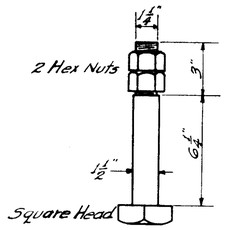
DESIGNED	J.R.B.	5-51
DRAWN	R.E.P.	6-2-51
TRACED	J.W.A.	8-17-51
CHECKED	J.R.B.	9-3-51
REVIEWED		
REVISED		

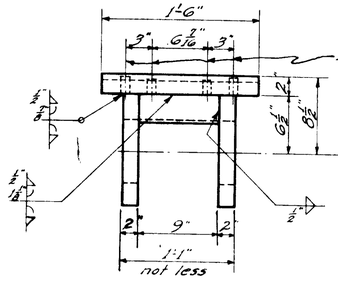
STATE PRECONST NUMBER 3081-02

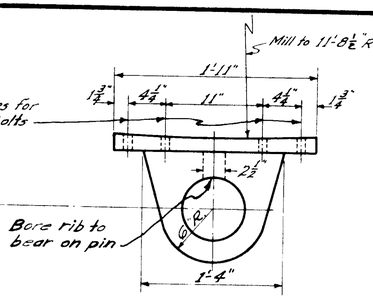
DRAWING NO. 3261

FED. ROAD DIST. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
8	MONT.	S 81(2)		9	11



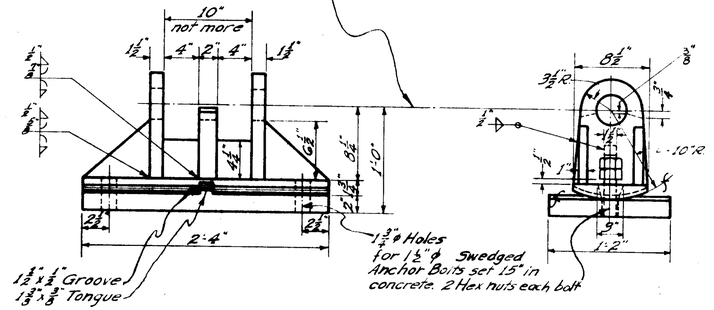




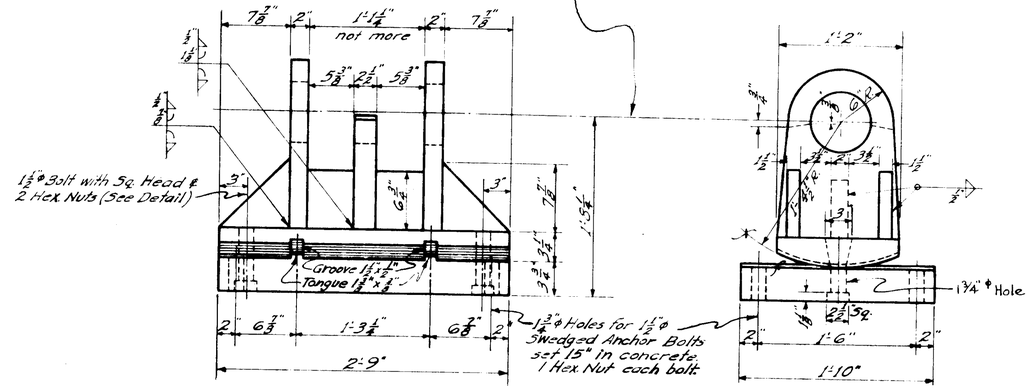


Bore $3\frac{13}{23}$" ϕ Hole for $3\frac{1}{2}$" ϕ Pin

Bore $7\frac{13}{32}$" ϕ Hole for 7" ϕ Pin



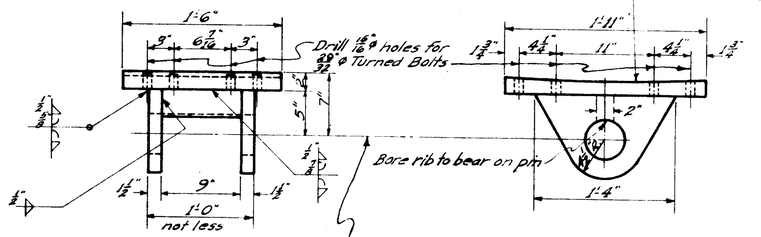
Material: Carbon Structural Steel.



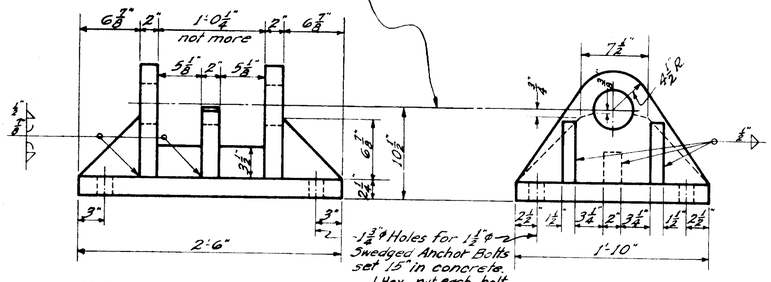
Material: Carbon Structural Steel.

ROCKER SHOE AT PIERS NOS. 3 & 5

ROCKER SHOE AT BENTS NOS. 2 & 6



Bore $4\frac{13}{23}$" ϕ hole for $4\frac{1}{2}$" ϕ pin



Material: Carbon Structural Steel.

FIXED SHOE AT PIER NO. 4

J.R.B.

- NOTES -

FINISHING — To assure full bearing, all surfaces in contact shall be edge planed or otherwise finished before welding.
Shoes are to be fully annealed after all welding is completed and before pin holes are drilled or curved bearing surfaces are finished.
Base plates under rockers are to be hot straightened before finishing.

WELDING — Welding is symmetrical about ℄s of shoes.

SETTING OF SHOES — Rocker shoes shall be set vertical under full dead load at 60°F. If rockers are not in correct position with final dead load on spans, spans shall be jacked and adjustments made.

WEIGHTS OF WELDS — For weights of welds, see Dwg. No. 3260

DESIGNED	J.R.B.	5-16-51
DRAWN	P.E.P.	8-6-51
TRACED	I.W.H.	8-11-51
CHECKED	J.R.B.	8-30-51
REVIEWED		
REVISED		

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK

FED. AID SECONDARY PROJ. NO. S81(2)

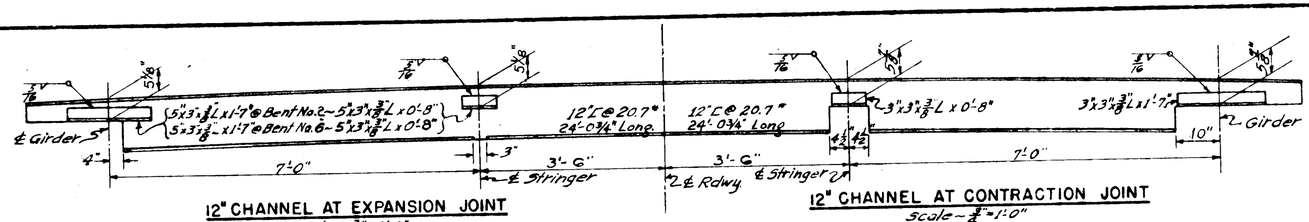
FLATHEAD COUNTY

DETAILS OF SHOES
Scale - 1 1/2" = 1'-0"

STATE PRECONST. NUMBER 3081-02

DRAWING NO 3262

FED ROAD DIST. NO.	STATE	FED AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
8	MONT	S81(2)		10	11

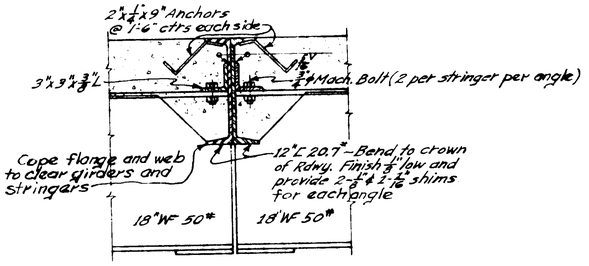


12" CHANNEL AT EXPANSION JOINT

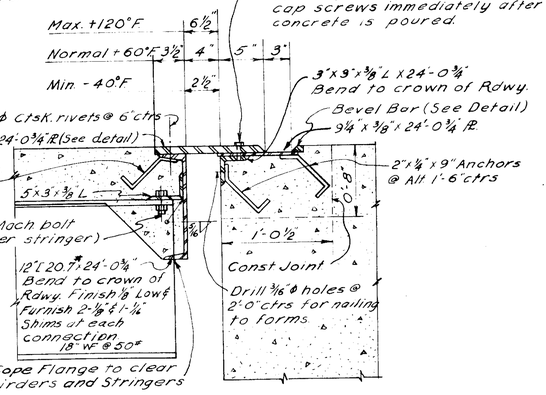
Scale - 3/4" = 1'-0"

12" CHANNEL AT CONTRACTION JOINT

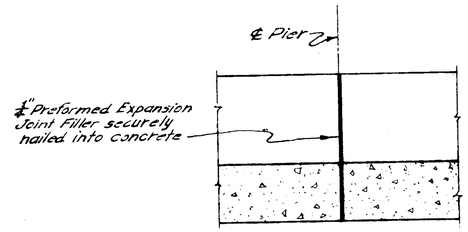
Scale - 3/4" = 1'-0"



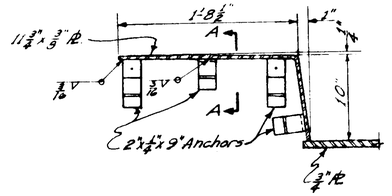
CONTRACTION JOINT AT PIERS NOS. 3, 4 & 5



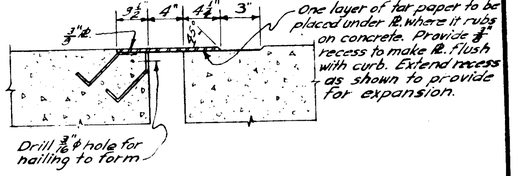
DETAIL OF EXPANSION JOINT BENTS NO. 2 & NO. 6



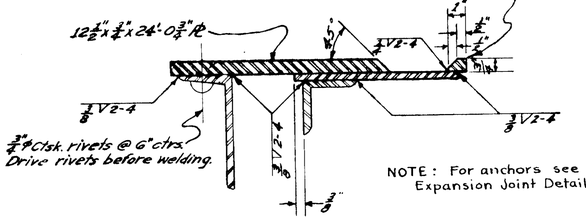
TYPICAL SIDEWALK CONTRACTION JOINT



TYPICAL CURB EXPANSION JOINT



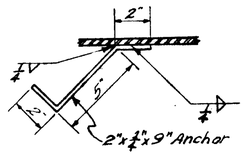
SECTION A-A



Set entire assembly level

EXPANSION PLATE DETAIL

Scale - 3" = 1'-0"



TYPICAL ANCHOR DETAIL

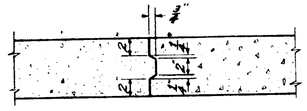
(Except For Curb Expansion Jt.)

Scale - 3" = 1'-0"

DESIGN INFORMATION					
D.L. = Dead Load L.L. = Live Load + Impact Moments in Ft. Kips Reactions & Shears in Kips. Deflections in Inches	Span "2 144'-0"	Span "3 180'-0"	Span "4 180'-0"	Span "5 144'-0"	
	R_1	R_2	R_3	R_4	R_5
	Span "2 Span "5	Span "3 Span "4	At R_1 R_5	At R_2 R_4	At R_3
MOMENT D.L.	2,675.0	2,395.0		-5,775.0	-6,120.0
MOMENT L.L.	1,804.0	1,850.0		-2,750.0	-3,050.0
REACTIONS D.L.			100.2	354.0	354.8
REACTIONS L.L.			66.4	149.2	154.8
SHEARS D.L.			100.2	180.4	177.4
SHEARS L.L.			66.4	85.2	90.0
DEFLECTIONS D.L.	1.46	1.38			
DEFLECTIONS L.L.	1.41	1.80			

SLAB POURING DIAGRAM

Note: Sections of the same number need not be poured simultaneously. Forms and reinforcing steel for all spans shall be in place before pouring is started.



SHEAR KEYS AT CONSTRUCTION JOINTS IN SLAB

-NOTES-

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.

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK
FED. AID SECONDARY PROJ. NO. S 81(2)
FLATHEAD COUNTY
FLOOR JOINTS & DESIGN INFORMATION

Scale - 1 1/2" = 1'-0" except as noted

DESIGNED	J.R.B.	5-51
DRAWN	R.E.P.	8-7-51
TRACED	[illegible]	8-16-51
CHECKED	J.R.B.	9-5-51
REVIEWED		
REVISED		

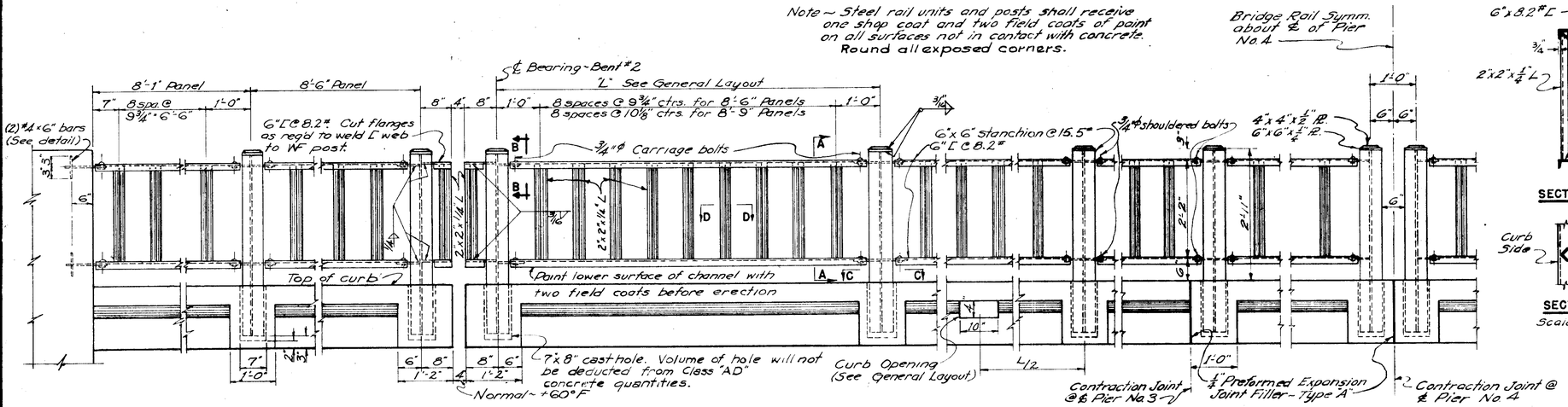
STATE PRECONST. NUMBER 3081-02

DRAWING NO. 3263

J.R.B.

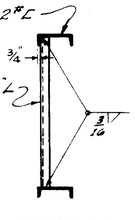
FED ROAD DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEET
8	MONT	S81(2)		11	11

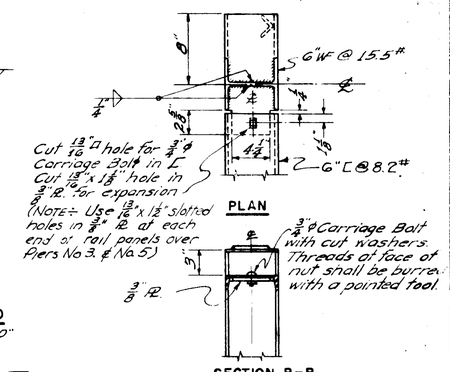
Note – Steel rail units and posts shall receive one shop coat and two field coats of paint on all surfaces not in contact with concrete. Round all exposed corners.

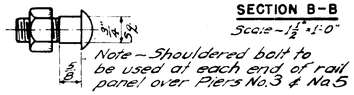


STEEL BRIDGE RAIL DETAILS

Scale – ¾" = 1'-0"







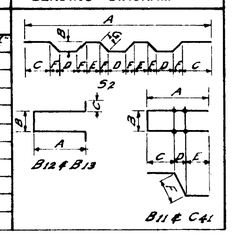
CARRIAGE BOLT DETAIL

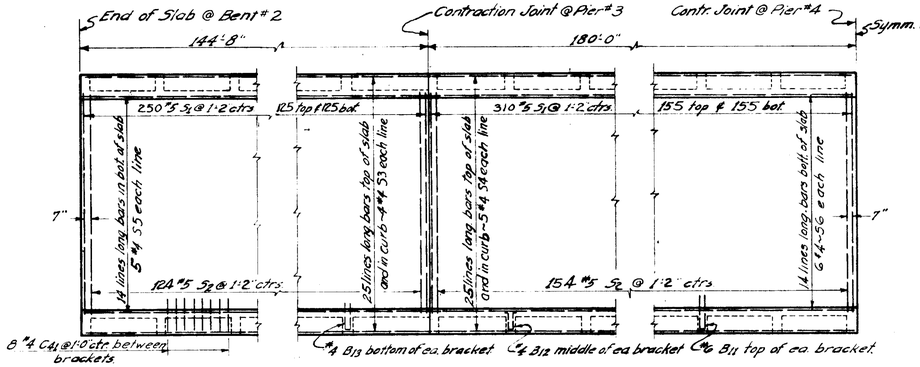
Scale – 6" = 1'-0"

BILL OF REINFORCING STEEL – SLAB & CURB

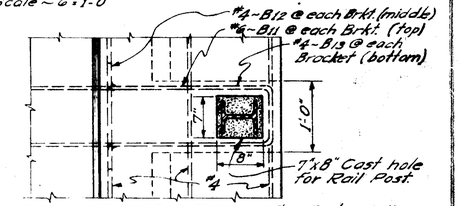
STRAIGHT BARS				BENT BARS										
NO	SIZE	LENGTH	MARK	NO	SIZE	LENGTH	MARK	A	B	C	D	E	F	G
1120	#5	25'-4"	S1	556	#5	26'-1"	S2	25'-6"	4	3'-7"	3'-7⅞"	2'-0	3½"	5½"
200	#4	37'-1"	S3	156	#6	11'-3"	B11	4'-1½"	0'-10	2'-6"	0'-1½"	1'-8"	1'-2½"	
250	#4	37'-0"	S4	156	#4	6'-5"	B12	2'-5"	0'-10	0'-4½"				
140	#4	29'-11	S5	156	#4	8'-5"	B13	3'-9½"	0'-10					
168	#4	31' 0"	S6	1216	#4	4'-10"	C41			2'-4"	0'-1½"	1'-8"	1'-2½"	

BENDING DIAGRAM





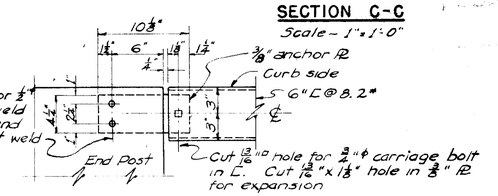
PLACING DIAGRAM FOR REINFORCING STEEL IN SLAB & CURB



GROUTING BRIDGE RAIL POSTS – After Bridge Rail for structure is in place, properly adjusted and aligned, 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 the entire pocket in which each post is set is completely filled with well tamped mortar, finished at top with slight slope away from steel posts to prevent formation of water pockets. Top of mortar shall be finished as specified for the curb.

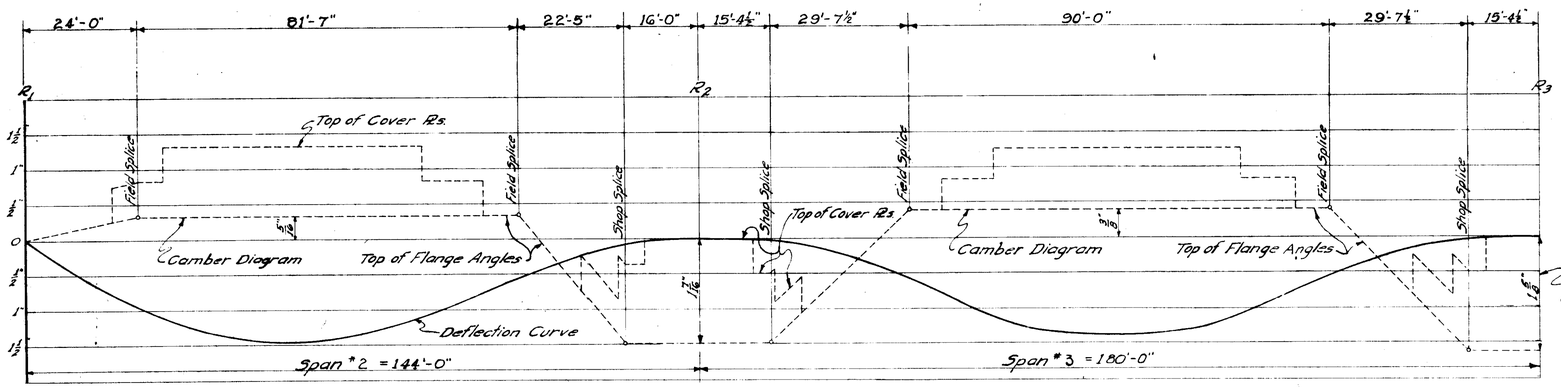
SECTION C-C

Scale – 1" = 1'-0"



DETAIL OF RAIL CONNECTION AT END POSTS

Scale : 1½" = 1'-0"



DEFLECTION & CAMBER DIAGRAM

STATE OF MONTANA
STATE HIGHWAY COMMISSION

BRIDGE OVER FLATHEAD RIVER
NEAR BIGFORK
FED. AID SECONDARY PROJ. NO. S81(2)
FLATHEAD COUNTY
BRIDGE RAIL, CAMBER DIAGRAM
AND SLAB REINFORCING DETAILS
Scale As Noted

DESIGNED	J.R.B.	5-51
DRAWN	P.E.P. & T.H.J.	8-3-51
TRACED	I.W.H.	8-20-51
CHECKED	J.R.B.	9-4-51
REVIEWED		
REVISED		

STATE PRECONST NUMBER 3081-02

DRAWING NO. 3264

J.R.B.