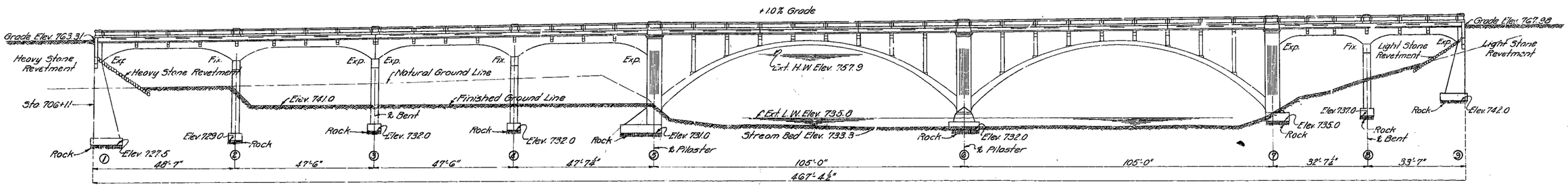
MISSOURI STATE HIGHWAY DEPARTMENT

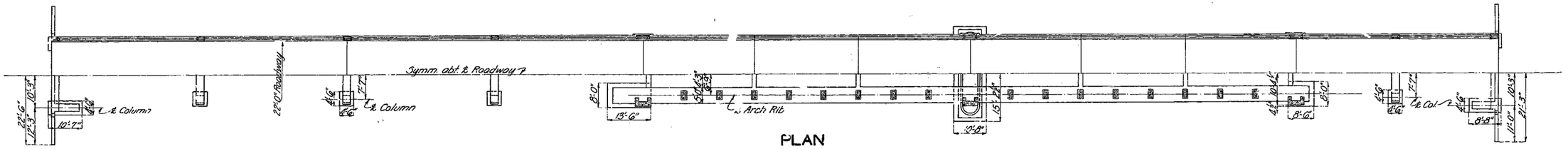
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	R64AP-563	19		



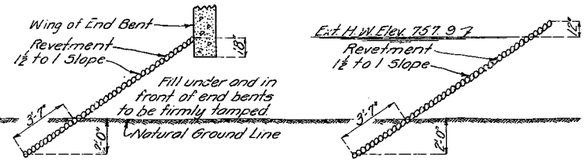
Note: Carry footings of Bents No. 1, 2, 3, 4, 8 & 9 at least 18" into shale and other soft rock or 6" into solid hard rock. Carry footings of Piers No. 5, 6 & 7 at least 18" into solid hard rock.

GENERAL ELEVATION

Note: Channel to be cleared above and below site as shown on road plans.



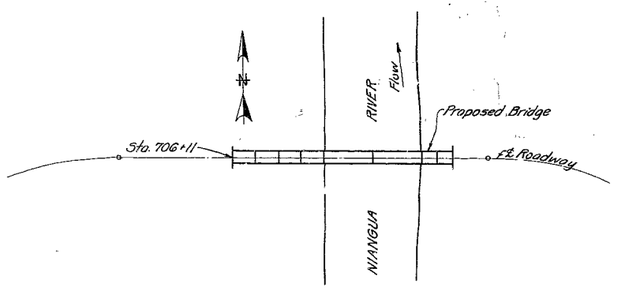
PLAN



FRONT OF END BENTS — SIDE SLOPES OF FILL

Stone revetment shall be placed on fills at end bents as shown in sketches; Heavy Stone Revetment at Bent No. 1 and Light Stone Revetment at Bent No. 9.
Approximately 280 sq. yds. of Heavy Stone Revetment and 142 sq. yds. of Light Stone Revetment included in road contract.

REVETMENT SKETCHES



LOCATION SKETCH

GENERAL NOTES:

Concrete in handrails to be 1:2:3 mix "A".
Concrete in deck girders to be 1:2:3½ mix "X".
Concrete in slab and curbs over arch rings to be 1:2:3½ mix "X".
Concrete in all girder bents, piers, pilasters, spandrel bents and arch rings to be 1:2:4 mix "B".
Exposed edges shall be beveled ¾" where no other bevel is noted.
Exposed surfaces to be rubbed to a smooth and uniform appearance. No plastering permitted.
Arch rings shall be poured in radial blocks in the order indicated on the detail drawings.
Corresponding sections in both ribs of each span shall be poured at the same time.
Columns over arches shall not be cast until after wedges under rings have been released.
Provisions must be made in the arch centering to bring loading upon all points of each ring as nearly simultaneously as practical in removing centering.
The centering shall not be removed from any span until the concrete over it has been in place at least 21 days, nor until the concrete in the adjacent span has been in place at least 14 days.
Where bituminous felt is used in expansion or partition joints in concrete, stitch felt in vertical joint securely to one face of concrete with copper wire.
Horizontal expansion joints in slab on arch spans to consist of 3 layers of roofing felt applied on smoothly finished surfaces.
Two name plates "type A" as shown on Std. 5818 to be furnished and placed by contractor. Cost of name plates to be included in price bid for other items.
Bridge excavation in accordance with section I of Standard Specifications issued April 1, 1930, except that quantities paid for will be computed from Ext. Low Water Elev. 735.3 where existing ground line is below this elevation and, for Piers No. 5 & 7 only, will include actual removal of any material lying within such plan limits as shown on Sheet No. 3 of design plans, instead of allowing quantities to only 18" outside of footings. See Special Provisions.

INDEX OF SHEETS:

Sheet No. 1 - General Elevation and Plan.
Sheet No. 2 - Bill of Reinforcing Steel.
Sheet No. 3 - Pilasters and Piers No. 5 & 7.
Sheet No. 4 - Pier No. 6.
Sheet No. 5 - Bents No. 1, 2, 3, 4 & 8.
Sheet No. 6 - Bent No. 9; Details of Bearings.
Sheet No. 7 - 45' Deck Girder Spans.
Sheet No. 8 - 30' Deck Girder Spans.
Sheet No. 9 - Details of Arch Rings.
Sheet No. 10 - Slab over Arch Spans.

ESTIMATED QUANTITIES

Item	Concrete Cu. Yds. 1:2:3 mix "A"	1:2:3½ mix "X"	1:2:4 mix "B"
Handrails	45.7		
Deck Girder Spans 1-2, 2-3, 3-4, 4-5, (7-8 & 8-9)		360.8	
Slab and Curbs over Arch Rings		180.0	
Arch Rings			144.8
Piers and Pilasters above Elev. 743.5			74.4
Piers below Elev. 743.5			152.8
Spandrel Bents			57.0
Girder Bents No. 1, 2, 3, 4, 8 & 9			157.0
Totals	45.7	547.5	586.0

Cast Steel Bearing Plates	Lbs.	4060
Phosphor Bronze Bearing Plates	Lbs.	600
Reinforcing Steel	Lbs.	171,420
Excavation Class 1	Cu. Yds.	494
Excavation Class 2	Cu. Yds.	322

Note: Bridge excavation above Elev. 737.0 will be paid for as Class 1 Bridge Excavation. Bridge excavation below Elev. 737.0 will be paid for as Class 2 Bridge Excavation.

B.M. Elev. 748.68 - Nail & Washer in Root of 20" Red Oak, 75' Lt. Sta. 708+80.

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS
ABOUT 13.5 MILES WEST OF LEBANON
PROJECT NO. R64-AP-563 STA. 706+11
DALLAS COUNTY

SUBMITTED BY ..... DATE 3/4/31 ..... BRIDGE ENGINEER
APPROVED BY ..... DATE ..... CHIEF ENGINEER

STD. 5818
J-782

Drawn Mar. 1931 By C.A.F.
Traced April 1931 By C.W.
Checked Apr. 1931 By F.C.L.

FINISHED

FINISHED

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MISSOURI STATE HIGHWAY DEPARTMENT

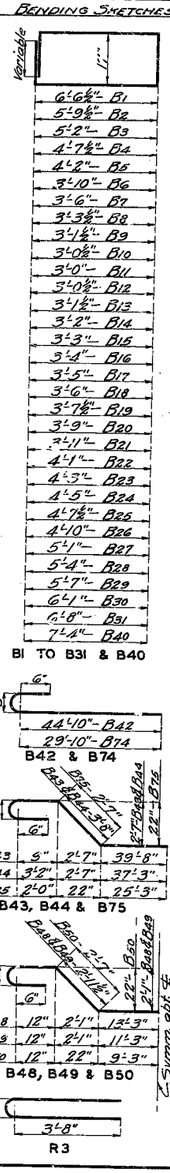
FED. ROAD DIST. NO.	STATE	FED. A'D PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	R64AP-S63	19		

COMPLETE BILL OF REINFORCING STEEL

45' Deck Girder Spans

No.	Size	Length	Mark	Location
8	⅝"ϕ	17'-0"	B1	Girder
8	⅝"ϕ	15'-6"	B2	"
8	⅝"ϕ	14'-3"	B3	"
8	⅝"ϕ	13'-0"	B4	"
8	⅝"ϕ	12'-3"	B5	"
8	⅝"ϕ	11'-6"	B6	"
8	⅝"ϕ	10'-9"	B7	"
8	⅝"ϕ	10'-6"	B8	"
8	⅝"ϕ	10'-0"	B9	"
208	⅝"ϕ	10'-0"	B10	"
8	⅝"ϕ	9'-9"	B11	"
8	⅝"ϕ	10'-0"	B12	"
8	⅝"ϕ	10'-0"	B13	"
8	⅝"ϕ	10'-3"	B14	"
6	⅝"ϕ	10'-3"	B15	"
8	⅝"ϕ	10'-6"	B16	"
8	⅝"ϕ	10'-9"	B17	"
8	⅝"ϕ	10'-3"	B18	"
8	⅝"ϕ	11'-0"	B19	"
8	⅝"ϕ	11'-3"	B20	"
8	⅝"ϕ	11'-9"	B21	"
8	⅝"ϕ	12'-0"	B22	"
8	⅝"ϕ	12'-3"	B23	"
8	⅝"ϕ	12'-9"	B24	"
8	⅝"ϕ	13'-0"	B25	"
8	⅝"ϕ	13'-6"	B26	"
8	⅝"ϕ	14'-0"	B27	"
8	⅝"ϕ	14'-6"	B28	"
8	⅝"ϕ	15'-0"	B29	"
8	⅝"ϕ	16'-0"	B30	"
8	⅝"ϕ	17'-3"	B31	"
26	⅝"ϕ	18'-6"	B40	"
48	¾"ϕ	15'-0"	B41	"
40	1⅛"□	46'-6"	B42	"
24	1⅛"□	45'-9"	B43	"
16	1⅛"□	45'-9"	B44	"
16	⅝"ϕ	24'-0"	B45	"
12	1⅛"□	45'-0"	B46	"
8	1⅛"□	36'-0"	B47	"
8	1⅛"□	37'-9"	B48	"
12	1⅛"□	33'-9"	B49	"
12	1⅛"□	29'-0"	B50	"
36	¾"ϕ	34'-0"	C1	Curb
128	⅝"ϕ	15"	C2	"
192	½"ϕ	9"	R2	Rail
112	½"ϕ	7'-9"	R3	Subpost
32	½"ϕ	4'-0"	R4	Post
1792	⅞"ϕ	18"	R5	Baluster
4	½"ϕ	2'-3"	R10	Post
56	½"ϕ	10'-9"	R11	Rail
24	½"ϕ	10'-6"	R12	"
32	½"ϕ	13'-3"	P3	"
16	½"ϕ	11'-0"	R14	"
224	¾"ϕ	26'-9"	S1	Slab
226	¾"ϕ	19'-6"	S2	"
228	¾"ϕ	26'-7"	S3	"
208	½"ϕ	25'-6"	S4	"
36	½"ϕ	16'-6"	W1	Web
36	½"ϕ	18'-0"	W2	"
50	½"ϕ	7'-3"	W3	"
64	½"ϕ	5'-0"	W4	Bracket

Bending Sketches



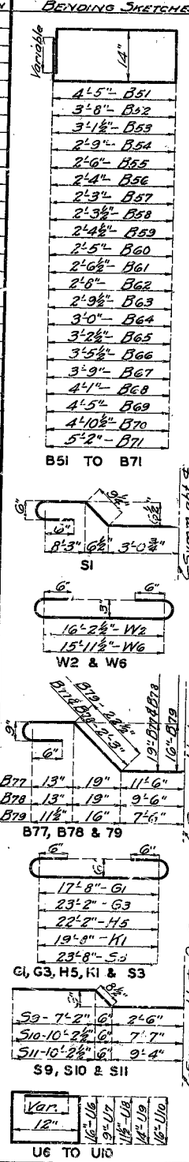
30' Deck Girder Spans

No.	Size	Length	Mark	Location
4	⅝"ϕ	12'-0"	B51	Girder
4	⅝"ϕ	10'-9"	B52	"
4	⅝"ϕ	9'-6"	B53	"
4	⅝"ϕ	8'-9"	B54	"
4	⅝"ϕ	8'-3"	B55	"
4	⅝"ϕ	8'-0"	B56	"
66	⅝"ϕ	7'-9"	B57	"
4	⅝"ϕ	8'-0"	B58	"
4	⅝"ϕ	8'-0"	B59	"
4	⅝"ϕ	8'-3"	B60	"
4	⅝"ϕ	8'-6"	B61	"
4	⅝"ϕ	8'-9"	B62	"
4	⅝"ϕ	9'-0"	B63	"
4	⅝"ϕ	9'-3"	B64	"
4	⅝"ϕ	9'-9"	B65	"
4	⅝"ϕ	10'-3"	B66	"
4	⅝"ϕ	10'-9"	B67	"
4	⅝"ϕ	11'-6"	B68	"
4	⅝"ϕ	12'-3"	B69	"
4	⅝"ϕ	13'-0"	B70	"
12	⅝"ϕ	13'-9"	B71	"
6	¾"ϕ	21'-0"	B72	"
12	¾"ϕ	12'-0"	B73	"
16	1⅛"□	31'-6"	B74	"
12	1⅛"□	31'-6"	B75	"
8	½"ϕ	22'-0"	B76	"
4	1⅛"□	33'-0"	B77	"
4	1⅛"□	29'-0"	B78	"
6	1⅛"□	24'-0"	B79	"
48	⅝"ϕ	15"	C2	Curb
12	¾"ϕ	33'-3"	C3	"
8	½"ϕ	9'-3"	R1	Rail
72	½"ϕ	9"	R2	"
40	½"ϕ	7'-9"	R3	Subpost
16	½"ϕ	4'-6"	R4	Post
600	⅞"ϕ	18"	R5	Baluster
16	½"ϕ	9'-6"	R7	Rail
8	½"ϕ	11'-9"	R7	"
8	½"ϕ	9'-9"	R8	"
8	½"ϕ	12'-0"	R9	"
77	¾"ϕ	26'-9"	S1	Slab
78	¾"ϕ	19'-6"	S2	"
80	¾"ϕ	26'-3"	S3	"
52	½"ϕ	33'-9"	S5	"
13	½"ϕ	16'-3"	W5	Web
10	½"ϕ	17'-9"	W6	"
30	½"ϕ	5'-3"	W7	"
20	½"ϕ	4'-9"	W8	Bracket

End Bent No. 1

12	⅞"ϕ	6'-9"	D1	Footing
12	¾"ϕ	9'-3"	F1	Haunch
10	¾"ϕ	17'-3"	H1	Wing
6	⅝"ϕ	29'-0"	H2	"
4	¾"ϕ	22'-9"	H3	Backwall
7	⅝"ϕ	22'-9"	H4	"
18	¾"ϕ	24'-9"	H5	Beam
6	¾"ϕ	16'-9"	T1	Wing
3	¾"ϕ	25'-0"	T2	Backwall
27	½"ϕ	10'-6"	U1	Beam
9	½"ϕ	11'-3"	V1	Wing
2	½"ϕ	8'-3"	V2	"
2	½"ϕ	6'-9"	V3	"
12	⅞"ϕ	32'-0"	V4	Column
12	½"ϕ	9'-9"	V5	Backwall

Bending Sketches



End Bent No. 9

12	⅞"ϕ	6'-9"	D1	Footing
12	¾"ϕ	9'-3"	F1	Haunch
4	¾"ϕ	22'-9"	H3	Backwall
4	⅝"ϕ	22'-9"	H4	"
14	¾"ϕ	7'-9"	I5	Beam
6	¾"ϕ	16'-0"	H6	Wing
2	⅝"ϕ	15'-6"	H7	"
4	⅝"ϕ	26'-3"	H8	"
3	¾"ϕ	25'-0"	T2	Backwall
6	¾"ϕ	14'-0"	T3	Wing
27	½"ϕ	10'-6"	U1	Beam
8	½"ϕ	7'-9"	V6	Wing
2	½"ϕ	6'-3"	V7	"
2	½"ϕ	4'-6"	V8	"
12	⅞"ϕ	22'-3"	V9	Column
12	½"ϕ	7'-6"	V10	Backwall

Bents No. 2, 3, 4 and 6

64	⅞"ϕ	6'-9"	D1	Footing
32	¾"ϕ	9'-3"	F1	Haunch
24	¾"ϕ	20'-3"	G1	Beam
8	¾"ϕ	18'-3"	G2	"
106	½"ϕ	10'-0"	P1	Column
16	¾"ϕ	24'-0"	P2	Col. Bent #2
16	¾"ϕ	21'-6"	P3	" " #3
32	¾"ϕ	22'-0"	P4	" " #4 & #6
72	½"ϕ	10'-0"	U2	Beam

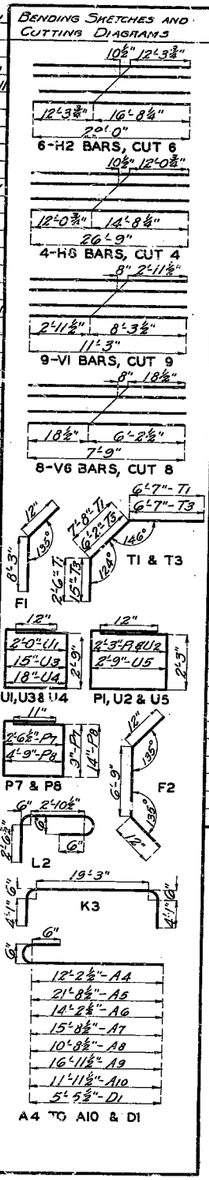
Pilaster and Pier No. 5

20	½"ϕ	4'-6"	A3	Pier
12	⅝"ϕ	13'-6"	A4	"
8	¾"ϕ	23'-0"	A5	"
8	⅝"ϕ	15'-6"	A6	"
32	¾"ϕ	2'-0"	D2	Footing
7	1"ϕ	22'-3"	K1	Beam
4	¾"ϕ	20'-3"	K2	"
7	1"ϕ	29'-0"	K3	"
8	⅝"ϕ	6'-0"	L1	Cap
10	⅝"ϕ	7'-6"	L2	"
8	¾"ϕ	14'-6"	N1	Tie Beam
24	1"ϕ	20'-6"	P5	Pilaster
4	1"ϕ	13'-6"	P6	"
32	½"ϕ	7'-6"	P7	"
16	½"ϕ	12'-9"	P8	"
20	1"ϕ	13'-6"	P9	Pier
20	½"ϕ	9'-0"	U3	Beam
24	½"ϕ	9'-6"	U4	"

Pilaster and Pier No. 7

14	½"ϕ	4'-6"	A3	Pier
14	⅞"ϕ	17'-0"	A7	"
14	⅞"ϕ	12'-0"	A8	"
20	¾"ϕ	2'-0"	D2	Footing
7	1"ϕ	22'-3"	K1	Beam
4	¾"ϕ	20'-3"	K2	"
7	1"ϕ	29'-0"	K3	"
8	⅝"ϕ	6'-0"	L1	Cap
10	⅝"ϕ	7'-6"	L2	"
8	¾"ϕ	14'-6"	N1	Tie Beam
44	½"ϕ	7'-6"	P7	Pilaster
22	½"ϕ	12'-9"	P8	"
44	1"ϕ	22'-6"	P10	"
4	1"ϕ	17'-9"	P11	"
28	1"ϕ	9'-6"	P12	Pier
20	½"ϕ	9'-0"	U3	Beam
24	½"ϕ	9'-6"	U4	"

Bending Sketches and Cutting Diagrams



Pilaster and Pier No. 6

28	⅞"ϕ	4'-6"	A3	Pier
28	⅞"ϕ	18'-3"	A9	"
28	⅞"ϕ	13'-3"	A10	"
28	¾"ϕ	2'-0"	D2	Footing
8	1"ϕ	8'-9"	F2	Haunch
6	1"ϕ	22'-3"	K1	Beam
4	1"ϕ	29'-0"	K3	"
2	1"ϕ	20'-3"	K4	"
10	⅝"ϕ	6'-0"	L1	Cap
10	⅝"ϕ	7'-6"	L2	"
52	½"ϕ	7'-6"	P7	Pilaster
26	½"ϕ	12'-9"	P8	"
52	1"ϕ	21'-6"	P9	"
32	1"ϕ	9'-6"	P10	"
25	½"ϕ	11'-0"	U5	Beam

Arch Rings

84	⅞"ϕ	39'-3"	A1	Arch Rib
112	⅝"ϕ	29'-6"	A2	" "
312	½"ϕ	4'-6"	A3	" "
32	½"ϕ	14'-6"	N1	Tie Beam

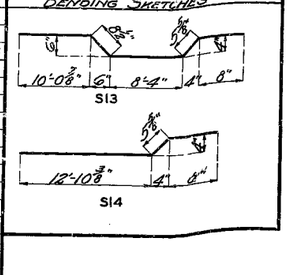
Spandrel Bents

80	¾"ϕ	25'-9"	G3	Beam
80	⅝"ϕ	14'-0"	G4	"
64	¾"ϕ	6'-6"	G5	Bracket
16	¾"ϕ	18'-3"	P1	Column
16	¾"ϕ	12'-3"	P2	"
8	¾"ϕ	15'-3"	P3	"
16	¾"ϕ	7'-0"	P4	"
16	¾"ϕ	7'-0"	P5	"
8	¾"ϕ	15'-9"	P6	"
16	¾"ϕ	2'-9"	P7	"
16	¾"ϕ	19'-0"	P8	"
16	¾"ϕ	19'-3"	P9	"
16	¾"ϕ	13'-3"	P10	"
8	¾"ϕ	17'-3"	P11	"
16	¾"ϕ	8'-0"	P12	"
16	¾"ϕ	8'-0"	P13	"
8	¾"ϕ	17'-9"	P14	"
16	¾"ϕ	13'-9"	P15	"
16	¾"ϕ	20'-0"	P16	"
304	½"ϕ	5'-6"	U6	Beam
32	½"ϕ	4'-3"	U7	Bracket
32	½"ϕ	4'-9"	U8	"
32	½"ϕ	5'-3"	U9	"
32	½"ϕ	5'-6"	U10	"

Slab, Curb and Rail over Arches

144	⅝"ϕ	15"	C2	Curb
24	⅜"ϕ	32'-9"	C4	"
12	¾"□	33'-6"	C5	"
18	⅝"ϕ	4'-9"	C6	"
216	½"ϕ	9"	R2	Rail
136	½"ϕ	7'-9"	R3	Subpost
2016	⅞"ϕ	18"	R5	Baluster
32	½"ϕ	10'-6"	R16	Rail
112	½"ϕ	11'-0"	R16	"
24	½"ϕ	4'-3"	R17	Post
48	⅝"ϕ	6'-0"	R18	"
170	½"ϕ	24'-3"	S6	Slab
192	⅝"ϕ	12'-3"	S7	"
150	⅝"ϕ	14'-0"	S8	"
144	⅝"ϕ	20'-9"	S9	"
200	⅝"ϕ	18'-6"	S10	"
50	⅝"ϕ	20'-3"	S11	"
48	⅝"ϕ	14'-0"	S12	"
50	⅝"ϕ	20'-3"	S13	"
48	⅝"ϕ	14'-0"	S14	"

Bending Sketches



Note:- Dimensions are given along ℄ of bars and are for computed lengths.
For bending sketches of P bars in spandrel bents see Sheet No. 9.
Bars in above units to be billed and tagged separately.
Reinforcing bars over ⅞" in diameter, which are bent to an angle greater than 90°, shall be of structural grade.

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS
ABOUT 13.5 MILES WEST OF LEBANON
PROJECT NO. R64AP-S63 STA. 706+11

DALLAS COUNTY

SUBMITTED BY . . . . . DATE 5/4/31 . . .
BRIDGE ENGINEER
APPROVED BY . . . . . DATE . . . . . .
CHIEF ENGINEER

FINISHED

STD. S818
J-782

Drawn Apr. 1931 by C.A.F.
Traced Apr. 1931 by C.A.F.
Checked Apr. 1931 by F.C.L.

FINISHED

Sheet No. 2 of 10.

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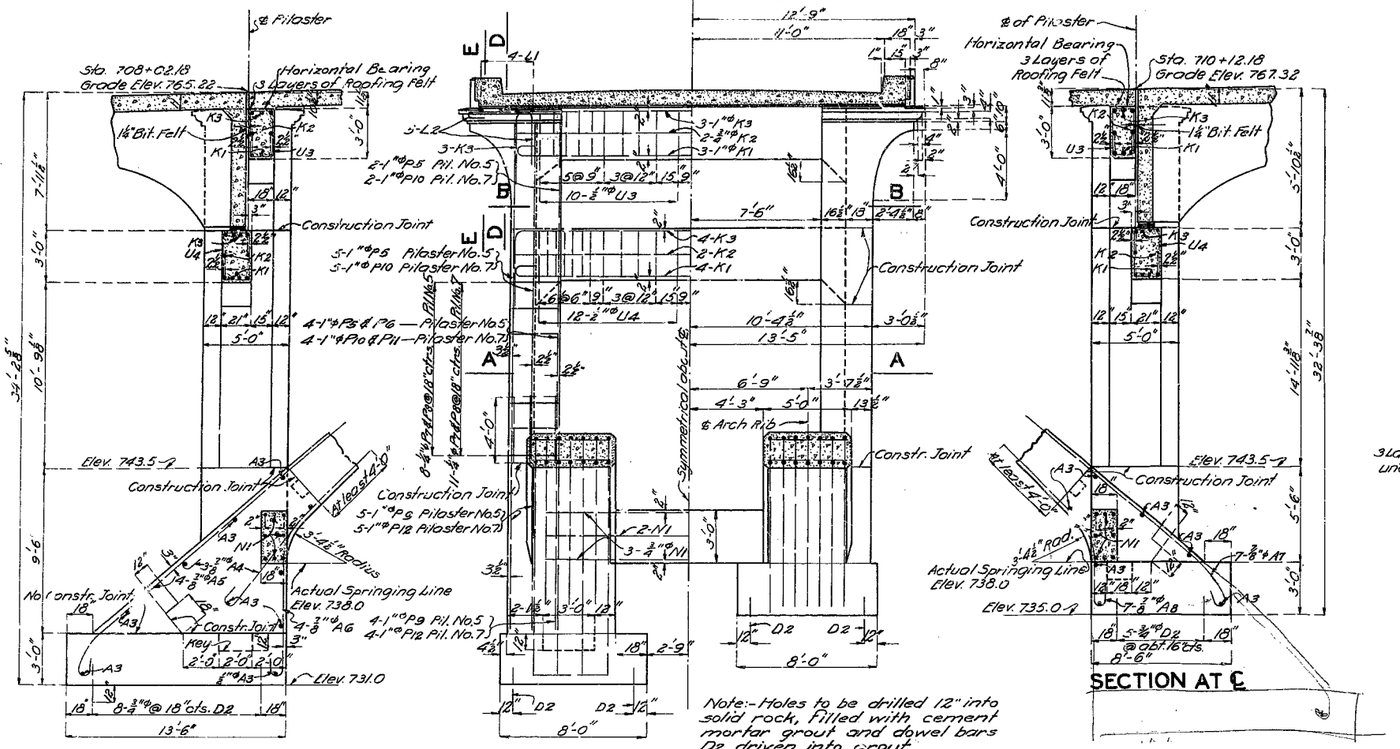
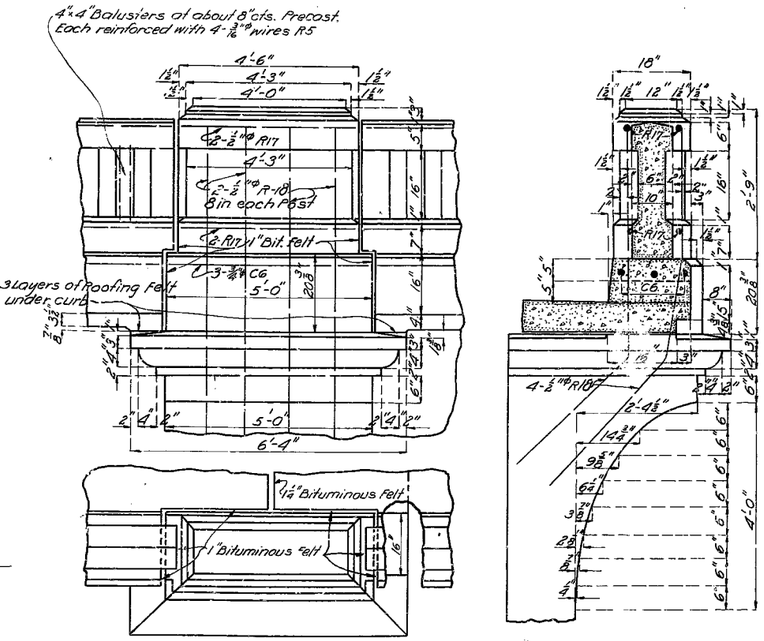
IMPERIAL TRACING CLOTH
MUCKEY - ST. LOUIS

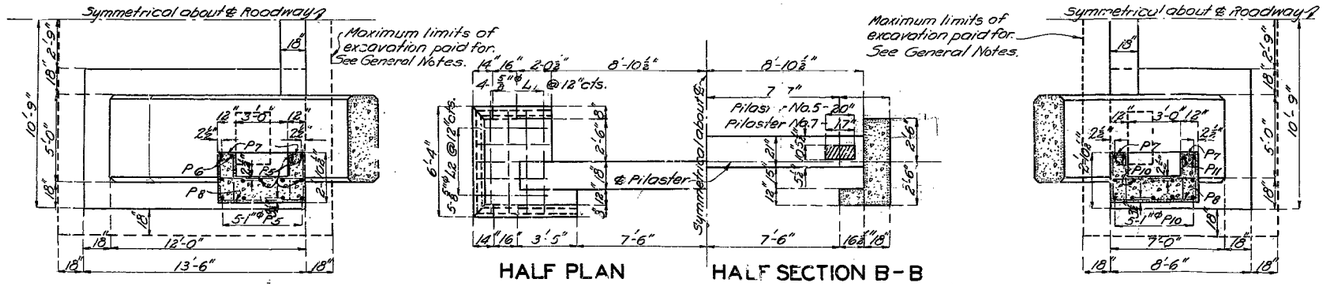
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	R64AP-563	19		

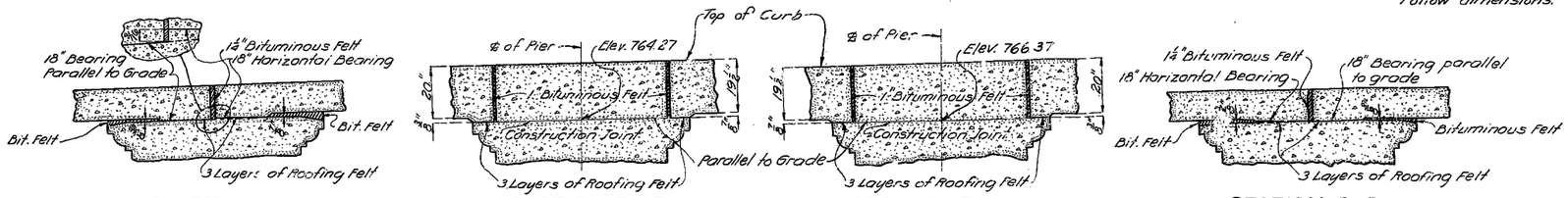




Note: Rails, top of posts and coping to be built parallel to grade.
Posts, subposts and balusters to be vertical.



Note:- This drawing is not to scale. Follow dimensions.



BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS
ABOUT 13.5 MILES WEST OF LEBANON
PROJECT NO. R64AP-S63 STA. 706+11

DALLAS COUNTY

SUBMITTED BY ..... DATE 5/4/51
BRIDGE ENGINEER

APPROVED BY ..... DATE .....
CHIEF ENGINEER

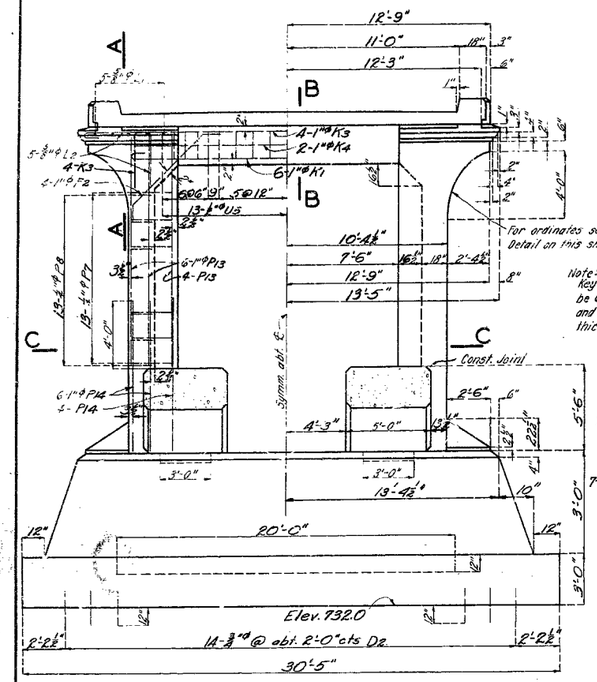
STD. S818
J-782

Drawn March 1931 by R.A.B.
Traced March 1931 by H.E.U.
Checked April 1931 by F.C.L.

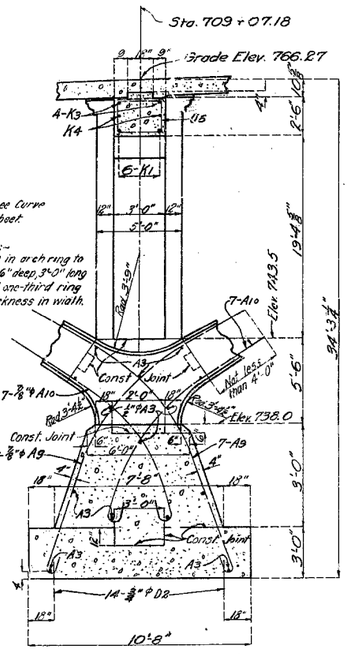
10

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	R64AP-S63	19		

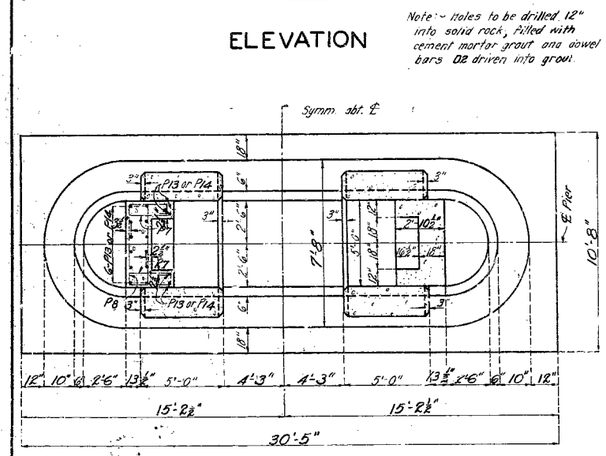


ELEVATION

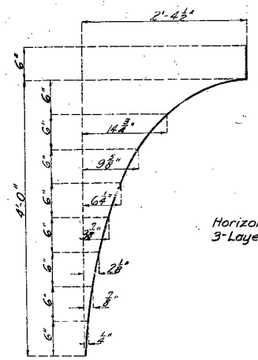


SECTION AT ℄

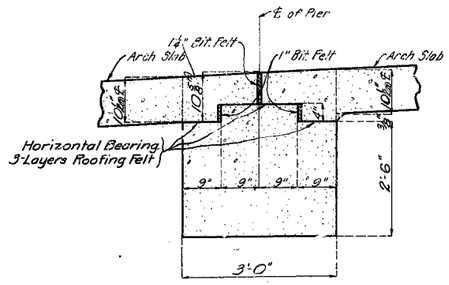
Note:- Holes to be drilled 12" into solid rock, filled with cement mortar grout and dowel bars D2 driven into grout.



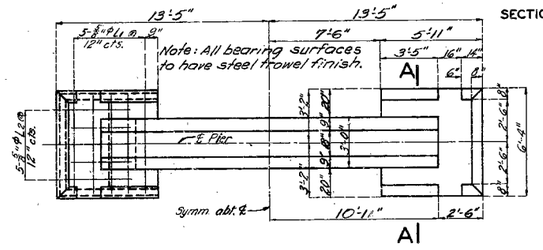
PLAN C-C



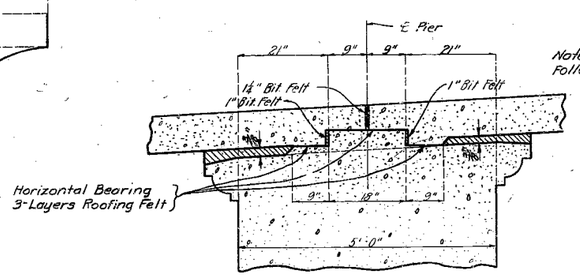
ORDINATES FOR CURVE OF PIER FACE AT TOP



SECTION B-B

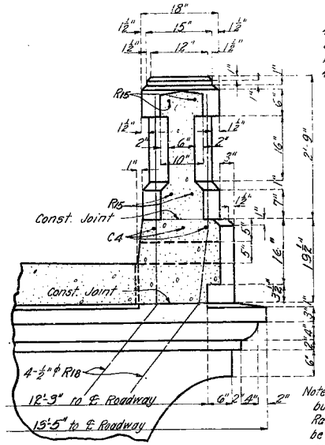


PLAN OF PIER TOP



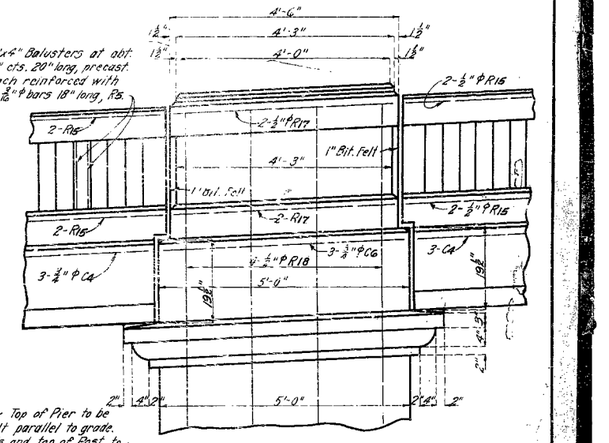
SECTION A-A

Note. This drawing is not to scale. Follow dimensions.



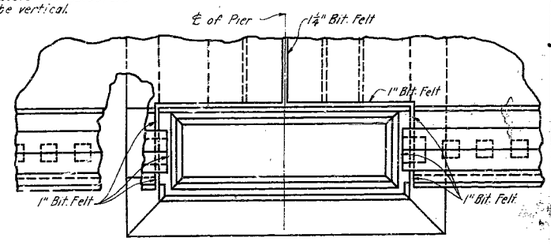
SECTION THRU SUBPOST

4"x6" Balusters at abt. 8" cts. 20" long, precast. Each reinforced with 4-⅜"ϕ bars 18" long, R5.



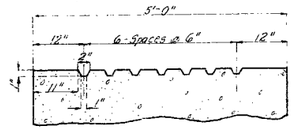
ELEVATION

Note:- Top of Pier to be built parallel to grade. Rails and top of Post to be parallel to grade. Posts, subposts and balusters to be vertical.



PLAN

DETAILS OF HANDRAIL POST OVER PIER NO. 6



PART SECTION THRU PIERS NO. 5, 6 & 7 SHOWING DETAIL OF FLUTING

DETAILS OF PIER NO. 6

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS

ABOUT 13.5 MILES WEST OF LEBANON

PROJECT NO. R 64AP-S63 STA. 706+11 FINISHED

DALLAS COUNTY

SUBMITTED BY ____ DATE 5/4/31 BRIDGE ENGINEER

APPROVED BY ____ DATE ____ CHIEF ENGINEER

FINISHED

STD. S 818

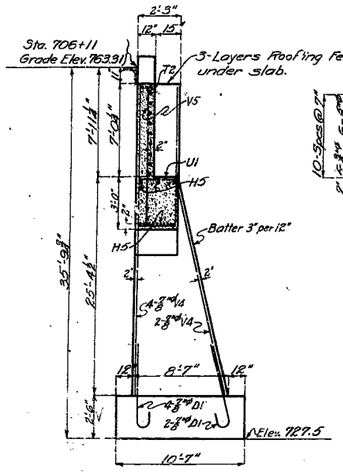
J-782

Assembled March 1931 By FAB.
Checked April 1931 By F.C.L.
Drawn Feb. 1929 By H.E.C.
Traced Feb. 1929 By H.E.C.
Checked Mar 1929 By F.W.H.

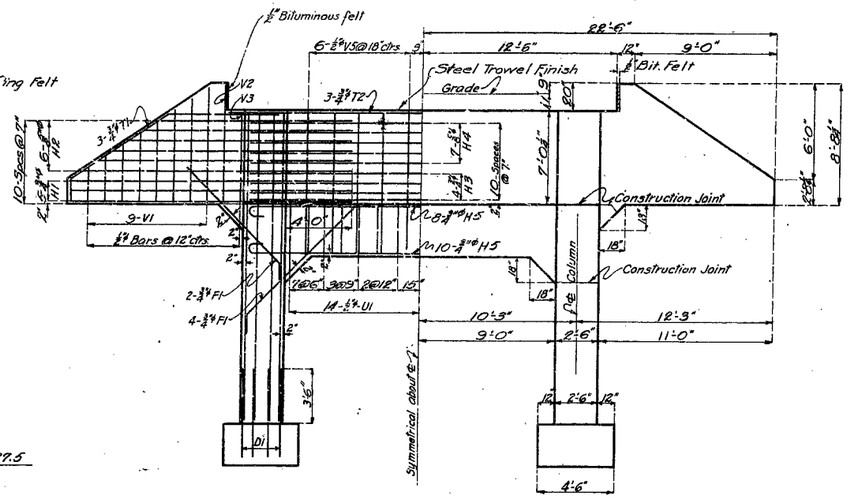
Sheet No. 4 of 10.

MISSOURI STATE HIGHWAY DEPARTMENT

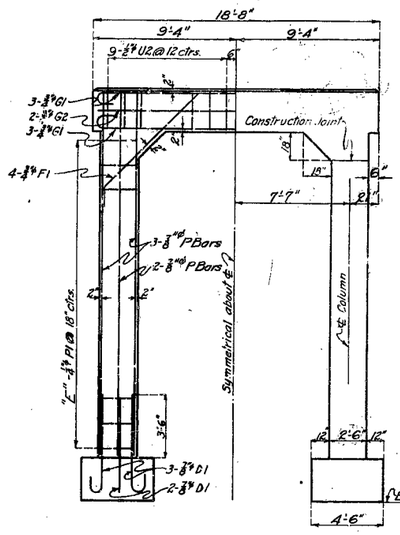
FED.ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	Mo.	R 64 AP -S63			



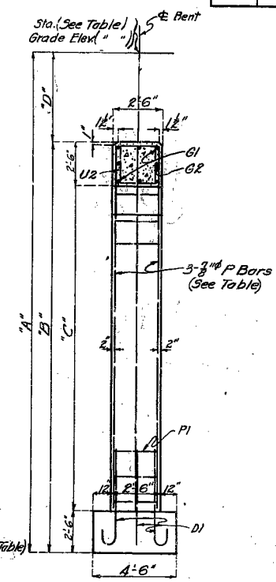
SECTION AT ℄



ELEVATION

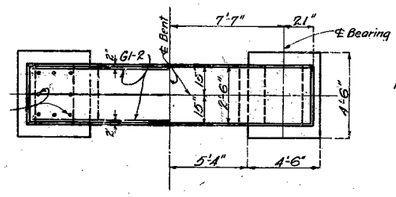


ELEVATION



SECTION AT ℄

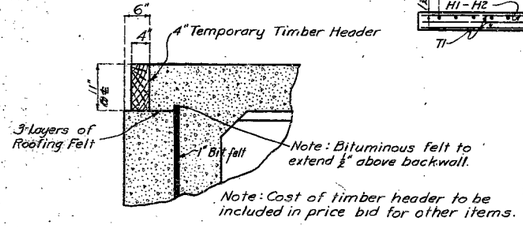
Note: See Table of Dimensions given below for variables A, B, C, D & E and P bars.



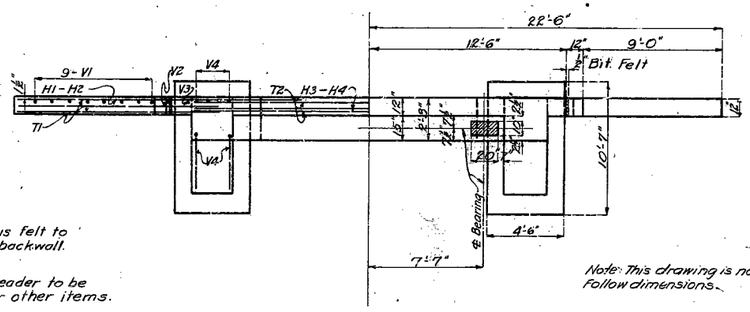
PLAN

Note: For details of bearing plates, see Sheet No. 6 of 10.

DETAILS OF BENTS NO. 2, 3, 4, & 8



DETAILS OF NOTCH FOR APPROACH SLAB



PLAN

Note: This drawing is not to scale. Follow dimensions.

DETAILS OF BENT NO. 1

TABLE OF DIMENSIONS

BENT	STA.	GR. ELEV.	FOOT. ELEV.	"A"	"B"	"C"	"D"	"E"	P-BARS
No. 2	706+39.6	765.80	729.0	34'-9⅜"	26'-8⅜"	21'-8⅜"	8'-0⅜"	14	P2
" 3	707+07.1	764.27	732.0	32'-3⅜"	24'-3⅜"	19'-3⅜"	7'-11⅜"	13	P3
" 4	707+54.6	764.75	738.0	32'-9"	24'-8⅜"	19'-8⅜"	8'-0⅜"	13	P4
" 8	710+44.8	767.65	737.0	30'-7⅞"	24'-5"	19'-8"	5'-11⅜"	13	P4

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS

ABOUT 13.5 MILES WEST OF LEBANON

PROJECT NO. R 64AP-S63 STA. 706+11

DALLAS COUNTY

SUBMITTED BY W. K. Lacy DATE 3/24/31 BRIDGE ENGINEER

APPROVED BY L. H. Gentry DATE FINISHED CHIEF ENGINEER

FINISHED

STD. SHT. J-782

Assembled March, 1931 By PAB.
Checked April 1931 by, P.C.L.

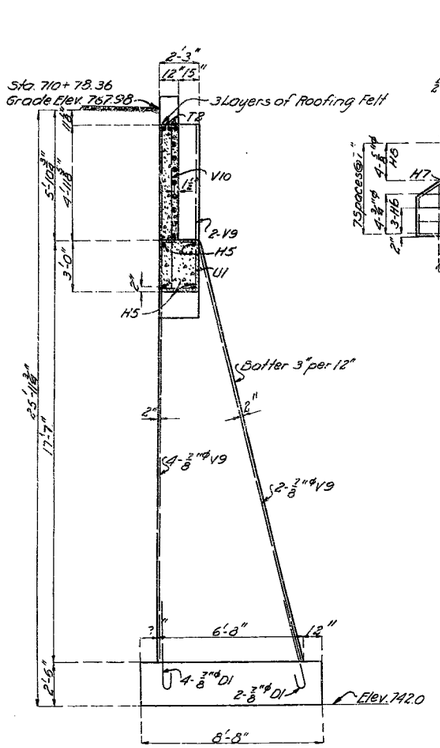
Sheet No. 5 of 10.

BENTS NOS.

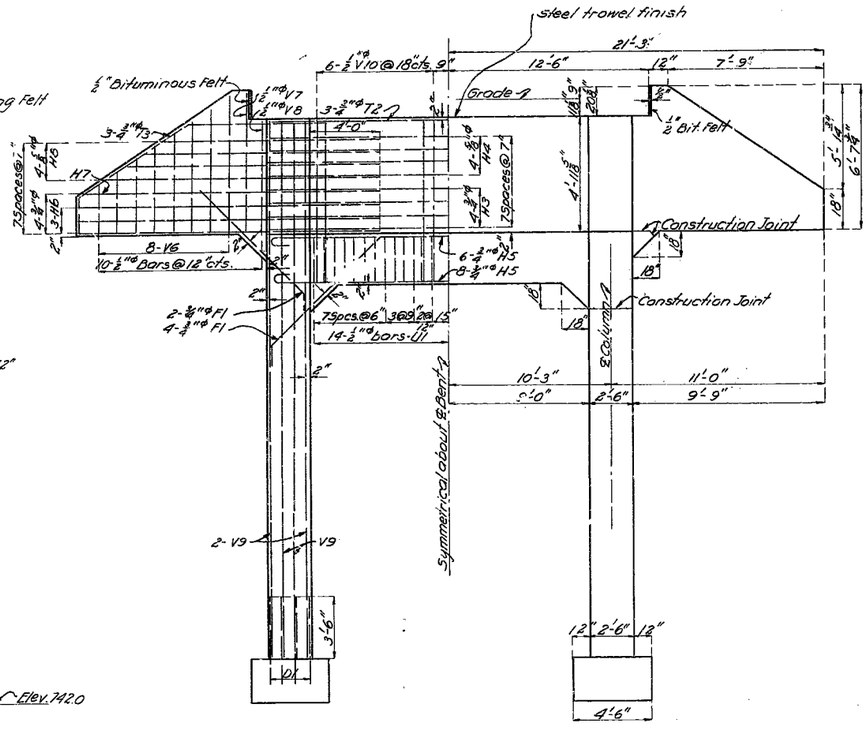
22

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	R64AP-S63	19		

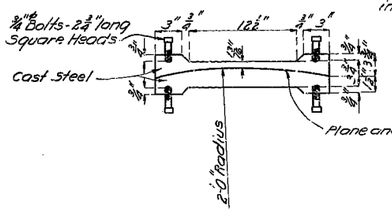


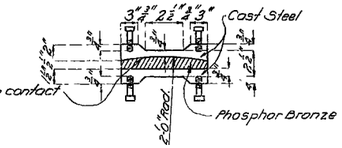
SECTION AT ℄

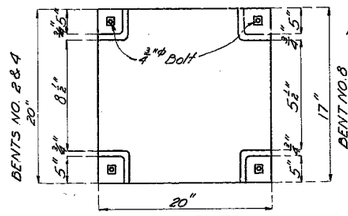


ELEVATION

Note: Weight of bolts for bearing plates is included in weight of reinforcing steel.





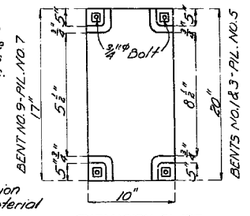


FIXED PLATE

Bents No. 2-4 & 8
4-20"×20" required
2-17"×20" required

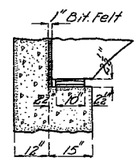
Note: A mixture of flake graphite and oil to be placed between plates before placing in conc.

See Special Provision for specification of material for bearing plates.

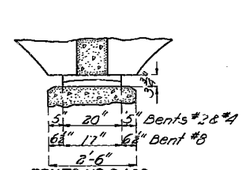


EXPANSION PLATE

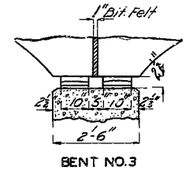
Bents No. 1-3 & 9
Pilasters No. 5 & 7
8-10"×20" required
4-10"×17" required



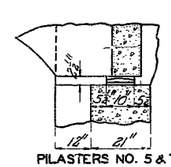
BENTS NO. 1 & 9



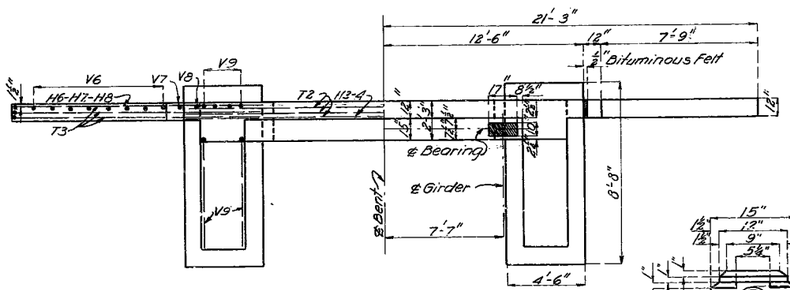
BENTS NO. 2, 4 & 8



BENT NO. 3

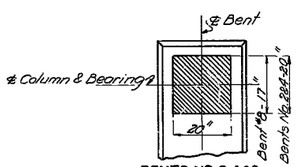


PILASTERS NO. 5 & 7

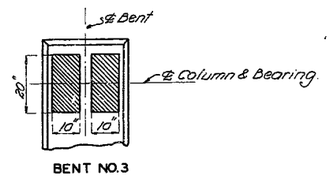


PLAN

DETAILS OF BENT NO. 9

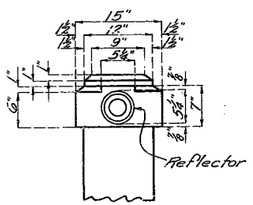


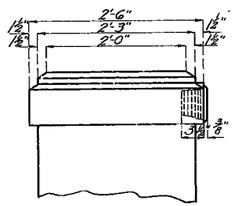
BENTS NO. 2, 4 & 8



BENT NO. 3

DETAILS OF BEARINGS





Note:- The contractor is to cast a reflector into the concrete of each end post each side of roadway. The four reflectors required will be furnished by the Missouri State Highway Department. Cost of placing reflectors to be included in price bid for other items.

DETAILS OF REFLECTOR FOR END POST

Note:- This drawing is not to scale. Follow dimensions.

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS
ABOUT 13.5 MILES WEST OF LEBANON
PROJECT NO. R64AP-S63 STA. 706+11

DALLAS COUNTY

SUBMITTED BY . . . . . DATE 2/4/31
BRIDGE ENGINEER

APPROVED BY . . . . . DATE . . . . .
CHIEF ENGINEER

FINISHED

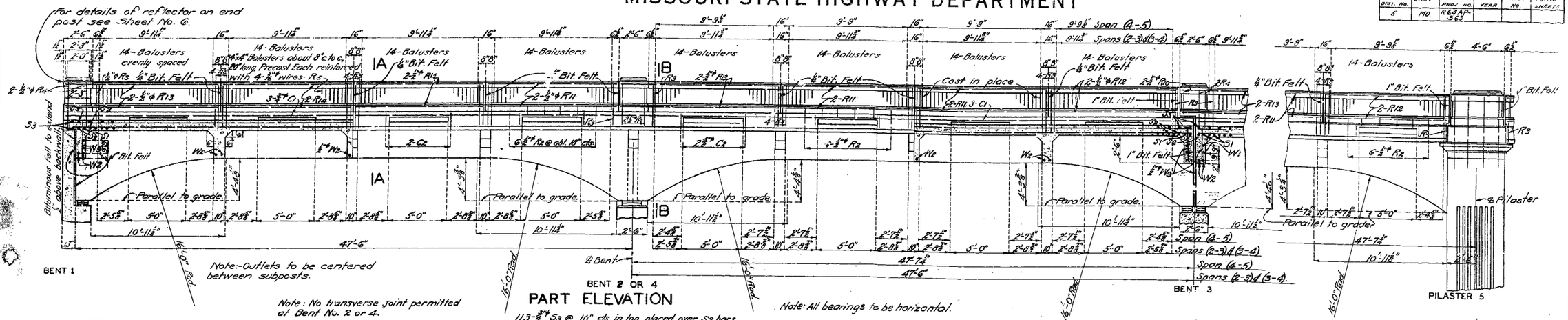
STD. S818
J-782

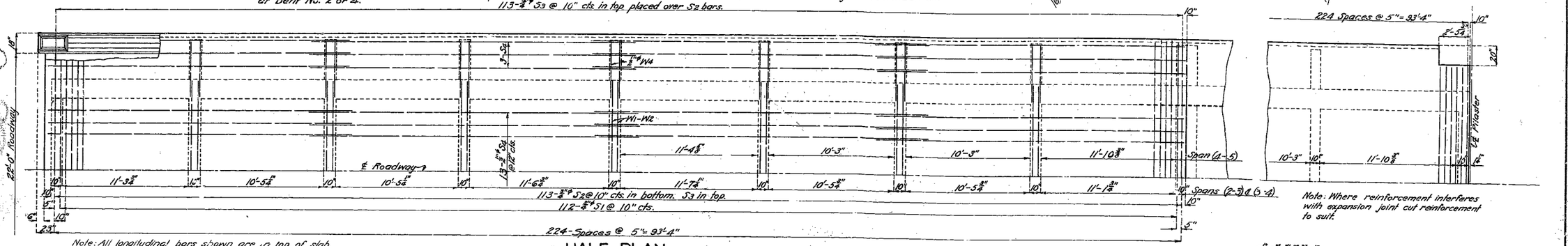
Drawn March 1931 by R.A.B.
Traced March 1931 by H.E.U.
Checked April 1931 by F.C.L.

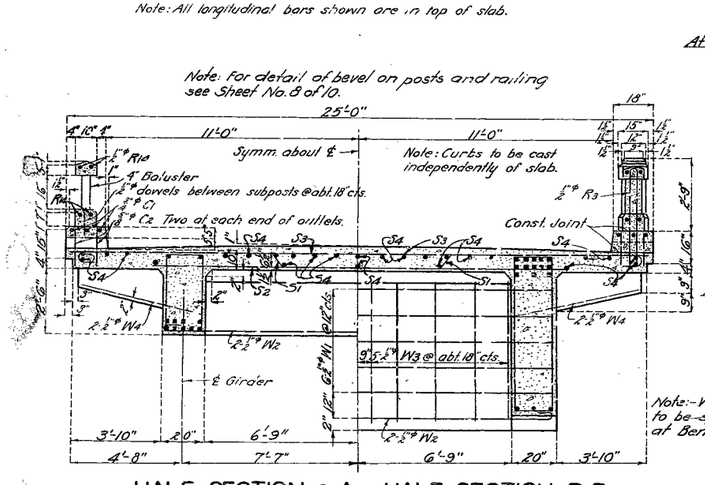
"IMPERIAL" TRACING CLOTH
BUCKERT - ST. LOUIS

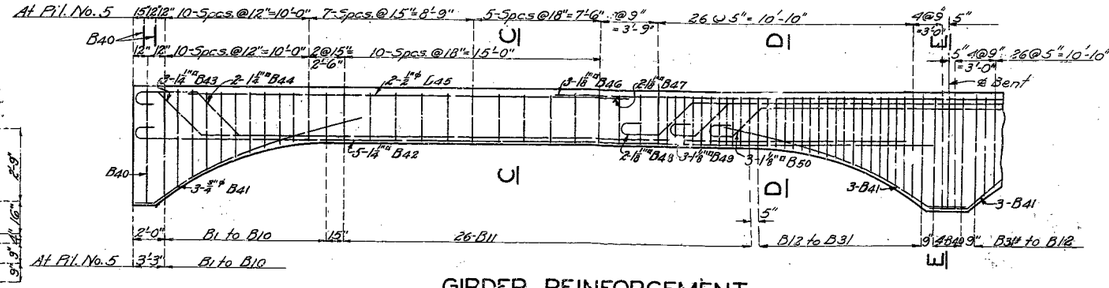
MISSOURI STATE HIGHWAY DEPARTMENT

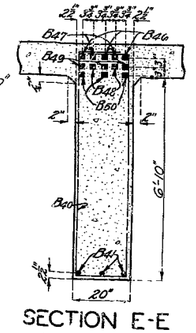
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO	R64AP-S63			

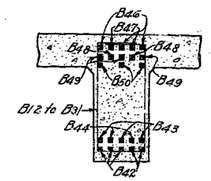


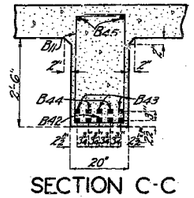












Note:- W3 bars in webs at Bents No. 1 & 3 to be spaced same as W3 bars in webs at Bents No. 2 & 4 and Pil. No. 5.

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS

ABOUT 13.5 MILES WEST OF LEBANON

PROJECT NO. R64AP-S63 STA. 706+11

DALLAS COUNTY

FINISHED

SUBMITTED BY ..... DATE 5/2/31 BRIDGE ENGINEER

APPROVED BY ..... DATE ..... CHIEF ENGINEER

STD. S818

J-782

DETAILS OF 45'-0" DECK GIRDER SPANS

Drawn Mar 1929 By A.F.K.
Traced Mar 1929 By W.S.M
Checked April 1929 By R.A.

Assembled Mar. 1931 by C.A.F.
Checked April 1931 by F.C.L.

Note:- This drawing is not to scale. Follow dimensions.

FINISHED

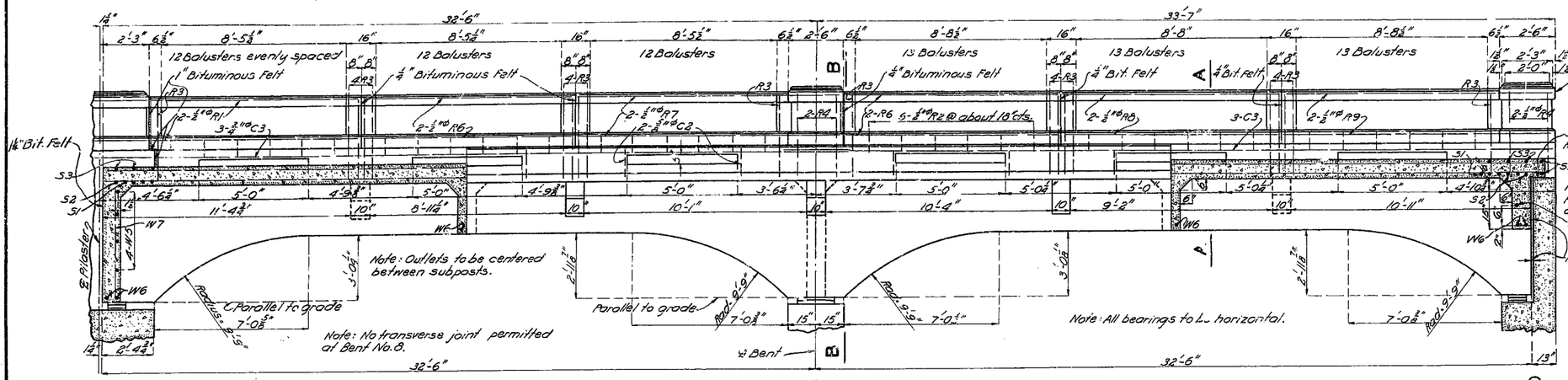
Sheet No. 7 of 10.

14

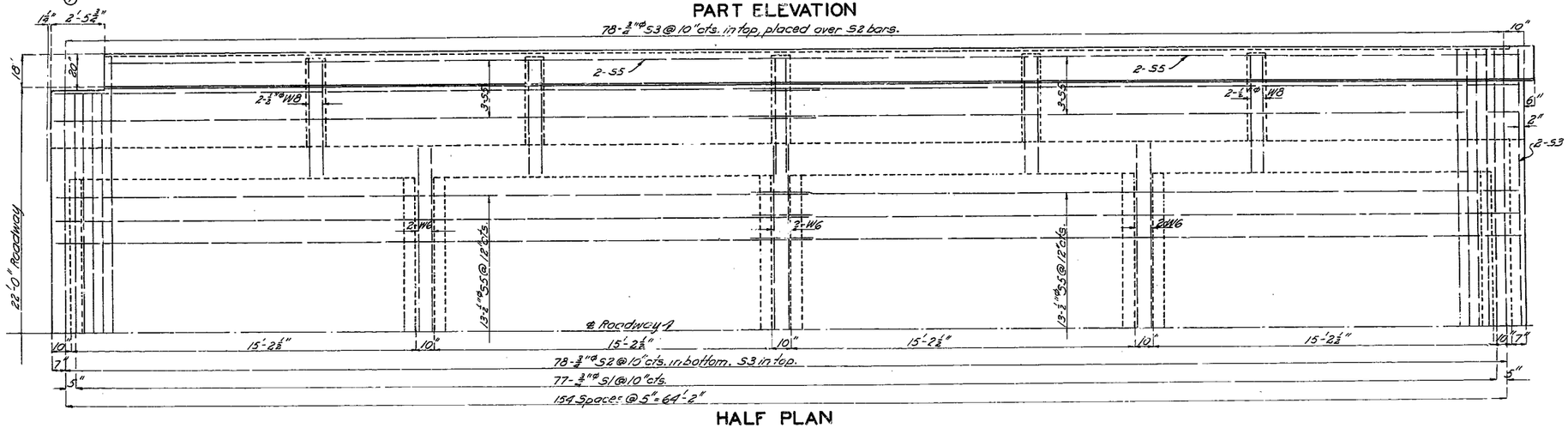
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	R64AP-S63	19		

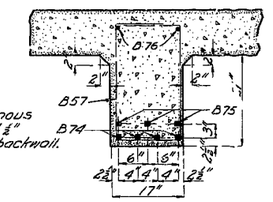
Note: Top of curb, rail and posts to be built parallel to grade. Posts, subposts and balusters to be built vertically.



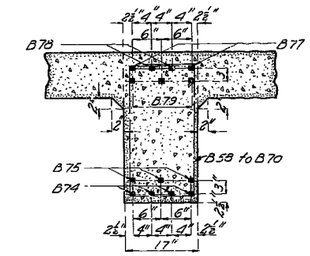
PART ELEVATION



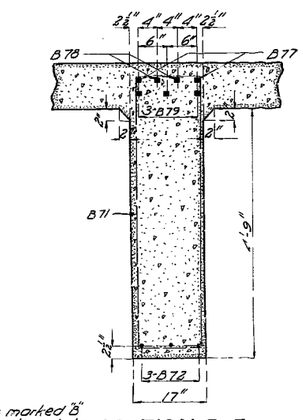
HALF PLAN



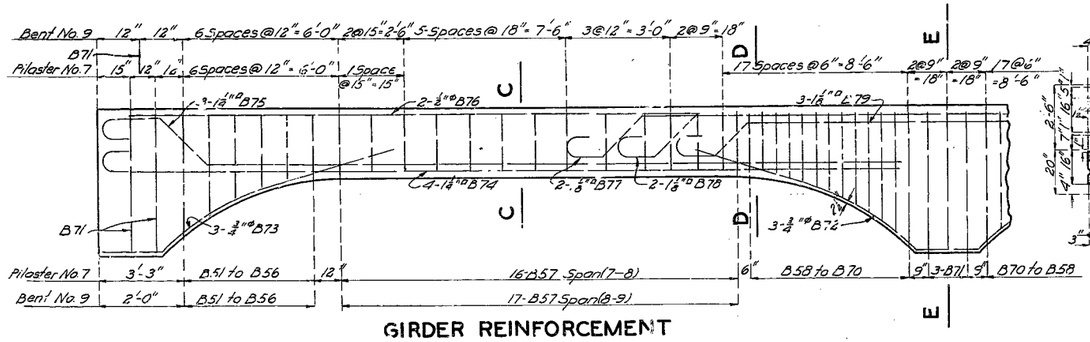
SECTION C-C



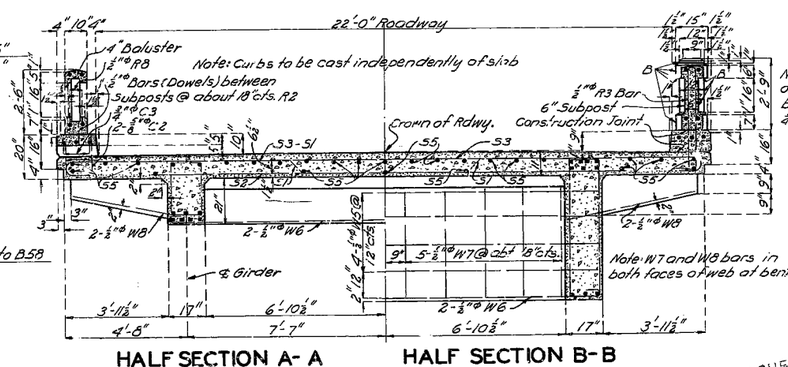
SECTION D-D



SECTION E-E



GIRDER REINFORCEMENT



HALF SECTION A-A

HALF SECTION B-B

Note: All edges marked "B" on post and railing to be beveled 1/2". 1/4" bevel to be used on balusters.

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS

ABOUT 13.5 MILES WEST OF LEBANON

PROJECT NO. R64AP-S63 STA. 706+11

DALLAS COUNTY

SUBMITTED BY [signature] DATE 5/4/31 BRIDGE ENGINEER

APPROVED BY [signature] DATE CHIEF ENGINEER

FINISHED

Drawn March 1931 by C.A.F.
Traced April 1931 by H.E.U.
Checked April 1931 by F.C.I.

DETAILS OF 30' DECK GIRDER SPANS

Sheet No. 8 of 10.

STD. S818

J-782

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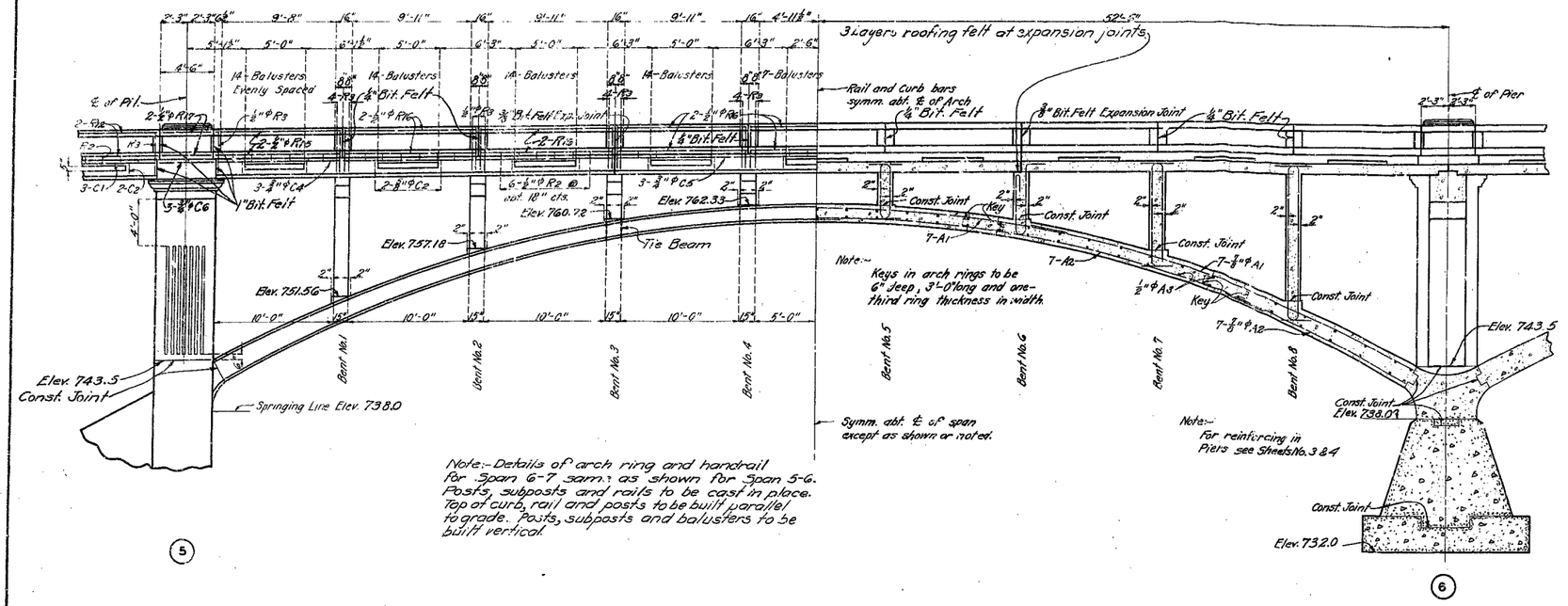
"IMPERIAL" TRACING CLOTH RUCKERT - ST. LOUIS

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	100	R64AP-363	19		

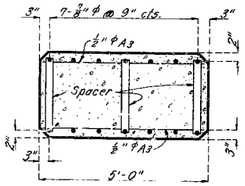


Note:- Details of arch ring and handrail for Span 6-7 same as shown for Span 5-6. Posts, subposts and rails to be cast in place. Top of curb, rail and posts to be built parallel to grade. Posts, subposts and balusters to be built vertical.

(5) (6)

HALF ELEVATION

HALF SECTION THRU ARCH RING



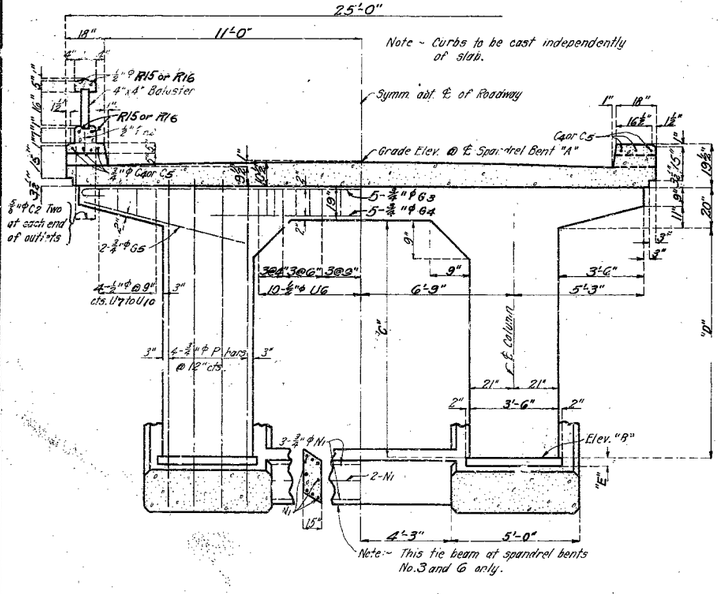
Note:- ½" ϕ bars As @ 2'-6" cts., measured horizontally, are to be placed in ring at points where ordinates are shown in detail giving "Dimensions of Arch Ring." Spacers to be placed as shown in above detail and spaced same as ½" ϕ tie bars. Wire spacers securely to both main and transvers steel.

SECTION THRU ARCH RING SHOWING REINFORCING

BAR SPACERS FOR RINGS

No. of Bars	Dimen. "A"	No. of Bars	Dimen. "A"
24	2'-6"	24	15½"
24	2'-2⅝"	24	15¼"
24	2'-3⅝"	24	15"
24	21"	24	14⅝"
24	19⅝"	24	14⅜"
24	17⅝"	24	14⅛"
24	16⅝"	48	14⅜"
24	16"	48	14⅛"
24	15⅝"	12	14⅝"

Note:- Weight of bar spacers included in weight of arch ring reinforcement.

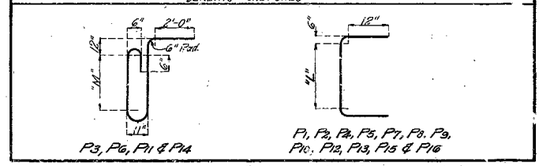


SECTION NEAR SPANDREL BENTS

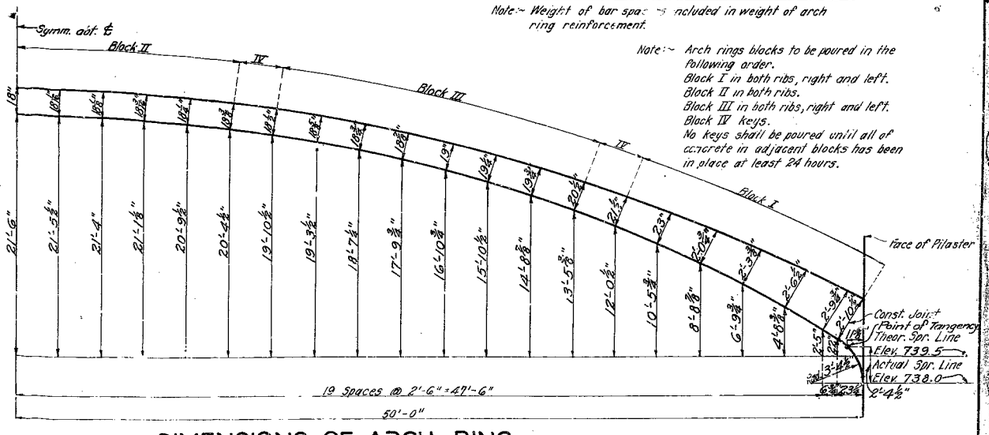
DIMENSIONS & BARS FOR SPANDREL BENTS

BENT No.	Elevations A	Elevations B	Dimensions C	Dimensions D	Dimensions E	P Bars No.	P Bars Mark	P Bars L	P Bars M
			SPAN 5-6						
1	765.35	751.56	11'-4"	11'-3"	11⅝"	16	P1	14'-8"	
2	765.47	757.18	5'-10"	5'-9"	8"	16	P2	8'-8"	
3	765.58	760.72	2'-4⅝"	2'-3⅜"	4½"	8	P3		4'-7½"
4	765.69	762.33	10⅜"	9⅜"	1⅝"	16	P4	3'-5"	
5	765.80	762.33	12⅝"	11⅝"	1⅝"	16	P5	3'-5"	
6	765.92	760.72	2'-8⅜"	2'-7⅜"	4½"	8	P6		4'-10½"
7	766.03	757.18	6'-4⅜"	6'-3⅜"	8"	16	P7	9'-2"	
8	766.14	751.56	12'-1⅛"	12'-0⅛"	11⅝"	16	P8	15'-3"	
			SPAN 6-7						
1	766.40	751.56	12'-4⅛"	12'-3⅛"	11⅝"	16	P9	15'-8"	
2	766.52	757.18	6'-10⅜"	6'-9⅜"	8"	16	P10	9'-8"	
3	766.63	760.72	3'-5⅜"	3'-4⅜"	4½"	8	P11		5'-7¼"
4	766.74	762.33	23⅜"	22⅜"	1⅝"	16	P12	4'-5"	
5	766.85	762.33	2'-0⅜"	23⅜"	1⅝"	16	P13	4'-5"	
6	766.97	760.72	3'-9⅜"	3'-8⅜"	4½"	8	P14		5'-10¼"
7	767.08	757.18	7'-5⅜"	7'-4⅜"	8"	16	P15	10'-2"	
8	767.19	751.56	13'-2"	13'-1"	11⅝"	16	P16	16'-3"	

BENDING SKETCHES



Note:- Dimensions given are along ℄ of bar and are for computed lengths. For length of P bars see Sheet No. 2. P bars to be placed in spandrel columns so as to allow all arch slab sections to expand up grade.



Note:- Arch rings blocks to be poured in the following order.
Block I in both ribs, right and left.
Block II in both ribs.
Block III in both ribs, right and left.
Block IV keys.
No keys shall be poured until all of concrete in adjacent blocks has been in place at least 24 hours.

DIMENSIONS OF ARCH RING

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS
ABOUT 13.5 MILES WEST OF LEBANON
PROJECT NO. R64AP-363 STA. 706+11
DALLAS COUNTY

FINISHED

FINISHED

Drawn Feb. 1929 By H.E.C.
Traced Feb. 1929 By H.E.C. Assembled Mar. 1931 by C.A.F.
Checked Mar. 1929 By F.W.H. Checked April 1931 by F.C.L.

Note:- This drawing is not to scale. Follow dimensions.

SUBMITTED BY ..... DATE 3/4/31 BRIDGE ENGINEER
APPROVED BY ..... DATE ..... CHIEF ENGINEER

STD. S 818
J-782

Sheet No. 9 of 10.

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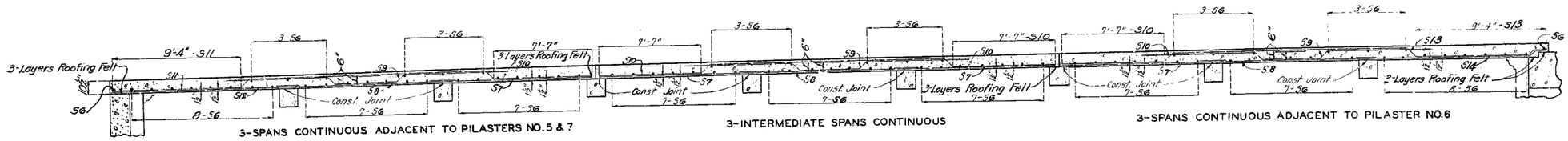
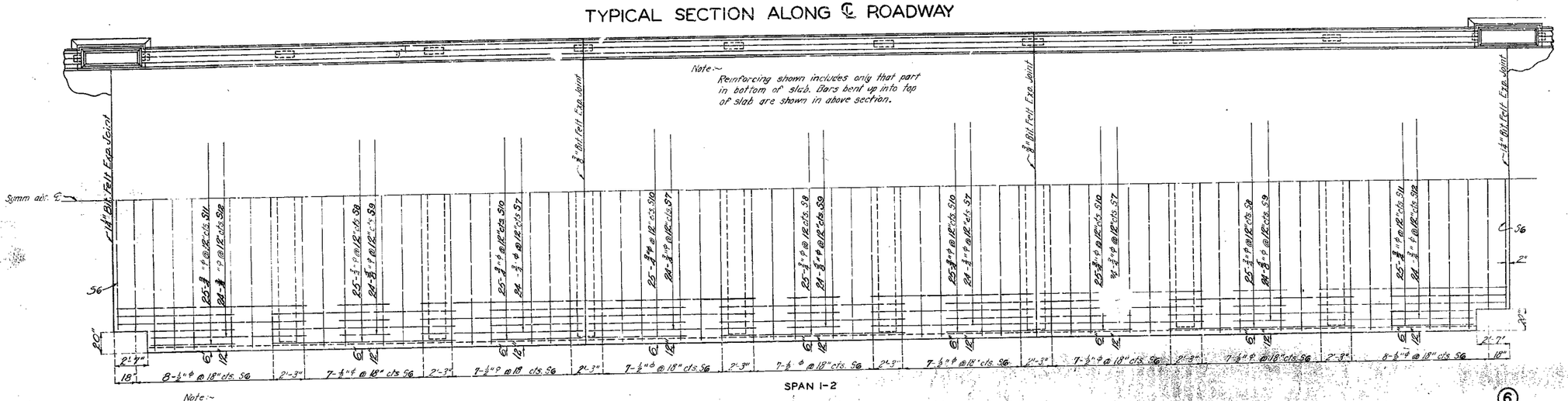
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO	R64AP-S63	1931		



3-SPANS CONTINUOUS ADJACENT TO PILASTERS NO. 5 & 7 — 3-INTERMEDIATE SPANS CONTINUOUS — 3-SPANS CONTINUOUS ADJACENT TO PILASTER NO. 6

TYPICAL SECTION ALONG ℄ ROADWAY



SPAN 1-2

⑤ OR ⑦

Note:- Cut "S" bars where interfered with by Posts.

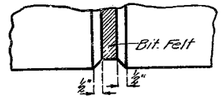
⑥

TYPICAL PLAN OF SLAB SPANS OVER ARCHES SHOWING REINFORCING

Note: All continuous orch slab sections to expand on up grade ends and at all pilasters.
"P" bars in spandrel bent columns to be placed as shown in Half Section Thru Arch Ring Sheet No. 9 of 10.
Bearing for expansion ends of slabs to consist of three layers of roofing felt placed on smoothly finished concrete surface.

Note: This drawing is not to scale. Follow dimensions.

DETAIL OF BEVEL FOR CONST. JOINT AT CURB



Note:- Use bevel as shown for exposed faces of all joints consisting of bituminous felt except at top surface of roadway slab. Use edging tool at top surface of roadway each side of felt joint.

DETAIL OF BEVEL FOR BITUMINOUS FELT JOINTS

Assembled Mar. 1931 By RAB.
Checked April 1931 by F.C.L.
Drawn Feb. 1929 By H.E.C.
Traced Feb. 1929 By H.E.C.
Checked Mar. 1929 By F.W.H.

Sheet No. 10 of 10.

FINISHED

BRIDGE OVER NIANGUA RIVER

STATE ROAD FROM ROUTE 73 TO BENNETT SPRINGS

ABOUT 13.5 MILES WEST OF LEBANON

PROJECT NO. R64AP-S63 STA. 706+11

DALLAS COUNTY

SUBMITTED BY ..... DATE 3/4/31
BRIDGE ENGINEER

APPROVED BY ..... DATE 3/4/31
CHIEF ENGINEER

FINISHED

STD. S 815

J-782

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