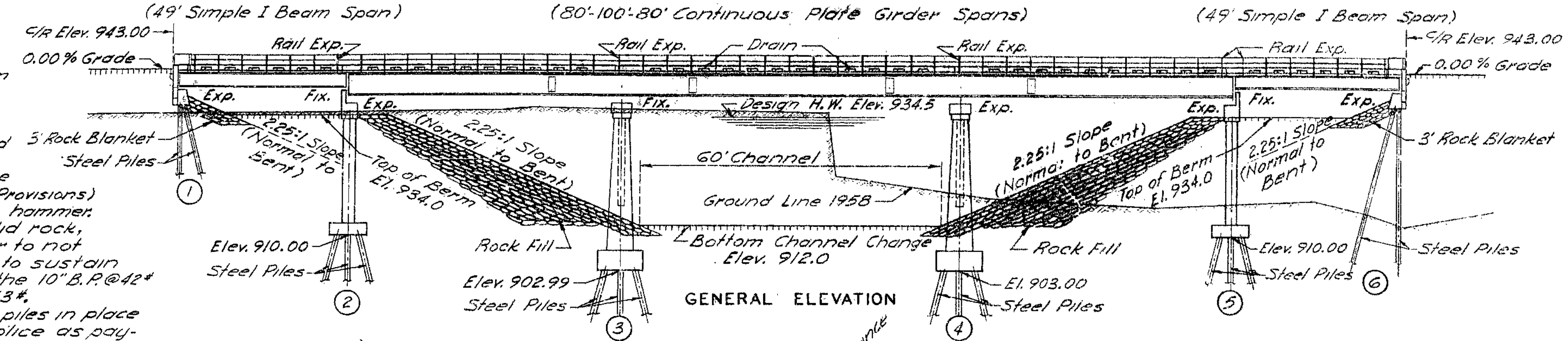
MISSOURI STATE HIGHWAY DEPARTMENT

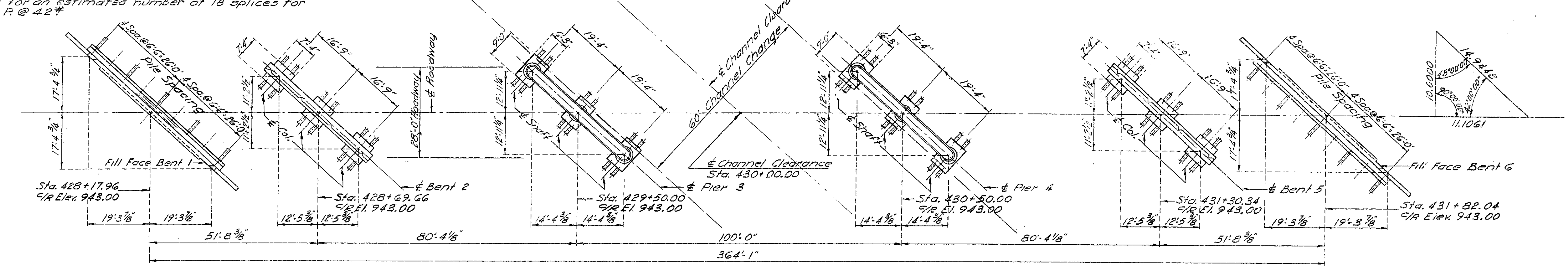
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	55	

Notes:
All piling for end bents No. 1 & 6 shall be 10" Bearing Piles @ 42# and shall conform with the details and notes on sheet No. 10 of the design plans. All piling for Bents No. 2, 3, 4 & 5 shall be 12" Bearing Piles @ 53# and shall conform with the details and notes on sheet No. 10 of the design plans.
All steel piles required for this structure will be furnished by the State. (See Special Provisions)
All piles shall be driven with a steam hammer.
All piles shall be driven to or into solid rock, boulders, shale, or cemented gravel; or to not less than full length authorized and to sustain a load of at least 37 ton per pile for the 10" B.P. @ 42# and 46 ton per pile for the 12" B.P. @ 53#.
The Estimated Quantities of steel piles in place include an allowance of 8 feet per splice as payment for an estimated number of 18 splices for 10" B.P. @ 42#



GENERAL ELEVATION

Notes:
Compacted roadway fill (full roadway width) shall be placed up to elevation of bottom of concrete beam in front of and not less than 25'-0" in back of end bent No. 6 before steel piles are driven.
For Details of Rock Blanket and Rock Fill see sheet No. 2 of the Br. Design plans.



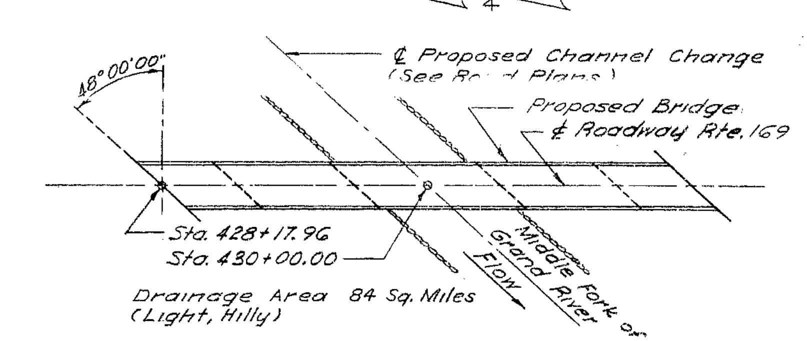
PLAN

GENERAL NOTES:
Design specifications A.A.S.H.O. 1957
Loading H20-44 (Future wearing surface 15 psf.)
Structural Steel Stress 18,000 psi.
Reinforcing Steel Stress 20,000 psi.
Concrete Stress 1200 psi.
Concrete for superstructure shall be Class "B-1" air-entrained.
Concrete for substructure shall be Class "B" air-entrained. If the Contractor desires he may use Class "B-1" in lieu of Class "B" for concrete in substructure with payment on the basis of Class "B" concrete.
Fabricated Plate Girders shall be Structural Steel for Welding conforming to A.S.T.M. A373-56T.
Rivets 3/4"; holes 13/16" except in handrail where rivets shall be 5/8"; holes 11/16".
Field connections may be riveted or bolted with high tensile bolts. Final pay weight for Fabricated Structural Steel will be based on the use of field rivets except for bolted connections specified for handrail.
Qualification of welding operators will be required.
Paint: Shop, none; Field, contact surfaces of bolted field connections, except where high tensile bolts are used, one coat of red lead and surfaces inaccessible after erection three coats of red lead. All other exposed surfaces first coat red lead, second coat brown, third coat aluminum. Payment for cleaning and all painting will be made under unit price bid for Painting. See Special Provisions for Aluminum Paint Materials.
See Section 22-9C of the Standard Specifications for required painting of steel piles.
Where joint filler is specified on the plans it shall conform with the requirements for Gray Rubber Compound Joints as given in Section 59-22 B of the Standard Specifications.
Permits must be obtained for all truck loads over legal length.

ESTIMATED QUANTITIES

Item		Substr.	Superstr.	Total
Class 1 Excavation for Structures	Cu. Yds.	655		655
Class 2 Excavation for Structures	Cu. Yds.	318		318
Class "B" Concrete	Cu. Yds.	369.9		369.9
Class "B-1" Concrete	Cu. Yds.		274.3	274.3
Fabricated Structural Steel (I-Bm. Spans)	Lbs.		77,560	77,560
Fabricated Structural Steel (Pl. Gir. Spans)	Lbs.		213,080	213,080
10" Steel Piles in Place (State Furnished)	Lin. Ft.	1,260		1,260
12" Steel Piles in Place (State Furnished)	Lin. Ft.	2,034		2,034
Steel Castings	Lbs.		5410	5410
Gray Iron Alloy Castings	Lbs.		1040	1040
Reinforcing Steel	Lbs.	28,550	78,090	106,640
Painting	Tons		148.5	148.5

Excavation for bridge made above Elev. 913.0 will be paid for as Class 1 Excavation for Structures.
Excavation for bridge made below Elev. 913.0 will be paid for as Class 2 Excavation for Structures.
Concrete in end posts is included with superstructure Class "B-1" Concrete.
No payment will be allowed for Class 1 Excavation for End Bent No. 6. Payment for Class 1 Excavation for Bent No. 5 will be made from the existing ground line.



LOCATION SKETCH

Bench Marks U.S.G.S. Datum (1929 Adj.)
Sta. 432+85, 3' Lt. One Nail 5" Willow Stump El. 917.55
Sta. 438+19, 1' Lt. N&W. in 3" Box Elder Stump El. 938.74

BRIDGE OVER MIDDLE FORK OF GRAND R.

STATE ROAD FROM GRANT CITY TO GENTRY
ABOUT 2 MILES S. OF GRANT CITY
PROJECT NO. F-297 (7) (RTE. 169) STA. 428 + 17.96

WORTH COUNTY

SUBMITTED BY Jack M. Lasley
REGISTERED PROFESSIONAL ENGINEER
MISSOURI NO. E-8243

SUBMITTED BY J.A. Williams DATE 10-6-1959
BRIDGE ENGINEER
APPROVED BY Rex M. Whitton DATE 10-6-1959
CHIEF ENGINEER

R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST
ST. LOUIS 1, MISSOURI

Drawn Aug. 1959 by W.J.H.
Checked 26 Aug 1959 by D.C.S.

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

Sheet No. 1 of 11

Std. C-110R7

A-448

SEE FINAL PLANS BROWN LINES

ROLL #726

1

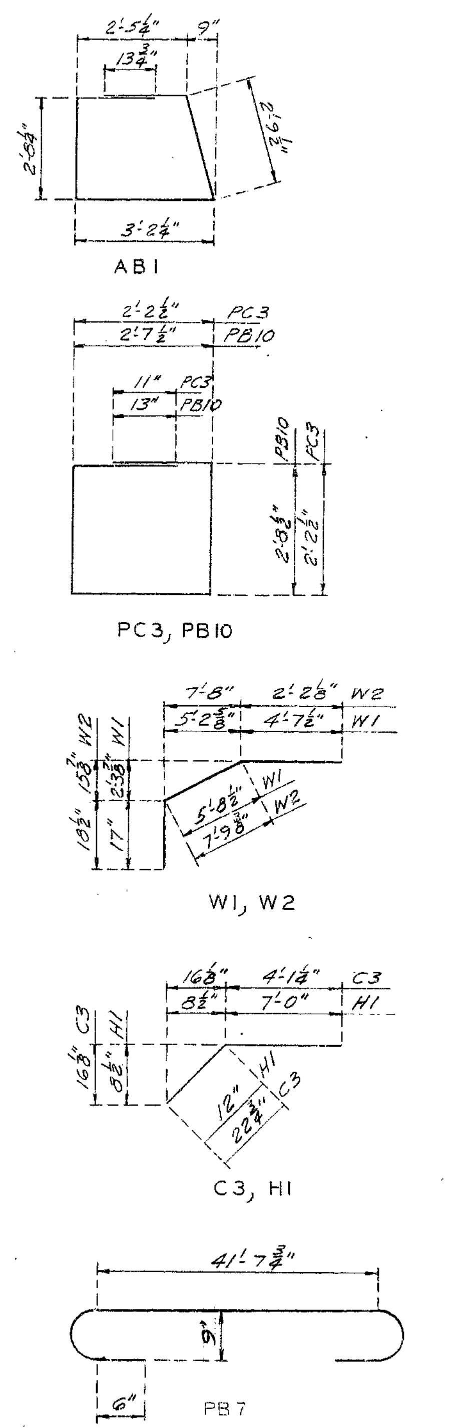
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	56	

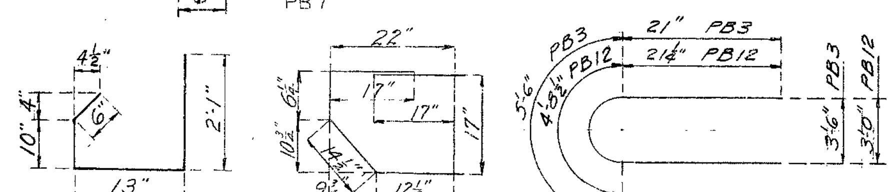
COMPLETE BILL OF REINFORCING STEEL

No.	Size	Length	Mark	Location
END BENT 1				
52	#4	12'-3"	AB1	Beam
8	#4	3'-6"	U10	"
16	#6	55'-9"	AB3	Bm. & Back wall
2	#4	55'-9"	AB2	Backwall
100	#4	3'-9"	V1	"
12	#4	5'-6"	V2	"
4	#6	11'-9"	W1	Wing Walls
4	#6	11'-6"	W2	"
8	#6	9'-9"	W3	"
3	#6	15'-0"	W4	"
2	#6	6'-6"	W5	"
7	#4	9'-0"	V3	"
BENT 2				
24	#8	4'-9"	D3	Footings
24	#6	8'-9"	D4	"
24	#8	23'-6"	PC2	Columns
60	#3	9'-9"	PC3	"
24	#6	8'-0"	H1	Col. Haunches
8	#2	19'-9"	P1	Beam
9	#8	45'-0"	PB7	"
8	#8	42'-6"	PB8	"
6	#6	42'-6"	PB9	"
49	#4	11'-9"	PB10	"
9	#4	4'-6"	PB11	"
5	#4	3'-9"	U7	"
41	#5	8'-9"	U8	"
9	#5	7'-6"	U9	"
1	#5	7'-3"	U11	"
1	#5	8'-0"	U12	"
2	#5	8'-6"	U13	"
3	#4	7'-0"	PB13	"
PIER 3				
24	#8	6'-3"	D1	Footings
12	#6	10'-3"	D2	"
18	#6	7'-3"	D5	"
24	#8	11'-9"	PC1	Columns
		20'-0"	PC4	
18	#4	38'-3"	PB4	Web & Cap
3	#8	38'-9"	PB5	Web
32	#4	20'-0"	PB6	"
32	#5	8'-0"	U6	"
6	#7	38'-9"	PB1	Cap
2	#6	42'-3"	PB2	"
4	#7	9'-0"	PB3	"
2	#7	8'-3"	PB12	"
40	#6	7'-0"	U1	"
2	#6	6'-3"	U2	"
2	#4	4'-6"	U3	"
6	#4	4'-9"	U4	"
38	#5	8'-3"	U5	"
8	#2	19'-9"	P1	"

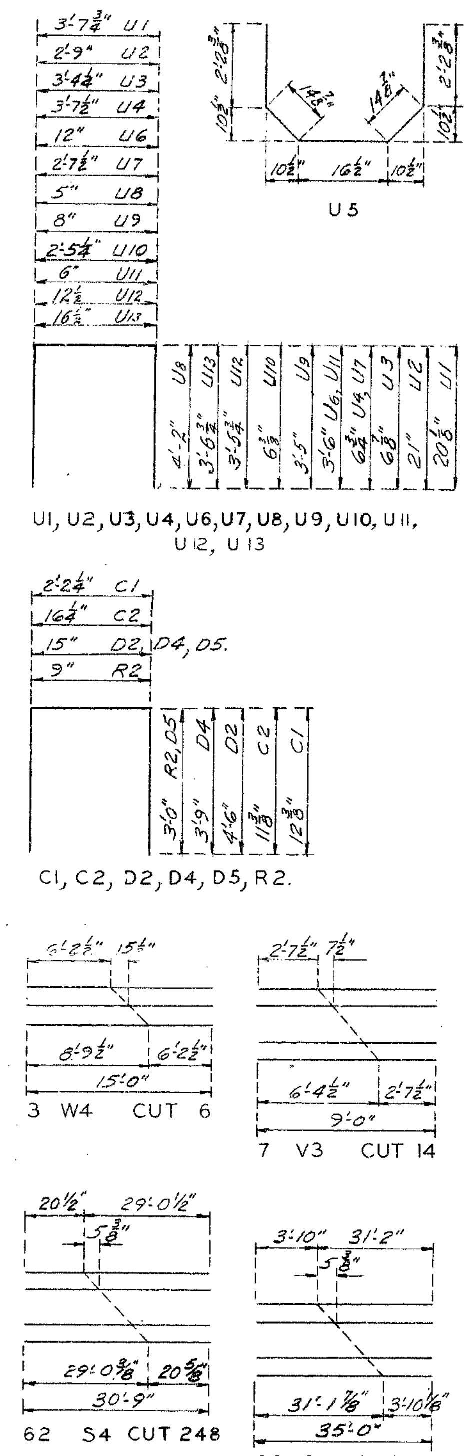
Bending Sketches & Cutting Diagrams



No.	Size	Length	Mark	Location
PIER 4				
24	#8	6'-3"	D1	Footings
12	#6	10'-3"	D2	"
18	#6	7'-3"	D5	"
24	#8	11'-9"	PC1	Columns
24	#8	20'-0"	PC4	"
18	#4	38'-3"	PB4	Web & Cap
3	#8	38'-9"	PB5	Web
32	#4	20'-0"	PB6	"
32	#5	8'-0"	U6	"
6	#7	38'-9"	PB1	Cap
2	#6	42'-3"	PB2	"
4	#7	9'-0"	PB3	"
2	#7	8'-3"	PB12	"
40	#6	7'-0"	U1	"
2	#6	6'-3"	U2	"
2	#4	4'-6"	U3	"
6	#4	4'-9"	U4	"
38	#5	8'-3"	U5	"
8	#2	19'-9"	P1	"
BENT 5				
24	#8	4'-9"	D3	Footings
24	#6	8'-9"	D4	"
24	#8	23'-6"	PC2	Columns
60	#3	9'-9"	PC3	"
24	#6	8'-0"	H1	Col. Haunches
8	#2	19'-9"	P1	Beam
9	#8	45'-0"	PB7	"
8	#8	42'-6"	PB8	"
6	#6	42'-6"	PB9	"
49	#4	11'-9"	PB10	"
9	#4	4'-6"	PB11	"
5	#4	3'-9"	U7	"
41	#5	8'-9"	U8	"
9	#5	7'-6"	U9	"
1	#5	7'-3"	U11	"
1	#5	8'-0"	U12	
2	#5	8'-6"	U13	
3	#4	7'-0"	PB13	
END BENT 6				
52	#4	12'-3"	AB1	Beam
8	#4	3'-6"	U10	"
16	#6	55'-9"	AB3	Bm. & Back wall
2	#4	55'-9"	AB2	Back wall
100	#4	3'-9"	V10	"
12	#4	5'-6"	V2	"
4	#6	11'-9"	W1	Wing Walls
4	#6	11'-6"	W2	"
8	#6	9'-9"	W3	"
3	#6	15'-0"	W4	"
2	#6	6'-6"	W5	"
7	#4	9'-0"	V3	"

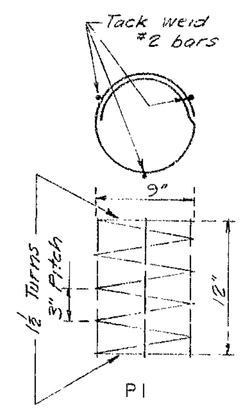


Bending Sketches & Cutting Diagrams



No.	Size	Length	Mark	Location
SUPERSTRUCTURE				
434	#5	38'-9"	S1	Slab
80	#5	16'-0"	S2	"
1060	#5	31'-3"	S3	"
248	#5	30'-9"	S4	"
20	#5	2'-0"	S5	"
124	#5	35'-0"	S6	"
248	#5	26'-3"	S7	"
20	#5	6'-0"	S8	"
18	#5	4'-3"	C1	Curb
448	#5	3'-3"	C2	"
4	#5	6'-0"	C3	"
24	#6	27'-6"	C4	"
18	#6	34'-6"	C5	"
24	#6	41'-0"	C6	"
24	#4	3'-9"	R1	End Post
20	#5	6'-9"	R2	"

Bending Sketches & Cutting Diagrams



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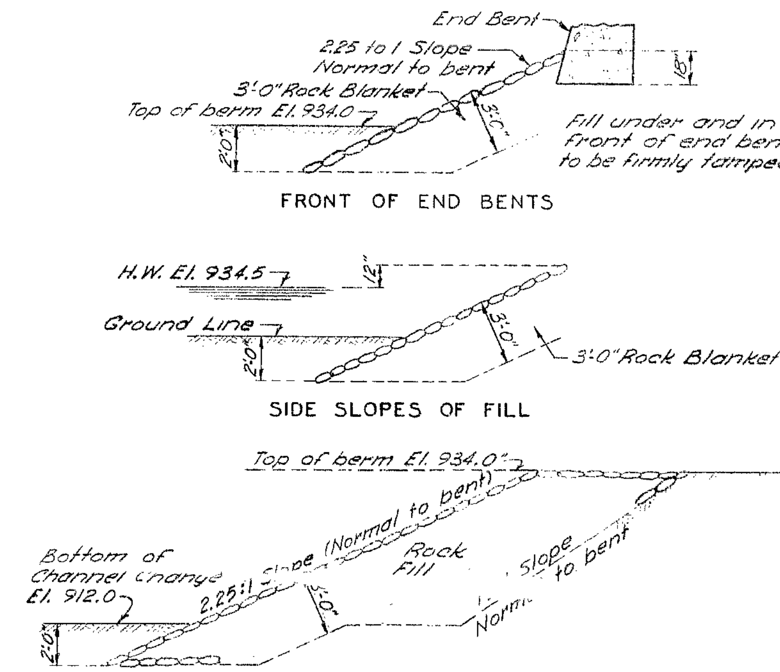


Note:
3'-0" Rock Blanket shall be placed on fills at ends of bridge as shown in sketches. Rock Fill shall be placed on side slopes of channel change as shown in sketch. See Road Plans for Quantities.

ROCK BLANKET & ROCK FILL DETAILS

BRIDGE OVER MIDDLE FORK OF GRAND R.

STATE ROAD FROM GRANT CITY TO GENTRY
ABOUT 2 MILES S. OF GRANT CITY
PROJECT NO. F-297(7)(RTE. 169) **STA.** 428 + 17.96

WORTH COUNTY

R.W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
219 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

Drawn AUG. 28 1959 by H.O.W.
Checked 28 Aug 1959 by D.C.S.

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

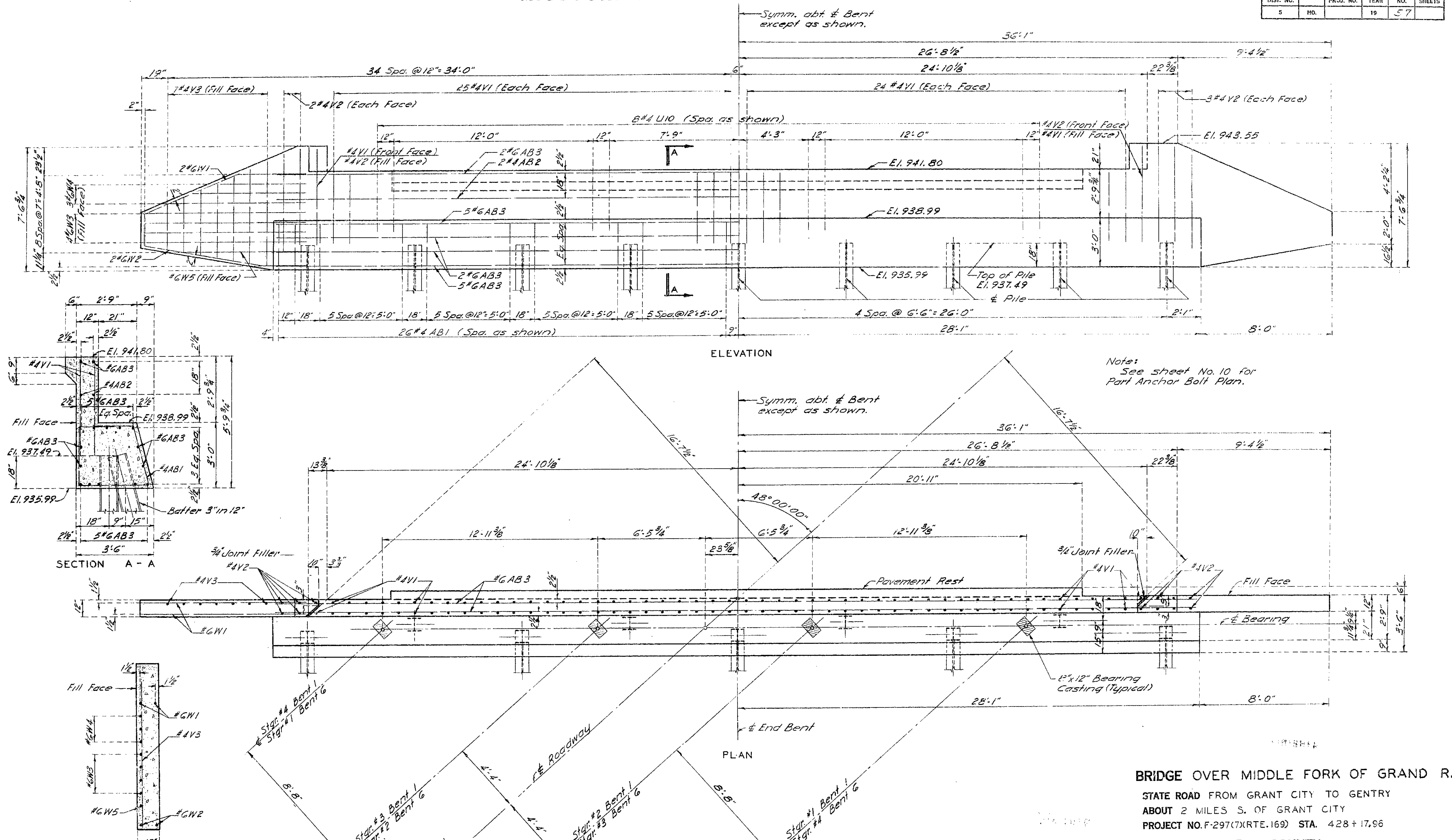
A-448

NO CONSTRUCTION CHANGES

2

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	57	



DETAILS END BENTS 1 & 6

BRIDGE OVER MIDDLE FORK OF GRAND R.

STATE ROAD FROM GRANT CITY TO GENTRY

ABOUT 2 MILES S. OF GRANT CITY

PROJECT NO. F-297(7)(RTE. 169) **STA.** 428 + 17.96

WORTH COUNTY

Drawn Aug. 1959 by W.J.H.

Checked 25 Aug 1959 by D.C.S.

R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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

Sheet No. 3 of 11

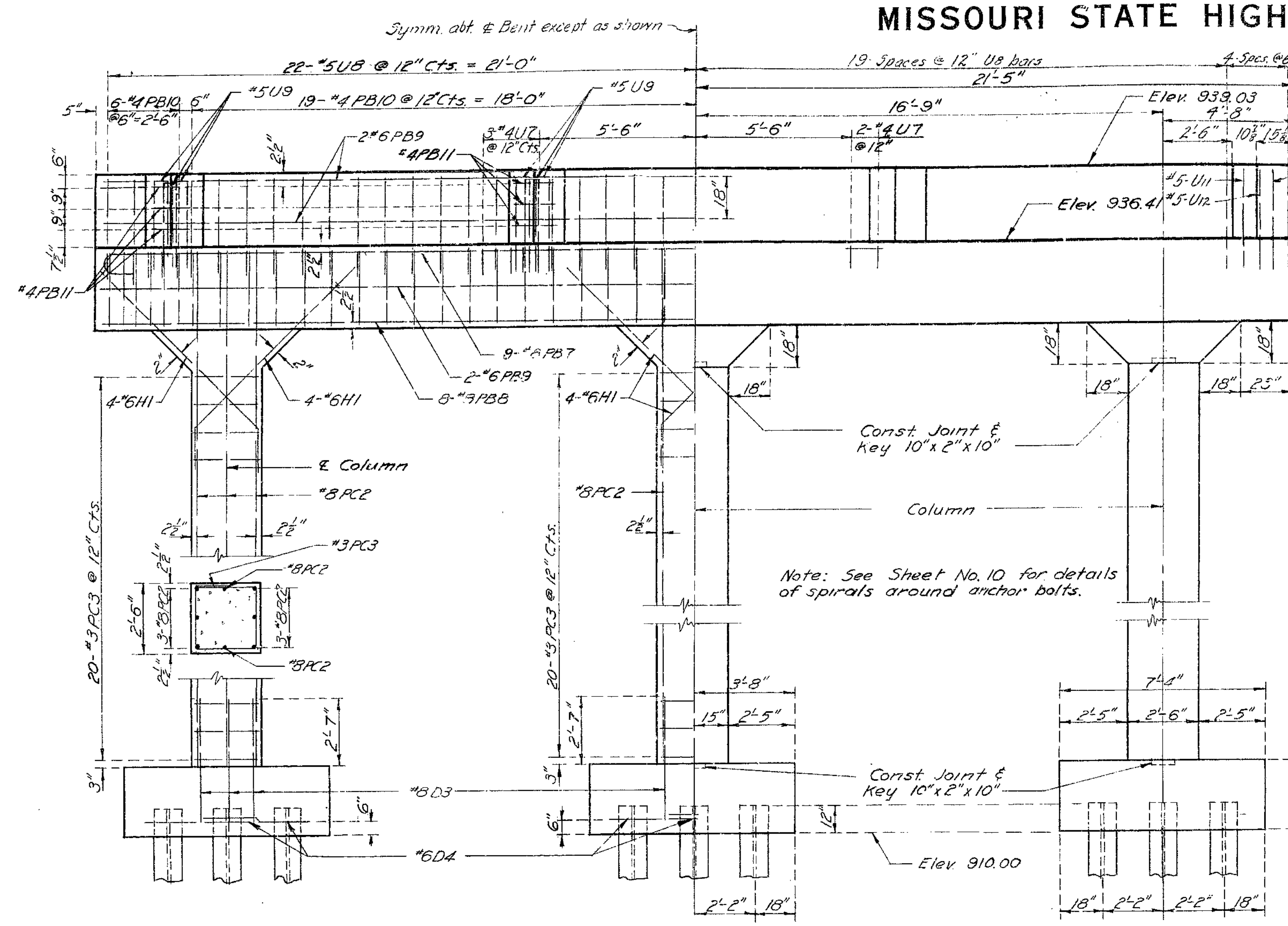
A-448

NO CONSTRUCTION CHANGES

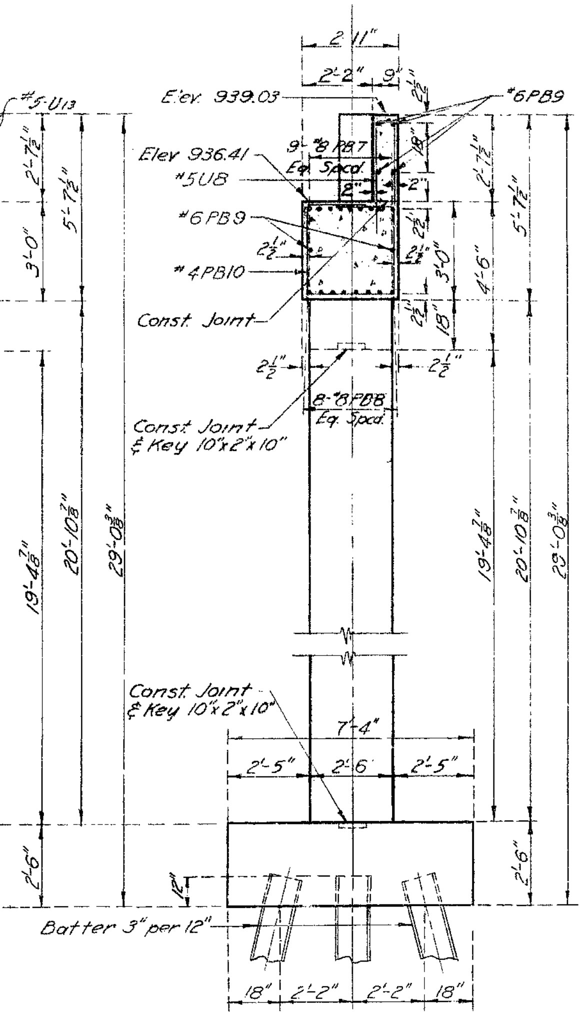
3

MISSOURI STATE HIGHWAY DEPARTMENT

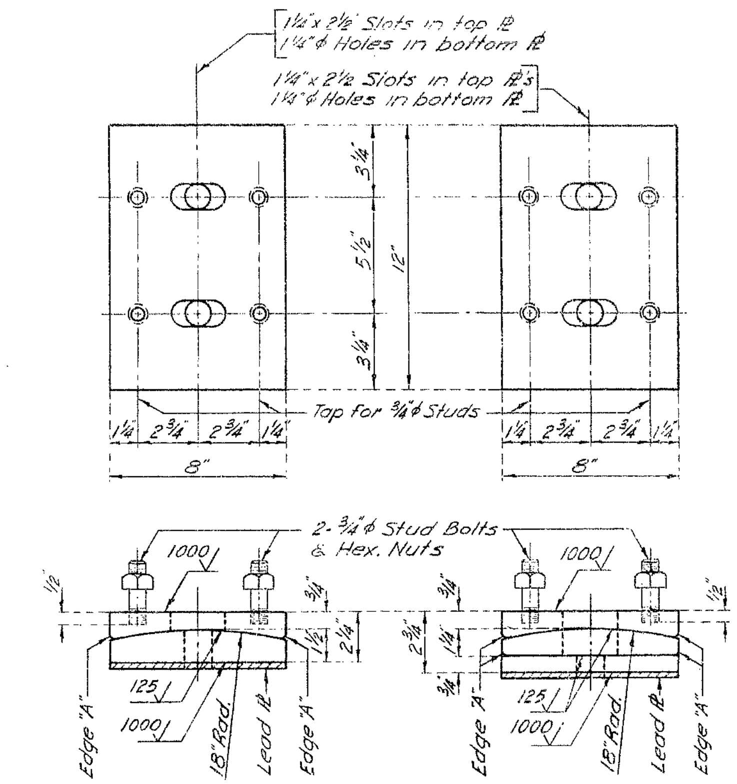
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	58	



ELEVATION



SECTION AT ℄

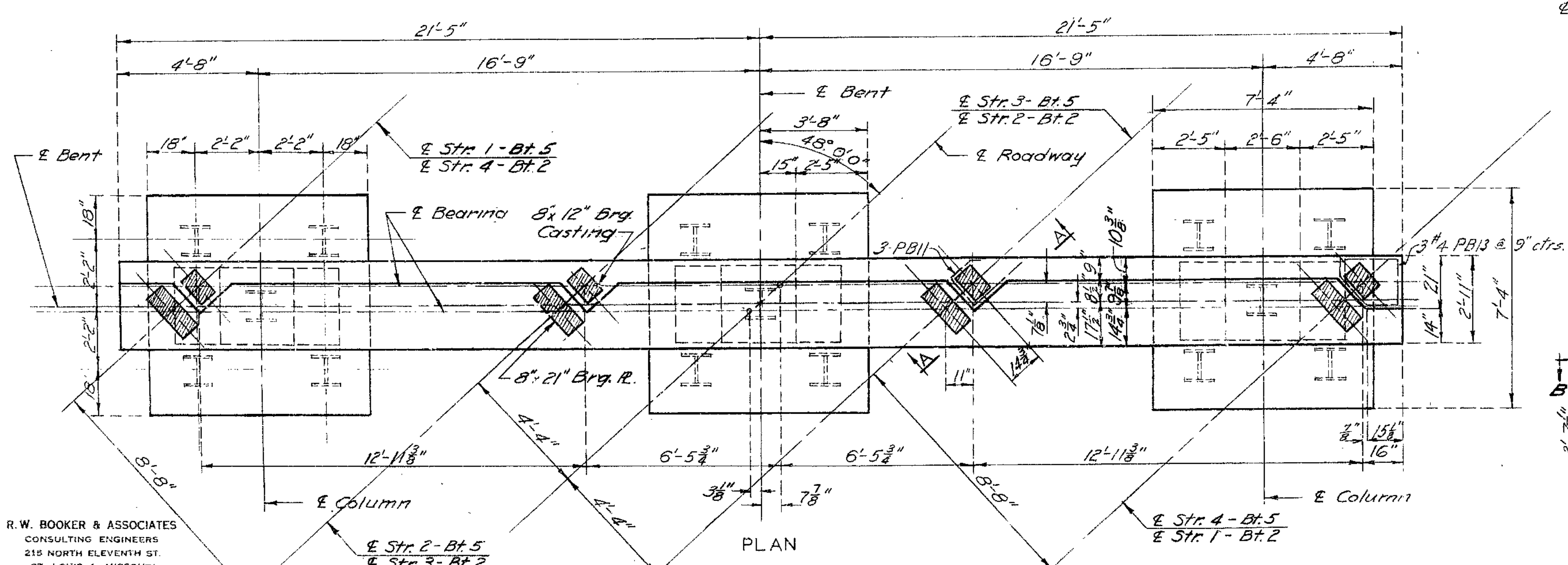


FIXED
4 REQ'D. BENT 2
4 REQ'D BENT 5

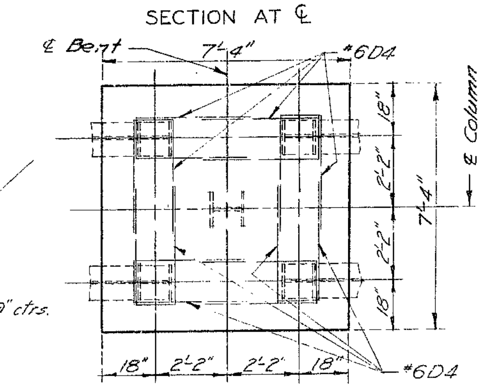
EXPANSION
4 REQ'D BENT 1
4 REQ'D BENT 6

Notes:
1¼"x 2½" slots to extend thru top plates, sliding segment and bottom flange of beam.
Material for castings shall be either gray iron alloy or cast steel but payment will be made as Gray Iron Alloy.
All bolts and nuts shall be paid for as structural steel.
Anchor bolts for castings shall be 1"ϕ swedged bolts, no heads or nuts and shall extend 10" into concrete. Top ends of anchor bolts shall be above the top of castings but not higher than ¼" below the top surface of the bottom flange of beam.
Lead plates under bearings shall be approximately ⅛" thickness and weight 8 psf. Cost of lead plates shall be included in price bid for other items.
Edge "A" to be rounded.

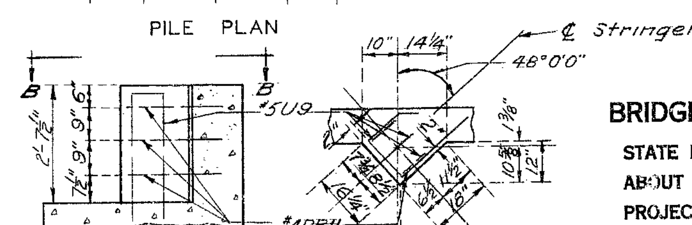
BEARING DEVICE DETAILS SPANS 1-2 & 5-6



PLAN



PILE PLAN



SECTION A-A

PLAN B-B

DETAILS OF INTERMEDIATE BENTS 2 & 5

R.W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

Drawn Aug 1959 by F.J.M.
Checked 26 Aug 1959 by D.C.S.

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

Sheet No. 4 of 11

BRIDGE OVER MIDDLE FORK OF GRAND R.

STATE ROAD FROM GRANT CITY TO GENTRY
ABOUT 2 MILES S. OF GRANT CITY
PROJECT NO. F-297(7)(RTE.169) STA. 428 + 17.96

WORTH COUNTY

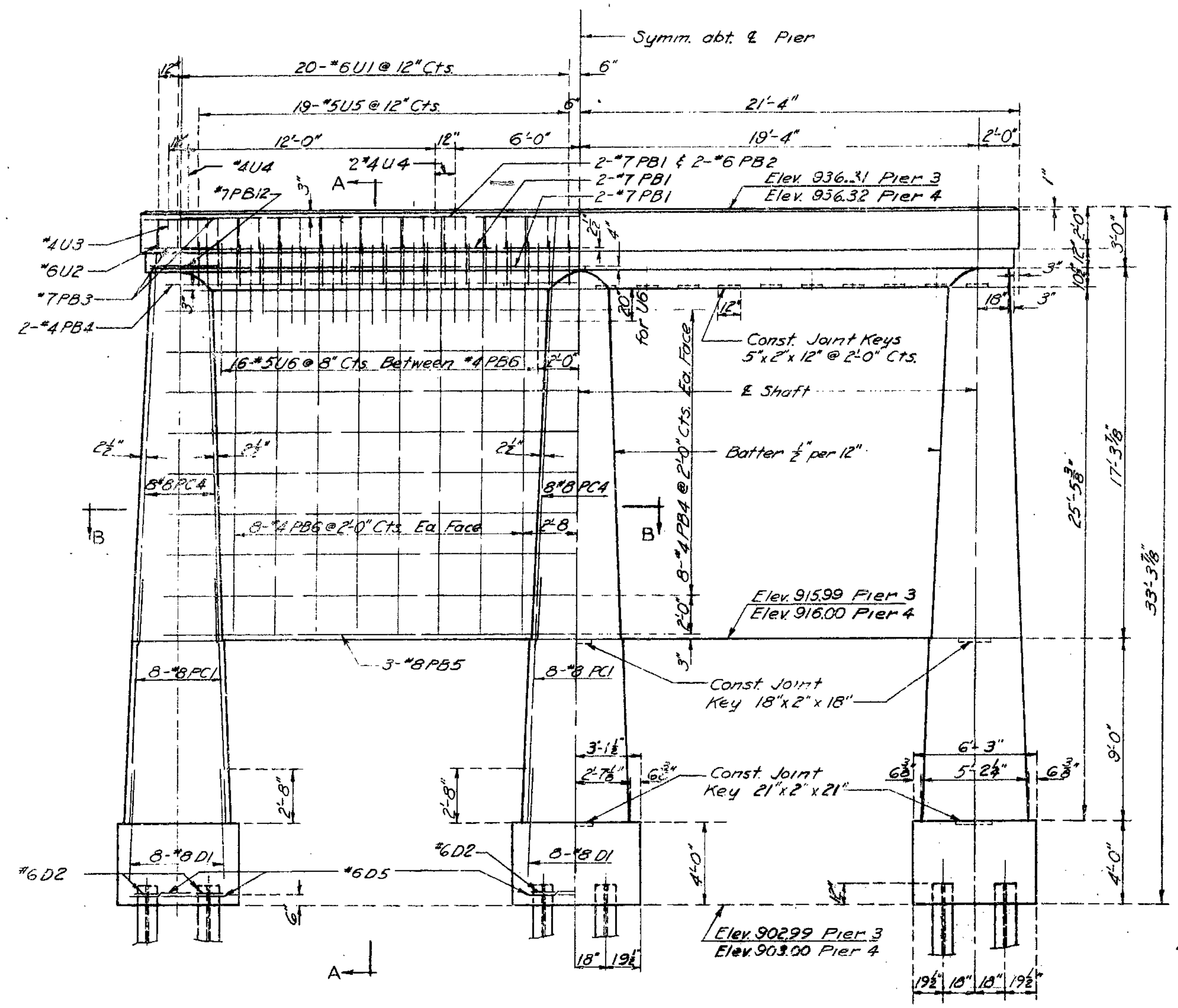
A-448

NO CONSTRUCTION CHANGES

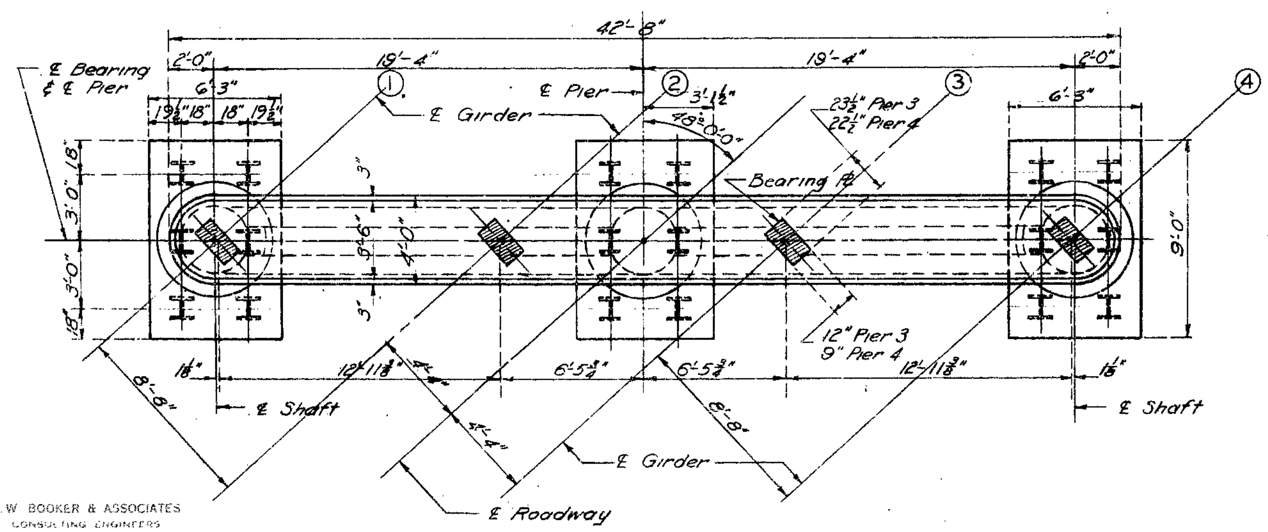
MISSOURI STATE HIGHWAY DEPARTMENT

Note: See Sheet #10 for details of spirals around Anchor Bolts.

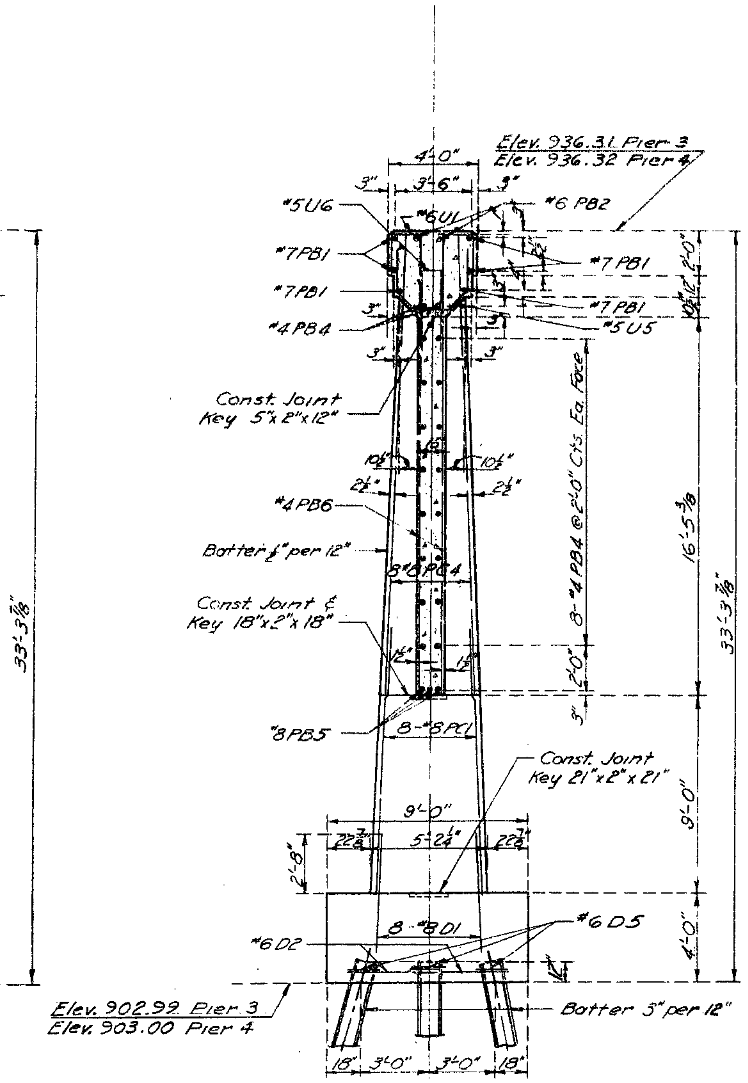
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	59	



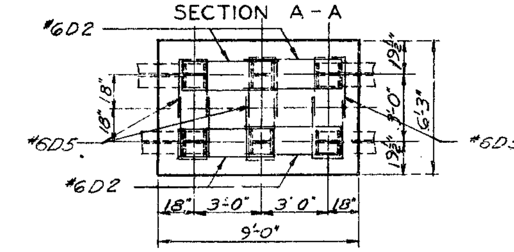
ELEVATION



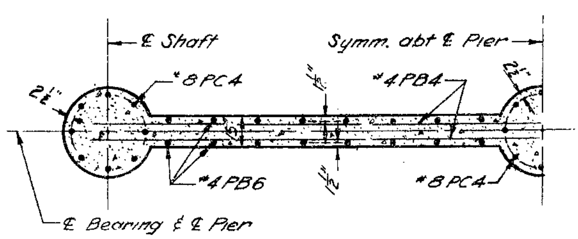
PLAN



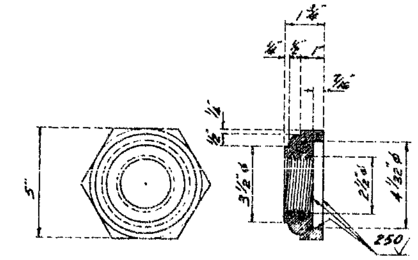
SECTION A-A



PILE PLAN



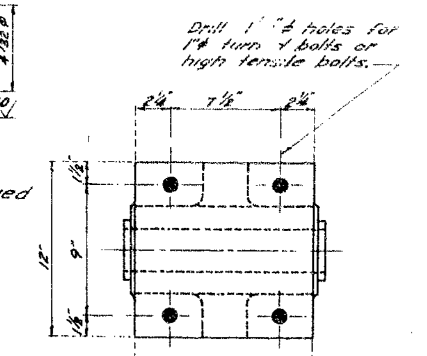
HALF SECTION B-B

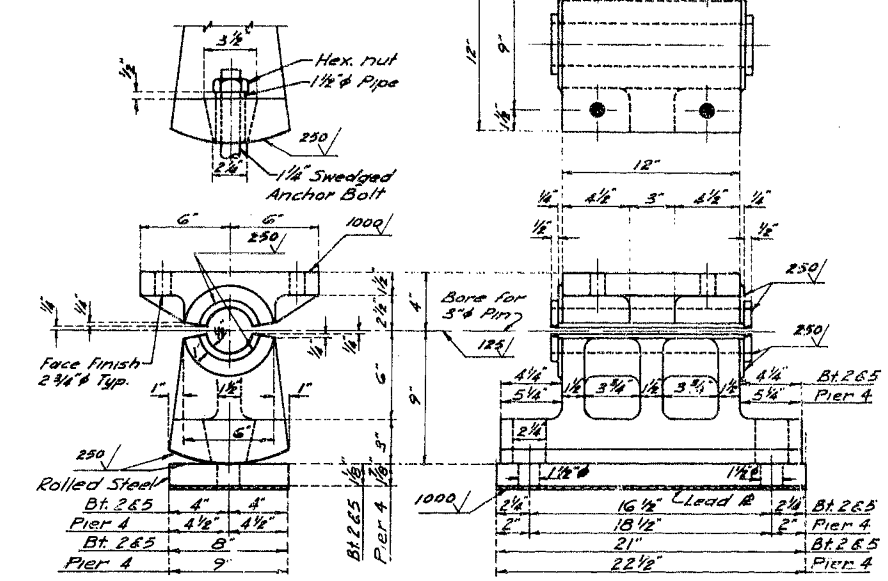


CAST STEEL NUT

32 Required

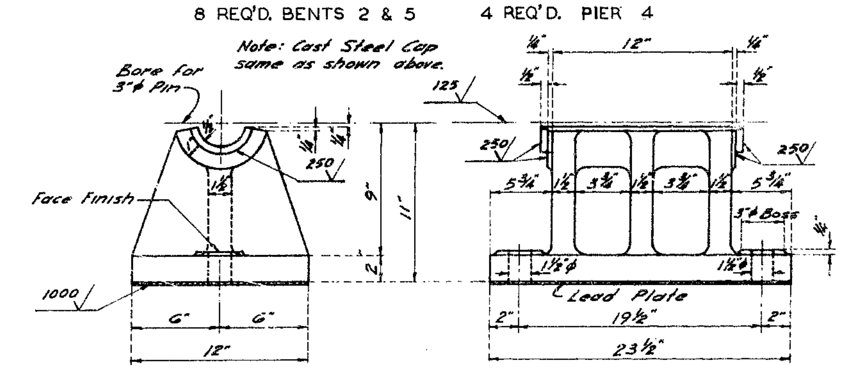
16-3"φ Rolled Steel Pins Required





EXPANSION ROCKER

8 REQ'D. BENTS 2 & 5 4 REQ'D. PIER 4



FIXED PEDESTAL

4 REQ'D. PIER 3

All fillets shall have ¾" radius.
Material shall be cast steel except as noted.
All pins, bolts, nuts, pipe sleeves, and rolled steel shall be paid for as structural steel.
Anchor bolts shall be 1¼"φ swedged bolts with hex. nuts and shall extend 12" into concrete.
Lead plates under bearings shall be approximately ⅛" thickness and weigh 8#/sq.ft. Cost of lead plates shall be included in price bid for other items.

BRIDGE OVER MIDDLE FORK OF GRAND R.

STATE ROAD FROM GRANT CITY TO GENTRY

ABOUT 2 MILES S. OF GRANT CITY

PROJECT NO. F-297(7) (RT. 169) **STA.** 428+17.96

WORTH **COUNTY**

R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
212 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

Drawn Aug. 1959 by F.J.M.
Checked 28 Aug 1959 by D.C.S.

DETAILS OF PIERS 3 & 4

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

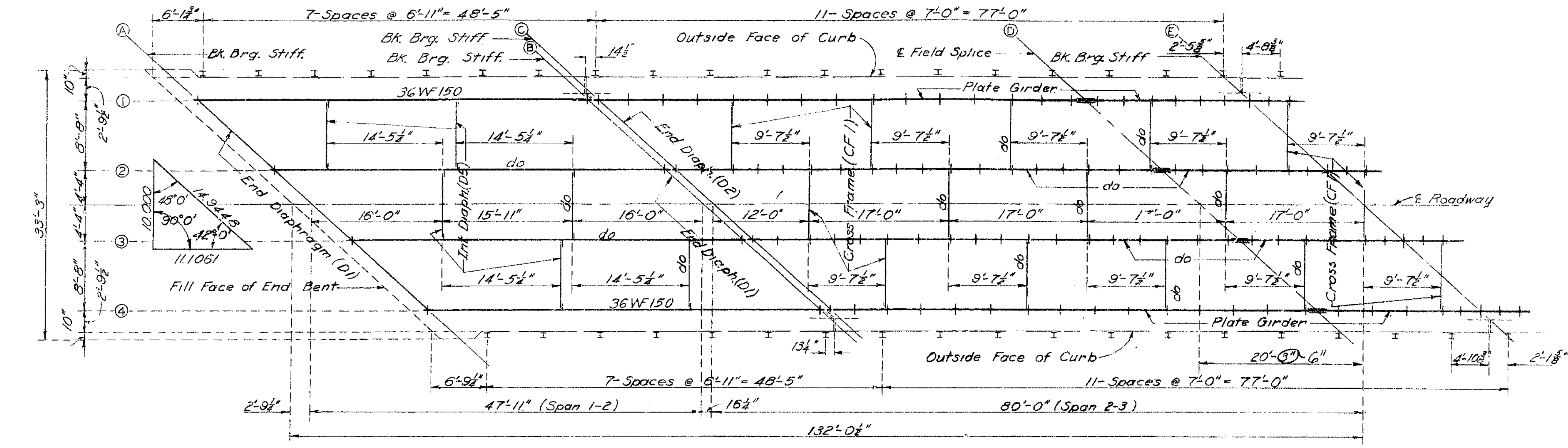
Sheet No. 5 of 11

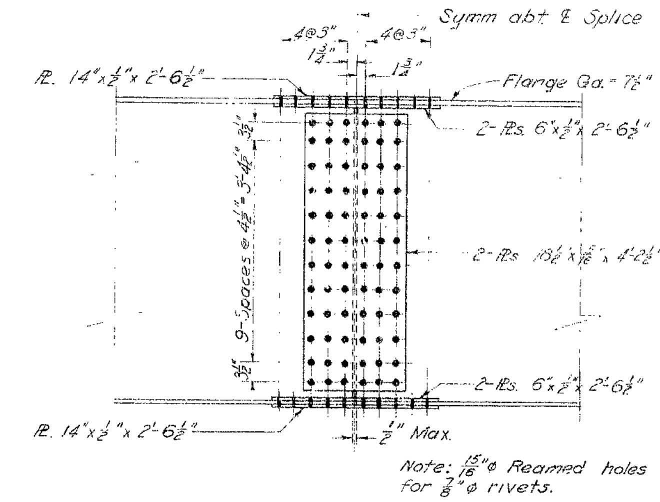
A-448

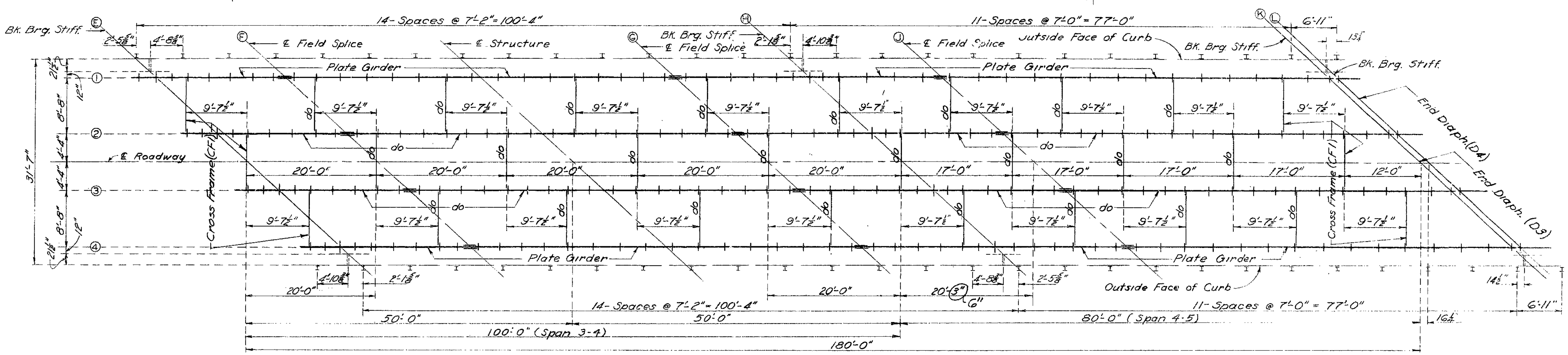
NO CONSTRUCTION CHANGES

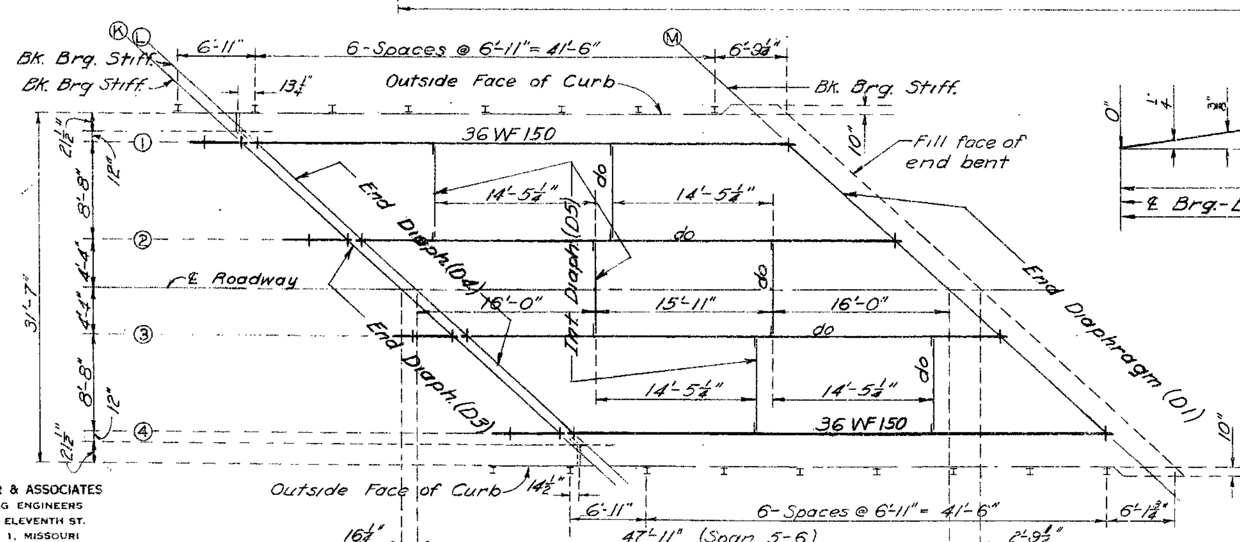
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	60	









PLAN OF STRUCTURAL STEEL

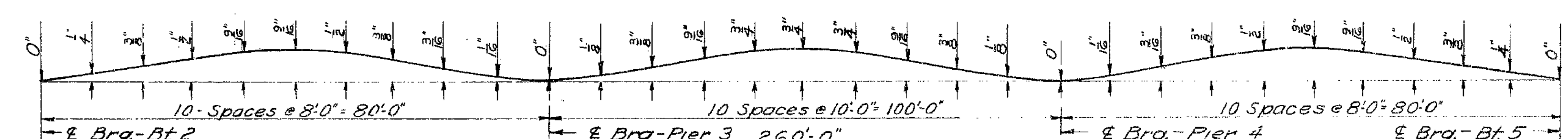


PLATE GIRDER CAMBER DIAGRAM

BRIDGE OVER MIDDLE FORK OF GRAND R.
STATE ROAD FROM GRANT CITY TO GENTRY
ABOUT 2 MILES S. OF GRANT CITY
PROJECT NO. F-297(7) (RT. 169) **STA.** 428+17.96
WORTH **COUNTY**

R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

Drawn July 1959 **by** F.I.M.
Checked 26 Aug 1959 **by** D.C.S.

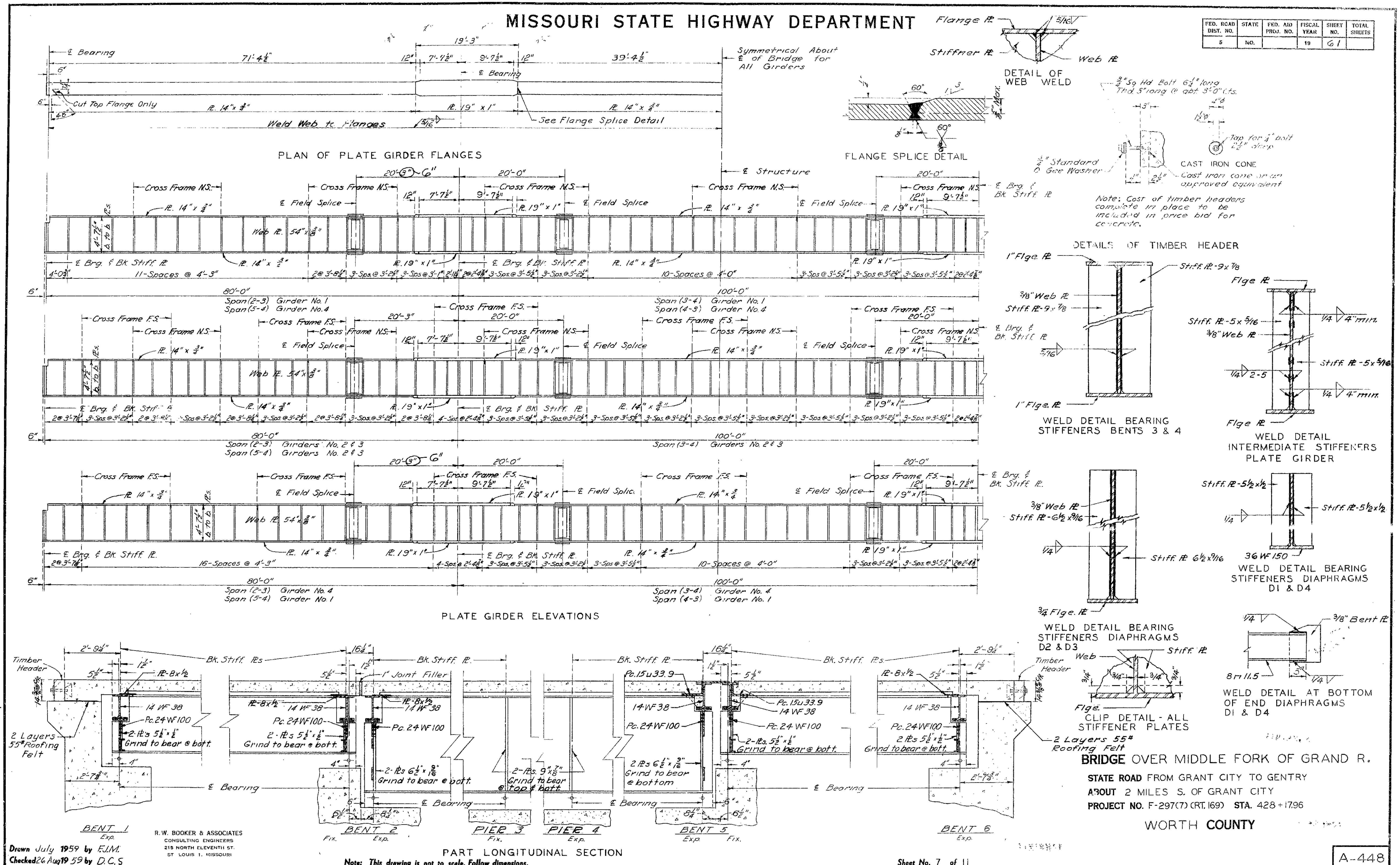
Note: This drawing is not to scale. Follow dimensions.

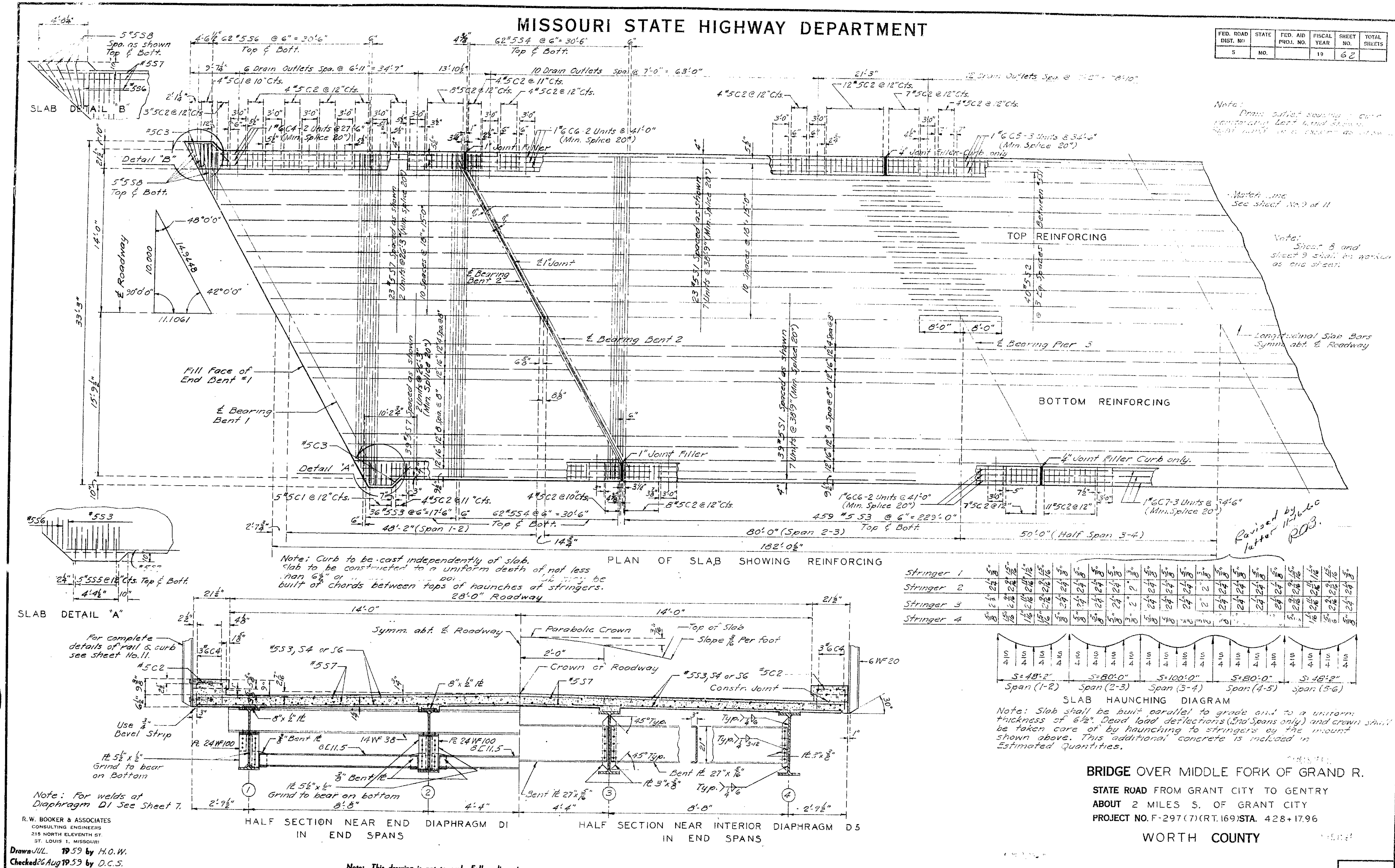
Sheet No. 6 **of** 11

A-448

NO CONSTRUCTION CHANGES

6


MISSOURI STATE HIGHWAY DEPARTMENT
FED. ROAD DIST. NO. 5
STATE NO.
FED. AID PROJ. NO.
FISCAL YEAR 19
SHEET NO. 61
TOTAL SHEETS
PLAN OF PLATE GIRDER FLANGES
Symmetrical About ℄ of Bridge for All Girders
Cut Top Flange Only
Weld Web to Flanges
See Flange Splice Detail
DETAIL OF WEB WELD
Flange PL
Stiffener PL
Web PL
FLANGE SPLICE DETAIL
CAST IRON CONE
Cast iron cone or an approved equivalent
Note: Cost of timber headers complete in place to be included in price bid for concrete.
DETAILS OF TIMBER HEADER
PLATE GIRDER ELEVATIONS
Span (2-3) Girder No. 1
Span (5-4) Girder No. 4
Span (3-4) Girder No. 1
Span (4-3) Girder No. 4
Span (2-3) Girders No. 2 & 3
Span (5-4) Girders No. 2 & 3
Span (3-4) Girders No. 2 & 3
Span (2-3) Girder No. 4
Span (5-4) Girder No. 1
Span (3-4) Girder No. 4
Span (4-3) Girder No. 1
WELD DETAIL BEARING STIFFENERS BENTS 3 & 4
WELD DETAIL INTERMEDIATE STIFFENERS PLATE GIRDER
WELD DETAIL BEARING STIFFENERS DIAPHRAGMS D1 & D4
WELD DETAIL BEARING STIFFENERS DIAPHRAGMS D2 & D3
CLIP DETAIL - ALL STIFFENER PLATES
WELD DETAIL AT BOTTOM OF END DIAPHRAGMS D1 & D4
PART LONGITUDINAL SECTION
BENT 1 Exp.
BENT 2 Fix. Exp.
PIER 3 Fix.
PIER 4 Exp.
BENT 5 Exp. Fix.
BENT 6 Exp.
BRIDGE OVER MIDDLE FORK OF GRAND R.
STATE ROAD FROM GRANT CITY TO GENTRY
ABOUT 2 MILES S. OF GRANT CITY
PROJECT NO. F-297(7) (RT. 169) STA. 428+17.96
WORTH COUNTY
R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI
Drawn July 1959 by F.J.M.
Checked 24 Aug 1959 by D.C.S.
Note: This drawing is not to scale. Follow dimensions.
Sheet No. 7 of 11
A-448
NO CONSTRUCTION CHANGES



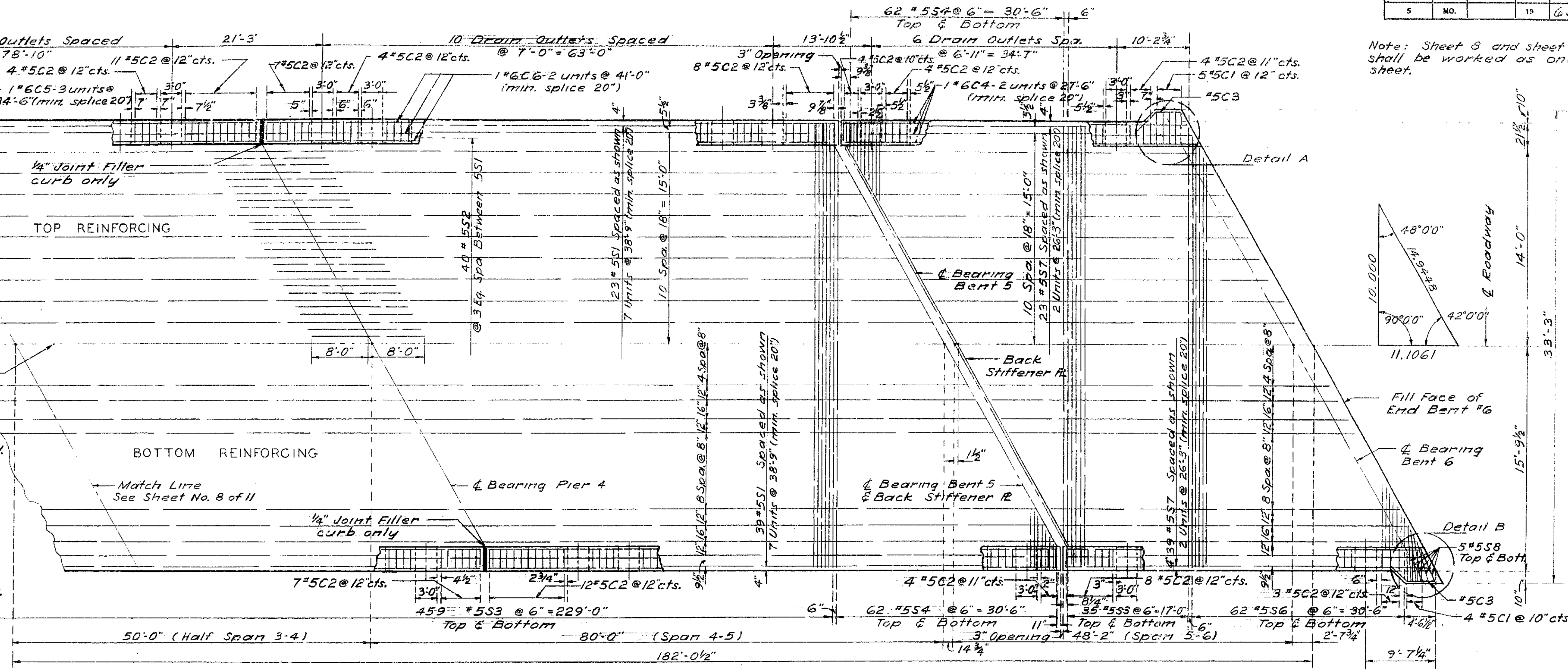
NO CONSTRUCTION CHANGES

MISSOURI STATE HIGHWAY DEPARTMENT

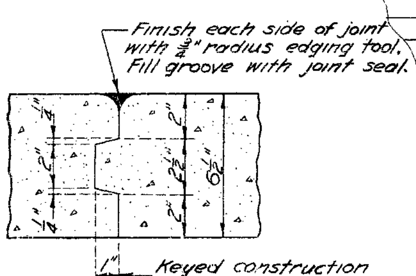
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	63	

Note: Sheet 8 and sheet 9 shall be worked as one sheet.

Note: Drain outlet spacing and curb reinforcement Lefthand shown Righthand same except as shown.



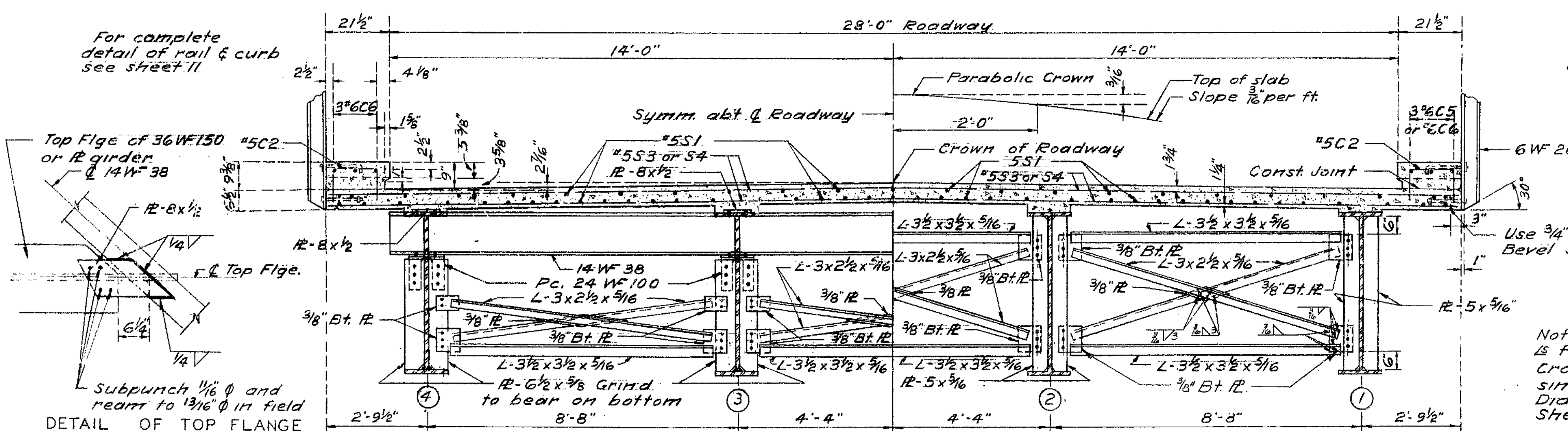
PLAN OF SLAB SHOWING REINFORCING



DETAIL OF SLAB CONSTRUCTION JOINT.

Note: Curb to be cast independently of slab. Slab to be constructed to a uniform depth of not less than 6½" or if desired the bottom of the slab may be built of chords between tops of haunches at stringers.

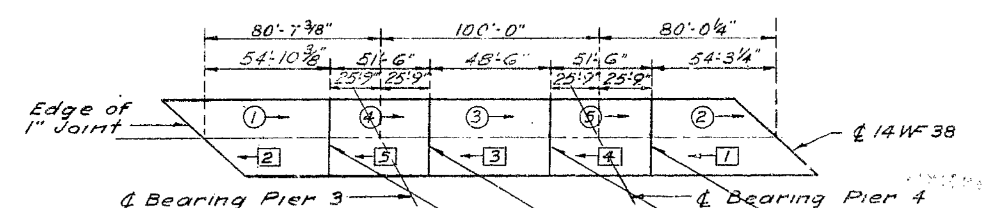
For complete detail of rail & curb see sheet 11



DETAIL OF TOP FLANGE DIAPHRAGMS D1 & D2

HALF SECTION NEAR DIAPHRAGM D2 — HALF SECTION NEAR CROSS FRAME CF1

Note: Welding of cross framing & for Diaphragm D2 & Cross frame CF1 shall be similar to those shown on Diaphragm D3. See Sheet 10.



Note: This slab shall be poured in sections of the lengths shown and in the sequence indicated by the numbers: ①②③④⑤ or as an alternate by the numbers: 1 2 3 4 5. The separate pours shall progress in the direction indicated by the arrows. Longitudinal construction joints shall not be permitted. See Section 16-3E of Supplemental Specifications. The above pouring sequence and the number of construction joints may be altered by the Engineer in order to obtain a more satisfactory surface finish.

SLAB POURING SEQUENCE

BRIDGE OVER MIDDLE FORK OF GRAND R.

STATE ROAD FROM GRANT CITY TO GENTRY

ABOUT 2 MILES S. OF GRANT CITY

PROJECT NO. F-297 (7) (RT. 169) STA. 428 + 17.96

WORTH **COUNTY**

Drawn July 1959 by D. L. B.
Checked 26 Aug 1959 by D. C. S.

R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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

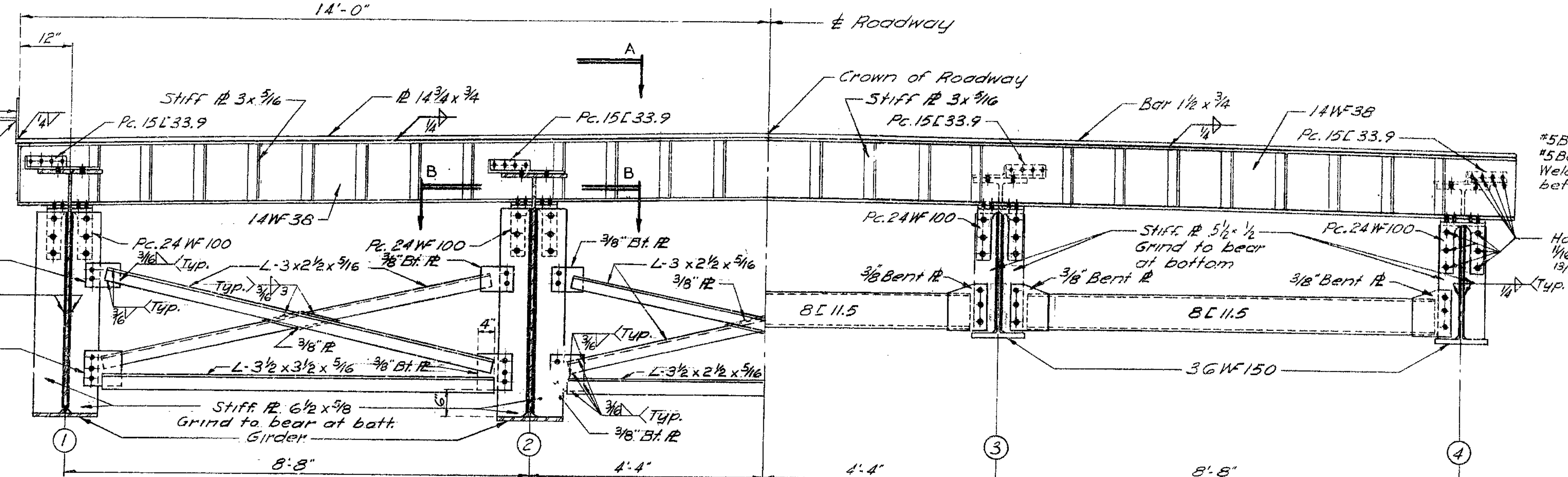
Sheet No. 9 of 11

A-448

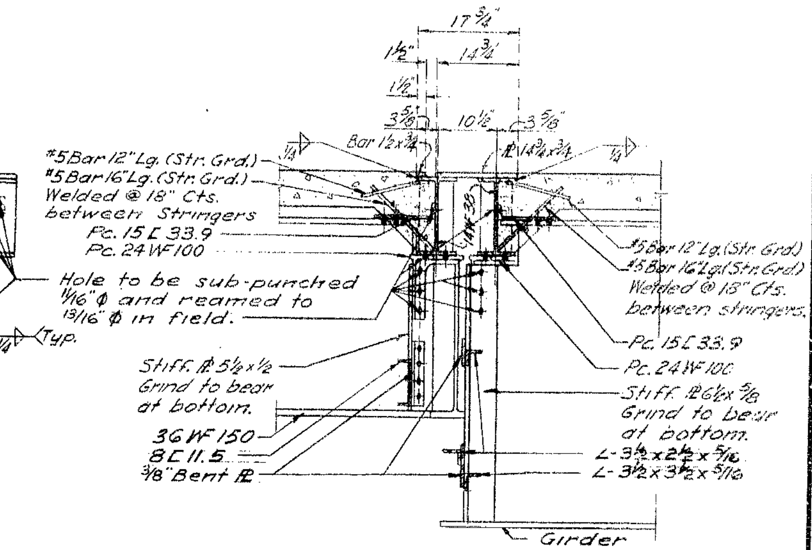
NO CONSTRUCTION CHANGES

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		18	64	

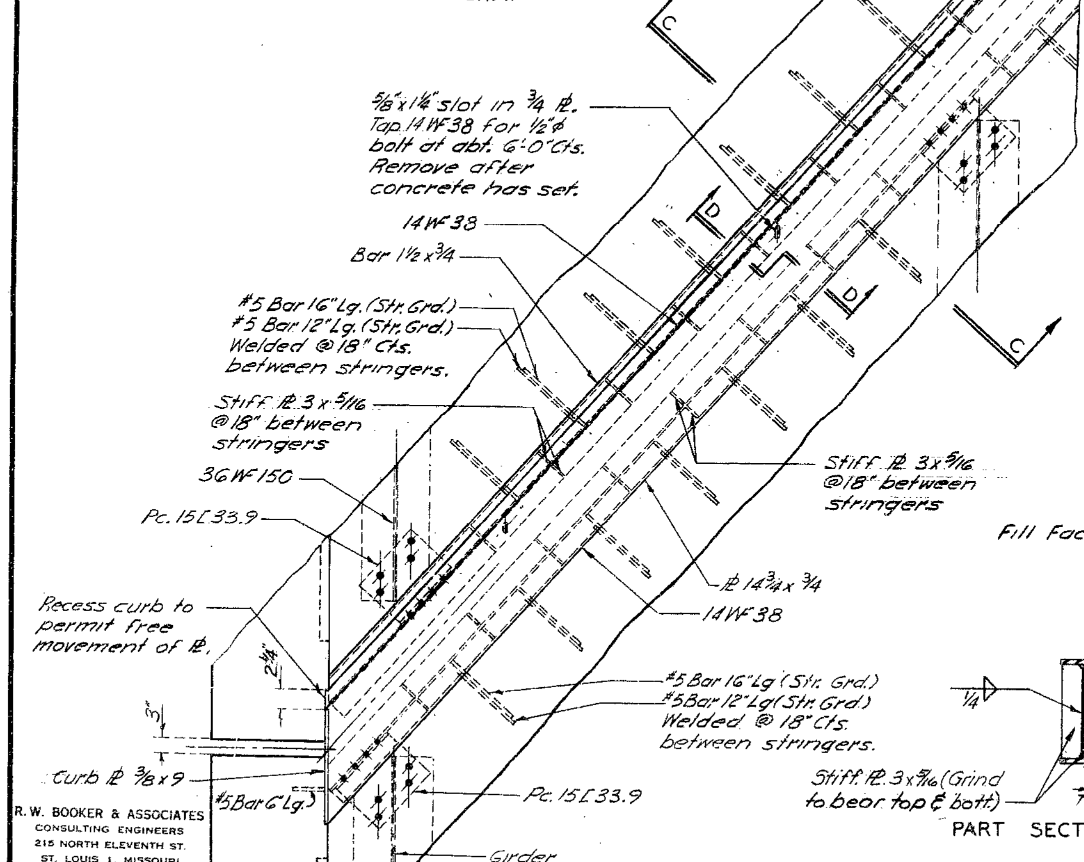


HALF SECTION SHOWING DIAPHRAGM D3 HALF SECTION SHOWING DIAPHRAGM D4

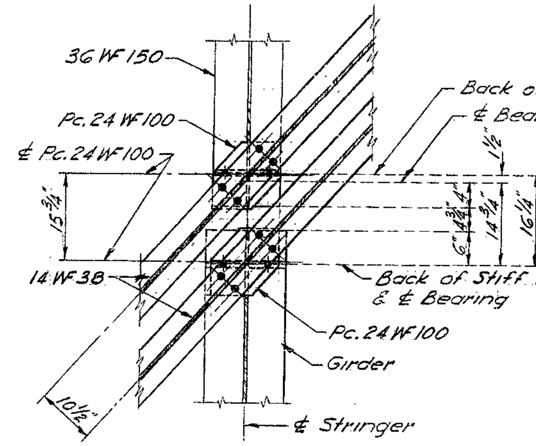


SECTION C - C

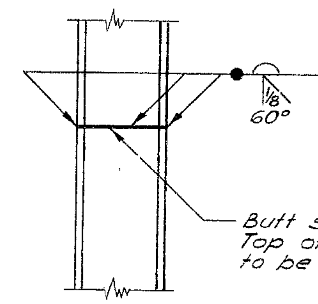
Notes:
Expansion device shall be fabricated in one section and shall be bent to conform to crown of roadway.
#5 Bars for expansion device shall be structural grade.
Approved stud welded anchors may be used in lieu of #5 bars shown.



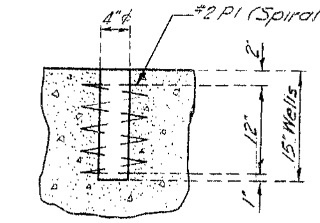
VIEW A - A



SECTION B - B

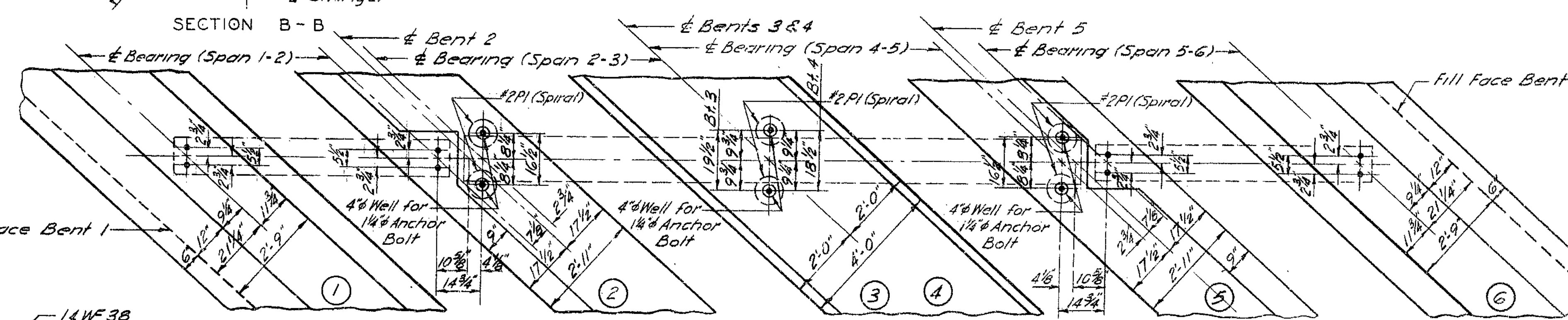


DETAILS OF STEEL PILE

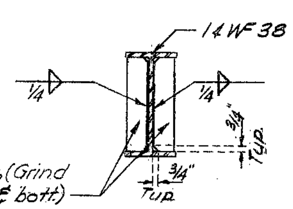


Note: Anchor bolts may be set in wells as shown or in holes drilled into concrete substructure. See Special Provisions for setting Anchor Bolts.

DETAIL OF SPIRAL AROUND ANCHOR BOLTS



PART ANCHOR BOLT PLAN



PART SECTION D-D

BRIDGE OVER MIDDLE FORK OF GRAND R.

STATE ROAD FROM GRANT CITY TO GENTRY
ABOUT 2 MILES S. OF GRANT CITY
PROJECT NO. F-297(7)(RT. 169) STA. 428 + 17.96

WORTH COUNTY

R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

Drawn Aug 1959 by W. J. H.
Checked 26 Aug 1959 by D. C. S.

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

Sheet No. 10 of 11

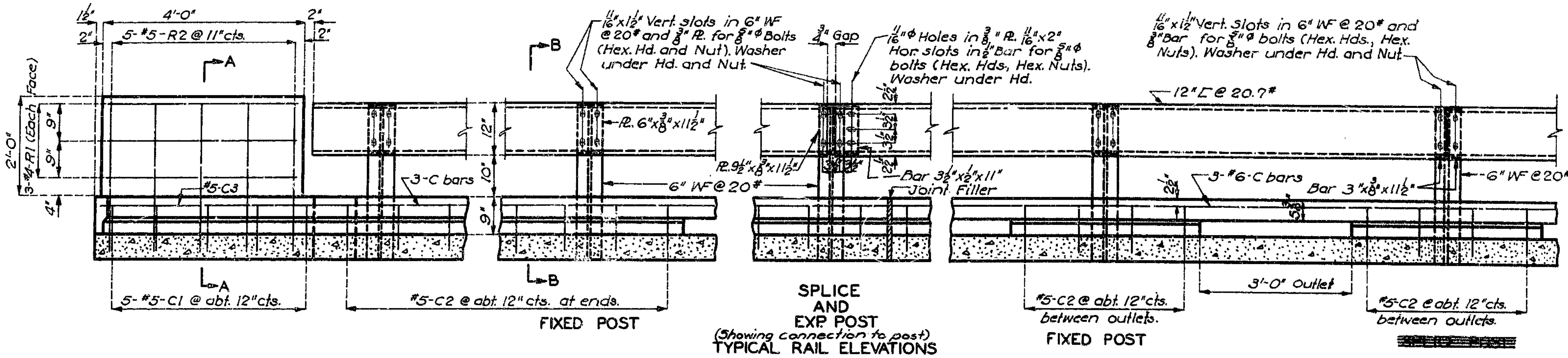
A-448

NO CONSTRUCTION CHANGES

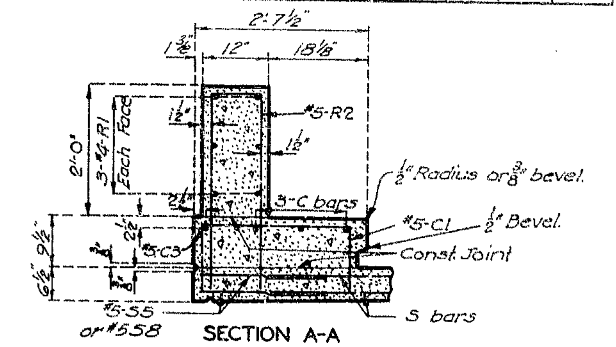
10

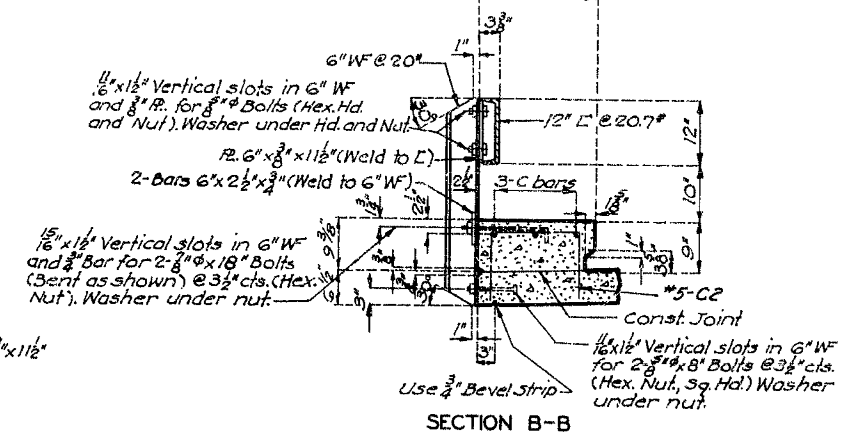
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19 65		

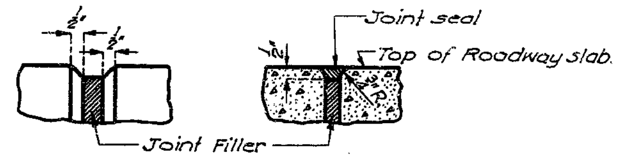


Note: Outlets to be centered between railpost. For location of outlets and curb reinforcing, see sheet No. 8 & 9.
Exposed edges of curb outlets on roadway side to be beveled 3/8".



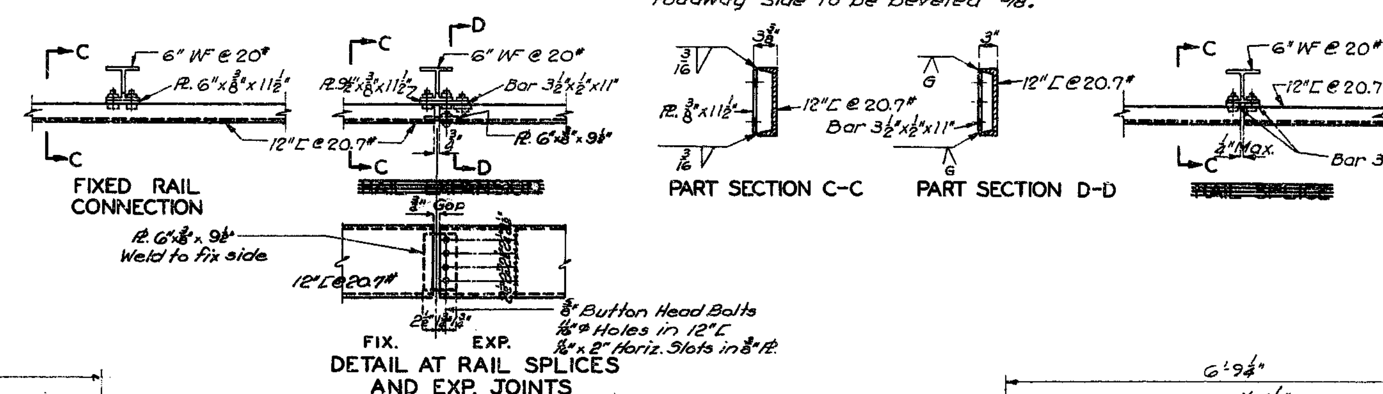


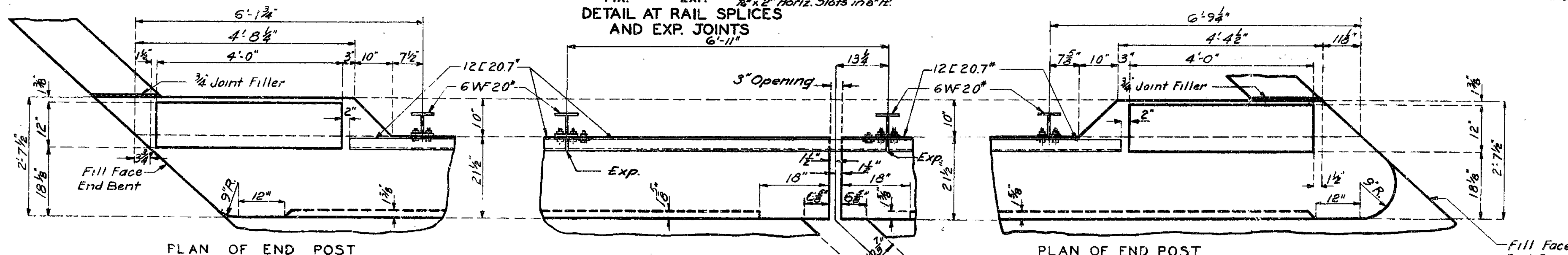
Note: Channel rail to be adjusted for horizontal alignment by use of full size metal shims placed between 6" WF and connection Pl. Shims of 1/8" & 1/4" thickness to be furnished with structural steel. Cost of shims to be included in price bid for other items.



Note: Use bevel as shown for exposed faces of all filled joints except at top surface of roadway slab. Use edging tool with 3/4" radius at top surface of roadway slab each side of joint and fill flush with joint seal as shown. Joint seal is not to be used at top surface of curbs.

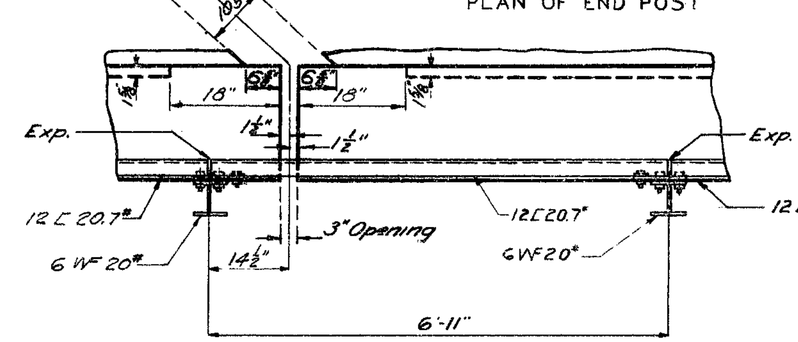
DETAILS OF BEVEL FOR FILLED JOINTS





Notes:

Top of curbs and post to be built parallel to grade.
Vertical faces of end post to be vertical. All exposed edges of end post to be beveled 1/2".
6 WF posts to be set normal to grade.



PLAN OF HAND RAIL AT EXPANSION DEVICE

BRIDGE OVER MIDDLE FORK OF GRAND R.
STATE ROAD FROM GRANT CITY TO GENTRY
ABOUT 2 MILES S. OF GRANT CITY
PROJECT NO. F-297(7) (RT. 169) **STA.** 428+17.96
WORTH **COUNTY**

R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
ST. LOUIS, MISSOURI

Drawn Aug 7, 1959 by DLP
Checked Aug 28 1959 by D.C.S

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

Sheet No. 11 of 11

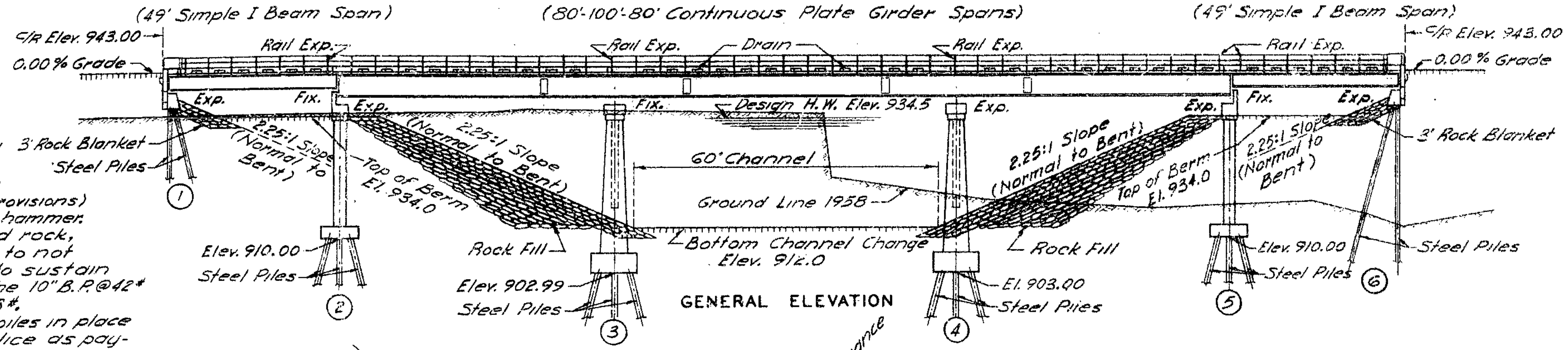
A-448

NO CONSTRUCTION CHANGES

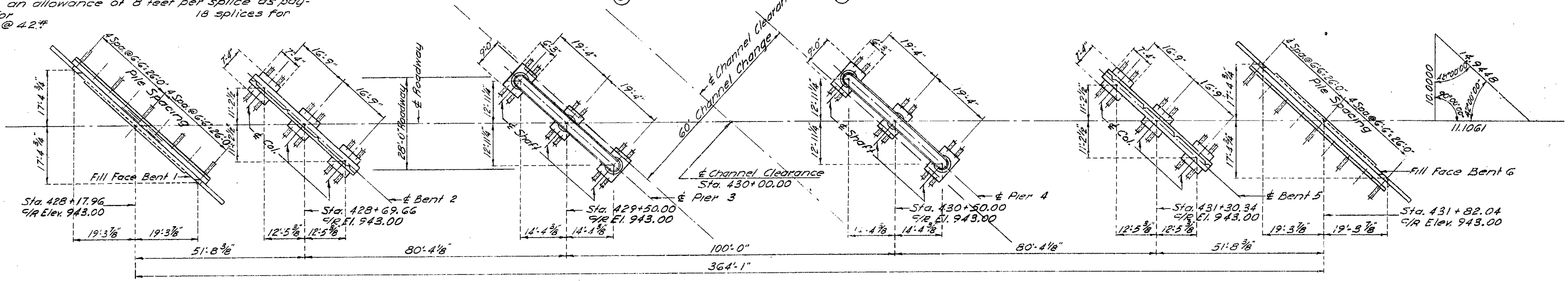
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	55	

Notes:
All piling for end bents No. 1 & 6 were 10" Bearing Piles @ 42# and did conform with the details and notes on sheet No. 10 of the design plans. All piling for Bents No. 2, 3, 4 & 5 were 12" Bearing Piles @ 53# and did conform with the details and notes on sheet No. 10 of the design plans.
All steel piles required for this structure were furnished by the State. (See Special Provisions)
All piles were driven with a Diesel hammer.
All piles were driven to or into solid rock, boulders, shale, or cemented gravel; or to not less than full length authorized and to sustain a load of at least 37 ton per pile for the 10" B.P. @ 42# and 46 ton per pile for the 12" B.P. @ 53#.
Quantities of steel piles in place include an allowance of 8 feet per splice as payment for 18 splices for 10" B.P. @ 42#.



Notes:
Compacted roadway fill (full roadway width) was placed up to elevation of bottom of concrete beam in front of and not less than 25'-0" in back of end bent No. 6 before steel piles were driven.
For Details of Rock Blanket and Rock Fill see sheet No. 2 of the Br. Design plans.

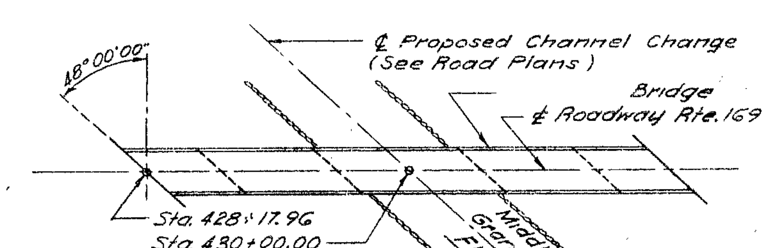


GENERAL NOTES:
Design specifications A.A.S.H.O. 1957
Loading H20-44 (Future wearing surface 15 psf.)
Structural Steel Stress 18,000 psi.
Reinforcing Steel Stress 20,000 psi.
Concrete Stress 1200 psi.
Concrete for superstructure was Class "B-1" air-entrained.
Concrete for substructure was Class "B" air-entrained.

Fabricated Plate Girders were Structural Steel for Welding conforming to A.S.T.M. A373-56T.
Rivets 3/4"; holes 13/16" except in handrail where rivets shall be 5/8"; holes 11/16".
Field connections were bolted with high tensile bolts. Final pay weight for Fabricated Structural Steel was based on the use of field rivets except for bolted connections specified for handrail.
Qualification of welding operators was required.
Paint: Shop, none; Field, contact surfaces of bolted field connections, except where high tensile bolts were used, one coat of red lead and surfaces inaccessible after erection three coats of red lead. All other exposed surfaces first coat red lead, second coat brown, third coat aluminum. Payment for cleaning and all painting was made under unit price bid for Painting. See Special Provisions for Aluminum Paint Materials.
See Section 22-9C of the Standard Specifications for required painting of steel piles.
Where joint filler was specified on the plans it did conform with the requirements for Gray Rubber Compound Joints as given in Section 59-22 B of the Standard Specifications.
Permits were obtained for all truck loads over legal length.

QUANTITIES					
Item		Substr.	Superstr.	Total
Class 1 Excavation for Structures	Cu. Yds.	298.5		298.5
Class 2 Excavation for Structures	Cu. Yds.	318		318
Class "B" Concrete	Cu. Yds.	369.9		369.9
Class "B-1" Concrete	Cu. Yds.		274.3	274.3
Fabricated Structural Steel (I-Bm. Spans)	Lbs.		76970	76970
Fabricated Structural Steel (P.Gir. Spans)	Lbs.		213950	213950
10" Steel Piles in Place (State Furnished)	Lin. Ft.	1206		1206
12" Steel Piles in Place (State Furnished)	Lin. Ft.	1800		1800
Steel Castings	Lbs.		5410	5410
Gray Iron Alloy Castings	Lbs.		1040	1040
Reinforcing Steel	Lbs.	28550	78090	106640
Painting	Tons		148.7	148.7

Excavation for bridge made above Elev. 913.0 was paid for as Class 1 Excavation for Structures.
Excavation for bridge made below Elev. 913.0 was paid for as Class 2 Excavation for Structures.
Concrete in end posts is included with superstructure Class "B-1" Concrete.
No payment was allowed for Class 1 Excavation for End Bent No. 6. Payment for Class 1 Excavation for Bent No. 5 was made from the existing ground line.



Drainage Area 84 Sq. Miles (Light, Hilly)

LOCATION SKETCH

FINISHED

Bench Marks U.S.G.S. Datum (1929 Adj.)
Bolt Head top Lt. Elephant Ear, Abutment No. 1
Bridge at Sta. 428+17.96 Elev. 946.56

BRIDGE OVER MIDDLE FORK OF GRAND R.

STATE ROAD FROM GRANT CITY TO GENTRY
ABOUT 2 MILES S. OF GRANT CITY
PROJECT NO. F-297 (7) (RTE. 169) STA. 428 + 17.96

WORTH COUNTY

FINISHED

SUBMITTED BY
Jack M. Lasley
REGISTERED PROFESSIONAL ENGINEER
MISSOURI NO. E-8243

SUBMITTED BY J. A. Williams, BRIDGE ENGINEER, DATE 10-6-1959
APPROVED BY Rex M. Whitton, CHIEF ENGINEER, DATE 10-6-1959

R. W. BOOKER & ASSOCIATES
CONSULTING ENGINEERS
21? NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

Drawn Aug. 1959 by W.J.H.
Checked 26 Aug 1959 by D.C.S.

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

Sheet No. 1A of 1

FINISHED

Std. C-110R7

A-448

FINAL PLANS

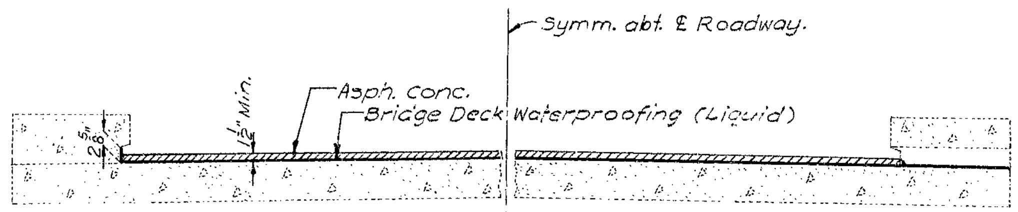
12

347

MISSOURI STATE HIGHWAY DEPARTMENT

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

FINAL PLANS



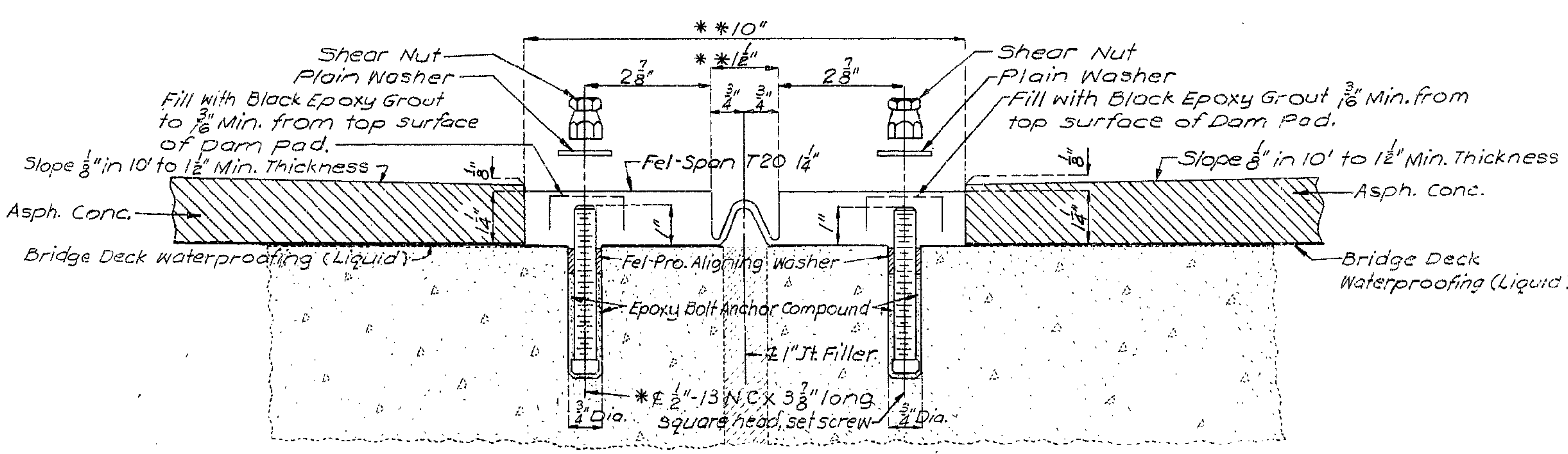
PART SECTION THRU CURB

PART SECTION THRU OUTLET

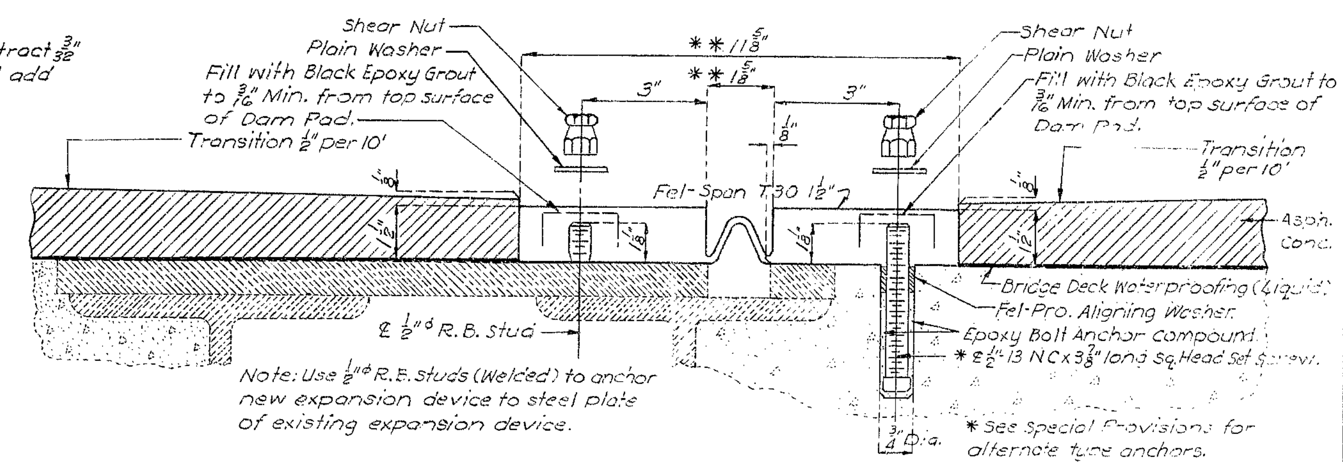
ESTIMATED QUANTITIES			
ITEM		TOTAL	Final Quantities Item
Asphalt Cement (Asphaltic Concrete)	Ton	5.7	[illegible]4
Mineral Aggregate (Asphaltic Concrete)(Special Mix)	Ton	108	96
Reinforced Neoprene Expansion Joint Seal (1.5in.)	Lin. Ft.	42	42
Reinforced Neoprene Expansion Joint Seal (1.6in.)	Lin. Ft.	42	42
Bridge Deck Waterproofing (Liquid)	Sq. Yd.	1106	1182

Note: The quantity of Asph. Conc. includes the additional volume necessary to provide a minimum thickness of $1\frac{1}{2}$" of Asph. Concrete due to the irregularity of the deck surface.

** Dimension shown is at 60°F. subtract $\frac{3}{32}$" for each 10° temperature rise and add $\frac{3}{32}$" for each 10° temperature fall.



SECTION THRU 1" JOINT FILLER AT BENT NO 2



SECTION THRU EXP. DEVICE AT BENT NO. 5

BRIDGE OVER MIDDLE FORK OF GRAND RIVER

STATE ROAD FROM IOWA STATE LINE TO RTE. M

ABOUT 2 MILES SOUTH OF GRANT CITY

JOB NO. I-P-169-43 (RTE. 169) STA. 428+17.9

Proj. No. I-P-169-43 Sec. A4C

DETAILED AUG 1975
CHECKED AUG 1975

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

Sheet No. 1 of 1 DATE 9-18-75

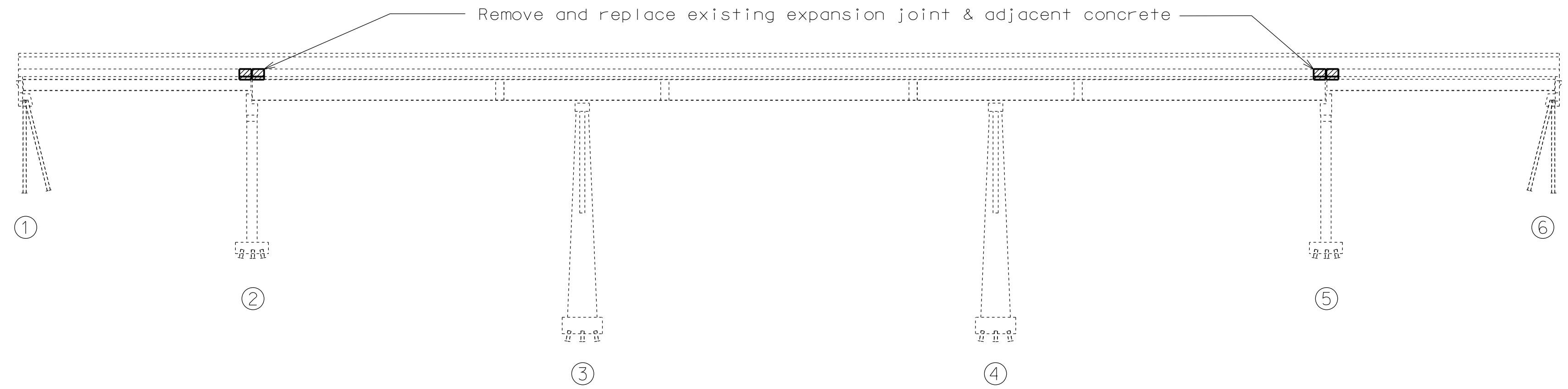
WORTH COUNTY

A-446R

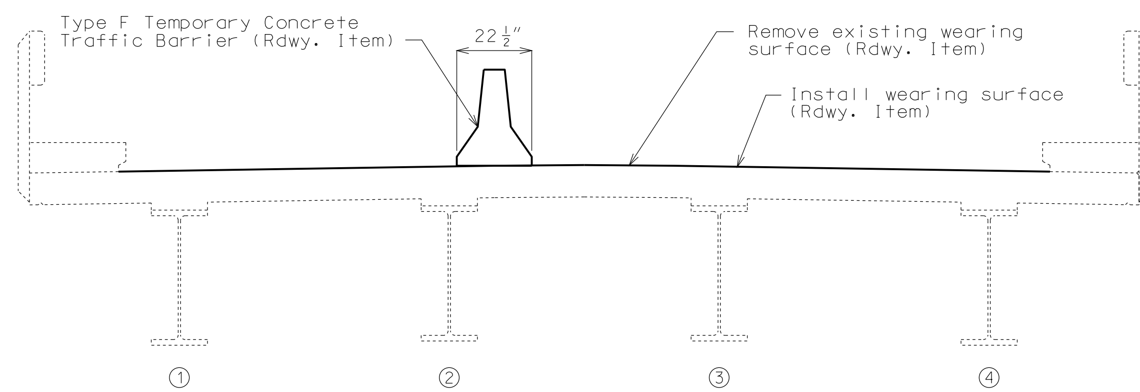
SEC/SUR 9	TWP 65N	RGE 31W

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

U.I.P. and Rehab. Existing (49') Simple Wide Flange Beam Span, (80'-100'-80') Continuous Plate Girder Spans, (49') Simple Wide Flange Beam Span



GENERAL ELEVATION SHOWING LOCATIONS OF EXPANSION JOINT REMOVAL AND REPLACEMENT



SECTION THRU SLAB

General Notes:

Design Specifications:

2002 - AASHTO 17th Edition
Load Factor Design
Bridge Deck Rating = 6

Design Loading:

HS20-44 (New Construction)

Design Unit Stresses:

Class B-1 Concrete (Barrier Curb)	f'c = 4,000 psi
Class B-2 Concrete (Slab)	f'c = 4,000 psi
Reinforcing Steel (Grade 60)	fy = 60,000 psi
Structural Steel (ASTM A709 Grade 50)	fy = 50,000 psi

Reinforcing Steel:

Minimum clearance to reinforcing steel shall be 1-1/2", unless otherwise shown.

Miscellaneous:

"Sec" refers to the sections in the standard and supplemental specifications unless specified otherwise.

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars, unless otherwise noted.

Remove existing (2"±) wearing surface and install new (1-3/4") wearing surface (Roadway Item).

Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.

Contractor shall verify all dimensions in field before ordering new material.

Temporary Barrier shall not be attached to the bridge.

Reuse or replacement of existing reinforcing steel shall be in accordance with Sec 216.90.3.3 except mechanical bar splices may be used at the contractor's option in lieu of lap splicing. Any mechanical bar splices used will be considered completely covered by the contract unit price for Removal of Existing Expansion Joints & Adjacent Concrete.

Traffic Handling:

Maintain traffic on structure during construction. See Roadway Plans for traffic control.

Estimated Quantities

Item		Total
Removal of Existing Expansion Joints & Adjacent Concrete	linear foot	84
Remove and Replace Barrier Curb	linear foot	36
Class B-2 Concrete	cu. yard	18.6
Reinforcing Steel	pound	240
Fabricated Structural Low Alloy Steel (Misc.)	pound	6110
Strip Seal Expansion Joint System	linear foot	84

Designed July 2011
Detailed July 2011
Checked July 2011

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

REPAIRS TO BRIDGE OVER MIDDLE FORK OF GRAND RIVER

STATE ROAD FROM RTE. M TO RTE. 46

ABOUT 2.3 MILES SOUTH OF RTE. 46

STA. 428+17.96± (Match Exist.)

STD. 617.20
STD. 706.35

STATE OF MISSOURI
BRYAN A. HARTNAGEL
NUMBER PE-2002024473
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	8/25/2011
ROUTE	169
STATE	MO
DISTRICT	BR
SHEET NO.	1
COUNTY	WORTH
JOB NO.	J1P1980
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A04482

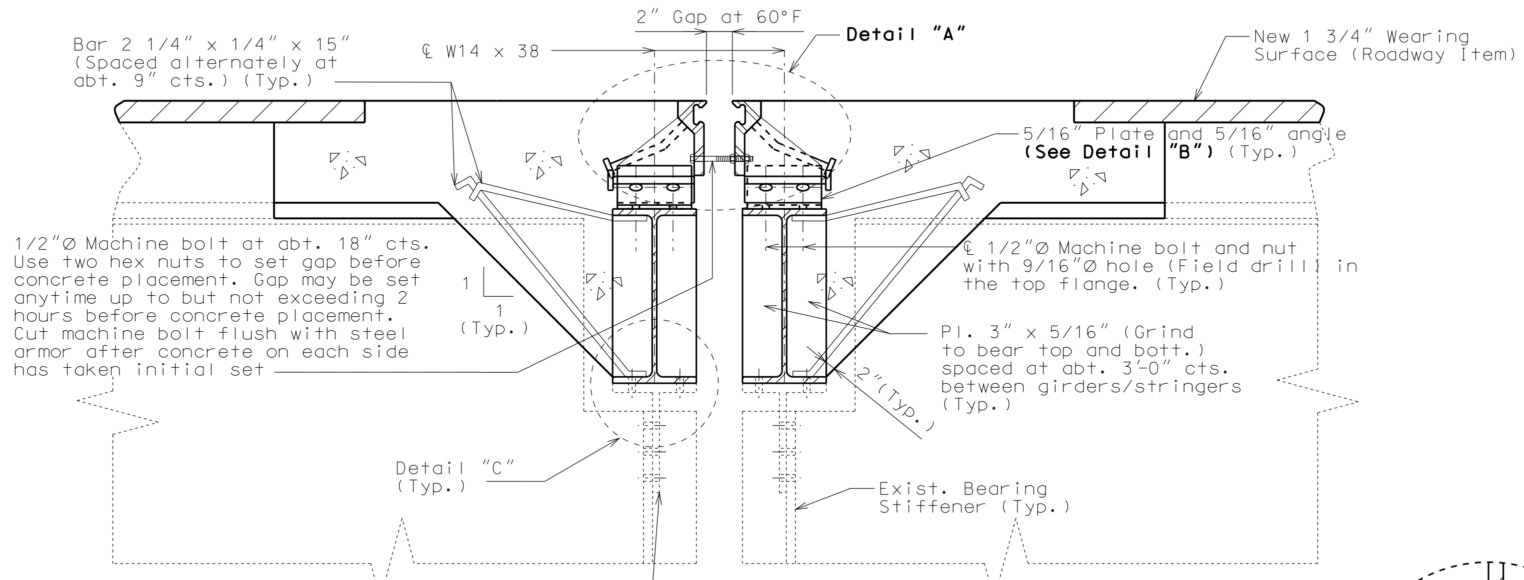
DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

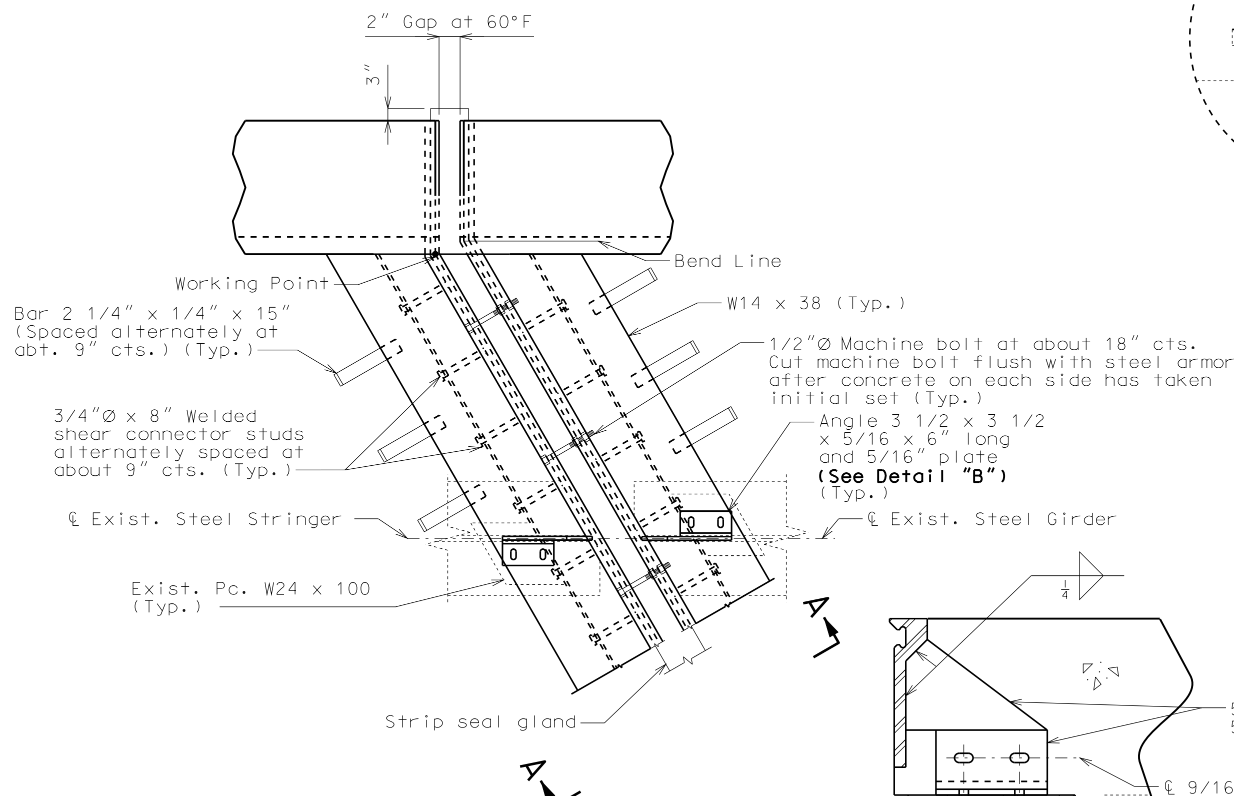
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

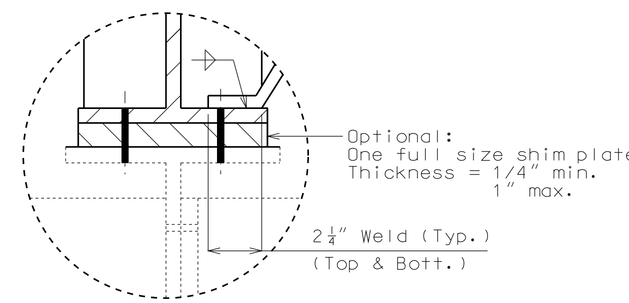


SECTION A-A

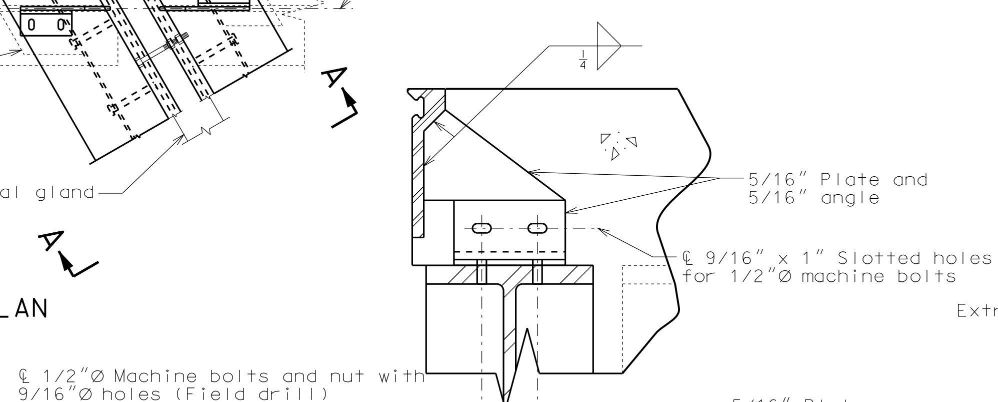
Note: Strip seal gland not shown for clarity

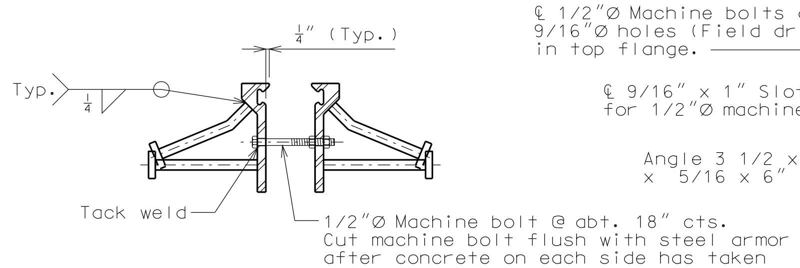


PART PLAN



DETAIL "C"





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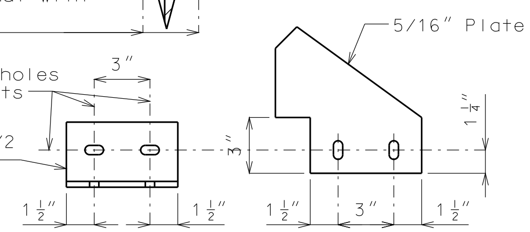

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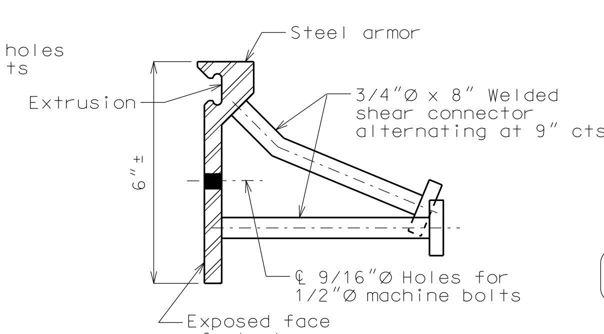
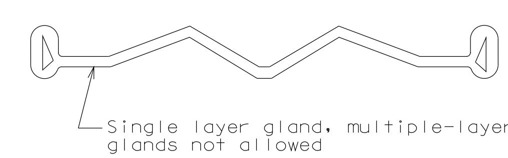


DETAIL OF JOINT ARMOR



Strip seal gland size = 3"

DETAIL OF GLAND

GENERAL NOTES:

Expansion joint system shall be fabricated in one section, except for stage construction and when the length is over 50 feet. A complete joint penetration groove welded splice shall be required. Welds shall be ground flush to provide a smooth surface. The expansion joint system shall be fabricated and installed to the crown and grade of the roadway.

The strip seal gland shall be installed in joints in one continuous piece without field splices. Factory splicing will be permitted for joints in excess of 53 feet.

Structural steel for the expansion joint system shall be ASTM A709 Grade 36 except the steel armor may be ASTM A709 Grade 50W and W14 x 38 shall be ASTM A709 Grade 50. Anchors for the expansion joint system shall be in accordance with Sec 1037. Strip seal expansion joint system shall be in accordance with Sec 717.

Structural steel for the expansion joint system shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 1/16" for each 10° fall or rise in temperature at installation.

Concrete shall be forced under and around steel armor, bars and anchors. Proper consolidation of the concrete shall be achieved by localized internal vibration.

Payment for furnishing, coating or galvanizing and installing wide flange beams will be considered completely covered by the contract unit price for Fabricated Structural Low Alloy Steel (Misc.) per pound. All other material and labor for furninshing and installing strip seal, complete-in-place, will be considered completely covered by the contract unit price for Strip Seal Expansion Joint System per linear foot.

DETAILS OF STRIP SEAL AT INTERMEDIATE BENT NO. 2

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

Detailed July 2011
Checked July 2011

STATE OF MISSOURI
BRYAN A. HARTNAGEL
NUMBER PE-2002024473
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	
8/25/2011	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 2
COUNTY WORTH	
JOB NO. J1P1980	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A04482	

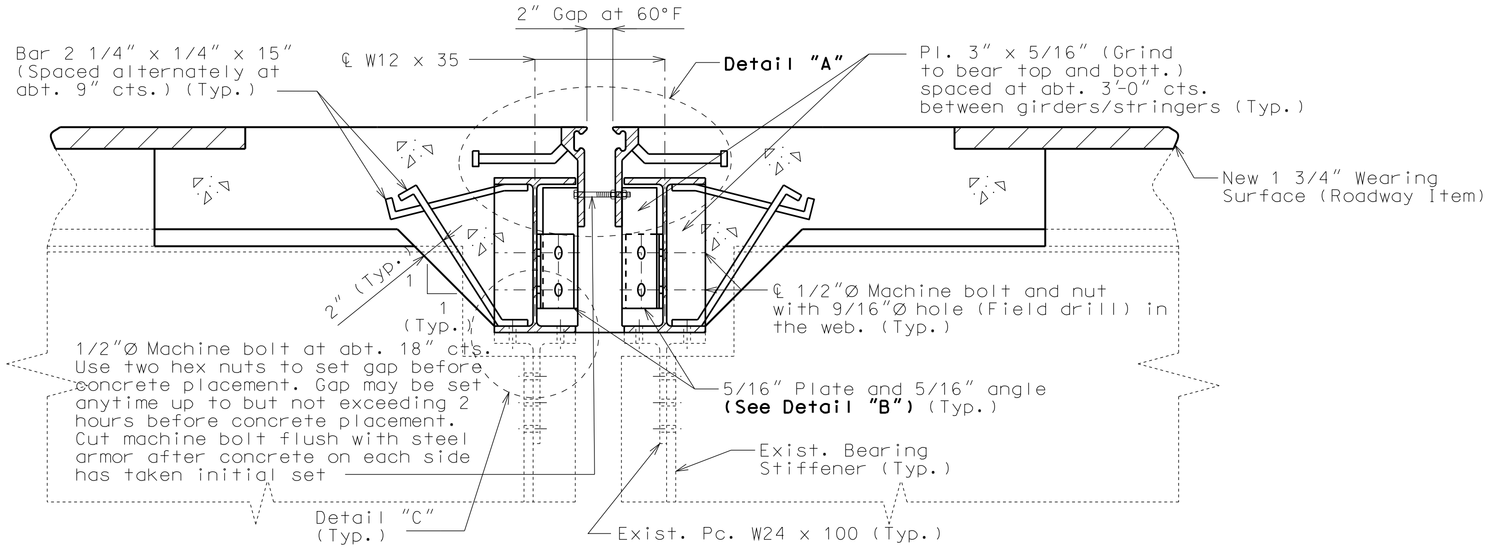
DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

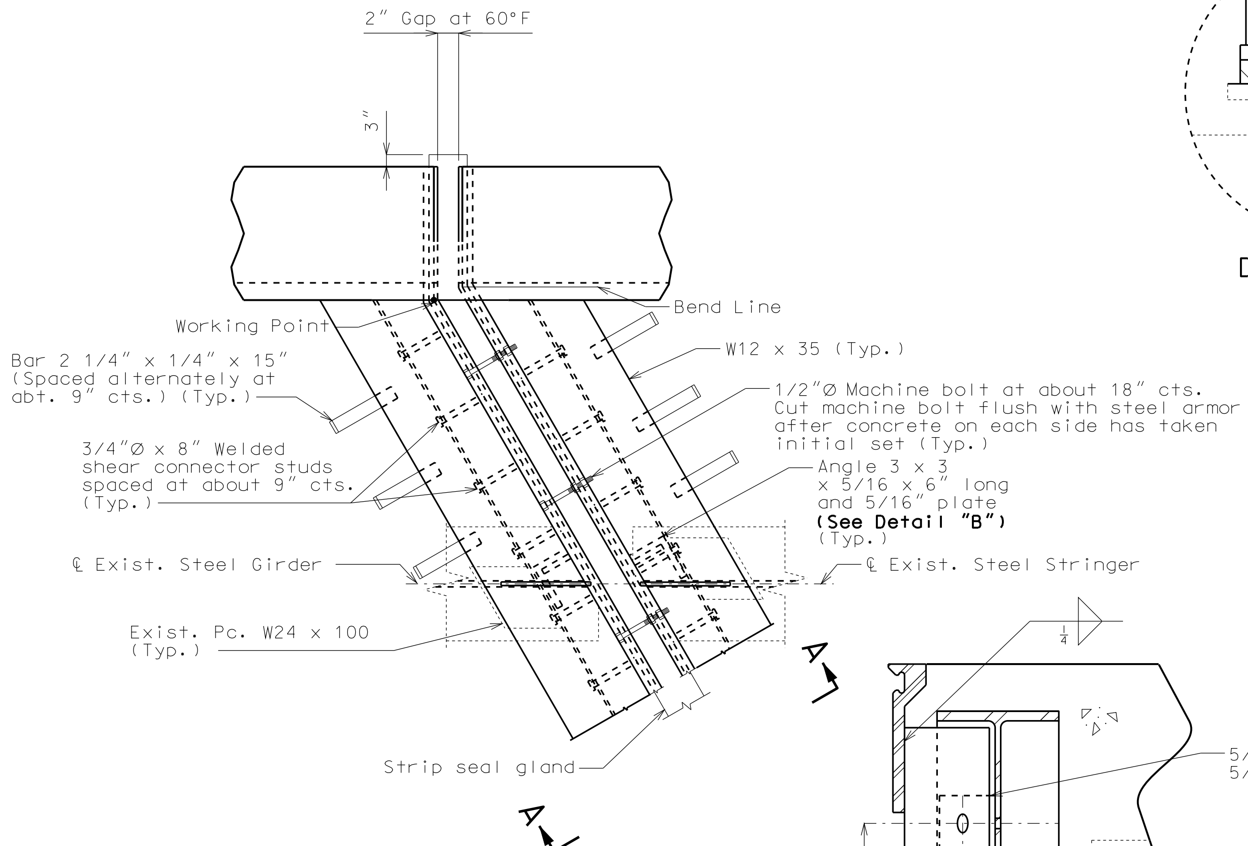
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

MoDOT

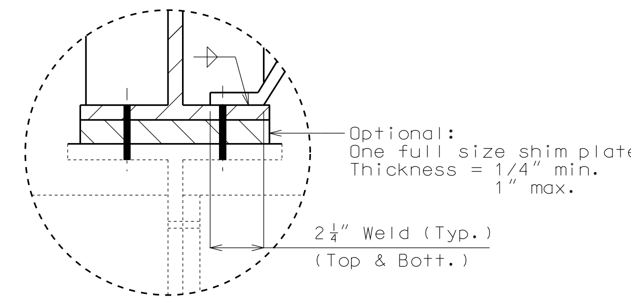


Note: Strip seal gland not shown for clarity.

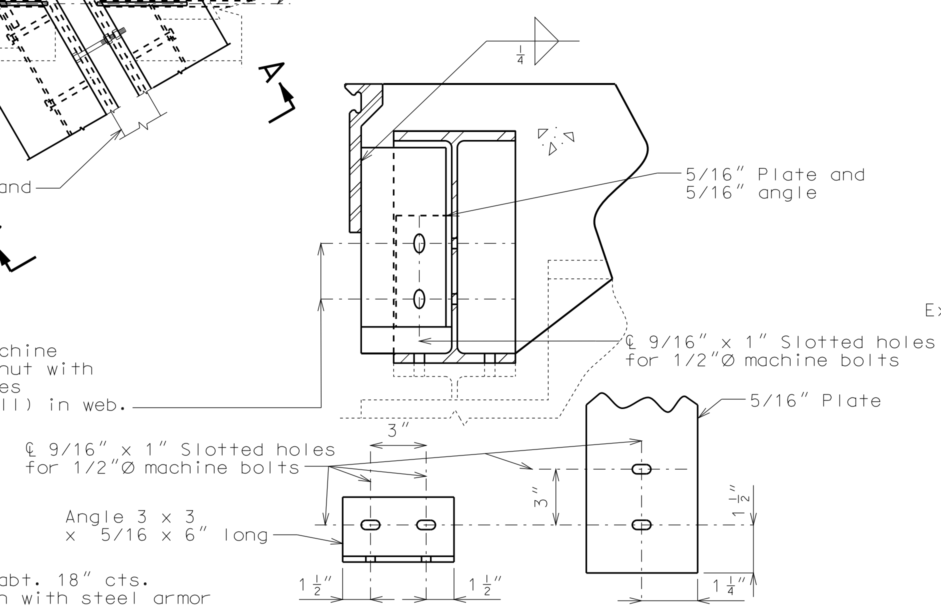
SECTION A-A



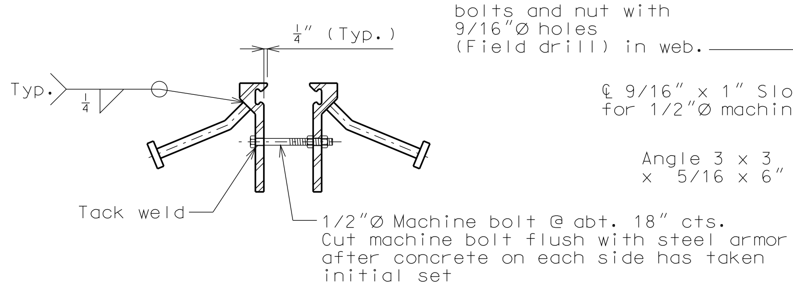
PART PLAN



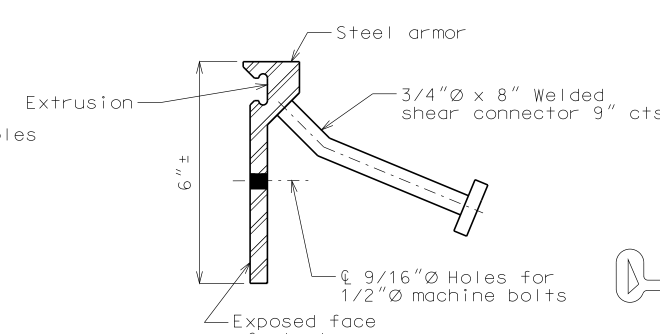
DETAIL "C"



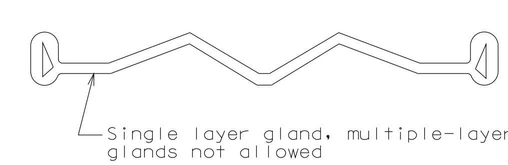
DETAIL "B"



DETAIL "A"



DETAIL OF JOINT ARMOR



Strip seal gland size = 3"

DETAIL OF GLAND

GENERAL NOTES:

Expansion joint system shall be fabricated in one section, except for stage construction and when the length is over 50 feet. A complete joint penetration groove welded splice shall be required. Welds shall be ground flush to provide a smooth surface. The expansion joint system shall be fabricated and installed to the crown and grade of the roadway.

The strip seal gland shall be installed in joints in one continuous piece without field splices. Factory splicing will be permitted for joints in excess of 53 feet.

Structural steel for the expansion joint system shall be ASTM A709 Grade 36 except the steel armor may be ASTM A709 Grade 50W and W12 x 35 shall be ASTM A709 Grade 50. Anchors for the expansion joint system shall be in accordance with Sec 1037. Strip seal expansion joint system shall be in accordance with Sec 717.

Structural steel for the expansion joint system shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 1/8" for each 10° fall or rise in temperature at installation.

Concrete shall be forced under and around steel armor, bars and anchors. Proper consolidation of the concrete shall be achieved by localized internal vibration.

Payment for furnishing, coating or galvanizing and installing wide flange beams will be considered completely covered by the contract unit price for Fabricated Structural Low Alloy Steel (Misc.) per pound. All other material and labor for furnishing and installing strip seal, complete-in-place, will be considered completely covered by the contract unit price for Strip Seal Expansion Joint System per linear foot.

DETAILS OF STRIP SEAL AT INTERMEDIATE BENT NO. 5

Detailed July 2011
Checked July 2011

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

STATE OF MISSOURI
BRYAN A. HARTNAGEL
NUMBER PE-2002024473
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	8/25/2011
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 3
COUNTY	WORTH
JOB NO.	J1P1980
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A04482

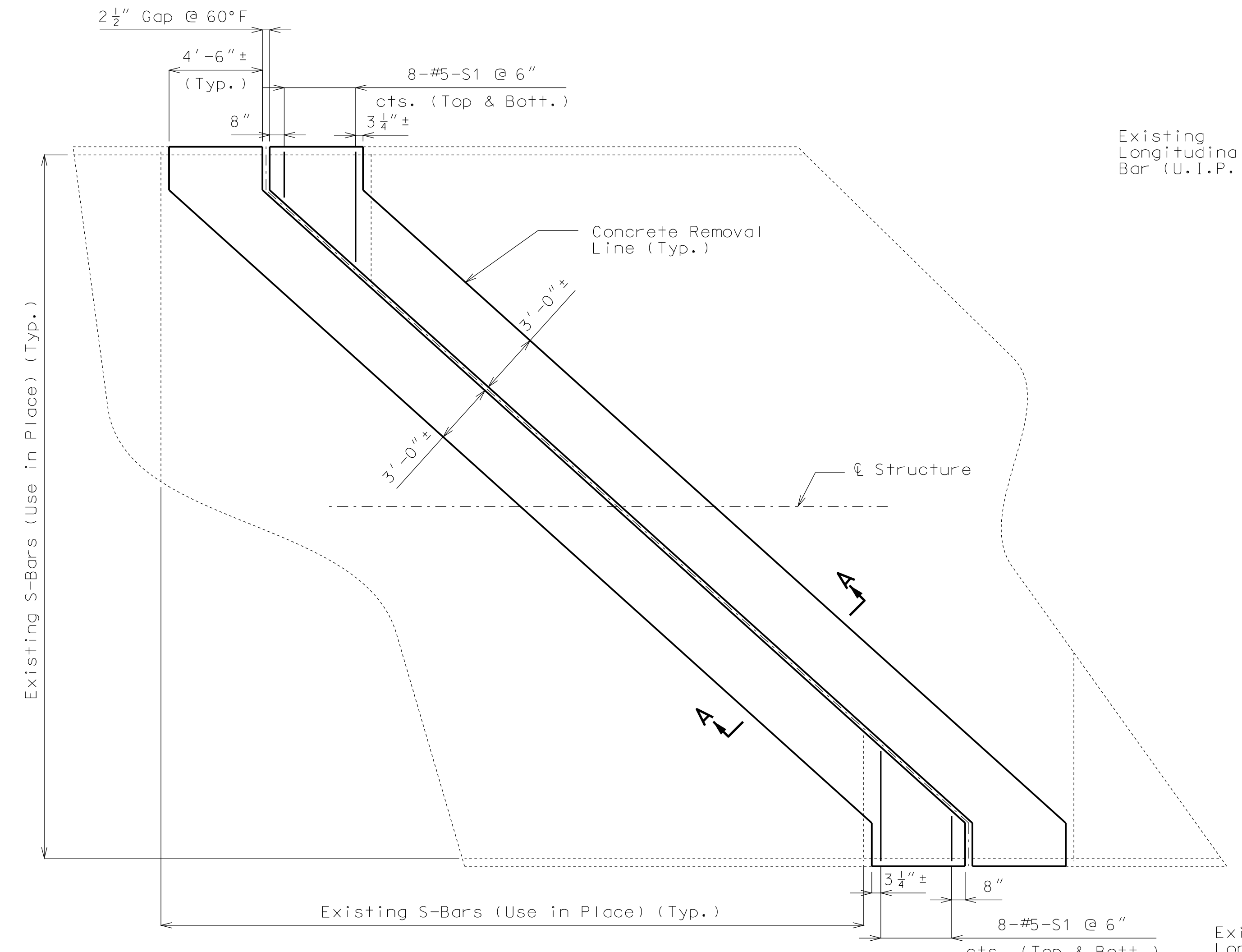
DESCRIPTION

DATE

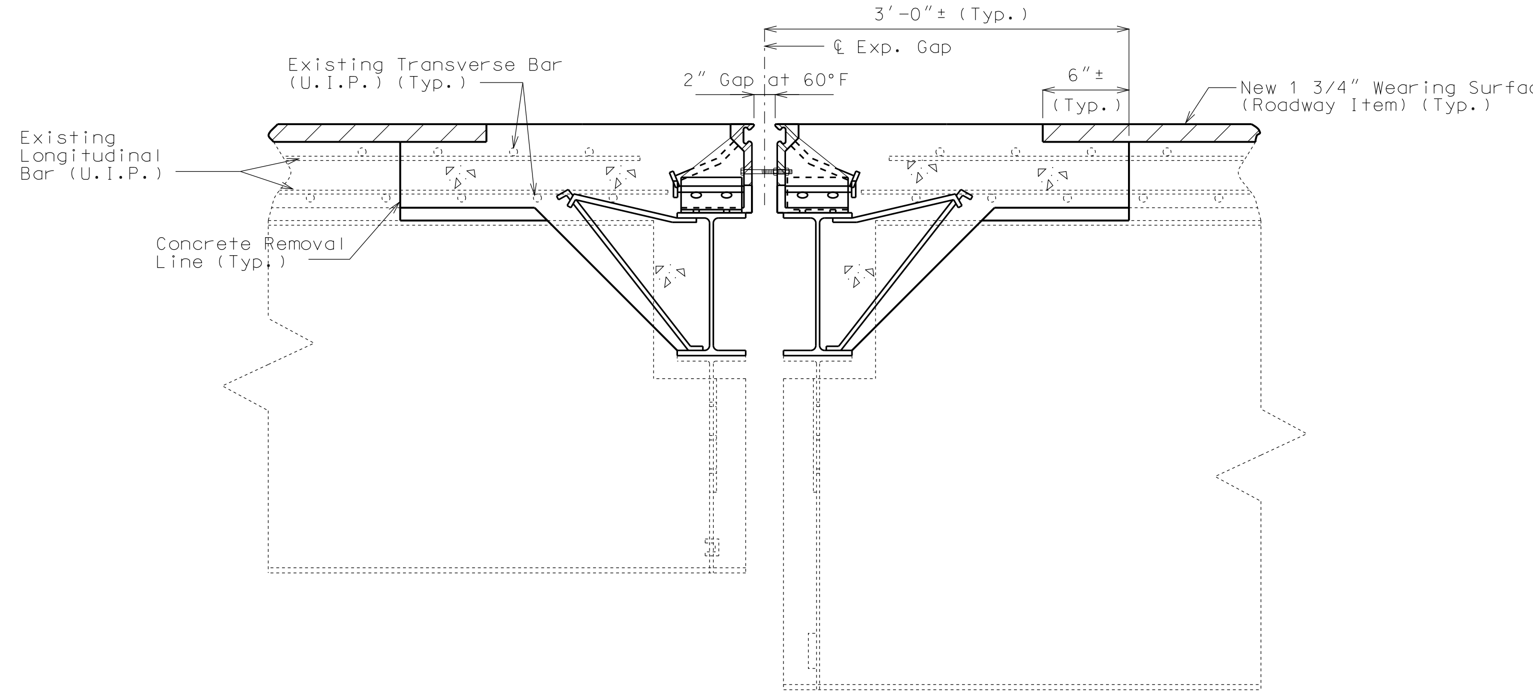
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

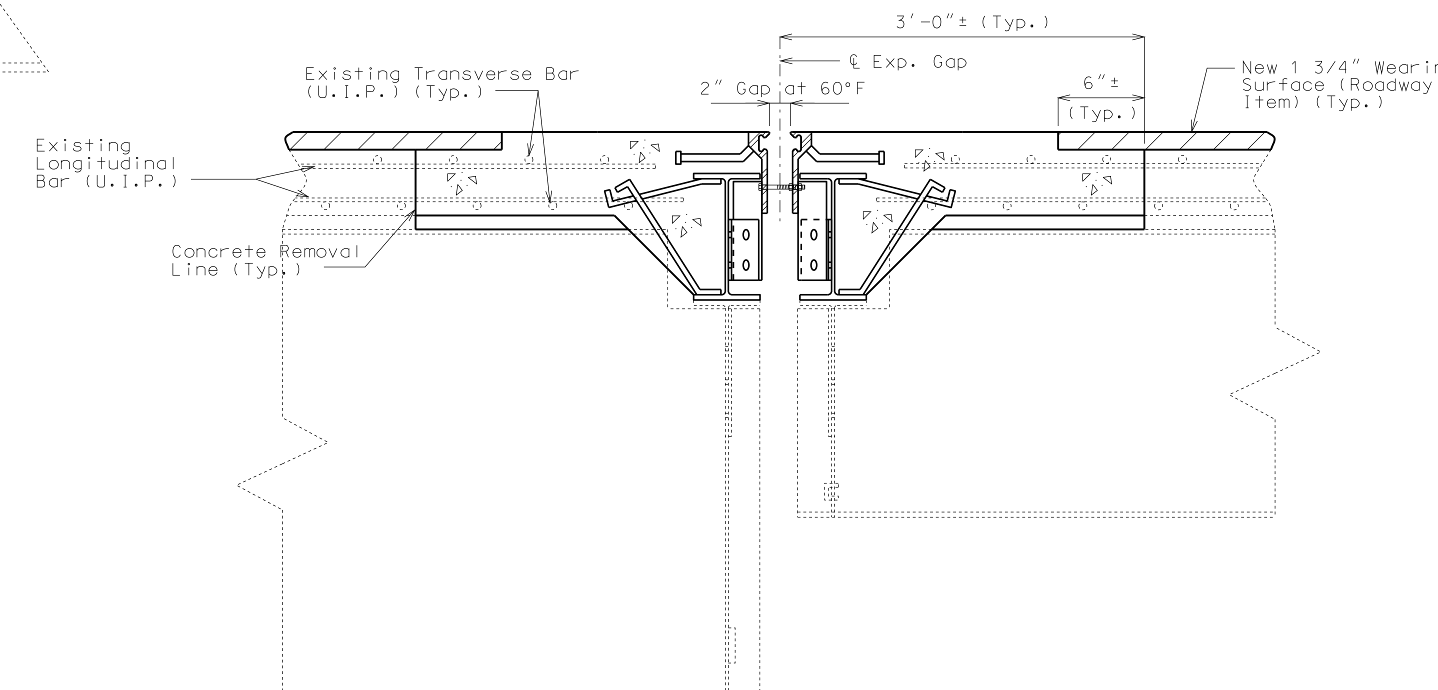
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PART PLAN OF SLAB AT INT. BENTS NO. 2 & 5
SHOWING REINFORCEMENT



PART SECTION A-A @ INT. BENT NO. 2
Note: Strip seal gland not shown for clarity.



PART SECTION A-A @ INT. BENT NO. 5
Note: Strip seal gland not shown for clarity.

Notes:

For Details of Strip Seal, see Sheets No. 2 & 3.

For Details of Barrier Curb Removal & Replacement, see Sheet No. 5.

DETAILS OF SLAB REMOVAL & REPLACEMENT AT INT. BENTS NO. 2 & 5

Detailed July 2011
Checked July 2011

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

STATE OF MISSOURI
BRYAN A. HARTNAGEL
NUMBER PE-2002024473
PROFESSIONAL ENGINEER

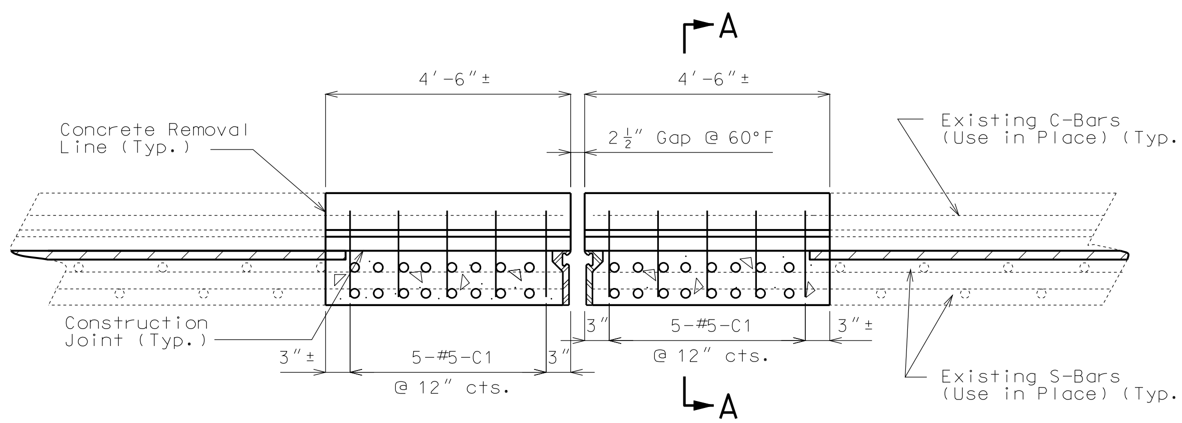
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	8/25/2011
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 4
COUNTY	WORTH
JOB NO.	J1P1980
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A04482

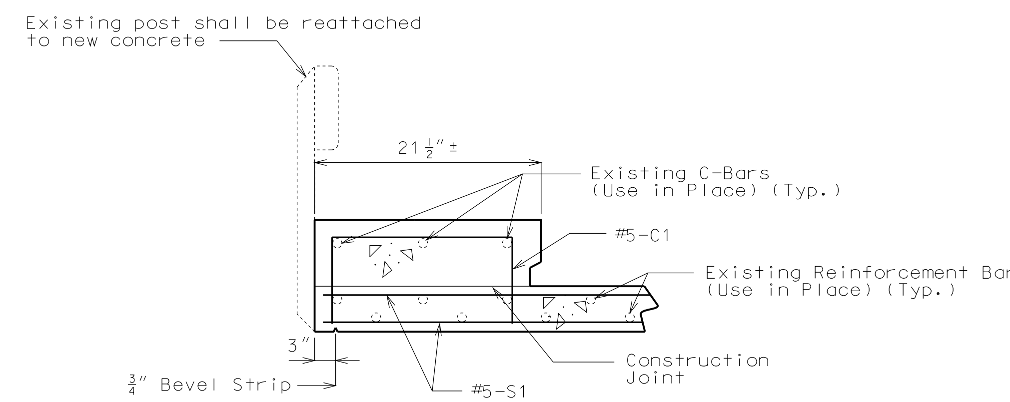
DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PART SECTION AT INT. BENTS NO. 2 & 5
Note: Existing channel rail and posts not shown.



PART SECTION A-A

Notes:

For Details of Strip Seal not shown, see Sheets No. 2 & 3.

For Details of Slab Removal & Replacement, see Sheet No. 4.

Payment for removing and replacing barrier curb including all labor, materials, concrete and reinforcement will be considered completely covered by the contract unit price for Remove & Replace Barrier Curb per linear foot.

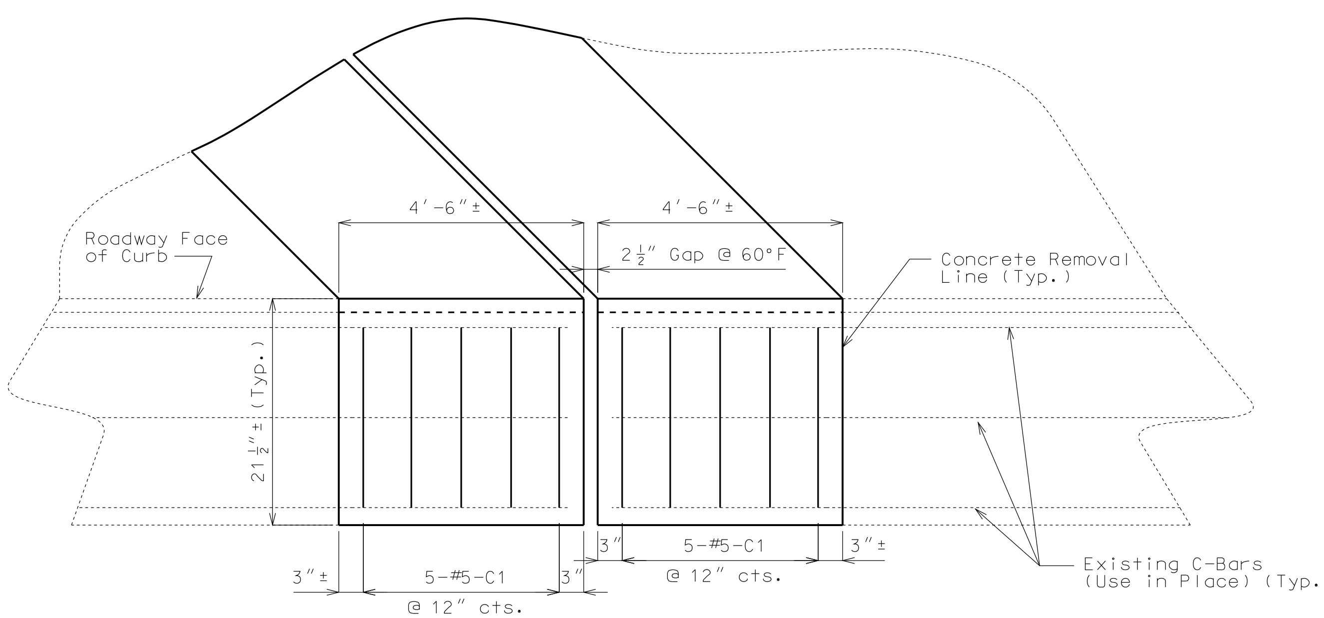
Replacement curb shall match existing curb dimensions.

Existing rail posts located within the limits of curb removal shall be reattached to new curb and slab. Contractor may clean and reuse existing anchor bolts as approved by the engineer or replace in-kind. Cost of rail post attachment will be considered completely covered by the contract unit price for Remove & Replace Barrier Curb.

Top of barrier curb shall be built parallel to grade with barrier curb joints normal to grade.

All exposed edges of barrier curb shall have either a 1/2" radius or a 3/8" bevel, unless otherwise noted.

Concrete in the barrier curb shall be Class B-1. At the contractor's option, Class B-2 concrete may be used with no price adjustment to the contract unit price for Remove & Replace Barrier Curb.



PART PLAN SHOWING CURB REINFORCEMENT
Note: Existing channel rail and posts and slab reinforcement not shown for clarity.

DETAILS OF BARRIER CURB REMOVAL & REPLACEMENT AT INT. BENTS NO. 2 & 5

Detailed July 2011
Checked July 2011

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

STATE OF MISSOURI
BRYAN A. HARTNAGEL
NUMBER PE-2002024473
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED 8/25/2011	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 5
COUNTY WORTH	
JOB NO. J1P1980	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A04482	

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

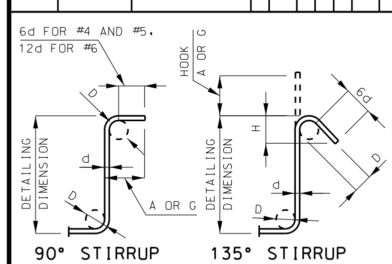
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

BILL OF REINFORCING STEEL

NO. REQ'D.	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
			SLAB																
64	5	S1	SLAB		20			V	8	2 0.000							2 0	2 0	
			INCREMENT =							5 1.000							5 1	5 1	236
			5.250 INCH																
			BARRIER CURB																
40	5	C1	BARRIER CURB		10	S					11.375	16.250					3 3	3 1	129
			TOTALS																
	5																		365
			TOTAL																365
			TOTAL	E															0
			Slab on																
			Girder																
	5																		236
			TOTAL																236
			Barrier																
			Curb																
	5																		129
			TOTAL																129

BILL OF REINFORCING STEEL

NO. REQ'D.	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.

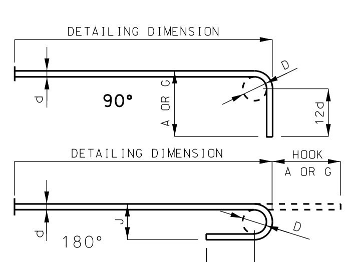


STIRRUP HOOK DIMENSIONS

GRADES 40 - 50 - 60 KSI

BAR SIZE	D (IN.)	90° HOOK: HOOK A OR G	135° HOOK: HOOK A OR G	135° HOOK: APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

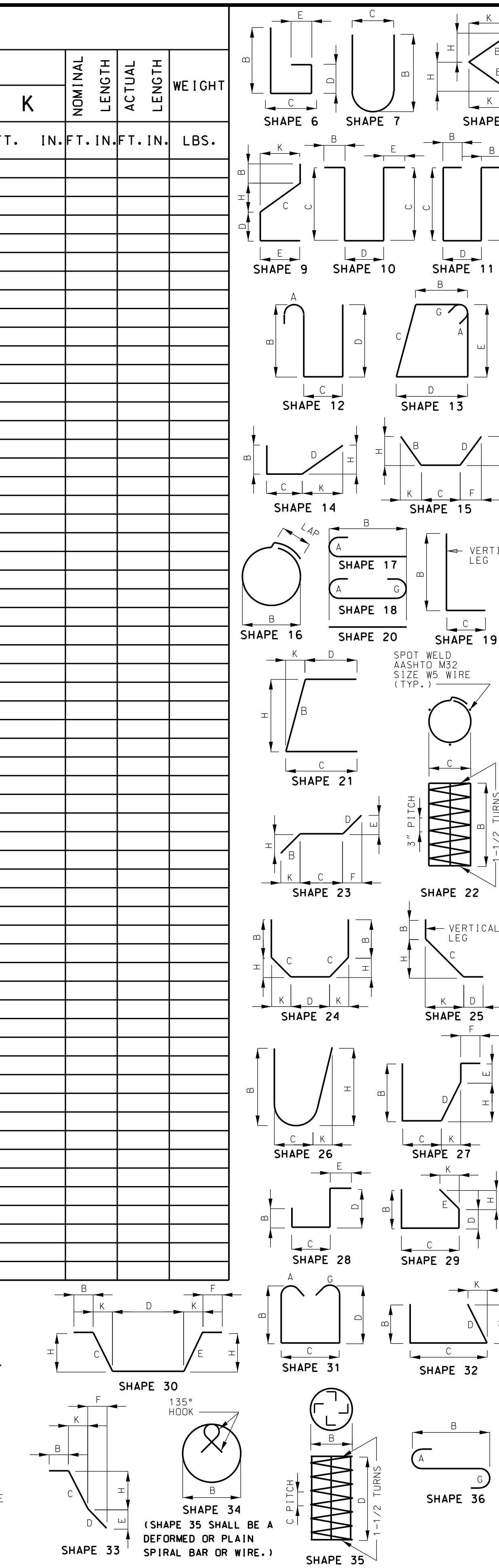
NOTE: UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS

BAR SIZE	D (IN.)	ALL GRADES 180° HOOKS: A OR G	ALL GRADES 180° HOOKS: J	ALL GRADES 90° HOOKS: A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.
FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.



BENDING DIAGRAMS

Detailed July 2011
Checked July 2011

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

STATE OF MISSOURI
BRYAN A. HARTNAGEL
NUMBER PE-2002024473
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE PREPARED	8/25/2011
ROUTE	169
STATE	MO
DISTRICT	BR
SHEET NO.	6
COUNTY	WORTH
JOB NO.	J1P1980
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A04482

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

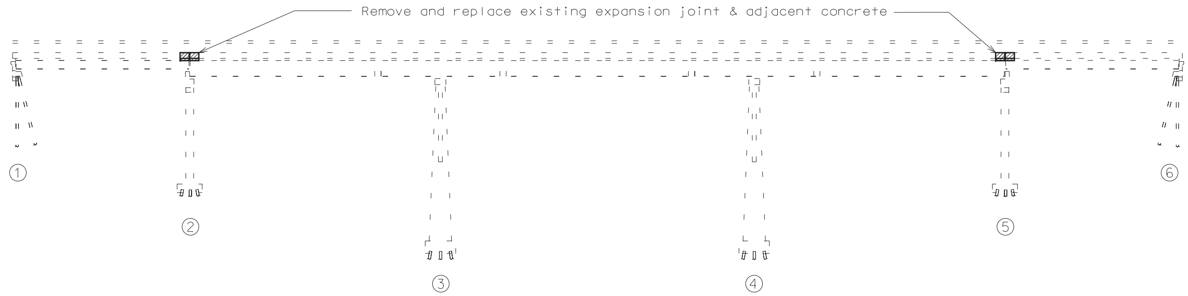
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

SEC/SUR 9	TWP 65N	RGE 31W

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

U.I.P. and Rehab. Existing (49') Simple Wide Flange Beam Span,
(80'-100'-80') Continuous Plate Girder Spans, (49') Simple Wide Flange Beam Span



GENERAL ELEVATION SHOWING LOCATIONS OF
EXPANSION JOINT REMOVAL AND REPLACEMENT

General Notes:

Design Specifications:
2002 - AASHTO 17th Edition
Load Factor Design
Bridge Deck Rating = 6

Design Loading:
HS20-44 (New Construction)

Design Unit Stresses:

Class B-1 Concrete (Barrier Curb)	f'c = 4,000 psi
Class B-2 Concrete (Slab)	f'c = 4,000 psi
Reinforcing Steel (Grade 60)	fy = 60,000 psi
Structural Steel (ASTM A709 Grade 50)	fy = 50,000 psi

Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 1-1/2", unless otherwise shown.

Miscellaneous:
"Sec" refers to the sections in the standard and supplemental specifications unless specified otherwise.

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars, unless otherwise noted.

Remove existing (2"±) wearing surface and install new (1-3/4") wearing surface (Roadway Item).

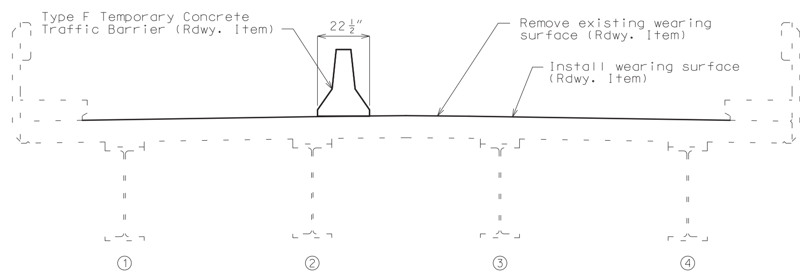
Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.

Contractor shall verify all dimensions in field before ordering new material.

Temporary Barrier shall not be attached to the bridge.

Reuse or replacement of existing reinforcing steel shall be in accordance with Sec 216.90.3.3 except mechanical bar splices may be used at the contractor's option in lieu of lap splicing. Any mechanical bar splices used will be considered completely covered by the contract unit price for Removal of Existing Expansion Joints & Adjacent Concrete.

Traffic Handling:
Maintain traffic on structure during construction. See Roadway Plans for traffic control.



SECTION THRU SLAB

Quantities

Item		Total
Removal of Existing Expansion Joints & Adjacent Concrete	linear foot	84
Remove and Replace Barrier Curb	linear foot	36
Class B-2 Concrete	cu. yard	18.6
Reinforcing Steel	pound	240
Fabricated Structural Low Alloy Steel (Misc.)	pound	6110
Strip Seal Expansion Joint System	linear foot	84

REPAIRS TO BRIDGE OVER MIDDLE FORK OF GRAND RIVER
STATE ROAD FROM RTE. M TO RTE. 46
ABOUT 2.3 MILES SOUTH OF RTE. 46
STA. 428+17.96± (Match Exist.)

STD. 617.20
STD. 706.35

Designed July 2011
Detailed July 2011
Checked July 2011

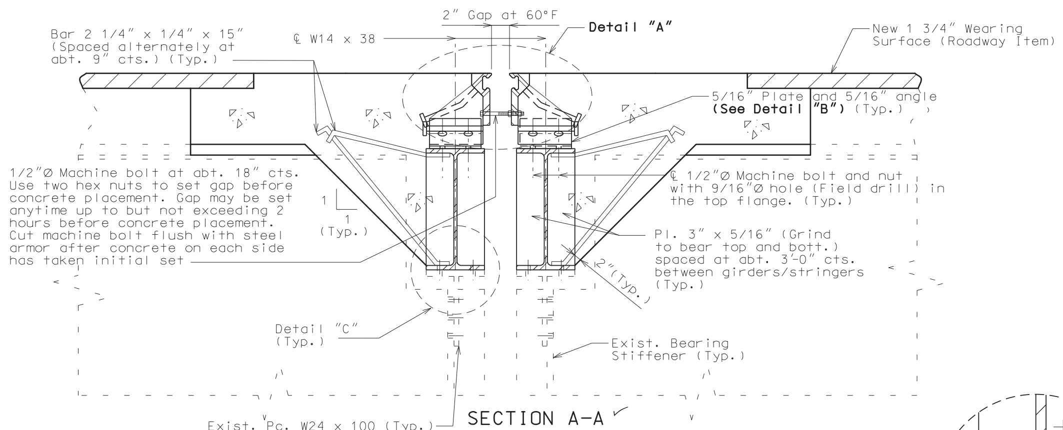
Note: This drawing is not to scale. Follow dimensions.

FINAL PLANS
DATE PREPARED 11/20/2012
ROUTE 169 | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY WORTH
JOB NO. J1P1980
CONTRACT ID. 111118-A01
PROJECT NO. FAF-169-2(24)
BRIDGE NO. A04482

DESCRIPTION | DATE

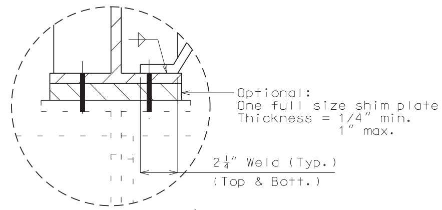
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

T:\co-proj\FinalPlans\J1P1980\A04482\B_A04482_001_J1P1980_frontsheet.dgn 8:51:24 AM 11/20/2012

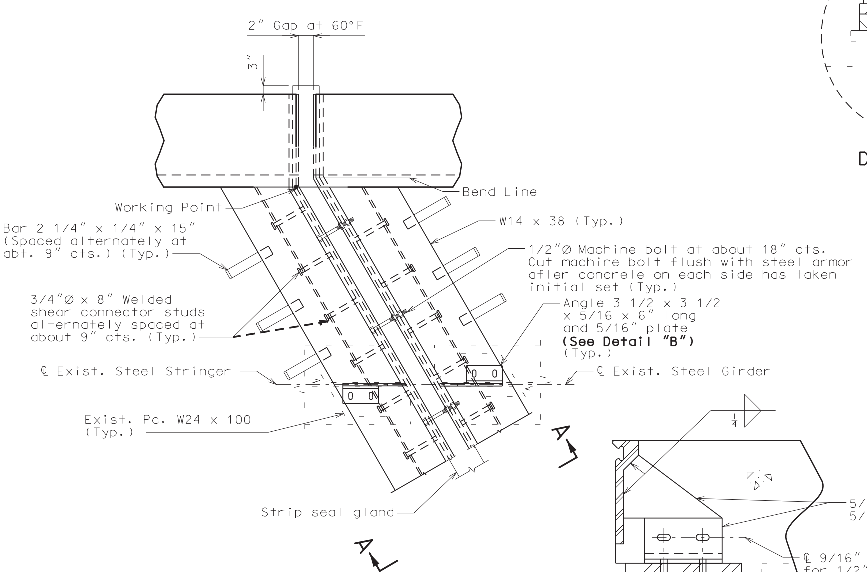


SECTION A-A

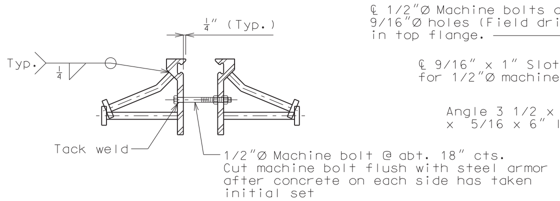
Note: Strip seal gland not shown for clarity



DETAIL "C"



PART PLAN



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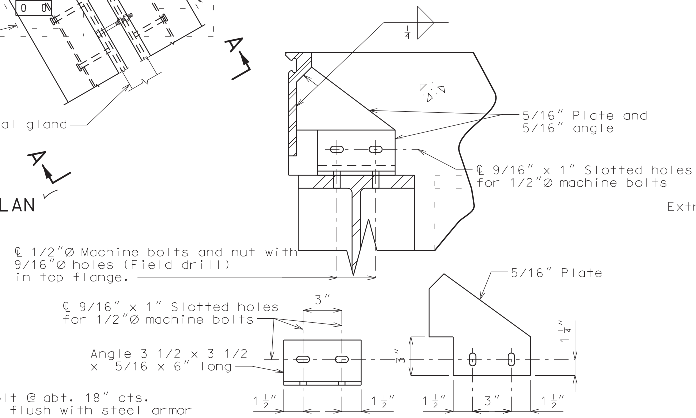

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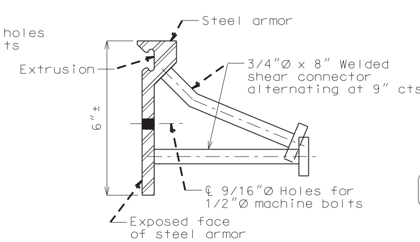
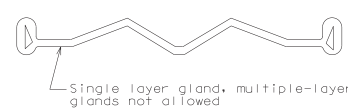


DETAIL OF JOINT ARMOR



DETAIL OF GLAND

GENERAL NOTES:

Expansion joint system shall be fabricated in one section, except for stage construction and when the length is over 50 feet. A complete joint penetration groove welded splice shall be required. Welds shall be ground flush to provide a smooth surface. The expansion joint system shall be fabricated and installed to the crown and grade of the roadway.

The strip seal gland shall be installed in joints in one continuous piece without field splices. Factory splicing will be permitted for joints in excess of 53 feet.

Structural steel for the expansion joint system shall be ASTM A709 Grade 36 except the steel armor may be ASTM A709 Grade 50W and W14 x 38 shall be ASTM A709 Grade 50. Anchors for the expansion joint system shall be in accordance with Sec 1037. Strip seal expansion joint system shall be in accordance with Sec 717.

Structural steel for the expansion joint system shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 1/16" for each 10° fall or rise in temperature at installation.

Concrete shall be forced under and around steel armor, bars and anchors. Proper consolidation of the concrete shall be achieved by localized internal vibration.

Payment for furnishing, coating or galvanizing and installing wide flange beams will be considered completely covered by the contract unit price for Fabricated Structural Low Alloy Steel (Misc.) per pound. All other material and labor for furnishing and installing strip seal, complete-in-place, will be considered completely covered by the contract unit price for Strip Seal Expansion Joint System per linear foot.

NOTE: DETAILS OF STRIP SEAL AT INTERMEDIATE BENT NO. 5 WERE RETROFITTED TO MATCH DETAILS AT INTERMEDIATE BENT NO. 2

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."

FINAL PLANS

DATE PREPARED	11/20/2012
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 2
COUNTY	WORTH
JOB NO.	J1P1980
CONTRACT ID.	111118-A01
PROJECT NO.	FAF-169-2(24)
BRIDGE NO.	A04482

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

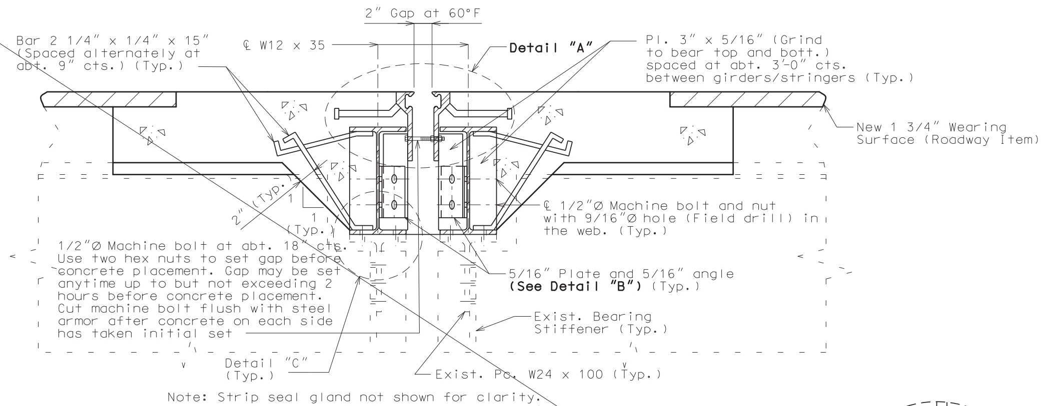
MoDOT

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

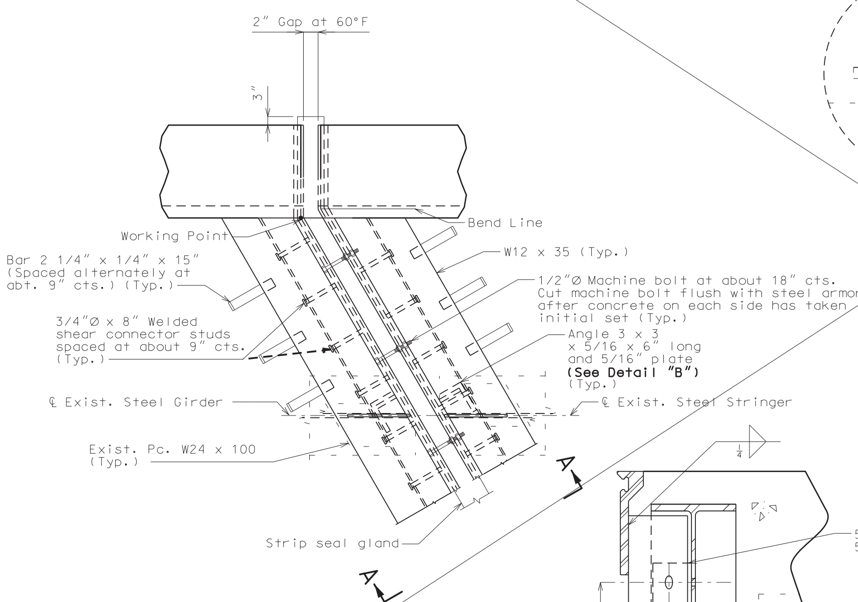
DETAILS OF STRIP SEAL AT INTERMEDIATE BENT NO. 2 & 5

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

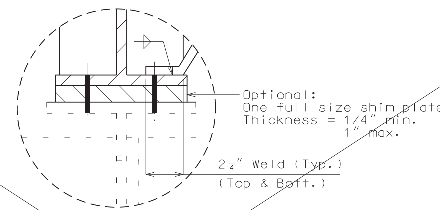
Detailed July 2011
Checked July 2011



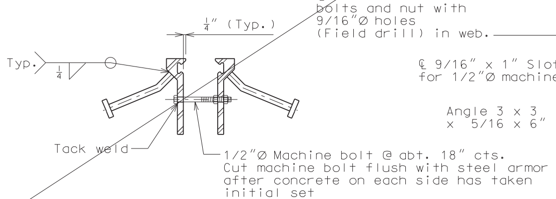
SECTION A-A



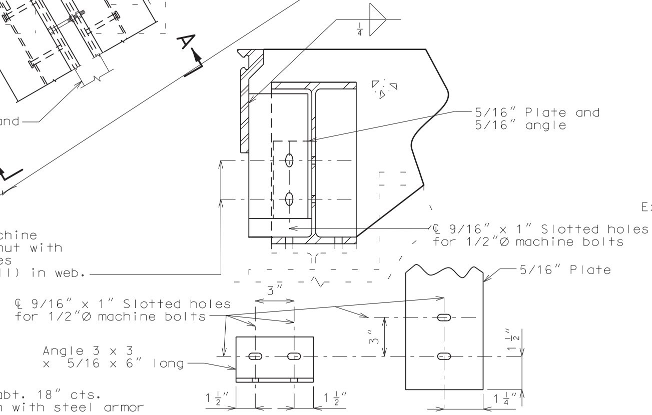
PART PLAN



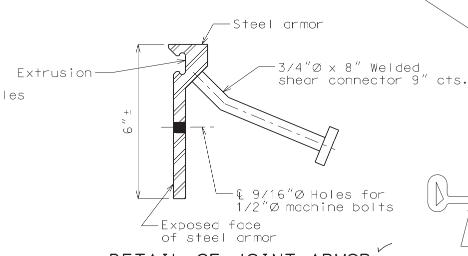
DETAIL "C"



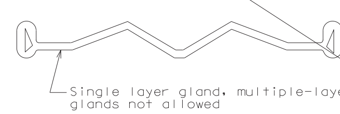
DETAIL "A"



DETAIL "B"



DETAIL OF JOINT ARMOR



DETAIL OF GLAND

GENERAL NOTES:

Expansion joint system shall be fabricated in one section, except for stage construction and when the length is over 50 feet. A complete joint penetration groove welded splice shall be required. Welds shall be ground flush to provide a smooth surface. The expansion joint system shall be fabricated and installed to the crown and grade of the roadway.

The strip seal gland shall be installed in joints in one continuous piece without field splices. Factory splicing will be permitted for joints in excess of 53 feet.

Structural steel for the expansion joint system shall be ASTM A709 Grade 36 except the steel armor may be ASTM A709 Grade 50W and W12 x 35 shall be ASTM A709 Grade 50. Anchors for the expansion joint system shall be in accordance with Sec 1037. Strip seal expansion joint system shall be in accordance with Sec 717.

Structural steel for the expansion joint system shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 1/8" for each 10° fall or rise in temperature at installation.

Concrete shall be forced under and around steel armor, bars and anchors. Proper consolidation of the concrete shall be achieved by localized internal vibration.

Payment for furnishing, coating or galvanizing and installing wide flange beams will be considered completely covered by the contract unit price for Fabricated Structural Low Alloy Steel (Misc.) per pound. All other material and labor for furnishing and installing strip seal, complete-in-place, will be considered completely covered by the contract unit price for Strip Seal Expansion Joint System per linear foot.

NOTE: DETAILS OF STRIP SEAL AT INTERMEDIATE BENT NO. 5 WERE RETROFITTED TO MATCH DETAILS AT INTERMEDIATE BENT NO. 2

DETAILS OF STRIP SEAL AT INTERMEDIATE BENT NO. 5

Detailed July 2011
Checked July 2011

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FINAL PLANS

DATE PREPARED	12/5/2012
ROUTE	169
STATE	MO
DISTRICT	BR
SHEET NO.	3
COUNTY	WORTH
JOB NO.	J1P1980
CONTRACT ID.	111118-A01
PROJECT NO.	FAF-169-2(24)
BRIDGE NO.	A04482

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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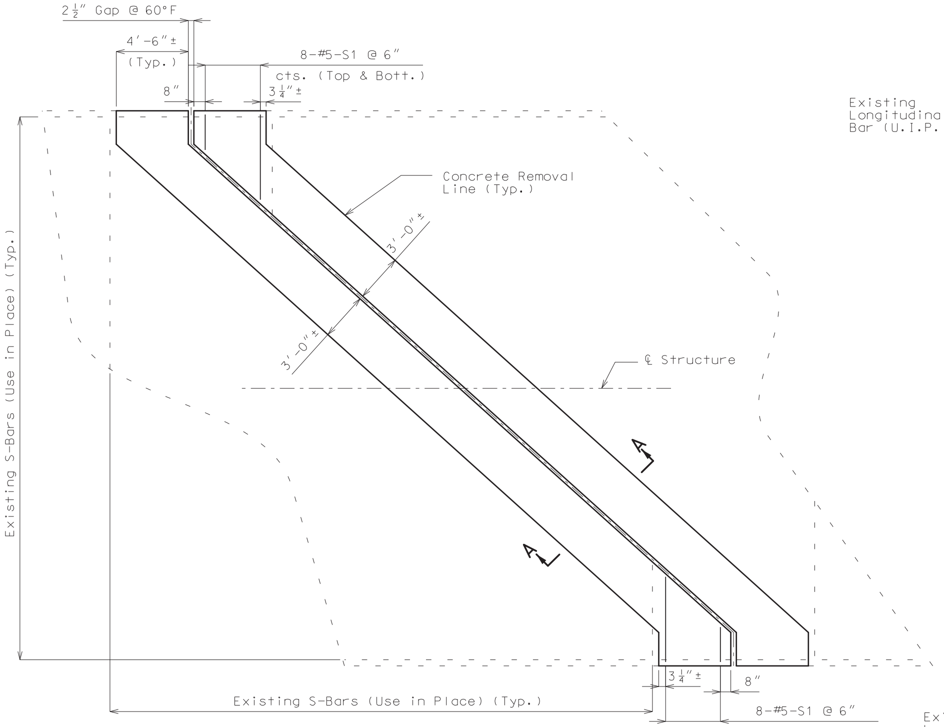
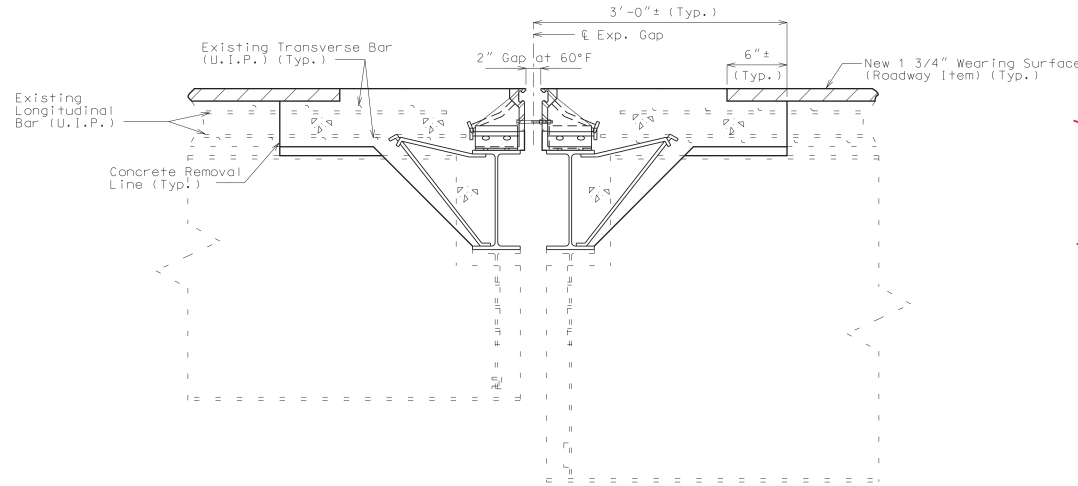


PART PLAN OF SLAB AT INT. BENTS NO. 2 & 5
SHOWING REINFORCEMENT

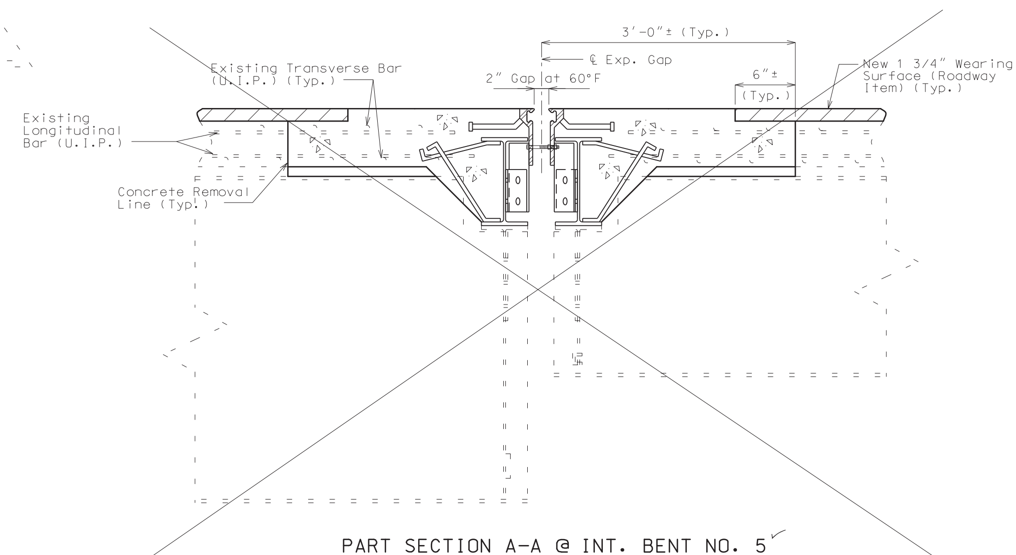
Notes:

For Details of Strip Seal, see Sheets No. 2 & 3.

For Details of Barrier Curb Removal & Replacement,
see Sheet No. 5.



PART SECTION A-A @ INT. BENT NO. 2 & 5
Note: Strip seal gland not shown for clarity.



PART SECTION A-A @ INT. BENT NO. 5
Note: Strip seal gland not shown for clarity.

DETAILS OF SLAB REMOVAL & REPLACEMENT AT INT. BENTS NO. 2 & 5

Detailed July 2011
Checked July 2011

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FINAL PLANS

DATE PREPARED	11/20/2012
ROUTE	169
STATE	MO
DISTRICT	BR
SHEET NO.	4
COUNTY	WORTH
JOB NO.	J1P1980
CONTRACT ID.	111118-A01
PROJECT NO.	FAF-169-2(24)
BRIDGE NO.	A04482

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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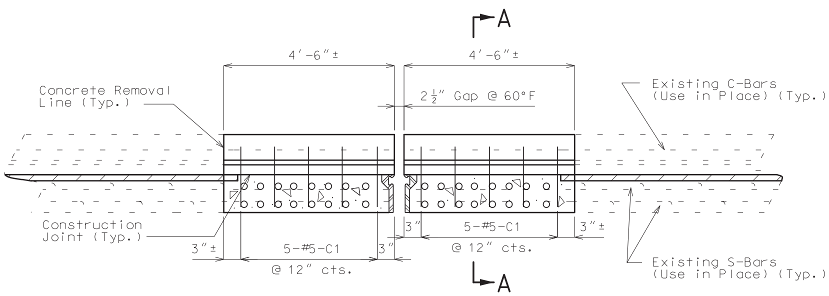
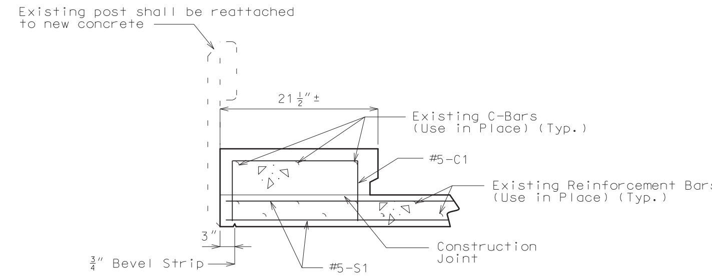


PART SECTION AT INT. BENTS NO. 2 & 5
Note: Existing channel rail and posts not shown.



PART SECTION A-A

Notes:

For Details of Strip Seal not shown, see Sheets No. 2 & 3.

For Details of Slab Removal & Replacement, see Sheet No. 4.

Payment for removing and replacing barrier curb including all labor, materials, concrete and reinforcement will be considered completely covered by the contract unit price for Remove & Replace Barrier Curb per linear foot.

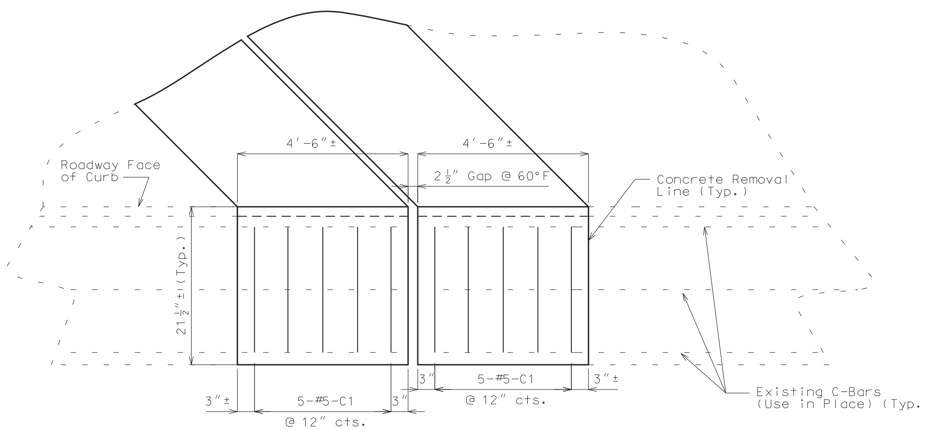
Replacement curb shall match existing curb dimensions.

Existing rail posts located within the limits of curb removal shall be reattached to new curb and slab. Contractor may clean and reuse existing anchor bolts as approved by the engineer or replace in-kind. Cost of rail post attachment will be considered completely covered by the contract unit price for Remove & Replace Barrier Curb.

Top of barrier curb shall be built parallel to grade with barrier curb joints normal to grade.

All exposed edges of barrier curb shall have either a 1/2" radius or a 3/8" bevel, unless otherwise noted.

Concrete in the barrier curb shall be Class B-1. At the contractor's option, Class B-2 concrete may be used with no price adjustment to the contract unit price for Remove & Replace Barrier Curb.



PART PLAN SHOWING CURB REINFORCEMENT
Note: Existing channel rail and posts and slab reinforcement not shown for clarity.

DETAILS OF BARRIER CURB REMOVAL & REPLACEMENT AT INT. BENTS NO. 2 & 5

Detailed July 2011
Checked July 2011

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FINAL PLANS

DATE PREPARED	11/20/2012
ROUTE	169
STATE	MO
DISTRICT	BR
SHEET NO.	5
COUNTY	WORTH
JOB NO.	J1P1980
CONTRACT ID.	111118-A01
PROJECT NO.	FAF-169-2(24)
BRIDGE NO.	A04482

DESCRIPTION
DATE

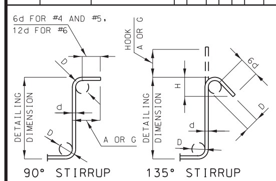
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

BILL OF REINFORCING STEEL

NO. REQ'D	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			SLAB																									
64	5	S1	SLAB		20			V	8	2	0.000													2	0	2	0	
			INCREMENT =							5	1.000													5	1	5	1	236
			5.250 INCH																									
			BARRIER CURB																									
40	5	C1	BARRIER CURB		10	S							11.375		16.250									3	3	3	1	129
			TOTALS																									
	5																											365
			TOTAL																									365
			TOTAL	E																								0
			Slab on Girder																									
	5																											236
			TOTAL																									236
			Barrier Curb																									
	5																											129
			TOTAL																									129

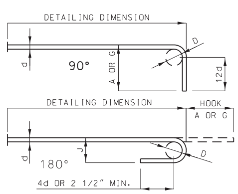
BILL OF REINFORCING STEEL

NO. REQ'D	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.



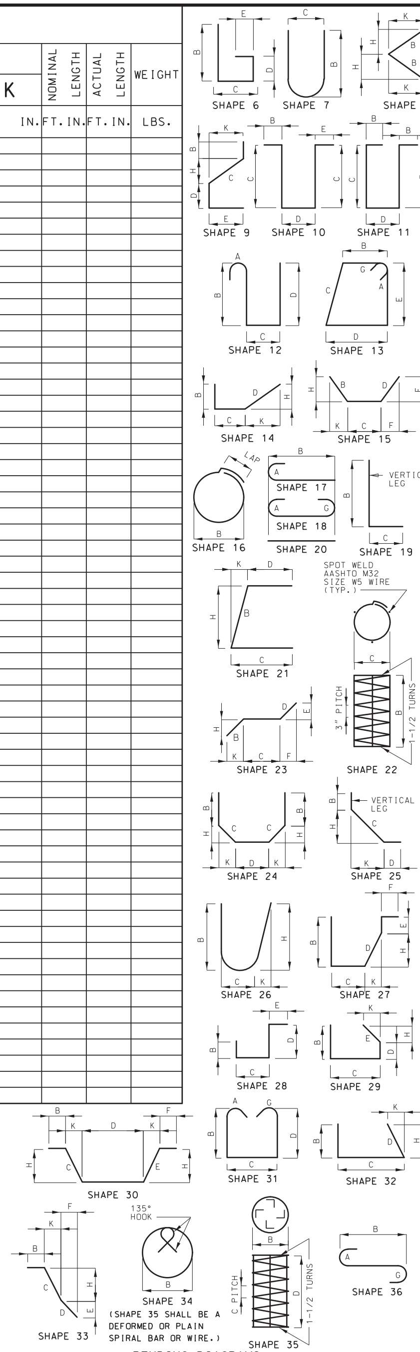
STIRRUP HOOK DIMENSIONS				
GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK: HOOK A OR G	135° HOOK: HOOK A OR G	135° HOOK: APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	ALL GRADES 180° HOOKS A OR G	ALL GRADES 180° HOOKS J	ALL GRADES 90° HOOKS A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
E = EPOXY COATED REINFORCEMENT.
S = STIRRUP.
X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.
FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.



BENDING DIAGRAMS

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FINAL PLANS

DATE PREPARED	
11/20/2012	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 6
COUNTY WORTH	
JOB NO. J1P1980	
CONTRACT ID. 111118-A01	
PROJECT NO. FAF-169-2(24)	
BRIDGE NO. A04482	

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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Detailed July 2011
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