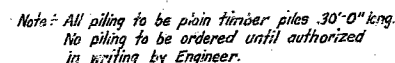
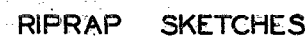
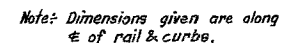


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
5	MO.	U.S. 60-582	19		



56-Plates-8" x $\frac{5}{8}$ " x 17" } Plane to $\frac{1}{8}$ " thickness
12-Plates-17" x $\frac{3}{8}$ " x 2'-0 $\frac{1}{2}$ " }
80- $\frac{3}{4}$ " ϕ Bolts-12" long-Sq. Nuts-Csk. Heads,
80- $\frac{3}{4}$ " ϕ Bolts-12" long- No threads or Nuts,
20-Copper Plates-8" x 17"-16 Gauge.
80- $\frac{3}{8}$ " ϕ Bolts-1 $\frac{1}{2}$ " long-Soft Iron.



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



No.	Size	Length	Mark	Location	BENDING SKETCHES & CUTTING DIAGRAMS										No.	Size	Mark	Length	Location
Superstructure																			

Note:- Dimensions given are along Φ of bars and are for computed lengths

Concrete in slabs, curbs and girders to be 1:2:3½ mix. All other concrete to be 1:2:4 mix. Exposed edges shall be beveled $\frac{3}{4}$ " where no other bevel is noted.

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.

Two name plates type "B" as shown on Std. S-819 to be furnished and placed by contractor.

Cost of name plates to be included in price bid for other items.

No permanent camber desired in finished girders. Any construction camber remaining in girders to be taken out in floor slab by thickening floor over supports.

Structural steel to be subpunched matchmarked and reamed. See Specifications.

Truss span to be assembled complete in shop for inspection. See Special Provisions.

Detail shop drawings for the steel span shall be submitted to the State Highway Department in duplicate and shall be approved before steel is fabricated.

Paint : Shop : Contact surfaces one coat of red lead.

Field : Surfaces inaccessible after erection three coats of red lead.

All other surfaces three coats of paint. All paint will be furnished by the Missouri State Highway Department.

Files to be driven to sustain a load of 20 ton per pile.

Truss span to be skewed opposite hand to detail shown on sheet No. 2.

Excavation in accordance with specifications XLIX of Standard Specifications issued November 1, 1929, except that quantities paid for will be computed from Extreme L.W. Elev. 307.0 where existing ground line is below this elevation.

8.M. Elev. 340.61: Rivet on S.W. Pier in Msy. Plate Sta. 553+88.

STATE ROAD FROM POPLAR BLUFF TO SIKESTON

ABOUT .25 MILE EAST OF FISK

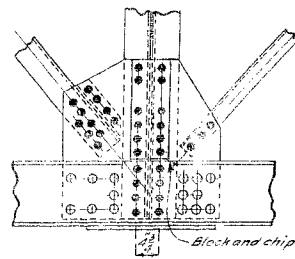
PROJECT NO. D.S. 60-582 STA. 532 + 00

BUTLER & STODDARD COUNTIES

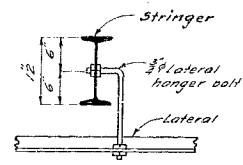
SUBMITTED BY *M. Sack* DATE *2/24/71*
BRIDGE ENGINEER
APPROVED BY *T. Huxley* DATE
CHIEF ENGINEER

STD. S-818
STD. C-6335
J-92

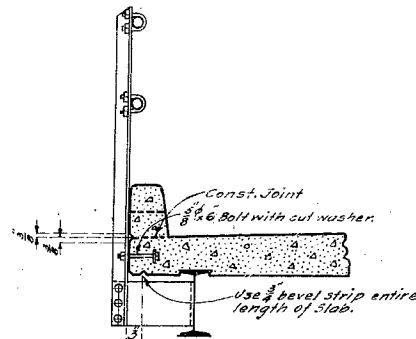
MISSOURI STATE HIGHWAY DEPARTMENT



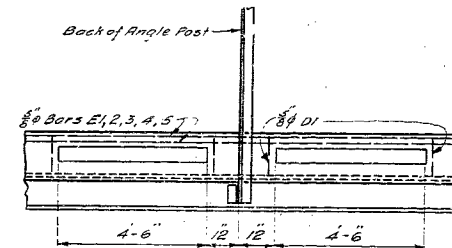
TYPICAL POST DETAILS



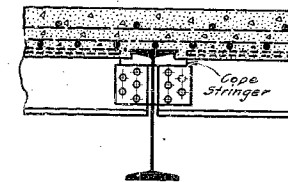
LATERAL HANGERS



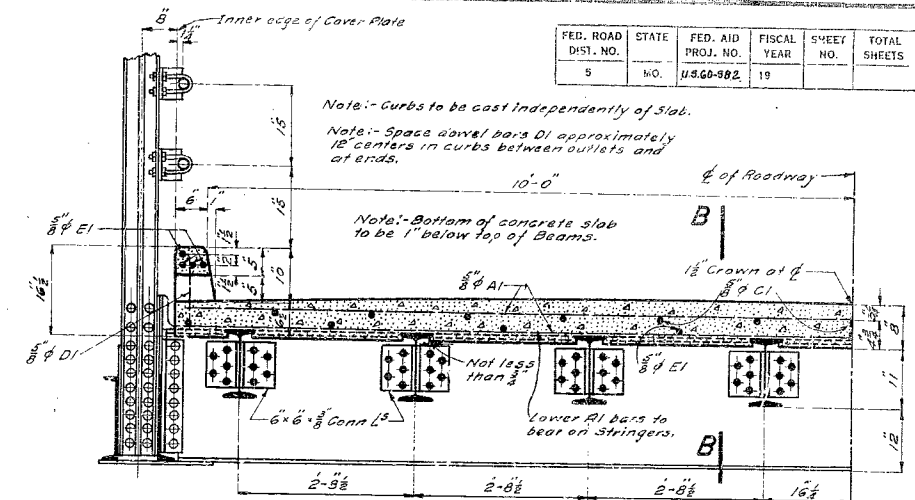
RAIL POST AT CENTER OF EACH 20'-0" PANEL



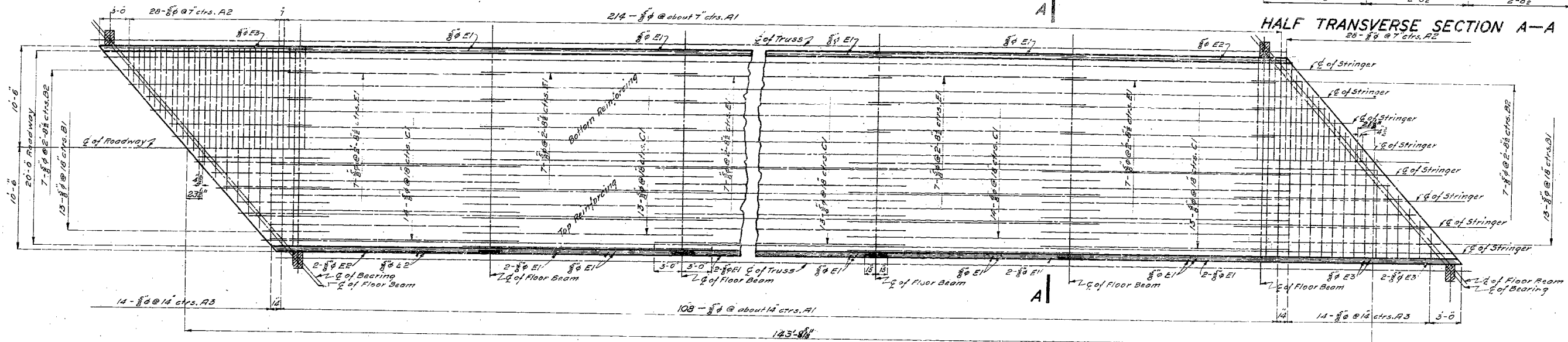
ELEVATION OF RAIL POST AND OUTLETS
TWO OUTLETS IN EACH PANEL



SECTION B-B



HALF TRANSVERSE SECTION A-A



PLAN SHOWING REINFORCING

Note: Bridge to be skewed opposite hand to details shown on this sheet.

BILL OF REINFORCING STEEL

NO.	SIZE	LENGTH	MARK	CUTTING DIAGRAMS
20	1/2"	25'-3"	A2	7 1/2" 2'-10 1/2"
14	3/4"	22'-3"	A3	15 1/2" 2'-11 1/2"
13	3/4"	20'-3"	B1	8'-10 1/2" 20'-4 1/2"
7	3/4"	26'-0"	B2	2'-11 1/2" 19'-9 1/2"
81	3/4"	26'-0"	C1	25'-3" 22'-9"
82	3/4"	22'-6"	E1	20 Bars A2 Cut 28
10	3/4"	23'-0"	E2	14 Bars A3 Cut 14
10	3/4"	23'-0"	E3	16 6'-7 1/2"
196	3/4"	12"	D1	2'-5 1/2" 2'-5 1/2"
322	3/4"	20'-9"	A1	6'-7 1/2" 22'-7 1/2"
				29'-3" 26'-0"
				13 Bars B1 Cut 13
				7 Bars B2 Cut 7

BRIDGE OVER ST. FRANCIS RIVER

STATE ROAD FROM POPLAR BLUFF TO SIKESTON

ABOUT 2.5 MILE EAST OF FISK

PROJECT NO. US.60-882 STA. 532 +00

BUTLER & STODDARD COUNTY

SUBMITTED BY *M. J. Butler* DATE *9/24/20*
APPROVED BY *M. J. Butler* BRIDGE ENGINEER
CHIEF ENGINEER

STD. 3818
STD. C-6335
J-92

TOP LATERAL SYSTEM

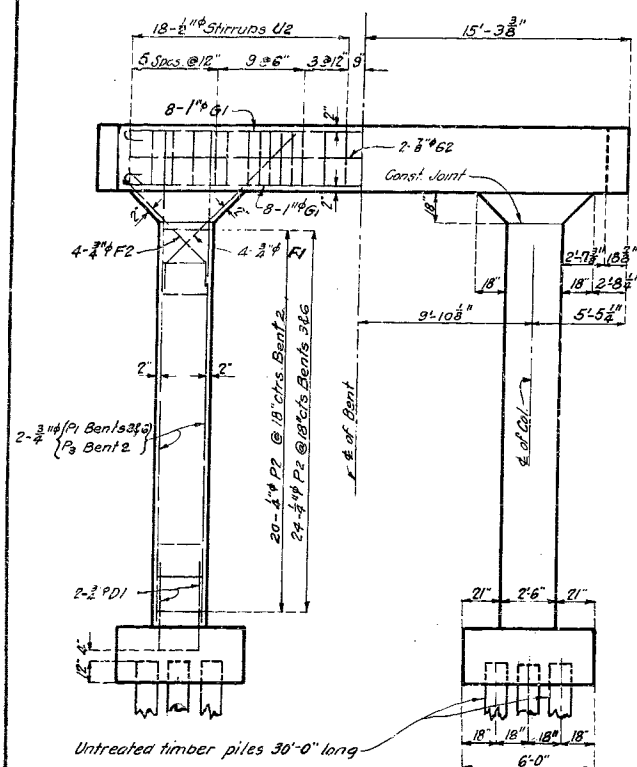
FLOOR PLAN

STRESS DIAGRAM

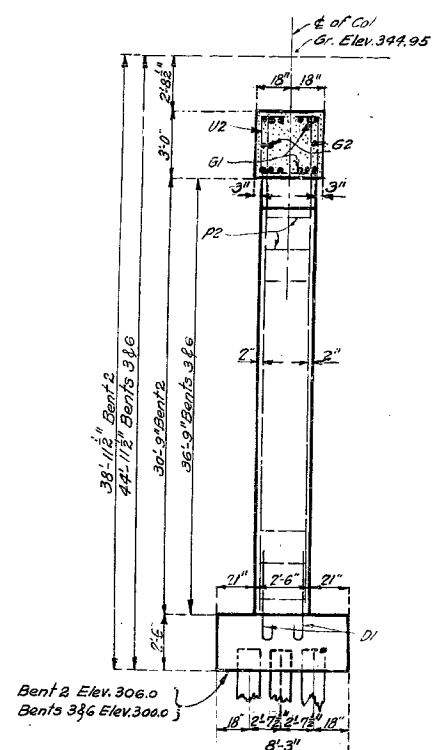
Revised July 1929 by J.G.
Checked July 1929 by P.B.R.
Drawn July 1929 by C.F.B.
Checked July 1929 by N.M.R.

Sheet No. 2 of 4

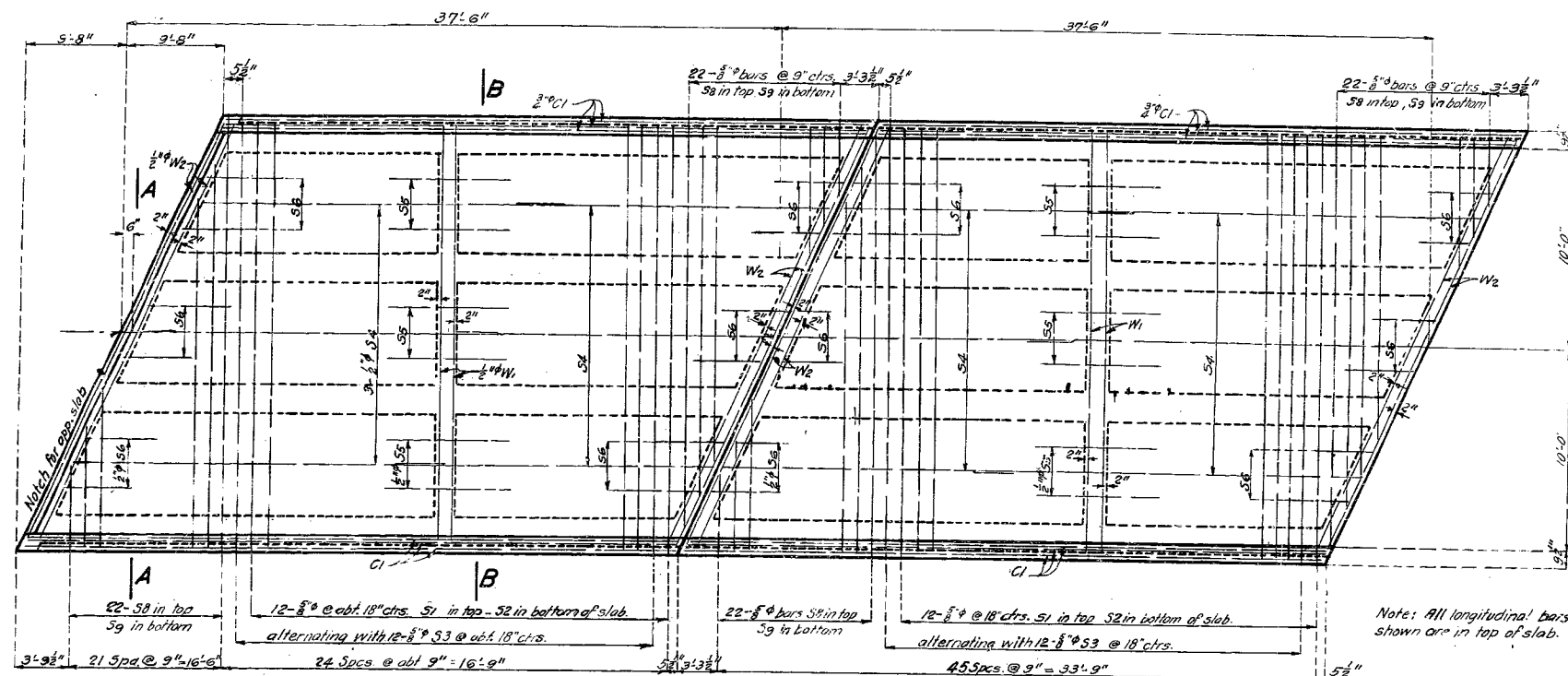
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MA	U.S. 60-582	19		



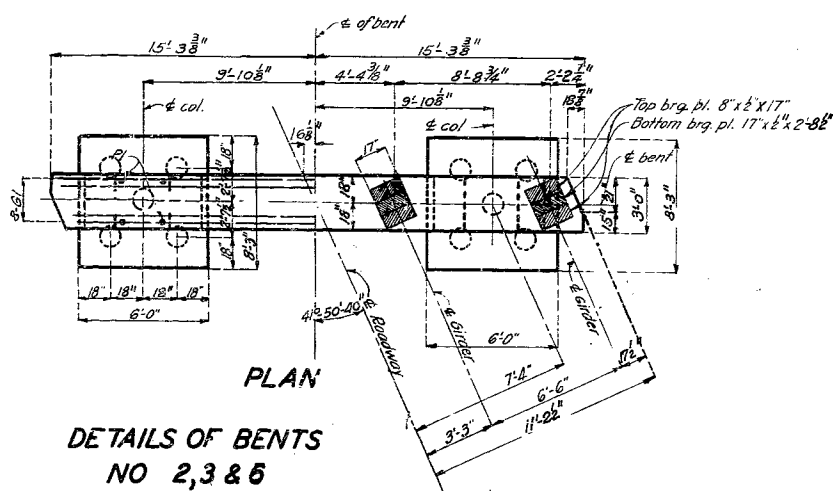
ELEVATION



SECTION AT C

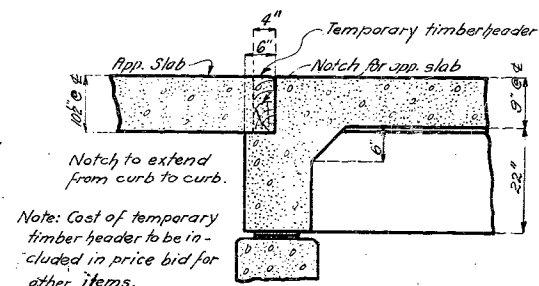


PLAN OF SLAB SHOWING REINFORCING

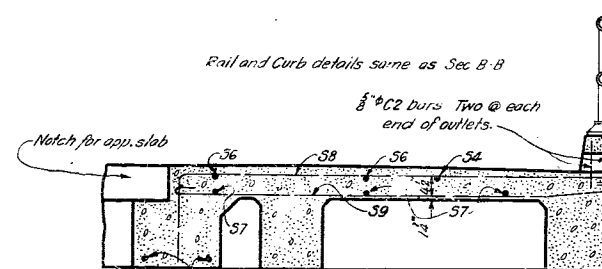


DETAILS OF BENTS
NO 2,3 & 5

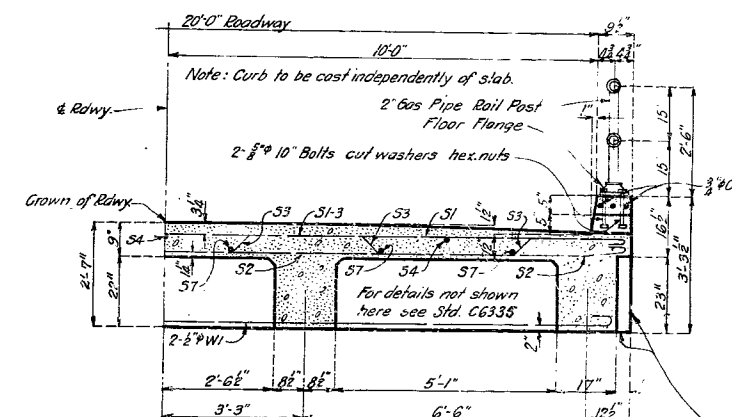
Note: This drawing is not to scale.
Follow dimensions.



DETAILS OF NOTCH FOR
APPROACH SLAB
Section parallel to E of Roadway

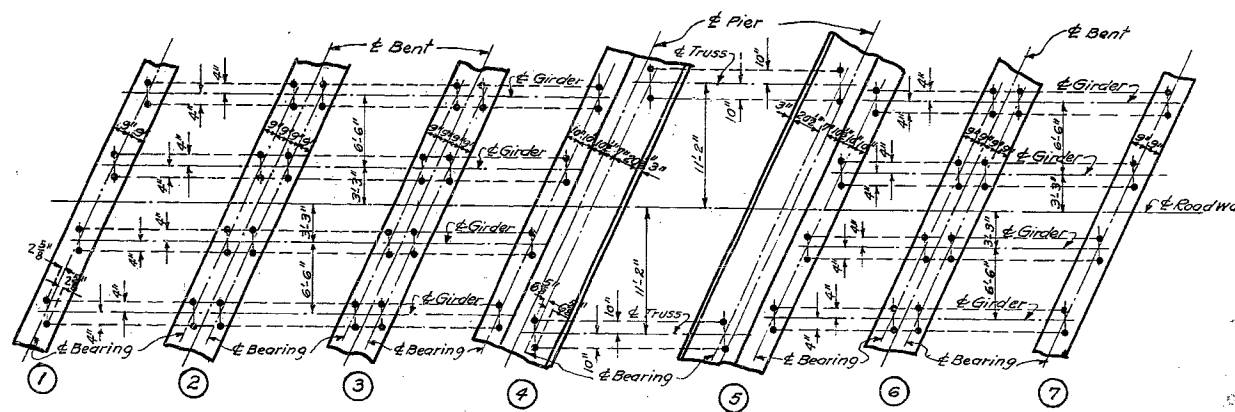


SECTION A-A



SECTION B-B

*Extend Web to these lines
at end bents only.*



ANCHOR BOLT PLAN

BRIDGE OVER ST. FRANCIS RIVER

STATE ROAD FROM POPLAR BLUFF TO SIKESTON

ABOUT .25 MILE EAST OF FISK

PROJECT NO. U.S. 60-S82 STA. 532+00

BUTLER & COUNTIES

STODDARD *msl* COUNTIES

SUBMITTED BY: W. Back DATE: _____

ACTING BRIDGE ENGINEER

T.H. K.

APPROVED BY L. J. Kelly DATE 11/1/54
CHIEF ENGINEER

STD. S818

STD. C 6335

J 92

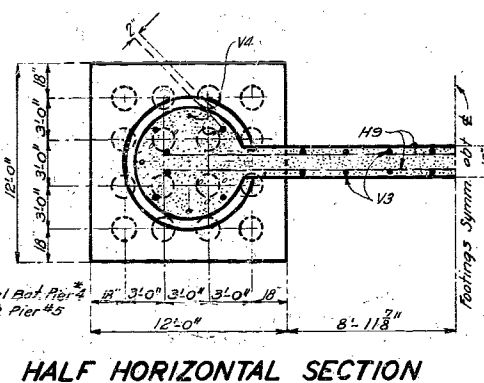
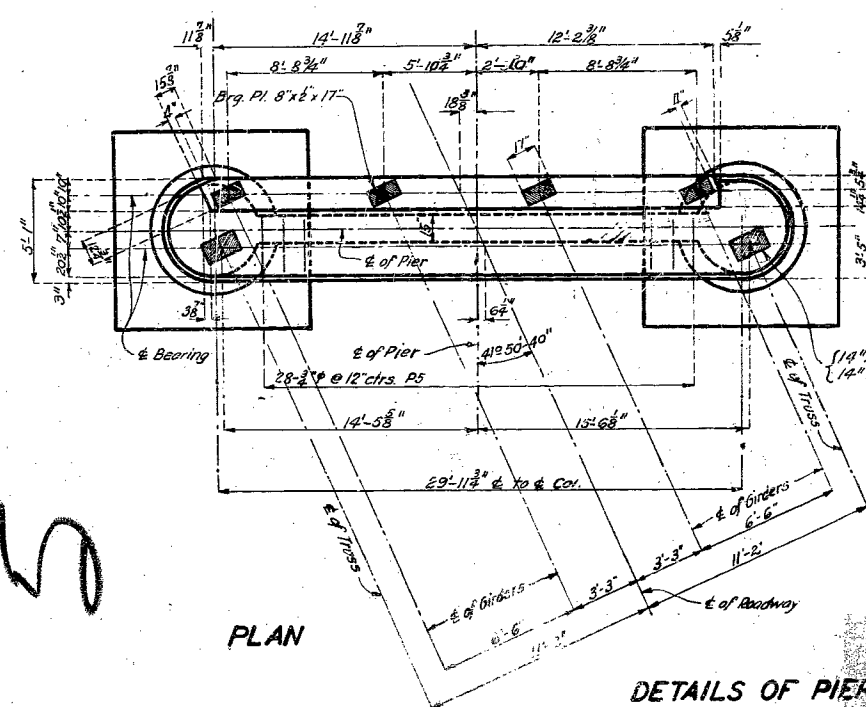
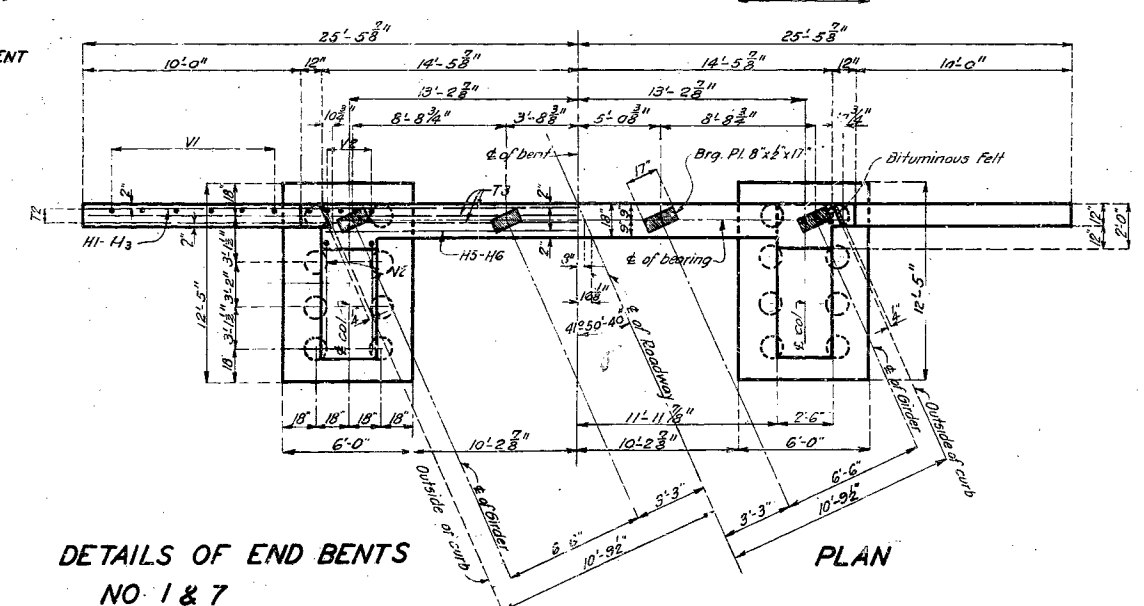
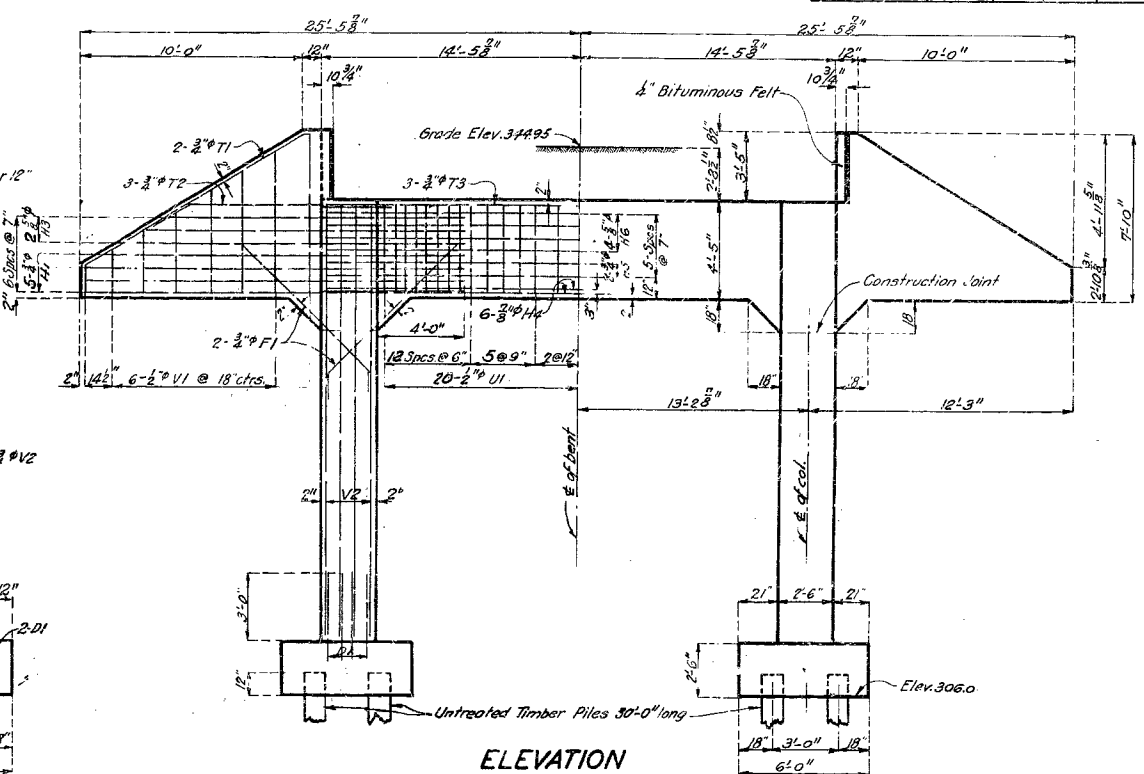
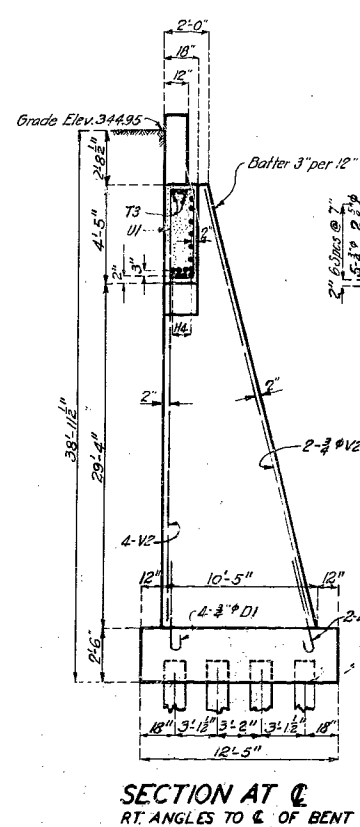
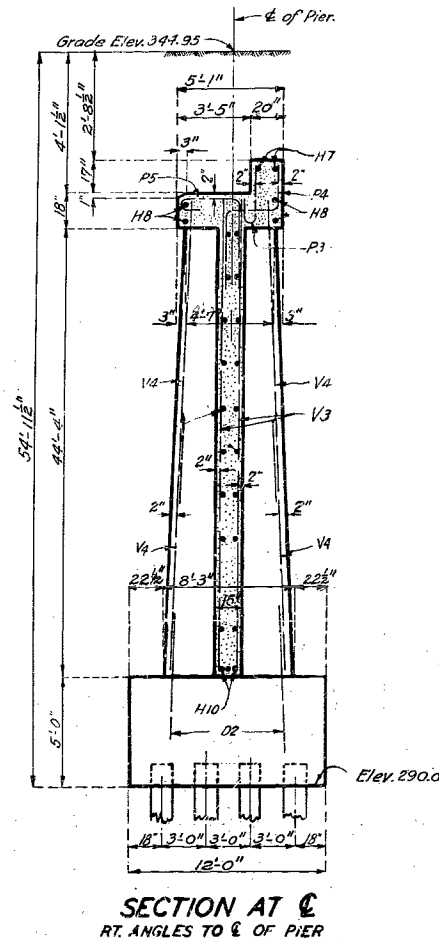
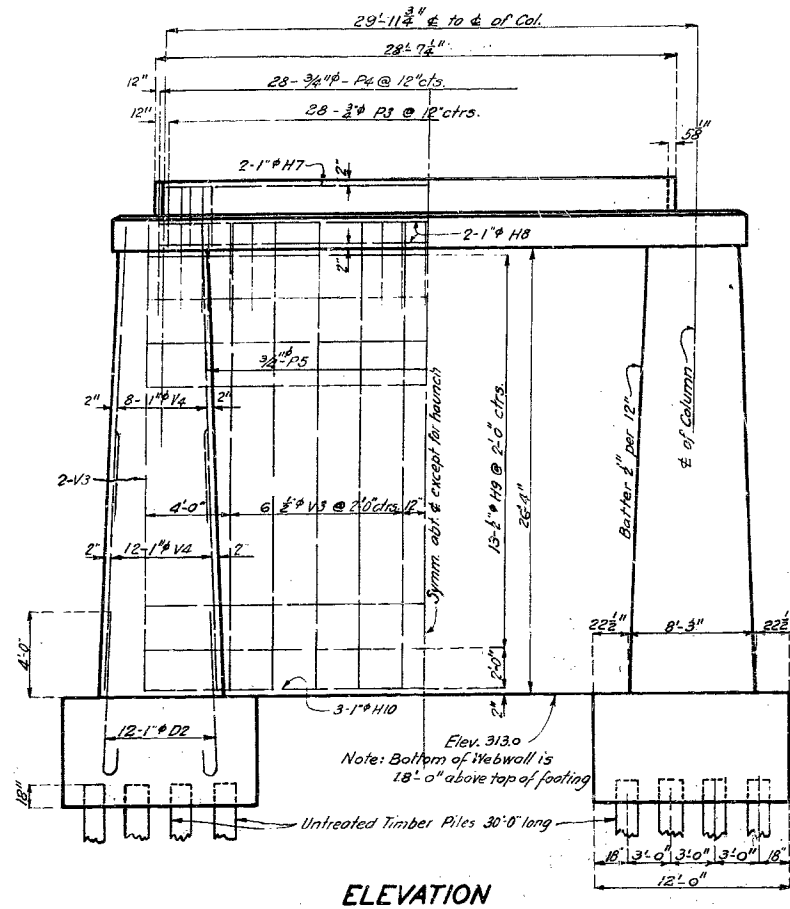
Drawn June 1929 by J.G.

Checked. July 1929 by P.B.R.

Sheet No. 3 of 4

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO	U.S. 60-582	19		



**DETAILS OF END BENTS
NO. 1 & 7**

BRIDGE OVER ST. FRANCIS RIVER

STATE ROAD FROM POPLAR BLUFF TO SIKESTON

ABOUT 25 MILE EAST OF FISK

PROJECT NO. U.S. 60-582 STA. 532+00

BUTLER & STODDARD

SUBMITTED BY: *[Signature]* DATE: *[Date]*
ACTING BRIDGE ENGINEER

APPROVED BY: *[Signature]* DATE: *[Date]*
CHIEF ENGINEER

STD. S818

STD. C6335

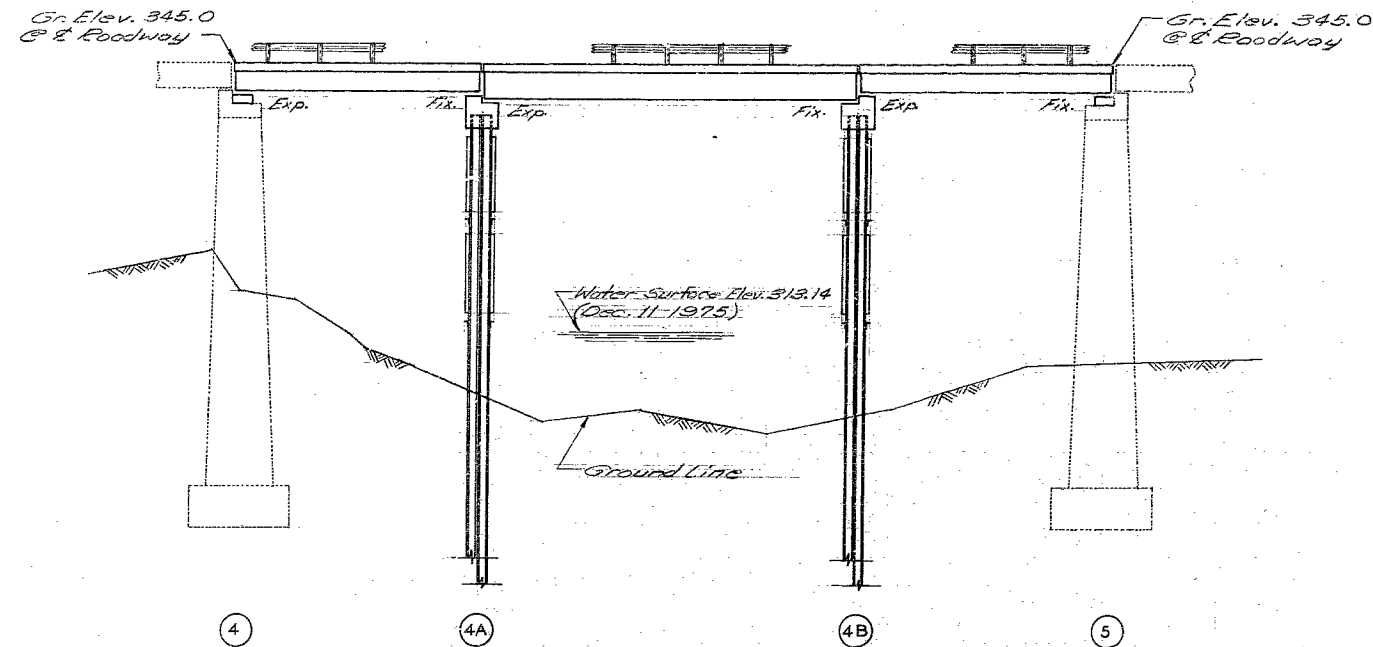
J92

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

MISSOURI STATE HIGHWAY DEPARTMENT

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

40'-60'-40' Simple I-Bm. Spans (Non-Composite)



PART GENERAL ELEVATION

General Notes:

Design Specifications: A.A.S.H.T.O. - 1973

Design Loading: H20-44

Design Unit Stresses:

Class B Concrete (Substructure) $f_c = 1,800$ psi
 Class B Concrete (Superstructure) $f_c = 1,600$ psi
 Reinforcing Steel $f_s = 20,000$ psi
 Structural Carbon Steel (W & I Bm.) $f_s = 18,000$
 Structural Carbon Steel (all other) $f_s = 20,000$

Fabricated Steel:

Field connections, High Strength Bolts $\frac{3}{4}$ " ϕ ,
 holes $\frac{3}{16}$ " except as noted.

Reinforcing Steel:

Minimum clearance to reinforcing steel shall be 1" unless otherwise shown.

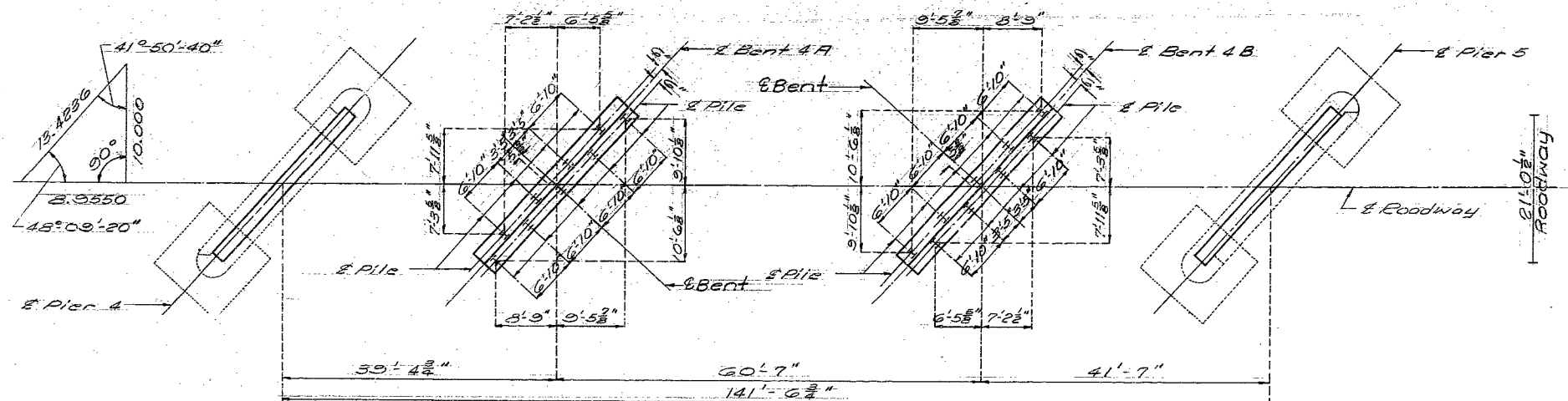
Notes:

Light dotted lines indicate old work. Heavy lines indicate new work.

The old truss dimensions from original plans dated July 1929 were used for these I-Bm. replacement spans. Field adjustments to these dimensions may have to be made to accommodate the new spans.

Paint: System C in accordance with Std. Spec. 712.12. The weight of steel piles and sway bracing is included in the tonnage for painting. Rail post and channel may be painted or galvanized.

Seal Coat: A seal coat shall be applied to the new concrete deck to match the existing approach spans.



PART PLAN

PILE DATA		
BENT NO.	4A	4B
Number	9	9
Kind	12BP	12BP
Approximate Length Ft.	69	69
Design Bearing Ton.	25	25
Min. Tip Penetration Elev.	271.00	271.00
Hammer Energy Required Ft.Lbs.	11,000	11,000

Minimum energy requirement of hammer based on plan length of pile.
 All pile shall be driven to the minimum penetrations and to not less than the design bearings noted.

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

DESIGNED Dec. 1975

DETAILED Dec. 1975

CHECKED Dec. 1975

B.M. Elev. 345.60 "0" Chiseled on conc. curb
 10.7' Lt. of Sta. 531+90.

BRIDGE OVER ST. FRANCIS RIVER

STATE ROAD

ABOUT

PROJECT NO.

STA.

JOB NO.

RTE. 60

BUTLER & STODDARD COUNTY

DATE

STD.

STD.

J-92R1

Wreck Repair - This design is for replacement of 140' truss with 40'-60'-40' simple I-beam spans. Work done by Maintenance Forces. (Wreck of 12-10-75)

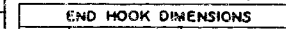
Sheet No. 1 of 7

504

STD. 90.8	REVISED
MAY 1974	

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

Sheet No. 2 of 7.

BUTLER & STODDARD COUNTYSTIRRUP HOOKS

STIRRUP HOOK DIMENSIONS

*ALL HOOKS AND BENDS FOR SHAPE NO. 12 (only) ARE BASED ON $D = 5d$.

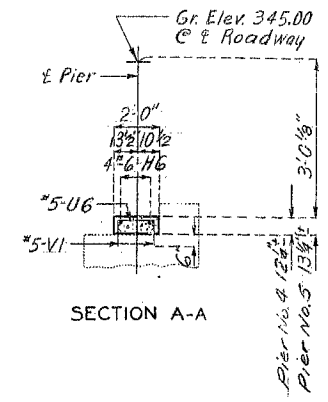
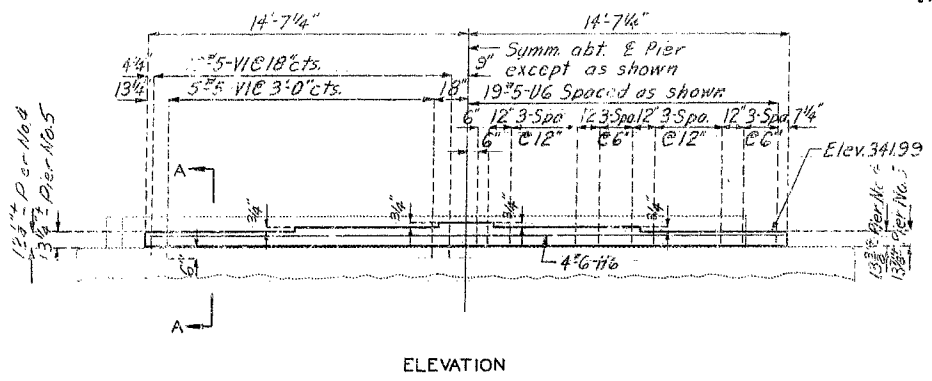
SHAPE 29 SHAPE 29 SHAPE 30

SHAPE 29 SHAPE 29 SHAPE 30

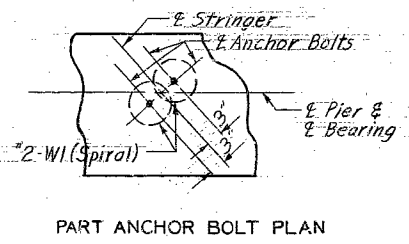
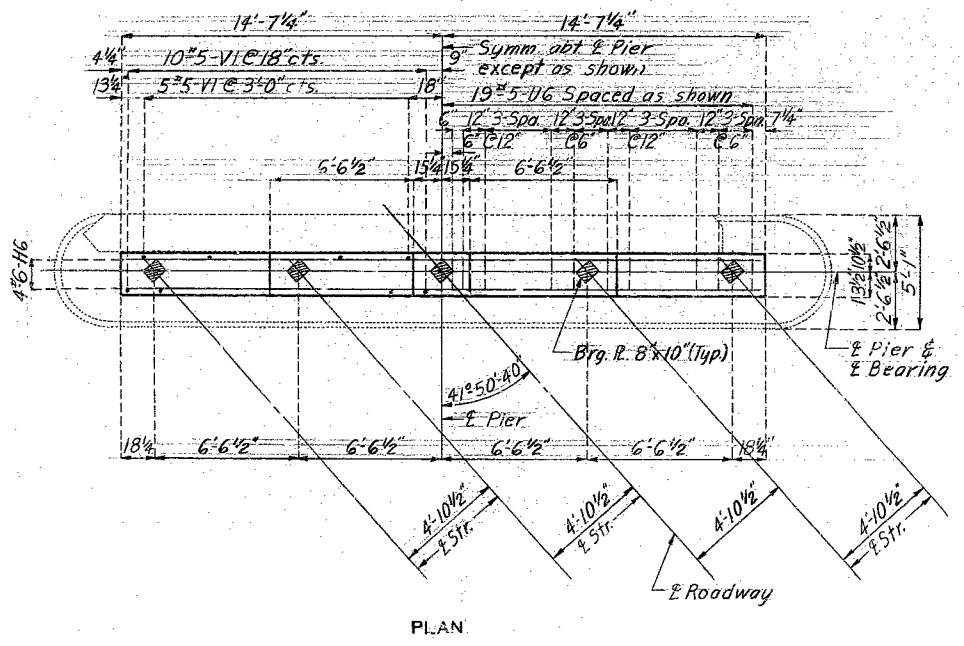
J-92R1

MISSOURI STATE HIGHWAY DEPARTMENT

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



Note: All reinforcing bars in tops of substructure beams or caps shall be spaced to clear anchor bolts for bearings by at least 1".
Light dotted lines indicate old work. Heavy lines indicate new work.
All #5-VI Anchor bars shall be grouted 6" into old beam. See Std. Specs. 712.6



DETAILS OF PIERS NO. 4 & 5
(Pier No. 5 shown) (Pier No. 4 same by 180° rotation)

496

DETAILED Dec. 1975
CHECKED Dec. 1975

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

Sheet No. 3 of 7

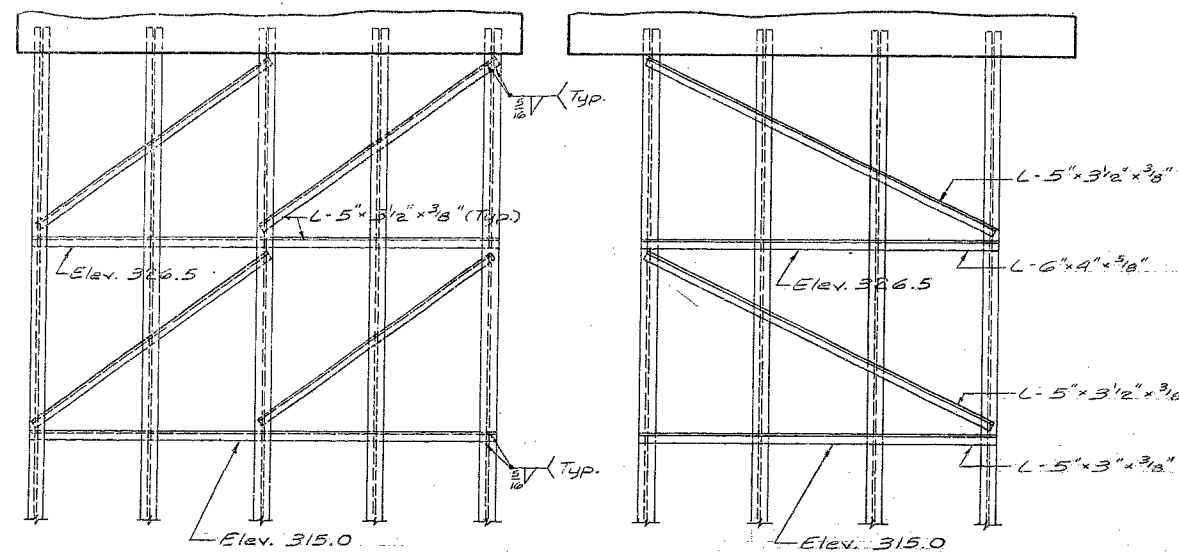
BUTLER & STODDARD

COUNTY

J 92R1

MISSOURI STATE HIGHWAY DEPARTMENT

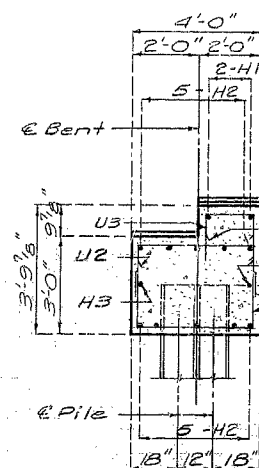
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO		19		



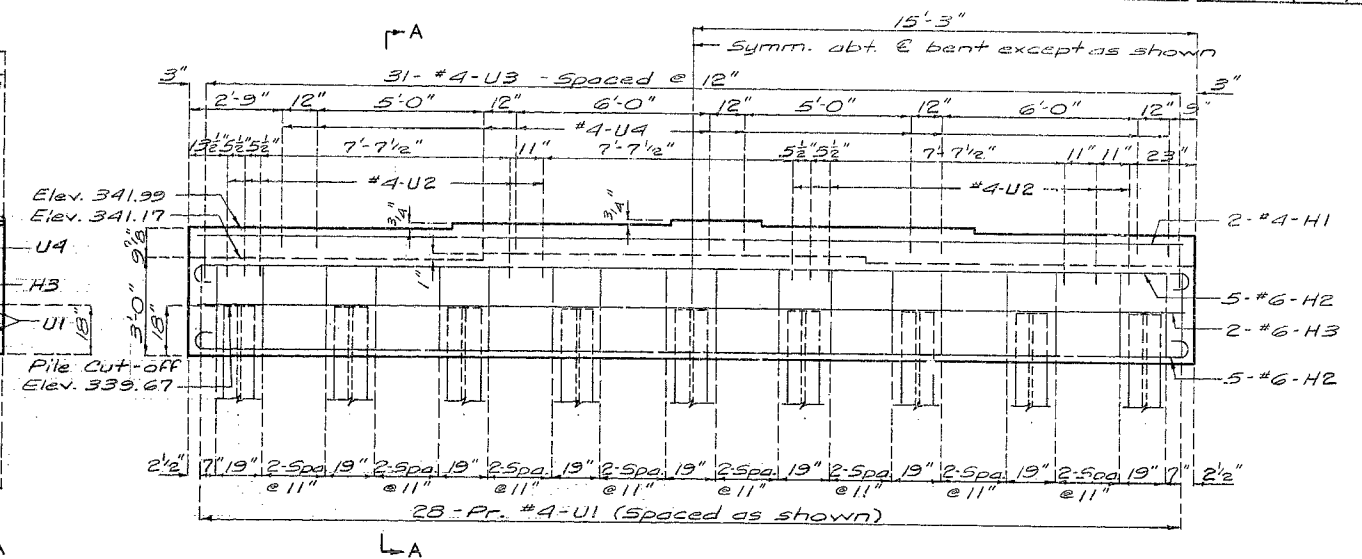
ELEVATION
(5-Pile side)

ELEVATION
(4-Pile side)

SWAY BRACING DETAILS
(For Bents No. 4A and 4B)

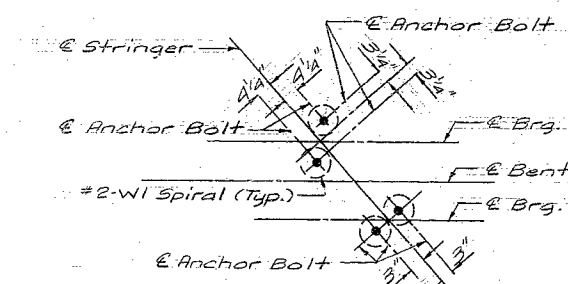


SECTION A-A

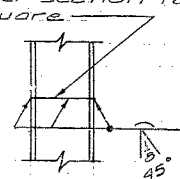


ELEVATION

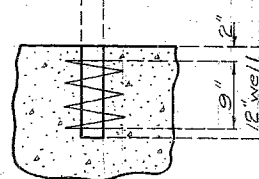
Note: All reinforcing bars in tops of substructure beams or caps shall be spaced to clear anchor bolts for bearings by at least 1/2\"/>



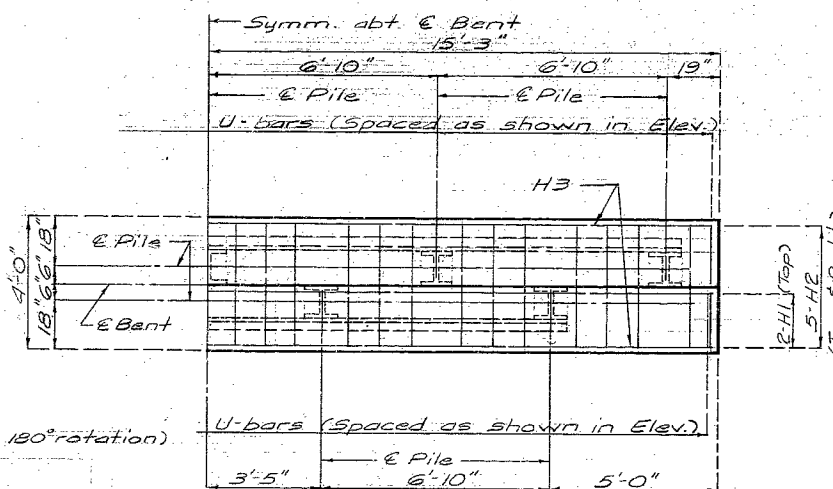
PART ANCHOR BOLT DETAILS
(Bent No. 4A shown; Bent No. 4B same by 180° rotation)
Butt splice (if required)
Top of lower section to be cut square



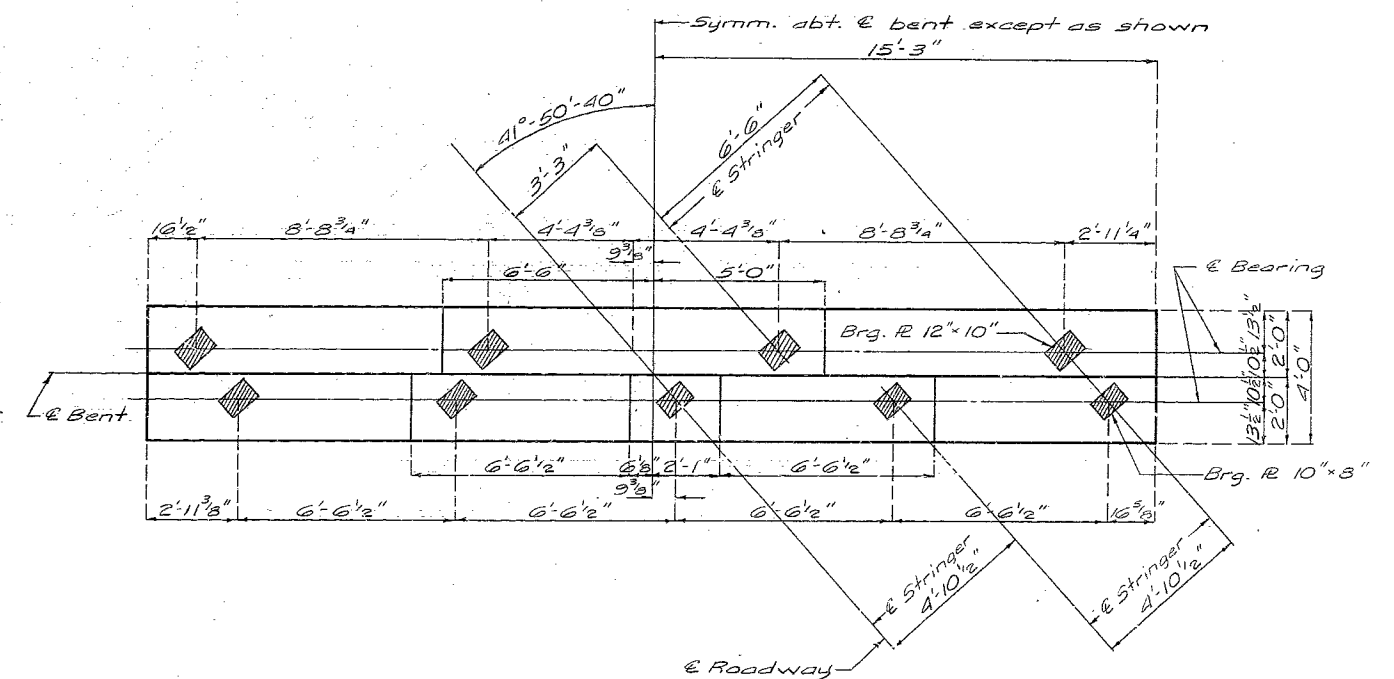
PILE SPICE DETAIL



ANCHOR BOLT WELL DETAIL



HALF PLAN
(Showing pile spacing)



PLAN

DETAILS OF INTERMEDIATE BENT NO. 4A
(Bent No. 4B same by 180° rotation)

DETAILED Dec. 19 75
CHECKED Dec. 19 75

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

Sheet No. 4 of 7

BUTLER & STODDARD

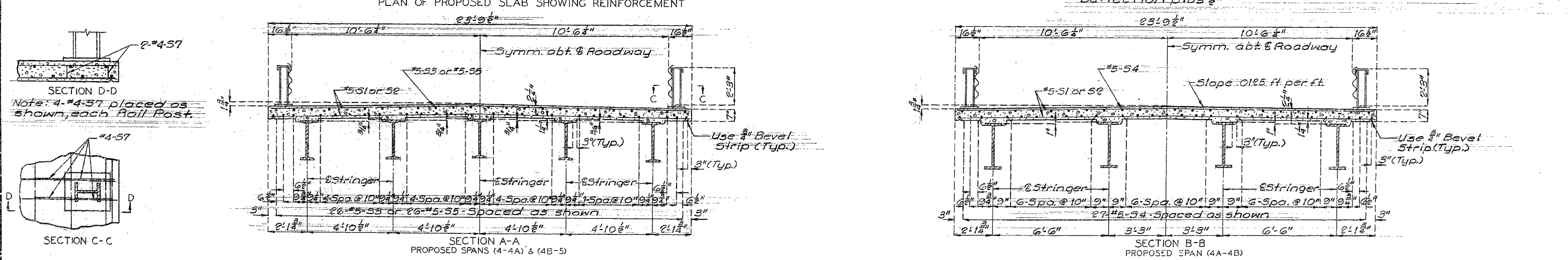
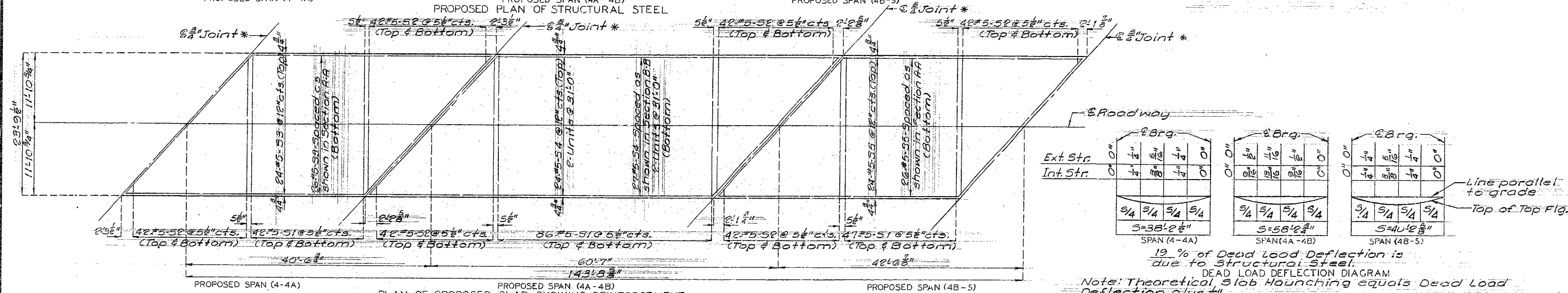
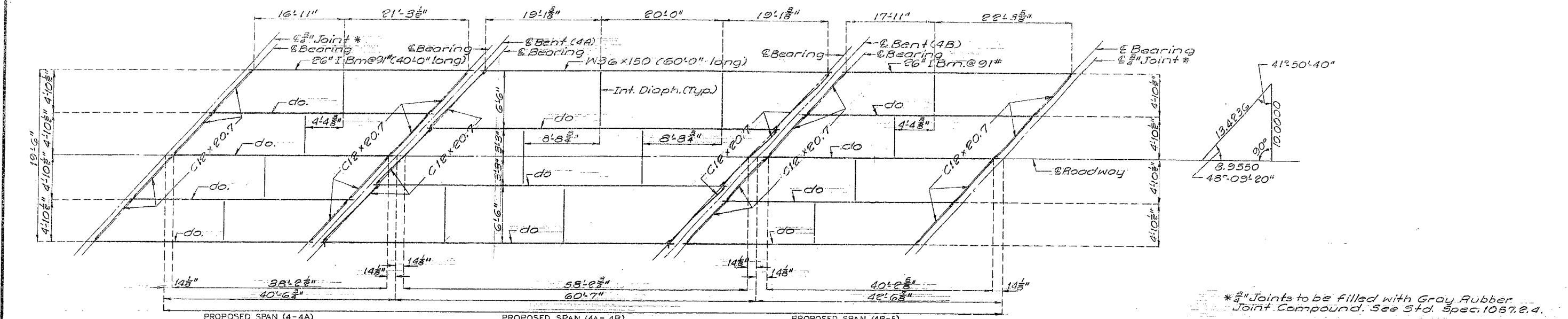
COUNTY

J-92 RI

497

MISSOURI STATE HIGHWAY DEPARTMENT

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



DETAILED DEC. 19 75
CHECKED DEC. 19 75

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

Sheet No. 5 of 7.

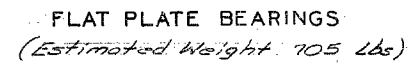
BUTLER & STODDARD COUNTY

J-92 RI

498

004

DETAILED *Dec. 19 75*
CHECKED *Dec. 19 75*



5@ Pier No. 4 (Spon 4-4A)
5@ Bent No. 4A (Spon 4-4A)
5@ Bent No. 4B (Spon 4B-5)
5@ Pier No. 5 (Spon 4B-5)

PART PLAN OF END DIAPH.

PART PLAN
(Interior Stringer)
Sheet No. 6 of 7.

J-92 RI

MISSOURI STATE HIGHWAY DEPARTMENT

PROJECT NO.	STATE	FED. AID DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	MO.		3		

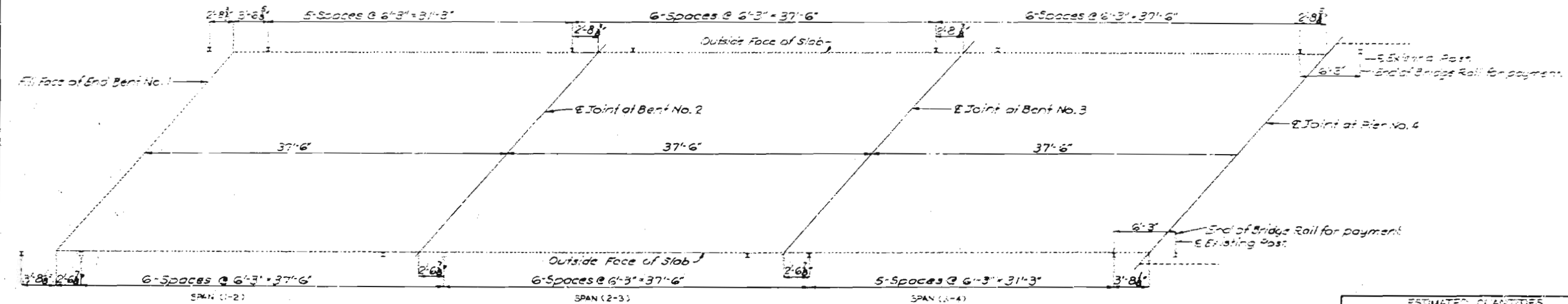
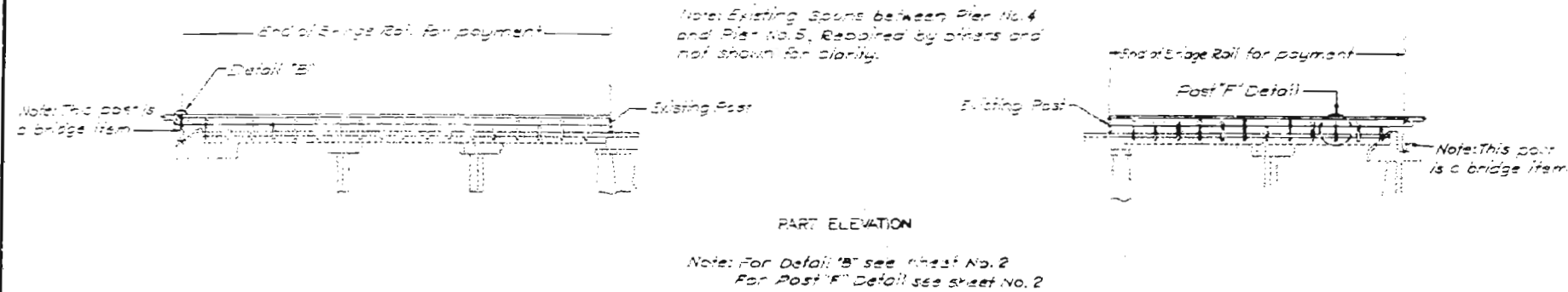
GENERAL NOTES:

Design AASHTO Std. Spec. Sections.
All bolts, nuts, washers, plates and shims are considered as parts of the rail for payment.

Place spans on slabs in N-beam rails and anchors, tighten bolts, back off one half turn and turn threads.
N-beam guard rail to be made of steel and shall be 12 gauge.
Light dotted lines indicate old work, heavy lines indicate new work.
High strength bolts in concrete anchors to be snug tight.
High strength bolts shall be A-325.
Panel lengths of channel members shall be attached continuously to a minimum of four posts and a maximum of six (exception at end bents).
Rail posts shall be set perpendicular to roadway profile grade and vertically in cross section.
Nashers shall be used at all post bolts (between bolt head and beam). They shall be rectangular in shape (2"x1 1/2"x1/2" min) and flat, or when necessary of such design to fit the contour of the beam. Washers shall have 1/2"x1" hole.

Plates and shims shall be fabricated from A-36 steel.

Contractor shall verify all dimensions in field before ordering materials.



ESTIMATED QUANTITIES		
ITEM	UNIT	TOTAL
Bridge Guard Rail (N-Beam)	Ln. Ft.	450
Special Work	Lump Sum	1

Note: All steel posts, channels, plates, shims, bolts, nuts and washers shall be galvanized after fabrication in accordance with ASTM A-123-73 or painted with System C in accordance with Std. Spec. 7.2.12. The coating selected shall be the same as applied to span (4-5).

B.M.

REPAIRS TO
BRIDGE OVER THE MISSOURI RIVER

STATE ROAD FROM POPULAR BLVD. TO LEXINGTON

ABOUT .25 MILE EAST OF FISK

PROJECT NO. 88-0000

STA. 51+00

JOB NO. 88-0000

RTE 60

BUTLER & STODDARD

COUNTY

DATE 11/1/76

STD.
STD. 806.01
J-92 R2

DESIGNED DEC. 1975
DETAILED DEC. 1975
CHECKED DEC. 1975

ENLARGED PART PLAN (RAIL POST SPACING)

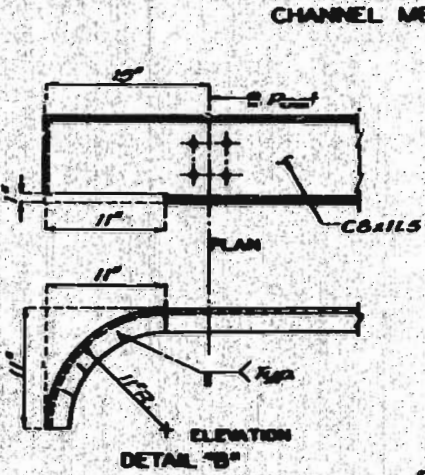
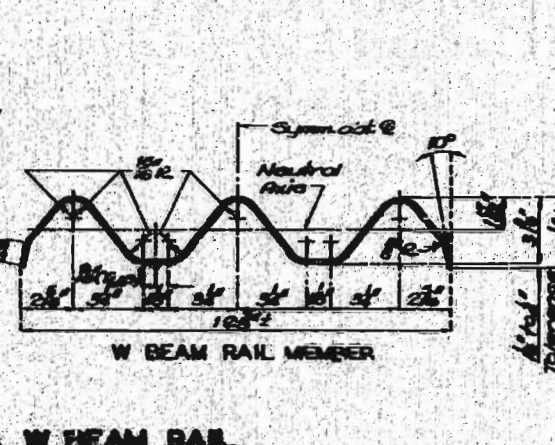
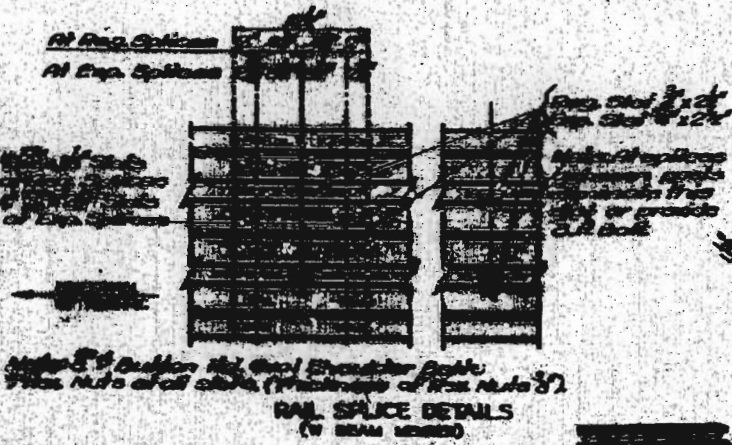
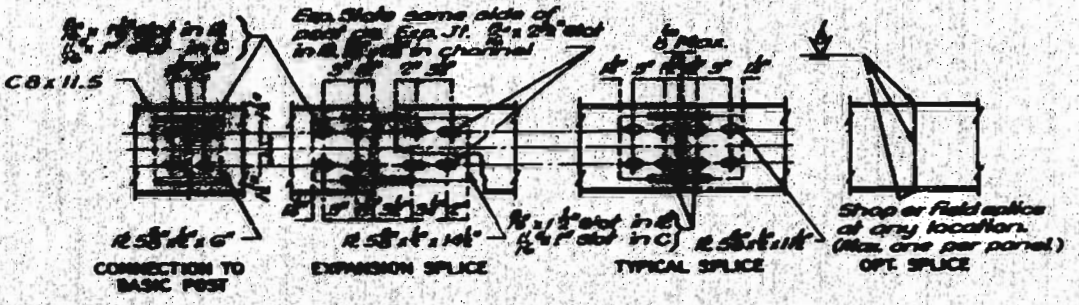
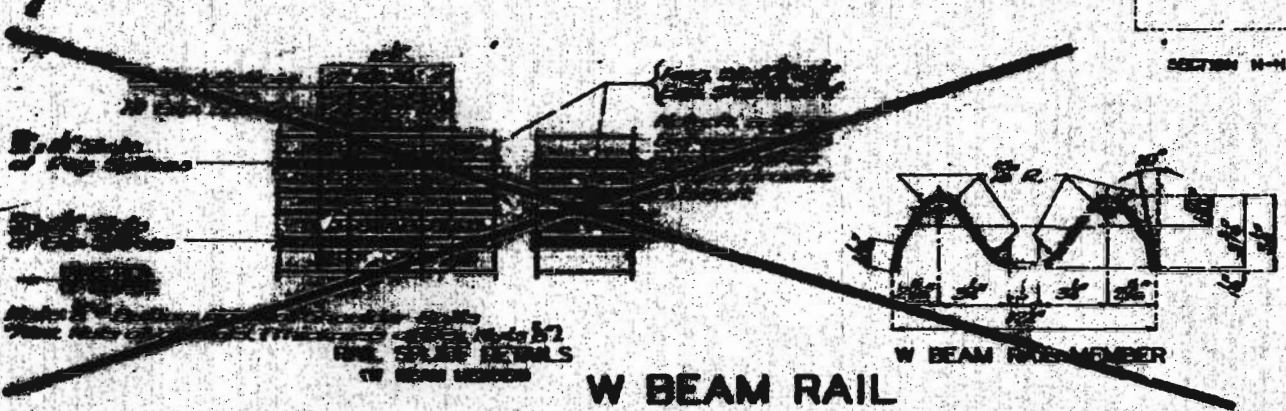
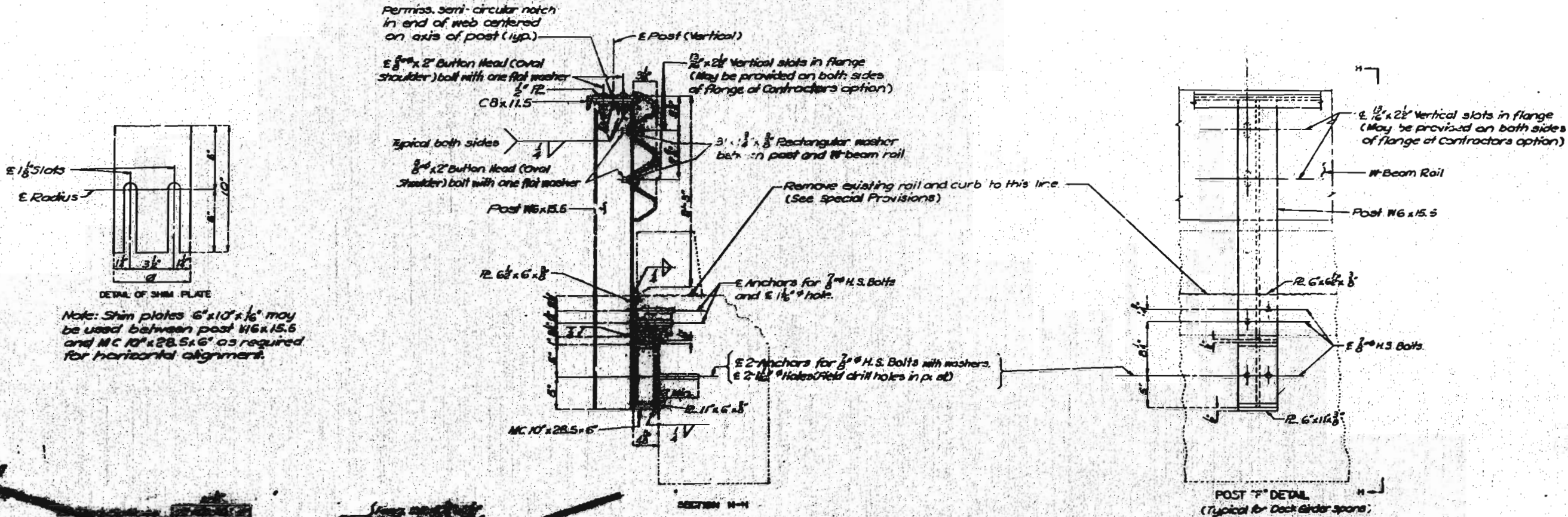
Note: This drawing is not to scale. Follow dimensions.

Sheet No. of 2

5075

MISSOURI STATE HIGHWAY DEPARTMENT

PROJ. NO.	SCHE.	PROJ. NO.	PROJ. YEAR	SHEET NO.	TOTAL SHEETS
1	MC		19		



Note: Expansion splice at slab joints. W-Beam Rail Expansion Splice shall be made at either the first or second post either side of joint. When splice is made at second post, an expansion slot shall be provided in W-beam for connection to first post to allow for movement.

W-Beam Expansion splice shall be made at first post either side of joint

Channel Member Expansion splice shall be made at first post either side of joint

U.I.P. & REHAB. EXISTING (35')(35')(35') CONC. DECK GIRDER SPANS,
(40')(60')(40') SIMPLE WIDE FLANGE BEAM SPANS, (35')(35') CONC. DECK GIRDER SPANS

SEC/SUR 28 TWP 25N RGE 8E



THIS SHEET HAS BEEN
SIGNED, SEALED AND DATED
ELECTRONICALLY.

DATE PREPARED
3/6/2015

ROUTE 51 STATE MO

DISTRICT BR SHEET NO. 1

COUNTY

BUTLER-STODDARD

JOB NO.

J9M0270

CONTRACT ID.

PROJECT NO.

BRIDGE NO.

J00923

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.

General Notes:

Design Specifications:

2002 AASHTO LFD (17th Ed.) Standard Specifications

Design Unit Stresses:

Class B Concrete (Substructure) $f'_c = 3000$ psi
Reinforcing Steel (Grade 60) $f_y = 60,000$ psi

Fabricated Steel Connections:

Field connections shall be made with 7/8" diameter high strength bolts and 15/16" diameter holes.

Traffic Control:

Structure shall remain open during repairs.

Structural Steel Protective Coating:

All exposed surfaces of the existing structural steel 5' from ends of beams shall be recoated with one 6-mil thickness of gray epoxy-mastic primer applied over an SSPC-SP3 surface preparation in accordance with Sec 1081. The cost of surface preparation will be considered completely covered by the contract sq. foot price for "Surface Preparation for Applying Epoxy-Mastic Primer". The cost of the gray epoxy-mastic primer will be considered completely covered by the contract sq. foot price for "Gray Epoxy-Mastic Primer".

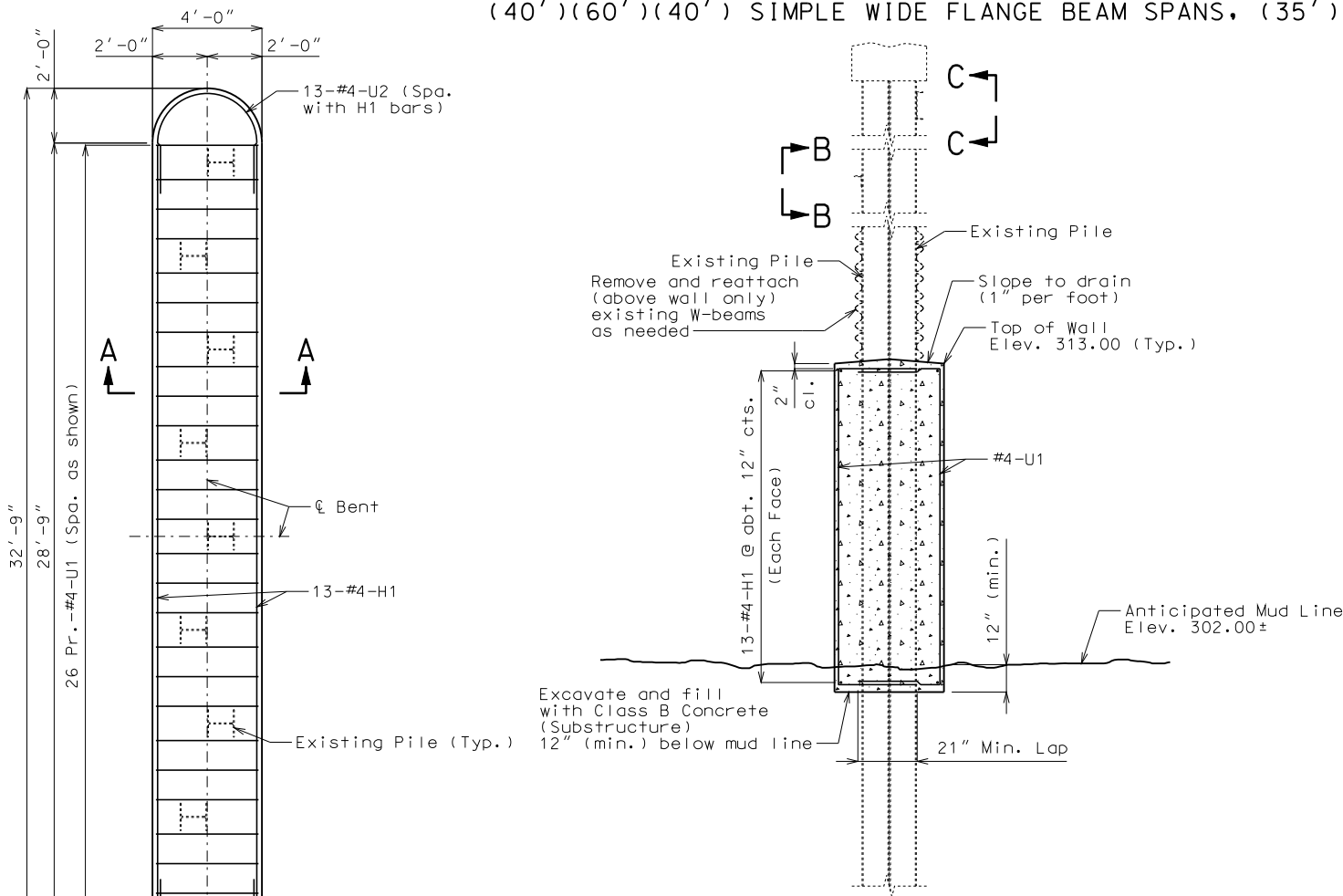
All exposed surfaces of the existing structural steel piles and sway bracing shall be recoated with one 6-mil thickness of gray epoxy-mastic primer applied over an SSPC-SP3 surface preparation in accordance with Sec 1081. The bituminous coating shall be applied one foot above and below the existing ground line and in accordance with Sec 702. These protective coatings will not be required below the normal low water line. The cost of surface preparation will be considered completely covered by the contract lump sum price for "Surface Preparation for Applying Epoxy-Mastic Primer". The cost of the gray epoxy-mastic primer and bituminous coating will be considered completely covered by the contract lump sum price for "Gray Epoxy-Mastic Primer".

Miscellaneous:

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

Rock blanket will be encountered and may need to be adjusted or removed to repair Intermediate Bents.

Removing and reattaching existing W beam (guardrail sections) and reattaching existing sway bracing will be considered completely covered by the contract unit price for other items.



SECTION A-A

REPAIRS FOR INTERMEDIATE BENTS NO. 4A & 4B

Estimated Quantities

Item		Total
Class 2 Excavation	cu. yard	64
Cofferdam - Bent 4A	lump sum	1
Cofferdam - Bent 4B	lump sum	1
Class B Concrete (Substructure)	cu. yard	116.4
Reinforcing Steel (Bridges)	pound	2500
Surface Preparation for Applying Epoxy-Mastic Primer	lump sum	1
Gray Epoxy-Mastic Primer	lump sum	1
Surface Preparation for Applying Epoxy-Mastic Primer	sq. foot	1100
Gray Epoxy-Mastic Primer	sq. foot	1100

The table of Estimated Quantities represents the quantities used by the State in preparing the cost estimate for Bridge Rehabilitation. Variations may be encountered in the estimated quantities but variations cannot be used for any adjustment in the contract price.

BILL OF REINFORCING STEEL				
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE	BENDING DIAGRAM
52	4 H1	28'-9"	20	
104	4 U1	16'-11"	10	
52	4 U2	9'-4"	7	

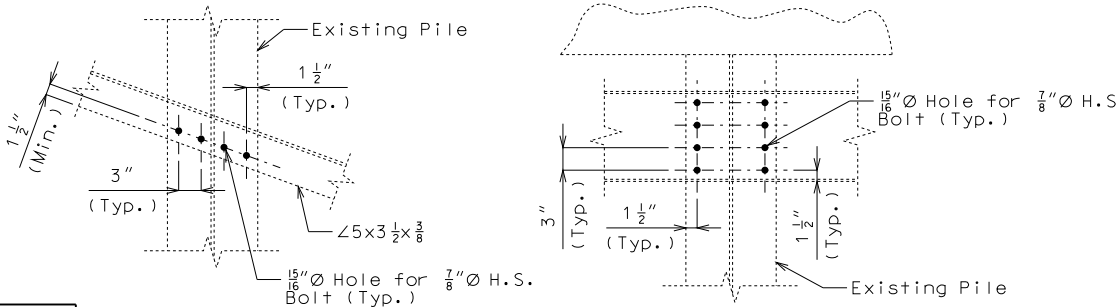
All dimensions are out to out.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

Actual lengths are measured along centerline of bar to the nearest inch.

Minimum clearance to reinforcing shall be 2", unless otherwise shown.

All reinforcement shall be Grade 60.



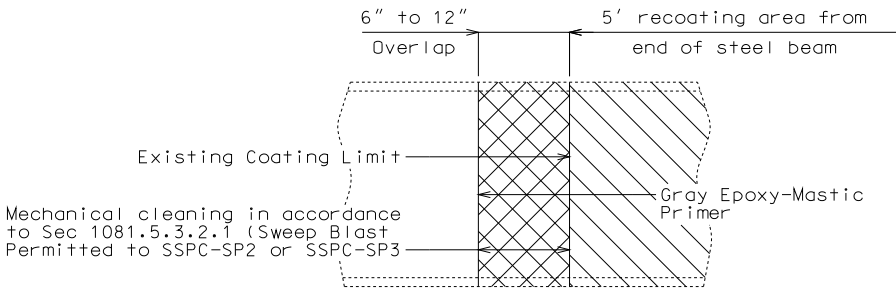
SECTION B-B

(5 locations estimated)

SECTION C-C

(1 location estimated)

Note: Reattach existing sway bracing at all locations where welds have failed.



PART ELEVATION SHOWING LIMITS OF PAINT OVERLAP

(Vertical or horizontal paint limit. Horizontal limit shown)

REPAIRS TO BRIDGE: ROUTE 51 OVER ST. FRANCIS RIVER

ROUTE 51 FROM RTE. FF TO RTE. 60

ABOUT 0.7 MILES EAST OF RTE. FF

STA. 532+00.00± (Match Existing)

Designed July 2014
Detailed July 2014
Checked July 2014

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

Sheet No. 1 of 1

GENERAL NOTES:
Design Specifications: 2002 – AASHTO 17th Edition

Guardrail delineators shall be attached to the top of the guardrail and shall similarly use the delineator details of Missouri Standard Plan 617.10, except that the delineator body shall be attached to the top of the cap rail using galvanized anchorage as shown on Missouri Standard Plan 606.00. Delineators on bridges with two-lane, two-way traffic shall have retroreflective sheeting on both sides. Guardrail delineators will be considered completely covered by the contract unit price for Bridge Guardrail (Thrie Beam).

Panel lengths of channel members shall be attached continuously to a minimum of four posts and a maximum of six posts (except at end bents).

All bolts, nuts, washers, and plates will be considered completely covered by the contract unit price for Bridge Guardrail (Thrie Beam).

All steel connecting bolts and fasteners for posts and railing, and all anchor bolts, nuts, washers and plates shall be galvanized after fabrication. Protective coating and material requirement of steel railing shall be in accordance with Sec 1040.

Rail posts shall be set perpendicular to roadway profile grade, vertically in cross section and aligned in accordance with Sec 713 except that the rail posts shall be aligned by the use of shims such that the post deviates not more than 1/2 inch from true horizontal alignment after final adjustment. The shims shall be 3" x 1 3/4" and placed between the blackout and the thrie beam rail. The thickness of the shims shall be determined by the contractor and verified by the engineer before ordering material for this work.

At the expansion slots in the thrie beam rails and channels, the bolts shall be tightened and backed off one-half turn and the threads shall be burred.

At the thrie beam connection to blackout on wings, the bolts shall be tightened and backed off one-half turn and the threads shall be burred.

Minimum length of thrie beam sections is equal to one post space.

5/8"Ø button-head, oval shoulder bolts with 3/8" min. thickness hex nuts shall be used at all slots.

Thrie beam guardrail on the bridge shall be 12 gage steel.

Posts, cap rail angles, bent plates, channels and channel splice plates shall be fabricated from ASTM A709 Grade 36 steel and galvanized.

Washers shall be used at all post bolts between the bolt head and beam. The flat washers shall be rectangular in shape 3" x 1 3/4" x 3/16" minimum and with a 1 1/16" x 1" slot, or when necessary of such design as to fit the contour of the beam. A 3" x 1 3/4" x 5/8" rectangular washer shall be used between the blackout and the thrie beam rail.

Special drilling of the thrie beam may be required at the splices. All drilling details shall be shown on the shop drawings.

Fabrication of structural steel shall be in accordance with Sec 1080.

Expansion splices in the thrie beam rail shall be made at either the first or second post on either side of the joint and on structure at bridge ends. When the splice is made at the second post, an expansion slot shall be provided in the thrie beam rail for connection to the first post to allow for movement.

In addition to the expansion provisions at the expansion joints, expansion splices in the thrie beam rail and the channel shall be provided at other locations so that the maximum length without expansion provisions does not exceed 200 ft.

Shim plates 6" x 6" x 1/16" may be used between the top of the post and the channel member as required for vertical alignment.

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

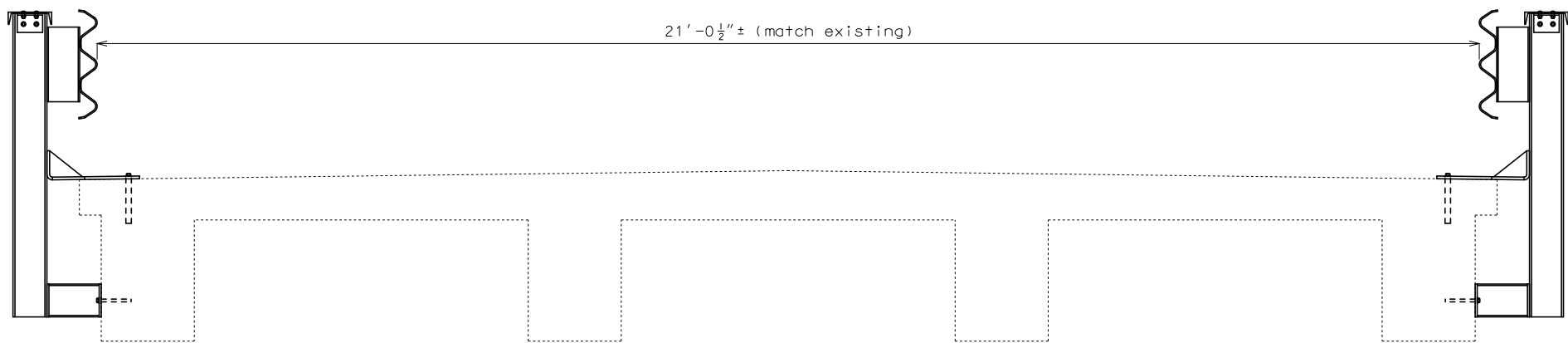
Contractor shall verify all dimensions in field before ordering new material.

For rail post spacing, see Sheet No. 2.

See Missouri Standard Plans 606.00 and 606.23 for details not shown.

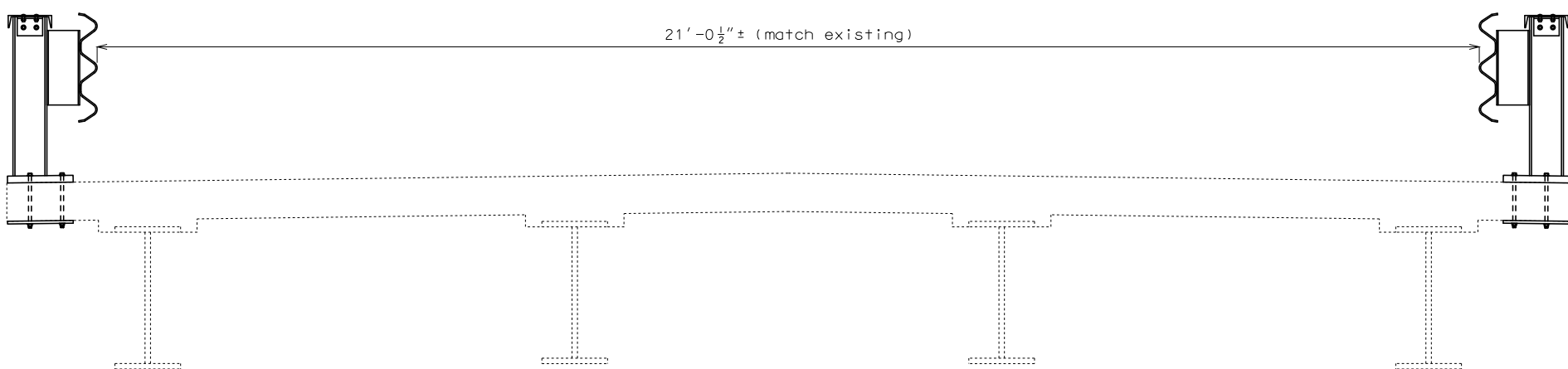
U.I.P. & REHAB, EXISTING (35')(35')(35') CONC. DECK GIRDER SPANS,
(40')(60')(40') SIMPLE WIDE FLANGE BEAM SPANS,
(35')(35') CONC. DECK GIRDER SPANS

SEC/SUR 28 TWP 25N RGE 8E



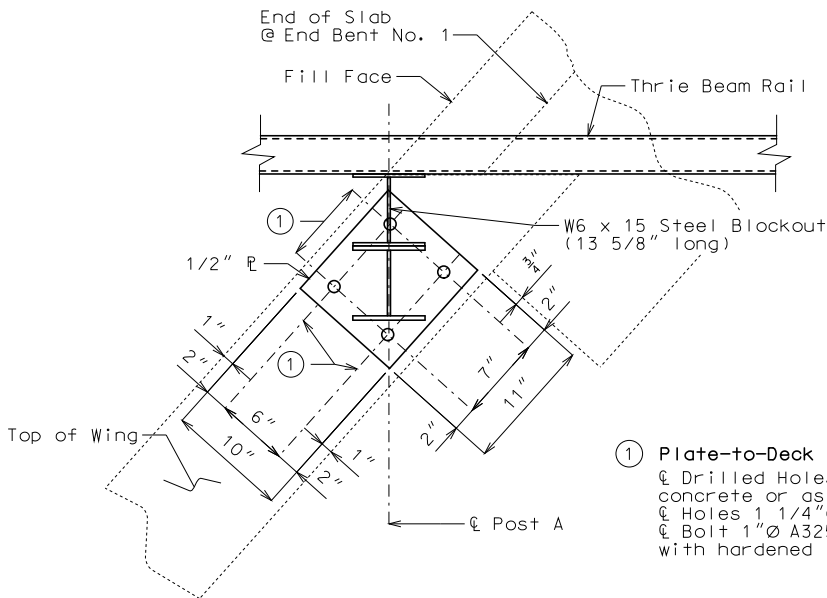
SECTION THRU SLAB SHOWING RAIL POST B

Note:
Typical for spans (1-2, 2-3, 3-4, 5-6, 6-7).

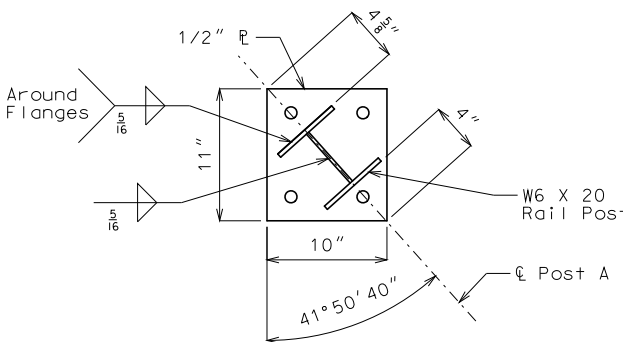


SECTION THRU SLAB SHOWING RAIL POST C

Notes:
Typical for spans (4-4A & 4B-5).
Span (4A-4B) similar.



PART PLAN OF RAIL POST A
SHOWING ANCHOR PLACEMENT



PLAN OF BASE PLATE
SHOWING POST LOCATION
FOR RAIL POST A

Note:
For additional details of rail post A, see Sheet No. 6.

Estimated Quantities		
Item		Total
Bridge Guardrail (Thrie Beam)	linear foot	660

REPAIRS TO BRIDGE: ROUTE 51 OVER ST. FRANCIS RIVER

ROUTE 51 FROM RTE. DD TO RTE. 60
ABOUT 0.4 MILES EAST OF RTE. DD
STA. 532+00.00± (MATCH EXISTING)

STD. 606.00
STD. 606.23
STD. 617.10

Detailed Nov. 2016
Checked Nov. 2016

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

Sheet No. 1 of 6



THIS SHEET HAS BEEN
SIGNED, SEALED AND DATED
ELECTRONICALLY.

DATE PREPARED
12/13/2016

ROUTE 51 STATE MO

DISTRICT BR SHEET NO. 1

COUNTY BUTLER-STODDARD

JOB NO. J9S3179

CONTRACT ID.

PROJECT NO.

BRIDGE NO. J00924

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.

(Typ.) $\frac{5}{16}$

1/2" Bent Plate

1/4" Post Stiffener

1/2" x 3 1/2" x 6" Post Plate Washer

W6 x 20 Post

1" Coped Corners

1" Edge of Slab

9" 2"

2" 2" 2"

4 Spc. @ 4"

20"

5 7/8" 10"

1 1/2" x 6" x 4" Wedge Bracket

Technical drawings of a bent plate assembly, showing top and side views with dimensions and component labels.

Top View (Left):

- Overall width: 16"
- Overall height: 4 1/2"
- Top flange width: 4" (left), 8" (center), 4" (right)
- Top flange thickness: 5/16"
- Two 1 1/4" $\varnothing$ Holes, spaced 2 5/16", 3 3/8", and 2 5/16" apart.
- Two 1/2" x 6" x 4" Wedge Brackets (Typ.) attached to the top flange.
- Two 1/2" Bent Plates (Grade 36) attached to the top flange.
- Bottom flange width: 4"
- Bottom flange thickness: 5/16"

Side View (Right):

- Overall width: 6"
- Overall height: 4 1/2"
- Top flange width: 5 7/8"
- Top flange thickness: 1"
- Top flange material: 1/2" Bent Plate (Grade 36)
- Top flange corners: 3/4" Coped Corners
- Three 1/2" x 6" x 4" Wedge Brackets attached to the top flange.
- Five 1 1/4" $\varnothing$ Holes in the top flange.
- Bottom flange width: 1"
- Bottom flange thickness: 5/16"
- Bottom flange material: 1/2" Bent Plate (Grade 36)
- Bottom flange corners: 3/4" Coped Corners

Detail View (Bottom Right):

- Overall width: 1 1/8"
- Overall height: 2"
- Bottom flange thickness: 1/8"

1/4" Post Stiffener
(Grade 36)

(Typ.)

$\frac{3}{16}$

1"

(Typ.)

1"

1"

W6 x 20 Post

6"

4"

1 1/16" Holes

1/2" Post

1/16" Plate Washer

3 3/8"

1 5/16"

1 5/16"

CONNECTION TO
RAIL POST ELEVATION

Technical drawing showing the connection to rail post plan. The drawing includes a side view and a top view of a cap rail assembly.

Side View Dimensions:

- Top flange: 1 1/2"
- Web: 1 1/2"
- Bottom flange: 2"
- Total height: 1 1/4"
- 2 Holes: 13/16" Ø

Top View Dimensions:

- Total width: 3 1/2"
- Top flange: 2"
- Web: 1 1/4"
- Bottom flange: 1 1/2"
- Total height: 4"
- 2 Slotted Holes: 13/16" x 1 1/2"

Labels include: C8 X 11.5 Cap Rail, Cap Rail Angle, Vertical, TOP VIEW, SIDE VIEW, and CONNECTION TO RAIL POST PLAN.

Shim plates 6" x 6" x 1/16" may be used between post W6 x 20 and 6" x 6" x 3/8" plate and shim plates 6" x 3 1/2" x 1/16" may be used between post W6 x 20 and 1/2" bent plate connection as required for horizontal alignment.

Shim plates may vary in thickness from 1/16" to the thickness required, and may be used in multiples.

Shim plates shall be galvanized after fabrication.

EXPANSION SPLICE PLAN

Expansion slots same side of post as exp. joint

Expansion slots same side of post as exp. joint

Technical drawing of a mechanical assembly showing a top view and a side view.

Top View Dimensions:

- Overall length: $15 \frac{5}{8}''$
- Overall width: $5 \frac{1}{8}''$
- Distance between hole centers (horizontal): $1 \frac{1}{2}''$
- Distance between hole centers (vertical): $1 \frac{3}{4}''$
- Distance from edge to hole center (horizontal): $1 \frac{3}{4}''$
- Distance from edge to hole center (vertical): $2 \frac{1}{4}''$

Hole Specifications:

- 2 Slotted Holes $\frac{13}{16}''$ x $1 \frac{1}{2}''$
- 2 Slotted Holes $\frac{13}{16}''$ x $2 \frac{1}{2}''$

Side View Dimensions:

- Plate thickness: $\frac{5}{8}''$
- Distance from edge to hole center (vertical): $1 \frac{3}{4}''$

Technical drawing of an Expansion Cap Rail Angle, showing two views: TOP VIEW and SIDE VIEW.

TOP VIEW: The top view shows a cross-section of the rail. It has a total width of 5 inches. The main body is 3 inches wide, and the flange is 2 inches wide. The flange has a thickness of 1 1/4 inches. The main body has a thickness of 2 1/4 inches. There are two slotted holes in the main body, each 13/16 inch wide and 1 1/2 inch high. The distance between the centers of the holes is 2 1/4 inches. The distance from the center of the left hole to the left edge is 1 1/4 inches. The distance from the center of the right hole to the right edge is 2 1/4 inches. The total length of the rail is 5 inches.

SIDE VIEW: The side view shows the profile of the rail. It has a total height of 5 inches. The main body is 2 1/4 inches high, and the flange is 1 1/4 inches high. The flange has a thickness of 1 1/4 inches. The main body has a thickness of 2 1/4 inches. There are two slotted holes in the main body, each 13/16 inch wide and 1 1/2 inch high. The distance between the centers of the holes is 2 1/4 inches. The distance from the center of the left hole to the left edge is 1 1/4 inches. The distance from the center of the right hole to the right edge is 2 1/4 inches. The total length of the rail is 5 inches.

Dimensions:

- 5" (Total width)
- 3" (Main body width)
- 2" (Flange width)
- 1 1/4" (Flange thickness)
- 2 1/4" (Main body thickness)
- 1 1/4" (Distance from center of left hole to left edge)
- 2 1/4" (Distance from center of right hole to right edge)
- 2 1/4" (Distance between centers of holes)
- 1 1/2" (Height of slotted holes)
- 13/16" (Width of slotted holes)
- 5" (Total length)

Notes:

- 2 Slotted Holes
- 13/16" x 1 1/2"

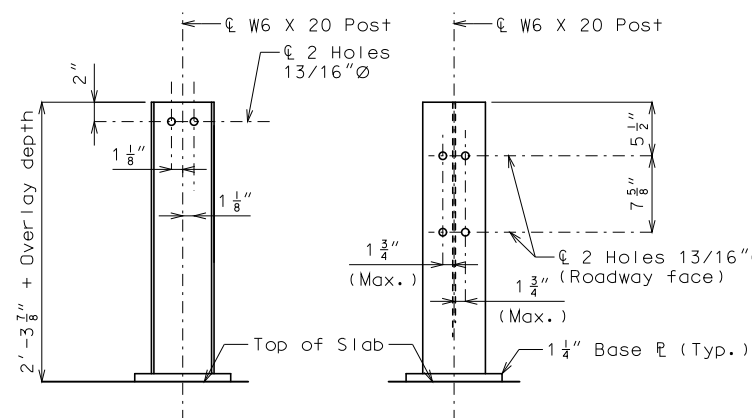
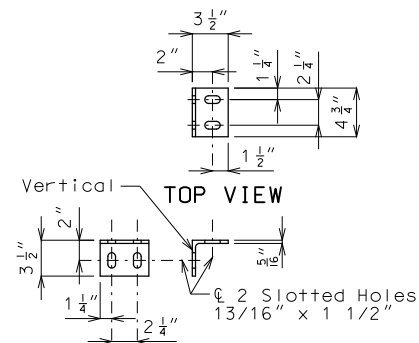
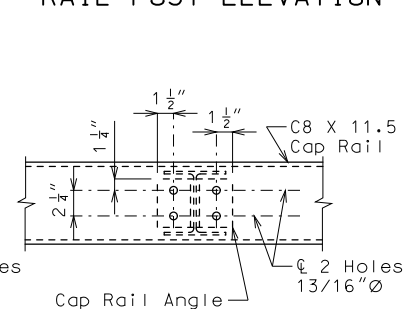
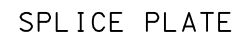
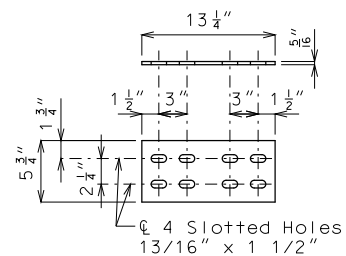
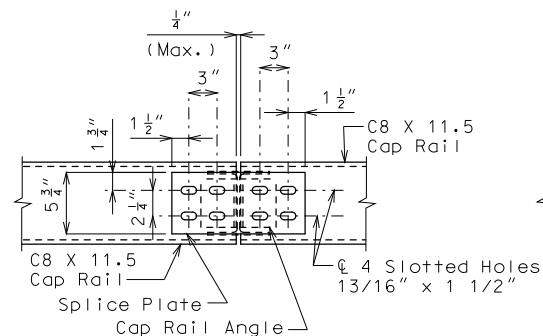
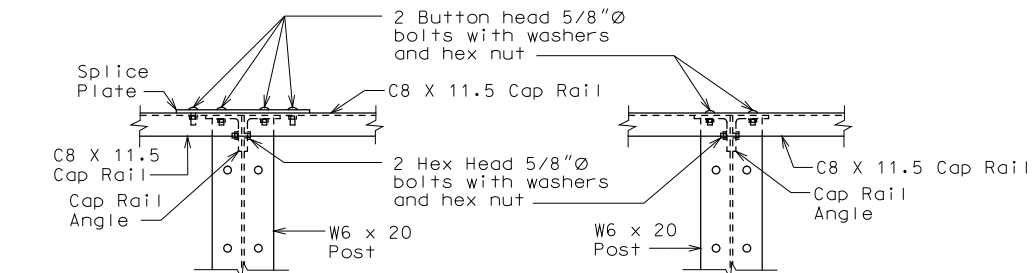
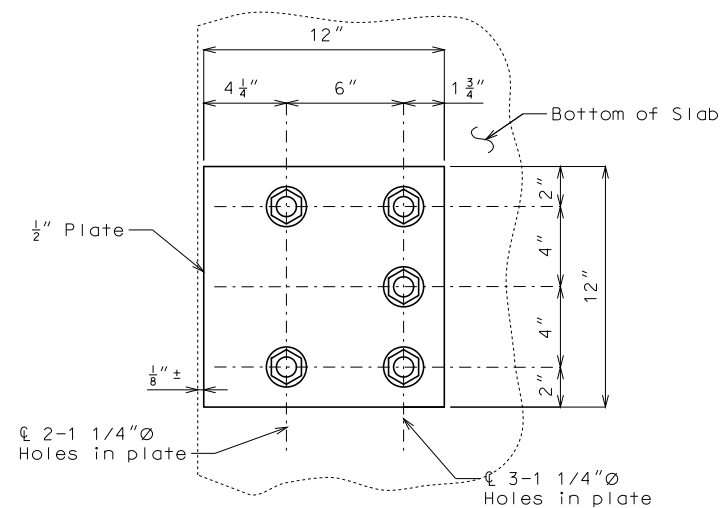
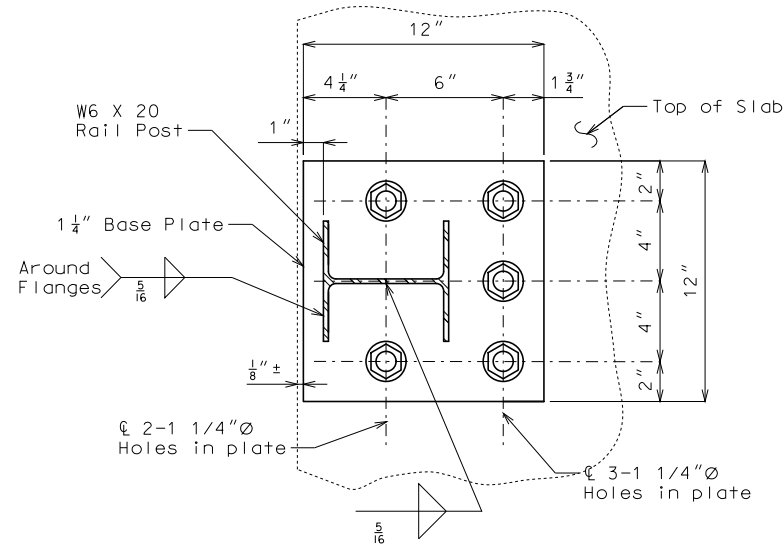
EXPANSION CAP RAIL ANGLE

25 x 3 1/2 x 5/16

$$45 \times 3 \frac{1}{2} \times \frac{5}{16}$$

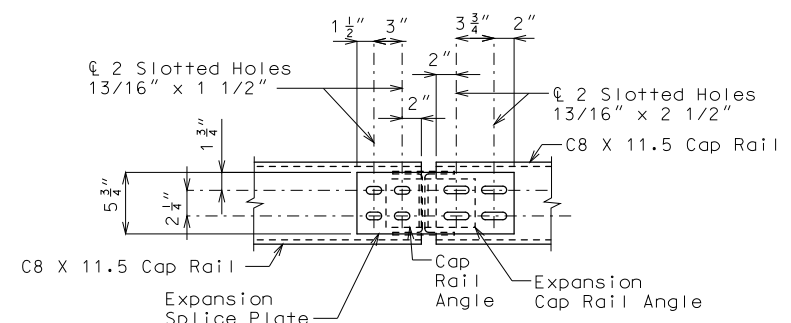
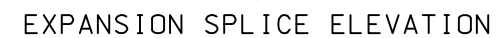
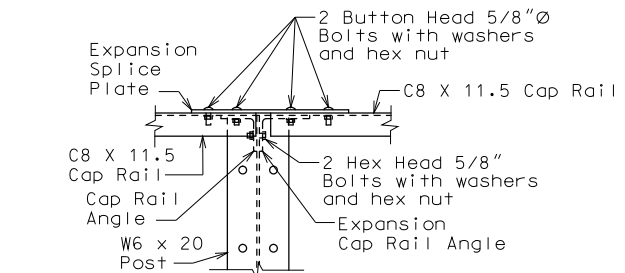
1/8
C8 X 11.5 Cap Rail
(Typ.)

Shop or field splice
at any location
(Max. one per panel)

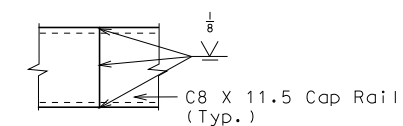
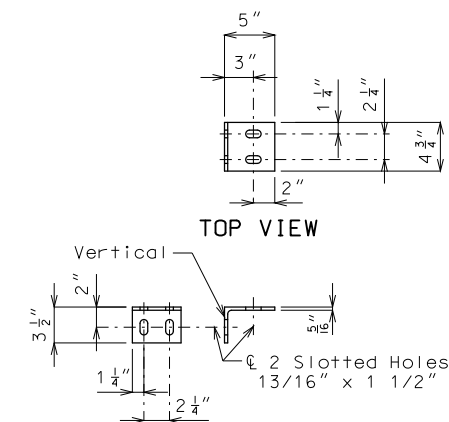
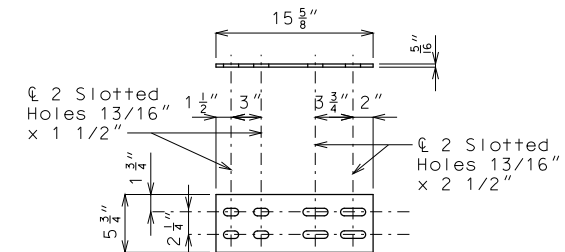


Note:

Rail post C shown, Rail post A similar except as shown on Sheet No. 1.

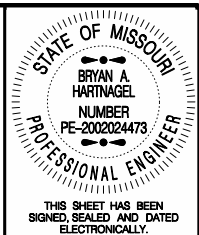


Expansion slots same side of post as exp. joint



OPTIONAL SPLICE

Shop or field splice
at any location
(Max. one per panel)



DATE PREPARED

DATE PREPARED
12/13/2016

ROUTE	STATE
51	MO

DISTRICT	SHEET NO.
BR	6

COUNTY

JOB NO.
J19S3179

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
100924[illegible]

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MoDOT

105 WEST CAPITOL
JEFFERSON CITY, MO 65102

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102

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