

CURVE 1		CURVE 2	
P.I. Sta. 170+82.28		P.I. Sta. 179+46.42	
$\Delta = 33^{\circ}00'43.9''$ Left		$\Delta = 21^{\circ}44'59.7''$ Right	
$D = 4^{\circ}00'00.0''$		$D = 5^{\circ}00'00.0''$	
$R = 1,432.394'$		$R = 1,145.916'$	
$L = 825.505'$		$L = 434.998'$	
$T = 424.460'$		$T = 220.149'$	
$E = 61.567'$		$E = 20.956'$	

Notes:
 Station points are given along @ Southbound Lanes.
 Elevations are given at top of pavement along @ Southbound Lanes.
 For relocated stop log storage building see Sheet 17.

Note: 6-21-96
 We do not have Plans for Br. A4642 (N.B. Lanes over B.N. RR). Built Prior to Const. of Br. A4643 by others

As Built 2-77

0 40 80

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY SOUTHBOUND LANES OVER BURLINGTON NORTHERN RAILROAD

GENERAL PLAN AND ELEVATION

MAD BY DATE 6-22-72 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CWD/KSS DATE 7-24-72 CONSULTING ENGINEERS
 KANSAS CITY NEW YORK
 SCALE 1"=40'-0" 171-A-3 SHEET 37 OF 66

239

Lot 26

Clay Co.

A4643

GENERAL NOTES

SPECIFICATIONS:

Design Specifications: AASHTO Standard Specifications for Highway Bridges, 1969, plus 1970 and 1971 Interim Specifications.
Construction Specifications: Specifications for North Broadway-Levee Road Widening dated March 1974.
Welding Specifications: AWS D2.0-1969 American Welding Society Specification for Highway and Railroad Bridges as amended and supplemented by the construction specifications. For welding inspection see Specifications.

DESIGN LOADING:

Live Load: HS20-44
Wind Load: 30 lbs. per sq. ft.
Concrete: 150 lbs. per cu. ft.
Future Wearing Surface: 15 lbs. per sq. ft.
Earth: 120 lbs. per cu. ft.
Equivalent Fluid Pressure: 35 lbs. per cu. ft.
16" Cast-in-place piles 45 tons

DESIGN UNIT STRESS:

Concrete in Deck: $f_c = 1600$ psi $n = 8$
Concrete in Substructure: $f_c = 1700$ psi $n = 10$
Reinforcing Steel: $f_s = 20,000$ psi (Grade 40)
Structural Steel: A.S.T.M. A-36 $f_s = 20,000$ psi and A.S.T.M. A-372 (Grade 50) $f_s = 27,000$ psi.

STRUCTURAL STEEL:

All Structural Steel for Planges, webs and bearing stiffeners of welded plate girders noted as A-372, Grade 50 in Unit 3 shall conform to A.S.T.M. requirements. All other structural steel, except as noted in plans, shall be A-36 and shall conform to A.S.T.M. requirements.
Expansion rollers shall conform to A.S.T.M. (A-235) requirements, Class B Grade 50.
Pins for shoes shall conform to A.S.T.M. C-1018 requirements.
All field connections shall be made with high strength bolts. Bolts will be 1/2", 3/4", 1" and 1 1/4" as noted on plans. Holes for bolts shall be 1/16" larger than the nominal bolt diameter.
Anchor bolts for shoes of Bents 9, 10 and 11 shall be 1 1/4" swedge bolts set 15" in the masonry. Anchor bolts for North and South Abutments and Bents 1 thru 8 shall be 1 1/4" swedge bolts set 12" in masonry-duff and grout-see Specifications.

GIRDER CAMBER:

All girders shall be cambered so that under total dead load the top of girder web is 1/8" above the finished roadway surface over centerline of deck.

PAINTING:

Structural steel shall be cleaned and painted one coat in the shop. The painting shall consist of one touch-up coat on unpainted and damaged areas. See Specifications.

UTILITIES:

All utilities, unless shown otherwise shall be removed or relocated by others. The Contractor shall notify the owner of the utilities of his work schedule sufficiently in advance to allow time for the adjustment of the utilities.

CONSTRUCTION OVER RAILROAD TRACKS:

Footwork over existing railroad tracks shall be constructed with a minimum vertical clearance of 25'-0" from top of rails and a minimum lateral clearance of 10'-6" from centerline of track.

BENCH MARKS:

B.M. 12 - 19 feet left of Sta. 161+54 Northbound Baseline, U.S.G.D. Monument No. L381.52, Elev. 761.594 (Destroyed)
B.M. 13 - 22 feet left of Sta. 177+53 Northbound Baseline, "Chiseled Square" in N.E. wingwall abutment-water works viaduct, Elev. 764.678, 764.653
B.M. 14 - 180 feet left of Sta. 183+00 Northbound Baseline, S.W. corner channel bar in South levee abutment of Railroad, Elev. 767.104, 763.308

DIMENSIONS:

Dimension given are measured horizontally and at 60 degrees F , unless otherwise shown.

PILING:

Piles for all Bents and Abutments are designed for a maximum bearing load of 45 tons. See Specification.
Design only. (Spec. State 60 tons)

APPROACH EMBANKMENTS:

Compacted roadway fill (full roadway width) shall be placed up to elevation of bottom of concrete beam in front of and not less than 30'-0" in back of North and South Abutments before piles are driven for North and South Abutments.

STRUCTURE EXCAVATION:

Excavation for Bents 1 thru 11 was estimated from bottom of footing to existing ground bounded by 1'-0" outside of dimensions shown for footings.

REINFORCING STEEL:

All bars, except as noted, are designated on the plans by bar numbers. The bar size is designated by the first digit of three-digit numbers and by the first two digits of four-digit numbers.
The clear distance between reinforcing steel and face of concrete shall be 3" for all bars in footings, 2" at bar mats under shoes and 2" elsewhere unless otherwise shown on the plans. All bar dimensions are given out to out.
All bar of a series shall vary by a constant increment.

ERECTION PROCEDURE:

The Contractor shall submit to the Engineer, for approval, three sets of prints showing his proposed erection procedure for the Plate Girders.
Bolts shall be placed with heads on the outside face of exterior beams and girders and on the bottom of beam and girder planges.
All exposed concrete edges shall have a 2" chamfer.

* ESTIMATED QUANTITIES

	UNIT	TOTAL
Structure Excavation	Cu. Yd.	1,116
Pile Test Loads	Each	2
Concrete Cast-in-Place Piles (16"Ø)	Lin. Ft.	12,596
Concrete in Deck	Cu. Yd.	1,182
Concrete in Substructure	Cu. Yd.	1,215
Reinforcing Steel	Lbs.	491,861
Structural Carbon Steel A-36	Lbs.	592,332
Structural Low Alloy Steel A-372 Grade 50	Lbs.	480,970
Railing	Lin. Ft.	2,156
Relocating Stop Log Storage Building	Lump Sum	Lump Sum
Damproofing Abutments	Sq. Yd.	132
Elastomeric Expansion Joint Seal (4" movement)	Lin. Ft.	131
Elastomeric Expansion Joint Seal (1/2" movement)	Lin. Ft.	40

* Payment for all work will be by lump sum. Quantities shown are incomplete and for information only. See Specifications.

As Built 2-77

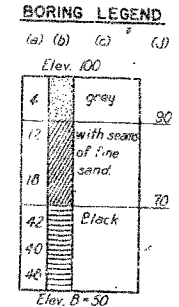
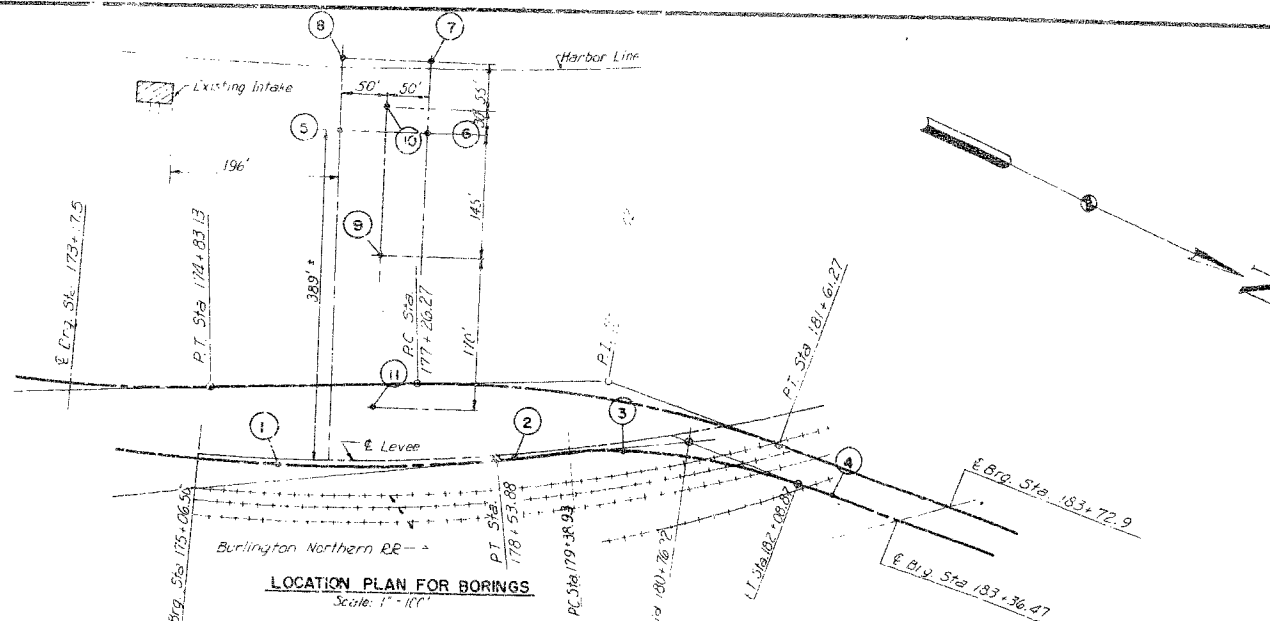
KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD
GENERAL NOTES AND QUANTITIES
MADE BY DATE 7-25-72
CHECKED DATE 8-1-72
DESIGNED DATE 7-16-72
HOWARD NEEDLES TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY, MISSOURI
NEW YORK, NEW YORK
171-A-3 SHEET 28 OF 86

240

3 of 26

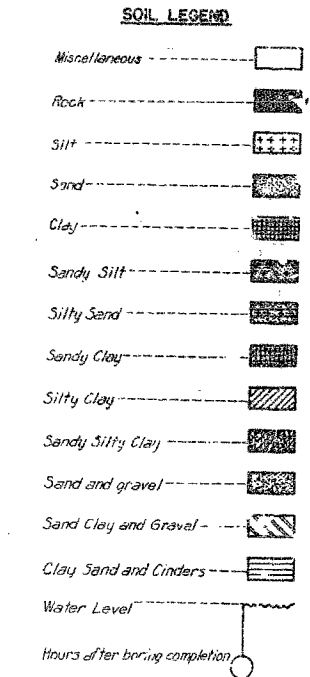
CIAT Co A9643

Test hole borings 5 thru inclusive were made by the Raymond Concrete Pile Company in 1953 for the City of Kansas City Water Department. This information was received from Black & Veatch Consulting Engineers.



- In column (a) the figures 4, 12, etc. are the hammer blows required to advance the casing one foot unless otherwise noted.
- Column (b) shows the legend of soil types.
- Column (c) gives additional information about the soil types indicated in column (b).
- Column (d) shows the immediate elevations of limits of different soil layers. Elevation 100 is the ground level and Elevation B=50 is the bottom of the boring.

Boring No.	Station	Elevation	Soil Description	Notes
1	Sta. 176+00	Elev. 763.4	29' fine to coarse, brown	
2	Sta. 178+75	Elev. 763.8	11' fine to coarse, brown	
3	Sta. 180+00	Elev. 763.2	31' brown with rock fragments	
4	Sta. 182+50	Elev. 747.3	5' black	
5		Elev. 737.5	7' gray very silty clay with silty sand	
6		Elev. 735.1	7' fine	
7		Elev. 721.8	water	
8		Elev. 713.8	water	
9		Elev. 749.0	19' coarse gray sand, small to large gravel	
10		Elev. 721.9	rock fragments, sand, silt and wood	
11		Elev. 737.8	4' topsoil	



- Notes:
- A₁ - Grey, trace of small gravel.
 - B₁ - Grey, trace of small gravel.
 - C₁ - Fine to coarse sand, large gravel.
 - D₁ - Grey shale with fine to coarse sand, small gravel.
 - E₁ - Core drilled, grey sandy shale.
 - A₂ - Grey, Clayey Silty Sand.
 - B₂ - Fine to coarse, brown, trace of small gravel.
 - C₂ - Fine, grey, traces of silt and clay.
 - D₂ - Grey, fine to coarse, traces of small gravel, silt and clay.
 - E₂ - Fine to medium, grey.
 - F₂ - Core drilled, grey shale.
 - A₃ - Grey, fine to coarse, trace of coal.
 - B₃ - Core drilled, grey shale.
 - A₄ - Brown, fine, trace of gravel.
 - B₄ - Core drilled, grey shale.
 - A₅ - Rock fragments.
 - B₅ - Very fine sandy clay.
 - C₅ - Grey, fine to coarse, trace of gravel.

- D₃ - Grey, fine to fine, thin seams of grey clay.
- E₃ - Fragments of grey shale.
- F₃ - Grey coarse sand, small to large gravel.
- G₃ - Grey coarse sand, large gravel, trace of decomposed rock.
- H₃ - Coarse sand, small to medium gravel, trace of clay.
- I₃ - Core drilled, grey sandstone.
- J₃ - Core drilled, fine, sandy, grey shale.
- K₃ - Core drilled, fine, sandy, grey shale.
- L₃ - Core drilled, fine, sandy, grey shale.
- M₃ - Core drilled, fine, sandy, grey shale.
- N₃ - Core drilled, fine, sandy, grey shale.
- O₃ - Core drilled, fine, sandy, grey shale.
- P₃ - Core drilled, fine, sandy, grey shale.
- Q₃ - Core drilled, fine, sandy, grey shale.
- R₃ - Core drilled, fine, sandy, grey shale.
- S₃ - Core drilled, fine, sandy, grey shale.
- T₃ - Core drilled, fine, sandy, grey shale.
- U₃ - Core drilled, fine, sandy, grey shale.
- V₃ - Core drilled, fine, sandy, grey shale.
- W₃ - Core drilled, fine, sandy, grey shale.
- X₃ - Core drilled, fine, sandy, grey shale.
- Y₃ - Core drilled, fine, sandy, grey shale.
- Z₃ - Core drilled, fine, sandy, grey shale.

- A₄ - Wood, sand and gravel.
- B₄ - Coarse grey sand, small to large gravel, trace of clay.
- C₄ - Sandstone, core recovery 1'-4'.
- D₄ - Core recovery 3'-11'.
- E₄ - Core recovery 4'-7'.
- F₄ - Core recovery 4'-9'.
- G₄ - Coarse grey sand, small to large gravel, limestone fragments, trace of clay.
- H₄ - Grey shale with fine sand.
- I₄ - Grey coarse to medium sand, trace of small gravel.
- J₄ - Grey shale with with fine sand.
- K₄ - Brown medium sand, trace of silt.
- L₄ - Grey coarse sand, small to large gravel, trace of clay.
- M₄ - Sandstone, core recovery 1'-6'.
- N₄ - Blue grey shale, thin seams sandstone.
- O₄ - Core recovery 5'-9'.

Max. Notes:
 1/4" = 1" scale for boring 1" = 30"
 Classification made by visual inspection.
 Used 2 1/2" casing, all borings.
 Hammer weight 140#, average fall 30"
 Borings taken prior to 1956.

NOTE:
 Subsurface information shown on this drawing was obtained solely for use in establishing design controls for the project. The accuracy of this information is not guaranteed and it is not to be construed as part of the plans governing construction of the project.

As Built 2-77

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY
 SOUTHWEST LANES OVER
 BURLINGTON NORTHERN RAILROAD

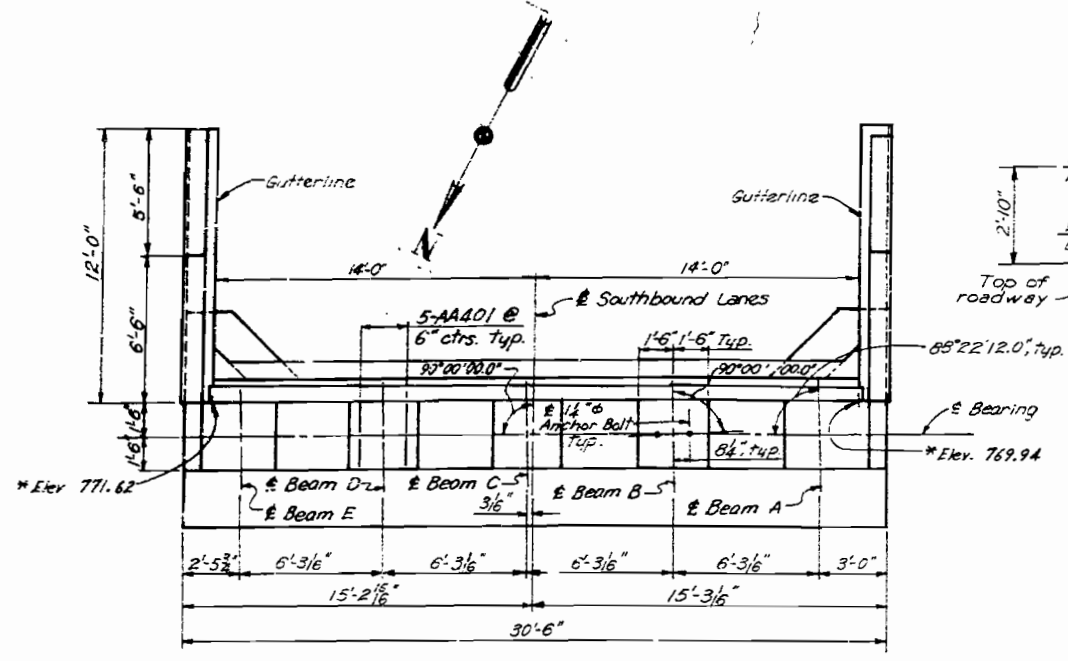
TEST HOLE BORINGS

MADE: DE. DATE: 7-72
 CHECKED: DATE: 171-A-3
 SCALE: AS SHOWN

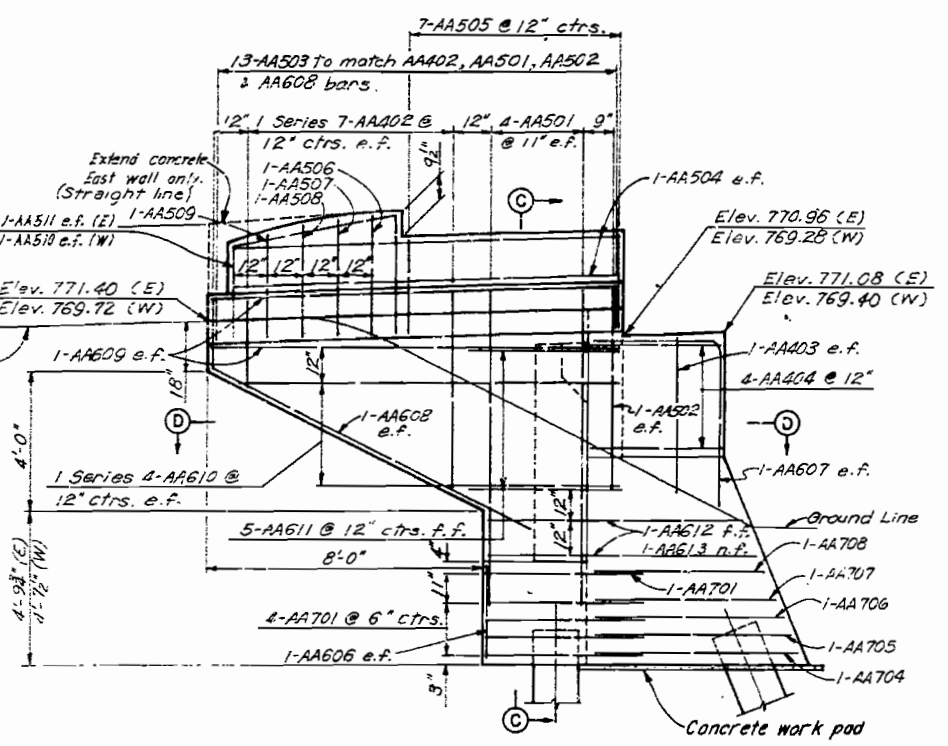
1748

3 of 26

CLAY CO. MISSOURI

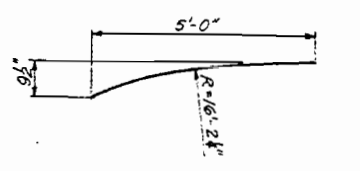


PLAN
Scale: 1/4" = 1'-0"

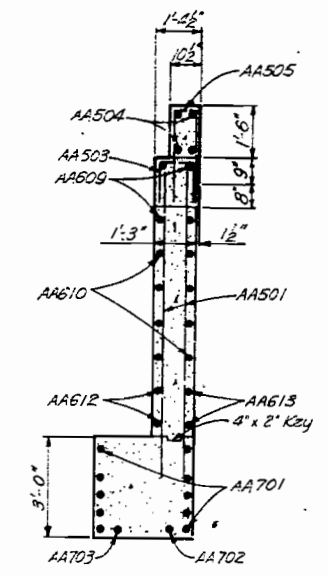


WINGWALL ELEVATION
Scale: 3/8" = 1'-0"

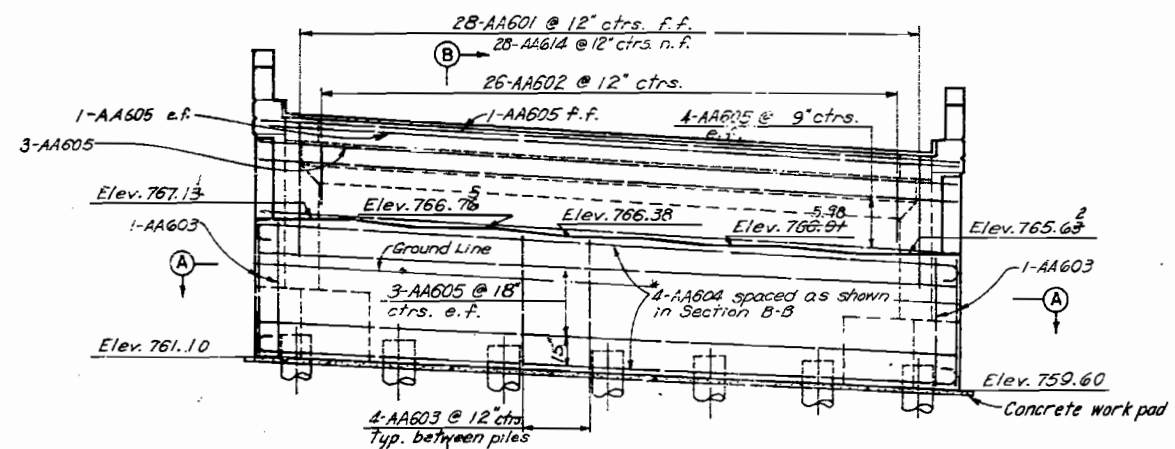
Wingwall Elevation shown is typical for East and West Wingwalls, except as shown.



CURVE OF TERMINAL POST
No Scale

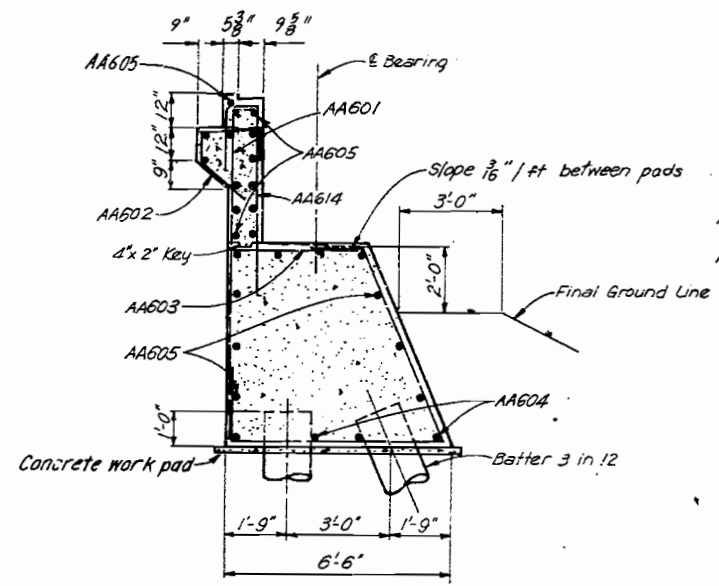


SECTION C-C
Scale: 3/8" = 1'-0"



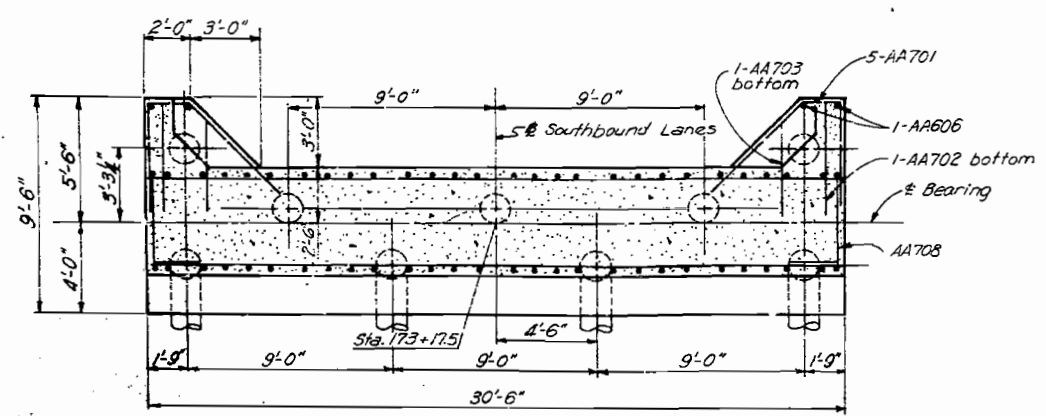
ELEVATION
Scale: 1/2" = 1'-0"

* See sheet 47 section A-A

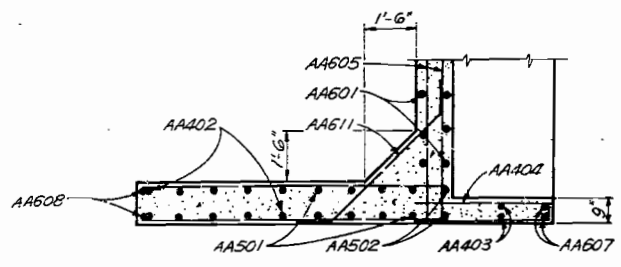


SECTION 9-B
Scale: 3/8" = 1'-0"

Note:
For end diaphragm details at South Abutment see sheet 49.



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



SECTION D-D
Scale: 3/8" = 1'-0"

Notes:
All piles shall be 16" CIP concrete piles.
e.f. denotes each face.
n.f. denotes near face.
f.f. denotes far face.
For reinforcement schedule see Sheet 50.
Expansion joint device is similar to North Abutment see Sheet 47.
For detail of pile reinforcing see Sheet 42.
For handrail and handrail anchor bolt details see Sheet 55 and 59.
Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolts.

As Built 2-77

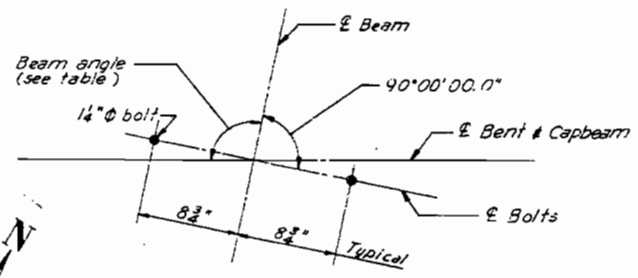
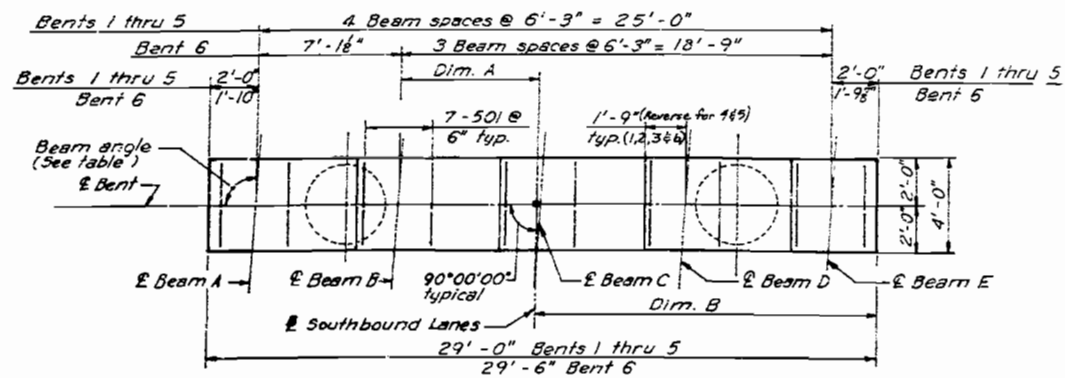
KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD

SOUTH ABUTMENT

DATE 5-24-72
BY [signature]
CHECKED [signature]
SCALE AS SHOWN

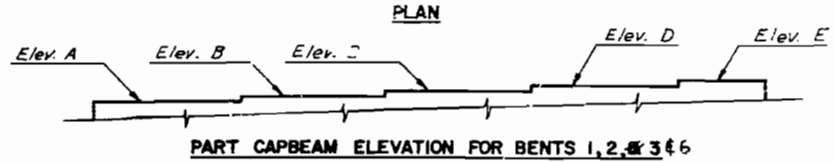
4 of 26



ANCHOR BOLT PLAN
No Scale

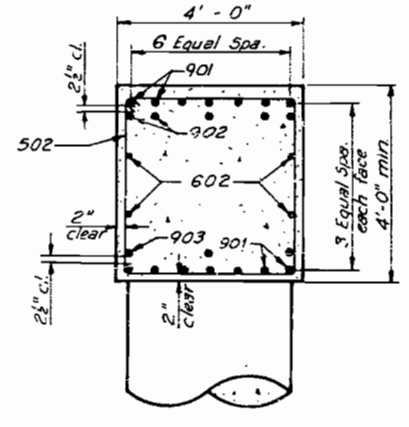
CAPBEAM DATA						
	Bent 1	Bent 2	Bent 3	Bent 4	Bent 5	Bent 6
Beam Angle	90°52'2.0"	90°44'08.2"	90°00'00.0"	90°00'00.0"	90°00'00.0"	90°00'00.0"
Dim. A	6'-4 1/2"	6'-8"	6'-3"	6'-3"	6'-3"	5'-11 1/2"
Dim. B	14'-4 1/2"	14'-1"	14'-6"	14'-6"	14'-6"	14'-7 1/2"
Elev. A	767.51 ⁰	771.53 ⁵	776.56 ⁸	780.08 ⁶	783.80	785.89 ¹
Elev. B	767.89 ⁸	771.89 ⁸	776.60 ¹	779.99 ⁸	783.60 ¹	785.46 ⁰
Elev. C	768.26	772.26 ¹	776.81 ²	779.51	783.2 ¹	785.02 ²
Elev. D	768.64 ²	772.54 ³	776.94	779.82 ¹	782.92 ⁰	784.69 ²
Elev. E	769.04 ²	772.87	777.06 ⁸	779.73 ¹	782.83 ²	784.26 ¹
Elev. F	763.15	767.11	772.44	776.04	779.67	781.82
Elev. G	763.50	767.47	772.56	775.95	779.40	781.25
Elev. H	764.51	768.35	772.90	775.73	779.62	780.24
Elev. J	764.86	768.65	773.02	775.64	779.34	779.87

* 88°07'23.0" for Beam A, 85°01'27.4" for Beams B thru E

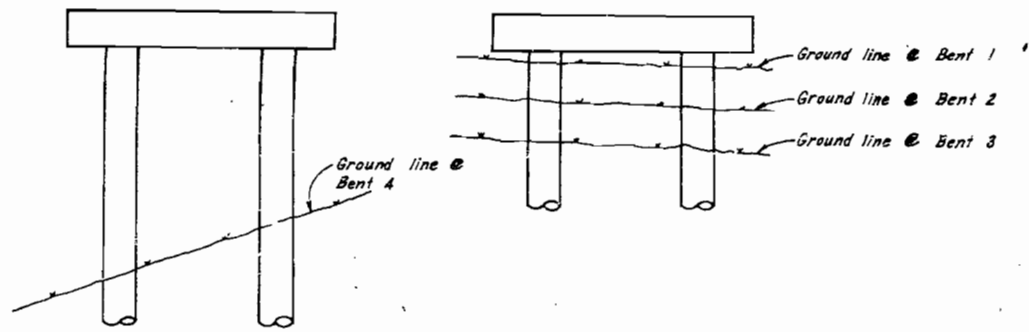


PART CAPBEAM ELEVATION FOR BENTS 1, 2, 3 & 6

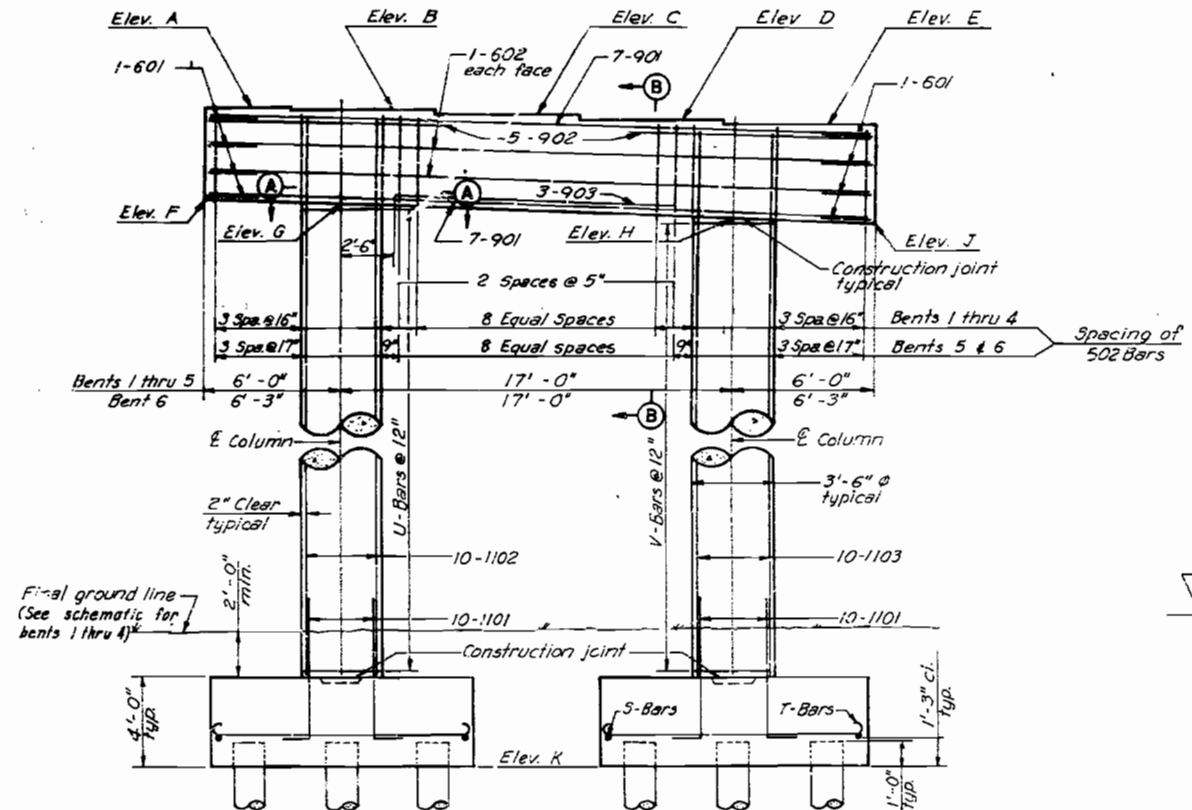
COLUMN DATA						
	Bent 1	Bent 2	Bent 3	Bent 4	Bent 5	Bent 6
U-Bars	17-401	21-401	27-401	35-401	33-401	35-401
V-Bars	18-401	22-401	27-401	30-401	32-401	34-401



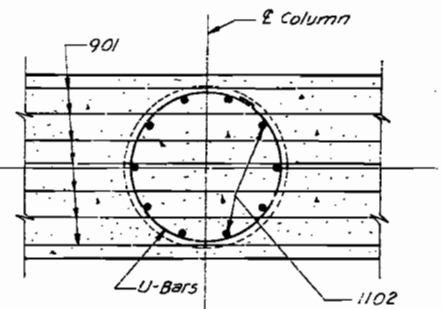
SECTION B-B
Scale: 1/2" = 1'-0"



GROUND LINE AT BENTS 1 THRU 4
LEVEE ACCESS ROAD ALTERNATE



ELEVATION

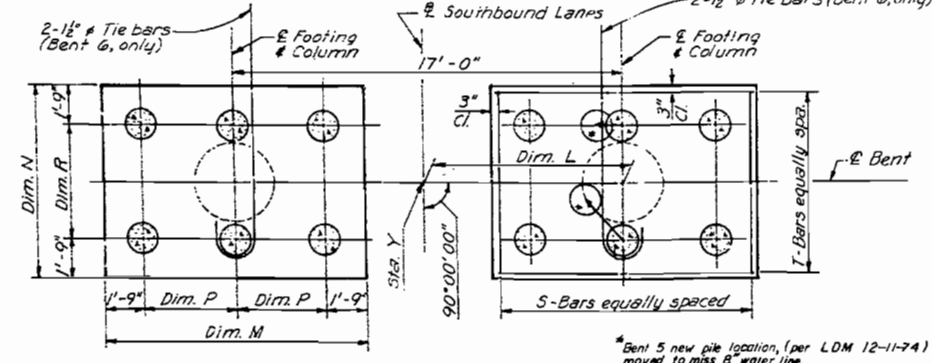


SECTION A-A
Scale: 1/2" = 1'-0"

FOOTING DATA						
	Bent 1	Bent 2	Bent 3	Bent 4	Bent 5	Bent 6
Sta. Y	173+80.0	174+65.0	175+50.0	176+35.0	177+17.0	177+78.0
Elev. K	743.7	743.3	742.7	742.9	743.2	743.4
Dim. L	8'-4 1/2"	8'-1"	8'-5"	8'-5"	8'-5"	8'-4 1/2"
Dim. M	10'-6"	11'-6"	11'-6"	11'-6"	10'-6"	10'-6"
Dim. N	7'-6"	8'-6"	10'-6"	8'-6"	9'-0"	9'-0"
Dim. P	3'-6"	4'-0"	4'-0"	4'-0"	3'-6"	3'-6"
Dim. R	4'-0"	5'-0"	7'-0"	5'-0"	5'-6"	5'-6"
S-Bars	14-802	15-802	15-802	15-802	15-802	15-802
T-Bars	10-801	11-801	11-801	11-801	10-801	10-801

Note: Elevation is shown for Bents 4, 5 and 6. Elevation for Bents 1, 2 and 3 is similar.

Notes:
Open corner of stirrup bars shall be placed at the bottom of capbeam within 1/3 span length from column, including cantilevers.
Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
Bars shall be prefixed as follows:
BA denotes Bent 1
BB denotes Bent 2
BC denotes Bent 3
BD denotes Bent 4
BE denotes Bent 5
BF denotes Bent 6
For reinforcement schedule see Sheet 60 and 61.
For details of pile reinforcing see Sheet 42.



FOOTING PLAN

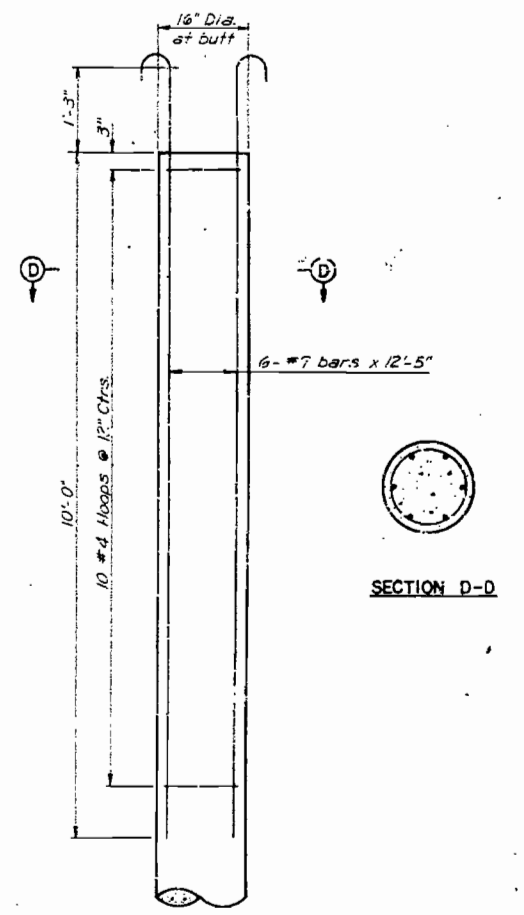
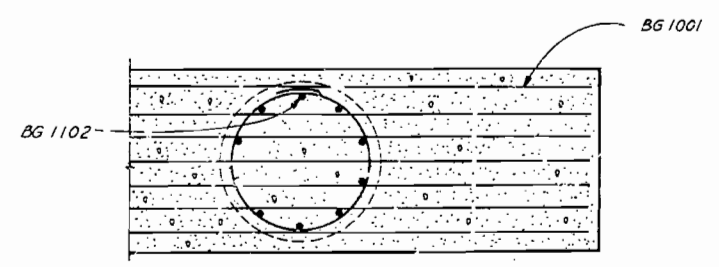
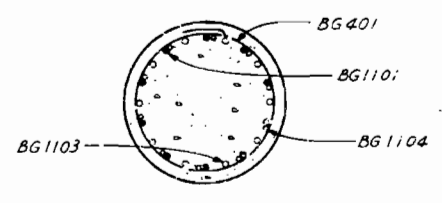
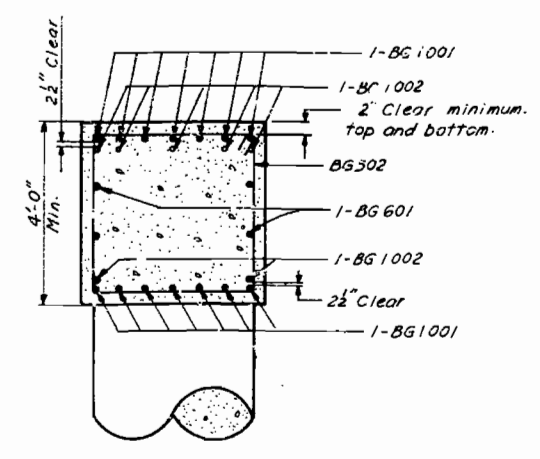
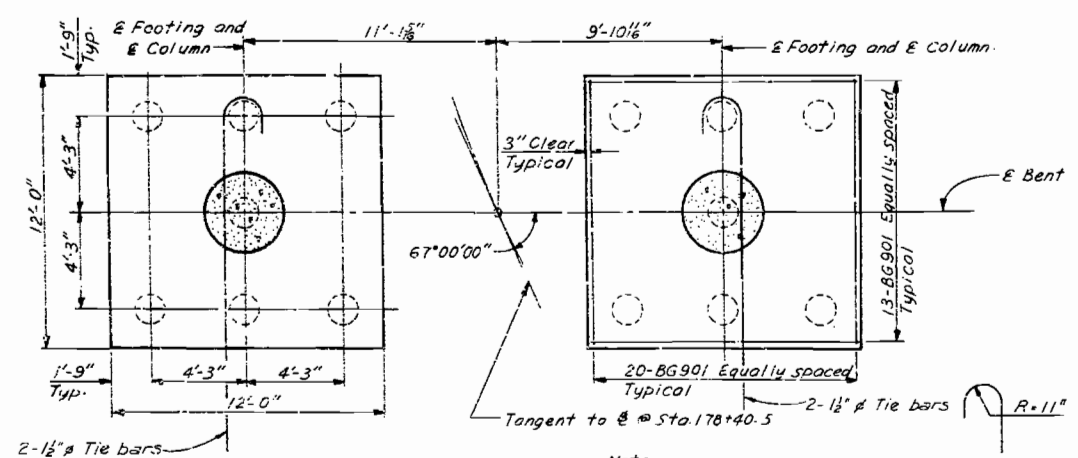
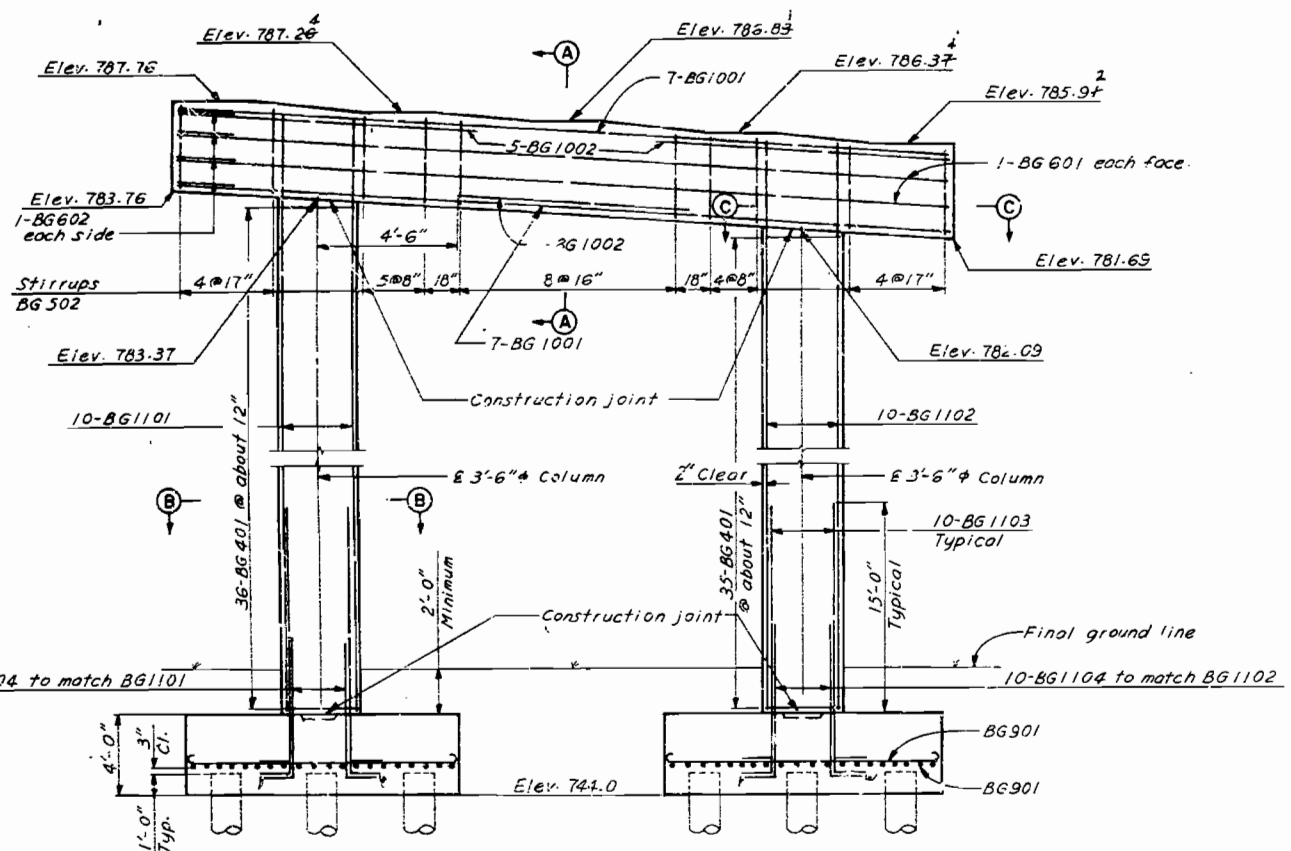
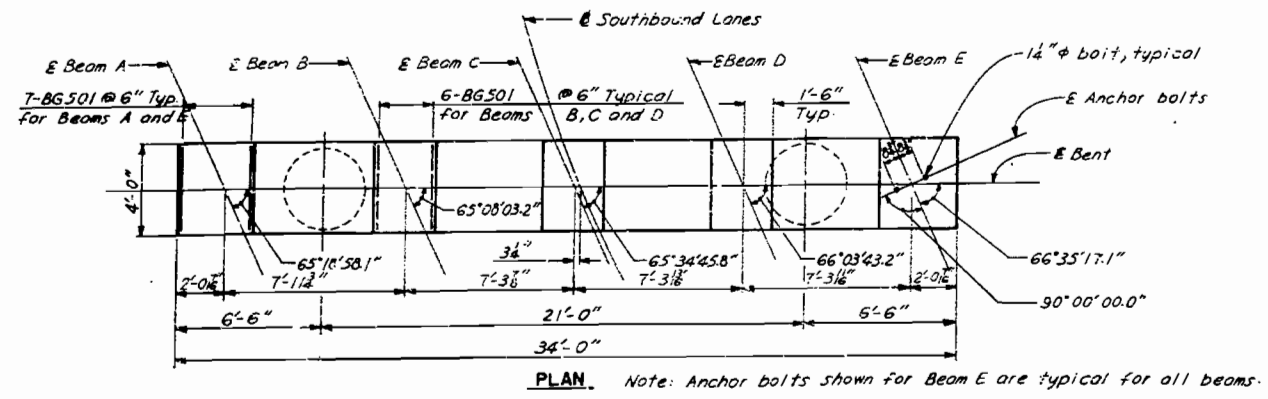
* Bent 5 new pile location, (per LDM 12-11-74) moved to miss B water line.

As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD

BENTS 1, 2, 3, 4, 5 AND 6



Notes:
 All piles are 16" cast-in-place concrete.
 For reinforcement schedule see Sheet 61.
 Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
 Open corner of stirrup bar shall be placed at the bottom of capbeam within 4' span length from E column, including cantilevers. (Omit due to AASHTO Rev. per RDM 2-10-75)

As built 2-77

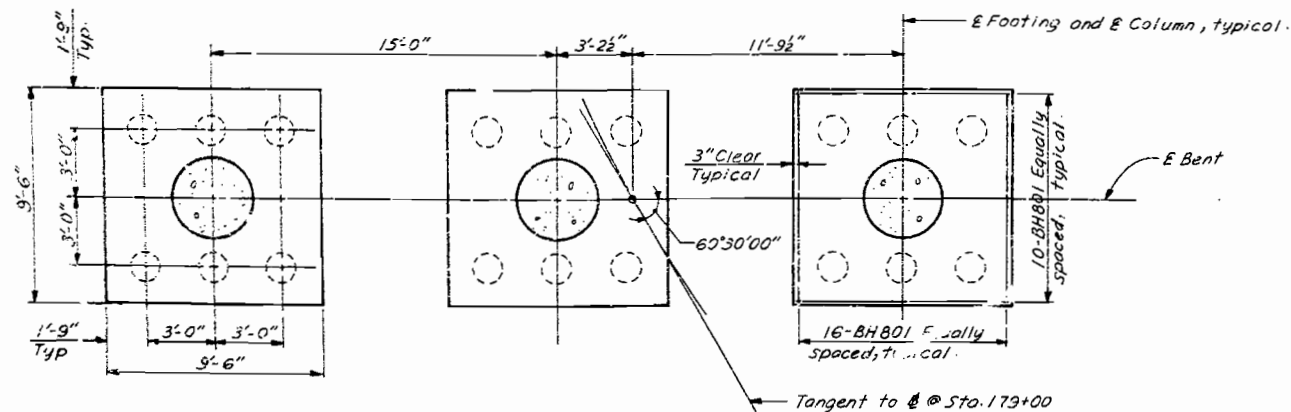
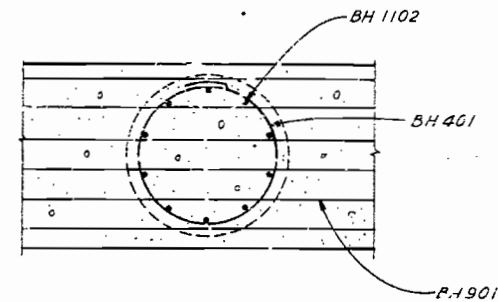
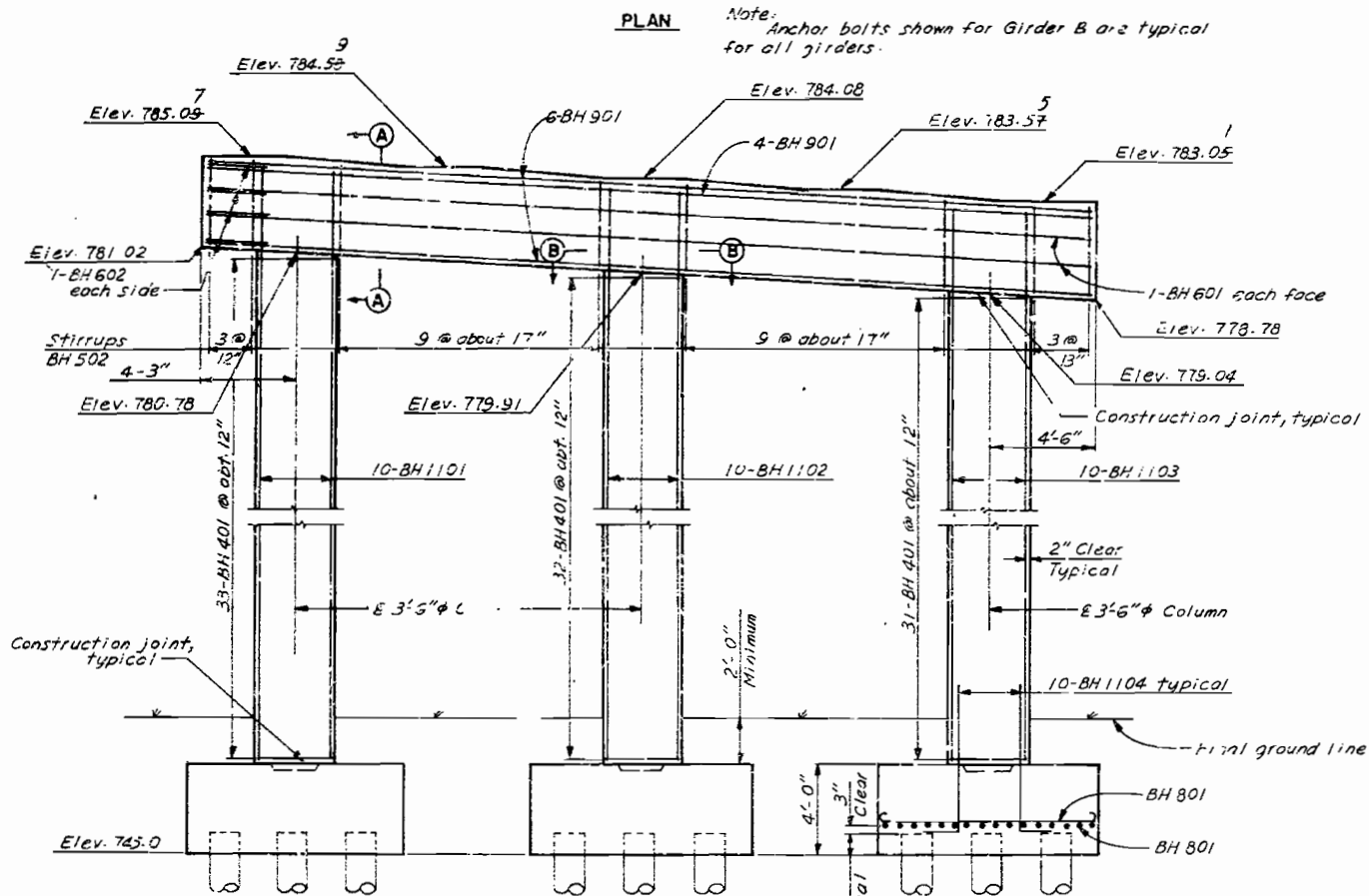
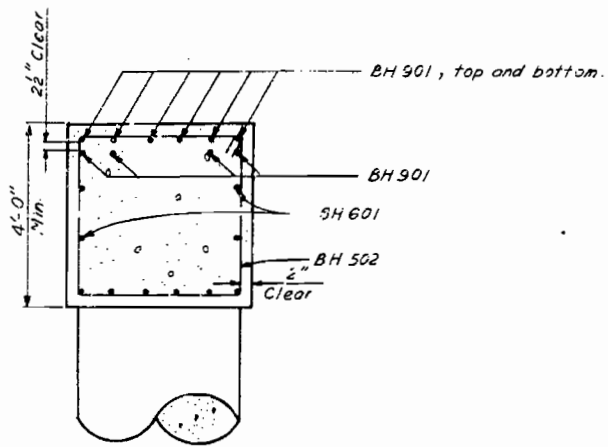
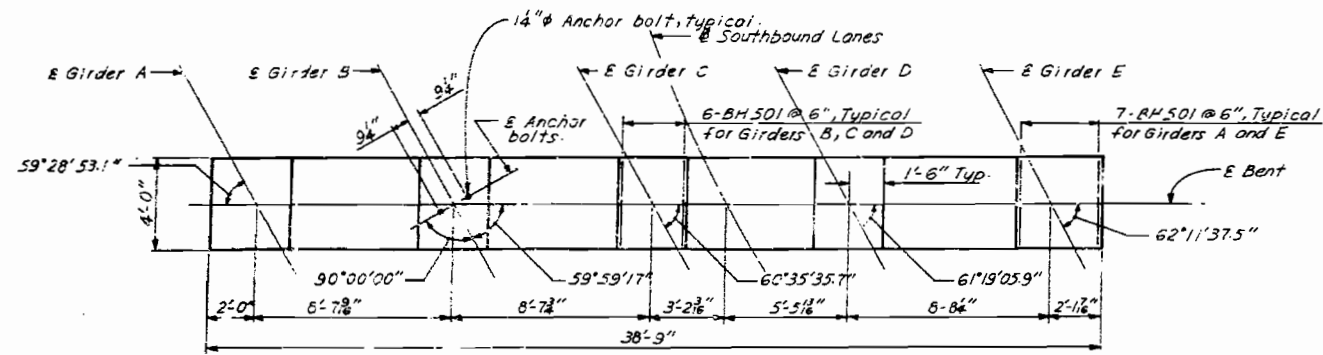
KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 MISSOURI RIVER BRIDGE AT BROADWAY
 SOUTHBOUND LANES OVER
 BURLINGTON NORTHERN RAILROAD

BENT 7

DATE: MAY 6-57
 DRAWN BY: H.S.S. DATE: 6-57
 SCALE: 1/2" = 1'-0"

NO. 171-A-3

6 of 26
 CLAY CO. 1944



Notes:
 All piles are 16" cast-in-place concrete.
 For reinforcement schedule see Sheet 61.
 Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
 Open corner of stirrups shall be placed at the bottom of capbeam within a span length from E Column including cantilevers. (Omit due to AASHTO Reper RDM 2-10-75)
 For details of pile reinforcing see Sheet 41.

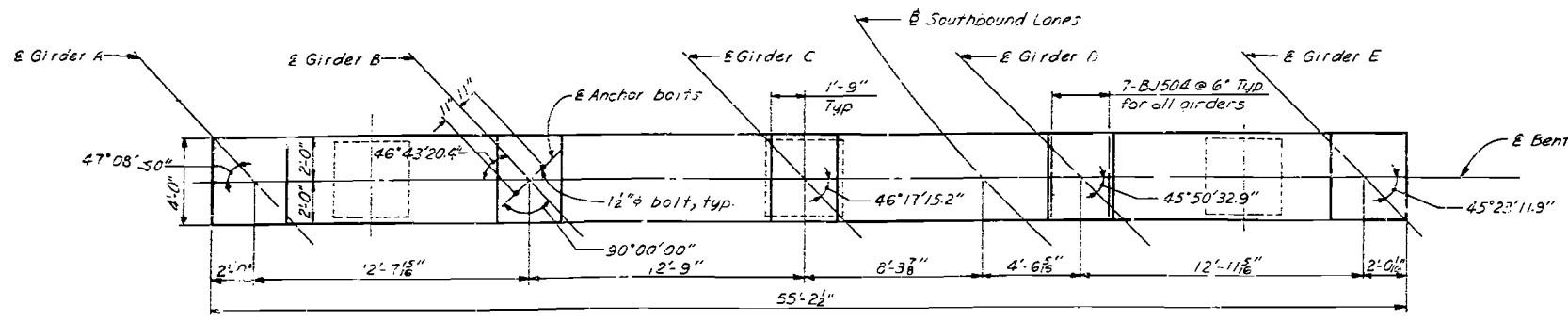
As Built 2-77

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 MISSOURI RIVER BRIDGE AT BROADWAY
 SOUTHBOUND LANES OVER
 BURLINGTON NORTHERN RAILROAD

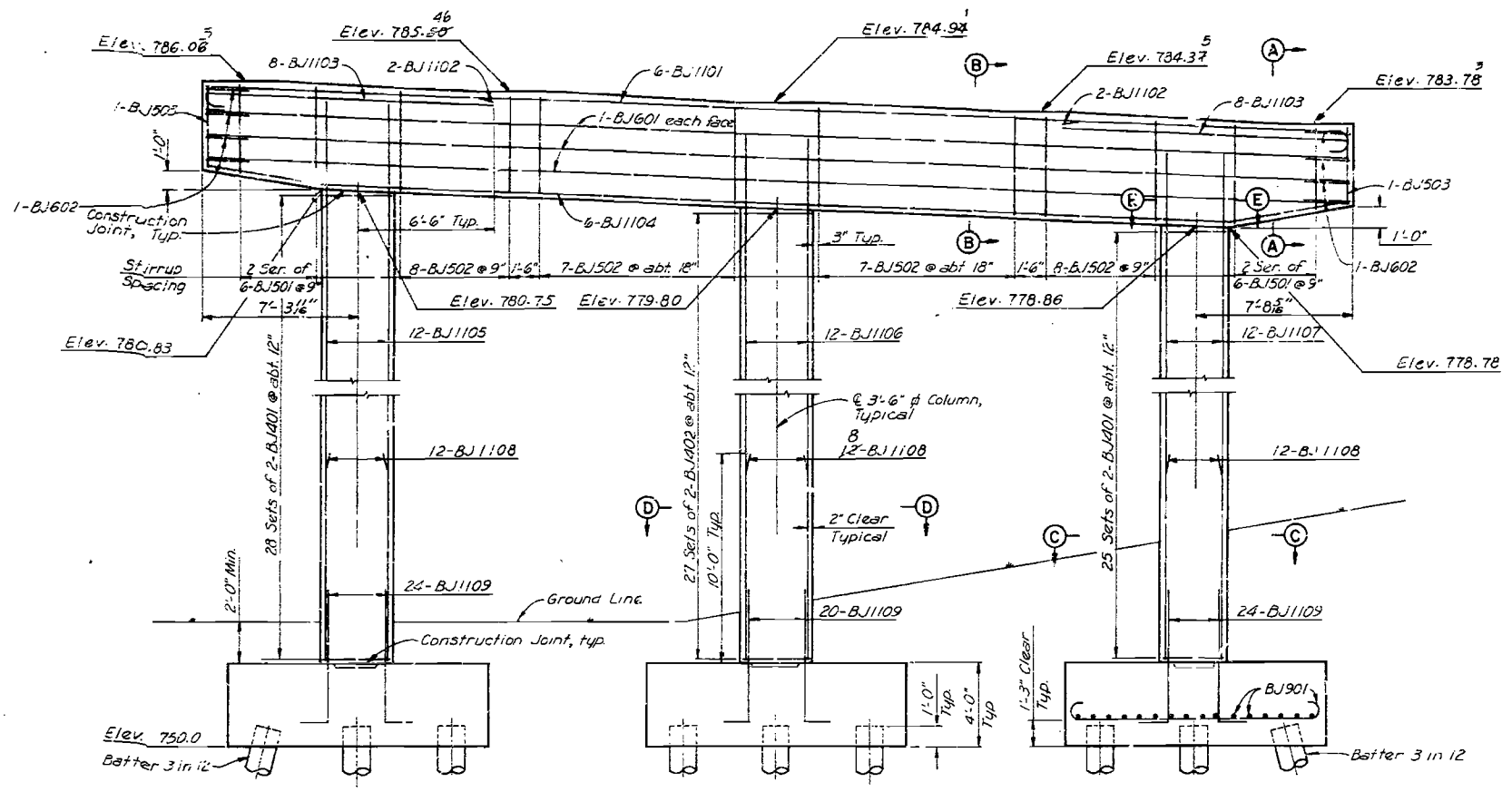
BENT 8

DESIGNED BY: [Signature]
 CHECKED BY: [Signature]
 DRAWN BY: [Signature]
 SCALE: 1/4" = 1'-0"
 171-A-3

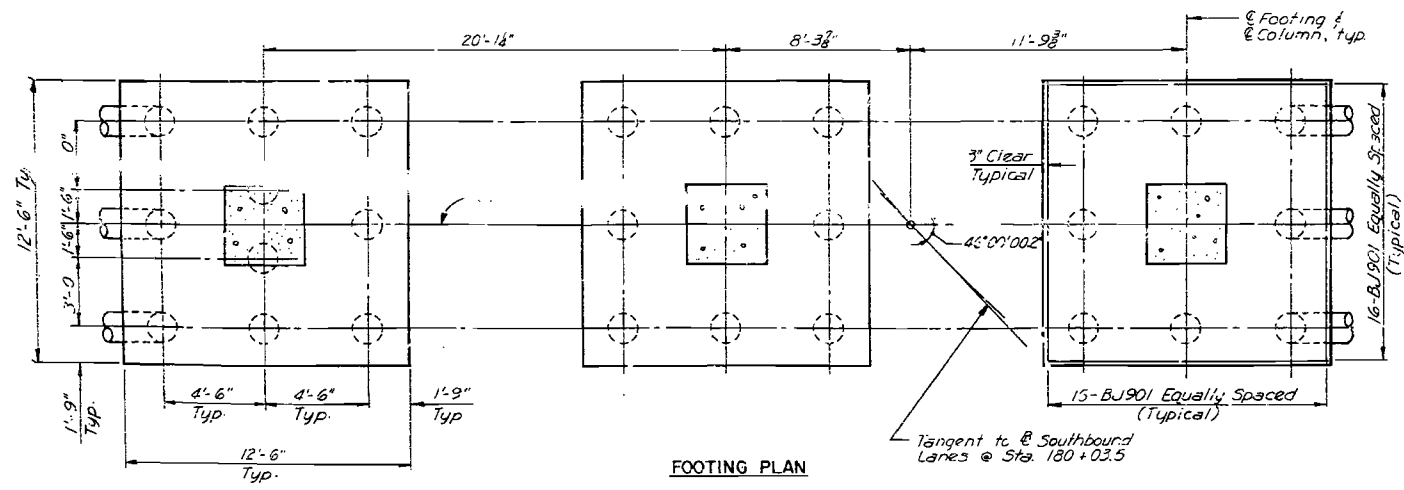
7 of 26
 Clay Co. [Signature]



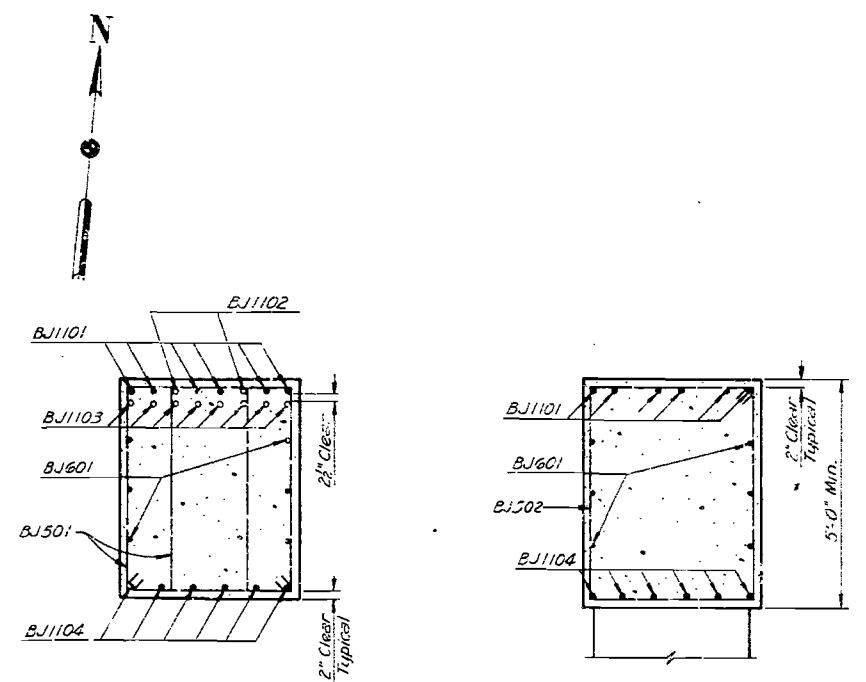
PLAN
Note: Anchor bolt layout shown is typical for all girders.



ELEVATION

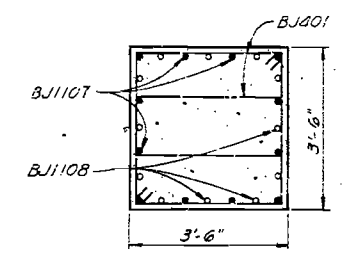


FOOTING PLAN

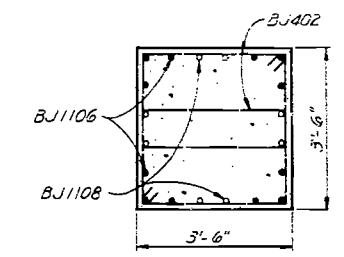


SECTION A-A
Scale: 1/2" = 1'-0"

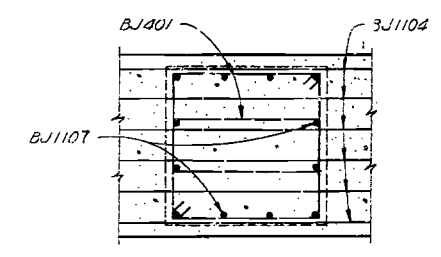
SECTION B-B
Scale: 1/2" = 1'-0"



SECTION C-C
Scale: 1/2" = 1'-0"



SECTION D-D
Scale: 1/2" = 1'-0"



SECTION E-E
Scale: 1/2" = 1'-0"

Notes:
Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
All piles are 16" cast-in-place concrete.
Open corner of stirrup bars shall be placed at the bottom of capbeam within 1 span length from E column, including... (Omit due to AASHTO Rev per RDM 2-1075)
For Reinforcement S, scale see Sheet 61.
For details of pile reinforcing see...

As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD

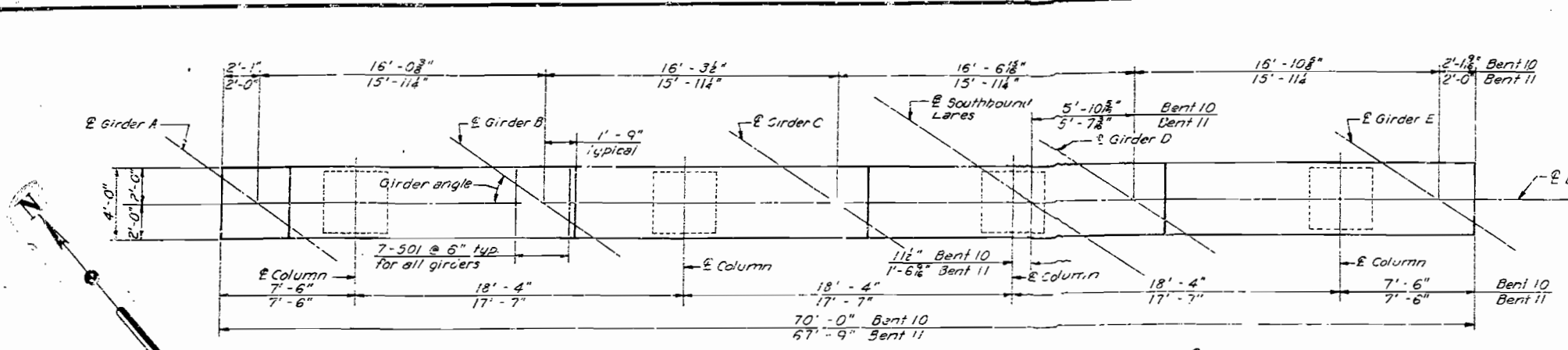
RENT 9

MADE BY: DATE: 6-21-72
CHK: KSS DATE: 30-72
SCALE: 1/4" = 1'-0"

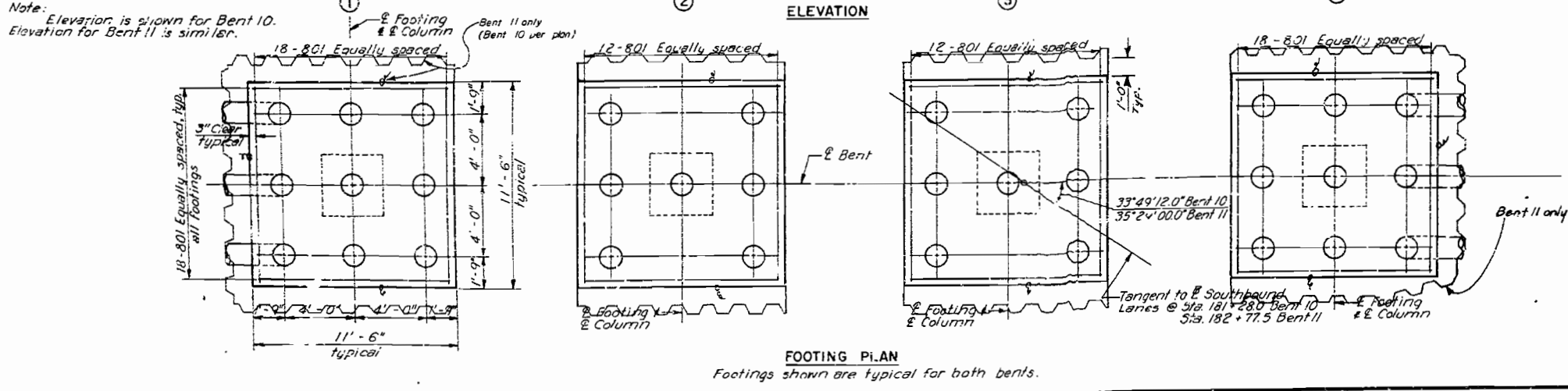
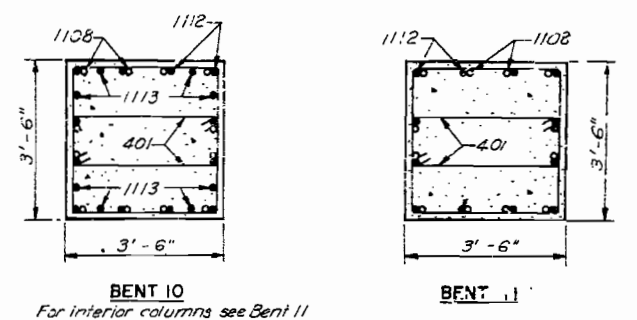
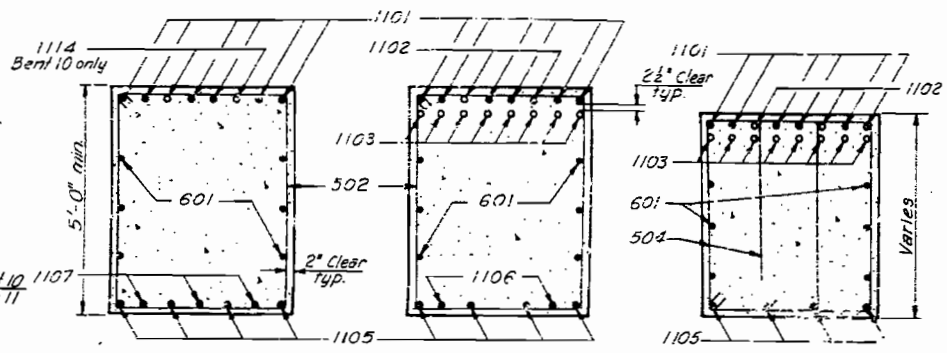
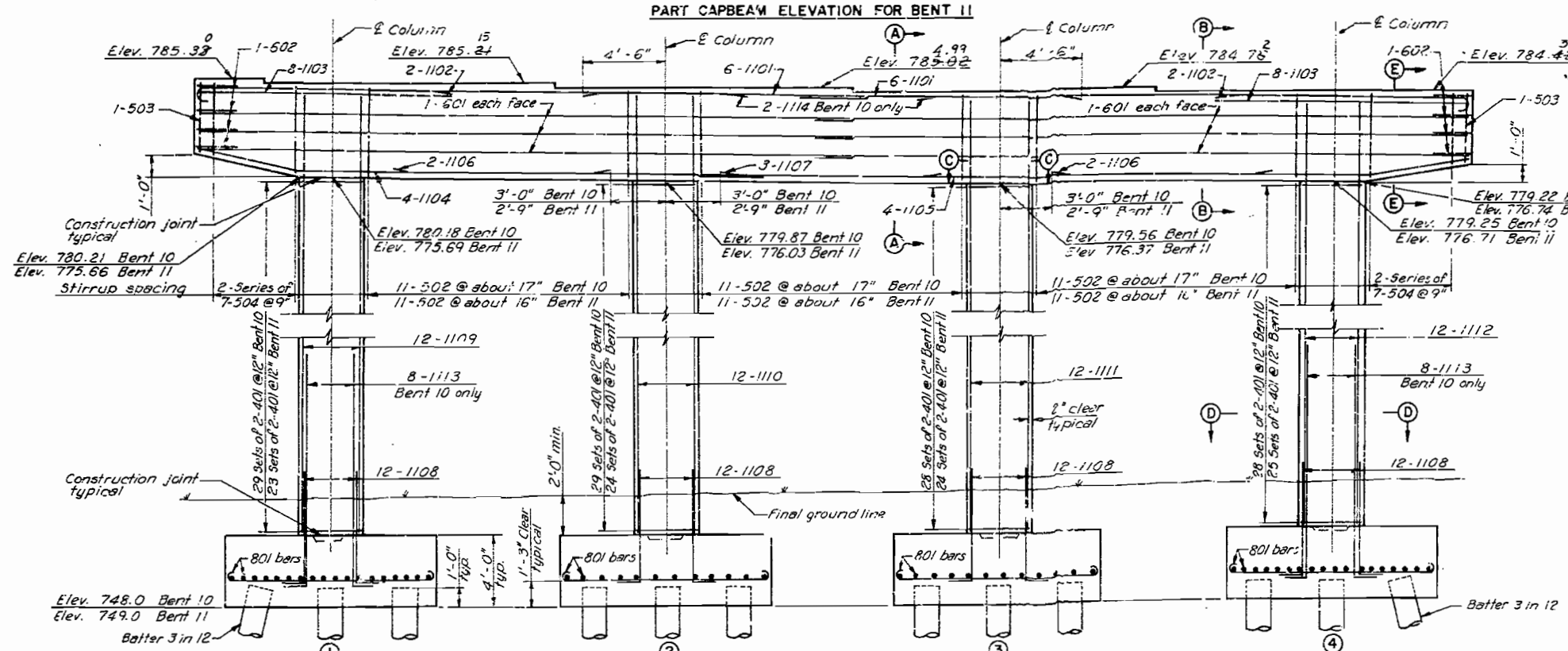
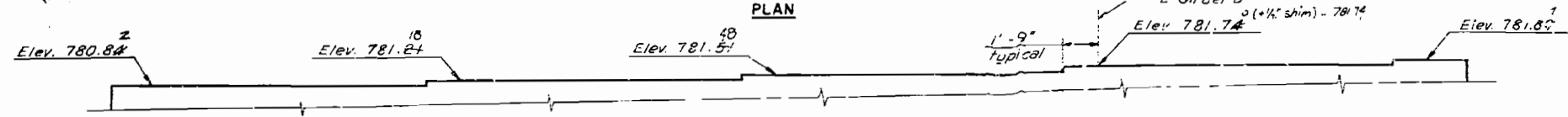
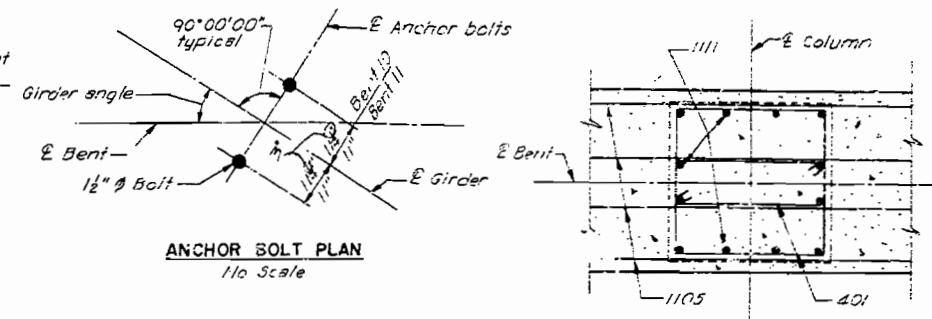
HOWARD, HERDLES, TAMMEN & BERGENSON
CONSULTING ENGINEERS
KANSAS CITY, MISSOURI
171-A-3 SHEET 14 OF 68

Clar Co. 14643

8 of 26



GIRDER ANGLES					
	Girder A	Girder B	Girder C	Girder D	Girder E
Bent 10	35° 29' 00.0"	34° 55' 38.2"	34° 15' 46.4"	33° 34' 33.5"	32° 51' 53.5"
Bent 11	35° 29' 00.0"	35° 29' 00.0"	35° 29' 00.0"	35° 29' 00.0"	35° 29' 00.0"



Notes:

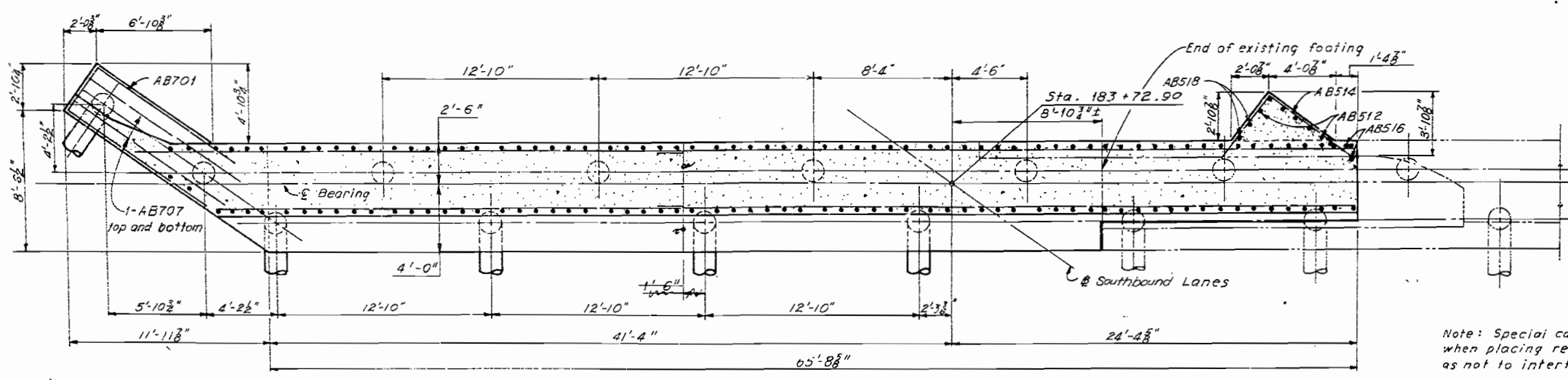
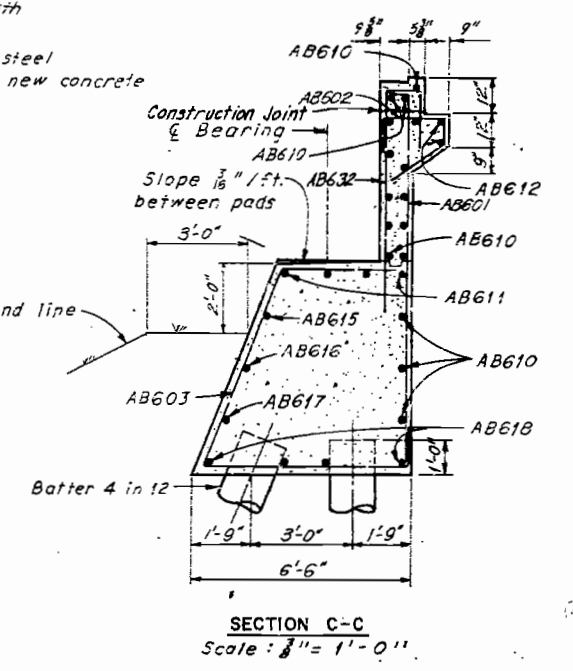
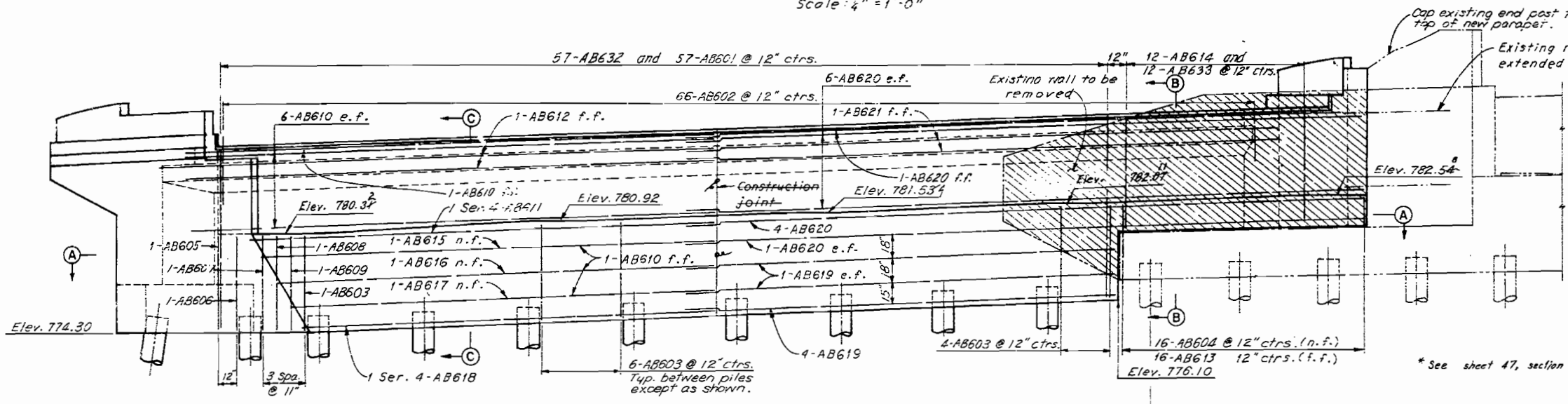
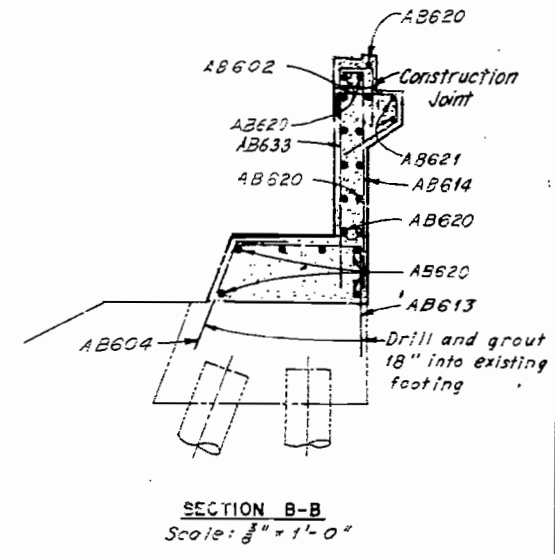
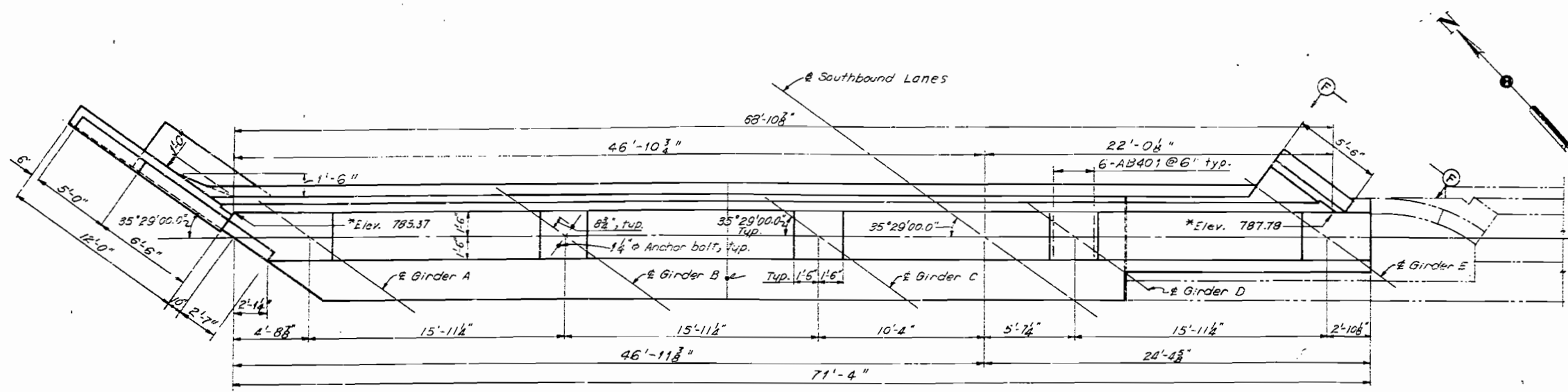
- Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.
- Stirrup bars shall be placed 3" clear from face of column.
- Open corner of stirrup bars shall be placed at the bottom of capbeam within 1 span length from E column, including cantilevers. (Omit due to AISI 900 Rev per RDM 2-10-75)
- Bars shall be prefixed as follows: BK denotes Bent 10, BL denotes Bent 11
- For reinforcement schedule see Sheet 61.
- All piles are 16" cast-in-place concrete.
- All piles in Footings 3 and 4 of Bent 11 shall be pre-drilled. See Specifications.
- For details of pile reinforcing see Sheet 42.

As Built 2-77

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 ENGINEERING DIVISION
MISSOURI RIVER BRIDGE AT BROADWAY SOUTHBOUND LANES OVER BURLINGTON NORTHERN RAILROAD
BENTS 10 AND 11

MADE C.S.S. DATE 6-23-72 HOWARD, HEBBLES, TAMMAM & REBERGHEIM CONSULTING ENGINEERS
 OLD C.S.S. DATE 7-2-72
 KANSAS CITY MISSOURI
 SCALE 1/2" = 1'-0" SHEET 171-A-2

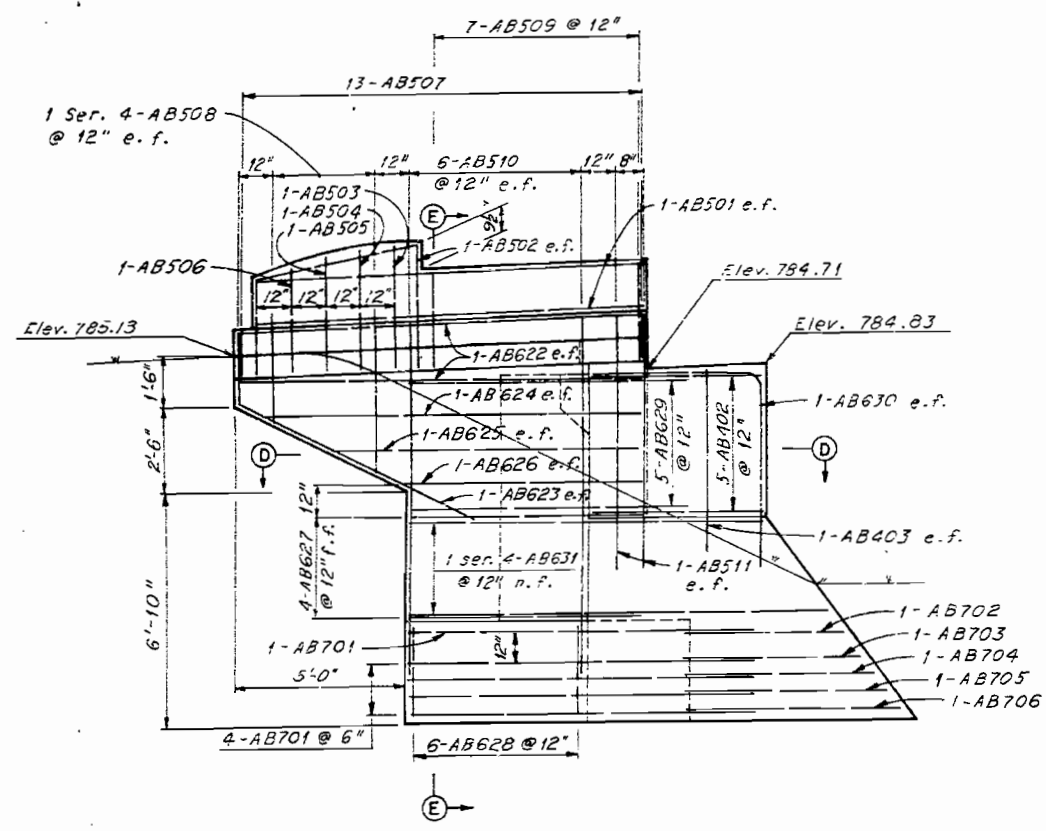
9 of 26
 City Co. 19675



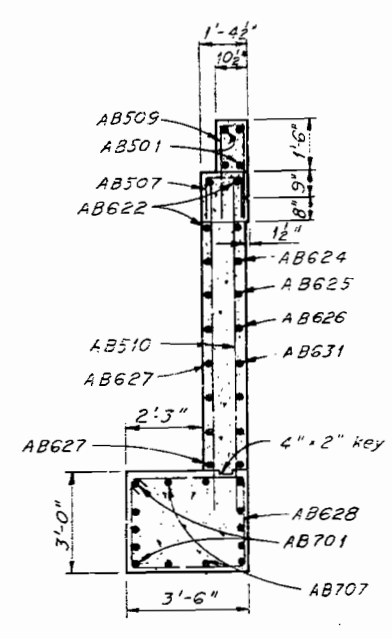
Notes:
 All piles shall be 16" C.I.P. concrete piles.
 n.f. denotes near face, f.f. denotes far face,
 and e.f. denotes each face.
 For reinforcement schedule see Sheet 61.
 For wingwall details see Sheet 47.
 For expansion device details see Sheet 47.
 For guardrail anchors at wingwalls see sheet 47.
 For details of pile reinforcing see Sheet 42.
 For details of handrail and handrail anchor bolt see Sheets 55 and 59.
 As Built 2-77

Note: Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolts.

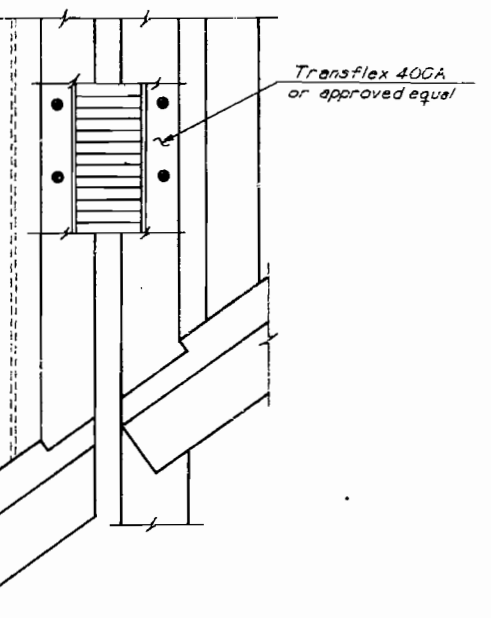
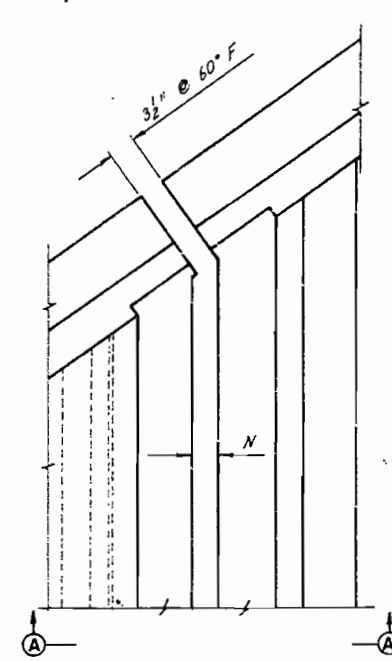
KANSAS CITY, MISSOURI		DEPARTMENT OF PUBLIC WORKS	
MISSOURI RIVER BRIDGE AT BROADWAY		SOUTHBOUND LANES OVER	
BURLINGTON NORTHERN RAILROAD		NORTH ABUTMENT	
DATE: 6-4-72	HOWARD, HERRICK, TAMM & BERENSON	CONTRACT NO. 171-A-3	SHEET 40 OF 41
DATE: 7-13-71	KANSAS CITY	SCALE: As Shown	10 of 26



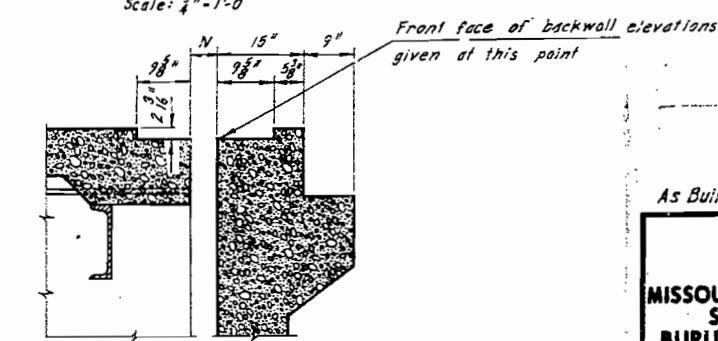
WINGWALL ELEVATION
Scale: $\frac{3}{8}$ " = 1'-0"



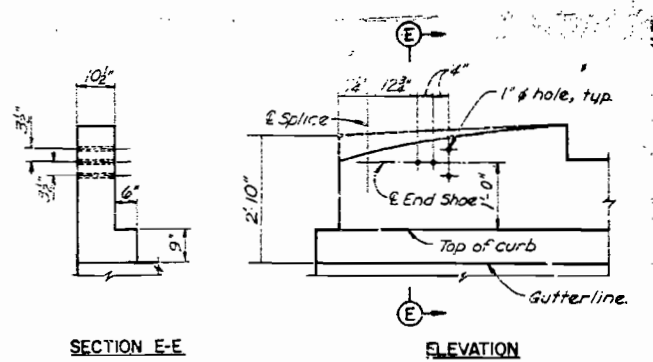
SECTION E-E
Scale: $\frac{3}{8}$ " = 1'-0"



EXPANSION JOINT NORTH ABUTMENT
Scale: $\frac{1}{4}$ " = 1'-0"

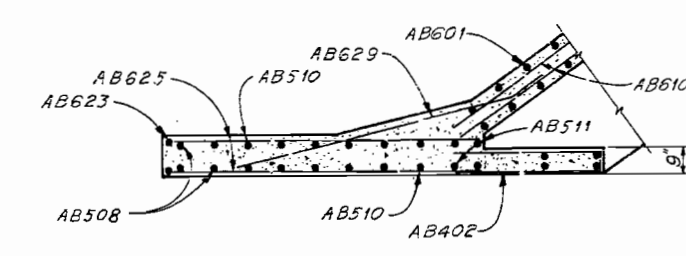


SECTION A-A
Scale: $\frac{1}{4}$ " = 1'-0"

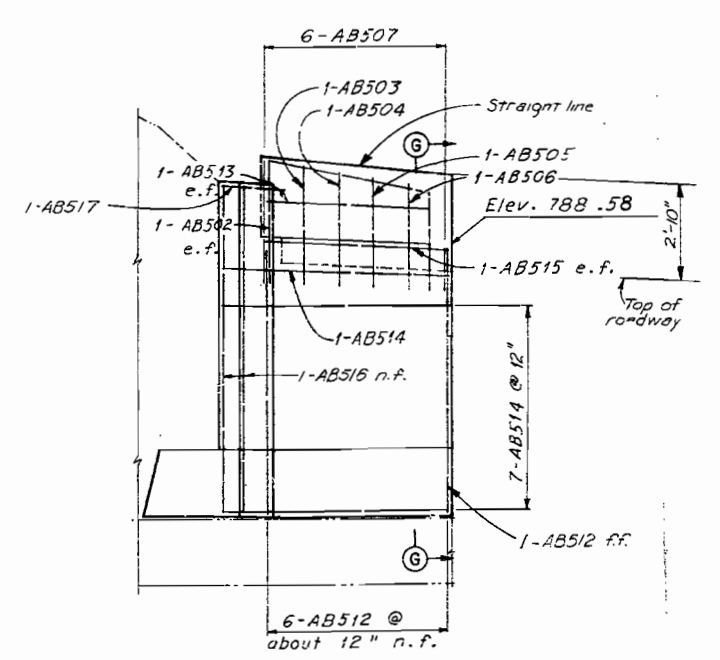


SECTION E-E ELEVATION

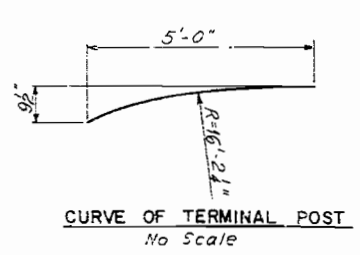
GUARD RAIL ANCHOR DETAIL
Scale: $\frac{1}{2}$ " = 1'-0"



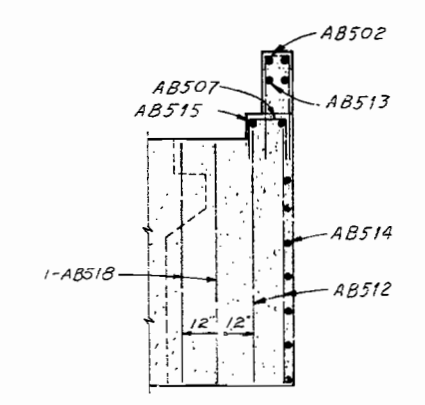
SECTION D-D
Scale: $\frac{3}{8}$ " = 1'-0"



VIEW F-F
Scale: $\frac{3}{8}$ " = 1'-0"



CURVE OF TERMINAL POST
No Scale



SECTION G-G
Scale: $\frac{3}{8}$ " = 1'-0"

Notes:
For end diaphragm details at North Abutment see sheet 51.
For additional expansion joint details and variable dimension "N" see sheet 52.

As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

**MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD**

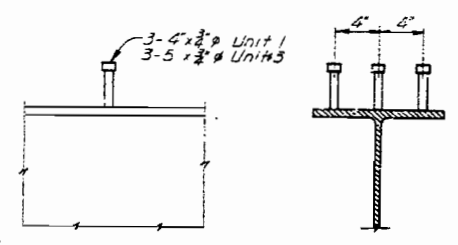
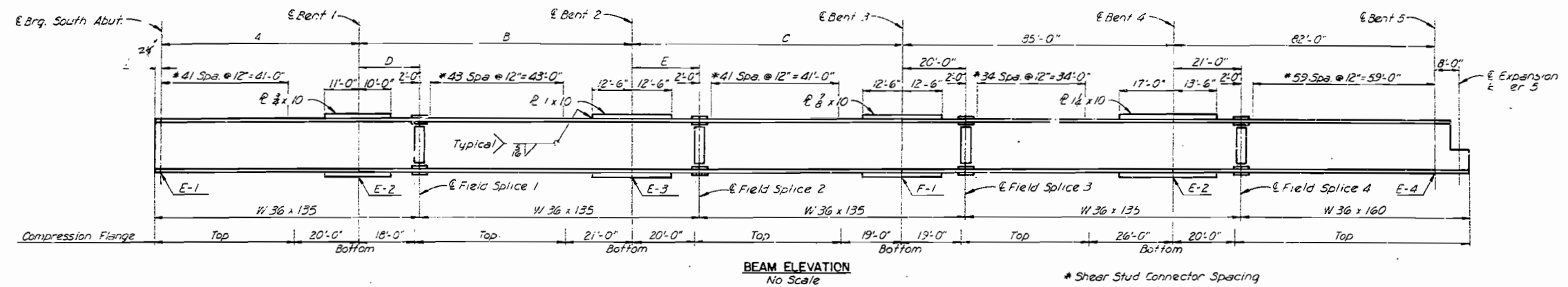
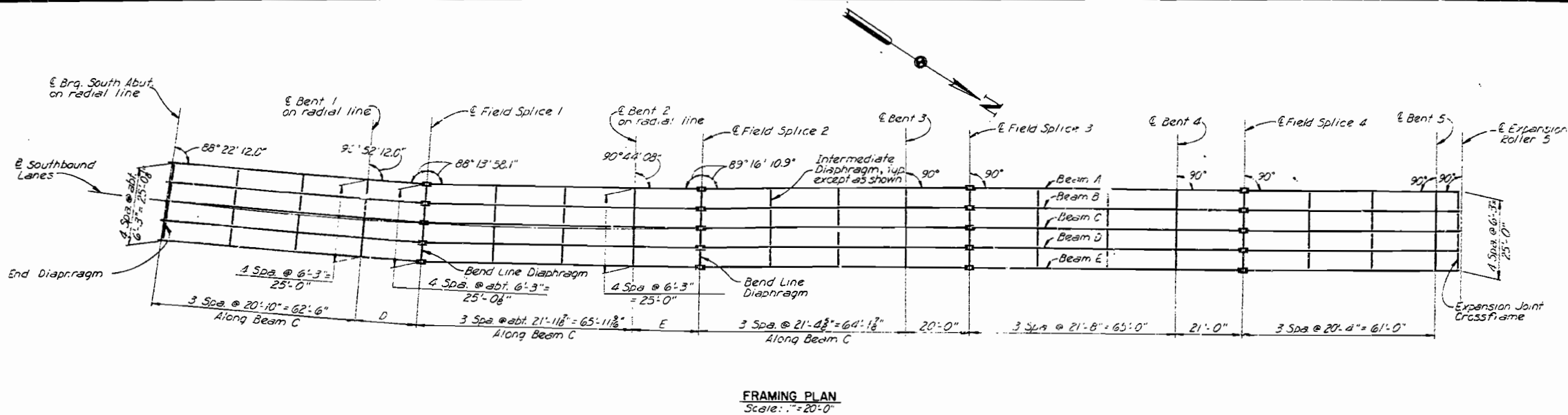
NORTH ABUTMENT

DATE: 6-6-72
REV: 7-13-72
BY: [Signature]

HOWARD, HERRICK, TAMMEN & WOODRUFF
CONSULTING ENGINEERS
KANSAS CITY
NEW YORK

SCALE AS SHOWN
171-A-3
SHEET 47 OF 68

11 of 26 Clay Co. 11/16/72



BEAM DIMENSIONS					
BEAM	A	B	C	D	E
A	61'-11 1/2"	84'-3 1/2"	84'-10 1/2"	18'-10 1/2"	20'-10 1/2"
B	62'-2 1/2"	84'-7 1/2"	84'-11 1/2"	18'-11 1/2"	20'-10 1/2"
C	62'-6"	85'-0"	85'-0"	19'-0 1/2"	20'-10 1/2"
D	62'-9 1/2"	85'-4 1/2"	85'-0 1/2"	19'-1 1/2"	20'-10 1/2"
E	63'-0 1/2"	85'-8 1/2"	85'-1 1/2"	19'-2 1/2"	20'-10 1/2"

TOP OF PAVEMENT ELEVATIONS																						
BEAM	SOUTH ABUTMENT	.25	.50	.75	BENT 1	.25*	.50	.75	BENT 2	.25*	.50	.75	BENT 3	.25*	.50	.75	BENT 4	.25*	.50	.75	BENT 5	EXPANSION ROLLER 5
A	770.28	770.80	771.35	771.94	772.56	773.35	774.31	775.26	776.32	777.46	778.64	779.81	780.97	782.02	783.16	784.18	785.16	786.09	787.93	787.75	788.52	788.82
B	770.65	771.17	771.73	772.31	772.93	773.73	774.69	775.63	776.66	777.74	778.87	779.99	781.10	782.10	783.18	784.15	785.08	785.95	786.74	787.51	788.23	788.50
C	771.03	771.55	772.10	772.69	773.30	774.10	775.06	776.00	776.99	778.02	779.13	780.17	781.22	782.17	783.20	784.11	784.99	785.81	786.55	787.26	787.94	788.19
D	771.40	771.92	772.48	773.06	773.68	774.48	775.44	776.36	777.33	778.30	779.33	780.34	781.34	782.25	783.21	784.08	784.90	785.67	786.36	787.02	787.65	787.88
E	771.78	772.30	772.85	773.44	774.06	774.85	775.81	776.73	777.66	778.58	779.56	780.52	781.47	782.32	783.23	784.05	784.81	785.53	786.17	786.78	787.35	787.57

* Elevation given is at Field Splice.

GUTTERLINE ELEVATIONS							
	SOUTH ABUTMENT	BENT 1	BENT 2	BENT 3	BENT 4	BENT 5	EXPANSION ROLLER 5
WEST GUTTERLINE	770.17	772.48	776.26	780.94	785.18	788.59	788.89
EAST GUTTERLINE	771.85	774.16	777.76	781.50	784.79	787.28	787.49

Notes:
 Shear Stud Connectors shall be end welded.
 For details of End Diaphragm see Sheet 49.
 For details of Expansion Joint Crossframe at Expansion Roller 5 see Sheet 52.
 For details of Intermediate Diaphragms, Bend Line Diaphragms see Sheet 49.
 For other notes see Sheet 49.
 Cover Plates @ Bents are same top & bottom.

As Built 2-77

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY SOUTHBOUND LANES OVER BURLINGTON NORTHERN RAILROAD

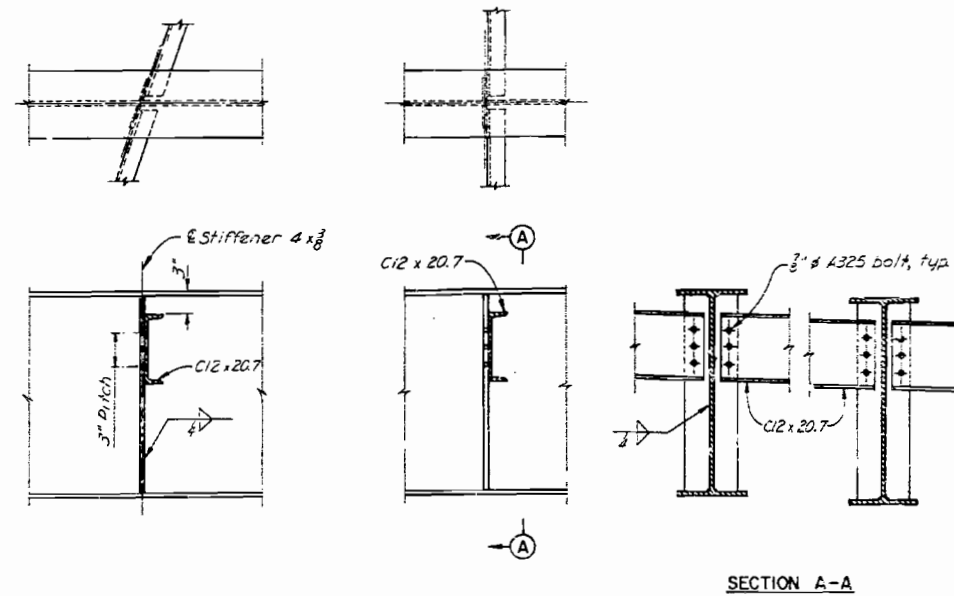
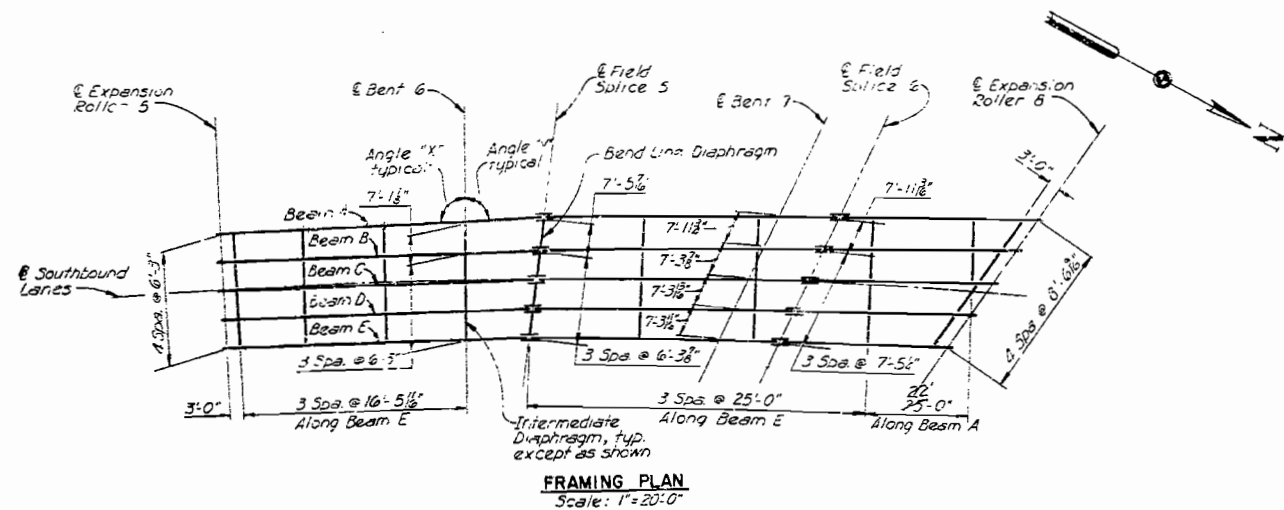
FRAMING PLAN, UNIT I

ADD. DATE 6-8-72
 DATE 6-28-72
 SCALE As shown

HOWARD, NEEDLES, TAMMEN & BERGMANN
 CONSULTING ENGINEERS
 KANSAS CITY, MISSOURI
 NEW YORK, NEW YORK

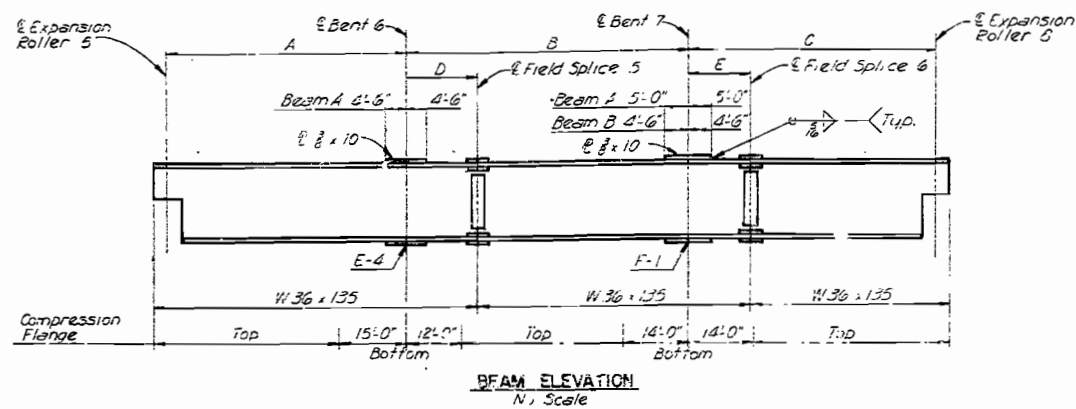
171-A-3
 SHEET 48 OF 96

12 of 216
 Clay Co.
 P1612

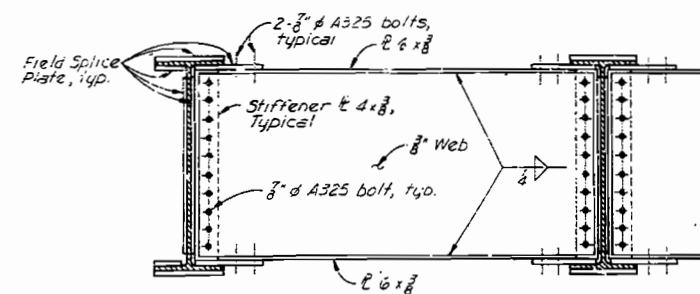


INTERMEDIATE DIAPHRAGM
Scale: 1/2"=1'-0"

INTERMEDIATE DIAPHRAGM CONNECTION
Scale: 1/2"=1'-0"



BEAM ELEVATION
N Scale



BEND LINE DIAPHRAGM
Scale: 1/2"=1'-0"

Notes:
Stiffeners are to be welded to the Compression Flange and web, and tight fitted at the Tension Flange.
For Field Splice Details see Sheet 54.
For Expansion Roller Details see Sheet 53.
For Shoe Details see Sheet 55.
Cover Plates @ Bents are same top & bottom.

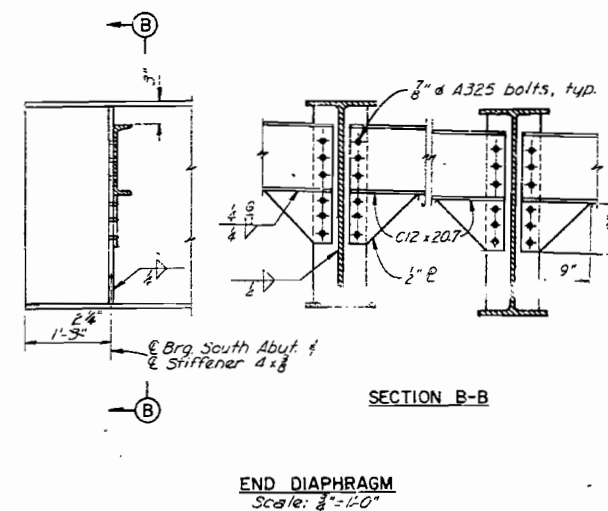
BEAM ANGLES "X" AND "Y"									
BEAM	EXPANSION ROLLER 5		BENT 6		FIELD SPLICE 5		BENT 7 AND FIELD SPLICE 6		EXPANSION ROLLER 8
	ANGLE "X"	ANGLE "Y"	ANGLE "X"	ANGLE "Y"	ANGLE "X"	ANGLE "Y"	ANGLE "X"	ANGLE "Y"	
A	90°42'14.7"	91°52'37.0"	88°07'23.0"	89°39'06.9"	83°39'58.1"	114°41'01.9"	65°18'58.2"	124°09'31.9"	
B	91°36'39.1"	90°58'32.6"	89°01'27.4"	98°45'02.5"	83°29'03.2"	114°51'56.8"	65°08'03.2"	124°20'26.8"	
C	91°36'39.1"	90°58'32.6"	89°01'27.4"	98°45'02.5"	83°55'45.8"	114°25'14.2"	65°34'45.8"	123°53'44.2"	
D	91°36'39.1"	90°58'32.6"	89°01'27.4"	98°45'02.5"	84°24'43.2"	113°55'16.8"	66°03'43.2"	123°24'46.8"	
E	91°36'39.1"	90°58'32.6"	89°01'27.4"	98°45'02.5"	84°56'17.1"	113°24'42.9"	66°35'17.1"	122°53'12.9"	

TOP OF PAVEMENT ELEVATIONS													
BEAM	EXPANSION ROLLER 5	.25	.50	.75	BENT 6	.25*	.50	.75	BENT 7	.25*	.50	.75	EXPANSION ROLLER 8
A	788.82	789.27	789.70	790.10	790.48	790.95	791.34	791.72	792.09	792.36	792.65	792.92	793.18
B	788.50	788.92	789.31	789.69	790.05	790.48	790.87	791.23	791.59	791.86	792.15	792.42	792.68
C	788.19	788.52	788.95	789.32	789.68	790.09	790.45	790.60	791.13	791.40	791.67	791.93	792.12
D	787.88	788.24	788.59	788.95	789.30	789.68	790.03	790.36	790.57	790.94	791.18	791.43	791.67
E	787.57	787.89	788.23	788.57	788.93	789.30	789.61	789.92	790.21	790.47	790.70	790.94	791.16

*Elevation given is at Field Splice.

GUTTERLINE ELEVATIONS				
	EXPANSION ROLLER 5	BENT 6	BENT 7	EXPANSION ROLLER 8
WEST GUTTERLINE	788.89	790.56	792.22	793.25
EAST GUTTERLINE	787.49	788.86	790.15	791.02

BEAM DIMENSIONS					
BEAM	A	B	C	D	E
A	53'-6 1/2"	69'-4 1/2"	55'-4 1/2"	17'-4 3/4"	13'-2 1/2"
B	53'-3 1/2"	65'-9 1/2"	54'-10 3/4"	16'-4 3/4"	13'-2 1/2"
C	52'-11 1/2"	62'-7 1/2"	53'-1 1/2"	15'-6 1/2"	13'-2 1/2"
D	52'-8 1/2"	60'-4 1/2"	51'-4 3/4"	14'-7 1/2"	13'-1 1/2"
E	52'-5 1/2"	56'-2 1/2"	49'-7 1/2"	13'-9 3/4"	13'-0 1/2"

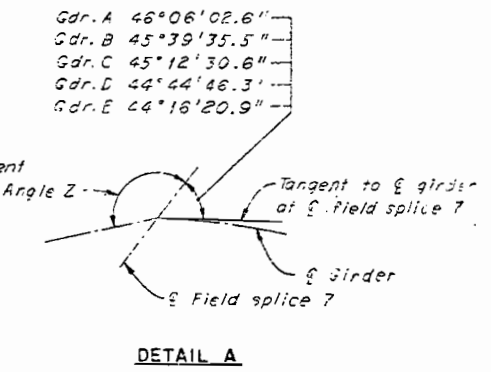
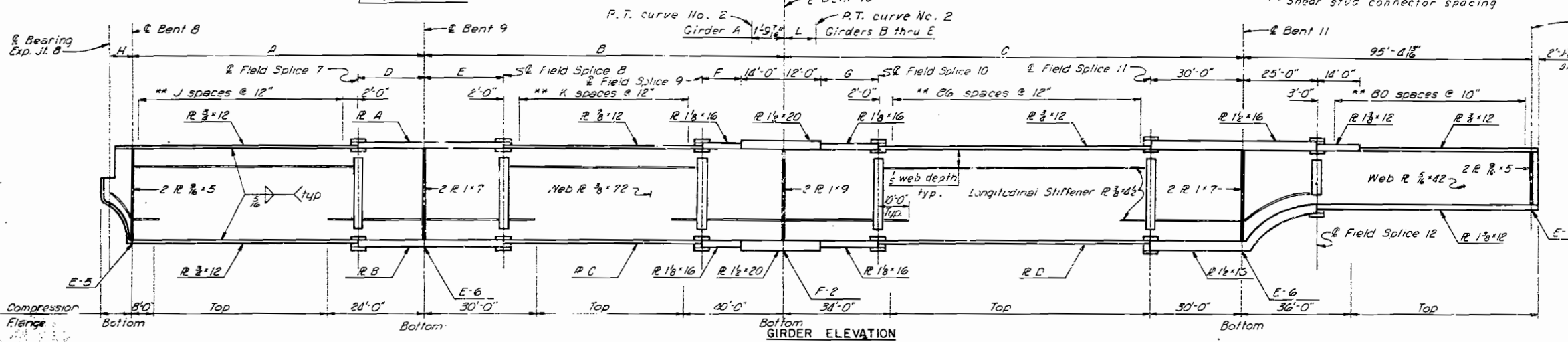
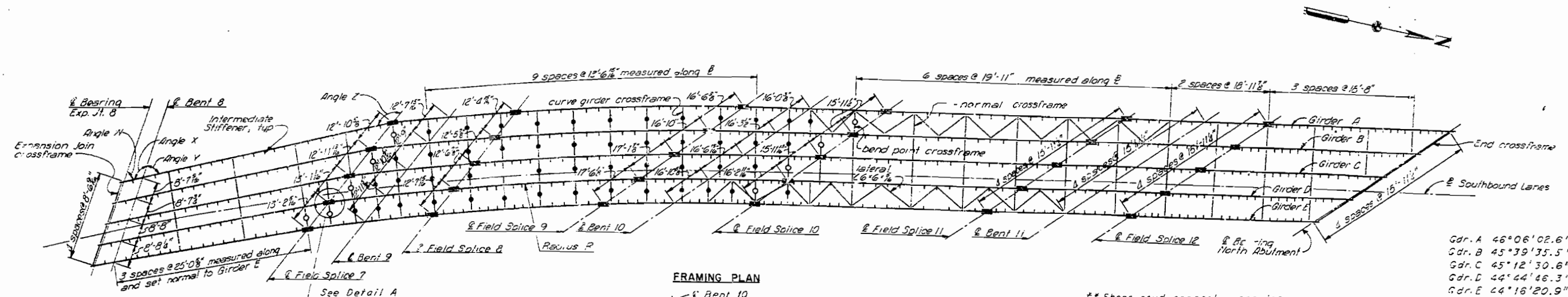


END DIAPHRAGM
Scale: 1/2"=1'-0"

As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD
FRAMING PLAN, UNIT 2
DRAWN DATE: 8-72 HOWARD, MEDLAS, TAMM & KROENHOFF
CHK'D DATE: 2-72 CONSULTING ENGINEERS
SCALE AS SHOWN KANSAS CITY NEW YORK
171-A-3 SHEET 13 OF 26

13 of 26
Elev Co. 94643



Notes

- All flange plates, web plates and bearing stiffeners at bents shall be ASTM A572, Grade 50. Transverse and longitudinal stiffeners, crossframes and laterals shall be A36.
- For field splice details see Sheet 54.
- For expansion roller details see Sheet 53.
- For expansion joint crossframe see Sheet 52.
- For shoe details see sheet 55.
- For shear stud connector detail see Sheet 48.
- For crossframe details see Sheet 51.
- For additional girder details see Sheet 51.
- Intermediate stiffeners shall be placed as shown on framing plan, equally spaced between crossframes or crossframes and bearing stiffeners or crossframes and field splices.
- Intermediate stiffeners shall be R_s 3 1/2" for 42" web others shall be R_s 4 1/2".

GIRDER DATA																				
Girder	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F	Dim. G	Dim. H	J	K	R A	R B	R C	R D	*Rad. R	Angle W	Angle X	Angle Y	Angle Z	Dim. L
A	118'4 1/2"	139'-5 1/2"	148'-9 1/2"	21'-4 3/8"	25'-6 3/8"	10'-9 3/8"	17'-3 1/2"	8'-0 3/8"	95	86	1 1/2 x 16	1 1/2 x 16	1 x 12	1 x 12	1170.42	59°28'53.1"	120°31'06.9"	59°28'53.1"	140°11'36.8"	
B	113'-6 5/8"	133'-11 1/2"	148'-10 3/8"	21'-6 3/8"	25'-8 3/8"	11'-2 3/8"	17'-4 3/8"	8'-0 3/8"	50	80	1 1/2 x 16	1 1/2 x 16	1 x 12	1 x 12	1161.17	59°59'17.0"	120°00'43.0"	59°59'17.0"	139°41'12.9"	11'-3 3/8"
C	108'-2 1/2"	128'-3 3/8"	140'-2 1/2"	21'-8 3/8"	25'-10 3/8"	11'-8 3/8"	17'-8 3/8"	7'-11 1/8"	81	73	1 1/2 x 16	1 1/2 x 16	1 x 12	1 x 12	1151.92	60°35'35.7"	119°24'24.3"	60°35'35.7"	139°04'54.2"	24'-6 3/8"
D	102'-8 1/4"	122'-5 1/4"	149'-8 3/8"	21'-4 10 3/8"	26'-0 3/8"	12'-2 3/8"	18'-2 3/8"	7'-11 1/8"	8	61	1 1/2 x 16	1 1/2 x 16	1 x 12	1 x 12	1142.67	61°19'05.9"	118°40'54.1"	61°19'05.9"	138°21'24.0"	38'-0 3/8"
E	97'-2 3/8"	116'-4 3/8"	150'-5 3/8"	22'-0 3/8"	26'-3 3/8"	12'-8 3/8"	18'-8 3/8"	7'-10 3/8"	73	60	1 1/2 x 16	1 1/2 x 16	1 x 12	1 x 12	1133.42	62°11'37.5"	117°48'22.5"	62°11'37.5"	137°28'52.4"	51'-9 3/8"

TOP OF PAVEMENT ELEVATIONS																					
Girder	Brig. Jt. 8	Bent 8	.1	.2	.3	.4	.5	.6	.7	.8*	.9	Bent 9	1	.2*	.3	.4	.5	.6	.7	.8*	.9
A	793.18	793.30	793.46	793.62	793.77	793.91	794.04	794.18	794.30	794.44	794.46	794.48	794.47	794.43	794.34	794.21	794.07	793.90	793.72	793.48	793.30
B	792.68	792.79	792.94	793.09	793.23	793.37	793.49	793.62	793.73	793.85	793.89	793.91	793.93	793.91	793.87	793.80	793.70	793.59	793.45	793.27	793.12
C	792.18	792.28	792.43	792.56	792.69	792.82	792.94	793.05	793.16	793.26	793.31	793.34	793.35	793.37	793.36	793.33	793.27	793.20	793.11	793.00	792.88
D	791.67	791.77	791.90	792.03	792.15	792.26	792.37	792.48	792.57	792.66	792.72	792.76	792.79	792.81	792.82	792.81	792.79	792.76	792.71	792.56	792.58
E	791.16	791.26	791.38	791.49	791.60	791.70	791.80	791.89	791.98	792.04	792.12	792.17	792.21	792.25	792.26	792.27	792.27	792.27	792.27	792.24	792.20
	Bent 10	.1	.2	.3	.4	.5	.6	.7	.8*	.9	Bent 11	1	.2	.3*	.4	.5	.6	.7	.8	.9	N. Abut.
A	793.05						791.05	790.63	790.20	789.74	789.86	788.94	788.61	788.40	787.93	787.58	787.21	786.84	786.46	786.08	785.73
B	792.94	792.71	792.46	792.18	791.88	791.56	791.22	790.85	790.47	790.06	789.56	789.62	789.34	788.85	788.42	788.10	787.77	787.42	787.07	786.71	786.35
C	792.74	792.56	792.36	792.13	791.88	791.61	791.32	791.00	790.67	790.31	789.97	789.67	789.40	789.23	789.84	789.55	789.25	788.94	788.62	788.29	787.95
D	792.48	792.35	792.20	792.02	791.82	791.60	791.35	791.09	790.80	790.49	790.15	789.93	789.69	789.54	789.20	788.94	788.61	788.39	788.10	787.80	787.49
E	792.15	792.07	791.95	791.84	791.69	791.51	791.32	791.10	790.86	790.60	790.31	790.12	789.92	789.79	789.49	789.26	789.02	788.77	788.51	788.24	787.91

GUTTERLINE ELEVATIONS						
	Brig. Jt. 8	Bent 8	Bent 9	Bent 10	Bent 11	N. Abut.
West Gutterline	793.25	793.38	794.57	793.08	789.19	785.64
East Gutterline	791.02	791.14	792.07	792.09	790.33	788.04

* Elevation given is at field splice.
* Girders are curved from E field splice 7 to P.T. curve No. 2 Sta. 181+61.27.

As Built 2-77

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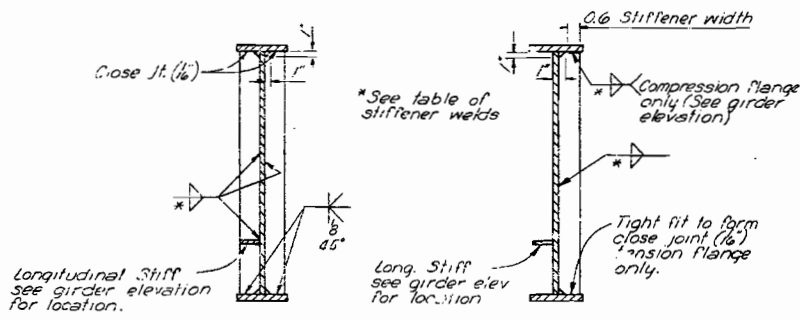
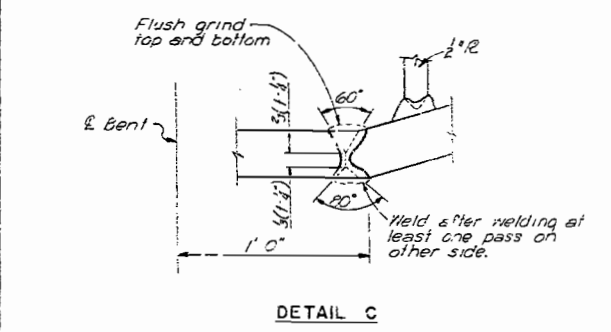
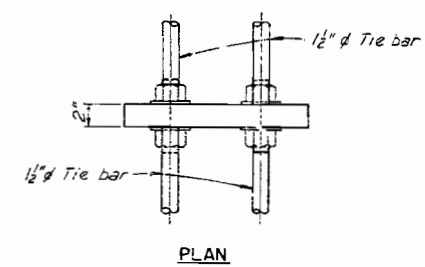
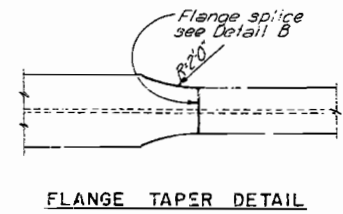
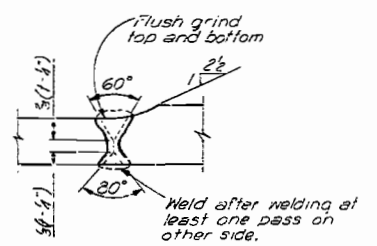
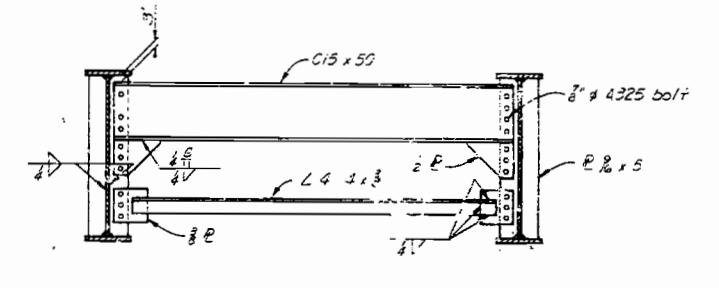
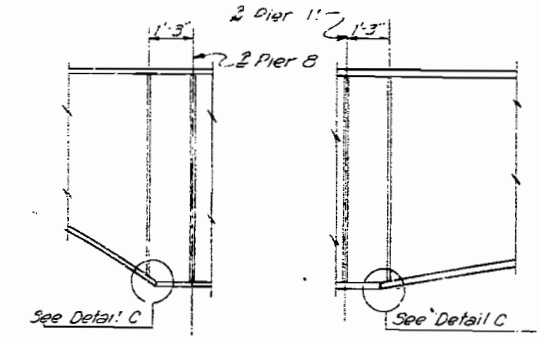
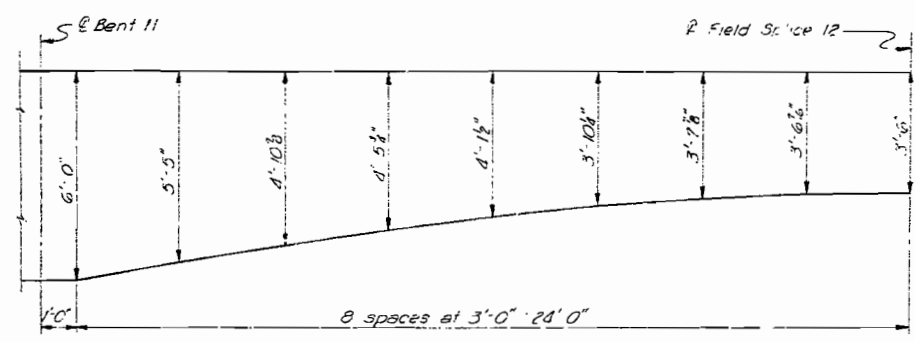
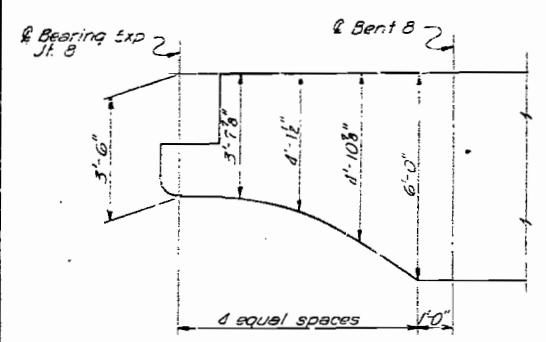
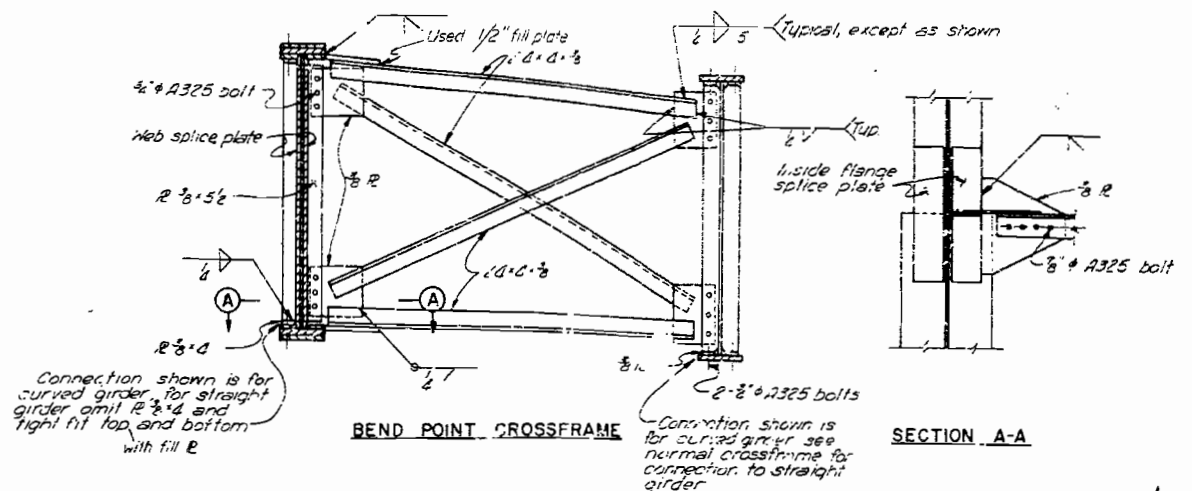
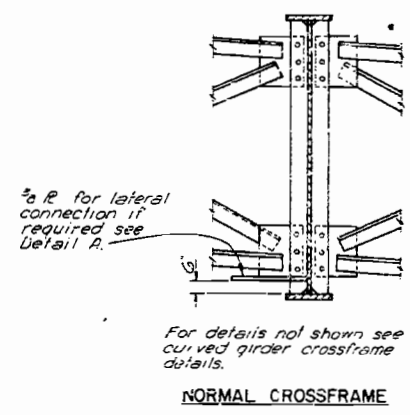
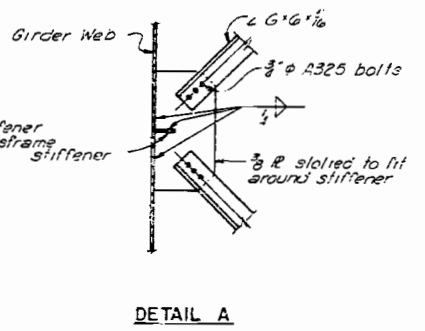
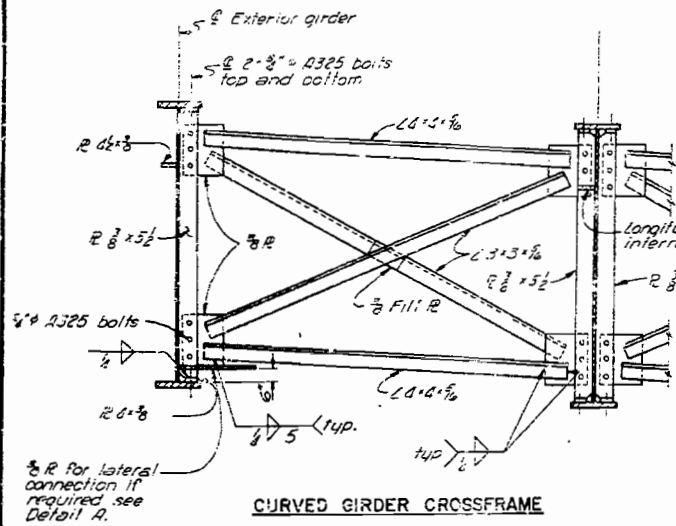
MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD

FRAMING PLAN, UNIT 3

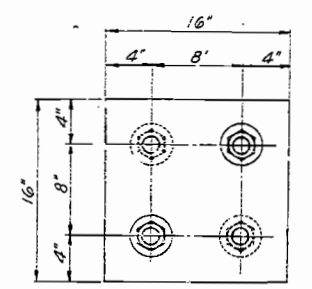
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KANSAS CITY
NEW YORK

14 of 26
G.M. Co. 44645



STIFFENER WELDS	
MAX. THICKNESS OF WEB OR STIFFENER	SIZE OF FILLET WELD
To 3/4" inclusive	3/8"
Over 3/4" to 1 1/2"	1/2"



TIE BAR SPLICE PLATE DETAIL

As Built 2-77

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 ENGINEERING DIVISION

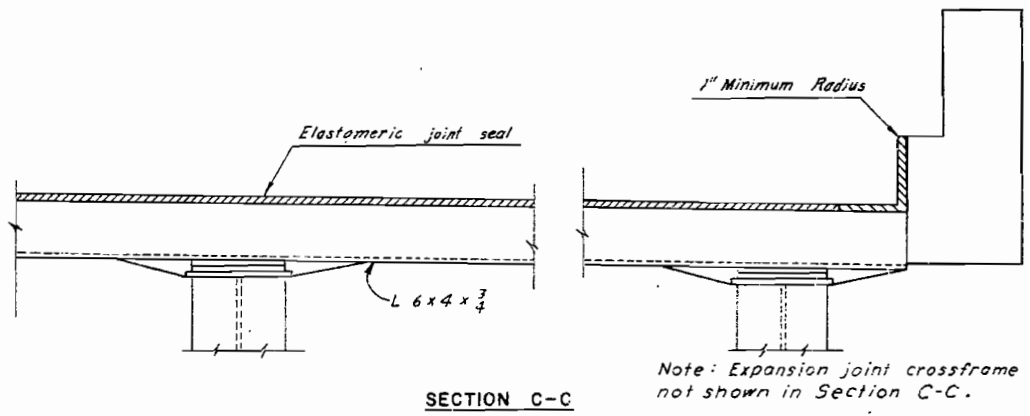
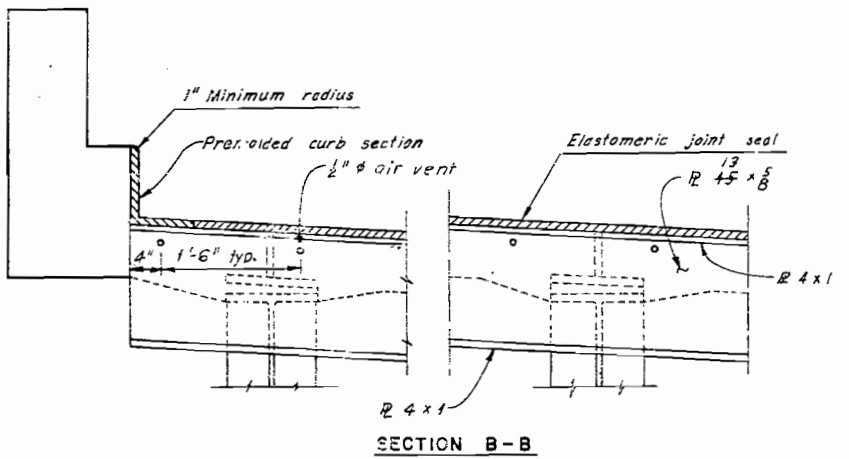
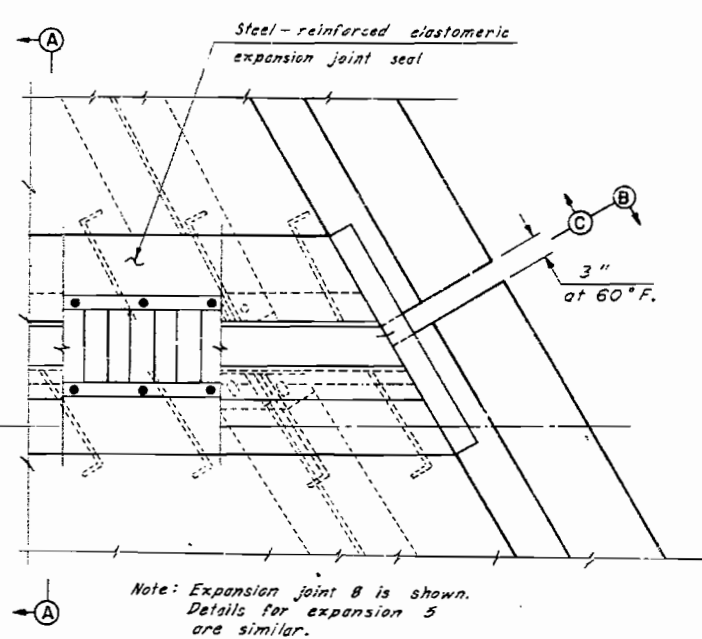
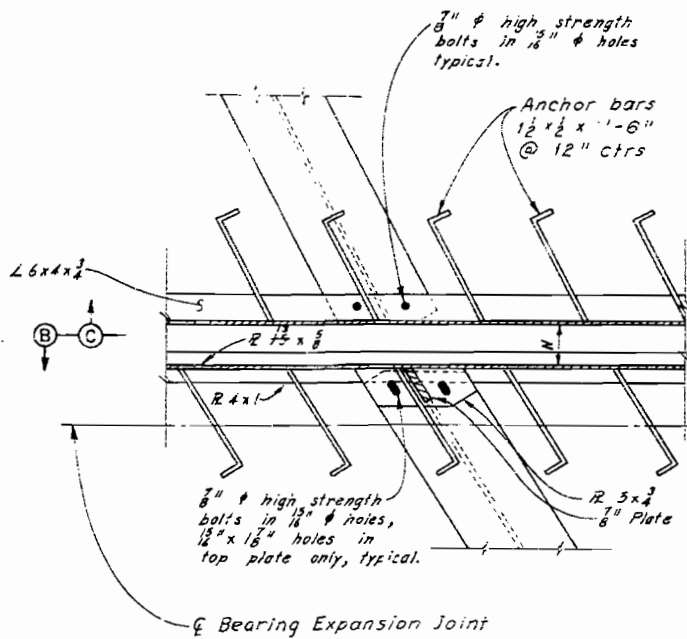
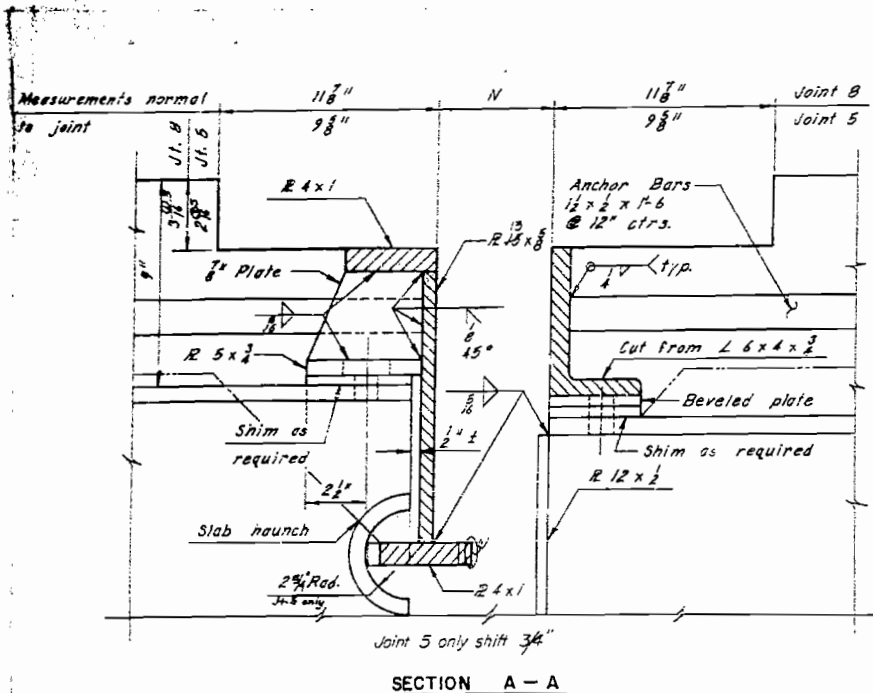
MISSOURI RIVER BRIDGE AT BROADWAY SOUTHBOUND LANES OVER BURLINGTON NORTHERN RAILROAD

GIRDER DETAILS

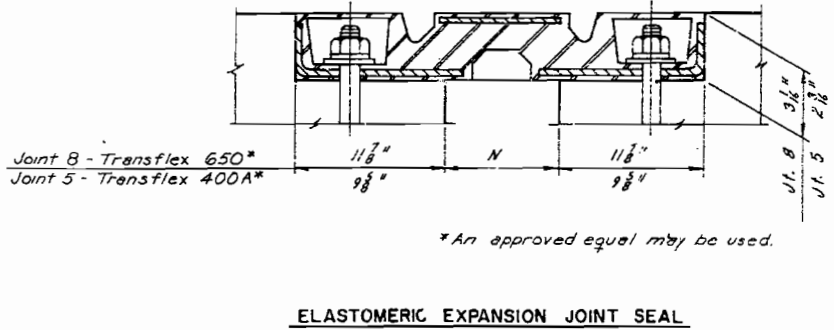
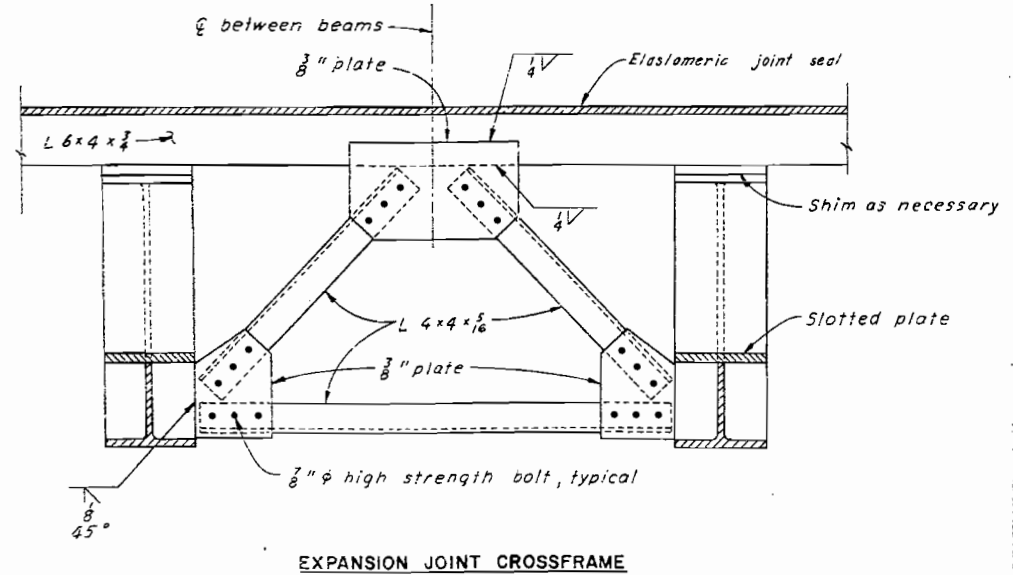
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 OLD C&C DATE 1-12-72 KANSAS CITY ENGINEERS ARCHITECTS
 SCALE No Scale KANSAS CITY NEW YORK
 171-A-3 SHEET 51 OF 64

15 of 26

Clayton 114613



DIMENSION - N		
	Joint 5 & Abuts.	Joint B
Temp.	N	N
120° F	2 1/4"	3"
100	2 3/4"	3 1/2"
80	3 1/4"	4"
70	3 1/2"	4 1/4"
60	3 3/4"	4 1/2"
50	4"	4 3/4"
40	4 1/4"	5"
20	4 3/4"	5 1/2"
0	5 1/4"	6"



As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD

EXPANSION JOINT DETAILS

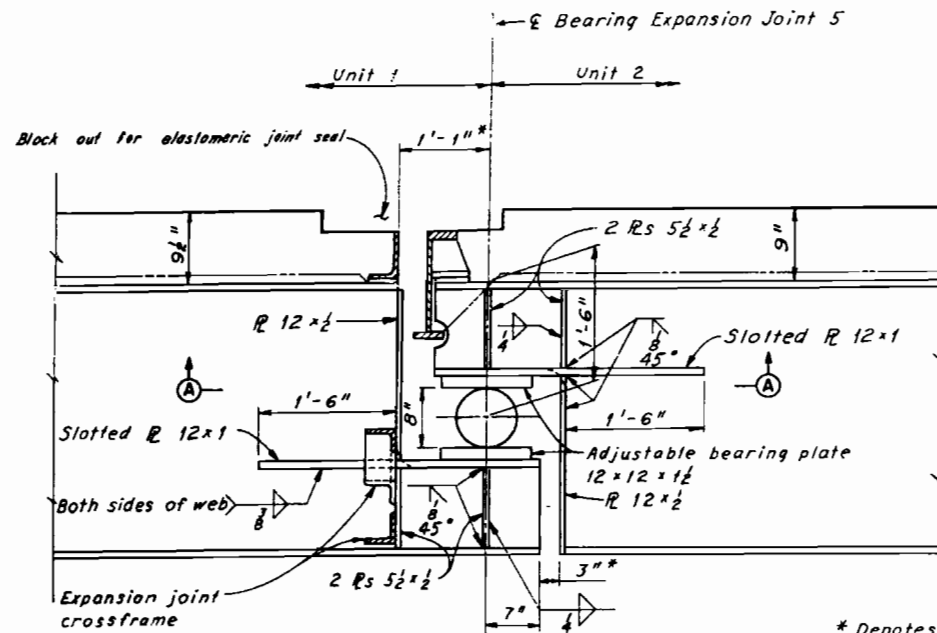
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ENGINEERS

CD: DGS DATE: 2-26-74 KANSAS CITY MISSOURI

SCALE: No Scale 171-A-3 SHEET 52 OF 60

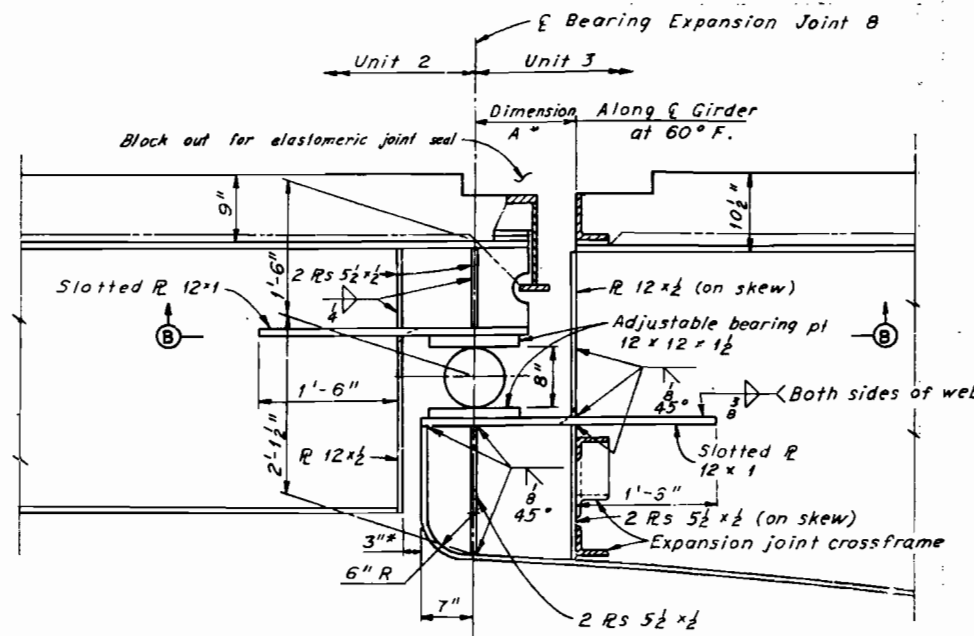
Clay Co. A4693

16 of 26

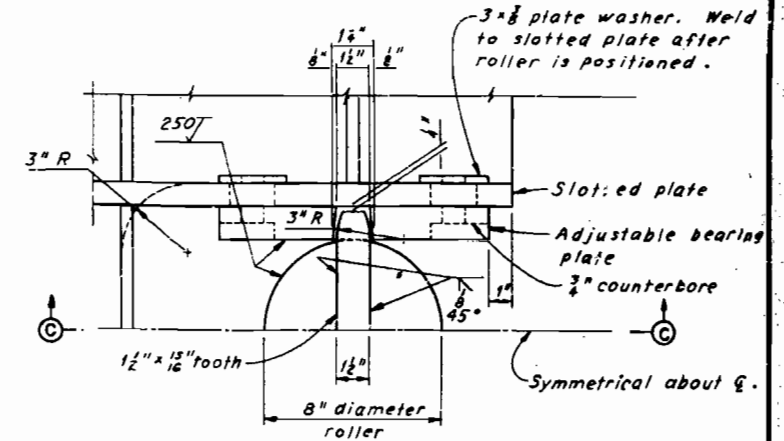


ELEVATION - EXPANSION ROLLER 5

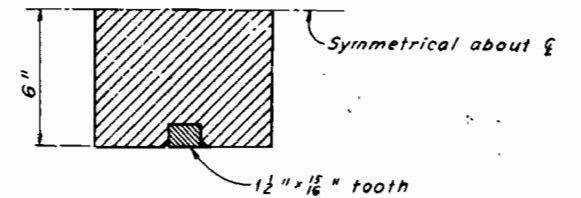
* Denotes dimension at 60° F.
Change for 10° = ¼"



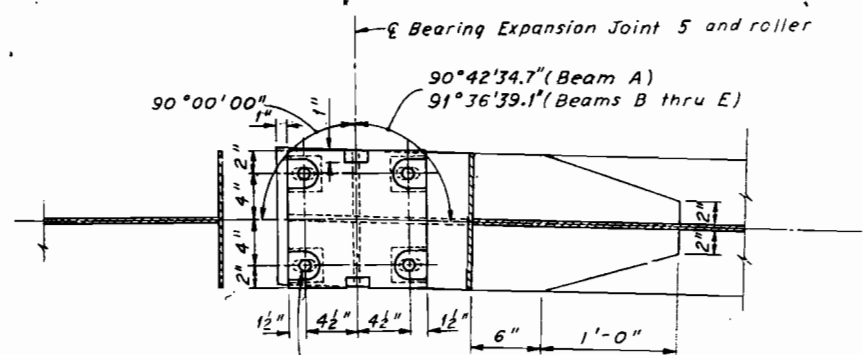
ELEVATION - EXPANSION ROLLER 8



ROLLER DETAIL

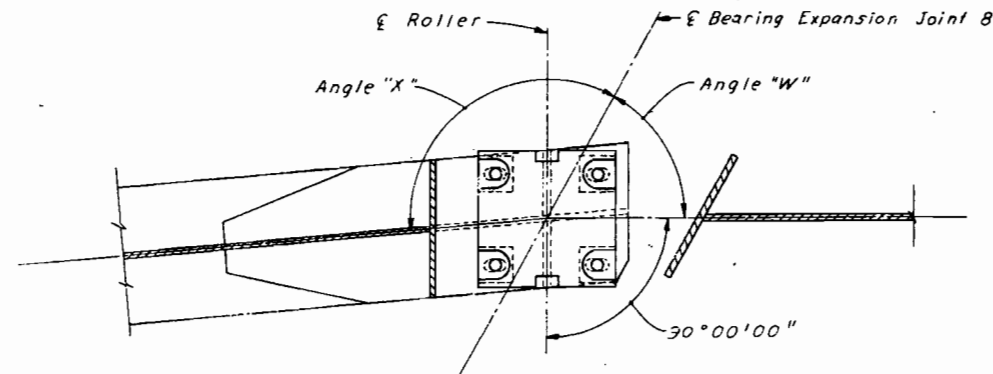


SECTION C-C



1½" hole with 2½" x ¾" counterbore in adjustable plate. 1½" x 1½" hole in slotted plate for ¾" high strength bolts.
Tighten bolts after roller is adjusted with both beams erected.

SECTION A-A



Note: For details not shown see Section A-A.

SECTION B-B

TABLE OF ANGLES AND DIMENSIONS			
BEAM	X	W	A
A	124°09'31.6"	59°28'53.1"	1'-1 1/8"
B	124°20'26.8"	59°59'17.0"	1'-1 1/8"
C	123°53'44.2"	60°35'35.7"	1'-1 1/8"
D	123°24'46.8"	61°19'05.9"	1'-1 1/8"
E	122°53'12.9"	62°11'37.5"	1'-1 1/8"

Notes:
The 8" diameter rollers shall be fabricated of ASTM A588 Class 6.

The adjustable bearing plates shall be fabricated of ASTM A-572 (Grade 50).
Other expansion joint steel shall be ASTM A-36.
For other expansion joint details see Sheet 52.

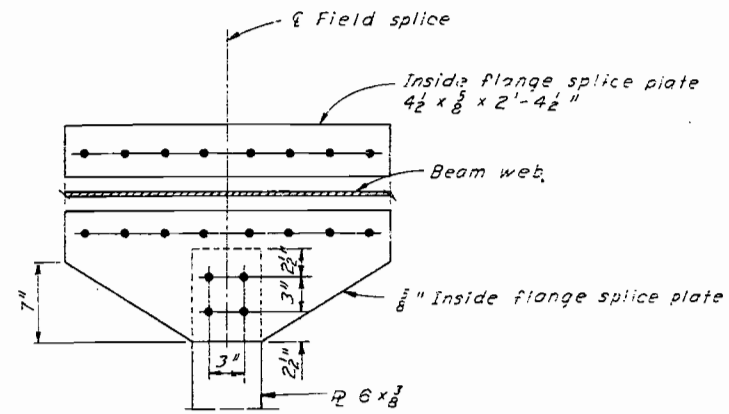
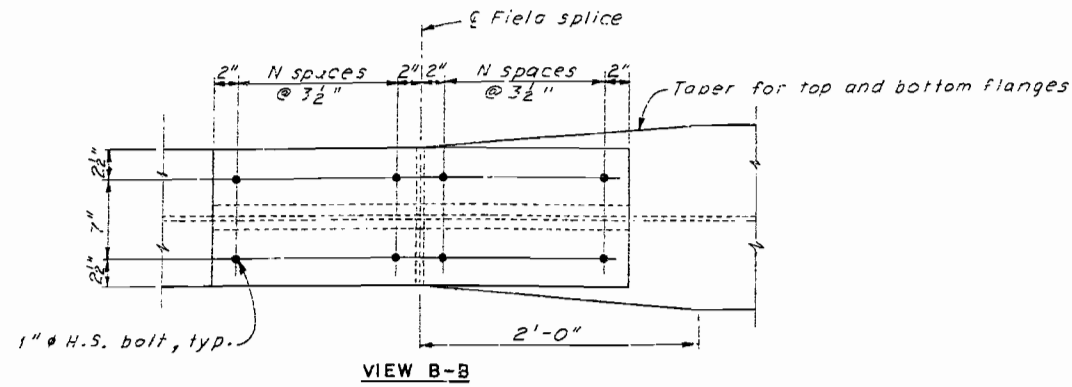
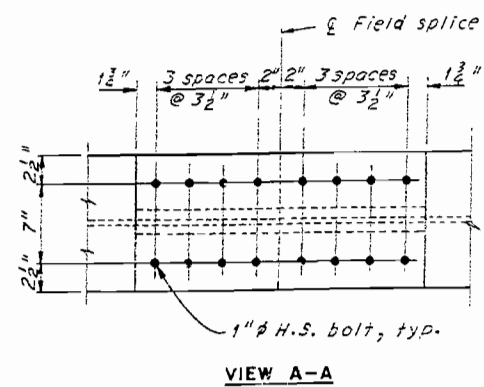
As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD
ROLLER JOINT DETAILS

MADE BY DATE 11-77
CD 1855 DATE 7-10-78
SCALE No Scale
171-A-3

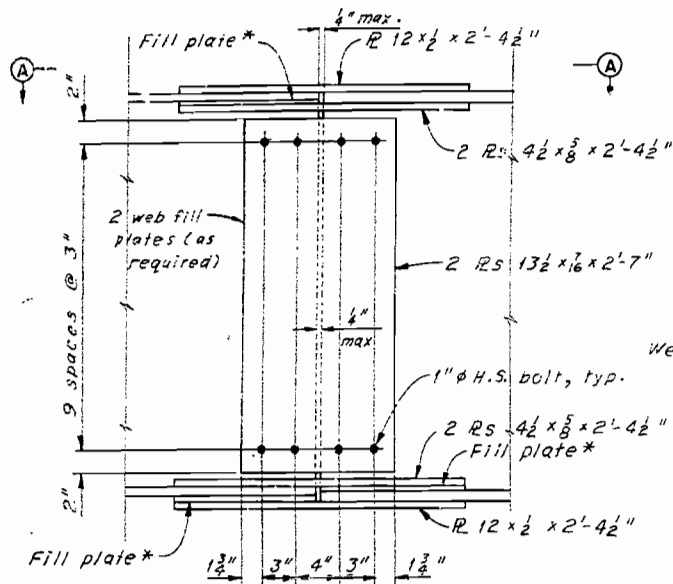
17 of 26

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CONSULTING ENGINEERS
KANSAS CITY
171-A-3



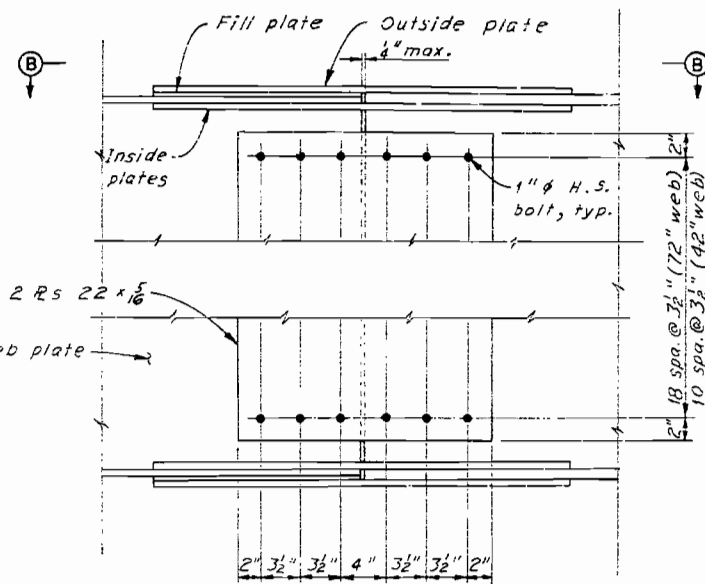
FLANGE SPLICE DETAILS AT BEND LINE DIAPHRAGM
UNITS 1 AND 2

Note: For details not shown see View A-A.

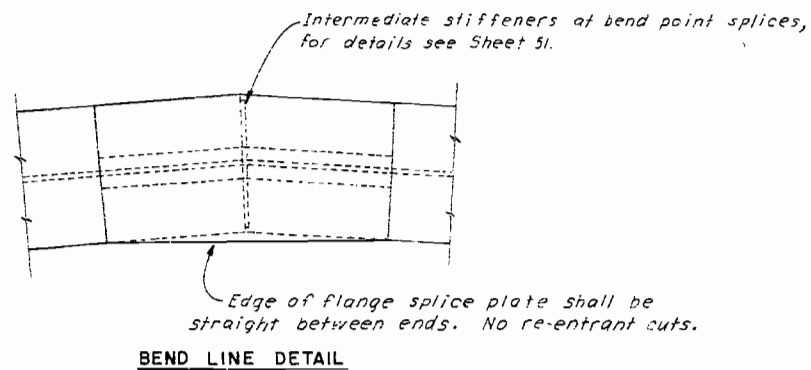


*Note: Fill plates required at Field Splice 4 only.

FIELD SPlice ELEVATION
UNITS 1 AND 2



FIELD SPlice ELEVATION
UNIT 3



CONNECTION	TABLE OF GIRDER FLANGE SPLICES			N
	OUTSIDE PLATE	INSIDE PLATE	FILL PLATE	
12x1/2 to 16x1/2	2 Required	4 Required	2 Required	SPACES
12x1/2 to 16x1/4	12x1/2x3'-0"	5x1/2x3'-0"	1/2"	4
12x1/2 to 16x1/4	12x1/2x3'-0"	5x1/2x3'-0"	1/2"	4
12x1/2 to 16x1/4	12x1/2x3'-0"	5x1/2x3'-0"	1/2"	4
12x1/2 to 16x1/4	12x1/2x3'-7"	5x1/2x3'-7"	1/2"	5
12x1/2 to 16x1/4	12x1/2x3'-7"	5x1/2x3'-7"	1/2"	5
12x1 to 16x1/2	12x1/2x4'-2"	5x1/2x4'-2"	1/2"	6
12x1 to 16x1/2	12x1/2x4'-2"	5x1/2x4'-2"	1/2"	6
12x1/2 to 16x1/2	12x1/2x4'-2"	5x1/2x4'-2"	1/2"	6
12x1/2 to 16x1/2	12x1/2x5'-4"	5x1/2x5'-4"	1/2"	8

Notes:

Flange and web splice plates in Units 1 and 2 shall be ASTM A-36.

Flange and web splice plates in Unit 3 shall be ASTM A-572 (Grade 50).

All fill plates shall be ASTM A-36.

All fasteners shall be ASTM A-325 1" ϕ bolts. The bolts shall be placed with the heads on the outside face of the exterior beams and the bottom of the beam flanges.

Both top and bottom flange splices are identical.

For Bend Line Diaphragm details see Sheet 49.

As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD

FIELD SPlice DETAILS

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

DATE: 2-17-72

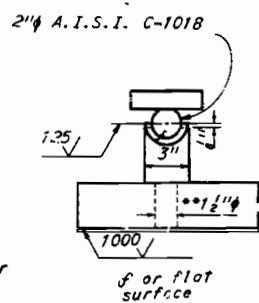
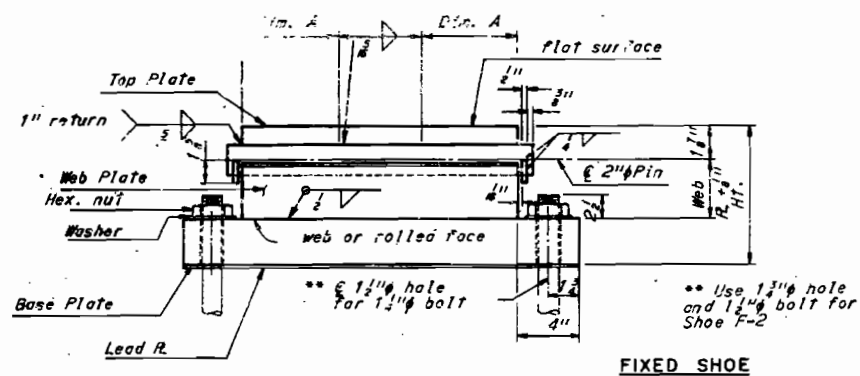
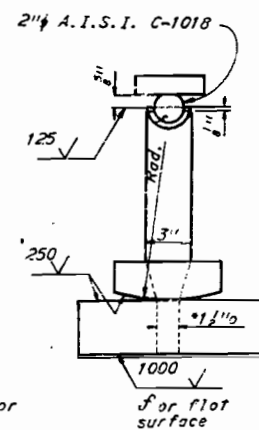
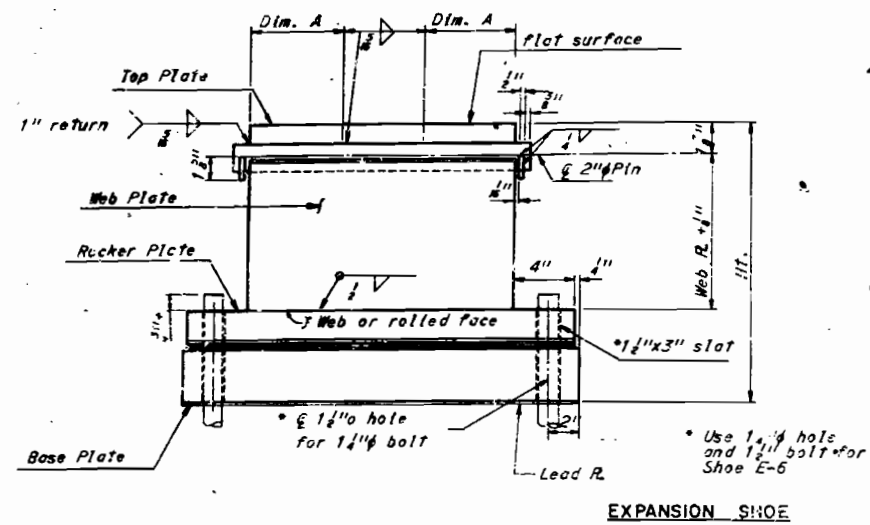
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CONSULTING ENGINEERS
KANSAS CITY, MISSOURI
NEW YORK, NEW YORK

171-A-3

SHEET 54 OF 55

700

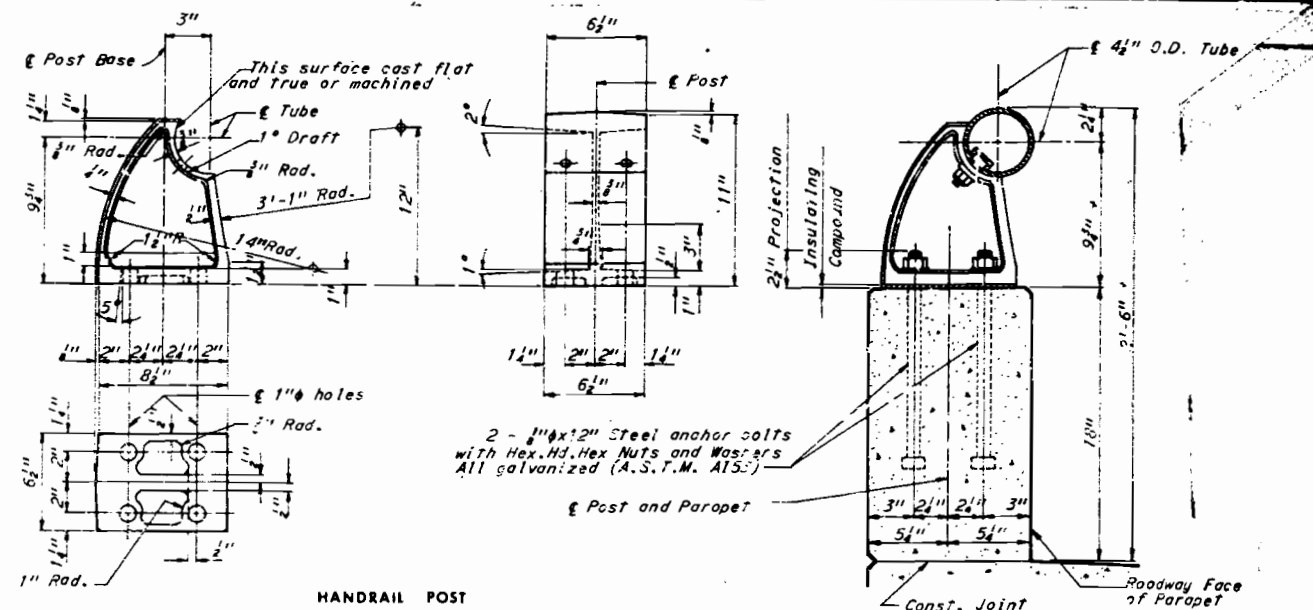
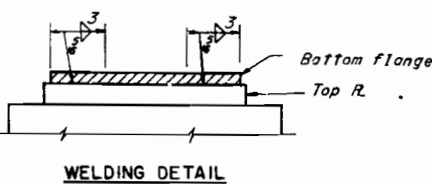
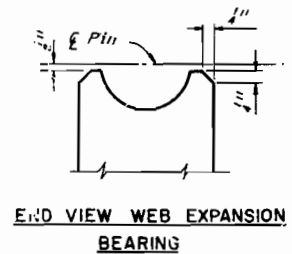
18 of 26
Clay Co.
A 4643



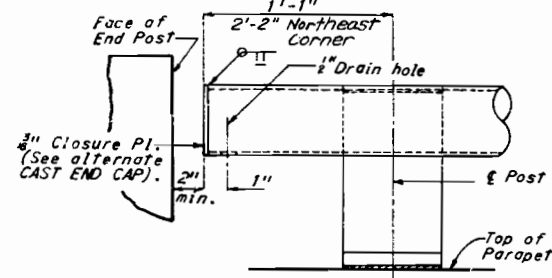
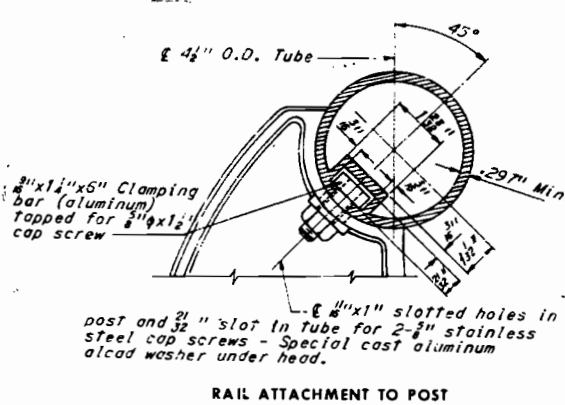
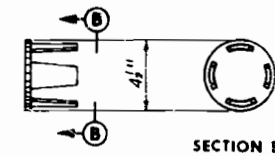
SHOE DATA									
TYPE	BASE PLATE	TOP PLATE	WEB PLATE	ROCKER PLATE	RAD.	DIM. A	HT.	WT.	NO. REQ'D
E-1	9x1 1/2x20 1/2	12x1 1/4x4 1/2	3x5 1/8x12	6x1 1/2x20	7 1/2	4 1/2	10 1/2	192	5
E-2	13x2 1/4x21 1/2	13x1 1/4x4 1/2	3x8 1/2x13	7x2x21	10 1/2	5	14 1/2	368	10
E-3	12x2x21 1/2	13x1 1/4x4 1/2	3x5 1/8x13	7x2x21	7 1/2	5	11 1/2	300	5
E-4	11x1 1/2x21 1/2	13x1 1/4x4 1/2	3x5 1/8x13	7x1 1/2x21	7 1/2	5	11 1/2	267	15
E-5	16x2 1/2x22 1/2	14x1 1/4x4 1/2	3x8 1/2x14	7x2 1/2x22	10 1/2	5 1/2	15 1/2	483	5
E-6	18x3 1/2x26	17 1/2x1 1/4x4 1/2	3x8 1/2x17 1/2	7x2 1/2x25 1/2	11 1/2	6 1/2	16 1/2	741	10
F-1	10x1 1/2x21	13x1 1/4x4 1/2	3x3 1/2x13			5	6 1/2	141	10
F-2	18x3x27	19x1 1/4x4 1/2	3x3 1/2x19			7	8 1/2	505	5

Notes:
Material for Bearings shall be A.S.T.M. A-36 unless shown otherwise.
Lead plates under bearings shall be approximately 1/4" in thickness and weigh 8 lbs./sq. ft.

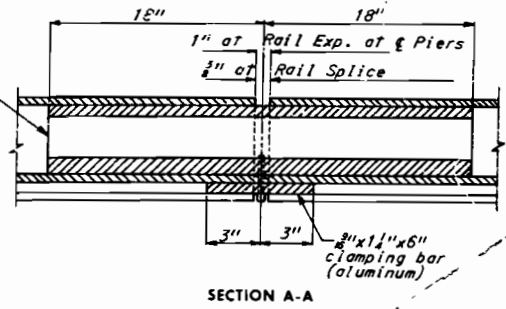
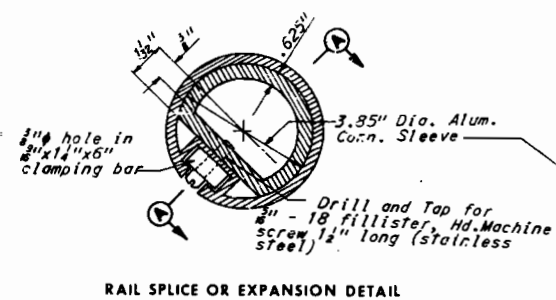
Anchor bolts shall be swaged bolts extended 12" into concrete for 1 1/4" bolts and 15" into concrete for 1 1/2" bolts.
Es noted weight of bearings does not include weight of anchor bolts.



SECTION THRU HANDRAIL



Notes:
All posts shall be set normal to grade.
Aluminum tube shall be bent to conform to vertical and horizontal alignment of parapet.
All outside corners of aluminum posts to be filleted 1/4" except as noted.
All drafts 3° except as noted.
Rail to be fabricated in min. of two panel lengths.
All rail splices, except between units, shall be located near a 1/4 point between rail posts.
If the contractor desires, he may use drive fit cast aluminum end caps in lieu of welded aluminum closure plates.
Top of curbs and parapets to be built parallel to grade with curb and parapet joints normal to grade, are plumb.
All exposed edges of parapets and curbs to have 1/4" radius.
For additional information see Specifications.
All exposed edges of end posts shall have 1/4" bevel.



As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

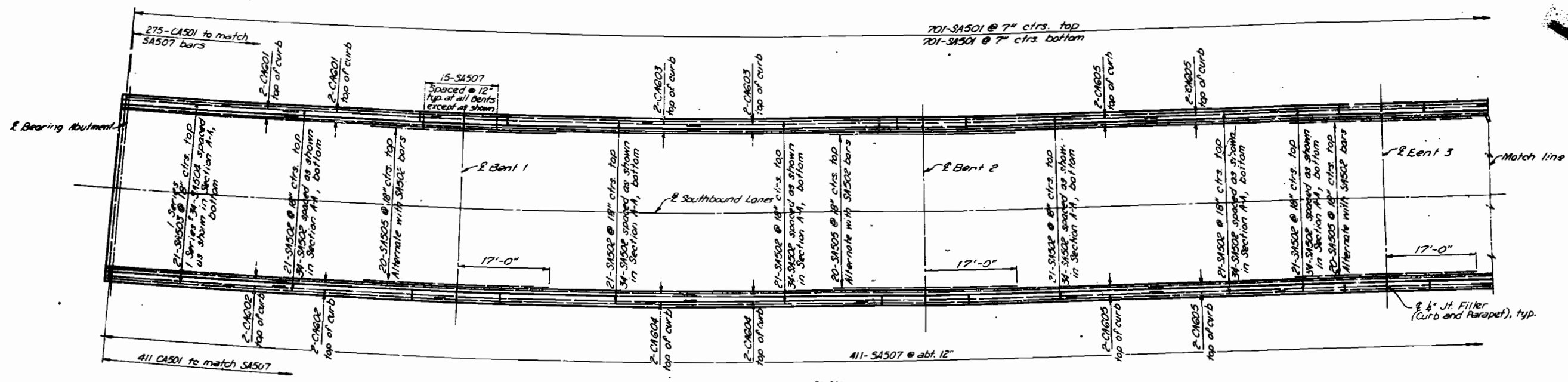
**MISSOURI RIVER BRIDGE AT BROADWAY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD**

SHOES AND HANDRAIL DETAILS

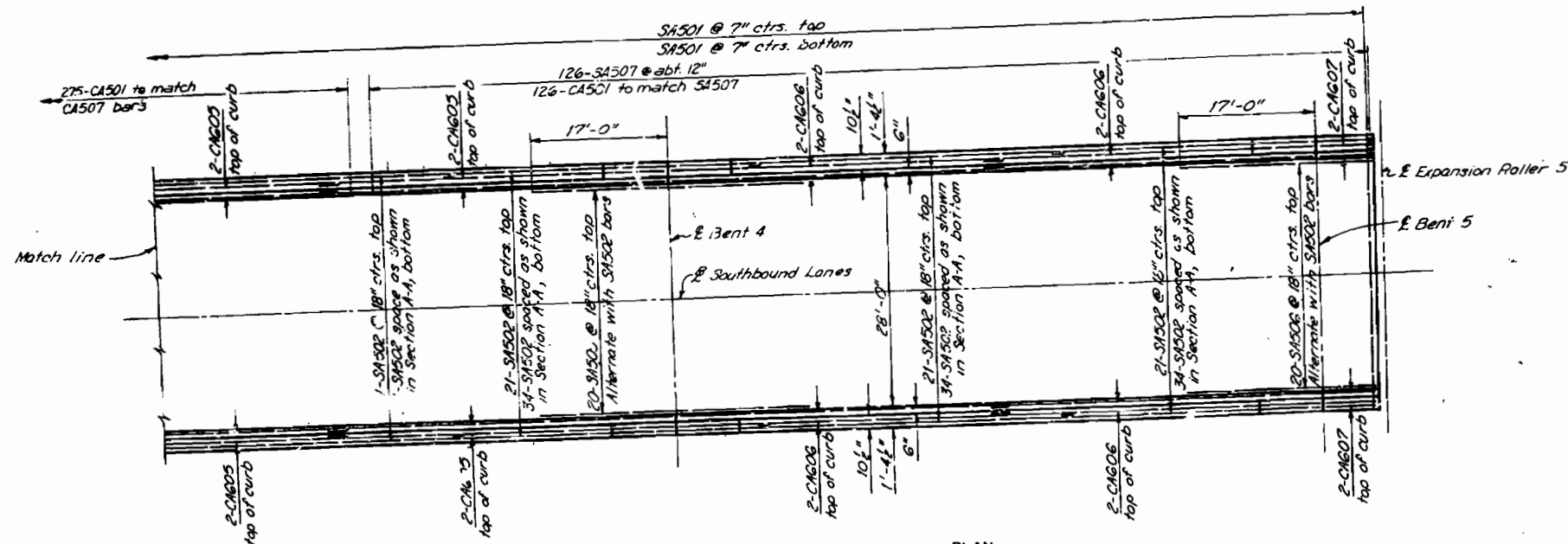
DATE 2-22-72
CHECKED DATE 7-11-72
SCALE No Scale

HOWARD, NEEDLES, TAMMEN & BERGENSON
CONSULTING ENGINEERS
KANSAS CITY, MISSOURI
NEW YORK, NEW YORK

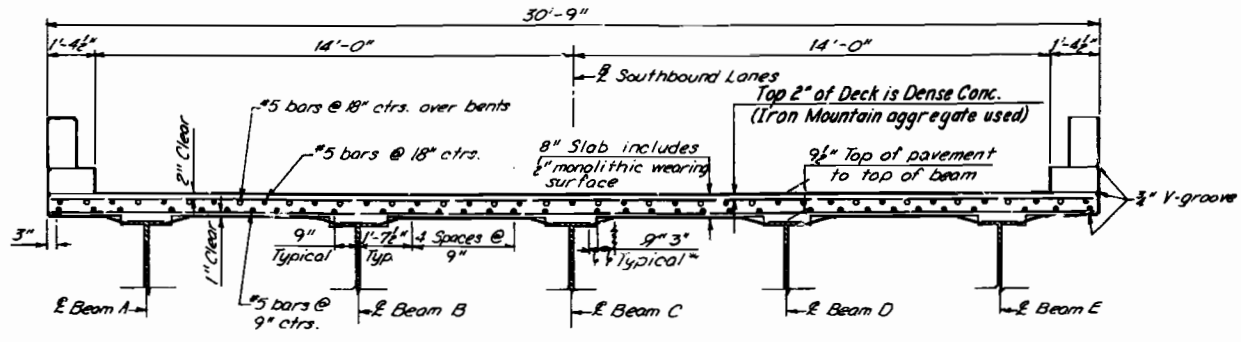
171-A-3



PLAN

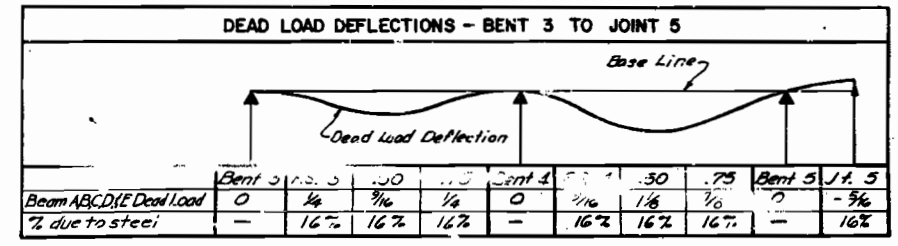
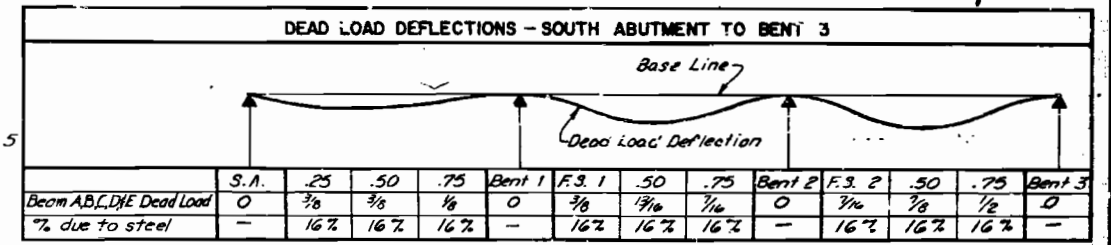


PLAN



TYPICAL SECTION

Scale: 3/8" = 1'-0"
* Chamfer corners 3/4"



Notes:
All transverse bars are normal to E Roadway.
The spacing of slab transverse bars are measured along West Fascia.
For other notes see Sheet 57.

As Built 2-77

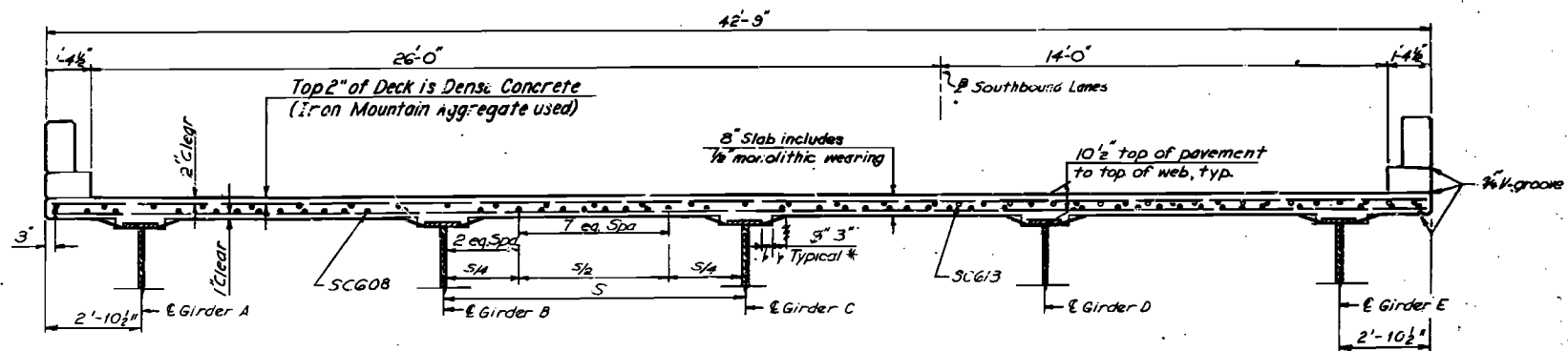
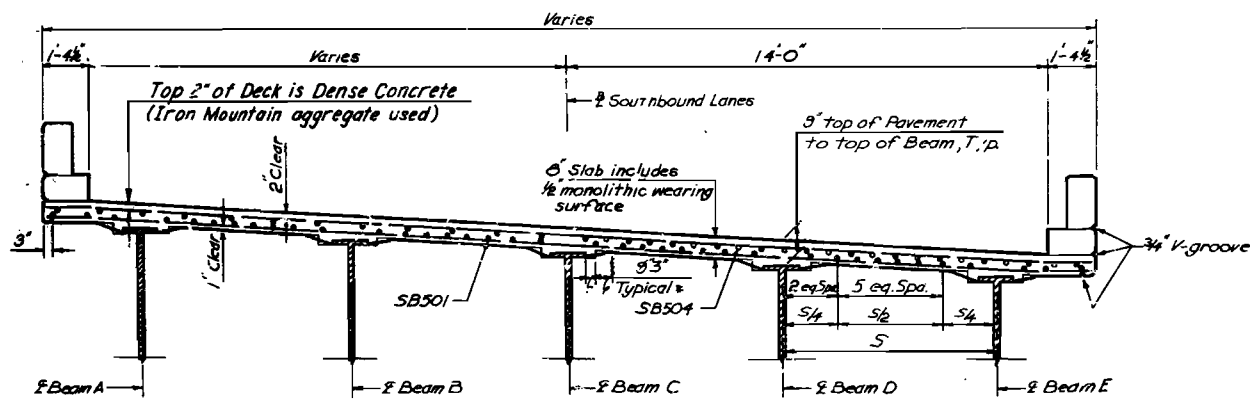
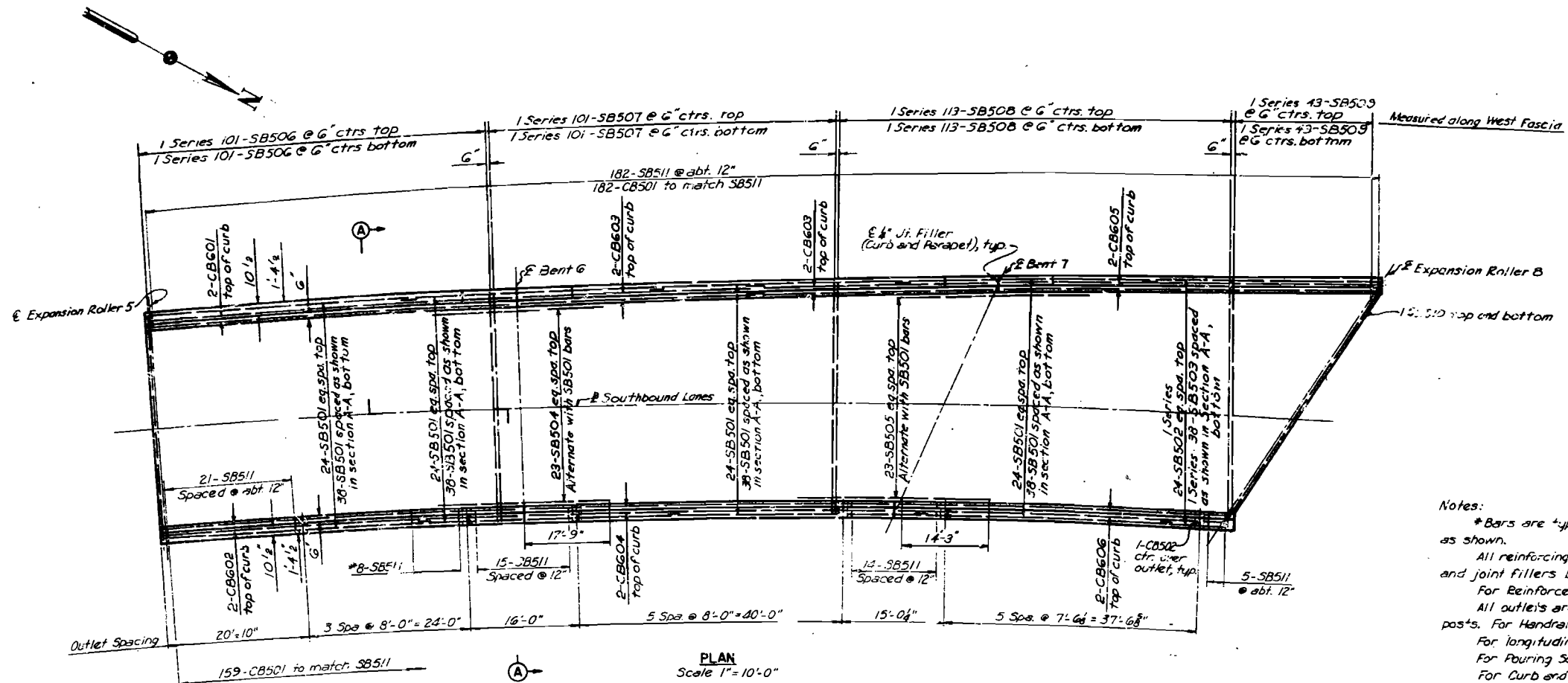
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MISSOURI RIVER BRIDGE AT BLOOMSBURY
SOUTHBOUND LANES OVER
BURLINGTON NORTHERN RAILROAD

SLAB PLAN, UNIT I

DESIGNED BY RAS DATE 5-26-72
CHECKED BY DWB DATE 7-7-72
SCALE 1" = 12'-0"

20 of 36
Sheet 8
4964



DEAD LOAD DEFLECTIONS - JOINT 5 TO JOINT 8

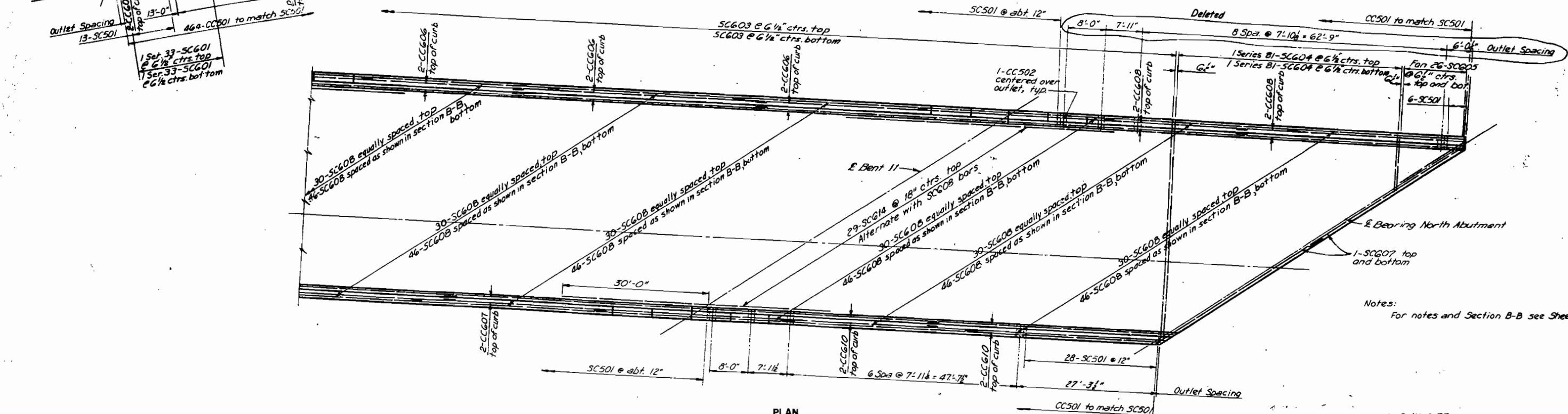
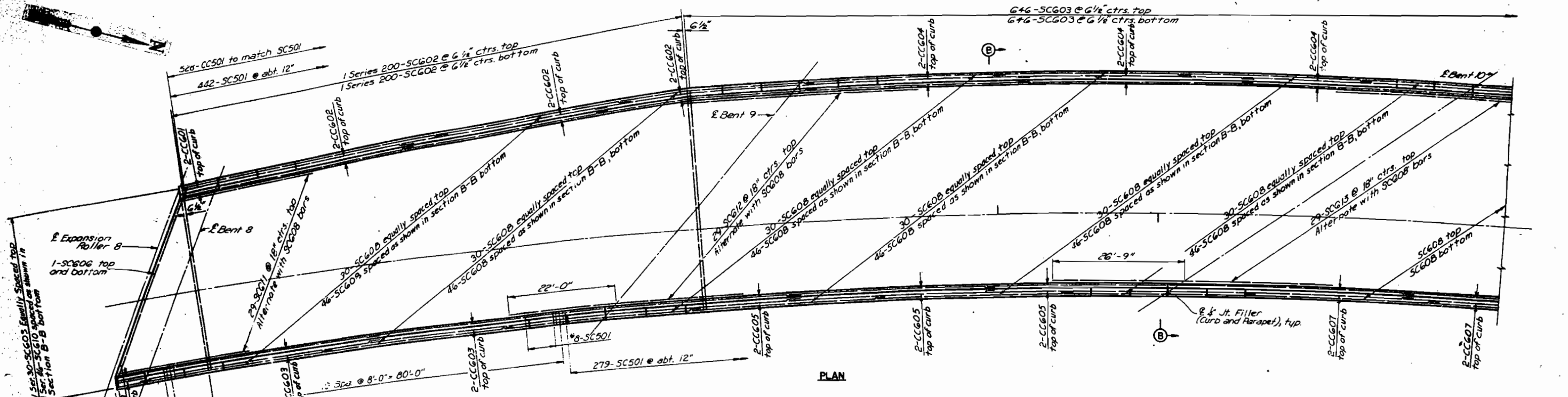
	Jt. 5	.25	.50	.75	Bent 6	F.S. 5	.50	.75	Bent 7	F.S. 6	.50	.75	Jt. 8
Beam A+B Dead Load	0	1/4	1/4	1/4	0	3/16	3/16	3/16	0	3/16	3/16	3/16	0
Beam C Dead Load	0	1/4	1/4	1/4	0	1/8	1/8	1/8	0	3/16	3/16	1/4	0
Beam D+E Dead Load	0	1/4	3/8	3/8	0	1/8	3/16	1/8	0	3/16	3/16	1/4	0
% due to Steel	-	16%	16%	16%	-	16%	16%	16%	-	16%	16%	16%	-

As Built 2-77

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 MISSOURI RIVER BRIDGE AT BROADWAY
 SOUTHBOUND LANES OVER
 BURLINGTON NORTHERN RAILROAD
 SLAB PLAN, UNIT 2

APPROVED DATE 6-9-72
 AND DWG DATE 2-6-72
 DRAWN AS SHOWN
 KANSAS CITY
 171-A-3

21 of 26
 City Co. 171-A-3



Notes:
For notes and Section B-B see Sheet 57.

As Built 2-77
10 0 10 20

DEAD LOAD DEFLECTIONS - JOINT 8 TO NORTH ABUTMENT

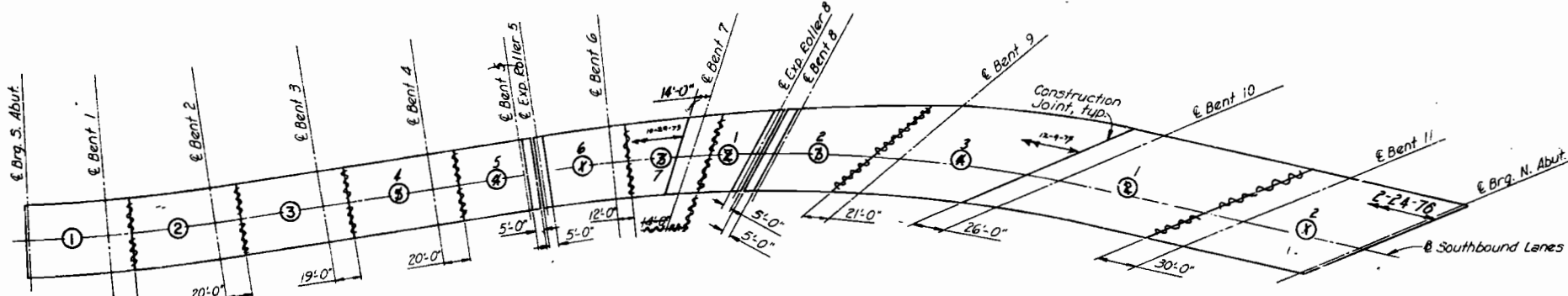
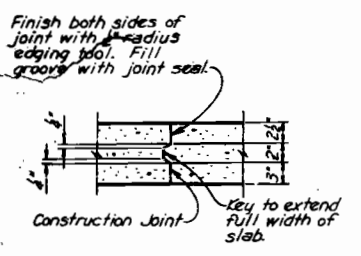
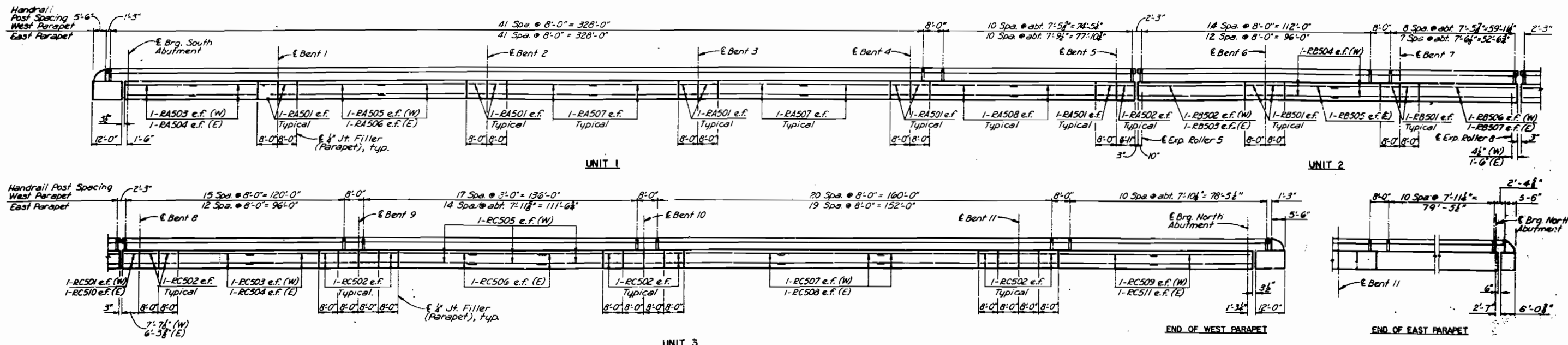
	Jt. 8	Bent 8	.25	.50	F.S. 7	Bent 9	.10	F.S. 8	.30	.40	.50	.60	.70	F.S. 9	.90	Bent 10	.10	F.S. 10	.30	.40	.50	.60	.70	F.S. 11	.90	Bent 11	F.S. 12	.50	.75	N.A.	
Beam A/B Dead Load	-1/8	0	1/8	1/4	3/8	0	1/8	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	0
Beam C Dead Load	-1/8	0	1/8	1/4	3/8	0	1/8	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	0
Beam D/E Dead Load	-1/8	0	1/8	1/4	3/8	0	1/8	1/4	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	0
% due to steel	25%	-	25%	25%	25%	-	25%	25%	25%	25%	25%	25%	25%	25%	25%	-	25%	25%	25%	25%	25%	25%	25%	25%	25%	-	25%	25%	25%	-	

SLAB PLAN, UNIT 3

MADE LJB MAR 20-72
CWD/DWB MAR 7-10-72
SCALE 1" = 10'-0"

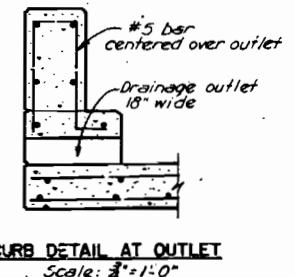
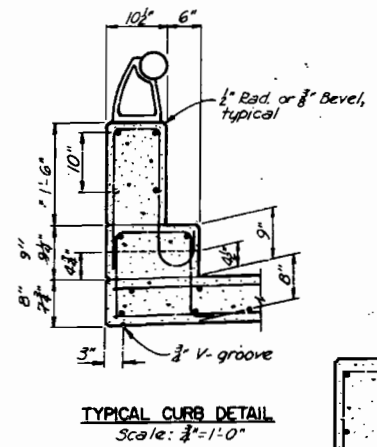
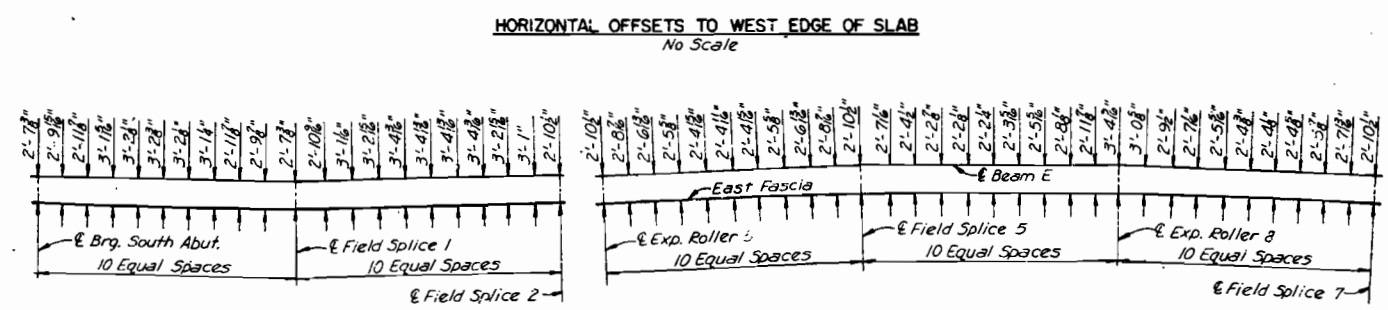
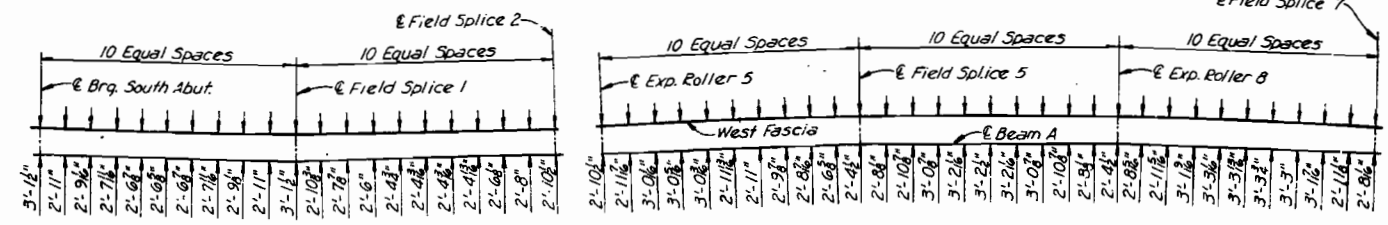
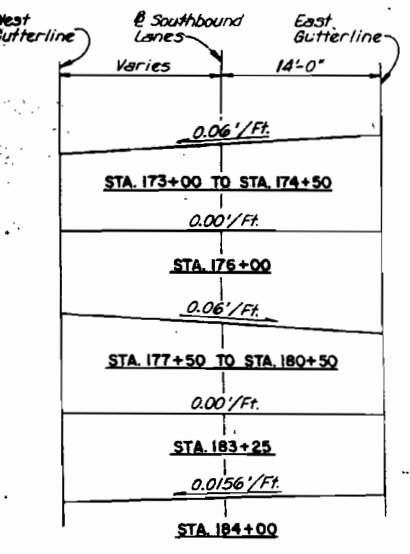
171-A-3

22 of 26
CMAA Co.



Notes:

All railing dimensions are given along E parapet.
e.f. denotes each face.
(W) denotes west parapet.
(E) denotes east parapet.
For Reinforcement Schedule see Sheet 62.
For handrail details see Sheet 53.
Pour 1 of Unit 2 prior to Pour 4 of Unit 1.
Pour 2 of Unit 2 prior to Pour 3 of Unit 3.
Pours are to be made within 5 ft. each side of the joints prior to setting the joints to line and grade. After setting joints, the remaining 5 ft. each side is to be poured.
For expansion joint dimensions see Sheets 47 and 53.
The Contractor may submit to the Engineer, for approval, alternate pouring sequences.



DETAILS OF BEVEL FOR FILLED JOINT
No Scale

Notes: Use bevel as shown for exposed faces of all filled joints.

As Built 2-77

KANSAS CITY, MISSOURI
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

MISSOURI RIVER BRIDGE AT BROADWAY SOUTHBOUND LANES OVER BURLINGTON NORTHERN RAILROAD

SLAB DETAILS

DATE: 6-22-72
CD: DMB DATE: 7-10-72
SCALE: AS SHOWN

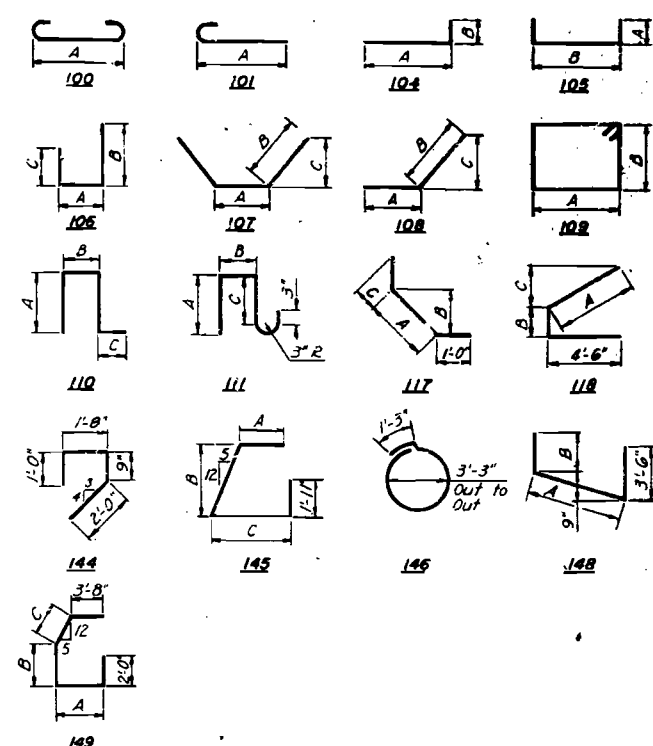
HOWARD, NEEDLES, TAMM & BERENSON
CONSULTING ENGINEERS
KANSAS CITY
171-A-3

1010

MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
SOUTH ABUTMENT								
AA401	25	4'-8"	105	2'-8"	1'-0"		78	
AA402	4 Str. 7	2'-6" to 5'-9"	Str.			6"	77	
AA403	4	4'-9"	Str.				13	
AA404	8	4'-3"	105	3'-9"	6"		23	
AA501	16	9'-6"	Str.				159	
AA502	4	6'-3"	Str.				26	
AA503	26	3'-2"	105	1'-7"	1'-0"		86	
AA504	8	11'-2"	Str.				93	
AA505	14	5'-9"	105	2'-7"	7"		84	
AA506	2	7'-3"	105	3'-4"	7"		15	
AA507	2	7'-1"	105	3'-3"	7"		15	
AA508	2	6'-9"	105	3'-1"	7"		14	
AA509	2	6'-5"	105	2'-11"	7"		13	
AA510	2	11'-0"	105	4'-8"	2'-9"		23	
AA511	2	11'-0"	105	3'-3"	2'-6"		29	
AA601	28	10'-8"	104	10'-0"	8"		448	
AA602	52	5'-3"	144				424	
AA603	28	17'-5"	145	3'-6"	5'-6"	6'-0"	733	
AA604	8	31'-6"	100	30'-2"			379	
AA605	29	30'-2"	Str.				907	
AA606	4	2'-8"	Str.				16	
AA607	4	9'-0"	104	5'-3"	3'-9"		54	
AA608	4	12'-3"	108	10'-3"	2'-0"	1'-9"	74	
AA609	8	11'-8"	Str.				140	
AA610	4 Str. 4	5'-0" to 11'-0"	Str.			2'-0"	192	
AA611	10	6'-6"	117	4'-6"	3'-2"	8"	98	
AA612	4	5'-6"	108	4'-6"	12"	9"	33	
AA613	4	7'-6"	Str.				45	
AA614	28	9'-2"	106	11"	6'-3"	2'-0"	386	
AA701	10	12'-9"	118	6'-3"	1'-6"	4'-5"	261	
AA702	2	6'-6"	104	5'-0"	2'-6"		31	
AA703	2	6'-9"	104	4'-3"	2'-6"		28	
AA704	2	8'-3"	104	6'-0"	2'-3"		34	
AA705	2	8'-0"	104	5'-9"	2'-3"		32	
AA706	2	7'-9"	104	5'-6"	2'-3"		32	
AA707	2	7'-5"	104	5'-3"	2'-3"		31	
AA708	2	7'-3"	104	5'-0"	2'-3"		30	
Total							5,151	
BENT 1								
BA401	35	11'-5"	146				267	
BA501	35	5'-4"	105	1'-0"	3'-8"		207	
BA502	21	15'-6"	109	3'-8"	3'-8"		339	
BA601	8	7'-4"	105	1'-11"	3'-6"		88	
BA602	4	28'-6"	Str.				171	
BA801	20	12'-2"	100	10'-0"			650	
BA802	28	9'-2"	100	7'-0"			685	
BA901	14	28'-6"	Str.				1,357	
BA902	10	10'-6"	Str.				357	
BA903	3	12'-0"	Str.				124	
BA1101	20	7'-5"	104	6'-3"	1'-2"		788	
BA1102	10	19'-0"	Str.				1,009	
BA1103	10	20'-0"	Str.				1,063	
Total							7,104	

MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
BENT 2								
BB401	43	11'-5"	146				328	
BB501	35	5'-8"	105	1'-0"	3'-8"		207	
BB502	21	15'-6"	109	3'-8"	3'-8"		339	
BB601	8	7'-4"	105	1'-11"	3'-6"		88	
BB602	4	28'-6"	Str.				171	
BB801	22	13'-2"	100	11'-0"			773	
BB802	30	10'-2"	100	8'-0"			914	
BB901	14	28'-6"	Str.				1,357	
BB902	10	10'-6"	Str.				357	
BB903	3	12'-0"	Str.				124	
BB1101	20	7'-5"	104	6'-3"	1'-2"		788	
BB1102	10	23'-6"	Str.				1,249	
BB1103	10	24'-6"	Str.				1,302	
Total							7,897	
BENT 3								
BC401	54	11'-5"	146				412	
BC501	35	5'-8"	105	1'-0"	3'-8"		207	
BC502	21	15'-6"	109	3'-8"	3'-8"		339	
BC601	8	7'-4"	105	1'-11"	3'-6"		88	
BC602	4	28'-6"	Str.				171	
BC801	22	13'-2"	100	11'-0"			773	
BC802	30	12'-2"	100	10'-0"			975	
BC901	14	28'-6"	Str.				1,357	
BC902	10	10'-6"	Str.				357	
BC903	3	12'-0"	Str.				124	
BC1101	20	7'-5"	104	6'-3"	1'-2"		788	
BC1102	10	29'-3"	Str.				1,554	
BC1103	10	29'-6"	Str.				1,562	
Total							8,712	
BENT 4								
BD401	60	11'-5"	146				458	
BD501	35	5'-8"	105	1'-0"	3'-8"		207	
BD502	21	15'-6"	109	3'-8"	3'-8"		339	
BD601	8	7'-4"	105	1'-11"	3'-6"		88	
BD602	4	28'-6"	Str.				171	
BD801	22	13'-2"	100	11'-0"			773	
BD802	30	10'-2"	100	8'-0"			914	

MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
BD901	14	28'-6"	Str.				1,357	
BD902	10	10'-6"	Str.				357	
BD903	3	12'-0"	Str.				124	
BD1101	20	7'-5"	104	6'-3"	1'-2"		788	
BD1102	10	32'-3"	Str.				1,713	
BD1103	10	32'-0"	Str.				1,700	
Total							8,889	
BENT 5								
BE401	65	11'-5"	146				496	
BE501	35	5'-8"	105	1'-0"	3'-8"		207	
BE502	19	15'-6"	109	3'-8"	3'-8"		307	
BE601	8	7'-4"	105	1'-11"	3'-6"		88	
BE602	4	28'-6"	Str.				171	
BE801	20	12'-2"	100	10'-0"			650	
BE802	30	10'-8"	100	8'-6"			855	
BE901	14	28'-6"	Str.				1,357	
BE902	10	10'-6"	Str.				357	
BE903	3	12'-0"	Str.				124	
BE1101	20	7'-5"	104	6'-3"	1'-2"		788	
BE1102	10	35'-6"	Str.				1,886	
BE1103	10	34'-9"	Str.				1,846	
Total							9,132	
BENT 6								
BF401	69	11'-5"	146				526	
BF501	35	5'-8"	105	1'-0"	3'-8"		207	
BF502	19	15'-6"	109	3'-8"	3'-8"		307	
BF601	8	7'-4"	105	1'-11"	3'-6"		88	
BF602	4	28'-0"	Str.				174	
BF801	20	12'-2"	100	10'-0"			650	
BF802	30	10'-8"	100	8'-5"			855	
BF901	14	29'-0"	Str.				1,380	
BF902	10	10'-6"	Str.				357	
BF903	3	12'-0"	Str.				122	
BF1101	20	7'-5"	104	6'-3"	1'-2"		788	
BF1102	10	37'-3"	Str.				1,979	
BF1103	10	36'-3"	Str.				1,926	
Total							9,359	



BAR BENDING DIAGRAM

Notes:
 All bar dimensions are given out to out.
 All bars of a series shall vary in length by a constant increment.

As Built 2-77

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 REINFORCEMENT DIVISION

**MISSOURI RIVER BRIDGE AT BROADWAY
 SOUTHBOUND LANES OVER
 BURLINGTON NORTHERN RAILROAD**

REINFORCEMENT SCHEDULE

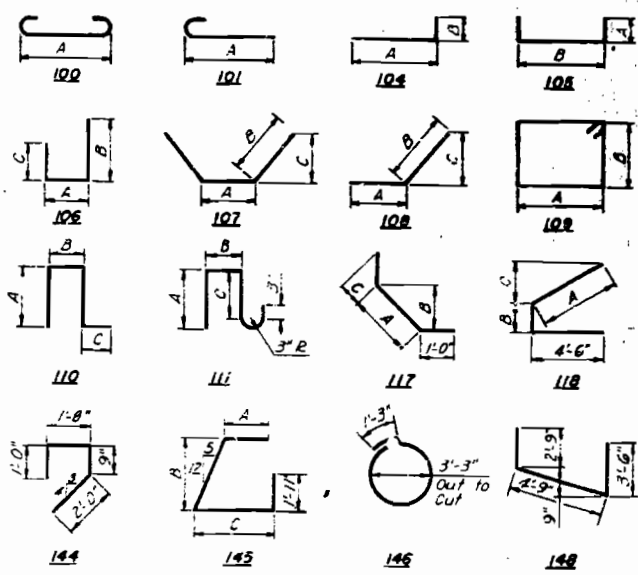
MADE BY J.F. DATE 7-14-72 HOWARD, NEEDLES, TAMM & BERGENFELD
 CHECKED BY C.E. DATE 7-26-72 CONSTRUCTION ENGINEERS
 KANSAS CITY MISSOURI
 SCALE 1/4" = 1'-0" SHEET 49 OF 50

24 of 26
 CTAT CO.
 1976

MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
BENT 7								
BG001	71	11'-5"	146					550
BG501	32	5'-8"	105	1'-0"	3'-8"			189
BG502	25	15'-6"	109	3'-8"	3'-8"			404
BG503	4	33'-5"	Str.					201
BG504	8	7'-6"	105	2'-0"	3'-6"			90
BG601	66	14'-0"	100	11'-6"				3,140
BG1001	14	33'-6"	Str.					2,020
BG1002	12	13'-0"	Str.					672
BG1101	10	38'-6"	Str.					2,045
BG1102	10	37'-3"	Str.					1,980
BG1103	20	18'-8"	104	17'-6"	1'-2"			1,980
BG1104	20	7'-2"	104	6'-0"	1'-2"			760
Total								14,031
BENT 8								
BK401	96	11'-5"	146					734
BK501	32	5'-8"	105	1'-0"	3'-8"			189
BK502	24	15'-6"	109	3'-8"	3'-8"			388
BK503	4	38'-3"	Str.					230
BK504	8	7'-6"	105	2'-0"	3'-6"			90
BK601	78	11'-2"	100	9'-0"				2,320
BK602	16	38'-3"	Str.					2,080
BK1101	10	34'-10"	Str.					1,855
BK1102	10	34'-2"	Str.					1,815
BK1103	10	33'-3"	Str.					1,770
BK1104	30	7'-7"	104	6'-5"	1'-2"			1,207
Total								12,678
BENT 9								
BJ401	106	11'-7"	109	3'-3"	2'-2"			820
BJ402	54	11'-1"	109	3'-3"	1'-11"			400
BJ501	4 Ser. 6	4'-2" to 15'-6"	109	2'-8"	4'-0" to 4'-8"		3"	371
BJ502	30	17'-6"	109	3'-8"	4'-8"			548
BJ503	2	15'-6"	109	3'-8"	3'-8"			32
BJ504	5	15'-6"	109	3'-8"	3'-8"			32
BJ601	6	54'-9"	Str.					493
BJ602	8	7'-4"	105	1'-11"	3'-6"			88
BJ801	96	14'-6"	100	12'-0"				4,733
BJ1101	6	57'-11"	100	54'-9"				1,846
BJ1102	4	15'-4"	101	13'-9"				326
BJ1103	16	13'-9"	Str.					1,169
BJ1104	6	5'-1'-9"	107	43'-9"	5'-6"	1'-0"		1,745
BJ1105	12	30'-6"	Str.					1,944
BJ1106	12	29'-6"	Str.					1,881

MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
BENT 10								
RJ1101	12	28'-9"	Str.					1,833
RJ1102	32	10'-0"	Str.					1,700
BJ1103	68	7'-5"	104	6'-3"	1'-2"			2,680
Total								22,816
BENT 11								
BK401	228	11'-7"	109	2'-2"	3'-3"			1,764
BK501	35	5'-8"	105	1'-0"	3'-8"			207
BK502	33	17'-6"	109	3'-8"	4'-8"			602
BK503	2	15'-6"	109	3'-3"	3'-8"			32
BK504	4 Ser. 7	13'-6" to 15'-0"	109	2'-6"	3'-10"		3"	416
BK601	12	35'-9"	Str.					644
BK602	8	7'-4"	105	1'-11"	3'-6"			88
BK801	132	13'-2"	100	11'-0"				4,642
BK1101	12	38'-1"	101	35'-6"				2,428
BK1102	4	15'-4"	101	13'-9"				326
BK1103	16	13'-9"	Str.					1,169
BK1104	4	30'-10"	108	25'-4"	5'-6"	1'-0"		555
BK1105	4	42'-2"	108	36'-8"	5'-6"	1'-0"		856
BK1106	4	12'-0"	Str.					255
BK1107	3	12'-4"	Str.					197
BK1108	48	7'-5"	104	6'-3"	1'-2"			1,892
BK1109	12	32'-6"	Str.					2,072
BK1110	12	32'-3"	Str.					2,056
BK1111	12	32'-0"	Str.					2,040
BK1112	12	31'-9"	Str.					2,024
BK1113	16	13'-11"	104	12'-9"	1'-2"			1,183
BK1114	4	9'-0"	Str.					191
Total								25,779
BENT 12								
BL401	192	11'-7"	109	2'-2"	3'-3"			1,465
BL501	35	5'-8"	105	1'-0"	3'-8"			207
BL502	33	17'-6"	109	3'-8"	4'-8"			602
BL503	2	15'-6"	109	3'-3"	3'-8"			32
BL504	4 Ser. 7	13'-6" to 15'-0"	109	2'-6"	3'-10"		3"	416
BL601	12	34'-7"	Str.					623
BL602	8	7'-4"	105	1'-11"	3'-6"			88
BL801	132	13'-2"	100	11'-0"				4,642
BL1101	12	37'-0"	101	35'-5"				2,359
BL1102	4	15'-4"	101	13'-9"				326
BL1103	16	13'-9"	Str.					1,169
BL1104	4	52'-1"	108	24'-7"	5'-6"	1'-0"		679
BL1105	4	40'-8"	108	35'-2"	5'-6"	1'-0"		864
BL1106	4	12'-0"	Str.					255
BL1107	3	12'-1"	Str.					197
BL1108	48	7'-5"	104	6'-3"	1'-2"			1,892
BL1109	12	27'-0"	Str.					1,721
BL1110	12	27'-6"	Str.					1,757
BL1111	12	27'-9"	Str.					1,769
BL1112	12	28'-0"	Str.					1,785
Total								32,820

MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
NORTH ABUTMENT								
AB401	30	4'-8"	105	1'-0"	2'-8"			94
AB402	5	9'-5"	105	4'-6"	5"			31
AB403	2	5'-6"	Str.					7
AB501	4	11'-0"	Str.					46
AB502	4	11'-0"	148					46
AB503	2	7'-6"	105	3'-6"	6"			26
AB504	2	7'-4"	105	3'-5"	6"			15
AB505	2	7'-0"	105	3'-3"	6"			15
AB506	2	6'-6"	105	3'-0"	6"			14
AB507	19	3'-6"	105	1'-3"	1'-0"			69
AB508	2 Ser. 4	2'-6" to 4'-0"	Str.				6"	27
AB509	7	6'-0"	105	2'-9"	6"			44
AB510	12	10'-6"	Str.					131
AB511	4	7'-6"	Str.					31
AB512	8	7'-9"	Str.					65
AB513	2	4'-9"	Str.					10
AB514	8	10'-6"	104	5'-2"	4'-4"			93
AB515	2	5'-2"	Str.					11
AB516	2	9'-6"	Str.					20
AB517	1	3'-2"	105	3'-3"	8"			3
AB518	2	6'-10"	Str.					14
AB601	57	11'-2"	104	10'-6"	8"			959
AB602	66	5'-5"	144					537
AB603	47	17'-5"	145	3'-6"	5'-6"	6'-0"		1,230
AB604	16	5'-2"	108	1'-11"	3'-3"	3'-0"		124
AB605	1	16'-10"	108	2'-3"	5'-8"			25
AB606	1	18'-4"	109	3'-0"	5'-8"			28
AB607	1	19'-8"	109	3'-8"	5'-8"			30
AB608	1	15'-11"	149	4'-6"	3'-9"	2'-0"		24
AB609	1	15'-11"	149	5'-3"	2'-0"	4'-0"		25
AB610	16	31'-6"	Str.					756
AB611	1 Ser. 4	28'-0" to 32'-6"	Str.				1'-6"	182
AB612	2	33'-0"	Str.					99
AB613	16	6'-8"	104	3'-8"	3'-0"			160
AB614	12	7'-8"	104	7'-0"	8"			138
AB615	1	27'-0"	Str.					41
AB616	1	26'-0"	Str.					39
AB617	1	25'-0"	Str.					38
AB618	1 Ser. 4	24'-6" to 33'-6"	Str.				3'-0"	174
AB619	8	28'-0"	Str.					336
AB620	19	43'-0"	Str.					1,226
AB621	2	40'-0"	Str.					120
AB622	4	11'-6"	Str.					69
AB623	2	9'-8"	108	7'-9"	1'-11"	1'-8"		29
AB624	2	11'-0"	Str.					39
AB625	2	9'-0"	Str.					21
AB626	2	7'-0"	Str.					21
AB627	4	6'-6"	Str.					39
AB628	6	12'-8"	108	3'-2"	2'-8"			114
AB629	5	10'-0"	108	8'-0"	2'-0"	9"		75
AB630	2	11'-0"	104	5'-0"	6'-0"			33
AB631	1 Ser. 4	12'-0" to 14'-0"	104	10'-0" to 12'-0"	2'-0"	1'-2"	8"	78
AB632	57	9'-5"	106	11"	6'-6"	2'-0"		807
AB633	12	9'-11"	106	11"	7'-0"	2'-0"		180
AB701	5	23'-2"	105	10'-0"	3'-2"			237
AB702	1	6'-9"	108	4'-6"	2'-3"	1'-4"		14
AB703	1	7'-3"	108	5'-0"	2'-3"	1'-4"		15
AB704	1	7'-6"	108	5'-3"	2'-3"	1'-4"		15
AB705	1	7'-9"	108	5'-6"	2'-3"	1'-4"		16
AB706	1	8'-0"	108	5'-9"	2'-3"	1'-4"		16
AB707	4	11'-0"	Str.					90
Total								9,003



BAR BENDING DIAGRAM

Notes:
 All bar dimensions are given out to out.
 All bars of a series shall vary in length by a constant increment.

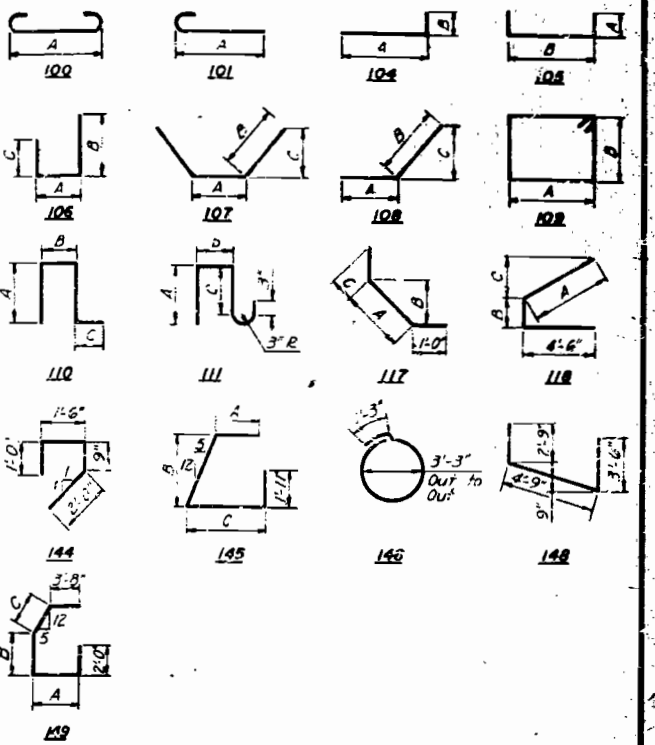
MISSOURI RIVER BRIDGE AT BROADWAY
 SOUTHBOUND LANES OVER
 BURLINGTON NORTHERN RAILROAD
 REINFORCEMENT SCHEDULE

MADE LTF DATE 7-14-12
 CDL BR DATE 7/2

MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
SLAB - UNIT 1								
SA501	1,402	30'-5"	Str.				44,482	
SA502	550	40'-0"	Str.				22,946	
SA503	1 Ser. 21	21'-3" to 24'-0"	Str.				1 3/4" 496	
SA504	1 Ser. 34	21'-3" to 24'-0"	Str.				1" 802	
SA505	80	34'-0"	Str.				2,837	
SA506	20	24'-0"	Str.				501	
SA507	312	3'-6"	110	12 1/2"	12 1/2"	4 1/2"	2,964	
SLAB - UNIT 2								
CA501	812	5'-4"	111	1'-11 1/2"	8"	1'-8 1/2"	4,517	
SLAB - UNIT 3								
CA601	4	32'-6"	Str.				195	
CA602	4	33'-3"	Str.				199	
CA603	4	42'-10"	Str.				257	
CA604	4	43'-9"	Str.				263	
CA605	16	43'-4"	Str.				1,041	
CA606	9	41'-10"	Str.				503	
CA607	4	6'-7"	Str.				40	
RA501	72	7'-8"	Str.				576	
RA502	8	6'-7"	Str.				55	
RA503	8	28'-2"	Str.				235	
RA504	8	28'-10"	Str.				241	
RA505	8	34'-9"	Str.				290	
RA506	8	35'-9"	Str.				298	
RA507	32	35'-4"	Str.				1,179	
RA508	16	33'-8"	Str.				562	
Total 85,479								
SLAB - UNIT 2								
SB501	248	38'-0"	Str.				9,829	
SB502	1 Ser. 24	14'-0" to 37'-0"	Str.				7 1/2" 638	
SB503	1 Ser. 38	14'-0" to 37'-0"	Str.				7 1/2" 1,011	
SB504	23	30'-3"	Str.				720	
SB505	23	28'-6"	Str.				684	
SB506	2 Ser. 101	30'-5" to 30'-10"	Str.				1" 6,452	
SB507	2 Ser. 101	30'-10" to 32'-2"	Str.				1" 6,637	
SB508	2 Ser. 113	32'-2" to 34'-3"	Str.				1" 7,828	
SB509	2 Ser. 43	34'-3" to 4'-0"	Str.				8 1/2" 1,715	
SB510	2	39'-6"	Str.				82	
SB511	341	3'-6"	110	12 1/2"	12 1/2"	4 1/2"	1,244	
SLAB - UNIT 3								
CB501	341	5'-4"	111	1'-11 1/2"	8"	1'-8 1/2"	1,895	
CB502	16	4'-3"	110	19"	8"	5"	71	
CB601	2	54'-2"	Str.				163	
CB602	2	52'-10"	Str.				159	
CB603	4	36'-8"	Str.				221	
CB604	2	54'-10"	Str.				164	
CB605	2	56'-5"	Str.				170	
CB606	2	49'-9"	Str.				149	
Total 211,259								

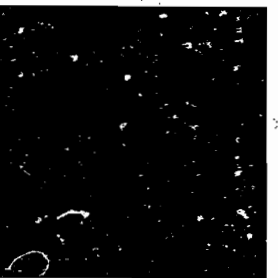
MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
SLAB - UNIT 1								
RB501	32	7'-8"	Str.				256	
RB502	4	46'-2"	Str.				193	
RB503	4	44'-10"	Str.				188	
RB504	0	28'-0"	Str.				231	
RB505	4	33'-0"	Str.				163	
RB506	4	48'-6"	Str.				202	
RP507	4	41'-9"	Str.				174	
Total 41,249								
SLAB - UNIT 3								
SC501	992	3'-6"	110	12 1/2"	12 1/2"	4 1/2"	3,621	
SLAB - UNIT 2								
CC501	992	5'-4"	111	1'-11 1/2"	8"	1'-8 1/2"	5,518	
CC502	31	4'-3"	110	19"	8"	5"	137	
SLAB - UNIT 3								
CC601	2	7'-3"	Str.				22	
CC602	5	41'-3"	Str.				372	
CC603	4	48'-10"	Str.				293	
CC604	6	48'-2"	Str.				434	
CC605	6	39'-5"	Str.				355	
CC606	6	51'-2"	Str.				461	
CC607	6	51'-5"	Str.				463	
CC608	4	49'-0"	Str.				294	
CC609	2	6'-0"	Str.				18	
CC610	4	49'-5"	Str.				297	
SLAB - UNIT 3								
RC501	4	7'-3"	Str.				30	
RC502	112	7'-8"	Str.				836	
RC503	8	44'-10"	Str.				374	
RC504	8	32'-7"	Str.				272	
RC505	12	37'-3"	Str.				456	
RC506	8	42'-3"	Str.				352	
RC507	12	40'-0"	Str.				501	
RC508	12	40'-8"	Str.				509	
RC509	8	40'-10"	Str.				340	
RC510	1	6'-0"	Str.				25	
RC511	8	41'-4"	Str.				345	
Total 211,259								

MARK	NUMBER	LENGTH	TYPE	DIMENSIONS			SERIES INCR.	WEIGHT POUNDS
				A	B	C		
SLAB - UNIT 1								
RB501	32	7'-8"	Str.				256	
RB502	4	46'-2"	Str.				193	
RB503	4	44'-10"	Str.				188	
RB504	0	28'-0"	Str.				231	
RB505	4	33'-0"	Str.				163	
RB506	4	48'-6"	Str.				202	
RP507	4	41'-9"	Str.				174	
Total 41,249								
SLAB - UNIT 3								
SC501	992	3'-6"	110	12 1/2"	12 1/2"	4 1/2"	3,621	
SLAB - UNIT 2								
CC501	992	5'-4"	111	1'-11 1/2"	8"	1'-8 1/2"	5,518	
CC502	31	4'-3"	110	19"	8"	5"	137	
SLAB - UNIT 3								
CC601	2	7'-3"	Str.				22	
CC602	5	41'-3"	Str.				372	
CC603	4	48'-10"	Str.				293	
CC604	6	48'-2"	Str.				434	
CC605	6	39'-5"	Str.				355	
CC606	6	51'-2"	Str.				461	
CC607	6	51'-5"	Str.				463	
CC608	4	49'-0"	Str.				294	
CC609	2	6'-0"	Str.				18	
CC610	4	49'-5"	Str.				297	
SLAB - UNIT 3								
RC501	4	7'-3"	Str.				30	
RC502	112	7'-8"	Str.				836	
RC503	8	44'-10"	Str.				374	
RC504	8	32'-7"	Str.				272	
RC505	12	37'-3"	Str.				456	
RC506	8	42'-3"	Str.				352	
RC507	12	40'-0"	Str.				501	
RC508	12	40'-8"	Str.				509	
RC509	8	40'-10"	Str.				340	
RC510	1	6'-0"	Str.				25	
RC511	8	41'-4"	Str.				345	
Total 211,259								



BAR BENDING DIAGRAM

Notes:
 All bar dimensions are given out to out.
 All bars of a series shall vary in length by a constant increment.



As Built 2-77

KANSAS CITY, MISSOURI
 DEPARTMENT OF PUBLIC WORKS
 MISSOURI RIVER BRIDGE AT BROADWAY SOUTHBOUND LANES OVER BURLINGTON NORTHERN RAILROAD

REINFORCEMENT SCHEDULE

DATE: 7-14-72
 DRAWN BY: F-26-72
 CHECKED BY: [Signature]

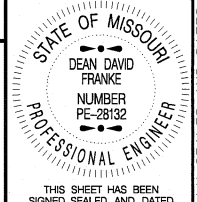
HOWARD, NEEDLES, TAMM & BERENSON
 CONSULTING ENGINEERS
 KANSAS CITY, MISSOURI

SCALE: 1/4" = 1'-0"
 SHEET 02 OF 02

26 of 27 Etat Co. 19673

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

U.I.P. & Rehab Existing (63'-85'-85'-85'-82'-8') Cont. Comp. WF Beam Spans, (53'-63'-52') Cont. Comp. WF Beam Spans, (8'-104'-125'-150'-95') Cont. Comp. Plate Girder Spans

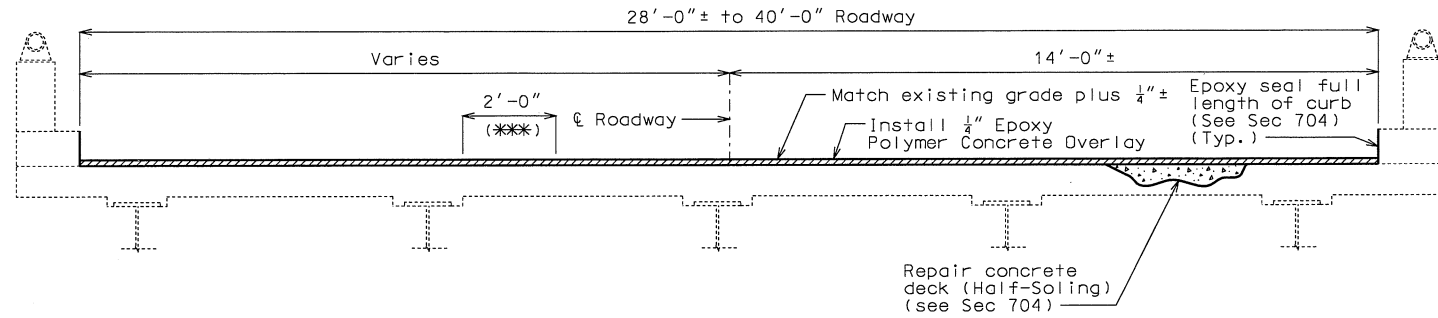


THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

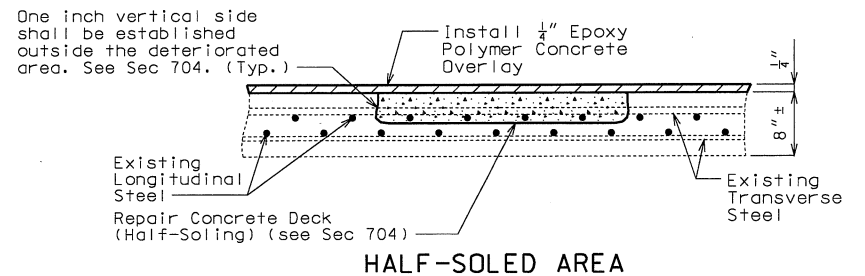
DATE PREPARED: 12/10/2008
 ROUTE: 169 STATE: MO
 DISTRICT: BR SHEET NO.: 1
 COUNTY: CLAY
 JOB NO.: J4P1852
 CONTRACT ID.:
 PROJECT NO.:
 BRIDGE NO.: A46431

DESCRIPTION	DATE

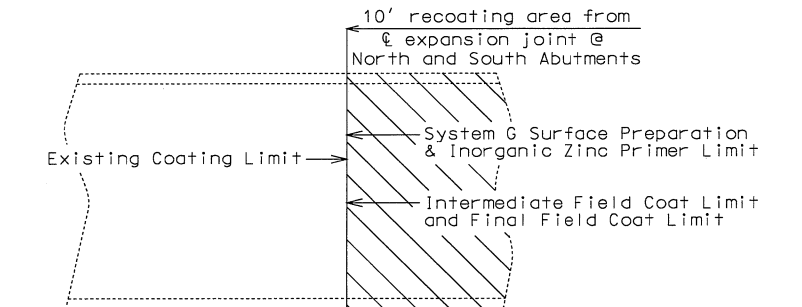
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-273-6636)



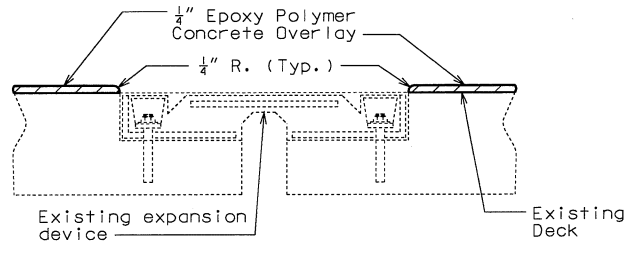
SECTION THRU ROADWAY
 *** Temporary Traffic Control Device (Roadway Item)



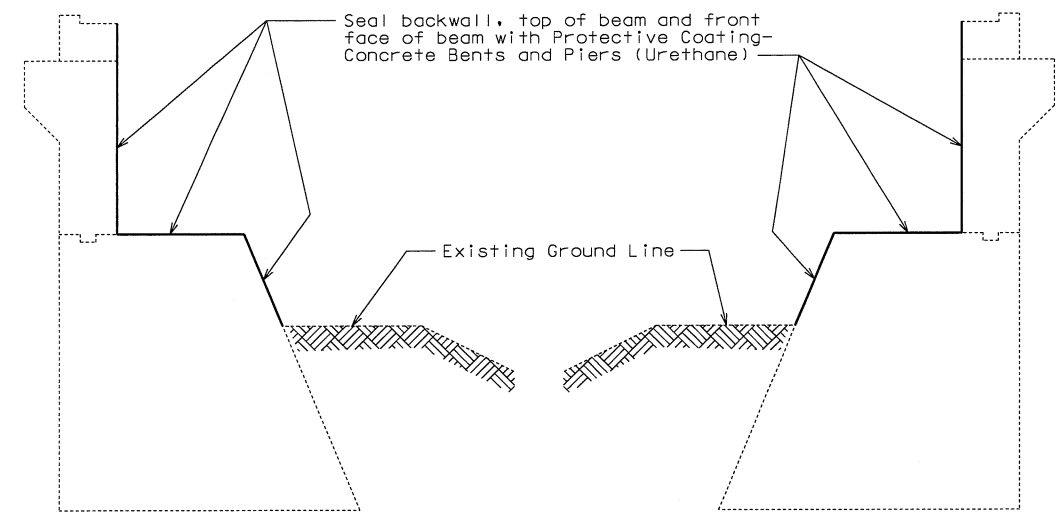
HALF-SOLED AREA



PART ELEVATION SHOWING LIMITS OF PAINT OVERLAP
 (Vertical or horizontal paint limit. Horizontal limit shown)



EPOXY POLYMER CONCRETE OVERLAY AT EXPANSION DEVICES NEAR BENTS 5 AND 8



DETAILS SHOWING CONCRETE PROTECTIVE COATINGS

GENERAL NOTES:

Design Specifications:
 2002 - AASHTO 17th Edition
 Load Factor Design
 Bridge Deck Rating = 7

Structural Steel Protective Coatings:
 Protective Coating: System G in accordance with Sec 1081.

Protective Coating Limits: All structural steel within 10 feet of each side of centerline joint at North and South Abutments shall be recoated with System G. Within these limits, items to be recoated shall include all surfaces of beams, girders, diaphragms, stiffeners, bearings and miscellaneous structural steel items.

Surface Preparation: Surface preparation of the existing steel shall be in accordance with Sec 1081 for "Recoating of Structural Steel (System G or H)". The cost of surface preparation will be considered completely covered by the contract unit price per sq. foot for "Surface Preparation for Recoating Structural Steel".

Prime Coat: The cost of the prime coat will be considered completely covered by the contract unit price per sq. foot for "Field Application of Inorganic Zinc Primer". Tint of the prime coat for System G shall be similar to the color of the field coat to be used.

Field Coat: The color of the finish field coat shall be Gray (Federal Standard #26373). The cost of the intermediate field coat will be considered completely covered by the contract unit price per sq. foot for "Intermediate Field Coat (System G)". The cost of the finish field coat will be considered completely covered by the contract unit price per sq. foot for "Finish Field Coat (System G)".

Sec 1081.4.5 shall be modified such that the word "RECOATED" is replaced by the words "RECOATED - SYSTEM G - EXPANSION AREAS ONLY".

Concrete Protective Coatings:
 Protective coating for concrete bents and piers (Urethane) shall be applied as shown on the bridge plans and in accordance with Sec 711.

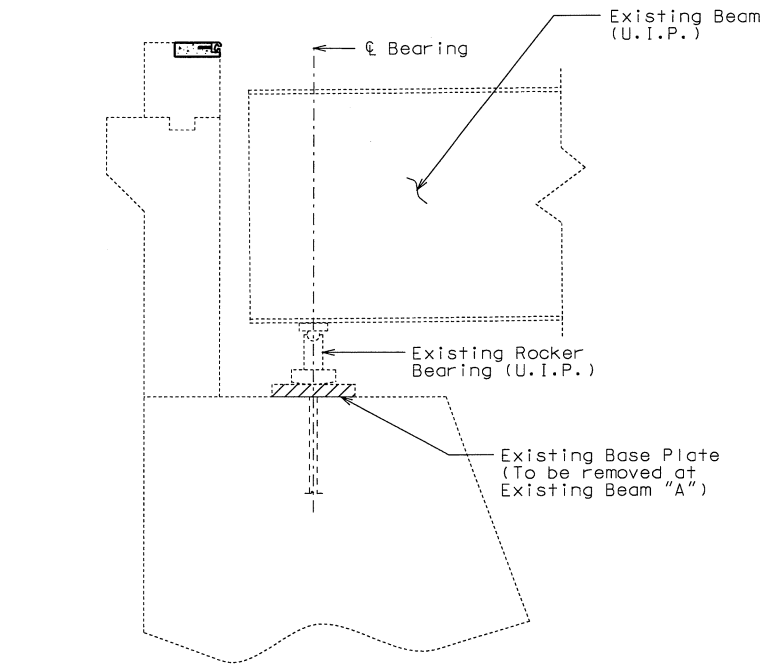
Traffic Handling:
 Traffic over structure to be maintained during construction. See Roadway plans for traffic control.

Miscellaneous:
 "Sec" refers to the sections in the standard and supplemental specifications unless specified otherwise.
 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.
 The contractor shall exercise care to ensure spillage over joint edges is prevented and that a neat line is obtained along any terminating edge of the epoxy polymer concrete.

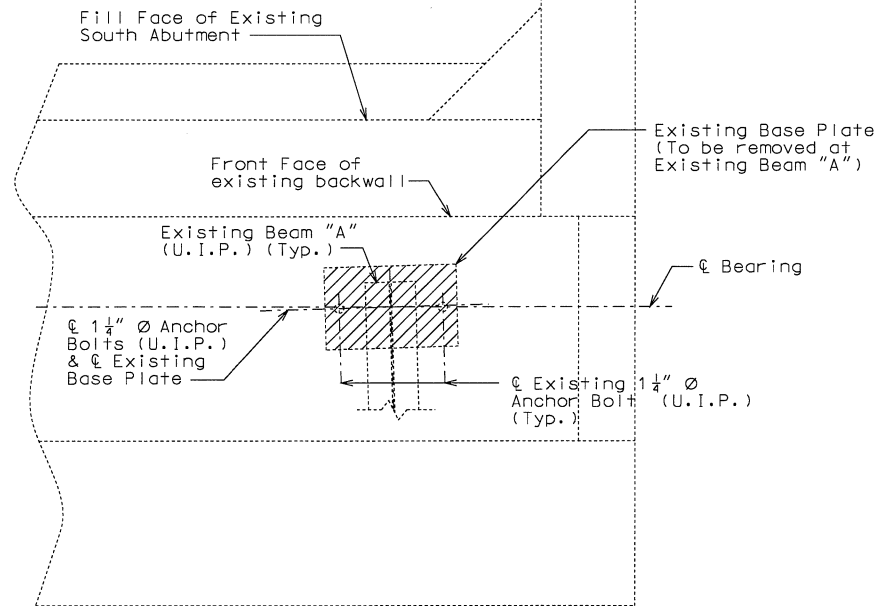
Item	Unit	Total
Partial Removal of Existing Expansion Device	linear foot	97
Epoxy Polymer Concrete Overlay	sq. yard	3,992
Polymer Concrete	cu. foot	32
Repairing Concrete Deck (Half-Soling)	sq. foot	100
Protective Coating - Concrete Bents and Piers (Urethane)	lump sum	1
Rehabilitate Bearing	each	1
Surface Preparation for Recoating Structural Steel	sq. foot	1,000
Field Application of Inorganic Zinc Primer	sq. foot	1,000
Intermediate Field Coat (System G)	sq. foot	1,000
Finish Field Coat (System G)	sq. foot	1,000
Strip Seal Expansion Joint System	linear foot	97

REPAIRS TO BRIDGE: ROUTE 169 (SBL) OVER ACCESS BRIDGE AND BNSF RR
 STATE ROAD FROM ROUTE 9 TO JACKSON CO. LINE
 ABOUT 0.3 MILES S. OF ROUTE 9
 STA. 173+17.50± (Match Existing)

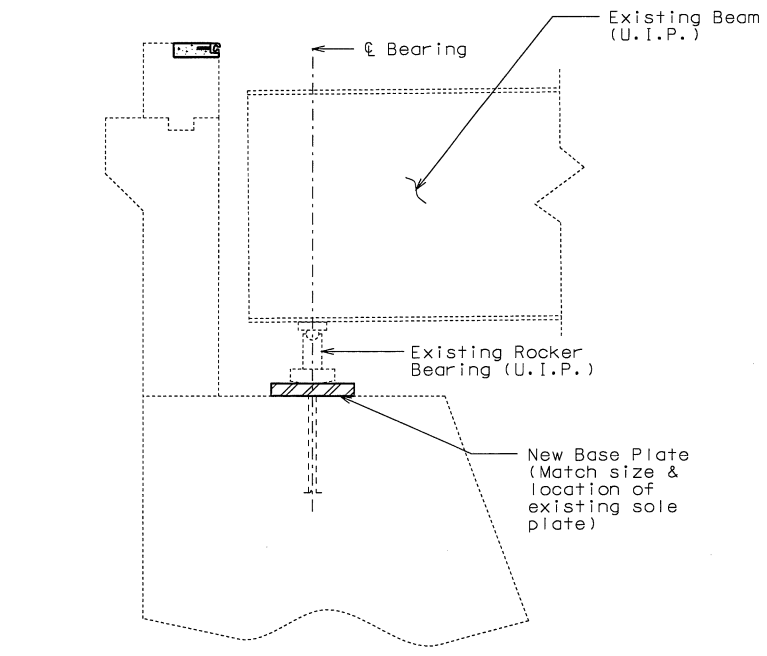
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



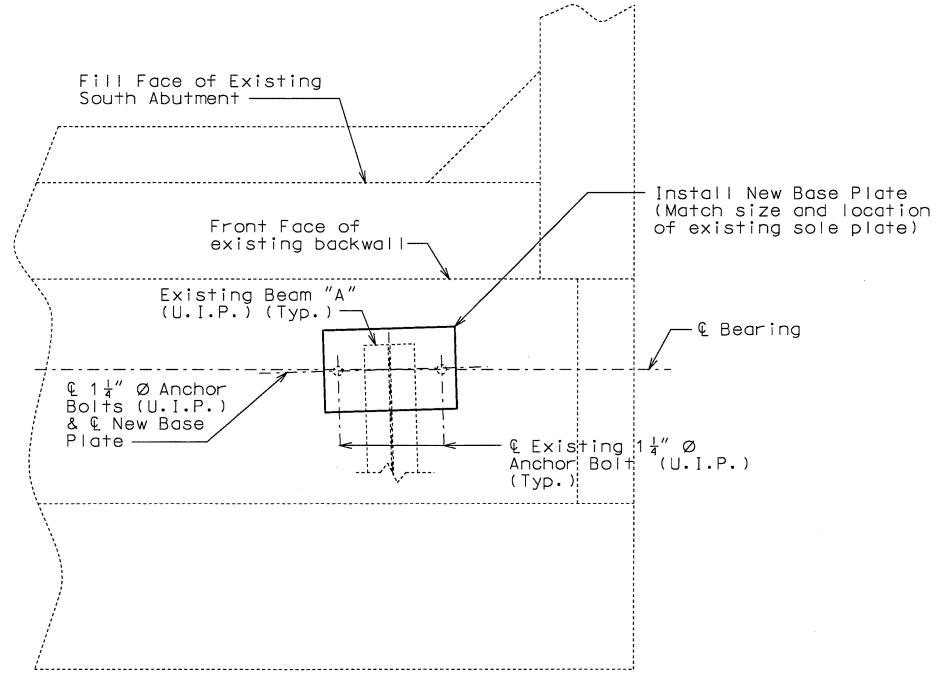
PART SECTION THRU EXISTING SOUTH ABUTMENT SHOWING BASE PLATE REMOVAL
(Slab not shown for clarity.)



PART PLAN OF EXISTING SOUTH ABUTMENT SHOWING BASE PLATE REMOVAL
(Existing rocker bearing not shown for clarity)



PART SECTION THRU EXISTING SOUTH ABUTMENT SHOWING BASE PLATE REPLACEMENT
(Slab not shown for clarity.)



PART PLAN OF EXISTING SOUTH ABUTMENT SHOWING BASE PLATE REPLACEMENT
(Existing rocker bearing not shown for clarity)

DETAILS OF BASE PLATE REPLACEMENT AT SOUTH ABUTMENT

NOTES:
Payment for removal and replacement of existing base plate will be considered completely covered by the contract unit price for Rehabilitate Bearing (See Special Provisions).
Structural steel for base plate shall be ASTM A709 Grade 36 and shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

STATE OF MISSOURI
DEAN DAVID FRANK
NUMBER PE-28132
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN
SIGNED, SEALED AND DATED
ELECTRONICALLY.

DATE PREPARED 12/5/2008	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 2
COUNTY CLAY	
JOB NO. J4P1852	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A46431	

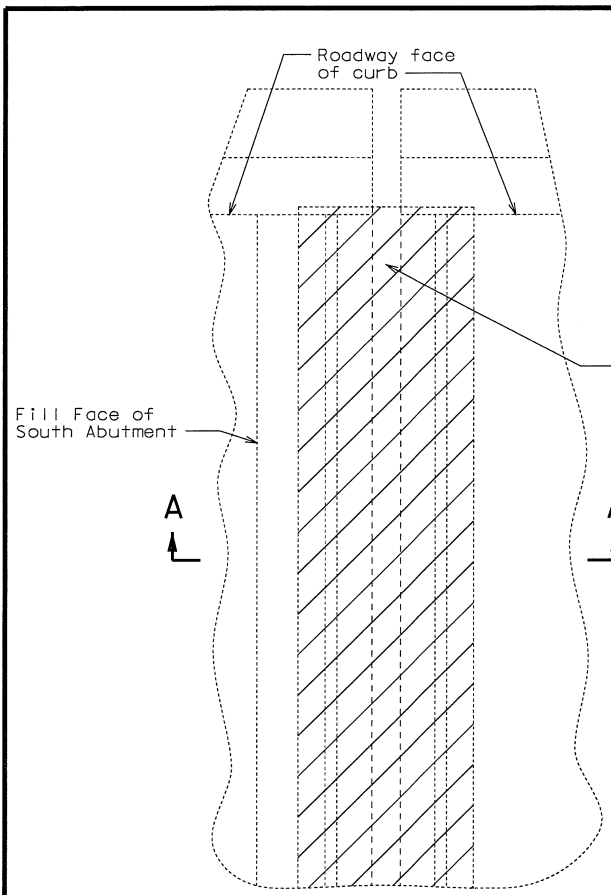
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

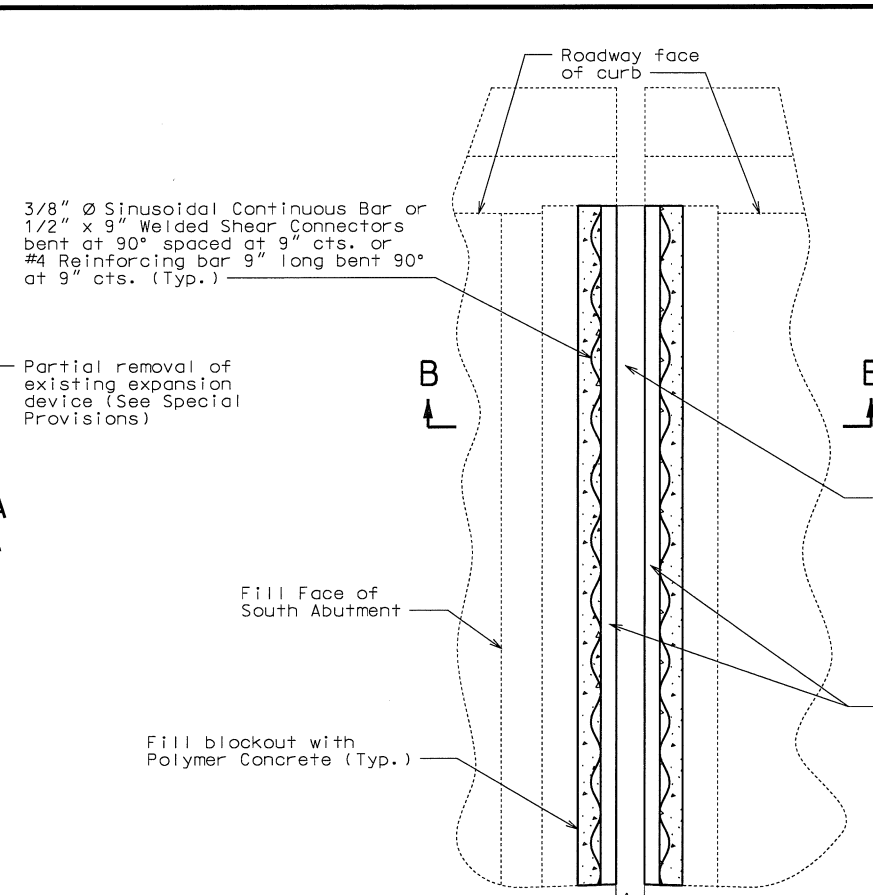
105 WEST CAPITAL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

MODOT

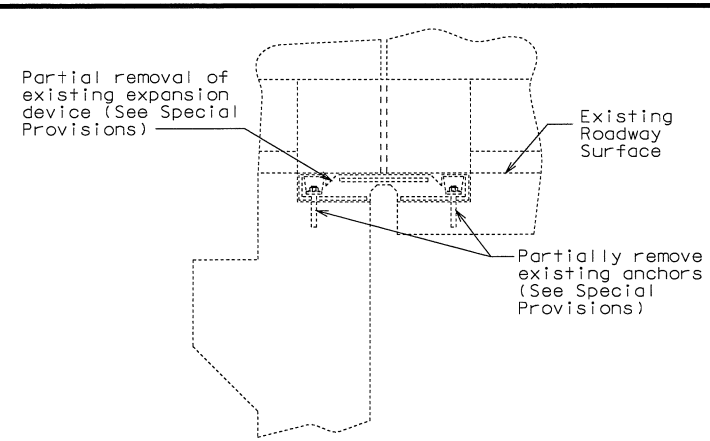
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



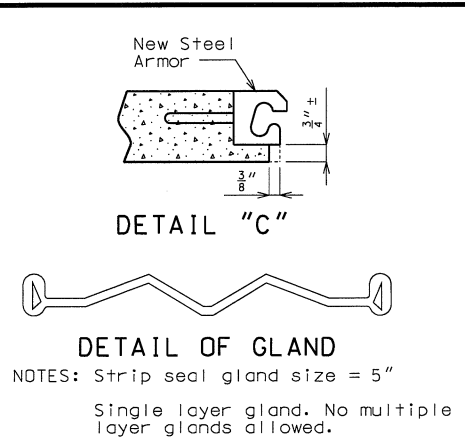
PART PLAN SHOWING PARTIAL REMOVAL OF EXISTING EXPANSION DEVICE AT SOUTH ABUTMENT



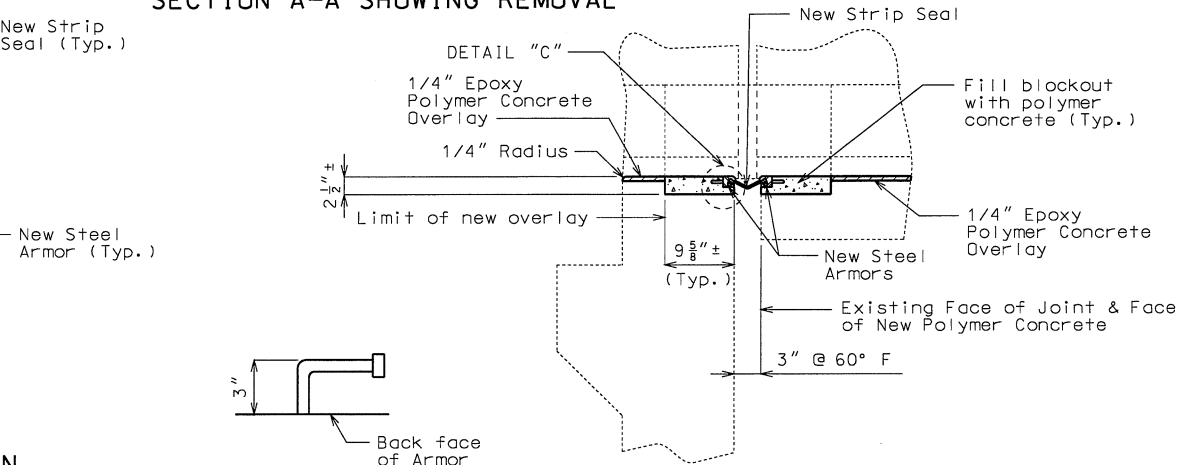
PART PLAN SHOWING NEW EXPANSION DEVICE AT SOUTH ABUTMENT



SECTION A-A SHOWING REMOVAL

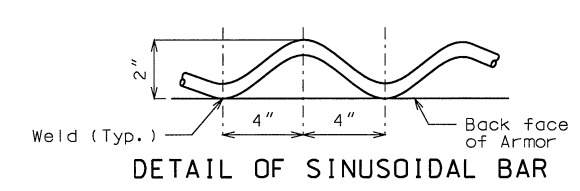


DETAIL OF GLAND
NOTES: Strip seal gland size = 5"
Single layer gland. No multiple layer glands allowed.

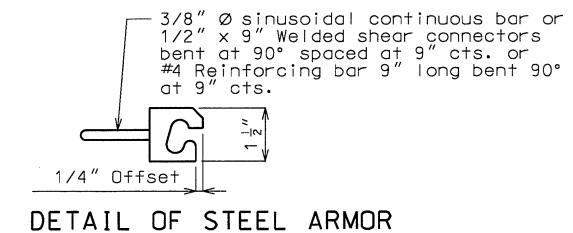


SECTION B-B SHOWING NEW EXPANSION DEVICE

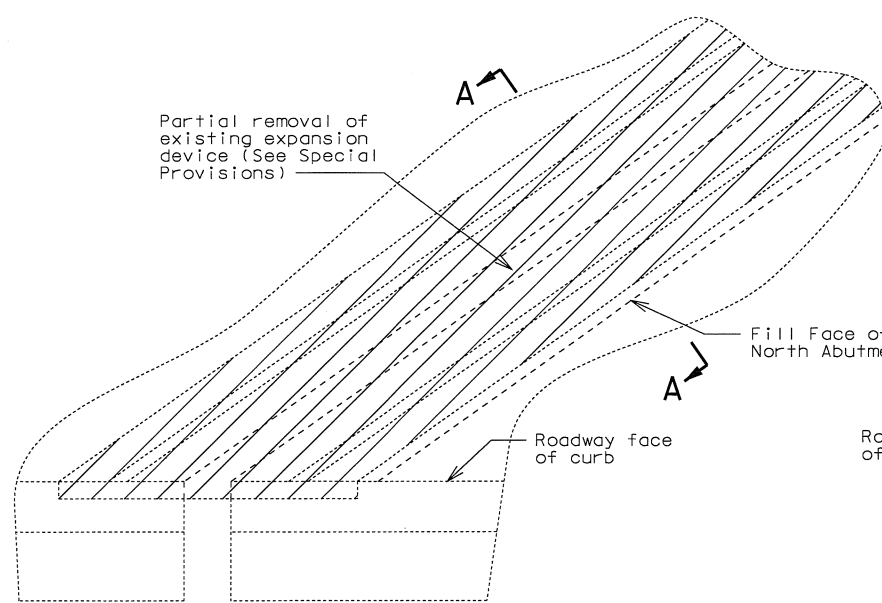
DETAIL OF SHEAR CONNECTOR
(#4 Reinforcing bar shall be bent in a similar manner)



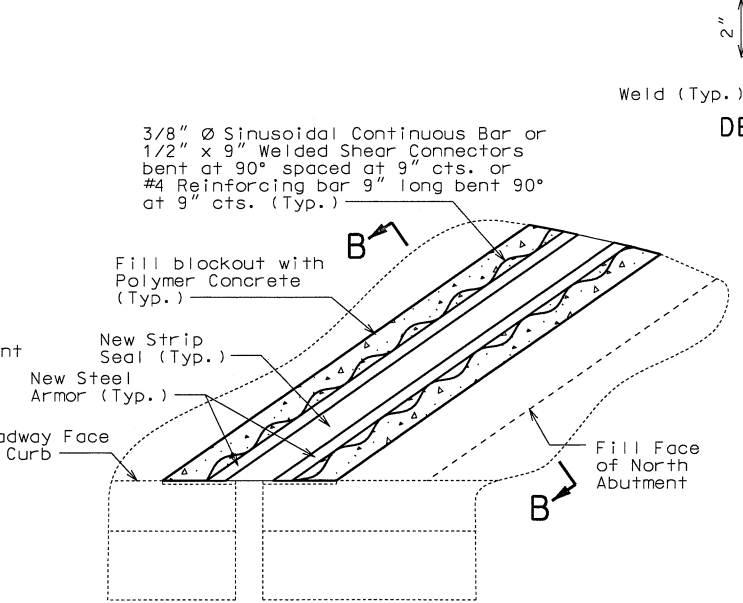
DETAIL OF SINUSOIDAL BAR



DETAIL OF STEEL ARMOR



PART PLAN SHOWING PARTIAL REMOVAL OF EXISTING EXPANSION DEVICE AT NORTH ABUTMENT



PART PLAN SHOWING NEW EXPANSION DEVICE AT NORTH ABUTMENT

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.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 3/16" for each 10° fall or rise in temperature at installation.

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. 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.

Polymer concrete shall be in accordance with Sec 623.

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

Structural steel for the expansion joint system and curb plate 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.

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.	
DATE PREPARED 12/5/2008	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 3
COUNTY CLAY	
JOB NO. J4P1852	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A46431	
DESCRIPTION	
DATE	
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
105 WEST CAPITAL 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.

DETAILS OF STRIP SEAL EXPANSION JOINT SYSTEM NEAR NORTH AND SOUTH ABUTMENTS

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

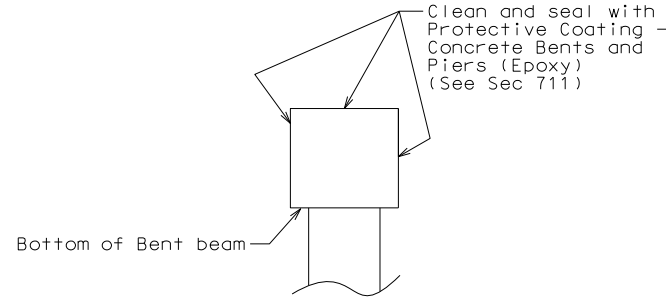
Sheet No. 3 of 3

Detailed Oct. 2008
Checked Oct. 2008

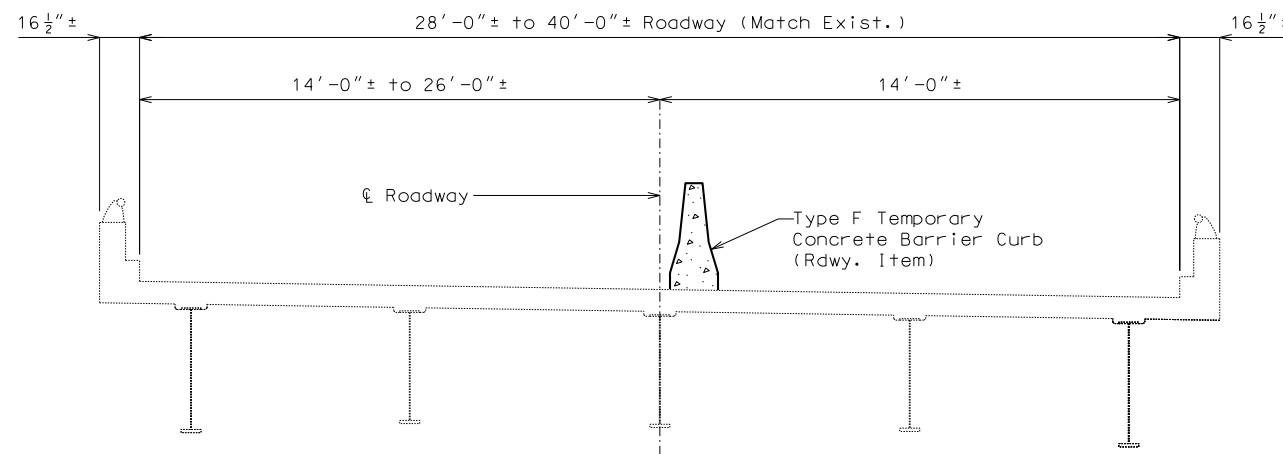
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 U.I.P. & Rehabilitate Existing (63'-85'-85'-82'-8')
 Continuous Composite WF Beam Spans, (53'-63'-52')
 Continuous Composite WF Beam Spans, (8'-104'-125'-150'-95')
 Continuous Composite Plate Girder Spans



DATE PREPARED October 31, 2014	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 1
COUNTY CLAY	
JOB NO. J413028	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A46432	



TYPICAL SECTION THRU BENTS NO. 5 & 8 SHOWING PROTECTIVE COATING



SECTION THRU EXISTING SLAB

General Notes:

- Design Specifications:**
 2002 - AASHTO 17th Edition
 Load Factor Design
 Seismic Performance Category A
 Bridge Deck Rating = 7
- Design Loading:**
 HS20-44 Military 24,000# Tandem Axle (1977 & New Construction)
 15#/Sq. Ft. Future Wearing Surface
 Fatigue Stress - Case II
- Design Unit Stresses:**
 Class B-1 Concrete (Superstructure and Safety Barrier Curb) $f'c = 4,000$ psi
 Reinforcing Steel (Grade 60) $f_y = 60,000$ psi
- Reinforcing Steel:**
 Minimum clearance to reinforcing steel shall be 1-1/2", unless otherwise shown.
- Concrete Protective Coatings:**
 Protective coating for concrete bents and piers (Epoxy) shall be applied as shown on the bridge plans and in accordance with Sec 711.
- Miscellaneous:**
 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.
 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.
- Traffic Handling:**
 Traffic over structure to be maintained during construction. See Sheet No. 2 for Staging Details.
 The Contractor may revise the location of the stage construction joint as shown on the plan with the approval of the Engineer (See Special Provisions).

Estimated Quantities		
Item		Total
Removal of Existing Expansion Joints & Adjacent Concrete	linear foot	163
Remove and Replace Barrier Curb	linear foot	36
Class B-1 Concrete	cu. yard	19.1
Reinforcing Steel (Epoxy Coated)	pound	3,260
Protective Coating - Concrete Bents and Piers (Epoxy)	lump sum	1
Strip Seal Expansion Joint System	linear foot	163

REPAIRS TO BRIDGE: 169 (SB) over Access Bridge & BNSF RR

STATE ROAD FROM ROUTE 9 TO JACKSON CO. LINE	STD. 617.20
STA. 173+14.75± (169 SB) (Match Existing)	STD. 706.35

DETAILED: CMS Sept. 2014
 CHECKED: ARB Sept. 2014

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

Sheet No. 1 of 11

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

Leigh & O'Kane, LLC
 Structural Engineers
 MO State Certificate of Authority #001644
 9201 Ward Parkway, Suite 301
 Kansas City, MO 64114
 816.444.3144 P
 816.444.9655 F
 www.leok.com

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DATE PREPARED
October 31, 2014

ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 2

COUNTY
CLAY

JOB NO.
J413028

CONTRACT ID.

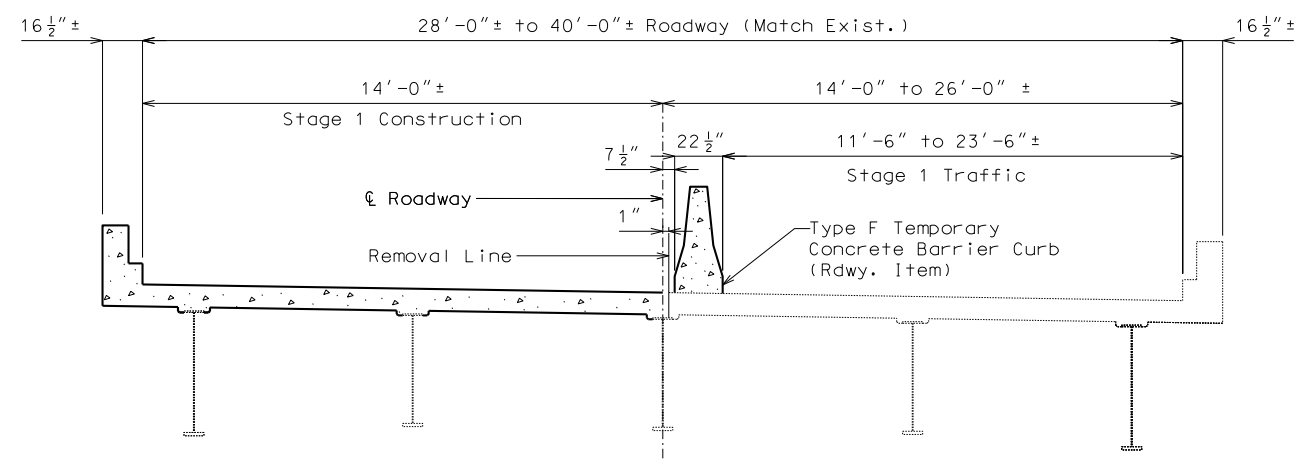
PROJECT NO.

BRIDGE NO.
A46432

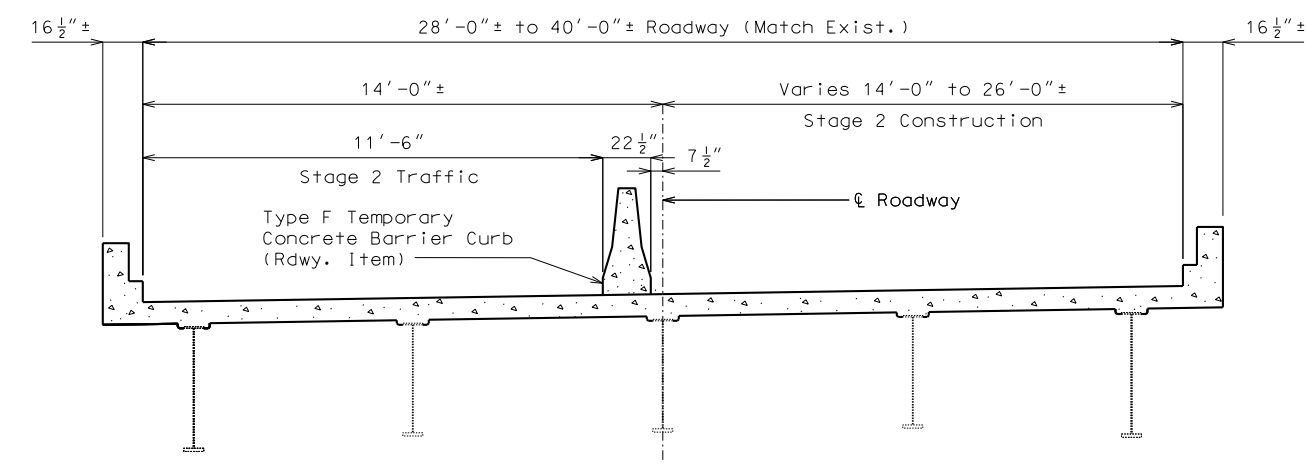
DATE	DESCRIPTION



Leigh & O'Kane, LLC
Structural Engineers
MO State Certificate of Authority #001644
9201 Ward Parkway, Suite 301
Kansas City, MO 64114
816.444.3144 P
816.444.9655 F
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Stage 1 Construction
(Looking Backstation)



Stage 2 Construction
(Looking Backstation)

DETAILS OF STAGE CONSTRUCTION FOR JOINT REPLACEMENT

Notes:
Temporary Barrier shall not be attached to Bridge.

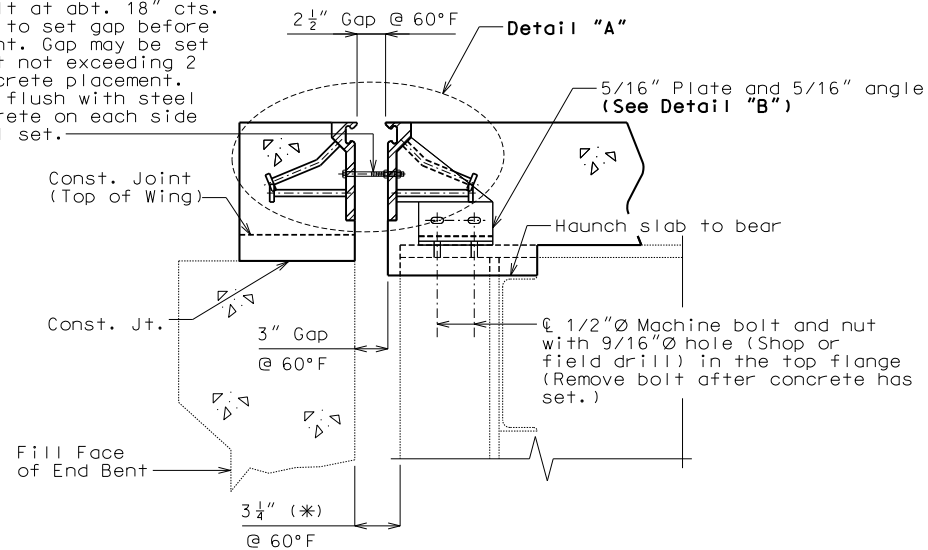
DETAILED: CMS Sept. 2014
CHECKED: ARB Sept. 2014

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

Sheet No. 2 of 11

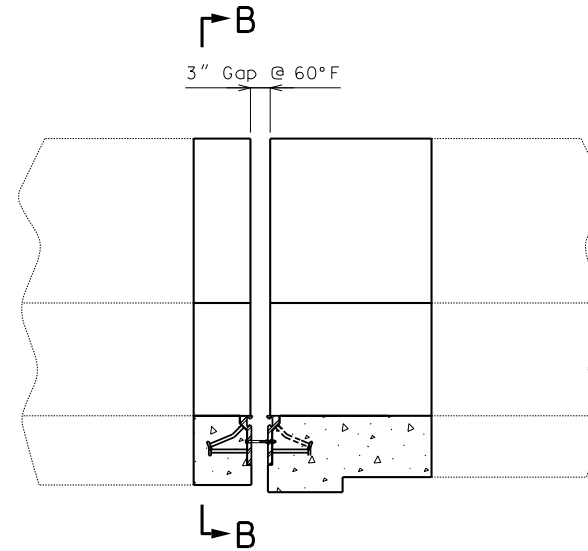
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

1/2"Ø Machine bolt at abt. 18" cts.
Use two hex nuts to set gap before
concrete placement. Gap may be set
anytime up to but not exceeding 2
hours before concrete placement.
Cut machine bolt flush with steel
armor after concrete on each side
has taken initial set.

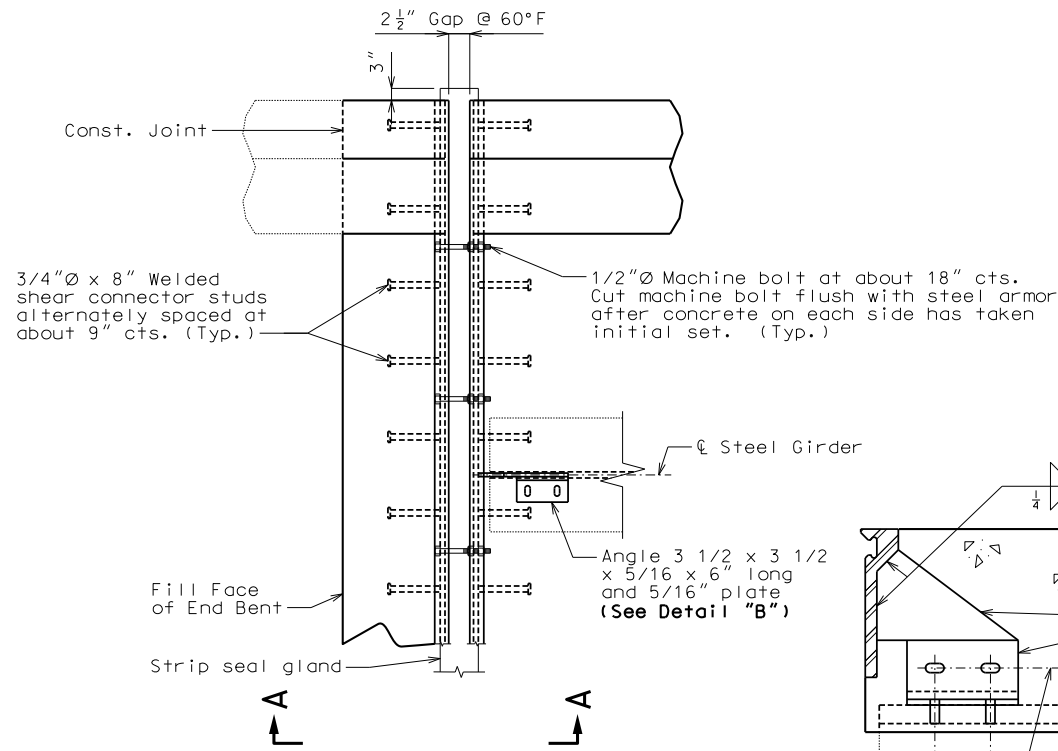


SECTION A-A

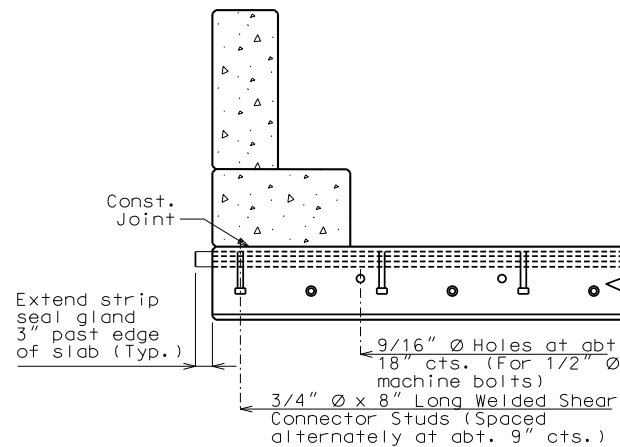
Note: Strip seal gland not shown for clarity.



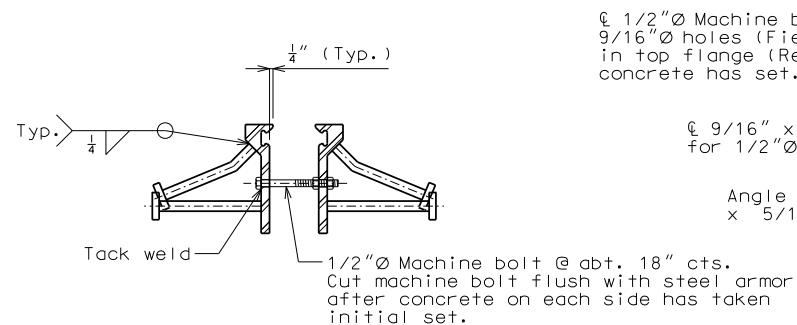
Note: Strip seal gland not shown for clarity.
PART ELEVATION OF BARRIER CURB



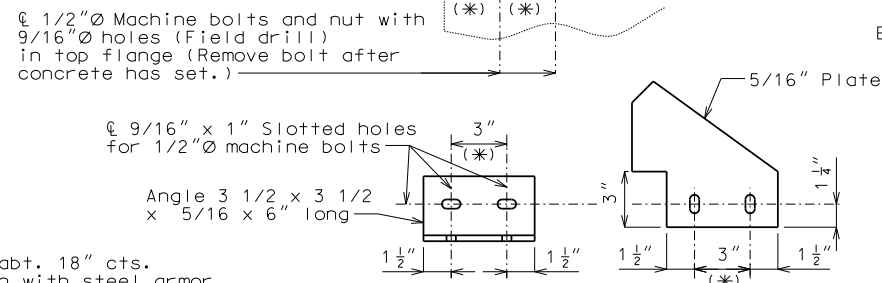
PART PLAN



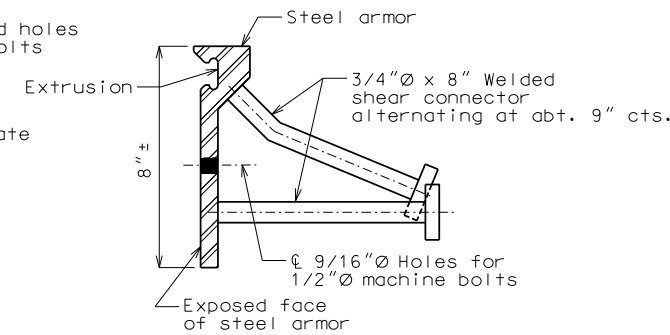
PART SECTION B-B



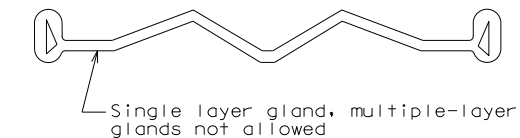
DETAIL "A"



DETAIL "B"



DETAIL OF JOINT ARMOR



Strip seal gland size = 5"
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. 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°F fall or rise in temperature at installation.

Existing longitudinal reinforcing steel shall be bent or cut so that ends shall not be more than ±1" from vertical leg of the steel armor at the expansion joint system.

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

(*) Match Existing.

DETAILED: CMS Sept. 2014
CHECKED: ARB Sept. 2014

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

Sheet No. 3 of 11



DATE PREPARED
October 31, 2014

ROUTE 169 STATE MO
DISTRICT BR SHEET NO. 3

COUNTY CLAY
JOB NO. J413028
CONTRACT ID.

PROJECT NO.
BRIDGE NO. A46432

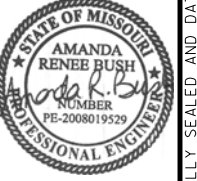
DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

Leigh & O'Kane, LLC
Structural Engineers
MO State Certificate of Authority #001644
9201 Ward Parkway, Suite 301
Kansas City, MO 64114
816.444.3144 P
816.444.9655 F
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DATE PREPARED October 31, 2014	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 4
COUNTY CLAY	
JOB NO. J413028	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A46432	

DESCRIPTION	DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

Leigh & O'Kane, LLC
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MO State Certificate of Authority #001644
9201 Ward Parkway, Suite 301
Kansas City, MO 64114
816.444.3144 P
816.444.9655 F
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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. 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.

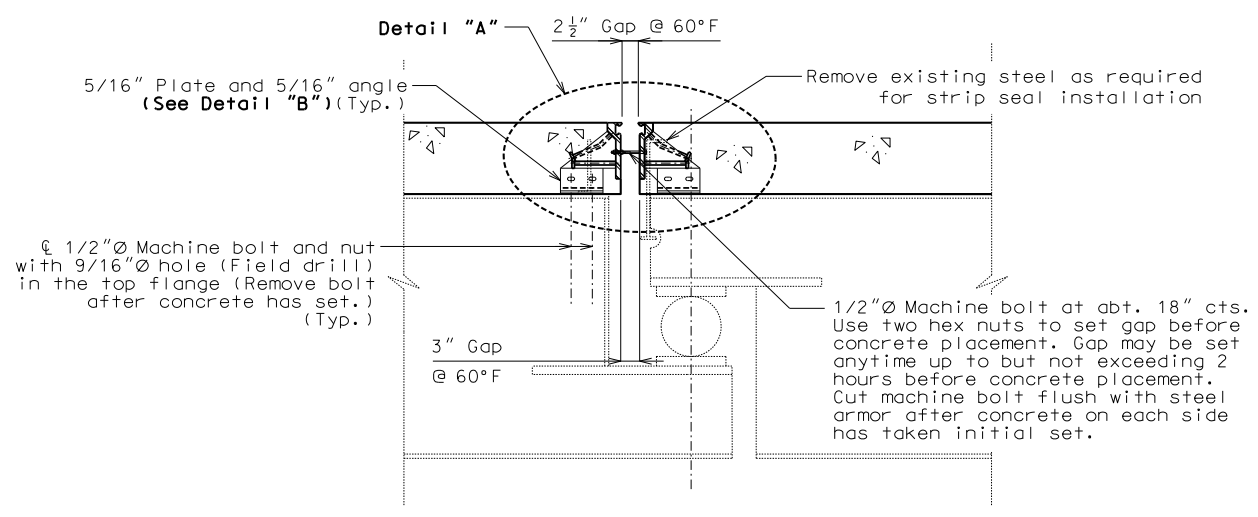
Structural steel for the expansion joint system shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 1/4" for each 10°F fall or rise in temperature at installation.

Existing longitudinal reinforcing steel shall be bent or cut so that ends shall not be more than ±1" from vertical leg of the steel armor at the expansion joint system.

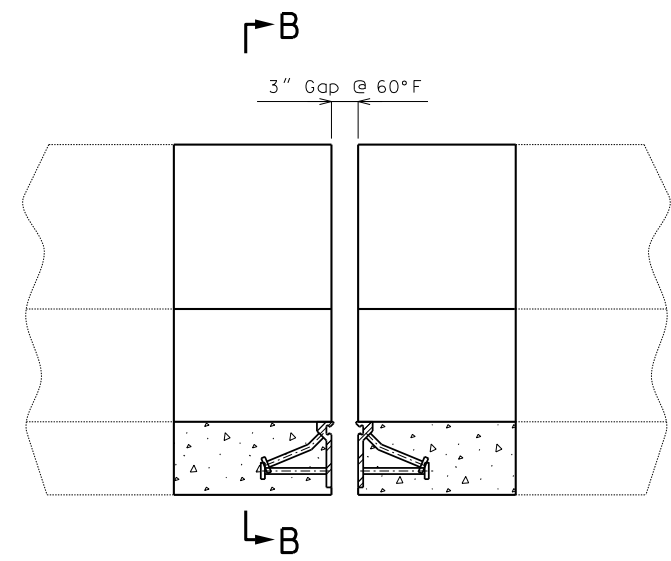
Concrete shall be forced under and around steel armor and anchors. Proper consolidation of the concrete shall be achieved by localized internal vibration.

(* Match Existing)



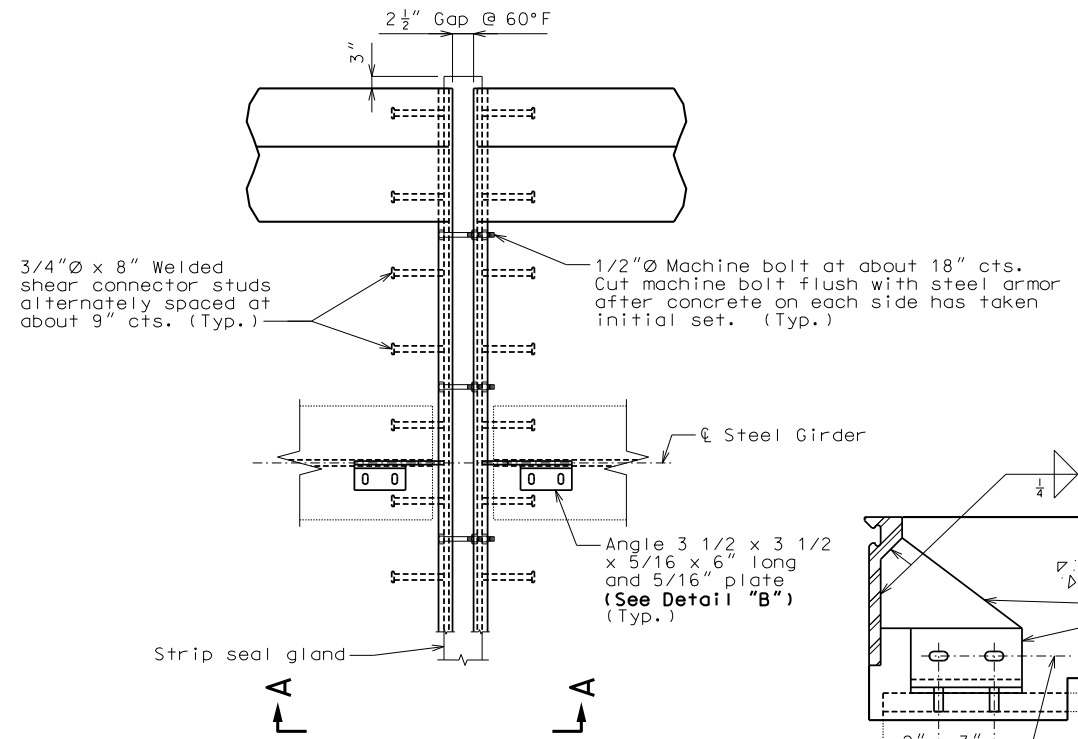
SECTION A-A

Note: Strip seal gland not shown for clarity.

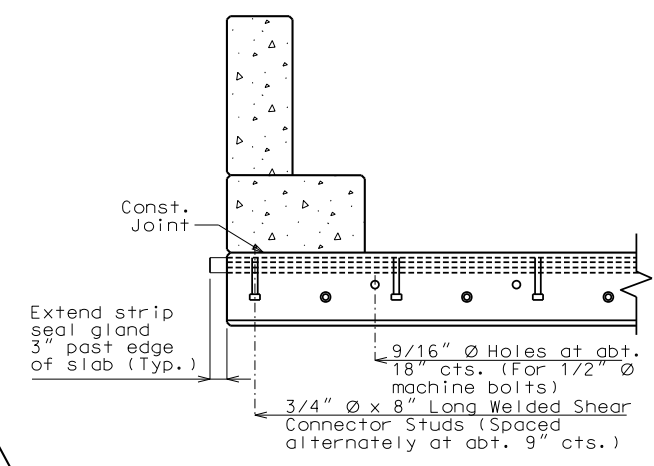


PART ELEVATION OF BARRIER CURB

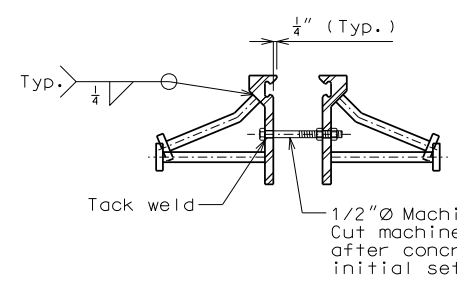
Note: Strip seal gland not shown for clarity.



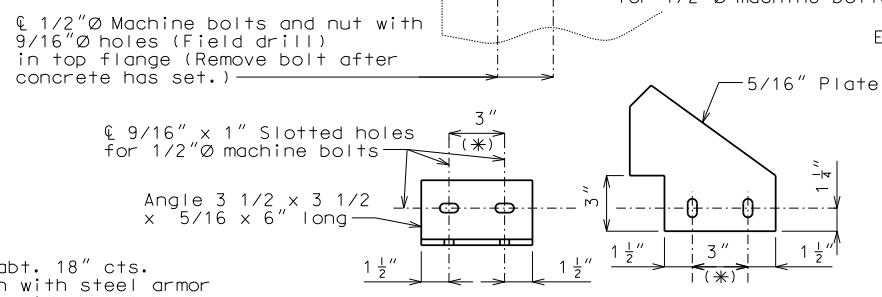
PART PLAN



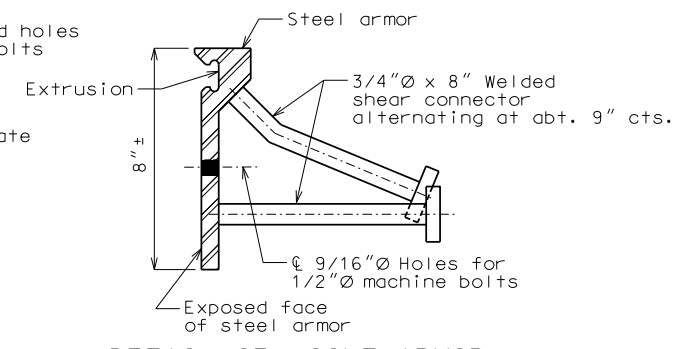
PART SECTION B-B



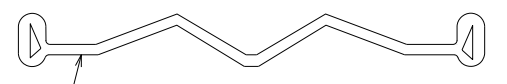
DETAIL "A"



DETAIL "B"



DETAIL OF JOINT ARMOR



DETAIL OF GLAND

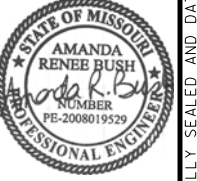
DETAILS OF STRIP SEAL NEAR INTERMEDIATE BENT NO. 5

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

Sheet No. 4 of 11

DETAILED: CMS Sept. 2014
CHECKED: ARB Sept. 2014

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



DATE PREPARED October 31, 2014	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 5
COUNTY CLAY	
JOB NO. J413028	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A46432	

DESCRIPTION	DATE

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

Leigh & O'Kane, LLC
 Structural Engineers
 MO State Certificate of Authority #001644
 9201 Ward Parkway, Suite 301
 Kansas City, MO 64114
 816.444.3144 P
 816.444.9655 F
 www.leok.com

REV. 10/31/2014

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. 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.

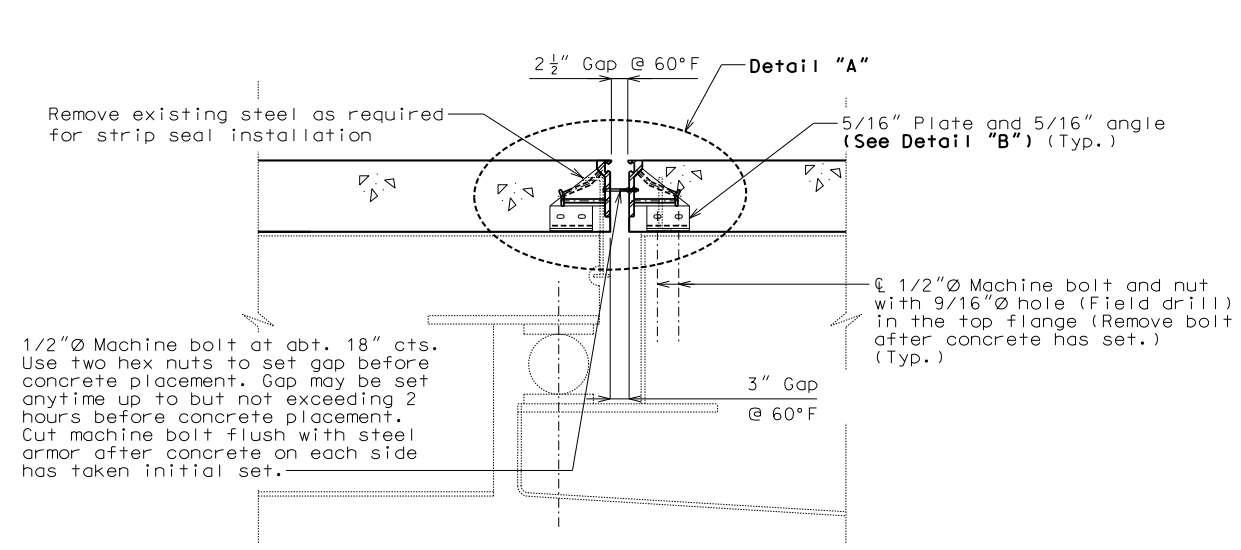
Structural steel for the expansion joint system shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

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°F fall or rise in temperature at installation.

Existing longitudinal reinforcing steel shall be bent or cut so that ends shall not be more than ±1" from vertical leg of the steel armor at the expansion joint system.

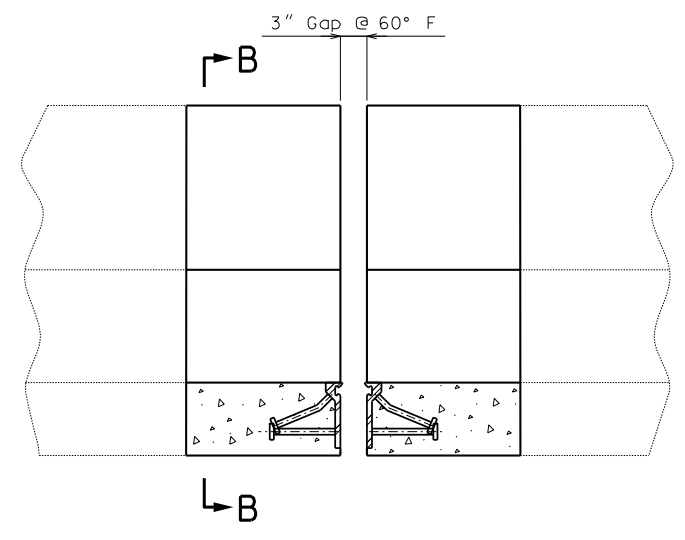
Concrete shall be forced under and around steel armor and anchors. Proper consolidation of the concrete shall be achieved by localized internal vibration.

(* Match Existing.)



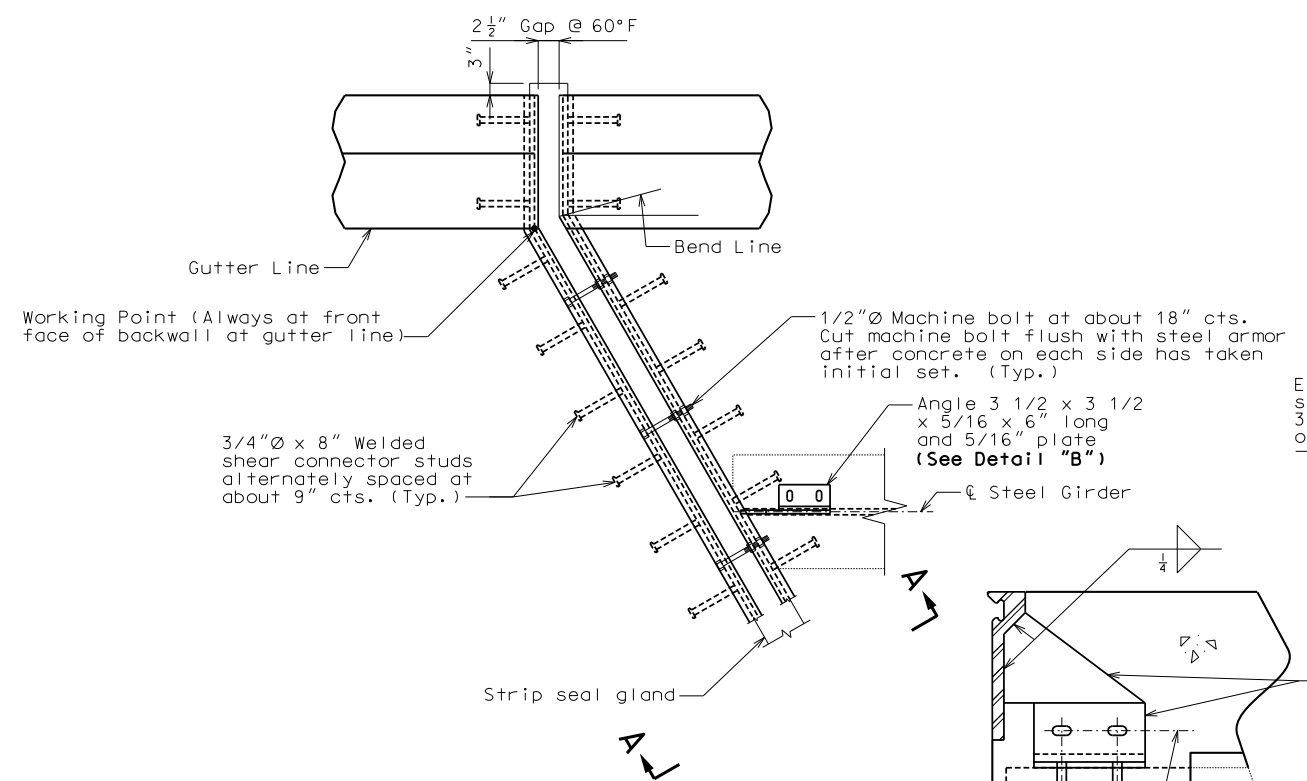
SECTION A-A

Note: Strip seal gland not shown for clarity.

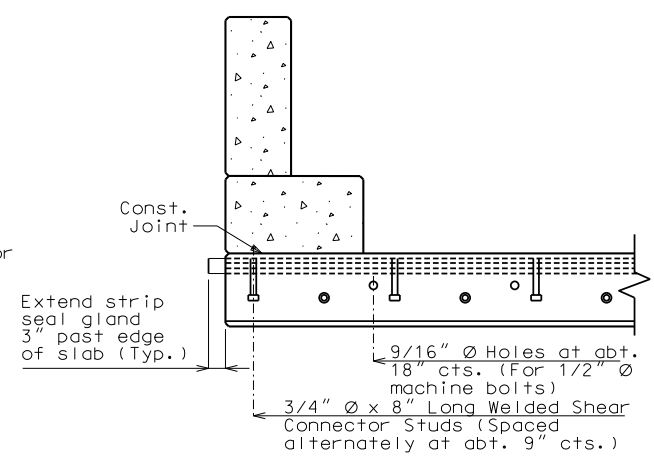


PART ELEVATION OF BARRIER CURB

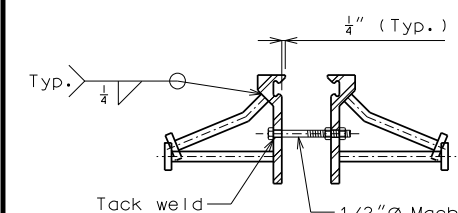
Note: Strip seal gland not shown for clarity.



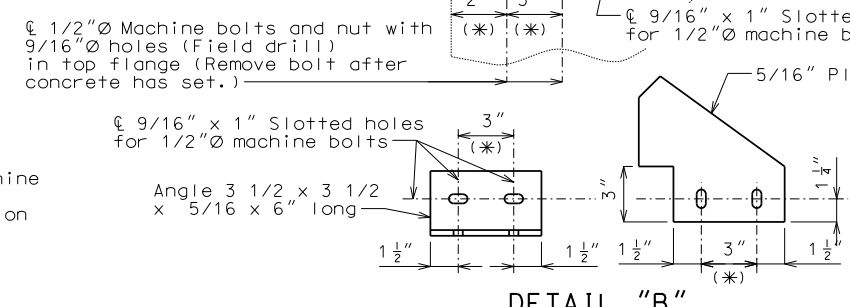
PART PLAN



PART SECTION B-B



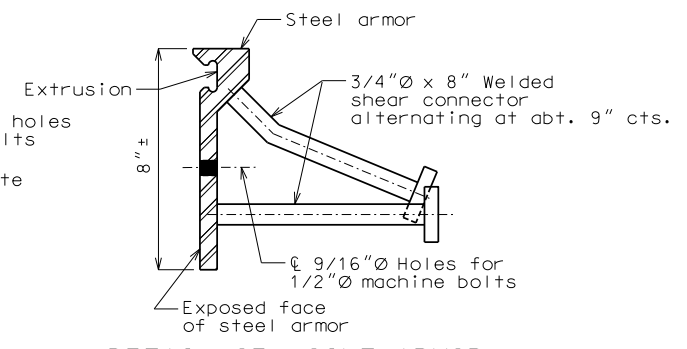
DETAIL "A"



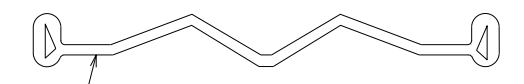
DETAIL "B"

DETAILS OF STRIP SEAL NEAR INTERMEDIATE BENT NO. 8

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



DETAIL OF JOINT ARMOR

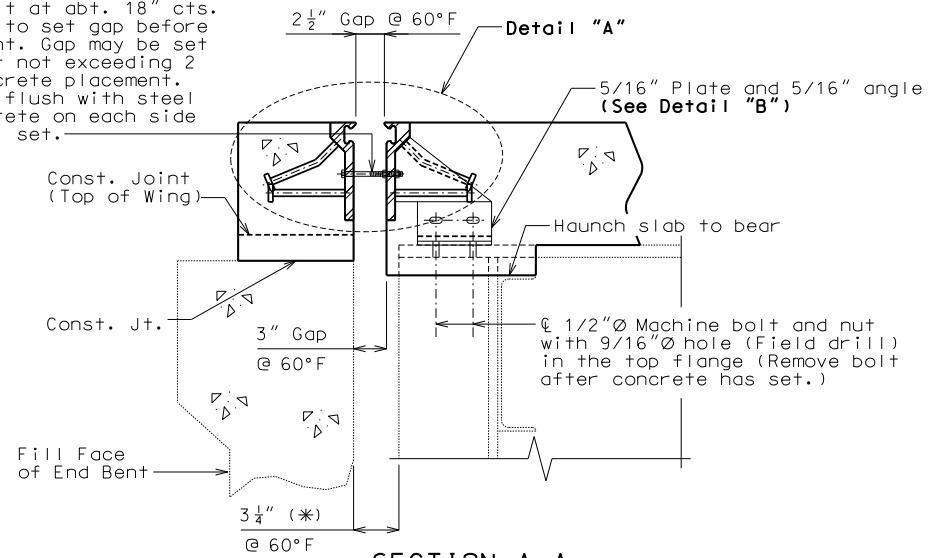


DETAIL OF GLAND

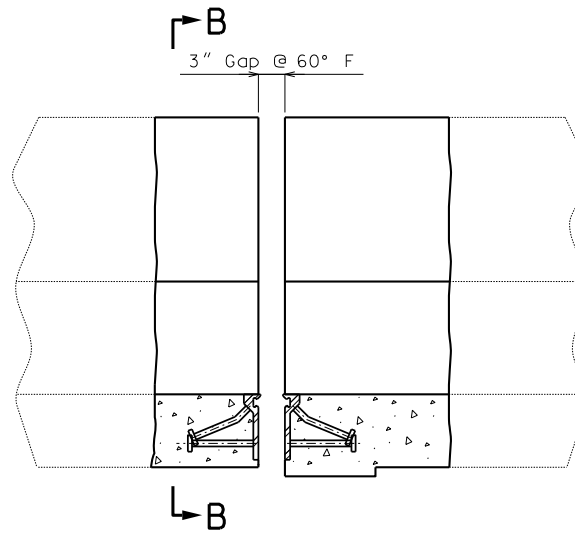
DETAILED: CMS Sept. 2014
 CHECKED: ARB Sept. 2014

Sheet No. 5 of 11

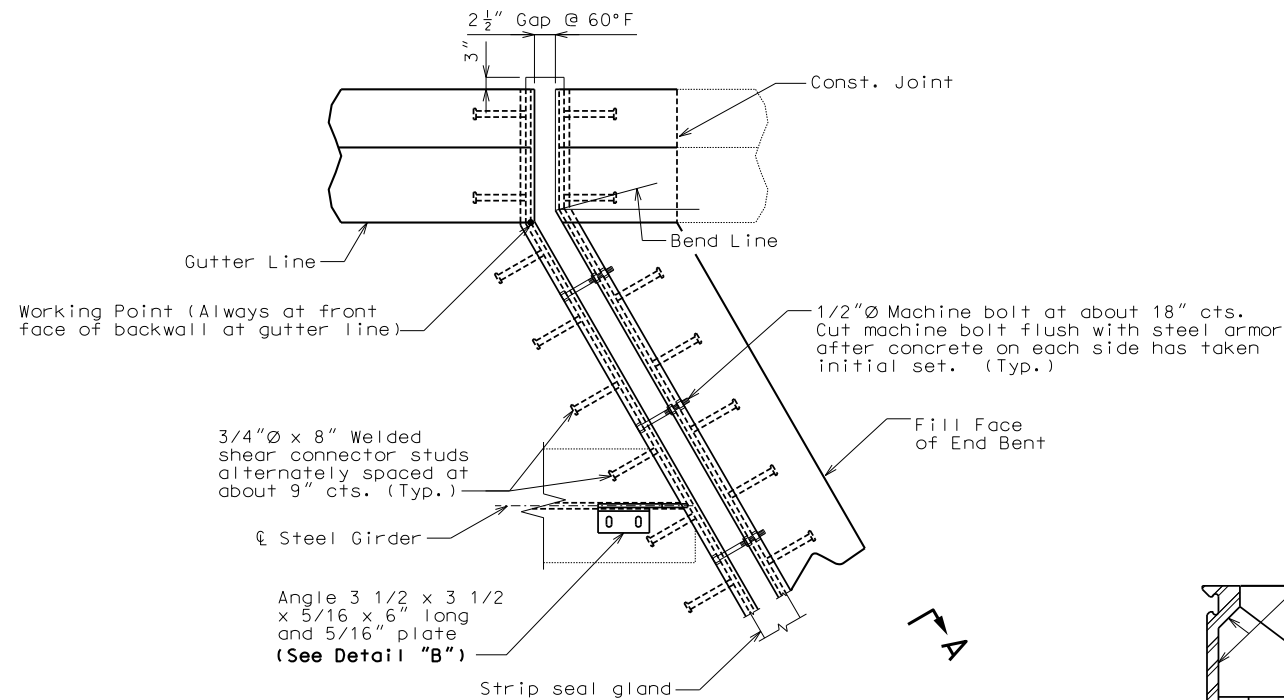
1/2"Ø Machine bolt at abt. 18" cts.
Use two hex nuts to set gap before
concrete placement. Gap may be set
anytime up to but not exceeding 2
hours before concrete placement.
Cut machine bolt flush with steel
armor after concrete on each side
has taken initial set.



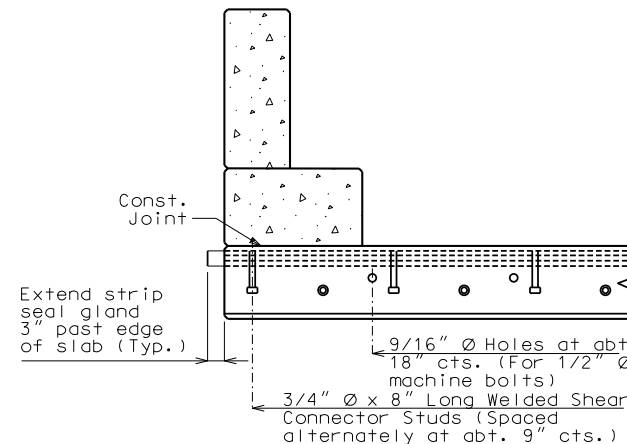
SECTION A-A
Note: Strip seal gland not shown for clarity.



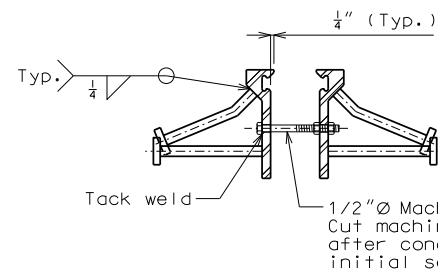
PART ELEVATION OF BARRIER CURB
Note: Strip seal gland not shown for clarity.



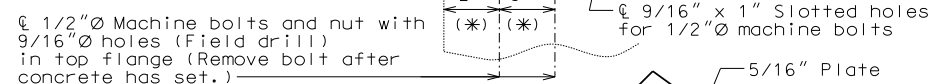
PART PLAN



PART SECTION B-B



DETAIL "A"



DETAIL "B"

DETAILS OF STRIP SEAL AT NORTH ABUTMENT

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

Sheet No. 6 of 11

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.
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.

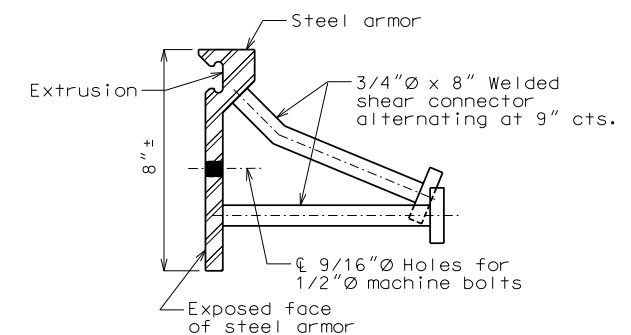
Structural steel for the expansion joint
system shall be coated with a minimum of two
coats of inorganic zinc primer (5 mils
minimum) or galvanized in accordance with
ASTM A123. Anchors need not be protected
from overspray.

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°F fall or rise in temperature at
installation.

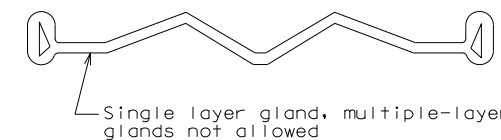
Existing longitudinal reinforcing steel
shall be bent or cut so that ends shall not
be more than ±1" from vertical leg of the
steel armor at the expansion joint system.

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

(*) Match Existing.



DETAIL OF JOINT ARMOR



DETAIL OF GLAND

DETAILED: CMS Sept. 2014
CHECKED: ARB Sept. 2014



DATE PREPARED
October 31, 2014

ROUTE 169 STATE MO
DISTRICT BR SHEET NO. 6

COUNTY CLAY
JOB NO. J413028
CONTRACT ID.

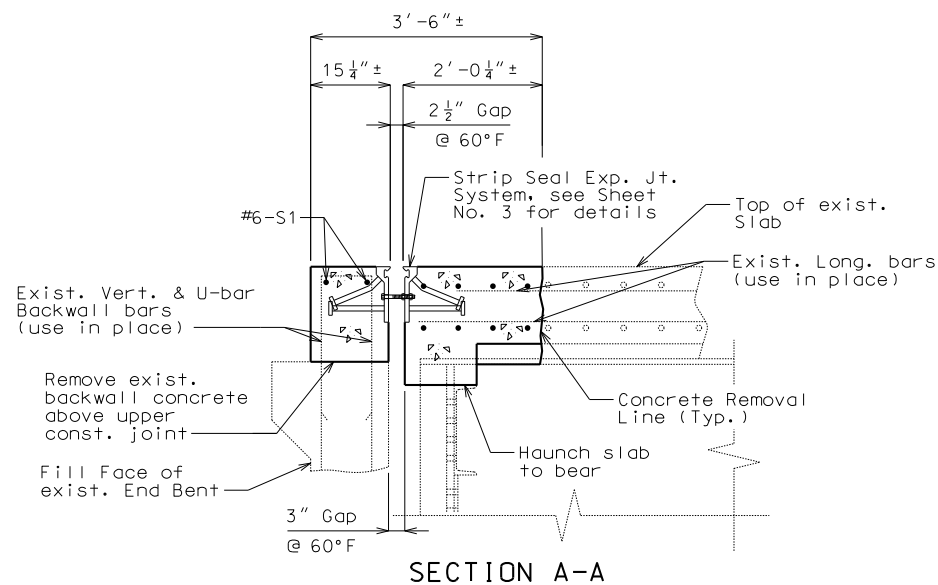
PROJECT NO.
BRIDGE NO. A46432

DATE	DESCRIPTION

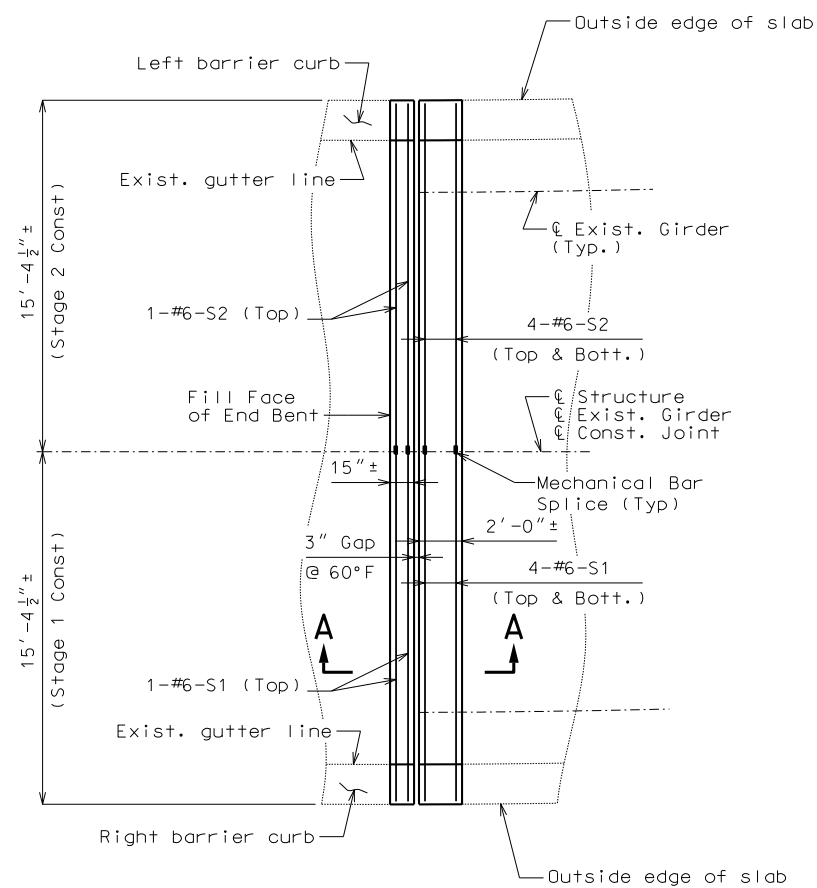
MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

Leigh & O'Kane, LLC
Structural Engineers
MO State Certificate of Authority #001644
9201 Ward Parkway, Suite 301
Kansas City, MO 64114
816.444.3144 P
816.444.9655 F
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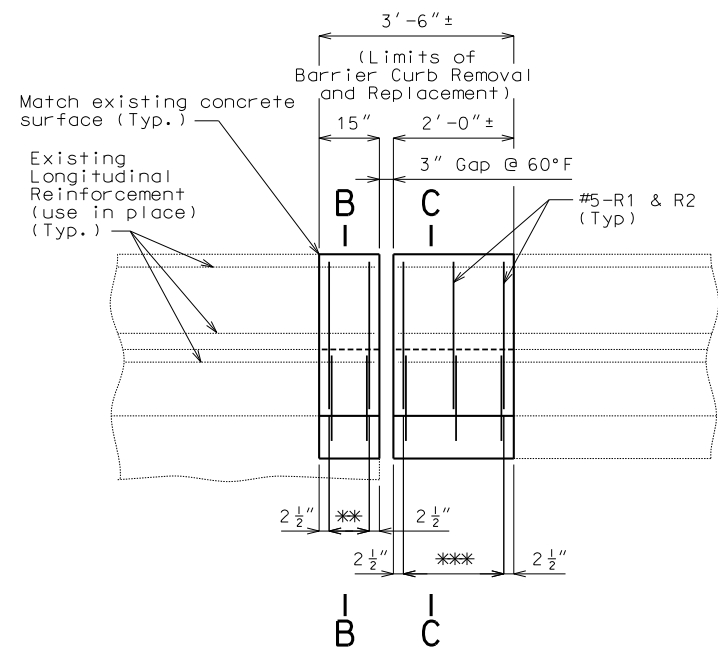




SECTION A-A



PART PLAN OF SLAB AT SOUTH ABUTMENT



PART ELEVATION OF RIGHT BARRIER CURB
(Right barrier curb shown, left barrier curb similar)

** 2-#5-R1 and #5-R2
*** 3-#5-R1 and #5-R2, equally spaced

Notes:

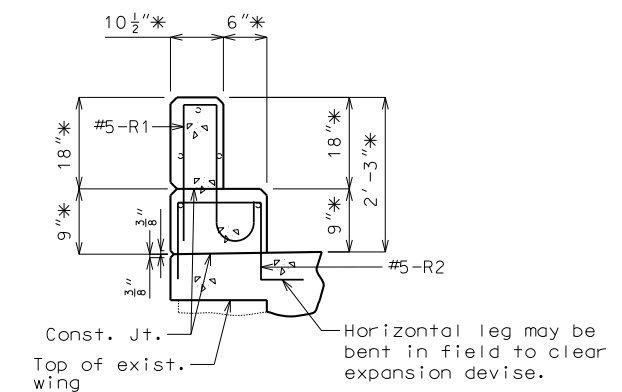
The contractor shall use a mechanical bar splice for #6-S1 & #6-S2 bars at the specified location. The total bar lengths for bars indicated in the bill of reinforcing steel are determined based on the end of the bars being located flush to the face of the construction joint. No additional payment will be made for any additional bar lengths required for the mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706 except that no measurement will be made for mechanical bar splice and will be considered completely covered by the contract unit price for the reinforcing steel.

All exposed edges of new barrier curbs shall match existing curbs.

Concrete in the barrier curb and slab shall be Class B-1.

Shift S-bars where necessary to clear the expansion device.

Payment for curb removal and all concrete and reinforcement for barrier curb, complete-in-place, will be considered completely covered by the contract unit price for Remove and Replace Barrier Curb per linear foot.



PART SECTION B-B
* Match existing.

PART SECTION C-C
* Match existing.

DETAILS OF SLAB AND BARRIER CURB AT SOUTH ABUTMENT

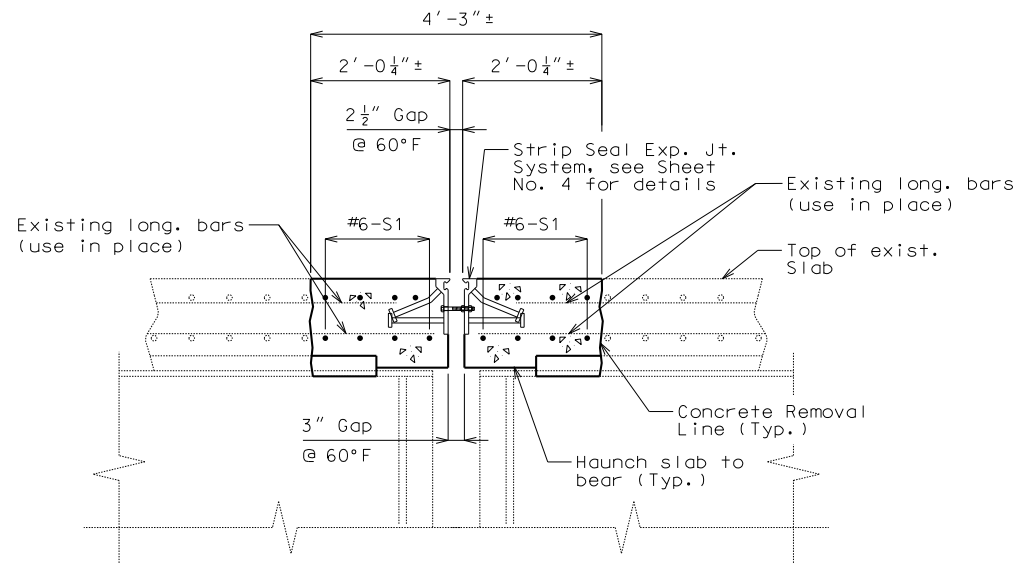
DETAILED: CMS Sept. 2014
CHECKED: ARB Sept. 2014

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

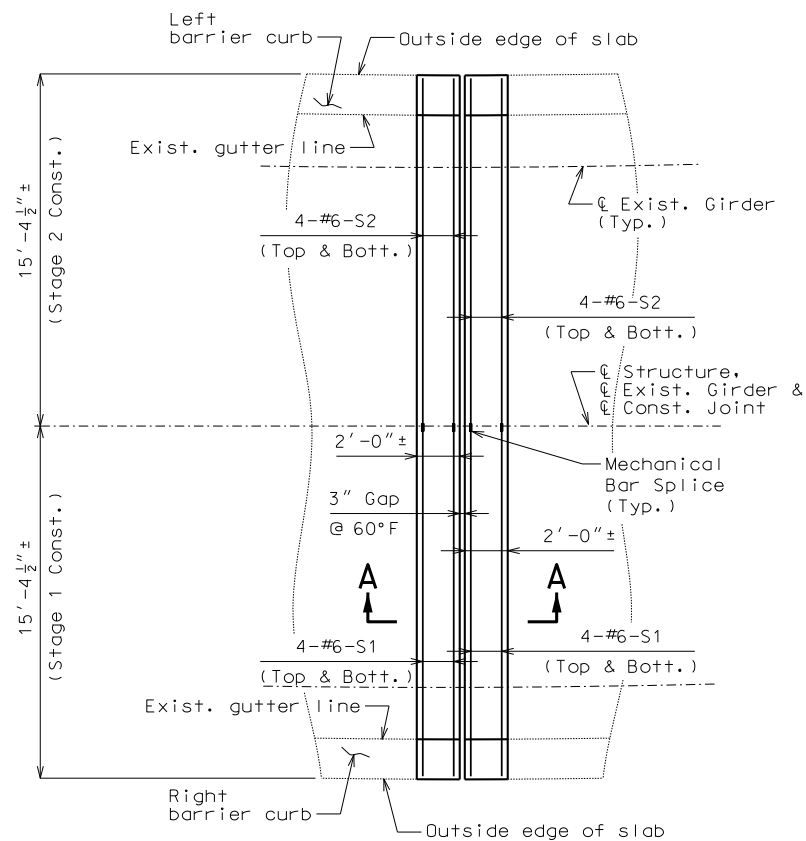
Sheet No. 7 of 11

DATE PREPARED October 31, 2014	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 7
COUNTY CLAY	
JOB NO. J413028	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A46432	
DESCRIPTION	DATE
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
Leigh & O'Kane, LLC Structural Engineers MO State Certificate of Authority #001644 9201 Ward Parkway, Suite 301 Kansas City, MO 64114 816.444.3144 P 816.444.9655 F www.leok.com	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	

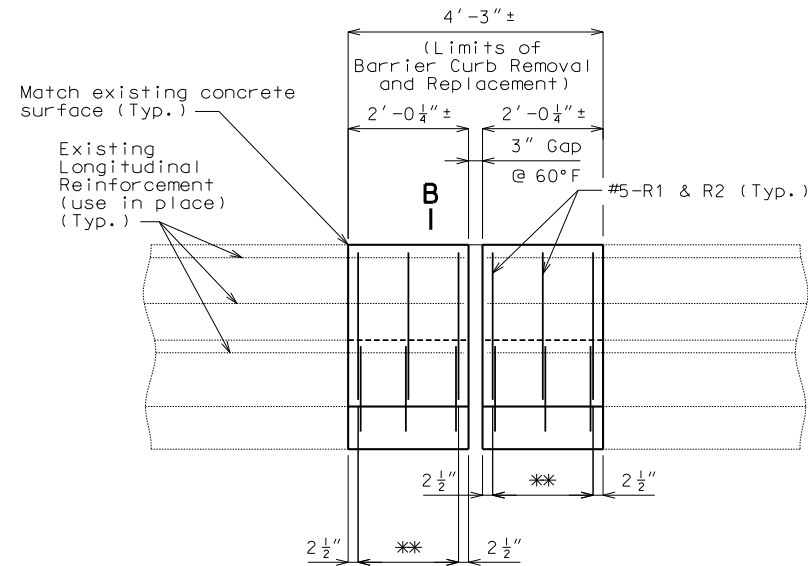
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



SECTION A-A

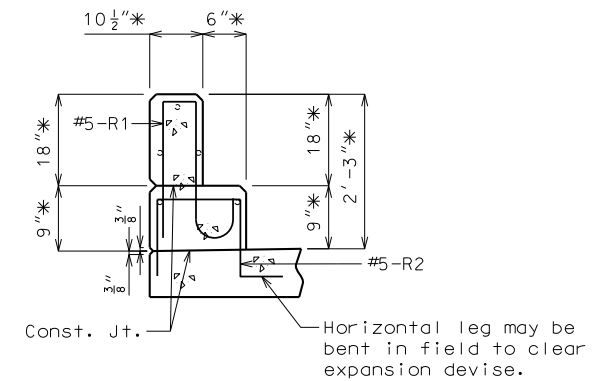


PART PLAN OF SLAB NEAR INT. BENT NO. 5



PART ELEVATION OF RIGHT BARRIER CURB
(Right barrier curb shown, left barrier curb similar)

** 3-#5-R1 and #5-R2, equally spaced.



PART SECTION B-B

* Match existing.

Note:
The contractor shall use a mechanical bar splice for #6-S1 & #6-S2 bars at the specified location. The total bar lengths for bars indicated in the bill of reinforcing steel are determined based on the end of the bars being located flush to the face of the construction joint. No additional payment will be made for any additional bar lengths required for the mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706 except that no measurement will be made for mechanical bar splice and will be considered completely covered by the contract unit price for the reinforcing steel.

All exposed edges of new barrier curbs shall match existing curbs.

Concrete in the barrier curb and slab shall be Class B-1.

Shift S-bars where necessary to clear the expansion device.

Payment for curb removal and all concrete and reinforcement for barrier curb, complete-in-place, will be considered completely covered by the contract unit price for Remove and Replace Barrier Curb per linear foot.



DATE PREPARED
October 31, 2014

ROUTE 169 STATE MO
DISTRICT BR SHEET NO. 8

COUNTY CLAY
JOB NO. J413028
CONTRACT ID.

PROJECT NO.
BRIDGE NO. A46432

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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Leigh & O'Kane, LLC
Structural Engineers
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Kansas City, MO 64114
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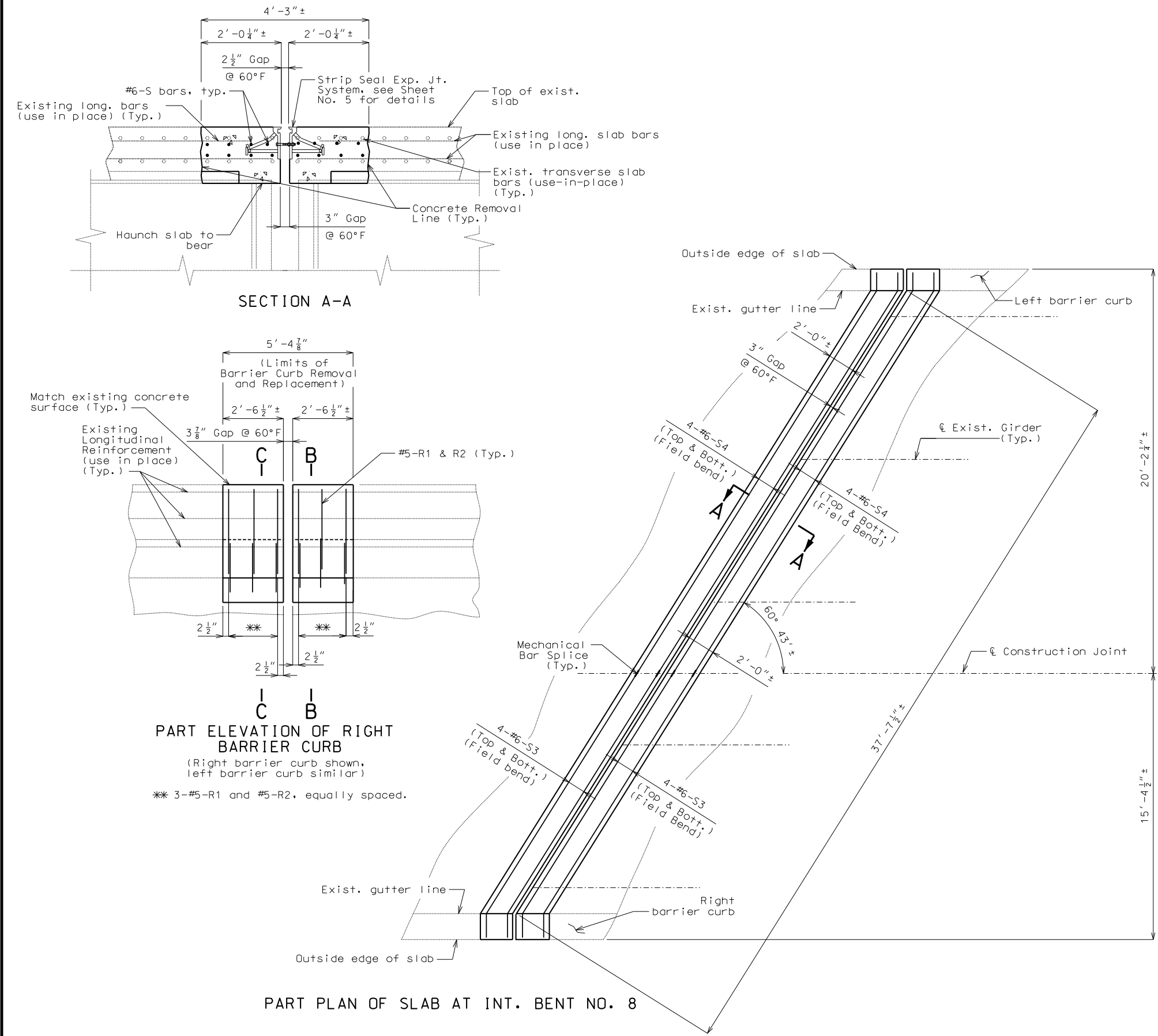
DETAILS OF SLAB AND BARRIER CURB AT JOINT 2 NEAR INT. BENT NO. 5

DETAILED: CMS Sept. 2014
CHECKED: ARB Sept. 2014

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

Sheet No. 8 of 11

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Notes:

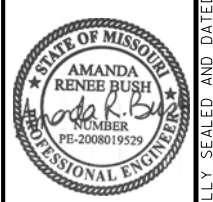
The contractor shall use a mechanical bar splice for #6-S3 & #6-S4 bars at the specified location. The total bar lengths for bars indicated in the bill of reinforcing steel are determined based on the end of the bars being located flush to the face of the construction joint. No additional payment will be made for any additional bar lengths required for the mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706 except that no measurement will be made for mechanical bar splice and will be considered completely covered by the contract unit price for the reinforcing steel.

All exposed edges of new barrier curbs shall match existing curbs.

Concrete in the barrier curb and slab shall be Class B-1.

Shift S-bars where necessary to clear the expansion device.

Payment for curb removal and all concrete and reinforcement for barrier curb, complete-in-place, will be considered completely covered by the contract unit price for Remove and Replace Barrier Curb per linear foot.



DATE PREPARED October 31, 2014	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 9
COUNTY CLAY	
JOB NO. J413028	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A46432	

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

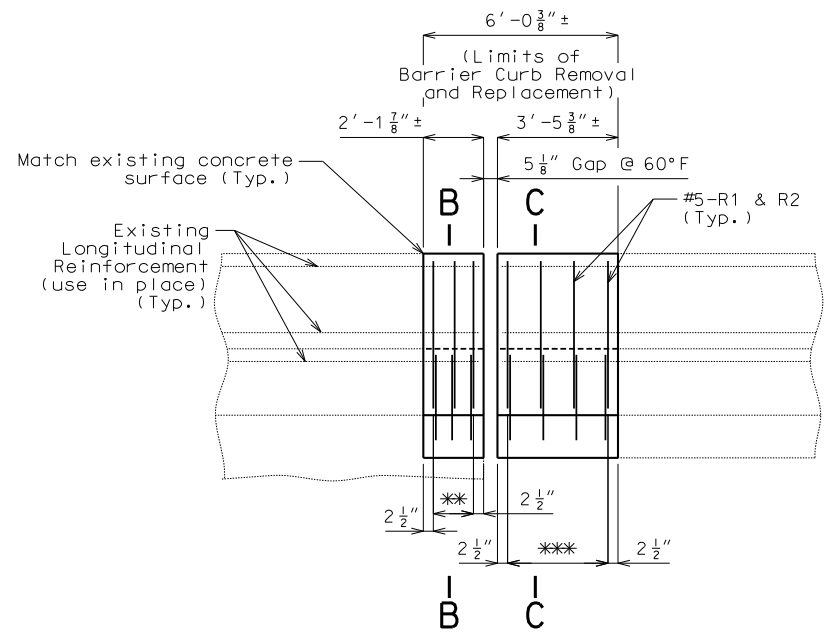
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MO State Certificate of Authority #001644
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DETAILED: CMS Sept. 2014
CHECKED: ARB Sept. 2014

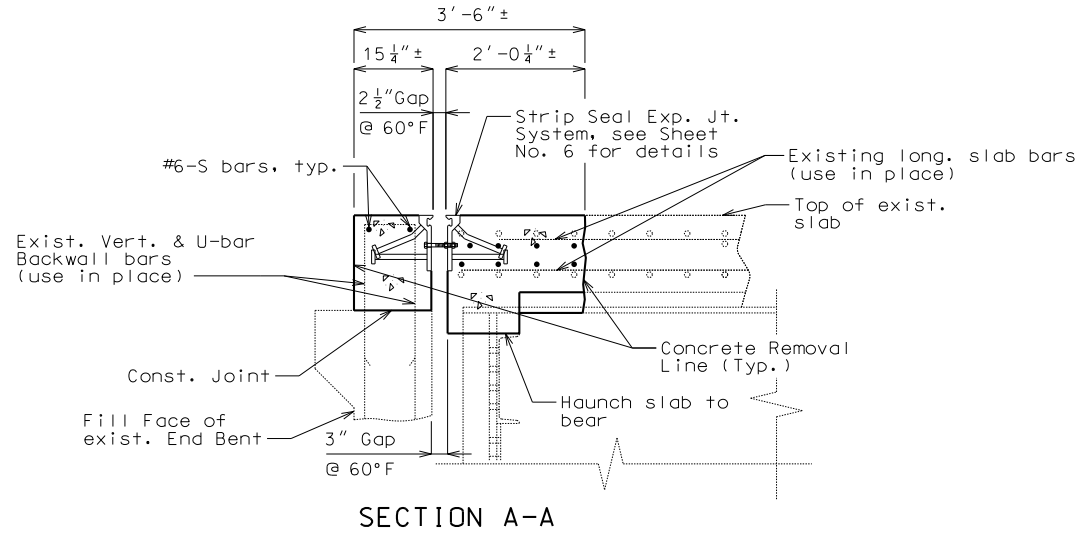
DETAILS OF SLAB AND BARRIER CURB AT JOINT 3 NEAR INT. BENT NO. 8

Note: This drawing is not to scale. Follow dimensions. Sheet No. 9 of 11

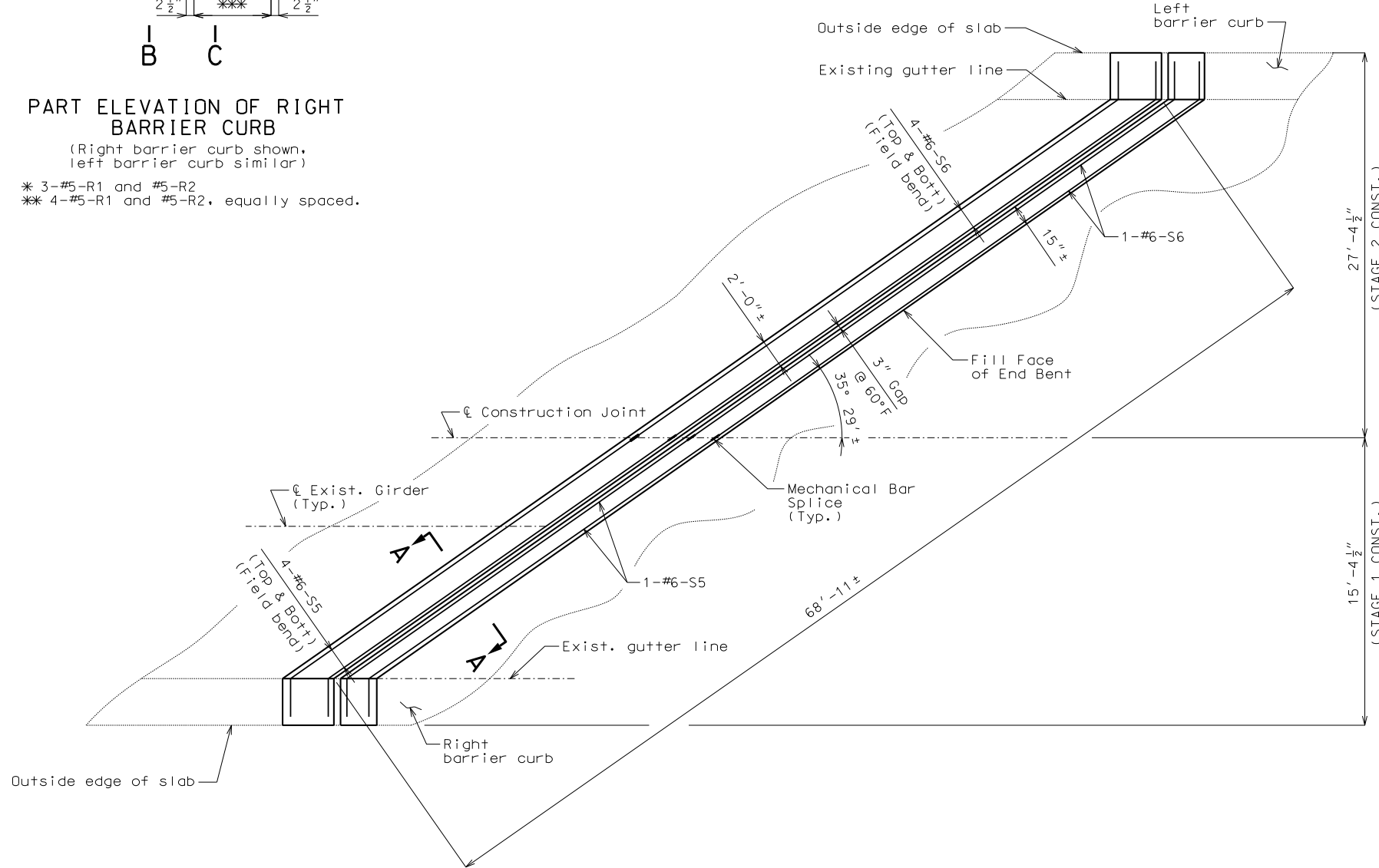
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PART ELEVATION OF RIGHT BARRIER CURB
 (Right barrier curb shown, left barrier curb similar)
 * 3-#5-R1 and #5-R2
 ** 4-#5-R1 and #5-R2, equally spaced.



SECTION A-A



PART PLAN OF SLAB AT NORTH ABUTMENT

Notes:

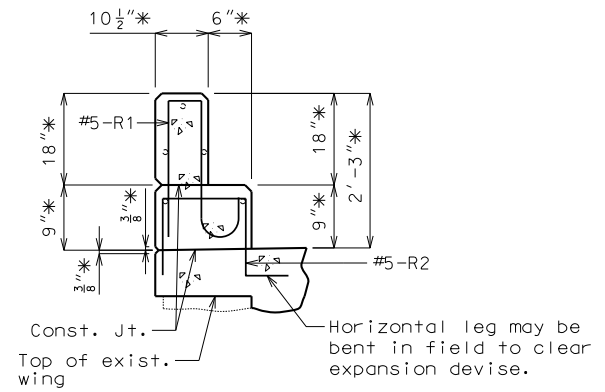
The contractor shall use a mechanical bar splice for #6-S5 & #6-S6 bars at the specified location. The total bar lengths for bars indicated in the bill of reinforcing steel are determined based on the end of the bars being located flush to the face of the construction joint. No additional payment will be made for any additional bar lengths required for the mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706 except that no measurement will be made for mechanical bar splice and will be considered completely covered by the contract unit price for the reinforcing steel.

All exposed edges of new barrier curbs shall match existing curbs.

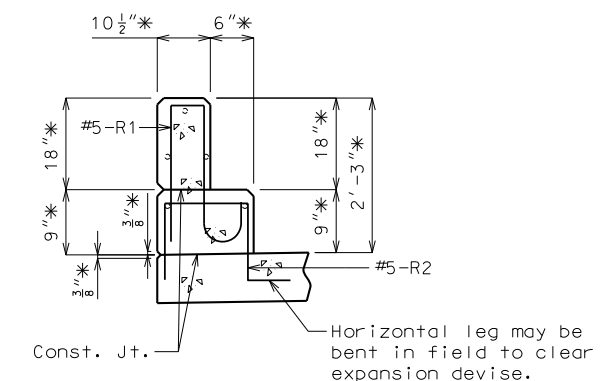
Concrete in the barrier curb and slab shall be Class B-1.

Shift S-bars where necessary to clear the expansion device.

Payment for curb removal and all concrete and reinforcement for barrier curb, complete-in-place, will be considered completely covered by the contract unit price for Remove and Replace Barrier Curb per linear foot.



PART SECTION B-B
 * Match existing.



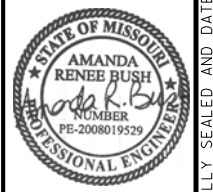
PART SECTION C-C
 * Match existing.

DETAILS OF SLAB AND BARRIER CURB AT JOINT 4 NEAR NORTH ABUTMENT

DETAILED: CMS Sept. 2014
 CHECKED: ARB Sept. 2014

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

Sheet No. 10 of 11



DATE PREPARED October 31, 2014	
ROUTE 169	STATE MO
DISTRICT BR	SHEET NO. 10
COUNTY CLAY	
JOB NO. J413028	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. A46432	

DATE	DESCRIPTION

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 Structural Engineers
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