ROLL #620

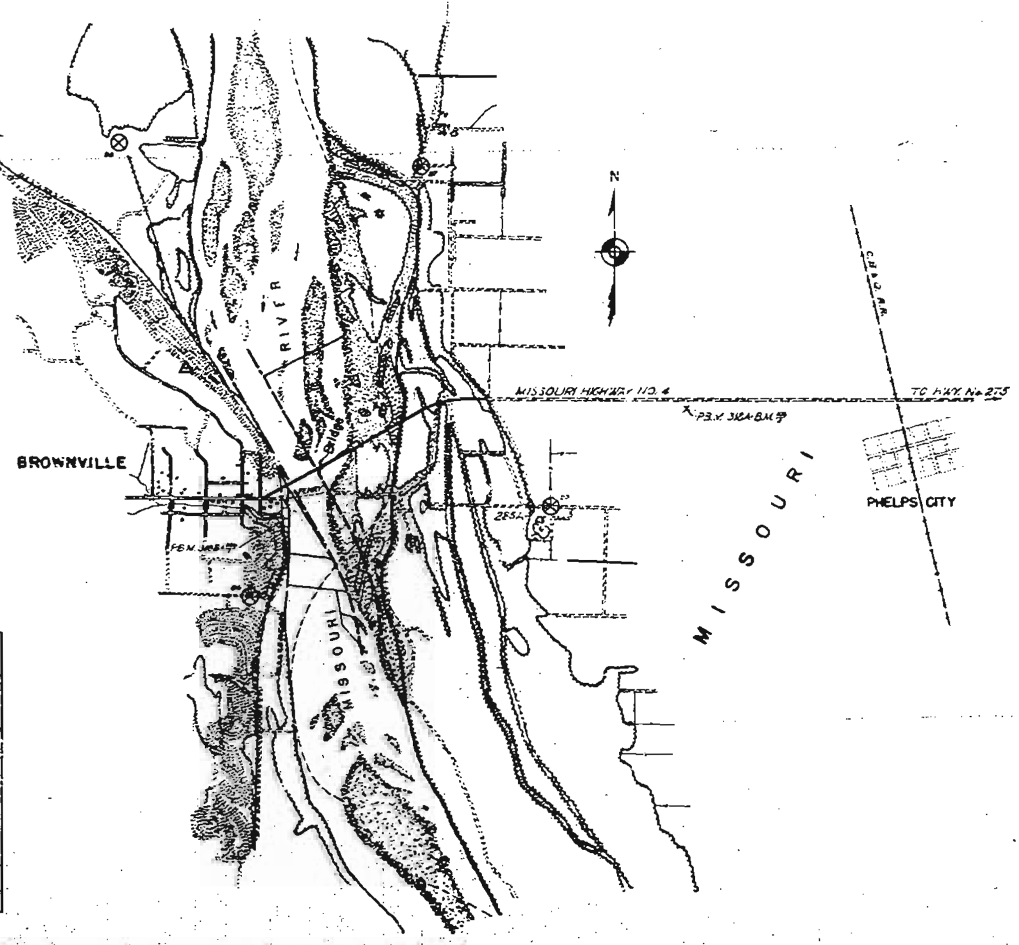
ROLL #620

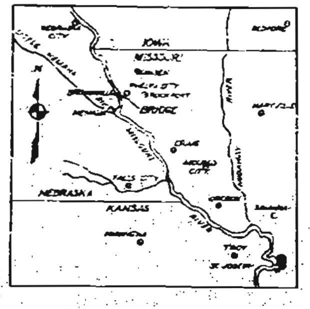
P.W.A. DOCKET, MO.NO.1099-F

MISSOURI RIVER BRIDGE

ATCHISON COUNTY, MISSOURI

AT BROWNVILLE, NEBR.





VICINITY MAP
1"=20 Miles

LOCALITY MAP
1"=2000'

LIST OF DRAWINGS

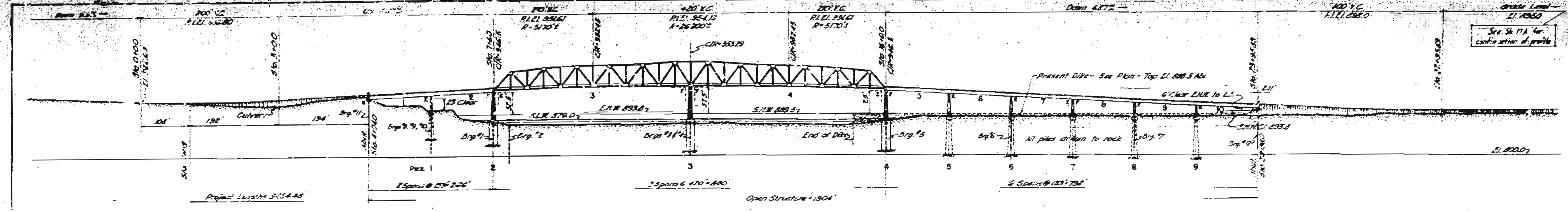
1 & 1A*	GENERAL PLAN AND ELEVATION *(1A includes Lighting)
2, 4, 4A, 5, 5A	TRUSS SPAN PIERS
3, 3A, 3B	GIRDER SPAN PIERS
6	ABUTMENTS
7	SHOES
8 TO 13	TRUSS SPANS, SUPERSTRUCTURE
14, 15	GIRDER SPANS, SUPERSTRUCTURE
16	EXPANSION JOINTS, HANDRAILS, ETC.
17, 17A, 18, 18A	APPROACH HIGHWAYS
19	TOLL HOUSE
20	EMBANKMENT PROTECTION
21, 22	NAME PLATES
23	FENDER DETAILS
24	ROADWAY LIGHTS ETC. AT TOLL HOUSE
25	PLAN AT BROWNVILLE BRIDGE PLAZA
26	PROFILE AT BROWNVILLE BRIDGE PLAZA
27	MISC. DETAILS AT BROWNVILLE PLAZA
28	TYPICAL LIGHTING DETAILS
29	BRIDGE CLEARANCE GAGE
30, 31	MAINTENANCE, STORAGE AND GARAGE BLDG.
32	RIPRAP NEAR EAST ABUTMENT
33	RIVER STAGES

L-98

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

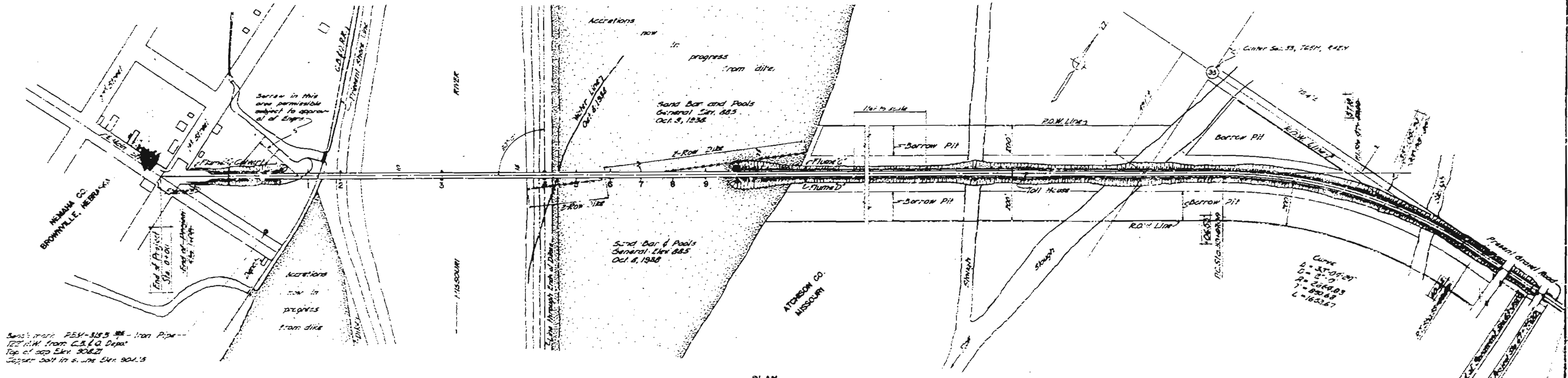
Revised as Constructed [illegible]

Atchison Co. #4 #98



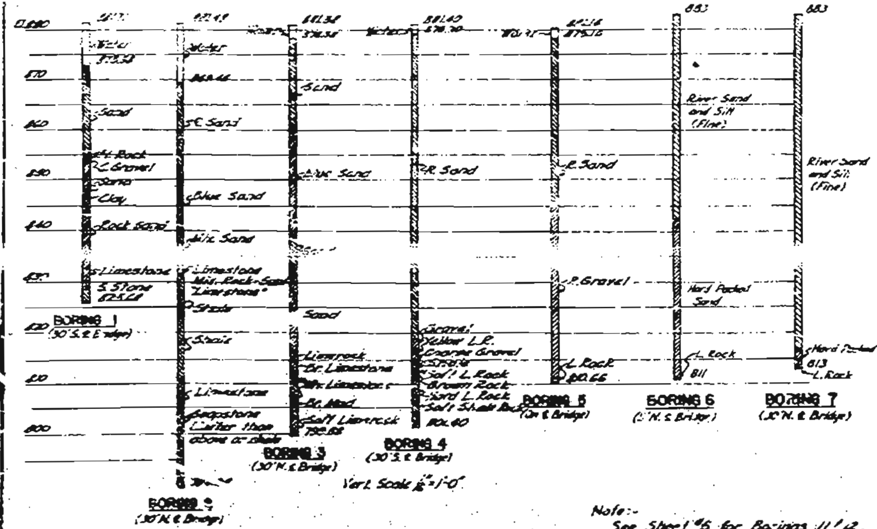
ELEVATION

1" = 100'

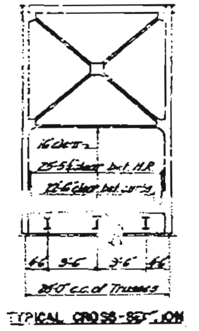

Accretions now in progress from dike
Sand Bar and Pools General Elev. 885 Oct. 8, 1938
Borrow in this area permissible subject to approval of Engrs.
NEMAHA CO. BROWNVILLE, NEBRASKA
ATCHISON CO. MISSOURI
RIVER
MISSOURI
Borrow Pit
Toll House
R.O.W. Line
Slough
Present Gravel Road
End of Project
Accretions now in progress from dike
Bench mark: PBM - 3189.86 - Iron Pipe - 122' N.W. from C.B.&Q. Depot
Top of cap Elev. 908.21
Copper bolt in stone Elev. 904.15

PLAN

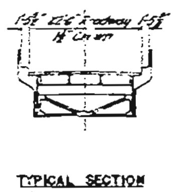
1" = 200'



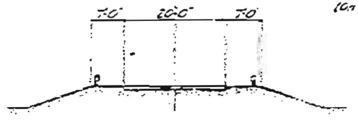
Note:- See Sheet #6 for Borings 11 & 12.



TYPICAL CROSS-SECTION

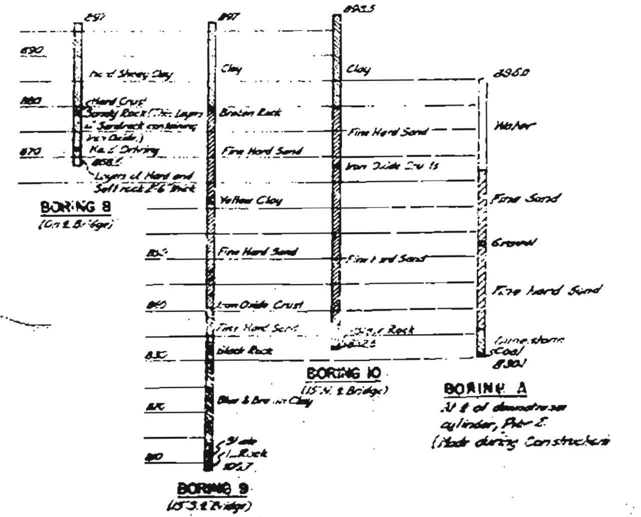


TYPICAL SECTION THRU GIRDER SPANS



TYPICAL SECTION THRU APPROACHES

Note: This Structure is designed for H20 Truck Loading. See Sheet 10.



BORINGS AT PIER 1

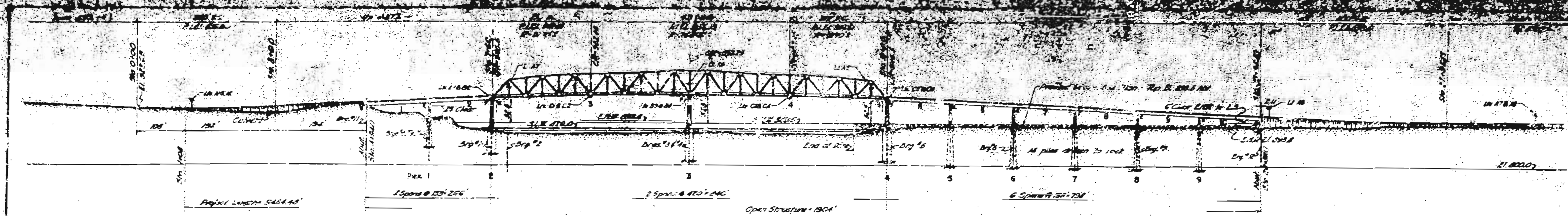
Permanent Bench Marks are tabulated on Sh. 3.

Note: Notes, elevations, etc. enclosed thus ⟷ are as finally constructed.

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

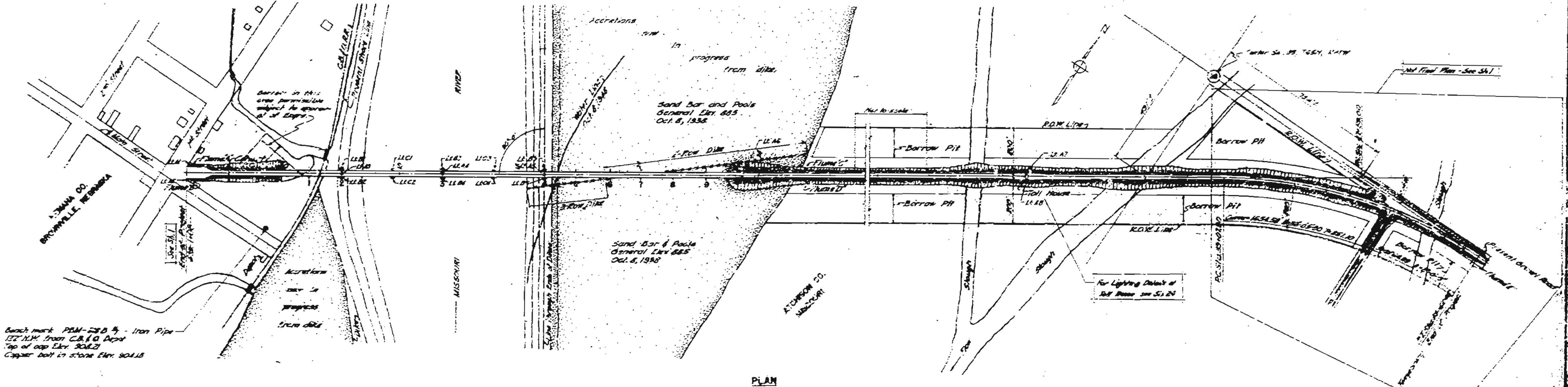
GENERAL PLAN AND ELEVATION



ELEVATION

1"=100'

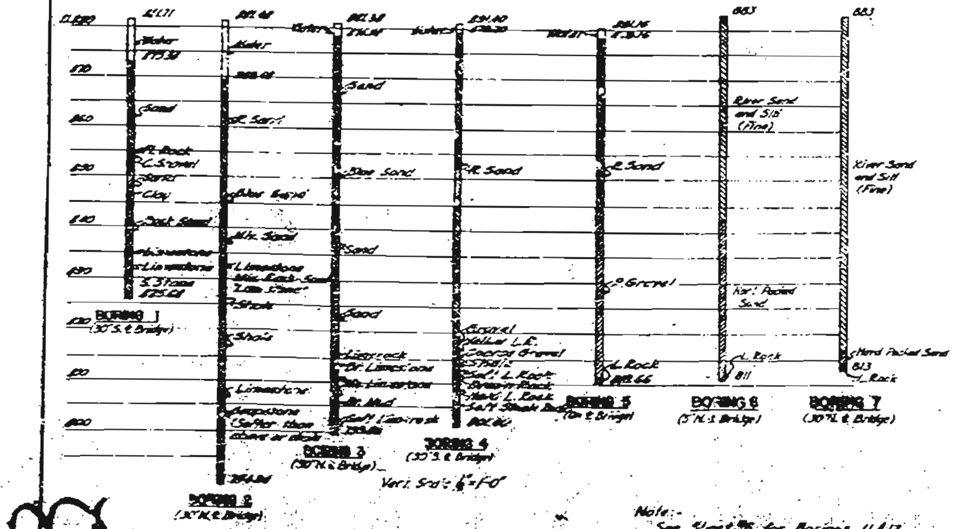
KEY TO LIGHTING:
A1, A2, A6, L2, L3 - 2? Watt Roadway Lights on Standards
L3, A4, A5 - ?? Watt Roadway Lights on Steel Trusses
B1 to B5 - 100' Red Navigation Lights on Piers
C1 to C4 - 300' Green Mid-Span Navigation Lights



NEMAHA CO.
BROWNVILLE, NEBRASKA
Main Street
Borrow in this area permissible subject to approval of Engrs.
Accretions now in progress from dike
RIVER
MISSOURI
Accretions now in progress from dike
Sand Bar and Pools General Elev. 885 Oct. 8, 1938
Sand Bar & Pools General Elev. 885 Oct. 8, 1938
ATCHISON CO. MISSOURI
Borrow Pit
Borrow Pit
Borrow Pit
Toll House
R.O.W. Line
For Lighting Details at Toll House see Sh. 24
Not Final Plan - See Sh. 1
Slough
Bench mark PBM-238 ... Iron Pipe
132' N.W. from C.B.&Q. Depot
Top of cap Elev. 908.21
Copper bolt in stone Elev. 904.18

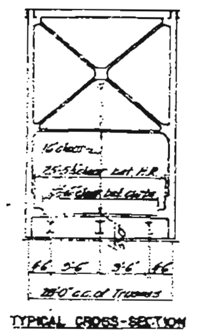
PLAN

1"=200'



Water
Sand
Blue Sand
Fine Sand
Gravel
Clay
Limestone
Shale
River Sand and Silt (Fine)
Hard Packed Sand
Rock
BORING 1 (30' S. E Bridge)
BORING 2 (30' N. E Bridge)
BORING 3 (30' N. E Bridge)
BORING 4 (30' S. E Bridge)
BORING 5 (On E Bridge)
BORING 6 (5' N. E Bridge)
BORING 7 (30' E Bridge)
Vert. Scale 1/8"=1'-0"

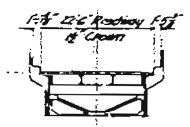
Note:- See Sheet 5 for Borings 11 & 12.



TYPICAL CROSS-SECTION

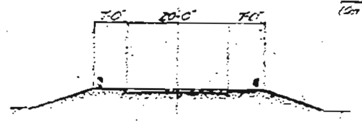
as at L4-U4

1/8"=1'-0"



TYPICAL SECTION THRU GIRDER SPANS

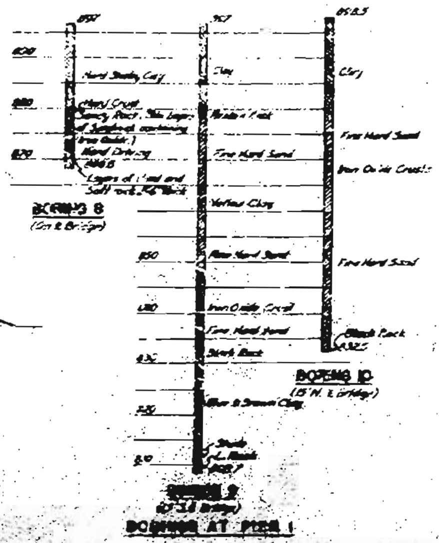
1/8"=1'-0"



TYPICAL SECTION THRU APPROACHES

1/8"=1'-0"

Note: This Structure is designed for H-20 Truck Loading. See Sheet 10.



BORINGS AT PIER 1

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

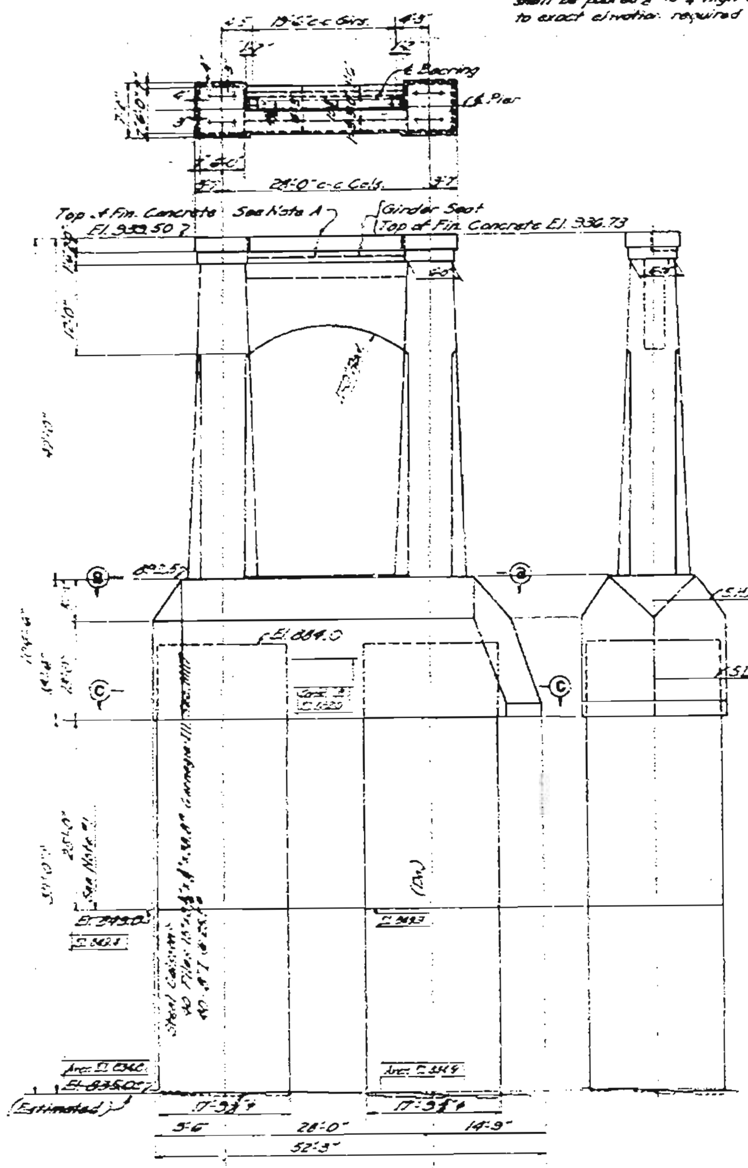
GENERAL PLAN AND ELEVATION

L-98

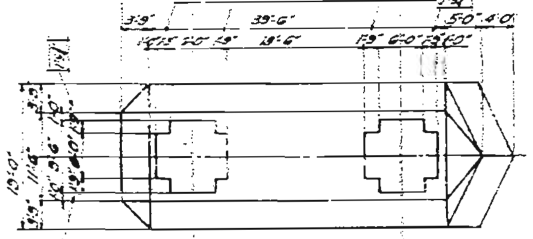
77

Note 1:-
Concrete pads under shoes shall be in general 6" wider in each direction than shoes and shall be poured ⅛" to ¼" high and ground level to exact elevation required by shoes.

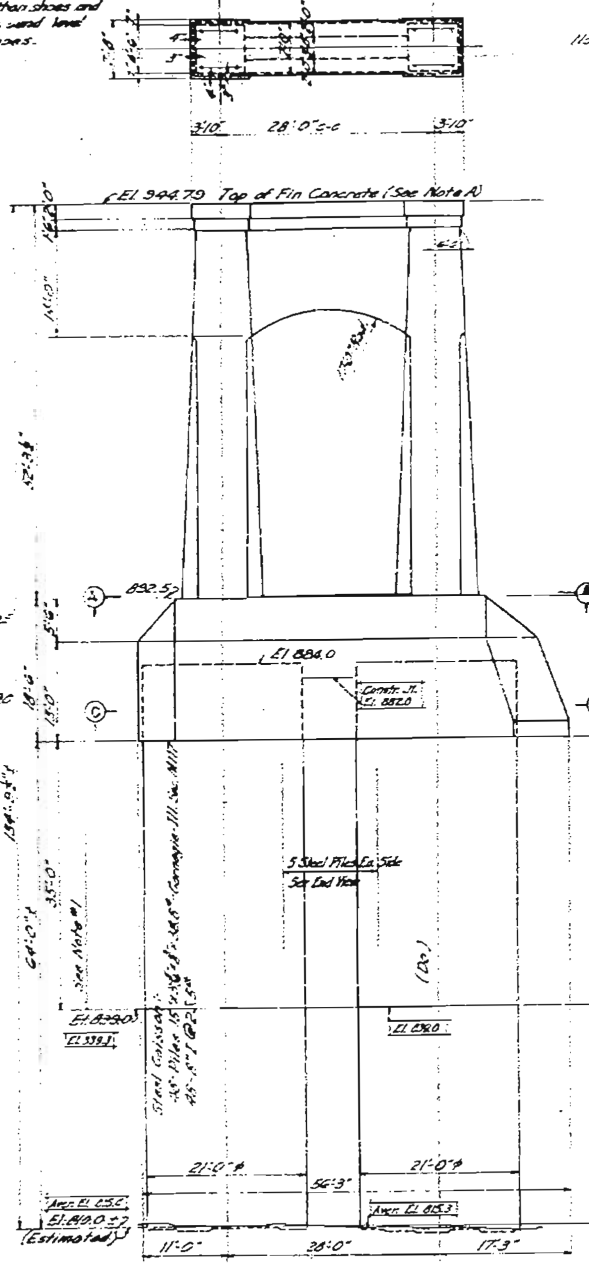
Note:
Batter Col. Shafts ⅛" to 12". All faces.



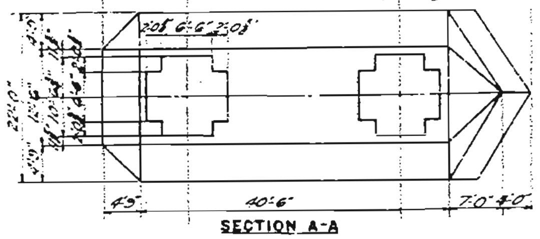
ELEVATION PIER 2 (Looking West)



SECTION B-B

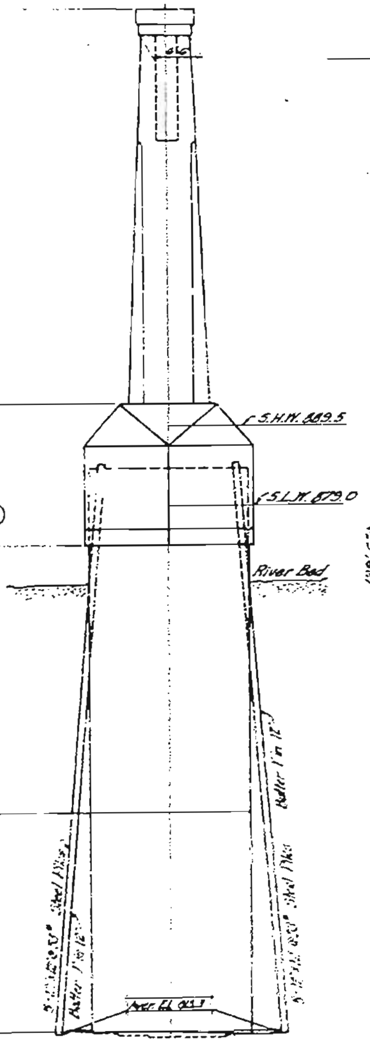


ELEVATION PIER 3 (Looking West)

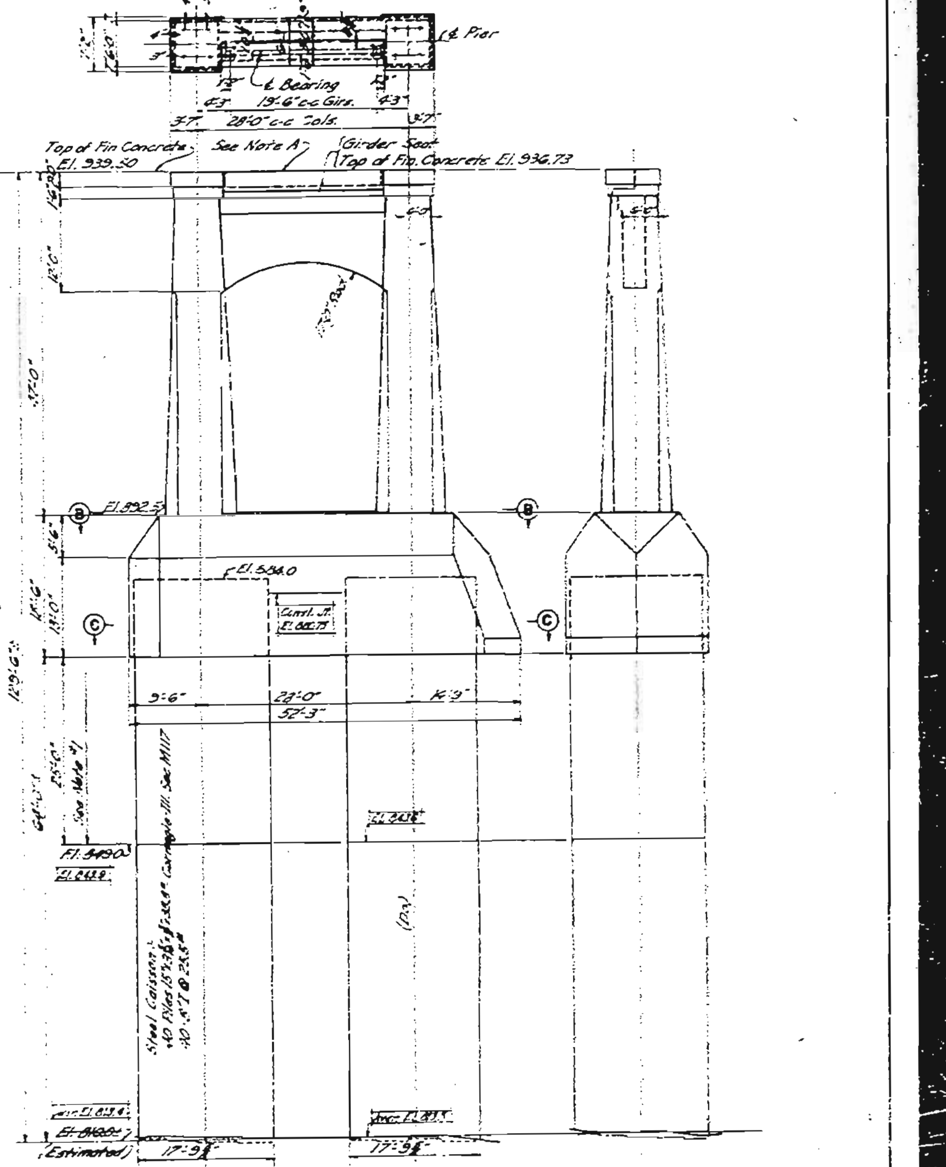


SECTION A-A

Note #1
Fill Steel Caisson with Concrete above this elevation.



END ELEVATION PIER 3



ELEVATION PIER 4 (Looking West)

GENERAL NOTES FOR CONCRETE

Classes of Concrete:-
All Deck Slabs shall be Class 35. In Base Cylinders of Piers use Class 25 for Seals and Class 20 for fill above seals, see Specifications. All other concrete in Piers and Abutments shall be Class 30.

Chamfers:-
For corner chamfers not shown, see Specifications.

Bar Bends:-
Reinforcing bar bends, unless otherwise provided shall be to a radius of 4 bar diameters. Stirrup bends shall be to 1½ bar diameters. Anchorage hooks shall be bent to 3½ bar diameters radius and have an overall length of 16 bar diameters. All measurements are to bar centers.

Bar Splices:-
Laps shall be 50 diameters of bar unless otherwise noted. Splices shall be avoided where practicable, and shall be subject to approval of the Engineers.

Note:- See Sh. 4 for Section C-C.
Substructure Contractor shall use care in location of reinforcing steel so that nearest bars shall be at least 3½" clear from theoretic centers of Fox Bolts to be set by others.

Note:
Notes, Elevations, etc. enclosed thus ⟶ are as finally constructed. H.J.B. 2-5-40.

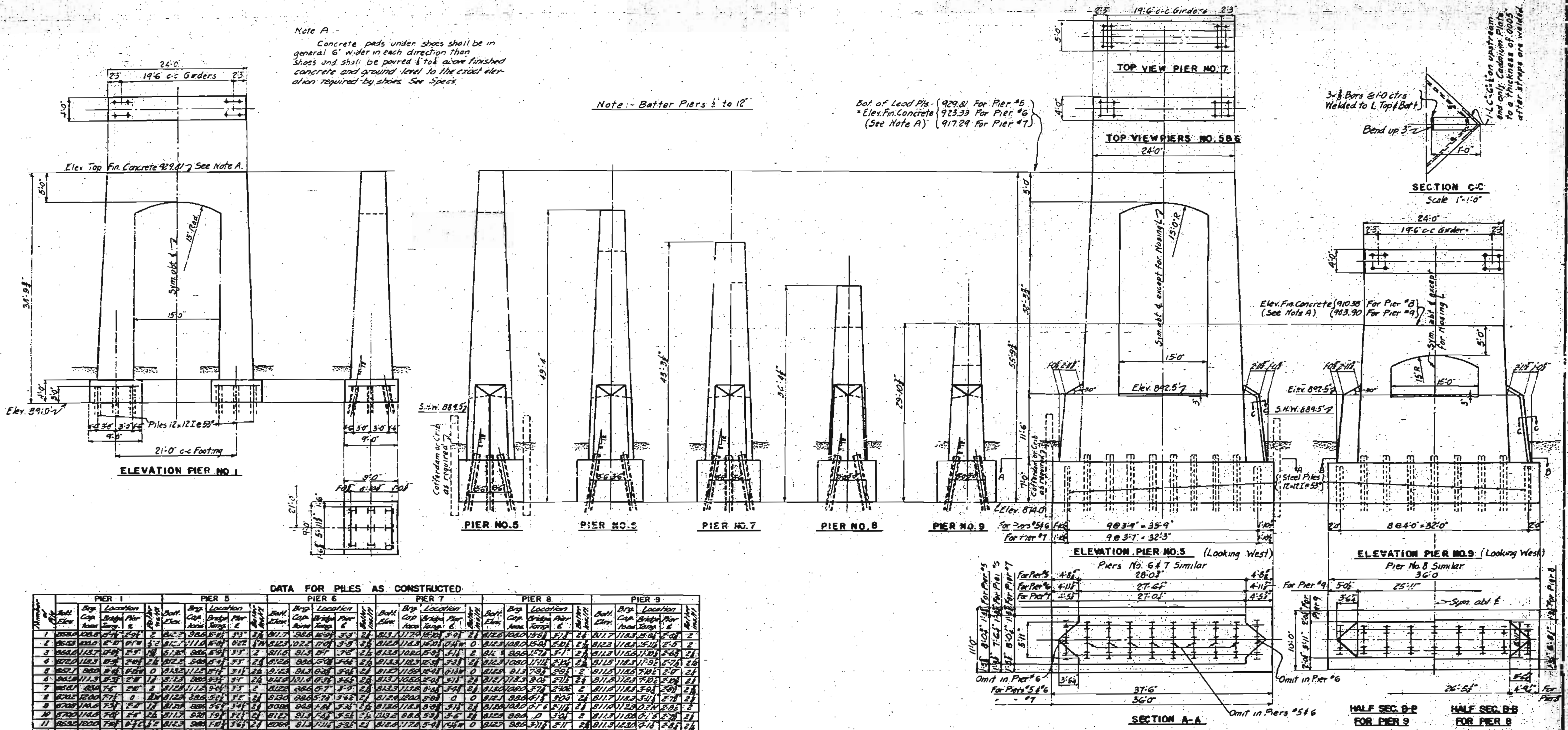
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPAN PIERS-GENERAL

SCALE ⅛"=1'-0"
[illegible]
CONTRACT NO. 2

Revised as Constructed - L.E.H. 5-6-40
Rev. 5-31-39 [illegible]



Note A.-

Concrete pads under shoes shall be in general 6" wider in each direction than shoes and shall be poured ⅛" to ¼" above finished concrete and ground level to the exact elevation required by shoes. See Specs.

Note:- Batter Piers ½ to 12"

DATA FOR PILES AS CONSTRUCTED

Number of Pile	PIER 1					PIER 5					PIER 6					PIER 7					PIER 8					PIER 9				
	Bott. Elev.	Brg. Cap. tons	Location: Bridge Tang.	Location: Pier ℄	Batter in 12	Bott. Elev.	Brg. Cap. tons	Location: Bridge Tang.	Location: Pier ℄	Batter in 12	Bott. Elev.	Brg. Cap. tons	Location: Bridge Tang.	Location: Pier ℄	Batter in 12	Bott. Elev.	Brg. Cap. tons	Location: Bridge Tang.	Location: Pier ℄	Batter in 12	Bott. Elev.	Brg. Cap. tons	Location: Bridge Tang.	Location: Pier ℄	Batter in 12	Bott. Elev.	Brg. Cap. tons	Location: Bridge Tang.	Location: Pier ℄	Batter in 12
1	858.0	108.6	8-1½	2-9½	2	812.3	98.6	15-11½	3-3"	2½	811.7	98.6	15-9½	3-3	2½	813.1	117.9	16-10½	3-9½	2½	812.6	108.0	15-6½	3-1½	2½	811.7	118.3	15-6½	2-6½	2
2	865.3	100.0	8-10	0-1½	[illegible]	812.1	111.0	15-8½	0-2	[illegible]	812.3	107.2	17-0½	3-3	2½	812.8	116.3	16-10½	0-4½W	0	812.3	108.0	15-9½	2-10½	2½	812.2	118.3	15-11½	2-5	2
3	866.6	118.7	8-0½	2-5	1½	813.5	98.6	15-9½	3-5	2	811.6	81.3	15-1	3-2	2½	813.5	108.0	15-9½	3-1½	2	[illegible]	98.6	11-7½	3-1	2½	811.3	115.6	11-10½	2-6½	2½
4	872.0	118.3	8-5½	2-0½	2½	812.2	54.6	15-4½	3-5	2½	812.6	98.6	15-8	3-6½	2½	813.3	118.3	12-5½	3-3½	2½	812.3	108.0	11-11½	2-10½	2½	811.5	118.3	11-9½	2-7½	2½
5	867.1	88.0	8-6½	0-5½	0	813.2	111.2	15-4½	3-1½	2½	812.3	81.3	6-3½	3-6½	2½	812.7	116.9	12-9½	0-1½W	0	812.8	81.3	7-9½	2-9½	2	811.5	118.6	7-10½	2-8	2½
6	864.8	111.3	8-5½	2-8	1½	812.3	98.6	9-3½	3-1	2½	812.9	121.6	6-3½	3-6½	2½	813.7	105.6	12-9½	3-1½	2½	812.1	118.3	8-0½	2-11½	2½	811.6	118.3	7-10½	2-10½	2½
7	868.1	88.0	7-6	2-10	2	812.8	111.2	9-3½	3-5	2	812.2	98.6	6-7	3-9	2½	813.3	112.8	8-8½	3-9½	2½	813.0	108.0	3-7½	2-10½	2	811.4	118.8	3-9½	2-9½	2½
8	870.2	120.0	7-7½	0	2½	812.3	98.6	5-0½	3-2	2½	813.0	98.6	5-7½	3-6½	2½	812.4	120.0	8-8½	0	0	812.5	98.6	4-1½	3-0½	2½	811.7	118.3	3-11½	2-7½	2½
9	870.8	116.6	7-5½	2-6	1½	812.5	98.6	5-6½	3-4½	2½	809.8	94.8	1-6½	3-3½	2½	812.6	116.3	8-6½	3-1½	2½	812.8	108.0	0-1 6	2-11½	2½	811.4	112.8	0-3½N	2-8½	2
10	870.0	114.6	7-6½	2-8	2½	811.7	93.6	5-9½	3-2½	2½	812.7	91.3	1-4½	3-5½	2½	813.2	88.6	5-3½	3-6	2½	812.5	98.6	0	3-0½	2	811.3	115.6	0-1½S	2-7½	2½
11	869.2	120.0	7-8½	0-1½	[illegible]	812.3	98.6	1-10½	3-6½	2½	808.4	81.2	1-11½	3-3½	2½	812.6	117.2	5-4½	0-5½W	0	812.7	98.6	3-11½	2-11	2½	811.3	123.0	4-1½	2-8½	2½
12	866.1	122.5	7-7½	2-9	1½	811.6	98.6	1-11	3-4	2½	812.8	99.8	1-11½	3-6½	2½	813.4	105.6	5-2½	3-0	1½	812.5	81.3	4-0½	2-11½	2	811.8	111.2	3-9½	2-6	2
13	869.6	118.3	8-6½	2-8½	2½	812.2	111.2	1-8½	3-6	2½	808.2	81.2	5-8½	3-3½	2½	813.1	118.3	2-0	3-4½	2	812.6	108.0	7-6	2-10	2	811.2	118.3	8-0½	2-8½	2½
14	868.0	120.0	8-6½	0-2½	[illegible]	811.6	80.7	5-7	3-6	2½	812.4	98.6	5-8	3-6½	2½	812.3	107.1	1-8½	0-½W	0	812.5	108.0	7-10½	2-11½	2½	811.6	118.3	8-2	2-8½	2½
15	868.8	116.6	8-4	2-5	1½	812.6	98.6	5-7½	3-3½	2½	810.9	98.6	9-2½	3-1½	2	813.6	102.2	1-9½	2-10½	1½	812.2	91.8	11-10½	2-9½	2	811.4	119.8	11-11½	2-5	2½
16	868.6	111.3	8-7½	3-1½	2½	811.0	86.6	9-3½	3-2	2½	812.6	98.6	9-6½	3-5½	2½	813.2	58.6	1-9½	3-4½	2	813.3	81.3	12-0½	2-11½	2½	811.6	115.3	12-0½	2-8½	2½
17	865.7	120.0	5-7½	0-3½	[illegible]	812.9	88.7	9-3½	3-4½	2½	811.1	98.6	13-1½	3-6	2	812.6	107.1	1-8½	0-2½W	0	812.6	108.0	15-9½	2-10½	1½	811.6	118.3	15-6	2-6	2
18	870.5	112.5	8-6½	2-9½	2½	811.2	88.7	12-10½	3-3	2	812.3	108.6	13-0½	3-6	2½	813.7	114.7	5-10½	3-1½	2	812.6	88.6	16-5½	3-½	2½	811.9	118.3	15-11	2-5	2½
19						813.1	103.6	15-1½	3-5½	2½	812.6	107.2	16-8½	3-4	1½	812.7	108.0	5-3½	3-6	2½										
20						812.1	98.6	15-7½	3-5½	2½	812.3	104.8	16-2½	3-9½	2½	812.2	109.9	5-3½	0-2½W	0										
21						812.0	103.6	15-10½	0	0						813.0	108.8	5-6	3-1½	2½										
22						812.8	98.6	17-0½	3-2	2½						811.8	108.0	8-9½	3-0½	2½										
23																812.3	107.1	9-0	0-1½W	0										
24																813.6	118.8	9-0	3-1½	2										
25																812.6	88.6	12-6	3-4½	2										
26																812.2	102.6	12-7½	0-2½W	0										
27																813.0	88.6	12-7½	3-1½	2										
28																812.3	117.9	16-1½	3-4½	2										
29																812.6	107.1	16-2½	0-2½W	0										
30																812.9	118.3	16-2½	3-2½	2½										

Note: The load capacity of vertically driven piles was determined by the formula -

$$P = \frac{2.0 W H}{S + 0.1} \text{ where}$$

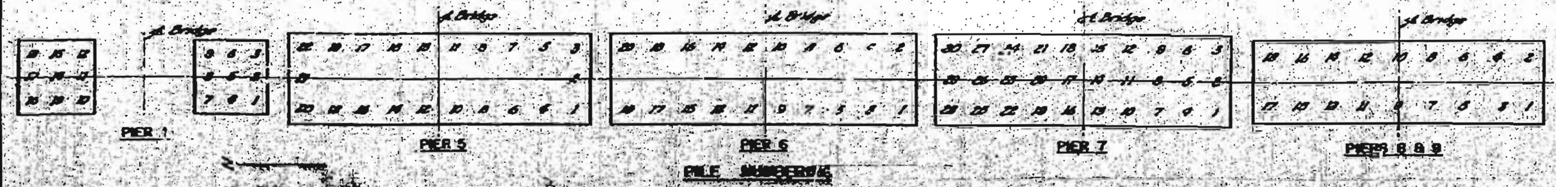
W = Weight of hammer in # = 5000#
H = Height of fall = 3.00'
S = Average penetration in inches per blow for the last 10 blows.
P = Load capacity for pile driven with steam hammer.

Note:
The steel bearing piles of all piers shown here shall be driven to rock. See Spec's.

PERMANENT BENCH MARKS FOR BROWNVILLE BRIDGE		
LOCATION	DESCRIPTION	ELEV.
West Abut. N.W. Cor. Downstream Curb.	Nail in lead plug	934.331
Pier 1 N.E. Cor. Top of Pier	Nail in lead plug	929.828
Pier 2 N.E. Cor. Top of Pier	Nail in lead plug	939.489
Pier 3 N.E. Cor. Top of Pier	Nail in lead plug	944.759
Pier 4 N.E. Cor. Top of Pier	Nail in lead plug	939.510
Pier 5 N.E. Cor. Top of Pier	Nail in lead plug	929.840
Pier 6 N.E. Cor. Top of Pier	Nail in lead plug	923.311
Pier 7 N.E. Cor. Top of Pier	Nail in lead plug	917.244
Pier 8 N.E. Cor. Top of Pier	Nail in lead plug	910.906
Pier 9 N.E. Cor. Top of Pier	Nail in lead plug	903.921
East Abut. S.E. Cor. Upstream Curb	Nail in lead plug	908.323
Sta. 64+56.97 ℄ Bridge & Railroad Track 60' South from Railroad Trestle.	Tack in lead plug in Concrete Mo. monument	898.08
Sta. 63+73 30' North Concrete R/W marker	Top of Concrete	892.80

Note:-
For General Notes for Concrete, see Sh. 2.
Pile Splice Details and Pile Cap Details to be same as shown on Sh. 6

All Concrete Class 30.

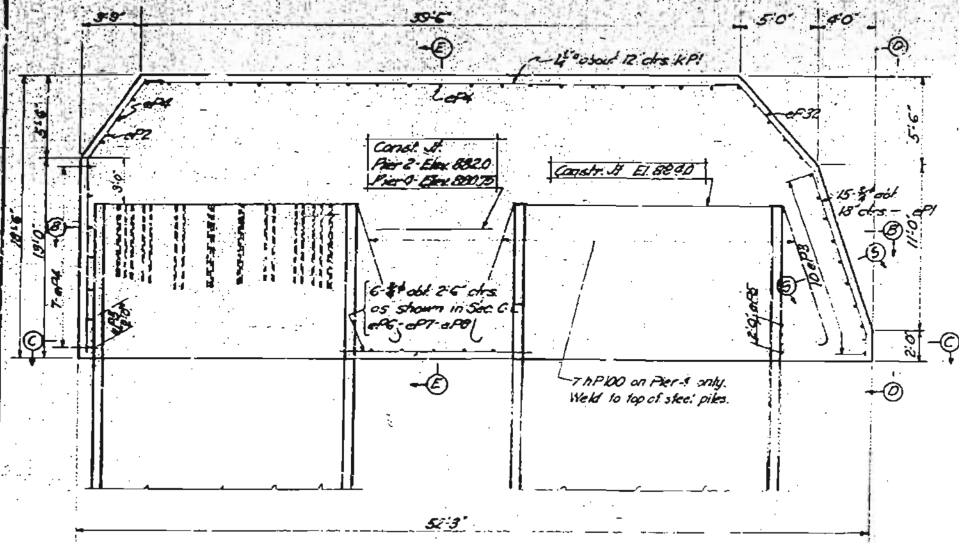


PILE NUMBERING

50

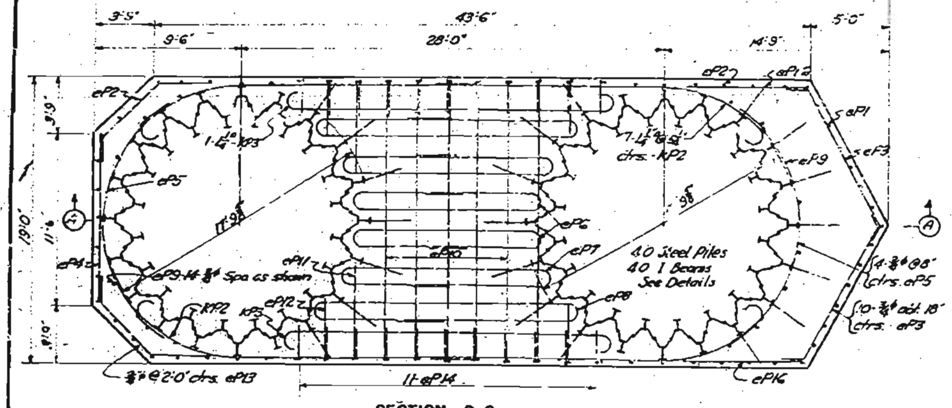
6-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

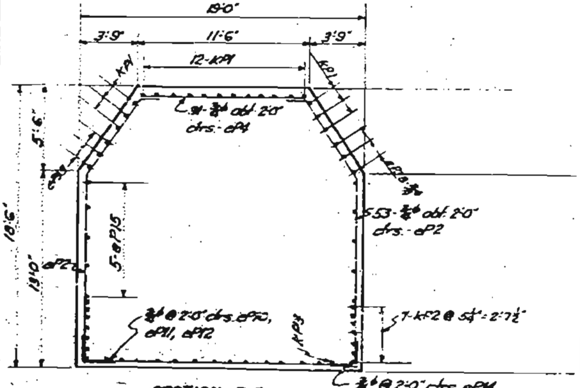


Const. Jt. Pier 2 - Elev. 882.0 Pier 4 - Elev. 880.75
Constr. Jt. El. 884.0
1¼"φ about 12" ctrs. kP1
15-¾"φ abt 18" ctrs. eP1
6-¾"φ abt 2'-6" ctrs. as shown in Sec. C-C eP6, eP7 & eP8
7 hP100 on Pier 4 only. Weld to top of steel piles.
52'-3"

SECTION A-A

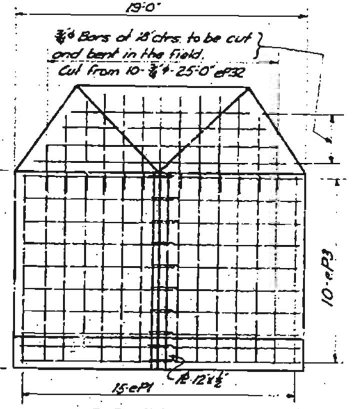


SECTION C-C



19'-0"
12-kP1
31-¾"φ abt 2'-0" ctrs. eP4
53-¾"φ abt. 2'-0" ctrs. eP2
5-eP15
7-kP2 @ 5¼" = 2'-7½"
¾"φ @ 2'-0" ctrs. eP10, eP11, eP12
¾"φ @ 2'-0" ctrs. eP14

SECTION E-E



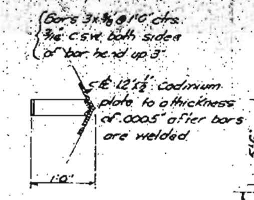
19'-0"
¾"φ Bars at 18" ctrs. to be cut and bent in the field. Cut from 10-¾"φ - 25'-0" eP32
10-eP3
15-eP1
eP12½

ELEVATION D-D

BAR LISTS

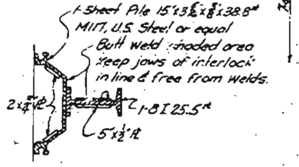
No	Mark	No per one	Size	Lgth.	Bending
		PIERS No 2 & 4			
30	eP1	15	¾"φ	13'-3"	11'-6" 1'-9" 4½ 12
106	eP2	53	"	20'-9"	12'-6" 6'-3" 6½ 12 2'-0"
40	eP3	20	"	13'-9"	1'-6" 10'-3" 6½ 12 12 2'-0"
62	eP4	31	"	11'-6"	Straight
16	eP5	8	"	20'-6"	6'-11" R
4	eP6	2	"	27'-6"	11'-0" eP6 12'-6" eP7 16'-0" eP8 2'-6" R
4	eP7	2	"	31'-6"	
4	eP8	2	"	38'-6"	
28	eP9	14	"	12'-0"	Straight
10	eP10	5	"	18'-0"	Straight
8	eP11	4	"	6'-0"	Straight
8	eP12	4	"	3'-6"	Straight
28	eP13	14	"	10'-11"	4'-0" 12 12
44	eP14	22	"	3'-6"	
40	eP15	20	"	31'-4"	6'-11" R 15'-8"
56	eP16	28	"	9'-6"	Straight
20	eP32	10	"	25'-0"	Bend in field
36	kP1	18	1¼"φ	39'-3"	Straight
56	kP2	28	1¼"φ	25'-4"	6" R 6'-11" R 7'-0" 16'-8"
4	kP3	2	1¼"φ	23'-3"	20'-0" 6" R 7'-0"
21	hP100	21	1"φ	11'-5"	Pier 4 only
12	eP33	6	¾"φ	39'-5"	Straight
		PIER No 3			
17	eP16	17	¾"φ	13'-3"	11'-6" 4½ 12
53	eP17	53	"	21'-5"	12'-6" 1'-8" 12
32	eP18	32	"	12'-6"	St.
20	eP19	20	"	16'-0"	12 12 2'-0"
8	eP20	8	"	20'-6"	10'-6"
2	eP21	2	"	21'-6"	eP21 7'-6"
2	eP22	2	"	24'-6"	eP22 9'-0"
2	eP23	2	"	30'-6"	eP23 12'-0"
2	eP24	2	"	38'-6"	eP24 16'-0"
18	eP25	18	"	12'-0"	St.
5	eP26	6	"	21'-0"	St.
4	eP27	4	"	5'-0"	St.
4	eP28	4	"	3'-0"	St.
14	eP29	14	"	12'-3"	4'-0" 12 12 2'-3"
22	eP14	22	"	3'-6"	See above
20	eP30	20	"	33'-10"	10'-6" R 15'-8"
12	eP32	12	"	25'-0"	Bend in field
19	kP4	19	1¼"φ	40'-3"	St.
28	kP5	28	1¼"φ	28'-1"	10'-6" R 16'-8"
2	kP6	2	1¼"φ	24'-6"	21'-0" 6" R
6	eP34	6	¾"φ	40'-3"	Straight
30	eP31	30	¾"φ	10'-0"	Straight

TABLE OF BAR MARKS			
Size	¾"φ	1"φ	1¼"φ
Letter	e	h	k

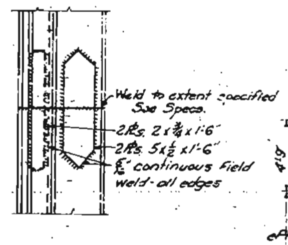


Bars 3 x ⅜ @ 1'-0" ctrs. 3/16" C.s.w. both sides of bar bend up 3"
℄ 12" x ½" cadmium plate to a thickness of .0005" after bars are welded
1'-0"

SECTION S-S

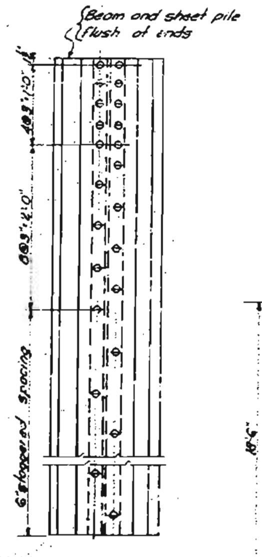


1-Sheet Pile 15" x 3⅝" x ⅜" x 38.8# M117, U.S. Steel or equal
Butt weld shaded area. Keep jaws of interlock in line & free from welds.
2 x ¾" ℞
1-8 I 25.5#
5" x ½" ℞

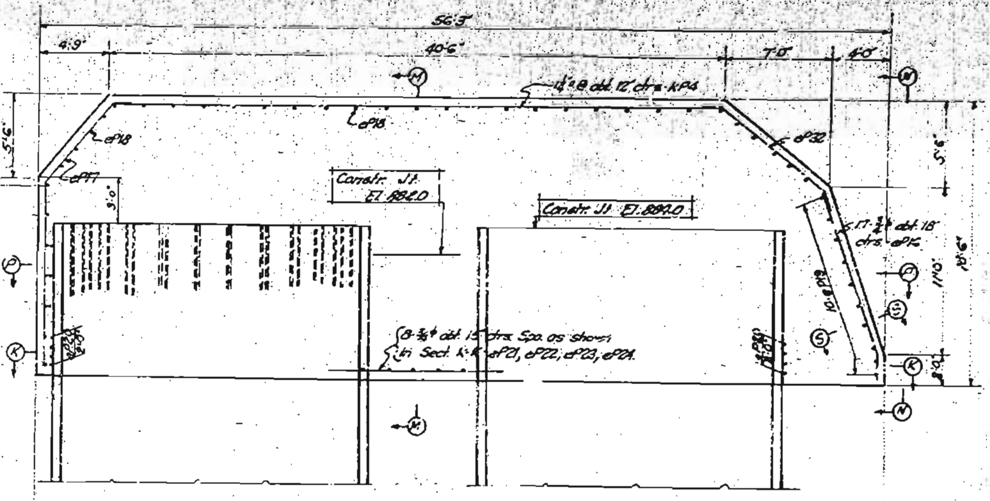


Weld to extent specified See Specs.
2 ℞s. 2 x ¾ x 1'-6"
2 ℞s. 5 x ½ x 1'-6"
5/16" continuous field weld - all edges

FIELD SPLICE
For Steel Piles

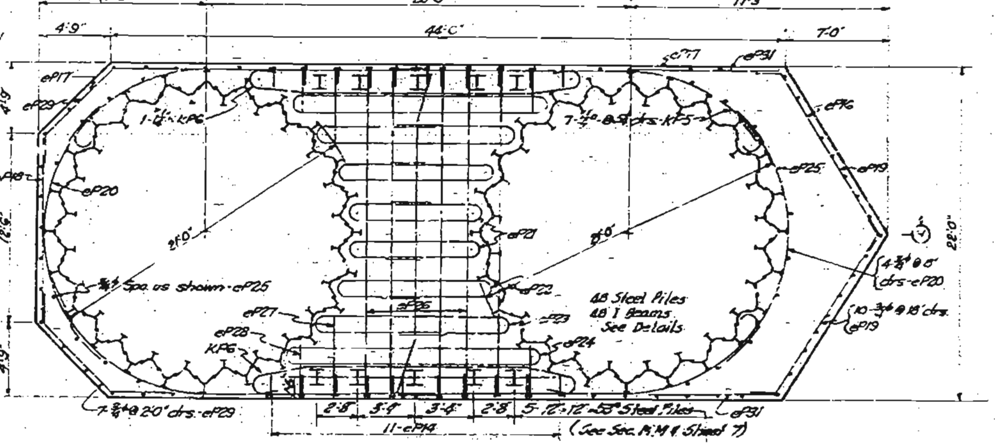


MAXIMUM RIVET PITCH
(at both ends of piles)
1'-1½"

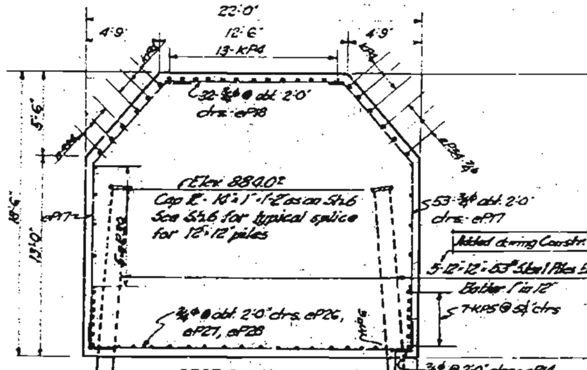


56'-3"
40'-6"
1¼"φ @ abt. 12" ctrs. - kP4
Constr. Jt. El. 882.0
Constr. Jt. El. 882.0
17-¾"φ abt. 18" ctrs. - eP16
13-¾"φ abt. 15" ctrs. Spa. as shown in Sect. K-K eP21, eP22, eP23, eP24.

SECTION H-K

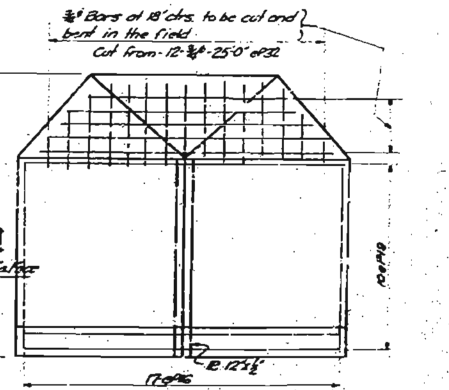


SECTION K-K



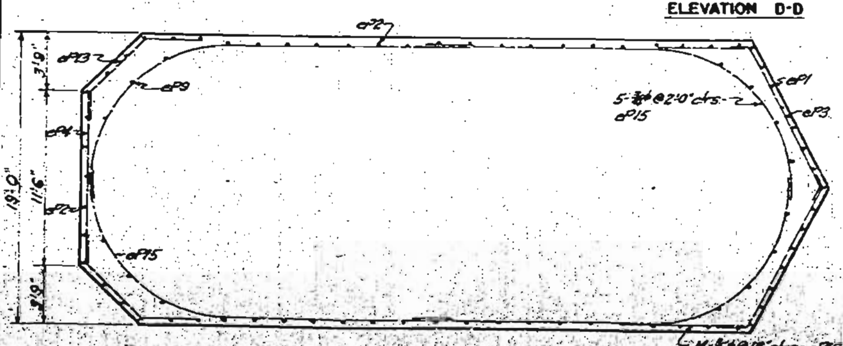
22'-0"
13-kP4
32-¾"φ abt. 2'-0" ctrs. - eP18
Elev. 884.0
Cap ℞ - 14" x 1" x 1'-2" as on Sh. 6 See Sh. 6 for typical splice for 12" x 12" piles
53-¾"φ abt. 2'-0" ctrs. - eP17
Added during Constr.
5-12" x 12" x 53# Steel Piles Ea. Face
Batter 1 in 12
7-kP5 @ 5½" ctrs.
¾"φ @ abt. 2'-0" ctrs. eP26, eP27, eP28
¾"φ @ 2'-0" ctrs. - eP14

SECTION M-M



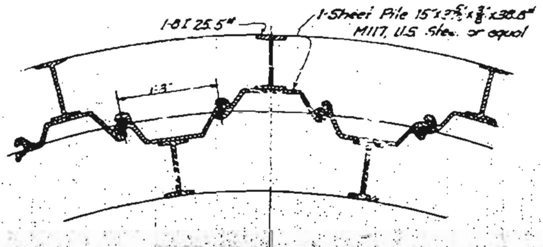
¾"φ Bars at 18" ctrs. to be cut and bent in the field. Cut from 12-¾"φ - 25'-0" eP32
17-eP16
eP12½

ELEVATION N-N



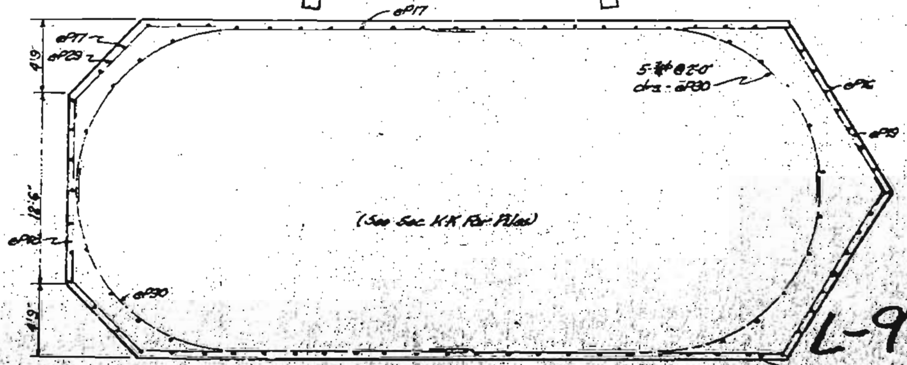
SECTION B-B
PIER BASE 2 & 4
⅛" = 1'-0"

Note: For Construction record for Pier 4 see Sh. 4A



1-8 I 25.5#
1-Sheet Pile 15" x 3⅝" x ⅜" x 38.8# M117, U.S. Steel or equal

PART SECTION THRU WALL



SECTION P-P
PIER BASE 3
⅛" = 1'-0"

Note: For General Notes for concrete, see sheet 2

Note: Notes, dimensions, etc. enclosed thus [ ] are as finally constructed.

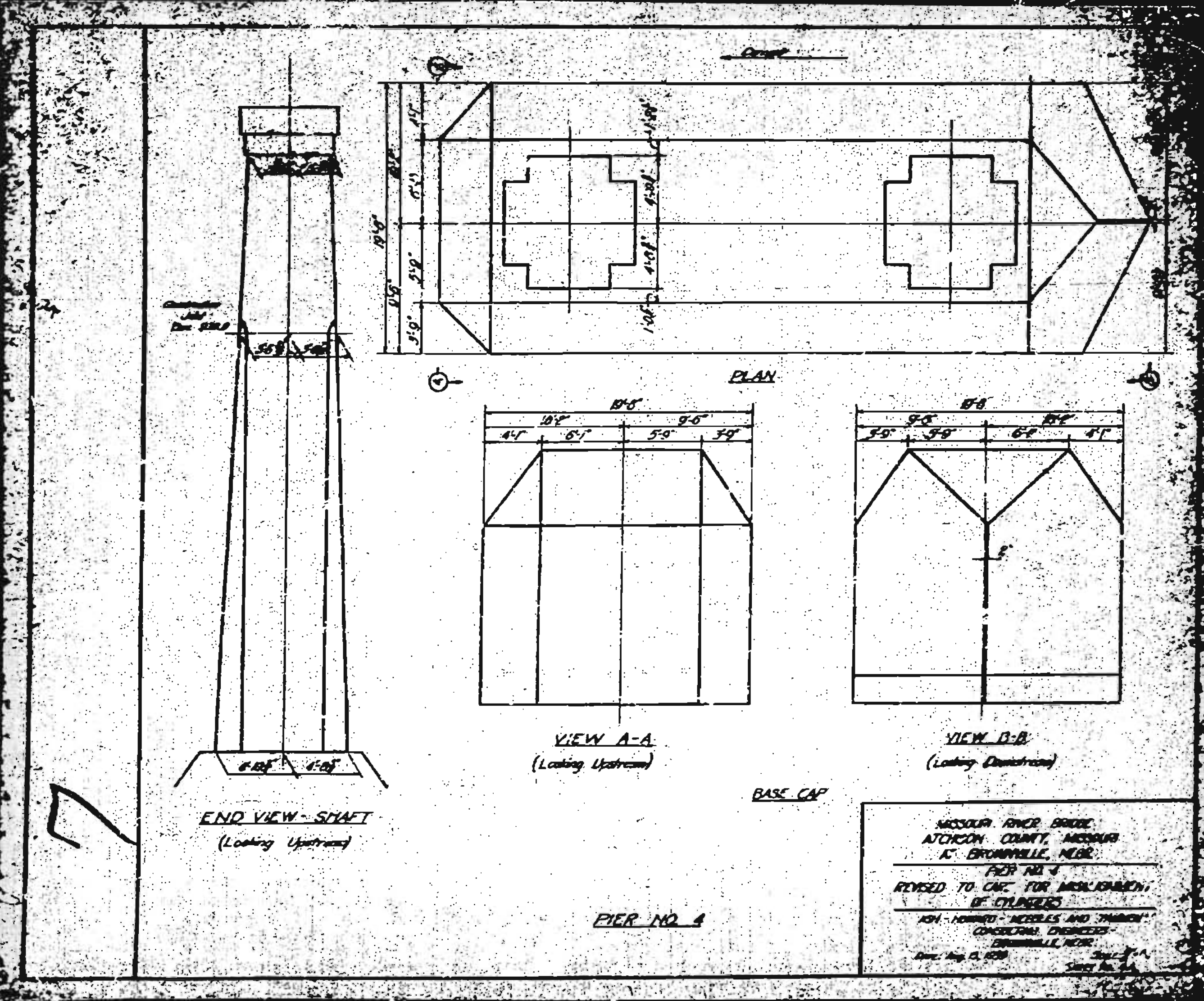
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

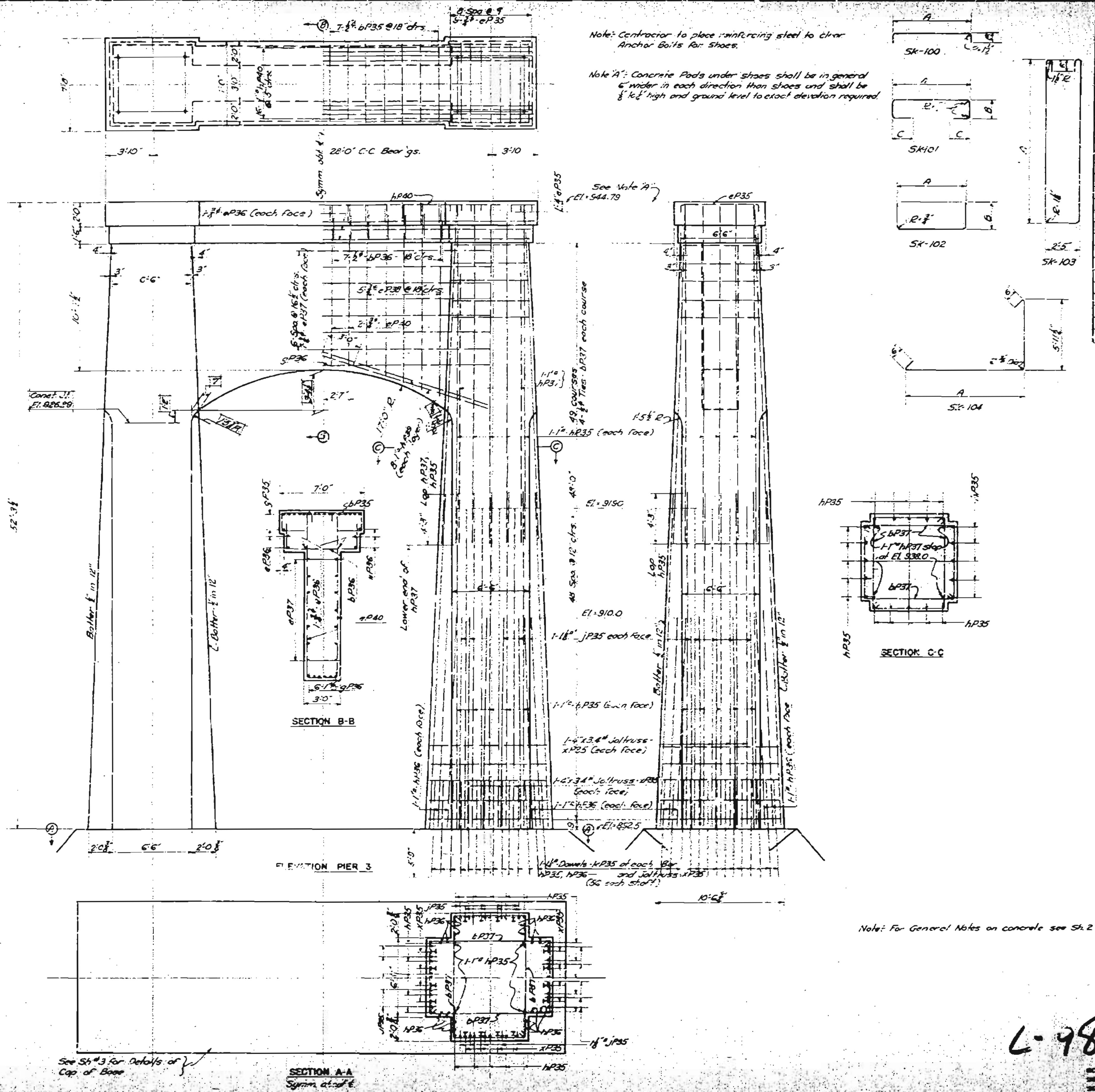
BASE CAPS, PIERS 2,3,4

L-98

6

Revised as Constructed


PLAN
END VIEW - SHAFT
(Looking Upstream)
VIEW A-A
(Looking Upstream)
VIEW B-B
(Looking Downstream)
BASE CAP
PIER NO. 4
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
PIER NO. 4
REVISED TO CALC. FOR MISALIGNMENT OF CYLINDERS
ASH - HOWARD - NEEDLES AND TAMMEN
CONSULTING ENGINEERS
BROWNVILLE, NEBR.
7



Note: Contractor to place reinforcing steel to clear Anchor Bolts for Shoes.

Note "A": Concrete Pads under shoes shall be in general 6" wider in each direction than shoes and shall be 1/8" to 1/4" high and ground level to exact elevation required.

BAR LIST							
Mark	No.	Size	Length	Type	A	B	C
xP35	32	4"ϕ	[illegible]	S			
hP35	88	1"sq.	28'-1"	S			
hP36	32	1"sq.	17'-6"	S			
hP37	8	1"sq.	21'-8"	S			
kP85	112	1¼"sq.	10'-6"	S			
hP40	16	1"sq.	35'-0"	S			
gP36	6	1"ϕ	28'-0"	S			
hP39	32	1"sq.	15'-3"	S			
eP35	18	3/4"ϕ	9'-0"	Bent SK-100	7'-0"	1'-0"	
eP36	8	3/4"ϕ	34'-6"	S			
eP37	14	3/4"ϕ	28'-0"	S			
bP35	14	1/2"ϕ	12'-7"	SK-101	6'-5"	1'-4"	1'-9"
bP36	14	1/2"ϕ	10'-3"	SK-102	5'-7"	2'-6"	
eP38	10	3/4"ϕ	2 Sets of 5 bars each. Length of bars of each set varies from 31'-3" to 35'-8" by 4 equal increments				
				SK-103	A varies from 12'-4" to 15'-11"		
bP37	392	1/2"ϕ	8 Sets of 49 bars each. Length of bars of each set varies from 12'-11" to 16'-11" by 48 equal increments				
				SK-104	A varies from 5'-11½" to 9'-11½"		
eP40	4	3/4"ϕ	30'-5"	SK-105	A-13'-6"		
jP35	40	1⅛"sq.	17'-6"	S			

KEY TO BAR MARKS	
b	1/2"ϕ
d	5/8"ϕ
e	3/4"ϕ
g	1"ϕ
h	1"sq.
x	4"x3.4# Joltruss

P indicates Pier

Note: For General Notes on concrete see Sh. 2

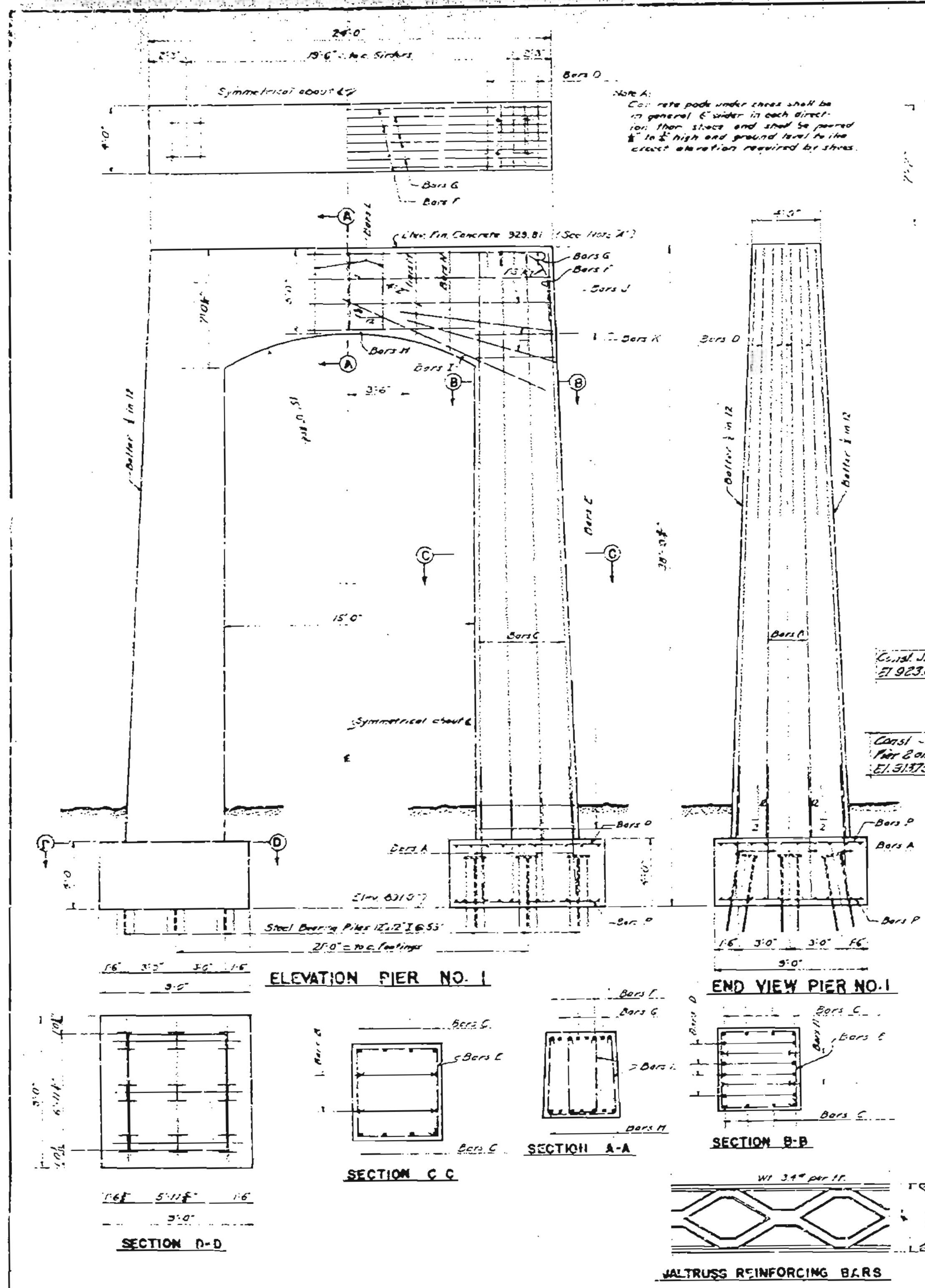
Note: Notes, elevations, etc. enclosed thus ▭ are as finally constructed.

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

PIER NO. 3 - SHAFT

Revised as Constructed - L.G.R. [illegible]



Note A:- Concrete pads under shoes shall be in general 6" wider in each direction than shoes and shall be poured ¼" to ½" high and ground level to the exact elevation required by shoes.

ELEVATION PIER NO. 1

END VIEW PIER NO. 1

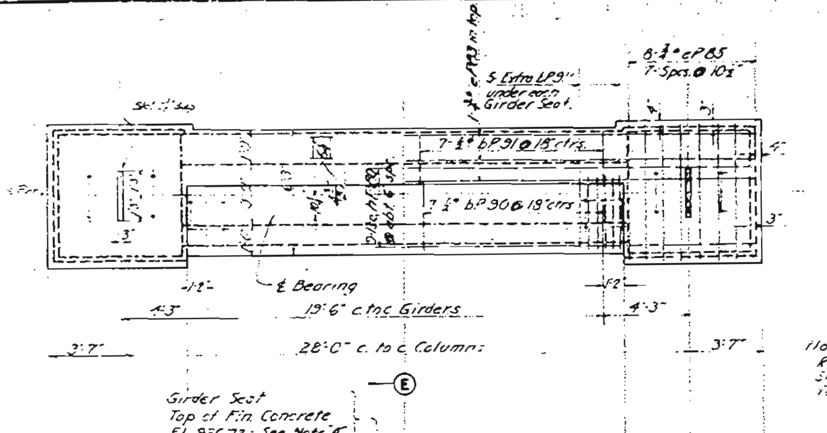
SECTION D-D

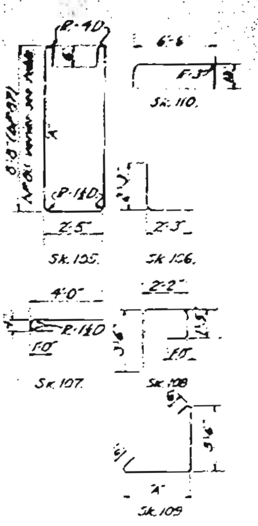
SECTION C-C

SECTION A-A

SECTION B-B

JALTRUSS REINFORCING BARS

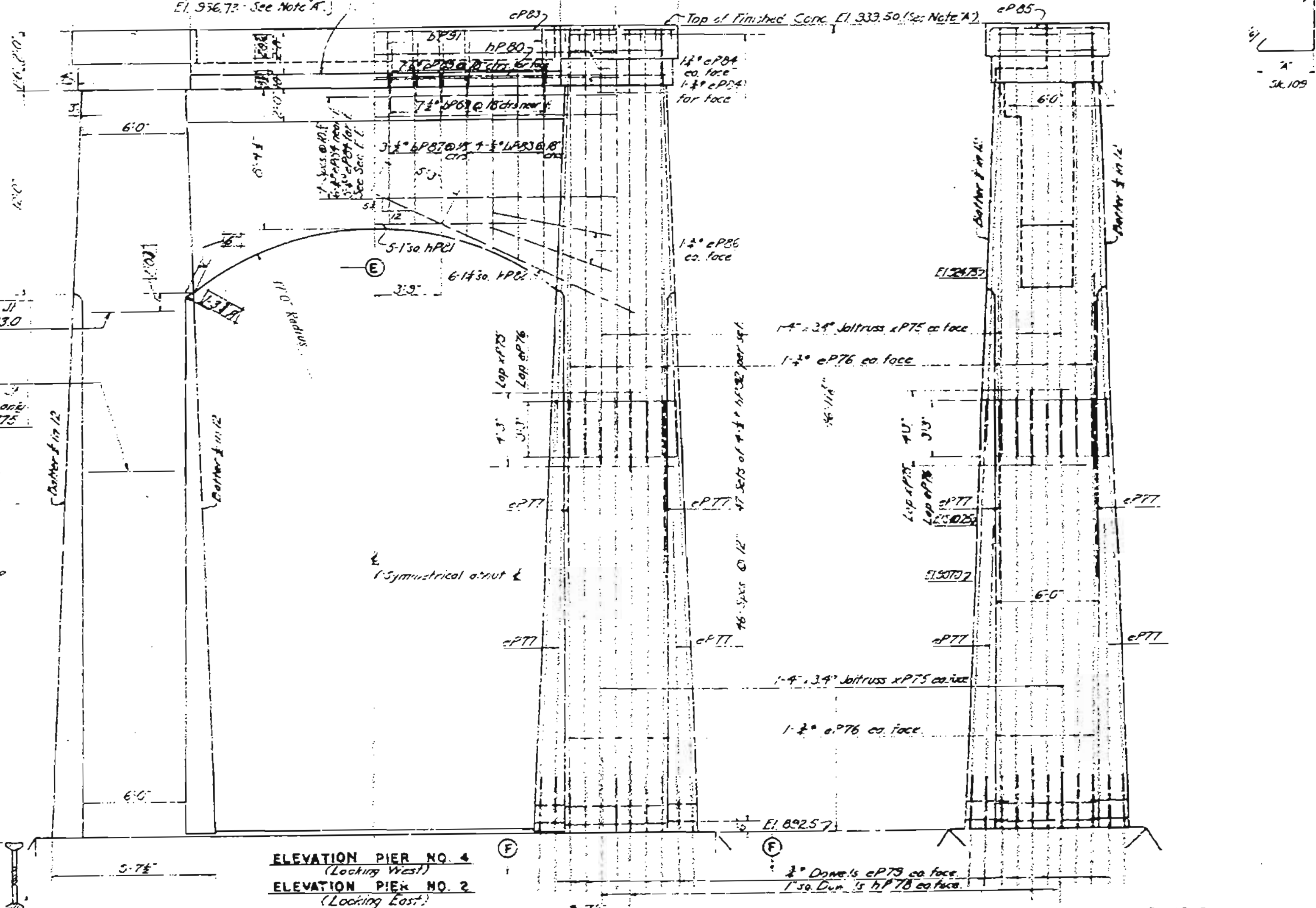




REINFORCING STEEL FOR PIER NO. 2

Mark	No. Req'd	Size	Length	Type	Mark	No. Req'd	Size	Length	Type
xP75	32	4.3#	25'-6"	Str.	bP87	6	½"	21'-3"	sk. 105
eP76	80	¾"	25'-0"	-	bP91	14	-	8'-1"	sk. 108
eP77	32	¾"	17'-9"	-					
hP78	16	1" sq.	6'-6"	-	bP88	8	½"	Length varies	
eP79	64	¾"	6'-6"	-	from 22'-8" to 27'-0" by				
hP80	9	1" sq.	34'-0"	-	equal increm.			A varies from	
hP81	5	-	18'-0"	-			sk. 105	5'-5" to 11'-6"	
hP82	12	1" sq.	17'-3"	-				by equal incr.	
eP83	3	¾"	31'-5"	-	bP89	28	½"	4'-6"	sk. 106
eP84	14	-	28'-0"	-	bP90	24	-	5'-3"	sk. 107
eP85	16	-	8'-5"	sk. 110	bP92	376	½"	Length varies	
eP86	8	-	7'-0"	Str.	from 12'-0" to 15'-10" by				
					equal increm.			A varies from	
							sk. 109	5'-3" to 9'-1"	
								by equal incr.	

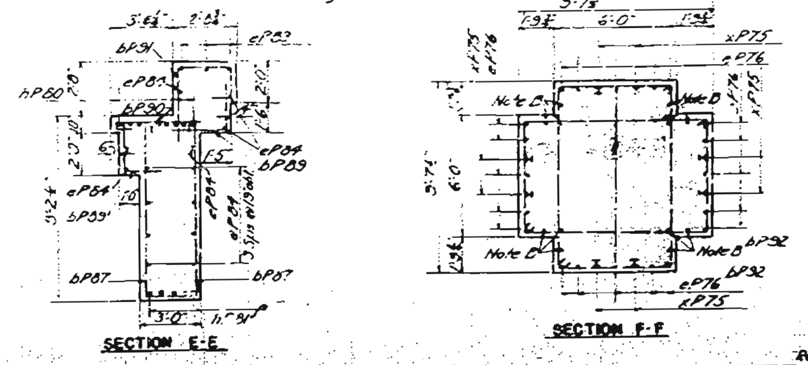
Note:- Reinforcing steel for Pier No. 4 Shaft is same throughout as for Pier No. 2 Shaft.



ELEVATION PIER NO. 4 (Looking West)

ELEVATION PIER NO. 2 (Looking East)

END VIEW PIER NO. 4 & NO. 2



SECTION E-E

SECTION F-F

REINFORCING STEEL FOR PIER NO. 1

Series	Description	Sets Req'd	Series	Description	Sets Req'd
A.	12-⅞" sq. x 8'-0" Dowels El. 891.25 to 899.25	2	I.	6-1" sq. x 13'-0" @ about 4" ctrs.	2.
B.	2-4" x 3.4# Jaltrusses x 34'-6" El. 895.0 to 929.5	4	J.	2-½" x 23'-6"	2.
C.	4-1⅛" sq. x 34'-6" El. 895.0 to 929.5	4.	K.	2-½" x 9'-0"	4.
D.	4-⅞" sq. x 36'-0" El. 914.0 to 930.0	4.	L.	2-½" x 12'-9" x 4'-6"	3.
E.	23-½" @ 15" ctrs. Length varies from 16'-10" to 22'-2" A varies from 4'-2" to 5'-5" by equal increm. B varies from 3'-11" to 6'-4"	2.	M.	2-½" x 13'-0" Same as L except x 4'-8"	2.
			N.	2-½" x 15'-0" x 5'-8"	2.
F.	4-1" sq. x 31'-10" El. 930.06	1.	O.	5-½" x 5'-4" El. 930.1	2.
G.	4-1" sq. x 26'-2" El. 930.76	1.	P.	10-¾" x 8'-6" El. 891.3 and 894.67	8.
H.	7-1" sq. x 15'-0" El. 925.6	1.			

Note "B":-
3-¾" eP77 each corner from El. 892.5 to El. 910.25.
1-¾" eP77 each corner from El. 907.0 to El. 924.75.

Note: For General Notes on Concrete see sheet 5.

Note: Notes, elevations, etc. enclosed thus ☐ are as finally constructed.

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

PIERS 2 & 4 - SHAFTS
PIER 1

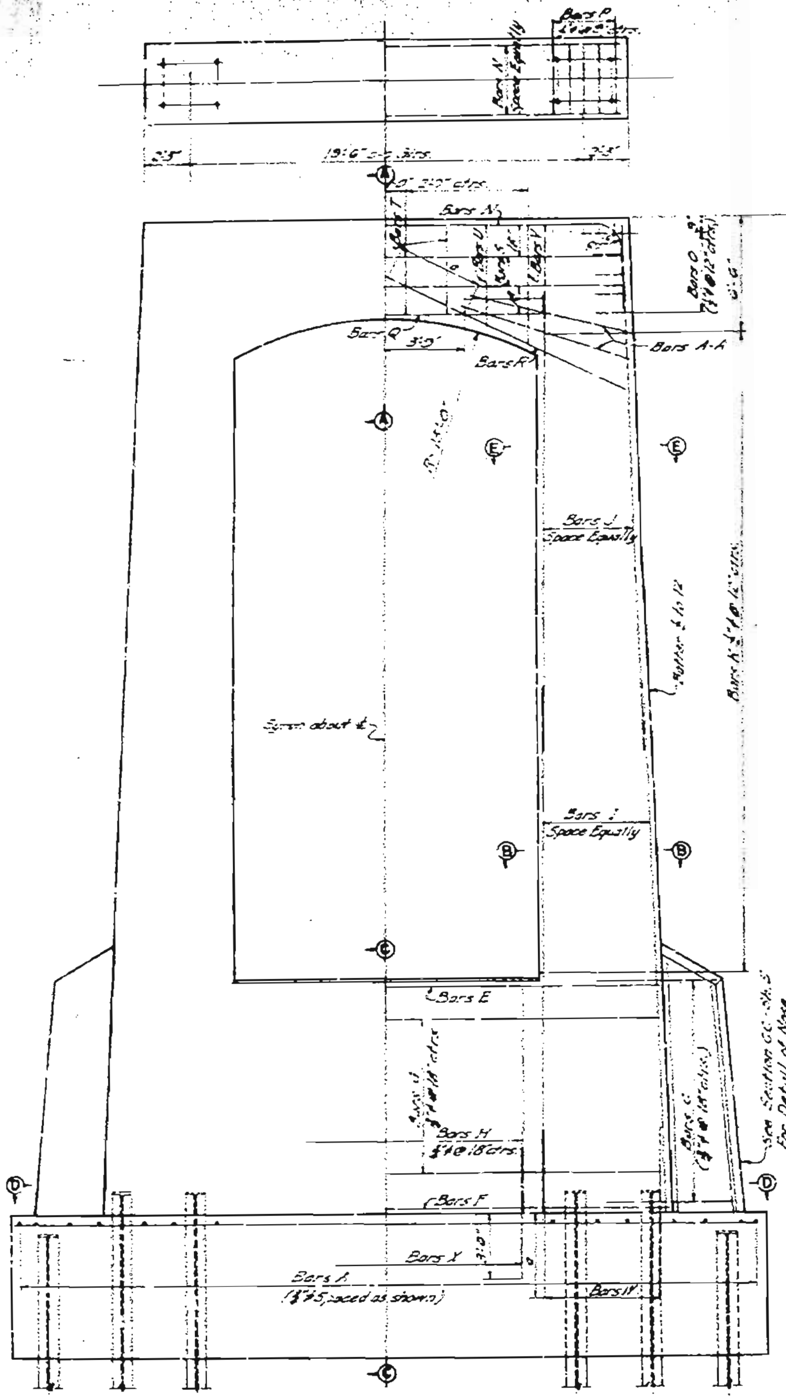
Scale ¼" = 1'-0"
[illegible]
Sheet No. 83

Revised as Constructed - L.C.K. 5-4-40

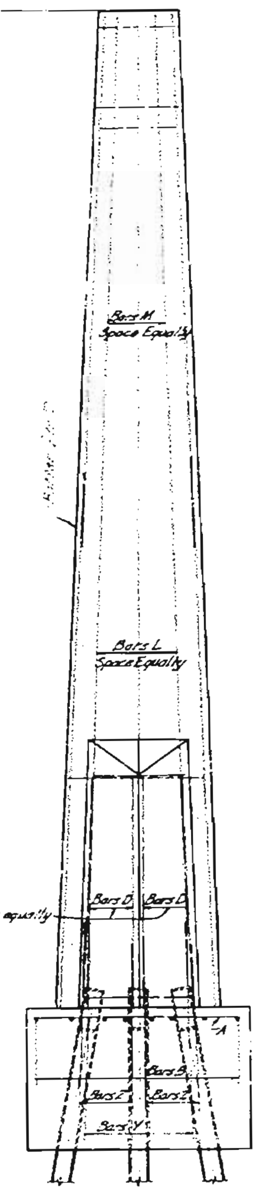
10

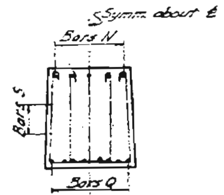
KEY TO BAR MARKS	
b	[illegible]
c	[illegible]
e	[illegible]
f	[illegible]
g	[illegible]
h	1" □
j	1⅛" □
k	1¼" □
x	[illegible]

P designates PIER



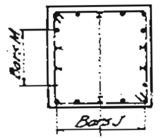
ELEVATION PIER 5
PIERS 6-7-8 & 9 SIMILAR



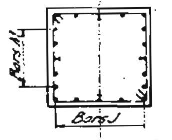


SECTION A-A

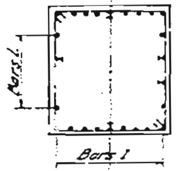
Sections BB & EE Symm about ℄



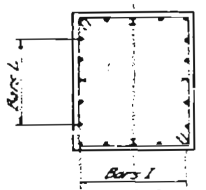
SECTION E-E FOR PIER 7



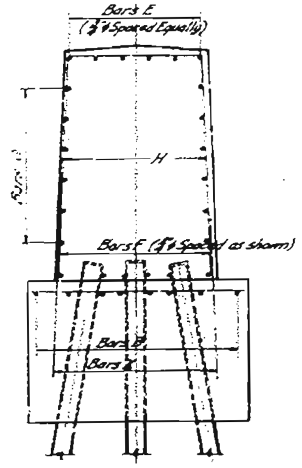
SECTION E-E FOR PIERS 5 & 6



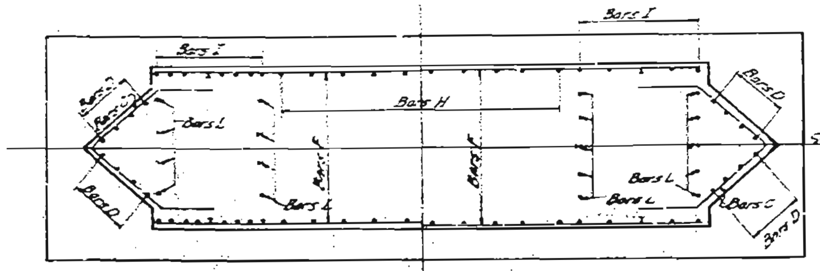
SECTION B-B FOR PIER 7



SECTION B-B FOR PIERS 5-6-8 & 9



SECTION C-C



HALF SECTION DD FOR PIER 7   **HALF SECTION DD FOR PIERS 5-6-8 & 9**

Note:- Place one Dowel of Series W-X-Y- & Z at each vertical bar of Series I, H, L, & D respectively.
For General dimensions of Piers and for number and spacing of Piles see Sh. 3.
See Sh. 2 for General Notes on Concrete.

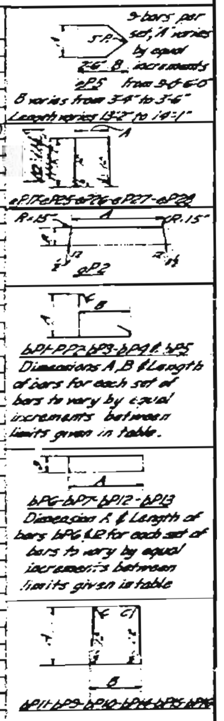
LOCATION NO. & DESCRIPTION OF BAR SETS

Mark of Bar Set	Pier 5 Desc of Set	Pier 5 No. Sets	Pier 6 Desc of Set	Pier 6 No. Sets	Pier 7 Desc of Set	Pier 7 No. Sets	Pier 8 Desc of Set	Pier 8 No. Sets	Pier 9 Desc of Set	Pier 9 No. Sets
A	22eP1	1	22eP1	1	22eP1	1	20eP2	1	20eP2	1
B	8eP3	1	8eP3	1	8eP4	1	8eP4	1	8eP4	1
C	9eP5	2	9eP5	2	9eP5	2	9eP5	2	9eP5	2
D	4eP6	4	4eP6	4	4eP6	4	4eP6	4	4eP6	4
E	6eP7	1	6eP8	1	6eP9	1	6eP10	1	6eP11	1
F	6eP12	1	6eP13	1	6eP14	1	6eP15	1	6eP16	1
G	6eP7	2	6eP8	2	6eP9	2	6eP10	2	6eP11	2
H	10eP17	1	10eP25	1	10eP26	1	10eP27	1	10eP28	1
I	4eP18 1-XP1	4	4eP19 1-XP2	4	8gP1 1-XP3	4	4eP20 1-XP4	4	4eP21 1-XP5	4
J	4eP18 1-XP1	4	4eP19 1-XP2	4	4gP1 1-XP3	4	none		none	
K	32bP1	4	25bP2	4	19bP3	4	13bP4	4	6bP5	4
L	4eP18 1-XP1	4	4eP19 1-XP2	4	2gP1 2XP3	4	4eP20 1-XP4	4	4eP21 1-XP5	4
M	4eP18 1-XP1	4	4eP19 1-XP2	4	2gP1 2XP3	4	none		none	
N	5gP2	1	5gP2	1	5gP2	1	5gP2	1	5gP2	1
O	5bP6	2	5bP6	2	5bP12	2	5bP6	2	5bP6	2
P	5bP7	2	5bP7	2	5bP13	2	5bP7	2	5bP7	2
Q	8eP22	1	8eP22	1	8eP22	1	8eP22	1	8eP22	1
R	8eP23	2	8eP23	2	8eP23	2	8eP23	2	8eP23	2
S	2bP8	2	2bP8	2	2bP8	2	2bP8	2	2bP8	2
T	2bP9	4	2bP9	4	2bP14	4	2bP9	4	2bP9	4
U	2bP10	2	2bP10	2	2bP15	2	2bP10	2	2bP10	2
V	2bP11	2	2bP11	2	2bP16	2	2bP11	2	2bP11	2
W	5eP24	4	5eP24	4	9gP5	4	5eP24	4	5eP24	4
X	10eP24	2	10eP24	2	10eP24	2	10eP24	2	10eP24	2
Y	5eP24	4	5eP24	4	9gP5	4	5eP24	4	5eP24	4
Z	4eP24	4	4eP24	4	4eP24	4	4eP24	4	4eP24	4
AA	2bP17	4	2bP17	4	2bP17	4	2bP17	4	2bP17	4

BAR LIST

Bar Mark	Total Reqd. Per Pier: Pier 5	Pier 6	Pier 7	Pier 8	Pier 9	Size	Length	Dimensions A	B	C	Type	Remarks
eP1	22	22	22			⅝"	10'-6"				Straight	
eP2				20	20	"	9'-6"				"	
eP3	8	8				"	37'-0"				"	
eP4			8	8	8	"	35'-6"				"	
eP5	18	18	18	18	18	"	See Sketch				Bent	
eP6	16	16	16	16	16	"	Lengths 11'-3", 11'-6", [illegible] (20 bars each length)					
eP7	18					"	26'-6"				Straight	
eP8		18				"	26'-0"				"	
eP9			18			"	25'-6"				"	
eP10				18		"	25'-0"				"	
eP11					18	"	24'-6"				"	
eP12	6					"	27'-6"				"	
eP13		6				"	27'-0"				"	
eP14			6			"	26'-6"				"	
eP15				6		"	26'-0"				"	
eP16					6	"	25'-6"				"	
eP17	10					"	28'-6"	6'-7"			Bent	
eP18	64					"	26'-6"				Straight	
eP19		64				"	23'-3				"	
eP20				32		"	29'-9"				"	
eP21					32	"	23'-0"				"	
eP22	6	6	8	8	8	"	14'-6"				"	a=3'-6
eP23	16	16	16	16	16	"	11'-6"				"	a=3'-6
eP24	76	76	36	76	76	"	7'-0"				"	a=3'-6"
eP25		10				"	28'-0"	6'-1"			Bent	
eP26			10			"	28'-5"	6'-6"			"	
eP27				10		"	26'-11"	5'-5"			"	
eP28					10	"	26'-4"	4'-5"			"	
gP1			64			1¼"	20'-3"				Straight	
gP2	5	5	5	5	5	"	31'-0"	23'-5	4'-3½		Bent	
gP5			52			"	9'-0"				Straight	a=4'-6"
bP1	128					¾"	9'-5" to 13'-2"	[illegible]	[illegible]	6	Bent	4 sets of bars
bP2		100				"	9'-3"-12'-3"	[illegible]	[illegible]	6	"	" " "
bP3			76			"	10'-3"-12'-6"	[illegible]	[illegible]	6	"	" " "
bP4				52		"	9'-3"-10'-5"	[illegible]	[illegible]	6	"	" " "
bP5					24	"	9'-3"-9'-11"	[illegible]	[illegible]	6	"	" " "
bP6	10	10		10	10	"	[illegible]	[illegible]	1'-6"		"	2 sets of Bars
bP7	10	10		10	10	"	5'-5"	3'-5"	1'-0"			
bP8	4	4	4	4	4	"	23'-6"				Straight	
bP9	8	8		8	8	"	12'-10"	4'-5"	3'-0"	6	Bent	
bP10	4	4		4	4	"	14'-0"	5'-0"	3'-0"	6	"	
bP11	4	4		4	4	"	16'-3"	6'-1"	3'-1"	6	"	
bP12			10			"	[illegible]	[illegible]	1'-6"		"	2 sets of Bars
bP13			10			"	6'-5"	4'-5	1'-0"		"	
bP14			8			"	13'-5"	4'-5	3'-1"	6	"	
bP15			4			"	14'-7"	5'-0"	3'-1"	6	"	
bP16			4			"	16'-10"	6'-1"	3'-6	6	"	
bP17	8	8	8	8	8	"	9'-0"				Straight	
XP1	16					[illegible]	26'-6"				"	
XP2		16					23'-3"				"	
XP3			21				20'-3"				"	
XP4				8			29'-9"				"	
XP5					8		23'-0"				"	

*Bar lengths or number revised



9-bars per set, A varies by equal increments from 9-6 to 6-0
B varies from 3'-4" to 3'-6"
Length varies 13'-2" to 14'-1"

bP1-bP2-bP3-bP4 & bP5
Dimensions A, B & Length of bars for each set of bars to vary by equal increments between limits given in table.

bP6-bP7-bP12-bP13
Dimension A & Length of bars bP6 & 12 for each set of bars to vary by equal increments between limits given in table

Note: Notes, elevations, etc. enclosed thus ☐ are as finally constructed.

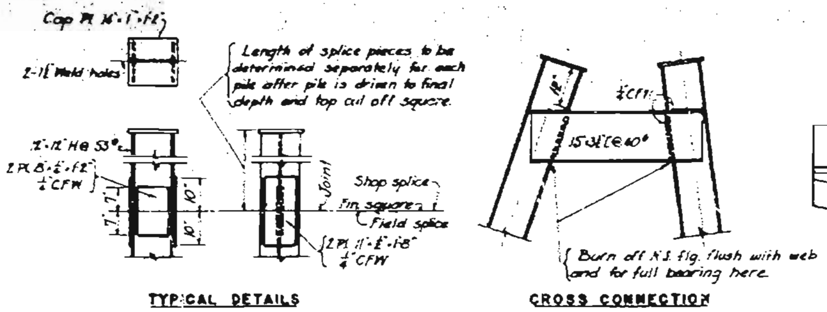
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

PIERS 5-6-7-8 & 9

L-98

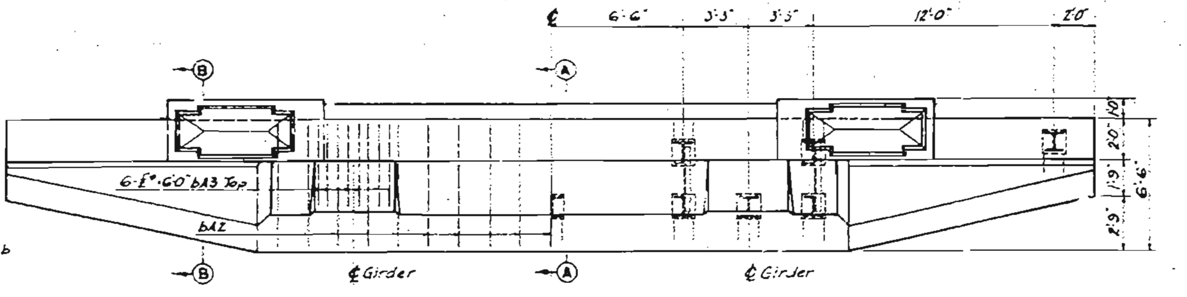
SCALE ⅜"=1'-0"
RBH 2-20-30
HPC 2-21-30
REH 2-7-30
[illegible]
KANSAS CITY NEW YORK
SHEET NO. 5B

Revised as Constructed - LGR 5-8-31

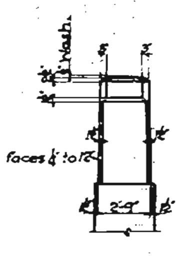

Cap Pl 14"×1"×1'-2"
2-1¼" Weld holes
Length of splice pieces to be determined separately for each pile after pile is driven to final depth and top cut off square.
12"×12" H @ 53#
2 Pl 8"×½"×1'-2" ¼" CFW
Joint
Shop splice
Fin. square
Field splice
2 Pl 11"×½"×1'-8" ¼" CFW
¼" CFW
15-3/4" [@ 40#
Burn off N.S. flg. flush with web and for full bearing here.

TYPICAL DETAILS **CROSS CONNECTION**

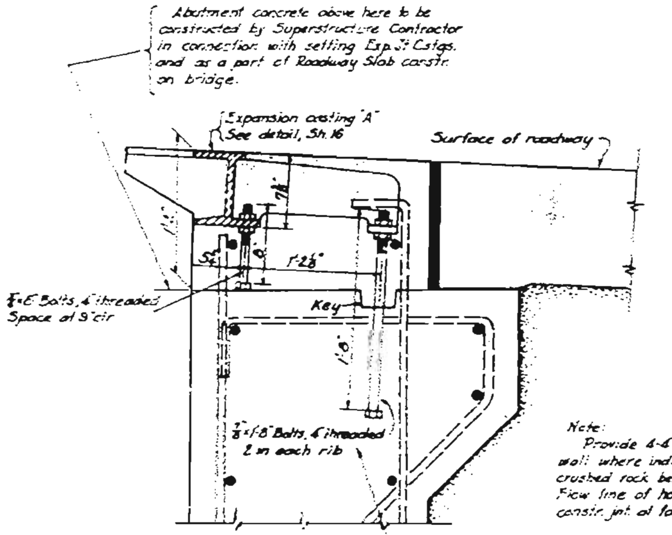
STEEL PILE DETAILS
1" = 1'-0"



PLAN



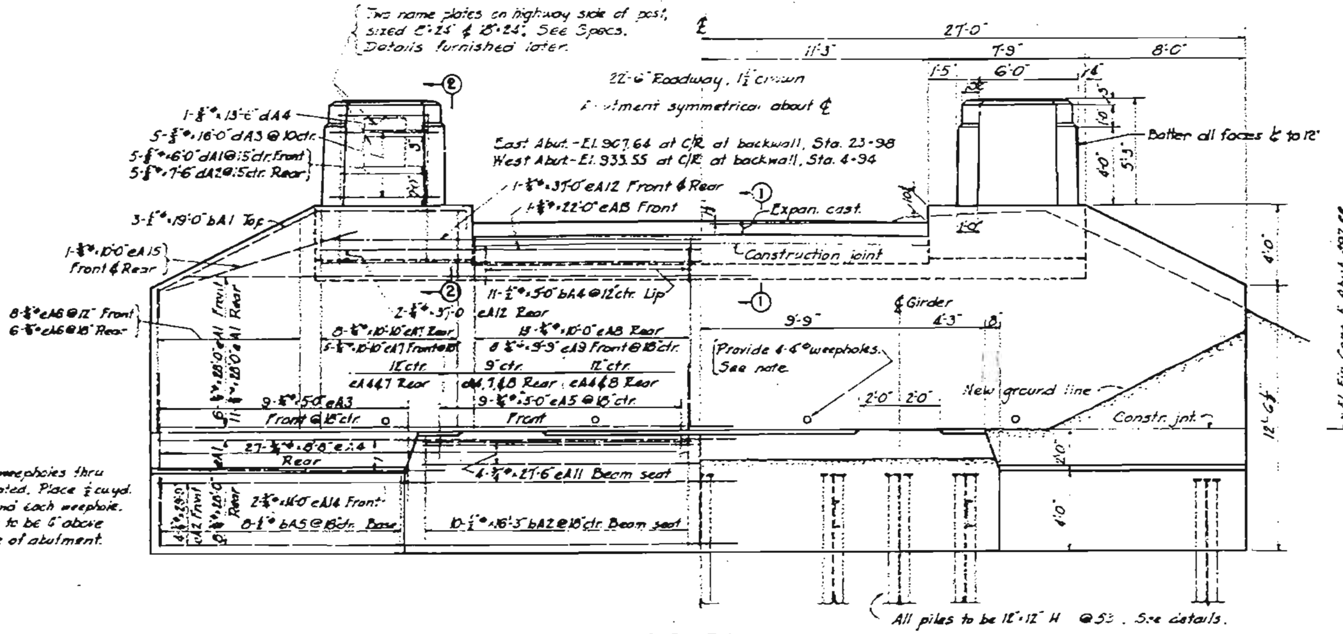
SECTION-22


Abutment concrete above here to be constructed by Superstructure Contractor in connection with setting Exp. Jt. Cstgs. and as a part of Roadway Slab constr. on bridge.
Expansion casting "A" See detail, Sh. 16
Surface of roadway
¾"×8" Bolts, 4" threaded Space at 9" ctr
Key
⅞"×1'-8" Bolts, 4" threaded 2 in each rib
1'-2½"

Note:
Provide 4-4" ϕ weepholes thru wall where indicated. Place ½ cu yd. crushed rock behind each weephole. Flow line of hole to be 6" above constr. jnt. at face of abutment.

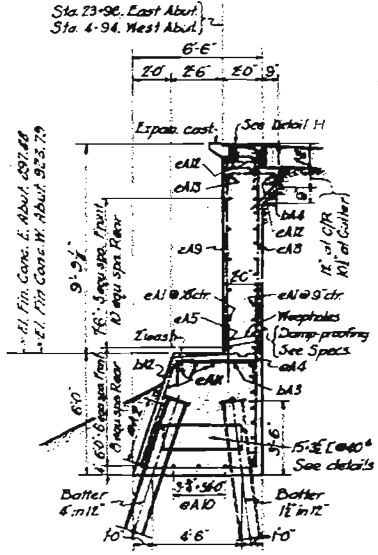
Furn. by Superstr. Contr. Set by Substr. Contr. (See Spec. Div II - Art 23)

DETAIL 1-1
1½" = 1'-0"

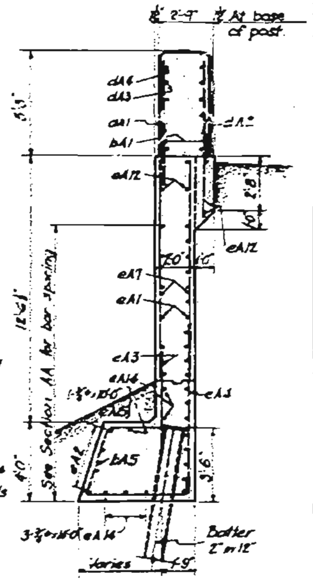

Two name plates on highway side of post, sized 8"×25" & 18"×24". See Specs. Details furnished later.
℄ 27'-0" 11'-3" 7'-9" 8'-0"
22'-6" Roadway, 1½" crown
Abutment symmetrical about ℄
East Abut. - El. 907.64 at C/R at backwall, Sta. 23+98
West Abut. - El. 933.55 at C/R at backwall, Sta. 4+94
1-⅝"ϕ×13'-6" dA4
5-⅝"ϕ×16'-0" dA3 @ 10" ctr.
5-⅝"ϕ×6'-0" dA1 @ 15" ctr. Front
5-⅝"ϕ×7'-6" dA2 @ 15" ctr. Rear
3-½"ϕ×19'-0" bA1 Top
1-¾"ϕ×10'-0" eA15 Front & Rear
8-¾"ϕ eA6 @ 12" Front
6-¾"ϕ eA6 @ 18" Rear
1-¾"ϕ×37'-0" eA12 Front & Rear
1-¾"ϕ×22'-0" eA13 Front
Expan. cast.
Construction joint
11-½"ϕ×5'-0" bA4 @ 12" ctr. Lip
2-¾"ϕ×37'-0" eA12 Rear
8-¾"ϕ×10'-10" eA7 Rear
5-¾"ϕ×10'-10" eA7 Front @ 18"
13-¾"ϕ×10'-0" eA8 Rear
8-¾"ϕ×9'-9" eA9 Front @ 18" ctr.
12" ctr. 9" ctr. 12" ctr.
eA4 & 7 Rear eA4, 7 & 8 Rear eA4 & 8 Rear
9-¾"ϕ×5'-0" eA3 Front @ 18" ctr.
9-¾"ϕ×5'-0" eA5 @ 18" ctr. Front
27-¾"ϕ×8'-8" eA4 Rear
4-¾"ϕ×27'-6" eA11 Beam seat
2-¾"ϕ×14'-0" eA14 Front
8-½"ϕ bA5 @ 18" ctr. Base
10-½"ϕ×16'-3" bA2 @ 18" ctr. Beam seat
6-¾"ϕ×28'-0" eA1 Front
11-¾"ϕ×28'-0" eA1 Rear
4-¾"ϕ×29'-9" eA2 Front
9-¾"ϕ×28'-0" Rear
Batter all faces ½" to 12"
℄ Girder 9'-9" 4'-3"
Provide 4-4" ϕ weepholes. See note.
New ground line
Constr. jnt.
2'-0" 2'-0"
1'-5" 6'-0" 1'-6"
4'-0" 12'-6½" 2'-0" 4'-0"
All piles to be 12"×12" H @ 53#. See details.

ELEVATION

EAST ABUTMENT
WEST ABUTMENT - Same as noted
Scale ¼" = 1'-0"

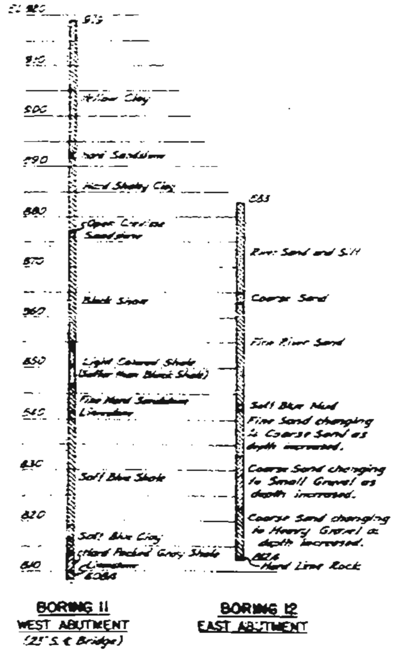


SECTION A-A



SECTION B-B

For General Notes For Concrete, see Sh. 2.
All concrete Class 30.

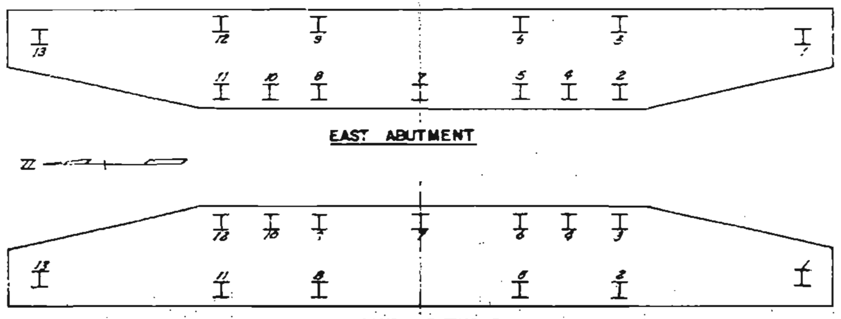


BORING 11
WEST ABUTMENT
(25' S. ℄ Bridge)

BORING 12
EAST ABUTMENT

DATA FOR PILES AS CONSTRUCTED

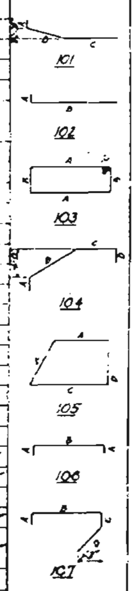
Number of Pile	West Abutment: Cut-off Elev.	West Abutment: Brg. Cap. tons	West Abutment: Location: Bridge Tang.	West Abutment: Location: Back Wall	West Abutment: Batter in/ft	East Abutment: Butt Elev.	East Abutment: Brg. Cap. tons	East Abutment: Location: Bridge Tang.	East Abutment: Location: Back Wall	East Abutment: Batter in/ft
1	888.5	98.6	28'-1½	1'-9½	1½	817.8	88.5	28'-9½	1'-6½	2½
2	888.3	111.8	13'-0½	1'-0½	1½	813.7	104.5	13'-2½	5'-2½	3½
3	887.7	113.8	12'-10	5'-6½	3½	813.0	120.0	13'-2½	1'-6	1½
4	887.8	113.8	9'-5	5'-6½	3½	812.5	108.5	9'-10½	5'-1	4½
5	888.2	111.9	6'-9½	1'-2	1½	803.2	101.5	6'-10½	4'-9½	3½
6	887.9	110.2	6'-3½	5'-7	4½	813.0	100.5	6'-8	1'-9½	1½
7	887.6	110.2	0'-1½	5'-7	3½	812.2	101.5	0'-3.5	5'-0	6½
8	886.9	118.0	6'-6½	1'-1½	1½	812.2	101.5	6'-5½	5'-2	4
9	888.6	109.9	6'-7	5'-6½	3	813.0	112.0	6'-3½	1'-6	1½
10	887.9	113.8	8'-10½	5'-6½	4	811.9	112.5	9'-7	5'-4½	9
11	886.9	118.0	13'-1½	1'-1½	1½	811.1	111.3	12'-1½	5'-2½	4
12	888.1	126.8	13'-5	5'-5½	4	812.9	112.0	12'-10½	1'-6	1½
13	887.8	108.6	25'-0½	1'-8½	2	812.5	98.6	29'-3½	1'-8½	1½



WEST ABUTMENT
PILE NUMBERING

SCHEDULE OF REINFORCING BARS

Mark	No.	Size	Length	Type	A	B	C	D
eA1	50	¾"ϕ	28'-0"	Str.				
eA2	8	"	29'-9"	101	1'-6"	12'-0"	16'-3"	
eA3	18	"	5'-0"	Str.				
eA4	54	"	8'-8"	"				
eA5	18	"	3'-0"	"				
eA6	28	"	6'-3" to 10'-3"	"				
eA7	26	"	10'-10"	"				
eA8	26	"	10'-0"	102	0'-6"	9'-6"		
eA9	16	"	9'-9"	Str.				
eA10	3	"	30'-0"	"				
eA11	4	"	27'-6"	"				
eA12	4	"	37'-0"	"				
eA13	1	"	22'-0"	"				
eA14	10	"	14'-0"	"				
eA15	6	"	10'-0"	"				
dA1	10	⅝"ϕ	6'-0"	Str.				
dA2	10	"	7'-6"	"				
dA3	10	"	16'-0"	103	5'-6"	2'-0"	0'-6"	
dA4	2	"	13'-6"	103	4'-9"	2'-0"	0'-6"	
bA1	6	½"ϕ	19'-0"	104	1'-0"	8'-9"	7'-6"	1'-9"
bA2	20	"	16'-3"	105	4'-0"	5'-9"	6'-0"	0'-6"
bA3	12	"	6'-0"	106	1'-0"	4'-0"		
bA4	22	"	5'-0"	107	0'-6"	2'-5"	0'-5"	1'-10"
bA5	16	"	10'-0" to 15'-0"	105	2'-3" to 4'-9"	5'-9"	3'-6" to 6'-0"	0'-6"



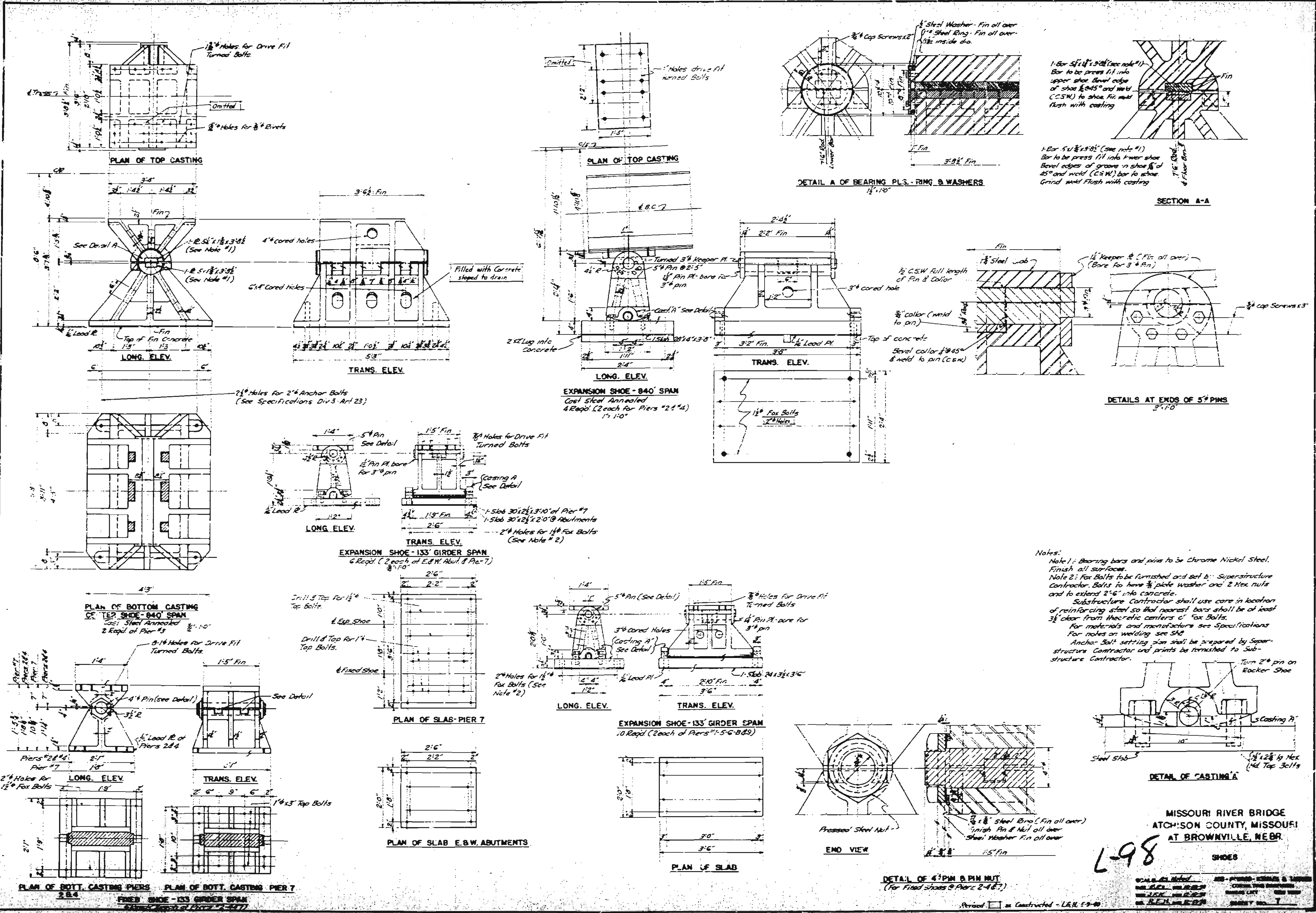
L98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

ABUTMENTS

Revised as Constructed - L.G.R. 6-8-40

12


PLAN OF TOP CASTING
1⅛" Holes for Drive Fit Turned Bolts
Omitted
⅞" Holes for ¾" Rivets
LONG. ELEV.
See Detail A
1-Ⓟ 5¼×1⅜×3'8½ (See Note #1)
1-Ⓟ 5¼×1⅜×3'8½ (See Note #1)
⅛" Lead Ⓟ
Top of Fin Concrete
TRANS. ELEV.
3'6½ Fin
4" cored holes
6×4" Cored Holes
Filled with Concrete sloped to drain
5'3"
2¼" Holes for 2" Anchor Bolts (See Specifications Div. 3 Art. 23)
PLAN OF BOTTOM CASTING
CENTER SHOE - 840' SPAN
Cast Steel Annealed
2 Reqd at Pier #3
½" = 1'-0"
PLAN OF TOP CASTING
1" Holes drive fit turned Bolts
Turned 3" Keeper Pl.
5" Pin @ 2'-5"
1½" Pin Pl. bore for 3" pin
Cast "A" See Detail
1 Slab 28¼×4"×3'8"
2"×2" Lug into Concrete
LONG. ELEV.
EXPANSION SHOE - 840' SPAN
Cast Steel Annealed
4 Reqd (2 each for Piers #2 & #4)
1" = 1'-0"
TRANS. ELEV.
2'2" Fin
3" cored hole
3'2" Fin.
⅛" Lead Pl.
Top of concrete
1½" Fox Bolts
DETAIL A OF BEARING PLS. - RING & WASHERS
1½" = 1'-0"
½" Steel Washer - Fin all over
1" Steel Ring - Fin all over
¾" Cap Screws×2"
3'-9¾" Fin
SECTION A-A
1-Bar 5¼×⅞×3'8½ (see note #1) Bar to be press fit into upper shoe. Bevel edge of shoe ⅛"@45° and weld (C.S.W.) to shoe. Fin. weld flush with casting
1-Bar 5¼×⅞×3'8½ (see note #1) Bar to be press fit into lower shoe. Bevel edges of groove in shoe ⅛" at 45° and weld (C.S.W.) bar to shoe. Grind weld flush with casting
DETAILS AT ENDS OF 5" PINS
3" = 1'-0"
1½" Keeper Ⓟ (Fin all over) (Bore for 3" Pin)
1½" Steel web
½" C.S.W. full length of Pin & Collar
⅜" collar (weld to pin)
Bevel collar ⅛"@45° & weld to pin (C.S.W.)
¾" cap Screws×3"
EXPANSION SHOE - 133' GIRDER SPAN
6 Reqd (2 each at E. & W. Abut. & Pier 7)
¾" = 1'-0"
5" Pin See Detail
1½" Pin Pl. bore for 3" pin
⅞" Holes for Drive Fit Turned Bolts
Casting A See Detail
1-Slab 30×2½×3'10" at Pier #7
1-Slab 30×2½×2'0" @ Abutments
2" Holes for 1½" Fox Bolts (See Note #2)
LONG. ELEV.
TRANS. ELEV.
PLAN OF SLAB - PIER 7
Drill & Tap for 1½" Tap Bolts
Ⓛ Exp. Shoe
Ⓛ Fixed Shoe
PLAN OF SLAB E. & W. ABUTMENTS
EXPANSION SHOE - 133' GIRDER SPAN
10 Reqd (2 each at Piers #1-5-6-8 & 9)
5" Pin (See Detail)
⅞" Holes for Drive Fit Turned Bolts
5¼" Pin Pl. bore for 3" pin
3" Cored Holes
Casting "A" See Detail
2" Holes for 1½" Fox Bolts (See Note #2)
1-Slab 24×1½×3'6"
LONG. ELEV.
TRANS. ELEV.
PLAN OF SLAB
8-1" Holes for Drive Fit Turned Bolts
4" Pin (see Detail)
⅛" Lead Ⓟ at Piers 2 & 4
See Detail
LONG. ELEV.
TRANS. ELEV.
2" Holes for 1½" Fox Bolts
1"×3" Tap Bolts
PLAN OF BOTT. CASTING PIERS 2 & 4
PLAN OF BOTT. CASTING PIER 7
FIXED SHOE - 133' GIRDER SPAN
6 Reqd (2 each at Piers 2-4-7)
Pressed Steel Nut
END VIEW
Steel Bro. (Fin all over)
Finish Pin & Nut all over
Steel Washer Fin all over
1'-5" Fin
DETAIL OF 4" PIN & PIN NUT
(For Fixed shoes @ Piers 2-4 & 7)
Turn 2" pin on Rocker Shoe
Casting "A"
Steel Slab
½"×2¾" lg Hex Hd Tap Bolts
DETAIL OF CASTING "A"

Notes:

Note 1: Bearing bars and pins to be Chrome Nickel Steel. Finish all surfaces.

Note 2: Fox Bolts to be furnished and set by Superstructure Contractor. Bolts to have ⅜" plate washer and 2 Hex nuts and to extend 2'-6" into concrete.

Substructure Contractor shall use care in location of reinforcing steel so that nearest bars shall be at least 3½" clear from theoretic centers of Fox Bolts.

For materials and manufacture see Specifications

For notes on welding see SH

Anchor Bolt setting plan shall be prepared by Superstructure Contractor and prints be furnished to Substructure Contractor.

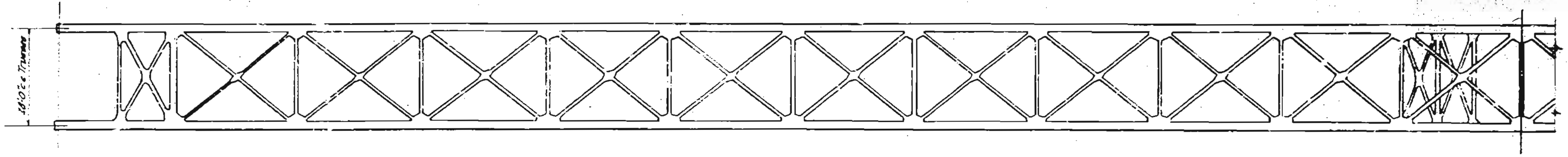
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

SHOES

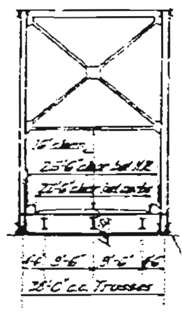
L-98

Scale As Noted
[illegible]
Consulting Engineers
Sheet No. 7

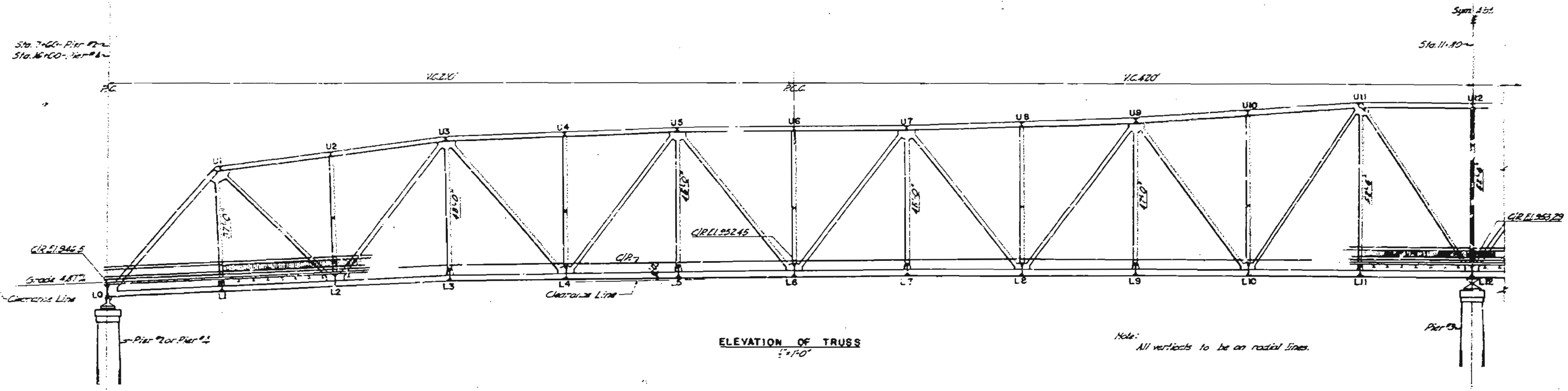
Revised ☐ as Constructed - L.E.H. 5-9-60



PLAN AT TOP CHORD

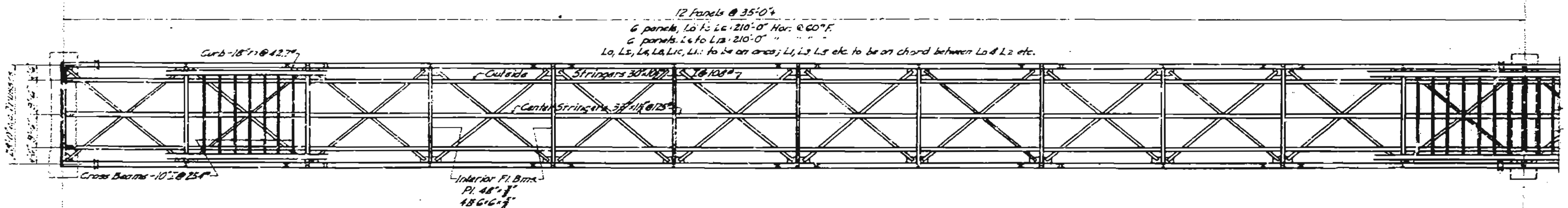


CROSS SECTION AS AT L4-U4



ELEVATION OF TRUSS
$\frac{1}{8}$" = 1'-0"

Note:
All verticals to be on radial lines.


12 Panels @ 35'-0"±
6 panels, L0 to L6 = 210'-0" Hor. @ 60° F.
6 panels, L6 to L12 = 210'-0" " " "
L0, L2, L4, L6, L8, L10, L12 to be on arcs; L1, L3, L5 etc. to be on chord between L0 & L2 etc.
Curb - 15" [33.9#
Outside Stringers 30" WF 108#
Center Stringers 33" WF 125#
Cross Beams - 10" I @ 25.4#
Interior Fl. Bms.
Pl. 48" × $\frac{3}{8}$"
4 ∠s 6 × 6 × $\frac{5}{8}$"

PLAN AT BOTTOM CHORD

GENERAL NOTES ON WELDING

For general requirements for welding see specifications.
All welds not otherwise indicated shall be $\frac{5}{16}$" continuous fillet welds.
Fillet welds are generally shown thus: ——, or ——, or ——
Butt welds are generally shown thus: ——, or ——, or ——
All butt welds shall be continuous. Unless otherwise shown use square cuts in metal $\frac{1}{4}$" or less in thickness, single V bevels for thickness $\frac{5}{16}$" to $\frac{7}{16}$", and double V bevels for metal $\frac{1}{2}$" or over.
Tack welds, plug, slot or seal welds shall be specifically noted if used.
The shop drawings shall show clearly the nature, dimensions, and location of all welds.

Typical Nomenclature:
- $\frac{5}{16}$" CSW indicates a $\frac{5}{16}$" continuous shop fillet weld
- $\frac{1}{4}$" CFW indicates a $\frac{1}{4}$" continuous field fillet weld
- $\frac{3}{8}$" 2" @ 6" SW indicates intermittent $\frac{3}{8}$" shop fillet welds, 2" long, and at 6" centers.
- FBW indicates a field butt weld and SBW a shop butt weld.

GENERAL NOTES FOR STEELWORK

See Specifications for provisions regarding punching, reaming, finish, assembly, riveting, painting and other shop and field operations. Such provisions shall be clearly noted on the working drawings.

RIVETS:

$\frac{7}{8}$" ϕ unless otherwise noted.
Field Rivets, Shear 11,000 #/□", Bearing 22,000 #/□"
Shop Rivets, Shear 13,500 #/□", Bearing 27,000 #/□"

RIVET SPACING:

Where not shown on detail drawings, spacing shall conform to requirements of Design Specifications A.A.S.H.O.-1935. For Compression Chord Members, splice points and panel points at which a change in chord stress occurs, are to be regarded as ends of members. In web members the ends shall be taken as the termination of flanges.

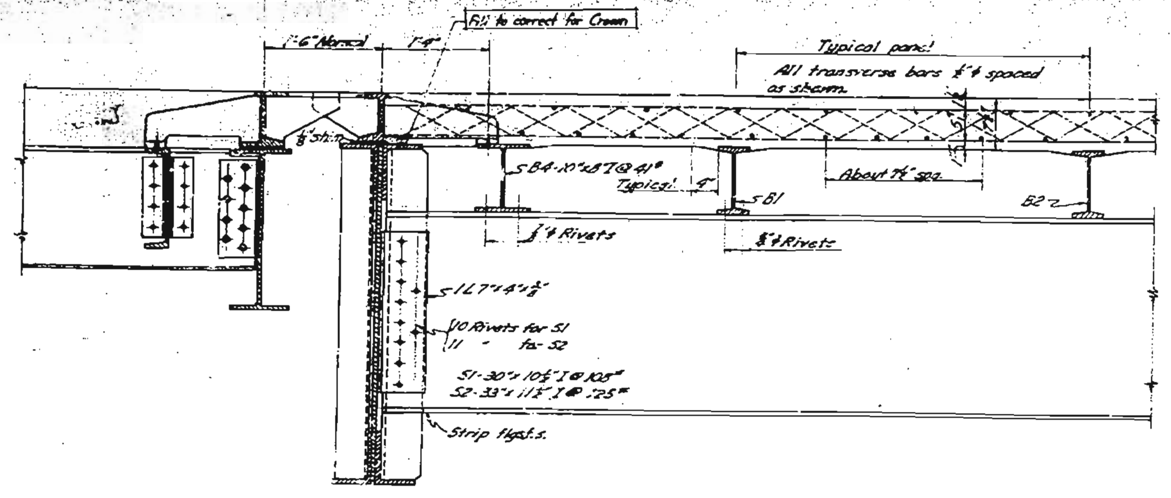
13

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
& BROWNVILLE, NEBR.

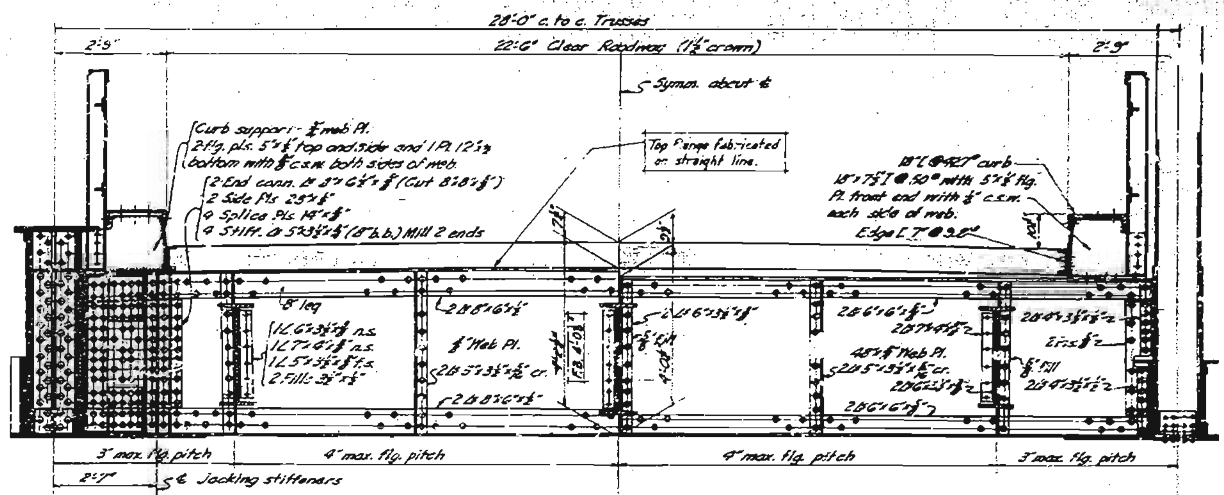
TRUSS SPANS
GENERAL LAYOUT

As Constructed - L.G.E. 5-



STRINGER CONNECTION AT FB1

1"=1'-0"



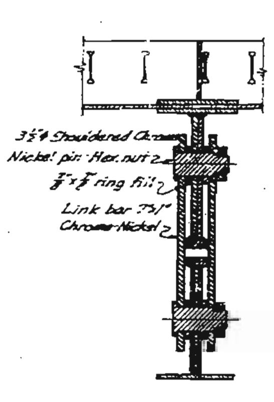
HALF SECTION AT END FLOORBEAM FB1

HALF SECTION AT INTERIOR FLOORBEAM FB2

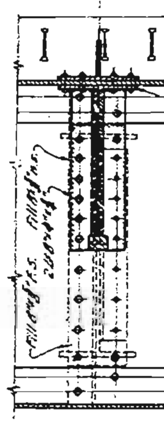
FLOORBEAM FB3 SIMILAR (For Str. conn. see detail this sheet)

FLOORBEAM FB2A SAME (Except for End Connection - see detl. "A")

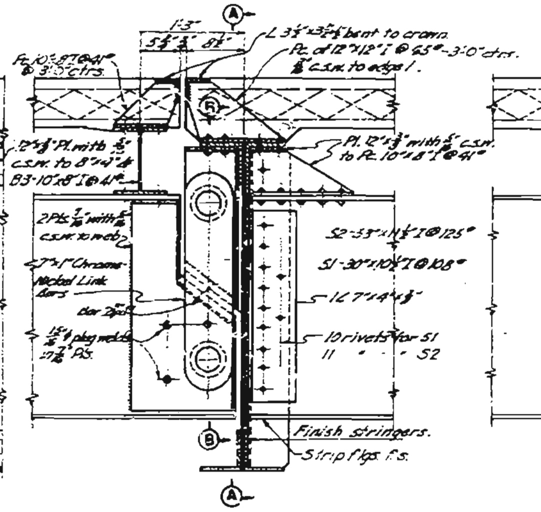
½"=1'-0"


3¾"φ Shouldered Chrome Nickel pin Hex. nut
⅞"×⅞" ring fill
Link bar 7"×1" Chrome Nickel

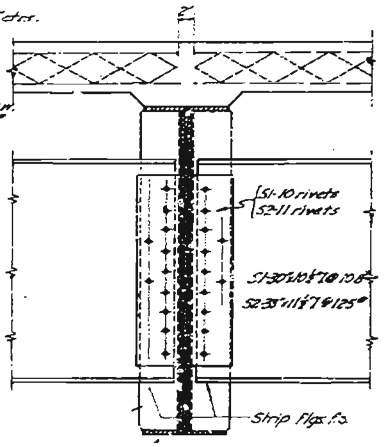
SECTION B-B



SECTION A-A

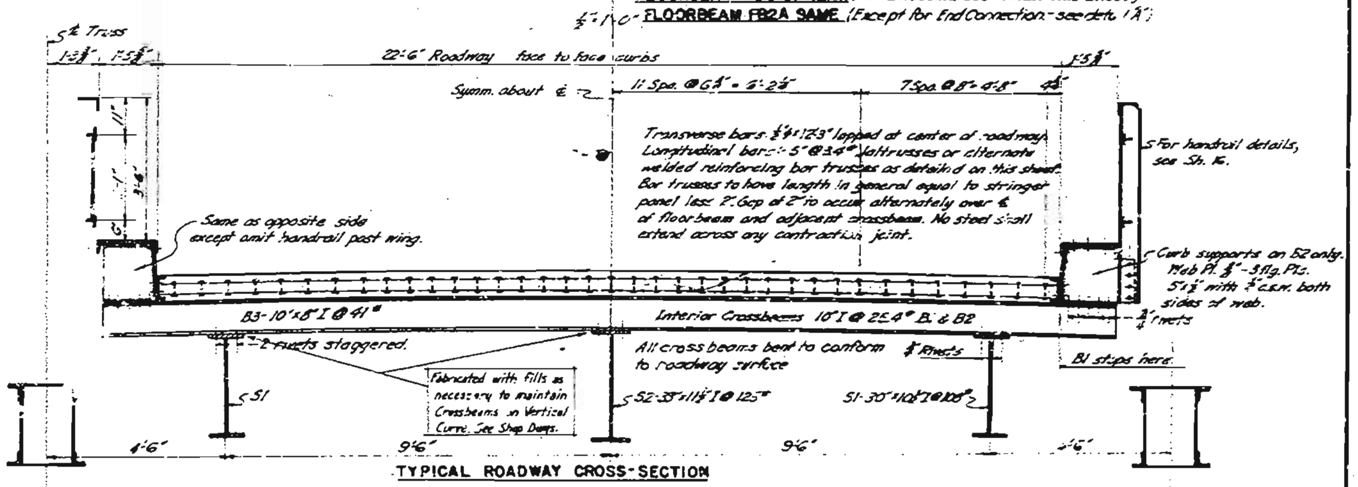

A
1'-3"
L 3½"×3½"×⅝" bent to crown
Pl. of 12"×12"I@65# - 3'-0" ctrs.
⅝" c.s.m. to edge
Fr. 10"×8"I@41# @ 3'-0" ctrs.
Pl. 12"×⅞" with ⅝" c.s.m. to Fr. 10"×8"I@41#
1"×⅞" Pl. with ⅝" c.s.m. to B"×4"×⅞"
B3-10"×8"I@41#
2 Pls. ⅝" with ⅝" c.s.m. to web
7"×1" Chrome Nickel Link bars
S2-33"×11½"I@125#
S1-30"×10½"I@108#
1L 7"×4"×⅝"
10 rivets for S1
11 " " S2
1⅝" plug welded
Finish stringers.
Strip flgs f.s.
B
A

STRINGER CONN. TO FB3



STRINGER CONN. TO FB2

1"=1'-0"

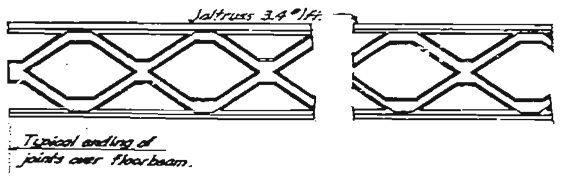

℄ Truss
1-3⅞"
1'-5⅞"
22'-6" Roadway face to face curbs
1'-5⅞"
Symm. about ℄
11 Spa. @ 6⅞" = 5'-2⅝"
7 Spa. @ 8" = 4'-8"
4⅞"
For handrail details, see Sh. 16.
Same as opposite side except omit handrail post wing.
Curb supports on S2 only. Web Pl. ⅜" - 3 Flg. Pls. 5"×⅜" with ⅝" c.s.m. both sides of web.
¾" rivets
B3-10"×8"I@41#
Interior Crossbeams 10"I@25.4# B1 & B2
2 rivets staggered
All cross beams bent to conform to roadway surface
⅝" Rivets
B1 stops here
Fabricated with fills as necessary to maintain Crossbeams in Vertical Curve. See Shop Dwgs.
S1
S2-33"×11½"I@125#
S1-30"×10½"I@108#
4'-6"
9'-6"
9'-6"
4'-6"

Transverse bars ⅝"φ×12'3" lapped at center of roadway. Longitudinal bars - 5"@3.4# Jaltrusses or alternate welded reinforcing bar trusses as detailed on this sheet. Bar trusses to have length in general equal to stringer panel less 2". Gap of 2" to occur alternately over ℄ of floorbeam and adjacent crossbeam. No steel shall extend across any contraction joint.

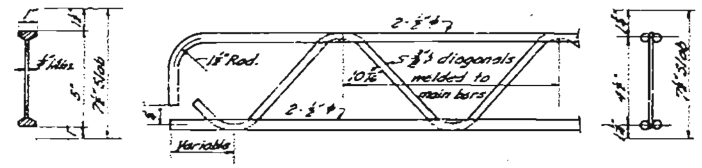
TYPICAL ROADWAY CROSS-SECTION

½"=1'-0"

Note: For General Notes on Steelwork and Welding see sheet 8. For Concrete, Sh. 2



JALTRUSS REINFORCING BAR



REINFORCING BAR TRUSS

3"=1'-0"

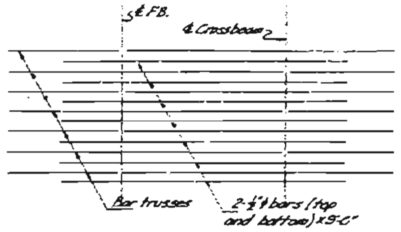
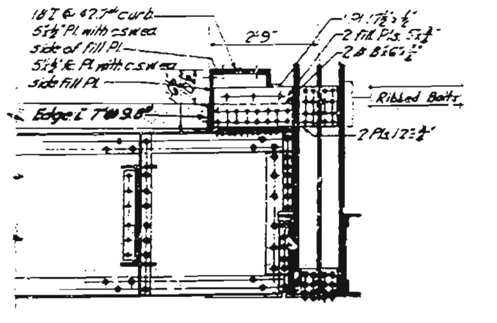


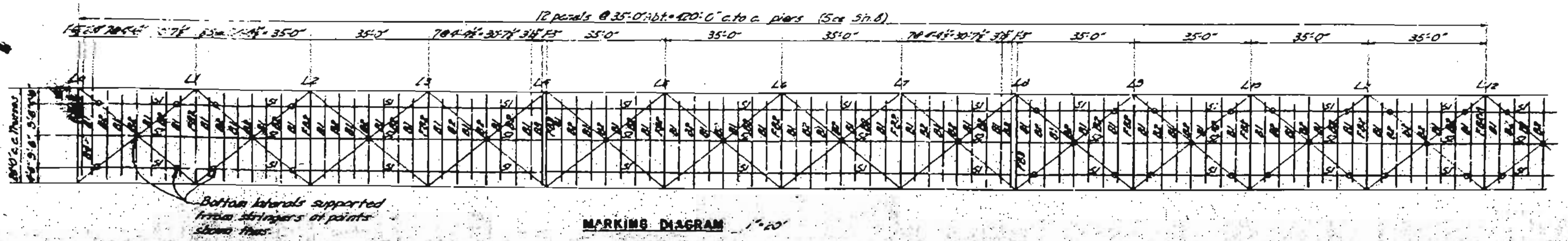
DIAGRAM OF SPLICES FOR JAL TRUSSES IN ROADWAY SLABS

No Scale



DETAIL "A"

½"=1'-0"


12 panels @ 35'-0" abt = 420'-0" c. to c. piers (See Sh. 8)
35'-0"
35'-0"
35'-0"
35'-0"
35'-0"
35'-0"
35'-0"
35'-0"
35'-0"
L0
L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
L12
28'-0" c. Trusses
Bottom laterals supported from stringers at points shown thus

MARKING DIAGRAM 1"=20'

14

L-98

Revised ☐ as Constructed - L.G.H. 5-5-41

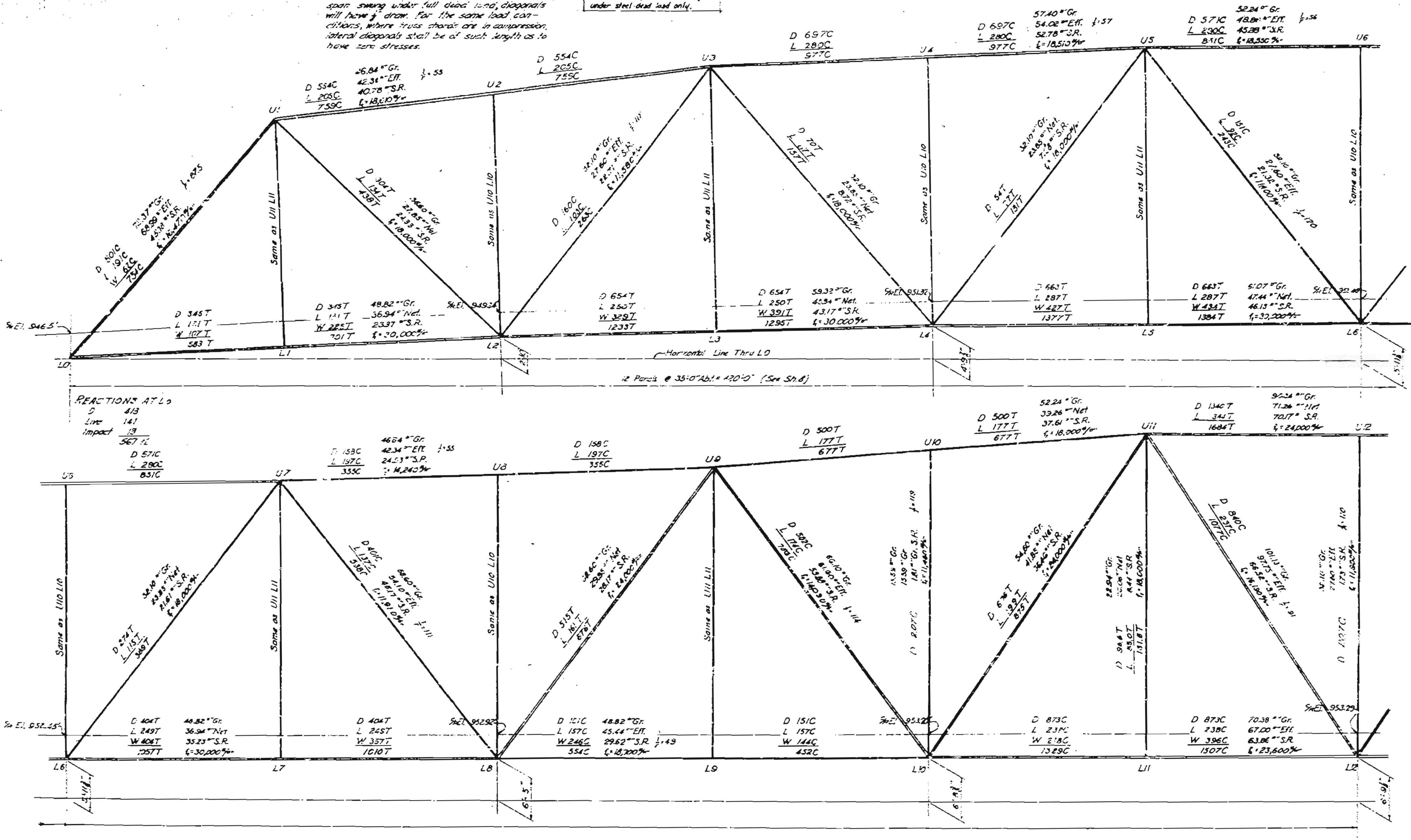
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS-
FLOOR SYSTEM

SHEET NO. 9

LATERALS:
Where truss chords are in tension, lateral diagonals shall be of such length that with span swung under full dead load, diagonals will have ⅛" draw. For the same load conditions, where truss chords are in compression, lateral diagonals shall be of such length as to have zero stresses.

Laterals fabricated to fit with no draw when spans are swung under steel dead load only.



REACTIONS AT L0
D 413
Live 141
Impact 13
567 K

DEAD LOAD

Per Lin. Ft. of Span - 2 Trusses

	At Bottom Chord	At Top Chord	Total
Future Paving	338	—	338
Deck Concrete	2133	—	2133
Floor Metal	871	—	871
Bracing	99	289	388
Trusses	895	895	1790
	4336	1184	5520

Total Dead Load 5520# p.l.f. span or 2760 p.l.f. truss

LIVE LOAD

For Floor System

On each 9 ft. traffic lane an H20 truck train consisting of 1-20 ton truck followed and preceded by 15 ton trucks at 44 ft. centers, placed to give maximum effect.

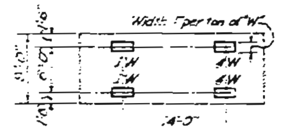
For Trusses

On each truss, one lane of H20 loading consisting of a uniform load of 640# per Lin. Ft. plus a single concentrated load of 18,000# for moment, or 26,000# for shear, placed so as to give maximum effect.

IMPACT

$I = \frac{50}{L+125}$ where

I = Impact fraction of Live Load Stress.
L = Loaded length of span in feet.



TYPICAL TRUCK
W= total loaded weight

REACTIONS AT L12
D 1493
Live 372
Impact 20
1885 K

GENERAL NOTES

DESIGN SPECIFICATIONS: A.A.S.H.O. 1935 except as otherwise shown hereon.

DESIGN UNIT STRESSES FOR D+L
Legend - D - Dead L - (Live + Impact)
W - Wind

	Carbon Steel	Silicon Steel
Axial Tension on Net Section	18,000	24,000
Axial Compression on Effective Gross Area	15,000-1/4(l/r)²	20,000-.46(l/r)²

For D+L+30%W or D+50%W allowable stresses are 1.25 times the above.

STRESSES GIVEN IN DIAGRAM are in units of 1000 pounds. Reactions given in same units. Allowable stresses are, unless otherwise noted, for direct stresses only. In sectioning members suitable allowances are made to care for dead load bending stresses.

DIMENSIONS AND CAMBER: Dimensions given, unless otherwise noted, are normal. Normal dimensions are at 60° Fahr. for a dead load of 2760# per lineal foot of truss, plus a live load of 640# per lineal foot of truss, extending over both 420'-0" spans. The length of truss members shall be such that, under the above dead load plus live load, all truss members will have their normal lengths and the trusses their normal or theoretical shape, free of secondary stresses. See Specifications. In computing deformation of members under stress, the area of the members shall be taken as the gross area.

CARBON AND SILICON STEELS: In stress diagram above, members mainly of silicon steel are indicated by double lines, single lines indicate carbon steel.

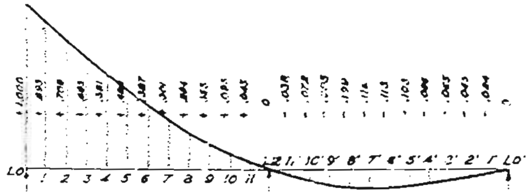
A further designation is made by use of letter "s" for silicon steel and letter "c" for carbon steel following the listing of steel parts on the detail truss drawings. Sheets #11-12-13.

DEAD LOAD
REACTION AT L12

Future paving		91
Concrete		577
Steel		825
	Total	1493 per truss

DEAD LOAD
REACTION AT L0

Future paving		25
Concrete		160
Steel		228
	Total	413 per truss



INFLUENCE LINE FOR END REACTION AT L0
Horiz. Scale ⅛"=35'-0"
Vert. Scale 1"=0.500

Example: A load "W" applied at Pt. 6' will produce a negative reaction at L0 of 0.113W.

Revised [ ] as Constructed - L.G.K. 5-9-40

15

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

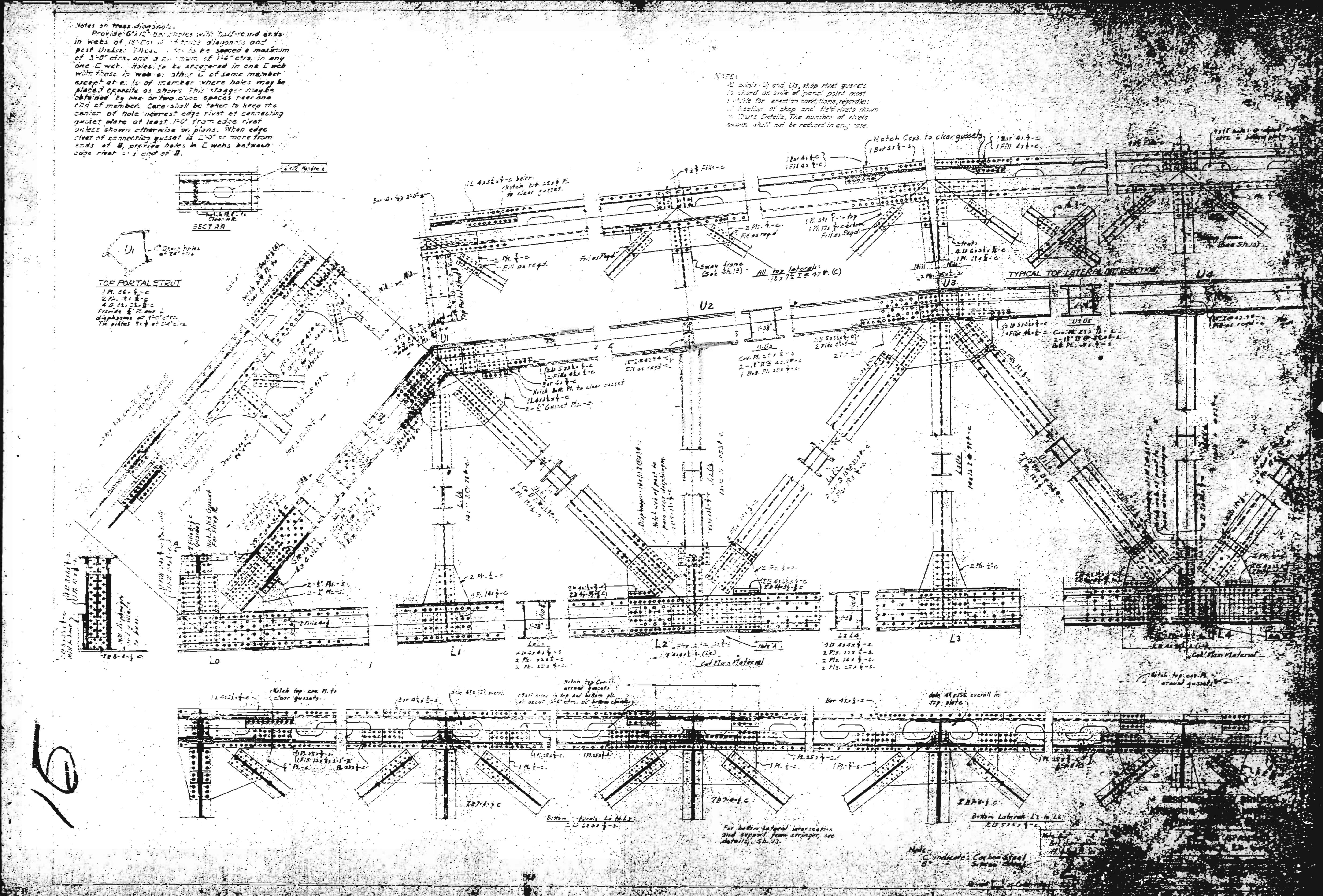
TRUSS SPANS
STRESS SHEET

SHEET NO. 10

Notes on truss diagonals.

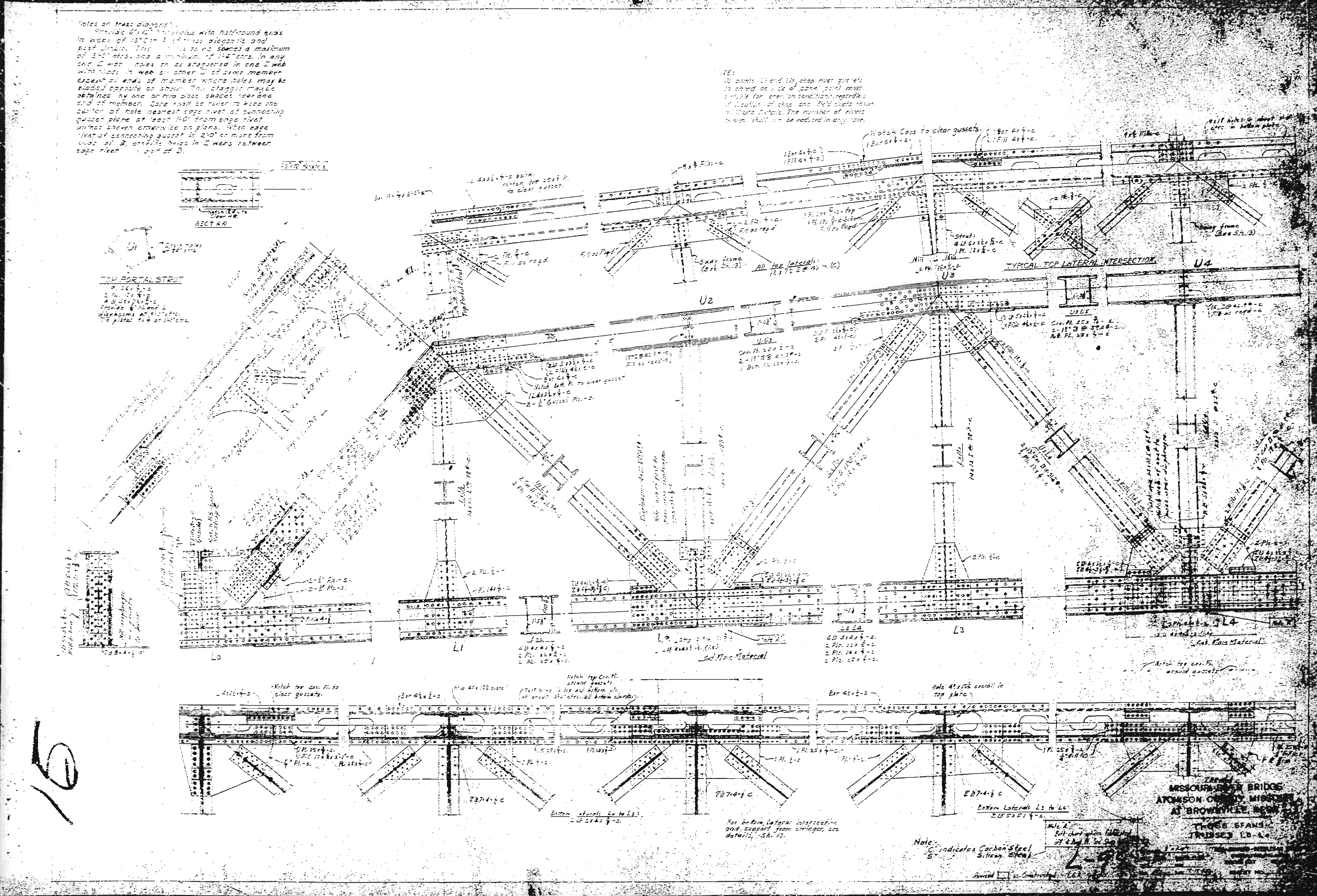
Provide 6"x12" hand holes with half-round ends in webs of 18" C's of truss diagonals and post U1L1. These holes to be spaced a maximum of 3'-0" ctrs. and a minimum of 1'-6" ctrs. in any one C web. Holes to be staggered in one C web with those in web of other C of same member except at ends of member where holes may be placed opposite as shown. This stagger may be obtained by one or two close spaces near one end of member. Care shall be taken to keep the center of hole nearest edge rivet of connecting gusset plate at least 1'-0" from edge rivet unless shown otherwise on plans. When edge rivet of connecting gusset is 2'-0" or more from ends of B, provide holes in C webs between edge rivet and end of B.

NOTE:
At points U1 and U3, shop rivet gussets to chord on side of panel point most suitable for erection conditions, regardless of location of shop and field rivets shown on Truss Details. The number of rivets shown shall not be reduced in any case.



Notes on truss diagonals:
Provide 6½×12" holes with half-round ends in webs of 15" C — of truss diagonals and post L1-U1. The holes to be spaced a maximum of 3'-0" ctrs. and a minimum of 1'-6" ctrs. In any one C web holes to be staggered in one C web with holes in web of other C of same member except at ends of member where holes may be placed opposite as shown. This stagger may be obtained by one or two close spaces near one end of member. Care shall be taken to keep the center of hole nearest edge rivet of connecting gusset plate at least 1'-0" from edge rivet unless shown otherwise on plans. When edge rivet of connecting gusset is 2'-0" or more from ends of B, omit the holes in C webs between edge rivet and end of B.

NOTE:
At points U1 and U4, shop rivet gussets to chord on side of panel point most suitable for erection conditions regardless of location of shop and field rivets shown on these details. The number of rivets shown shall not be reduced in any case.



For bottom lateral intersection and support from stringers, see details, Sh. 13.

Note:
C indicates Carbon Steel
S Silicon Steel

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

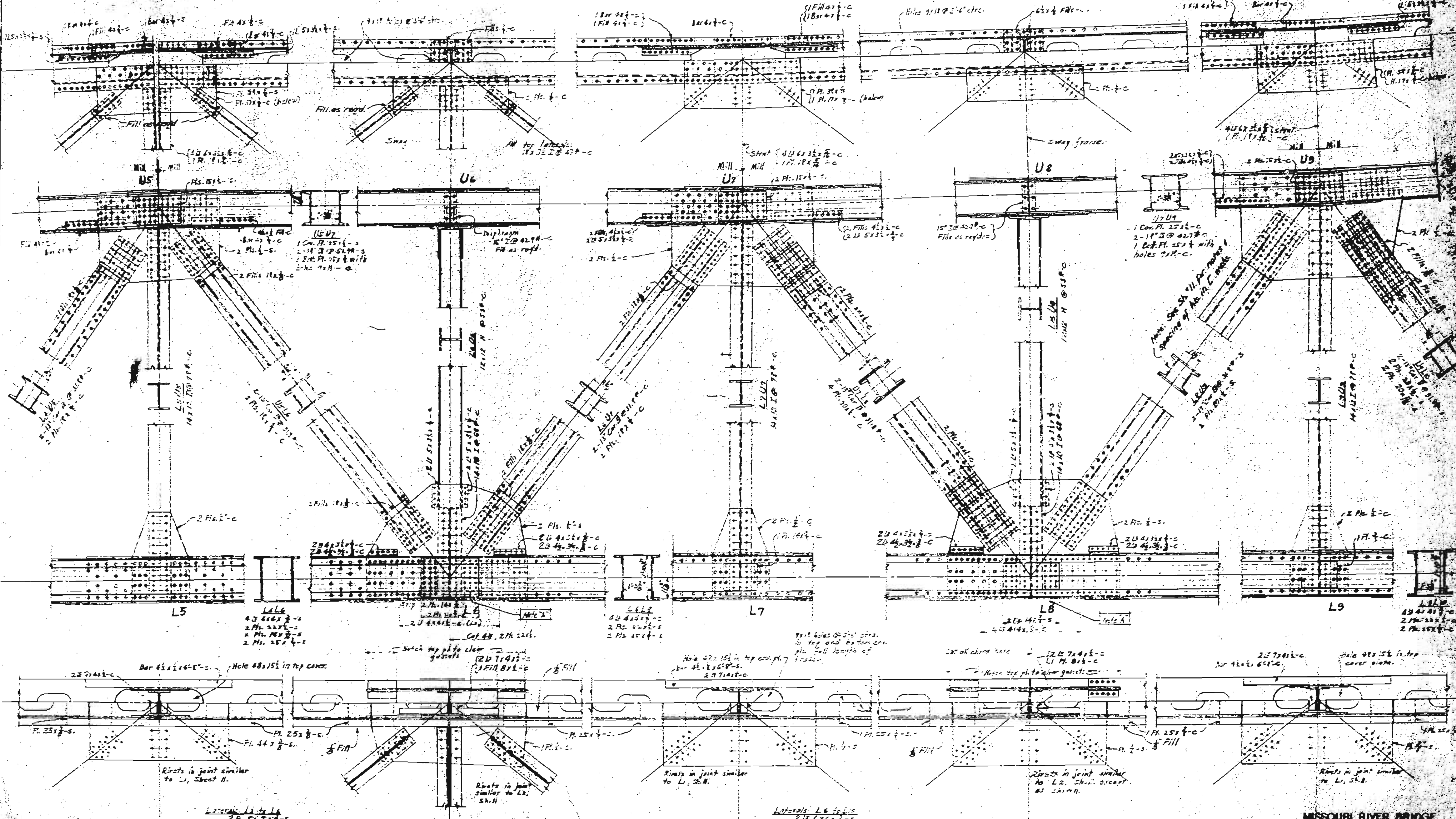
THROUGH SPANS
TRUSSES L0-L4

Revised ☐ as Constructed

L-9

15

NOTE:
At points U5, U7, and U9, shop rivet gussets to chord on side of panel point most suitable for erection conditions, regardless of location of shop and field rivets shown on Truss Details. The number of rivets shown shall not be reduced in any case.


U5
U6
U7
U8
U9
L5
L6
L7
L8
L9
Sway frame
Fill as reqd.
Note A
Rivets in joint similar to L2, Sheet 11.
Rivets in joint similar to L2, Sh. 11.
Rivets in joint similar to L2, Sh. 11 except as shown.
Laterals L5 to L6
Laterals L6 to L10
Note: See Sh. 11 for notes & spacing of bars in C. web

For bottom lateral intersection and support from stringer see details Sh. 13.

Note A
Bott. chord splices fabricated off ℄ Panel Pt. See Shop Dwgs.

Note:
All Silicon Steel marked - s
All Carbon Steel marked - c

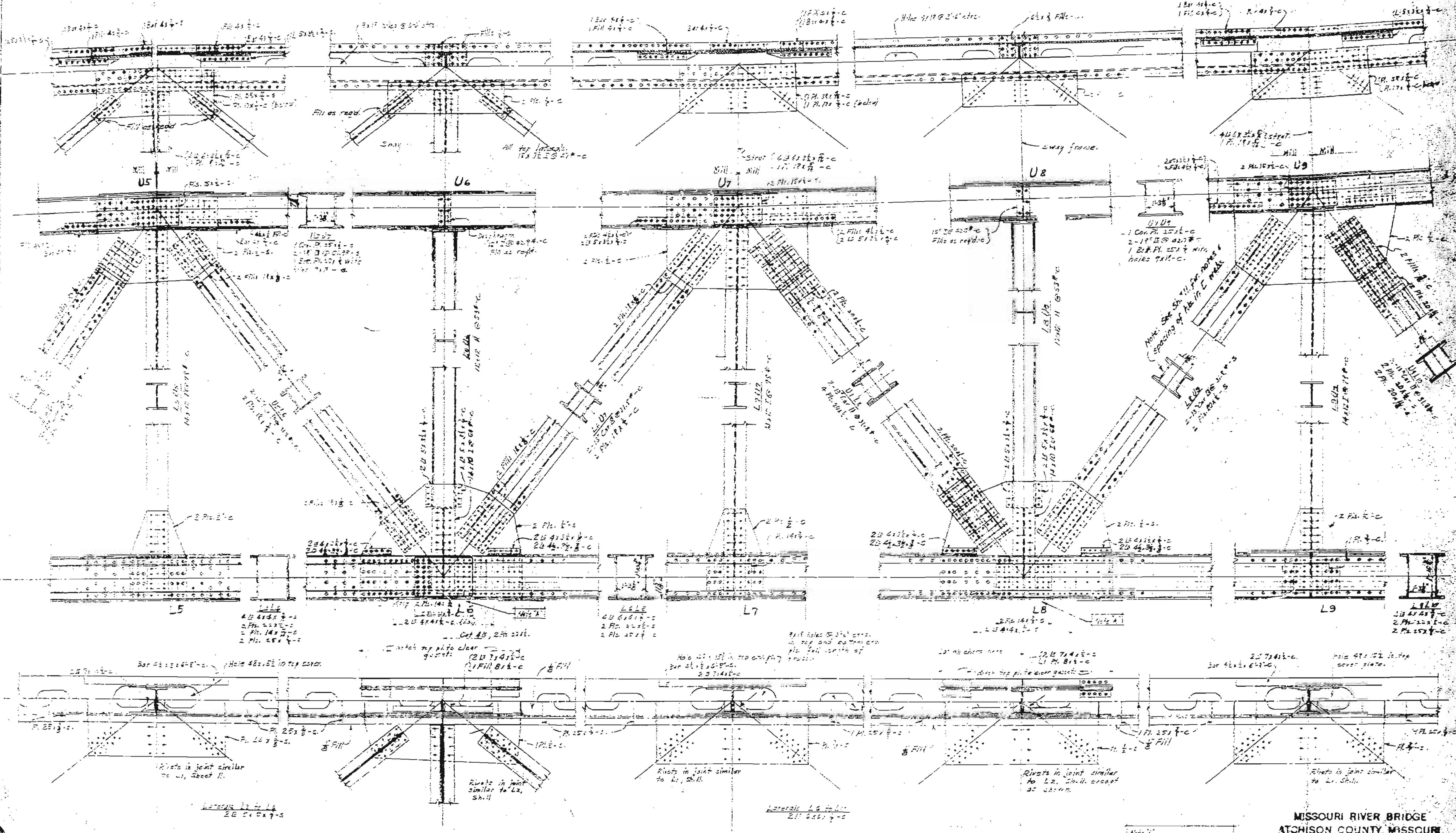
17

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS
TRUSSES L5-L9

Revised ☐ as Constructed


U5
U6
U7
U8
U9
L5
L6
L7
L8
L9
Fill as reqd.
Sway frame.
Note: See Sh. 11 for notes & spacing of holes in E webs.
Rivets in joint similar to L1, Sheet 11.
Rivets in joint similar to L2, Sh. 11
Rivets in joint similar to L2, Sh. 11
Rivets in joint similar to L2, Sh. 11 except as shown.
Rivets in joint similar to L2, Sh. 11
Laterals L5 to L6
Laterals L6 to L7

NOTE:
At points U5, U7, and U9, shop rivet gussets to chord on side of panel point most suitable for erection conditions, regardless of location of shop and field rivets shown on Truss Details. The number of rivets shown shall not be reduced in any case.

For bottom lateral intersection and support from stringer, see details Sh. 13.

Note "A"
Ends stent splices fabricated of ¼ Pearl Pl. Inc Stop Diags.

NOTE.
All Silicon Steel marked - S
All Carbon Steel marked - C

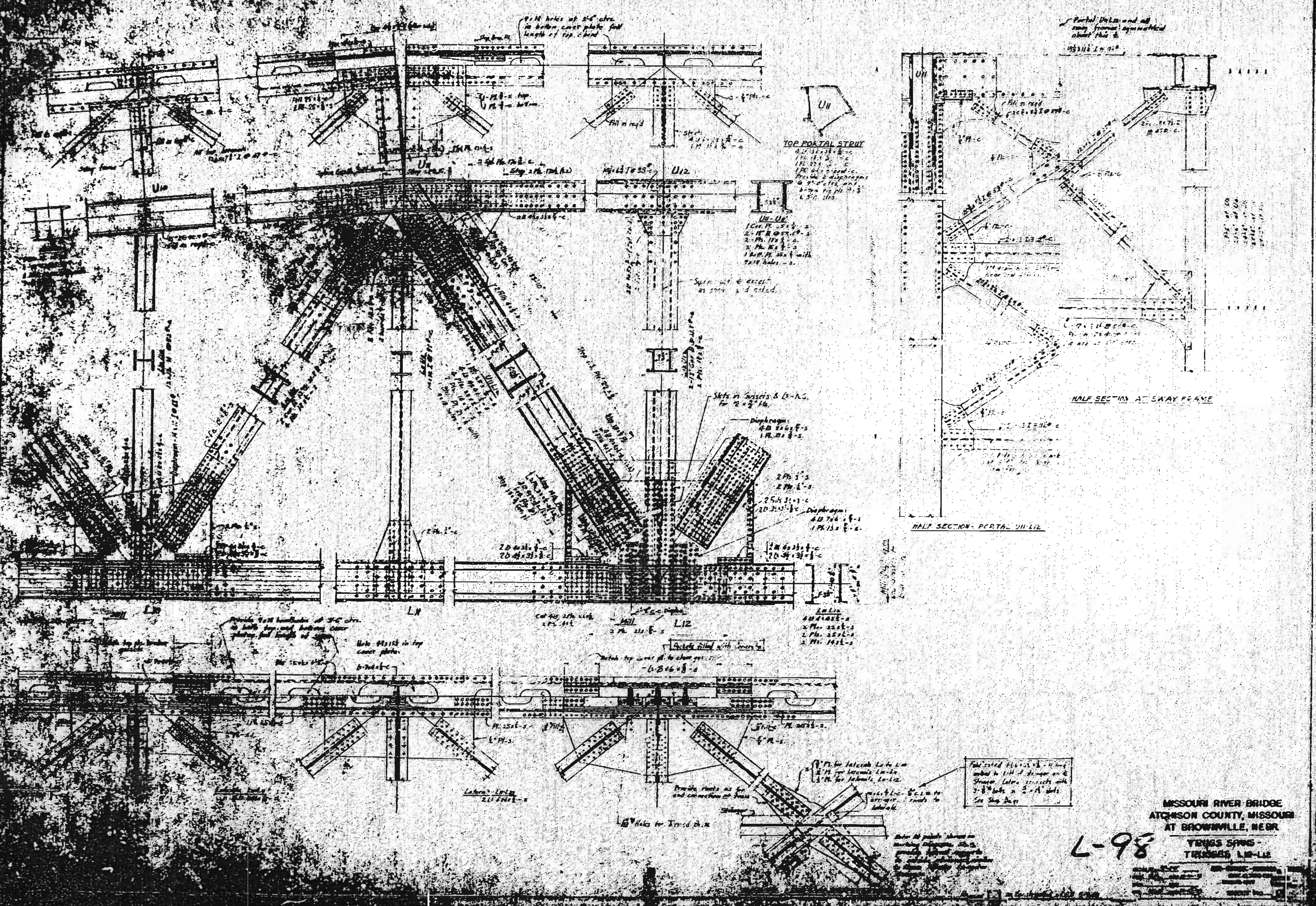
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS
TRUSSES L5-L9

Rivets ⊐ = Countersunk - S.H. 5-1-40

SHEET NO. 17


U10
U11
U12
L10
L11
L12
TOP PORTAL STRUT
U11-U11
Skts. in gussets & L's - h.s. for ⅞ x ¾ fills
Diaphragm
HALF SECTION - PORTAL U11-L12
HALF SECTION AT SWAY FRAME
L10-L12
Pockets filled with concrete
Laterals L10-L12
Stringer

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
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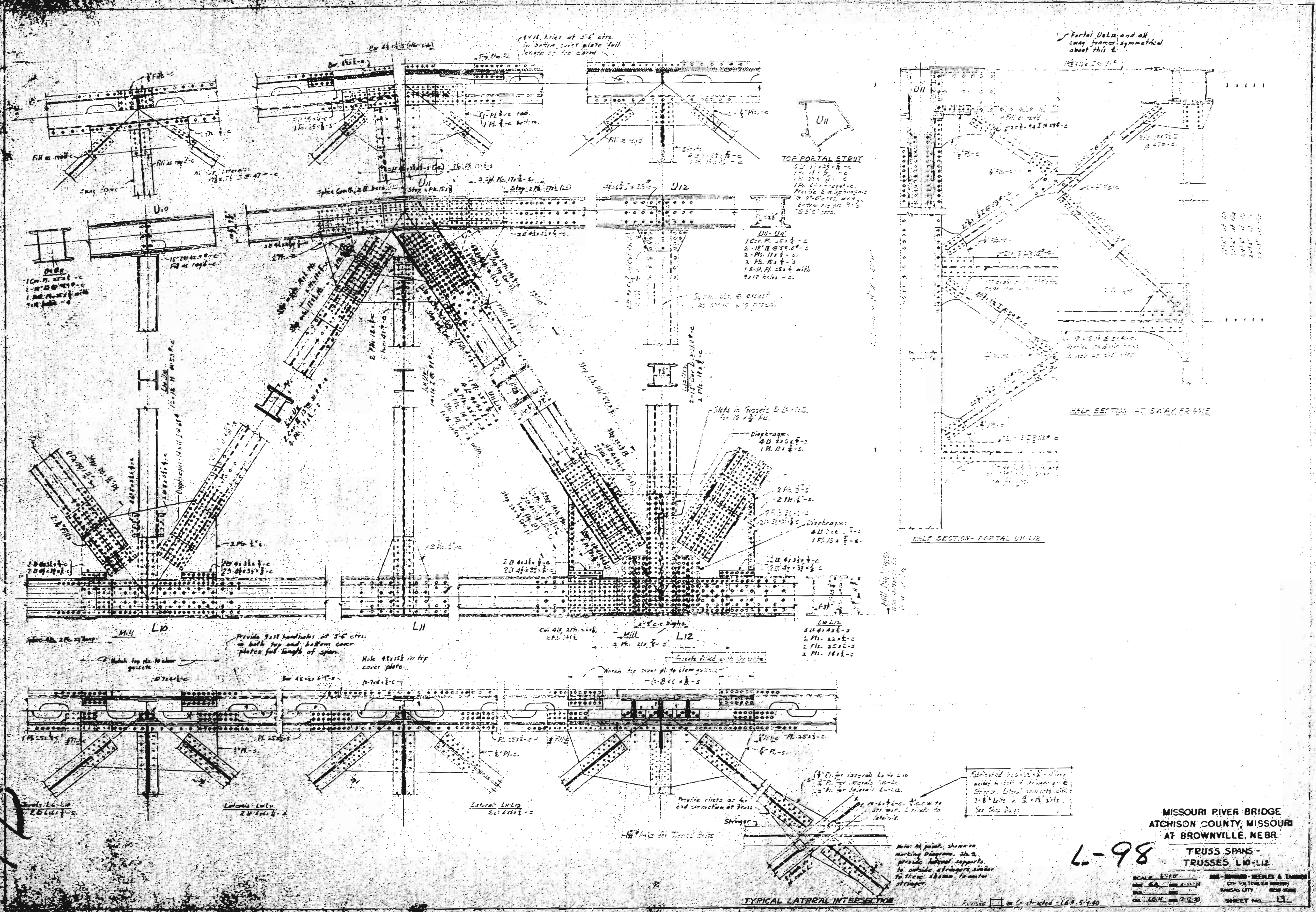
TRUSS SPANS -
TRUSSES L10-L12


U10
U11
U12
L10
L11
L12
TOP PORTAL STRUT
U11-U11
HALF SECTION AT SWAY FRAME
HALF SECTION - PORTAL U11-L12
TYPICAL LATERAL INTERSECTION
Mill
Provide 9x18 handholes at 3'-6" ctrs. in both top and bottom cover plates full length of span.
Hole 4 1/2" in top cover plate.
Portal U11-L12 and all sway frames symmetrical about this ℄
Laterals L10-L11
Laterals L11-L12
Provide rivets as for end connection at truss
Stringer
Note: At points shown on Marking Diagrams, Sh. 2, provide lateral supports to outside stringers similar to those shown to center stringer.

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS -
TRUSSES L10-L12

Revised ☐ as Constructed - L6H 5-1-40

SCALE 1"=1'-0"
DR. GA DATE 2-11-38
CK. LGH DATE 2-17-38

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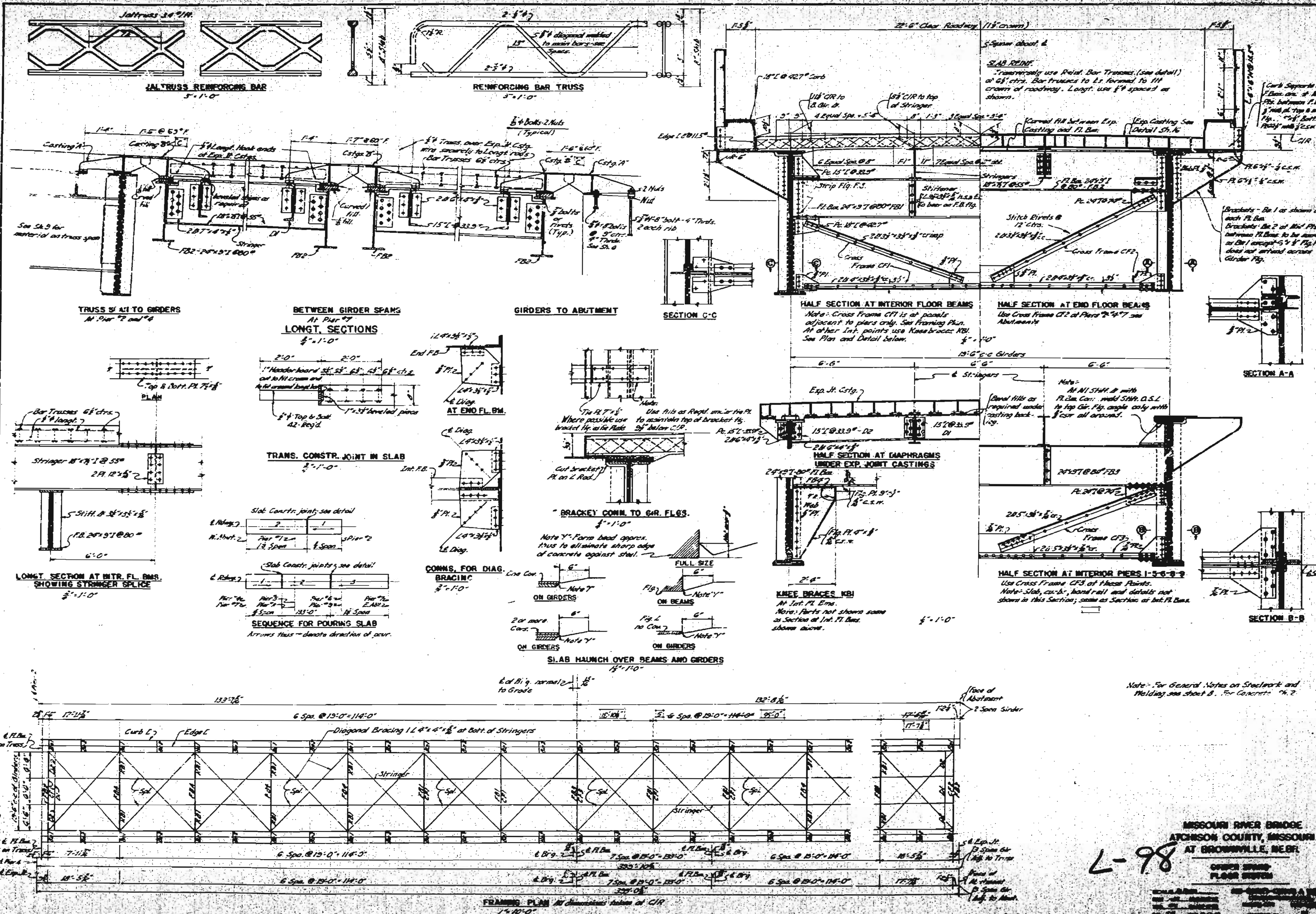
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET NO. 13

19



JALTRUSS REINFORCING BAR
3" = 1'-0"
Jaltruss 3/4" @ 1ft.
REINFORCING BAR TRUSS
3" = 1'-0"
5/8" ϕ diagonal welded to main bars-see Specs.
TRUSS SPAN TO GIRDERS
At Pier #2 and #6
BETWEEN GIRDER SPANS
At Pier #7
GIRDERS TO ABUTMENT
LONGT. SECTIONS
3/4" = 1'-0"
Casting "A"
Casting "B"
Cstg. "B"
Cstg. "A"
See Sh. 3 for material on truss span
Stringer
FB2
SECTION C-C
HALF SECTION AT INTERIOR FLOOR BEAMS
Note: Cross Frame CF1 is at panels adjacent to piers only. See Framing Plan. At other Int. points use Knee braces KB1. See Plan and Detail below.
HALF SECTION AT END FLOOR BEAMS
Use Cross Frame CF2 at Piers 2, 4, 7 and Abutments
22'-6" Clear Roadway (1 1/2" crown)
15'-6" c-c Girders
SLAB REINF.
Transversely use Reinf. Bar Trusses (see detail) at 6 1/2" ctrs. Bar trusses to be formed to fit crown of roadway. Longt. use 5/8" ϕ spaced as shown.
Cross Frame CF1
Cross Frame CF2
Stitch Rivets @ 12" ctrs.
SECTION A-A
PLAN
Top & Bott. Pl. 7 1/2" x 3/8"
Bar Trusses 6 1/2" ctrs.
Stringer 18" WF @ 55#
LONGT. SECTION AT INTR. FL. BMS. SHOWING STRINGER SPLICE
3/4" = 1'-0"
TRANS. CONSTR. JOINT IN SLAB
3/4" = 1'-0"
1" Headerboard cut to fit crown and fit around longl. bars
SEQUENCE FOR POURING SLAB
Arrows thus → denote direction of pour.
Slab Constr. joints, see detail
CONNS. FOR DIAG. BRACING
3/4" = 1'-0"
AT END FL. BM.
BRACKET CONN. TO GIR. FLGS.
3/4" = 1'-0"
Note "Y" - Form bead approx. thus to eliminate sharp edge of concrete against steel.
FULL SIZE
ON GIRDERS
ON BEAMS
ON GIRDERS
ON GIRDERS
SLAB HAUNCH OVER BEAMS AND GIRDERS
1 1/2" = 1'-0"
HALF SECTION AT DIAPHRAGMS UNDER EXP. JOINT CASTINGS
KNEE BRACES KB1
At Int. Fl. Bms.
Note: Parts not shown same as Section at Int. Fl. Bms. shown above.
3/4" = 1'-0"
HALF SECTION AT INTERIOR PIERS 1-3-5-8-9
Use Cross Frame CF3 at these Points.
Note: Slab, curb, hand rail and details not shown in this Section; same as Section at Int. Fl. Bms.
Cross Frame CF3
SECTION B-B
Diagonal Bracing 1 L 4" x 4" x 3/8" at Bott. of Stringers
Curb
Edge
Stringer
Spl.
6 Spa. @ 19'-0" = 114'-0"
7 Spa. @ 19'-0" = 133'-0"
FRAMING PLAN All dimensions taken at C/R
1" = 10'-0"

Note:- For General Notes on Steelwork and Welding see Sheet 8. For Concrete Sh. 2

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

GIRDER SPANS
FLOOR SYSTEM

L-98

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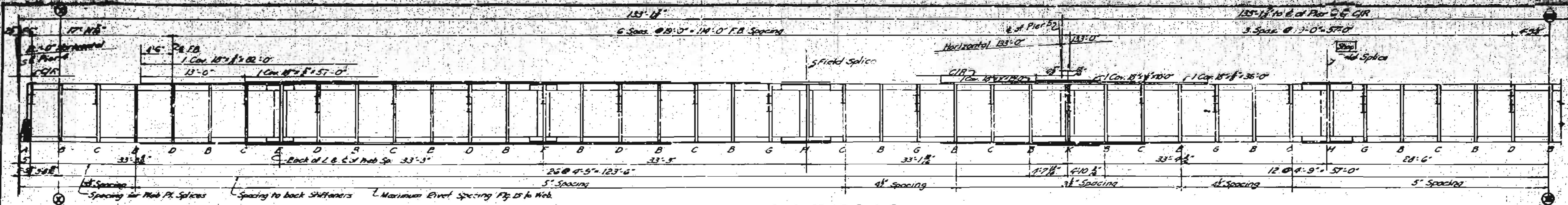
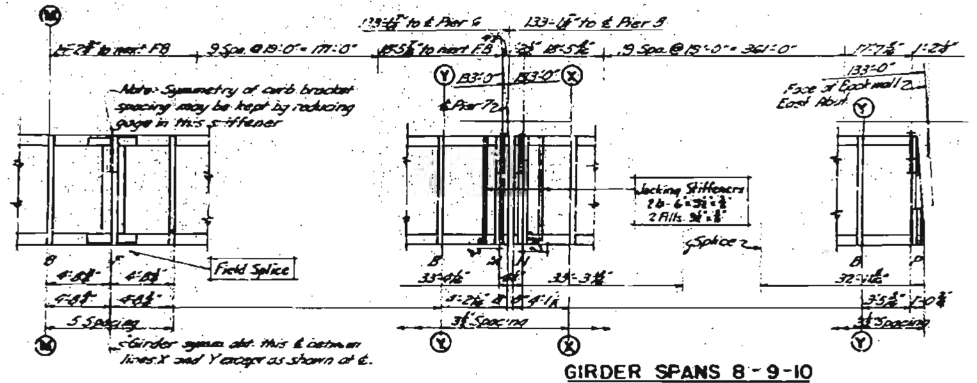

133'-1⅜"
6 Spas. @ 19'-0" = 114'-0" F.B. Spacing
3 Spas. @ 19'-0" = 57'-0"
Field Splice
Horizontal 133'-0"
A B C D E F G H K
33'-3"
26 @ 4'-9" = 123'-6"
12 @ 4'-9" = 57'-0"
28'-6"
5" Spacing
4½" Spacing
3½" Spacing
Spacing for Web Pl. Splices
Spacing to back Stiffeners
Maximum Rivet Spacing Flg. 15 to Web.

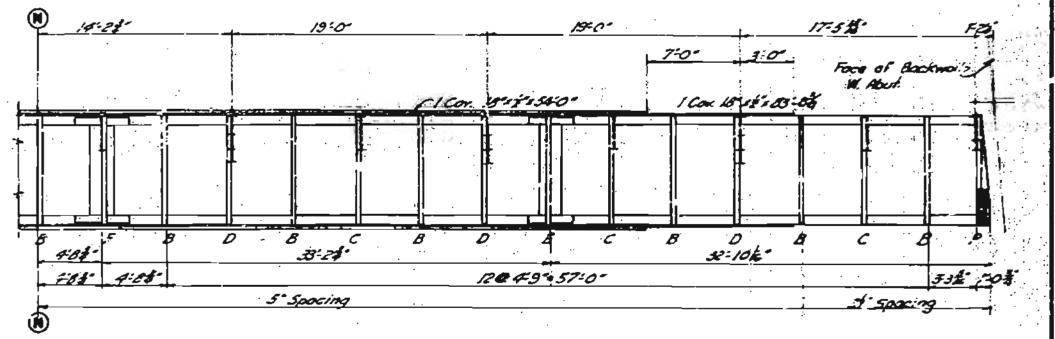
GIRDER SPANS 5-6-7

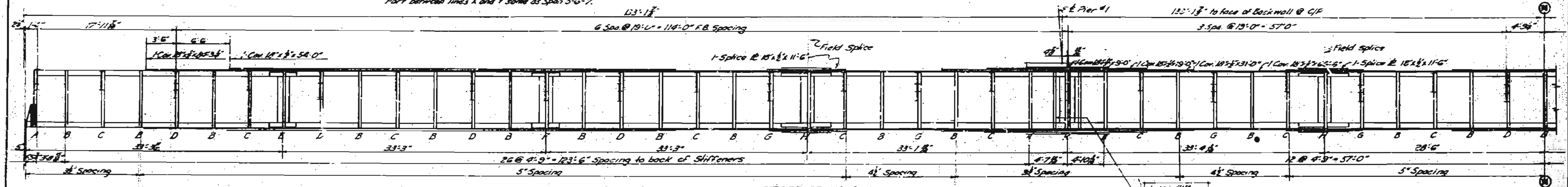

Note: Symmetry of curb bracket spacing may be kept by reducing gage in this stiffener
9 Spa. @ 19'-0" = 171'-0"
9 Spa. @ 19'-0" = 361'-0"
Face of Backwall East Abut.
Jacking Stiffeners 2 ∠s 6×3½×½ 2 Fills 3⅞×½
Field Splice
Splice
5" Spacing
3½" Spacing
Girder symm. abt. this ℄ between lines X and Y except as shown at ℄.

GIRDER SPANS 8-9-10

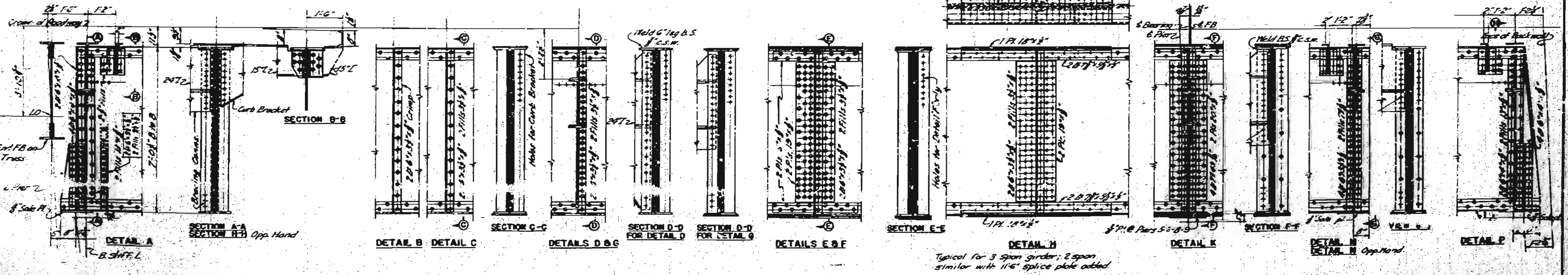
Part between lines X and Y same as Span 5-6-7.

All Flange ∠s 6"×6"×⅞". All web pls. 84"×7/16".
Covers for bottom flange same as top flange.
For cover ℄ rivet spacing see detail below.

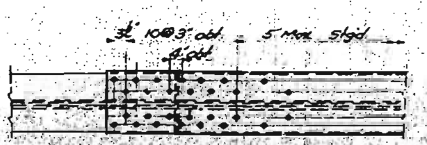



133'-1⅜"
℄ Pier #1
133'-1⅜" to face of Backwall at C/R
6 Spa. @ 19'-0" = 114'-0" F.B. Spacing
3 Spa. @ 19'-0" = 57'-0"
Field Splice
26 @ 4'-9" = 123'-6" Spacing to back of Stiffeners
12 @ 4'-9" = 57'-0"
3½" Spacing
5" Spacing
4½" Spacing
4" Spacing
5" Spacing
Jacking Stiffeners 2 ∠s 6×3½×½ 2 Fills 3⅞×½

GIRDER SPANS 2-1



Typical for 3 Span girder; 2 span similar with 11'-6" Splice plate added.



DETAIL AT END OF COVER PLATES

For General Notes on Steelwork and Welding, see Sh. 8.
In riveting a minimum pitch of at least 3" shall be maintained.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

L-98

20

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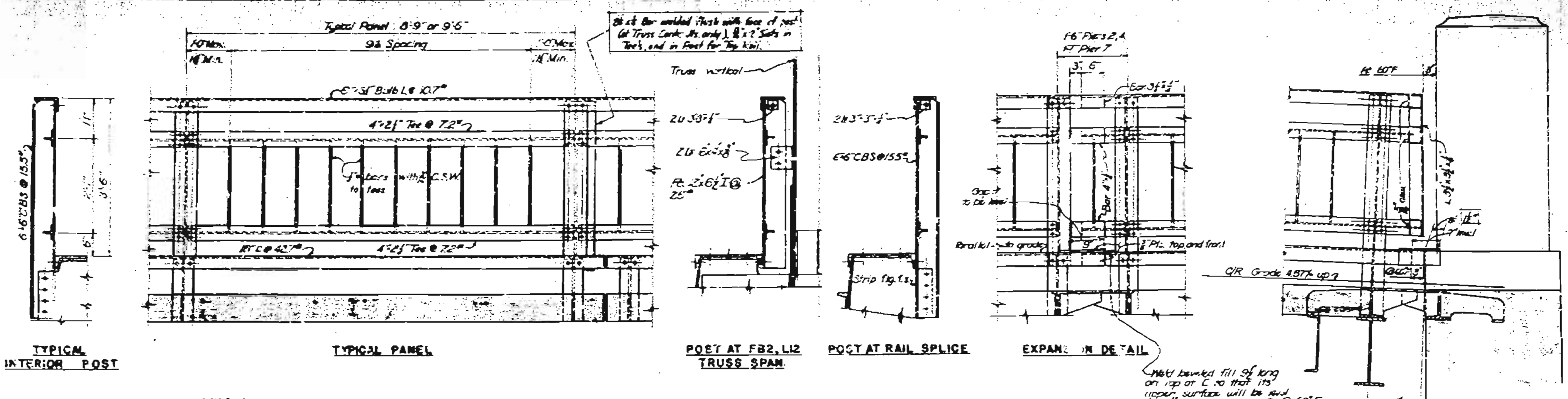


TYPICAL INTERIOR POST

TYPICAL PANEL

POST AT FB2, L12 TRUSS SPAN

POST AT RAIL SPLICE

EXPANSION DETAIL

Weld beveled fill of long on top of C so that its upper surface will be level and ⅛" clear below gap @ 60°F. Round all projecting edges.

TYPICAL RAILING DETAILS

¾" = 1'-0"

Notes on Railing—

All posts to be set normal to grade.

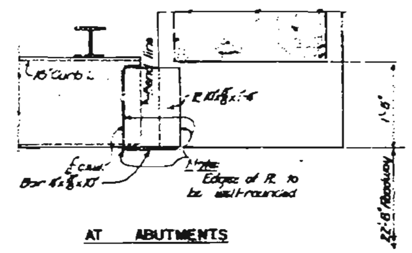
Bulb angle top rail to be spliced as follows: On thru truss spans, at panel points. On Nebraska deck spans, at every fourth handrail post (38'-0"). On Missouri deck spans, at every third handrail post (28'-6").

All sections to be cut straight. Cut and finish ends of bulb angles to leave ⅛" normal gap at ends, and to insure neat joints. Remove sharp corners of joints in top rail.

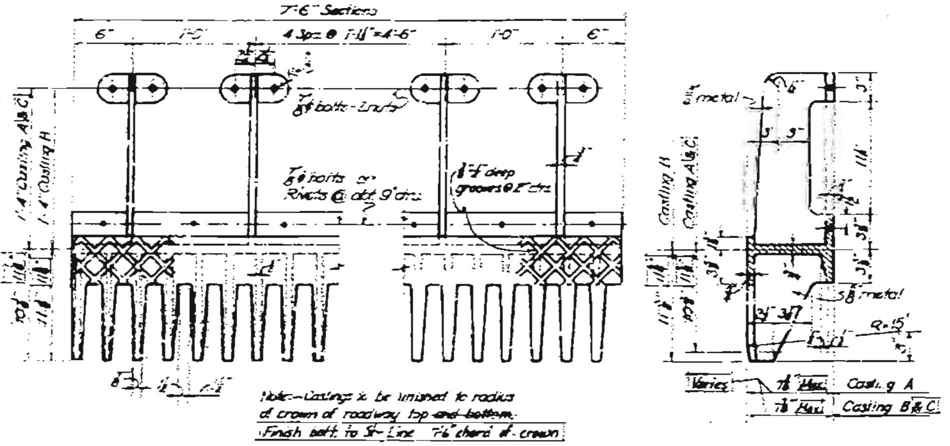
Rivets of posts to curbs and curb brackets to be ⅞"⌀. Attach railing to posts with ⅝"⌀ button head bolts with buttonheads on top and toward roadway. Provide 1 hex nut and 1 hex lock nut for each bolt. Holes for bolts to be ⅝"⌀ in bulb angle and tees, ⅝"⌀ in posts. Locate holes so that bolts are centered under normal conditions.

Lateral adjustment shall be obtained in field by reaming holes for attaching post to curb support.

Final adjustment of handrail to be made with roadway slab in place.

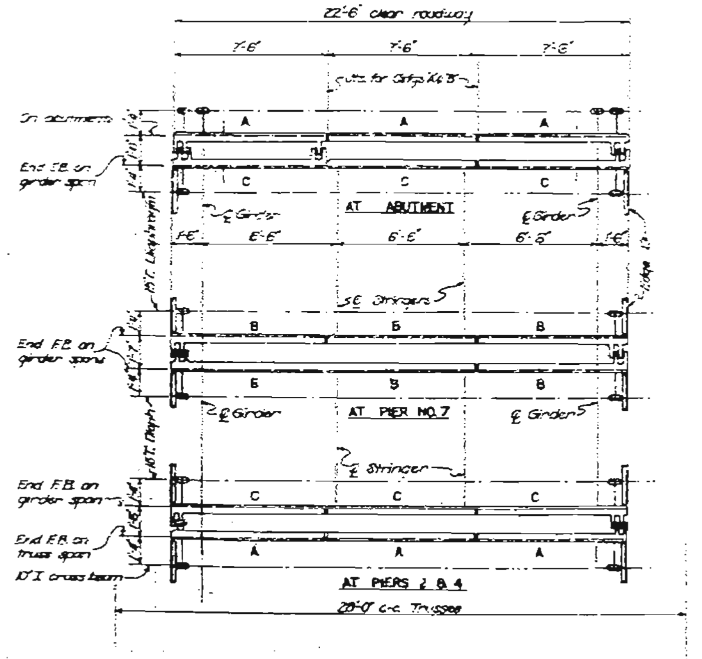


AT ABUTMENTS



Note—Castings to be warped to radius of crown of roadway, top and bottom. Finish bott. to St. Line 7'-6" chord of crown.

12 EXPANSION CASTINGS AS NOTED-MARK A (At end FB on truss spans & abutments)
18 EXPANSION CASTINGS AS NOTED-MARK B (On Deck Girder spans)
6-Mark B & 12-Mark C
(CAST STEEL)
(Galvanized)
1½" = 1'-0"



ARRANGEMENT OF EXP. JT. CASTINGS

¼" = 1'-0" Revised as Constructed

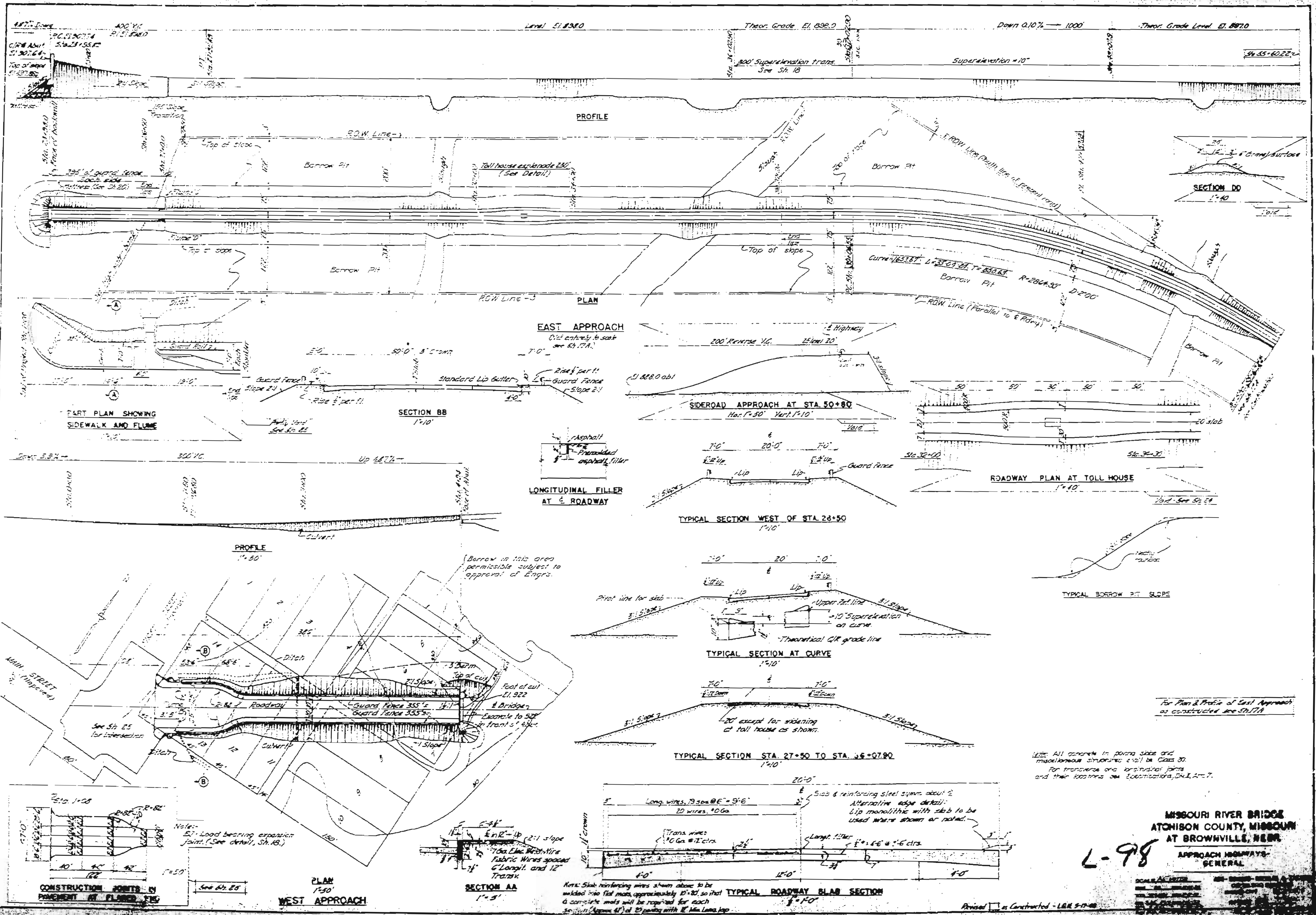
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EXPANSION JOINTS,
HANDRAILS, ETC.

L-98

Revised [illegible] as Constructed

22



Note: Slab reinforcing wires shown above to be welded into flat mats, approximately 10'×20', so that 6 complete mats will be required for each section (Approx 41') of 20 paving with 12" Min. Long. lap

For Plan & Profile of East Approach as constructed see Sh. 17A

Note: All concrete in paving slabs and miscellaneous structures shall be Class 30.

For transverse and longitudinal joints and their locations see Specifications, Div. I, Art. 7.

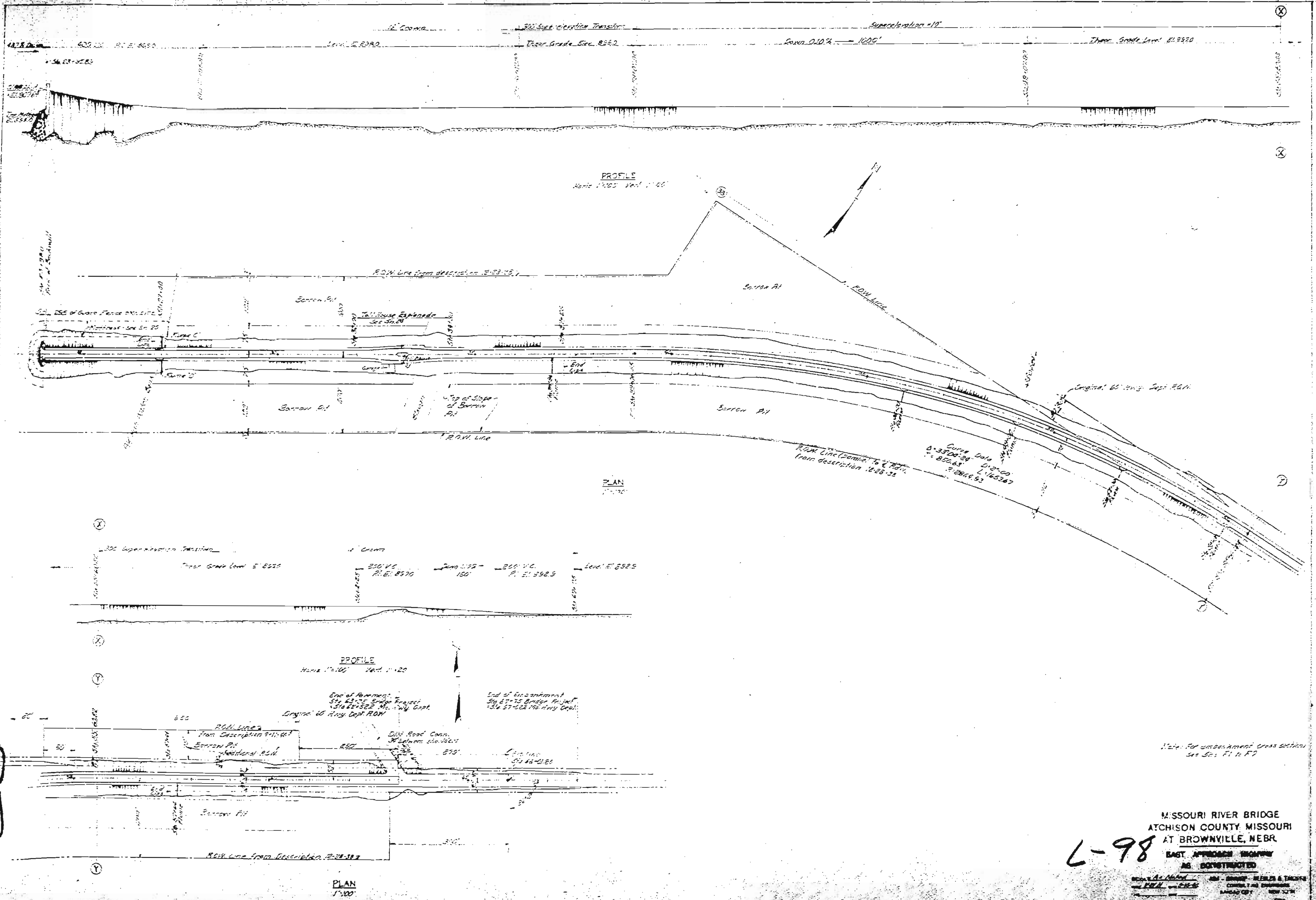
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

APPROACH HIGHWAYS-
GENERAL

Revised ☐ as Constructed - L.G.R. 5-11-40

23

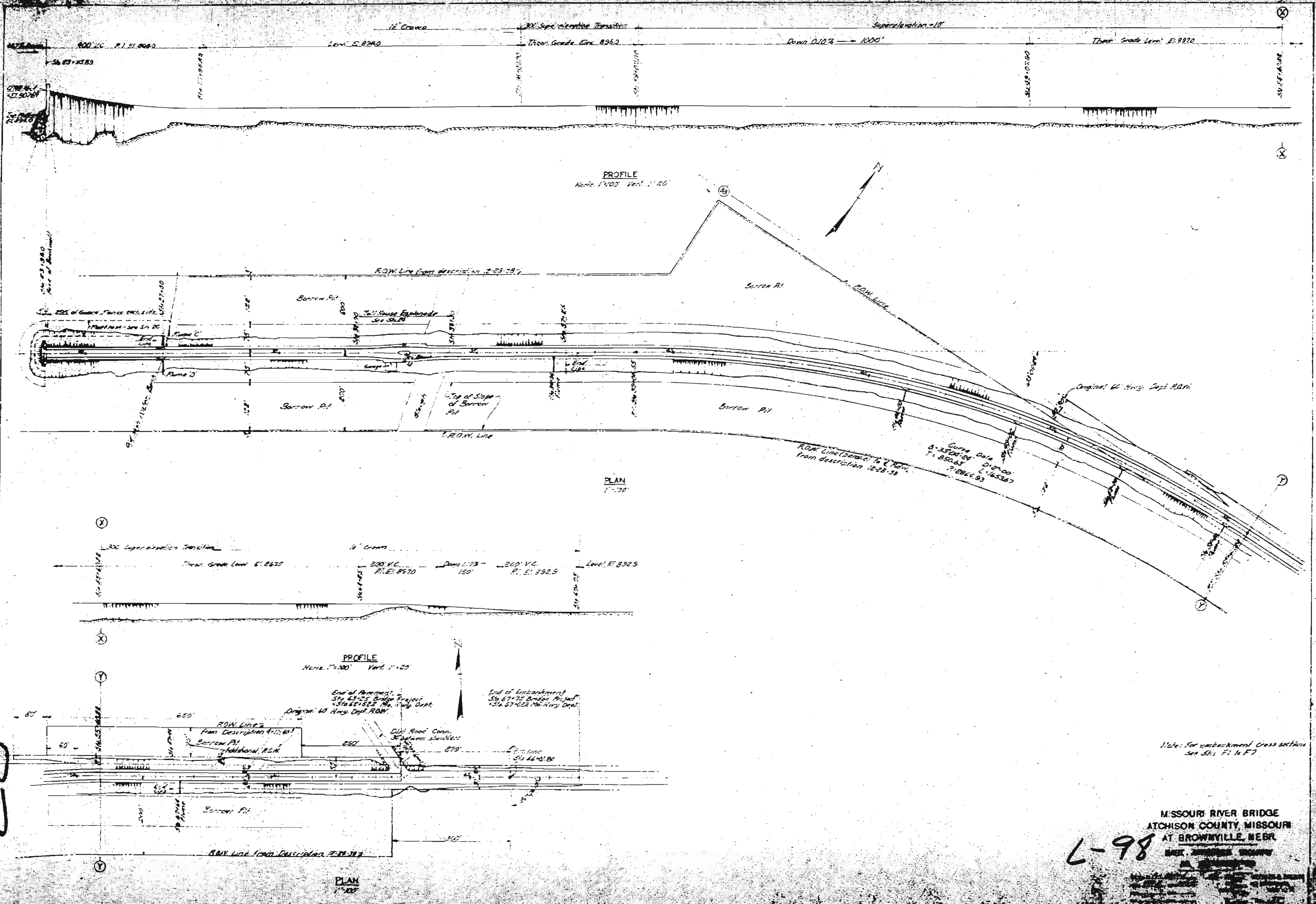

12" Crown
300' Superelevation Transition
Superelevation = 1.0"
Down 0.10% — 1000'
Level El. 838.0
Theor. Grade Elev. 836.2
Theor. Grade Level El. 837.0
Sta. 63+52.83
PROFILE
Horiz. 1"=100' Vert. 1"=20'
R.O.W. Line from description 12-28-38
Borrow Pit
Tollhouse Esplanade
Borrow Pit
End Slope
Top of Slope of Borrow Pit
R.O.W. Line
R.O.W. Line
Original 66' Hwy. Dept. R.O.W.
Curve Data
Δ=33°00'29"
T=850.63'
D=2°-00'
L=1653.67
R=2864.93
R.O.W. Line (parallel to ℄ Rdwy.) from description 12-28-38
PLAN
1"=100'
300' Superelevation Transition
12" Crown
Theor. Grade Level El. 862.0
250' V.C. P.I. El. 837.0
Down 0.02 — 150'
250' V.C. P.I. El. 832.5
Level El. 832.5
PROFILE
Horiz. 1"=100' Vert. 1"=20'
End of Pavement Sta. 63+75 Bridge Project = Sta. 62+52.2 Mo. Hwy. Dept.
Original 66' Hwy. Dept. R.O.W.
End of Embankment Sta. 67+75 Bridge Project = Sta. 67+52.2 Mo. Hwy. Dept.
R.O.W. Lines from Description 9-11-40
Borrow Pit Additional R.O.W.
Dirt Road Conn.
250'
275'
Borrow Pit
R.O.W. Line from Description 12-28-38
PLAN
1"=100'
Note: For embankment cross sections see Shs. F1 to F9

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY MISSOURI
AT BROWNVILLE, NEBR.
EAST APPROACH HIGHWAY
AS CONSTRUCTED

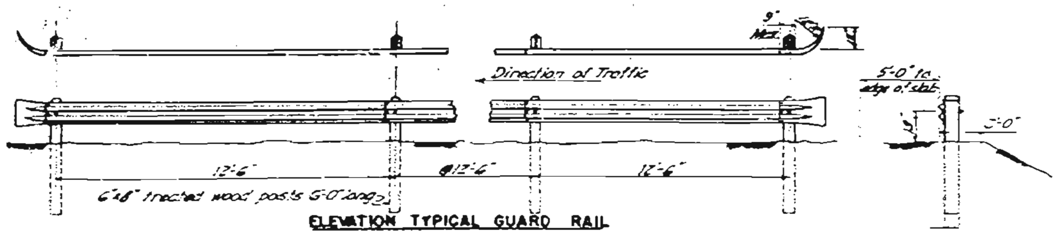
Scale As Noted
ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET No. 172

23


12" Crown
300' Super-elevation Transition
Superelevation = 1.5"
800' V.C. P.I. El. 898.0
Level El. 893.0
Theor. Grade Elev. 896.2
Down 0.10% — 1000'
Theor. Grade Level El. 897.0
Sta. 23+93.89
PROFILE
Horiz. 1"=100' Vert. 1"=20'
N
R.O.W. Line from description 2-23-38
Borrow Pit
295' of Guard Fence each side
Mattress - see Sh. 20
Flume 'C'
Flume 'D'
End Line
Toll House Esplanade
See Sh. 28
Garage
End Lips
Flume
Top of Slope of Borrow Pit
R.O.W. Line
Original 60' Hwy. Dept. R.O.W.
Curve Data
Δ = 33°00'20"
D = 2°00'
T = 850.63
L = 1653.67
R = 2864.93
R.O.W. Line (parallel to ℄ Rdwy.) from description 12-28-38
PLAN
1" = 100'
300' Super-elevation Transition
12" Crown
Theor. Grade Level El. 886.2
200' V.C. P.I. El. 897.0
Down 1.25 — 150'
200' V.C. P.I. El. 892.9
Level El. 892.5
PROFILE
Horiz. 1"=100' Vert. 1"=20'
End of Pavement
Sta. 63+25 Bridge Project
=Sta. 62+52.2 Mo. Hwy. Dept.
End of Embankment
Sta. 67+75 Bridge Project
=Sta. 67+02.2 Mo. Hwy. Dept.
Original 60' Hwy. Dept. R.O.W.
650'
60'
R.O.W. Lines from Description 9-11-40
Borrow Pit
Additional R.O.W.
250'
Dirt Road Conn. 30' between shoulders
279'
State Line Sta. 66+01.80
Flume
Borrow Pit
300'
R.O.W. Line from Description 2-23-38
PLAN
1" = 100'
Note: For embankment cross sections see Shs. F1 to F7

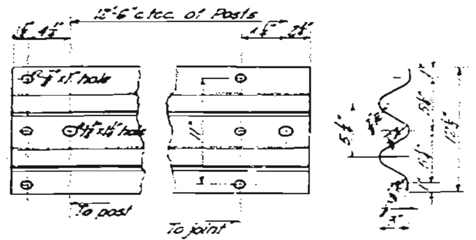
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

L-98



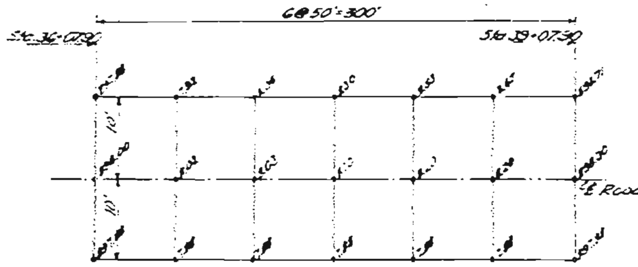
ELEVATION TYPICAL GUARD RAIL
¼" = 1'-0"

Note: Guard rail shall be #10 gage "Flex-Beam" type as manufactured by Sheffield Steel Co., K.C. Mo. or approved equivalent.

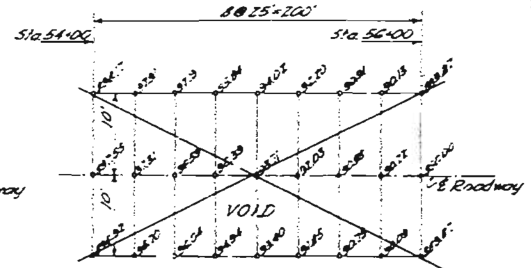


Details as per Manufacturer's Specs.

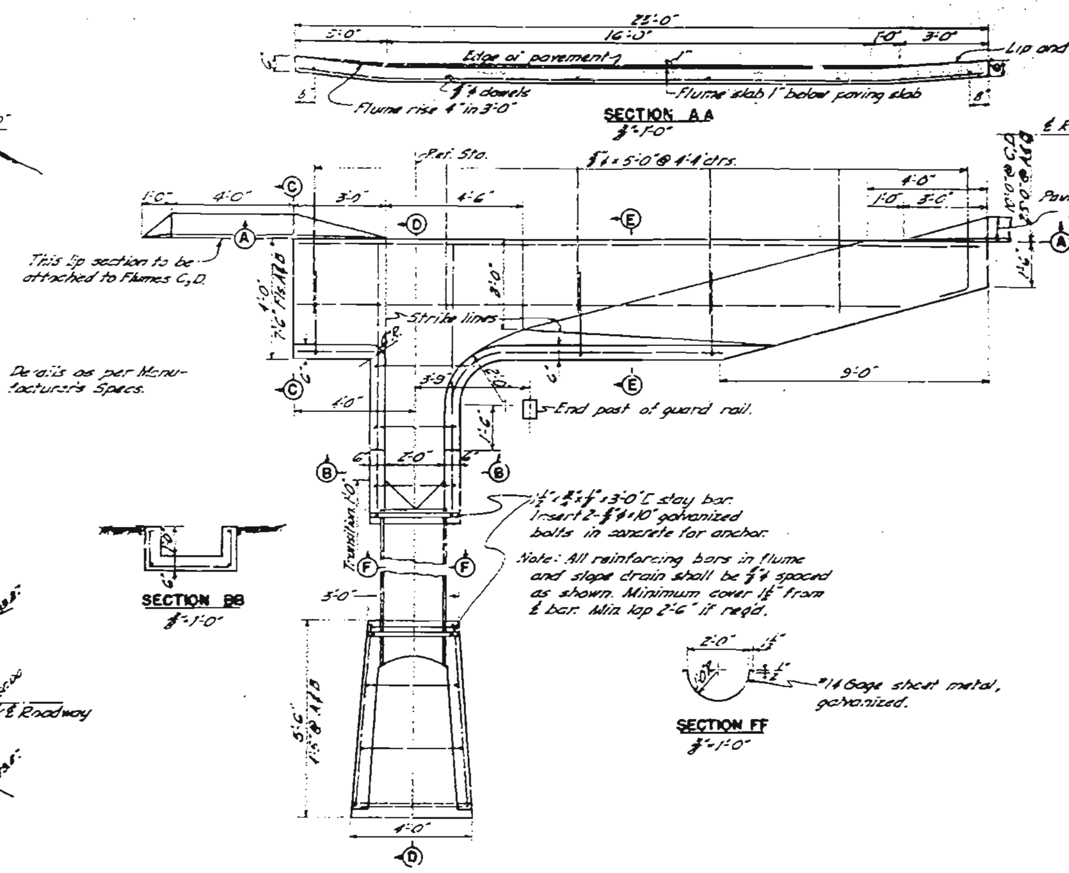
TYPICAL SECTION OF GUARD RAIL (#10 Gage)
1½" = 1'-0"



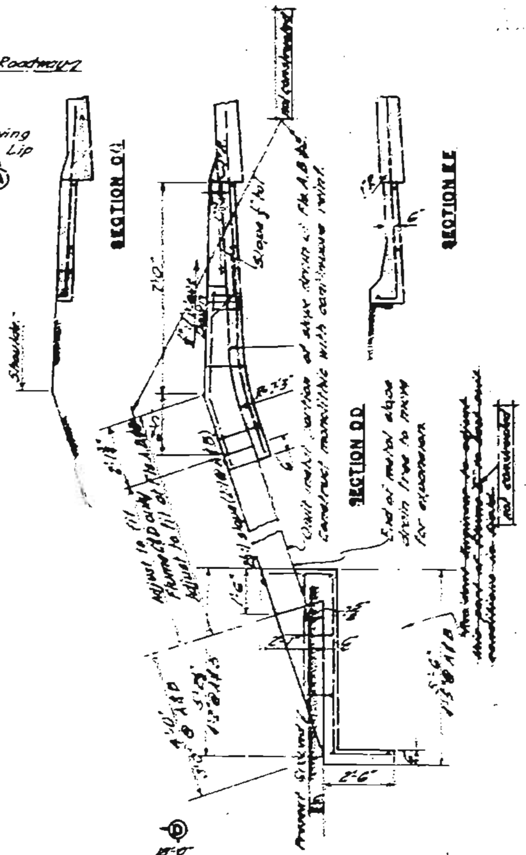
TOP OF SLAB ELEVATIONS AT 300' TRANSITION

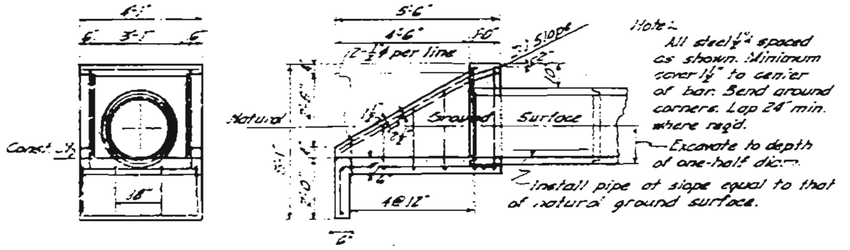


TOP OF SLAB ELEVATIONS AT 200' TRANSITION

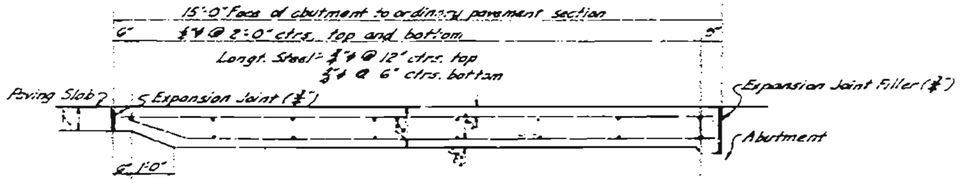

25'-0"
5'-0"
16'-0"
1'-0"
3'-0"
Edge of pavement
⅝"⌀ dowels
Flume rise 4" in 3'-0"
Flume slab 1" below paving slab
Lip and flume rise 3" in 3'-0"
SECTION AA
⅜" = 1'-0"
℄ Roadway
Ref. Sta.
⅝"⌀ x 5'-0" @ 4'-4" ctrs.
Paving Lip
This lip section to be attached to Flumes C, D.
Strike lines
End post of guard rail.
Transition
1½"x1½"x¼"x3'-0" L stay bar. Insert 2-⅝"⌀x10" galvanized bolts in concrete for anchor.
Note: All reinforcing bars in flume and slope drain shall be ⅜"⌀ spaced as shown. Minimum cover 1½" from ℄ bar. Min. lap 2'-6" if req'd.
SECTION BB
⅜" = 1'-0"
#14 Gage sheet metal, galvanized.
SECTION FF
⅜" = 1'-0"

PLAN OF FLUME & SLOPE DRAIN
⅜" = 1'-0"
Flumes A, B, C, & D shown & noted.



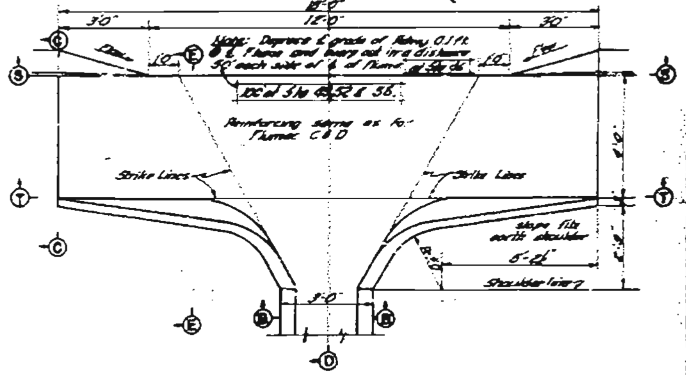

4'-1"
6" 3'-1" 6"
5'-6"
4'-6"
1'-0"
12-½"⌀ per line
Slope
Natural Ground Surface
Const. Jt.
18"
4@12"
Note:
All steel ½"⌀ spaced as shown. Minimum cover 1½" to center of bar. Bend around corners. Lap 24" min. where req'd.
Excavate to depth of one-half dia.
Install pipe at slope equal to that of natural ground surface.
END VIEW
SECTION AT ℄ OF PIPE

CULVERT PIPE HEADWALL STA. 2+90
½" = 1'-0"

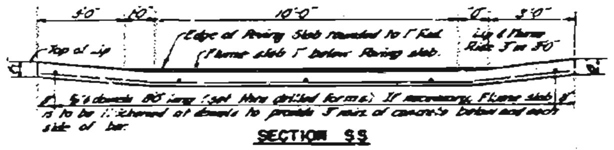

15'-0" Face of abutment to ordinary pavement section
6"
⅝"⌀ @ 2'-0" ctrs. top and bottom
5"
Longt. Steel: ⅝"⌀ @ 12" ctrs. top
⅝"⌀ @ 6" ctrs. bottom
Paving Slab
Expansion Joint (¾")
Expansion Joint Filler (¾")
Abutment
1'-0"

Omit longitudinal plane of weakness in this slab.
Crown to match road and bridge slabs and make smooth connection between.

APPROACH SLAB
½" = 1'-0"

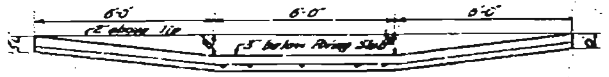

15'-0"
3'-0"
12'-0"
3'-0"
Note: Depress ℄ grade of Paving 0.1 ft. @ ℄ Flume and feather out in a distance 50' each side of ℄ of Flume
℄ of Sta 48, 52 & 55.
Reinforcing same as for Flume C & D
Strike Lines
Strike Lines
slope fills earth shoulder
6'-2½"
Shoulder line
3'-0"

PLAN OF FLUMES AT STA'S. 46, 49, 52 & 55. ⅜" = 1'-0"

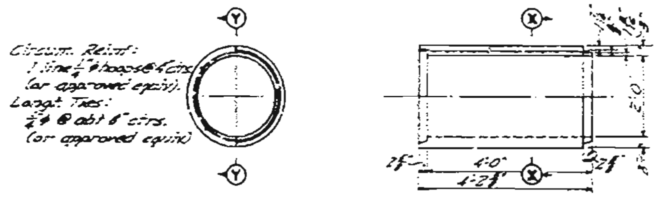

3'-0"
1'-0"
10'-0"
1'-0"
3'-0"
Top of Lip
Edge of Paving Slab rounded to 1" Rad.
Flume slab 1" below Paving slab.
Lip & Flume Rise 3" in 3'-0"

⅝"⌀ dowels 0'-0" long (set thru drilled forms). If necessary, Flume slab is to be thickened at dowels to provide 3" min. of concrete below and each side of bar.

SECTION SS



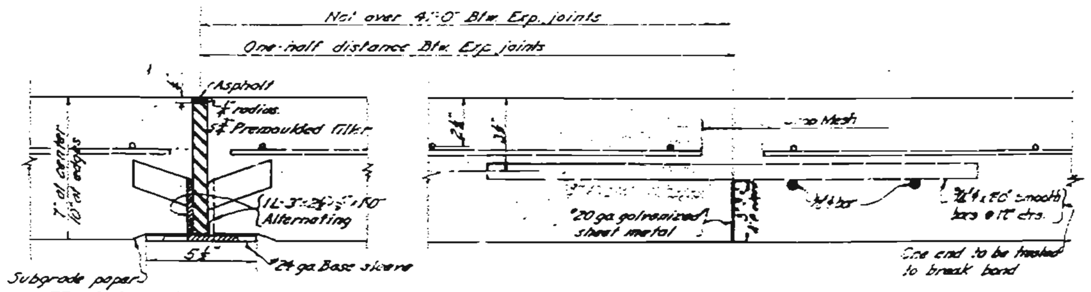
SECTION TT


Circum. Reinf.: 1 line ¼"⌀ hoops @ 4" ctrs. (or approved equiv.)
Longt. Ties: ¼"⌀ @ abt 6" ctrs. (or approved equiv.)
4'-0"
4'-2½"
2½"
HALF SECT. X-X & END VIEW
SECT. Y-Y & SIDE ELEVATION

CONCRETE CULVERT PIPE
½" = 1'-0"

TEST LOADS FOR 24" CONCRETE PIPE

	Load to produce a 0.01 in. crack	Ultimate Load
Three-edge Bearing Method	2400 lbs/lin. ft.	3600 lbs/lin. ft.
Sand Bearing Method	3900 lbs/lin. ft.	5400 lbs/lin. ft.


Not over 40'-0" Btw. Exp. joints
One-half distance Btw. Exp. joints
Asphalt
¼" radius
⅝" Premoulded Filler
7" at center 10" at edges
1L-3"x2½"x⅜"x1'-0" Alternating
5¼"
#24 ga. Base sleeve
Subgrade paper
Mesh
#20 ga. galvanized sheet metal
¾"⌀ bar
¾"⌀ x 2'-0" smooth bars @ 12" ctrs.
One end to be treated to break bond

TRANSVERSE EXPANSION JOINT

"Translode" joint as manufactured by Highway Steel Products Co., or approved equal. See Specs.

CONTRACTION JOINT

TYPICAL PAVING JOINT DETAILS
Scale 3" = 1'-0"

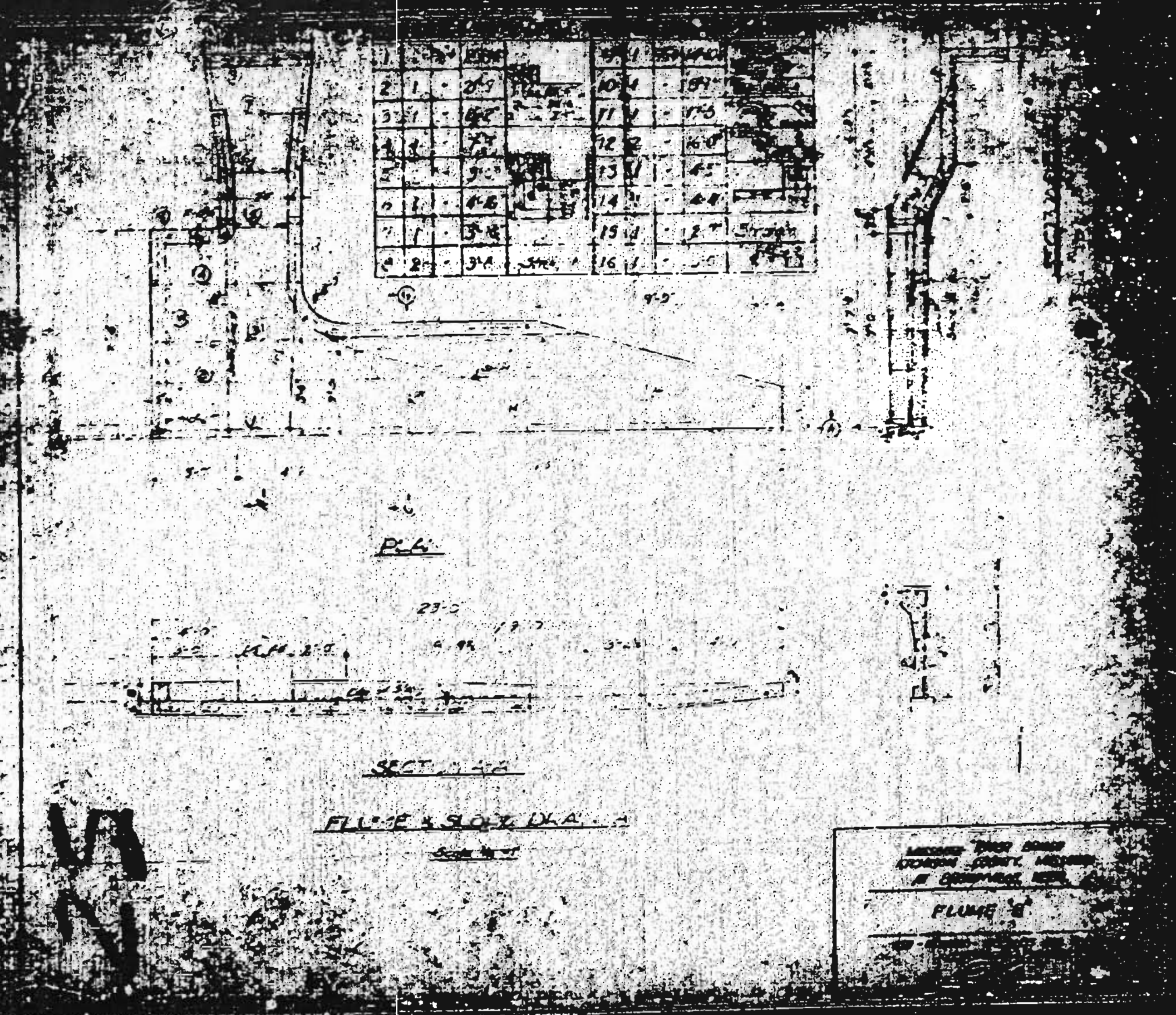
Note: Notes, elevations, etc. enclosed thus ⟷ are as finally constructed.

L-98

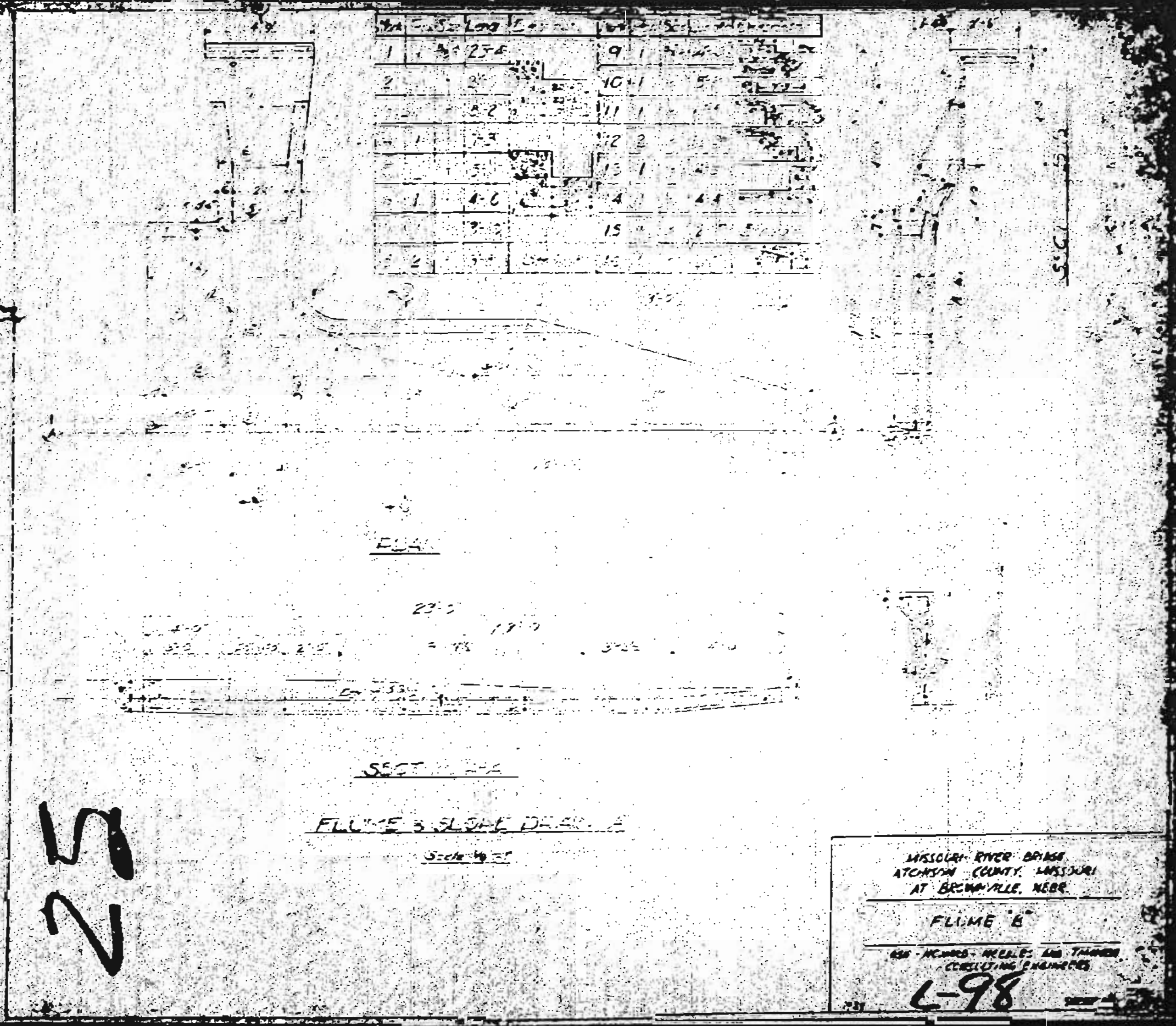
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

APPROACH HIGHWAYS
MISC. DETAILS

Revised as Constructed – [illegible]



PLAN
23'-0"
SECT. A-A
FLUME & SLOT DRAIN
FLUME "B"
Straight



[illegible]	[illegible]	Long	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	25-4		9	1	[illegible]
2	[illegible]	2'		10	1	5'
[illegible]	[illegible]	8-2		11	1	[illegible]
[illegible]	1	7-3		12	2	[illegible]
[illegible]	[illegible]	5'		13	1	[illegible]
[illegible]	1	4-6		14	[illegible]	4-4
[illegible]	[illegible]	3-3		15	[illegible]	2
[illegible]	2	[illegible]	[illegible]	16	[illegible]	[illegible]

FLUME & SLOPE DRAIN A

Scale ¼"=1'

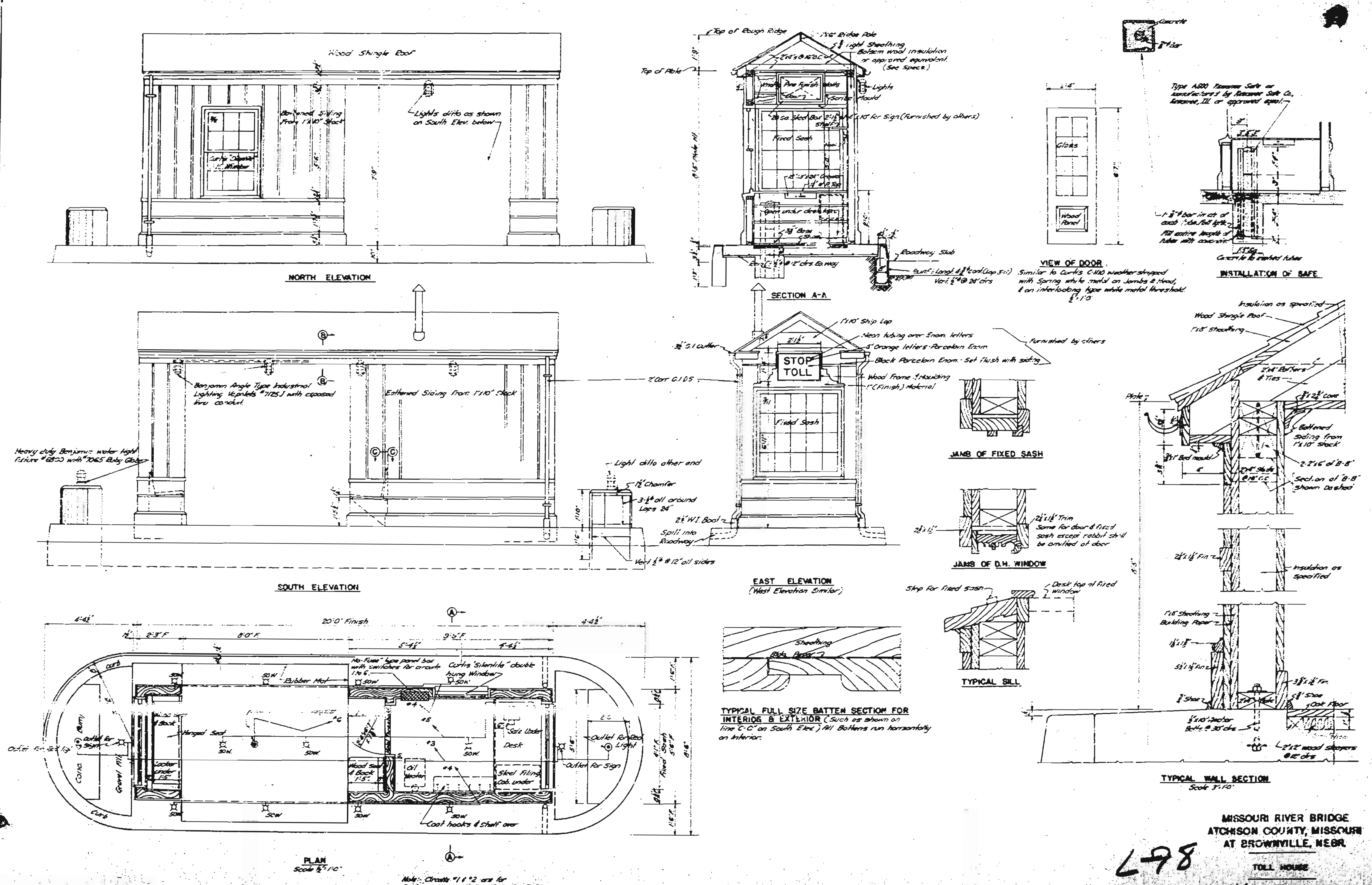
25

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

FLUME "B"

ASH - HOWARD - NEEDLES AND TAMMEN
CONSULTING ENGINEERS

L-98

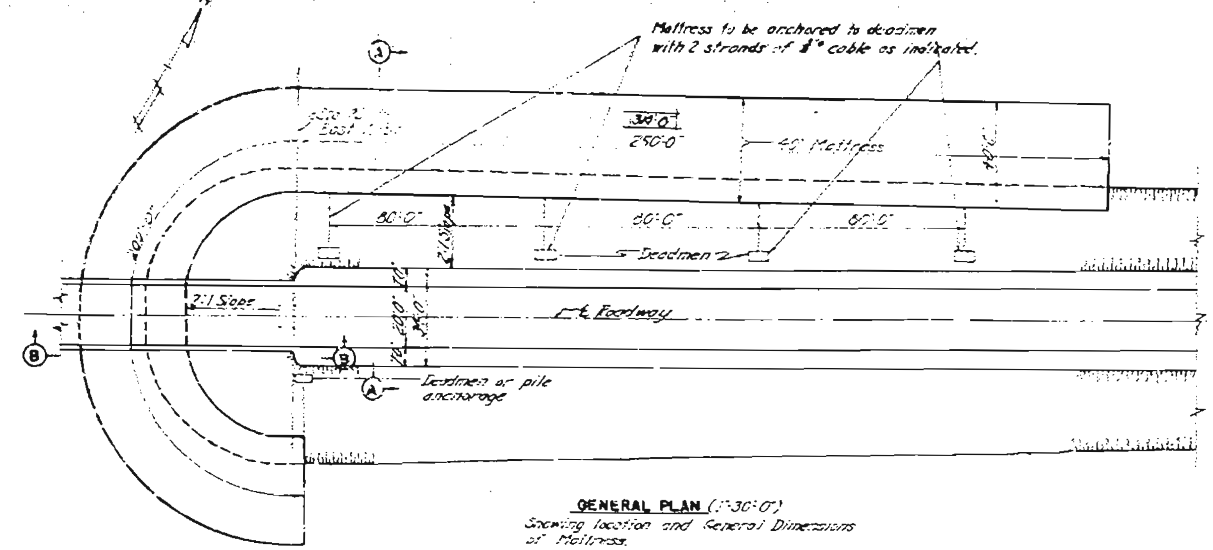

Wood Shingle Roof
Battened Siding From 1"x10" Stock
Curtis "Silentite" Window
Lights ditto as shown on South Elev. below
NORTH ELEVATION
Benjamin Angle Type Industrial Lighting Vaporlets #7125 J with exposed thru conduit
Battened Siding from 1"x10" Stock
Heavy duty Benjamin water tight fixture #6520 with #7065 Ruby Globe
7" Corr. G.I.D.S.
Light ditto other end
1½" Chamfer
3-1" all around Laps 24"
2½" W.I. Bool
Spill into Roadway
Vert. ½" ⌀ 12" all sides
SOUTH ELEVATION
Top of Rough Ridge
1"x6" Ridge Pole
⅝" light Sheathing
Balsam wool insulation or approved equivalent. (See Specs.)
2"x4"s @ 16" O.C.
Top of Plate
Knotty Pine Finish Walls
Lights
Scribe Mould
20 Ga. Steel Box 2'-1½" x 1'-10" for Sign (Furnished by others)
Shelf
Fixed Sash
Open under desk tops
3⅝" Base
Shoe
Roadway Slab
Reinf.: Longl. 4-⅝" ⌀ cont. (Lap 3'-1")
Vert. ½" ⌀ @ 24" ctrs.
SECTION A-A
1"x10" Ship Lap
Neon tubing over Enam. letters
5" Orange letters - Porcelain Enam.
Black Porcelain Enam. - Set flush with siding
Furnished by others
Wood Frame & Moulding 1" (Finish) Material
3½" G.I. Gutter
STOP TOLL
Fixed Sash
EAST ELEVATION (West Elevation Similar)
Glass
Wood Panel
VIEW OF DOOR
Similar to Curtis C-1110 weather stripped with Spring white metal on Jambs & Head, & on interlocking type white metal threshold.
Type A500 Vitreous Safe as manufactured by Kewanee Safe Co., Kewanee, Ill. or approved equal.
Concrete
INSTALLATION OF SAFE
JAMB OF FIXED SASH
JAMB OF D.H. WINDOW
1¾"x1⅛" Trim Same for door & fixed sash except rabbit sill be omitted at door
Stop for fixed sash
Desk top at fixed window
TYPICAL SILL
Insulation as specified
Wood Shingle Roof
1"x8" Sheathing
2"x4" Rafters & Ties
Plate
Battened Siding from 1"x10" Stock
2-2"x6" at B-B
Section at B-B Shown Dashed
1"x8" Sheathing Building Paper
Insulation as Specified
Oak Floor
2"x2" wood sleepers @ 12" ctrs.
TYPICAL WALL SECTION
Scale 3" = 1'-0"
Sheathing
Bldg. Paper
TYPICAL FULL SIZE BATTEN SECTION FOR INTERIOR & EXTERIOR (Such as shown on line C-C on South Elev.) All Battens run horizontally on interior.
20'-0" Finish
"No-Fuse" type panel box with switches for circuits 1 to 6.
Curtis "Silentite" double hung Window
Rubber Mat
Hinged Seat
Safe Under Desk
Steel Filing Cab. under
Oil Heater
Wood Seat & Book
Coat hooks & Shelf over
Outlet for Sign
Outlet for Red Light
Curb
Gravel Fill
Conc.
Fixed Sash
PLAN
Scale ½" = 1'-0"
Note: Circuits #1 & 2 are for Roadway and Navigation Lights. See Sh. 28.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

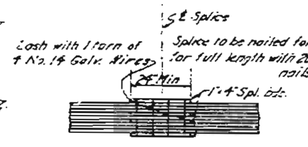
TOLL HOUSE

L-98

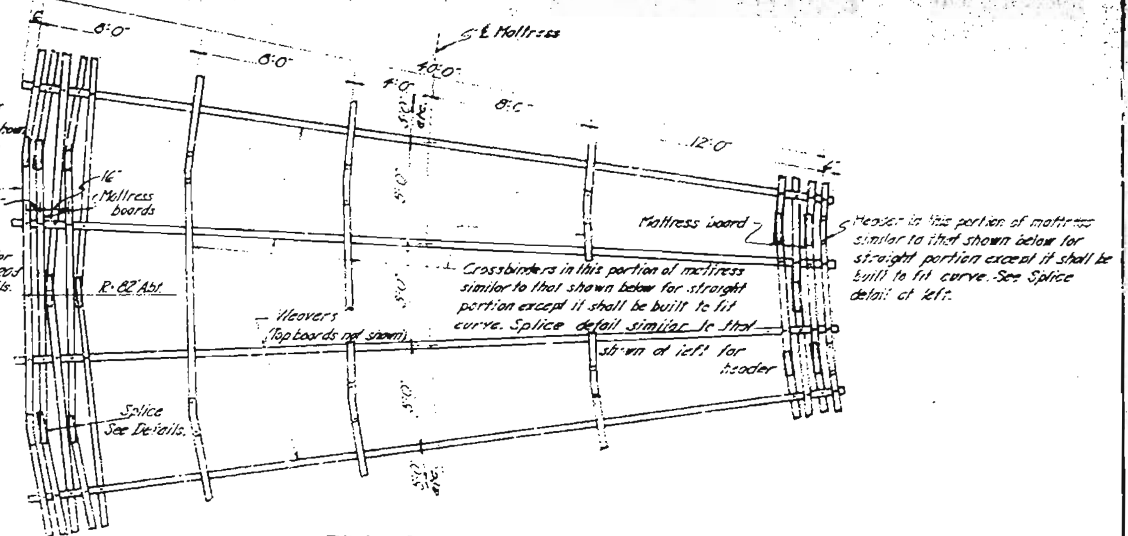
26


Mattress to be anchored to deadmen with 2 strands of ¾" cable as indicated.
A
30'-0"
250'-0"
40' Mattress
40'-0"
80'-0"
80'-0"
80'-0"
2:1 Slope
Deadmen
2:1 Slope
℄ Roadway
B
B
A
Deadmen or pile anchorage

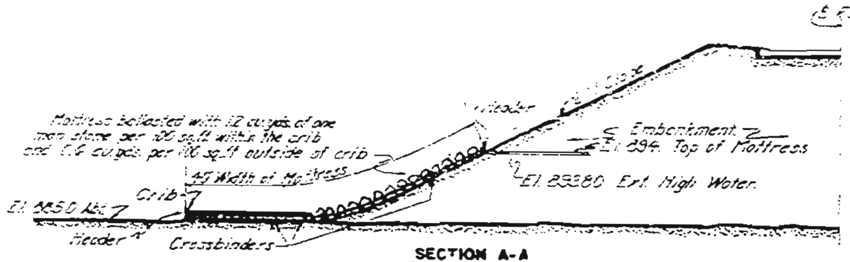
GENERAL PLAN (1"=30'-0")
Showing location and General Dimensions of Mattress.


℄ Splice
Lash with 1 turn of 4 No. 14 Galv. Wires
Splice to be nailed for full length with 20d nails.
24" Min
1"×4" Spl. bds.

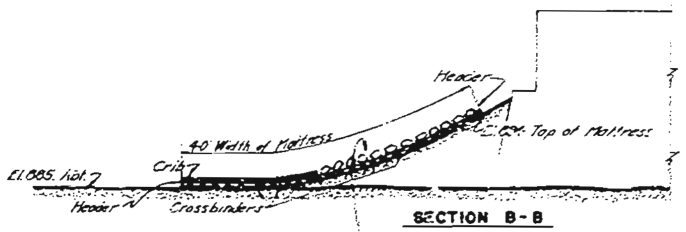
TYPICAL HEADER SPLICE AT CURVE
¾"=1'-0"


Header in this portion of mattress similar to that shown below for straight portion except it shall be built to fit curve.
8'-0"
8'-0"
℄ Mattress
40'-0"
4'-0"
8'-0"
12'-0"
16"
8"
Mattress boards
R=82' Abt.
5'-0"
5'-0"
5'-0"
5'-0"
Mattress board
Header in this portion of mattress similar to that shown below for straight portion except it shall be built to fit curve. See Splice detail at left.
Crossbinders in this portion of mattress similar to that shown below for straight portion except it shall be built to fit curve. Splice detail similar to that shown at left for header
Weavers (Topboards not shown)
Splice See Details.

TYPICAL PART-PLAN AT CURVED PORTION OF MATTRESS (¼"=1'-0")
Details not shown are to be similar to those shown and noted in details below for straight portion of mattress.
Cribs not shown - See Note "C"

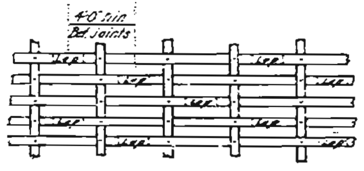

℄ Pkwy.
Mattress ballasted with 12 cu.yds. of one man stone per 100 sq.ft. within the crib and 0.6 cu.yds. per 100 sq.ft. outside of crib
Header
Embankment
El. 894. Top of Mattress
El. 883.80 Ext. High Water.
45' Width of Mattress
Crib
El. 885.0 Abt.
Header
Crossbinders

SECTION A-A
1"=10'-0"



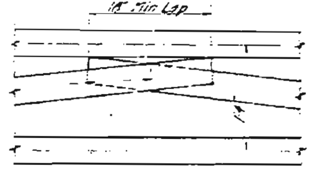
SECTION B-B
1"=10'-0"

Mattress ballasted with 12 cu.yds. of one man stone per 100 sq.ft. within the crib and 0.6 cu.yds. per 100 sq.ft. outside of crib.

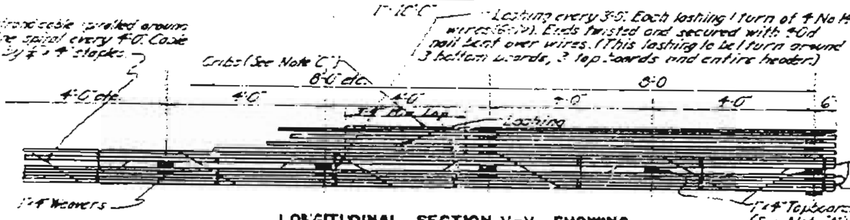


MATTRESS BOARD SPLICING DIAGRAM STRAIGHT SECTION (No Scale)
For location of splices in curved section see Part Plan above.

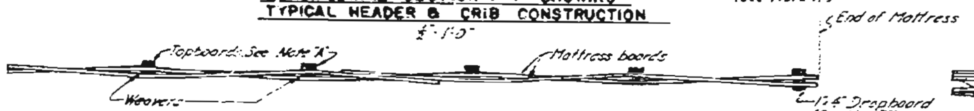
Splice lashed in center with one turn of 4 No. 14 Galv. wires. Ends twisted tight. Splice nailed along lap with 10d nails.



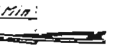
PLAN OF MATTRESS BOARD SPLICE AT CURVED SECTION
1"=1'-0"


¾" Galv. strand cable spiralled around header. One spiral every 4'-0". Cable secured by ¼"×4" staples.
Cribs (See Note "C")
8'-0" etc.
4'-0" etc.
4'-0"
4'-0"
4'-0"
8'-0"
4'-0"
6"
3'-0" Min. Lap
Lashing
Lashing every 3'-0". Each lashing 1 turn of 4 No. 14 wires (Galv). Ends twisted and secured with 40d nail bent over wires. (This lashing to be 1 turn around 3 bottom boards, 3 top boards and entire header)
3-1"×4" Bds. built up and nailed with 20d nails.
1"×4" Filler.
1"×4" Weavers
1"×4" Topboards (See Note "A")

LONGITUDINAL SECTION V-V SHOWING TYPICAL HEADER & CRIB CONSTRUCTION
¾"=1'-0"

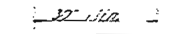


LONGITUDINAL SECTION W-W



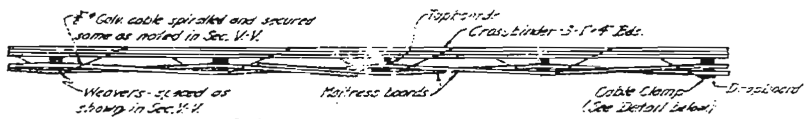
Splice lashed at loose end with one turn of 4 No. 14 Galv. wires. Ends twisted tight. Lap nailed with 10d nails.

MATTRESS BOARD SPLICE
Splices in straight portion of mattress as shown.
" " curved " " " " similar except as shown and noted in detail above.
For location of splices see Diagram and plan above.



Splice lashed at each end of lap with one turn of 4 No. 14 Galv. wires. Ends twisted tight. Splice to be nailed along lap with 10d nails.

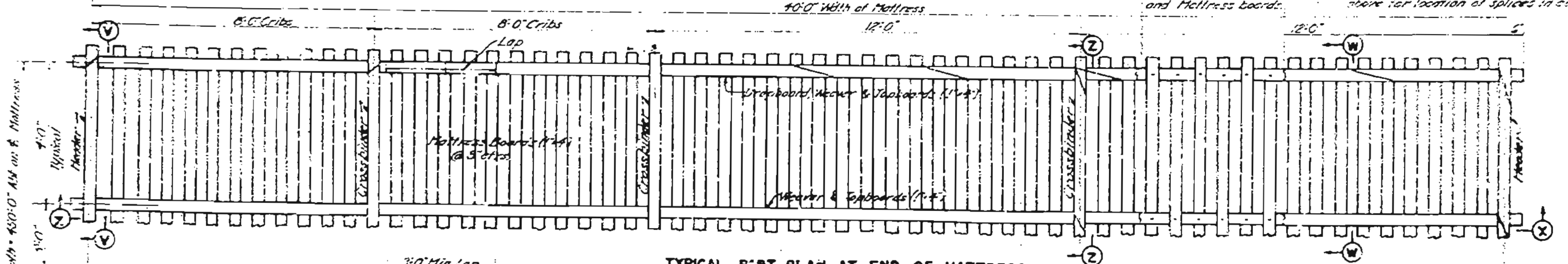
WEAVER BOARD SPLICE
All splices to be broken with splices of adjoining weaver boards.


¾" Galv. cable spiralled and secured same as noted in Sec. V-V.
Topboards
Crossbinder 3-1"×4" Bds.
Weavers - spaced as shown in Sec. V-V.
Mattress boards
Cable Clamp (See Detail below)
Dropboard

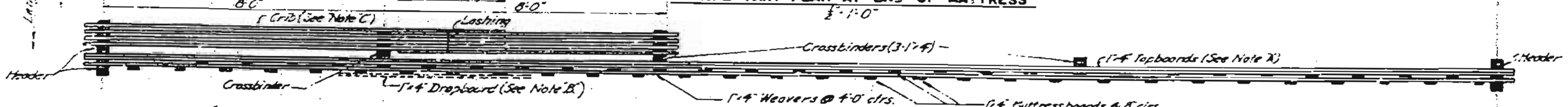
LONGITUDINAL SECTION Z-Z SHOWING CROSSBINDER

Note "C": Build two rows of cribs along lower edge full length of mattress. Cribs about 8 ft. square. Crib walls to be 4 boards high separated by spaces 1 board in height. Nail laps and intersections with 20d nails. Lash each lap with one turn of 4 No. 14 Galv. wires. Lash each intersection with 1 turn of ¾" Galv. strand passing around mattress board beneath. Twist ends of top and secure with ¼"×4" staples.

Note: Crossbinder to be lashed and nailed to weavers and topboards with 1 turn of 4 No. 14 wires Galv. and 40d nails.
Splices to break joints at least two weavers in straight section of mattress. See Plan above for location of splices in curved portion.


40'-0" Width of Mattress
8'-0" Cribs
8'-0" Cribs
12'-0"
12'-0"
Plan with Topboards removed showing Weavers and Mattress boards.
V
V
Z
Z
W
W
X
Lap
Dropboard, Weaver & Topboards (1"×4")
Mattress Boards (1"×4") @ 8" ctrs.
Weaver & Topboards (1"×4")
Crossbinder
Crossbinder
Crossbinder
Header
Header
Length = 450'-0" Abt. on ℄ Mattress
4'-0" Typical
4'-0"

TYPICAL PART-PLAN AT END OF MATTRESS
¾"=1'-0"


8'-0"
3'-0" Min. Lap
8'-0"
℄ Crib (See Note "C")
Lashing
Crossbinders (3-1"×4")
1"×4" Topboards (See Note "A")
Header
Header
Crossbinder
1"×4" Dropboard (See Note "B")
1"×4" Weavers @ 4'-0" ctrs.
1"×4" Mattress boards @ 8" ctrs.

TRANSVERSE SECTION X-X (¾"=1'-0")
Typical at Weaver and Topboard Lines

Note "B": Dropboards to be placed at ends of mattress for its full width. They are to be lashed to weavers and mattress boards every 4 ft. with one turn of 4 No. 14 Galv. wires.

Note "A": Topboards are to be lashed to weaver every 5 ft. with one turn of 4 No. 14 Galv. wires and nailed with 20d nails.
All joints to be broken with weaver and and adjacent topboards.

GENERAL NOTES

Mattress Lumber shall be sound live timber, free from rot, large knots, shakes, brittleness or other defects that may impair its strength, endurability or make it unfit for use in a mattress normally above water level. The species of timber used shall be subject to approval of the engineers. All lumber shall be 1"×4" undressed. Lengths shall be from 8 to 16 feet to provide a minimum number of splices. Minimum lap of mattress boards shall be 1'-6", weaver boards 3'-0". Joints in successive layers of topboards, crossbinders, and in top and bottom parts of headers shall be broken not less than 3 feet and no two out of any three consecutive layers shall have joints at one point except as otherwise provided for headers and crossbinders of curved portion.

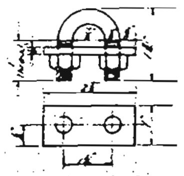
Wire Lashing shall have not less than 4 No. 14 wires of iron or soft steel having tensile strength of at least 80,000 lbs. per sq.in. well annealed and galvanized. At least one full turn is to be made at every point and ends securely twisted together then further secured by bent nails where noted.

¾" Galv. Cables of 7 No. 11 wires shall be spiralled around headers and crossbinders one turn to every weaver space, also around topboards and weavers on lines about 16 feet centers starting with ends of mattress making 10 complete spirals to each line in width of 40 feet. Draw each cable tight with block and tackle. Clamp ends with cable clamps. Fasten each spiral down at top of turn with ¼"×4" Galv. staples.

Nails shall be common wire nails of size noted.

Stone for Ballast shall be sandstone, limestone or other approved hardstone not readily disintegrated by action of air or water. Stones shall be approximately rectangular in crossection, weight each to average 75 pounds, no piece less than 25 or more than 150 pounds. Not more than 25% under 30 pounds.

Note: Notes, elevations, etc. enclosed thus ▭ are as finally constructed.



CABLE CLAMP
(Half Size)

Revised as Constructed [illegible]

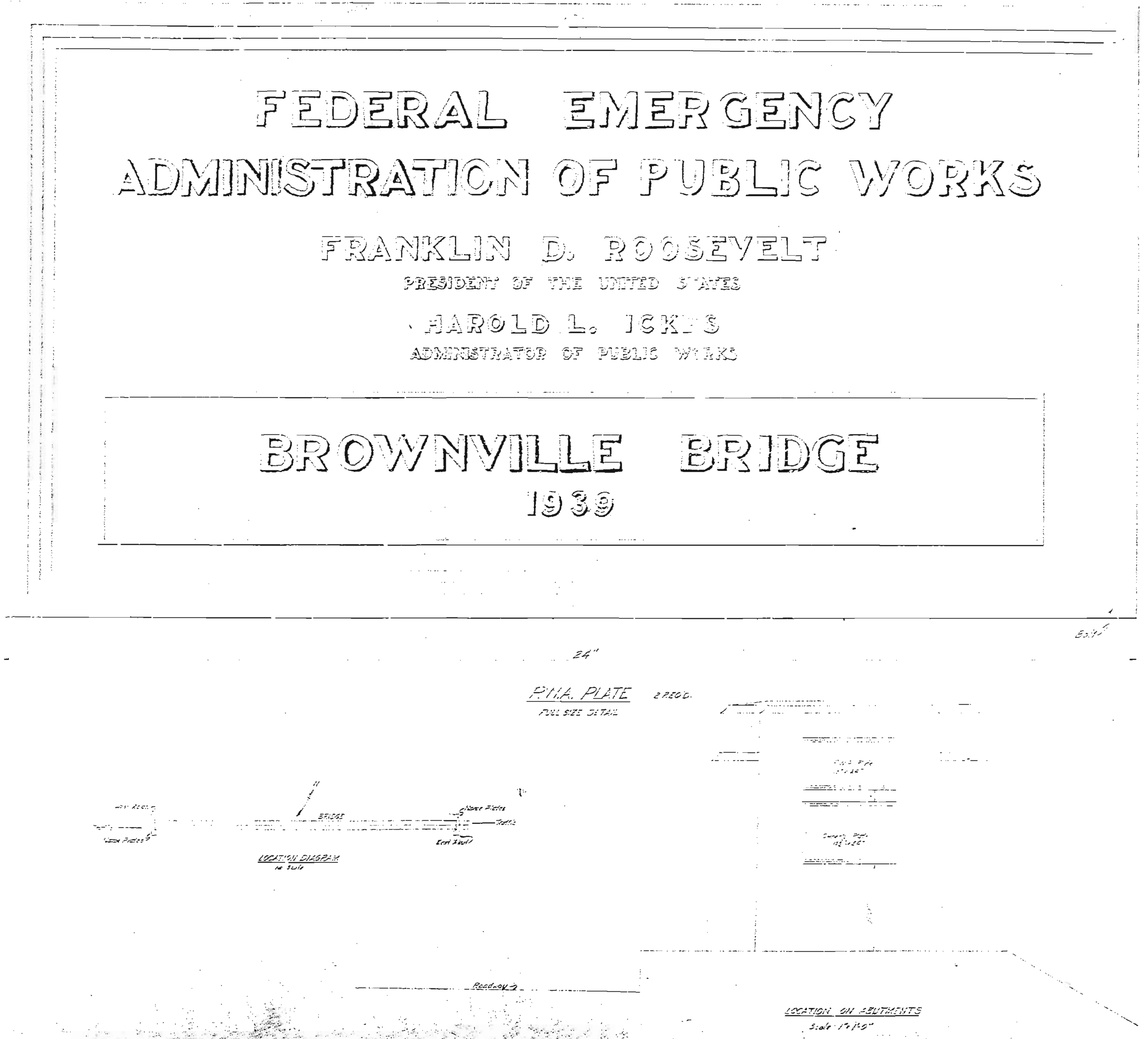
27

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EMBANKMENT PROTECTION

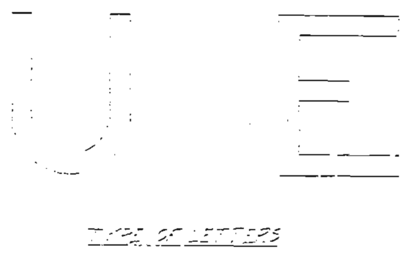
SCALE As Noted
[illegible]



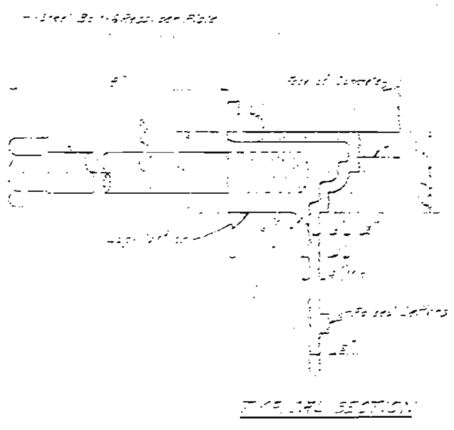
P.W.A. PLATE 2 REQD.
FULL SIZE DETAIL

LOCATION DIAGRAM
No Scale

LOCATION ON ABUTMENTS
Scale 1"=1'-0"



TYPE OF LETTERS



TYPICAL SECTION

Notes: Plates shall be of Statuary Bronze having raised Lettering. Surface of Lettering, Borders, and Molding shall be polished. The background shall be Etched.
Plates must be carefully placed in Forms before Concrete is poured.
Blueprint copies of a Rubbing to be submitted for Approval.

28

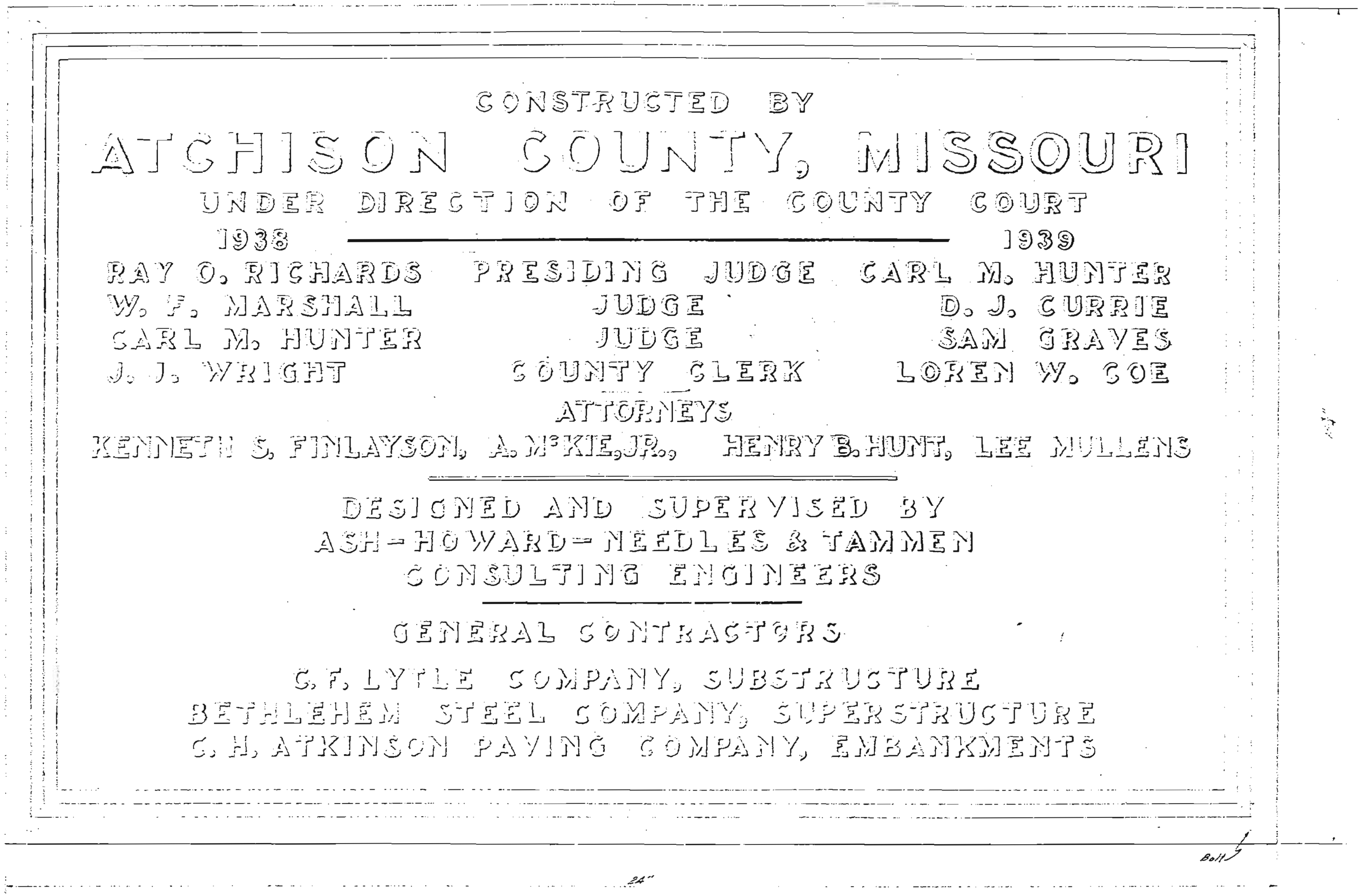
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

NAME PLATES

L-98

Scale: As Noted
Ash-Howard-Needles & Tammen
Consulting Engineers
Kansas City New York
Sheet No. 21

29



CONSTRUCTED BY

ATCHISON COUNTY, MISSOURI

UNDER DIRECTION OF THE COUNTY COURT

1938		1939
RAY O. RICHARDS	PRESIDING JUDGE	CARL M. HUNTER
W. F. MARSHALL	JUDGE	D. J. CURRIE
CARL M. HUNTER	JUDGE	SAM GRAVES
J. J. WRIGHT	COUNTY CLERK	LOREN W. COE

ATTORNEYS

KENNETH S. FINLAYSON, A. McKIE, JR., HENRY B. HUNT, LEE MULLENS

DESIGNED AND SUPERVISED BY
ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS

GENERAL CONTRACTORS

C. F. LYTLE COMPANY, SUBSTRUCTURE
BETHLEHEM STEEL COMPANY, SUPERSTRUCTURE
C. H. ATKINSON PAVING COMPANY, EMBANKMENTS

OWNER'S PLATE 2 REQ'D.
FULL SIZE DETAIL

See Sheet 21 for Notes, Typical Section and Location on Structure.

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

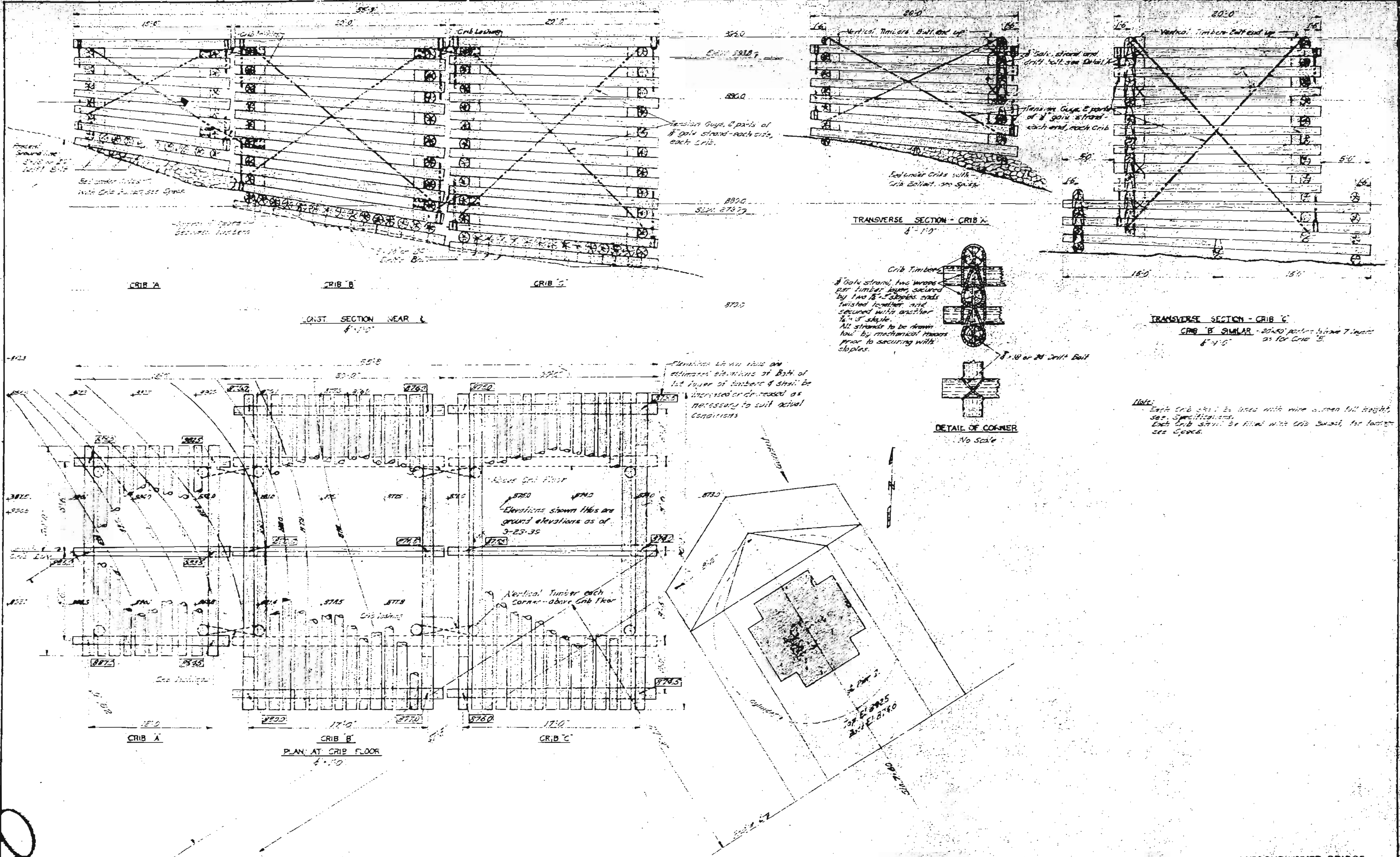
NAME PLATES

SCALE Full Size
[illegible] C.E.A. DATE 6-6-39

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. 22

Rev. [illegible] Attorney's Names



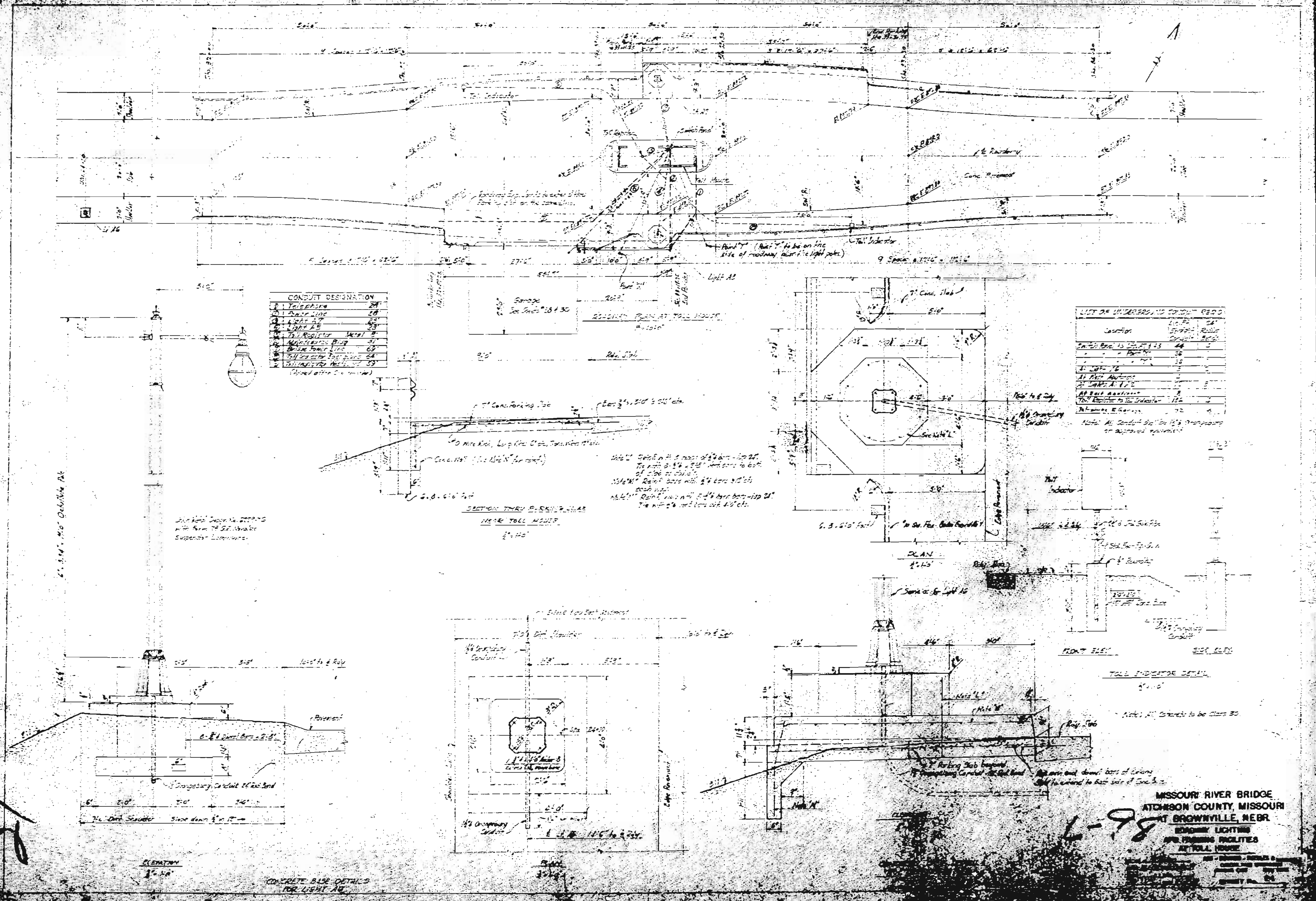
55'-9"
15'-0"
20'-0"
20'-0"
Crib Lashing
Crib Lashing
896.0
893.8
890.0
883.0
879.7
870.0
Tension Guys, 2 parts of ⅜" galv. strand - each side, each Crib.
Present Ground line
Sod under Cribs with Crib Ballast, see Specs.
Space of Spars between Timbers
Drift Bolt
CRIB "A"
CRIB "B"
CRIB "C"
LONGT. SECTION NEAR ℄
20'-0"
Vertical Timbers - Butt end up
⅜" Galv. strand and drift bolt, see Detail "A"
Tension Guys, 2 parts of ⅜" galv. strand - each end, each Crib
Sod under Cribs with Crib Ballast, see Specs.
TRANSVERSE SECTION - CRIB "A"
⅛" = 1'-0"
20'-0"
Vertical Timbers - Butt end up
5'-0"
5'-0"
16'-0"
15'-0"
TRANSVERSE SECTION - CRIB "C"
CRIB "B" SIMILAR - 20'x20' portion above 7 layers as for Crib "B"
Crib Timbers
⅜" Galv. strand, two wraps per timber layer, secured by two ⅜"x3" staples, ends twisted together and secured with another ⅜"x3" staple. All strands to be drawn taut by mechanical means prior to securing with staples.
⅝"x18 or 24 Drift Bolt
DETAIL OF CORNER
No Scale
Note:
Each Crib shall be lined with wire screen full height, see Specifications.
Each Crib shall be filled with Crib Ballast, for latter see Specs.
55'-8"
30'-0"
Elevations shown thus are estimated elevations of Butt of 1st layer of timbers & shall be increased or decreased as necessary to suit actual conditions
Above Crib Floor
Elevations shown thus are ground elevations as of 3-23-39
Vertical Timber each Corner - above Crib Floor
Crib lashing
876.2
876.1
875.0
874.5
874.0
875.0
875.0
876.5
874.5
887.5
884.5
880.0
877.0
876.0
873.0
Cylinders
Top El. 892.5
Bott. El. 874.0
17'-0"
17'-0"
15'-0"
CRIB "A"
CRIB "B"
CRIB "C"
PLAN AT CRIB FLOOR
⅛" = 1'-0"

30

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY MISSOURI
AT BROWNVILLE, NEBR.

CRIB DIKE FENDER AT PIER 2



CONDUIT DESIGNATION			
1	Telephone		24"
2	Power Line		28"
3	Light A7		24"
4	Light A5		23"
5	Toll Register	[illegible]	9"
6	Maintenance Bldg		31"
7	Bridge Power Line		63"
8	Toll Indicator [illegible]		64"
9	Toll Indicator [illegible]		59"

(Placed after [illegible])

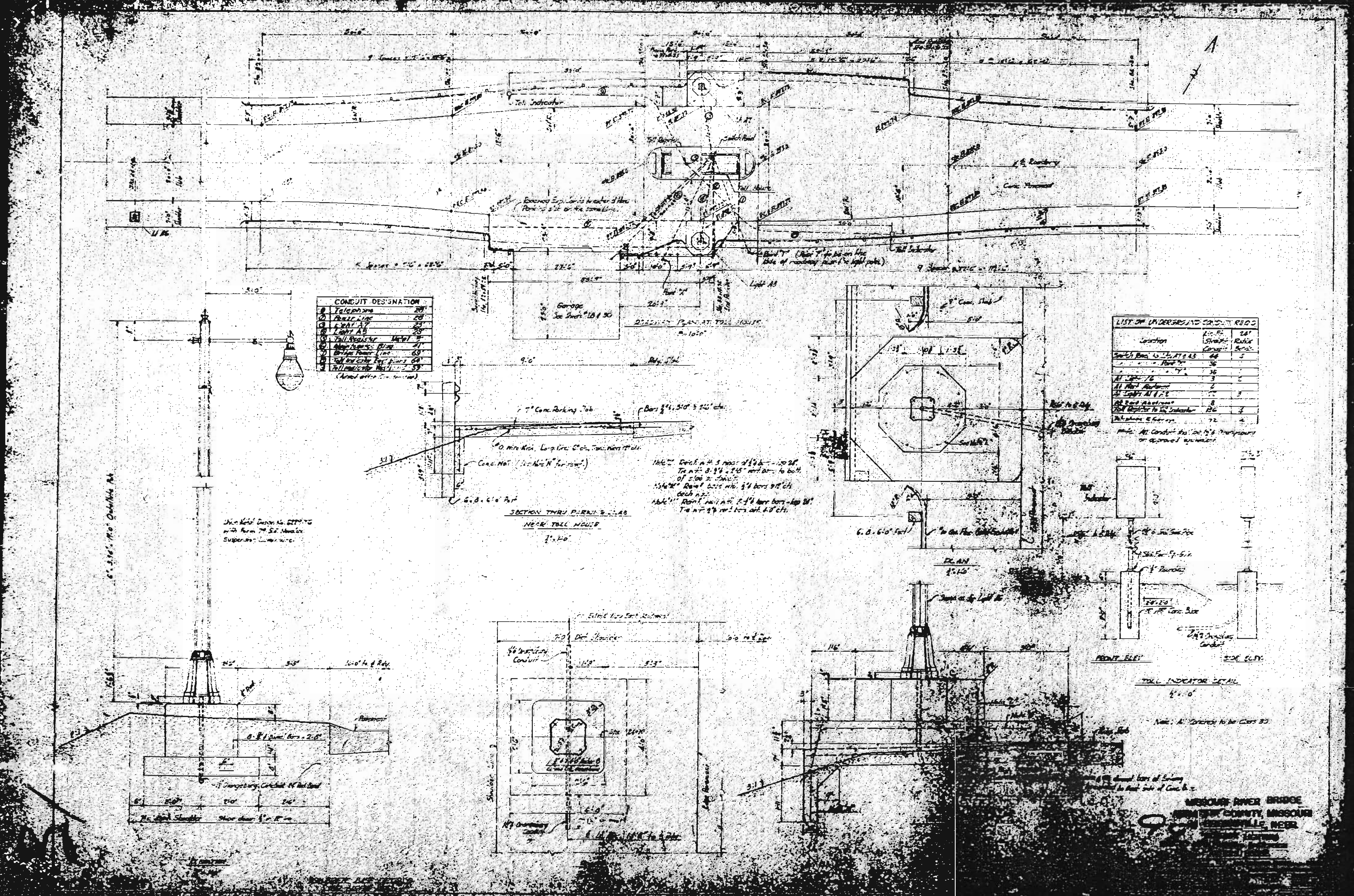
Location	Lin. Ft. [illegible] Conduit	24" Radius Bends
Switch Box to Light 1 & 3	44	[illegible]
" " " [illegible]	36	
" " " [illegible]	36	
[illegible]	[illegible]	[illegible]
At West Abutment	[illegible]	
[illegible]	[illegible]	[illegible]
At East Abutment	8	
Toll Register to Toll Indicator	126	[illegible]
Telephone & Garage	72	4

Note: All Conduit [illegible] [illegible] or approved equivalent

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
ROADWAY LIGHTING
AND PARKING FACILITIES
AT TOLL HOUSE

L-98

36

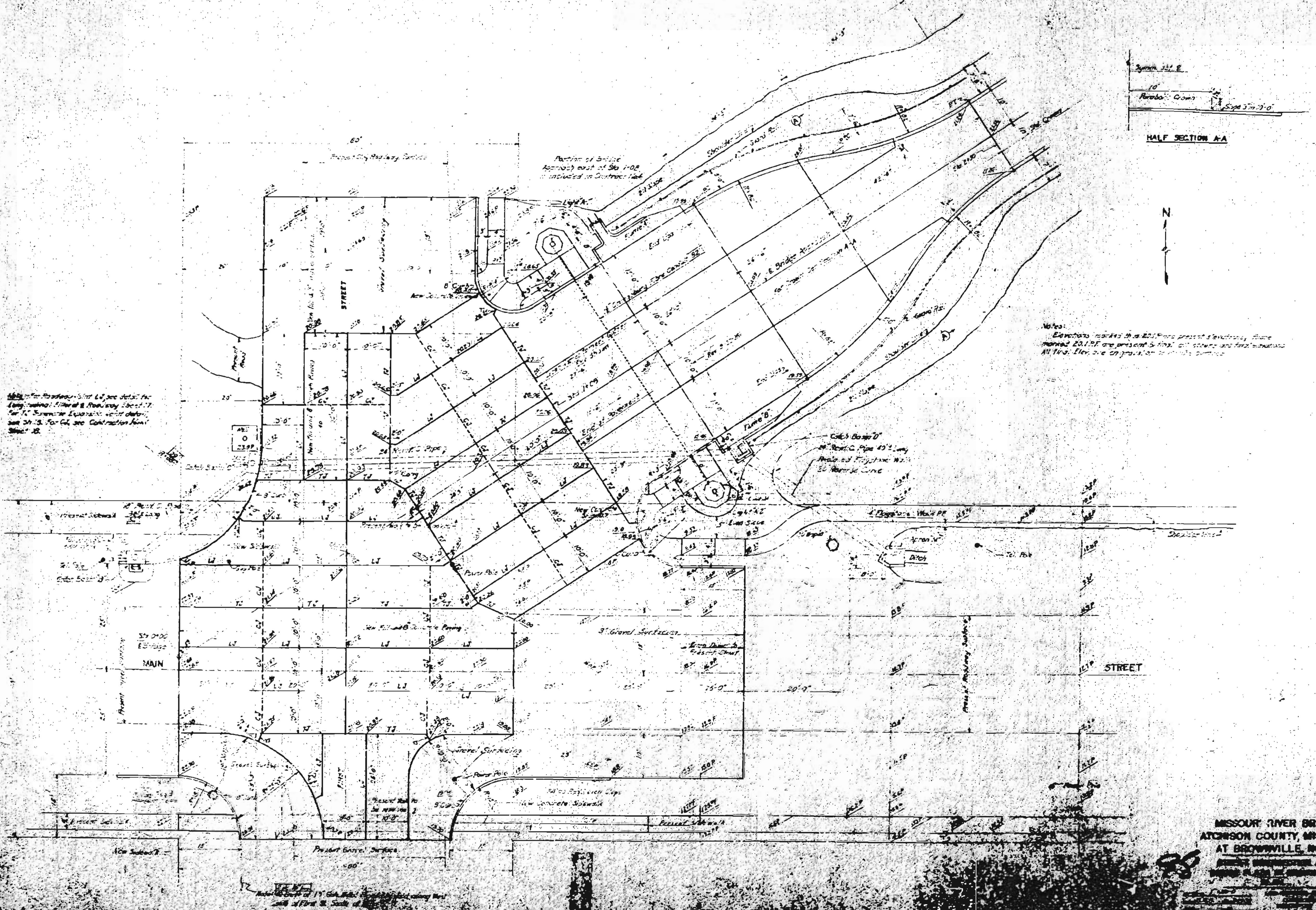


CONDUIT DESIGNATION		
1	Telephone	28'
2	Power Line	28'
3	Light A7	23'
4	Light A8	25'
5	Toll Register [illegible]	5'
6	[illegible] Bldg	41'
7	Bridge Power Line	69'
8	Toll Indicator [illegible]	64'
9	Toll Indicator [illegible]	53'

LIST OF UNDERGROUND CONDUIT REQ'D		
Location	Lin. Ft. Straight Conduit	24" Radius Bends
Switch Box to Lights A7 & A8	44	5
" " " " Post "X"	36	
" " " " "Y"	36	
At Light A6	3	2
At Post Pavement	6	
At Lights A7 & A8	[illegible]	3
At Back Abutment	8	
Toll Register to Toll Indicator	126	4
Telephone & Garage	72	4

Note: All Conduit shall be 1½" ø Orangeburg or approved equivalent.

MISSOURI RIVER BRIDGE
[illegible] COUNTY, MISSOURI
[illegible]LLE, NEBR.

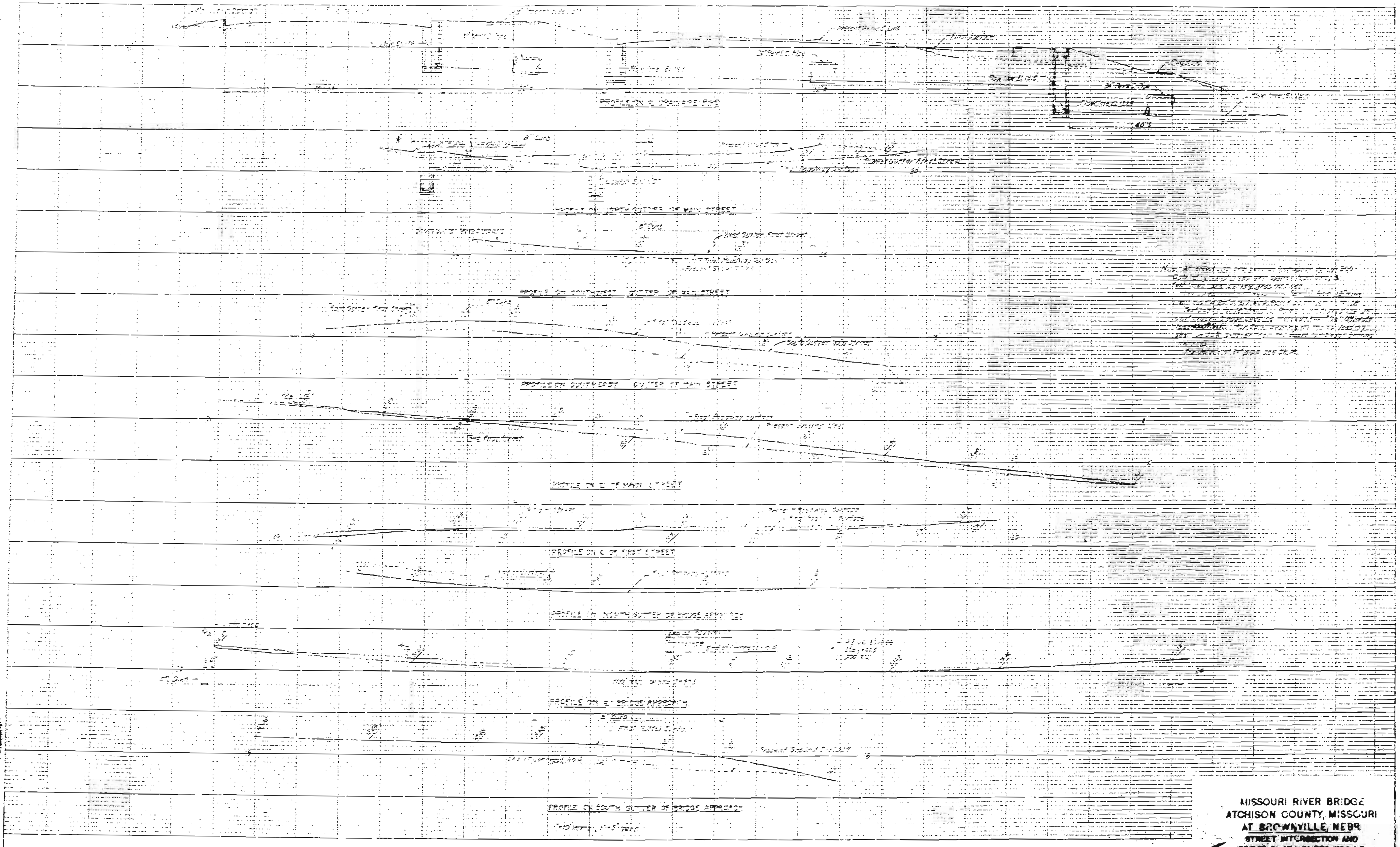


Note: For Roadway Joint LJ, see detail for Longitudinal Joint on Roadway Sheet 7. For TJ Transverse Expansion Joint details, see Sh. 13. For CJ, see Contraction Joint Sheet 18.

Notes:
Elevations marked thus 20.1 P are present elevations, those marked 20.1 P.F. are present final grades and final elevations. All Fin. Elev. are on projection of the curb.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

38


PROFILE ON © DRAINAGE PIPE
PROFILE ON NORTH GUTTER OF MAIN STREET
PROFILE ON SOUTHWEST GUTTER OF MAIN STREET
PROFILE ON SOUTHEAST GUTTER OF MAIN STREET
PROFILE ON © OF MAIN STREET
PROFILE ON © OF FIRST STREET
PROFILE ON NORTH GUTTER OF BRIDGE APPROACH
PROFILE ON © BRIDGE APPROACH
PROFILE ON SOUTH GUTTER OF BRIDGE APPROACH
8" Curb
Present Ground Line
Final Roadway Surface
40'

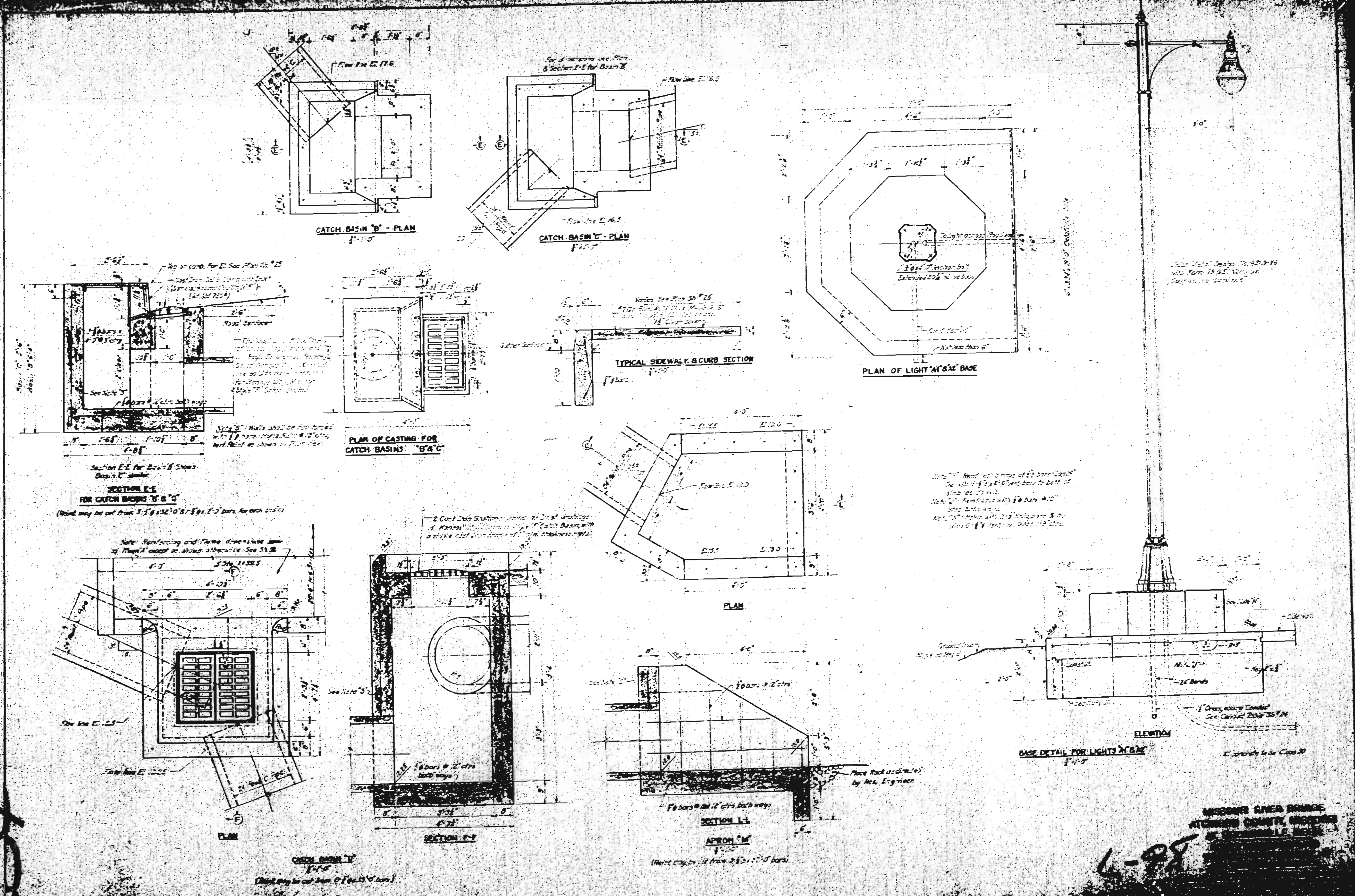
33

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
STREET INTERSECTION AND
BRIDGE PLAZA IN BROWNVILLE
PROFILES

L-98

SHEET No. 28

Rev. C.A.S. 9-16-39



CATCH BASIN "B" - PLAN

CATCH BASIN "C" - PLAN

SECTION E-E
FOR CATCH BASINS "B" & "C"

PLAN OF CASTING FOR
CATCH BASINS "B" & "C"

TYPICAL SIDEWALK & CURB SECTION

PLAN OF LIGHT "A1" & "A2" BASE

PLAN

PLAN

CATCH BASIN "D"

SECTION F-F

SECTION L-L

APRON "M"

ELEVATION

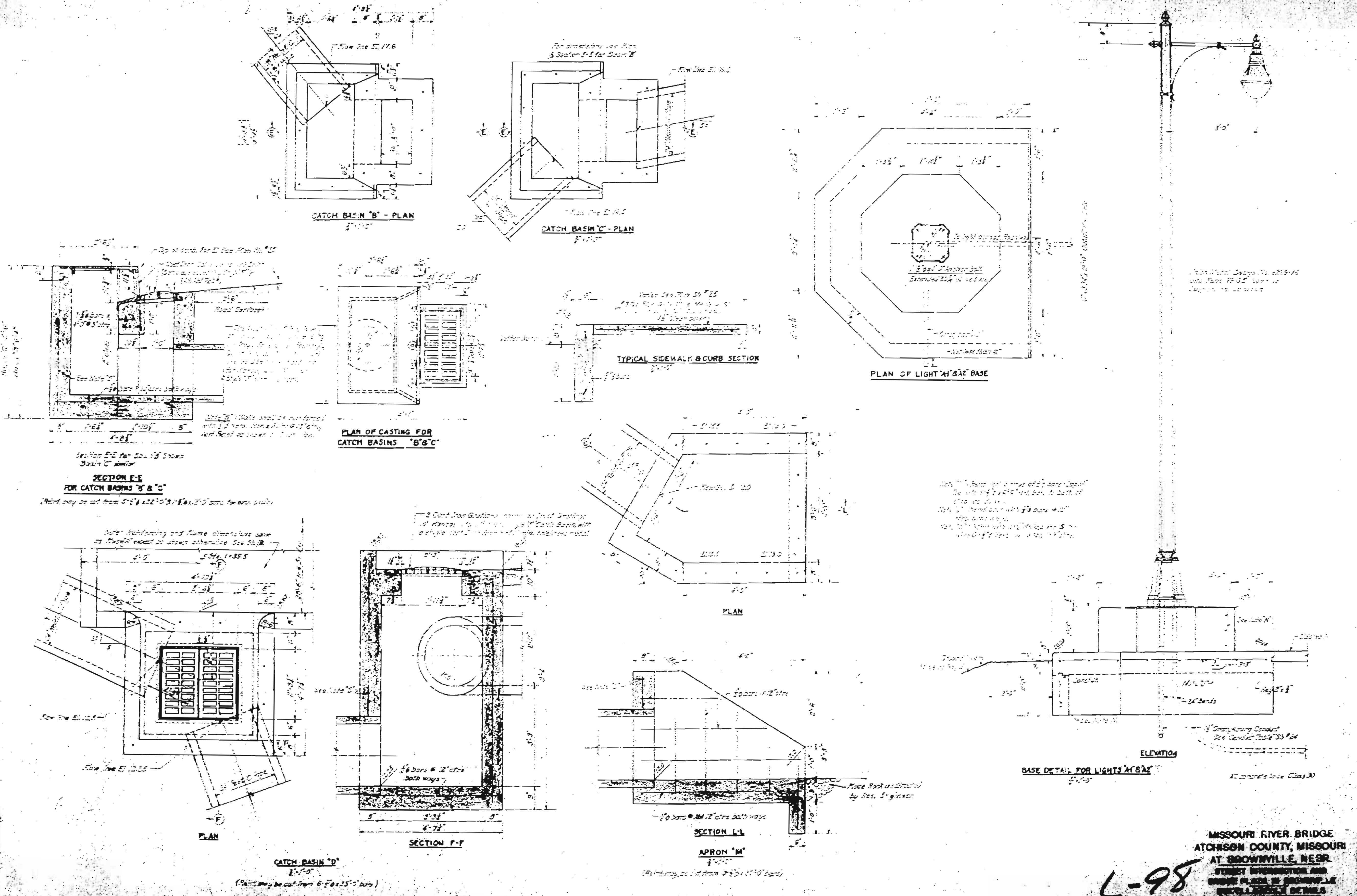
BASE DETAIL FOR LIGHTS "A1" & "A2"

Concrete to be Class 30

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI

34

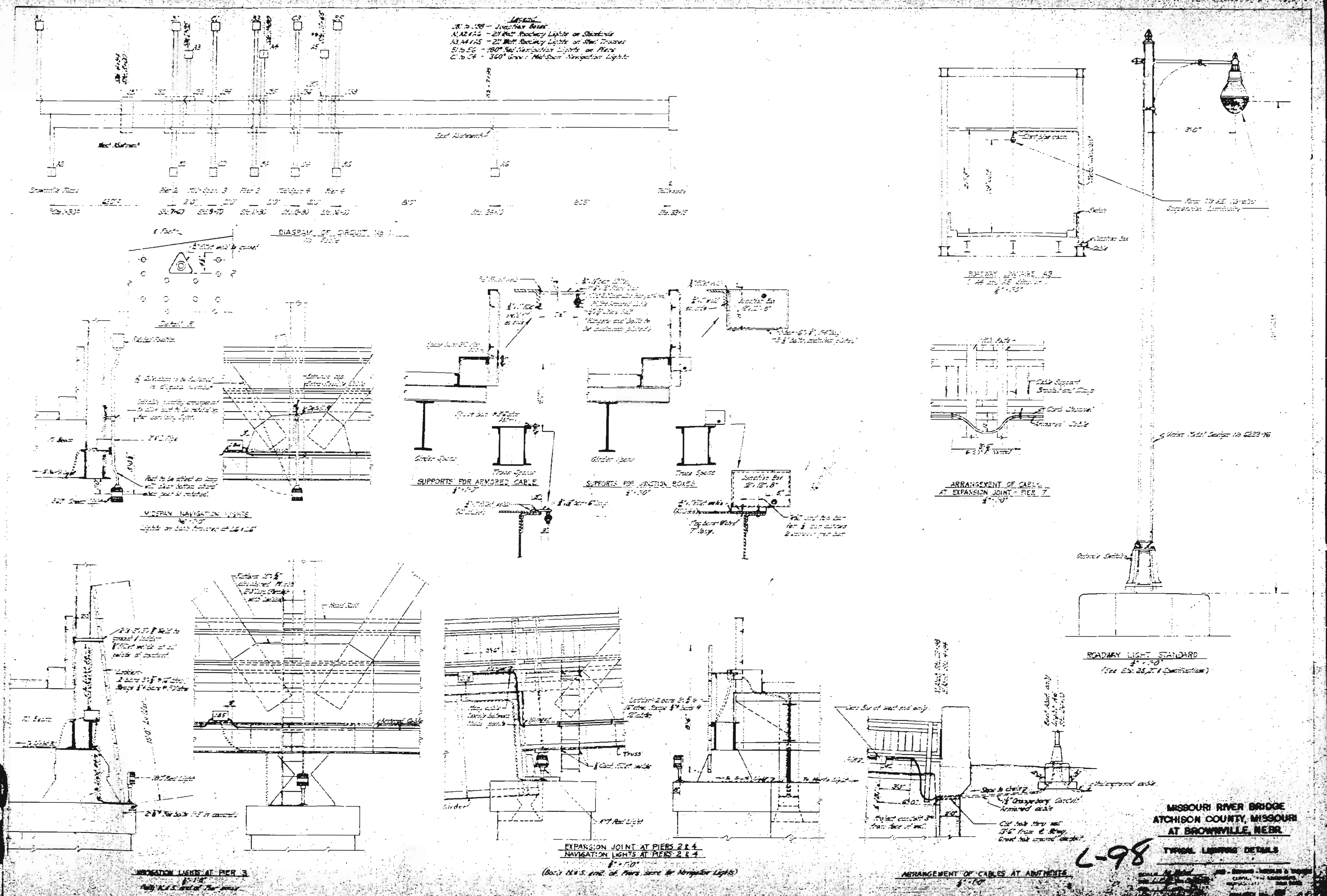
L-98


CATCH BASIN "B" - PLAN
CATCH BASIN "C" - PLAN
For dimensions see Plan & Section E-E for Basin "B"
Flow line El. 17.6
PLAN OF LIGHT "A" & "AE" BASE
SECTION E-E
FOR CATCH BASINS "B" & "C"
Section E-E for Basin "B" Shown
Basin "C" similar
PLAN OF CASTING FOR
CATCH BASINS "B" & "C"
TYPICAL SIDEWALK & CURB SECTION
PLAN
APRON "M"
SECTION L-L
Place Rock as directed by Res. Engineer
CATCH BASIN "D"
PLAN
SECTION F-F
Note: Reinforcing and Frame dimensions same as Basin "B" except as shown otherwise. See Sh. 18
6' Sta. 1+39.5
ELEVATION
BASE DETAIL FOR LIGHTS "A" & "AE"
All concrete to be Class 30
Flow line El. 13.35

34

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
STREET INTERSECTION AND
BRIDGE PLAZA IN BROWNVILLE
MISCELLANEOUS DETAILS

L-98

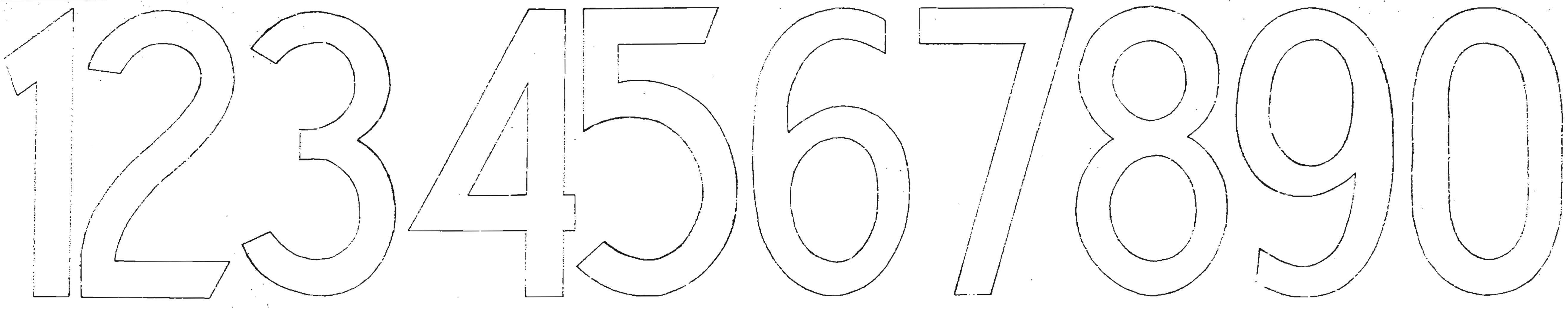

Legend
JB1 to JB8 — Junction Boxes
A1, A2 & A6 — 2?? Watt Roadway Lights on Standards
A3, A4 & A5 — 2?? Watt Roadway Lights on Steel Trusses
S1 to S6 — 180° Red Navigation Lights on Piers
C1 to C4 — 360° Green Mid-Span Navigation Lights
West Abutment
East Abutment
DIAGRAM OF CIRCUIT No.
No Scale
Detail "A"
MIDSPAN NAVIGATION LIGHTS
360° Green Light
SUPPORTS FOR ARMORED CABLE
Girder Spans
Truss Spans
SUPPORTS FOR JUNCTION BOXES
Junction Box
ROADWAY LUMINAIRE A3
ARRANGEMENT OF CABLE AT EXPANSION JOINT - PIER 7
Cable Support
Curb Channel
Armored Cable
ROADWAY LIGHT STANDARD
Union Metal Design No. 6229-16
Outdoor Switch
NAVIGATION LIGHTS AT PIER 3
180° Red Light
EXPANSION JOINT AT PIERS 2 & 4
NAVIGATION LIGHTS AT PIERS 2 & 4
Truss
Girder
ARRANGEMENT OF CABLES AT ABUTMENTS
Underground cable

35

L-98

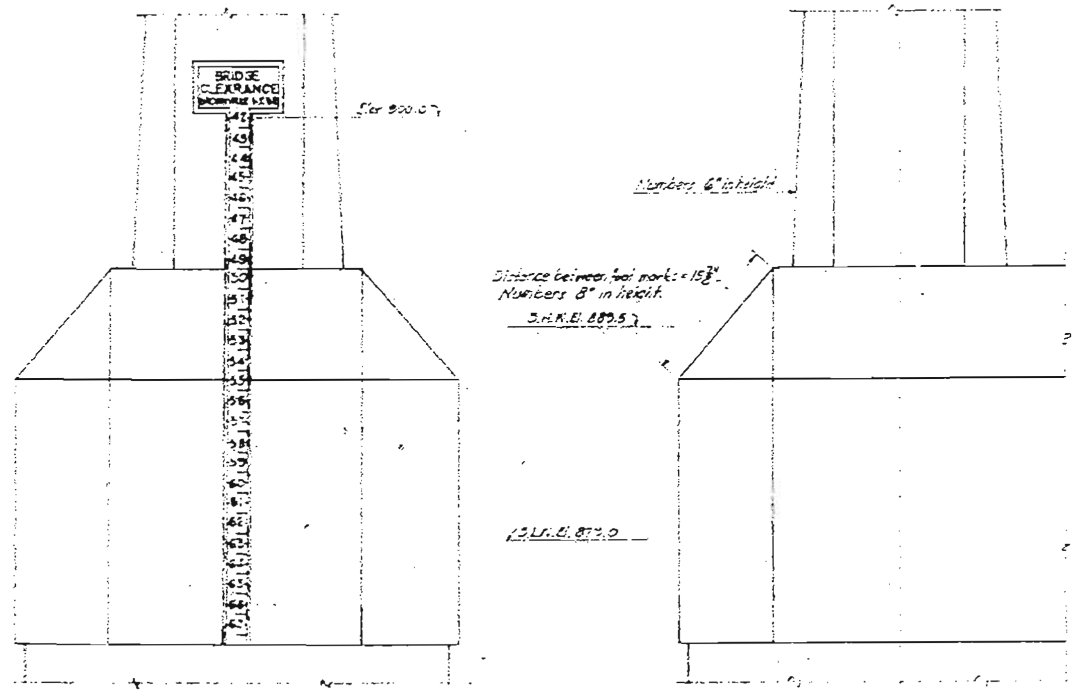
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TYPICAL LIGHTING DETAILS



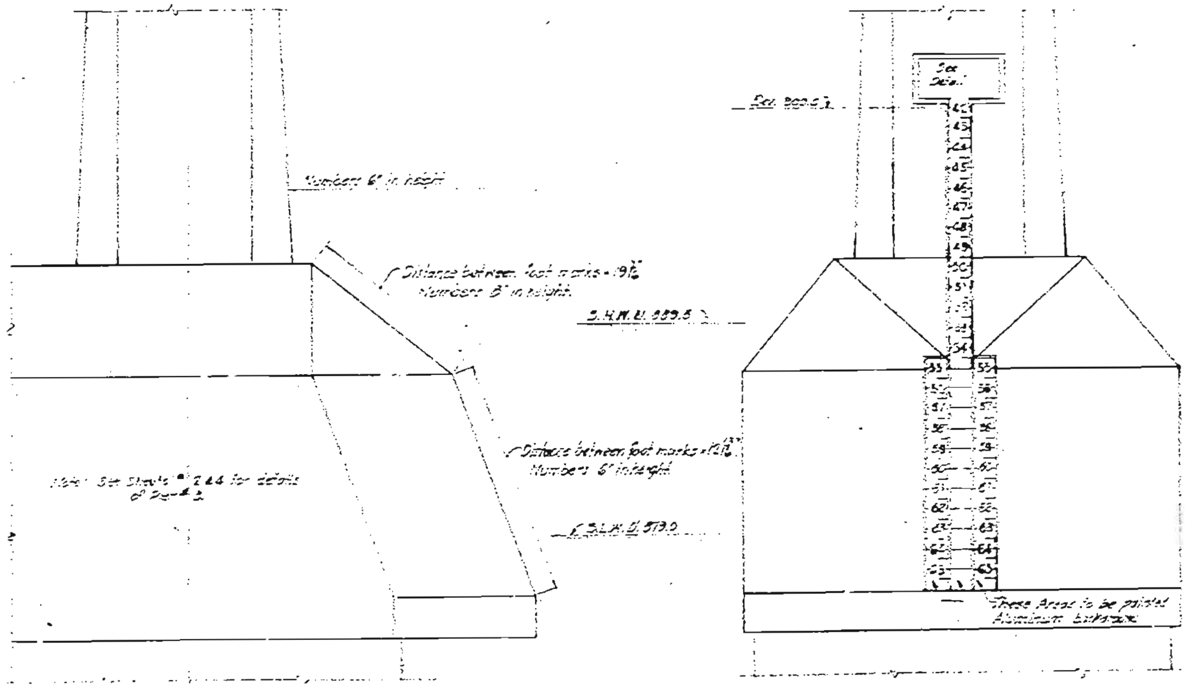
FULL SIZE OUTLINE OF NUMBERS

Note: 6" numbers to be as shown. 8" numbers to be the same width of 6" numbers but elongated.



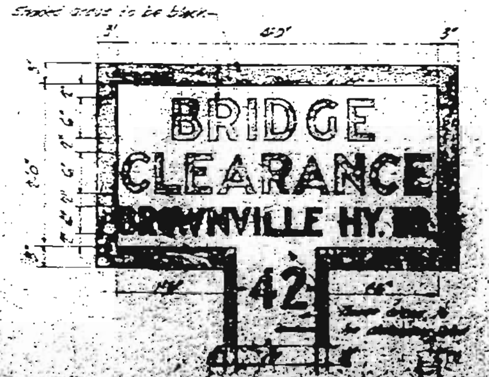
GAGE ON DOWNSTREAM FACE OF PIER 3

¼" = 1'-0"


Numbers 6" in height
Distance between foot marks = 19⅝"
Numbers 8" in height.
S.H.W.El. 889.5
Note: See Sheets # 2 & 4 for details of Pier # 3
Distance between foot marks = 12⅞"
Numbers 6" in height
S.L.W.El. 873.0
El. 900.0
See Detail
These Areas to be painted Aluminum bakground

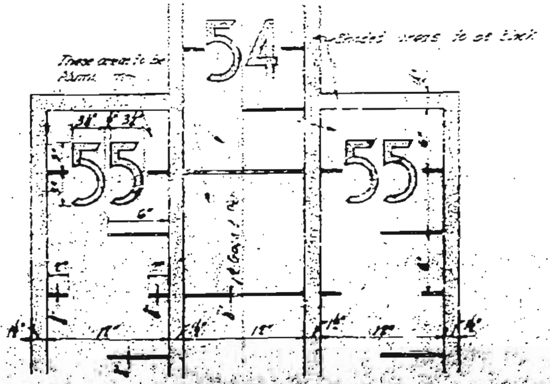
GAGE ON UPSTREAM FACE OF PIER 3

¼" = 1'-0"



NOTES ON PAINTING

1. Brush areas to be painted with a stiff brush to remove all loose particles, then apply a wash coat consisting of a mixture of 3 pounds of sulphate of zinc to a gallon of warm water. Apply with a flat broad brush and allow to dry. After drying, brush with a stiff brush to remove any crystallization.
2. Apply a primer coat of aluminum paint with Dulux vehicle, similar to Brownville Bridge Specs., Div. II, Art 27, page 18. Each gallon of paint thinned with 1 quart of special thinner suitable to the paint.
3. Apply as a second coat aluminum paint with Dulux vehicle similar to Brownville Bridge Specs., Div. II, Art 27, page 18 without special thinner.
4. Paint division markers, border lines, letters and figures black with 1 coat of du Ponts Black Floor and Deck Enamel or equivalent approved material.



TYPICAL DETAIL OF GAGE MARKINGS

Note:
Copper sheet stencils for each letter and figure shall be provided, and upon completion of the work shall be suitably boxed and delivered to the owner for future use in repainting

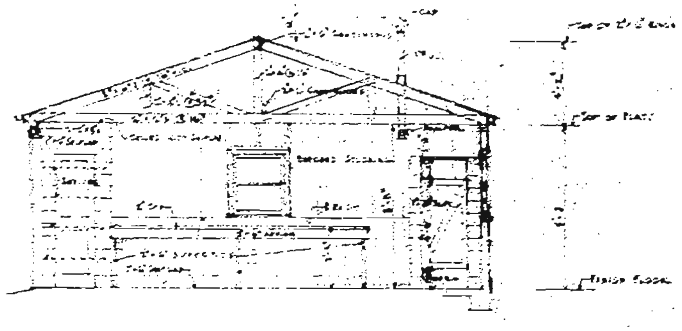
36

L-98

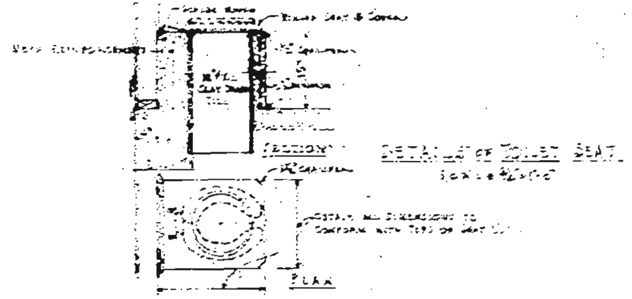
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

BRIDGE CLEARANCE GAGE
PIER 3

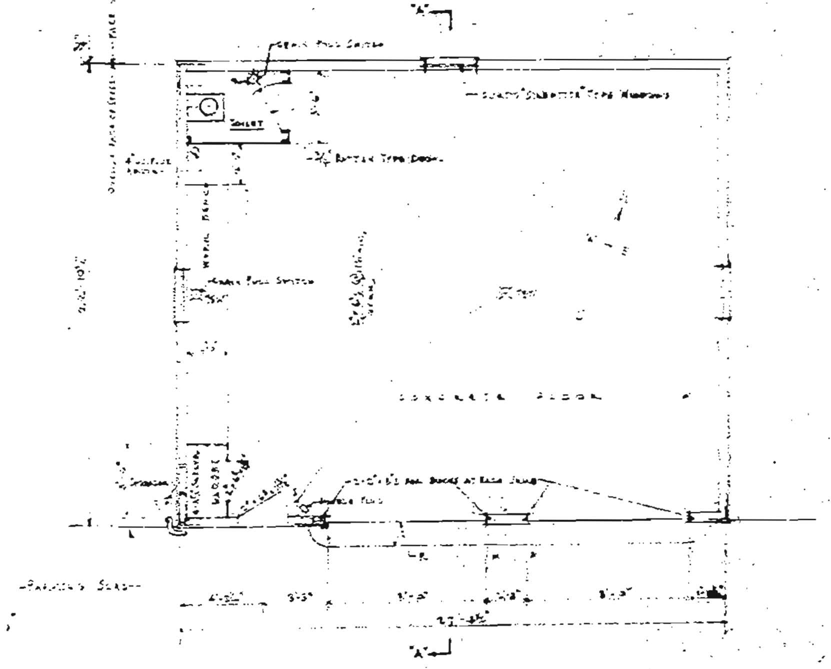
1. Garage Bldg. to be Constructed Complete Ready for Use, Floor and Foundation. Contract 4, Remainder Contract 7.
2. Construction, Wood Frame as Detailed, Materials Not Specified to be First Class of Their Various Kinds. Workmanship to be First Class.
3. Rough Framing Lumber, #1 Yellow Pine S4S Kiln Dried, or Fir of Equivalent Quality. Roof Sheathing [illegible] Fir. Interior Wainscoting, Closet, & Toilet Partitioning to be [illegible]. Exterior Siding to be 1"x6" Grade "D" Fir or Y.P. Drop Siding, Placed Vertical & Horizontal as Shown. Roof Shingles [illegible] to 2", Cedar Laid 5" to Weather.
4. Millwork, [illegible].
5. Glass, Lights [illegible] Grade B or Equal.
6. Rough Carpentry to be Substantial. Finish Carpentry to be Capable of Withstanding Rigid Examination. Finish Nails to be Set in & Holes Puttied Up.
7. Guttering, [illegible], Flashing over Windows, Doors, & Around Flue, Flue & Sleeve, Shall be [illegible].
8. Rough Hardware for Garage Doors, Steel Strap Hinges [illegible] Made by Richards-Wilcox, or Equal. Hinges Shall be Secured by Screwed to Jamb & Door to Swing Against Siding. Suitable Latch, Hasp, Padlock, & Chrome Bolts at Top & Bottom Shall be Furnished for Each Set of Doors. Other Finish Hardware, Bronze Finish, Substantial, & Match That of Toll House. Cylinder Lock Shall be Included for Small Door.
9. All Exposed Outside Surfaces of the Bldg., Except the Shingle Roof & Concrete Work, But Including Both Sides of Exterior Doors & Windows, Shall be Painted with Primer & 2 Coats Best Quality White Titanium House Paint Manufactured by Cook Paint & Varnish Co., or Equal.
10. Electrical Wiring Shall Conform to All Local & Underwriters' Codes. One Circuit Shall be Run Underground in Suitable Conduit from the Toll House Panel Box to the Garage to Which the Outlets Shown Shall be Connected. The Light Fixtures Shall be Merely Sockets with Switches as Shown. BX Cable May be Used for the Circuit in the Bldg. Lamps of Wattage Shown Shall be Included.
11. Toilet Shall Consist of a 3' Section of Salt Glazed Vitrified Tile 12" Inside Diameter, Encased in Conc., with a # [illegible] "[illegible]" Black Toilet Seat & Cover or Equal, Mounted as Shown. Seat Lugs to be Anchored in the Concrete.



CROSS SECTION ON LINE "A-A" Scale [illegible]

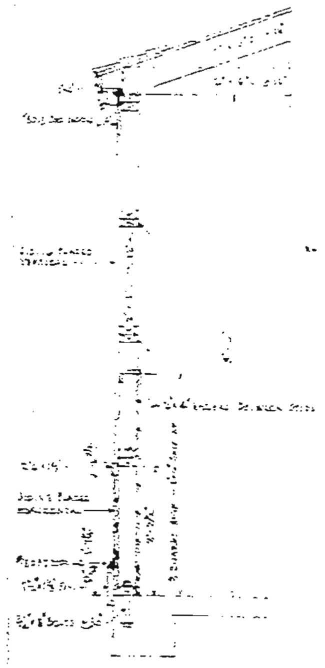


DETAIL OF TOILET SEAT
Scale [illegible]

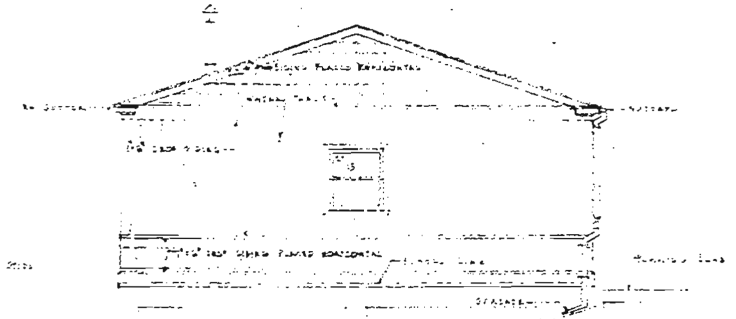


PLAN Scale 1/4"=1'-0"

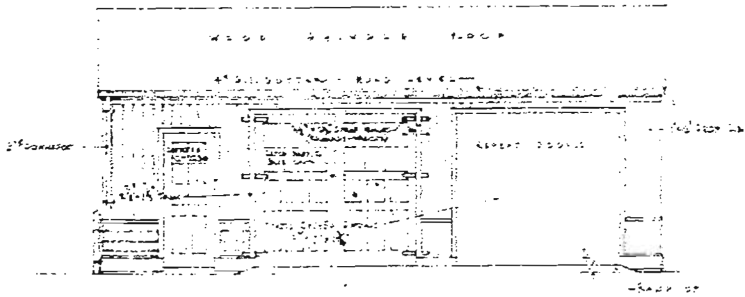
—Note:—
Other Arrangements of Siding May be Used if Approved by Resident Engineer.



TYPICAL WALL SECTION
Scale 3/4"=1'-0"



SIDE ELEVATION
Opposite Side Similar Except No Downspout.
Scale 1/4"=1'-0"



FRONT ELEVATION
Scale 1/4"=1'-0"

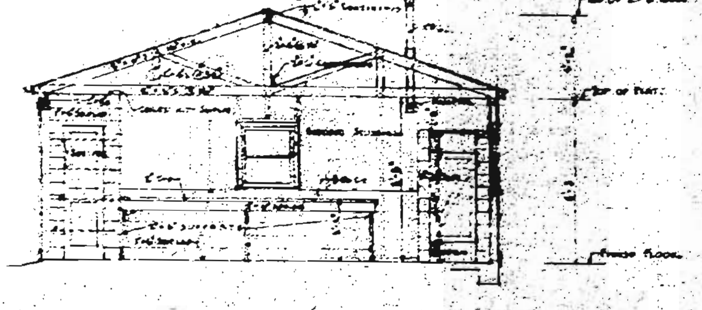
For Details of Floor and Foundations See Sheet 31.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
[illegible] NEBR.

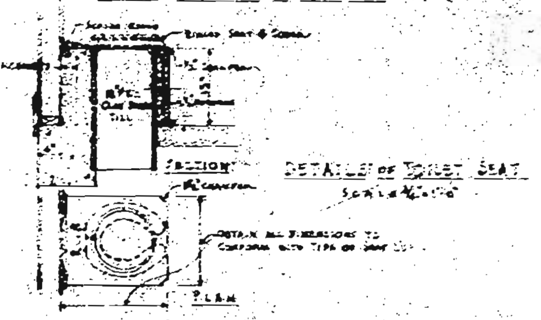
L-98

37

1. Garage: Bldg. to be constructed complete ready for use. Floor and excavation contract A; remainder contract Z.
2. Construction, wood frame as detailed. Materials not specified to be first class of their various kinds. Workmanship to be first class.
3. Rough framing, [illegible] #1 [illegible] pine S4S kiln dried, or fir of equivalent quality. Roof sheathing [illegible], interior wainscoting, closet & toilet partitioning to be [illegible]. Exterior siding to be 1"x6" grade "D" fir or Y.P. drop siding, placed vertical & horizontal as shown. Roof shingles [illegible] to 2" cedar laid 5" to weather.
4. Millwork, clear white pine.
5. Glass, [illegible] grade B, or equal.
6. Rough carpentry to be substantial; finish carpentry to be capable of withstanding rigid examination. Finish nails to be set in & holes puttied up.
7. Guttering, [illegible], spreader, flashing over windows, doors, & around flue, flue & sleeve, shall be [illegible].
8. Rough hardware for garage doors, steel strap hinges [illegible] made by Richards-Wilcox, or equal. Hinges shall be securely screwed to jamb & door to insure against sagging. Suitable hasp, padlock & cremone bolts at top & bottom shall be furnished for each set of doors. Other finish hardware, bronze finish, substantial, & match that of toll house. Cylinder lock shall be included for small door.
9. All exposed outside surfaces of the bldg., except the shingle roof & concrete work, but including both sides of exterior doors & windows, shall be painted with primer & 2 coats best quality white titanium house paint manufactured by [illegible] Paint & Varnish Co., or equal.
10. Electric wiring shall conform to all local & underwriters' codes; one circuit shall be run underground in suitable conduit from the toll house panel box to the garage to which the outlets shown shall be connected. The light fixtures shall be merely sockets with switches as shown. BX cable may be used for the circuit in the bldg. Lamps of wattage shown shall be included.
11. Toilet shall consist of a 2' section of salt glazed vitrified tile 12" inside diameter, encased in conc., with a #[illegible] "Whalebonite" black toilet seat & cover, or equal, mounted as shown. Seat legs to be anchored in the concrete.

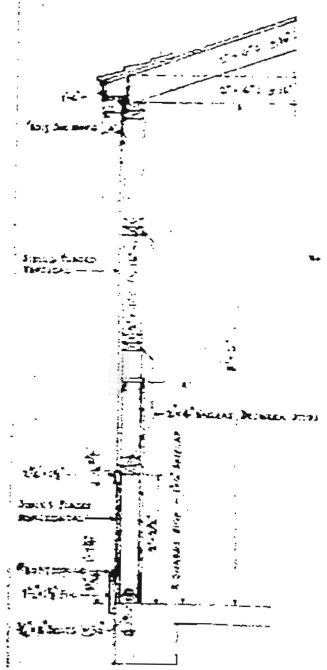


CROSS SECTION – LINE A-A SCALE ¼"=1'-0"

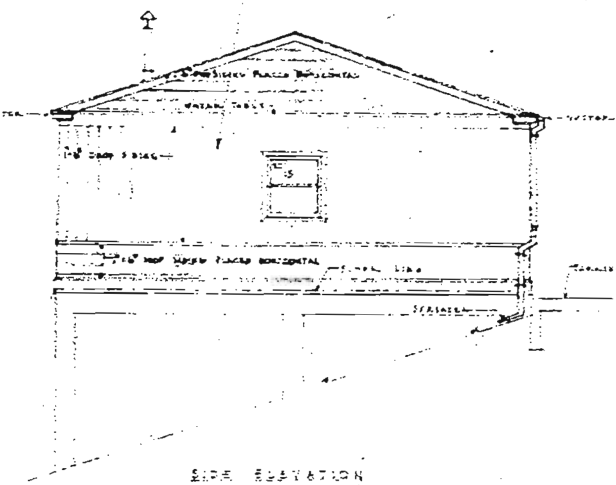


DETAILS OF TOILET SEAT SCALE ¾"=1'-0"

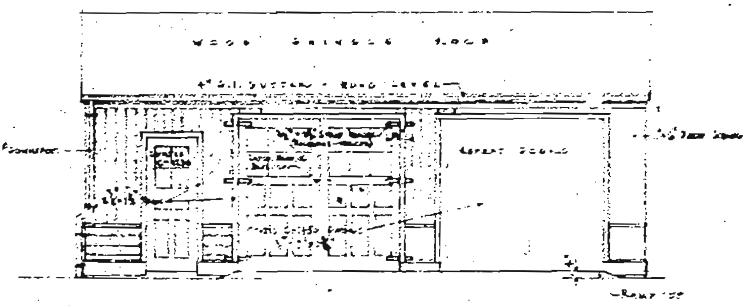
NOTE: Other arrangements of siding may be used if approved by Resident Engineer.



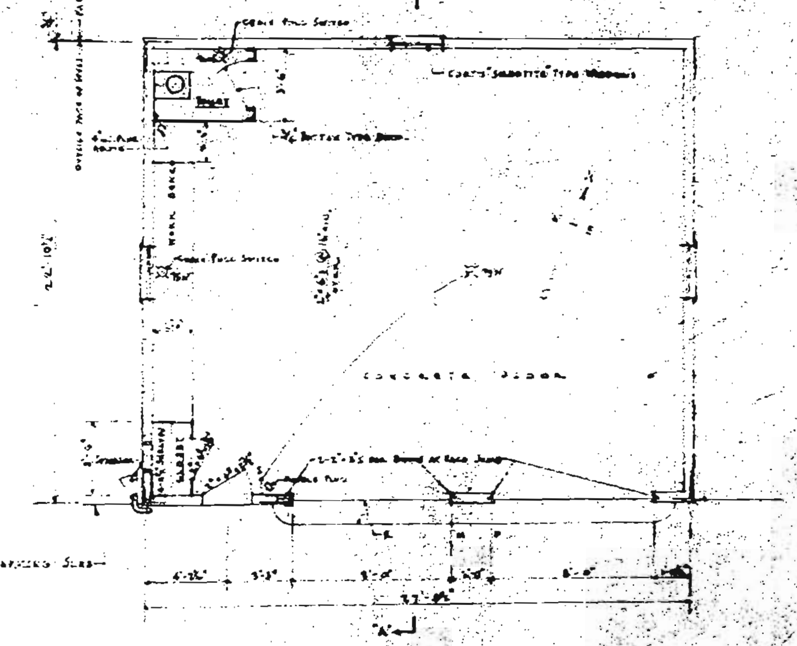
TYPICAL WALL SECTION SCALE ¾"=1'-0"



SIDE ELEVATION
Opposite Side Similar Except No Downspout.
SCALE ¼"=1'-0"

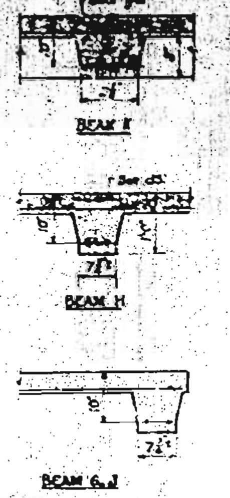


FRONT ELEVATION SCALE ¼"=1'-0"



PLAN SCALE ¼"=1'-0"

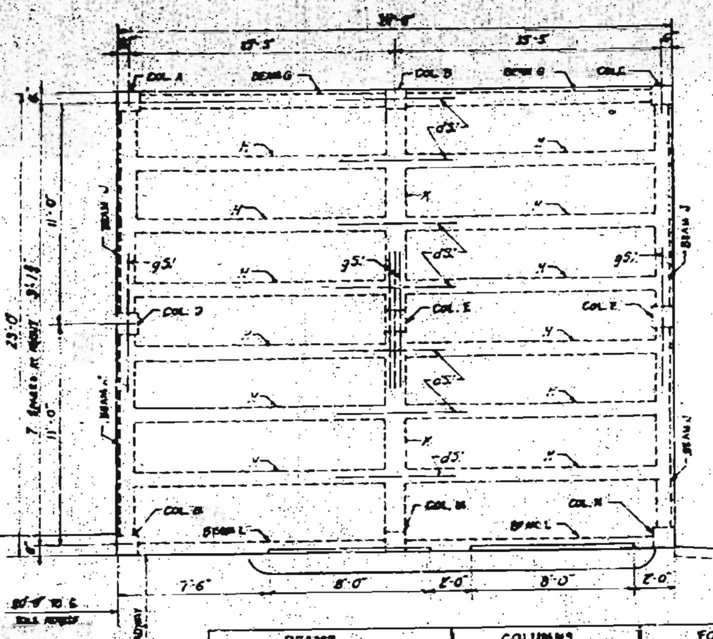
For details of floor and foundations see sheet 31.



BAR TABLE

No.	Mark	Size	Length	Bending
10	b51	⅝"φ	5'-5"	
5	g1	⅝"φ	7'-0"	
8	g52	⅝"φ	26'-6"	
4	g53	⅝"φ	25'-1"	
7	d51	⅝"φ	6'-0"	
12	d32	⅝"φ	26'-5"	
12	c51	⅝"φ	12'-6"	
12	c52	⅝"φ	6'-5"	
12	c53	⅝"φ	5'-5"	

26'-6" g53
22'-5" g52
26'-0" d32



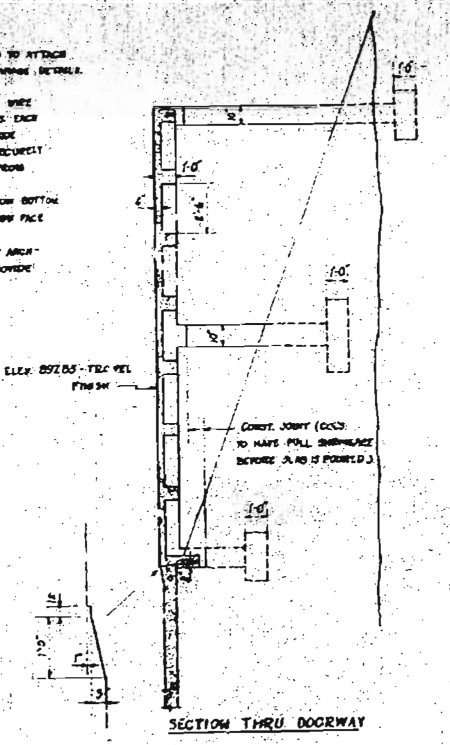
PLACE ½"φ × 0'-8" BOLTS IN SLAB TO ATTACH TIMBER PLATE OF WALLS. SEE GARAGE DETAILS.

SLAB REINFORCING TO BE WELDED WIRE MESH MADE OF #6 WIRES @ 6" CTRS. EACH WAY. CUT IN 22'-5" SHEETS. LAP SIDE SPLICES 6" AT EACH LAP. WIRE SECURELY. PLACE ALL SLAB REINFORCING 1" FROM BOTTOM OF SLAB.

BARS IN BEAMS TO BE PLACED 2" FROM BOTTOM OF CONCRETE. COLUMNS ONE 2" FROM FACE OF CONCRETE.

ALTER SLAB AS NECESSARY TO FIT ARCHITECTURAL FEATURES AND TO PROVIDE FOR TOILET NEAR COLUMN A.

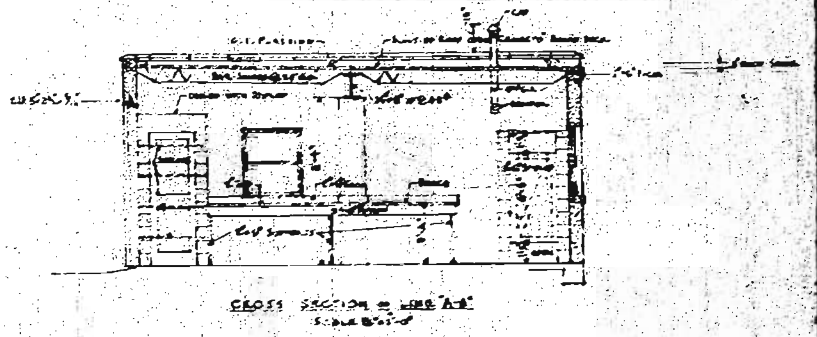
CONCRETE TO BE CLASS 30.


1'-0"
1'-0"
1'-0"
ELEV. 892.85 - TROWEL FINISH
CONST. JOINT (CONC. TO HAVE FULL SHRINKAGE BEFORE SLAB IS POURED.)
1'-0"

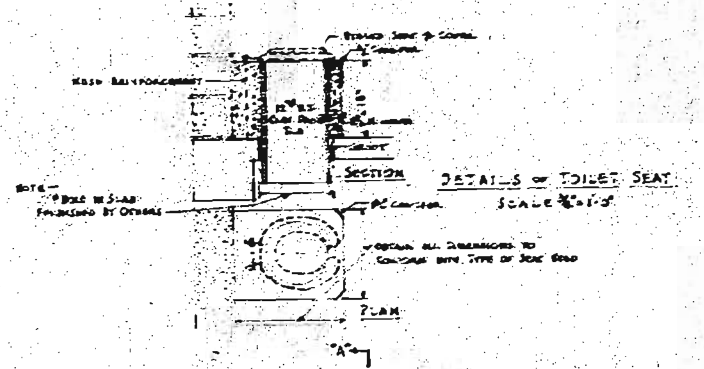
SECTION THRU DOORWAY

BEAMS			COLUMNS			FOOTINGS		
MARK	APPROX. SIZE	REINFORCING	MARK	SIZE	REINF.	SIZE	REINFORCING	BOTTOM ELEV.
G	6"x12"	2-1"φ - g53	A, C	10"x11½"	4-⅝"φ	5'-0" sq.	NONE	885.0
H	6"x12"	2-⅞"φ - d32	B	10"x11½"	4-⅝"φ	5'-6" sq.	⅝"φ @ 6" ctrs.	885.0
J	6"x12"	2-1"φ - g52	D, F	10"x11½"	4-⅝"φ	5'-6" sq.	⅝"φ @ 6" ctrs.	885.3
K	[illegible]x20"	4-1"φ - g52	E	13"x11½"	4-⅝"φ	5'-6" sq.	⅝"φ @ 6" ctrs.	880.8
L	6"x24"	2-1"φ - g53	H, J	10"x11½"	4-⅝"φ	5'-0" sq.	NONE	882.5
			M	10"x11½"	4-⅝"φ	5'-6" sq.	⅝"φ @ 6" ctrs.	892.5

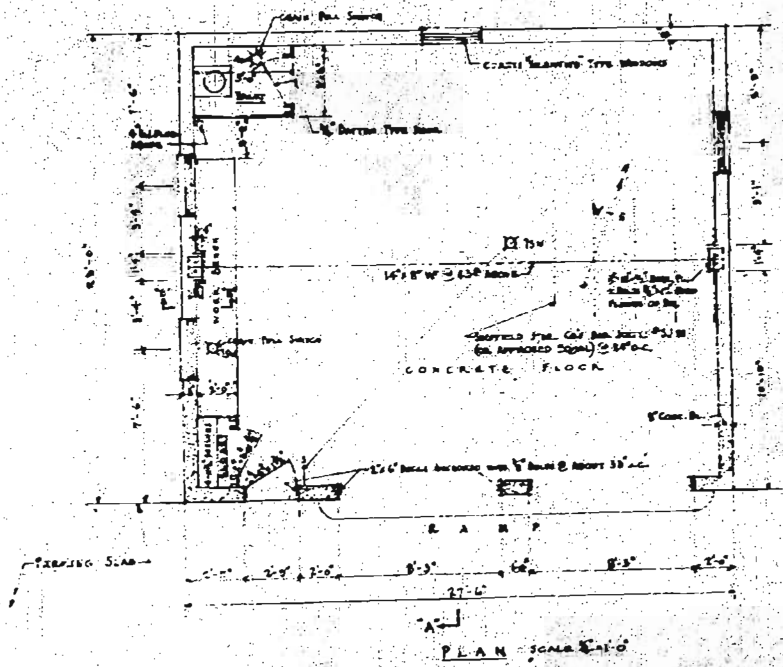
FLOOR SLAB AND FOUNDATIONS ⅛"=1'-0"



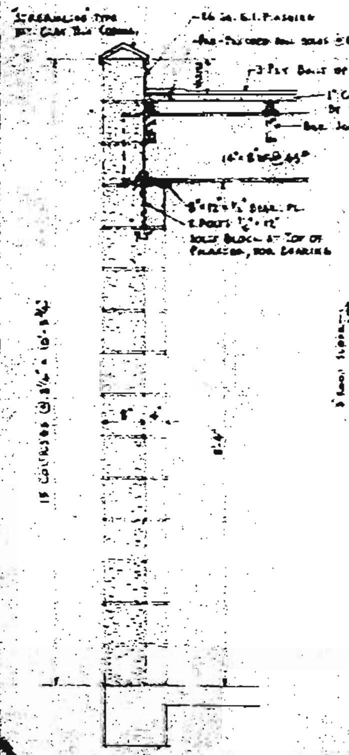
CROSS SECTION ON LINE "A-A"
SCALE ⅛"=1'-0"



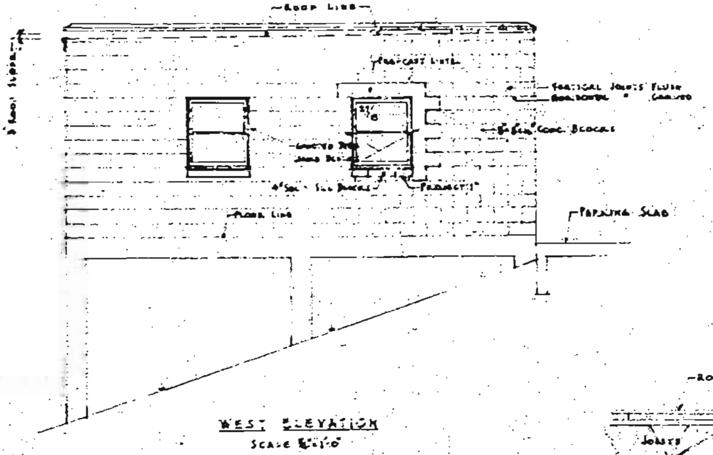
DETAILS OF TOILET SEAT
SCALE ¾"=1'-0"



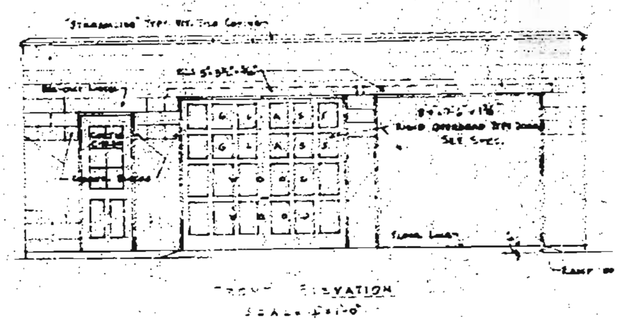
PLAN SCALE ⅛"=1'-0"


"STREAMLINE" TYPE BET. CLAY TILE COPING
26 GA. G.I. FLASHING
3 PLY BUILT UP ROOF
1" CELOTEX "CONCRETE" BOARD 5.25 - SECURED TO BAR JOISTS BY MEANS OF GALVANIZED ROOF CLIPS.
BAR JOISTS
14" 8" W @ 6.5"
8"×12"×½" BEAR. PL.
2 BOLTS ¾"×12"
SOLID BLOCK AT TOP OF PILASTER FOR BEARING

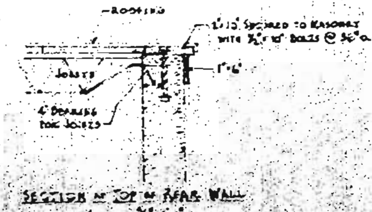
TYPICAL WALL SECTION AT "B-B"
SCALE ¾"=1'-0"



WEST ELEVATION
SCALE ⅛"=1'-0"


"STREAMLINE" TYPE BET. TILE COPING
ROLL OVERHEAD TYPE DOOR SEE SPEC.
FLOOR LINE

FRONT ELEVATION
SCALE ⅛"=1'-0"



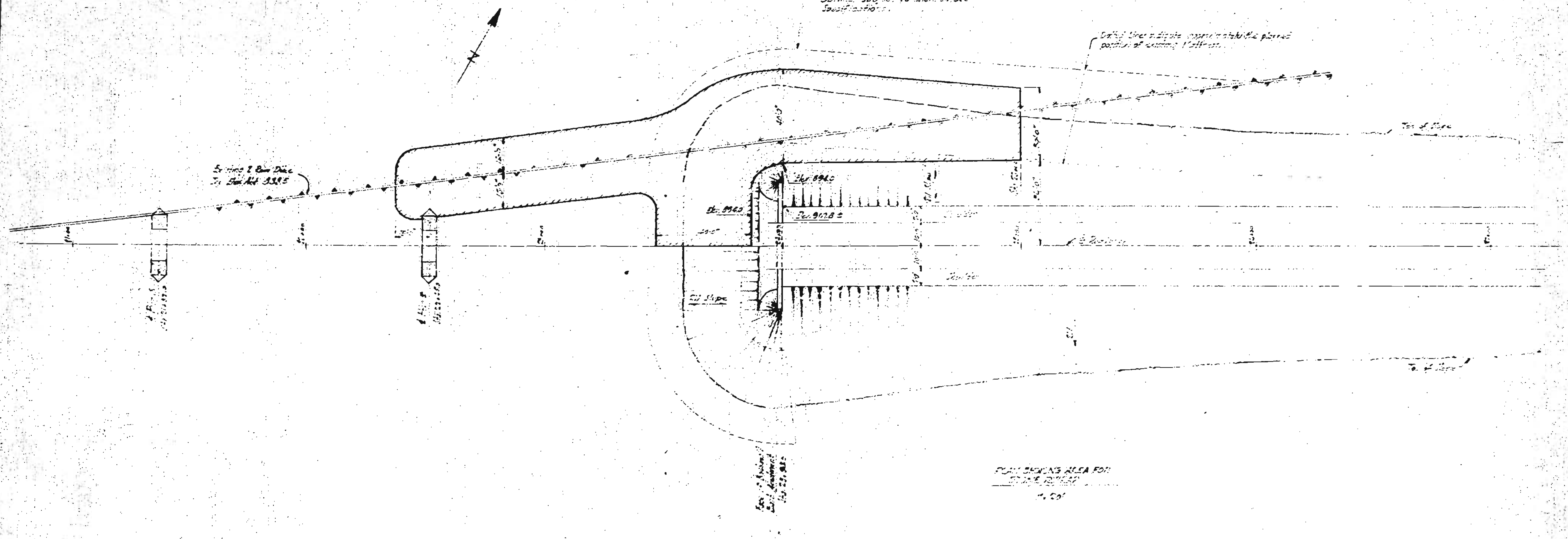
SECTION AT TOP OF REAR WALL
SCALE ¾"=1'-0"

30

L-98

MISSOURI RIVER BR-1032
[illegible] COUNTY

NOTE: FLOOR SLAB AND FOUNDATIONS [illegible] CONSTRUCTED UNDER CONTRACT [illegible]



Hatched Lines indicate the area (about 10000 sq. ft) to be covered by Riprap under Contract G. Outlines subject to change. See Specifications.

Dotted lines indicate approximately the planned position of existing Mattress.

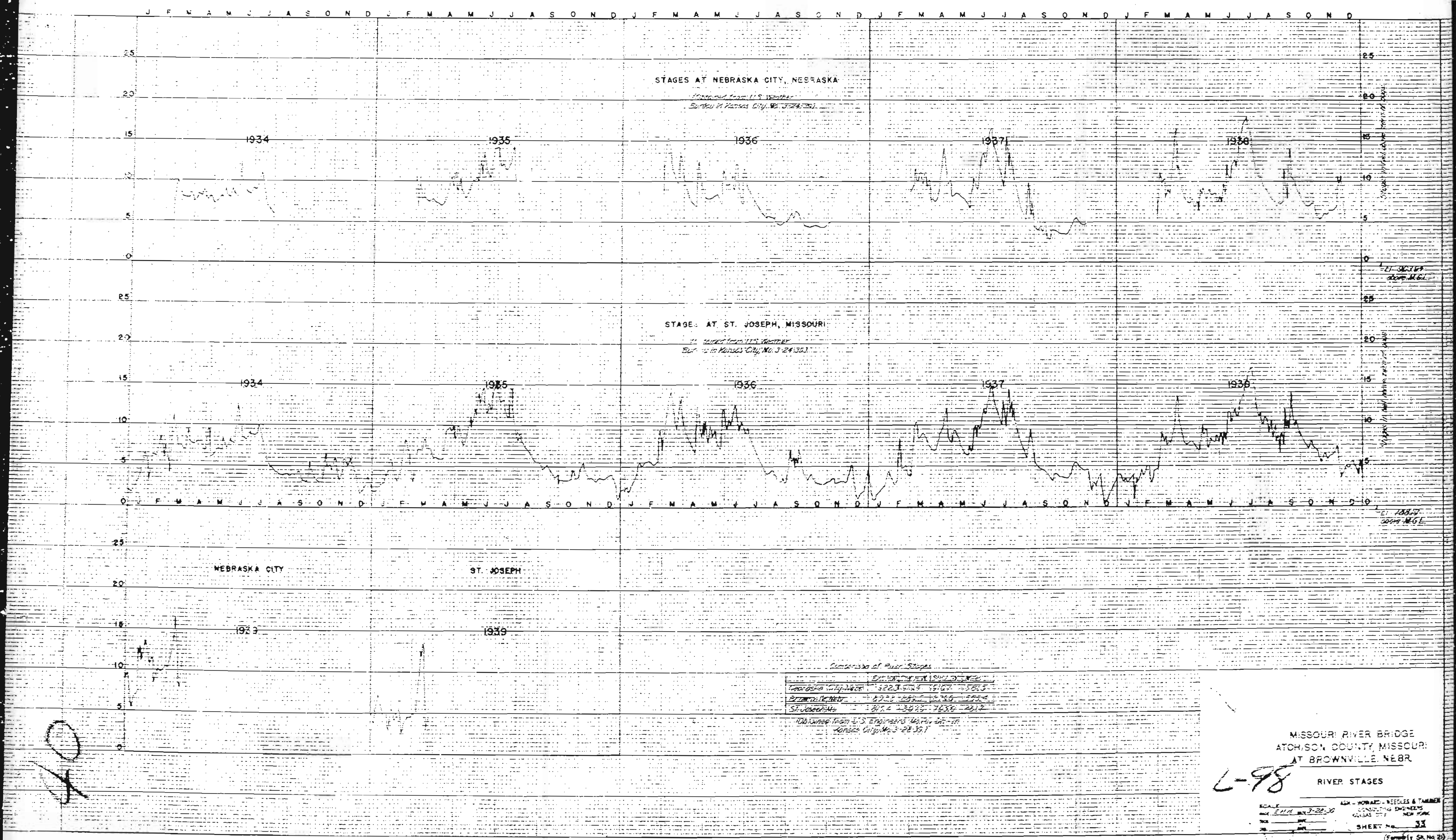
PLAN SHOWING AREA FOR STONE RIPRAP

Note: For description of stone, method of placing, etc. see Specifications.

MISSOURI RIVER BRIDGE
[illegible] COUNTY, [illegible]
AT [illegible]

L-98

59



Comparison of River Stages

	[illegible]	[illegible]
Nebraska City, Nebr.	322.3 [illegible]	[illegible]
Brownville, Nebr.	[illegible]	[illegible]
St. Joseph, Mo.	811.4 [illegible]	765.9 [illegible]

Obtained from U.S. Engineers' Office in Kansas City, Mo. 3-28-39.

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

RIVER STAGES

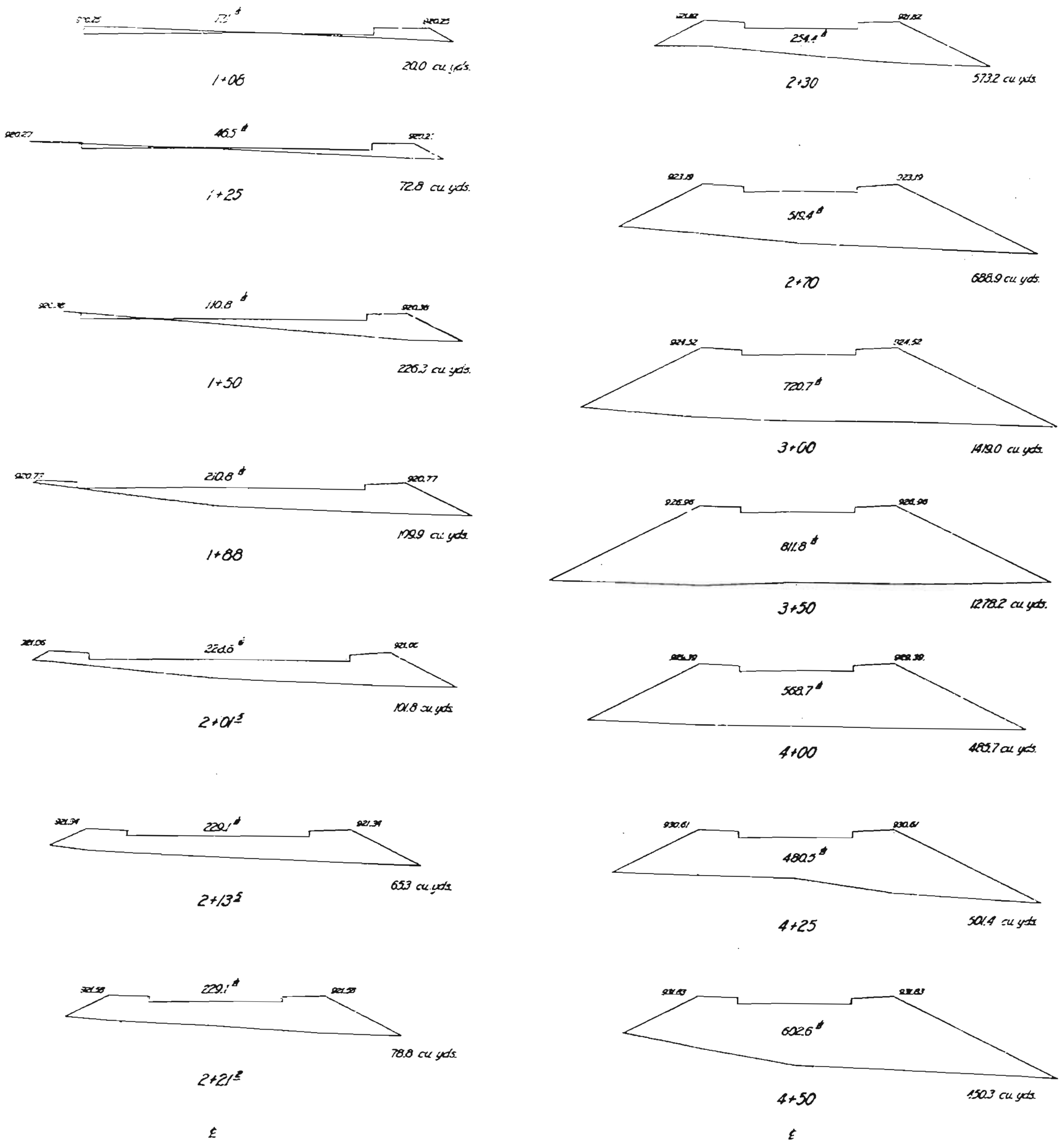
SCALE
DRN. E.H.H. DATE 3-28-39
TR. DATE
CH. DATE

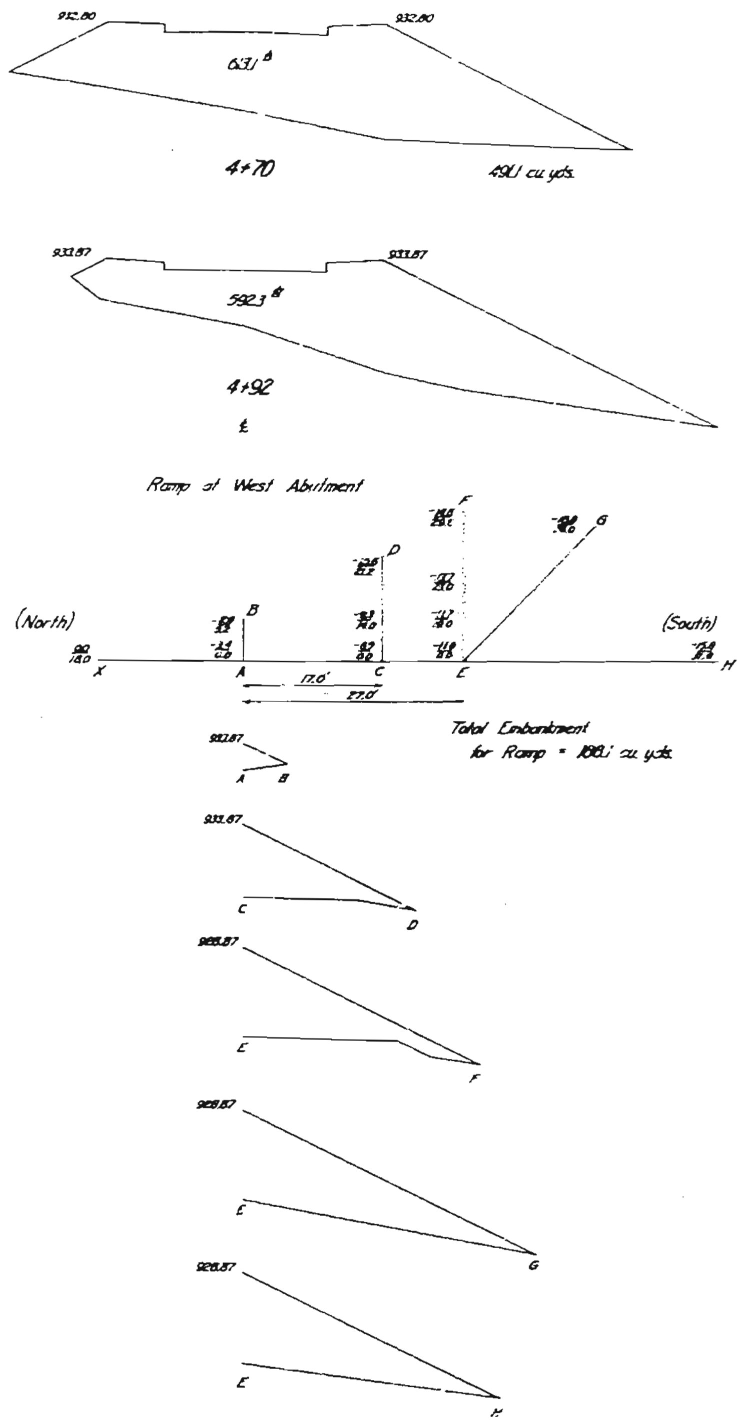
ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. 33

(Formerly Sh. No. 21)

151





Additional Embankment = 133.3 cu. yds.

Sta. 1+30 — Basement (23' x 25' x 5')
Vol. = 106.5 cu. yds.

Sta. 3+60 - 20' Rt. - Dry well (lined with dry masonry)
3' diam. - 26' deep - Vol. = 6.8 cu. yds.

Sta. 4+32 - 23' Rt. - Cistern (Cement mortar over bricks)
7' diam. - 14' deep - Vol. = 20.0 cu. yds.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

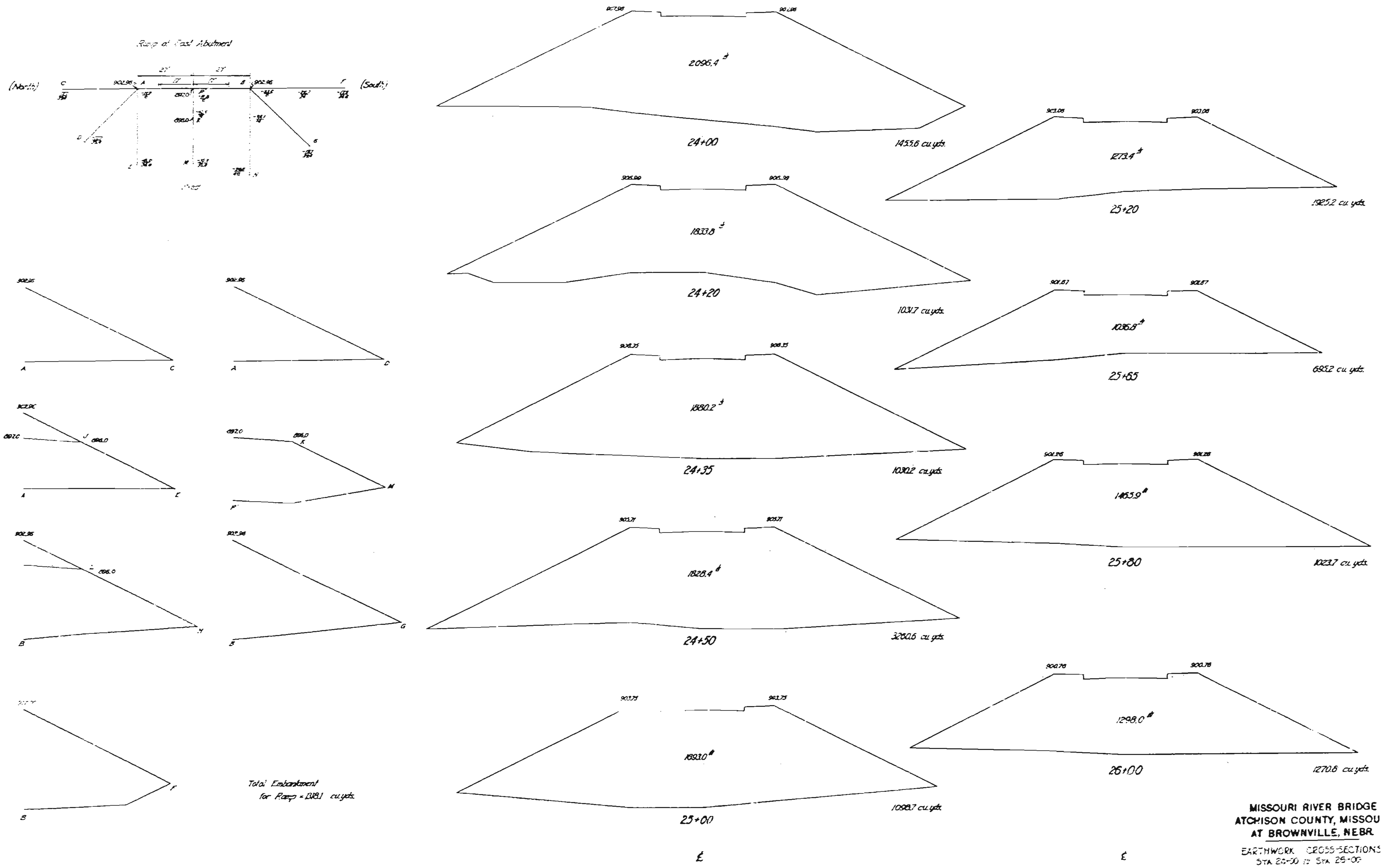
EARTHWORK CROSS-SECTIONS
STA. 1+08 TO STA. 4+92

SCALE 1" = 10'-0"
[illegible]
[illegible]

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. E1

L-98 L-92



152

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EARTHWORK CROSS-SECTIONS
STA 24+00 TO STA 26+00

SCALE [illegible]
[illegible] E.A.M. [illegible] 6-22-[illegible]
[illegible] E.A.M. [illegible] 6-22-[illegible]

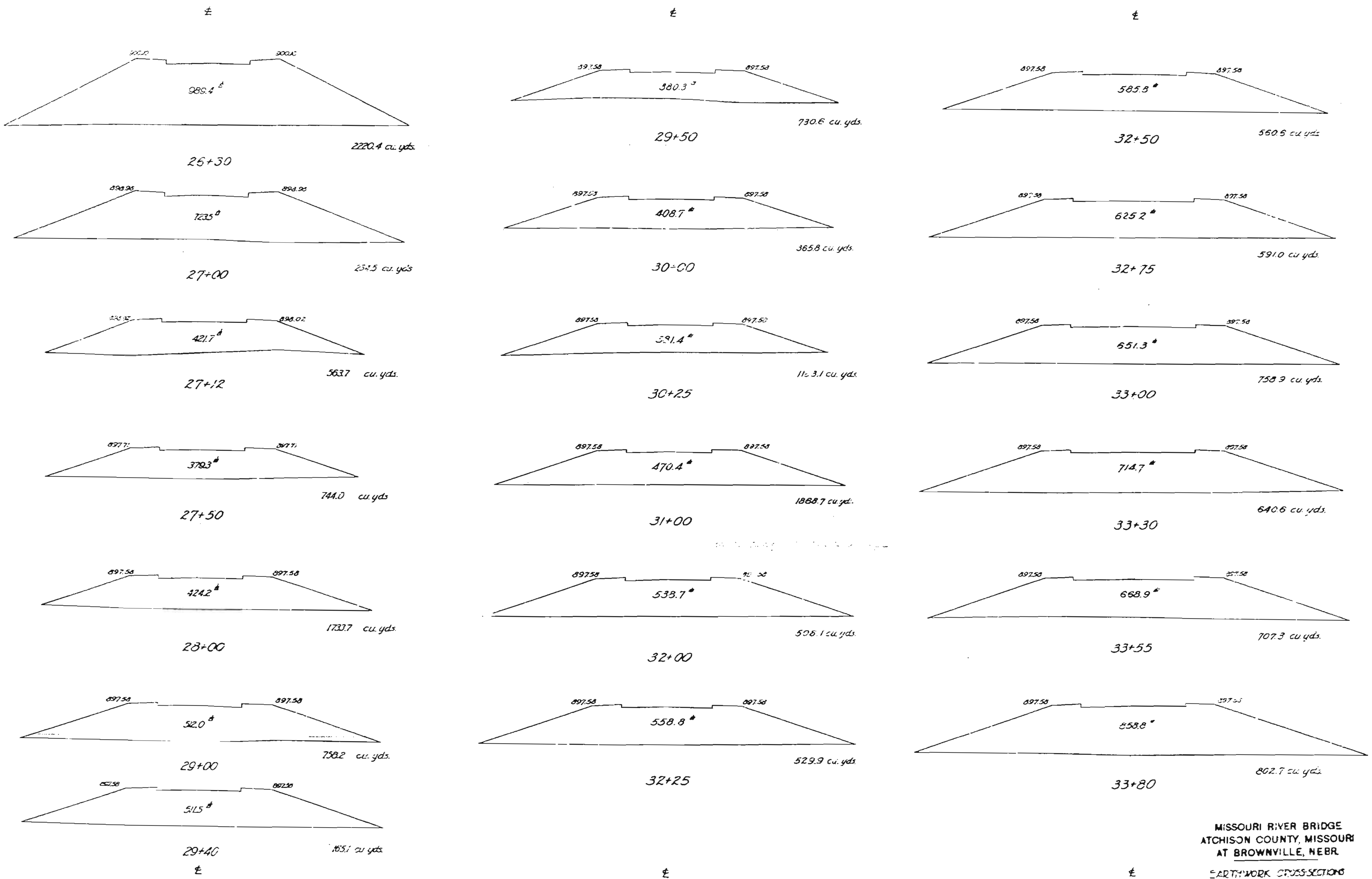
[illegible] - [illegible] - NEEDLES & [illegible]
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET NO. F2

L-98

L-97

153



MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

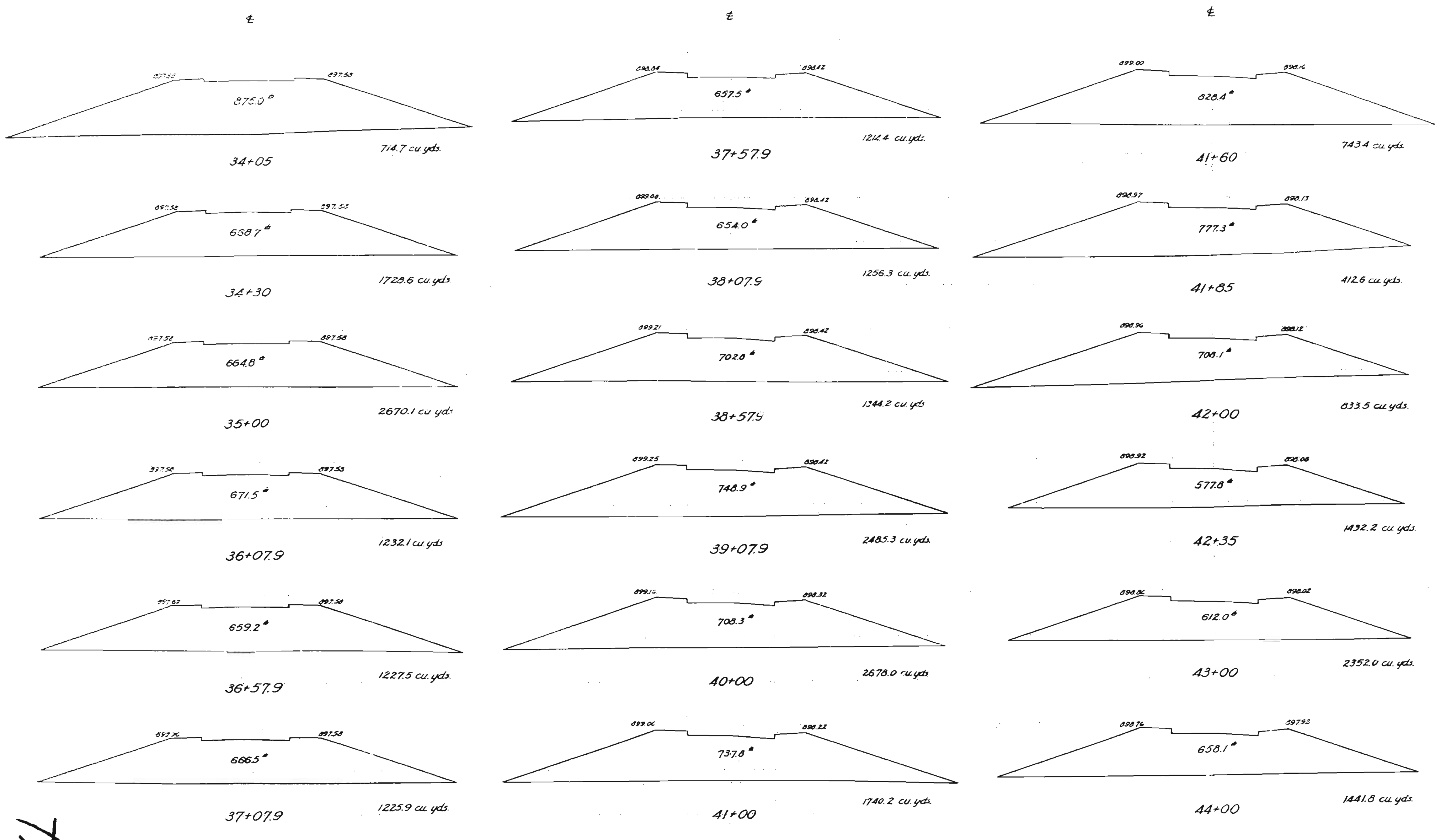
EARTHWORK CROSS-SECTIONS
Sta. 26+30 to Sta. 33+80

SCALE [illegible]
[illegible] DATE 6-22-[illegible]
[illegible] DATE 6-22-[illegible]
[illegible]

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET NO. 53

E-98



154

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EARTHWORK CROSS-SECTIONS
STA. 34+05 TO STA. 44+00

SCALE [illegible]
[illegible]

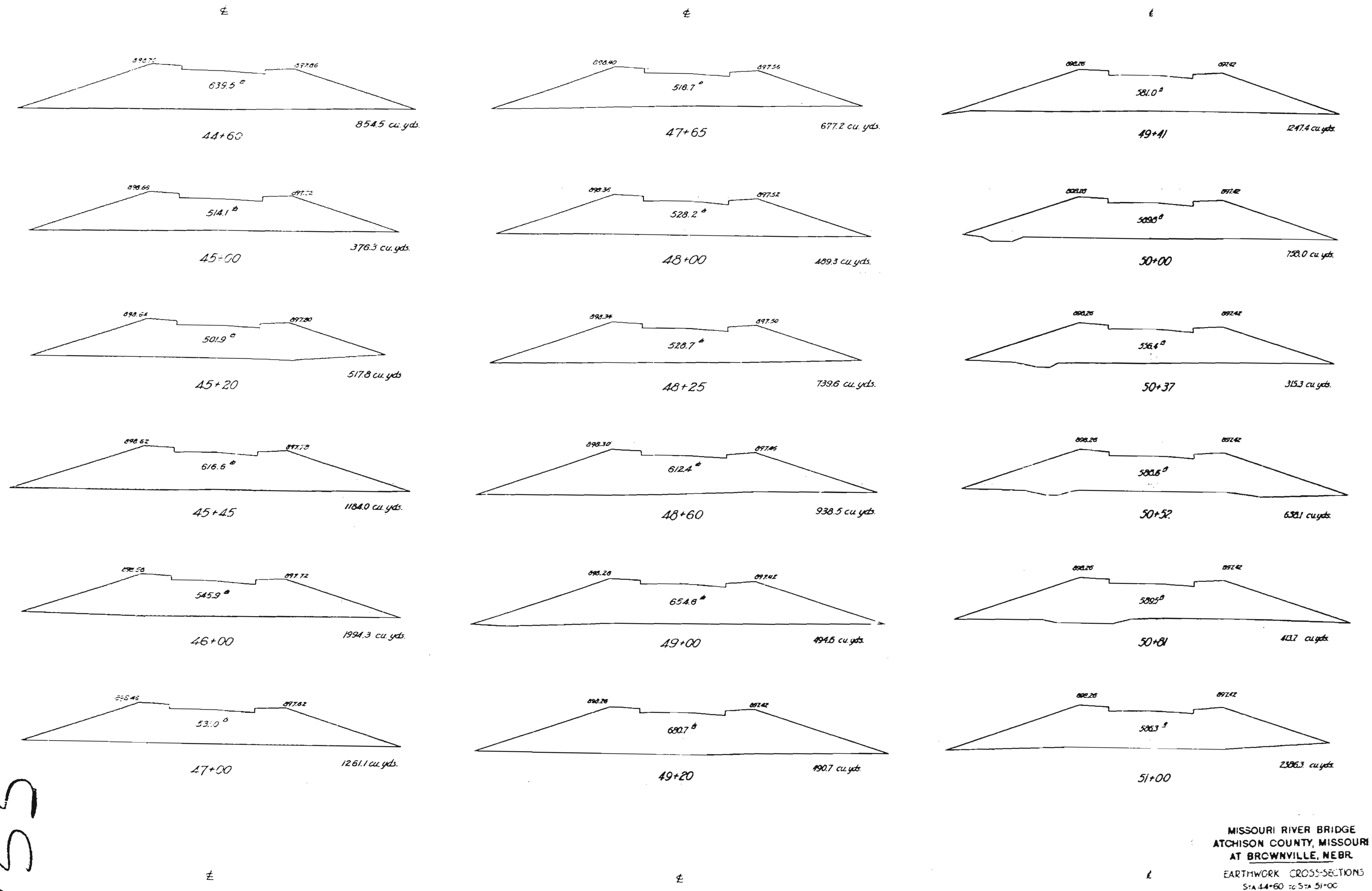
ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. E4

L-98

L-98

155



MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EARTHWORK CROSS-SECTIONS
STA 44+60 TO STA 51+00

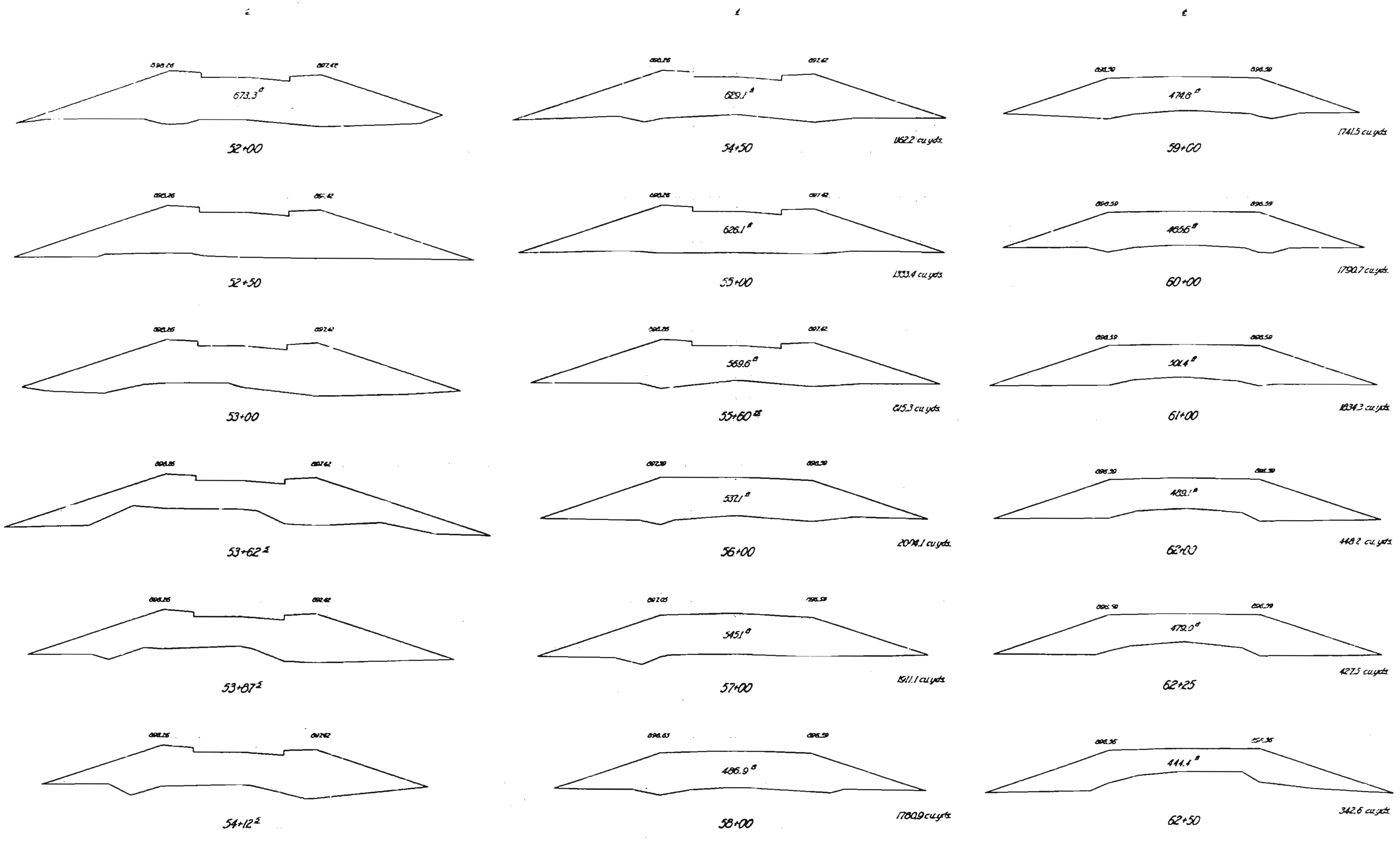
SCALE [illegible]
[illegible] 6-24-39
[illegible] 6-26-39

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. E5

L-98

L-98



156

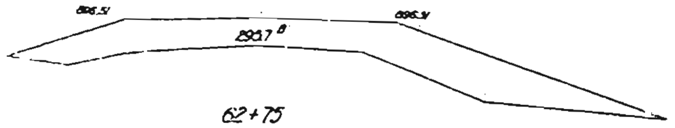
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR

EARTHWORK CROSS-SECTIONS
STA 52+00 to STA 62+50

SCALE
ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET No. F6

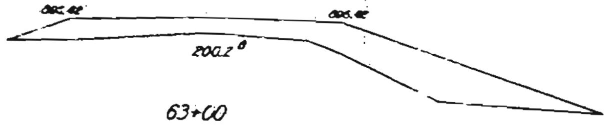
L-98

L-98



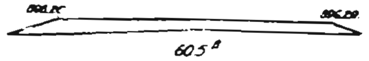
62+75

229.6 cu yds.



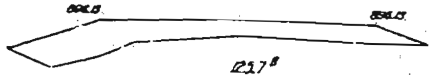
63+00

120.7 cu yds.



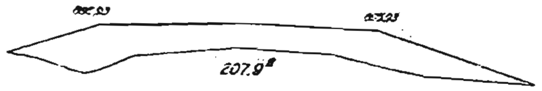
63+25

55.2 cu yds.



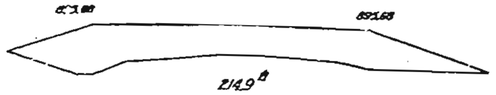
63+50

154.4 cu yds.



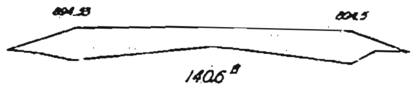
63+75

195.7 cu yds.



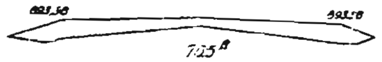
64+00

658.3 cu yds.



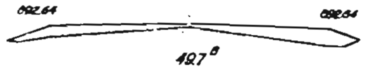
65+00

402.0 cu yds.



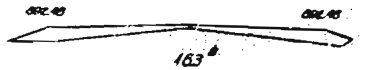
66+00

233.7 cu yds.



67+00

133.3 cu yds.



67+75

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EARTHWORK CROSS-SECTIONS
STA 62+75 TO STA 67+75

SCALE 1" = 10'-0"
R.A.M.
R.A.M.

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. F7

L-98

L-98

H11-1
(80)

PLANS FOR BROWNVILLE BRIDGE

DRAWINGS 1 TO 33
EARTHWORK CROSS-SECTIONS F1 to F7

SKETCHES

L2 - Bridge Right of Way in
L3 - Right of Way in Missouri -
L5 - Raising & Extension of Embankment - East Approach
L6 - Light Support Beams
L7 - Sheet to Show Length of Metal Slope Drains req'd for Missouri Approach to Bridge
L8 - Garage floor at Toll House (Traced on Dwg. 30)
L10 - Alternate Plan for "Supports for Armored Cable."
Sk.1 - Jacking Stiffeners
S2 - Location of Signs at Intersec. of Highways 4 & 275
S3 - Sketch of Proposed Sign
S4 - Proposed Additional Slope Drains

TABULATION OF BIDS

Contract 1 - Substructure
Contract 2 - Superstructure
Contract 4 - Paving
Contract 5 - Lighting
Contract 6 - Fender & Riprap
Contract 7 - Toll House

158

L-98
L-98

ATCHISON COUNTY, MISSOURI - MISSOURI RIVER BRIDGE AT BROWNVILLE, NEBR.
PWA DOCKET MISSOURI NO. 1099-F
BIDS RECEIVED BY COUNTY COURT, ATCHISON COUNTY, NOVEMBER 14, 1938

I certify that the figures given on the accompanying pages 1, 2, 3, 4, 5 and 6 comprise a complete and correct tabulation of all bids received by the County Court of Atchison County, Missouri, on November 14, 1938 for the construction of the Missouri River Bridge Project at Brownville, Nebraska, PWA Docket Missouri No. 1099-F

County Clerk, Atchison County

159

L-98

(9)

ATCHISON COUNTY, MISSOURI - MISSOURI RIVER BRIDGE AT BROWNVILLE, NEBR.
PWA DOCKET MISSOURI NO. 1099-F
BIDS RECEIVED BY COUNTY COURT, ATCHISON COUNTY, NOVEMBER 14, 1938

CONTRACT NO. I Substructure		Estimated Quantities	C. F. Lytle Co. Sioux City, Ia.		Keliher Constr. Co. Dallas, Texas	
Item	Description		Unit Bid	Amount	Unit Bid	Amount
	Piers 2, 3, & 4 Alternate I					
I-1	Bases of Piers	5,200 cu.yds.			30.00	156,000.
I-2	Shafts of Piers	1,610 " "			26.00	41,860.
I-3	Reinforcing Steel	230,000 lbs.			.0433	9,959.
	Total - Alternate I					207,819.
II-1	Steel Sheet Bearing Piles	1,160,000 lbs.	.086	99,760.	.06	69,600.
II-2	Concrete Cylinder Bases	2,110 cu.yds.	11.60	24,476.	23.00	48,530.
II-3	Shafts & Base Caps	2,070 " "	20.80	43,056.	28.40	58,788.
II-4	Reinforcing Steel	80,000 lbs.	.042	3,360.	.0433	3,464.
	Total - Alternate II			170,652.		180,382.
	Piers 1, 5, 6, 7, 8 & 9 and Abutments					
5	Steel Bearing Piles	575,000 lbs.	.063	36,225.	.05	28,750.
6	Concrete	1,640 cu.yds.	19.50	31,980.	25.00	41,000.
7	Reinforcing & Angle Nosing	65,000 lbs.	.044	2,860.	.0433	2,814.50
8	Bronze Inscription Plates	A Lump Sum		280.		200.
	Total Contract 1, Alternate I					280,583.50
	Total Contract 1, Alternate II			241,997.		253,146.50

160

6-98

10

ATCHISON COUNTY, MISSOURI - MISSOURI RIVER BRIDGE AT BROWNVILLE, NEBR.
PWA DOCKET MISSOURI NO. 1099-F
BIDS RECEIVED BY COUNTY COURT, ATCHISON COUNTY, NOVEMBER 14, 1938

CONTRACT NO. I Substructure		Estimated Quantities	Massman Constr. Co. K.C. Mo.		Mo. Valley Bridge & Iron Co. & K.C. Bridge Co.	
Item	Description		Unit Bid	Amount	Unit Bid	Amount
	Piers 2, 3, & 4 Alternate I					
I-1	Bases of Piers	5,200 cu.yds.	32.00	166,400.	33.60	174,720.
I-2	Shafts of Piers	1,610 " "	20.00	32,200.	25.00	40,250.
I-3	Reinforcing Steel	230,000 lbs.	.055	12,650.	.05	11,500.
	Total - Alternate I			211,250.		226,470.
II-1	Steel Sheet Bearing Piles	1,160,000 lbs.	.08	92,800.	.102	118,320.
II-2	Concrete Cylinder Bases	2,110 cu.yds.	15.00	32,650.	10.00	21,100.
II-3	Shafts & Base Caps	2,070 " "	30.00	62,100.	25.00	51,750.
II-4	Reinforcing Steel	80,000 lbs.	.055	4,400.	.07	5,600.
	Total - Alternate II			190,950.		196,770.
	Piers 1, 5, 6, 7, 8 & 9 and Abutments					
5.	Steel Bearing Piles	575,000 lbs.	.065	37,375.	.065	37,375.
6	Concrete	1,640. cu.yds.	30.00	49,200.	30.00	49,200.
7	Reinforcing & Angle Nosing	65,000 lbs.	.055	3,575.	.07	4,550.
8	Bronze Inscription Plates	A Lump Sum		400.		75.
	Total Contract 1, Alternate I			301,800.		317,670.
	Total Contract 1, Alternate II			281,500.		287,970.

161

L-98

(11)

ATCHISON COUNTY, MISSOURI - MISSOURI RIVER BRIDGE AT BROWNVILLE, NEBR.
PWA DOCKET MISSOURI NO. 1099-F
BIDS RECEIVED BY COUNTY COURT, ATCHISON COUNTY, NOVEMBER 14, 1938

CONTRACT NO. 2 Superstructure		Estimated Quantities	Bethlehem Steel Bethlehem, Pa.		American Bridge Co. St. Louis, Mo.		Mo. Valley & K.C. Bridge Co.	
Item	Description		Unit Bid	Amount	Unit Bid	Amount	Unit Bid	Amount
1	Structural Metal: Erected & Painted	4,010,000 #	.0627	251,427	.0628	251,828	.067	268,670
2	Concrete in Slabs on Spans	1,050 cuyds.	20.	21,000	30.	31,500	25.	26,250
3	Reinforcing Metal	336,000 #	.045	15,120	.05	16,800	.055	18,480
	Total - Contract 2			287,547		300,128		313,400

			Wisconsin Bridge & Iron, Milwaukee.		Omaha Steel Wks. Omaha, Nebr.		Mt. Vernon Bridge Mt. Vernon, Ohio	
1	Structural Metal: Erected & Painted	4,010,000 #	.072	288,720	.075	300,750	.0775	310,775
2	Concrete in Slabs on Spans	1,050 cuyds.	34.00	35,700	25.00	26,250	25.00	26,250
3	Reinforcing Metal	336,000 #	.056	18,816	.06	20,160	.0475	15,960
	Total - Contract 2			343,236		347,160		352.985

162

L-98

12

ATCHISON COUNTY, MISSOURI - MISSOURI RIVER BRIDGE AT BROWNVILLE, NEBR.
PWA DOCKET MISSOURI NO. 1099-F
BIDS RECEIVED BY COUNTY COURT, ATCHISON COUNTY, NOVEMBER 14, 1938

CONTRACT NO. 3 Complete Bridge		Estimated Quantities	C.F. Lytle Co. Sioux City, Ia.		Keliher Constr. Co. Dallas, Tex.	
Item	Description		Unit Bid	Amount	Unit Bid	Amount
	Piers 2, 3, & 4 Alternate -I					
I-1	Bases of Piers	5,200 cuyds			30.00	156,000
I-2	Shafts of Piers	1,610 "			26.00	41,860
I-3	Reinforcing Steel	230,000 #			.0433	9,959
	Total - Alternate I					207,819
	Piers 2, 3, & 4 - Alternate II					
II-1	Steel Sheet Bearing Piles	1,160,000 #	.077	89,320	.06	69,600
II-2	Concrete Filling in Pile Cylinder Bases	2,100 cuyds	10.24	21,606.40	23.00	48,530
II-3	Shafts & Base Caps	1,960 "	18.35	35,966	28.40	55,664
II-4	Reinforcing Steel	80,000 #	.037	2,960	.0433	3,464
	Total - Alternate II			149,852.40		177,258
	Piers 1, 5, 6, 7, 8 & 9 & Abutments					
5	Steel Bearing Piles	575,000 #	.057	32,775	.05	28,750
6	Concrete	1,640 cuyds	17.12	28,076.80	25.00	41,000
7	Reinforcing & Angle Nosing	65,000 #	.038	2,470	.0433	2,814.50
8	Bronze Inscription Plates	A Lump Sum		244		200
9	Structural Metal: Erected & Painted	4,010,000 #	.0765	306,765	.065	260,650
10	Concrete in Slabs on Spans	1,050 cuyds	17.40	18,270	25.00	26,250
11	Reinforcing Metal	336,000 #	.043	14,448	.055	18,480
	Total Contract 3 - Alternate I					585,963.50
	Total Contract 3 - Alternate II			552,901.20		555,402.50

163

L-98

(13)

ATCHISON COUNTY, MISSOURI - MISSOURI RIVER BRIDGE AT BROWNVILLE, NEBR.
PWA DOCKET MISSOURI NO. 1099-F
BIDS RECEIVED BY COUNTY COURT, ATCHISON COUNTY, NOVEMBER 14, 1938

164

CONTRACT NO. 3 Complete Bridge		Estimated Quantities	Mo. Valley Bridge Co.& K.C.BridgeCo.		Omaha Steel Wks. Omaha, Nebr.	
Item	Description		Unit Bid	Amount	Unit Bid	Amount
	Piers 2, 3, & 4 Alternate -I					
I-1	Bases of Piers	5,200 cuyds	33.60	174,720	40.00	208,000
I-2	Shafts of Piers	1,610 "	25.00	40,250	20.00	32,200
I-3	Reinforcing Steel	230,000 #	.05	11,500	.05	11,500
	Total Alternate I			226,470		251,700
	Piers 2, 3, & 4 - Alternate II					
II-1	Steel Sheet Bearing Piles	1,160,000 #	.102	118,320	.09	104,400
II-2	Concrete Filling in Pile Cylinder Bases	2,100 cuyds	10.00	21,100	21.00	44,310
II-3	Shafts & Base Caps	1,960 "	25.00	49,000	20.00	39,200
II-4	Reinforcing Steel	80,000 #	.07	5,600	.05	4,000
	Total Alternate II			194,020		191,910
	Piers 1, 5, 6,7,8 & 9 & Abutments					
5	Steel Bearing Piles	575,000 #	.065	37,375	.06	34,500
6	Concrete	1,640 cuyds	30.00	49,200	20.00	32,800
7	Reinforcing & Angle Nosing	65,000 #	.07	4,550	.05	3,250
8	Bronze Inscription Plates	A Lump Sum		75		300
9	Structural Metal: Erected & Painted	4,010,000 #	.067	268,670	.073	292,730
10	Concrete in Slabs on Spans	1,050 cuyds	22.00	23,100	25.00	26,250
11	Reinforcing Metal	336,000 #	.055	18,480	.05	16,800
	Total Contract 3 - Alternate I			627,920		658,330
	Total Contract 3 - Alternate II			595,470		598,540

6-98

14

ATCHISON COUNTY, MISSOURI - MISSOURI RIVER BRIDGE AT BROWNVILLE, NEBR.
PWA DOCKET MISSOURI NO. 1099-F
BIDS RECEIVED BY COUNTY COURT, ATCHISON COUNTY, NOVEMBER 14, 1938

CONTRACT NO. 4 Embankment Approaches		Estimated Quantities	C.H. Atkinson Paving Co. St. Joseph, Mo.		Cook O'Brien Cons.Co. Kansas City, Mo.		E.A. Wickham & Co. Council Bluffs,	
Item	Description		Unit Bid	Amount	Unit Bid	Amount	Unit Bid	Amount
1.	Clearing & Grubbing	A Lump Sum		5,000		250.		1,000
2.	Embankment	85,000 cuyds	0.32	27,200	0037	31,450	0.35	29,750
3.	Completed Concrete Pavement	8,450 sqyds	2.85	24,082.50	3.00	25,350	2.90	24,505
4.	Miscellaneous concrete	50 cuyds	25.00	1,250	20.00	1,000	20.00	1,000
5.	Embedded Metal in Misc. Concrete	5,000 #	.05	250	.10	500	.07	350
6.	Metal Slope Drains	50 Lin.Ft.	2.50	125	2.00	100	3.00	150
7.	Complete Guard Fence	1,400 Lin.Ft.	1.25	1,750	1.00	1,400	1.00	1,400
8.	Complete Concrete Culvert Pipes	80 Lin.Ft.	4.00	320	3.00	240	3.00	240
9.	Complete Toll House	A Lump Sum		800		1,200		2,800
10.	Embankment Protection	2,000 sq.yds	0.50	1,000	2.00	4,000	4.00	8,000
	Total - Contract 4			61,777.50		65,490		69,195

LOW BIDS

CONTRACT 1 - Alternate II,	C.F. Lytle Co.	$241,997.
CONTRACT 2	Bethlehem Steel Co.	287,547.
MAIN BRIDGE = CONTRACT 3		529,544
CONTRACT 4	Atkinson Paving Co.	61,777.50
TOTAL PROJECT		591,321.50
ENGINEER'S ESTIMATE		593,000.00

165

6-98

15

ATCHISON COUNTY, MISSOURI
MISSOURI RIVER BRIDGE
AT
BROWNVILLE, NEBRASKA

PWA PROJECT MISSOURI NO. 1099-F

Bids Received 10:00 A.M. Oct. 9
for
LIGHTING SYSTEM FOR
BRIDGE AND APPROACHES

CONTRACT NO. 5

	NAME	ADDRESS	AMOUNT	$500.
1.	Mann Electric Co.	Troy, Kas.	$ 3444.80	Check
2.	Interstate Construction Co.	Rulo, Nebr.	3718.00	Bond
3.	A.Tucker Electric Co.	Topeka, Kas.	4089.00	Bond
4.	J.H. MacKay Electric Co.	Kansas City, Mo.	4400.00	Bond
5.	Crescent Electric Co.	Kansas City, Mo.	4458.00	Check
6.	Sterling Electric Co.	Omaha, Nebr.	4728.00	Bond
7.	Squire Electric Co.	Kansas City, Mo.	6500.00	Check

STATE OF MISSOURI :
: SS.
County of Atchison :

I certify that the above is a correct tabulation of all bids received by the County Court of Atchison County for Contract No. 5.

Loren W. Coe
County Clerk

TABULATED AND VERIFIED,

ASH, HOWARD, NEEDLES & TAMMEN

By E. E. Howard

166

L-98

⑯

ATCHISON COUNTY, MISSOURI
MISSOURI RIVER BRIDGE
AT
BROWNVILLE, NEBRASKA

PWA PROJECT MISSOURI NO. 1099-F

BIDS RECEIVED 10:00 A.M. Dec. 1

for

MAINTENANCE, STORAGE AND GARAGE
BUILDING

CONTRACT NO. 7

NAME	ADDRESS	AMOUNT	$500.00
1. Mr. Lee F. Caldwell Jr.	Kansas City, Mo.	$ 1567.75	Check

STATE OF MISSOURI)
: SS.
County of Atchison)

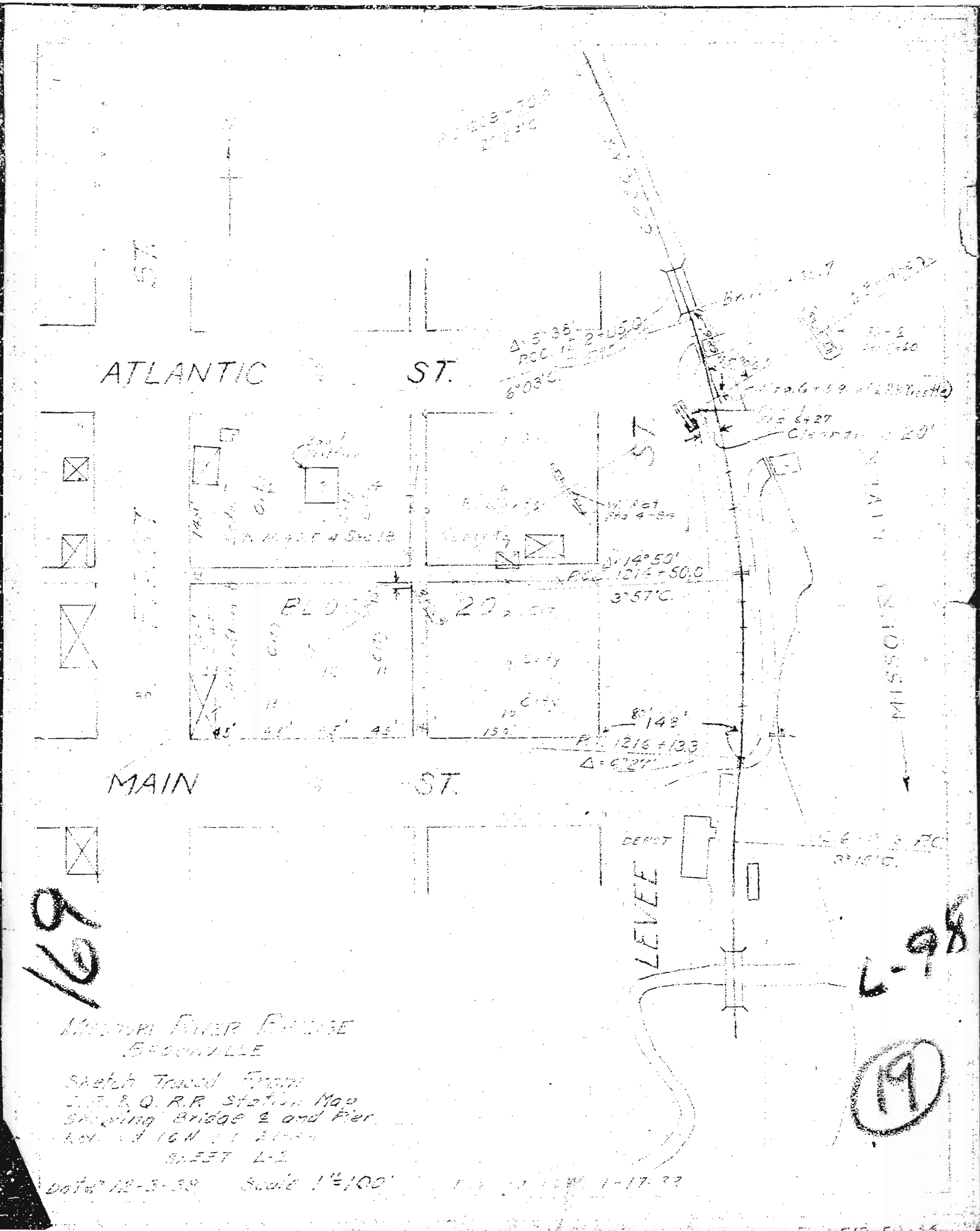
I certify that the above is a correct tabulation of all bids received by the County Court of Atchison County for Contract No. 7.

6-98

168

/s/ Loren W. Coe
Clerk of the Atchison County,
County Court

18



Missouri River Bridge
Boonville

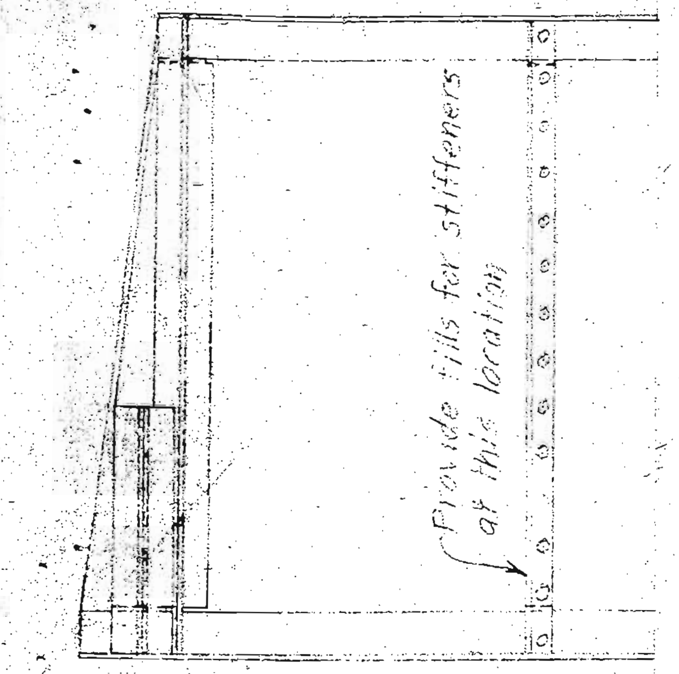
Sketch Traced From
C.B. & Q. R.R. Station Map
Showing Bridge ℄ and Pier.
Rev. [illegible] 1 6 N [illegible]
Sheet L-1

Dated 12-3-39 Scale 1"=100' [illegible] 1-17-39

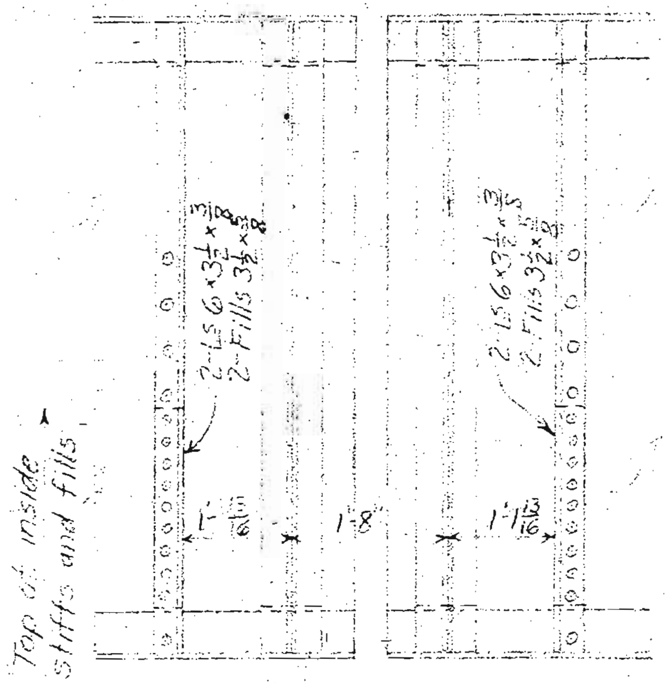
169

L-98

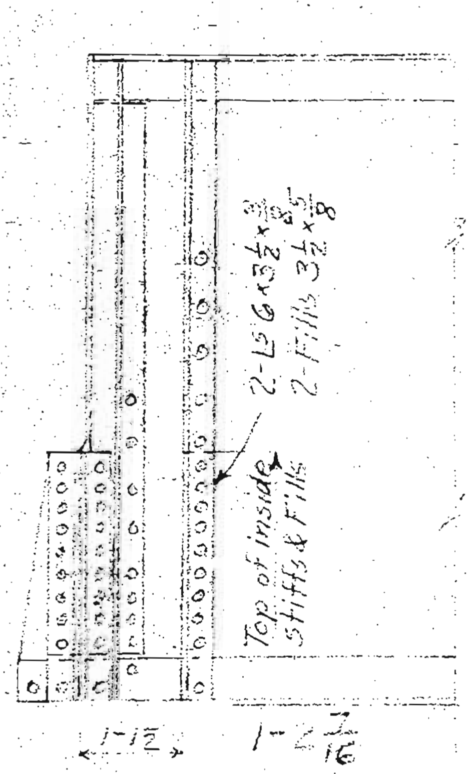
(19)



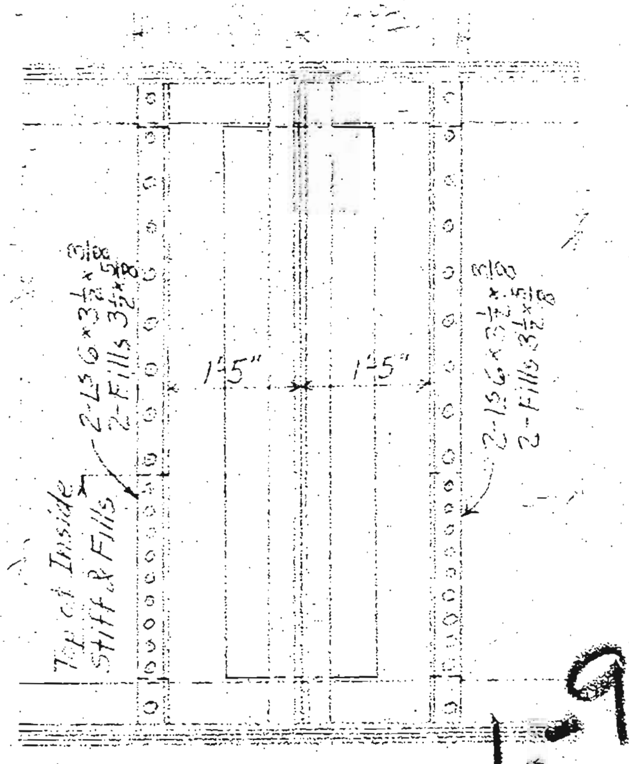
E. & W. ABUTMENTS



PIER 7



PIERS 2 & 4



PIERS 1-5-6-8 & 9

L-98

20

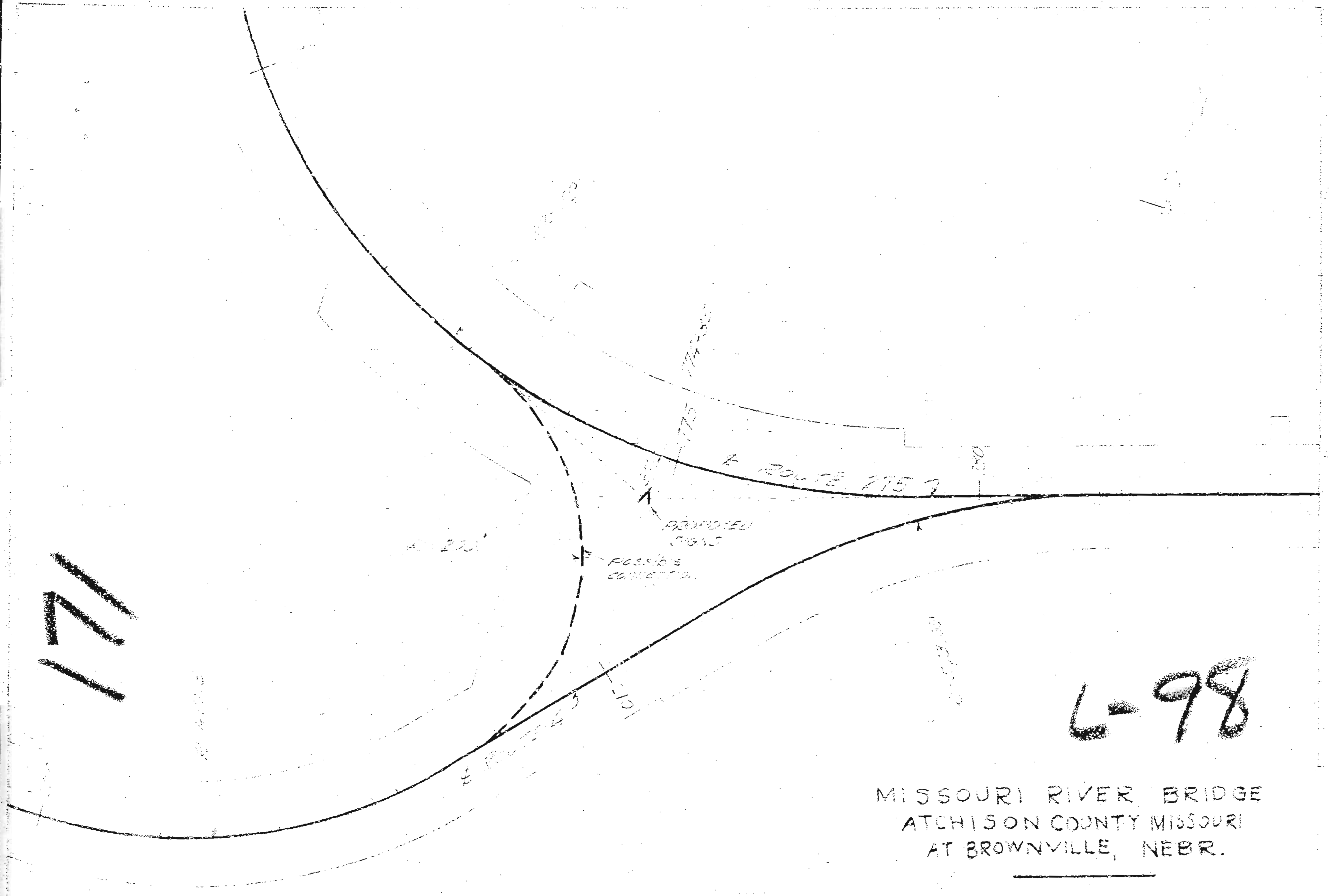
170

Missouri River Bridge
Atchison County, Missouri
at Brownville, Nebraska
Jacking Stiffeners on Girders

Sketch SK1
Feb. 1, 1939

Ash-Howard-Needles & Tammen
Consulting Engineers
Kansas City New York

F16-068



171

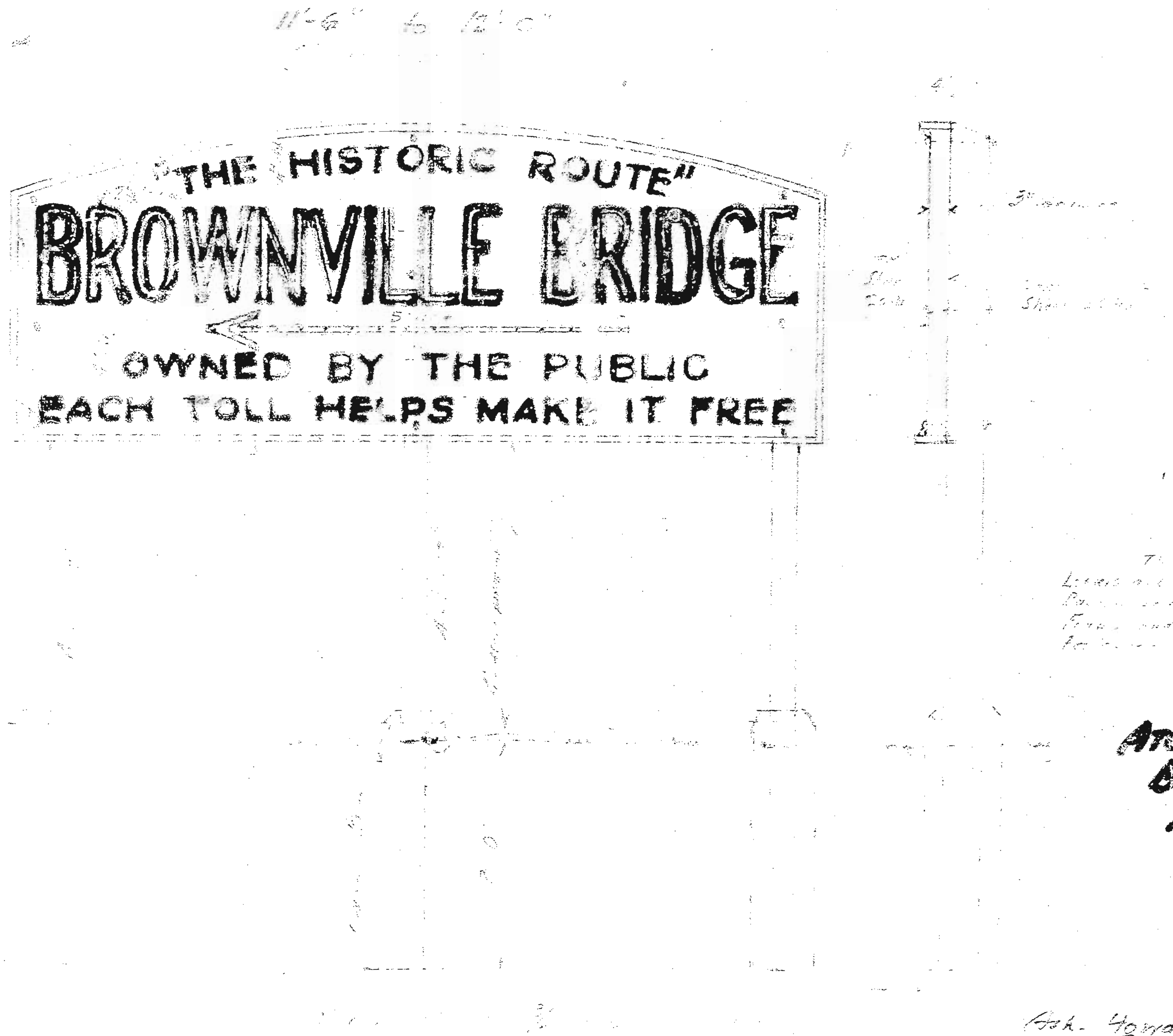
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY MISSOURI
AT BROWNVILLE, NEBR.

LOCATION OF SIGNS AT INTERSECTION
OF HIGHWAY 4 & HIGHWAY 275

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

1" = 100' Date 11-17-39 SHEET No. 52



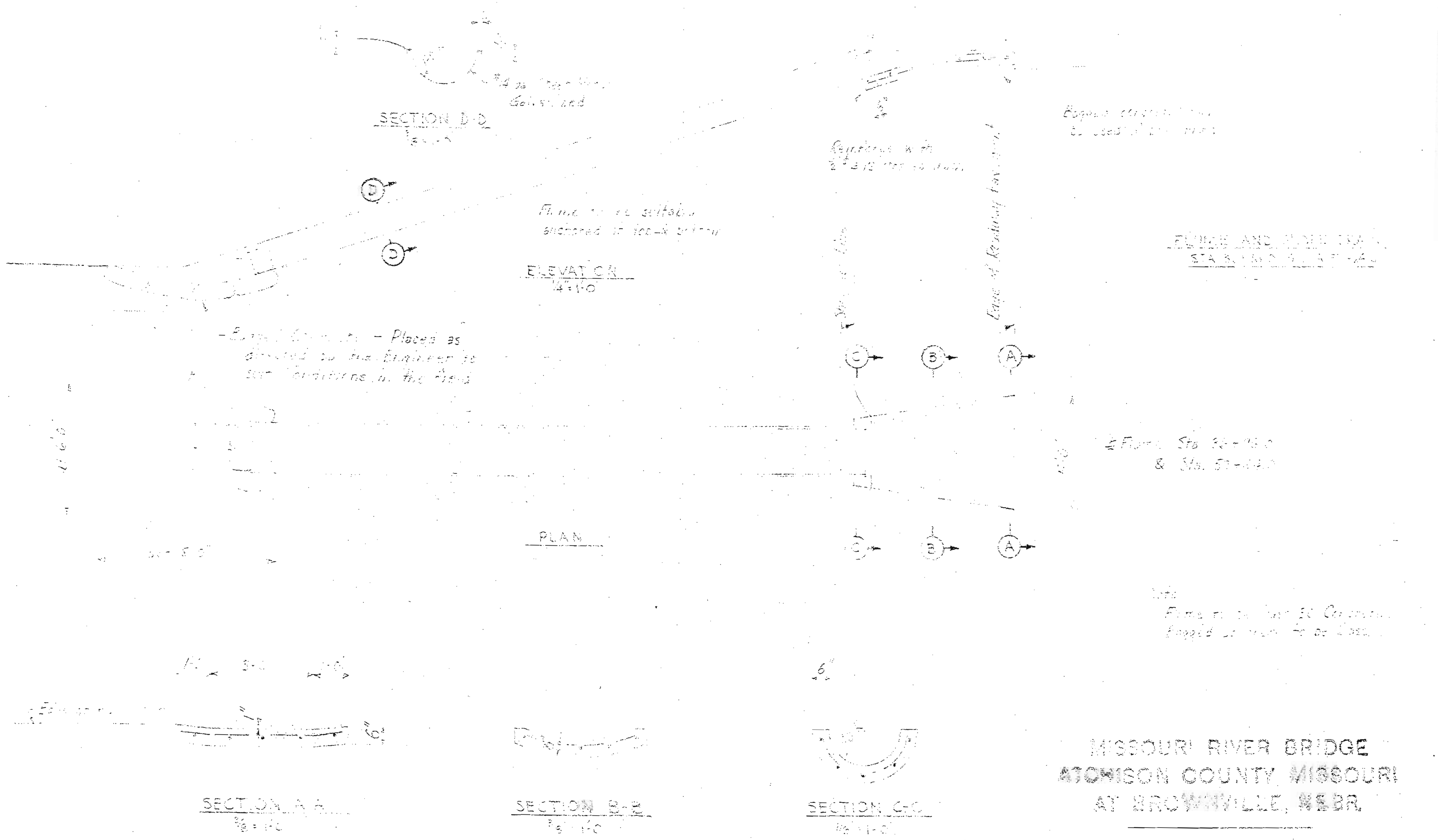
ATCHISON COUNTY, MO.
BROWNVILLE BRIDGE
P.W.A. MO. No 1099 F
ROAD SIGNS
2 REQD
1 RT. ARROW
1 LEFT "

Ash-Howard-Needles & Tammen
Consulting Engineers.

L-98

172

173

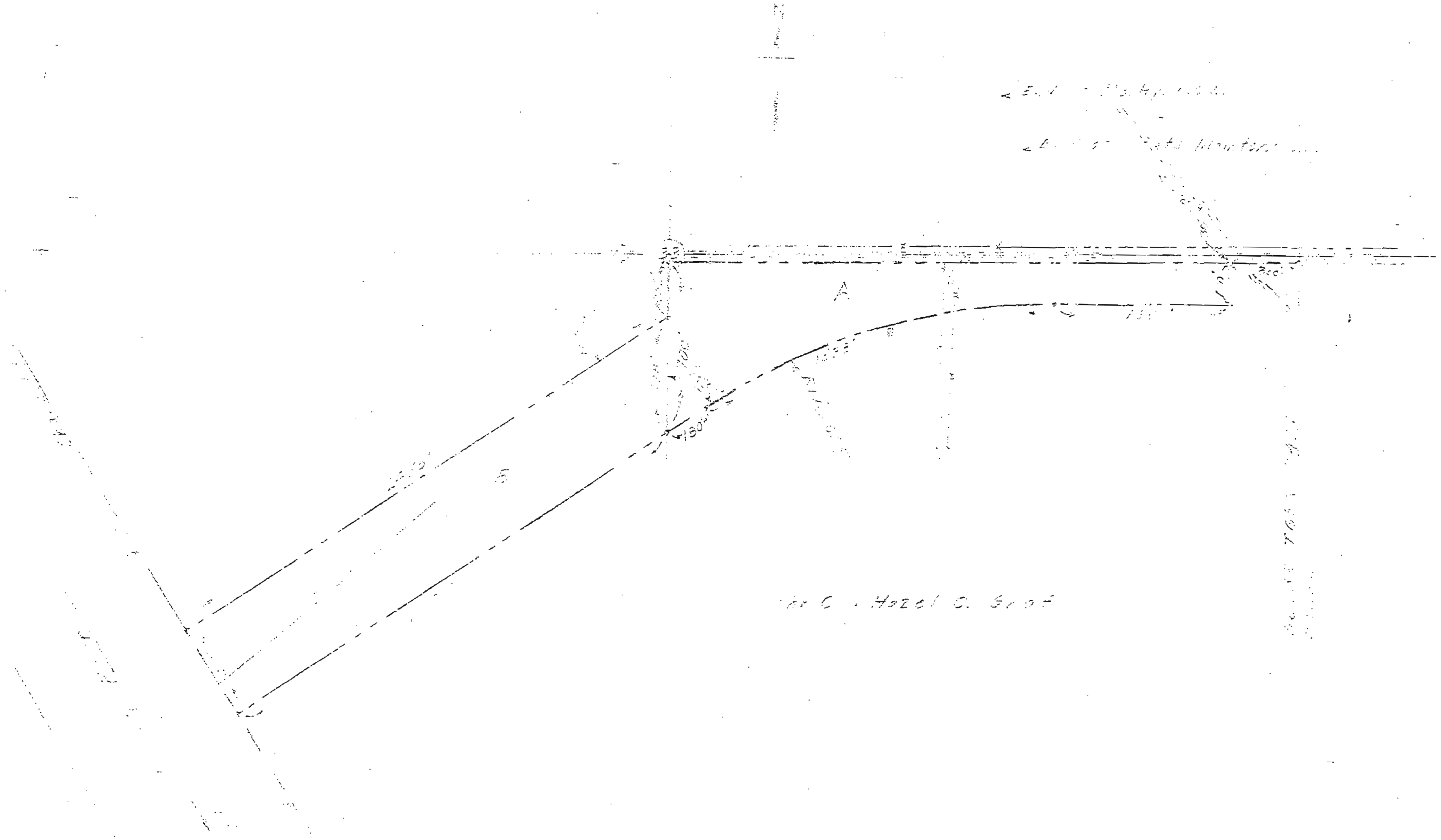

SECTION D-D
#4 as ... Galvanized
ELEVATION
$\frac{1}{4}$" = 1'-0
Flume to be suitably anchored at ... bottom
Riprap ... Placed as directed by the Engineer to suit conditions in the field
PLAN
D
C
B
A
Edge of Roadway ...
Bogus ... be used ...
℄ Flume Sta. ... & Sta. ...
Flume to be ... Corrugated ...
SECTION A-A
SECTION B-B
SECTION C-C
6"
$\frac{3}{8}$" = 1'-0"

FLUME AND ... DRAIN
STA. ...

MISSOURI RIVER BRIDGE
ATCHISON COUNTY MISSOURI
AT BROWNVILLE, NEBR.

... NEEDLES & TAMMEN
... ENGINEERS
... NEW YORK
SHEET NO. 54

T.G.H. 5-5-41



L-98

174

MISSOURI RIVER BRIDGE
ATCHISON COUNTY MISSOURI
AT BROWNVILLE, NEBR.

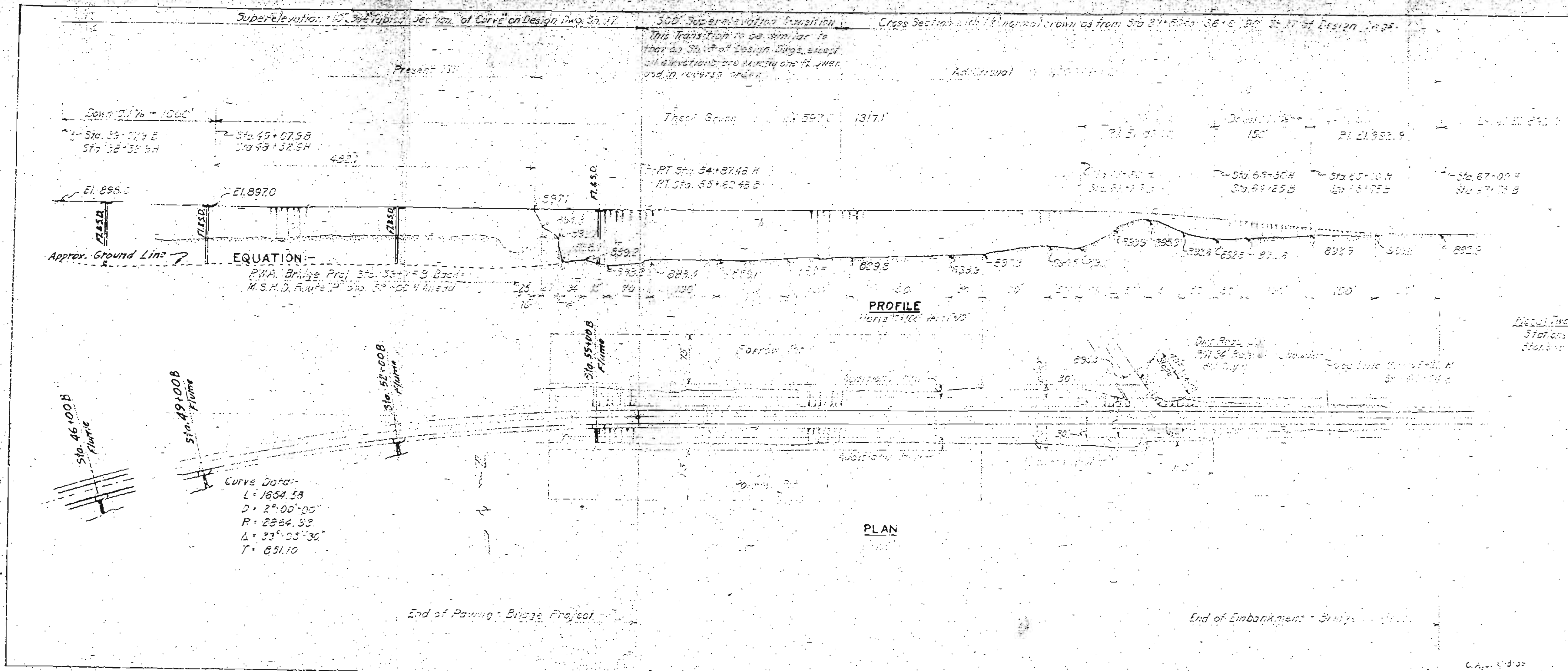
RIGHT OF WAY
IN
MISSOURI

[illegible]
CONSULTING ENGINEERS
1012 BALTIMORE AVENUE
KANSAS CITY, MO.

SHEET NO.

30-1

175


Superelevation ... See Typical Section of Curve on Design Dwg. Sh. 17
300' Superelevation Transition
This Transition to be similar to that on Sh. 17 of Design Dwgs. except all elevations are exactly one ft. lower and in reverse order.
Cross Section with ... normal crown as from Sta. ... Sh. 17 of Design Dwgs.
Present ...
Additional ...
Theor. Grade
1317.1
Down 0.1% - 1000'
Sta. 39+57.9 B
Sta. 32+39.9 H
Sta. 49+57.98
Sta. 43+32.5 H
PT Sta. 54+87.48 H
PT Sta. 55+62.48 B
Sta. 63+30 H
Sta. 63+25 B
Sta. 65+10 H
Sta. 67+00 H
El. 898.0
El. 897.0
El. 893.9
Approx. Ground Line
EQUATION:-
P.W.A. Bridge Proj. Sta. 53+ ... B Back
M.S.H.D. Route "P" Sta. 53+00 H Ahead
Flume
PROFILE
Horiz. 1"=100' Vert. 1"=5'
Sta. 46+00 B Flume
Sta. 49+00 B Flume
Sta. 52+00 B Flume
Sta. 55+00 B Flume
Borrow Pit
Additional Width
Curve Data:-
L = 1654.58
D = 2°-00'-00"
R = 2864.93
Δ = 33°-05'-30"
T = 851.10
PLAN
End of Paving - Bridge Project
End of Embankment - Sta. ...
Note: Two sets of stations ...
Stations ... Bridge ...
Stations ... State Hwy. Dept. ...

C-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

RAISING AND EXTENSION OF
EMBANKMENT EAST APPROACH

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. L5

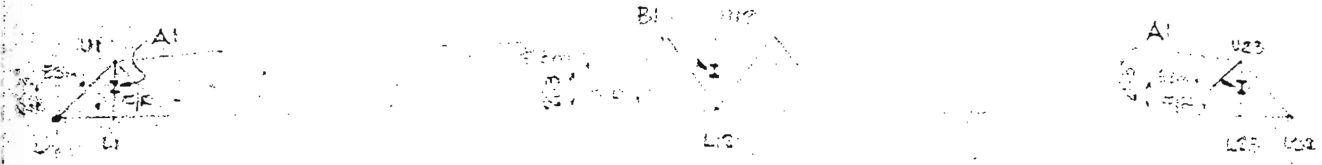
Rev. 9-30-39 Add. Flumes & Slope Drains G.B.D.

620

[illegible]

In Both Fly. [illegible]

Note. [illegible]

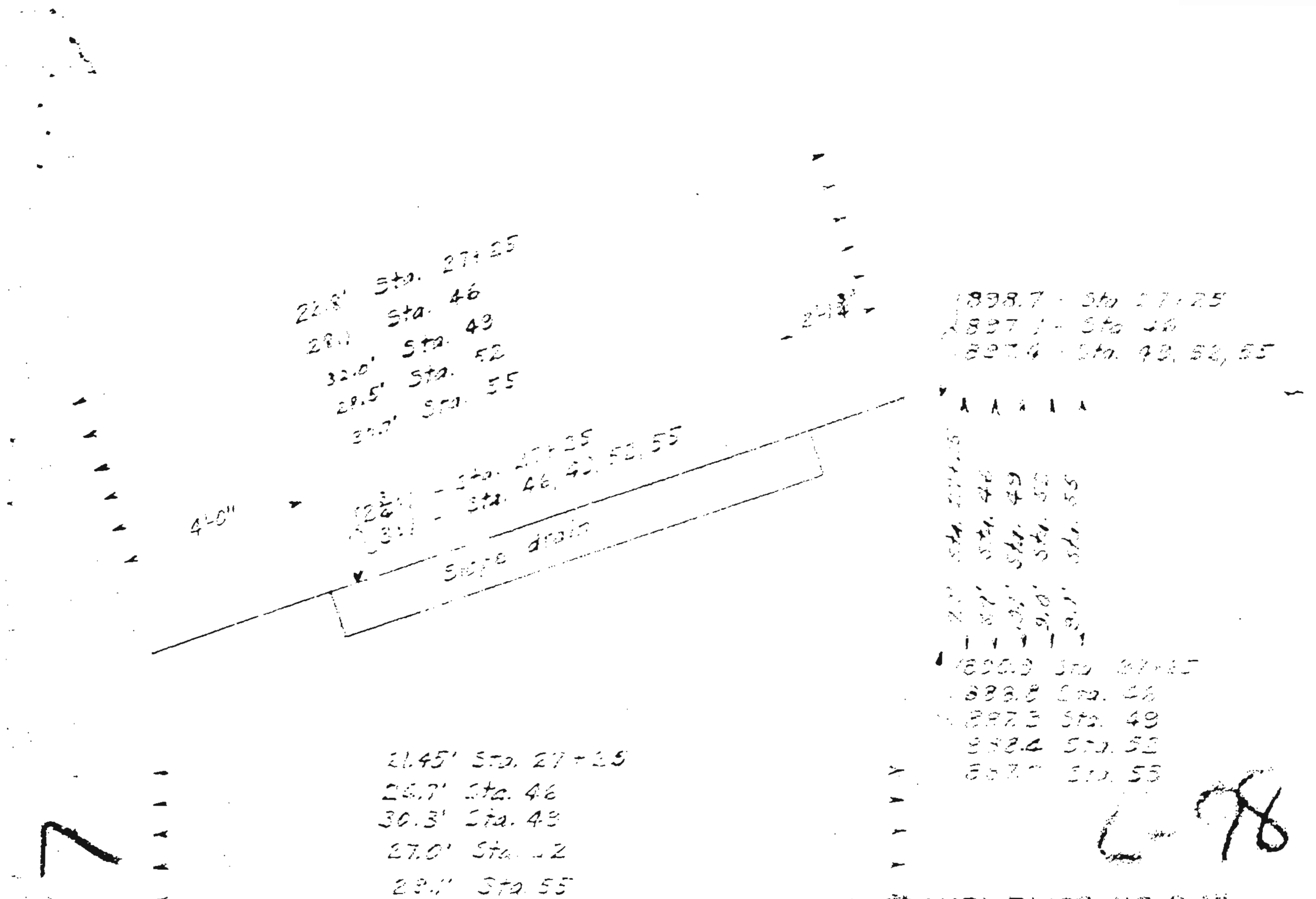


[illegible]

176

L-98

[illegible]



177

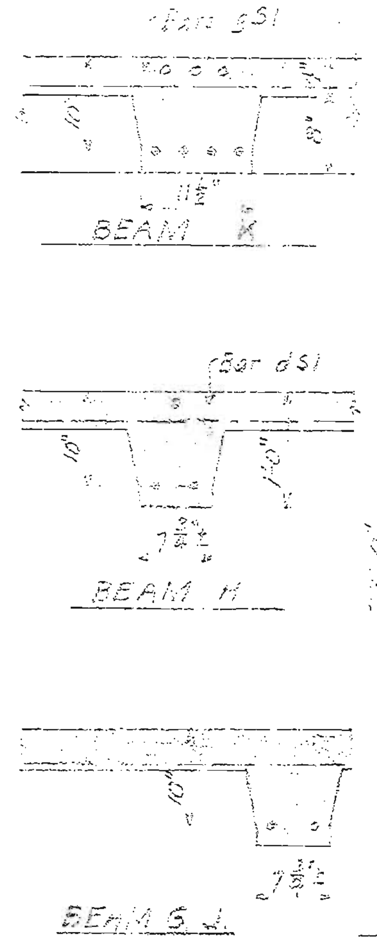
C-78

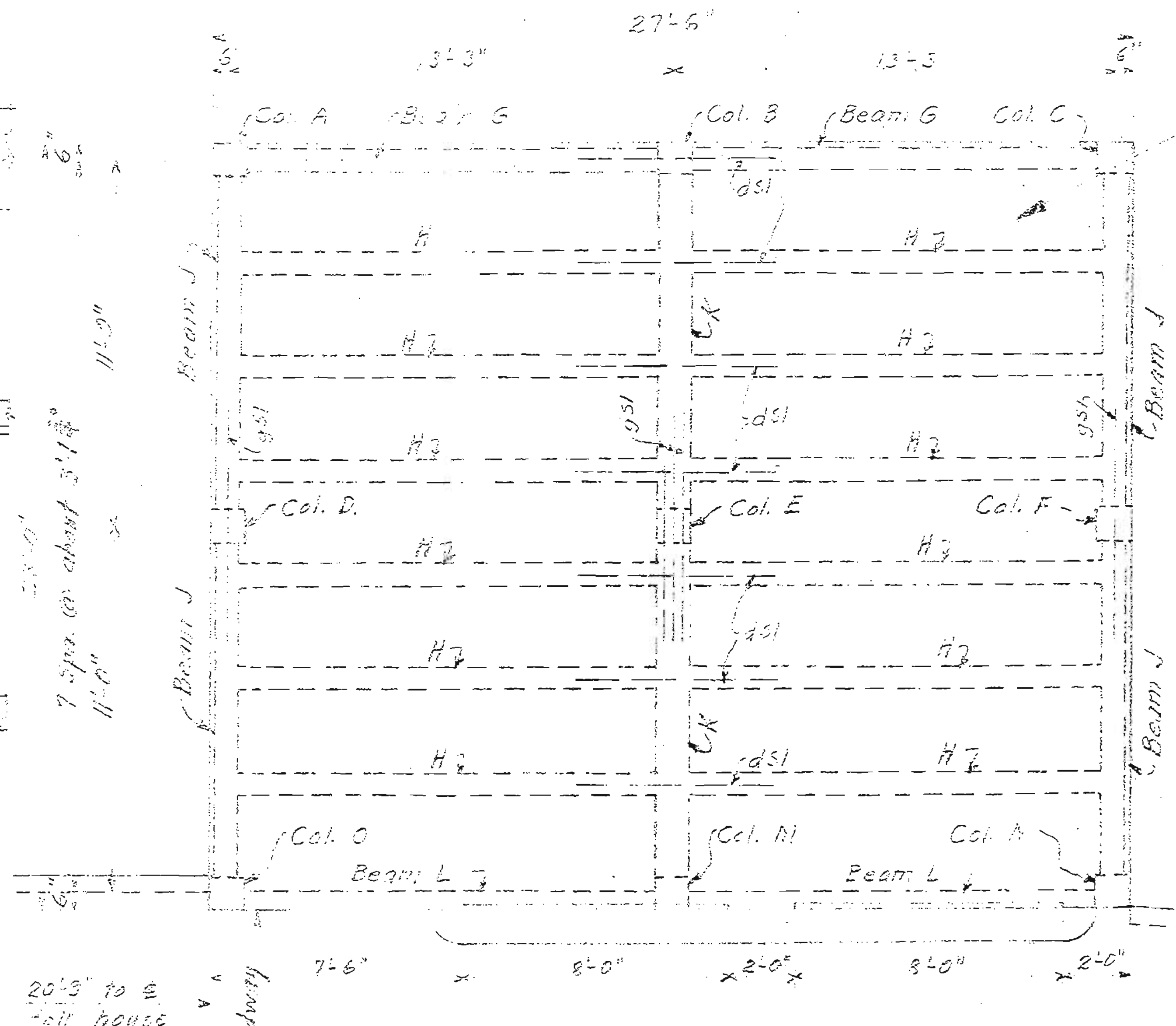
MISSOURI RIVER BRIDGE
ATCHISON COUNTY MISSOURI
AT BROWNVILLE NEBR.

G.A. - 10-14-39

SHEET 17

178





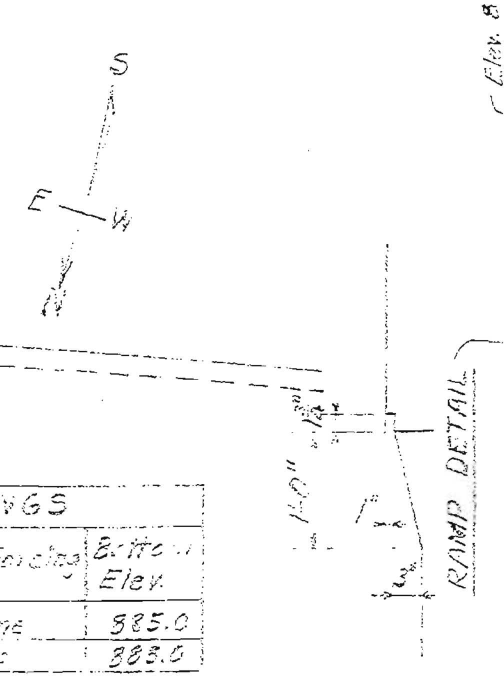
Place ¾" ø 0'-8" bolts in slab to attach timber plate of walls. See garage details.

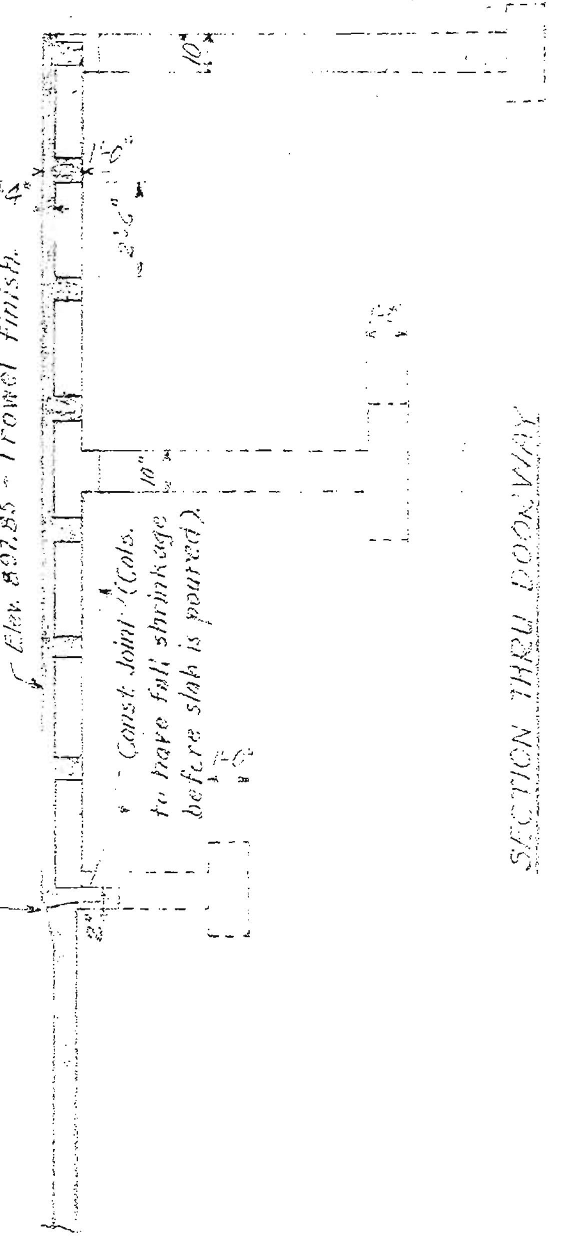
Slab reinforcing to be welded wire mesh made of # 6 wires @ 5" ctrs. each way. Cut in 22'-9" sheets. Lap side splices 6" at each lap. Wire securely. Place all slab reinforcing 1" from bottom of slab.

Bars in beams to be placed 2" from bottom of concrete. Column bars 2" from face of concrete.

Alter slab as necessary to fit architectural features and to provide for toilet near column A.

Concrete to be Class 30.




10"
1'-0"
4"
2'-6"
Elev. 897.85 - Trowel finish.
10"
Const. Joint - (Cols. to have full shrinkage before slab is poured).
1'-0"
2½"
SECTION THRU DOORWAY

BEAMS			COLUMNS			FOOTINGS		
Mark	Approx. Size	Reinforcing	Mark	Size	Reinf.	Size	Reinforcing	Bottom Elev.
G	8"x12"	2-1"φ - gS3	A, C	10 x 11½	4-¾"φ	[illegible] sq.	None	885.0
H	8"x12"	2-⅝"φ - dS2	B	10 x 11½	4-¾"φ	3'-[illegible] sq.	do	888.0
J	8"x12"	2-1"φ - gS2	D, F	10 x 11½	4-¾"φ	3'-[illegible] sq.	do	888.5
K	11½"x12"	4-1"φ - gS2	E	10 x 11½	4-¾"φ	3'-6" sq.	¾"φ @ 6" ctrs.	888.5
L	8"x24"	2-1"φ - gS3	N, O	10 x 11½	4-¾"φ	[illegible] sq.	None	892.5
			M	10 x 11½	4-¾"φ	3'-[illegible] sq.	do	892.5

BAR TABLE

No.	Mark	Size	Length	Bending
[illegible]	bS	¾"φ	3'-3"	28'-4" gS3 24'-0" gS2 26'-9" dS2
5	gS1	1"φ	7'-0"	
8	gS2	1"φ	24'-8"	
4	gS3	1"φ	29'-2"	
7	dS1	⅝"φ	6'-0"	
12	dS2	⅝"φ	28'-5"	
12	eS1	¾"φ	12'-6"	
12	eS2	¾"φ	9'-3"	
12	eS3	¾"φ	5'-3"	

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY MISSOURI
AT BROWNVILLE, NEBR.

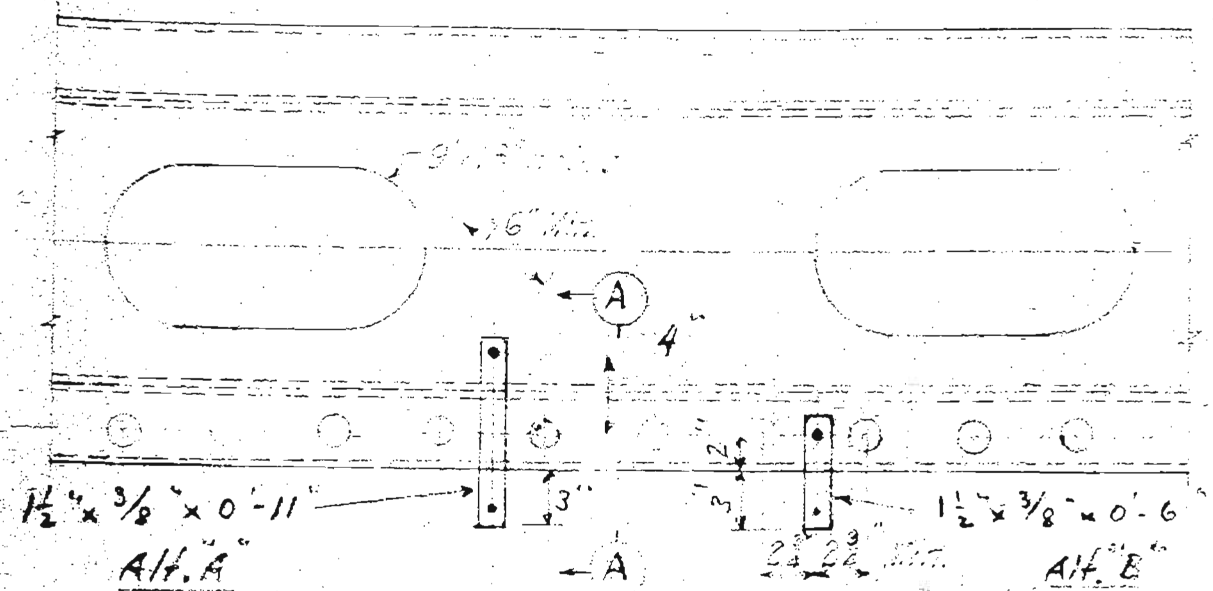
GARAGE FLOOR AT TOLL HOUSE

Scale ¼" = 1'-0" unless noted. G.A.-10-9-39 Sheet L8

620

16-1

179

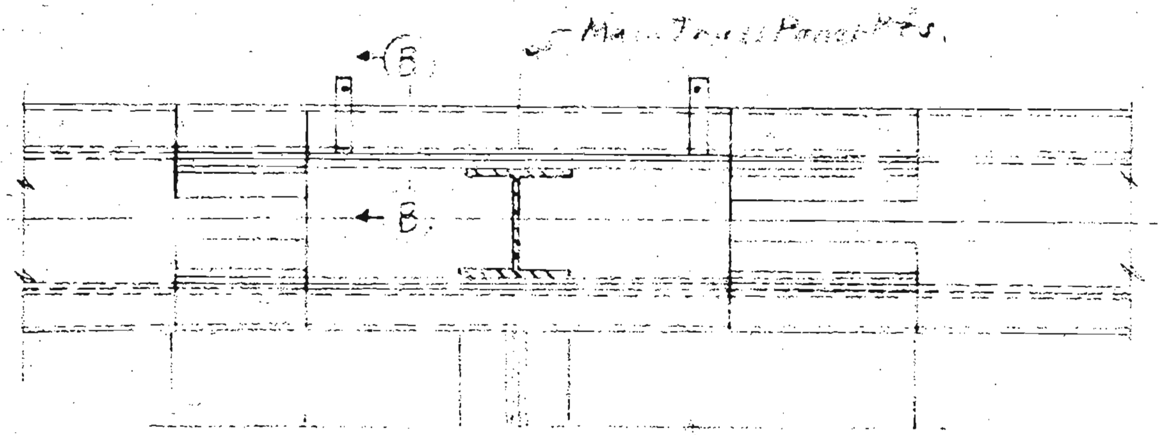


Alt. "A"
(Can be used except at Vert. Gussets)

PLAN

Alt. "B"
Can be used where rivets are at least 5½" ctrs.

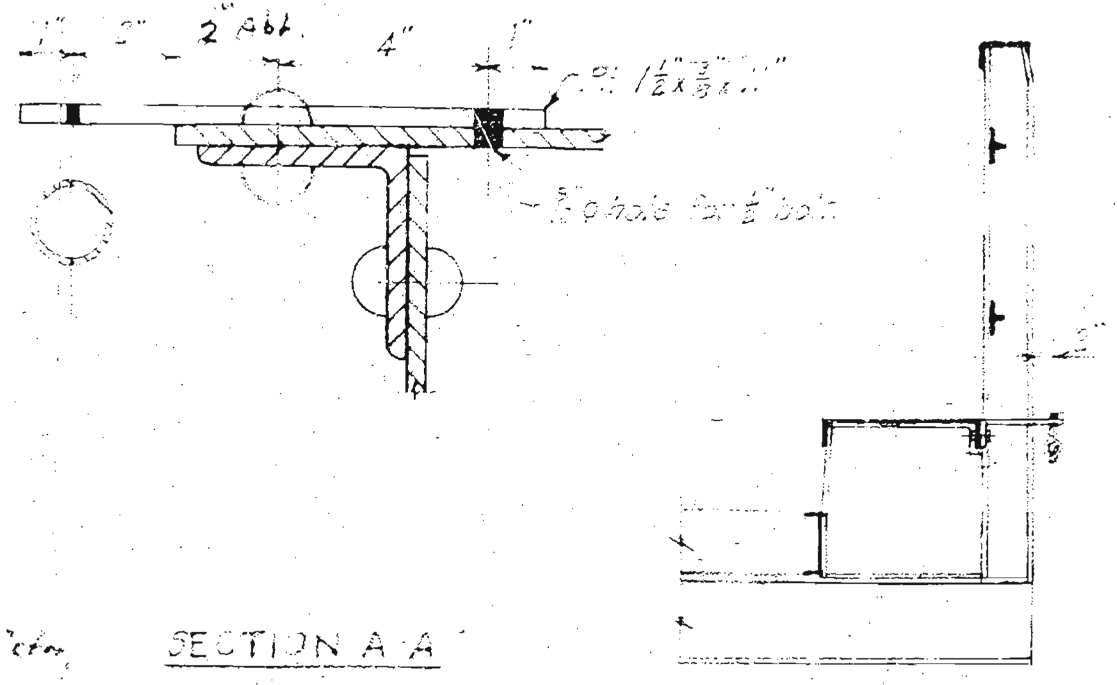
Sketch showing [illegible] 9/16" drilled holes [illegible] large holes [illegible] of bottom chord [illegible]



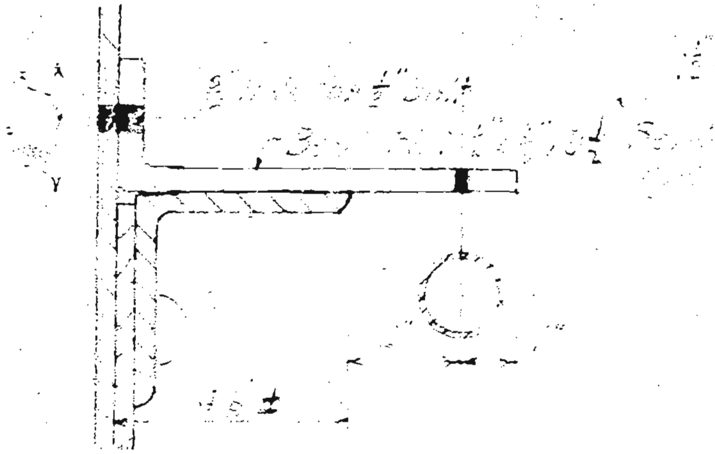
PLAN

[illegible]

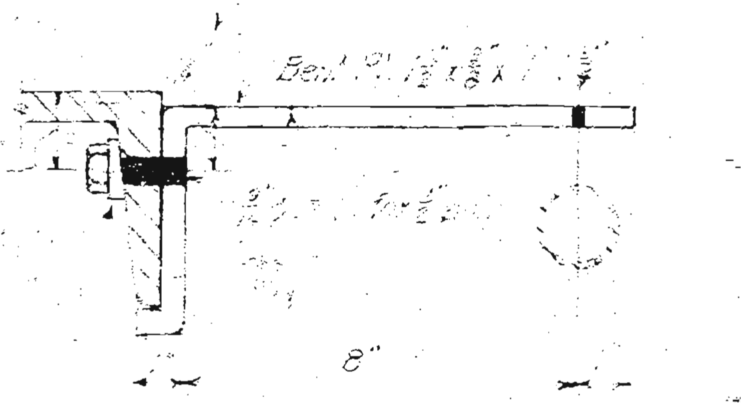
SUPPORTS FOR ARMORED CABLE



SECTION A-A



SECTION B-B
Abt. 40 Bent Bars Req'd at Vert. Gussets



GIRDER SUPPORTS

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

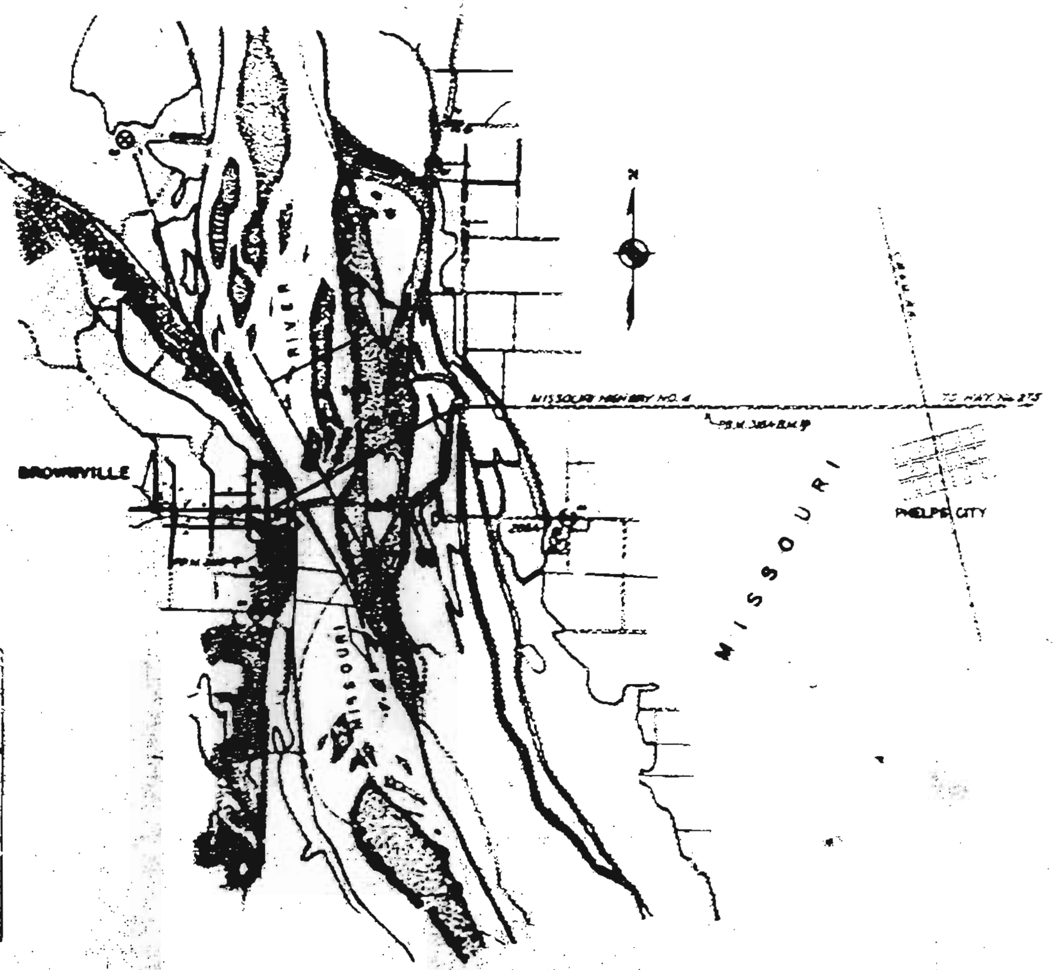
SHEET No. L-10

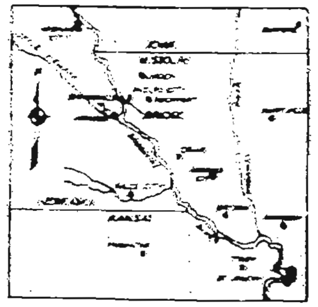
P.W.A. DOCKET, MO.NO.1099-F

MISSOURI RIVER BRIDGE

ATCHISON COUNTY, MISSOURI

AT BROWNVILLE, NEBR.





VICINITY MAP

LOCALITY MAP

LIST OF DRAWINGS

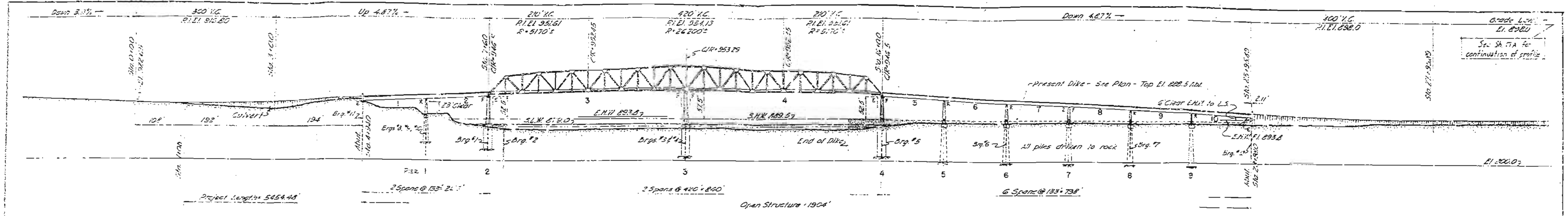
1 & 1A	GENERAL PLAN AND ELEVATION
2, 4, 5, 5A	TRUSS SPAN PIERS
3, 5A, 5B	GIRDER SPAN PIERS
6	ABUTMENTS
7	SHOES
8 TO 13	TRUSS SPANS, SUPERSTRUCTURE
14, 15	GIRDER SPANS, SUPERSTRUCTURE
16	EXPANSION JOINTS, HANDRAILS, ETC.
17, 18	APPROACH HIGHWAYS
19	TOLL HOUSE
20	EMBANKMENT PROTECTION
21, 22	NAME PLATES
23	FENDER DETAILS
24	ROADWAY LIGHTS ETC. AT TOLL HOUSE
25	PLAN AT BROWNVILLE BRIDGE PLAZA
26	PROFILE AT BROWNVILLE BRIDGE PLAZA
27	MISC. DETAILS AT BROWNVILLE PLAZA
28	TYPICAL LIGHTING DETAILS

L-98

180

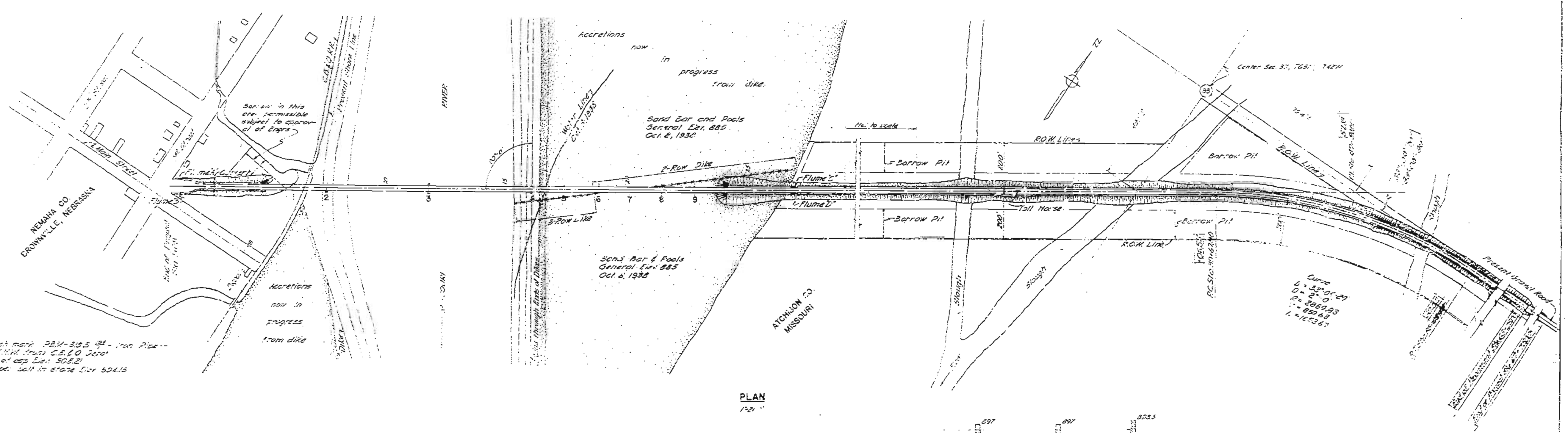
ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET A



ELEVATION

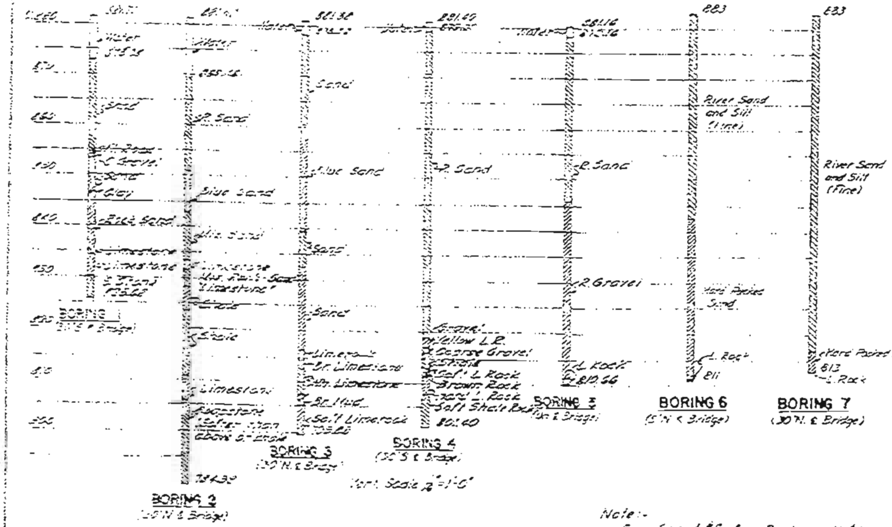
1"=100'



Bench mark PBM-3185 - Iron Pipe - 122' N.W. from C.B.&Q. Depot
Top of cap Elev. 905.21
Copper bolt in stone Elev. 904.15

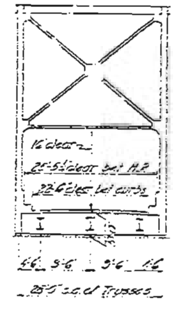
PLAN

1"=200'

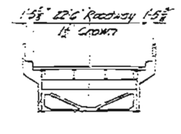


Vert. Scale 1/8"=1'-0"

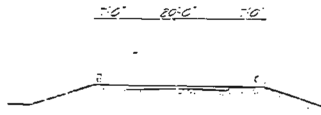
Note:-
See Sheet #6 for Borings 11 & 12.



TYPICAL CROSS-SECTION
as at L4-L4'
1/16"=1'-0"

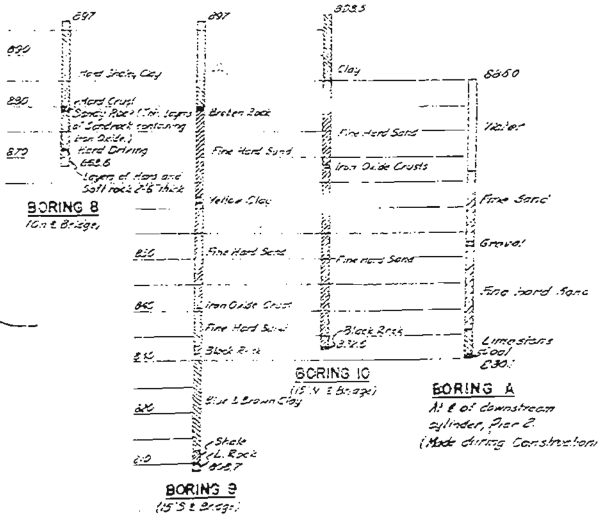


TYPICAL SECTION
THRU GIRDER SPANS
1/16"=1'-0"



TYPICAL SECTION
THRU APPROACHES
1/16"=1'-0"

Note: This Structure is designed for H20 Truck Loading. See Sheet 10.


897
Hard Shale, Clay
Hard Crust
Sandy Rock (Thin layers of Sandrock containing iron Oxide.)
Hard Driving
Layers of Hard and Soft rock 2'-6" thick
BORING 8 (10' n. ℄ Bridge)
Broken Rock
Fine Hard Sand
Yellow Clay
Iron Oxide Crust
Black Rock
Blue & Brown Clay
Shale
L. Rock
BORING 9 (15' S. ℄ Bridge)
Clay
Iron Oxide Crusts
Fine Hard Sand
Black Rock
BORING 10 (15' N. ℄ Bridge)
Water
Fine Sand
Gravel
Fine hard Sand
Limestone
Coal
BORING A
At ℄ of downstream cylinder, Pier 2.
(Made during Construction)

BORINGS AT PIER 1

Permanent Bench Marks are tabulated on Sh. 3.

6-98

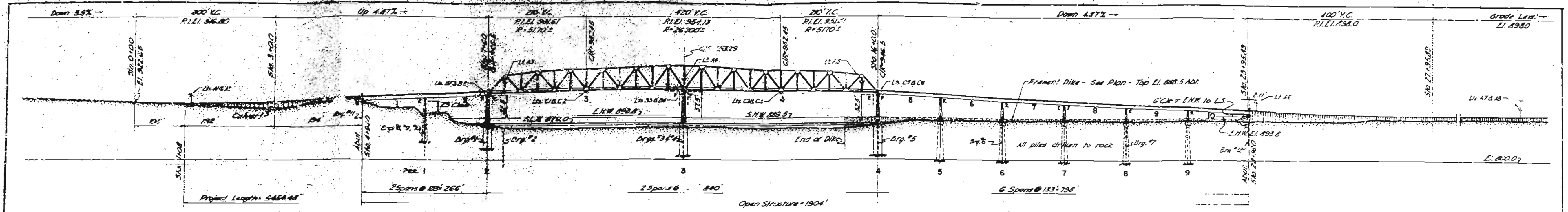
Note: Notes, elevations, etc. enclosed thus are as finally constructed.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

GENERAL PLAN AND ELEVATION

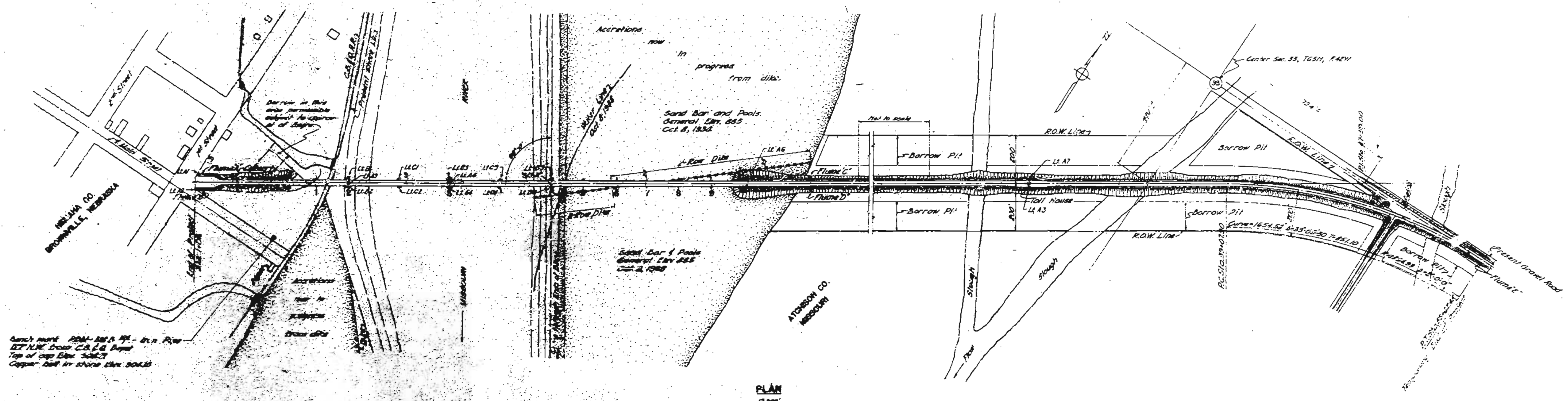
Scale As Noted
K.S.A.
K.S.A.
R.R.H.
ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET NO.

Revised as Constructed - L.G.H. 5-10-40
Rev. 5-6-39. Added borings 8 to 10 inc.

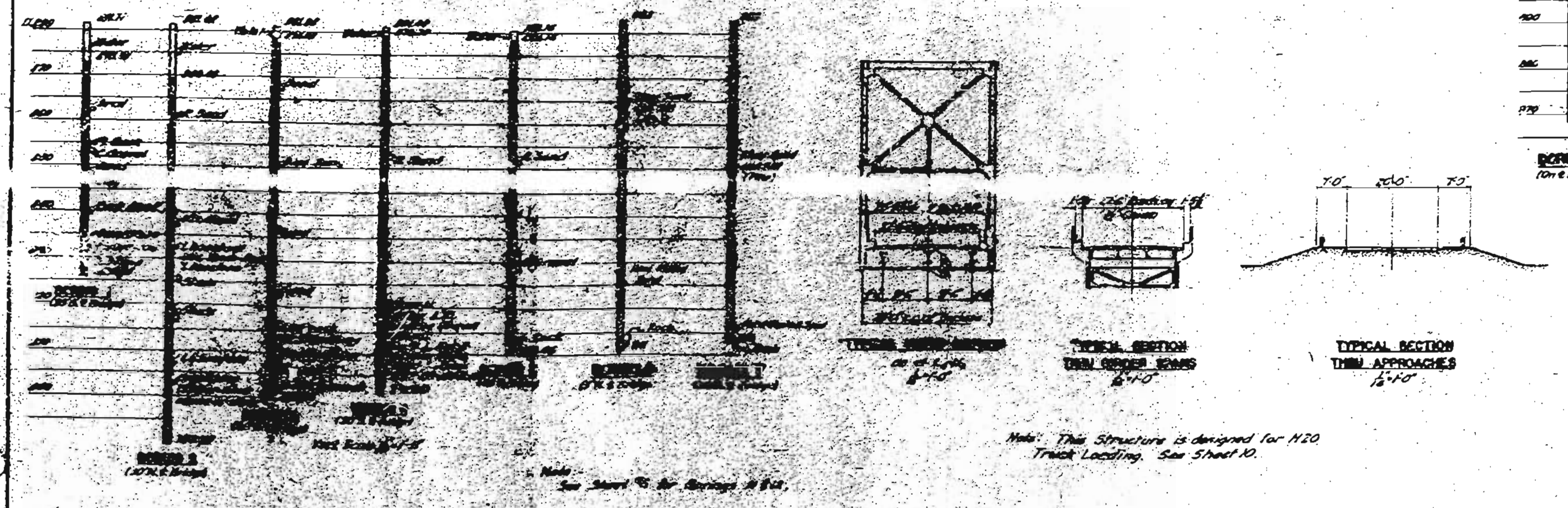


ELEVATION
1"=100'

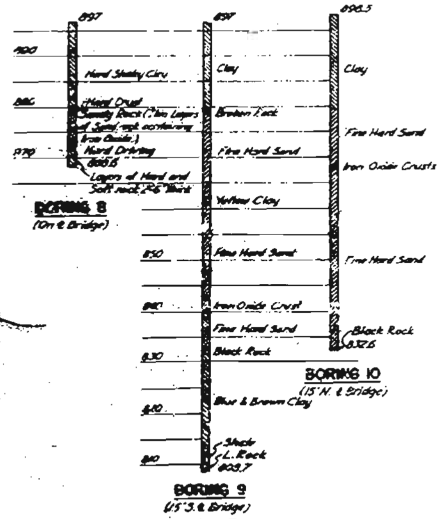
KEY TO LIGHTING:
A1, A2, A6, A7, A8 - 200 Watt Roadway Lights on Standards.
A3, A4, A5 - 200 Watt Roadway Lights on Steel Trusses
B1 to B9 - 180° Red Navigation Lights on Piers.
C1 To C4 - 360° Green Mid-Span Navigation Lights


Accretions now in progress from dike
Sand Bar and Pools General Elev. 885 Oct. 6, 1938
Sand Bar & Pools General Elev. 885 Oct. 6, 1938
Borrow in this area permissible subject to approval of Engr.
Present Shore Line
River
Missouri
Water Line Oct. 6, 1938
Main Street
2nd Street
1st Street
NEMAHA CO.
BROWNVILLE, NEBRASKA
ATCHISON CO.
MISSOURI
R.O.W. Lines
Borrow Pit
Toll House
Flume C
Flume D
Flume E
Slough
Center Sec. 33, T.65N., R.42W.
Present Gravel Road
Not to scale
Bench mark P.B.M. - U.S.E. Nail - R.R. Rail
Top of cap Elev. 908.3
Copper bolt in stone Elev. 904.18

PLAN
1"=200'


BORING 1
BORING 2
BORING 3
BORING 4
BORING 5
BORING 6
BORING 7
TYPICAL SECTION THRU TRUSS SPANS
TYPICAL SECTION THRU GIRDER SPANS
1/4"=1'-0"
TYPICAL SECTION THRU APPROACHES
1/16"=1'-0"
7'-0"
20'-0"
7'-0"
Note: See Sheet 4 for Borings 11 & 12.

Note: This Structure is designed for H20 Truck Loading. See Sheet 10.



BORINGS AT PIER 1

182

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

GENERAL PLAN AND ELEVATION
SHOWING LIGHTING

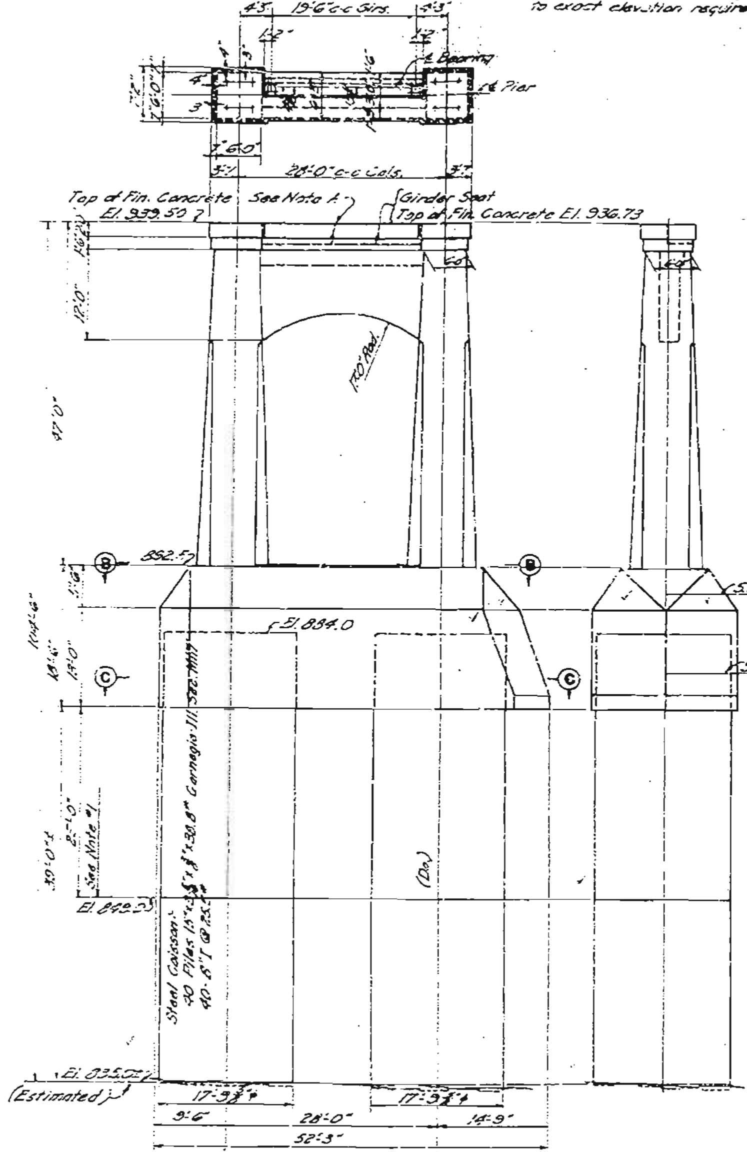
SCALE As Noted
K.F.J. 10-11-38
K.F.J. 10-14-38
R.R.W. 12-7-38
Rev. Pier, etc. 1-6-39 A.
Lights added C.A.S. 8-30-39

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET NO. 1-A

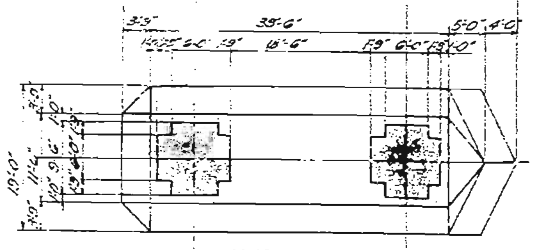
Rev. 5-15-39. Added borings 6 to 10 inc.

Note A:-
Concrete pads under shoes shall be in general 6" wider in each direction than shoes and shall be poured ⅜" to ¼" high and ground level to exact elevation required by shoes.

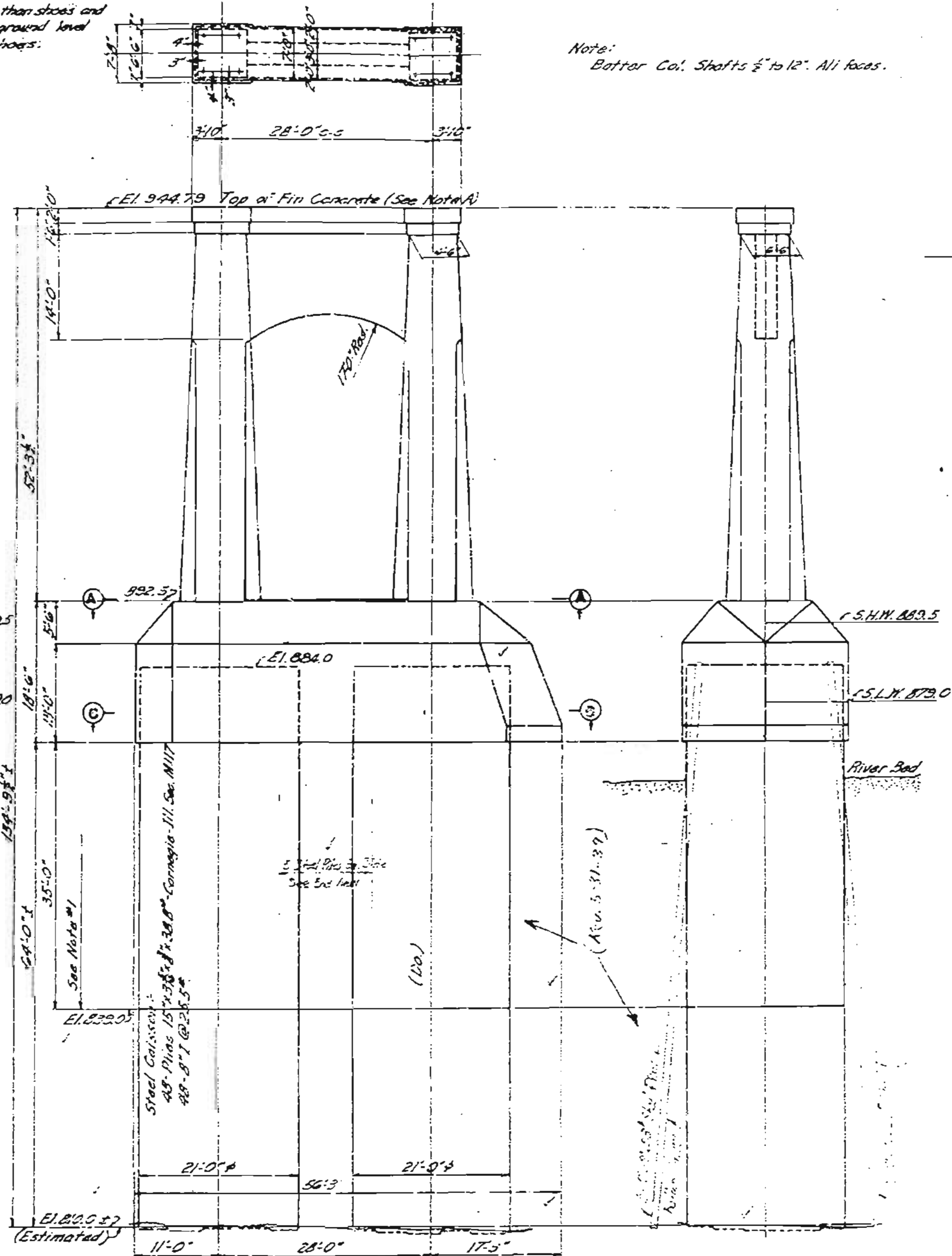
Note:
Batter Col. Shafts ⅛" to 12". All faces.



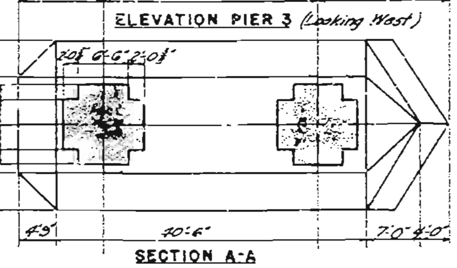
ELEVATION PIER 2 (Looking West)



SECTION B-B

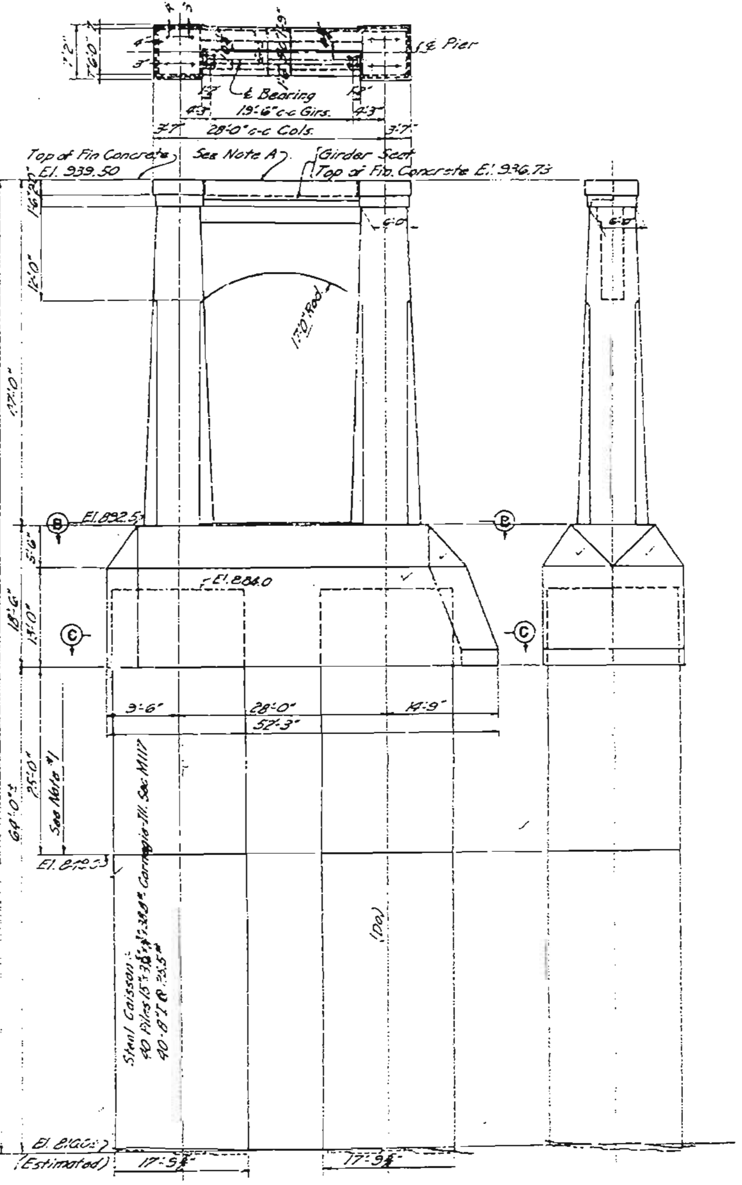


ELEVATION PIER 3 (Looking West)



SECTION A-A

Note #1
Fill Steel Caisson with Concrete above this elevation.



ELEVATION PIER 4 (Looking West)

GENERAL NOTES FOR CONCRETE

Classes of Concrete:-
All Deck Slabs shall be Class 35. In Base Cylinders of Piers use Class 2.5 for Seals and Class 20 for fill above seals, see Specifications. All other concrete in Piers and Abutments shall be Class 30.

Chamfers:-
For corner chamfers not shown, see Specifications.

Bar Bends:-
Reinforcing bar bends, unless otherwise provided shall be to a radius of 4 bar diameters. Stirrup bends shall be to 1½ bar diameters. Anchorage hooks shall be bent to 3½ bar diameters radius and have an overall length of 16 bar diameters. All measurements are to bar centers.

Bar Splices:-
Laps shall be 50 diameters of bar unless otherwise noted. Splices shall be avoided where practicable, and shall be subject to approval of the Engineers.

Note:- See Sh. 4 for Section C-C.
Substructure Contractor shall use care in location of reinforcing steel so that nearest bars shall be at least 3½" clear from theoretic centers of Fox Bolts to be set by others.

L-98

183

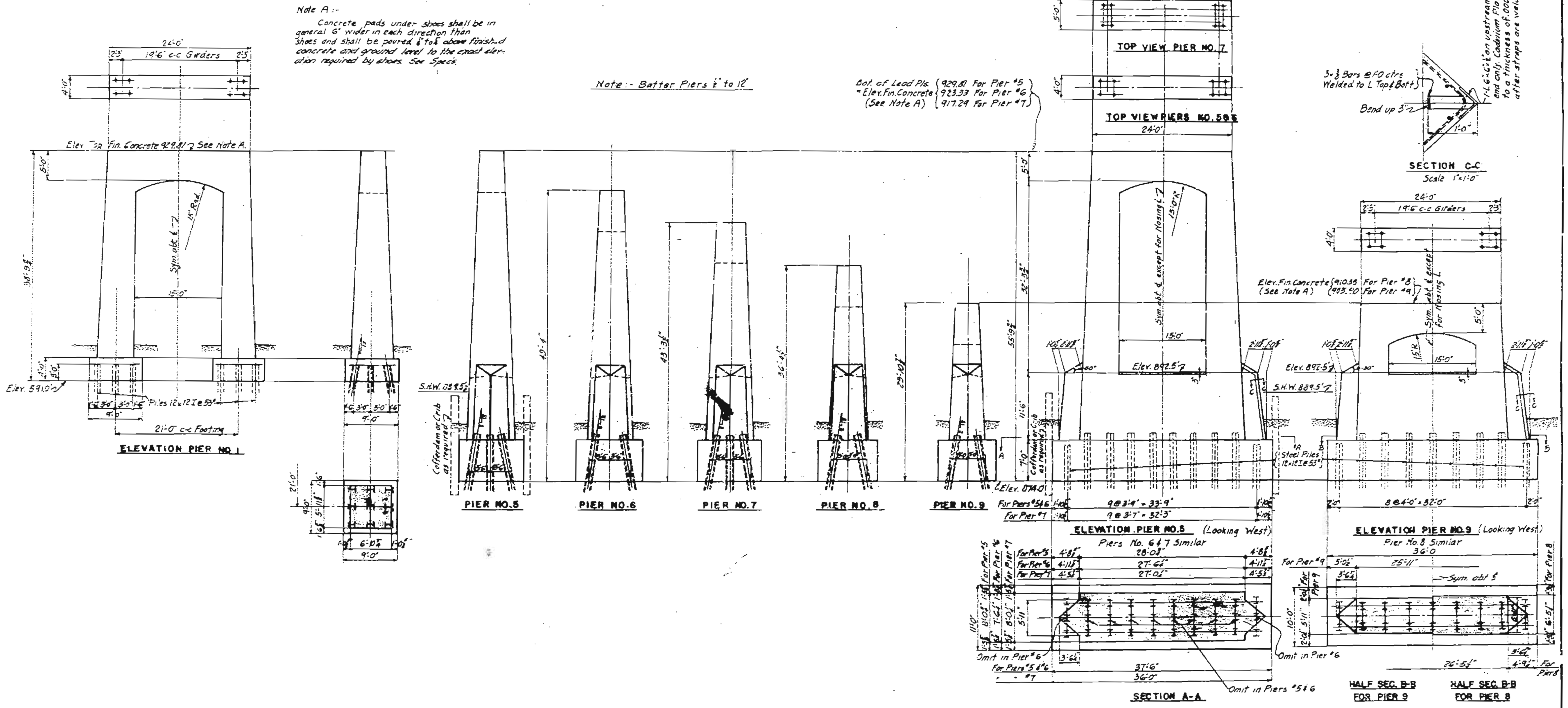
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPAN PIERS-GENERAL

Scale ⅛"=1'-0"
Drawn R.R.W. Date 10-7-35
Traced HRC-RLK Date 12-8-36
Ch. A.E.E. Date 12-8-36

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET NO. 2

Rev. 5-31-35-10 Extra Piles Piers


ELEVATION PIER NO. 1
21'-0" c-c Footing
Piles 12x12 I @ 53#
Elev. Top Fin. Concrete 929.81 ℄ See Note A.
PIER NO. 5
PIER NO. 6
PIER NO. 7
PIER NO. 8
PIER NO. 9
Cofferdam or Crib as required
S.H.W. 889.5
Bot. of Lead Pls. 929.81 For Pier #5
" Elev. Fin. Concrete 923.33 For Pier #6
(See Note A) 917.29 For Pier #7
TOP VIEW PIER NO. 7
TOP VIEW PIERS NO. 5 & 6
19'-6" c-c Girders
24'-0"
Sym. abt. ℄ except for Nosing
Elev. 892.5
Steel Piles 12x12 I @ 53#
Elev. 874.0
For Piers #5 & 6
For Pier #7
9 @ 3'-9" = 33'-9"
9 @ 3'-7" = 32'-3"
ELEVATION PIER NO. 5 (Looking West)
Piers No. 6 & 7 Similar
Elev. Fin. Concrete 910.39 For Pier #8
(See Note A) 903.40 For Pier #9
8 @ 4'-0" = 32'-0"
ELEVATION PIER NO. 9 (Looking West)
Pier No. 8 Similar
36'-0"
SECTION C-C
Scale 1" = 1'-0"
3 - ½ Bars @ 1'-0 ctrs Welded to L Top & Bott.
Bend up 3"
1-L 6 x 6 x ½ on upstream end only Cadmium Plate to a thickness of .0005 after straps are welded.
Omit in Pier #6
Omit in Piers #5 & 6
SECTION A-A
HALF SEC. B-B FOR PIER 9
HALF SEC. B-B FOR PIER 8
Sym. abt. ℄

Note A:-

Concrete pads under shoes shall be in general 6" wider in each direction than shoes and shall be poured ⅛" to ⅜" above finished concrete and ground level to the exact elevation required by shoes. See Specs.

Note:- Batter Piers ½" to 12"

Note:
The steel bearing piles of all piers shown here shall be driven to rock. See Spec's.

Note:-
For General Notes for Concrete, see Sh. 2.
Pile Splice Details and Pile Cap Details to be same as shown on Sh. 6.

All Concrete Class 30.

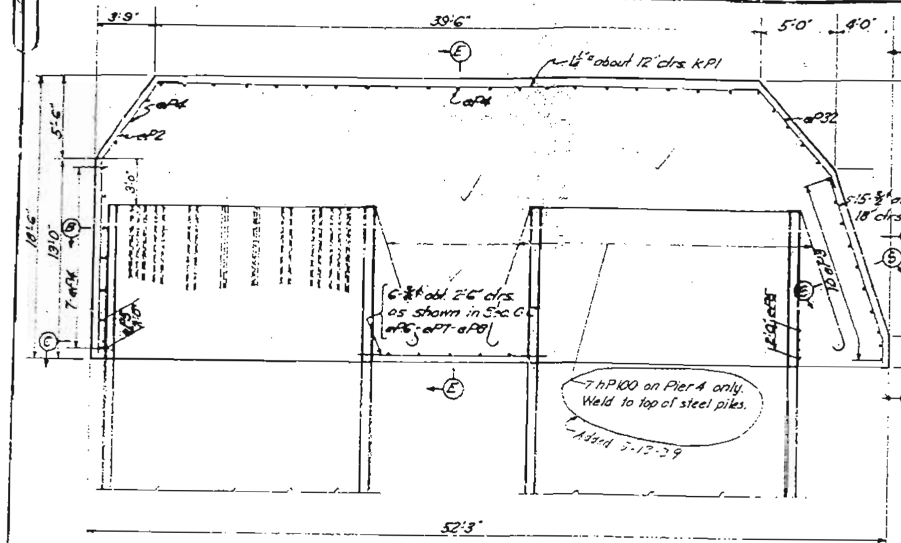
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

GIRDER SPAN PIERS
GENERAL

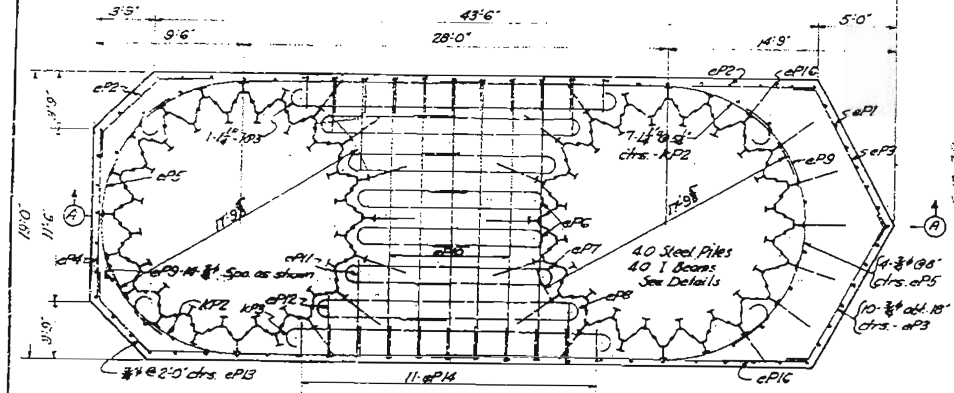
SCALE [illegible]
[illegible] - [illegible] - [illegible] & [illegible]
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET NO. 3

15

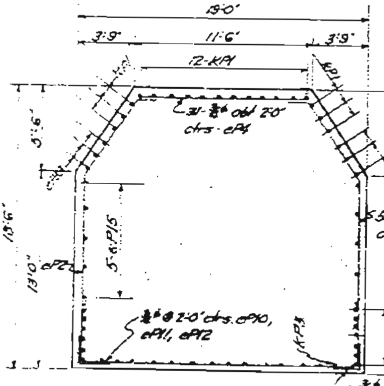


39'-6"
5'-0"
4'-0"
3'-9"
1¼" about 12" ctrs. kP1
eP4
eP2
eP32
5-5-¾" abt. 18" ctrs. eP1
6-¾" abt. 2'-6" ctrs. as shown in Sec. C-C eP6, eP7, eP8
7-hP100 on Pier 4 only. Weld to top of steel piles.
Added 5-13-39
52'-3"

SECTION A-A

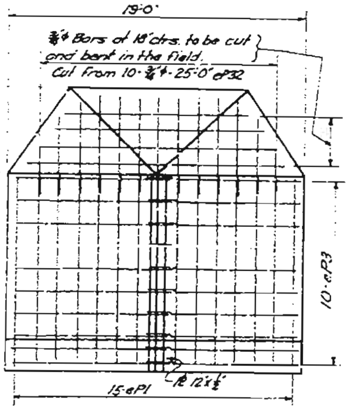


SECTION C-C



19'-0"
11'-6"
3'-9"
12-kP1
31-¾" abt. 2'-0" ctrs. eP4
5-53-¾" abt. 2'-0" ctrs. eP2
5-eP15
¾" @ 2'-0" ctrs. eP10, eP11, eP12
7-kP2 @ 5¼" = 2'-7½"
¾" @ 2'-0" ctrs. eP14

SECTION E-E

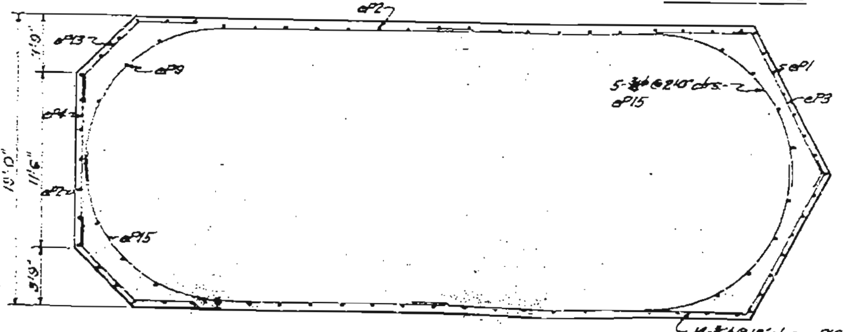


19'-0"
¾" Bars at 18" ctrs. to be cut and bent in the field. Cut from 10-¾"-25'-0" eP32
10-eP3
15-eP1
Pℓ 12x½

ELEVATION D-D

No	Mark	No for one	Size	Lgth.	Bending
BAR LISTS					
PIERS No 2 & 4					
30	eP1	15	¾ϕ	13'3"	
106	eP2	53	"	20'9"	
40	eP3	20	"	13'9"	
62	eP4	31	"	11'6"	Straight
16	eP5	8	"	20'6"	
4	eP6	2	"	28'6"	
4	eP7	2	"	31'6"	
4	eP8	2	"	38'6"	
28	eP9	14	"	12'0"	Straight
10	eP10	5	"	13'0"	Straight
8	eP11	4	"	6'0"	Straight
8	eP12	4	"	3'6"	Straight
28	eP13	14	"	10'11"	
44	eP14	22	"	3'6"	
40	eP15	20	"	31'4"	
56	eP16	28	"	9'6"	Straight
20	eP32	10	"	25'0"	Bend in field
36	kP1	18	1¼□	39'3"	Straight
56	KP2	28	1¼□	25'4"	
4	KP3	2	1¼□	23'3"	
21	hP100	21	1"□	11'-5"	
12	eP33	6	¾ϕ	39'3"	Straight
PIER No 3					
17	eP16	17	¾ϕ	13'3"	
53	eP17	53	"	21'3"	
32	eP18	32	"	12'6"	St.
20	eP19	20	"	16'0"	
8	eP20	8	"	20'6"	
2	eP21	2	"	21'6"	
2	eP22	2	"	24'6"	
2	eP23	2	"	30'6"	
2	eP24	2	"	38'6"	
18	eP25	18	"	12'0"	St.
5	eP26	5	"	7'0"	St.
4	eP27	4	"	5'0"	St.
4	eP28	4	"	3'0"	St.
14	eP29	14	"	12'3"	
22	eP14	22	"	3'6"	See above
20	eP30	20	"	33'10"	
12	eP32	12	"	25'0"	Bend in field
19	KP4	19	1¼□	40'3"	St.
28	KP5	28	1¼□	26'1"	
2	KP6	2	1¼□	24'6"	
6	eP34	6	¾ϕ	40'3"	Straight
30	eP31	30	¾ϕ	10'0"	Straight

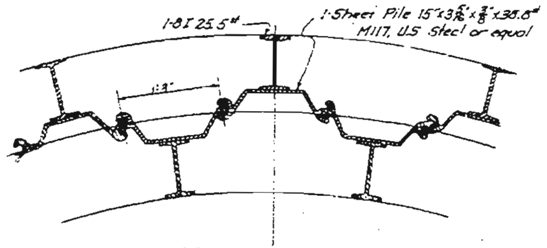
TABLE OF BAR MARKS			
Size	¾ϕ	1□	1¼□
Letter	e	h	k



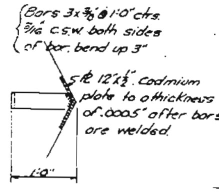
SECTION B-B

PIER BASE "2 & 4"

3/16" = 1'-0"

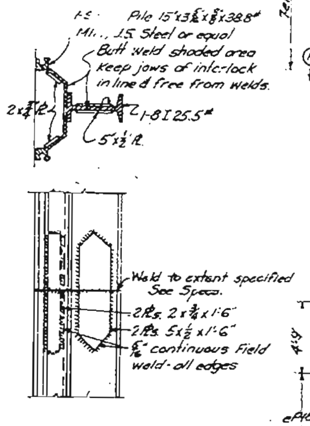


PART SECTION THRU WALL



Bars 3x⅜ @ 1'-0" ctrs. 5/16 c.s.w. both sides of bar; bend up 3"
Pℓ 12x½ Cadmium plate to a thickness of .0005" after bars are welded.
1'-0"

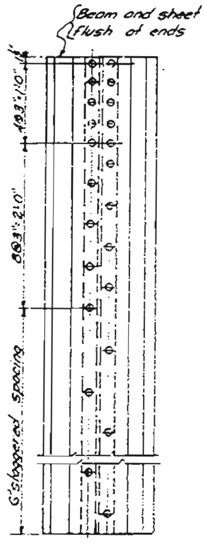
SECTION S-S



Pile 15"x3⅜"x⅜"x38.8# M117 U.S. Steel or equal
Butt weld shaded area
Keep jaws of interlock in lined free from welds.
2x⅞ Pℓ
1-8I 25.5#
5x½ Pℓ
Weld to extent specified See Specs.
2 Pℓs. 2x⅞x1'-6"
2 Pℓs. 5x½x1'-6"
5/16 continuous field weld - all edges

FIELD SPLICE

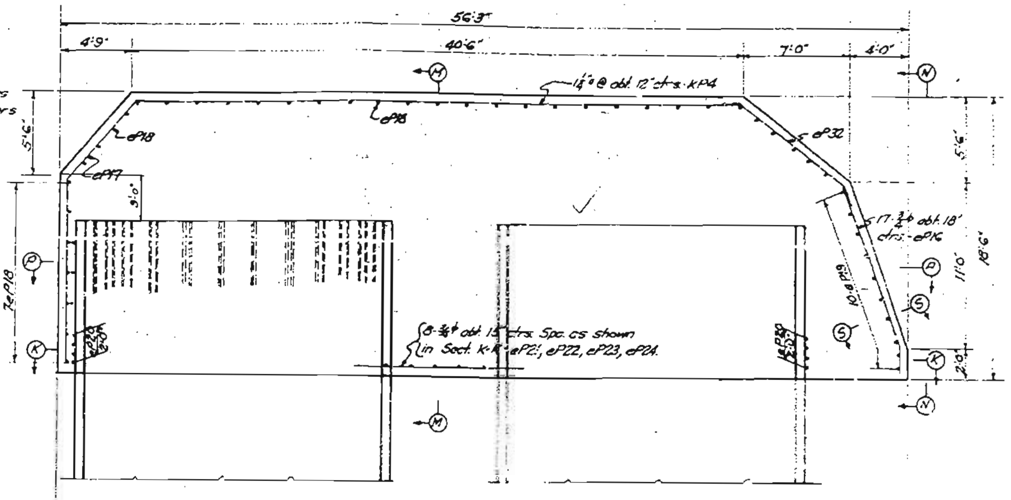
For Steel Piles



MAXIMUM RIVET PITCH

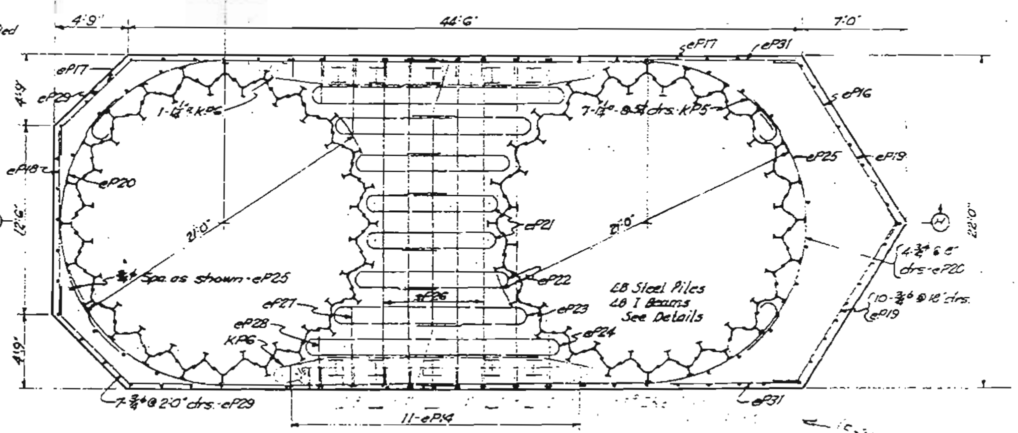
(at both ends of piles)

1" = 1'-0"

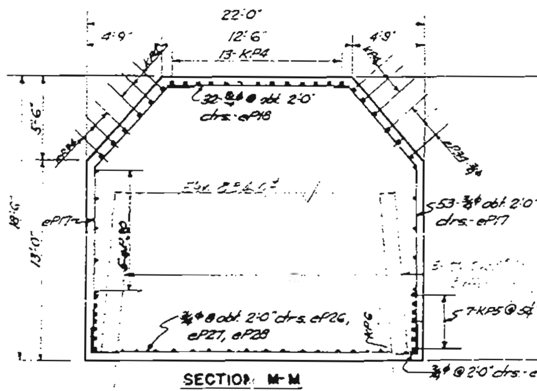


56'-3"
4'-9"
40'-6"
7'-0"
4'-0"
1¼" @ abt. 12" ctrs. kP4
eP18
eP17
eP32
17-¾" abt. 18" ctrs. eP16
8-¾" abt. 15" ctrs. Spa. as shown in Sect. K-K eP21, eP22, eP23, eP24

SECTION H-H

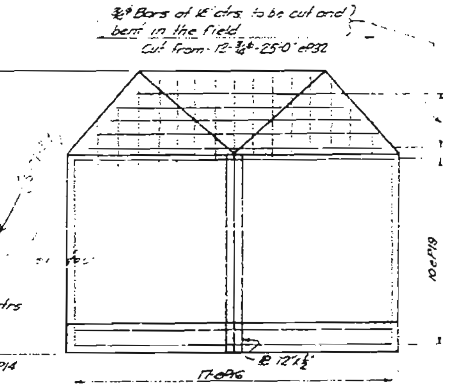


SECTION K-K



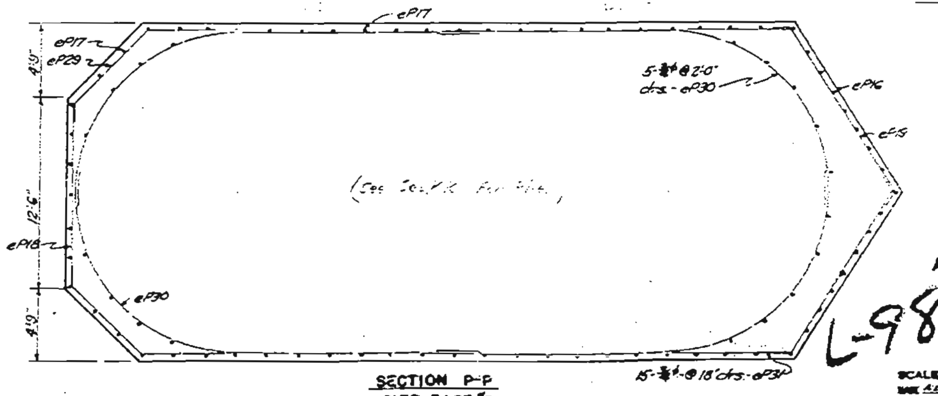
22'-0"
12'-6"
13-kP4
4'-9"
32-¾" @ abt. 2'0" ctrs. eP18
53-¾" abt. 2'0" ctrs. eP17
¾" @ abt. 2'0" ctrs. eP26, eP27, eP28
7-KP5 @ 5¼" ctrs.
¾" @ 2'0" ctrs. eP14
Pℓ 12x½

SECTION M-M



¾" Bars at 18" ctrs. to be cut and bent in the field. Cut from 12-¾"-25'0" eP32
10-eP19
17-eP16

ELEVATION N-N



SECTION P-P

PIER BASE "3"

3/16" = 1'-0"

Note: For General Notes for concrete, see sheet 2.

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

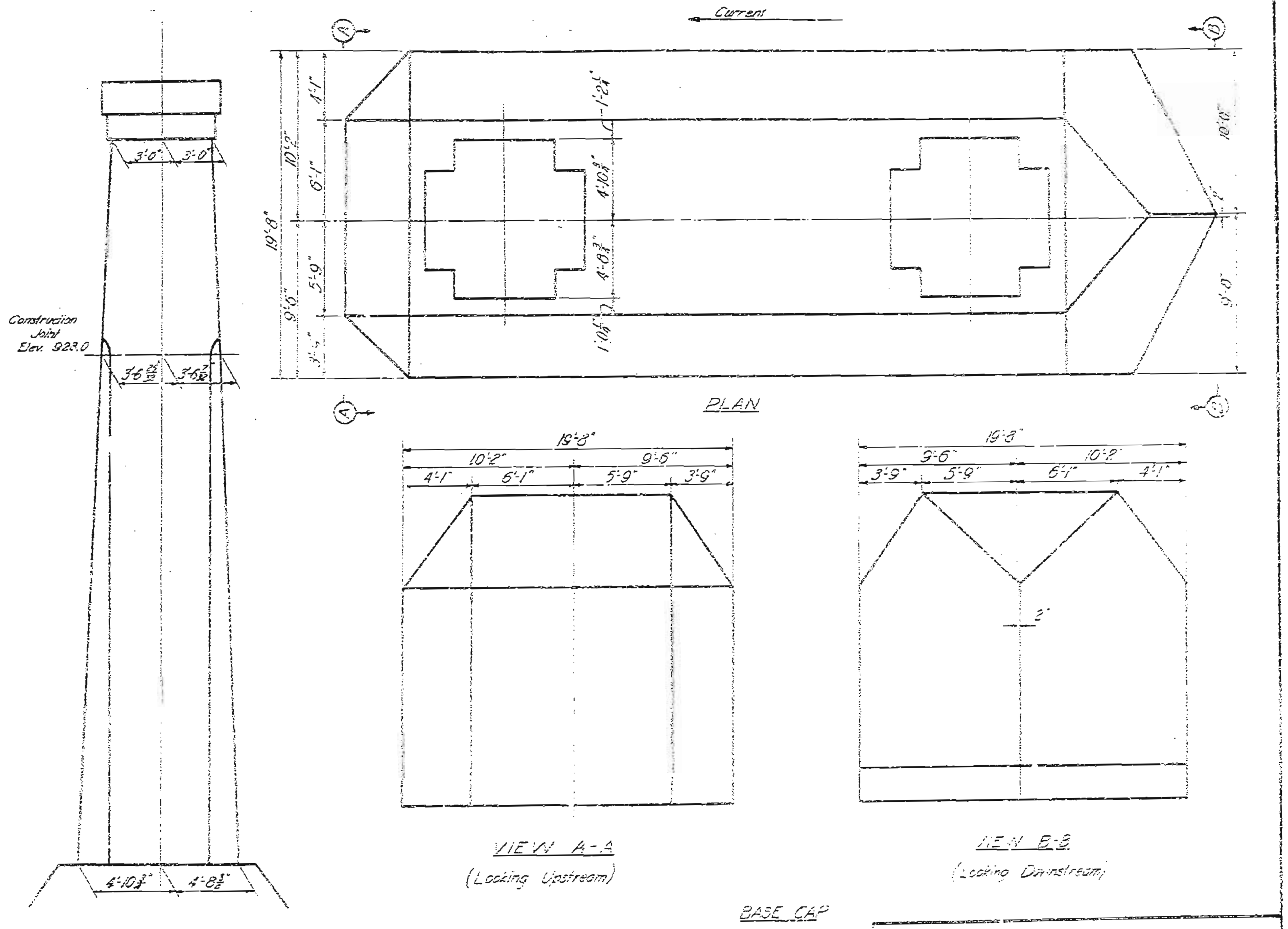
BASE CAPS, PIERS 2,3,4

SCALE As noted
A.E.C.
J.F.K.
Y.M.A.

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET No. 4

Revised 5-13-39 - Added Bars hP100
Rev. 6-?-39 - 10 Extra Piles Pier 3

186



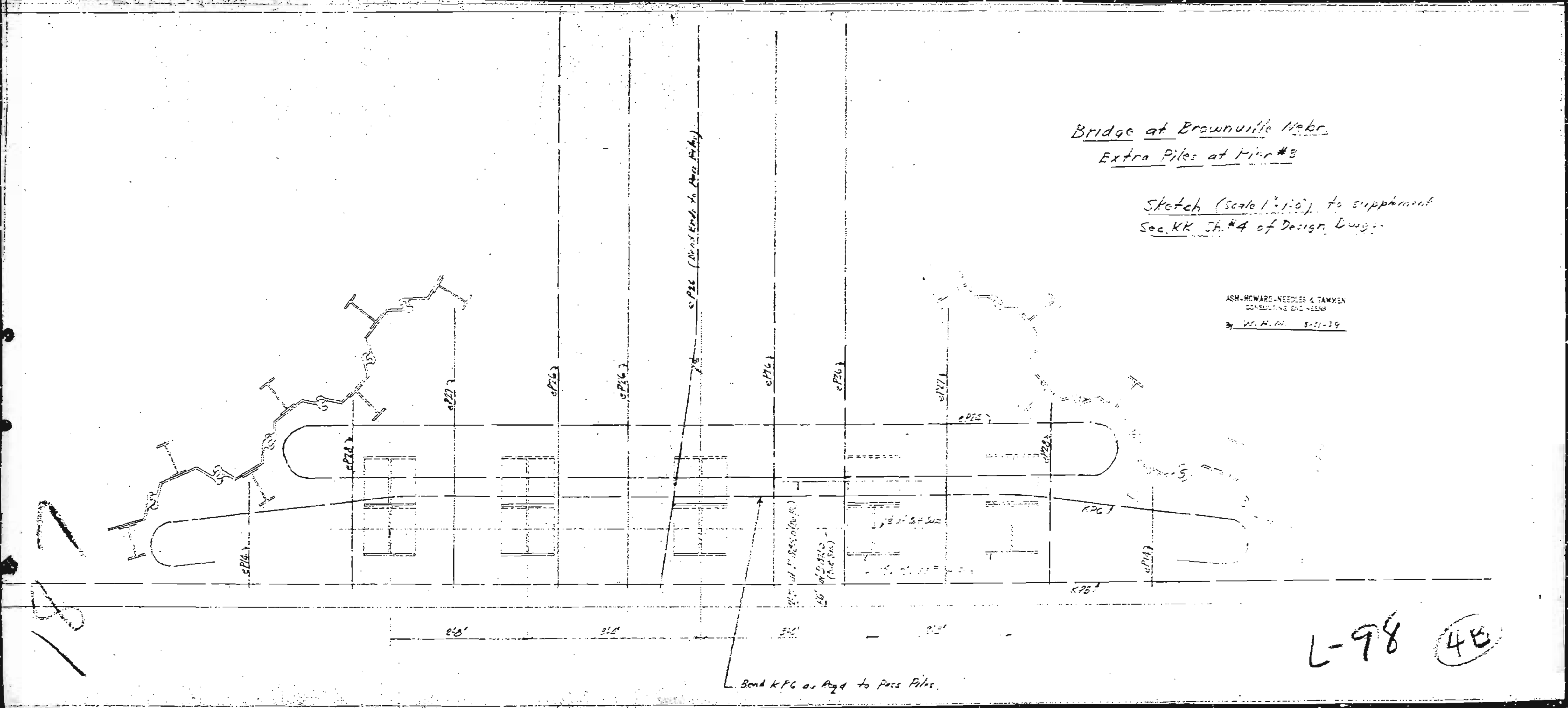
END VIEW - SHAFT
(Looking Upstream)

PIER NO. 4

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

PIER NO. 4
REVISED TO CARE FOR MISALIGNMENT
OF CYLINDERS

ASH - HOWARD - NEEDLES AND TAMMEN
CONSULTING ENGINEERS
BROWNVILLE, NEBR.
Date: Aug 5, 1939 Scale: ¼" = 1'



Bridge at Brownville Nebr.
Extra Piles at Pier #3

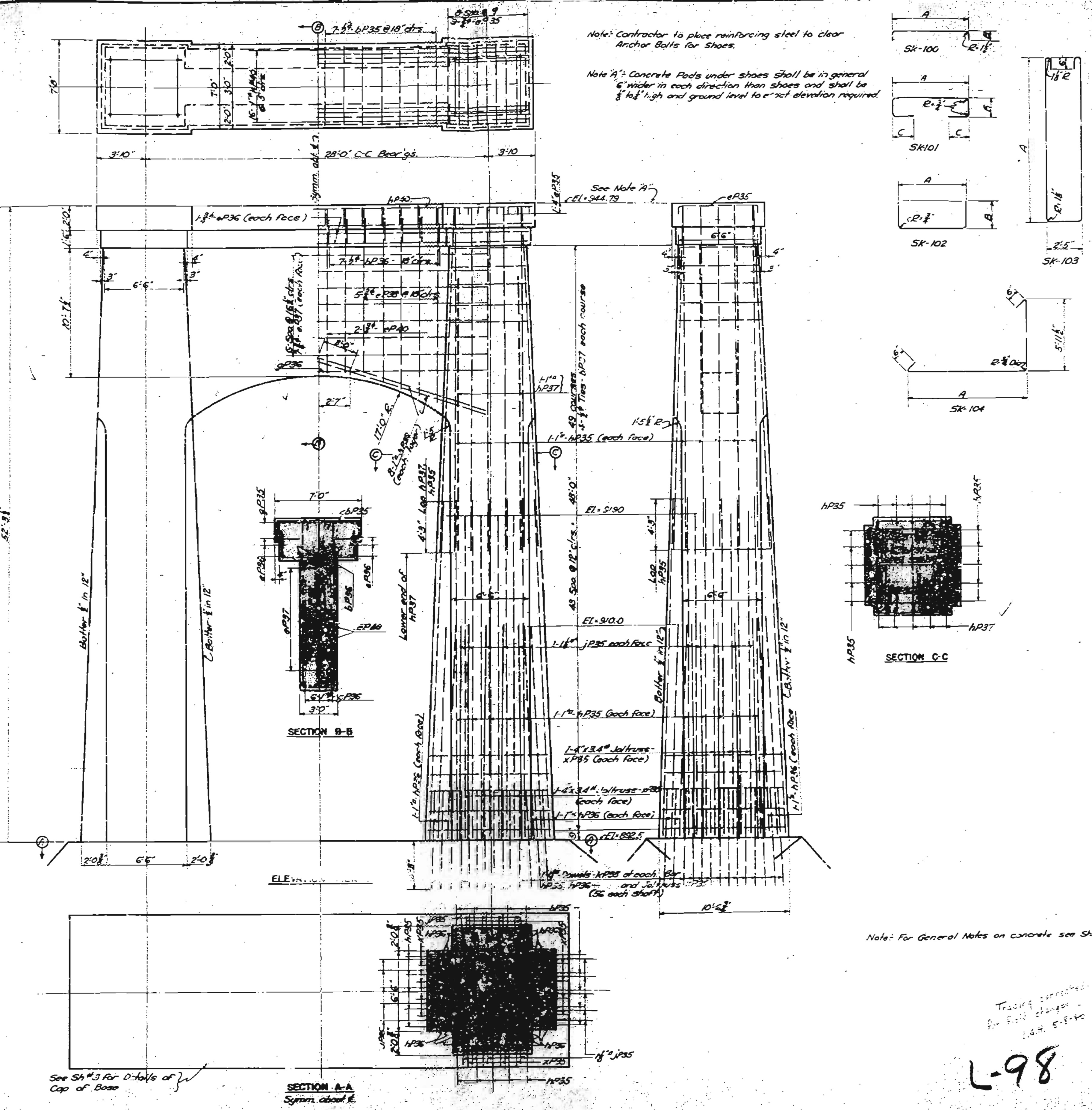
Sketch (scale 1"=1'-0") to supplement
Sec. KK Sh. #4 of Design Dwgs.

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
By W. H. M. 5-31-39

Bend KP6 as Reqd to Pass Piles.

L-98 ⑧

188



Note:- Contractor to place reinforcing steel to clear Anchor Bolts for Shoes.

Note "A":- Concrete Pads under shoes shall be in general 6" wider in each direction than shoes and shall be ⅜" to ⅝" high and ground level to exact elevation required.

BAR LIST							
Mark	No.	Size	Length	Type	A	B	C
xP35	32	4"x1.34# Joltruss	12'-6"	S			
hP35	88	1⅛□	28'-1"	S			
hP36	32	1⅛□	17'-6"	S			
hP37	8	1⅛□	21'-8"	S			
[illegible]	112	[illegible]	10'-6"	S			
hP40	16	1⅛□	35'-0"	S			
gP36	6	1□	28'-0"	S			
hP39	32	1⅛□	15'-3" 13'-3	S			
eP35	18	¾□	9'-0"	Bent SK-100	7'-0"	1'-0"	
eP36	8	¾□	34'-6"	S			
eP37	14	¾□	28'-0"	S			
bP35	14	½□	12'-7"	SK-101	6'-5"	1'-4"	1'-9"
bP36	14	½□	10'-3"	SK-102	5'-7"	2'-4"	
eP38	10	¾□	2 sets of 5 bars each. Length of bars of each set varies from 31'-3" to 35'-8" by 4 equal increments	SK-103	A varies from 12'-11" to 15'-11"		
bP37	392	½□	8 sets of 49 bars each. Length of bars of each set varies from 12'-11" to 15'-11" by 7 equal increments	SK-104	A varies from 5'-11½" to 9'-11½"		
eP40	4	¾□	30'-5"	SK-103	A = 13'-6"		
jP35	40	1⅛□	17'-6"	S			

KEY TO BAR MARKS	
b	½□
d	⅝□
e	¾□
g	1□
h	1⅛□
x	4"1.34# Joltruss

P indicates Pier

Note:- For General Notes on concrete see Sh. 2

Tracing corrected for field changes - L.G.H. 5-8-40

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

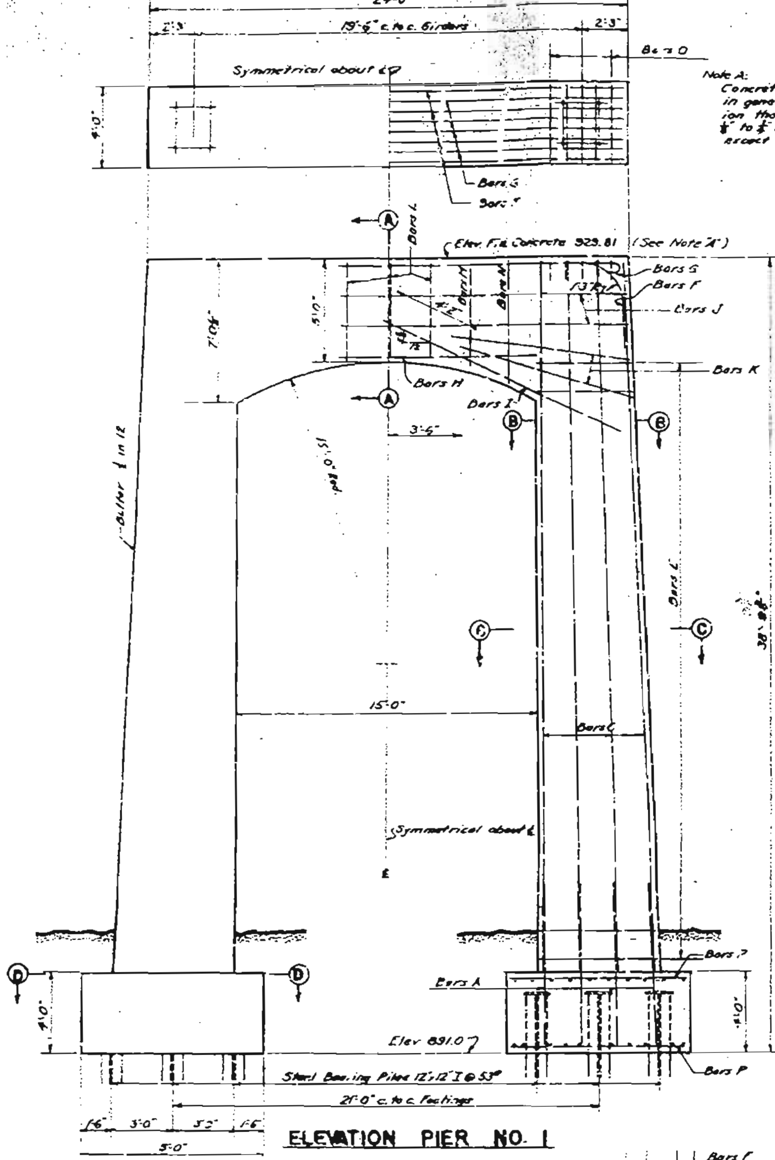
PIER NO. 3 - SHAFT

SCALE ¼" = 1'-0"

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

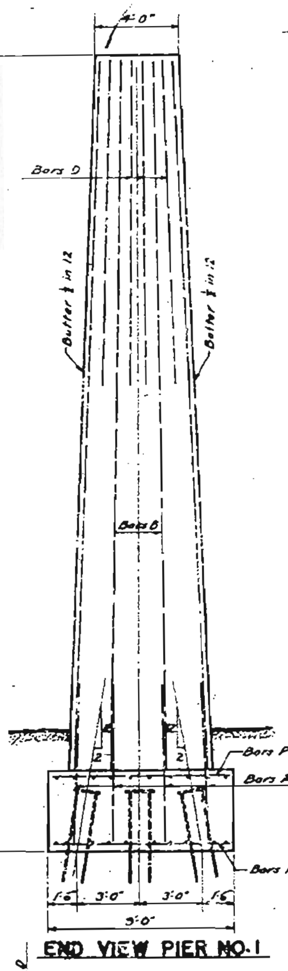
SHEET NO. 5

189

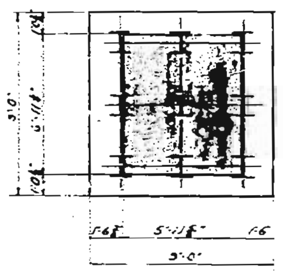


ELEVATION PIER NO. 1

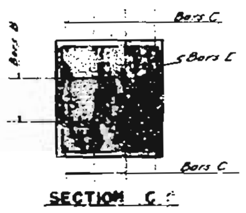
Note A:
Concrete pads under shoes shall be in general 6" wider in each direction than shoes and shall be poured ½" to ¾" high and ground level to the exact elevation required by shoes.



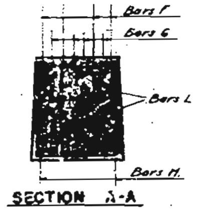
END VIEW PIER NO. 1



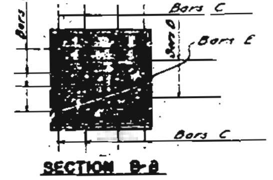
SECTION D-D



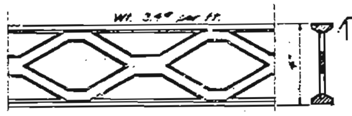
SECTION C-C



SECTION A-A



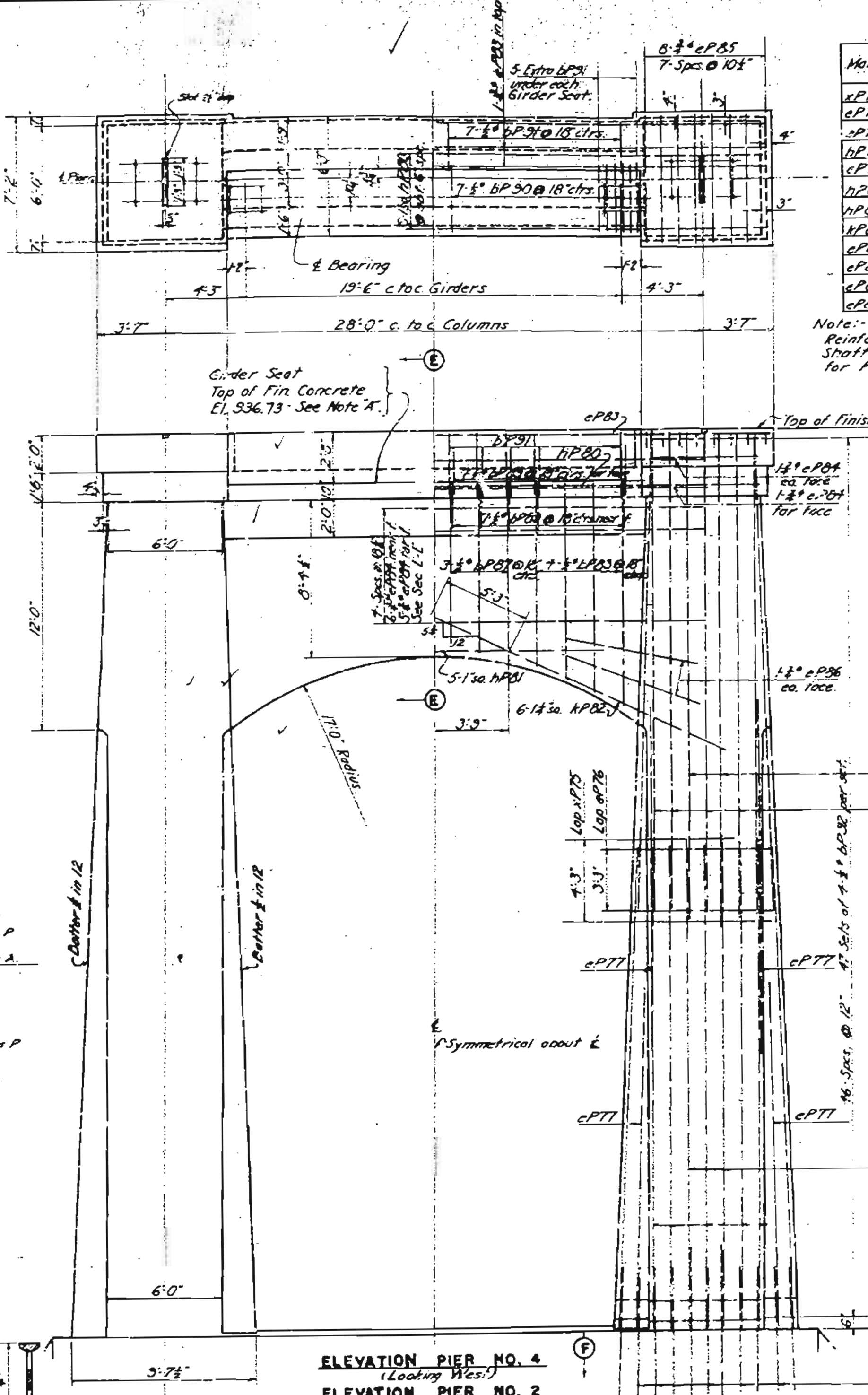
SECTION B-B



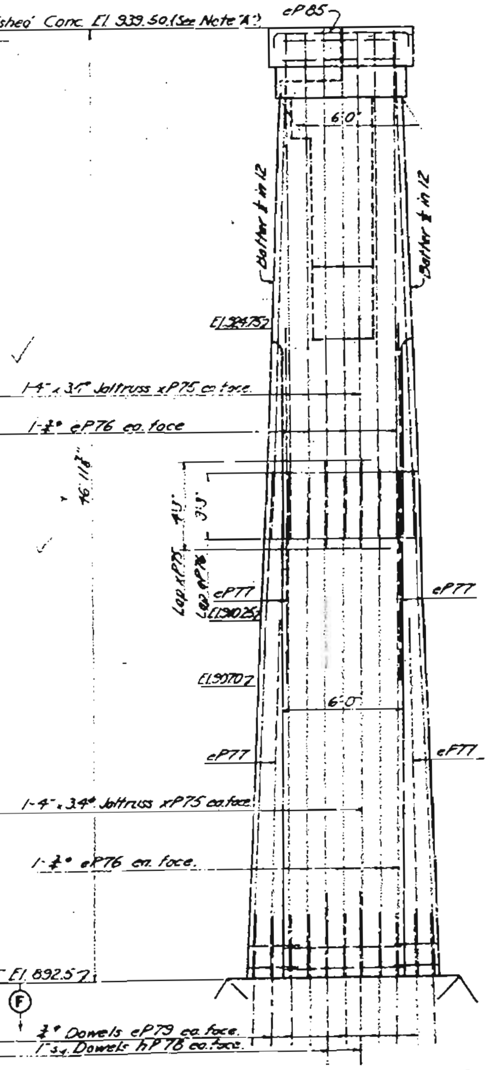
JALTRUSS REINFORCING BARS

REINFORCING STEEL FOR PIER NO. 1

Series	Description	Sets Req'd	Series	Description	Sets Req'd
A.	12-1"sq. x 8'-0" Dowels El. 891.25 to 899.25	2	I.	8-1"sq. x 13'-0" @ about 4" ctrs.	2.
B.	2-4 x 3½# Jaltrusses x 34'-6" El. 895.0 to 929.5	4.	J.	2-½"ø x 23'-6"	2.
C.	4-1⅛"sq. x 34'-6" El. 895.0 to 929.5	4.	K.	2-½"ø x 5'-0"	4.
D.	4-1⅛"sq. x 16'-0" El. 914.0 to 930.0	4.	L.	2-½"ø x 12'-9" x=4'-6"	3.
E.	23-½"ø @ 16" ctrs. Length varies from 16'-10" to 26'-2". A varies from 4'-2" to 5'-5" by equal increm. B varies from 3'-11" to 6'-4"	2.	M.	2-½"ø x 13'-0" Same as L except x=4'-8"	2.
			N.	2-½"ø x 15'-0" x=5'-8"	2.
F.	4-1"sq. x 31'-11" El. 930.06	1.	O.	5-½"ø x 5'-4" El. 930.1	2.
G.	4-1"sq. x 26'-2" El. 930.06	1.	P.	10-¾"ø x 8'-6" El. 891.3 and 894.67	8.
H.	7-1"sq. x 15'-0" El. 925.6	1.			



ELEVATION PIER NO. 4
(Looking West)
ELEVATION PIER NO. 2
(Looking East)

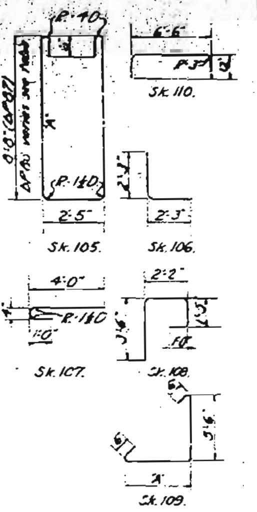


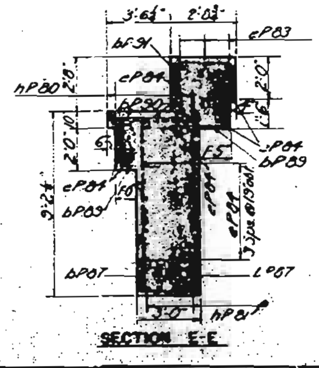
END VIEW PIER NO. 4 & NO. 2

REINFORCING STEEL FOR PIER NO. 2

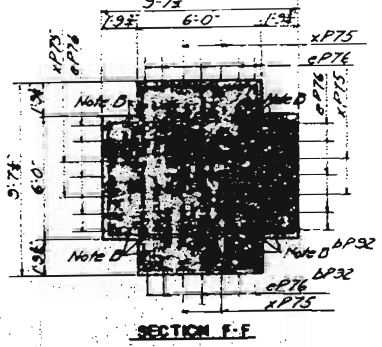
Mark	No. Req'd	Size	Length	Type	Mark	No. Req'd	Size	Length	Type
xP75	32	4x3½	Jaltruss x 25'-6"	Str.	bP87	6	½"	21'-3"	sk.105
eP76	10	¾"	25'-0"	-	bP91	14	-	8'-1"	sk.108
eP77	32	¾"	17'-9"	-					
hP78	16	1"sq.	8'-6"	-	bP88	8	½"	Length varies from 22'-8" to 27'-0" by equal increm.	sk.105 A varies from 9'-5" to 11'-6" by equal incr.
cP79	64	¾"	6'-6"	-					
hP80	9	1"sq.	34'-0"	-					
hP81	5	-	18'-0"	-					
kP82	12	1⅛"sq.	17'-3"	-					
eP83	3	¾"	34'-8"	-	bP89	28	½"	7'-6"	sk.106
eP84	14	-	28'-0"	-	bP90	24	-	5'-3"	sk.107
eP85	16	-	8'-5"	sk.110	bP92	376	½"	Length varies from 12'-0" to 15'-10" by equal increm.	sk.109 A varies from 5'-3" to 9'-1" by equal incr.
eP86	8	-	7'-0"	Str.					

Note:-
Reinforcing steel for Pier No. 4 Shaft is same throughout as for Pier No. 2 Shaft.





SECTION E-E



SECTION F-F

Note: For General Notes for Concrete see sheet 2

Note B:-
3-¾"ø eP77 each corner from El. 892.5 to El. 910.25.
1-¾"ø eP77 each corner from El. 907.0 to El. 924.75.

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

PIERS 2 & 4 - SHAFTS
PIER 1

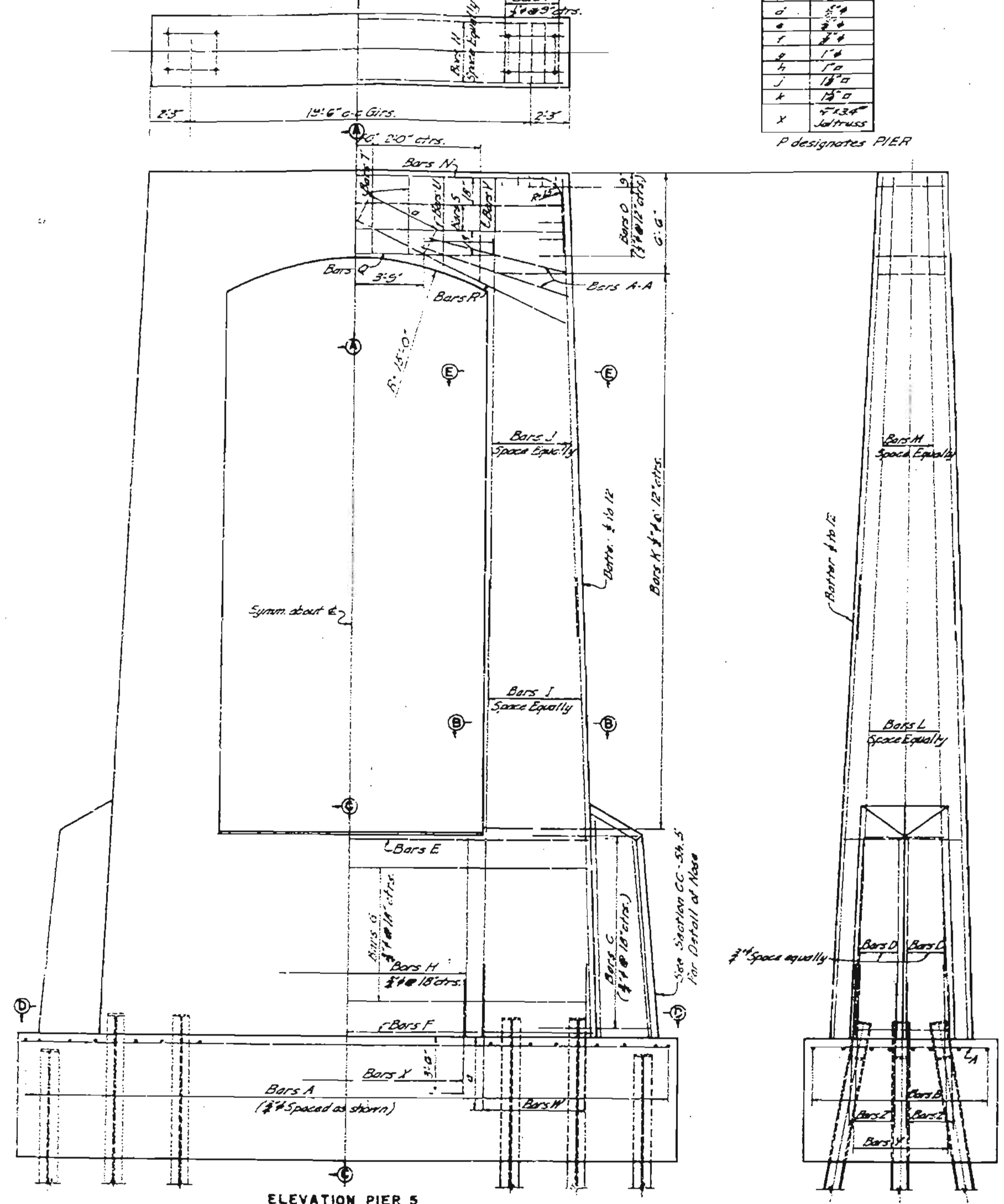
SCALE ¼"=1'-0"
DR. K.M.D.
TR. L.F.H.
CH. A.F.F.

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET NO. 9A

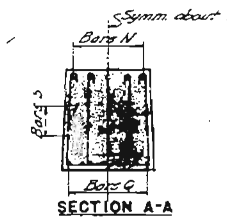
190

KEY TO BAR MARKS	
b	½"φ
d	⅝"φ
e	¾"φ
f	⅞"φ
g	1"φ
h	1"□
j	1⅛"□
k	1¼"□
x	4"x34" Jal truss

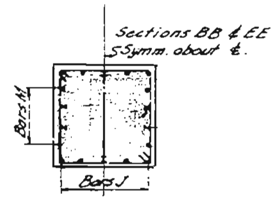
P designates PIER



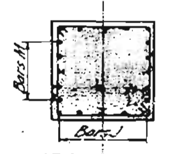
ELEVATION PIER 5
PIERS 6-7-8 & 9 SIMILAR



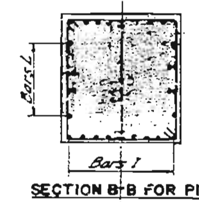
SECTION A-A



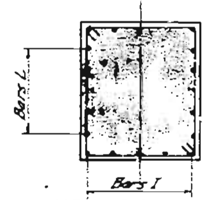
SECTION E-E FOR PIER 7



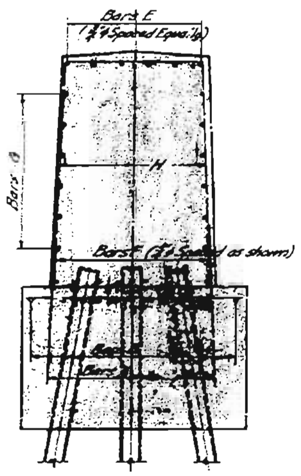
SECTION E-E FOR PIERS 5 & 6



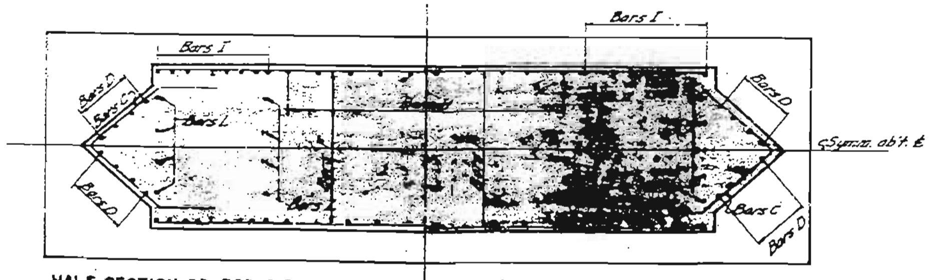
SECTION B-B FOR PIER 7



SECTION B-B FOR PIERS 5-6-8 & 9



SECTION C-C



HALF SECTION DD FOR PIER 7

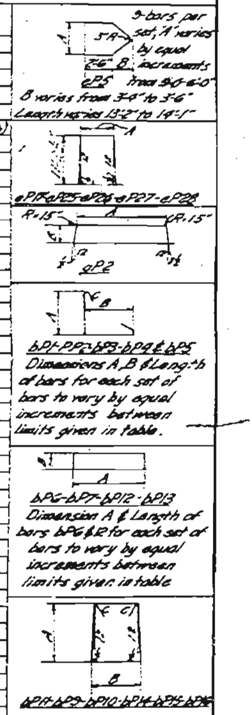
HALF SECTION DD FOR PIERS 5-6-8 & 9

Note:- Place one Dowel of Series W-X-Y- & Z at each vertical bar of Series I, M, L, & D respectively.
For General dimensions of Piers and for number and spacing of Piles see Sh.5.
See Sh.2 for General Notes on Concrete.

Mark of Bar Set	LOCATION No. & DESCRIPTION OF BAR SETS									
	PIER 5		PIER 6		PIER 7		PIER 8		PIER 9	
	Des of Set	No. Sets	Des of Set	No. Sets	Des of Set	No. Sets	Des of Set	No. Sets	Des of Set	No. Sets
A	22eP1	1	22eP1	1	22eP1	1	20eP2	1	20eP2	1
B	8eP3	1	8eP3	1	8eP4	1	8eP4	1	8eP4	1
C	9eP5	2	9eP5	2	9eP5	2	9eP5	2	9eP5	2
D	4eP6	4	4eP6	4	4eP6	4	4eP6	4	4eP6	4
E	6eP7	1	6eP8	1	6eP9	1	6eP10	1	6eP11	1
F	6eP12	1	6eP13	1	6eP14	1	6eP15	1	6eP16	1
G	6eP7	2	6eP8	2	6eP9	2	6eP10	2	6eP11	2
H	10eP17	1	10eP25	1	10eP26	1	10eP27	1	10eP28	1
I	4eP18 1-XP1	4	4eP19 1-XP2	4	8gP1 1-XP3	4	4eP20 1-XP4	4	4eP21 1-XP5	4
J	4eP18 1-XP1	4	4eP19 1-XP2	4	4gP1 1-XP3	4	none		none	
K	32bP1	4	25bP2	4	19bP3	4	13bP4	4	6bP5	4
L	4eP18 1-XP1	4	4eP19 1-XP2	4	2gP1 2XP3	4	4eP20 1-XP4	4	4eP21 1-XP5	4
M	4eP18 1-XP1	4	4eP19 1-XP2	4	2gP1 2XP3	4	none		none	
N	5gP2	1	5gP2	1	5gP2	1	5gP2	1	5gP2	1
O	5bP6	2	5bP6	2	5bP12	2	5bP6	2	5bP6	2
P	5bP7	2	5bP7	2	5bP13	2	5bP7	2	5bP7	2
Q	8eP22	1	8eP22	1	8eP22	1	8eP22	1	8eP22	1
R	8eP23	2	8eP23	2	8eP23	2	8eP23	2	8eP23	2
S	2bP8	2	2bP8	2	2bP8	2	2bP8	2	2bP8	2
T	2bP9	4	2bP9	4	2bP14	4	2bP9	4	2bP9	4
U	2bP10	2	2bP10	2	2bP15	2	2bP10	2	2bP10	2
V	2bP11	2	2bP11	2	2bP16	2	2bP11	2	2bP11	2
W	5eP24	4	5eP24	4	9gP5	4	5eP24	4	5eP24	4
X	10eP24	2	10eP24	2	10eP24	2	10eP24	2	10eP24	2
Y	5eP24	4	5eP24	4	9gP5	4	5eP24	4	5eP24	4
Z	4eP24	4	4eP24	4	4eP24	4	4eP24	4	4eP24	4
AA	2bP17	4	2bP17	4	2bP17	4	2bP17	4	2bP17	4

BAR LIST

Bar Mark	Total Reqd. Per Pier					Size	Length	Dimensions			Type	Remarks
	Pier 5	Pier 6	Pier 7	Pier 8	Pier 9			A	B	C		
eP1	22	22	22			¾"φ	10'-6"				Straight	
eP2				20	20	"	9'-6"				"	
eP3	8	8				"	37'-0"				"	
eP4			8	8	8	"	35'-6"				"	
eP5	18	18	18	18	18	"	See Sketch				Bent	
eP6	16	16	16	16	16	"	Lengths 11'-3", 11'-8", 12'-1", 12'-6" (20 bars each length)					
eP7	18					"	26'-6"				Straight	
eP8		18				"	26'-0"				"	
eP9			18			"	25'-6"				"	
eP10				18		"	25'-0"				"	
eP11					18	"	24'-6"				"	
eP12	6					"	27'-6"				"	
eP13		6				"	27'-0"				"	
eP14			6			"	26'-6"				"	
eP15				6		"	26'-0"				"	
eP16					6	"	25'-6"				"	
* eP17	10					"	29'-0"	6'-7"			Bent	
eP18	64					"	26'-6"				Straight	
eP19		64				"	23'-3				"	
eP20				32		"	23'-9"				"	
eP21					32	"	23'-0"				"	
eP22	8	8	8	8	8	"	14'-6"				"	a=3'-6
eP23	16	16	16	16	16	"	11'-6"				"	a=3'-6
* eP24	76	76	76	76	76	"	7'-0"				"	a=3'-6"
* eP25		10				"	28'-6"	6'-1"			Bent	
* eP26			10			"	28'-11"	6'-6"			"	
* eP27				10		"	27'-5"	5'-0"			"	
* eP28					10	"	26'-10"	4'-5"			"	
gP1			64			1"φ	20'-3"				Straight	
* gP2	5	5	5	5	5	"	32'-0"	23'-5"	4'-3"		Bent	
gP5			52			"	9'-0"				Straight	a=4'-5"
bP1	128					½"φ	9'-5 to 13'-2	[illegible]	[illegible]	6	Bent	4 sets of bars
bP2		100				"	9'-3-12'-3	[illegible]	[illegible]	6	"	" " "
bP3			76			"	[illegible]	[illegible]	[illegible]	6	"	" " "
bP4				52		"	9'-3-10'-9	[illegible]	[illegible]	6	"	" " "
bP5					24	"	9'-3-9'-11	[illegible]	[illegible]	6	"	" " "
* bP6	10	10		10	10	"	6'-6-6'-10	[illegible]	1'-6"		"	10 sets of Bars
bP7	10	10		10	10	"	5'-5"	3'-5"	1'-0"			
bP8	4	4	4	4	4	"	23'-6"				Straight	
bP9	8	8		8	8	"	12'-10"	4'-5"	3'-0"	6	Bent	
bP10	4	4		4	4	"	14'-0"	5'-0"	3'-0"	6	"	
bP11	4	4		4	4	"	16'-5"	6'-1"	3'-1"	6	"	
bP12			10			"	[illegible]	[illegible]	1'-6"		"	2 sets of Bars
bP13			10			"	6'-5"	4'-5"	1'-0"		"	
bP14			8			"	13'-5"	4'-5"	3'-7"	6	"	
bP15			4			"	14'-7"	5'-0"	3'-7"	6	"	
bP16			4			"	16'-10"	6'-1"	3'-8"	6	"	
bP17	8	8	8	8	8	"	9'-0"				Straight	
XP1	16					[illegible]	26'-6"				"	
XP2		16					27'-3"				"	
XP3			24				20'-3"				"	
XP4				8			23'-9"				"	
XP5					8		23'-0"				"	



9-bars per set, "A" varies by equal increments from 9'-0"-6'-0"
eP5
B varies from 3'-4" to 3'-6"
Length varies 13'-2" to 14'-1"

eP17-eP25-eP26-eP27-eP28

eP2

bP1-bP2-bP3-bP4 & bP5
Dimensions A, B & Length of bars for each set of bars to vary by equal increments between limits given in table.

bP6-bP7-bP12-bP13
Dimension A & Length of bars bP6 & 12 for each set of bars to vary by equal increments between limits given in table

bP8-bP9-bP10-bP14-bP15-bP16

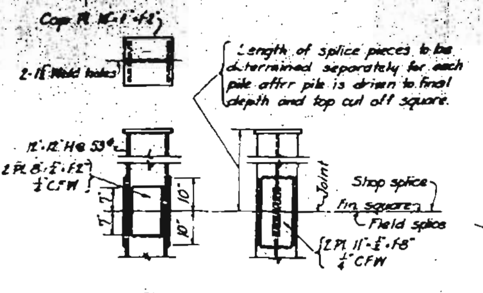
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

PIERS 5-6-7-8 & 9

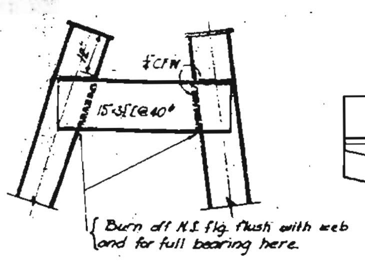
SCALE ¼"=1'-0"
R.R.M. 11-30-37
N.P.G. 12-6-38
R.E.M. 12-7-38

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET No. 59



Length of splice pieces to be determined separately for each pile after pile is driven to final depth and top cut off square.

TYPICAL DETAILS

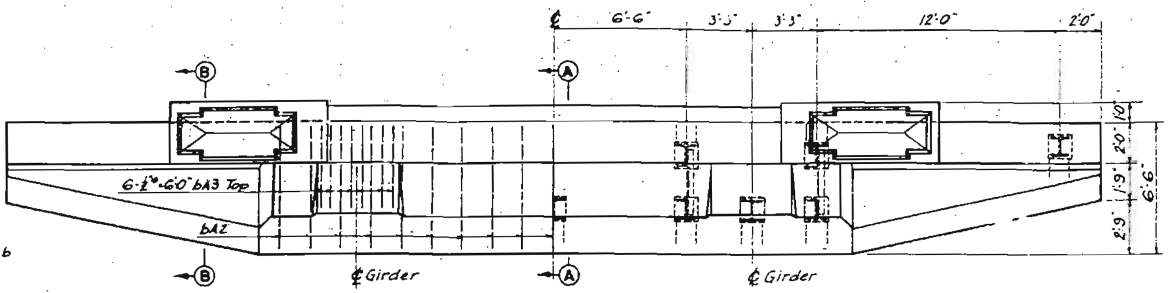


Burn off N.S. flg. flush with web and for full bearing here.

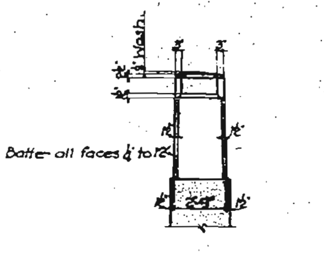
CROSS CONNECTION

STEEL PILE DETAILS

¾"-1'-0"

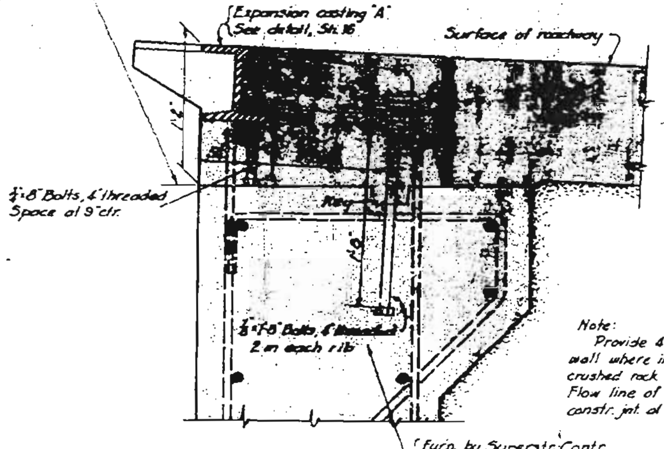


PLAN



SECTION-22

Abutment concrete above here to be constructed by Superstructure Contractor in connection with setting Exp. Jt. Cstgs. and as a part of Roadway Slab constr. on bridge.


Expansion casting "A" See detail, Sh. 16
Surface of roadway
1'-6"
¾"·8" Bolts, 4" threaded Space at 9" ctr.
Key
1'-0"
⅝"·1'-8" Bolts, 6" threaded 2 in each rib

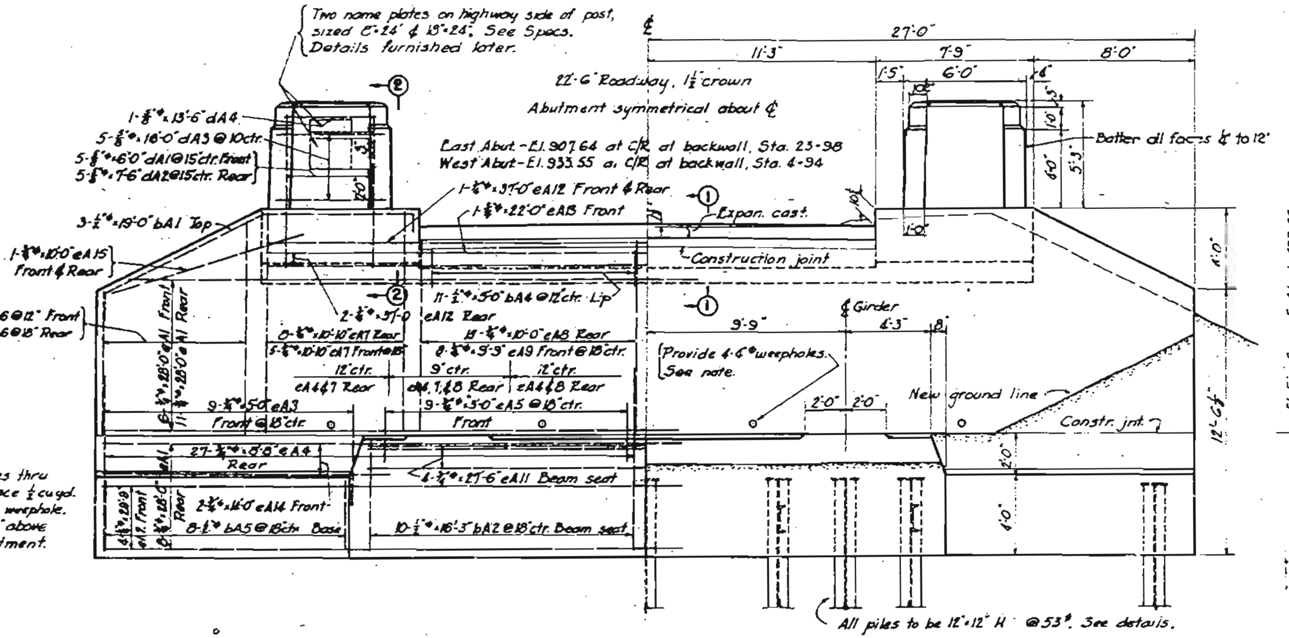
DETAIL 1-1

1½"-1'-0"

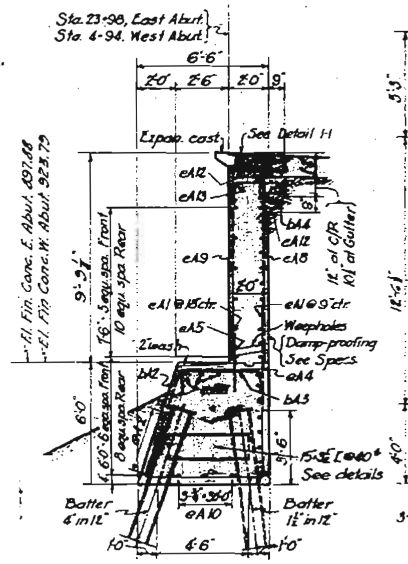
Furn. by Superstr. Contr.
Set by Substr. Contr.
(See Spec. Div. II - Art. 23)

Note:
Provide 4-4"⌀ weepholes thru wall where indicated. Place ½ cu.yd. crushed rock behind each weephole. Flow line of hole to be 4" above constr. jnt. at face of abutment.

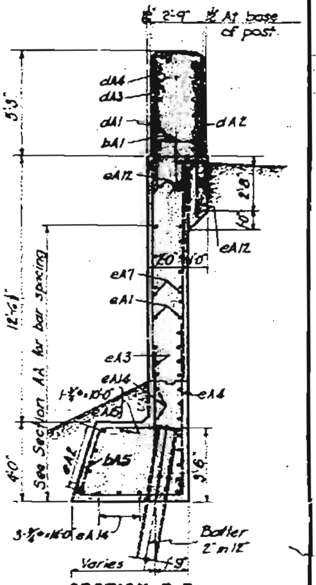
Two name plates on highway side of post, sized 8"·24" & 13"·24". See Specs. Details furnished later.


2
1-⅝"⌀·13'-6" dA4
5-⅝"⌀·16'-0" dA3 @ 10" ctr.
5-⅝"⌀·6'-0" dA1 @ 15" ctr. Front
5-⅝"⌀·7'-6" dA2 @ 15" ctr. Rear
3-½"⌀·19'-0" bA1 Top
1-¾"⌀·10'-0" eA15 Front & Rear
8-¾"⌀ eA6 @ 12" Front
6-¾"⌀ eA6 @ 18" Rear
¾"⌀·28'-0" eA1 Front
¾"⌀·28'-0" eA1 Rear
2-¾"⌀·37'-0 eA12 Rear
8-¾"⌀·10'-10" eA7 Rear
5-¾"⌀·10'-10" eA7 Front @ 18" 12" ctr.
eA4 & 7 Rear
9-¾"⌀·5'-0" eA3 Front @ 18" ctr.
27-¾"⌀·8'-8" eA4 Rear
2-¾"⌀·14'-0" eA14 Front
8-½"⌀ bA5 @ 18" ctr. Base
1-¾"⌀·37'-0" eA12 Front & Rear
1-¾"⌀·22'-0" eA13 Front
11-½"⌀·5'-0" bA4 @ 12" ctr. Lip
13-¾"⌀·10'-0" eA8 Rear
8-¾"⌀·9'-9" eA9 Front @ 18" ctr.
9" ctr.
12" ctr.
eA4, 7, & 8 Rear
eA4 & 8 Rear
9-¾"⌀·3'-0" eA5 @ 18" ctr.
Front
4-¾"⌀·27'-6" eA11 Beam seat
10-½"⌀·16'-3" bA2 @ 18" ctr. Beam seat
22'-6" Roadway, 1½" crown
Abutment symmetrical about ℄
East Abut. - El. 907.64 at C/R at backwall, Sta. 23-98
West Abut. - El. 933.55 at C/R at backwall, Sta. 4-94
℄
27'-0"
11'-3"
7'-9"
8'-0"
1'-5"
6'-0"
6"
10"
5"
10"
6'-0"
5'-3"
Batter all faces ¼" to 12"
1
Expan. cast.
Construction joint
1'-0"
4'-0"
℄ Girder
9'-9"
4'-3"
8"
Provide 4-4"⌀ weepholes. See note.
2'-0"
2'-0"
New ground line
Constr. jnt.
2'-0"
4'-0"
12'-6½"
All piles to be 12"·12" H @ 53#. See details.

ELEVATION



SECTION A-A



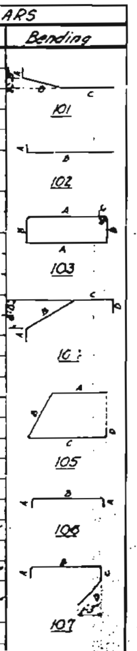
SECTION B-B

EAST ABUTMENT
WEST ABUTMENT — Same as noted

Scale ¼"=1'-0"

For General Notes For Concrete, see Sh. 2.
All concrete Class 30.

SCHEDULE OF REINFORCING BARS									
Mark	No.	Size	Length	Type	A	B	C	D	Bending
eA1	50	¾"⌀	28'-0"	Str.					
eA2	8	"	29'-9"	101	1'-6"	12'-0"	16'-3"		
eA3	18	"	5'-0"	Str.					
eA4	54	"	8'-8"	"					
eA5	18	"	3'-0"	"					
eA6	28	"	6'-3" to 10'-5"	"					
eA7	26	"	10'-10"	"					
eA8	26	"	10'-0"	102	0'-6"	9'-6"			
eA9	16	"	9'-9"	Str.					
eA10	3	"	30'-0"	"					
eA11	4	"	27'-6"	"					
eA12	4	"	37'-0"	"					
eA13	1	"	22'-0"	"					
eA14	10	"	14'-0"	"					
eA15	6	"	10'-0"	"					
dA1	10	⅝"⌀	6'-0"	Str.					
dA2	10	"	7'-6"	"					
dA3	10	"	16'-0"	103	5'-6"	2'-0"	0'-6"		
dA4	2	"	13'-6"	103	4'-3"	2'-0"	0'-6"		
bA1	6	½"⌀	19'-0"	104	1'-0"	8'-9"	7'-6"	1'-9"	
bA2	20	"	16'-3"	105	4'-0"	5'-9"	6'-0"	0'-6"	
bA3	12	"	6'-0"	106	1'-0"	4'-0"			
bA4	22	"	5'-0"	107	0'-6"	2'-5"	0'-5"	1'-10"	
bA5	16	"	10'-0" to 15'-0"	105	2'-3" to 4'-9"	3'-9"	3'-6" to 6'-0"	0'-6"	



191

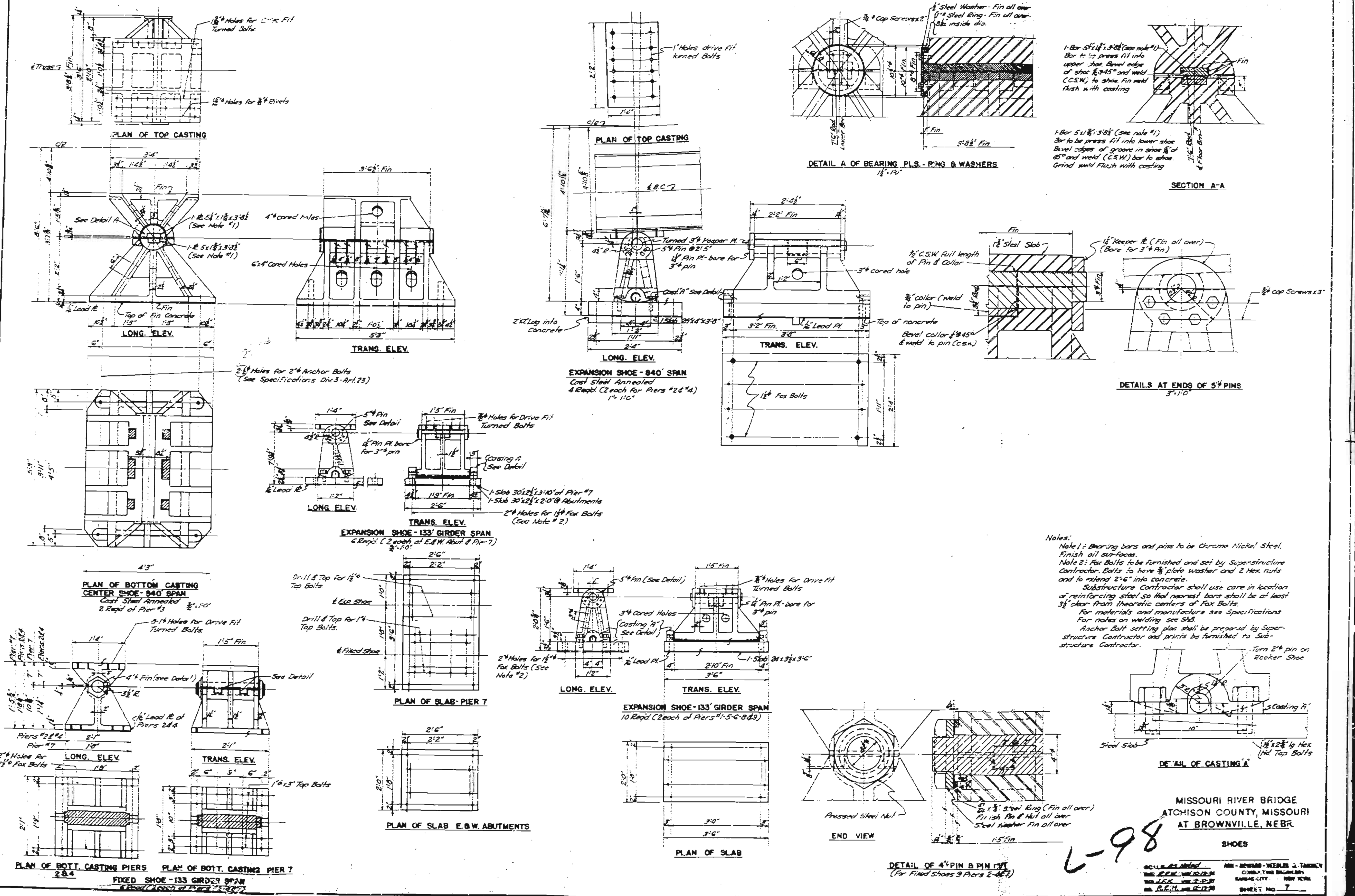
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

ABUTMENTS

SCALE As Noted
S.L.C.
S.L.C.
B.L.K.

SHEET NO. 6


PLAN OF TOP CASTING
1⅜" ϕ Holes for Drive Fit Turned Bolts
15/16" ϕ Holes for ⅞" ϕ Rivets
LONG. ELEV.
See Detail A
(See Note #1)
Top of Fin. Concrete
½" Lead Pl.
TRANS. ELEV.
4" ϕ cored holes
6"x4" Cored Holes
2⅛" ϕ Holes for 2" ϕ Anchor Bolts (See Specifications Div. 3-Art. 23)
PLAN OF BOTTOM CASTING
CENTER SHOE-840' SPAN
Cast Steel Annealed
2 Reqd. at Pier #3
PLAN OF TOP CASTING
1" Holes drive fit turned Bolts
Turned 5" ϕ Keeper Pl.
5" ϕ Pin @ 2'-5"
Cast. "A" See Detail
2"x2" Lug into Concrete
LONG. ELEV.
TRANS. ELEV.
3" ϕ cored hole
Top of concrete
1¼" ϕ Fox Bolts
EXPANSION SHOE-840' SPAN
Cast Steel Annealed
4 Reqd. (2 each for Piers #2 & #4)
DETAIL A OF BEARING PLS.-RING & WASHERS
½" Steel Washer - Fin all over
Steel Ring - Fin all over
¾" ϕ Cap Screws x 2"
SECTION A-A
DETAILS AT ENDS OF 5" ϕ PINS
1½" Steel Slab
1½" Keeper Pl. (Fin all over) (Bore for 3" ϕ Pin)
⅝" ϕ cap Screws x 3"
⅜" collar (weld to pin)
Bevel collar ⅛"x45° & weld to pin (C.S.W.)
5" ϕ Pin See Detail
LONG. ELEV.
TRANS. ELEV.
⅞" ϕ Holes for Drive Fit Turned Bolts
Casting A See Detail
1-Slab 30"x2½"x3'-10" at Pier #7
1-Slab 30"x2½"x2'-0" @ Abutments
2" ϕ Holes for 1¾" ϕ Fox Bolts (See Note #2)
EXPANSION SHOE-133' GIRDER SPAN
6 Reqd. (2 each at E & W. Abut. & Pier 7)
PLAN OF SLAB-PIER 7
Drill & Tap for 1¼" ϕ Top Bolts
PLAN OF SLAB E & W. ABUTMENTS
LONG. ELEV.
TRANS. ELEV.
5" ϕ Pin (See Detail)
3" ϕ cored Holes
(Casting "A" See Detail)
EXPANSION SHOE-133' GIRDER SPAN
10 Reqd. (2 each at Piers #1-5-6-8 & 9)
PLAN OF SLAB
END VIEW
Pressed Steel Nut
DETAIL OF 4" ϕ PIN & PIN NUT
(For Fixed Shoes 3 Piers 2-4 & 7)
Turn 2" ϕ pin on Rocker Shoe
Steel Slab
Casting "A"
1¼"x2⅝" lg Hex Hd. Top Bolts
DETAIL OF CASTING "A"
LONG. ELEV.
TRANS. ELEV.
4" ϕ Pin (see Detail)
See Detail
1"x3" Top Bolts
PLAN OF BOTT. CASTING PIERS 2 & 4
PLAN OF BOTT. CASTING PIER 7
FIXED SHOE-133' GIRDER SPAN

Notes:
Note 1: Bearing bars and pins to be Chrome Nickel Steel. Finish all surfaces.
Note 2: Fox Bolts to be furnished and set by Super-structure Contractor. Bolts to have ⅜" plate washer and 2 Hex nuts and to extend 2'-6" into concrete.

Substructure Contractor shall use care in location of reinforcing steel so that nearest bars shall be at least 3½" clear from theoretic centers of Fox Bolts.

For materials and manufacture see Specifications
For notes on welding see Sh8.

Anchor Bolt setting plan shall be prepared by Super-structure Contractor and prints be furnished to Sub-structure Contractor.

192

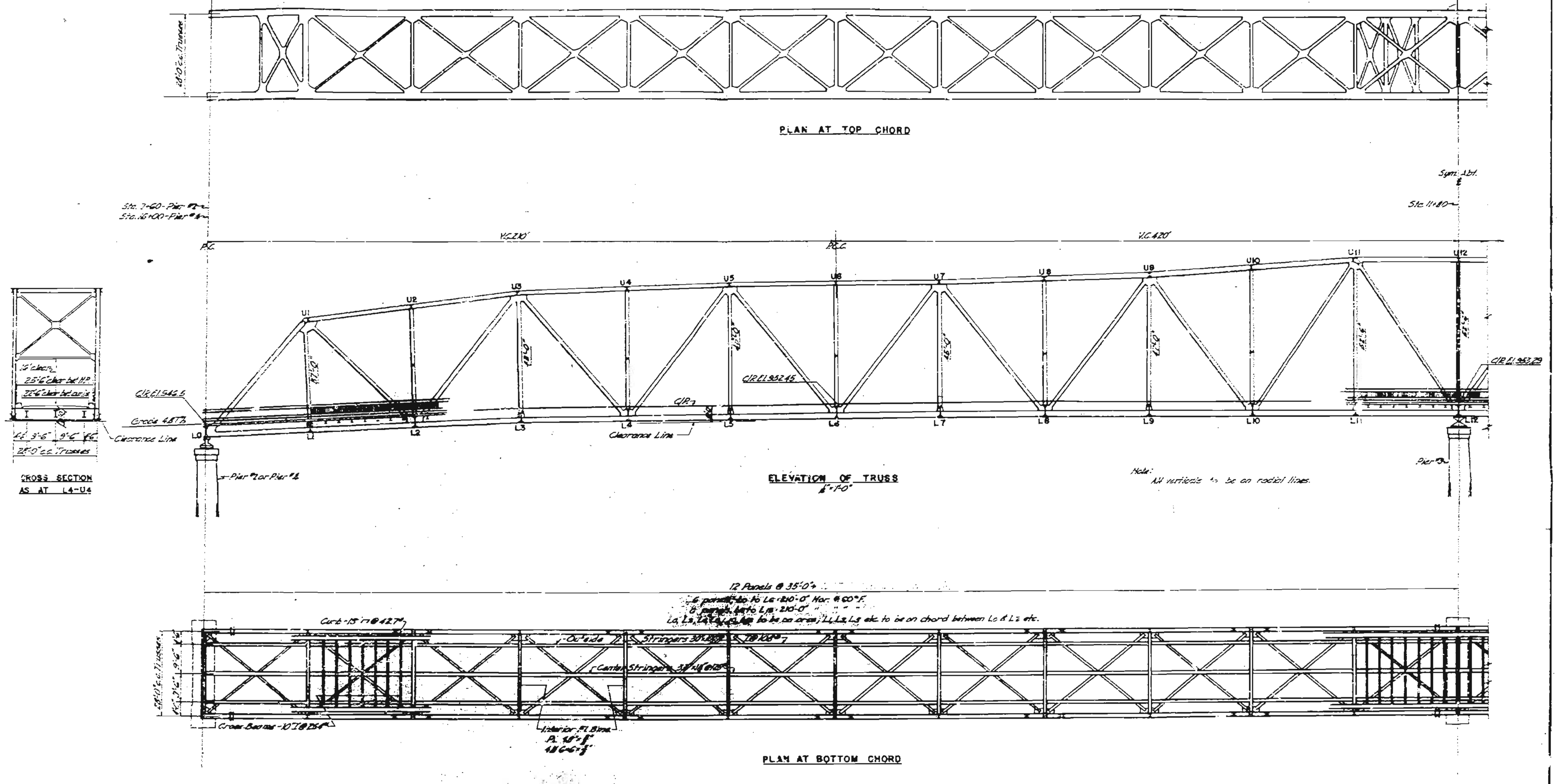
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

SHOES

SCALE As Noted
R.E.K.
J.E.K.
R.E.H.

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY   NEW YORK
SHEET NO. 7



GENERAL NOTES ON WELDING

For general requirements for welding see specifications.
All welds not otherwise indicated shall be 5/16" continuous fillet welds.
Fillet welds are generally shown thus: ⟶ or ⟶ or ═══
Butt welds are generally shown thus: ⟶ or ⟶ or ═══
All butt welds shall be continuous. Unless otherwise shown use square cuts in metal 1/4" or less in thickness, single V bevels for thickness 5/16" to 1/2", and double V bevels for metal 5/8" or over.
Tack welds, plug, slot or seal welds shall be specifically noted if used.
The shop drawings shall show clearly the nature, dimensions, and location of all welds.

Typical Nomenclature:
- 5/16" CSW indicates a 5/16" continuous shop fillet weld
- 1/4" CFW indicates a 1/4" continuous field fillet weld
- 5/16" x 2" @ 6" SW indicates intermittent 5/16" shop fillet welds, 2" long and at 6" centers.
- FBW indicates a field butt weld and SBW a shop butt weld.

GENERAL NOTES FOR STEELWORK

See Specifications for provisions regarding punching, reaming, finish, assembly, riveting, painting and other shop and field operations. Such provisions shall be clearly noted on the working drawings.

RIVETS:

7/8" ϕ unless otherwise noted.
Field Rivets, Shear 11,000 #/□", Bearing 22,000 #/□"
Shop Rivets, Shear 13,500 #/□", Bearing 27,000 #/□"

RIVET SPACING:

Where not shown on detail drawings, spacing shall conform to requirements of Design Specifications A.A.S.H.O.-1935. For Compression Chord Members, splice points and panel points at which a change in chord stress occurs, are to be regarded as ends of members. In web members the ends shall be taken as the termination of flanges.

13

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS
GENERAL LAYOUT

SCALE As Noted
[illegible]

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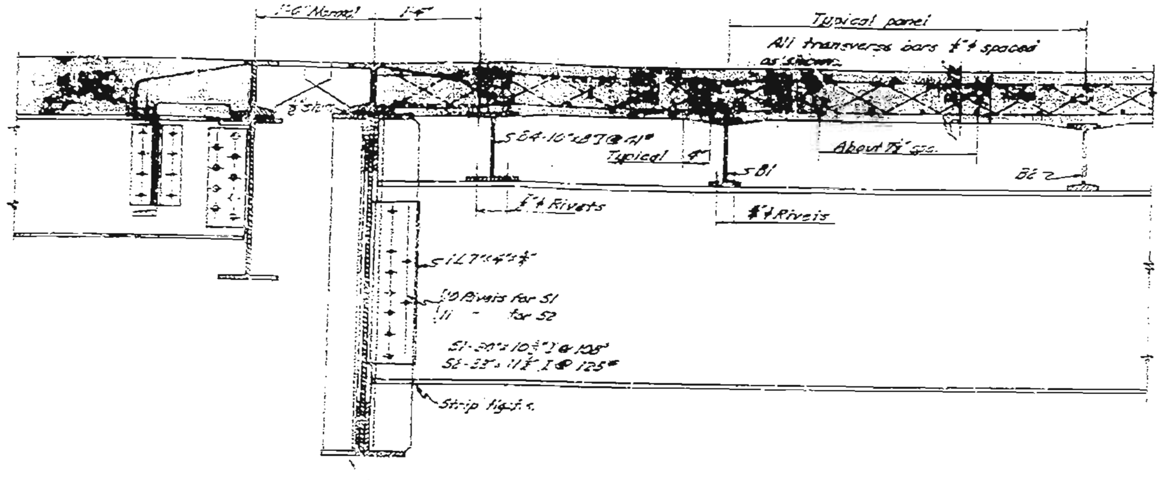
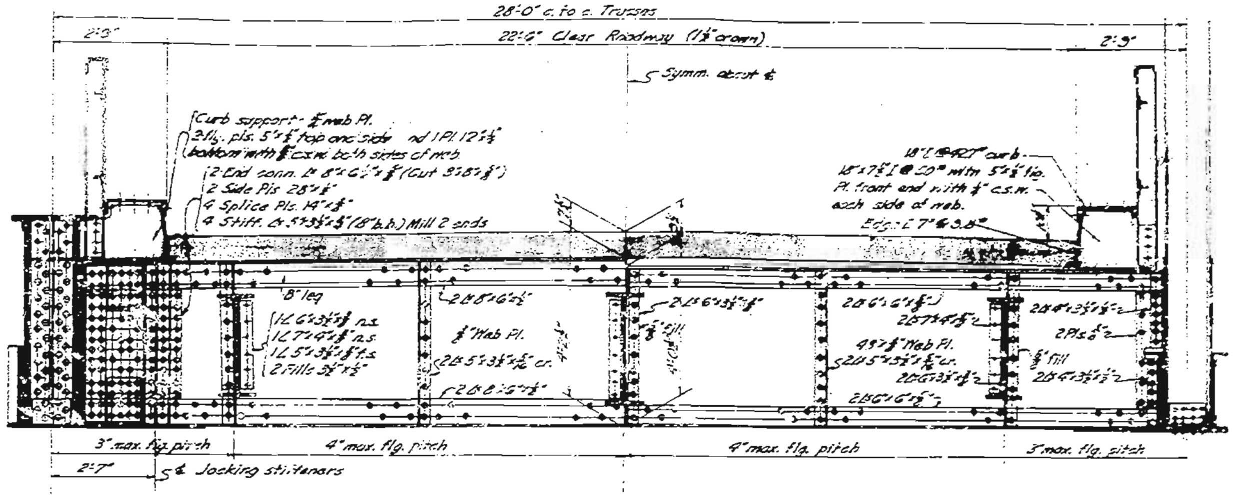
KANSAS CITY NEW YORK
SHEET NO. [illegible]



STRINGER CONNECTION AT FB1

1"=1'-0"



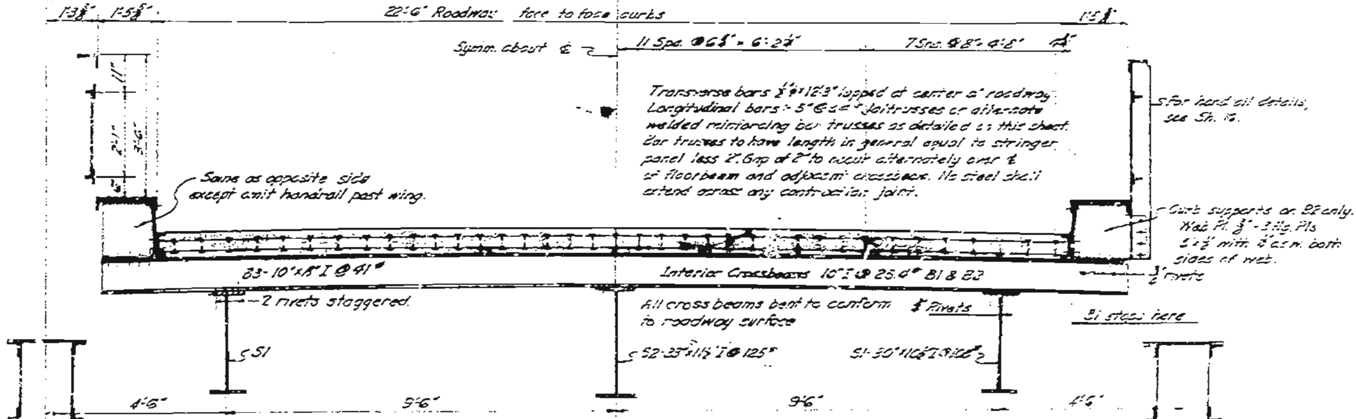
HALF SECTION AT END FLOORBEAM FB1

½"=1'-0"

HALF SECTION AT INTERIOR FLOORBEAM FB2

FLOORBEAM FB3 SIMILAR (For Str. conn. see detail this sheet)

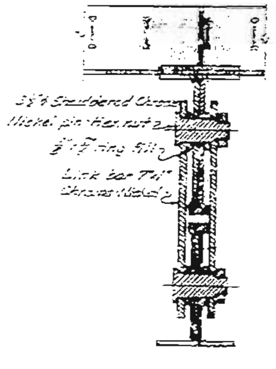
FLOORBEAM FB2A SAME (Except for End Connection - see detail "A")


℄ Truss
22'-6" Roadway face to face curbs
Symm. about ℄
11 Spa. @ 6⅛" = 6'-2¼"
7 Sp. @ 8" = 4'-8"
Same as opposite side except omit handrail post wing.
For hand rail details, see Sh. 10.
Curb supports on B2 only.
B3-10"x8" I @ 41#
Interior Crossbeams 10" I @ 25.4# B1 & B2
2 rivets staggered
All cross beams bent to conform to roadway surface
⅞"φ Rivets
S1
S2-33"x11½" I @ 125#
S1-30"x10½" I @ 108#
4'-6"
9'-6"
9'-6"
4'-6"

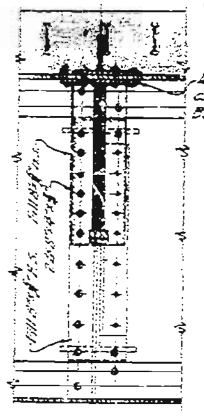
Transverse bars ⅝"φ x 12'-3" lapped at center of roadway. Longitudinal bars - 5" @ 2⅞"φ Jaltrusses or alternate welded reinforcing bar trusses as detailed on this sheet. Bar trusses to have length in general equal to stringer panel less 2". Gap of 2" to occur alternately over ℄ of floorbeam and adjacent crossbeam. No steel shall extend across any contraction joint.

TYPICAL ROADWAY CROSS-SECTION

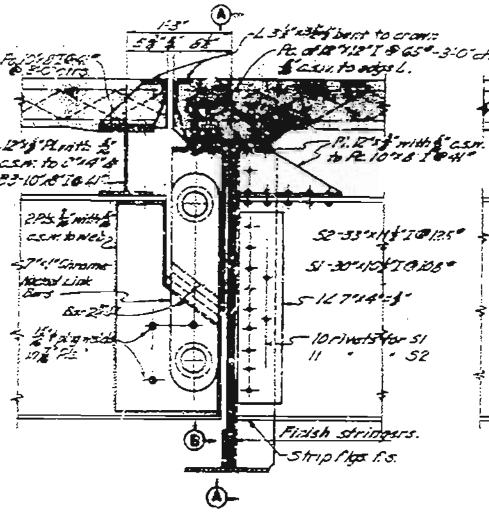
½"=1'-0"



SECTION B-B

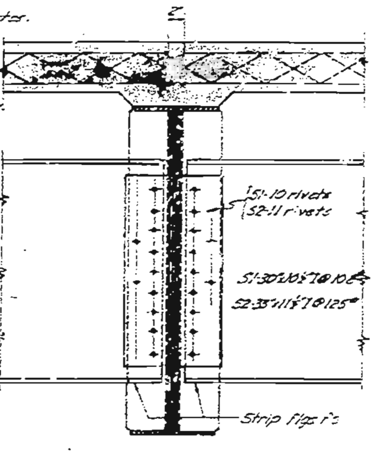


SECTION A-A



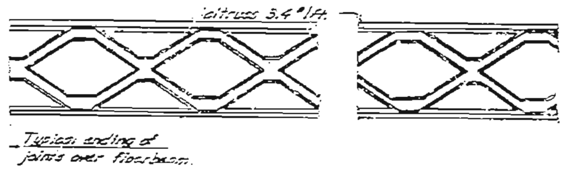
STRINGER CONN. TO FB3

1"=1'-0"



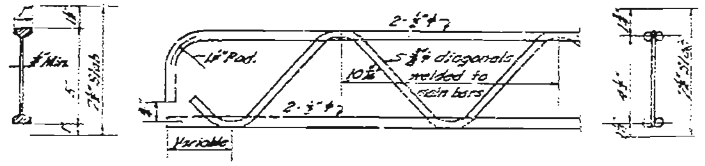
STRINGER CONN. TO FB2

Note: For General Notes on Steelwork and Welding see sheet 8. For Concrete, Sh. 2



JALTRUSS REINFORCING [illegible]

3"=1'-0"



REI[illegible]

3"=1'-0"

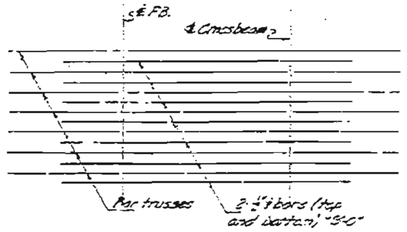
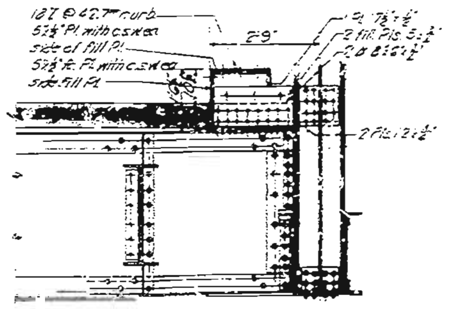


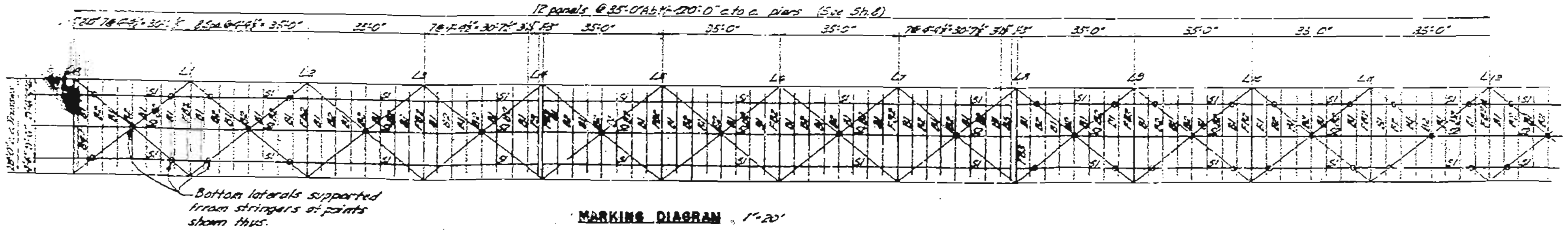
DIAGRAM OF SPLICES FOR JAL TRUSSES IN ROADWAY SLABS

No Scale



DETAIL "A"

½"=1'-0"


12 panels @ 35'-0" Abt.= 420'-0" c. to c. piers (See Sh. 6)
L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
L12
Bottom laterals supported from stringers at points shown thus.

MARKING DIAGRAM 1"=20'

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS-
FLOOR SYSTEM

SCALE As Noted
ASH-HOWARD-NEEDLES & TAMMEN
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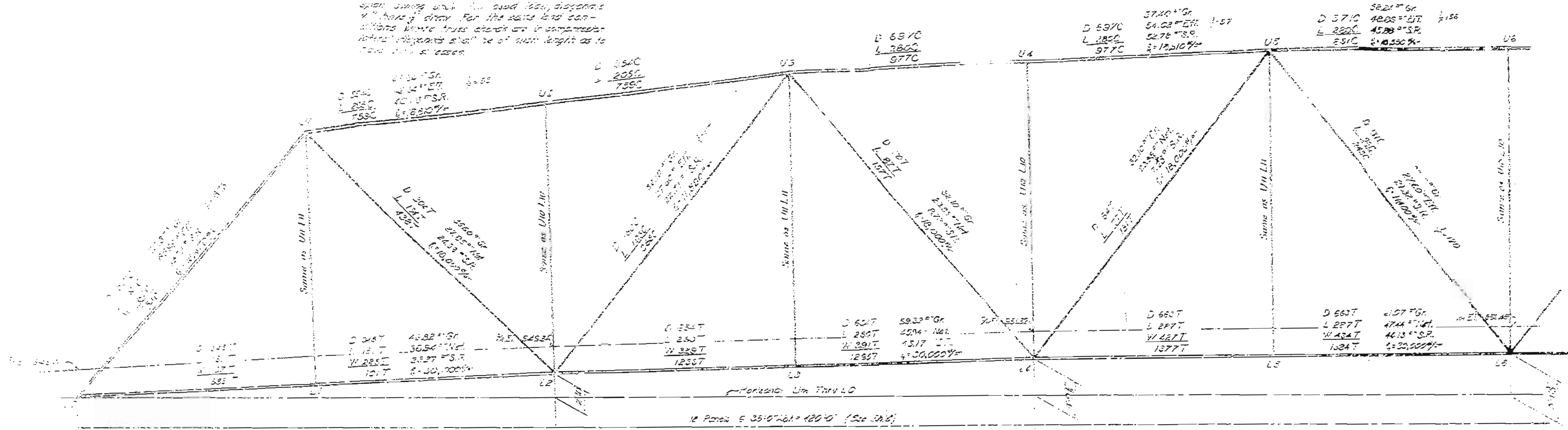
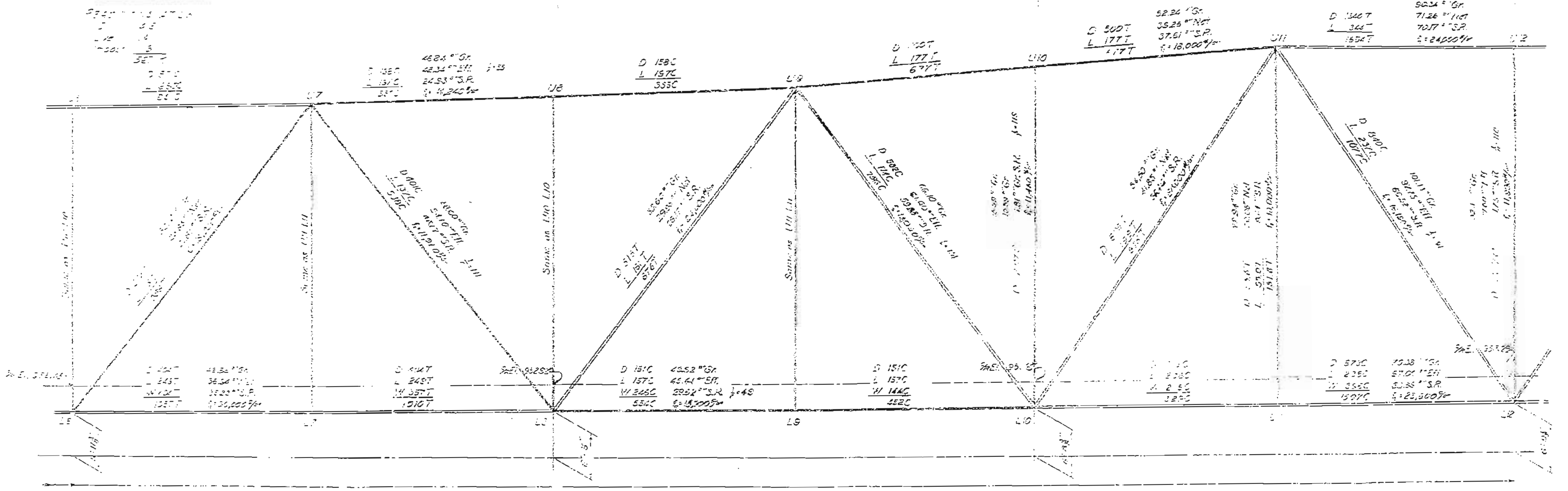
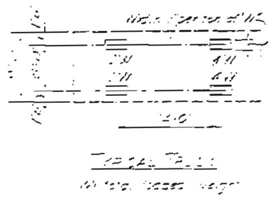
KANSAS CITY NEW YORK
SHEET No. 9

LATERALS:
Where truss chords are in tension, lateral diagonals shall be of such length that with span swung and [illegible] dead load, diagonals will have [illegible] stress. For the same load conditions where truss chords are in compression lateral diagonals shall be of such length as to have [illegible] stresses.







DEAD LOAD

Per Lin. Ft. of Span - 2 Trusses

	At Bottom Chord	At Top Chord	Total
Future Paving	338	—	338
Deck Concrete	2133	—	2133
Floor Steel	871	—	871
Bracing	98	280	322
Trusses	895	895	1790
	4335	1184	5520

Total Dead Load 5520# Lin. ft. span or 2760 plf truss

LIVE LOAD

For Floor System

On each 9 ft. traffic lane an H20 truck train consisting of H20 ton truck followed and preceded by 15 ton trucks at 44 ft. centers, placed to give maximum effect.

For Trusses

On each truss, one lane of H20 loading consisting of a uniform load of 640# per Lin. Ft. plus a single concentrated load of 18,000# for moment, or 26,000# for shear, placed so as to give maximum effect.

IMPACT

$I = \frac{50}{L+125}$ where

I = impact fraction of Live Load Stress.
L = loaded length of span in feet.

GENERAL NOTES

DESIGN SPECIFICATIONS: A.A.S.H.O. 1935 except as otherwise shown herein.

DESIGN UNIT STRESSES FOR D+L
Legend: D-Dead L-(Live + Impact)
W-Wind

	Carbon Steel	Silicon Steel
Axial Tension on Net Section	18,000	24,000
Axial Compression on Effective Gross Area	15,000-¼(l/r)²	20,000-½(l/r)²

For D+L+30%W or D+50%W allowable stresses are 1.25 times the above.

STRESSES GIVEN IN DIAGRAM are in units of 1000 pounds. Reactions given in same units. Allowable stresses are, unless otherwise noted, for axial stresses only. In sectioning members suitable allowances are made to care for dead load bending stresses.

DIMENSIONS AND CAMBER: Dimensions given, unless otherwise noted, are normal. Normal dimensions are at 60° Fahr. for a dead load of 2710# per lineal foot of truss, plus a live load of 640# per lineal foot of truss, extending over both 420'-0" spans. The length of truss members shall be such that, under the above dead load plus live load, all truss members will have their normal lengths and the trusses their normal or theoretical shape, free of secondary stresses. See Specifications. In computing deformation of members under stress, the area of the member shall be taken as the gross area.

CARBON AND SILICON STEELS: In stress diagram above, members mainly of silicon steel are indicated by double lines, single lines indicate carbon steel.

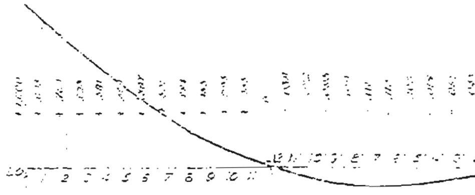
A further designation is made by use of letter "S" for silicon steel and letter "C" for carbon steel following the listing of steel parts on the detail truss drawings. Sheets #11-12-13.

DEAD LOAD
REACTION AT L12

Future paving		31
Concrete		577
Steel		885
	Total	1493 per truss

DEAD LOAD
REACTION AT L0

Future paving		25
Concrete		160
Steel		228
	Total	413 per truss



INFLUENCE LINE FOR END REACTION AT L0
Horiz. Scale 1"=35'-0"
Vert. Scale 1"=0.500

Example: A load "W" applied at Pt. [illegible] causes a negative reaction at L0 of [illegible]

REACTIONS AT L12

D	1493
Live	372
Impact	20
	1885 #

6-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS PLANS-
STRESS SHEET

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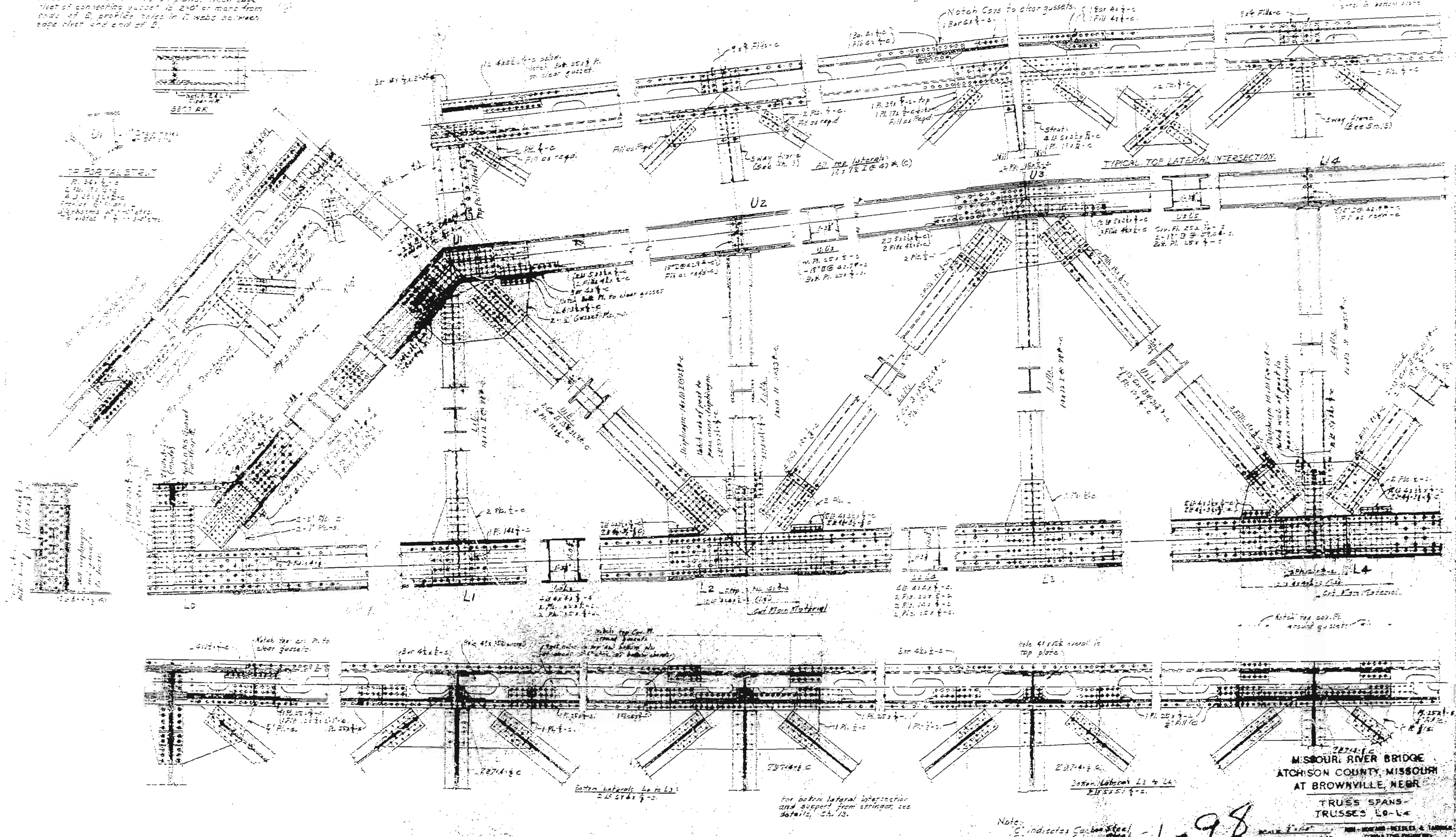
SHEET NO. 10

Notes on truss diagonals:
Provide 2'-2" [illegible] with [illegible] in webs of 18" Cor. [of truss diagonals and post [illegible]. These [illegible] to be spaced a maximum of 3'-0" ctrs. and a minimum of 1'-6" ctrs. in any one [with [illegible] to be staggered in [illegible] with those in web of other [of same member except at ends of member where holes may be placed opposite [illegible]. The stagger may be [illegible] two close spaces near one end of member. Care [illegible] be taken to keep the center of hole nearest edge rivet of connecting gusset plate at least [illegible]-0" from edge rivet unless shown otherwise on plans. When edge rivet of connecting gusset is 2'-0" or more from ends of [, provide holes in [webs between edge rivet and end of [.

NOTE:
At [illegible] shop rivet gussets to chord [illegible] of panel point most suitable for [illegible] conditions, regardless of location of shop and field rivets shown on Truss Details. The number of rivets shown shall not be reduced in any case.


Notch Cov. Pls. to clear gussets
Sway Frame (See Sh. 13)
All top laterals
TYPICAL TOP LATERAL INTERSECTION
U1
U2
U3
U4
L0
L1
L2
L3
L4
TOP PORTAL STRUT
Cut Main Material
Bottom laterals L0 to L3
Bottom laterals L3 to L4
For bottom lateral intersection and support from stringers, see details, Sh. 13.

Note:
C indicates Carbon Steel
S " Silicon Steel

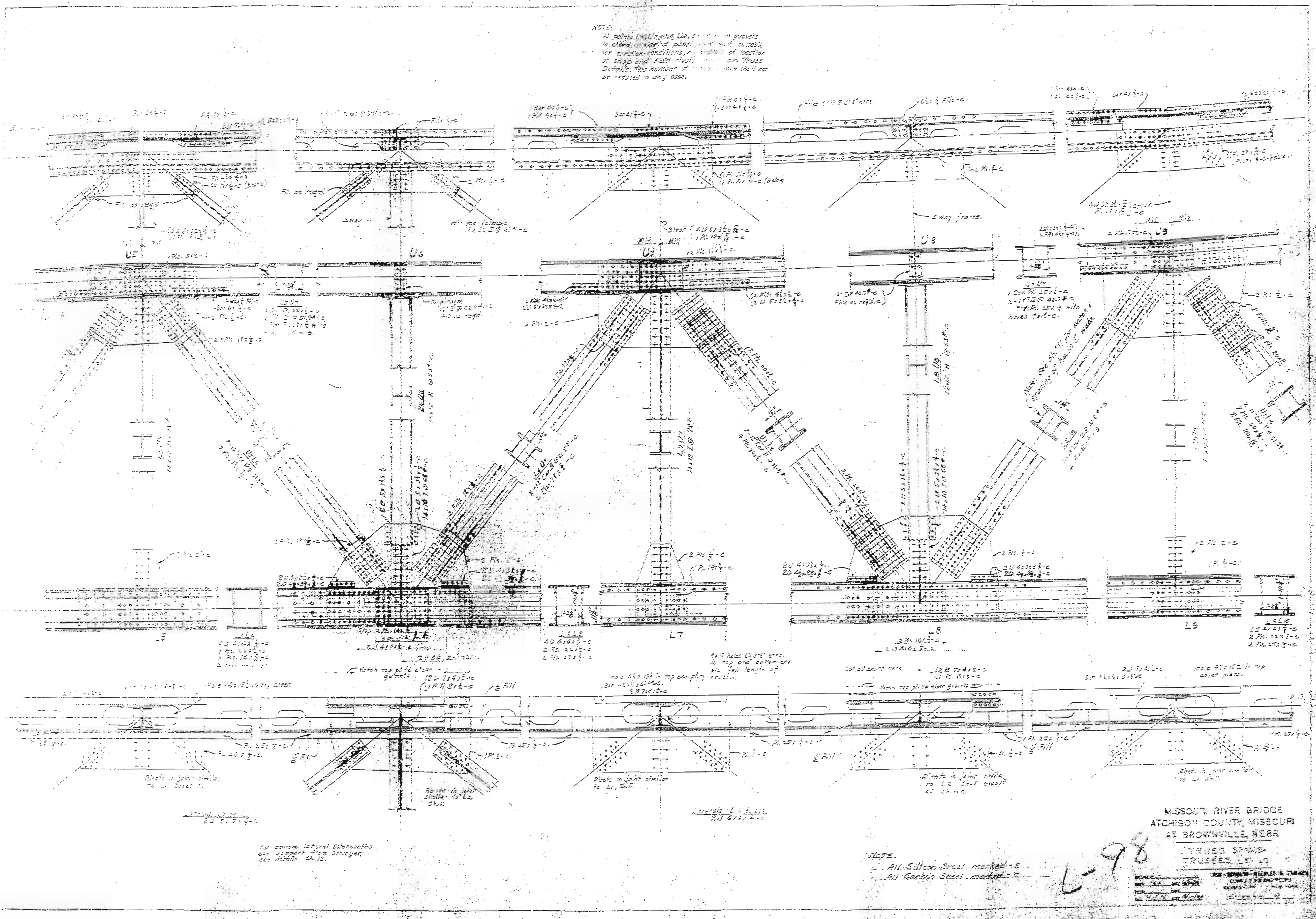
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS-
TRUSSES L0-L4

Scale [illegible]
[illegible] 12-12-38

[illegible] CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET NO. 11



NOTE:
At joints L6, U7, and U8, [illegible] gussets to chord [illegible] panel [illegible] suitable for erection conditions, [illegible] of location of shop and field rivets [illegible] on Truss Details. The number of [illegible] shall not be reduced in any case.

U5
U6
U7
U8
U9
L5
L6
L7
L8
L9
2 way Brace
Rivets in joint similar to L1 Sect. II
Rivets in joint similar to L5 Sect.
Rivets in joint similar to L1 Sect.
Rivets in joint similar to L2 Sect. except as shown
Rivets in joint similar to L1 Sect.

For bottom lateral intersection see support from stringer, see detail Sh. 13.

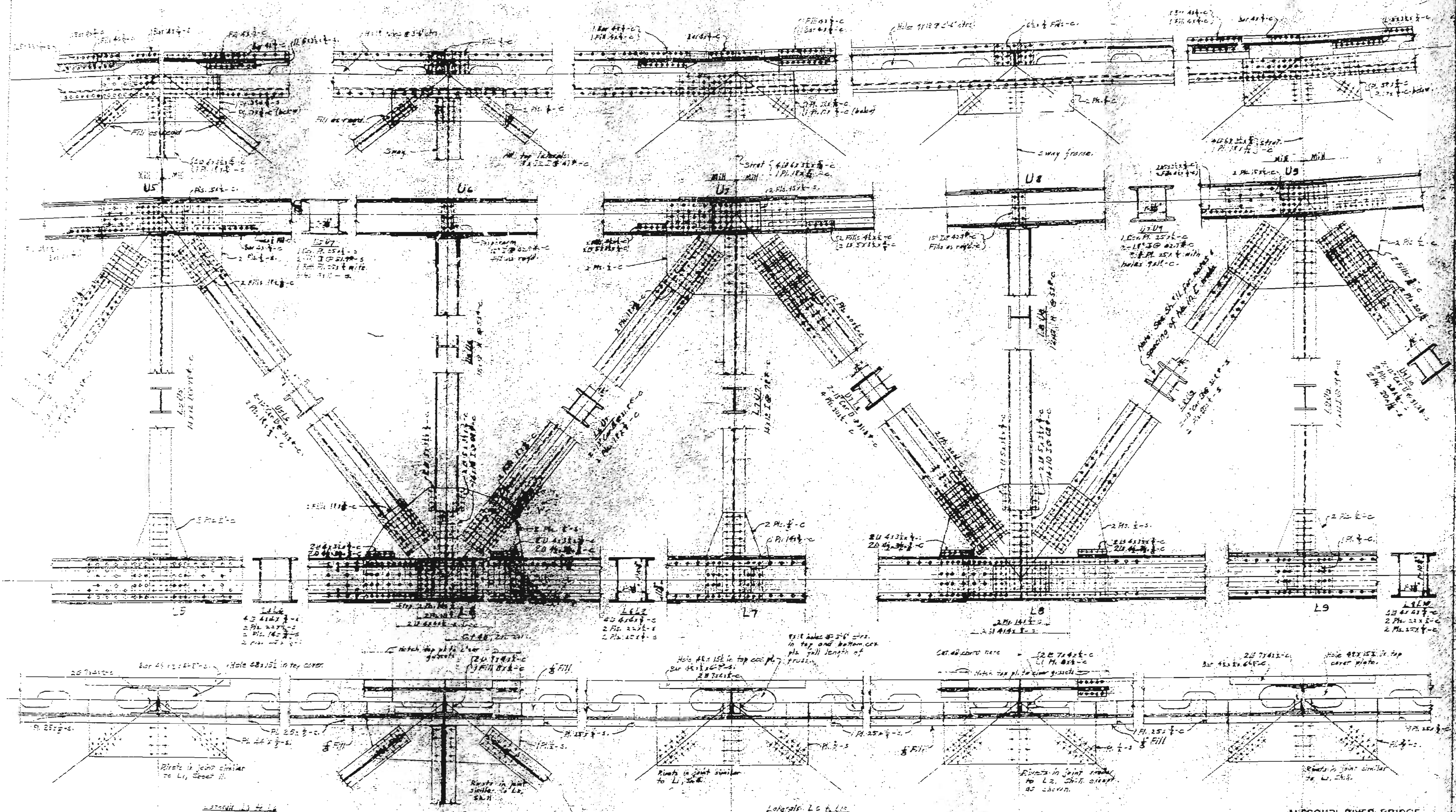
NOTE.
All Silicon Steel marked - S
All Carbon Steel marked - C

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS
TRUSSES L5 - L9

NOTE:
At points [illegible] and U9, shop rivet gussets to chord member of panel point most suitable for erection conditions, regardless of location of shop and field rivets shown on Truss Details. The number of rivets shown shall not be reduced in any case.

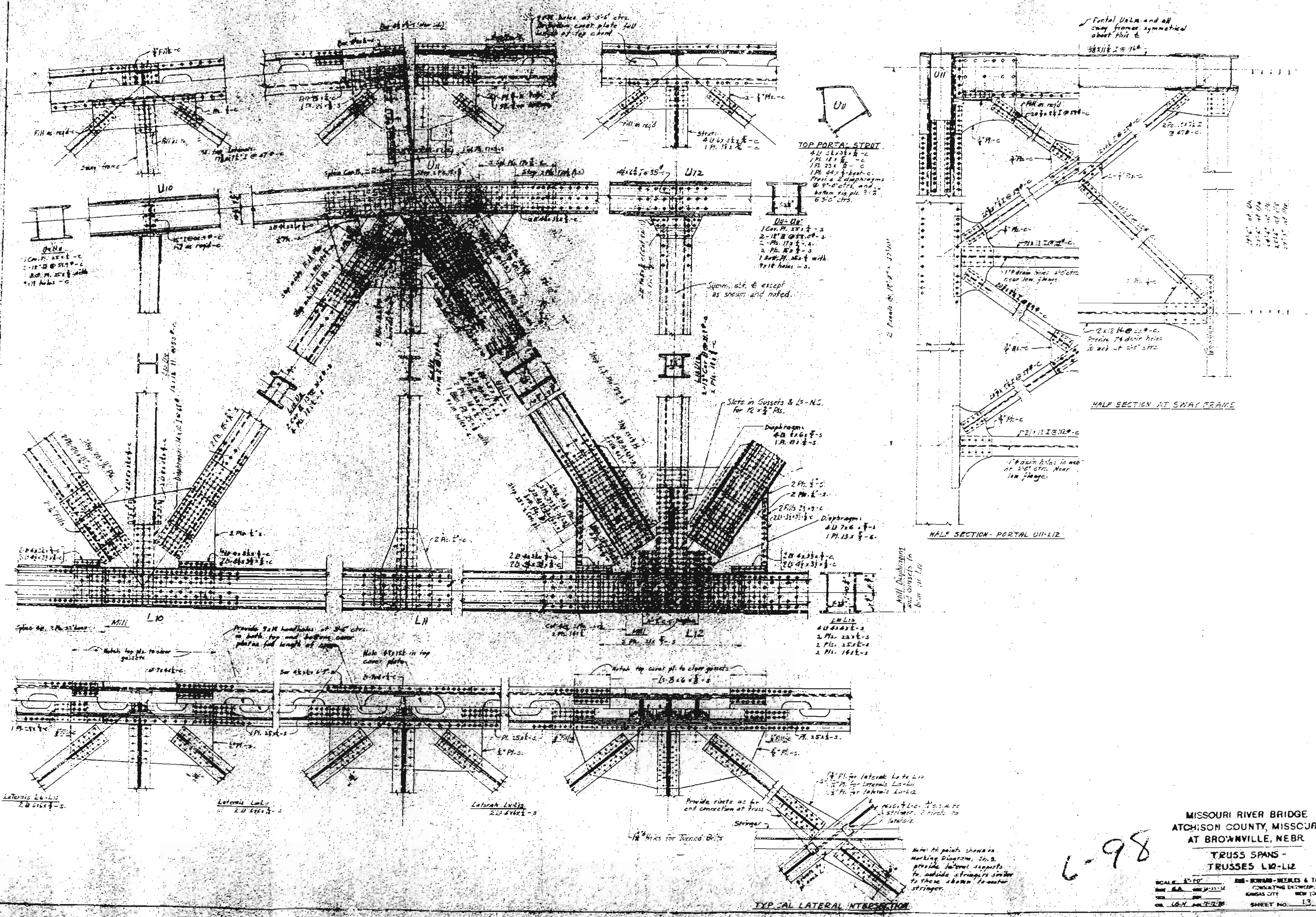

U5
U6
U7
U8
U9
L5
L7
L8
L9
Fill as reqd.
Sway
Sway frame
Rivets in joint similar to L1, Sheet 11.
Rivets in joint similar to L2, Sh. 11, except as shown.
For bottom lateral intersection see support from stringer, see details - Sh. 12.

NOTE.
All Silicon Steel marked -S
All Carbon Steel marked -C

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS
TR 13323 L5-L9

6-98



Portal U11L12 and all sway frames symmetrical about this ℄
U10
U11
U12
L10
L11
L12
U11
Mill
TOP PORTAL STRUT
4 Ls 3½x3½x⅝-c
1 Pl. 18x⅝-c
1 Pl. 23x⅝-c
1 Pl. 44x⅜-bent-c.
Provide 2 diaphragms @ 9'-0" ctrs. and bottom tie pls. @ 3'-0" ctrs.
U11-U12
1 Cov. Pl. 25x⅜-s
2-18" ⌶ @ 58.0#-s
2-Pls. 17x½-s.
2 Pls. 15x½-s
Symm. abt. ℄ except as shown and noted.
Fill as req'd.
Sway frame
Strut
Slots in Gussets & Ls-N.S. for 12x⅜" Pls.
Diaphragm
4 Ls 4x6x⅝-s
1 Pl. 13x½-s.
2 Pls. ½"-s.
2 Pls. ½"-s.
2 Fills
Diaphragm
4 Ls 7x6x⅝-s
1 Pl. 13x⅝-s.
2 Ls 4x3½x⅜-c
2 Ls 4½x3½x⅜-c
L10-L12
4 Ls 4x4x½-s
2 Pls. 22x½-s
2 Pls. 25x½-s
2 Pls. 14x½-s
Mill Diaphragms and Gussets to bear on L12
Provide 9x12 handholes at 3'-6" ctrs. in both top and bottom cover plates full length of span
Notch top pls. to clear gussets
Note 4½x15½ in top cover plate
Notch top cover pl. to clear gussets
1 Pl. 25x½-s
Laterals L6-L10
2 Ls 6x6x⅜-s
Laterals L10-L11
2 Ls 6x6x⅜-s
Laterals L11-L12
2 Ls 6x6x½-s
Provide rivets as for end connection at truss
Stringer
⅝" Pl. for laterals L6 to L10
⅝" Pl. for laterals L10-L11
¾" Pl. for laterals L11-L12
stringer. 2 rivets to laterals.
15/16" Holes for Turned Bolts
Note: At points shown on Marking Diagram, Sh. 9, provide lateral supports to outside stringers similar to those shown to center stringer.
TYPICAL LATERAL INTERSECTION
HALF SECTION - PORTAL U11-L12
HALF SECTION AT SWAY FRAME
1" drain holes in web at 2'-0" ctrs. near low. flange.

178

6-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TRUSS SPANS -
TRUSSES L10-L12

SCALE ½"=1'0"
DRN. G.A.
CK. G.H. 7-7-38

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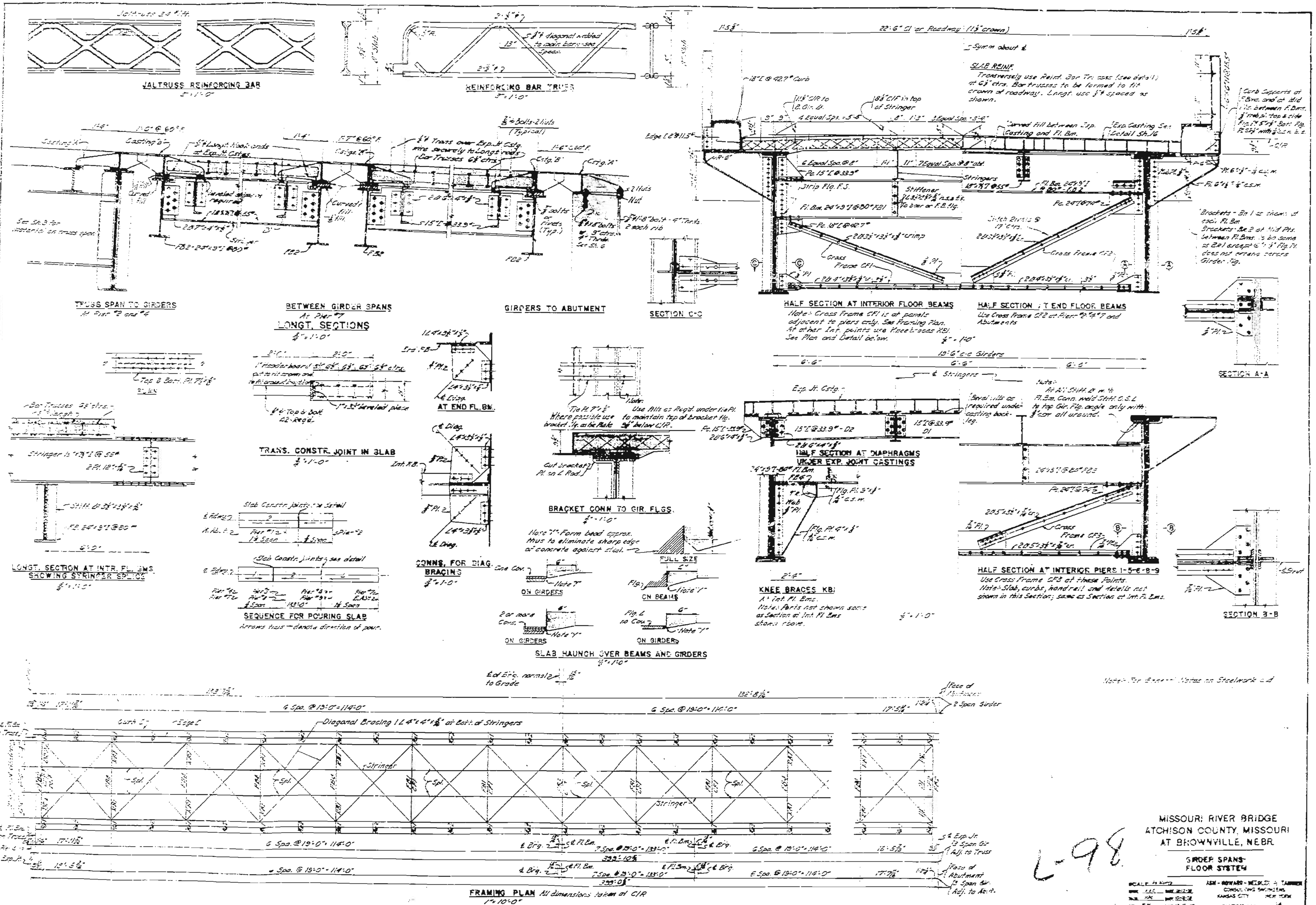
SHEET NO. 13


JALTRUSS REINFORCING BAR
REINFORCING BAR TRUSS
TRUSS SPAN TO GIRDERS
At Pier #2 and #4
BETWEEN GIRDER SPANS
At Pier #7
LONGT. SECTIONS
GIRDERS TO ABUTMENT
SECTION C-C
HALF SECTION AT INTERIOR FLOOR BEAMS
Note: Cross Frame CF1 is at panels adjacent to piers only. See Framing Plan. At other Int. points use Knee braces KB1 See Plan and Detail below.
HALF SECTION AT END FLOOR BEAMS
Use Cross Frame CF2 at Piers #2, #4, #7 and Abutments
22'-6" Clear Roadway (1½" crown)
SLAB REINF.
Transversely use Reinf. Bar Trusses (see detail) at 6½" ctrs. Bar trusses to be formed to fit crown of roadway. Longt. use ⅝"φ spaced as shown.
SECTION A-A
TRANS. CONSTR. JOINT IN SLAB
AT END FL. BM.
CONNS. FOR DIAG. BRACING
BRACKET CONN. TO GIR. FLGS.
HALF SECTION AT DIAPHRAGMS UNDER EXP. JOINT CASTINGS
KNEE BRACES KB1
At Int. Fl. Bms.
Note: Parts not shown same as Section at Int. Fl. Bms shown above.
HALF SECTION AT INTERIOR PIERS 1-5-6-8-9
Use Cross Frame CF3 at these Points.
Note: Slab, curbs, hand rail and details not shown in this Section; same as Section at Int. Fl. Bms.
SECTION B-B
LONGT. SECTION AT INTR. FL. BMS. SHOWING STRINGER SPLICE
SEQUENCE FOR POURING SLAB
Arrows thus → denote direction of pour.
SLAB HAUNCH OVER BEAMS AND GIRDERS
ON GIRDERS
ON BEAMS
FULL SIZE
Diagonal Bracing 1 L 4"x4"x⅜" at Bott. of Stringers
6 Spa. @ 19'-0" = 114'-0"
FRAMING PLAN All dimensions taken at C/R
1" = 10'-0"

L-98

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GIRDER SPANS
FLOOR SYSTEM

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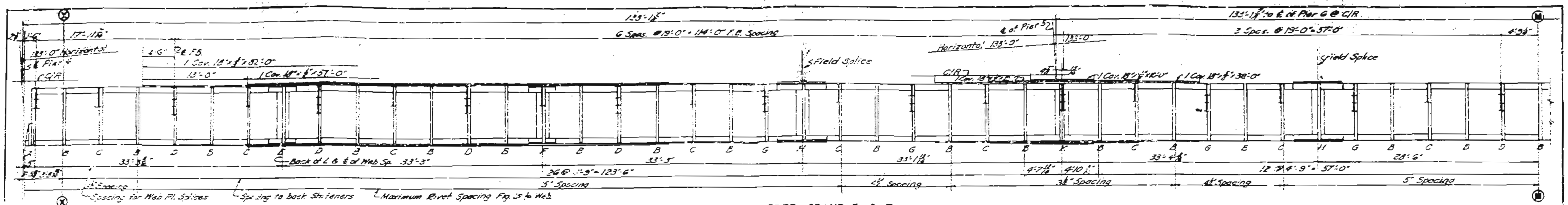
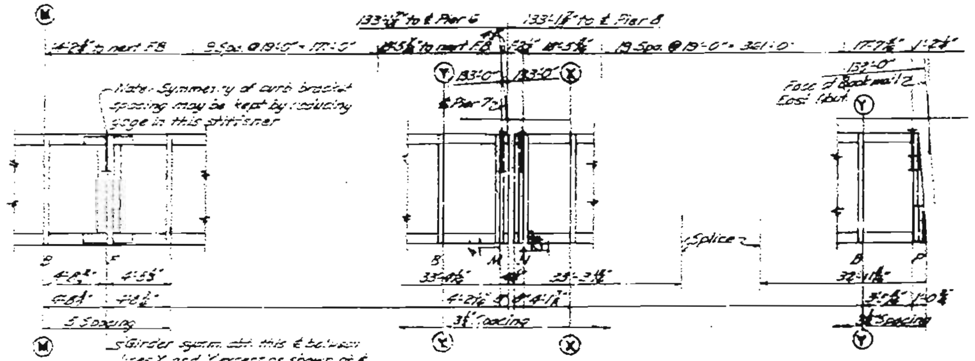
SHEET NO. 4


133'-1 1/8" to ℄ of Pier 6 @ G.R.
6 Spa. @ 19'-0" = 114'-0" F.B. Spacing
3 Spcs. @ 19'-0" = 57'-0"
Field Splice
Field Splice
Horizontal 133'-0"
26 @ 4'-9" = 123'-6"
12 @ 4'-9" = 57'-0"
5" Spacing
4 1/2" Spacing
3 1/2" Spacing
Spacing for Web Pl. Splices
Spacing to back Stiffeners
Maximum Rivet Spacing Fig. 5 to Web
Back of L & ℄ of Web Sp. 33'-3"

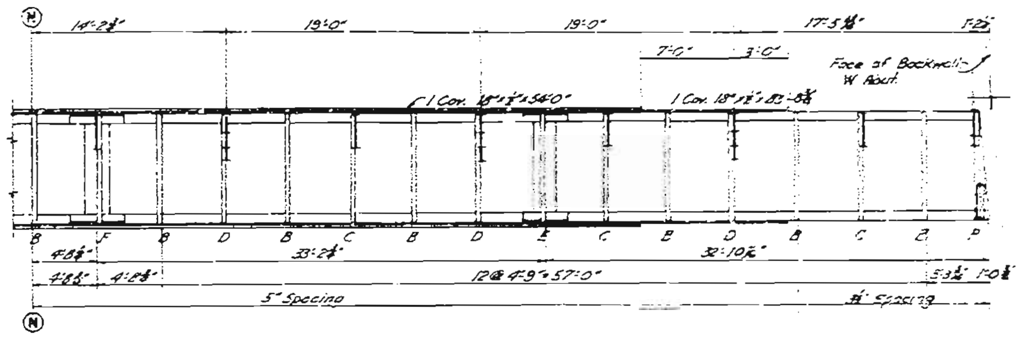
GIRDER SPANS 5-6-7

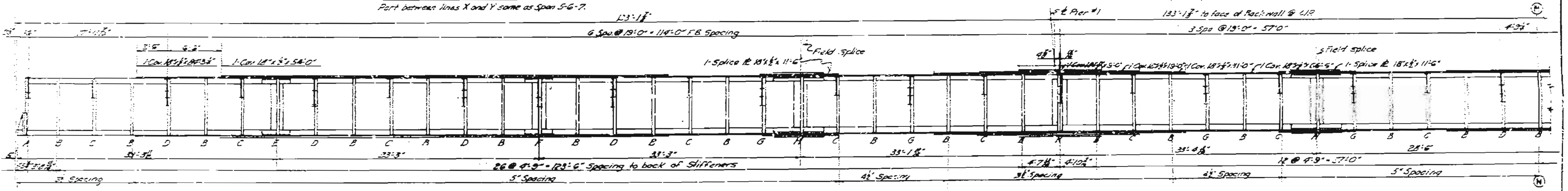

133'-1 1/8" to ℄ Pier 6
133'-1 1/8" to ℄ Pier 8
19 Spa. @ 19'-0" = 361'-0"
Note: Symmetry of curb bracket spacing may be kept by reducing gage in this stiffener
Face of Backwall ℄ East Abut.
Splice
Girder system abt. this ℄ between lines X and Y except as shown at ℄.
5" Spacing
3 1/2" Spacing

GIRDER SPANS 8-9-10

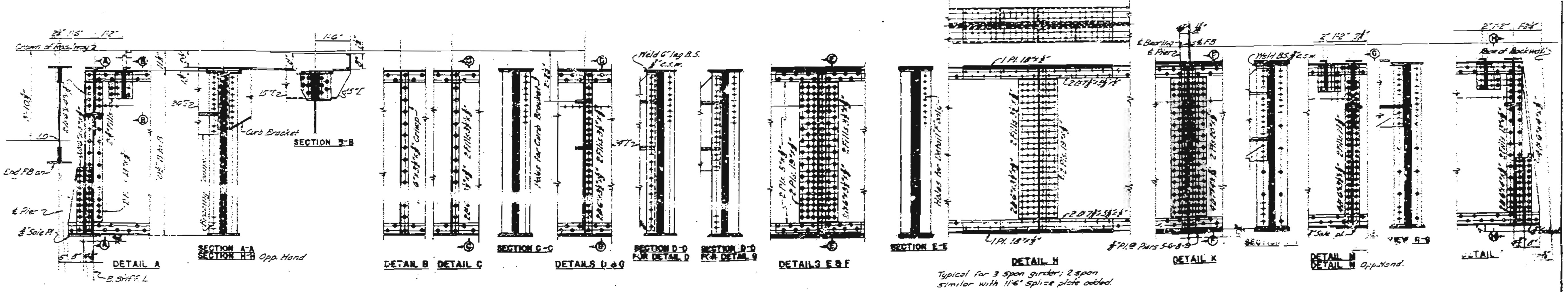
Part between lines X and Y same as Span 5-6-7.

All Flange ∠s 8"× 6"× 5/8". All web pls. 84"× 7/16".
Covers for bottom flange same as top flange.
For cover ℄. rivet sp g see detail below.



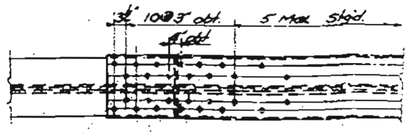

133'-1 1/8"
℄ Pier #1
133'-1 1/8" to face of Backwall @ G.R.
6 Spa. @ 19'-0" = 114'-0" F.B. Spacing
3 Spa. @ 19'-0" = 57'-0"
Field Splice
Field Splice
1 Splice Pl. 18"× 5/8"× 11'-6"
26 @ 4'-9" = 123'-6" Spacing to back of Stiffeners
12 @ 4'-9" = 57'-0"
5" Spacing
4 1/2" Spacing
3 1/2" Spacing

GIRDER SPANS 2-1



Typical for 3 Span girder; 2 span similar with 11'-6" splice plate added.

200



DETAIL AT END OF COVER PLATES

For General Notes on Steelwork and Welding, see Sh. 6.
In riveting a minimum pitch of at least 3" shall be maintained.

6-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
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GIRDER SPANS-
GIRDERS

SCALE As Noted
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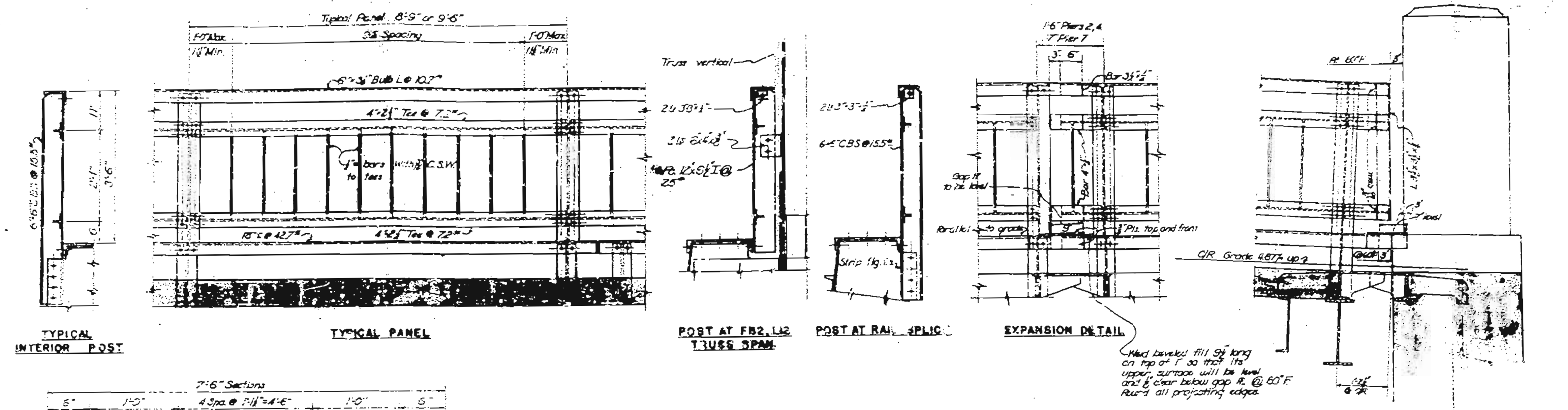

TYPICAL INTERIOR POST
TYPICAL PANEL
Typical Panel 8'-9" or 9'-6"
3/8 Spacing
6"×3½" Bulb L @ 10.7#
4"×2½" Tee @ 7.2#
POST AT FB2, L12 TRUSS SPAN
Truss vertical
POST AT RAIL SPLICE
6-4"CBS@15.5#
EXPANSION DETAIL
Bar 3½×½
Pls. top and front
Metal beveled fill 9½ long on top of L so that its upper surface will be level and ⅛" clear below gap R. @ 60°F. Round all projecting edges.
C/R Grade 4.87% up

Notes on Railing:—

All posts to be set normal to grade.

Bulb angle top rail to be spliced as follows: On thru truss spans, at panel points. On Nebraska deck spans at every fourth handrail post (38'-0"). On Missouri deck spans, at every third handrail post (28'-6").

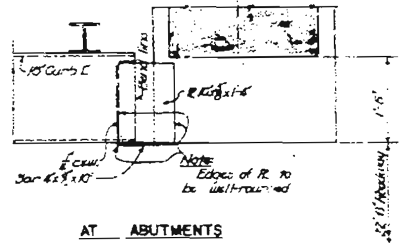
All sections to be cut straight. Cut and finish ends of bulb angles to leave ⅛" normal gap at ends, and to insure neat joints. Remove sharp corners of joints in top rail.

Rivets of posts to curbs and curb brackets to be ¾"φ. Attach railing to posts with ⅝"φ button head bolts with buttonheads on top and toward roadway. Provide 1 hex nut and 1 hex lock nut for each bolt. Holes for bolts to be ⅝"φ in bulb angle and tees, ⅝"φ in posts. Locate holes so that bolts are centered under normal conditions.

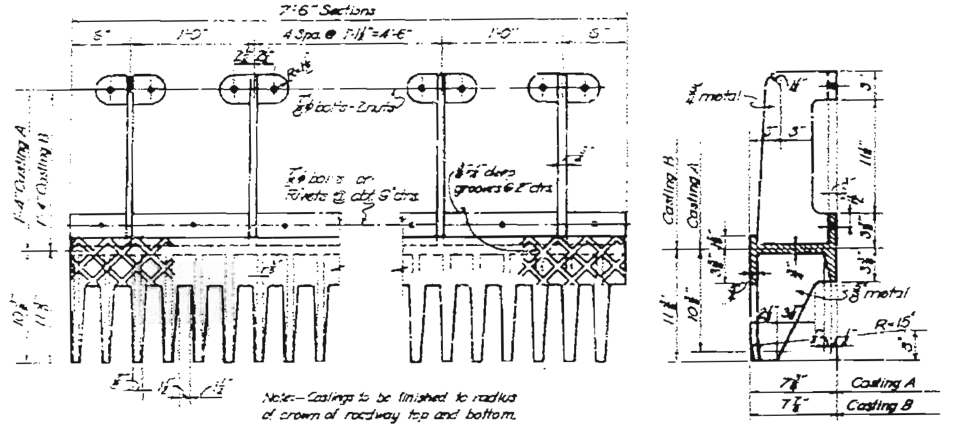
Lateral adjustment shall be obtained in field by reaming holes for attaching post to curb support.

Final adjustment of handrail to be made with roadway slab in place.

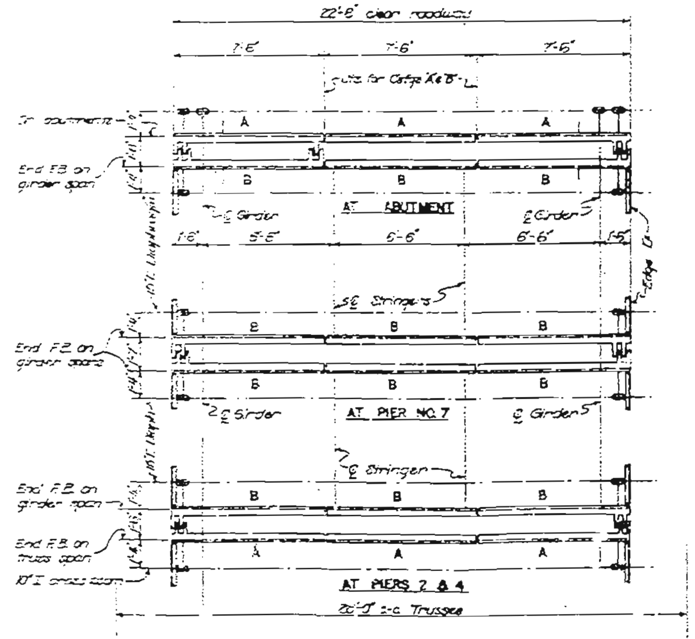
TYPICAL RAILING DETAILS
¾" = 1'-0"



AT ABUTMENTS


7'-6" Sections
4 Spa.@ 1'-1½"=4'-6"
Casting A
Casting B
⅝" metal
R=15"
Note—Castings to be finished to radius of crown of roadway top and bottom.

12 EXPANSION CASTINGS AS NOTED-MARK A (At end FB on truss spans & abutments)
18 EXPANSION CASTINGS AS NOTED-MARK B (On Deck Girder spans)
(CAST STEEL)
(Galvanized)
1½" = 1'-0"



ARRANGEMENT OF EXP. JT. CASTINGS
¼" = 1'-0"

201

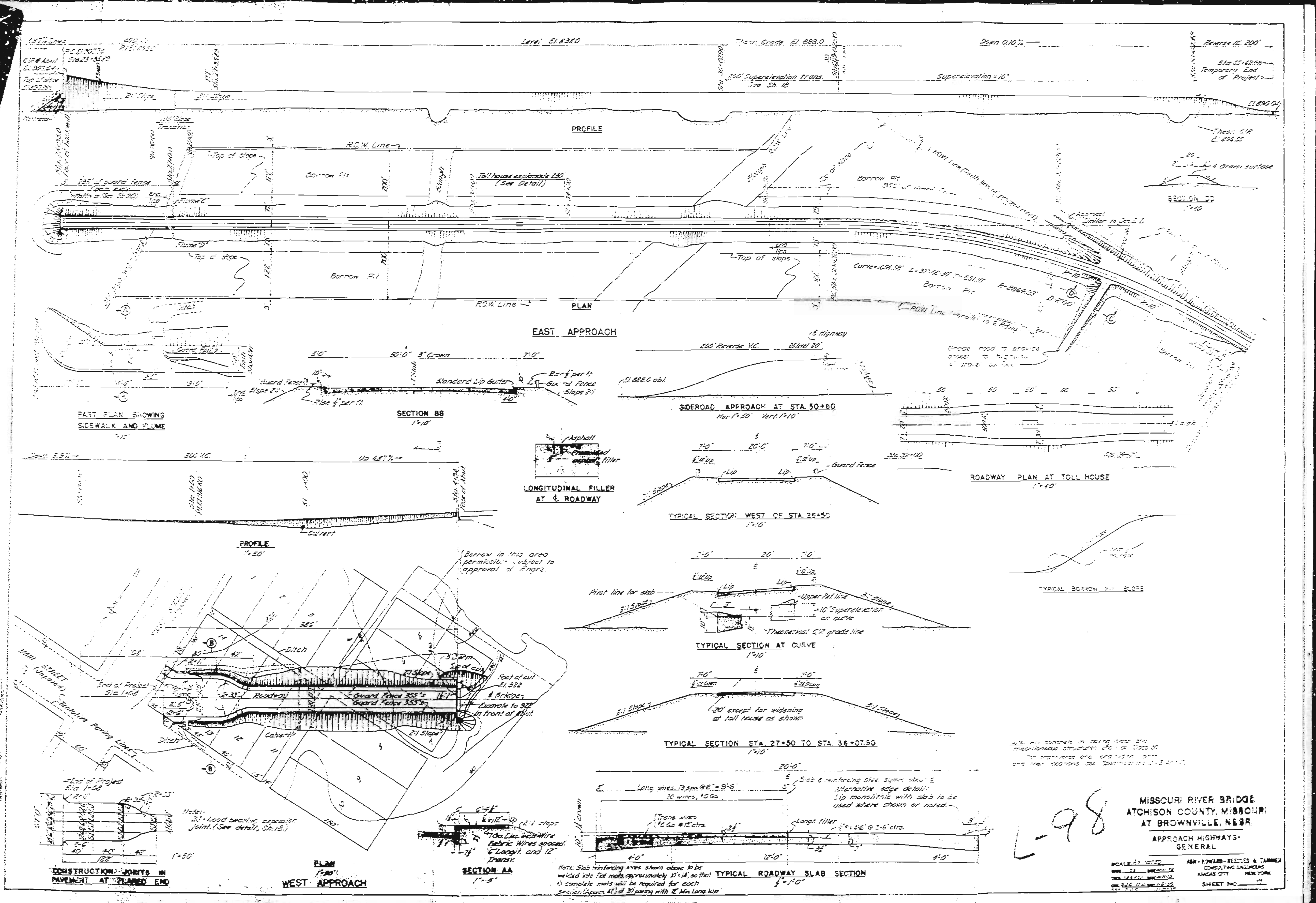
6-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EXPANSION JOINTS,
HANDRAILS, ETC.

SCALE As noted
[illegible] 6A [illegible]
[illegible]
[illegible]

[illegible]
CONSULTING ENGINEERS
KANSAS CITY [illegible]
SHEET NO. [illegible]


PROFILE
R.O.W. Line
Borrow Pit
Top of slope
Toll house esplanade 250' (See Detail)
PLAN
EAST APPROACH
Curve=1654.58' Δ=33°42'30" T=551.10'
R.O.W. Line (Parallel to ℄ Pav't)
SECTION DD 1"=10'
PART PLAN SHOWING SIDEWALK AND FLUME 1"=10'
SECTION BB 1"=10'
Standard Lip Gutter
Guard Fence
SIDEROAD APPROACH AT STA. 50+60 Hor. 1"=50' Vert. 1"=10'
ROADWAY PLAN AT TOLL HOUSE 1"=40'
LONGITUDINAL FILLER AT ℄ ROADWAY
Asphalt
Premolded filler
TYPICAL SECTION WEST OF STA. 26+50 1"=10'
PROFILE 1"=50'
Culvert
Borrow in this area permissible subject to approval of Engrs.
TYPICAL BORROW PIT SLOPE
Pivot line for slab
Upper Pav't line
10' Superelevation on curve
Theoretical C.P. grade line
TYPICAL SECTION AT CURVE 1"=10'
20' except for widening at toll house as shown
TYPICAL SECTION STA. 27+50 TO STA. 36+07.50 1"=10'
MAIN STREET (Improved)
End of Project Sta. 1+64
Roadway
Guard Fence 355'±
℄ Bridge
Excavate to 932 in front of Abut.
Foot of cut El. 932
Ditch
Tentative Paving Lines
End of Project Sta. 1+62
Note: 3/4" Load bearing expansion joint. (See detail, Sh. 13.)
CONSTRUCTION JOINTS IN PAVEMENT AT FLARED END 1"=50'
PLAN 1"=50'
WEST APPROACH
SECTION AA 1"=5'
Fabric Wires spaced 6" Longit. and 12" Transv.
Slab reinforcing steel symmetrical about ℄
Alternative edge detail: Lip monolithic with slab to be used where shown or noted.
Long. wires #5 Ga. @ 6" = 9'-6"
Trans. wires #6 Ga. @ 12" ctrs.
Longit. filler
Note: Slab reinforcing wires shown above to be welded into flat mats, approximately 10'×14', so that 3 complete mats will be required for each section (approx. 41') of 20' paving with 12" Min. Long. lap
TYPICAL ROADWAY SLAB SECTION 3/4"=1'-0"
Note: All concrete in paving slabs and miscellaneous structures shall be Class B.
For precautions and grade lines and their locations see Specifications

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

APPROACH HIGHWAYS-
GENERAL

SCALE AS NOTED

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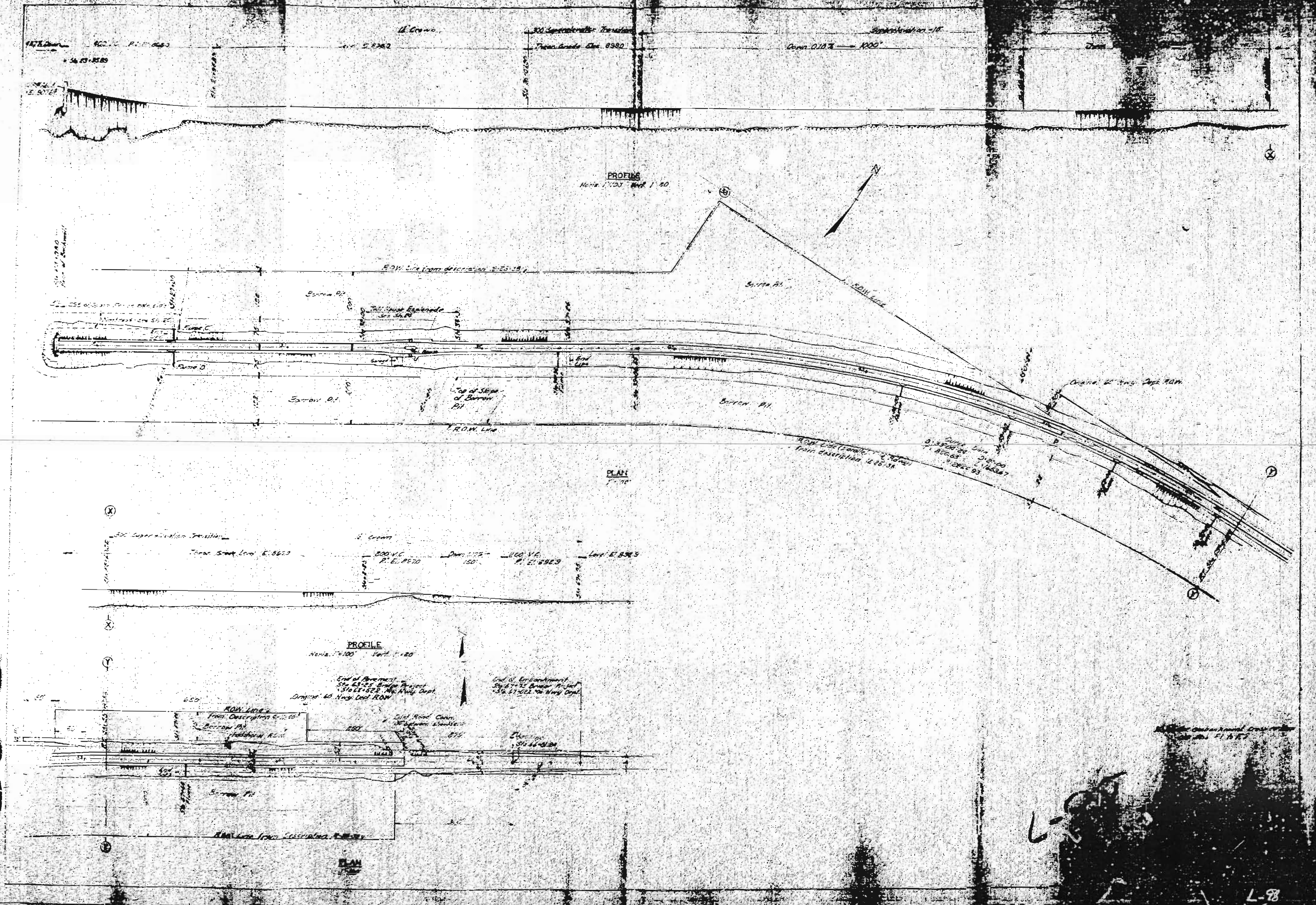
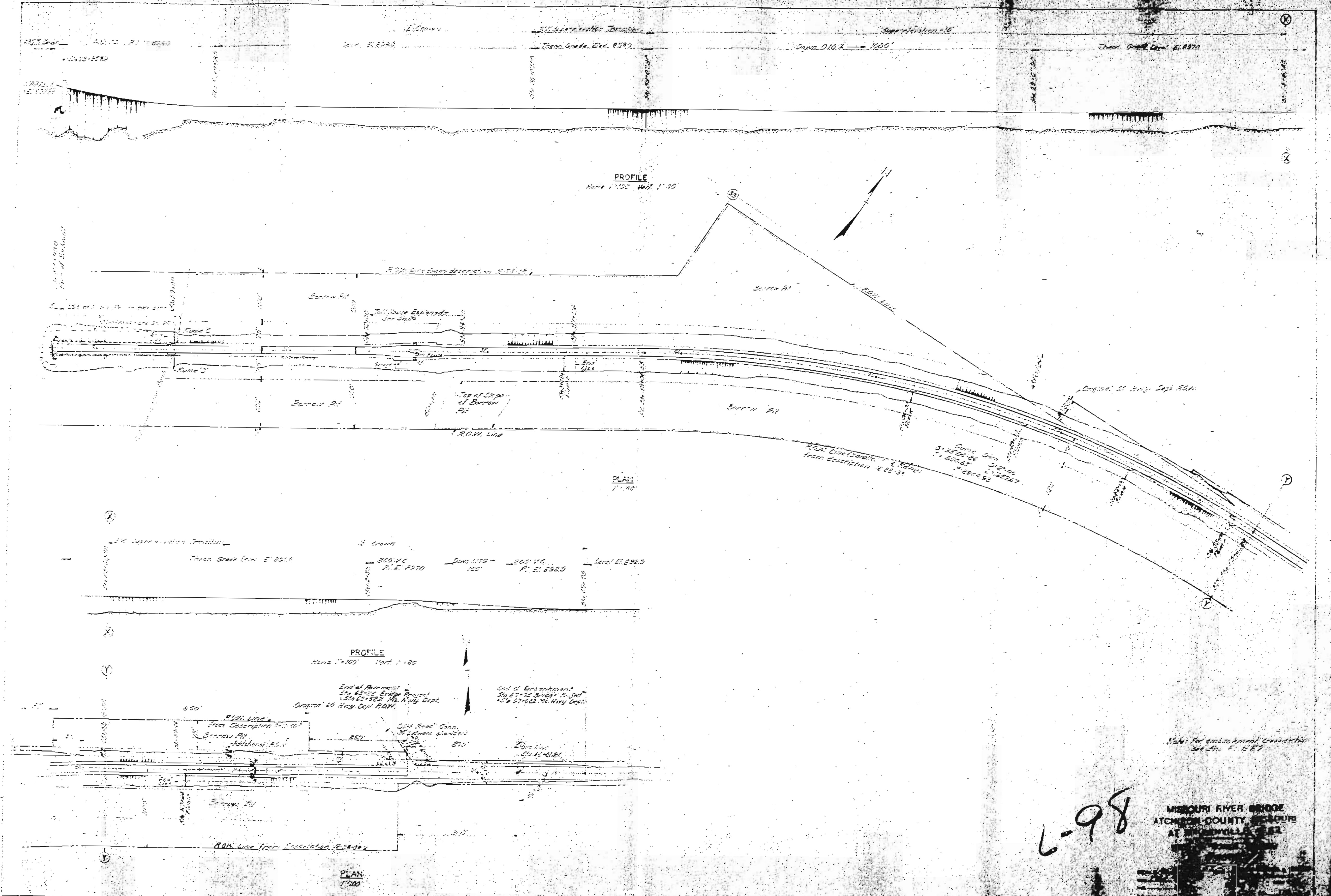
SHEET NO. 17

203


Ꞓ Crown
300 Superelevation Transition
Superelevation -10
Tran. Grade Elev. 8980
Down 0.10% — 1000'
Level El. 898.2
Sta. 23+35.89
PROFILE
Horiz. 1"=100' Vert. 1"=20
R.O.W. Line from description 8-25-38
Barrow Pit
Toll House Esplanade See Sh. 88
Flume C
Flume D
Garage
End Lips
Top of Slope of Barrow Pit
R.O.W. Line
Barrow Pit
R.O.W. Line
Original 60' Hwy. Dept. R.O.W.
R.O.W. Line (parallel to Ꞓ Rdwy.) from description 8-25-38
Curve Data
T: 850.63
PLAN
1"=100'
300 Superelevation Transition
Ꞓ Crown
Tran. Grade Level El. 892.0
200' V.C. P.I. El. 897.0
Down 1.0% 150'
200' V.C. P.I. El. 892.9
Level El. 892.9
PROFILE
Horiz. 1"=100' Vert. 1"=20
End of Pavement Sta. 63+25 Bridge Project = Sta. 63+52.2 Mo. Hwy. Dept.
Original 60' Hwy. Dept. R.O.W.
End of Embankment Sta. 67+75 Bridge Project = Sta. 67+02.2 Mo. Hwy. Dept.
R.O.W. Line from Description 8-25-38
Barrow Pit
Additional R.O.W.
Dist. Road Conn.
Elevation Sta. 66+81.84
R.O.W. Line from Description 8-25-38
PLAN
1"=100'
L-98

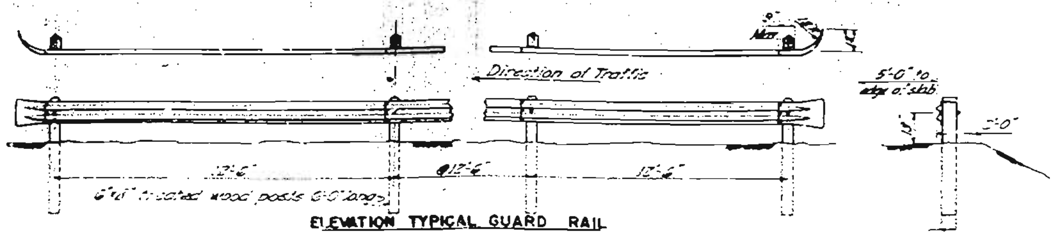
203


℄ Crown
3⅛" Superelevation Transition
Superelevation = ½"
Level El. 8980
Theor. Grade Elev. 8980
Grade 0.10% → 1000'
Theor. Grade Elev. El. 8970
PROFILE
Horiz. 1"=100' Vert. 1"=20'
33
Borrow Pit
R.O.W. Line
Borrow Pit
Borrow Pit
Toe of Slope of Borrow Pit
R.O.W. Line
R.O.W. Line (Parallel to ℄ Bridge) from description 18-88-31
Curve Data
PLAN
1"=100'
Original Mo. Hwy. Dept. R.O.W.
Theor. Grade Level El. 8980
℄ Crown
PROFILE
Horiz. 1"=100' Vert. 1"=20'
End of Pavement Sta 63+22 Bridge Project = Sta 65+522 Mo. Hwy. Dept.
Original Mo. Hwy. Dept. R.O.W.
End of Embankment Sta 67+72 Bridge Project = Sta 67+622 Mo. Hwy. Dept.
R.O.W. Line from Description
Borrow Pit
250'
Borrow Pit
R.O.W. Line from Description
PLAN
1"=200'

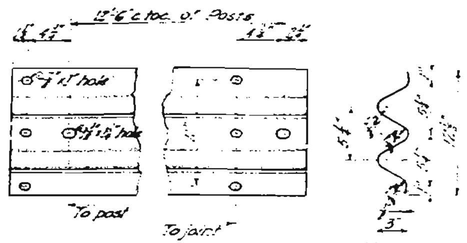
Note: For embankment cross-sections see Sh. 5 & 6

6-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT [illegible]



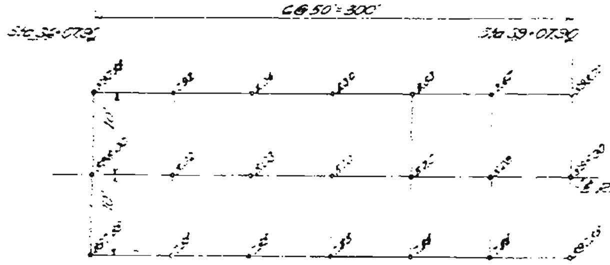
ELEVATION TYPICAL GUARD RAIL
¼" = 1'-0"



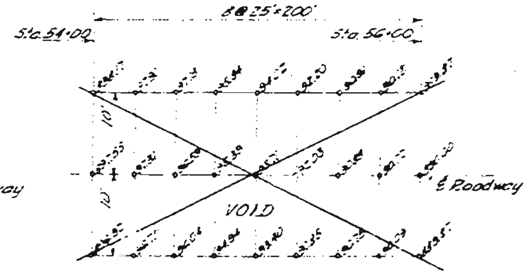
Note: Guard rail shall be #10 gage "Flex-Beam" type as manufactured by Sheffield Steel Co., K.C. Mo. or approved equivalent.

Details as per Manufacturer's Specs.

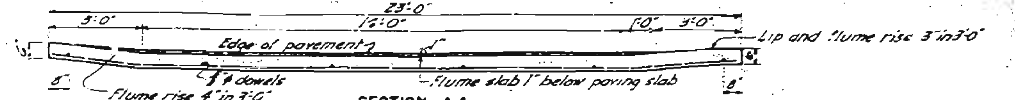
TYPICAL SECTION OF GUARD RAIL (#10 Gage)
1½" = 1'-0"



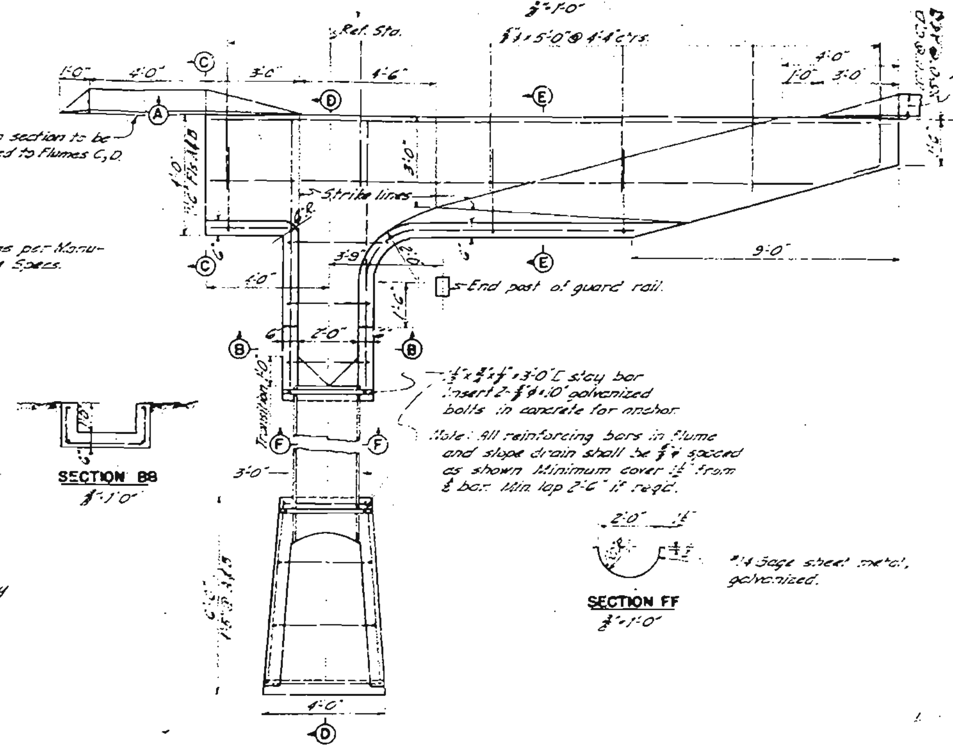
TOP OF SLAB ELEVATIONS
AT 300' TRANSITION



TOP OF SLAB ELEVATIONS
AT 200' TRANSITION



SECTION AA
¾" = 1'-0"

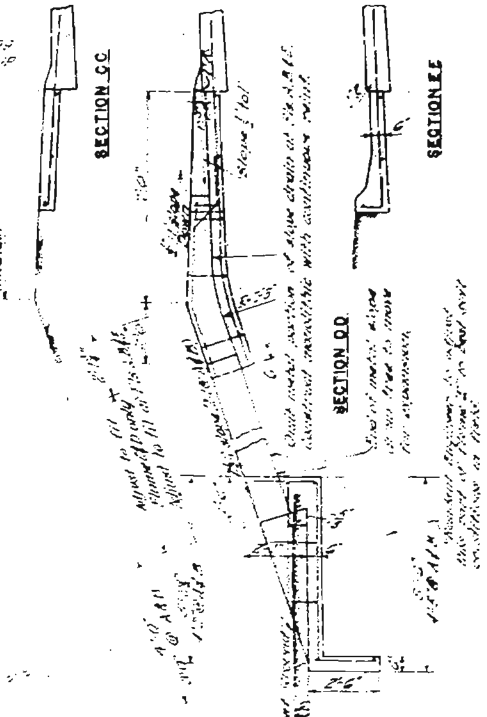

Ref. Sta.
¾" ϕ x 5'-0" @ 4'-4" ctrs.
℄ Roadway
Paving Lip
This lip section to be attached to Flumes C, D.
Strike lines
9'-0"
End post of guard rail.
Transition
½"x¾"x⅛" x 3'-0" L stay bar
Insert 2-⅝" ϕ x 10" galvanized bolts in concrete for anchor
#14 Gage sheet metal, galvanized.

Note: All reinforcing bars in flume and slope drain shall be ⅜" ϕ spaced as shown. Minimum cover 1½" from ℄ bar. Min. lap 2'-6" if reqd.

SECTION BB
¾" = 1'-0"

SECTION FF
¾" = 1'-0"

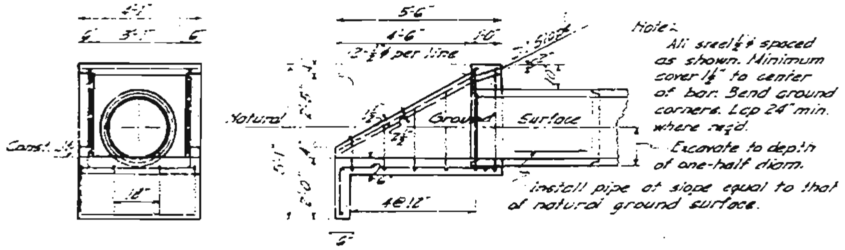
PLAN OF FLUME & SLOPE DRAIN
¾" = 1'-0"
Flumes A, B, C, & D shown as noted.



SECTION CC

SECTION DD

SECTION EE

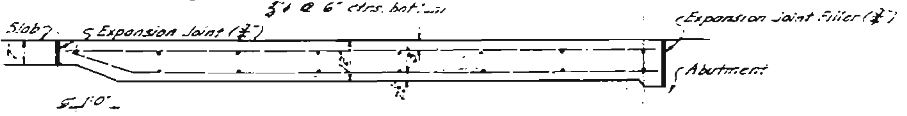


Note:
All steel ⅜" ϕ spaced as shown. Minimum cover 1½" to center of bar. Bend around corners. Lap 24" min. where reqd.
Excavate to depth of one-half diam.
Install pipe at slope equal to that of natural ground surface.

END VIEW

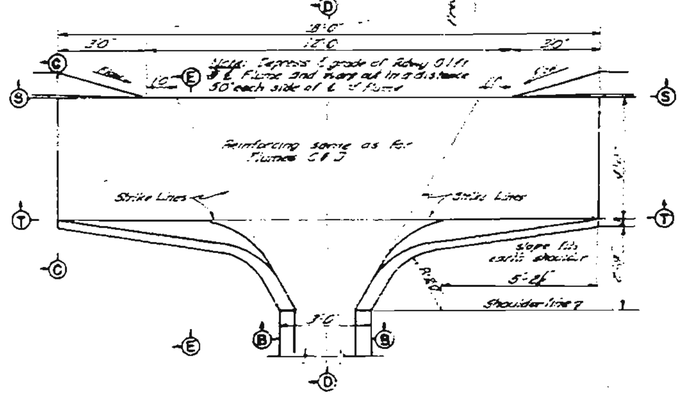
SECTION AT ℄ OF PIPE

CULVERT PIPE HEADWALL STA. 2+90
⅜" = 1'-0"

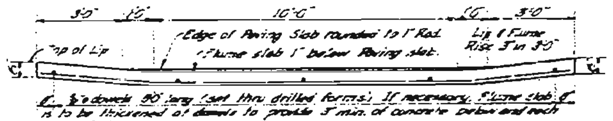

15'-0" Face of abutment to ordinary pavement section
⅜" ϕ @ 2'-0" ctrs. top and bottom
Longt. Steel: ½" ϕ @ 12" ctrs. top
⅝" ϕ @ 6" ctrs. bottom
Paving Slab
Expansion Joint (¾")
Expansion Joint Filler (¾")
Abutment

Omit longitudinal plane of weakness in this slab.
Crown to match road and bridge slabs and make smooth connection between.

APPROACH SLAB
½" = 1'-0"

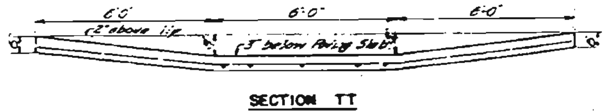

Note: Depress ℄ grade of Rdwy 0.1 ft at ℄ Flume and warp out in a distance 50' each side of ℄ of Flume
Reinforcing same as for Flumes C & D
Strike Lines
Strike Lines
Slope fill earth shoulder
Shoulder line

PLAN OF FLUMES AT STA'S. 46, 49, 52 & 55. ⅜" = 1'-0"

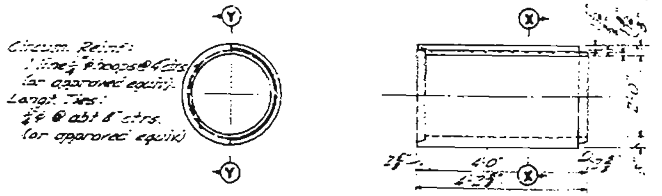

Top of Lip
Edge of Paving Slab rounded to 1" Rad.
Flume slab 1" below Paving slab.
Lip & Flume Rise 3" in 3'-0"

℄ ⅝" ϕ dowels 30" long (set thru drilled forms). If necessary, Flume slab ℄ is to be thickened at dowels to provide 3" min. of concrete below and each side of bar.

SECTION SS



SECTION TT


Circum. Reinf.:
1 line ¼" ϕ hoops @ 4" ctrs. (or approved equiv.)
Longt. Ties:
¼" ϕ @ abt 6" ctrs. (or approved equiv.)
4'-0"

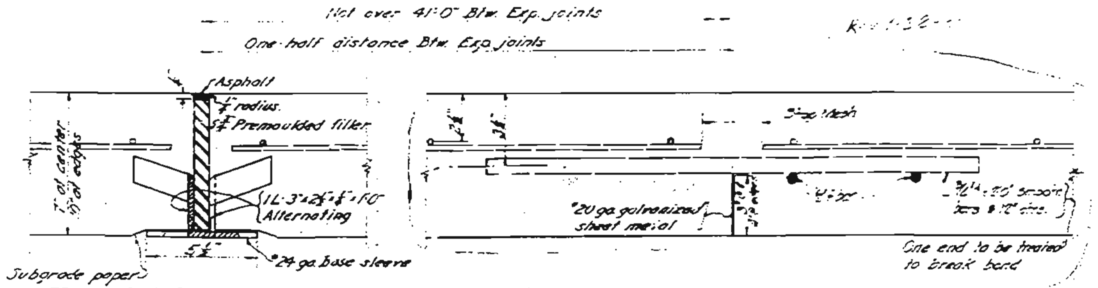
HALF SECT. X-X & END VIEW

SECT. Y-Y & SIDE ELEVATION

CONCRETE CULVERT PIPE
½" = 1'-0"

TEST LOADS FOR 24" CONCRETE PIPE

	Load to produce a 0.01 in. crack	Ultimate Load
Three-edge Bearing Method	2400 lbs/lin.ft.	3600 lbs/lin.ft.
Sand Bearing Method	3600 lbs/lin.ft.	5400 lbs/lin.ft.


Not over 41'-0" Btw. Exp. joints
One-half distance Btw. Exp. joints
Asphalt
¼" radius.
¾" Premoulded filler
1L-3"x2½"x¼"x1'-0" Alternating
Subgrade paper
#24 ga. base sleeve
Steel Mesh
#20 ga. galvanized sheet metal
One end to be treated to break bond

TRANSVERSE EXPANSION JOINT

"Translode" joint as manufactured by Highway Steel Products Co., or approved equal. See Specs.

CONTRACTION JOINT

TYPICAL PAVING JOINT DETAILS
Scale 3" = 1'-0"

204

L-98

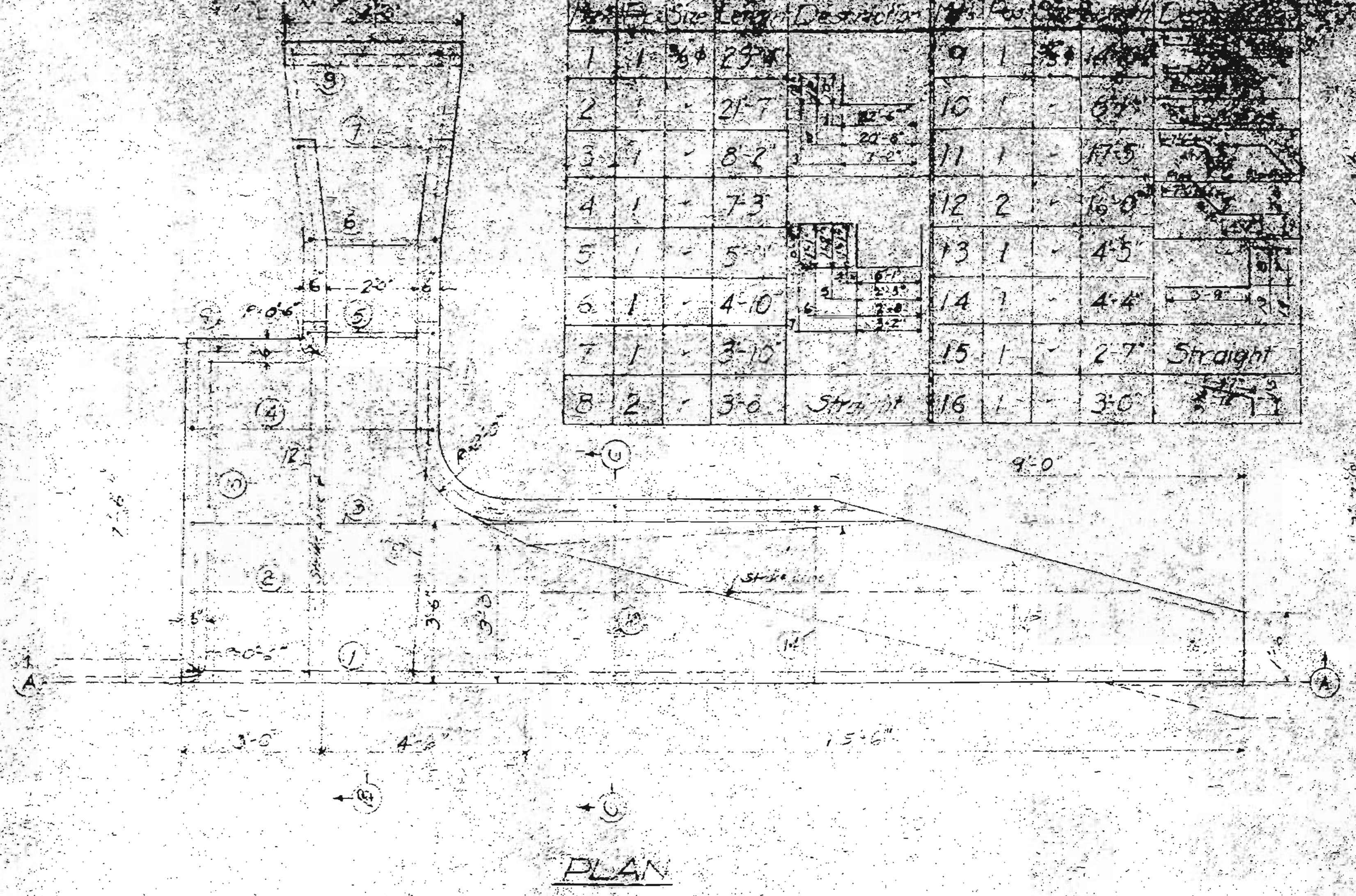
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

APPROACH HIGHWAYS
MISC. DETAILS

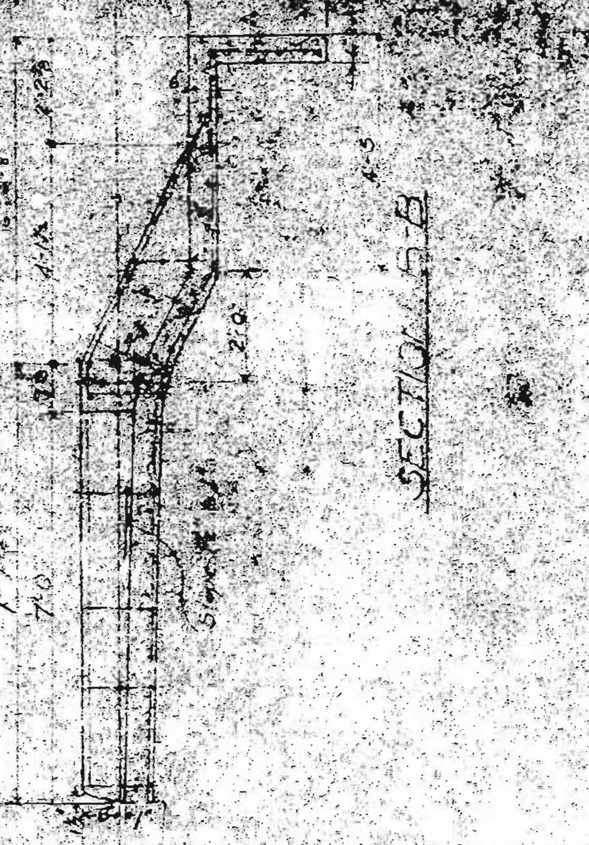
SCALE As Noted
SHEET NO.

205

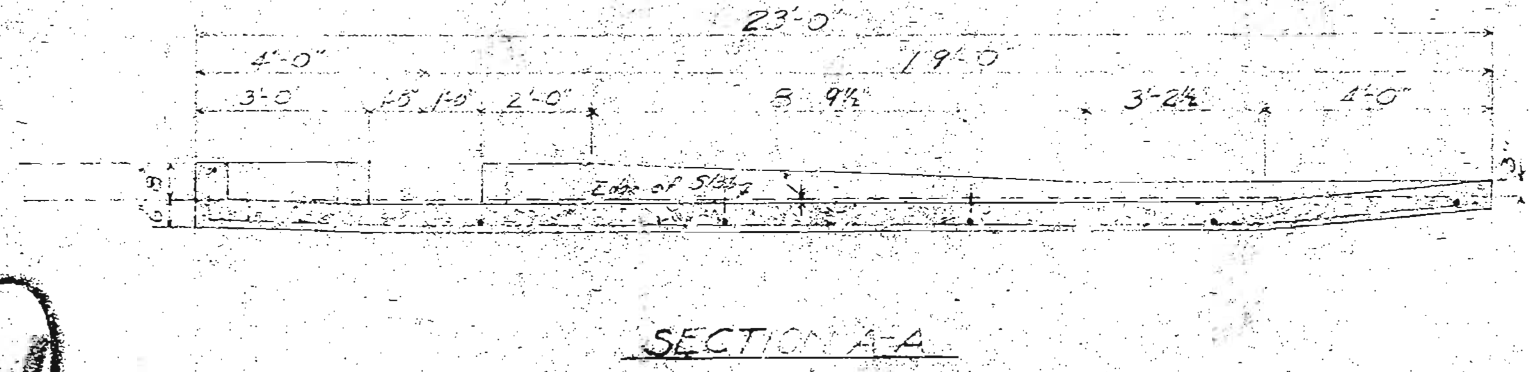
Mark	No.	Size	Length	Description	Mark	No.	Size	Length	Description
1	1	⅜ φ	29'-[illegible]		9	1	⅜ φ	14'-[illegible]	
2	1	-	21'-7"		10	1	-	6'-[illegible]	
3	1	-	8'-2"		11	1	-	17'-5"	
4	1	-	7'-3"		12	2	-	16'-0"	
5	1	-	5'-[illegible]		13	1	-	4'-5"	
6	1	-	4'-10"		14	1	-	4'-4"	
7	1	-	3'-10"		15	1	-	2'-7"	Straight
8	2	-	3'-6"	Straight	16	1	-	3'-0"	



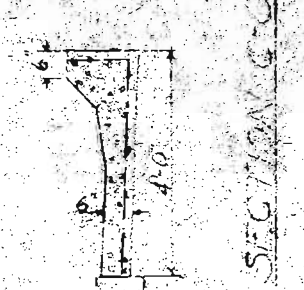
PLAN



SECTION B-B



SECTION A-A



SECTION C-C

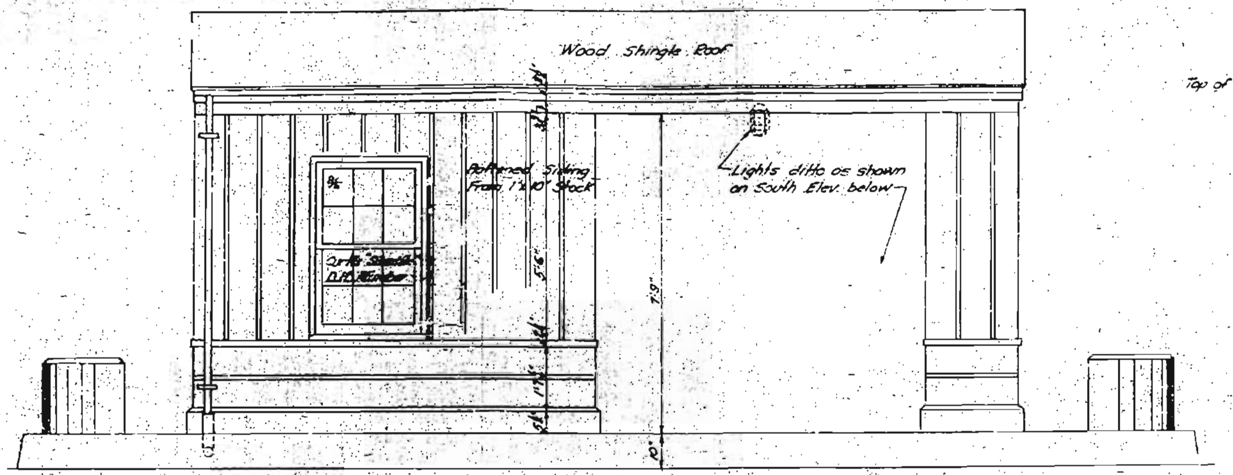
FLUME & SLOPE DRAIN "A"

Scale ⅛" = 1'

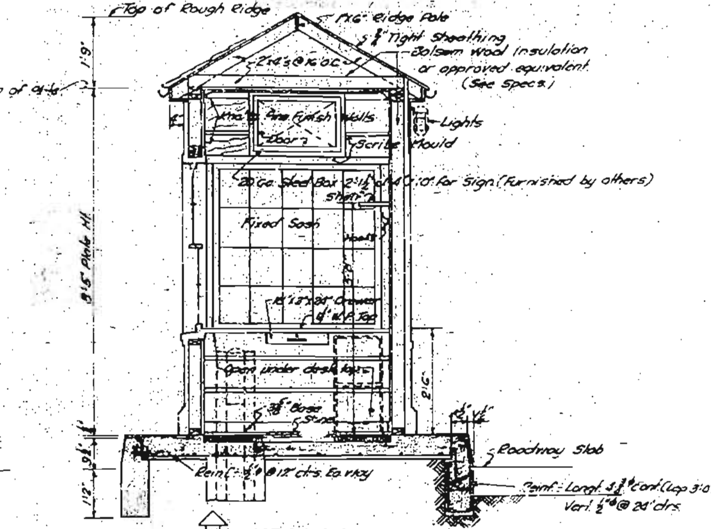
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

FLUME "B"

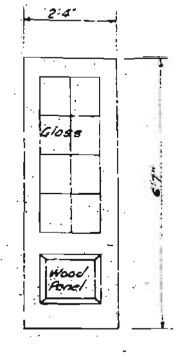
ASH - HOWARD - NEEDLES AND TAMMEN
CONSULTING ENGINEERS


Wood Shingle Roof
Battened Siding From 1"x10" Stock
Curtis "Silentite" D.H. Window
Lights ditto as shown on South Elev. below
7'-9"
5'-6"
10"

NORTH ELEVATION


Top of Rough Ridge
1"x6" Ridge Pole
3/4" Tight Sheathing
Balsam Wood Insulation or approved equivalent. (See Specs.)
2"x4"s @ 16" o.c.
Top of Plate
Lights
Scribe Mould
Pine Finish Walls
Door
20 Ga. Steel Box 2'-1 1/2" x 1'-10" for Sign (Furnished by others)
Fixed Sash
12"x12"x24" Drawer
Open under desk top
Base
Roadway Slab
Reinf. 1/2" Ø @ 12" ctrs. Ea. Way
Reinf.: Longit. 4-3/4" Ø Cont. (Lap 3'-0") Vert. 1/2" Ø @ 24" ctrs.
8'-5" Plate Ht.
1'-9"
2'-6"

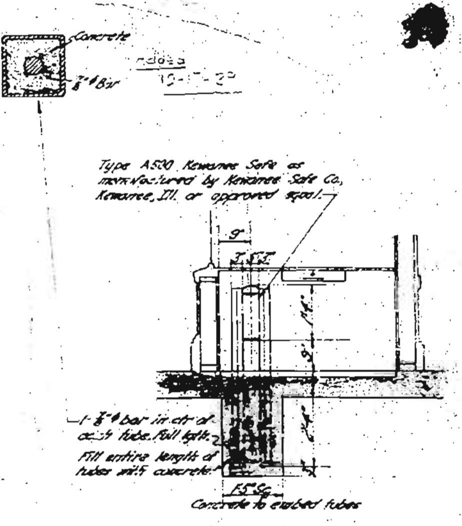
SECTION A-A



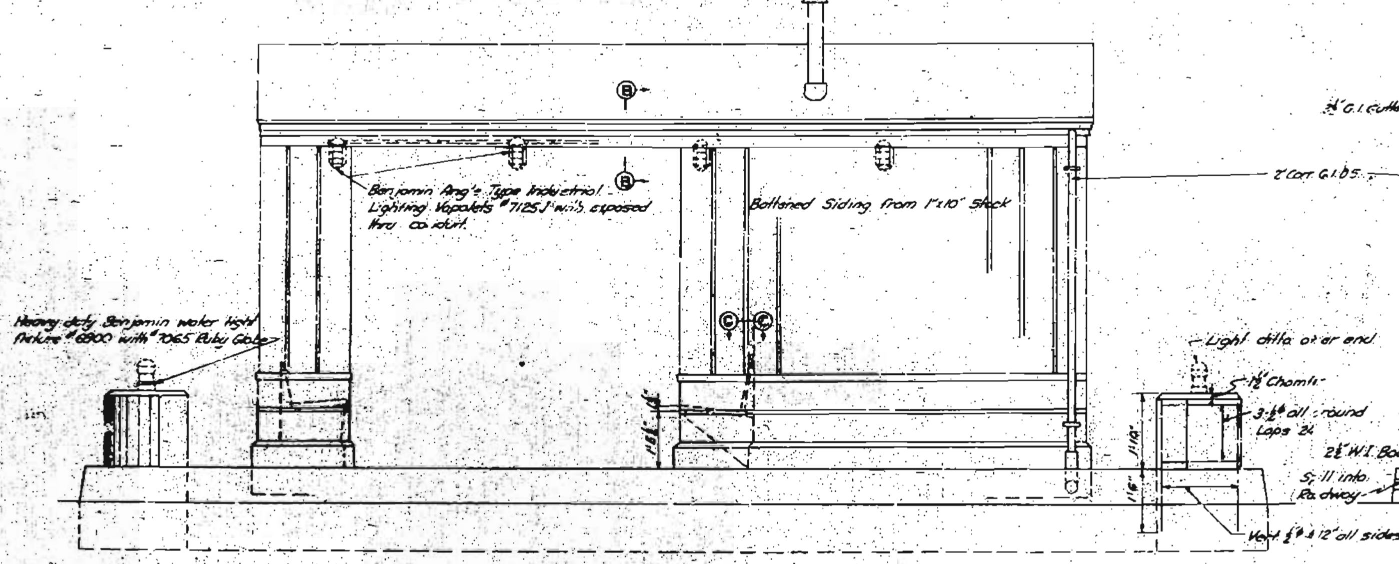
VIEW OF DOOR

Similar to Curtis C-1113 Weather stripped with Spring white metal on Jambs & Head, & an interlocking type white metal threshold.

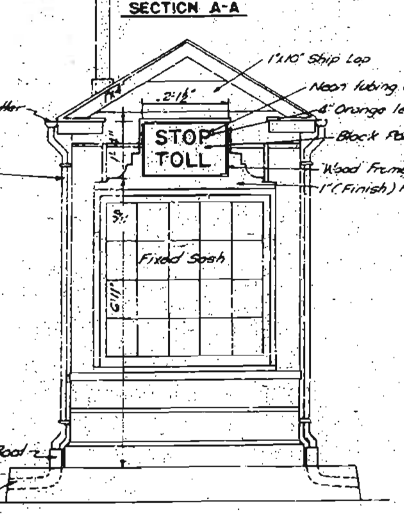
1/2":1'-0"


Concrete
7/8" Ø Bar
Type A500 Kewanee Safe as manufactured by Kewanee Safe Co., Kewanee, Ill. or approved equal.
1-7/8" Ø bar in ctr. of each tube, full lgth.
Fill entire length of tubes with concrete
Concrete to embed tubes

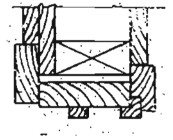
INSTALLATION OF SAFE


Benjamin Ang's Type Industrial Lighting Vaporlets #7125 J walls exposed thru conduit.
Battened Siding from 1"x10" Stock
Heavy duty Benjamin water tight fixture #6900 with #7065 Ruby Globe
2" Corr. G.I.D.S.
Light ditto at ar end
1 1/2" Chamfer
3/4" all around Laps 24"
2 1/2" W.I. Bool
Sill into Roadway
Vert. 3/4" Ø x 12" all sides
1'-6"

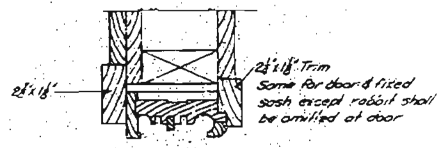
SOUTH ELEVATION



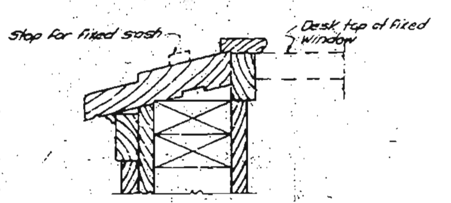
EAST ELEVATION
(West Elevation Similar)



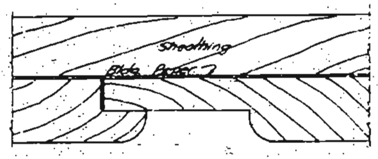
JAMB OF FIXED SASH


2 1/4"x1 1/8" Trim
Same for door & fixed sash except rabbit shall be omitted at door

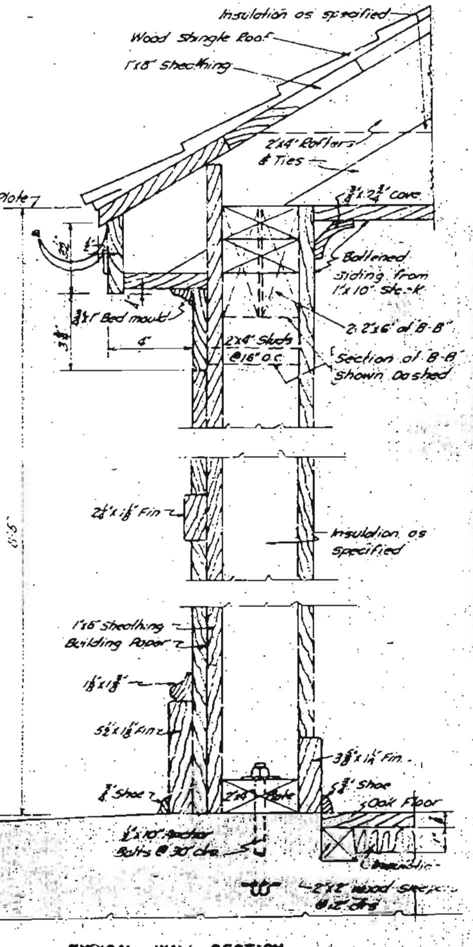
JAMB OF D.H. WINDOW



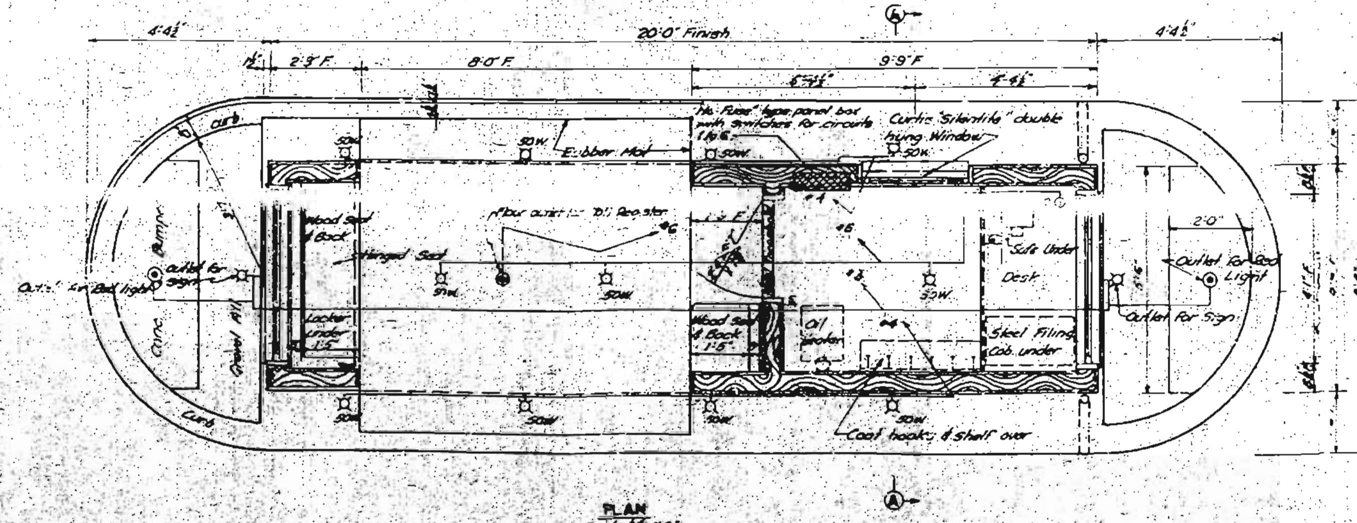
TYPICAL SILL



TYPICAL FULL SIZE BATTEN SECTION FOR INTERIOR & EXTERIOR (Such as shown on line "C-C" on South Elev.) All Battens run horizontally on Interior.



TYPICAL WALL SECTION
Scale 3":1'-0"



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

Note: Circuits #1 & #2 are for Roadway and Navigation Lights. See Sh. 28.

206

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TOLL HOUSE

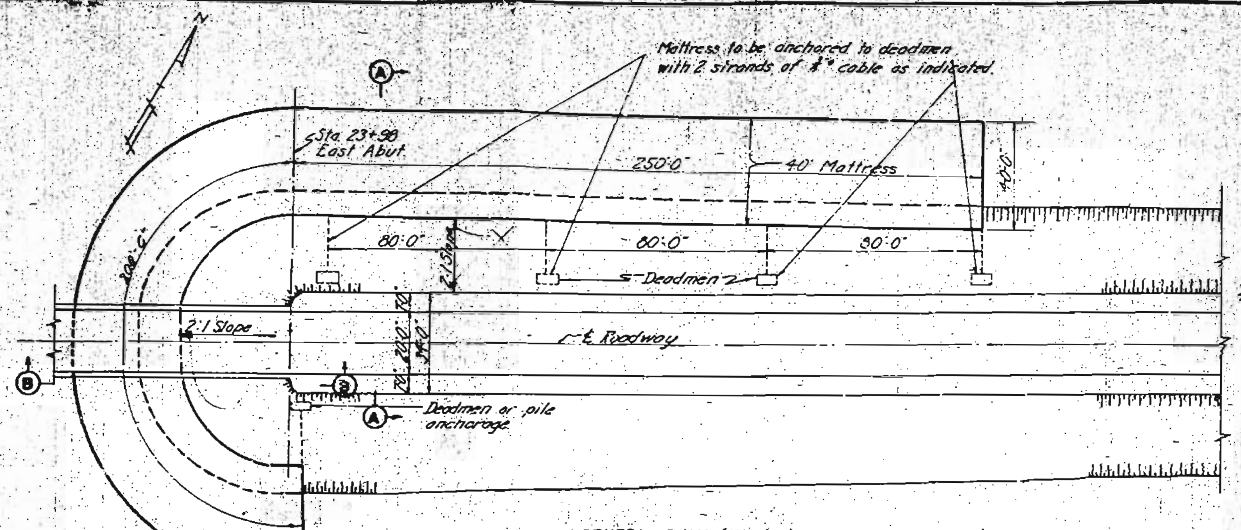
SCALE As Noted
DRAWN F.N.W. DATE 10-27-29
TRACED J.F.K. DATE 12-24-29
CHECKED F.J.C. DATE 12-22-29

ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. 19

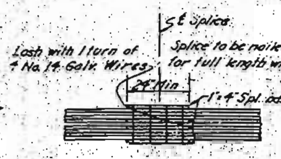
Rev. Lighting Circuit Numbers
Rev. Fixture and panel box
Rev. Safe Detail
Rev. [illegible]

207


N.
Mattress to be anchored to deadmen with 2 strands of ⅜" cable as indicated.
Sta. 23+90 East Abut.
250'0"
40' Mattress
40'0"
80'0"
80'0"
80'0"
Deadmen
2:1 Slope
℄ Roadway
Deadmen or pile anchorage.
A
B

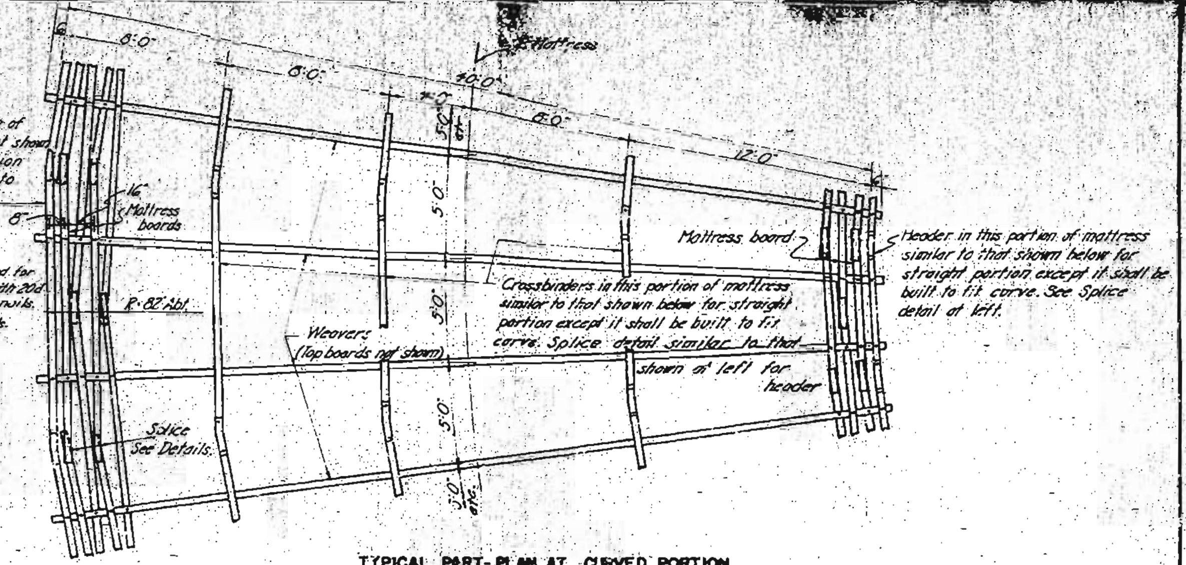
GENERAL PLAN (1"=30'0")

Showing location and General Dimensions of Mattress.


Lash with 1 turn of 4 No. 14 Galv. Wires.
℄ Splice
Splice to be nailed for full length with 20d nails.
24" Min.
1"×4" Spl. bds.

TYPICAL HEADER SPLICE AT CURVE

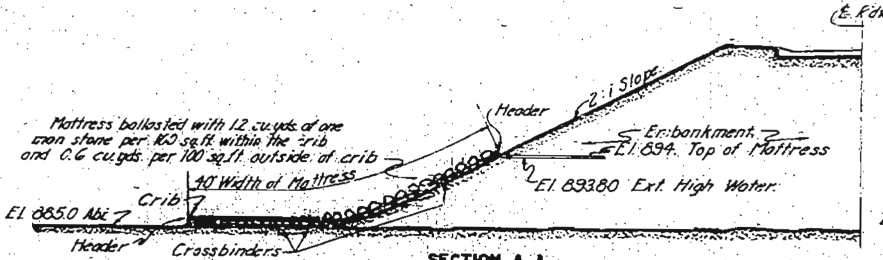
¼"=1'-0"


℄ Mattress
8'0"
8'0"
10'0"
8'0"
12'0"
Header in this portion of mattress similar to that shown below for straight portion except it shall be built to fit curve.
16 Mattress boards
R=80' Abt.
Weavers (Topboards not shown)
Splice See Details.
5'0"
5'0"
5'0"
3'0"
3'0"
Crossbinders in this portion of mattress similar to that shown below for straight portion except it shall be built to fit curve. Splice detail similar to that shown at left for header
Mattress board
Header in this portion of mattress similar to that shown below for straight portion except it shall be built to fit curve. See Splice detail at left.

TYPICAL PART-PLAN AT CURVED PORTION OF MATTRESS (¼"=1'0")

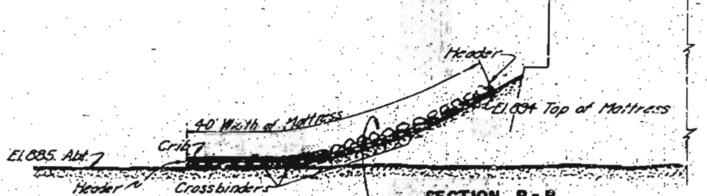
Details not shown are to be similar to those shown and noted in details below for straight portion of mattress.

Cribs not shown. See Note C


℄ Rdwy.
Mattress ballasted with 1.2 cu.yds. of one man stone per 100 sq.ft. within the crib and 0.6 cu.yds. per 100 sq.ft. outside of crib.
Header
2:1 Slope
Embankment.
El. 894. Top of Mattress
40 Width of Mattress
Crib
El. 893.80 Ext. High Water.
El. 885.0 Abt.
Header
Crossbinders

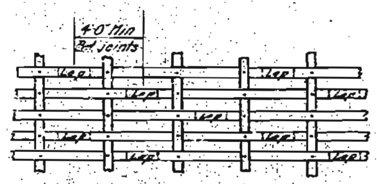
SECTION A-A

1"=10'0"


Header
40' Width of Mattress
El. 894 Top of Mattress
El. 885. Abt.
Crib
Header
Crossbinders
Mattress ballasted with 1.2 cu.yds. of one man stone per 100 sq.ft. within the crib and 0.6 cu.yds. per 100 sq.ft. outside of crib.

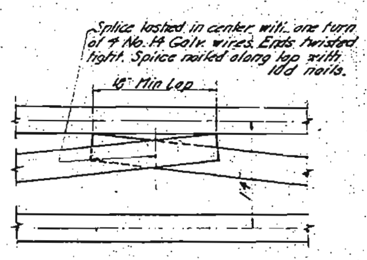
SECTION B-B

1"=10'0"



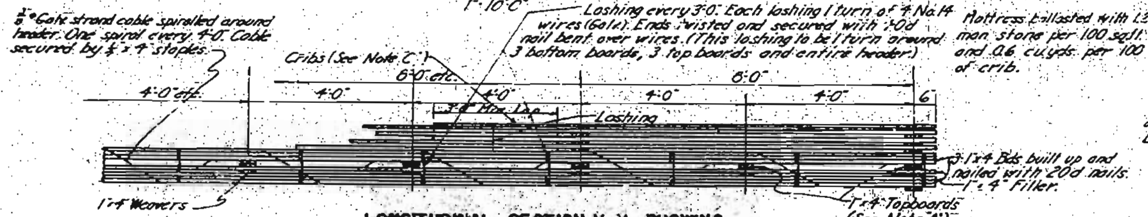
MATTRESS BOARD SPLICING DIAGRAM STRAIGHT SECTION (No Scale)

For location of splices in curved section see Part Plan above.


Splice lashed in center with one turn of 4 No. 14 Galv. wires. Ends twisted tight. Splice nailed along lap with 10d nails.
15" Min Lap

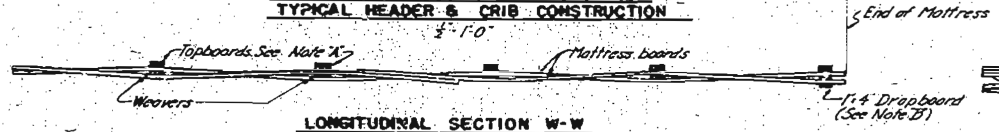
PLAN OF MATTRESS BOARD SPLICE AT CURVED SECTION

1"=1'0"


⅜" Galv. strand cable spiralled around header. One spiral every 4'0". Cable secured by ¼"×4" staples.
Cribs (See Note C)
Lashing every 3'0". Each lashing 1 turn of 4 No. 14 wires (Galv.). Ends twisted and secured with 40d nail bent over wires. (This lashing to be 1 turn around 3 bottom boards, 3 top boards and entire header.)
8'0" ctr.
4'0" ctr.
4'0"
4'0"
4'0"
8'0"
4'0"
6
3'0" Min. Lap
Lashing
3-1"×4" Bds. built up and nailed with 20d nails
1"×4" Filler
1"×4" Weavers
1"×4" Topboards (See Note "A")

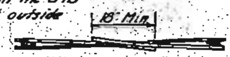
LONGITUDINAL SECTION V-V SHOWING TYPICAL HEADER & CRIB CONSTRUCTION

½"=1'0"



LONGITUDINAL SECTION W-W

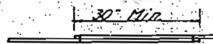
Note "C": Build two rows of cribs along lower edge full length of mattress. Cribs about 8 ft. square. Crib walls to be 4 boards high separated by spaces 1 board in height. Nail laps and intersections with 20d nails. Lash each lap with one turn of 4 No. 14 Galv. wires. Lash each intersection with 1 turn of ⅜" Galv. strand passing around mattress board beneath. Twist ends at top and secure with ¼"×4" staples.



Splice lashed at loose end with one turn of 4 No. 14 Galv. wires. Ends twisted tight. Lap nailed with 10d nails.

MATTRESS BOARD SPLICE

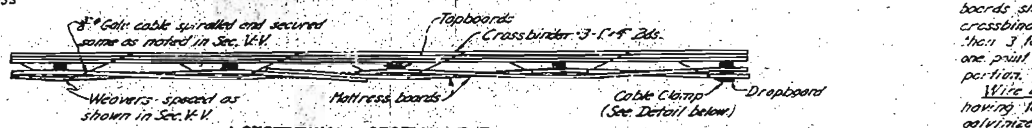
Splices in straight portion of mattress as shown.
" curved " " " similar except as shown and noted in detail above.
For location of splices see Diagram and plan above.



Splice lashed at each end of lap with one turn of 4 No. 14 Galv. wires. Ends twisted tight. Splice to be nailed along lap with 10d nails.

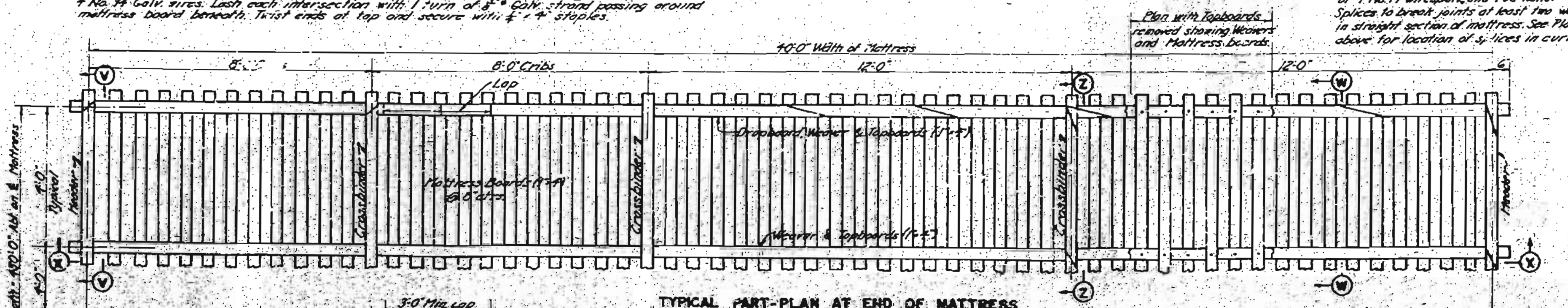
WEAVER BOARD SPLICE

All splices to be broken with splices of adjoining weaver boards.


⅜" Galv. cable spiralled and secured same as noted in Sec. V-V.
Topboards
Crossbinder 3-1"×4" Bds.
Weavers spaced as shown in Sec. V-V.
Mattress boards
Cable Clamp (See Detail below.)
Dropboard

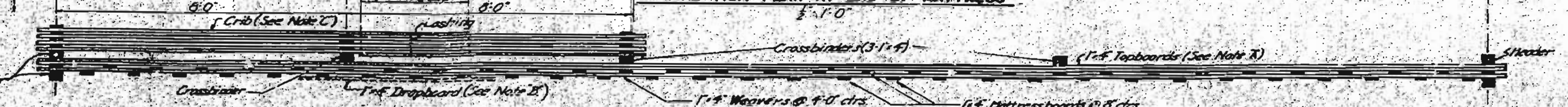
LONGITUDINAL SECTION Z-Z SHOWING CROSSBINDER

Note: Crossbinder to be lashed and nailed to weavers and topboards with 1 turn of 4 No. 14 wires Galv. and 40d nails. Splices to break joints at least two weavers in straight section of mattress. See Plan above for location of splices in curved portion.


Plan with Topboards removed showing Weavers and Mattress boards.
40'0" Width of Mattress
8'0"
8'0" Cribs
12'0"
12'0"
6
V
Z
W
X
Lap
Dropboard, Weaver & Topboards (1"×4")
Mattress Boards 1"×4" @ 6" ctrs.
Crossbinder
Crossbinder
Crossbinder
Weaver & Topboards (1"×4")
Header
Header
Length=1820'0" Abt on ℄ Mattress
4'0" Typical
4'0"

TYPICAL PART-PLAN AT END OF MATTRESS

¼"=1'0"


8'0"
3'0" Min. Lap
8'0"
Crib (See Note C)
Lashing
Crossbinders (3-1"×4")
1"×4" Topboards (See Note "A")
Header
Header
Crossbinder
1"×4" Dropboard (See Note "B")
1"×4" Weavers @ 4'0" ctrs.
1"×4" Mattress boards @ 6" ctrs.

Note "B": Dropboards to be placed at ends of mattress for its full width. They are to be nailed to weavers and mattress boards every 4 ft. with one turn of 4 No. 14 Galv. wires.

TRANSVERSE SECTION X-X (¼"=1'0")

Typical at Weaver and Topboard Lines

Note "A": Topboards are to be lashed to weaver every 5 ft. with one turn of 4 No. 14 Galv. wires and nailed with 20d nails.
All joints to be broken with weaver and and adjacent topboards.

GENERAL NOTES

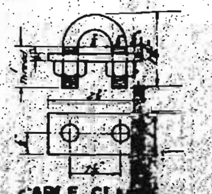
Mattress Lumber shall be sound live timber, free from rot, large knots, shakes, brittleness or other defects that may impair its strength, endurability or make it unfit for use in a mattress normally above water level. The species of timber used shall be subject to approval of the engineers. All timbers shall be 1"×4" undressed. Lengths shall be from 8 to 16 feet to provide a minimum number of splices. Minimum Lap of mattress boards shall be 1'-6", weaver boards 3'-0". Joints in successive layers of topboards, crossbinders, and in top and bottom parts of headers shall be broken not less than 3 feet and no two out of any three consecutive layers shall have joints at one point except as otherwise provided for headers and crossbinders of curved portion.

Wire Lashing shall have not less than 4 No. 14 wires of iron or soft steel having tensile strength of at least 80,000 lbs. per sq. in., well annealed and galvanized. At least one full turn is to be made at every point and ends securely twisted together then further secured by bent nails where noted.

⅜" Galv. Cables of 7 No. 11 wires shall be spiralled around headers and crossbinders one turn to every weaver space, also around topboards and weavers on lines about 16 feet centers starting with ends of mattress, making 10 complete spirals to each line in width of 40 feet. Draw each cable tight with block and tackle. Clamp ends with cable clamps. Fasten each spiral down at top of turn with ¼"×4" Galv. staples.

Nails shall be common wire nails of size noted.

Stone for Ballast shall be sandstone, limestone or other approved hardstone not readily disintegrated by action of air or water. Stones shall be approximately rectangular in crossection, weight each to average 75 pounds, no piece less than 25 or more than 150 pounds. Not more than 25% under 30 pounds.



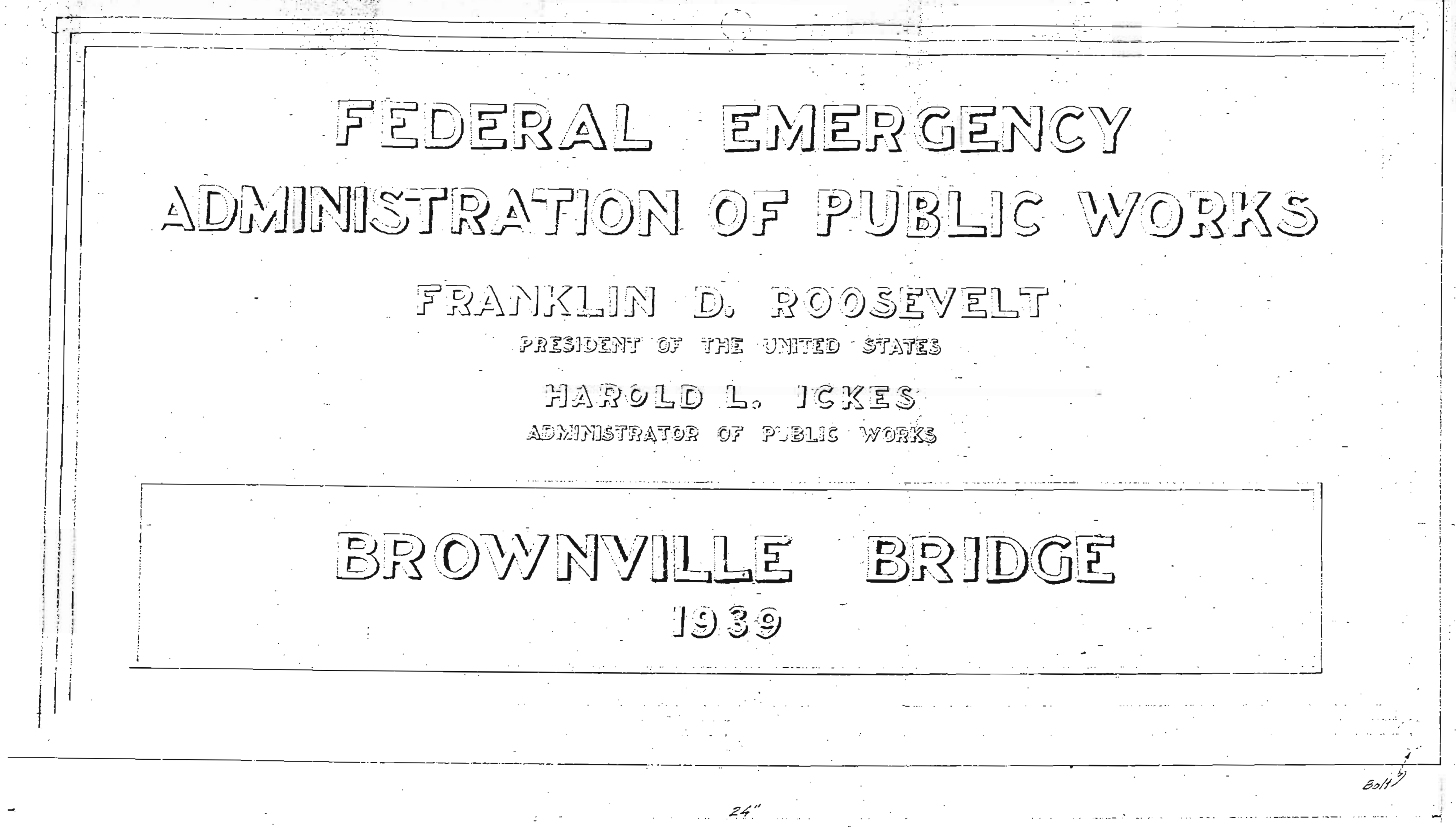
CABLE CLA

(Half Siz

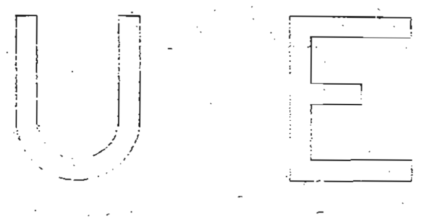
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

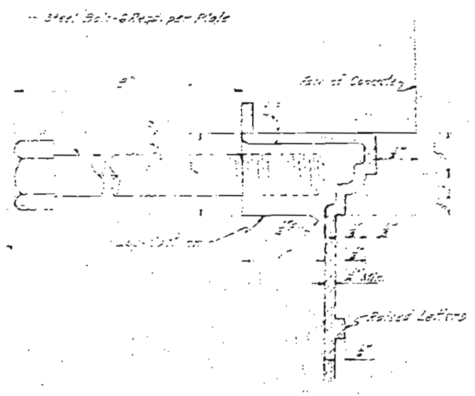
EMBANKMENT PROTECTION


FEDERAL EMERGENCY
ADMINISTRATION OF PUBLIC WORKS
FRANKLIN D. ROOSEVELT
PRESIDENT OF THE UNITED STATES
HAROLD L. ICKES
ADMINISTRATOR OF PUBLIC WORKS
BROWNVILLE BRIDGE
1939
Bolt
24"

P.W.A. PLATE 2 REQ'D.
FULL SIZE DETAIL

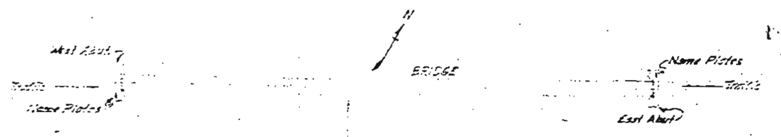


TYPE OF LETTERS

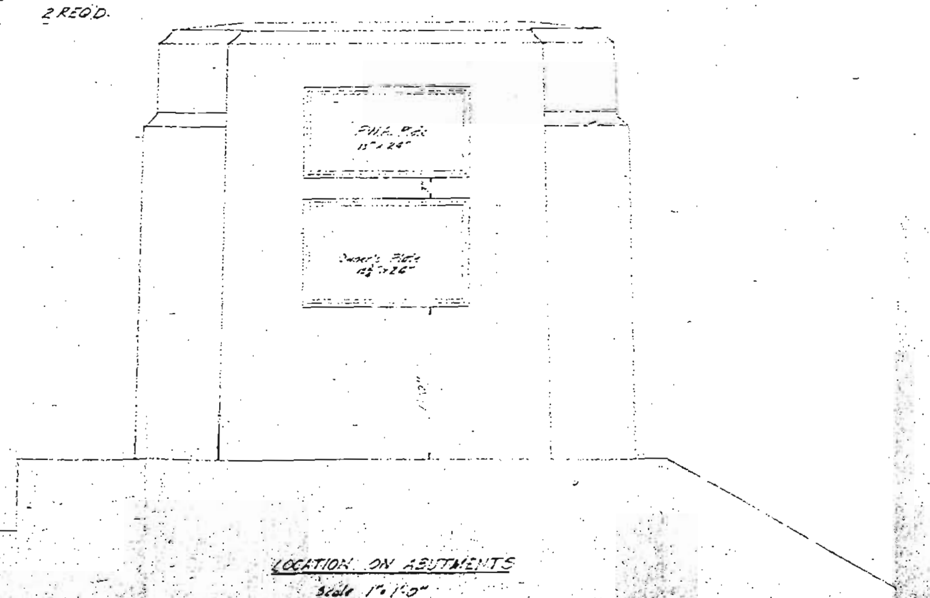


TYPICAL SECTION

Notes- Plates shall be of Statuary Bronze having raised Lettering. Surface of Lettering, Borders, and Molding shall be polished. The background shall be Etched.
Plates must be carefully placed in Forms before Concrete is poured.
6 Blueprint copies of a Rubbing to be submitted for Approval.



LOCATION DIAGRAM
No Scale



LOCATION ON ABUTMENTS
Scale 1" = 1'-0"

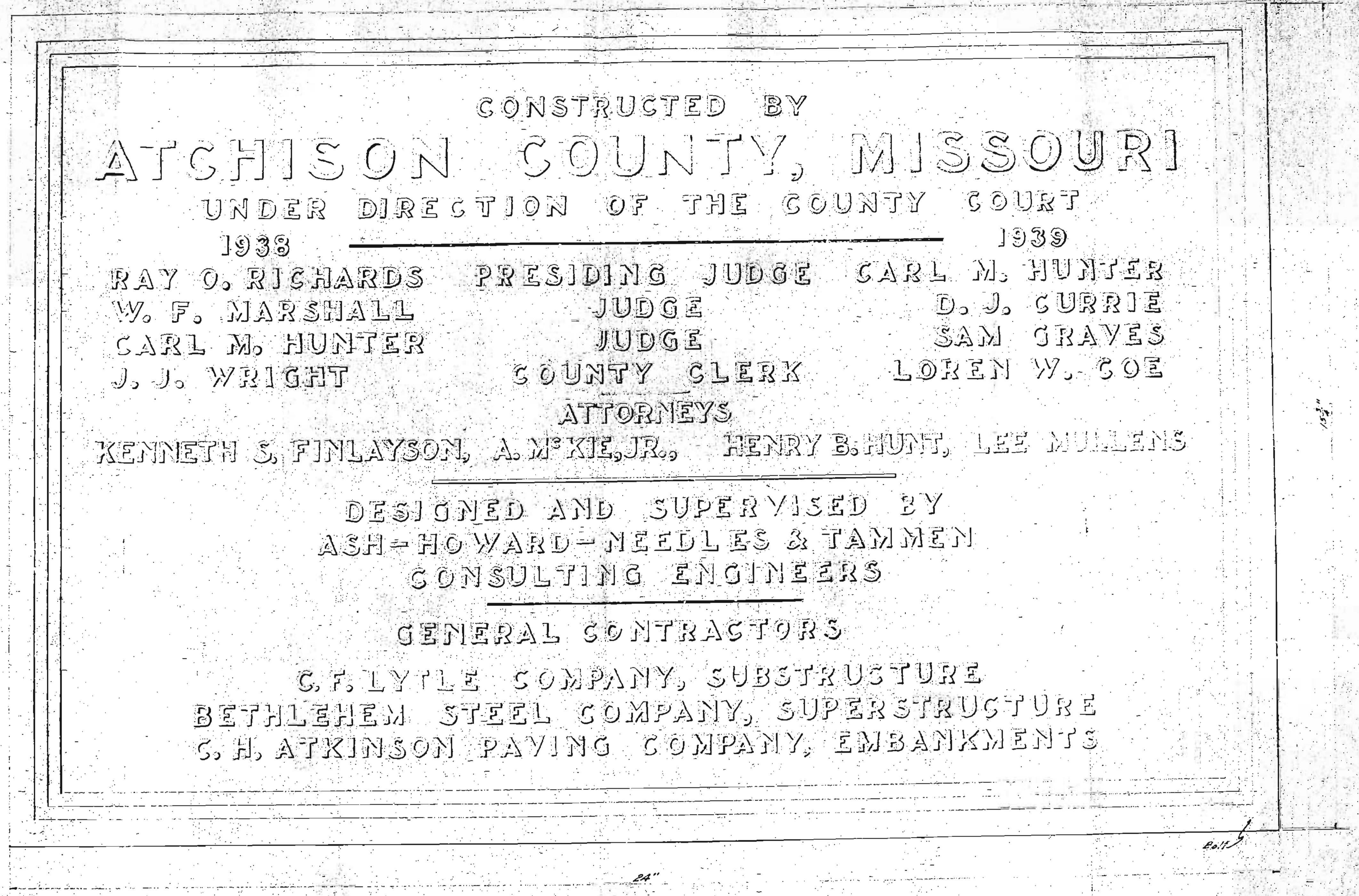
208

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

NAME PLATES

As Noted
[illegible]
ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET No. 21



CONSTRUCTED BY

ATCHISON COUNTY, MISSOURI

UNDER DIRECTION OF THE COUNTY COURT

1938		1939
RAY O. RICHARDS	PRESIDING JUDGE	CARL M. HUNTER
W. F. MARSHALL	JUDGE	D. J. CURRIE
CARL M. HUNTER	JUDGE	SAM GRAVES
J. J. WRIGHT	COUNTY CLERK	LOREN W. COE

ATTORNEYS

KENNETH S. FINLAYSON, A. McKIE, JR., HENRY B. HUNT, LEE MULLENS

DESIGNED AND SUPERVISED BY
ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS

GENERAL CONTRACTORS

C. F. LYTLE COMPANY, SUBSTRUCTURE
BETHLEHEM STEEL COMPANY, SUPERSTRUCTURE
C. H. ATKINSON PAVING COMPANY, EMBANKMENTS

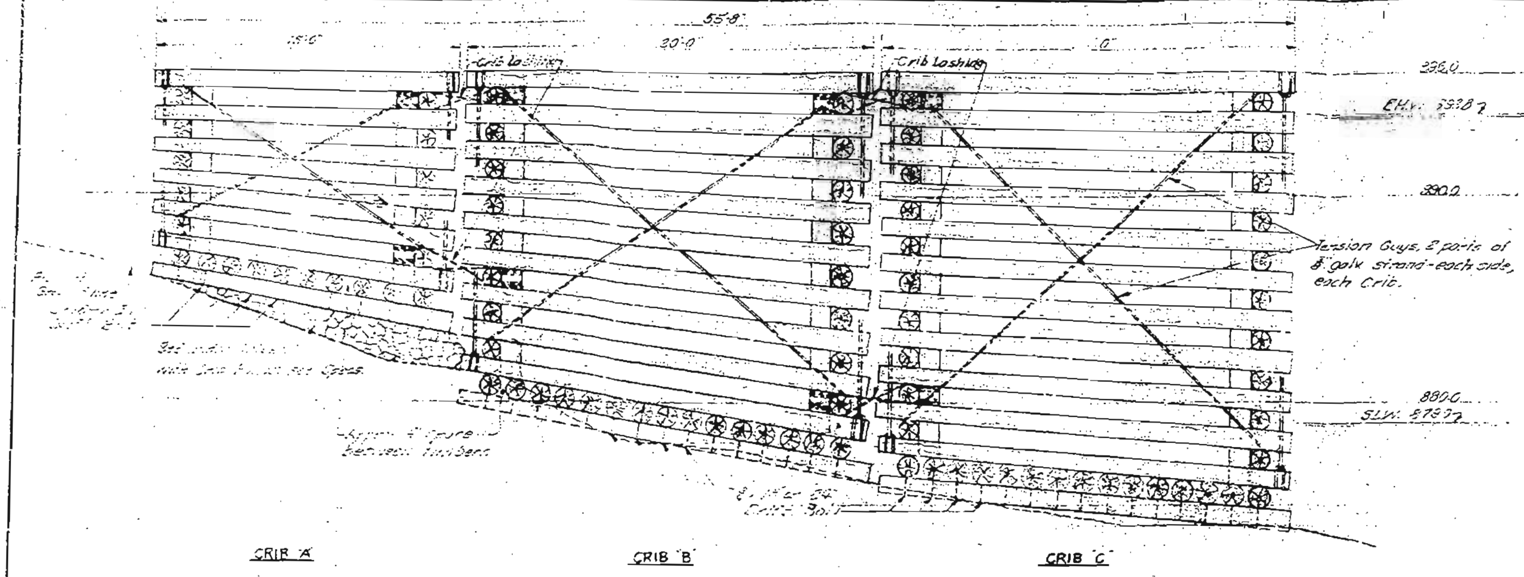
OWNER'S PLATE - 2 REQ'D
FULL SIZE DETAIL

See Sheet 21 for Notes, Typical Section and Location on Structure.

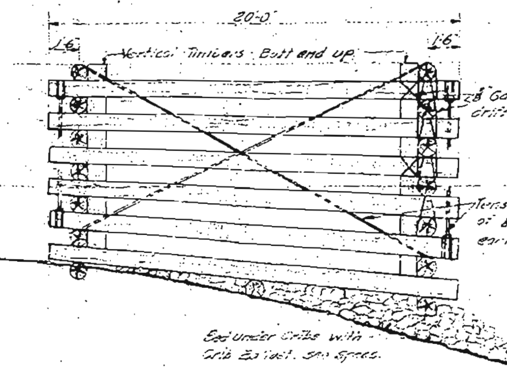
209

L-98

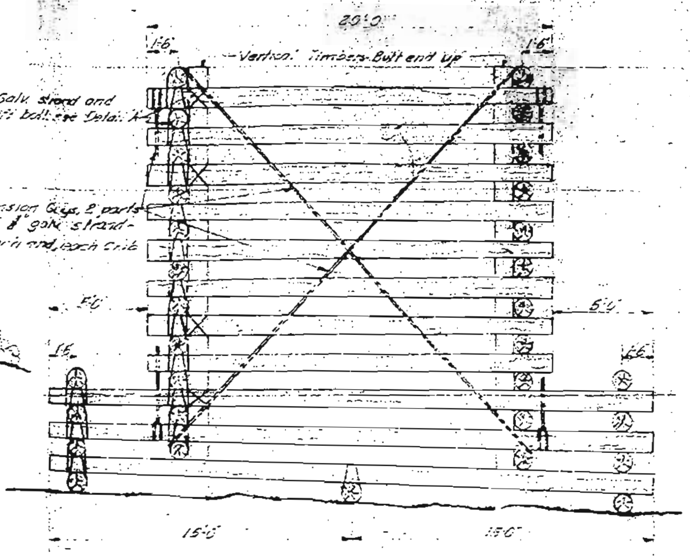
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.


55'8"
15'0"
20'0"
20'0"
Crib Lashing
Crib Lashing
896.0
E.H.W. 893.8
890.0
Tension Guys, 2 parts of ⅜" galv. strand-each side, each Crib.
Bed under Cribs with Crib Ballast, see Specs.
Approx. 4" Space Between Timbers
⅞" x 18" or 24" Drift Bolt
880.0
S.L.W. 878.9
CRIB 'A'
CRIB 'B'
CRIB 'C'
870.0

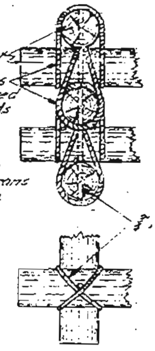
LONGT. SECTION NEAR ℄
¼" = 1'0"


20'0"
1'6"
1'6"
Vertical Timbers - Butt end up
⅜" Galv. strand and drift bolt see Detail
Tension Guys, 2 parts of ⅜" galv. strand-each end, each Crib
Bed under Cribs with Crib Ballast, see Specs.

TRANSVERSE SECTION - CRIB 'A'
¼" = 1'0"

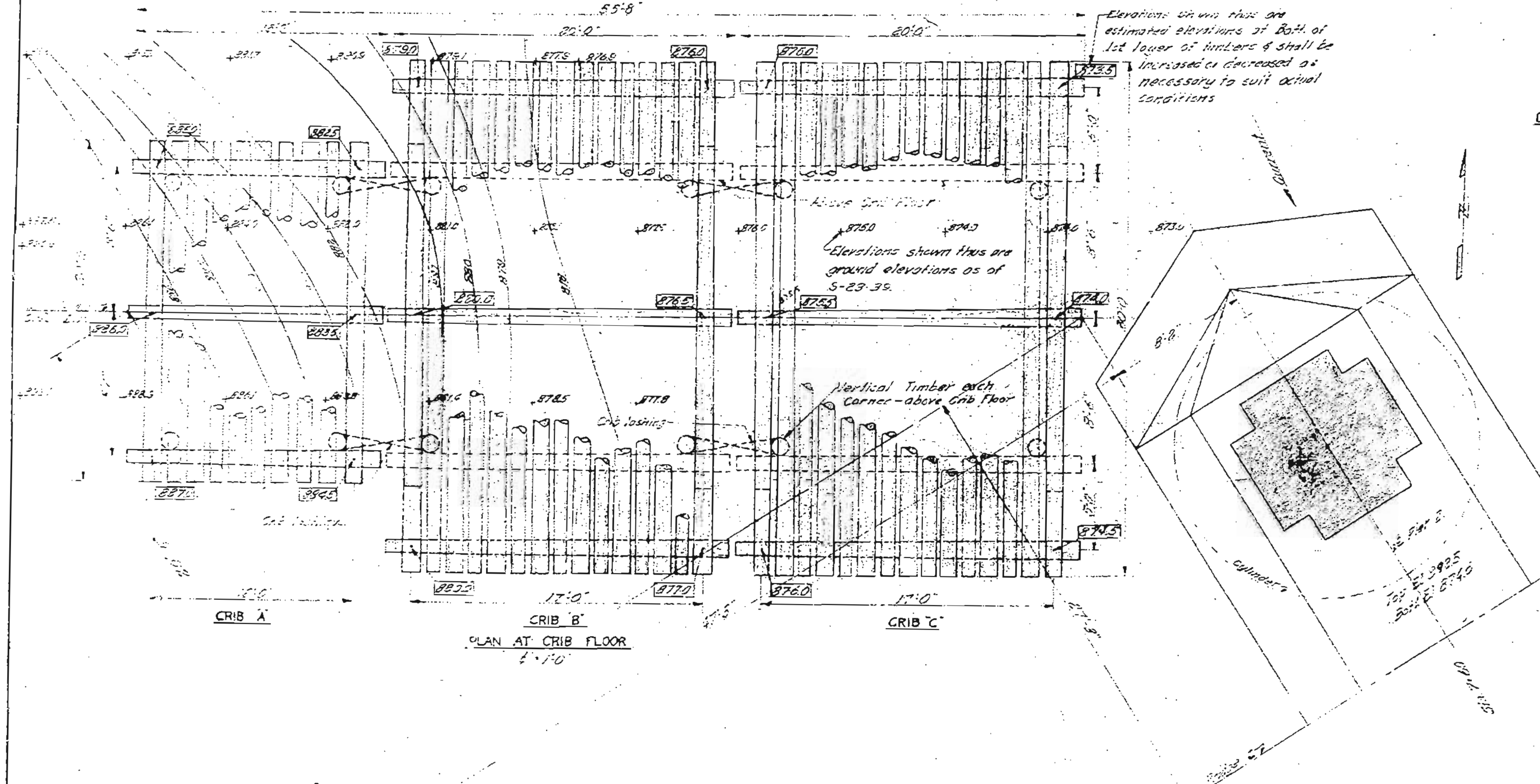


TRANSVERSE SECTION - CRIB 'C'
CRIB 'B' SIMILAR - 20'x30' portion to have 7 layers as for Crib 'B'.
¼" = 1'0"


Crib Timbers
⅜" Galv. strand, two wraps per timber layer, secured by two ⅜" x 3" staples, ends twisted together and secured with another ⅜" x 3" staple. All strands to be drawn taut by mechanical means prior to securing with staples.
⅞" x 18" or 24" Drift Bolt

DETAIL OF CORNER
No Scale

Note:
Each Crib shall be lined with wire screen full height, see Specifications.
Each Crib shall be filled with Crib Ballast, for tonnage see Specs.


55'8"
15'0"
20'0"
20'0"
879.0
876.0
876.0
873.5
Elevations shown thus are estimated elevations of Bott. of 1st layer of timbers & shall be increased or decreased as necessary to suit actual conditions
Above Crib Floor
876.0
875.0
874.0
Elevations shown thus are ground elevations as of 5-23-39.
876.5
875.5
874.0
Vertical Timber each Corner - above Crib Floor
Crib Lashing
Current
873.0
8'2"
Cylinders
Pier 2
Top El. 892.5
Bott. El. 874.0
CRIB 'A'
CRIB 'B'
CRIB 'C'
12'0"
12'0"
17'0"
877.0
876.0

PLAN AT CRIB FLOOR
¼" = 1'0"

210

L-98

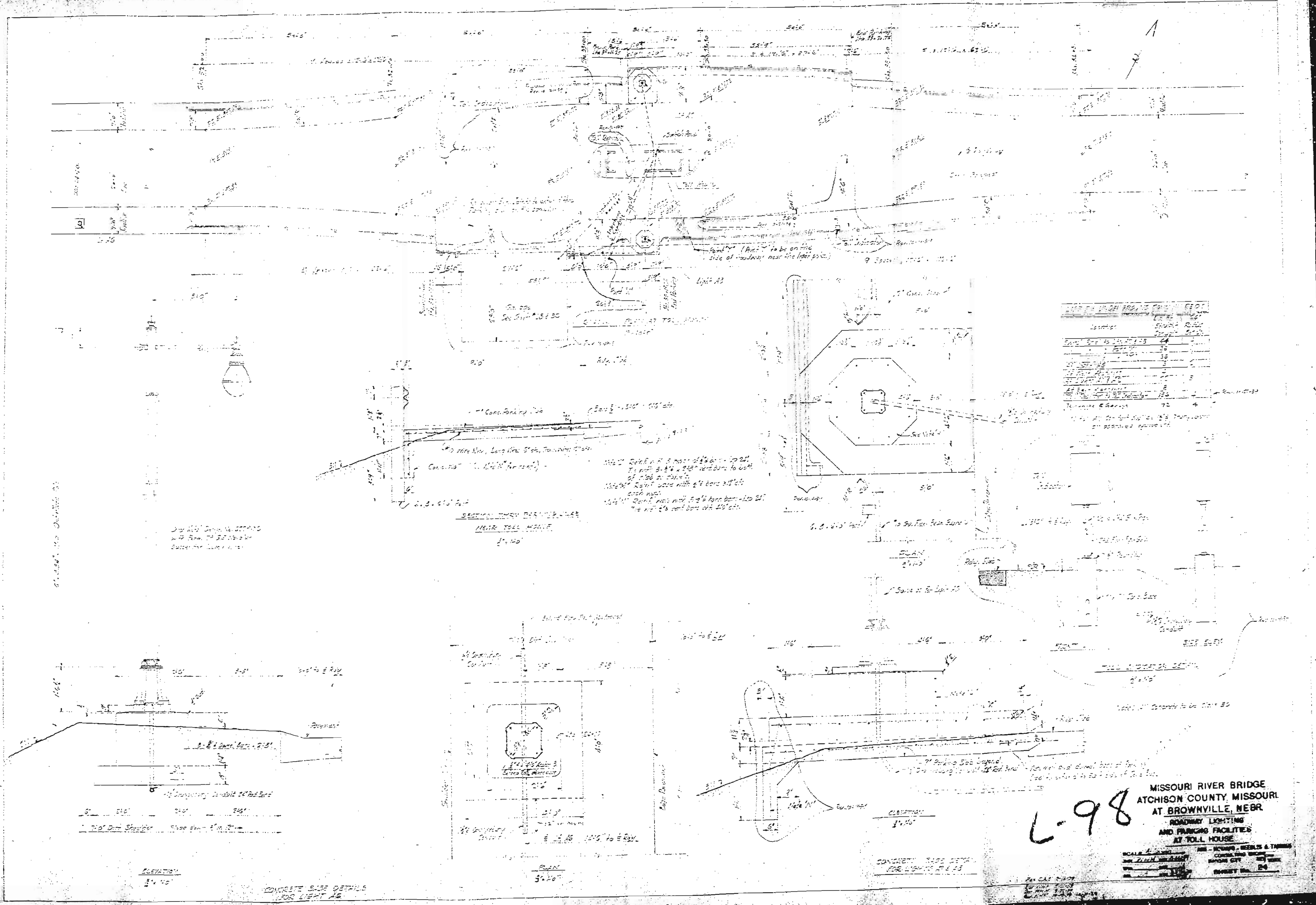
MISSOURI RIVER BRIDGE
ATCHISON COUNTY MISSOURI
AT BROWNVILLE, NEBR.

CRIB DIKE FENDER AT PIER 2

SCALE ¼" = 1'0"

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. 23

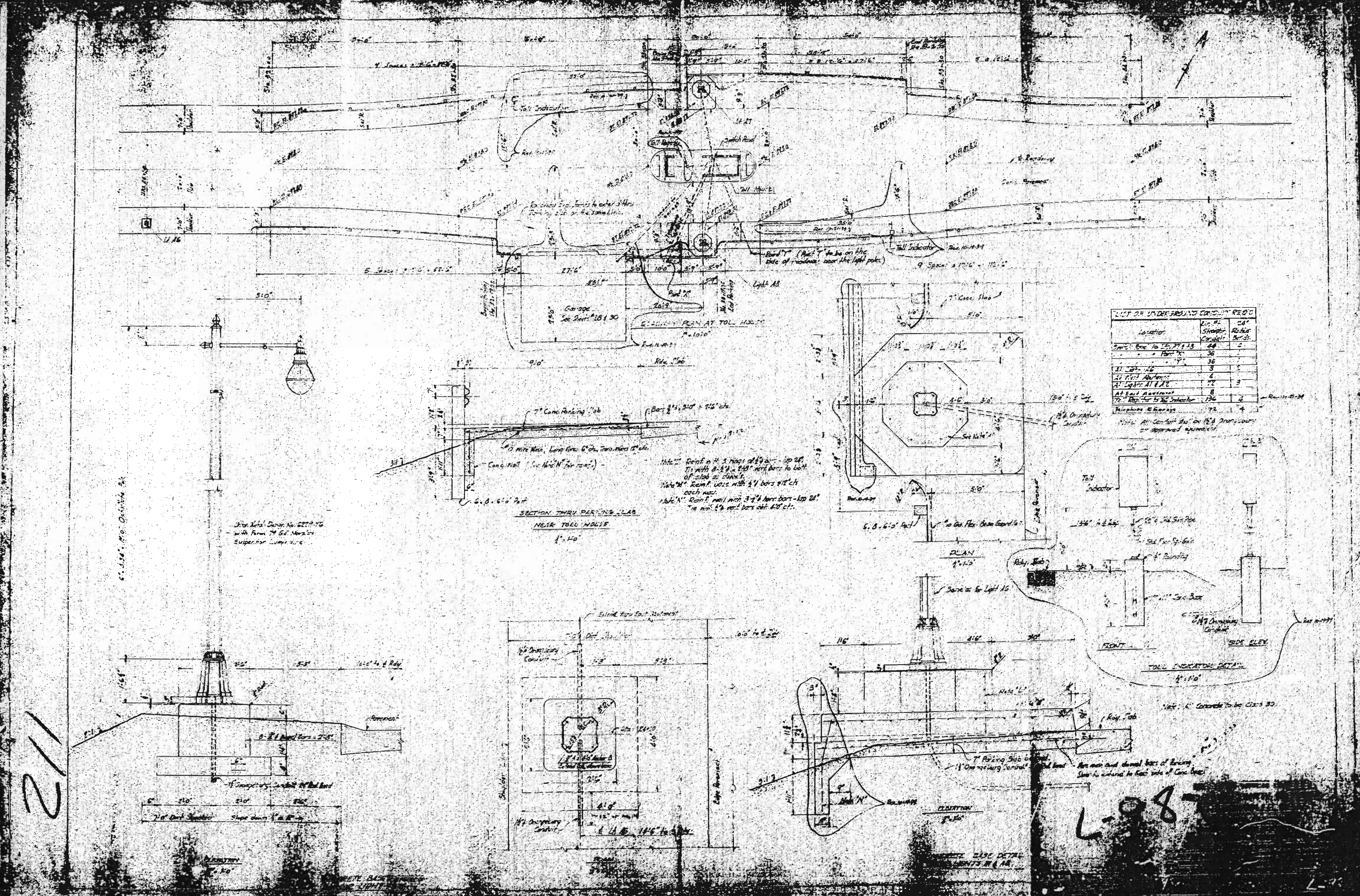

Light A3
Toll House
PLAN
SECTION THRU PARKING AREA NEAR TOLL HOUSE
ELEVATION
PLAN
CONCRETE BASE DETAILS FOR LIGHT A6
CONCRETE BASE DETAILS FOR LIGHTS A1 & A3
TOLL INDICATOR DETAIL
SIDE ELEV.
Rdwy. Slab
Pavement
Tollbooth
Location
72
4

211

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
ROADWAY LIGHTING
AND PARKING FACILITIES
AT TOLL HOUSE

SCALE
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET No. 24


Toll Indicator
Switch Box
Toll House
Light A7
Light A8
Light A6
Post "X"
Post "Y"
Post "Y" (Post "Y" to be on the side of roadway near the light poles)
Garage "See Sheet" 28 & 30
GENERAL PLAN AT TOLL HOUSE
1" = 10'-0"
Rdy. Slab
7" Conc. Parking Slab
Bars 3/4" ⌀, 3'-0" @ 1'-6" cts.
Conc. Wall (See Note "N" for reinf.)
6. B. 6'-0" Post
SECTION THRU PARKING SLAB NEAR TOLL HOUSE
1/2" = 1'-0"
Note "T": Reinf. w. 4 - 3 rings of 1/4" ⌀ - lap 24". Tie with 8 - 1/2" ⌀ × 2'-8" vert. bars to bott. of slab at corners.
Note "M": Reinf. base with 1/2" ⌀ bars @ 12" cts. each way.
Note "N": Reinf. wall with 3 - 1/2" ⌀ horz. bars - lap 24". Tie with 1/2" ⌀ vert. bars abt. 4'-0" cts.
PLAN
1" = 1'-0"
7" Conc. Slab
Set Note "M"
1 1/2" ⌀ Orangeburg Conduit
Edge Pavement
Toll Indicator
FRONT
SIDE ELEV.
TOLL INDICATOR DETAIL
1/2" = 1'-0"
Rdy. Slab
Note: 6" Concrete to be Class "B"
Same as for Light A6
ELEVATION
1/2" = 1'-0"
7" Parking Slab
1 1/2" Orangeburg Conduit
Rdy. Slab
Note "N"
Note "L"
Std. Metal Design No. 6229-TG with Form 79 GE Novalux Suspension Luminaire
1 1/2" Orangeburg Conduit at Bell End
7'-0" Dirt Shoulder
Slope down 1/2" in 1'-0"
ELEVATION
1/2" = 1'-0"
Pavement
Extend thru East Abutment
Shoulder
Edge Pavement
1 1/2" Orangeburg Conduit
℄ Lt. A6 14'-6" to ℄ Rdy.
10'-0" to ℄ Rdy.
CONCRETE BASE DETAIL FOR LIGHTS
CONCRETE BASE DETAIL FOR LIGHTS A7 & A8

LIST OF UNDERGROUND CONDUIT REQ'D

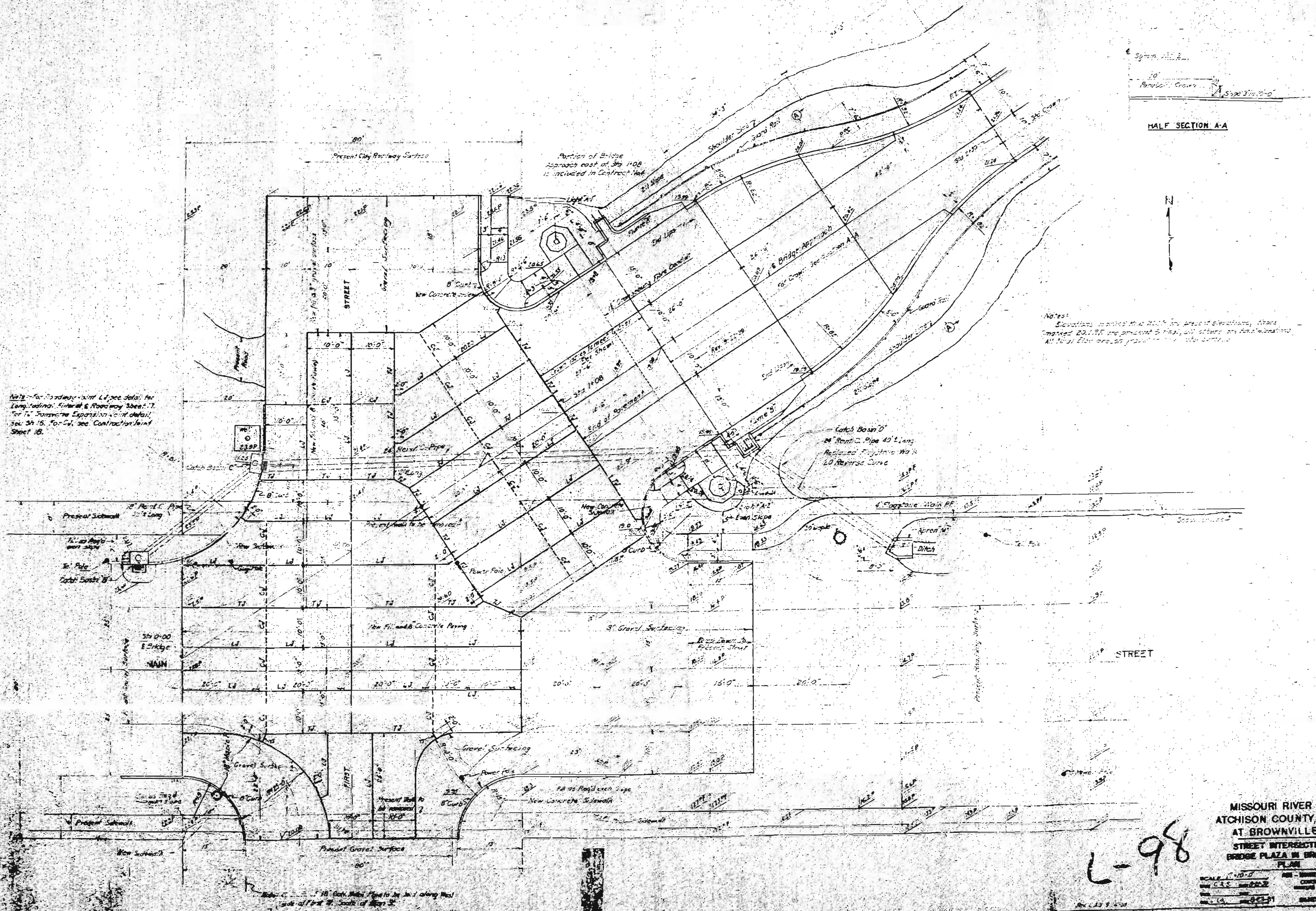
Location	Lin. Ft. Straight Conduit	"2A" Radius Bends
Switch Box to Lts. A7 & A8	44	2
" " " Post "X"	36	1
" " " "Y"	36	1
At Light A6	3	1
At West Abutment	6	3
At Lights A7 & A8	72	
At East Abutment	8	
Tr. Register to Toll Indicator	136	4
Telephone & Garage	72	4

Note: All Conduit shall be 1 1/2" ⌀ Orangeburg or approved equivalent.

211

L-98

212



MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

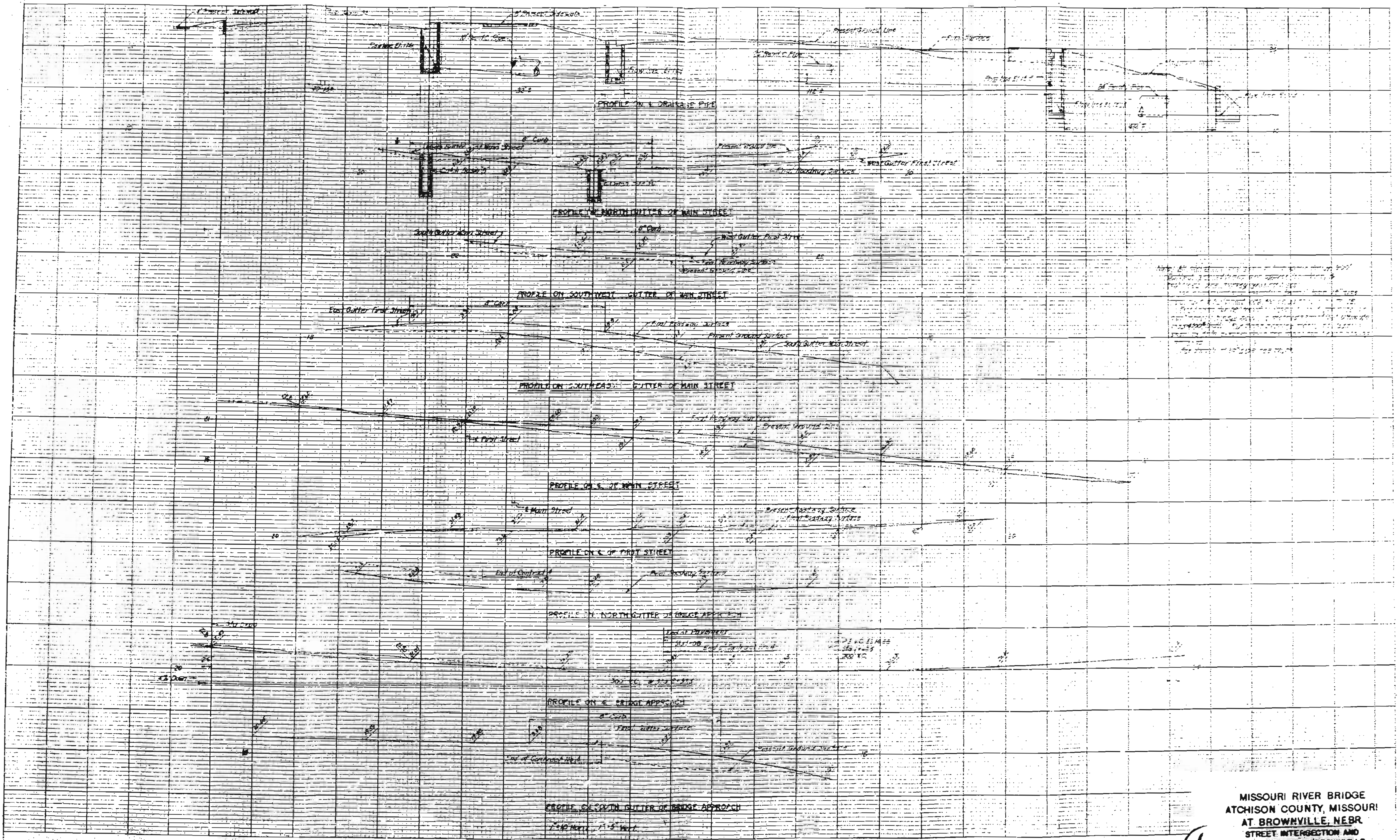
STREET INTERSECTION AND
BRIDGE PLAZA IN BROWNVILLE
PLAN

SCALE 1" = 10'-0"
C.R.S.
SHEET No. 26

Rev. C.R.S. 9-6-39
Rev. 9-22-39
Rev. Concrete Slab 12-14-39

L-98

213


PROFILE ON ℄ DRAINAGE PIPE
PROFILE ON NORTH GUTTER OF MAIN STREET
PROFILE ON SOUTHWEST GUTTER OF MAIN STREET
PROFILE ON SOUTHEAST GUTTER OF MAIN STREET
PROFILE ON ℄ OF MAIN STREET
PROFILE ON ℄ OF FIRST STREET
PROFILE ON NORTH GUTTER OF BRIDGE APPROACH
PROFILE ON ℄ BRIDGE APPROACH
PROFILE ON SOUTH GUTTER OF BRIDGE APPROACH
1"=10' Horiz. 1"=5' Vert.
Present Ground Line
Final Roadway Surface
Present Ground Surface
East Gutter First Street
West Gutter First Street
South Gutter Main Street
6" Curb
End of Contract
End of Pavement

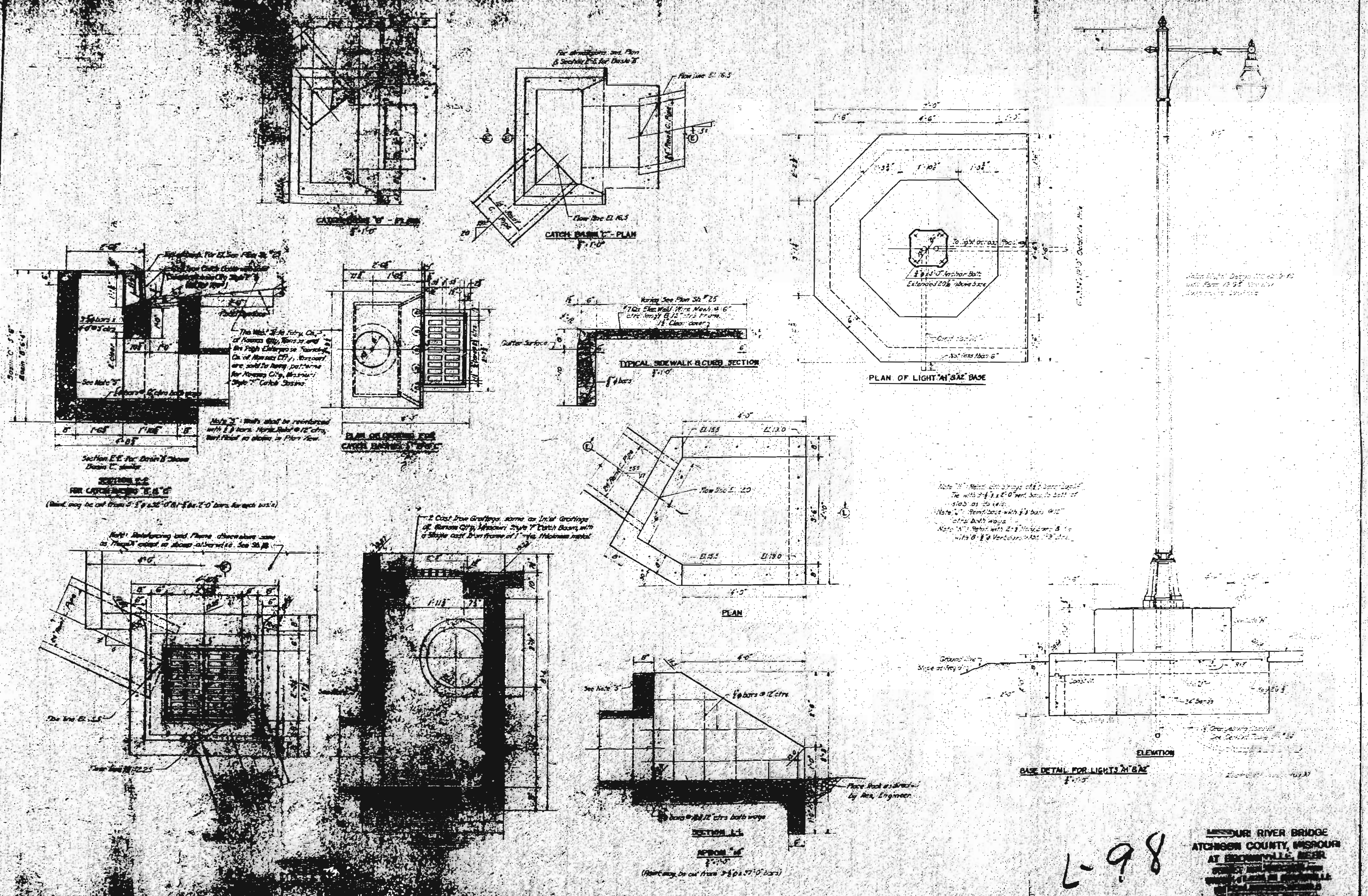
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
STREET INTERSECTION AND
BRIDGE PLAZA IN BROWNVILLE
PROFILES

SCALE As Shown
C.A.S.
J.S. 8-23-39

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. 26



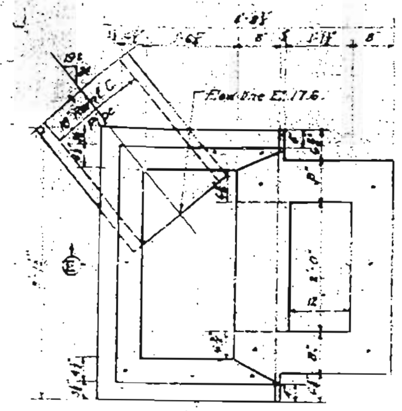
CATCH BASIN "B" - PLAN
For dimensions see Plan & Section E-E for Basin "B"
Flow line El. 16.5
Flow line El. 16.5
CATCH BASIN "C" - PLAN
Section E-E for Basin "B" shown Basin "C" similar
Basin "C" 5'-6"
Basin "B" 6'-4"
See Note "S"
4'-8½"
SECTION E-E
FOR CATCH BASINS "B" & "C"
(Reinf. may be cut from 5-⅝"φ x 36'-0" & 1-⅝"φ x 2'-0" bars for each basin)
The Wm. Beck Fdry. Co., of Kansas City, Kansas and the Pugh Enterprise Foundry Co. of Kansas City, Missouri are said to have patterns for Kansas City, Missouri Style "F" Catch Basins
Note "S": Walls shall be reinforced with ⅝"φ bars. Horiz. Reinf. @ 12" ctrs, Vert. Reinf. as shown in Plan View.
PLAN OF OPENING FOR CATCH BASINS "B" & "C"
Gutter Surface
Varies See Plan Sh. 25
TYPICAL SIDEWALK & CURB SECTION
2 Cast Iron Gratings same as Inlet Gratings of Kansas City, Missouri Style "F" Catch Basin, with a single cast iron frame of 1" min. thickness metal
Flow line El. 12.25
El. 15.5
El. 13.0
Flow line El. 12.0
PLAN
See Note "S"
⅝"φ bars @ 12" ctrs
Place Rock as directed by Res. Engineer
⅝"φ bars @ 12" ctrs both ways
SECTION L-L
APRON "A"
(Reinf. may be cut from 7-⅝"φ x 37'-0" bars)
7'-0"
1'-6"
4'-6"
1'-3¾"
1'-10½"
¾"φ x 3'-0" Anchor Bolt Extended 2⅞" above base
To light across roadway
Not less than 6"
PLAN OF LIGHT "A1" & "A2" BASE
Note "B": Reinf. with 4 loops of ⅜" bars & tie with 3-⅜"φ x 2'-0" vert. bars to bott. of slab as shown.
Note "C": Reinf. base with ⅝"φ bars @ 12" ctrs both ways
Note "A": Reinf. with 2-⅜" horiz. bars & tie with 8-⅜"φ vert. bars
Ground line
ELEVATION
BASE DETAIL FOR LIGHTS "A1" & "A2"

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

214

L-98

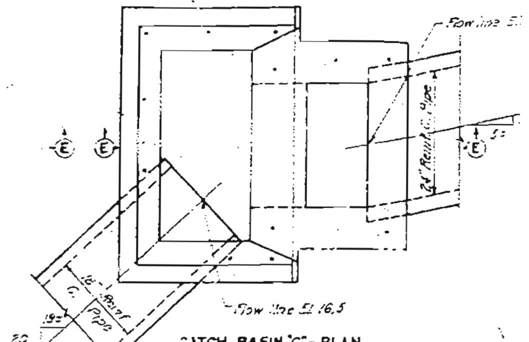
214



CATCH BASIN "B" - PLAN

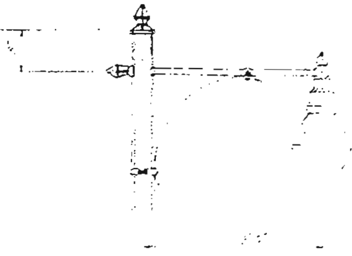
¾" = 1'-0"

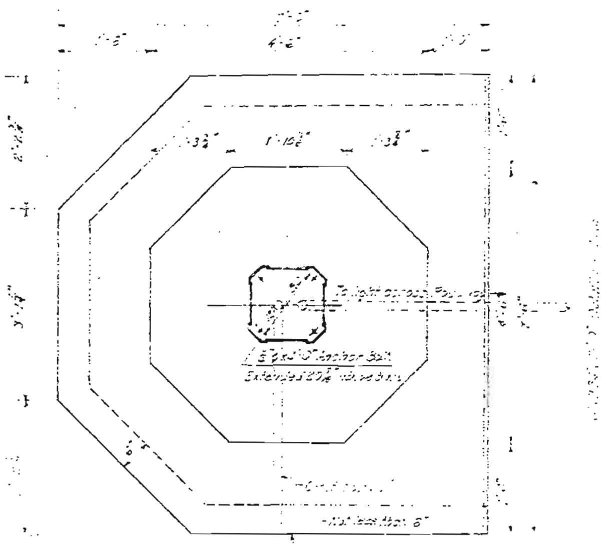
For dimensions see Plan & Section E-E for Basin "B"



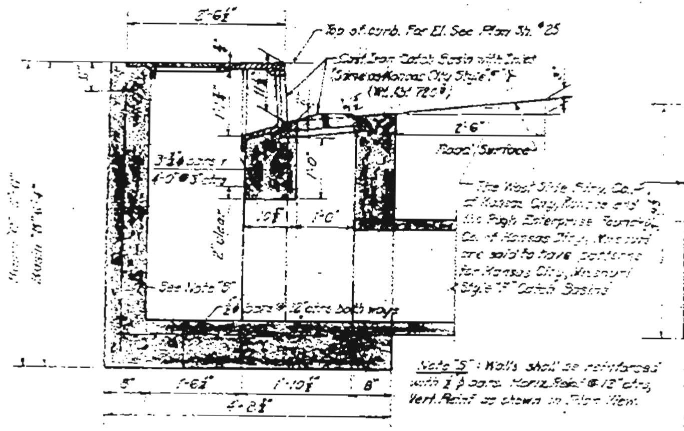
CATCH BASIN "C" - PLAN

¾" = 1'-0"





PLAN OF LIGHT "A1" & "A2" BASE



2'-6½"
Top of curb. For El. See Plan Sh. #25
Cast Iron Catch Basin with Inlet (Same as Kansas City Style "F") (Wt. Ab. 720#)
2'-6"
Road Surface
3-¾ø bars 4'-0" @ 3" ctrs.
2' clear
See Note "S"
½ø bars @ 12" ctrs. both ways
5"
1'-6½"
1'-10½"
8"
4'-2½"

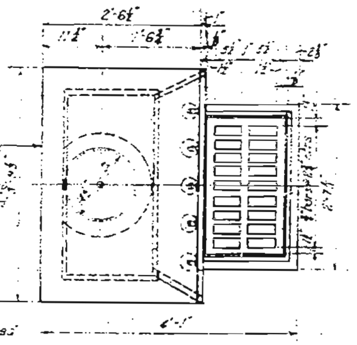
The West Side Eng. Co. of Kansas City, Kansas and the High Enterprise Foundry Co. of Kansas City, Missouri are said to have patterns for Kansas City, Missouri Style "F" Catch Basins

Note "S": Walls shall be reinforced with ½ ø bars. Horiz. Reinf. @ 12" ctrs. Vert. Reinf. as shown in Plan View.

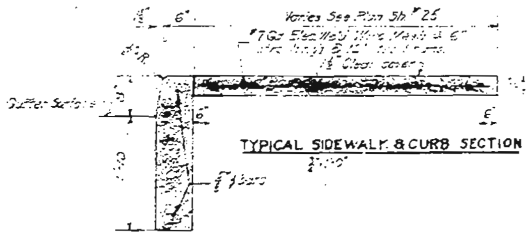
Section E-E for Basin "B" Shown
Basin "C" similar

SECTION E-E
FOR CATCH BASINS "B" & "C"

(Reinf. may be cut from 5-½"ø x 32'-0" & 1-⅜"ø x 2'-0" bars for each basin)

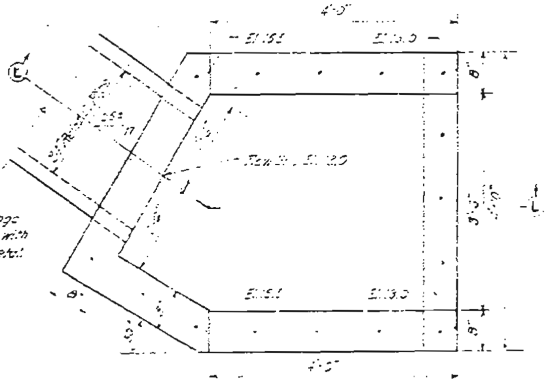


PLAN OF CASTING FOR
CATCH BASINS "B" & "C"



TYPICAL SIDEWALK & CURB SECTION

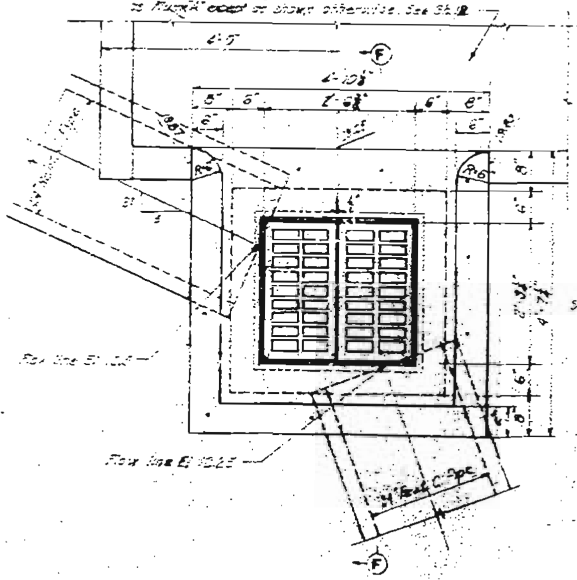
¾" = 1'-0"



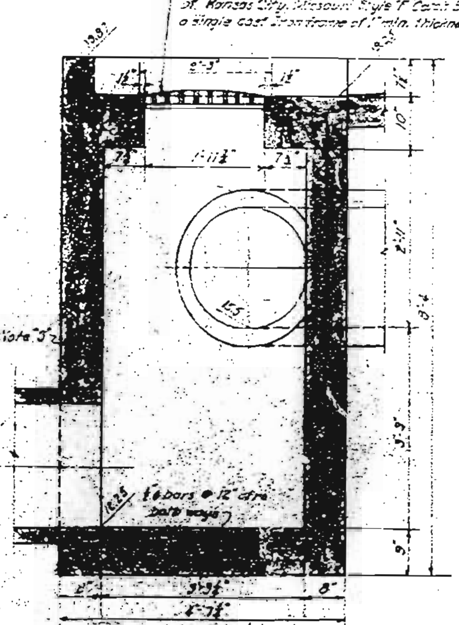
PLAN

Note: Reinforcing and Flume dimensions same as Flume "A" except as shown otherwise. See Sh. 12

2 Cast Iron Gratings same as Inlet Gratings of Kansas City, Missouri Style "F" Catch Basin, with a single cast iron frame of 1" min. thickness metal.



PLAN

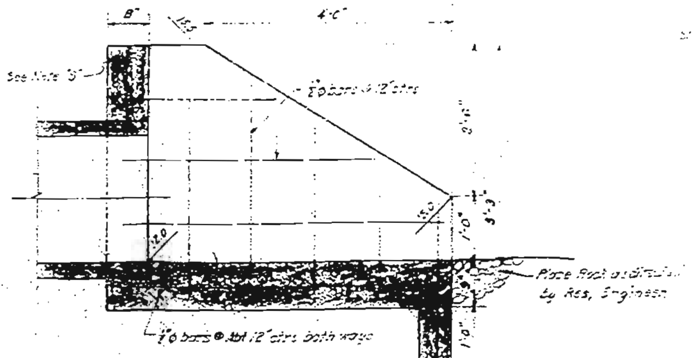


SECTION F-F

CATCH BASIN "D"

¾" = 1'-0"

(Reinf. may be cut from 6-½"ø x 35'-0" bars)



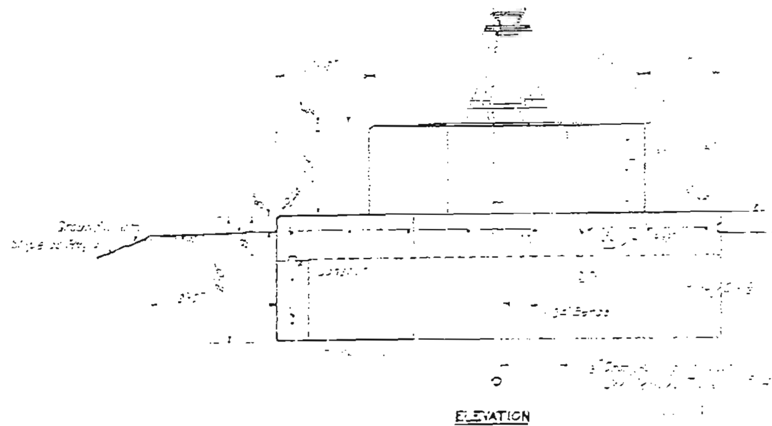
8"
4'-0"
See Note "S"
½ø bars @ 12" ctrs.
½ø bars @ abt. 12" ctrs. both ways
Place Rock as directed by Res. Engineer
6"

SECTION L-L

APRON "M"

¾" = 1'-0"

(Reinf. may be cut from 3-½"ø x 37'-0" bars)



ELEVATION

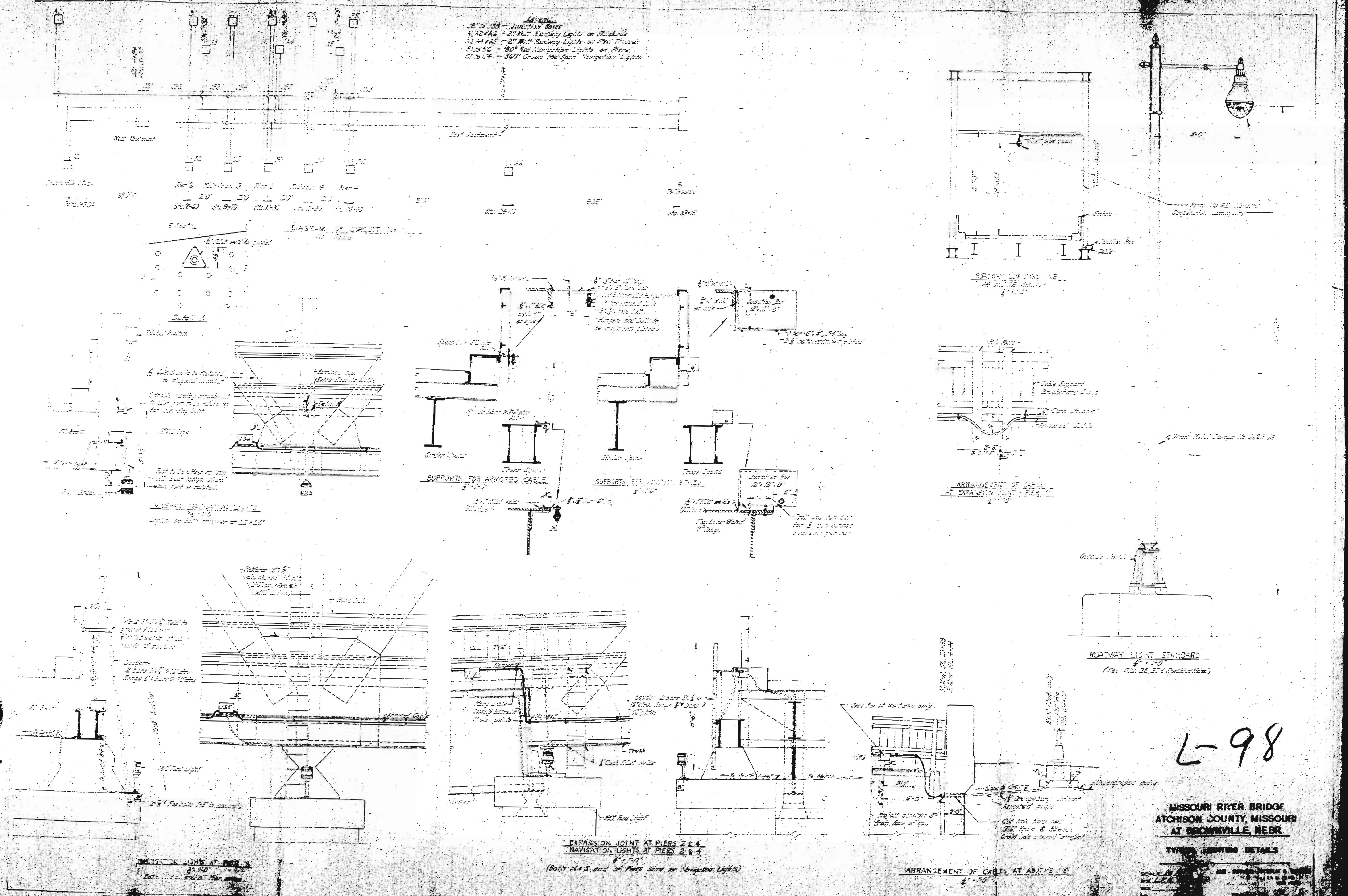
BASE DETAIL FOR LIGHTS "A1" & "A2"

L-98

Rev. C.A.S. 5-6-39

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
STREET INTERSECTION AND
BRIDGE PLAZA IN BROWNVILLE
MISCELLANEOUS DETAILS

SCALE As Shown
ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET No. 27



Legend
JB1 to JB9 – Junction Boxes
A1, A2 & A5 – 2" Watt Roadway Lights on Standards
A3, A4 & A6 – 2" Watt Roadway Lights on Steel Trusses
B1 to B6 – 180° Red Navigation Lights on Piers
C1 to C4 – 360° Green Mid-Span Navigation Lights
DIAGRAM OF CIRCUITS
Detail E
SUPPORTS FOR ARMORED CABLE
SUPPORTS FOR JUNCTION BOXES
Junction Box
Girder Spans
Truss Spans
ARRANGEMENT OF CABLE AT EXPANSION JOINT - PIER
ROADWAY LIGHT STANDARD
EXPANSION JOINT AT PIERS 2 & 4
NAVIGATION LIGHTS AT PIERS 2 & 4
(Both U.S. and D.S. ends of Piers same for Navigation Lights)
ARRANGEMENT OF CABLES AT ABUTMENTS
NAVIGATION LIGHTS AT PIER 3
180° Red Light
Truss

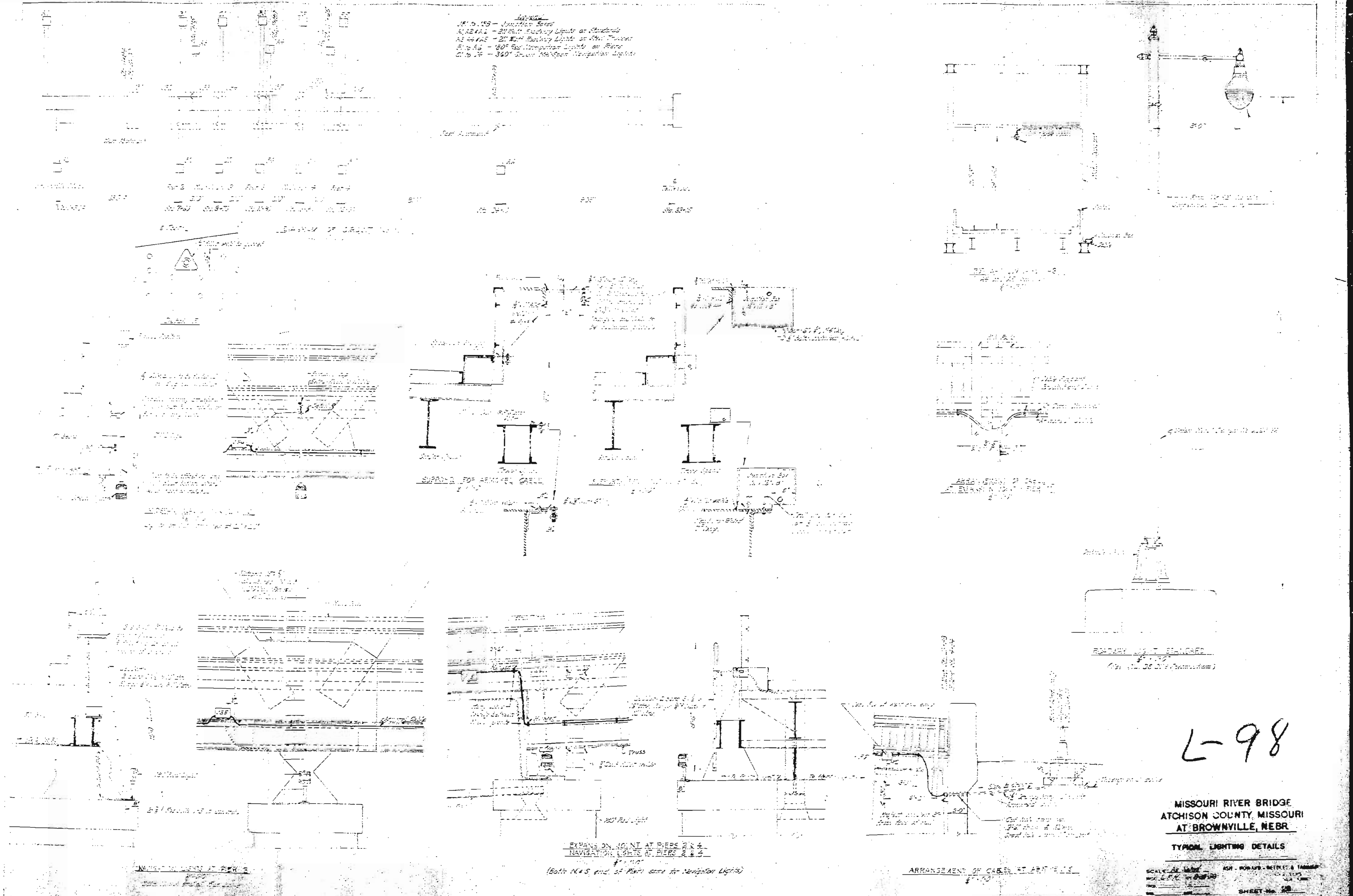
215

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TYPICAL LIGHTING DETAILS

215


LEGEND
J.B. 1-155 – Junction Boxes
A1, A2 & A3 – 200 Watt Roadway Lights on Standards
A3, 44 & 45 – 200 Watt Roadway Lights on Steel Trusses
... – 180° Red Navigation Lights on Piers
... – 360° Green Midspan Navigation Lights
DIAGRAM OF CIRCUIT
SUPPORTS FOR ARMORED CABLE
ARRANGEMENT OF CABLES AT EXPANSION JOINT PIER 1
ROADWAY LIGHT STANDARD
Truss
180° Red Light
NAVIGATION LIGHTS AT PIER 3
EXPANSION JOINT AT PIERS 2 & 4
NAVIGATION LIGHTS AT PIERS 2 & 4
(Both N. & S. end of Piers same for Navigation Lights)
ARRANGEMENT OF CABLES AT ABUTMENTS

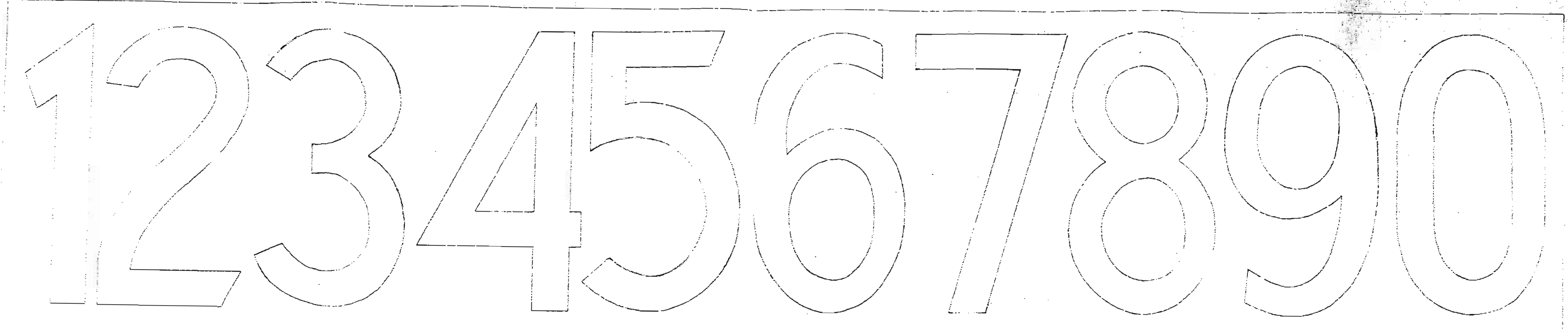
L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

TYPICAL LIGHTING DETAILS

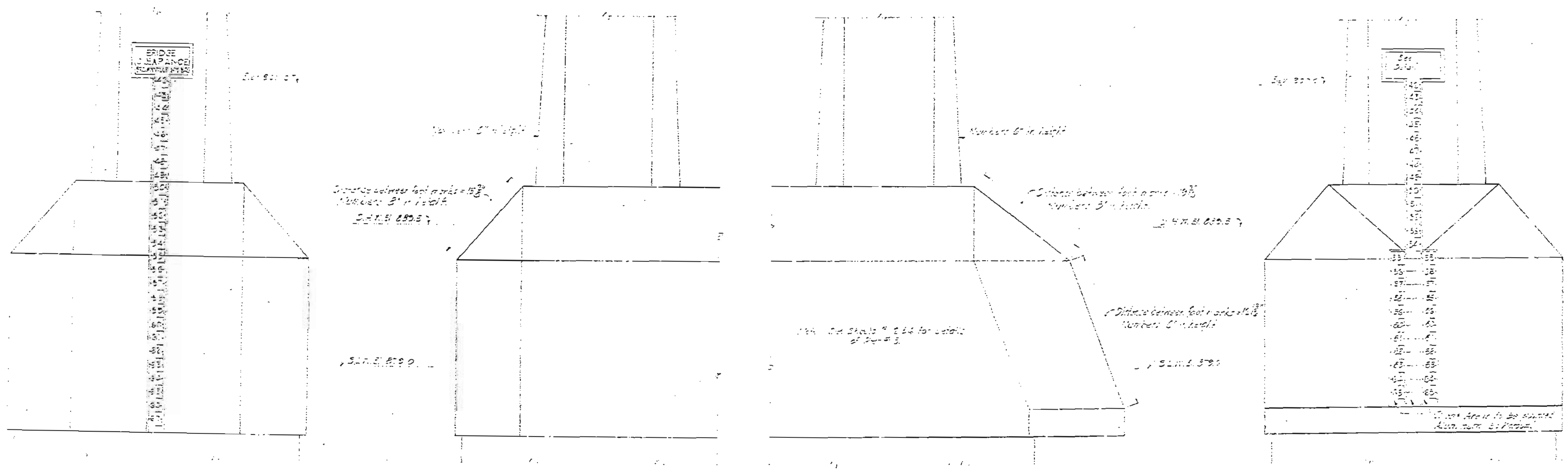
SCALE As Noted
ASH – HOWARD – NEEDLES & TAMMEN
SHEET No. 58

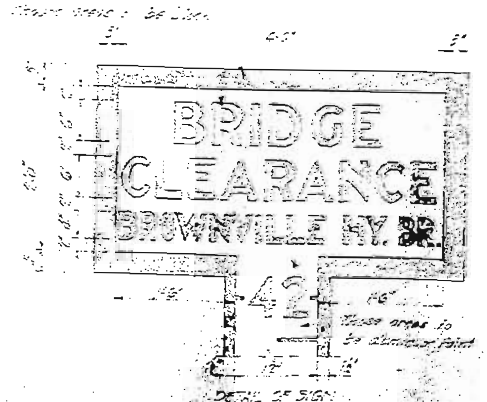
216



FULL SIZE OUTLINE OF NUMBERS

Note: 6" numbers to be as shown. 8" numbers to be the same width of 6" number but elongated.


BRIDGE CLEARANCE
Numbers 6" in height
Distance between foot marks = 15⅜"
Numbers 8" in height
Distance between foot marks = 15⅜"
Numbers 8" in height
See Sheets No. 24 for details of Pier 3
See Sign
These areas to be painted aluminum as required



DETAIL OF SIGN

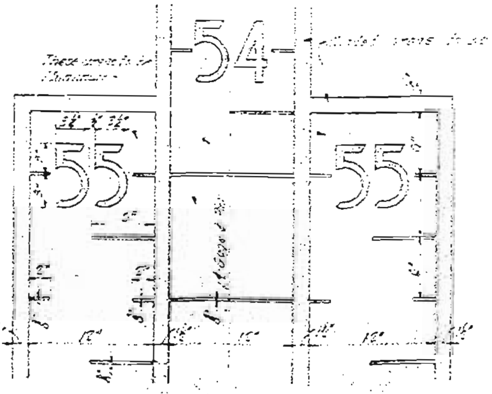
1" = 1'-0"

GAGE ON DOWNSTREAM FACE OF PIER 3

¼" = 1'-0"

NOTES ON PAINTING

1. Areas to be painted with a stiff brush to remove all loose particles, then apply a wash coat consisting of a mixture of 8 pounds of sulphate of zinc to a gallon of warm water. Apply with a flat broad brush and allow to dry. After drying, brush with a stiff brush to remove any crystallization.
2. Apply a primer coat of aluminum paint with Dulux vehicle, similar to Brownville Bridge Specs, Div. III, Art 27, page 18. Each gallon of paint thinned with 1 quart of special thinner suitable to the paint.
3. Apply a second coat aluminum paint with Dulux vehicle similar to Brownville Bridge Specs, Div. III, Art 27, page 18 without special thinner.
4. Paint division markers, border lines, letters and figures black with 1 coat of du Pont's Black Floor and Deck Enamel or equivalent approved material.



TYPICAL DETAIL OF GAGE MARKINGS

1½" = 1'-0"

GAGE ON UPSTREAM FACE OF PIER 3

¼" = 1'-0"

L-98

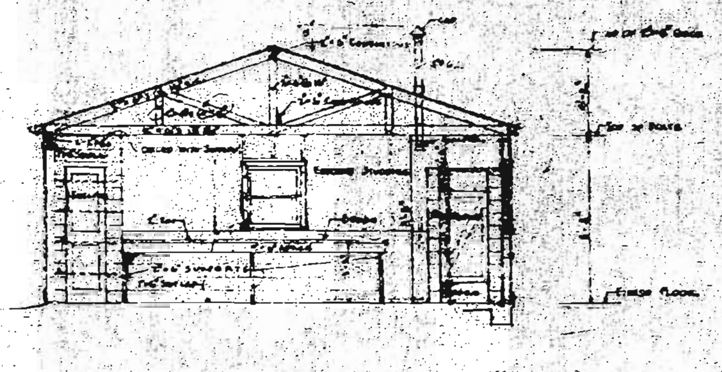
Notes:
Copper sheet stencils for each letter and figure shall be provided, and upon completion of the work shall be suitably boxed and delivered to the owner for future use in repainting.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

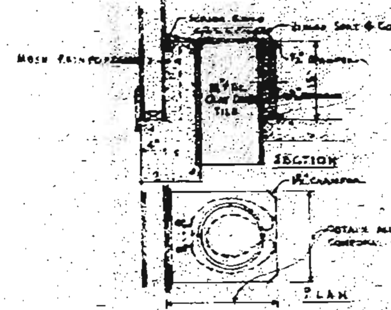
BRIDGE CLEARANCE GAGE
PIER 3

SCALE: As Noted
ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
SHEET No. 23

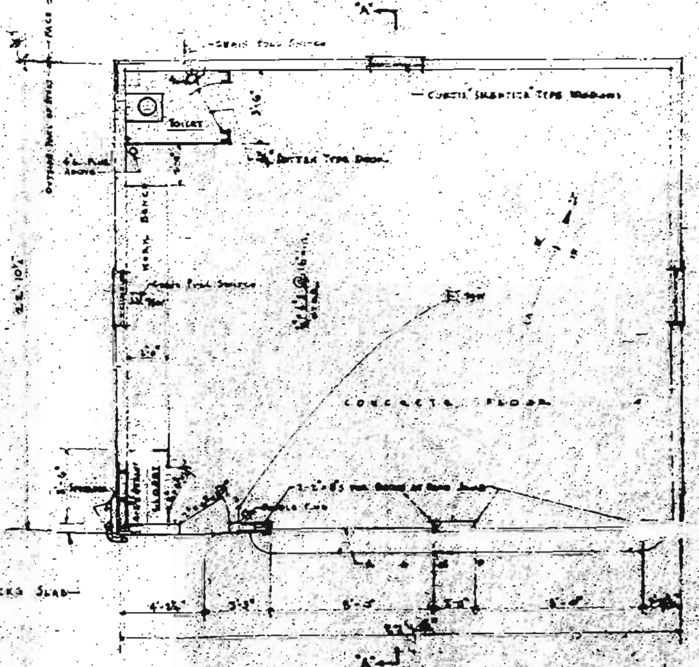
1. GARAGE BLDG. TO BE CONSTRUCTED COMPLETE READY FOR USE. FLOOR AND FOUNDATION CONTRACT ... REMAINDER CONTRACT #2.
2. CONSTRUCTION WOOD FRAME AS DETAILED. MATERIALS NOT SPECIFIED TO BE FIRST CLASS OF THEIR VARIOUS KINDS. WORKMANSHIP TO BE FIRST CLASS.
3. ROUGH FRAMING LUMBER, #1 YELLOW PINE S4S KILN DRIED, OR FIR OF EQUIVALENT QUALITY. ROOF SHEATHING #2 Y.P. OR FIR. EXTERIOR TRIM, SCREEDING, CLOSET, & TOILET PARTITIONING TO BE "C" SELECT Y.P. EXTERIOR SIDING #1 WHITE PINE OF PATTERN TO MATCH TOLL HOUSE. ROOF SHINGLES 16", 5 TO 2", CEDAR LAID 5" TO WEATHER.
4. MILLWORK, CLEAR WHITE PINE.
5. GLASS, U.S. "PENNVERNON" D.S. GRADE B, OR EQUAL.
6. ROUGH CARPENTRY TO BE SUBSTANTIAL. FINISH CARPENTRY TO BE CAPABLE OF WITHSTANDING RIGID EXAMINATION. FINISH NAILS TO BE SET & HOLES PUTTIED UP.
7. GUTTERS, DOWNSPOUT, SPREADER, FLASHING OVER WINDOWS, DOORS, & AROUND FLUE, FLUE & SLEEVE, SHALL BE 26 GA. G.I.
8. ROUGH HARDWARE FOR GARAGE DOORS, STEEL STRAP HINGES ⅜"x2½"x16" MADE BY RICHARDS-WILCOX, OR EQUAL. HINGES SHALL BE SECURELY SCREWED TO JAMB & DOOR TO INSURE AGAINST SAGGING. SUITABLE LATCH, HASP, PADLOCK & CREMONE BOLTS AT TOP & BOTTOM SHALL BE FURNISHED FOR EACH SET OF DOORS. OTHER FINISH HARDWARE, BRONZE FINISH, SUBSTANTIAL, & MATCH THAT OF TOLL HOUSE. CYLINDER LOCK SHALL BE INCLUDED FOR SMALL DOOR.
9. ALL EXPOSED OUTSIDE SURFACES OF THE BLDG., EXCEPT THE SHINGLE ROOF & CONCRETE WORK, BUT INCLUDING BOTH SIDES OF EXTERIOR DOORS & WINDOWS, SHALL BE PAINTED WITH PRIMER & 2 COATS BEST QUALITY WHITE TITANIUM HOUSE PAINT MANUFACTURED BY COOK PAINT & VARNISH CO., OR EQUAL.
10. ELECTRIC WIRING SHALL CONFORM TO ALL LOCAL & UNDERWRITERS' CODES. ONE CIRCUIT SHALL BE RUN UNDERGROUND IN SUITABLE CONDUIT FROM THE TOLL HOUSE PANEL BOX TO THE GARAGE TO WHICH THE OUTLETS SHOWN SHALL BE CONNECTED. THE LIGHT FIXTURES SHALL BE MERELY SOCKETS WITH SWITCHES AS SHOWN. BX CABLE MAY BE USED FOR THE CIRCUIT IN THE BLDG. LAMPS OF WATTAGE SHOWN SHALL BE INCLUDED.
11. TOILET SHALL CONSIST OF A 2' SECTION OF SALT GLAZED VITRIFIED TILE 12" INSIDE DIAMETER, ENCASED IN CONC., WITH A #16-81 "WEARBONITE" BLACK TOILET SEAT & COVER OR EQUAL, MOUNTED AS SHOWN. SEAT LUGS TO BE ANCHORED IN THE CONCRETE.



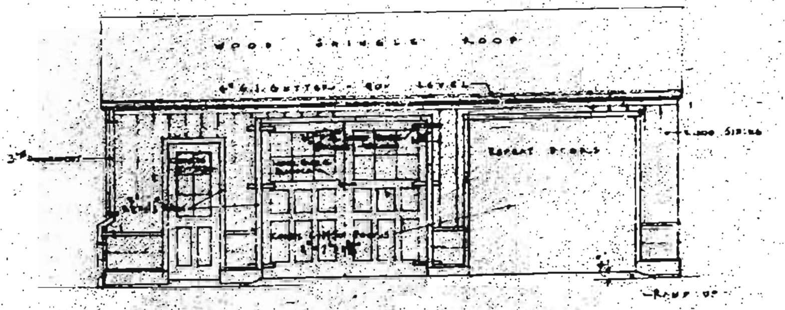
CROSS SECTION ON LINE "A-A" SCALE ½"=1'-0"



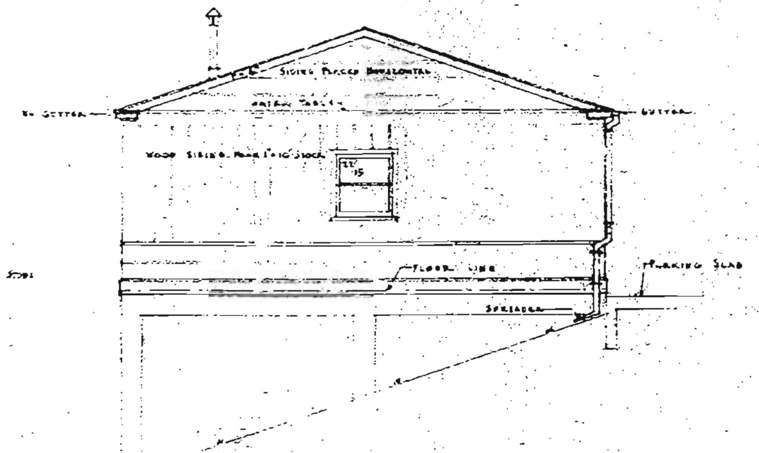
DETAILS OF TOILET SEAT
SCALE 1½"=1'-0"



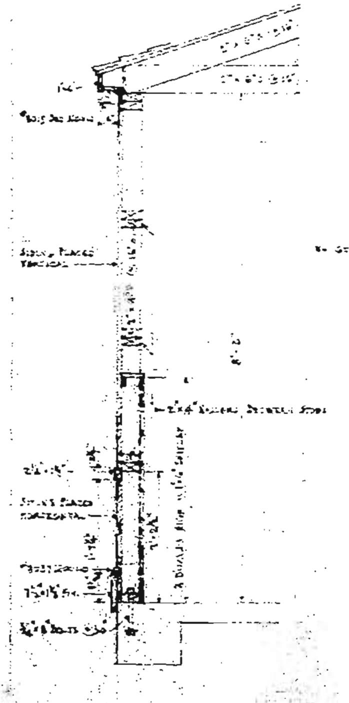
PLAN SCALE ¼"=1'-0"



FRONT ELEVATION
SCALE ¼"=1'-0"



SIDE ELEVATION
OPPOSITE SIDE SIMILAR, EXCEPT NO DOWNSPOUT.
SCALE ¼"=1'-0"



TYPICAL WALL SECTION
SCALE ¾"=1'-0"

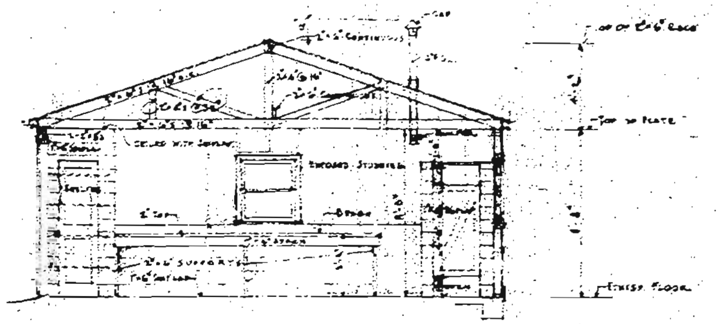
FOR DETAILS OF FLOOR AND FOUNDATIONS SEE SHEET 31.

217

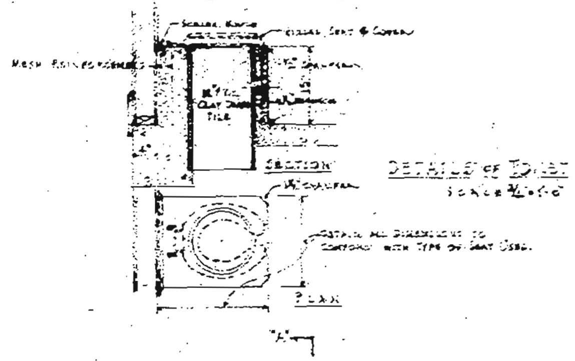
L-98

L-98

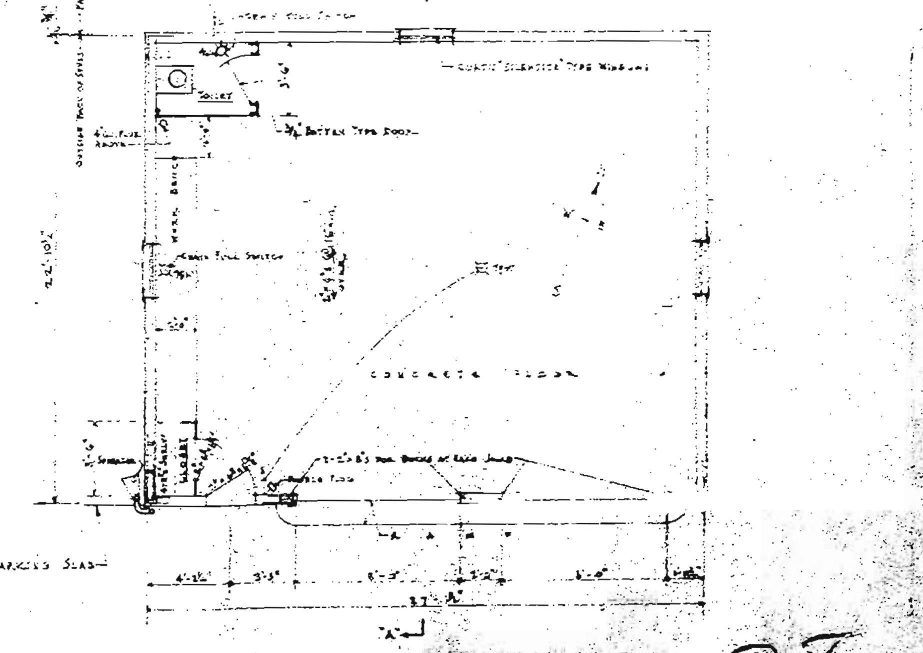
1. GARAGE BLDG. TO BE CONSTRUCTED COMPLETE READY FOR USE, FLOOR AND FOUNDATION CONTRACT ... REMAINDER CONTRACT 37.
2. CONSTRUCTION WOOD FRAME AS DETAILED, MATERIALS NOT SPECIFIED TO BE FIRST CLASS OF THE VARIOUS KINDS. WORKMANSHIP TO BE FIRST CLASS.
3. ROUGH FRAMING LUMBER, #1 YELLOW PINE S4S KILN DRIED, OR FIR OF EQUIVALENT QUALITY. ROOF SHEATHING #2 Y.P. OR FIR. INTERIOR WAINSCOTING, CLOSET, & TOILET PARTITIONING TO BE 1"x6" SHIPLAP #2 Y.P. EXTERIOR SIDING #2 WHITE PINE OF PATTERN TO MATCH TOLL HOUSE. ROOF SHINGLES 16", 5 TO 2", CEDAR LAID 5" TO WEATHER.
4. MILLWORK, CLEAR WHITE PINE.
5. GLASS, L.O.F. "PENNVERNON" D.S. GRADE B, OR EQUAL.
6. ROUGH CARPENTRY TO BE SUBSTANTIAL. FINISH CARPENTRY TO BE CAPABLE OF WITHSTANDING RIGID EXAMINATION. FINISH NAILS TO BE SET IN & HOLES PUTTIED UP.
7. GUTTERING, DOWNSPOUT, SPREADER, FLASHING OVER WINDOWS, DOORS, & AROUND FLUE, FLUE & SLEEVE, SHALL BE 24 GA. G.I.
8. ROUGH HARDWARE FOR GARAGE DOORS, STEEL STRAP HINGES 3/8"x2½"x16" MADE BY RICHARDS-WILCOX, OR EQUAL, HINGES SHALL BE SECURELY SCREWED TO JAMB & DOOR TO INSURE AGAINST SAGGING. SUITABLE LATCH, HASP, PADLOCK & CREMONE BOLTS AT TOP & BOTTOM SHALL BE FURNISHED FOR EACH SET OF DOORS. OTHER FINISH HARDWARE, BRONZE FINISH, SUBSTANTIAL, & MATCH THAT OF TOLL HOUSE, CYLINDER LOCK SHALL BE INCLUDED FOR SMALL DOOR.
9. ALL EXPOSED OUTSIDE SURFACES OF THE BLDG., EXCEPT THE SHINGLE ROOF & CONCRETE WORK, BUT INCLUDING BOTH SIDES OF EXTERIOR DOORS & WINDOWS, SHALL BE PAINTED WITH PRIMER & 2 COATS BEST QUALITY WHITE TITANIUM HOUSE PAINT MANUFACTURED BY COOK PAINT & VARNISH CO., OR EQUAL.
10. ELECTRIC WIRING SHALL CONFORM TO ALL LOCAL & UNDERWRITERS' CODES. ONE CIRCUIT SHALL BE RUN UNDERGROUND IN SUITABLE CONDUIT FROM THE TOLL HOUSE PANEL BOX TO THE GARAGE TO WHICH THE OUTLETS SHOWN SHALL BE CONNECTED. THE LIGHT FIXTURES SHALL BE MERELY SOCKETS WITH SWITCHES AS SHOWN. BX CABLE MAY BE USED FOR THE CIRCUIT IN THE BLDG. LAMPS OF WATTAGE SHOWN SHALL BE INCLUDED.
11. TOILET SHALL CONSIST OF A 2' SECTION OF SALT GLAZED VITRIFIED TILE 12" INSIDE DIAMETER, ENCASED IN CONC., WITH A #16-91 "WHALEBONITE" BLACK TOILET SEAT & COVER, OR EQUAL, MOUNTED AS SHOWN, SEAT LUGS TO BE ANCHORED IN THE CONCRETE.



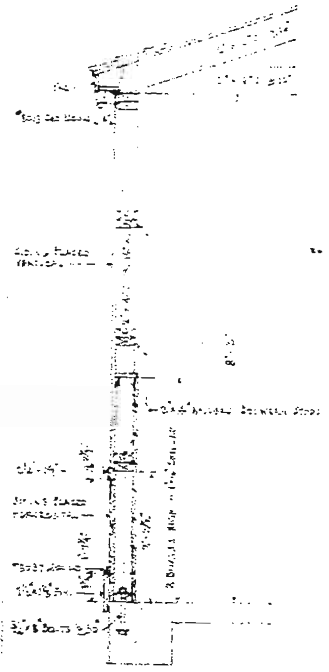
CROSS SECTION ON LINE "A-A" SCALE 1/4"=1'-0"



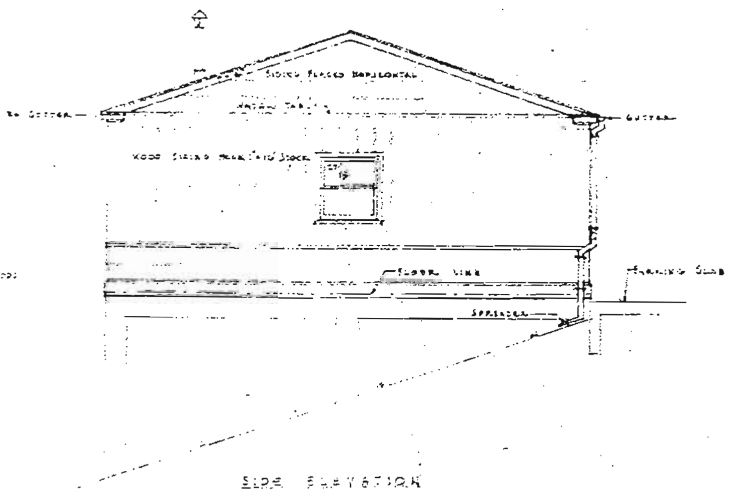
DETAILS OF TOILET SEAT
SCALE 3/4"=1'-0"



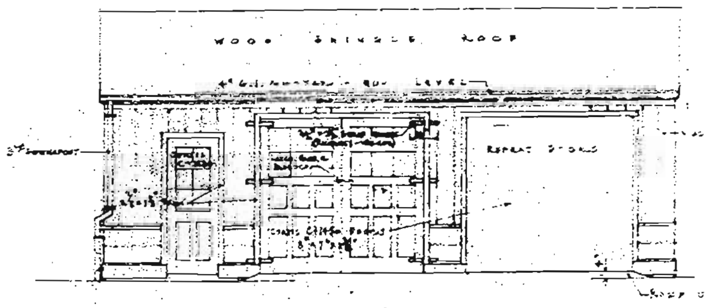
PLAN SCALE 1/4"=1'-0"



TYPICAL WALL SECTION
SCALE 3/4"=1'-0"



SIDE ELEVATION
OPPOSITE SIDE SIMILAR EXCEPT NO DOWNSPOUT.
SCALE 1/4"=1'-0"



FRONT ELEVATION
SCALE 1/4"=1'-0"

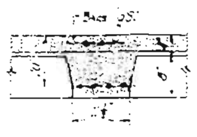
FOR DETAILS OF FLOOR AND FOUNDATIONS SEE SHEET 31.

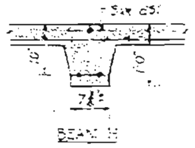
217

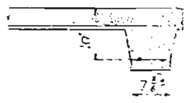
L-98

RIVER BRIDGE
COUNTY

28

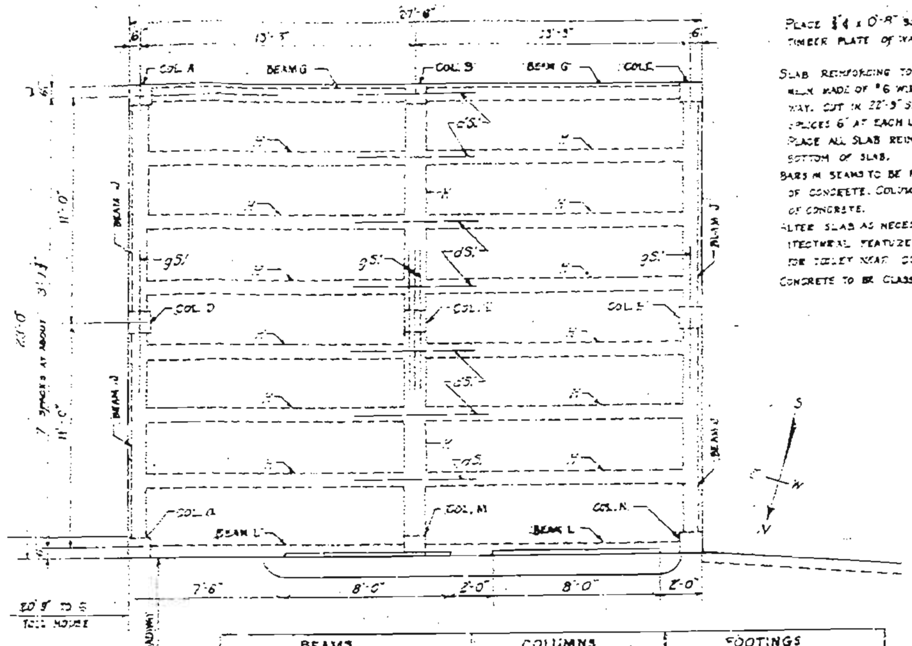






BEAM G, J

SAR TABLE				
No.	Mark	Size	Length	Bending
70	g51	[illegible]	5'-5"	
5	g51	[illegible]	7'-0"	
8	g52	[illegible]	24'-8"	26'-6" g53
4	g53	[illegible]	23'-2"	22'-0" g52
7	g51	[illegible]	8'-0"	25'-9" g52
12	g52	[illegible]	25'-5"	
12	g51	[illegible]	12'-5"	
12	g52	[illegible]	8'-5"	
12	g53	[illegible]	5'-3"	



Place ¾"φ x 0'-8" bolt in slab to attach timber plate of walls. See garage details.

Slab reinforcing to be welded wire mesh made of #6 wires @ 6" ctrs. each way. Cut in 22'-9" sheets. Lap side splices 6" at each lap. Wire securely. Place all slab reinforcing 1" from bottom of slab.

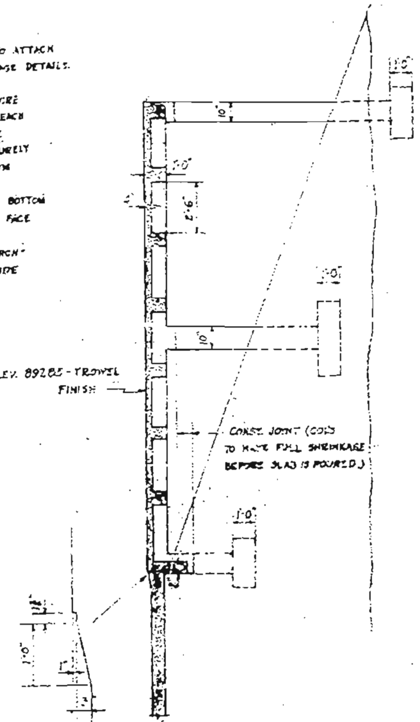
Bars in beams to be placed 2" from bottom of concrete. Column bars 1" from face of concrete.

Alter slab as necessary to fit architectural features and to provide for toilet near column A.

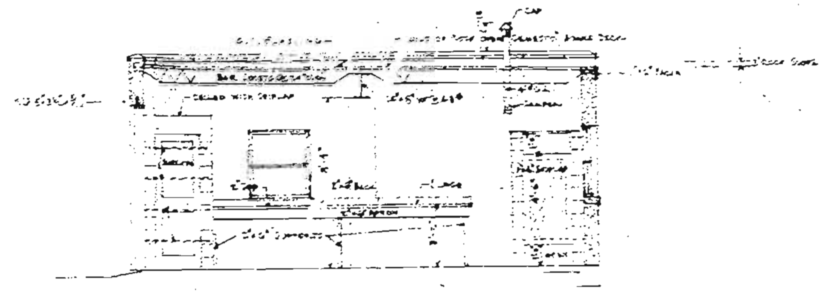
Concrete to be Class 30.

BEAMS			COLUMNS			FOOTINGS		
MARK	APPROX. SIZE	REINFORCING	MARK	SIZE	REINF.	SIZE	REINFORCING	BOTTOM ELEV.
G	6"x12"	2-1"φ - g53	A, C	10"x11½"	4-½"φ	3'-0" sq.	NONE	883.0
H	5"x12"	2-⅝"φ - g52	B	10"x11½"	4-⅝"φ	3'-6" sq.	½"φ @ 6" ctrs.	885.0
J	8"x12"	2-1"φ - g52	D, F	10"x11½"	4-⅝"φ	3'-6" sq.	½"φ @ 6" ctrs.	888.3
K	12"x12"	4-1"φ - g52	E	10"x11½"	4-⅝"φ	3'-6" sq.	½"φ @ 6" ctrs.	886.0
L	8"x24"	2-1"φ - g50	N, O	10"x11½"	4-½"φ	3'-0" sq.	NONE	882.8
			M	10"x11½"	4-⅝"φ	3'-6" sq.	½"φ @ 6" ctrs.	892.5

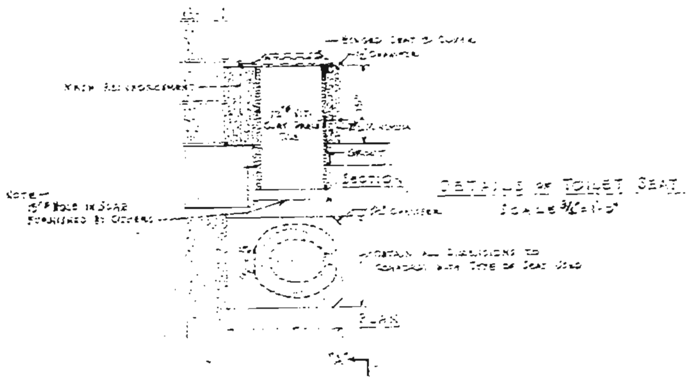
FLOOR SLAB AND FOUNDATIONS ¼"=1'-0"


ELEV. 892.85 - TROWEL FINISH
CONST. JOINT (COLD TO HAVE FULL SHRINKAGE BEFORE SLAB IS POURED.)

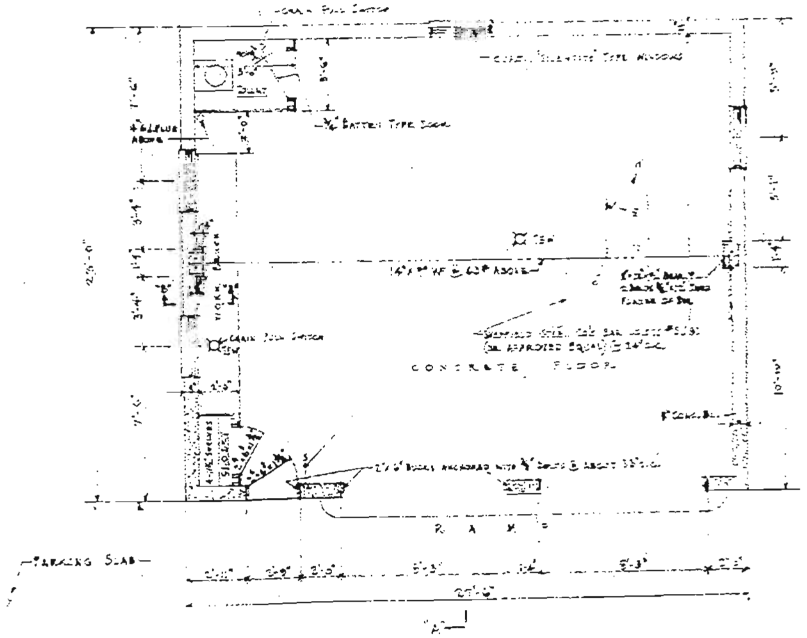
SECTION THRU DOORWAY



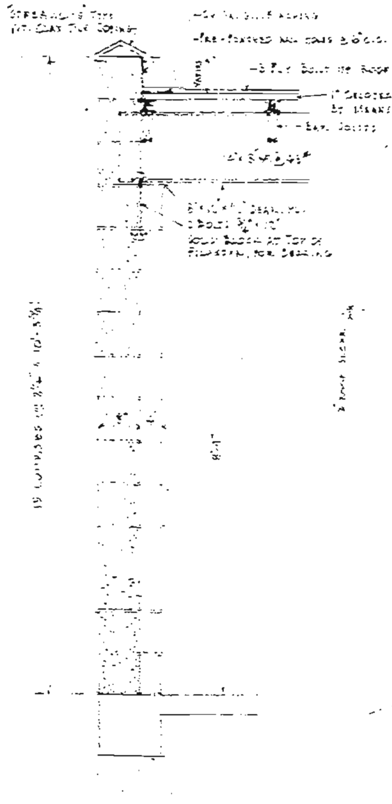
CROSS SECTION ON LINE "A-A"



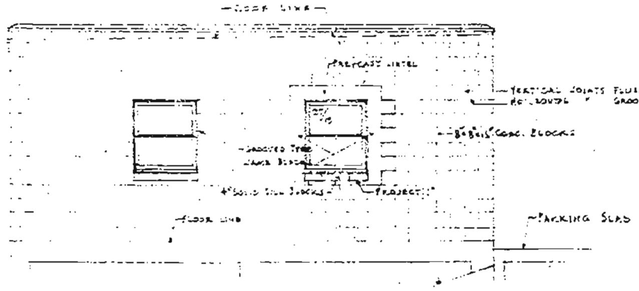
DETAILS OF TOILET SEAT



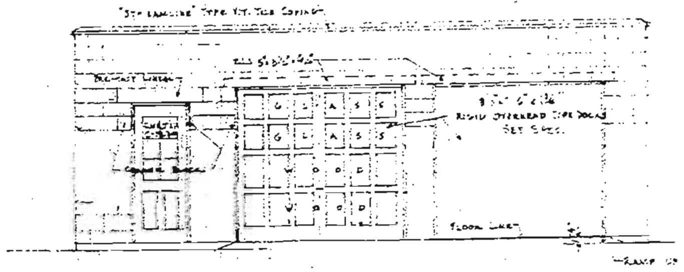
PLAN



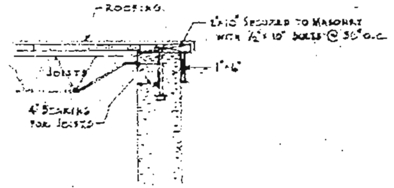
TYPICAL WALL SECTION AT "B-B"



WEST ELEVATION



FRONT ELEVATION



SECTION AT TOP OF REAR WALL

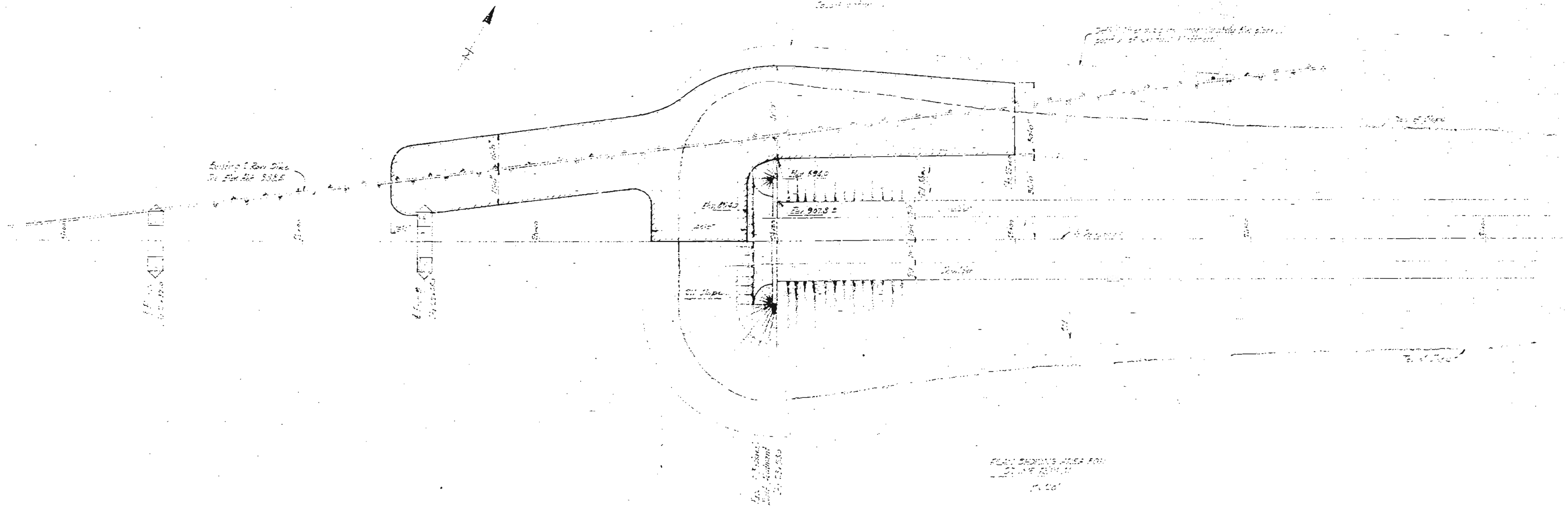
6-48

NOTE: FLOOR SLAB AND FOUNDATIONS TO BE CONSTRUCTED UNDER CONTRACT 6. REMAINDER OF STRUCTURE TO BE COMPLETED READY FOR USE UNDER CONTRACT 7. SEE SPEC.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

MAINTENANCE, STORAGE AND GARAGE BLDG.
ALTERNATE "B", MASONRY CONSTRUCTION

CONSULTING ENGINEERS
KANSAS CITY
SHEET No.

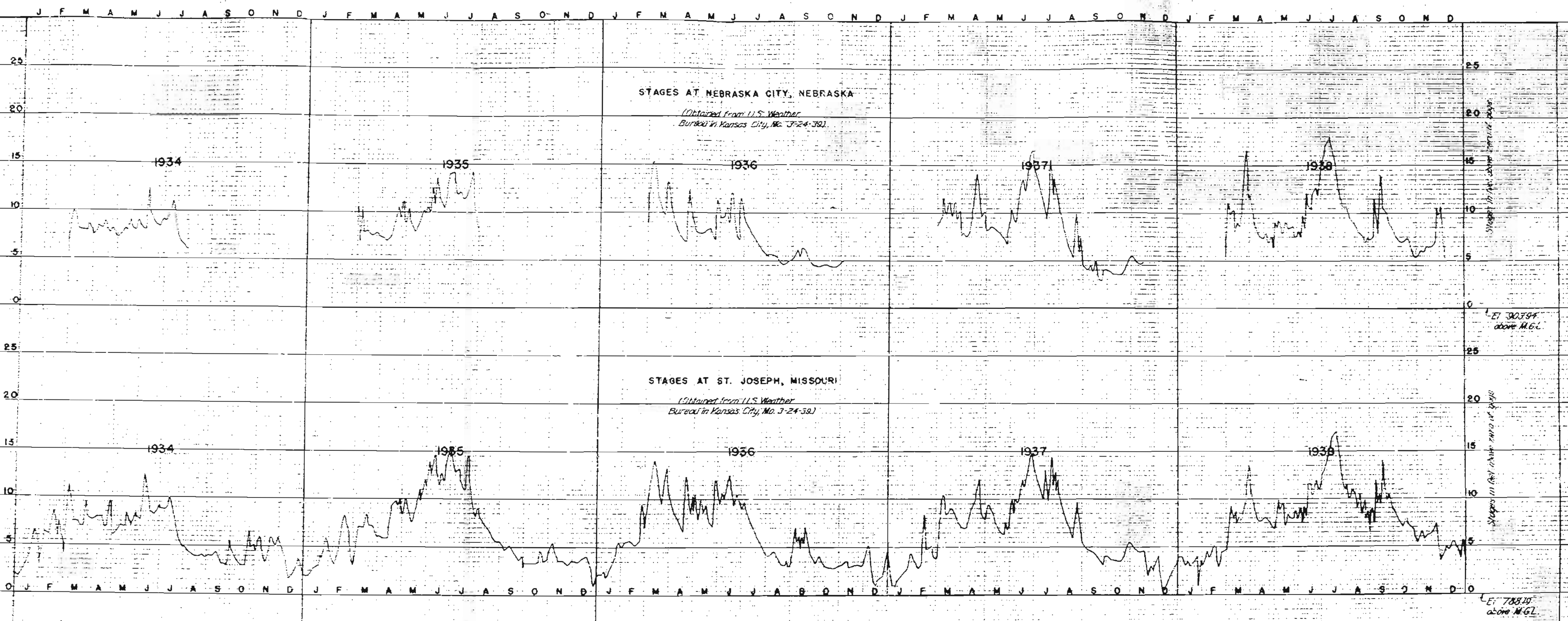


219

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

SHEET

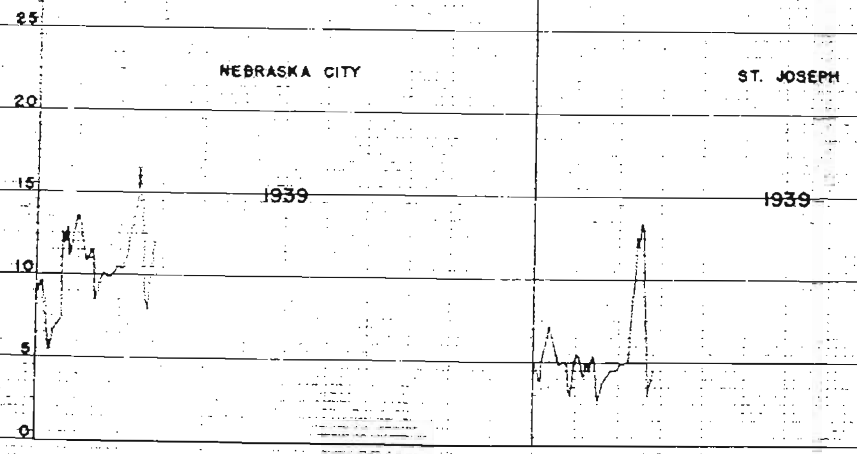


STAGES AT NEBRASKA CITY, NEBRASKA

(Obtained from U.S. Weather Bureau in Kansas City, Mo. 3-24-39)

STAGES AT ST. JOSEPH, MISSOURI

(Obtained from U.S. Weather Bureau in Kansas City, Mo. 3-24-39)



Comparison of River Stages

	Ext. H.W.	Std. H.W.	Std. L.W.	Miles
Nebraska City, Nebr.	922.0	919.4	910.7	581.5
Brownville, Nebr.	899.8	889.5	879.0	555.4
St. Joseph, Mo.	815.4	807.9	795.0	461.7

(Obtained from U.S. Engineers Mo. Riv. Div. in Kansas City, Mo. 3-28-39.)

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

RIVER STAGES

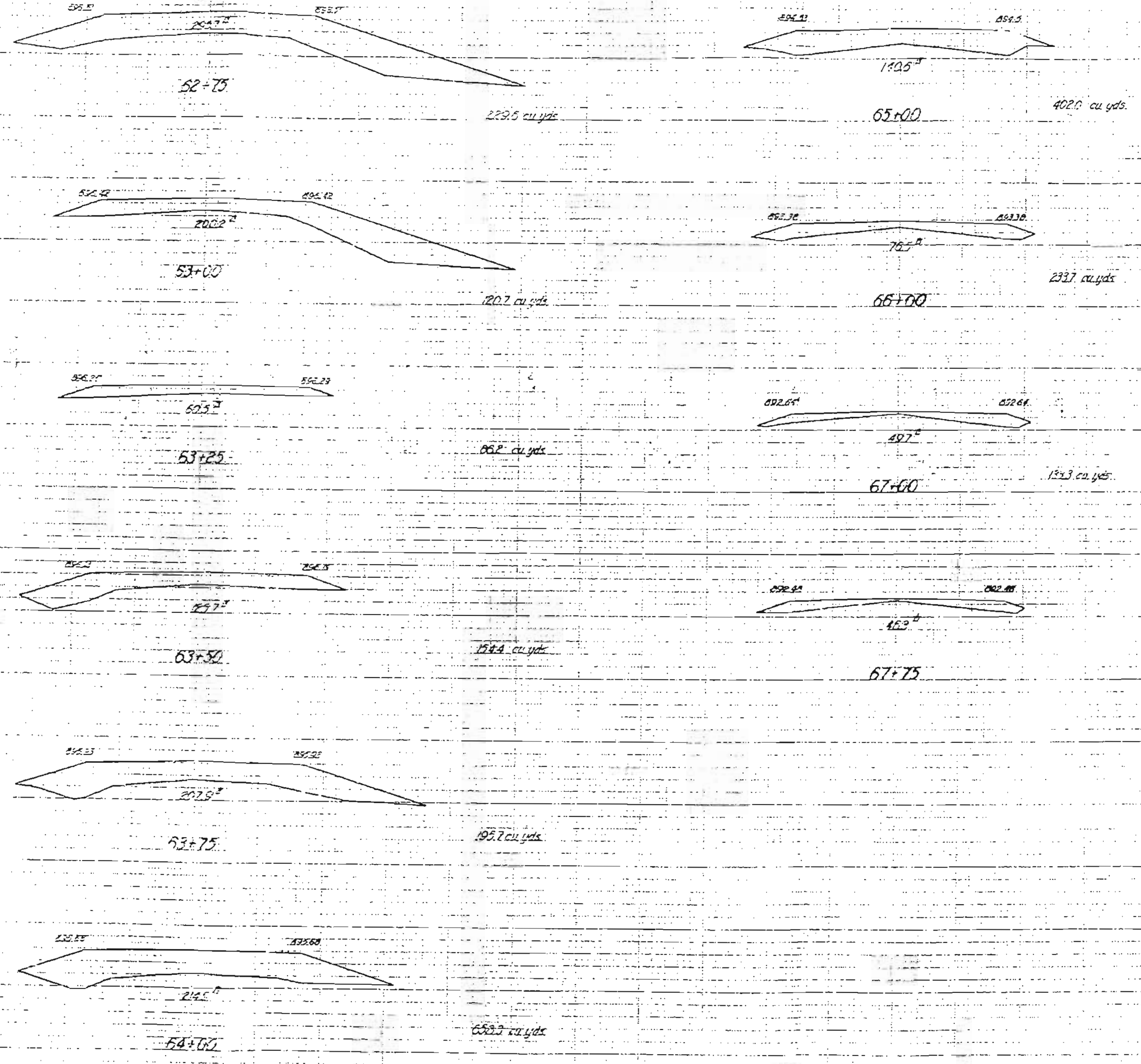
SCALE
DRN. E.M.H. DATE 3-28-39
TRCD. DATE
CK. DATE

ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. 33

(Formerly Sh. No. 2)

220



L-98

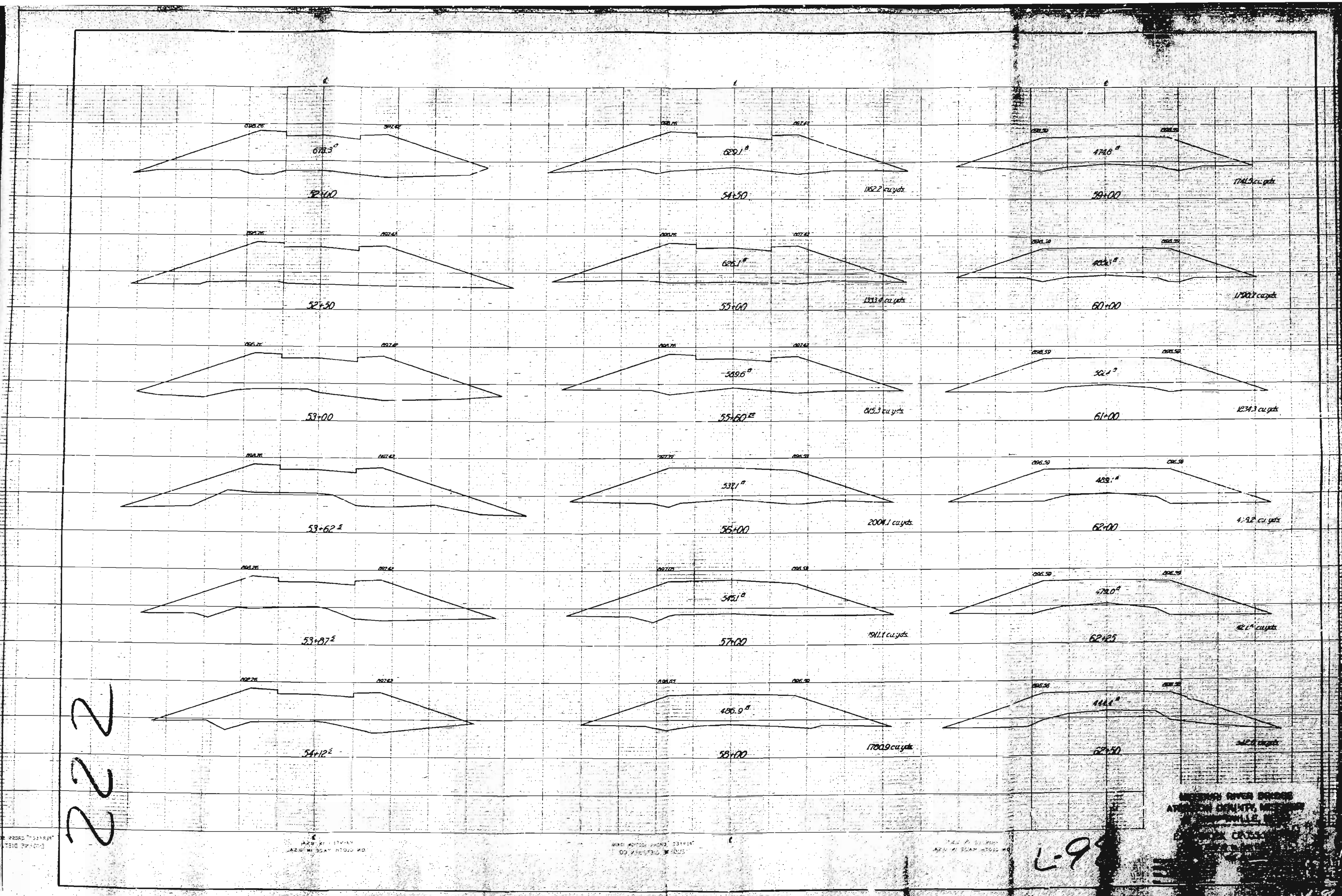
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EARTHWORK CROSS-SECTIONS
STA 62+75 to STA 67+75

SCALE 1" = 10'-0"
RAM 6-24-39
RJK

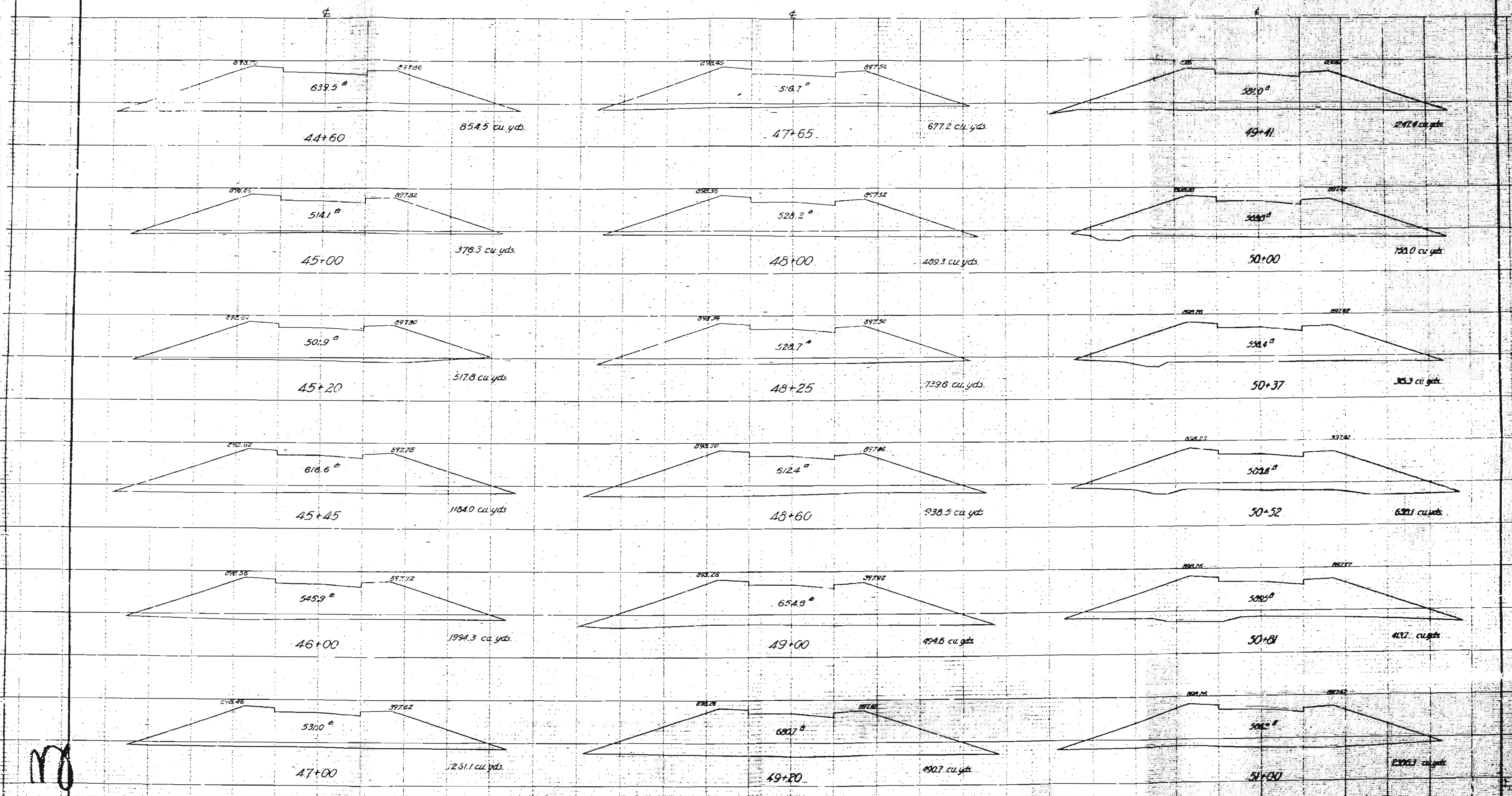
ASH - HOWARD - NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY NEW YORK

SHEET No. E7


678.3
52+00
629.1
54+50
1162.2 cu.yds.
474.6
59+00
1741.5 cu.yds.
52+50
626.1
55+00
1333.4 cu.yds.
60+00
1790.3 cu.yds.
53+00
589.6
55+60
815.3 cu.yds.
61+00
1234.3 cu.yds.
53+62½
532.1
56+00
2004.1 cu.yds.
62+00
53+87½
545.1
57+00
1911.1 cu.yds.
479.0
62+25
54+12½
486.9
58+00
1760.9 cu.yds.
62+50
RIVER BRIDGE
COUNTY,
CROSS

222

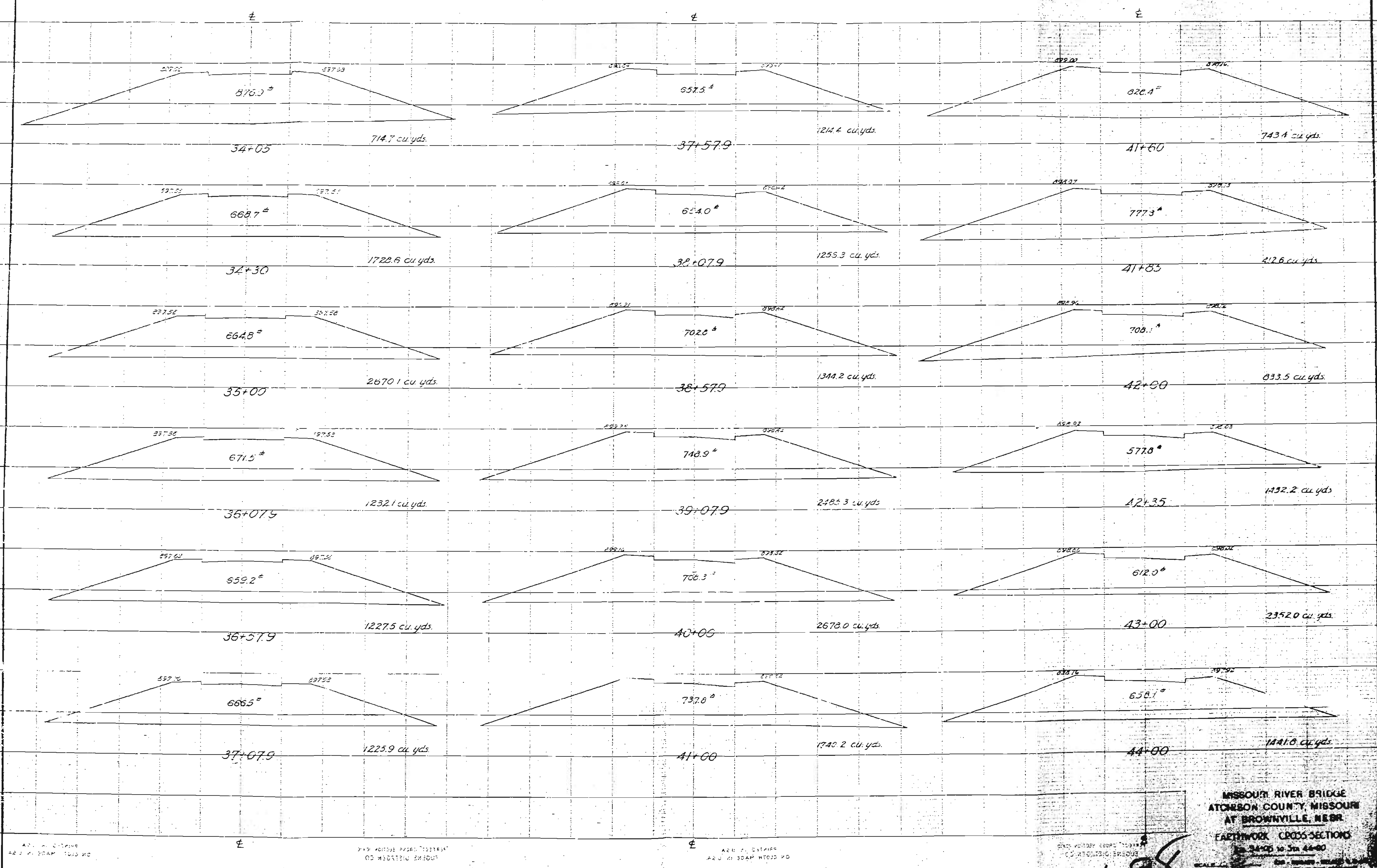
L-98



223

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT [illegible]VILLE, NEBR.
E[illegible] CROSS SECTIONS

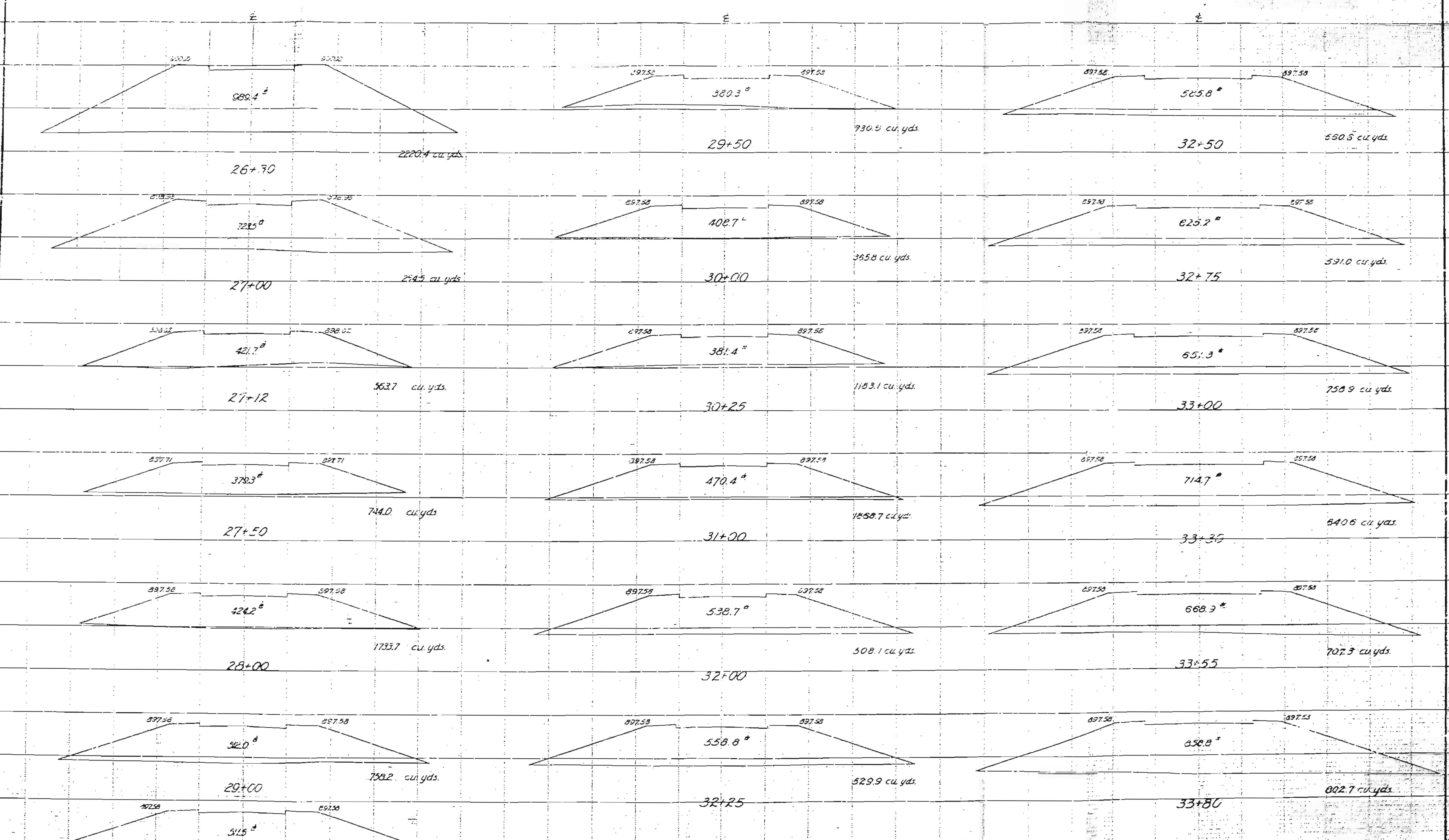
L-9



MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
EARTHWORK CROSS SECTIONS
Sta. 34+05 to Sta. 44+00

L-98

224



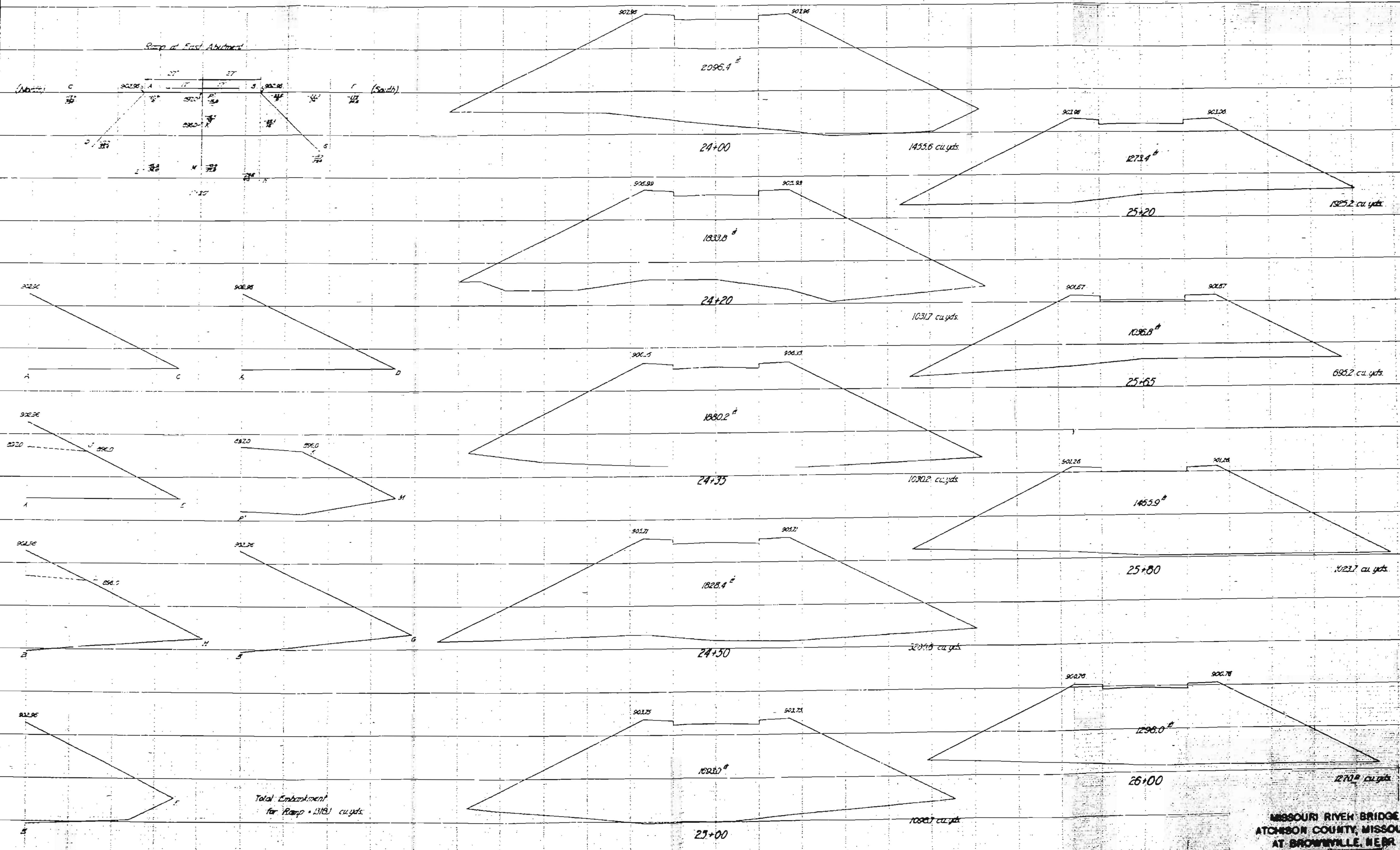
225

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EARTH WORK CROSS SECTIONS
STA 26+30 TO STA 33+80

L-98

SCALE 1"=50'
ASH-HOWARD-NEEDLES & TAMMEN
CONSULTING ENGINEERS
KANSAS CITY   NEW YORK
SHEET NO. F3



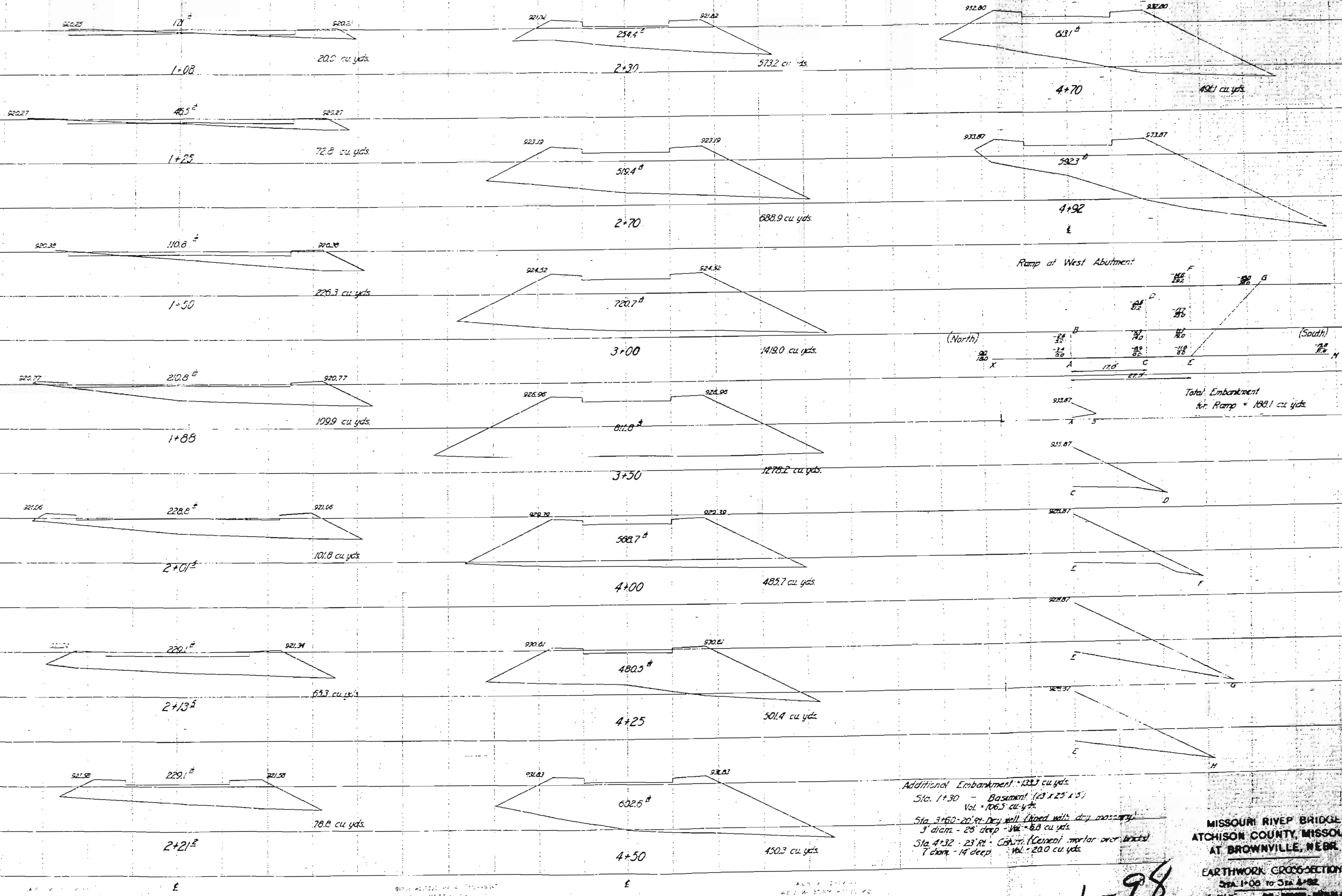
226

L-98

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

EARTHWORK CROSS-SECTIONS
Sta. 24+00 to Sta. 26+00

F 2



Additional Embankment = 133.3 cu. yds.
Sta. 1+30 – Basement (23'x25'x5')
Vol. = 106.5 cu. yds.
Sta. 3+60 - 20' Rt - Dry well (lined with dry masonry)
3' diam. - 26' deep - Vol. = 6.8 cu. yds.
Sta. 4+32 - 23' Rt - Cistern (Cement mortar over brick)
7' diam. - 14' deep Vol. = 20.0 cu. yds.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.

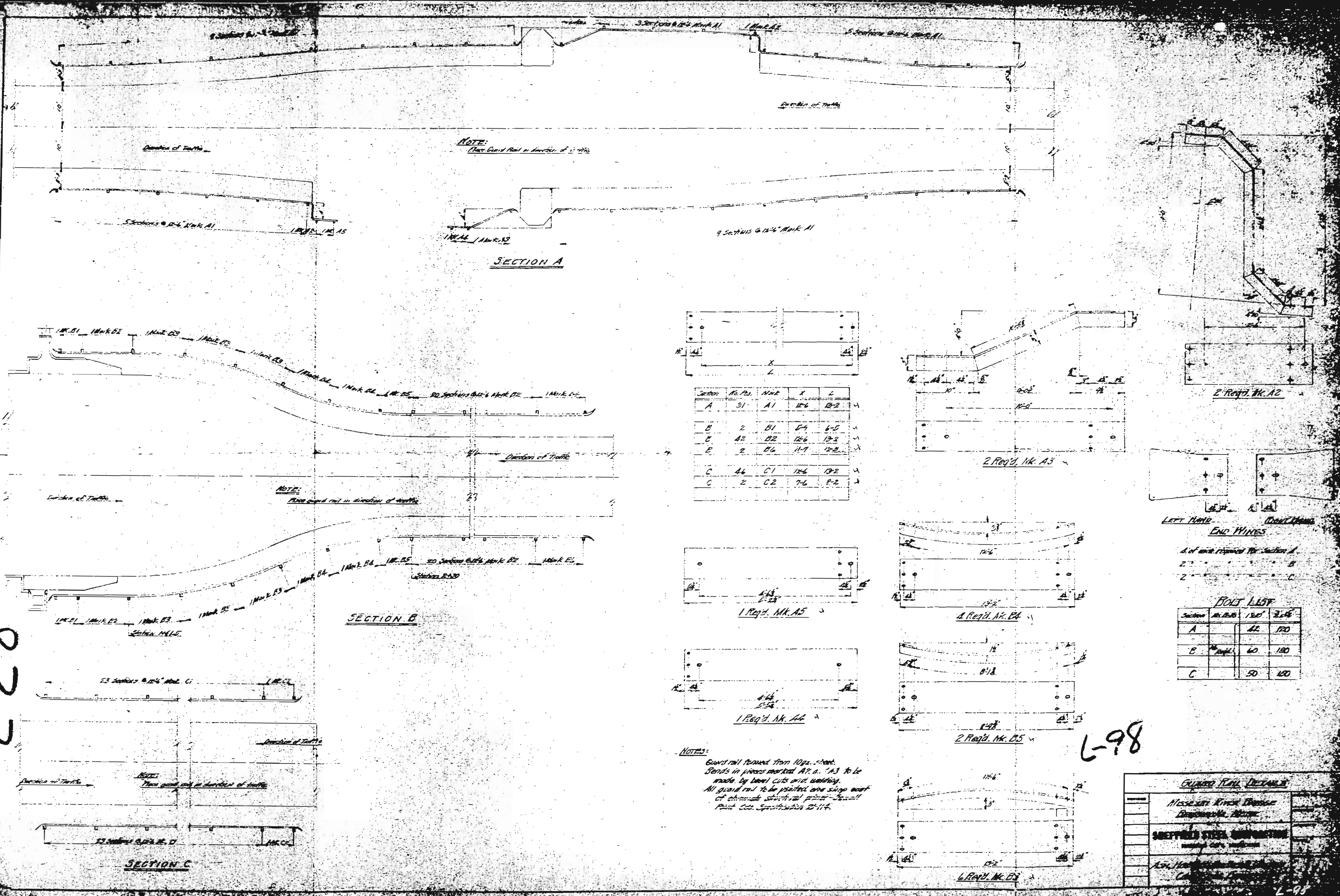
EARTHWORK CROSS-SECTIONS
STA. 1+08 TO STA. 4+92

SHEET No. F 1

L-98

227

228



Section	No. Pcs.	Mark	X	L
A	31	A1	12-6	13-2
B	2	B1	5-4	6-5
B	42	B2	12-6	13-2
B	2	B6	11-7	12-3
C	46	C1	12-6	13-2
C	2	C2	7-6	8-2

4 of each required for Section A
2 " " " " " B
2 " " " " " C

BOLT LIST

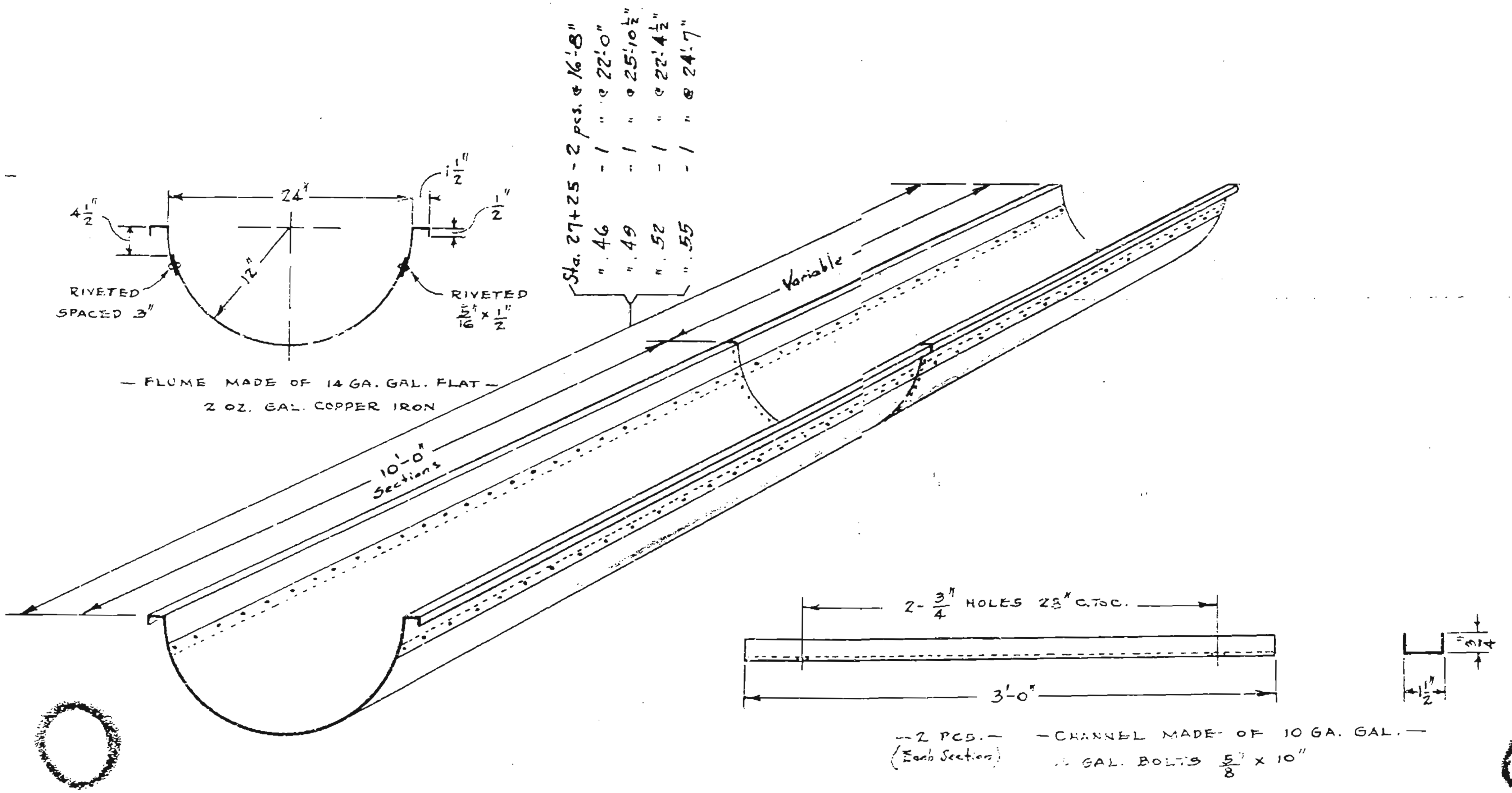
Section	No. Bolts	1¼"	2¼"
A		42	120
B	Req'd	60	180
C		50	150

NOTES:
Guard rail formed from 10 ga. sheet.
Bends in pieces marked A2 a. A3 to be made by bevel cuts and welding.
All guard rail to be painted one shop coat of chromate structural primer–Sewall Paint Co. Specification 23-114.

L-98

GUARD RAIL DETAILS
Missouri River Bridge
Brownville, Nebr.
SHEFFIELD STEEL CORPORATION
Kansas City, Missouri

L-98



230

C-98

24" FLUME

MISSOURI RIVER BRIDGE

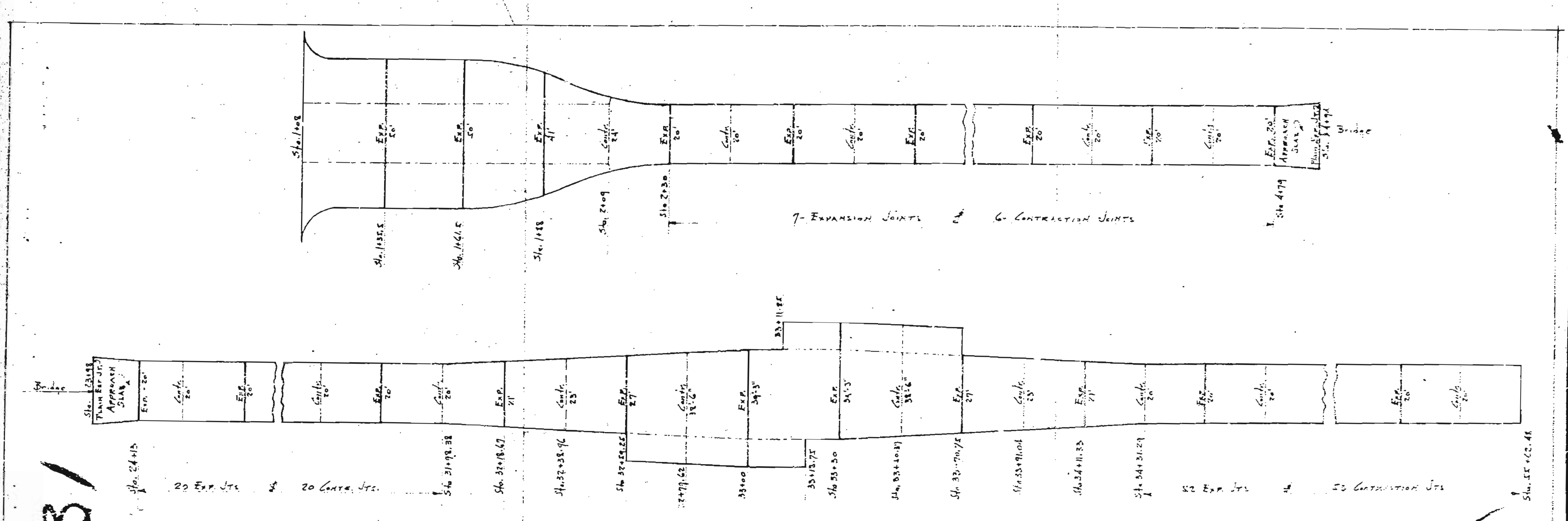
BROWNVILLE, NEB.

P.W.A. MO. No. 1099 F

(3)

CARTER-WATERS CORP.

A.C.L.



LAYOUT

EXPANSION & CONTRACTION JOINTS

For

APPROACH HIGHWAYS MISSOURI RIVER BRIDGE AT BROWNVILLE NEBR.

PWA Proj. No. Ne1099 F

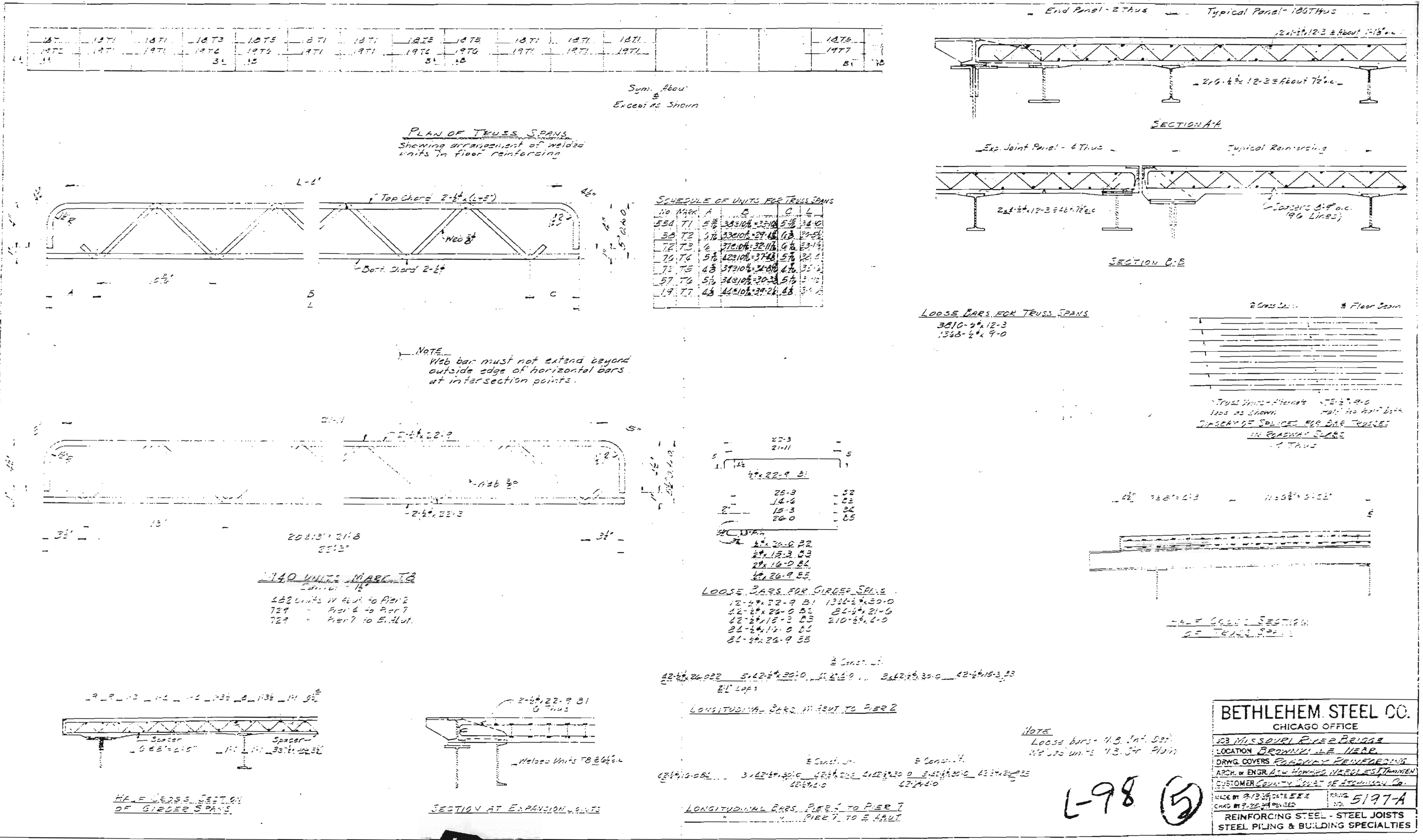
Prepared by

The Carter-Waters Corp. K. C. Mo.

231

L-98

④


End Panel - 2 Thus
Typical Panel - 186 Thus
Section A-A
Exp. Joint Panel - 4 Thus
Typical Reinforcing
Spacers 8'-0" o.c. (96 Lines)
Section B-B
Sym. About ℄ Except as Shown
Plan of Truss Spans
Showing arrangement of welded units in floor reinforcing
Top Chord
Web
Bott. Chord
Web
Half Cross Section of Girder Spans
Spacer
Section at Expansion Joints
Welded Units T8
Half Cross Section of Truss Spans
Diagram of Splices for Bar Trusses in Roadway Slab

NOTE
Web bar must not extend beyond outside edge of horizontal bars at intersection points.

SCHEDULE OF UNITS FOR TRUSS SPANS

No	Mark	A	B	C	L
554	T1	5 15/16	38@10 5/8=33-10 [illegible]	5 15/16	34-0
38	T2	5 7/16	33@10 5/8=29-[illegible]	6 3/8	29-5 1/2
72	T3	6	37@10 5/8=32-11 7/8	6 7/16	33-1 [illegible]
76	T4	5 7/16	42@10 5/8=37-[illegible]	5 7/16	[illegible]
72	T5	4 3/8	39@10 5/8=34-8 [illegible]	4 7/16	35-[illegible]
57	T6	5 1/2	34@10 5/8=30-3 [illegible]	5 1/2	[illegible]
19	T7	4 3/8	44@10 5/8=39-2 [illegible]	4 3/8	[illegible]

LOOSE BARS FOR TRUSS SPANS
3810-1/2"x12-3
1368-1/2"x9-0

1140 UNITS MARK T8
Camber 1 1/2"
282 Units W. Abut. to Pier 2
729 " Pier 4 to Pier 7
729 " Pier 7 to E. Abut.

LOOSE BARS FOR GIRDER SPANS
12-1/2"x22-9 B1 1386-1/2"x30-0
42-1/2"x26-0 B2 84-1/2"x21-6
42-1/2"x15-3 B3 210-1/2"x6-0
84-1/2"x16-0 B4
84-1/2"x26-9 B5

LONGITUDINAL BARS W. ABUT. TO PIER 2

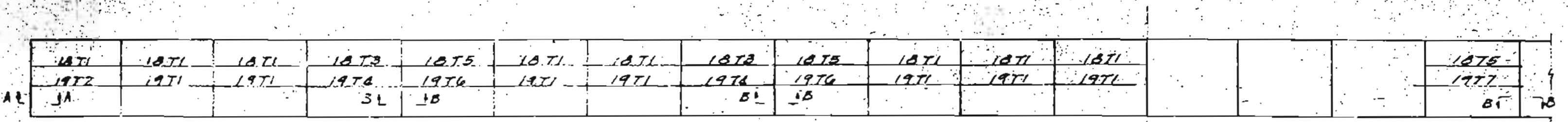
LONGITUDINAL BARS PIER 4 TO PIER 7
" " PIER 7 TO E. ABUT.

NOTE
Loose bars - U.S. Int. Def.
Welded units U.S. Str. Plain

232

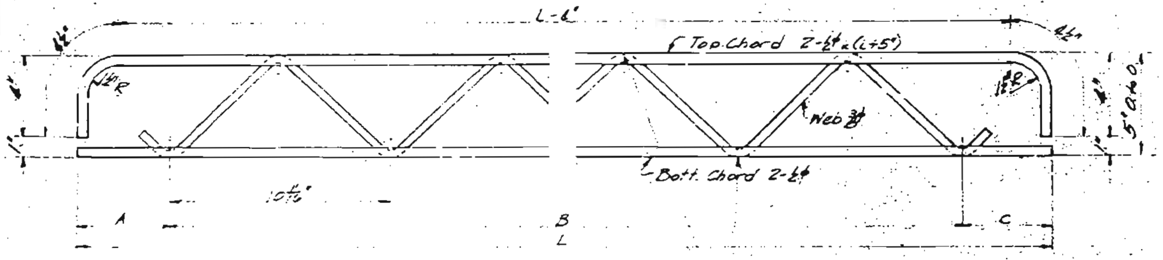
L-98 ⑤

BETHLEHEM STEEL CO.
CHICAGO OFFICE
JOB Missouri River Bridge
LOCATION Brownville Nebr.
DRWG. COVERS Roadway Reinforcing
ARCH. or ENGR. Ash Howard Needles & Tammen
CUSTOMER County Court of Atchison Co.
MADE BY 7-13-39 DATE
CHKD BY 7-25-39 REVISED
DRWG. NO. 5197-A
REINFORCING STEEL - STEEL JOISTS
STEEL PILING & BUILDING SPECIALTIES



Sym. About ℄
Except as Shown

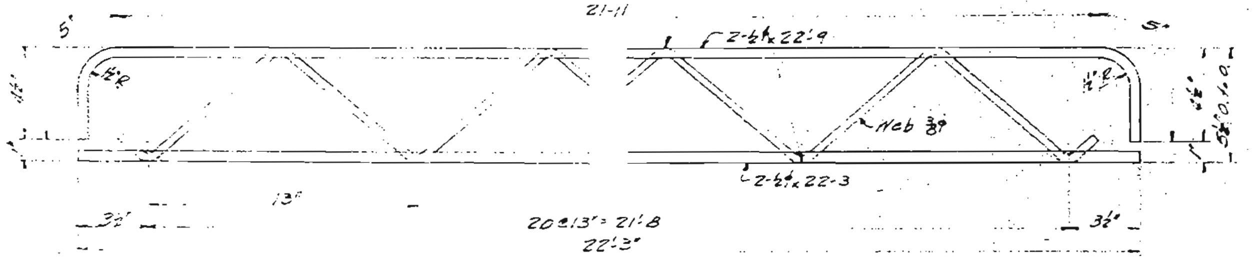
PLAN OF TRUSS SPANS
Showing arrangement of welded units in floor reinforcing



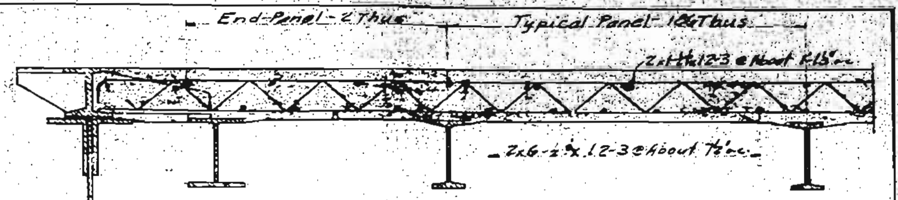
No.	Mark	A	B	C	L
550	T1	5 15/16	38@10⅝=33-10⅝	5 15/16	34-10
38	T2	6 7/16	33@10⅝=29-4⅝	6⅜	30-5½
72	T3	6	37@10⅝=32-11⅝	6 1/16	33-1½
76	T4	5 9/16	42@10⅝=37-2⅝	5 9/16	38-6
72	T5	4⅝	39@10⅝=34-6⅝	4 7/16	35-6
57	T6	5 1/16	34@10⅝=30-3⅝	5 1/16	31-1½
19	T7	4⅝	44@10⅝=39-2⅝	4⅝	39-10½

SCHEDULE OF UNITS FOR TRUSS SPANS

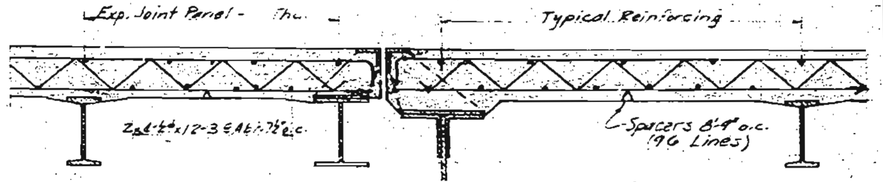
NOTE
Web bar must not extend beyond outside edge of horizontal bars at intersection points.



1940 UNITS MARK T8
Camber ½"
482 Units W. Abut. to Pier 2
729 " Pier 4 to Pier 7
729 " Pier 7 to E. Abut.


End Panel - 2 Thus
Typical Panel - 12 & Thus
2-½φx12-3 @ About 8¼" o.c.
2x6-½φx12-3 @ About 7½" o.c.

SECTION A-A



SECTION B-B

LOOSE BARS FOR TRUSS SPANS
3810-½φx12-3
1368-½φx9-0

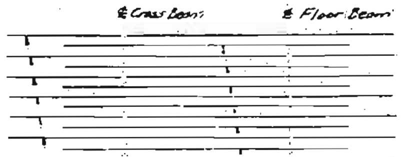
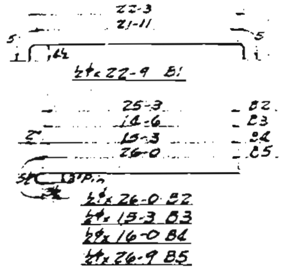
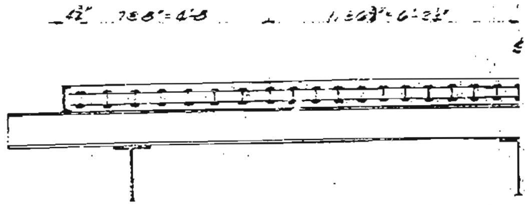

℄ Cross Beam
℄ Floor Beam
Truss Units - Alternate laps as shown
72-½φx9-0 Half top half bott.

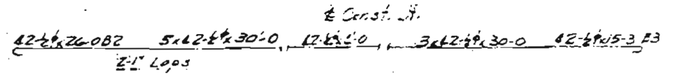
DIAGRAM OF SPLICES FOR BAR TRUSSES IN ROADWAY SLABS
19 Thus



LOOSE BARS FOR GIRDER SPANS
12-½φx22-9 B1
42-½φx26-0 B2
42-½φx15-3 B3
84-½φx16-0 B4
84-½φx26-9-B5
1344-½φx30-0
84-½φx21-6
210-½φx6-0

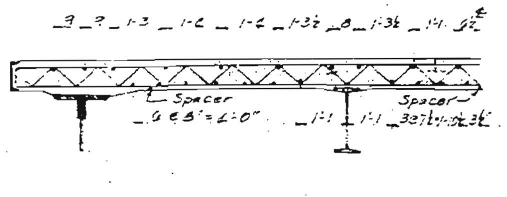


HALF CROSS SECTION OF TRUSS SPANS

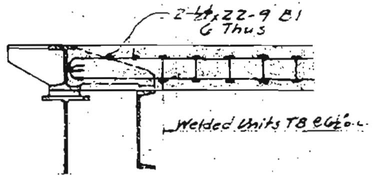


LONGITUDINAL BARS W. ABUT TO PIER 2

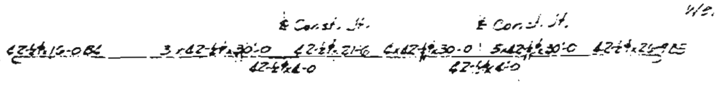
L-98



HALF CROSS SECTION OF GIRDER SPANS



SECTION AT EXPANSION JOINTS



LONGITUDINAL BARS PIER 4 TO PIER 7
" " PIER 7 TO E. ABUT

NOTE
Loose bars - N.S. Int. Def.
Welded units - N.S. St. Plain

⑥

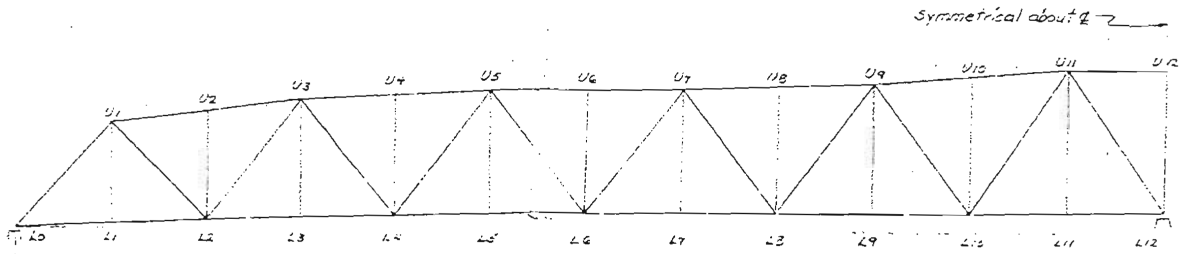
233

BETHLEHEM STEEL CO.
CHICAGO OFFICE
JOB Missouri River Bridge
LOCATION Brownville Nebr.
DRWG. COVERS Roadway Reinforcing
ARCH. or ENGR. Ash Howard Needles & Tammen
CUSTOMER County Court of Atchinson Co.
MADE BY 9-13-39 DATE EEE
CHKD BY 9-25-39 REVISED
DRWG. NO. 5197-A
REINFORCING STEEL - STEEL JOISTS
STEEL PILING & BUILDING SPECIALTIES

CG3-04

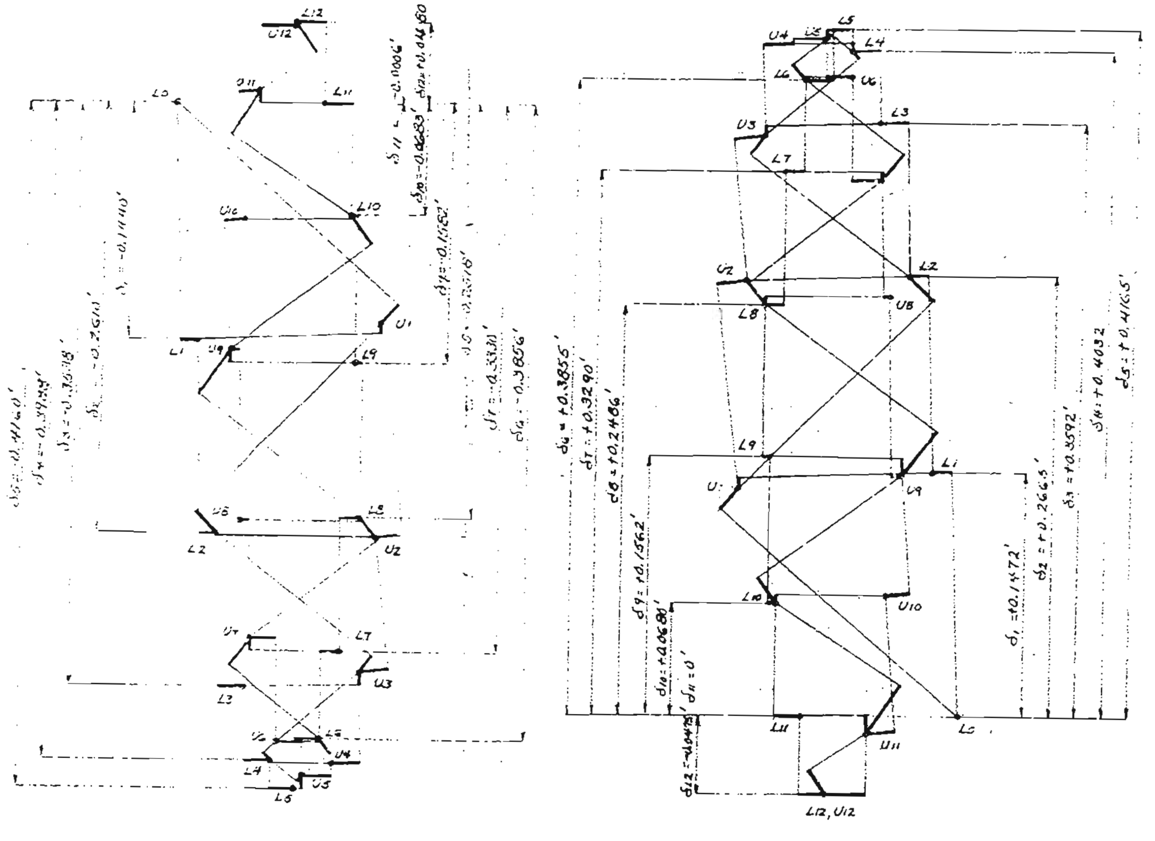
SHEET No. E01

111



ELEVATION

For truss dimensions not shown, see drawing room sheet No. L1



DEFLECTION

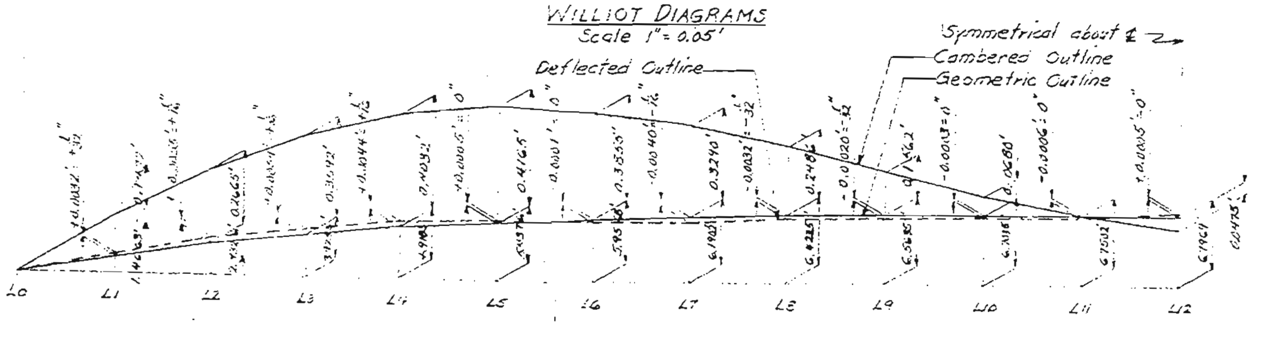
CAMBER

WILLIOT DIAGRAMS
Scale 1" = 0.05'

Member	Geometric Length (ft.)	Effective Gross Area Ag (sq. in.)	Effective Area 1.05×Ag A (sq. in.)	Dead Load Stress D (Kips)	Uniform Live Load Stress L (Kips)	Total Stress for Camber D+L=P (Kips)	Deformation PL/AE E=29,000,000# (ft.)	Shop Length: Theoretical Length (ft.)	Shop Length: Length Used (ft. in.)	Shop Length: Length Used ft.	Diff between Shop Length and Geometric Length = Δ (ft)
L0-U1	50.9425	70.68	74.21	-501.0	-116.0	-617.0	-.0146	50.9571	50-11½	50.9583	+.0158
U1-U2	35.3930	45.15	47.41	-554.0	-128.5	-682.5	-.0175	35.4105	35-4 15/16	35.4115	+.0185
U2-U3	35.4337	45.15	47.41	-554.0	-128.5	-682.5	-.0176	35.4513	35-5 7/16	35.4531	+.0194
U3-U4	35.3205	55.71	58.50	-697.0	-161.6	-858.6	-.0178	35.3383	35-4 1/16	35.3385	+.0180
U4-U5	35.3340	55.71	58.50	-697.0	-161.6	-858.6	-.0178	35.3518	35-4¼	35.3542	+.0202
U5-U6	35.3227	50.55	53.08	-571.0	-132.4	-703.4	-.0161	35.3390	35-4 1/16	35.3385	+.0156
U6-U7	35.0603	50.55	53.08	-571.0	-132.4	-703.4	-.0160	35.0763	35-0 15/16	35.0781	+.0178
U7-U8	35.0744	45.15	47.41	-158.0	-36.6	-194.6	-.0050	35.0794	35-0 15/16	35.0781	+.0037
U8-U9	35.0772	45.15	47.41	-158.0	-36.6	-194.6	-.0050	35.0822	35-1	35.0833	+.0061
U9-U10	35.1706	50.55	53.08	+500.0	+115.9	+615.9	+.0140	35.1566	35-1⅞	35.1563	-.0143
U10-U11	35.1780	50.55	53.08	+500.0	+115.9	+615.9	+.0140	35.1640	35-1 15/16	35.1615	-.0165
U11-U12	35.0703	88.65	93.08	+1344.0	+310.7	+1654.7	+.0214	35.0489	35-0 9/16	35.0469	-.0234
L0-L1	35.0163	48.81	51.25	+345.0	+80.0	+425.0	+.0100	35.0063	35-0 1/16	35.0052	-.0111
L1-L2	35.0163	48.81	51.25	+345.0	+80.0	+425.0	+.0100	35.0063	35-0 1/16	35.0052	-.0111
L2-L3	35.0163	59.31	62.28	+654.0	+151.7	+805.7	+.0157	35.0006	35-0	35.0000	-.0163
L3-L4	35.0163	59.31	62.28	+654.0	+151.7	+805.7	+.0157	35.0006	35-0	35.0000	-.0163
L4-L5	35.0163	61.06	64.11	+663.0	+153.7	+816.7	+.0154	35.0009	35-0 1/16	35.0052	-.0111
L5-L6	35.0163	61.06	64.11	+663.0	+153.7	+816.7	+.0154	35.0009	35-0	35.0000	-.0163
L6-L7	35.0004	48.81	51.25	+404.0	+93.7	+497.7	+.0118	34.9886	34-11⅞	34.9896	-.0108
L7-L8	35.0004	48.81	51.25	+404.0	+93.7	+497.7	+.0118	34.9886	34-11⅞	34.9896	-.0108
L8-L9	35.0004	48.81	51.25	-151.0	-35.0	-186.0	-.0044	35.0048	35-0 1/16	35.0052	+.0048
L9-L10	35.0004	48.81	51.25	-151.0	-35.0	-186.0	-.0044	35.0048	35-0 1/16	35.0052	+.0048
L10-L11	35.0004	71.50	75.08	-873.0	-202.4	-1075.4	-.0173	35.0177	35-0 3/16	35.0156	+.0152
L11-L12	35.0004	71.50	75.08	-873.0	-202.4	-1075.4	-.0173	35.0177	35-0 3/16	35.0156	+.0152
U1-L2	50.9425	34.35	36.07	+304.0	+70.5	+374.5	+.0182	50.9243	50-11 1/16	50.9219	-.0206
L2-U3	55.4539	29.85	31.34	-160.0	-37.1	-197.1	-.0121	55.4660	55-5⅝	55.4688	+.0149
U3-L4	55.4559	29.85	31.34	+70.0	+16.2	+86.2	+.0053	55.4496	55-5⅜	[illegible]	-.0066
L4-U5	57.0185	29.85	31.34	+54.0	+12.5	+66.5	+.0042	57.0146	57-0 3/16	57.0156	-.0032
U5-L6	57.0188	29.85	31.34	-151.0	-35.0	-186.0	-.0117	57.0305	57-0⅜	57.0313	+.0125
L6-U7	57.0090	29.85	31.34	+274.0	+63.5	+337.5	+.0212	56.9878	56-11⅞	56.9896	-.0194
U7-L8	57.0090	56.35	59.17	-401.0	-92.9	-493.9	-.0164	57.0254	57-0 5/16	57.0260	+.0170
L8-U9	58.6006	[illegible]	33.17	+515.0	+119.4	+634.4	[illegible]	58.5672	[illegible]	[illegible]	[illegible]
U9-L10	58.6006	63.85	67.04	-562.0	-155.0	-717.0	-.0216	58.6222	58-7 7/16	[illegible]	+.0192
L10-U11	63.0973	52.35	54.97	+676.0	+156.8	+832.8	+.0330	63.0643	63-0¾	[illegible]	[illegible]
U11-L12	63.0973	99.41	~~107.41~~ 104.41	-840.0	-194.8	-1034.8	-.0216	63.1189	63-1⅜	63.1146	+.0173
U1-L1	37.0000	22.94	24.09	+96.6	+22.4	+119.0	+.0063	36.9937	36-11 15/16	36.9948	-.0052
U2-L2	39.7635	15.59	16.37	-20.7	0	-20.7	-.0017	39.7652	39-9⅛	39.7604	-.0031
U3-L3	43.0000	22.94	24.09	+96.6	+22.4	+119.0	+.0073	42.9927	42-11 15/16	42.9948	-.0052
U4-L4	43.7620	15.59	16.37	-20.7	0	-20.7	-.0019	43.7639	43-9 3/16	43.7656	+.0036
U5-L5	45.0000	22.94	24.09	+96.6	+22.4	+119.0	+.0077	44.9923	44-11 15/16	44.9948	-.0052
U6-L6	44.5571	15.59	16.37	-20.7	0	-20.7	-.0020	44.5591	44-10 11/16	44.5594	+.0023
U7-L7	45.0000	22.94	24.09	+96.6	+22.4	+119.0	+.0077	44.9923	44-11 15/16	44.9948	-.0052
U8-L8	45.9533	15.59	16.37	-20.7	0	-20.7	-.0020	45.9553	45-11½	45.9583	+.0050
U9-L9	47.0000	22.94	24.09	+96.6	+22.4	+119.0	+.0080	46.9920	46-11⅞	46.9896	-.0104
U10-L10	49.7030	15.59	16.37	-20.7	0	-20.7	-.0020	49.7050	49-8½	49.7083	+.0053
U11-L11	52.5000	22.94	24.09	+96.6	+22.4	+119.0	+.0089	52.4911	52-5⅞	52.4896	-.0104
U12-L12	52.4535	29.85	31.34	-20.7	0	-20.7	-.0012	52.4545	52-5 7/16	52.4531	-.0002

APPROVED 1-17-39
Ash-Howard-Needles & Tammen

234



CAMBER BLOCKING DIAGRAM
Not to scale

Notes:-

Trusses are cambered for a dead load of 2760# per lineal foot of truss plus a live load of 640# per lineal foot of truss, extending over both 420'-0" spans. Dead load stresses are taken from engineer's design drawing, sheet No. 16. Live load stresses were computed as 23.2% of the dead load stresses. Normal temperature is assumed 60°F.

For determining the effective gross area for members having the large hand holes, 50% of the cross sectional area of the hand holes was deducted for both tension and compression members.

The difference, at L12 of 0.0475' (approximately ½") in elevation between the theoretical geometric outline and the cambered outline is due to the difference between the reactions and stresses assumed for design and for camber, and those which would have resulted if they had been computed for the actual sections tabulated above.

Fabricating the truss to the dimensions and shape shown, including this 0.0475' difference, will result in producing the stresses and reactions as shown in the design.

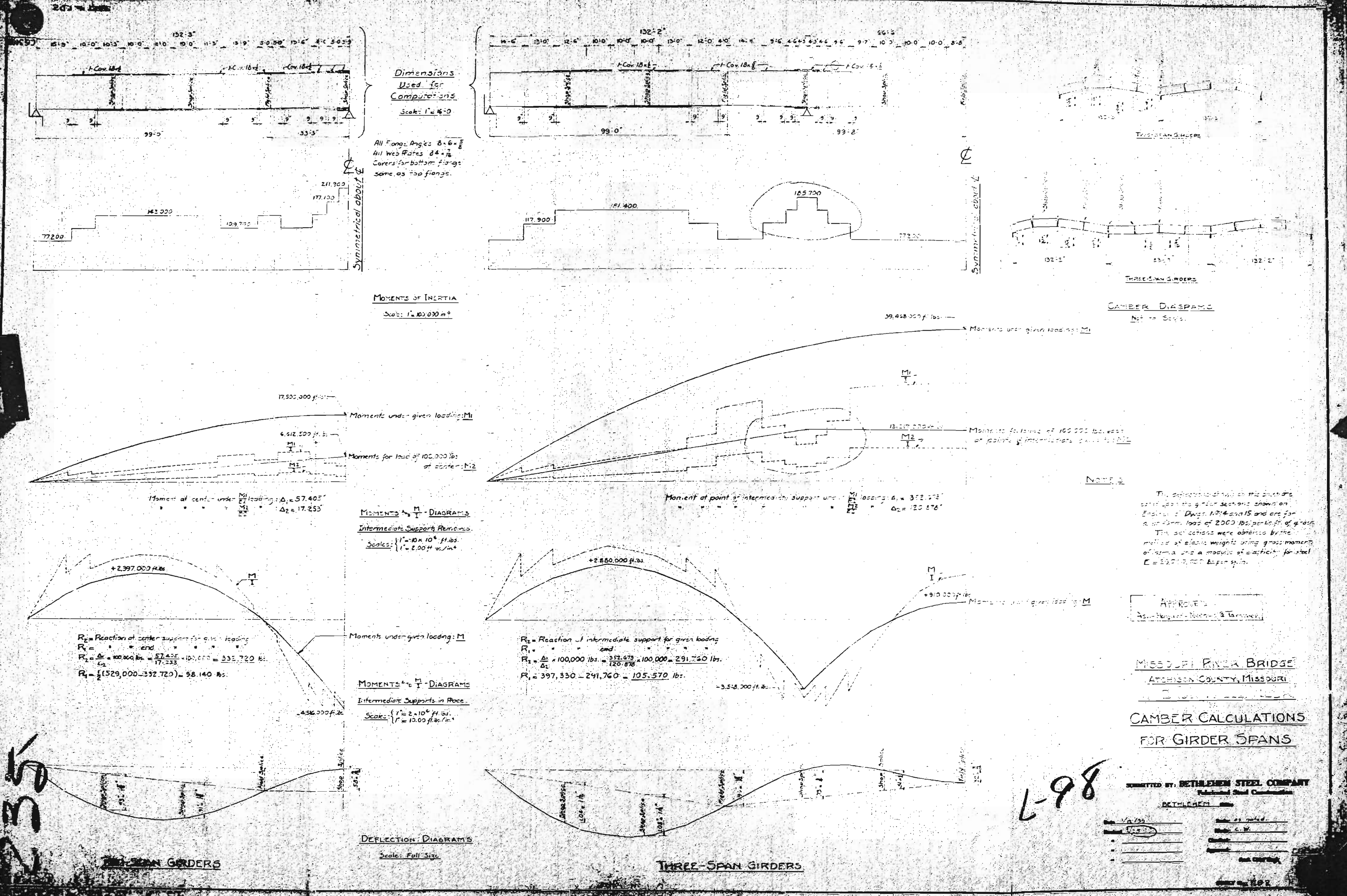
L-98

MISSOURI RIVER BRIDGE
ATCHINSON COUNTY MISSOURI
AT BROWNVILLE, NEBRASKA
SHOP LENGTHS AND CAMBER DIAGRAM

SUBMITTED BY: **BETHLEHEM STEEL COMPANY**
Fabricated Steel Construction
Bethlehem Office

Date Jan. 5, 1938
Revised 1-12-39
Scale As noted
Made J. B. P.
Checked
Approved
Asst. Chief Eng'r.

SHEET No. E01



All Flange Angles $8 \times 6 \times \frac{5}{8}$
All Web Plates $84 \times \frac{7}{16}$
Covers for bottom flange same as top flange.

Moment at center under $\frac{M_1}{EI}$ loading: $\Delta_1 = 57.405"$
" " " " $\frac{M_2}{EI}$ " : $\Delta_2 = 17.253"$

Moment at point of intermediate support under $\frac{M_1}{EI}$ loading: $\Delta_1 = 352.673"$
" " " " " " $\frac{M_2}{EI}$ " $\Delta_2 = 120.876"$

R_2 = Reaction at center support for given loading
R_1 = " " end " " "
$R_2 = \frac{\Delta_1}{\Delta_2} \times 100,000$ lbs. $= \frac{57.405}{17.253} \times 100,000 = \underline{332,720}$ lbs.
$R_1 = \frac{1}{2}(529,000 - 332,720) = 98,140$ lbs.

R_2 = Reaction at intermediate support for given loading
R_1 = " " end " " "
$R_2 = \frac{\Delta_1}{\Delta_2} \times 100,000$ lbs. $= \frac{352.673}{120.876} \times 100,000 = \underline{291,760}$ lbs.
$R_1 = 397,330 - 241,760 = \underline{105,570}$ lbs.

NOTE:

The deflections shown on this sheet are based upon the girder sections shown on Erection Dwgs. Nº 14 and 15 and are for a uniform load of 2000 lbs. per lin. ft. of girder.
The deflections were obtained by the method of elastic weights using gross moments of inertia and a modulus of elasticity for steel E = 29,000,000 lbs. per sq. in.

APPROVED
Ash-Howard-Needles & Tammen

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
[illegible]

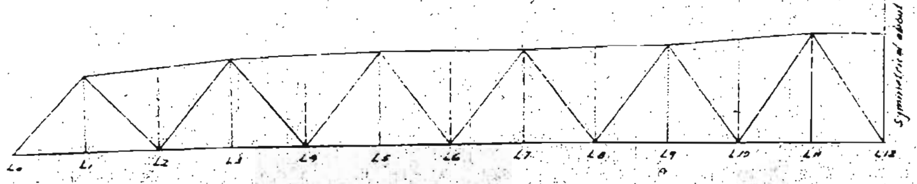
CAMBER CALCULATIONS
FOR GIRDER SPANS

SUBMITTED BY: BETHLEHEM STEEL COMPANY
Fabricated Steel Construction
BETHLEHEM Office

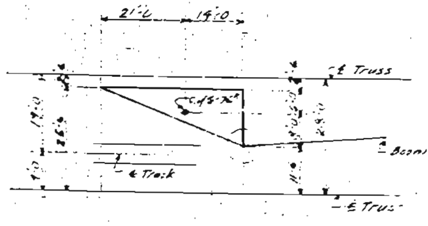
Date 1/13/39
Revised 1/25/39
Scale as noted.
Made C. W.
Checked
Approved
Cont. [illegible]
Sheet No. 18 B

235

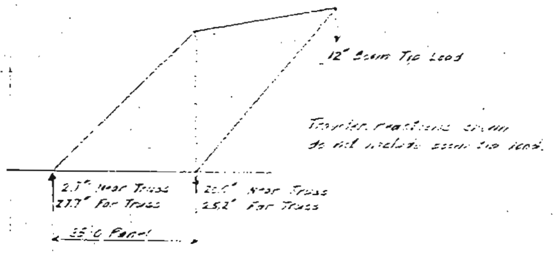
L-98



Panel Point	0	1	2	3	4	5	6	7	8	9	10	11	12
Top Chords		3.74	3.74 3.74	3.74 4.41	4.41 4.41	4.41 4.16	4.16 4.16	4.16 3.86	3.86 3.86	3.66 3.62	3.62 3.62	3.62 6.32	6.32 6.32
Bottom Chords	5.45	5.45 5.45	5.45 5.05	5.05 5.05	5.05 6.23	6.23 6.23	6.23 4.34	4.34 4.34	4.34 3.51	3.51 3.51	3.51 6.63	6.63 6.63	6.63 6.63
Diagonals	7.48	7.48 3.21	3.21 3.13	3.13 3.14	3.14 3.23	3.23 3.25	3.25 3.25	3.25 5.77	5.77 3.81	3.81 5.65	5.65 6.38	6.38 12.74	12.74 12.74
Verticals		2.91	2.07	3.43	2.28	3.64	2.28	3.64	2.28	3.64	3.50	3.88	5.18
Portals & Sway Frs.		7.19	2.98	.80	2.98	.80	2.98	.80	2.98	.80	2.98	7.11	.80
Top Laterals		1.02	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04
Bottom Laterals	.67	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Floorbeams	3.63	2.82	2.82	2.82	3.58	2.82	2.82	2.82	3.58	2.82	2.82	2.82	2.82
Stringers	3.01	6.02	6.02	6.02	6.17	6.02	6.02	6.02	6.17	6.02	6.02	6.02	6.02
Cross beams	1.17	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.34
Curb	1.24	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48
Handrailing	.64	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29
Total Steel	23.34	52.74	47.65	47.08	56.97	50.28	48.98	48.51	49.67	46.73	54.22	71.64	76.29
Erection Track, etc.	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Erection Loads	24.84	54.24	49.15	48.58	58.47	51.78	50.48	50.01	51.17	48.23	55.72	73.14	77.79



DISTRIBUTION OF TRAVELER WEIGHTS



Traveler reactions shown do not include beam tip load.

TRAVELER REACTIONS

NOTES:

All loads are given in kips for one truss.

Weights of structural steel are taken from estimated weights.

Traveler reactions are computed from information furnished by Erection Department.

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
STEEL DEAD LOAD CONCENTRATIONS

L-98

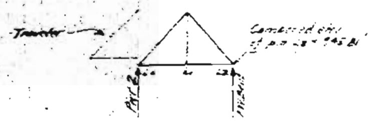
SUBMITTED BY: **BETHLEHEM STEEL COMPANY**
Fabricated Steel Construction
Bethlehem Office

Date: 12-28-38
Revised:
Scale:
Made: MSL
Checked:
Approved:
Asst. Chief Engr.

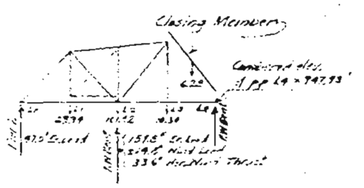
C3409

SHEET No. ED-3

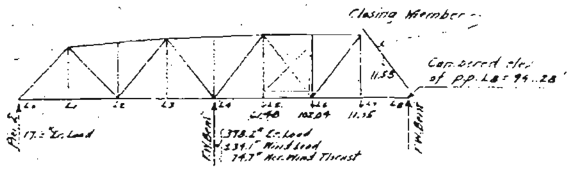
236



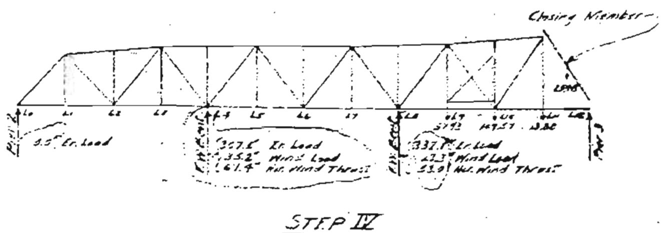
STEP I



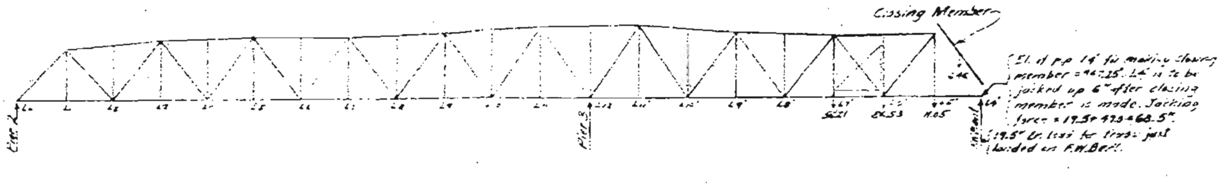
STEP II



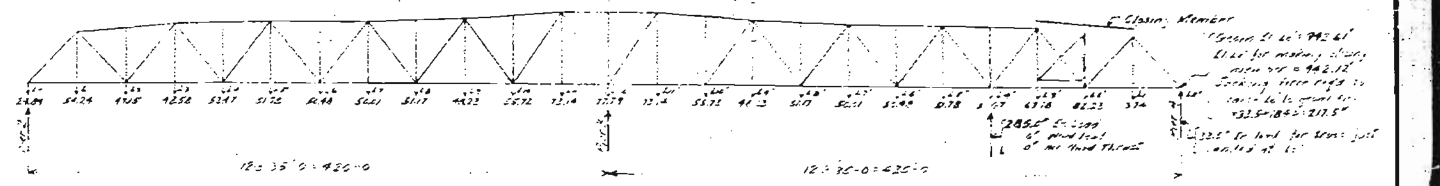
STEP III



STEP IV


Closing Member
El. of p.p. L4' for making closing member = 947.25'. L4' is to be jacked up 6" after closing member is made. Jacking force = 19.5 + 49.0 = 68.5"
19.5" Er. Load for truss just landed on F.W. Bent
55.53
11.05

STEP V



STEP VI

ERECTION STRESSES

Member	Step V* E* Erection Stress	Step V* EW Wind Stress	Step V* E*+EW	Step VI E Erection Stress	Step VI EW Wind Stress	Step VI E+EW	Capacity at basic unit stress	Remarks
[illegible]	+144	±58	+252	-175	±77	+252	+866	
[illegible]	+258		+329	-327	179	+508	+1162	
[illegible]	+215	133	+348	+332	282	+608	+1137	
[illegible]	[illegible]	[illegible]	+197	-172	324	+576	+838	
[illegible]	[illegible]	22	[illegible]	[illegible]	447	-527	-654	
[illegible]	[illegible]	[illegible]	[illegible]	-475	527	-1063	-1265	
[illegible]	[illegible]	[illegible]	[illegible]	-533	502	-1101	-1265	
[illegible]	-365	131	[illegible]	-254	371	-675*	-654*	*Capacity at basic stress ×1.33 for E+EW = -870
[illegible]	[illegible]	43	-121	-142	246	-382	-857	
[illegible]	—			-137	131	-266	-1665	
[illegible]	—			-71	46	-117	-1652	
[illegible]	—			—	—	—	-857	
[illegible]	-232	±46	-278	-298	±46	-344	-790	
[illegible]	-257	57	314	-351	89	-435	-1066	
[illegible]	-127	30	-197	-250	111	-461	-917	
[illegible]	+129	[illegible]	+176	-57	158	-215	-604	
[illegible]	+505	61	+566	-283	175	+478	+720	
[illegible]	-792	[illegible]	[illegible]	+737	213	+950	+1363	
[illegible]	[illegible]	50	-500	-405	167	+574	-720	
[illegible]	-207	27	-234	-193	112	-304	-640	
[illegible]	—			+112	5	-173	[illegible]	
[illegible]	—			+150	37	+217	-1062	
[illegible]	—			—	—		+853	
[illegible]	-217			-260			-1125	
[illegible]	+118			+155			+501	
[illegible]	-41			-74			-320	
[illegible]	-3			+31			+430	
[illegible]	+72			-37			+430	
[illegible]	-122			-61			-314	
[illegible]	+188			+143			+430	
[illegible]	-247			-318			-545	
[illegible]	+327			+279			+716	
[illegible]	-323			-303			-845	
[illegible]	+378			+351			+1045	
[illegible]	-520	±414	-736	-467	±564†	-1031	-563	†Dir. Wind Stress = 72.8 ; [illegible] = 491.0
[illegible]	-482	±351	-834	-305	±440*	-725	-1550	*Dir. Wind Stress = 67.7 ; [illegible] = 476.0
[illegible]	+343			+240			+1045	
[illegible]	-287			-192			-845	
[illegible]	+270			+152			+716	
[illegible]	-209			-94			-545	
[illegible]	+120			+41			+436	
[illegible]	—			+33			-314	
[illegible]	—			-76			+430	
[illegible]	—			-190			-320	
[illegible]	—			+108			+430	
[illegible]	—			—			-372	
[illegible]	—			—			+1020	

* The stresses shown for Step V were computed for the actual traveler reactions (max.) and assuming that U5'U7' is the closing member. The stresses for the assumptions noted or indicated elsewhere on this sheet will be slightly less.

237

ERECTION PROCEDURE

Erect Span 2-3 by successive cantilevering over falsework bents at L2, L4, and L6 as indicated in Steps I, II, III, and IV above.

Cantilever from Pier 3 to a falsework bent at L4' as indicated in Step V. After the closing member (L4'U5') is made and the truss adequately pinned and bolted to L4', panel point L4' must be jacked up 6" from its position at that time by means of the jacks on the falsework bent. The jacking force required to do this is approximately 35 tons.

Cantilever from this falsework bent to L0' as indicated in Step VI, landing on blocking or jacks on Pier 4. At the time of making the closing member (U1'U2'), L0' will be about 6" below its geometric elevation, and the clearance between the bottom lateral plate on the underside of the end floorbeam and the top of the pier will be about 1'-7". Before the rocker shoes can be erected, jacks must be inserted under the end floorbeam and the end of the truss thus raised as required. The jacking force to raise the L0' point to its geometric elevation is approximately 116 tons; to raise it 4" above this position as will be required if the upper portion of the shoe is in place on the chord, is approximately 115 tons. This jacking movement will automatically free the bent at L4'.

GENERAL NOTES

All loads and reactions are given in kips per truss. All stresses are given in kips.

Steel dead load concentrations are taken from sheet ED3. Loads not shown for Steps I to V inclusive are the same as for Step VI.

All steel is assumed to be erected as shown in the sketches above except that the top bracing, stringers, crossframes, curbs, handrailing, and erection track are omitted in the panels ahead of the traveler.

Wind pressure of 30#/□' on the exposed area of the [illegible] and floorsystem as seen in elevation (2.3k per [illegible] on the top chord and 6.0k per panel on the bottom chord) [illegible] kips on the traveler. All wind stresses [illegible] assumed carried to the piers through the top and bottom lateral systems acting [illegible]. Wind load and thrusts shown for the falsework bent are at the ℄ of the bottom chord.

[illegible] cantilevered over the falsework bent at L4' to L0', the wind forces are assumed to be carried by the top and bottom lateral systems acting as cantilevers from Pier 3, and no wind force is assumed to be carried by the falsework bent at L4'.

Allowable stresses in the truss members were assumed as follows:

[illegible] stress = .85 × basic capacity

For erection plus [illegible] wind = 1.33 × basic capacity.

For compressed [illegible] of bottom chord see sheet ED1.

For Steps V and VI for computing erection deflections and stresses the traveler reactions have been assumed distributed equally to the two trusses: 22.8k at front end excluding boom tip and 15.2k at rear end and 5.0k for boom tip.

L-98

TRUSS DEFLECTIONS

Truss Cantilevered from Pier 3 to L6' - No Falsework Acting

Loading	Deflection at p.p. L4'	Deflection at p.p. L6'
1 kip at L6'	.01615 ft.	.0277 ft.
1 kip at L4'	.0112	.01615
Loading shown in Step V	.81	—
Loading shown in Step VI but without falsework bent acting	3.22	5.17

APPROVED 1-17-39
Ash-Howard-Needles & Tammen

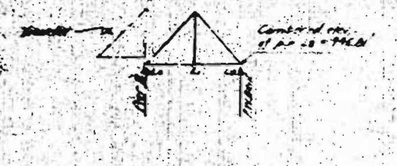
MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
ERECTION STRESSES AND PROCEDURE

SUBMITTED BY: BETHLEHEM STEEL COMPANY
Fabricated Steel Construction
Bethlehem Office

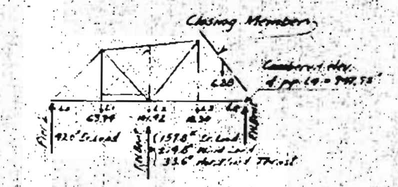
Date 1-10-39
Revised 2-27-39
(3-13-39)
Scale 1" = [illegible]
Drawn [illegible]
Checked
Approved
Asst. Chief Engr.

C340

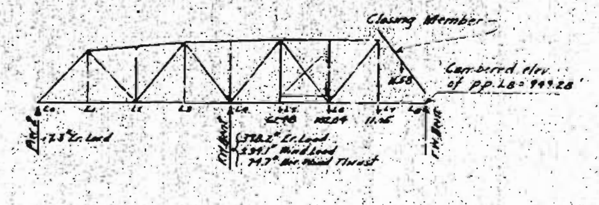
SHEET No. ED4



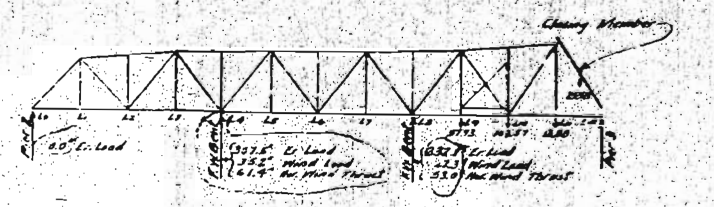
STEP I



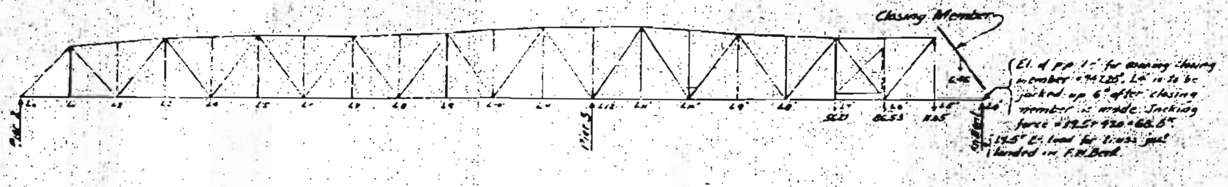
STEP II



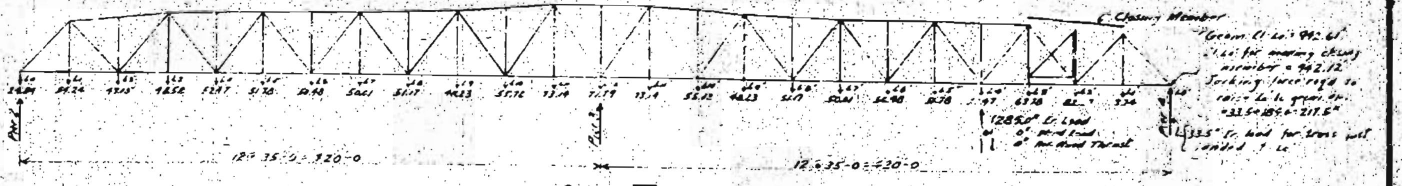
STEP III



STEP IV



STEP V



STEP VI

ERECTION STRESSES

Member	Step V* E* Erection Stress	Step V* EW Wind Stress	Step V* E*+EW	Step VI E Erection Stress	Step VI EW Wind Stress	Step VI E+EW	Capacity at basic unit stress	Remarks
L0L2	+144	±56	+262	+175	±77	+252	+886	
L2L4	+258	[illegible]	+359	+229	179	+368	+1162	
L4L6	+213	133	[illegible]	+326	282	+608	+1137	
L6L8	+23	[illegible]	+177	+212	364	+576	+888	
[illegible]	-3	22	-532	-100	487	-587	-664	
[illegible]	-727	2	-474	-474	589	-1063	-1265	
[illegible]	-727	243	-971	-535	566	-1101	-1225	
[illegible]	-348	131	-479	-284	391	-675*	-654*	*Capacity at basic stress x1.33 for E+EW = -870
[illegible]	-77	45	-122	-142	246	-388	-857	
[illegible]	—	—	—	-137	131	-268	-1083	
[illegible]	—	—		-71	46	-117	-1053	
[illegible]	—	—		—	—	—	+857	
U1U3	-232	±40	-272	-298	±46	-344	-790	
[illegible]	-257	57	-314	-351	84	-435	-1000	
[illegible]	-137	50	-187	-250	121	-461	-927	
[illegible]	+129	27	+146	-57	158	-215	-604	
[illegible]	+503	83	+586	+283	195	+478	+720	
[illegible]	+998	[illegible]	+1057	+737	213	+750	+1703	
[illegible]	+540	60	+600	+405	167	+574	+720	
[illegible]	+207	27	+234	+196	108	+304	+690	
[illegible]	—			+112	6	+173	+961	
[illegible]	—			+190	27	+217	-1062	
[illegible]				—	—		+853	
[illegible]	-21			-205			-1135	
[illegible]	+118			+156			+501	
[illegible]	-43			-74			-320	
[illegible]	-3			+31			+430	
[illegible]	+22			[illegible]			+430	
[illegible]	-122			-81			-314	
[illegible]	+182			+198			+430	
[illegible]	-247			-218			-645	
[illegible]	+337			+270			+715	
[illegible]	-323			-303			-815	
[illegible]	+378			+351			+1055	
[illegible]	-520	±414	-936	-467	±564†	-1031	-1583	†Dir. Wind Stress = 72.8; [illegible] = 491.0
[illegible]	-488	±351	-839	-365	±540‡	-905	-1533	‡Dir. Wind Stress = 67.7; [illegible] = 470.5
[illegible]	+343			+240			+1005	
[illegible]	-287			-192			-865	
[illegible]	+272			+152			+715	
[illegible]	-207			-94			-645	
[illegible]	+120			+41			+430	
[illegible]	—			+73			-314	
[illegible]	—			-96			+430	
[illegible]	—			-190			-320	
[illegible]	—			+108			+430	
[illegible]	—			—			-372	
[illegible]	—			—			+1020	

* The stresses shown for Step V were computed for the actual traveler reactions [illegible] and assuming that [illegible] in the closing member. The stresses for the assumptions noted are indicated elsewhere on this [illegible]

ERECTION PROCEDURE

Erect Span 2-3 by successive cantilevering over falsework bents at L2, L4, and L6 as indicated in Steps I, II, III, and IV above.

Cantilever from Pier 3 to a falsework bent at L4' as indicated in Step V. After the closing member (L4'U5') is made and the truss adequately pinned and bolted to L4', panel point L4' must be jacked up 6" from its position at that time by means of the jacks on the falsework bent. The jacking force required to do this is approximately 35 tons.

Cantilever from this falsework bent to L0' as indicated in Step VI, landing on blocking or jacks on Pier 4. At the time of making the closing member (U4'U5'), L0' will be about 6" below its geometric elevation, and the clearance between the bottom lateral plate on the underside of the end floorbeam and the top of the pier will be about 1'-7". Before the rocker shoes can be erected, jacks must be inserted under the end floorbeam and the end of the truss then raised as required. The jacking force to raise the L0' point to its geometric elevation is approximately 110 tons; to raise it 4" above this position, as will be required if the upper portion of the shoe is in place on the chord, is approximately 115 tons. This jacking movement will automatically free the bent at L4'.

GENERAL NOTES

All loads and reactions are given in kips per truss. All stresses are given in kips.

Steel dead load concentrations are taken from sheet ED3. Loads not shown for Steps I to V inclusive are the same as for Step VI.

All steel is assumed to be erected as shown in the sketches above except that the top bracing, stringers, crossframes, curbs, handrailing, and erection track are omitted in the panels ahead of the traveler.

Wind assumed at 20#/□' on the exposed area of the truss and floorsystem as seen in elevation (2.7^k per panel on the top chord and 6.0^k per panel on the bottom chord) plus 10 kips on the traveler. All wind stress was assumed carried to the piers through the top and bottom lateral systems acting independently. Wind loads and thrusts shown for the falsework bents act at the ℄ of the bottom chord.

When the span is cantilevered over the falsework bent at L4' to L0', the wind forces are assumed to be carried by the top and bottom lateral systems acting as cantilevers from Pier 3, and no wind force is assumed to be carried by the falsework bent at L4'.

Allowable stresses in the truss members were assumed as follows:

For erection stress = 1.25 × basic capacity.
For erection plus erection wind = 1.33 × basic capacity.

For cambered elevations of bottom chord see sheet ED1.

For Steps V and VI for computing erection deflection and stresses the traveler reactions have been assumed distributed equally to the two trusses; 22.8^k at front end excluding boom tip and 15.2^k at rear end and 6.0^k for boom tip.

TRUSS DEFLECTIONS

Truss Cantilevered from Pier 3 to L0'. No Falsework Acting

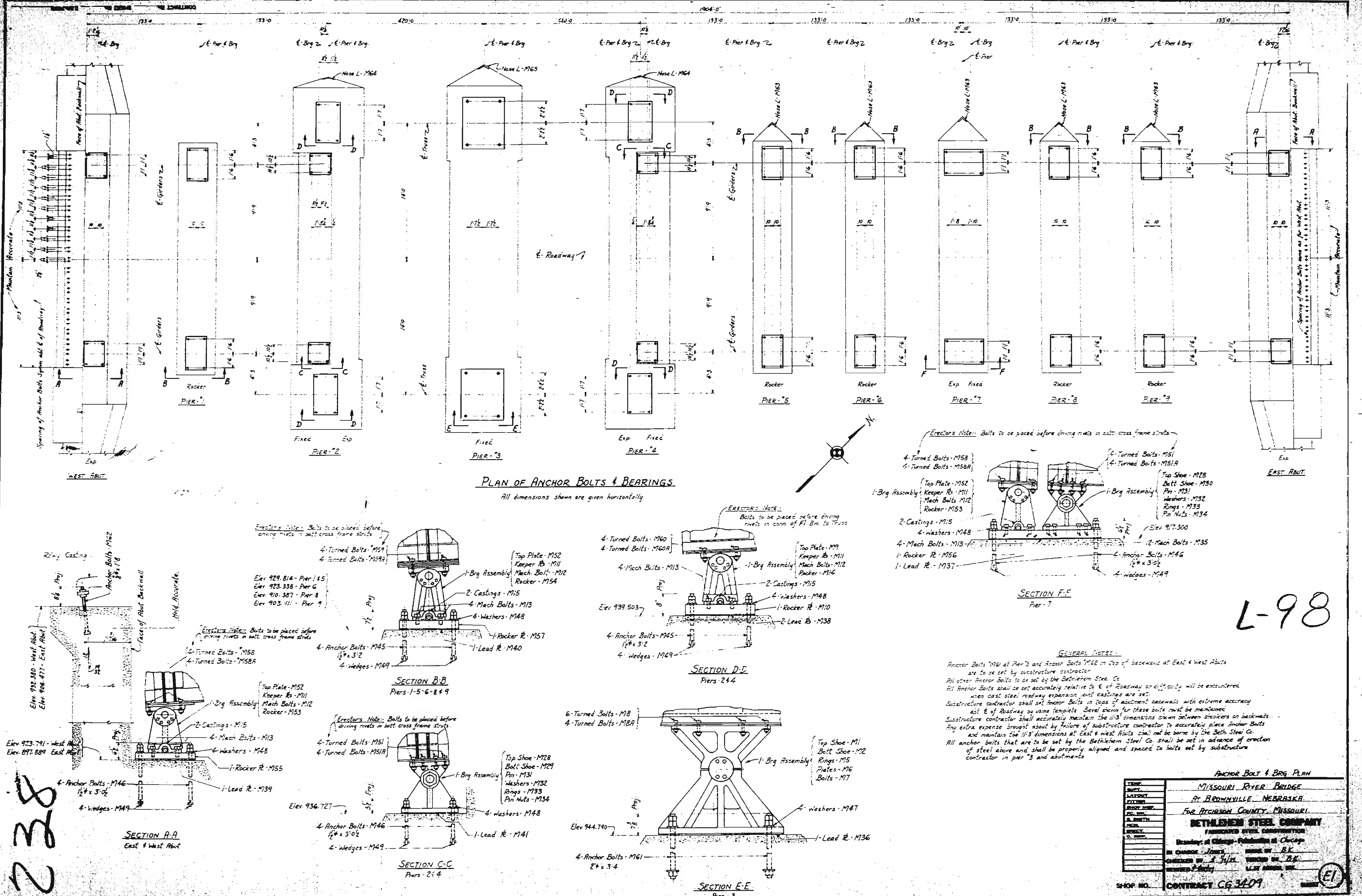
Loading	Deflection d p.p. L4'	Deflection d p.p. L0'
1 kip at L0'	.0615 ft.	.0277 ft.
1 kip at L4'	.0162	.01615
Loading shown in Step V	.81	—
Loading shown in Step VI but without falsework bent acting	3.22	5.19

APPROVED 1-17-39
Ash-Howard-Needles & Tammen

MISSOURI RIVER BRIDGE
ATCHISON COUNTY, MISSOURI
AT BROWNVILLE, NEBR.
ERECTION STRESSES AND PROCEDURE

237

L-98



PLAN OF ANCHOR BOLTS & BEARINGS

All dimensions shown are given horizontally

L-98

GENERAL NOTES -

Anchor Bolts M61 at Pier 3 and Anchor Bolts M62 in top of backwalls at East & West Abuts are to be set by substructure contractor

All other Anchor Bolts to be set by the Bethlehem Steel Co

All Anchor Bolts shall be set accurately relative to ℄ of Roadway or difficulty will be encountered when cast steel roadway expansion joint castings are set.

Substructure contractor shall set Anchor Bolts in tops of abutment backwalls with extreme accuracy abt ℄ of Roadway by using templets. Bevel shown for these bolts must be maintained

Substructure contractor shall accurately maintain the 11'-3" dimensions shown between stickers on backwalls.

Any extra expense brought about by failure of substructure contractor to accurately place Anchor Bolts and maintain the 11'-3" dimensions at East & West Abuts shall not be borne by the Beth. Steel Co.

All anchor bolts that are to be set by the Bethlehem Steel Co. shall be set in advance of erection of steel above and shall be properly aligned and spaced to bolts set by substructure contractor in pier 3 and abutments

ANCHOR BOLT & BRG. PLAN

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
FG. WK.
B. SMITH
MCH.
INSPECT.
O. INSP.

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI.

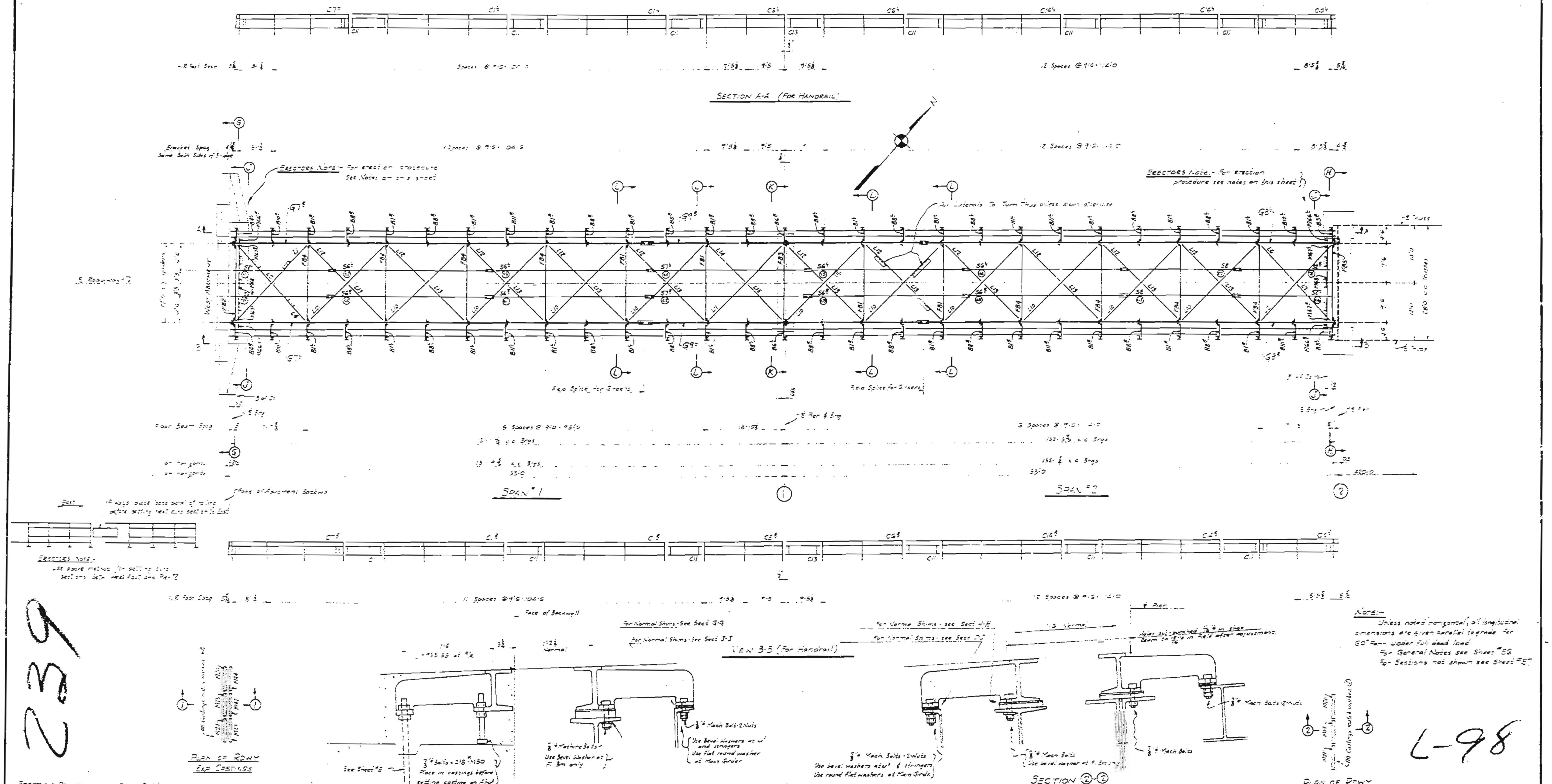
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jones MADE BY BK
CHECKED BY [illegible] TRACED BY BK
[illegible] [illegible]

SHOP NO.
CONTRACT CG 3409
E1

238

239

L-98


Section A-A (For Handrail)
Erectors Note:- For erection procedure see notes on this sheet
All laterals to turn thus unless shown otherwise
West Abutment
Field Splice for Stringers
Span #1
Span #2
Erectors Note:- Use same method for setting curb sections both West Abut. and Pier #2
View 3-3 (For Handrail)
For Normal Shims see Sect G-G
For Normal Shims see Sect J-J
Section ①-①
Section ②-②
Plan of Rdwy Exp Castings
$\frac{3}{4}$" Mach Bolts 2-Nuts
Use Bevel washers at ⊈ and stringers
Use flat round washer at Main Girder
$\frac{3}{4}$" Bolts x 2'-8" M50 Place in castings before setting casting on Abut
See Sheet #E

Note:- Unless noted horizontal, all longitudinal dimensions are given parallel to grade for 60° Fahr. under full dead load.
For General Notes see Sheet #E6
For Sections not shown see Sheet #E7

Erection Procedure at East & West Abutments

First:- Erect all structural steel, including curb sections, except pieces #M66^E, #M67^E & #M68.

Second:- Drive and chip four csk. rivets to top flg of girder for each Brkt 84^E.

Third:- Set all six roadway expansion castings, with the normal shims to floor beams, but using only two bolts temporarily to connect each casting to floor beam.

Fourth:- Adjust curb and expansion castings laterally by adjusting cross frames. If necessary, erector to dress abutment walls where they abut ends of expansion castings. (See special note)

Fifth:- Drive up structural parts already set including end lateral connections, but not curbs or handrail.

Sixth:- Set pieces #M66^E, #M67^E and #M68 and drive up connections for same.

Seventh:- Adjust curbs vertically, if necessary using shim #M75 between bott. of curb diaphragms & top of curb brackets, dressing concrete curb on abutment as required. Rivet curbs in place.

Eighth:- Adjust expansion castings vertically using additional shims #M69, M72, M73, & M74 if necessary. Bolt expansion casting finally in place.

Ninth:- After slabs are poured, adjust top rail of handrail laterally by adjusting conn. of posts to curb diaphragms. The riveting of posts to curb diaphragms to be final operation.

Special Note:- If chipping of concrete is necessary it shall be done by undercutting and not extend up face of curb so as to deface it.

Erection Procedure at Piers #2 & #4

First:- Erect all structural steel for both spans, including curb sections except for pieces #M66^E, #M67^E & M68

Second:- Drive and chip four csk. rivets to top flg of girder for each Bracket #83^E.

Third:- Set all six roadway expansion castings, with the normal shims to floor beams, but using only two bolts temporarily to connect each casting to floor beam

Fourth:- Adjust curbs and expansion castings laterally, first by adjusting cross frame of approach span, and then if further adjustment is necessary by moving curbs and castings transversally on floor beams and brackets to proper position.

Fifth:- Drive up all structural parts already set including end lateral conns for approach span, but not curbs or handrail.

Sixth:- Set pieces #M66^E, #M67^E & M68 and drive up conns for same

Seventh:- Adjust curbs vertically, if necessary, using shims #M75 between bottom of curb diaphragms and top of curb brackets #83^E or by using shims M92 between bottom of curb diaphragms & top of floor beams on truss span. Ream holes for connection of curbs to floor beam, trusses and curb brackets to $\frac{15}{16}$"⌀ and drive up connections.

Eighth:- Adjust expansion castings vertically using additional shims #M69, M72, M73, M74, M54, M55, M56, M57 & M58 if necessary. Bolt expansion castings finally in place.

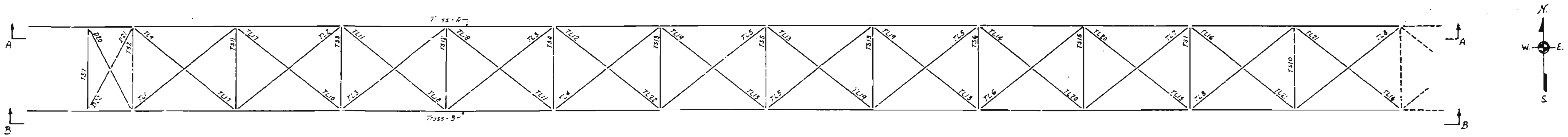
Ninth:- After slabs are poured, adjust top rail of handrail laterally by adjusting conn. of posts to curb diaphragms. The riveting of posts to curb diaphragms to be the final operation.

Erection Plan Spans ① & ②

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
FIELD INSP.
B. SMITH
MCH.
STRUCT.
G. INSP.

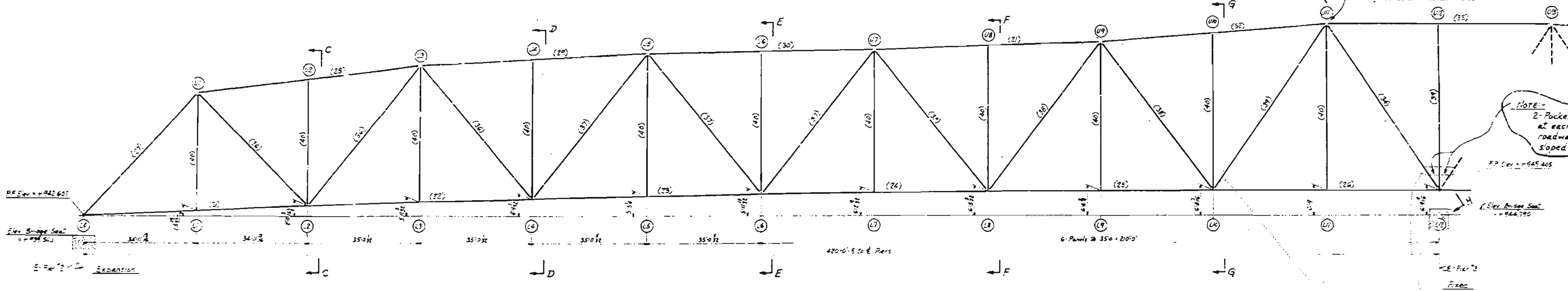
Missouri River Bridge
at Brownville, Nebraska
For Atchison County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jagla MADE BY JWK
CHECKED BY 9-1-37 TRACED BY STS
REVISED LAST AMEND. INC.
SHOP NO. CONTRACT CG3497 SHEET Ⓔ2



PLAN OF TOP LATERALS

ERECTOR'S NOTE:- See detail sheets #32&33, 33, 34 & 41 for use of Rib Bolts in certain holes



NOTE:- 2-Pockets formed by diaphragms between gussets at each truss to be filled with concrete at time roadway slabs are poured. Top of concrete to be sloped properly for good drainage.

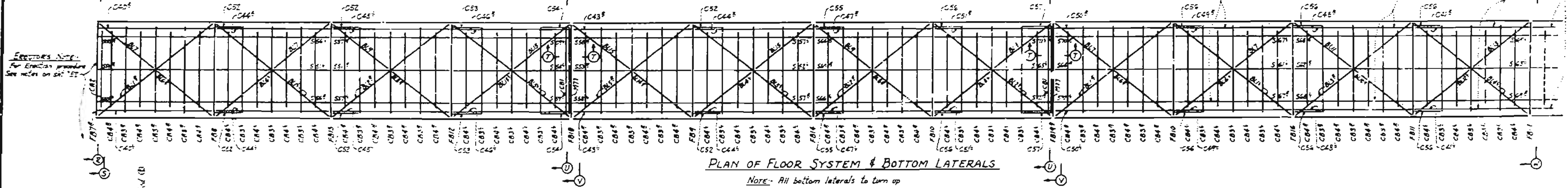
SECTION A-A & B-B

All dimensions shown are for full Live and Dead Load @ 70° Fahr. with spans swung. Figures given thus (21) indicate detail sheet numbers for the truss members

ERECTOR'S NOTE:- These four curb sections to be pulled slightly in out of place to buck certain rivets connecting truss diagonal to gussets - See detail shts #25B & #26AC

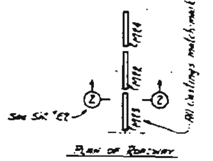
ERECTOR'S NOTE:- These four curb sections to be pulled slightly in out of place to buck certain rivets connecting truss diagonals & verticals to gussets - See detail shts. #26BC, #34B & #37

ERECTOR'S NOTE:- For Erection procedure See notes on sht. #E7

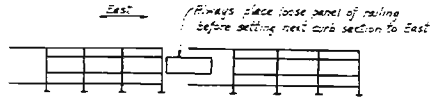


PLAN OF FLOOR SYSTEM & BOTTOM LATERALS

Note:- All bottom laterals to turn up

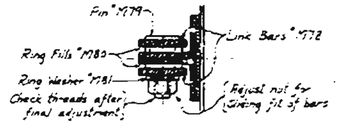


PLAN OF ROADWAY EXPANSION CASTINGS

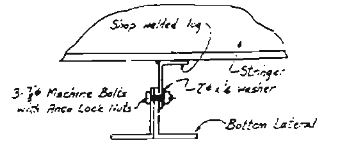

East
Always place loose panel of railing before setting next curb section to East

ERECTOR'S NOTE:- Use above method for setting curb sections betw. L0 & L12

ERECTOR'S NOTES:-
Center to center of bottom chords must be spread abt. ¾" to erect floor beams at U, L3, L5, L7, L9, L11 & L12.
At L4 & L8, cross beam #CB1 and Exp. guard #M77 are not to be set in final positions until erection track is removed.


Pin #M79
Link Bars #M72
Ring Fills #M80
Ring Washer #M81
Check threads after final adjustment
Adjust nut for sliding fit of bars

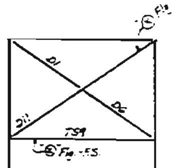
SECTION AT UPPER PIN
Similar at Lower Pin



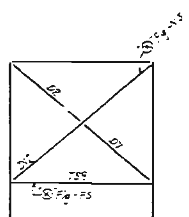
TYPICAL CONNECTION OF BOTTOM LATERALS TO STRINGERS SPANS #3 & #4

NOTES:-
For General Notes see sheet #E4
For Sections R-R, S-S, U-U, V-V & W-W and typical sections see sheet #E8.
For notes on riveting and bolting see sheet #E8.

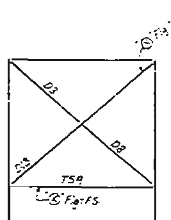
L-98



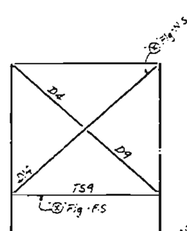
SECTION C-C



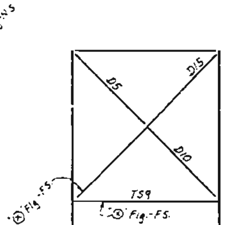
SECTION D-D



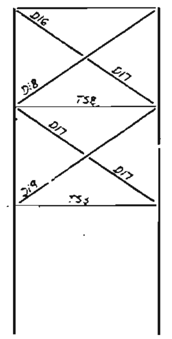
SECTION E-E



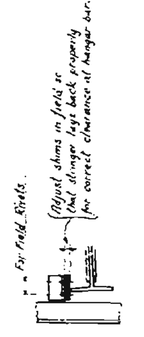
SECTION F-F



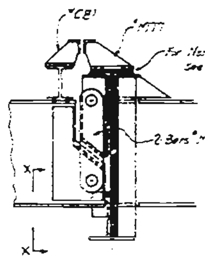
SECTION G-G



SECTION H-H


For Field Rivets.
Adjust shims in field so that stringer lays back properly for correct clearance at hanger bars.

SECTION X-X
For Exterior Stringers only



SECTION Ⓣ Ⓣ
Same at all three stringers at L4, L8, L16 & L20 except guide lug not used at middle stringer.

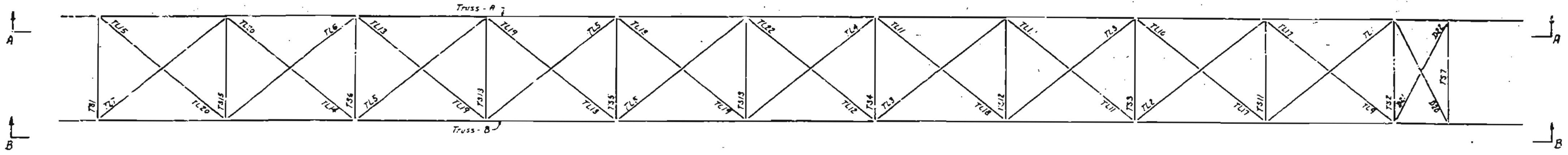
240

Rev. A 8/7/59

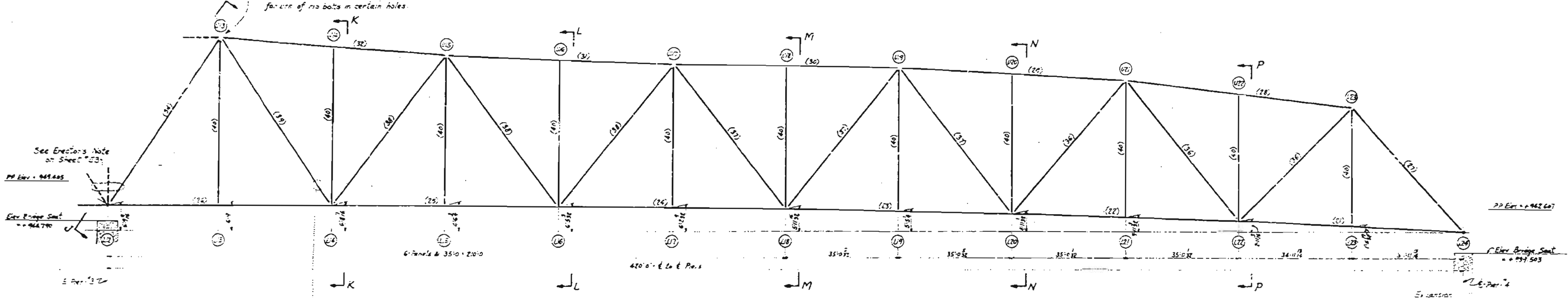
ERECTION PLAN - SPAN ③

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago-Fabrication at Chicago
IN CHARGE - Jones
MADE BY B.K.
CHECKED BY [illegible]
TRACED BY B.K.
REVISED
LAST REVISION NO.
SHOP NO.
CONTRACT CG 3409
SHEET E3

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT
O. INSP.



PLAN OF TOP LATERALS

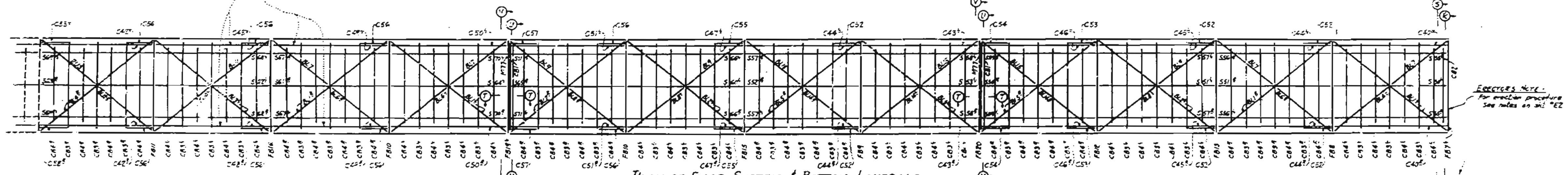


ERECTOR'S NOTE:-
See Detail sheets "32BB, "33, "34AB & "41 for use of ms bolts in certain holes

ERECTOR'S NOTE:-
The four curb sections to be pulled slightly in out of place to buck certain rivets connecting truss diagonal to gusset see detail sheets "25BB & "26AC

SECTION A-A & B-B

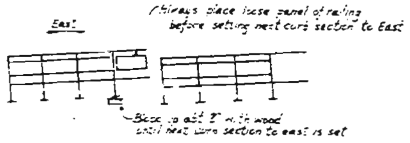
All dimensions shown are for full Live & Dead Load @ 70° Fahr with spans swung
Figures given thus (21) indicate detail sheet numbers for the truss members



ERECTOR'S NOTE:-
For erection procedure see notes on sht "E2

PLAN OF FLOOR SYSTEM & BOTTOM LATERALS

Note:- All bottom laterals to turn up.

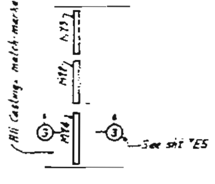

East
Always place loose panel of railing before setting next curb section to East
Block up abt 2" with wood until next curb section to east is set

ERECTORS NOTE:-
Use above method for setting curb sections betw L12 & L24

ERECTOR'S NOTES:-
Center to center of bottom chords must be spread abt ¾" to erect floor beams at L13, L15, L17, L19, L21 & L23.
At L16 & L20, cross beams "CB1 and Exp guards "M77 are not to be set in final position until erection track is removed

GENERAL NOTES FOR TRUSS SPANS "3 & "4

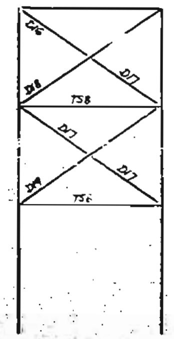
① Reference shall be made to detail sheet "35 for notes covering erection marks and match marks for truss members.
② Erection marks for members other than truss members, are painted on pieces in shop on same ends of members as they appear on plans. Such members shall be erected with marks in these positions. If marks appear on plans at middle of members, such members are symmetrical and may be turned end for end in erection.
③ Curbs shall be aligned laterally to be not more than ⅛" out of a straight line in any 25'-0" of length
④ Tops of Curbs & Handrail shall not vary more than ⅛" from the required grades and elevations.
⑤ Top rails of Handrail shall be aligned laterally to be not more than 1/16" out of straight lines at handrail posts.
⑥ Lateral and vertical adjustment of curbs and roadway expansion joints at piers "2 & "4 shall be accomplished as noted under "Erection Procedure at Piers "2 & "4 as shown on sheet "E2.
⑦ If any lateral adjustment of curbs is necessary between Piers "2 & "4 same shall be accomplished by shifting curb diaphragms on floor beams and cross beams and reaming connections may be required.
⑧ Since trusses are cambered for full live and dead load, vertical adjustment of curbs and handrail, except at piers "2 & "4, will only be where it may seem necessary by general inspection by inserting shims "M93, "M94, "M95 & "M96 under diaphragms before slabs are poured. After slabs are poured, if further vertical adjustment be necessary, it must be accomplished by knocking out rivets connecting 18" curb channels to diaphragms, inserting shims and by reaming as necessary. Shims for this purpose shall be ordered from shop as required.
⑨ Lateral adjustment of top handrail shall be made after slabs are poured. This shall be accomplished by adjusting connections of handrail posts to curb diaphragms, by use of adjusting shims "M97 to "M104 incl. at connections to truss members, and by reaming of holes shown in Section W-W on sheet "E8. The riveting of Handrail Posts to curb diaphragms and to lugs at trusses at L12 to be the final operation.
⑩ Expansion guards "M77 at L4, L8, L16 & L20 to be adjusted vertically with shims "M82 & "M85.
⑪ Stringer guide lugs at bottom of exterior expansion stringers at L4, L8, L16 & L20 to be adjusted with shims "M90 and "M91. See section X-X on sheet "E3.
⑫ Roadway Expansion Castings have been shop assembled for each pier and match-marked. Castings shall be erected according to these match-marks.
⑬ Top chord splices at U1, U3, U5, U7, U9, U15, U17, U19, U21 & U23 and bottom chord splices at L8, L10, L12, L14 & L16 are not to be driven up until spans are swung. All other truss connections may be driven up at any time desired
⑭ Top and bottom laterals may be driven up at any time that holes become "fair"
⑮ Erector to refer to Sheet "E8 for notes regarding riveting and bolting of field connections.



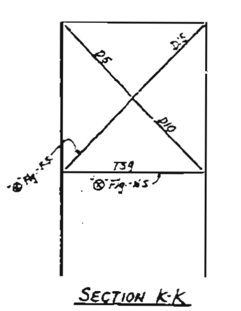
PLAN OF ROADWAY EXPANSION CASTINGS

L-98

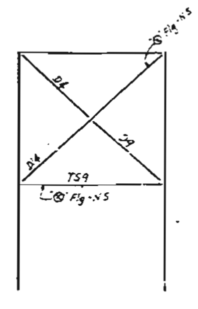
241



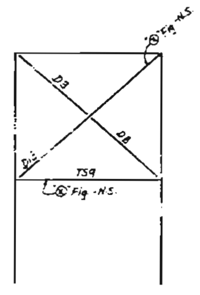
SECTION J-J



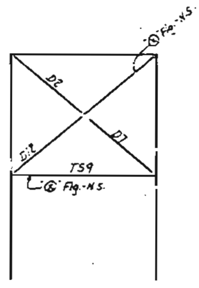
SECTION K-K



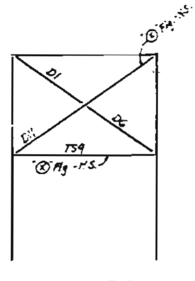
SECTION L-L



SECTION M-M



SECTION N-N



SECTION P-P

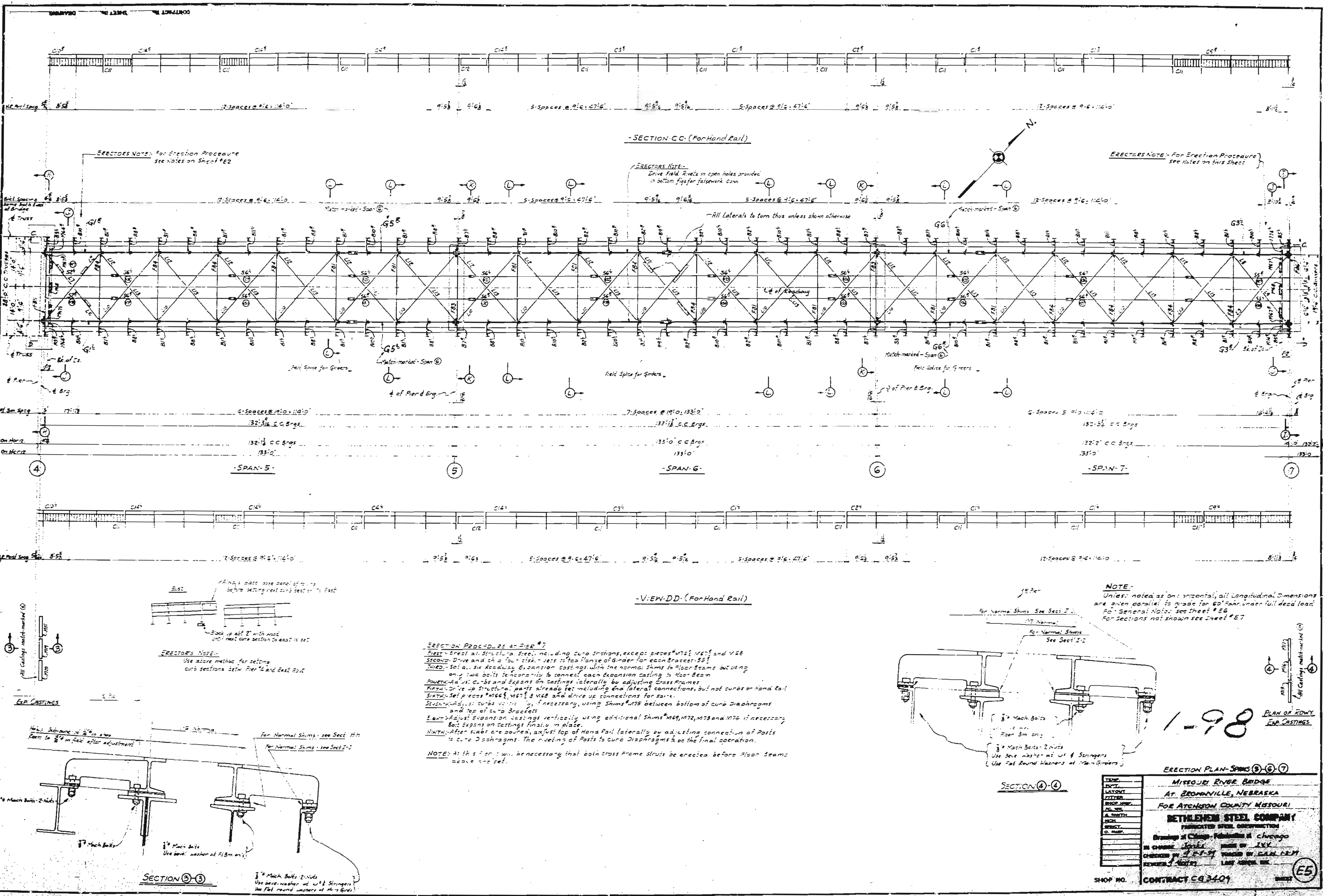
NOTES:-
For Section T-T See sheet "E3
For Sections R-R, S-S, [illegible] and typical sections see sheet "E3
For typical connections of bottom laterals to stringers see sheet "E3.
For notes on riveting & bolting see sheet "E8.

ERECTION PLAN - SPAN ④
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
[illegible]

SHOP NO. CONTRACT NO. [illegible]

L-98

242


-SECTION CC- (For Hand Rail)
Hd. Rail Spcg.
12-Spaces @ 9'-6" = 114'-0"
5-Spaces @ 9'-6" = 47'-6"
Brkt. Spacing Same both sides of Bridge
℄ Truss
℄ Pier
℄ Brg.
Match-marked - Span ⑥
G1E
G5E
G6E
G3E
Field Splice for Girders
℄ of Pier & Brg.
℄ of Roadway
All Laterals to turn thus unless shown otherwise
Str. Spcg.
6-Spaces @ 19'-0" = 114'-0"
7-Spaces @ 19'-0" = 133'-0"
132'-3¼" C.C. Brgs.
133'-0" C.C. Brgs.
On Horiz.
133'-0"
-SPAN-5-
-SPAN-6-
-SPAN-7-
④
⑤
⑥
⑦
N.
-VIEW-DD- (For Hand Rail)
East
Finally place base panel of railing before setting next curb section to East
Block up abt. 1" with wood until next curb section to east is set
All Castings match-marked ④
Exp. Castings
Plan of Rdwy. Exp. Castings
For Normal Shims - see Sect. H-H
For Normal Shims - see Sect. I-I
⅞" Mach. Bolts - 2 Nuts
⅞" Mach. Bolts
Use bevel washer at Flg. only
⅞" Mach. Bolts - 2 Nuts
Use bevel washer at ℄ Stringers
Use Flat round washers at Main Girders
SECTION ③-③
SECTION ④-④

ERECTORS NOTE:- For Erection Procedure see Notes on Sheet #E2

ERECTORS NOTE:- Drive Field Rivets in open holes provided in bottom flgs. for falsework Conn.

ERECTORS NOTE:- For Erection Procedure see Notes on this Sheet

ERECTOR'S NOTE:- Use above method for setting curb sections betw. Pier #4 and East Abut.

ERECTION PROCEDURE AT PIER #7

FIRST – Erect all Structural Steel including Curb Sections, except pieces #M75, M67 and M68

SECOND – Drive and ship four stake sets to top flange of Girder for each Bracket-53

THIRD – Set all six Roadway Expansion castings with the normal Shims to Floor Beams but using only two bolts temporarily to connect each Expansion casting to Floor Beam

FOURTH – Adjust Curbs and Expansion castings laterally by adjusting Cross Frames

FIFTH – Drive up Structural parts already set including end lateral connections, but not curbs or Hand Rail

SIXTH – Set pieces #M66, M67 & M68 and drive up connections for same.

SEVENTH – Adjust curbs vertically, if necessary, using Shims #M75 between bottom of curb Diaphragms and top of curb Brackets

EIGHTH – Adjust Expansion castings vertically using additional Shims #M69, M72, M73 and M74 if necessary. Bolt Expansion castings finally in place.

NINTH – After slabs are poured, adjust top of Hand Rail laterally by adjusting connection of Posts to curb Diaphragms. The riveting of Posts to curb Diaphragms to be the final operation.

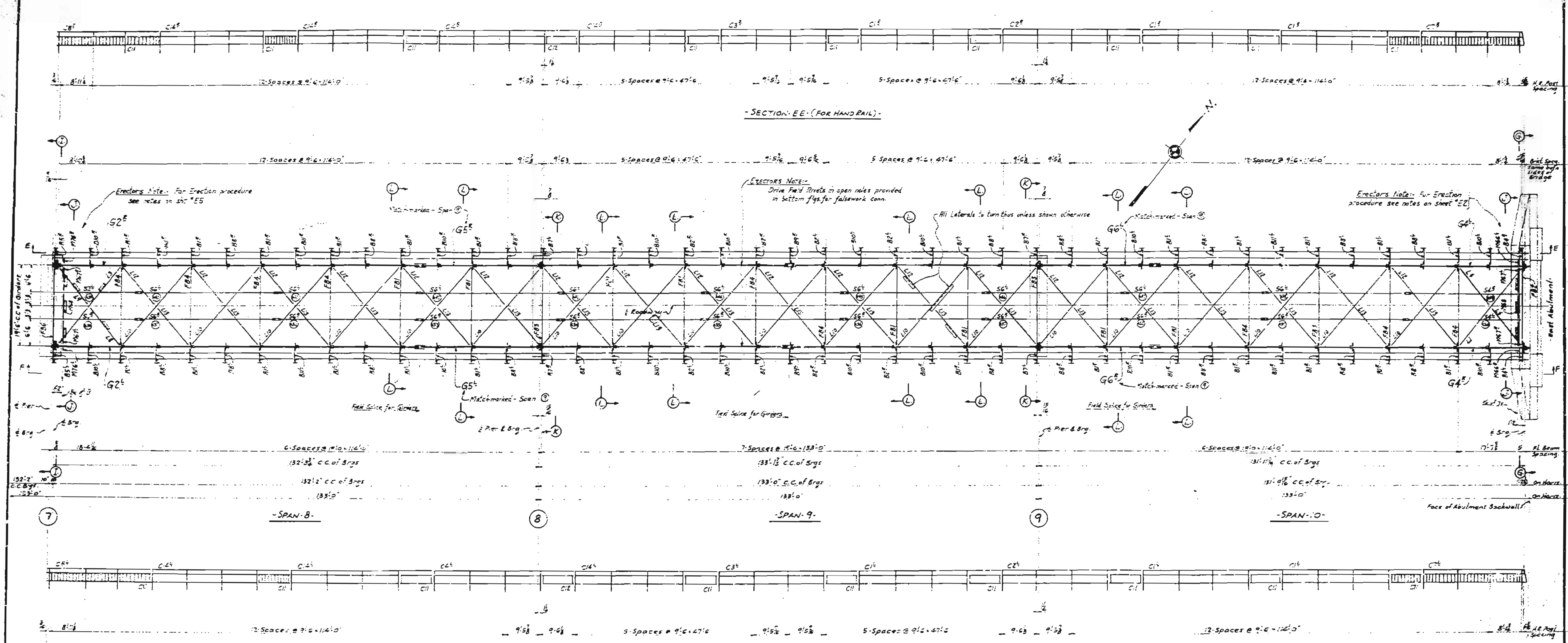
NOTE: At this Pier it will be necessary that both Cross Frame Struts be erected before Floor Beams above are set.

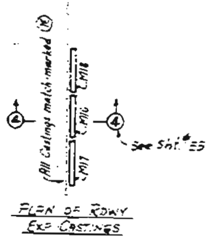
NOTE:- Unless noted as on horizontal, all Longitudinal Dimensions are given parallel to grade for 60° Fahr. under full dead load. For General Notes see Sheet #E6. For Sections not shown see Sheet #E7

1-98

ERECTION PLAN - SPANS ⑤-⑥-⑦

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jonkis   MADE BY KKY
CHECKED BY 9-21-39   TRACED BY C.A.H.
REVISED 1 Notes   LAST REVISION NO.
SHOP NO.
CONTRACT C93409   SHEET E5


-SECTION-EE-(FOR HAND RAIL)-
12-Spaces @ 9'-6 = 114'-0"
5-Spaces @ 9'-6 = 47'-6"
H.R. Post Spacing
N.
Erectors Note:- For Erection procedure see notes on sht #E5
Erectors Note:- Drive Field Rivets in open holes provided in bottom flgs. for falsework conn.
All Laterals to turn thus unless shown otherwise
Erectors Note:- For Erection procedure see notes on sheet #E2
Matchmarked - Span 8
Matchmarked - Span 9
Matchmarked - Span 10
Field Splice for Girders
East Abutment
6-Spaces @ 19'-0 = 114'-0"
7-Spaces @ 19'-0 = 133'-0"
132'-3 3/4" c.c. of Brgs
133'-1 1/2" c.c. of Brgs
133'-0" c.c. of Brgs
Fl. Beam Spacing
On Horiz.
Face of Abutment Backwall
7
8
9
-SPAN-8-
-SPAN-9-
-SPAN-10-
-VIEW-FF-(FOR HAND RAIL)-



PLAN OF RDWY.
EXP. CASTINGS

243

GENERAL NOTES FOR APPROACH SPANS #1, 2, 5, 6, 7, 8, 9 & 10

① All erection marks are painted on members in shop on same ends of members as marks appear on Plans. Members shall be erected with marks in these positions. If marks appear on Plans at middle of members, such members are symmetrical and may be turned end for end in erection.

② Main Girder Sections have been Shop assembled for each complete continuous Girder and Field Splices reamed. Middle Girder sections at Spans #6 and #9 have been match marked at Shop as shown on Plans. Erect these particular Girder Sections as per these match marks. Stringers have been shop assembled and Splices reamed. To insure placing these Stringers in field in same order as they were reamed, Stringers have been match marked at Shop as shown on Plans thus: ⓀⒻ, ⓀⒼ, ⓀⒽ, ⓀⒾ etc. Erect these Stringers properly according to match marks.

③ (a) Curbs shall be adjusted laterally so that they are not more than 1/8" out of a straight line in any 25'-0 length. Lateral adjustment of curbs (except at Piers and Abutments) shall be done by sliding curbs on brackets to proper positions, and reaming holes in brackets for connection of curb diaphragms - See Sections.

(b) Tops of curbs and handrails shall not vary more than 1/4" from required grades and elevations. Since main girders are cambered for full dead load, no vertical adjustment can be made before slabs are poured, except at piers and abutments as noted elsewhere under "Procedure for Erection," or as may seem necessary by general inspection by inserting shims #M75 under diaphragms. After slabs are poured, if further vertical adjustment be found necessary it must be accomplished by knocking out rivets connecting 18" curb channels to diaphragms, inserting shims and reaming as is found necessary. Shims for this purpose shall be ordered from shop as required.

(c) Top rails of Handrail shall be adjusted laterally after slabs are poured to be not more than 1/16" out of straight lines at handrail posts. Such adjustment shall be made by adjusting connections of handrail posts to curb diaphragms. The riveting of Handrail Posts to Curb diaphragms is to be the final operation.

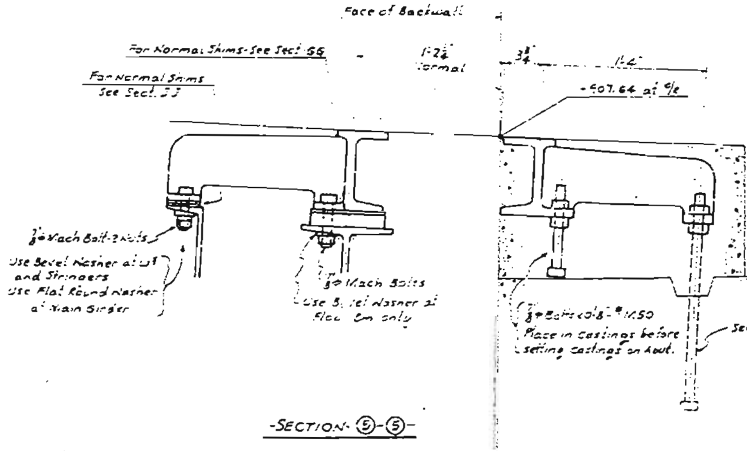
④ Lateral adjustment of roadway Expansion Joints shall be simultaneous with lateral adjustment of adjacent curbs. Such adjustment shall be accomplished as noted elsewhere under "Procedure of Erection" at these points. Vertical adjustment of Expansion Joints shall be accomplished by use of the additional Shims #M69, M72, M73 & M74 furnished for this purpose.

⑤ All field connections shall be riveted except as follows:
(a) Girders to be bolted to Bearings with turned bolts as shown on Sheet #E1.
(b) Roadway Expansion Castings to be bolted to supporting steel with machine bolts.
(c) Bulb angles and Tees in Hand Rail to be bolted to Posts with 5/8" hemi-spherical head bolts. Each bolt to be provided with one Hex. Nut and one Boss Hex. Lock Nut. Hemi-spherical heads of bolts to be on top of Rails and towards center line of Roadway.
(d) Butt of curbs to be bolted to Brackets-M66E with machine bolts.
(e) Joints between Roadway Expansion Castings on Abutments to be bolted with machine bolts.
(f) Curb Brackets #B6E & B7E at Piers #1, 5, 6, 8 & 9 to be connected to Girder Stiffeners with rib bolts with Anco Lock Nuts. - See Section "KK" Sheet #E7
(g) Cross Frame Struts #6, and Curb Brackets B5E at piers #2 & 4 to be connected to Girder Stiffeners with rib bolts with Anco Lock Nuts. - See Section "HH" Sheet #E7

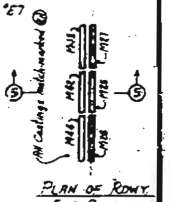
⑥ Expansion Castings have been shop assembled for each Pier and Abutment, adjusted for fit, and match marked as shown on Plans. Castings to be erected according to these match marks.

ERECTOR'S NOTE:-
See sketch on sheet #E5 for method to be used to set curb sections betw. Pier #4 & East Abut.

NOTE:-
Unless noted as "on horizontal" all longitudinal Dimensions are given parallel to grade at 60° Fahr. under full dead load.
For Sections not shown on this sheet see sheet #E7


For Normal Shims - See Sect. GG
For Normal Shims See Sect. JJ
Face of Backwall
1'-2 3/4" Normal
3 3/4"
1'-4"
-407.64 at c/l
3/4" Mach. Bolts & Nuts and Stringers
Use Bevel Washer at c/l and Stringers
Use Flat Round Washer at Main Girder
5/8" Mach. Bolts
Use Bevel Washer at Flange only
7/8" Bolts-Std. #M50
Place in castings before setting castings on Abut.
See Sht. #E1

-SECTION-⑤-⑤-



PLAN OF RDWY.
EXP. CASTINGS.

L-98

-ERECTION PLAN-SPANS-⑧-⑨-⑩-

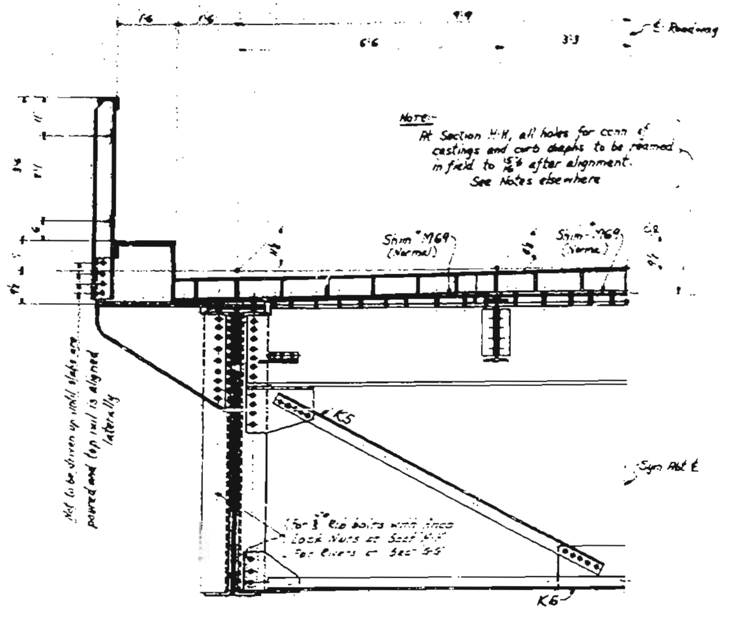
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY MISSOURI

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago

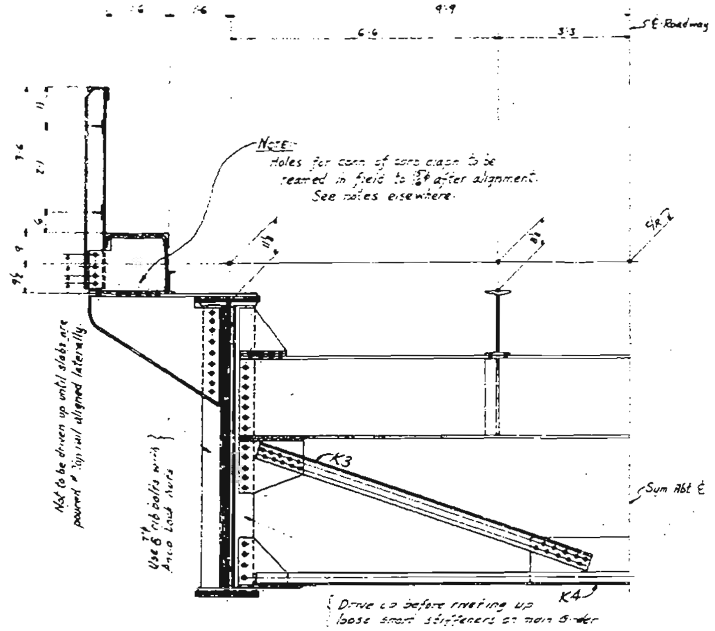
TEMP.	
SUPT.	
LAYOUT	
FITTER	
SHOP INSP.	
FG. INS.	
B. SMITH	
MCH.	
ENGR.	
O. INST.	

IN CHARGE Jenks — MADE BY J.V.V.
CHECKED BY [illegible] — TRACED BY C.A.N. [illegible]
REVISED [illegible] — LAST REVISED [illegible]

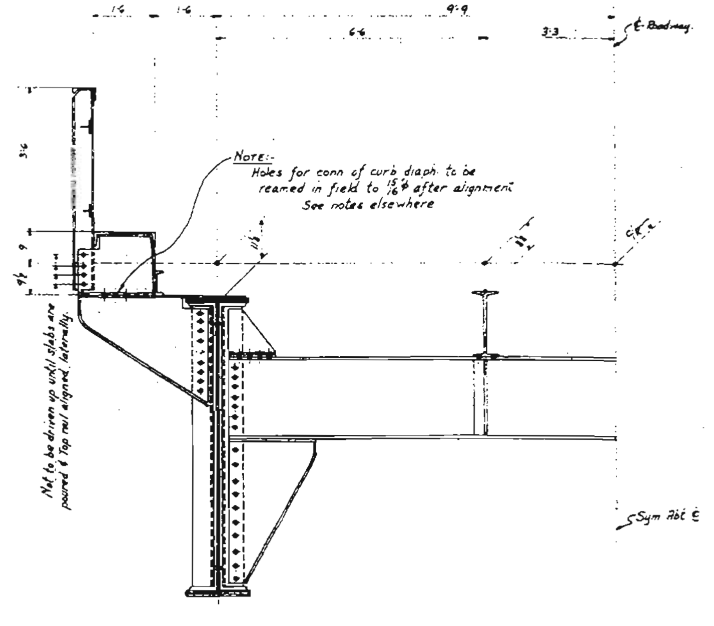
SHOP NO.
CONTRACT CG 3409
SHEET ⒺⒼ


1·6
1·6
9·9
6·6
3·3
℄ Roadway
Note:-
At Section H-H, all holes for conn of castings and curb diaphs to be reamed in field to 15/16 ϕ after alignment.
See Notes elsewhere
Shim #M69 (Normal)
Shim #M69 (Normal)
K5
K6
Sym Abt ℄
For 7/8" Rib bolts with Anco Lock Nuts at Sect H-H
For Rivets at Sect G-G
Not to be driven up until slabs are poured and top rail is aligned laterally

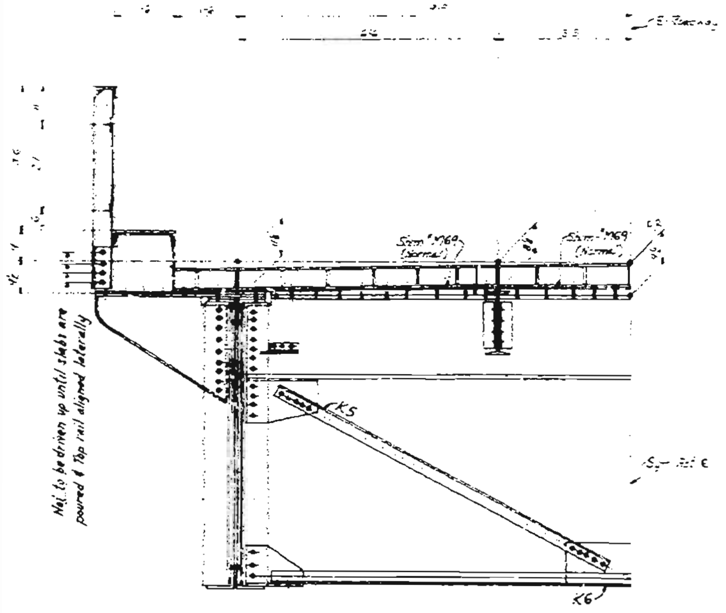
SECTIONS Ⓖ Ⓖ & Ⓗ Ⓗ


1·6
1·6
9·9
6·6
3·3
℄ Roadway
Note:-
Holes for conn of curb diaph to be reamed in field to 15/16 ϕ after alignment.
See notes elsewhere.
K3
K4
Sym Abt ℄
Use 7/8" rib bolts with Anco Lock Nuts
Not to be driven up until slabs are poured & Top rail aligned laterally.
Drive up before riveting up loose short stiffeners at main Girder

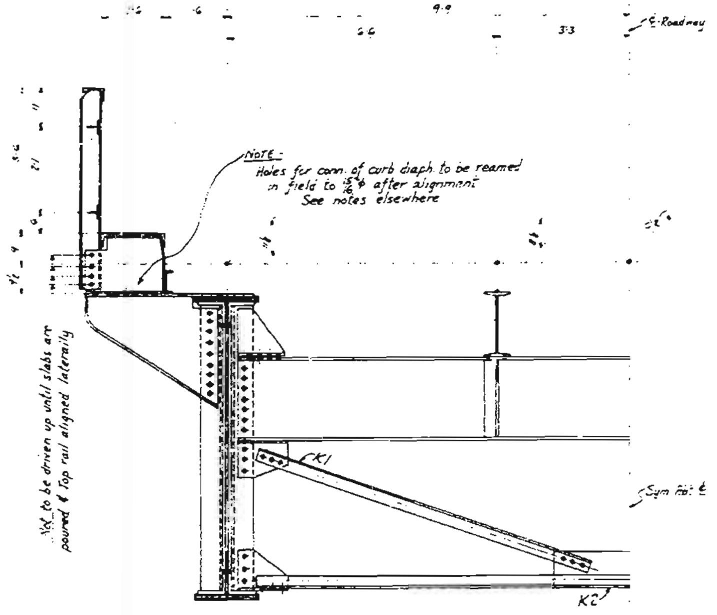
SECTION Ⓚ Ⓚ


1·6
1·6
9·9
6·6
3·3
℄ Roadway.
Note:-
Holes for conn of curb diaph to be reamed in field to 15/16 ϕ after alignment
See notes elsewhere
Sym Abt ℄
Not to be driven up until slabs are poured & Top rail aligned laterally.

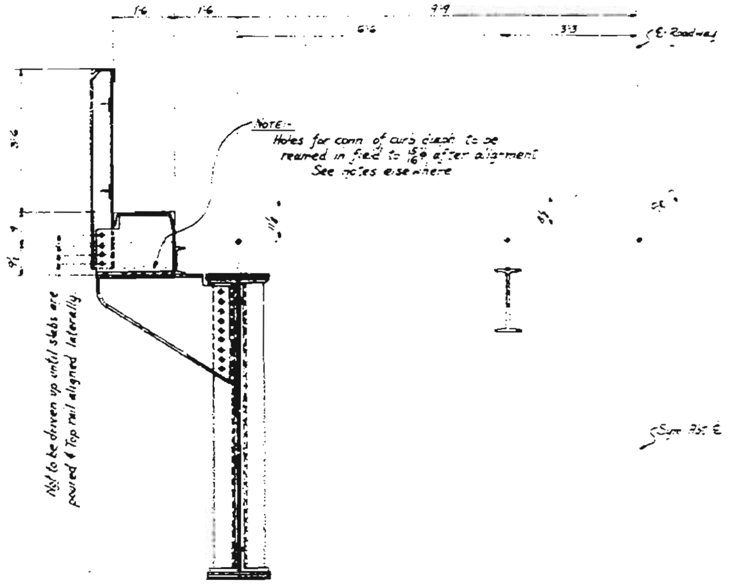
TYPICAL SECTION AT FLOOR BEAM
WHERE NO CROSS FRAME


℄ Roadway
Shim #M69 (Normal)
Shim #M69 (Normal)
K5
K6
Sym Abt ℄
Not to be driven up until slabs are poured & Top rail aligned laterally

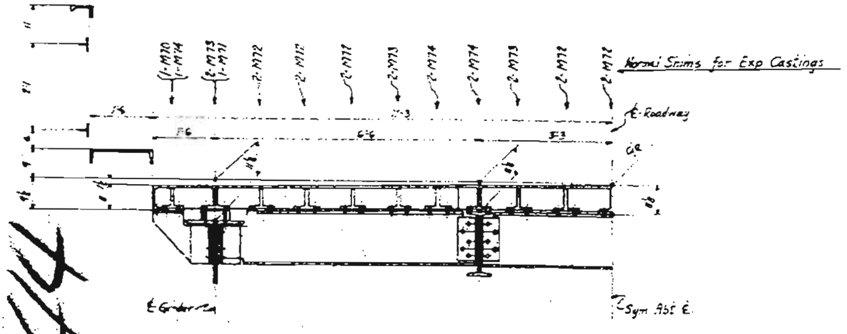
SECTION Ⓘ Ⓘ


9·9
6·6
3·3
℄ Roadway
Note-
Holes for conn. of curb diaph. to be reamed in field to 15/16 ϕ after alignment
See notes elsewhere
K1
K2
Sym Abt ℄
Not to be driven up until slabs are poured & Top rail aligned laterally

SECTION Ⓛ Ⓛ


1·6
1·6
9·9
6·6
3·3
℄ Roadway
Note:-
Holes for conn of curb diaph to be reamed in field to 15/16 ϕ after alignment
See notes elsewhere
Sym Abt ℄
Not to be driven up until slabs are poured & Top rail aligned laterally.

TYPICAL SECTION AT CURB BRKTS BETW FLOOR BMS



SECTION Ⓙ Ⓙ

244

Note:-
For location of sections see sheets #E2, E5 & E6.
For General Notes see sheet #E6

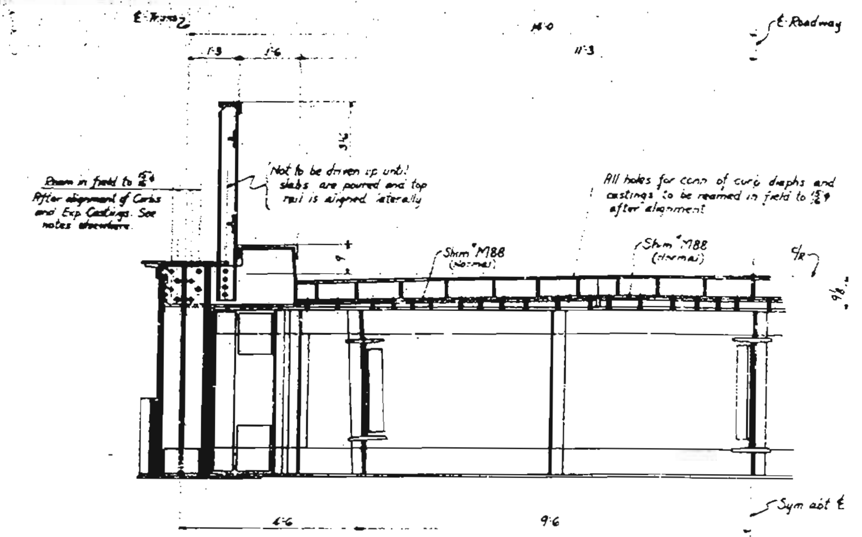
L-98

CROSS SECTIONS FOR APPROACH SPANS

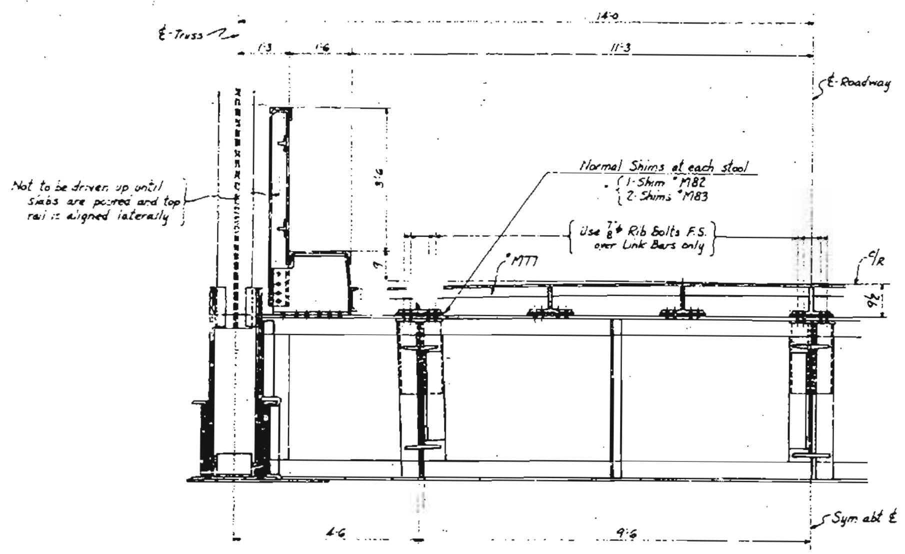
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago

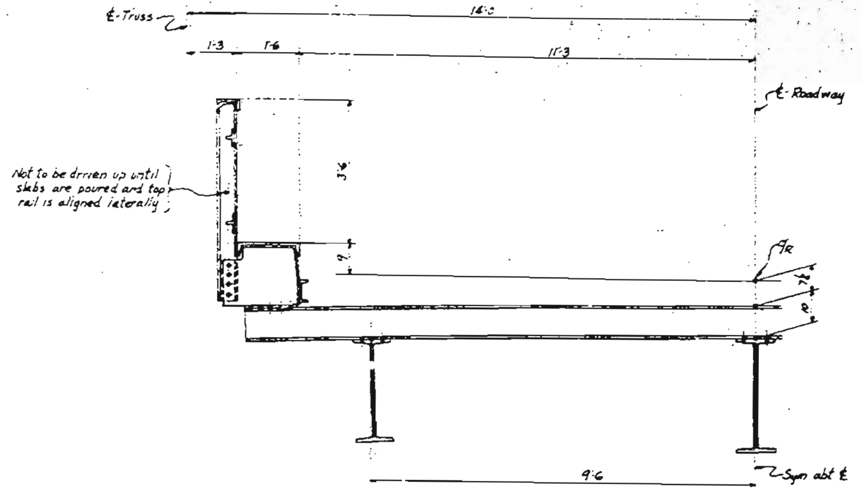
IN CHARGE - Jenks MADE BY JEV
CHECKED BY [illegible] TRACED BY BK
REVISED 8/4/[illegible] LAST REVISED
SHOP NO. CONTRACT CG 3407 SHEET E7


℄ Truss
℄ Roadway
14'-0
11'-3
1'-3
1'-6
Ream in field to 15/16"⌀ After alignment of Curbs and Exp Castings. See notes elsewhere
Not to be driven up until slabs are poured and top rail is aligned laterally
All holes for conn of curb diaphs and castings to be reamed in field to 15/16"⌀ after alignment
Shim #M88 (Normal)
Shim #M88 (Normal)
4'-6
9'-6
Sym abt ℄

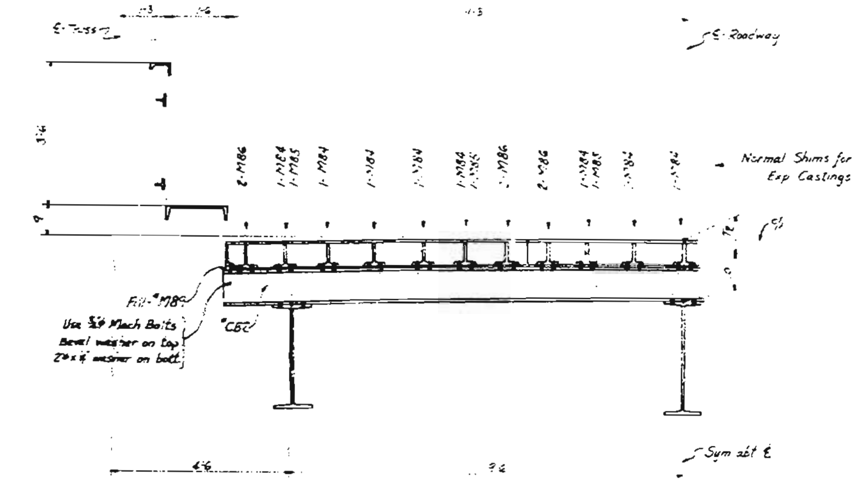
SECTION Ⓡ Ⓡ


℄ Truss
℄ Roadway
14'-0
1'-3
1'-6
11'-3
3'-6
Not to be driven up until slabs are poured and top rail is aligned laterally
Normal Shims at each stool
1-Shim #M82
2-Shims #M83
Use 7/8"⌀ Rib Bolts F.S. over Link Bars only
#M77
4'-6
9'-6
Sym abt ℄

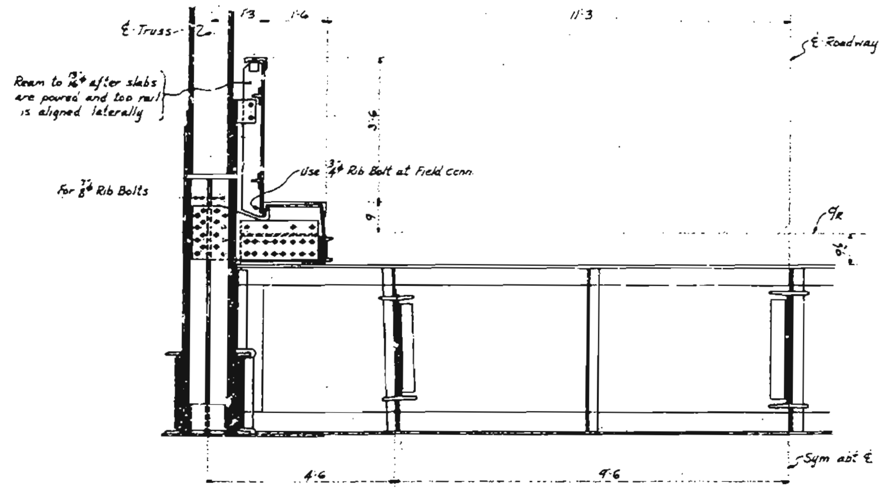
SECTION Ⓥ Ⓥ


℄ Truss
14'-0
1'-3
1'-6
11'-3
℄ Roadway
3'-6
Not to be driven up until slabs are poured and top rail is aligned laterally
9'-6
Sym abt ℄

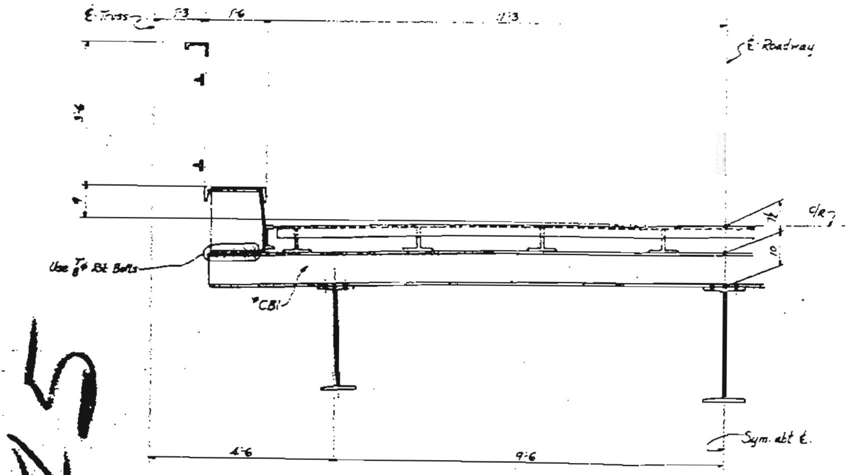
TYPICAL SECTION AT LONG CROSS BEAMS


℄ Truss
℄ Roadway
1'-3
1'-6
11'-3
3'-6
Normal Shims for Exp Castings
Fill-#M85
Use 3/4"⌀ Mach Bolts Bevel washer on top 2"x1/4" washer on bolt
#CB2
4'-6
9'-6
Sym abt ℄

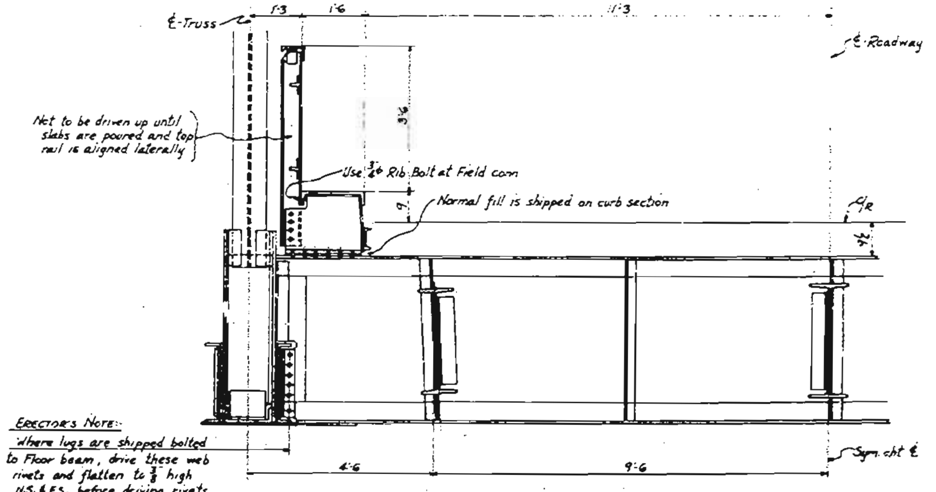
SECTION Ⓢ Ⓢ


℄ Truss
1'-3
1'-6
11'-3
℄ Roadway
Ream to 15/16"⌀ after slabs are poured and top rail is aligned laterally
For 7/8"⌀ Rib Bolts
Use 7/8"⌀ Rib Bolt at Field conn
3'-6
4'-6
9'-6
Sym abt ℄

SECTION Ⓦ Ⓦ



SECTION Ⓤ Ⓤ


℄ Truss
1'-3
1'-6
11'-3
℄ Roadway
Not to be driven up until slabs are poured and top rail is aligned laterally
3'-6
Use 7/8"⌀ Rib Bolt at Field conn
Normal fill is shipped on curb section
4'-6
9'-6
Sym abt ℄

TYPICAL SECTION AT FLOOR BEAMS

ERECTOR'S NOTE:-
Where lugs are shipped bolted to Floor beam, drive these web rivets and flatten to 1/8" high N.S. & F.S. before driving rivets thru other lugs to trusses.

NOTES ON FIELD BOLTING & RIVETING FOR SPANS #3 & #4.

All field connections to be riveted except as noted below.

(a) Trusses to be bolted to bearings with turned bolts as shown on Sheet #E1.
(b) Roadway Exp Castings to be bolted to supporting steel with machine bolts. See Sheets #E2 & #E5.
(c) [illegible] on curb sections to be bolted to Cross Beams #CB2 at piers #2 & #4 with machine bolts. See Section S-S
(d) Bottom laterals to be bolted to lugs on bottom of stringers with machine bolts with Anco Lock Nuts - See detail on sheet #E3.

(f) The following connections to be made with Rib Bolts with Anco Lock Nuts:-
① Connections of handrail posts to rear flg of 18" curb E1 - See sections on this sheet.
② Connections to truss diaphragms at L12 for gussets to curb diaphragms - See section W-W.
③ Connections of Exp Guard #M77 to Floor Beams at L4, L8, L16 & L20 where link bars below prevent driving rivets - See section V-V.
④ Connection of curb diaphragms to cross beams #CB1 at L4, L8, L16 & L20 - see section U-U.
⑤ Certain holes at bottom of top chords of trusses at U11 & U13 - See detail sheets #32, 38 & #39.
⑥ Certain holes for connection of top struts "TS1" to trusses at U11 & U13 - See detail shts. #33, 34, 40 & #41

(g) Bulb angles and tees to be field bolted to handrail posts with 5/8"⌀ semi-spherical head bolts provided with one Hex Nut and one Hex Boss Lock Nut. For slotted holes at L4, L8, L16 & L20 round washers also to be used. Round Heads to be on top and inside face of railing.

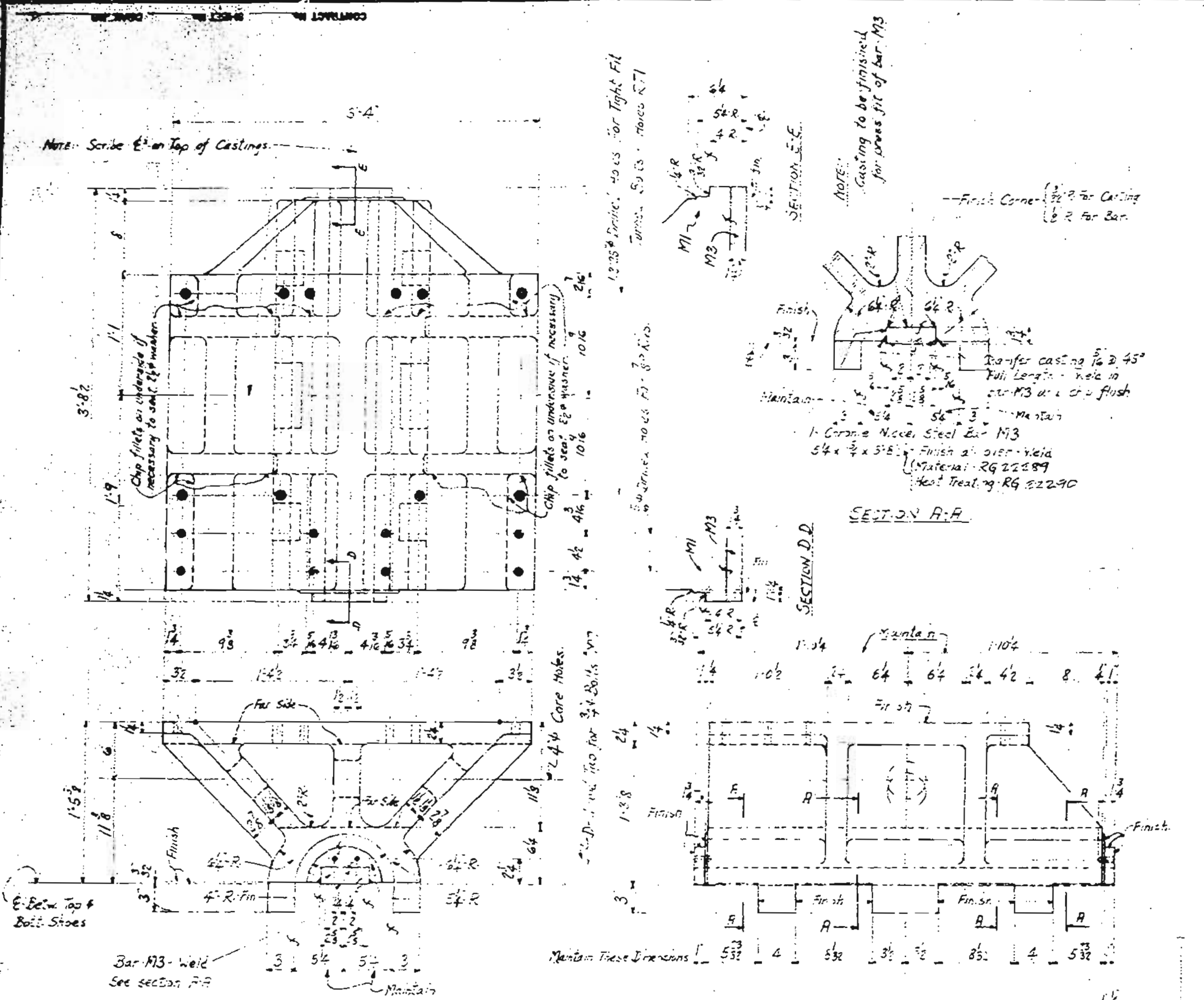
Special Jamb Riveters to be used to drive following:-
(a) Rivets in bottom chord splices where blocked by bottom laterals.
(b) Rivets in top chord splices where blocked by top laterals.
(c) Rivets in bottom flgs. of top struts where blocked by sway diagonals.
(d) Rivets in joints L0 & L24 where blocked by curb sections.
(e) Rivets in joints L10 & L14 where blocked by curb sections
(f) Rivets in joint L12 where blocked by curb sections

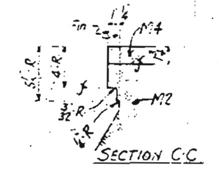
NOTES:-
For location of sections see sheets #E3 & #E4
For general notes see sheet #E4.

L-98

245

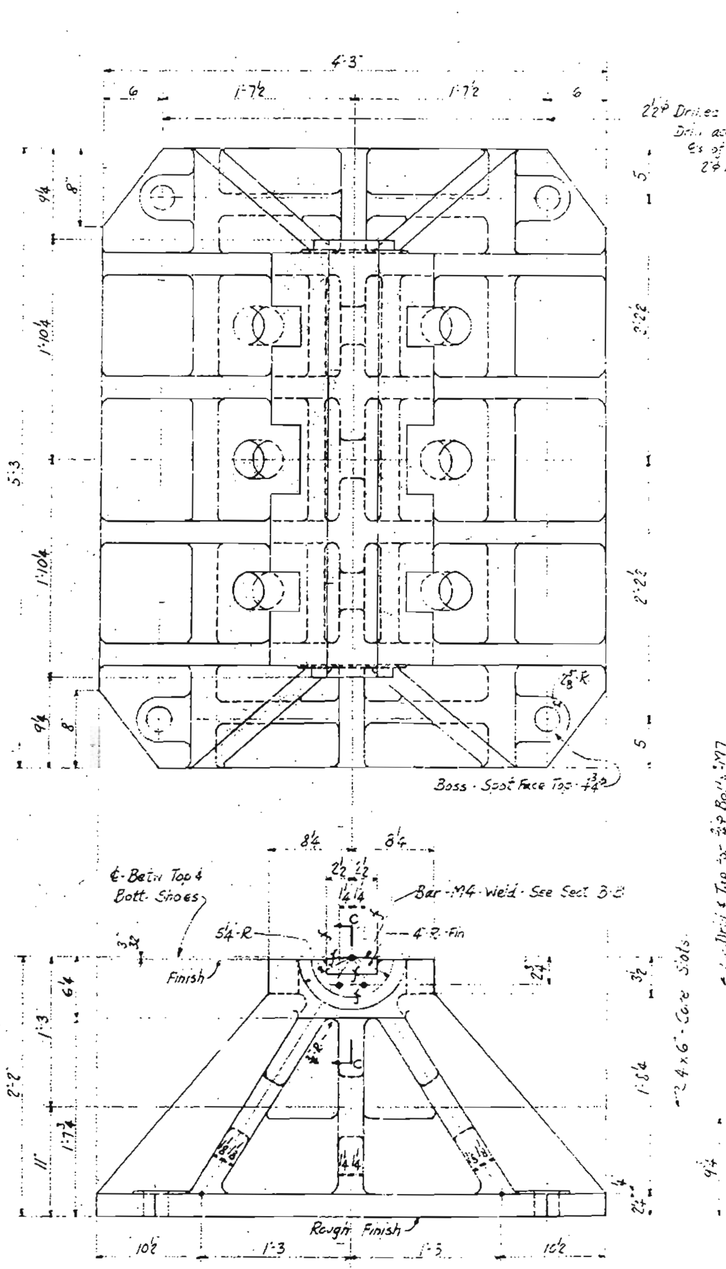
CROSS SECTIONS FOR TRUSS SPANS
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
[illegible]
SHOP NO.
CONTRACT CG 3[illegible]

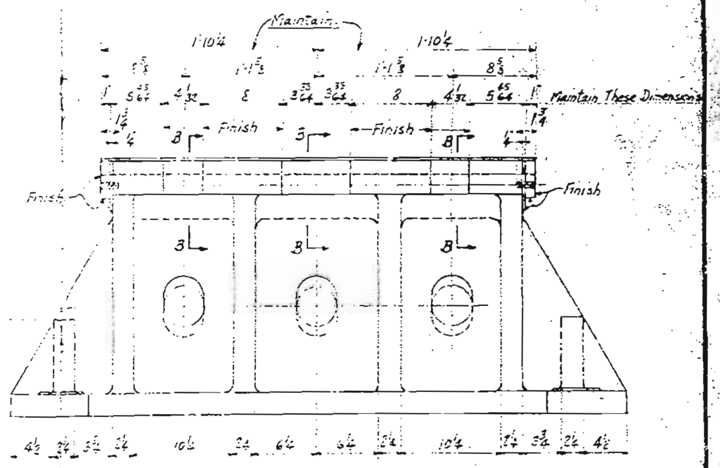

Note:- Scribe ℄ on Top of Castings.
3'-4"
Chip fillets as necessary to seat 2¼" washers
Section A-A
1-Chrome Nickel Steel Bar-M3 5¼ x 3/4 x 3'-5½. Finish all over-Weld
Material-RG 22289
Heat Treating-RG 22290
Chamfer casting 5/16 @ 45° Full Length-Weld in Bar M3 and chip flush
Finish Corner-{ 1/16 R For Casting, 1/8 R For Bar
Note:- Casting to be finished for press fit of Bar M3
Section E-E
Section D-D
2-4 Core Holes
Maintain
Maintain These Dimensions
Fin Side
Finish
℄ Betw. Top & Bott. Shoes
Bar M3-Weld See section A-A
Maintain



TOP SHOE - M1

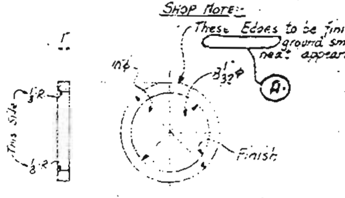
Material:- Cast Steel
ORD. RG 22288


4'-3"
2½" Drilled Holes Drill accurately to ℄s of Casting For 2¼" Anchor Bolts
Boss-Spot Face Top-4½"
℄ Betw. Top & Bott. Shoes
Bar-M4-Weld-See Sect. B-B
4 R Fin
5¼ R
Finish
2-4x6 Core Slots
Rough Finish



BOTTOM SHOE - M2

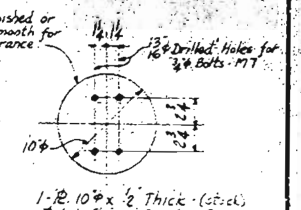
Material:- Cast Steel
ORD. RG 22288


Shop Note:- These Edges to be finished or ground smooth for neat appearance
A
Finish

1-PL 10"φ x 1" Thick (Stock) PL to be Flat and Free from Burrs

RING - M5

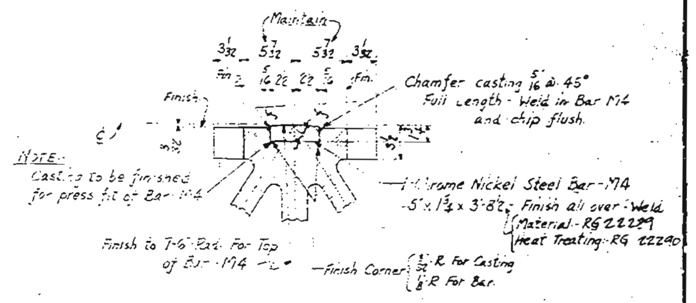
Material:- Structural Steel



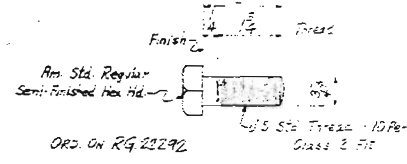
1-PL 10"φ x ½" Thick (Stock) PL to be Flat and Free from Burrs.

PLATE - M6

Material:- Structural Steel.


Maintain
Chamfer casting 5/16 @ 45° Full Length-Weld in Bar M4 and chip flush.
Note:- Casting to be finished for press fit of Bar M4
1-Chrome Nickel Steel Bar-M4 5 x 1¾ x 3'-8½. Finish all over-Weld
Material-RG 22289
Heat Treating-RG 22290
Finish to 7'-6" Rad. For Top of Bar-M4
Finish Corner-{ 1/16 R For Casting, 1/8 R For Bar.

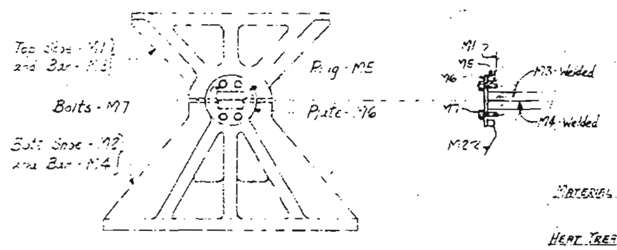
SECTION B-B


Finish
Thread
Am. Std. Regular Semi-Finished Hex Hd.
US Std. Thread-10 Per Inc. Class 3 Fit

ORD. ON RG 22292

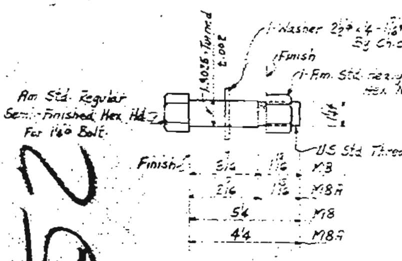
BOLTS - M7

Material:- Structural Steel



ASSEMBLY DIAGRAM

2-Assemblies Reqd. This For 1.3


1-Washer 2¼ x ¼ x 1⅛ Hole-Flatten By Chicago Works-Shop
Finish
1-Am. Std. Hvy Semi-Finished Hex Nut-1⅛ Tap
Am. Std. Regular Semi-Finished Hex Hd. For 1⅛ Bolt.
US Std. Thread-Class 2 Fit
M8
M8A

BOLTS ORD.-RG 22305

TURNED BOLTS-M8 & M8A

Material:- Structural Steel
No Paint
(For M1 to Truss)

252

GENERAL NOTES:-

MATERIAL SPECS:- Structural Steel:-ASTM-A7-34
Cast Steel:-ASTM-A27-36T-Grade B1-Annealed.
Chrome Nickel Steel:-SAE-3130 Forged & Annealed

HEAT TREATING:- Chrome Nickel Steel to be heat treated after finishing to produce following properties:-
(a) Ultimate Tensile Strength-125,000# Min.
(b) Yield Point-75,000# Min.
(c) Hardness-300 Brinell Min.

WORKMANSHIP SPECS:- Project Specifications.
MILL & SHOP INSP:- By R.W. Hunt Co.
CASTING FILLETS:- To have ½" Radius unless noted otherwise.
DRILLING:- Holes marked RT1 to be drilled thru a steel templet.

CHICAGO WORKS-BETH STEEL CO. (a) To provide M8 & M8A and ship same to site with superstructure proper.
(b) To provide M3, M4, M5, M6 & M7 completely finished (except painting) and ship same to supplier of castings for assembly.

SUPPLIER OF CASTINGS:- (a) To provide M1 & M2 completely finished
(b) To weld bars M3 & M4 into M1 & M2
(c) To assemble the two assemblies shown and ship same to site assembled.
(d) To do all cleaning and painting required for the assemblies.

SHOP PAINTING:- Shop contact surfaces to be cleaned but not painted. No Shop Paint where so noted.
Surfaces not in shop contact ~~but~~ inaccessible after shop assembly shall be given two coats of shop paint before assembly, first the shop paint and then the first coat of field paint.
All other surfaces to be given one shop coat of paint.
Shop paint to be an approved Red Lead Paint as per project specifications.
First field coat of paint to be an approved Brown Lead Paint as per project specifications. Ⓐ

Rev. Ⓐ 1/18/40

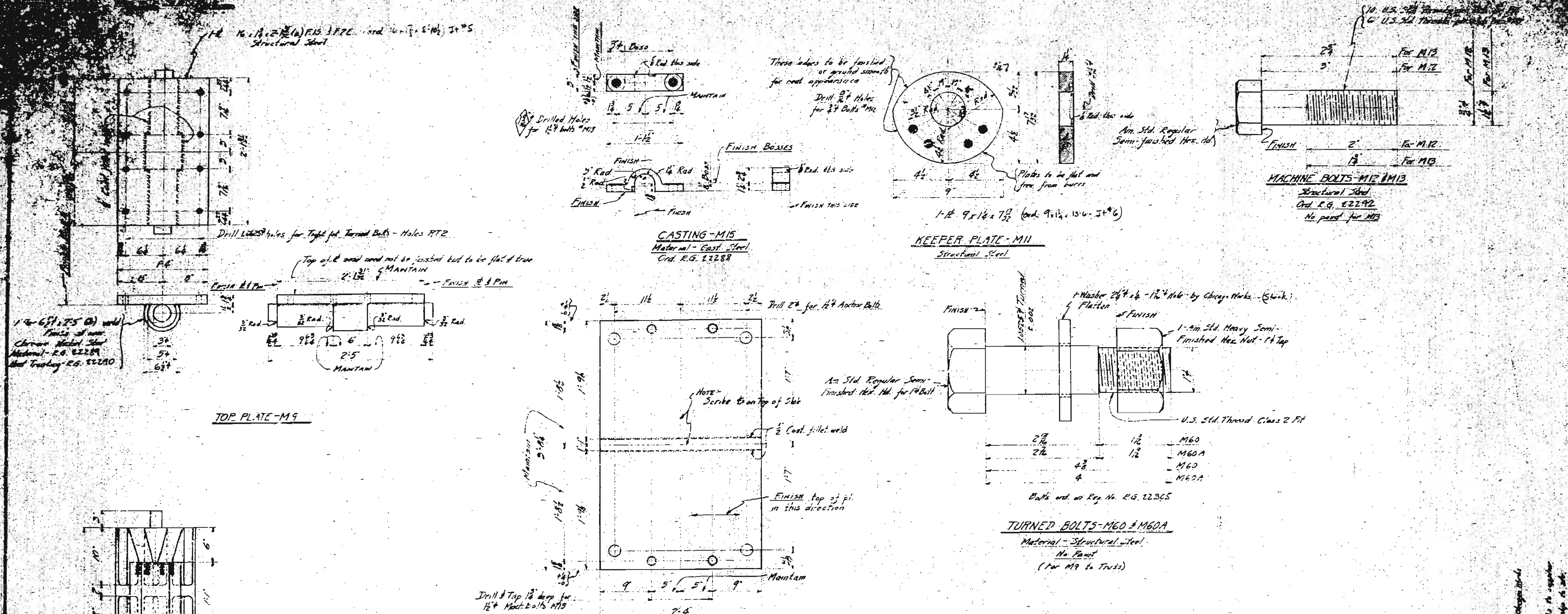
REQUIRED LIST

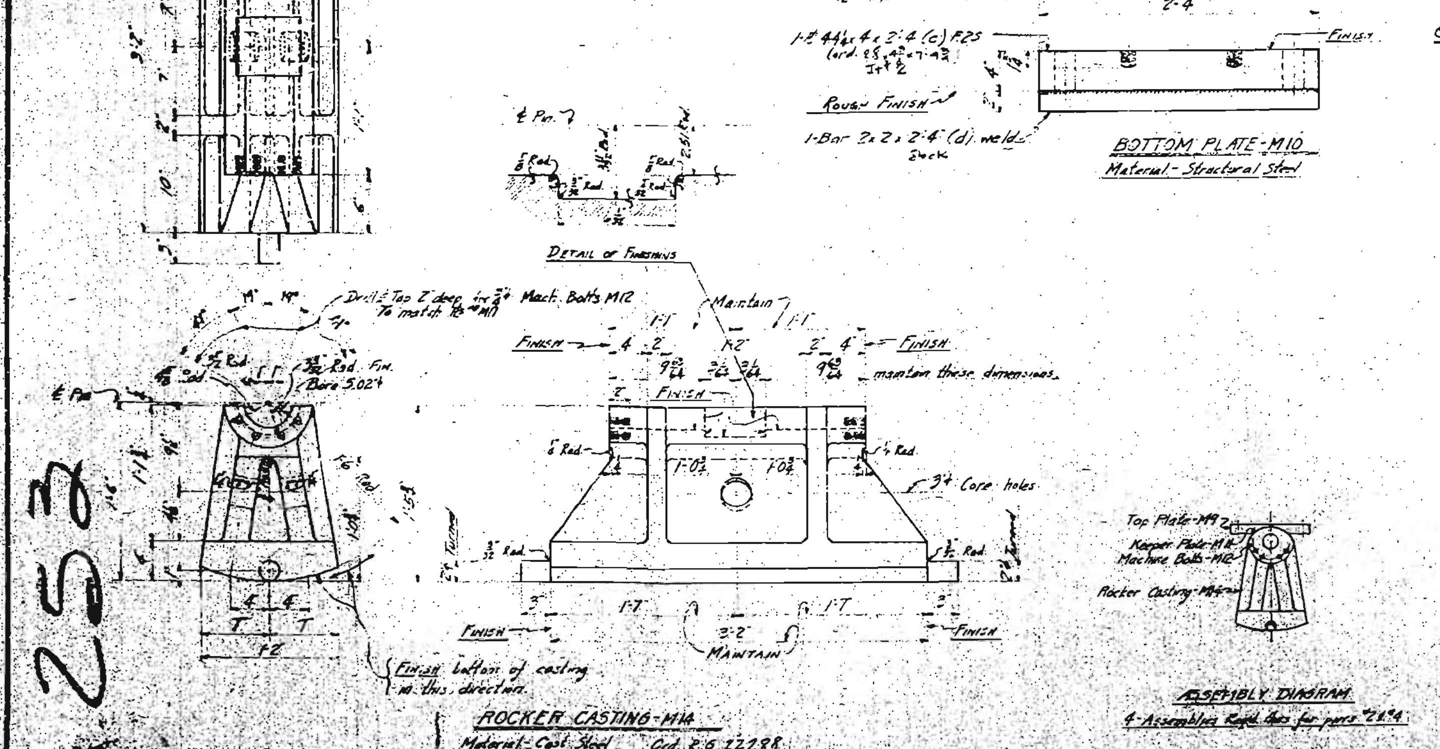
	No. REQ'D	DESCRIPTION	MARK	
By Supplier of Castings	2	Top Shoes	M1	Shipped Direct to Site by Supplier of Castings.
	2	Bott. Shoes	M2	
By Chicago Works	2	Bars	M3	Shipped by Chicago Wks. to Supplier of Castings who will reship direct to Site.
	2	do	M4	
	4	Rings	M5	
	4	Plates	M6	
	16	Bolts	M7	
	12	Turned Bolts	M8	Shipped direct to site by Chicago Wks.
	8	do	M8A	

RIVETS - None
OPEN HOLES - As Noted
REAM - None - All holes drilled.
MILLING - As Noted
PAINT - See General Notes.

L-98

BEARING DETAILS
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago-Fabrication at Chicago
IN CHARGE Jeaks MADE BY P.K.
CHECKED BY [illegible] 4/4/39 TRACED BY
REVISED LAST ASSEMBLY NO.
SHOP NO.
CONTRACT CG34093 SHEET ①


TOP PLATE-M9
1-Pl. 16 x 1¾ x 2'-1⁵⁄₁₆ (a) F15 & F2E
Structural Steel
Drill holes for Tight fit Turned Bolts - Holes RTZ
1-Pin 6½ x 2'-5 (d) weld
Chrome Nickel Steel
Finish & Pin
Top of ℄ and need not be finished but to be flat & true
MAINTAIN
CASTING-M15
Material - Cast Steel
Ord. R.G. 22288
Drilled Holes for 1⅛" bolts #M13
Finish Bosses
FINISH
KEEPER PLATE-M11
Structural Steel
These edges to be finished or ground smooth for neat appearance
Drill ⅞" Holes for ⅞" Bolts #M12
Plates to be flat and free from burrs
1-Pl. 9 x 1¼ x 7½
MACHINE BOLTS-M12 & M13
Structural Steel
Ord. R.G. 22292
No paint for M13
10 U.S. Std. Threads per inch for M12
6 U.S. Std. Threads per inch for M13
Am. Std. Regular Semi-finished Hex. Hd.
For M12
For M13
Drill 2" for 1⅞" Anchor Bolts
Scribe ℄ on Top of Slab
Cont. fillet weld
Finish top of pl. in this direction
TURNED BOLTS-M60 & M60A
Material - Structural Steel
No Paint
(For M9 to Truss)
1-Washer 2⅝" x ⅛ - 1⅞" hole - by Chicago Works - (Stock) Flatten
1-Am. Std. Heavy Semi-Finished Hex. Nut - 1⅛ Tap
Am. Std. Regular Semi-finished Hex. Hd. for 1⅛ Bolt
U.S. Std. Thread Class 2 Fit
M60
M60A
Bolts ord. on Req. No. R.G. 22305


Drill & Tap 1½" deep for 1⅛" Mach. bolts M13
1-Pl. 44½ x 4 x 2'-4 (c) F2S
Rough Finish
1-Bar 2 x 2 x 2'-4 (d) weld
Maintain
BOTTOM PLATE-M10
Material - Structural Steel
Detail of Finishes
Drill & Tap 2" deep for ⅞" Mach. Bolts M12 To match ⅞" M11
Bore 5.024
Finish
maintain these dimensions
¾" Core holes
Finish bottom of casting in this direction
ROCKER CASTING-M14
Material - Cast Steel
Ord. R.G. 22288
Top Plate-M9
Keeper Plate-M11
Machine Bolts-M12
Rocker Casting-M14
ASSEMBLY DIAGRAM
4-Assemblies Reqd. thus for piers #2 & #4

253

GENERAL NOTES:-

MATERIAL SPECS:- Structural Steel - A.S.T.M. - A7-34
Cast Steel - A.S.T.M. - A27-36T - Grade B1 - Annealed.
Chrome Nickel Steel - S.A.E. - 3130 - Forged and Annealed

HEAT TREATING:- Chrome Nickel Steel to be heat treated after forging to produce following properties:- (a) Ultimate Tensile Strength - 125,000 # Min.
(b) Yield Point - 75,000 # Min.
(c) Hardness - 300 Brinell Min.

WORKMANSHIP SPECS:- Project Specifications.

MILL & SHOP INSP:- By R.W. Hunt Co.

CASTING FILLETS:- To have ¾" radius unless noted otherwise.

DRILLING:- Holes marked RTZ to be drilled thru a steel templet.

CHICAGO WORKS - BETH STEEL CO.:- (a) To provide M10, M13, M60 & M60A and ship same to site with superstructure proper.
(b) To provide M9, M11 & M12 completely finished (except painting) and ship same to supplier of castings for assembly.

SUPPLIER OF CASTINGS:- (a) To provide M14 and M15 completely finished.
(b) To assemble the four assemblies shown and ship same to site assembled.
(c) To do all cleaning and painting required for the assemblies.

SHOP PAINTING:- Chrome Nickel Steel pins on M9, pin holes in M11, and bearing surfaces in M14 for pins to be given a coat of heavy grease before assembly.
Other shop contact surfaces to be cleaned but not painted.
No shop paint where so noted.
All other surfaces to be given one shop coat of paint.
Shop Paint to be an approved Red Lead Paint as per project specifications.

REQUIRED LIST

	Total Reqd.	Description	Mark	Extra
By Chicago Works	4	Top Plate	M9	
	4	Bottom Plate	M10	
	40	Keeper Plate	M11	
	160	Machine Bolt	M12	
	87	do	M13	7
By Supplier of Castings	4	Rocker Casting	M14	
	40	Casting	M15	
By Chicago Works	16	Turned Bolts	M60	
	16	do	M60A	

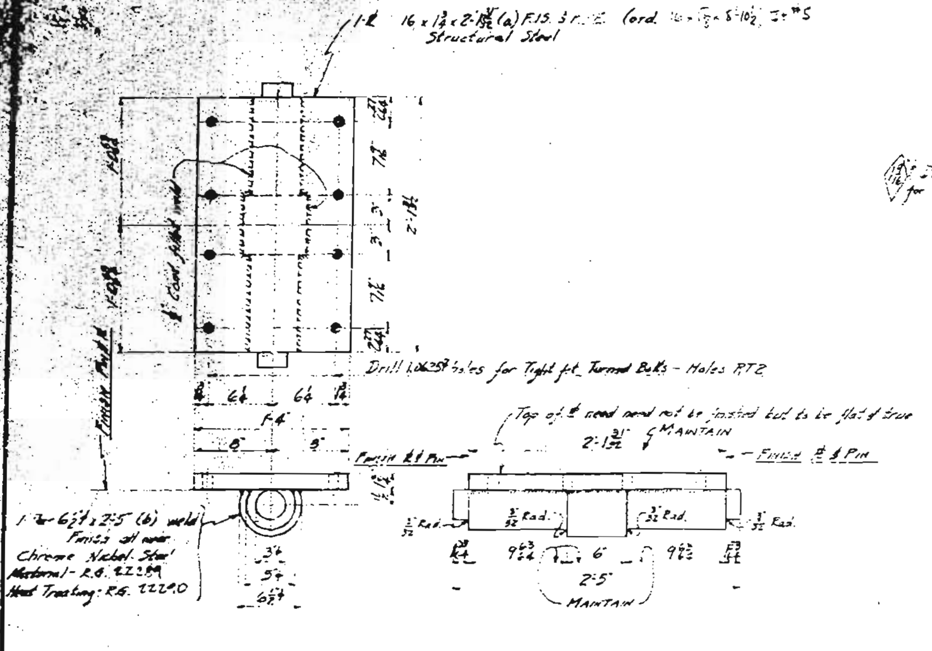
Note:- 32 Pl. M11 and 128 Bolts M12 to be used by supplier of castings for assemblies on piers 2 & 4.

L-98

RIVETS - None.
OPEN HOLES - As noted
[illegible] - None - [illegible]
[illegible] - As noted
[illegible]

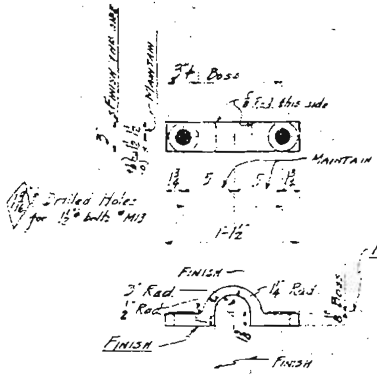
BEARING
M15
[illegible]

L-98



1-Pl 16 x 1¾ x 2-1½ (a) F.I.S. 3 r.t.c. (ord. ...) Structural Steel
Drill 1/16 holes for Tight fit Turned Bolts - Holes RTZ
Finish Pl. & Pin
Top of ℄ need need not be finished but to be flat & true
Maintain
Finish ℄ & Pin
1-Bar 6¾ x 2-5 (b) weld
Finish all over
Chrome Nickel Steel
Material - R.G. 22289
Heat Treating - R.G. 22290

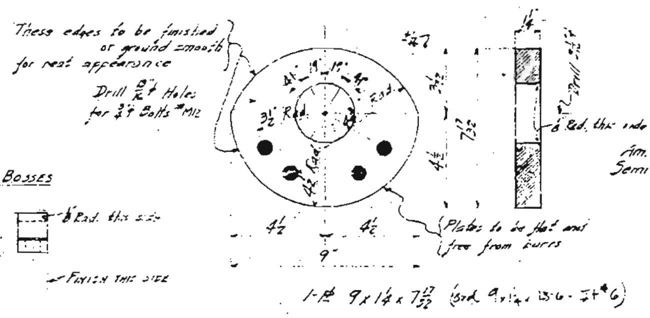
TOP PLATE-M9



CASTING-M15

Material - Cast Steel

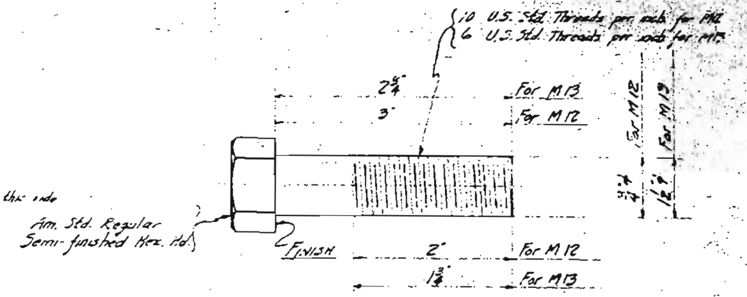
Ord. R.G. 22288



These edges to be finished or ground smooth for neat appearance
Drill 2⅞ Holes for 2¾ Bolts M12
Rad. this side
Plates to be flat and free from burrs
1-Pl 9 x 1¾ x 7½ (ord. ... 3-6 ...)

KEEPER PLATE-M11

Structural Steel



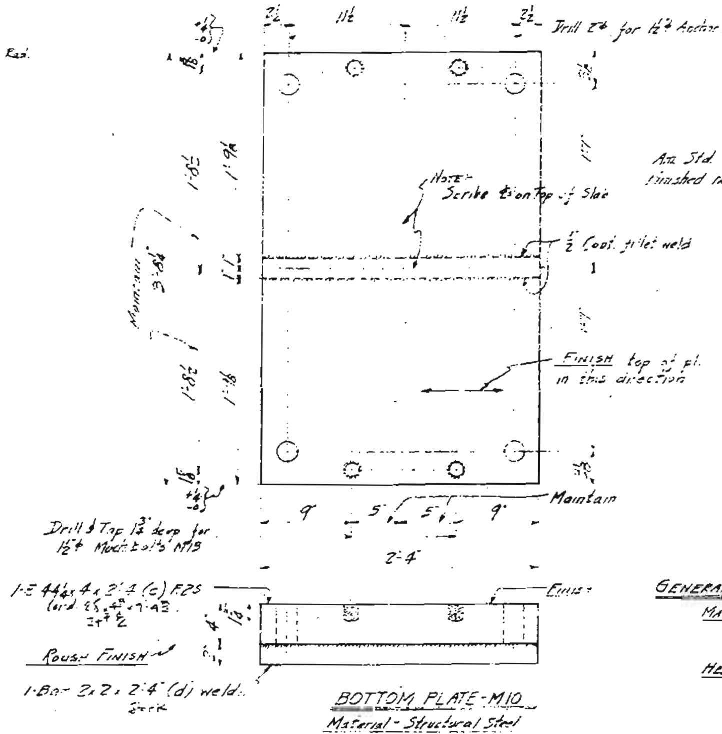
10 U.S. Std. Threads per inch for M12
6 U.S. Std. Threads per inch for M13
For M13
For M12
Am. Std. Regular Semi-finished Hex. Hd.
Finish
For M12
For M13

MACHINE BOLTS-M12 & M13

Structural Steel

Ord. R.G. 22290

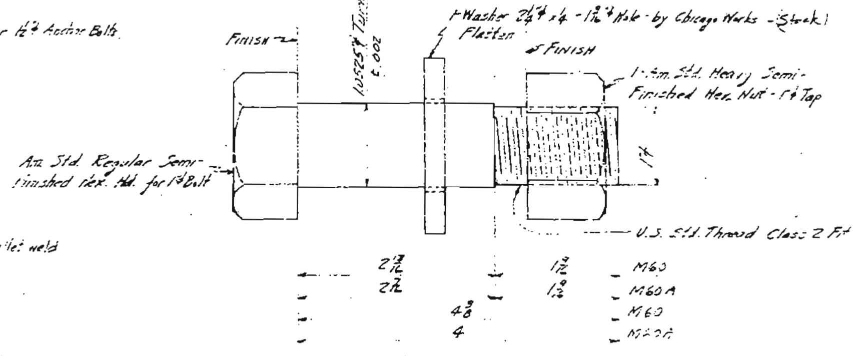
No paint for M13



Drill 2¼ for 1¾ Anchor Bolts
Note - Scribe ℄ on top of Slab
½ Cont. fillet weld
Finish top of pl. in this direction
Maintain
Drill & Tap 1⅞ deep for 1¾ Mach. Bolts M13
1-E 44½ x 4 x 2-4 (c) F.2.S
Rough Finish
1-Bar 2 x 2 x 2-4 (d) weld
Finish

BOTTOM PLATE-M10

Material - Structural Steel



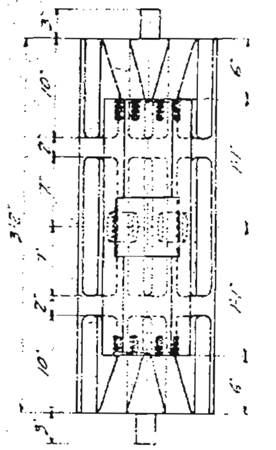
1-Washer 2¾ x ¼ - 1¾ Hole - by Chicago Works - (Stock) Plates
Finish
1-Am. Std. Heavy Semi-Finished Hex. Nut - 1¾ Tap
Am. Std. Regular Semi-finished Hex. Hd. for 1¾ Bolt
U.S. Std. Thread Class 2 Fit
M60
M60A
M60
M60A
Bolts ord. on Req. No. R.G. 22305

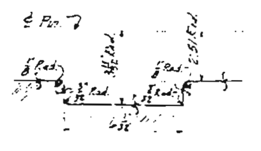
TURNED BOLTS-M60 & M60A

Material - Structural Steel

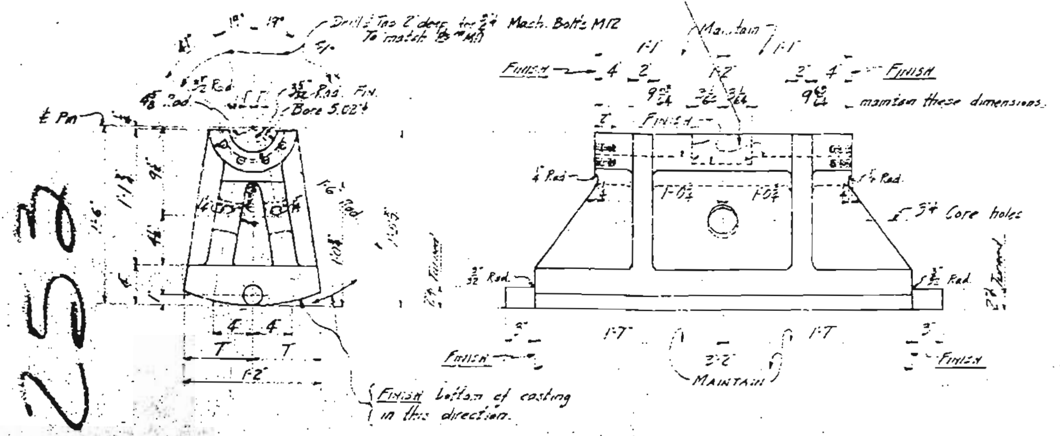
No Paint

(For M9 to Truss)





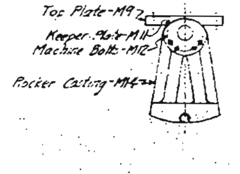
DETAIL OF FINISHING



Drill & Tap 2" deep for 2¾ Mach. Bolts M12 To match 1⅞ in M11
Bore 5.02¾
℄ Pin
Finish
Maintain
Finish
maintain these dimensions
3¾ Core holes
Finish
Maintain
Finish bottom of casting in this direction

ROCKER CASTING-M14

Material - Cast Steel   Ord. R.G. 22288



ASSEMBLY DIAGRAM

4-Assemblies Reqd. thus for piers #2 & 3

GENERAL NOTES:-

MATERIAL SPECS:- Structural Steel - A.S.T.M.-A7-34
Cast Steel - A.S.T.M.-A27-36T - Grade B1 - Annealed.
Chrome Nickel Steel - S.A.E.-3130 - Forged and Annealed

HEAT TREATING:- Chrome Nickel Steel to be heat treated after casting to produce following properties:- (a) Ultimate Tensile Strength - 125,000# Min
(b) Yield Point - 75,000# Min
(c) Hardness - 300 Brinell Min.

WORKMANSHIP SPECS:- Project Specifications.

MILL & SHOP INSP.:- By R.W. Hunt Co.

CASTING FILLETS:- To have ¾ radius unless noted otherwise.

DRILLING:- Holes marked RTZ to be drilled thru a steel templet.

CHICAGO WORKS - BETH. STEEL CO.:- (a) To provide M10, M13, M60 & M60A and ship same to site with superstructure proper.
(b) To provide M9, M11 & M12 completely finished (except painting) and ship same to supplier of castings for assembly.

SUPPLIER OF CASTINGS:- (a) To provide M14 and M15 completly finished.
(b) To assemble the four assemblies shown and ship same to site assembled.
(c) To do all cleaning and painting required for the assemblies.

SHOP PAINTING:- Chrome Nickel Steel pins on M9, pin holes in M11, and bearing surfaces in M14 for pins to be given a coat of heavy grease before assembly.
Other shop contact surfaces to be cleaned but not painted.
No shop paint where so noted.
All other surfaces to be given one shop coat of paint.
Shop Paint to be an approved Red Lead Paint as per project specifications.

REQUIRED LIST

	Total Reqd.	Description	Mark	Excess
By Chicago Works	4	Top Plate	M9	
	4	Bottom Plate	M10	
	40	Keeper Plate	M11	
	160	Machine Bolt	M12	
	[illegible]	do	M13	2
By Supplier of Castings	4	Rocker Casting	M14	
	40	Casting	M15	
By Chicago Works	16	Turned Bolts	M60	
	16	do	M60A	

Shipped to site by Chicago Works

Shipped by Chicago Works to supplier of castings who will reship to site

Shipped direct to site by supplier of castings

Note:- 32 Pls-M11 and 128 Bolts-M12 to be used by supplier of castings for assemblies on sht. #2

L-98

252

RIVETS - None.

OPEN HOLES - As noted.

REAM - None - Holes drilled.

DRILLING - As noted.

PAINT - See general notes.

BEARING DETAILS

MISSOURI RIVER BRIDGE

AT BROWNVILLE, NEBRASKA

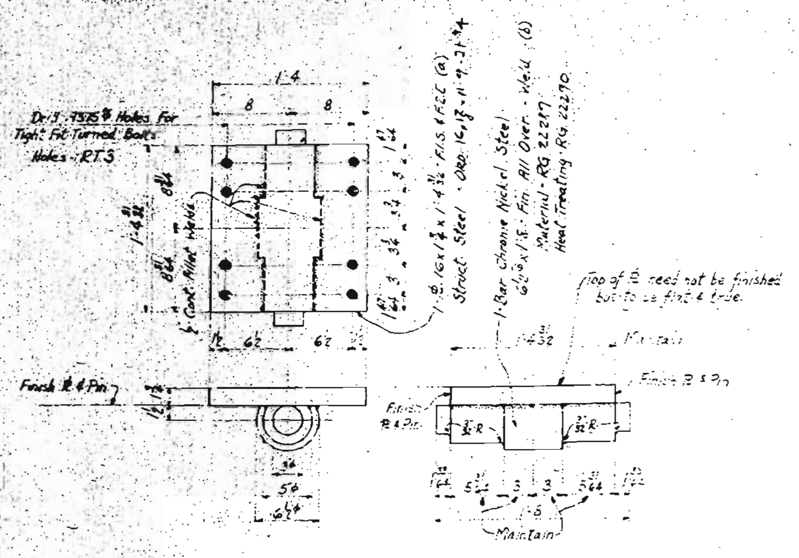
For Atchison County, Missouri.

BETHLEHEM STEEL COMPANY

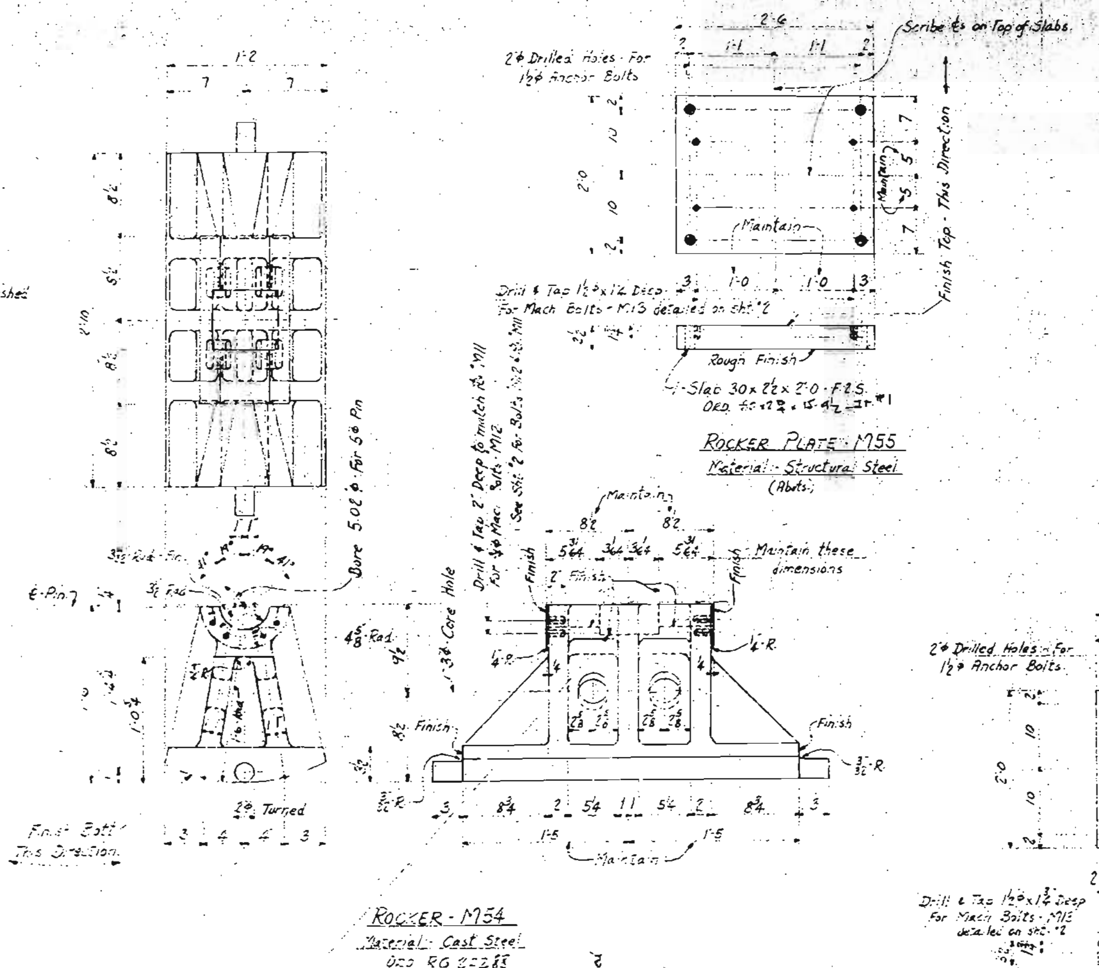
[illegible]

CHECKED BY S.V.H.

SHEET NO.

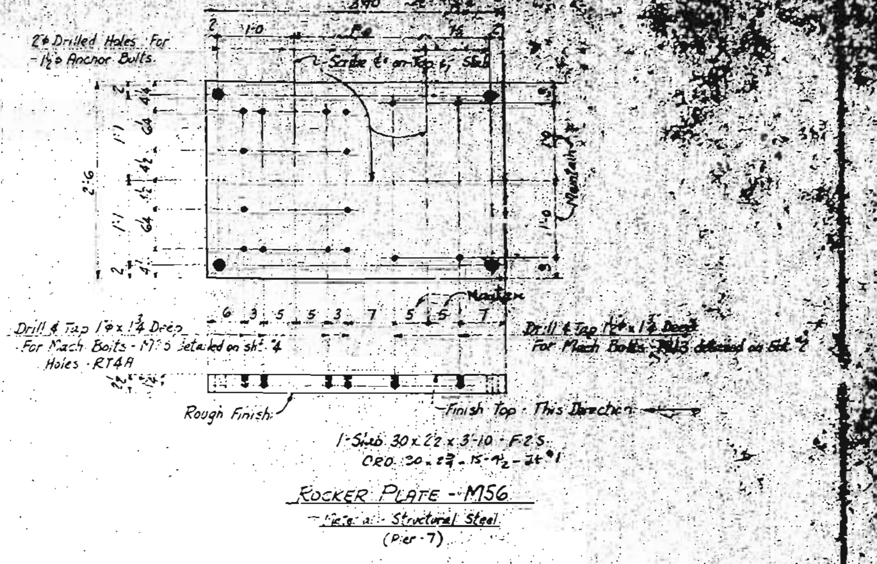

Dr. 3 - 15/16" Holes For Tight Fit Turned Bolts - Holes - RT3
1-4
8
8
Finish B & Pin
Top of B need not be finished but is to be flat & true.
Maintain
1-Bar Chrome Nickel Steel
Struct. Steel
Heat Treating RG 22270

TOP PLATE - M52

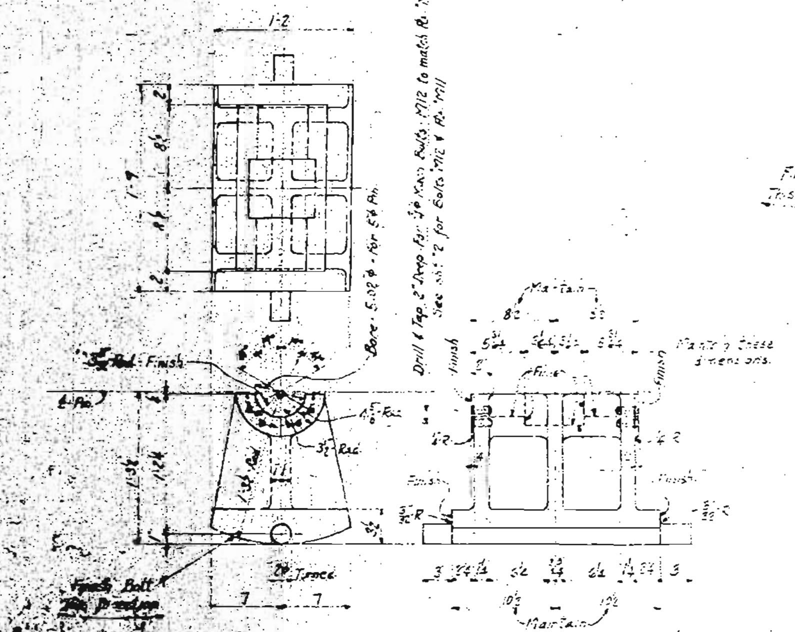

1-2
7
7
Bore 5.02" For 5" Pin
Finish Bott. This Direction
2" Turned
Drill & Tap 2" Deep to match Pl. M11
1-3" Core Hole
Maintain
Maintain these dimensions
Finish
2" Drilled Holes For 1¾" Anchor Bolts
Scribe ℄s on Top of Slabs
Maintain
Finish Top - This Direction
Drill & Tap 1½" x 1¼" Deep For Mach. Bolts - M15 detailed on sht. 2
Rough Finish
1-Slab 30 x 2½ x 2-0 - F.2.S.

ROCKER - M54
Material:- Cast Steel
Ord. RG 22265

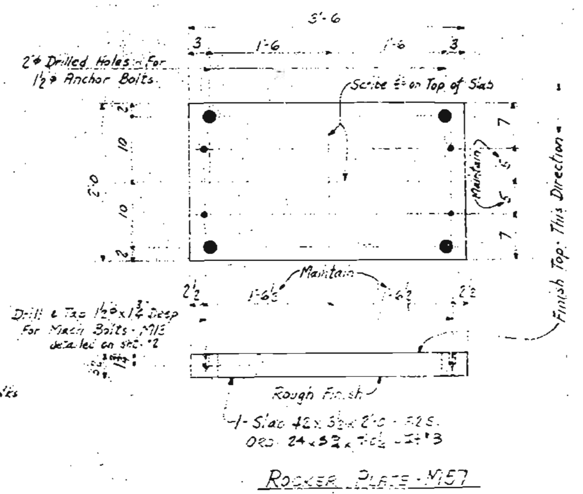
ROCKER PLATE - M55
Material:- Structural Steel
(Abuts.)


3-10
2" Drilled Holes For 1¾" Anchor Bolts
Scribe ℄s on Top of Slab
Maintain
Drill & Tap 1½" x 1¼" Deep For Mach. Bolts - M15 detailed on sht. 2
Holes - RT4A
Drill & Tap 1½" x 1¼" Deep For Mach. Bolts - M15 detailed on sht. 2
Rough Finish
Finish Top - This Direction
1-Slab 30 x 2½ x 3-10 - F.2.S.

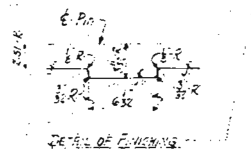
ROCKER PLATE - M56
Material:- Structural Steel
(Pier 7)


1-2
Drill & Tap 2" Deep for ¾" Mach. Bolts - M12 to match Pl. M11
Bore 5.02" For 5" Pin
Finish
℄ Pin
Maintain
Maintain these dimensions
Finish Bott. This Direction
2" Turned
Maintain

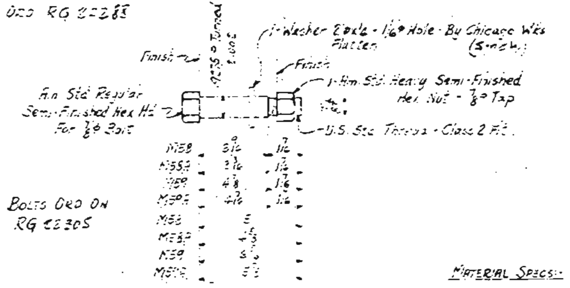
ROCKER - M53
Material:- Cast Steel
Or[illegible]


3-6
2" Drilled Holes For 1¾" Anchor Bolts
Scribe ℄s on Top of Slab
Maintain
Finish Top - This Direction
Drill & Tap 1½" x 1¼" Deep For Mach. Bolts - M15 detailed on sht. 2
Rough Finish
1-Slab 42 x 3¼ x 2-0 - F.2.S.

ROCKER PLATE - M57
Material:- Structural Steel
(Piers 1-5-6-8-9)

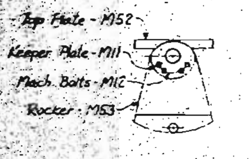


DETAIL OF FINISHING

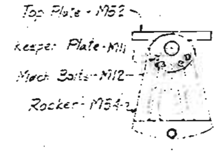

1-Washer 2⅞ x ¼ - 1⅛" Hole - By Chicago Wks.
Finish
1-Am. Std. Heavy Semi-Finished Hex. Nut - ⅞" Tap
Am. Std. Regular Semi-Finished Hex. Hd. For ⅞" Bolt
U.S. Std. Threads - Class 2 Fit.
M58
M58A
M59
M59A

Bolts Ord. On RG 22305

TURNED BOLTS: M58, M58A, M59 & M59A
Material:- Structural Steel
No Paint.
(For M52 to Girders)



ASSEMBLY DIAGRAM
For East & West Abut. & Pier 7
6-Assemblies thus required



ASSEMBLY DIAGRAM
For Piers 1-5-6-8 & 9
10-Assemblies thus required.

NOTE:-
Pl. M11 & Bolts M12 for the assemblies are detailed and billed on sht. 2.

GENERAL NOTES:-

MATERIAL SPECS:- Structural Steel - ASTM - A7-34
Cast Steel - ASTM - A27-36T - Grade B - Annealed
Chrome Nickel Steel - SAE-3130 - Forged and Annealed
HEAT TREATING:- Chrome Nickel Steel to be heat treated after finishing to produce following properties:-
(a) Ultimate Tensile Strength - 125,000# Min.
(b) Yield Point - 75,000# Min.
(c) Hardness - 300 Brinell Min.
WORKMANSHIP SPECS:- Project Specifications.
MILL & SHOP INSPECTION:- R.W. Hunt Co.
CASTING FILLETS:- To have ½" radius unless otherwise noted.
DRILLING:- Holes marked RT3 and RT4A to be drilled thru steel templets
CHICAGO WORKS - BETH. STEEL CO.:- (a) To provide M55, M56, M57, M58, M58A, M59 & M59A and ship same to site with superstructure proper.
(b) To provide M52 completely finished (except painting) and ship same to supplier of castings for assembly.
SUPPLIER OF CASTINGS:- (a) To provide M53 & M54 completely finished.
(b) To assemble the sixteen assemblies and ship same to site assembled.
(c) To do all cleaning and painting required for the assemblies.
SHOP PAINTING:- Chrome Nickel Pins on M52, pin holes in Mill and bearing surfaces in M53 & M54 for pins to be given a heavy coat of grease before assembly.
Other shop contact surfaces to be cleaned but not painted.
No Shop Paint where so noted.
All other surfaces to be given one shop coat of paint.
Shop Paint shall be an approved Red Lead Paint as per project specs.

RIVETS - None
OPEN HOLES - As Noted
REAM - None - Holes Drilled
MILLING - As Noted
PAINT - See General Notes

SHOP CONTACT - [illegible]

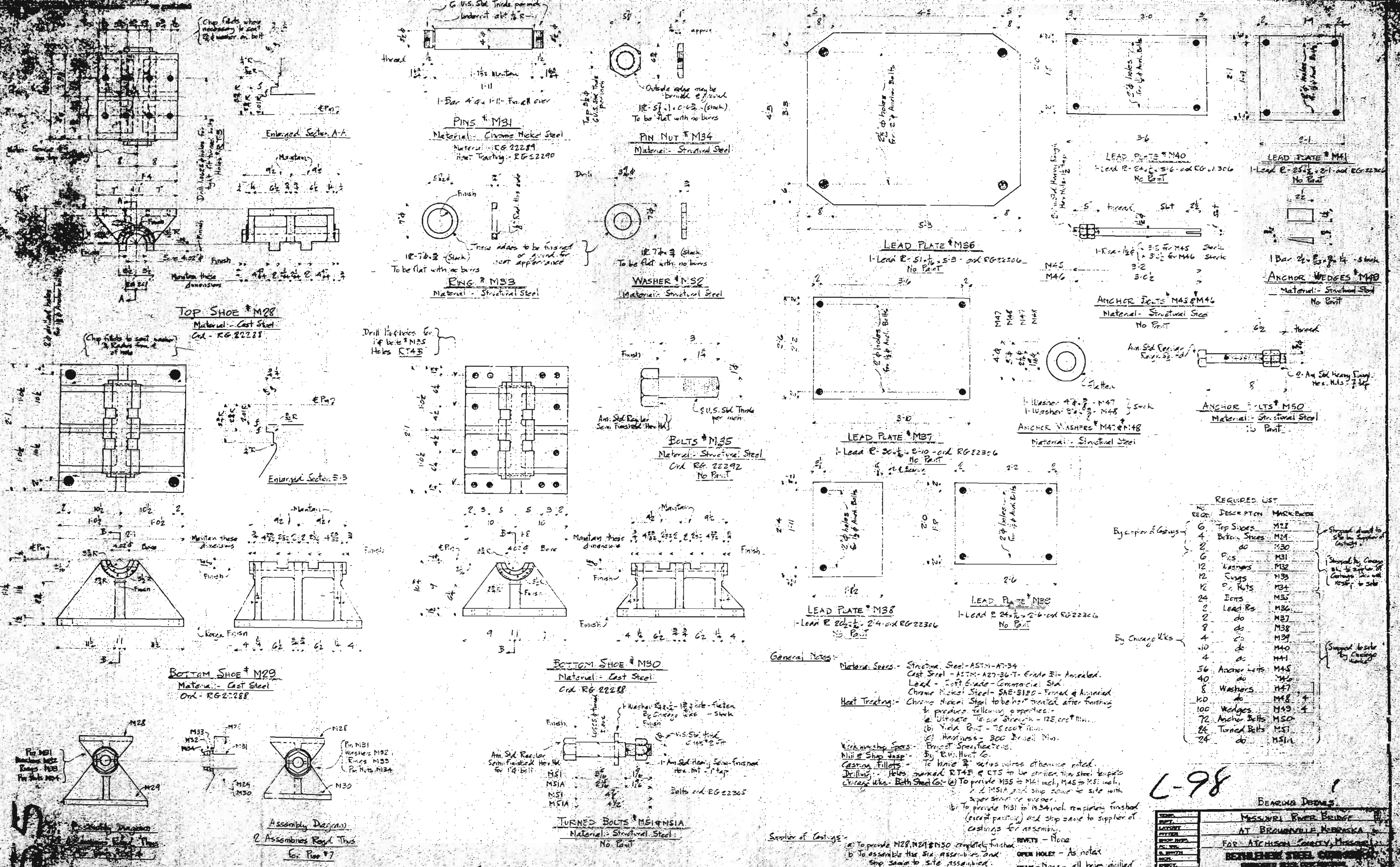
L-98

REQUIRED LIST

	Total Req'd	Description	Mark	Extras
By Chicago Wks.	6	Top Plates	M52	
By Supplier of Castings	6	Rockers	M53	
	10	Do.	M54	
	4	Rocker Plates	M55	
	2	Do.	M56	
By Chicago Wks.	10	Do.	M57	
	25	Turned Bolts	M58	1
	25	Do.	M58A	1
	42	Do.	M59	2
	42	Do.	M59A	2

Shipped by Chicago Wks. to supplier of Castings who will assign to site.
Shipped direct to site by supplier of castings
Shipped to Site by Chicago Wks.

BEARING DETAILS
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE - Jenks MADE BY BK
CHECKED BY 9/14/39 TRACED BY
REVISED LAST ASSIGN. NO.
SHOP NO. CONTRACT - CG 34093


Enlarged Section A-A
TOP SHOE # M28
Material:- Cast Steel
Ord.- RG 22288
Enlarged Section B-B
BOTTOM SHOE # M29
Material:- Cast Steel
Ord.- RG 22288
Assembly Diagram
2 Assemblies Req'd This for Pier #7
PINS # M31
Material:- Chrome Nickel Steel
Material:- RG 22289
Heat Treating:- RG 22290
1-Bar 4 1/4 x 1-11 - Finish over
RING # M33
Material:- Structural Steel
To be flat with no burrs
These edges to be finished or ground for neat appearance
PIN NUT # M34
Material:- Structural Steel
To be flat with no burrs
WASHER # M32
Material:- Structural Steel
BOLTS # M35
Material:- Structural Steel
Ord. RG 22292
No Paint
BOTTOM SHOE # M30
Material:- Cast Steel
Ord. RG 22288
TURNED BOLTS # M51 & M51A
Material:- Structural Steel
No Paint
Bolts ord. RG 22305
LEAD PLATE # M36
1-Lead R 5-1 x 1/4 x 5-3 - ord RG 22306
No Paint
LEAD PLATE # M37
1-Lead R 30 x 1/4 x 2-10 - ord RG 22306
No Paint
LEAD PLATE # M38
1-Lead R 20 1/2 x 1/4 x 2-4 - ord RG 22306
No Paint
LEAD PLATE # M39
1-Lead R 24 x 1/4 x 2-6 - ord RG 22306
No Paint
LEAD PLATE # M40
1-Lead R 24 x 1/4 x 3-6 - ord RG 22306
No Paint
LEAD PLATE # M41
1-Lead R 25 1/2 x 1/4 x 2-1 - ord RG 22306
No Paint
ANCHOR BOLTS # M45 & M46
Material:- Structural Steel
No Paint
ANCHOR WASHERS # M47 & M48
Material:- Structural Steel
ANCHOR WEDGES # M49
Material:- Structural Steel
No Paint
ANCHOR BOLTS # M50
Material:- Structural Steel
No Paint
Maintain these dimensions
Finish
Finish
thread
Bore
EPin

General Notes:-

Material Specs.- Structural Steel - ASTM - A7-34
Cast Steel - ASTM - A27-36-T - Grade B - Annealed.
Lead - Soft Grade - Commercial Std.
Chrome Nickel Steel - SAE-3120 - Forged & Annealed

Heat Treating:- Chrome Nickel Steel to be heat treated after finishing to produce following properties:-
(a) Ultimate Tensile Strength - 125,000# Min.
(b) Yield Point - 75,000# Min.
(c) Hardness - 300 Brinell Min.

Workmanship Specs.- Project Specifications.
Mill & Shop Insp.- By R.W. Hunt Co.
Casting Fillets.- To have 3/4" radius unless otherwise noted.
Drilling:- Holes marked RT4E & CTS to be drilled thru steel templets
Chicago Wks.- Beth. Steel Co.- (a) To provide M35 to M41 incl., M45 to M51 incl., and M51A and ship same to site with superstructure proper.
(b) To provide M31 to M34 incl. completely finished (except painting) and ship same to supplier of castings for assembly.

Supplier of Castings:-
(a) To provide M28, M29 & M30 completely finished
(b) To assemble the six assemblies and ship same to site assembled.
(c) To do all cleaning and painting required for the assemblies.

General Notes:-
Shop Painting:-
Chrome Nickel Pins # M31, pin holes in M32, M33 & M34, and bearing surfaces in M28, M29 & M30 to be given a coat of heavy grease before assembly.
Other shop contact surfaces to be cleaned but not painted.
No Shop paint where so noted. Surfaces not in contact, but inaccessible after assembly shall be given two coats of shop paint before assembly. All other surfaces shall be given one shop coat of paint.
Shop Paint shall be an approved Red Lead Paint as per project specifications.

RIVETS - None
OPEN HOLES - As noted
REAM - None - all holes drilled
MILLING - As noted
PAINT - See general notes

REQUIRED LIST

	No. Reqd.	Description	Mark	Boxes	
By Supplier of Castings	6	Top Shoes	M28		Shipped direct to site by Supplier of Castings.
	4	Bottom Shoes	M29		
	2	do	M30		
By Chicago Wks	6	Pins	M31		Shipped by Chicago Wks. to supplier of Castings. Sent with assembly to site
	12	Washers	M32		
	12	Rings	M33		
	12	Pin Nuts	M34		
	24	Bolts	M35		Shipped to site by Chicago Works
	2	Lead Rs	M36		
	2	do	M37		
	8	do	M38		
	4	do	M39		
	10	do	M40		
	4	do	M41		
	56	Anchor Bolts	M45		
	40	do	M46		
	8	Washers	M47		
	100	do	M48	4	
	100	Wedges	M49	4	
	72	Anchor Bolts	M50		
	24	Turned Bolts	M51		
	24	do	M51A		

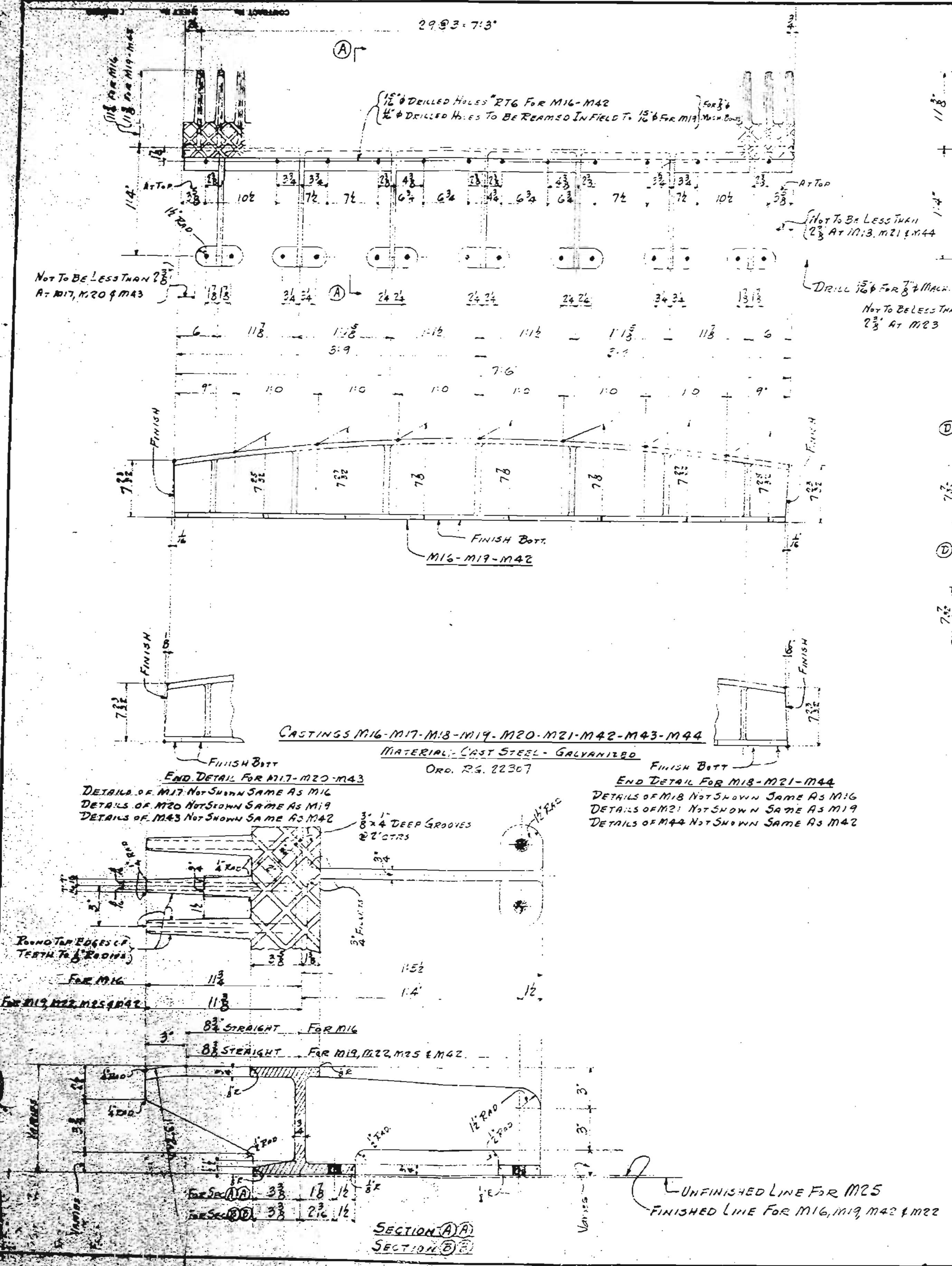
L-98

BEARING DETAILS.

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY

Drawn by Jacobs
Checked by
CAT

SHOP NO.
CONTRACT CG 24098


29 @ 3 = 7'3"
Ⓐ
11 5/8 For M16
11 3/8 For M19-M42
15/16 ϕ Drilled Holes "RT6 For M16-M42
11/16 ϕ Drilled Holes To Be Reamed In Field To 15/16 ϕ For M19
For 7/8 ϕ Mach. Bolts
At Top
1 1/2 Rad
Not To Be Less Than 2 3/8 At M17, M20 & M43
Not To Be Less Than 2 3/8 At M18, M21 & M44
Drill 15/16 ϕ For 7/8 ϕ Mach. Bolts
Finish
Finish Bott.
M16-M19-M42
Finish Bott
3/8 x 1/4 Deep Grooves @ 2" ctrs
Round Top Edges of Teeth To 1/8 Radius
For M16
For M19, M22, M25 & M42
8 3/4 Straight For M16
8 3/4 Straight For M19, M22, M25 & M42
For Sec Ⓐ Ⓐ
For Sec Ⓑ Ⓑ
Unfinished Line For M25
Finished Line For M16, M19, M42 & M22
Section Ⓐ Ⓐ
Section Ⓑ Ⓑ

End Detail For M17-M20-M43

Details of M17 Not Shown Same As M16
Details of M20 Not Shown Same As M19
Details of M43 Not Shown Same As M42

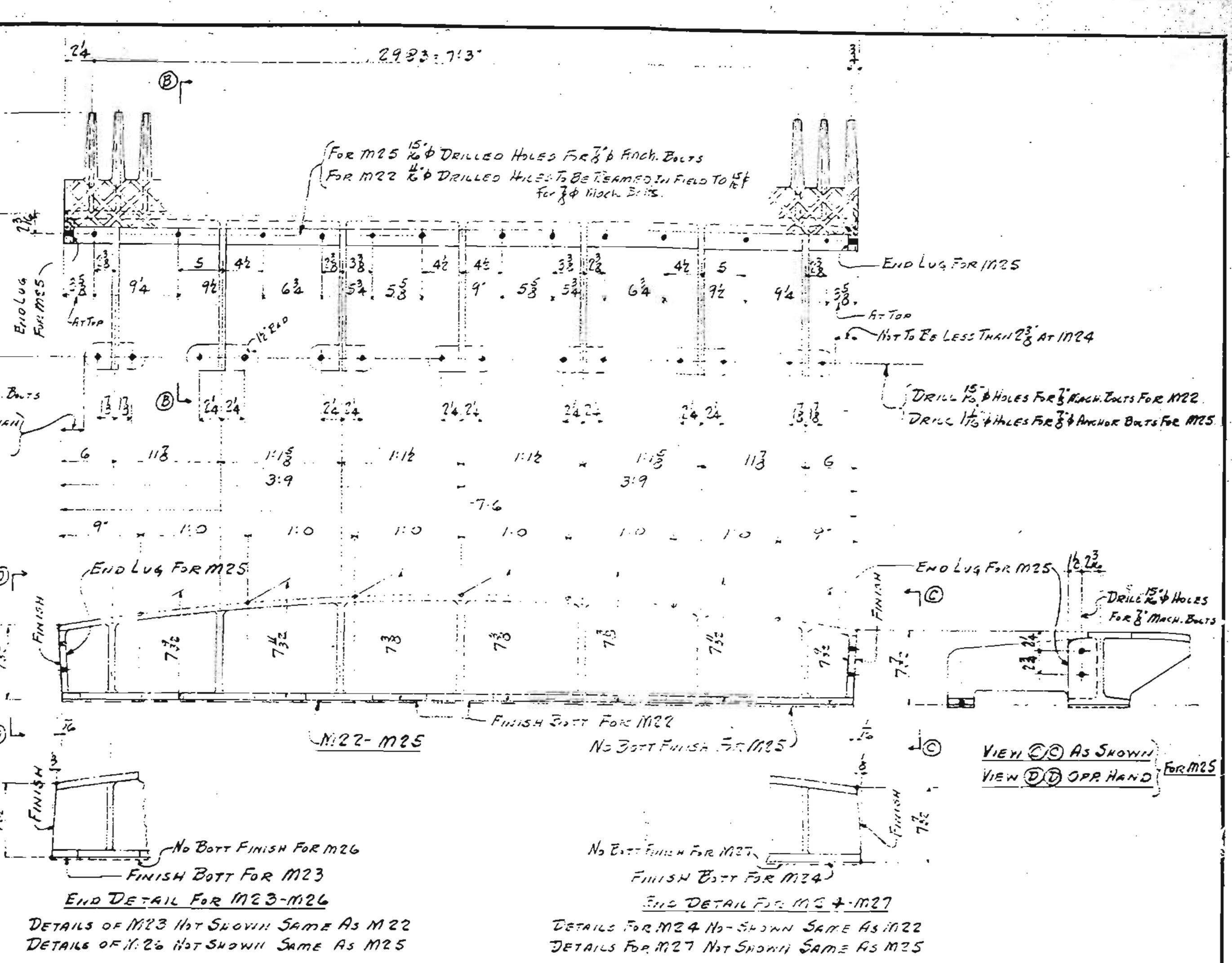
Castings M16-M17-M18-M19-M20-M21-M42-M43-M44

Material:- Cast Steel - Galvanized

Ord. R.G. 22307

End Detail For M18-M21-M44

Details of M18 Not Shown Same As M16
Details of M21 Not Shown Same As M19
Details of M44 Not Shown Same As M42


29 @ 3 = 7'3"
Ⓑ
For M25 15/16 ϕ Drilled Holes For 7/8 ϕ Anch. Bolts
For M22 11/16 ϕ Drilled Holes To Be Reamed In Field To 15/16 ϕ For 7/8 ϕ Mach. Bolts
End Lug For M25
At Top
Not To Be Less Than 2 3/8 At M24
Not To Be Less Than 2 3/8 At M23
Drill 15/16 ϕ Holes For 7/8 ϕ Mach. Bolts For M22
Drill 1 1/16 ϕ Holes For 7/8 ϕ Anchor Bolts For M25
Ⓓ
Ⓒ
Finish
Drill 1 1/16 ϕ Holes For 7/8 Mach. Bolts
Finish Bott For M22
No Bott Finish For M25
M22-M25
View Ⓒ Ⓒ As Shown
View Ⓓ Ⓓ Opp. Hand
For M25
No Bott Finish For M26
Finish Bott For M23
No Bott Finish For M27
Finish Bott For M24

End Detail For M23-M26

Details of M23 Not Shown Same As M22
Details of M26 Not Shown Same As M25

End Detail For M24-M27

Details For M24 Not Shown Same As M22
Details For M27 Not Shown Same As M25

Castings M22-M23-M24-M25-M26-M27

Material:- Cast Steel - Galvanized

Ord. R.G. 22307

Notes:- End Lugs Are At Both Ends of M25
End Lug Is At Right End of M26
End Lug Is At Left End of M27
(See Assembly Diagram on Sh. #5BB)
Location of Holes In End Lugs of M26 & M27 To Be Marked At Assembly With M25 And Thus Drilled To Match.

Note:- For Assembly Diagram See Sheet #5BB

Required List

No. Reqd	Description	Mark
2	Castings	M16
2	Do	M17
2	Do	M18
2	Do	M19
2	Do	M20
2	Do	M21
2	Do	M22
2	Do	M23
2	Do	M24
2	Do	M25
2	Do	M26
2	Do	M27
2	Do	M42
2	Do	M43
2	Do	M44

Shipped Direct To Site By Supplier

Shop Note:-
Work Sheets #5AB & 5BB As One Sheet
For General Notes See Sheet #5BB

C-98

Roadway Expansion Castings

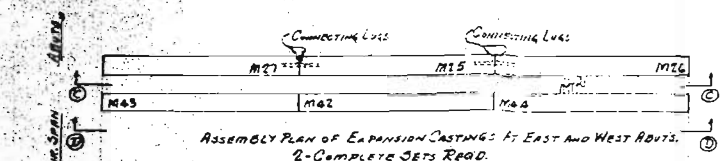
Rivets None
Open Holes As Noted
Ream None - Holes To Be Drilled
Milling As Noted
Paint See Gen. Notes

~~Shop Contact Surfaces~~

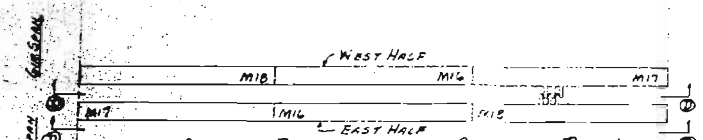
Temp.
Supt.
Layout
Fitter
Shop Insp.
Fc. Wk.
B. Smith
Mch.
Erect.
O. Insp.

Missouri River Bridge
At Brownville Nebraska
For Atchison County Missouri

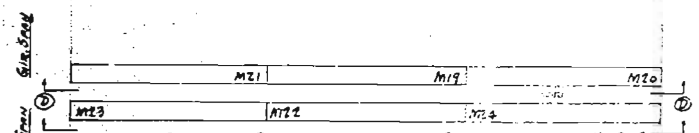
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
In Charge Jenks Made By A.T.A. 12-28-38
Checked By ⟨illegible⟩ 1/4/39 Traced By
Revised Last Assem. Mk.
Shop No. Contract CG34293 Sheet 5AB



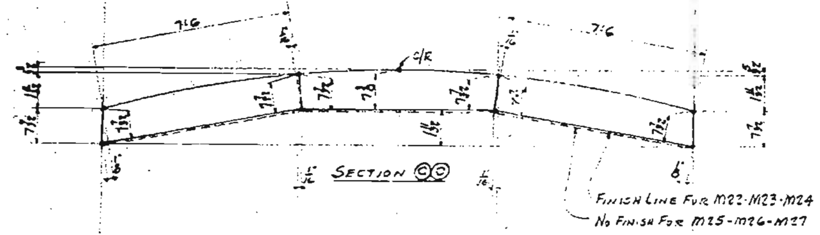
Assembly Plan of Expansion Castings At East and West Abuts.
2-Complete Sets Req'd.
Matchmark One Set "EA" For East Abut.
Matchmark One Set "WA" For West Abut.

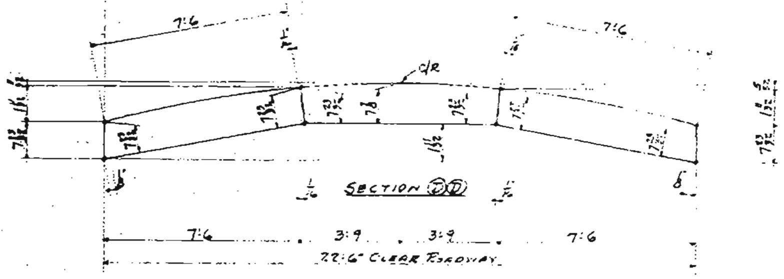


Assembly Plan of Expansion Castings at Pier No. 7
One Complete Set Req'd
Matchmark West Half Castings "7W"
Matchmark East Half Castings "7E"



Assembly Plan of Expansion Castings At Piers Nos. 2 & 4
2-Complete Sets Req'd
Matchmark One Set "2" For Pier 2
Matchmark One Set "4" For Pier 4





Assembly For Expansion Castings Detailed on Sht #5AB

General Notes

Material Spec's - Cast Steel: A.S.T.M. - A27-36T - Grade B1 - Annealed
Galvanizing - A.S.T.M. - A123-33 The Weight of Zinc Coating Per Square Foot of Actual Surface Shall Not Average Less Than 2 ozs. And No Individual Speciman Shall Show Less Than 1.8 ozs.

Workmanship Spec's. - Project Specifications

Mill and Shop Inspection: - R. W. Hunt Co.

Casting Fillets: - To Have ½" Radius Unless Noted

Drilling: - Holes Marked RTG To Be Drilled To Steel Templets

Finishing: - (a) Bottoms and Ends of Castings Shall Be Finished Except That Finishing of Bottoms On The Abutment Castings Can Be Omitted As Noted. No Charge, However, Is To Be Made For Metal Not Finished Off on The Abutment Castings.
(b) Tops of Castings To Be Finished Only Where Necessary To Meet Specified Tolerances, And Such Finishing May Be Done By Chipping and Grinding, By Grinding Alone, or By Machine Finishing.
(c) At Bolt Holes, Fillets Shall Be Chipped Where Necessary To Seat ⅞" American Std. Heavy Hex. Nuts.

Assembling and Match Marking: - After Finishing, Castings For The Two Halves of Each Joint Shall Be Assembled To Proper Alignment And Elevation, And While So Assembled, Checked To See That Tolerances Specified Are Maintained, And If Not, Properly Adjusted And Rechecked. Castings Shall Not Be Finally Disassembled Until Passed By The Inspector. Before Final Disassembly, Castings Shall Be Marked To Show Erection Marks And Match Marks. Both Marks Are To Be Placed On Left Hand Ends of Castings, Looking From The Rear, And Shall Be Put on with Steel Dies.

Tolerances: - (a) Tops of Adjacent Castings In Each Half of Joint Shall Be Flush When Properly Assembled.
(b) Tops of Adjacent Teeth In The Complete Joint Shall Not Vary More Than $\frac{1}{16}$" in Elevation With The Joint In A Closed Position
(c) Clearance Between Adjacent Teeth Shall Not Be Less Than $\frac{3}{16}$" or More Than $\frac{7}{16}$" With The Joint in A Closed Position

Cleaning: - After Finishing And Before Galvanizing, Castings Shall Be Thoroughly Cleaned And Such Cleaning Shall Include Sand Blasting

Shop Painting: - The Galvanized Surfaces Shall Be Prepared For Painting As Per Par. 13 on Page III-6 of The Project Specifications.
All Parts Shall Be Given One Shop Coat of Paint.
Shop Paint Shall Be An Approved Red Lead Paint As Per Project Specifications.

L-98

Shop Note: -
Work Sheets #5AB & 5BB As One Sheet

257

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See Sheet #5AE

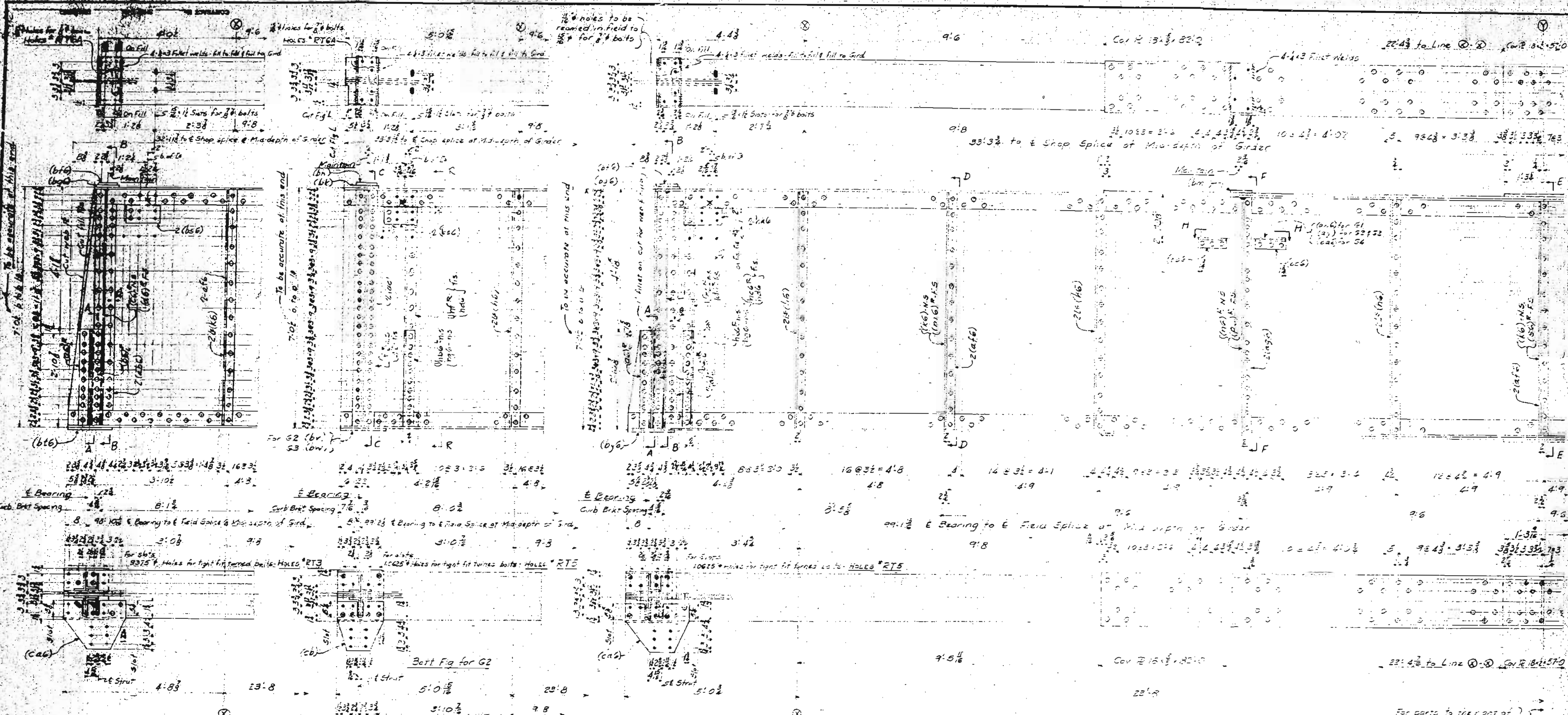
~~SHOP CONTACT SURFACES~~

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

SHOP NO.

Roadway Expansion Castings
Missouri River Bridge
At Brownville Nebraska
For Atchison County Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks   MADE BY A.T.A.
CHECKED BY J 1/4/39   TRACED BY
REVISED   LAST ASSEM. MK.
CONTRACT CG34293   SHEET 5BB


Holes for ⅞" bolts - Holes #RT6A
4:4⅜ Fillet welds - Edit Fill & Edit Fill to Gird
On Fill
5-¾" Slots for ⅞" bolts
93:11⅜ to ℄ Shop Splice at Mid-depth of Girder
To be accurate at this end
Maintain
℄ Bearing
Curb Brkt Spacing
98:10⅜ ℄ Bearing to ℄ Field Splice at Mid-depth of Gird.
For slots .9375" Holes for tight fit turned bolts - Holes #RT3
For slots 1.0625" Holes for tight fit turned bolts - Holes #RT5
⅞" holes to be reamed in field to 15/16" for ⅞" bolts
Cor ℞ 13·⅝"·82·0
4·4·3 Fillet Welds
22:4⅜ to Line Ⓧ-Ⓧ
93:3¾ to ℄ Shop Splice at Mid-depth of Girder
99:1⅛ ℄ Bearing to ℄ Field Splice at Mid-depth of Girder
Cov ℞ 16·⅝"·82·0
22:4⅜ to Line Ⓧ-Ⓧ
Bott Fig for G2
℄ Strut
23:8
9:5 11/16
For parts to the right of Line Y-Y see Shts #6B & 6C
A
B
C
D
E
F
H
R
Ⓧ
Ⓨ

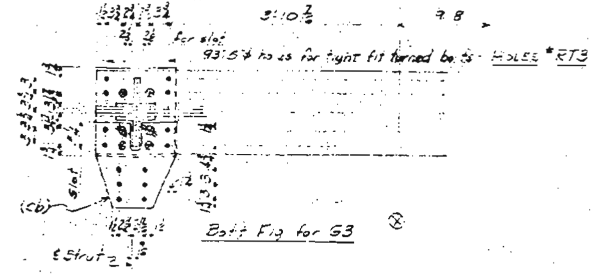
GIRDER #G4R - As shown

Parts to right of line Ⓧ-Ⓧ same as for G1R except as shown in Section H-H

GIRDER #G4L: Opp hand to G4R

GIRDER #G1R: As shown

GIRDER #G1L: Opp hand to G1R

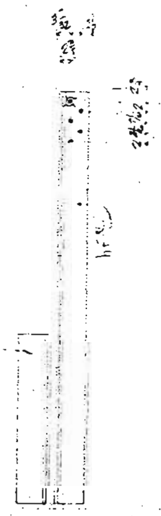


Bott Fig for G3

GIRDERS #G2R & #G3L - As shown

Parts to right of line X-X same as for G1R except as shown in Section H-H

GIRDERS #G2L & #G3L Opp hand to G2R & G3R Respectively



Section R-R

REQUIRED LIST

No. Reqd	Description	Mark
One	Girder	G1R
One	"	G1L
One	"	G2R
One	"	G2L
One	"	G3R
One	"	G3L
One	"	G4R
One	"	G4L

L-98

SHOP NOTES:- For General Notes and Camber diagram See Sht #1.0
Work Shts #5A, 5B, 5C, 16C as one sheet
Work Shts #5, 7, 8, 9 & 10 Together

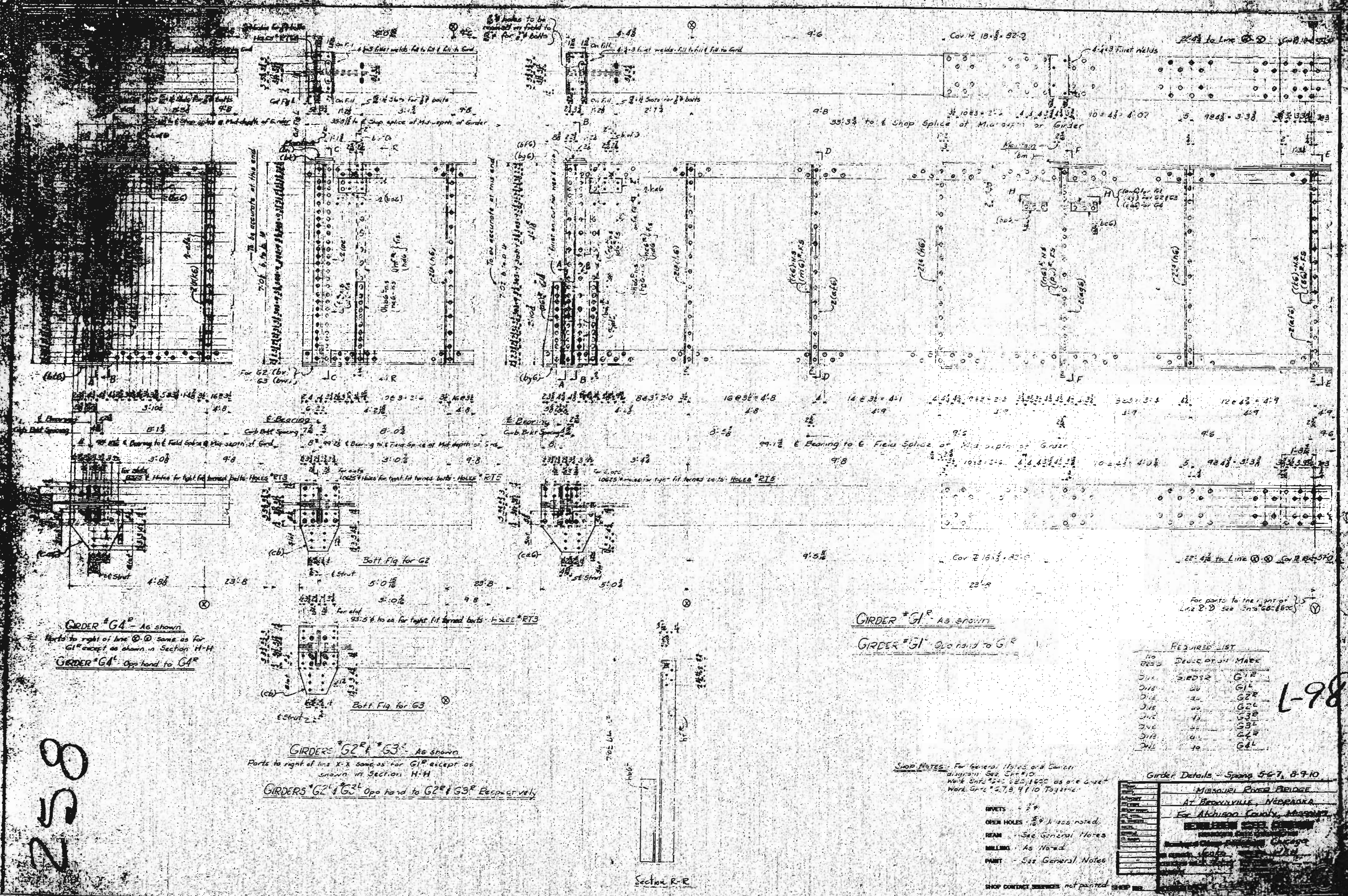
RIVETS - ⅞"
OPEN HOLES - 15/16" Unless noted
REAM - See General Notes
MILLING - As Noted
PAINT - See General Notes
SHOP CONTACT SURFACES not painted

Girder Details - Spans 5-6-7, 8-9-10

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
CHECT.
O. INSP.

MISSOURI RIVER BRIDGE
AT BRACEVILLE, NEBRASKA
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY WEH
CHECKED BY [illegible] 2/2/39 TRACED BY
REVISED LAST ADDED. MK.
SHOP NO. CONTRACT CG34091 SHEET 6AC

258



GIRDER $^\#G4^R$ - As shown

Parts to right of line Ⓧ-Ⓧ same as for $G1^R$ except as shown in Section H-H

GIRDER $^\#G4^L$ - Opp. hand to $G4^R$

GIRDERS $^\#G2^R$ & $^\#G3^R$ - As shown

Parts to right of line X-X same as for $G1^R$ except as shown in Section H-H

GIRDERS $^\#G2^L$ & $^\#G3^L$ Opp. hand to $G2^R$ & $G3^R$ Respectively

GIRDER $^\#G1^R$ - As shown

GIRDER $^\#G1^L$ - Opp. hand to $G1^R$

For parts to the right of Line Ⓨ-Ⓨ see Shts. #6B & 6C

REQUIRED LIST

No. Reqd.	Description	Mark
One	Girder	$G1^R$
One	do	$G1^L$
One	do	$G2^R$
One	do	$G2^L$
One	do	$G3^R$
One	do	$G3^L$
One	do	$G4^R$
One	do	$G4^L$

L-98

SHOP NOTES: - For General Notes and Camber diagram See Sht. #10
Work Shts. #6A, 6B, 6C as one sheet
Work Shts. #5, 7, 8, 9 & 10 Together

RIVETS - ⅞
OPEN HOLES - $\frac{15}{16}$ unless noted
REAM - See General Notes
MILLING - As Noted
PAINT - See General Notes
SHOP CONTACT SURFACES not painted

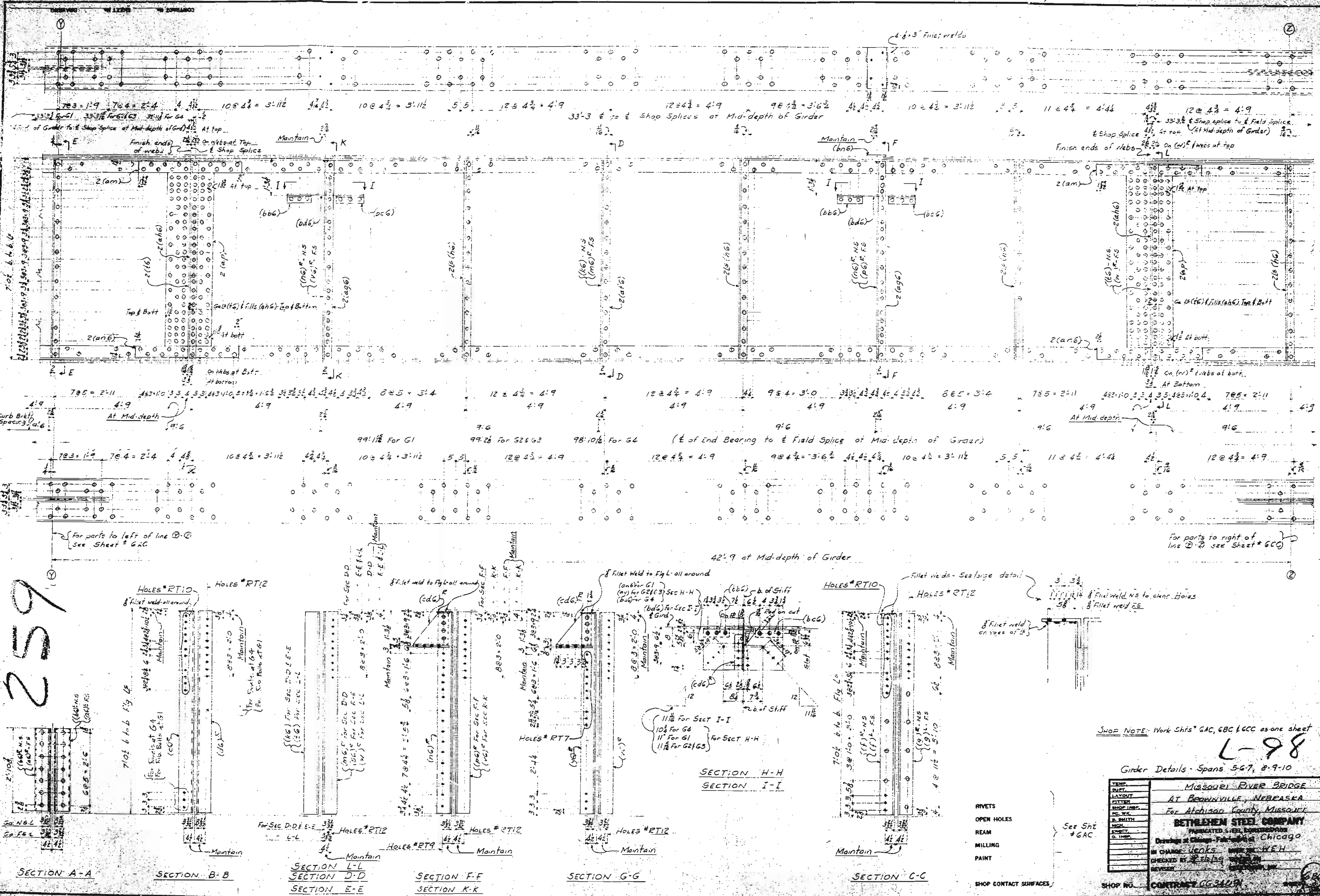
Girder Details - Spans 5-6-7, 8-9-10

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
Chicago

258

L-98

259

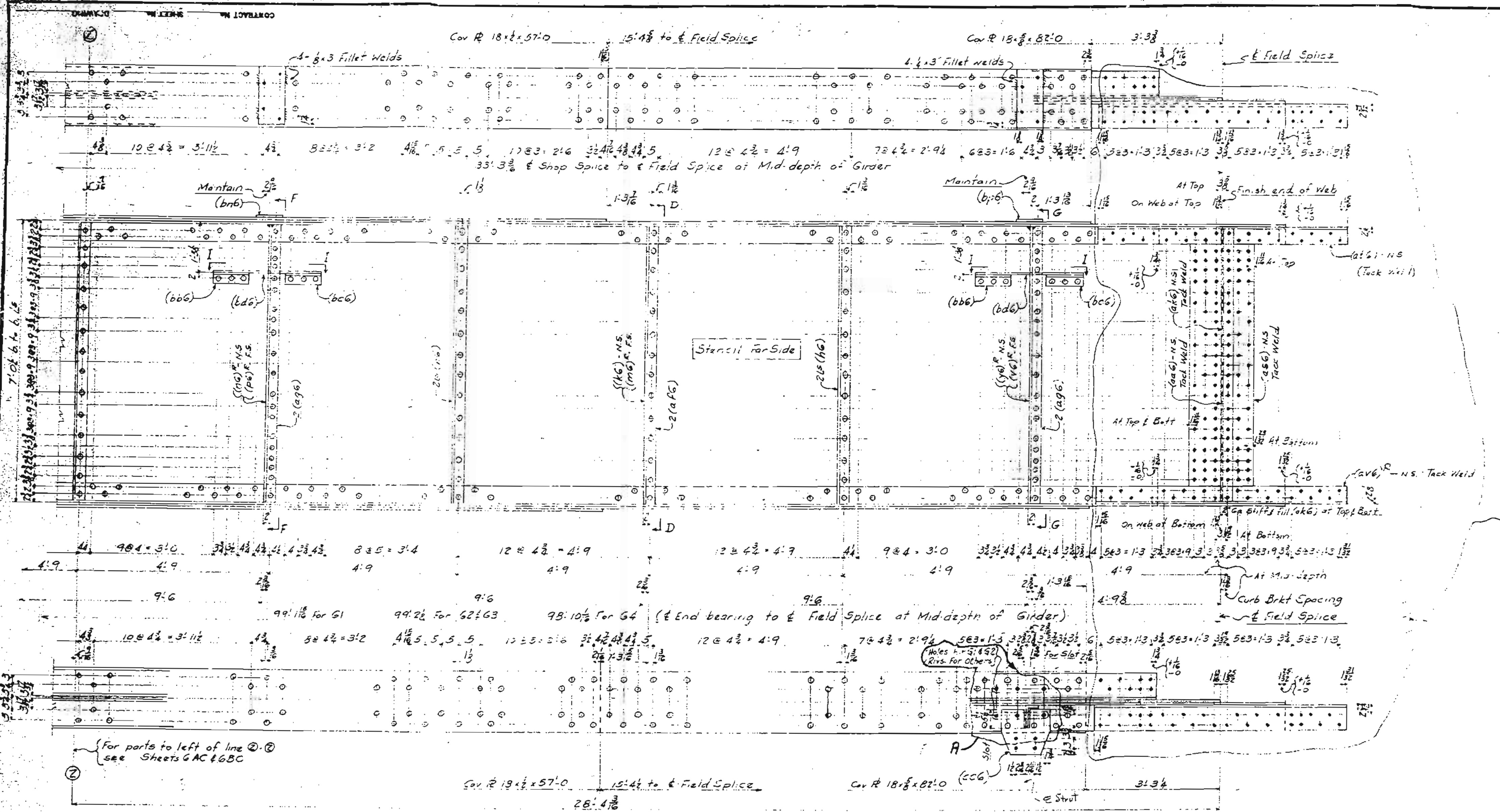


SHOP NOTE:- Work Shts # 6AC, 6BC & 6CC as one sheet

L-98

Girder Details - Spans 5-6-7, 8-9-10

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago-Fabricated at Chicago
IN CHARGE Jenks MADE BY WEH
CHECKED BY 2/26/39
REVISED
SHOP NO.
CONTRACT GG 34091
6BC



Bill of Material For One Girder $G1^R$-$G2^R$-$G3^R$-$G4^R$

1-Web ℞ 84 × 7/16 × 33'-3 13/16 (Ord 33'-5 1/2) It 89 - F1E - For G1
1-Web ℞ 84 × 7/16 × 33'-4 (Ord 33'-5 3/4) It 68 - F1E - For G2 & G3
1-Web ℞ 84 × 7/16 × 32'-11 15/16 (Ord 33'-1 1/2) It 92 - F1E - For G4
1-Web ℞ 84 × 7/16 × 33'-3 1/16 Stock - F2E
1-Web ℞ 84 × 7/16 × 33'-3 1/4 (Ord 33'-5 1/4) It 90 - F2E

For G1:
Top Flg — 1L 8 × 6 × 5/8 × 100'-8 5/16 (Ord 100'-10) It 63
Top Flg — 1L 8 × 6 × 5/8 × 97'-6 15/16 (Ord 97'-8 1/2) It 72
Bott Flg — 1L 8 × 6 × 5/8 × 101'-4 1/4 (Ord 101'-6) It 61
Bott Flg — [illegible] 6 × 5/8 × 98'-4 [illegible] ([illegible] 98'-4 1/2) It [illegible]

For G2 & G3:
Top Flg — 1L 8 × 6 × 5/8 × 101'-4 7/8 (Ord 101'-6 1/2) It 64
Top Flg — 1L 8 × 6 × 5/8 × 98'-3 1/2 (Ord 98'-5) It 68
Bott Flg — 1L 8 × 6 × 5/8 × 101'-4 7/16 (Ord 101'-6 1/4) It 65
Bott Flg — 1L 8 × 6 × 5/8 × 98'-3 1/16 (Ord 98'-4 3/4) It 69

For G4:
Top Flg — 1L 8 × 6 × 5/8 × 100'-4 7/16 (Ord 100'-6) It 66
Top Flg — 1L 8 × 6 × 5/8 × 97'-3 1/16 (Ord 97'-4 3/4) It 73
Bott Flg — 1L 8 × 6 × 5/8 × 101'-0 3/8 (Ord 101'-2) It 62
Bott Flg — 1L 8 × 6 × 5/8 × 97'-11 (Ord 98'-0 3/4) It 71

2 Cov ℞s 18 UM × 5/8 × 82'-0 - It 84
2 Cov ℞s 18 UM × 1/2 × 57'-0 - It 98

For G1 & G4:
2Ls 6 × 4 × 3/8 × 2'-10 1/4 $(a6)^F_L$ - F1E
2Ls 6 × 4 × 3/8 × 2'-10 1/4 $(b6)^F_L$ - F1E
1L 6 × 4 × 3/8 × 6'-11 1/4 $(c6)^R$ - F2E - Weld
1L 6 × 4 × 3/8 × 6'-11 1/4 $(d6)^R$ - F2E

For G2 & G3:
2Ls 6 × 3 1/2 × 3/8 × 6'-11 1/4 $(f6)^F$ - F2E - Weld
2Ls do $(g)^R$ - F2E

18Ls do (h6) Crimped - F2E - for G1, G2, G3
4Ls do (k6) - F2E - for G1, G2, G3
[illegible] do $(m6)^R$ - F2E
[illegible] do $(n6)^R$ - F2E - Weld
6Ls (k6) for G4

3Ls 6 × 3 1/2 × 3/8 × 6'-11 1/4 $(p6)^R$ - F2E
1L do $(s6)^R$ - F2E
3Ls do (t6) - F2E
2Ls do $(v6)^R$ - F2E
1L do $(w)^R$ - F2E
1L do $(y6)^R$ - F2E - Weld
1L 6 × 3 1/2 × 3/8 × 6'-10 1/4 (aa6) F2E - Tack weld
2 Fills 7 UM × 5/8 × 6'-0 1/2 (ac) For G2 & G3
2 Fills 12 1/2 UM × 5/8 × 6'-0 1/2 (ad6) For G1
8-Fills 3 1/2 × 5/8 × 6'-0 1/2 (af6) for G1, G2, G3
10-Fills do (ag6)
4 Fills do (ah6)
1-Fill - 3 1/2 × 3/4 × 6'-0 1/2 (ak6) Tack weld
4 ℞s - 5 UM × 3/8 × 3'-8 (am)
4 ℞s do (an6)
4 ℞s 19 UM × 3/8 × 6'-0 1/2 (ap)
1 ℞ 19 UM × 3/8 × 6'-0 1/2 (ae6) Tack weld
1L 7 3/8 × 5 3/8 × 1/2 × 6'-3 (Cut from 8 × 6 × 1/2 L) (at6)
(Grind to fit fillet of 8 × 6 × 5/8 L) Tack weld
1L 7 3/8 × 5 3/8 × 1/2 × 6'-3 (Cut from 8 × 6 × 1/2 L) $(av6)^R$
(Grind to fit fillet of 8 × 6 × 5/8 L) Tack weld
1 ℞ 16 3/4 × 3/8 × 2'-8 1/2 (aw6) For G1
1 ℞ do (ay) For G2 & G3
1 ℞ do (ba6) For G4
5 Ls 3 1/2 × 3 1/2 × 1/2 × 0-10 3/8 (bb6)
5 Ls 3 1/2 × 3 1/2 × 1/2 × 0-11 1/4 (bc6)
4 ℞s 16 3/4 × 3/8 × 2'-8 1/2 (bd6)
10 fills (at6) for G4

For G1 & G4:
1-Fill - 7 1/2 × 1/2 × 1'-4 1/2 (bf6) weld
1-Fill - 8 × 5/8 × 1'-4 1/2 (bg6) weld

For G2 & G3:
1-Fill - 7 1/2 × 1/2 × 1'-4 1/2 (bh) weld
1-Fill - 8 × 5/8 × 1'-4 1/2 (bk) weld

1-Fill - 7 1/2 × 5/8 × 1'-5 1/2 (bm) weld
2-Fills - 7 1/2 × 5/8 × 1'-5 1/2 (bn6) weld
1 Fill - 7 1/2 × 1/2 × 1'-5 1/2 (bp6) weld
2 Fills 6 1/2 × 5/8 × 0-11 3/4 (bs6) for G2, G3, G4
1 Sole ℞ 16 UM × 3/4 × 1'-5 (bt6) For G4
1 Sole ℞ do (bv) For G2
1 Sole ℞ do (bw) For G3
1 Sole ℞ do (by6) For G1
1 ℞ 17 1/4 × 3/8 × 1'-9 3/4 (13'-6 cuts 8 ℞s) (ca6) For G1 & G4
1 ℞ 17 1/4 × 3/8 × 1'-4 1/4 (5'-1 cuts 4) (cb) For G2 & G3
1 ℞ 14 1/4 × 3/8 × 1'-1 1/4 (cc6)
5 Pc [15 @ 33.9# × 1'-2 1/2 (1'-6 3/4 Cuts 2) $(cd6)^R$
(ord 50-0 It # 52)

2 fills 6 1/2 × 5/8 × 1'-0 13/16 - ha6 for G1
1L 6 × 3 1/2 × 3/8 × 2'-10 1/4 F1E - $hb6^R$ for G1
1L 6 × 3 1/2 × 3/8 × 6'-11 1/4 F2E - $hc6^R$ for G1
1 fill 5 1/2 × 5/8 × 5'-5 5/8 - hd6 for G1, G2, G3
1L 6 × 3 1/2 × 3/8 × 6'-11 1/2 - F2E - hfR - for G2, G3
1 fill 3 1/2 × 5/8 × 2'-4 7/8 - hg6 for G1, G2, G3
1L - $hb6^L$ for G2, G3

260

Shop Note - Work Shts # 6AC, 6BC & 6CC as one sheet

L-7F

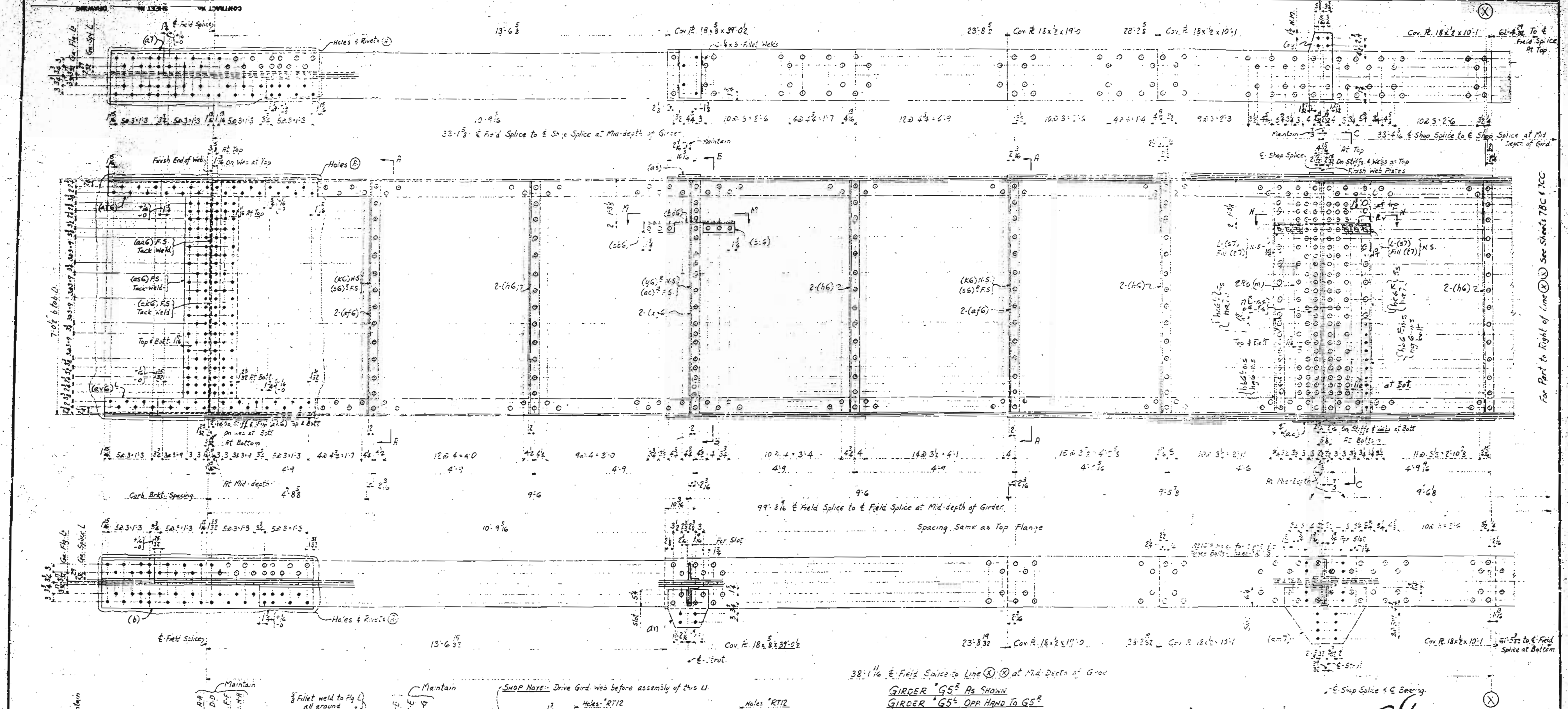
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
SHOP CONTACT SURFACES
See Sht. # 6AC

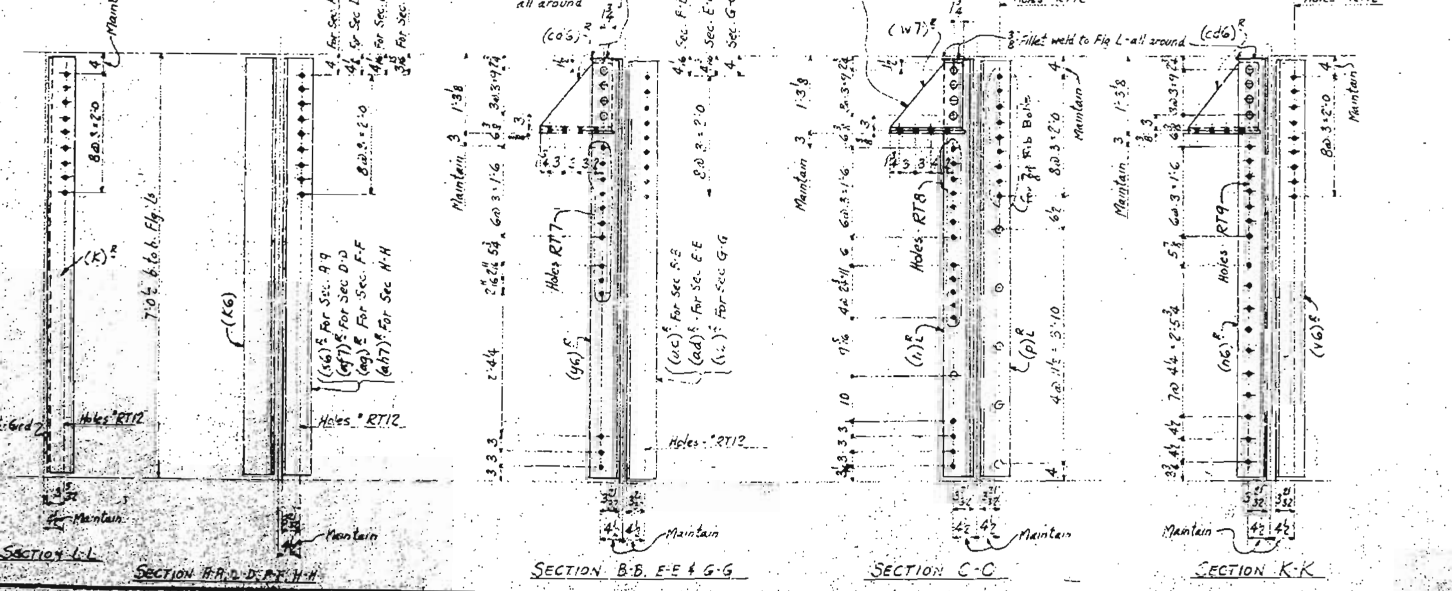
Girder Details - Spans 5-6-7 & 8-9-10

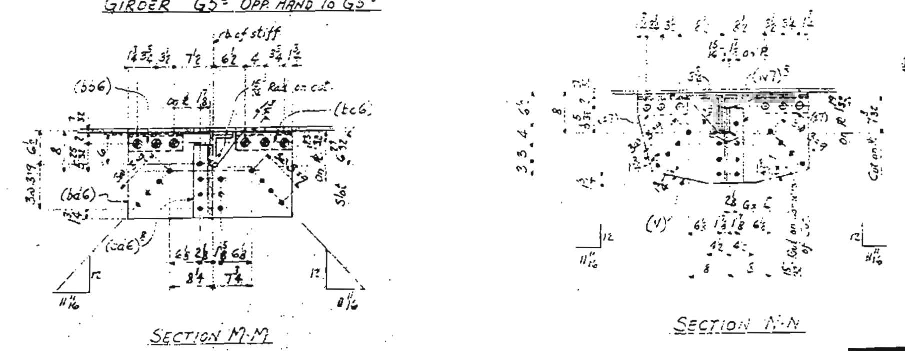
TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
For Atchison County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY WEH
CHECKED BY 5-4-39 TRACED BY
REVISED LAST ASSIGN. NO.
SHOP NO.
CONTRACT CG34091
SHEET


Holes & Rivets (E)
Cov. Pl. 18 x 5/8 x 39'-0½
Cov. Pl. 18 x ½ x 19'-0
Cov. Pl. 18 x ½ x 10'-1
Cov. Pl. 18 x ½ x 10'-1
61'-4 9/32 To ℄ Field Splice At Top
33'-1 3/8 ℄ Field Splice to ℄ Shop Splice at Mid-depth of Girder
33'-4 5/8 ℄ Shop Splice to ℄ Shop Splice at Mid-depth of Gird.
Finish End of Web
Holes (F)
℄ Shop Splice
Finish Web Plates
For Part to Right of Line (X)(X) See Sheets 7BC & 7CC
Tack-Weld
Curb Brkt. Spacing
At Mid-depth
99'-8 3/16 ℄ Field Splice to ℄ Field Splice at Mid-depth of Girder
Spacing Same as Top Flange
For Slot
Holes & Rivets (E)
℄ Field Splice
Cov. Pl. 18 x 5/8 x 39'-0½
Cov. Pl. 18 x ½ x 19'-0
Cov. Pl. 18 x ½ x 10'-1
Cov. Pl. 18 x ½ x 10'-1
61'-5 7/32 to ℄ Field Splice at Bottom
℄ Strut
38'-1 1/16 ℄ Field Splice to Line (X)(X) at Mid Depth of Gird.
℄ Shop Splice & ℄ Bearing
(X)


Maintain
Holes "RT12
SECTION L-L
SECTION A-A, D-D, F-F, H-H
3/8 Fillet weld to Flg L all around
SECTION B-B, E-E & G-G
SHOP NOTE - Drive Gird. Web before assembly of this L.
3/8 Fillet weld to Flg L all around
SECTION C-C
SECTION K-K



L-98

REQUIRED LIST

No. REQ'D	DESCRIPTION	MARK
2	Girders	G5R
2	Do	G5L
2	Do	G6R
2	Do	G6L

SHOP NOTES:-

For General Notes and Camber Diagram see sheet #10
Work sheets #7AC, 7BC & 7CC as one sheet
Work sheets #6, 7, 8, 9 & 10 together

RIVETS - 7/8 ⌀
OPEN HOLES - 15/16 ⌀ Unless noted
REAM - See General Notes.
MILLING - As noted.
PAINT - See General Notes.

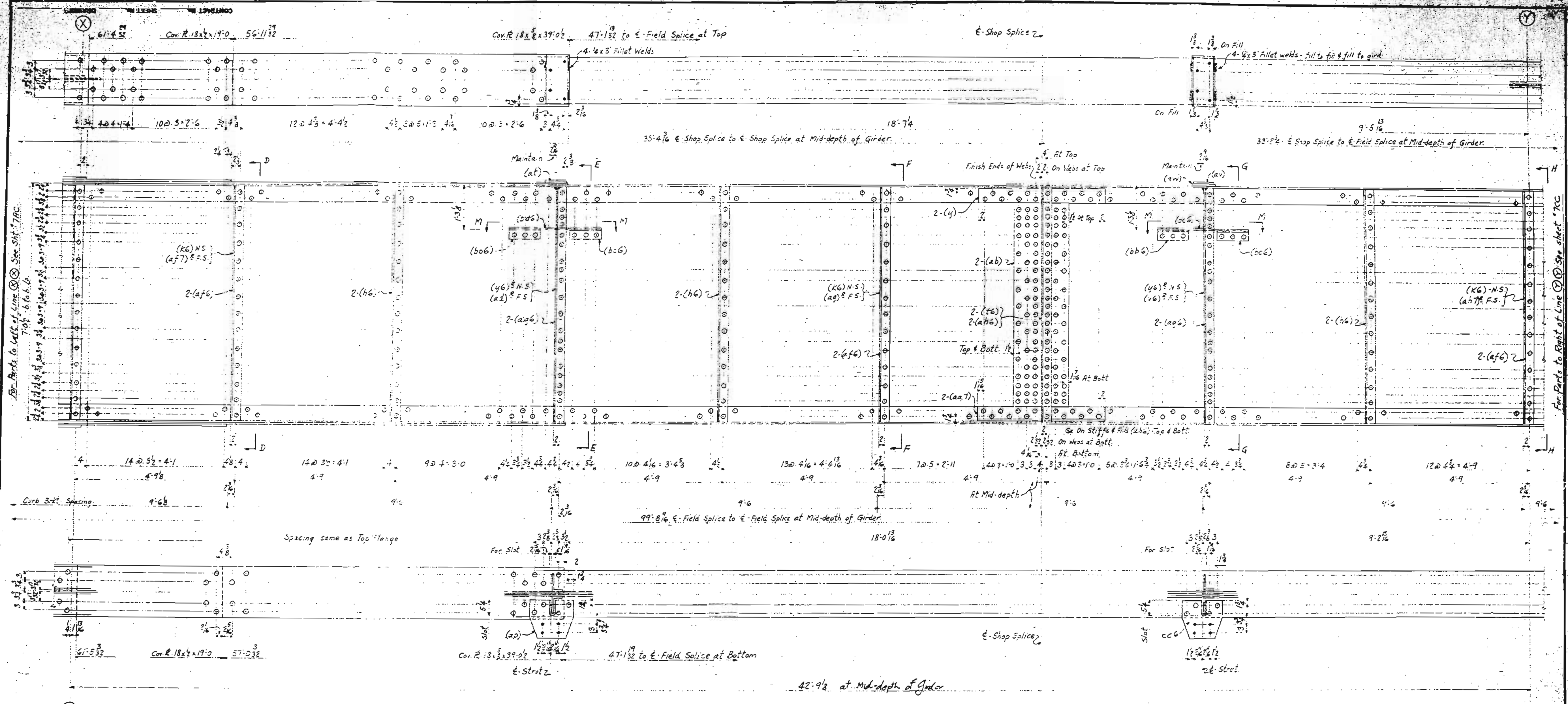
SHOP CONTACT SURFACES Not Painted. SHOP NO. ____

Girder Details - Spans 5-6-7, 8-9-10

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PL. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago Fabricated at Chicago
IN CHARGE Jenks MADE BY B.K.
CHECKED BY F. 4/2/29 TRACED BY
REVISED LAST SHEET NO.
CONTRACT CG 34091 SHEET

261



BILL OF MATERIAL FOR ONE GIRDER G5^R OR G6^L

1-Web PL 84 x 7/16 x 33'-1 11/16 - (ORD 33'-3½) F.2.E. - It.91
1-Web PL 84 x 7/16 x 33'-4 9/32 - (ORD 33'-6¼) F.2.E - It.87
1-Web PL 84 x 7/16 x 33'-7 13/16 - F.2.E. - Stk.
2-Top Flg. Ls 8x6x5/8 x 99'-8¼ - (ORD. 99'-11) It.67 } For G5
2-Bott. Flg. Ls 8x6x5/8 x 99'-8½ - (ORD. 99'-11) It 67. }
1-Top Flg. L 8x6x5/8 x 102'-9 5/8 - (ORD 102'-11½) It.60 } For G6
1-Top Flg. L 8x6x5/8 x 96'-6 7/8 - (ORD. 96'-8¾) It.74 }
1-Bott. Flg. L 8x6x5/8 x 102'-9 7/8 - (ORD 102'-11½) It.60 }
1-Bott. Flg. L 8x6x5/8 x 96'-7 7/8 - (ORD 96'-8¾) It.74 }
2-Cov. PLs 18 U.M. x 5/8 x 39'-0½ - It. 97
2-Cov. PLs 18 U.M. x ½ x 19'-0 - It. 103
2-Cov. PLs 18 U.M. x ½ x 10'-1 - It 105
1-Splice PL 18 U.M. x ½ x 6'-3 - (a7)
1-Splice PL 18 U.M. x ½ x 6'-3 - (b)
1- do. - (c) } For G5
1- do. - (d) }
1-L 7 3/8 x 5 3/8 x ½ x 6'-3 (cut from 8x6x½ L) - (at6) } Grind to fit fillet of 8x6x5/8 L
1-L do. do. - (ax6)^L
1-L do. do. - (f)^R } Rivet for G5 tack weld for G6
1-L do. do. - (g)^R }
1-PL 19 U.M. x 3/8 x 6'-0½ - (as6) - tack weld
1-PL do. - (h) - tack weld
2-Bars 3½ x ¾ x 6'-0½ - (ak6) - tack weld
2-Ls 6x3½x3/8 x 6'-10¼ - F.2.E. - (aa6) - tack weld - for G5
1-L (aa6) tack weld } For G6
1-L 6x3½x3/8 x 6'-10¼ - F.2.E. - (k)^R - tack weld }

2-PLs 20 U.M. x 5/8 x 6'-0½ - (m)
2-Ls 7x4x11/16 x 6'-11¼ - F.2.E. - (n)^R_L - Weld
2-Ls 7x4x11/16 x 6'-11¼ - F.2.E. - (p)^R_L
2-Ls 3½ x 3½ x ½ x 0'-10 - (s7)
2-Bars 3½ x 5/8 x 0'-6¾ - (t7)
1-PL 17 x 3/8 x 2'-10 - (v)
1-Pc. 15 ⊔ 33.9 x 1'-3½ - (w7)^R (1'-8½ cuts 2) - ord. 50'-0 - It 52
2-Bars 5 U.M. x 3/8 x 3'-8 - (y)
2-Bars 5 U.M. x 3/8 x 3'-8 - (aa7)
2-PLs 19 U.M. x 3/8 x 6'-0½ - (ab)
2-Ls 6x3½x3/8 x 6'-11¼ - F.2.E. - (t6)
2-Bars 3½ x 3/8 x 6'-0½ - (ah6)
1-L 6x3½x3/8 x 6'-11¼ - F.2.E. - (n6)^L Weld
3-Ls do. - F.2.E. - (y6)^R Weld
2-Ls do. - F.2.E. - (v6)^R
1-L do. - F.2.E. - (ac)^R
1-L do. - F.2.E. - (ad)^R
2-Ls do. - F.2.E. - (s6)^R
1-L do. - F.2.E. - (af7)^R
1-L do. - F.2.E. - (ag)^R
1-L do. - F.2.E. - (ah7)^R
5-Ls do. - F.2.E. - (k6)
18-Ls 6x3½x3/8 x 6'-11¼ - F.2.E. - Crimped - (h6)
10-Bars 3½ x 5/8 x 6'-2½ - (af6)
8- do. - (ag6)
4-Ls 3½x3½x½ x 0'-10¾ - (bb6)
4-Ls 3½x3½x½ x 0'-11¼ - (bc6)

4-PLs 16¾ x 3/8 x 2'-8½ - (bd6)
4-PLs 15 ⊔ 33.9 x 1'-2½ - (cd6)^R - (1 Pc. 1'-6¾ cuts 2) - ord 50'-0 It 52
1-PL 18 U.M. x 3/8 x 1'-10½ - (ak)
1-PL 20¼ x 7/16 x 2'-5 - (am7) (1 PL 20-6 cuts 10)
1-PL 14¾ x 3/8 x 1'-1¼ - (an)
1-PL do. - (ap)
1-PL 14¼ x 3/8 x 1'-1¼ - (cc6)
1-PL 7½ x 7/16 x 1'-5½ - (as) Weld
1-PL 7½ x 5/16 x 1'-5½ - (at) Weld
2-PLs 7½ x ½ x 1'-4½ - (av) Weld
2-PLs 8 x 5/8 x 1'-4½ - (aw) Weld
1-PL 8½ x ½ x 2'-0 - (ay)
2Ls 6 x 3½ x 3/8 x 6'-11¼ F2E - hc6^R_L
2 bars 3½ x 3/8 x 6'-0½ - ha7
2Ls 6 x 3½ x 3/8 x 3'-10¼ F2E - hb6^R_L - bolt one
2 bars 3½ x 3/8 x 3'-4 7/8 hg6 - bolt - one

SHOP NOTE:- Work sheets #7AC, 7BC & 7CC as one sheet.

L-98

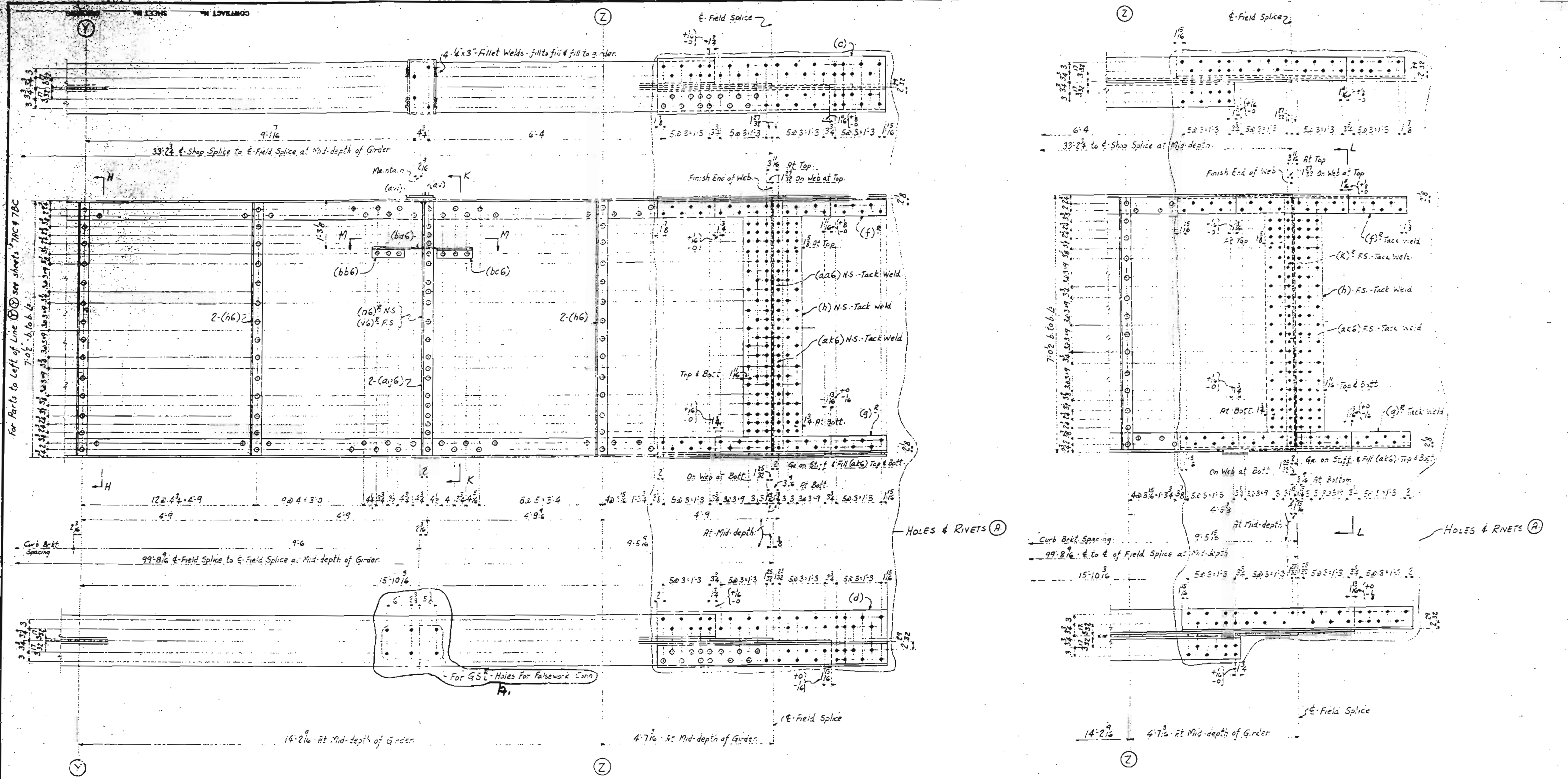
262

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
SHOP CONTACT SURFACES
} See Sheet #7AC

Girder Details :- Spans 5-6-7, 8-9-10

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
SC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY B.K.
CHECKED BY 2/2/39 TRACED BY
REVISED LAST ADDED NO.
SHOP NO.
CONTRACT CG34091 SHEET 7BC



GIRDER - G6R - A SHOWN

Parts to Left of Line Ⓩ-Ⓩ same as for G5R (Except as Noted For Holes For Falsework Conn.)

A.

GIRDER - G6L - OPP. HAND TO G6R

SHOP NOTE:- Work Sheets #7AC - 7BC & 7CC as one sheet.

L-98

Girder Details - Spans 5-6-7, 8-9-10.

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
SHOP CONTACT SURFACES

See Sheet #7AC

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

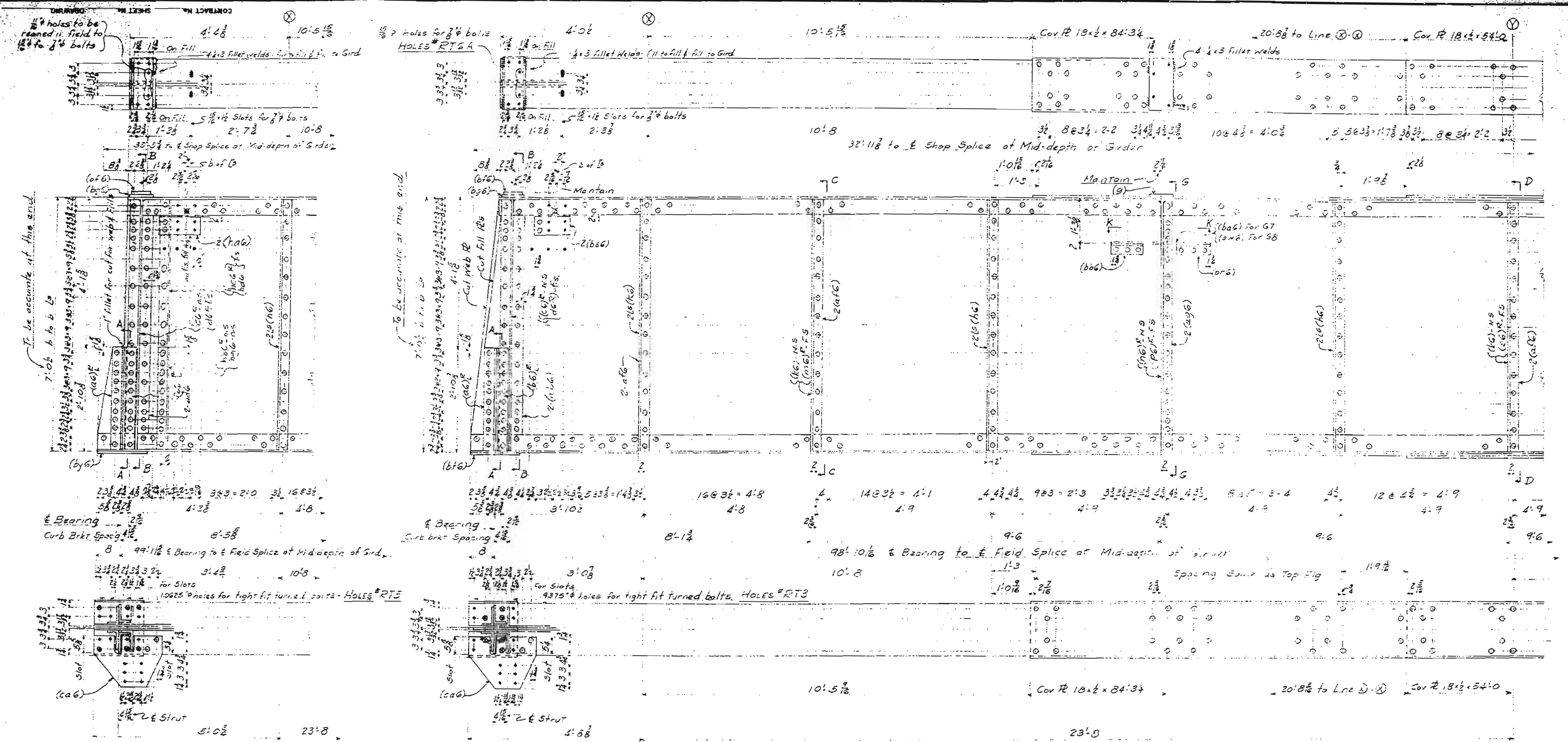
SHOP NO.

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA.
For Atchison County, Missouri.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY B.K.
CHECKED BY 4-21-'29 TRACED BY
REVISED LAST ASSEM. MK.
CONTRACT CG 340-71 SHEET 7CC

263

264



13/16"φ holes to be reamed in field to 15/16"φ for 7/8"φ bolts
15/16"φ Holes for 7/8"φ bolts
Holes #RT64
On Fill
Slots for 7/8"φ bolts
Cov Pl 18 x 1/2 x 84:3 3/4
20:8 3/8 to Line X-X
Cov Pl 18 x 1/2 x 54:0
4:4 x 3 Fillet welds
32:11 1/8 to ¢ Shop Splice at Mid-depth of Girder
To be accurate at this end
Cut Web Pl
Cut Fill Pl
Maintain
¢ Bearing
Curb Brkt Spacing
99:11 1/8 ¢ Bearing to ¢ Field Splice at Mid-depth of Gird.
98:10 1/2 ¢ Bearing to ¢ Field Splice at Mid-depth of Girder
.9375"φ holes for tight fit turned bolts. Holes #RT3
1.0625"φ holes for tight fit turned bolts - Holes #RT3
For Slots
Spacing Same as Top Flg
¢ Strut
X
Y
A
B
C
D
G
K

For parts to right of Line Y-Y see Shts 8BC & 8CC

GIRDER #$G8^R$ AS SHOWN

Parts to right of Line X-X same as for $G7^R$ except as shown in Section K-K

GIRDER #$G8^L$ - OPP HAND TO #$G8^R$

GIRDER #$G7^R$ AS SHOWN

GIRDER #$G7^L$ OPP HAND TO #$G7^R$

REQUIRED LIST

No Req'd	Description	Mark
One	Girder	$G7^R$
One	do.	$G7^L$
One	do.	$G8^R$
One	do.	$G8^L$

L-98

SHOP NOTES:- For General Notes and Camber diagram see Sht #10
Work Shts #8AC, 8BC & 8CC as one sheet
Work Shts #6, 7, 8, 9 & 10 Together

RIVETS - 7/8"φ
OPEN HOLES - 15/16"φ Unless noted
BEAM - See General Notes
MILLING - As Noted
PAINT - See General Notes

SHOP CONTACT SURFACES not painted SHOP NO.

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

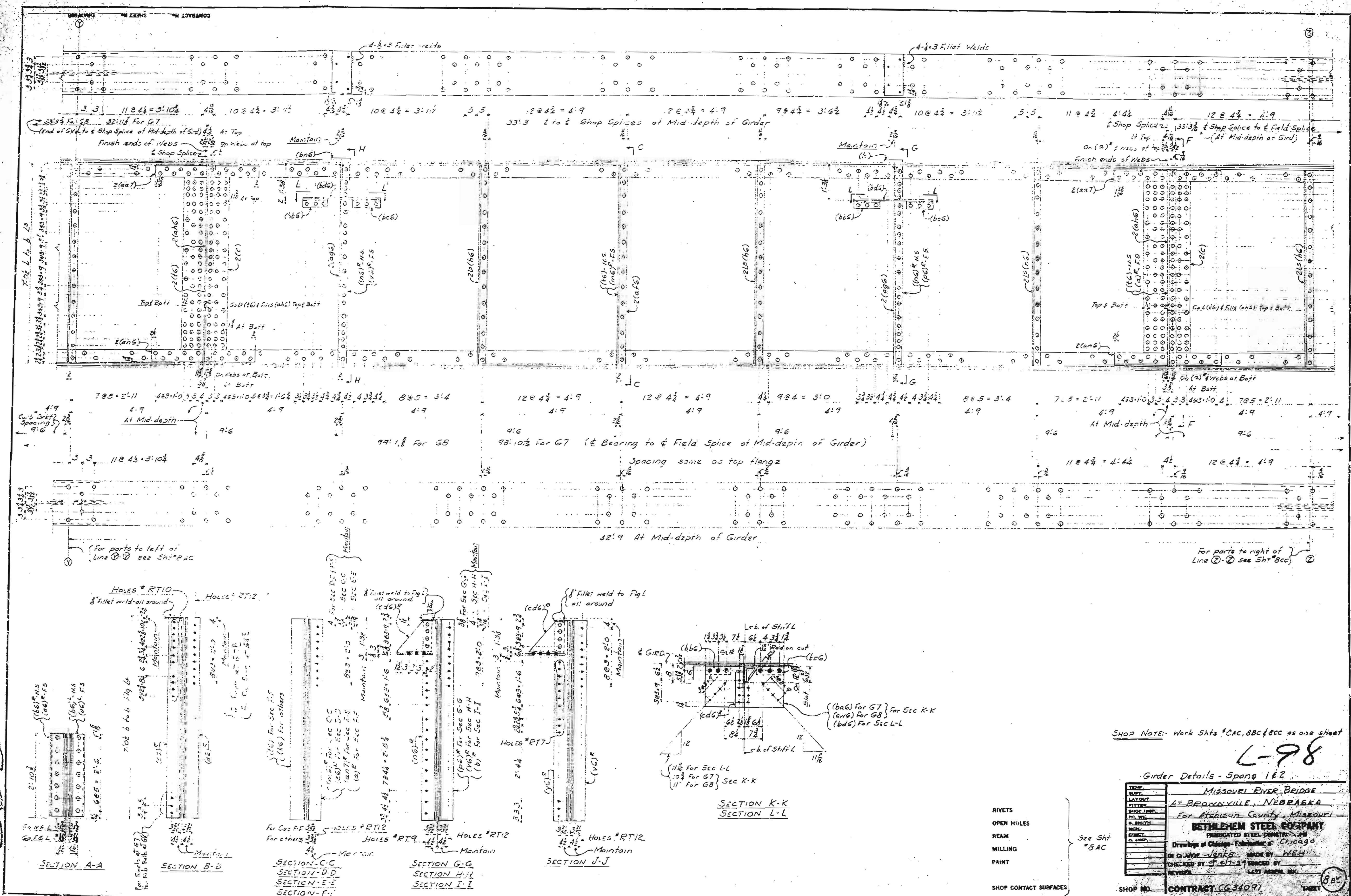
Girder Details Spans 1 & 2

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago

IN CHARGE Jenks MADE BY WEH
CHECKED BY 9 3/7/39 TRACED BY
REVISED LAST ASSEM. MK.

CONTRACT CG34091 SHEET 8AC


4·4·3 Fillet welds
4·4·3 Fillet Welds
33'3 ℄ to ℄ Shop Splices at Mid-depth of Girder
32'11⅛ For G7
(End of Gird. to ℄ Shop Splice at Mid-depth of Gird.)
Finish ends of Webs
℄ Shop Splice
Maintain
35'3⅞ ℄ Shop Splice to ℄ Field Splice (At Mid-depth of Gird.)
Finish ends of Webs
At Mid-depth
99'1⅛ For G8
98'10⅞ For G7 (℄ Bearing to ℄ Field Splice at Mid-depth of Girder)
Spacing same as top flange
42'9 At Mid-depth of Girder
For parts to left of Line Y-Y see Sht #8AC
For parts to right of Line Z-Z see Sht #8CC
Holes #RT10
Holes #RT12
⅜ Fillet weld all around
Holes #RT9
Holes #RT7
⅜ Fillet weld to Flg L all around
(bb6) (bc6) (cd6)
Slot
(ba6) For G7 (aw6) For G8 Sec K-K
(bd6) For Sec L-L
Section A-A
Section B-B
Section C-C
Section D-D
Section E-E
Section F-F
Section G-G
Section H-H
Section I-I
Section J-J
Section K-K
Section L-L

Shop Note:- Work Shts #8AC, 8BC & 8CC as one sheet

L-98

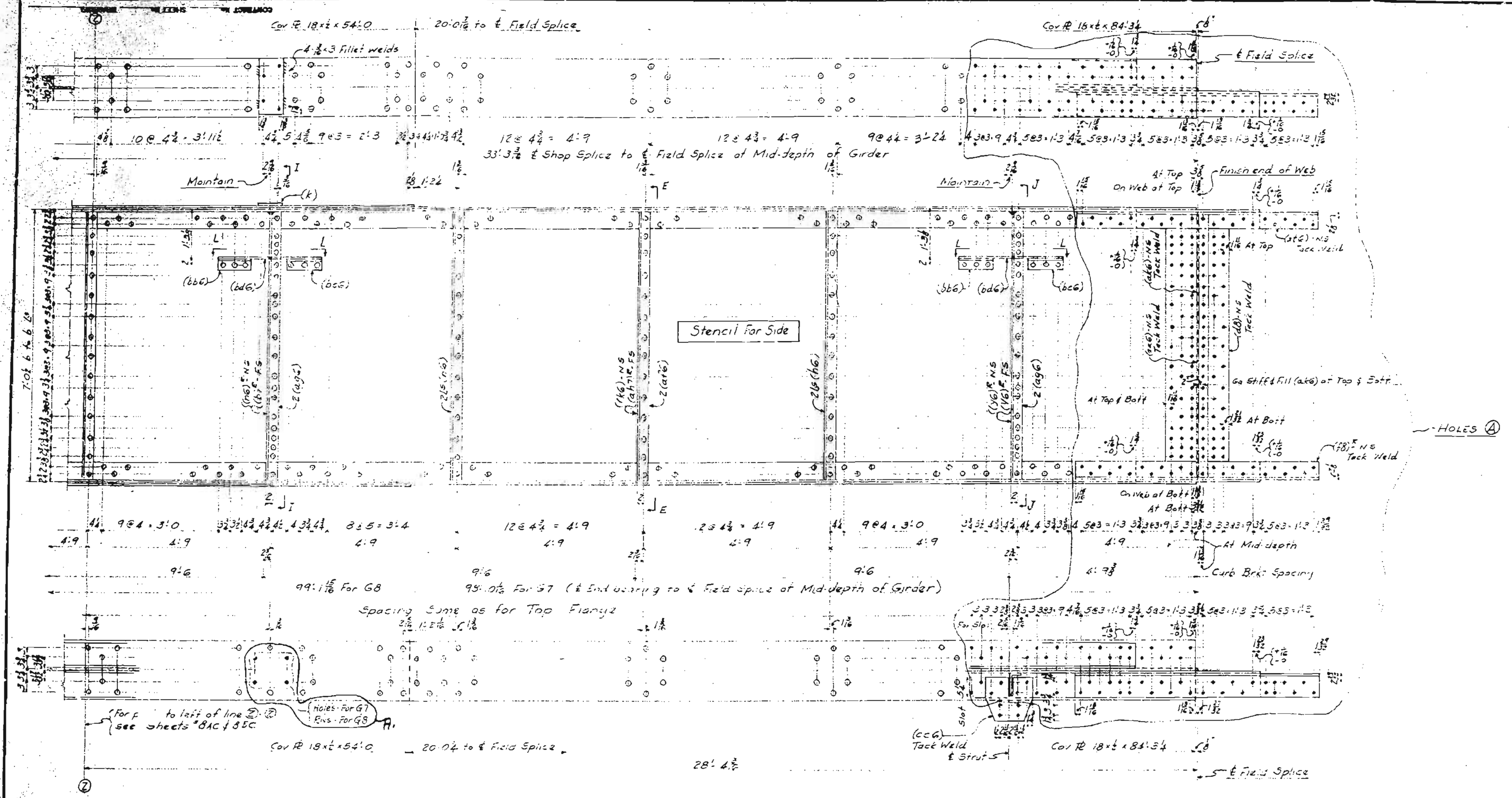
Girder Details - Spans 1 & 2

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
SHOP CONTACT SURFACES
See Sht #8AC

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago-Fabrication at Chicago
IN CHARGE Jenks MADE BY WEH
CHECKED BY [illegible] 2-17-37 TRACED BY
REVISED LAST ADDEN. NO.
SHOP NO.
CONTRACT CG34091 SHEET 8BC

265



BILL OF MATERIAL FOR ONE GIRDER - G7ᴿ - G8ᴿ

1-Web ⅊ 54×7/16×32'-11 27/32 (Ord 33'-1½) It 92 - F1E - For G7
1-Web ⅊ 84×7/16×33'-3 25/32 (Ord 33'-5½) It 89 - F1E - For G8
1-Web ⅊ 84×7/16×33'-3 1/16 F2E - Stock
1-Web ⅊ 84×7/16×33'-3 7/32 (Ord 33'-5¼) It 90 - F2E
Top Flg - 1L-8×6×⅝×100'-4⅞ (Ord 100'-6) It 66 } For G7
Top Flg - 1L-8×6×⅝× 97'-3 (Ord 97'-4¾) It 73 } For G7
Bott Flg - 1L-8×6×⅝× 101'-0⅜ (Ord 101'-2) It 62 } For G7
Bott Flg - 1L-8×6×⅝× 97'-11 (Ord 98'-0¾) It 71 } For G7
Top Flg - 1L-8×6×⅝× 100'-0¼ [illegible]
Top Flg - 1L-8×6×⅝× 97'-6⅞ (Ord 97'-8½) It 72 } For G8
Bott Flg - 1L-8×6×⅝× 101'-4¼ (Ord 101'-6) It 61 } For G8
Bott Flg - 1L-8×6×⅝× 98'-2⅞ (Ord 98'-4½) It 70 } For G8
2 Cov ⅊s 18UM×½×84'-3¼ (Ord 84'-4¾) It 85
2 Cov ⅊s 18UM×½×54'-0 It 99
2 L's 6×4×⅜×2'-10¼ (a6)ᴱ F1E
2 L's do (b6)ᴱ - F1E
1L 6×4×⅜×6'-11¼ (c6)ᴱ - F2E - Weld
1L do (d6)ᴱ - F2E
18-L's 6×3½×⅜×6'-11¼ (h6) - F2E - Crimped for G8
4 L's do (k6) - F2E for G8
2 L's do (m6)ᴱ - F2E
4 L's do (n6)ᴱ - F2E - Weld
2 L's do (p6)ᴱ - F2E
1L do (s6)ᴱ - F2E
39 do (t6) - F2E
2 L's do (v6)ᴱ - F2E
1L do (y6)ᴱ - F2E - Weld
1L do (a)ᴱ - F2E
1L do (b)ᴱ - F2E

16 L's - h6 } For G7
10 Fills af6 } For G7
6 L's k6 } For G7

1L 6×3½×⅜×6'-11¼ (an7)ᴱ - F2E
1L 6×3½×⅜×6'-10¼ (aa6) - F2E - Tack Weld
2 Fills 12½ UM×⅜×6'-0½ (ab6) For G7
2 Fills do (ad6) For G8
8 Fills 3½×⅜×6'-0½ (af6) for G8
10 Fills do (ag6)
4 Fills do (an6)
1 Fill 3½×¾×6'-0½ (ak6) Tack Weld
[illegible]
4 ⅊s do (ar6)
4 ⅊s 19UM×⅜×6'-0½ (c)
1 ⅊ 19UM×⅜×6'-0½ (d8) Tack Weld
1L 7⅞×5⅜×½×6'-3 (Cut from 8×6×½ L) (at6)
(Grind to fit fillet of 8×6×⅝ L) Tack Weld
1L 7⅞×5⅜×½×6'-3 (Cut from 8×6×½ L) (f8)ᴱ
(Grind to fit fillet of 8×6×⅝ L) Tack Weld
1 ⅊ 16¾×⅜×2'-8½ (aw6) For G8
1 ⅊ do (ba6) For G7
5 L's 3½×3½×½×0'-10¾ (bb6)
5 L's 3½×3½×½×0'-11⅛ (bc6)
4 ⅊s 16⅜×⅜×2'-8½ (bd6)
1 Fill 7½×½×1'-6½ (bf6) Weld
1 Fill 3×⅜×1'-4½ (bg6) Weld
1 Fill 7½×⅜×1'-5½ (bn6) Weld
1 Fill 7½×¾×1'-5½ (g) Weld
1 Fill 7½×¼×1'-5½ (h) Weld
1 Fill 7½×3/16×1'-5½ (k) Weld
2 Fills 6½×⅝×0'-11⅞ (bs6) for G7
2 Fills 6½×⅝×1'-0 11/16 (bw6) for G8

1 Sole ⅊ 16UM×¾×1'-5 (bt6) For G7
1 Sole ⅊ do (by6) For G8
1 ⅊ 17¼×⅜×1'-9¾ (13'-6 cuts 8 ⅊s) (ca6)
1 ⅊ 14¼×⅜×1'-1¼ (cc6) Tack Weld
5 Pc L 15 @ 33.9#×1'-2½ (1'-6¾ cuts 2) (cd6)ᴱ
(Ord 50'-0 - It #52)

1L 6×3½×⅜×6'-11¼ - F2E - hc6ᴱ } For G8
1L do ×2'-10¼ - F1E - hb6ᴱ } For G8
1 Bar 5½×⅝×5'-5⅝ - hd6 } For G8
1 Bar 5½×⅝×2'-4⅞ - [illegible] } For G8

SHOP NOTE: Work Shts #8AC, 8BC ⅋ 8CC as one sheet

L-98

Girder Details - Spans 1 ⅋ 2

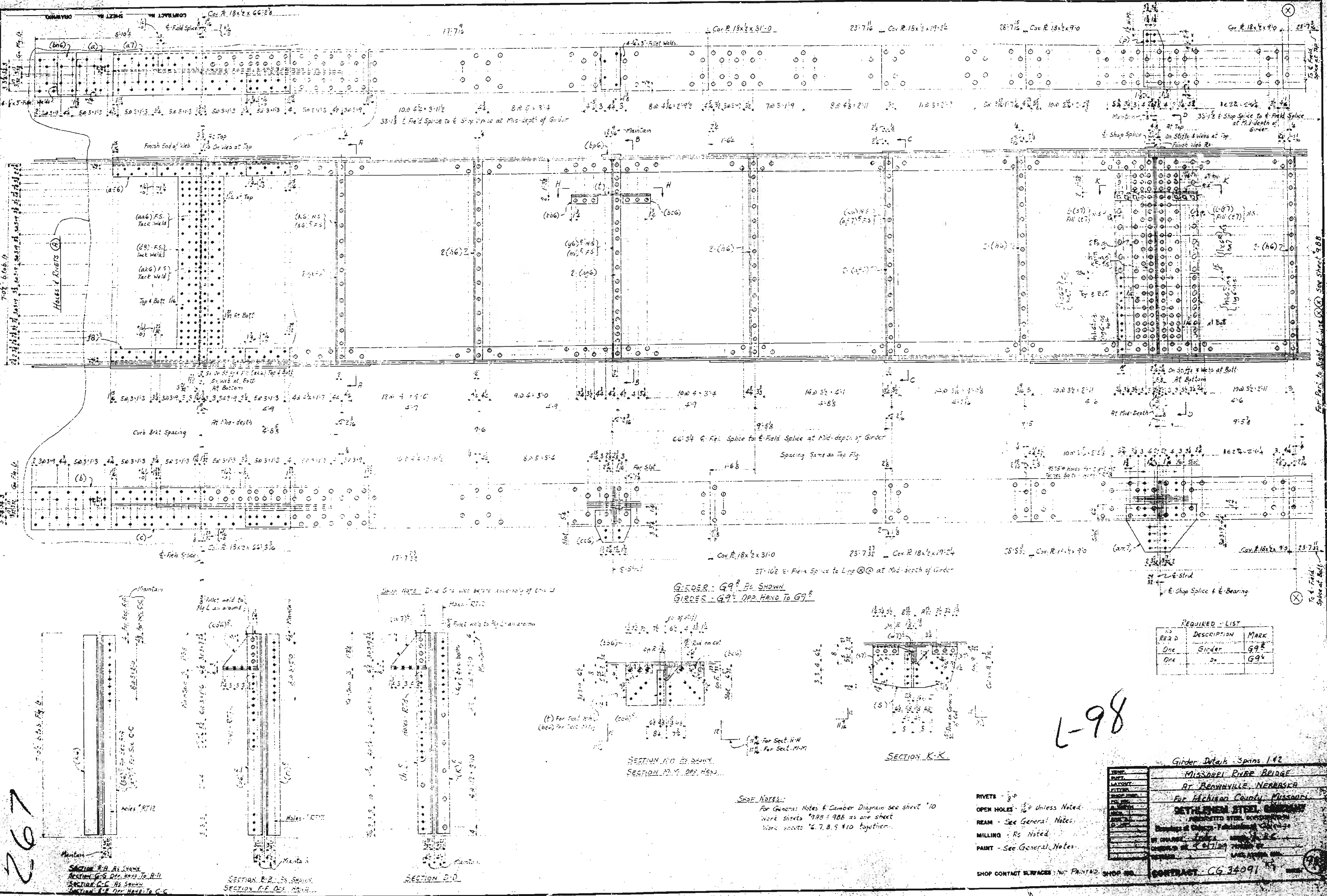
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
SHOP CONTACT SURFACES
} See Sht #8AC

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

SHOP NO.

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
For Atchison County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY WEH
CHECKED BY 9 2/1/39 TRACED BY
REVISED LAST ANNUAL INK
CONTRACT CG 34091 SHEET 8CC



GIRDER : G9R AS SHOWN
GIRDER - G9L OPP. HAND TO G9R

37'-10½ ℄ Field Splice to Line Ⓧ Ⓧ at Mid-depth of Girder

Required - List

No. Req'd	Description	Mark
One	Girder	G9R
One	Do	G9L

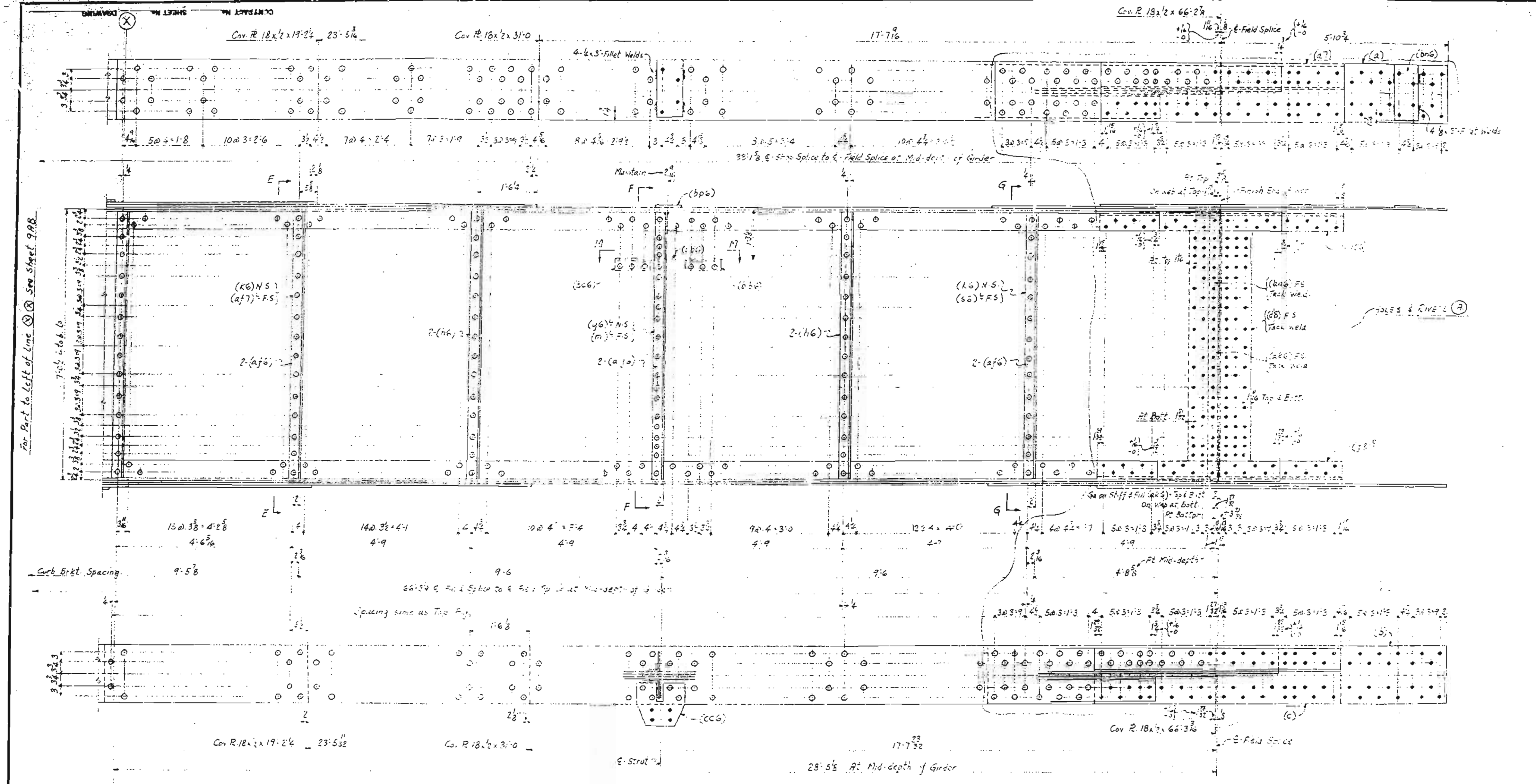
Shop Notes:-
For General Notes & Camber Diagram see sheet #10
Work sheets #97B & 98B as one sheet
Work sheets #6, 7, 8, 9 & 10 together.

RIVETS - ⅞"
OPEN HOLES - 15/16" Unless Noted
REAM - See General Notes
MILLING - As Noted
PAINT - See General Notes
SHOP CONTACT SURFACES - Not Painted
SHOP NO.

Girder Details - Spans 1 & 2
Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
CONTRACT CG 34091

L-98

267



MATERIAL FOR ONE GIRDER - G9

2 - Web Rs 84x⁷⁄₁₆x33'-1²³⁄₃₂ (ord 33'-3½) F.2.E. - It. 41
1 - Top Flg L 8x6x⅝x69'-4¼ (ord 69'-6¼) It. 75
1 - Top Flg. L 8x6x⅝x63'-1½ (ord 63'-3½) It. 76
1 - Bott. Flg L 8x6x⅝x69'-4½ (ord 69'-6¼ It. 75
1 - Bott. Flg L 8x6x⅝x63'-1¾ (ord. 63'-3½ It. 76
1 - Top Cov. R 18U.M.x½x66'-2⅞ (ord 66'-4½) It. 56
1 - Bott. Cov. R 18U.M.x½x66'-3⅝ (ord 66'-4½) It. 56
2 - Cov. Rs 18U.M.x½x31'-0 - It. 100
2 - Cov. Rs. 18U.M.x½x19'-2¼ - It. 102
2 - Cov. Rs. 18U.M.x½x9'-0 - It. 106
2 - Splice Rs 18U.M.x½x11'-8¾ - (a)
2 - do. - (b)
2 - Splice Rs. 18U.M.x½x6'-3 - (a1)
2 - do. - (c)
2 - Ls 7⅜x5⅜x½x6'-3 (cut from 8x6x½) - (af6) Grind to fit fillet
2 Ls do. - (f8) [illegible]
2 - Rs. 19U.M.x⅜x6'-0½ - (c8) - Tack Weld
2 - Bars 3½x¾x6'-0½ - (ak6) - Tack weld.
2 - Ls 6x3½x⅜x6'-10¼ - (ak6) - F.2.E. - Tack Weld
2 - Rs 20U.M.x⅝x6'-0½ - (g)
2 - Ls 7x4x¹¹⁄₁₆x6'-11¼ - F.2.E. - (h) - Weld.
2 - Ls do. - (i)
2 - Ls 3½x3½x½x0'-10 - (s7)
2 - Bars 3½x⅝x0'-6¾ - (t7)
1 - R. 17x⅜x2'-9¹⁵⁄₁₆ - (s)
1 - R. 15⊔33.9x1'-3½ - (w7) (1'-8½ cuts 2) (ord 50'-0 - It. 52)

4 - Ls 6x3½x⅜x6'-11¼ - F.2.E. - (k6)
2 - Ls do - (s6)
2 - Ls do - (y6) - Weld.
2 - Ls do - (af7)
2 - Ls do - (m)
12 - Ls 6x3½x⅜x6'-11¼ - F.2.E. - (h6) - Crimped.
5 - Bars 3½x⅝x6'-0½ - (a7)
4 - Bars do - (a10)
2 - Ls [illegible] x0'-10½ - (b6)
2 - Ls [illegible] x0'-11¼ - [illegible]
1 - R. 16½x⅜x2'-8½ - (cd6)
2 - Ls 15⊔33.9x1'-[illegible] - (cc6) - (1'-R 1'-6¾ cuts 2) (ord. 50'-0 - It. 52)
2 - Rs 7½x⅜x1'-5[illegible] - (bn6) - weld
2 - Rs 7½x½x1'-5[illegible] - (bp6) - weld
2 - Rs 14¼x⅝x1'-1¼ - (cc6)
1 - R 20¼x[illegible]x[illegible] - (am7) (20'-6 cuts 10)
1 - R. 9½x[illegible]x[illegible]'-0 - (p)
1 - R 16¾x⅜x2'-5½ - (t)
2 Ls 6x3½x⅜x6'-11¼ - F.2.E. - hc6
2 Bars 3½x⅝x6'-0½ - ha7
2 Ls 6x3½x⅜x2'-10½ F.2.E. - hb6 - halftone
2 Bars 3½x⅝x2'-4⅞ - hg6 - bolt one.

Shop Note: Work sheets *9AB & *9BB as one sheet

L-98

268

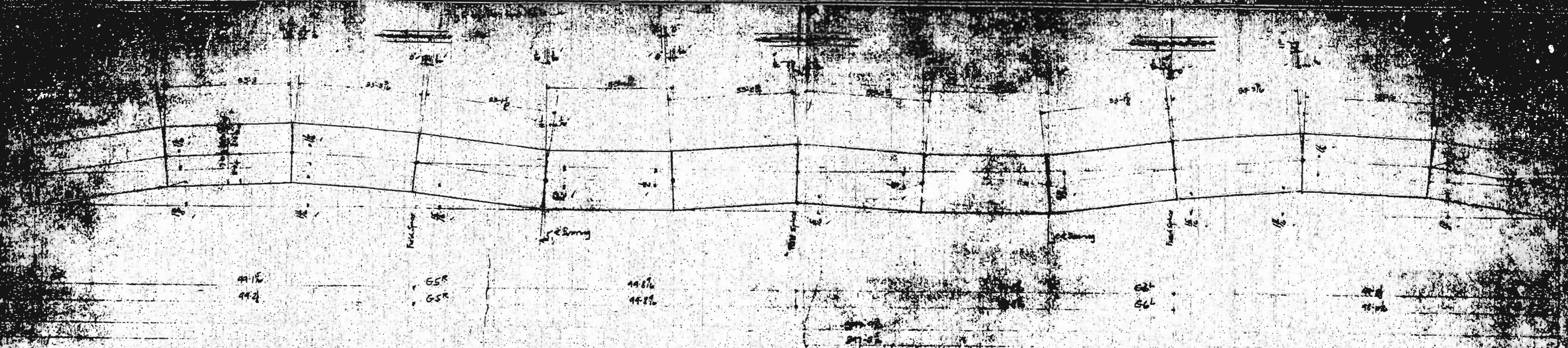
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
SHOP CONTACT SURFACES
See Sheet *9AB

SHOP NO.

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

Girder Details - Spans *1 & 2
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
For Atchison County, Missouri

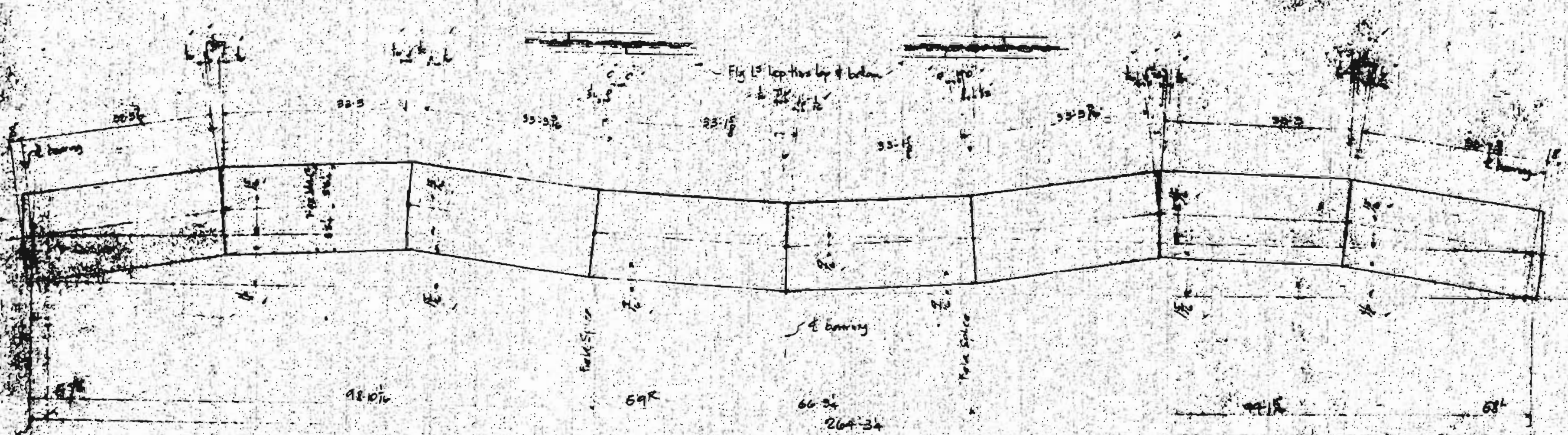
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY B.K.
CHECKED BY [illegible] 7/39 TRACED BY
REVISED LAST ASSIGN. MK.
CONTRACT CG 34091 SHEET 9BB



Spans ⑤-⑥-⑦ & ⑧-⑨-⑩

Diagram showing cambers for shop assembly of shipping sections [illegible] showing camber for yard assembly of entire girders.

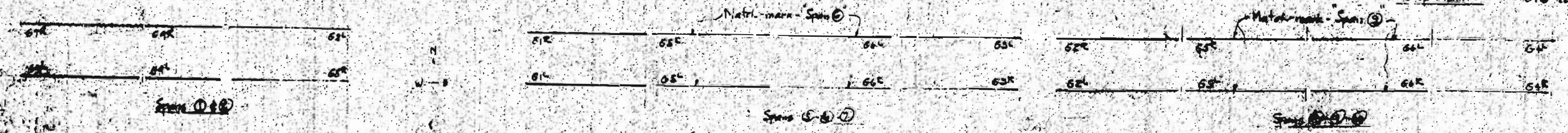
Diagram is shown looking North for North girders
South girders are opp hand to North girders
Camber shown is for girders lying flat (no steel load)



SPANS ① & ②

Diagram showing cambers for shop assembly of shipping sections [illegible] showing camber for yard assembly of entire girders

Diagram is shown looking North for North girder
South girder is opp hand to North girder
Camber shown is for girders lying flat (no steel load)



Reference diagram of Girder System Marks

General Notes for Sts. 6,7,8,9 & 10

Material Specs:- Structural steel as per ASTM-A7-54
Workmanship Specs:- As per Project Specifications.
Welding Specs:- As per ASHO 1955
Shop Inspection:- By R.W. Hunt Co.

Finishing of Web Pls:- Abutting ends of web plates shall be [illegible] to proper [illegible] for [illegible]

Fit of Splice Pls, etc:- Ends of splice plates and fillers under stiffeners need not be finished [illegible] shall fit against flange if sufficiently close to be sealed by paint against admission of water.

Gussets on Bottom Flgs:- Slots for gussets on bottom flanges of girders shall have [illegible] inside corners.

Punching:- All holes (except slotted holes), for shop and field rivets or bolts [illegible] thru the main material of the girders, and all [illegible] be subpunched [illegible] and reamed to size.
All other holes may be punched full size.

Reaming:- Subpunched holes shall be reamed to size [illegible] at holes and rivets marked Ⓐ, reaming shall be [illegible]
Holes marked P.T. shall be reamed thru steel templates.

Shop Assembly:- Girder sections shall be assembled to the cambers [illegible] while so assembled reaming (except for holes [illegible] Contact surfaces are not to be painted but [illegible] cleaned as per Project Specifications.

Yard Assembly:- Girder sections shall be yard assembled into the [illegible] shown on this sheet while lying in a flat position [illegible] to the camber shown on this sheet and reamed to [illegible]

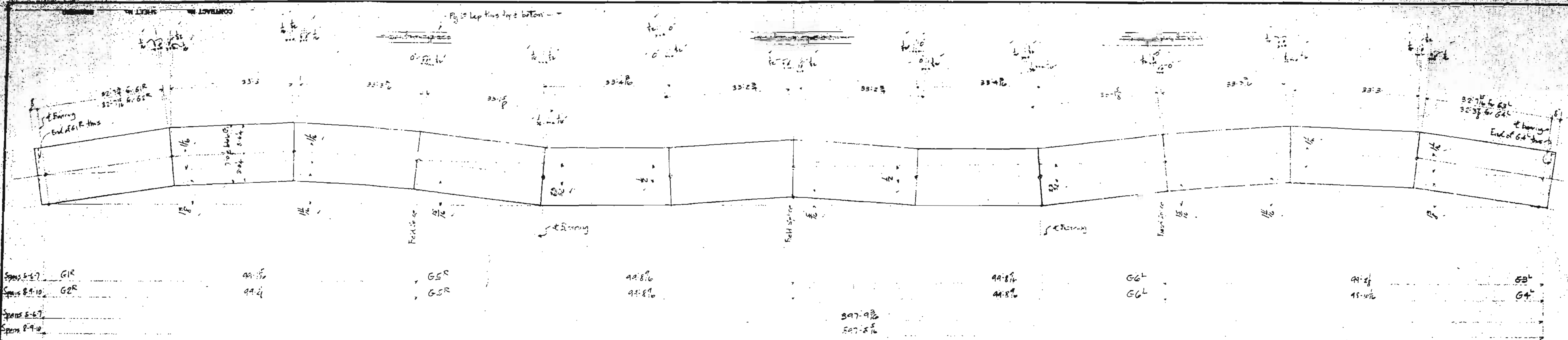
Tack Welding at Field Splices:- Tack welding at field splices shall not [illegible] until girders are yard assembled.

Match Marking:- Girders 65E & 65[illegible] shall be match marked with span number as shown [illegible]

Shop Painting:- Cleaning and painting shall be as per Project Specifications.
Shop Paint:- One coat of an approved Red Lead Paint as per [illegible]

L-98

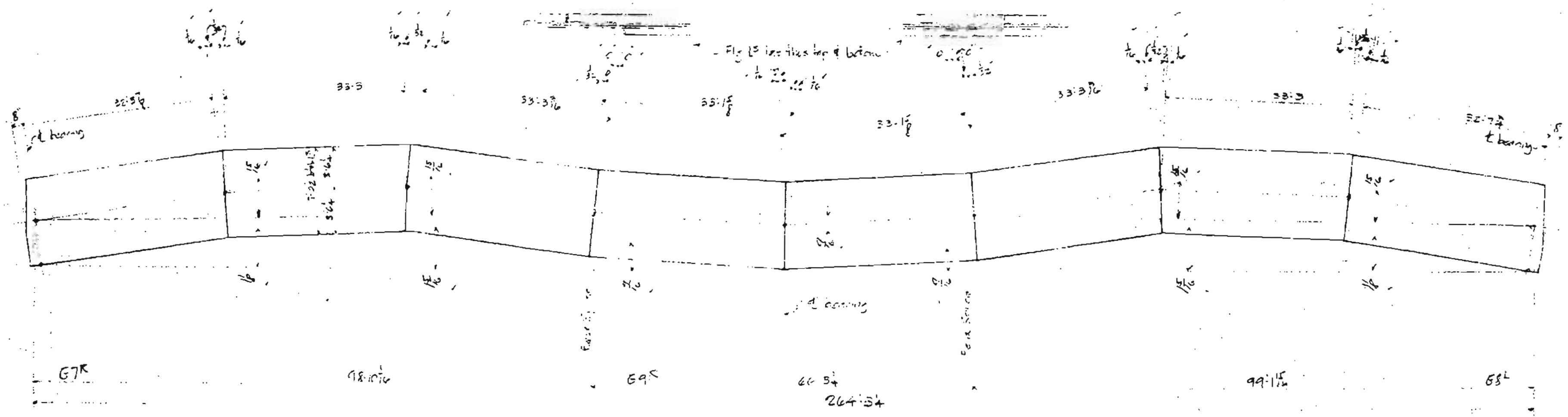
Shop Bolt [illegible] Sts. 6,7,8,9 & 10 together



SPANS ⑤-⑥-⑦ & ⑧-⑨-⑩

Diagram showing cambers for shop assembly of shipping sections and showing camber for yard assembly of entire girders.

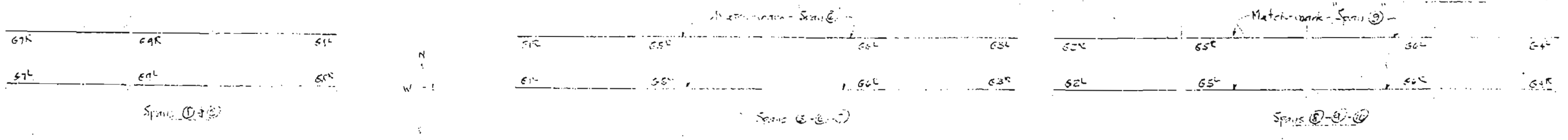
Diagram is shown looking North for North girders
South girders are opp hand to North girders
Camber shown is for girders lying flat (no steel load)



SPANS ① & ②

Diagram showing cambers for shop assembly of shipping sections and showing camber for yard assembly of entire girders.

Diagram is shown looking North for North girder.
South girder is opp hand to North girder
Camber shown is for girders lying flat (no steel load)



Reference diagram of Girder Section Marks

General Notes for Sht.* 6,7,8,9 & 10

Material Specs:- Structural steel as per ASTM-A7-54
Workmanship Specs:- As per Project Specifications.
Welding Specs:- As per ASHO 1955
Shop Inspection:- By R.W. Hunt Co.

Finishing of Web Plates:- Abutting ends of web plates shall be finished to proper bevel for a tight fit.

Fit of Splice Plates:- Ends of splice plates and fillers under stiffeners need not be finished but shall fit against flange L's sufficiently close to be sealed by paint against admission of water.

Gussets on Bottom Flge.:- Slots for gussets on bottom flanges of girders shall have 1/2 radius at inside corners.

Punching:- All holes (except slotted holes), for shop and field rivets or bolts which will extend thru the main material of the girders, and all holes marked RT, shall be subpunched 11/16 and reamed to size.
All other holes may be punched full size.

Reaming:- Subpunched holes shall be reamed to size at shop assembly except that at holes and rivets marked Ⓐ, reaming shall be at yard assembly.
Holes marked RT shall be reamed thru steel templets.

Shop Assembly:- Girder sections shall be assembled to the cambers shown on this sheet and while so assembled reaming (except for holes & rivets Ⓐ) shall be done.
The contact surfaces are not to be painted but such surfaces shall be cleaned as per Project Specifications.

Yard Assembly:- Girder sections shall be yard assembled into the six complete girders shown on this sheet. While lying in a flat position, they shall be adjusted to the cambers shown on this sheet and reamed to size at holes & rivets Ⓐ.
Turn Marking at Field Splices:- Turn marking at field splices shall not be done until girders are yard assembled.

Match Marking:- Girders G5L & G6L shall be match marked with span number as shown on this sheet.

Shop Painting:- Cleaning and painting shall be as per Project Specifications.
Shop Paint:- One coat of an approved Red Lead Paint as per Project Specifications.

Shop Note:- Work shts.* 6,7,8 & 9 & 10 together

L-98

269

RIVETS
OPEN HOLES
REAM
MILLING
PAINT

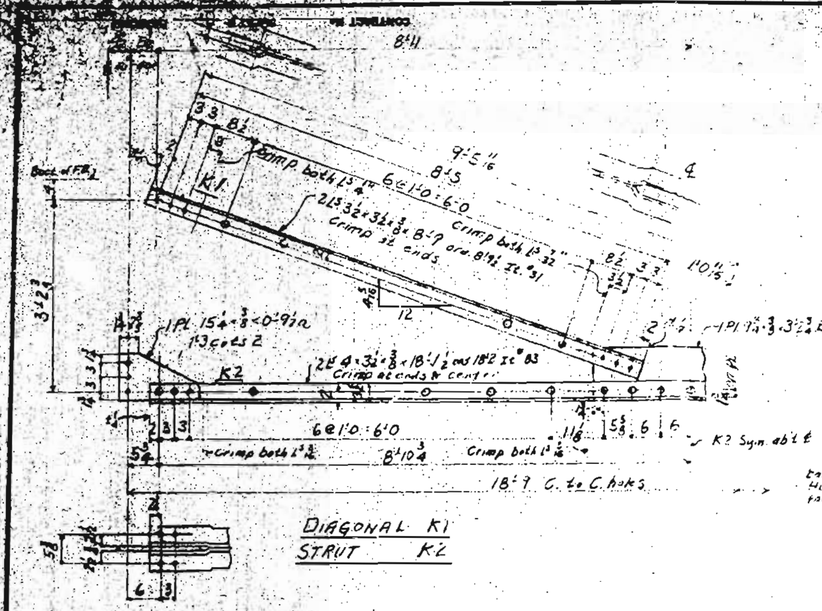
SHOP CONTACT SURFACES

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
Q. INSP.

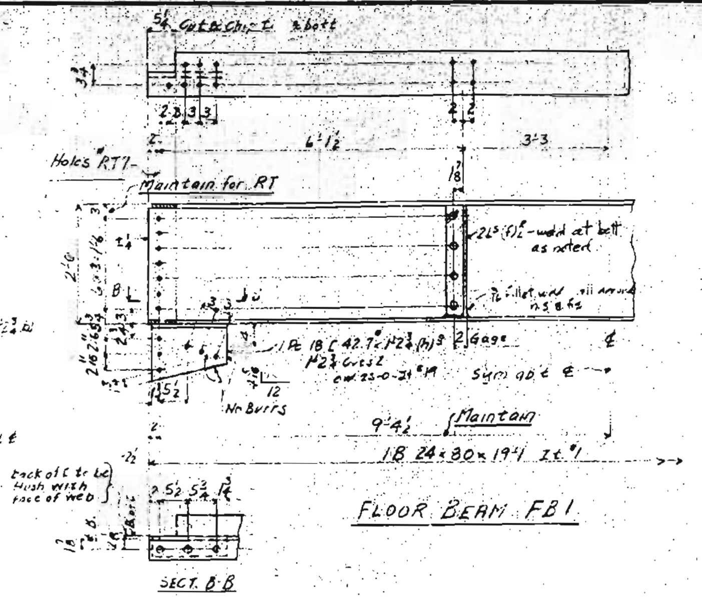
General Data for Girders - Approach Spans

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY - MISSOURI

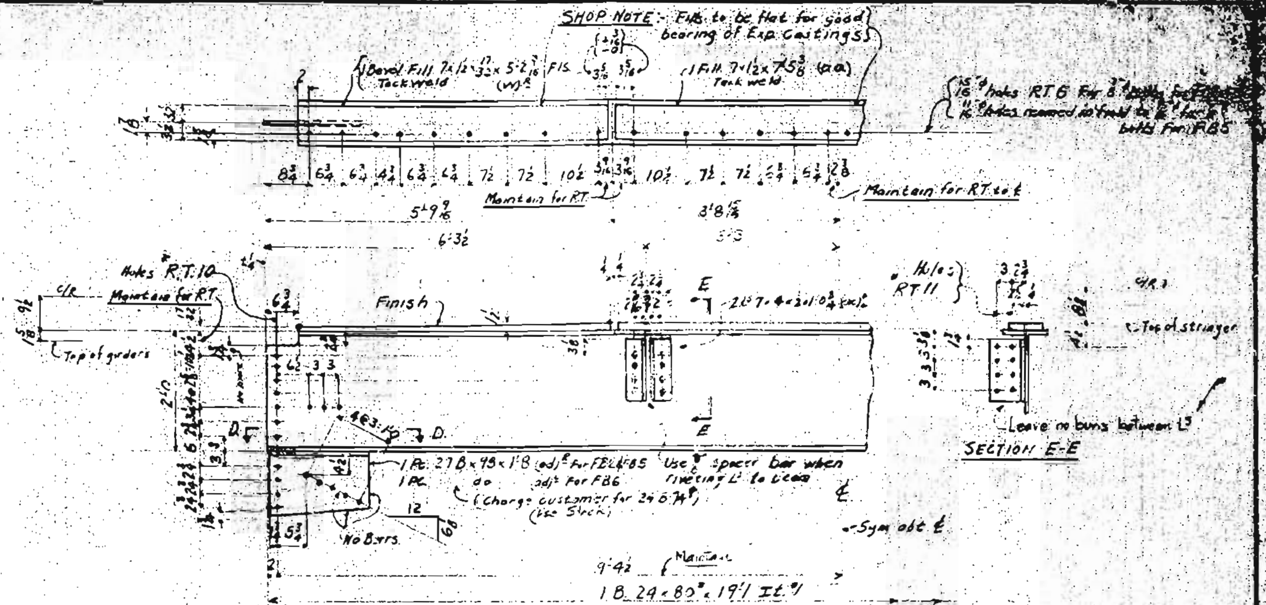
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabricated at Chicago
IN CHARGE Jenks MADE BY F
CHECKED BY F 7/27/59 TRACED BY
REV. SHOP NO.
CONTRACT CG34091

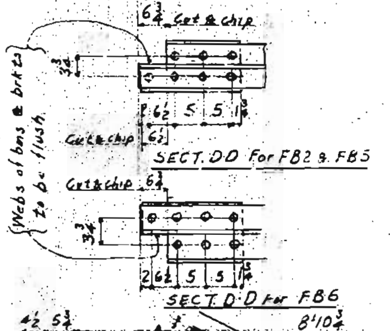


DIAGONAL K1
STRUT K2

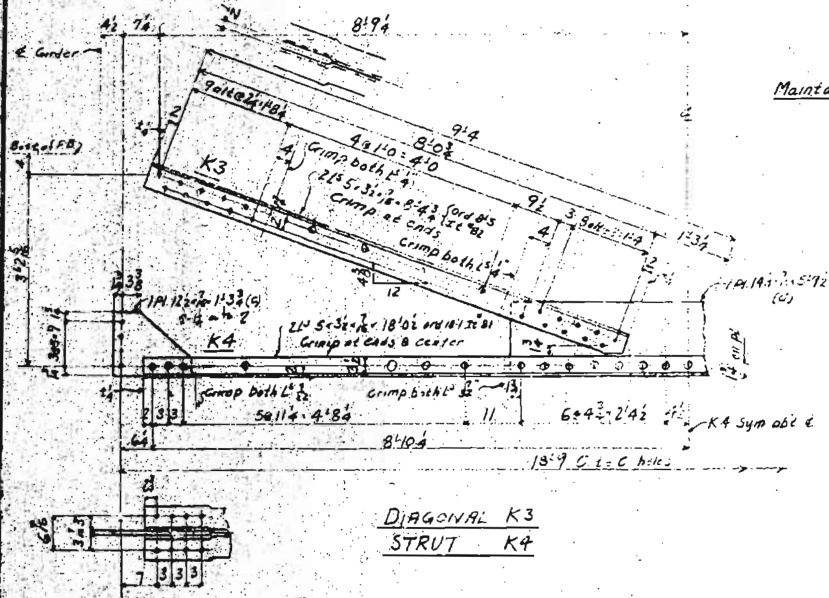


FLOOR BEAM FB1

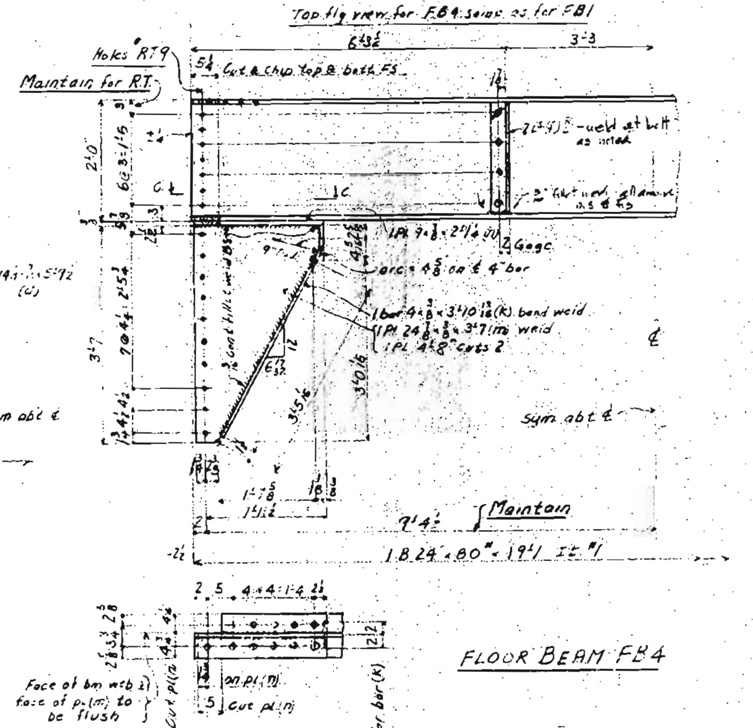




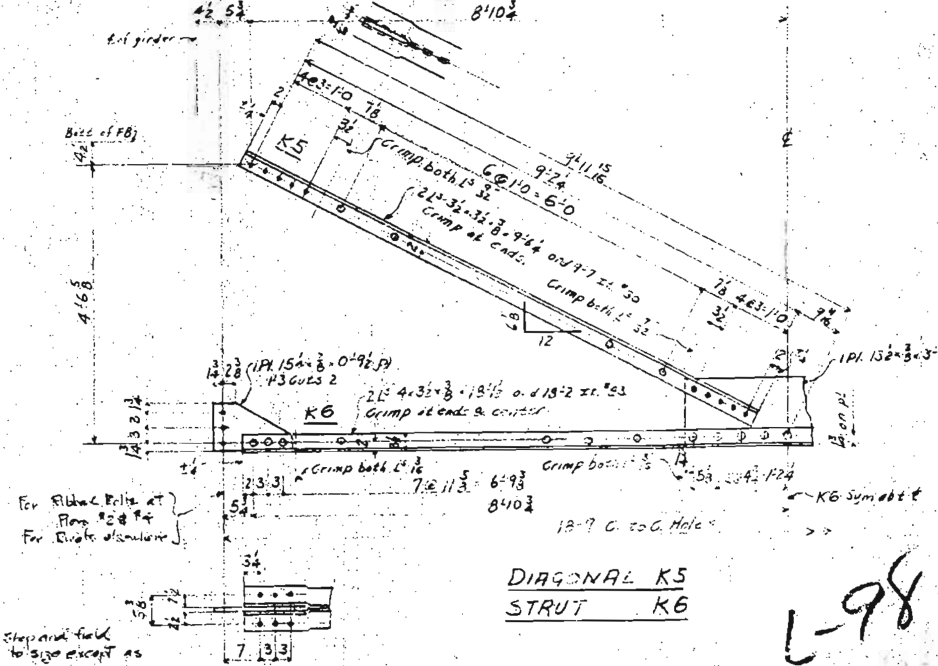
FLOOR BEAM FB2
" " FB5
" " FB6



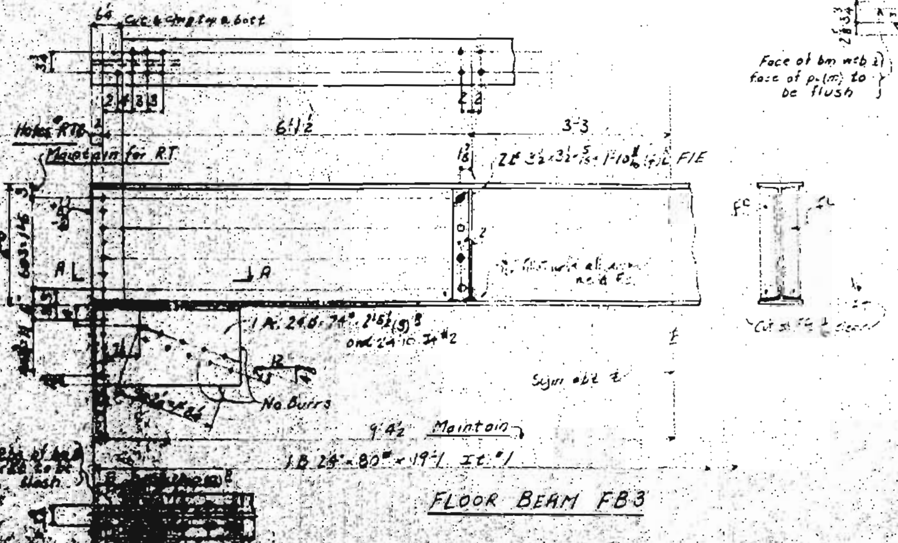
DIAGONAL K3
STRUT K4



FLOOR BEAM FB4



DIAGONAL K5
STRUT K6



FLOOR BEAM FB3

GENERAL NOTES:-

Material Specs:- Structural Steel as per A.S.T.M.-A7-34
Workmanship Specs:- As per Project Specifications.
Welding Specs:- As per A.S.H.O 1935
Shop Inspection:- By R.W. Hunt Co.
Punching, Reaming, Drilling:- (a) Holes in main material of floor beams for shop and field rivets shall be subpunched 11/16 and reamed to size except as noted under (b)
(b) Holes in top flgs of FB2, FB5 & FB6 and fills on same shall be drilled full size
(c) Holes marked RT7 to RT11 in brackets and lugs shall be subpunched & reamed.
(d) All holes not covered by (a), (b) & (c) may be punched full size
(e) Holes RT6 to be drilled to a steel templet
(f) Holes RT7 to RT11 shall be reamed to steel templets.
Shop Assembly:- Shop contact surfaces are not to be painted but shall be cleaned as per project specifications.
Shop Painting:- Cleaning and painting shall be as per project specifications.
Shop Paint:- One coat of an approved Red Lead as per project specifications.

REQUIRED LIST

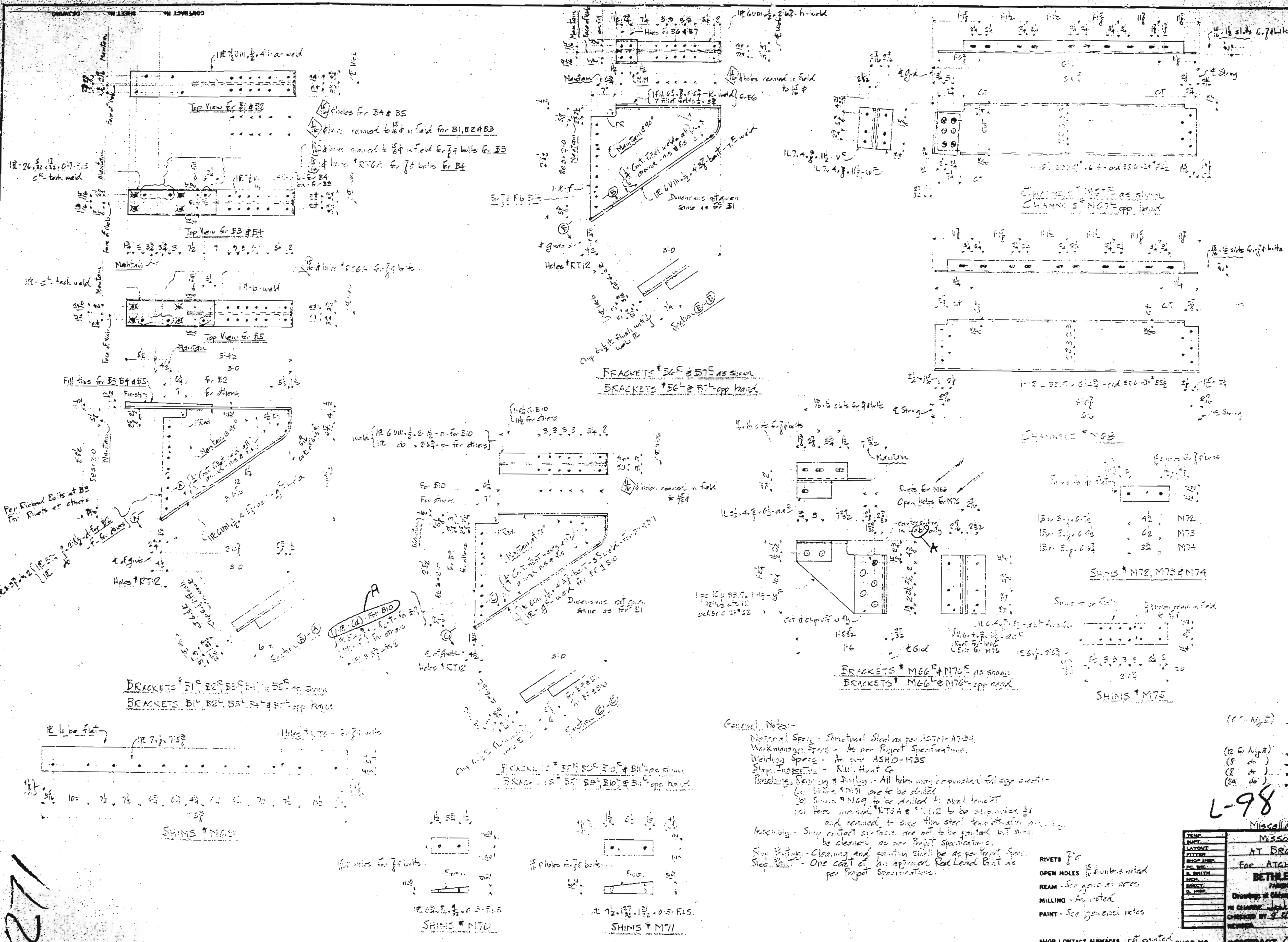
No Reqd	DESCRIPTION	MARK
20	Floor Beams	FB1
2	do	FB2
5	do	FB3
28	do	FB4
2	do	FB5
2	do	FB6
40	Diagonals	K1
10	do	K3
12	do	K5
20	Struts	K2
5	do	K4
6	do	K6

L-98

270

RIVETS 7/8
OPEN HOLES 15/16 Unless noted
REAM See general notes
MILLING As noted
PAINT See general notes
SHOP CONTACT SURFACES not painted

FLOOR BEAMS & CROSS FRAMES FOR APPROACH SPANS
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
Drawings at Chicago—Fabricated at Chicago
IN CHARGE Jenks MADE BY CBF
CHECKED BY
SHOP NO. CONTRACT CG34091


Top View for B1 & B2
Top View for B3 & B4
Top View for B5
Brackets # B1R, B2R, B3R, B4R & B5R as shown
Brackets B1L, B2L, B3L, B4L & B5L opp hand
Brackets # B6R & B7R as shown
Brackets # B6L & B7L opp hand
Channels # M67R as shown
Channels # M67L opp hand
Channels # M68
Brackets # B8R, B9R, B10R & B11R as shown
Brackets B8L, B9L, B10L & B11L opp hand
Brackets # M66R & M76R as shown
Brackets # M66L & M76L opp hand
Shims # M72, M73 & M74
Shims # M75
Shims # M69
Shims # M70
Shims # M71
Holes # RT12
Section E-E

General Notes:-

Material Spec:- Structural Steel as per ASTM-A7-34.
Workmanship Spec:- As per Project Specifications.
Welding Spec:- As per ASHO-1935
Shop Inspection - R.W. Hunt Co.
Punching, Reaming & Drilling - All holes may be punched full size except:-
(a) Shims # M71 are to be drilled
(b) Shims # M69 to be drilled thru steel template
(c) Holes marked # RT6A & # RT12 to be sub-punched 3/4 and reamed to size thru steel template in assembly.
Assembly - Shop contact surfaces are not to be painted but shall be cleaned as per Project Specifications.
Shop Painting - Cleaning and painting shall be as per Project Spec.
Shop Paint - One coat of an approved Red Lead Paint as per Project Specifications.

RIVETS 7/8 ø
OPEN HOLES 15/16 ø unless noted
REAM - See general notes
MILLING - As noted
PAINT - See general notes
SHOP CONTACT SURFACES not painted
SHOP NO.

REQUIRED LIST

	No. Reqd	Description	Mark
	40	Brackets	B1R
	40	do	B1L
	8	do	B2R
	8	do	B2L
	2	do	B3R
	2	do	B3L
	2	do	B4R
	2	do	B4L
	2	do	B5R
	2	do	B5L
	1	do	B6R
	1	do	B6L
	4	do	B7R
	4	do	B7L
	30	do	B8R
	30	do	B8L
	2	do	B9R
	2	do	B9L
	18	do	B10R
	18	do	B10L
	6	do	B11R
	6	do	B11L
	4	do	M66R
	4	do	M66L
	6	Channels	M67R
	6	do	M67L
	6	do	M68
(6 for Adj.t)	24	Shims	M69
	12	do	M70
	12	do	M71
(12 for Adj.t)	120	do	M72
(8 do)	80	do	M73
(8 do)	68	do	M74
(24 do)	24	do	M75
	2	Brackets	M76R
	2	do	M76L

L-98

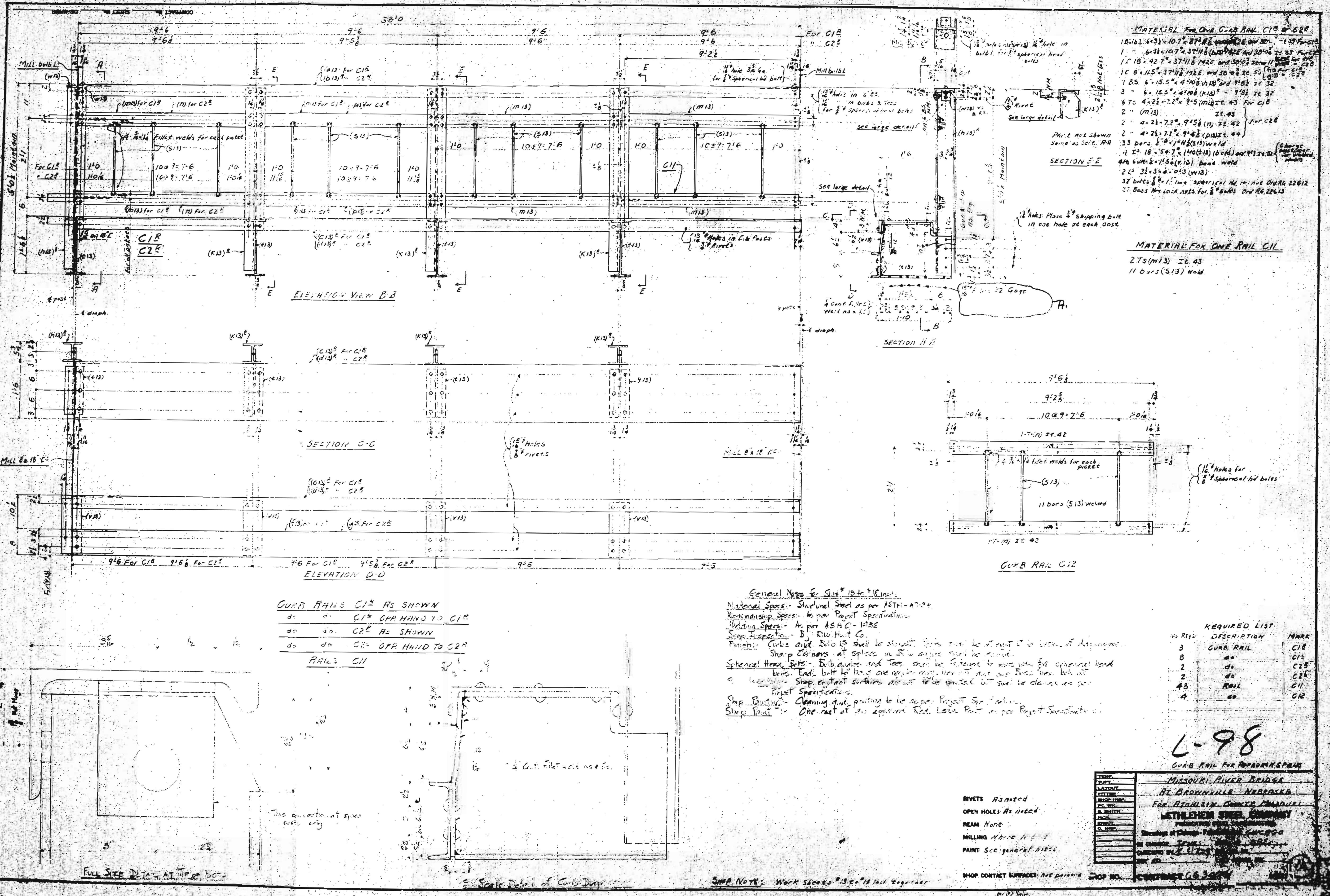
Miscellaneous - Approach Spans
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY, MISSOURI

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
G. INSP.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago Fabrication at Chicago
IN CHARGE Jenks MADE BY J
CHECKED BY J 2/21/39 TRACED BY
REVISED LAST REVISED DATE
CONTRACT C634091 SHEET ⑫

Ⓐ Revised 3/2/39.

271



MATERIAL FOR ONE CURB RAIL C1R or C2R

1 Bulb L 6×3½×10.7#×37'11⅞ [illegible] and 30'0¾ Lt. 35 For C1R
1 " 6×3½×10.7#×37'11⅞ [illegible] M2E and 30'0¾ Lt. 35 For C2R
1 [18×42.7#×37'11⅞ M2E and 30'0¾ [illegible] for C1R " C2R
1 [8×11.5#×37'11⅞ M2E and 30'0¾ Lt. 53 (f13 For C1R, g13 " C2R)
1 B.S. 6×15.5#×4'10⅞ (h13)R and 9'8½ Lt. 32
3 " 6×15.5#×4'10⅞ (K13)R " 9'8½ Lt. 32
6 Ts 4×2½×7.2#×9'5 (m13) Lt. 43 For C1R
2 " (m13) Lt. 43 } For C2R
2 " 4×2½×7.2#×9'5⅛ (n) Lt. 42 } For C2R
2 " 4×2½×7.2#×9'4⅞ (p13) Lt. 44 } For C2R
33 bars ⅝"×1'11½ (S13) weld
4 [s 18×54.7#×1'4⅞ (d13) (bolts) and 9'3 Lt. 51 {[illegible]}
4 Pls 6 [illegible]×½×1'5¼ (v13) Bend weld
2 Ls 3½×3×¼×0'4¾ (w13)
32 bolts ⅝"×1½ lg. spherical Hd. [illegible] Ord. Rg 22612
32 Boss Hex lock nuts for ⅝" bolts Ord Rg 22613

MATERIAL FOR ONE RAIL C11

2 Ts (m13) Lt. 43
11 bars (S13) weld

CURB RAILS C1R AS SHOWN
do do C1L OPP. HAND TO C1R
do do C2R AS SHOWN
do do C2L OPP. HAND TO C2R
RAILS C11

General Notes for Sub. # 13 to # 18 incl.:
Material Specs:- Structural Steel as per ASTM-A7-34.
Workmanship Specs:- As per Project Specifications.
Welding Specs:- As per ASWC - 1935
Shop Inspection:- By Rob. Hunt Co.
Finish:- Curbs and Bolts [illegible] shall be [illegible] [illegible]
Sharp Corners at splices in [illegible] shall be [illegible].
Spherical Head Bolts:- Bulb angles and Tees shall be fastened to posts with ⅝" spherical head bolts. Each bolt to have one [illegible]
[illegible]:- Shop contact surfaces are not to be painted but shall be cleaned as per Project Specifications.
Shop Painting:- Cleaning and painting to be as per Project Specifications.
Shop Paint:- One coat of an approved Red Lead Paint as per Project Specifications.

REQUIRED LIST

No. Reqd.	DESCRIPTION	MARK
3	CURB RAIL	C1R
8	do	C1L
2	do	C2R
2	do	C2L
48	RAIL	C11
4	do	C12

RIVETS As noted
OPEN HOLES As noted
REAM None
MILLING Where noted
PAINT See general notes
SHOP CONTACT SURFACES not painted
SHOP NO.

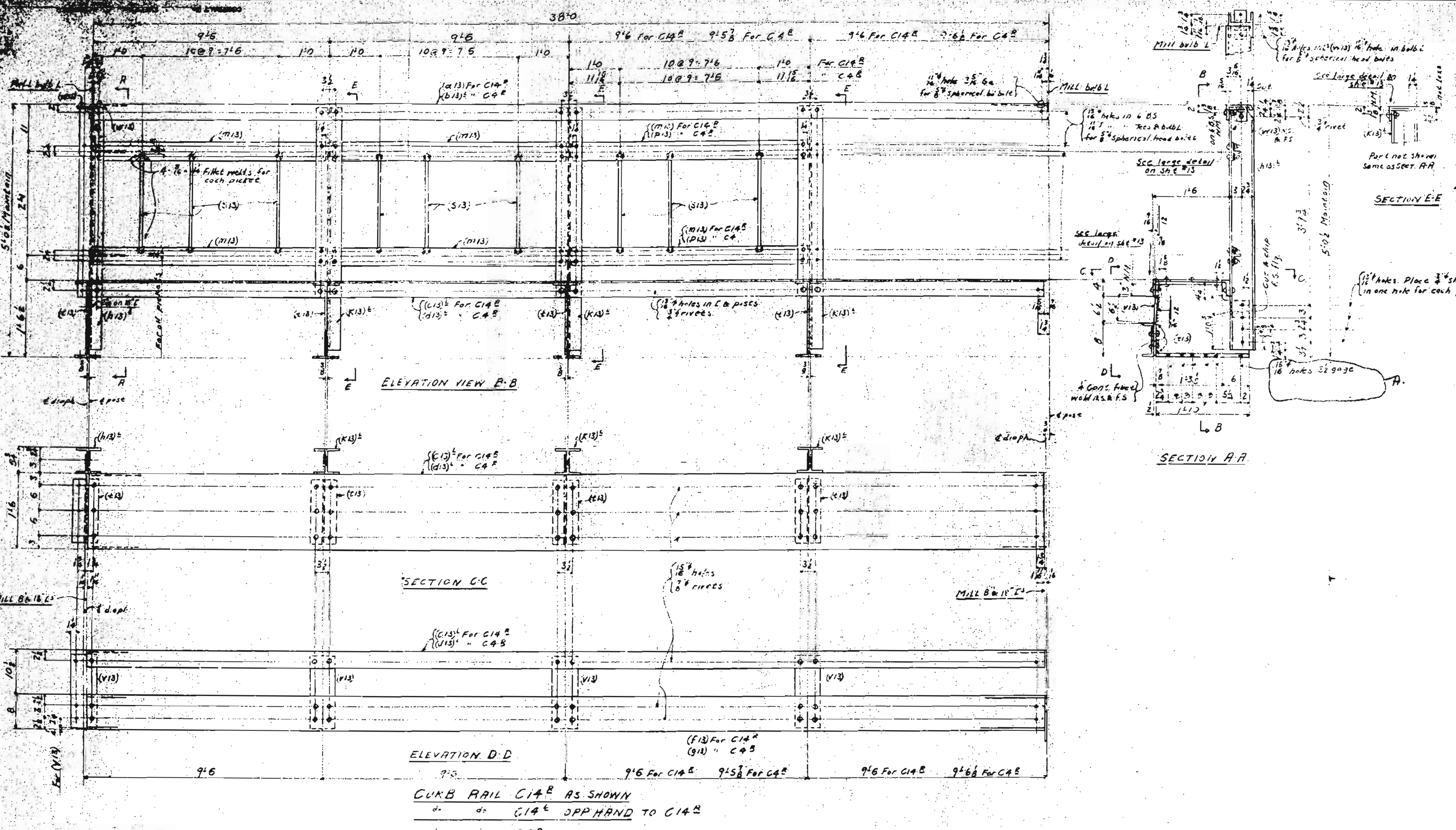
SHOP NOTE: Work sheets # 13 to # 18 incl. together

L-98

CURB RAIL FOR APPROACH SPANS

MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
[illegible]
CONTRACT C.G. 34[illegible]

272



MATERIAL For Each Curb Rail $C14^{B}$ [illegible]

1 Bulb L 6×3½×10.7# × 37'11⅞ M2E [illegible]
1 ⊏ 18×42.7# × 37'11⅞ M2E (ord [illegible]) [illegible] C14 [illegible]
1 ⊏ 8×11.5# × 37'11⅞ M2E (ord [illegible]) {(f13) – C14 / (g13) – C4}
1 BS 6×15.5#×4'11⅝ (h13) (ord 9'8½ It 32)
3 BS 6×15.5 – 4'10⅝ (K13) (" 9'8½ It 32)
6 Ts 4×2½×7.2#×9'5 (m13) It 43 For C14
4 " (m13) It 43 } For C4
2 " 4×2½×7.2#×9'4⅞ (p13) It 44 }
53 bars ½"φ × 1'4½ (S13) weld
4 I's 10×54.7#×1'10 (t13) (bot) ord 9'3 It 51 } Charge 6 extra for welded plates
4 Pls 6 UM × ½ × 1'5¼ (V13) bent weld
2 Ls 3½×3×¼×0'4⅞ (W13)
32 bolts ⅝"φ×1½ long Spherical Head & Hex nut Ord R 22612
32 Boss Hex Lock Nuts for ⅝" bolts. Ord 22613

CURB RAIL $C14^{B}$ AS SHOWN
do do $C14^{L}$ OPP HAND TO $C14^{B}$
do do $C4^{B}$ AS SHOWN
do do $C4^{L}$ OPP. HAND TO $C4^{B}$

Note: For general notes see Sht #13

REQUIRED LIST

No Reqd	DESCRIPTION	MARK
8	CURB RAIL	$C14^{B}$
8	do do	$C14^{L}$
2	do do	$C4^{B}$
2	do do	$C4^{L}$

L-98

CURB RAIL FOR [illegible] SPANS

MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI

BETHLEHEM STEEL COMPANY
[illegible]
Drawings at [illegible] CHICAGO
[illegible] Towns [illegible] C.R.S.
CHECKED BY G. Shlag
CONTRACT CG 32097

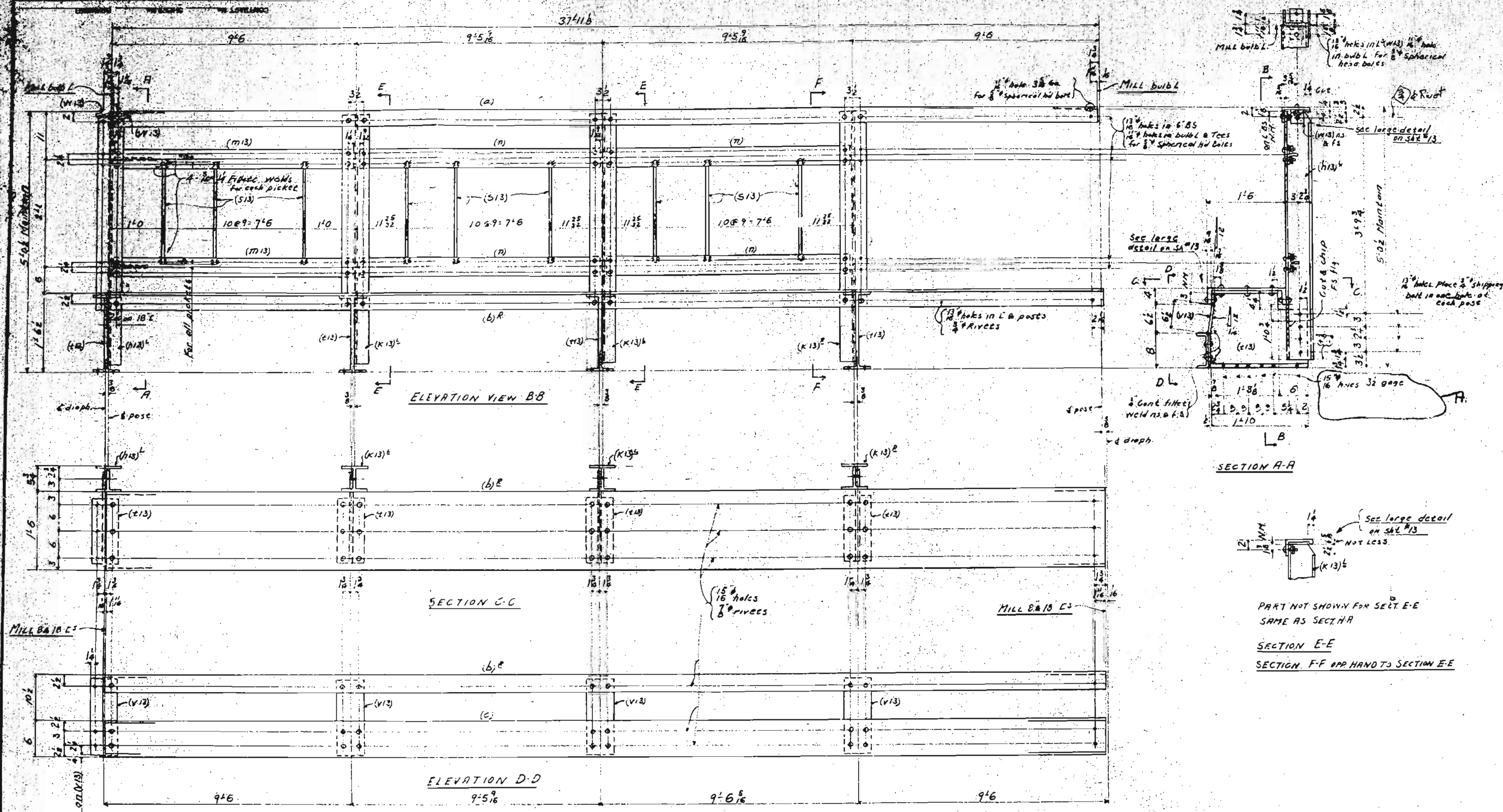
TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

RIVETS As noted
OPEN HOLES As noted
REAM None
MILLING Where noted
PAINT See general notes

SHOP CONTACT SURFACES not painted SHOP NO.

SHOP NOTE: Work sheets #13 to #18 incl together

273


37'-11 5/8
9'-6
9'-5 9/16
9'-5 9/16
9'-6
Mill bulb L
Mill bulb L
ELEVATION VIEW B-B
SECTION C-C
ELEVATION D-D
SECTION A-A
See large detail on Sht #13
4-3/16 Fillet welds for each picket
For all pickets
13/16 holes in L & posts 3/4 Rivets
15/16 holes 3/4 rivets
Mill B&18 C's
Mill B&18 C's
¢ diaph.
¢ post
3/16 Cont. fillet weld as s.f.s.
15/16 holes 3 1/2 gage
13/16 holes. Place 3/4 shipping bolt in one hole of each post
Cut & chip F.S.
5'-0 1/4 Maintain
PART NOT SHOWN FOR SECT. E-E SAME AS SECT. A-A
SECTION E-E
SECTION F-F OPP. HAND TO SECTION E-E

CURB RAIL C3R AS SHOWN
" " C3L OPP. HAND

MATERIAL FOR ONE CURB RAIL C3R

1 Bulb L 6×3½×10.7#×37'-11(a) M2E (ord 37'-11¼ It 34)
1 C 18×42.7#×37'-11⅝ (b)R M2E (ord 38'-0½ It 12)
1 C 8×11.5×37'-11⅝ (c) M2E (ord 38'-0⅝ It 54)
1 BS 6×15.5×4'-10⅛ (h13)L (ord 9'-8½ It 32)
1 BS 6×15.5×4'-10⅛ (K13)R (ord 9'-8½ It 32)
2 BS (K13)L ord 9'-8½ It 32
2 Ts 4×2½×7.2×9'-5 (m13) It 45
4 Ts 4×2½×7.2×9'-4⅝ (n) It 45
33 bars ½ ⌀ ×1'-11½ (S13) Weld
4 I's 18×54.7×1'-10 (t13) (bolt) ord 9'-3 It 51 { Charge customer for welded pts.
4 PLs 6×½×1'-5¼ (V13) boat weld
2L's 3½×3×¼×0'-3 (W13)
32 bolts ⅝"⌀×1½ Long Spherical Hd & Hex nut ord RG 22612
32 Boss Hex Lock Nuts for ⅝"⌀ bolts ord RG 22613

REQUIRED LIST

No. Reqd	Description	Mark
2	Curb Rail	C3R
2	do	C3L

L-98

274

Note:- For general notes see Sht #13

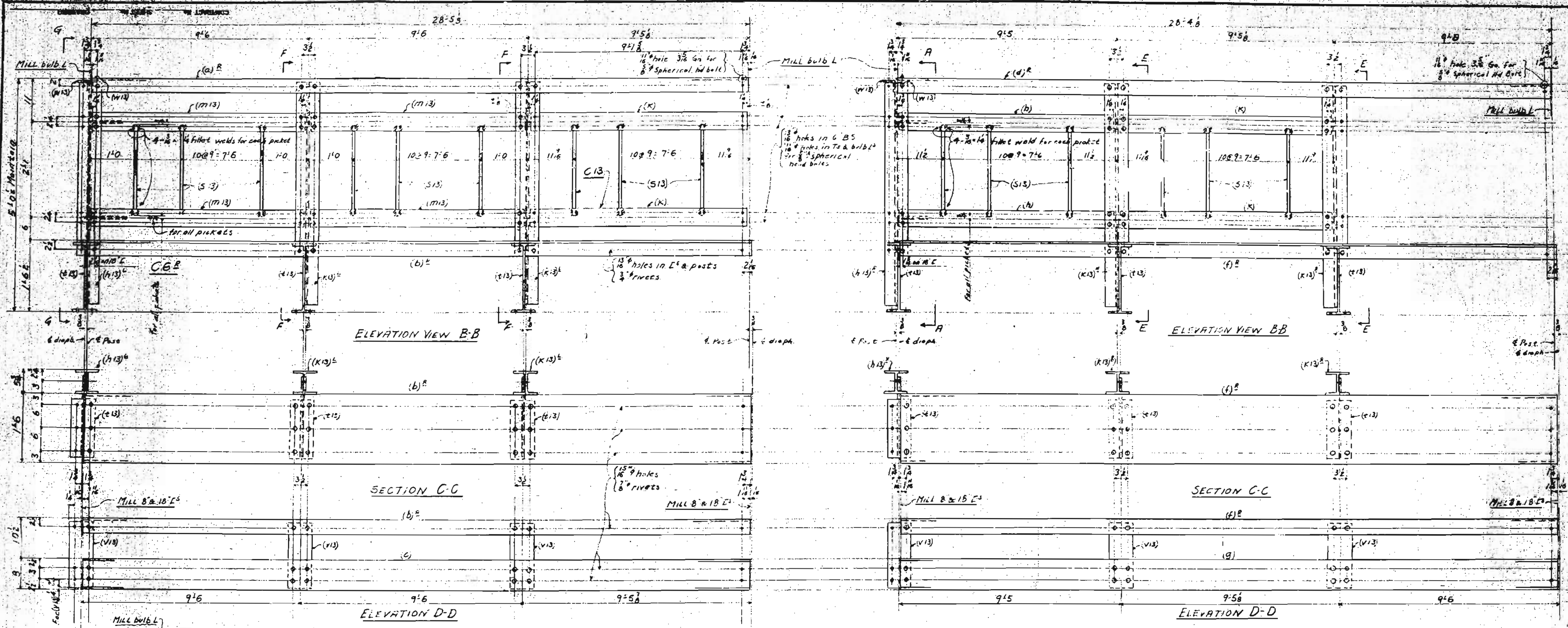
RIVETS As noted
OPEN HOLES As noted
REAM None
MILLING Where noted
PAINT See general notes
SHOP CONTACT SURFACES not painted
SHOP NO.

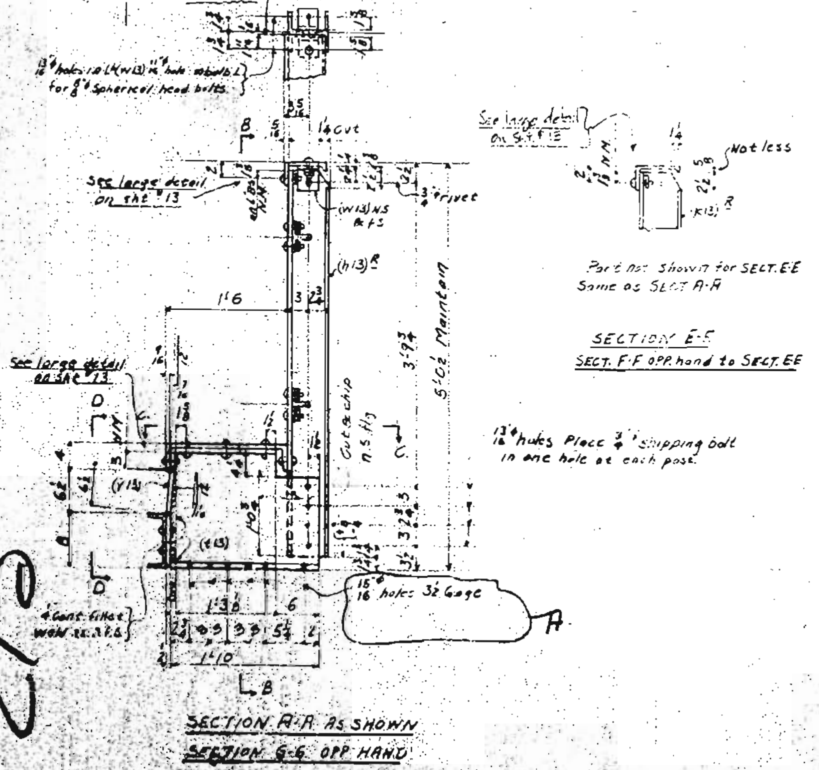
SHOP NOTE Work sheets #13 to #18 incl. together

Ex ① 3/4/77

CURB RAIL FOR APPROACH SPANS
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
CONTRACT C.G.34091

15




Mill bulb L
See large detail on sht #13
Part not shown for SECT. EE Same as SECT. A-A
SECTION E-E
SECT. F-F opp. hand to SECT. EE
See large detail on SH. #13
Not less
13/16" holes Place 3/4" shipping bolt in one hole at each post
15/16" holes 3 1/2 Gage
A
5'-0 1/2 Maintain

SECTION A-A AS SHOWN

SECTION G-G OPP HAND

275

CURB RAIL C6R AS SHOWN
do do C6L OPP. HAND
RAIL C13

MATERIAL FOR ONE CURB RAIL C6R

1 Bulb L 6×3½×10.7#×28'-5 (a)R M2E ord. 28'-5¾ It. 37
1 [18×42.7#×28'-5¾ (b)R M2E ord. 28'-6½ It. 14
1 [8×11.5#×28'-5¾ (c) M2E ord 28'-6½ It. 55
1 B.S. (h13)L } ord 9'-8½ It. 32
2 " (k13)L }
4 Ts 4×2½×7.2×9'-5 (m13) It. 43
22 bars ½"⌀×1'-11½ (S13) weld
3 I's (t13) bolt ord 9'-3 It. 51 charge customer for welded pls.
3 Pls (v13) weld
2 Ls (w13)
22 Bolts ⅝"⌀×1½ long spherical head & hex nut ord R.G. 22612
22 Boss Hex. Lock Nuts for ⅝"⌀ bolts ord R.G. 22613

MATERIAL FOR ONE RAIL C13

2 Ts (K) It. #46
11 bars (S13) weld

CURB RAIL C5R AS SHOWN
do do C5L OPP HAND

MATERIAL FOR ONE CURB RAIL C5R

1 Bulb L 6×3½×10.7#×28'-4 (d)R M2E ord 28'-4¾ It 38
1 [18×42.7#×28'-4 (f)R M2E ord 28'-4¾ It 16
1 " 8×11.5#×28'-4 (g) M2E " 28'-4¾ It 56
1 B.S. 6×15.5#×4'-10⅛ (h13)R " 9'-8½ " 32
2 " 6×15.5 ×4'-10⅛ (K13)R " 9'-8½ " 32
2 Ts 4×2½×7.2#×9'-4 (h) It 47
2 " 4×2½×7.2#×9'-4⅛ (k) It 46
22 bars (S13) weld
3 I's 18×54.7×1'-10 (t13) bolt - ord 9'-3 - It 51 Charge customer for welded pls
3 Pls 6 UM×⅜×1'-5¾ (V13) bent - weld
2 Ls 3½×3×⅜×0'-3 (W13)
22 Bolts ⅝"⌀×1½ long spherical head & hex. nut ord R.G. 22617
22 Boss Hex Lock Nuts for ⅝"⌀ bolts Ord R.G. 22613

L-98

REQUIRED LIST

No Reqd	DESCRIPTION	MARK
1	CURB RAIL	C5R
1	do.	C5L
1	do.	C6R
1	do.	C6L
2	RAIL	C13

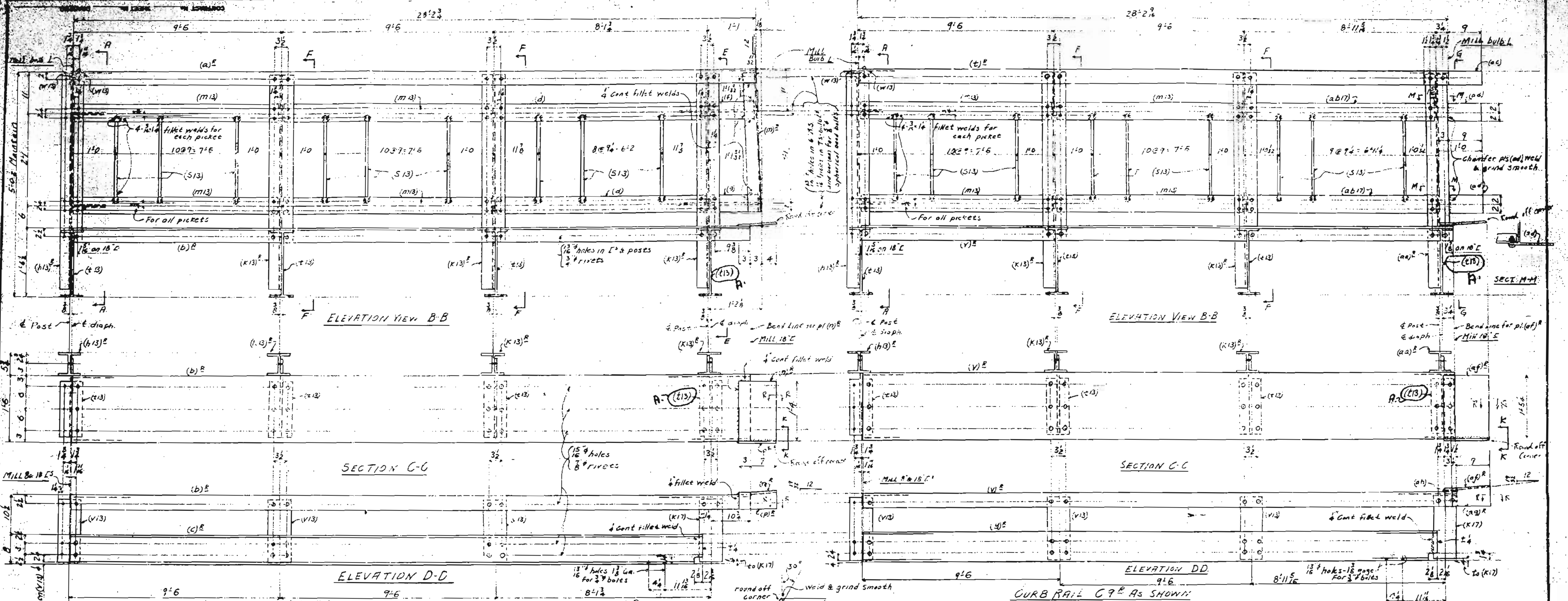
NOTE: For general notes see sht #13

RIVETS as noted
OPEN HOLES as noted
REAM None
MILLING Where noted
PAINT See general notes
SHOP CONTACT SURFACES not painted

SHOP NOTE: Work sheets #13 to #18 incl. together

Rev. ② 3/19/39

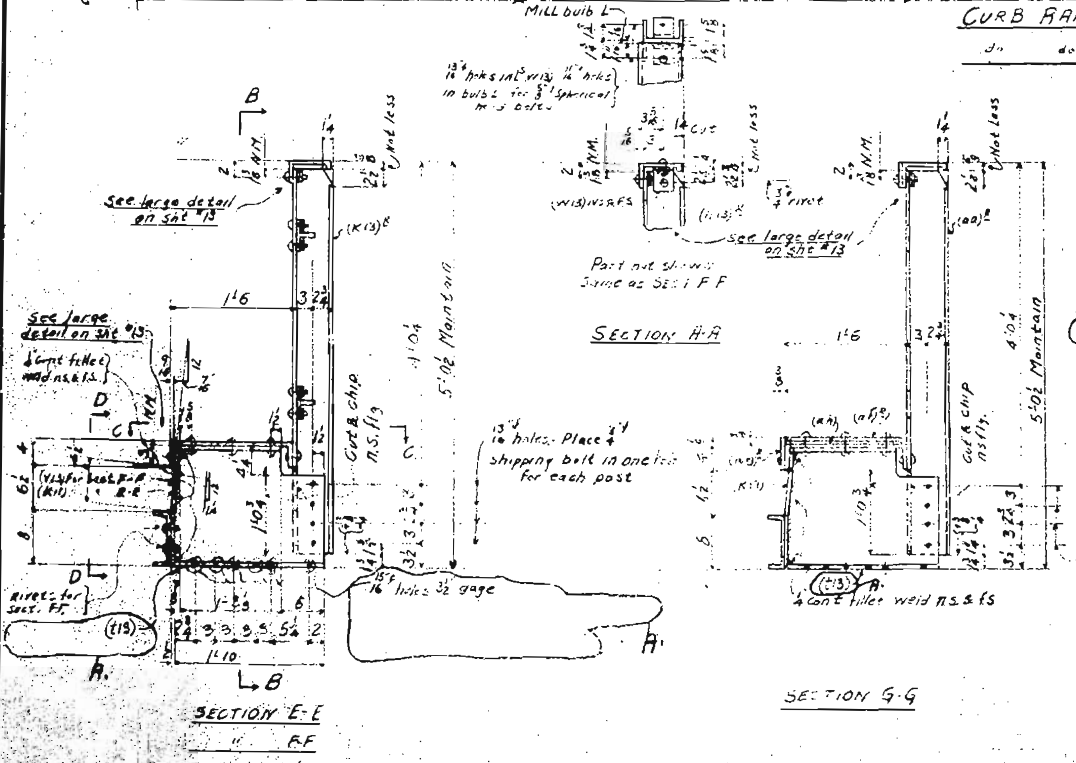
CURB RAIL FOR APPROACH SPANS
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at CHICAGO
IN CHARGE Dennis
MADE BY C.B.J.
CHECKED BY [illegible]
SHOP NO.
CONTRACT C.G. 30671



CURB RAIL C7R AS SHOWN
do do C7L OPP. HAND

CURB RAIL C9R AS SHOWN
do C9L OPP HAND

ENLARGED SECT K-K


SECTION H-H
SECTION G-G
SECTION E-E
" F-F
See large detail on sht #13
Part not shown same as Sect F-F
Mill bulb L
13/16 holes. Place 3/4 shipping bolt in one hole for each post

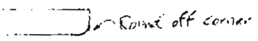
13/16 holes. Place 3/4 shipping bolt in one hole

MATERIAL FOR ONE CURB RAIL C7R

1 Bulb L 6×3½×10.7#×28'-2 11/16 (a)R M2E ord 28'-3¾ It 40
1 C 18"×42.7×29'-0⅞ (b)R M2E ord 29'-1¼ It 18
1 C 8"×11.5×26'-11½ (c)R M1E " 27'-0 " 59
1 BS 6"×15.5×4'-10⅛ (h13)R " 9'-8½ " 32
3 " 6×15.5×4'-10⅛ (K13)R " 9'-5½ " 32
4 Ts 4×2½×7.2×9'-5 (m13) It 43
2 " 4×2½×7.2×8'-0¾ (d) " 50
1 " 4×2½×7.2×1'-0⅛ (f) ord 22'-0 It 41
1 " 4×2½×7.2×1'-0⅜ (g) " 22'-0 " 41
31 bars ½"φ×1'-11½ (S13) weld
4-I's 18×54.7×1'-10 (t13) bolt } ord. 9'-3 It 51 Charge customer for welded pls
3 Pls 6 UM×½×1'-5¼ (V13) bend weld
1 " 6 UM×½×1'-5¼ (K17) bend weld
2 Ls 3½×3×¼×0'-3 (W13)
1 L 3½×3½×¼×3'-1⅜ (m)R (weld)
1 Pl. 16×⅜×0'-10 (n)R bend weld
1 " 4¾×⅜×0'-10 (p)R weld
36 Bolts ⅝"φ×1½ long Spherical hd & hex. nut Ord. RG 22612
36 Boss Hex. Lock Nuts for ⅝"φ bolts Ord RG 22613

MATERIAL FOR ONE CURB RAIL C9R

1 Bulb L 6×3½×10.7#×28'-2½ (t)R M2E ord 28'-3¾ It. 39
1 C 18×42.7×28'-2½ (V)R M2E ord 28'-3¾ It. 17
1 C 8×11.5×27'-9 3/16 (y)R M1E " 27'-9¾ " 57
1 B.S. (h13)R } ord 9'-8½ It. 32
2 " (K13)R }
1 " 6×15.5×4'-10⅛ (aa)R ord 9'-8½ It 32
4 Ts (m13) It. 43
2 " 4×2½×7.2×8'-10⅜ (ab17) It 48
32 Bars (S13) Weld
4-I's (t13) bolt } ord 9'-3 It.51 Charge customer for welded pls
3 Pls (V13) weld
1 " (K17) weld
2 Ls (W13)
1 Bar 3½×¼×1'-3½ (ac)
2 " 4×¼×0'-9 (ad) Weld
1 Pl. 12¼×⅜×1'-5¼ (af)R bend weld
1 Bar 4 15/16×⅜×1'-0¼ (ag)R Weld
30 Bolts ⅝"φ×1½ long } spherical hd & hex. nut Ord. RG 22612
2 " ⅝"φ×1¾ long }
32 Boss Hex Lock Nuts for ⅝"φ bolts Ord. RG 22613
1 Fill. 3¼×⅜×1'-5¼ (ah)



Enlarged Section R-R

REQUIRED LIST

No Req'd	DESCRIPTION	MARK
2	CURB RAIL	C7R
2	do	C7L
1	do	C9R
1	do	C9L

L-98

NOTE: For general notes see sht #13

RIVETS As noted
OPEN HOLES As noted
REAM None
MILLING Where noted
PAINT See general notes
SHOP CONTACT SURFACES not painted

SHOP NOTE: Work Sheets #13 to #18 incl. together

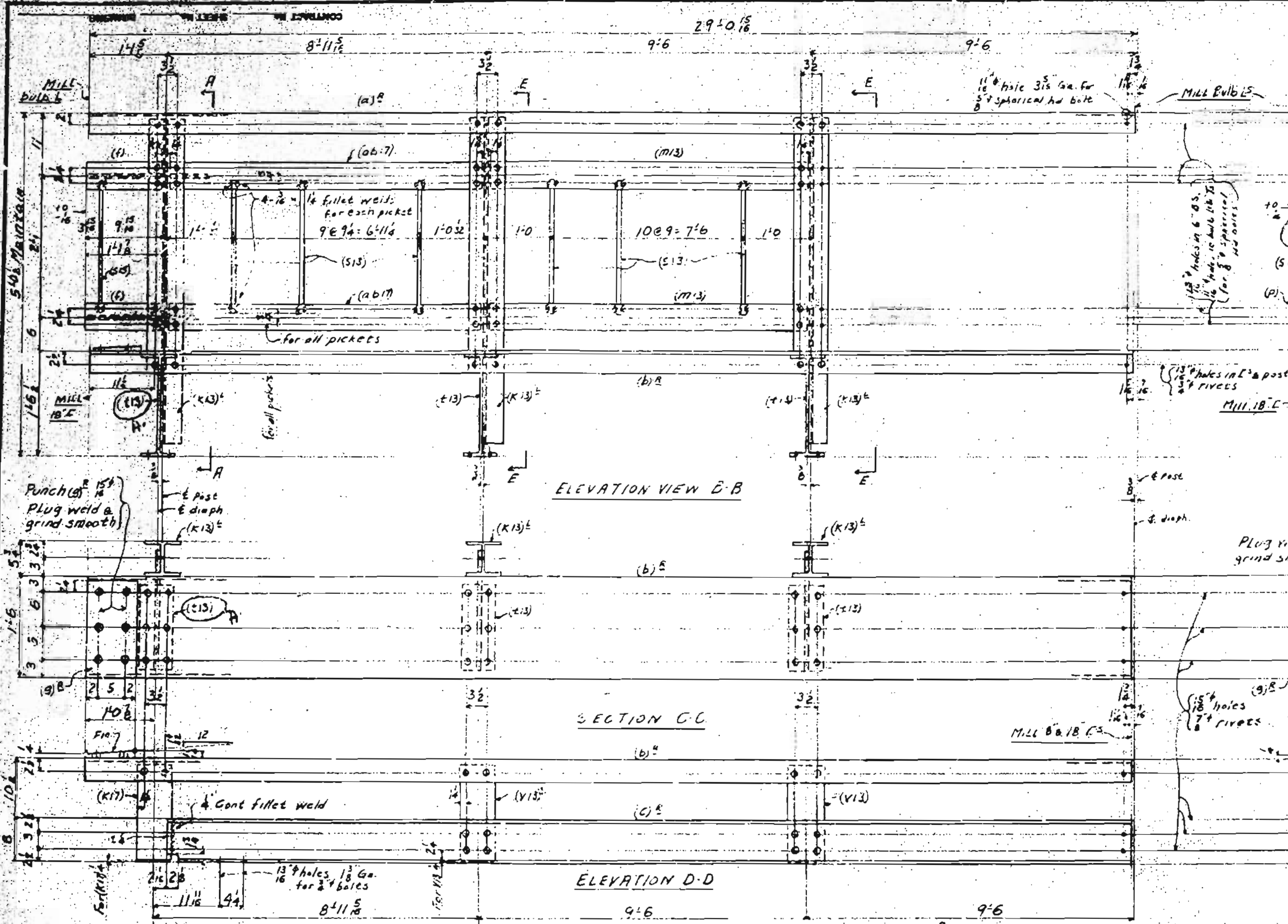
Curb Rail for [illegible]

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

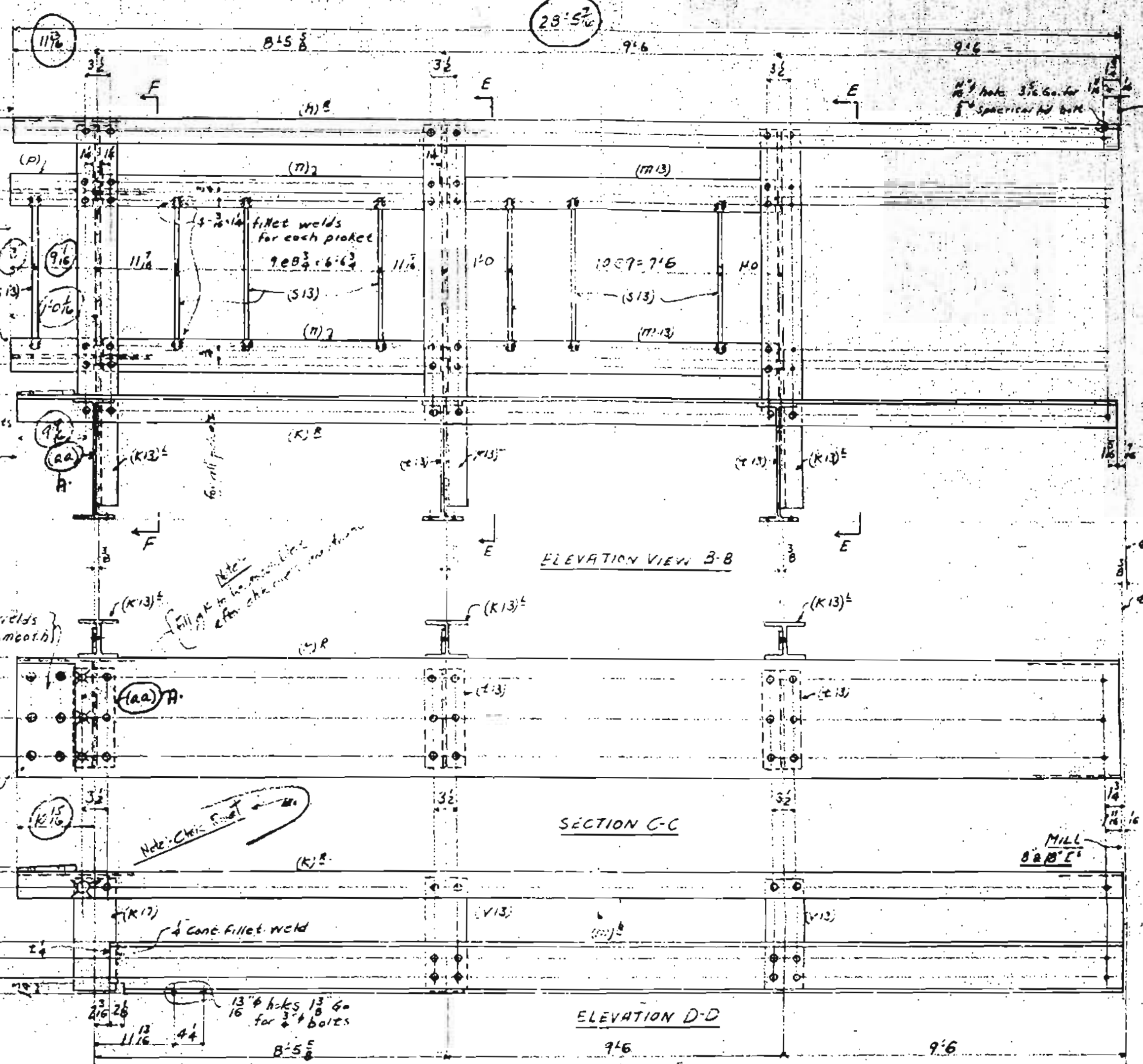
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at CHICAGO
IN CHARGE Jenks MADE BY C.A.T.
CHECKED BY 4-28-39 TRACED BY
REVISED LAST ADJ. DWG.
SHOP NO.
CONTRACT CG 34091 SHEET 17

Rev 8-7-1939

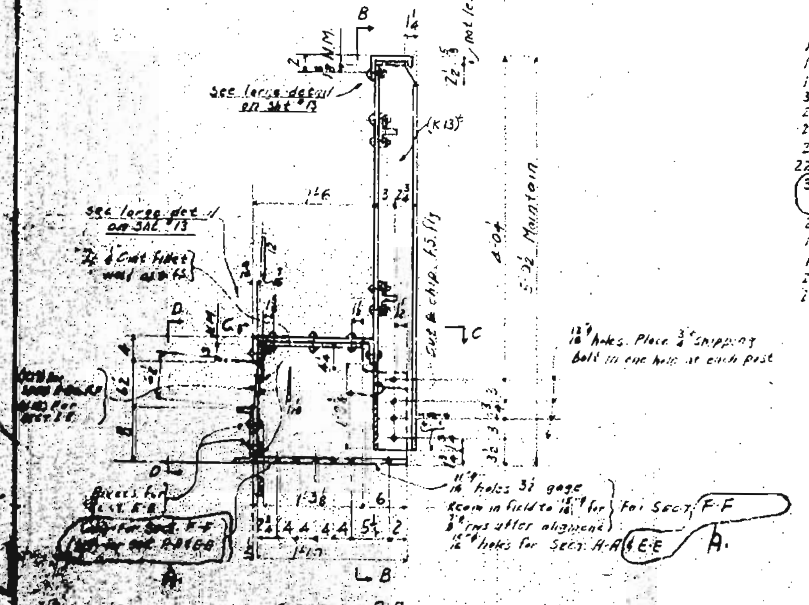
276



CURB RAIL C8R AS SHOWN
do do C8L OPP HAND



CURB RAIL C10R AS SHOWN
do do C10L OPP HAND


B
see large detail on sht #13
(k13)
5'-2 1/2 Maintain
1'-6
13/16 holes. Place 3/4 shipping bolt in one hole at each post
Cut & chip
1/16 holes 3 1/2 gage Ream in field to 15/16 for 7/8 rivets after alignment for Sect. F-F
15/16 holes for Sect. H-A & E-E
A.
L B
C

SECTION A-A
" E-E
" F-F

MATERIAL FOR ONE CURB RAIL C8R

1 Bulb L 6×3 1/2×16.7#×29'-0 5/8 (a)R M2E ord 29'-1 3/8 It 35
1 [18×42.7×29'-0 5/8 (b)R M2E Ord 29'-1 It 13
1 [8×11.5×27'-9 3/16 (c)R M1E " 27'-9 3/8 " 57
3 B.S. 6×15.5×4'-0 5/8 (K13)L " 9'-8 1/4 " 32
2 Ts 4×2 1/2×7.2×9'-5 (m13) It 43
2 " 4×2 1/2×7.2×8'-10 3/8 (ab17) " 48
2 " 4×2 1/2×7.2×1'-1 3/8 (f) ord 22'-0 It 41
22 bars 3/4" × 1'-11 1/2 (s13) weld
3-I 18×54.7×1'-10 (t13) bolt ord 9'-3 It 51 charge customer for welded pls. A.
2 Pls 6×1/2×1'-5 1/4 (v13) bend weld
1 Pl 6×1/2×1'-5 1/4 (K17) bend weld
1 beveled pl. 9×1/2×11/16×1'-5 1/4 (g)R weld on one side
26 Bolts 5/8"×1 1/2 Long spherical hd & hex nut Ord. R4 22612
26 Boss Hex Lock Nuts for 5/8" bolts Ord. R4 22613

MATERIAL FOR ONE CURB RAIL C10R

1 Bulb L 6×3 1/2×10.7×28'-5 5/8 (h)R M2E ord 28'-7 It 36
1 [18×42.7×28'-4 3/8 (k)R M2E ord 28'-6 It 15
1 [8×11.5×27'-3 5/8 (m)R M1E " 27'-4 " 58
3 B.S. (K13)L ord 9'-8 1/4 It 32
2 Ts (m13) It 43
2 " 4×2 1/2×7.2×8'-4 5/8 (n) It 49
2 " 4×2 1/2×7.2×11 9/16 (p) ord 22'-0 It 41
22 bars (S13) weld
A. 2 I (t13) bolt Ord 9'-3 It 51 charge customer for welded pls
2 Pls (V13) weld
1 Pl (K17) weld
1 beveled Pl (g)R weld
26 Bolts 5/8"×1 1/2 Long spherical hd & hex. nut Ord R4 22612
26 Boss Hex Lock Nuts for 5/8" bolts Ord R4 22613
A. 1-I-18×54.7×1'-10 (aa) bolt Ord. 9'-3 It 51 - Charge customer for welded pls

L-98

REQUIRED LIST

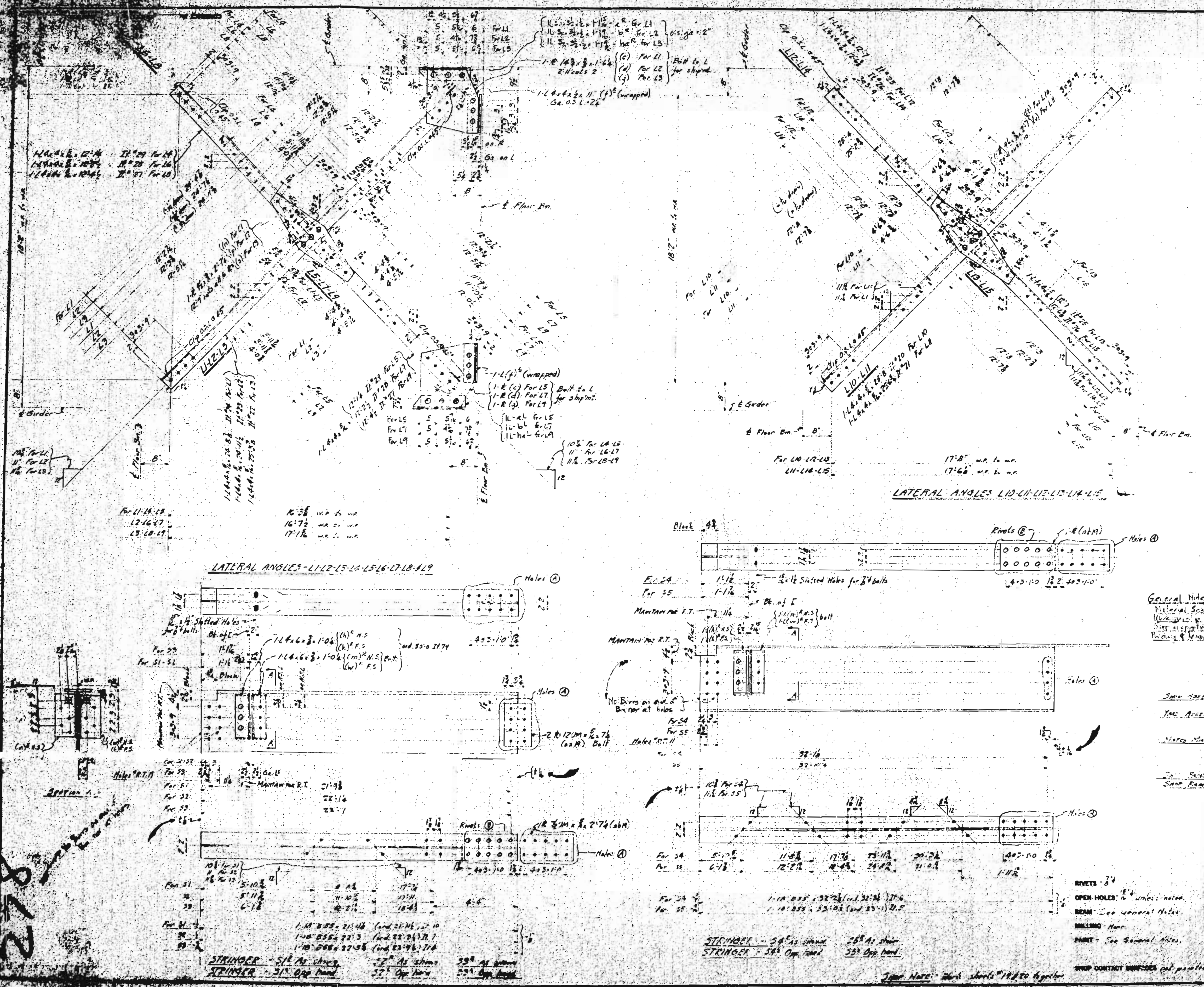
No Reqd	DESCRIPTION	MARK
1	CURB RAIL	C8R
1	do	C8L
2	do	C10R
2	do	C10L

NOTE: For general notes see sht #13

RIVETS As noted
OPEN HOLES As noted
REAM None
MILLING Where noted
PAINT See general notes
SHOP CONTACT SURFACES not painted
SHOP NOTE: Work sheets #13 to #18 incl. together

Curb Rail for Approach Spans
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
Drawings at Chicago
In charge James Drawn by GRT
CONTRACT C.S. 34071
SHOP NO.
18

3/4/39



REQUIRED LIST

No. Pcs.	Description	Mark
2	Laterals	L1
2	do	L2
2	do	L3
2	do	L4
2	do	L5
2	do	L6
2	do	L7
2	do	L8
2	do	L9
49	do	L10
One	do	L11
49	do	L12
49	do	L13
One	do	L14
One	do	L15
One	Stringer	51E
One	do	51W
2	do	52E
2	do	52W
One	do	53E
One	do	53W
One	do	54E
One	do	54W
One	do	55E
One	do	55W

General Notes:-

Material Specs. - Structural Steel as per ASTM-A7-34

Workmanship Specs. - As per Project Specifications.

Shop Inspection - By Kile Hunt Co.

Punching & Reaming - (a) All holes in main material of Stringers and in the connection angles for shop & field rivets shall be subpunched and reamed to size except that slotted holes [illegible]
(b) All other holes may be punched full size
(c) Holes "R.T.R." shall be reamed to steel template.
(d) Holes for rivets Ⓑ shall be reamed after shop assembly
(e) Holes Ⓐ shall be reamed at yard assembly.

Shop Assembly - Shop contact surfaces are not to be painted but shall be cleaned as per Project Specifications.

Yard Assembly - Stringers shall be yard assembled to correct centers for connections to floor beams and while so assembled, Holes Ⓐ shall be reamed to size.

Match Marking - Stringers shall be match-marked during yard assembly with match marks shown on Erection Plans.
Web splice plates shall be match marked with auxiliary match marks to prevent misplacement if removed in field.

Shop Painting - Cleaning and painting shall be as per Project Specifications.

Shop Painting - One coat of an approved [illegible] paint as per Project Specifications.

L-98

STRINGERS & LATERALS - [illegible]

MISSOURI [illegible]

AT BROWNVILLE [illegible]

RIVETS - 7/8"

OPEN HOLES - 15/16" unless noted.

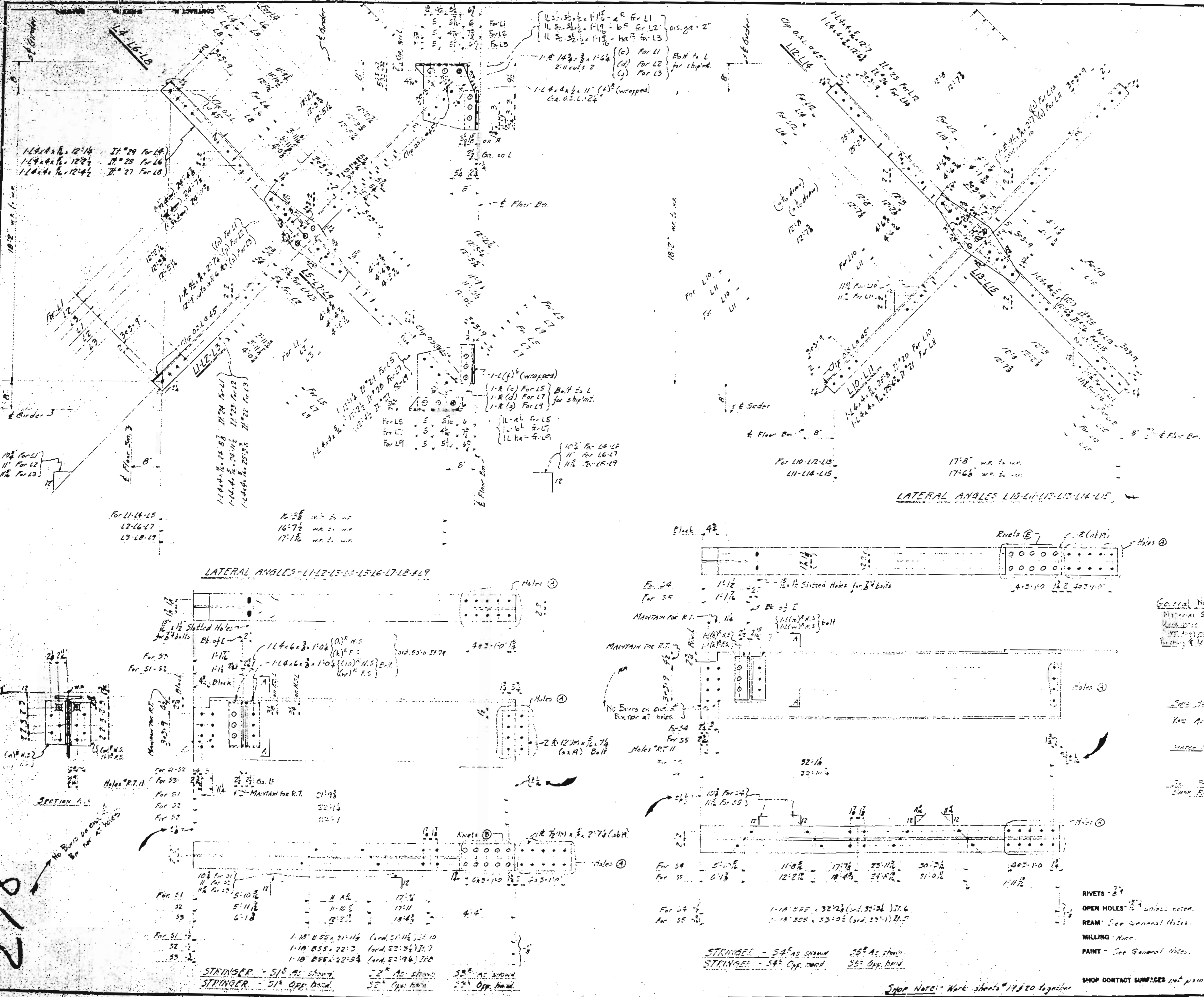
REAM - See General Notes.

MILLING - None.

PAINT - See General Notes.

SHOP CONTACT SURFACES not painted

L-98



Shop Note:- Work sheets # 19 & 20 together

278

PROUIRED LIST

No. Reqd.	Description	Mark
2	Laterals	L1
2	do	L2
2	do	L3
2	do	L4
2	do	L5
2	do	L6
2	do	L7
2	do	L8
2	do	L9
47	do	L10
One	do	L11
47	do	L12
49	do	L13
One	do	L14
One	do	L15
One	Stringer	51E
One	do	51W
2	do	52E
2	do	52W
One	do	53E
One	do	53W
One	do	54E
One	do	54W
One	do	55E
One	do	55W

General Notes -
Material Specs.:- Structural Steel as per ASTM-A7-34
Rivets ~~[illegible]~~: As per Project Specifications.
[illegible]:- By Silk Hoit Co.
Punching & Reaming:- (a) All holes in main material of Stringers and in Rg. ends & splice for shop & field rivets shall be subpunched and reamed to size except that slotted holes are to be punched full size.
(b) All other holes may be punched full size.
(c) Holes "R.T." shall be reamed to steel template.
(d) Holes for rivets Ⓑ shall be reamed after shop assembly.
(e) Holes Ⓐ shall be reamed at yard assembly.
Shop Assembly:- Shop contact surfaces are not to be painted but shall be cleaned as per Project Specifications.
Yard Assembly:- Stringers shall be yard assembled to correct centers for connections to floor beams and while so assembled, Holes Ⓐ shall be reamed to size.
Match Marking:- Stringers shall be match-marked during yard assembly with match marks shown on Erection Plans.
Web splice plates shall be match-marked with auxiliary match marks to prevent misplacement if removed in field.
Shop Painting:- Cleaning and painting shall be as per Project Specifications.
Shop Paint:- One coat of an approved [illegible] as per Project Specifications.

L-98

RIVETS - 7/8"
OPEN HOLES - 15/16" unless noted.
REAM - See General Notes.
MILLING - None.
PAINT - See General Notes.
SHOP CONTACT SURFACES not painted

STRINGERS & LATERALS - APPROACH SPANS

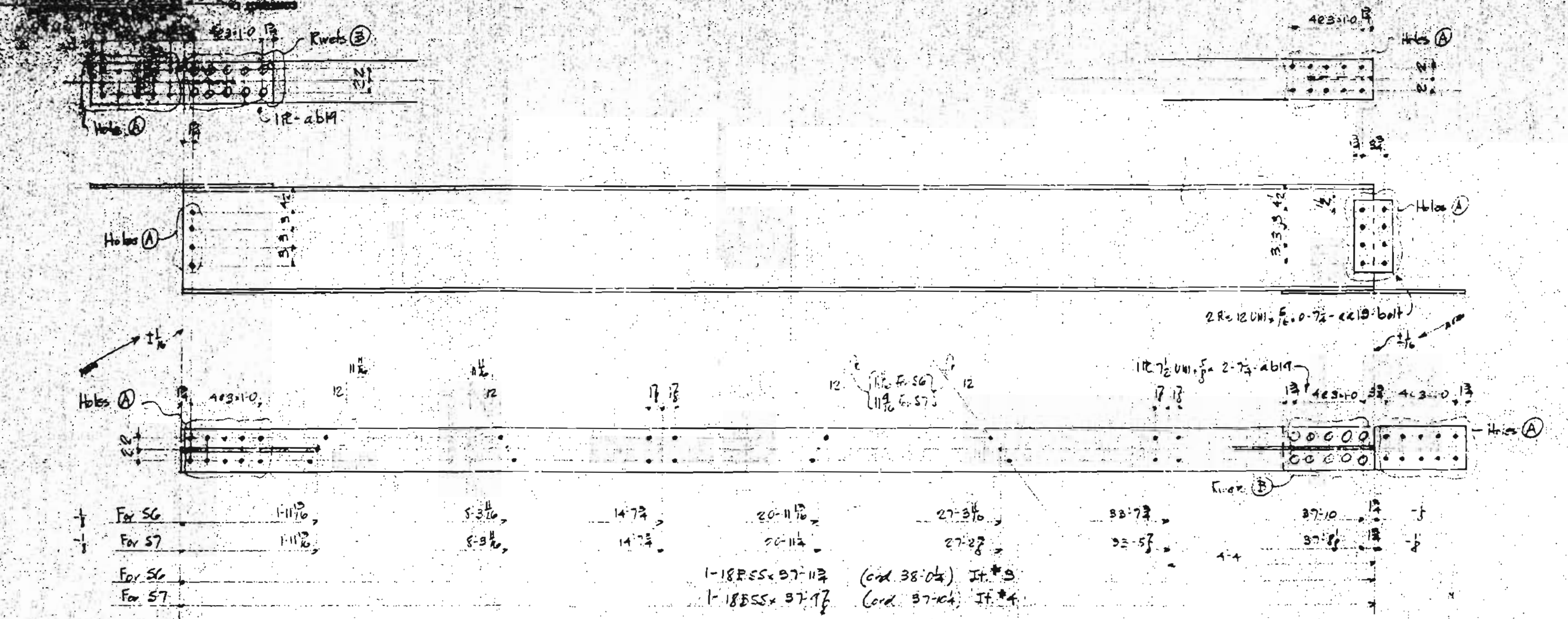
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
For Atchison County, - Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago

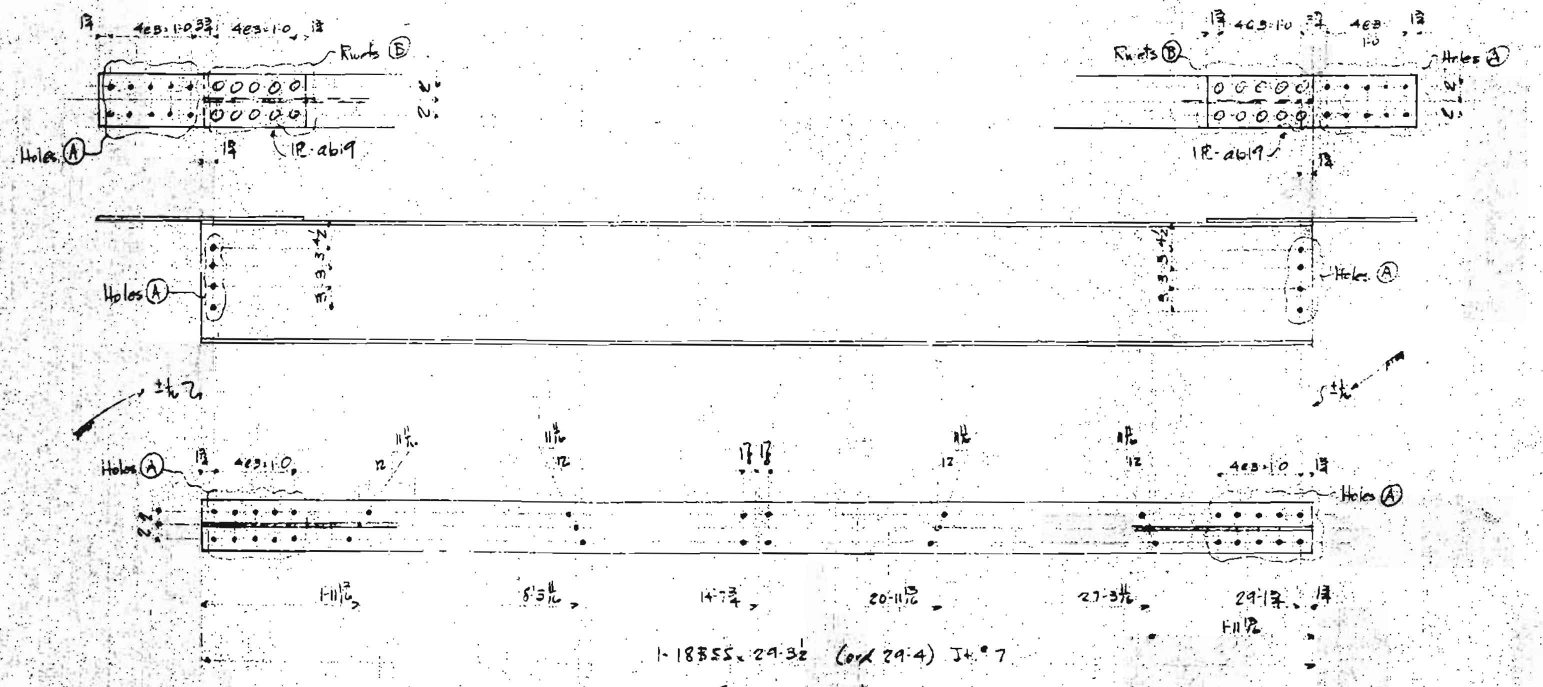
DESIG.	
SUPT.	
TEMPLET	
FITTER	
SHOP INSP.	
PC. WK.	
B. SMITH	
MCH.	
ERECT.	
Q. INSP.	

IN CHARGE Jacobs
CHECKED BY ? 2/27/39
REVISED
MADE BY C.H.
TRACED BY
LAST ISSUED NO.

SHOP NO.
CONTRACT C934091
SHEET 19


Rivets Ⓑ
Holes Ⓐ
12-ab19
4e3@1-0
2 Rs 12 Ult x 5/16 x 0-7 1/2 x 2 x 19 bolt
11 7/8 Ult x 5/16 x 2-7 1/2 x ab19
For 56
For 57
1-18 S 55 x 37-11 7/8 (ord 38-0 1/4) Jt #3
1-18 S 55 x 37-9 7/8 (ord 37-10 1/4) Jt #4

STRINGERS # 56R & 57R as shown
STRINGERS # 56L & 57L opp hand



STRINGER # 58

General Notes:-

Material Specs:- Structural Steel as per ASTM-A7-34
Workmanship Specs:- As per Project Specifications.
Shop Inspection:- By R.W. Hunt Co.
Punching & Reaming:- All holes for shop and field rivets shall be subpunched 11/16 ⌀ and reamed to size.
Holes for rivets Ⓑ shall be reamed after shop assembly.
Holes Ⓐ shall be reamed at yard assembly.
Shop Assembly:- Shop contact surfaces are not to be painted but shall be cleaned as per Project Specifications.
Yard Assembly:- Stringers shall be yard assembled to correct centers for connections to floor beams and while so assembled, Holes Ⓐ shall be reamed to size.
Match Marking:- Stringers shall be match-marked with match marks shown on erection plans.
Web splice plates shall be match-marked with auxiliary match marks to prevent misplacement if removed in field.
Shop Painting:- Cleaning and painting to be as per Project Specifications.
Shop Paint:- One coat of an approved Red Lead Paint as per Project Specifications.

REQUIRED LIST

No. Reqd	Description	Mark
22	Stringers	56R
22	do	56L
1	do	57R
1	do	57L
2	do	58

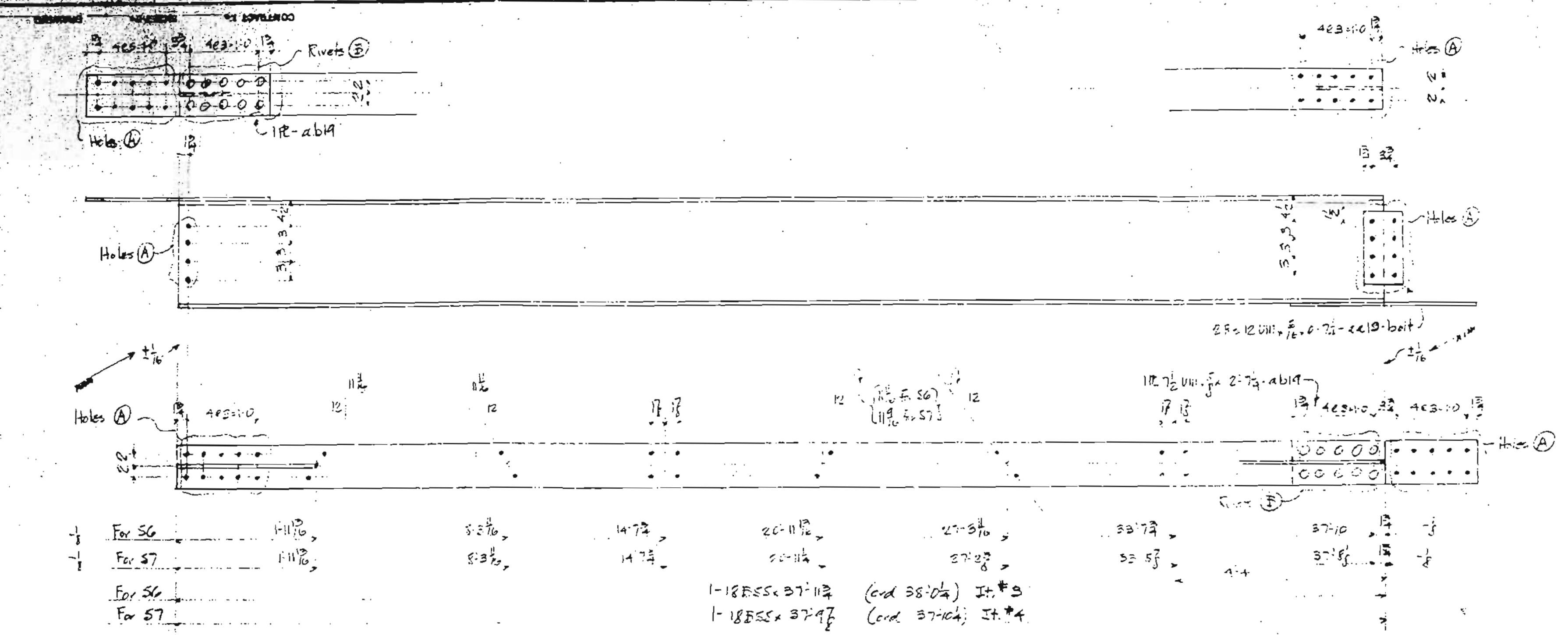
6-98

Shop Note:- Work sets #19 & 20 together.

RIVETS 7/8 ⌀
OPEN HOLES 15/16 ⌀
REAM - See general notes
MILLING - None
PAINT - See general notes
SHOP CONTACT SURFACES not painted
SHOP NO.

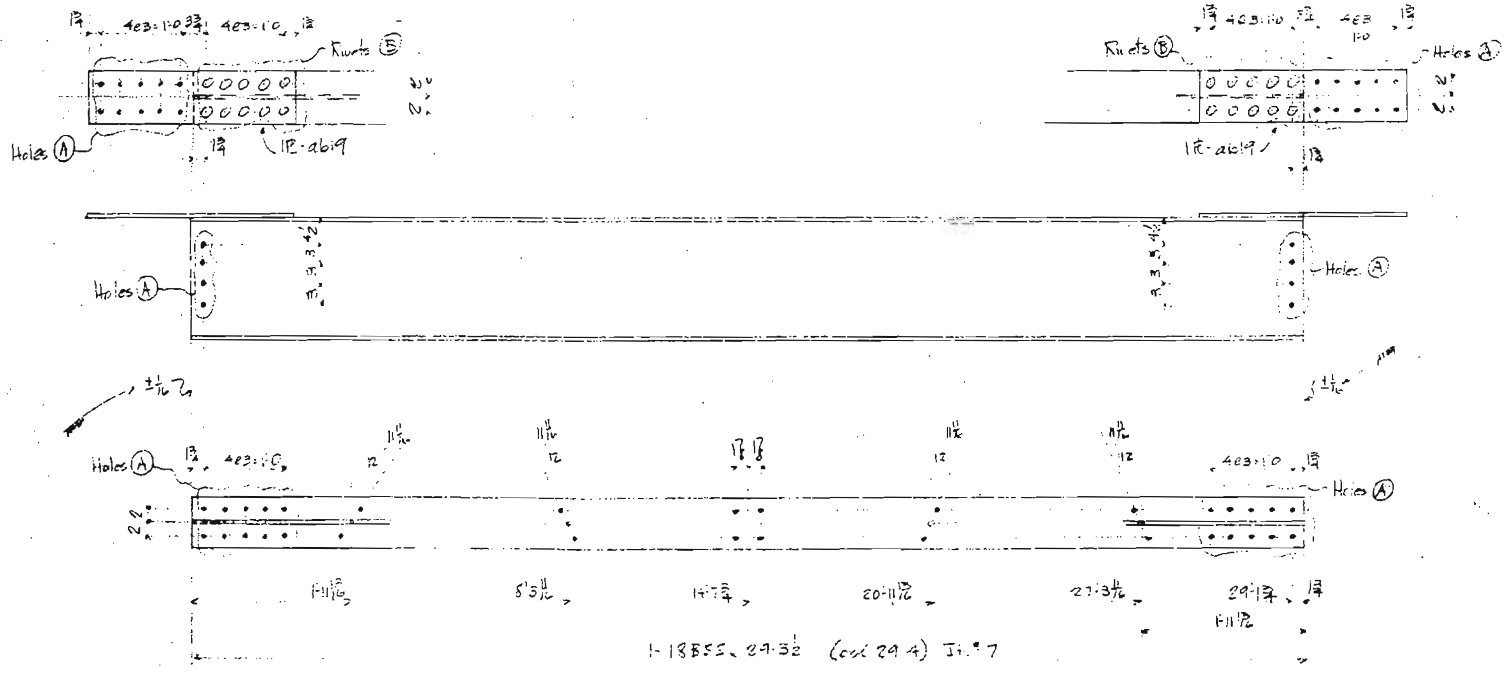
Stringers - Approach Spans
Missouri River Bridge
at Brownville, Nebraska
For Highway [illegible] Missouri

279



Rivets (B)
Holes (A)
1R-ab19
4e3=1-0
Holes (A)
For 56
For 57
1-18B55 x 37-11¾ (ord 38-0¼) It.#3
1-18B55 x 37-9⅞ (ord 37-10¼) It.#4

STRINGERS #56R & 57R as shown
STRINGERS #56L & 57L opp hand



STRINGER #58

General Notes:-

Material Specs:- Structural Steel as per ASTM-A7-54

Workmanship Specs:- As per Project Specifications.

Shop Inspection:- By R.W. Hunt Co.

Punching & Reaming:- All holes for shop and field rivets shall be subpunched 3/16 and reamed to size.
Holes for rivets (B) shall be reamed after shop assembly.
Holes (A) shall be reamed at yard assembly.

Shop Assembly:- Shop contact surfaces are not to be painted but shall be cleaned as per Project Specifications.

Yard Assembly:- Stringers shall be yard assembled to correct centers for connections to floor beams and while so assembled, Holes (A) shall be reamed to size.

Match Marking:- Stringers shall be match-marked with match marks shown on erection plans.
Web splice plates shall be match-marked with auxiliary match marks to prevent misplacement if required in field.

Shop Painting:- Cleaning and painting to be as per Project Specifications.

Shop Paint:- One coat of an approved Red Lead Paint as per Project Specifications.

REQUIRED LIST

No. Reqd.	Description	Mark
22	Stringers	56R
22	do	56L
1	do	57R
1	do	57L
2	do	58

L-98

279

Shop Note:- Work sheets #19 & 20 together

RIVETS 7/8

OPEN HOLES 15/16

REAM - See general notes

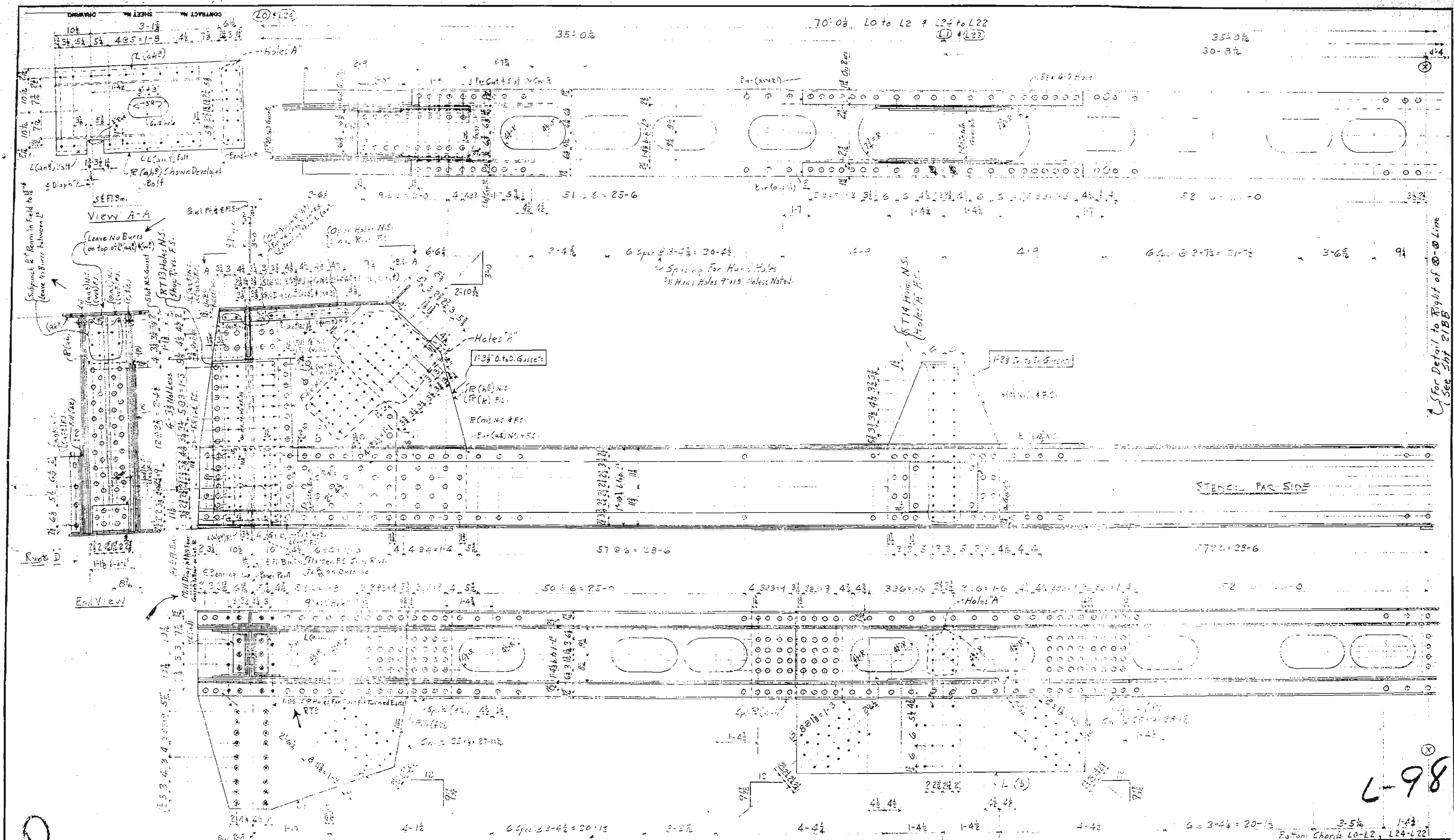
MILLING - None

PAINT - See general notes

SHOP CONTACT SURFACES not painted SHOP NO.

Stringers - Approach Spans
Missouri River Bridge
At Brownville Nebraska
For Atchison County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago · Fabrication at Chicago
IN CHARGE [illegible] MADE BY [illegible]
CHECKED BY [illegible] TRACED BY
REVISED LAST ADDED MK.
CONTRACT CC34091 SHEET 20



Bottom Chord L0-L2-A As Shown
" " L0-L2-B Opp Hand to L0-L2-A
" " L24-L22-B As Shown
" " L24-L22-A Opp Hand to L24-L22-B

For Gen. Notes See Sheet 35

Work Shts 21AB & 21BB As One Sheet.
Work Shts 21AB & BB, 22AB & BB, 23AB & BB
24AB & BB, 25AB & BB, 26AC-BC & CC together

RIVETS
OPEN HOLES
REAM
MILLING
PAINT

See Gen. Notes

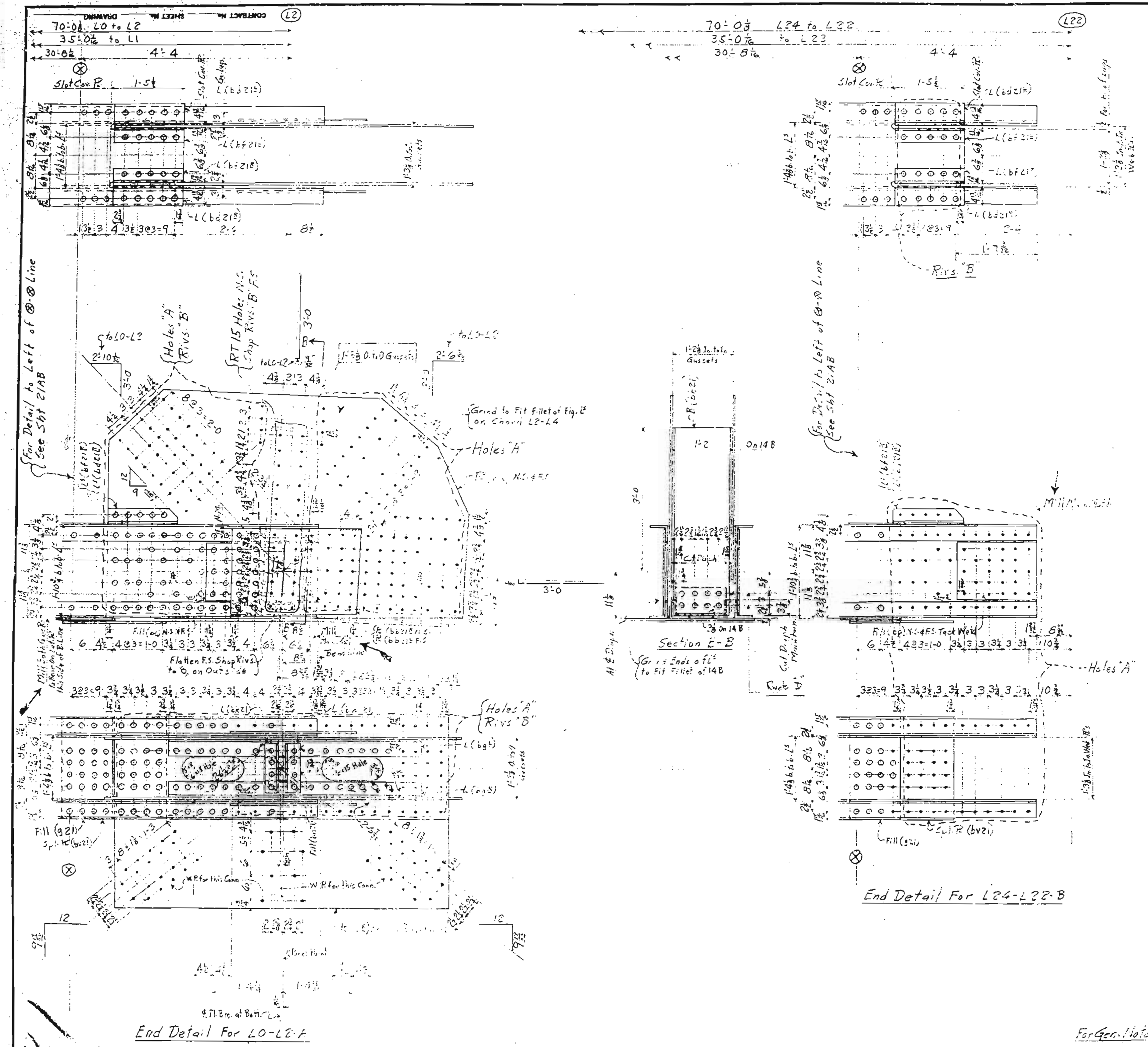
TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

Bridge Over Missouri River
at Brownville, Nebr.
For Atchison County, Missouri.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY H.G.
CHECKED BY F 4/8/29 TRACED BY
REVISED LAST ASSEM. MK.
SHOP NO.
CONTRACT CG34092 SHEET 21 AB

L-98

280



70-0⅞ L0 to L2
35-0¼ to L1
30-8⅞
4-4
Slot Cov Pl
Slot Cov Pl
(L2)
(L22)
70-0⅞ L24 to L22
35-0 to L23
30-8⅞
Holes "A"
Rivs "B"
RT 15 Holes N.S. Shop Rivs "B" F.S.
For Detail to Left of ⊗-⊗ Line See Sht 21AB
For Detail to Left of ⊗-⊗ Line See Sht 21AB
Grind to Fit Fillet of Fig. L on Chord L2-L4
Mill Both Ends
Flatten F.S. Shop Rivs to ⅝ on Outside
Section E-B
Grind Ends of L's to Fit Fillet of 14B
Rivs "B"
Mill
Holes "A"
Fill (bp) N.S. F.S. Tack Weld
W.P. for this Conn.
W.P. for this Conn.
End Detail For L0-L2-A
End Detail For L24-L22-B

L-98

281

[illegible] of Mat'l for One Bottom Chord Section L0-L2-A

2-Web Pls 72UM×⅜×72-[illegible] M.F.E. (Silicon) Ord 72-[illegible] Ir 32
2-Top Flg L's 8×[illegible]×⅝×6[illegible]-8 M.F.E. (Silicon) Ord 68-9¼ Ir 76
2-Bot Flg L's [illegible]×⅜×72-0⅜ [illegible] (Silicon) Ord 72-1½ Ir 71
1-Top Cov Pl [illegible]×⅜×65-[illegible] F.E.E. (Silicon) Ord 65-7 Ir 30
1-Bot Cov Pl [illegible]×⅜×27-11⅜ F.E.E. (Silicon) Ord 28-[illegible] Ir 110
1-Bot Cov Pl [illegible]×⅜×29-1 F.E.E. (Silicon) Ord 29-3 Ir 109
[illegible]

1-L 8×4×½×0-10⅜ (ac) bent
1-L 8×4×½×0-10⅜ (ad) bent
1-L 5×3½×⅜×1-9 15/16 (af) F.H.E. Cut 6×3½ L
1-L 5×3½×⅜×1-9⅜ (ag) F.H.E.
1-P 25UM×⅜×4-6 13/16 (ah) Bent Bolt
1-L 4×3½×⅜×3-6 (ak)
1-L 4×3½×⅜×2-7⅜ (am) Cut Bolt
1-L 4×3½×⅜×0-9⅞ (an) Bolt
2-L 4×3½×⅜×2-7½ (ap)
2-Bars 4×½×1-7¾ (as)
2-Gusset Pls 47×⅝×2-7⅝ (at 21)
1-Pl 14UM×⅜×1-7½ (av 21)
2-Bars 4½UM×½×6-8 (aw 21) (Silicon)
[illegible] (ba) (Silicon)
[illegible] for
[illegible] 21UM×⅝×2-7⅜ F.E.E. (bb 21) (Silicon)
2-Fills 14UM×⅜×[illegible] (bc)
2-L 5×3½×⅜×1-5 (bd 21)
2-L 4×3½×⅜×1-5 (bf 21)
2-L 4×4×½×5-2 (bg) bent (Silicon)
1-S 14×63×3-10½ (bh 21) Ir. 193
1-L 7×4×½×0-11⅞ (bk 21)
1-L 7×4×½×0-11⅞ (bm 21) bent
1-Fill 8½×½×0-5⅝ (bn 21) bent
1-Fill 10½×⅜×1-6 1/16 (bt)

[illegible] of Mat'l for One Bottom Chord Section L24-L22-B

2-Web Pls 72UM×⅜×72-6 [illegible] (Silicon) Ord 72-8 Ir 34
2-Top Flg L's [illegible] Ord [illegible] Ir 77
2-Bot Flg L's [illegible]
1-Top Cov Pl [illegible] F.E.E. (Silicon) Ord [illegible]
1-Bot Cov Pl [illegible]×⅜×27-11 F.E.E. (Silicon) Ord [illegible]
1-Bot Cov Pl [illegible]×⅜×28-1 F.E.E. (Silicon) Ord [illegible]
[illegible]

2-L (w)
2-L (aa)
1-P (ab)
1-L (ac)
1-L (ad)
1-L (af)
1-L (ag)
1-P (ah) Bolt
1-L (ak)
1-L (am) Bolt
1-L (an) Bolt
2-L (ap)
2-Bars (as)
2-Gusset Pls (at 21)
1-P (av 21)
2-Bars (aw 21)
2-L (bd 21)
2-L (bf 21)
1-Fill 14UM×⅜×1-7⅝ (bp) Tack Weld
1-Fill (bt)

REQUIRED LIST

No. Reqd	Description	Mark
One	Bottom Chord Section	L0-L2-A
One	do do do	L0-L2-E
One	do do do	L24-L22-B
One	do do do	L24-L22-A

For Gen. Notes See Sheet 35

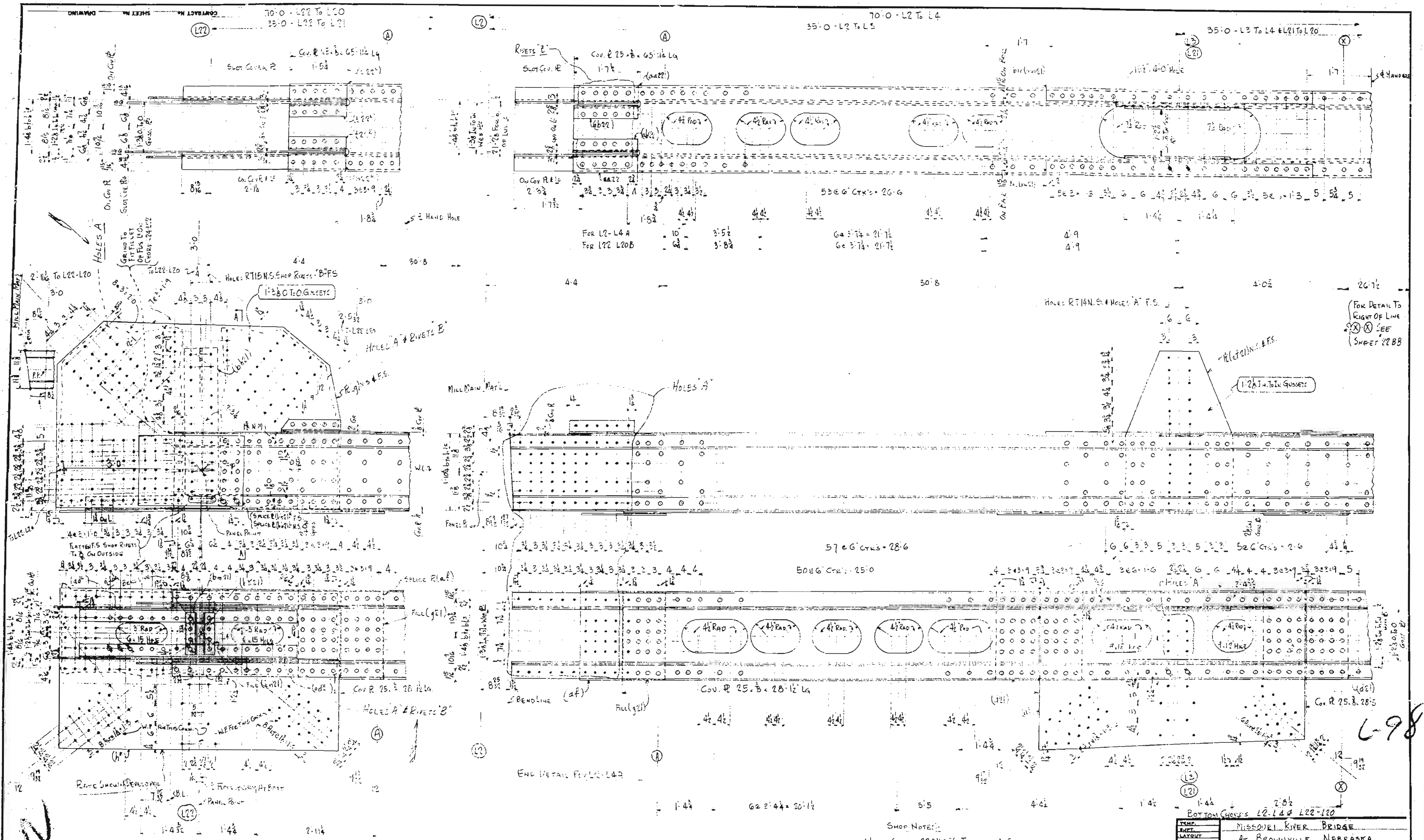
Work Shts 21AB & 21EE as One Sheet
Work Shts 21AB & BB, 22AB & BB, 23AB & BB, 24AB & BB, 25AB & BB, 26AC-BC & CC Together

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See Gen. Notes

Bottom Chords L0-L2, L24-L22
Bridge Over Missouri River
At Brownville Nebr.
For Atchison County, Missouri

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
FREST.
O. INSP.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jacks
MADE BY H.G.
CHECKED BY F 4/8/39
TRACED BY
REVISED
LAST ASSEM. MK.
SHOP NO.
CONTRACT CG34092
SHEET 21 B



Bottom Chords L2-L4 & L22-L20

Bottom Chord L2-L4A - As Shown

Bottom Chord L2-L4B - Opp Hand To L2-L4A

Bottom Chord L22-L20B - As Shown

Bottom Chord L22-L20A Opp Hand To L22-L20B

Shop Notes:

Work Sheets 22AB & BB Together As One Sheet

Work Sheets 21AB & BB, 22AB & EB, 23AB & BB, 24AB & BB, 25AB & BB, & 26AC - BC & CC Together

For General Notes See Sheet 35

RIVETS
OPEN HOLES
REAM
MILLING
PAINT

See General Notes

TEMP.
ENGT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri

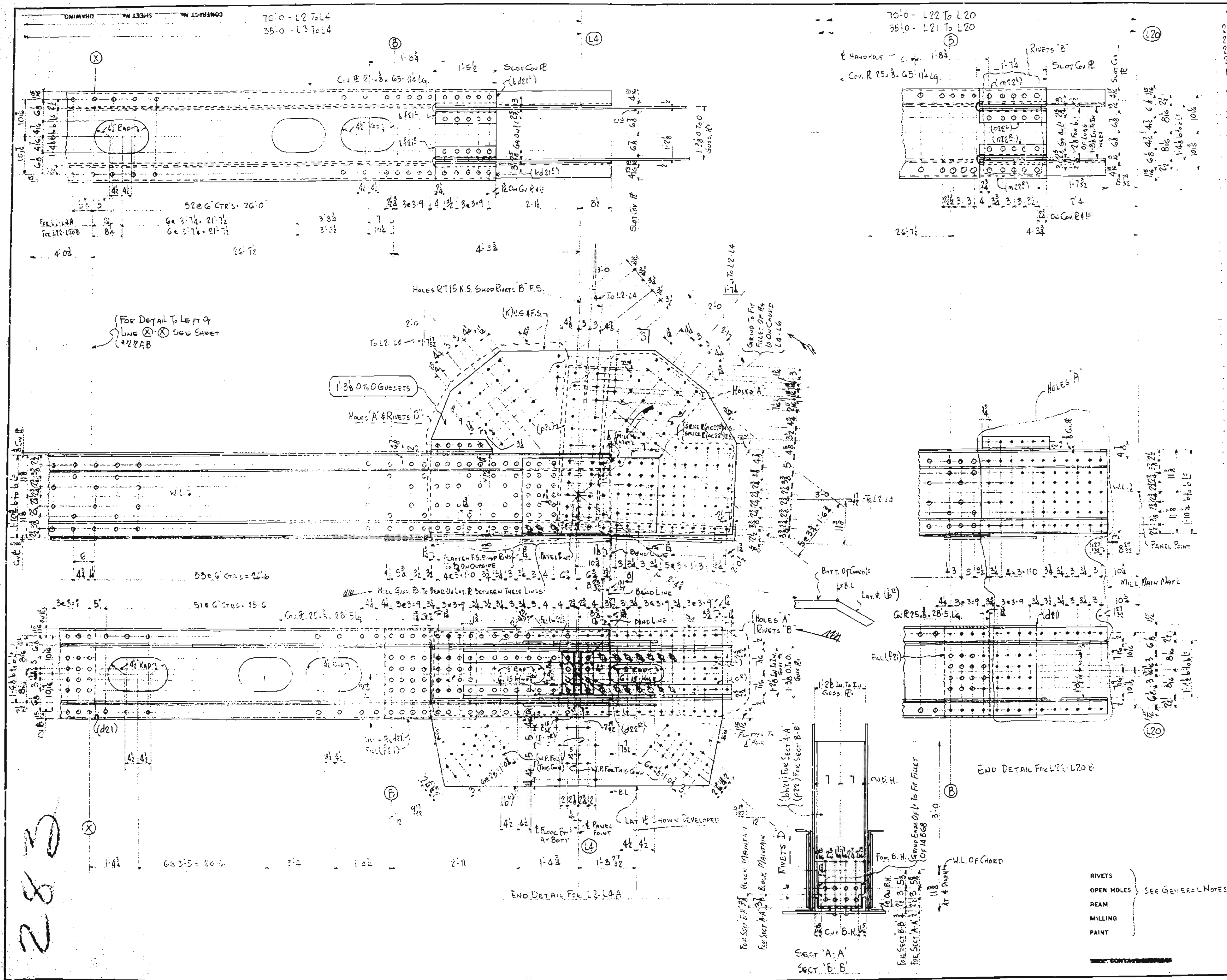
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago

IN CHARGE Jenks MADE BY C.A.D.
CHECKED BY J 4/5/29 TRACED BY
REVISED LAST ASSEM. MK.

SHOP NO.
CONTRACT CG 34092
SHEET 22 AB

282

C-98



283

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See General Notes

Bill Of Material For One Bottom Chord L2-L4A

2Ls 4·4·3/8·69-11 29/32 M2E Ord 70-1 It#74 Silicon Steel (Top Ls)
2Ls 4·4·3/8·69-11 29/32 M2E Ord 70-1 It#74 Silicon Steel (Bott Ls)
2 Rs 22UM·1/2·69-11 29/32 M2E Ord 70-1 It#36 Silicon Steel (Web Rs)
2 Rs 14UM·3/8·69-11 29/32 M2E Ord 70-1 It#46 Silicon Steel (Side Rs)
1 R 25UM·3/8·65-11 1/4 F2E Ord 66-1 It#27 Silicon Steel Top Cov R
1 R 25UM·3/8·28-1 1/2 F2E Ord 28-3 It#109 Silicon Steel Bott Cov R
2Ls 5·3 1/2·3/8·1-7 (aa22)
2Ls 4·3 1/2·3/8·1-7 (ab22)
3 Rs 25UM·3/8·2-1 1/4 (d21) F2E Silicon Steel
1 Fill 25·3/8·1-0 1/2 (g21)
1 Lat R 46 1/4 MIN FIW·3/8·6-6 3/4 (a) F2E Silicon Steel Ord 46 1/2 UM·3/8·[illegible] Feed
2 Guss Rs 47·1/2·2-7 1/2 (at21)
2 Bars 4 1/2 UM·1/2·6-8 (aw21) Silicon Steel
1 Fill 25·1/4·1-0 1/2 (f21)
1 Lat R 42 1/2 UM·3/8·6-3 19/32 (b R) F2E Bent Silicon Steel
2Ls 4·4·1/2·6-3 11/32 (c L/R) Bent Silicon Steel
1L 7·4·1/2·0-11 1/8 (d22 R) Bent
1L 7·4·1/2·0-11 1/8 (f22 R) Bent
1 Fill 8 1/2·1/2·0-5 1/8 (w22)
1 PH 14·68·3-10 1/2 (p22) It#184
2 Guss Rs 52 MIN FIW·1/2·7-0 1/16 (K) F2E Silicon Steel Ord 1 R 52 1/2·1/2·28-4 3/8 For 4
2 Splice Rs 21UM·1/2·3-1 3/8 (ac22) F2E Silicon Steel
2Ls 5·3 1/2·3/8·1-5 (bd21 R/L)
2Ls 4·3 1/2·3/8·1-5 (bf21 R/L)
1 R 25UM·3/8·28-5 F2E Ord 28-6 1/2 It#108 Silicon Steel Bott Cov. R
1 R 25UM·3/8·2-1 1/2 (af) F2E Silicon Steel

Bill Of Material For One Bottom Chord L22-L20B

2Ls 4·4·3/8·69-11 29/32 M2E Ord 70-1 It#74 Silicon Steel (Top Ls)
2Ls 4·4·3/8·69-11 29/32 M2E Ord 70-1 It#74 Silicon Steel (Bott Ls)
2 Rs 22UM·1/2·69-11 29/32 M2E Ord 70-1 It#36 Silicon Steel (Web Rs)
2 Rs 14UM·3/8·69-11 27/32 M2E Ord 70-1 It#46 Silicon Steel (Side Rs)
1 R 25UM·3/8·65-11 1/4 F2E Ord 66-1 It#27 Silicon Steel (Top Cov. R)
1 R 25UM·3/8·25-1 1/2 F2E Ord 2[illegible]-3 It#109 Silicon Steel (Bott Cov. R)
2 Guss Rs 84 7/16 F2W·1/2·4-7 5/8 (g) F2E (Silicon Steel) 1 R 29-0 1/8 Cuts 2 {Ord [illegible] 1/2·18-3/4 For 4
1 BH 14·63·3-10 1/2 (bh21) It#83
2Ls 5·3 1/2·3/8·1-5 1/4 (s22 R/L)
2Ls 4·3 1/2·3/8·1-5 1/4 (t22 R/L)
2 Splice Rs 21UM·3/8·2-7 3/8 (bd21 R/L) F2E Silicon Steel
1 Lat R 46 1/2 UM·1/2·6-9 27/32 (h R) F2E Bent Silicon Steel
3 Splice Rs (d21)
1 Fill (g21)
1L 7·4·1/2·0-11 1/8 (bk21) Bent
1L 7·4·1/2·0-11 1/8 (bm21) Bent
2Ls 4·4·1/2·5-2 19/32 (ad L/R) Bent Silicon Steel
1 Lat R (a)
2 Guss Rs (at21)
2 Bars (aw21)
1 Fill (f21)
2Ls 5·3 1/2·3/8·1-6 3/4 (m22 R/L)
2Ls 4×3 1/2·3/8·1-6 3/4 (n22 R/L)
1 Fill 8 1/2·1/2·0-5 1/8 (bn21)
1 R 25UM·3/8·28-5 F2E Ord 28-6 1/2 It#108 Silicon Steel Bott Cov. R
1 Splice R (af)

Required List

No. Req'd	Description	Mark
One	Bottom Chord	L2-L4A
One	Do	L2-L4B
One	Do	L22-L20B
One	Do	L22-L20A

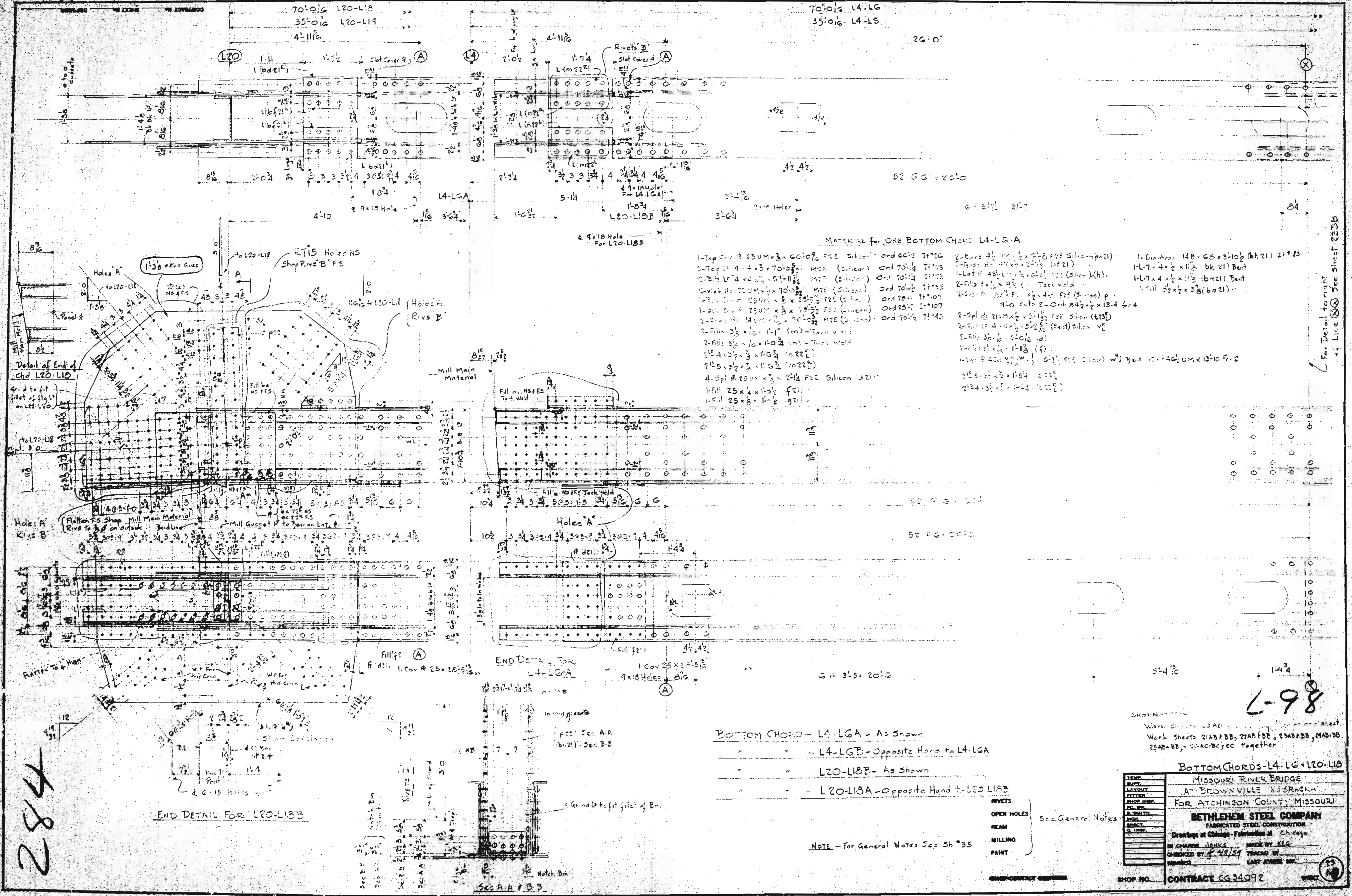
Shop Notes:-
Work Sheets 22AB & BB Together As One Sheet
Work Sheets 21AB & BB, 22AB & BB, 23 AB & BB, 24AB & BB, 25AB & BB, & 26AC:EC & CC Together
For General Notes See Sheet #35

C 98

Bottom Chords - L2-L4 & L22-L20

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
R. SMITH
MCH
CHKR
O. INSP.

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY C.A.P.
CHECKED BY [illegible] 4/8/39 TRACED BY
REVISED LAST ASSEM. MK.
SHOP NO. CONTRACT CG 24092 SHEET 22B



Material for One Bottom Chord L4-L6-A

1-Top Cov ℞ 25 UM × 3/8 × 66'-0 9/16 F2E Silicon Ord 66'-3 It #26
2-Top L's 4 × 4 × 3/8 × 70'-0 5/8 M2E (Silicon) Ord 70'-1/4 It #13
2-Bott L's 4 × 4 × 3/8 × 51'-11 [illegible] M2E (Silicon) Ord 70'-1/4 It #15
2-Web ℞s 25 UM × 1/2 × 70'-0 [illegible] M2E (Silicon) Ord 70'-1/2 It #33
1-Bott Cov ℞ 25 UM × 3/8 × 28'-5 [illegible] F2E (Silicon) Ord 28'-7 It #107
1-Bott Cov ℞ 25 UM × 3/8 × 28'-5 [illegible] F2E (Silicon) Ord 28'-7 It #107
2-[illegible] ℞s 14 UM × 7/16 × 70'-0 3/32 M2E (Silicon) Ord 70'-1/2 It #45
2-Fills 3 1/8 × 1/16 × 1'-1" (m) - Tack Weld
2-Fills 3 1/8 × 1/16 × 1'-0 3/4 (n) - Tack Weld
2 L's 4 × 3 1/2 × 3/8 × 1'-6 3/4 (n 22 R/L)
2 L's 5 × 3 1/2 × 3/8 × 1'-6 3/4 (m 22 R/L)
4-Spl ℞s 25 UM × 3/8 × 2'-1 1/4 F2E Silicon (d 21)
1-Fill 25 × 1/4 × 1'-0 1/2 f 21
1-Fill 25 × 1/8 × 1'-1/2 g 21

2-Bars 4 1/2 UM × 1/2 × 6'-8 F2E Silicon (a 21)
2-Gusset ℞s [illegible] × 1/2 × 8'-7 1/2 (at 21)
1-Lat ℞ 43 1/2 UM × 3/8 × 6'-[illegible] F2E (Silicon) (h)
2-Fills [illegible] × 1/16 × 9 3/8 ([illegible]) Tack Weld
2-Gusset ℞s 28 3/8 [illegible] × 1/2 × 4'-[illegible] F2E (Silicon) p
9'-0 cuts 2-Ord 84 1/2 × 1/2 × 18'-4 for 4
2-Spl ℞s 21 UM × 1/2 × 5'-1 11/32 F2E Silicon (t 23 R/L)
2-Spl L's 4 × 4 × 1/2 × 5'-2 5/32 (Bent) Silicon v R/L
2-Fills 3 1/8 × 1/16 × 2'-0 1/16 (d)
2-Fills 3 1/2 × 1/16 × 1'-11 7/8 (f)
1-Lat ℞ 40[illegible] UM/PW × 1/2 × 6'-1[illegible] F2E (Silicon) w) Bent Cut 46 1/2 UM × 13'-10 for 2
2 L's 5 × 3 1/2 × 3/8 × 1'-5 1/4 (s 22 R/L)
2 L's 4 × 3 1/2 × 3/8 × 1'-5 1/4 (t 22 R/L)

1-Diaphragm 14 B × 65 × 3'-10 1/2 (bh 21) It #183
1-L 7 × 4 × 1/2 × 1'-1 5/8 (bk 21) Bent
1-L 7 × 4 × 1/2 × 1'-1 5/8 (bm 21) Bent
1-Fill 3 1/2 × 1/2 × 5 7/8 (bn 21)

For Detail to right of Line ⊗⊗ See Sheet 23BB

Bottom Chord - L4-L6A - As Shown
" " - L4-L6B - Opposite Hand to L4-L6A
" " - L20-L18B - As Shown
" " - L20-L18A - Opposite Hand to L20-L18B

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See General Notes

NOTE - For General Notes See Sh #35

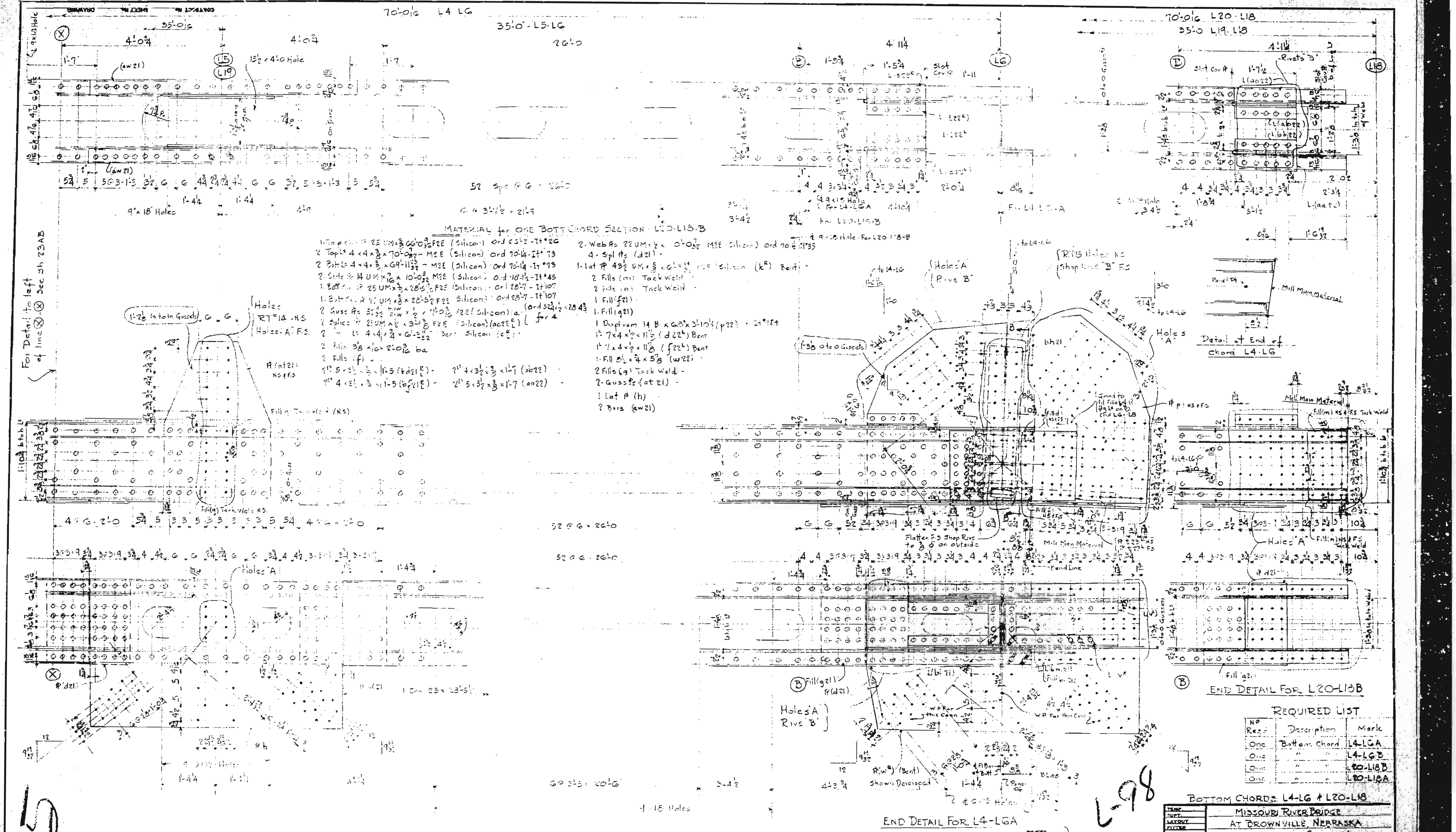
Shop Notes:
Work Sheets [illegible] one sheet
Work Sheets 21AB & BB, 22AB & BB, 23AB & BB, 24AB & BB, 25AB & BB, 26AC-BC & CC together

L-98

284

Bottom Chords - L4-L6 & L20-L18
Missouri River Bridge
At Brownville, Nebraska
For Atchinson County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY KEG
CHECKED BY 4/8/59 TRACED BY
REVISED LAST ASSIGN. MK.
SHOP NO. CONTRACT CG 34092 SHEET 23 AB



MATERIAL for ONE BOTT CHORD SECTION L20-L18-B

1-Top Cov P 25 UM × 3/8 × 66'-0 9/16 F2E (Silicon) Ord 65'-2 - It #26
2 Top Ls 4 × 4 × 3/8 × 70'-0 7/32 - M2E (Silicon) Ord 70'-1 1/4 - It #73
2 Bott Ls 4 × 4 × 3/8 × 69'-11 25/32 - M2E (Silicon) Ord 70'-1 1/4 - It #73
2 Side Ps 14 UM × 7/16 × 10'-0 3/32 M2E (Silicon) Ord 10'-1 1/2 - It #45
1 Bott Cov P 25 UM × 3/8 × 28'-5 1/2 F2E (Silicon) Ord 28'-7 - It #107
1 Bott Cov P 25 UM × 3/8 × 28'-5 1/2 F2E (Silicon) Ord 28'-7 - It #107
2 Guss Ps 52 3/32 MW/FW × 1/2 × 7'-0 3/16 F2E (Silicon) (a) (Ord 52 3/4 × 1/2 × 28 4 3/4 for 4)
2 Splice Ps 21 UM × 1/2 × 3'-1 3/8 F2E (Silicon) (ac22 R/L)
2 " Ls 4 × 4 × 3/4 × 6'-2 11/32 Bent Silicon (c R/L)
2 Fills 3 1/8 × 1/16 × 2'-0 3/16 ba
2 Fills (f)
2 Ls 5 × 3 1/2 × 3/8 × 1'-5 (kd21 R/L)
2 Ls 4 × 3 1/2 × 3/8 × 1'-5 (bf21 R/L)
2 Ls 4 × 3 1/2 × 3/8 × 1'-7 (ab22)
2 Ls 5 × 3 1/2 × 3/8 × 1'-7 (ao22)
2 Web Ps 22 UM × 1/2 × 0'-0 7/32 M2E (Silicon) Ord 70'-1 It #35
4 Spl Ps (d21)
1 Lat P 43 1/2 UM × 5/8 × 6'-[illegible] F2E (Silicon) (k R) Bent
2 Fills (m) Tack Weld
2 Fills (n) Tack Weld
1 Fill (f21)
1 Fill (g21)
1 Diaphram 14 B × 63# × 3'-10 1/4 (p22) - It #184
1 L 7 × 4 × 1/2 × 11 7/8 (d22 L) Bent
1 L 7 × 4 × 1/2 × 11 7/8 (f22 L) Bent
1 Fill 8 1/2 × 3/4 × 5 7/8 (w22)
2 Fills (g) Tack Weld
2 Guss Ps (at 21)
1 Lat P (h)
2 Bars (aw21)

REQUIRED LIST

No Reqd	Description	Mark
One	Bottom Chord	L4-L6A
One	" "	L4-L6B
One	" "	L20-L18B
One	" "	L20-L18A

SHOP NOTES:- Work Shts 22AB + 23BB together as one Sheet
Work Shts 21AB + BB, 22AB BB, 23AB + BB, 24AB + BB, 25AB + BB + 26AC + BC + CC together
For general notes see Sht #35

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See General Notes

L-98

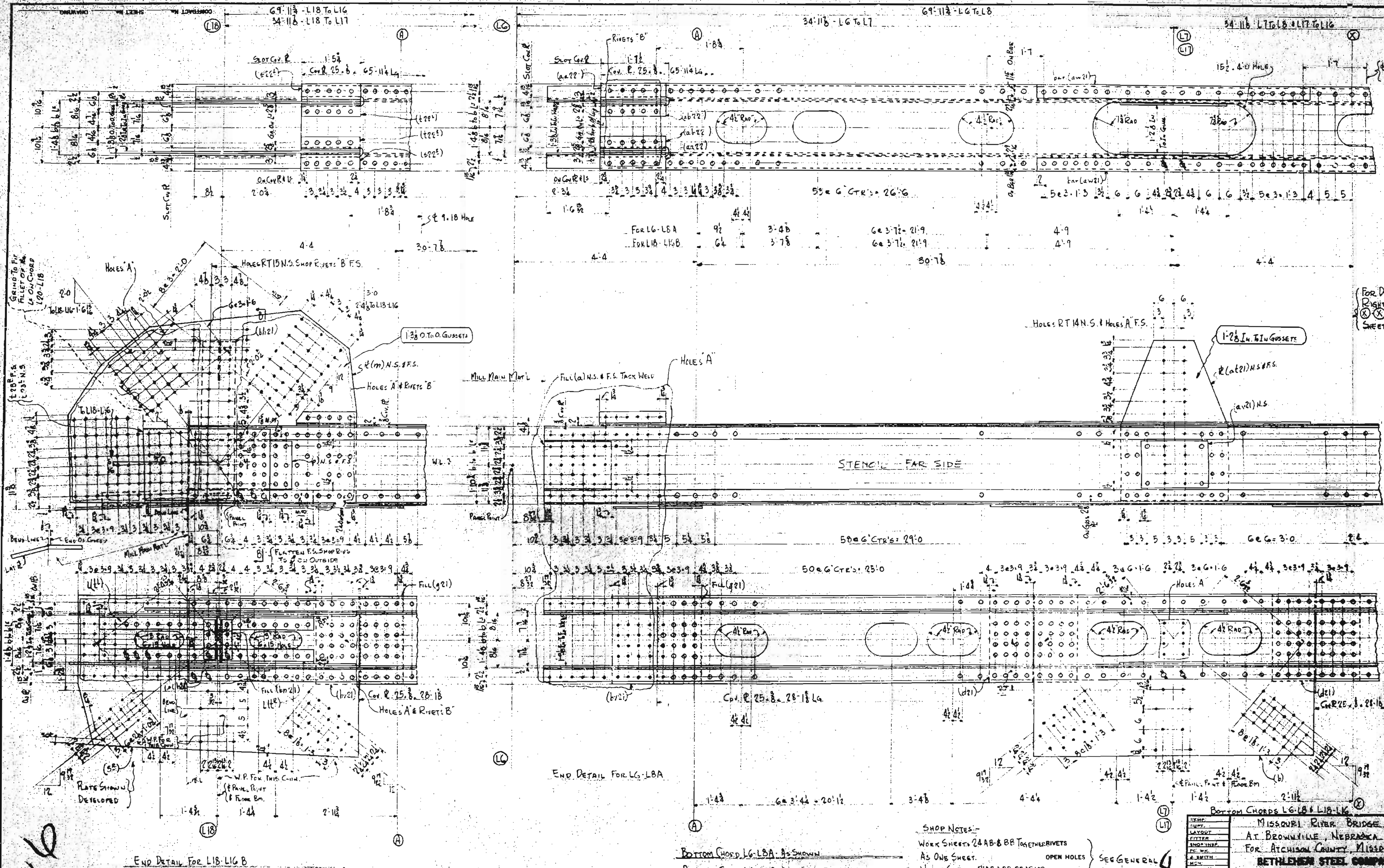
285

BOTTOM CHORDS L4-L6 + L20-L18

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHINSON COUNTY, MISSOURI

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE [illegible] MADE BY KEG
CHECKED BY [illegible] 4/18/29 TRACED BY
REVISED LAST ASSEM. MK.
SHOP NO.
CONTRACT CG34092
SHEET



Bottom Chords L6-L8 & L18-L16

Bottom Chord L6-L8A - As Shown
Bottom Chord L6-L8B - Opp. Hand To L6-L8A
Bottom Chord L18-L16B - As Shown
Bottom Chord L18-L16A - Opp. Hand To L18-L16B

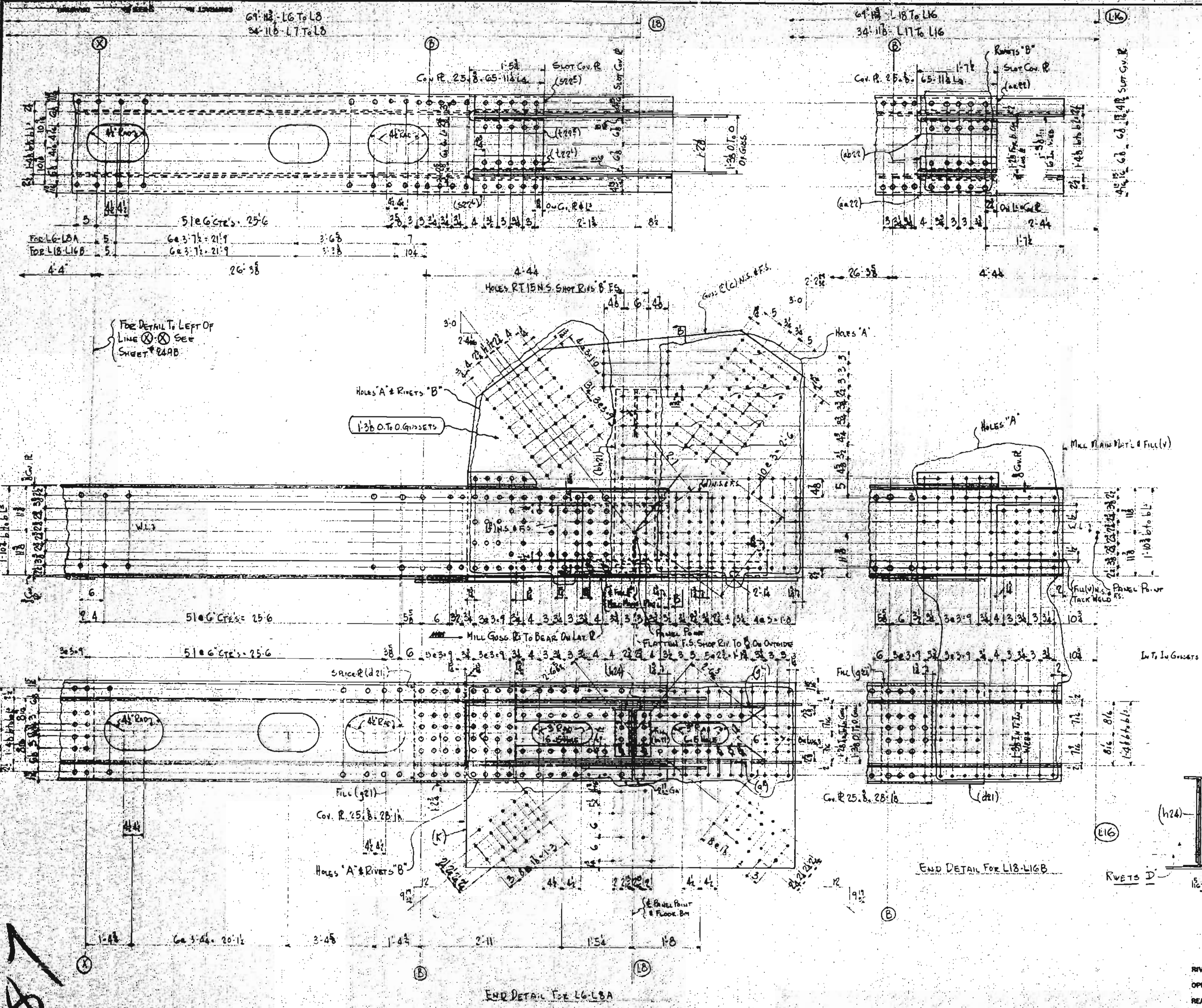
Shop Notes:-
Work Sheets 24AB & BB Together As One Sheet.
Work Sheets 21AB & BB, 22AF & BB, 23AB & CB, 24AB & BB, 25AB & BB, 26AC, BC & CC, Together.
For General Note's See Sheet #35

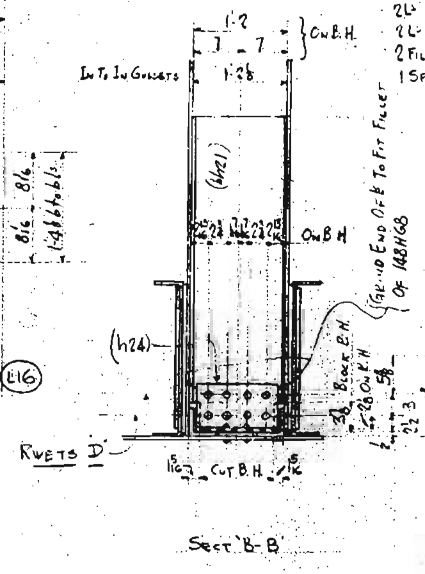
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See General Notes

L-98

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY C.B.D.
CHECKED BY 4-16-29 TRACED BY
REVISED
SHOP NO.
CONTRACT C634092

256





Sect "B-B"

Bill Of Material For One Bottom Chord L6 - L8A

4Ls 4·4·⅝·69·11$\frac{13}{32}$ M2E Ord 70·0½ It # 75 Silicon Steel Top & Bott Flg Ls
2 Rs 22UM·½·69·11$\frac{15}{32}$ M2E Ord 70·1 It # 36 Silicon Steel Web Rs
1 R 25UM·⅝·65·11⅛ F2E Ord 70·1 It # 24 Silicon Steel Top Cov. R
1 R 25UM·⅝·28·1⅛ F2E Ord 28·3 It # 109 Silicon Steel Bot & Cov. R
1 R 25UM·⅝·28·1⅛ F2E Ord 28·3 It # 109 Silicon Steel Bott. Cov. R
2Ls 5·3½·⅜·1·7 (aa22)
2Ls 4·3½·⅜·1·7 (ab22)
2 Rs 14UM·⅜·1·7$\frac{5}{32}$ (a) Tack Weld
3 Splice Rs 25UM·⅝·2·1¼ (d21) F2E Silicon Steel
2 Fills 25·⅛·1·0½ (g21)
2 Guss. Rs 47·½·2·7½ (at21)
2 Bars [illegible]·6·8 (aw21) Silicon Steel
1 R 14UM·⅜·1·7½ (av21)
1 Lat R 46½UM·⅜·6·10 (b) F2E Silicon Steel
2Ls 5·2½·⅜·1·5¼ (s22$\frac{R}{L}$)
2Ls 4·3½·⅜·1·5¼ (t22$\frac{R}{L}$)
2 Guss. Rs 83½ F2W·½·5·3 (c) $\frac{M1E}{F1E}$ (Silicon Steel) 1 R 10·1 Cuts 2 Ord. 1 R 84·½·20·6 For 4
1 BH 14·68·3·10½ (bh21) It # 183
2 Splice Rs 21UM·⅜·2·6½ (d) F2E Silicon Steel
2 Splice Fills 14UM·⅜·2·3¼ (f) M1E
2Ls 4·4·½·5·2¼ (g$\frac{R}{L}$) Silicon Steel
2Ls 7·4·½·0·11⅛ (h24) Grind Ends Of L
1 Fill 8½·⅛·0·5⅜ (bn21)
1 Lat R 46½UM·½·6·10¼ (K) F2E Silicon Steel
1 Splice R 25UM·⅜·2·2 (bv21) F2E Silicon Steel

Bill Of Material For One Bottom Chord L18 - L16B

4Ls 4·4·⅝·69·11½ M2E Ord 70·0½ It # 75 Silicon Steel Top & Bott Flg Ls
1 R 25UM·⅝·65·11⅛ F2E Ord 66·1 It # 24 Silicon Steel Top Cov. R
2 Rs 22UM·½·69·11½ M2E Ord 70·1 It # 36 Silicon Steel Web Rs
1 R 25UM·½·28·1⅛ F2E Ord 28·3 It # 109 Silicon Steel Bott. Cov. R
1 R 25UM·⅝·28·1⅛ F2E Ord 28·3 It # 109 Silicon Steel Bott Cov. R
2Ls (s22$\frac{R}{L}$)
2Ls (t22$\frac{R}{L}$)
2 Guss. Rs 83⅜ F2W·½·4·8⅛ (m) F2E (Silicon Steel) 1 R 9·0¼ Cuts 2 Ord 1 R 84½·½·18·4½ For 4
1 BH (bh21) It # 183
2 Splice Rs 21UM·½·2·1$\frac{11}{32}$ (t2$\frac{R}{L}$) F2E Silicon Steel
2 Splice Fills 14UM·⅜·2·6¼ (p)
2Ls (h24)
1 Fill (bn21)
1 Lat. R 46¼ $\frac{UM1W}{F1W}$·½·6·9$\frac{5}{32}$ (5$\frac{R}{L}$) F2E (Silicon Steel) Bent
3 Splice Rs (d21)
2 Fills (g21)
1 Lat R (b)
2 Goss Rs (at21)
1 R (av21)
2 Bars (aw21)
2Ls (aa22)
2Ls (ab22)
2Ls 4·4·½·5·2$\frac{5}{32}$ (t$\frac{R}{L}$) Bent Silicon Steel
2 Fills 14UM·⅜·1·4¼ (v) M1E Tack Weld
1 Splice R (bv21)

No. Req'd	Description	Mark
One	Bottom Chord	L6-L8A
One	Do	L6-L8B
One	Do	L18-L16B
One	Do	L18-L16A

Shop Notes:-
Work Sheets 24AB & BB Together As One Sheet
Work Sheets 21AB & BB, 22AB & BB, 23AB & BB, 24AB & BB, 25AB & BB, & 26AC·BC & CC, Together
For General Notes See Sheet 35

Rivets
Open Holes
Ream
Milling
Paint
See General Notes

L-98

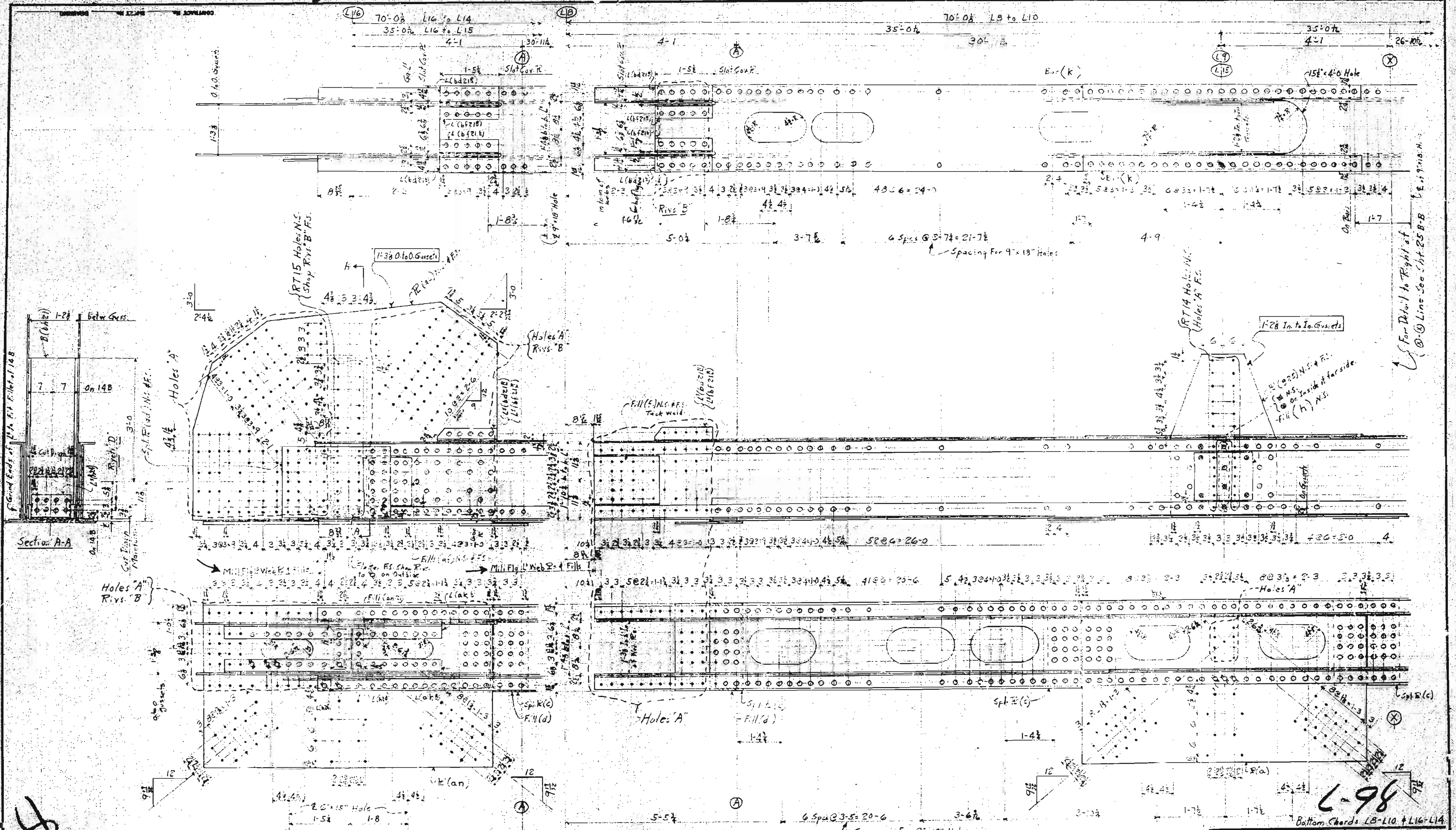
Bottom Chords L6-L8 & L18-L16

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
[illegible]
[illegible] Chicago
In charge Jenks Drawn C.A.D
Checked by [illegible]

Shop No.
Contract C634[illegible]

287

288



End Detail For L16-L14-B

End Detail For L8-L10-A

Bottom Chord L8-L10-A As Shown
" " L8-L10-B Opp Hand to L8-L10A
" " L16-L14-B As Shown
" " L16-L14-A Opp Hand to L16-L14-B

For Gen Notes See Sheet 35

Work Shts 25AB & 25BB as One Sheet
Work Shts 21AB & BB, 22AB & BB, 23AB & BB
24AB & BB, 25AB & BB, 26AC-BC & CC together

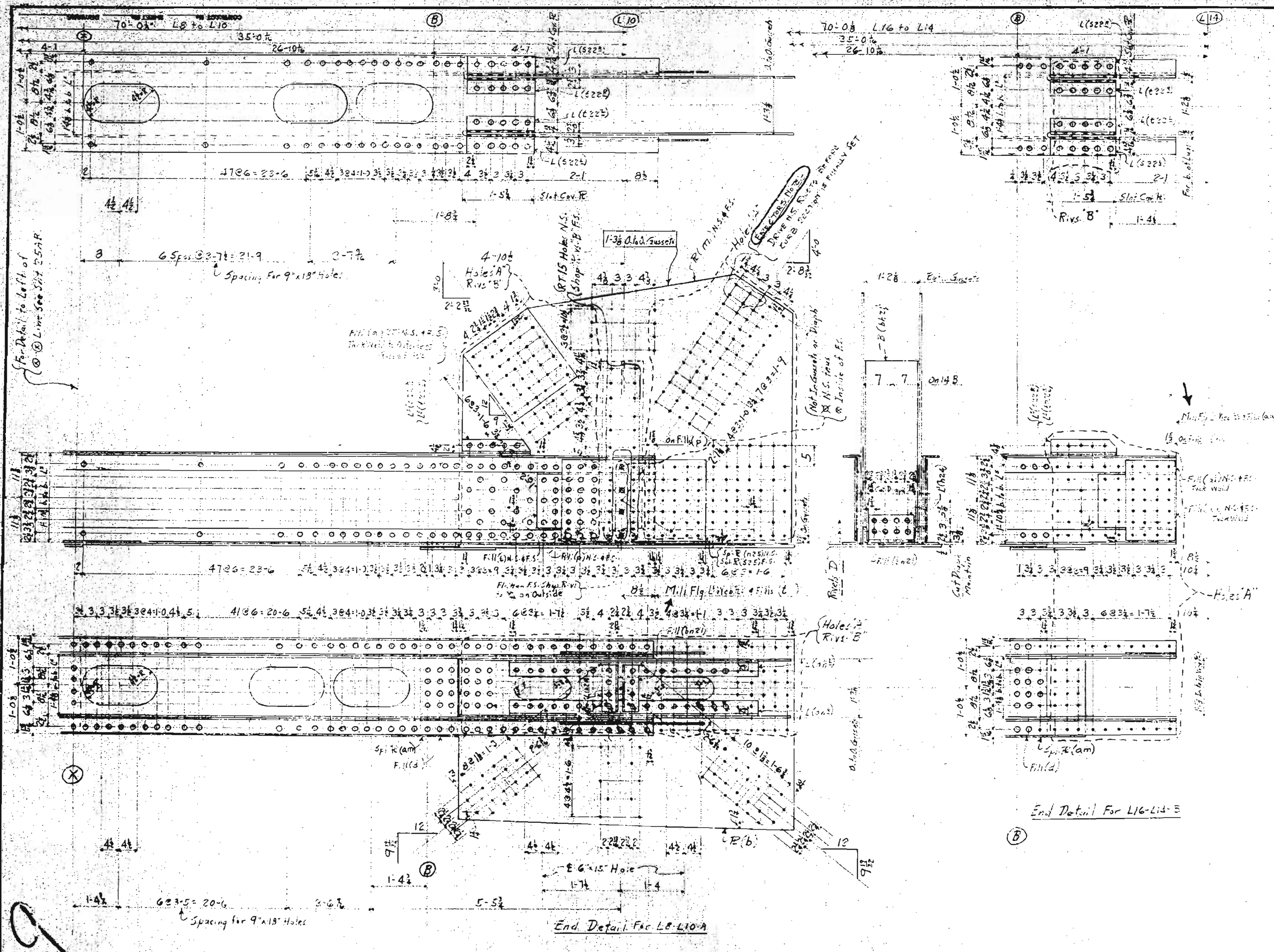
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See Gen. Notes

L-98

Bottom Chords L8-L10 & L16-L14

Bridge Over Missouri River
At Brownville Nebr.
For Atchison County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY H.G.
CHECKED BY F. 4/10/39 TRACED BY
REVISED LAST ORDER NO.
SHOP NO.
CONTRACT CG 34892
SHEET 25 AB



Bill of Mat'l for One Bottom Chord Section L8-L10-A

2 Web Pls 22UM x ½ x 70-0 5/16 M-2-E Ord 70-1¼ It. 246
2-Top Chd Ls 4 x 4 x ⅜ x 70-0 5/16 M-2-E Ord 70-1¼ It. 273
2-Bott Chd Ls 4 x 4 x ⅜ x 70-0 5/16 M-2-E Ord 70-1¼ It. 273
1-Top Cov. Pl 25UM x ⅜ x 65-11⅜ Slot Ord 66-1 It. 296
2-Bott Cov. Pl 25UM x ⅜ x 28-1 7/16 Ord 28-3 It. 300
1-Flat Pl 46½UM x ⅜ x 6-10 F-2-E (a) (Silicon)
1-Flat Pl 95 F-2½ x ½ x 4-1 F-2-E (b) (Silicon) (1-Pl 7-11 Cuts 2)
3-Spl Pls 25UM x ⅜ x 1-7¼ (c)
2-Fill Pls 25 x ⅜ x 0-9½ (d)
2-Fills 14UM x ⅜ x 1-6 11/16 M-1-E (f) Tack Weld
2-Ls 5 x 3½ x ⅜ x 1-5 (b&21⅝)
2-Ls 4 x 3½ x ⅜ x 1-5 (bf21⅝)
2-Ls 5 x 3½ x ⅜ x 1-5¼ (s22⅝)
2-Ls 4 x 3½ x ⅜ x 1-5¼ (t22⅝)
2-Guss Pls 47 x ½ x 2-6½ (e25)
1-Fill 14UM x ⅜ x 1-4½ (h)
2-Bars 4½UM x ½ x 6-8 (k)
2-Guss Pls 83½ F2W x ½ x 5-9 F-2-E (m) (Silicon) 10-9½ Cuts 2 - 1 Pl 84 x ½ x 21-11 Ord for 4
1-Spl Pl 21UM x ⅜ x 3-0¼ F-2-E (n25) (Silicon)
2-Fills 21 x ⅜ x 1-1⅜ (p)
2-Fills 14UM x ⅜ x 2-5¾ M-1-E (t) 1-Spl Pl 21UM x ⅜ x 3-0¼ F-2-E (s25) (Silicon)
1-B 14 x 69# x 3-10½ (bh21) It. 183
2-Ls 7 x 4 x ½ x 0-11⅜ (h24)
2-Fills 20 x ⅜ x 1-9½ (ag25) Tack Weld
2-Ls 4 x 4 x ½ x 5-2¼ (Silicon) (ah⅝)
1-Fill 8½ x ⅜ x 0-7⅝ (ba21)
1-Spl Pl 25UM x ⅜ x 1-7¾ (am)

Bill of Mat'l For One Bottom Chord Section L16-L14-B

2-Web Pls 22UM x ½ x 70-0 5/16 M-2-E Ord 70-1¼ It. 246
2-Top Chd Ls 4 x 4 x ⅜ x 70-0 5/16 M-2-E Ord 70-1¼ It. 273
2-Bott Chd Ls 4 x 4 x ⅜ x 70-0 5/16 M-2-E Ord 70-1¼ It. 273
1-Top Cov. Pl 25UM x ⅜ x 65-11⅜ Slot Ord 66-1 It. 296
2-Bott Cov. Pl 25UM x ⅜ x 28-1 7/16 Ord 28-3 It. 300
1-Flat Pl 46½UM x ⅜ x 6-10¼ F-2-E (Silicon) (an)
1-Flat Pl (a)
3-Spl Pls (c)
2-Fills (d)
2-Fills 14UM x ⅜ x 1-7⅜ M-1-E (aa) Tack Weld
2-Fills 21 x ⅜ x 1-0⅝ (ab) Tack Weld
2-Ls (b&21⅝)
2-Ls (bf21⅝)
2-Ls (s22⅝)
2-Ls (t22⅝)
2-Guss Pls (e25)
1-Fill (h)
2-Bars (k)
2-Guss Pls 86¾ F2W x ½ x 5-3¼ F-2-E (ac) (Silicon) (Pl [illegible] Cuts 2 Ord 1-Pl 87 x ½ x 23-5 for 4)
2-Spl Pls 21UM x ⅜ x 2-6¼ F-2-E (ad) (Silicon)
2-Fills 14UM x ⅜ x 2-2 11/16 M-1-E (af)
1-B 14 x 58# x 3-10½ (bh21) It. 183
2-Ls (h24)
2-Ls 4 x 4 x ½ x 5-2¼ (Silicon) (ak⅝)
1-Fill 8½ x ⅜ x 0-7⅝ (bn21)
1-Spl Pl (am)

REQUIRED LIST

No. Reqd.	Description	Mark
One	Bottom Chord Section	L8-L10-A
One	do do do	L8-L10-B
One	do do do	L16-L14-B
One	do do do	L16-L14-A

Work Sheets 25AB & 25BB As One Sheet
Work Sheets 21AB & BB, 22AB & BB, 23AB & BB, 24AB & BB, 25AB & BB, 26AB-BB & CC together.

L-98

289

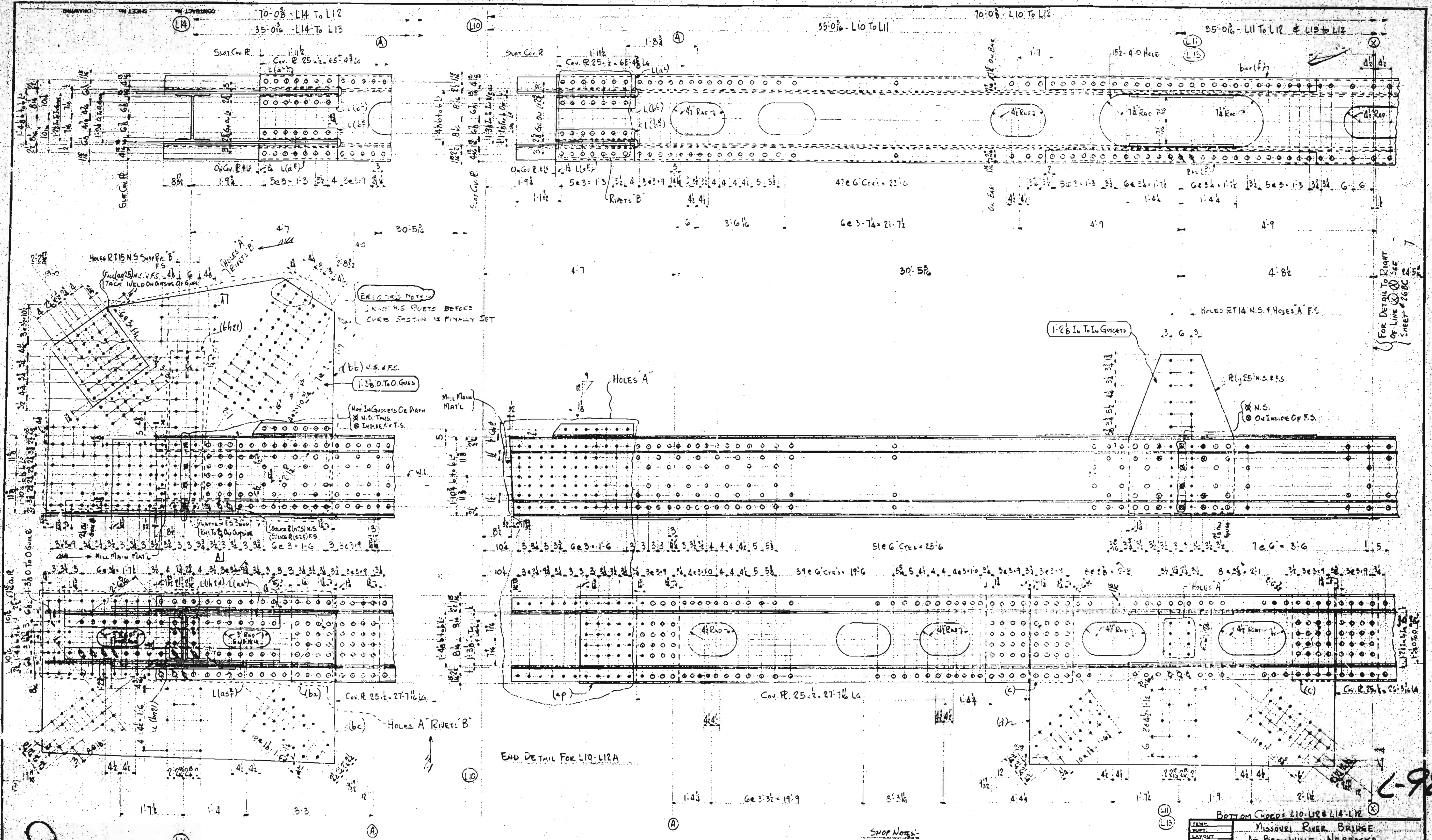
For Gen. Notes See Sheet 35

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See Gen. Notes

Bottom Chords L8-L10 & L16-L14

Bridge Over Missouri River
At Brownville Nebr.
For Atchinson County, Missouri.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings of Chicago Fabricating Works
IN CHARGE Jeffs
CHECKED BY
SHOP NO.
CONTRACT



290

C-98

BOTTOM CHORD-L10-L12A- AS SHOWN

BOTTOM CHORD-L10-L12B- OPP. HAND TO L10-L12A

BOTTOM CHORD-L14-L12B- AS SHOWN

BOTTOM CHORD-L14-L12A- OPP. HAND TO L14-L12B

SHOP NOTES:-

WORK SHEETS 26AC-BC & CC TOGETHER AS ONE SHEET.

WORK SHEETS 21AB & BB, 22AB & BB, 23AB & BB, 24AB & BB, 25AB & BB, & 26AC-BC & CC, TOGETHER.

FOR GENERAL NOTES SEE SHEET 35

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} SEE GENERAL NOTES

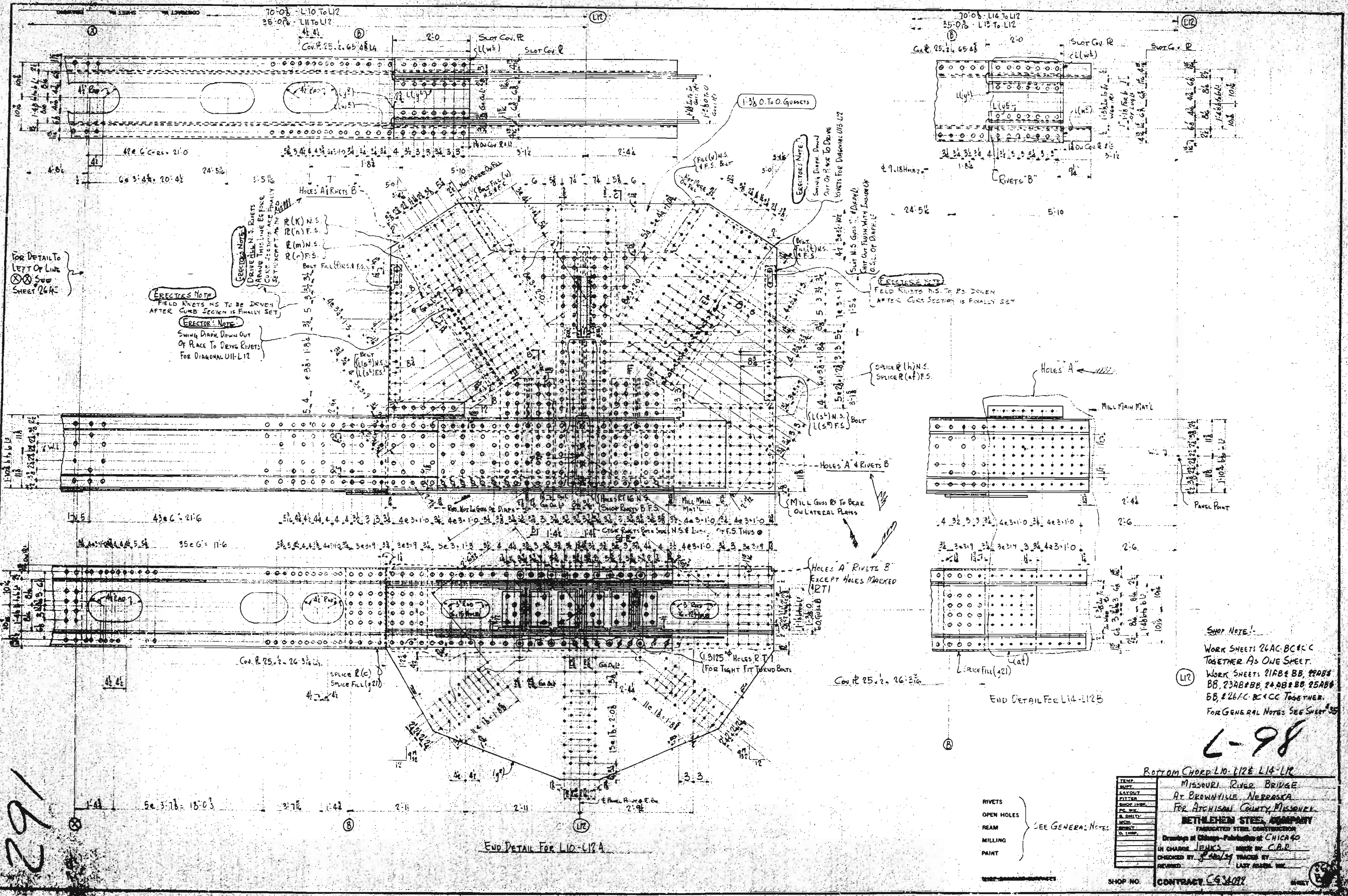
BOTTOM CHORDS L10-L12 & L14-L12

TEMP.	
SUPT.	
LAYOUT	
FITTER	
SHOP INSP.	
FC. WK.	
B. SMITH	
MCH.	
ERECT.	
O. INSP.	

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago Fabrication at CHICAGO
IN CHARGE JENKS MADE BY G.A.H.
CHECKED BY [illegible] TRACED BY
REVISED LAST REVISION

SHOP NO.
CONTRACT C6 34092


70-0⅝ · L10 To L12
35-0⅝ · L11 To L12
Cov. ℞ 25 x ½ · 65-4⅞ L4
Slot Cov. ℞
Slot Cov. ℞
1-3⅛ O. To O. Gussets
Holes "A" & Rivets "B"
℞(K) N.S.
℞(n) F.S.
℞(m) N.S.
℞(r) F.S.
Bolt Fill (f) N.S. & F.S.
Erector's Note
Drive All N.S. Rivets Above This Line Before Curb Sections Are Finally Set Except As Noted
For Detail To Left Of Line ⊗⊗ See Sheet 26AC
Erector's Note
Field Rivets NS To Be Driven After Curb Section Is Finally Set
Erector's Note
Swing Diaph. Down Out Of Place To Drive Rivets For Diagonal U11-L12
Erector's Note
Swing Diaph. Down Out Of Place To Drive Rivets For Diagonal U13-L12
Bolt Fill (t) N.S. & F.S.
Slot N.S. Guss ℞ & Diaph. L. Chip Cut Flush With Inside Of O.S.L. Of Diaph. L.
Erector's Note
Field Rivets N.S. To Be Driven After Curb Section Is Finally Set
℄ 9.18 Holes
Rivets "B"
Splice ℞ (h) N.S.
Splice ℞ (af) F.S.
Bolt L(s⁴) N.S. L(s⁵) F.S.
Holes "A" & Rivets "B"
Mill Guss ℞s To Bear On Lateral Plates
Mill Main Mat'l
Holes "A" Rivets "B" Except Holes Marked RT1
1.3125" Holes RT1 (For Tight Fit Turned Bolts)
Cov. ℞ 25 x ½ · 26-3⅛ L4
Splice ℞ (c)
Splice Fill (g21)
Holes "A"
Mill Main Mat'l
Panel Point
Cov. ℞ 25 x ½ · 26-3⅛
Splice Fill (g21)
End Detail For L14-L12B
End Detail For L10-L12A
℄ Panel Point & ℄ Ch.

Shop Note:-
Work Sheets 26AC · BC & CC Together As One Sheet.
(L12) Work Sheets 21AB & BB, 22AB & BB, 23AB & BB, 24AB & BB, 25AB & BB, & 26AC · BC & CC Together.
For General Notes See Sheet #35

L-98

291

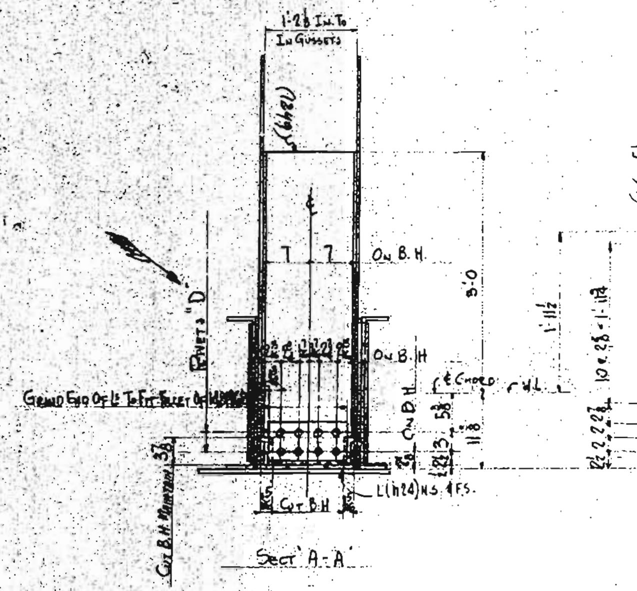
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See General Notes

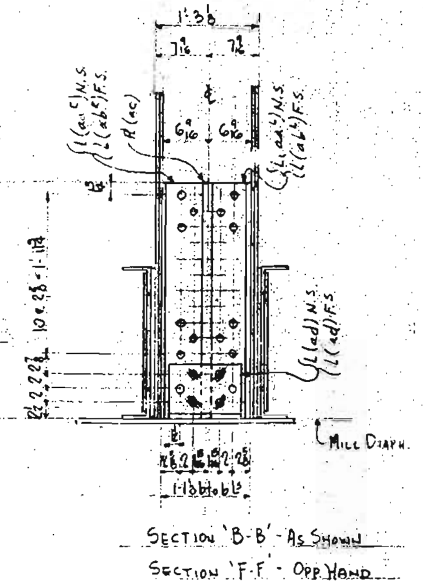
Bottom Chord L10-L12 & L14-L12

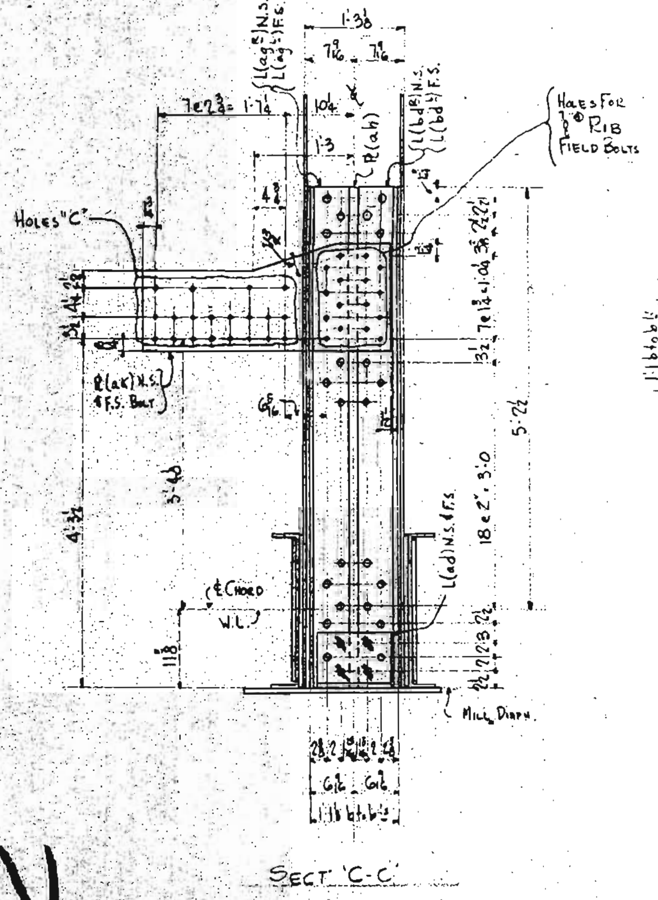
TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

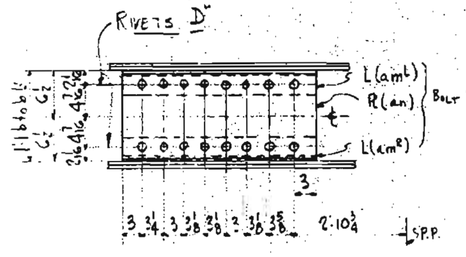
Missouri River Bridge
At Brownville Nebraska
For Atchison County Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago—Fabrication at Chicago
IN CHARGE Jenks MADE BY C.A.R.
CHECKED BY J. 4/10/59 TRACED BY
REVISED LAST ASSEM. MK.
SHOP NO. CONTRACT CG34092 SHEET









Bill Of Material For One Bottom Chord L10 - L12A

2Lˢ 4 × 4 × ½ × 71'-8 5/32 M2E Ord 71'-9 It.# 63 Silicon Steel (Top Flg.)
2Lˢ 4 × 4 × ½ × 71'-8 5/32 M2E Ord 71'-9 It.# 63 Silicon Steel (Bott. Flg.)
2 ℞ 22UM × ½ × 71'-8 5/32 M2E Ord 71'-9 It.# 33 Silicon Steel (Web ℞)
2 ℞ 14UM × ½ × 71'-8 5/32 M2E Ord 71'-9 It.# 42 Silicon Steel (Side ℞s)
1 ℞ 25UM × ½ × 65'-4⅝ F2E Ord 65'-6 It.# 20 Silicon Steel (Top Flg. Cov. ℞)
1 ℞ 25UM × ½ × 27'-7 1/16 F2E Ord 27'-9 It.# 22 Silicon Steel (Bott. Flg. Cov. ℞)
1 ℞ 25UM × ½ × 26'-3 1/16 F2E Ord 26'-4½ It.# 23 Silicon Steel (Bott. Flg. Cov. ℞)
2Lˢ 5 × 3½ × ⅜ × 1'-11 (aᴿ/ᴸ)
2Lˢ 4 × 3½ × ⅜ × 1'-11 (bᴿ/ᴸ)
3 Splice ℞s 25UM × ½ × 2'-1¼ (c) F2E Silicon Steel
1 Lat. ℞ 8½ F2W × ½ × 4'-2⅞ (d) F2E (Silicon Steel) 1 ℞ 8'-3 Cuts 2 ℞ Ord 1 ℞ 90 × ½ × 16'-10 For 4
2 Guss. ℞s 47 × ½ × 2'-6½ (g25)
2 Bars 4½UM × ½ × 6'-8 (f) Silicon Steel
1 Lat. ℞ 65 F2W × ⅜ × 9'-10 (gᴿ) F2E (Silicon Steel) 1 ℞ 18'-10 Cuts 2 ℞ Ord 1 ℞ 65½ × ⅜ × 19'-0 For 2
1 Fill 25 × ⅜ × 1'-0½ (g21)
1 Splice ℞ 21UM × ⅜ × 7'-3½ (h) F2E Silicon Steel
1 Guss. ℞ 88⅞ MIW/FIW × ½ × 9'-10 (K) F2E Silicon Steel
1 Guss. ℞ 73⅞ MIW/FIW × ½ × 9'-10 (m) F2E Silicon Steel
1 Guss. ℞ 88⅞ MIW/FIW × ½ × 9'-10 (n) F2E Silicon Steel
1 Guss. ℞ 73⅞ MIW/FIW × ½ × 9'-10 (p) F2E Silicon Steel
4Lˢ 3½ × 3½ × ⅜ × 3'-5⅞ (sᴱ) Bolt
4 Fills 3½ × ½ × 1'-3¼ (t) Bolt
4 Fills 4 × ½ × 1'-8¼ (v) Bolt
2Lˢ 5 × 3½ × ⅜ × 1'-11¼ (wᴿ/ᴸ)
2Lˢ 3½ × 2½ × ⅜ × 1'-11¼ (yᴿ/ᴸ)
4Lˢ 7½ × 6 × ⅜ × 2'-10⅞ (aᴿ/ᴸ) MIE Cut 8 × 6L (Silicon Steel)
4Lˢ 8 × 6 × ⅜ × 2'-10⅞ (abᴿ/ᴸ) MIE Silicon Steel
2 ℞s 12¾UM × ⅜ × 2'-10⅞ (ac) MIE & FIE Silicon Steel
6 ℞ 8 × 6 × ⅜ × 0'-10⅞ (ad) Silicon Steel
1 Splice ℞ 21UM × ⅜ × 7'-3½ (aᶠ) F2E Silicon Steel
2Lˢ 8 × 6 × ⅜ × 6'-1⅞ (agᴿ/ᴸ) MIE Silicon Steel
1 ℞ 12¾UM × ⅜ × 6'-1⅞ (ah) F.I.E. MIE Silicon Steel
2 ℞s 15¾ × ¾ × 3'-0 11/16 (aK) Bolt
4Lˢ 3½ × 3½ × ⅜ × 2'-4⅛ (amᴿ/ᴸ) } Bolt
2 ℞s 12⅝ × ⅜ × 2'-4⅛ (an) }
1 Splice ℞ 25UM × ½ × 2'-5¼ (ap) F2E Silicon Steel
2Lˢ 8 × 6 × ⅜ × 6'-1⅞ (bdᴿ/ᴸ) MIE Silicon Steel

Bill Of Material For One Bottom Chord L14 - L12B

2Lˢ 4 × 4 × ½ × 68'-4 21/32 M2E Ord 68'-5½ It.# 64 Silicon Steel (Top Flg.)
2Lˢ 4 × 4 × ½ × 68'-4 11/32 M2E Ord 68'-5½ It.# 64 Silicon Steel (Bott. Flg.)
2 Web ℞s 22UM × ½ × 68'-4 21/32 M2E Ord 68'-6 It.# 37 Silicon Steel (Web ℞s)
2 ℞ 14UM × ½ × 68'-4 21/32 M2E Ord 68'-6 It.# 43 Silicon Steel (Side ℞s)
1 ℞ 25UM × ½ × 65'-4⅝ F2E Ord 65'-6 It.# 20 Silicon Steel (Top Flg. Cov. ℞)
1 ℞ 25UM × ½ × 27'-7 11/16 F2E Ord 27'-9 It.# 22 Silicon Steel (Bott. Flg. Cov. ℞)
1 ℞ 25UM × ½ × 26'-3 11/16 F2E Ord 26'-4½ It.# 23 Silicon Steel (Bott. Flg. Cov. ℞)
2Lˢ (aᴿ/ᴸ)
2Lˢ (bᴿ/ᴸ)
2 Guss. ℞s 83½ F2W × ½ × 5'-9 (bb) F2E (Silicon Steel) 10'-9½ Cuts 2 ℞s Ord 1 ℞ 84 × ½ × 21'-11 For 4
2 Fills 20 × 3/16 × 1'-9½ (ag25) Tack Weld
1 Splice ℞ 21UM × ⅜ × 3'-0¼ (n25) F2E Silicon Steel
1 Lat. ℞ 85 F2W × ½ × 4'-1 (bc) F2E (Silicon Steel) 1 ℞ 7'-11½ Cuts 2
1 BH 14 × 68 × 3'-10½ (bh21) It.# 183
2Lˢ 7 × 4 × ½ × 0'-11⅞ (h24) Grind
2 Splice ℞s (c)
1 Lat. ℞ (d)
2 Guss. ℞s (g25)
2 Bars (f)
2Lˢ (wᴿ/ᴸ)
2Lˢ (yᴿ/ᴸ)
1 Splice Fill (g21)
1 Splice ℞ 25UM × ½ × 2'-2⅛ (be) F2E Silicon Steel
2Lˢ 4 × 4 × ½ × 5'-2½ (asᴿ/ᴸ) Silicon Steel
1 Fill 8½ × ½ × 0'-5⅞ (bn21)
1 Splice ℞ 25UM × ½ × 2'-4¼ (at) F2E Silicon Steel
1 Splice ℞ 21UM × ⅜ × 3'-0¼ (s25) F2E Silicon Steel

Required List

No. Req'd	Description	Mark
One	Bottom Chord	L10-L12A
One	Do.	L10-L12B
One	Do.	L14-L12B
One	Do.	L14-L12A

Shop Notes:-
Work Sheets 26AC - BC & CC Together As One Sheet
Work Sheets 21AB & BB, 22AB & BB, 23AB & BB, 24AB & BB, 25AB & BB, & 26AC - BC & CC, Together
For General Notes See Sheet # 35

L-98

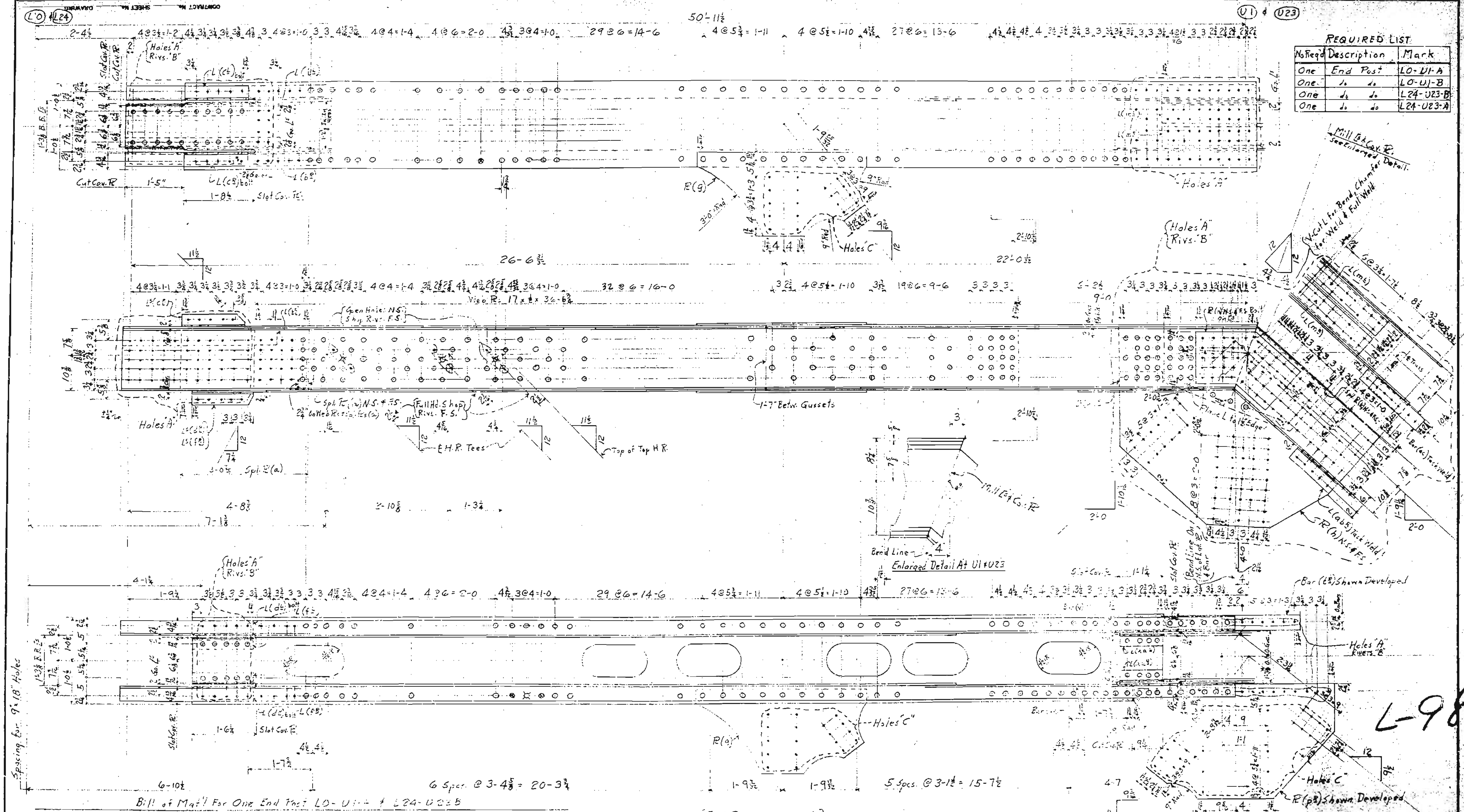
Rivets
Open Holes
Ream
Milling
Paint
} See General Notes

Bottom Chords - L10-L12 & L14-L12
Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM [illegible]

Temp.
Supt.
Layout
Fitter
Shop Insp.
Pc. Wk.
B. Smith
Mch.
Erect.
O. Insp.

Shop No.

292



REQUIRED LIST

No. Req'd	Description	Mark
One	End Post	L0-U1-A
One	do do	L0-U1-B
One	do do	L24-U23-B
One	do do	L24-U23-A

Bill of Mat'l For One End Post L0-U1-A & L24-U23-B

2-18 [51.9# x 48-11¾ M-1-E (Silicon) Ord 49-0¼ It. 4
1-Top Cov. R 25 UM x ⅝ x 49-0 F-1-E (Silicon) Ord 49-1½ It. 102
1-Bott Cov. R 25 UM x ⅜ x 45-0½ F-2-E (Silicon) Ord 45-2 It. 105
2-Web Rs 11 UM x ½ x 36-6¾ F-2-E (Silicon) Ord 36-8 It. 132
2-Spl. Rs 11 UM x ½ x 3-0⅜ F-2-E (a) (Silicon)
2-Ls 5 x 3½ x ⅜ x 3-8¾ (b8)
2-Ls 4 x 3½ x ⅜ x 1-6⅜ (c8) bolt
2-Ls 4 x 3½ x ⅜ x 1-5¾ (d8) bolt
2-Ls 3½ x 3½ x ⅜ x 1-5¾ (f8)
2-Rs 23¾ x ⅜ x 4-0½ (g) (1-R 26-6 Cuts 8)
2-Guss R 52¾ F-2-W x ½ x 6-4⅜ F-2-E (h) (Silicon
(1-R 25-1 Cuts 4) (Ord 2-Rs 52¾ x ½ x 25-3 for 8)

2-[illegible] Rs 24½ F-2-W x ⅝ x 4-1¾ F-2-E (k) (Silicon)
2-[illegible] 7⅛ x 6 x ½ x 4-5⅜ (m8 Cut from 8 x 6 L) (Silicon) Plane, Cut, Chamfer, Bend & Weld
2-[illegible] Rs 20 F-2-W x ⅝ x 2-7⅜ F-2-E (n) (Silicon) bolt (1-R 19-5 Cuts 8 Ord 1-R [illegible] x 19-11 for 8)
1-Lat. R 32½ x ⅜ x 4-9⅜ bent (p8) (1-R 17-10½ Cuts 4) (Ord 1-R 18-2 for 4)
1-Bar 4 UM x ⅜ x 3-2⅝ bent (t8) (Silicon)
1-Bar 4 UM x ½ x 2-8½ (v) (Silicon)
1-Bar 4 UM x ½ x 2-7¼ (w) (Silicon)
2-Ls 5 x 3½ x ⅜ x 1-0¾ (aa8)
1-L 4 x 3½ x ⅜ x 1-3½ (ab8) Tack Weld
1-Bar 4 UM x ⅜ x 1-10 (ac) Tack Weld

Alike { End Post L0-U1-A
End Post L24-U23-B } As Shown

Alike { End Post L0-U1-B
End Post L24-U23-A } Opp Hand

For Gen. Notes See Sheet 35

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See Gen. Notes

End Posts L0-U1 & L24-U23

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

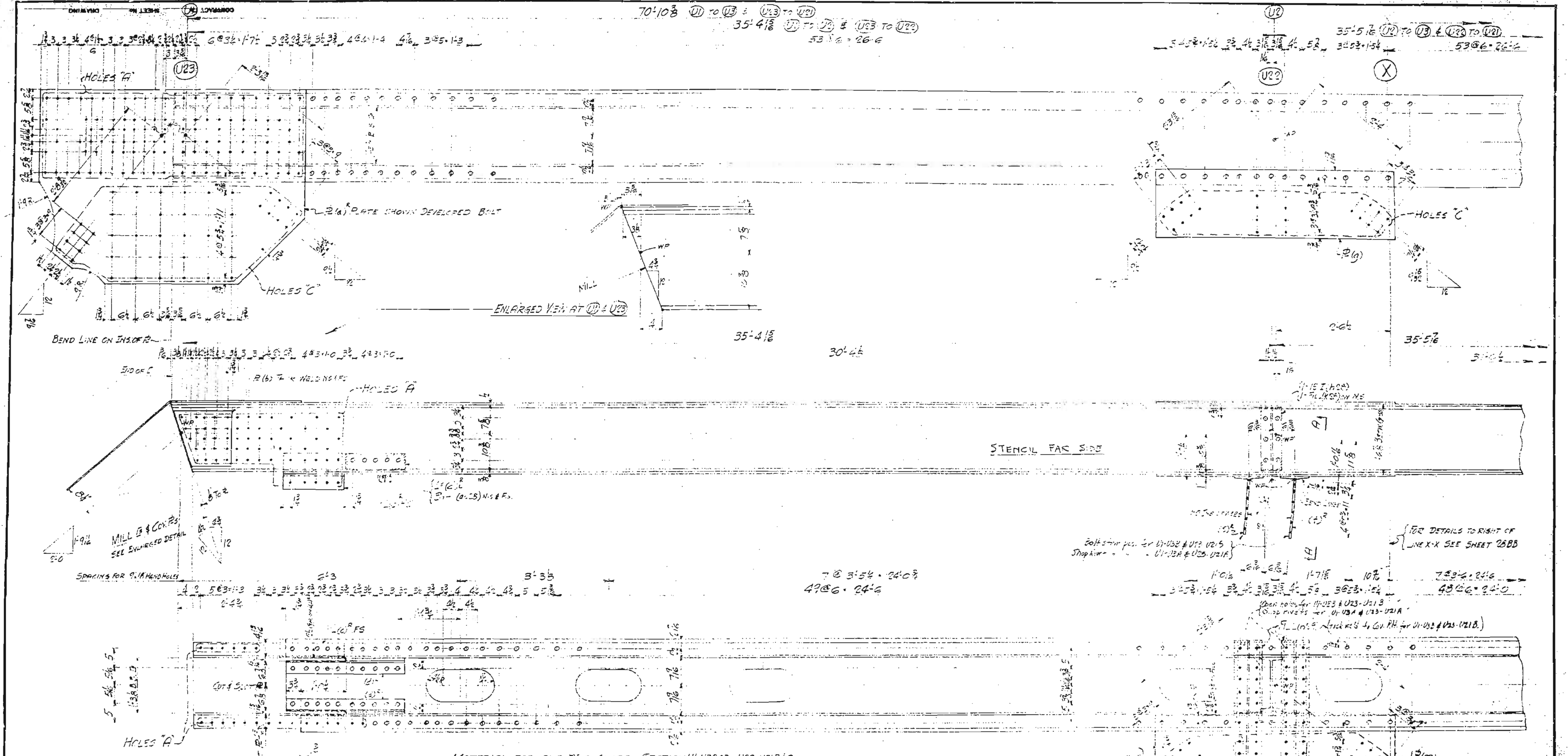
Bridge Over Missouri River
At Brownville Nebr.
For Atchison County, Missouri

SHOP NO.

CONTRACT [illegible]

83

294

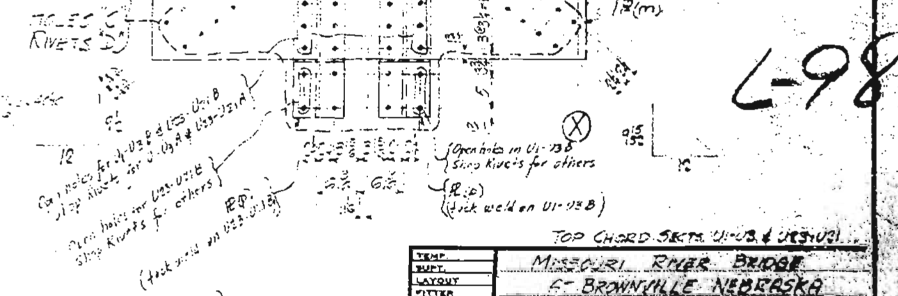

70'-10⅜ U1 to U3 & U23 to U21
35'-4 1/16 U1 to U2 & U23 to U22
53 @ 6 = 26'-6
U23
HOLES "A"
℞(a) PLATE SHOWN DEVELOPED BELT
HOLES "C"
ENLARGED VIEW AT U1 & U23
MILL
BEND LINE ON INS. OF ℞
35'-4 1/16
30'-4½
U2
U22
35'-5 1/16 U2 to U3 & U22 to U21
53 @ 6 = 26'-6
X
HOLES "C"
℞(g)
35'-5 7/16
MILL ℞ & COV. ℞S SEE ENLARGED DETAIL
SPACING FOR 9.14 HAND HOLES
STENCIL FAR SIDE
HOLES "A"
FOR DETAILS TO RIGHT OF LINE X-X SEE SHEET 28BB
Bolt shop pcs. for U1-U3B & U23-U21B
Shop rivets for U1-U3A & U23-U21A
7 @ 3'-5¾ = 24'-0⅜
49 @ 6 = 24'-6
48 @ 6 = 24'-0
Open holes for U1-U3B & U23-U21B
Shop rivets for U1-U3A & U23-U21A
Tack weld & Cov. Pl. for U1-U3B & U23-U21B
HOLES "A"

MATERIAL FOR ONE TOP CHORD SECTION U1-U3A&B OR U23-U21B&A

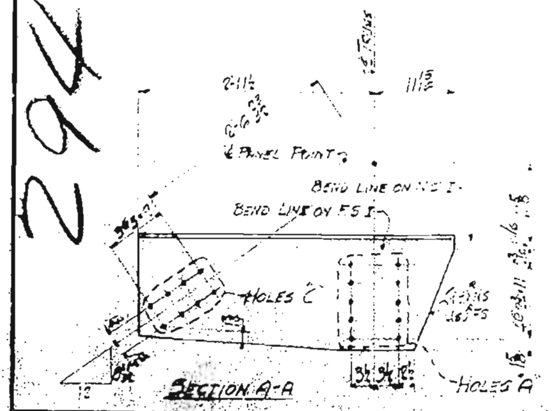
SILICON
- 2-Ɪ 18 @ 42#, 71'-0 9/16 MEE — ORD 71'-3½ — It 5
- 1 Cov. ℞ 22 × ½ × 71'-0⅜ MEE — 71'-3¾ — 16
- 1 Bot ℞ 22 × ½ × 65'-9⅜ FEE — 66'-10½ — 25
- 1-℞ 5[illegible] × [illegible] × 5'-11 15/16 (a) Bent
- 2-℞ [illegible] × ⅜ × 1'-2⅛ (b) Tack weld (1 ℞ 0'-3⅛ cuts 2)
- [illegible] (c)
- [illegible] (d)

- 1-℞ 18½ UM × ⅜ × 5'-4½ (g)
- 1-15 Ɪ 50# × [illegible] (h2B) Ord 28'-6 It 247
- 1-Fill [illegible] (k)
- 1-℞ 16½ UM × ⅜ × 5'-5½ (m)
- 2-℞s 7½ UM × ⅜ × 1'-7 3/16 (n) (Tack weld for U1-U3B & U23-U21B)
- 2-℞s 7½ UM × ⅜ × 8½ (o) (Tack weld 1 ℞ for U1-U3B & U23-U21B)

- 1-18 B 47# × 3'-11 5/16 (s) Bent } One Pc 18 B 47 × 20'-2¼ cuts 8) It 165
- 1-18 B 47# × 3'-11 5/16 (t) } Bolt for U1-U3B & U23-U21B
- 1-℞ 39½ UM × ⅜ × 5'-5½ (v2B) FCE - Bent - Bolt - Silicon For U23-U21B & A
- 2-℞s 46½ Flw × ½ × 5'-11 (w2B) FCE - Silicon - For U1-U3A&B [illegible]
- 2-℞s 15 [illegible] (y2B) FCE - Silicon - Bolt For U1-U3A&B
- [illegible] (z) Tack weld
- [illegible] (ac)
- 4-Fills [illegible] 1'-3½ (ae2B)
- 1-℞ [illegible] (ad2B) Bent For U1-U3A&B
- 1-Bar [illegible] (af2B) Bent For U1-U3A&B Silicon
- 2-[illegible] (ag) (Bolt one Pc for U23-U21B [illegible])
- 1-Fill 4[illegible] × ⅜ × 1'-1 (Smile)



L-98



SECTION A-A

FOR GEN. NOTES SEE SHT 55
WORK SHTS 28AB & 5B TOGETHER AS ONE SHT
WORK SHTS 1A TO 33 INCLUSIVE TOGETHER

RIVETS
OPEN HOLES
REAM — SEE GEN. NOTES
MILLING
PAINT

SHOP/CONTACT SURFACES

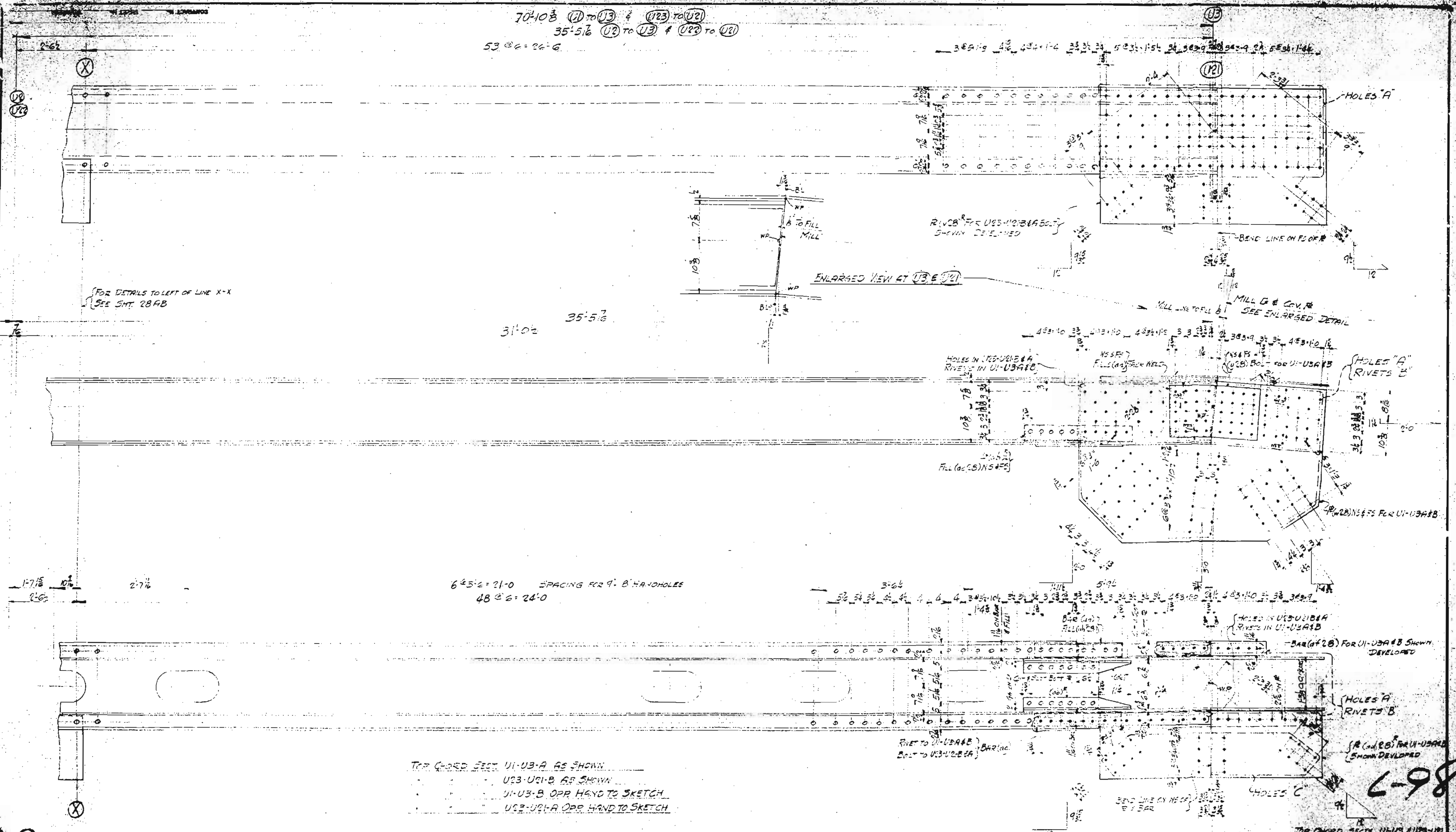
TOP CHORD SECTS U1-U3 & U23-U21

TEMP.	MISSOURI RIVER BRIDGE
SUPT.	AT BROWNVILLE NEBRASKA
LAYOUT	FOR ATCHISON COUNTY MISSOURI
FITTER	**BETHLEHEM STEEL COMPANY**
SHOP INSP.	FABRICATED STEEL CONSTRUCTION
PC. WK.	Drawings at Chicago - Fabrication at CHICAGO
B. SMITH	IN CHARGE JENKS MADE BY RJL
MCH.	CHECKED BY JVK TRACED BY
ERECT.	REVISED LAST ASSEM. MK.
O. INSP.	

SHOP NO.

CONTRACT CG 8409

SHEET 28


70'-10⅜ U1 to U3 & U23 to U21
35'-5 7/16 U2 to U3 & U22 to U21
53 @ 6 = 26'-6
2'-6½
X
U3
U21
Holes "A"
Riv U3B & F's U23-U21B & A Bolt Shown Developed
Bend line on F's of ℞
Enlarged View at U3 & U21
To Fill
Mill
WP
For details to left of line X-X See Sht. 28AB
35'-5 7/16
31'-0½
Mill ℄ & Cov. ℞ See Enlarged Detail
Holes in U23-U21 B & A Rivets in U1-U3 A & B
Fill (ac)
Holes "A" Rivets "B"
Fill (ac) (S) NS & FS
℞ (ac 2B) NS & FS For U1-U3 A & B
6 @ 3'-6 = 21-0 Spacing for 9" - 8" Handholes
48 @ 6 = 24'-0
1'-7 7/16
2'-6½
2'-7½
3'-6½
5'-9½
Bar (ac)
Holes in U23-U21 B & A Rivets in U1-U3 A & B
Bar (ac 2B) For U1-U3 A & B Shown Developed
Holes "A" Rivets "B"
Rivet to U1-U3 A & B Bolt to U23-U21 B & A
Bar (ac)
℞ (ac 2B) For U1-U3 A & B Shown Developed
Holes "C"
Bend line on NS of Bar
X
C-98
295

Top Chord Sect. U1-U3-A As Shown
" " " U23-U21-B As Shown
" " " U1-U3-B Opp. Hand to Sketch
" " " U23-U21-A Opp. Hand to Sketch

Required List

No. Reqd.	Description	Mark
1	Top Chord Sect.	U1-U3-A
1	Do	U23-U21-B
1	Do	U1-U3-B
1	Do	U23-U21-A

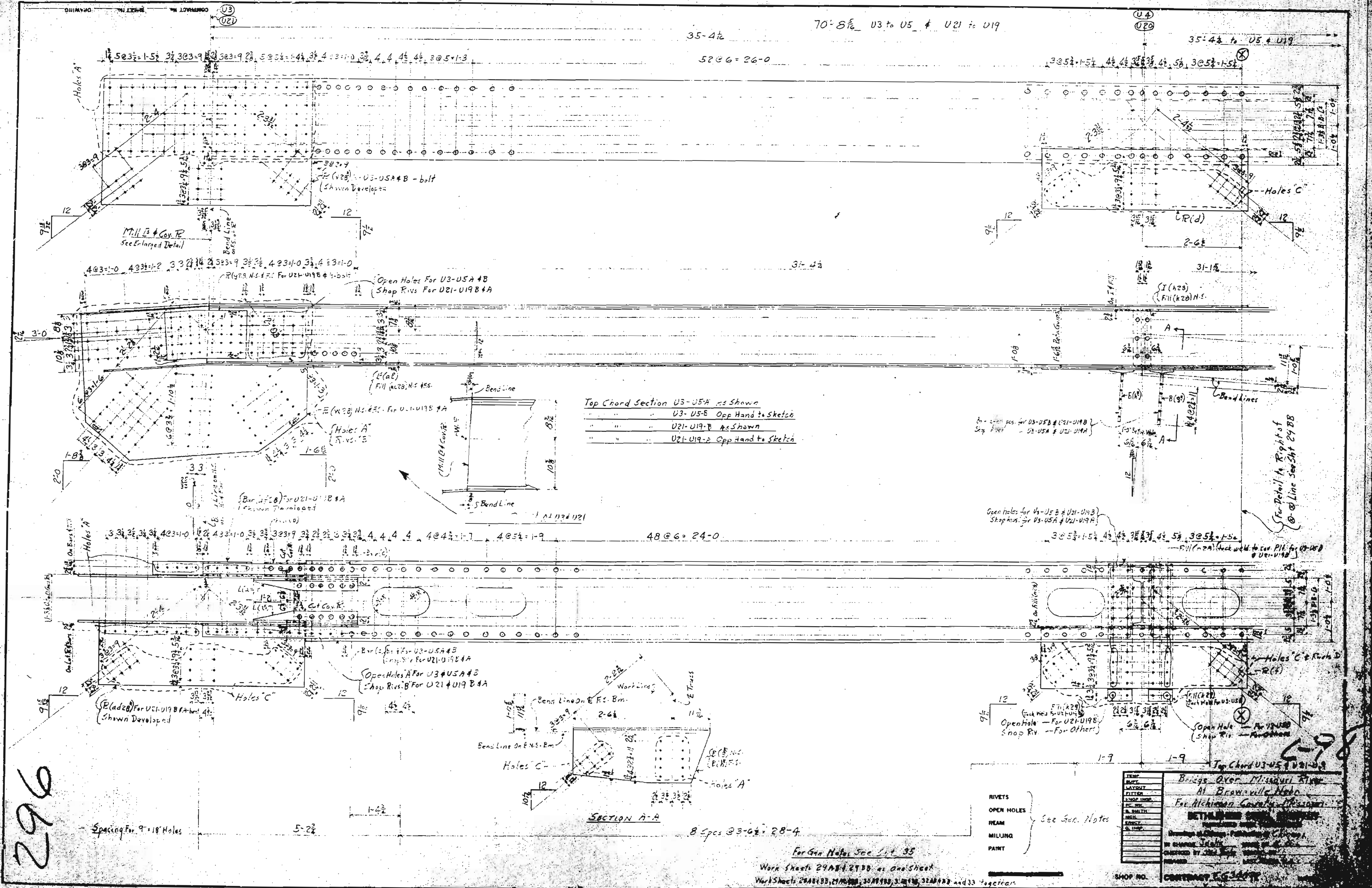
For Gen. Notes See Sheet 35
Work Shts. 28AB & 88 Together as one Sht.
Work Shts. 28 to 33 Inclusive Together

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See Gen. Notes

Top Chord Sects U1-U3 & U23-U21

TEMP.	Missouri River Bridge
SUPT.	At Brownville Nebraska
LAYOUT	For Atchison County, Missouri
FITTER	BETHLEHEM STEEL COMPANY
SHOP INSP.	[illegible]
PC. WK.	[illegible] Chicago
B. SMITH	[illegible]
MCH.	[illegible]
ERECT.	[illegible]
O. INSP.	

SHOP NO. ___ CONTRACT [illegible]



RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See Gen. Notes

For Gen Notes See Sht 35

Work Sheets 29AB ¢ 29BB as One Sheet

Work Sheets 28AB ¢ BB, 29AB ¢ BB, 30AB ¢ BB, 31AB ¢ BB, 32AB ¢ BB and 33 together

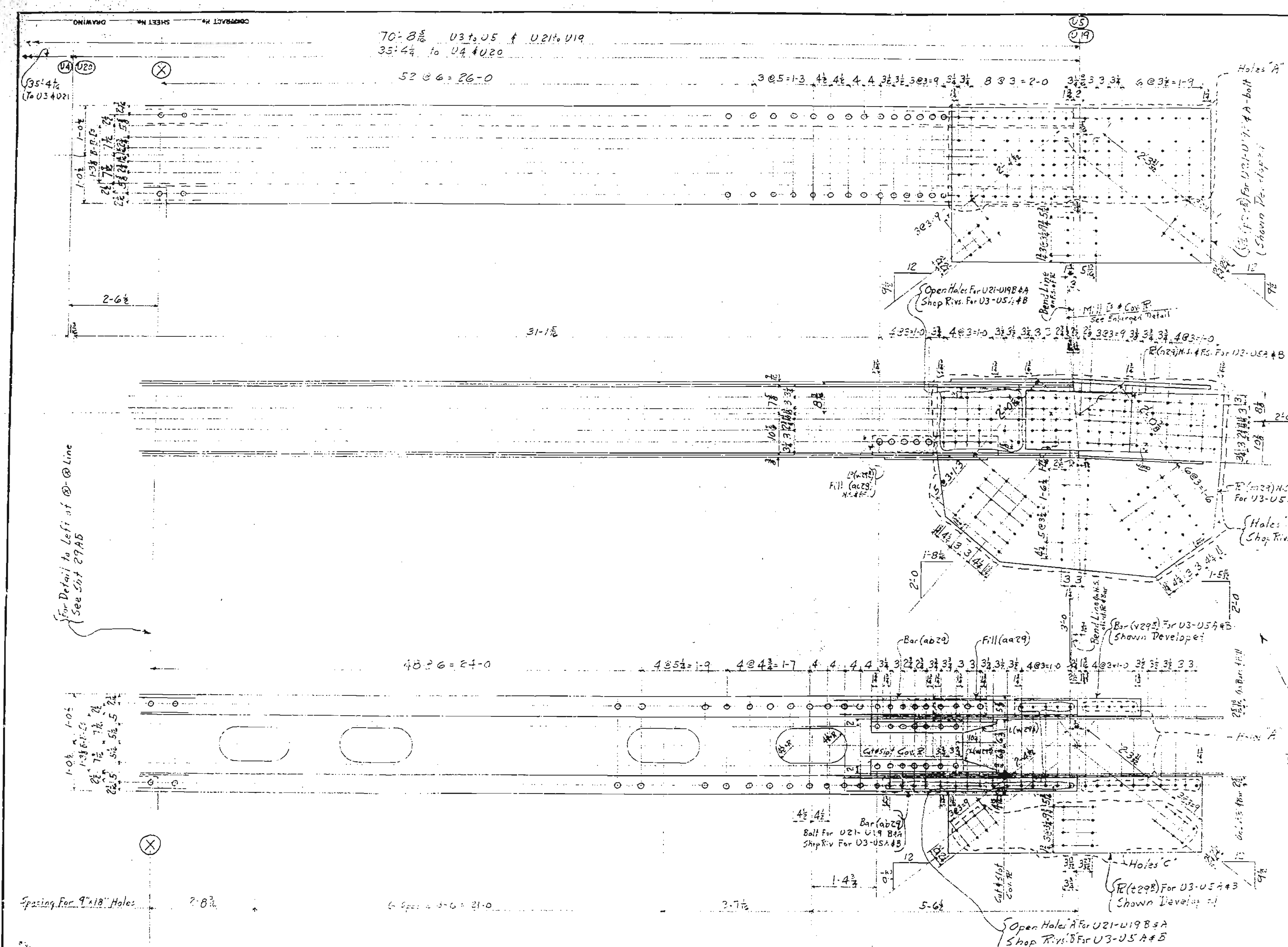
Top Chord U3-U5 ¢ U21-U19

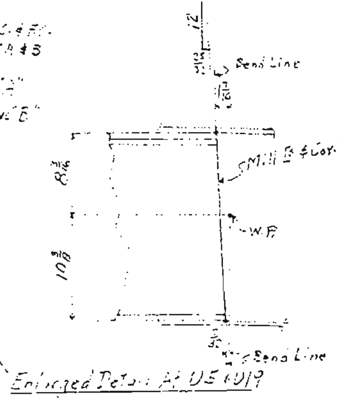
Bridge Over Missouri River
At Brownville Nebr.
For Atchison County Missouri

BETHLEHEM STEEL COMPANY

IN CHARGE [illegible]
CHECKED BY [illegible]

SHOP NO.
CONTRACT [illegible]





Open Holes "A" For U21-U19 B & A
Shop Rivs. "B" For U3-U5 A & B

Bill of Mat'l for One Top Chord Section U3-U5 A & B – U21-U19 B & A

2-13 [58 × 70-7 13/16 M-Z-E (Silicon) Ord 70-9 1/2 Jr. 1
1-Top Cov P 25 UM × 7/16 × 70-6 1/4 M-Z-E (Silicon) Ord 70-7 Jr. 17
1-Bott. Cov. P 25 UM × 3/8 × 65-10 5/8 F-Z-E (Silicon) Ord 66-0 Jr. 28
2-Guss P 46 1/2 F-Z-W × 1/2 × 5-11 F-Z-E (w28) (Silicon) (1-P 11-7 Cuts 2)
(Ord 1-P 47 × 1/2 × 46-10 for 8) For U21-U19 B & A
2-Spl. P 15 1/2 F-Z-W × 1/2 × 2-1 1/8 F-Z-E (y28) (Silicon) For U21-U19 B & A bolt
1-Lat. P 39 1/4 UM × 5/8 × 5-5 5/8 F-Z-E (v28) (Silicon) bent for U3-U5 A & B – bolt
1-Lat. P 19 UM × 3/8 × 5-3 3/4 (ad28) bent For U21-U19 B & A
1-Bar 4 UM × 3/8 × 2-7 1/4 (af28) (Silicon) bent For U21-U19 B & A
2-L 5 × 3 1/2 × 3/8 × 2-7 1/4 (a8)
4-Fills 4 1/2 × 1/2 × 1-3 1/2 (ac29)
1-Fill 4 UM × 3/8 × 1-0 1/2 (b)
2-Bars 4 UM × 3/8 × 2-0 3/4 (c) bolt one & Riv. one for U3-U5 A & B, Shop Riv. 2 for U21-U19 B & A
1-Lat. P 18 1/2 UM × 3/8 × 5-4 1/2 (d)
1-Diaph. 15 I 42.9 × 1-5 (h28) Ord 28-8 IT 247
1-Fill 5 1/2 × 3/8 × 1-5 (k29)
1-Lat. P 18 1/2 UM × 3/8 × 5-4 1/2 (f)
1-P 18 B 47 × 3-6 5/16 (g8) bent & Cut } Ord 26-10 1/4 Cuts 8 IT 166
1-P 13 B 47 × 3-6 5/16 (h8) bent & Cut } Bolt for U3-U5 B & U21-U19 B
2-Fills 7 1/2 × 3/8 × 1-7 13/16 (n28) Tack weld for U3-U5 B & U21-U19 B
2-Fills 7 1/2 × 3/8 × 0-3 1/2 (k29) {Shop Riv. 2 For U3-U5 A – U21-U19 A
{Shop Riv. One & Tack weld One For U3-U5 B – U21-U19 B
2-Guss P 71 3/4 F-Z-W × 1/2 × 4-0 1/2 F-Z-E (m29) (Silicon) (1-P 7-7 1/2 Cuts 2)
(Ord 1-P 72 1/4 × 1/2 × 31-3 for 8) For U3-U5 A & B
2-Spl. P 15 UM × 1/2 × 2-2 1/2 F-Z-E (n29) (Silicon) For U3-U5 A & B – bolt
1-Lat. P 39 1/4 UM × 5/8 × 5-4 13/16 F-Z-E (p29) (Silicon) bent For U21-U19 A & B – bolt
1-Lat. P 19 UM × 3/8 × 5-4 5/16 (t29) For U3-U5 A bent
1-Bar 4 UM × 3/8 × 2-7 5/16 (v29) (Silicon) bent For U3-U5 A & B
2-L 5 × 3 1/2 × 3/8 × 2-7 1/4 (w29)
1-Fill 4 UM × 3/8 × 1-1 1/4 (aa29)
2-Bars 4 UM × 3/8 × 2-1 1/2 (ab29) bolt one & Riv. one for U21-U19 A & B, Riv. 2 for U3-U5 A & B

REQUIRED LIST

No. Reqd	Description	Mark
One	Top Chord	U3-U5 A
One	Top Chord	U3-U5 B
One	Top Chord	U21-U19 A
One	Top Chord	U21-U19 B

L-98

For Gen. Notes See Sheet 35

Work Sheets 29AB & 29BB as One Sheet.
Work Sheets 28AB & BB, 29AB & BB, 30AB & BB, 31AB & BS, 32AB & BS and 33 together

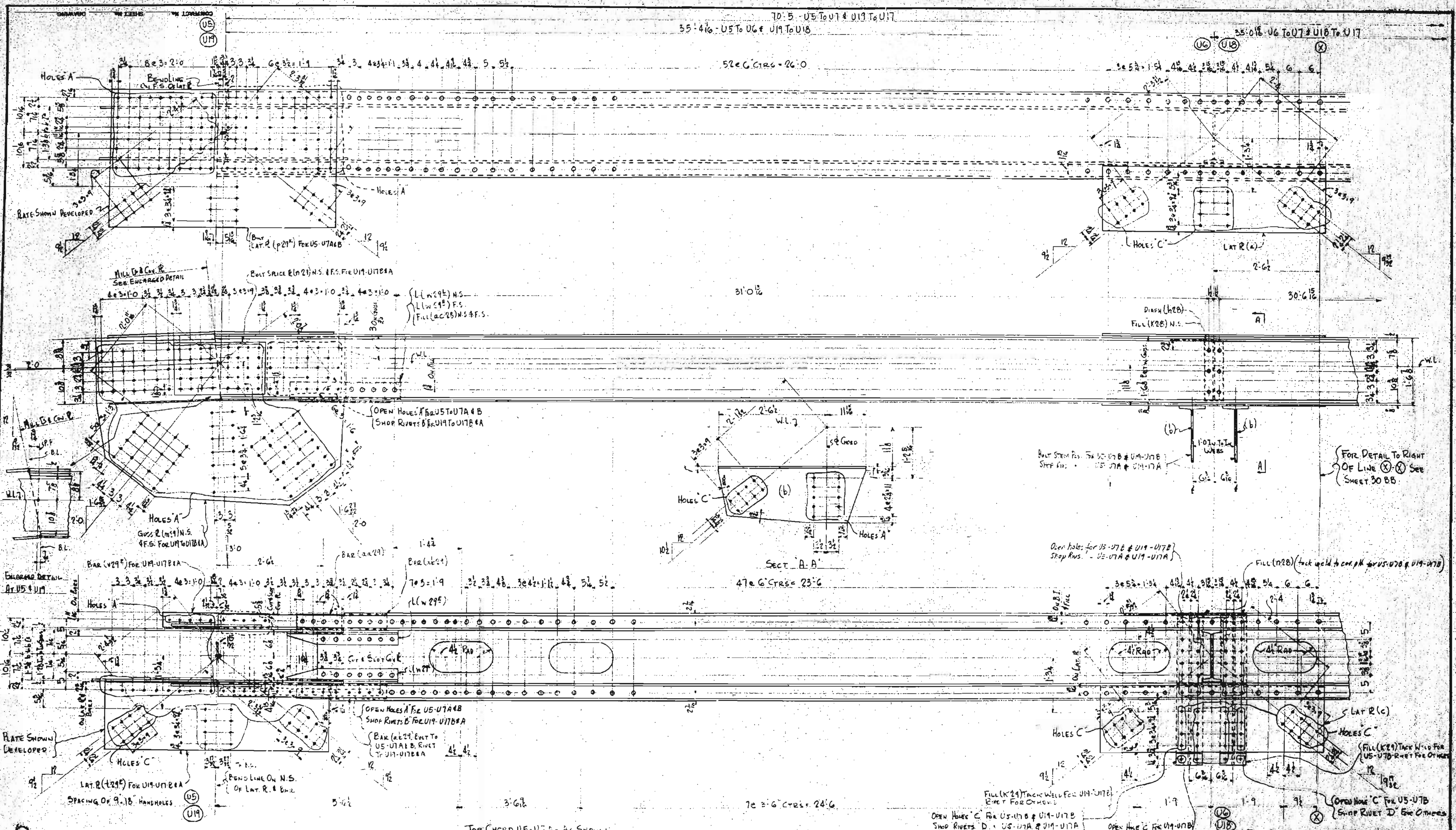
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See Gen. Notes.

Top Chord U3-U5 & U21-U19

TEMP.	Bridge Over Missouri River
SUPT.	At Brownville Nebr
LAYOUT	For Atchinson County Missouri
FITTER	
SHOP INSP.	
PC. WK.	
B. SMITH	
MCH.	
ERECT.	
O. INSP.	

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawn at Chicago – Fabricated at Chicago
IN CHARGE Jenks DRAWN BY H.G.
CHECKED BY J.K.V. [illegible]
SHOP NO.
CONTRACT C634892
SHEET 29

297


70'-5 - U5 To U7 & U19 To U17
35'-4 1/16 - U5 To U6 & U19 To U18
35'-0 15/16 - U6 To U7 & U18 To U17
U5
U19
U6
U18
Holes A
Bend Line On F.S. Of Lat R
52 e 6" Ctrs = 26'-0
Plate Shown Developed
Holes A
Lat. R (p29") For U5-U7A & B
Holes C
Lat R (a)
Mill Cb & Cov R
See Enlarged Detail
Bolt Splice R (n29) N.S. & F.S. For U19-U17B & A
L (w29") N.S.
L (w29") F.S.
Fill (ac28) N.S. & F.S.
31'-0 1/16
30'-6 15/16
Diaph (h28)
Fill (k28) N.S.
A
W.L.
Open Holes A For U5-U7A & B
Shop Rivets B For U19 To U17B & A
Mill Cb & Cov R
Holes A
Guss R (m29) N.S. & F.S. For U19 To U17B & A
Bolt Stem Plt. For U5-U7B & U19-U17B
Shop Riv. U5-U7A & U19-U17A
1'-0 3/4 To Tr. Webs
For Detail To Right Of Line X-X See Sheet 30 BB.
Sect A-A
Holes C
Holes A
Enlarged Detail At U5 & U19
Bar (v29") For U19-U17B & A
Bar (aa29)
Bar (ab29)
47 e 6" Ctrs = 23'-6
Open holes for U5-U7B & U19-U17B
Shop Rivs. U5-U7A & U19-U17A
Fill (n28) (tack weld to cont plt for U5-U7B & U19-U17B)
4 1/2 Rad
Lat R (c)
Holes C
Plate Shown Developed
Holes C
Open Holes A For U5-U7A & B
Shop Rivets B For U19-U17B & A
Bar (ab29) Bolt To U5-U7A & B, Rivet To U19-U17B & A
Lat. R (t29") For U19-U17B & A
Bend Line On N.S. Of Lat. R & Bar
Spacing Of 9-18 Handholes
Fill (k29) Tack Weld For U5-U7B, Rivet For Others
Open Hole C For U5-U7B
Shop Rivet D For Others
3'-6 9/16
7 e 3'-6" Ctrs = 24'-6
Fill (k29) Tack Weld For U19-U17B
Rivet For Others
Open Holes C For U5-U7B & U19-U17B
Shop Rivets D " U5-U7A & U19-U17A
Open Hole C For U19-U17B
Shop Rivet D For Others
X

Top Chord U5-U7A - As Shown
Top Chord U5-U7B - Opp. Hand To Sketch
Top Chord U19-U17B - As Shown
Top Chord U19-U17A - Opp. Hand To Sketch

Shop Notes:-

Work Sheets 30AB & BB Together As One Sheet.

Work Sheets 28AB & BB, 29AB & BB, 30AB & BB, 31AB & BB, 32AB & BB, And 33 Together

For General Notes See Sheet #35

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See General Notes

L-98

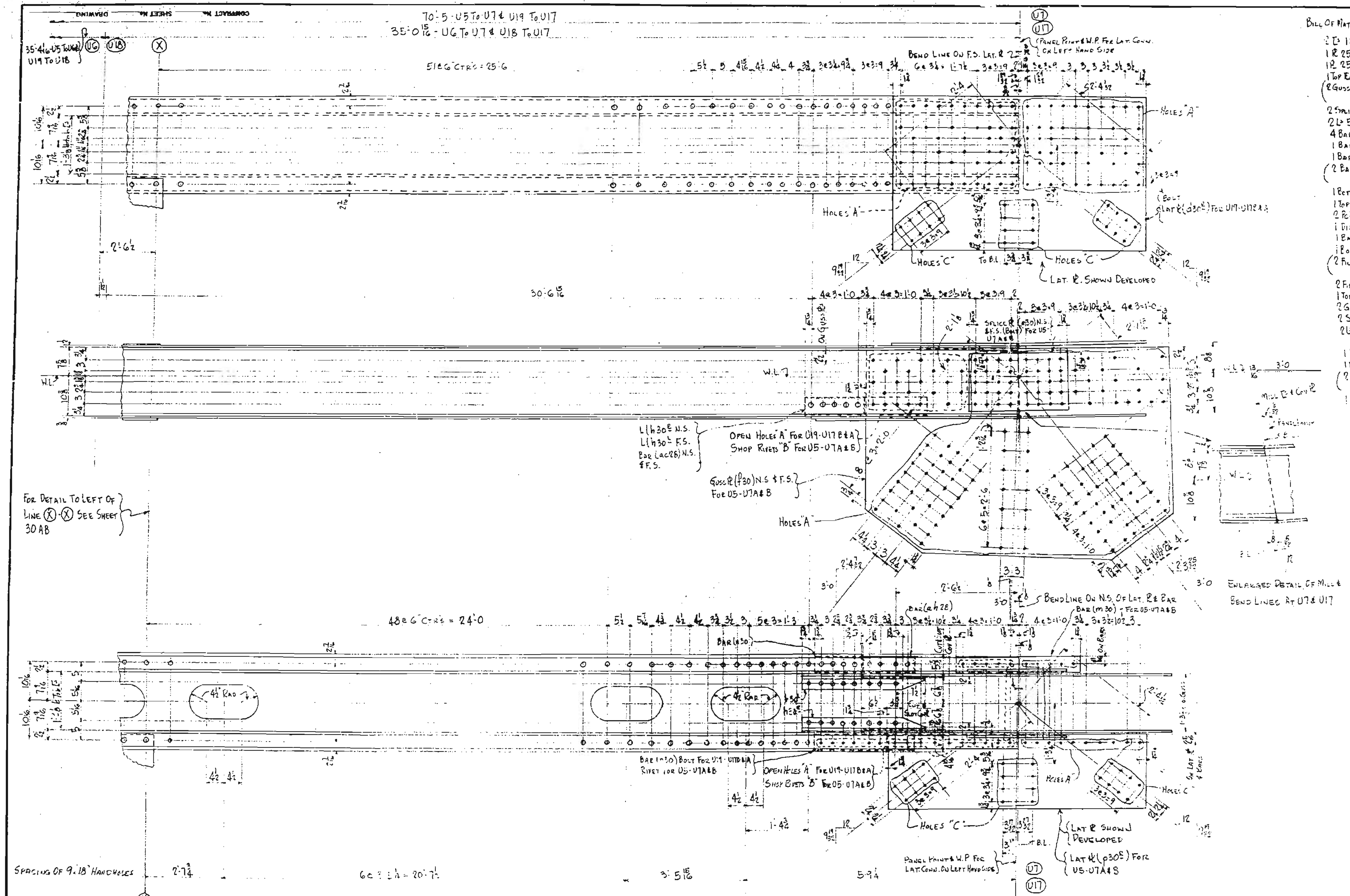
298

Top Chord U5-U7 & U19-U17

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
FC. WK.
B/SMITH
MCH.
ERECT.
O. INSP.

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago—Fabrication at CHICAGO
IN CHARGE Jenks MADE BY C.A.D.
CHECKED BY JKV TRACED BY
REVISED LAST ADDED, ETC.
SHOP NO.
CONTRACT CG34098


70'-5 - U5 To U7 & U19 To U17
35'-0 15/16 - U6 To U7 & U18 To U17
35'-4 1/16 - U5 To U6 & U19 To U18
U6
U18
X
51 @ 6" Ctrs = 25'-6
U7
U17
Panel Point & W.P. For Lat. Conn. On Left Hand Side
Bend Line On F.S. Lat. ℞
Holes "A"
Holes "C"
To B.L.
Lat. ℞. Shown Developed
Bolt Lat ℞ (d30E) For U19-U17B & A
2'-6½
30'-6 5/8
W.L.
Splice ℞ (e30) N.S. & F.S. (Bolt) For U5-U7A & B
L (h30E) N.S.
L (h30L) F.S.
Bar (ac28) N.S. & F.S.
Open Holes "A" For U19-U17B & A
Shop Rivets "B" For U5-U7A & B
Guss ℞ (f30) N.S. & F.S. For U5-U7A & B
For Detail To Left Of Line X-X See Sheet 30AB
Enlarged Detail Of Mill & Bend Lines At U7 & U17
Mill E & Cov ℞
Bend Line On N.S. Of Lat. ℞ & Bar
Bar (m30) - For U5-U7A & B
Bar (ah28)
48 @ 6" Ctrs = 24'-0
Bar (n30)
4½ Rad
Bar (n30) Bolt For U19-U17B & A
Rivet For U5-U7A & B
Lat ℞ Shown Developed
Lat ℞ (p30E) For U5-U7A & B
Panel Point & W.P. For Lat. Conn. On Left Hand Side
Spacing Of 9-18 Handholes
6 @ 3'-4½ = 20'-7½
3'-5 15/16
5'-9¼

Bill Of Material For One Top Chord U5-U7A & B & U19 To U17B & A

2 [s 18 - 51.9 - 70'-6 13/16 M2E Ord 70'-7½ It #3 Silicon Steel
1 ℞ 25UM - ½ - 70'-6 21/32 M2E Ord 70'-7½ It #19 Silicon Steel (Top Eg. G. ℞)
1 ℞ 25UM - ⅜ - 65'-7½ F2E Ord 65'-9 It #29 Silicon Steel (Bott. Eg. G. ℞)
1 Top Eg. Lat. ℞ 39¼UM - ⅜ - 5'-4½ (p29E) F2E (Bent) (Bolt) Silicon Steel - For U5-U7A & B
(2 Guss ℞ 71⅞ F.W. - ⅜ - 4'-0½ (m29) F2E (Silicon Steel) 1 ℞ 7'-4½ Cuts 2 - Ord 1 ℞ 72½ - ⅜ - 31'-8 For 8 ℞s. For U19-U17B & A)
2 Splice ℞ 15UM - ½ - 2'-2½ (n29) F2E - Bolt (Silicon Steel) For U19-U17B & A
2 Ls 5 × 3½ - ⅜ - 2'-7¼ (w29E)
4 Bars 4½ × ½ - 1'-3½ (ac28)
1 Bar 4UM × ⅜ - 2'-7 5/16 (v29E) Bent (Silicon Steel) For U19-U17B & A
1 Bar 4UM × ⅜ - 1'-1¼ (aa29)
(2 Bars 4UM × ⅜ - 2'-1½ (ab29) Bolt One & Rivet One To U5-U7A & B - Rivet Two To U19-U17B & A)
1 Bott Lat. ℞ 19UM - ⅜ - 5'-4 1/16 (t29E) Bent. For U19-U17B & A
1 Top Lat. ℞ 18½UM - ⅜ - 5'-4½ (a)
2 Pcs. BT 18 - 47 - 3'-6 5/16 (b) (1 Pc 25'-9¼ Cuts 8 It #167) Bent For U5-U7B & U19-U17B
1 Diaph. 15I - 42.9 - 1'-5 (h28) Ord 28'-8 It #247
1 Bar 5½ - ⅜ - 1'-5 (K28)
1 Bott Lat ℞ 15½UM - ⅜ - 5'-4½ (c)
(2 Fill ℞ 7½UM - ⅜ - 0'-3½ (K29) Tack Weld One & Rivet One To U5-U7B & U19-U17B - Rivet Two To U5-U7A & U19-U17A)
2 Fill ℞ 7½UM - ⅜ - 1'-7 13/16 (n28) Tack Weld For U5-U7B & U19-U17B.
1 Top Eg Lat. ℞ 39 5/16 UM - 7/16 - 5'-4 5/16 (d30E) Bolt Bent For U19-U17B & A
2 Guss. ℞ 78 - ½ - 4'-6¾ (f30) 1 ℞ 9'-0 Cuts 2. For U5-U7A & B
2 Splice ℞ 15UM - ½ - 2'-1⅜ (g30) F2E (Silicon Steel) Bolt. For U5-U7A & B
2 Ls 5 × 3½ - ⅜ - 2'-7¼ (h30E)

1 Bar 4UM - ⅜ - 1'-1 (ah28)
1 Bar 4UM - ⅜ - 2'-7¼ (m30) Bent. For U5-U7A & B
(2 Bars 4UM - ⅜ - 2'-1¼ (n30) Bolt One & Rivet One To U19-U17B & A - Rivet Two To U5-U7A & B)
1 Bott Lat. ℞ 19UM - ⅜ - 5'-4¾ (p30E) Bent. For U5-U7A & B

Required List

No. Req'd	Description	Mark
One	Top Chord	U5-U7A
One	Do	U5-U7B
One	Do	U19-U17B
One	Do	U19-U17A

Shop Notes:-

Work Sheets 30AB & BB - Together As One Sheet.
Work Sheets 28AB & BB, 29AB & BB, 30AB & BB, 31AB & BB, 32AB & BB, And 33 Together
For General Notes See Sheet # 35

C-98

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See General Notes

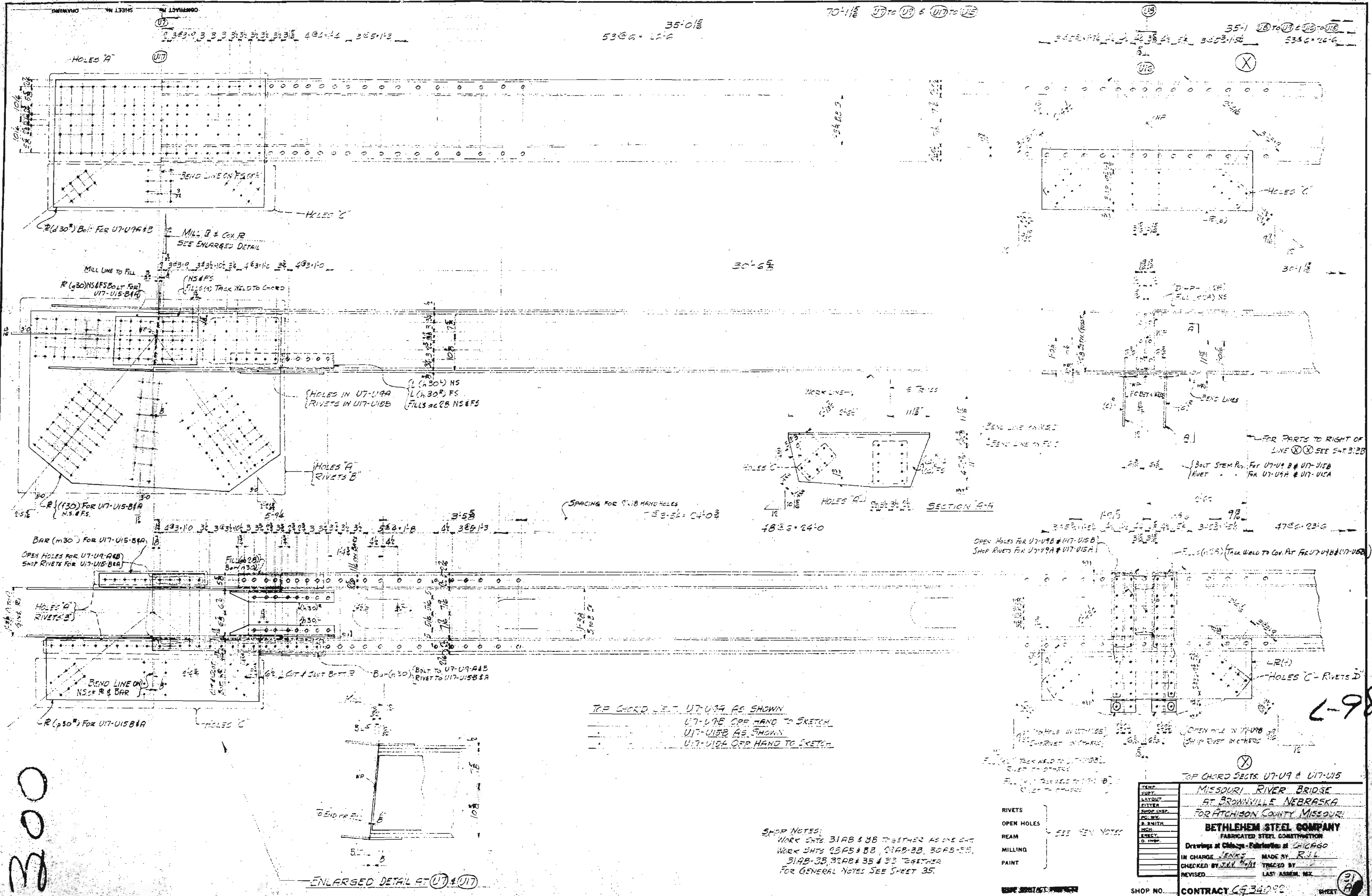
Top Chords U5-U7 & U19-U17

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago · Chicago
IN CHARGE Jenks MADE BY C.A.D.
CHECKED BY [illegible] TRACED BY
REVISED LAST [illegible]

SHOP NO.
CONTRACT CG 34092

299



300

C-98

TOP CHORD SECT. U7-U9A AS SHOWN
U7-U9B OPP HAND TO SKETCH
U17-U15B AS SHOWN
U17-U15A OPP HAND TO SKETCH

SHOP NOTES:
WORK SHTS. 31AB & 8B TOGETHER AS ONE SHT.
WORK SHTS 29AB & 8B, 29AB-3B, 30AB-3B,
31AB-3B, 32AB & 35 & 33 TOGETHER
FOR GENERAL NOTES SEE SHEET 35.

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
SEE GEN. NOTES

TOP CHORD SECTS. U7-U9 & U17-U15

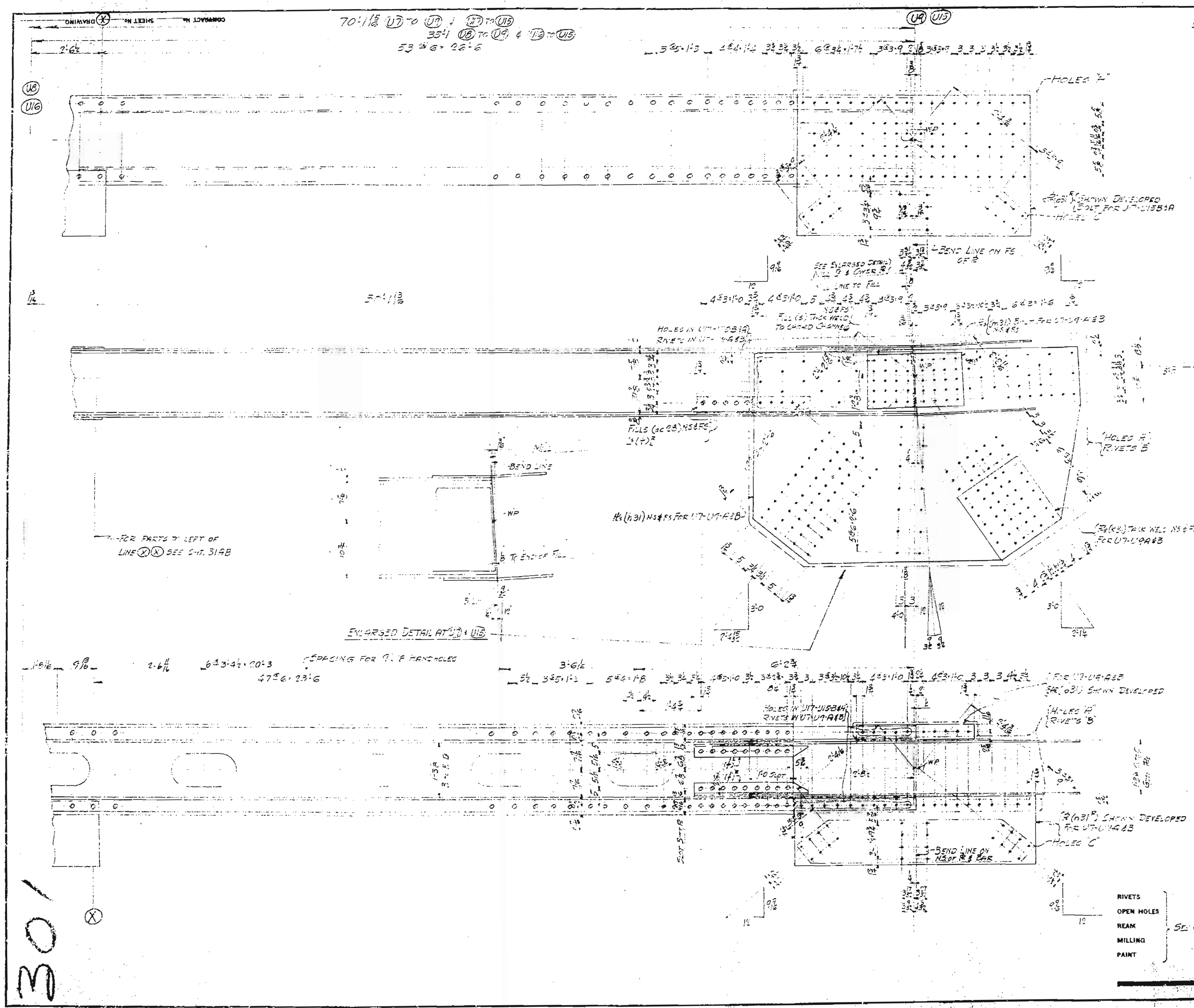
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at CHICAGO

IN CHARGE JENKS
MADE BY R.J.L.
CHECKED BY J.L.V. 4/9/38
TRACED BY
REVISED
LAST ASSEM. MK.

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

SHOP NO.
CONTRACT CG34098
SHEET 31A


DRAWING (X) SHEET No. CONTRACT No.
70'-1 1/16 U7 to U9 & U17 to U15
35'-1 U8 to U9 & U16 to U15
53 @ 6 = 26'-6
U8
U16
U9 U15
HOLES "A"
HOLES "C"
BEND LINE ON FS
SEE ENLARGED DETAIL
FILLS (ac28) NS & FS
FOR PARTS TO LEFT OF LINE (X)(X) SEE SHT. 31AB
ENLARGED DETAIL AT U9 & U15
BEND LINE
WP
SPACING FOR 7 1/2 HANDHOLES
HOLES IN U17-U15B & A
RIVETS IN U7-U9A & B
HOLES "A"
RIVETS "B"
BEND LINE ON NS OF PL & BAR
(X)
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
SEE GENERAL NOTES

301

MATERIAL FOR ONE TOP CHORD SECTION U7-U9 A & B or U17-U15 A & B

2-B 18 @ 42.7 # . 70'-2 1/16 M2E ORD. 70'-3 It. 210.
1-Cov. PL 25 . 1/2 . 70'-1 21/32 M2E . 70'-2 1/2 . 245.
1-Bott. PL 25 . 3/8 . 65'-7 1/16 . 65'-8 . 297.
1-PL 39 1/4 UM . 1 1/16 . 5'-4 5/16 (d30 R) Bolt-Bent For U7-U9-A & B
2-PLs 7 5/8 . 1/2 . 4'-6 3/4 (f30) 1 PL 9'-0 Cuts 2 For U17-U15-B & A
2-PL 15 UM . 1/2 . 2'-1 3/4 (a30) F2E (Silicon) Bolt For U17-U15-B & A
2-Fills 15 . 3/16 . 1'-0 3/4 (a) Tack Weld
2-Ls 5 . 3 1/2 . 3/8 . 2'-7 1/4 (h30 R)
4-Fills 4 1/2 . 1/2 . 1'-3 1/2 (ac28)
1-Bar 4 UM . 3/4 . 2'-7 1/4 (m30) Bent For U17-U15-B & A
1-PL 19 UM . 3/8 . 5'-4 3/4 (p30 R) Bent For U17-U15-B & A
1-Fill 4 UM . 3/4 . 1'-1 (ah28)
2-Bar 4 UM . 3/8 . 2'-1 1/4 (n30) {Bolt One & Rivet One to U7-U9 A & B
{Rivet Two to U17-U15-B & A
1-PL 15 1/2 UM . 3/8 . 5'-4 1/2 (b)
1-Diaph 15 I . 42.9 # . 1'-5 (h29) Ord. 26'-8 It. #467
1-Fill 5 1/2 . 1/2 . 1'-5 (k28)
1-PL BI 18 . 47 # . 3'-6 7/16 (c) R Bent } 1 PL 25'-7 1/4 Cuts 8 It. 168
1-PL BI 18 . 47 # . 3'-6 7/16 (c) R Bent } Bolt For U7-U9B & U17-U15B.
1-PL 18 1/2 UM . 3/8 . 5'-4 1/2 (f)
2-Fills 7 1/2 UM . 3/8 . 1'-7 13/16 (n28) Tackweld For U7-U9B & U17-U15B.
(2-Fills 7 1/2 UM . 3/8 . 0'-3 1/2 (k29) Tack weld One & Rivet One to U7-U9-B & U17-U15-B Rivet Two to U7-U9A & U17-U15-A)
1-PL 39 1/4 UM . 1 1/16 . 5'-6 1/8 (g31 R) Bent Bolt For U17-U15B & A
2-PLs 5 9/16 . 1/2 . 7'-2 (h31) 1 PL 29'-3 3/4 Cuts 4 Ord. 2 PLs 29'-6 For 8 For U7-U9 A & B
2-PLs 20 UM . 1/16 . 1'-9 1/2 (k31) Tack Weld For U7-U9-A & B
2-PLs 15 UM . 1/2 . 2'-2 1/8 (m31) Bolt For U7-U9A & B
1-PL 19 UM . 3/8 . 5'-5 (n31 R) Bent For U7-U9-A & B
1-Bar 4 UM . 3/4 . 2'-7 1/2 (p31) Bent For U7-U9-A & B
2-Fill 15 . 3/16 . 1'-0 1/8 (s) Tack Weld
2-Ls 5 . 3 1/2 . 3/8 . 2'-7 1/4 (t) R

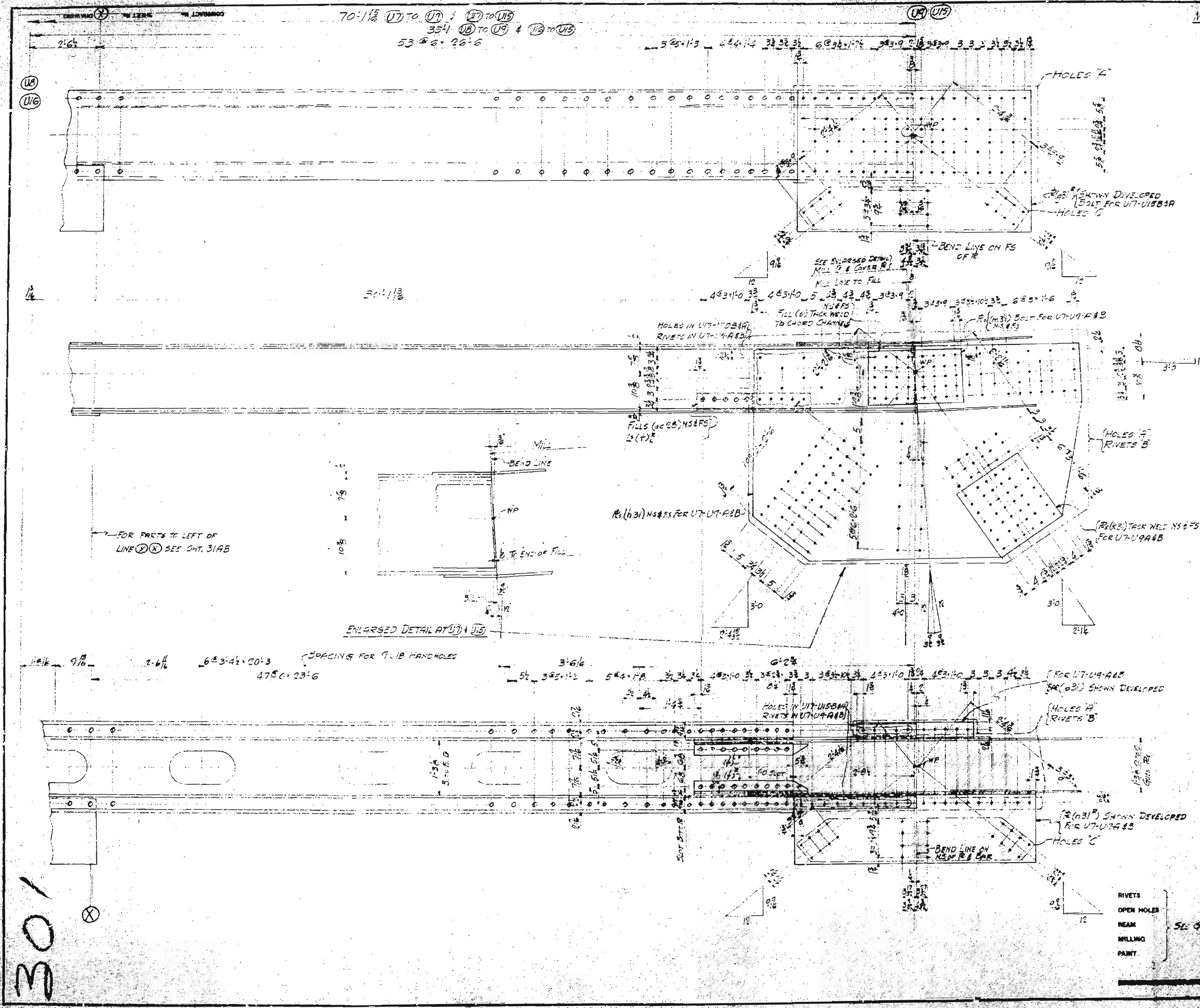
REQUIRED LIST		
No. REQD.	DESCRIPTION	MARK
ONE	TOP CHORD SECT.	U7-U9-A
ONE	do	U7-U9-B
ONE	do	U17-U15-A
ONE	do	U17-U15-B

SHOP NOTES:
Work Shts. 31AB & BB together as one sht.
Work Shts. 28AB-BB, 29AB-BB, 30AB-BB, 31AB-BB, 32AB-BB & 33 together.
For General Notes See Sheet 35

C-98

TOP CHORD SECTS. U7-U9 & U17-U15

TEMP.	MISSOURI RIVER BRIDGE
SUPT.	AT BROWNVILLE NEBRASKA
LAYOUT	FOR ATCHISON COUNTY MISSOURI
FITTER	BETHLEHEM STEEL COMPANY
SHOP INSP.	[illegible]
PC. WK.	[illegible] Chicago
B. SMITH	[illegible]
MCH.	
ERECT.	
O. SHOP.	
SHOP NO.	CONTRACT [illegible]



MATERIAL FOR ONE TOP CHORD SECTION [illegible]

2-[18 @ 42.7# x 70'-2 1/16 M2E ORD 70'-3 IT. 810
1-COV. PL 25 x 1/2 x 70'-1 21/32 M2E 70'-2 1/2 845
1-BOTT. PL 25 x 3/8 x 65'-7 1/16 65'-8 297
1-PL 39 1/4 UM x 9/16 x 5'-4 5/16 (d30R) BOLT-BENT FOR U7-U9-A&B
2-PLS 7 8 x 1/2 x 4'-6 3/4 (f30) 1 PL 9'-0 CUTS 2 FOR U17-U15-B&A
2-PLS 15 UM x 1/2 x 2'-1 3/4 (g30) F2E (SILICON) BOLT FOR U17-U15B&A
2-FILLS 15 x 3/16 x 1'-0 3/4 (a) TACK WELD
2-Ls 5 x 3 1/2 x 3/8 x 2'-7 1/4 (h30 L R)
4-FILLS 4 1/2 x 1/2 x 1'-3 1/2 (ac28)
1-BAR 4UM x 3/8 x 2'-7 1/4 (m30) BENT FOR U17-U15-B&A
1-PL 19UM x 3/8 x 5'-4 3/4 (p30R) BENT FOR U17-U15-B&A
1-FILL 4UM x 3/8 x 1'-1 (ah28)
2-BAR 4UM x 3/8 x 2'-1 1/4 (n30) {BOLT ONE & RIVET ONE TO U7-U9-A&B / RIVET TWO TO U17-U15-B&A

1-PL 18 1/2 UM x 3/8 x 5'-4 1/2 (b)
1-DIAPH. 15I x 42.9# x 1'-5 (h28) ORD. 28'-8 IT. #847
1-FILL 5 1/2 x 3/8 x 1'-5 (k28)
1-PC. BI 18 x 47# x 3'-6 5/16 (c)R BENT } 1 PC 25'-7 1/4 CUTS 8 IT. 68
1-PC. BI 18 x 47# x 3'-6 5/16 (d)R BENT } BOLT FOR U7-U9B & U17-U15B.
1-PL 18 1/2 UM x 3/8 x 5'-4 1/2 (f)
2-FILLS 7 1/2 UM x 3/8 x 1'-7 13/16 (n28) TACK WELD FOR U7-U9B & U17-U15B.
(2-FILLS 7 1/2 UM x 3/8 x 0'-3 1/2 (k29) TACK WELD ONE & RIVET ONE TO U7-U9-B & U17-U15-B RIVET TWO TO U7-U9A & U17-U15-A)
1-PL 39 1/4 UM x 9/16 x 5'-4 1/8 (g31R) BENT BOLT FOR U17-U15B&A
2-PLS 5? x 1/2 x 7'-6 (h31) PL 29'-3 3/4 CUTS 4 ORD. 2 PLS 29'-6 FOR 8 FOR U7-U9A&B
2-PLS 20UM x 5/16 x 1'-9 1/2 (k31) TACK WELD FOR U7-U9-A&B
2-PLS 15UM x 1/2 x 2'-2 1/8 (m31) BOLT FOR U7-U9A&B
1-PL 19UM x 3/8 x 5'-5 (n31R) BENT FOR U7-U9-A&B
1-BAR 4UM x 3/8 x 2'-7 1/2 (p31) BENT FOR U7-U9-A&B
2-FILLS 15 x 3/16 x 1'-0 1/8 (s) TACK WELD
2-Ls 5 x 3 1/2 x 3/8 x 2'-7 1/4 (t) R L

REQUIRED LIST		
NO. REQD.	DESCRIPTION	MARK
ONE	TOP CHORD SECT.	U7-U9-A
ONE	do	U7-U9-B
ONE	do	U17-U15-A
ONE	do	U17-U15-B

SHOP NOTES:
WORK SHTS. 31AB & BB TOGETHER AS ONE SHT.
WORK SHTS. 28AB-BB, 29AB-BB, 30AB-BB, 31AB-BB 32AB-BB & 33 TOGETHER
FOR GENERAL NOTES SEE SHEET 35

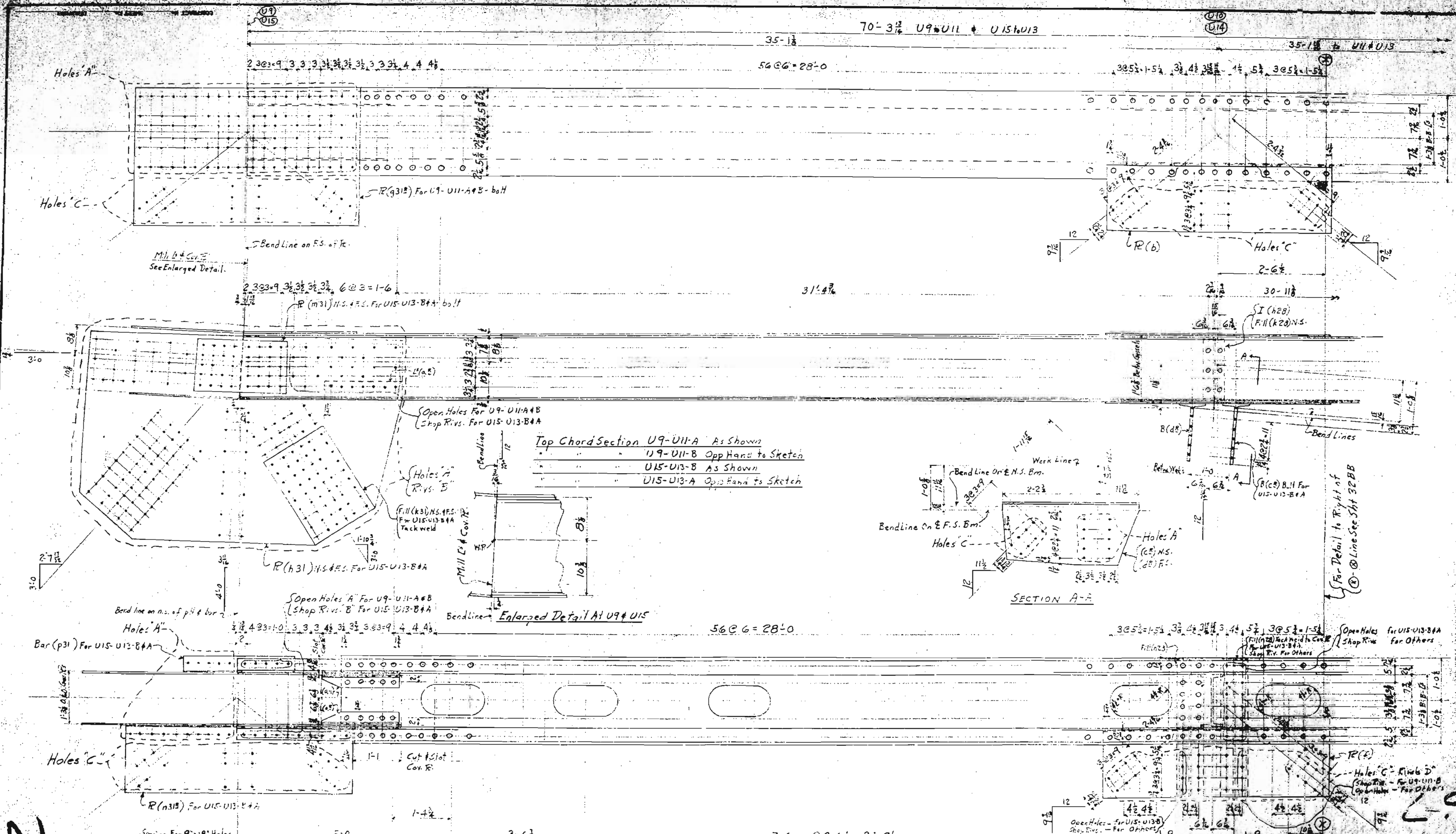
C-98

TOP CHORD SECTS. U7-U9 & U17-U15

MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR [illegible] COUNTY [illegible]

301

C-98



70'-3 13/16 U9 to U11 & U15 to U13
35'-1 5/8
35'-1 5/8 to U11 & U13
56@6 = 28'-0
Holes "A"
Holes "C"
R(g31) For U9-U11-A & B - both
Bend Line on F.S. of Pc.
Mill L & Cov. Pl. See Enlarged Detail.
R(m31) N.S. & F.S. For U15-U13-B & A - both
31'-4 3/4
30'-11 5/8
2'-6 1/2
R(b)
Open Holes For U9-U11-A & B
Shop Rivs. For U15-U13-B & A
Holes "A" Rivs. "B"
Fill(k31) N.S. & F.S. For U15-U13-B & A Tackweld
R(h31) N.S. & F.S. For U15-U13-B & A
Top Chord Section U9-U11-A As Shown
U9-U11-B Opp Hand to Sketch
U15-U13-B As Shown
U15-U13-A Opp Hand to Sketch
Bendline
Mill L & Cov. Pl.
W.P.
Enlarged Detail At U9 & U15
I (h28)
Fill (k28) N.S.
Bend Lines
B(d8)
B(c8) Bolt For U15-U13-B & A
Bendline On & N.S. Bm.
Work Line
Bendline On & F.S. Bm.
Holes "C"
Holes "A"
(c8) N.S. (d8) F.S.
Section A-A
For Detail to Right of Ⓧ-Ⓧ Line See Sht 32BB
Bend line on n.s. of pl & bar
Open Holes "A" For U9-U11-A & B
Shop Rivs. "B" For U15-U13-B & A
Bar (p31) For U15-U13-B & A
56@6 = 28'-0
Open Holes For U15-U13-B & A
Shop Rivs For Others
Fill (n28)
Cut & Slot Cov. Pl.
R(f)
Holes "C" - Rivets "D"
Shop Rivs - For U9-U11-B
Open Holes - For Others
R(n31) For U15-U13-B & A
Spacing For 9" x 18" Holes
5'-0
3'-6 7/16
7 Spcs @ 3-6 1/2 = 24'-9 1/2
Open Holes - For U15-U13-B
Shop Rivs. - For Others

Top Chord U9-U11 & U15-U13

For Gen. Notes. See Sht 35

Work Shts 32AB & 32B-B as One Sheet.

Work Shts 28AB & BB, 27AB & BB, 30AB & BB, 31AB & BB, 32AB & BB and 33 together.

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See Gen. Notes.

Bridge Over Missouri River
At Brownville Nebr.
For Atchison County Missouri

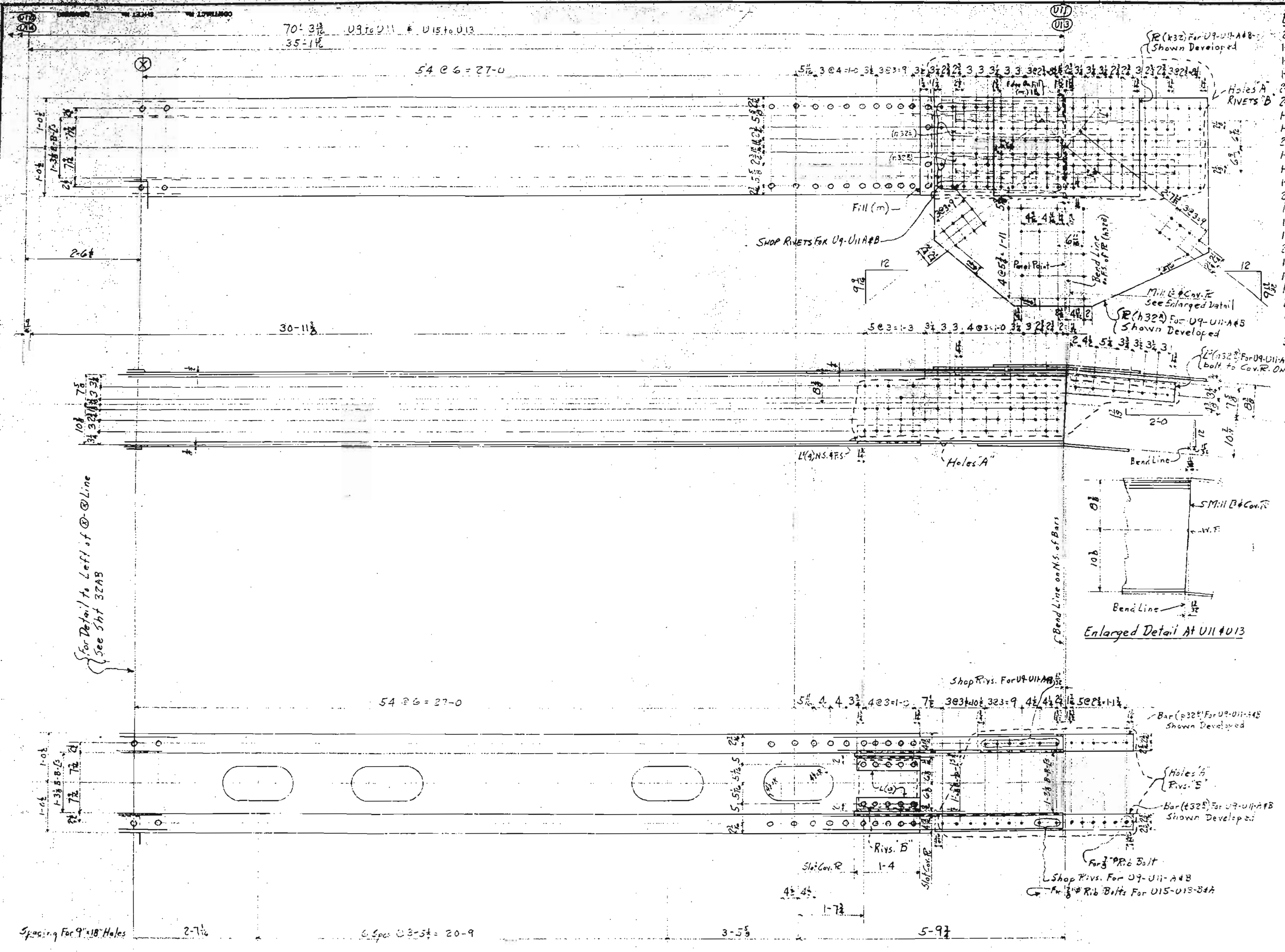
BETHLEHEM STEEL COMPANY

[illegible] Chicago

[illegible] Jenks [illegible] H. H.

SHOP NO. C 34092

302


U11
U13
70-3½ U9 to U11 & U15 to U13
35-1⅞
54 @ 6 = 27-0
R (k32) For U9-U11-A&B Shown Developed
Holes "A"
Rivets "B"
Fill (m)
Shop Rivets For U9-U11-A&B
Bend Line on N.S. of R (n32)
Mill ℄ & Cov. R See Enlarged Detail
R (h32) For U9-U11-A&B Shown Developed
2-6¾
30-11⅞
5 @ 3 = 1-3
L (n32) For U9-U11-A&B bolt to Cov. R. ONLY
L (a) N.S. & F.S.
Holes "A"
Bend Line
2-0
Mill ℄ & Cov. R
W.P.
Bend Line
Enlarged Detail At U11 & U13
Bend Line on N.S. of Bars
For Detail to Left of ⊗-⊗ Line See Sht 32AB
54 @ 6 = 27-0
Shop Rivs. For U9-U11-A&B
Bar (p32) For U9-U11-A&B Shown Developed
Holes "A"
Rivs. "B"
Bar (t32) For U9-U11-A&B Shown Developed
Rivs. "B"
Slot Cov. R
1-4
For ⅞" Rib Bolt
Shop Rivs. For U9-U11-A&B
For ⅞" Rib Bolts For U15-U13-B&A
Spacing For 9"×18" Holes
2-7¼
6 Spa. @ 3-5½ = 20-9
3-5⅝
5-9¾
1-7⅞

Bill of Mat'l For One Top Chord Section U9-U11-A&B and U15-U13 B&A

2-18 [s 51.9 × 70-4⅛ M-E-E Ord 70-5¼ It. 209
1-Top Cov. R 25 UM × ½ × 70-3 13/16 M-E-E Ord 70-4¾ It. 244
1-Bott. Cov. R 25 UM × ⅜ × 64-10 13/16 Ord 65-0 It. 290
1-Top Lat R 39½ UM × 7/16 × 5-4⅛ bent (g31) For U9-U11-A&B - bolt
2-Guss Rs 59 × ½ × 7-6 (h31) 1-R 29-3¾ Cuts 4 (Ord R 29-6 for B) For U15-U13 B&A
2-Spl. Rs 15 UM × ½ × 2-2⅛ (m31) For U15-U13-B&A - bolt
1-Bott. Lat. R 19 UM × ⅜ × 5-5 bent (n31) For U15-U13-B&A
1-Bar 4 UM × ⅜ × 2-7½ bent (p31) For U15-U12-B&A
2-Ls 5 × 3½ × ⅜ × 1-9½ (a)
1-Top Lat R 18½ UM × ⅜ × 5-4½ (b)
1-15 I 42.9 × 1-5 (h28) Ord 28-8 It. 247
1-Fill 5½ × ⅜ × 1-5 (k28)
2-Fill 7½ × ⅜ × 1-7 13/16 (n28) {Tackweld one / Rivet one} For U15-U13 B&A. Rivet 2 for U9-U11-A&B
1-18 B 47 × 3-2 5/16 bent & Cut (c) } Ord 24-0 Cuts 8 It. 169
1-18 B 47 × 3-2 9/16 bent & Cut (d) }
{Bolt For U15-U13-B&A / Rivet For U9-U11-A&B}
1-Bott. Lat R 18½ UM × ⅜ × 5-4½ (f)
2-Ls 5 × 3½ × ⅜ × 1-3½ (g)
1-Top Lat R 52½ F.E-W × ⅜ × 5-8 7/16 F.E-E. bent (h32) (Silicon) For U9-U11 A&B
1-Spl. R 25 UM × ⅜ × 3-0⅜ F.E-E. bent (k32) (Silicon) For U9-U11-A&B
1-Fill 25 UM × ¼ × 2-11 13/16 (m)
2-Ls 5 × 3½ × ½ × 4-7⅛ (n32) bent (Silicon) For U9-U11-A&B - bolt to Cov. R.
1-Bar 4½ UM × ½ × 3-2⅝ (p32) bent (Silicon) For U9-U11-A&B
1-Bar 4½ UM × ½ × 4-1⅛ (t32) bent (Silicon) For U9-U11-A&B
2-Fills 20 UM × 7/16 × 1-9½ (k31) tack weld For U15-U13-B&A

REQUIRED LIST

No Req'd	Description	Mark
One	Top Chord	U9-U11A
One	Top Chord	U9-U11B
One	Top Chord	U15-U13A
One	Top Chord	U15-U13B

L-98

For Gen. Notes See Sheet 35

Work Shts 32AB & 32BB as One Sheet

Work Shts 28AB&BB, 29AB&BB, 30AB&BB, 31AB&BB, 32AB&BB and 33 togeth.

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See Gen. Notes

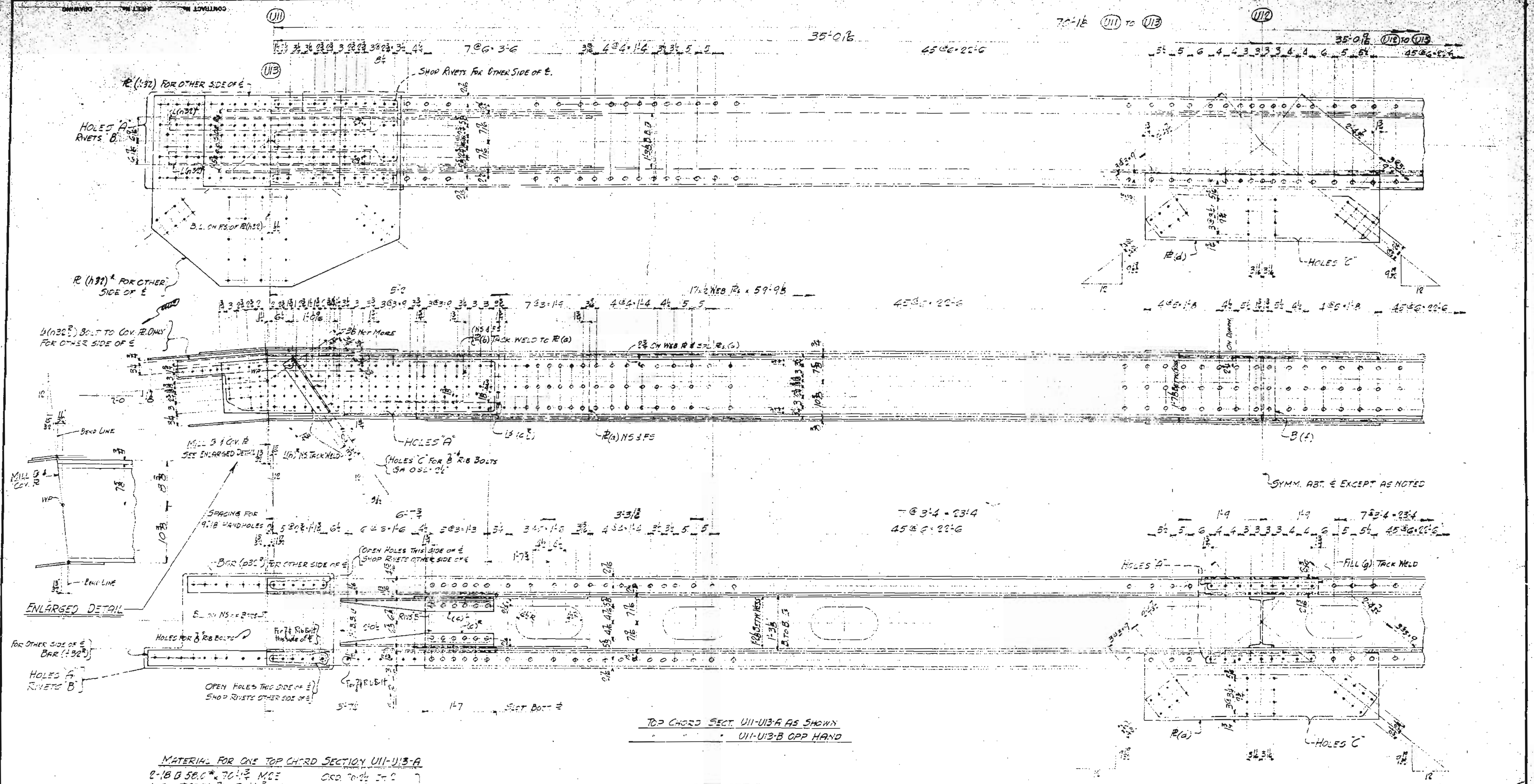
Top Chord U9-U11 & U15-U13.

Bridge Over Missouri River
At Brownville Nebr.
For Atchison County Missouri

BETHLEHEM STEEL COMPANY

Jenks

303


U11
U13
U12
35'-0 1/16
70'-1 1/8 U11 to U13
35'-0 1/16 U12 to U13
7@6·3'-6
45@6·22'-6
Shop Rivets for other side of ℄.
ℙ (n32) for other side of ℄
Holes 'A'
Rivets 'B'
B.L. on F.S. of ℙ(n32)
ℙ (h32) for other side of ℄
ℙ(d)
Holes 'C'
17×½ Web ℙs × 59'-9 5/8
7@3·1'-9
L(n32) Bolt to Cov. ℙ only for other side of ℄
ℙ(b) Tack weld to ℙ(a)
Holes 'A'
ℙ(a) NS & FS
B(f)
Bend line
Mill ℙ & Cov. ℙ
Mill ℙ & Cov. ℙ See enlarged detail
Holes 'C' for ⅞ Rib Bolts
Symm. abt. ℄ except as noted
Spacing for 9×18 handholes
Bar (p32) for other side of ℄
Open holes this side of ℄ Shop rivets other side of ℄
Holes 'A'
Fill (g) Tack weld
Enlarged Detail
Holes for ⅞ Rib Bolts
For other side of ℄ Bar (t32)
Holes 'A' Rivets 'B'
Open holes this side of ℄ Shop rivets other side of ℄
Slot bolt ⅞
ℙ(d)
Holes 'C'

Top Chord Sect. U11-U13-A As Shown
" " U11-U13-B Opp Hand

MATERIAL FOR ONE TOP CHORD SECTION U11-U13-A

2-18 ⊏ 58.0# × 70'-1 3/4 MCE ORD. 70'-3½ It. 2
1-Cov. ℙ 25UM × ¾ × 70'-1 3/4 MCE " 70'-2½ " 15
1-Bott. ℙ 25UM × ¾ × 62'-10⅝ FCE " 63'-0 " 31
2-ℙs 17UM × ½ × 59'-9⅝ FCE " 59'-10½ " 131
2-ℙs 15UM × ½ × 72'-2⅜ FCE " 72'-5 " 41
(Silicon)
1-Top Lat. ℙ 50½ FCW × ⅜ × 5'-8⅝ FCE Bent (a32) Silicon
1-ℙ 25UM × ⅜ × 3'-1⅝ FCE Bent (k32) Silicon
2-L 5 × 3½ × ½ × 4'-7⅜ (n32) Bent (Silicon) Bolt
1-Bar 4½ UM × ½ × 3'-2¾ (p32) Bent (Silicon)
1-Bar 4½ UM × ½ × 4'-1⅞ (t32) Bent (Silicon)
4-Spl. ℙ 17 UM × ½ × 5'-10½ (a) FCE (Silicon)
4-ℙs 12¾ FCW × ½ × 2'-1¼ (b) FCE (Silicon) Tack weld
4-Ls 4⅜ × 3½ × ⅜ × 3'-5¼ (c) Cut 5×3½ L
2-ℙ 18½UM × ⅜ × 5'-4½ (d)
1-B 14 × 38# × 1'-5 (f) ORD. 2'-10⅜ It. 185
1-Fill 5UM × ⅜ × 2'-7½ (g) Tack weld
2-Ls 4 × 3½ × ⅜ × 1'-6⅜ (h) Tack weld

REQUIRED LIST		
No. Reqd.	Description	Mark
One	Top Chord Sect.	U11-U13-A
One	do	U11-U13-B

Shop Notes:

For gen. notes see sht. 35
Work sheets 27 to 33 incl. together.

Rivets
Open holes
Ream
Milling
Paint
— See gen. notes

304

L-98

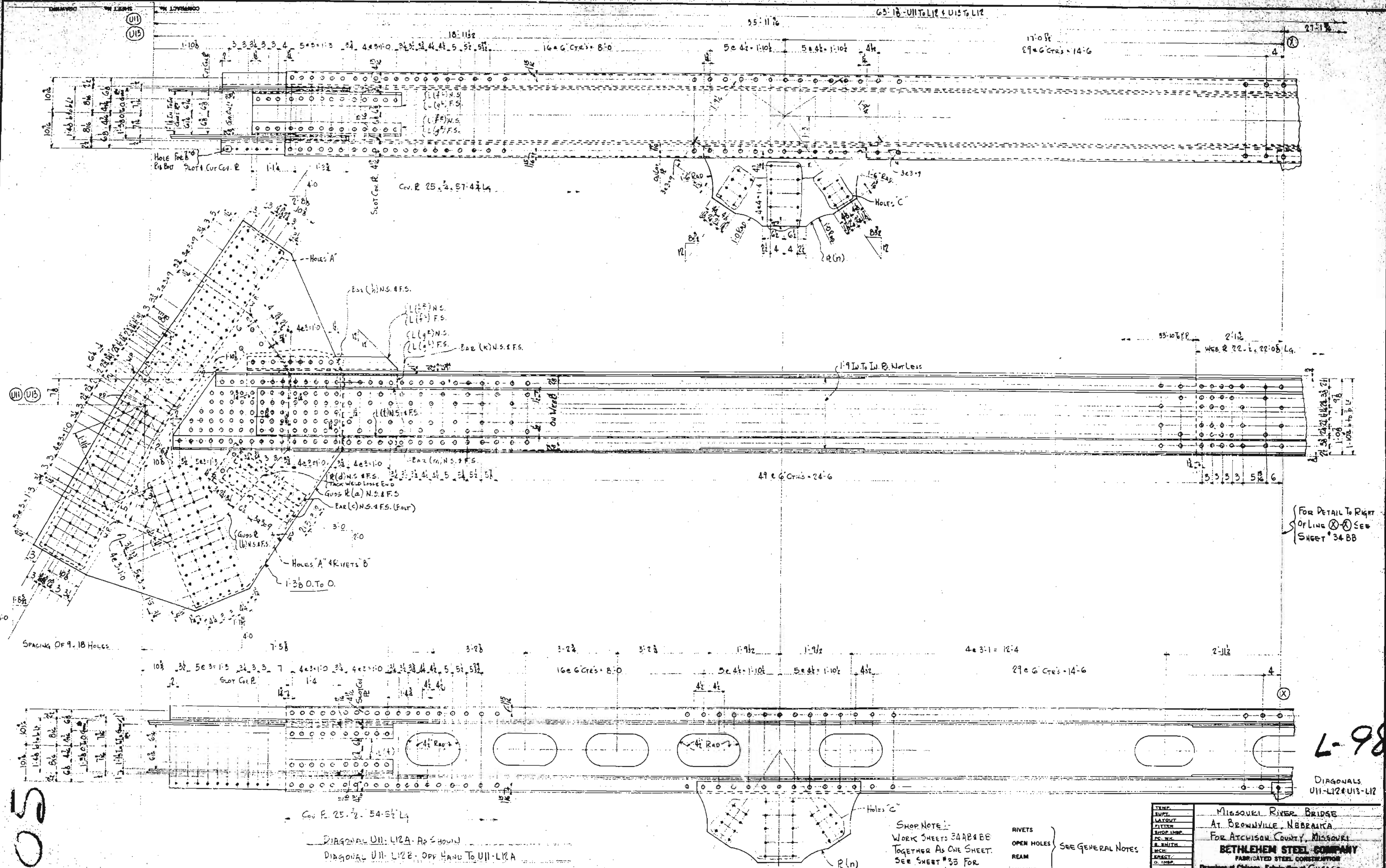
Top Chord Sect. U11-U13

Temp.
Sl. Pt.
Layout
Fitter
Shop Insp.
Pc. Wk.
B. Smith
Mch.
Erect.
O. Insp.

Missouri River Bridge
at Brownville Nebraska
for Atchison County Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
In charge Jenks Made by R.H.
Checked by J.K.V.
Traced by
Revised
Last Revision No.

Shop No. Contract CG340 Sheet 33



L-98

Diagonals
U11-L12 & U13-L12

Diagonal U11-L12A - As Shown
Diagonal U11-L12B - Opp Hand To U11-L12A
Diagonal U13-L12B - As Shown - Same As U11-L12A Except Shipping Mark
Diagonal U13-L12A - Opp. Hand To U11-L12A - Same As U11-L12B Except Shipping Mark

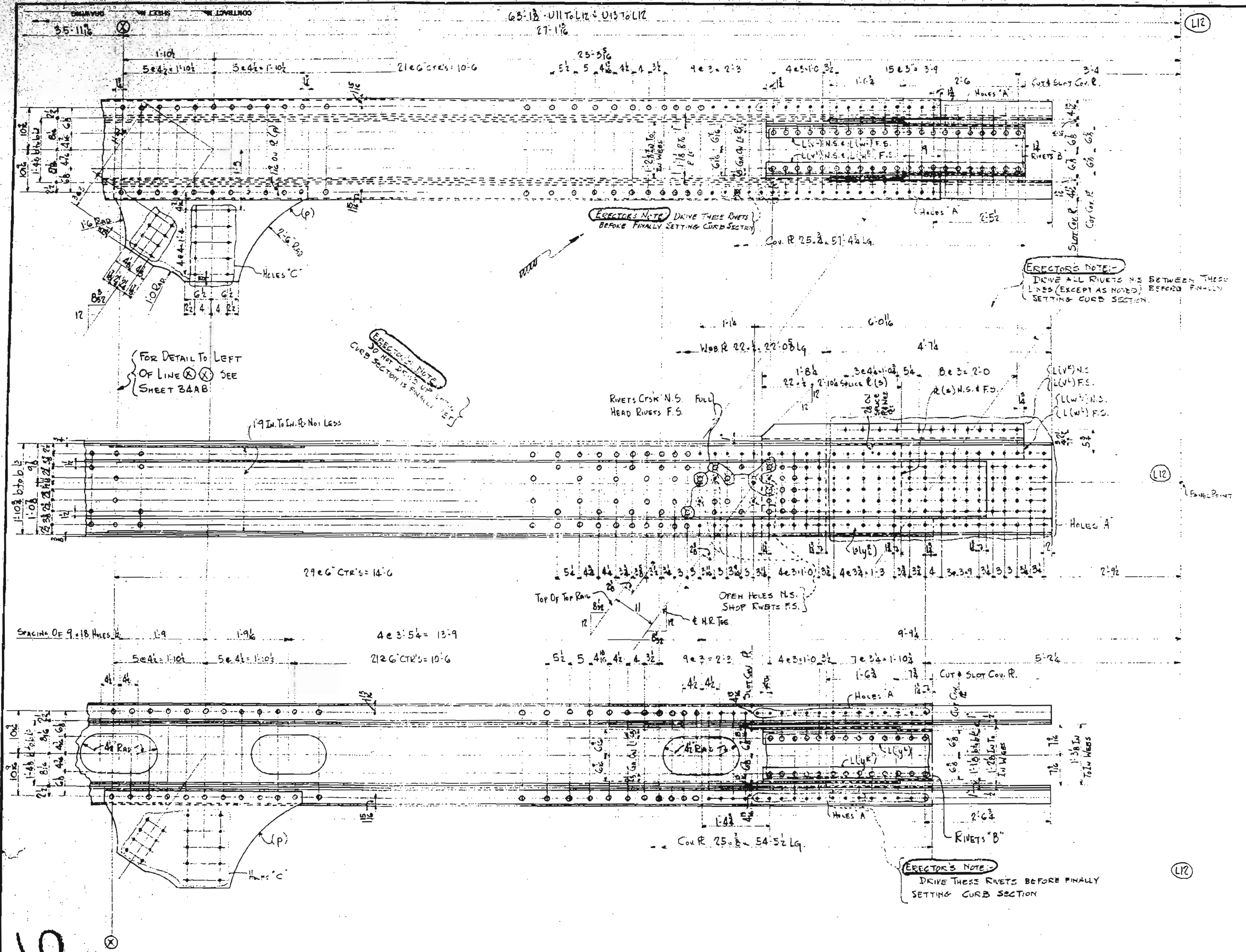
Shop Note:-
Work Sheets 34AB & BB
Together As One Sheet.
See Sheet #35 For
General Notes.

RIVETS OPEN HOLES REAM MILLING PAINT	See General Notes

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY C.A.D.
CHECKED BY T.V.V. 7/34 TRACED BY
REVISED LAST AGENDA INK.
SHOP NO.
CONTRACT CG 34092
SHEET 34

305



Erector's Note: Drive These Rivets Before Finally Setting Curb Section

Erector's Note:- Drive All Rivets N.S. Between These Lines (Except As Noted) Before Finally Setting Curb Section.

Erector's Note: Do Not Drive Up Curb Section Is Finally Set

Erector's Note:- Drive These Rivets Before Finally Setting Curb Section

Bill Of Material For One Diagonal - U11-L12A Or U13-L12B

2Ls 4.4.½. 58-9 It# 66 Silicon Steel (Top Fig.)
2Ls 4.4.½. 59-9½ It# 65 Silicon Steel (Bott. Fig.)
2R 22UM.½. 59-9½ F2E Ord 59-11 It# 38 Silicon Steel (Web R)
2R 22UM.½. 22-0⅜ F2E Ord 22-2⅜ It# 40 Silicon Steel (Web R)
2Rs 14UM.½. 56-4¼ F2E Ord 56-5⅜ It# 44 Silicon Steel (Side Rs)
1R 25UM.⅜. 54-5½ F2E Ord 54-7 It# 104 Silicon Steel (Bott. Fg. Cov. R.)
1R 25UM.⅜. 57-4¾ F2E Ord 57-6¼ It# 16 Silicon Steel (Top Fg. Cov. R.)
2 Guss Rs 64½ F2W.½. 9-6¼ (a) F2E (Silicon Steel) 1R 34-4½ Cuts 4 Ord 2R 65.½. 34-0½ For 8B
2 Guss Rs 50¼ F2W.½. 6-1½ (b) F2E (Silicon Steel) 1R 46-2½ Cuts 8 Ord 1R 50¼.½. 46-0½ For 8B
4 Bars 4UM.⅜. 2-0½ (c) Bolt
2 Rs 12.¼. 1-1¼ (d) 1R 2-0⅜ Cuts 2 (Tack Weld)
2Ls 4.4.½. 3-8¼ (f R/L) Silicon Steel
2Ls 4.4.½. 3-8¼ (g R/L) Silicon Steel
2 Bars 4UM.½. 1-6½ (h)
2 Bars 4UM.½. 2-7¼ (k)
4 Bars 4UM.½. 1-3½ (m)
2 Guss Rs 23½.⅜. 4-0½ (n) 1R 29-8 Cuts 8
2 Guss Rs 23½.⅜. 4-0½ (o) 1R 26-0 Cuts 8
2 Rs 22UM.½. 2-10¼ (s) F2E Silicon Steel
2Ls 4.4.⅜. 2-7¼ (t) Silicon Steel
2Ls 4.4.½. 5-4 (v R/L) Silicon Steel
2Ls 4.4.½. 5-4 (w R/L) Silicon Steel
2Ls 3½.4.⅜. 3-5½ (y R/L) Silicon Steel

Required List

No. Req'd.	Description	Mark
One	Diagonal	U11-L12A
One	Do	U11-L12B
One	Do	U13-L12B
One	Do	U13-L12A

Shop Notes:-
Work Sheets 34AB & BB Together As One Sheet
See Sheet #35 For General Notes

L-98

306

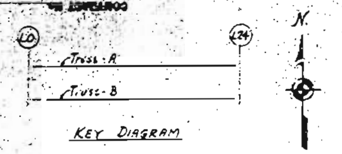
RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See General Notes

SHOP CONTACT SURFACES

Diagonals U11-L12 & U13-L12

TEMP.	Missouri River Bridge
SUPT.	At Brownville, Nebraska
LAYOUT	For Atchison County, Missouri
[illegible]	BETHLEHEM STEEL COMPANY
SHOP INSP.	FABRICATED STEEL CONSTRUCTION
PC. WK.	[illegible] Chicago
B. SMITH	[illegible] Made by C.G.B.
MCH.	[illegible]
ERECT.	[illegible]
Q. INSP.	

SHOP NO. CG 34092



KEY DIAGRAM

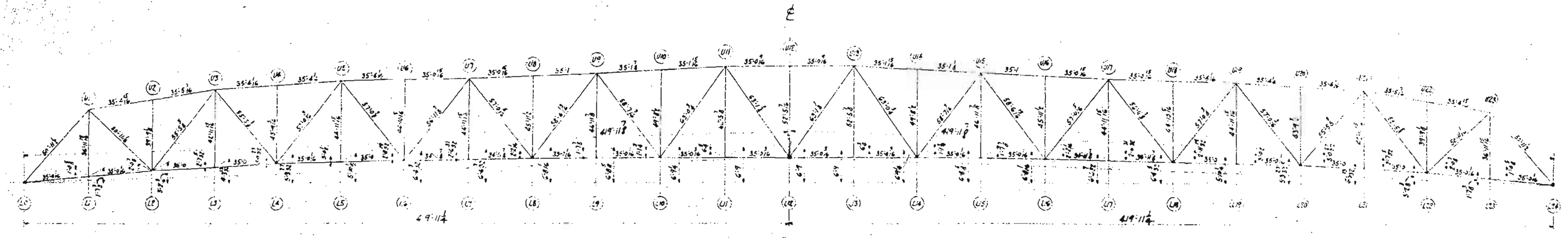


DIAGRAM SHOWING SHOP CAMBER FOR TRUSS SPAN

Dimensions given are shop fabricating dimensions c to c of panel points.

GENERAL NOTES FOR SHEETS #21 TO #40 INCLUSIVE.

MATERIAL:- All material to be Carbon Steel except where noted "Silicon"

MATERIAL SPECS:- Carbon Steel to be as per ASTM-A7-34. Silicon Steel to be as per ASTM-A94-36.

WORKMANSHIP SPECS:- As per project specifications

WELDING SPECS:- As per ASHO Specs. 1935.

SHOP INSPECTION:- By R.W. Hunt Co.

RIVETS:- ⅞"

OPEN HOLES:- 15/16" Unless Noted

MILLING:- Where Noted.

EDGES OF SILICON STEEL PLS:- All sheared edges of Silicon Steel plates shall be cut with ¼" more edge distance than shown on details and then milled or finished to dimensions shown.

FILLETS ON NOTCHES & SLOTS:- Notches and slots in cover pls. and gussets shall be filleted as shown on this sheet.

HAND HOLES, SLOTS, NOTCHES & RADIAL CUTS:- Hand holes, Slots, Notches, and Radial cuts shall be produced in following manner–
In Carbon Steel:- 6x12 hand holes to be punched with special large punches and dies.
All other hand holes, all slots, notches & radial cuts to be flame cut (not softened).
In Silicon Steel:- All hand holes, all slots and all notches to be flame cut and softened.

FLAME CUTTING:- All flame cutting shall be by mechanically guided and mechanically operated torches.

FLAME SOFTENING:- All flame cutting of silicon steel shall be followed by flame softening. Flame softening shall be by mechanically guided and mechanically timed torches properly regulated to maintain the original physical properties of the silicon steel as closely as possible.

CHIPPING & GRINDING:- All burrs or rough edges at hand holes, slots, notches & radial cuts, left by punching or flame cutting shall be removed by chipping or grinding.

PUNCHING & REAMING:- All holes for shop and field rivets or bolts shall be subpunched at least ¼" undersize and then reamed to size except:-
(a) Holes "C" may be punched full size.
(b) Holes for Rivets "D" may be punched full size.
Subpunched holes shall be reamed to size at shop assembly except that the following shall be reamed at yard assembly:-
(a) Holes "A"
(b) Holes for Rivets "B"
(c) Holes RT14, RT15 & RT16.
Holes marked RT shall be reamed thru steel templets.

TACK WELDING:- Tack welding shall be kept to a minimum of weld.

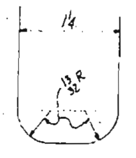
SHOP ASSEMBLY:- Shop contact surfaces are not to be painted but such surfaces shall be cleaned as per project specifications.

YARD ASSEMBLY:- Trusses shall be yard assembled to the camber shown on this sheet, and while so assembled Holes "A", Holes for rivets "B", and Holes RT14, RT15 & RT16 shall be reamed to size.
In the assembly of trusses, care to be taken to place diagonals and verticals according to direction marks shown on detail sheets #36 to #40 inclusive.

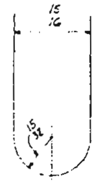
MARKING & MATCH MARKING:- The North Truss is designated as the Ⓐ truss and the South Truss as the Ⓑ truss. All erection marks of main truss members include truss marks thus (U1-U3A) (U3-U5B) (L0-L2A) etc and need not therefore be match marked. Direction marks for diagonals & verticals shown on detail sheets #36 to #40 shall be transferred to painted surfaces before shipment.
All detail pieces that are reamed & ship bolted shall be match marked locally by shop to prevent misplacement if removed in field.

SHOP CLEANING & PAINTING:- Shall be as per project specifications.

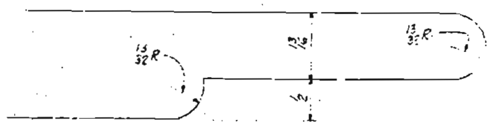
SHOP PAINT:- One coat of an approved Red Lead Paint as per Project Specifications.



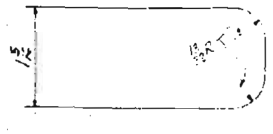
For Slots in Gussets at (L0) & (L24)



For Slots in Gussets at (L12)



Typical for Slots in Cover Plates



Special Slots for Cover Pls. at (L12)

DETAIL OF FILLETS FOR SLOTS IN TRUSS MEMBERS

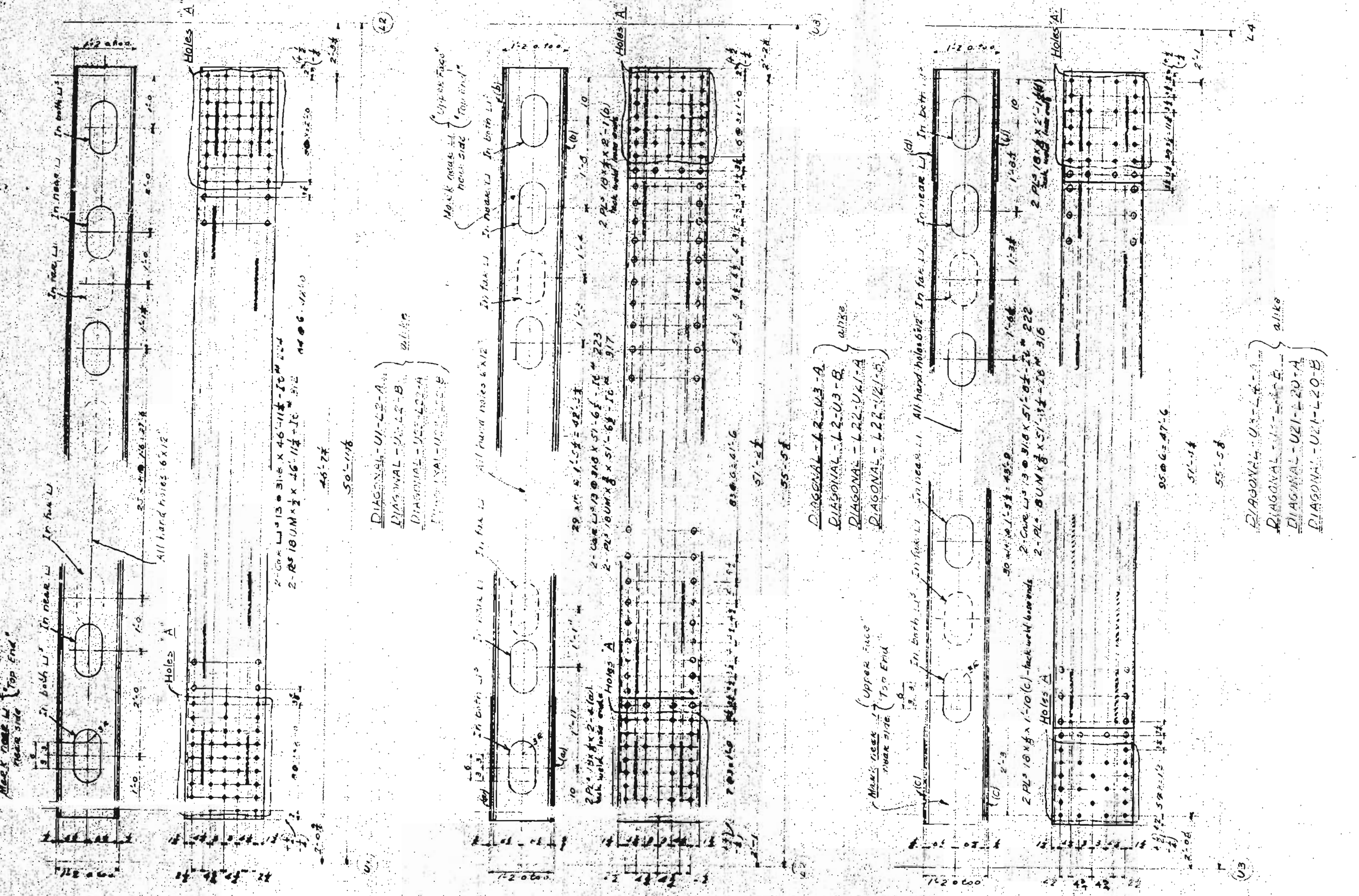
307

L-98

RIVETS
OPEN HOLES
REAM
MILLING
PAINT

SHOP CONTACT SURFACES

MISSOURI RIVER BRIDGE
AT BROWNVILLE [illegible]
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY



L-98

Required List

No. Reqd	Description	Mark
One	Diagonal	U1-L2-A ✓
One	do	U1-L2-B
One	do	U23-L22-A ✓
One	do	U23-L22-B
One	do	L2-U3-A ✓
One	do	L2-U3-B
One	do	L22-U21-A ✓
One	do	L22-U21-B
One	do	U3-L4-A
[illegible]	do	U3-L4-B
One	do	U21-L20-A
One	do	U21-L20-B ✓

Diagonals: U1-L2, L2-U3, U3-L4, U23-L22, L22-U21, [illegible]

Bridge Over Missouri [illegible]
At Brownville Nebr.
For Atchison County [illegible]

For Gen. Notes [illegible]

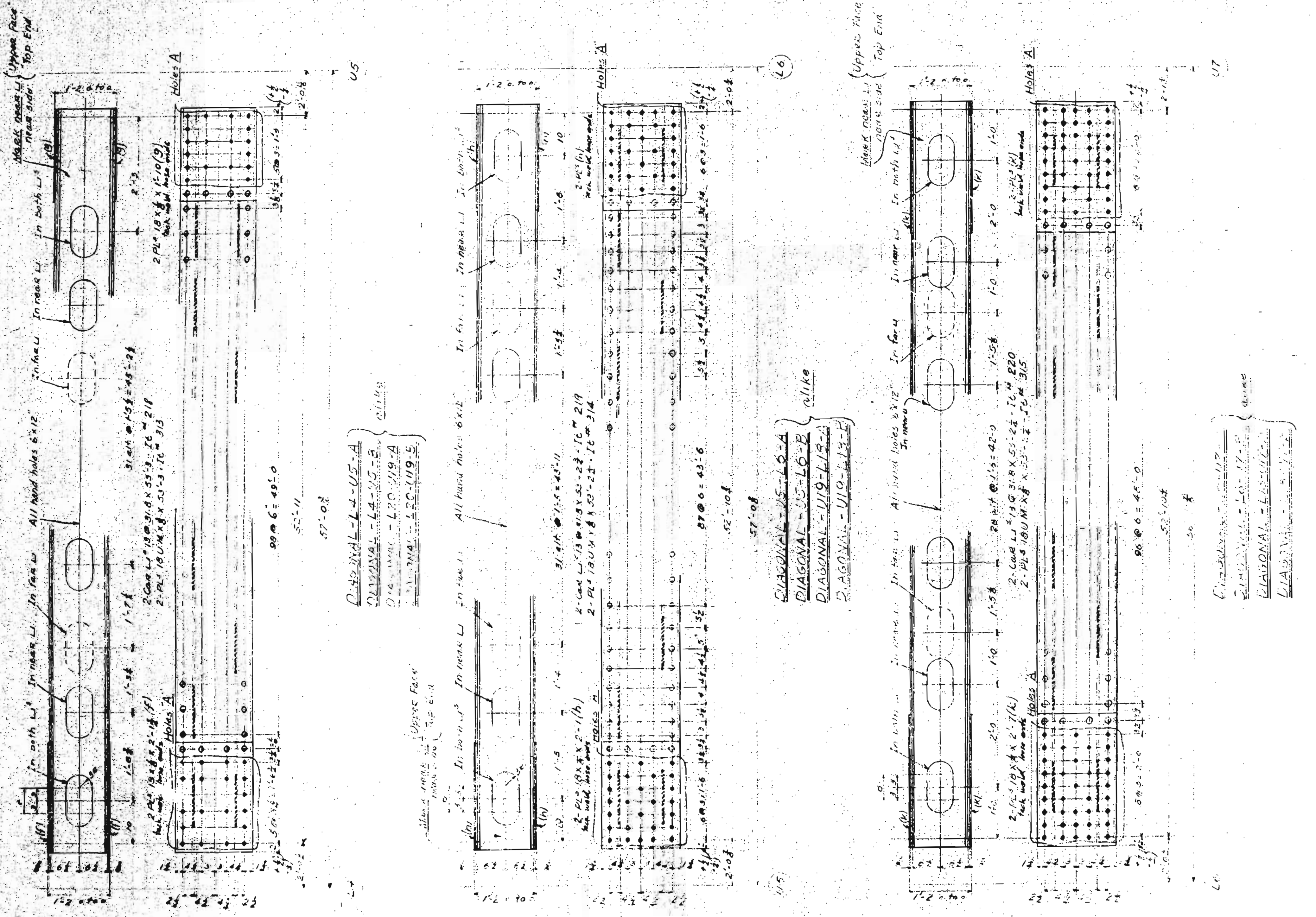
RIVETS
OPEN HOLES
REAM
MILLING
PAINT

See Gen. Notes

Shop Note:
Direction marks to be painted on members
in shop before sending to yard for truss assembly

98

L-98



309

Required List

No Reqd	Description	Mark
One	Diagonal	L4-U5-A
One	do	L4-U5-B
One	do	L20-U19-A
One	do	L20-U19-B
One	do	U5-L6-A
One	do	U5-L6-B
One	do	U19-L18-A
One	do	U19-L18-B
One	do	L6-U7-A
One	do	L6-U7-B
One	do	L18-U17-A
One	do	L18-U17-B

Shop Notes:
Erection marks to be painted on members
in shop before sending to yard for truss assembly

RIVETS
OPEN HOLES
REAM
MILLING
PAINT

See Gen. Notes

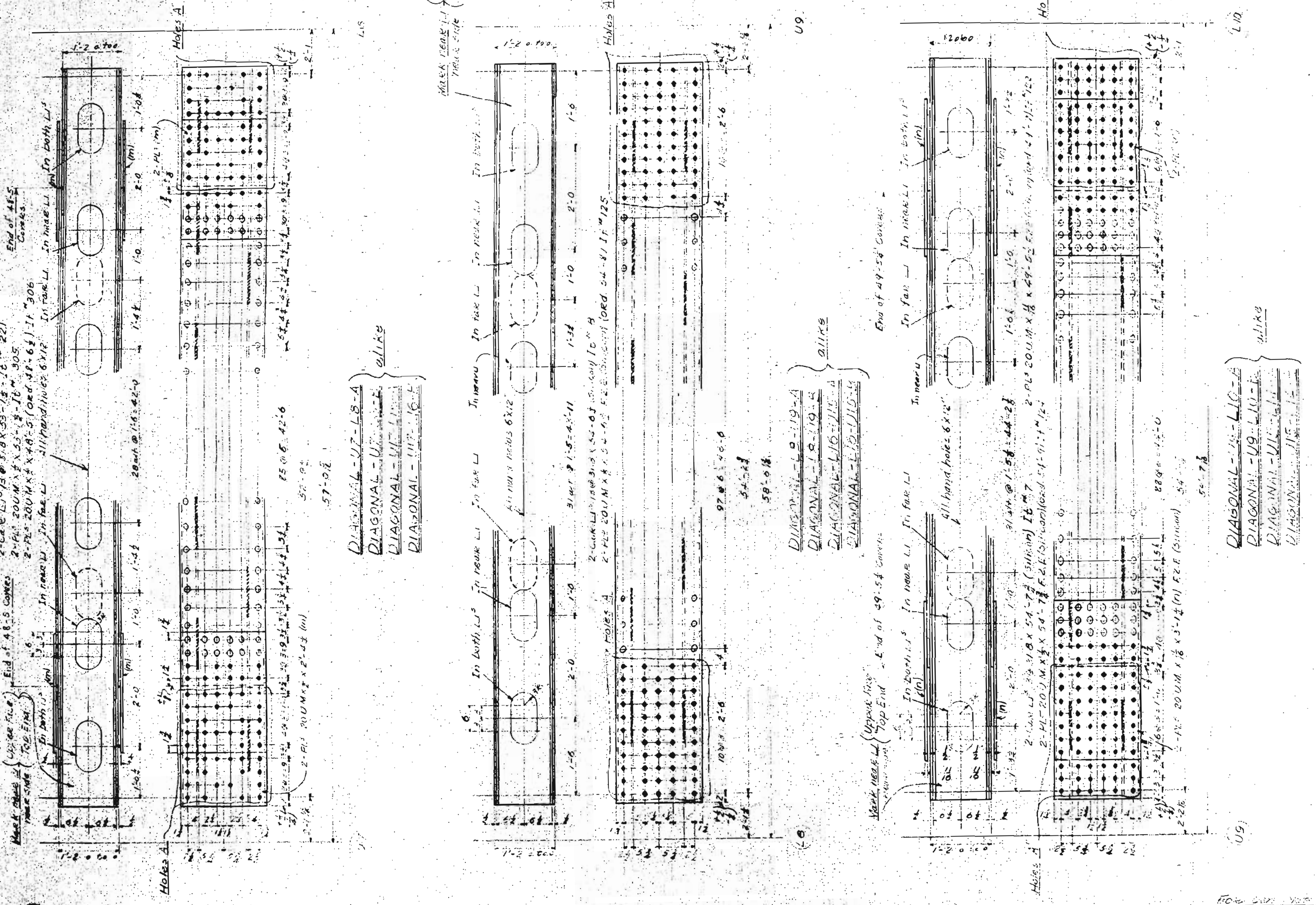
L-98

Diagonals L4-U5, U5-L6, L6-U7, L20-U19, U19-L18 & L18-U17

Bridge over Missouri River
at Brownville Nebr.
For Atchison County Missouri

BETHLEHEM STEEL COMPANY

TEMP.
SUPT.
LAYOUT
CHECKER
SHOP INSP.
SHOP NO.



Required List

No. Reqd.	Description	Mark
One	Diagonal	U7-L8-A ✓
One	do	U7-L8-B ✓
One	do	U17-L16-A ✓
One	do	U17-L16-B ✓
One	do	L8-U9-A ✓
One	do	L8-U9-B ✓
One	do	L16-U15-A
One	do	L16-U15-B ✓
One	do	U9-L10-A ✓
One	do	U9-L10-B ✓
One	do	U15-L14-A ✓
One	do	U15-L14-B ✓

For Shop Notes See Sheet #5

Shop Note:
Direction marks to be painted on members in shop before sending to yard for truss assembly

RIVETS
OPEN HOLES
REAM
MILLING
PAINT

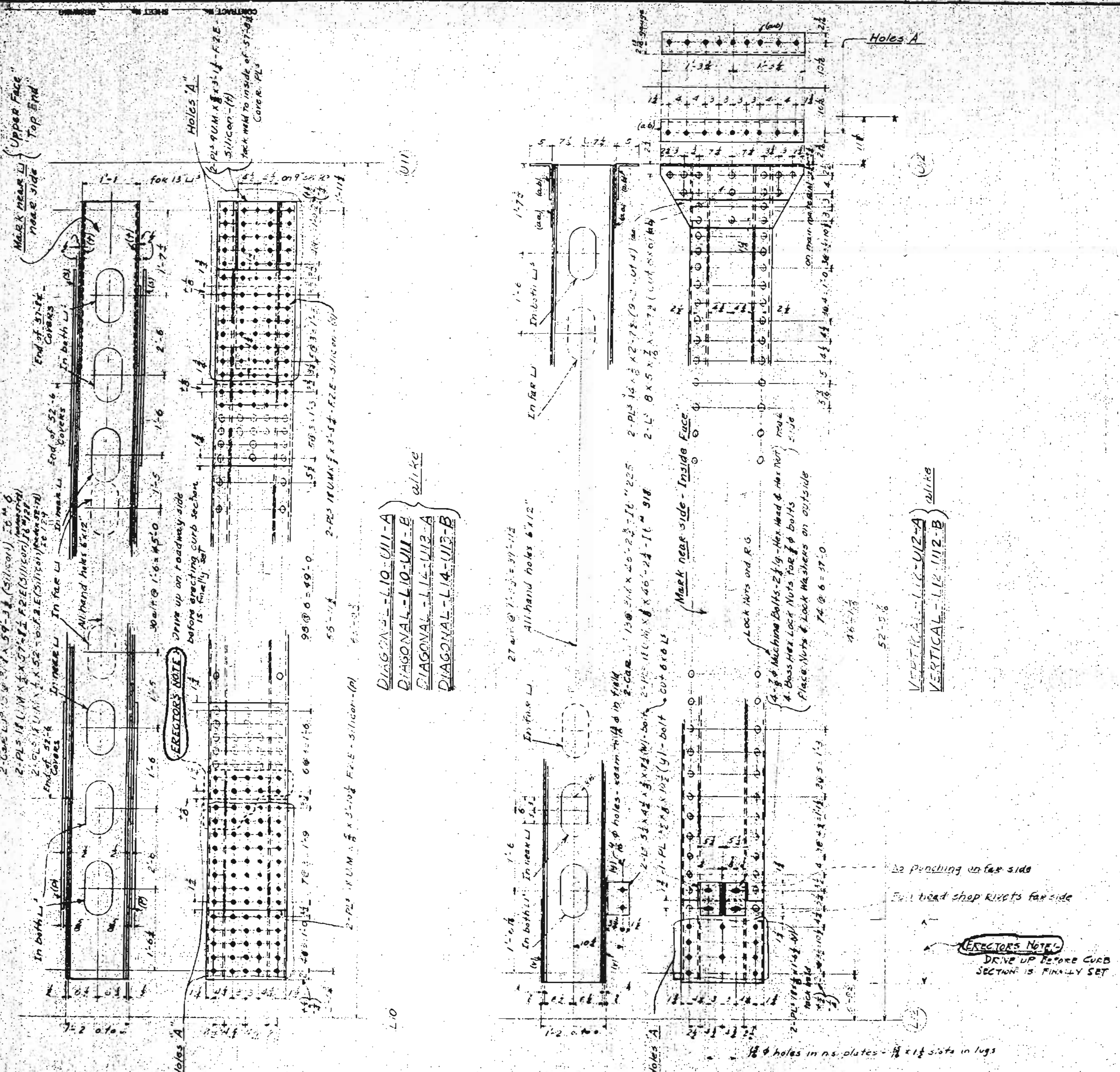
L-98

Diagonals U7-L8, L8-U9, U9-L10, U17-L16, L16-U15 & U15-L14

Bridge Over Missouri River
At Brownville, Nebr.
For Atchison County, Missouri
BETHLEHEM STEEL COMPANY

SHOP NO.

310


Mark near ⊔ near side
Upper Face Top End
Holes "A"
Erectors Note: Drive up on roadway side before erecting curb section is finally set
Diagonal - L10-U11-A
Diagonal - L10-U11-B
Diagonal - L14-U13-A
Diagonal - L14-U13-B
alike
Holes A
Mark near side - Inside Face
Vertical - L12-U12-A
Vertical - L12-U12-B
alike
No punching on far side
Full head shop rivets far side
Erectors Note:-
Drive up before curb section is finally set
$\frac{13}{16}$ ⌀ holes in n.s. plates - $\frac{13}{16}$ x 1$\frac{1}{8}$ slots in lugs

L-98

Required List

No Req'd.	Description	Mark
One	Diagonal	L10-U11-A
One	do	L10-U11-B
One	do	L14-U13-A
One	do	L14-U13-B
One	Vertical	L12-U12-A
One	do	L12-U12-B

Verticals L12-U12-A & L12-U12-B
Diagonals L10-U11-A, L10-U13-B, L14-U13-A & L14-U13-B

Shop Note:
Direction marks to be painted on members in shop before sending to yard for truss assembly.

For Gen. Notes See Sheet 3T

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
See Gen. Notes

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

Bridge Over Missouri River
At Brownville Nebr.
For Atchison County, Missouri

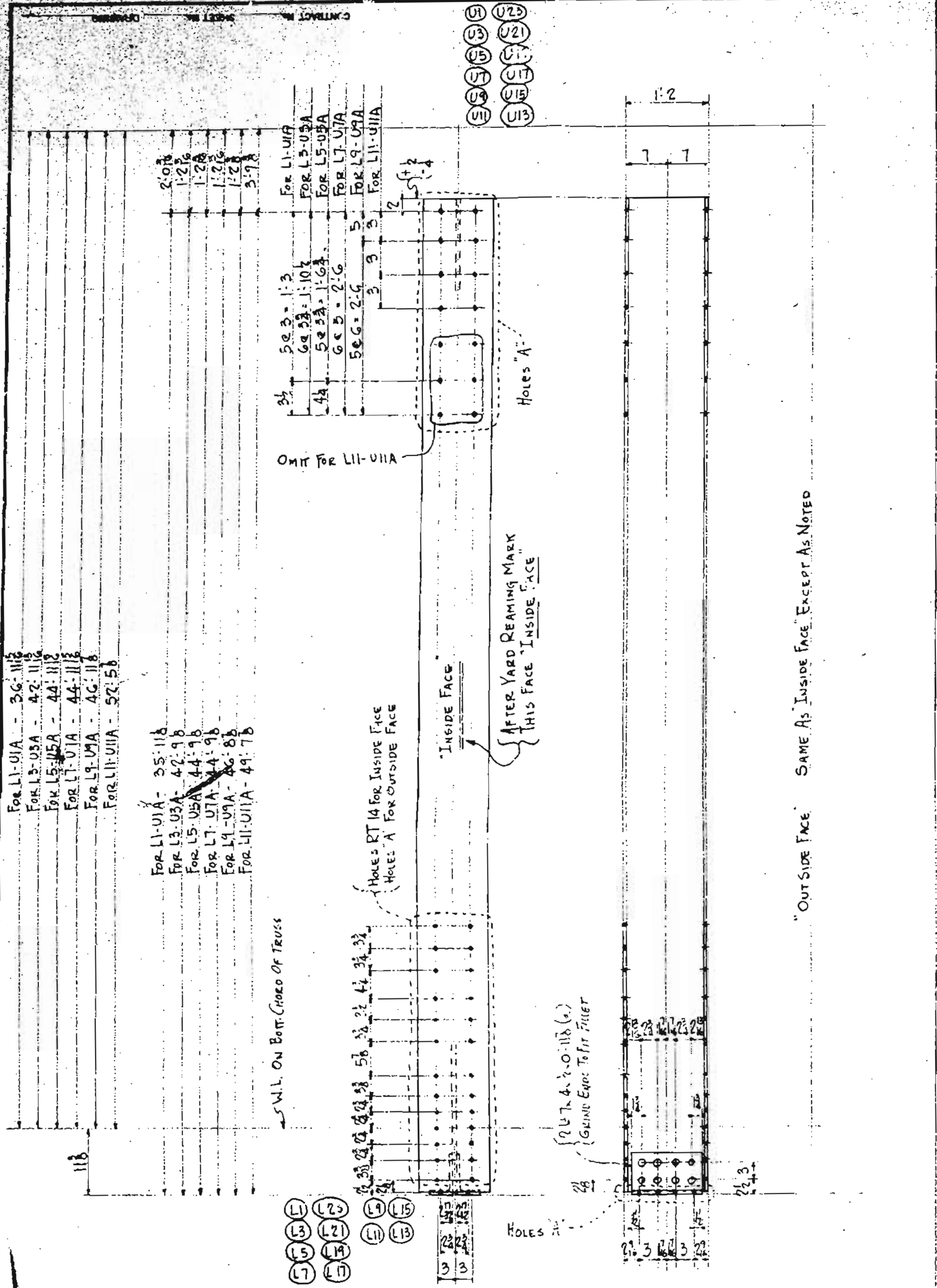
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabricated at Chicago
Jacks
R.S.K.
Checked by 4/11/39

SHOP NO.
CONTRACT CG34042

71

3/11

3/2



1-BH 14.78. 36'-0¾ It# 182 For L1-U1A
1-BH 14.78. 42'-10¾ It# 181 For L3-U3A
1-BH 14.78. 44'-10¾ It# 180 For L5-U5A & L7-U7A
1-BH 14.78. 46'-10½ It# 179 For L9-U9A
1-BH 14.78. 49'-9½ It# 178 For L11-U11A

Vertical L1-U1A
Vertical L1-U1B
Vertical L23-U23B
Vertical L23-U23A
} Alike Except Shipping Mark

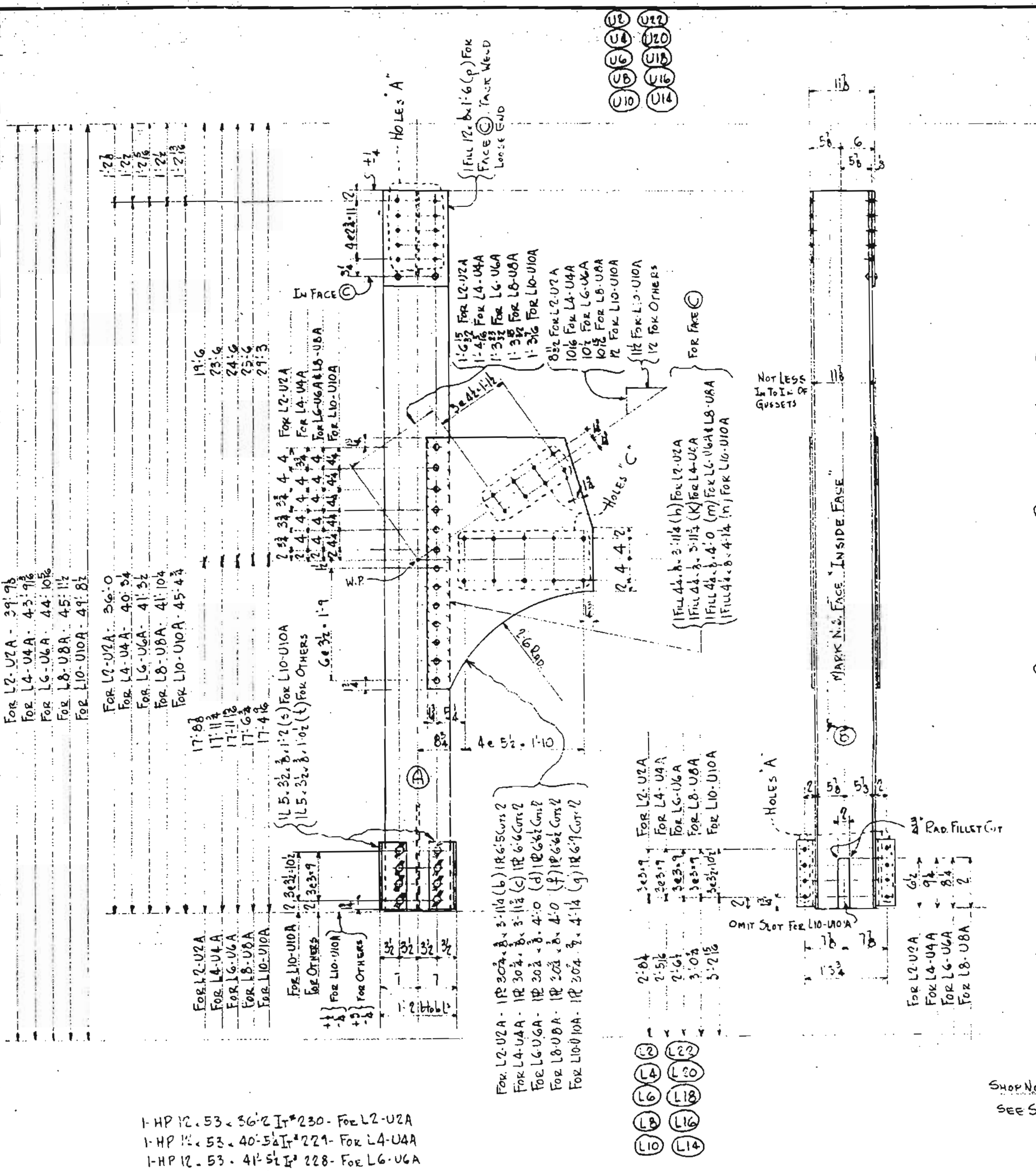
Vertical L3-U3A
Vertical L3-U3B
Vertical L21-U21B
Vertical L21-U21A
} Alike Except Shipping Mark

Vertical L5-U5A
Vertical L5-U5B
Vertical L19-U19B
Vertical L19-U19A
} Alike Except Shipping Mark

Vertical L7-U7A
Vertical L7-U7B
Vertical L17-U17B
Vertical L17-U17A
} Alike Except Shipping Mark

Vertical L9-U9A
Vertical L9-U9B
Vertical L15-U15B
Vertical L15-U15A
} Alike Except Shipping Mark

Vertical L11-U11A
Vertical L11-U11B
Vertical L13-U13B
Vertical L13-U13A
} Alike Except Shipping Mark



C Face C Opp. Hand To Face A Except As Noted, Respectively

1-HP 12.53. 36'-2 It# 230- For L2-U2A
1-HP 12.53. 40'-5¼ It# 229- For L4-U4A
1-HP 12.53. 41'-5½ It# 228- For L6-U6A
1-HP 12.53. 42'-0¼ It# 227- For L8-U8A
1-HP 12.53. 45'-6¾ It# 226 For L10-U10A

Vertical L2-U2A- As Shown
Vertical L22-U22B- Do
} Alike Except Shipping Mark

Vertical L2-U2B-Opp. Hand To L2-U2A
Vertical L22-U22A-Opp. Hand To L2-U2A
} Alike Except Shipping Mark

Vertical L4-U4A- As Shown
Vertical L20-U20B- Do
} Alike Except Shipping Mark

Vertical L4-U4B-Opp. Hand To L4-U4A
Vertical L20-U20A-Opp. Hand To L4-U4A
} Alike Except Shipping Mark

Vertical L6-U6A- As Shown
Vertical L18-U18B- Do
} Alike Except Shipping Mark

Vertical L6-U6B-Opp. Hand To L6-U6A
Vertical L18-U18A-Opp. Hand To L6-U6A
} Alike Except Shipping Mark

Vertical L8-U8A- As Shown
Vertical L16-U16B- Do
} Alike Except Shipping Mark

Vertical L8-U8B-Opp. Hand To L8-U8A
Vertical L16-U16A-Opp. Hand To L8-U8A
} Alike Except Shipping Mark

Vertical L10-U10A- As Shown
Vertical L14-U14B- Do
} Alike Except Shipping Mark

Vertical L10-U10B-Opp. Hand To L10-U10A
Vertical L14-U14A-Opp. Hand To L10-U10A
} Alike Except Shipping Mark

Rivets
Open Holes
Ream
Milling
Paint
} See General Notes

Required List		
No. Req'd	Description	Mark
One	Vertical	L1-U1A
One	Do	L1-U1B
One	Do	L23-U23B
One	Do	L23-U23A
One	Do	L3-U3A
One	Do	L3-U3B
One	Do	L21-U21B
One	Do	L21-U21A
One	Do	L5-U5A
One	Do	L5-U5B
One	Do	L19-U19B
One	Do	L19-U19A
One	Do	L7-U7A
One	Do	L7-U7B
One	Do	L17-U17B
One	Do	L17-U17A
One	Do	L9-U9A
One	Do	L9-U9B
One	Do	L15-U15B
One	Do	L15-U15A
One	Do	L11-U11A
One	Do	L11-U11B
One	Do	L13-U13B
One	Do	L13-U13A
One	Do	L2-U2A
One	Do	L2-U2B
One	Do	L22-U22B
One	Do	L22-U22A
One	Do	L4-U4A
One	Do	L4-U4B
One	Do	L20-U20B
One	Do	L20-U20A
One	Do	L6-U6A
One	Do	L6-U6B
One	Do	L18-U18B
One	Do	L18-U18A
One	Do	L8-U8A
One	Do	L8-U8B
One	Do	L16-U16B
One	Do	L16-U16A
One	Do	L10-U10A
One	Do	L10-U10B
One	Do	L14-U14B
One	Do	L14-U14A

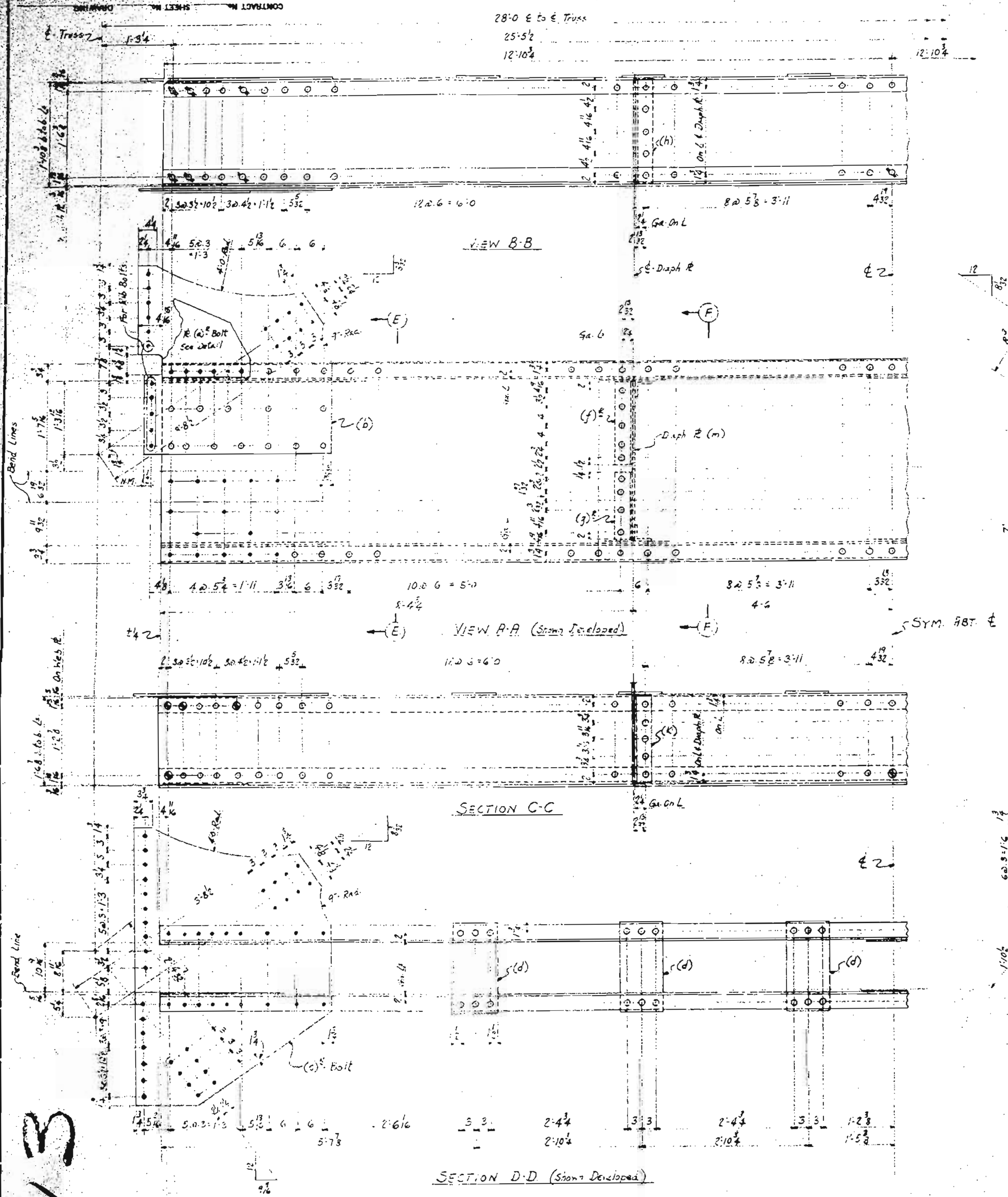
Shop Note:-
See Sheet 35 For General Notes.

C-98

Vert. L1-U1, L2-U2, L3-U3, L4-U4, L5-U5, L6-U6, L7-U7, L8-U8, L9-U9, L10-U10 & L11-U11
Vert. L23-U23, L22-U22, L21-U21, L20-U20, L19-U19, L18-U18, L17-U17, L16-U16, L15-U15, L14-U14, L13-U13

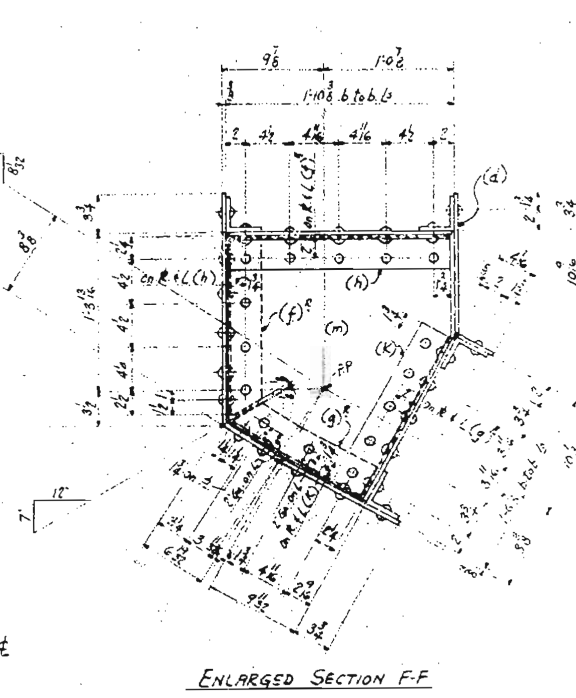
Temp.
Supt.
Layout
Fitter
Shop Insp.
Pc. Wk.
B. Smith
Mch.
Erect.
O. Insp.

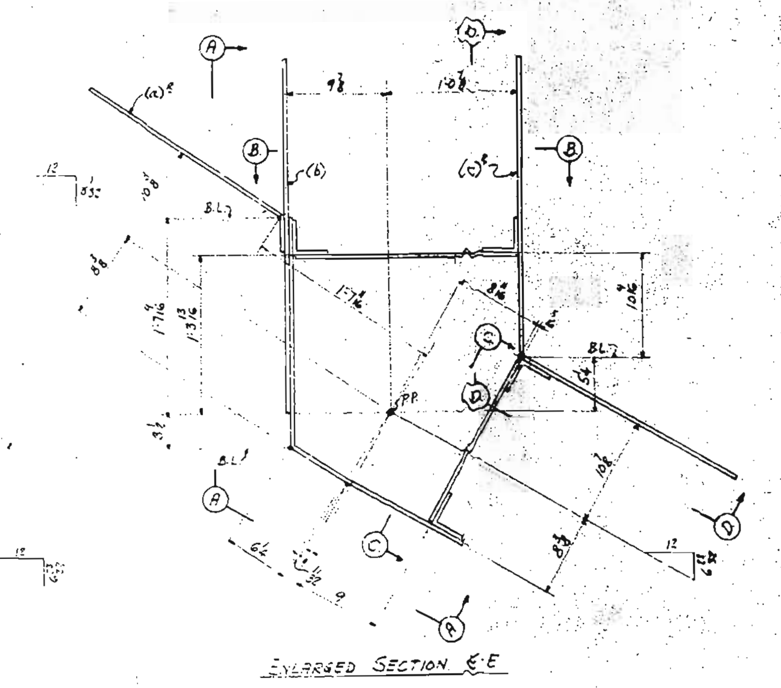
Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
BETHLEHEM STEEL CORPORATION
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
In Charge Jenks Made by C.A.D.
Checked by J. Shaky Traced by
Approved Last Revised
Shop No. Contract CG 94098 Sheet 40



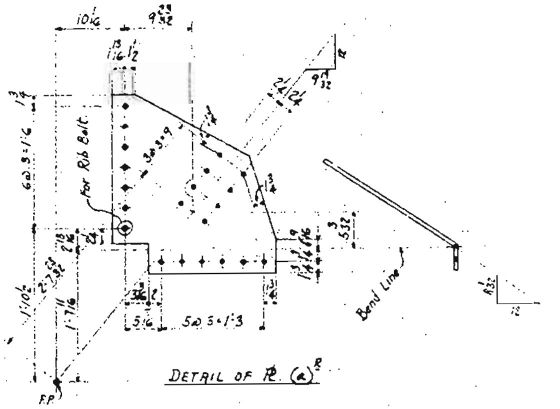
Bill of Material For One Top Strut - TS1

- 1-Cov ℞ 42½ U.M. x ⅜ x 25'-9½ - Bent - Ord. 25'-11 - It. 241
- 1-Web ℞ 2? U.M. x $\frac{5}{16}$ x 25'-9½ - Ord. 25'-11 - It. 304
- 1-Web ℞ 18½ U.M. x $\frac{5}{16}$ x 25'-9½ - Ord. 25'-11 - It. 311
- 4-Ls 3½ x 3½ x $\frac{5}{16}$ x 25'-9½ - Ord. 25'-11 - It. 275
- 2-℞s 23¾ x ⅜ x 2'-2¼ - (a)℄ - Bent - (1-℞ 3'-6¾ cuts 2)
- 2-℞s 41½ x ⅜ x 3'-5⅞ - (b) - (1-℞ 6'-1½ cuts 2)
- 2-℞s 41½ x ⅜ x 4'-10 - (c)℄ - Bent - Bolt (1-℞ 17'-3 cuts 4)
- 6-Tie ℞s 4 U.M. x ⅜ x 1'-6⅛ - (d) - Bent
- 2-Ls 3½ x 3½ x $\frac{5}{16}$ x 1'-5¾ - (f)℄
- 2-Ls 3½ x 3½ x $\frac{5}{16}$ x 1'-2⅝ - (g)℄ - Bent
- 2-Ls 3½ x 3½ x $\frac{5}{16}$ x 1'-9⅞ - (h)
- 2-Ls 3½ x 3½ x $\frac{5}{16}$ x 1'-6⅞ - (k)
- 2-Diaph. ℞s 21⅞ x $\frac{5}{16}$ x 2'-2⅛ - (m) - (1-℞ 4'-2 cuts 2)


ENLARGED SECTION F-F


ENLARGED SECTION E-E

No. Req'd	Description	Mark
2	Top Struts (at VII)	TS1


DETAIL OF ℞ (a)℄

L-98

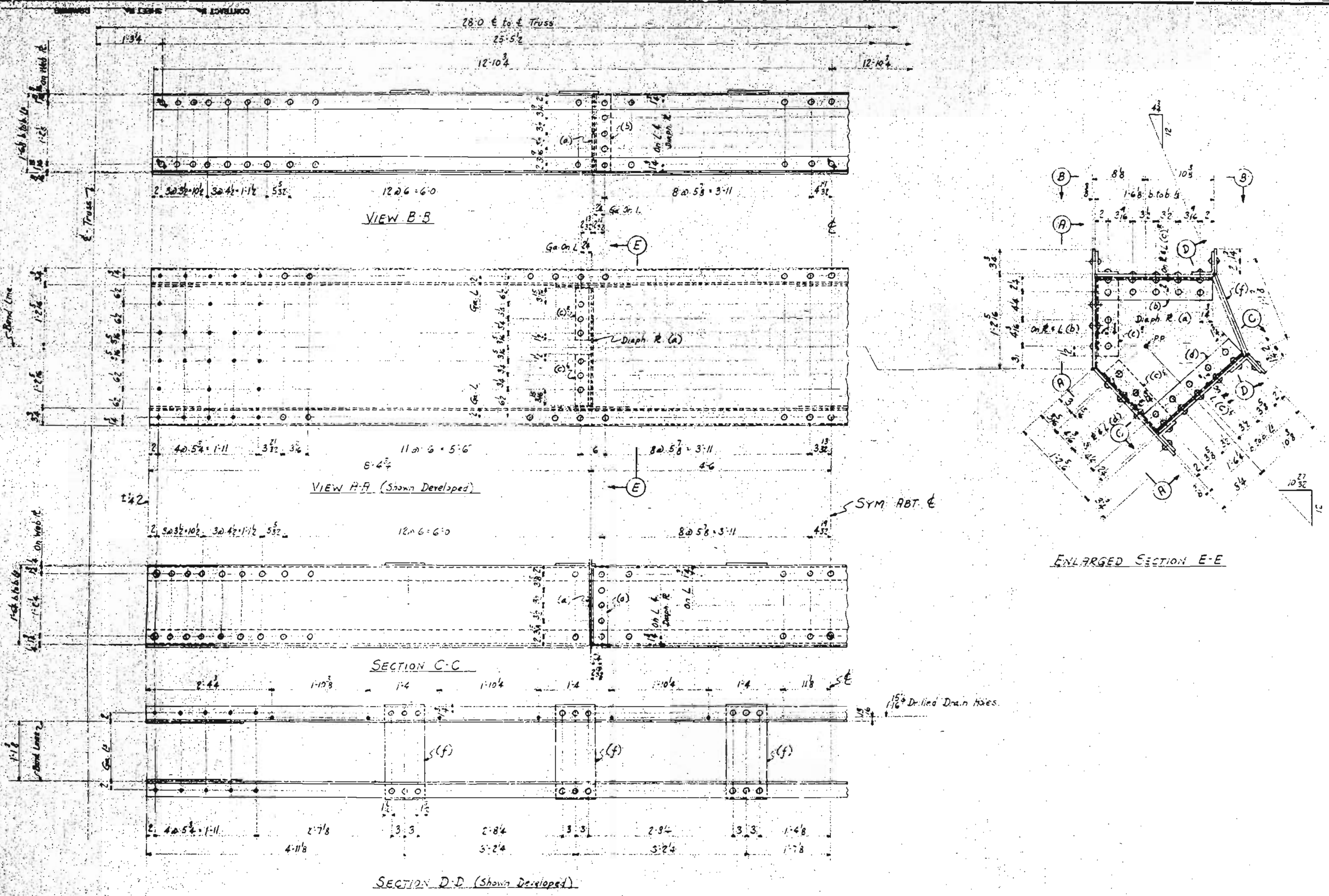
GENERAL NOTES:

Material Spec: Structural Steel as per A.S.T.M. - A7-34
Workmanship Spec: As per Project Specifications.
Shop Inspection: By R.W. Hunt Co.
Shop Contact Surfaces: Shop contact surfaces are not to be painted but to be cleaned same as painted surfaces.
Painting & Cleaning: To be as per project specifications.
Shop Paint: One coat of an approved Red Lead Paint as per Project Specifications.

RIVETS - ⅞"
OPEN HOLES - $\frac{15}{16}$"
REAM - None
MILLING - None
PAINT - See General Notes.

TOP STRUT TS1 - (At VII)
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA.
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawn at Chicago [illegible] Chicago
IN CHARGE OF [illegible] MADE BY B.K.
CHECKED BY [illegible]
REVISED [illegible]
SHOP NO. CONTRACT CG 34098 (41)

3/13



BILL OF MATERIAL FOR ONE TOP STRUT - TS2

1-Cov. R 36 U.M. x 3/8 x 25'-9½ - Bent - ORD 25'-11 - It. 243
2-Web Rs 17¾ U.M. x 5/16 x 25'-9½ - ORD 25'-11 - It. 32[illegible]
4-Flg. Ls 3½ x 3½ x 5/16 x 25'-9½ - ORD 25'-11 - It. 275
2-Diaph. R 21¼ x 5/16 x 2'-1¼ - (a) (1 R 7'-3½ cuts 4)
2-Ls 3½ x 3½ x 5/16 x 1'-5 5/8 - (b)
4-Ls 3½ x 3½ x 5/16 x 0'-11 5/16 - (c) & (c)₂
2-Ls 3½ x 3½ x 5/16 x 1'-5 3/4 - (d)
6-Tie Rs 10 U.M. x 3/8 x 1'-8 3/4 - (f) - Bent

REQUIRED LIST

No. Reqd.	Description	Mark
2	Top Struts (at U)	TS2

L-98

GENERAL NOTES:

Material: Structural Steel as per A.S.T.M. A7-34.
Workmanship Spec.: As per Project Specifications.
Shop Inspection: By R. W. Hunt Co.
Shop Assembly: Shop contact surfaces are not to be painted but to be cleaned same as painted surfaces.
[illegible] - To be as per project specifications.
Shop Paint: One coat of an approved Red Lead Paint as per Project Specifications.

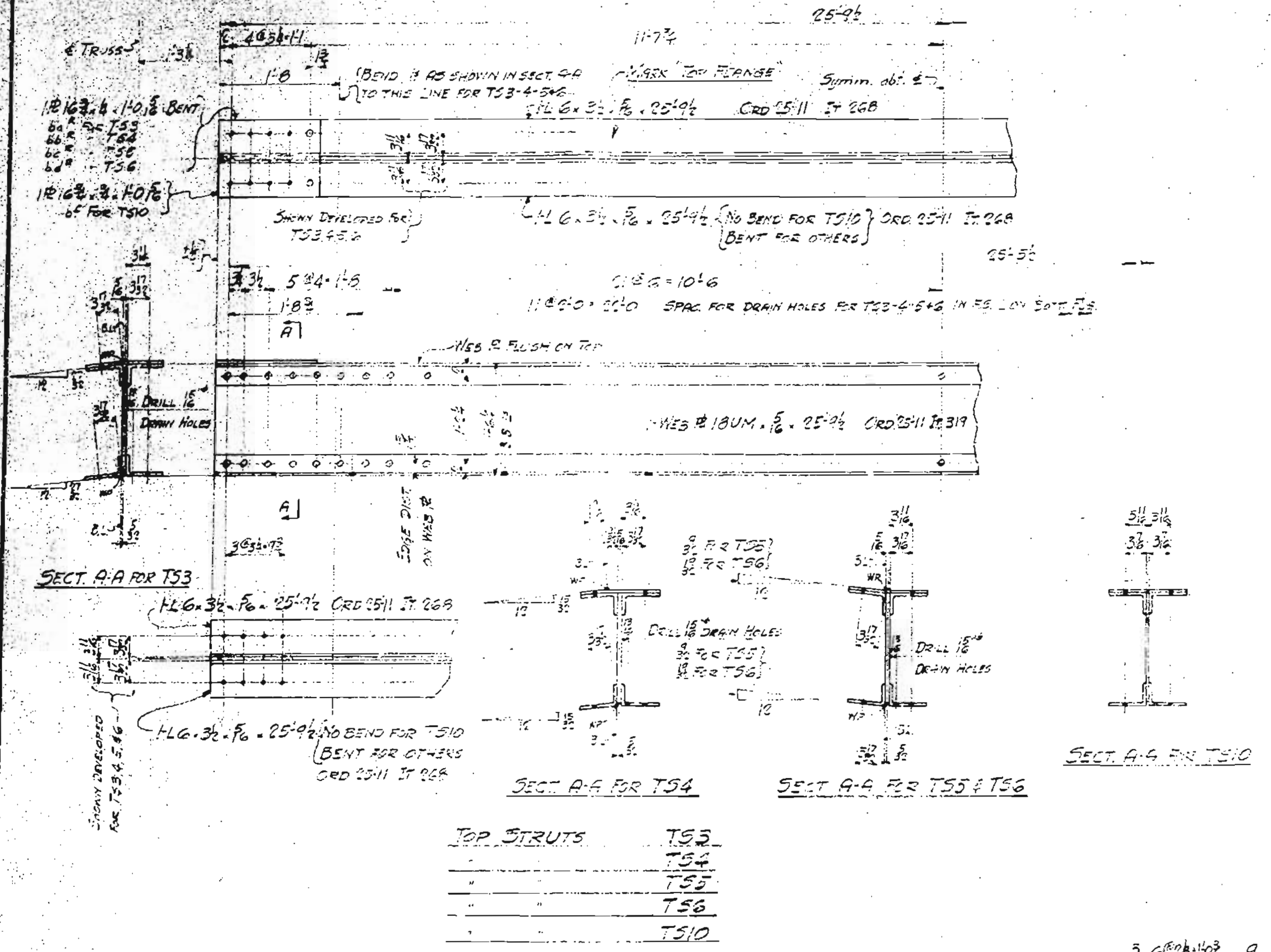
RIVETS - 7/8"
OPEN HOLES - 15/16"
REAM - None
MILLING - None
PAINT - See General Notes.

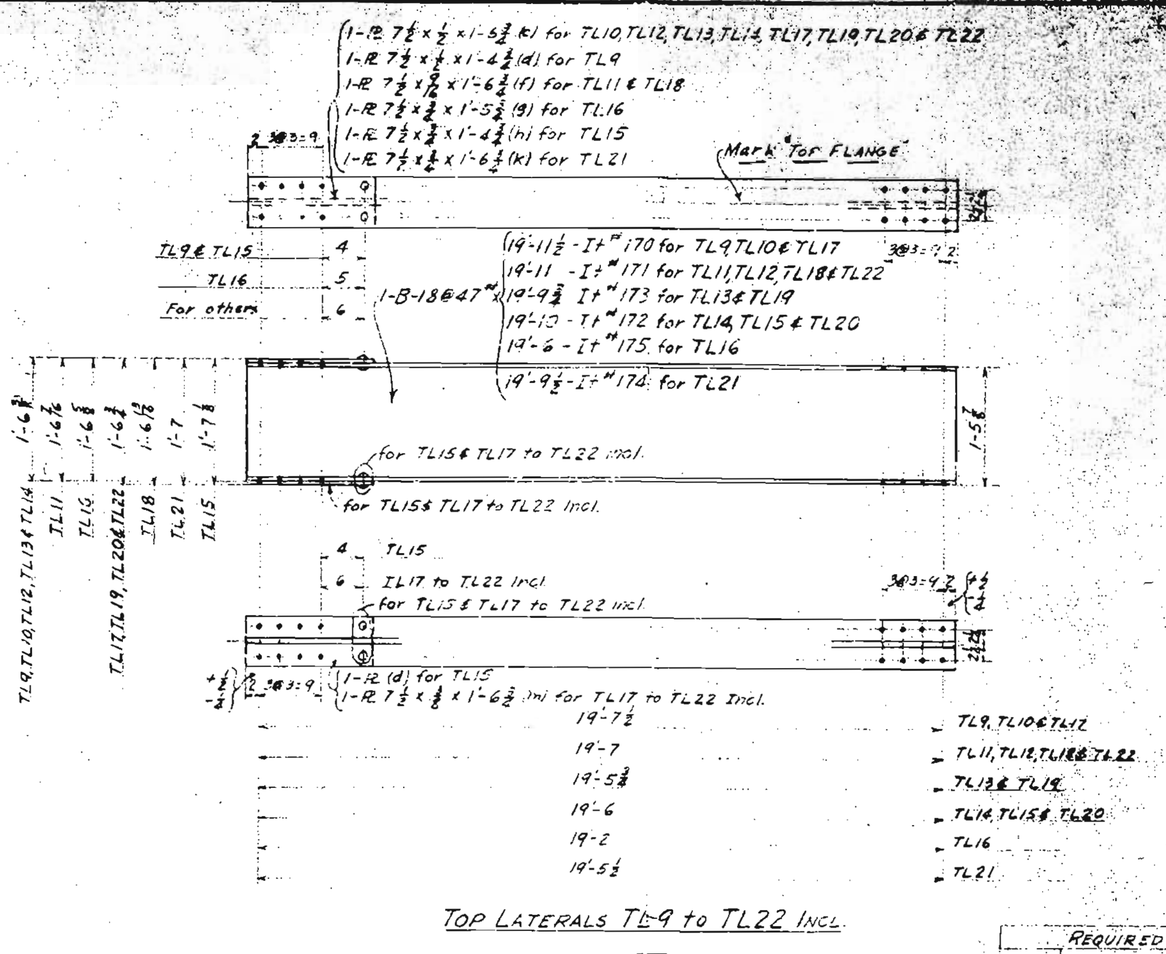
Top Strut TS2 (at U)
Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri
[illegible]

SHOP NO.

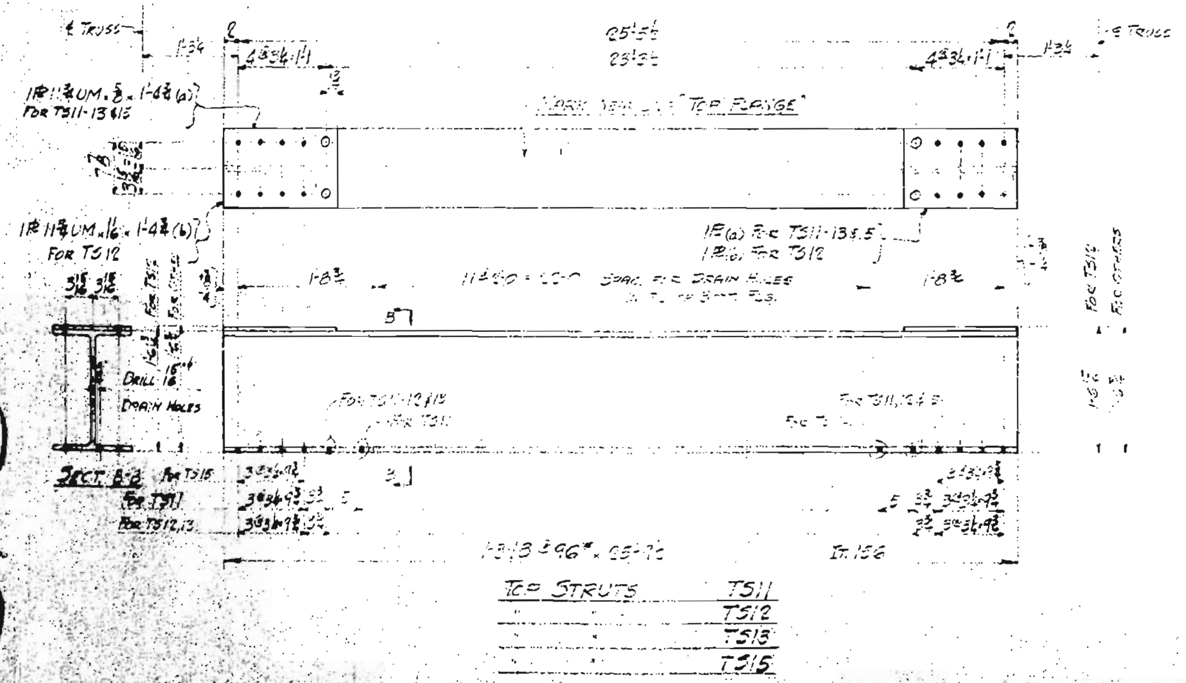
314

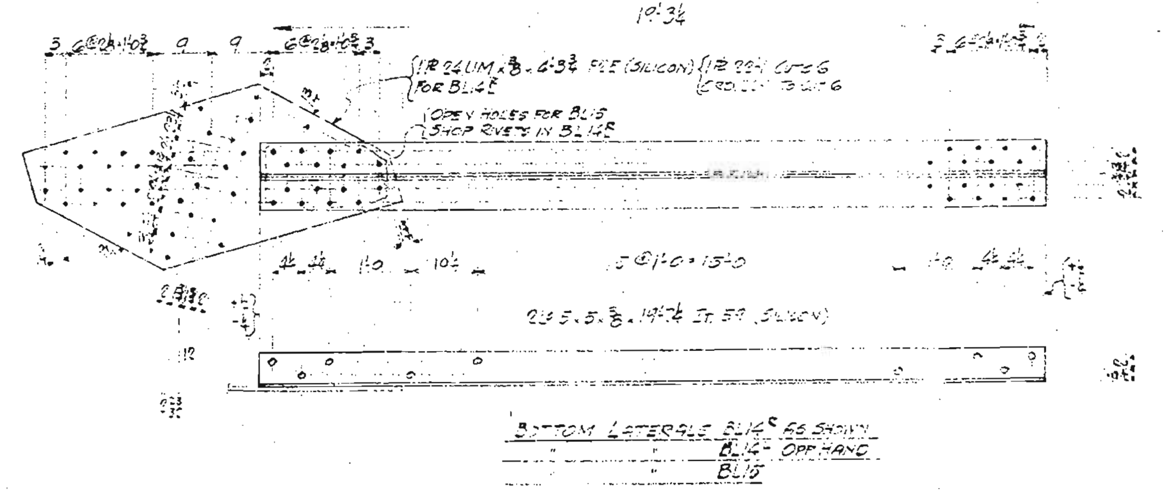
L-98





1-℞ 7½ x ½ x 1'-6¾ (c) for TL10, TL12, TL13, TL14, TL17, TL19, TL20 & TL22
1-℞ 7½ x ½ x 1'-4½ (d) for TL9
1-℞ 7½ x ⅜ x 1'-6½ (f) for TL11 & TL18
1-℞ 7½ x ⅜ x 1'-5¾ (g) for TL16
1-℞ 7½ x ⅜ x 1'-4½ (h) for TL15
1-℞ 7½ x ½ x 1'-6½ (k) for TL21
Mark "Top Flange"
19'-11½ - It# 170 for TL9, TL10 & TL17
19'-11 - It# 171 for TL11, TL12, TL18 & TL22
19'-9¾ It# 173 for TL13 & TL19
19'-10 - It# 172 for TL14, TL15 & TL20
19'-6 - It# 175 for TL16
19'-9½ - It# 174 for TL21
1-B-18@47#
for TL15 & TL17 to TL22 incl.
Top Laterals TL9 to TL22 Incl.





Required List		
No. Reqd.	Description	Mark
3	Bottom Laterals	BL14R
3	"	BL14L
2	Top Struts	TS3
2	"	TS4
2	"	TS5
2	"	TS6
One	"	TS10
2	"	TS11
2	"	TS12
4	"	TS13
2	"	TS15
6	Bottom Laterals	BL15
2	Top Laterals	TL9
2	"	TL10
4	"	TL11
2	"	TL12
6	"	TL13
2	"	TL14
2	"	TL15
2	"	TL16
4	"	TL17
4	"	TL18
6	"	TL19
4	"	TL20
2	"	TL21
2	"	[illegible]

General Notes:-
Material:- All material to be carbon steel unless noted "Silicon".
Material Spec.:- Carbon Steel as per ASTM-A7-34. Silicon Steel as per ASTM-A94-36
Workmanship Spec.:- As per Project Specifications
Shop Inspection:- By R.W. Hunt Co.
Silicon Steel ℞:- All sheared edges of silicon steel plate to be cut with [illegible] edge distance and then finished to dimensions shown.
Punching & Reaming:- All holes for shop and field rivets in Silicon Steel to be [illegible] and reamed to size after assembly. All other holes for shop and field rivets may be punched full size except where noted to be [illegible]
Shop Assembly:- Shop contact surfaces are not to be painted but shall be cleaned same as painted surfaces.
Cleaning and Painting:- To be as per Project Specifications.
Shop Paint:- One coat of an Approved Red Lead Paint as per Project Specifications

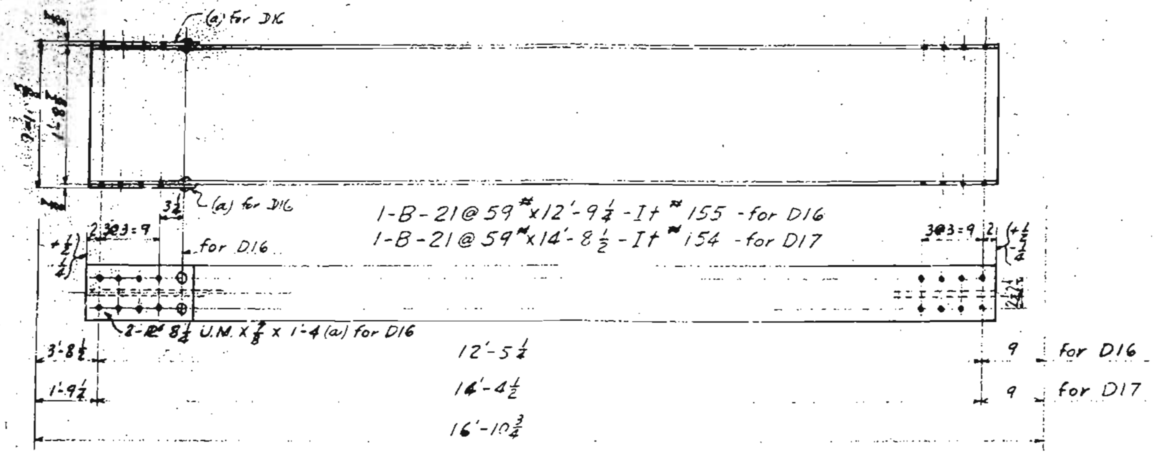
RIVETS - ⅞
OPEN HOLES - 15/16
REAM - See General Notes
MILLING - None
PAINT - See General Notes

L-98

Top Struts [illegible]
Missouri [illegible]
At [illegible]
For [illegible]

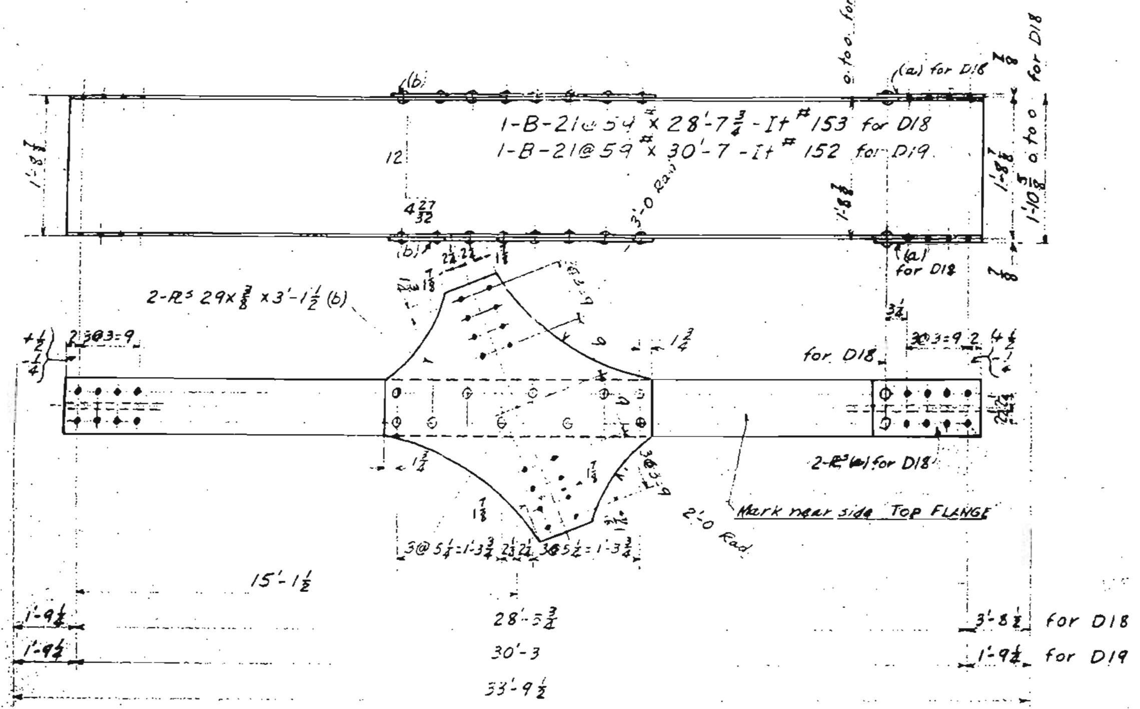
315

L-98

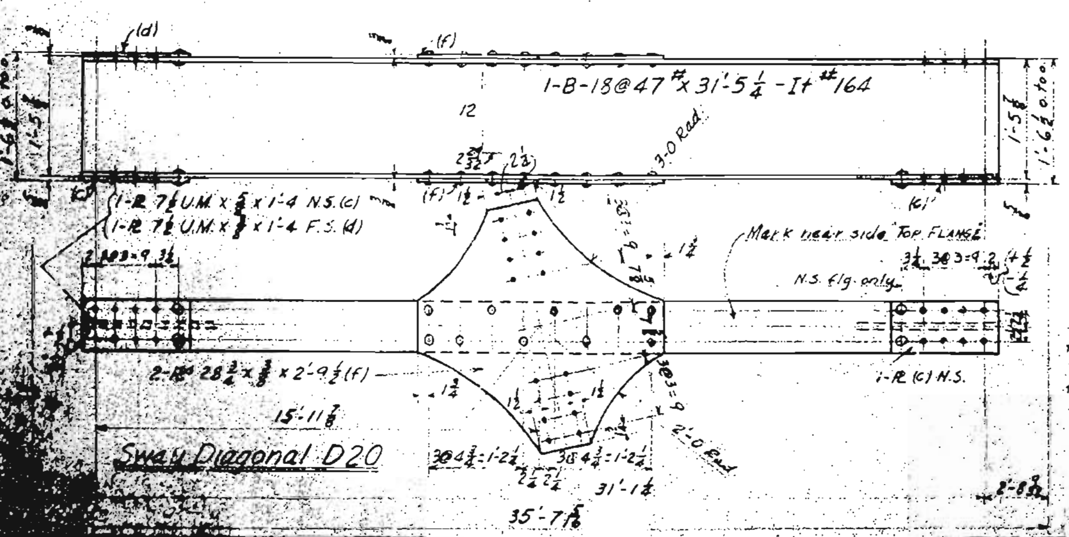


(a) for D16
1-B-21@59#x12'-9¼-It#155 - for D16
1-B-21@59#x14'-8½-It#154 - for D17
2-R 8¾ U.M.x⅜x1-4 (a) for D16
12'-5½
14'-4½
16'-10¾
9 for D16
9 for D17

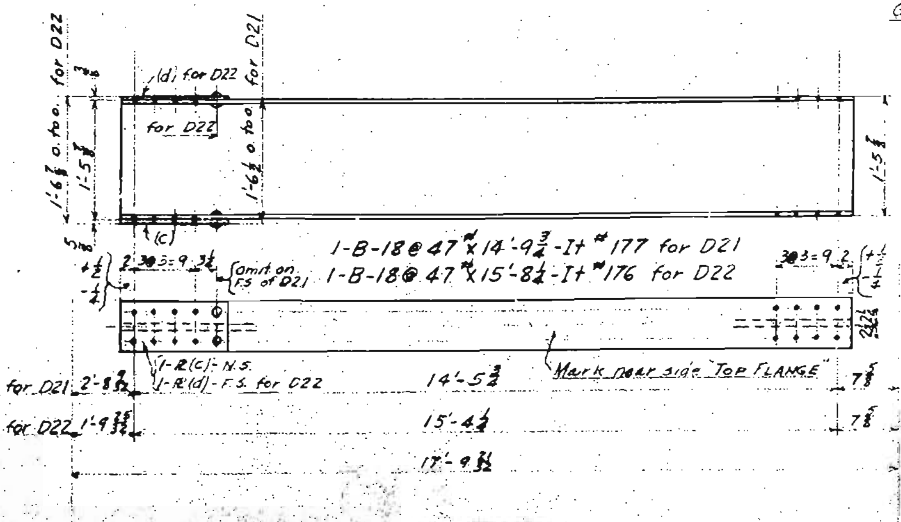
Sway Diagonals D16 & D17



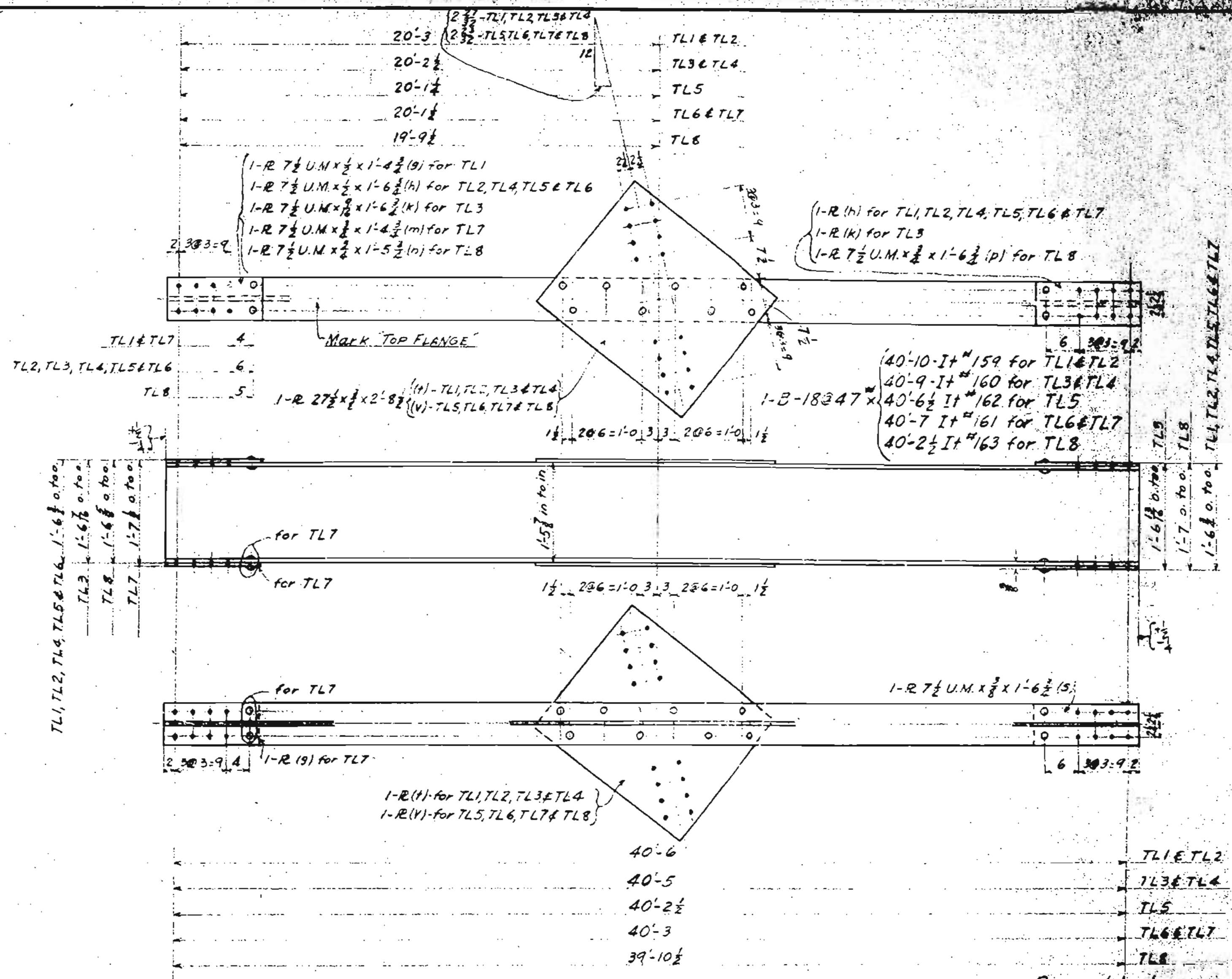
Sway Diagonals D18 & D19



Sway Diagonal D20



Sway Diagonals D21 & D22



20'-3
20'-2½
20'-1½
20'-1½
19'-9½
TL1 & TL2
TL3 & TL4
TL5
TL6 & TL7
TL8
1-R 7½ U.M.x⅜x1'-4½ (g) for TL1
1-R 7½ U.M.x⅜x1'-6½ (h) for TL2, TL4, TL5 & TL6
1-R 7½ U.M.x⅜x1'-6⅞ (k) for TL3
1-R 7½ U.M.x⅜x1'-4⅞ (m) for TL7
1-R 7½ U.M.x⅜x1'-5½ (n) for TL8
1-R (h) for TL1, TL2, TL4, TL5, TL6 & TL7
1-R (k) for TL3
1-R 7½ U.M.x⅜x1'-6½ (p) for TL8
Mark Top FLANGE
1-R 27½x⅜x2'-8½ (t) - TL1, TL2, TL3 & TL4
(v) - TL5, TL6, TL7 & TL8
1-B-18@47#x 40'-10-It#159 for TL1 & TL2
40'-9-It#160 for TL3 & TL4
40'-6½ It#162 for TL5
40'-7 It#161 for TL6 & TL7
40'-2½ It#163 for TL8
for TL7
1-R 7½ U.M.x⅜x1'-6½ (s)
1-R (g) for TL7
1-R (t) for TL1, TL2, TL3 & TL4
1-R (v) for TL5, TL6, TL7 & TL8
40'-6
40'-5
40'-2½
40'-3
39'-10½

Top Laterals TL1 to TL8 Incl.

Required List

No. Req'd	Description	Mark
2	Sway Diagonals	D16
6	do	D17
2	do	D18
2	do	D19
2	do	D20
2	do	D21
2	do	D22
2	Top Laterals	TL1
2	do	TL2
4	do	TL3
2	do	TL4
6	do	TL5
2	do	TL6
2	do	TL7
2	do	TL8

General Notes:-

Material Specs:- ASTM - A7-34

Workmanship Specs:- As per Project Specifications.

Shop Inspection:- By R.W. Hunt Co.

Shop Assembly:- Shop contact surfaces are not to be painted but to be cleaned same as painted surfaces.

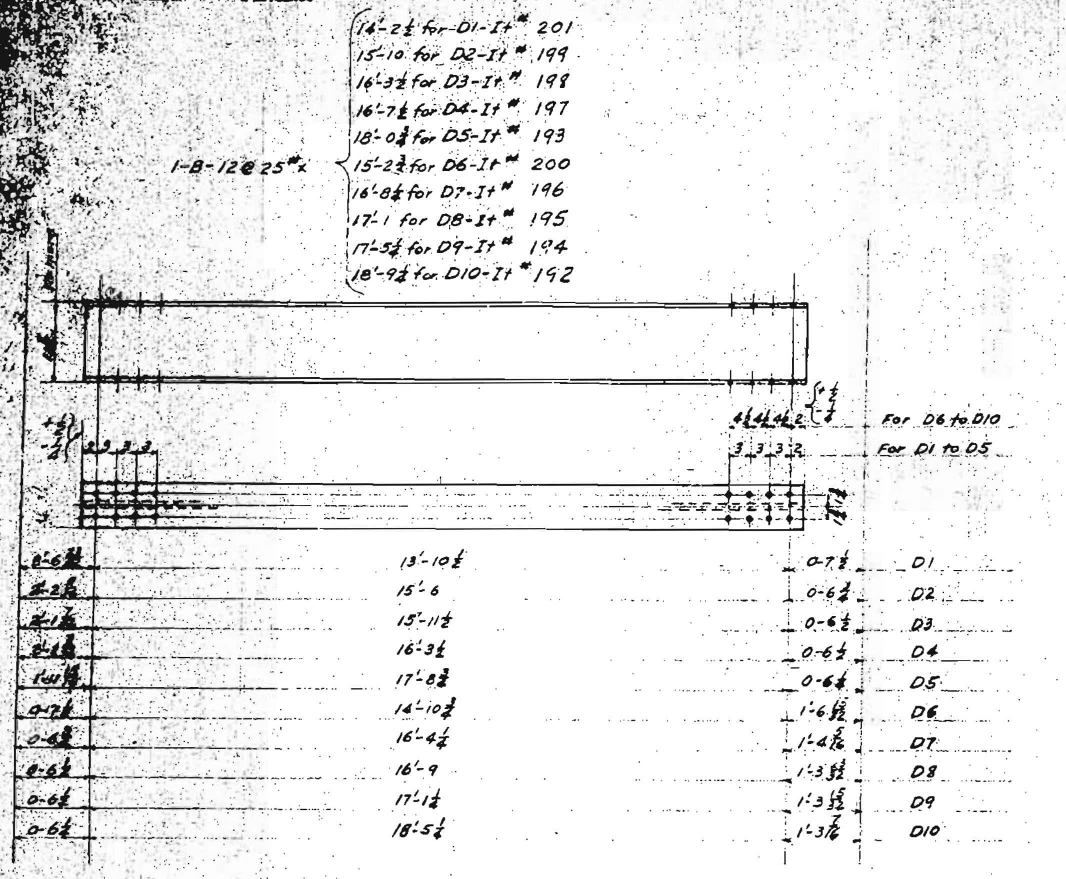
Cleaning & Painting:- To be as per Project Specifications.

Shop Paint:- One coat of an approved Red Lead Paint as per Project Specifications.

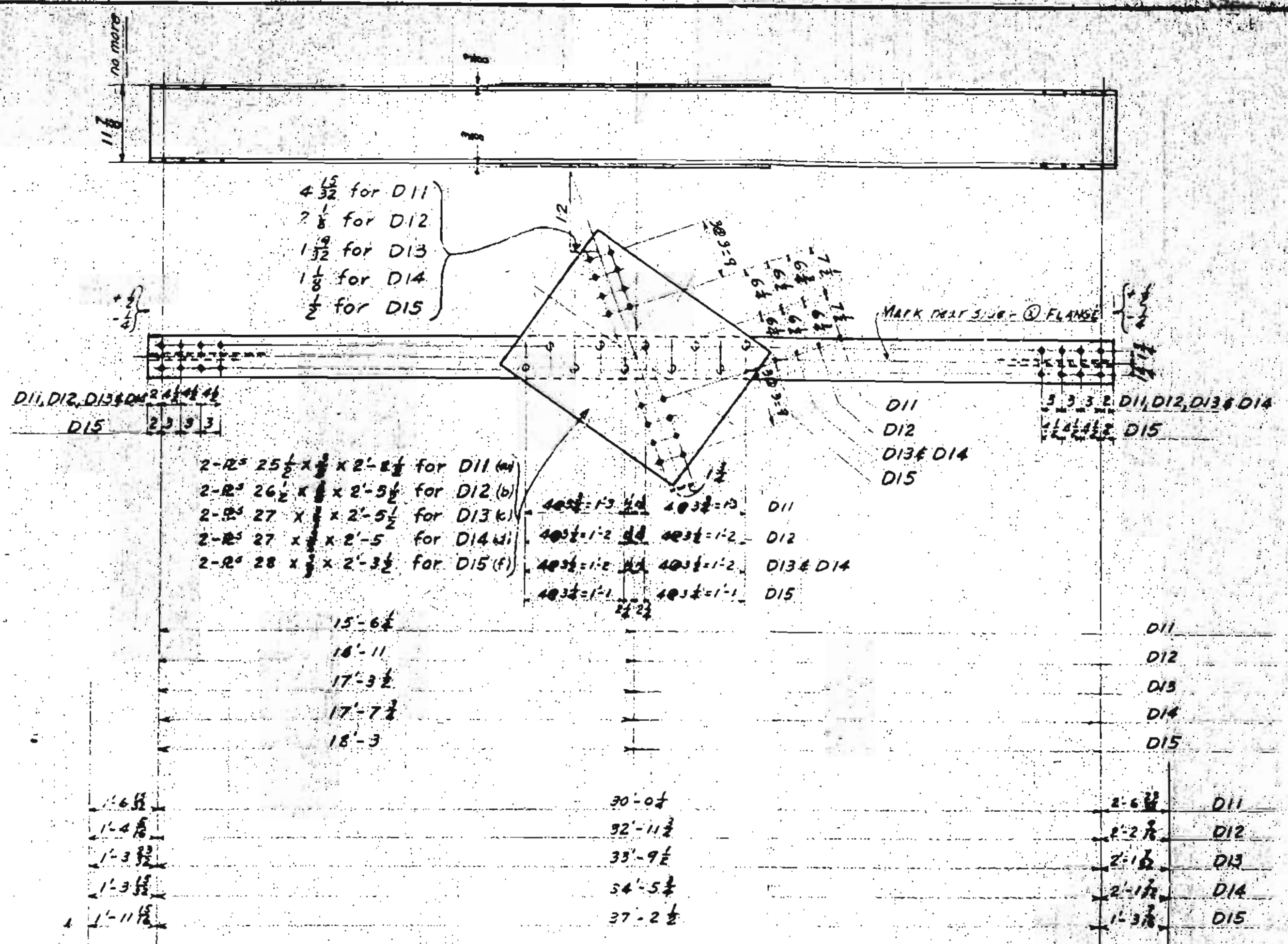
L-98

RIVETS - ⅞ ϕ
OPEN HOLES - $\frac{15}{16}$ ϕ
REAM - None
MILLING - None
PAINT - See General notes

SWAY DIAGONALS & TOP LATERALS
Bridge Over Missouri River
At Brownville Nebr.
For Atchison County Missouri
BETHLEHEM STEEL COMPANY

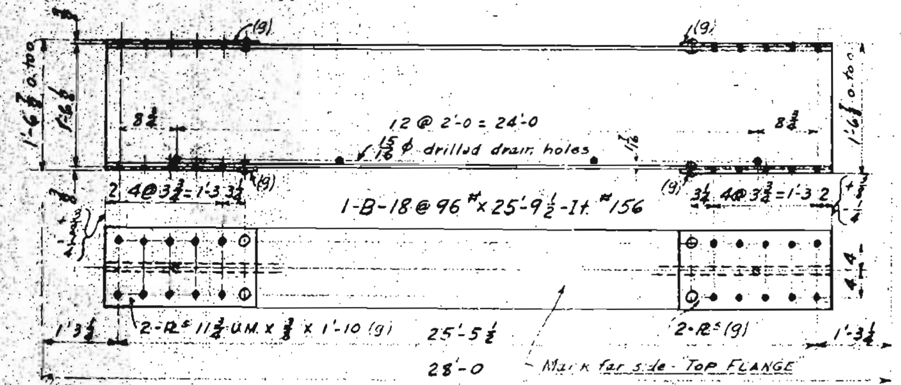


Sway Diagonals D1 to D10 Incl.

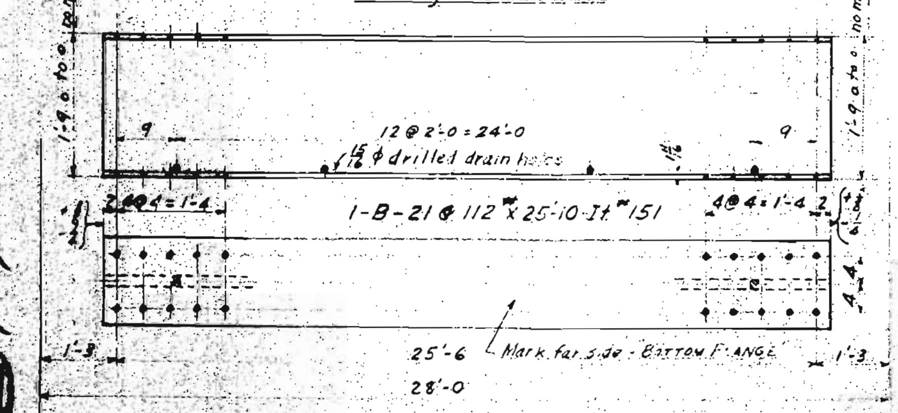


Sway Diagonals D11 to D15 Incl.

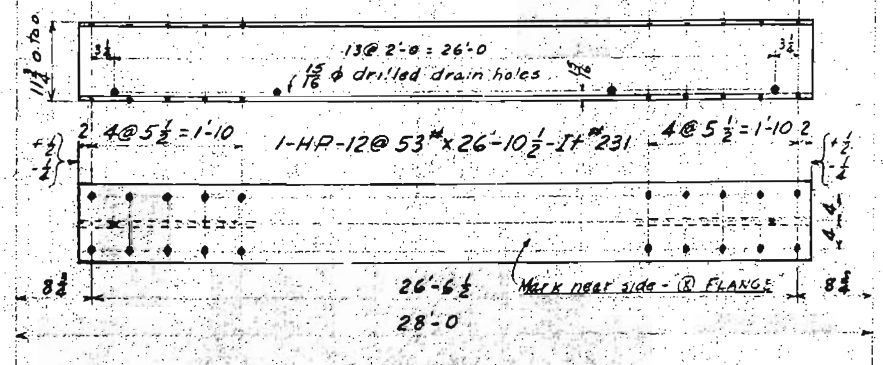
1-B-12@25# x
30'-4½ for D11 It# 191
33'-3½ for D12 It# 190
34'-1½ for D13 It# 189
34'-9¾ for D14 It# 188
37'-6½ for D15 It# 187


(9)
(9)
1'-6⅞ o.to o.
12 @ 2'-0 = 24'-0
15/16 ϕ drilled drain holes
2 4@3½=1'-3½
1-B-18@96# x 25'-9½-It# 156
3½ 4@3½=1'-3 2
1'-3½
2-P 11½ U.M. x ⅜ x 1'-10 (9)
25'-5½
2-P (9)
1'-3½
28'-0
Mark far side - TOP FLANGE

Sway Strut-TS7


no more
1'-9 o.to o.
12 @ 2'-0 = 24'-0
15/16 ϕ drilled drain holes
2 4@4=1'-4
1-B-21@112# x 25'-10-It# 151
4@4=1'-4 2
1'-3
25'-6
Mark far side - BOTTOM FLANGE
1'-3
28'-0

Sway Strut-TS8


11¾ o.to o.
13@ 2'-0 = 26'-0
15/16 ϕ drilled drain holes
2 4@5½=1'-10
1-HP-12@53# x 26'-10½-It# 231
4@5½=1'-10 2
8½
26'-6½
Mark near side - ⓑ FLANGE
8½
28'-0

Sway Strut-TS9

General Notes:-

Material Specs - A.S.T.M. - A7-34

Workmanship Specs - As per Project Specifications.

Shop Inspection - By R.W. Hunt Co.

Shop Assembly - Shop contact surfaces are not to be painted, but to be cleaned same as painted surfaces.

Cleaning & Painting - To be as per Project Specifications.

Shop Paint - One coat of an approved Red Lead Paint as per Project Specifications.

Required List

No. Reqd	Description	Mark
2	Sway Strut	TS7
4	do	TS8
10	do	TS9
2	Sway Diagonal	D1
2	do	D2
2	do	D3
2	do	D4
2	do	D5
2	do	D6
2	do	D7
2	do	D8
2	do	D9
2	do	D10
2	do	D11
2	do	D12
2	do	D13
2	do	D14
2	do	D15

L-98

RIVETS - ⅞ ϕ
OPEN HOLES - 15/16 ϕ
REAM - None
MILLING - None
PAINT - See general notes

SWAY BRACING

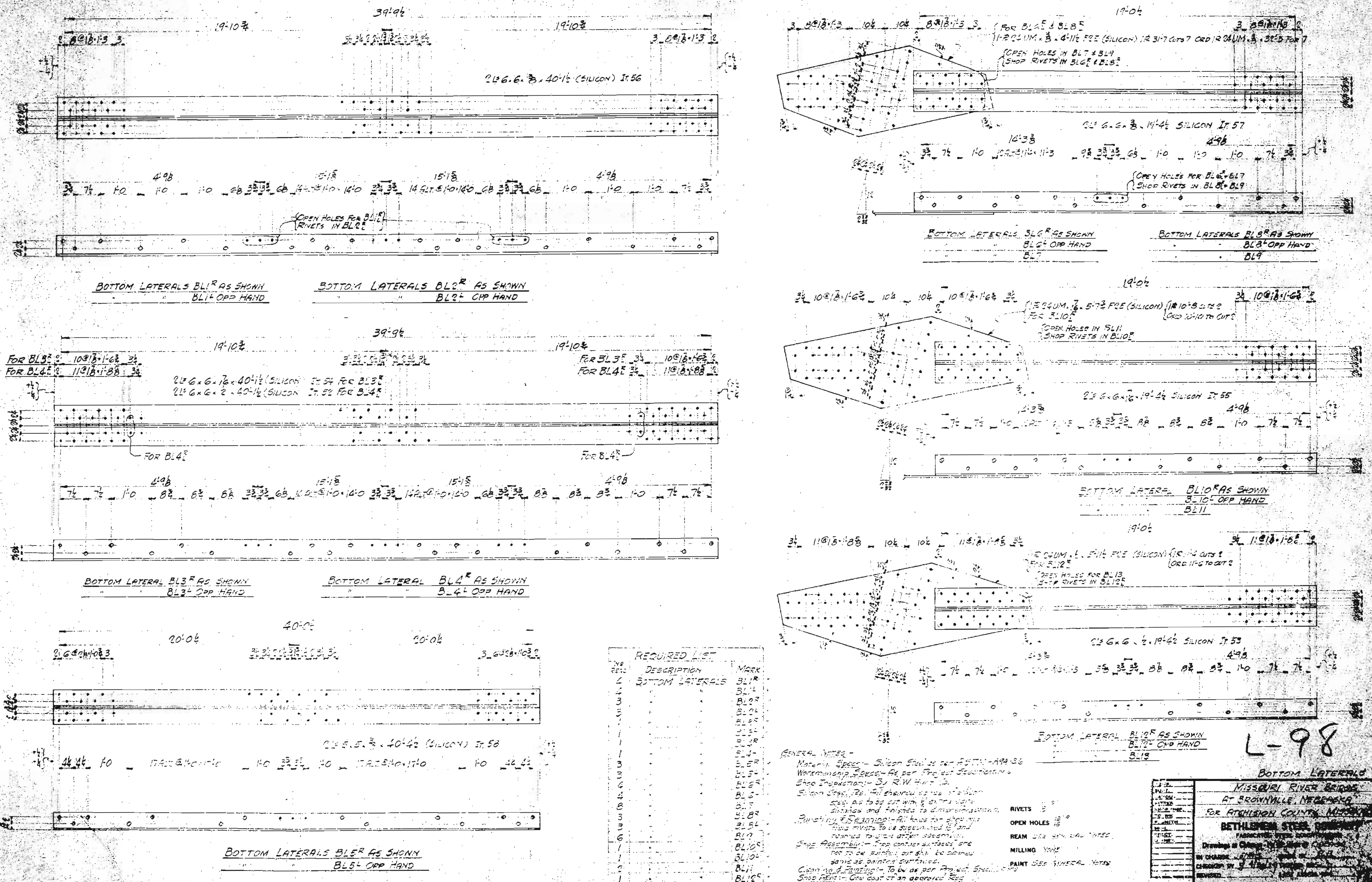
Bridge Over Missouri River
At Brownville, Nebr.
For Atchison County
[illegible]

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
FD. INS.
B. SMITH
MCH.
SHOPT.
CHIPPER

SHOP NO.

317

L-98


39'-9½
19'-10¾
19'-10¾
2L 6.6.⅜.40'-1½ (SILICON) It.56
4'-9⅛
15'-1⅝
15'-1⅝
4'-9⅛
OPEN HOLES FOR BL1L
RIVETS IN BL2L
BOTTOM LATERALS BL1R AS SHOWN
BL1L OPP HAND
BOTTOM LATERALS BL2R AS SHOWN
BL2L OPP HAND
FOR BL3R
FOR BL4R
2L 6×6×⅞×40'-1½ (SILICON) It.54 FOR BL3R
2L 6×6×½×40'-1½ (SILICON) It.52 FOR BL4R
FOR BL4R
BOTTOM LATERAL BL3R AS SHOWN
BL3L OPP HAND
BOTTOM LATERAL BL4R AS SHOWN
BL4L OPP HAND
40'-0½
20'-0¼
20'-0¼
2L 5.5.⅜.40'-4½ (SILICON) It.58
BOTTOM LATERALS BL5R AS SHOWN
BL5L OPP HAND
19'-0½
FOR BL6R & BL8R
OPEN HOLES IN BL7 & BL9
SHOP RIVETS IN BL6R & BL8R
2L 6.6.⅜.14'-4½ SILICON It.57
16'-3⅜
OPEN HOLES FOR BL6L & BL7
SHOP RIVETS IN BL8L & BL9
BOTTOM LATERALS BL6R AS SHOWN
BL6L OPP HAND
BL7
BOTTOM LATERALS BL8R AS SHOWN
BL8L OPP HAND
BL9
19'-0½
FOR BL10R
OPEN HOLES IN BL11
SHOP RIVETS IN BL10R
2L 6×6×⅞×19'-4½ SILICON It.55
BOTTOM LATERAL BL10R AS SHOWN
BL10L OPP HAND
BL11
19'-0½
FOR BL12R
OPEN HOLES FOR BL13
SHOP RIVETS IN BL12R
2L 6×6×½×19'-4½ SILICON It.53
BOTTOM LATERAL BL12R AS SHOWN
BL12L OPP HAND
BL13

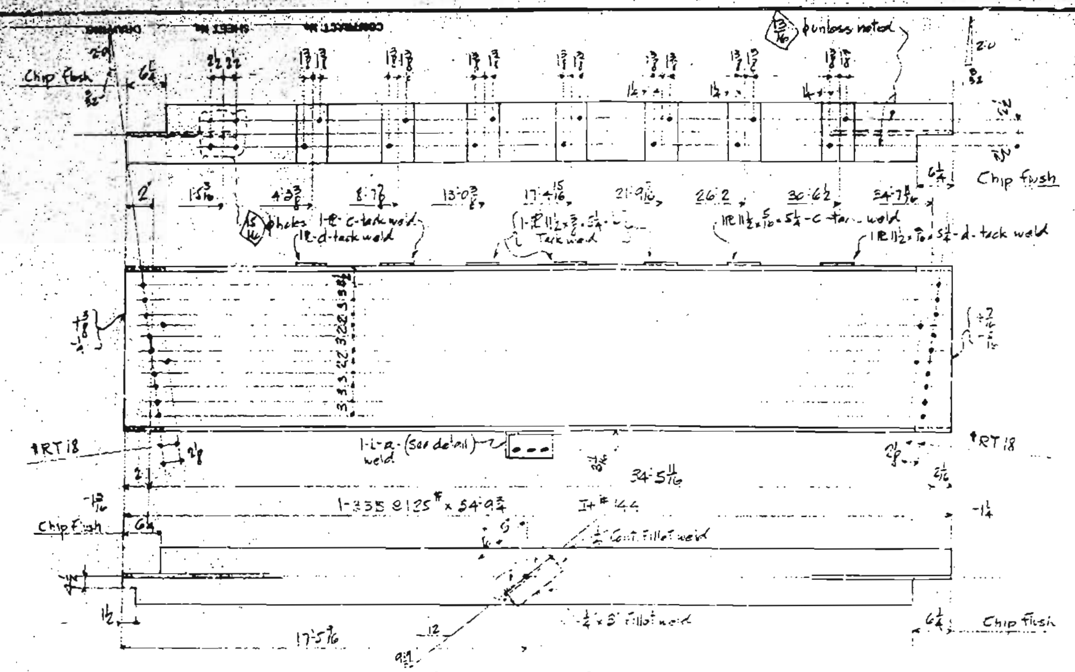
L-98

REQUIRED LIST		
NO REQD	DESCRIPTION	MARK
4	BOTTOM LATERALS	BL1R
4	"	BL1L
3	"	BL2R
3	"	BL2L
1	"	BL3R
1	"	BL3L
1	"	BL4R
1	"	BL4L
3	"	BL5R
3	"	BL5L
4	"	BL6R
4	"	BL6L
8	"	BL7
3	"	BL8R
3	"	BL8L
6	"	BL9
1	"	BL10R
1	"	BL10L
2	"	BL11
1	"	BL12R
1	"	BL12L
2	"	BL13

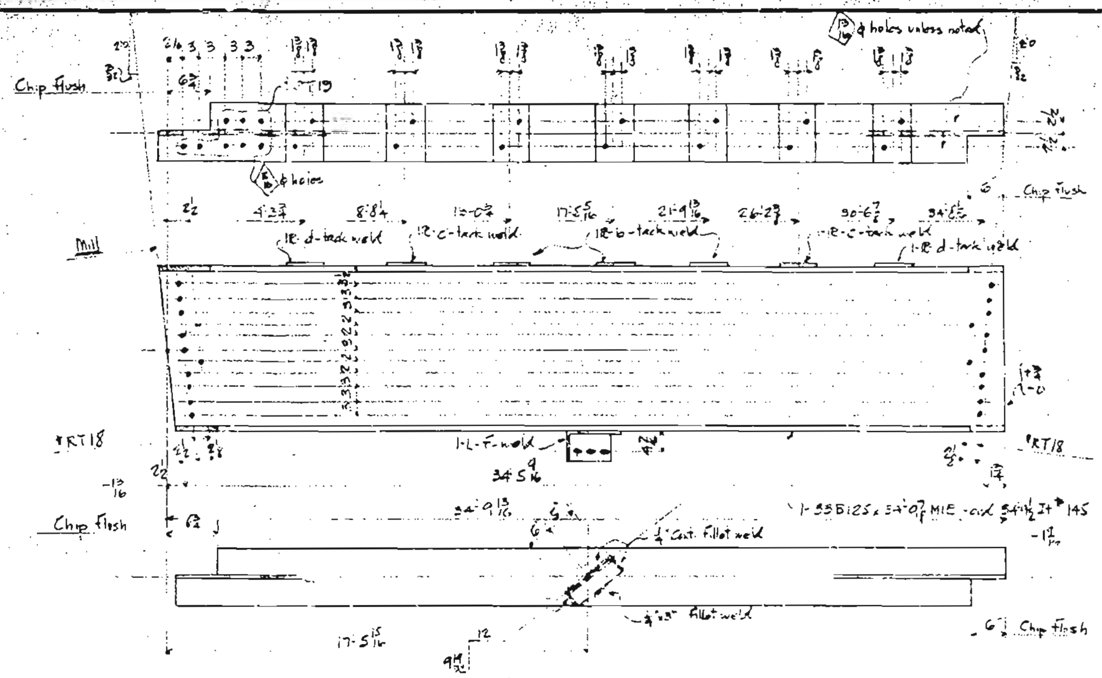
GENERAL NOTES –
Material Specs:– Silicon Steel as per A.S.T.M.-A94-36
Workmanship Specs:– As per Project Specifications
Shop Inspection:– By R.W. Hunt Co.
Silicon Steel Pcs. All sheared edges of silicon steel pcs to be cut with ¼" extra stock and finished to dimension shown.
Punching & Reaming:– All holes for shop and field rivets to be subpunched ⅞" and reamed to size after assembly.
Shop Assembly:– Shop contact surfaces are not to be painted but shall be cleaned same as painted surfaces.
Cleaning & Painting:– To be as per Project Specifications
Shop Paint:– One coat of an approved Red Lead Paint as per Project Specifications

RIVETS ⅞"
OPEN HOLES 15/16"
REAM SEE GENERAL NOTES
MILLING NONE
PAINT SEE GENERAL NOTES

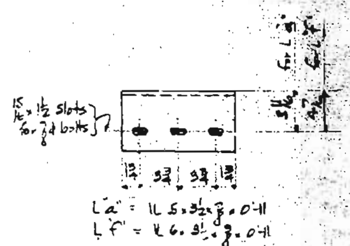
BOTTOM LATERALS
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago
IN CHARGE
CHECKED BY
REVISED
SHOP NO.
CONTRACT C.S. 36092



STRINGER $S50^{R}$ as shown
STRINGER $S50^{L}$ opp hand

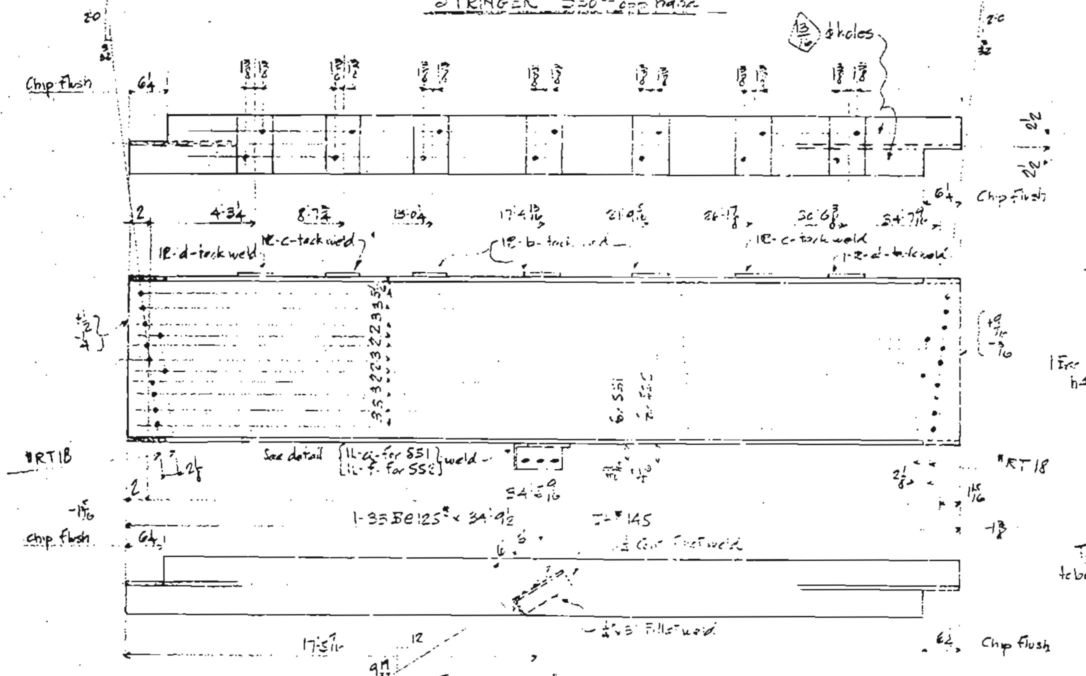


STRINGER $S53^{R}$ as shown
STRINGER $S53^{L}$ opp hand

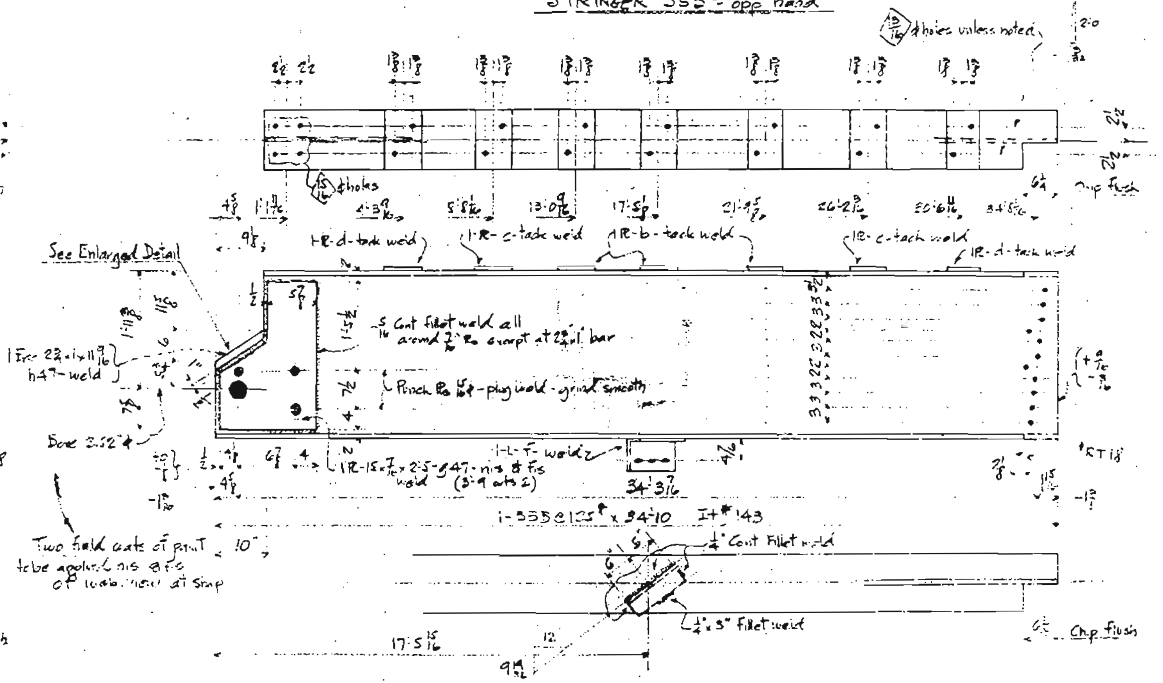


L"a" = L 5 × 3½ × ⅜ × 0'-11
L"F" = L 6 × 3½ × ⅜ × 0'-11

Detail of L's "a" & "F"

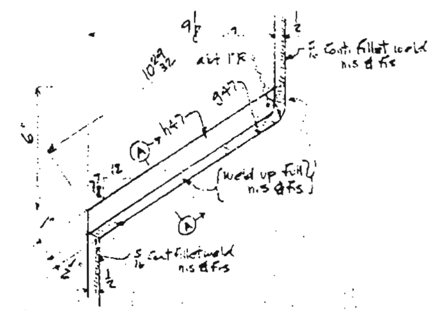


STRINGERS #$S51^{R}$ & $S52^{R}$ as shown
STRINGERS #$S51^{L}$ & $S52^{L}$ opp hand



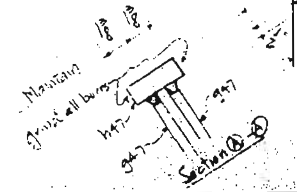
See Enlarged Detail
5/16 Cont. fillet weld all around 2¾ × 1 except at 2¾ × 1 bar
Punch & ⅞ plug weld - grind smooth
1 Pc. 2¾ × 1 × 11 h47 weld
Bore 2.22" ⌀
Two field coats of paint to be applied on s & fs of web near at shop
1-L-F weld
#RT18
1-335 B 125# × 54'-10
I+# 143
¼ Cont. Fillet weld
¼ × 3" Fillet weld
Chip flush

STRINGER $S54^{R}$ as shown
STRINGER $S54^{L}$ opp hand



5/16 Cont. fillet weld n.s. & fs
weld up full n.s. & fs
5/16 Cont. fillet weld n.s. & fs

Enlarged Detail at 2¾ × 1" bar on $S54^{R}$



Section A-A

319

Genrl Notes For Shts #47, #48, #49 & #50.

Material Specs:- Structural Steel as per A.S.T.M.-A7-34 except where noted otherwise.
Workmanship Specs:- As per project specifications.
Welding Specs:- As per A.A.S.H.O. 1935
Shop Inspection:- By R.W. Hunt Co.
Punching & Reaming:- All holes in main material for field rivets & bolts shall be subpunched & underage and reamed to size except holes marked "Punch Full Size" and except that flgs of 30 & 53 Beams shall be drilled. Holes marked R.T. to be reamed to steel templets.
Shop Assembly:- Shop contact surfaces not to be painted but to be cleaned same as painted surfaces.
Cleaning and Painting:- To be as per project specifications.
Shop Paint:- Pins and pin holes to be give a coat of white lead & tallow. All other surfaces to be given one shop coat. Where noted the two field coats of paint are to be applied at shop in addition to shop coat.
Shop Coat:- Red Lead Paint.
1st Field Coat:- Brown Paint.
2d Field Coat:- Aluminum Paint.
All paints to be approved paints conforming to Project Specifications

RIVETS – None
OPEN HOLES – 15/16 ⌀ unless noted
REAM – See general notes
MILLING – As noted
PAINT – See general notes

REQUIRED LIST:

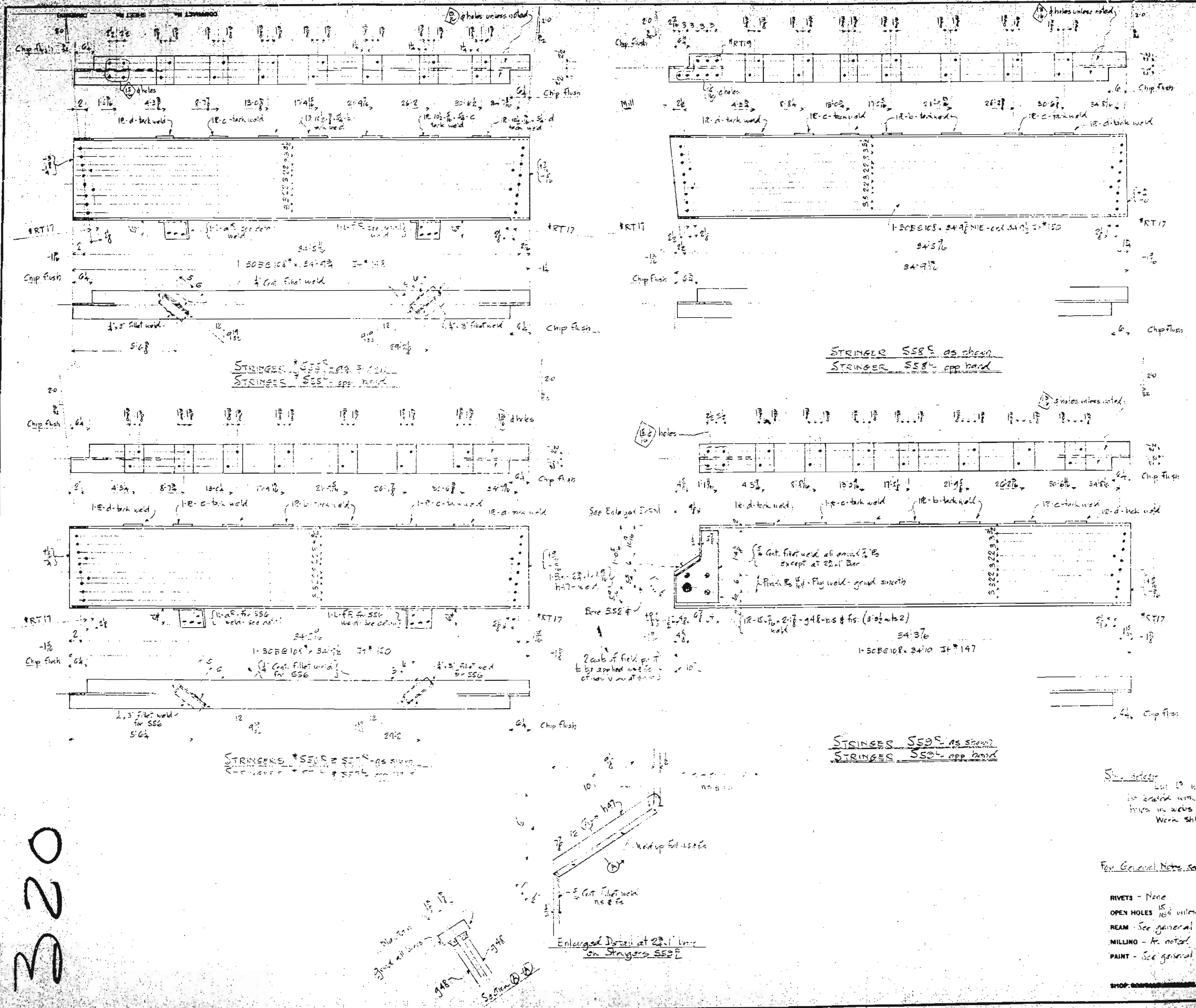
No Reqd	Description	Mark
One	Stringer	$S50^{R}$
One	do	$S50^{L}$
2	do	$S51^{R}$
2	do	$S51^{L}$
One	do	$S52^{R}$
One	do	$S52^{L}$
One	do	$S53^{R}$
One	do	$S53^{L}$
One		$S54^{R}$
One	do	$S54^{L}$

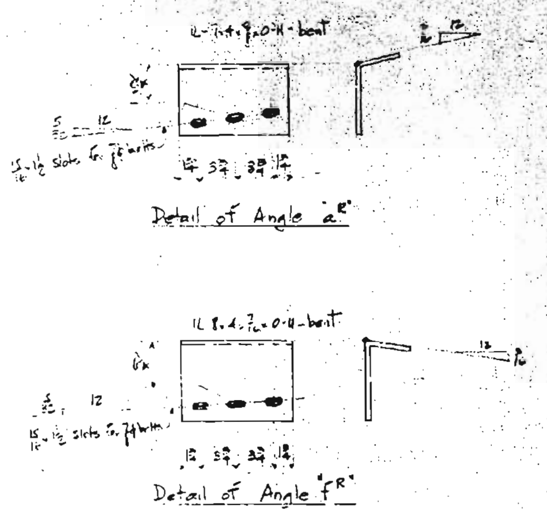
Shop Notes:-
Lug L's welded to bottom of stringers to be located with extreme accuracy relative to field holes in webs of stringers, and relative to ℄ of webs of stringers.
Work Shts #47, 48, 49 & 50 together

L-98

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PO. WK.
B. SMITH
SIGN.
ERECT.
Q. INSP.

Missouri River
At Brownville
For Atchison [illegible]
BETHLEHEM [illegible]
Drawing [illegible]
SHOP NO.





REQUIRED LIST

No. Reqd	Description	Mark
2	Stringer	S55R
2	do	S55L
2	do	S56R
2	do	S56L
4	do	S57R
4	do	S57L
2	do	S58R
2	do	S58L
2	do	S59R
2	do	S59L

Sh. notes: [illegible] 13 welded to bottom of stringers to be erected with extreme accuracy [illegible] to end holes in webs of stringers, and relative to ℄ of webs of stringers. Work shts #47, 48, 49 & 50 together.

L-98

For General Notes see sht. #47

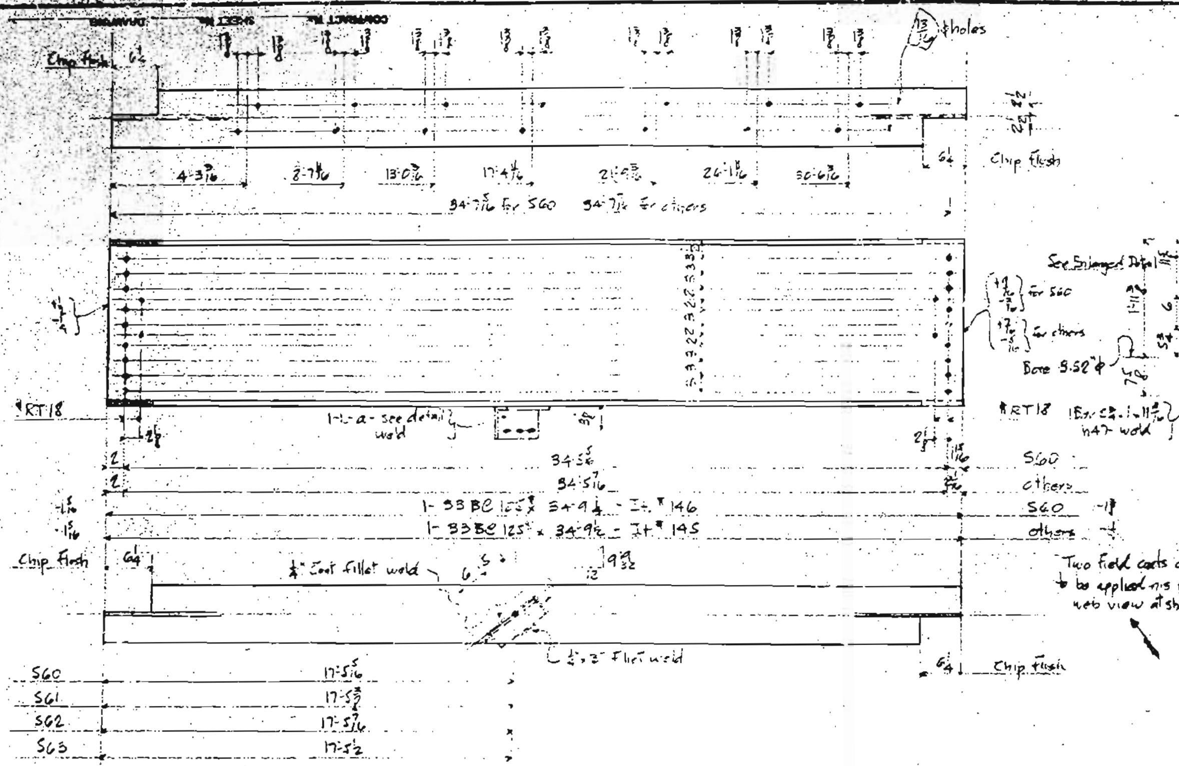
RIVETS - None
OPEN HOLES 15/16 unless noted
REAM - See general notes
MILLING - As noted
PAINT - See general notes

Outside Stringers
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY

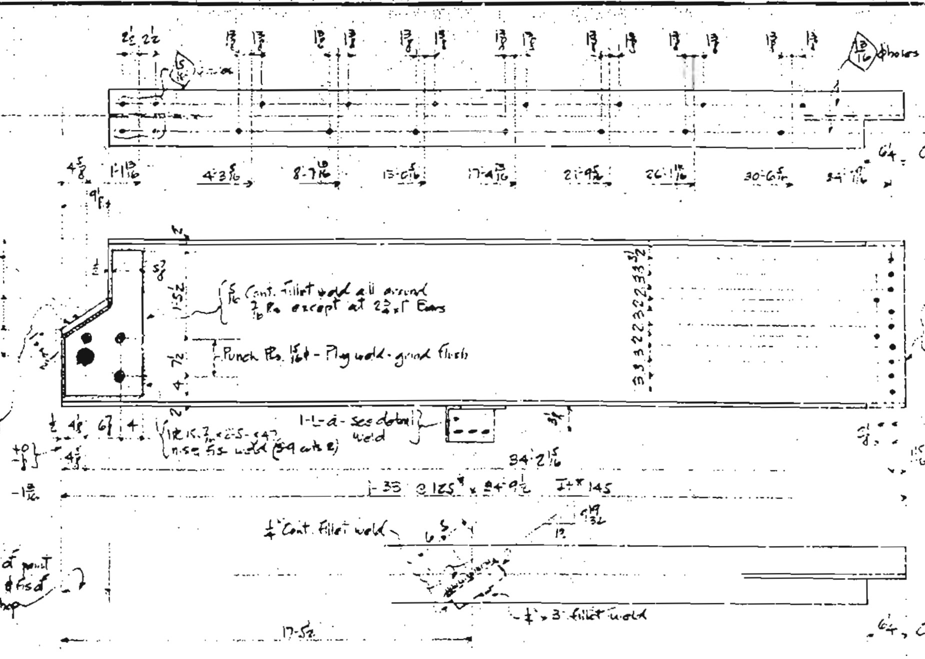
SHOP NO.

320

L-98

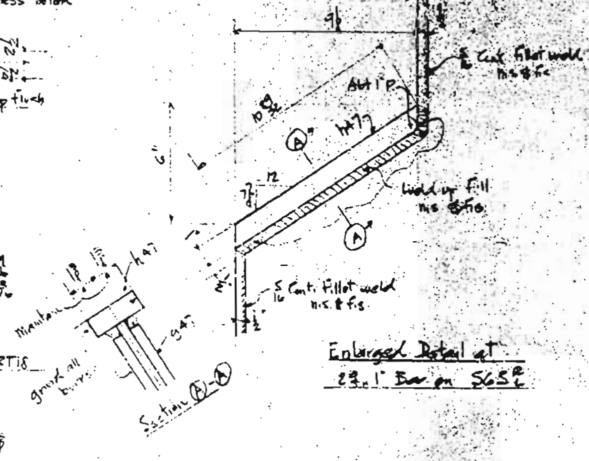


STRINGERS S60^R, S61^R, S62^R, S63^R as shown
STRINGERS S60^L, S61^L, S62^L, S63^L - opp hand

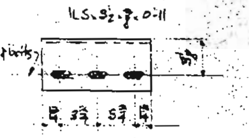


¹³⁄₁₆ ⌀ holes unless noted
Chip flush
4'-3⅞
8'-7⅞
13'-0⅞
17'-4⅞
21'-9⅝
26'-1⅞
30'-6⅞
34'-1⅞
5/16 Cont. fillet weld all around ⅝ Pe except at 23'-1 Brg
Punch Pe, Flg. - Plug weld - grind flush
1-L-a - see detail weld
34'-2⅞
1-33 B 125# x 34'-9⅛ Jt # 145
¼ Cont. fillet weld
L ¼ x 3 fillet weld
17'-5⅞
#RT18
Chip flush

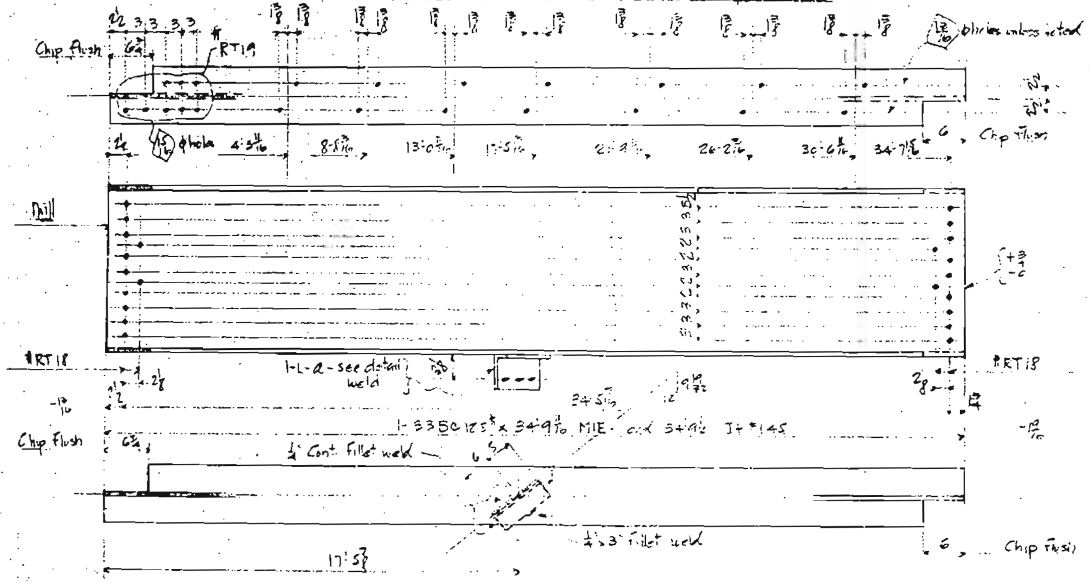
STRINGER S65^R - as shown
STRINGER S65^L - opp hand



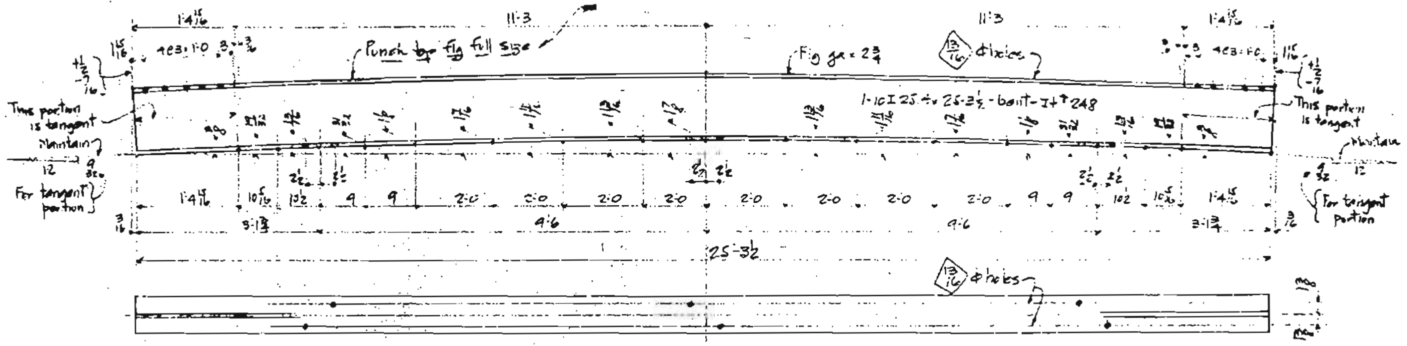
Enlarged Detail at 23'-1" Bear'g S65^R



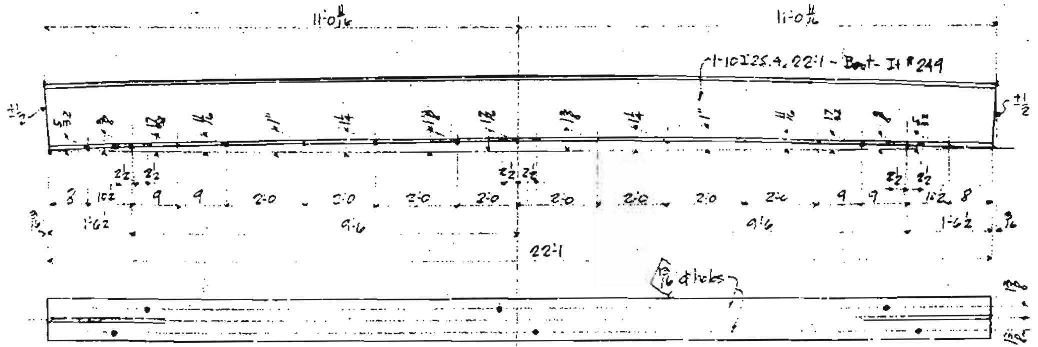
Detail of Angle "a"



STRINGERS S64^R - as shown
STRINGERS S64^L - opp hand



CROSS BEAMS *CB3^R as shown
CROSS BEAMS *CB3^L - opp hand



CROSS BEAMS - *CB4^R - as shown
CROSS BEAMS - *CB4^L - opp hand

REQUIRED LIST

No. Reqd	Description	Mark
One	Stringer	S60^R
One	do	S60^L
One	do	S61^R
One	do	S61^L
One	do	S62^R
One	do	S62^L
One	do	S63^R
One	do	S63^L
One	do	S64^R
One	do	S64^L
One	do	S65^R
One	do	S65^L
36	Cross Beam	CB3^R
36	do	CB3^L
48	do	CB4^R
48	do	CB4^L

L-98

Shop Notes:-

If any of the beams to be used for stringers on this sheet are received with slight mill camber, be sure to turn camber up.

Lug Ls welded to bottom of stringers to be located with extreme accuracy relative to end holes in webs of stringers, and relative to ℄ of webs of stringers.

Work shts # 47, 48, 49 & 50 together.

For General Notes - see sht #47

RIVETS - None
OPEN HOLES - ¹⁵⁄₁₆ ⌀ unless noted
REAM - See general notes
MILLING - As noted
PAINT - See general notes

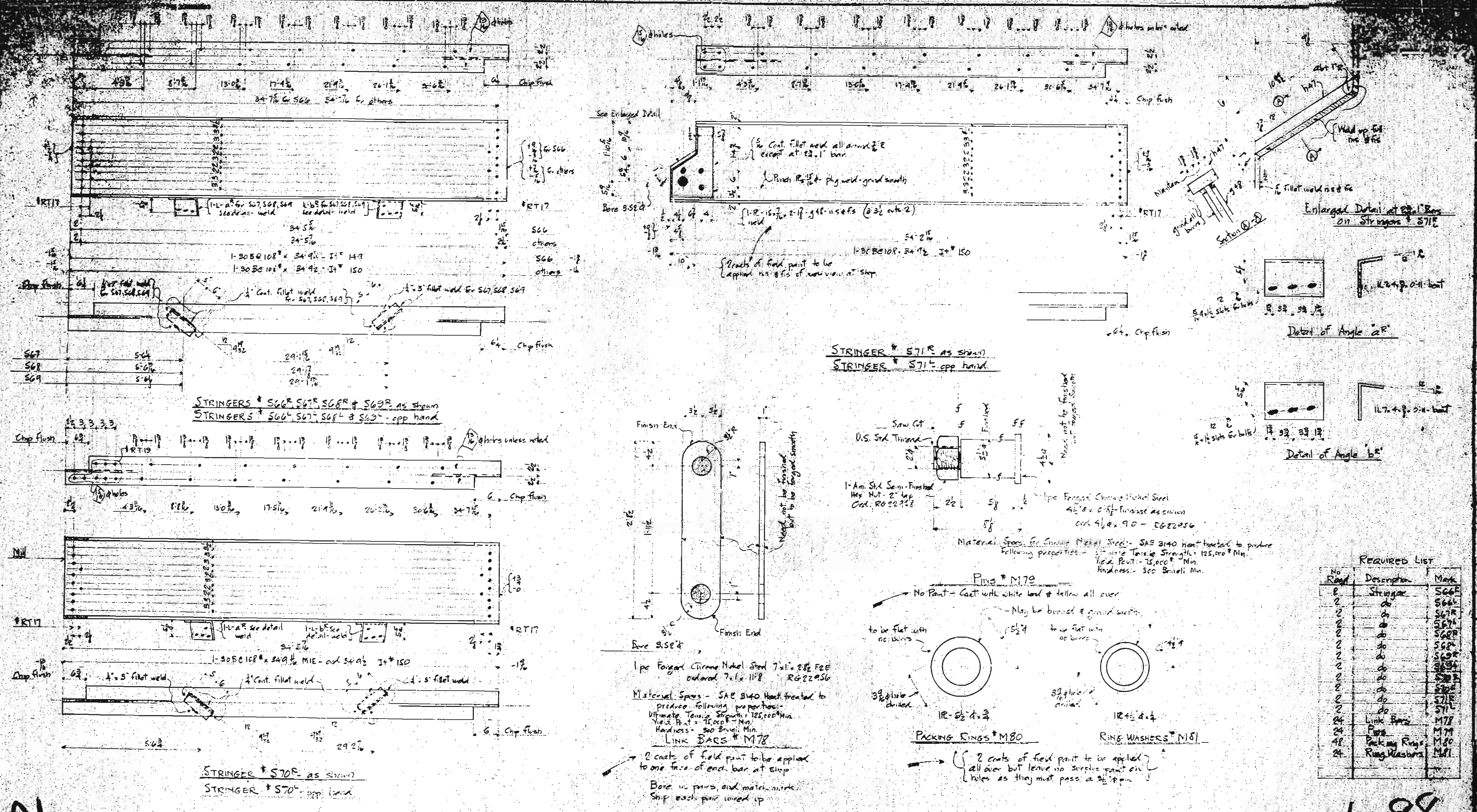
Cross Beams & Center Stringers

TEMP.	Missouri River Bridge
SUPT.	At Brownville Nebraska
LAYOUT	For Atchison County, Missouri
FITTER	**BETHLEHEM STEEL COMPANY**
SHOP INSP.	FABRICATED STEEL CONSTRUCTION
FC. WK.	Drawings at Chicago Fabricating Works Chicago
B. SMITH	IN CHARGE [illegible]
MCH.	CHECKED BY [illegible]
ERECT.	[illegible]
O. INSP.	

SHOP NO.

CONTRACT CO[illegible]

321


34-7⅞ ℄ S66 - 34-7⅛ ℄ others
Chip flush
Seat-of-weld
1-L-aR for S67, S68, S69 See detail weld
1-L-bR for S67, S68, S69 See detail weld
1-30 B 108# x 34-9¼ - Jt# 149
1-30 B 108# x 34-9½ - Jt# 150
¼" Cont. fillet weld for S67, S68, S69
4"-5" fillet weld for S67, S68, S69
S67
S68
S69
See Enlarged Detail
⅜ Cont. fillet weld all around ℄ except at ℄ 1" bar
Finish Rs plug weld - grind smooth
Bore 3.52"φ
1-R-15 x ⅞ - 2-1⅝ - 9⅛ - 11 sets (3½ cuts 2)
weld
2 coats of field paint to be applied to ⅞ fts of web view at shop
1-30 B 108 - 34-9½ - Jt# 150
RT17
RT19
Mill
1-30 B 108# x 34-9⅞ MIE - ord 34-9½ Jt# 150
Weld up full the ℄ fts
⅜ Fillet weld n.s. & f.s.
Section A-A
grind all burs
Enlarged Detail at ℄ 1" Bars on Stringers # S71R
1-L 2 x 4 x ⅜ - 0-11 - bolt
Detail of Angle "aR"
1 L 7 x 4 x ⅜ - 0-11 - bolt
Detail of Angle "bR"
Finish End
Need not be finished but to be forged smooth
Saw Cut
U.S. Std. Thread
Finished
Need not be finished but forged smooth
May be burned & ground smooth
to be flat with no burrs
3 9/16 φ hole drilled
1R - 5½"φ x ¾
1R 4½"φ x ¼
Outside St
AT Br
For

STRINGERS # S66R, S67R, S68R & S69R as shown
STRINGERS # S66L, S67L, S68L & S69L - opp hand

STRINGER # S70R as shown
STRINGER # S70L - opp hand

STRINGER # S71R as shown
STRINGER # S71L - opp hand

1 pc Forged Chrome Nickel Steel 7 x 1" x 2-8½ F2E
ordered 7 x 1 x 11"8 RG22956

Material Specs - SAE 3140 Heat treated to produce following properties -
Ultimate Tensile Strength = 125,000# Min.
Yield Point = 75,000# Min.
Hardness - 500 Brinell Min.

LINK BARS # M78

2 coats of field paint to be applied to one face of each bar at shop

Bore in pairs, and match mark.
Ship each pair wired up

1-Am. Std. Semi-Finished Hex Nut - 2" tap
Ord. RG22958

1 pc Forged Chrome Nickel Steel
4½"φ x 0-8⅝ - Finished as shown
ord. 4½φ x 9 0 - RG22956

Material Specs for Chrome Nickel Steel - SAE 3140 heat treated to produce following properties - Ultimate Tensile Strength - 125,000# Min.
Yield Point - 75,000# Min.
Hardness - 500 Brinell Min.

PINS # M79

No Paint - Coat with white lead & tallow all over

PACKING RINGS # M80

RING WASHERS # M81

2 coats of field paint to be applied all over but leave no surplus paint on holes as they must pass a 3½"φ pin

REQUIRED LIST

No Reqd	Description	Mark
2	Stringer	S66R
2	do	S66L
2	do	S67R
2	do	S67L
2	do	S68R
2	do	S68L
2	do	S69R
2	do	S69L
2	do	S70R
2	do	S70L
2	do	S71R
2	do	S71L
24	Link Bars	M78
24	Pins	M79
48	Packing Rings	M80
24	Ring Washers	M81

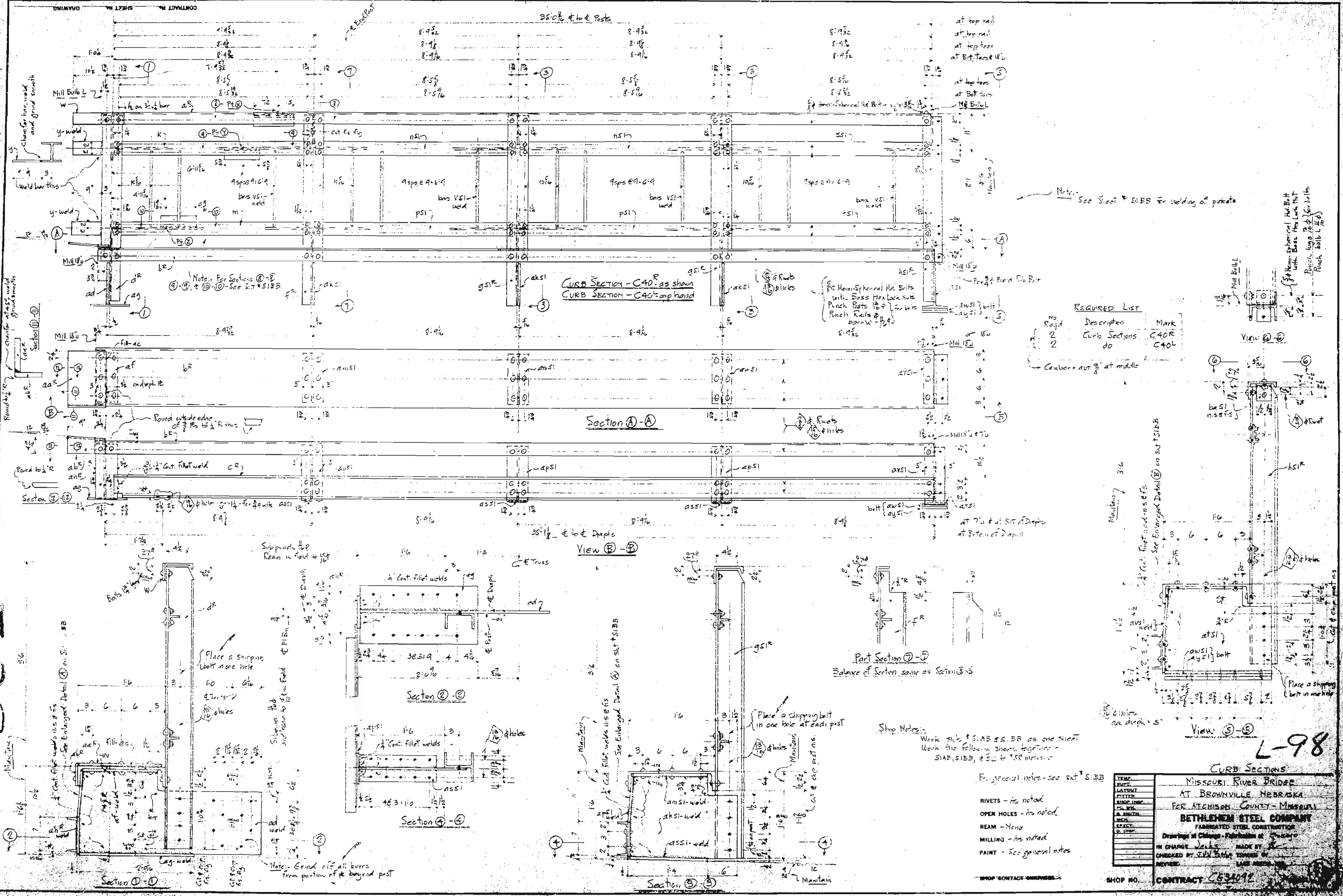
Shop Notes:-
If any of the beams to be used for stringers on this sheet are received with slight mill camber, be sure to turn camber up.
Lugs welded to bottom of stringers to be located with extreme accuracy relative to end holes in webs of stringers, and relative to ℄ of webs of stringers.
Work Shts. # 47, 48, 49 & 50 together.

For general notes - See Sht # 47

RIVETS - None
OPEN HOLES - 15/16 φ unless noted
REAM - See general notes
MILLING - As noted
PAINT - See general notes

L-98

322


35'-0¼" ℄ to ℄ Posts
℄ End Post
at top rail
at top rail
at top tees
at Bot. tees
at top tees
at Bot. tees
Mill Bulb L
Mill Bulb L
y-weld
chamfer bar, weld and grind smooth
weld bar thru
y-weld
Mill 18"
9 sps @ 4" = 6'-9
bars vs1 weld
ns1
ps1
ss1
Curb Section - C40R as shown
Curb Section - C40L opp hand
Note:- For Sections 8-8, 9-9, & 10-10 - See Sht # S1BB
⅞" Hemi-Spherical Hd. Bolts with Boss Hex Lock Nuts
Punch Posts 13/16" ⌀ for bolts
Punch Rails & bar-w 11/16" ⌀
For ¾" Field Rib Bolt
hs1R
aks1
gs1R
Section Ⓐ-Ⓐ
Round outside edge of ⅜" Pls to ½" R thus
¼" Cont. Fillet weld
Mill 18"
aps1
as1
Section ⑫-⑫
Round to ¼" R
View Ⓑ-Ⓑ
35'-1⅛" ℄ to ℄ Diaphs
at Top ℄ at Bot. of Diaphs
at Bottom of Diaphs
Section ①-①
Place a shipping bolt in one hole
Note:- Grind off all burrs from portion of ℄ beyond post
Section ②-②
¼" Cont. fillet welds
℄ Truss
℄ Diaph
Section ④-④
¼" Cont. fillet welds
Section ③-③
Place a shipping bolt in one hole at each post
Maintain
Part Section ⑦-⑦
Balance of Section same as Section 3-3
View ⑥-⑥
View ⑤-⑤
Place a shipping bolt in one hole
13/16" ⌀ holes
L-98
323

Note:- See Sheet # S1BB for welding of pickets

REQUIRED LIST

No Req'd	Description	Mark
2	Curb Sections	C40R
2	do	C40L

Cambers out ⅜" at middle

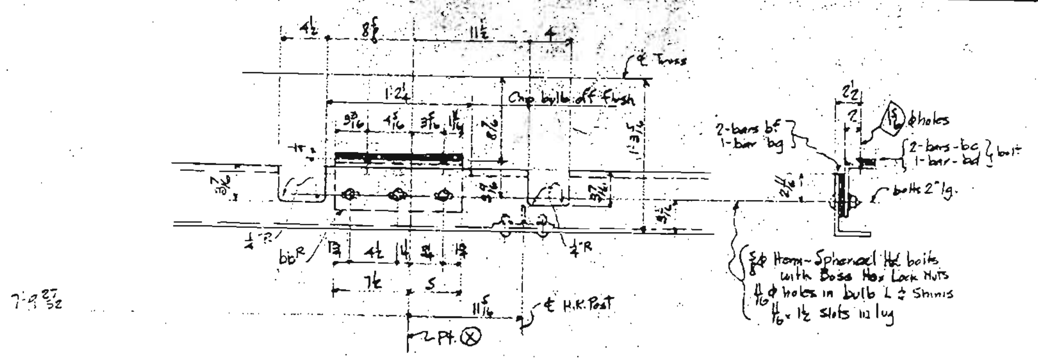
Shop Notes:-
Work sht # S1AB & S1BB as one sheet
Work the following sheets together -
S1AB, S1BB, & S1C to S5C inclusive

For general notes - see sht # S1BB

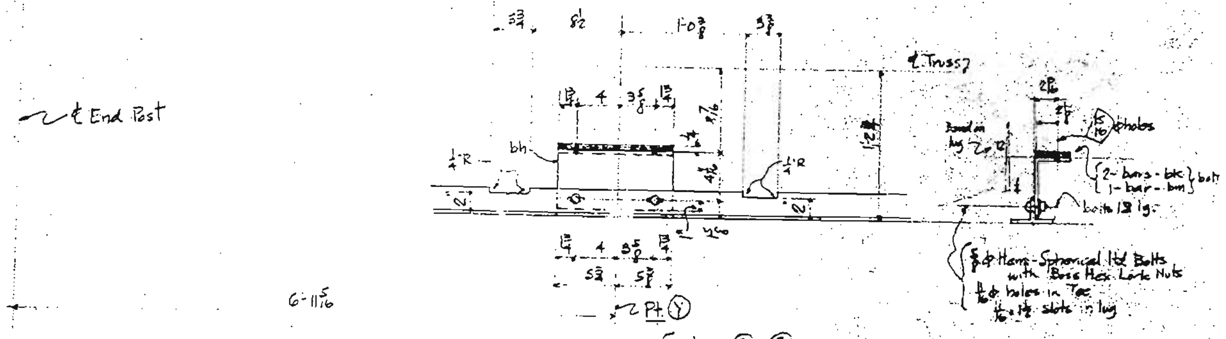
RIVETS - As noted
OPEN HOLES - As noted
REAM - None
MILLING - As noted
PAINT - See general notes

SHOP CONTACT SURFACES

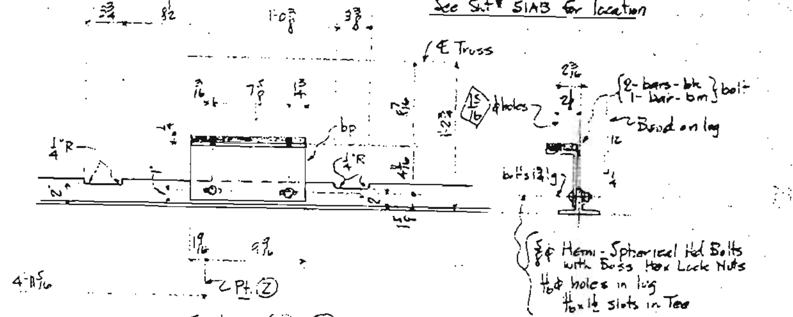
CURB SECTIONS
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY - MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jacks MADE BY
CHECKED BY JVN
REVISED
SHOP NO.
CONTRACT C634092



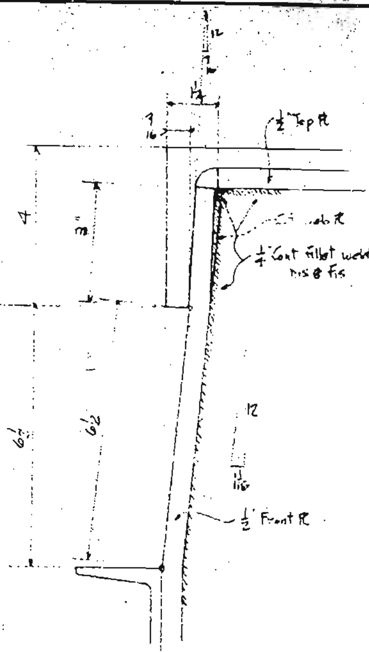
Section ⑧-⑧
See Sht # S1AB for location



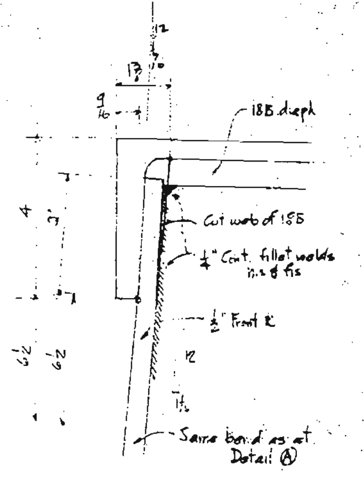
Section ⑨-⑨
See Sht # S1AB for location



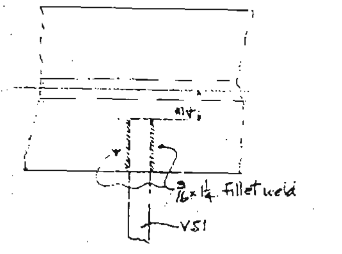
Section ⑩-⑩
See Sheet # S1AB for location



Enlarged Detail Ⓐ
For all plate diaphragms



Enlarged Detail Ⓑ
For diaphragms with 18B



Detail of welding of pickets

BILL OF MATERIAL FOR ONE CURB SECTION # C40R

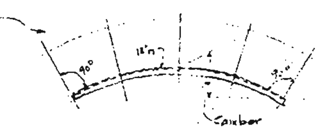
1- Bulb angle - 6 x 3½ x 10.7# x 35'-3⅞ - M2E - a^R - ord 35'-4¾ - It# 232
1- 18"⊔ 42.7 x 35'-4⅞ - M2E - b^R - ord 35'-5¼ - It# 213
1- 7"⊔ 9.8 x 34'-10 5/16 - M1E - c^R - ord 34'-10¾ - It# 254 - weld
1- BS-6e 15½# x 1'-10⅛ - d^R - ord 9'-8½ - It# 208
1- BS-6e 15½# x 4'-11¼ - f^R - ord 9'-10¾ - It# 207
2- BS-6e 15½# x 4'-11¼ - $gS1^R$ - ord 9'-10¾ - It# 207
1- BS-6e 15½# x 4'-10⅛ - $hS1^R$ - ord 9'-8½ - It# 208
1- Tee - 4 x 2½ x 7.2# x 8'-8⅛ - k - It# 237
1- Tee - 4 x 2½ x 7.2# x 8'-8 - m - It# 238
2- Tees - 4 x 2½ x 7.2# x 8'-8⅛ - nS1 - It# 237
2- Tees - 4 x 2½ x 7.2# x 8'-8 - pS1 - It# 238
1- Tee - 4 x 2½ x 7.2# x 8'-8⅛ - sS1 - It# 237
1- Tee - 4 x 2½ x 7.2# x 8'-8⅛ - tS1 - It# 237
40 Bars ½"φ x 1'-11½ - vS1 - weld
1- Bar 3½ x ¼ x 1'-3½ - w
2- Bars 4 x ¼ x 0'-9 - y - weld
1- PL - 12¼ x ⅜ x 1'-5¼ - bent - aa^R - weld
1- Bar - 4 11/16 x ⅝ x 1'-0¼ - ab^R - weld
1- Bar 3¼ x ⅛ x 1'-5¼ - ac
1- PL 16⅝ x 11/16 x 3'-2 9/16 - ad - weld
1- PL - 6½ um x ½ x 1'-3¼ - af - weld
1- PL - 12 um x ½ x 2'-0 1/16 - ag - weld
1- PL - 6½ um x ½ x 1'-4⅞ - bent - ah^R - weld
3- PLs - 22 x ⅝ x 1'-4⅞ - akS1 - weld
3- PLs - 6 um x ½ x 1'-3¼ - amS1 - weld
3- PLs - 6 um x ½ x 1'-4¾ - bent - apS1 - weld

3- PLs 5¼ um x ½ x 1'-4 - asS1 - weld
1- 18B 50# x 1'-10 - atS1 - ord 1'-11½ - It# 158
1- PL - 6 um x ½ x 1'-5¼ - bent - avS1 - weld
1- PL - 7½ um x ¾ x 1'-10 - awS1 - bolt
1- PL - 7½ um x 11/16 x 1'-10 - ayS1 - bolt
2 Ls 5½ x 3 x ¼ x 0'-3 - baS1
1- L - 5 x 3½ x ⅜ x 1'-0½ - bb^R
2- Bars 3½ x 7/16 x 1'-0½ - bc } bolt
1- Bar 3½ x ⅜ x 1'-0½ - bd }
2- Bars 4⅛ x 7/16 x 1'-0½ - bf
1- Bar 4⅛ x ⅜ x 1'-0½ - bg
1L - 5 11/16 x 3½ x ⅜ x 11⅛ - bent - bh - cut 6 x 3½ L
4 Bars 3½ x 7/16 x 0'-11⅛ - bk } bolt
2 Bars 3½ x ⅜ x 0'-11⅛ - bm }
1L - 5 11/16 x 3½ x ⅜ x 11⅛ - bent - bp - cut 6 x 3½ L

40- Hemi-Spherical Hd Bolts ⅝φ x 1½ }
6- do ⅝φ x 1 9/16 } Hex Nuts
5- do ⅝φ x 2 } ord RG 23157
49- Boss Hex Lock Nuts for ⅝φ bolts - ord RG 23158

General Notes for Shts # 51 to # 58 incl.

Material Specs:- Structural Steel as per ASTM-A7-34.
Workmanship Specs:- As per Project Specifications.
Welding Specs:- As per A.A.S.H.O. 1935
Shop Inspection:- By R.W. Hunt Co.
Punching:- All punching may be full size.
Shop Assembly:- No paint on shop contact surfaces but same shall be cleaned same as painted surfaces.
Hemi-Spherical Hd Bolts:- Place all hemi-spherical hd bolts with hemi-spherical hds toward inside of or on top of railing.
Cleaning and Painting:- Cleaning and painting to be as per Project Specifications.
Shop Paint:- One coat of an approved Red Lead Paint as per Project Specifications.
Finish:- 18⊔s and Bulb angles shall be straight. Posts shall be at right angles to bottom of diaphragms. Sharp corners at splices in bulb angles and at Bar w on Sht. # S1AB shall be ground.
Camber:- Since curb sections are slightly cambered, they are longer along top than at bottom. The extra length along top shall be equally distributed to the two ends of curb sections causing posts to be on radial lines thus



Shop Notes:-
Work shts # S1AB & S1BB as one sheet
Work the following sheets together:-
S1AB, S1BB, & 52 to 58 inclusive

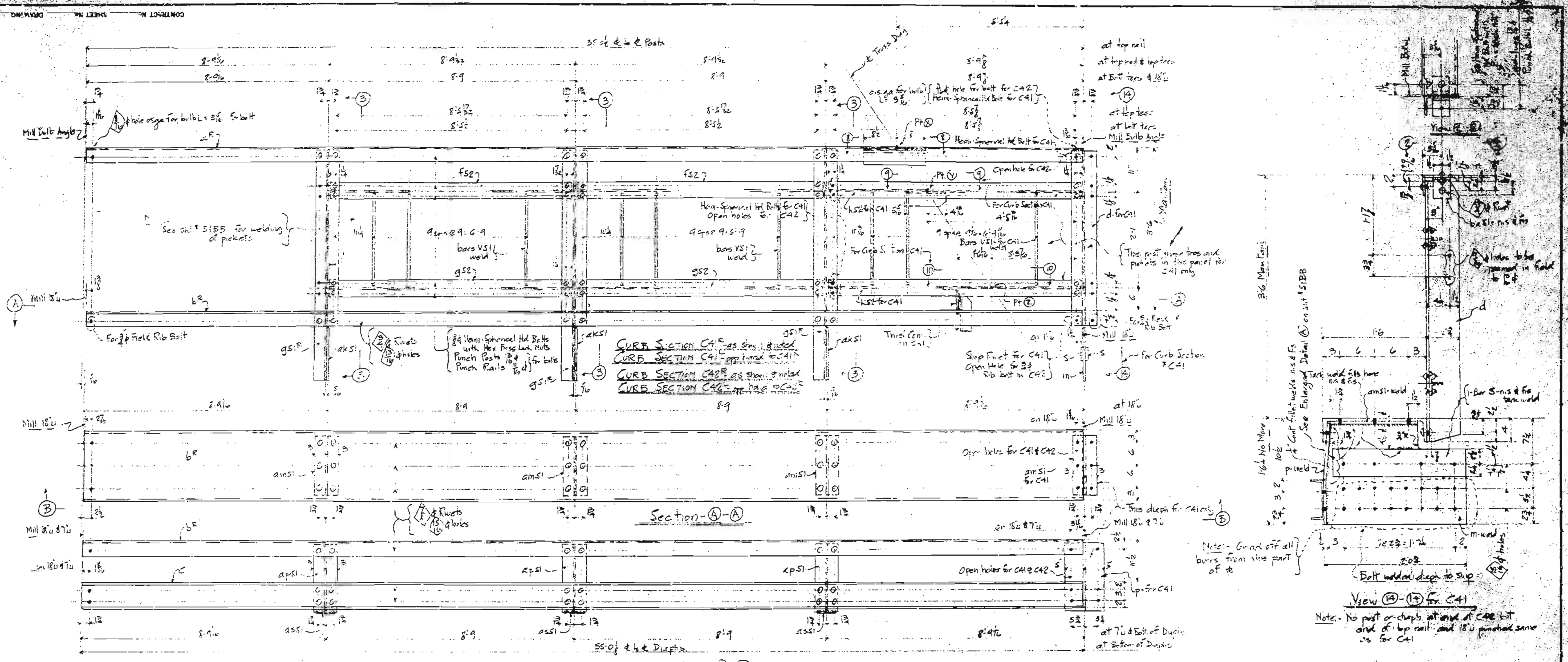
L-98

RIVETS
OPEN HOLES
REAM
MILLING
PAINT
} See Sheet # S1AB

CURB SECTIONS
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY

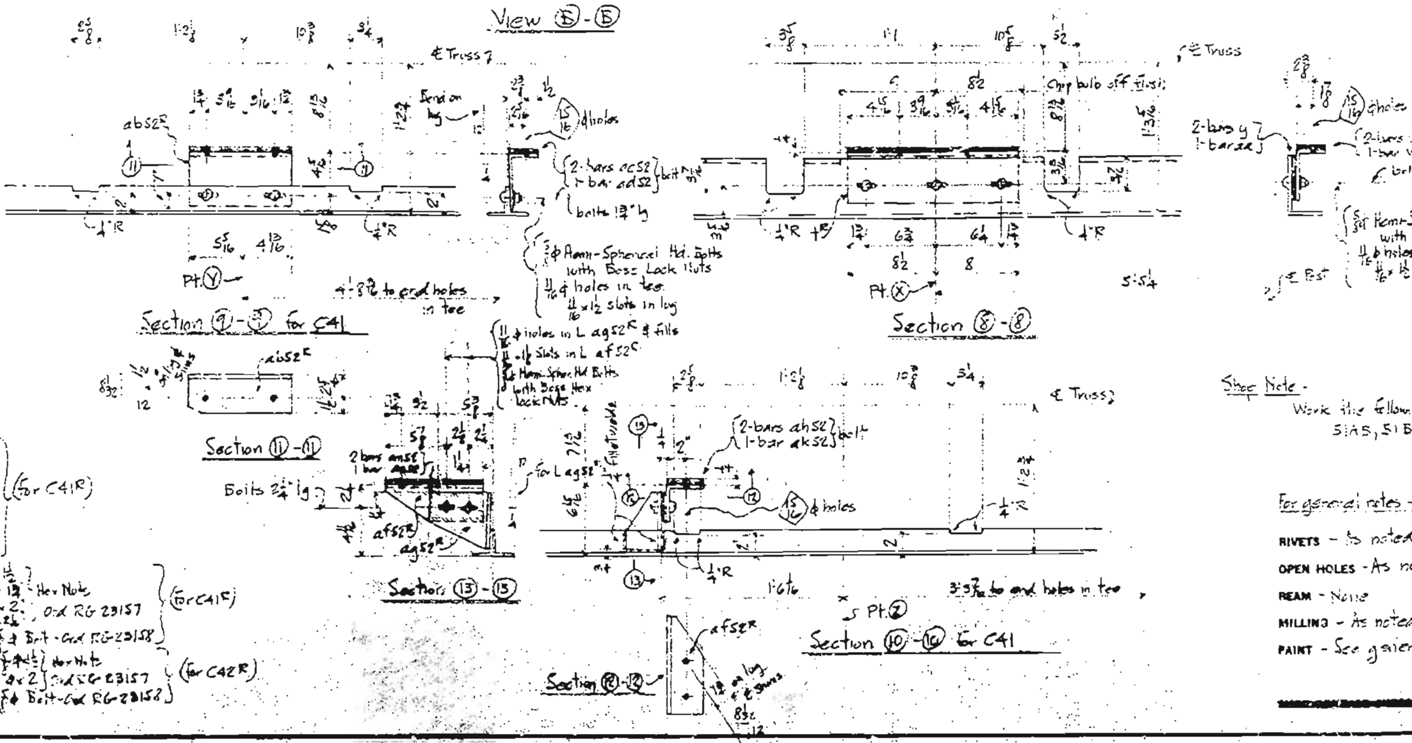
SHOP NO.

324


35-0⅛ ℄ to ℄ Posts
Mill Bulb Angle
Mill 18⊔
Mill 8⊔ & 7⊔
See sht 51BB for welding of pickets
9 sps @ 9-6-9
bars v51 weld
g52
f52
Hemi-Spherical Hd Bolts for C41
Open holes for C42
For Curb Section C41
Curb Section C41R as shown & noted
Curb Section C41L opposite hand to C41R
Curb Section C42R as shown & noted
Curb Section C42L opposite hand to C42R
For ⅞ Field Rib Bolt
⅞ Rivets
15/16 ⌀ holes
Section Ⓐ-Ⓐ
This post, upper tees and pickets in this panel for C41 only
Open holes for C41 & C42
This depth for C41 only
55-0⅛ ℄ to ℄ Diaphs
at 7⅞ & Bott of Diaphs
at Botton of Diaphs
Note:- Grind off all burrs from this part of ℄
Bolt welded diaph to stop
View ⑭-⑭ for C41
Note:- No post or diaph. at end of C42 but end of top rail and 18⊔ punched same as for C41
16⅛ No More
See Enlarged Detail Ⓐ on sht 51BB
3/16 Max Gap
Mill Bulb
View Ⓑ-Ⓑ
⅞ Rivet
bolts in field
¹⁵⁄₁₆ holes to be reamed in field

BILL OF MATERIAL FOR ONE CURB SECTION # C41R or # C42R

1- Bulb Angle- 6×3½×10.7#× 35-0⅜ MZE - aR- ord 35-1¼ It # 233
1- 18"⊔ 42.7#× 35-0 MZE- bR- ord 35-0¾ It # 215
1- 7"⊔ 9.8× 35-0 MZE- c- ord 35-0¾ It # 255
1- 8BC24× 3-9⅝ - d - ord 7-7 It # 206 (For C41R)
5- BS- 6"R 15½#× 4-11¼- g51R ord 9-10¾ - It # 207
2- Tees- 4×2½×7.2× 8-8 - f52 - It # 238
2- Tees- 4×2½×7.2×8-8 - g52 - It # 238
1- Tee- 4×2½×7.2×8-8⅜- h52 - It # 236 (For C41R)
1- Tee- 4×2½×7.2×8-8⅜ - k52 - It # 236 (For C41R)
30- Bars- ½"⌀ × 1-11½- v51- weld (For C41R)
27- Bars- v51- weld (For C42R)
3- Ps- 22×⅜× 1-4⅜- ak51- weld
3- Ps- 6um×½× 1-3¼- am51- weld (For C42R)
3- Ps- 6 um×½× 1-4¾ bent- ap51- weld
3- Ps- 5¼ um×½× 1-4- as51- weld
1-P- 17¼×½× 2-0¼- m- weld
1-P- 10um ½× 1-5½- bent- p- weld (For C41R) (bolted)
2- Bars 4½×⅜× 1-11- s- tack weld
4- Ps- am51- weld (For C41R)
2L³- 3½×3×¼×0-3- ba51 (For C41R)
1L 8×8½×⅜× 1-4½ - tR
2 bars 3½×⅞× 1-4½- v } bolt
1 bar 3½×⅞× 1-4½- w }
2 bars 4½×⅞× 1-4½- y
1 bar 4½×⅞× 1-4½- aa
1L 5⅝×3⁹⁄₁₆×⅜×10⅞- ab52R cut 6.6L
2 Bars 3⁹⁄₁₆×⅛×10⅞- ac52 } bolt
1 Bar 3⁹⁄₁₆×½×10⅞- ad52 } (For C41R)
1L 3½×3½×⅜× 9⅝- af52R
1L 6×3½×⅜× 5³⁄₁₆- ag52R weld
2 Bars 3½×⅞× 9⅝- ah52 } bolt (For C41R)
1 Bar 3½×⅛× 9⅝- ak52 }
2 Bars 2½×⅞× 0-5- am52
1 Bar 2½×⅛× 0-5- an52
52 Hemi-Spherical Hd Bolts- ⅝×1½ } Hex Nuts (For C41R)
2 do ⅝×1¾
3 do ⅝×2 } Ord RG 23157
2 do ⅝×2¼
39 Boss Hex Lock Nuts for ⅝⌀ Bolt- Ord RG-23158
22- Hemi-Spherical Hd Bolts- ⅝×1½ } Hex Nuts (For C42R)
5- do - ⅝×2 } Ord RG 23157
25- Boss Hex Lock Nuts for ⅝⌀ Bolt- Ord RG-23158



Shop Note-
Section ③-③ Same as on sht # 51AB

Shop Note-
Work the following sheets together:- 51AS, 51BB, & # 52 to # 58 inclusive.

REQUIRED LIST

No Reqd	Description	Mark
One	Curb Section	C41R
One	do	C41L
One	do	C42R
One	do	C42L

camber = abt ⅛" at middle

For general notes - See sht # 51BE

RIVETS - As noted
OPEN HOLES - As noted
REAM - None
MILLING - As noted
PAINT - See general notes

L-98

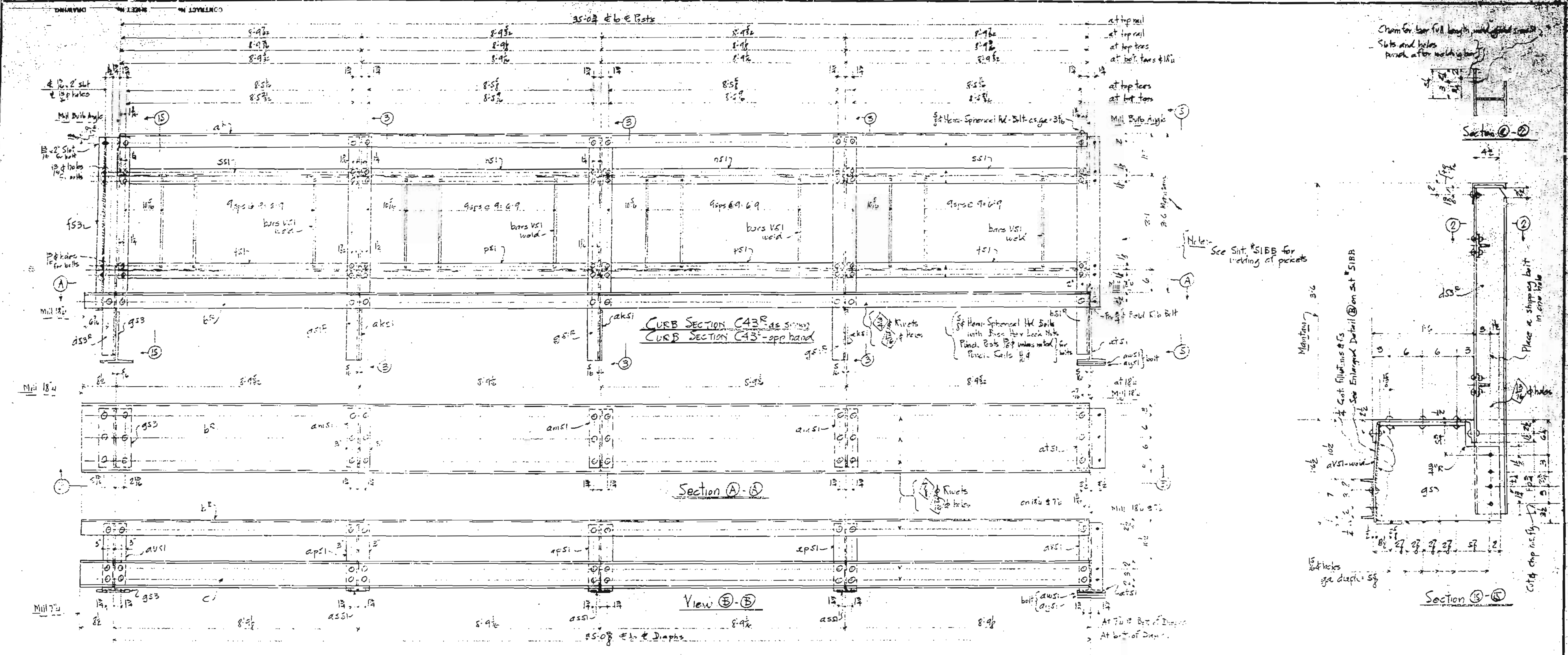
CURB SECTIONS

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
FC. WK.
B. SMITH
MCH.
E. DIST.
J. INSP.

MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MO
BETHLEHEM STEEL [illegible]

SHOP NO.

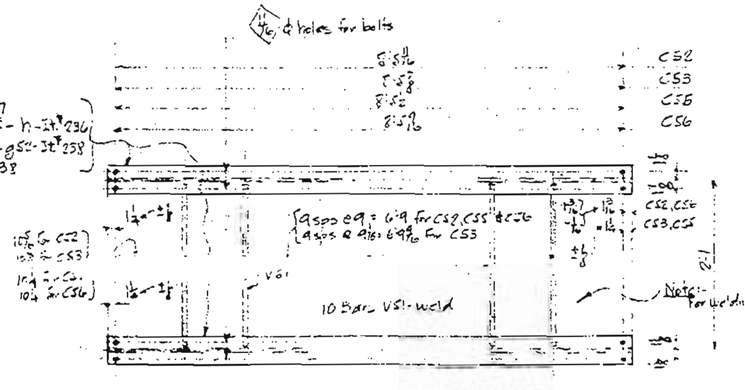
328


35-0⅜ ℄ to ℄ Posts
at top rail
at top tees
at bot. tees & 18⊔
Mill Bulb Angle
½ Hemi-Spherical Hd. Bolts
Curb Section C43R as shown
Curb Section C43L opp hand
Section A-A
View B-B
35-0⅜ ℄ to ℄ Diaphs.
Note:- See Sht #S1BB for welding of pickets
Place a shipping bolt in one hole
Section 2-2
Section 15-15
Chamfer bar full length
Slots and holes punch after welding bar

BILL OF MATERIAL FOR ONE CURB SECTION C43R

1- Bulb Angle - 6x3½x10.7# x 35-0⅜ M2E - aR ord 35-1¼ - It# 233
1- 18"⊔42.7 x 35-8⅞ M2E - bR - ord 35-9¾ - It# 211
1- 7"⊔9.8 - 35-8 13/16 M2E - c - ord. 35-9½ - It# 250
1- BS - 6E 15½# x 4-10⅛ - d53R - ord 9-8½ - It# 208
3- BS - 6E 15½ x 4-11¾ - g51R - ord 9-10¾ - It# 207
1- BS - 6E 15½ x 4-10⅛ - h51R - ord 9-8½ - It# 208
2- Tees - 4 x 2½ x 7.2# x 8-8⅛ - n51 - It# 237
2- Tees - 4 x 2½ x 7.2# x 8-8 - p51 - It# 238
2- Tees - 4 x 2½ x 7.2# x 8-8⅛ - s51 - It# 237
2- Tees - 4 x 2½ x 7.2# x 8-8⅛ - t51 - It# 237

1- Bar 2¼ x ¼ x 3-9½ - f53 - weld
1- 18B70 x 1-10 - g53 - ord 14-9½ - It# 157 {(Charge Customer for 18B50)
2- Pls 6UM x ½ x 1-5¼ - bent - av51 - weld
1- 18B50 x 1-10 - at51 - ord 11-1½ - It# 158
1- Pl 7½UM x ¾ - 1-10 - aw51 - bolt
1- Pl 7½UM x ¾ x 1 - ay51 - bolt
5 Pls 12 x ⅜ x 1-4⅞ - ak51 - weld
3 Pls 6UM x ½ x 1-5¼ - am51 - weld
3 Pls 6UM x ½ x 1-4¾ - bent - ap51 - weld
3 Pls 5¼UM x ½ x 1-4 - as51 - weld
2 ∟s 3½ x 3 x ¼ x 0-3 - bz51
41- Hemi-Spherical Hd Bolts ⅝ x 1½ - Hex Nuts - Ord RG 23157
41- Boss Hex Lock Nuts for ⅝ bolt - ord RG 23158


11/16 ⌀ holes for bolts
8-5 11/16 C52
8-5⅞ C53
8-5½ C55
8-5 9/16 C56
9 sps @ 9 = 6-9 for C52, C55 & C56
9 sps @ 9 1/16 = 6-9 9/16 for C53
10 Bars v51 - weld
2-1
Note:- For welding of pickets - see sht #S1BB

For C52 - 1-Tee - s51 - It# 237
For C53 - 1-Tee - 4 x 2½ x 7.2# x 8-8⅞ - h - It# 236
For C55 - 1-Tee - 4 x 2½ x 7.2# x 8-8 - g52 - It# 238
For C56 - 1-Tee - p51 - It# 238

RAILING SECTIONS # C52, C53, C55 & C56

Shop Note:-
For Sections 3-3 & 5-5 - See Sht # S1AB

Shop Note:-
Weld the following sheets together:
#S1AB, S1BB & #S2 to #S8 inclusive

REQUIRED LIST

No. Reqd	Description	Mark
2	Curb Section	C43R
2	do	
12	Railing Section	C52
4	do	C53
4	do	C55
16	do	C56

L-98

For general notes - see Sht #S1BB

RIVETS As noted
OPEN HOLES As noted
REAM - None
MILLING - As noted
PAINT - See general notes

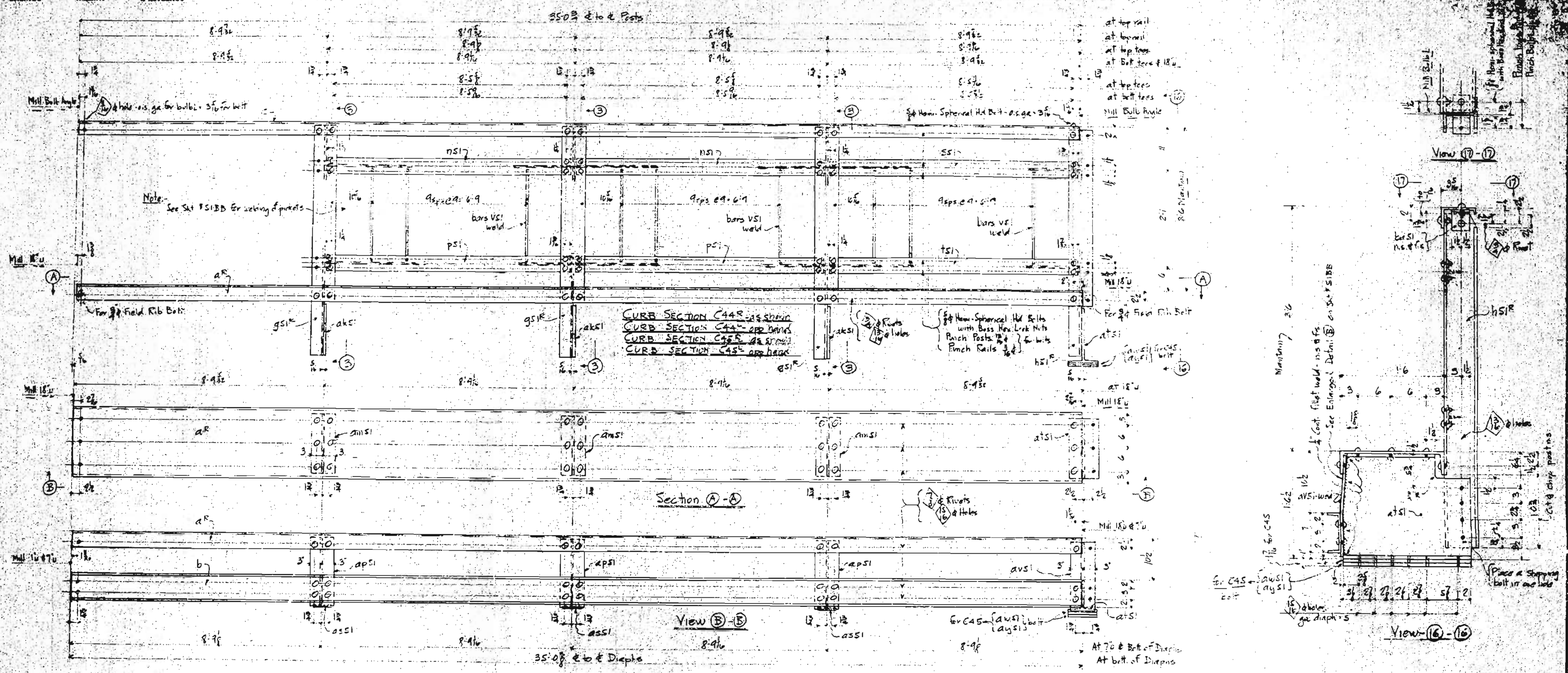
SHOP CONTACT SURFACES

SHOP NO.

CURB & RAILING SECTIONS
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY
CHECKED BY G.V.V. TRACED BY
REVISED
CONTRACT CG 54092
SHEET 53

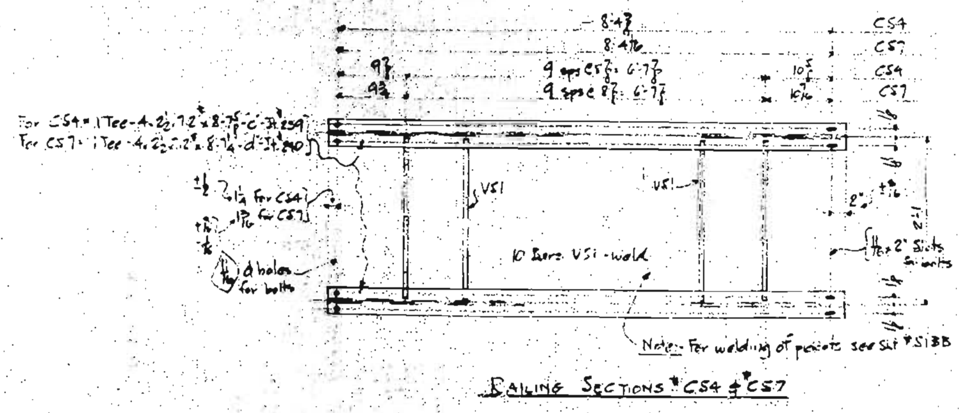
TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PG. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

326


35-0⅝ ℄ to ℄ Posts
Mill Bulb Angle
Mill 18⊔
Mill 18⊔ & 7⊔
Note:- See Sht #S1BB for welding of pickets
9 sps @ 9 = 6-9
bars VS1 weld
nS1
pS1
sS1
tS1
aR
b
gS1R
akS1
amS1
apS1
asS1
atS1
avS1
hS1R
For ⅞ Field Rib Bolt
⅝ Non-Spherical Hd Bolt - o.s. ga - 3⅝
⅝ Non-Spherical Hd Bolts with Boss Hex Lock Nuts Punch Posts 13/16 Punch Rails ¾ for bolts
CURB SECTION C44R - as shown
CURB SECTION C44L - opp hand
CURB SECTION C45R - as shown
CURB SECTION C45L - opp hand
⅞ Rivets 15/16 ⌀ Holes
Section Ⓐ-Ⓐ
View Ⓑ-Ⓑ
35-0⅝ ℄ to ℄ Diaphs
At 7⊔ & Bott of Diaphs
At bott. of Diaphs
at top rail
at top tees
at bott tees
View ⑯-⑯
View ⑰-⑰
for C45 {awS1 ayS1} bolt
⅞ Cont. fillet weld - ns & fs - See Enlarged Detail Ⓑ on Sht #S1BB
Place a Shipping bolt in one hole
15/16 ⌀ holes ga diaph's

BILL OF MATERIAL FOR ONE CURB SECTION C44R or C45R

1- Bulb Angle 6×3½×10.7#×35-0⅝ M2E - c - ord 35-1¼ - It# 233
1- 18⊔ 42.7#×35-0⅝ M2E - aR - ord 35-1 - It# 214
1- 7⊔ 9.8#×35-0⅝ - M2E - b - ord 35-1 - It# 252
3- BS- 6e 15½#×4-11¼ - gS1R - ord 9-10⅞ - It# 207
1- BS- 6e 15½#×1-10½ - hS1R - ord 9-8½ - It# 205
2- Tees- 4×2½×7.2#×8-8⅝ - nS1 - It# 237
2- Tees- 4×2½×7.2×8-8 - pS1 - It# 238
1- Tee- 4×2½×7.2×8-8⅝ - sS1 - It# 237
1- Tee- 4×2½×7.2×8-8⅝ - tS1 - It# 237
30- Bars ½⌀×1-11½ - vS1 - weld
3- Pls 22×⅜×1-4⅞ - akS1 - weld
6- Pls 6um ½×1-3¼ - amS1 - weld
8- Pls 6um×½×1-4⅞ - bent - apS1 - weld
3- Pls 5¼um×½×1-4 - asS1 - weld
1- 18⊏ 50×1-10 - atS1 - ord 11-1½ - It# 158
1- Pl- 6um×½×1-5¼ - bent - avS1 - weld
1- Pl 7½um×⅜×1-10 - awS1 - bolt } (for C45R)
1- Pl 7½um×½×1-10 - ayS1 - bolt }
2Ls 3½×3½×... 0-8 - baS1
32 Non-Spherical Hd Bolts - ⅝×1½ - Hex Nuts - Ord RG 23157
32 Boss Hex Lock Nuts for ⅝ bolt - Ord RG 23158


8-4⅞
8-4¾
9 sps @ 8⅞ = 6-7⅞
9 sps @ 8⅞ = 6-7⅞
C54
C57
For C54: 1 Tee 4×2½×7.2#×8-7⅝ - c-3 - It# 239
For C57: 1 Tee 4×2½×7.2#×8-7¼ - d-3 - It# 240
VS1
10 Bars VS1 - weld
13/16 ⌀ holes for bolts
13/16 × 2" Slots for bolts
Note:- For welding of pickets see Sht #S1BB

RAILING SECTIONS #C54 & C57

Shop Note:-
For Section Ⓑ-Ⓑ - see sht # S1AB

Required List

No Reqd	Description	Mark
4	Curb Section	C44R
4	do	C44L
2	do	C45R
2	do	C45L
4	Railing Section	C54
4	do	C57

Camber = abt ⅜" at middle

Shop Note:-
Work the following sheets together:-
#S1AB, S1BB, S#52 to #58 inclusive

For general notes - see Sht # S1BB

RIVETS as noted
OPEN HOLES as noted
REAM - None
MILLING - As noted
PAINT - See general notes

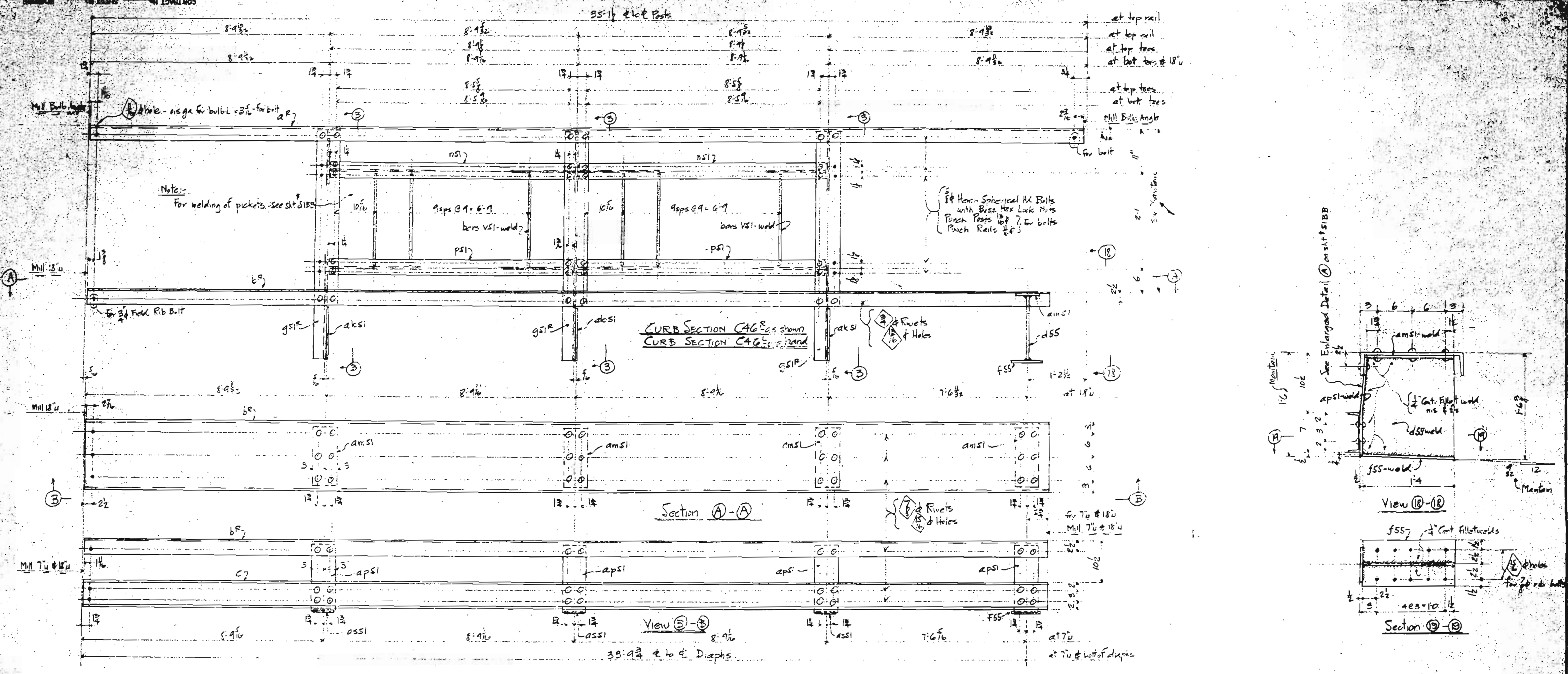
SHOP No.

CURB & RA...
MISSOURI RIVER B...
AT BROWNVILLE, NE...
FOR ATCHISON C...
BETHLEHEM STEEL...

L-98

327

L-98



BILL OF MATERIAL FOR ONE CURB SECTION C46R

1- Bulb Angle - 6 × 3½ × 10.7# × 35-0⅞ MZE - a^R - ord 35-1⅛ - It# 233
1- 18⊔ @ 42.7# × 34-3½ MZE - b^R - ord 34-4¼ - It# 216
1- 7⊔ 9.8 × 34-3 7/16 - MZE - c - ord 34-4¼ - It# 235
3- BS - 6 C 15½# × 4-11¼ - $g51^R$ - ord 9-10¾ - It# 207
2- Tees - 4 × 2½ × 7.2# × 8-8⅛ - n51 - It# 237
2- Tees - 4 × 2½ × 7.2# × 8-8 - p51 - It# 238
20- Bars - ½" Φ × 1-11½ - v51 - weld
3- Ps 22 × ⅜ × 1-4⅞ - ak51 - weld
4- Ps 6 UM × ½ × 1-3¼ - am51 - weld
4- Ps 6 UM × ½ × 1-4¾ - bent - ap51 - weld
5- Ps 5¾ UM × ½ × 1-4 - as51 - weld
1- P - 16 × ⅜ × 1-4⅝ - d55 - weld
1- P - 8 UM × ½ × 1-4 - f55 - weld
22- Hemi-Spherical Hd. Bolts ⅝ø × 1½ - Hex Nuts - ord FG 23157
22- Boss Hex Lock Nuts for ⅝ø bolt - ord FG-23158

Shop Note:-
For Section Ⓑ-Ⓑ - See Sheet # S1AB

REQUIRED LIST

No Reqd	Description	Mark
2	Curb Sections	C46R
2	do	C46L

camber = abt ⅜ at middle

Shop Note:-
Work the following sheets together:-
S1AB, S1BB, & S2 to # S8 inclusive.

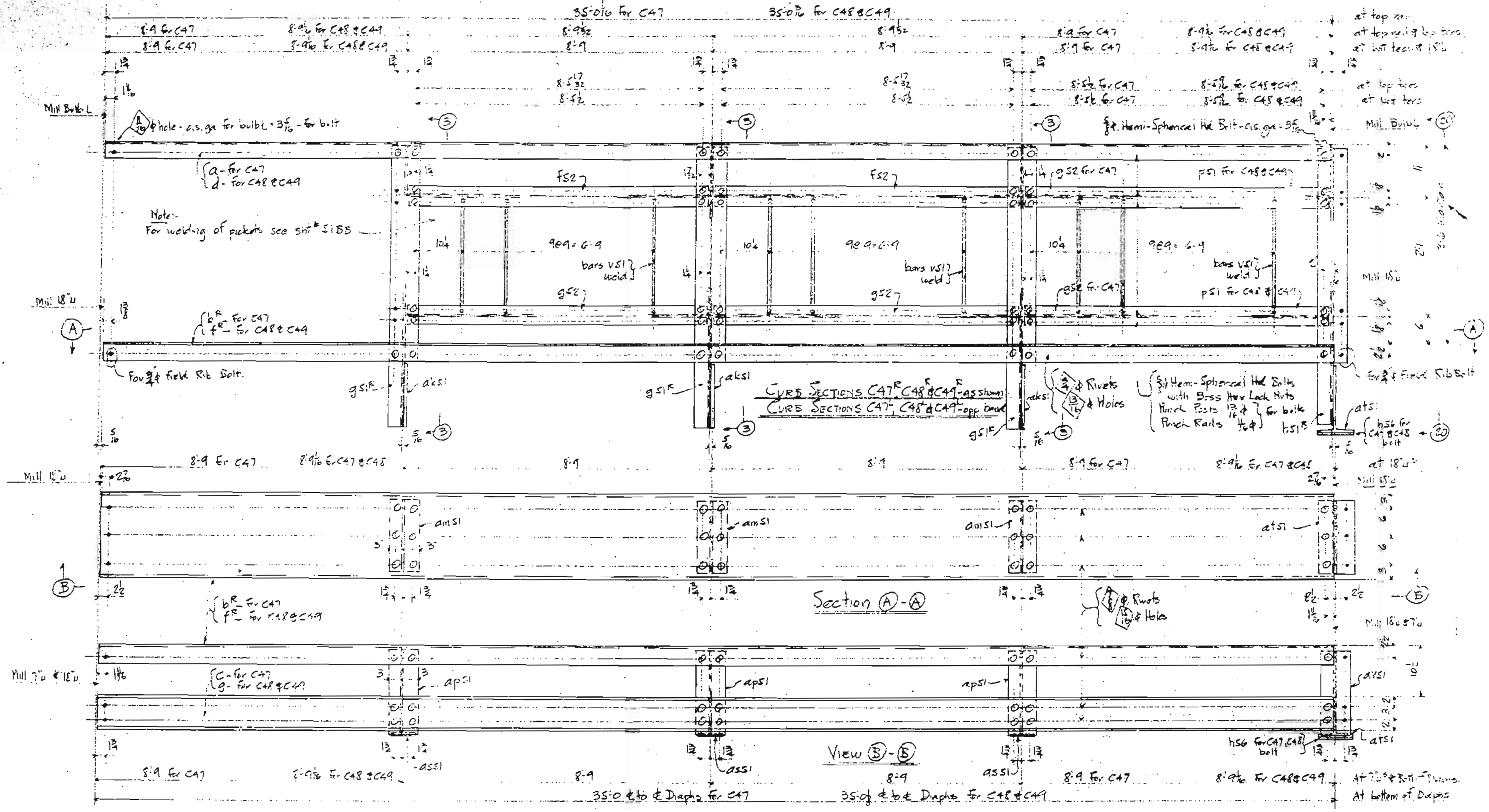
L-98

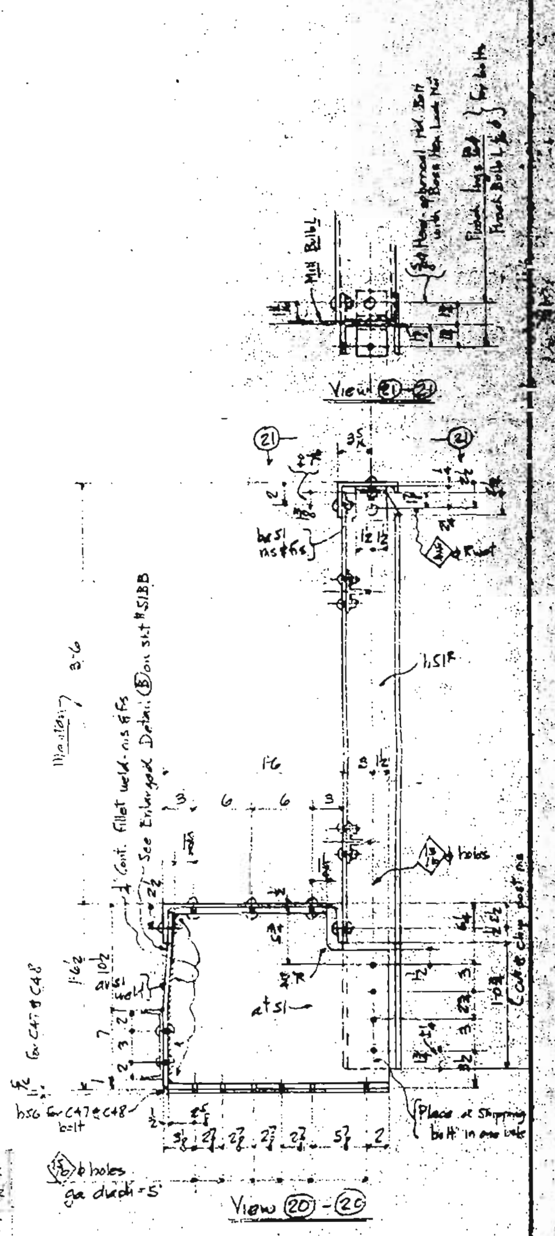
For general notes - see sheet # S1BB

RIVETS - as noted
OPEN HOLES - as noted
REAM - None
MILLING - As noted
PAINT - See general notes

CURB SECTIONS
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawing Office Chicago
CHECKED BY J.H.K.
SHOP NO. CONTRACT CG 84098

328




Mill Butt
View (21)-(21)
Punch Posts
Punch Bolts
h51^R
1 3/16 ф holes
Cont. fillet weld - as B4
See Enlarged Detail (B) on sht # 51BB
av51 weld
at51
h56 for C47 & C48 bolt
Place a shipping bolt in one hole
15/16 ф holes ga disch = 5'
View (20)-(20)

Bill of Material for One Curb Section C47^R, C48^R or C49^R

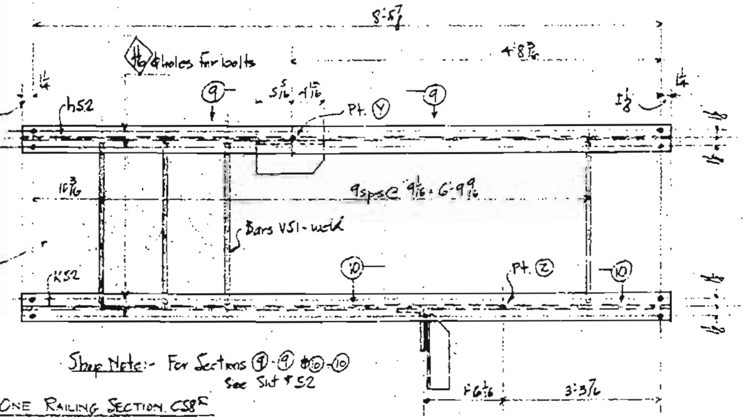
1- Bulb Angle - 6 x 3 1/2 x 10.7# x 34'-11 15/16 M2E - a - ord 35'-0 3/4 It # 234
1- 18"u @ 42.7 x 34'-11 7/8 M2E - b^R - ord 35'-0 3/4 It # 215
1- 7"u @ 9.8 x 34'-11 7/8 M2E - c - ord 35'-0 3/4 It # 253
2- Tees - 4 x 2 1/2 x 7.2# x 8'-8 - f52 - It # 238
4- Tees - 4 x 2 1/2 x 7.2# x 8'-8 - g52 - It # 238
(for C47^R)

1- Bulb Angle - 6 x 3 1/2 x 10.7# x 35'-0 1/16 M2E - d - ord 35'-0 3/4 It # 234
1- 18"u @ 42.7 x 35'-0 - M2E - f^R - ord 35'-0 3/4 It # 215
1- 7"u 9.8 x 35'-0 - M2E - g - ord 35'-0 3/4 It # 253
2- Tees - f52 It # 238
?- Tees - g52 It # 238
2- Tees - 4 x 2 1/2 x 7.2# x 8'-8 - p51 - It # 238
(for C48^R & C49^R)

3- BS - 6 x 15 1/2# x 4'-11 1/4 - g51^R - ord 9'-10 3/4 - It # 217
1- BS - 6 x 15 1/2 x 4'-10 5/8 - h51^R - ord 9'-8 1/2 - It # 205
30 Bars 1/2" ф x 1'-11 1/2 - vs1 - weld
3 Pls 22 x 3/8 x 1'-4 7/8 - ak51 - weld
3 Pls 6 um x 1/2 x 1'-3 1/4 - am51 - weld
3 Pls 6 um x 1/2 x 1'-4 3/4 - bent - ap51 - weld
3 Pls 5 1/4 um x 1/2 x 1'-4 - as51 - weld
1- 18 BS 0 x 1'-10 - at51 - ord 11'-1 1/2 - It # 152
1- Pl - 6 um x 1/2 x 1'-5 1/4 - bent - av51 - weld
2 Ls - 3 1/2 x 3 x 1/4 x 0'-3 - ba51
1 Pl 7 1/2 um x 5/16 x 1'-10 - h56 - bolt (for C47^R & C48^R)
32- Hemi-Spherical Hd Bolts - 5/8 ф x 1 1/2 - Hex Nuts - Ord RG 23157
32- Boss Hex Lock Nuts for 5/8 ф bolts - Ord RG 23158

329

Note:- For welding of pickets see sht # 51BB



Shop Note:- For Sections (9)-(9) & (10)-(10) See Sht # 52

Bill of Material for One Railing Section C58^R

1- Tee - 4 x 2 1/2 x 7.2# x 8'-5 7/8 - h52 - It # 236
1- Tee - 4 x 2 1/2 x 7.2# x 8'-5 5/8 - k52 - It # 236
10- Bars - vs1 - weld
1 L 5 5/16 x 3 9/16 x 3/8 x 10 1/8 - ab52^R - cut 6 x 6 L
2 Bars 3 13/16 x 1/16 x 10 1/8 - ac52 } bolt
1 Bar 3 9/16 x 3/8 x 10 1/8 - ad52 }
1 L 3 1/2 x 3 1/2 x 3/8 x 9 5/8 - at52^R
1 L 6 x 3 1/2 x 3/8 x 5 3/16 - ag52^R - weld
2 Bars 3 1/2 x 1/16 x 9 5/8 - ah52 } bolt
1 Bar 3 1/2 x 3/8 x 1 5/8 - ak52 }
2 Bars 2 1/2 x 1/16 x 0'-5 - am52
2 Bars 2 1/2 x 3/8 x 0'-5 - an52

2- Hemi-Spherical Hd Bolts 5/8 x 1 3/4 } Hex Nuts
2- do 5/8 x 2 1/4 } Ord RG 23157
4- Boss Hex Lock Nuts for 5/8 ф bolts - Ord RG 23158

Railing Section # C58^R - as shown
Railing Section # C58^L - opp hand

Shop Note:-
For Section (3)-(3) - See sht # 51AB

Required List

Camber abt 1/16" at middle (C47^R to C49^L)

No. Reqd	Description	Mark
2	Curb Section	C47^R
2	do	C47^L
2	do	C48^R
2	do	C48^L
2	do	C49^R
2	do	C49^L
One	Railing Section	C58^R
One	do	C58^L

Shop Note:-
Work the following sheets together:- Shts # 51AB, 51BB, # 52 to # 58 incl.

For general notes - see sht # 51BB

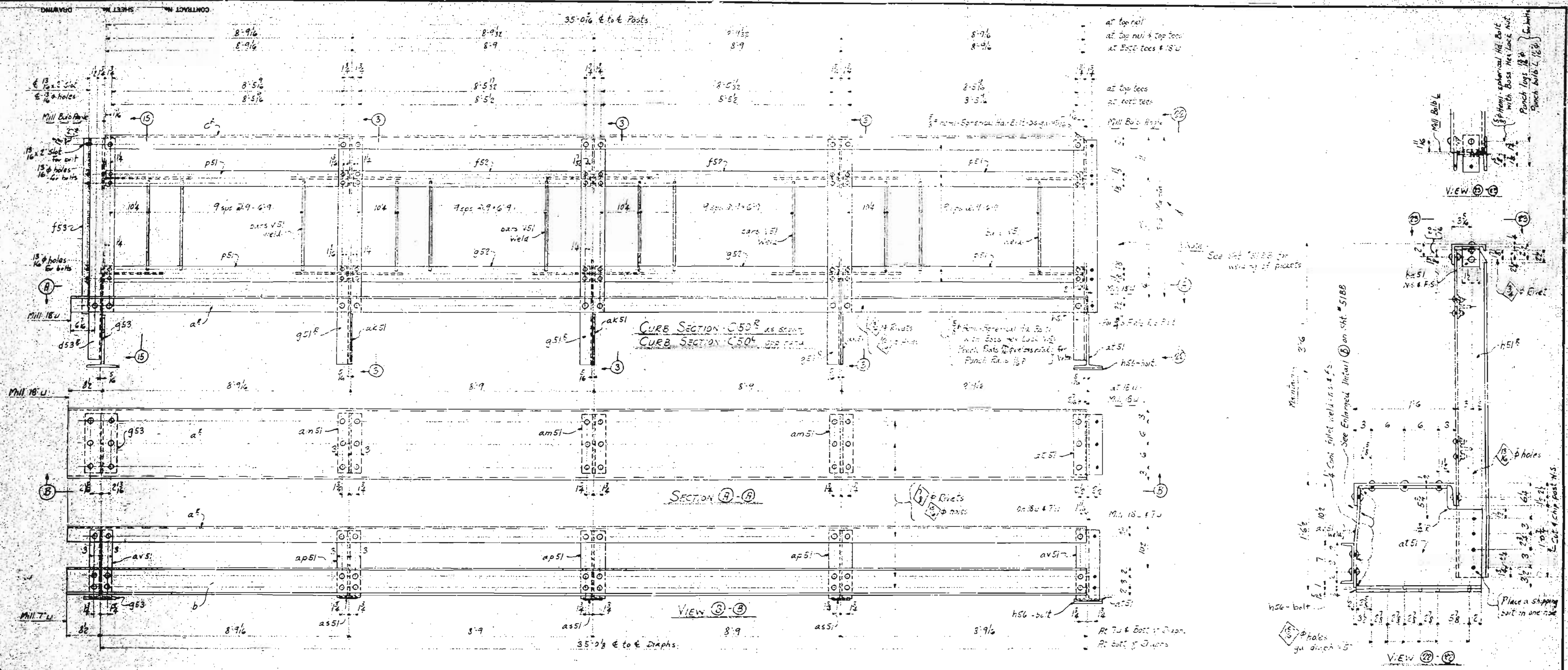
RIVETS - as noted
OPEN HOLES - as noted
REAM - None
MILLING - As noted
PAINT - See general notes

L-98

CURB & RAILING SECTIONS
MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Jenks MADE BY [illegible]
CHECKED BY J.V.V. [illegible] TRACED BY
REVISED LAST ADDEN. NO.

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.

SHOP NO.
CONTRACT C4 S4092



BILL OF MATERIAL FOR ONE CURB SECTION C50R

1 - Bulb Angle - 6x3 1/2x10.7# x 35'-0 1/16 M2E - cR ord 35'-0 3/4 - It # 234
1 - 18 u 42.7 x 35'-8 1/16 M2E - aR Ord 35'-9 1/4 - It # 212
1 - 7 u 9.8 x 35'-8 1/16 - M2E - b - Ord 35'-9 1/4 - It # 251
1 - BS - 6 @ 15 1/2# x 4'-10 1/8 - d53R - ord 9'-8 1/2 - It # 208
3 - BS - 6 @ 15 1/2 x 4'-11 1/4 - g51R - Ord 9'-10 3/8 - It # 207
9 - BS - 6 @ 15 1/2 x 4'-10 1/8 - h51R Ord 9'-8 1/2 - It # 208
4 - Tees - 4x2 1/2x7.2# x 8'-8 - p51 - It # 238
2 - Tees - 4x2 1/2x7.2# x 8'-8 - f52 - It # 238
2 - Tees - 4x2 1/2x7.2# x 8'-8 - g52 - It # 238
40 - Bars 3/4 ⌀ x 1'-11 1/2 - v51 - Weld
1 - Bar 2 1/4 x 1/4 x 3'-9 1/2 - f53 - Weld
1 - 18 B 70 x 1'-10 - g53 - Ord 14'-7 1/2 - It # 157 (Charge Customer for 18 B 53)
2 - Pl 6 UM x 1/2 x 1'-5 1/4 - bent - av51 - weld
1 - 18 B 50 x 1'-10 - at51 - Ord 11'-1 1/2 - It # 158
3 - Pls 22 x 3/8 x 1'-4 7/8 - ak51 - Weld
3 - Pls 6 UM x 1/2 x 1'-3 1/4 - am51 - Weld
3 - Pls 6 UM x 1/2 x 1'-4 1/4 - bent - ap51 - Weld
3 - Pls 6 1/4 UM x 1/2 x 1'-4 - as51 - Weld
2 - Ls 3 1/2 x 3 x 1/4 x 0'-3 - ba51
41 - Hemi Spherical Hd. Bolts - 5/8 ⌀ x 1 1/2 - Hex Nuts - Ord RG 23157
41 - Boss Lock Nuts for 5/8 ⌀ bolt - Ord. RG 23158
1 - R - 7 1/2 UM x 5/8 x 1'-10 - h56 - bolt

330

SHOP NOTE:

For Section 3-3 - See sht # 51A5
For section 15-15 - See sht # 53

SHOP NOTE:

Work the following sheets together:-
51A8, 51B8 & # 52 to # 55 inclusive

REQUIRED LIST

Camber abt 1/16 at middle.

NO REQD	DESCRIPTION	MARK
2	Curb Sections	C50R
2	do	C50L

L-98

CURB SECTIONS

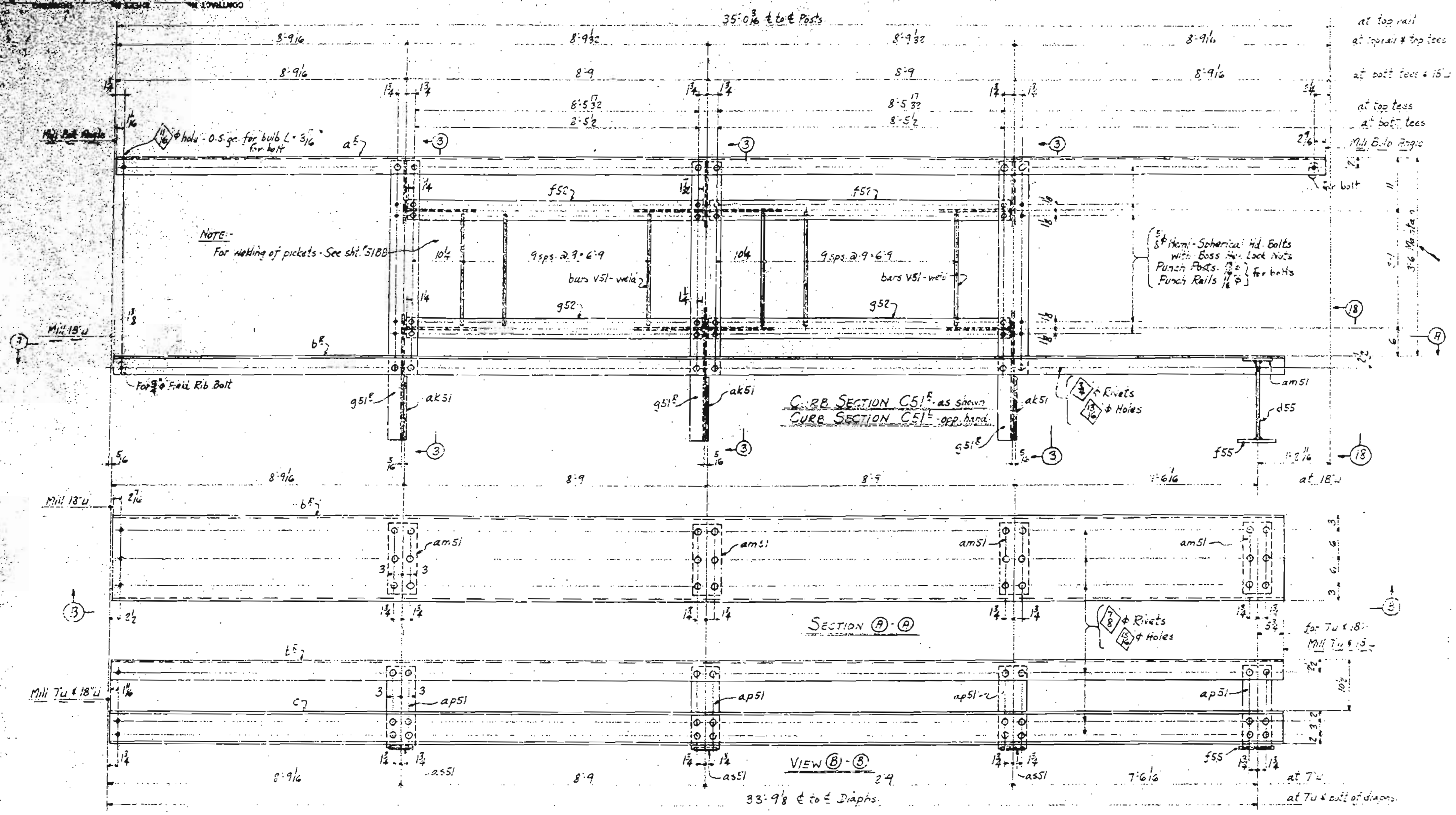
For general notes - See sht # 51B8

RIVETS As noted
OPEN HOLES As noted
REAM - None
MILLING - As noted
PAINT - See general notes

~~SHOP CONTACT SURFACES~~

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
FC. WR.
BL. SMITH
MCH.
ERECT.
C. INSP.

MISSOURI RIVER BRIDGE
AT BROWNVILLE NEBRASKA
FOR ATCHISON COUNTY MISSOURI
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
IN CHARGE Tenk MADE BY B.F.
CHECKED BY T.W.R. TRACED BY
REVISED LAST ASSEM. MK.
SHOP NO. CONTRACT CG 34092 SHEET 57



BILL OF MATERIAL FOR ONE CURB SECTION C51ᴿ

1 - Bulb Angle - 6 x 3½ x 10.7# x 34'-11 7/16 - M2E - aᴿ Ord 35'-0¼ - It. #235
1 - 18⊔ 42.7# x 34'-2 13/16 - M2E - bᴿ - Ord 34'-3½ - It. #217
1 - Tu 9.8# - 34'-2 13/16 - M2E - c - Ord 34'-3½ - It. #256
3 - BS 6@18½# - 4'-11¼ - g51ᴿ - ord 9'-10¾ - It. #207
2 - Tees - 4 x 2½ x 7.2# x 8'-8 - f52 - It. #238
2 - Tees - 4 x 2½ x 7.2# x 8'-8 - g52 - It. #238
20 - Bars - ½ ɸ x 1'-11½ - v51 - Weld.
3 - Pls. 22 x 7/8 x 1'-4 7/8 - ak51 - Weld.
4 - Pls. 6 UM x ½ x 1'-3¼ - am51 - Weld
4 - Pls. 6 UM x ½ x 1'-4¾ - bent - ap51 - Weld
3 - Pls. 5¼ UM x ½ x 1'-4 - as51 - Weld.
1 - Pl. 16 x 3/8 x 1'-4 1/16 - d55 - Weld.
1 - Pl. 8 UM x ½ x 1'-4 - f55 - Weld.
22 - Hemi-Spherical Hd. Bolts - 5/8 ɸ x 1½ - Hex Nuts - Ord. RG 23157
22 - Boss Hex Lock Nuts - for 5/8 ɸ bolt - Ord. RG 23158

Shop Note:-

For Section ③-③ - See Sheet #51AB
For View ③-③ - See Sheet #55

REQUIRED LIST

No Req'd	Description	Mark
2	Curb Sections	C51ᴿ
2	do.	C51ᴸ

Camber abt. 1/16 at middle

Shop Note:-

Work the following sheets together:- #51AB, 51BB, & 52 to 58 inclusive.

L-98

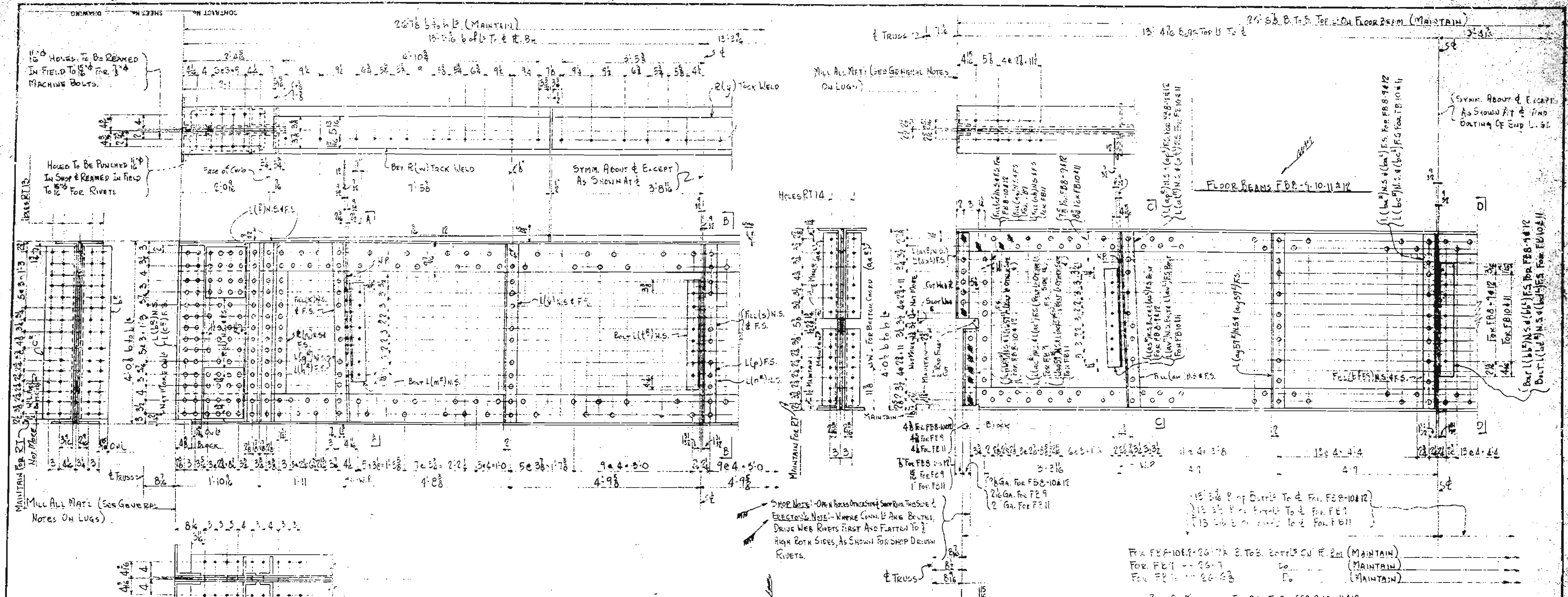
For general notes - See Sheet #51BB

RIVETS - as noted
OPEN HOLES - as noted
REAM - None
MILLING - As noted
PAINT - See general notes

CURB SECTIONS
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBR.
FOR [illegible] COUNTY

SHOP NO.
CONTRACT

331


26'-7 1/8 b to b L^s (Maintain)
15'-5 3/16 b of L^s To ₵ R. Bm
11/16"φ Holes To Be Reamed In Field To 15/16"φ For 7/8"φ Machine Bolts.
Holes To Be Punched 11/16"φ In Shop & Reamed In Field To 15/16"φ For Rivets
Face of Curb
Bev. R (w) Tack Weld
Symm. About & Except As Shown At ₵
2(y) Tack Weld
Holes RT 12
Holes RT 14
Mill All Mat'l (See General Notes On Lugs)
Maintain For RT
₵ Truss
Floor Beams FB8-9-10-11 & 12
(Symm. About ₵ Except As Shown At ₵ And Bolting Of End L^s.)
25'-5 3/8 B. To B. Top L^s On Floor Beam (Maintain)
13'-4 7/16 B. To B. Top L^s To ₵
Fill (F.S.) N.S. & F.S.
Block
Bolt L(m^R) N.S.
L(p) F.S.

Mill All Mat'l (See General Notes On Lugs)

Shop Note:- Open Holes Other Side & Shop Rivs. This Side ₵

Erector's Note:- Where Conn. L^s Are Bolted, Drive Web Rivets First And Flatten To 3/8" High Both Sides, As Shown For Shop Driven Rivets.

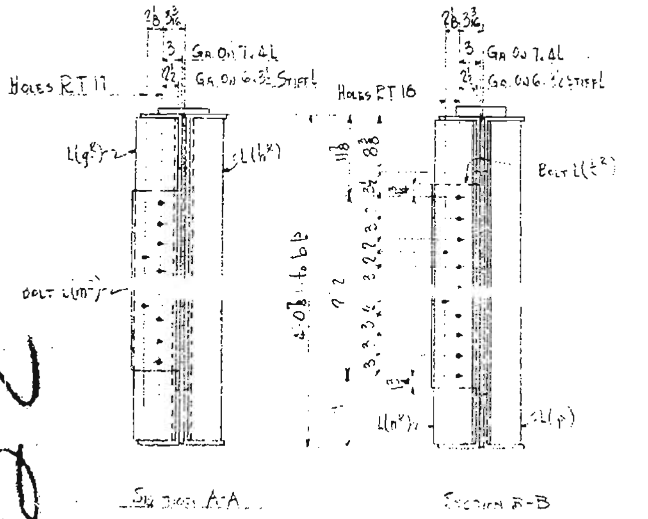
2 7/8 Ga. For FB8-10 & 12
2 1/16 Ga. For FB9
2" Ga. For FB11

13'-3 5/8 Bott. L^s To ₵ For FB8-10 & 12
13'-3 1/2 Bott. L^s To ₵ For FB9
13'-3 3/8 Bott. L^s To ₵ For FB11

For FB8-10 & 12 - 26'-7 5/8 B. To B. Bott. L^s On Fl. Bm. (Maintain)
For FB9 -- 26'-7 Do (Maintain)
For FB11 -- 26'-6 3/8 Do (Maintain)

Floor Beam FB7^R As Shown

Floor Beam FB7^L Opp Hand

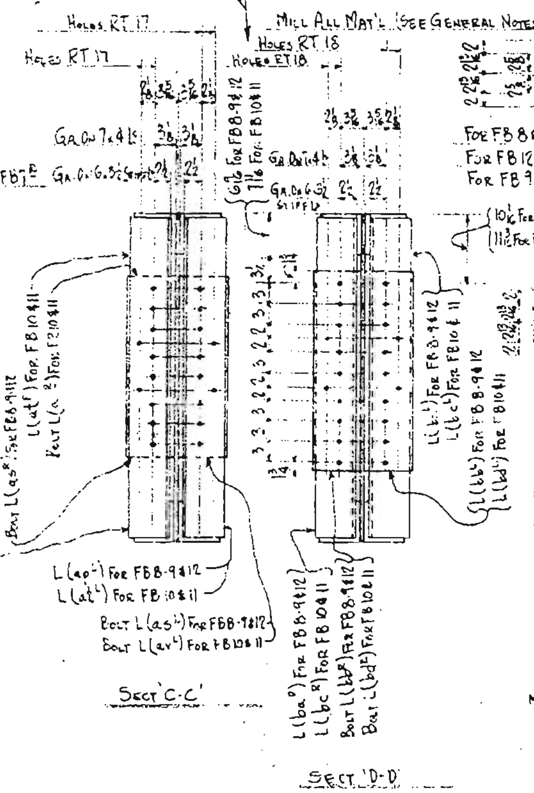


Section A-A

Section B-B

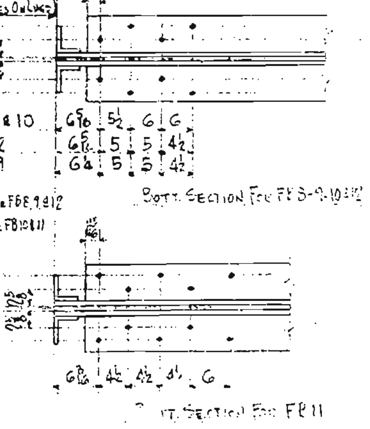
Bill Of Material For One Floor Bm. FB7^R

4 L^s 8.6.1/2.26'-1 1/8 M&E Ord 26'-8 It# 258
1 Web R 48 1/2.5/8.26'-7 1/8 M&E Ord 26'-8 It# 279
4 End R^s 3 2 7/8.1/2.2'-5 9/16 (a) M&E
2 L^s 7 1/2.7.5/8.3'-10 7/8 (b^R_L) Cut 8.8L
2 L^s 8.7.5/8.3'-10 7/8 (c^R_L) Cut 8.8L
8 R^s 14.5/8.0'-11 1/4 (d)
2 Stiff L^s 6.3 1/2.3/8.3'-11 15/16 (g^R_L) F2E
2 Stiff L^s 5.3 1/2.3/8.3'-11 15/16 (h^R_L) F2E
4 Fills 3 1/4.1/2.2'-8 15/16 (k)
2 L^s 7.4.3/8.2'-2 1/2 (m^R_L) Bolt
1 Stiff L6.3 1/2.3/8.3'-11 7/8 (n^R) F2E
1 Stiff L5.3 1/2.3/8.3'-11 7/8 (p) F2E
2 Fills 3 1/2.1/2.2'-6 7/8 (s)
1 L 7.4.3/8.2'-5 1/2 (t^R) Bolt
4 Stiff L^s 5.3 1/2.5/16.3'-11 7/8 (v) F2E. Crimp
2 Bev. R^s 7 1/2.9/32.1 5/8.7'-5 3/8 (w) F.S. Tack Weld
1 R 7 1/2.1 5/8.7'-5 3/8 (y) Tack Weld



Sect 'C-C'

Sect 'D-D'



Bott. Section For FB8-9-10 & 12

Bott. Section For FB11

Bill Of Material For One Fl. Bm. FB8-9-10-11 & 12

2 L^s 6.6.5/8.26'-8 5/8 M&E Ord 26'-9 3/4 It# 260 (Top Flg)
2 L^s 6.6.5/8.26'-7 5/8 M&E Ord 26'-8 It# 261 (Bott Flg) For FB8-10 & 12
2 L^s 6.6.5/8.26'-7 M&E Ord 26'-7 3/4 It# 262 (Bott. Flg) For FB9
2 L^s 6.6.5/8.26'-6 3/8 M&E Ord 26'-7 3/4 It# 262 (Bott Flg) For FB11
1 Web R 49.5/8.26'-8 5/8 M&E Ord 26'-9 3/4 It# 280
4 L^s 4.3 1/2.3/8.1'-11 (aa^R_L)
4 L^s 4.3 1/2.3/8.1'-5 3/4 (ab^R_L) Bolt 2. For FB8-10 & 12
4 L^s 4.3 1/2.3/8.1'-5 1/4 (ac^R_L) Bolt 2. For FB9
4 L^s 4.3 1/2.3/8.1'-5 (ad^R_L) Bolt 2 For FB11
4 End Fill R^s 8 1/2 Min. 3/8.3'-0 1/2 (af^R) Ord 8 3/4. For FB8-10 & 12
4 End Fill R^s 8 1/2 Min. 3/8.3'-0 1/2 (ag) Ord 8 3/4. For FB9
4 End Fill R^s 8 1/2 Min. 3/8.3'-0 1/2 (ah) Ord 8 3/4. For FB11

4 Stiff L^s 6.3 1/2.3/8.3'-11 5/16 (ap^R_L) F2E } For FB8-9 & 12
4 L^s 7.4.3/8.2'-2 1/2 (as^R_L) Bolt }
4 Stiff L^s 6.3 1/2.3/8.3'-11 5/16 (at^R_L) F2E } For FB10 & 11
4 L^s 7.4.3/8.2'-2 1/2 (av^R_L) Bolt }
4 Fills 3 1/2.5/8.3'-0 1/16 (aw)
[illegible] 3'-11 1/4 (ay 59) Crimp
2 Stiff L^s 6.[illegible]
2 L^s 7.4.3/8.2'-5 1/2 (bb^R_L) Bolt }
2 Stiff L^s 6.3 1/2.3/8.3'-11 1/4 (bc^R) F2E } For FB10 & 11
2 L^s 7.4.3/8.2'-5 1/2 (bd^R_L) Bolt }
2 Fills 3 1/2.5/8.3'-0 1/2 (b 59)

No. Req'd	Description	Mark
One	Floor Beam	FB7^R
One	Do	FB7^L
2	Do	FB8
2	Do	FB9
4	Do	FB10
2	Do	FB11
2	Do	FB12

L-98

Shop Note:-
Work Sheets 59 & 60 Together

General Notes For Sheets # 59 & 60.

Material Spec's:- A.S.T.M.- A7-34.

Workmanship Spec's:- As Per Project Specifications.

Welding Spec's:- As Per A.A.HO Spec's 1935

Shop Inspection:- By R.W. Hunt Co

Punching, Drilling & Reaming:-

Fills On Top Flg. Of FB7^R To Be Drilled.
Slotted Holes To Be Punched Full Size.
All Other Holes For Shop And Field Rivets Or Bolts Are To Be Subpunched 11/16"φ And Reamed To Size After Assembly Except Where Noted To Be Reamed In Field.
Holes Marked RT. To Be Reamed To Steel Templets.

Milling On Ends Of Floorbeams:-

Ends Of Floorbeams, Including Connection L^s, To Be Milled After Assembly. Connection L^s Are Not To Be Reduced In Thickness More Than 1/16".

(For continuation of general notes, see notes elsewhere on this drawing)

Continuation of General Notes For Shts # 59 & 60

Shop Assembly:- Shop Contact Surfaces Are Not To Be Painted But Shall Be Cleaned Same As Painted Surfaces

Cleaning & Painting:- To Be As Per Project Specifications.

Shop Paint:-

Pin Holes To Be Given A Heavy Coat Of White Lead & Tallow. All Other Parts Shall Be Given One Coat Of Shop Paint. Parts Covered By "Paint Note ⓧ" On Sheet # 60 Shall Be Given The Two Field Coats Of Paint At Shop In Addition To The Shop Coat.
Shop Coat - Red Lead. }
1st Field Coat - Brown Paint } To Be Approved Paints As Per Project Specifications.
2nd Field Coat - Aluminum. }

RIVETS 7/8"φ

OPEN HOLES 15/16"φ Unless Noted

REAM See General Notes

MILLING As Noted

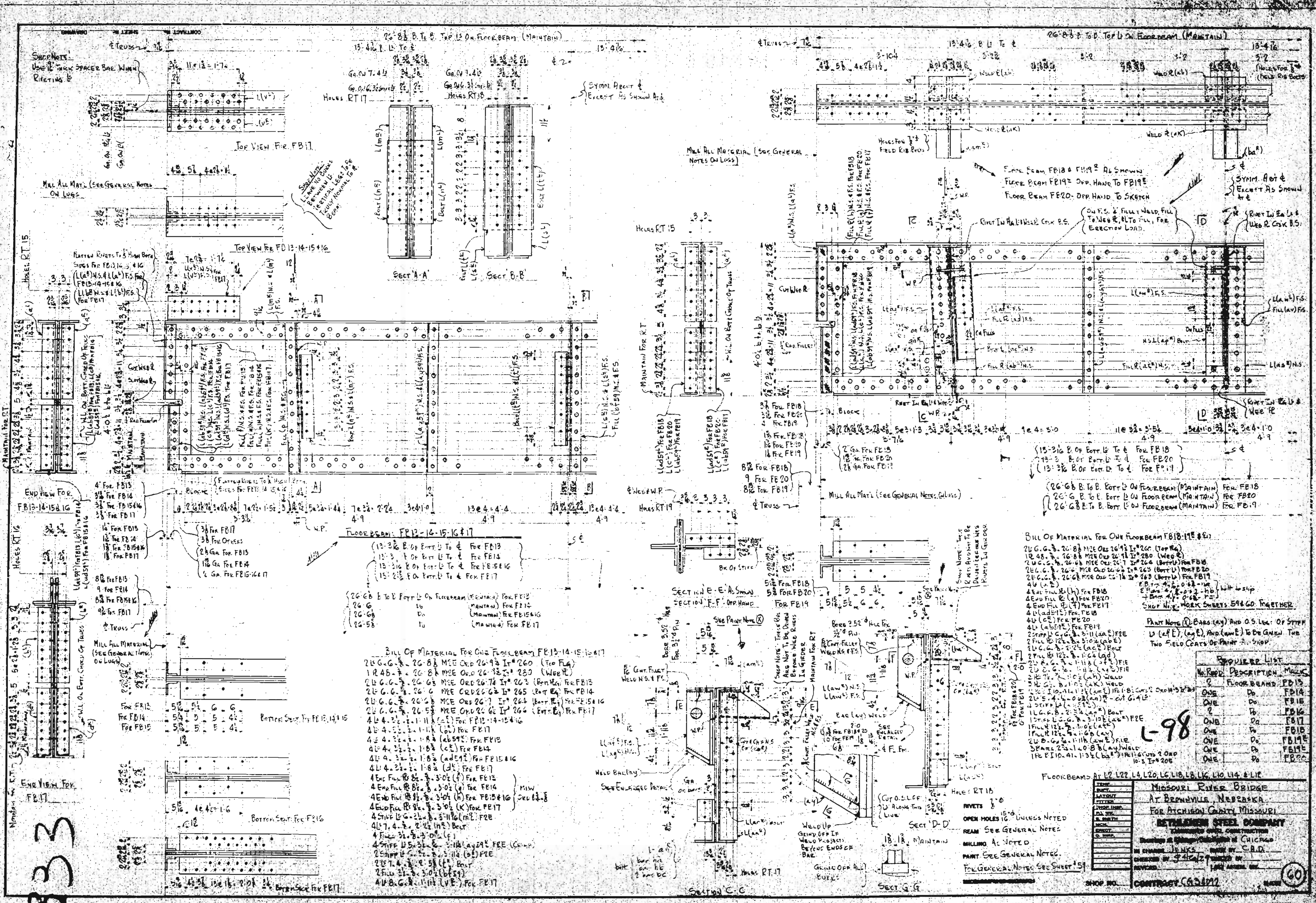
PAINT See General Notes

~~SHOP CONTACT SURFACES~~

Floor Beams At L1, L23, L3, L21, L5, L19, L7, L17, L9, L15, L11 & L13

Missouri River Bridge
At Brownville, Nebraska
For Atchison County, Missouri

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings at Chicago - Fabrication at Chicago
In Charge Jenks Made By C.A.D.
Checked By [illegible]
SHOP NO.
CONTRACT C 6540 12
SHEET 59


Shop Note: Use ½" Thick Spacer Bar When Riveting Ls
Top View For FB17
Top View For FB13-14-15 & 16
Mill All Mat'l (See General Notes On Lugs)
Sect 'A-A'
Sect 'B-B'
Holes RT 17
Holes RT 18
Holes RT 15
Holes RT 16
Holes RT 19
Symm. About ℄ Except As Shown
End View For FB13-14-15 & 16
End View For FB17
Floorbeam: FB13-14-15-16 & 17
Bottom Sect. For FB13, 14, 15
Bottom Sect. For FB16
Bottom Sect. For FB17
Section E-E As Shown
Section F-F Opp. Hand
Section C-C
Sect 'D-D'
Sect G-G
See Enlarged Detail
See Paint Note ⓧ
Weld Up Grind Off If Weld Projects Beyond Ends Of Bar
Floor Beam FB18 & FB19E As Shown
Floor Beam FB19E Opp. Hand To FB19E
Floor Beam FB20 Opp. Hand To Sketch
Symm. Abt ℄ Except As Shown
Rivet In ℞ & Web ℞ Csk B.S.
Mill All Mat'l (See General Notes On Lugs)
26'-8⅛ B. To B. Top Ls On Floor Beam (Maintain)
℄ Truss
L-98

(13'-3⅛ B. Of Bott. Ls To ℄ For FB13
(13'-3 B. Of Bott. Ls To ℄ For FB14
(13'-3⅛ B. Of Bott. Ls To ℄ For FB15 & 16
(13'-2⅝ B. Of Bott. Ls To ℄ For FB17

(26'-6⅛ B. To B. Bott. Ls On Floorbeam (Maintain) For FB13
26'-6 Do (Maintain) For FB14
26'-6⅛ Do (Maintain) For FB15 & 16
26'-5⅝ Do (Maintain) For FB17

Bill Of Material For One Floorbeam FB13-14-15-16 & 17

2 Ls 6.6.⅝. 26'-8⅛ M2E Ord 26'-9¾ It# 260 (Top Flg)
1 ℞ 48.⅜. 26'-8⅛ M2E Ord 26'-9⅞ It# 280 (Web ℞)
2 Ls 6.6.⅝. 26'-6⅛ M2E Ord 26'-7¼ It# 263 (Bott Flg) For FB13
2 Ls 6.6.⅝. 26'-6 M2E Ord 26'-6¾ It# 265 (Bott Flg) For FB14
2 Ls 6.6.⅝. 26'-6⅛ M2E Ord 26'-7 It# 264 (Bott Flg) For FB15 & 16
2 Ls 6.6.⅝. 26'-5⅝ M2E Ord 26'-6½ It# 266 (Bott Flg) For FB17
4 Ls 4.3½.½. 1'-11⅛ (a⁵) For FB13-14-15 & 16
4 Ls 4.3½.½. 1'-11⅛ (b⁵) For FB17
4 Ls 4.3½.½. 1'-8¾ (ab59⁵) For FB13
4 Ls 4.3½.½. 1'-8¾ (c⁵) For FB14
4 Ls 4.3½.½. 1'-8¾ (ad59⁵) For FB15 & 16
4 Ls 4.3½.½. 1'-8¾ (d⁵) For FB17
4 End Fill ℞s 8½.⅝. 3'-0½ (f) For FB13
4 End Fill ℞s 8½.⅝. 3'-0½ (g) For FB14
4 End Fill ℞s 8½.⅝. 3'-0½ (h) For FB15 & 16
4 End Fill ℞s 8½.⅝. 3'-0½ (K) For FB17
} M.I.W. Ord 8¾.⅝
4 Stiff Ls 6.3½.⅜. 3'-11⅞ (m⁵) F2E
4 Ls 7.4.⅜. 2'-2½ (n⁵) Bolt
4 Fills 3½.⅝. 3'-0½ (r)
4 Stiff Ls 5.3½.⅜. 3'-11¾ (ay29⁵) F2E (Crimp)
2 Stiff Ls 6.3½.⅜. 3'-11¾ (s⁵) F2E
2 Ls 7.4.⅜. 2'-5⅜ (t⁵) Bolt
2 Fills 3½.⅜. 3'-0½ (bf59)
4 Ls 8.6.⅜. 1'-11¾ (v⁵) For FB17

(13'-3⅛ B. Of Bott. Ls To ℄ For FB18
(13'-3 B. Of Bott. Ls To ℄ For FB20
(13'-3⅛ B. Of Bott. Ls To ℄ For FB19

(26'-6⅛ B. To B. Bott. Ls On Floorbeam (Maintain) For FB18
26'-6 B. To B. Bott. Ls On Floorbeam (Maintain) For FB20
26'-6⅛ B. To B. Bott. Ls On Floorbeam (Maintain) For FB19

Bill Of Material For One Floorbeam FB18-19E & 20

2 Ls 6.6.⅝. 26'-8⅛ M2E Ord 26'-9¾ It# 260 (Top Flg)
1 ℞ 48.⅜. 26'-8⅛ M2E Ord 26'-9⅞ It# 280 (Web ℞)
2 Ls 6.6.⅝. 26'-6⅛ M2E Ord 26'-7 It# 264 (Bott Ls) For FB18
2 Ls 6.6.⅝. 26'-6 M2E Ord 26'-6¾ It# 265 (Bott Ls) For FB20
2 Ls 6.6.⅝. 26'-6⅛ M2E Ord 26'-7¼ It# 263 (Bott Ls) For FB19
4 Ls (a⁵)
4 End Fill ℞s (h) For FB18
4 End Fill ℞s (g) For FB20
4 End Fill ℞s (f) For FB17
4 Ls (ad59⁵) For FB18
4 Ls (c⁵) For FB20
4 Ls (ab59⁵) For FB19
2 Stiff Ls 6.6.⅜. 3'-11 (aa⁵) F2E
2 Fill ℞s 12½.⅜. 3'-0½ (ab⁵)
2 Ls 6.6.⅜. 2'-2½ (ac⁵) Bolt
2 Fill ℞s 12½.⅜. 1'-6¼ (ad)
2 Ls 8.6.⅜. 1'-11⅛ (af⁵) F1E
2 Ls 8.6.⅜. 1'-11⅛ (ag⁵) F1E
2 ℞s 7½.⅜. 1'-0½ (ah) Weld
3 ℞s 6½.⅜. 1'-0½ (ak) Weld
2 Ls I 10.41. 1'-3½ (am⁵) 1 ℞ 1'-8 Cuts 2 Ord 11'-3½ It# 203
2 Ls 5.4.½. 0'-6¾ (an) ½ - cut 6.4 L
4 Stiff Ls (a⁵)
1 L 6.6.⅜. 2'-2½ (ap⁵) Bolt
1 Stiff L 6.6.⅜. 3'-10⅞ (aa⁵) F2E
1 Fill ℞ 12½.⅜. 3'-0½ (at⁵)
1 Fill ℞ 12½.⅜. 1'-6⅛ (av)
2 Ls 8.6.⅜. 1'-11⅛ (aw⁵) F1E
3 Bars 2⅝. 1'-0⅞ (ay) Weld
1 Fe ℞ I 10.41. 1'-3½ (ba⁵) 1 ℞ 1'-6 Cuts 2 Ord 10'-3 It# 205

2 Bars 4.½. 0'-6¾ - hc
2 Bars 4.½. 0'-6¾ - hb
+ Bars 4.½. 0'-6¾ - hr
} Wt ship

Shop Note: Work Sheets 59 & 60 Together.

Paint Note ⓧ: Bars (ay) And O.S. Legs Of Stiff Ls (af⁵), (ag⁵), And (aw⁵) To Be Given The Two Field Coats Of Paint At Shop.

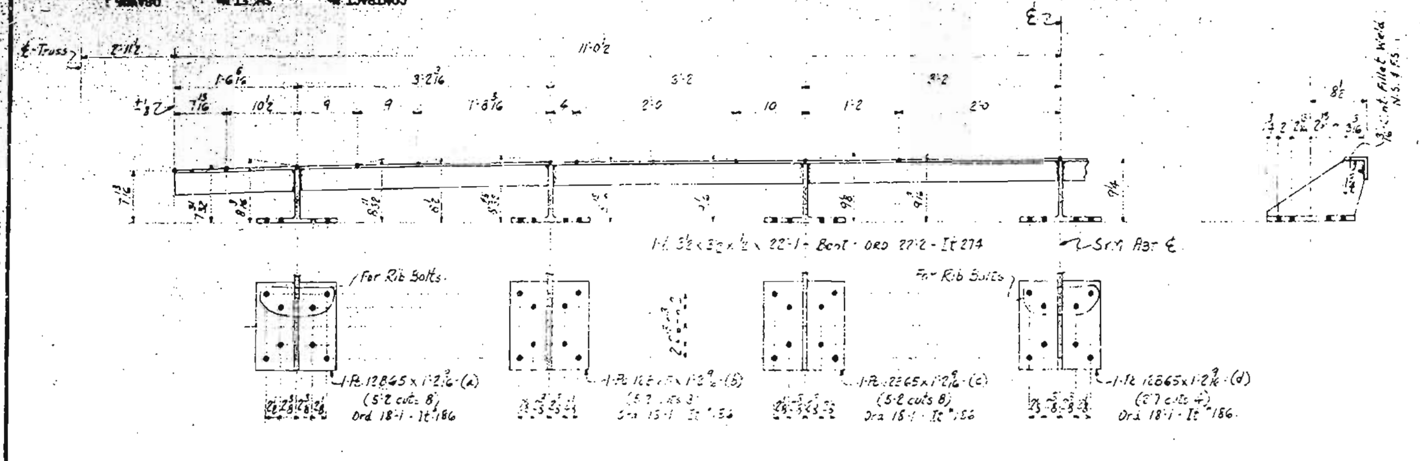
No. Reqd.	Description	Marks
2	Floorbeams	FB13
One	Do	FB14
One	Do	FB15
2	Do	FB16
One	Do	FB17
One	Do	FB18
One	Do	FB19E
One	Do	FB19E
One	Do	FB20

Floorbeams At L2, L22, L4, L20, L6, L18, L8, L16, L10, L14 & L12.

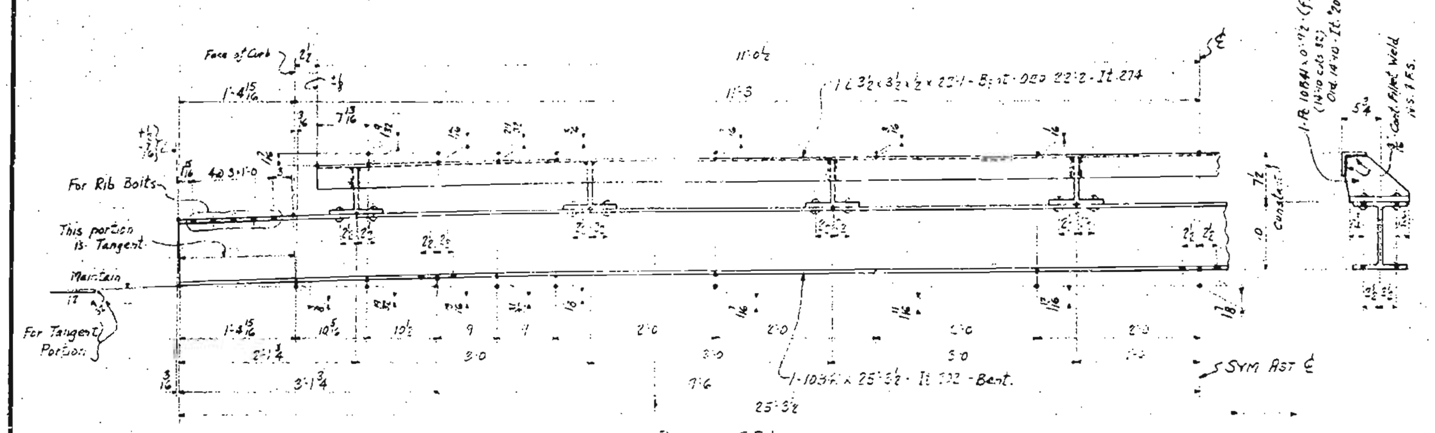
Rivets ⅞"⌀
Open Holes 15/16"⌀ Unless Noted
Ream See General Notes
Milling As Noted
Paint See General Notes.
For General Notes See Sheet #59

Missouri River Bridge
At Brownville, Nebraska
For Atchison County Missouri
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
Drawings & [illegible] Chicago
In Charge Jenks Made By C.B.D.
Checked By [illegible]
Revised
Shop No.
Contract C63492
Sheet 60

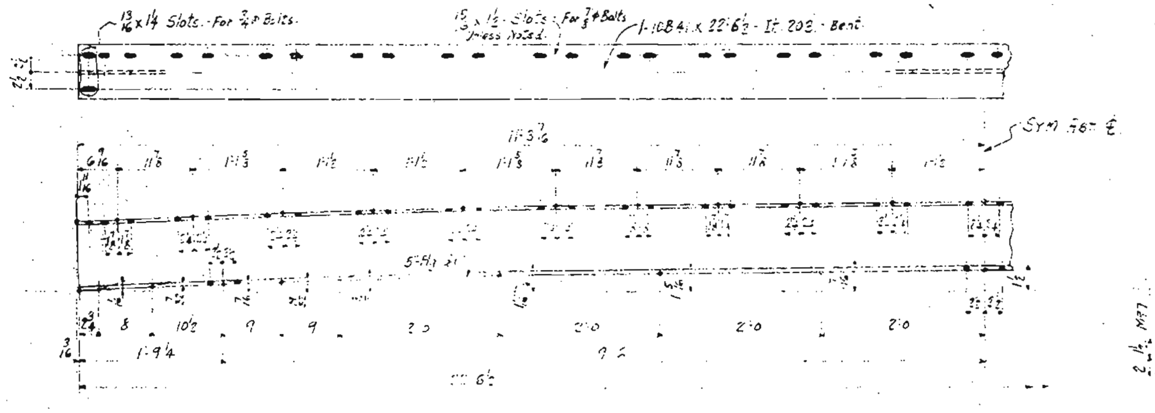
33


℄ Truss
1-Pl 3½x3½x½x22'-1 - Bent - Ord 22'-2 - It 274
Sym Abt ℄
For Rib Bolts
1-Pl 12x65x1'-2⅞-(a) (5'-2 cuts 8) Ord 18'-1 - It 186
1-Pl 12x65x1'-2⅞-(b)
1-Pl 12x65x1'-2⅞-(c) (5'-2 cuts 8) Ord 18'-1 - It 186
1-Pl 12x65x1'-2⅞-(d) Ord 18'-1 - It 186

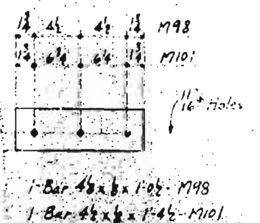
EXPANSION GUARD - M77



CROSS BEAM - CB1

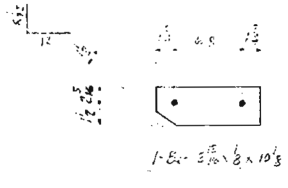


CROSS BEAM - CB2



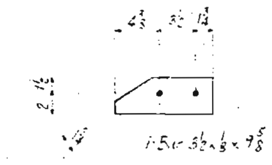
1-Bar 4½x⅛x1'-0½-M98
1-Bar 4½x⅛x1'-4½-M101

SHIMS - M98-M101



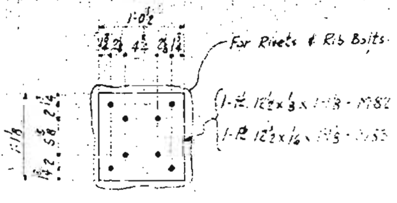
1-Bar 3½x⅛x10⅛

SHIM - M102

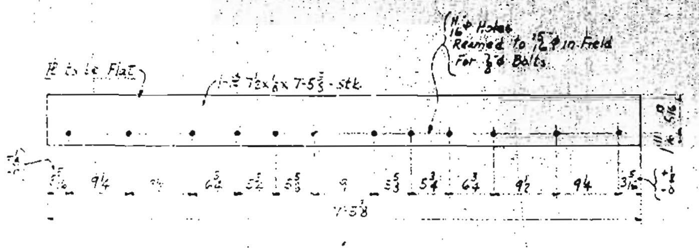


1-Bar 3½x⅛x7⅝

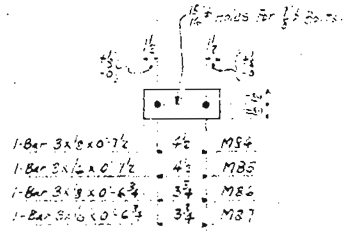
SHIM - M103



SHIMS - M82-M83

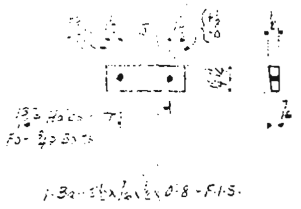


SHIM - M88



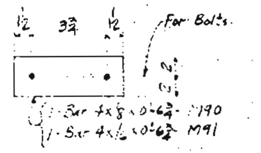
1-Bar 3½x⅛x0'-7½ - 4½ - M84
1-Bar 3½x⅛x0'-7½ - 4½ - M85
1-Bar 3½x⅛x0'-6¾ - 3¾ - M86
1-Bar 3½x⅛x0'-6¾ - 3¾ - M87

SHIMS - M84-M85-M86-M87



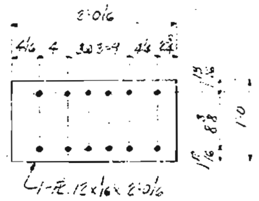
1-Bar 3½x⅛x0'-8 - F.S.

SHIM - M89



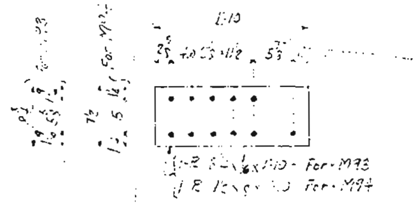
1-Bar 4x⅛x0'-6⅞ - M90
1-Bar 4x⅟₁₆x0'-6⅞ - M91

SHIMS - M90-M91



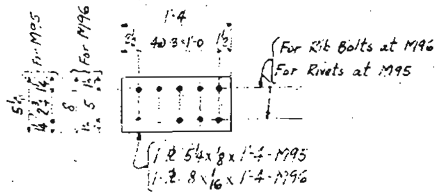
1-Pl 12x⅛x2'-0⅝

SHIM - M92



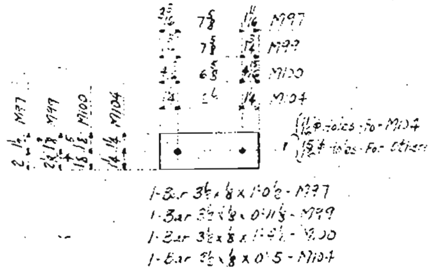
1-Pl 12x⅛x1'-10 - For M93
1-Pl 12x⅟₁₆x1'-10 - For M94

SHIMS - M93-M94



1-Pl 5¼x⅛x1'-4-M95
1-Pl 8x⅟₁₆x1'-4-M96

SHIMS - M95-M96



1-Bar 3½x⅛x1'-0½ - M97
1-Bar 3½x⅛x0'-11⅛ - M99
1-Bar 3½x⅛x1'-4½ - M100
1-Bar 3½x⅛x0'-5 - M104

SHIMS - M97-M99-M100-M104

REQUIRED LIST

	No Reqd	Description	Mark
	4	Expansion Guard	M77
	4	Cross Beam	CB1
	2	Do.	CB2
(8-Adjust)	34	Shims	M82
(12-Adjust)	68	Do.	M83
(8-Adjust)	25	Do.	M84
(10-Adjust)	28	Do.	M85
(4-Adjust)	28	Do.	M86
	8	Adjusting Shims	M87
(4-Adjust)	10	Shims	M88
	4	Do.	M89
	4	Adjusting Shims	M90
	4	Do.	M91
	4	Do.	M92
	8	Do.	M93
	8	Do.	M94
	20	Do.	M95
	8	Do.	M96
	5	Do.	M97
	8	Do.	M98
	16	Do.	M99
	8	Do.	M100
	8	Do.	M101
	8	Do.	M102
	8	Do.	M103
	8	Do.	M104

GENERAL NOTES:-

MATERIAL SPECS:- ASTM-A7-34
WORKMANSHIP SPECS:- As per project specifications
WELDING SPECS:- As per A.A.H.O. Specs 1935
SHOP INSPECTION:- By Robt Hunt Co.
SHOP ASSEMBLY:- Shop contact surfaces are not to be painted but to be cleaned same as painted surfaces.
CLEANING & PAINTING:- As per Project Specifications.
SHOP PAINT:- One coat of an approved Red Lead shop paint as per Project Specifications.

L-98

RIVETS - ⅞⌀
OPEN HOLES - ¹⁵⁄₁₆ Unless Noted
REAM - None
MILLING - As Noted
PAINT - See General Notes

EXP. GUARD - CROSS BMS. & SHIMS
MISSOURI RIVER BRIDGE
AT BROWNVILLE, NEBRASKA
FOR ATCHISON COUNTY, MISSOURI
BETHLEHEM STEEL COMPANY
Chicago
B.K.

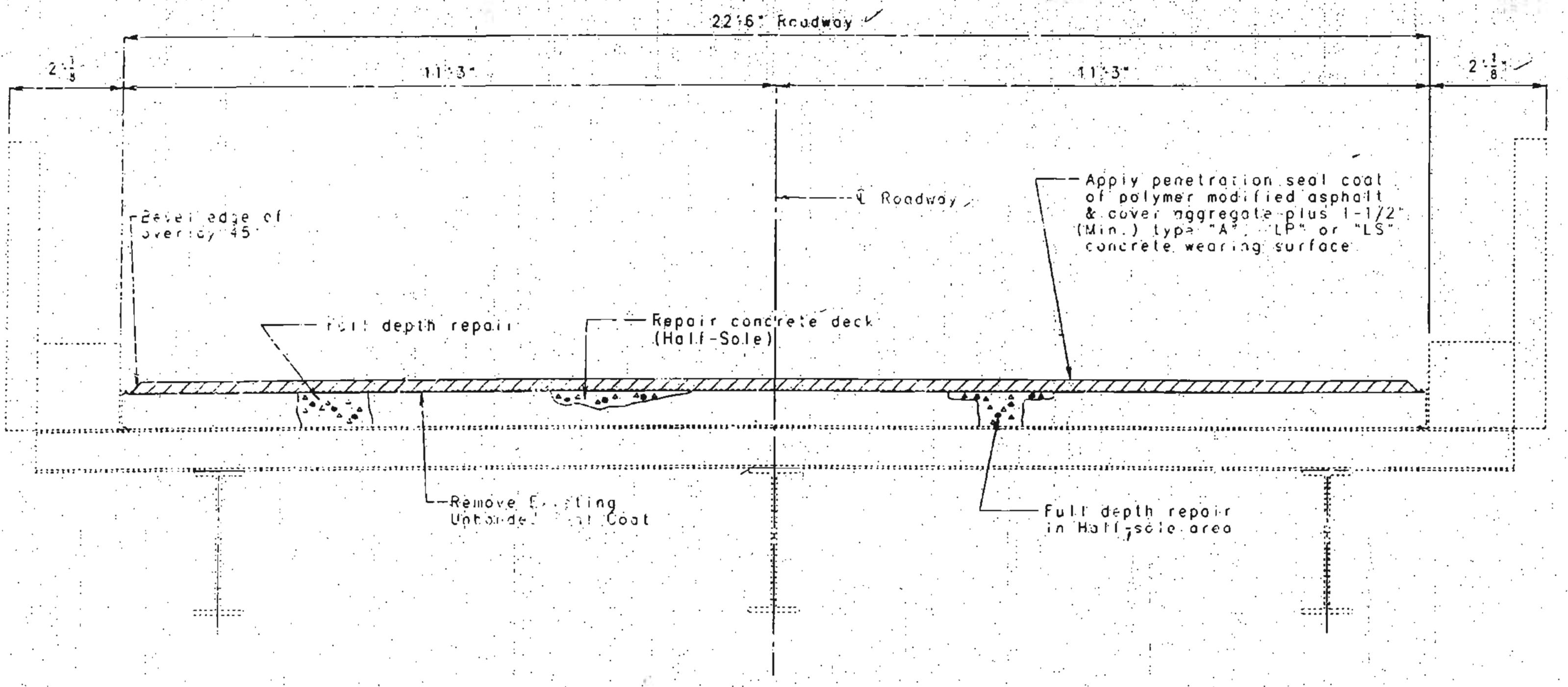
334

L-98

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ. NO.	SHEET NO.
MO.	ACSTP-136-1(38)	5
SEC./SUR. 33 TWP. 65N RGE. 42W		

98D42A-01-PCB

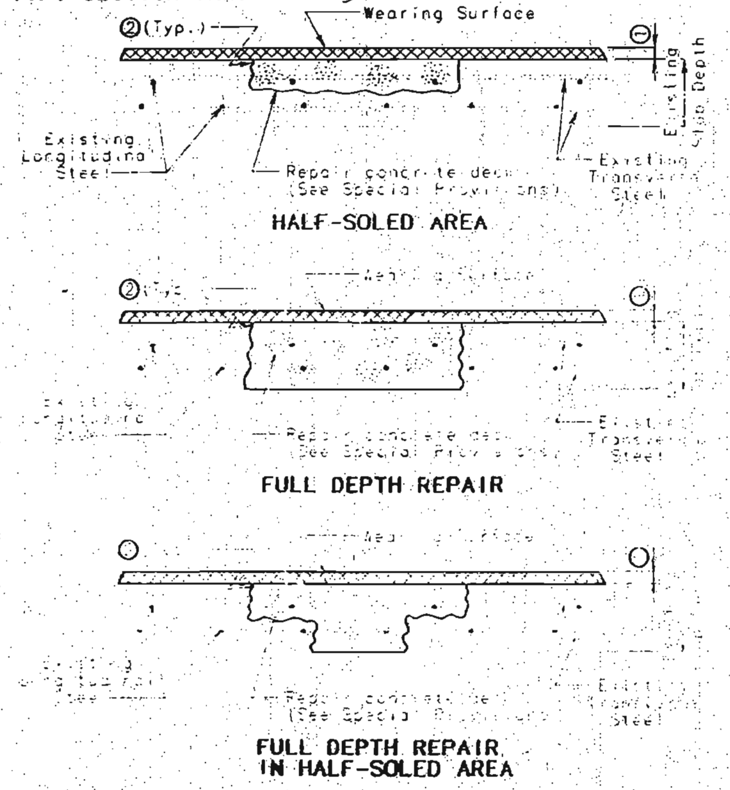

22'6" Roadway
2 1/8"
11'3"
11'3"
2 1/8"
Bevel edge of overlay 45°
℄ Roadway
Apply penetration seal coat of polymer modified asphalt & cover aggregate plus 1-1/2" (Min.) type "A", "LP" or "LS" concrete wearing surface
Full depth repair
Repair concrete deck (Half-Sole)
Remove Existing Unbonded Seal Coat
Full depth repair in Half-sole area

SECTION THRU ROADWAY

(Approach Spans Shown - Truss Spans Similar)

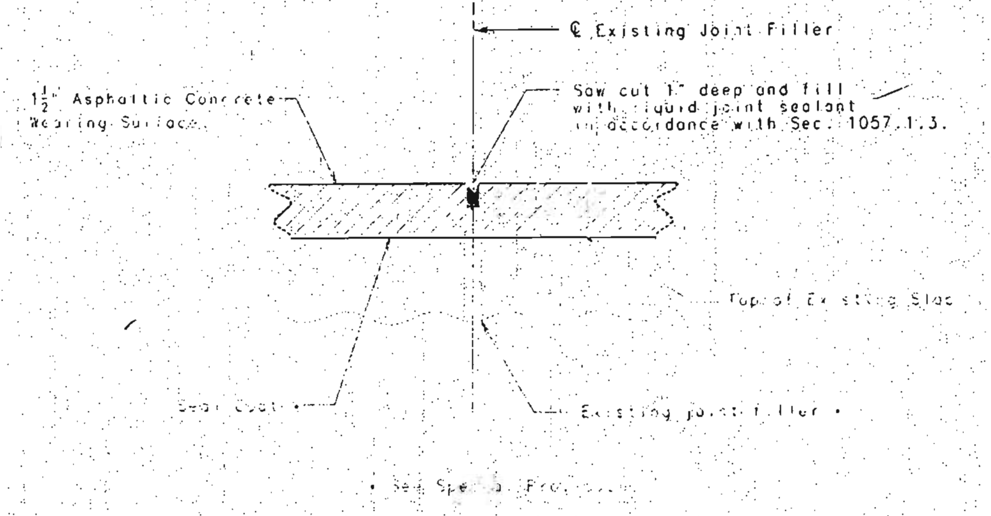
DECK REPAIR

TYP. SECTION THRU SLAB


②(Typ.)
Wearing Surface
①
Existing Slab Depth
Existing Longitudinal Steel
Repair concrete deck (See Special Provisions)
Existing Transverse Steel
HALF-SOLED AREA
②(Typ.)
Wearing Surface
①
Existing Longitudinal Steel
Repair concrete deck (See Special Provisions)
Existing Transverse Steel
FULL DEPTH REPAIR
①
Wearing Surface
①
Existing Longitudinal Steel
Repair concrete deck (See Special Provisions)
Existing Transverse Steel
FULL DEPTH REPAIR IN HALF-SOLED AREA

① Penetration seal coat of polymer modified asphalt and cover aggregate plus 1½" (Min.) type A, LP, or LS asphalt concrete overlay.

② Saw cut or vertically [illegible] 1/2" [illegible] deck [illegible] hydroblasting allowed [illegible]


℄ Existing Joint Filler
1½" Asphaltic Concrete Wearing Surface
Saw cut 1" deep and fill with liquid joint sealant in accordance with Sec. 1057.1.3.
Top of Existing Slab
Seal Coat
Existing joint filler
See Special Provisions

SECTION THRU JOINT

GENERAL NOTES:

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

Roadway surfacing adjacent to bridge ends to match bridge overlay. (See Roadway Plans)

In order to maintain grade and a minimum thickness of overlay as shown on plans it may be necessary to use additional quantities of overlay at various locations throughout the structure. No payment will be allowed for additional labor, materials or equipment for variations in thickness of overlay.

See Roadway Plans for Traffic Control.

All navigation and clearance lighting shall be kept in operation during all phases of construction.

Profile Grade Elevations shall be 1½" above existing concrete slab.

FINAL QUANTITIES

ITEM		TOTAL
Unbonded Seal Coat Removal	Sq. Ft.	42,840
Alternate Asphaltic Concrete Wearing Surface (Bridge)	Sq. Yd.	0
Polymer Modified Asphalt (Seal Coat)	Gallon	1,360
Cover Aggregate	Ton	60
Repairing Concrete Deck (Half-Soling)	Sq. Ft.	18,852
Full Depth Repair	Sq. Ft.	0
Steel Bar Dam	Each	9
503.01 - Alternate Asph. Conc. Wearing Surface (Bridge)	Sq Yd.	4760
503.02 - Density Sample	Each	1

Contingent Items

The polymer modified asphalt shall be applied at a rate of 0.35 gal per sq. yd.

The cover aggregate shall be applied at a rate of 0.0125 tons per sq. yd.

Estimated Quantities for Alternate Asphaltic Concrete Wearing Surface

Type of Wearing Surface	Asphaltic Cement (tons)	Mineral Aggregate (tons)	Mix Used (✓)
Limestone Porphyry (LP) Asphaltic Concrete Mix	19.6	372	
Limestone Steel Slag (LS) Asphaltic Concrete Mix	21.2	412	✓
Type A Asphaltic Concrete Mix	19.6	371	

MoDOT construction personnel shall complete column labeled "Mix Used (✓)".

Type PG 64-34 asphalt cement is required in the asphaltic concrete mix for the bridge deck overlay.

1/28/98
Dennis W. Heckman

REPAIRS TO BRIDGE OVER MISSOURI RIVER AT BROWNVILLE NEBRASKA

STATE ROAD FROM PHELPS CITY MO. TO BROWNVILLE NE.
ABOUT 1.7 MILES WEST OF PHELPS CITY
PROJECT NO.
STA. 4+92.0(Match Exist.)
JOB NO. J1P0757
RTE. 136
ATCHISON COUNTY
DATE 1/28/98

STD.
STD. 712.40
L00981

DETAILED DEC. 1997
CHECKED DEC. 1997

SHEET NO. 1 OF 1

355

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

U.I.P. AND REDECK EXISTING (133'-133') CONTINUOUS GIRDER SPANS
(420'-420') CONTINUOUS THROUGH TRUSS SPANS (133'-133'-133')(133'-133'-133') CONTINUOUS GIRDER SPANS

SEC/SUR 33	TWP 65N	RGE 42W

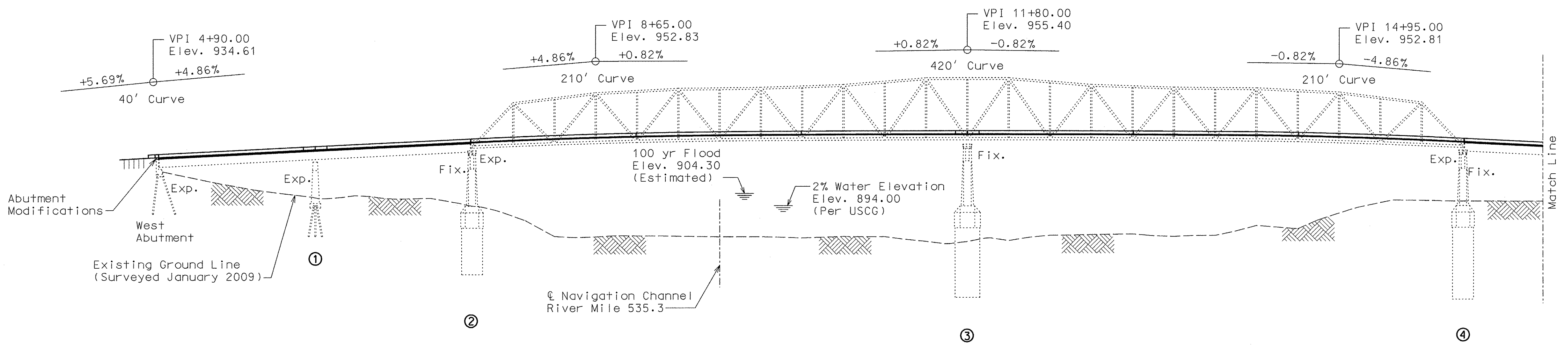
CORY MICHAEL IMHOFF
NUMBER PE-2002016669
PROFESSIONAL ENGINEER

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 1
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

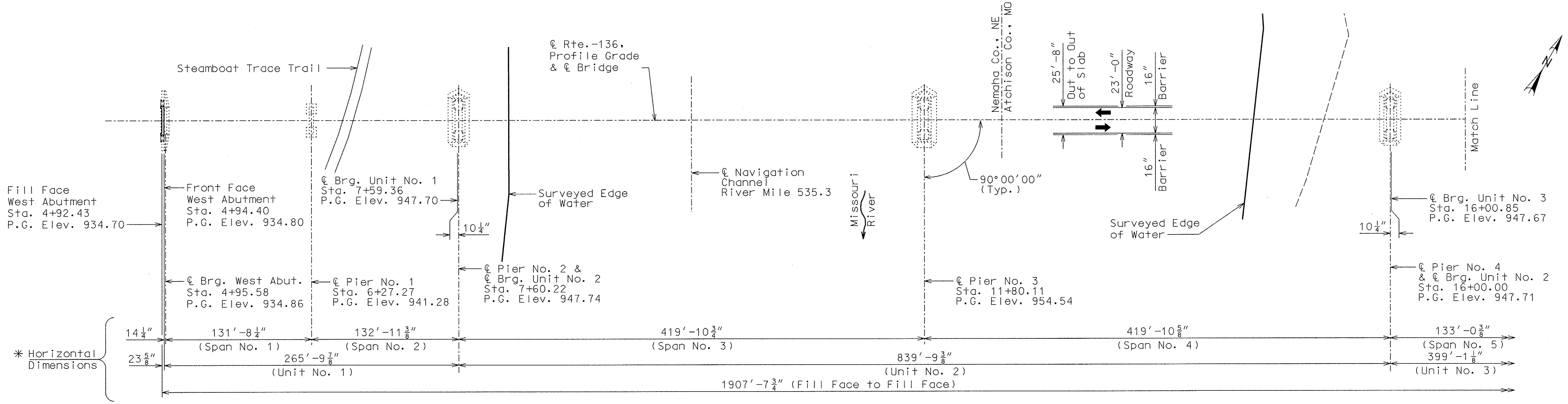
DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

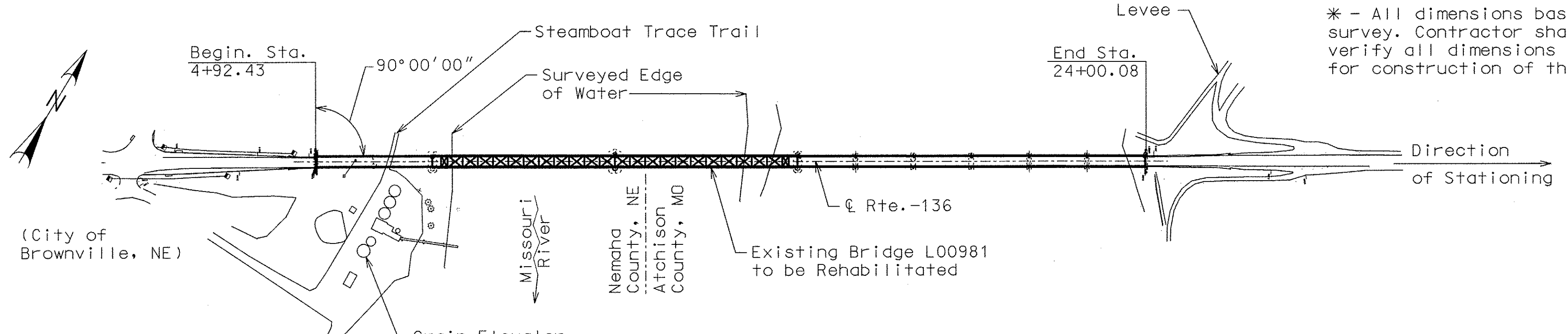


ELEVATION



Steamboat Trace Trail
℄ Rte.-136, Profile Grade & ℄ Bridge
Nemaha Co., NE
Atchison Co., MO
25'-8" Out to Out of Slab
23'-0" Roadway
16" Barrier
16" Barrier
Match Line
Fill Face West Abutment Sta. 4+92.43 P.G. Elev. 934.70
Front Face West Abutment Sta. 4+94.40 P.G. Elev. 934.80
℄ Brg. Unit No. 1 Sta. 7+59.36 P.G. Elev. 947.70
Surveyed Edge of Water
℄ Navigation Channel River Mile 535.3
Missouri River
90°00'00" (Typ.)
Surveyed Edge of Water
℄ Brg. Unit No. 3 Sta. 16+00.85 P.G. Elev. 947.67
10¼"
10¼"
℄ Brg. West Abut. Sta. 4+95.58 P.G. Elev. 934.86
℄ Pier No. 1 Sta. 6+27.27 P.G. Elev. 941.28
℄ Pier No. 2 & ℄ Brg. Unit No. 2 Sta. 7+60.22 P.G. Elev. 947.74
℄ Pier No. 3 Sta. 11+80.11 P.G. Elev. 954.54
℄ Pier No. 4 & ℄ Brg. Unit No. 2 Sta. 16+00.00 P.G. Elev. 947.71
* Horizontal Dimensions
14¼"
23⅝"
131'-8¼" (Span No. 1)
132'-11⅜" (Span No. 2)
419'-10¾" (Span No. 3)
419'-10⅝" (Span No. 4)
133'-0⅜" (Span No. 5)
265'-9⅞" (Unit No. 1)
839'-9⅜" (Unit No. 2)
399'-1⅛" (Unit No. 3)
1907'-7¾" (Fill Face to Fill Face)
N

PLAN



LOCATION SKETCH

* - All dimensions based on field survey. Contractor shall field verify all dimensions as required for construction of this project.

BM - ½" REBAR, 465' SW OF EAST ABUTMENT, 93.8' NW OF NORTH EDGE OF PAVEMENT, 110.9' NW OF THE NW CORNER OF PIER 7, 111.8' NORTH OF THE NE CORNER OF PIER 6, ELEV. 896.56.

BM - ½" REBAR, 93' NE OF WEST OF ABUTMENT, 20' SE OF SOUTH EDGE OF PAVEMENT, 26.9' NE OF THE SE CORNER OF COMMUNICATION SHED, 43' SW OF THE SW CORNER OF PIER 1, ELEV. 905.66.

REPAIRS TO BRIDGE OVER THE MISSOURI RIVER

STATE ROAD FROM RTE. D TO NEBRASKA STATE LINE
ABOUT 1.7 MILES WEST OF RTE. D
STA. 4+92.43 (MATCH EXISTING)

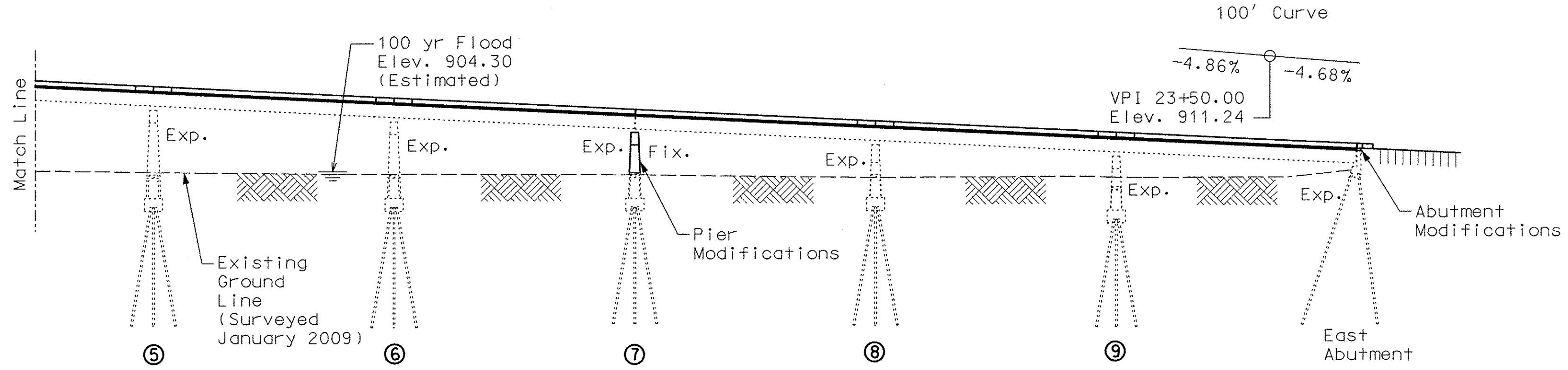
STD. 609.00
STD. 617.10
STD. 617.20
STD. 706.35

GENERAL ELEVATION AND PLAN

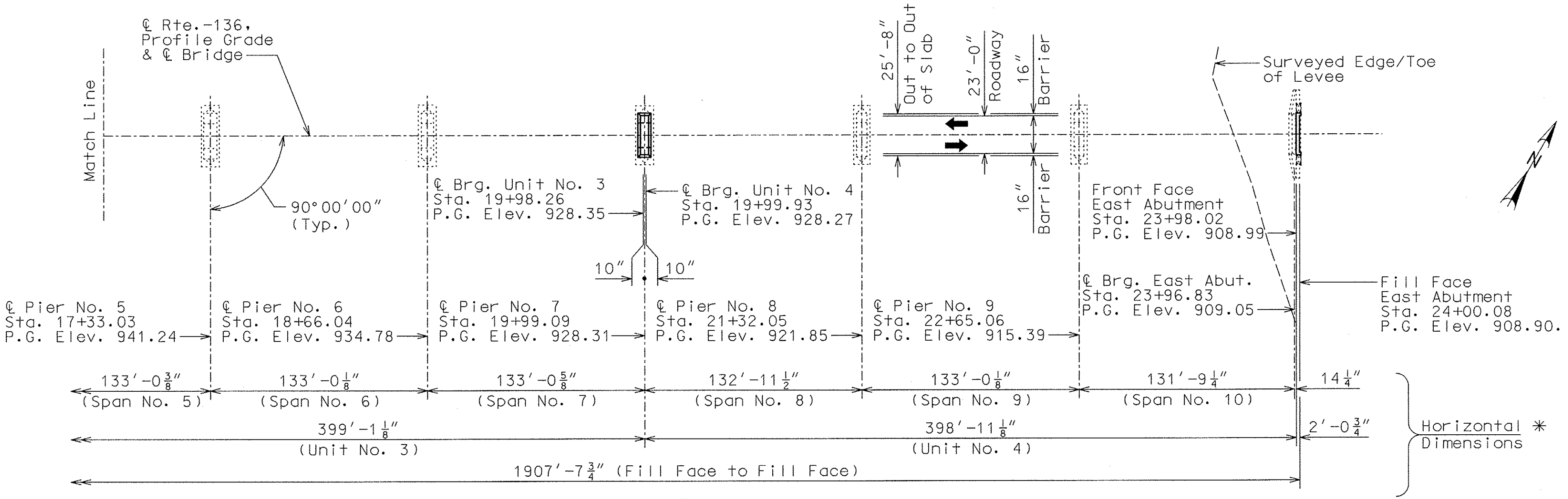
Detailed April 2009
Checked April 2009

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

Sheet No. 1 of 57



ELEVATION



PLAN

✳ - All dimensions based on field survey. Contractor shall field verify all dimensions as required for construction of this project.

GENERAL ELEVATION AND PLAN

Detailed April 2009
Checked April 2009

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

Sheet No. 2 of 57

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CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	2

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L00982

DESCRIPTION	DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

ESTIMATED QUANTITIES

Item	Unit	Substr.	Superstr.	Total
Temporary Supports	Lump Sum			1
Removal of Existing Bridge Decks	Sq. Ft.		42832	42832
Partial Removal of Substructure Concrete	Lump Sum			1
Removal of Existing Bridge Rails	Lin. Ft.		3807	3807
Bridge Approach Slab (Bridge)	Sq. Yd.		135	135
Water Transportation for Engineer	Lump Sum			1
Class B-1 Concrete (Substructure)	Cu. Yd.	68.0		68.0
Slab on Steel	Sq. Yd.		5424	5424
* Safety Barrier Curb	Lin. Ft.		3830	3830
Migratory Bird Nesting Prevention Netting	Lump Sum			1
Clearance Gauge	Lump Sum			1
Substructure Repair (Formed)	Sq. Ft.	1269		1269
Substructure Repair (Unformed)	Sq. Ft.	1295		1295
Reinforcing Steel (Bridges)	Lbs.	3040		3040
Mechanical Bar Splice	Each	10	5628	5638
Reinforcing Steel (Epoxy Coated)	Lbs.	3320		3320
Protective Coating - Concrete Bents & Piers (Urethane)	Lump Sum			1
Cleaning & Coating Existing Bearings	Each		10	10
Rehabilitate Bearing	Each		4	4
Slab Drain	Each		324	324
Drainage System (On Structure)	Lump Sum			1
Surface Preparation for Recoating Structural Steel	Sq. Ft.		95700	95700
Surface Preparation for Overcoating Structural Steel	Sq. Ft.		158600	158600
Field Application of Inorganic Zinc Primer	Sq. Ft.		95700	95700
Intermediate Field Coat (System G)	Sq. Ft.		88900	88900
Finish Field Coat (System G)	Sq. Ft.		88900	88900
Calcium Sulfonate Rust Penetrating Sealer	Lump Sum			1
Calcium Sulfonate Primer	Sq. Ft.		158600	158600
Calcium Sulfonate Topcoat	Sq. Ft.		158600	158600
Replace Truss Lower Lateral Bracing System	Lump Sum			1
Heat Straightening	Lump Sum			1
Strengthening Existing Girders	Lump Sum			1
Shear Connectors	Each		6416	6416
Structural Steel Repair A	Each		6	6
Structural Steel Repair B	Each		1	1
Structural Steel Repair C	Each		8	8
Structural Steel Repair D	Each		14	14
Structural Steel Repair E	Each		20	20
Structural Steel Repair F	Each		1	1
Structural Steel Repair G	Each		1	1
Structural Steel Repair H	Each		1	1
Structural Steel Repair J	Each		8	8
Structural Steel Repair K	Each		4	4
Structural Steel Repair L	Each		24	24
Structural Steel Repair M	Each		14	14
Structural Steel Repair N	Each		8	8
Structural Steel Repair P	Each		20	20
Structural Steel Repair Q	Each		12	12
Structural Steel Repair R	Each		50	50
Structural Steel Repair S	Each		44	44
Structural Steel Repair T	Each		12	12
Structural Steel Repair U	Each		13	13
Structural Steel Repair V	Lump Sum			1
Laminated Neoprene Bearing Pad Assembly	Each		2	2
Type N PTFE Bearing	Each		2	2
Strip Seal Expansion Joint System	Lin. Ft.		228	228
Navigation Lighting System	Lump Sum			1

* Safety Barrier Curb shall be Cast-In-Place or Slip-Form Option.

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2002 - AASHTO 17th Edition
Load Factor Design
Seismic Performance Category = A.

DESIGN LOADING:
HS20-44 (New Construction)
35#/Sq. Ft. Future Wearing Surface

DESIGN UNIT STRESSES:

Class B-2 Concrete (Superstructure, except Safety Barrier Curb)	f'c = 4,000 psi.
Class B-1 Concrete (Substructure)	f'c = 4,000 psi.
Class B-1 Concrete Safety Barrier Curb	f'c = 4,000 psi.
Reinforcing Steel (Grade 60)	fy = 60,000 psi.
Structural Carbon Steel (ASTM A709 Grade 36)	fy = 36,000 psi.
Structural Steel (ASTM A709 Grade 50)	fy = 50,000 psi.

GENERAL NOTES (CONTINUED):

FABRICATED STEEL CONNECTIONS:
Field connections shall be made with 7/8" diameter high strength bolts and 15/16" diameter holes, except as noted.
All bolts shall be fully tensioned.
Rivit removal method shall be in accordance with the Special Provisions

JOINT FILLER:
All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion and partition joint filler, except as noted.

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

STRUCTURAL STEEL PROTECTIVE COATINGS:
For Painting Limit Detail, see Sheet No. 35.

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface Preparation of the existing steel shall be in accordance with Sec 1081 for "Recoating of Structural Steel (System G)". 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: For existing structural steel to remain in place, 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.

Prime Coat: For portions of the structural steel to be replaced, the prime coat shall be applied in the fabrication shop. The cost of the prime coat will be considered completely covered by the contract unit price for the Fabricated Structural Steel.

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)".

For the duration of cleaning and recoating the truss spans, the truss span superstructure in any span shall not be draped with an impermeable surface subject to wind loads for a length any longer than 1/4 the span length at any one time regardless of height of coverage. Simultaneous work in adjacent spans is permissible using the specified limits in each span. No portion of the truss spans shall be draped during the replacement of the lower lateral bracing.

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

Rust Penetrating Sealer: The rust penetrating sealer shall be applied to the surfaces of all bearings, overlapping steel plates, pin connections, pin and hanger connections and other locations where rust bleeding, pack rust and layered rust is occurring. The cost of the rust penetrating sealer will be considered completely covered by the contract lump sum price for "Calcium Sulfonate Rust Penetrating Sealer".

Prime Coat: The cost of the prime coat will be completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Primer"

Topcoat: The color of the topcoat shall be Gray (Federal Standard #26373). The cost of the topcoat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Topcoat".

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.

MISCELLANEOUS:
Traffic over structure to be maintained during construction unless otherwise noted. See Roadway plans for traffic control.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106 and Field Section (FS-712) from Materials Manual.

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

Bridge seats for Laminated Neoprene Bearing Pad Assemblies and Type N PTFE Bearings shall be finished to a smooth even surface and shall be finished to within 1/8" above plan elevation and shall be dressed to a uniform, level bearing with a Carborundum brick or power grinder after the concrete has set sufficiently to fix the larger particles of sand. The deviation of the bearing seat from a true level surface shall not exceed 1/16".

Heat Straightening shall be in accordance with the Special Provisions.

Removal and Storage of Existing Bridge Rail shall be in accordance with the Special Provisions.

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

GENERAL NOTES (CONTINUED):

RESIN ANCHORS (East & West Abutments & Pier No. 7):
The Contractor shall use one of the qualified resin anchor systems in accordance with Sec 1039.

Cost of furnishing and installing the resin anchor system complete-in-place at the Abutments will be considered completely covered by the contract unit price for Slab on Steel.

Cost of furnishing and installing the resin anchor system complete-in-place at Pier No. 7 will be considered completely covered by the contract unit price for Class B-1 Concrete (Substructure).

The minimum embedment depth in concrete with f'c = 3,000 psi for the resin anchor system shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 6".

An epoxy coated #5 Grade 60 reinforcing bar shall be substituted for the 5/8"Ø threaded rod.

A #4 Grade 60 reinforcing bar 3'-9" long shall be substituted for the 1/2"Ø threaded rod.

ESTIMATED QUANTITIES:

CONCRETE:
Concrete above the upper construction joint in backwall at Abutments is included with Class B-2 Concrete (Slab on Steel) Quantities.
The cost of concrete removal above the upper construction joint in the abutments is included in the plan quantity for Removal of Existing Bridge Decks.
Cost of any required excavation for bridge will be considered completely covered by the contract unit price for other items.

NEOPRENE BEARING PADS:
Laminated Neoprene Bearing Pads shall be in accordance with Sec 716.

ESTIMATED QUANTITIES FOR SLAB ON STEEL

Item	Cu. Yds.	Total
Class B-2 Concrete	Cu. Yd.	1272.9
Reinforcing Steel (Epoxy Coated)	Lbs.	303190

The table of Estimated Quantities for Slab on Steel represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard with the horizontal dimensions as shown on the plan of slab. Payment for stay-in-place forms, conventional forms, all concrete and coated reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slabs shall be as shown on the plans and in accordance with Sec. 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

Slab shall be cast-in-place with conventional forming or stay-in-place corrugated metal forms. Precast prestressed panels will not be permitted.

Permanent steel bridge deck forms, supports closure elements and accessories shall be in accordance with grade requirement and coating designation G165 of ASTM A653. Complete shop drawings of the permanent steel deck forms shall be required in accordance with Sec. 1080.

Corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

Form sheets shall not rest directly on the top of girders, stringers, crossbeams or floorbeam flanges. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the flange. Welding on or drilling holes in the flanges of the girders, stringers, crossbeams or floorbeams will not be permitted. All steel fabrication and construction shall be in accordance with Sec's 1080 and 712.

GENERAL NOTES AND SUMMARY OF QUANTITIES

Detailed April 2009
Checked April 2009

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

Sheet No. 3 of 57

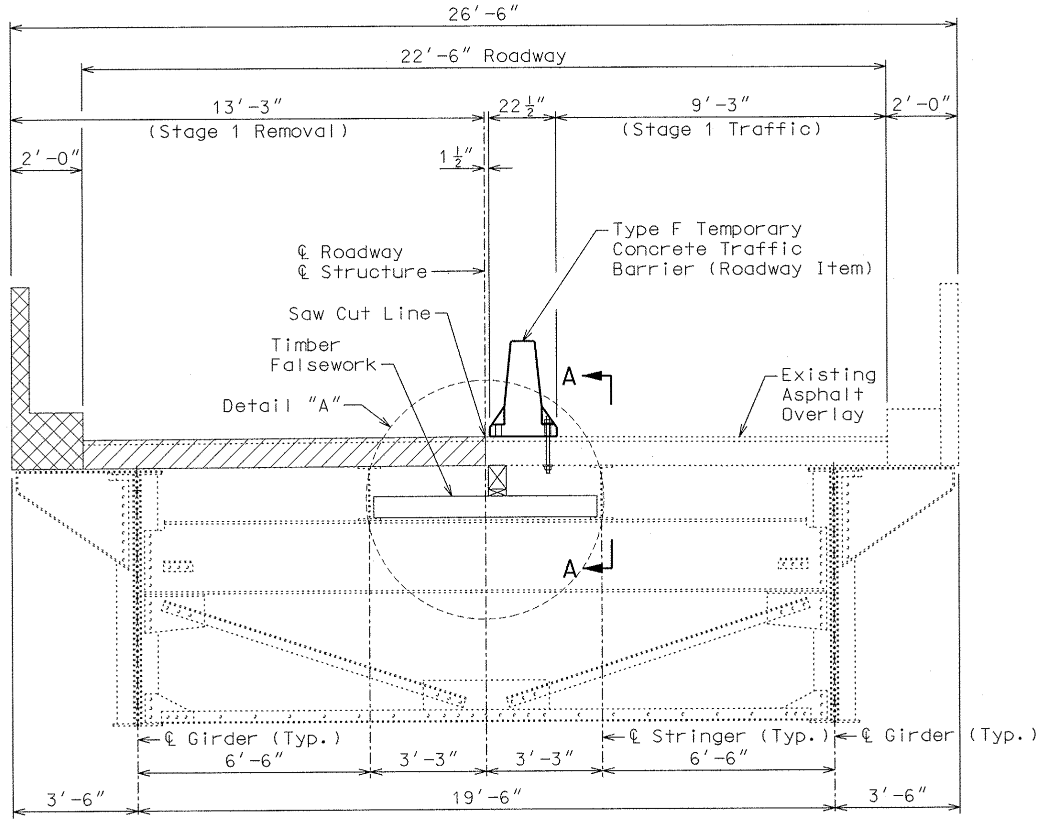
CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	5-27-09
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	3
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DESCRIPTION
DATE

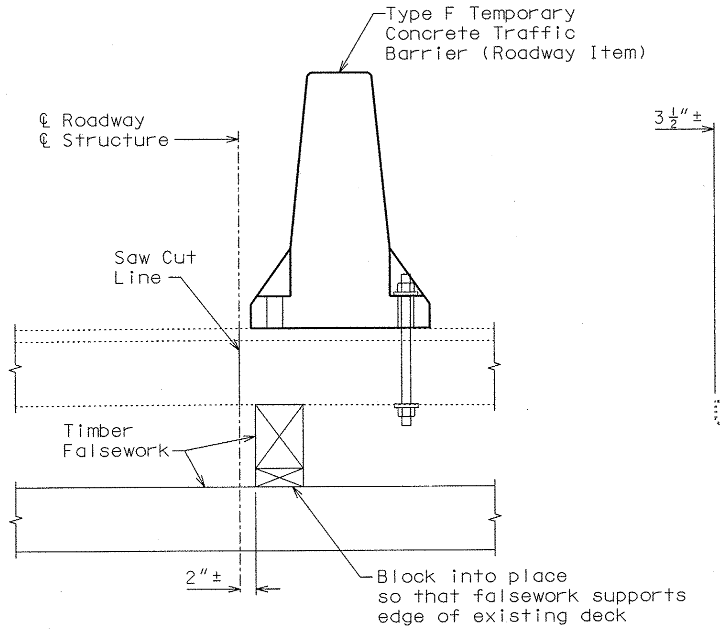
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
MoDOT
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

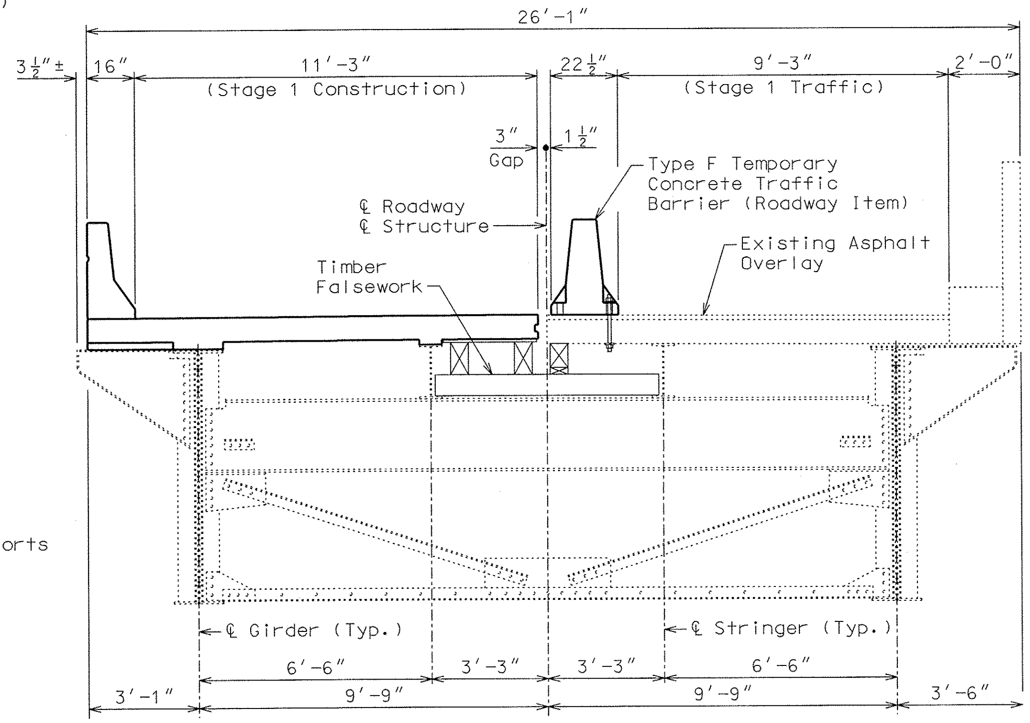


STAGE 1 REMOVAL
(Looking Ahead Station)

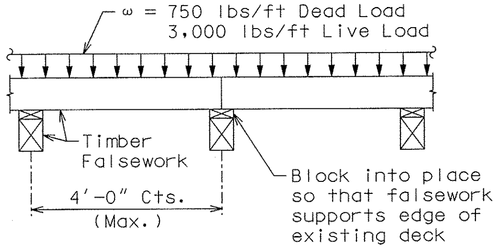
▨ Limits of Removal of Existing Bridge Decks ⊠ Limits of Removal of Existing Bridge Rails


Type F Temporary Concrete Traffic Barrier (Roadway Item)
℄ Roadway
℄ Structure
Saw Cut Line
Timber Falsework
2"±
Block into place so that falsework supports edge of existing deck

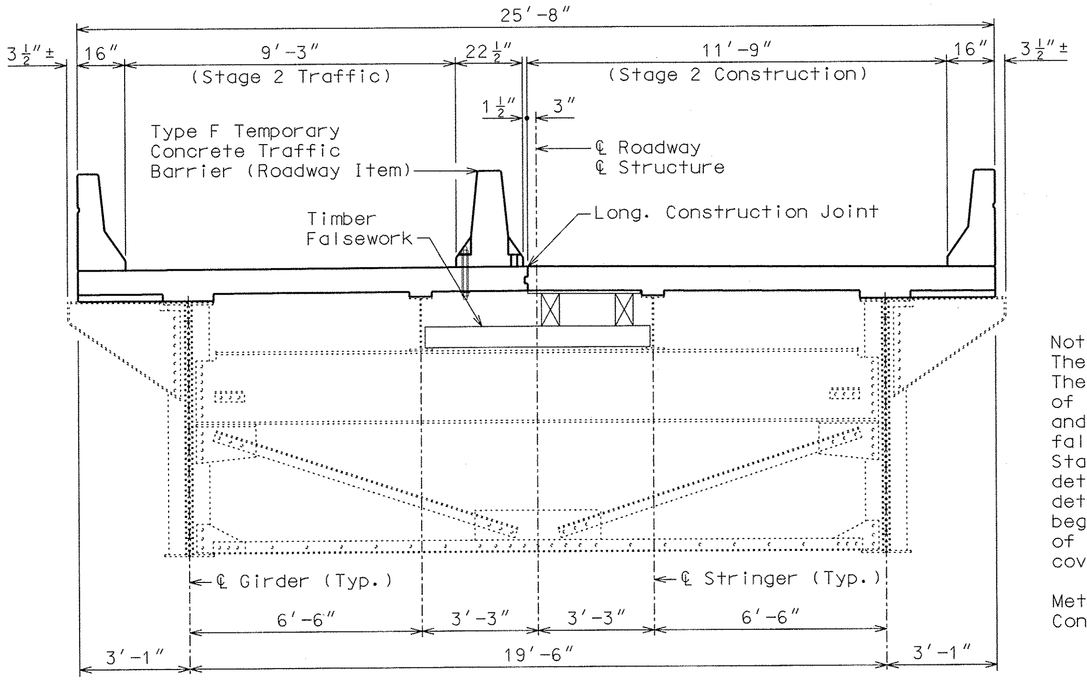
DETAIL "A"



STAGE 1 CONSTRUCTION
(Looking Ahead Station)



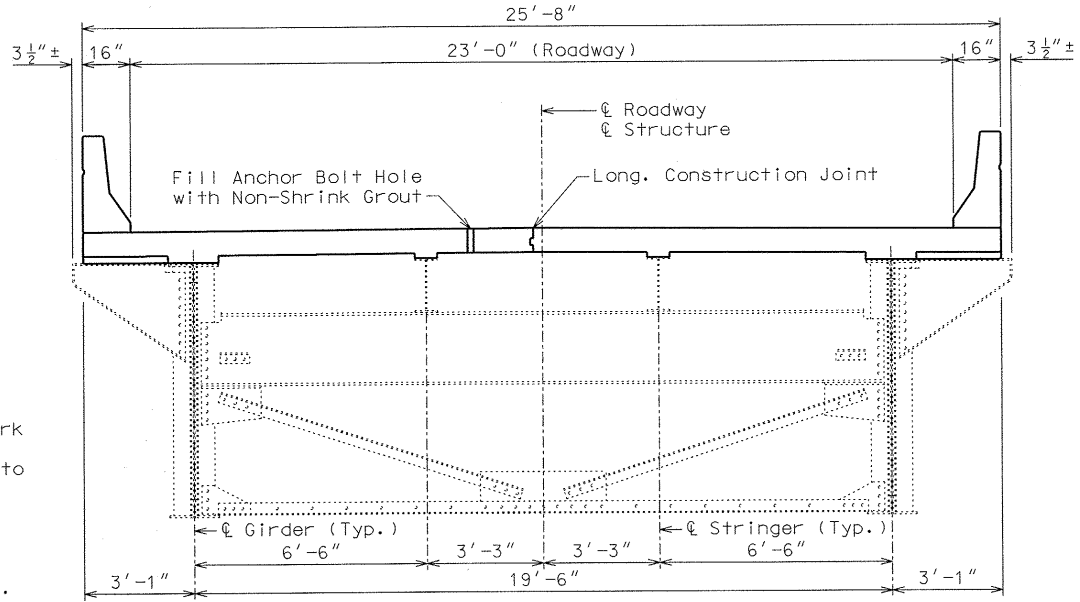
SECTION A-A
(Deck and Temporary Concrete Traffic Barrier Not Shown for Clarity)



STAGE 2 CONSTRUCTION
(Looking Ahead Station)

Notes:
The loads shown are unfactored service loads. The Contractor shall add these loads to the weight of the Falsework, Stage 1 Construction Concrete and Construction Live Load when designing the falsework. A Professional Engineer licensed in the State of Missouri shall design and seal the falsework details. The Contractor shall submit the falsework details to the Engineer for review two weeks prior to beginning the saw cutting operation. The cost of the Falsework shall be considered completely covered by the cost of other items.

Method of attachment for the Type F Temporary Concrete Traffic Barrier shall be bolt through deck.



FINAL CONFIGURATION
(Looking Ahead Station)

CONSTRUCTION STAGING DETAILS - UNITS NO. 1, 3 & 4

Detailed April 2009
Checked April 2009

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

Sheet No. 4 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016689

DATE PREPARED	5-21-09
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	4
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DATE DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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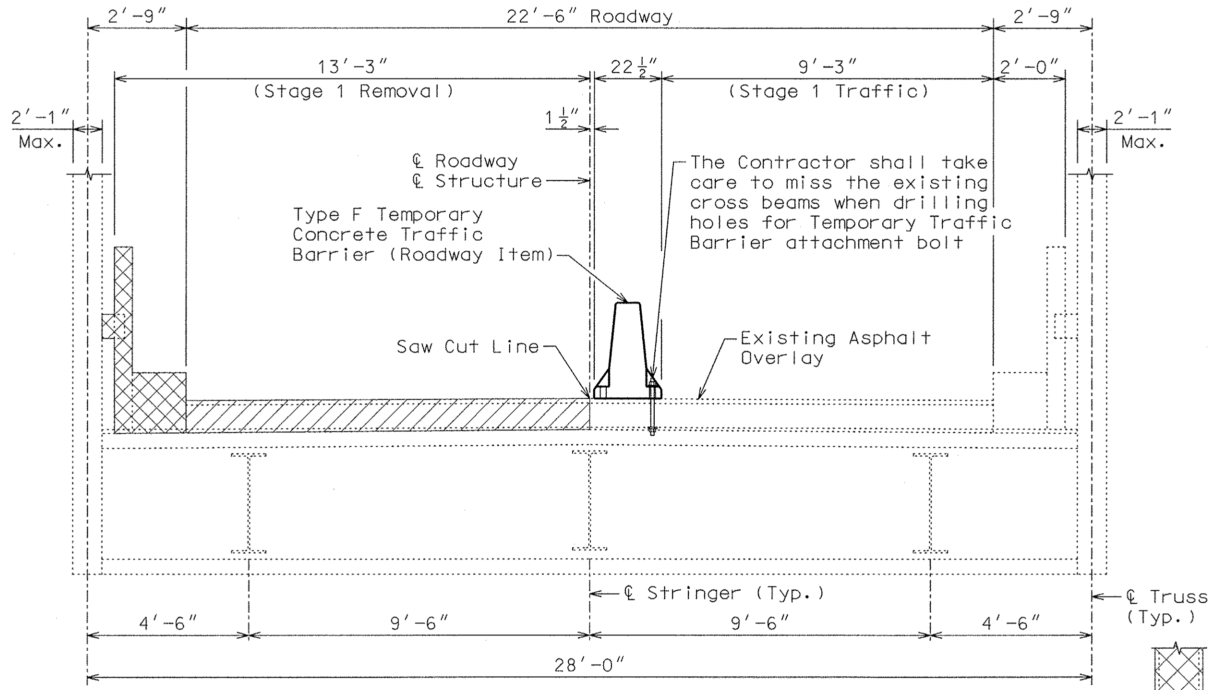
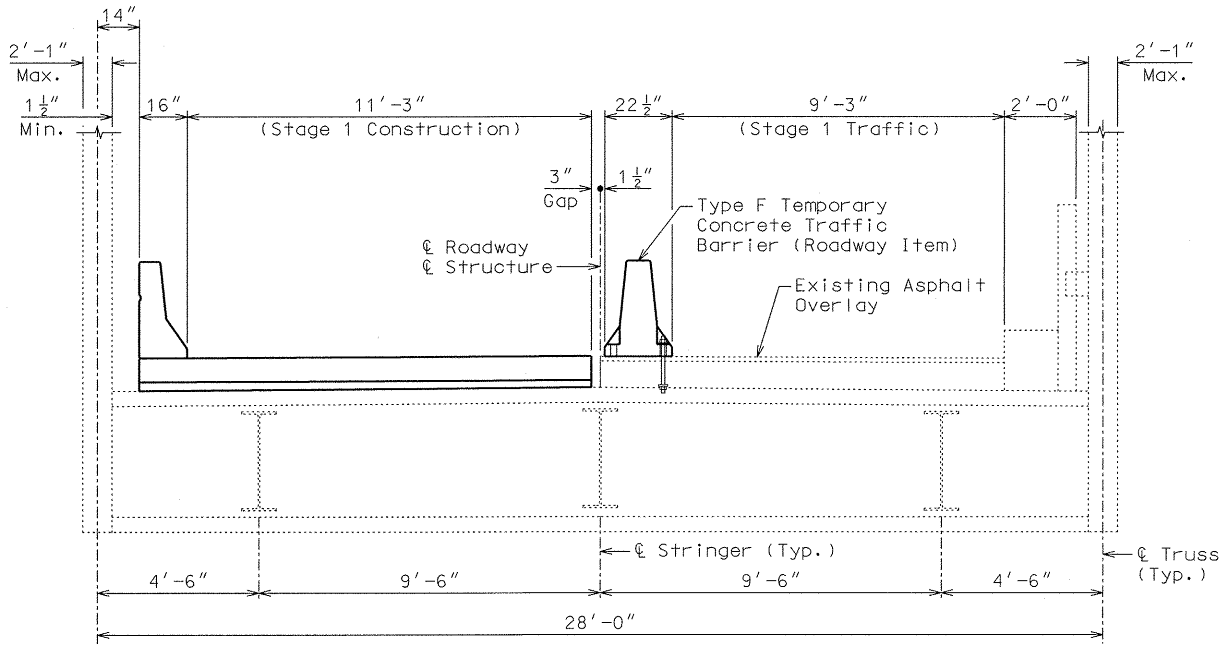


STAGE 1 REMOVAL

(Looking Ahead Station)

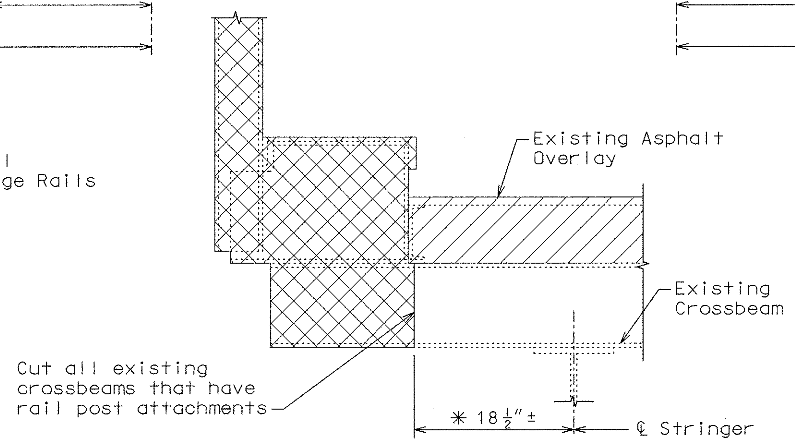
▨ Limits of Removal of Existing Bridge Decks

▩ Limits of Removal of Existing Bridge Rails



STAGE 1 CONSTRUCTION

(Looking Ahead Station)



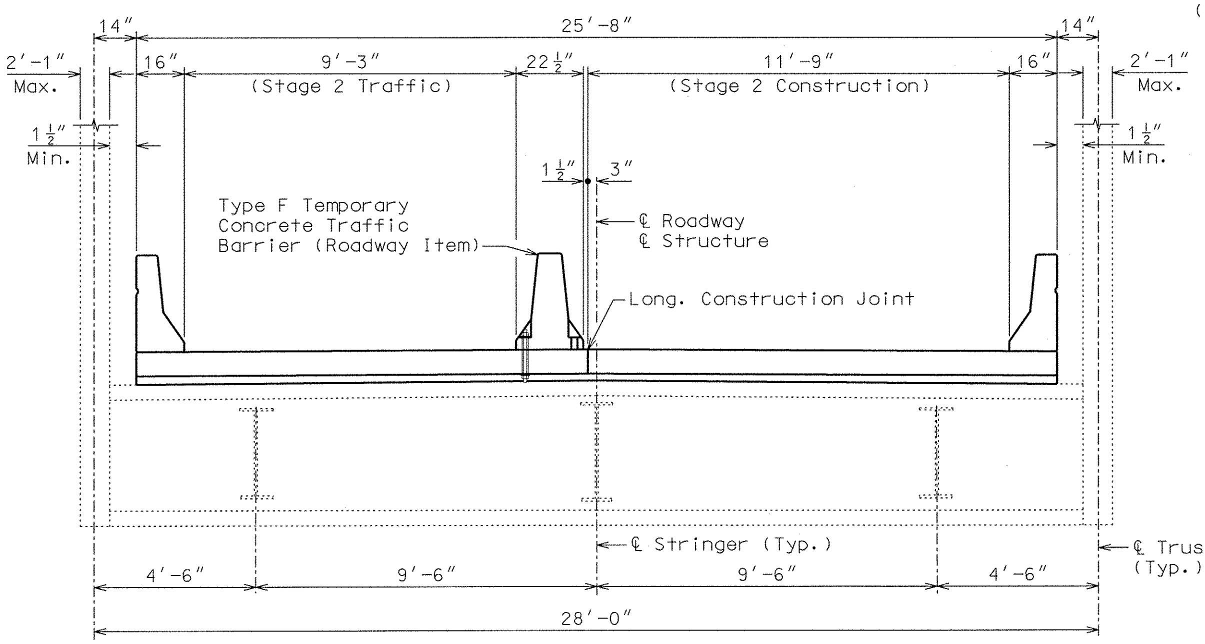
CROSSBEAM REMOVAL DETAIL

(Stage 1 Shown, Stage 2 Similar)

Notes:
✻ Align Cut with End of Crossbeams without rail post attachments.

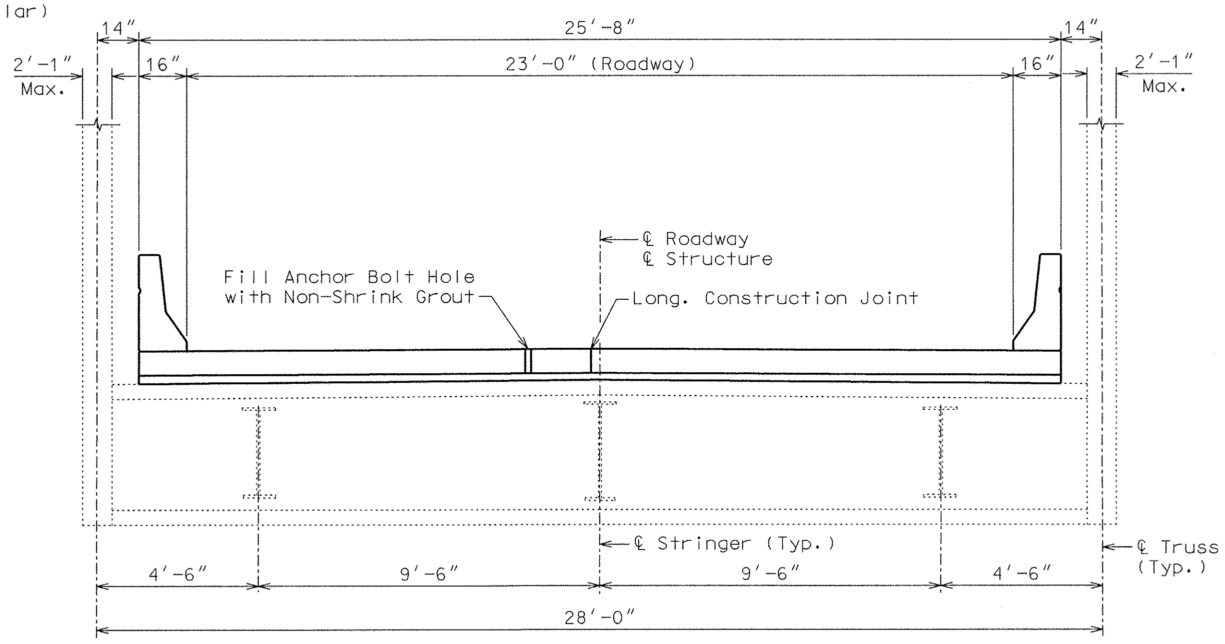
The cost of all equipment, labor and materials required to remove and dispose of the ends of the upper Crossbeamsn shall be included in the contract unit price for Removal and Storage of Existing Bridge Rails per Lin. Ft.

Method of attachment for the Type F Temporary Concrete Traffic Barrier shall be bolt through deck.



STAGE 2 CONSTRUCTION

(Looking Ahead Station)



FINAL CONFIGURATION

(Looking Ahead Station)

CONSTRUCTION STAGING DETAILS - UNIT NO. 2

Detailed April 2009
Checked April 2009

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

Sheet No. 5 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09

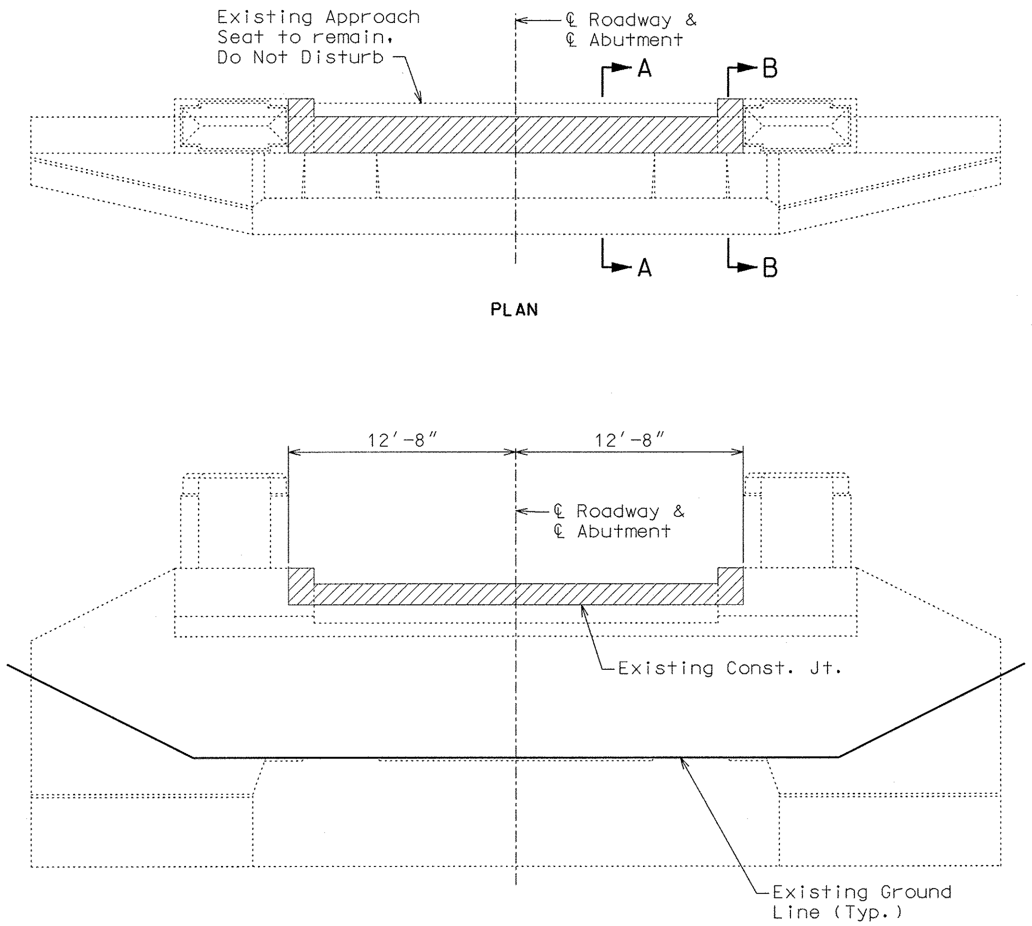
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	5

COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO. L00982

DESCRIPTION
DATE

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

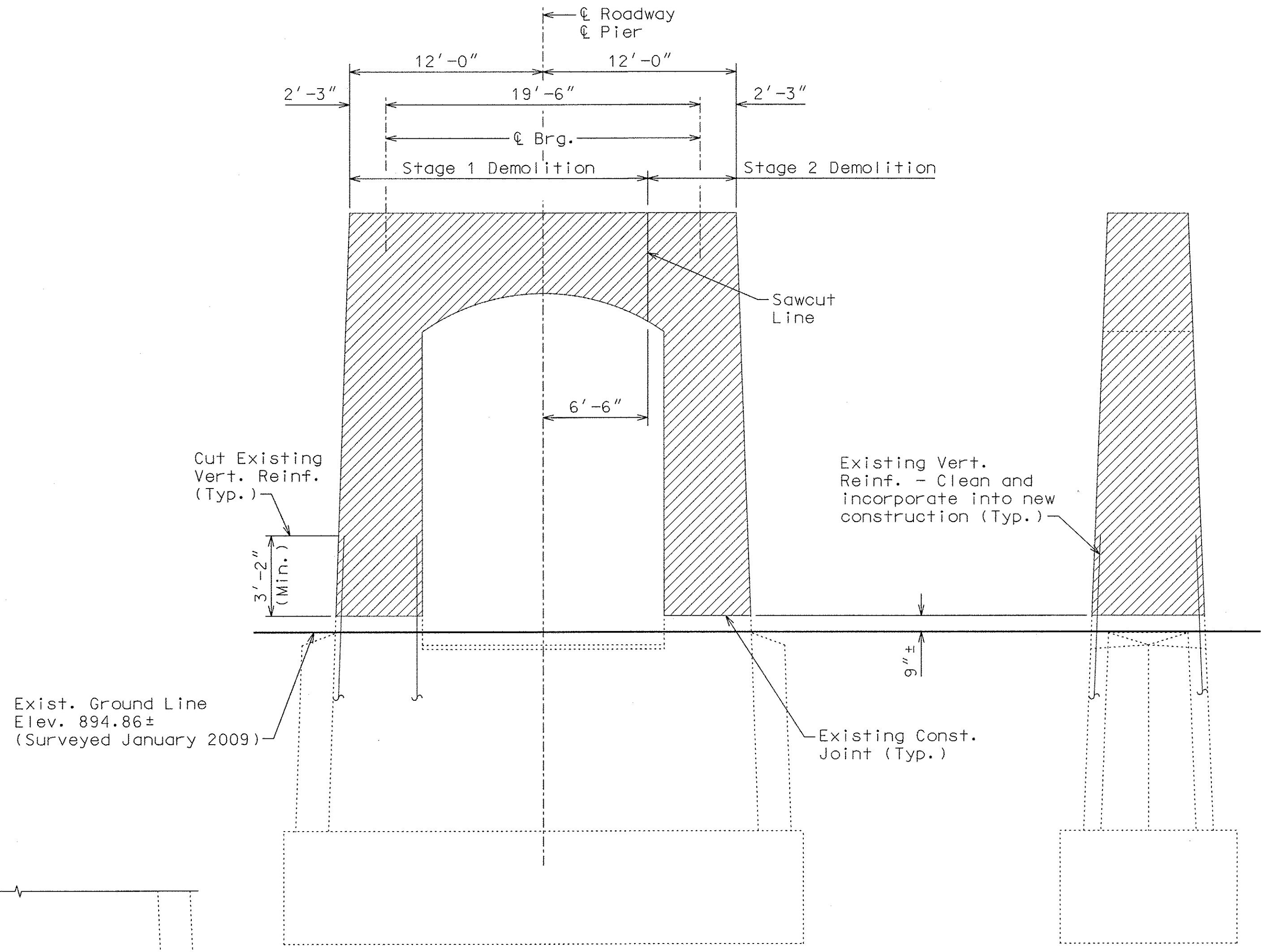
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



PLAN

ELEVATION

DEMOLITION - EAST AND WEST ABUTMENT



SIDE ELEVATION

END ELEVATION

DEMOLITION - PIER NO. 7

Notes:
Outline of old work is indicated by light dashed lines. Solid lines and hatched areas indicate limits of removal.

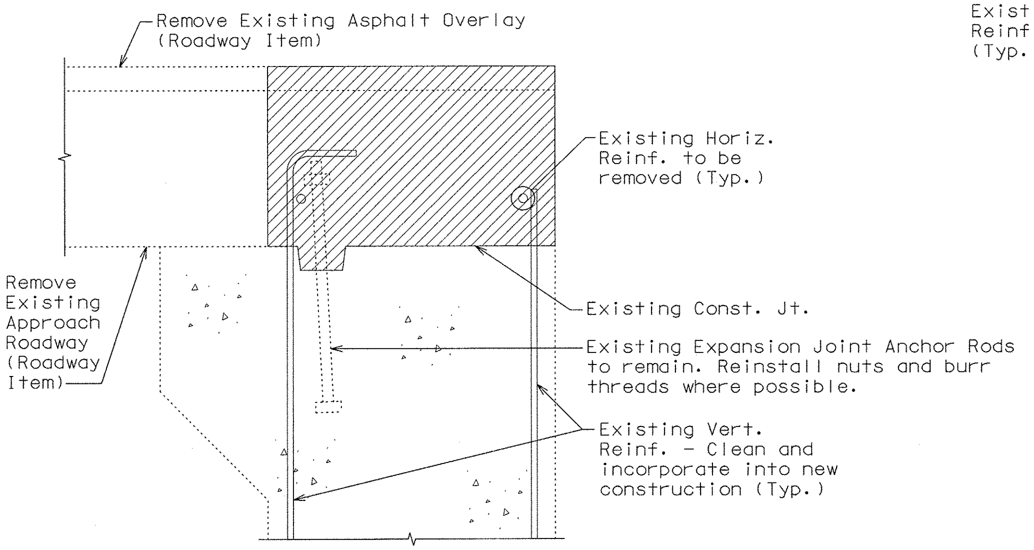
Contractor shall verify all dimensions in field before ordering new material.

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete as shown. 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.

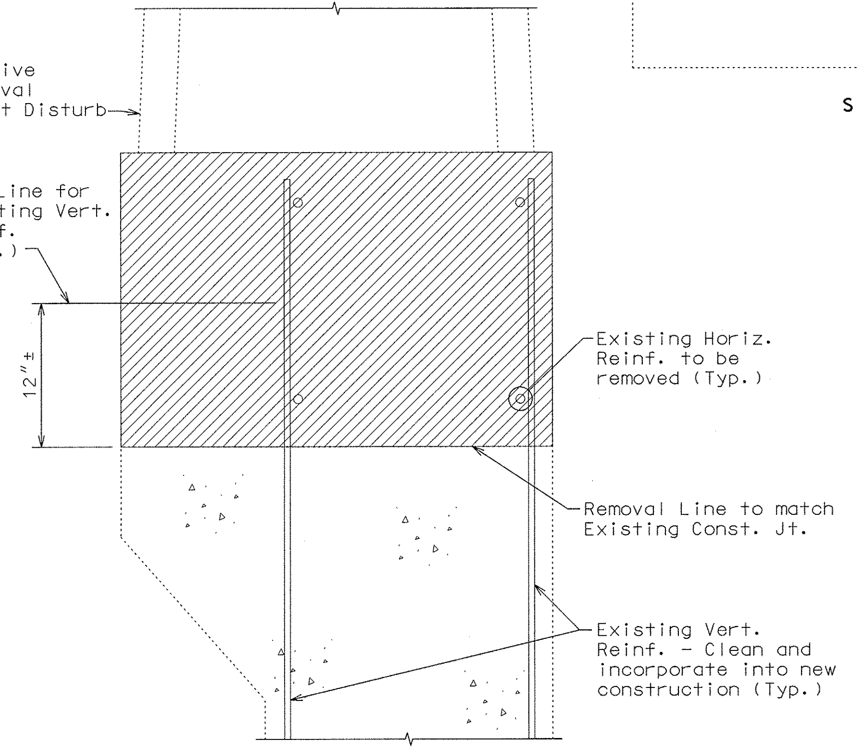
The Demolition Line shall be adjusted as required to obtain the minimum protrusion of existing reinforcing steel to successfully lap with new reinforcing.

The cost of removal of existing substructure concrete will be completely covered by the contract lump sum price for Partial Removal of Substructure Concrete.

▨ Limits of Partial Removal of Substructure Concrete



SECTION A-A



SECTION B-B

SUBSTRUCTURE DEMOLITION DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 6 of 57

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CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	5-21-09
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 6
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

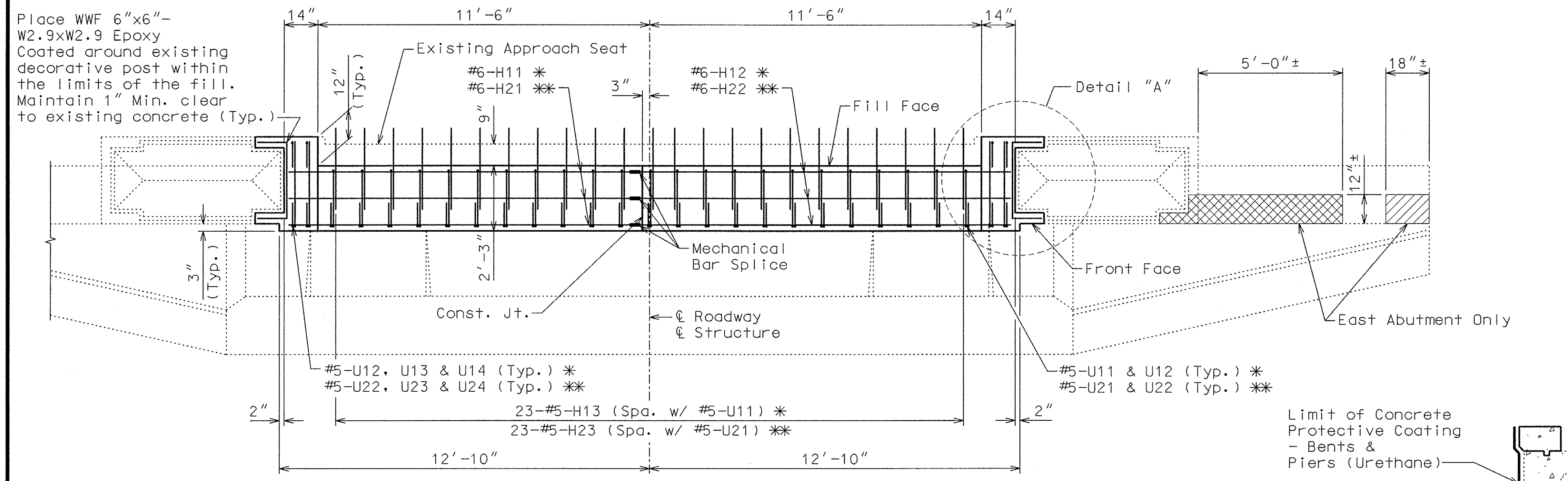
DESCRIPTION

DATE

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

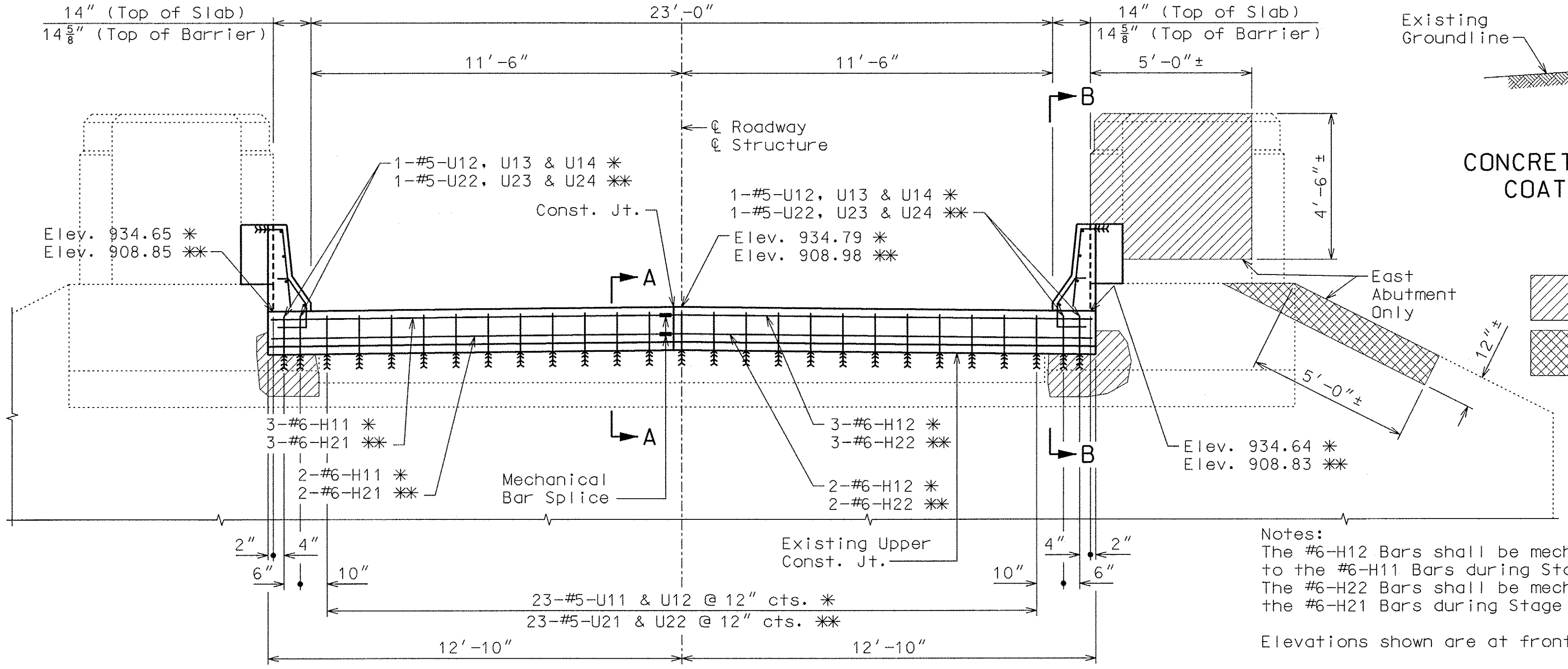
MoDOT

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



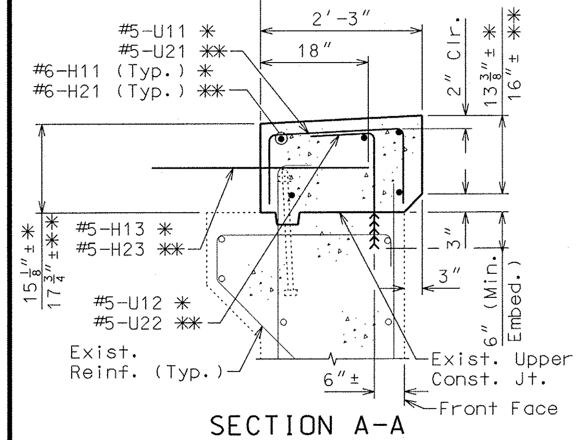
PLAN

(East Abutment Shown Looking Ahead Station, West Abutment SimilarLooking Back Station)



ELEVATION

(East Abutment Shown Looking Ahead Station, West Abutment Similar Looking Back Station)



SECTION A-A

Detailed April 2009
Checked April 2009

SUBSTRUCTURE QUANTITY TABLE EAST ABUTMENT

ITEM		QUANTITY
Substructure Repair (Unformed)	Sq. Ft.	28
Substructure Repair (Formed)	Sq. Ft.	11
Mechanical Bar Splice	Each	5
Reinforcing Steel (Epoxy Coated)	Lbs.	520

SUBSTRUCTURE QUANTITY TABLE WEST ABUTMENT

ITEM		QUANTITY
Substructure Repair (Unformed)	Sq. Ft.	5
Mechanical Bar Splice	Each	5
Reinforcing Steel (Epoxy Coated)	Lbs.	550

Note:
These quantities are included in the Estimated Quantities Table on Sheet No. 3.

Notes:
The #6-H12 Bars shall be mechanically coupled to the #6-H11 Bars during Stage 2 Construction. The #6-H22 Bars shall be mechanically coupled to the #6-H21 Bars during Stage 2 Construction.

Elevations shown are at front face of backwall.

Top of backwall shall be formed to the crown and grade of the roadway.

Backwall above upper construction joint shall not be poured until the superstructure slab has been poured in the adjacent span.

All concrete above the upper construction joint in backwall including the portions of Barrier Curb detailed on this sheet shall be Class B-2 (Superstructure). This quantity is included in the Estimated Quantities for Slab on Steel.

Cost of Welded Wire Fabric shall be considered completely covered by the cost of other items.

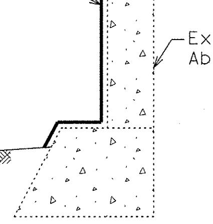
For Drainage System Details, see Sheet No. 47.

✱ = West Abutment
✱✱ = East Abutment
⩚ = Denotes Resin Anchored Reinforcing Steel.

ABUTMENT REPAIR DETAILS

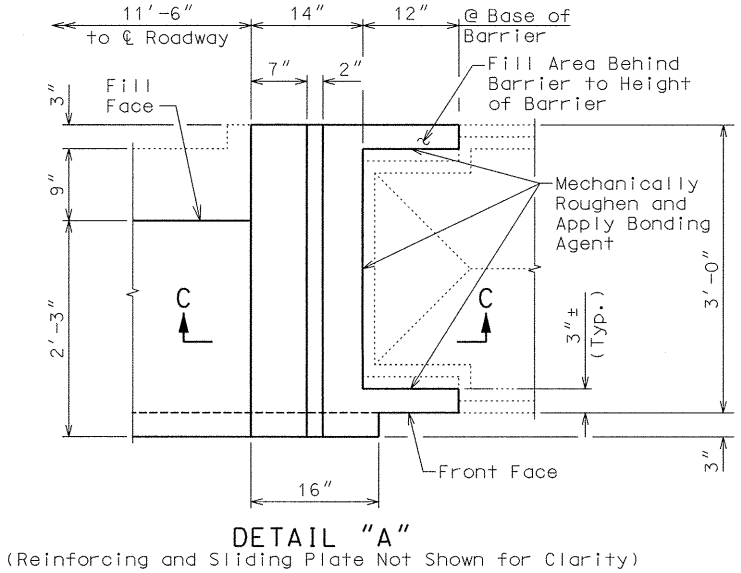
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 7 of 57


Limit of Concrete Protective Coating - Bents & Piers (Urethane)
Existing Abutment
Existing Groundline

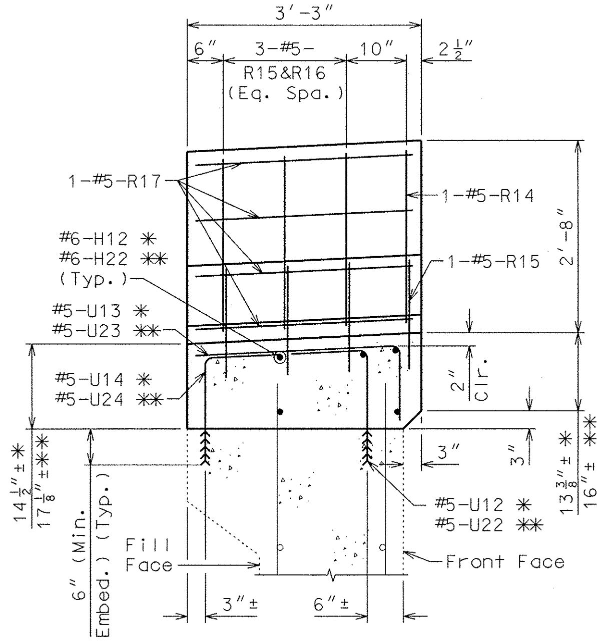
CONCRETE PROTECTIVE COATING DETAIL

▨ Approximate Limits of Unformed Concrete Repair
▩ Approximate Limits of Formed Concrete Repair

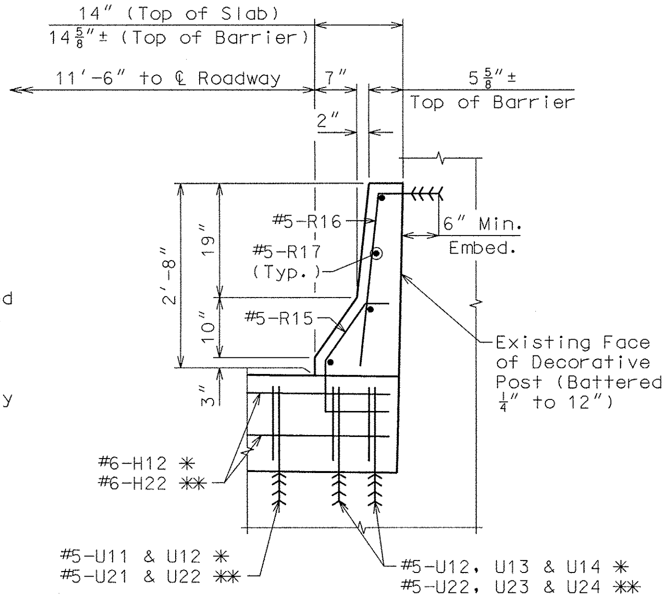


DETAIL "A"

(Reinforcing and Sliding Plate Not Shown for Clarity)



SECTION B-B



SECTION C-C

STATE OF MISSOURI
CORY MICHAEL IMHOFF
NUMBER PE-2002016669
PROFESSIONAL ENGINEER

Cory Imhoff

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	7
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION
DATE

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

MoDOT

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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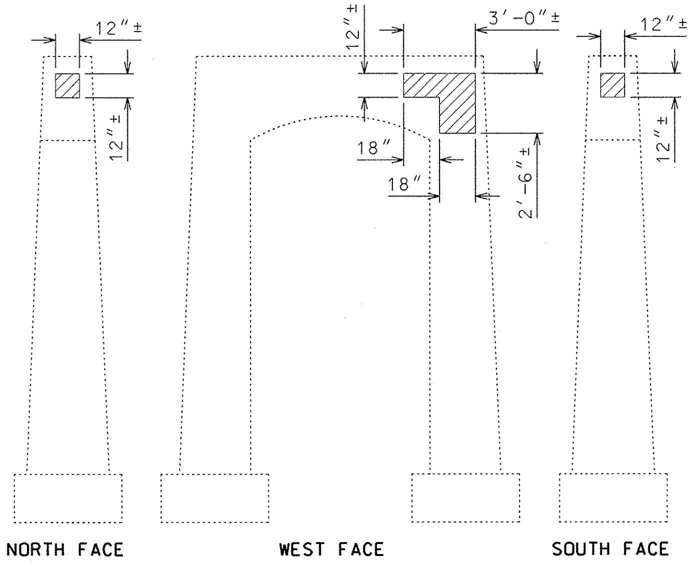
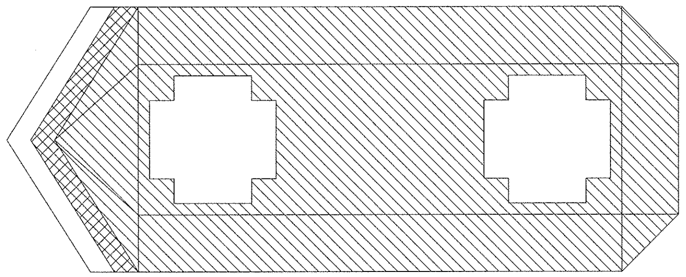
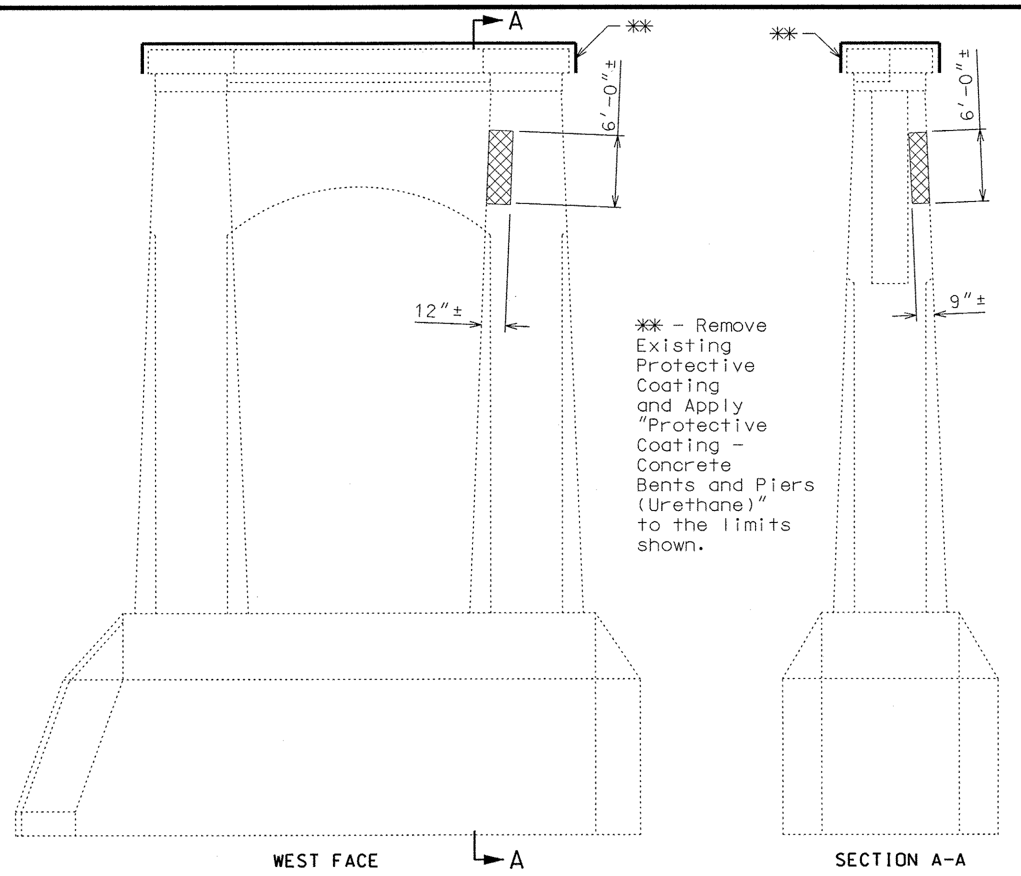


PIER NO. 1

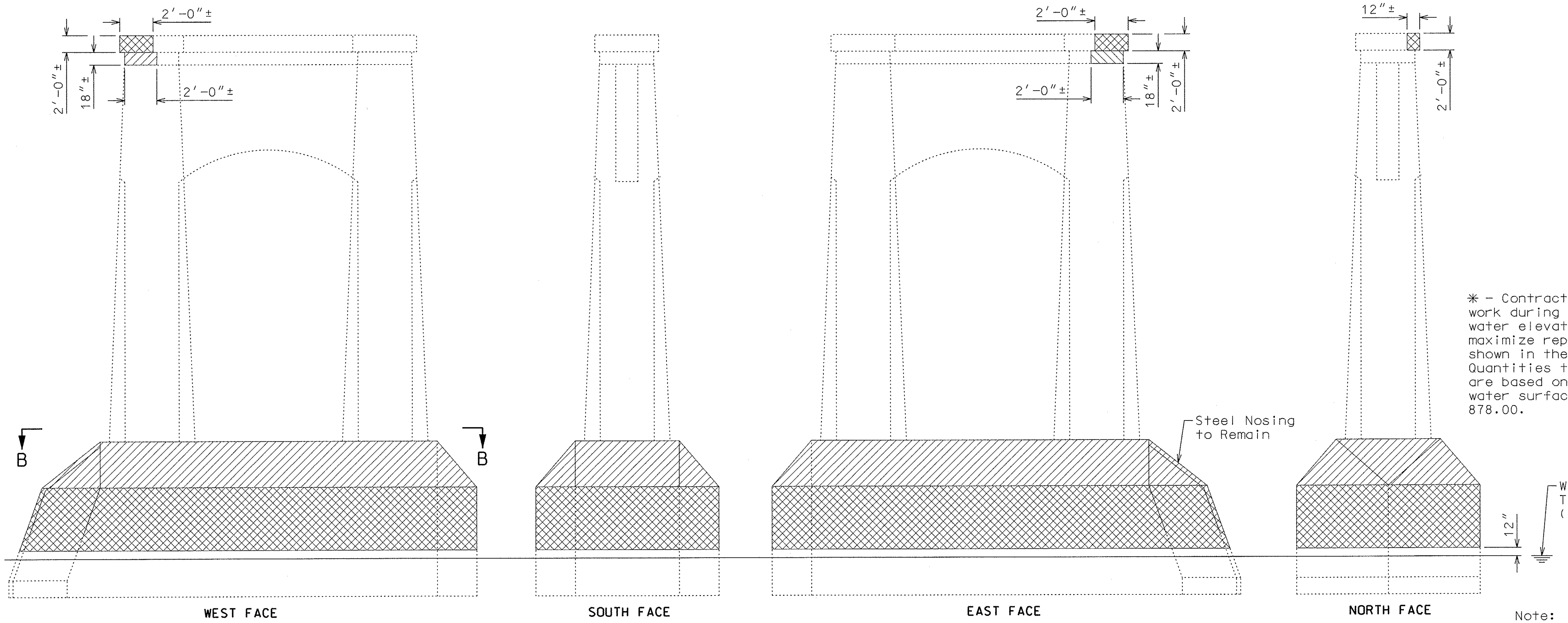


SECTION B-B



✻✻ - Remove Existing Protective Coating and Apply "Protective Coating - Concrete Bents and Piers (Urethane)" to the limits shown.

PIER NO. 2



PIER NO. 3

▩	Approximate Limits of Formed Concrete Repair
▨	Approximate Limits of Unformed Concrete Repair

✻ - Contractor to schedule work during period of low water elevation in order to maximize repair area. Quantities shown in the Estimated Quantities table on sheet No. 3 are based on an assumed water surface elevation of 878.00.

Note:
The cost of all equipment and labor to remove existing coating shall be included in the contract unit price for Protective Coating - Concrete Bents and Piers (Urethane), Lump Sum.

PIERS NO. 1, 2 & 3 REPAIR DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 8 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	8

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
L00982

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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HDR Engineering, Inc.
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Suite 1000
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816-360-2700
Certificate of Authority: 000856

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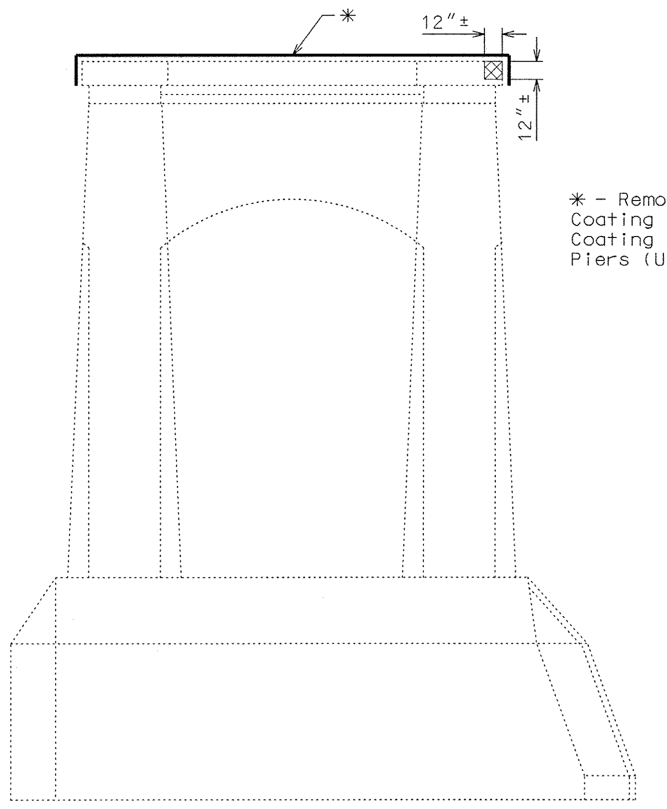
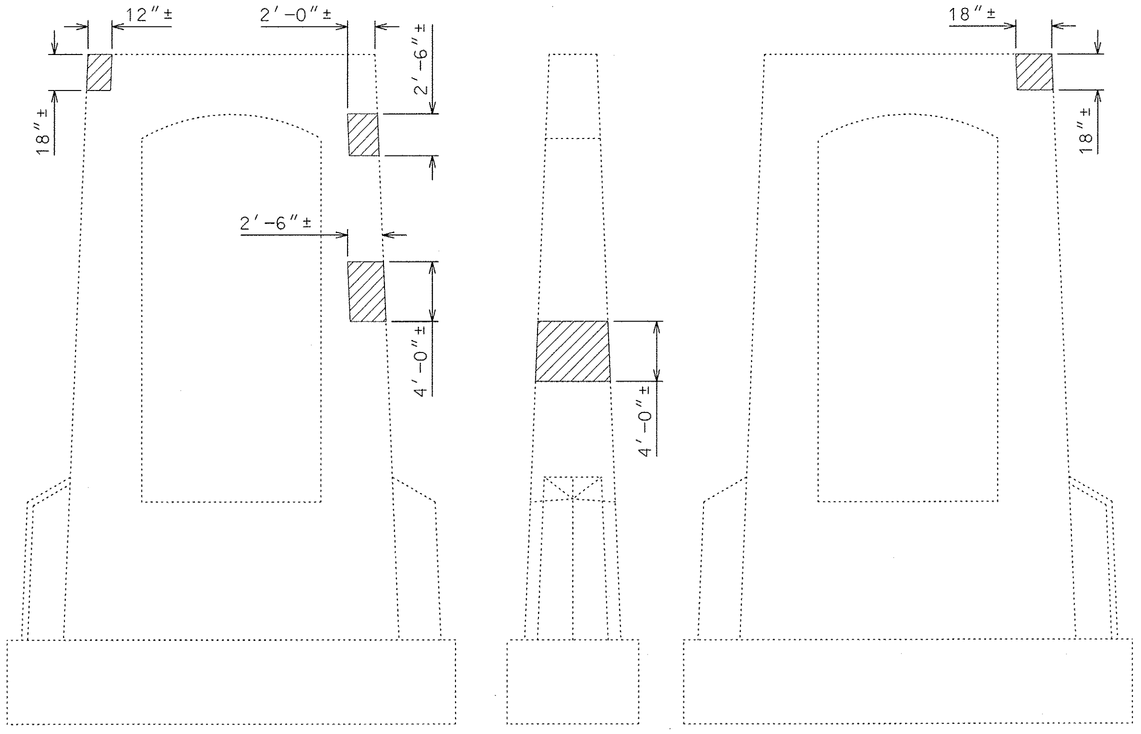


∗ - Remove Existing Protective Coating and Apply Protective Coating - Concrete Bents and Piers (Urethane)

PIER NO. 4
(East Face)

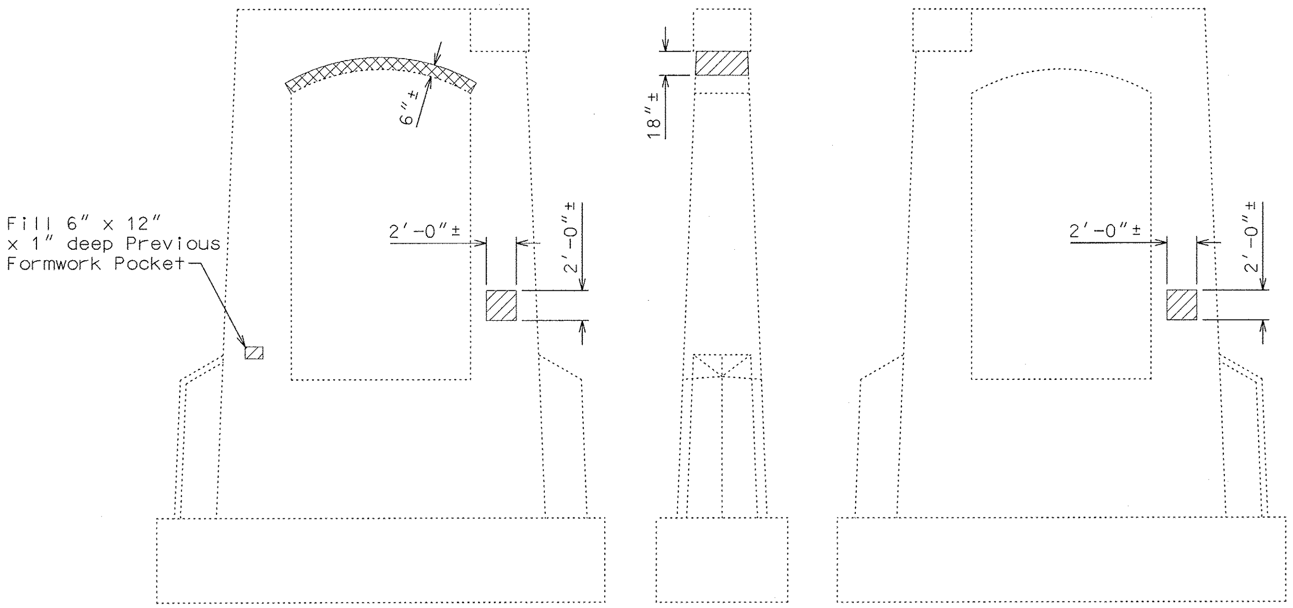


WEST FACE SOUTH FACE EAST FACE

PIER NO. 5

▩ Approximate Limits of Formed Concrete Repair

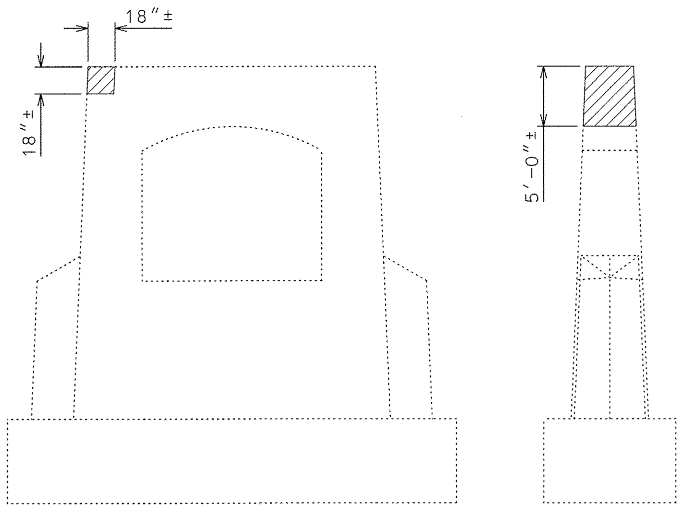
▨ Approximate Limits of Unformed Concrete Repair



Fill 6″ x 12″ x 1″ deep Previous Formwork Pocket

WEST FACE SOUTH FACE EAST FACE

PIER NO. 6



WEST FACE SOUTH FACE

PIER NO. 9

Note:
The cost of all equipment and labor to remove the existing coating and apply the new coating shall be included in the contract unit price for Protective Coating - Concrete Bents and Piers (Urethane), Lump Sum.

PIERS NO. 4, 5, 6 & 9 REPAIR DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 9 of 57

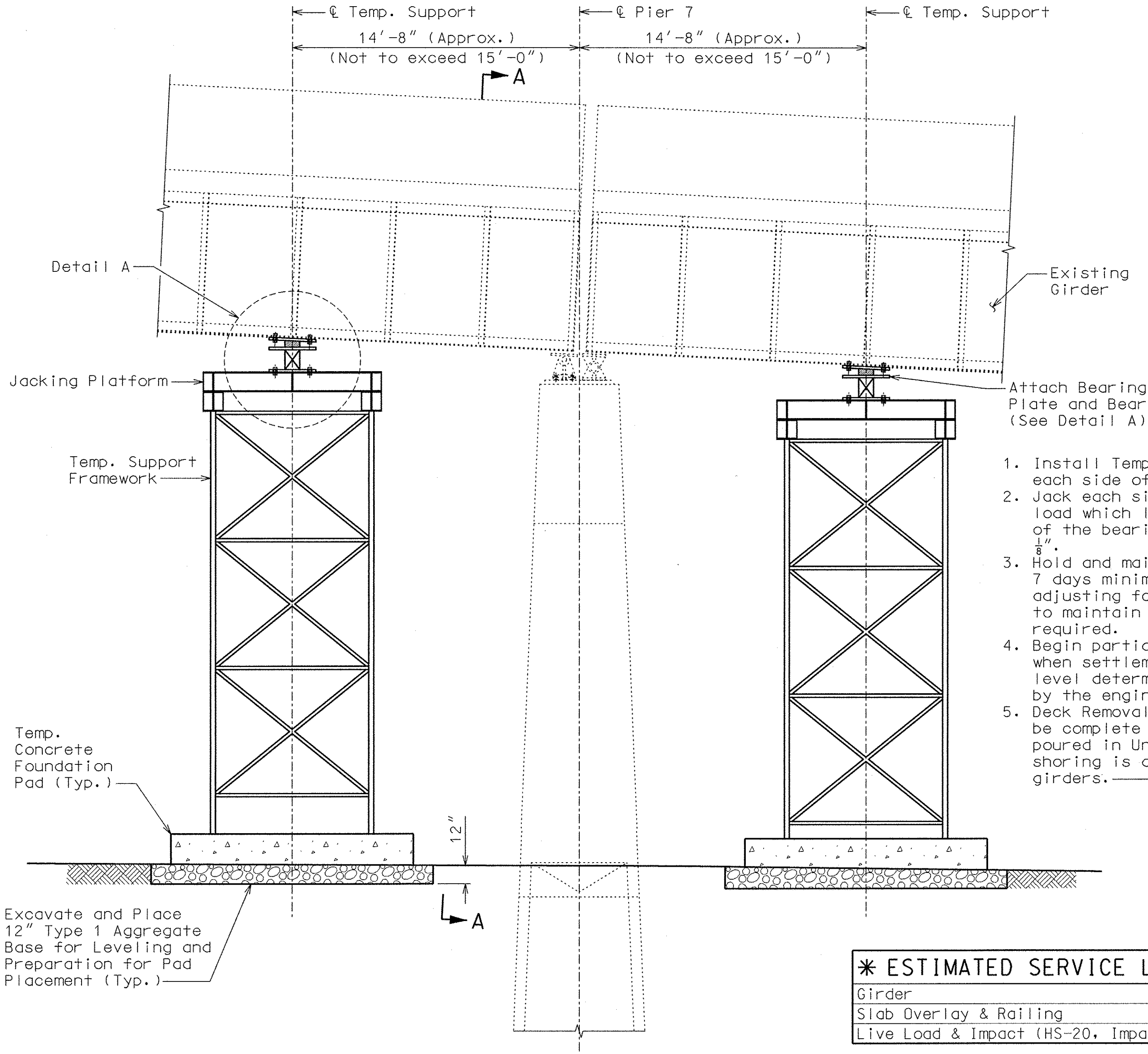
CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	9
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DATE DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

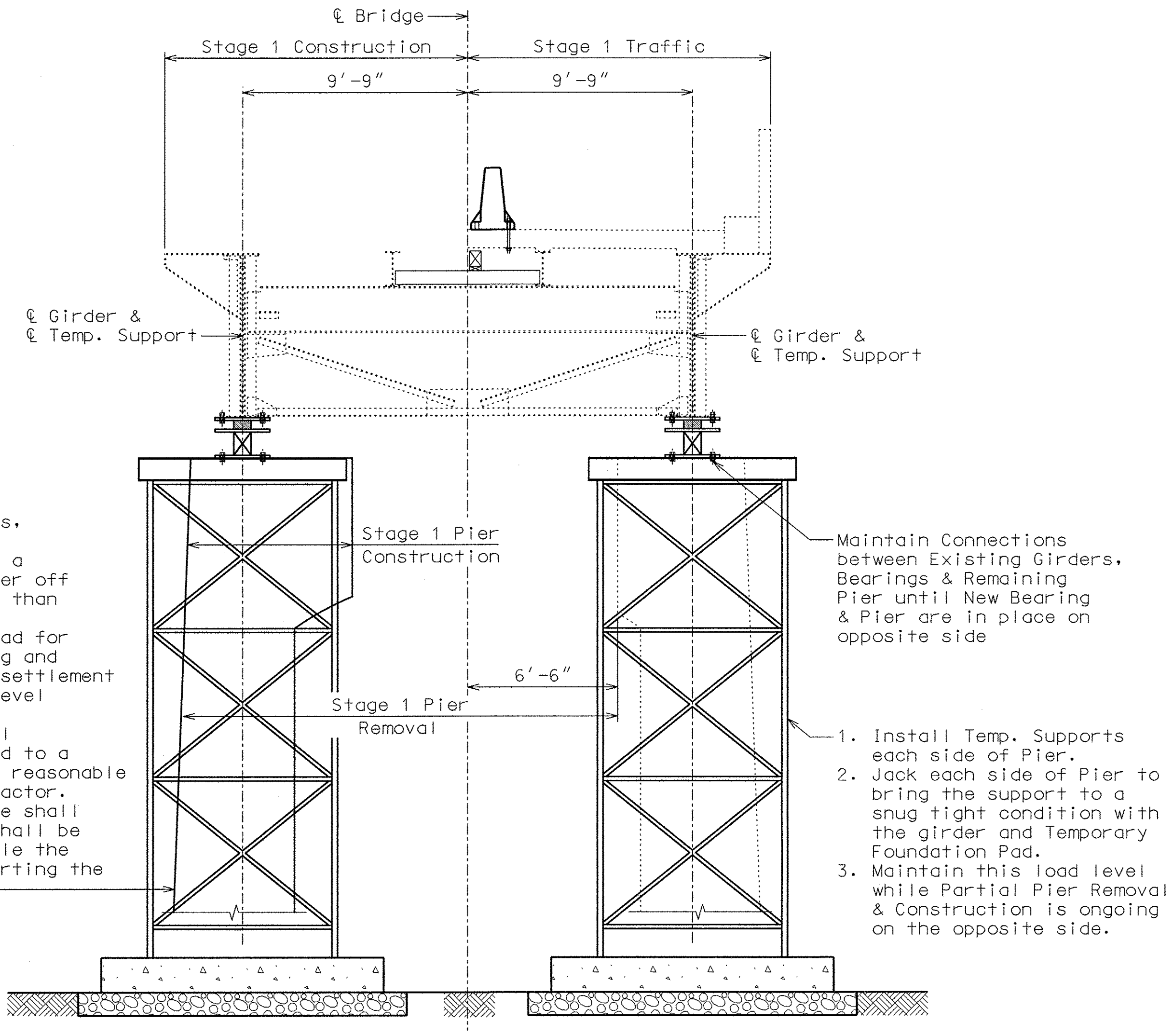

℄ Temp. Support
℄ Pier 7
℄ Temp. Support
14'-8" (Approx.)
(Not to exceed 15'-0")
14'-8" (Approx.)
(Not to exceed 15'-0")
A
Detail A
Existing Girder
Jacking Platform
Attach Bearing Plate and Bearing (See Detail A)
Temp. Support Framework
Temp. Concrete Foundation Pad (Typ.)
12"
Excavate and Place 12" Type 1 Aggregate Base for Leveling and Preparation for Pad Placement (Typ.)
A

1. Install Temporary Supports, each side of pier.
2. Jack each side of pier to a load which lifts the girder off of the bearing by no more than ⅛".
3. Hold and maintain this load for 7 days minimum, monitoring and adjusting for foundation settlement to maintain ⅛" and load level required.
4. Begin partial pier removal when settlement has slowed to a level determined safe and reasonable by the engineer and contractor.
5. Deck Removal for the stage shall be complete and no deck shall be poured in Units 3 & 4 while the shoring is actively supporting the girders.

ELEVATION SHOWING TEMPORARY SUPPORTS AT PIER 7

✱ ESTIMATED SERVICE LOAD REACTIONS	
Girder	24000 lbs
Slab Overlay & Railing	88000 lbs
Live Load & Impact (HS-20, Impact = 30%)	76000 lbs

✱ For Existing Conditions. Contractor shall verify all loads for design of Temporary Supports.

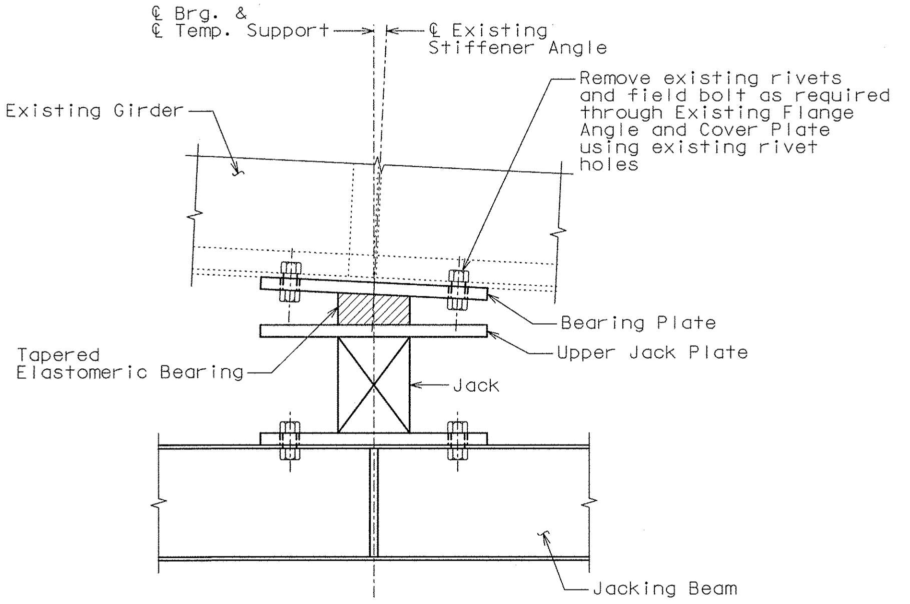


Maintain Connections between Existing Girders, Bearings & Remaining Pier until New Bearing & Pier are in place on opposite side

1. Install Temp. Supports each side of Pier.
2. Jack each side of Pier to bring the support to a snug tight condition with the girder and Temporary Foundation Pad.
3. Maintain this load level while Partial Pier Removal & Construction is ongoing on the opposite side.

SECTION A-A

(Stage 1 Construction shown, Stage 2 Construction similar)


℄ Brg. &
℄ Temp. Support
℄ Existing Stiffener Angle
Remove existing rivets and field bolt as required through Existing Flange Angle and Cover Plate using existing rivet holes
Existing Girder
Bearing Plate
Upper Jack Plate
Tapered Elastomeric Bearing
Jack
Jacking Beam

DETAIL A

(Alternate Bearing & Jacking arrangements will be allowed. This detail shows only one viable concept for contractor consideration)

Notes:

The contractor is responsible for maintaining the stability of the structure at all times and shall take all necessary precautions to maintain the stability and safety of the existing bridge at the contractor's cost.

The contractor shall be responsible for the design of the Falsework and Temporary Foundations necessary to replace Pier No. 7.

The contractor shall submit drawings and calculations signed and sealed by a Professional Engineer in the state of Missouri to the engineer for review a minimum of 4 weeks prior to installation of any temporary supports.

The temporary supports shall be designed and constructed to be capable of supporting the weight of the entire structure and one traffic lane without consideration of reduced weights and load for staged construction.

The weights provided are based on the as-built drawings for the existing bridge and shall be verified by the contractor in the design of the falsework.

Temporary Concrete Foundation Pads shall be designed for a maximum bearing stress of 2000 psf.

The contractor shall provide blocking between the bottom flange of the girder and abutment backwall at the East Abutment to prevent sliding of Unit No. 4.

The cost of all materials, equipment and labor necessary to design, construct, maintain, and remove the temporary supports shall be included in the contract lump sum price for "Temporary Supports".

TEMPORARY SUPPORTS - PIER NO. 7

Detailed April 2009
Checked April 2009

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

Sheet No. 10 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	10
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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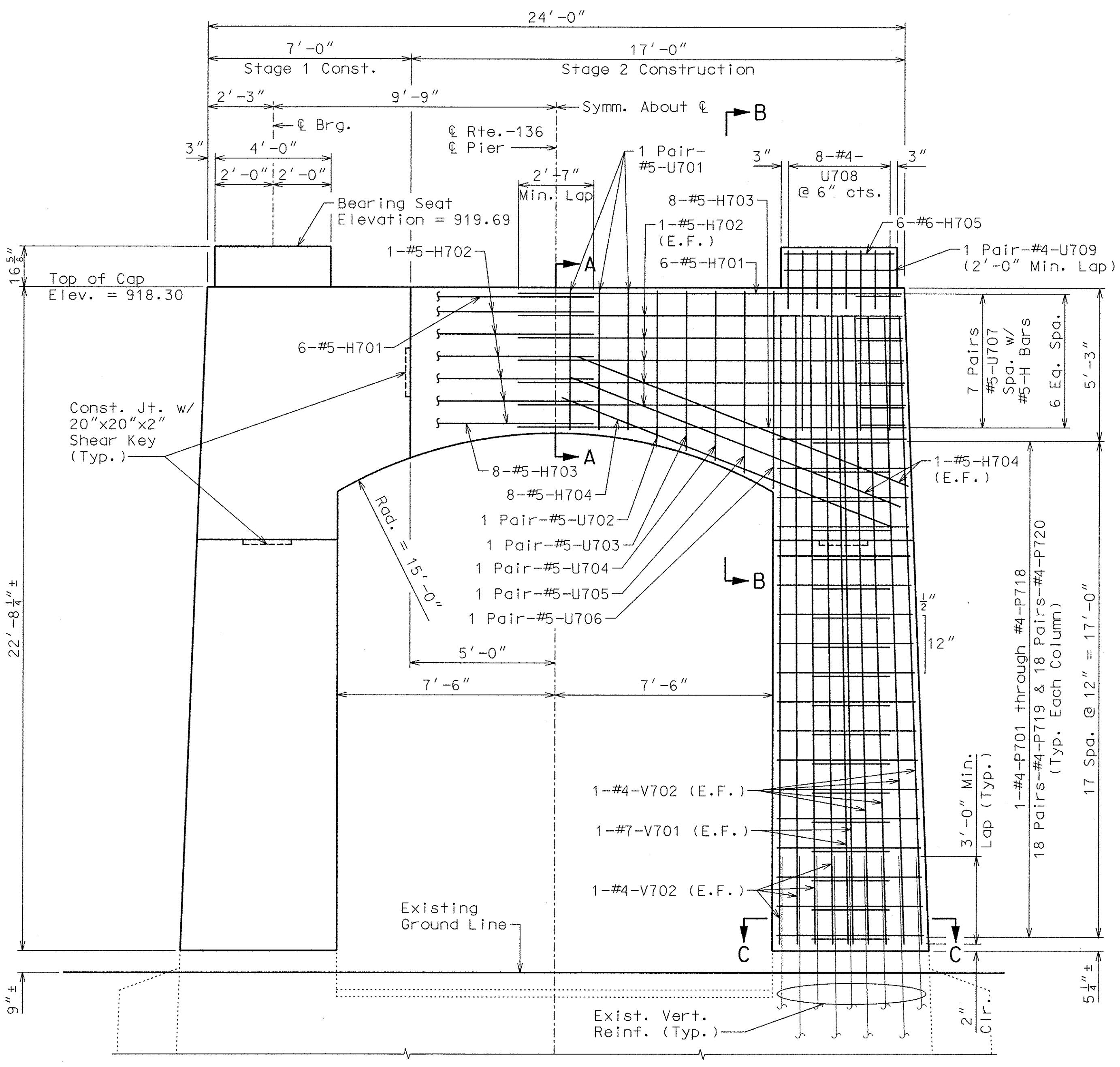
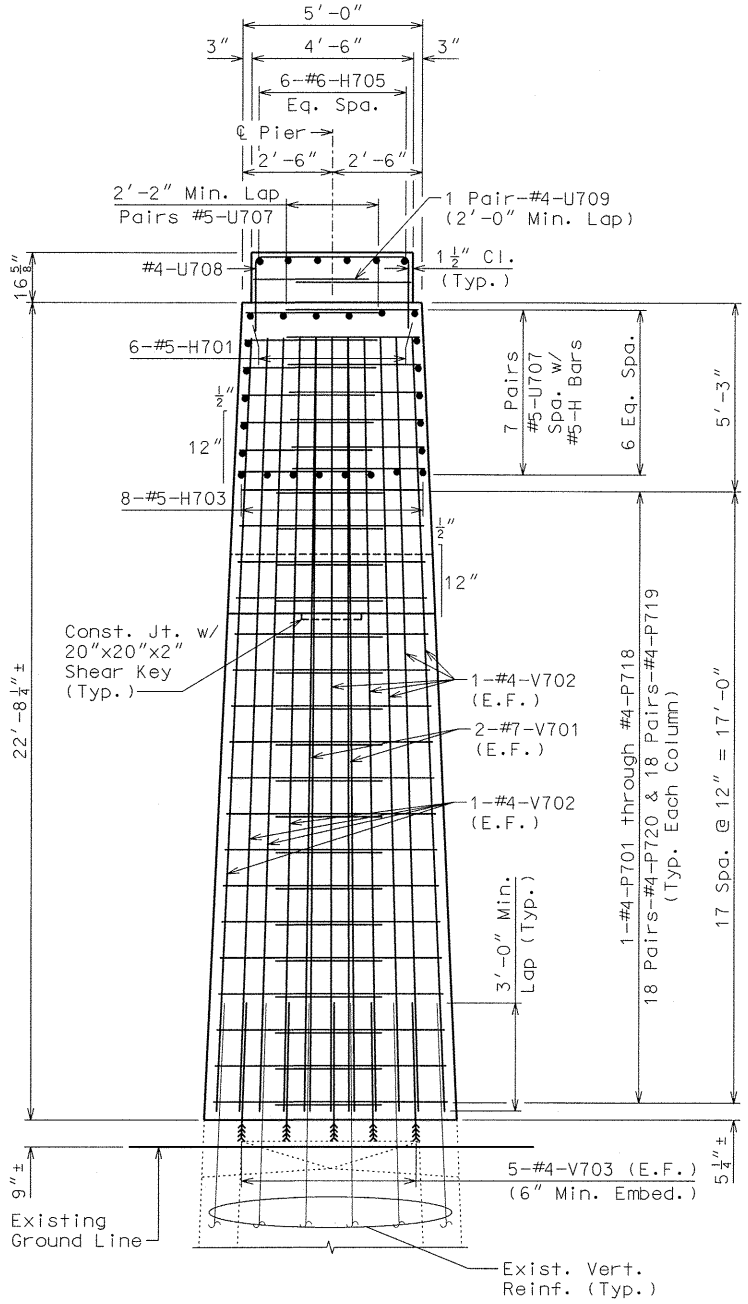
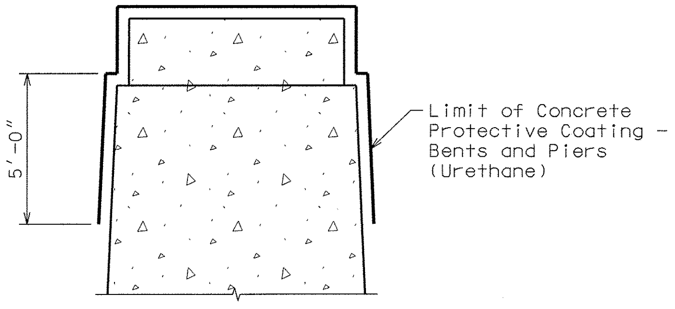


SIDE ELEVATION
(Looking Ahead Station)



END ELEVATION


5'-0"
Limit of Concrete Protective Coating - Bents and Piers (Urethane)

CONCRETE PROTECTIVE COATING DETAIL

SUBSTRUCTURE QUANTITY TABLE FOR PIER NO. 7		
ITEM		QUANTITY
Class B-1 Concrete (Substructure)	Cu. Yd.	68.0
Reinforcing Steel (Bridges)	Lbs.	3040
Reinforcing Steel (Epoxy Coated)	Lbs.	2250

These quantities are included in the estimated quantities table on Sheet No. 3.

Notes:
All reinforcing bars in the tops of substructure beams or caps shall be spaced to clear anchor bolt wells for bearings by at least 1/2".

For Sections A-A, B-B & C-C, see Sheet No. 12.

For Drainage System Details, see Sheet No. 47.

E.F. = Each Face.

↟ = Denotes Resin Anchored Reinforcing Steel.

PIER NO. 7 REPAIR DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 11 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

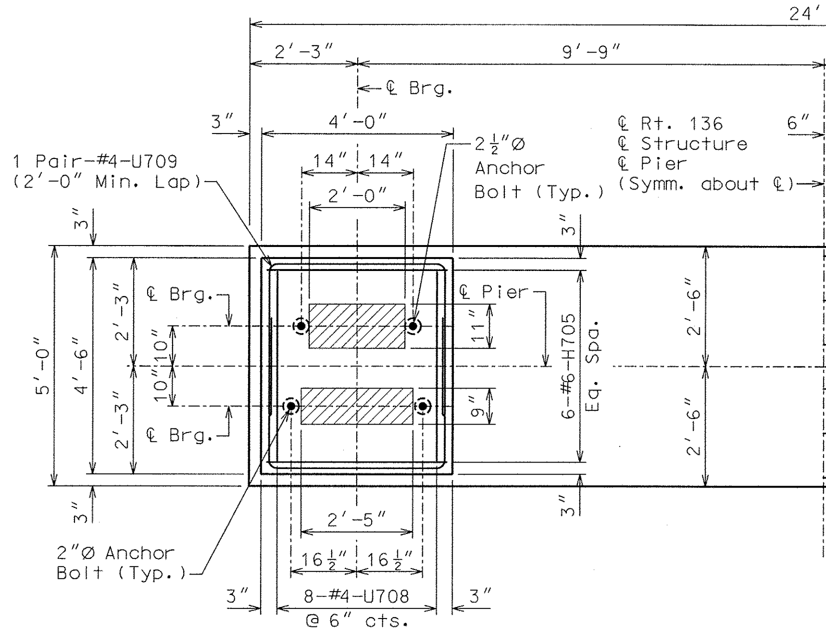
Cory Imhoff

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	11
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

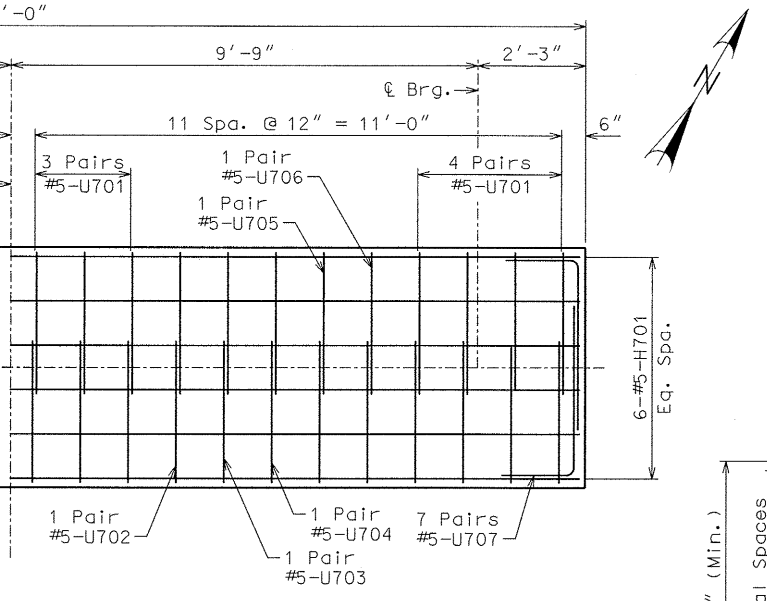
DATE	DESCRIPTION

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

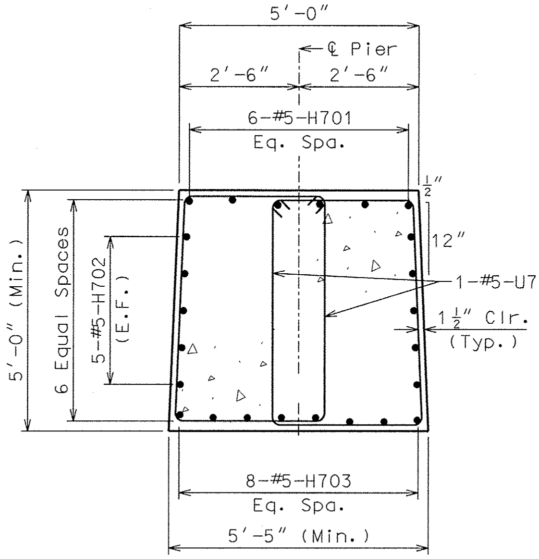
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



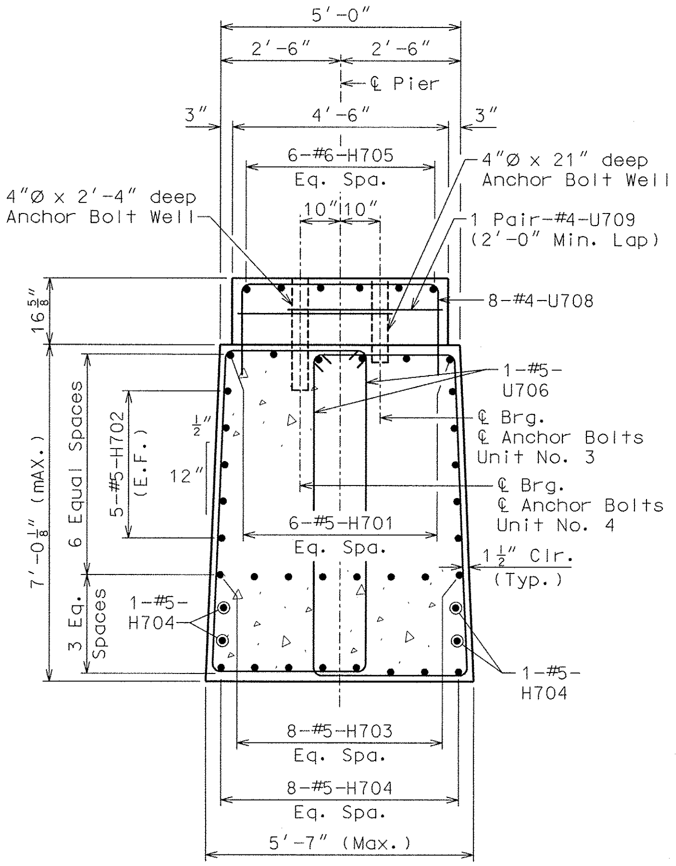
HALF PLAN SHOWING BEARING SEAT



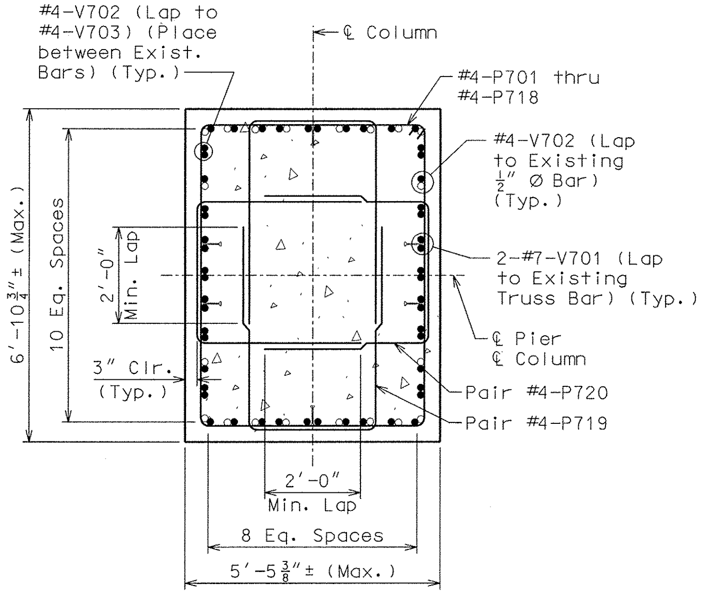
HALF PLAN SHOWING CAP REINFORCEMENT



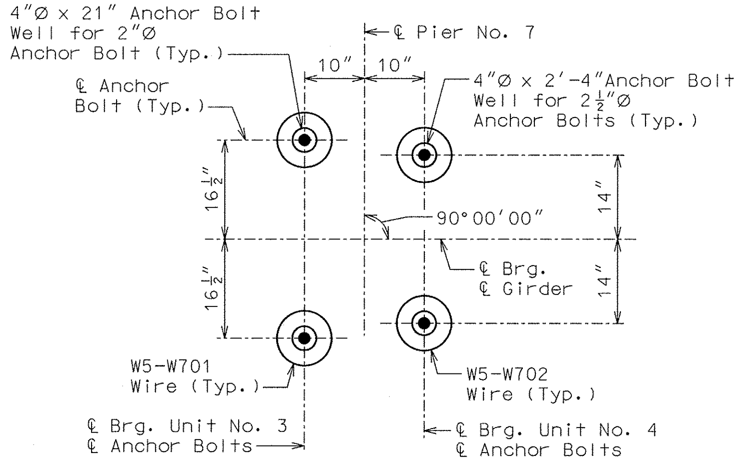
SECTION A-A
(Bearing Seat and Anchor Bolt Wells not shown for clarity)



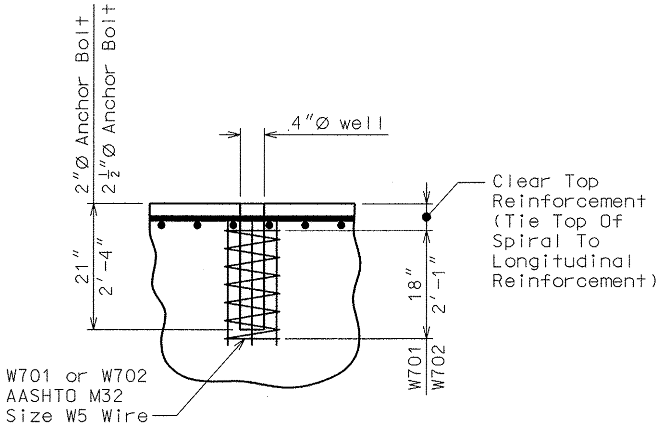
SECTION B-B



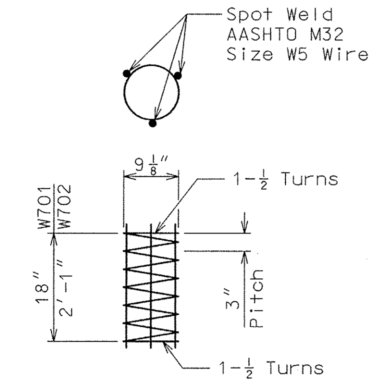
SECTION C-C



ANCHOR BOLT PLACEMENT DETAIL


2"Ø Anchor Bolt
2½"Ø Anchor Bolt
4"Ø well
Clear Top Reinforcement (Tie Top Of Spiral To Longitudinal Reinforcement)
21"
2'-4"
18"
2'-1"
W701
W702
W701 or W702 AASHTO M32 Size W5 Wire

DETAIL OF ANCHOR BOLT WELLS



DETAIL OF SPIRAL REINFORCEMENT

Note:
For location of Sections A-A, B-B & C-C, see Sheet No. 11.

PIER NO. 7 REPAIR DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 12 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	12
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION	DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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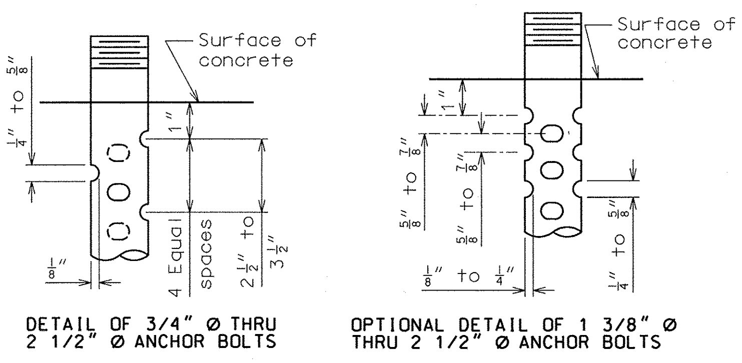
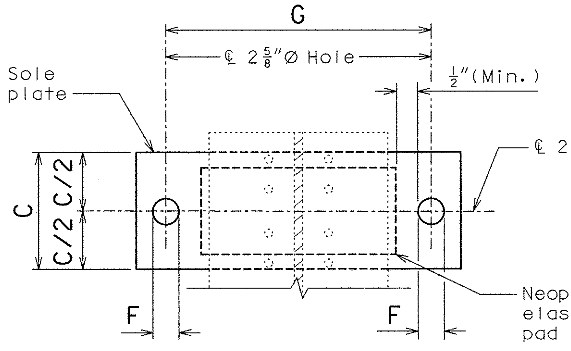


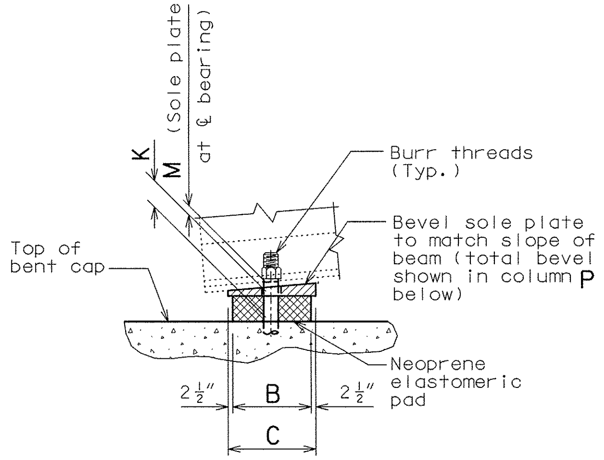
DETAIL OF 3/4" Ø THRU 2 1/2" Ø ANCHOR BOLTS

OPTIONAL DETAIL OF 1 3/8" Ø THRU 2 1/2" Ø ANCHOR BOLTS

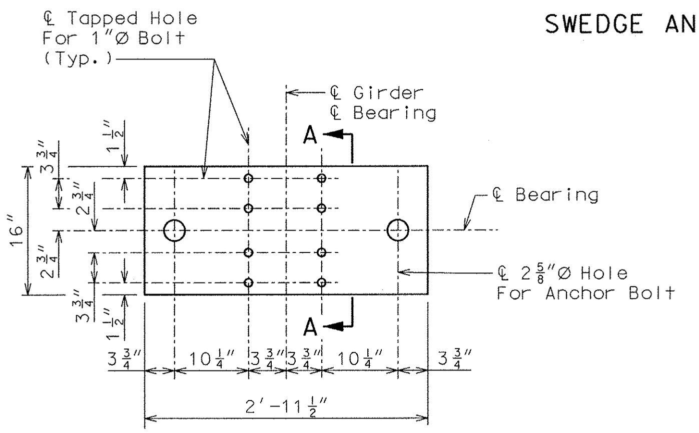
SWEDGE ANCHOR BOLT DETAILS



PART PLAN

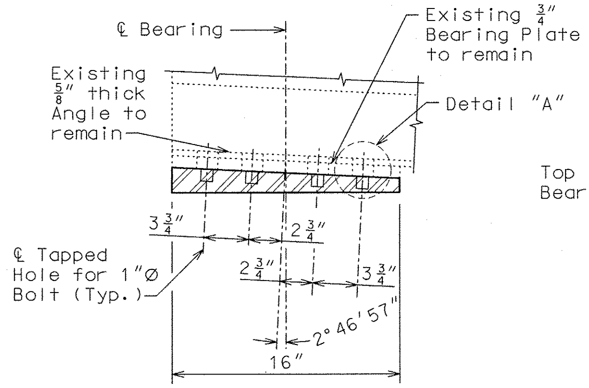

K
M
(Sole plate at ℄ bearing)
Burr threads (Typ.)
Bevel sole plate to match slope of beam (total bevel shown in column P below)
Top of bent cap
Neoprene elastomeric pad
2 1/2"
B
2 1/2"
C

SIDE VIEW

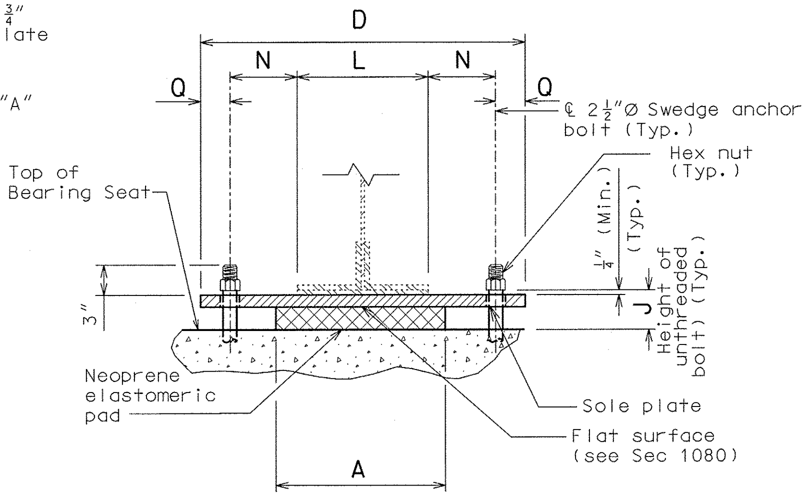


PLAN OF SOLE PLATE

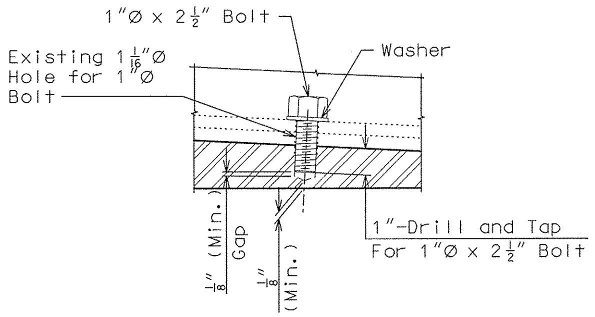
Note:
Dimensions for 1"Ø Bolts taken from As-Built plans, contractor to verify prior to fabrication.


℄ Bearing
Existing 3/4" Bearing Plate to remain
Existing 3/8" thick Angle to remain
Detail "A"
3 3/4"
2 3/4"
℄ Tapped Hole for 1"Ø Bolt (Typ.)
2 3/4"
3 3/4"
2° 46' 57"
16"

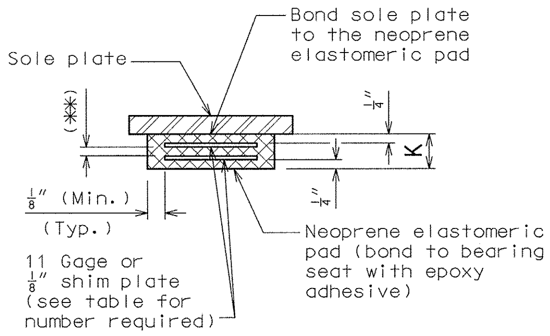
SECTION A-A



END VIEW


1"Ø x 2 1/2" Bolt
Washer
Existing 1 1/16"Ø Hole for 1"Ø Bolt
1/8" (Min.) Gap
1/8" (Min.)
1"-Drill and Tap For 1"Ø x 2 1/2" Bolt

DETAIL "A"


Sole plate
Bond sole plate to the neoprene elastomeric pad
(✱✱)
1/4"
K
1/4"
1/8" (Min.)
(Typ.)
11 Gage or 1/8" shim plate (see table for number required)
Neoprene elastomeric pad (bond to bearing seat with epoxy adhesive)

(✱✱) Layers of 1/2" elastomer alternating with 11 gage or 1/8" shim plate

NEOPRENE ELASTOMERIC PAD

GENERAL NOTES:

Anchor rods shall be 2 1/2"Ø ASTM F1554 Grade 55 swedged rods and shall extend 2'-1" into the concrete with AASHTO M291 (ASTM A563) Grade A Hex or Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

All structural steel for the anchor rods and heavy hexagon nuts shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

Neoprene Elastomeric Pads shall be 60 Durometer.

Structural steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum or two coats of inorganic zinc primer (5 mils minimum).

Laminated Neoprene Bearing Pad Assembly shall be in accordance with Sec 716.

FIXED BEARINGS															
LOCATION	A	B	C	D	F	G	J	K	L	M	N	P	Q	NUMBER OF SHIM PLATES(✱)	NUMBER REQUIRED
Pier No. 7 - Unit No. 4	24"	11"	16"	35 1/2"	2 5/8"	28"	4"	1 7/8"	16 1/2"	1 3/4"	5 3/4"	3/4"	3 3/4"	3	2
														TOTAL BEARINGS	2

(✱) The required shim plate shall be placed between layers of elastomer and molded together to form an integral unit.

DETAILS OF LAMINATED NEOPRENE BEARING ASSEMBLY

Detailed April 2009
Checked April 2009

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

Sheet No. 13 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 13
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DATE
DESCRIPTION

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

MoDOT

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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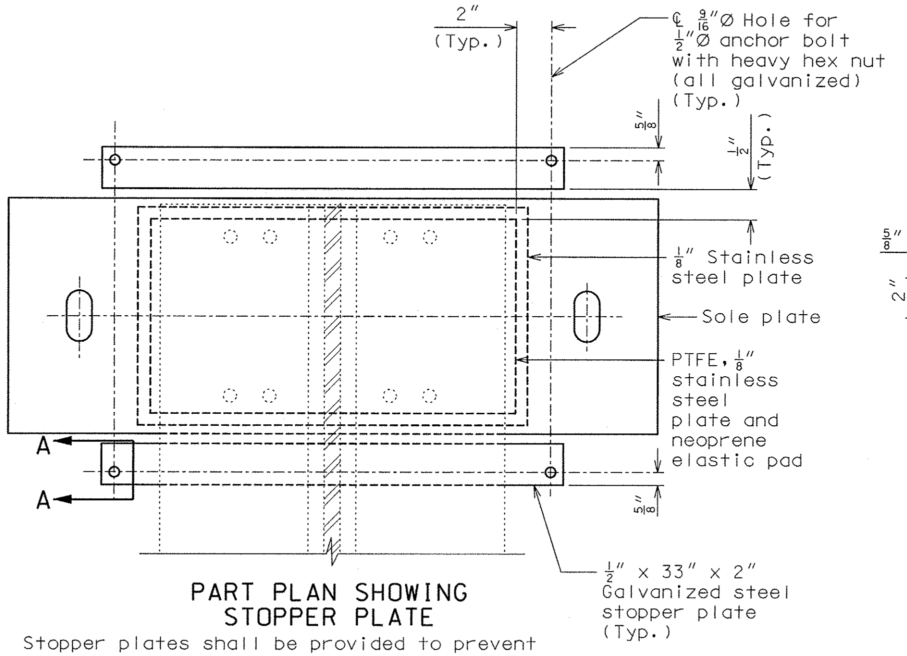
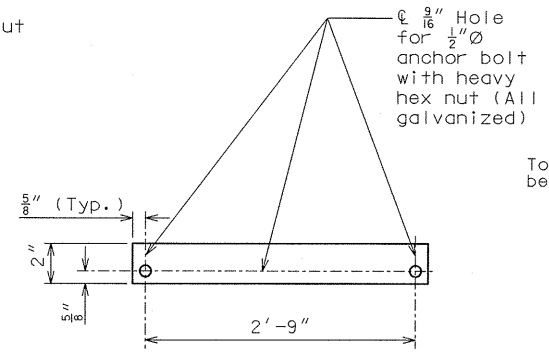

2" (Typ.)
℄ 9/16"Ø Hole for 1/2"Ø anchor bolt with heavy hex nut (all galvanized) (Typ.)
5/8"
1/2" (Typ.)
1/8" Stainless steel plate
Sole plate
PTFE, 1/8" stainless steel plate and neoprene elastic pad
A
A
5/8"
1/2" x 33" x 2" Galvanized steel stopper plate (Typ.)

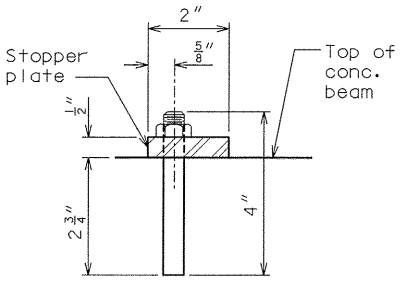
PART PLAN SHOWING STOPPER PLATE

Stopper plates shall be provided to prevent loss of support due to creeping of PTFE bearings. Payment for fabricating and installing the stopper plates will be considered completely covered by the contract unit price for Type N PTFE Bearing.

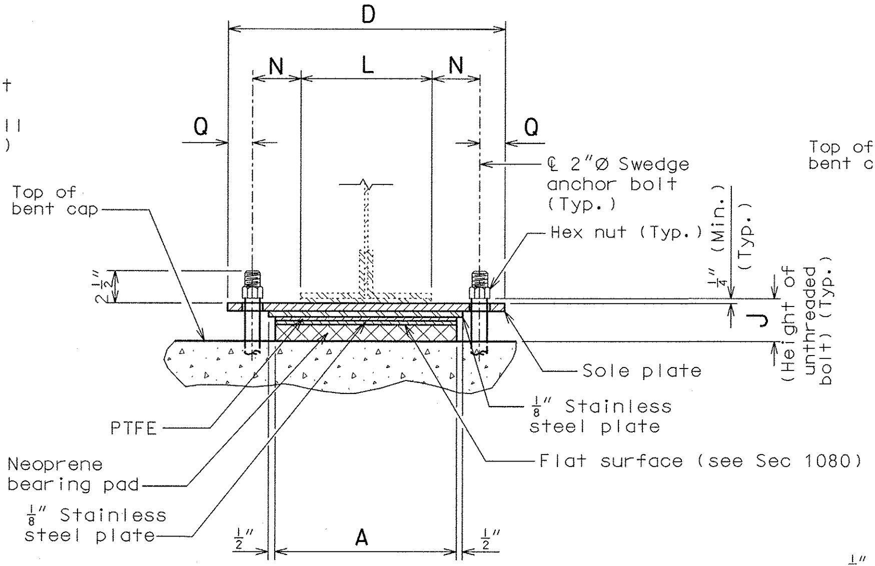
The bottom face of the 1/8" stainless steel plate that is welded to the sole plate shall be lubricated with a lubricant that is approved by the bearing manufacturer.


℄ 9/16" Hole for 1/2"Ø anchor bolt with heavy hex nut (All galvanized)
5/8" (Typ.)
2"
5/8"
2'-9"

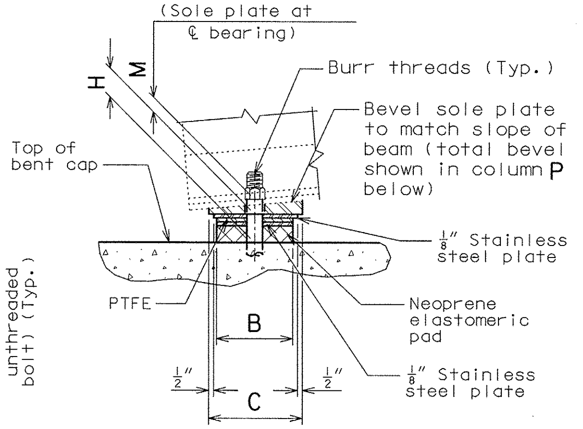
PLAN OF GALVANIZED STEEL STOPPER PLATE



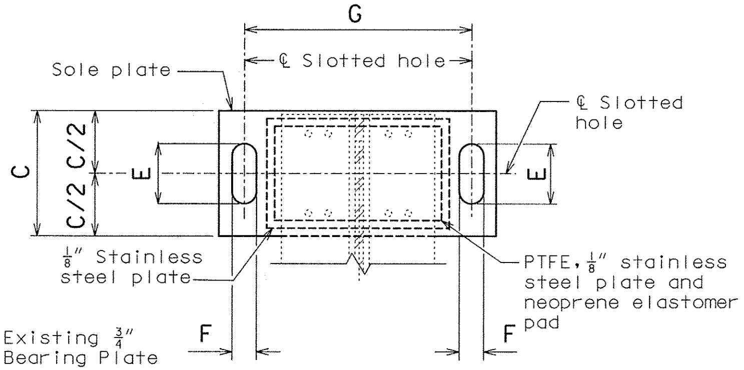
SECTION A-A


D
N
L
N
Q
Q
℄ 2"Ø Swedge anchor bolt (Typ.)
Hex nut (Typ.)
Top of bent cap
2 1/2"
1/4" (Min.)
J
(Typ.) (Height of unthreaded bolt) (Typ.)
Sole plate
1/8" Stainless steel plate
PTFE
Neoprene bearing pad
1/8" Stainless steel plate
Flat surface (see Sec 1080)
1/2"
A
1/2"

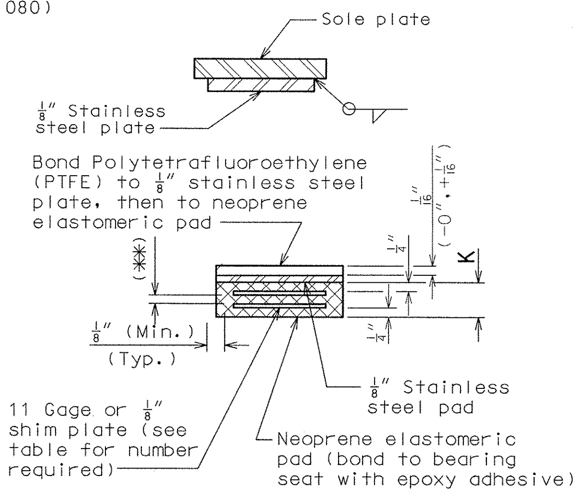
END VIEW


(Sole plate at ℄ bearing)
H
M
Burr threads (Typ.)
Bevel sole plate to match slope of beam (total bevel shown in column P below)
Top of bent cap
1/8" Stainless steel plate
PTFE
Neoprene elastomeric pad
B
1/2"
1/2"
C
1/8" Stainless steel plate

SIDE VIEW

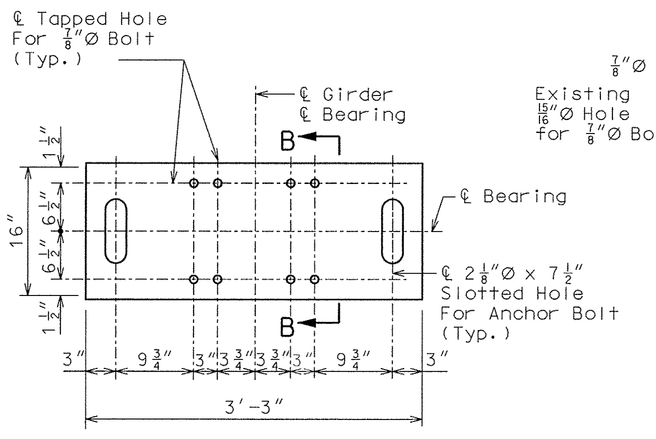

G
℄ Slotted hole
Sole plate
℄ Slotted hole
C
C/2
C/2
E
E
1/8" Stainless steel plate
PTFE, 1/8" stainless steel plate and neoprene elastomeric pad
F
F

PART PLAN


Sole plate
1/8" Stainless steel plate
Bond Polytetrafluoroethylene (PTFE) to 1/8" stainless steel plate, then to neoprene elastomeric pad
1/16" (-0", +1/16")
1/4"
K
(✱✱)
1/8" (Min.) (Typ.)
1/4"
11 Gage or 1/8" shim plate (see table for number required)
1/8" Stainless steel pad
Neoprene elastomeric pad (bond to bearing seat with epoxy adhesive)

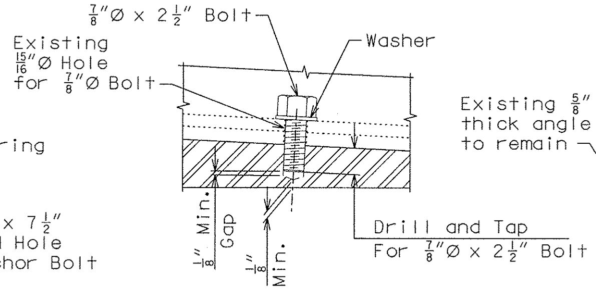
NEOPRENE ELASTOMERIC PAD

(✱✱) Layers of 3/8" elastomer alternating with 11 gage or 1/8" shim plate.

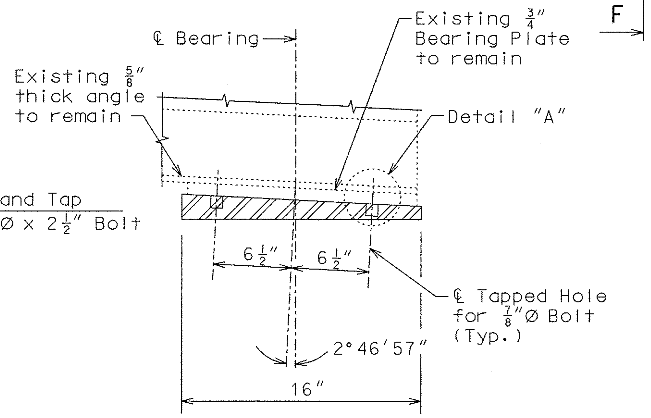


PLAN OF SOLE PLATE

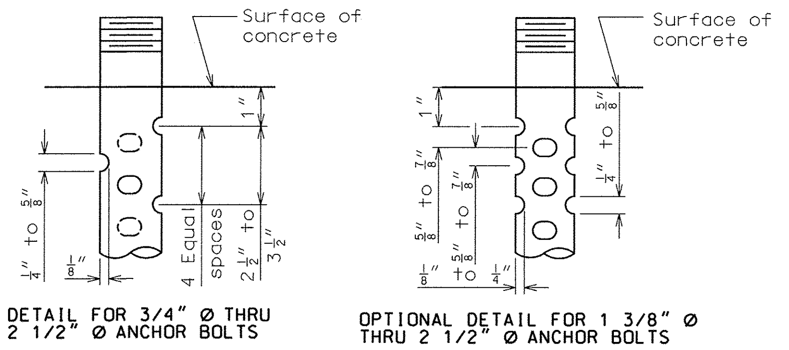
Note:
Dimensions for 7/8"Ø Bolts taken from As-Built plans, contractor to verify prior to fabrication.


7/8"Ø x 2 1/2" Bolt
Existing 15/16"Ø Hole for 7/8"Ø Bolt
Washer
Min. Gap
1/8"
1/8" Min.
Drill and Tap For 7/8"Ø x 2 1/2" Bolt

DETAIL "A"


℄ Bearing
Existing 3/4" Bearing Plate to remain
Existing 5/8" thick angle to remain
Detail "A"
6 1/2"
6 1/2"
℄ Tapped Hole for 7/8"Ø Bolt (Typ.)
2°46'57"
16"

SECTION B-B



DETAIL FOR 3/4" Ø THRU 2 1/2" Ø ANCHOR BOLTS

OPTIONAL DETAIL FOR 1 3/8" Ø THRU 2 1/2" Ø ANCHOR BOLTS

SWEDGE ANCHOR BOLT DETAILS

GENERAL NOTES:

Anchor rods shall be 2"Ø ASTM F1554 Grade 55 swedged rods and shall extend 18" into the concrete with AASHTO M291 (ASTM A563) Grade A Hex or Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

Anchor rod shall be at the ℄ of the slotted hole at 60°F. Bearing position shall be adjusted R for each 10° fall or rise in temperature at installation.

All structural steel for the anchor rods and heavy hexagon nuts shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum). The stainless steel plate shall be protected from any coating.

Neoprene Elastomeric Pads shall be 70 Durometer.

Structural Steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum). The stainless steel plate shall be protected from any coating.

Type N PTFE Bearings shall be in accordance with Sec 716.

Stopper plates shall be provided to prevent loss of support due to creeping of PTFE bearings. Payment for fabricating and installing the stopper plates will be considered completely covered by the contractor unit price for Type N PTFE Bearing.

The bottom face of the 1/8" stainless steel plate that is welded to the sole plate shall be lubricated with a lubricant that is approved by the bearing manufacturer.

PTFE SLIDING BEARINGS

LOCATION	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	NUMBER OF SHIM PLATES (✱)	NUMBER REQUIRED
Pier No. 7 - Unit No. 3	29"	9"	16"	39"	7 1/2"	2 1/8"	33"	2 1/2"	5"	2 1/8"	16 1/2"	2 1/8"	8 1/4"	3/4"	3"	5/16"	4	2
(✱) The required shim plate shall be placed between layers of elastomer and molded together to form an integral unit.																	TOTAL BEARINGS	2

DETAILS OF TYPE "N" PTFE BEARINGS

Detailed April 2009
Checked April 2009

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

Sheet No. 14 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09

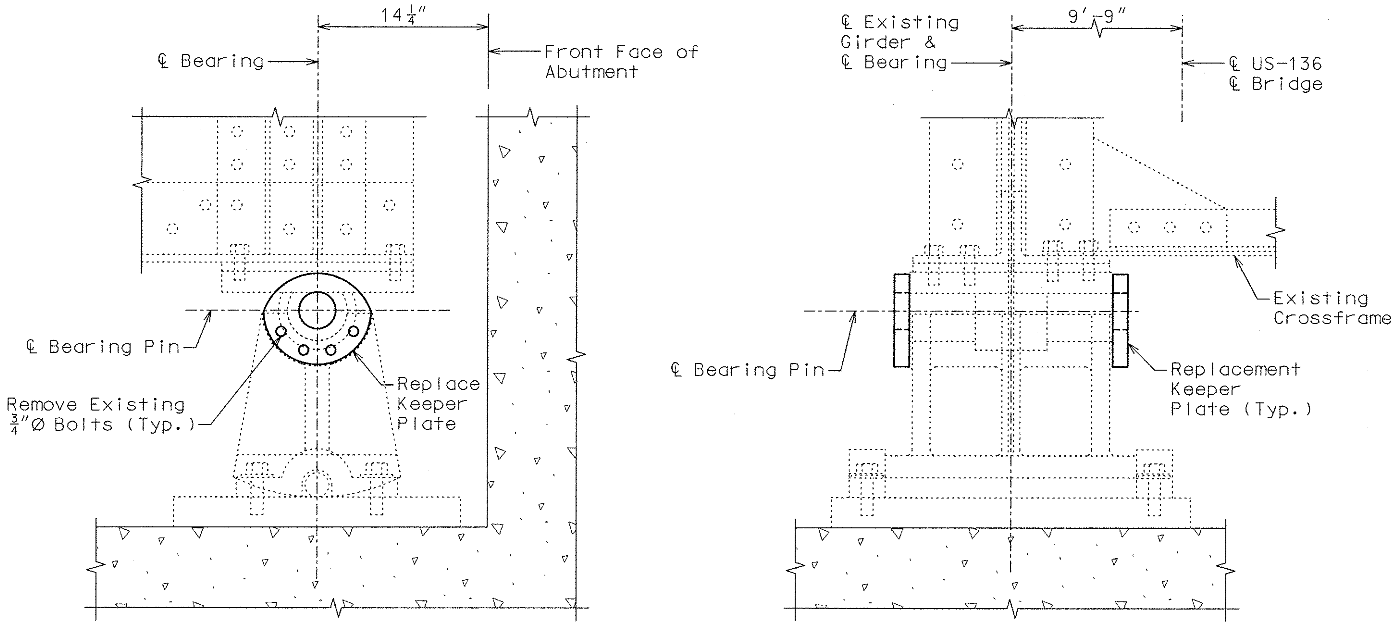
ROUTE	STATE
136	MO
DISTRICT	**SHEET NO.**
BR	14

COUNTY: ATCHISON
JOB NO.: J1P2161
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: L00982

DESCRIPTION
DATE

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

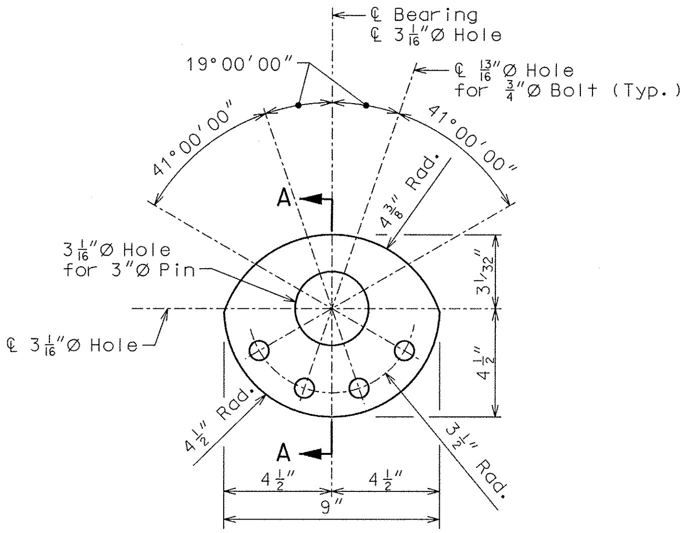
HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



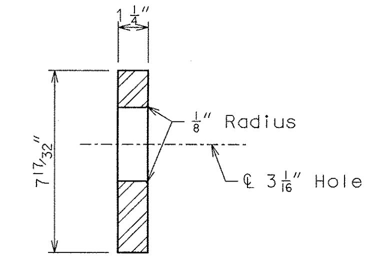
LONGITUDINAL ELEVATION

TRANSVERSE ELEVATION

EXPANSION SHOE - AT ABUTMENTS



ELEVATION OF KEEPER PLATE



SECTION A-A

Notes:

New structural steel for Keeper Plates and Optional Attachment Plate shall be ASTM A709 Grade 36.

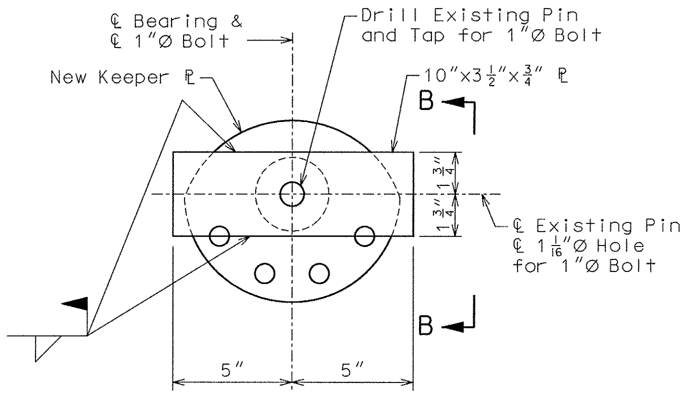
All dimensions are approximate and were taken from "As-Built" drawings and limited Field Measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

New bolts for standard attachment are 3/4 "Ø Grade A325 high-strength bolts through 13/16 "Ø holes. New bolts for optional attachment are 1"Ø Grade A325 high-strength bolts through 1 1/16 "Ø holes.

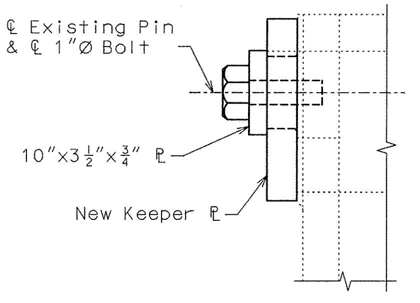
All equipment, labor and materials necessary to complete the keeper plate replacement and clean and lubricate the bearings at the East and West Abutments shall be considered completely covered by the contract unit price for Rehabilitate Bearings per each.

Additional rocker bearings at Piers No. 1, 5, 6, 8 & 9 shall be cleaned and coated. All equipment, labor and materials necessary to complete the clean and recoat shall be considered completely covered by the contract unit price for Cleaning and Coating Existing Bearings per each.


℄ Bearing & ℄ 1″Ø Bolt
Drill Existing Pin and Tap for 1″Ø Bolt
New Keeper ℙ
10″x3½″x¾″ ℙ
B
1¾″
1¾″
℄ Existing Pin
℄ 1$\frac{1}{16}$″Ø Hole for 1″Ø Bolt
B
5″
5″

OPTIONAL KEEPER PLATE ATTACHMENT

(To be used only in the event the existing ¾″Ø attachment holes are unusable)



VIEW B-B

ROCKER BEARING REHABILITATION

Detailed April 2009
Checked April 2009

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

Sheet No. 15 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	15

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
L00982

DESCRIPTION	DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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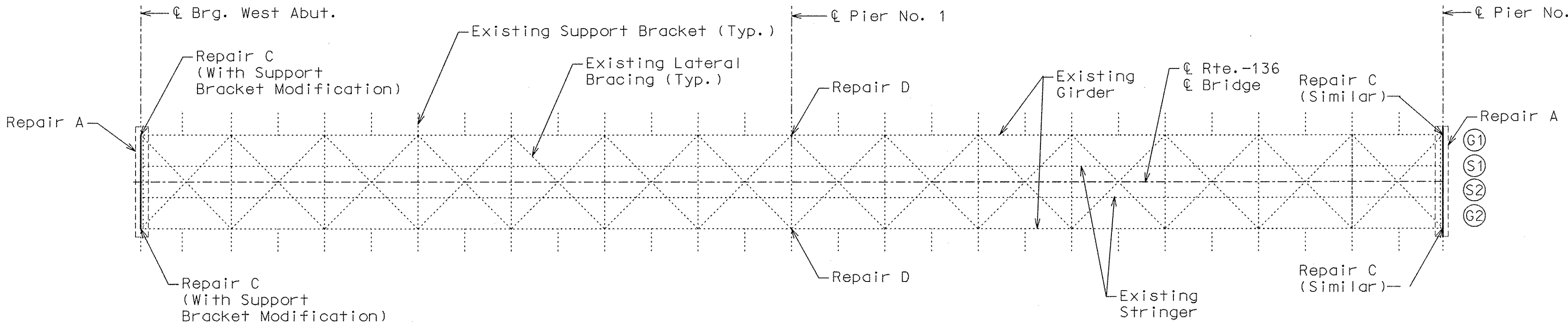
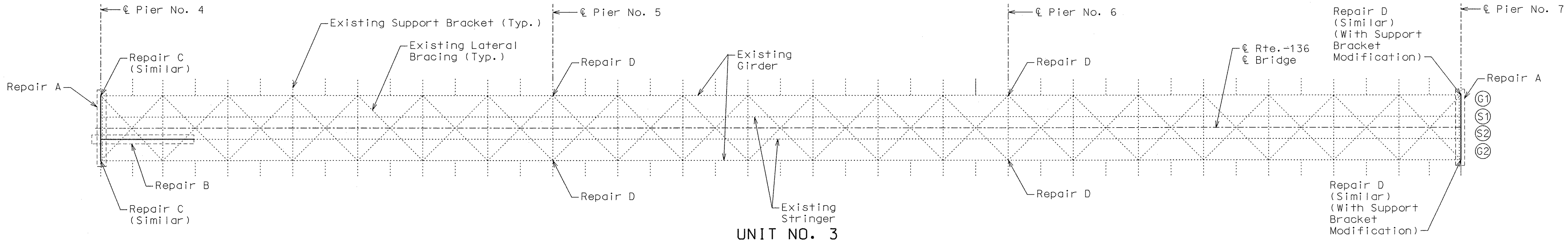
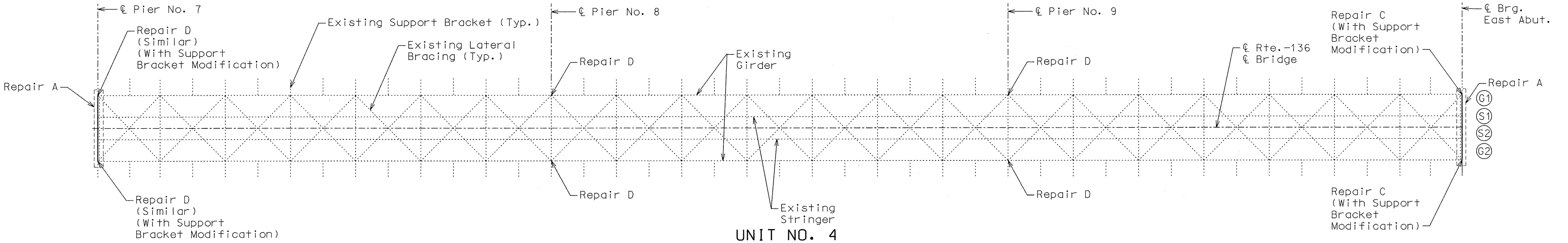


UNIT NO. 1



UNIT NO. 3


℄ Pier No. 7
Repair D (Similar) (With Support Bracket Modification)
Existing Support Bracket (Typ.)
℄ Pier No. 8
Existing Lateral Bracing (Typ.)
Repair D
Existing Girder
℄ Pier No. 9
Repair D
℄ Rte.-136 ℄ Bridge
Repair C (With Support Bracket Modification)
℄ Brg. East Abut.
Repair A
Repair A
G1
S1
S2
G2
Repair D (Similar) (With Support Bracket Modification)
Repair D
Existing Stringer
Repair D
Repair C (With Support Bracket Modification)

UNIT NO. 4

Note:
For additional girder modification details, see Sheet No. 27 thru 32.

PLAN OF STRUCTURAL STEEL REPAIR LOCATIONS - UNITS NO. 1, 3 & 4

Detailed April 2009
Checked April 2009

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

Sheet No. 16 of 57

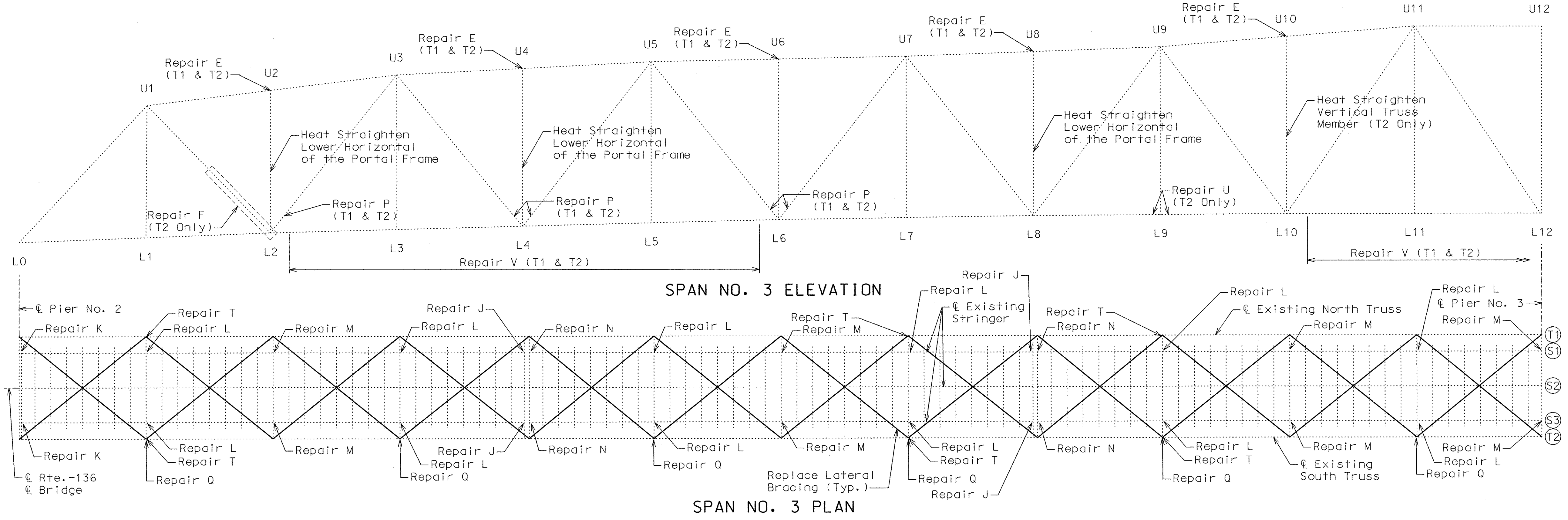
CORY MICHAEL IMHOFF
NUMBER PE-2002016669

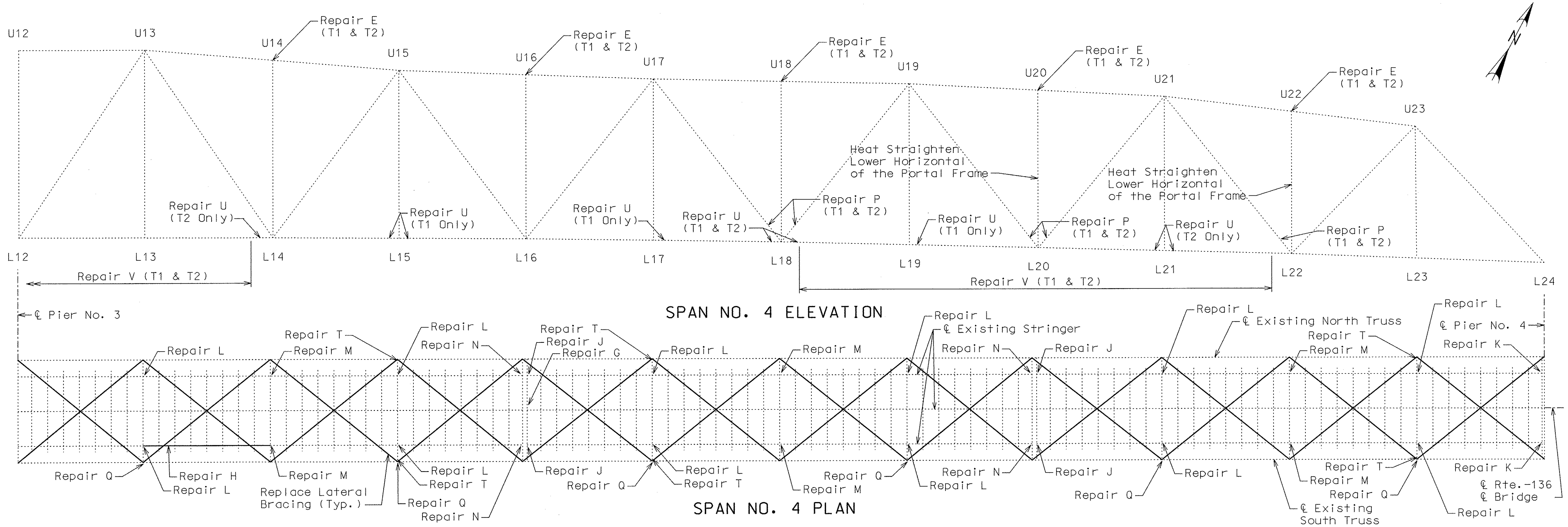
DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	16
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856





Notes:
Repair R occurs along the outside edge of T2 at approximately 25 locations in Span No. 3 & 25 locations in Span No. 4.

Repair S occurs at all Floorbeam to Truss connections except at L0, L12 & L24 along T1 & T2.

PLAN OF STRUCTURAL STEEL REPAIR LOCATIONS - UNIT NO. 2

Detailed April 2009
Checked April 2009

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

Sheet No. 17 of 57

STATE OF MISSOURI
CORY MICHAEL IMHOFF
NUMBER PE-2002016669
PROFESSIONAL ENGINEER

Cory Imhoff

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 17
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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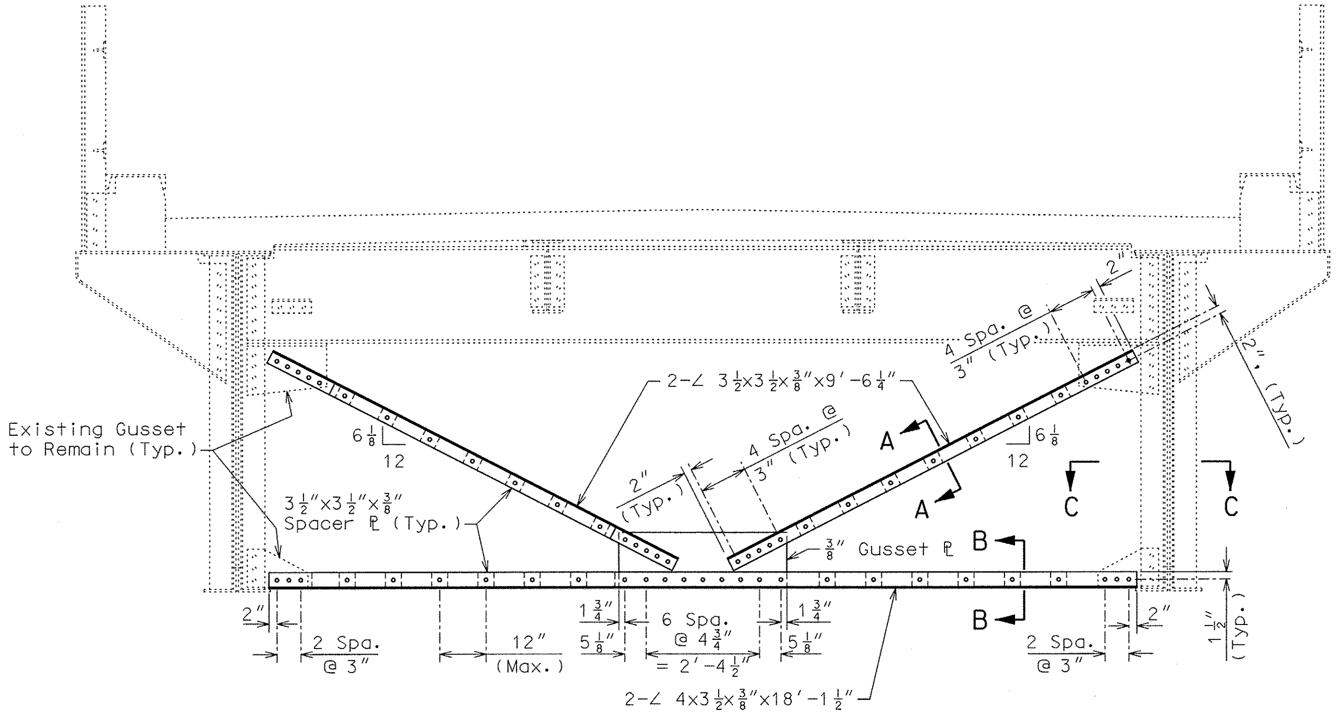
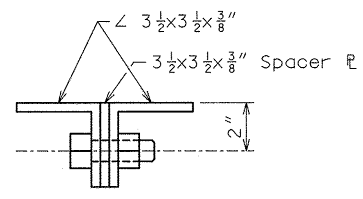
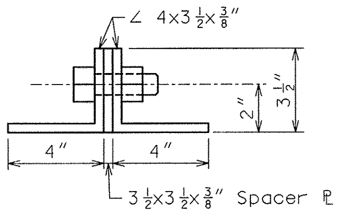


REPAIR A

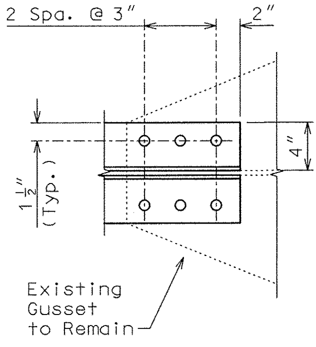
Existing angles are crimped. New angles will have spacer plates (no crimping necessary)



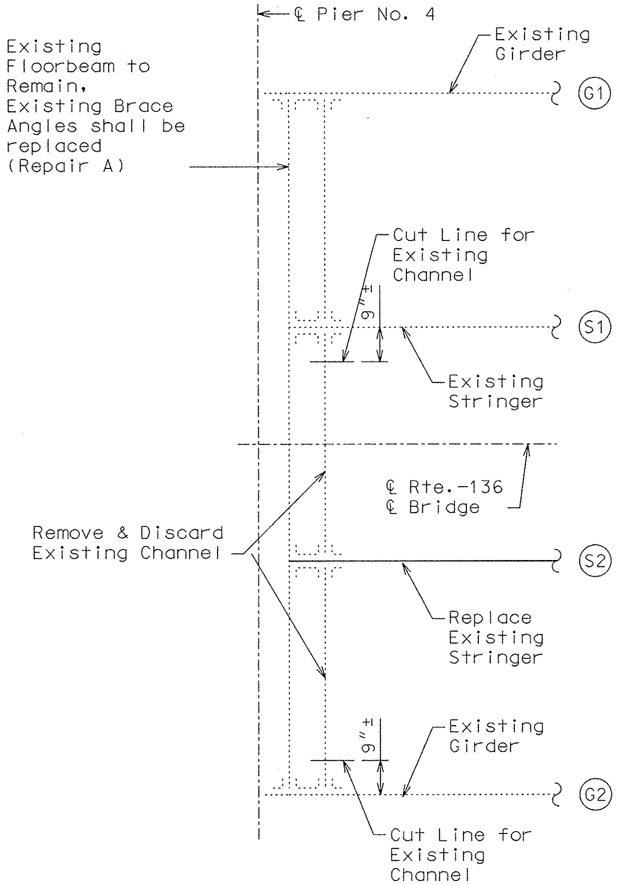
SECTION A-A



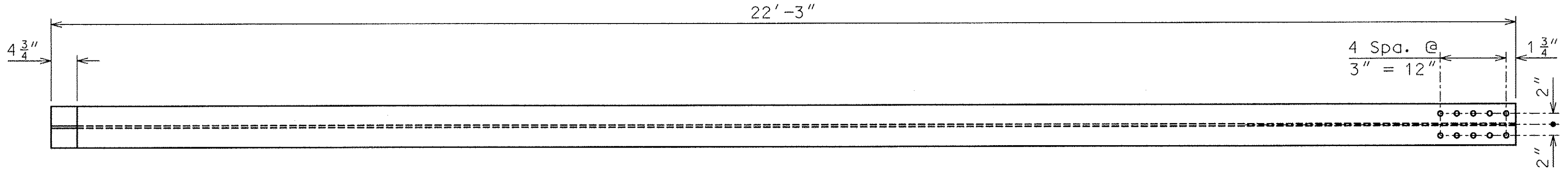
SECTION B-B



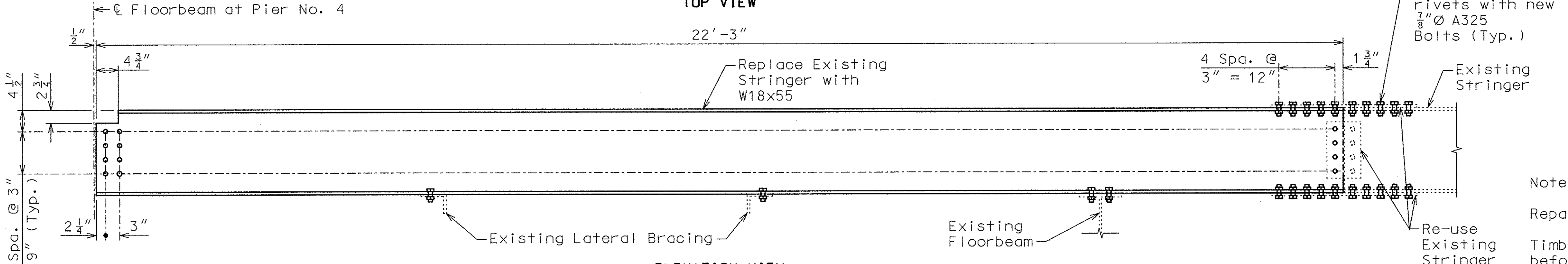
SECTION C-C


Existing Floorbeam to Remain, Existing Brace Angles shall be replaced (Repair A)
℄ Pier No. 4
Existing Girder
G1
Cut Line for Existing Channel
9"±
Existing Stringer
S1
℄ Rte.-136
℄ Bridge
Remove & Discard Existing Channel
S2
Replace Existing Stringer
Existing Girder
9"±
G2
Cut Line for Existing Channel

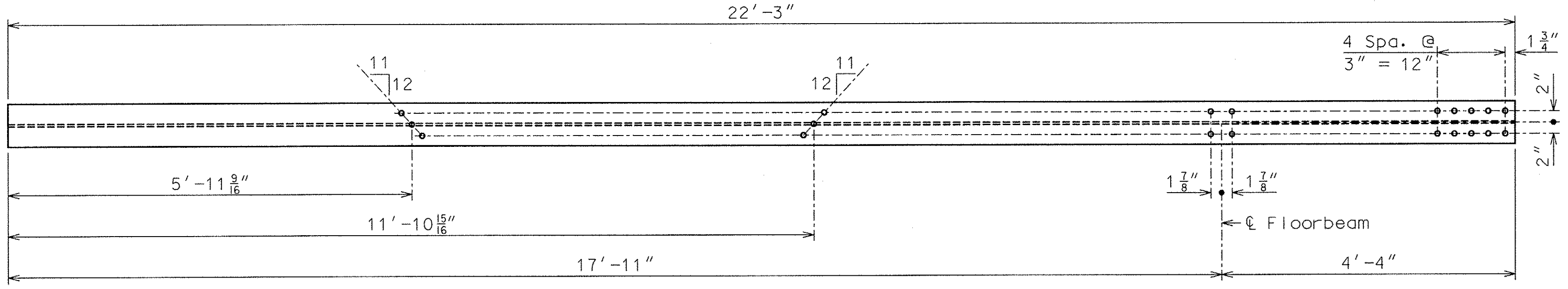
PLAN VIEW
(Repair B)



TOP VIEW


℄ Floorbeam at Pier No. 4
22'-3"
1/2"
4 3/4"
4 1/2"
2 3/4"
Replace Existing Stringer with W18x55
4 Spa. @ 3" = 12"
1 3/4"
Replace splice rivets with new 7/8"Ø A325 Bolts (Typ.)
Existing Stringer
3 Spa. @ 3" = 9" (Typ.)
2 1/4"
3"
Existing Lateral Bracing
Existing Floorbeam
Re-use Existing Stringer Splice Plates

ELEVATION VIEW



BOTTOM VIEW

REPAIR B (NEW STRINGER S2)

Notes:

Repair B shall be completed during a weekend closure.

Timber falsework shown on Sheet No. 4 shall be reinstalled before the lane is reopened to traffic.

All new structural steel shall be ASTM A709 Grade 36.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes unless noted otherwise. If contractor encounters interference in fit up, the holes may be reamed to 1 1/16" for a 1" Ø bolt.

All equipment, labor and materials necessary to complete Repair A shall be considered completely covered by the contract unit price for Structural Steel Repair A per each.

All equipment, labor and materials necessary to complete Repair B shall be considered completely covered by the contract unit price for Structural Steel Repair B per each.

REPAIR A & B DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 18 of 57

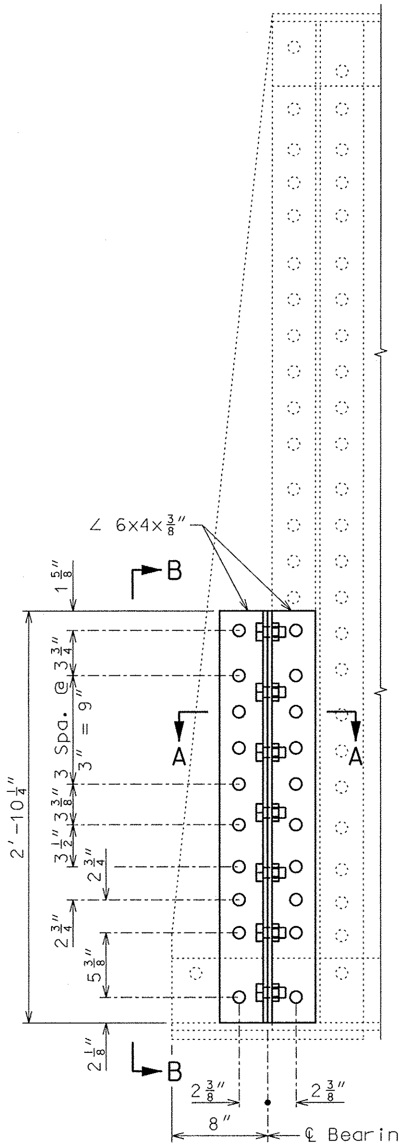
CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	18
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

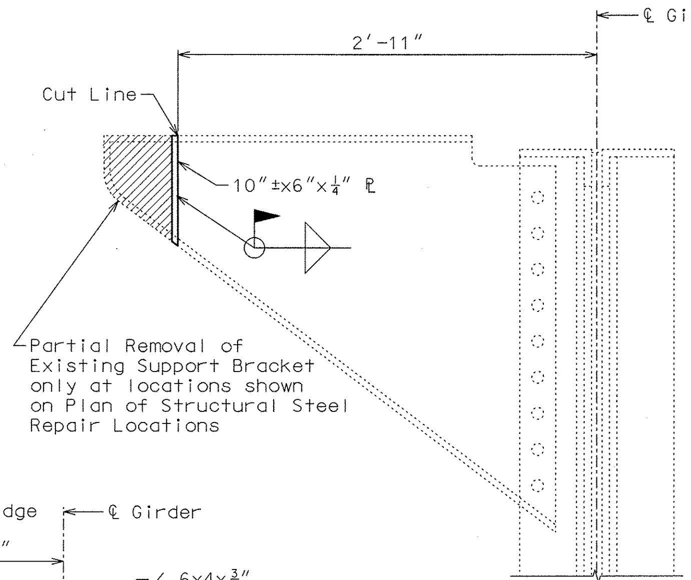
DATE	DESCRIPTION

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

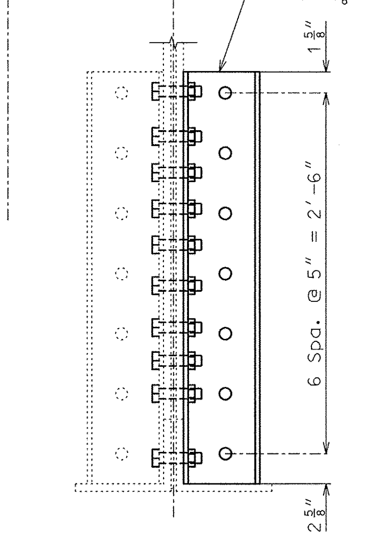
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



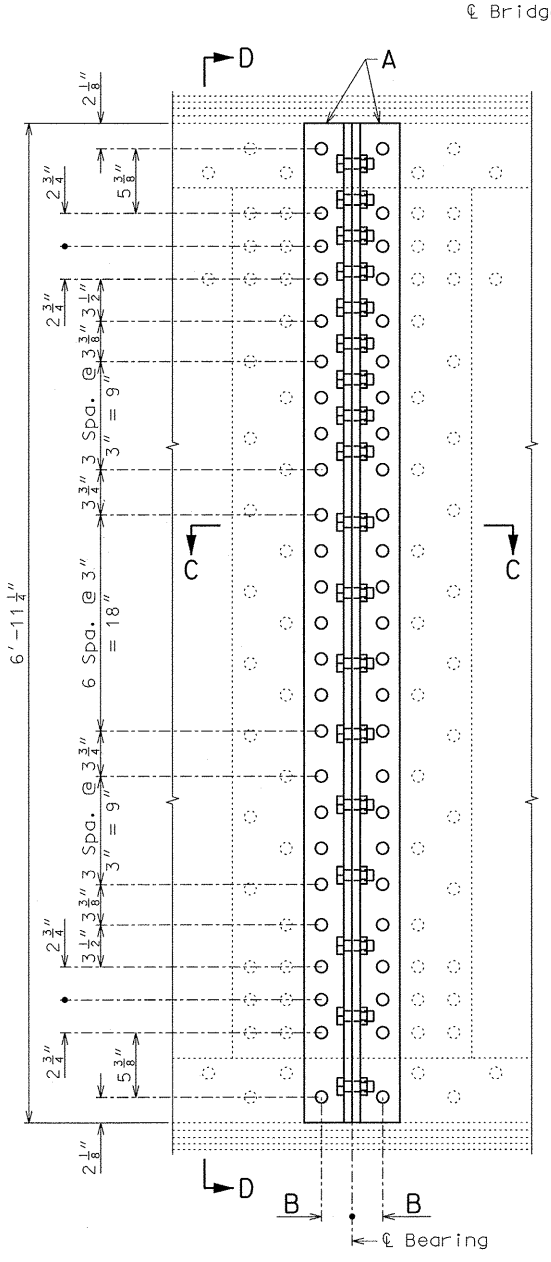
REPAIR C


℄ Girder
2'-11"
Cut Line
10"±x6"x1/4" ℄
Partial Removal of Existing Support Bracket only at locations shown on Plan of Structural Steel Repair Locations

SUPPORT BRACKET MODIFICATION DETAIL

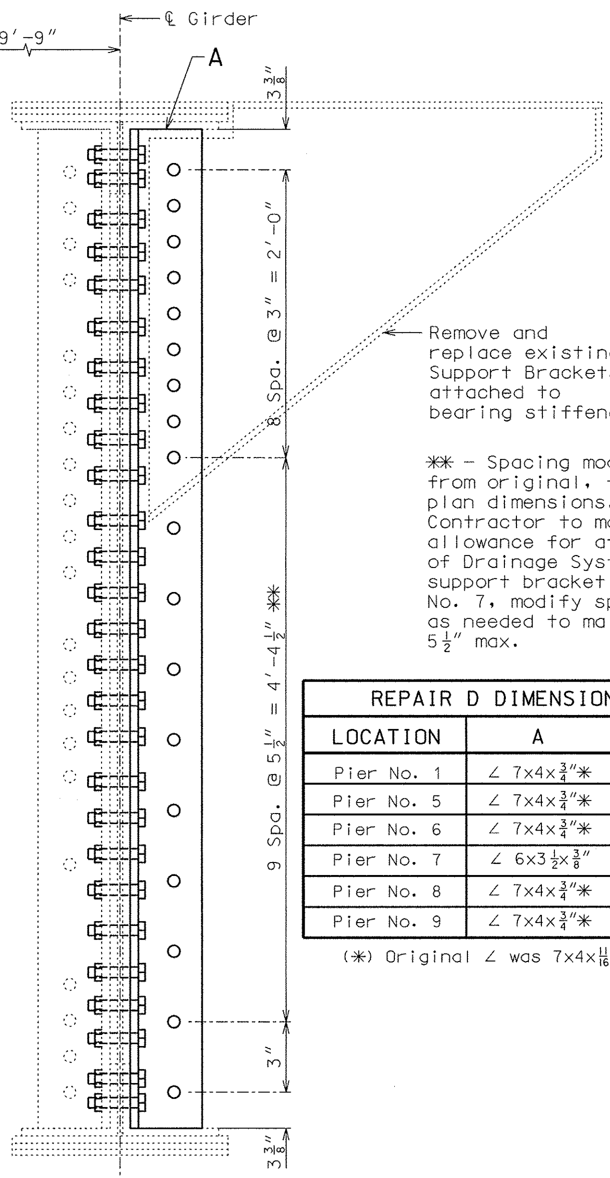


VIEW B-B



REPAIR D

(Support Bracket not shown for clarity)



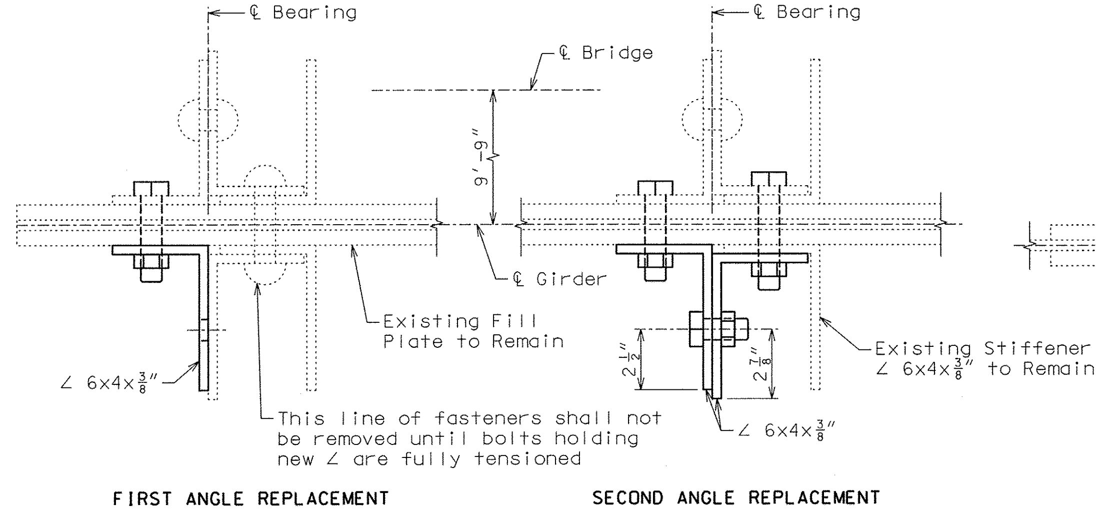
Remove and replace existing Support Brackets attached to bearing stiffeners

✱✱ - Spacing modified from original, follow plan dimensions. Contractor to make allowance for attachment of Drainage System support bracket at Pier No. 7, modify spacing as needed to maintain 5 1/2" max.

REPAIR D DIMENSIONS		
LOCATION	A	B
Pier No. 1	∠ 7x4x3/4"✱	2 9/16"
Pier No. 5	∠ 7x4x3/4"✱	2 9/16"
Pier No. 6	∠ 7x4x3/4"✱	2 9/16"
Pier No. 7	∠ 6x3 1/2x3/8"	2"
Pier No. 8	∠ 7x4x3/4"✱	2 9/16"
Pier No. 9	∠ 7x4x3/4"✱	2 9/16"

(✱) Original ∠ was 7x4x11/16"

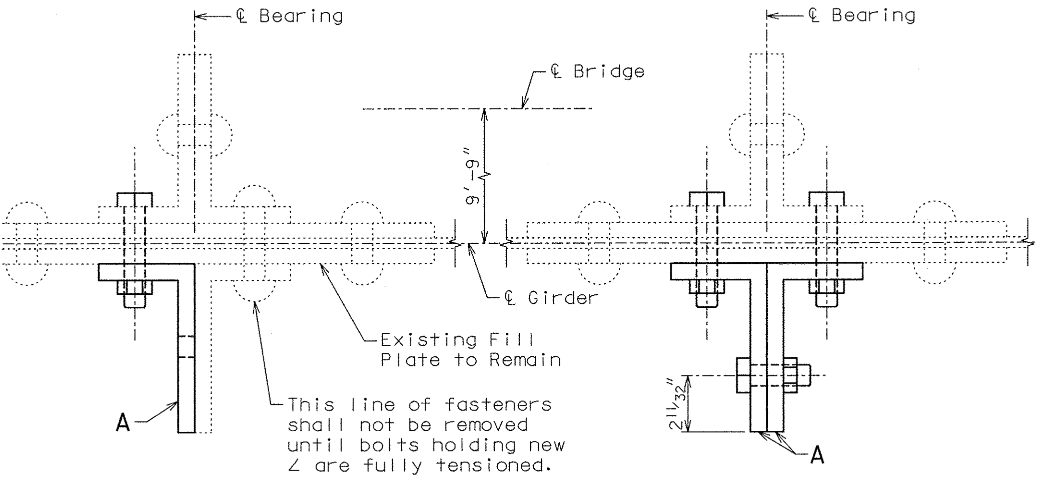
SECTION D-D


℄ Bearing
℄ Bridge
9'-9"
℄ Girder
Existing Fill Plate to Remain
∠ 6x4x3/8"
This line of fasteners shall not be removed until bolts holding new ∠ are fully tensioned
℄ Bearing
2 1/2"
2 7/8"
Existing Stiffener ∠ 6x4x3/8" to Remain
∠ 6x4x3/8"

FIRST ANGLE REPLACEMENT

SECOND ANGLE REPLACEMENT

SECTION A-A


℄ Bearing
℄ Bridge
9'-9"
℄ Girder
Existing Fill Plate to Remain
A
This line of fasteners shall not be removed until bolts holding new ∠ are fully tensioned.
℄ Bearing
2 11/32"
A

FIRST ANGLE REPLACEMENT

SECOND ANGLE REPLACEMENT

SECTION C-C

REPAIR C & D DETAILS

Notes:

Repairs C & D shall be completed when traffic is limited to the opposite side of the structure.

All new structural steel shall be ASTM A709 Grade 36.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 1"Ø holes unless noted otherwise. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt.

All equipment, labor and materials necessary to complete Repair C shall be considered completely covered by the contract unit price for Structural Steel Repair C per each.

All equipment, labor and materials necessary to complete Repair D shall be considered completely covered by the contract unit price for Structural Steel Repair D per each.

Detailed April 2009
Checked April 2009

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

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	19
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DATE
DESCRIPTION

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

MoDOT

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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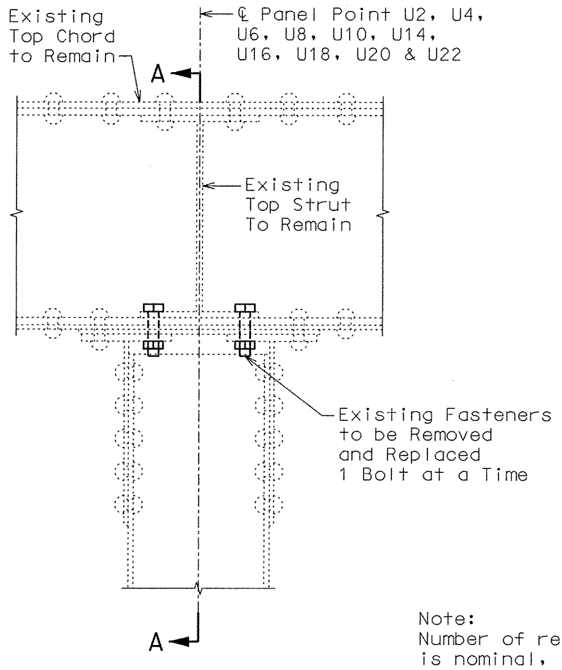
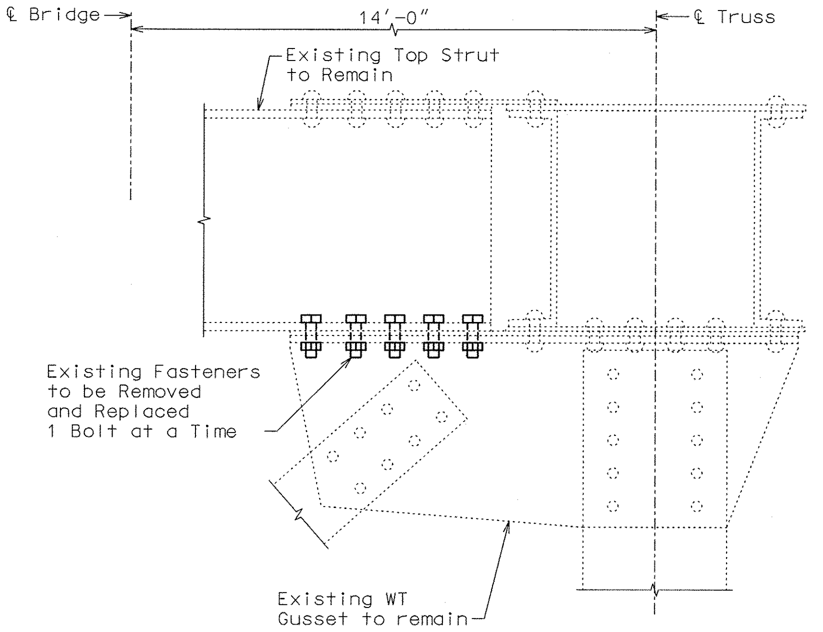
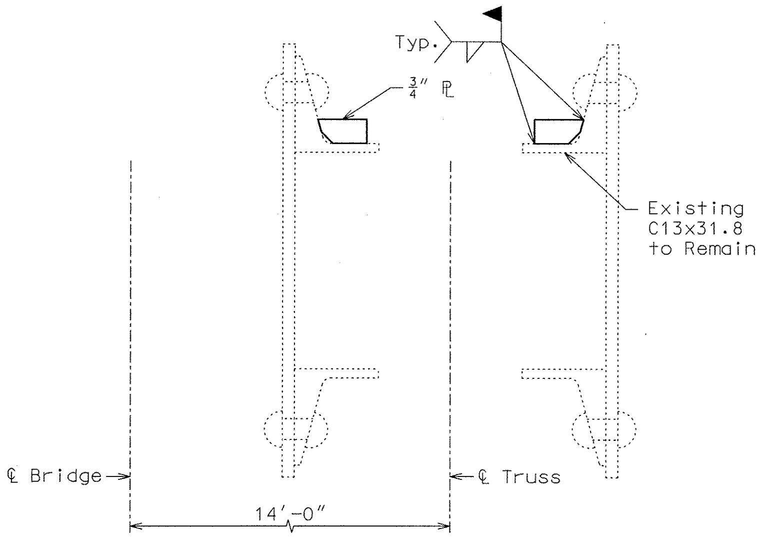

Existing Top Chord to Remain
℄ Panel Point U2, U4, U6, U8, U10, U14, U16, U18, U20 & U22
A
Existing Top Strut To Remain
Existing Fasteners to be Removed and Replaced 1 Bolt at a Time
A

REPAIR E

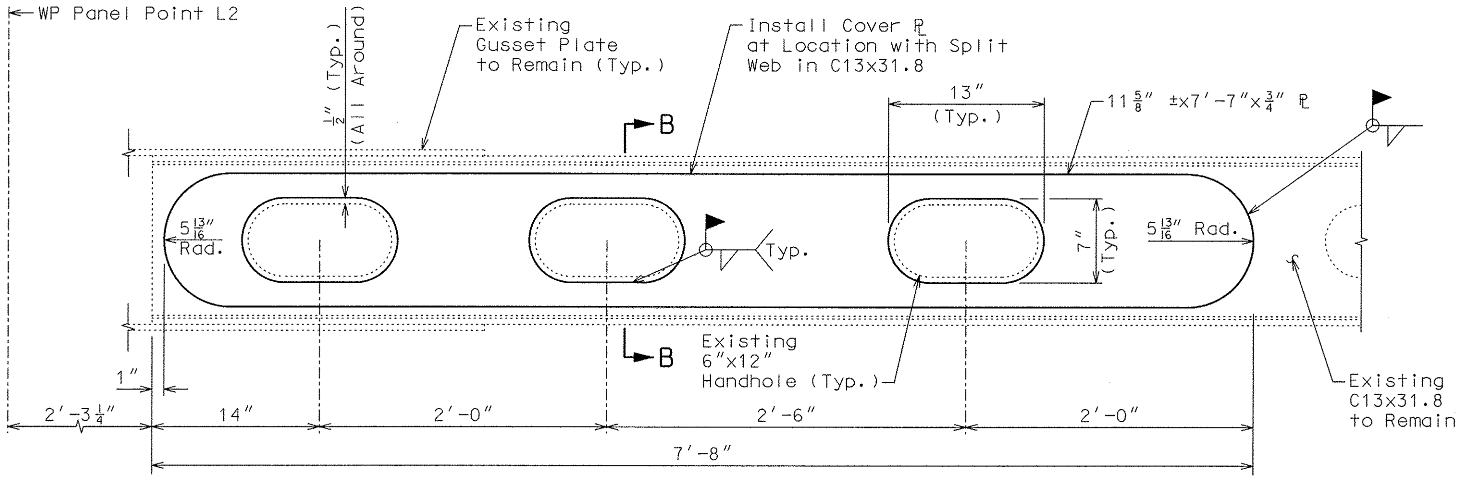

℄ Bridge
14′-0″
℄ Truss
Existing Top Strut to Remain
Existing Fasteners to be Removed and Replaced 1 Bolt at a Time
Existing WT Gusset to remain

Note:
Number of replacement bolts shown is nominal, some repair locations have fewer bolts, replace all bolts at each noted repair location.

SECTION A-A



SECTION B-B


WP Panel Point L2
½″ (Typ.) (All Around)
Existing Gusset Plate to Remain (Typ.)
Install Cover ℙ at Location with Split Web in C13x31.8
B
B
13″ (Typ.)
11⅝″ ±x7′-7″x¾″ ℙ
5 13/16″ Rad.
5 13/16″ Rad.
Typ.
7″ (Typ.)
Existing 6″x12″ Handhole (Typ.)
Existing C13x31.8 to Remain
1″
2′-3¼″
14″
2′-0″
2′-6″
2′-0″
7′-8″

REPAIR F

Notes:

New Structural Steel for Repair F shall be ASTM A709 Grade 50.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8″Ø Grade A325 high-strength bolts in 15/16″Ø holes. If the Contractor encounters interferences in fit-up, the holes may be reamed to 1 1/16″Ø for a 1″Ø bolt.

All equipment, labor and materials necessary to complete Repair E shall be considered completely covered by the contract unit price for Structural Steel Repair E per each.

All equipment, labor and materials necessary to complete Repair F shall be considered completely covered by the contract unit price for Structural Steel Repair F per each.

REPAIR E & F DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 20 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 20
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DESCRIPTION	DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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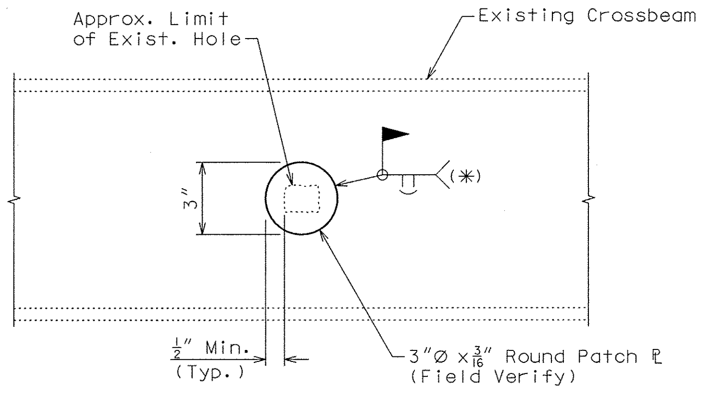
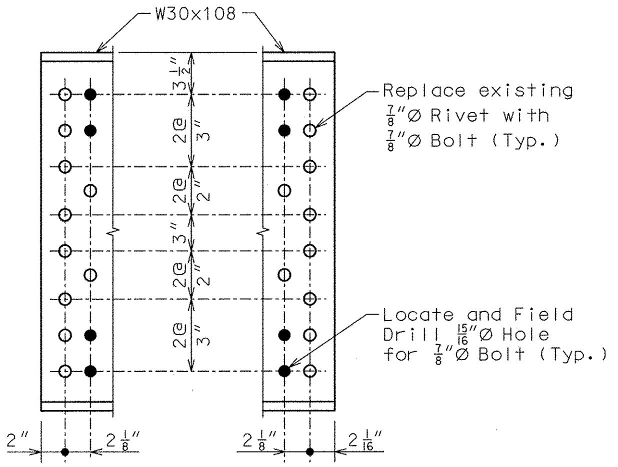
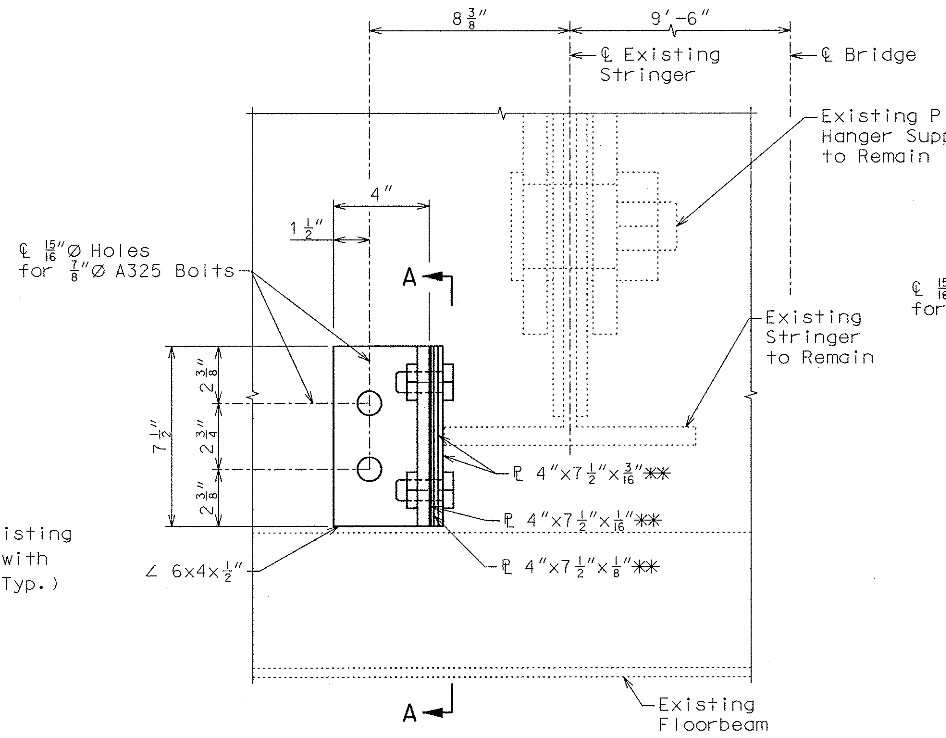

Approx. Limit of Exist. Hole
Existing Crossbeam
3"
(*)
1/2" Min. (Typ.)
3"Ø x 3/16" Round Patch ℄ (Field Verify)

REPAIR G

* - Cut web of existing crossbeam to accept round patch plate.

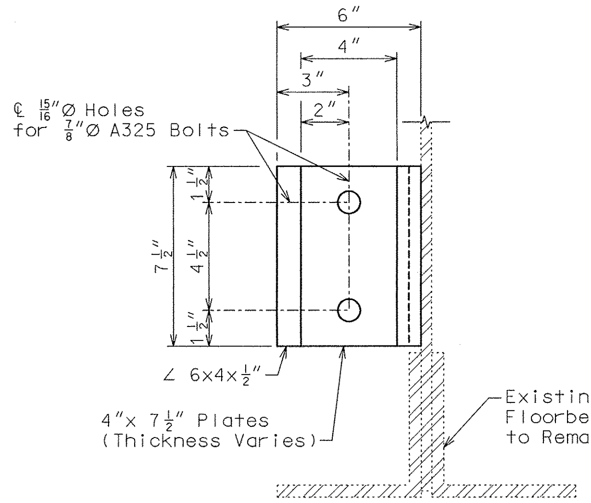

W30x108
Replace existing 7/8"Ø Rivet with 7/8"Ø Bolt (Typ.)
3 1/2"
2@ 3"
2@ 2"
3"
2@ 2"
2@ 3"
Locate and Field Drill 15/16"Ø Hole for 7/8"Ø Bolt (Typ.)
2"
2 1/8"
2 1/8"
2 1/16"

DETAIL "A" DETAIL "B"

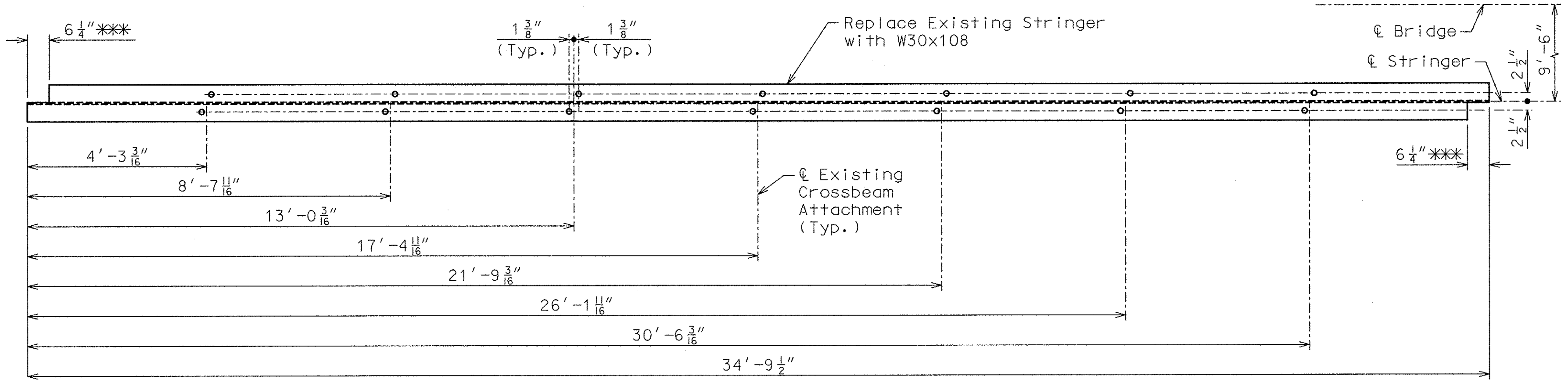


REPAIR J

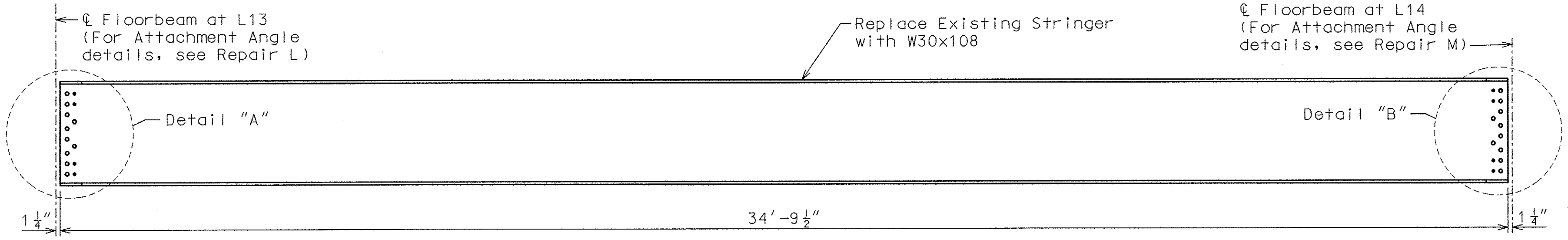
** - Place Shim Plates as needed to maintain 1/16" clearance from Shim Plate to Flange of Existing Stringer.


6"
4"
3"
2"
℄ 15/16"Ø Holes for 7/8"Ø A325 Bolts
7 1/2"
1 1/2"
4 1/2"
1 1/2"
∠ 6x4x1/2"
4"x 7 1/2" Plates (Thickness Varies)
Existing Floorbeam to Remain

SECTION A-A



PLAN OF TOP FLANGE


℄ Floorbeam at L13 (For Attachment Angle details, see Repair L)
Replace Existing Stringer with W30x108
℄ Floorbeam at L14 (For Attachment Angle details, see Repair M)
Detail "A"
Detail "B"
1 1/4"
34'-9 1/2"
1 1/4"

ELEVATION

Note:
Contractor to support existing crossbeams during stringer replacement.
*** Cope Top & Bottom Flanges.

REPAIR H

Notes:

Repair H shall be completed when traffic is limited to the opposite side of the structure.

New Structural Steel for Repairs G, H & J shall be ASTM A709 Grade 36.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt.

All equipment, labor and materials necessary to complete Repair G shall be considered completely covered by the contract unit price for Structural Steel Repair G per each.

All equipment, labor and materials necessary to complete Repair H shall be considered completely covered by the contract unit price for Structural Steel Repair H per each.

All equipment, labor and materials necessary to complete Repair J shall be considered completely covered by the contract unit price for Structural Steel Repair J per each.

REPAIR G, H & J DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 21 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	21
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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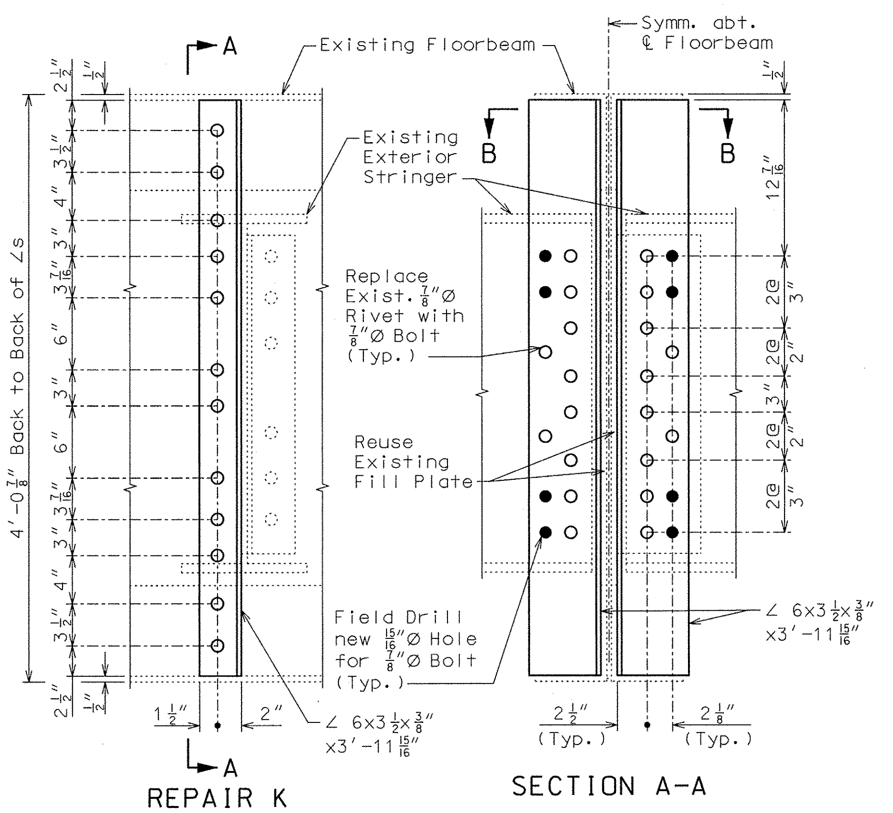
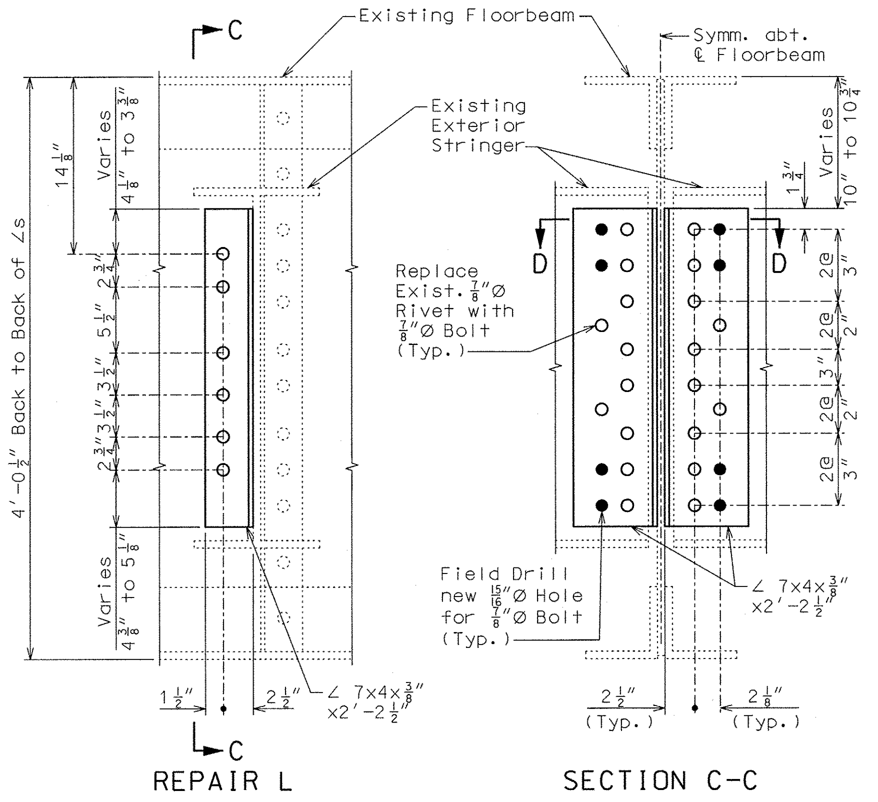
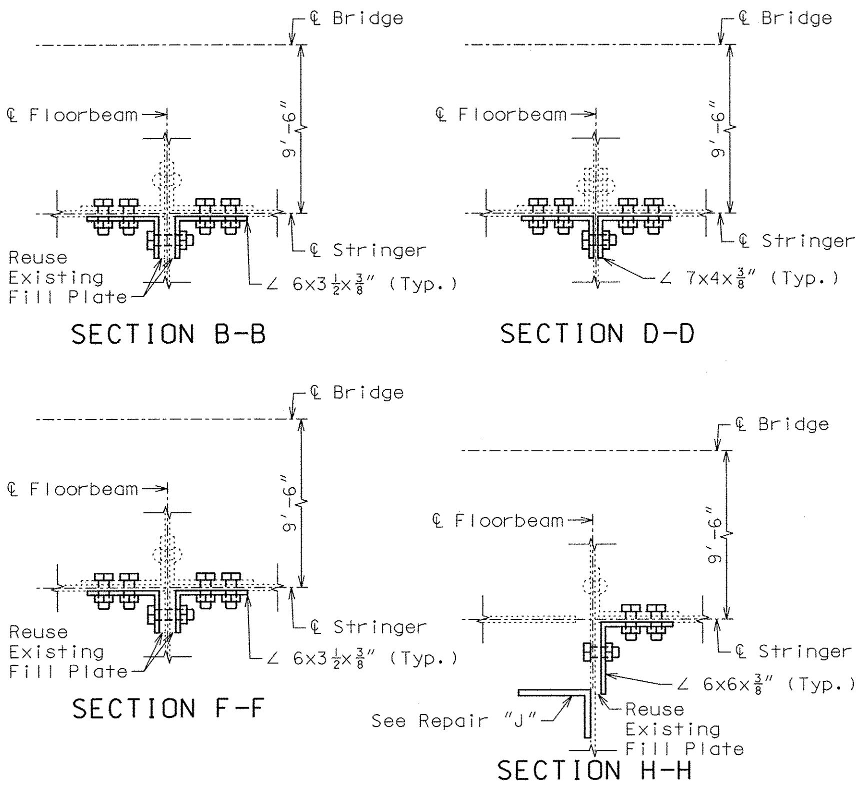

Existing Floorbeam
Symm. abt. ℄ Floorbeam
Existing Exterior Stringer
Replace Exist. 7/8"Ø Rivet with 7/8"Ø Bolt (Typ.)
Reuse Existing Fill Plate
Field Drill new 15/16"Ø Hole for 7/8"Ø Bolt (Typ.)
∠ 6x3½x3/8" x3'-11 15/16"
4'-0⅛" Back to Back of ∠s
1½"
2"
2½" (Typ.)
2⅛" (Typ.)
A
B
REPAIR K

SECTION A-A


Existing Floorbeam
Symm. abt. ℄ Floorbeam
Existing Exterior Stringer
Replace Exist. 7/8"Ø Rivet with 7/8"Ø Bolt (Typ.)
Field Drill new 15/16"Ø Hole for 7/8"Ø Bolt (Typ.)
∠ 7x4x3/8" x2'-2½"
4'-0½" Back to Back of ∠s
Varies 4⅛" to 3⅜"
Varies 4⅜" to 5⅛"
Varies 10" to 10¾"
1½"
2½"
2½" (Typ.)
2⅛" (Typ.)
C
D
REPAIR L

SECTION C-C

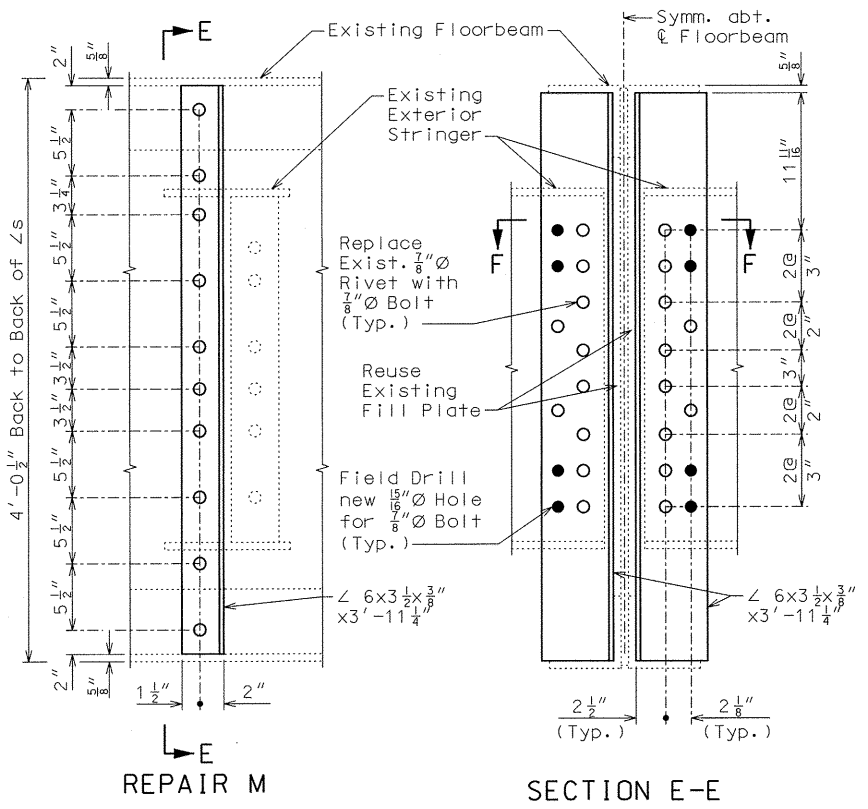


SECTION B-B

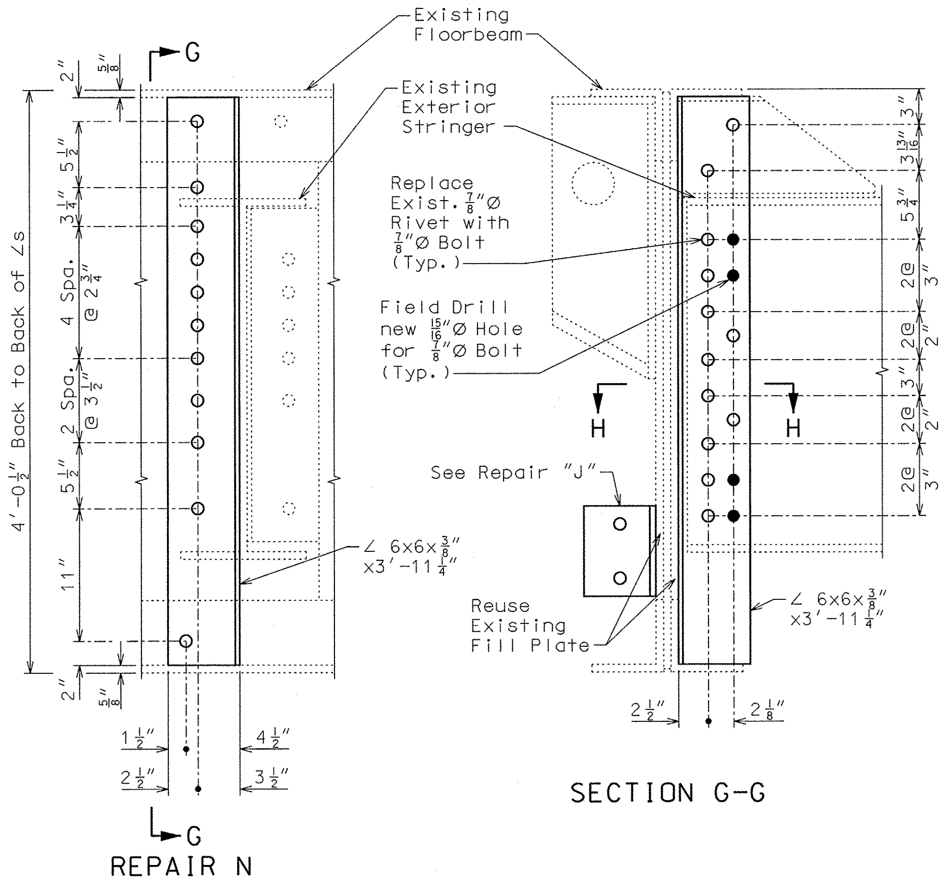
SECTION D-D

SECTION F-F

SECTION H-H


Existing Floorbeam
Symm. abt. ℄ Floorbeam
Existing Exterior Stringer
Replace Exist. 7/8"Ø Rivet with 7/8"Ø Bolt (Typ.)
Reuse Existing Fill Plate
Field Drill new 15/16"Ø Hole for 7/8"Ø Bolt (Typ.)
∠ 6x3½x3/8" x3'-11¼"
4'-0½" Back to Back of ∠s
1½"
2"
2½" (Typ.)
2⅛" (Typ.)
E
F
REPAIR M

SECTION E-E


Existing Floorbeam
Existing Exterior Stringer
Replace Exist. 7/8"Ø Rivet with 7/8"Ø Bolt (Typ.)
Field Drill new 15/16"Ø Hole for 7/8"Ø Bolt (Typ.)
See Repair "J"
Reuse Existing Fill Plate
∠ 6x6x3/8" x3'-11¼"
4'-0½" Back to Back of ∠s
4 Spa. @ 2¾"
2 Spa. @ 3½"
1½"
2½"
4½"
3½"
2½"
2⅛"
G
H
REPAIR N

SECTION G-G

REPAIR K, L, M & N DETAILS

Notes:

Repairs K, L, M and N shall be completed when traffic is limited to the opposite side of the structure.

The Contractor shall be responsible for providing temporary support of the existing stringers and connected crossbeams during replacement of the Stringer-to-Floorbeam connection angles.

New Structural Steel shall be ASTM A709 Grade 36.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interferences in fit-up, the holes may be reamed to 1 1/16"Ø for a 1"Ø bolt.

All equipment, labor and materials necessary to complete Repair K shall be considered completely covered by the contract unit price for Structural Steel Repair K per each.

All equipment, labor and materials necessary to complete Repair L shall be considered completely covered by the contract unit price for Structural Steel Repair L per each.

All equipment, labor and materials necessary to complete Repair M shall be considered completely covered by the contract unit price for Structural Steel Repair M per each.

All equipment, labor and materials necessary to complete Repair N shall be considered completely covered by the contract unit price for Structural Steel Repair N per each.

Detailed April 2009
Checked April 2009

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

Sheet No. 22 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

Cory Imhoff

DATE PREPARED	5-21-09
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 22
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DESCRIPTION

DATE

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

MoDOT

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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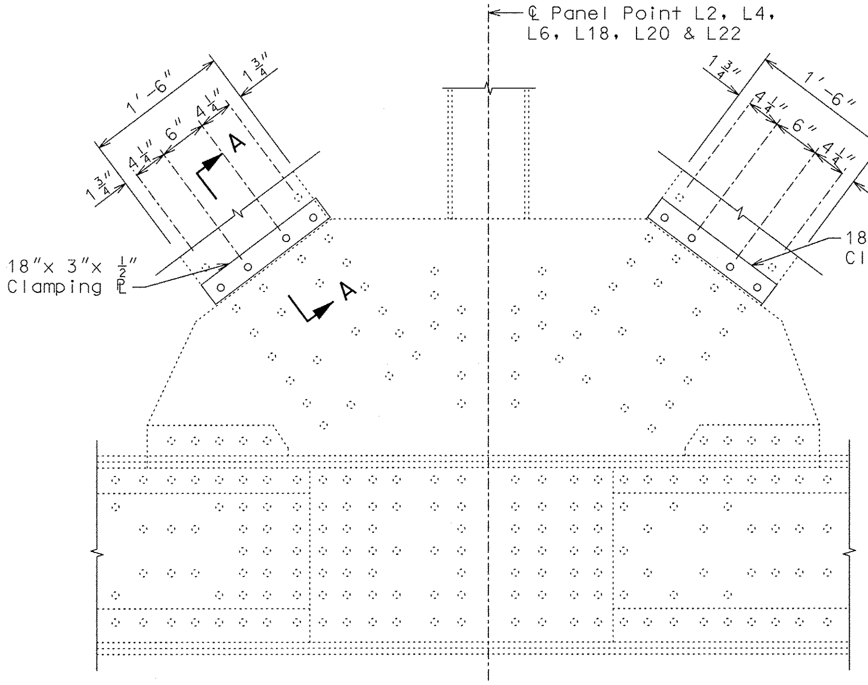
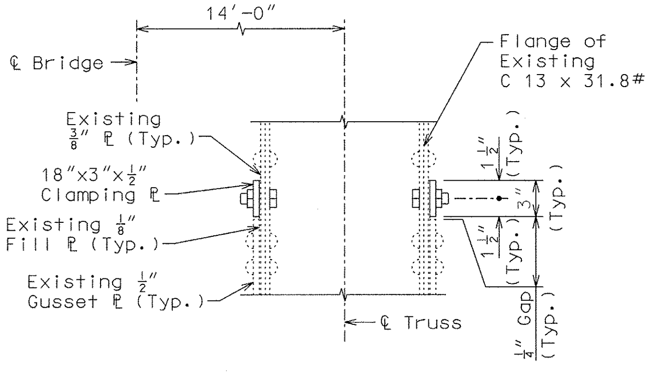
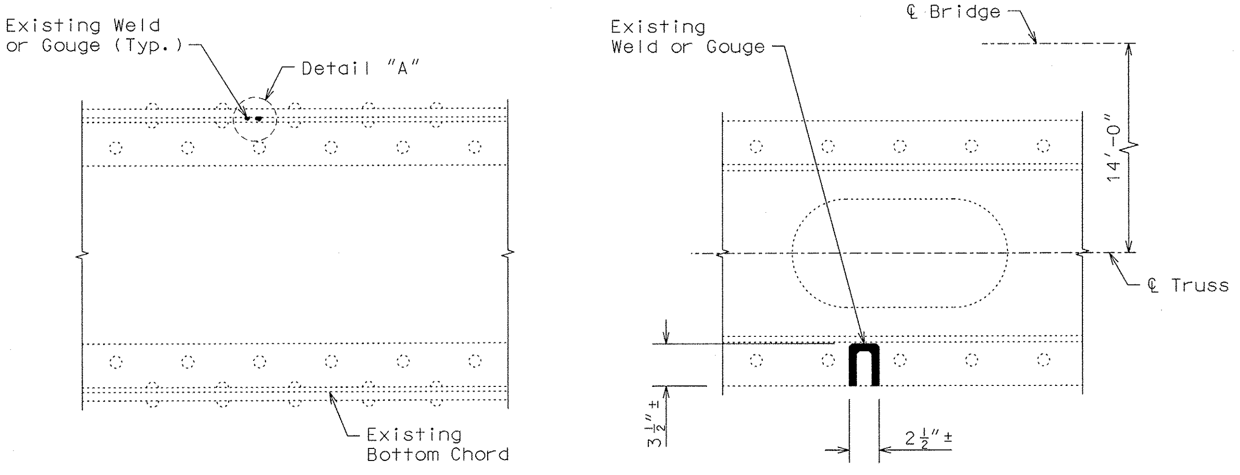


REPAIR P

(Location L4 shown, others similar)



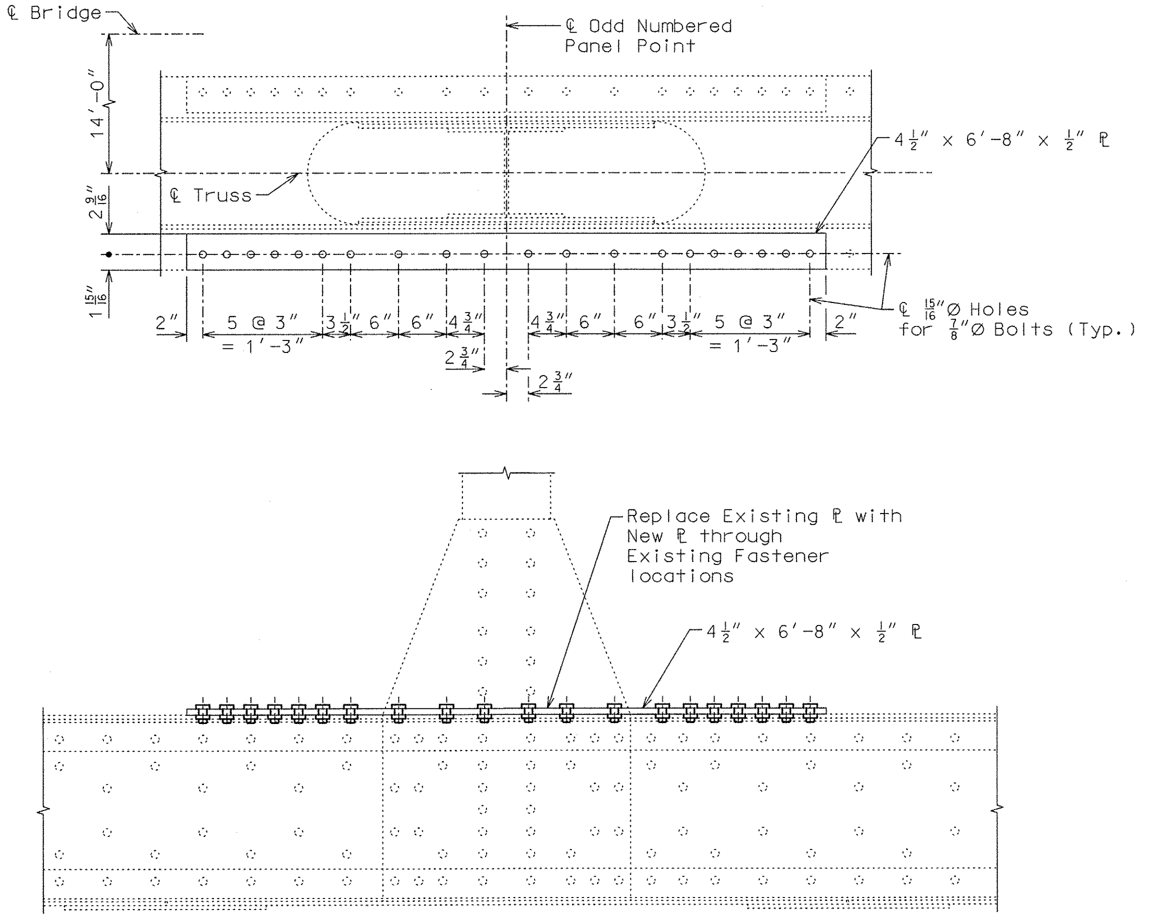
SECTION A-A



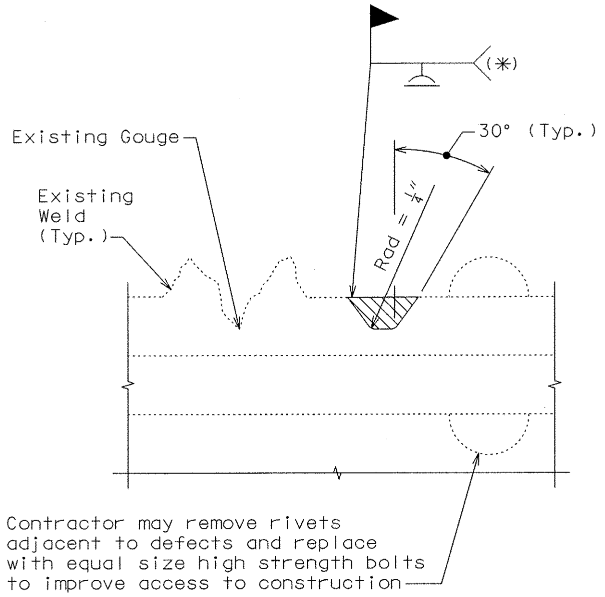
ELEVATION

PLAN

REPAIR R



REPAIR Q



Contractor may remove rivets adjacent to defects and replace with equal size high strength bolts to improve access to construction

DETAIL "A"

* = Prepare existing defect as shown, fill with weld and grind smooth.

Notes:

New Structural Steel for Repairs P and Q shall be ASTM A709 Grade 50.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interferences in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt.

All equipment, labor and materials necessary to complete Repair P shall be considered completely covered by the contract unit price for Structural Steel Repair P per each.

All equipment, labor and materials necessary to complete Repair Q shall be considered completely covered by the contract unit price for Structural Steel Repair Q per each.

All equipment, labor and materials necessary to complete Repair R shall be considered completely covered by the contract unit price for Structural Steel Repair R per each.

REPAIR P,Q & R DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 23 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	23
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

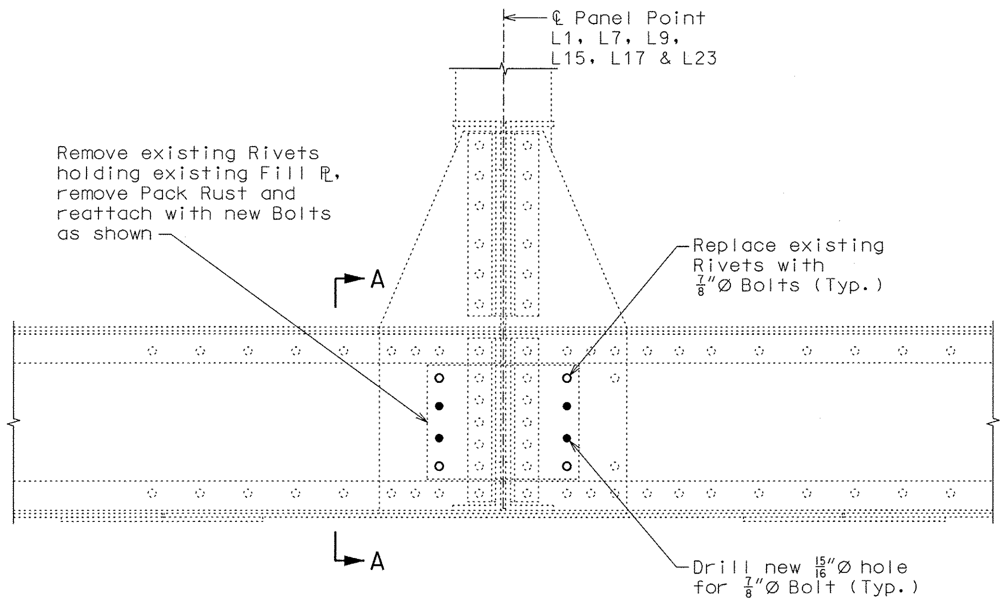
DESCRIPTION

DATE

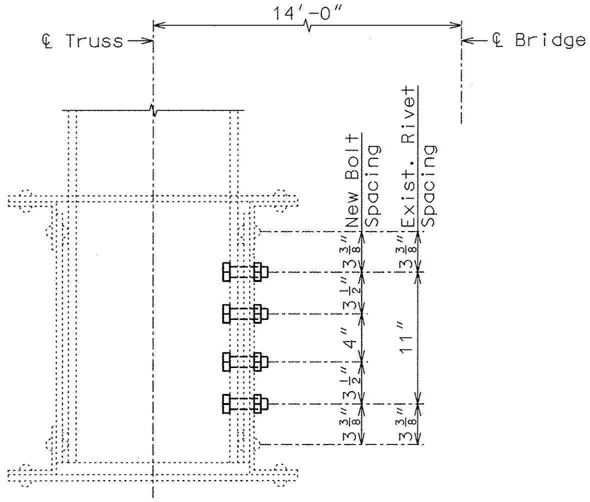
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

MoDOT

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

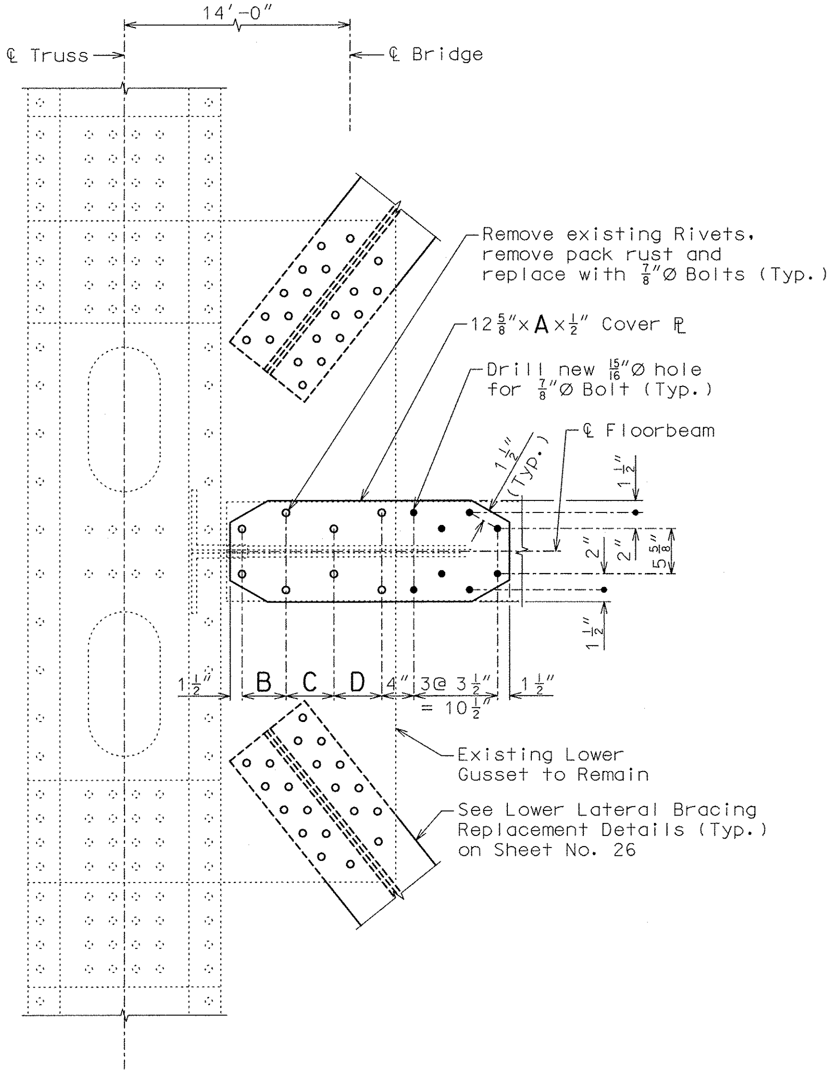


REPAIR T

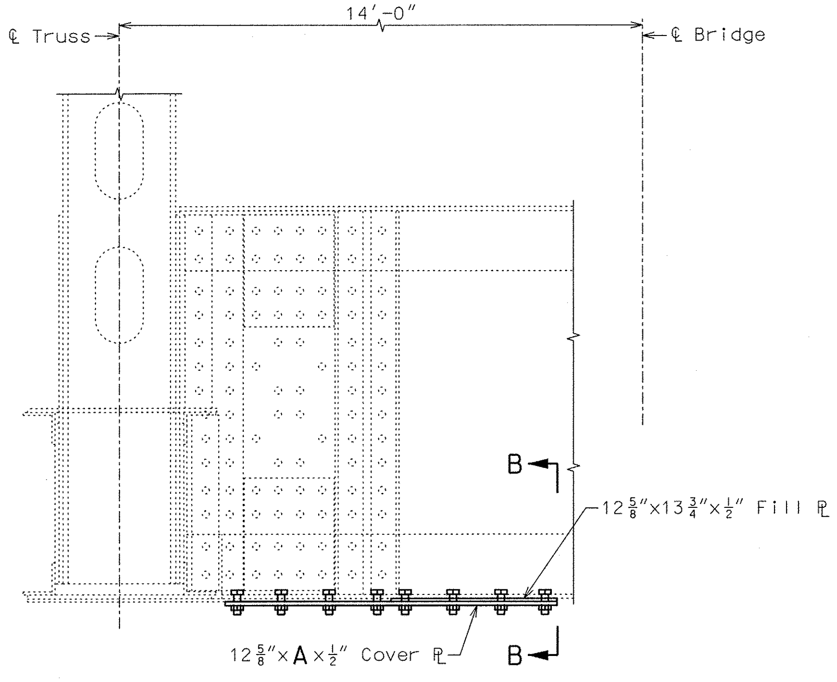


SECTION A-A
(Floorbeam Connection
not shown for clarity)

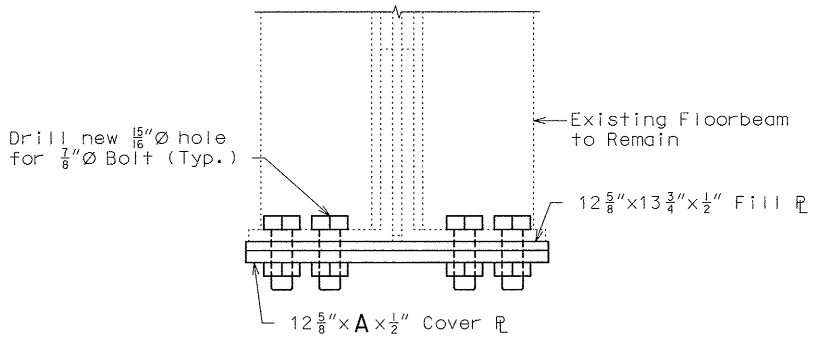
REPAIR S DIMENSIONS				
LOCATION	A	B	C	D
L1, L23	3'-6"	5½"	6"	6"
L2, L22	3'-3"	5"	5"	4½"
L3, L21	3'-3"	5"	5"	4½"
L4, L20	3'-3"	5"	5"	4½"
L5, L19	3'-3"	5"	5"	4½"
L6, L18	3'-3"	5"	5"	4½"
L7, L17	3'-6"	5½"	6"	6"
L8, L16	3'-6"	5½"	6"	6"
L9, L15	3'-6"	5½"	6"	6"
L10, L14	3'-6"	5½"	6"	6"
L11, L13	3'-2"	4½"	4½"	4½"



PLAN BOTTOM FLANGE REPAIR S
(View From Below Truss)



ELEVATION REPAIR S



SECTION B-B

Notes:

New Structural Steel for Repair S shall be ASTM A709 Grade 36.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interferences in fit-up, the holes may be reamed to 1 1/16"Ø for a 1"Ø bolt.

All equipment, labor and materials necessary to complete Repair S shall be considered completely covered by the contract unit price for Structural Steel Repair S per each.

All equipment, labor and materials necessary to complete Repair T shall be considered completely covered by the contract unit price for Structural Steel Repair T per each.

REPAIR S & T DETAILS

Detailed April 2009
Checked April 2009

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

STATE OF MISSOURI
CORY MICHAEL IMHOFF
NUMBER PE-2002016669
PROFESSIONAL ENGINEER
Cory Imhoff

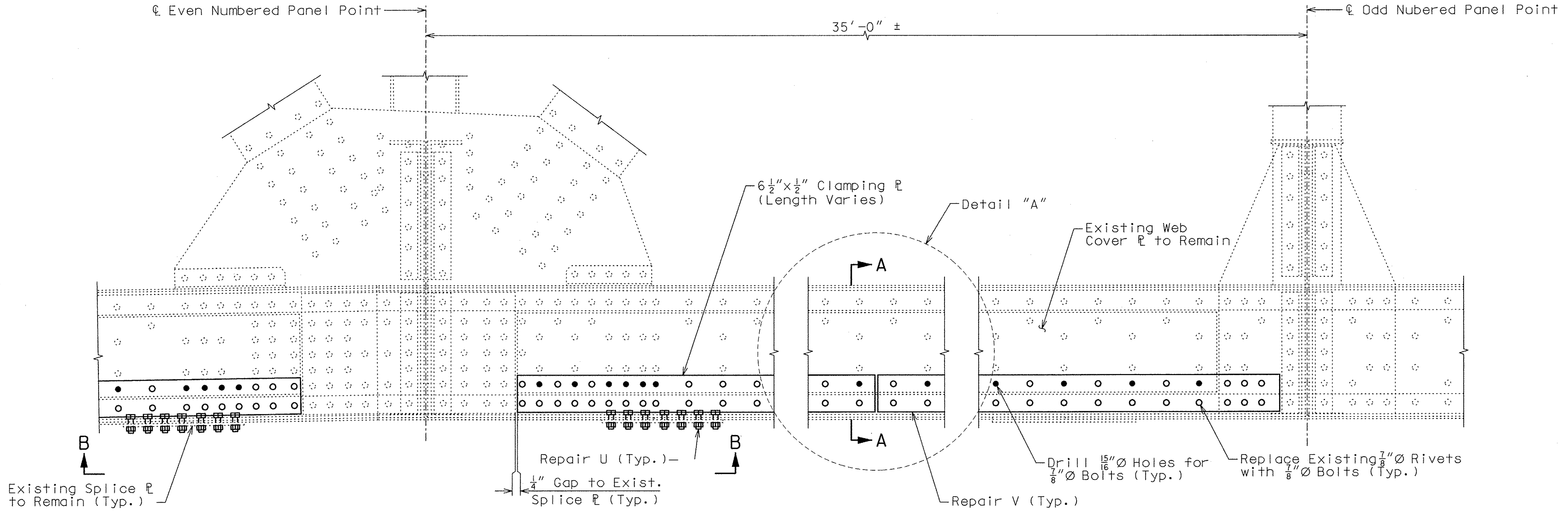
DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 24
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DATE
DESCRIPTION

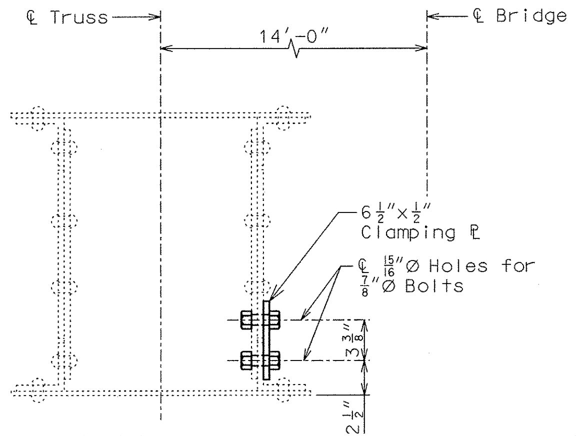
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

MoDOT

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

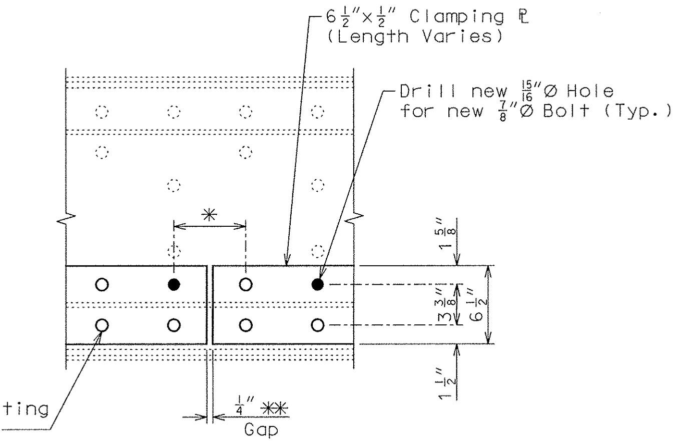

℄ Even Numbered Panel Point
35'-0" ±
℄ Odd Nubered Panel Point
$6\frac{1}{2}''\times\frac{1}{2}''$ Clamping ℄
(Length Varies)
Detail "A"
Existing Web Cover ℄ to Remain
A
A
B
B
Existing Splice ℄ to Remain (Typ.)
Repair U (Typ.)
$\frac{1}{4}''$ Gap to Exist. Splice ℄ (Typ.)
Drill $\frac{15}{16}''$Ø Holes for $\frac{7}{8}''$Ø Bolts (Typ.)
Replace Existing $\frac{7}{8}''$Ø Rivets with $\frac{7}{8}''$Ø Bolts (Typ.)
Repair V (Typ.)

ELEVATION OF REPAIRS U & V


℄ Truss
℄ Bridge
14'-0"
$6\frac{1}{2}''\times\frac{1}{2}''$ Clamping ℄
℄ $\frac{15}{16}''$Ø Holes for $\frac{7}{8}''$Ø Bolts
$3\frac{3}{8}''$
$2\frac{1}{2}''$

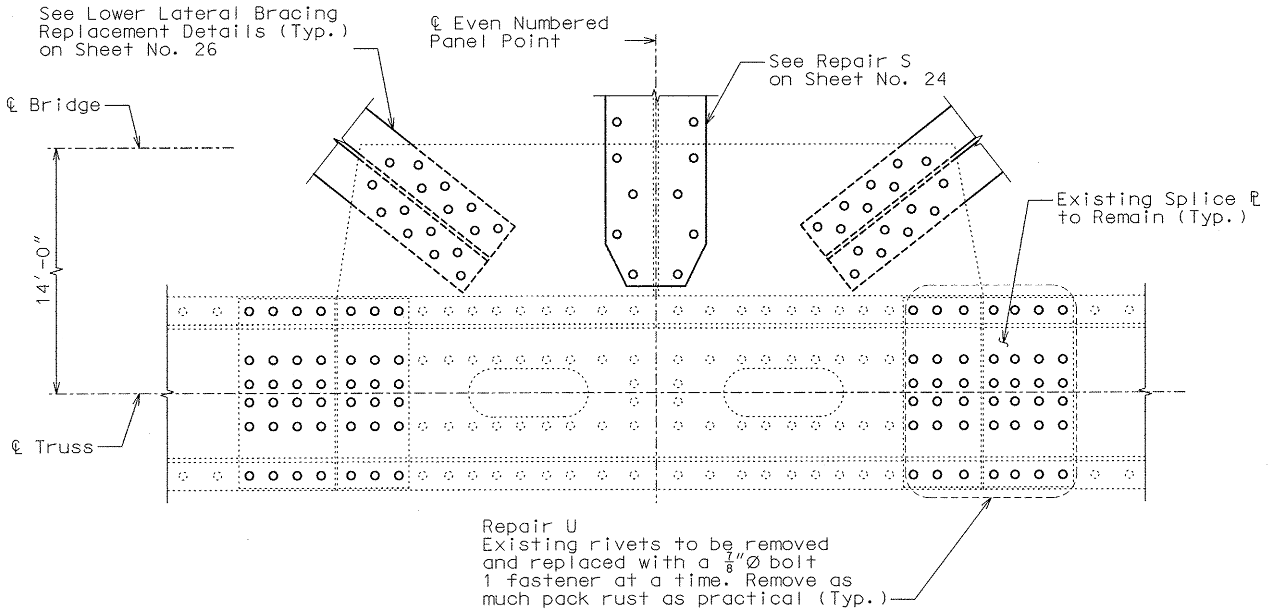
SECTION A-A

✱ - Spacing varies, 6" Max. Match existing condition except where existing fastener spacing exceeds 6", drill a 15/16"Ø Hole for a 7/8"Ø Bolt.


$6\frac{1}{2}''\times\frac{1}{2}''$ Clamping ℄
(Length Varies)
Drill new $\frac{15}{16}''$Ø Hole for new $\frac{7}{8}''$Ø Bolt (Typ.)
✱
$1\frac{5}{8}''$
$3\frac{3}{8}''$
$6\frac{1}{2}''$
$1\frac{1}{2}''$
$\frac{1}{4}''$ ✱✱
Gap
Replace existing rivet (Typ.)

DETAIL "A"

✱✱ - The Contractor shall break the clamping plate near the mid-point of each Truss bay.


See Lower Lateral Bracing Replacement Details (Typ.) on Sheet No. 26
℄ Even Numbered Panel Point
See Repair S on Sheet No. 24
℄ Bridge
14'-0"
℄ Truss
Existing Splice ℄ to Remain (Typ.)
Repair U
Existing rivets to be removed and replaced with a $\frac{7}{8}''$Ø bolt 1 fastener at a time. Remove as much pack rust as practical (Typ.)

VIEW B-B

Notes:

Repairs U & V shall be completed when traffic is limited to the opposite side of the structure and half of the slab is removed.

New Structural Steel for Repairs V shall be ASTM A709 Grade 50.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt.

Repair U shall consist of removing existing rivets in the splice plate and bottom flange of the lower chord, removing pack rust, coating existing steel with inorganic zinc primer and reassembling with 7/8"Ø A325 bolts.

All equipment, labor and materials necessary to complete Repair U shall be considered completely covered by the contract unit price for Structural Steel Repair U per each.

Repair V shall consist of removing existing rivets in the web cover plate and the bottom flange connection angles, removing pack rust, coating existing steel with inorganic zinc primer, placing new clamping plate, field drilling additional holes as needed and reassembling with 7/8"Ø A325 bolts.

The contractor shall only work on half of a truss bay in each span at a time. Rivets shall only be removed at the repair location being worked on, not in advance of the repair. All repairs must be completed and new bolts must be installed prior to leaving the work unattended.

All equipment, labor and materials necessary to complete Repair V shall be considered completely covered by the contract price for Structural Steel Repair V lump sum.

REPAIR U & V DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 25 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

Cory Imhoff

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 25
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

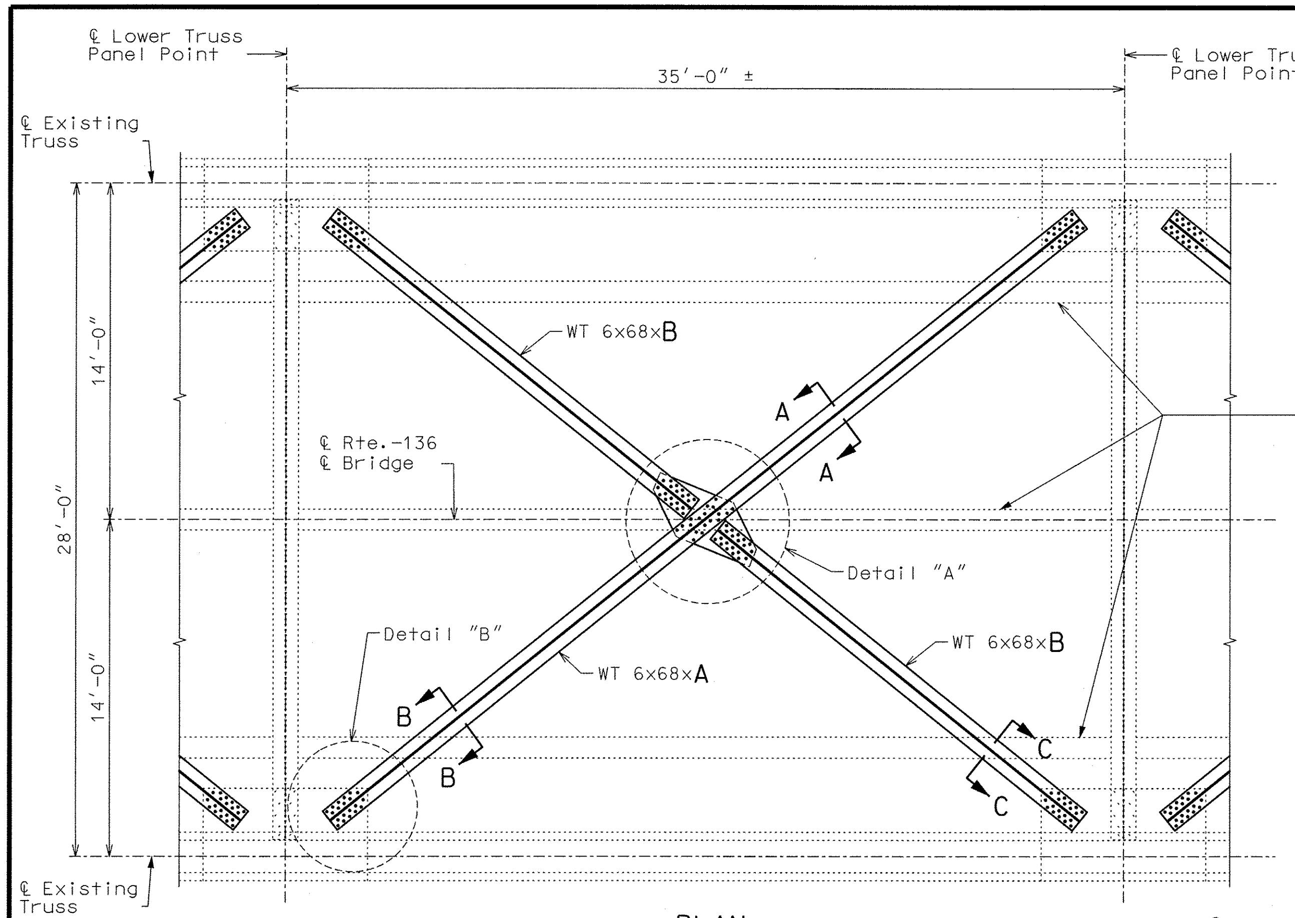
DATE

DESCRIPTION

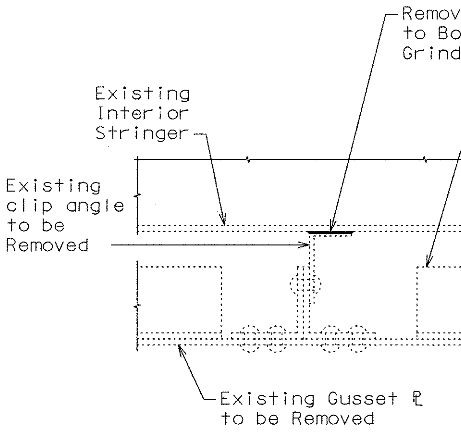
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

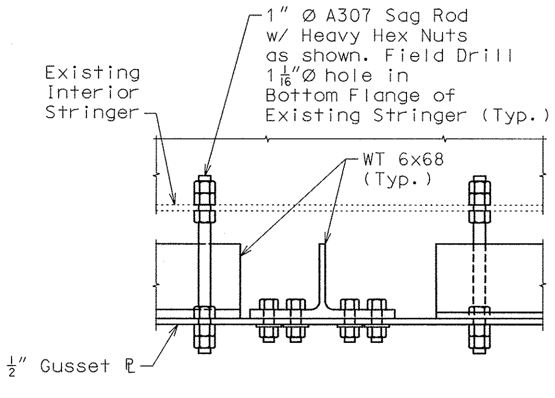
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



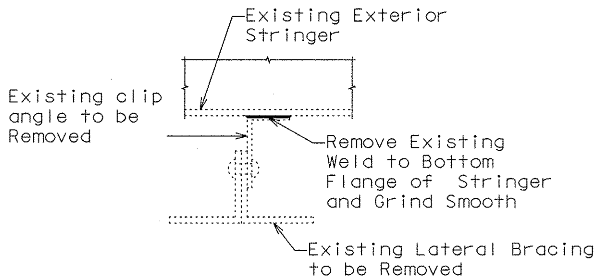
PLAN


Remove Existing Weld to Bottom of Stringer Grind Smooth
Existing Interior Stringer
Existing Lateral Bracing to be Removed (Typ.)
Existing clip angle to be Removed
Existing Gusset PL to be Removed

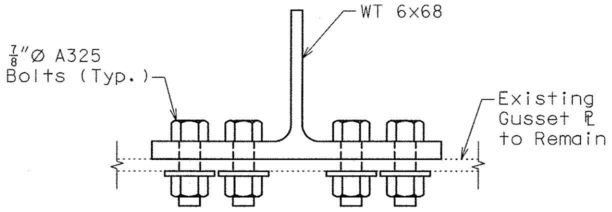
SECTION A-A
(Existing Condition)


Existing Interior Stringer
1" Ø A307 Sag Rod w/ Heavy Hex Nuts as shown. Field Drill $1\frac{1}{16}$"Ø hole in Bottom Flange of Existing Stringer (Typ.)
WT 6x68 (Typ.)
½" Gusset PL

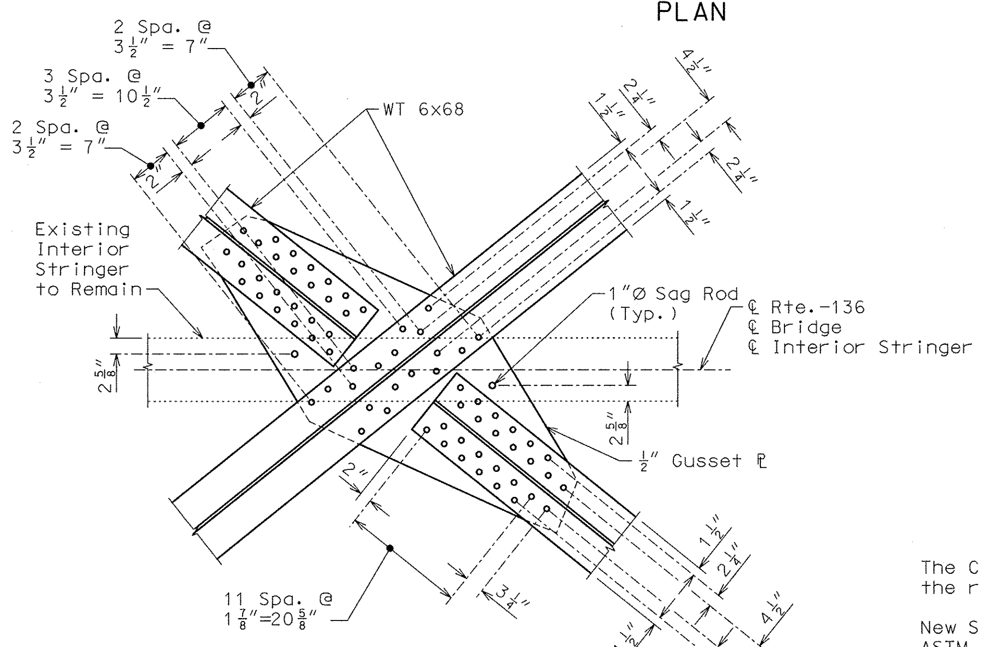
SECTION A-A
(Modified Condition)


Existing Exterior Stringer
Existing clip angle to be Removed
Remove Existing Weld to Bottom Flange of Stringer and Grind Smooth
Existing Lateral Bracing to be Removed

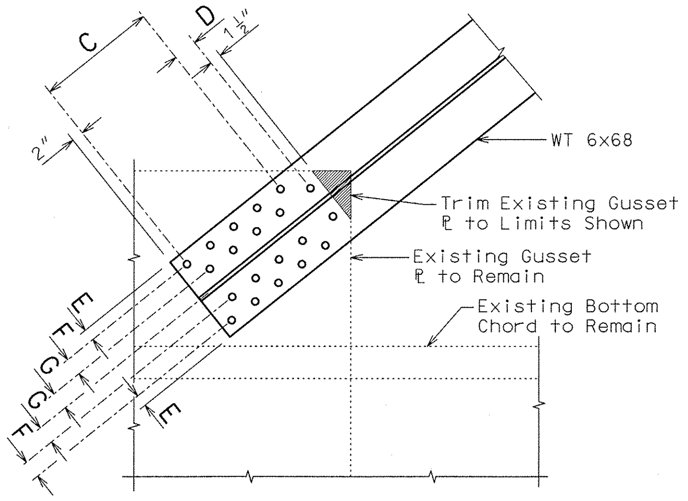
SECTION B-B
(Existing Condition Shown)



SECTION C-C



DETAIL "A"


C
D
1½"
2"
WT 6x68
Trim Existing Gusset PL to Limits Shown
Existing Gusset PL to Remain
Existing Bottom Chord to Remain
E
F
G
G
F
E

DETAIL "B"

LOWER LATERAL BRACING DIMENSIONS							
LOCATION	A	B	C	D	E	F	G
L0-L1, L23-L24	39'-9½"	19'-0½"	8 @ 1⅞"	3"	$1\frac{11}{16}$"	2¼"	2¼"
L1-L2, L22-L23	39'-9½"	19'-0½"	8 @ 1⅞"	3"	$1\frac{11}{16}$"	2¼"	2¼"
L2-L3, L21-L22	39'-9½"	19'-0½"	8 @ 1⅞"	3"	$1\frac{11}{16}$"	2¼"	2¼"
L3-L4, L20-L21	40'-0½"	19'-2¼"	6 @ 2⅛"	3"	$2\frac{7}{16}$"*	2"	1¾"
L4-L5, L19-L20	40'-0½"	19'-2¼"	6 @ 2⅛"	3"	$2\frac{7}{16}$"*	2"	1¾"
L5-L6, L18-L19	40'-0½"	19'-2¼"	6 @ 2⅛"	3"	$2\frac{7}{16}$"*	2"	1¾"
L6-L7, L17-L18	39'-9½"	19'-0½"	8 @ 1⅞"	3"	$1\frac{11}{16}$"	2¼"	2¼"
L7-L8, L16-L17	39'-9½"	19'-0½"	8 @ 1⅞"	3"	$1\frac{11}{16}$"	2¼"	2¼"
L8-L9, L15-L16	39'-9½"	19'-0½"	8 @ 1⅞"	3"	$1\frac{11}{16}$"	2¼"	2¼"
L9-L10, L14-L15	39'-9½"	19'-0½"	8 @ 1⅞"	3"	$1\frac{11}{16}$"	2¼"	2¼"
L10-L11, L13-L14	39'-9½"	19'-0½"	10 @ 1⅞"	3¼"	$1\frac{11}{16}$"	2¼"	2¼"
L11-L12, L12-L13	39'-9½"	19'-0½"	11 @ 1⅞"	3¼"	$1\frac{11}{16}$"	2¼"	2¼"

* Clip corner of new WT 6x68 to clear existing floorbeam and bottom chord of truss.

Notes:
The Lower Lateral Bracing system shall be replaced one truss bay at a time. The contractor shall ensure repairs to the active bay are completed with all bolts fully tensioned prior to beginning removal in another bay.

No portion of the truss may be draped for painting while the Lower Lateral Bracing is being replaced.

No bay of the Lower Lateral Bracing system shall be removed if winds are projected to be over 20 mph for the duration of the replacement operation.

The Contractor shall provide temporary lateral bracing or cabling to stabilize the truss as required to allow replacement of the lateral bracing. The Contractor is responsible for maintaining stability of the truss at all times.

The Contractor shall provide wind monitoring equipment during the replacement of the Lower Lateral Bracing.

New Structural Steel for Truss Lower Lateral Bracing shall be ASTM A709 Grade 50.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt.

All equipment, labor and materials necessary to complete the Truss Lower Lateral Bracing replacement shall be considered completely covered by the contract lump sum price for Replace Truss Lower Lateral Bracing System.

LOWER LATERAL BRACING REPLACEMENT - UNIT NO. 2

Detailed April 2009
Checked April 2009

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

Sheet No. 26 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 26
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DESCRIPTION

DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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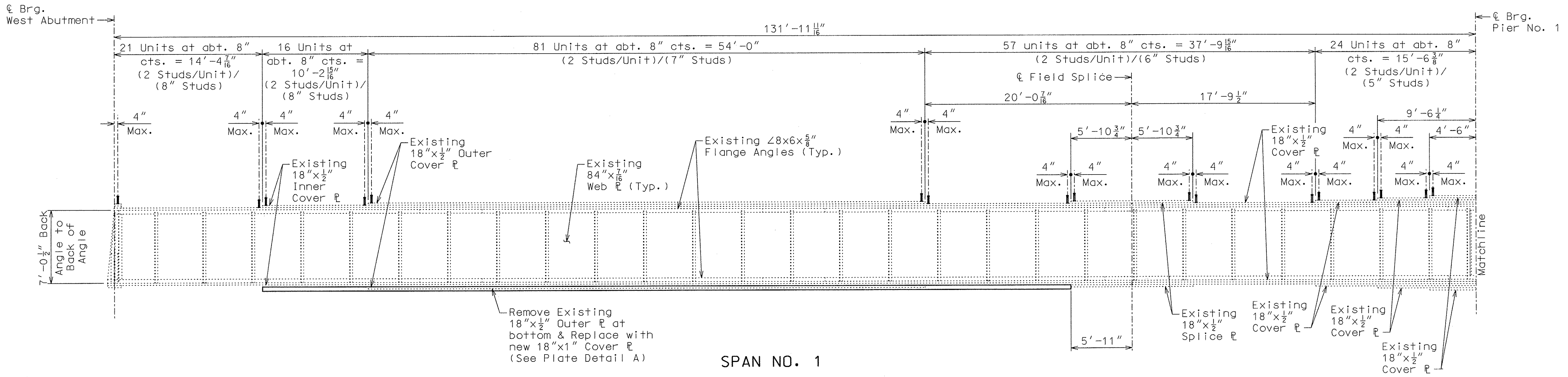
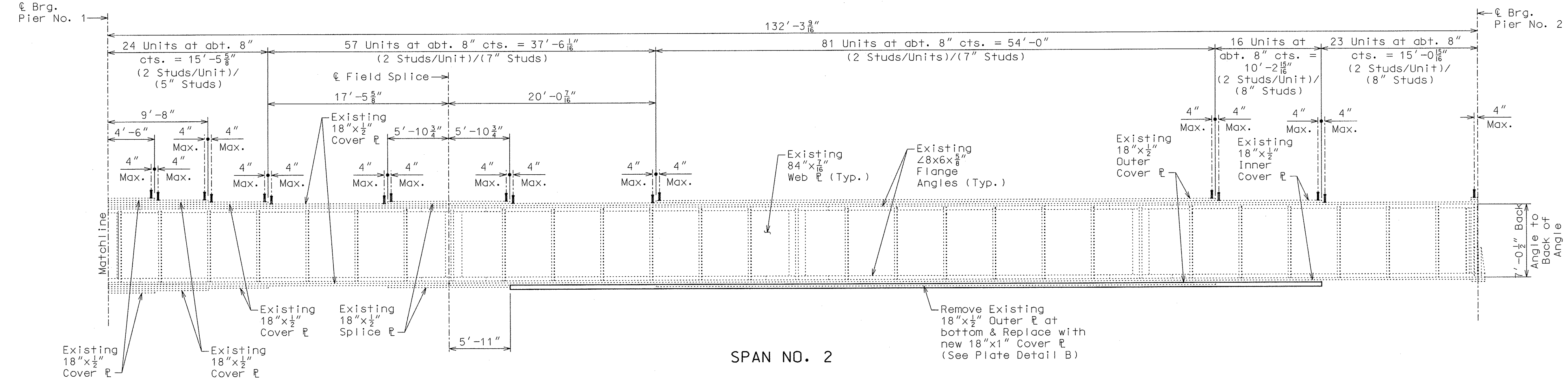

℄ Brg. West Abutment
℄ Brg. Pier No. 1
131′-11 11/16″
21 Units at abt. 8″ cts. = 14′-4 7/16″ (2 Studs/Unit)/ (8″ Studs)
16 Units at abt. 8″ cts. = 10′-2 15/16″ (2 Studs/Unit)/ (8″ Studs)
81 Units at abt. 8″ cts. = 54′-0″ (2 Studs/Unit)/(7″ Studs)
57 units at abt. 8″ cts. = 37′-9 15/16″ (2 Studs/Unit)/(6″ Studs)
24 Units at abt. 8″ cts. = 15′-6 3/8″ (2 Studs/Unit)/ (5″ Studs)
℄ Field Splice
20′-0 7/16″
17′-9 1/2″
9′-6 1/4″
4′-6″
5′-10 3/4″
5′-10 3/4″
4″ Max.
Existing 18″x1/2″ Inner Cover ℄
Existing 18″x1/2″ Outer Cover ℄
Existing 84″x7/16″ Web ℄ (Typ.)
Existing ∠8x6x5/8″ Flange Angles (Typ.)
Existing 18″x1/2″ Cover ℄
7′-0 1/2″ Back Angle to Back of Angle
Matchline
Remove Existing 18″x1/2″ Outer ℄ at bottom & Replace with new 18″x1″ Cover ℄ (See Plate Detail A)
5′-11″
Existing 18″x1/2″ Splice ℄
Existing 18″x1/2″ Cover ℄
Existing 18″x1/2″ Cover ℄
Existing 18″x1/2″ Cover ℄

SPAN NO. 1


℄ Brg. Pier No. 1
℄ Brg. Pier No. 2
132′-3 9/16″
24 Units at abt. 8″ cts. = 15′-5 5/8″ (2 Studs/Unit)/ (5″ Studs)
57 Units at abt. 8″ cts. = 37′-6 1/16″ (2 Studs/Unit)/(7″ Studs)
81 Units at abt. 8″ cts. = 54′-0″ (2 Studs/Units)/(7″ Studs)
16 Units at abt. 8″ cts. = 10′-2 15/16″ (2 Studs/Unit)/ (8″ Studs)
23 Units at abt. 8″ cts. = 15′-0 15/16″ (2 Studs/Unit)/ (8″ Studs)
℄ Field Splice
17′-5 5/8″
20′-0 7/16″
9′-8″
4′-6″
5′-10 3/4″
5′-10 3/4″
4″ Max.
Existing 18″x1/2″ Cover ℄
Existing 84″x7/16″ Web ℄ (Typ.)
Existing ∠8x6x5/8″ Flange Angles (Typ.)
Existing 18″x1/2″ Outer Cover ℄
Existing 18″x1/2″ Inner Cover ℄
Matchline
7′-0 1/2″ Back Angle to Back of Angle
Existing 18″x1/2″ Cover ℄
Existing 18″x1/2″ Splice ℄
5′-11″
Remove Existing 18″x1/2″ Outer ℄ at bottom & Replace with new 18″x1″ Cover ℄ (See Plate Detail B)
Existing 18″x1/2″ Cover ℄
Existing 18″x1/2″ Cover ℄

SPAN NO. 2

Notes:
New Cover Plates shall be ASTM A36 (Fy=36,000 psi) steel. All New Plates shall be subject to charpy V-Notch Testing Requirements.

The Cover Plates shall be replaced with no live load or construction loads present within the unit. The slab above the girder shall be removed prior to beginning any Cover Plate replacement work. This work shall be completed during a scheduled weekend closure.

Existing 18″x1/2″ Bottom Outer Plates in Spans No. 1 & No. 2 shall be discarded. Existing 18″x1/2″ Bottom Inner Plates in Spans No. 1 & No. 2 shall be temporarily secured in place with drift pins and clamps or temporary fasteners at a maximum spacing of 4′-0″ to each flange angle leg.

The bottom of existing 18″x1/2″ Bottom Inner Plates in Spans No. 1 & No. 2 shall be cleaned and coated according to the special provisions prior to installation of new cover plates.

The cost of supplying and installing shear connectors will be considered completely covered by the contract unit price for Shear Connectors per each.

Shear connectors shall be in accordance with Sec. 712, 1037 & 1080.

The cost of all labor, equipment and material to remove, clean, repaint, paint, rebolt, bolt, weld and splice the cover plates as shown on this sheet shall be included in the contract lump sum price for "Strengthening Existing Girders".

Optional Field Splices may be used by the Contractor for handling & ease of installation. Minimum spacing of Optional Field Splices shall be 30′-0″. Contractor shall determine optional Field Splice location & geometry & submit to engineer for approval.

The Contractor shall field verify the dimensions & bolt locations prior to fabrication of the replacement and new cover plates.

Existing 7/8″Ø rivets shall be replaced with 7/8″Ø A325 fully tensioned bolts within the limits of the new cover plates unless noted otherwise.

Stud heights shown have been estimated. The Contractor shall verify stud heights based on Field Survey to maintain 3″ min. penetration into deck and 3 1/4″ clear from top of deck.

See Sheet No. 28 for Plate Details A & B.

ELEVATION OF STRUCTURAL STEEL - UNIT NO. 1

Detailed April 2009
Checked April 2009

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

Sheet No. 27 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	5-21-09
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	27
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DESCRIPTION

DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

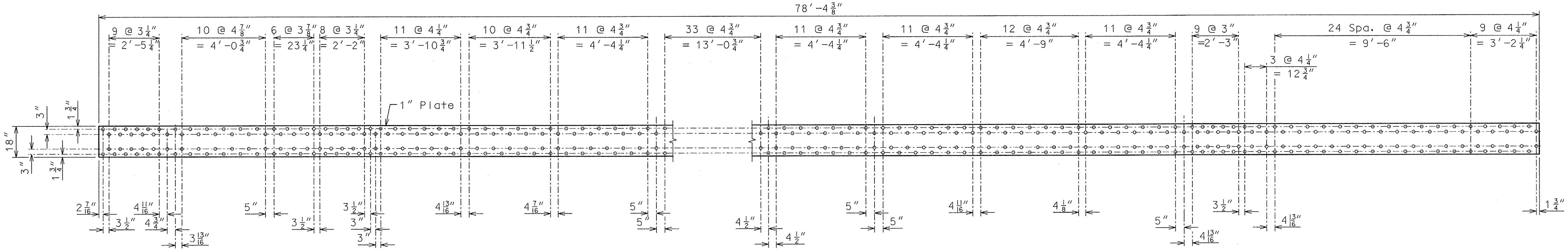


PLATE DETAIL A

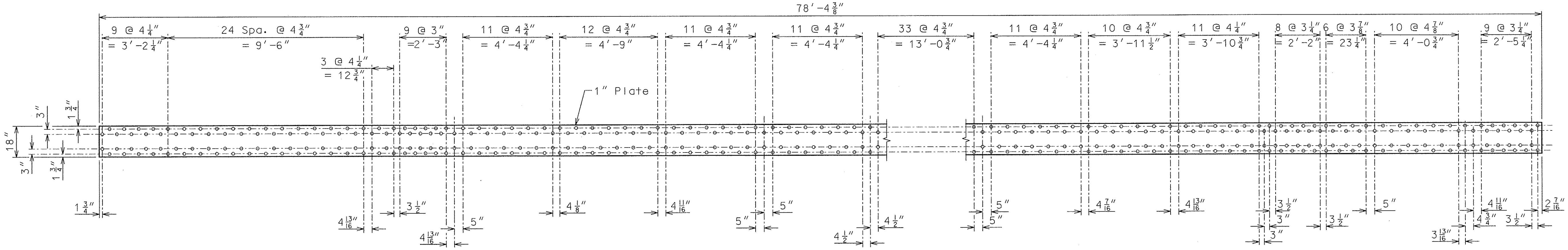
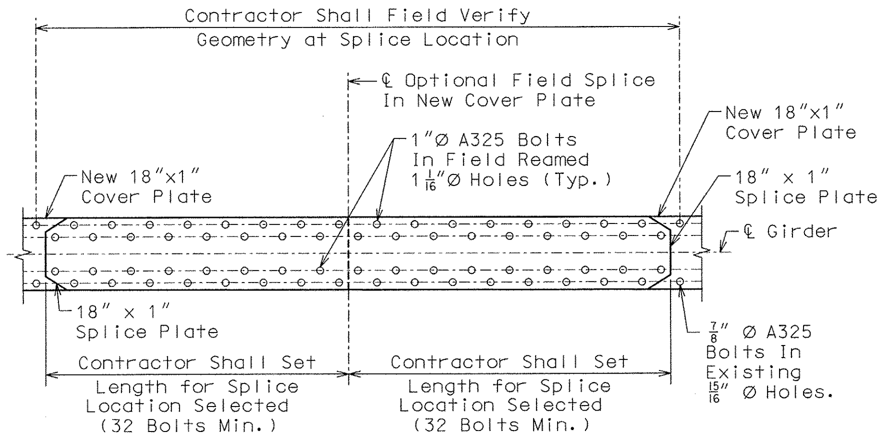
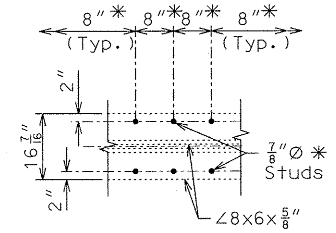


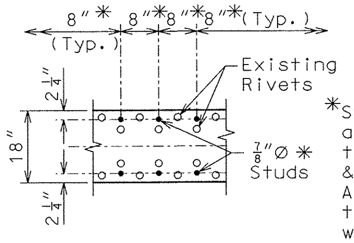
PLATE DETAIL B



OPTIONAL COVER PLATE
FIELD SPLICE



SHEAR STUD PLACEMENT
ON FLANGE ANGLES



*Space studs
as required
to clear rivets
& obstructions.
Add studs adjacent
to obstructions
where necessary.

SHEAR STUD PLACEMENT
ON COVER PLATES

MISCELLANEOUS STEEL DETAILS - UNIT NO. 1

Detailed April 2009
Checked April 2009

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

Sheet No. 28 of 57

CORY MICHAEL IMHOFF
PE-2002016669

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	28

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L00982

DATE	DESCRIPTION

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

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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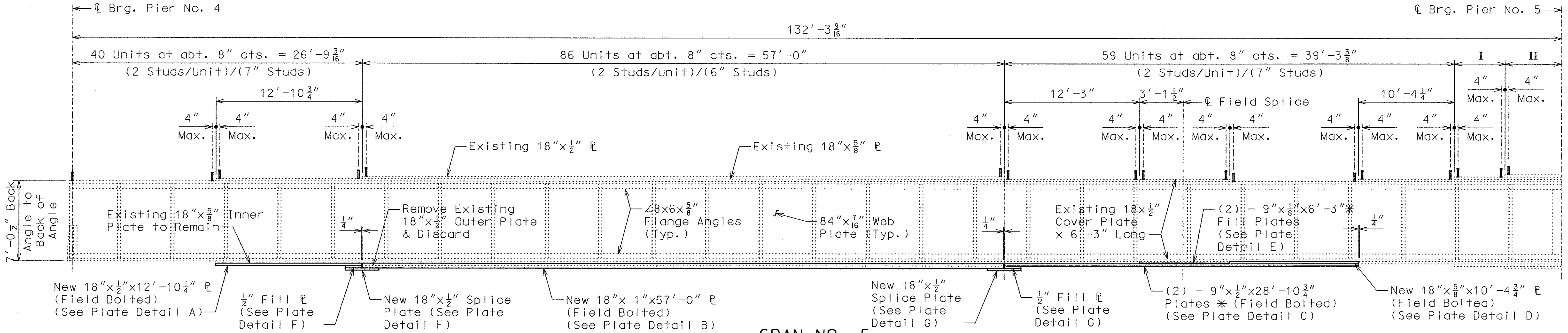
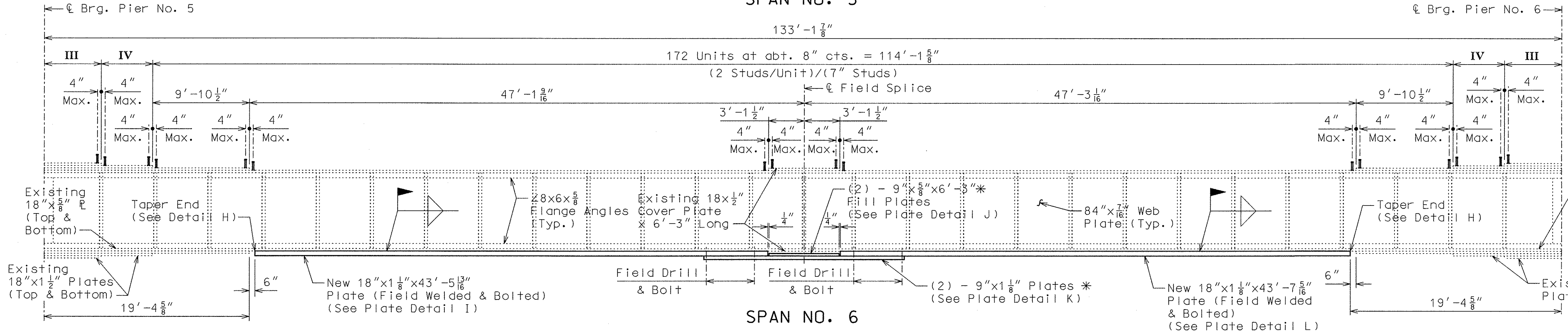
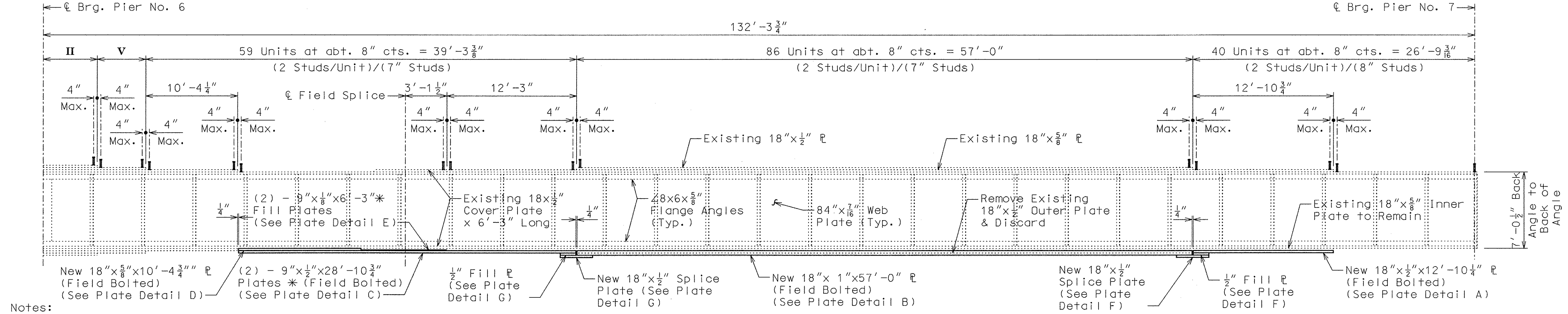

℄ Brg. Pier No. 4
℄ Brg. Pier No. 5
132'-3 9/16"
40 Units at abt. 8" cts. = 26'-9 3/16"
(2 Studs/Unit)/(7" Studs)
86 Units at abt. 8" cts. = 57'-0"
(2 Studs/unit)/(6" Studs)
59 Units at abt. 8" cts. = 39'-3 3/8"
(2 Studs/Unit)/(7" Studs)
I
II
12'-10 3/4"
12'-3"
3'-1 1/2"
℄ Field Splice
10'-4 1/4"
4" Max.
Existing 18"x1/2" ⅊
Existing 18"x5/8" ⅊
7'-0 1/2" Back to Back of Angle
Existing 18"x5/8" Inner Plate to Remain
1/4"
Remove Existing 18"x1/2" Outer Plate & Discard
∠8x6x5/8" Flange Angles (Typ.)
84"x7/16" Web Plate (Typ.)
Existing 18x1/2" Cover Plate x 6'-3" Long
(2) - 9"x1/2"x6'-3"∗ Fill Plates (See Plate Detail E)
New 18"x1/2"x12'-10 1/4" ⅊ (Field Bolted) (See Plate Detail A)
1/2" Fill ⅊ (See Plate Detail F)
New 18"x1/2" Splice Plate (See Plate Detail F)
New 18"x 1"x57'-0" ⅊ (Field Bolted) (See Plate Detail B)
New 18"x1/2" Splice Plate (See Plate Detail G)
1/2" Fill ⅊ (See Plate Detail G)
(2) - 9"x1/2"x28'-10 3/4" Plates ∗ (Field Bolted) (See Plate Detail C)
New 18"x5/8"x10'-4 3/4" ⅊ (Field Bolted) (See Plate Detail D)

SPAN NO. 5


℄ Brg. Pier No. 5
℄ Brg. Pier No. 6
133'-1 7/8"
III
IV
172 Units at abt. 8" cts. = 114'-1 5/8"
(2 Studs/Unit)/(7" Studs)
℄ Field Splice
9'-10 1/2"
47'-1 9/16"
47'-3 1/16"
3'-1 1/2"
4" Max.
Existing 18"x5/8" ⅊ (Top & Bottom)
Taper End (See Detail H)
∠8x6x5/8 Flange Angles (Typ.)
Existing 18x1/2" Cover Plate x 6'-3" Long
1/4"
(2) - 9"x5/8"x6'-3"∗ Fill Plates (See Plate Detail J)
84"x7/16" Web Plate (Typ.)
Existing 18"x1 1/2" Plates (Top & Bottom)
19'-4 5/8"
6"
New 18"x1 1/8"x43'-5 13/16" Plate (Field Welded & Bolted) (See Plate Detail I)
Field Drill & Bolt
(2) - 9"x1 1/8" Plates ∗ (See Plate Detail K)
New 18"x1 1/8"x43'-7 5/16" Plate (Field Welded & Bolted) (See Plate Detail L)

SPAN NO. 6


℄ Brg. Pier No. 6
℄ Brg. Pier No. 7
132'-3 3/4"
II
V
59 Units at abt. 8" cts. = 39'-3 3/8"
(2 Studs/Unit)/(7" Studs)
86 Units at abt. 8" cts. = 57'-0"
(2 Studs/Unit)/(7" Studs)
40 Units at abt. 8" cts. = 26'-9 3/16"
(2 Studs/Unit)/(8" Studs)
10'-4 1/4"
℄ Field Splice
3'-1 1/2"
12'-3"
12'-10 3/4"
4" Max.
Existing 18"x1/2" ⅊
Existing 18"x5/8" ⅊
1/4"
(2) - 9"x1/2"x6'-3"∗ Fill Plates (See Plate Detail E)
Existing 18x1/2" Cover Plate x 6'-3" Long
∠8x6x5/8" Flange Angles (Typ.)
84"x7/16" Web Plate (Typ.)
Remove Existing 18"x1/2" Outer Plate & Discard
Existing 18"x5/8" Inner Plate to Remain
7'-0 1/2" Back to Back of Angle
New 18"x5/8"x10'-4 3/4"" ⅊ (Field Bolted) (See Plate Detail D)
(2) - 9"x1/2"x28'-10 3/4" Plates ∗ (Field Bolted) (See Plate Detail C)
1/2" Fill ⅊ (See Plate Detail G)
New 18"x1/2" Splice Plate (See Plate Detail G)
New 18"x 1"x57'-0" ⅊ (Field Bolted) (See Plate Detail B)
New 18"x1/2" Splice Plate (See Plate Detail F)
1/2" Fill ⅊ (See Plate Detail F)
New 18"x1/2"x12'-10 1/4" ⅊ (Field Bolted) (See Plate Detail A)

SPAN NO. 7

I - 7 Units at abt. 8" cts. = 4'-6" (2 Studs/Unit)/ (6" Studs)

II - 8 Units at abt. 8" cts. = 4'-11 7/8" (2 Studs/Unit)/ (6" Studs)

III - 8 Units at abt. 8" cts. = 5'-1 1/8" (2 Studs/Unit)/ (6" Studs)

IV - 7 Units at abt. 8" cts. = 4'-5" (2 Studs/Unit)/ (6" Studs)

V - 7 Units at abt. 7" cts. = 4'-6" (2 Studs/Unit)/ (6" Studs)

∗ 9" Plates and 9" Fill Plates shall be installed one at a time to maintain one half of bolts in splice plates at all time.

Notes:

New Cover Plates shall be ASTM A36 (Fy=36,000 psi) steel. All New Plates shall be subject to charpy V-Notch Testing Requirements.

The Cover Plates shall be replaced with no live load or construction loads present within the unit. The slab above the girder shall be removed prior to beginning any Cover Plate replacement work.
This work shall be completed during a scheduled weekend closure.

Existing 18"x 1/2" Bottom Outer Plates in Spans No. 5 & No. 7 shall be discarded. Existing 18"x 5/8" Bottom Inner Plates in Spans No. 5 & No. 7 shall be temporarily secured in place with drift pins and clamps or temporary fasteners at a maximum spacing of 4'-0" to each flange angle leg.

The bottom of existing 18"x 5/8" Bottom Inner Plates in Spans No. 5 & No. 7 will be cleaned and coated according to the special provisions prior to installation of new cover plates.

The cost of all labor, equipment and material to remove, clean, repaint, paint, rebolt, bolt, weld and splice the cover plates as shown on this sheet shall be included in the contract lump sum price for "Strengthening Existing Girders".

Optional Field Splices may be used by the Contractor for handling & ease of installation. Minimum spacing of Optional Field Splices shall be 30'-0". Contractor shall determine optional Field Splice location & geometry & submit to engineer for approval.

The Contractor shall field verify the dimensions & bolt locations prior to fabrication of the replacement and new cover plates.

Existing 7/8"Ø rivets shall be replaced with 7/8"Ø A325 fully tensioned bolts within the limits of the new cover plates unless noted otherwise.

Stud heights shown have been estimated. The Contractor shall verify stud heights based on Field Survey to maintain 3" min. penetration into deck and 3 1/4" clear from top of deck.

See Sheet No. 31 & 32 for Plate Details A to L.

The cost of supplying and installing shear connectors will be considered completely covered by the contract unit price for Shear Connectors per each.

Shear connectors shall be in accordance with Sec. 712, 1037 & 1080.

ELEVATION OF STRUCTURAL STEEL - UNIT NO. 3

Detailed April 2009
Checked April 2009

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

Sheet No. 29 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 29
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DESCRIPTION

DATE

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

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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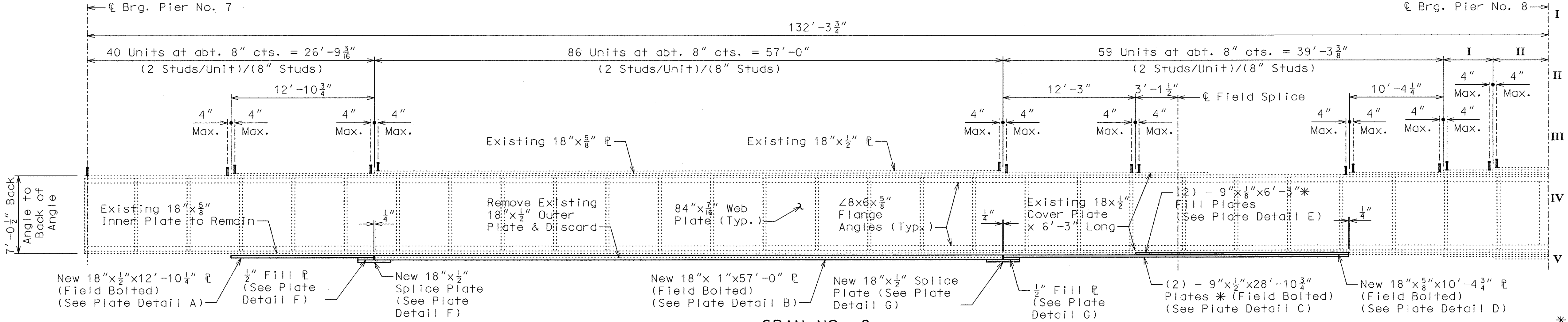
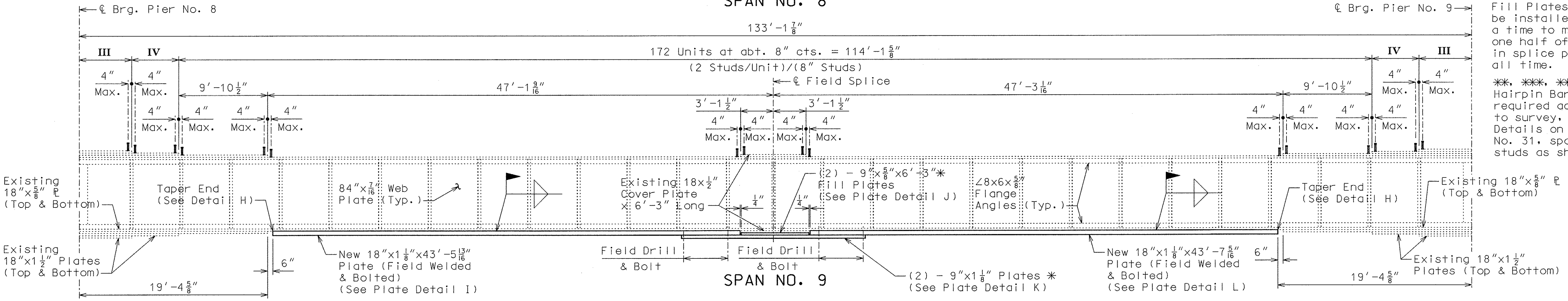
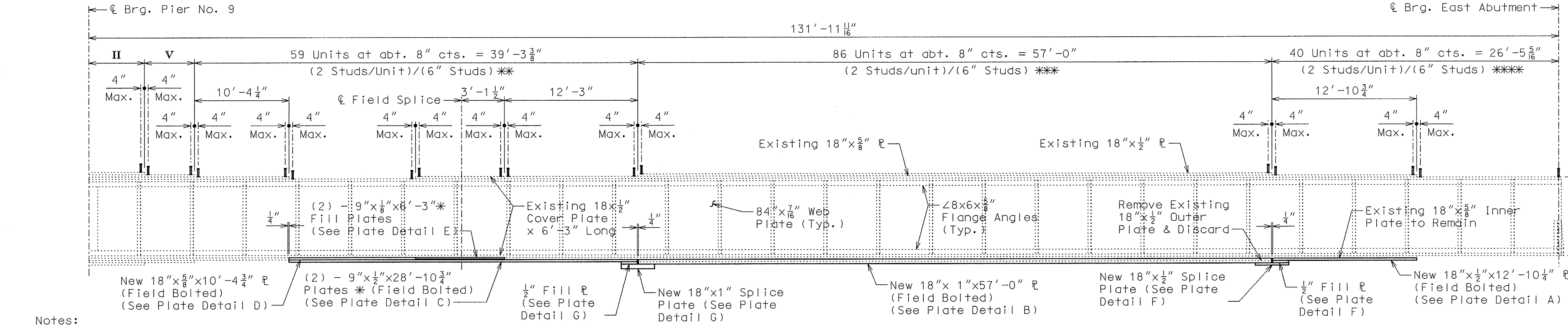

℄ Brg. Pier No. 7
℄ Brg. Pier No. 8
132'-3 3/4"
40 Units at abt. 8" cts. = 26'-9 3/16"
(2 Studs/Unit)/(8" Studs)
86 Units at abt. 8" cts. = 57'-0"
(2 Studs/Unit)/(8" Studs)
59 Units at abt. 8" cts. = 39'-3 3/8"
(2 Studs/Unit)/(8" Studs)
I
II
12'-10 3/4"
12'-3"
3'-1 1/2"
℄ Field Splice
10'-4 1/4"
4" Max.
Existing 18"x5/8" PL
Existing 18"x1/2" PL
7'-0 1/2" Back Angle to Back of Angle
Existing 18"x5/8" Inner Plate to Remain
1/4"
Remove Existing 18"x1/2" Outer Plate & Discard
84"x7/16" Web Plate (Typ.)
∠8x6x5/8" Flange Angles (Typ.)
Existing 18x1/2" Cover Plate x 6'-3" Long
(2) - 9"x5/8"x6'-3"* Fill Plates (See Plate Detail E)
New 18"x1/2"x12'-10 1/4" PL (Field Bolted) (See Plate Detail A)
1/2" Fill PL (See Plate Detail F)
New 18"x1/2" Splice Plate (See Plate Detail F)
New 18"x 1"x57'-0" PL (Field Bolted) (See Plate Detail B)
New 18"x1/2" Splice Plate (See Plate Detail G)
1/2" Fill PL (See Plate Detail G)
(2) - 9"x1/2"x28'-10 3/4" Plates * (Field Bolted) (See Plate Detail C)
New 18"x5/8"x10'-4 3/4" PL (Field Bolted) (See Plate Detail D)

SPAN NO. 8


℄ Brg. Pier No. 8
℄ Brg. Pier No. 9
133'-1 7/8"
III
IV
172 Units at abt. 8" cts. = 114'-1 5/8"
(2 Studs/Unit)/(8" Studs)
℄ Field Splice
9'-10 1/2"
47'-1 9/16"
47'-3 1/16"
3'-1 1/2"
4" Max.
Existing 18"x5/8" PL (Top & Bottom)
Existing 18"x1 1/2" Plates (Top & Bottom)
Taper End (See Detail H)
84"x7/16" Web Plate (Typ.)
Existing 18x1/2" Cover Plate x 6'-3" Long
1/4"
(2) - 9"x5/8"x6'-3"* Fill Plates (See Plate Detail J)
∠8x6x5/8" Flange Angles (Typ.)
6"
19'-4 5/8"
New 18"x1 1/8"x43'-5 13/16" Plate (Field Welded & Bolted) (See Plate Detail I)
Field Drill & Bolt
Field Drill & Bolt
(2) - 9"x1 1/8" Plates * (See Plate Detail K)
New 18"x1 1/8"x43'-7 5/8" Plate (Field Welded & Bolted) (See Plate Detail L)

SPAN NO. 9


℄ Brg. Pier No. 9
℄ Brg. East Abutment
131'-11 11/16"
II
V
59 Units at abt. 8" cts. = 39'-3 3/8"
(2 Studs/Unit)/(6" Studs)**
86 Units at abt. 8" cts. = 57'-0"
(2 Studs/unit)/(6" Studs) ***
40 Units at abt. 8" cts. = 26'-5 5/16"
(2 Studs/Unit)/(6" Studs) ****
10'-4 1/4"
℄ Field Splice
3'-1 1/2"
12'-3"
12'-10 3/4"
4" Max.
Existing 18"x5/8" PL
Existing 18"x1/2" PL
1/4"
(2) - 9"x1/2"x6'-3"* Fill Plates (See Plate Detail E)
Existing 18x1/2" Cover Plate x 6'-3" Long
84"x7/16" Web Plate (Typ.)
∠8x6x5/8" Flange Angles (Typ.)
Remove Existing 18"x1/2" Outer Plate & Discard
Existing 18"x5/8" Inner Plate to Remain
7'-0 1/2" Back Angle to Back of Angle
New 18"x5/8"x10'-4 3/4" PL (Field Bolted) (See Plate Detail D)
(2) - 9"x1/2"x28'-10 3/4" Plates * (Field Bolted) (See Plate Detail C)
1/2" Fill PL (See Plate Detail G)
New 18"x1" Splice Plate (See Plate Detail G)
New 18"x 1"x57'-0" PL (Field Bolted) (See Plate Detail B)
New 18"x1/2" Splice Plate (See Plate Detail F)
1/2" Fill PL (See Plate Detail F)
New 18"x1/2"x12'-10 1/4" PL (Field Bolted) (See Plate Detail A)

SPAN NO. 10

Notes:
New Cover Plates shall be ASTM A36 (Fy=36,000 psi) steel. All New Plates shall be subject to charpy V-Notch Testing Requirements.

The Cover Plates shall be replaced with no live load or construction loads present within the unit. The slab above the girder shall be removed prior to beginning any Cover Plate replacement work. This work shall be completed during a scheduled weekend closure.

Existing 18"x1/2" Bottom Outer Plates in Spans No. 8 & No. 10 shall be discarded. Existing 18"x5/8" Bottom Inner Plates in Spans No. 8 & No. 10 shall be temporarily secured in place with drift pins and clamps or temporary fasteners at a maximum spacing of 4'-0" to each flange angle leg.

The bottom of existing 18"x5/8" Bottom Inner Plates in Spans No. 8 & No. 10 shall be cleaned and coated according to the special provisions prior to installation of new cover plates.

The cost of all labor, equipment and material to remove, clean, repaint, paint, rebolt, bolt, weld and splice the cover plates as shown on this sheet shall be included in the contract lump sum price for "Strengthening Existing Girders".

Optional Field Splices may be used by the Contractor for handling & ease of installation. Minimum spacing of Optional Field Splices shall be 30'-0". Contractor shall determine optional Field Splice location & geometry & submit to engineer for approval.

The Contractor shall field verify the dimensions & bolt locations prior to fabrication of the replacement and new cover plates.

Existing 7/8"Ø rivets shall be replaced with 7/8"Ø A325 fully tensioned bolts within the limits of the new cover plates unless noted otherwise.

Stud heights shown have been estimated. The Contractor shall verify stud heights based on Field Survey to maintain 3" min. penetration into deck and 3 1/4" clear from top of deck.

See Sheet No. 31 & 32 for Plate Details A to L.

The cost of supplying and installing shear connectors will be considered completely covered by the contract unit price for Shear Connectors per each.

Shear connectors shall be in accordance with Sec. 712, 1037 & 1080.

ELEVATION OF STRUCTURAL STEEL - UNIT NO. 4

Detailed April 2009
Checked April 2009

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

Sheet No. 30 of 57

- I - 7 Units at abt. 8" cts. = 4'-6" (2 Studs/Unit)/(7" Studs)
- II - 8 Units at abt. 8" cts. = 4'-11 7/8" (2 Studs/Unit)/(7" Studs)
- III - 8 Units at abt. 8" cts. = 5'-1 1/8" (2 Studs/Unit)/(7" Studs)
- IV - 7 Units at abt. 8" cts. = 4'-5" (2 Studs/Unit)/(7" Studs)
- V - 7 Units at abt. 7" cts. = 4'-6" (2 Studs/Unit)/(8" Studs)

* 9" Plates and 9" Fill Plates shall be installed one at a time to maintain one half of bolts in splice plates at all time.

, *, **** - Hairpin Bars required according to survey, see Details on Sheet No. 31, space with studs as shown.

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	30

COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO. L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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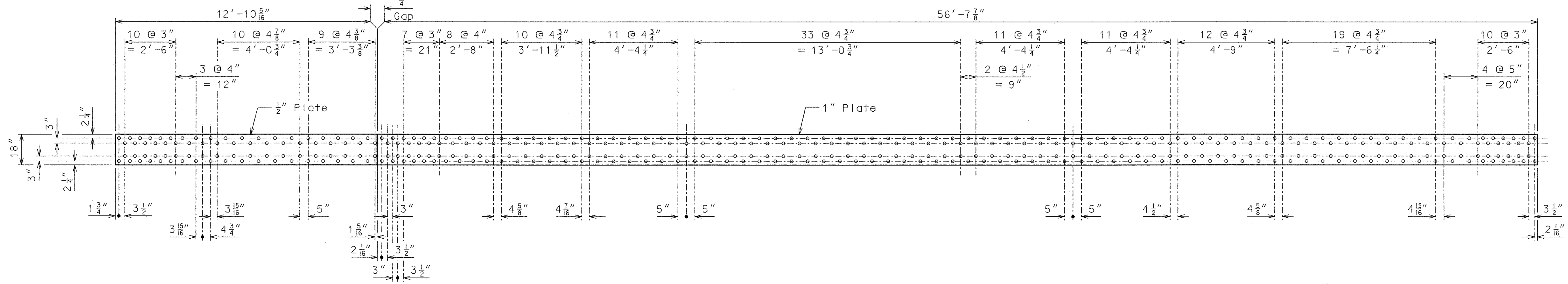


PLATE DETAIL A
(Unit No. 3 - Span No. 5, Span No. 7 Opposite Hand)
(Unit No. 4 - Similar)

PLATE DETAIL B
(Unit No. 3 - Span No. 5, Span No. 7 Opposite Hand)
(Unit No. 4 - Similar)

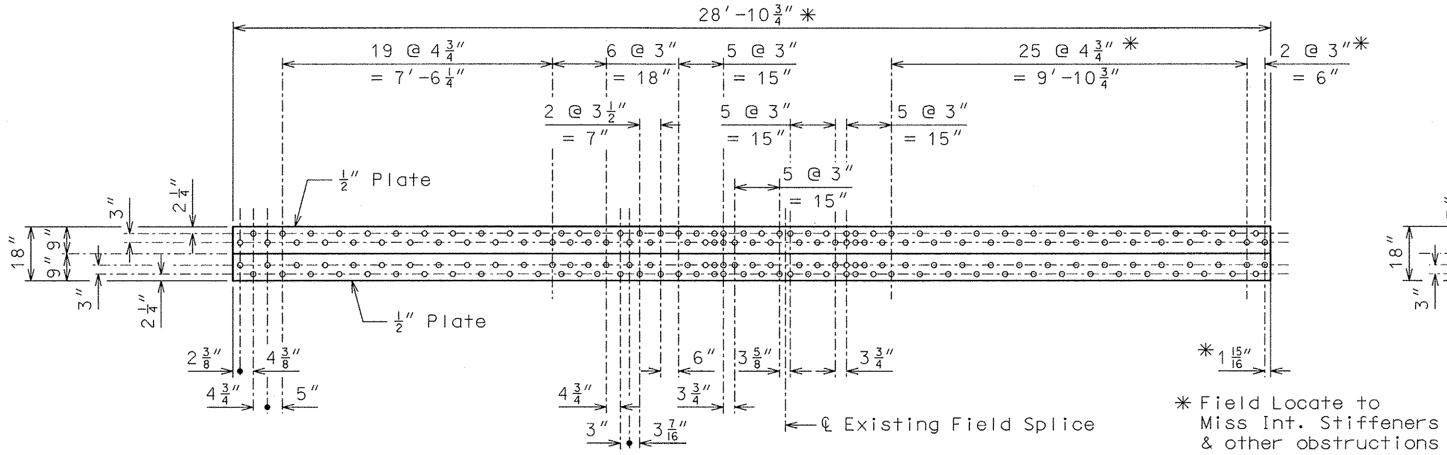


PLATE DETAIL C
(Unit No. 3 - Span No. 5, Span No. 7 Opposite Hand)
(Unit No. 4 - Similar)

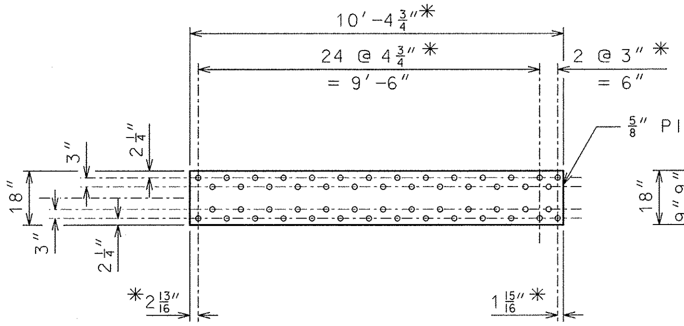


PLATE DETAIL D
(Unit No. 3 - Span No. 5,
Span No. 7 Opposite Hand)
(Unit No. 4 - Similar)

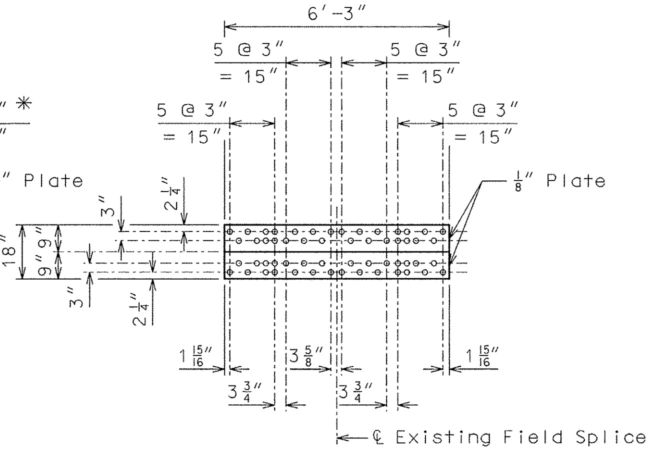


PLATE DETAIL E
(Unit No. 3 - Span No. 5,
Span No. 7 Opposite Hand)
(Unit No. 4 - Similar)

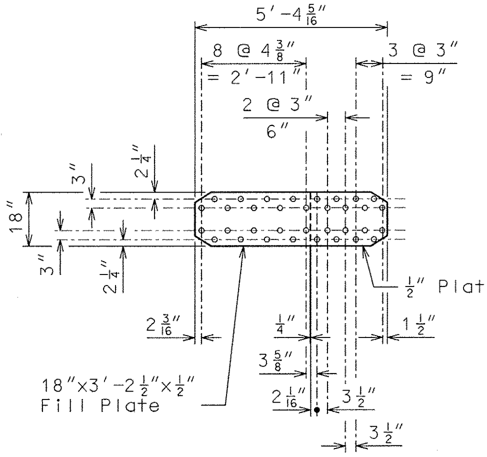


PLATE DETAIL F
(Unit No. 3 - Span No. 5,
Span No. 7 Opposite Hand)
(Unit No. 4 - Similar)

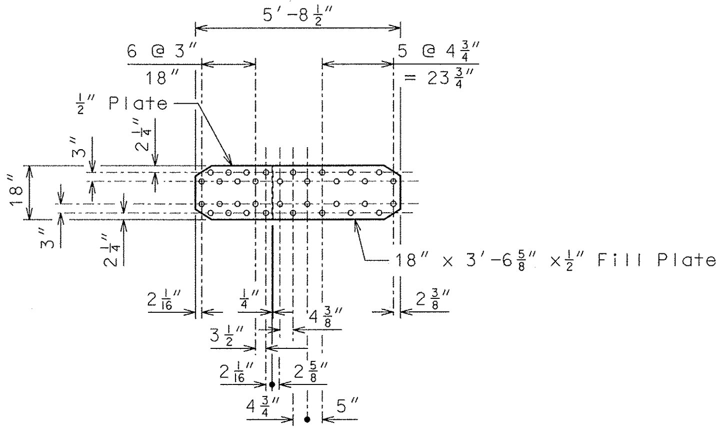
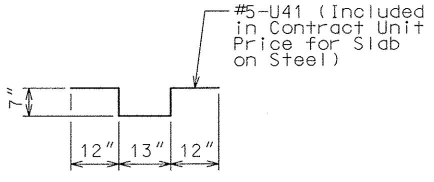
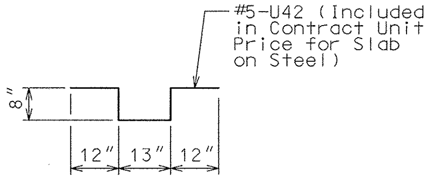


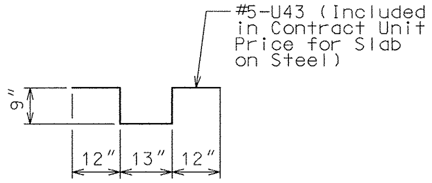
PLATE DETAIL G
(Unit No. 3 - Span No. 5,
Span No. 7 Opposite Hand)
(Unit No. 4 - Similar)



✱✱ - 6" STUDS W/#5-U41



✱✱✱ - 6" STUDS W/#5-U42



✱✱✱✱ - 6" STUDS W/#5-U43

HAUNCH REINFORCEMENT BARS - UNIT NO. 4

Notes: For locations of studs and haunch reinforcement bars, see Sheet No. 30. Haunch reinforcement bars shall be placed at each stud location as shown.

MISCELLANEOUS STEEL DETAILS - UNIT NO. 3 & 4

Detailed April 2009
Checked April 2009

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

Sheet No. 31 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 31
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DATE	DESCRIPTION

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

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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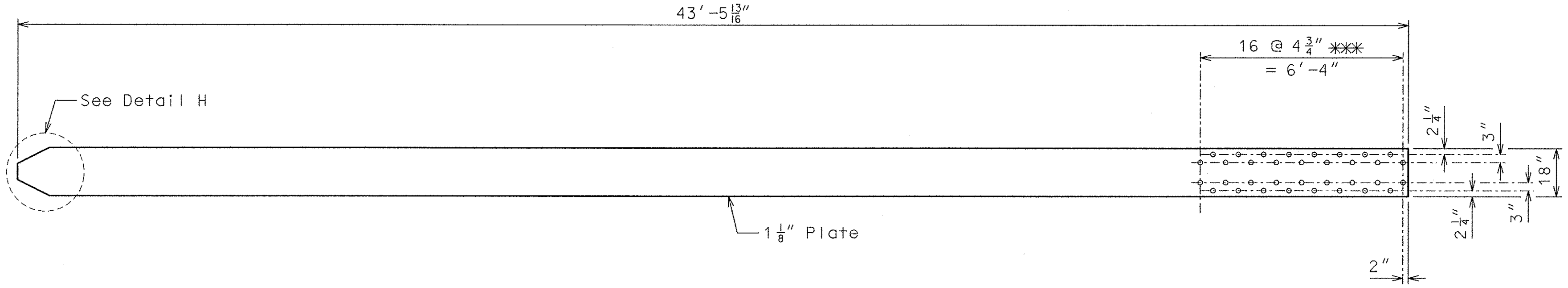


PLATE DETAIL I
(Unit No. 3 - Span No. 6)
(Unit No. 4 - Similar)

✱✱✱ - Field Locate to miss Int. Stiffeners & other obstructions

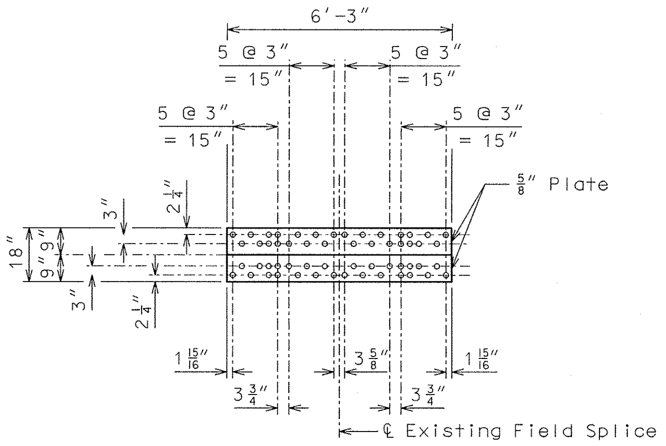


PLATE DETAIL J
(Unit No. 3 - Span No. 6)
(Unit No. 4 - Similar)

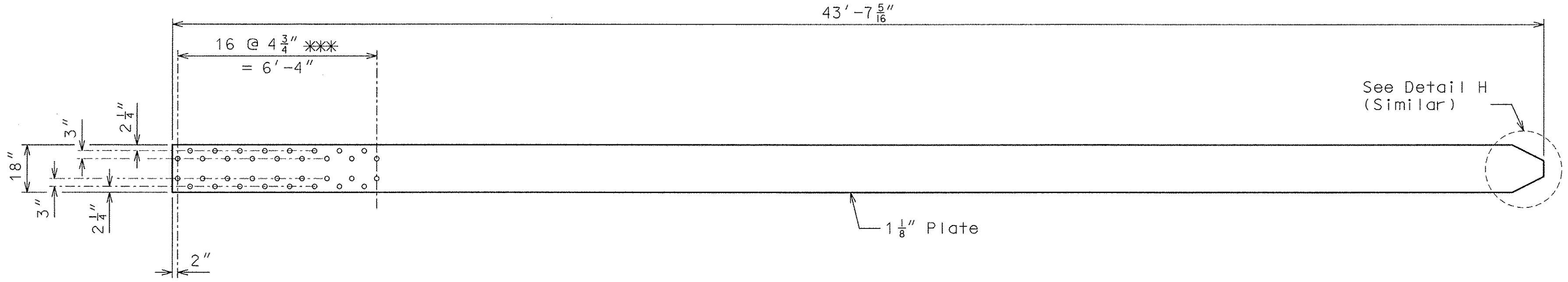


PLATE DETAIL L
(Unit No. 3 - Span No. 6)
(Unit No. 4 - Similar)

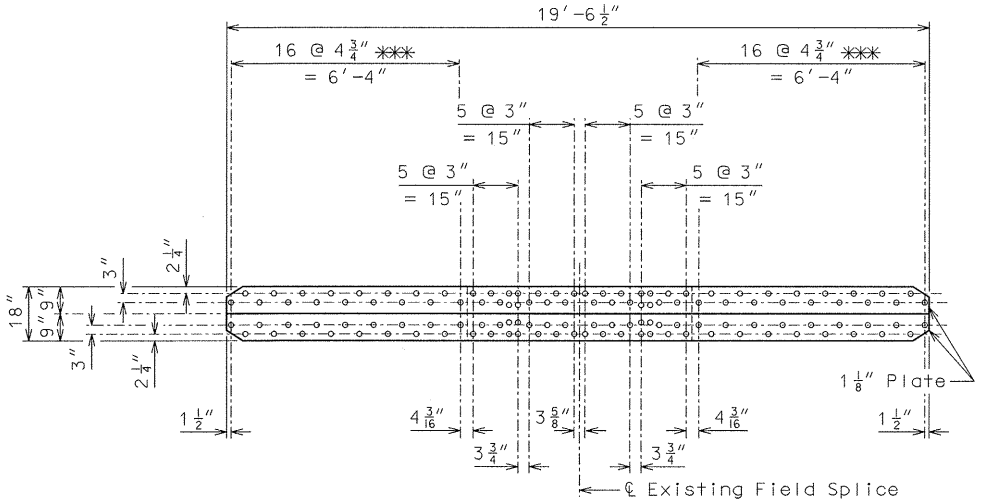
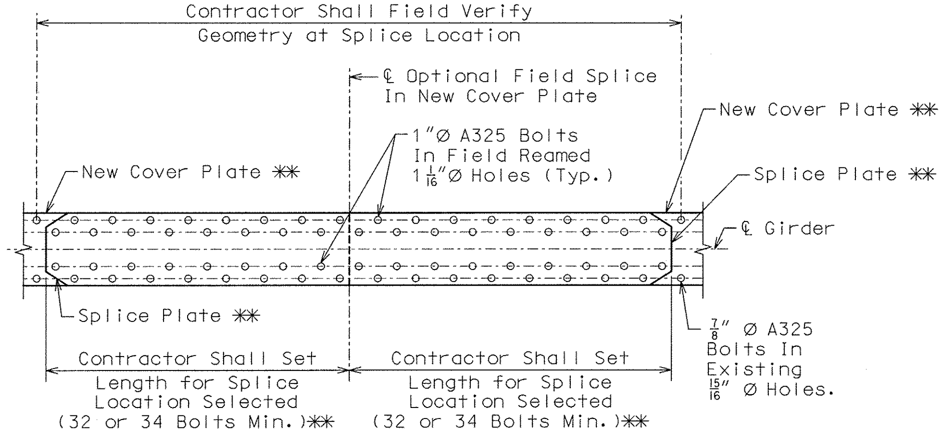
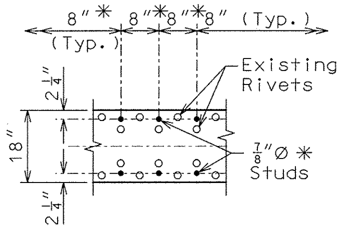


PLATE DETAIL K
(Unit No. 3 - Span No. 6)
(Unit No. 4 - Similar)

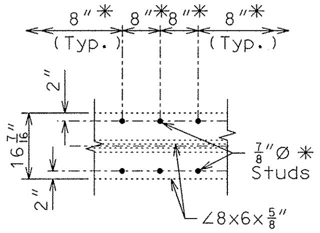


OPTIONAL COVER PLATE FIELD SPLICE 18″x1″ & 18″x1 1/8″
✱✱ (18″x1″ w/32 Bolts; 18″x1 1/8″ w/34 Bolts)

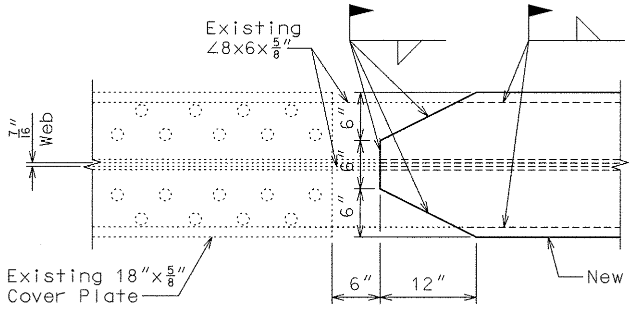


SHEAR STUD PLACEMENT ON COVER PLATES

✱Space studs as required to clear rivets & obstructions. Add studs adjacent to obstructions where necessary.



SHEAR STUD PLACEMENT ON FLANGE ANGLES



DETAIL H

MISCELLANEOUS STEEL DETAILS - UNIT NO. 3 & 4

Detailed April 2009
Checked April 2009

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

Sheet No. 32 of 57

c:\modot\batchplot\B_L00982_032_J1P2161.DGN 1:24:10 PM 5/21/2009

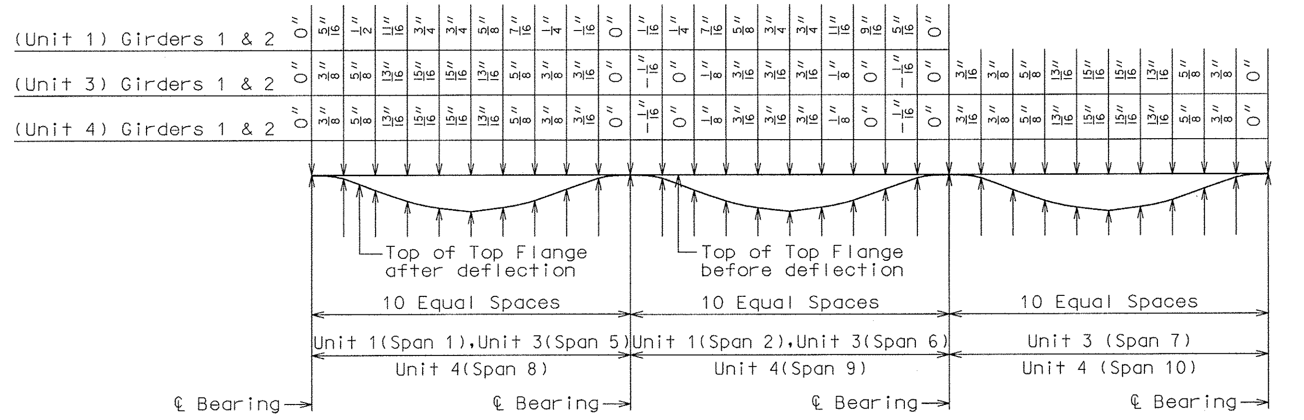
CORY MICHAEL IMHOFF
NUMBER PE-2020016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	32
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION	DATE

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

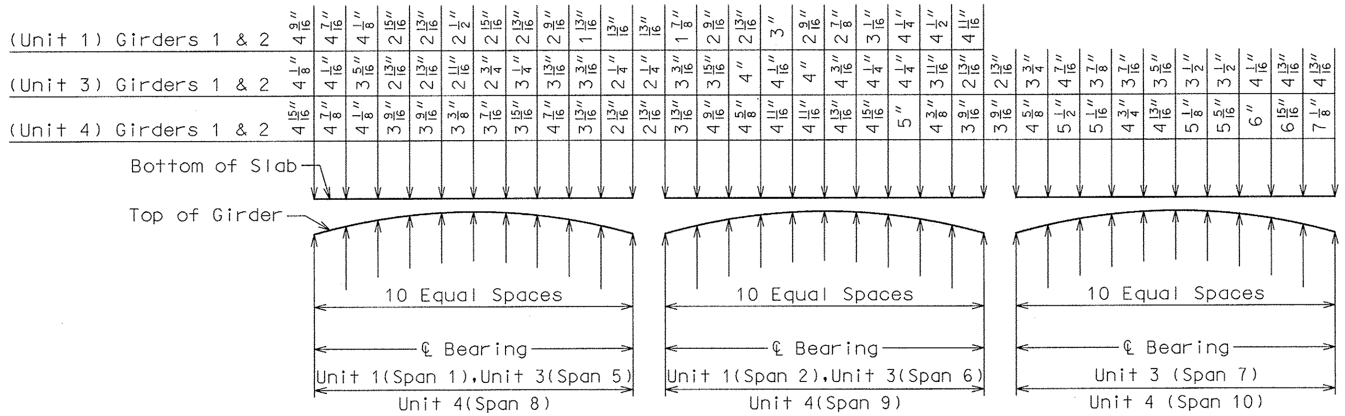
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



(Unit 1) Girders 1 & 2	0″	5/16″	1/2″	11/16″	3/4″	3/4″	5/8″	7/16″	1/4″	1/16″	0″	1/16″	1/4″	7/16″	5/8″	3/4″	3/4″	11/16″	9/16″	5/16″	0″										
(Unit 3) Girders 1 & 2	0″	3/8″	5/8″	13/16″	15/16″	15/16″	13/16″	5/8″	3/8″	3/16″	0″	−1/16″	0″	1/8″	3/16″	3/16″	3/16″	1/8″	0″	−1/16″	0″	3/16″	3/8″	5/8″	13/16″	15/16″	15/16″	13/16″	5/8″	3/8″	0″
(Unit 4) Girders 1 & 2	0″	3/8″	5/8″	13/16″	15/16″	15/16″	13/16″	5/8″	3/8″	3/16″	0″	−1/16″	0″	1/8″	3/16″	3/16″	3/16″	1/8″	0″	−1/16″	0″	3/16″	3/8″	5/8″	13/16″	15/16″	15/16″	13/16″	5/8″	3/8″	0″

DEAD LOAD DEFLECTION - UNITS NO. 1, 3 & 4

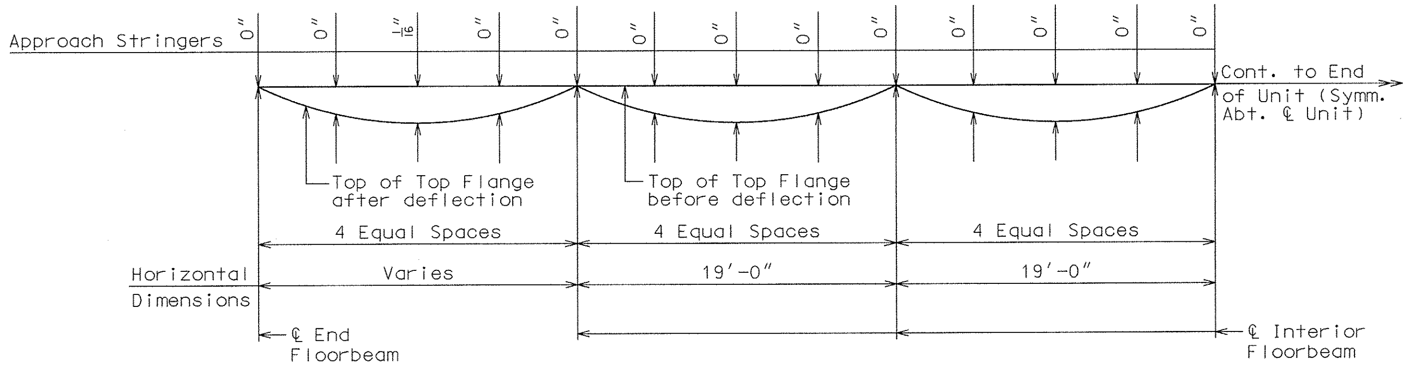
Notes: Dead load deflection includes weight of concrete slab and barrier curbs.



(Unit 1) Girders 1 & 2	4 9/16″	4 7/16″	4 1/8″	2 15/16″	2 13/16″	2 1/2″	2 15/16″	2 13/16″	2 9/16″	1 13/16″	13/16″	13/16″	1 7/8″	2 9/16″	2 13/16″	3″	2 9/16″	2 7/8″	3 1/16″	4 1/4″	4 1/2″	4 11/16″											
(Unit 3) Girders 1 & 2	4 1/8″	4 1/16″	3 5/16″	2 13/16″	2 13/16″	2 11/16″	2 3/4″	3 1/4″	3 13/16″	3 3/16″	2 1/4″	2 1/4″	3 3/16″	3 15/16″	4″	4 1/16″	4″	4 3/16″	4 1/4″	4 1/4″	3 11/16″	2 13/16″	2 13/16″	3 3/4″	4 7/16″	3 7/8″	3 7/16″	3 5/16″	3 1/2″	3 1/2″	4 1/16″	4 13/16″	4 13/16″
(Unit 4) Girders 1 & 2	4 15/16″	4 7/8″	4 1/8″	3 9/16″	3 9/16″	3 3/8″	3 7/16″	3 15/16″	4 7/16″	3 13/16″	2 13/16″	2 13/16″	3 13/16″	4 9/16″	4 5/8″	4 11/16″	4 11/16″	4 13/16″	4 15/16″	5″	4 3/8″	3 9/16″	3 9/16″	4 5/8″	5 1/2″	5 1/16″	4 3/4″	4 13/16″	5 1/8″	5 5/16″	6″	6 15/16″	7 1/8″

ESTIMATED HAUNCH - UNITS NO. 1, 3 & 4

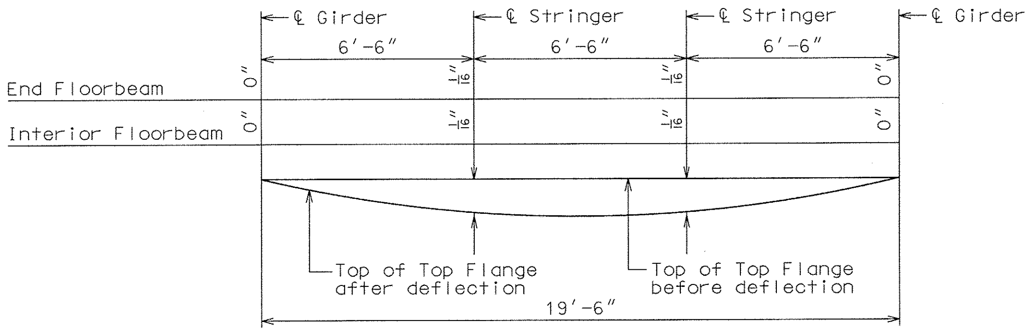
(Field Verify)



Approach Stringers	0″	0″	1/16″	0″	0″	0″	0″	0″	0″	0″	0″	0″	0″

STRINGER DEAD LOAD DEFLECTION - UNITS NO. 1, 3 & 4

Notes: Dead load deflection includes weight of concrete slab. Local deflections have been shown. Deflections are additive to the local floorbeam deflections and girder deflections. Staged construction effects have not been included in the deflections shown.


℄ Girder
℄ Stringer
℄ Stringer
℄ Girder
6′-6″
6′-6″
6′-6″
Top of Top Flange after deflection
Top of Top Flange before deflection
19′-6″

End Floorbeam	0″	1/16″	1/16″	0″
Interior Floorbeam	0″	1/16″	1/16″	0″

FLOORBEAM DEAD LOAD DEFLECTION - UNITS NO 1, 3 & 4

Notes: Dead load deflection includes weight of concrete slab. Local deflections have been shown. Deflections are additive to the girder deflections. Staged construction effects have not been included in the deflections shown.

Theoretical Bottom of Slab Elevations at ℄ of Girder (Prior to Forming for Slab) ✱✱

Unit	Span		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
Unit 1	Span No. 1 (131′-8¼″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	934.09	934.76	935.42	936.08	936.72	937.36	938.00	938.62	939.25	939.88	940.51
	Span No. 2 (132′-1⅛″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	940.51	941.16	941.82	942.47	943.13	943.78	944.43	945.06	945.69	946.31	946.93
Unit 3	Span No. 5 (132′-2⅛″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	946.90	946.29	945.67	945.04	944.41	943.76	943.11	942.45	941.79	941.13	940.47
	Span No. 6 (133′-0⅛″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	940.47	939.82	939.18	938.54	937.90	937.26	936.61	935.96	935.30	934.65	934.01
	Span No. 7 (132′-2⅝″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	934.01	933.38	932.76	932.14	931.51	930.87	930.23	929.58	928.92	928.25	927.58
Unit 4	Span No. 8 (132′-1½″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	927.50	926.89	926.27	925.65	925.01	924.37	923.72	923.06	922.40	921.74	921.08
	Span No. 9 (133′-0⅛″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	921.08	920.43	919.79	919.15	918.51	917.86	917.21	916.56	915.91	915.26	914.61
	Span No. 10 (131′-9¼″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	914.61	913.99	913.38	912.77	912.15	911.52	910.89	910.25	909.60	908.94	908.28

✱✱ Elevations are based on a constant slab thickness of 8″ and include allowance for theoretical dead load deflections for staged construction due to weight of slab and barrier curb.

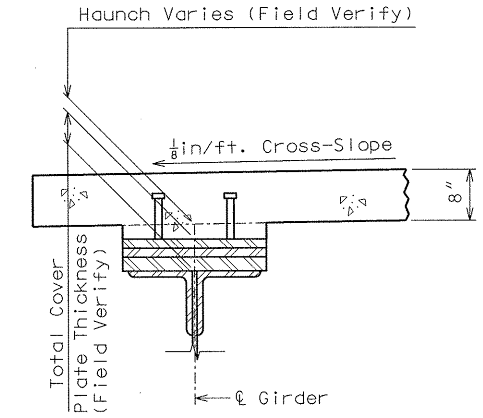
Notes:
No payment will be made for any adjustment in forming or additional concrete required for variation in haunching.

Span Lengths are Horizontal Dimensions Based on Survey Data.

Total Top Cover Plate Thickness (in.)

Unit	Span		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
Unit 1	Span No. 1 (131′-8¼″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	0.000	0.000	0.000	1.000	1.000	1.000	0.500	0.500	0.500	1.000	2.000
	Span No. 2 (132′-1⅛″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	2.000	1.000	0.500	0.500	0.500	1.000	1.000	1.000	0.000	0.000	0.000
Unit 3	Span No. 5 (132′-2⅛″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	0.000	0.000	0.625	1.125	1.125	1.125	1.125	0.625	0.000	0.625	1.625
	Span No. 6 (133′-0⅛″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	1.625	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	1.625
	Span No. 7 (132′-2⅝″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	1.625	0.625	0.000	0.625	1.125	1.125	1.125	1.125	0.625	0.000	0.000
Unit 4	Span No. 8 (132′-1½″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	0.000	0.000	0.625	1.125	1.125	1.125	1.125	0.625	0.000	0.625	1.625
	Span No. 9 (133′-0⅛″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	1.625	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	1.625
	Span No. 10 (131′-9¼″ ℄ Brg - ℄ Brg.)	Girders 1 & 2	1.625	0.625	0.000	0.625	1.125	1.125	1.125	1.125	0.625	0.000	0.000

Span Lengths are Horizontal Dimensions Based on Survey Data.


Haunch Varies (Field Verify)
1/8 in/ft. Cross-Slope
8″
Total Cover Plate Thickness (Field Verify)
℄ Girder

HAUNCH DETAIL - UNITS NO. 1,3 & 4

DEAD LOAD DEFLECTION AND SLAB ELEVATIONS - UNIT NO. 1, 3 & 4

Detailed April 2009
Checked April 2009

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

Sheet No. 33 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

Cory Imhoff

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO

DISTRICT	SHEET NO.
BR	33

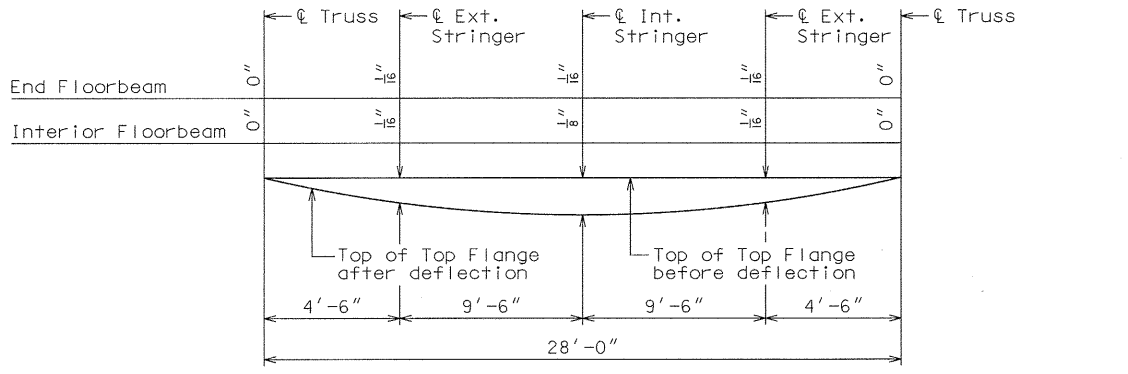
COUNTY: ATCHISON
JOB NO.: J1P2161
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: L00982

DESCRIPTION
DATE

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

MoDOT

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



FLOORBEAM DEAD LOAD DEFLECTION - UNIT NO. 2

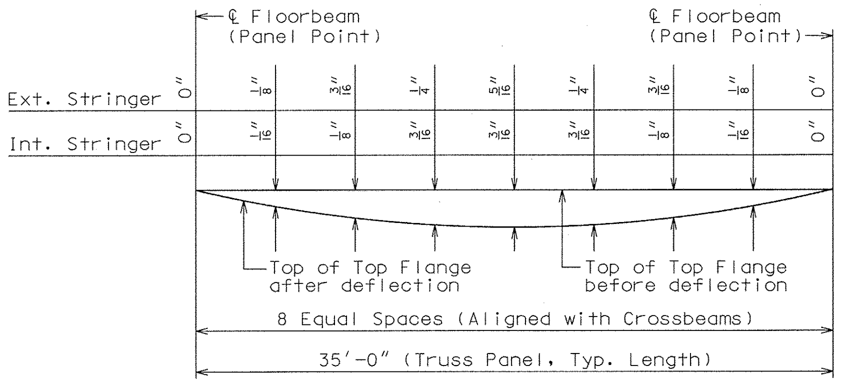
Notes: Dead load deflection includes weight of concrete slab and barrier curbs.
The barrier weight has been included in the exterior stringers defections only.
Local deflections have been shown. Deflections are additive to the truss deflections.

Theoretical Bottom of Slab Elevations at ℄ of Floorbeam & ℄ Bridge (Prior to Forming for Slab) ✱✱														
Unit 2		Span No. 3 (419′-10¾″ ℄ Brg - ℄ Brg.)												
		L0	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
	Trusses 1 & 2	947.11	948.74	950.12	951.27	952.16	952.80	953.19	953.44	953.63	953.77	953.86	953.91	953.91
		Span No. 4 (419′-10⅝″ ℄ Brg - ℄ Brg.)												
		L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24
	Trusses 1 & 2	953.91	953.91	953.86	953.77	953.63	953.44	953.18	952.78	952.13	951.24	950.10	948.71	947.08

✱✱ Elevations are based on a constant slab thickness of 7 1/2″ and include allowance for theoretical dead load deflections for staged construction due to weight of slab and barrier curb.

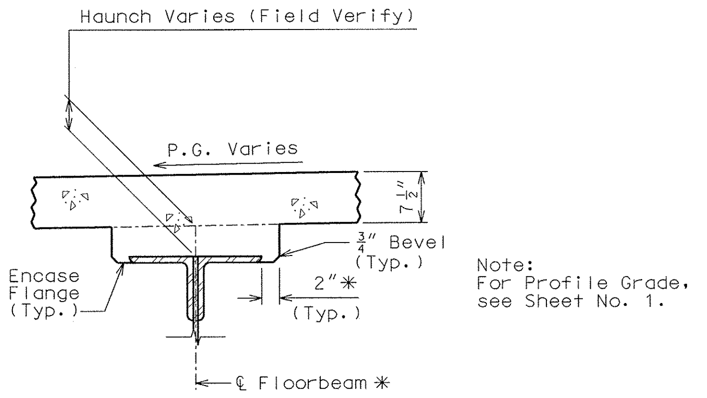
Notes:
No payment will be made for any adjustment in forming or additional concrete required for variation in haunching.

Span Lengths are Horizontal Dimensions based on Survey Data.


℄ Floorbeam (Panel Point)
℄ Floorbeam (Panel Point)
Ext. Stringer
0″
1/8″
3/16″
1/4″
5/16″
1/4″
3/16″
1/8″
0″
Int. Stringer
0″
1/16″
1/8″
3/16″
3/16″
3/16″
1/8″
1/16″
0″
Top of Top Flange after deflection
Top of Top Flange before deflection
8 Equal Spaces (Aligned with Crossbeams)
35′-0″ (Truss Panel, Typ. Length)

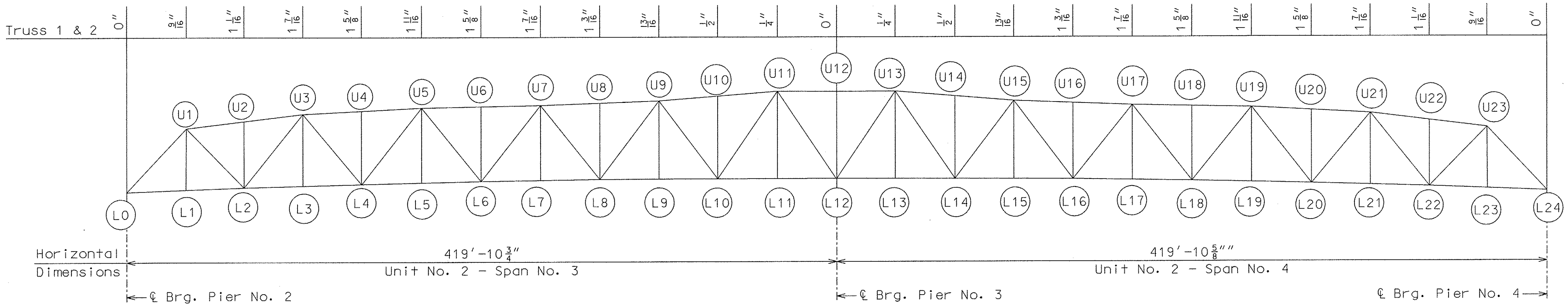
STRINGER DEAD LOAD DEFLECTION - UNIT NO. 2

Notes: Dead load deflection includes weight of concrete slab and barrier curbs.
Local defelctions have been shown. Deflections are additive to the truss deflections and local floorbeam deflections.



HAUNCH DETAIL - UNIT NO. 2

✱ Extend Haunch to bottom of Top Flange of Crossbeams as well as at all Floorbeam locations in Unit No. 2.



TRUSS DEAD LOAD DEFLECTION - UNIT NO. 2

Notes: Dead load deflection includes weight of concrete slab and barrier curbs.
Staged construction effects have been included in the deflections shown.

DEAD LOAD DEFLECTION AND SLAB ELEVATIONS - UNIT NO. 2

Detailed April 2009
Checked April 2009

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

Sheet No. 34 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	5-21-09
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	34
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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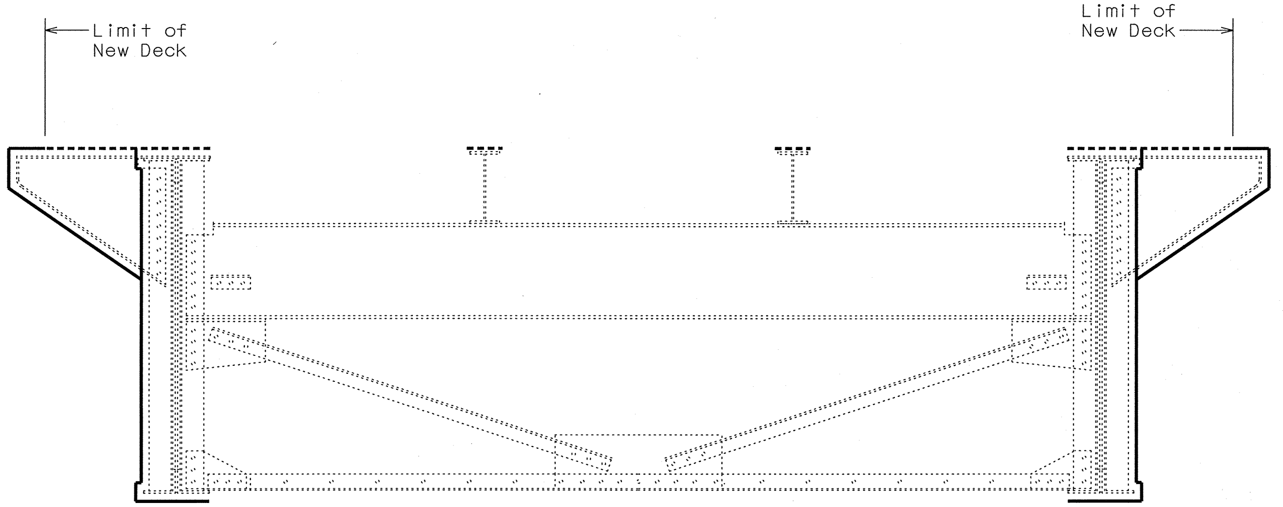
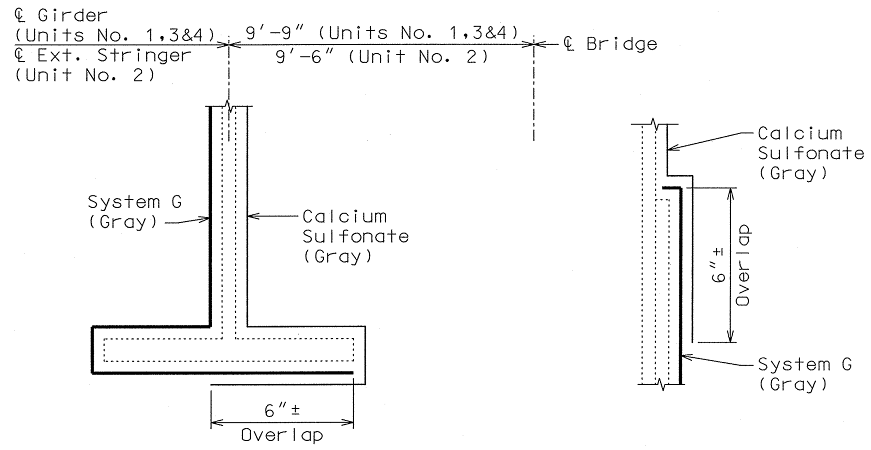
——— Limit of Surface Preparation for Recoating Structural Steel and Repaint with System G (Gray).

------- Limit of Surface Preparation for Recoating Structural Steel and coating with zinc rich primer prior to deck placement.

Remaining Structural Steel shall be prepared and overcoated with Calcium Sulfonate (Gray).

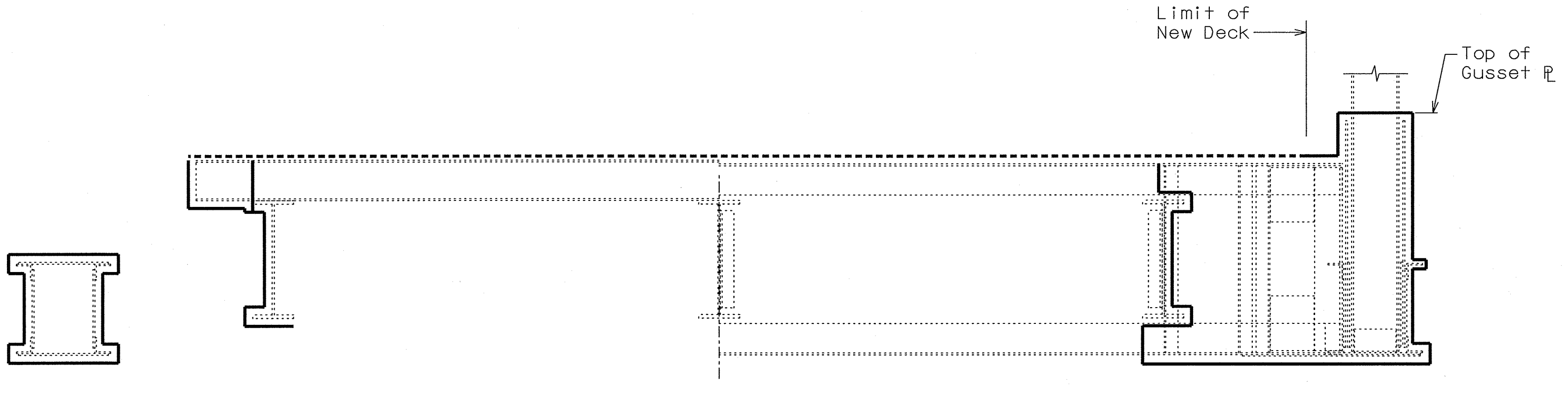


SECTION THRU UNITS NO. 1, 3 & 4
(Deck Not Shown for Clarity)



BOTTOM FLANGE EXT. GIRDER OR STRINGER **OTHER LOCATIONS**

PAINTING SYSTEM OVERLAP DETAIL



HALF SECTION NEAR MID-PANEL **HALF SECTION NEAR FLOORBEAM**

SECTION THRU UNIT NO. 2
(Deck Not Shown for Clarity)

Notes:

Approach Spans (Units No. 1, 3 & 4):

Prepare the exterior face of the girders, to the limits shown, to include the support brackets, in accordance with the requirements of Sec 1081 for Surface Preparation for Recoating Structural Steel and repaint with System G (Gray).

Additionally, all structural steel within 15' of the expansion joints at the East and West Abutments and at Pier Nos. 2 and 4 and 15' each side of Pier No. 7 shall be prepared in accordance with Sec 1081 for Surface Preparation for Recoating Structural Steel and repainted with System G (Gray).

Through Truss Spans (Unit No. 2):

Prepare the truss and floor system below the top of the bottom gusset plates and outside of the exterior stringer to the limits shown in accordance with the requirements of Sec 1081 for Surface Preparation for Recoating Structural Steel and repaint with System G (Gray). This area shall include all interior surfaces of the bottom chord as well as the surfaces of the verticals, diagonals and gusset plates inside each lower truss joint.

Additionally, all structural steel within 15' of the expansion joints at Piers No. 2 and 4 and within 15' to each side of the expansion joints at panel point L4, L8, L16 and L20 shall be prepared in accordance with Sec 1081 for Surface Preparation for Recoating Structural Steel and repainted with System G (Gray).

Structural Steel Repairs:

All new material used to complete structural steel repairs as detailed in these plans shall be coated with System G (Gray).

All faces of existing structural steel exposed during the repairs as detailed in these plans shall be cleaned of all loose material by the best method available and as directed by the engineer and coated with zinc rich primer prior to being reassembled.

All existing structural steel not coated with System G shall be treated with a rust penetrating sealer where needed and a prime coat and top coat of Calcium Sulfonate (Gray).

See General Notes and Missouri Standard Specifications for additional details of System G and Calcium Sulfonate coatings.

PAINTING LIMIT DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 35 of 57

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CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-27-09

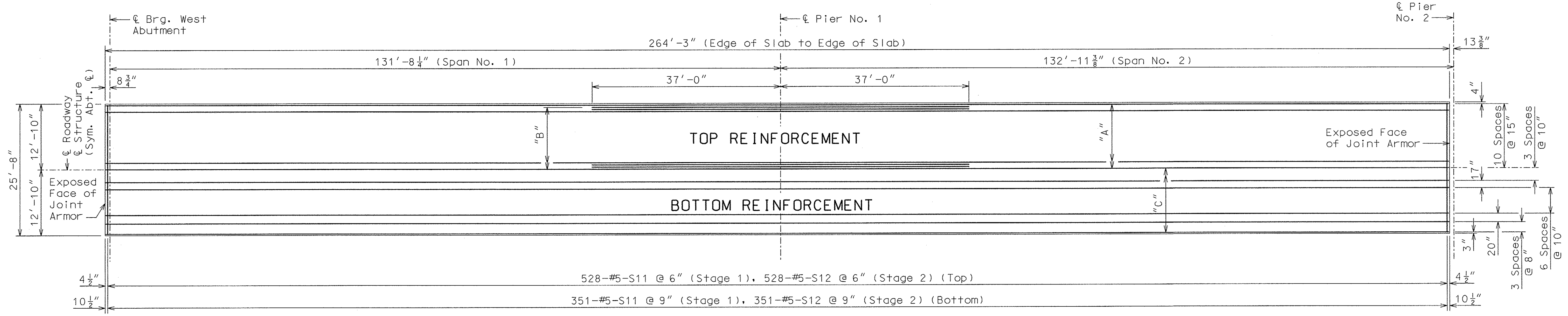
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	35

COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO. L00982

DESCRIPTION	DATE

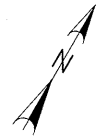
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

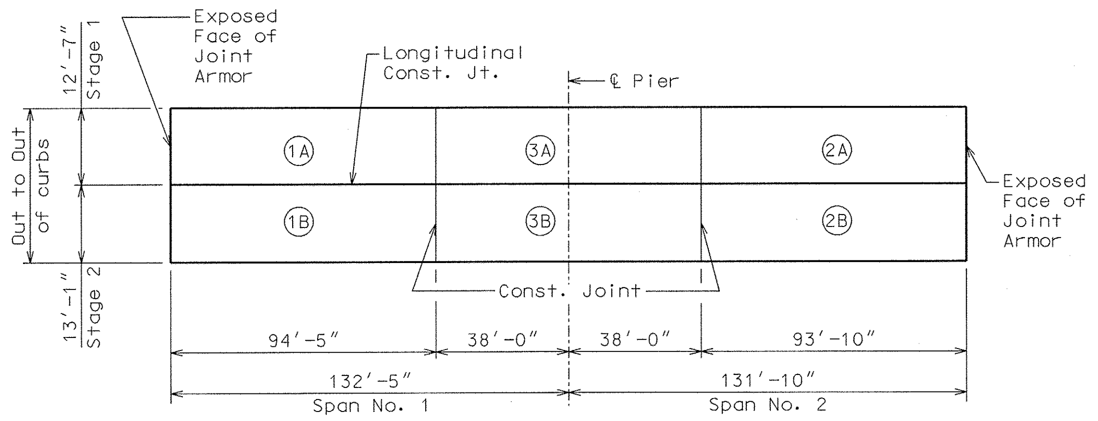


PLAN - UNIT NO. 1

Construction Joints not shown for clarity, see Slab Pouring Sequence.



Longitudinal Slab Reinforcing		
"A"	21-#5-S14	Spa. as Shown 5 Units @ 55'-5" Min. Lap = 3'-3"
"B"	40-#6-S15 and 40-#6-S16	@ 5" Between #5-S14 Alternate Splices Min. Lap = 3'-10"
"C"	29-#5-S13	Spa. as Shown 5 Units @ 54'-11" Min. Lap = 2'-7"



<table>
<tr><td rowspan="2"></td><td colspan="3">Sequence of Pours</td><td colspan="2">Min. rate of pour cu. yds./hr.</td></tr>
<tr><td colspan="3">Direction</td><td>With retarder</td><td>No retarder</td></tr>
<tr><td rowspan="2">Basic sequence</td><td>1</td><td>2</td><td>3</td><td rowspan="2">25</td><td rowspan="2">25</td></tr>
<tr><td colspan="3">Either direction</td></tr>
<tr><td colspan="6">Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.</td></tr>
<tr><td rowspan="2">Alternate "A" pours</td><td>1</td><td colspan="2">3 + 2</td><td rowspan="2">25</td><td rowspan="2">25</td></tr>
<tr><td>End to 3</td><td colspan="2">1 to End</td></tr>
<tr><td rowspan="2">Alternate "B" pours</td><td colspan="3">1 + 3 + 2</td><td rowspan="2">25</td><td rowspan="2">25</td></tr>
<tr><td colspan="3">End to End</td></tr>
</table>

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE - UNIT NO. 1

Notes:
The contractor shall use a mechanical bar splice for #5-S11 & #5-S12 bars at the specified location during Stage 2 Construction. 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 of any additional bar lengths required for the mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706.

For details of Strip Seal at the West Abutment, see Sheet No. 41.

For details of Strip Seal at Pier No. 7, see Sheet No. 44.

For details of Slab Drains, see Sheet No. 45 & 46.

For Typical Section, see Sheet No. 40.

All dimensions are horizontal. Longitudinal dimensions are based on 2 1/2" expansion gap at 60° near the West Abutment and Pier No. 2.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the strip seal expansion joint.

PART PLAN OF SLAB SHOWING REINFORCEMENT - UNIT NO. 1

Detailed April 2009
Checked April 2009

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

Sheet No. 36 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669
Cory Imhoff

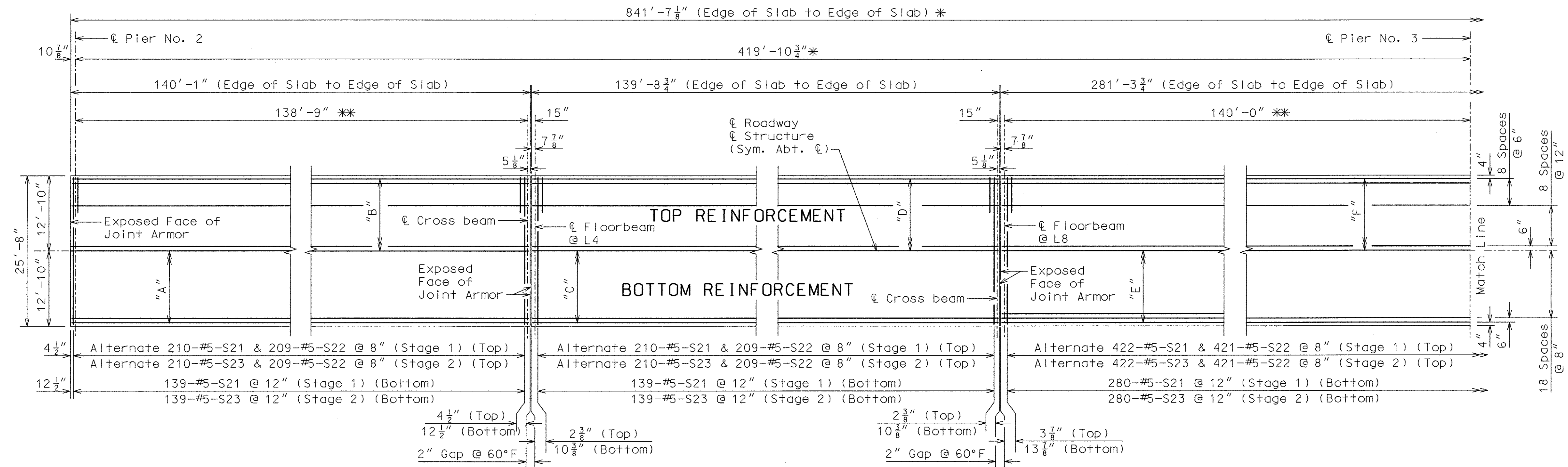
DATE PREPARED	5-21-09
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	36
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DESCRIPTION

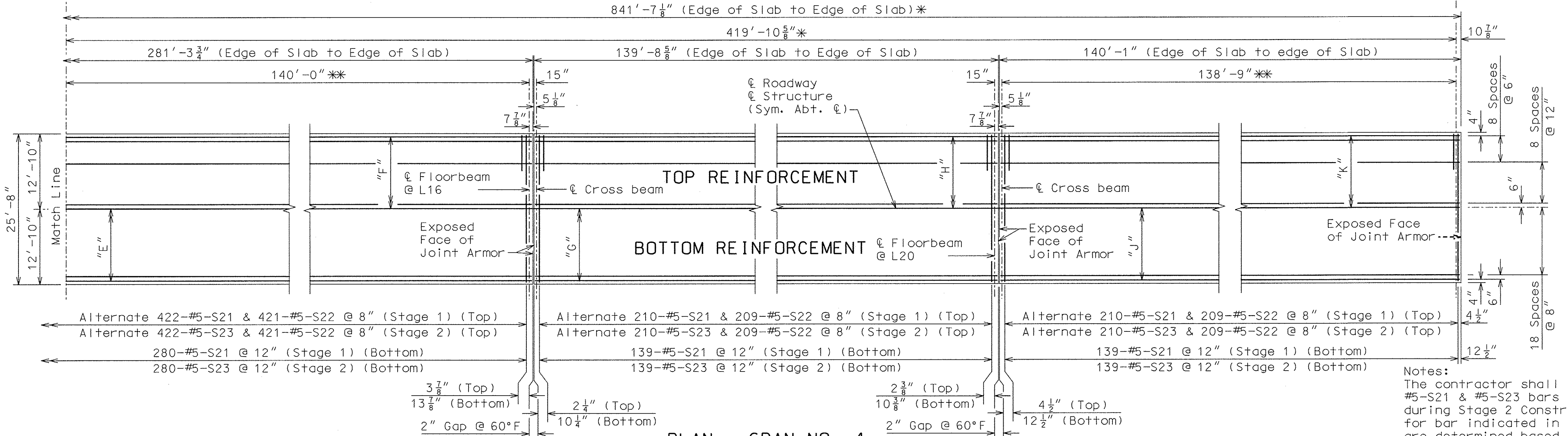
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

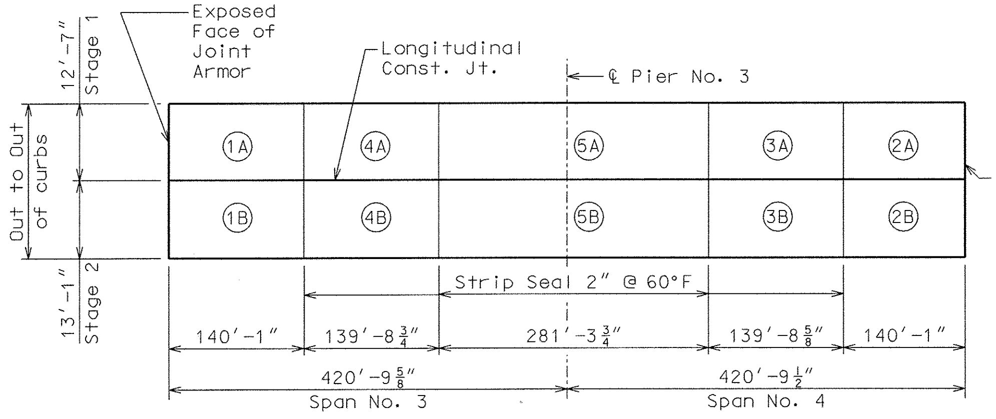

841'-7 1/8" (Edge of Slab to Edge of Slab) *
℄ Pier No. 2
℄ Pier No. 3
10 7/8"
419'-10 3/4" *
140'-1" (Edge of Slab to Edge of Slab)
139'-8 3/4" (Edge of Slab to Edge of Slab)
281'-3 3/4" (Edge of Slab to Edge of Slab)
138'-9" **
15"
15"
140'-0" **
7 7/8"
7 7/8"
5 1/8"
5 1/8"
℄ Roadway
℄ Structure
(Sym. Abt. ℄)
8 Spaces @ 6"
8 Spaces @ 12"
4"
6"
Match Line
25'-8"
12'-10"
12'-10"
Exposed Face of Joint Armor
"B"
℄ Cross beam
℄ Floorbeam @ L4
TOP REINFORCEMENT
"D"
℄ Floorbeam @ L8
"F"
"A"
Exposed Face of Joint Armor
"C"
BOTTOM REINFORCEMENT
℄ Cross beam
Exposed Face of Joint Armor
"E"
4 1/2"
12 1/2"
Alternate 210-#5-S21 & 209-#5-S22 @ 8" (Stage 1) (Top)
Alternate 210-#5-S23 & 209-#5-S22 @ 8" (Stage 2) (Top)
139-#5-S21 @ 12" (Stage 1) (Bottom)
139-#5-S23 @ 12" (Stage 2) (Bottom)
Alternate 210-#5-S21 & 209-#5-S22 @ 8" (Stage 1) (Top)
Alternate 210-#5-S23 & 209-#5-S22 @ 8" (Stage 2) (Top)
139-#5-S21 @ 12" (Stage 1) (Bottom)
139-#5-S23 @ 12" (Stage 2) (Bottom)
Alternate 422-#5-S21 & 421-#5-S22 @ 8" (Stage 1) (Top)
Alternate 422-#5-S23 & 421-#5-S22 @ 8" (Stage 2) (Top)
280-#5-S21 @ 12" (Stage 1) (Bottom)
280-#5-S23 @ 12" (Stage 2) (Bottom)
4 1/2" (Top)
12 1/2" (Bottom)
2 3/4" (Top)
10 3/4" (Bottom)
2" Gap @ 60°F
2 3/8" (Top)
10 3/8" (Bottom)
3 7/8" (Top)
13 7/8" (Bottom)
2" Gap @ 60°F
4"
6"
18 Spaces @ 8"

PLAN - SPAN NO. 3


℄ Pier No. 3
℄ Pier No. 4
841'-7 1/8" (Edge of Slab to Edge of Slab) *
419'-10 5/8" *
10 7/8"
281'-3 3/4" (Edge of Slab to Edge of Slab)
139'-8 5/8" (Edge of Slab to Edge of Slab)
140'-1" (Edge of Slab to edge of Slab)
140'-0" **
15"
15"
138'-9" **
5 1/8"
5 1/8"
7 7/8"
7 7/8"
℄ Roadway
℄ Structure
(Sym. Abt. ℄)
8 Spaces @ 6"
8 Spaces @ 12"
4"
6"
25'-8"
12'-10"
12'-10"
Match Line
"F"
℄ Floorbeam @ L16
℄ Cross beam
TOP REINFORCEMENT
"H"
℄ Cross beam
"K"
"E"
Exposed Face of Joint Armor
"G"
BOTTOM REINFORCEMENT
℄ Floorbeam @ L20
Exposed Face of Joint Armor
"J"
Exposed Face of Joint Armor
Alternate 422-#5-S21 & 421-#5-S22 @ 8" (Stage 1) (Top)
Alternate 422-#5-S23 & 421-#5-S22 @ 8" (Stage 2) (Top)
280-#5-S21 @ 12" (Stage 1) (Bottom)
280-#5-S23 @ 12" (Stage 2) (Bottom)
Alternate 210-#5-S21 & 209-#5-S22 @ 8" (Stage 1) (Top)
Alternate 210-#5-S23 & 209-#5-S22 @ 8" (Stage 2) (Top)
139-#5-S21 @ 12" (Stage 1) (Bottom)
139-#5-S23 @ 12" (Stage 2) (Bottom)
Alternate 210-#5-S21 & 209-#5-S22 @ 8" (Stage 1) (Top)
Alternate 210-#5-S23 & 209-#5-S22 @ 8" (Stage 2) (Top)
139-#5-S21 @ 12" (Stage 1) (Bottom)
139-#5-S23 @ 12" (Stage 2) (Bottom)
3 7/8" (Top)
13 7/8" (Bottom)
2 1/4" (Top)
10 1/4" (Bottom)
2" Gap @ 60°F
2 3/8" (Top)
10 3/8" (Bottom)
4 1/2" (Top)
12 1/2" (Bottom)
2" Gap @ 60°F
4 1/2"
12 1/2"
4"
6"
18 Spaces @ 8"

PLAN - SPAN NO. 4

Longitudinal Slab Reinforcing	
"A"	39-#5-S24 Spa. as Shown 3 Units @ 48'-4" Min. Lap = 2'-7"
"B"	34-#5-S24 Spa. as Shown 3 Units @ 48'-4" Min. Lap = 2'-7"
"C"	39-#5-S25 Spa. as Shown 3 Units @ 48'-3" Min. Lap = 2'-7"
"D"	34-#5-S25 Spa. as Shown 3 Units @ 48'-3" Min. Lap = 2'-7"
"E"	39-#5-S26 Spa. as Shown 5 Units @ 58'-4" Min. Lap = 2'-7"
"F"	34-#5-S26 Spa. as Shown 5 Units @ 58'-4" Min. Lap = 2'-7"
"G"	39-#5-S25 Spa. as Shown 3 Units @ 48'-3" Min. Lap = 2'-7"
"H"	34-#5-S25 Spa. as Shown 3 Units @ 48'-3" Min. Lap = 2'-7"
"J"	39-#5-S24 Spa. as Shown 3 Units @ 48'-4" Min. Lap = 2'-7"
"K"	34-#5-S24 Spa. as Shown 3 Units @ 48'-4" Min. Lap = 2'-7"



	Sequence of Pours					Min. rate of pour cu. yds./hr.	
	Direction					With retarder	No retarder
Basic sequence	1	2	3	4	5	26	43
	Either direction						
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.							

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE - UNIT NO. 2

* - Dimension taken from January 2009 Survey

** - Dimension taken from As-Built Plans

Notes:

The contractor shall use a mechanical bar splice for #5-S21 & #5-S23 bars at the specified location during Stage 2 Construction. The total bar lengths for bar 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.

For details of Strip Seal at Pier No. 2 and 4, see Sheet No. 42.

For details of Strip Seal at Floorbeams L4, L8, L16, and L20 see Sheet No. 43.

For details of Slab Drains, see Sheet No. 45 & 46.

For Typical Section, see Sheet No. 40.

All dimensions are horizontal. Longitudinal dimensions are based on 2 1/2" expansion gap at 60° at Pier No. 2 and 4, and a 2" gap at Floorbeams L4, L8, L16, and L20.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the strip seal expansion joints.

PART PLAN OF SLAB SHOWING REINFORCEMENT - UNIT NO. 2

Detailed April 2009
Checked April 2009

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

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	37

COUNTY
ATCHISON

JOB NO.
J1P2161

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L00982

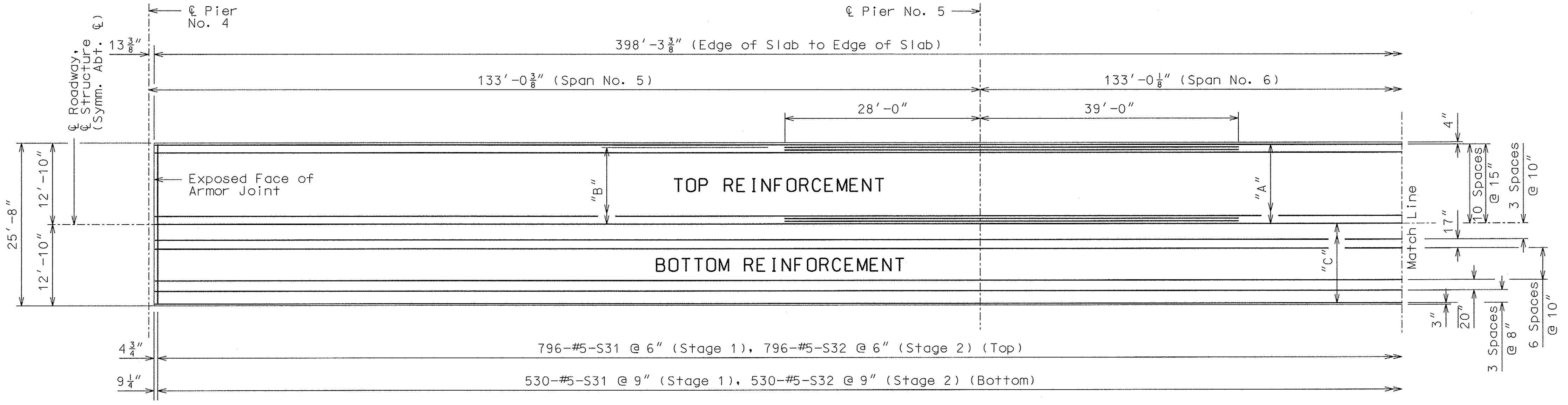
DESCRIPTION

DATE

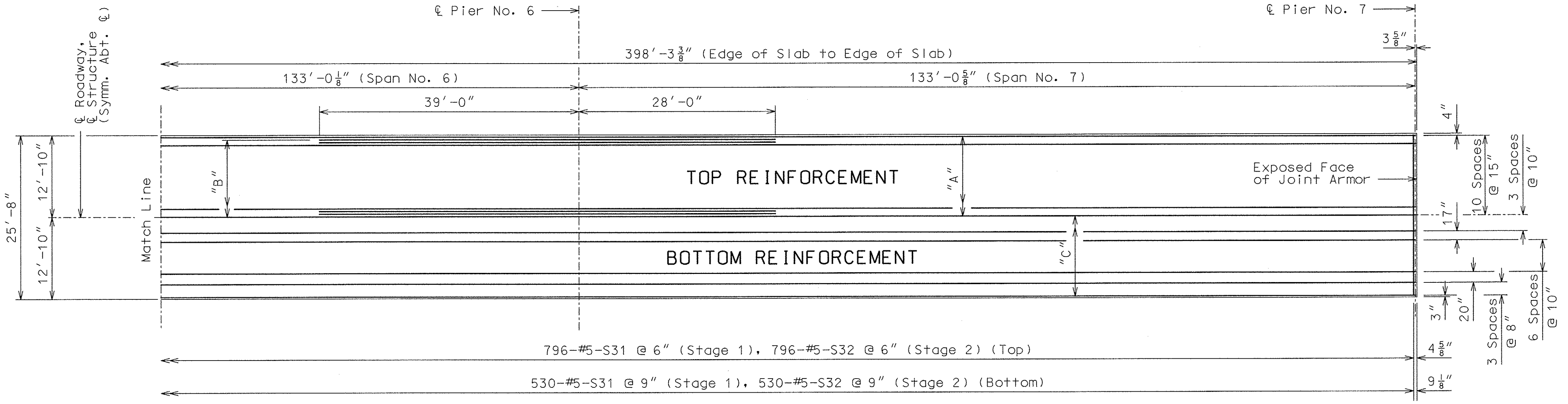
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

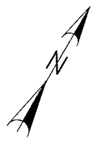


PLAN - UNIT NO. 3

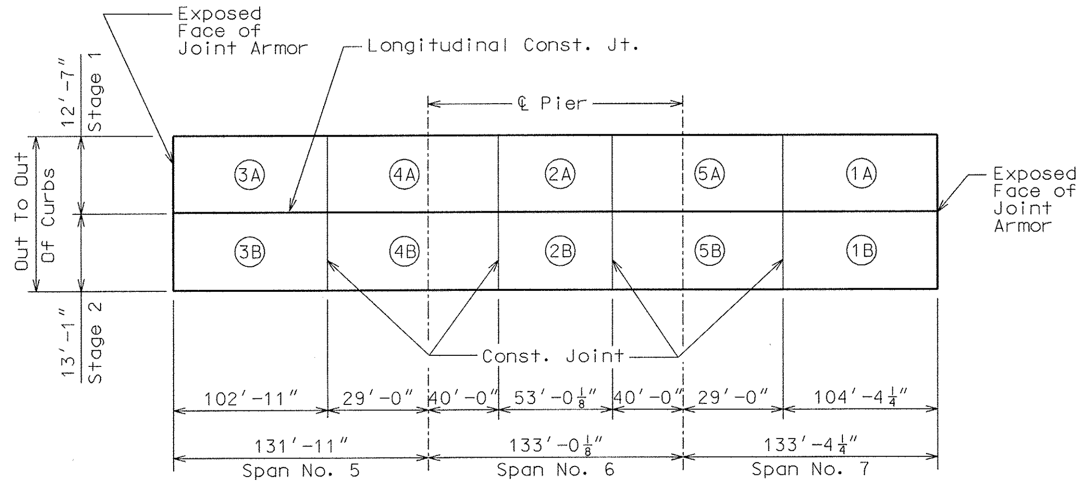


PLAN - UNIT NO. 3

Construction Joints not shown for clarity, see Slab Pouring Sequence.



Longitudinal Slab Reinforcing		
"A"	21-#5-S34	Spa. as Shown 7 Units @ 59′-8″ Min. Lap = 3′-3″
"B"	40-#6-S35 and 40-#6-S36	@ 5″ Between #5-S34 Alternate Splices Min. Lap = 3′-10″
"C"	29-#5-S33	Spa. as Shown 7 Units @ 59′-1″ Min. Lap = 2′-7″



	Sequence of Pours					Min. rate of pour cu. yds./hr.	
	Direction					With retarder	No retarder
Basic sequence	1	2	3	4	5	25	25
	Either direction						
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.							
Alternate "A" pours	1	5 + 2	4 + 3			25	25
	End to 5	1 to 4	2 to End				
Alternate "B" pours	1 + 5 + 2	4 + 3				25	25
	End to 4	2 to End					
Alternate "C" pours	1 + 5 + 2 + 4 + 3					25	25
	End to End						

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE - UNIT NO. 3

PART PLAN OF SLAB SHOWING REINFORCEMENT - UNIT NO. 3

Notes:

The contractor shall use a mechanical bar splice for #5-S31 & #5-S32 bars at the specified location during Stage 2 Construction. The total bar lengths for bar 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.

For details of Strip Seal at Pier No. 4, see Sheet No. 42.

For details of Strip Seal at Pier 7, see Sheet No. 44.

For details of Slab Drains, see Sheet No. 46.

For Typical Section, see Sheet No. 40.

All dimensions are horizontal.
Longitudinal dimensions are based on 2 1/2″ expansion gap at 60° at Piers No. 4 and 7.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1″ from vertical leg of the steel armor at the strip seal expansion joint.

Detailed April 2009
Checked April 2009

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

Sheet No. 38 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

Cory Imhoff

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 38
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DATE	DESCRIPTION

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

MoDOT

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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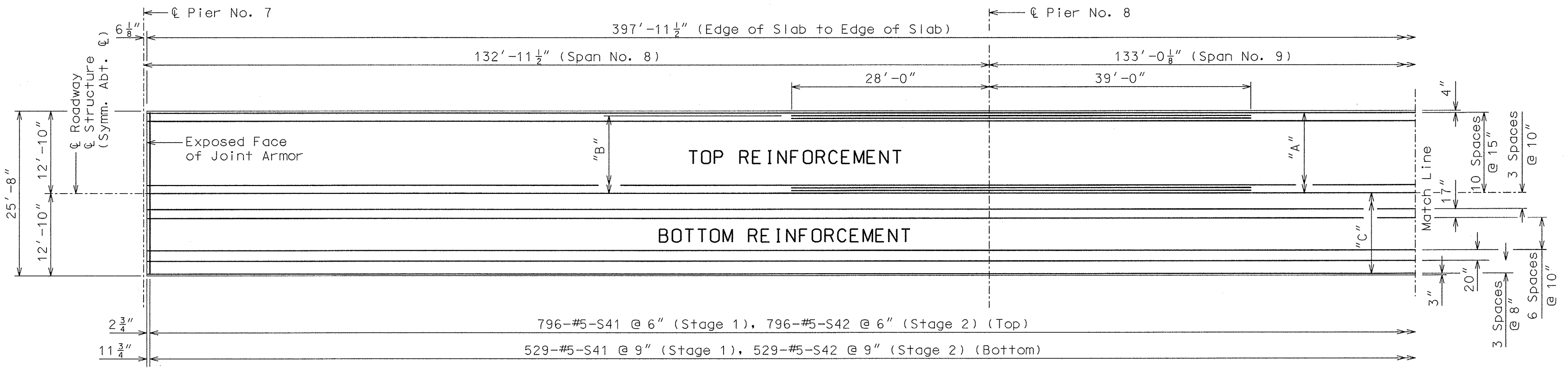
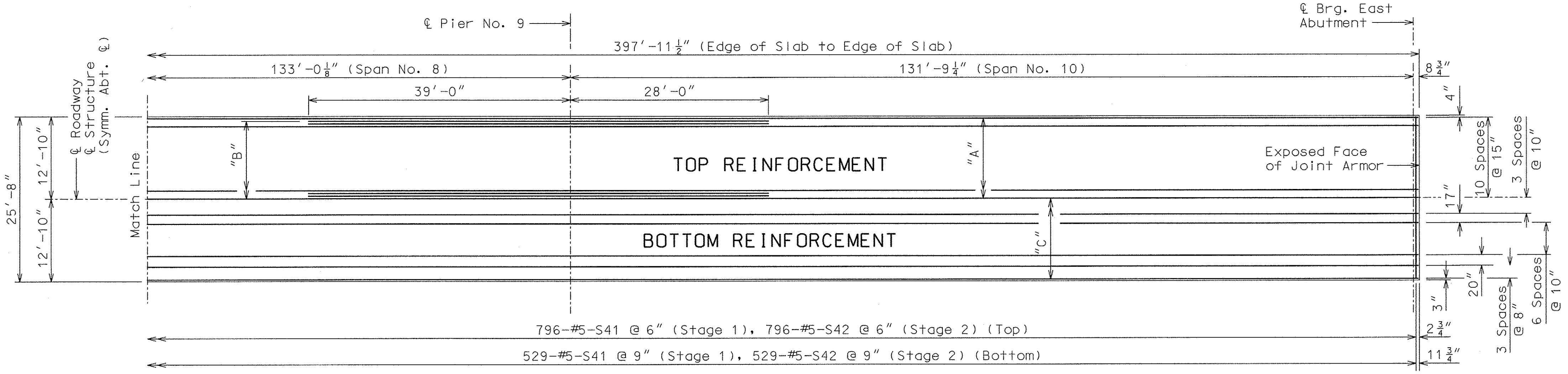


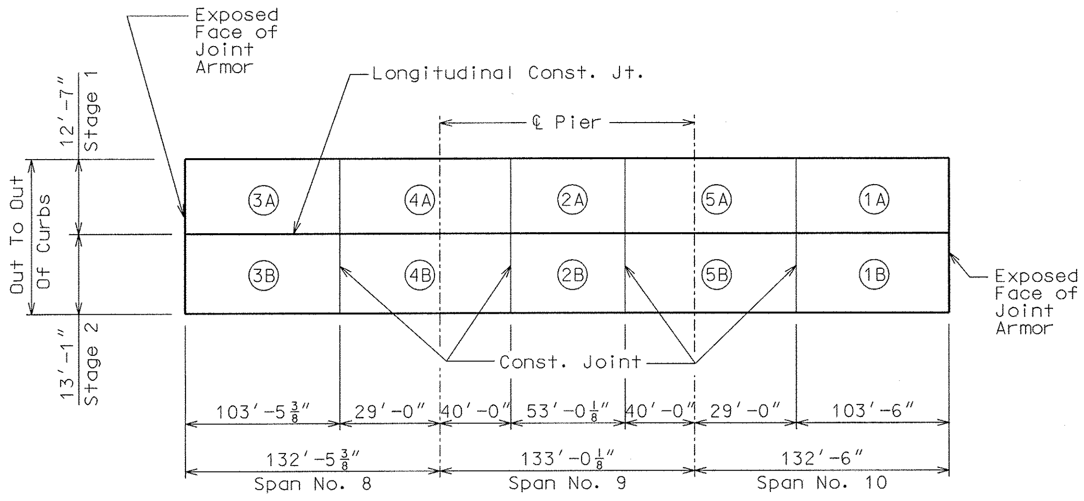
PLAN - UNIT NO. 4



PLAN - UNIT NO. 4

Construction Joints not shown for clarity, see Slab Pouring Sequence.

Longitudinal Slab Reinforcing		
"A"	21-#5-S44	Spa. as Shown 7 Units @ 59'-8" Min. Lap = 3'-3"
"B"	40-#6-S45 and 40-#6-S46	@ 5" Between #5-S44 Alternate Splices Min. Lap = 3'-10"
"C"	29-#5-S43	Spa. as Shown 7 Units @ 59'-1" Min. Lap = 2'-7"



	Sequence of Pours					Min. rate of pour cu. yds./hr.	
	Direction					With retarder	No retarder
Basic sequence	1	2	3	4	5	25	25
	Either direction						
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.							
Alternate "A" pours	1	5 + 2	4 + 3			25	25
	End to 5	1 to 4	2 to End				
Alternate "B" pours	1 + 5 + 2	4 + 3				25	25
	End to 4	2 to End					
Alternate "C" pours	1 + 5 + 2 + 4 + 3					25	25
	End to End						

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE - UNIT NO. 4

Notes:
The contractor shall use a mechanical bar splice for #5-S41 & #5-S42 bars at the specified location during Stage 2 Construction. The total bar lengths for bar 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.

For details of Strip Seal at Pier No. 7, see Sheet No. 44.

For details of Strip Seal at East Abutment, see Sheet No. 41.

For details of Slab Drains, see Sheet No. 46.

For Typical Section, see Sheet No. 40.

All dimensions are horizontal.
Longitudinal dimensions are based on 2 1/2" expansion gap at 60° at Pier No. 7 and the East Abutment.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the strip seal expansion joint.

PART PLAN OF SLAB SHOWING REINFORCEMENT - UNIT NO. 4

Detailed April 2009
Checked April 2009

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

Sheet No. 39 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669
Cory Imhoff

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	39

COUNTY
ATCHISON

JOB NO.
J1P2161

CONTRACT ID.

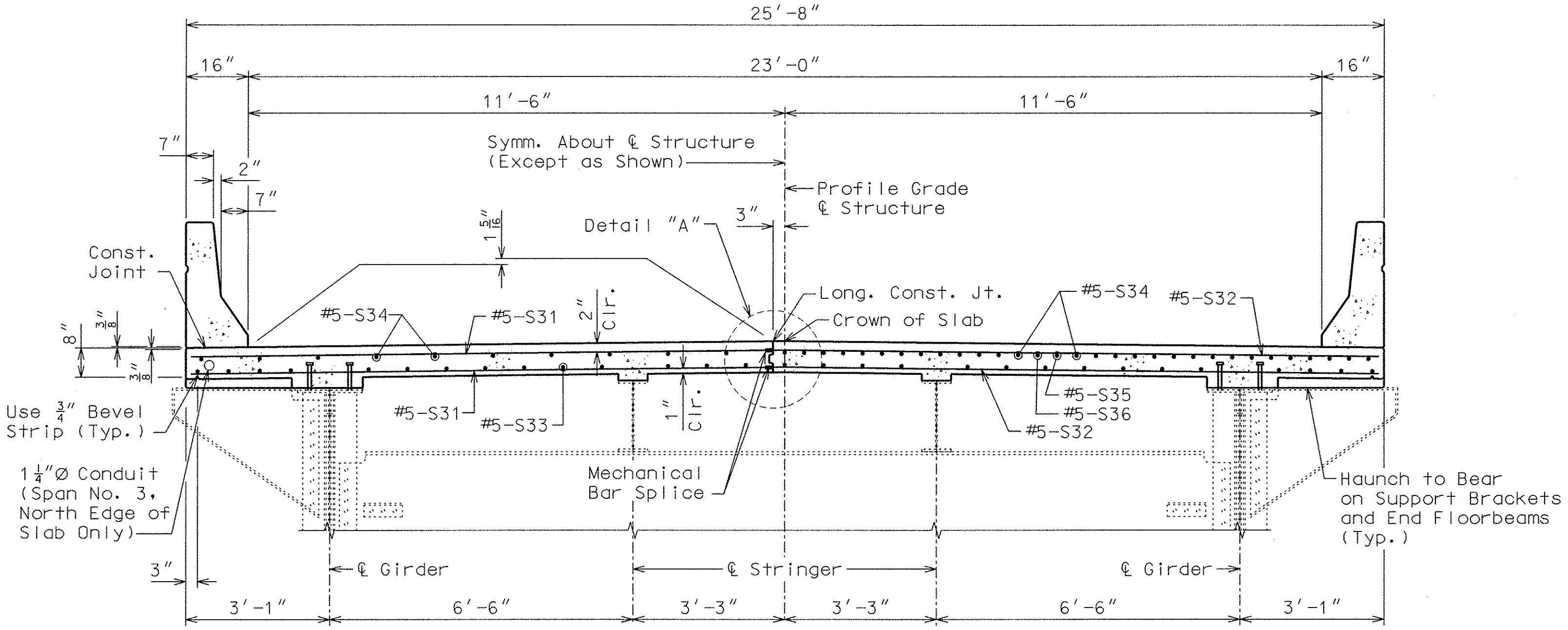
PROJECT NO.

BRIDGE NO.
L00982

DESCRIPTION
DATE

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

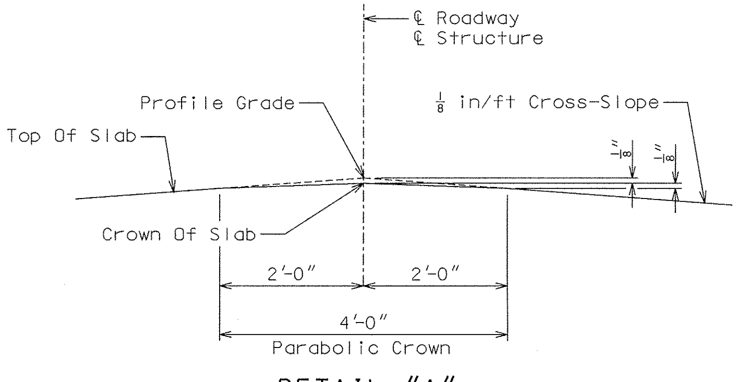
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



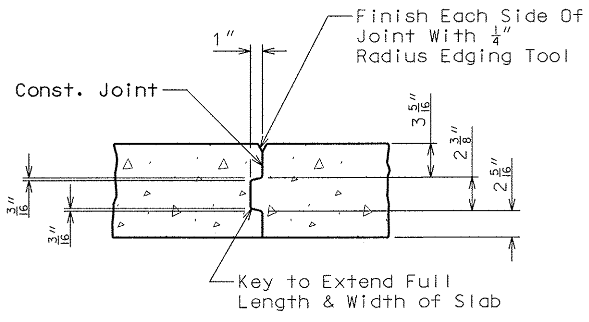
HALF SECTION NEAR ℄ SPAN HALF SECTION NEAR PIER

TYPICAL SECTION THRU UNIT NOS. 1, 3 & 4

(Unit No. 3 Shown, Units No. 1 & 4 Similar)

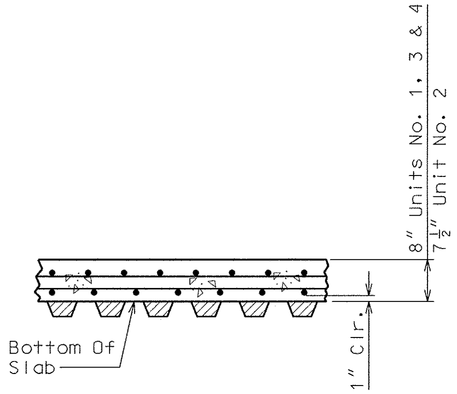


DETAIL "A"

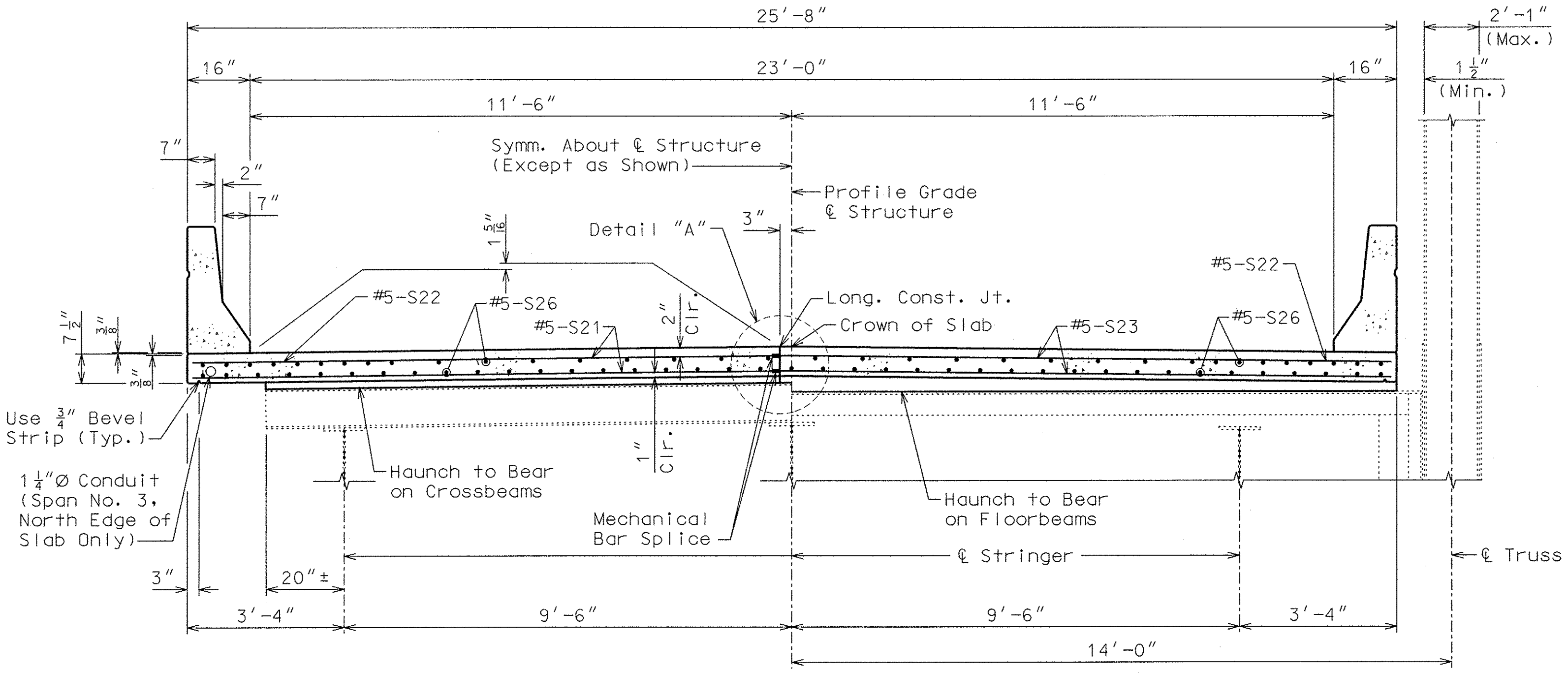

Finish Each Side Of Joint With $\frac{1}{4}$″ Radius Edging Tool
1″
Const. Joint
$3\frac{5}{16}$″
$2\frac{3}{8}$″
$2\frac{5}{16}$″
$\frac{3}{16}$″
$\frac{3}{16}$″
Key to Extend Full Length & Width of Slab

TYPICAL C.I.P. CONST JOINT

(Units No. 1, 3 & 4 Only)
(Long. and Transverse Joints)



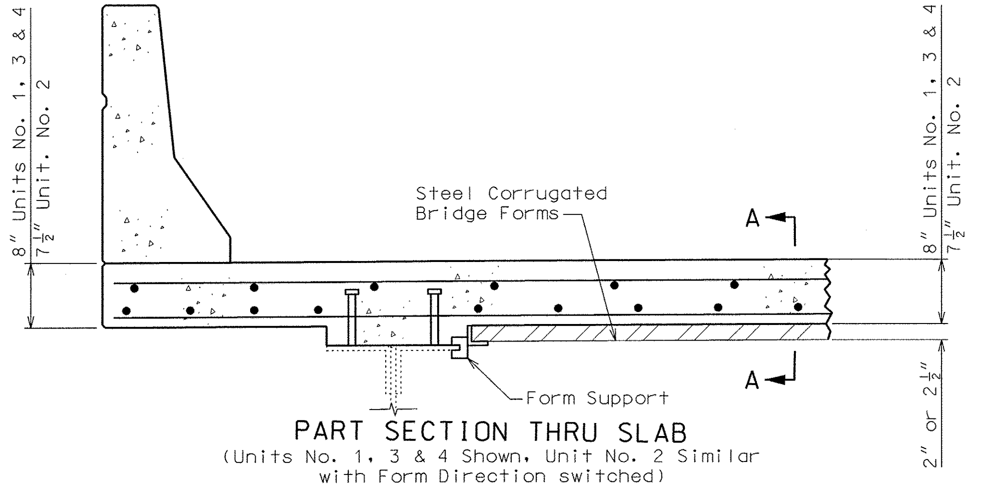
SECTION A-A



HALF SECTION NEAR ℄ PANEL HALF SECTION NEAR FLOORBEAM

TYPICAL SECTION THRU UNIT NO. 2

(Section near Pier No. 3 Shown, remainder of Unit is Similar)


8″ Units No. 1, 3 & 4
$7\frac{1}{2}$″ Unit. No. 2
Steel Corrugated Bridge Forms
A
A
Form Support
8″ Units No. 1, 3 & 4
$7\frac{1}{2}$″ Unit. No. 2
2″ or $2\frac{1}{2}$″

PART SECTION THRU SLAB

(Units No. 1, 3 & 4 Shown, Unit No. 2 Similar with Form Direction switched)

Notes:
If the contractor elects to use stay-in-place forms, the corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

The stay-in-place forms shall be a minimum of 22 gauge and shall be limited to less than 1/2″ of deflection under the weight of the wet concrete and 50 psf construction loading. (See additional notes on Sheet No. 3)

For details and reinforcement of Safety Barrier Curb, see Sheet No. 48 & 49.
For details of Slab Drains, see Sheet No. 45 & 46.
For Part Plan of Slab showing reinforcement and Slab Pouring Sequence, see Sheet No. 36 thru 39.

MISCELLANEOUS SLAB DETAILS AND TYPICAL SECTIONS

Detailed April 2009
Checked April 2009

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

Sheet No. 40 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	40
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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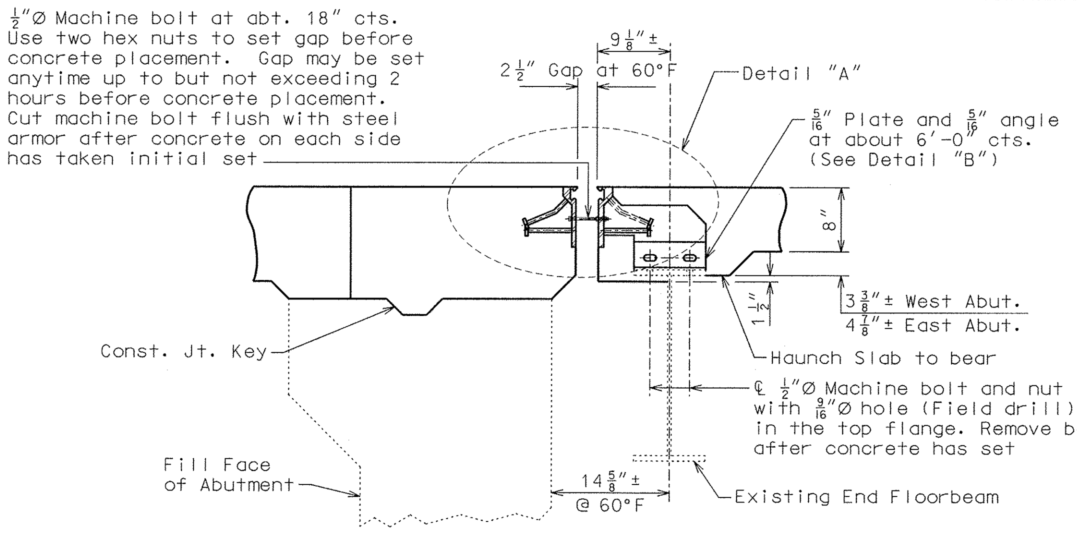
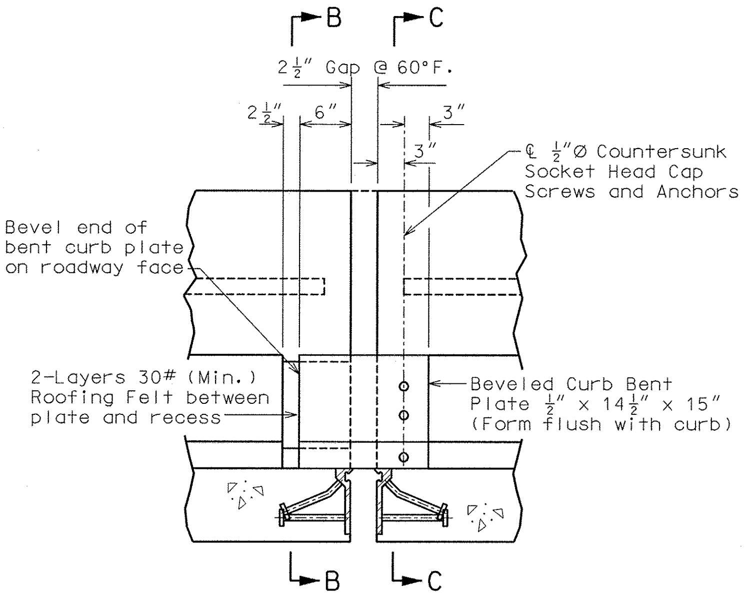

½"Ø Machine bolt at abt. 18" cts. Use two hex nuts to set gap before concrete placement. Gap may be set anytime up to but not exceeding 2 hours before concrete placement. Cut machine bolt flush with steel armor after concrete on each side has taken initial set
9⅛"±
2½" Gap at 60°F
Detail "A"
5/16" Plate and 5/16" angle at about 6'-0" cts. (See Detail "B")
8"
1½"
3⅜"± West Abut.
4⅜"± East Abut.
Const. Jt. Key
Haunch Slab to bear
℄ ½"Ø Machine bolt and nut with 9/16"Ø hole (Field drill) in the top flange. Remove bolt after concrete has set
Fill Face of Abutment
14⅝"± @ 60°F
Existing End Floorbeam

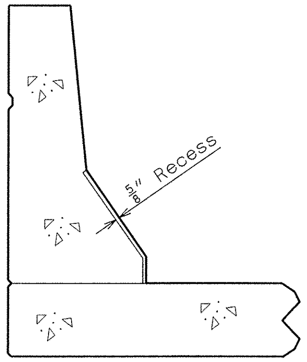
Note: Strip seal gland not shown for clarity.

SECTION A-A

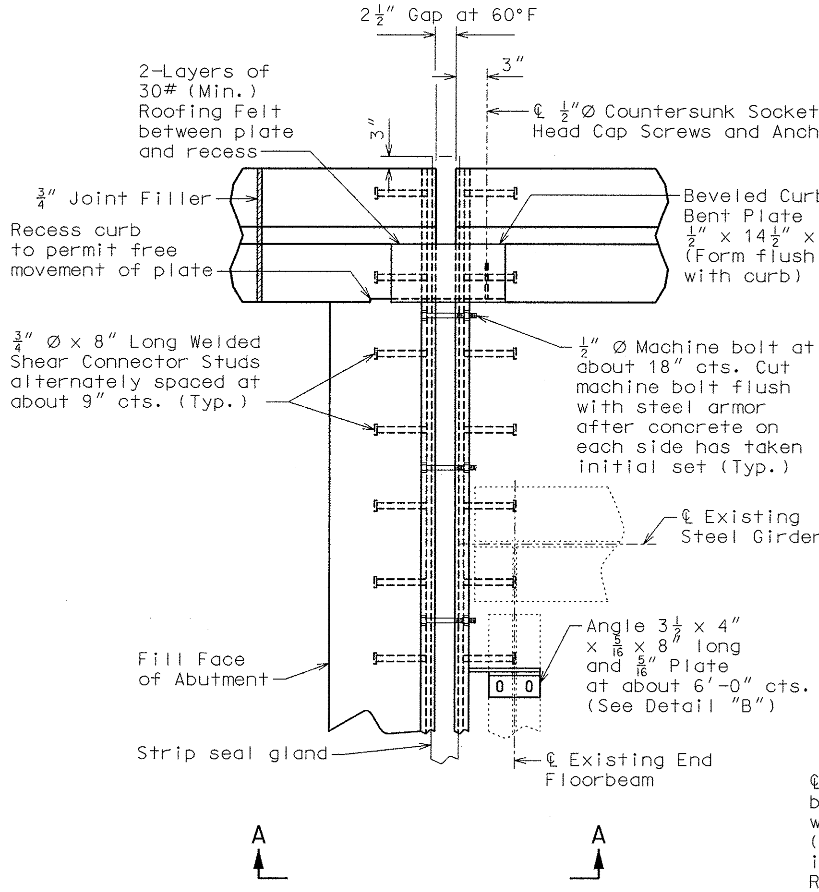

B
C
2½" Gap @ 60°F.
2½"
6"
3"
3"
℄ ½"Ø Countersunk Socket Head Cap Screws and Anchors
Bevel end of bent curb plate on roadway face
2-Layers 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate ½" x 14½" x 15" (Form flush with curb)
B
C

Note: Strip seal gland not shown for clarity.

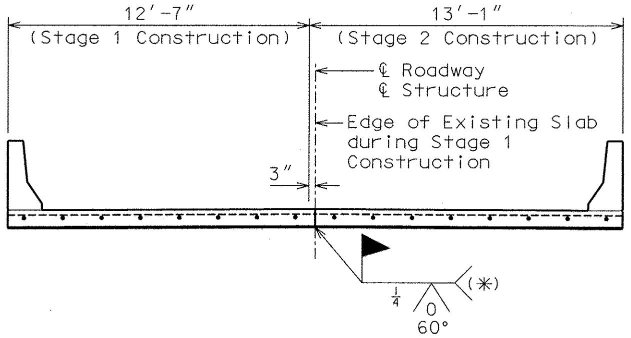
PART ELEVATION OF BARRIER CURB



PART SECTION B-B

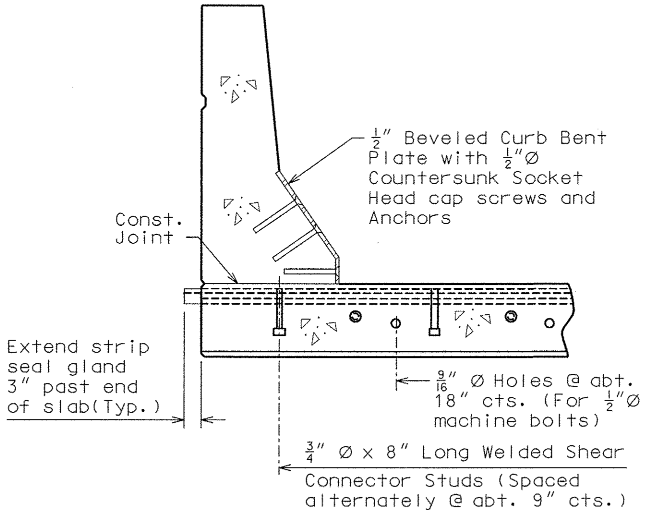

2½" Gap at 60°F
3"
2-Layers of 30# (Min.) Roofing Felt between plate and recess
3"
℄ ½"Ø Countersunk Socket Head Cap Screws and Anchors
¾" Joint Filler
Recess curb to permit free movement of plate
Beveled Curb Bent Plate ½" x 14½" x 15" (Form flush with curb)
¾" Ø x 8" Long Welded Shear Connector Studs alternately spaced at about 9" cts. (Typ.)
½" Ø Machine bolt at about 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set (Typ.)
℄ Existing Steel Girder
Angle 3½ x 4" x 5/16 x 8" long and 5/16" Plate at about 6'-0" cts. (See Detail "B")
Fill Face of Abutment
Strip seal gland
℄ Existing End Floorbeam
A
A

PART PLAN

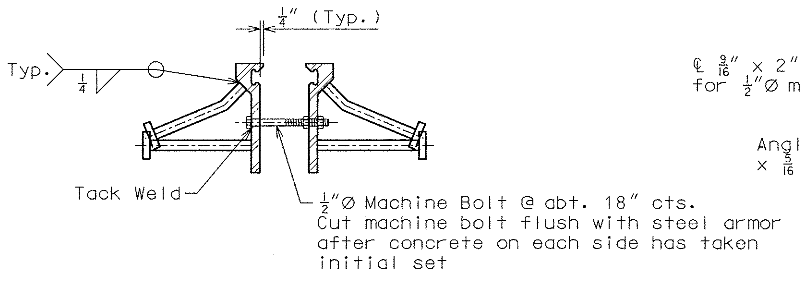


SECTION SHOWING JOINT SPLICE

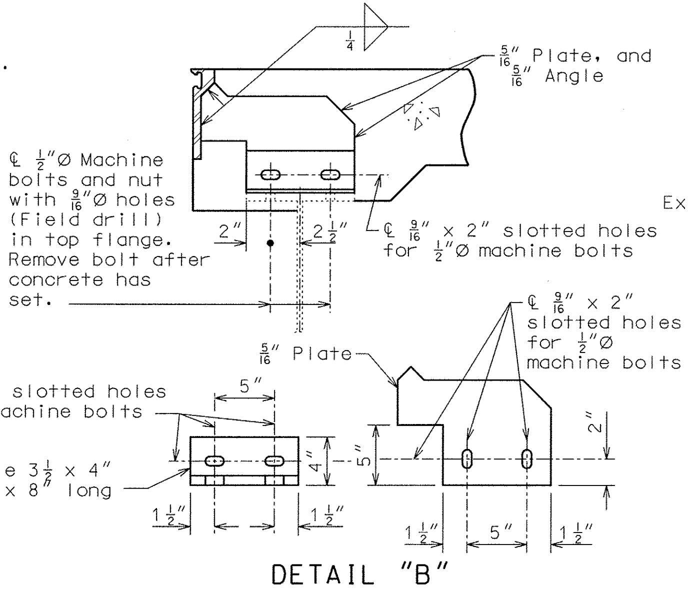
(✱) Weld after steel extrusion for Stage 2 is properly located. Repair galvanizing adjacent to the welds by the zinc alloy stick method. Coat the welds using the same method.


Const. Joint
½" Beveled Curb Bent Plate with ½"Ø Countersunk Socket Head cap screws and Anchors
Extend strip seal gland 3" past end of slab (Typ.)
9/16" Ø Holes @ abt. 18" cts. (For ½"Ø machine bolts)
¾" Ø x 8" Long Welded Shear Connector Studs (Spaced alternately @ abt. 9" cts.)

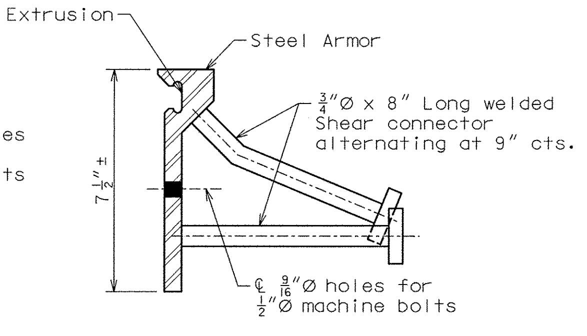
PART SECTION C-C


¼" (Typ.)
Typ.
¼
Tack Weld
½"Ø Machine Bolt @ abt. 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set

DETAIL "A"


¼
5/16" Plate, and 5/16" Angle
℄ ½"Ø Machine bolts and nut with 9/16"Ø holes (Field drill) in top flange. Remove bolt after concrete has set.
2"
2½"
℄ 9/16" x 2" slotted holes for ½"Ø machine bolts
℄ 9/16" x 2" slotted holes for ½"Ø machine bolts
5"
Angle 3½ x 4" x 5/16 x 8" long
4"
5"
1½"
1½"
5/16" Plate
℄ 9/16" x 2" slotted holes for ½"Ø machine bolts
2"
1½"
5"
1½"

DETAIL "B"


Extrusion
Steel Armor
¾"Ø x 8" Long welded Shear connector alternating at 9" cts.
7½"±
℄ 9/16"Ø holes for ½"Ø machine bolts

DETAIL OF JOINT ARMOR

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. No gland shall be installed during Stage 1 Construction, the gland shall be installed full width of bridge after the completion of Stage 2 Construction.

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.

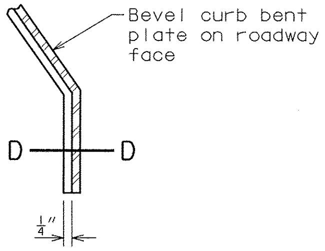
Structural steel for the expansion joint system and curb plate shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from over spray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 3/16" (West Abut.) or 5/16" (East Abut.) for each 10° fall or rise in temperature at installation.

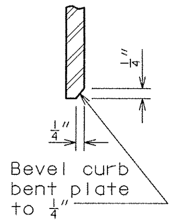
Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the expansion joint system.

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

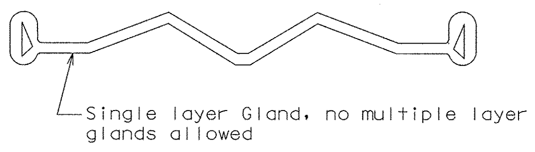
Curb plate anchors shall be a drilled cone expansion or a cast-in-place wing type threaded insert. The minimum ultimate pullout capacity for these anchors shall be 2700 lbs in f'c = 4000 psi concrete. Lead anchors will not be permitted. Holes in the barrier curb for anchors shall not be drilled until the concrete is at least 7 days old.



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION D-D



Strip seal gland size = 6"

DETAIL OF GLAND

DETAILS OF STRIP SEAL AT ABUTMENTS

Detailed April 2009
Checked April 2009

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

Sheet No. 41 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	41

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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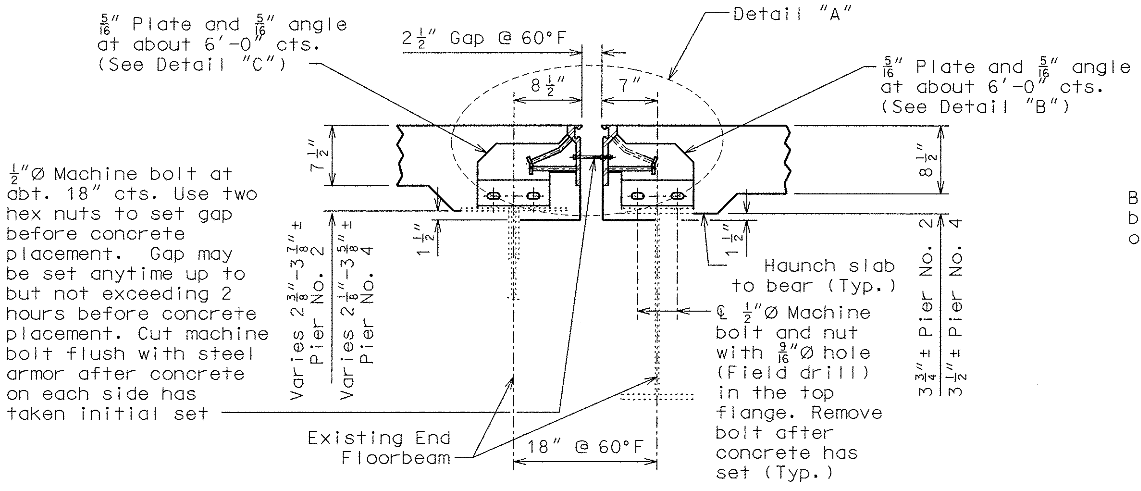
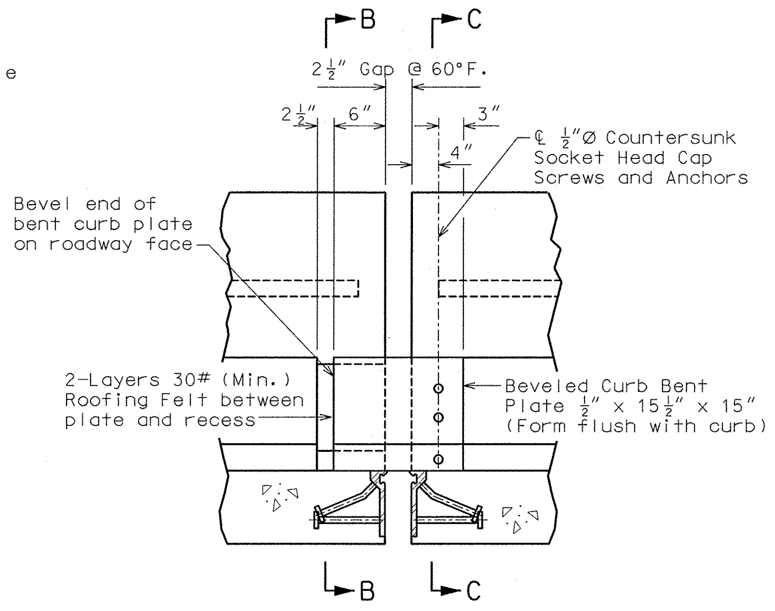

5/16" Plate and 5/16" angle at about 6'-0" cts. (See Detail "C")
2½" Gap @ 60°F
Detail "A"
8½"
7"
5/16" Plate and 5/16" angle at about 6'-0" cts. (See Detail "B")
7½"
8½"
½"Ø Machine bolt at abt. 18" cts. Use two hex nuts to set gap before concrete placement. Gap may be set anytime up to but not exceeding 2 hours before concrete placement. Cut machine bolt flush with steel armor after concrete on each side has taken initial set
1½"
1½"
Varies 2⅜"-3⅞"± Pier No. 2
Varies 2⅛"-3⅝"± Pier No. 4
Haunch slab to bear (Typ.)
℄ ½"Ø Machine bolt and nut with 9/16"Ø hole (Field drill) in the top flange. Remove bolt after concrete has set (Typ.)
3¾"± Pier No. 2
3½"± Pier No. 4
Existing End Floorbeam
18" @ 60°F

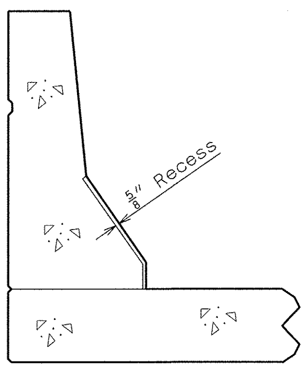
Note: Strip seal gland not shown for clarity.

SECTION A-A

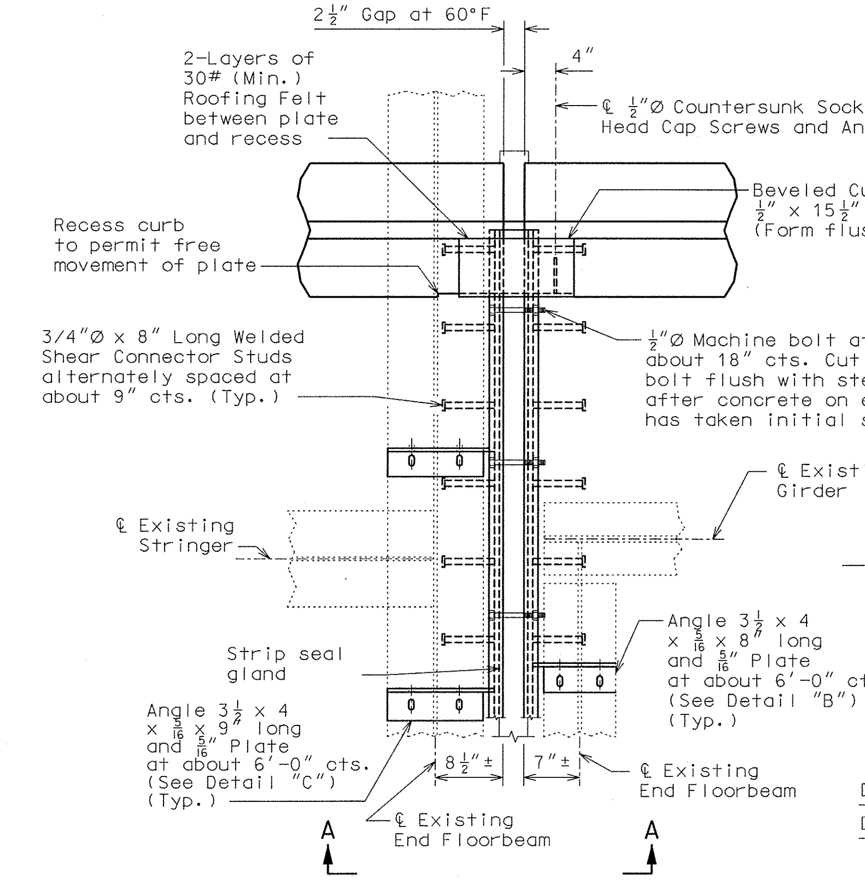

B
C
2½" Gap @ 60°F.
2½"
6"
3"
4"
℄ ½"Ø Countersunk Socket Head Cap Screws and Anchors
Bevel end of bent curb plate on roadway face
2-Layers 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate ½" x 15½" x 15" (Form flush with curb)
B
C

Note: Strip seal gland not shown for clarity.

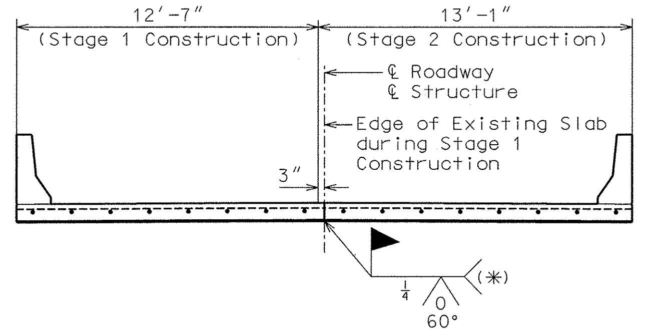
PART ELEVATION OF BARRIER CURB



PART SECTION B-B

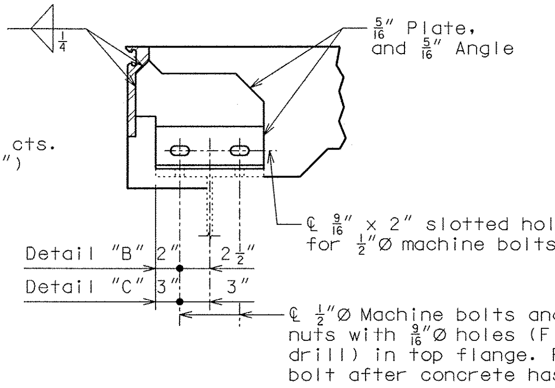

2½" Gap at 60°F
4"
2-Layers of 30# (Min.) Roofing Felt between plate and recess
℄ ½"Ø Countersunk Socket Head Cap Screws and Anchors
Beveled Curb Bent Plate ½" x 15½" x 15" (Form flush with curb)
Recess curb to permit free movement of plate
3/4"Ø x 8" Long Welded Shear Connector Studs alternately spaced at about 9" cts. (Typ.)
½"Ø Machine bolt at about 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set (Typ.)
℄ Existing Girder
℄ Existing Stringer
Strip seal gland
Angle 3½ x 4 x 5/16 x 8" long and 5/16" Plate at about 6'-0" cts. (See Detail "B") (Typ.)
Angle 3½ x 4 x 5/16 x 9" long and 5/16" Plate at about 6'-0" cts. (See Detail "C") (Typ.)
8½"±
7"±
℄ Existing End Floorbeam
℄ Existing End Floorbeam
A
A

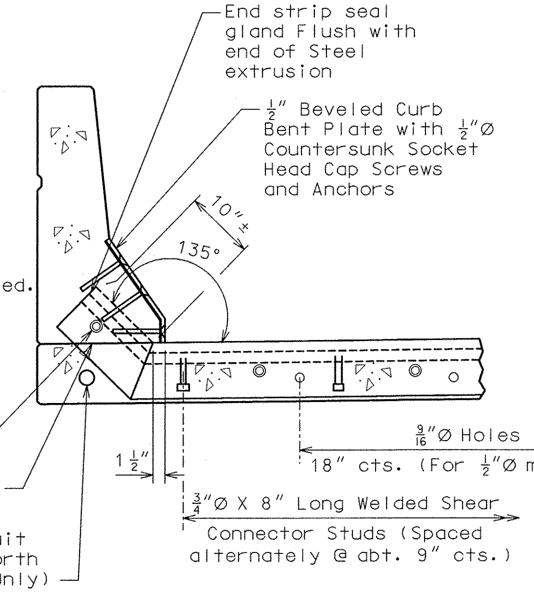
PART PLAN



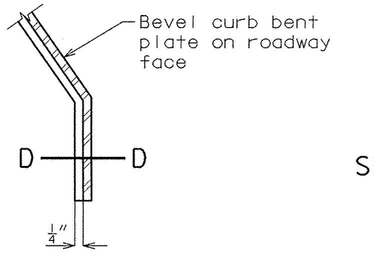
SECTION SHOWING JOINT SPLICE

(*) Weld after steel extrusion for Stage 2 is properly located. Repair galvanizing adjacent to the welds by the zinc alloy stick method. Coat the welds using the same method.

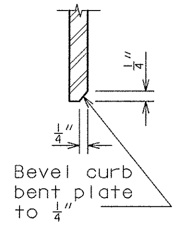

¼
5/16" Plate, and 5/16" Angle
℄ 9/16" x 2" slotted holes for ½"Ø machine bolts
Detail "B" 2"
2½"
Detail "C" 3"
3"
℄ ½"Ø Machine bolts and nuts with 9/16"Ø holes (Field drill) in top flange. Remove bolt after concrete has set


End strip seal gland Flush with end of Steel extrusion
½" Beveled Curb Bent Plate with ½"Ø Countersunk Socket Head Cap Screws and Anchors
10"±
135°
¾"Ø X 8" Long Welded Shear Connector Stud (Contractor to ensure stud does not foul ½"Ø Sock Head Cap Screws and Anchors)
Const. Joint
1½"
9/16"Ø Holes @ abt. 18" cts. (For ½"Ø machine bolts.)
¾"Ø X 8" Long Welded Shear Connector Studs (Spaced alternately @ abt. 9" cts.)
1¼"Ø PVC Conduit (Pier No. 2 North Edge of Slab Only)

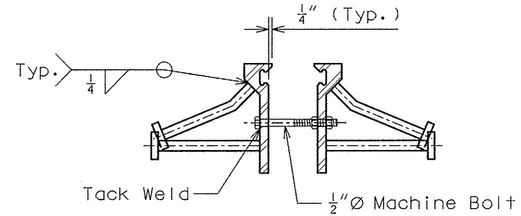
PART SECTION C-C



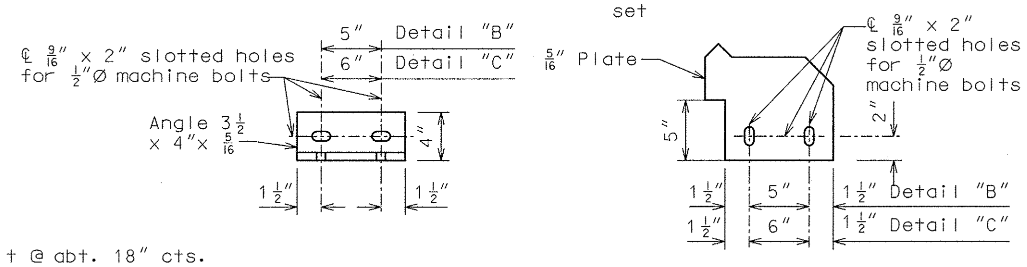
PART ELEVATION AT END OF BEVELED CURB BENT PLATE



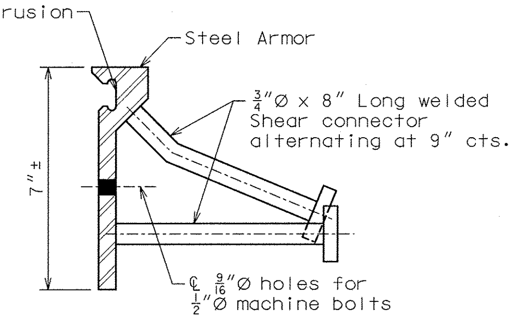
SECTION D-D


¼" (Typ.)
Typ.
¼
Tack Weld
½"Ø Machine Bolt @ abt. 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set

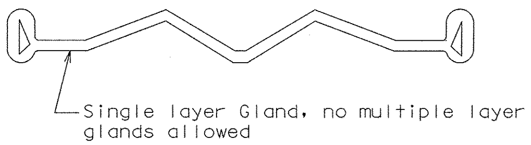
DETAIL "A"



DETAILS "B" & "C"


Extrusion
Steel Armor
¾"Ø x 8" Long welded Shear connector alternating at 9" cts.
7"±
℄ 9/16"Ø holes for ½"Ø machine bolts

DETAIL OF JOINT ARMOR



Strip seal gland size = 6"

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. No gland shall be installed during Stage 1 Construction, the gland shall be installed full width of bridge after completion of Stage 2 Construction.

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 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 over spray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 5/16" for each 10° fall or rise in temperature at installation.

Longitudinal reinforcing steel shall be placed 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.

Curb plate anchors shall be a drilled cone expansion or a cast-in-place wing type threaded insert. The minimum ultimate pullout capacity for these anchors shall be 2700 lbs in f'c = 4000 psi concrete. Lead anchors will not be permitted. Holes in the barrier curb for anchors shall not be drilled until the concrete is at least 7 days old.

DETAILS OF STRIP SEAL AT PIERS NO. 2 & 4

Detailed April 2009
Checked April 2009

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

Sheet No. 42 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

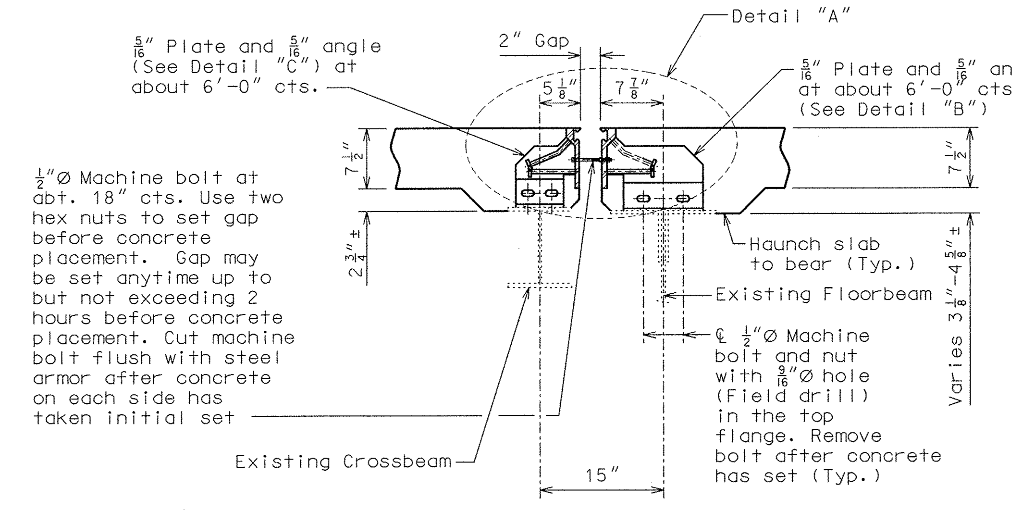
DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 42
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DESCRIPTION
DATE

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

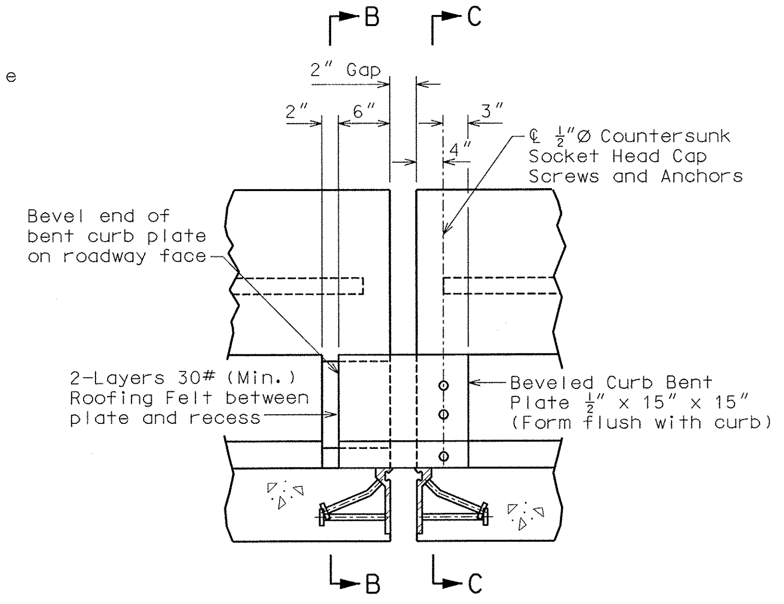
MoDOT

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856


Detail "A"
2" Gap
$5\frac{1}{8}$"
$7\frac{7}{8}$"
$\frac{5}{16}$" Plate and $\frac{5}{16}$" angle (See Detail "C") at about 6'-0" cts.
$\frac{5}{16}$" Plate and $\frac{5}{16}$" angle at about 6'-0" cts. (See Detail "B")
$7\frac{1}{2}$"
$7\frac{1}{2}$"
$\frac{1}{2}$"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
$2\frac{3}{4}$" ±
Haunch slab to bear (Typ.)
Existing Floorbeam
Varies $3\frac{1}{8}$"–$4\frac{5}{8}$" ±
℄ $\frac{1}{2}$"Ø Machine bolt and nut with $\frac{9}{16}$"Ø hole (Field drill) in the top flange. Remove bolt after concrete has set (Typ.)
Existing Crossbeam
15"

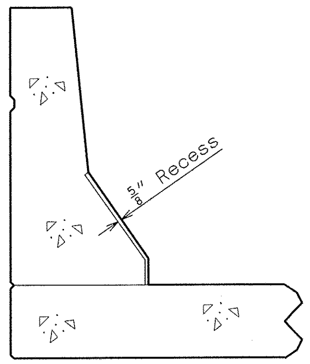
Note: Strip seal gland not shown for clarity.

SECTION A-A


B
C
2" Gap
2"
6"
3"
4"
℄ $\frac{1}{2}$"Ø Countersunk Socket Head Cap Screws and Anchors
Bevel end of bent curb plate on roadway face
2-Layers 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate $\frac{1}{2}$" x 15" x 15" (Form flush with curb)
B
C

Note: Strip seal gland not shown for clarity.

PART ELEVATION OF BARRIER CURB



PART SECTION B-B

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. No gland shall be installed during Stage 1 Construction, the gland shall be installed full width of bridge after completion of Stage 2 Construction.

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.

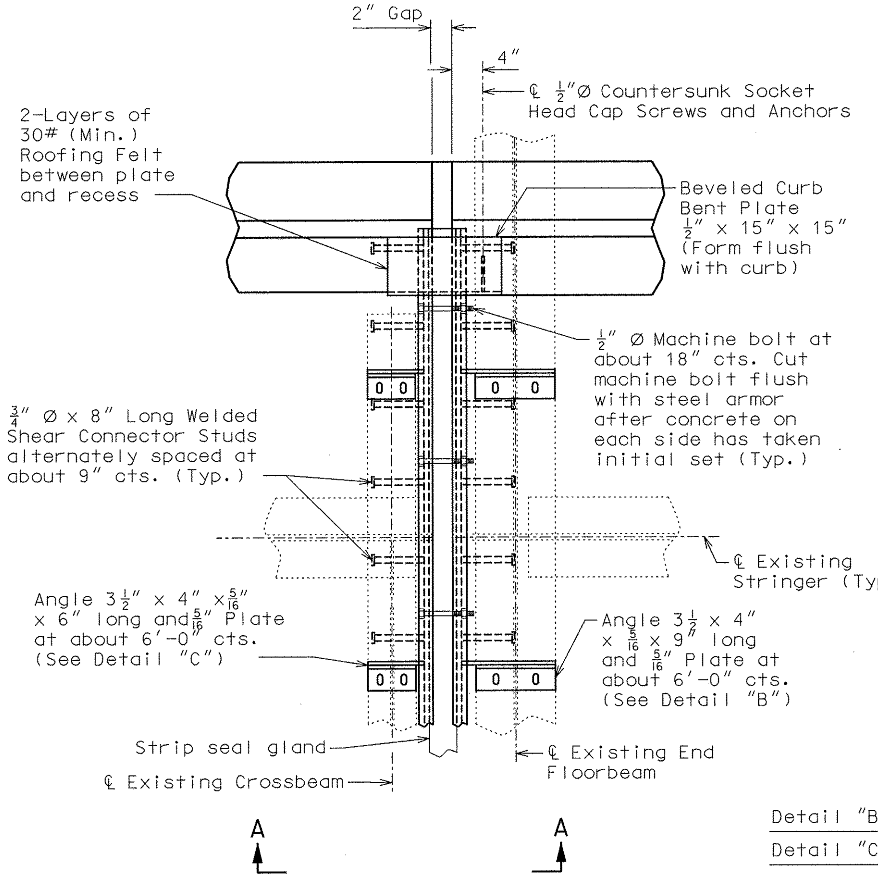
Structural steel for the expansion joint system and curb plate shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from over spray.

The expansion gap shall be set at 2" regardless of temperature at the time of installation.

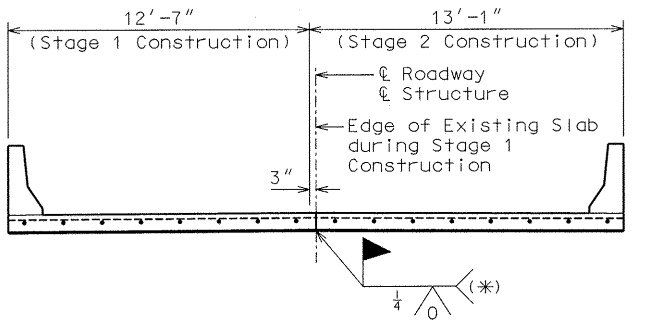
Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the expansion joint system.

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

Curb plate anchors shall be a drilled cone expansion or a cast-in-place wing type threaded insert. The minimum ultimate pullout capacity for these anchors shall be 2700 lbs in f'c = 4000 psi concrete. Lead anchors will not be permitted. Holes in the barrier curb for anchors shall not be drilled until the concrete is at least 7 days old.

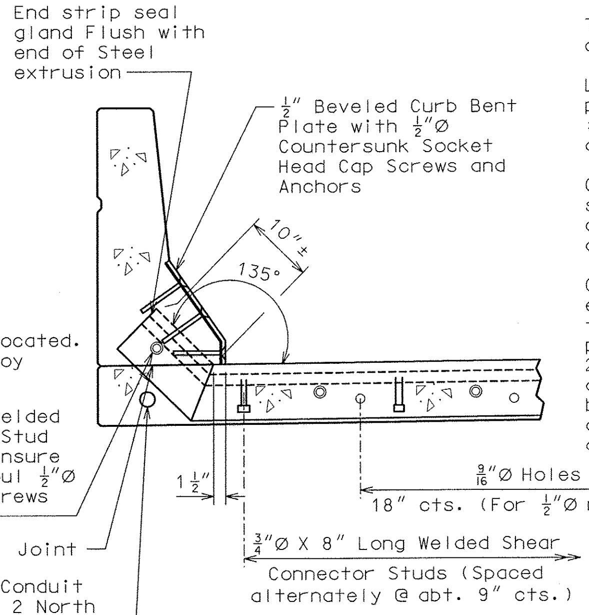

2" Gap
4"
℄ $\frac{1}{2}$"Ø Countersunk Socket Head Cap Screws and Anchors
2-Layers of 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate $\frac{1}{2}$" x 15" x 15" (Form flush with curb)
$\frac{1}{2}$" Ø Machine bolt at about 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set (Typ.)
$\frac{3}{4}$" Ø x 8" Long Welded Shear Connector Studs alternately spaced at about 9" cts. (Typ.)
℄ Existing Stringer (Typ.)
Angle $3\frac{1}{2}$" x 4" x $\frac{5}{16}$" x 6" long and $\frac{5}{16}$" Plate at about 6'-0" cts. (See Detail "C")
Angle $3\frac{1}{2}$ x 4" x $\frac{5}{16}$ x 9" long and $\frac{5}{16}$" Plate at about 6'-0" cts. (See Detail "B")
Strip seal gland
℄ Existing Crossbeam
℄ Existing End Floorbeam
A
A

PART PLAN

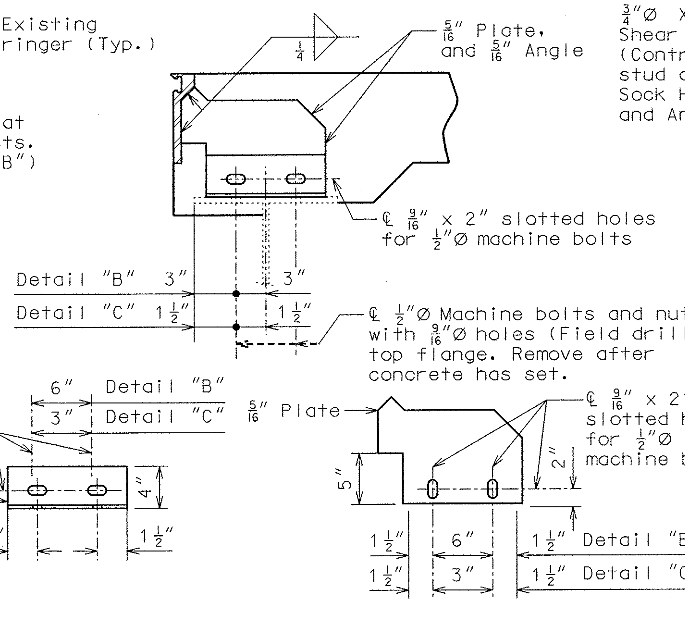


SECTION SHOWING JOINT SPLICE

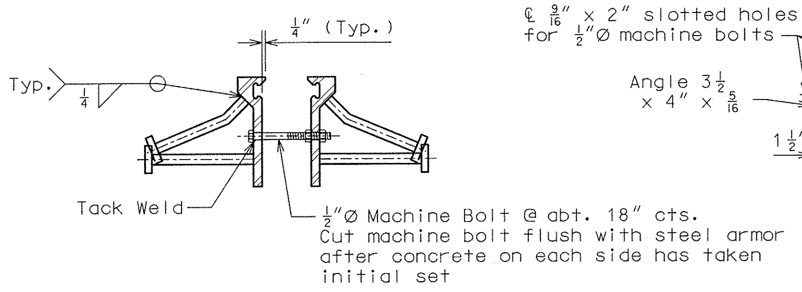
(✳) Weld after steel extrusion for Stage 2 is properly located. Repair galvanizing adjacent to the welds by the zinc alloy stick method. Coat the welds using the same method.


End strip seal gland Flush with end of Steel extrusion
$\frac{1}{2}$" Beveled Curb Bent Plate with $\frac{1}{2}$"Ø Countersunk Socket Head Cap Screws and Anchors
10" ±
135°
$\frac{3}{4}$"Ø X 8" Long Welded Shear Connector Stud (Contractor to ensure stud does not foul $\frac{1}{2}$"Ø Sock Head Cap Screws and Anchors)
Const. Joint
$1\frac{1}{4}$"Ø PVC Conduit (Pier No. 2 North Edge of Slab Only)
$1\frac{1}{2}$"
$\frac{9}{16}$"Ø Holes @ abt. 18" cts. (For $\frac{1}{2}$"Ø machine bolts.)
$\frac{3}{4}$"Ø X 8" Long Welded Shear Connector Studs (Spaced alternately @ abt. 9" cts.)

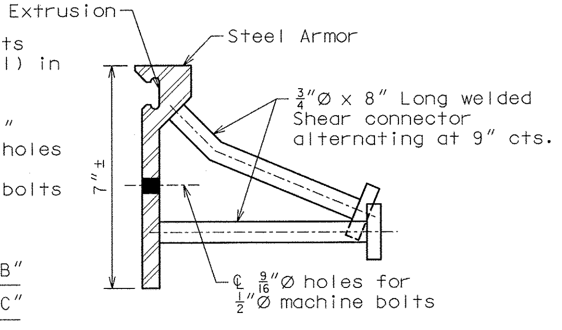
PART SECTION C-C


$\frac{1}{4}$
$\frac{5}{16}$" Plate, and $\frac{5}{16}$" Angle
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts
Detail "B" 3"
Detail "C" $1\frac{1}{2}$"
3"
$1\frac{1}{2}$"
℄ $\frac{1}{2}$"Ø Machine bolts and nuts with $\frac{9}{16}$"Ø holes (Field drill) in top flange. Remove after concrete has set.
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts
Angle $3\frac{1}{2}$ x 4" x $\frac{5}{16}$
6" Detail "B"
3" Detail "C"
4"
$1\frac{1}{2}$"
$1\frac{1}{2}$"
$\frac{5}{16}$" Plate
5"
2"
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts
$1\frac{1}{2}$"
6"
$1\frac{1}{2}$" Detail "B"
$1\frac{1}{2}$"
3"
$1\frac{1}{2}$" Detail "C"

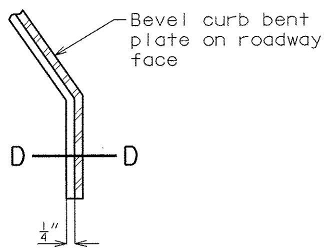
DETAILS "B" & "C"


Typ.
$\frac{1}{4}$
$\frac{1}{4}$" (Typ.)
Tack Weld
$\frac{1}{2}$"Ø Machine Bolt @ abt. 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set

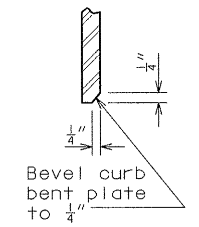
DETAIL "A"


Extrusion
Steel Armor
$\frac{3}{4}$"Ø x 8" Long welded Shear connector alternating at 9" cts.
7" ±
℄ $\frac{9}{16}$"Ø holes for $\frac{1}{2}$"Ø machine bolts

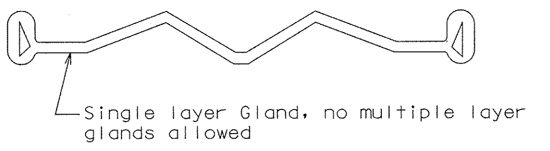
DETAIL OF JOINT ARMOR



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION D-D



Strip seal gland size = 3"

DETAIL OF GLAND

DETAILS OF STRIP SEAL AT PANEL POINTS L4, L8, L16, & L20

Detailed April 2009
Checked April 2009

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

Sheet No. 43 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	43
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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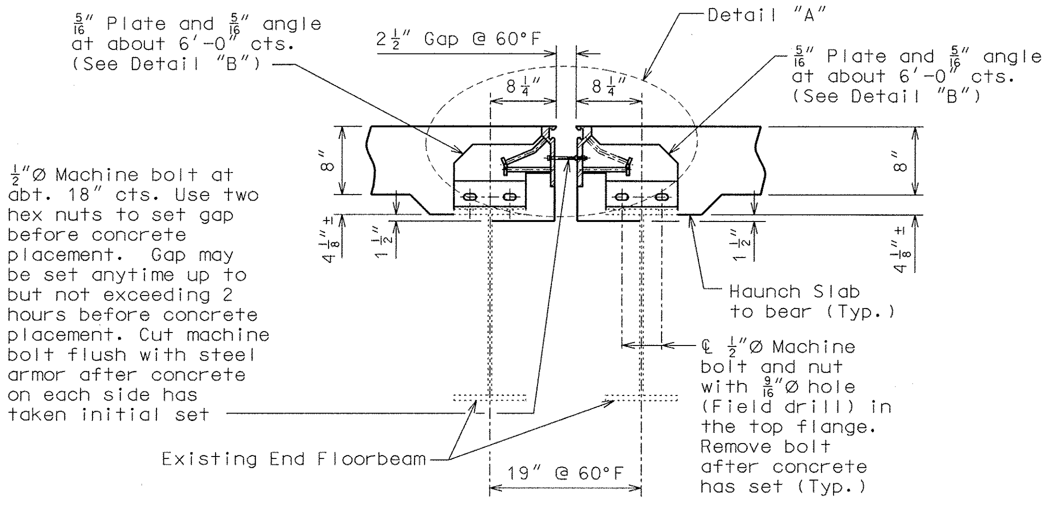
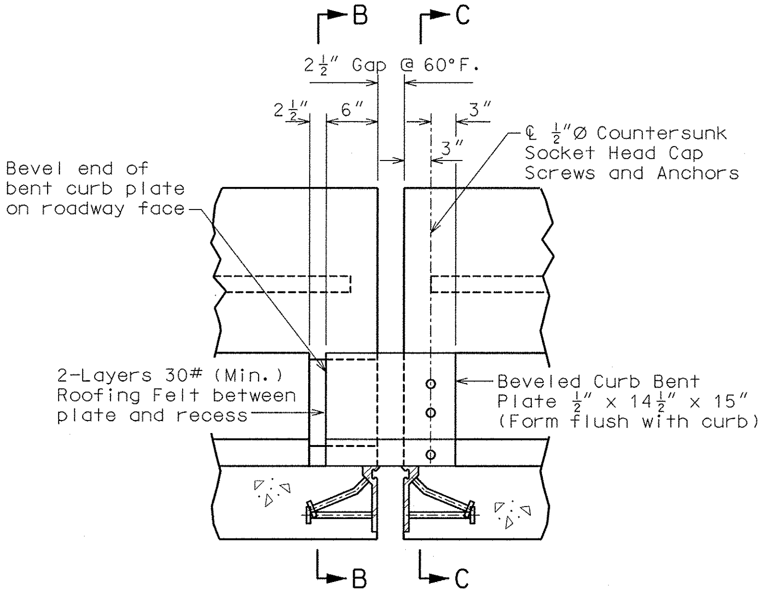


$\frac{5}{16}$" Plate and $\frac{5}{16}$" angle at about 6'-0" cts. (See Detail "B")
2$\frac{1}{2}$" Gap @ 60°F
Detail "A"
$\frac{5}{16}$" Plate and $\frac{5}{16}$" angle at about 6'-0" cts. (See Detail "B")
8$\frac{1}{4}$"
8$\frac{1}{4}$"
8"
8"
$\frac{1}{2}$"Ø Machine bolt at abt. 18" cts. Use two hex 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
4$\frac{1}{8}$"±
1$\frac{1}{2}$"
1$\frac{1}{2}$"
4$\frac{1}{8}$"±
Haunch Slab to bear (Typ.)
℄ $\frac{1}{2}$"Ø Machine bolt and nut with $\frac{9}{16}$"Ø hole (Field drill) in the top flange. Remove bolt after concrete has set (Typ.)
Existing End Floorbeam
19" @ 60°F

Note: Strip seal gland not shown for clarity.

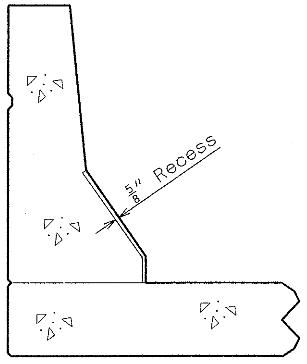
SECTION A-A



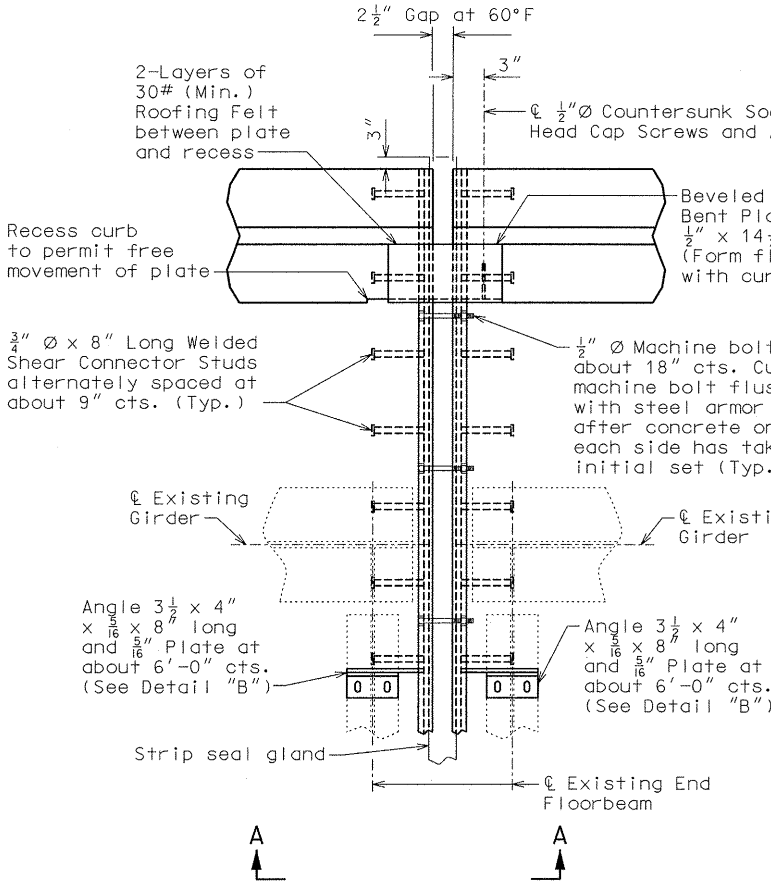
B
C
2$\frac{1}{2}$" Gap @ 60°F.
2$\frac{1}{2}$"
6"
3"
3"
℄ $\frac{1}{2}$"Ø Countersunk Socket Head Cap Screws and Anchors
Bevel end of bent curb plate on roadway face
2-Layers 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate $\frac{1}{2}$" x 14$\frac{1}{2}$" x 15" (Form flush with curb)
B
C

Note: Strip seal gland not shown for clarity.

PART ELEVATION OF BARRIER CURB

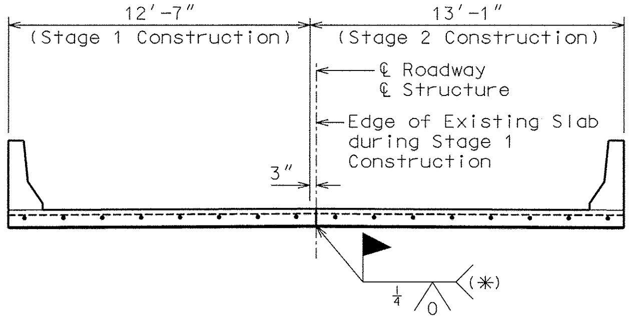


PART SECTION B-B



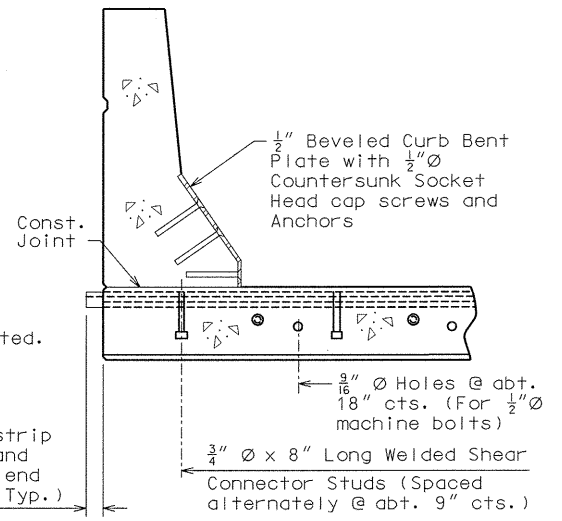
2$\frac{1}{2}$" Gap at 60°F
3"
3"
2-Layers of 30# (Min.) Roofing Felt between plate and recess
℄ $\frac{1}{2}$"Ø Countersunk Socket Head Cap Screws and Anchors
Beveled Curb Bent Plate $\frac{1}{2}$" x 14$\frac{1}{2}$" x 15" (Form flush with curb)
Recess curb to permit free movement of plate
$\frac{3}{4}$" Ø x 8" Long Welded Shear Connector Studs alternately spaced at about 9" cts. (Typ.)
$\frac{1}{2}$" Ø Machine bolt at about 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set (Typ.)
℄ Existing Girder
℄ Existing Girder
Angle 3$\frac{1}{2}$ x 4" x $\frac{5}{16}$ x 8" long and $\frac{5}{16}$" Plate at about 6'-0" cts. (See Detail "B")
Angle 3$\frac{1}{2}$ x 4" x $\frac{5}{16}$ x 8" long and $\frac{5}{16}$" Plate at about 6'-0" cts. (See Detail "B")
Strip seal gland
℄ Existing End Floorbeam
A
A

PART PLAN



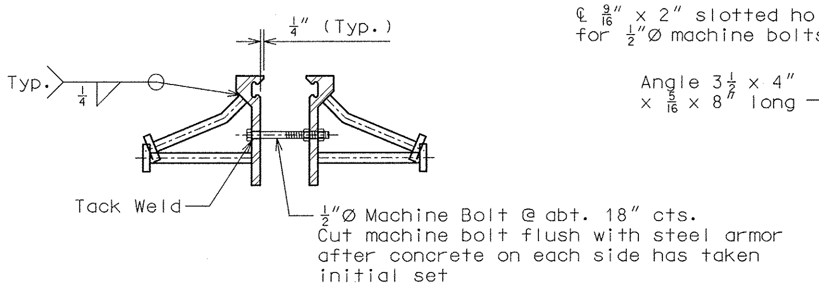
SECTION SHOWING JOINT SPLICE

(✱) Weld after steel extrusion for Stage 2 is properly located. Repair galvanizing adjacent to the welds by the zinc alloy stick method. Coat the welds using the same method.



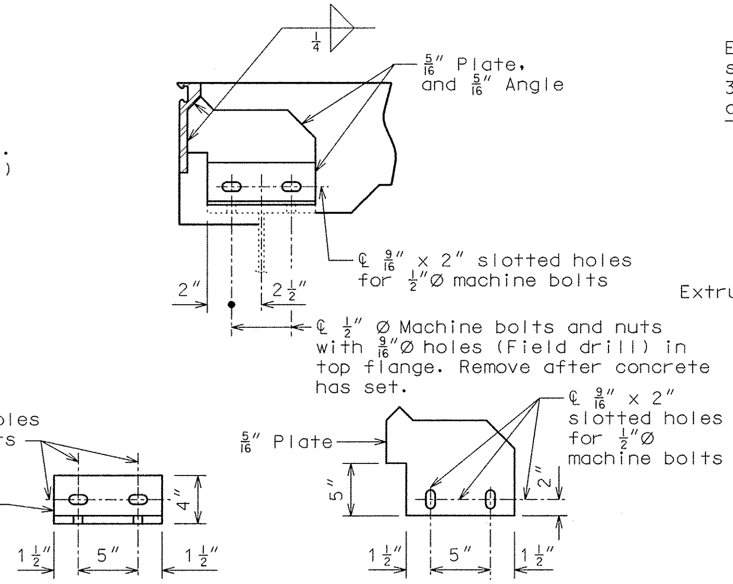
$\frac{1}{2}$" Beveled Curb Bent Plate with $\frac{1}{2}$"Ø Countersunk Socket Head cap screws and Anchors
Const. Joint
$\frac{9}{16}$" Ø Holes @ abt. 18" cts. (For $\frac{1}{2}$"Ø machine bolts)
$\frac{3}{4}$" Ø x 8" Long Welded Shear Connector Studs (Spaced alternately @ abt. 9" cts.)
Extend strip seal gland 3" past end of slab(Typ.)

PART SECTION C-C



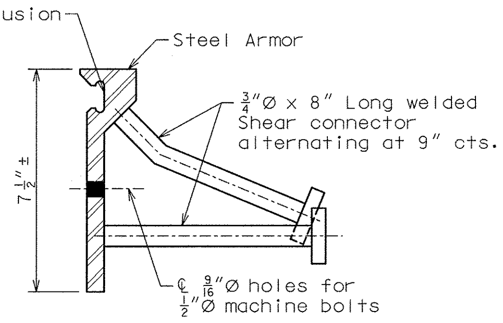
$\frac{1}{4}$" (Typ.)
Typ.
$\frac{1}{4}$
Tack Weld
$\frac{1}{2}$"Ø Machine Bolt @ abt. 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set

DETAIL "A"



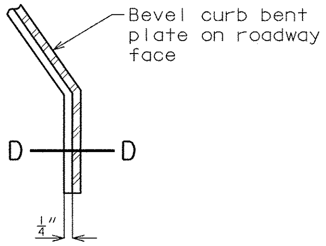
$\frac{1}{4}$
$\frac{5}{16}$" Plate, and $\frac{5}{16}$" Angle
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts
2"
2$\frac{1}{2}$"
℄ $\frac{1}{2}$" Ø Machine bolts and nuts with $\frac{9}{16}$"Ø holes (Field drill) in top flange. Remove after concrete has set.
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts
Angle 3$\frac{1}{2}$ x 4" x $\frac{5}{16}$ x 8" long
4"
1$\frac{1}{2}$"
5"
1$\frac{1}{2}$"
$\frac{5}{16}$" Plate
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts
5"
2"
1$\frac{1}{2}$"
5"
1$\frac{1}{2}$"

DETAIL "B"

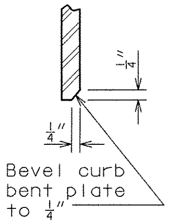


Extrusion
Steel Armor
$\frac{3}{4}$"Ø x 8" Long welded Shear connector alternating at 9" cts.
7$\frac{1}{2}$"±
℄ $\frac{9}{16}$"Ø holes for $\frac{1}{2}$"Ø machine bolts

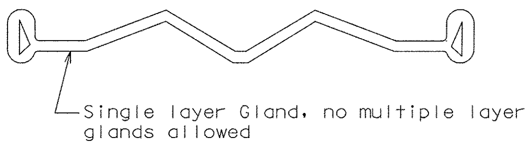
DETAIL OF JOINT ARMOR



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION D-D



Strip seal gland size = 6"

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. No gland shall be installed during Stage 1 Construction, the gland shall be installed full width of bridge after completion of Stage 2 Construction.

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 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 over spray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 5/16" for each 10° fall or rise in temperature at installation.

Longitudinal reinforcing steel shall be placed 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.

Curb plate anchors shall be a drilled cone expansion or a cast-in-place wing type threaded insert. The minimum ultimate pullout capacity for these anchors shall be 2700 lbs in f'c = 4000 psi concrete. Lead anchors will not be permitted. Holes in the barrier curb for anchors shall not be drilled until the concrete is at least 7 days old.

DETAILS OF STRIP SEAL AT PIERS NO. 7

Detailed April 2009
Checked April 2009

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

Sheet No. 44 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	44
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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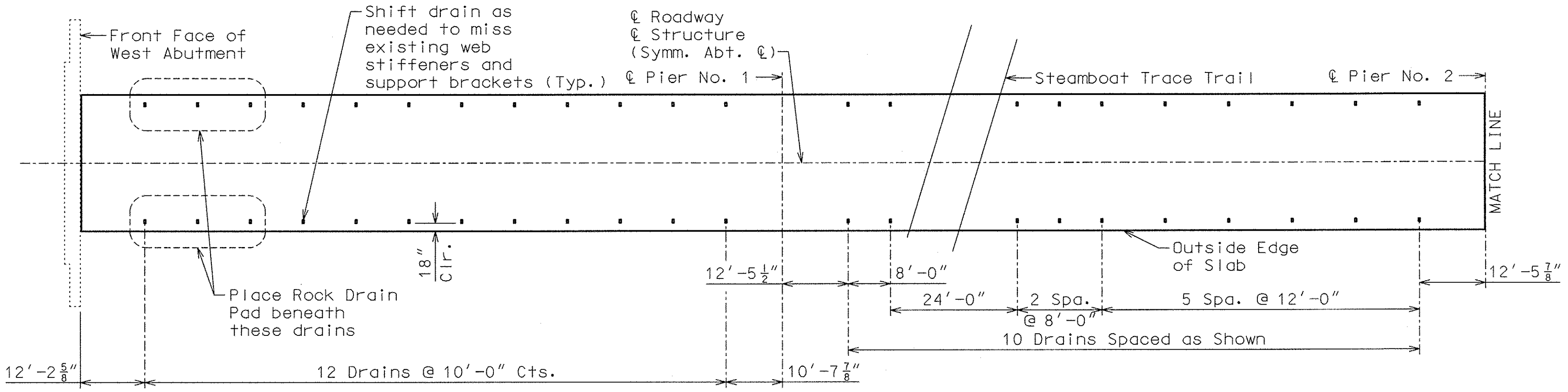
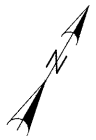
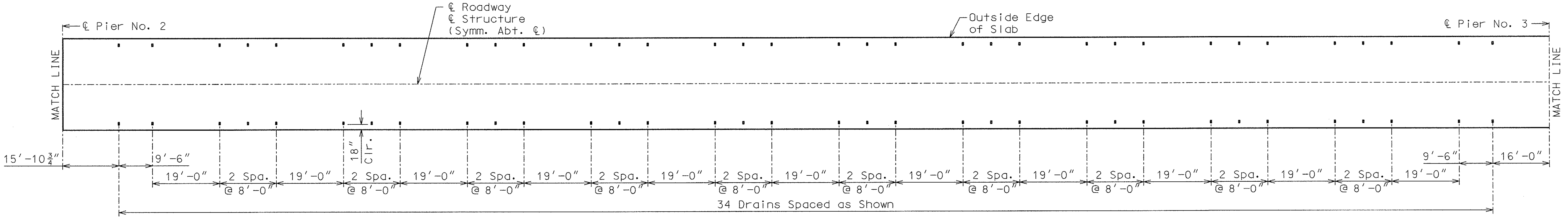
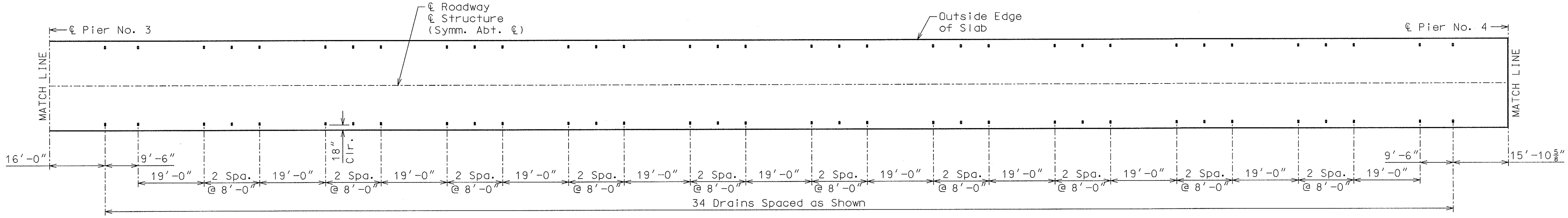


PLAN UNIT NO. 1





PLAN UNIT NO. 2 - SPAN NO. 3



PLAN UNIT NO. 2 - SPAN NO. 4

Note:
For details of Slab Drains
& Rock Drain Pads,
see Sheet No. 46.

SLAB DRAIN LAYOUT

Detailed April 2009
Checked April 2009

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

Sheet No. 45 of 57

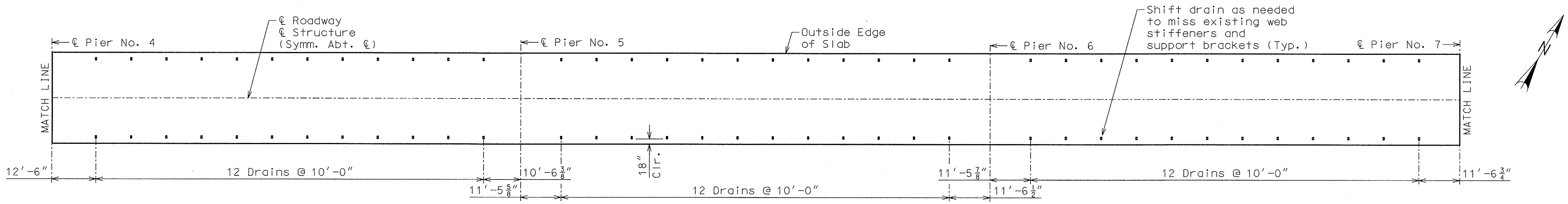
CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 45
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

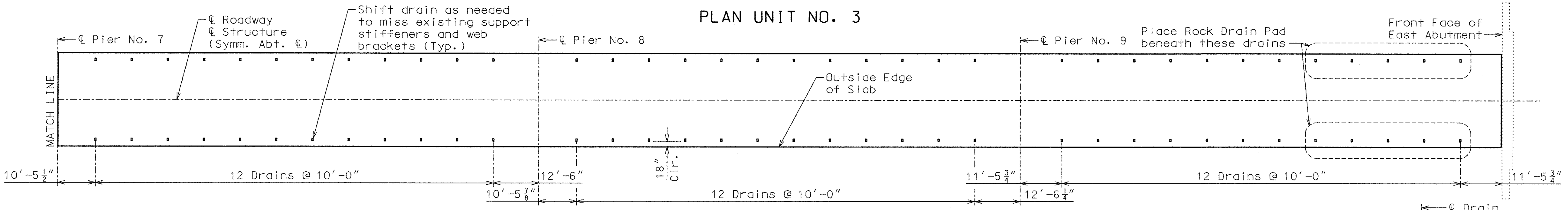
DESCRIPTION
DATE

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

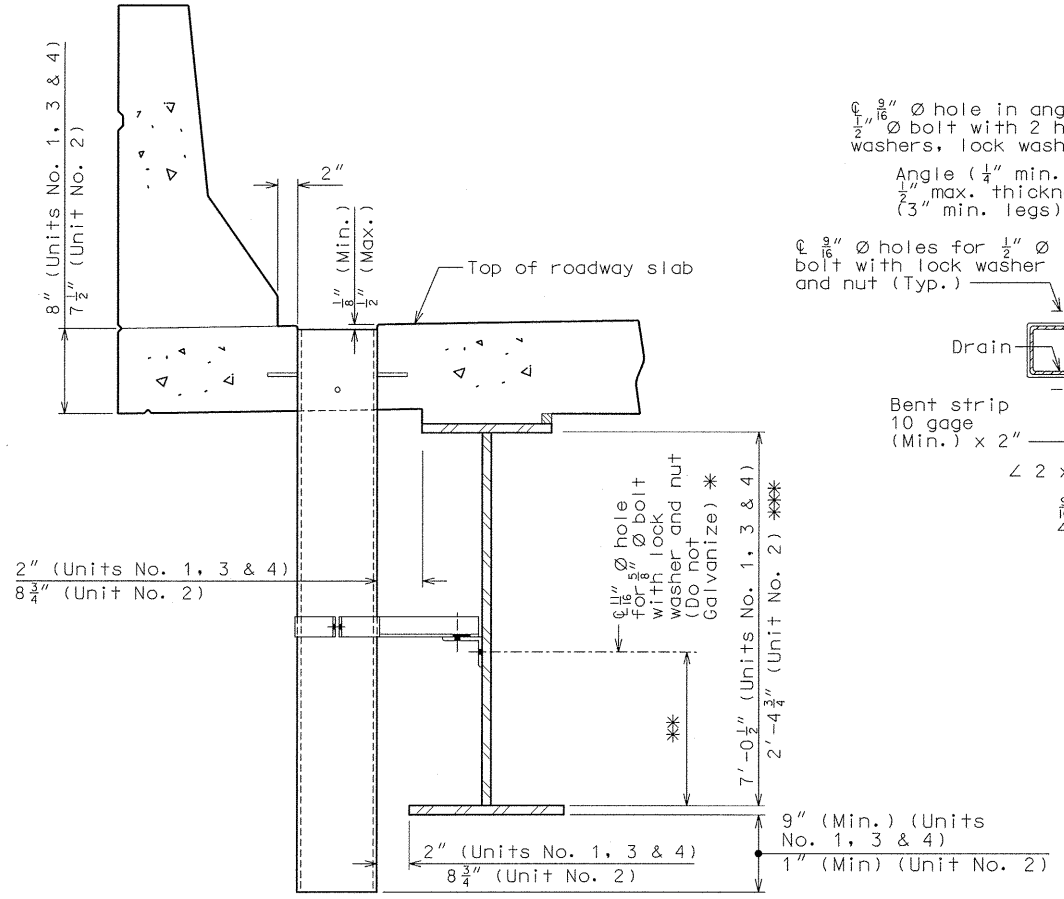
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



PLAN UNIT NO. 3



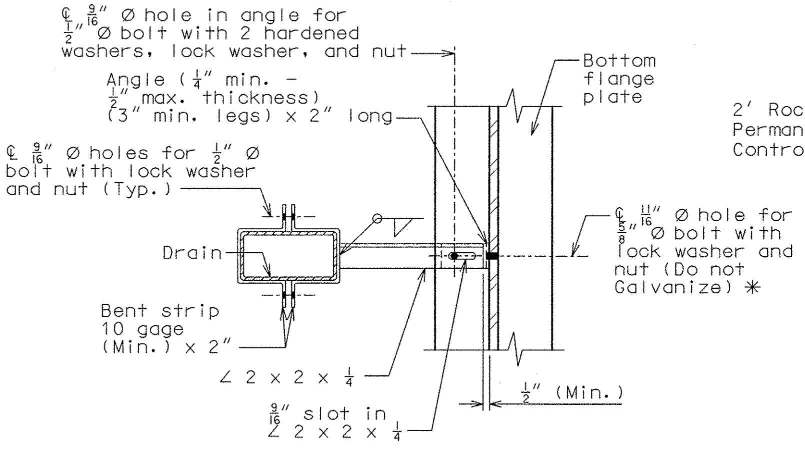
PLAN UNIT NO. 4



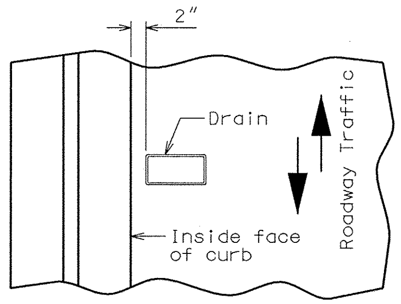
PART SECTION NEAR DRAIN

(See Sec. 1080.4.4.2 For Additional Coating Requirement)

✻✻ 14″ (Units No. 1, 3 & 4)
5″ (Unit No. 2)
✻✻✻ 4′-1 1/2″ to Bottom of Floorbeam

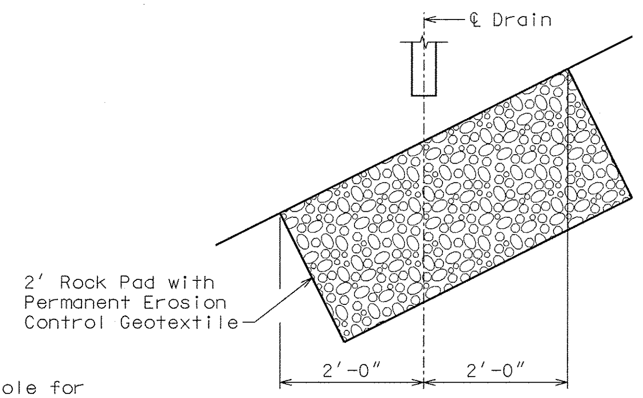

℄ 9/16″ Ø hole in angle for 1/2″ Ø bolt with 2 hardened washers, lock washer, and nut
Angle (1/4″ min. - 1/2″ max. thickness) (3″ min. legs) x 2″ long
℄ 9/16″ Ø holes for 1/2″ Ø bolt with lock washer and nut (Typ.)
Drain
Bent strip 10 gage (Min.) x 2″
∠ 2 x 2 x 1/4
9/16″ slot in ∠ 2 x 2 x 1/4
Bottom flange plate
℄ 11/16″ Ø hole for 5/8″ Ø bolt with lock washer and nut (Do not Galvanize) ✻
1/2″ (Min.)

PART SECTION SHOWING BRACKET ASSEMBLY

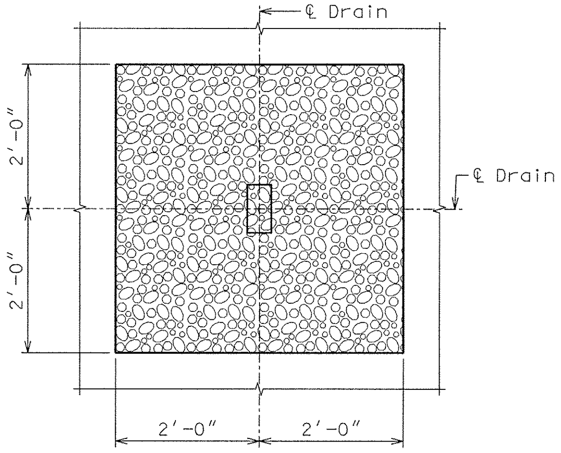


PART PLAN OF SLAB AT DRAIN

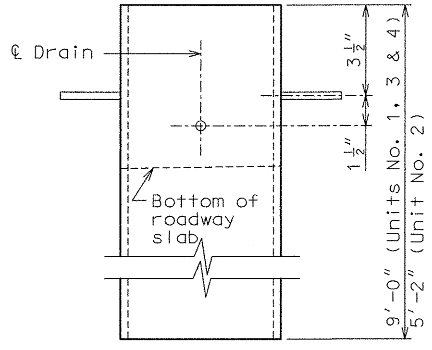
DETAILS OF DRAINS TRANSVERSE TO ROADWAY



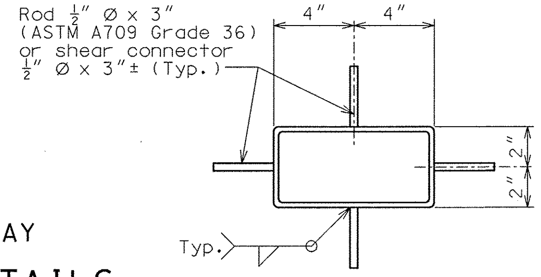
ELEVATION OF DRAIN PAD



PLAN OF DRAIN PAD



ELEVATION OF DRAIN


Rod 1/2″ Ø x 3″ (ASTM A709 Grade 36) or shear connector 1/2″ Ø x 3″± (Typ.)
4″
4″
2″
2″
Typ.

PLAN OF DRAIN

Notes:

Slab drains may be fabricated of either 1/4″ welded sheets of ASTM A709 Grade 36 steel or from 1/4″ structural steel tubing ASTM A500 or A501.

Slab drain bracket assembly shall be ASTM A709 Grade 36 steel.

Outside dimensions of drains are 8″ x 4″.

Locate drains in slab by dimensions shown in Part Section Near Drain. Shift reinforcing steel in field where necessary to clear drains.

The drains and bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with ASTM A153, except as shown.

Shop drawings will not be required for the slab drains and the bracket assembly.

The bolt hole for the bracket assembly attachment shall be field located on the existing girders.
✻ See Sec 1080.4

For Plan of Slab Drains from West Abutment to Pier No. 4, see Sheet No. 45.

Cost of Drain Pads and Geotextile complete in place shall be included with bid item Slab Drain per Each.

SLAB DRAIN DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 46 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	46

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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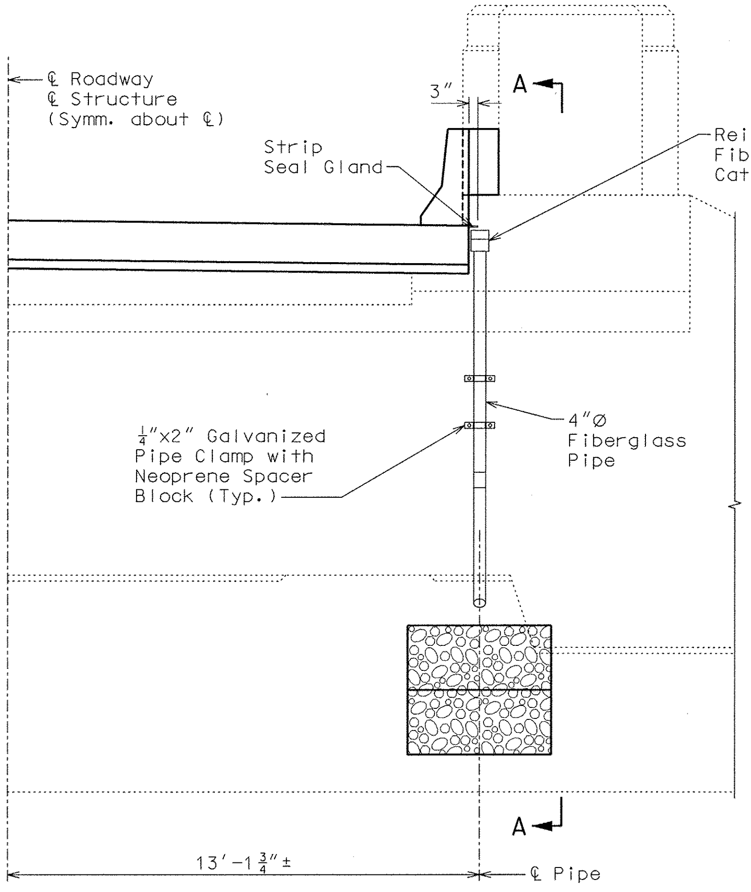
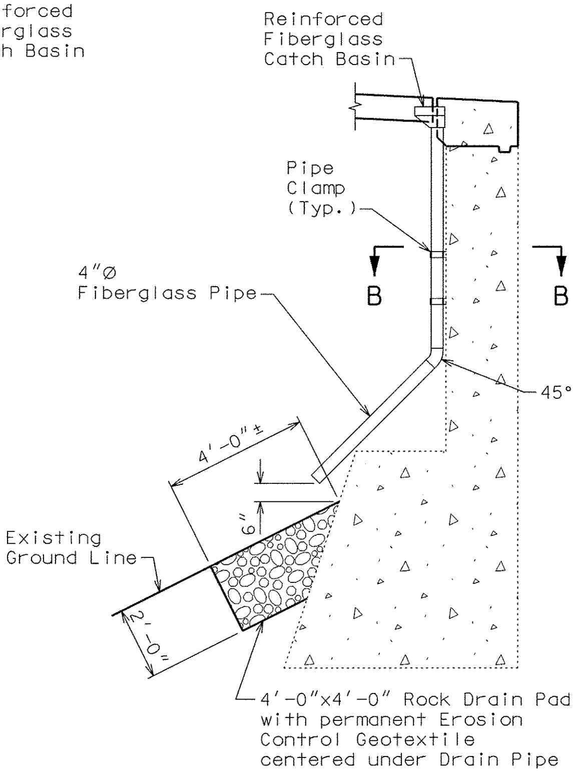
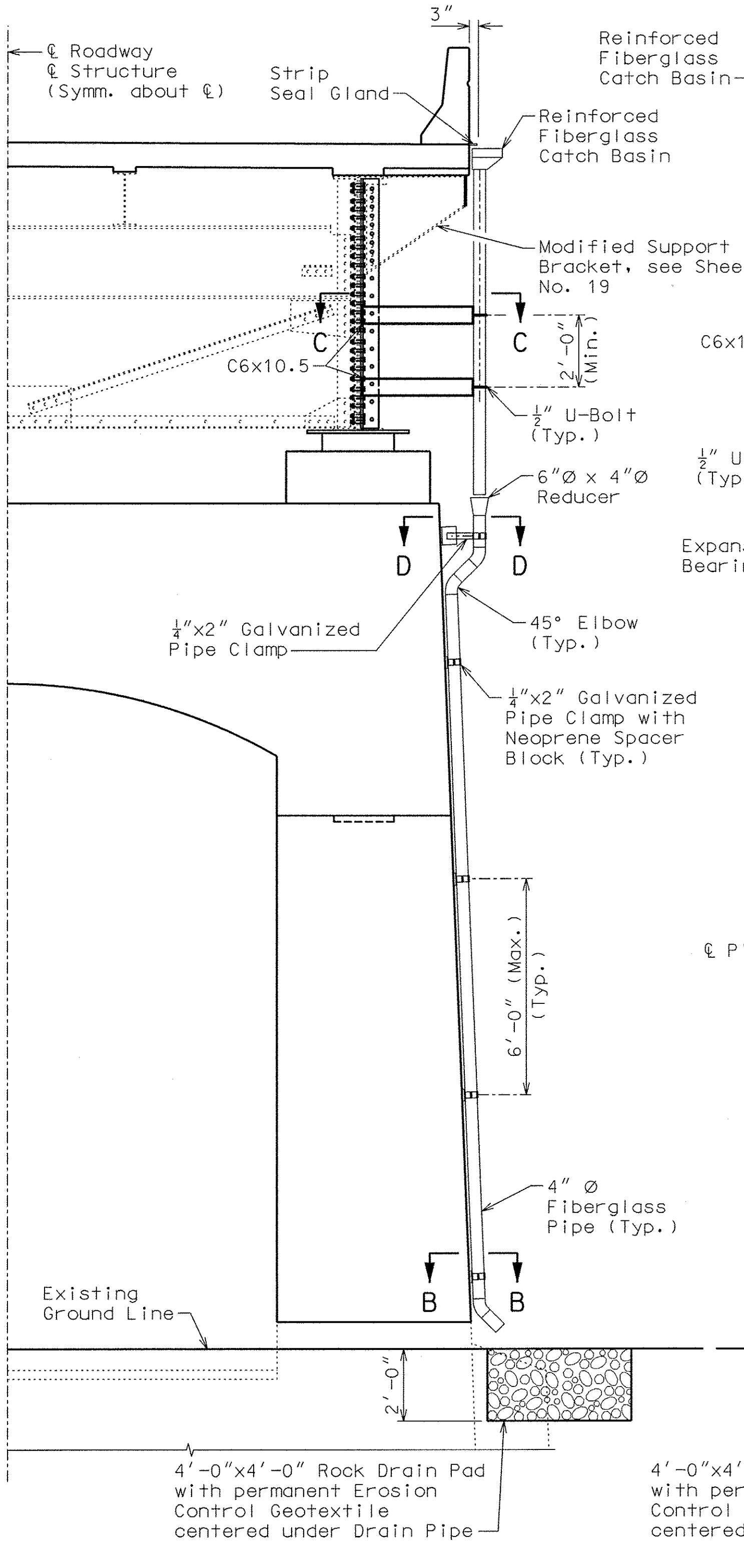


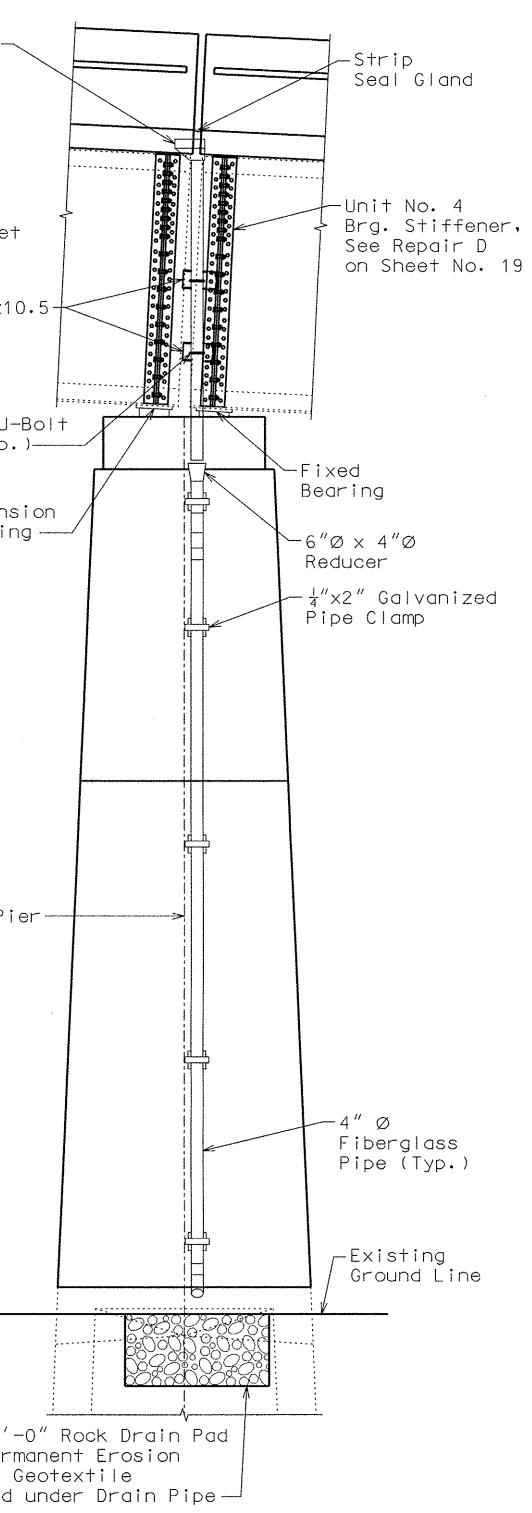
ABUTMENT ELEVATION



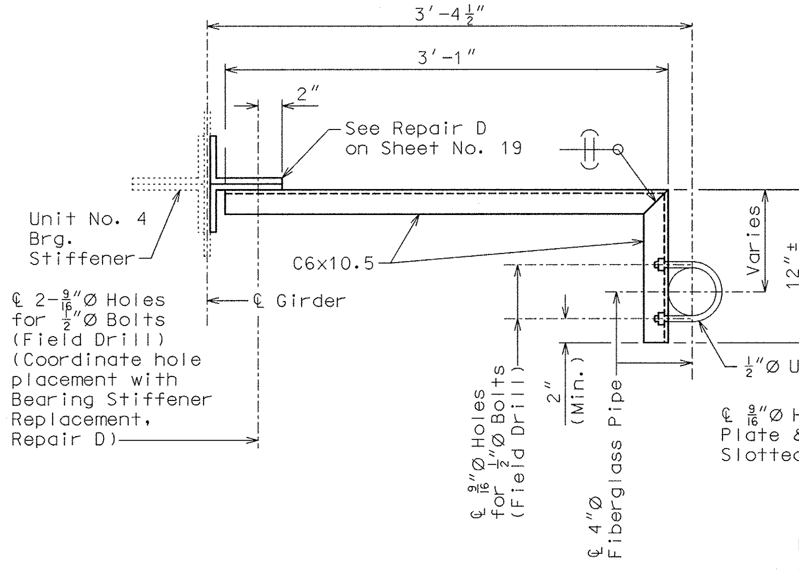
SECTION A-A
(Barrier Curb not shown)



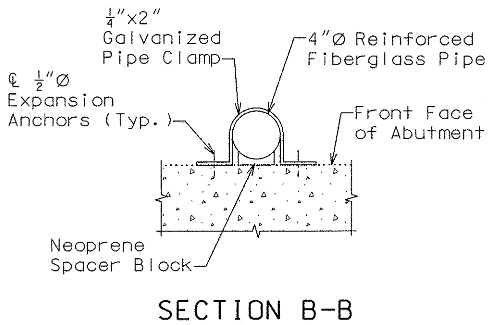
PIER NO. 7 ELEVATION



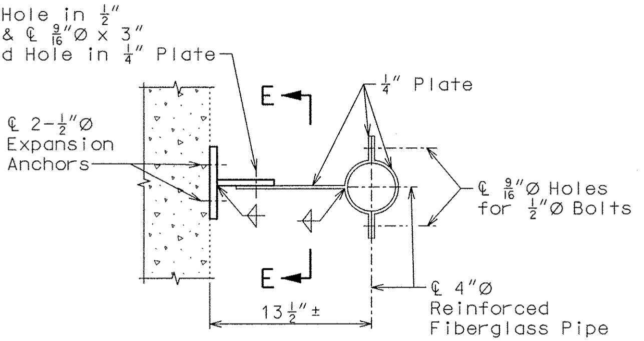
END ELEVATION



SECTION C-C

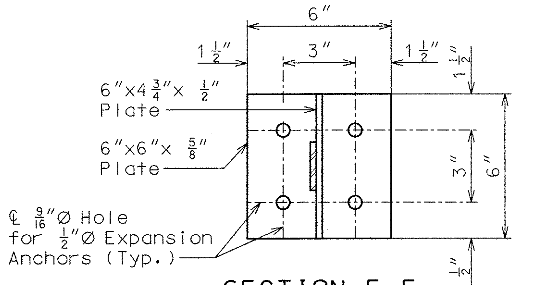


SECTION B-B
(Abutment Shown, Pier No. 7 Similar)

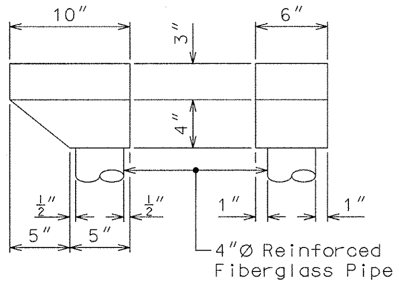


SECTION D-D

Note:
The cost of all equipment, labor and materials required to install the Drainage System at the Abutments and Pier No. 7 shall be included in the contract lump sum price for Drainage System (On Structure).



SECTION E-E



CATCH BASIN DETAILS

DRAIN DETAILS AT EXPANSION JOINTS

Detailed April 2009
Checked April 2009

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

Sheet No. 47 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016569

DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	47
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

c:\modot\batchplot\B_L00982_047_J1P2161.DGN 1:25:35 PM 5/21/2009

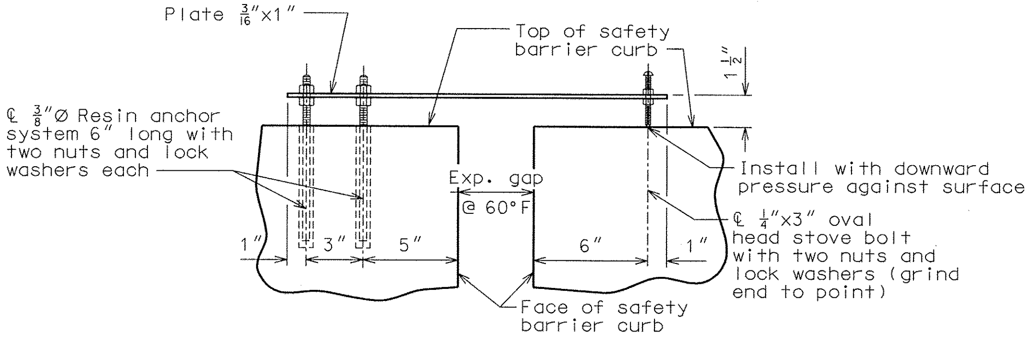
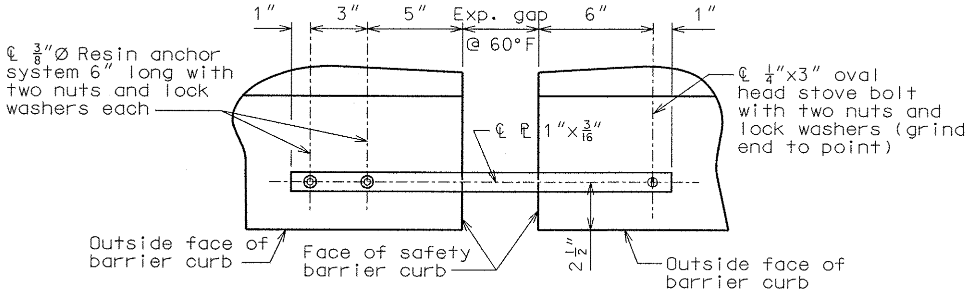


Plate $\frac{3}{16}$"x1"
Top of safety barrier curb
1½"
℄ ⅜"Ø Resin anchor system 6" long with two nuts and lock washers each
Exp. gap @ 60°F
Install with downward pressure against surface
℄ ¼"x3" oval head stove bolt with two nuts and lock washers (grind end to point)
1"
3"
5"
6"
1"
Face of safety barrier curb

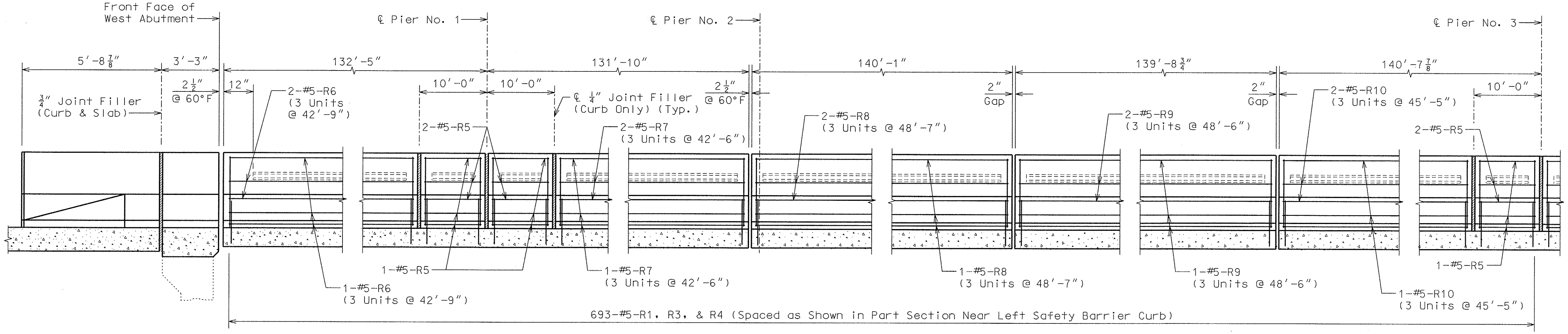
PART ELEVATION OF BARRIER CURB SHOWING MOVEMENT GAUGE

(At Each Exp. Joint)


1"
3"
5"
Exp. gap @ 60°F
6"
1"
℄ ⅜"Ø Resin anchor system 6" long with two nuts and lock washers each
℄ ¼"x3" oval head stove bolt with two nuts and lock washers (grind end to point)
℄ ℄ 1"x$\frac{3}{16}$"
Outside face of barrier curb
Face of safety barrier curb
2½"
Outside face of barrier curb

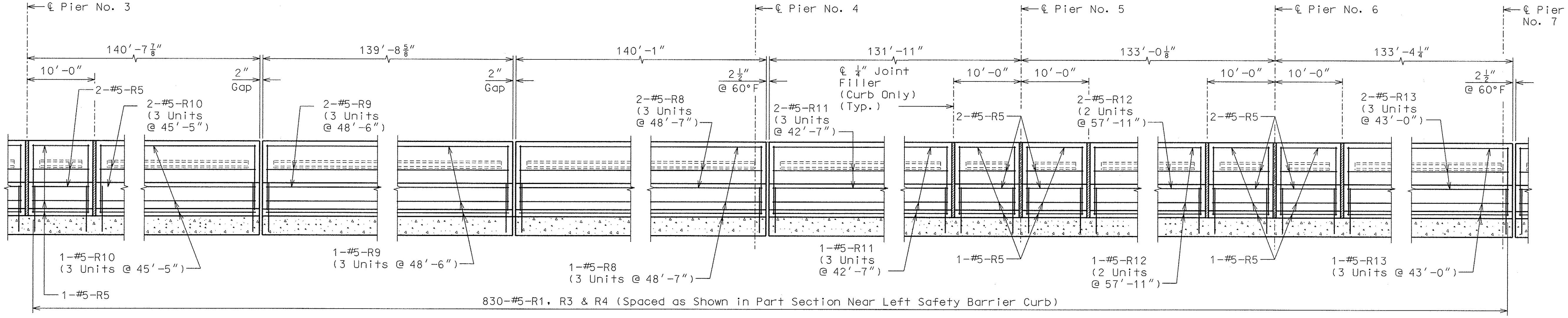
PART PLAN OF BARRIER CURB SHOWING MOVEMENT GAUGE

(At Each Exp. Joint)


Front Face of West Abutment
℄ Pier No. 1
℄ Pier No. 2
℄ Pier No. 3
5'-8⅞"
3'-3"
132'-5"
131'-10"
140'-1"
139'-8¾"
140'-7⅞"
¾" Joint Filler (Curb & Slab)
2½" @ 60°F
12"
2-#5-R6 (3 Units @ 42'-9")
10'-0"
10'-0"
2-#5-R5
℄ ¼" Joint Filler (Curb Only) (Typ.)
2-#5-R7 (3 Units @ 42'-6")
2½" @ 60°F
2-#5-R8 (3 Units @ 48'-7")
2" Gap
2-#5-R9 (3 Units @ 48'-6")
2" Gap
2-#5-R10 (3 Units @ 45'-5")
10'-0"
2-#5-R5
1-#5-R5
1-#5-R6 (3 Units @ 42'-9")
1-#5-R7 (3 Units @ 42'-6")
1-#5-R8 (3 Units @ 48'-7")
1-#5-R9 (3 Units @ 48'-6")
1-#5-R5
1-#5-R10 (3 Units @ 45'-5")
693-#5-R1, R3, & R4 (Spaced as Shown in Part Section Near Left Safety Barrier Curb)

SECTION NEAR LEFT SAFETY BARRIER CURB - UNITS NO. 1 & 2

(Right Barrier Curb Is Similar)
(Curb Bent Plates not shown for clarity)


℄ Pier No. 3
℄ Pier No. 4
℄ Pier No. 5
℄ Pier No. 6
℄ Pier No. 7
140'-7⅞"
139'-8⅝"
140'-1"
131'-11"
133'-0⅛"
133'-4¼"
10'-0"
2-#5-R5
2-#5-R10 (3 Units @ 45'-5")
2" Gap
2-#5-R9 (3 Units @ 48'-6")
2" Gap
2-#5-R8 (3 Units @ 48'-7")
2½" @ 60°F
2-#5-R11 (3 Units @ 42'-7")
℄ ¼" Joint Filler (Curb Only) (Typ.)
10'-0"
10'-0"
2-#5-R5
2-#5-R12 (2 Units @ 57'-11")
10'-0"
10'-0"
2-#5-R5
2-#5-R13 (3 Units @ 43'-0")
2½" @ 60°F
1-#5-R10 (3 Units @ 45'-5")
1-#5-R5
1-#5-R9 (3 Units @ 48'-6")
1-#5-R8 (3 Units @ 48'-7")
1-#5-R11 (3 Units @ 42'-7")
1-#5-R5
1-#5-R12 (2 Units @ 57'-11")
1-#5-R5
1-#5-R13 (3 Units @ 43'-0")
830-#5-R1, R3 & R4 (Spaced as Shown in Part Section Near Left Safety Barrier Curb)

SECTION NEAR LEFT SAFETY BARRIER CURB - UNITS NO. 2 & 3

(Right Barrier Curb Is Similar)
(Curb Bent Plates not shown for clarity)

Note:

For Part Sections Near Left Safety Barrier Curb, see Sheet No. 49.

For details of Barrier Curb on the Approach Slab, see Sheet No. 50.

For details of Barrier Curb above the Abutment Backwall, see Sheet No. 7.

Longitudinal dimensions are horizontal.

DETAILS OF SAFETY BARRIER CURB

Detailed April 2009
Checked April 2009

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

Sheet No. 48 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

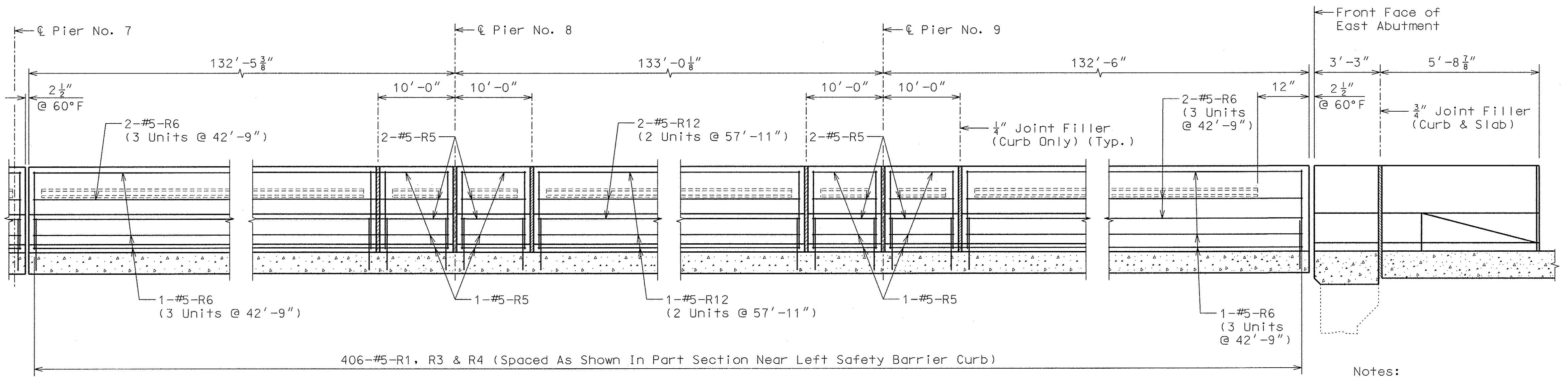
Cory Imhoff

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 48
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DATE	DESCRIPTION

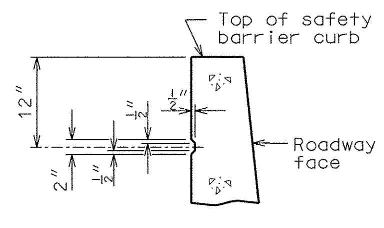
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

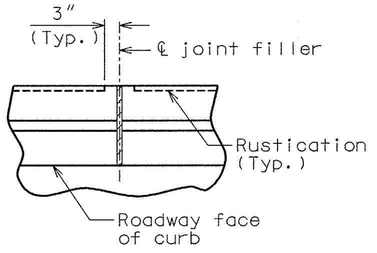

℄ Pier No. 7
℄ Pier No. 8
℄ Pier No. 9
Front Face of East Abutment
132'-5⅜"
133'-0⅛"
132'-6"
3'-3"
5'-8⅞"
2½" @ 60°F
10'-0"
12"
2-#5-R6 (3 Units @ 42'-9")
2-#5-R5
2-#5-R12 (2 Units @ 57'-11")
¼" Joint Filler (Curb Only) (Typ.)
¾" Joint Filler (Curb & Slab)
1-#5-R6 (3 Units @ 42'-9")
1-#5-R5
1-#5-R12 (2 Units @ 57'-11")
406-#5-R1, R3 & R4 (Spaced As Shown In Part Section Near Left Safety Barrier Curb)

SECTION NEAR LEFT SAFETY BARRIER CURB - UNIT NO. 4

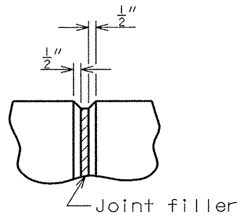
(Right Barrier Curb Is similar)
(Curb Bent Plates not shown for clarity)



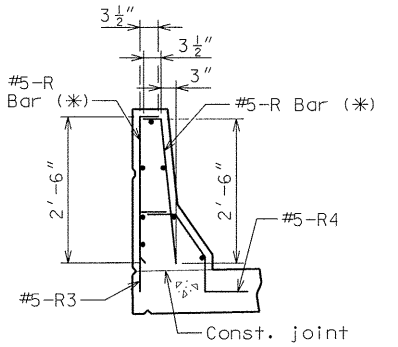
PART SECTION SHOWING RUSTICATION DETAILS



PART PLAN SHOWING SAFETY BARRIER CURB JOINT

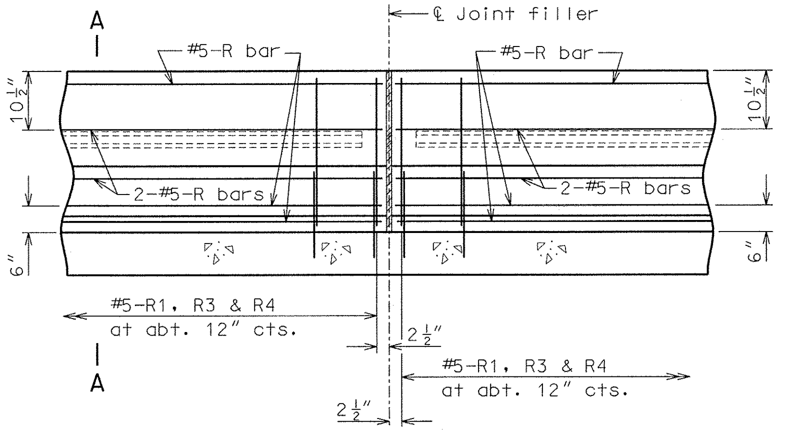


FILLED JOINT DETAIL

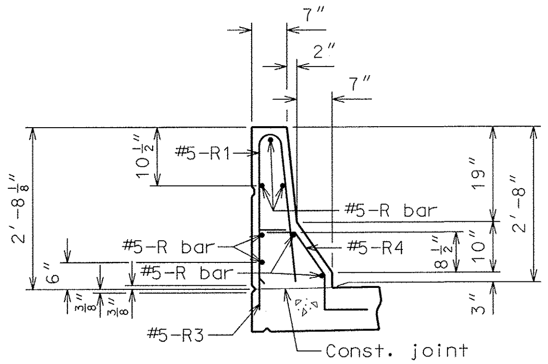


R-BAR PERMISSIBLE ALTERNATE SHAPE

(✱) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)



PART SECTION NEAR LEFT SAFETY BARRIER CURB
(CAST-IN-PLACE CONVENTIONAL FORMING OPTION)



PART SECTION A-A

Notes:

Use a minimum lap of 2'-11" for #5 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 2.27 sq. ft.

Notes:

Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

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

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

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

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of curb to end of curb except for portion above abutment backwall.

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

A movement gauge shall be provided on one side of the bridge at all safety barrier curb expansion joints. All steel shall be galvanized.

Cost of movement gauge complete-in-place will be considered completely covered by the contract unit price for Safety Barrier Curb per Lin. Ft.

For Section near Left Safety Barrier Curb from West Abutment to Pier No. 7, see Sheet 48.

For details of Barrier Curb on the Approach Slab, see Sheet No. 50.

For details of Barrier Curb above the Abutment Backwall, see Sheet No. 7.

For details of Curb Bent Plates, see Strip Seal Details. Cost of furnishing and installing Curb Bent Plates at Abutments and Piers No. 2, 4 & 7 shall be considered completely covered by the contract unit price for Safety Barrier Curb per linear foor.

Longitudinal dimensions are horizontal.

DETAILS OF SAFETY BARRIER CURB

Detailed April 2009
Checked April 2009

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

Sheet No. 49 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 49
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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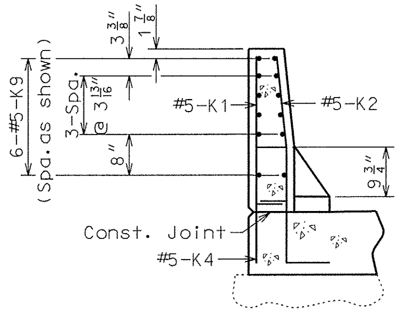
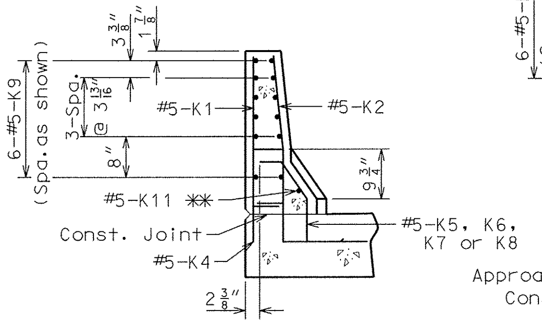
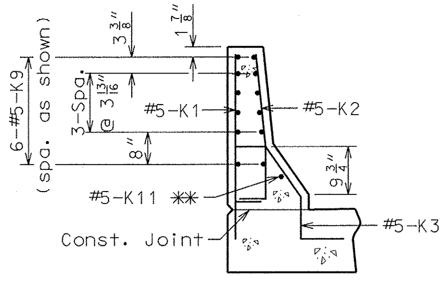


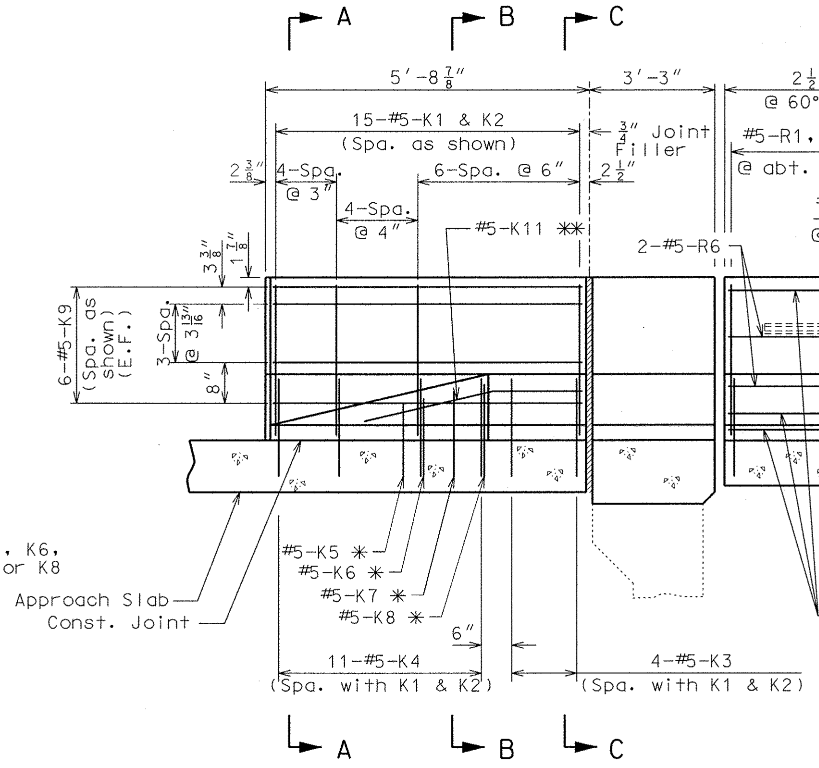
SECTION A-A



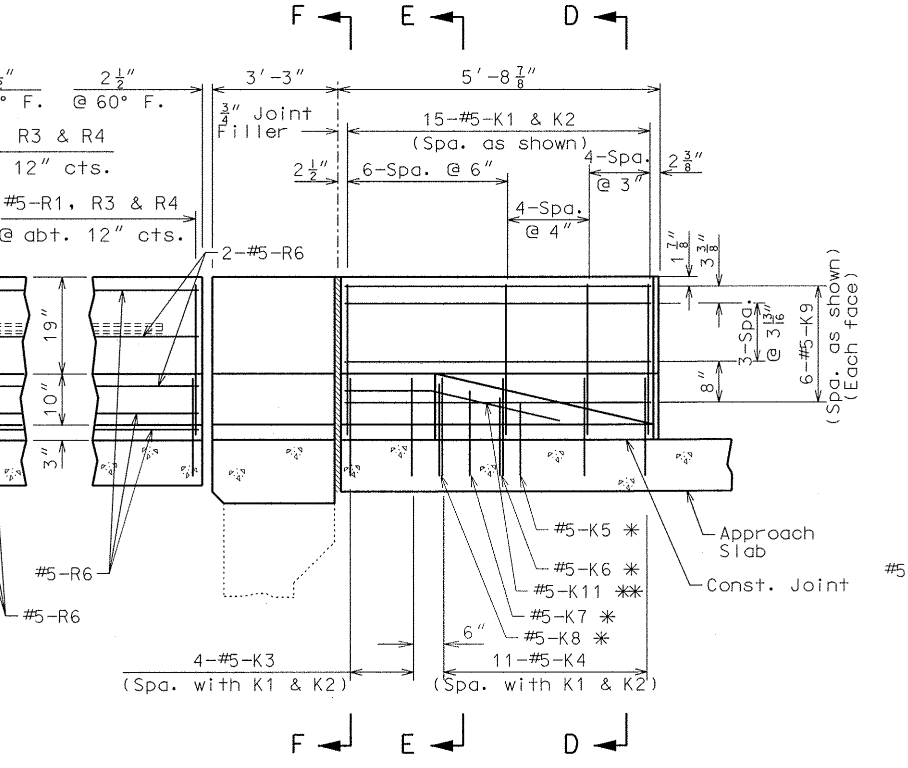
SECTION B-B



SECTION C-C

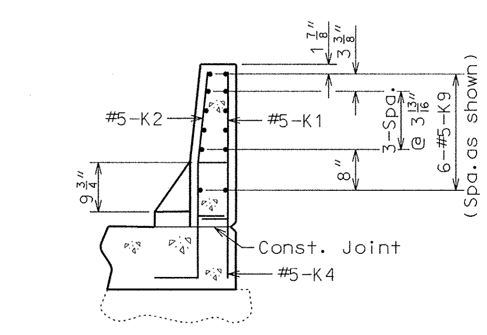


ELEVATION

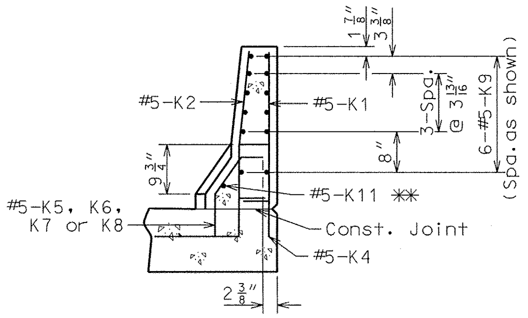


ELEVATION

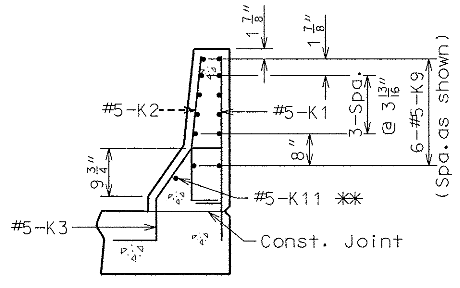
✱ Spaced with #5-K4 bars.
✱✱ Fit bar to follow transition face of curb.



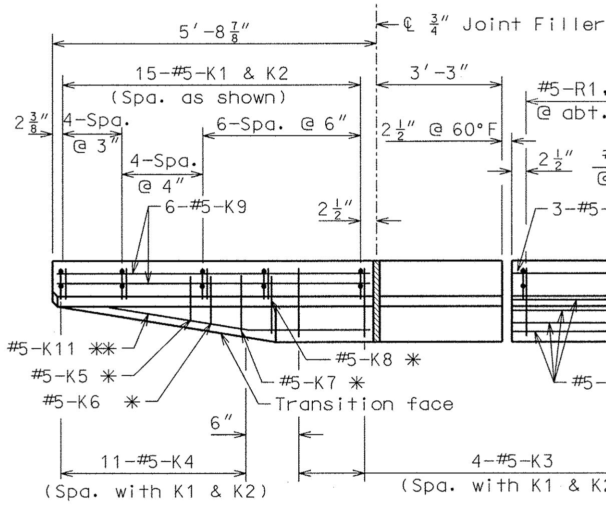
SECTION D-D



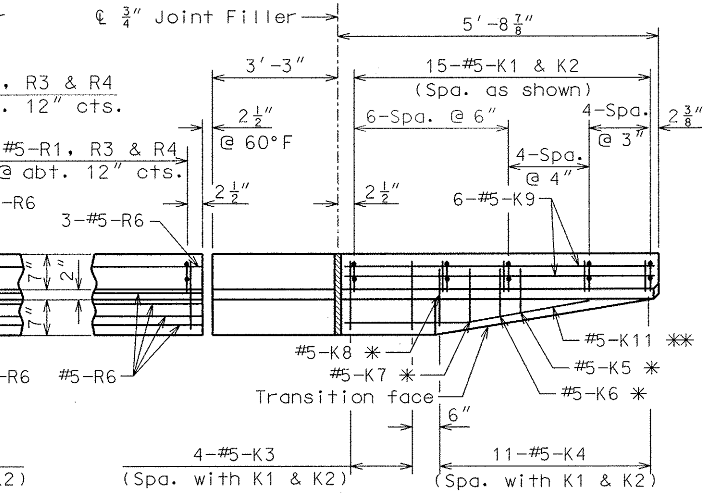
SECTION E-E



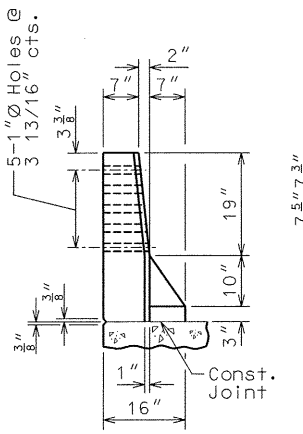
SECTION F-F



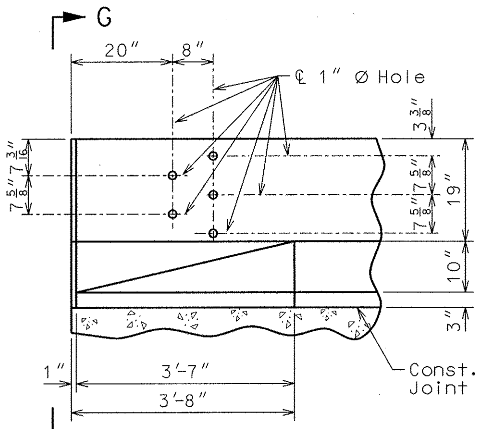
PLAN



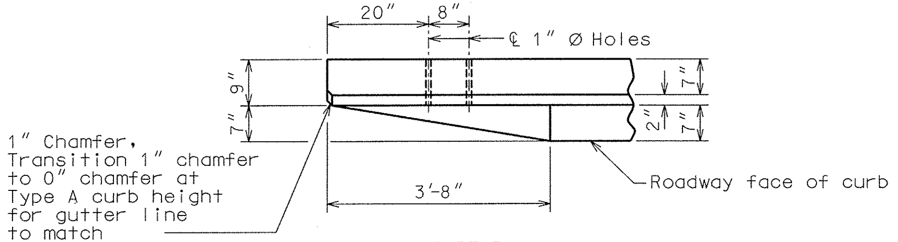
PLAN



PART ELEVATION G-G



PART ELEVATION


G
20"
8"
℄ 1" Ø Holes
9"
7"
7"
2"
7"
3'-8"
1" Chamfer, Transition 1" chamfer to 0" chamfer at Type A curb height for gutter line to match
Roadway face of curb

PART PLAN

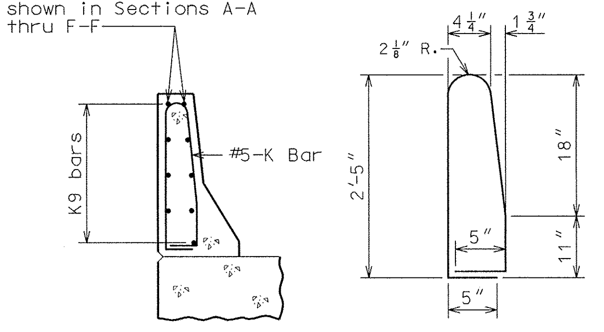
DETAILS OF GUARD RAIL ATTACHMENT

Notes:

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

For details of the Barrier Curb above the Abutment Backwall, see Sheet No. 7.

The top two K9 bars shall be kept with position close to those shown in Sections A-A thru F-F



(K3 or K4 thru K8 bars not shown for clarity)

K1-K2 BAR PERMISSIBLE
ALTERNATE SHAPE (✱✱✱)

(✱✱✱) The K1 and K2 bar combination may be furnished as one bar as shown, at the contractor's option.

DETAILS OF SAFETY BARRIER CURB AT ABUTMENTS

(Left barrier curb shown: right barrier curb similar)

Detailed April 2009
Checked April 2009

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

Sheet No. 50 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2003016669

DATE PREPARED 5-21-09

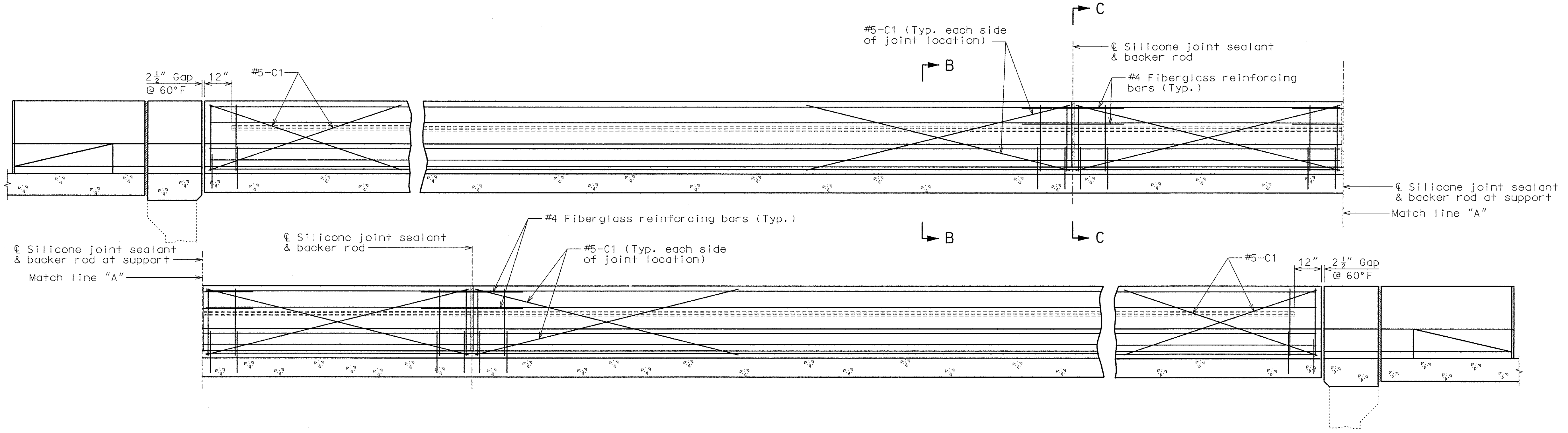
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	50

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856


#5-C1 (Typ. each side of joint location)
C
B
℄ Silicone joint sealant & backer rod
#4 Fiberglass reinforcing bars (Typ.)
2½" Gap @ 60°F
12"
#5-C1
℄ Silicone joint sealant & backer rod at support
Match line "A"
#4 Fiberglass reinforcing bars (Typ.)
℄ Silicone joint sealant & backer rod
#5-C1 (Typ. each side of joint location)
℄ Silicone joint sealant & backer rod at support
Match line "A"
B
C
#5-C1
12"
2½" Gap @ 60°F

TYPICAL SECTION NEAR LEFT SAFETY BARRIER CURB AT SUPPORT LOCATIONS (OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB)

Notes:

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

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

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

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of curb to end of curb.

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

Notes:

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

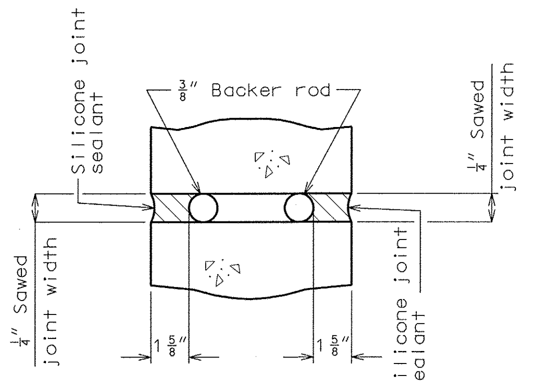
Plastic waterstop shall not be used with slip-form option.

C Bars (Slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

For Slip-Form option, all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

Cost of silicone joint sealant and backer rod complete-in-place will be considered completely covered by the contract unit price for Safety Barrier Curb per Lin. Ft.

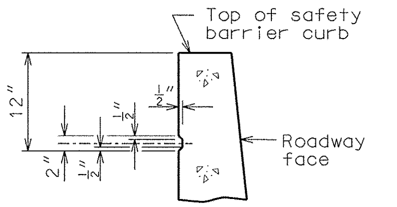
Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".



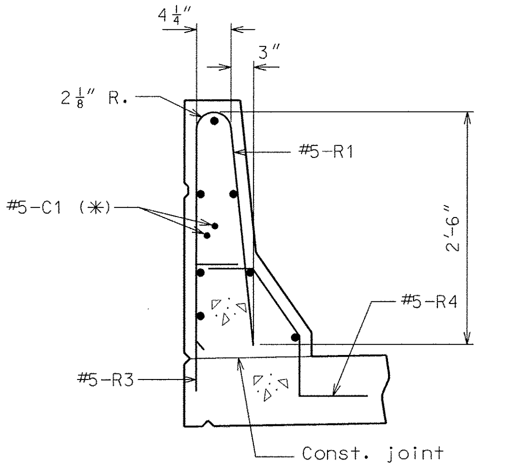
SECTION A-A

Note:

Cost of silicone joint sealant and backer rod, complete-in-place, will be considered completely covered by the contract unit price for Safety Barrier Curb.

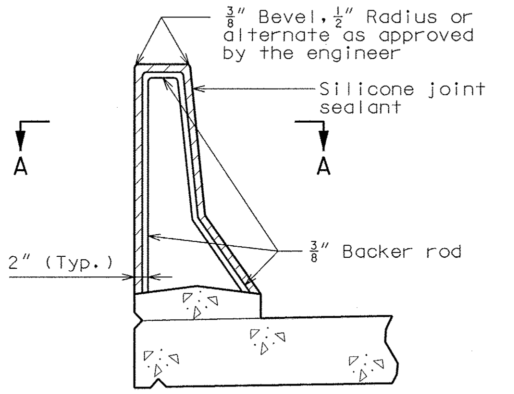


PART SECTION SHOWING RUSTICATION DETAILS

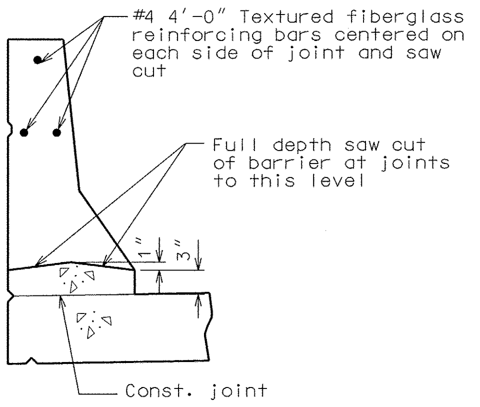


PART SECTION B-B

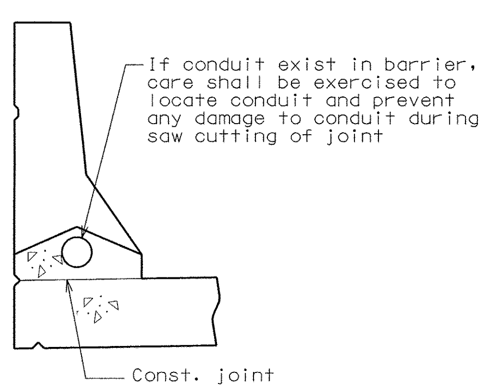
(✱) Each side of joint location.


⅜" Bevel, ½" Radius or alternate as approved by the engineer
Silicone joint sealant
A
A
2" (Typ.)
⅜" Backer rod

SECTION THRU JOINT


#4 4'-0" Textured fiberglass reinforcing bars centered on each side of joint and saw cut
Full depth saw cut of barrier at joints to this level
1"
3"
Const. joint

PART SECTION C-C


If conduit exist in barrier, care shall be exercised to locate conduit and prevent any damage to conduit during saw cutting of joint
Const. joint

PART SECTION C-C
(Use when conduit required)

OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB

(Left barrier curb shown, right barrier curb similar.)

Detailed April 2009
Checked April 2009

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

Sheet No. 51 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED
5-21-09

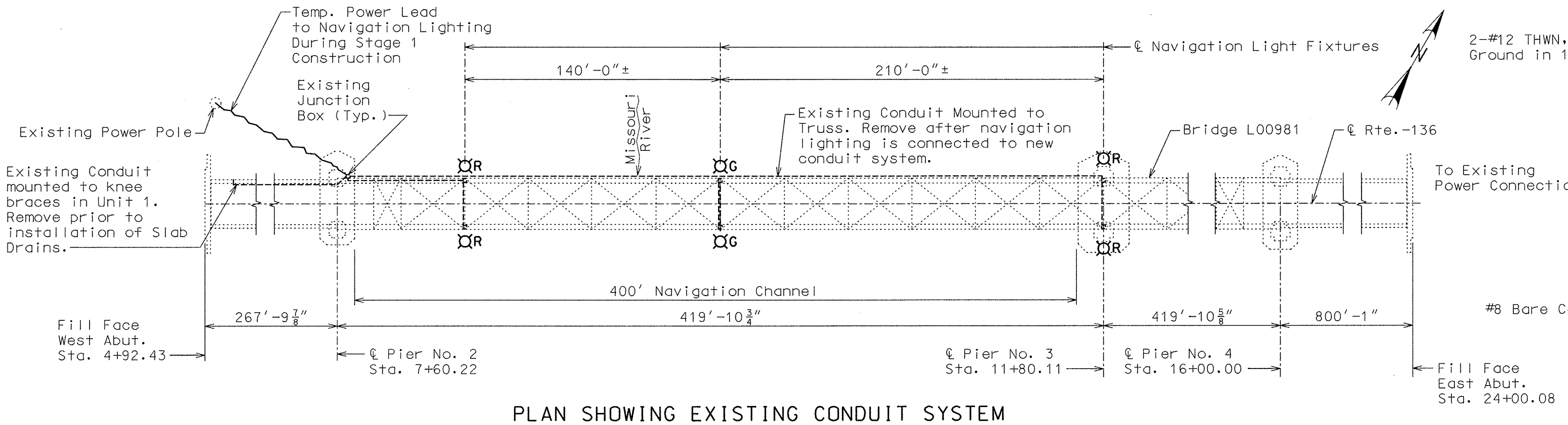
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	51

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
L00982

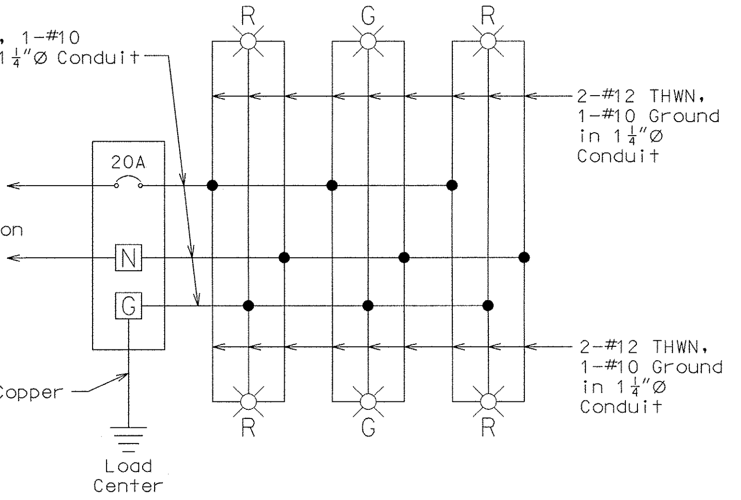
DESCRIPTION
DATE

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

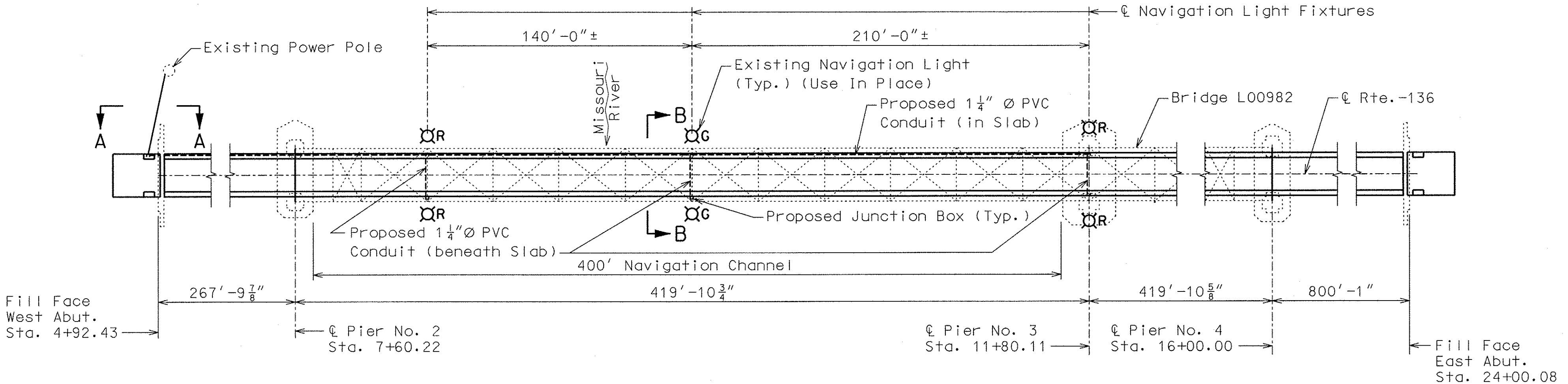
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856


Temp. Power Lead to Navigation Lighting During Stage 1 Construction
Existing Junction Box (Typ.)
Existing Power Pole
Existing Conduit mounted to knee braces in Unit 1. Remove prior to installation of Slab Drains.
℄ Navigation Light Fixtures
140′-0″±
210′-0″±
Missouri River
Existing Conduit Mounted to Truss. Remove after navigation lighting is connected to new conduit system.
Bridge L00981
℄ Rte.-136
R
G
R
R
G
R
400′ Navigation Channel
267′-9⅞″
419′-10¾″
419′-10⅝″
800′-1″
Fill Face West Abut. Sta. 4+92.43
℄ Pier No. 2 Sta. 7+60.22
℄ Pier No. 3 Sta. 11+80.11
℄ Pier No. 4 Sta. 16+00.00
Fill Face East Abut. Sta. 24+00.08

PLAN SHOWING EXISTING CONDUIT SYSTEM


2-#12 THWN, 1-#10 Ground in 1¼″Ø Conduit
To Existing Power Connection
20A
N
G
#8 Bare Copper
Load Center
R
G
R
2-#12 THWN, 1-#10 Ground in 1¼″Ø Conduit
2-#12 THWN, 1-#10 Ground in 1¼″Ø Conduit

NAVIGATION LIGHTING SCHEMATIC


℄ Navigation Light Fixtures
140′-0″±
210′-0″±
Existing Power Pole
Missouri River
Existing Navigation Light (Typ.) (Use In Place)
Proposed 1¼″ Ø PVC Conduit (in Slab)
Bridge L00982
℄ Rte.-136
A
A
B
B
R
G
R
R
G
R
Proposed 1¼″Ø PVC Conduit (beneath Slab)
Proposed Junction Box (Typ.)
400′ Navigation Channel
267′-9⅞″
419′-10¾″
419′-10⅝″
800′-1″
Fill Face West Abut. Sta. 4+92.43
℄ Pier No. 2 Sta. 7+60.22
℄ Pier No. 3 Sta. 11+80.11
℄ Pier No. 4 Sta. 16+00.00
Fill Face East Abut. Sta. 24+00.08

PLAN SHOWING PROPOSED CONDUIT SYSTEM

Notes: All conduit for Navigation Lighting wiring shall be rigid, non-metallic, Schedule 40, heavy wall, PVC (polyvinyl chloride) plastic. Each section of conduit shall bear the Underwriter's Laboratories, Inc. (UL) label.

Conduit shall be embedded in the slab or barrier where shown. Shift reinforcing steel in the field where necessary to clear conduit and junction boxes.

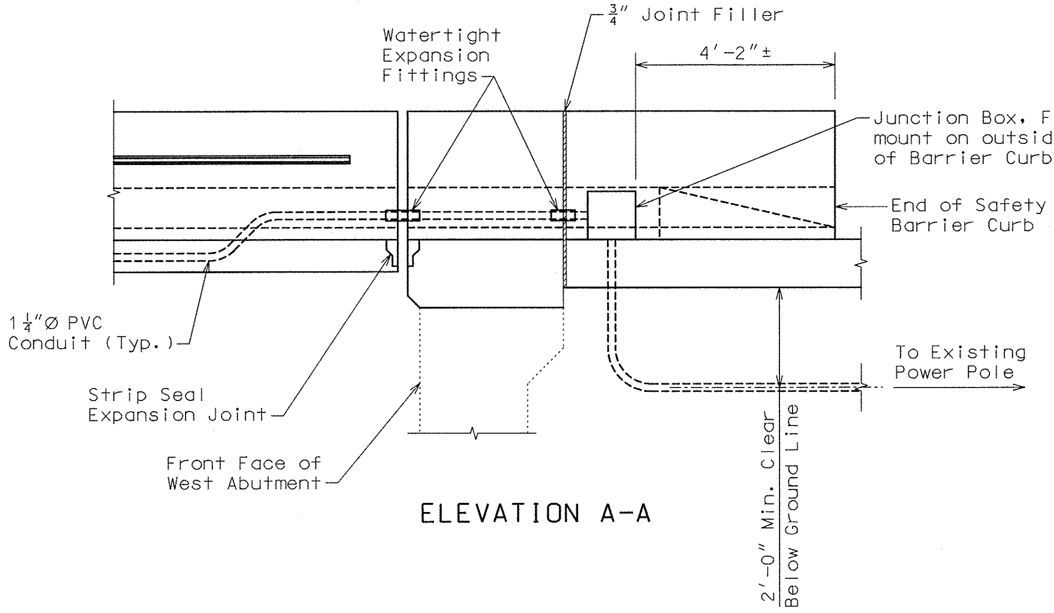
A watertight expansion fitting shall be provided at the expansion joints at the West Abutment and Pier No. 2 to accommodate a minimum movement in either direction of 3 inches. Gap between the slabs at 60° F. is 2 1/2″. Movement per 10° F. temperature change is approximately 5/16″. A watertight expansion fitting shall be provided at the expansion joints at Panel Points L4 & L8 in Span No. 3 to accomodate a minimum movement in either direction of 1 inch. Gap between the slabs shall be 2″ regardless of the temperature at the time of installation. The expansion fitting shall be equal to Carlon Electrical Construction Products or Cantex, Inc.

Weepholes shall be provided at appropriate locations to drain any moisture in the conduit system.

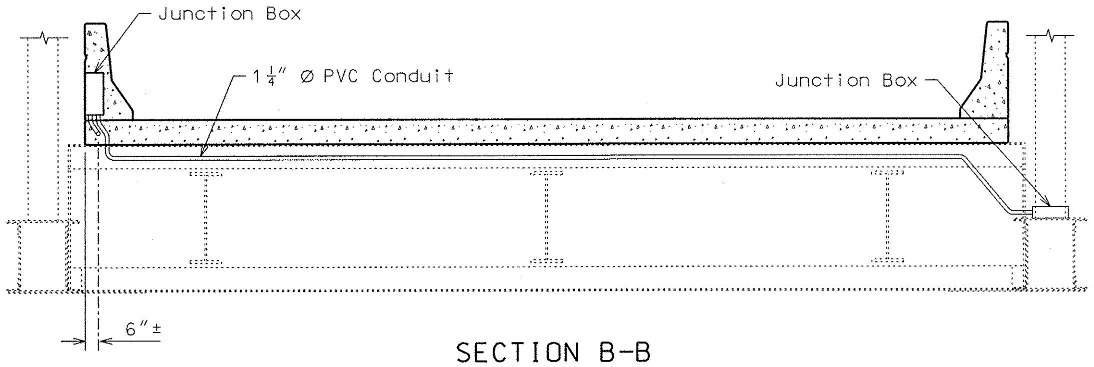
All junction boxes shall be PVC molded flush mounted in barrier or surface mounted on truss and equal to Carlon Electrical Construction Products or Cantex, Inc. The conduit terminations shall be permanent or separable. The terminations and covers shall be of watertight construction and shall meet requirements for NEMA 4 enclosure.

Cost of permanent Navigation Lighting, including furnishing and installing conduit, expansion fittings, wiring, junction boxes, connection to permanent power source, connection to existing lights and testing of the lighting system shall be paid for at the contract unit price for "Navigation Lighting System", Lump Sum.

See special provisions for wiring and additional requirements.


Watertight Expansion Fittings
¾″ Joint Filler
4′-2″±
Junction Box, Flush mount on outside Face of Barrier Curb
End of Safety Barrier Curb
1¼″Ø PVC Conduit (Typ.)
Strip Seal Expansion Joint
Front Face of West Abutment
To Existing Power Pole
2′-0″ Min. Clear Below Ground Line

ELEVATION A-A



SECTION B-B

Flexible cable connection from Junction Boxes to Existing Navigation Lights not shown for clarity.

PERMANENT NAVIGATION LIGHTING REPAIR DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 52 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

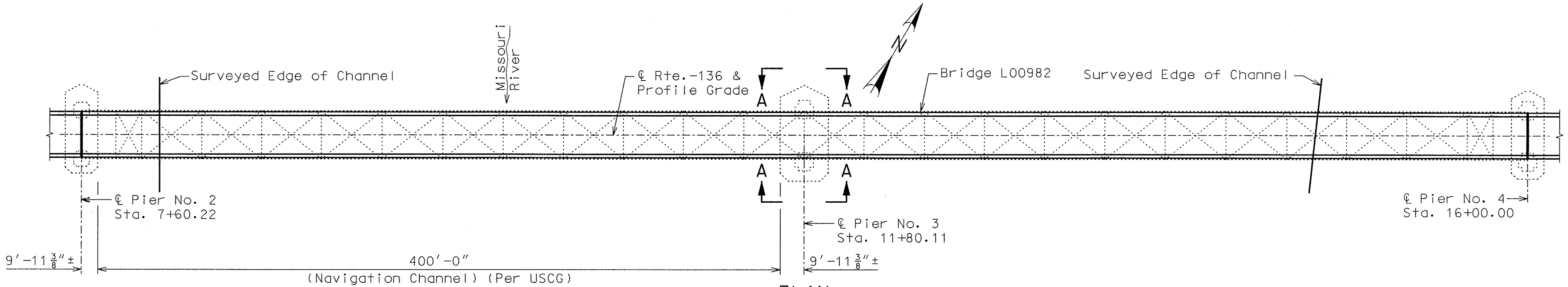
DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	52
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION
DATE

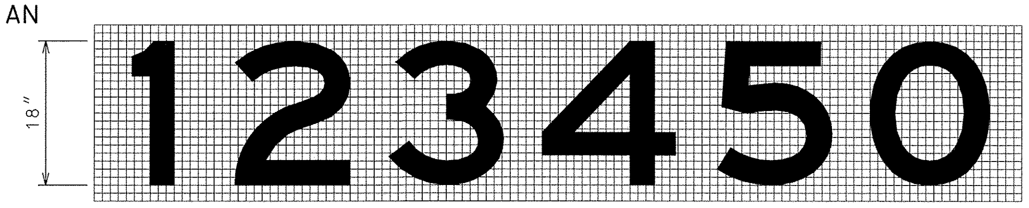
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

c:\modot\batchplot\B_L00982_052_J1P2161.DGN 1:25:57 PM 5/21/2009

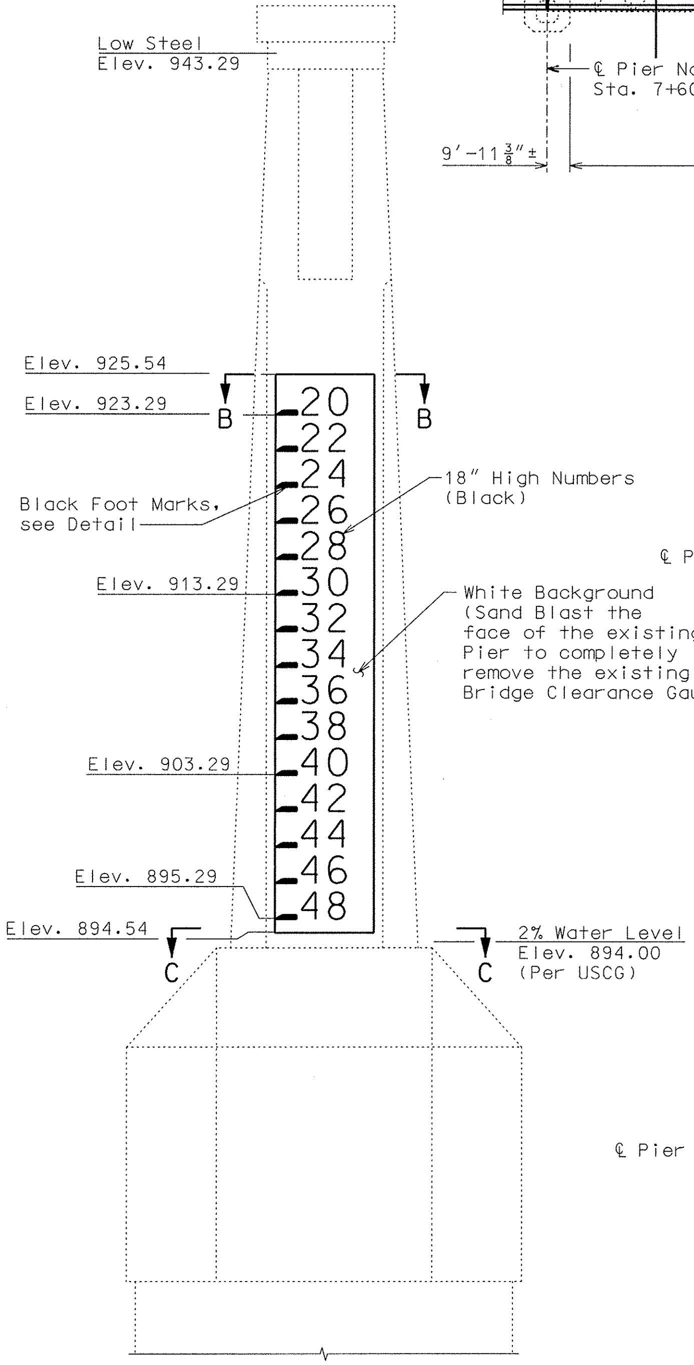


PLAN



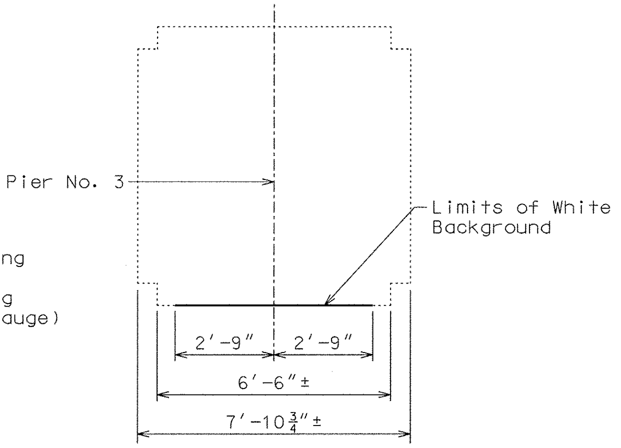
NUMBERS DETAIL

NOTE:
Series B Type Numbers



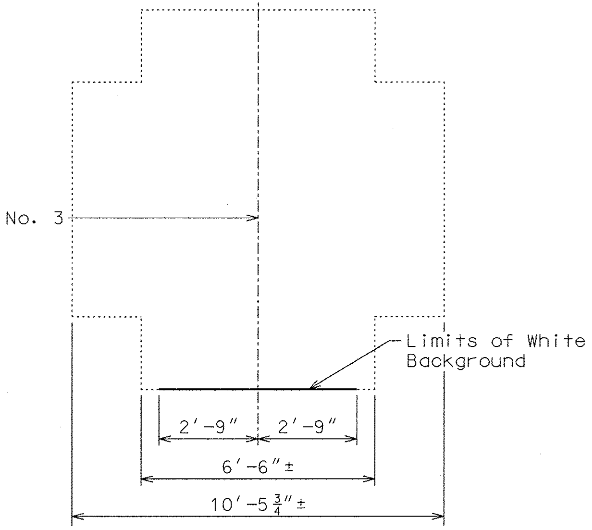
ELEVATION A-A

Downstream Face Shown,
Upstream Face Similar



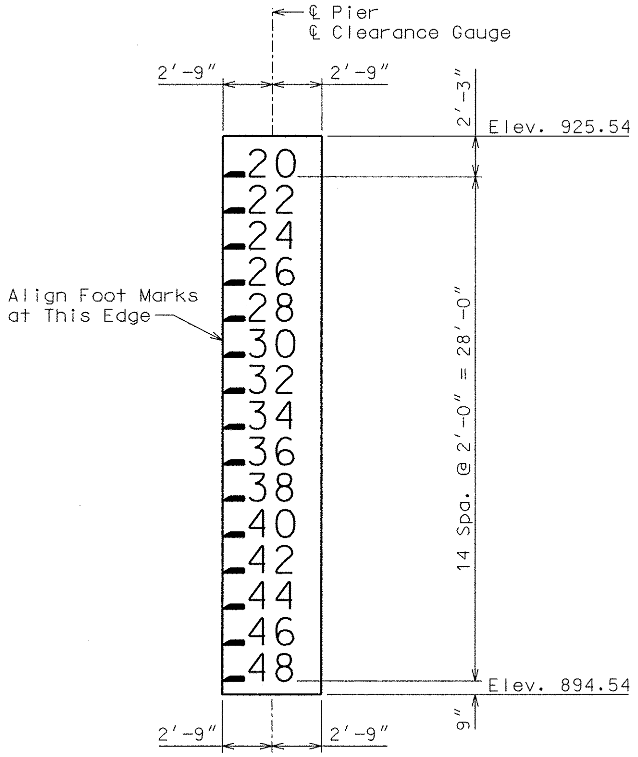
SECTION B-B

(South Column Shown,
North Column Similar)

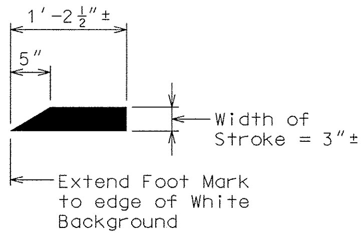


SECTION C-C

(South Column Shown,
North Column Similar)



DEVELOPED GAUGE ELEVATION



FOOT MARK DETAIL

Notes:
Gauges to be painted on upstream and downstream face of Pier No. 3. (See Special Provisions.)

The width of stroke for the numerals and Foot Marks shall be approximately 3 inches.

The width of the numerals shall be proportionate to the height as detailed for Series "B" Type numerals.

The horizontal distance between the numeral and nearest edge of the white background shall be no less than one-half the width of a single numeral.

The furnishing of and the installation of materials for the Bridge Clearance Gauges on the Pier shall be considered completely covered by the contract price for Clearance Gauge, Lump Sum.

BRIDGE CLEARANCE GAUGE

Detailed April 2009
Checked April 2009

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

Sheet No. 53 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

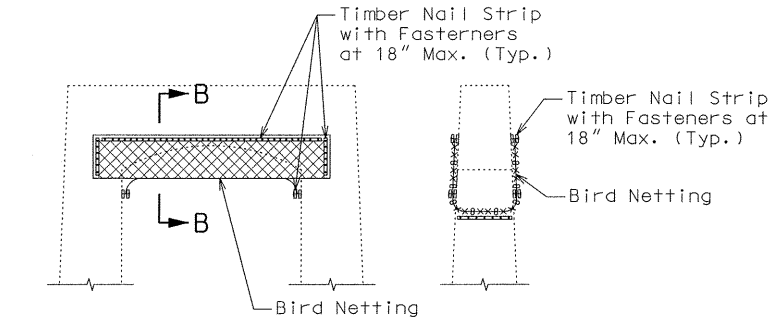
DATE PREPARED	
5-21-09	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	53
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION

DATE

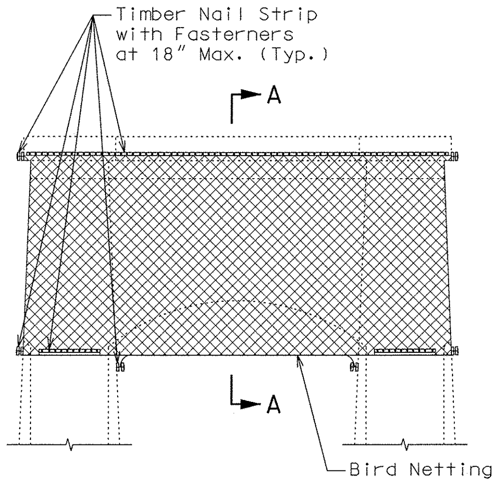
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

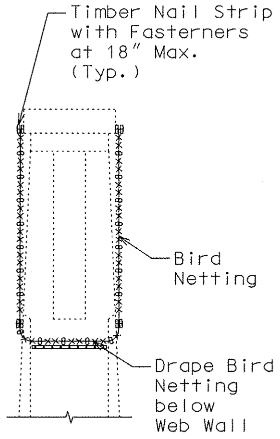

Timber Nail Strip with Fasteners at 18" Max. (Typ.)
B
B
Bird Netting
Timber Nail Strip with Fasteners at 18" Max. (Typ.)
Bird Netting

ELEVATION SHOWING BIRD NETTING (PIERS NO. 1, 5, 6, 8 & 9)

SECTION B-B



ELEVATION SHOWING BIRD NETTING (PIERS NO. 2, 3 & 4)


Timber Nail Strip with Fasterners at 18" Max. (Typ.)
Bird Netting
Drape Bird Netting below Web Wall

SECTION A-A

Notes:
There is evidence of a substantial colony of migratory birds on the existing bridge with nests under the bridge deck and under the pier caps and pier cap overhangs. The contractor shall avoid disturbance seasonally by restricting work on nesting areas of the bridge between April 1 and August 1 or installation of netting to prevent bird access to nesting areas during this timeframe.

To prevent adverse impacts to the migratory bird population, the contractor shall remove nests found on the underside of the deck and install all bird netting as shown in the details on this sheet. This work shall be completed, with all bird netting in place, between the date that the contractor is given notice to proceed with the project and April 1.

The contractor may elect to complete deck removals without removing nests from the underside of the deck as long as the Stage 1 deck is completely removed prior to April 1 and the bird netting under the remaining existing deck is completely in place prior to April 1.

The contractor shall maintain the bird netting in a manner that prevents bird entry to the satisfaction of the engineer between April 1 and August 1. Any work that requires entry into the netting between April 1 and August 1 shall be done with caution and with countermeasures in place to prevent bird entry.

Bird netting is not required under the new deck constructed during the first stage. Any nests that are constructed between April 1 and August 1 under the new deck constructed during the first stage shall be avoided and protected from damage as directed by the engineer from April 1 to August 1.

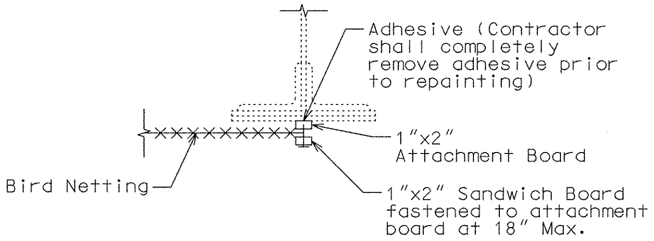
Bird netting shall be installed on the existing cap at Pier No. 7 if the demolition is not complete prior to April 1. Bird netting shall be installed on any portion of the new cap at Pier No. 7 that is completed prior to August 1.

The bird netting shall be installed as shown in the details on this sheet and according to the bird netting manufacturer's instructions. The bird netting shall have a maximum opening size of 1/2" x 1/2".

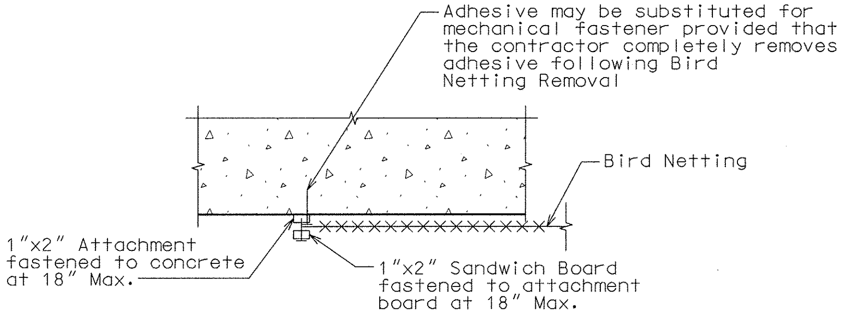
The contractor shall submit sketches, plans, materials samples, attachment details, and splicing details to the engineer for review a minimum of 4 weeks prior to beginning bird net installation. The information submitted shall be of sufficient detail to fully explain the contractor's bird netting installation and maintenance approach.

Alternate netting approaches can be submitted by the contractor for review but must be effective in preventing migratory bird nesting on portions of the bridge that will be disturbed by the contractor's operations between April 1 and August 1.

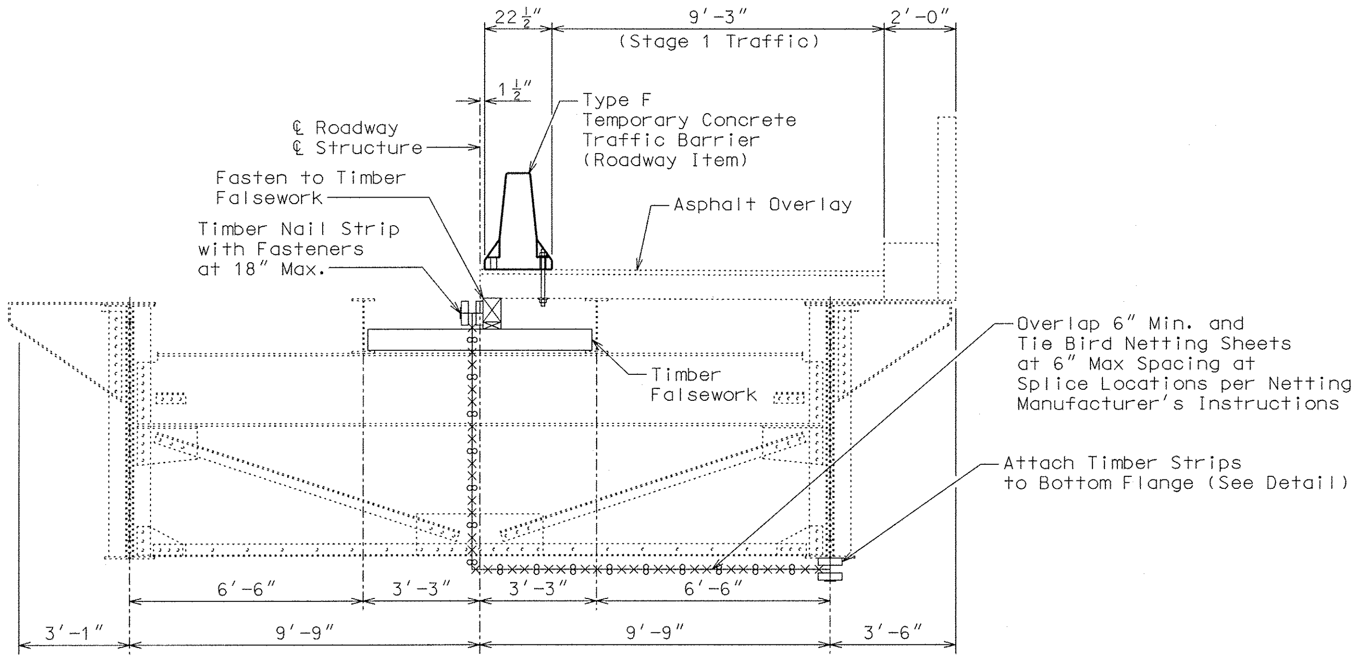
The cost of installing, maintaining, and removing the bird netting as shown and as directed by the engineer, including all labor, equipment and materials, shall be included in the contract lump sum price for Migratory Bird Nesting Prevention Netting.


Adhesive (Contractor shall completely remove adhesive prior to repainting)
1"x2" Attachment Board
Bird Netting
1"x2" Sandwich Board fastened to attachment board at 18" Max.

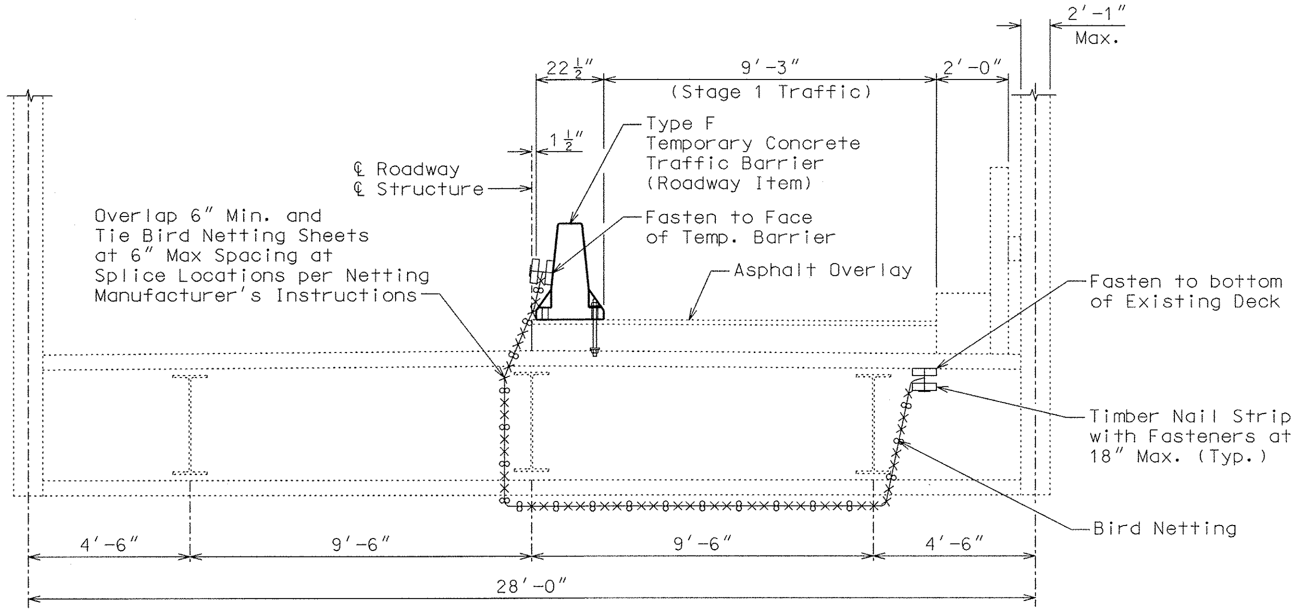
APPROACH GIRDER ATTACHMENT DETAIL


Adhesive may be substituted for mechanical fastener provided that the contractor completely removes adhesive following Bird Netting Removal
Bird Netting
1"x2" Attachment fastened to concrete at 18" Max.
1"x2" Sandwich Board fastened to attachment board at 18" Max.

CONCRETE ATTACHMENT DETAIL


22 1/2"
9'-3"
(Stage 1 Traffic)
2'-0"
1 1/2"
℄ Roadway
℄ Structure
Type F Temporary Concrete Traffic Barrier (Roadway Item)
Fasten to Timber Falsework
Timber Nail Strip with Fasteners at 18" Max.
Asphalt Overlay
Timber Falsework
Overlap 6" Min. and Tie Bird Netting Sheets at 6" Max Spacing at Splice Locations per Netting Manufacturer's Instructions
Attach Timber Strips to Bottom Flange (See Detail)
6'-6"
3'-3"
3'-3"
6'-6"
3'-1"
9'-9"
9'-9"
3'-6"

BIRD NETTING INSTALLATION - UNITS NO. 1, 3 & 4


2'-1" Max.
22 1/2"
9'-3"
(Stage 1 Traffic)
2'-0"
1 1/2"
℄ Roadway
℄ Structure
Type F Temporary Concrete Traffic Barrier (Roadway Item)
Fasten to Face of Temp. Barrier
Overlap 6" Min. and Tie Bird Netting Sheets at 6" Max Spacing at Splice Locations per Netting Manufacturer's Instructions
Asphalt Overlay
Fasten to bottom of Existing Deck
Timber Nail Strip with Fasteners at 18" Max. (Typ.)
Bird Netting
4'-6"
9'-6"
9'-6"
4'-6"
28'-0"

BIRD NETTING INSTALLATION - UNIT NO. 2

MIGRATORY BIRD NESTING PREVENTION NETTING

Detailed April 2009
Checked April 2009

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

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

Cory Imhoff

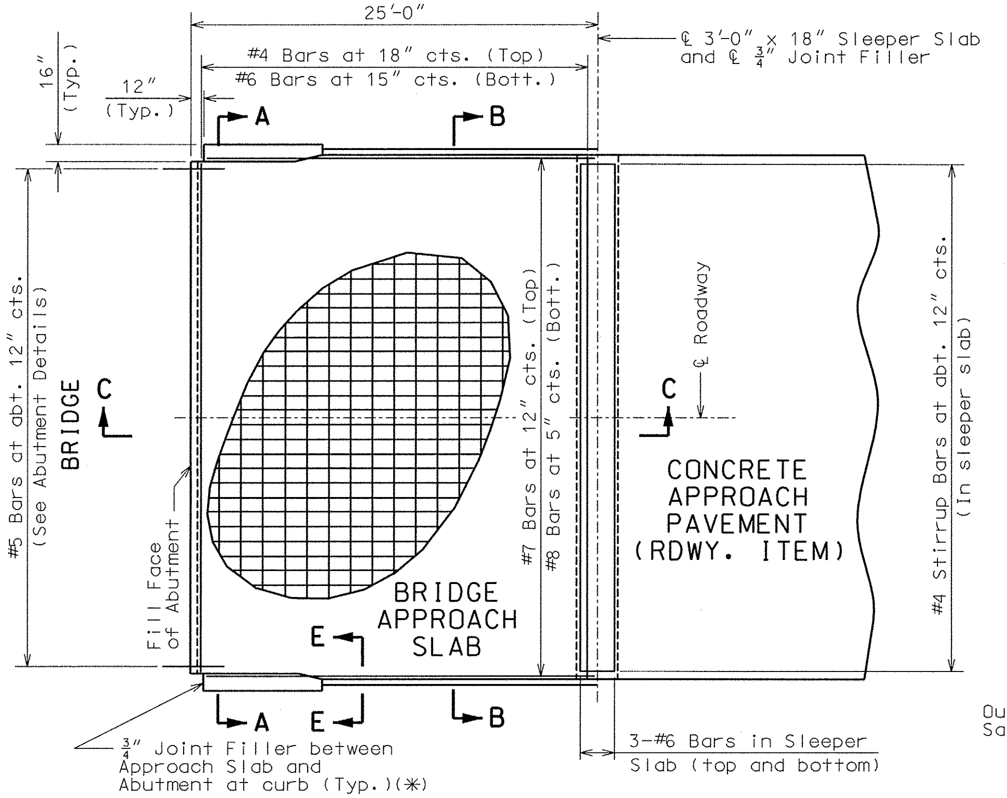
DATE PREPARED 5-21-09	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 54
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DESCRIPTION

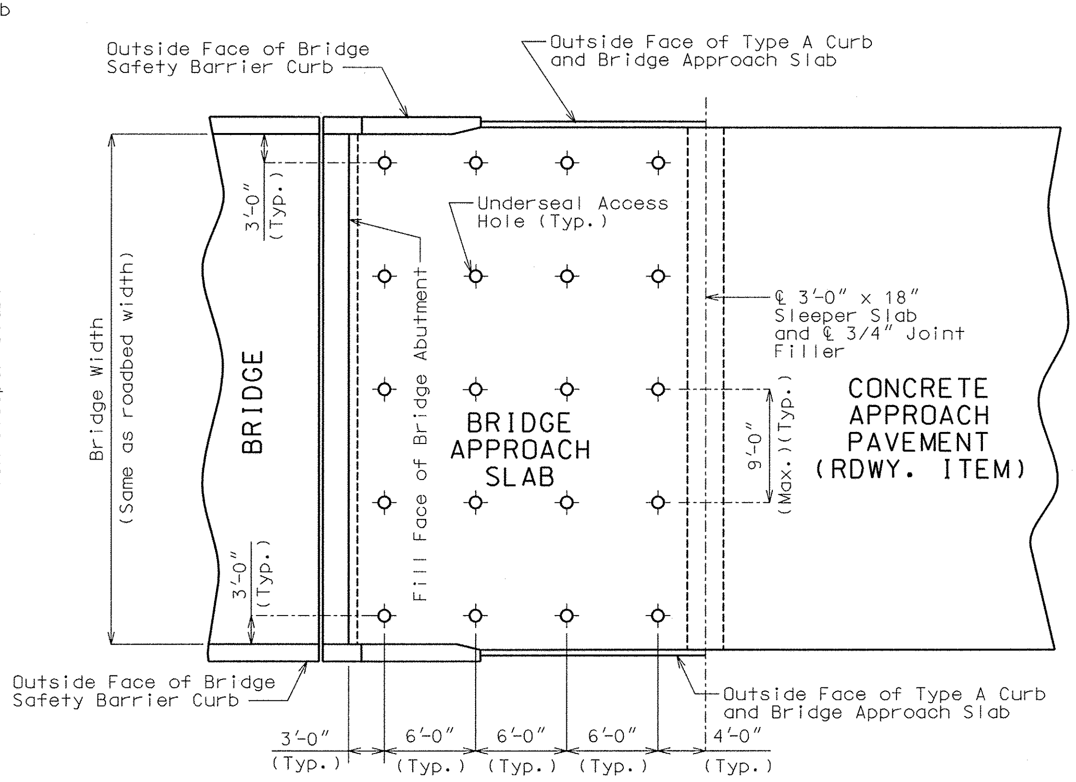
DATE

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

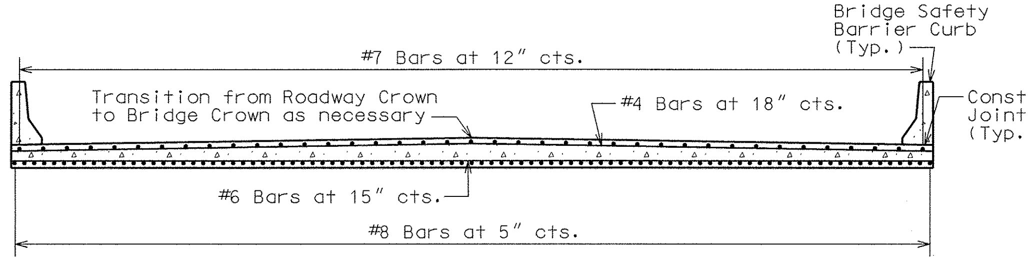
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856


25'-0"
#4 Bars at 18" cts. (Top)
#6 Bars at 15" cts. (Bott.)
℄ 3'-0" x 18" Sleeper Slab and ℄ ¾" Joint Filler
16" (Typ.)
12" (Typ.)
A
B
#5 Bars at abt. 12" cts. (See Abutment Details)
BRIDGE
C
Fill Face of Abutment
#7 Bars at 12" cts. (Top)
#8 Bars at 5" cts. (Bott.)
C
℄ Roadway
CONCRETE APPROACH PAVEMENT (RDWY. ITEM)
#4 Stirrup Bars at abt. 12" cts. (In sleeper slab)
BRIDGE APPROACH SLAB
E
A
E
B
¾" Joint Filler between Approach Slab and Abutment at curb (Typ.)(✳)
3-#6 Bars in Sleeper Slab (top and bottom)

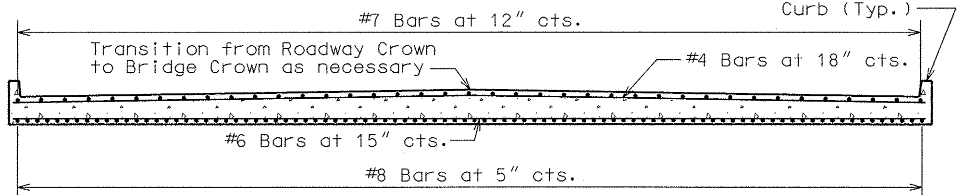
PART PLAN SHOWING REINFORCEMENT


Outside Face of Bridge Safety Barrier Curb
Outside Face of Type A Curb and Bridge Approach Slab
3'-0" (Typ.)
Underseal Access Hole (Typ.)
Bridge Width (Same as roadbed width)
BRIDGE
Fill Face of Bridge Abutment
BRIDGE APPROACH SLAB
℄ 3'-0" x 18" Sleeper Slab and ℄ 3/4" Joint Filler
9'-0" (Max.)(Typ.)
CONCRETE APPROACH PAVEMENT (RDWY. ITEM)
3'-0" (Typ.)
Outside Face of Bridge Safety Barrier Curb
Outside Face of Type A Curb and Bridge Approach Slab
3'-0" (Typ.)
6'-0" (Typ.)
6'-0" (Typ.)
6'-0" (Typ.)
4'-0" (Typ.)

PART PLAN
(SHOWING TYPICAL UNDERSEAL ACCESS HOLE LOCATIONS)

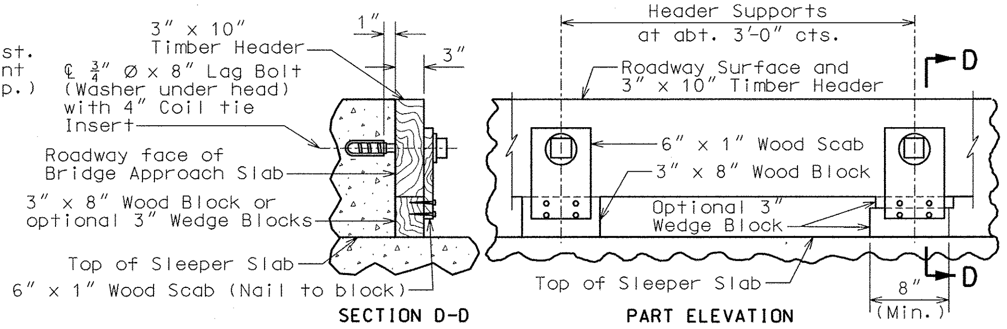


SECTION A-A


Type A Barrier Curb (Typ.)
#7 Bars at 12" cts.
Transition from Roadway Crown to Bridge Crown as necessary
#4 Bars at 18" cts.
#6 Bars at 15" cts.
#8 Bars at 5" cts.

SECTION B-B

Note: With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.

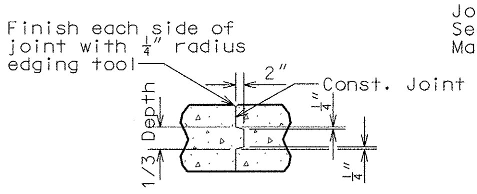

3" x 10" Timber Header
1"
3"
℄ ¾" Ø x 8" Lag Bolt (Washer under head) with 4" Coil tie Insert
Roadway face of Bridge Approach Slab
3" x 8" Wood Block or optional 3" Wedge Blocks
Top of Sleeper Slab
6" x 1" Wood Scab (Nail to block)
Header Supports at abt. 3'-0" cts.
D
Roadway Surface and 3" x 10" Timber Header
6" x 1" Wood Scab
3" x 8" Wood Block
Optional 3" Wedge Block
Top of Sleeper Slab
8" (Min.)
D

SECTION D-D

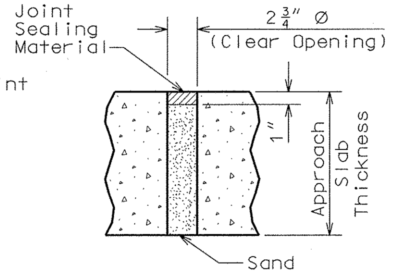
PART ELEVATION

Note: Remove timber header when concrete pavement is placed.

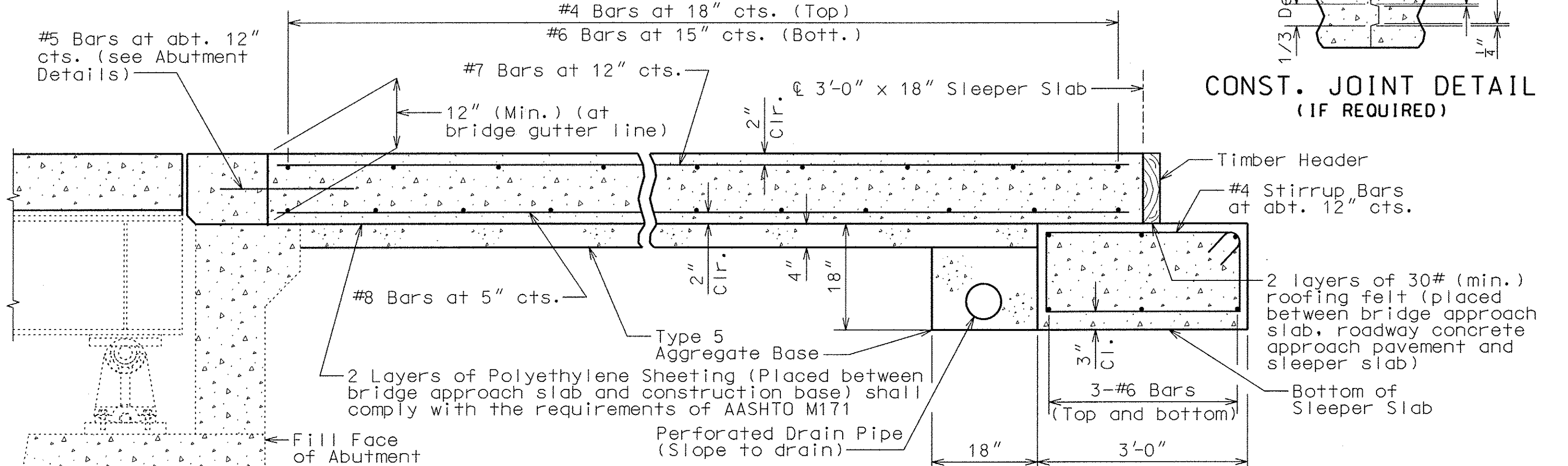
DETAILS OF TIMBER HEADER



CONST. JOINT DETAIL
(IF REQUIRED)

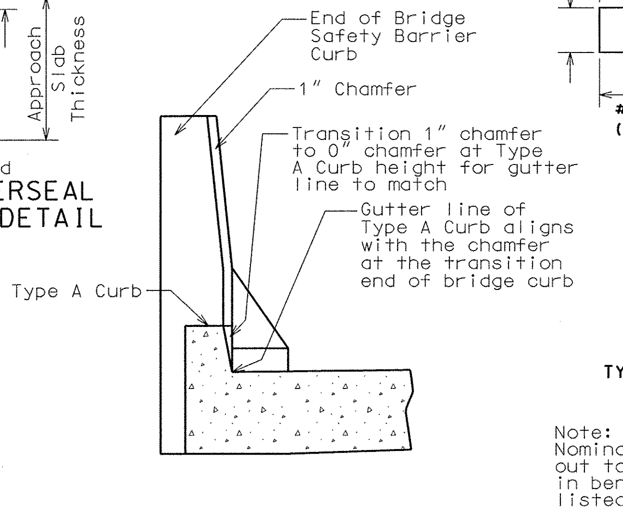


TYPICAL UNDERSEAL ACCESS HOLE DETAIL


#4 Bars at 18" cts. (Top)
#6 Bars at 15" cts. (Bott.)
#5 Bars at abt. 12" cts. (see Abutment Details)
#7 Bars at 12" cts.
℄ 3'-0" x 18" Sleeper Slab
12" (Min.) (at bridge gutter line)
2" Clr.
Timber Header
#4 Stirrup Bars at abt. 12" cts.
#8 Bars at 5" cts.
2" Clr.
4"
18"
2 layers of 30# (min.) roofing felt (placed between bridge approach slab, roadway concrete approach pavement and sleeper slab)
3" Clr.
Type 5 Aggregate Base
2 Layers of Polyethylene Sheeting (Placed between bridge approach slab and construction base) shall comply with the requirements of AASHTO M171
3-#6 Bars (Top and bottom)
Bottom of Sleeper Slab
Fill Face of Abutment
Perforated Drain Pipe (Slope to drain)
18"
3'-0"

SECTION C-C

BRIDGE APPROACH SLAB


End of Bridge Safety Barrier Curb
1" Chamfer
Transition 1" chamfer to 0" chamfer at Type A Curb height for gutter line to match
Gutter line of Type A Curb aligns with the chamfer at the transition end of bridge curb
Type A Curb

SECTION E-E

GENERAL NOTES:

All concrete for the bridge approach slab and sleeper slab shall be in accordance with Sec 503 (f'c = 4,000 psi).

All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler, except as noted.

The reinforcing steel in the bridge approach slab and the sleeper slab shall be epoxy coated Grade 60 with Fy = 60,000 psi.

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

The reinforcing steel in the bridge approach slab and the sleeper slab shall be continuous. The transverse reinforcing steel may be made continuous by lap splicing the #4 & #6 bars 18" and 2'-2", respectively.

Mechanical bar splices shall be in accordance with Sec 706.

(✳) Seal joint between vertical face of Approach Slab Barrier and Barrier above Abutment Backwall with "Silicone Joint Sealant for Saw Cut and Formed Joints" in accordance with Sec. 717.

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

The contractor shall pour and satisfactorily finish the bridge or semi-deep slab before pouring the bridge approach slabs.

Longitudinal construction joints in approach slab and sleeper slab shall be aligned with longitudinal construction joints in bridge or semi-deep slab.

Payment for furnishing all materials, labor and excavation necessary to construct the approach slab, including the timber header, sleeper slab, underdrain, Type 5 aggregate base, joint filler and all other appurtenances and incidental work as shown on this sheet, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Bridge) per Sq. Yd.

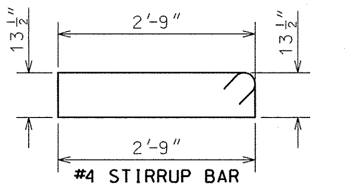
For Concrete Approach Pavement details, see roadway plans.

See Missouri Standard Plans Drawing 609.00 for details of Type A Curb.

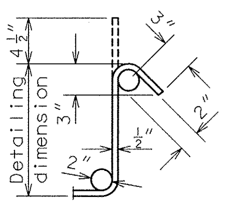
At the contractor's option, Grade 40 reinforcement may be substituted for the Grade 60 #5 dowel bars connecting the bridge approach slab to the bridge abutment. No additional payment will be made for this substitution.

When Grade 40 reinforcement is substituted for the Grade 60 #5 dowel bars connecting the bridge approach slab to the bridge abutment, the reinforcement may be bent up to 90 degrees with a 2" minimum radius near the abutment to allow compaction of the backfill material near the abutment. Damage to epoxy coating shall be repaired in accordance with Sec 710.

Drain pipe may be either 6" diameter corrugated metallic-coated pipe underdrain, 4" diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4" diameter corrugated polyethylene (PE) drain pipe.



#4 STIRRUP BAR
(ACTUAL LENGTH = 8'-3")



TYPICAL 135° STIRRUP HOOK DIMENSIONS BENDING DIAGRAM

Note:
Nominal lengths are based on out to out dimensions shown in bending diagram and are listed for fabricators use (nearest inch).

Detailed April 2009
Checked April 2009

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

Sheet No. 55 of 57

CORY MICHAEL IMHOFF
NUMBER PE-2002016669
Cory Imhoff

DATE PREPARED	5-21-09
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	55
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DATE
DESCRIPTION

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

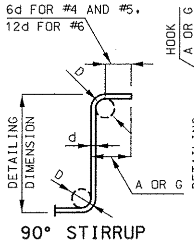
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

BILL OF REINFORCING STEEL

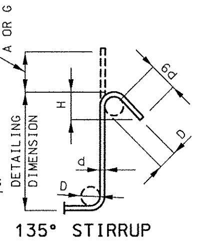
NO. REQ'D.	MARK NO.		LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS							NOMINAL LENGTH	ACTUAL LENGTH	WEIGHT
	SIZE	MARK								B	C	D	E	F	H	K			
										FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	LBS.
West Abutment																			
7	6	H11	Backwall	E	20		X			12 3.000							12 3	12 3	129
5	6	H12	Backwall	E	20		X			12 9.000							12 9	12 9	96
23	5	H13	Backwall	E	20		X			3 0.000							3 0	3 0	72
2	5	R14	Backwall	E	26	S	X			2 6.000	4.250	2 6.250			2 6.000	3.000	5 3	5 3	11
8	5	R15	Backwall	E	27	S	X			10.750	9.000	12.250	4.750		7.000	10.000	3 1	2 11	24
6	5	R16	Backwall	E	21	S	X			2 4.750		10.000					3 3	3 2	20
8	5	R17	Backwall	E	20	S	X			3 0.000							3 0	3 0	25
23	5	U11	Backwall	E	21	S	X			22.500	11.625	10.375			22.500	1.250	3 9	3 6	84
27	5	U12	Backwall	E	19	S	X			18.000	10.000						2 4	2 3	63
4	5	U13	Backwall	E	21	S	X			2 9.000	11.625				2 9.000	1.750	3 9	3 7	15
4	5	U14	Backwall	E	19	S	X			17.000	10.000						2 3	2 2	9
Pier No. 7																			
12	5	H701	Cap	E	20		X			13 2.000							13 2	13 2	165
20	5	H702	Cap	E	20		X			13 3.000							13 3	13 3	276
16	5	H703	Cap	E	20		X			13 5.000							13 5	13 5	224
26	5	H704	Cap	E	20		X			12 2.000							12 2	12 2	330
12	6	H705	Pedestal	E	20		X			3 9.000							3 9	3 9	68
2	4	P701	Column		13	S	X			4 2.625	4 11.250	4 2.625	4 11.250				19 1	18 10	25
2	4	P702	Column		13	S	X			4 3.125	5 0.250	4 3.125	5 0.250				19 4	19 1	25
2	4	P703	Column		13	S	X			4 3.625	5 1.250	4 3.625	5 1.250				19 7	19 4	26
2	4	P704	Column		13	S	X			4 4.125	5 2.250	4 4.125	5 2.250				19 10	19 7	26
2	4	P705	Column		13	S	X			4 4.625	5 3.250	4 4.625	5 3.250				20 1	19 10	26
2	4	P706	Column		13	S	X			4 5.125	5 4.250	4 5.125	5 4.250				20 4	20 1	27
2	4	P707	Column		13	S	X			4 5.625	5 5.250	4 5.625	5 5.250				20 7	20 4	27
2	4	P708	Column		13	S	X			4 6.125	5 6.250	4 6.125	5 6.250				20 10	20 7	27
2	4	P709	Column		13	S	X			4 6.625	5 7.250	4 6.625	5 7.250				21 1	20 10	28
2	4	P710	Column		13	S	X			4 7.125	5 8.250	4 7.125	5 8.250				21 4	21 1	28
2	4	P711	Column		13	S	X			4 7.625	5 9.250	4 7.625	5 9.250				21 7	21 4	29
2	4	P712	Column		13	S	X			4 8.125	5 10.250	4 8.125	5 10.250				21 10	21 7	29
2	4	P713	Column		13	S	X			4 8.625	5 11.250	4 8.625	5 11.250				22 1	21 10	29
2	4	P714	Column		13	S	X			4 9.125	6 0.250	4 9.125	6 0.250				22 4	22 1	30
2	4	P715	Column		13	S	X			4 9.625	6 1.250	4 9.625	6 1.250				22 7	22 4	30
2	4	P716	Column		13	S	X			4 10.125	6 2.250	4 10.125	6 2.250				22 10	22 7	30
2	4	P717	Column		13	S	X			4 10.625	6 3.250	4 10.625	6 3.250				23 1	22 10	31
2	4	P718	Column		13	S	X			4 11.125	6 4.250	4 11.125	6 4.250				23 4	23 1	31
72	4	P719	Column		10	S	X				4 3.000	2 8.000					11 2	11 0	529
72	4	P720	Column		10	S	X				3 6.000	2 11.000					9 11	9 9	469
28	5	U701	Cap	E	13	S	X			2 11.125	4 9.125	3 1.375	4 9.000				16 6	16 2	472
4	5	U702	Cap	E	13	S	X			2 11.125	5 2.125	3 1.750	5 2.000				17 4	17 0	71
4	5	U703	Cap	E	13	S	X			2 11.125	5 5.375	3 1.875	5 5.250				17 11	17 7	73
4	5	U704	Cap	E	13	S	X			2 11.125	5 9.625	3 2.125	5 9.500				18 7	18 3	76
4	5	U705	Cap	E	13	S	X			2 11.125	6 2.875	3 2.250	6 2.750				19 6	19 2	80
4	5	U706	Cap	E	13	S	X			2 11.125	6 9.250	3 2.500	6 9.125				20 7	20 3	84
28	5	U707	Cap	E	19	S	X			3 8.000	22.000						5 6	5 5	158
18	4	U708	Pedestal	E	10	S	X				2 0.000	4 2.000					8 2	8 0	96
4	4	U709	Pedestal	E	10	S	X				3 2.000	3 9.000					10 1	9 11	26
24	7	V701	Column		20		X			21 7.000							21 7	21 7	1059
30	4	V702	Column		20		X			21 7.000							21 7	21 7	433
20	4	V703	Column		20		X			3 9.000							3 9	3 9	50
4	W5	W701	Pedestal	E	22		X			18.000	9.125						30 10	30 10	21
4	W5	W702	Pedestal	E	22		X			2 1.000	9.125						39 8	39 8	27

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO.		LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS							NOMINAL LENGTH	ACTUAL LENGTH	WEIGHT
	SIZE	MARK								B	C	D	E	F	H	K			
										FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	LBS.
East Abutment																			
5	6	H21	Backwall	E	20		X			12 3.000							12 3	12 3	92
5	6	H22	Backwall	E	20		X			12 9.000							12 9	12 9	96
23	5	H23	Backwall	E	20		X			3 0.000							3 0	3 0	72
2	5	R14	Backwall	E	26	S	X			2 6.000	4.250	2 6.250			2 6.000	3.000	5 3	5 3	11
8	5	R15	Backwall	E	27	S	X			10.750	9.000	12.250	4.750		7.000	10.000	3 1	2 11	24
6	5	R16	Backwall	E	21	S	X			2 4.750		10.000					3 3	3 2	20
8	5	R17	Backwall	E	20	S	X			3 0.000							3 0	3 0	25
23	5	U21	Backwall	E	21	S	X			22.500	13.125	11.875			22.500	1.250	4 0	3 9	90
27	5	U22	Backwall	E	19	S	X			20.000	10.000						2 6	2 5	68
4	5	U23	Backwall	E	21	S	X			2 9.000	13.125				2 9.000	1.750	3 10	3 9	16
4	5	U24	Backwall	E	19	S	X			18.000	10.000						2 4	2 3	9
Slab																			
879	5	S11	Slab	E	20					12 5.000							12 5	12 5	11384
879	5	S12	Slab	E	20					12 11.000							12 11	12 11	11842
145	5	S13	Slab	E	20					54 11.000							54 11	54 11	8305
105	5	S14	Slab	E	20					55 5.000							55 5	55 5	6069
40	6	S15	Slab	E	20					50 0.000							50 0	50 0	3004
40	6	S16	Slab	E	20					27 10.000							27 10	27 10	1672
2098	5	S21	Slab	E	20					12 5.000							12 5	12 5	27170
2514	5	S22	Slab	E	20					6 0.000							6 0	6 0	15733
2098	5	S23	Slab	E	20					12 11.000							12 11	12 11	28264
438	5	S24	Slab	E	20					48 4.000							48 4	48 4	22080
438	5	S25	Slab	E	20					48 3.000							48 3	48 3	22042
365	5	S26	Slab	E	20					58 4.000							58 4	58 4	22207
1326	5	S31	Slab	E	20					12 5.000							12 5	12 5	17172
1326	5	S32	Slab	E	20					12 11.000							12 11	12 11	17864
203	5	S33	Slab	E	20					59 1.000							59 1	59 1	12510
147	5	S34	Slab	E	20					59 8.000							59 8	59 8	9148
40	6	S35	Slab	E	20					50 0.000							50 0	50 0	3004
40	6	S36	Slab	E	20					20 10.000							20 10	20 10	1252
1325	5	S41	Slab	E	20					12 5.000							12 5	12 5	17160
1325	5	S42	Slab	E	20					12 11.000							12 11	12 11	17851
203	5	S43	Slab	E	20					59 1.000							59 1	59 1	12510
147	5	S44	Slab	E	20					59 8.000							59 8	59 8	9148
40	6	S45	Slab	E	20					50 0.000							50 0	50 0	3004
40	6	S46	Slab	E	20					20 10.000							20 10	20 10	1252
118	5	U41	Slab	E	10	S				12.000	7.000	13.000	12.000				4 3	3 10	472
172	5	U42	Slab	E	10	S				12.000	8.000	13.000	12.000				4 5	4 0	718
80	5	U43	Slab	E	10	S				12.000	9.000	13.000	12.000				4 7	4 2	348



90° STIRRUP

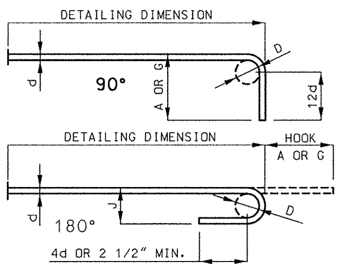


135° STIRRUP

STIRRUP HOOK DIMENSIONS

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

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



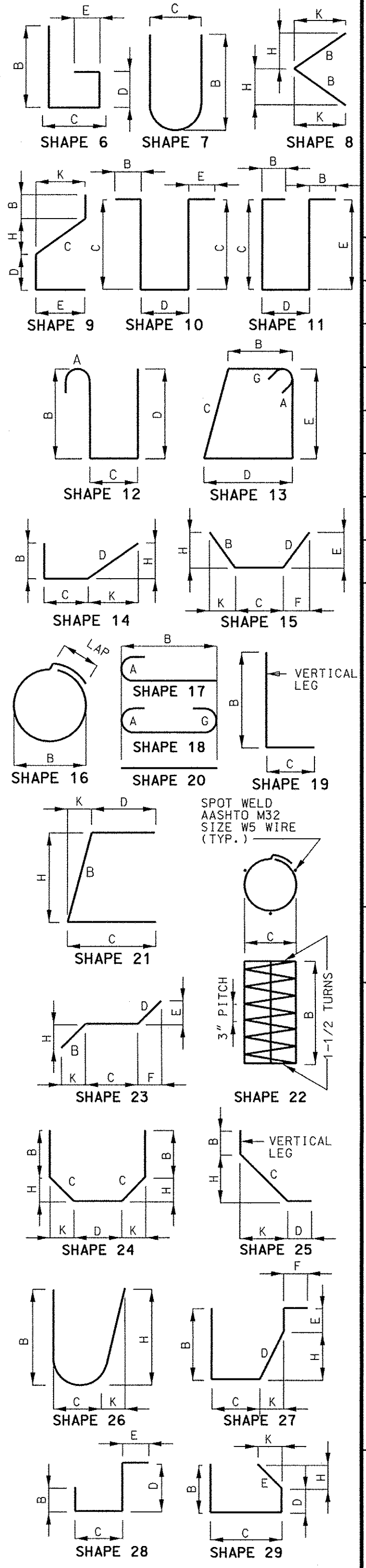
END HOOK DIMENSIONS

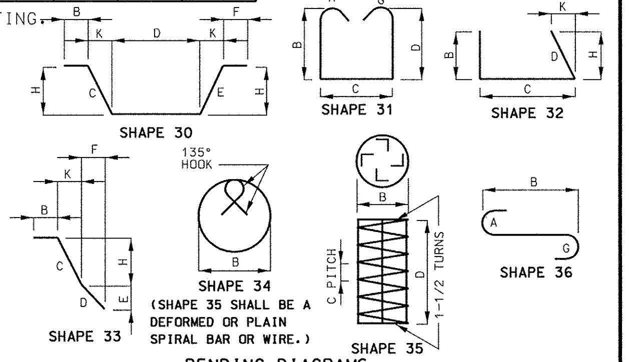
BAR SIZE	D (IN.)	ALL GRADES		
		180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"
#7	5 1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9 1/2"	15"	11 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

TWO ADDITIONAL H11, H704 & U708 ARE INCLUDED IN THE BAR BILL FOR TESTING.

NOTE:

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





BENDING DIAGRAMS

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

Cory Imhoff

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	56

COUNTY
ATCHISON

JOB NO.
J1P2161

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L00982

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

Detailed April 2009
Checked April 2009

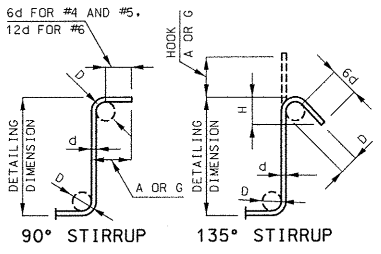
Note: This drawing is not to scale. Follow dimensions.

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			Barrier																									
3858	5	R1	Barrier	E	26					2	6.000		4.250							2	6.000		3.000	5	3	5	3	21125
3858	5	R3	Barrier	E	19	S					17.000		6.000											1	11	1	10	7377
3858	5	R4	Barrier	E	27	S							6.000		11.250		7.000		12.000		9.250		6.375	3	0	2	10	11401
168	5	R5	Barrier	E	20					9	9.000													9	9	9	9	1708
126	5	R6	Barrier	E	20					42	9.000													42	9	42	9	5618
42	5	R7	Barrier	E	20					42	6.000													42	6	42	6	1862
84	5	R8	Barrier	E	20					48	7.000													48	7	48	7	4256
84	5	R9	Barrier	E	20					48	6.000													48	6	48	6	4249
84	5	R10	Barrier	E	20					45	5.000													45	5	45	5	3979
42	5	R11	Barrier	E	20					42	7.000													42	7	42	7	1865
56	5	R12	Barrier	E	20					57	11.000													57	11	57	11	3383
42	5	R13	Barrier	E	20					43	0.000													43	0	43	0	1884
60	5	K1	Barrier	E	19	S				2	5.000		5.125											2	10	2	9	172
60	5	K2	Barrier	E	14	S					5.125		11.125		18.000						2.000		17.875	2	10	2	9	172
16	5	K3	Barrier	E	27	S					18.250		5.125		12.000		8.375		12.000		9.875		6.875	4	8	4	5	74
44	5	K4	Barrier	E	10	S					12.000	1	6.250		6.000									4	7	4	3	195
4	5	K5	Barrier	E	27	S							4.375		6.875		12.750		12.000		5.500		4.000	3	0	2	10	12
4	5	K6	Barrier	E	27	S							4.375		7.875		11.750		12.000		6.500		4.500	3	0	2	10	12
4	5	K7	Barrier	E	27	S							4.375		9.625		10.375		12.000		7.875		5.500	3	0	2	10	12
4	5	K8	Barrier	E	27	S							4.375		11.250		9.000		12.000		9.250		6.500	3	1	2	11	12
48	5	K9	Barrier	E	20					5	5.000													5	5	5	5	271
4	5	K11	Barrier	E	8					2	2.125													4	4	4	4	18
160	5	C1	Slip Form	E	20					10	0.000													10	0	10	0	1669

BILL OF REINFORCING STEEL

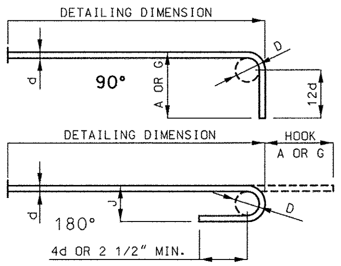
NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			Totals																									
4																												1985
4				E																								122
5				E																								364032
6				E																								13669
7																												1059
W5				E																								48
			Slab on Steel																									
5				E																								289997
6				E																								13188
			Reinforcing Steel (Bridges)																									
4																												1985
7																												1059
			Reinforcing Steel (Epoxy Coated)																									
4				E																								122
5				E																								2667
6				E																								481
			Barriers																									
5				E																								71326



90° STIRRUP   135° STIRRUP

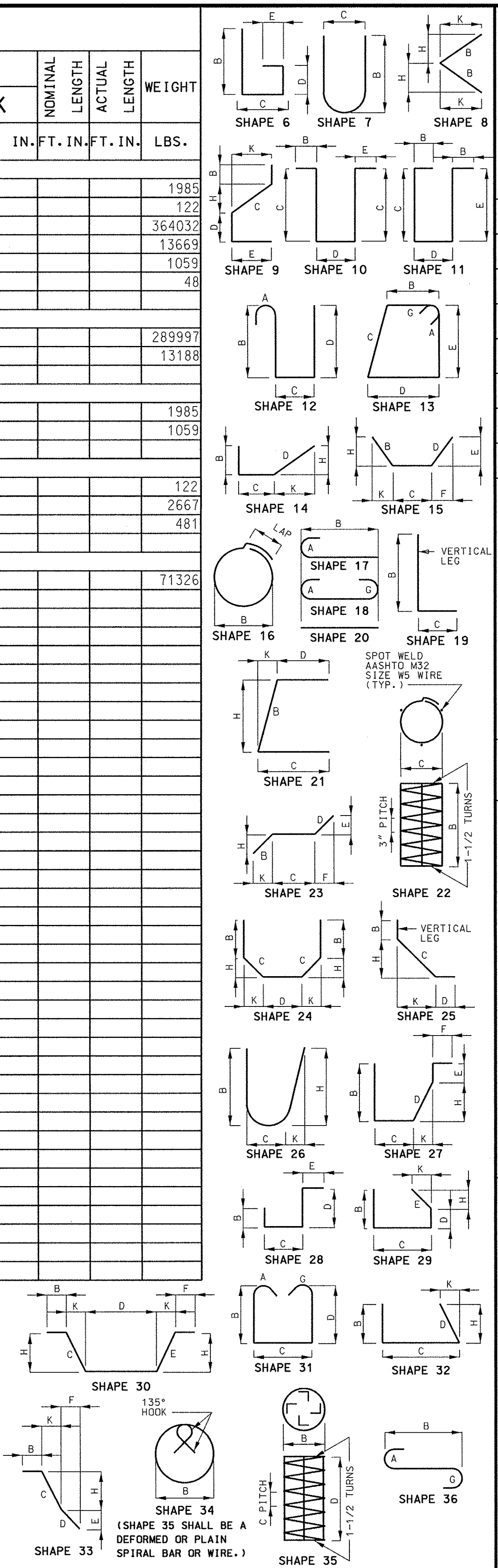
STIRRUP HOOK DIMENSIONS				
GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK	135° HOOK	
		HOOK A OR G	HOOK A OR G	APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

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



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

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



BENDING DIAGRAMS

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

Cory Imhoff

DATE PREPARED
5-21-09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	57

COUNTY
ATCHISON

JOB NO.
J1P2161

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L00982

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

Detailed April 2009
Checked April 2009

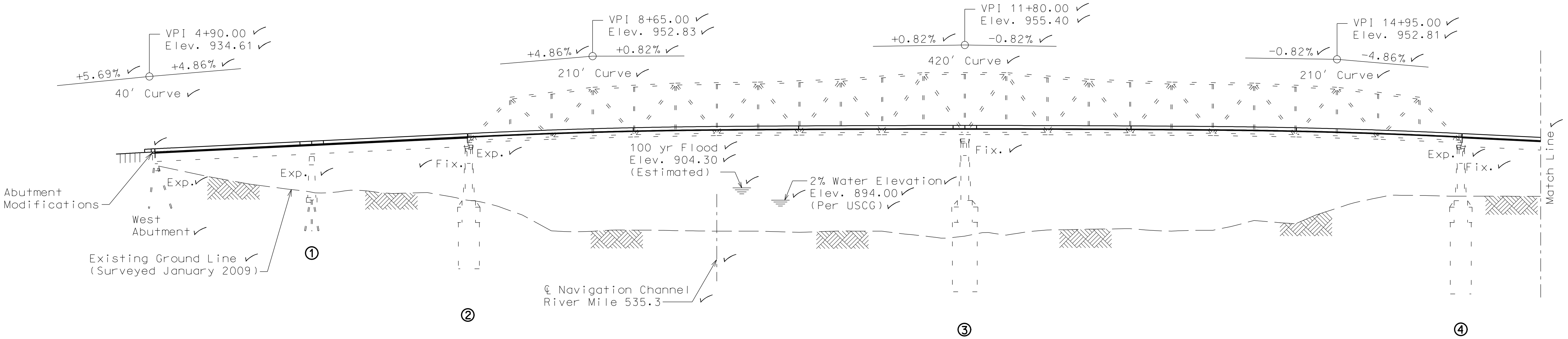
Note: This drawing is not to scale. Follow dimensions.

SEC/SUR 33 TWP 65N RGE 42W

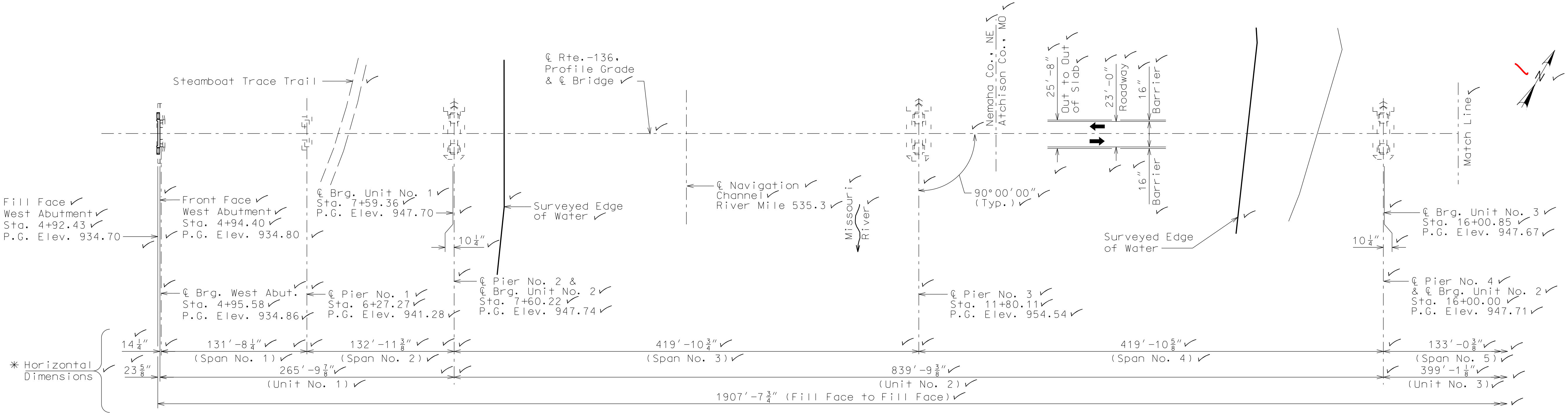
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

U.I.P. AND REDECK EXISTING (133'-133') CONTINUOUS GIRDER SPANS

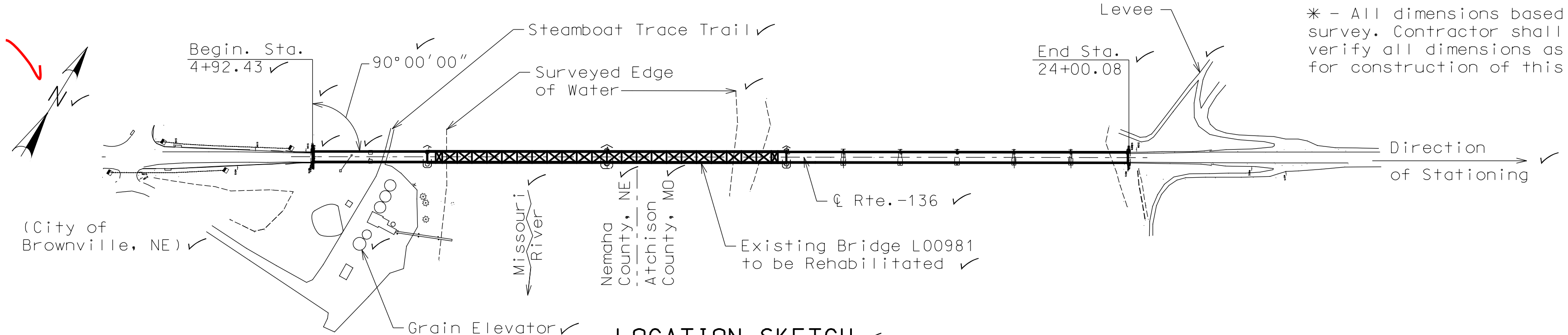
(420'-420') CONTINUOUS THROUGH TRUSS SPANS (133'-133'-133')(133'-133'-133') CONTINUOUS GIRDER SPANS



ELEVATION



PLAN



LOCATION SKETCH

✱ - All dimensions based on field survey. Contractor shall field verify all dimensions as required for construction of this project.

BM -4" BRASS USGS MARKER SET IN TOP OF SW CORNER OF WESTBOUND BARRIER WALL AT WEST ABUTMENT. BENCHMARK SET BY NEBRASKA DEPARTMENT OF ROADS. ELEVATION IS AVAILABLE THROUGH NEBRASKA DEPARTMENT OF ROADS.

BM -½" REBAR, 465' SW OF EAST ABUTMENT, 93.8' NW OF NORTH EDGE OF PAVEMENT, 110.9' NW OF THE NW CORNER OF PIER 7, 111.8' NORTH OF THE NE CORNER OF PIER 6, ELEV. 896.56.

BM -½" REBAR, 93' NE OF WEST OF ABUTMENT, 20' SE OF SOUTH EDGE OF PAVEMENT, 26.9' NE OF THE SE CORNER OF COMMUNICATION SHED, 43' SW OF THE SW CORNER OF PIER 1, ELEV. 905.66.

REPAIRS TO BRIDGE OVER THE MISSOURI RIVER

STATE ROAD FROM RTE. D TO NEBRASKA STATE LINE
ABOUT 1.7 MILES WEST OF RTE. D
STA. 4+92.43 (MATCH EXISTING)

GENERAL ELEVATION AND PLAN

STD. 609.00
STD. 617.10
STD. 617.20
STD. 706.35

Detailed April 2009
Checked April 2009

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

Sheet No. 1 of 57

FINAL PLANS

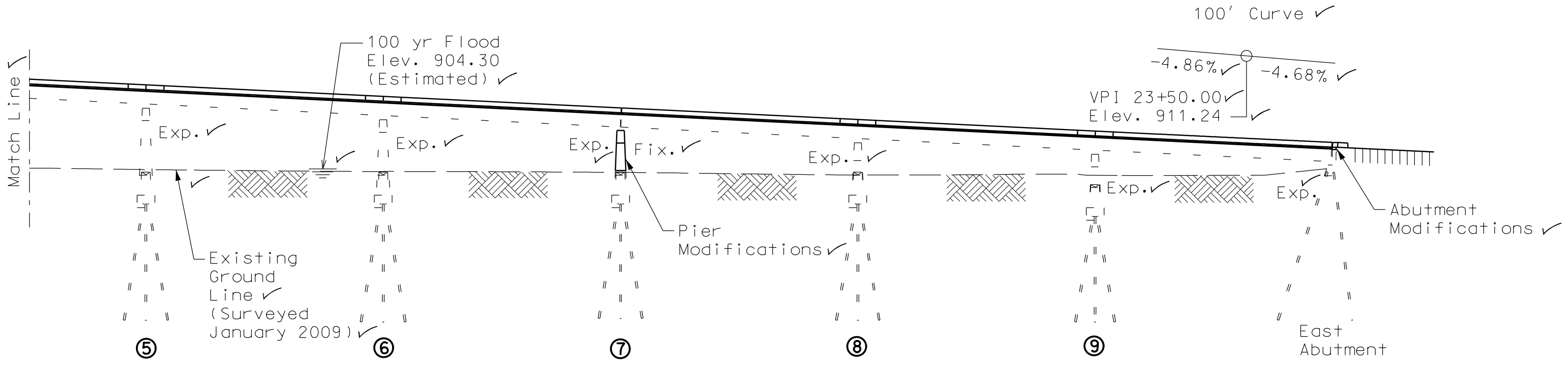
DATE PREPARED	8/23/2012
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 1
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	090724-101
PROJECT NO.	ARRA-136-1(59)
BRIDGE NO.	L00982

DESCRIPTION
DATE

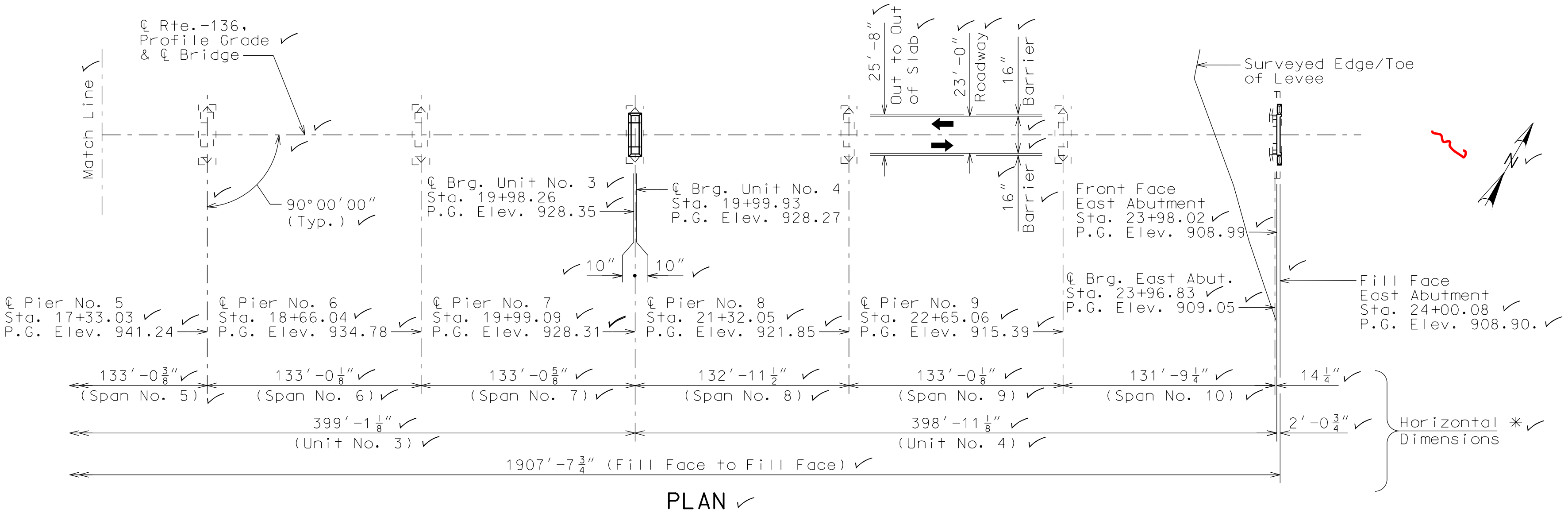
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.



ELEVATION



PLAN

* - All dimensions based on field survey. Contractor shall field verify all dimensions as required for construction of this project.

FINAL PLANS

DATE PREPARED	
8/23/2012	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	2
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
090724-101	
PROJECT NO.	
ARRA-136-1(59)	
BRIDGE NO.	
L00982	

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MoDOT

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

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

GENERAL ELEVATION AND PLAN

Detailed April 2009
Checked April 2009

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

Sheet No. 2 of 57

REPORTED QUANTITIES

Item	Unit	Substr.	Superstr.	Total
Temporary Supports	Lump Sum			1
Removal of Existing Bridge Decks	Sq. Ft.		42832	42832
Partial Removal of Substructure Concrete	Lump Sum			1
Removal of Existing Bridge Rails	Lin. Ft.		3807	3807
Bridge Approach Slab (Bridge)	Sq. Yd.		135	135
Water Transportation for Engineer	Lump Sum			0
Class B-1 Concrete (Substructure)	Cu. Yd.	68.0		68.0
Slab on Steel	Sq. Yd.		5424	5424
✳ Safety Barrier Curb	Lin. Ft.		3830	3830
Migratory Bird Nesting Prevention Netting	Lump Sum			1
Clearance Gauge	Lump Sum			1
Substructure Repair (Formed)	Sq. Ft.	55		55
Substructure Repair (Unformed)	Sq. Ft.	195		195
Reinforcing Steel (Bridges)	Lbs.	3480		3480
Mechanical Bar Splice	Each	10	5628	5638
Reinforcing Steel (Epoxy Coated)	Lbs.	3320		3320
Protective Coating - Concrete Bents & Piers (Urethane)	Lump Sum			1
Cleaning & Coating Existing Bearings	Each		10	10
Rehabilitate Bearing	Each		4	4
Slab Drain	Each		324	324
Drainage System (On Structure)	Lump Sum			1
Surface Preparation for Recoating Structural Steel	Sq. Ft.		93946	93946
Surface Preparation for Overcoating Structural Steel	Sq. Ft.		158600	158600
Field Application of Inorganic Zinc Primer	Sq. Ft.		93946	93946
Intermediate Field Coat (System G)	Sq. Ft.		88900	88900
Finish Field Coat (System G)	Sq. Ft.		88900	88900
Calcium Sulfonate Rust Penetrating Sealer	Lump Sum			1
Calcium Sulfonate Primer	Sq. Ft.		158600	158600
Calcium Sulfonate Topcoat	Sq. Ft.		158600	158600
Replace Truss Lower Lateral Bracing System	Lump Sum			1
Heat Straightening	Lump Sum			1
Strengthening Existing Girders	Lump Sum			1
Shear Connectors	Each		6416	6416
Structural Steel Repair A	Each		6	6
Structural Steel Repair B	Each		1	1
Structural Steel Repair C	Each		8	8
Structural Steel Repair D	Each		14	14
Structural Steel Repair E	Each		20	20
Structural Steel Repair F	Each		1	1
Structural Steel Repair G	Each		1	1
Structural Steel Repair H	Each		1	1
Structural Steel Repair J	Each		8	8
Structural Steel Repair K	Each		4	4
Structural Steel Repair L	Each		24	24
Structural Steel Repair M	Each		14	14
Structural Steel Repair N	Each		8	8
Structural Steel Repair P	Each		20	20
Structural Steel Repair Q	Each		12	12
Structural Steel Repair R	Each		50	50
Structural Steel Repair S	Each		44	44
Structural Steel Repair T	Each		8	8
Structural Steel Repair U	Each		13	13
Structural Steel Repair V	Lump Sum			1
Laminated Neoprene Bearing Pad Assembly	Each		2	2
Type N PTFE Bearing	Each		2	2
Strip Seal Expansion Joint System	Lin. Ft.		228	228
Navigation Lighting System	Lump Sum			1

✳ Safety Barrier Curb shall be Cast-In-Place or Slip-Form Option.

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2002 - AASHTO 17th Edition
Load Factor Design
Seismic Performance Category = A.
DESIGN LOADING:
HS20-44 (New Construction)
35#/Sq. Ft. Future Wearing Surface
DESIGN UNIT STRESSES:
Class B-2 Concrete (Superstructure, except
Safety Barrier Curb) f'c = 4,000 psi.
Class B-1 Concrete (Substructure) f'c = 4,000 psi.
Class B-1 Concrete Safety Barrier Curb f'c = 4,000 psi.
Reinforcing Steel (Grade 60) fy = 60,000 psi.
Structural Carbon Steel (ASTM A709 Grade 36) fy = 36,000 psi.
Structural Steel (ASTM A709 Grade 50) fy = 50,000 psi.

Detailed April 2009
Checked April 2009

GENERAL NOTES (CONTINUED):

FABRICATED STEEL CONNECTIONS:
Field connections shall be made with 7/8" diameter high strength bolts and 15/16" diameter holes, except as noted. All bolts shall be fully tensioned.
Rivit removal method shall be in accordance with the Special Provisions
JOINT FILLER:
All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion and partition joint filler, except as noted.
REINFORCING STEEL:
Minimum clearance to reinforcing steel shall be 1 1/2", unless otherwise shown.
STRUCTURAL STEEL PROTECTIVE COATINGS:
For Painting Limit Detail, see Sheet No. 35.

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface Preparation of the existing steel shall be in accordance with Sec 1081 for "Recoating of Structural Steel (System G)". 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: For existing structural steel to remain in place, 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.

Prime Coat: For portions of the structural steel to be replaced, the prime coat shall be applied in the fabrication shop. The cost of the prime coat will be considered completely covered by the contract unit price for the Fabricated Structural Steel.

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)".

For the duration of cleaning and recoating the truss spans, the truss span superstructure in any span shall not be draped with an impermeable surface subject to wind loads for a length any longer than 1/4 the span length at any one time regardless of height of coverage. Simultaneous work in adjacent spans is permissible using the specified limits in each span. No portion of the truss spans shall be draped during the replacement of the lower lateral bracing.

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

Rust Penetrating Sealer: The rust penetrating sealer shall be applied to the surfaces of all bearings, overlapping steel plates, pin connections, pin and hanger connections and other locations where rust bleeding, pack rust and layered rust is occurring. The cost of the rust penetrating sealer will be considered completely covered by the contract lump sum price for "Calcium Sulfonate Rust Penetrating Sealer".

Prime Coat: The cost of the prime coat will be completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Primer"

Topcoat: The color of the topcoat shall be Gray (Federal Standard #26373). The cost of the topcoat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Topcoat".
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.
MISCELLANEOUS:
Traffic over structure to be maintained during construction unless otherwise noted. See Roadway plans for traffic control.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106 and Field Section (FS-712) from Materials Manual.

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

Bridge seats for Laminated Neoprene Bearing Pad Assemblies and Type N PTFE Bearings shall be finished to a smooth even surface and shall be finished to within 1/8" above plan elevation and shall be dressed to a uniform, level bearing with a Carborundum brick or power grinder after the concrete has set sufficiently to fix the larger particles of sand. The deviation of the bearing seat from a true level surface shall not exceed 1/16".

Heat Straightening shall be in accordance with the Special Provisions.

Removal and Storage of Existing Bridge Rail shall be in accordance with the Special Provisions.

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

GENERAL NOTES (CONTINUED):

RESIN ANCHORS (East & West Abutments & Pier No. 7):
The Contractor shall use one of the qualified resin anchor systems in accordance with Sec 1039.

Cost of furnishing and installing the resin anchor system complete-in-place at the Abutments will be considered completely covered by the contract unit price for Slab on Steel.

Cost of furnishing and installing the resin anchor system complete-in-place at Pier No. 7 will be considered completely covered by the contract unit price for Class B-1 Concrete (Substructure).

The minimum embedment depth in concrete with f'c = 3,000 psi for the resin anchor system shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 6".

An epoxy coated #5 Grade 60 reinforcing bar shall be substituted for the 5/8"Ø threaded rod.

A #4 Grade 60 reinforcing bar 3'-9" long shall be substituted for the 1/2"Ø threaded rod.

ESTIMATED QUANTITIES:

CONCRETE:
Concrete above the upper construction joint in backwall at Abutments is included with Class B-2 Concrete (Slab on Steel) Quantities.
The cost of concrete removal above the upper construction joint in the abutments is included in the plan quantity for Removal of Existing Bridge Decks.
Cost of any required excavation for bridge will be considered completely covered by the contract unit price for other items.
NEOPRENE BEARING PADS:
Laminated Neoprene Bearing Pads shall be in accordance with Sec 716.

QUANTITIES FOR SLAB ON STEEL

Item	Cu. Yds.	Total
Class B-2 Concrete	Cu. Yd.	1272.9
Reinforcing Steel (Epoxy Coated)	Lbs.	311700

The table of Estimated Quantities for Slab on Steel represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard with the horizontal dimensions as shown on the plan of slab. Payment for stay-in-place forms, conventional forms, all concrete and coated reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slabs shall be as shown on the plans and in accordance with Sec. 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

Slab shall be cast-in-place with conventional forming or stay-in-place corrugated metal forms. Precast prestressed panels will not be permitted.

Permanent steel bridge deck forms, supports closure elements and accessories shall be in accordance with grade requirement and coating designation G165 of ASTM A653. Complete shop drawings of the permanent steel deck forms shall be required in accordance with Sec. 1080.

Corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

Form sheets shall not rest directly on the top of girders, stringers, crossbeams or floorbeam flanges. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the flange. Welding on or drilling holes in the flanges of the girders, stringers, crossbeams or floorbeams will not be permitted. All steel fabrication and construction shall be in accordance with Sec's 1080 and 712.

FINAL PLANS
DATE PREPARED 8/24/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 3
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

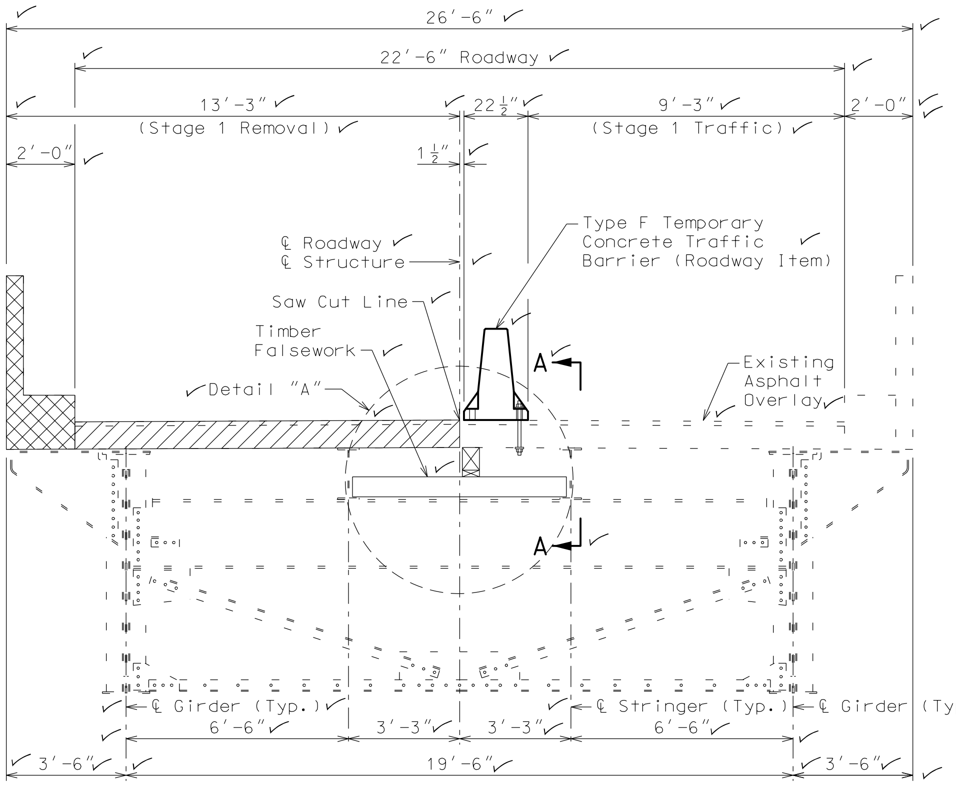
REV.

GENERAL NOTES AND SUMMARY OF QUANTITIES

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

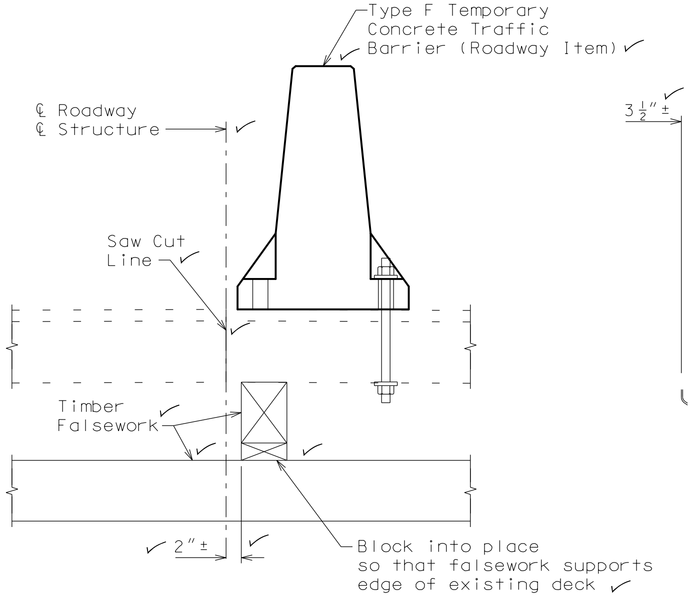
Sheet No. 3 of 57

B L00982 003 J1P2161 R2.DGN 10:38:44 AM 3/22/2013

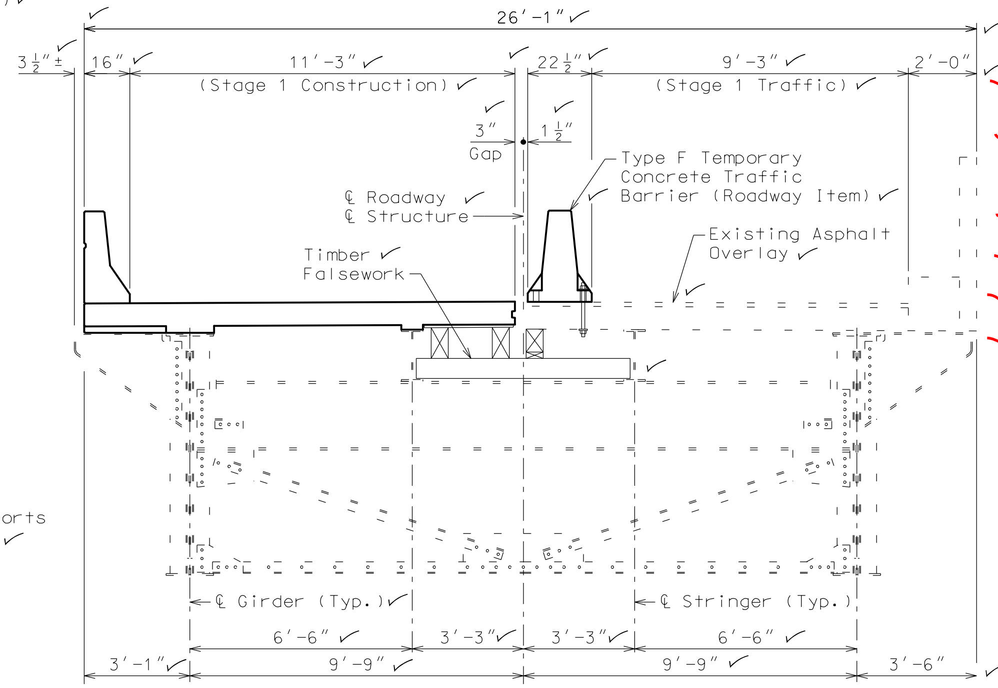


STAGE 1 REMOVAL ✓
(Looking Ahead Station) ✓

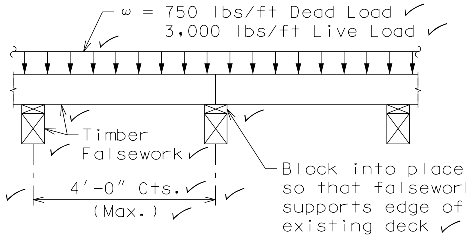
▨	Limits of Removal of Existing Bridge Decks ✓	▦	Limits of Removal of Existing Bridge Rails ✓



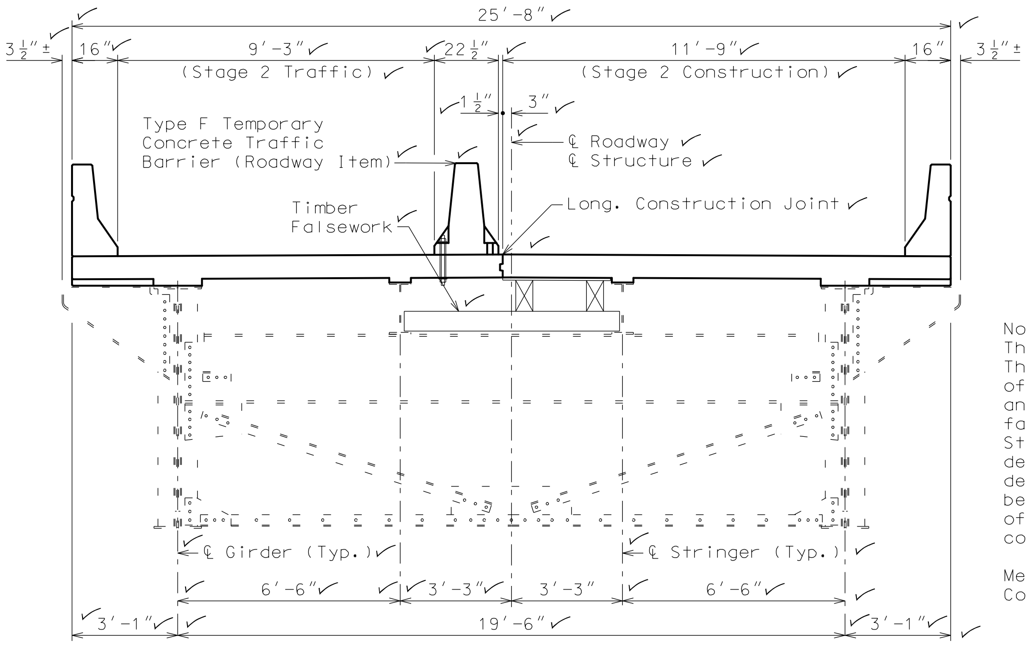
DETAIL "A" ✓



STAGE 1 CONSTRUCTION ✓
(Looking Ahead Station) ✓



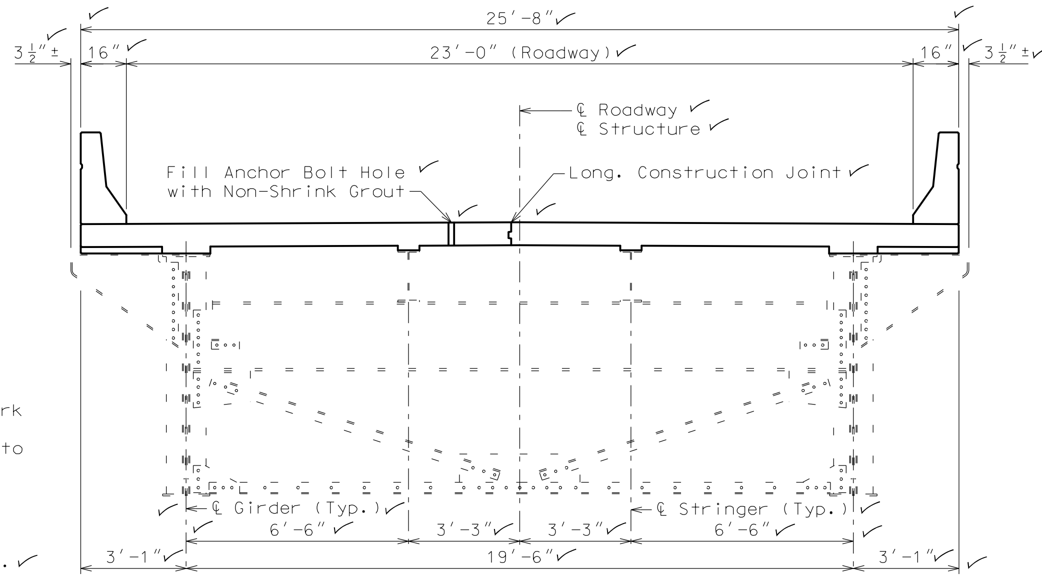
SECTION A-A ✓
(Deck and Temporary Concrete Traffic Barrier Not Shown for Clarity) ✓



STAGE 2 CONSTRUCTION ✓
(Looking Ahead Station) ✓

Notes: ✓
The loads shown are unfactored service loads. The Contractor shall add these loads to the weight of the Falsework, Stage 1 Construction Concrete and Construction Live Load when designing the falsework. A Professional Engineer licensed in the State of Missouri shall design and seal the falsework details. The Contractor shall submit the falsework details to the Engineer for review two weeks prior to beginning the saw cutting operation. The cost of the Falsework shall be considered completely covered by the cost of other items. ✓

Method of attachment for the Type F Temporary Concrete Traffic Barrier shall be bolt through deck. ✓



FINAL CONFIGURATION ✓
(Looking Ahead Station) ✓

CONSTRUCTION STAGING DETAILS - UNITS NO. 1, 3 & 4 ✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 4 of 57 ✓

FINAL PLANS ✓
DATE PREPARED
8/23/2012 ✓
ROUTE 136 ✓
STATE MO ✓
DISTRICT BR ✓
SHEET NO. 4 ✓
COUNTY ATCHISON ✓
JOB NO. J1P2161 ✓
CONTRACT ID. 090724-101 ✓
PROJECT NO. ARRA-136-1(59) ✓
BRIDGE NO. L00982 ✓

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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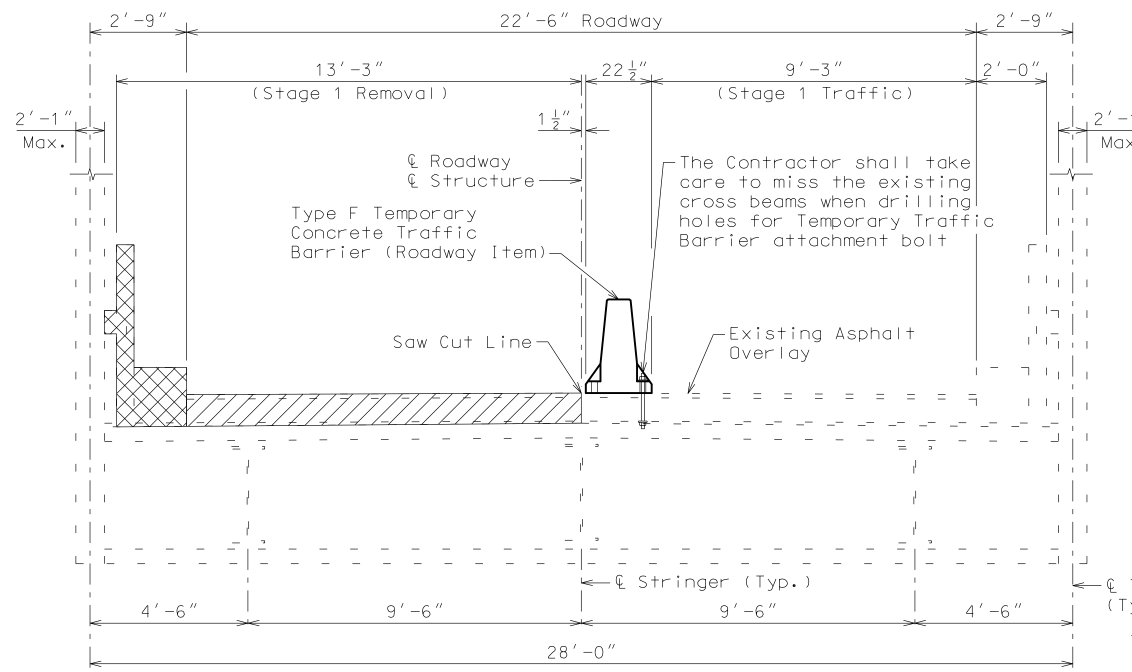
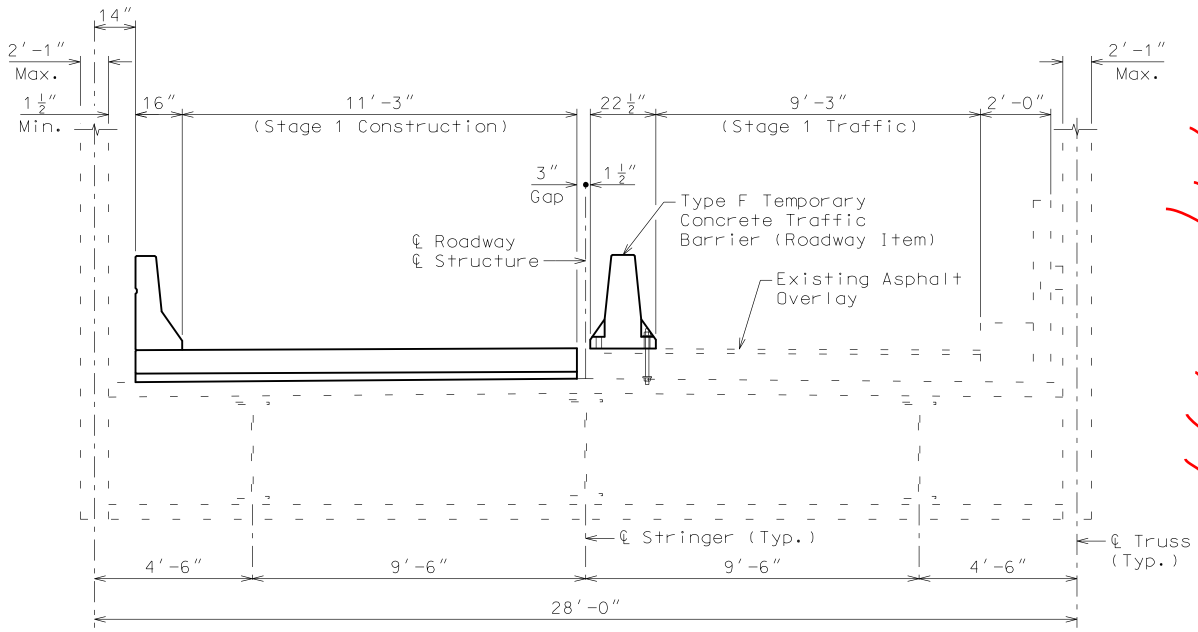


STAGE 1 REMOVAL ✓

(Looking Ahead Station) ✓

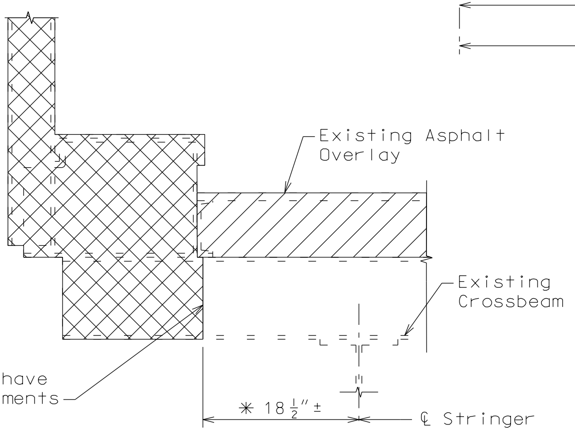
▨ Limits of Removal of Existing Bridge Decks ✓

▩ Limits of Removal of Existing Bridge Rails ✓



STAGE 1 CONSTRUCTION ✓

(Looking Ahead Station) ✓



CROSSBEAM REMOVAL DETAIL ✓

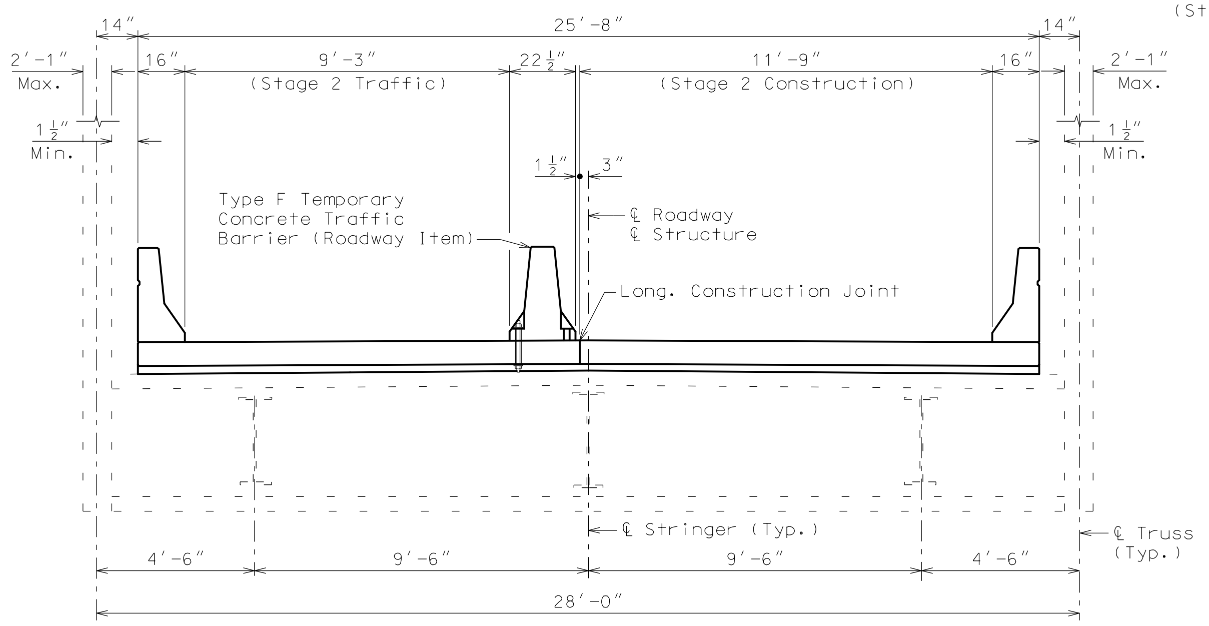
(Stage 1 Shown, Stage 2 Similar) ✓

Notes:

∗ Align Cut with End of Crossbeams without rail post attachments.

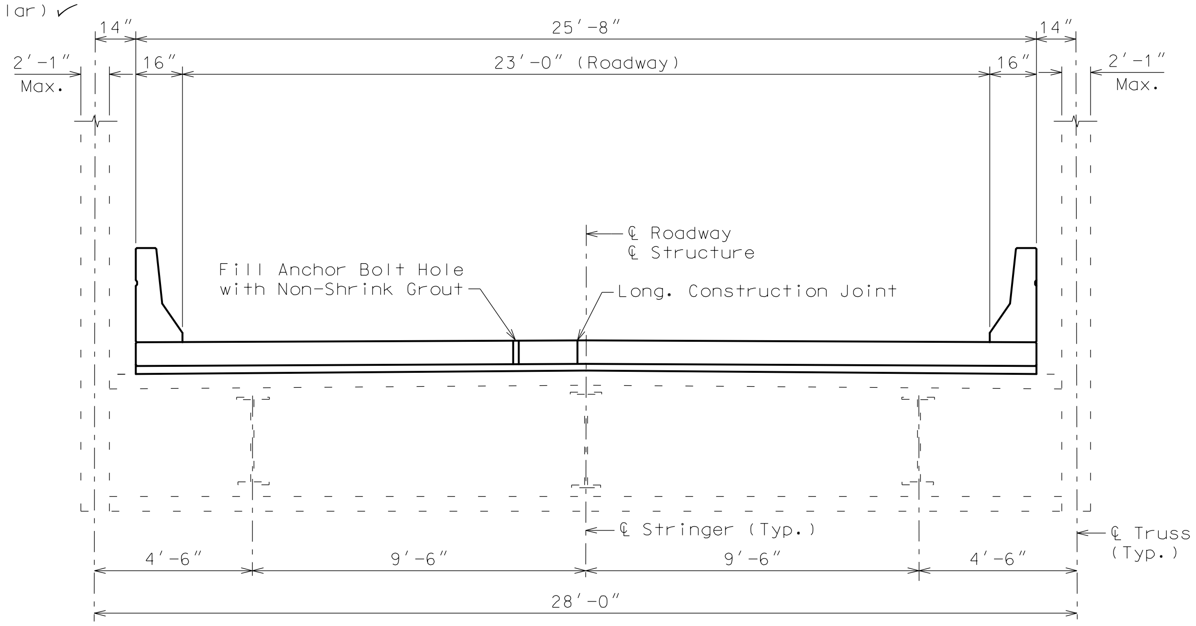
The cost of all equipment, labor and materials required to remove and dispose of the ends of the upper Crossbeamsn shall be included in the contract unit price for Removal and Storage of Existing Bridge Rails per Lin. Ft.

Method of attachment for the Type F Temporary Concrete Traffic Barrier shall be bolt through deck.



STAGE 2 CONSTRUCTION ✓

(Looking Ahead Station) ✓



FINAL CONFIGURATION ✓

(Looking Ahead Station) ✓

CONSTRUCTION STAGING DETAILS - UNIT NO. 2 ✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 5 of 57 ✓

FINAL PLANS ✓

DATE PREPARED	8/23/2012 ✓
ROUTE	136 ✓
STATE	MO ✓
DISTRICT	BR ✓
SHEET NO.	5 ✓
COUNTY	ATCHISON ✓
JOB NO.	J1P2161 ✓
CONTRACT ID.	090724-101 ✓
PROJECT NO.	ARRA-136-1(59) ✓
BRIDGE NO.	L00982 ✓

DESCRIPTION	DATE

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

HDR Engineering, Inc.
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Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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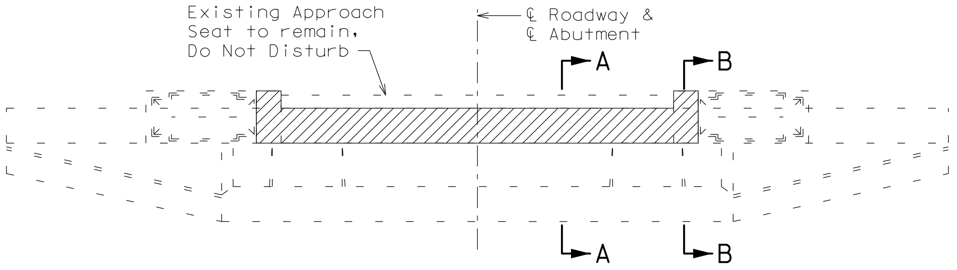
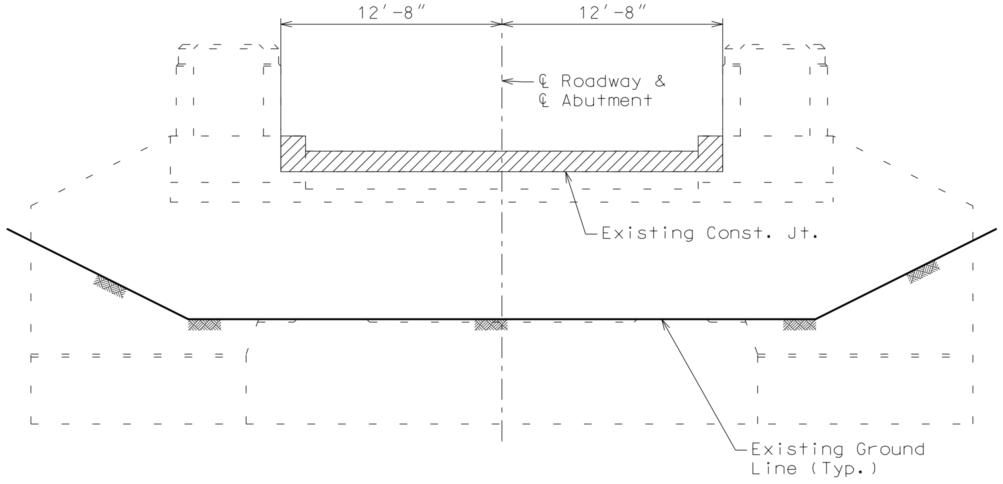
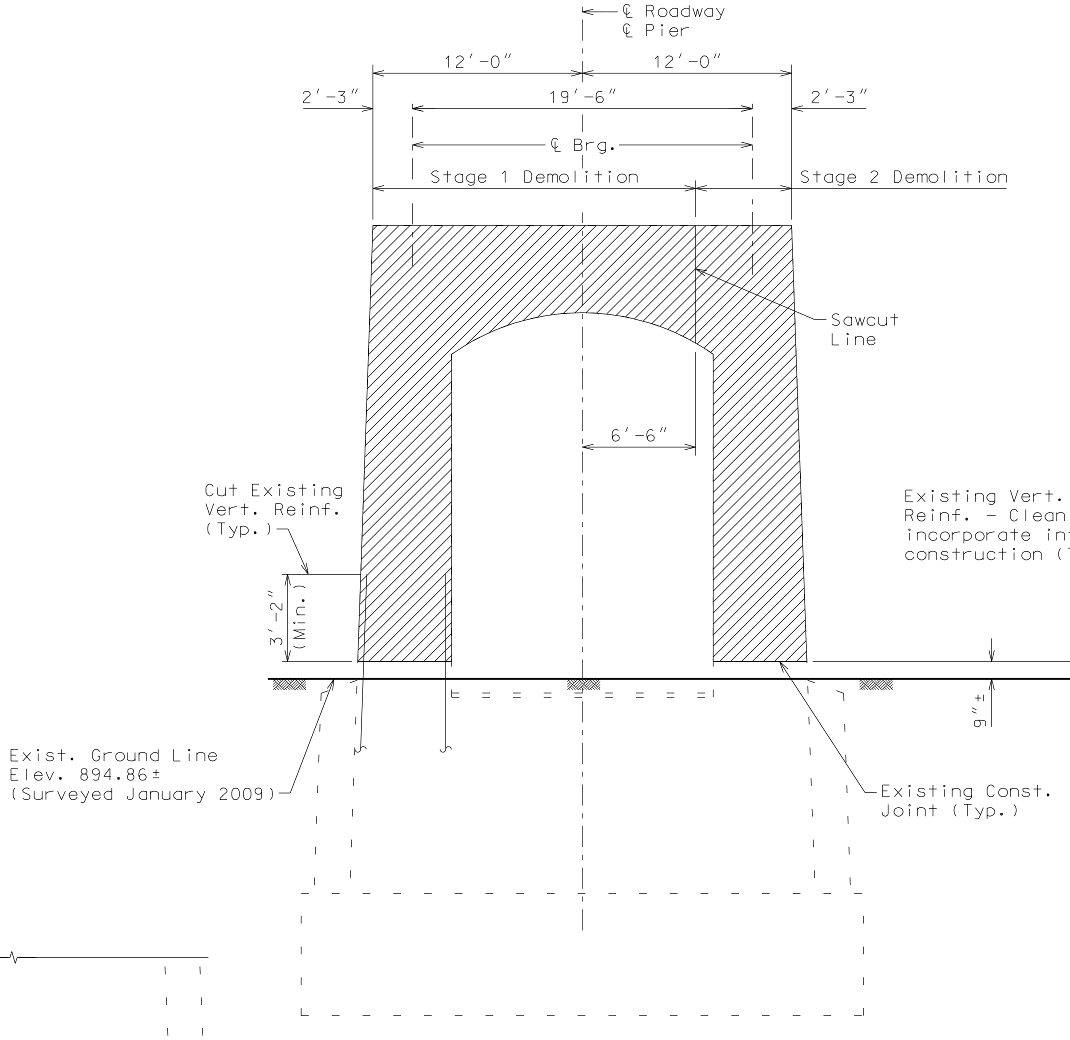


PLAN ✓

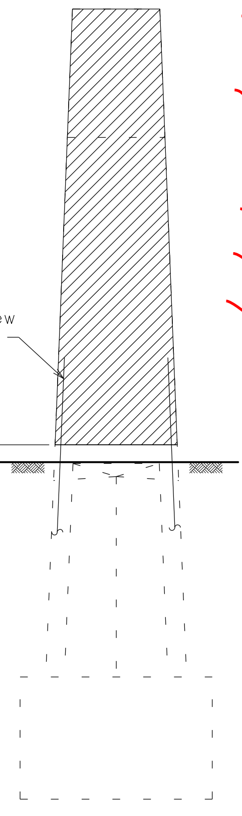


ELEVATION ✓

DEMOLITION - EAST AND WEST ABUTMENT ✓

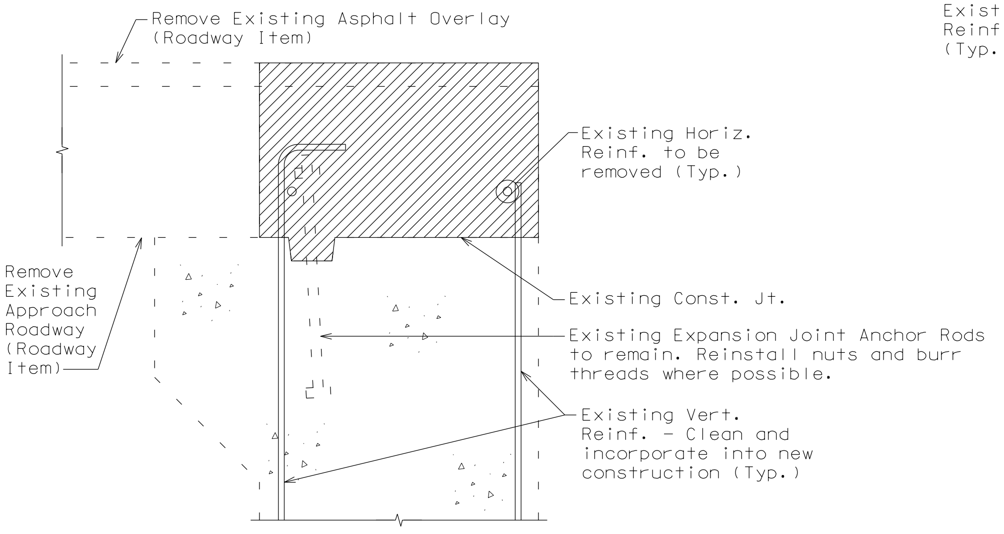


SIDE ELEVATION ✓

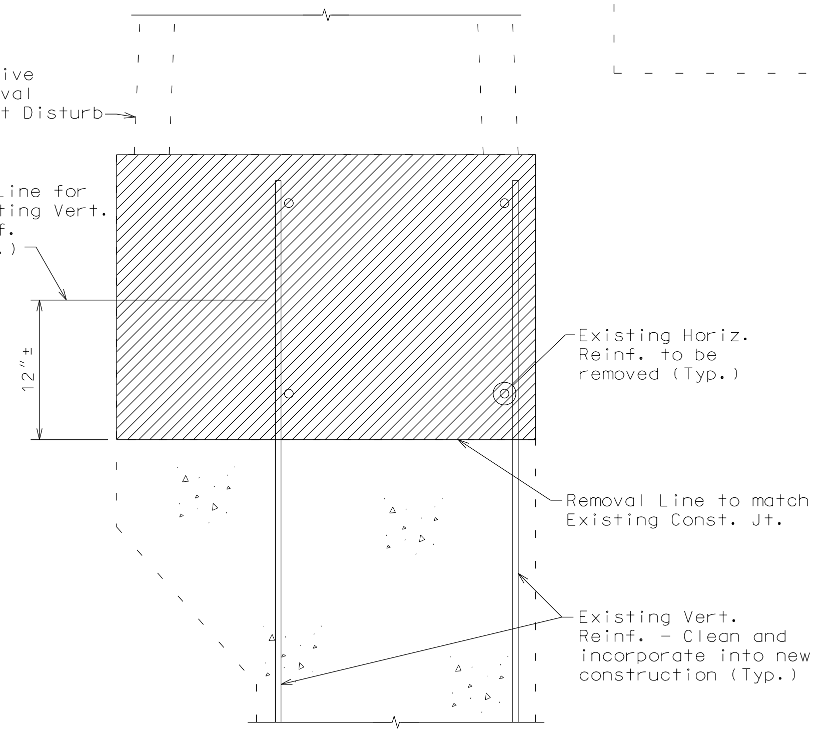


END ELEVATION ✓

DEMOLITION - PIER NO. 7 ✓



SECTION A-A ✓



SECTION B-B ✓

Notes: ✓

Outline of old work is indicated by light dashed lines. Solid lines and hatched areas indicate limits of removal.

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 as shown. 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.

The Demolition Line shall be adjusted as required to obtain the minimum protrusion of existing reinforcing steel to successfully lap with new reinforcing.

The cost of removal of existing substructure concrete will be completely covered by the contract lump sum price for Partial Removal of Substructure Concrete.

▨ Limits of Partial Removal of Substructure Concrete ✓

SUBSTRUCTURE DEMOLITION DETAILS ✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 6 of 57 ✓

FINAL PLANS ✓
DATE PREPARED
8/23/2012 ✓
ROUTE 136 ✓
STATE MO ✓
DISTRICT BR ✓
SHEET NO. 6 ✓
COUNTY
ATCHISON ✓
JOB NO.
J1P2161 ✓
CONTRACT ID.
090724-101 ✓
PROJECT NO. ✓
ARRA-136-1(59)
BRIDGE NO.
L00982 ✓

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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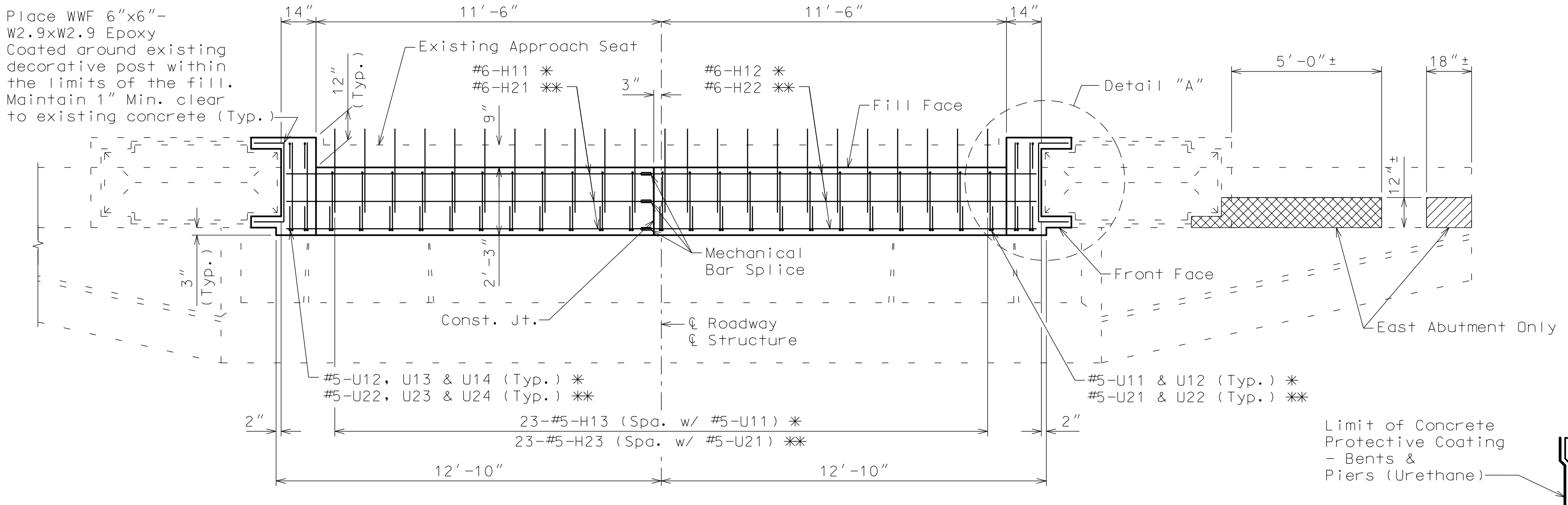
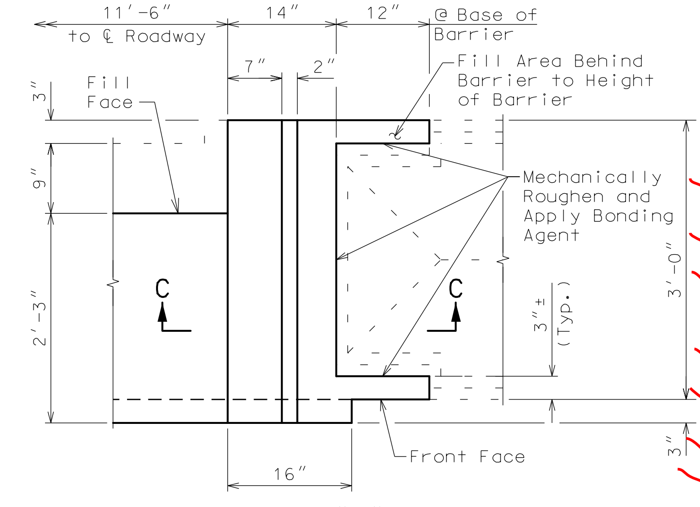


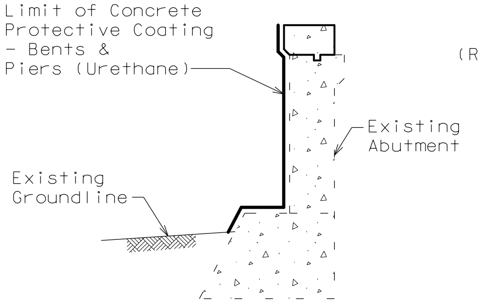
PLAN ✓

(East Abutment Shown Looking Ahead Station, West Abutment SimilarLooking Back Station)



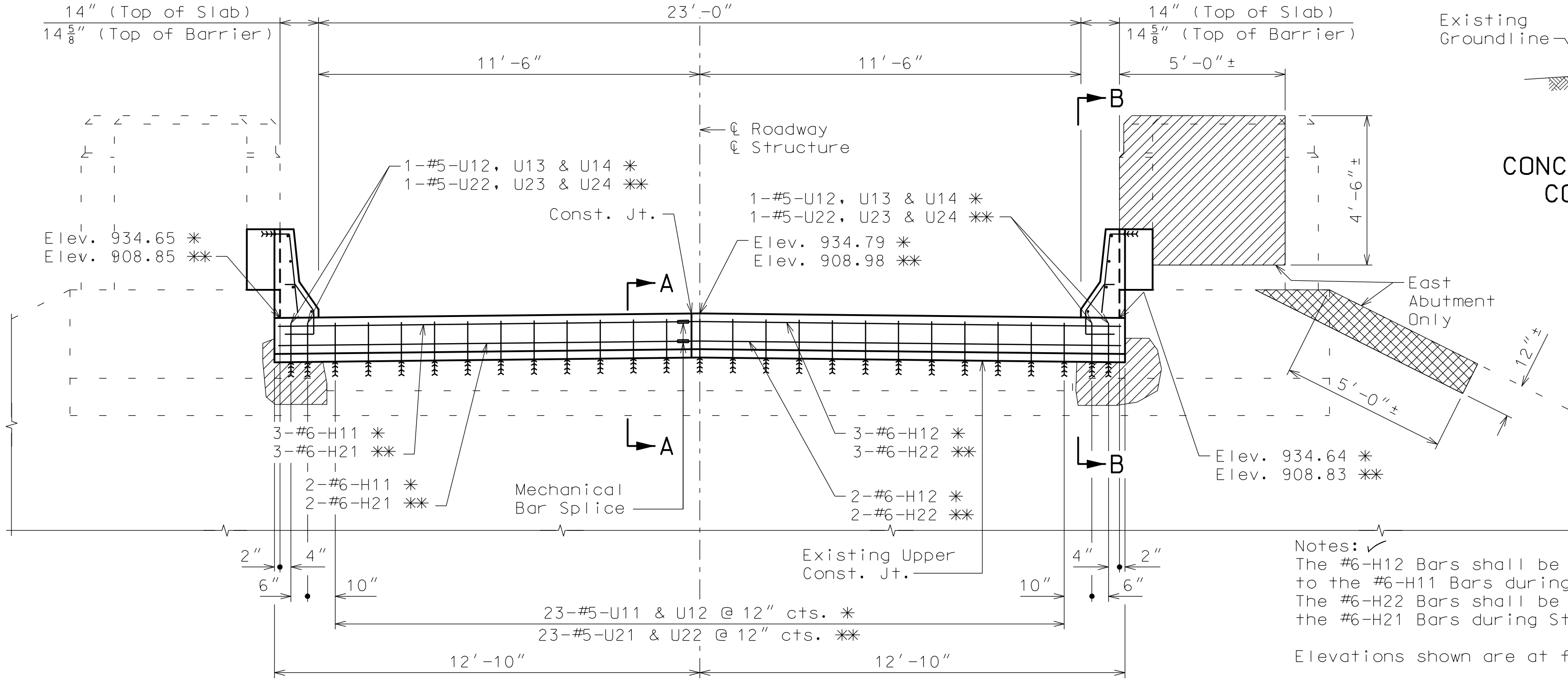
DETAIL "A" ✓

(Reinforcing and Sliding Plate Not Shown for Clarity)



Limit of Concrete Protective Coating - Bents & Piers (Urethane)
Existing Abutment
Existing Groundline

CONCRETE PROTECTIVE COATING DETAIL ✓

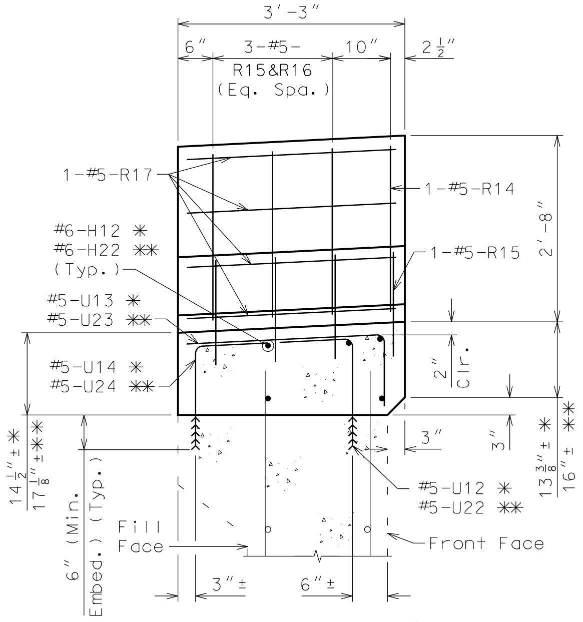


ELEVATION ✓

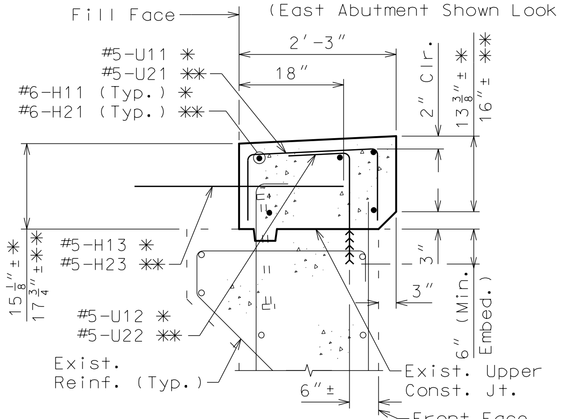
(East Abutment Shown Looking Ahead Station, West Abutment Similar Looking Back Station)

▨ Approximate Limits of Unformed Concrete Repair

▩ Approximate Limits of Formed Concrete Repair



SECTION B-B ✓



SECTION A-A ✓

SUBSTRUCTURE QUANTITY TABLE EAST ABUTMENT ✓		
ITEM		QUANTITY ✓
Substructure Repair (Unformed)	Sq. Ft.	30 ✓
Substructure Repair (Formed)	Sq. Ft.	29 ✓
Mechanical Bar Splice	Each	5 ✓
Reinforcing Steel (Epoxy Coated)	Lbs.	520 ✓

SUBSTRUCTURE QUANTITY TABLE WEST ABUTMENT ✓		
ITEM		QUANTITY ✓
Substructure Repair (Unformed)	Sq. Ft.	4 ✓
Mechanical Bar Splice	Each	5 ✓
Reinforcing Steel (Epoxy Coated)	Lbs.	550 ✓

Note:
These quantities are included in the Quantities Table on Sheet No. 3.

Notes: ✓

The #6-H12 Bars shall be mechanically coupled to the #6-H11 Bars during Stage 2 Construction. The #6-H22 Bars shall be mechanically coupled to the #6-H21 Bars during Stage 2 Construction.

Elevations shown are at front face of backwall.

Top of backwall shall be formed to the crown and grade of the roadway.

Backwall above upper construction joint shall not be poured until the superstructure slab has been poured in the adjacent span.

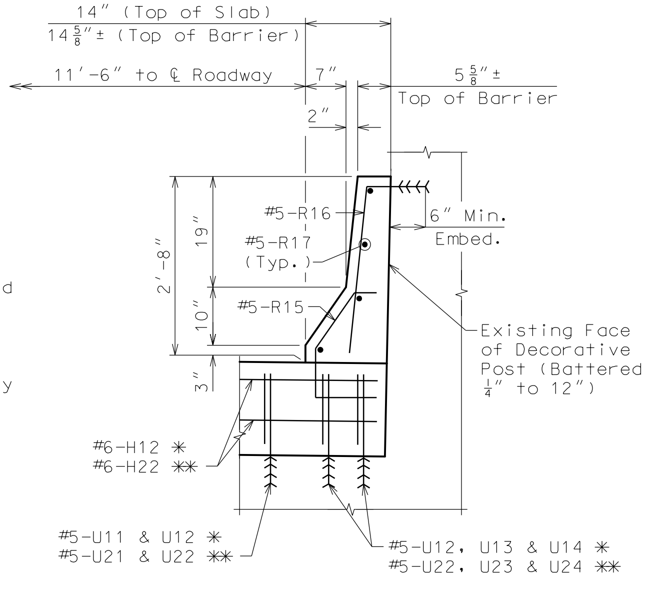
All concrete above the upper construction joint in backwall including the portions of Barrier Curb detailed on this sheet shall be Class B-2 (Superstructure). This quantity is included in the Estimated Quantities for Slab on Steel.

Cost of Welded Wire Fabric shall be considered completely covered by the cost of other items.

For Drainage System Details, see Sheet No. 47.

✳ = West Abutment
✳✳ = East Abutment

⩛ = Denotes Resin Anchored Reinforcing Steel.



SECTION C-C ✓

Detailed April 2009
Checked April 2009

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

ABUTMENT REPAIR DETAILS ✓

Sheet No. 7 ✓ of 57 ✓

FINAL PLANS ✓
DATE PREPARED 8/23/2012 ✓
ROUTE 136 ✓ STATE MO ✓
DISTRICT BR ✓ SHEET NO. 7 ✓
COUNTY ATCHISON ✓
JOB NO. J1P2161 ✓
CONTRACT ID. 090724-101 ✓
PROJECT NO. ARRA-136-1(59) ✓
BRIDGE NO. L00982 ✓

DESCRIPTION	DATE

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

HDR Engineering, Inc.
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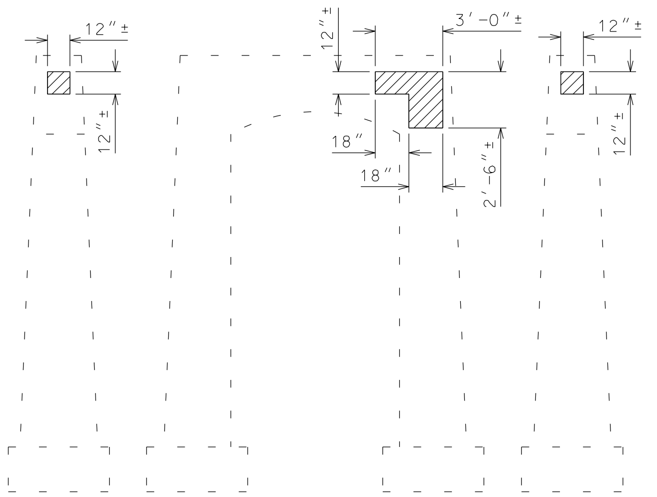
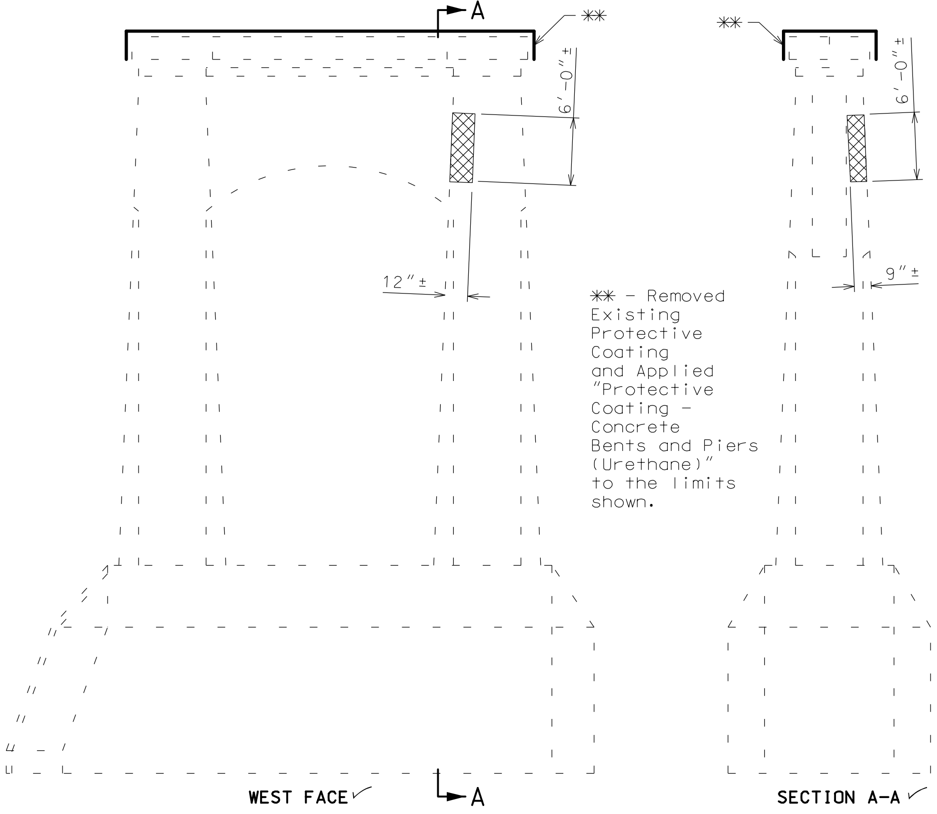


NORTH FACE ✓ WEST FACE ✓ SOUTH FACE ✓

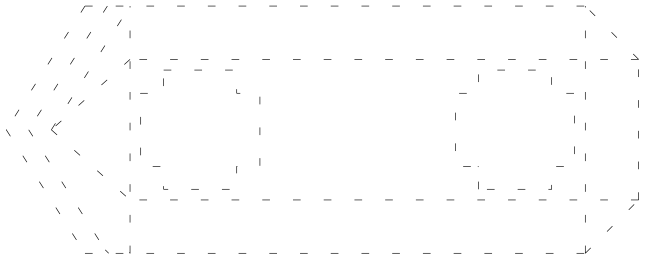
PIER NO. 1 ✓



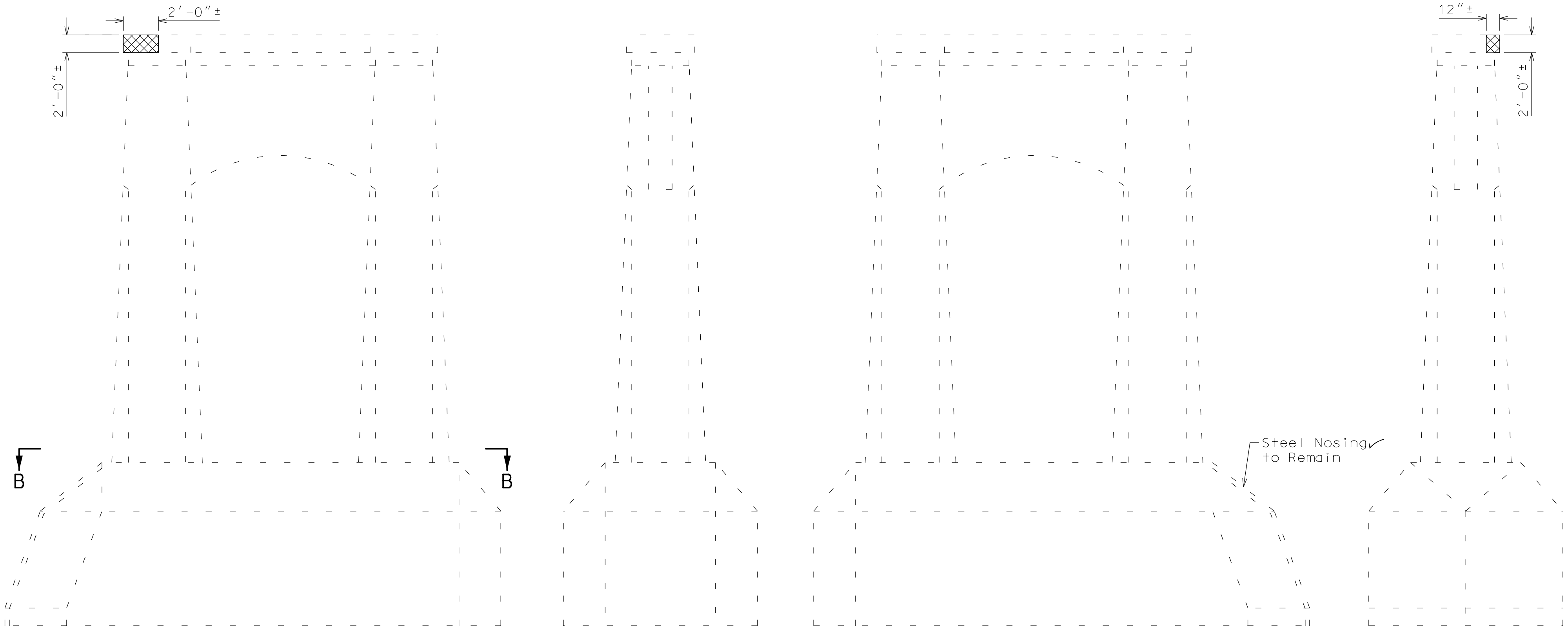
** - Removed Existing Protective Coating and Applied "Protective Coating - Concrete Bents and Piers (Urethane)" to the limits shown.

WEST FACE ✓ SECTION A-A ✓

PIER NO. 2 ✓



SECTION B-B ✓



Steel Nosing ✓ to Remain

WEST FACE ✓ SOUTH FACE ✓ EAST FACE ✓ NORTH FACE ✓

PIER NO. 3 ✓

▩ Approximate Limits of ✓ Formed Concrete Repair

▨ Approximate Limits of ✓ Unformed Concrete Repair

Note: ✓
The cost of all equipment and labor to remove existing coating shall be included in the contract unit price for Protective Coating - Concrete Bents and Piers (Urethane), Lump Sum.

PIERS NO. 1, 2 & 3 REPAIR DETAILS ✓

Detailed April 2009
Checked April 2009

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

Sheet No. 8 ✓ of 57 ✓

FINAL PLANS ✓	
DATE PREPARED 8/23/2012 ✓	
ROUTE 136 ✓	STATE MO ✓
DISTRICT BR ✓	SHEET NO. 8 ✓
COUNTY ATCHISON ✓	
JOB NO. J1P2161 ✓	
CONTRACT ID. 090724-101 ✓	
PROJECT NO. ARRA-136-1(59) ✓	
BRIDGE NO. L00982 ✓	

DATE	DESCRIPTION

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

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HDR
HDR Engineering, Inc.
4435 Main Street
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816-360-2700
Certificate of Authority: 000856

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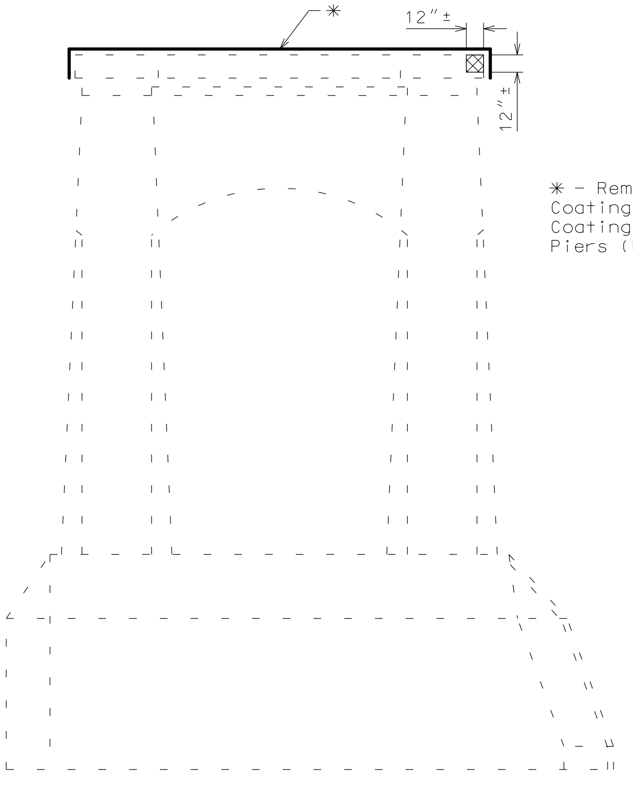
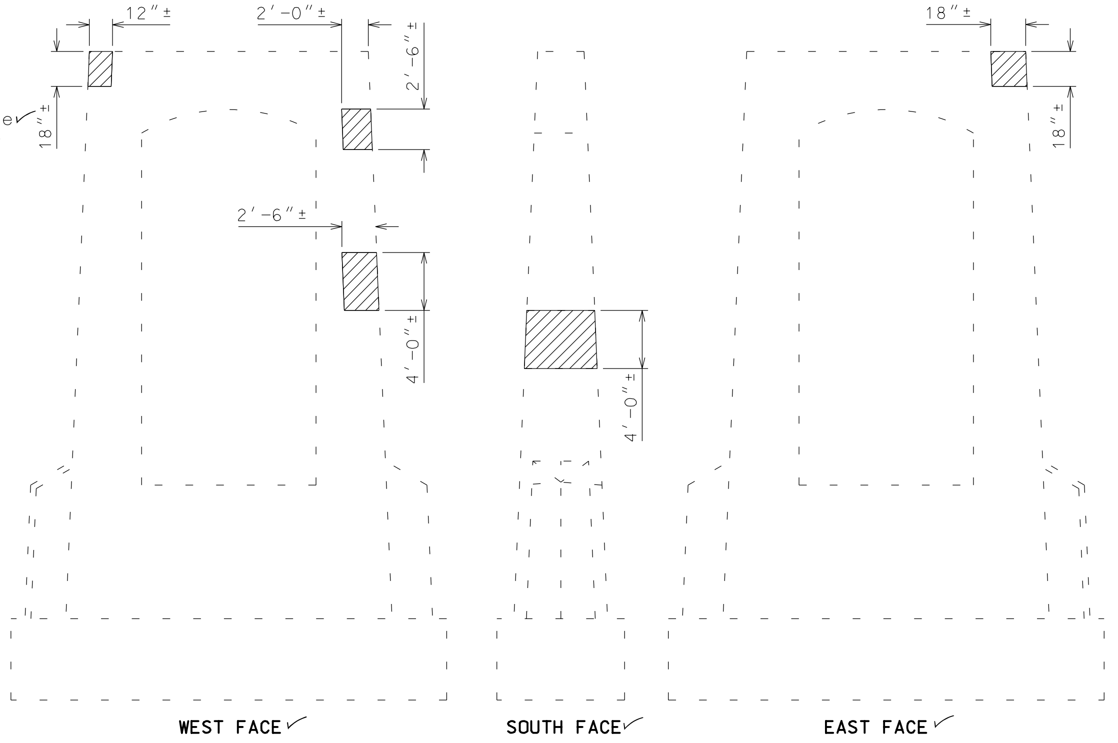


* – Removed Existing Protective Coating and Applied Protective Coating – Concrete Bents and Piers (Urethane)

PIER NO. 4

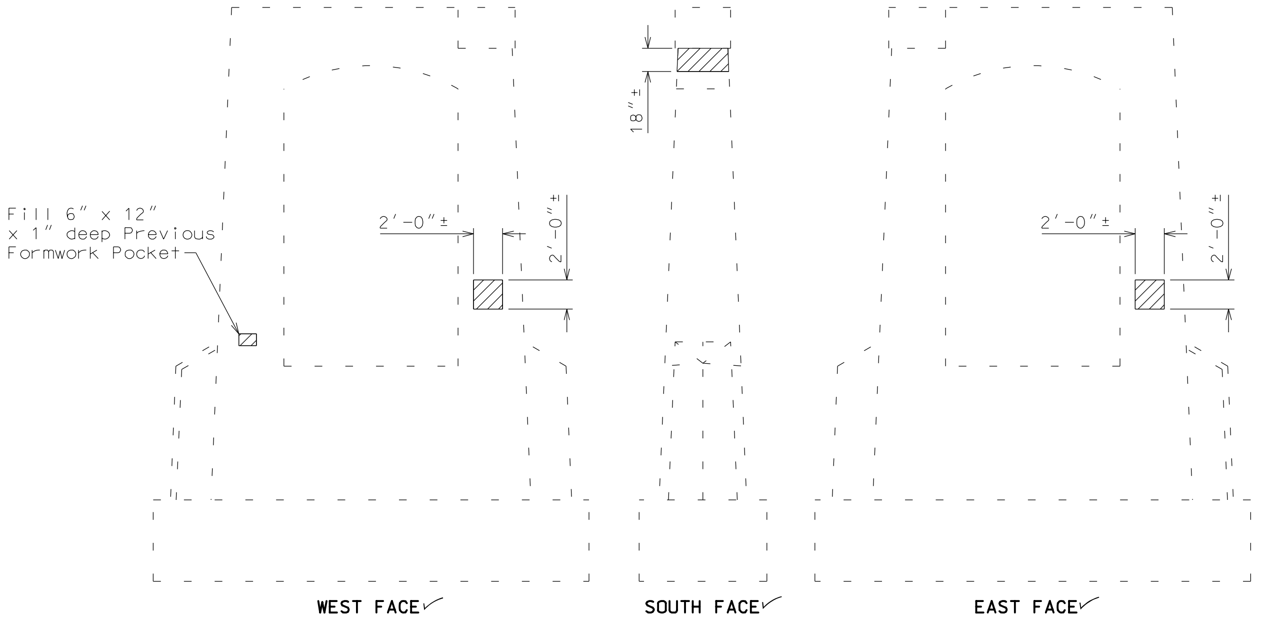
(East Face)



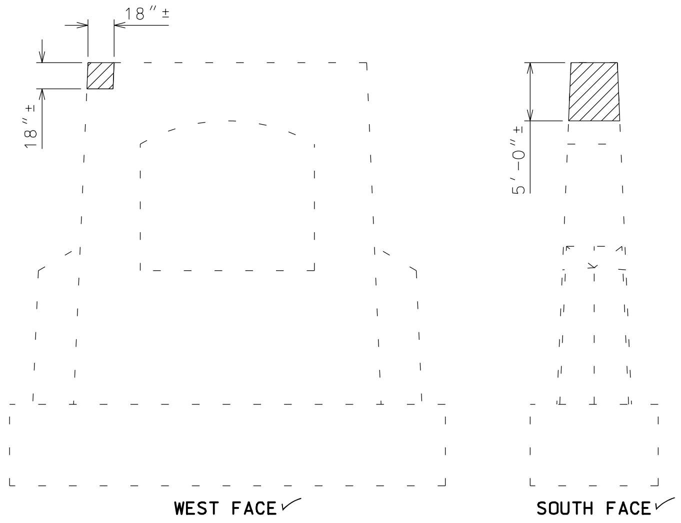
PIER NO. 5

▩ Approximate Limits of Formed Concrete Repair

▨ Approximate Limits of Unformed Concrete Repair



PIER NO. 6



PIER NO. 9

Note:
The cost of all equipment and labor to remove the existing coating and apply the new coating shall be included in the contract unit price for Protective Coating – Concrete Bents and Piers (Urethane). Lump Sum.

PIERS NO. 4, 5, 6 & 9 REPAIR DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 9 of 57

FINAL PLANS
DATE PREPARED 8/23/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 9
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. J1P2161
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
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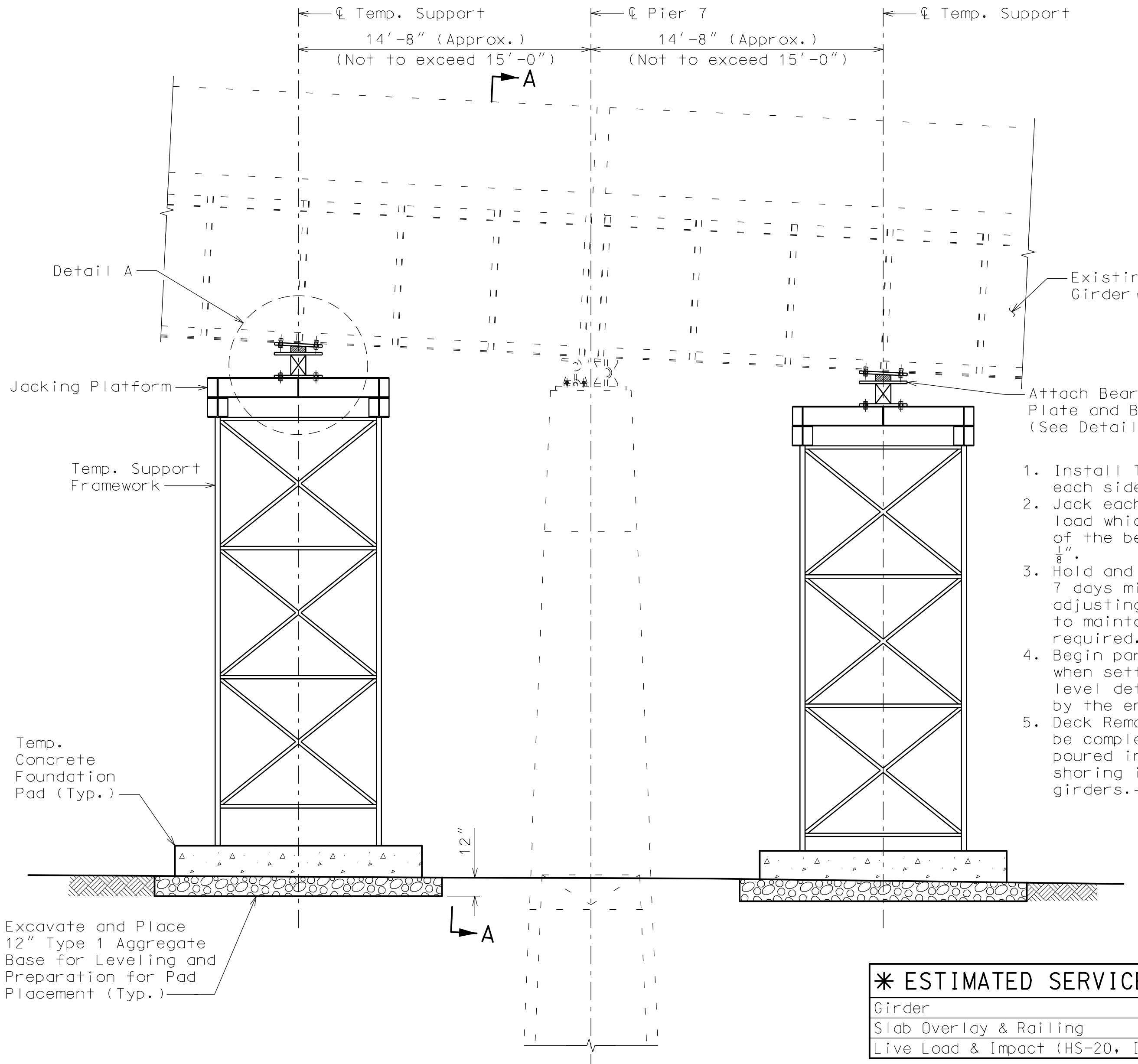
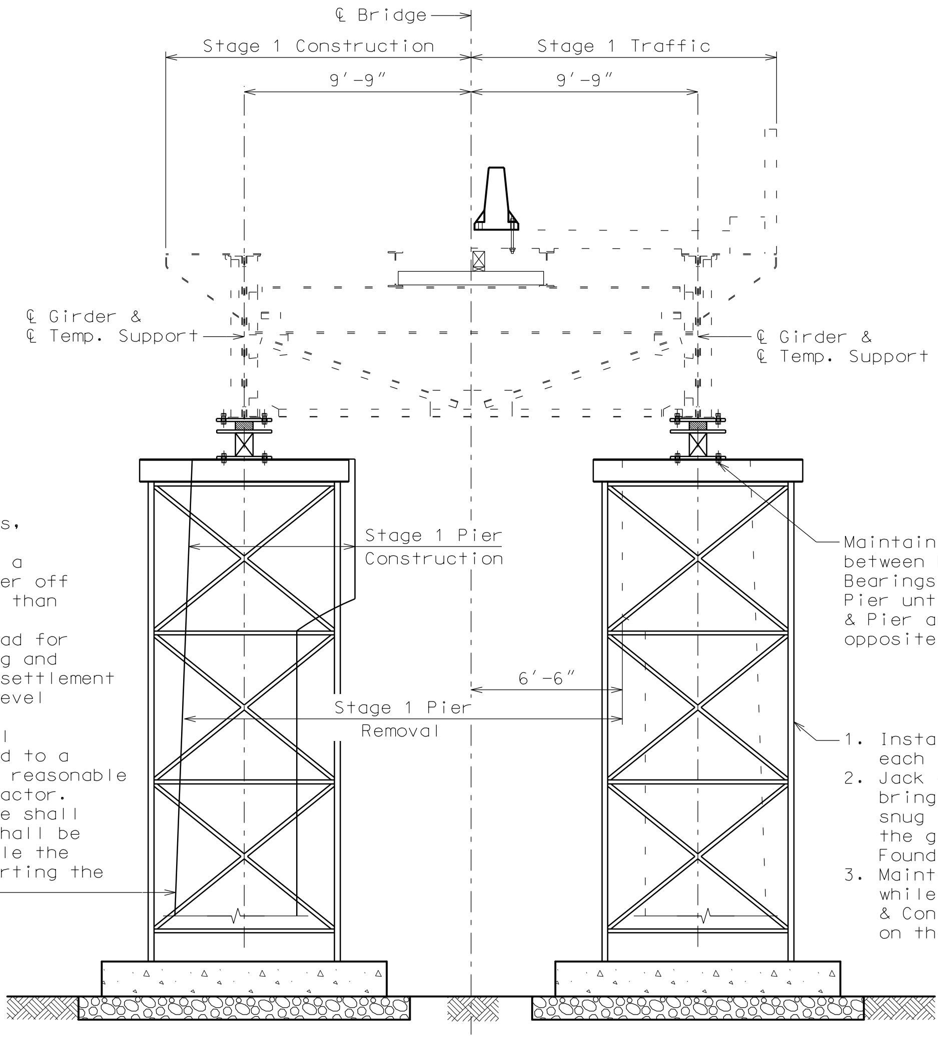


℄ Temp. Support
℄ Pier 7
℄ Temp. Support
14'-8" (Approx.)
(Not to exceed 15'-0")
14'-8" (Approx.)
(Not to exceed 15'-0")
A
Detail A
Existing Girder
Jacking Platform
Attach Bearing Plate and Bearing (See Detail A)
Temp. Support Framework
Temp. Concrete Foundation Pad (Typ.)
12"
A
Excavate and Place 12" Type 1 Aggregate Base for Leveling and Preparation for Pad Placement (Typ.)

ELEVATION SHOWING TEMPORARY SUPPORTS AT PIER 7

1. Install Temporary Supports, each side of pier.
2. Jack each side of pier to a load which lifts the girder off of the bearing by no more than $\frac{1}{8}$".
3. Hold and maintain this load for 7 days minimum, monitoring and adjusting for foundation settlement to maintain $\frac{1}{8}$" and load level required.
4. Begin partial pier removal when settlement has slowed to a level determined safe and reasonable by the engineer and contractor.
5. Deck Removal for the stage shall be complete and no deck shall be poured in Units 3 & 4 while the shoring is actively supporting the girders.



℄ Bridge
Stage 1 Construction
Stage 1 Traffic
9'-9"
9'-9"
℄ Girder &
℄ Temp. Support
℄ Girder &
℄ Temp. Support
Stage 1 Pier Construction
6'-6"
Stage 1 Pier Removal
Maintain Connections between Existing Girders, Bearings & Remaining Pier until New Bearing & Pier are in place on opposite side

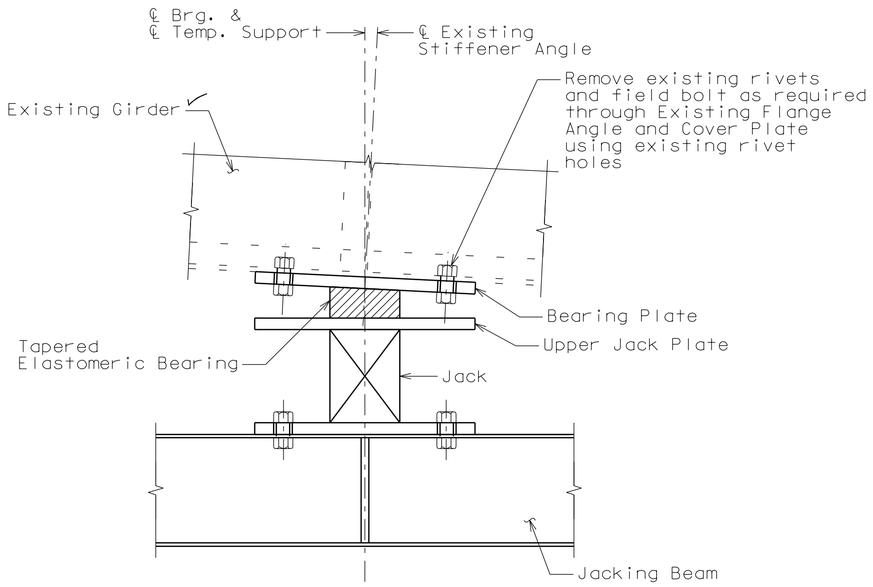
1. Install Temp. Supports each side of Pier.
2. Jack each side of Pier to bring the support to a snug tight condition with the girder and Temporary Foundation Pad.
3. Maintain this load level while Partial Pier Removal & Construction is ongoing on the opposite side.

SECTION A-A

(Stage 1 Construction shown, Stage 2 Construction similar)

✳ ESTIMATED SERVICE LOAD REACTIONS	
Girder	24000 lbs
Slab Overlay & Railing	88000 lbs
Live Load & Impact (HS-20, Impact = 30%)	76000 lbs

✳ For Existing Conditions. Contractor shall verify all loads for design of Temporary Supports.



℄ Brg. & ℄ Temp. Support
℄ Existing Stiffener Angle
Existing Girder
Remove existing rivets and field bolt as required through Existing Flange Angle and Cover Plate using existing rivet holes
Bearing Plate
Upper Jack Plate
Tapered Elastomeric Bearing
Jack
Jacking Beam

DETAIL A

(Alternate Bearing & Jacking arrangements will be allowed. This detail shows only one viable concept for contractor consideration)

Notes:
The contractor is responsible for maintaining the stability of the structure at all times and shall take all necessary precautions to maintain the stability and safety of the existing bridge at the contractor's cost.

The contractor shall be responsible for the design of the Falsework and Temporary Foundations necessary to replace Pier No. 7.

The contractor shall submit drawings and calculations signed and sealed by a Professional Engineer in the state of Missouri to the engineer for review a minimum of 4 weeks prior to installation of any temporary supports.

The temporary supports shall be designed and constructed to be capable of supporting the weight of the entire structure and one traffic lane without consideration of reduced weights and load for staged construction.

The weights provided are based on the as-built drawings for the existing bridge and shall be verified by the contractor in the design of the falsework.

Temporary Concrete Foundation Pads shall be designed for a maximum bearing stress of 2000 psf.

The contractor shall provide blocking between the bottom flange of the girder and abutment backwall at the East Abutment to prevent sliding of Unit No. 4.

The cost of all materials, equipment and labor necessary to design, construct, maintain, and remove the temporary supports shall be included in the contract lump sum price for "Temporary Supports".

TEMPORARY SUPPORTS - PIER NO. 7

Detailed April 2009
Checked April 2009

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

Sheet No. 10 of 57

FINAL PLANS
DATE PREPARED 2-5-12
ROUTE 136 STATE MO
DISTRICT BR SHEET NO. 10
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION
DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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HDR Engineering, Inc.
4435 Main Street
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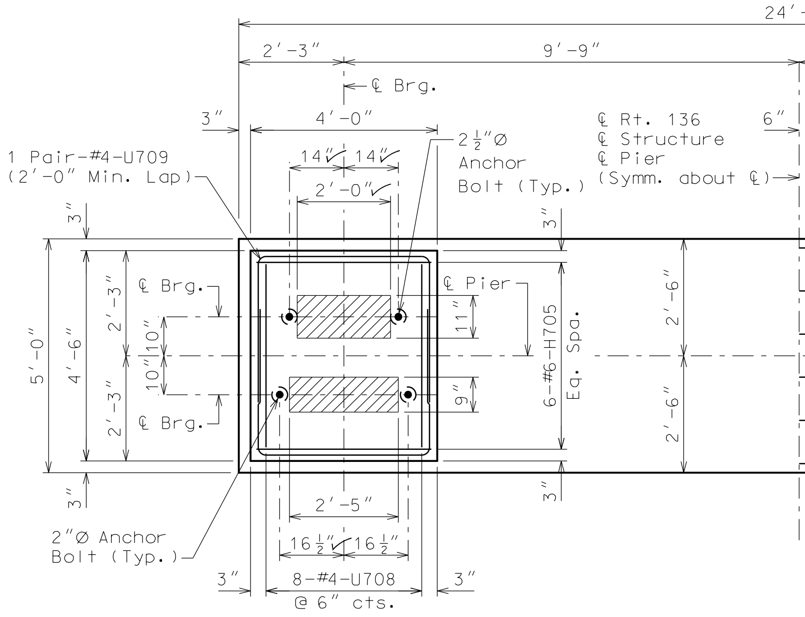
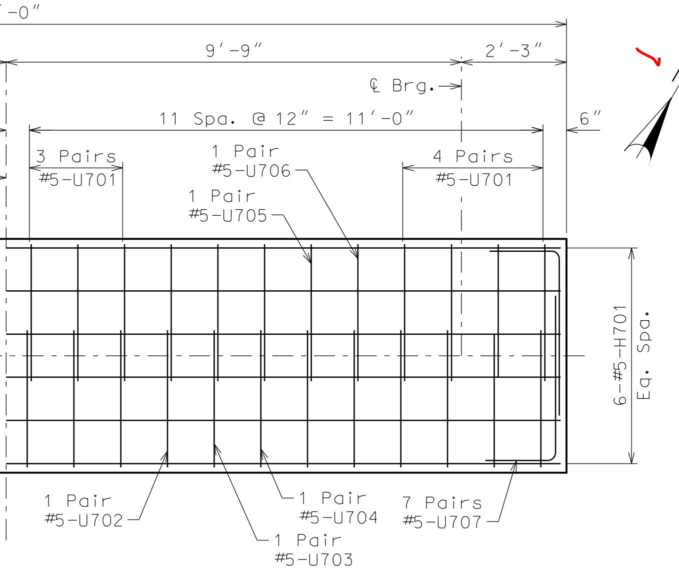
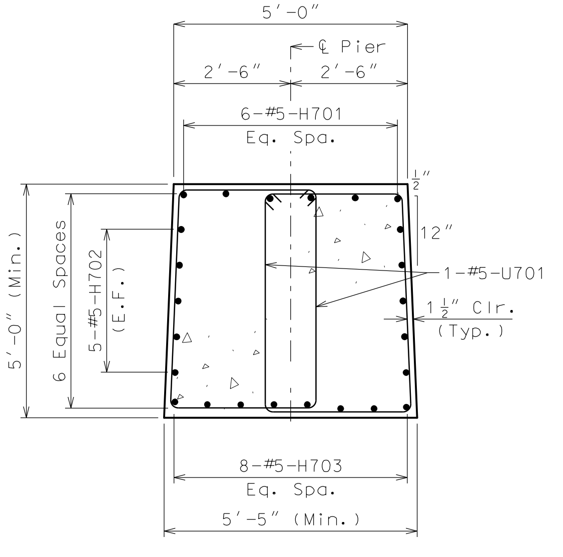


HALF PLAN SHOWING BEARING SEAT

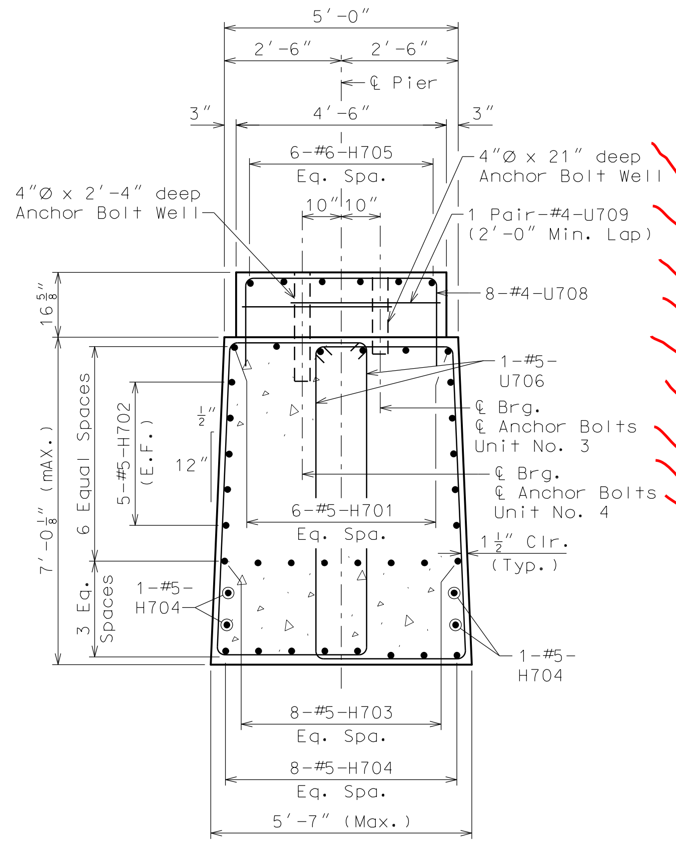


HALF PLAN SHOWING CAP REINFORCEMENT

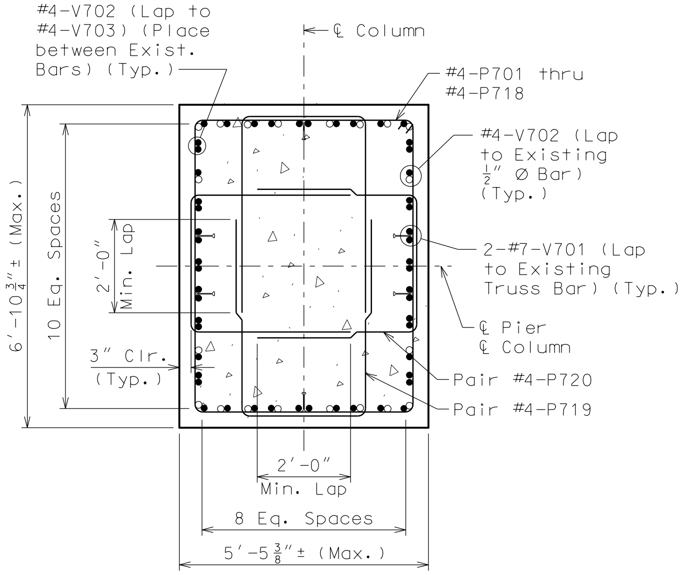


SECTION A-A

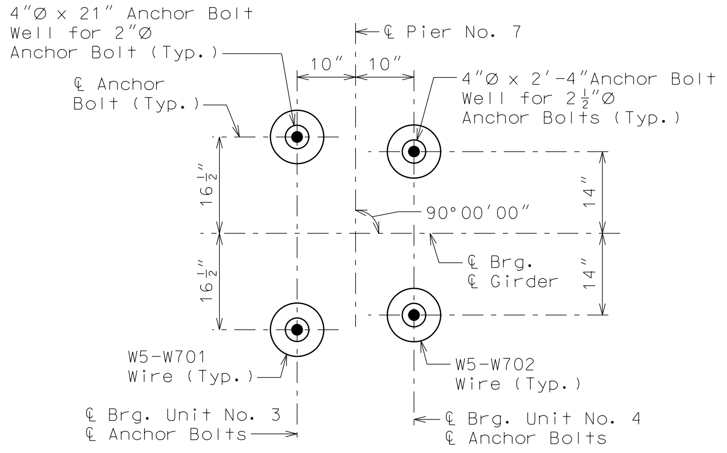
(Bearing Seat and Anchor Bolt Wells not shown for clarity)



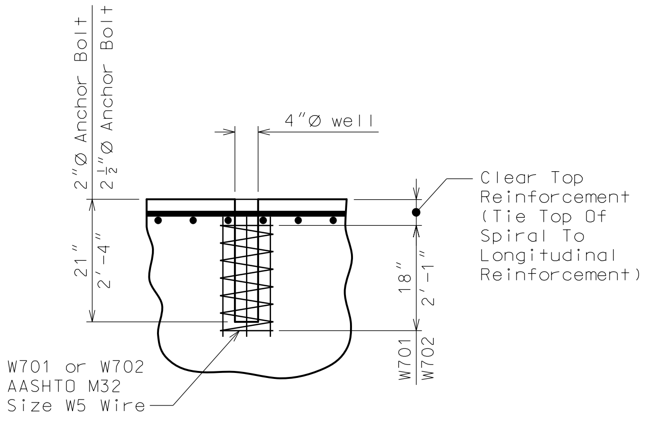
SECTION B-B



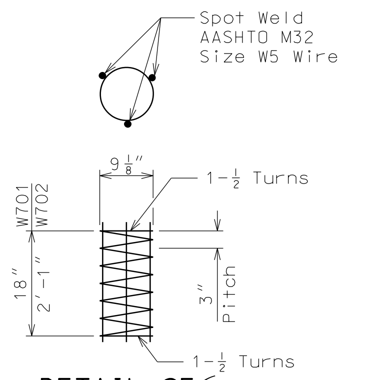
SECTION C-C



ANCHOR BOLT PLACEMENT DETAIL


2"Ø Anchor Bolt
2½"Ø Anchor Bolt
4"Ø well
Clear Top Reinforcement (Tie Top Of Spiral To Longitudinal Reinforcement)
21"
2'-4"
18"
2'-1"
W701
W702
W701 or W702 AASHTO M32 Size W5 Wire

DETAIL OF ANCHOR BOLT WELLS



DETAIL OF SPIRAL REINFORCEMENT

Note:
For location of Sections A-A, B-B & C-C, see Sheet No. 11.

PIER NO. 7 REPAIR DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 12 of 57

FINAL PLANS

DATE PREPARED	
8/23/2012	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	12
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
090724-101	
PROJECT NO.	
ARRA-136-1(59)	
BRIDGE NO.	
L00982	

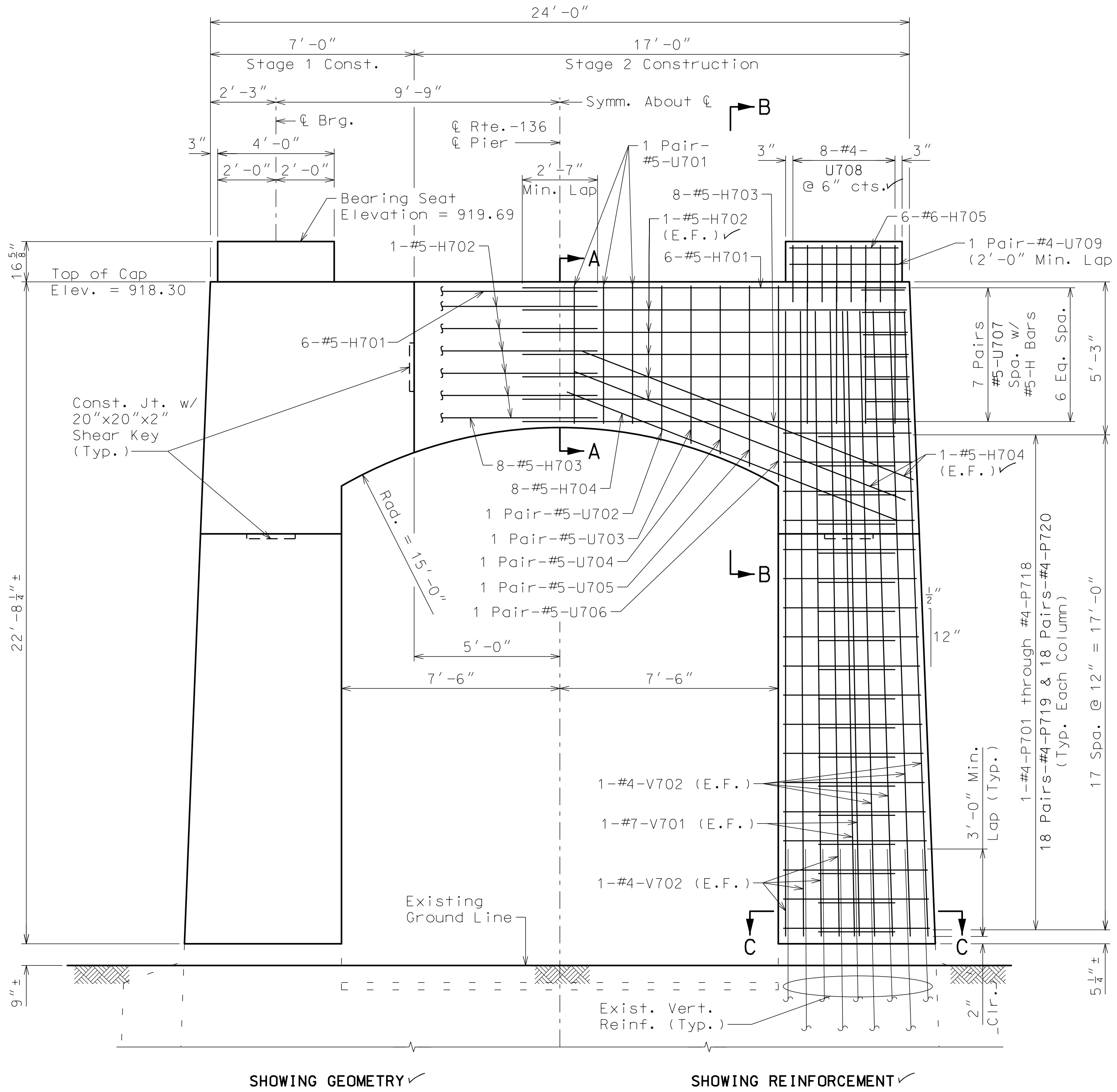
DESCRIPTION

DATE

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

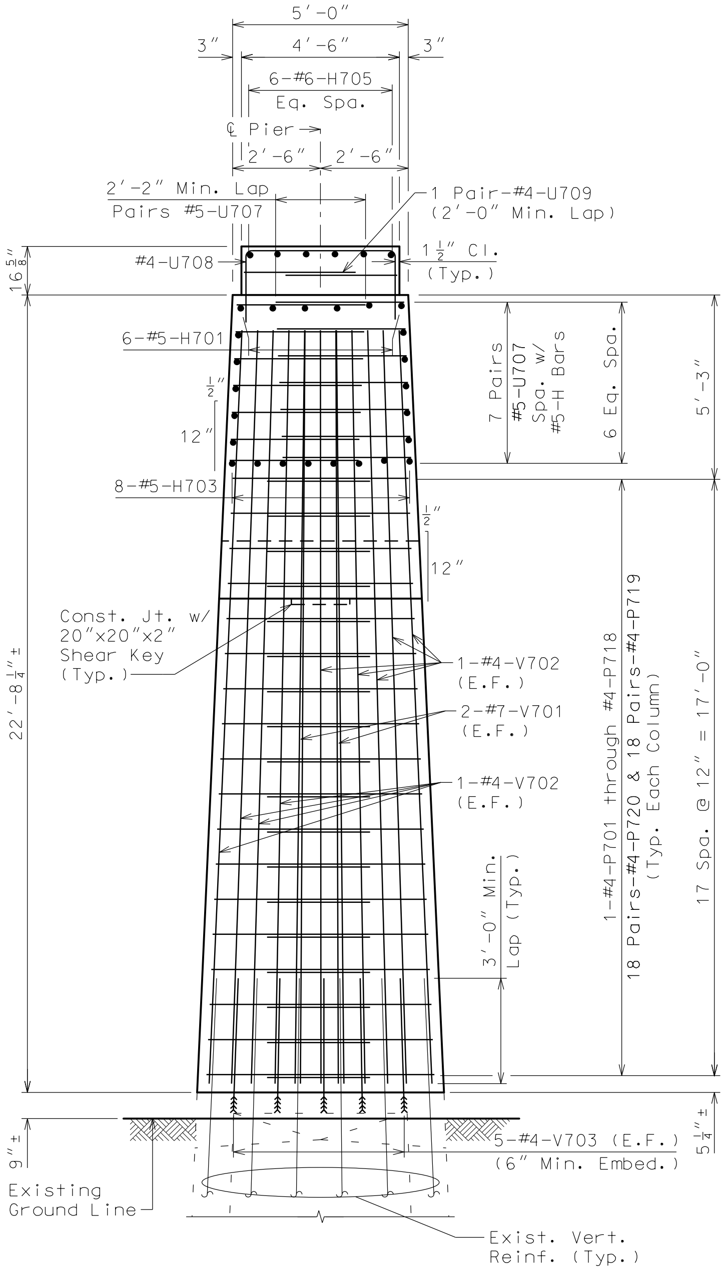
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

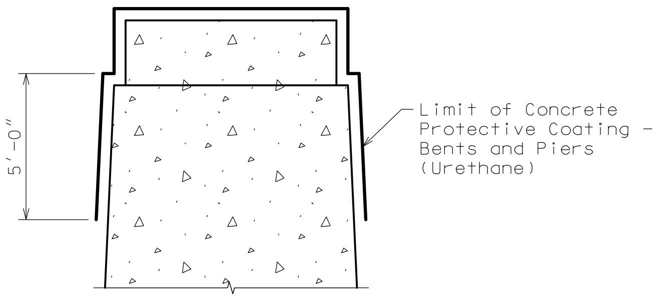


SHOWING GEOMETRY ✓ **SHOWING REINFORCEMENT** ✓

SIDE ELEVATION ✓
(Looking Ahead Station)



END ELEVATION ✓


5'-0"
Limit of Concrete Protective Coating - Bents and Piers (Urethane)

CONCRETE PROTECTIVE COATING DETAIL ✓

SUBSTRUCTURE QUANTITY TABLE FOR PIER NO. 7 ✓

ITEM		QUANTITY
Class B-1 Concrete (Substructure)	Cu. Yd.	68.0✓
Reinforcing Steel (Bridges)	Lbs.	3040✓
Reinforcing Steel (Epoxy Coated)	Lbs.	2250✓

These quantities are included in the estimated quantities table on Sheet No. 3.

Notes:
All reinforcing bars in the tops of substructure beams or caps shall be spaced to clear anchor bolt wells for bearings by at least 1/2".

For Sections A-A, B-B & C-C, see Sheet No. 12.

For Drainage System Details, see Sheet No. 47.

E.F. = Each Face.

⇞ = Denotes Resin Anchored Reinforcing Steel.

PIER NO. 7 REPAIR DETAILS ✓

Detailed April 2009
Checked April 2009

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

Sheet No. 11✓ of 57✓

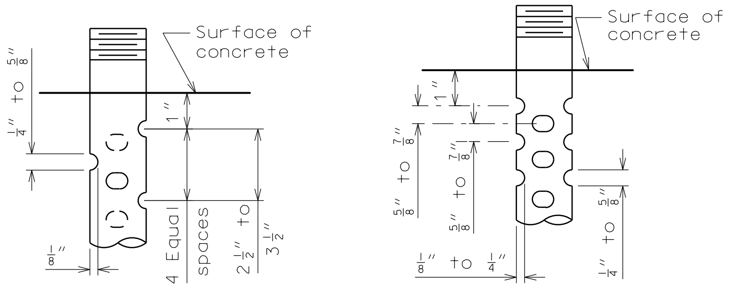
FINAL PLANS ✓
DATE PREPARED 8/23/2012 ✓
ROUTE 136 ✓ STATE MO ✓
DISTRICT BR ✓ SHEET NO. 11 ✓
COUNTY ATCHISON ✓
JOB NO. J1P2161 ✓
CONTRACT ID. 090724-101 ✓
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982 ✓

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

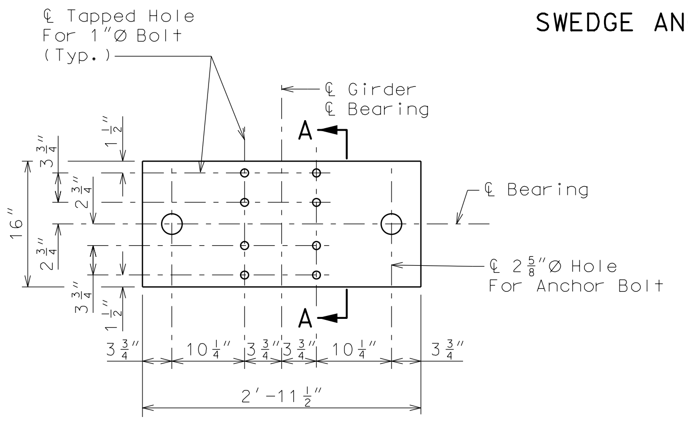
REV.



DETAIL OF 3/4" Ø THRU 2 1/2" Ø ANCHOR BOLTS

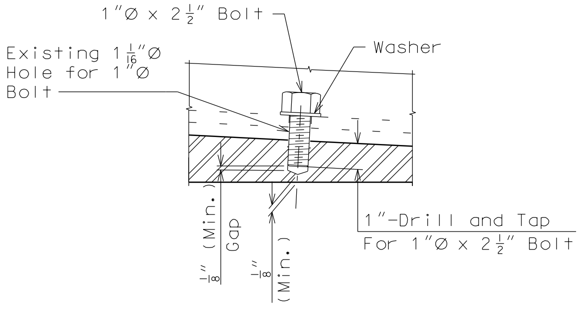
OPTIONAL DETAIL OF 1 3/8" Ø THRU 2 1/2" Ø ANCHOR BOLTS

SWEDGE ANCHOR BOLT DETAILS



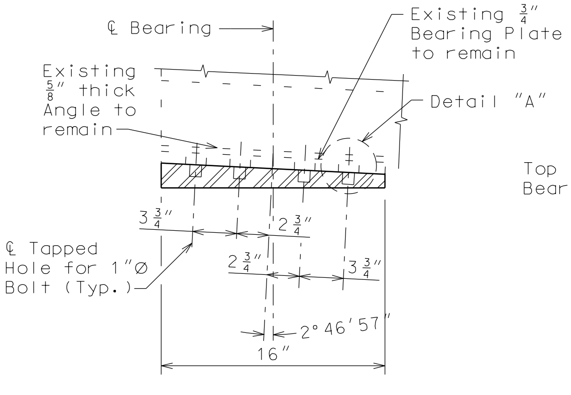
PLAN OF SOLE PLATE

Note:
Dimensions for 1"Ø Bolts taken from As-Built plans, contractor to verify prior to fabrication.



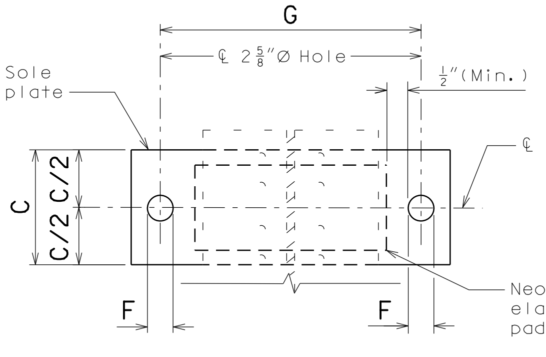
1"Ø x 2 1/2" Bolt
Washer
Existing 1 1/16"Ø Hole for 1"Ø Bolt
1"-Drill and Tap For 1"Ø x 2 1/2" Bolt
1/8" (Min.) Gap
1/8" (Min.)

DETAIL "A"

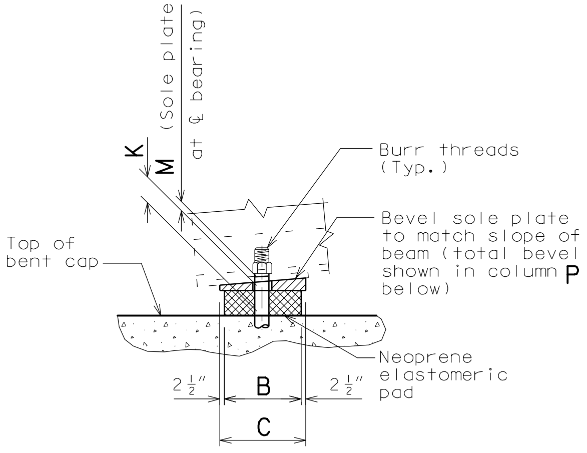


℄ Bearing
Existing 3/4" Bearing Plate to remain
Existing 5/8" thick Angle to remain
Detail "A"
℄ Tapped Hole for 1"Ø Bolt (Typ.)
3 3/4"
2 3/4"
2 3/4"
3 3/4"
2° 46' 57"
16"

SECTION A-A

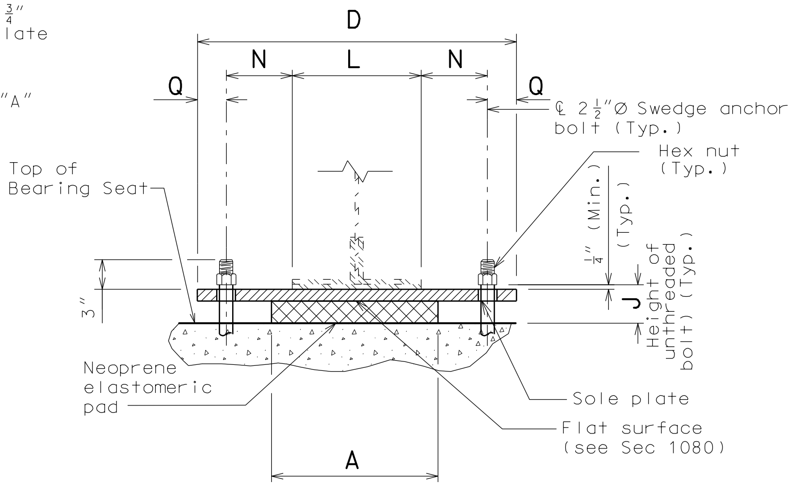


PART PLAN

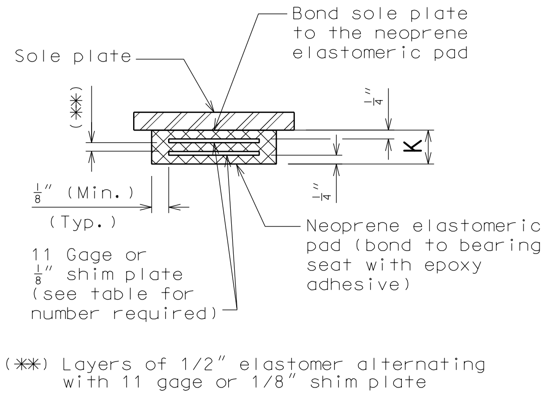


K
M
(Sole plate at ℄ bearing)
Burr threads (Typ.)
Bevel sole plate to match slope of beam (total bevel shown in column P below)
Top of bent cap
Neoprene elastomeric pad
2 1/2"
B
2 1/2"
C

SIDE VIEW



END VIEW



Sole plate
Bond sole plate to the neoprene elastomeric pad
(✱✱)
1/4"
K
1/8" (Min.) (Typ.)
1/4"
11 Gage or 1/8" shim plate (see table for number required)
Neoprene elastomeric pad (bond to bearing seat with epoxy adhesive)

(✱✱) Layers of 1/2" elastomer alternating with 11 gage or 1/8" shim plate

NEOPRENE ELASTOMERIC PAD

GENERAL NOTES:

Anchor rods shall be 2 1/2"Ø ASTM F1554 Grade 55 swedged rods and shall extend 2'-1" into the concrete with AASHTO M291 (ASTM A563) Grade A Hex or Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

All structural steel for the anchor rods and heavy hexagon nuts shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum).

Neoprene Elastomeric Pads shall be 60 Durometer.

Structural steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum or two coats of inorganic zinc primer (5 mils minimum).

Laminated Neoprene Bearing Pad Assembly shall be in accordance with Sec 716.

FIXED BEARINGS

LOCATION	A	B	C	D	F	G	J	K	L	M	N	P	Q	NUMBER OF SHIM PLATES(✱)	NUMBER REQUIRED
Pier No. 7 - Unit No. 4	24"	11"	16"	35 1/2"	2 5/8"	28"	4"	1 7/8"	16 1/2"	1 3/4"	5 3/4"	3/4"	3 3/4"	3	2
														TOTAL BEARINGS	2

(✱) The required shim plate shall be placed between layers of elastomer and molded together to form an integral unit.

DETAILS OF LAMINATED NEOPRENE BEARING ASSEMBLY

Detailed April 2009
Checked April 2009

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

Sheet No. 13 of 57

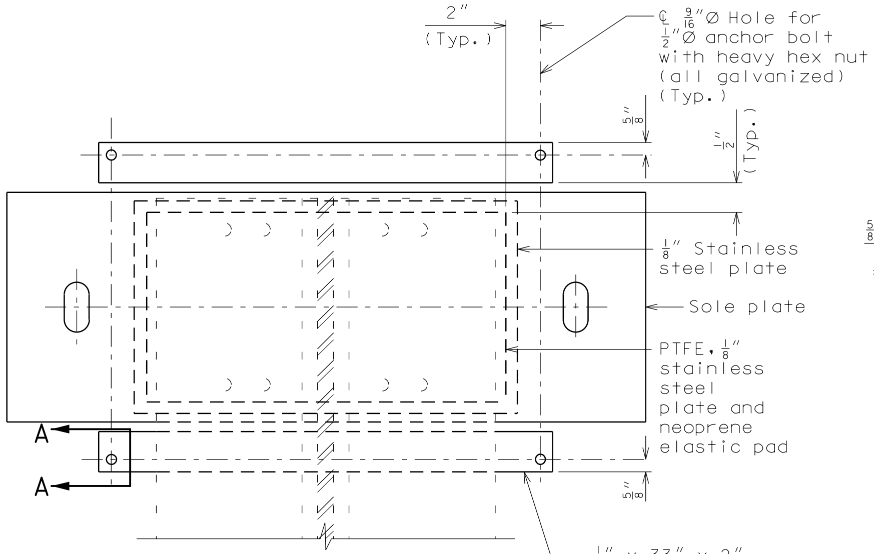
FINAL PLANS
DATE PREPARED 8/23/2012
ROUTE 136 STATE MO
DISTRICT BR SHEET NO. 13
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

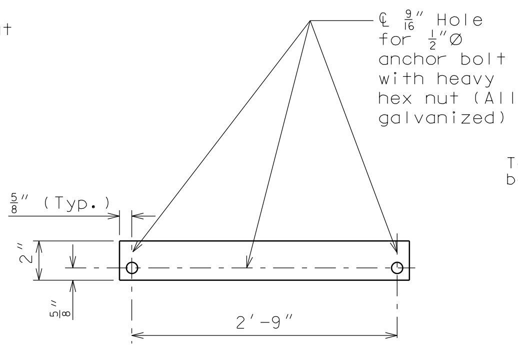
REV.


2" (Typ.)
℄ 9/16"Ø Hole for 1/2"Ø anchor bolt with heavy hex nut (all galvanized) (Typ.)
5/8"
1/2" (Typ.)
1/8" Stainless steel plate
Sole plate
PTFE, 1/8" stainless steel plate and neoprene elastic pad
A
A
5/8"
1/2" x 33" x 2" Galvanized steel stopper plate (Typ.)

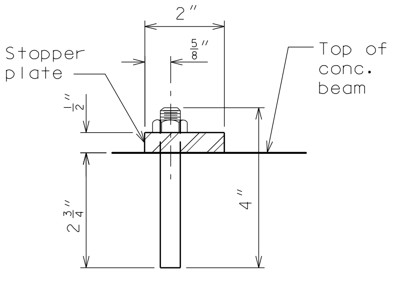
PART PLAN SHOWING STOPPER PLATE

Stopper plates shall be provided to prevent loss of support due to creeping of PTFE bearings. Payment for fabricating and installing the stopper plates will be considered completely covered by the contract unit price for Type N PTFE Bearing.

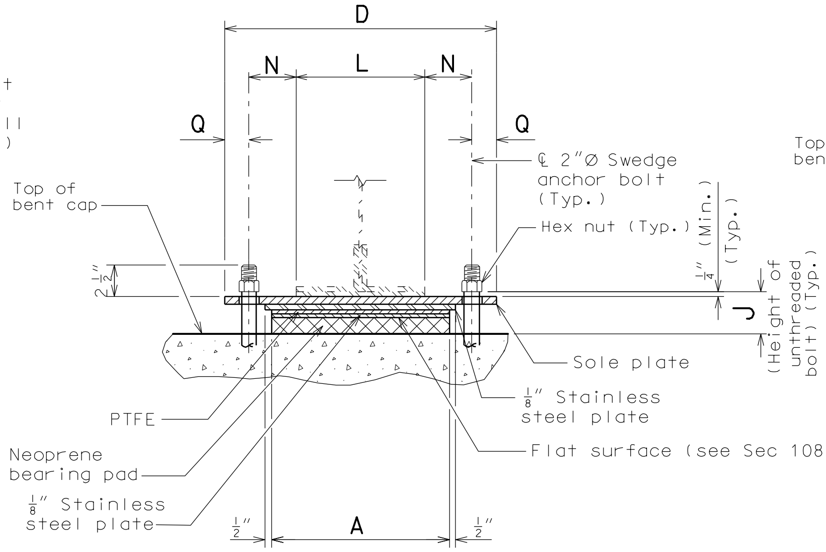
The bottom face of the 1/8" stainless steel plate that is welded to the sole plate shall be lubricated with a lubricant that is approved by the bearing manufacturer.


℄ 9/16" Hole for 1/2"Ø anchor bolt with heavy hex nut (All galvanized)
5/8" (Typ.)
2"
5/8"
2'-9"

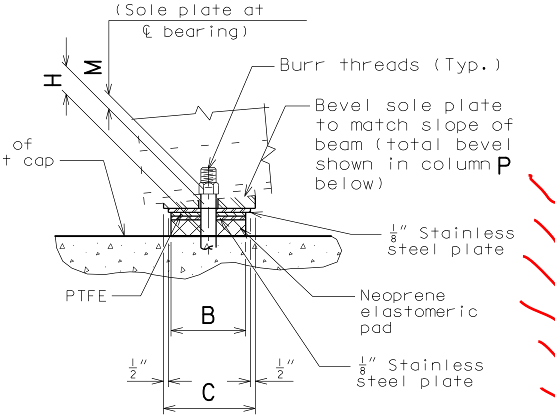
PLAN OF GALVANIZED STEEL STOPPER PLATE



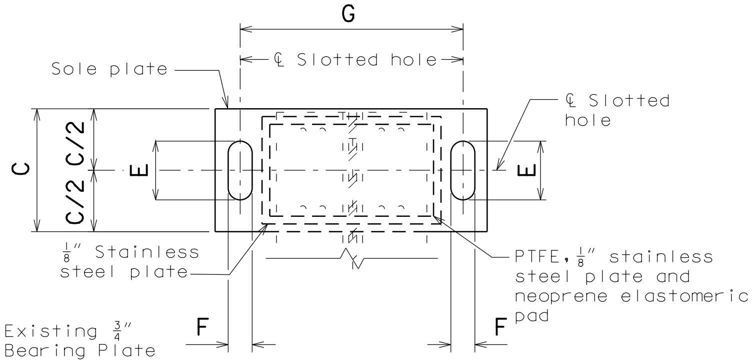
SECTION A-A


D
N
L
N
Q
Q
℄ 2"Ø Swedge anchor bolt (Typ.)
Hex nut (Typ.)
Top of bent cap
2 1/2"
1/4" (Min.)
(Typ.)
J
(Height of unthreaded bolt) (Typ.)
Sole plate
1/8" Stainless steel plate
PTFE
Flat surface (see Sec 1080)
Neoprene bearing pad
1/8" Stainless steel plate
1/2"
A
1/2"

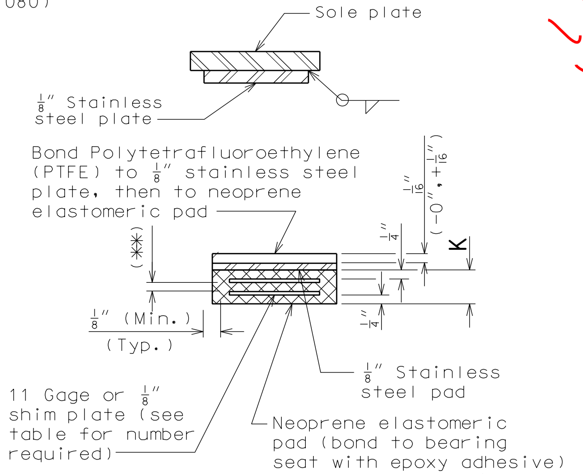
END VIEW


(Sole plate at ℄ bearing)
H
M
Burr threads (Typ.)
Bevel sole plate to match slope of beam (total bevel shown in column P below)
Top of bent cap
1/8" Stainless steel plate
PTFE
Neoprene elastomeric pad
B
1/2"
1/2"
C
1/8" Stainless steel plate

SIDE VIEW

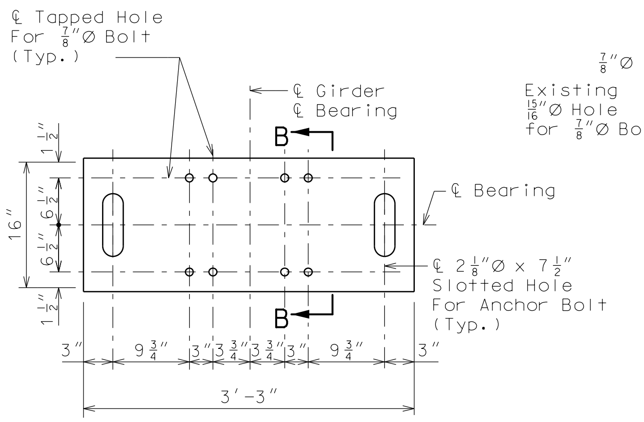

G
℄ Slotted hole
Sole plate
℄ Slotted hole
C
C/2
C/2
E
E
1/8" Stainless steel plate
PTFE, 1/8" stainless steel plate and neoprene elastomeric pad
F
F

PART PLAN


Sole plate
1/8" Stainless steel plate
Bond Polytetrafluoroethylene (PTFE) to 1/8" stainless steel plate, then to neoprene elastomeric pad
(✱✱)
1/16"
(−0", +1/16")
1/4"
K
1/4"
1/8" (Min.)
(Typ.)
1/8" Stainless steel pad
11 Gage or 1/8" shim plate (see table for number required)
Neoprene elastomeric pad (bond to bearing seat with epoxy adhesive)

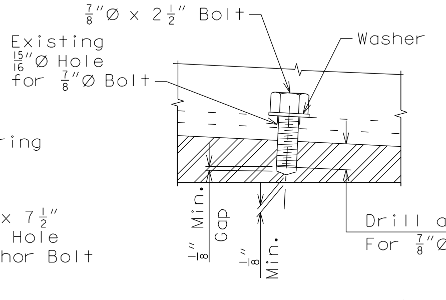
NEOPRENE ELASTOMERIC PAD

(✱✱) Layers of 3/8" elastomer alternating with 11 gage or 1/8" shim plate.

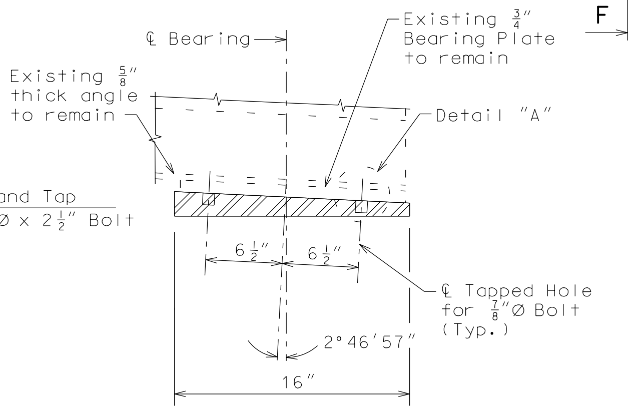


PLAN OF SOLE PLATE

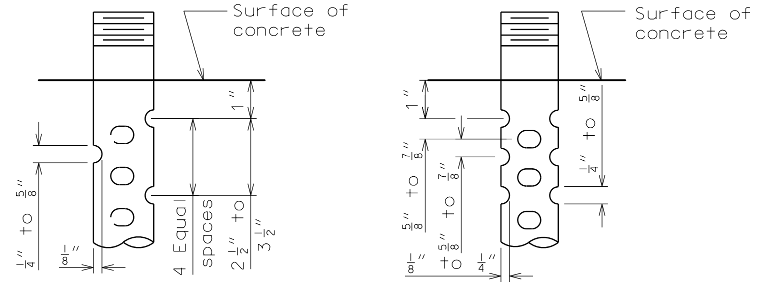
Note:
Dimensions for 7/8"Ø Bolts taken from As-Built plans, contractor to verify prior to fabrication.


7/8"Ø x 2 1/2" Bolt
Existing 15/16"Ø Hole for 7/8"Ø Bolt
Washer
1/8" Min. Gap
1/8" Min.
Drill and Tap For 7/8"Ø x 2 1/2" Bolt

DETAIL "A"


℄ Bearing
Existing 5/8" thick angle to remain
Existing 3/4" Bearing Plate to remain
Detail "A"
6 1/2"
6 1/2"
℄ Tapped Hole for 7/8"Ø Bolt (Typ.)
2°46'57"
16"

SECTION B-B



DETAIL FOR 3/4" Ø THRU 2 1/2" Ø ANCHOR BOLTS

OPTIONAL DETAIL FOR 1 3/8" Ø THRU 2 1/2" Ø ANCHOR BOLTS

SWEDGE ANCHOR BOLT DETAILS

PTFE SLIDING BEARINGS

LOCATION	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	NUMBER OF SHIM PLATES (✱)	NUMBER REQUIRED
Pier No. 7 - Unit No. 3	29"	9"	16"	39"	7 1/2"	2 1/8"	33"	2 1/2"	5"	2 1/8"	16 1/2"	2 1/8"	8 1/4"	3/4"	3"	5/16"	4	2
																	TOTAL BEARINGS	2

(✱) The required shim plate shall be placed between layers of elastomer and molded together to form an integral unit.

GENERAL NOTES:

Anchor rods shall be 2"Ø ASTM F1554 Grade 55 swedged rods and shall extend 18" into the concrete with AASHTO M291 (ASTM A563) Grade A Hex or Heavy Hex nuts. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided. Swedging shall be 1" less than extension into the concrete.

Anchor rod shall be at the ℄ of the slotted hole at 60°F. Bearing position shall be adjusted R for each 10° fall or rise in temperature at installation.

All structural steel for the anchor rods and heavy hexagon nuts shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum). The stainless steel plate shall be protected from any coating.

Neoprene Elastomeric Pads shall be 70 Durometer.

Structural Steel for sole plate shall be ASTM A709 Grade 50 and shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum). The stainless steel plate shall be protected from any coating.

Type N PTFE Bearings shall be in accordance with Sec 716.

Stopper plates shall be provided to prevent loss of support due to creeping of PTFE bearings. Payment for fabricating and installing the stopper plates will be considered completely covered by the contractor unit price for Type N PTFE Bearing.

The bottom face of the 1/8" stainless steel plate that is welded to the sole plate shall be lubricated with a lubricant that is approved by the bearing manufacturer.

DETAILS OF TYPE "N" PTFE BEARINGS

Detailed April 2009
Checked April 2009

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

Sheet No. 14 of 57

FINAL PLANS

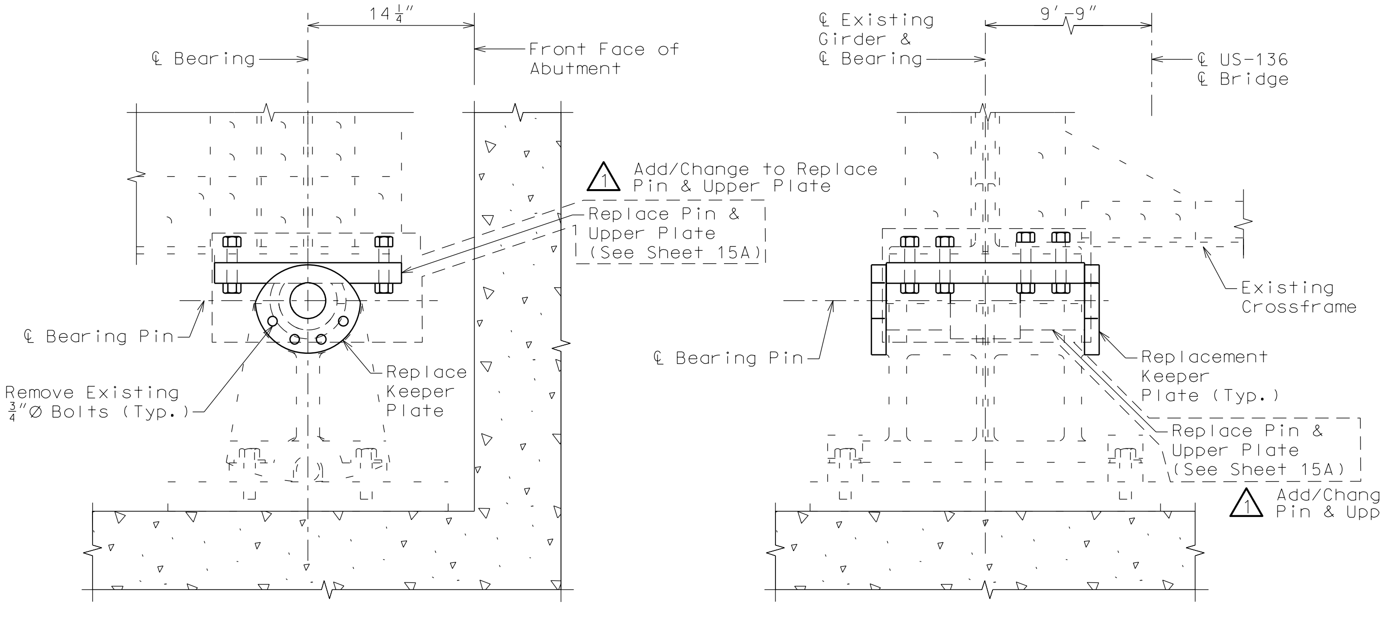
DATE PREPARED	8/23/2012
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	14
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	090724-101
PROJECT NO.	ARRA-136-1(59)
BRIDGE NO.	L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

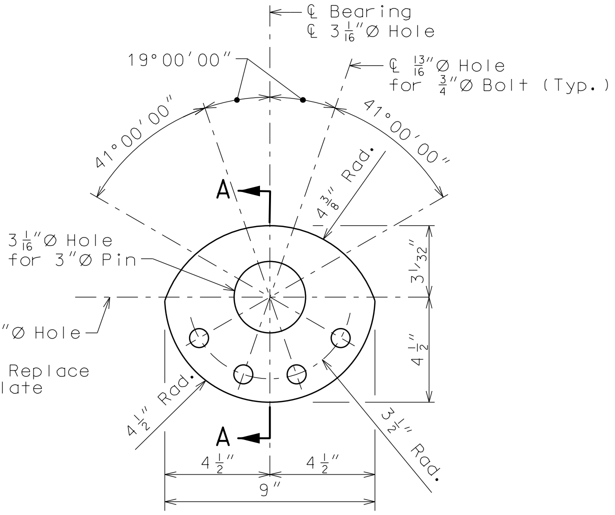
REV.


14 1/4″
℄ Bearing
Front Face of Abutment
Add/Change to Replace Pin & Upper Plate
Replace Pin & Upper Plate (See Sheet 15A)
℄ Bearing Pin
Remove Existing 3/4″Ø Bolts (Typ.)
Replace Keeper Plate
℄ Existing Girder & ℄ Bearing
9′-9″
℄ US-136 ℄ Bridge
Existing Crossframe
℄ Bearing Pin
Replacement Keeper Plate (Typ.)
Replace Pin & Upper Plate (See Sheet 15A)
Add/Change to Replace Pin & Upper Plate

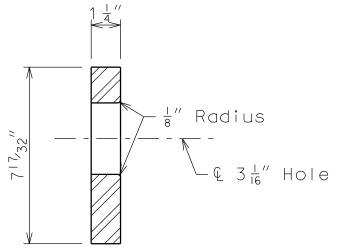
LONGITUDINAL ELEVATION

TRANSVERSE ELEVATION

EXPANSION SHOE – AT ABUTMENTS



ELEVATION OF KEEPER PLATE



SECTION A–A

Notes:

New structural steel for Keeper Plates and Optional Attachment Plate shall be ASTM A709 Grade 36.

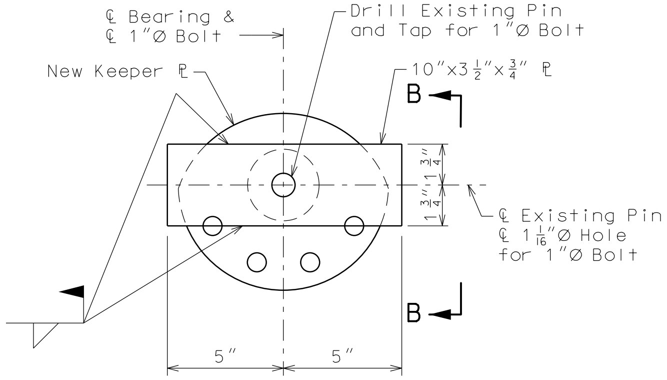
All dimensions are approximate and were taken from "As-Built" drawings and limited Field Measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

New bolts for standard attachment are 3/4″Ø Grade A325 high-strength bolts through 13/16″Ø holes. New bolts for optional attachment are 1″Ø Grade A325 high-strength bolts through 1 1/16″Ø holes.

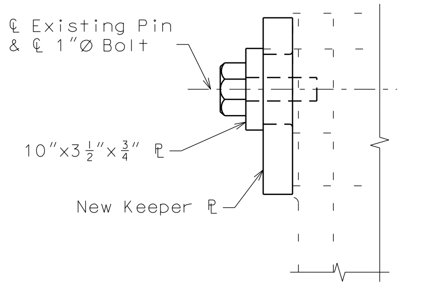
All equipment, labor and materials necessary to complete the keeper plate replacement and clean and lubricate the bearings at the East and West Abutments shall be considered completely covered by the contract unit price for Rehabilitate Bearings per each.

Additional rocker bearings at Piers No. 1, 5, 6, 8 & 9 shall be cleaned and coated. All equipment, labor and materials necessary to complete the clean and recoat shall be considered completely covered by the contract unit price for Cleaning and Coating Existing Bearings per each.


℄ Bearing & ℄ 1″Ø Bolt
Drill Existing Pin and Tap for 1″Ø Bolt
New Keeper ℙ
10″x3 1/2″x3/4″ ℙ
B
1 3/4″
1 3/4″
℄ Existing Pin ℄ 1 1/16″Ø Hole for 1″Ø Bolt
B
5″
5″

OPTIONAL KEEPER PLATE ATTACHMENT

(To be used only in the event the existing 3/4″Ø attachment holes are unusable)



VIEW B–B

FINAL PLANS
DATE PREPARED 8/24/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 15
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION

DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

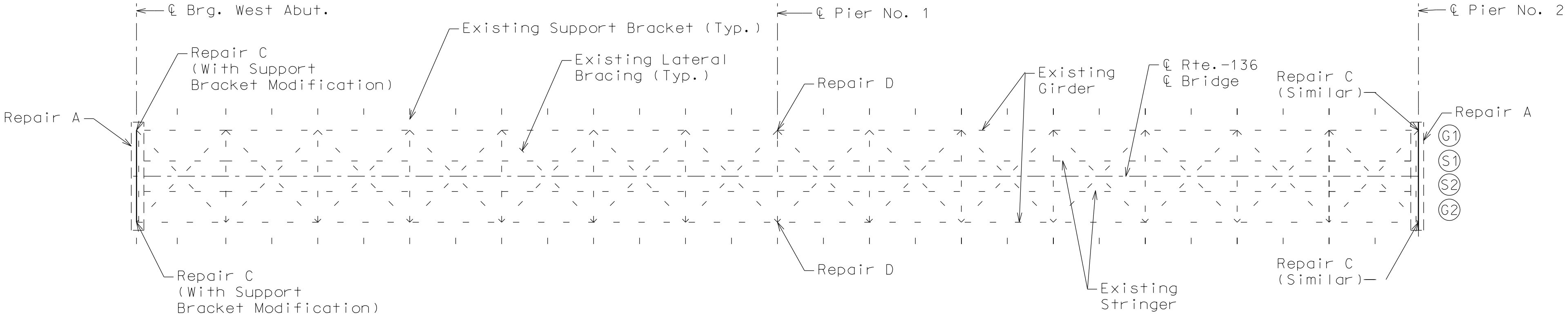
ROCKER BEARING REHABILITATION

Detailed December 2009
Checked December 2009

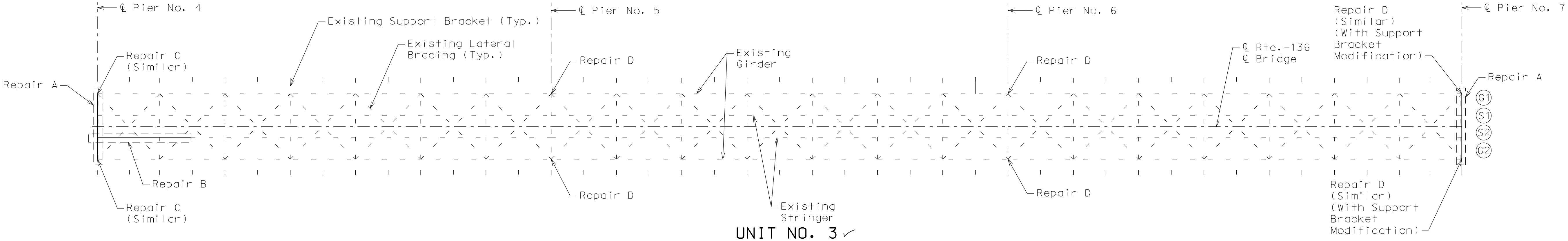
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 15 of 57

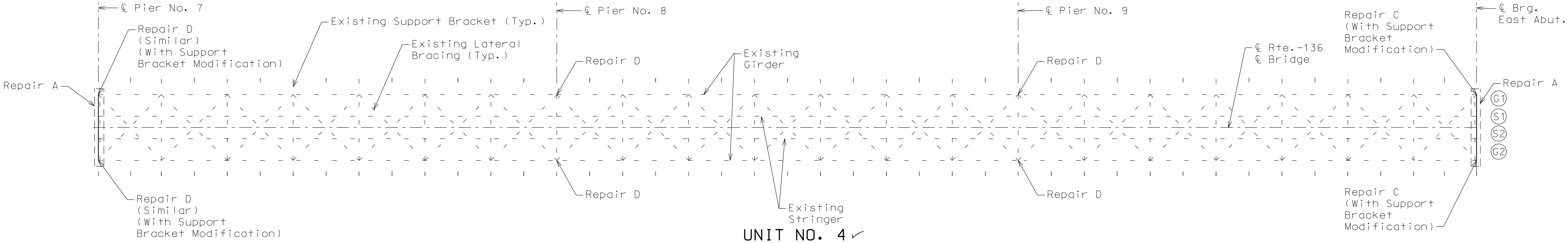
△1 Revised 12/11/09



UNIT NO. 1✓



UNIT NO. 3✓


℄ Pier No. 7
℄ Pier No. 8
℄ Pier No. 9
℄ Brg. East Abut.
Repair D (Similar) (With Support Bracket Modification)
Existing Support Bracket (Typ.)
Existing Lateral Bracing (Typ.)
Repair A
Repair D
Existing Girder
Repair D
℄ Rte.-136 ℄ Bridge
Repair C (With Support Bracket Modification)
Repair A
G1
S1
S2
G2
Repair D (Similar) (With Support Bracket Modification)
Repair D
Existing Stringer
Repair D
Repair C (With Support Bracket Modification)

UNIT NO. 4✓

Note:
For additional girder modification details, see Sheet No. 27 thru 32.✓

PLAN OF STRUCTURAL STEEL REPAIR LOCATIONS - UNITS NO. 1, 3 & 4✓

Detailed April 2009✓
Checked April 2009✓

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

Sheet No. 16 of 57✓

FINAL PLANS✓
DATE PREPARED 8/23/2012✓
ROUTE 136✓
STATE MO✓
DISTRICT BR✓
SHEET NO. 16✓
COUNTY ATCHISON✓
JOB NO. J1P2161✓
CONTRACT ID. 090724-101✓
PROJECT NO. ARRA-136-1(59)✓
BRIDGE NO. L00982✓

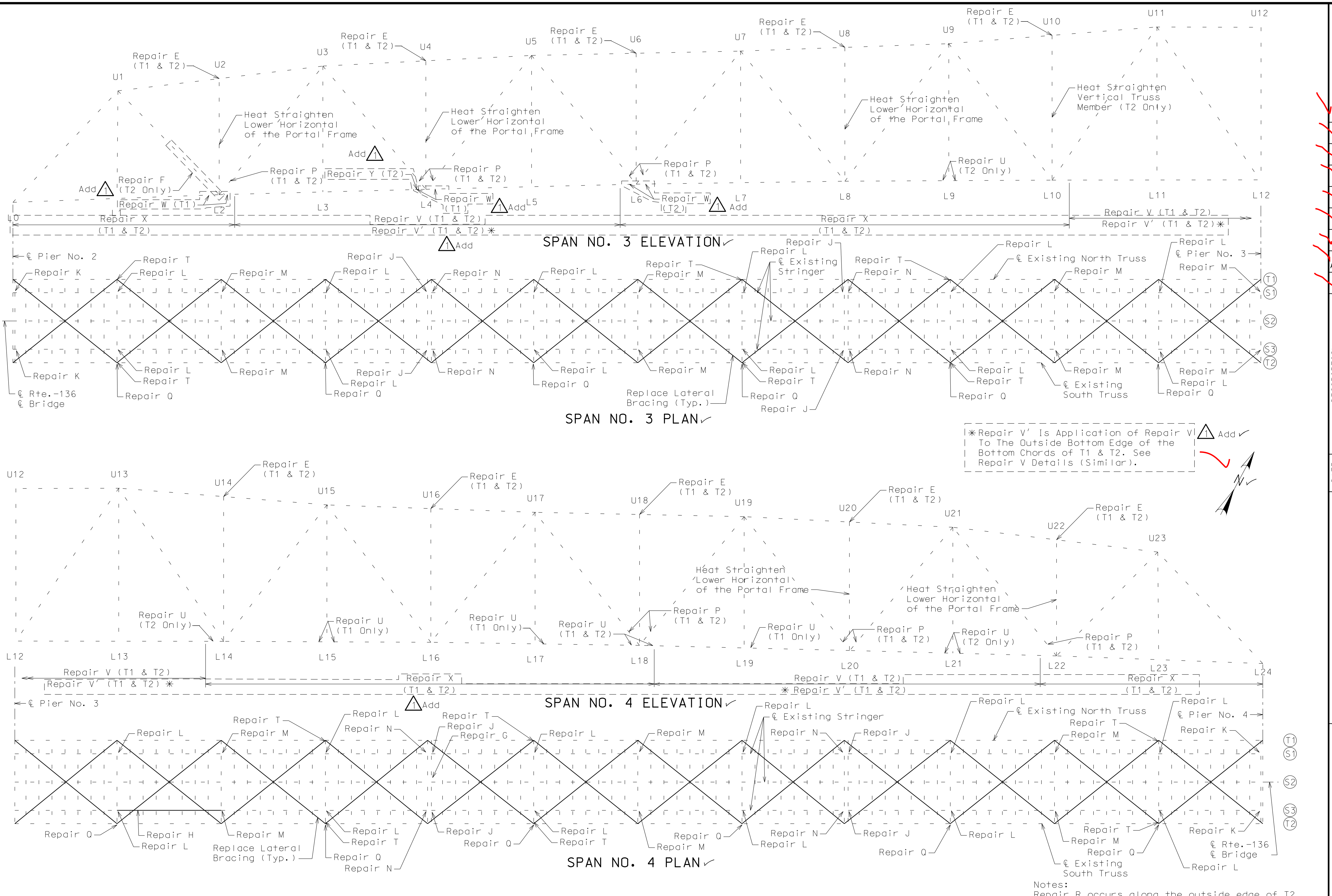
DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

B_L00982_016_J1P2161.DGN 1:48:02 PM 3/26/2013



*Repair V' Is Application of Repair V To The Outside Bottom Edge of the Bottom Chords of T1 & T2. See Repair V Details (Similar). 1 Add ✓

Notes:
Repair R occurs along the outside edge of T2 at approximately 25 locations in Span No. 3 & 25 locations in Span No. 4. ✓

Repair S occurs at all Floorbeam to Truss connections except at L0, L12 & L24 along T1 & T2. ✓

PLAN OF STRUCTURAL STEEL REPAIR LOCATIONS - UNIT NO. 2 ✓

Detailed April 2009 ✓
Checked April 2009 ✓

1 Revised 10/12/10 ✓

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

Sheet No. 17 of 57 ✓

FINAL PLANS ✓

DATE PREPARED	8/24/2012 ✓
ROUTE	136 ✓
STATE	MO ✓
DISTRICT	BR ✓
SHEET NO.	17 ✓
COUNTY	ATCHISON ✓
JOB NO.	J1P2161 ✓
CONTRACT ID.	090724-101 ✓
PROJECT NO.	ARRA-136-1(59) ✓
BRIDGE NO.	L00982 ✓

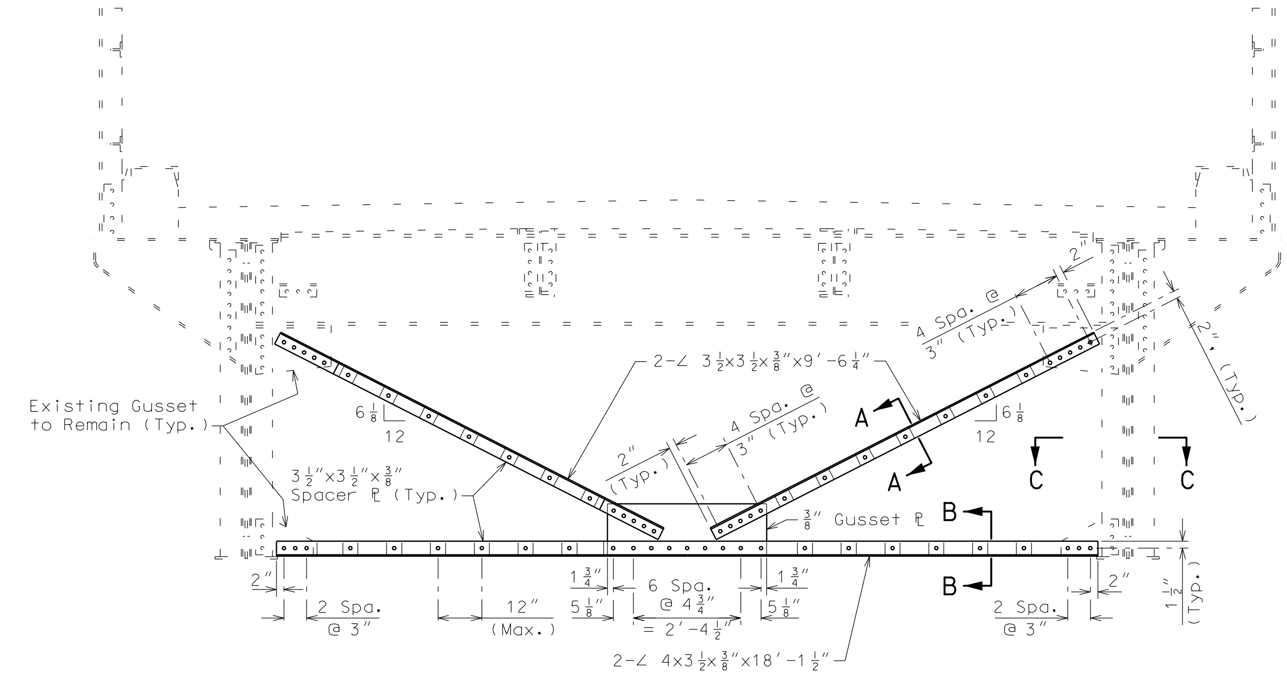
DESCRIPTION

DATE

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

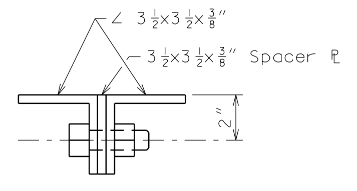
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

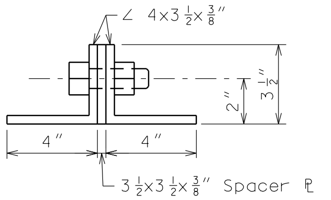

Existing Gusset to Remain (Typ.)
6 1/8
12
3 1/2"x3 1/2"x3/8" Spacer ℙ (Typ.)
2-∠ 3 1/2x3 1/2x3/8"x9'-6 1/4"
4 Spa. @ 3" (Typ.)
2" (Typ.)
A
A
C
C
6 1/8
12
2" (Typ.)
3/8" Gusset ℙ
B
B
2"
2 Spa. @ 3"
12" (Max.)
1 3/4"
5 1/8"
6 Spa. @ 4 3/4" = 2'-4 1/2"
1 3/4"
5 1/8"
2 Spa. @ 3"
2"
1 1/2" (Typ.)
2-∠ 4x3 1/2x3/8"x18'-1 1/2"

REPAIR A

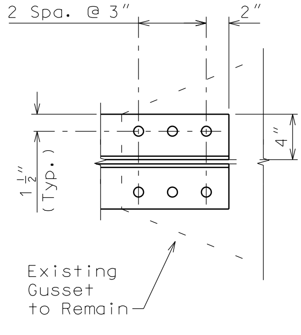
Existing angles are crimped. New angles will have spacer plates (no crimping necessary)



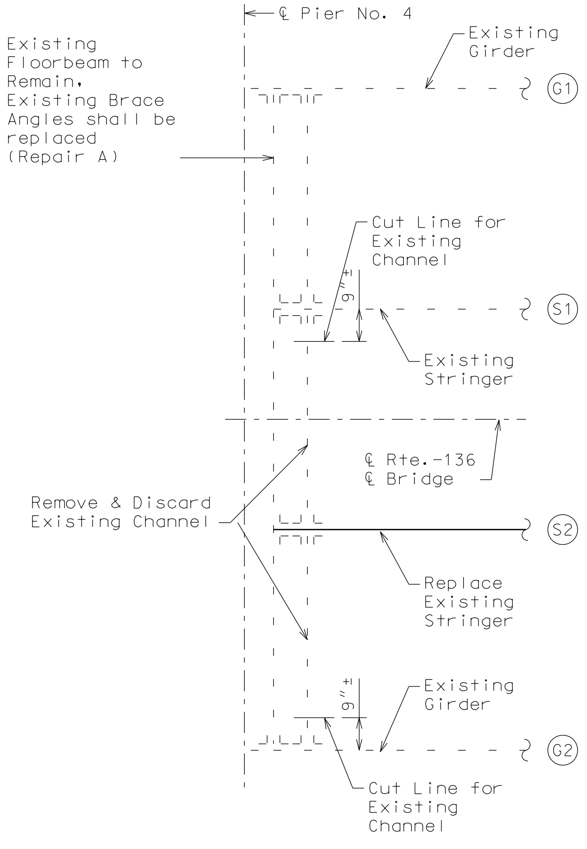
SECTION A-A



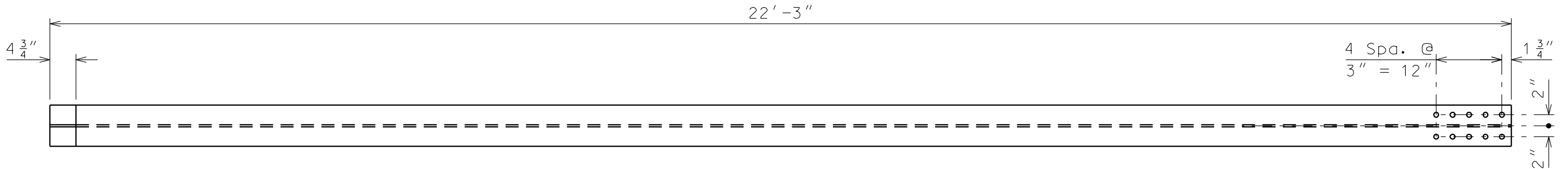
SECTION B-B



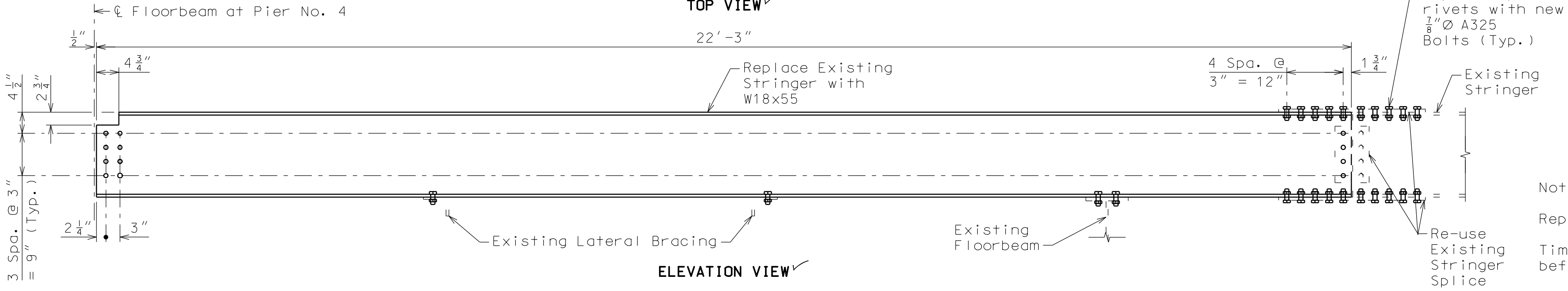
SECTION C-C


℄ Pier No. 4
Existing Girder
G1
Existing Floorbeam to Remain, Existing Brace Angles shall be replaced (Repair A)
Cut Line for Existing Channel
9"±
S1
Existing Stringer
℄ Rte.-136
℄ Bridge
Remove & Discard Existing Channel
S2
Replace Existing Stringer
Existing Girder
9"±
G2
Cut Line for Existing Channel

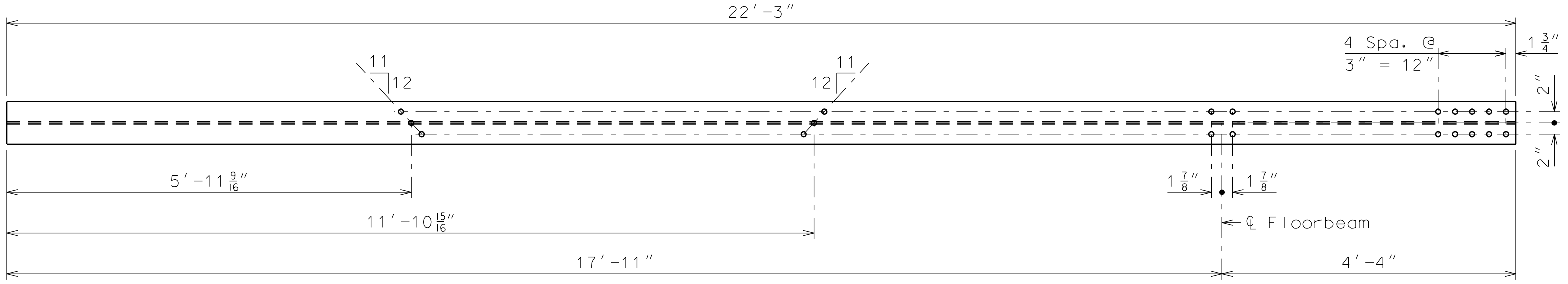
PLAN VIEW
(Repair B)



TOP VIEW


℄ Floorbeam at Pier No. 4
1/2"
22'-3"
4 3/4"
4 Spa. @ 3" = 12"
1 3/4"
Replace Existing Stringer with W18x55
Replace splice rivets with new 7/8"Ø A325 Bolts (Typ.)
Existing Stringer
4 1/2"
2 3/4"
3 Spa. @ 3" = 9" (Typ.)
2 1/4"
3"
Existing Lateral Bracing
Existing Floorbeam
Re-use Existing Stringer Splice Plates

ELEVATION VIEW



BOTTOM VIEW

REPAIR B (NEW STRINGER S2)

Notes:

Repair B shall be completed during a weekend closure.

Timber falsework shown on Sheet No. 4 shall be reinstalled before the lane is reopened to traffic.

All new structural steel shall be ASTM A709 Grade 36.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes unless noted otherwise. If contractor encounters interference in fit up, the holes may be reamed to 1 1/16" for a 1" Ø bolt.

All equipment, labor and materials necessary to complete Repair A shall be considered completely covered by the contract unit price for Structural Steel Repair A per each.

All equipment, labor and materials necessary to complete Repair B shall be considered completely covered by the contract unit price for Structural Steel Repair B per each.

REPAIR A & B DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 18 of 57

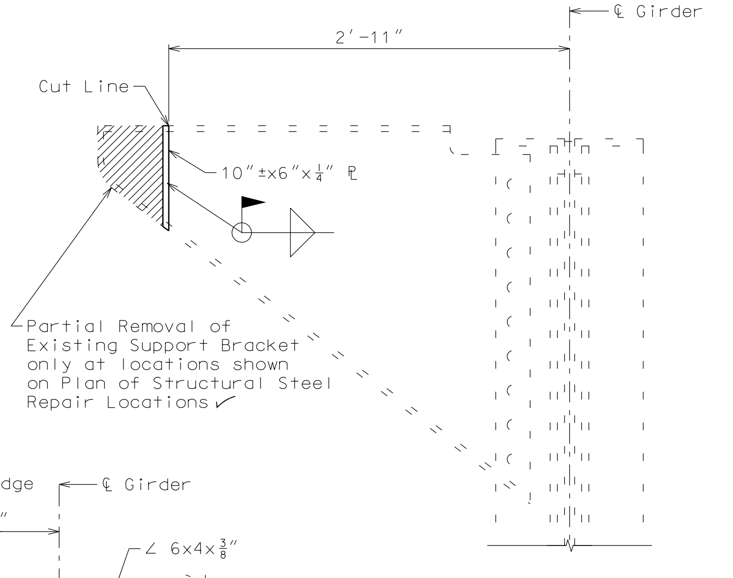
FINAL PLANS
DATE PREPARED 8/23/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 18
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION	DATE

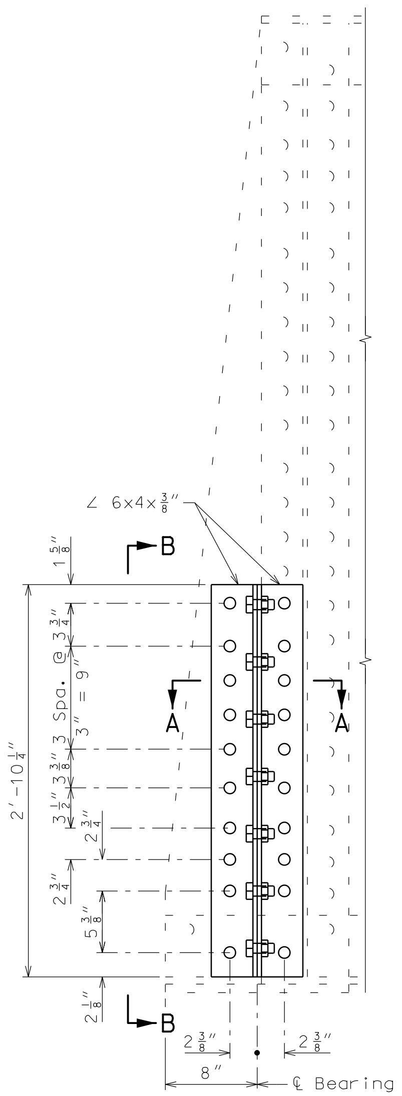
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

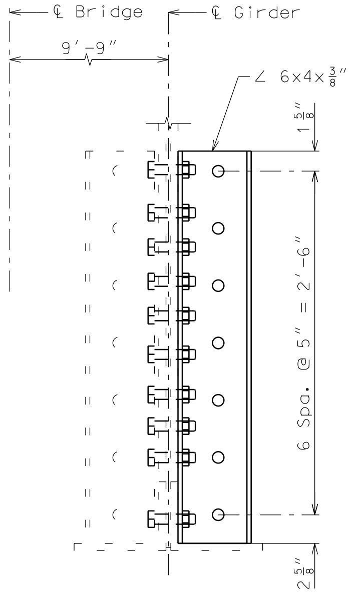
REV.


℄ Girder
2'-11"
Cut Line
10"±x6"x1/4" ℙ
Partial Removal of Existing Support Bracket only at locations shown on Plan of Structural Steel Repair Locations

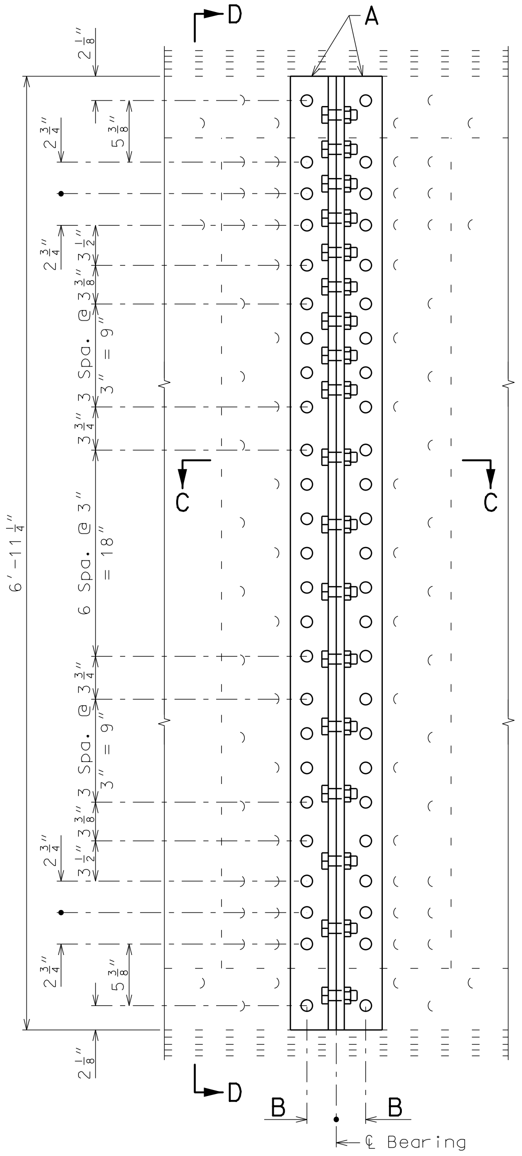
SUPPORT BRACKET MODIFICATION DETAIL



REPAIR C

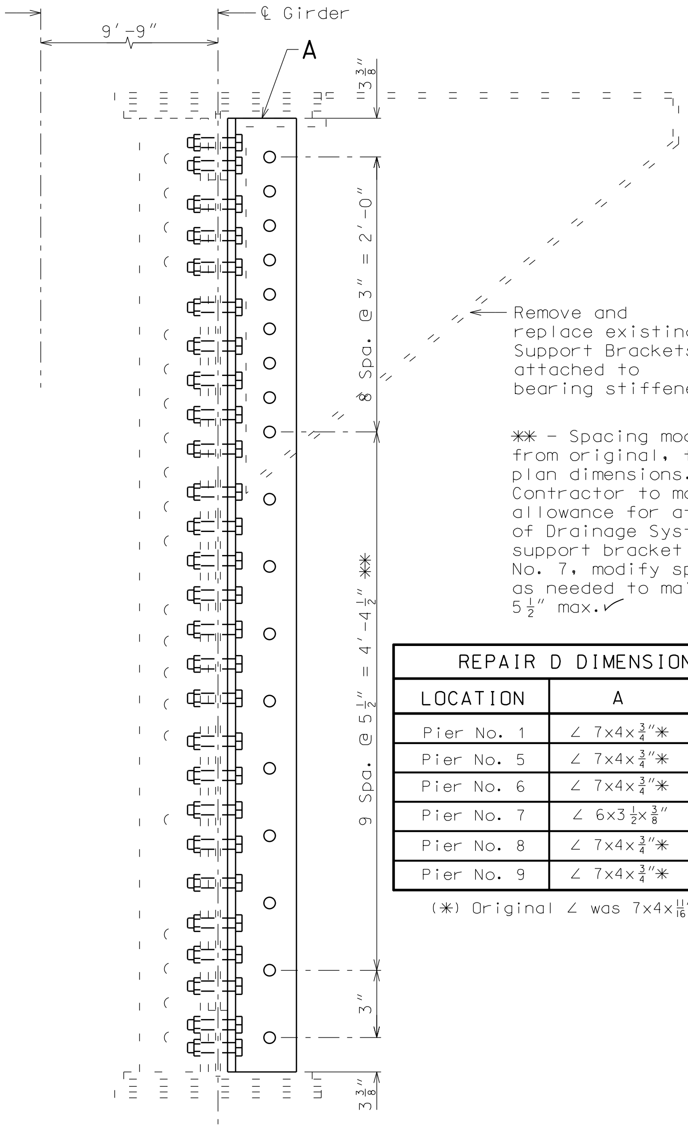


VIEW B-B



REPAIR D

(Support Bracket not shown for clarity)



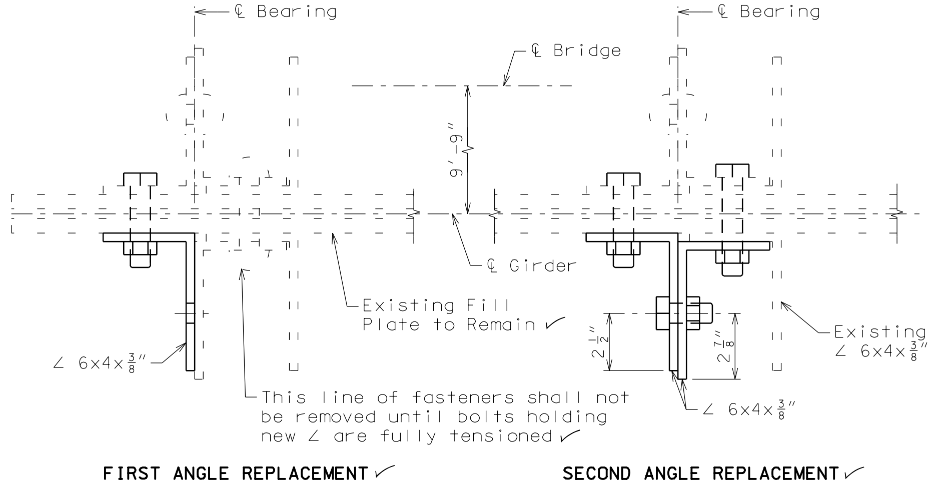
Remove and replace existing Support Brackets attached to bearing stiffeners

✳✳ - Spacing modified from original, follow plan dimensions. Contractor to make allowance for attachment of Drainage System support bracket at Pier No. 7, modify spacing as needed to maintain 5 1/2" max.

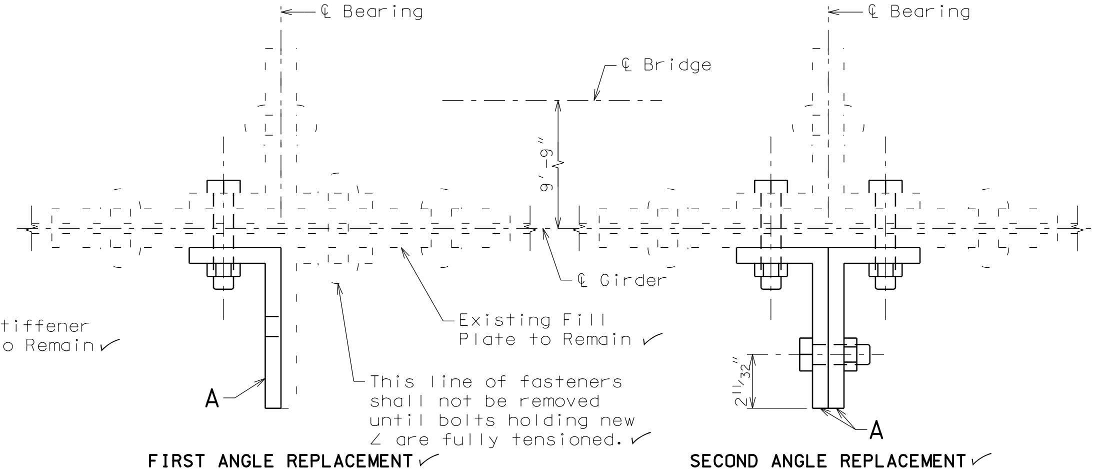
SECTION D-D

REPAIR D DIMENSIONS		
LOCATION	A	B
Pier No. 1	∠ 7x4x3/4"✳	2 9/16"
Pier No. 5	∠ 7x4x3/4"✳	2 9/16"
Pier No. 6	∠ 7x4x3/4"✳	2 9/16"
Pier No. 7	∠ 6x3 1/2x3/8"	2"
Pier No. 8	∠ 7x4x3/4"✳	2 9/16"
Pier No. 9	∠ 7x4x3/4"✳	2 9/16"

(✳) Original ∠ was 7x4x11/16"


℄ Bearing
℄ Bearing
℄ Bridge
9'-9"
℄ Girder
Existing Fill Plate to Remain
Existing Stiffener ∠ 6x4x3/8" to Remain
∠ 6x4x3/8"
2 1/2"
2 7/8"
∠ 6x4x3/8"
This line of fasteners shall not be removed until bolts holding new ∠ are fully tensioned
FIRST ANGLE REPLACEMENT
SECOND ANGLE REPLACEMENT

SECTION A-A


℄ Bearing
℄ Bearing
℄ Bridge
9'-9"
℄ Girder
Existing Fill Plate to Remain
This line of fasteners shall not be removed until bolts holding new ∠ are fully tensioned.
A
A
2 11/32"
FIRST ANGLE REPLACEMENT
SECOND ANGLE REPLACEMENT

SECTION C-C

Notes:

Repairs C & D shall be completed when traffic is limited to the opposite side of the structure.

All new structural steel shall be ASTM A709 Grade 36.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 1"Ø holes unless noted otherwise. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt.

All equipment, labor and materials necessary to complete Repair C shall be considered completely covered by the contract unit price for Structural Steel Repair C per each.

All equipment, labor and materials necessary to complete Repair D shall be considered completely covered by the contract unit price for Structural Steel Repair D per each.

REPAIR C & D DETAILS

Detailed April 2009
Checked April 2009

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

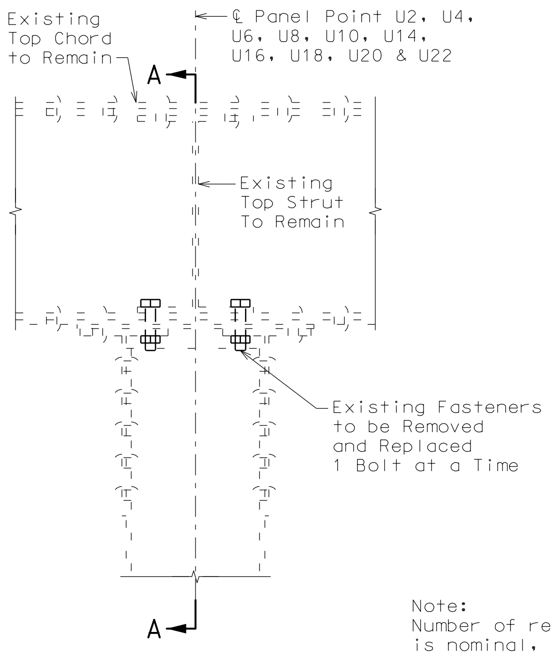
FINAL PLANS	
DATE PREPARED	8/23/2012
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	19
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	090724-101
PROJECT NO.	ARRA-136-1(59)
BRIDGE NO.	L00982

DESCRIPTION	DATE

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

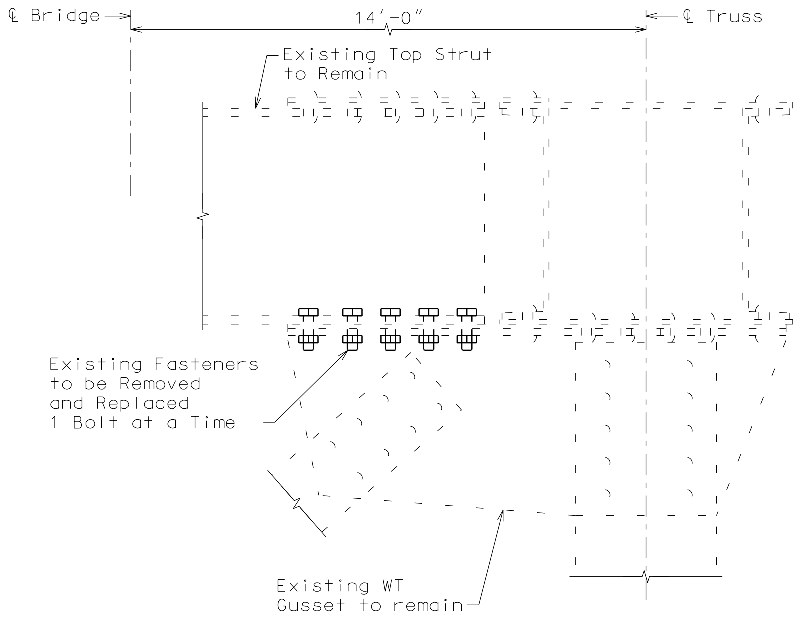
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.



Existing Top Chord to Remain
℄ Panel Point U2, U4, U6, U8, U10, U14, U16, U18, U20 & U22
A
Existing Top Strut To Remain
Existing Fasteners to be Removed and Replaced 1 Bolt at a Time
A

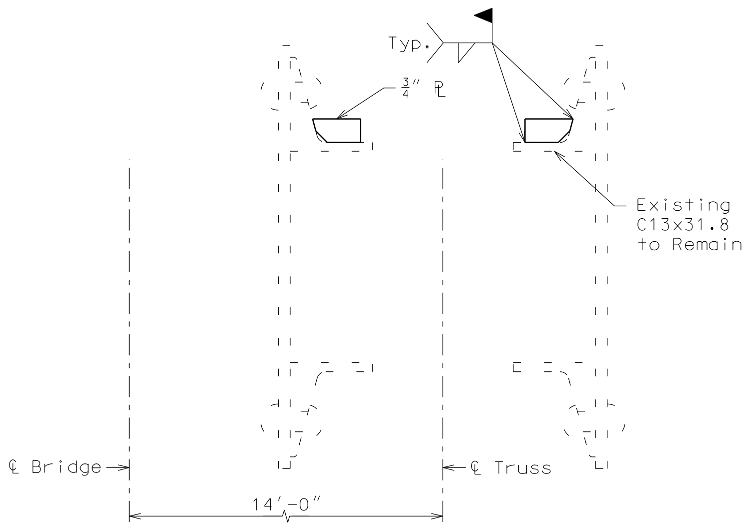
REPAIR E ✓



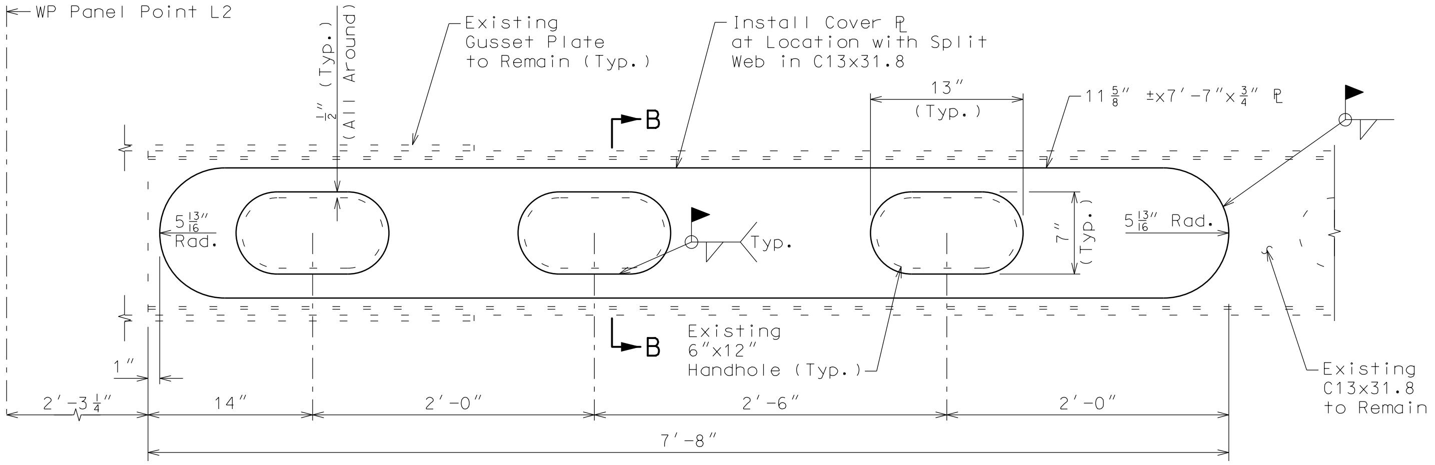
℄ Bridge
14′-0″
℄ Truss
Existing Top Strut to Remain
Existing Fasteners to be Removed and Replaced 1 Bolt at a Time
Existing WT Gusset to remain

SECTION A-A ✓

Note:
Number of replacement bolts shown is nominal, some repair locations have fewer bolts, replace all bolts at each noted repair location. ✓



SECTION B-B ✓



WP Panel Point L2
½″ (Typ.) (All Around)
Existing Gusset Plate to Remain (Typ.)
Install Cover ℘ at Location with Split Web in C13x31.8
B
13″ (Typ.)
11⅝″ ±x7′-7″x¾″ ℘
5 13/16″ Rad.
Typ.
7″ (Typ.)
5 13/16″ Rad.
B
Existing 6″x12″ Handhole (Typ.)
Existing C13x31.8 to Remain
1″
2′-3¼″
14″
2′-0″
2′-6″
2′-0″
7′-8″

REPAIR F ✓

Notes:

New Structural Steel for Repair F shall be ASTM A709 Grade 50. ✓

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements. ✓

All dimensions should be field verified prior to fabrication of new structural steel. ✓

All new bolts are 7/8″Ø Grade A325 high-strength bolts in 15/16″Ø holes. If the Contractor encounters interferences in fit-up, the holes may be reamed to 1 1/16″Ø for a 1″Ø bolt. ✓

All equipment, labor and materials necessary to complete Repair E shall be considered completely covered by the contract unit price for Structural Steel Repair E per each. ✓

All equipment, labor and materials necessary to complete Repair F shall be considered completely covered by the contract unit price for Structural Steel Repair F per each. ✓

REPAIR E & F DETAILS ✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 20 of 57 ✓

FINAL PLANS ✓
DATE PREPARED 8/23/2012 ✓
ROUTE 136 ✓
STATE MO ✓
DISTRICT BR ✓
SHEET NO. 20 ✓
COUNTY ATCHISON ✓
JOB NO. J1P2161 ✓
CONTRACT ID. 090724-101 ✓
PROJECT NO. ARRA-136-1(59) ✓
BRIDGE NO. L00982 ✓

DATE	DESCRIPTION

REV.

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

HDR Engineering, Inc.
4435 Main Street
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Kansas City, MO 64111-1856
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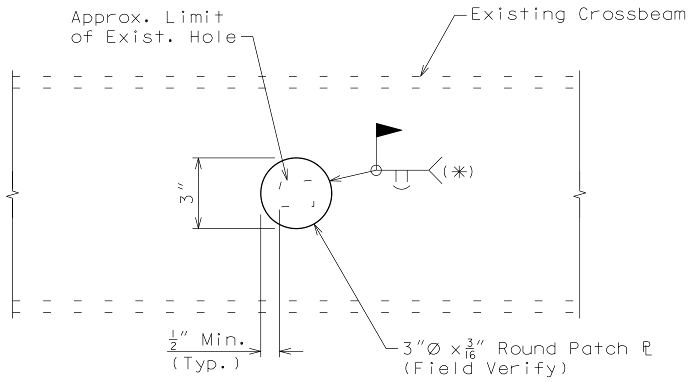
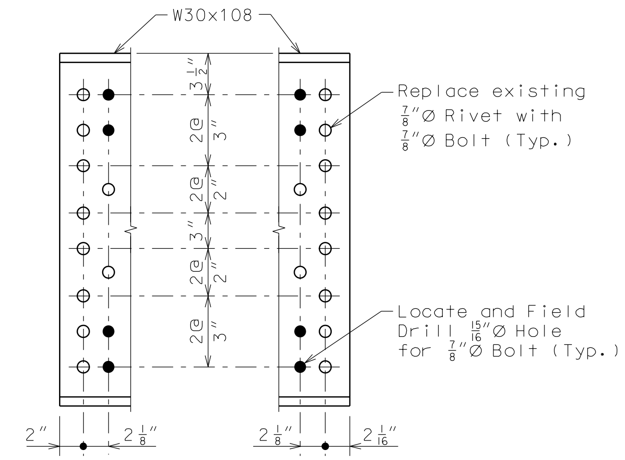
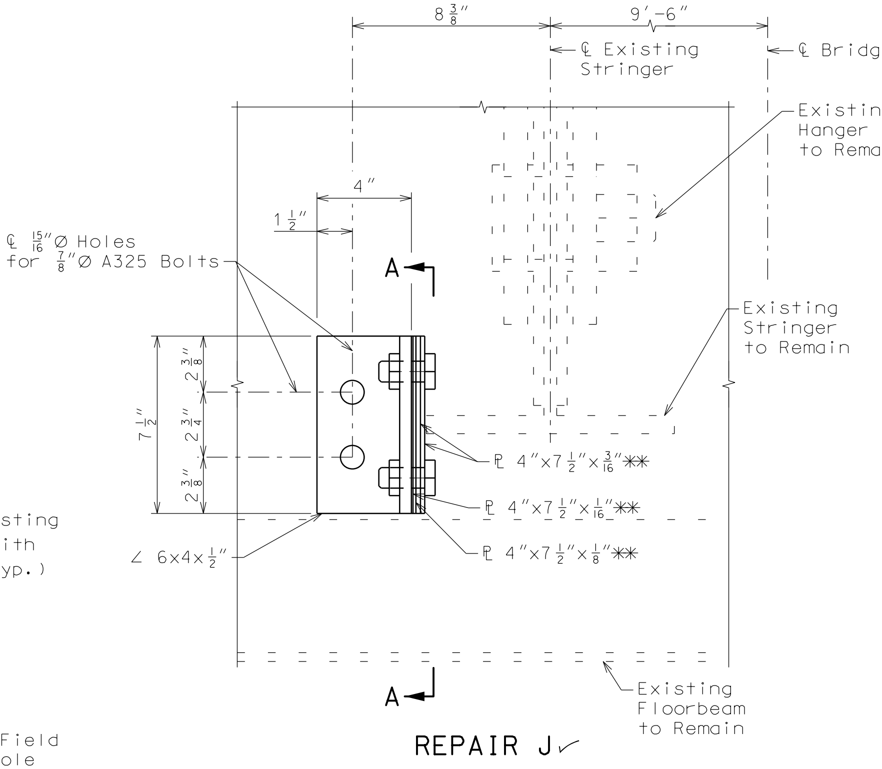

Approx. Limit of Exist. Hole
Existing Crossbeam
3"
(*)
1/2" Min. (Typ.)
3"Ø x 3/16" Round Patch ℘ (Field Verify)

REPAIR G✓

* - Cut web of existing crossbeam to accept round patch plate.✓

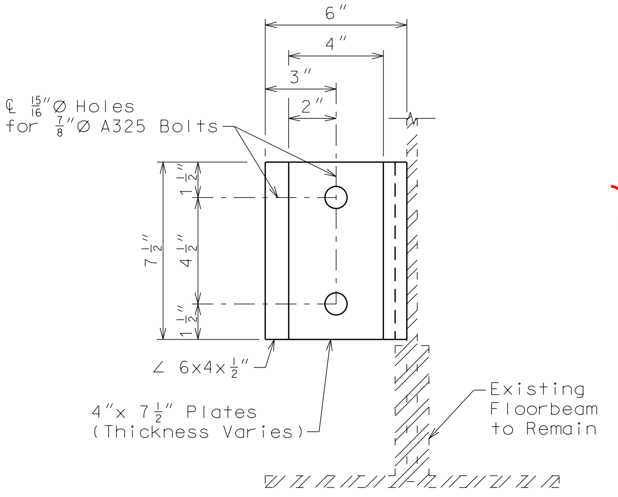

W30x108
Replace existing 7/8"Ø Rivet with 7/8"Ø Bolt (Typ.)
3 1/2"
2@ 3"
2@ 2"
3"
2@ 2"
2@ 3"
Locate and Field Drill 15/16"Ø Hole for 7/8"Ø Bolt (Typ.)
2"
2 1/8"
2 1/8"
2 1/16"

DETAIL "A"✓ DETAIL "B"✓

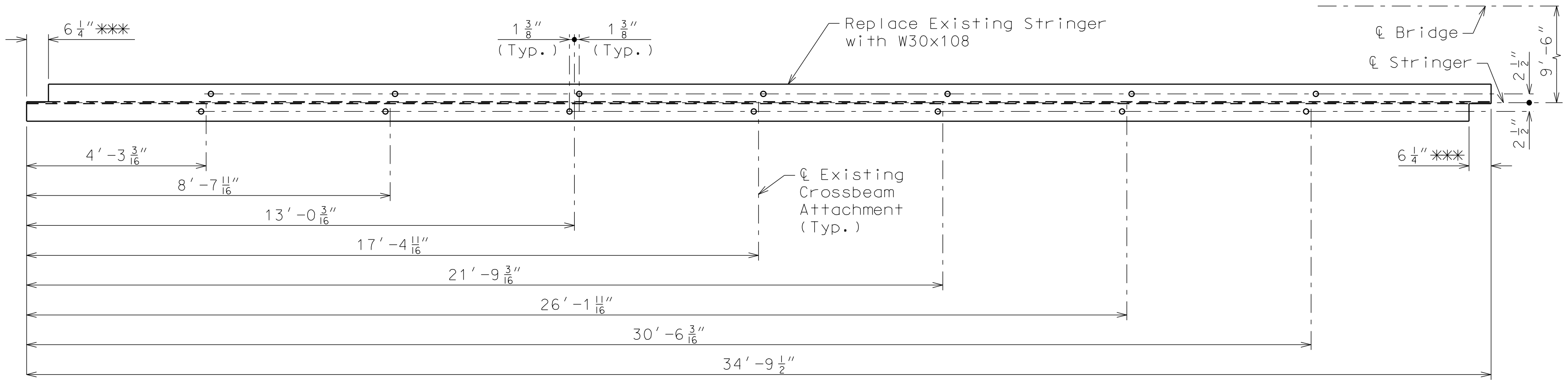


REPAIR J✓

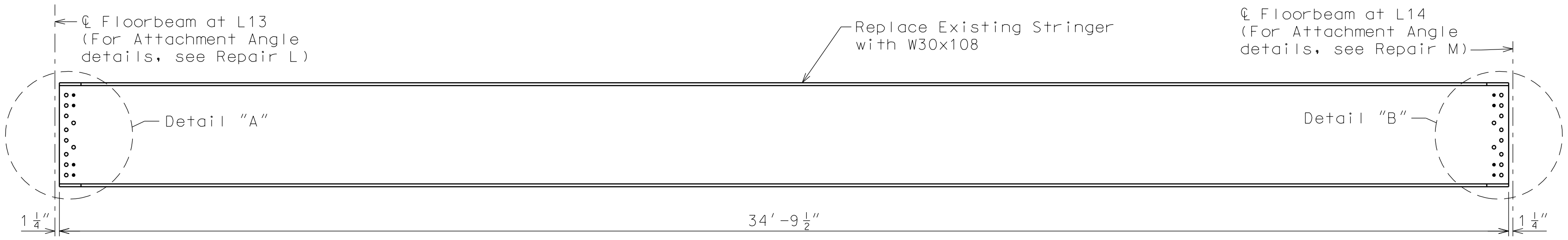
** - Place Shim Plates as needed to maintain 1/16" clearance from Shim Plate to Flange of Existing Stringer.✓


6"
4"
3"
2"
℄ 15/16"Ø Holes for 7/8"Ø A325 Bolts
7 1/2"
1 1/2"
4 1/2"
1 1/2"
∠ 6x4x1/2"
4"x 7 1/2" Plates (Thickness Varies)
Existing Floorbeam to Remain

SECTION A-A✓



PLAN OF TOP FLANGE✓


℄ Floorbeam at L13 (For Attachment Angle details, see Repair L)
Replace Existing Stringer with W30x108
℄ Floorbeam at L14 (For Attachment Angle details, see Repair M)
Detail "A"
Detail "B"
1 1/4"
34'-9 1/2"
1 1/4"

Note:
Contractor to support existing crossbeams during stringer replacement.✓
*** Cope Top & Bottom Flanges.✓

ELEVATION✓

REPAIR H✓

Notes:

Repair H shall be completed when traffic is limited to the opposite side of the structure.✓

New Structural Steel for Repairs G, H & J shall be ASTM A709 Grade 36.✓

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.✓

All dimensions should be field verified prior to fabrication of new structural steel.✓

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt.✓

All equipment, labor and materials necessary to complete Repair G shall be considered completely covered by the contract unit price for Structural Steel Repair G per each.✓

All equipment, labor and materials necessary to complete Repair H shall be considered completely covered by the contract unit price for Structural Steel Repair H per each.✓

All equipment, labor and materials necessary to complete Repair J shall be considered completely covered by the contract unit price for Structural Steel Repair J per each.✓

REPAIR G, H & J DETAILS✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 21 of 57✓

FINAL PLANS✓

DATE PREPARED	
8/23/2012✓	
ROUTE	STATE
136✓	MO✓
DISTRICT	SHEET NO.
BR✓	21✓
COUNTY	
ATCHISON✓	
JOB NO.	
J1P2161✓	
CONTRACT ID.	
090724-101✓	
PROJECT NO.	
ARRA-136-1(59)✓	
BRIDGE NO.	
L00982✓	

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

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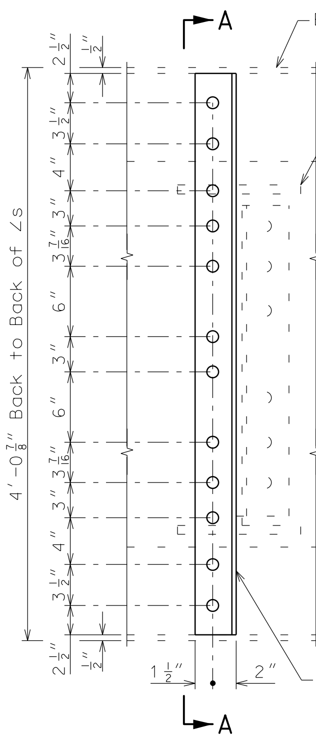
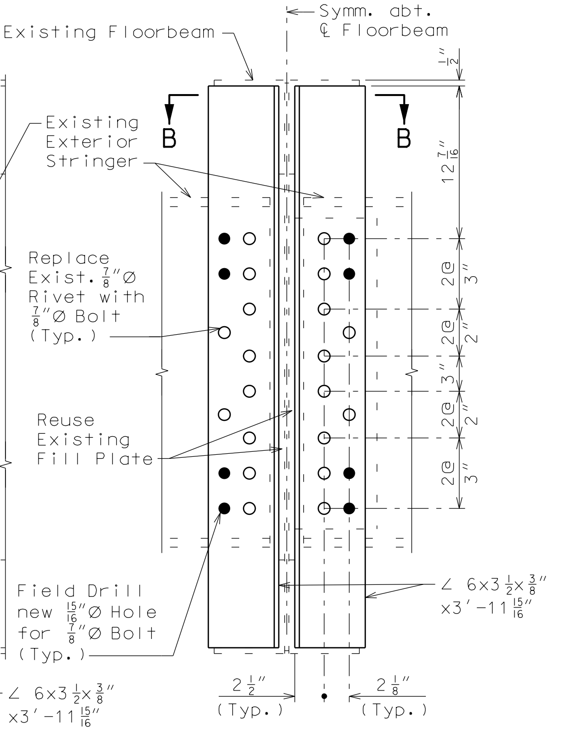
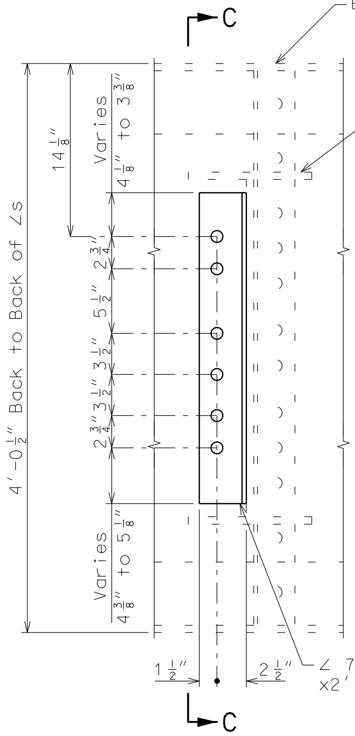


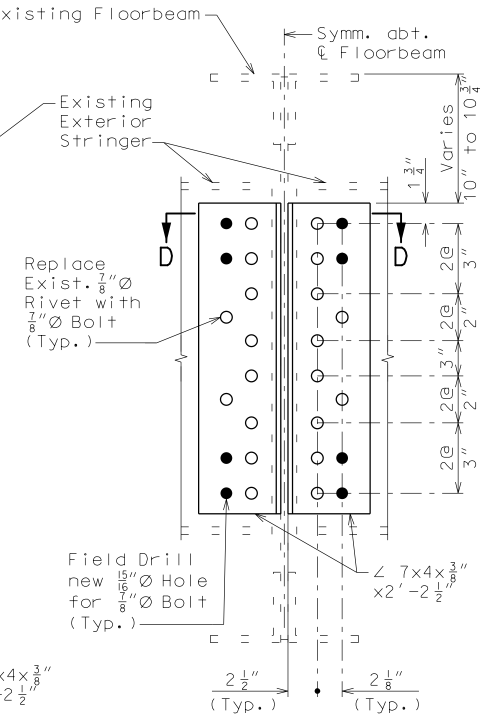
REPAIR K✓


Existing Floorbeam
Symm. abt. ℄ Floorbeam
Existing Exterior Stringer
B
B
Replace Exist. ⅞"Ø Rivet with ⅞"Ø Bolt (Typ.)
Reuse Existing Fill Plate
Field Drill new 15/16"Ø Hole for ⅞"Ø Bolt (Typ.)
∠ 6x3½x⅜" x3'-11 15/16"
12 7/16"
2@ 3"
2@ 2"
2@ 3"
2@ 2"
2@ 3"
2½" (Typ.)
2⅛" (Typ.)

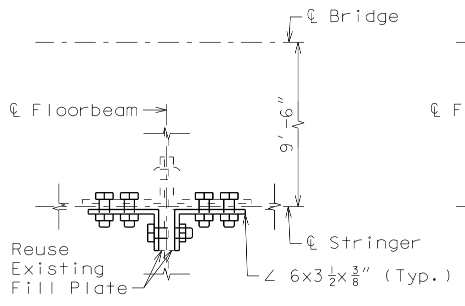
SECTION A-A✓



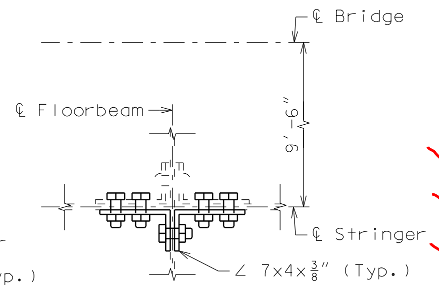
REPAIR L✓



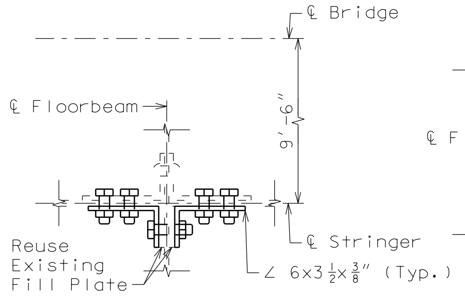
SECTION C-C✓



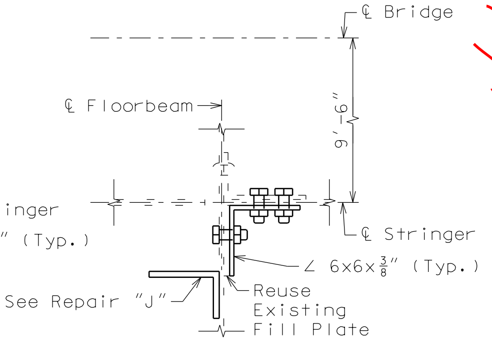
SECTION B-B✓



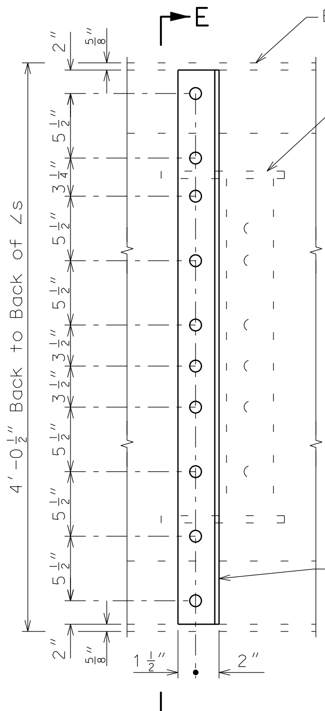
SECTION D-D✓



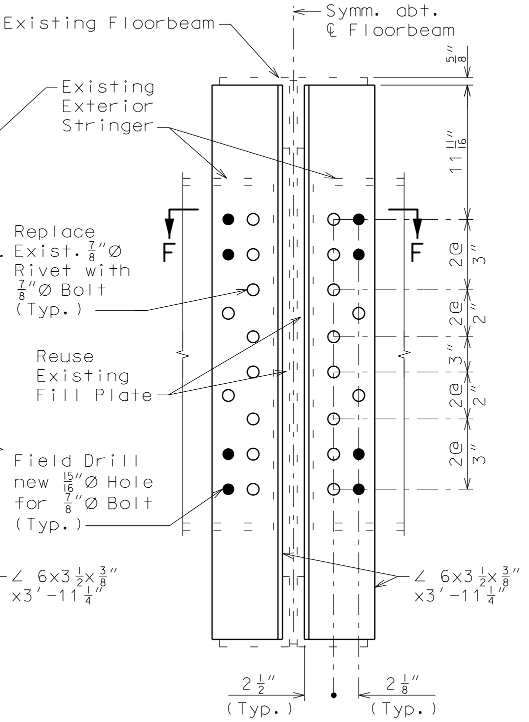
SECTION F-F✓



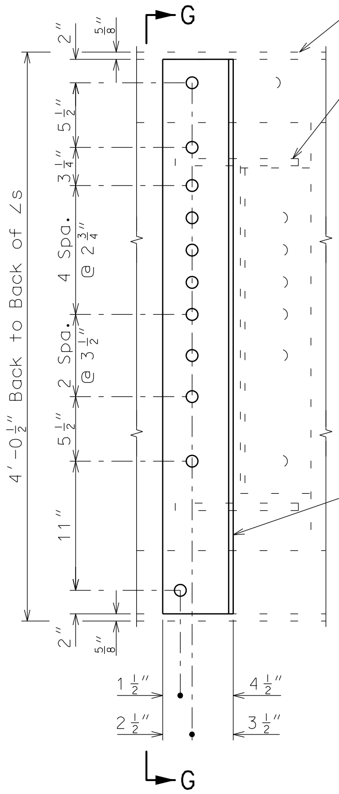
SECTION H-H✓



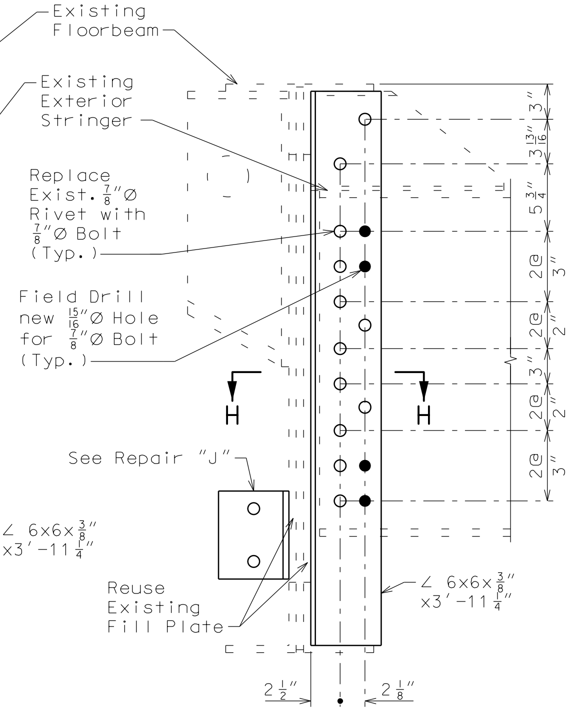
REPAIR M✓


Existing Floorbeam
Symm. abt. ℄ Floorbeam
Existing Exterior Stringer
F
F
Replace Exist. ⅞"Ø Rivet with ⅞"Ø Bolt (Typ.)
Reuse Existing Fill Plate
Field Drill new 15/16"Ø Hole for ⅞"Ø Bolt (Typ.)
∠ 6x3½x⅜" x3'-11¼"
∠ 6x3½x⅜" x3'-11¼"
11 11/16"
2@ 3"
2@ 2"
2@ 3"
2@ 2"
2@ 3"
2½" (Typ.)
2⅛" (Typ.)

SECTION E-E✓



REPAIR N✓


Existing Floorbeam
Existing Exterior Stringer
Replace Exist. ⅞"Ø Rivet with ⅞"Ø Bolt (Typ.)
Field Drill new 15/16"Ø Hole for ⅞"Ø Bolt (Typ.)
H
H
See Repair "J"
Reuse Existing Fill Plate
∠ 6x6x⅜" x3'-11¼"
13 13/16"
5¾"
2@ 3"
2@ 2"
2@ 3"
2@ 2"
2@ 3"
2½"
2⅛"

SECTION G-G✓

Notes:

Repairs K, L, M and N shall be completed when traffic is limited to the opposite side of the structure.✓

The Contractor shall be responsible for providing temporary support of the existing stringers and connected crossbeams during replacement of the Stringer-to-Floorbeam connection angles.✓

New Structural Steel shall be ASTM A709 Grade 36.✓

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.✓

All dimensions should be field verified prior to fabrication of new structural steel.✓

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interferences in fit-up, the holes may be reamed to 1 1/16"Ø for a 1"Ø bolt.✓

All equipment, labor and materials necessary to complete Repair K shall be considered completely covered by the contract unit price for Structural Steel Repair K per each.✓

All equipment, labor and materials necessary to complete Repair L shall be considered completely covered by the contract unit price for Structural Steel Repair L per each.✓

All equipment, labor and materials necessary to complete Repair M shall be considered completely covered by the contract unit price for Structural Steel Repair M per each.✓

All equipment, labor and materials necessary to complete Repair N shall be considered completely covered by the contract unit price for Structural Steel Repair N per each.✓

REPAIR K, L, M & N DETAILS✓

Detailed April 2009✓
Checked April 2009✓

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

Sheet No. 22 of 57✓

FINAL PLANS✓

DATE PREPARED	8/23/2012✓
ROUTE	136✓
STATE	MO✓
DISTRICT	BR✓
SHEET NO.	22✓
COUNTY	ATCHISON✓
JOB NO.	J1P2161✓
CONTRACT ID.	090724-101✓
PROJECT NO.	ARRA-136-1(59)✓
BRIDGE NO.	L00982✓

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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Certificate of Authority: 000856

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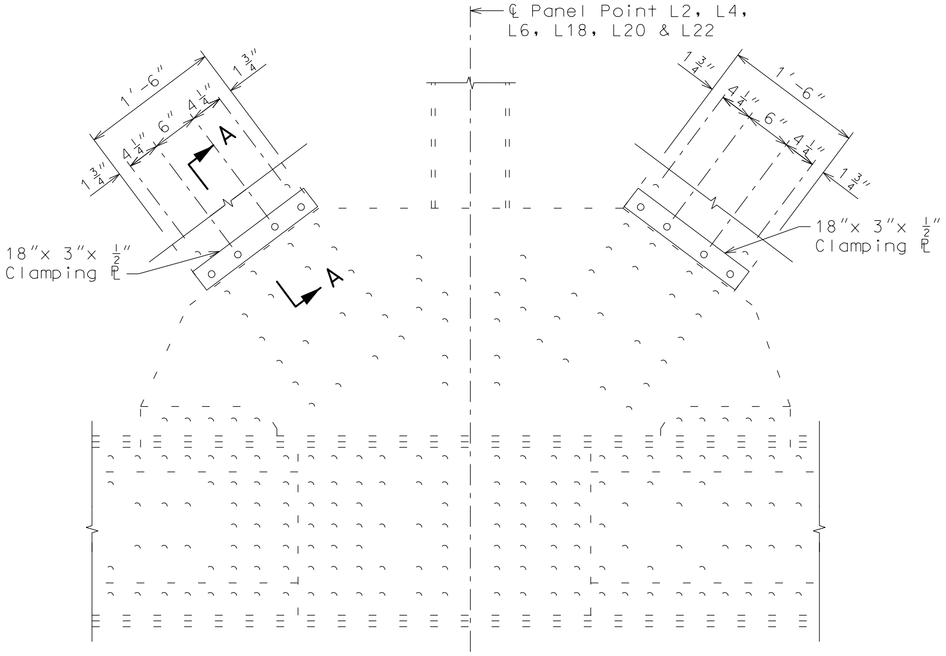
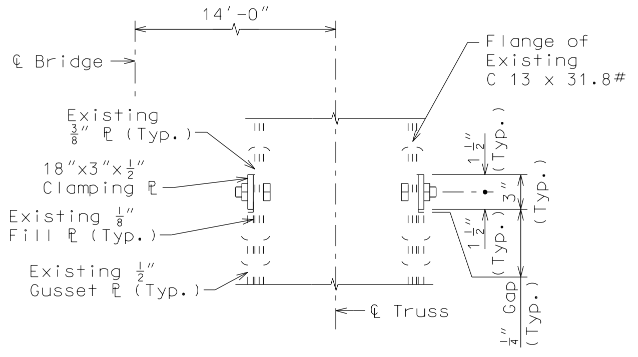
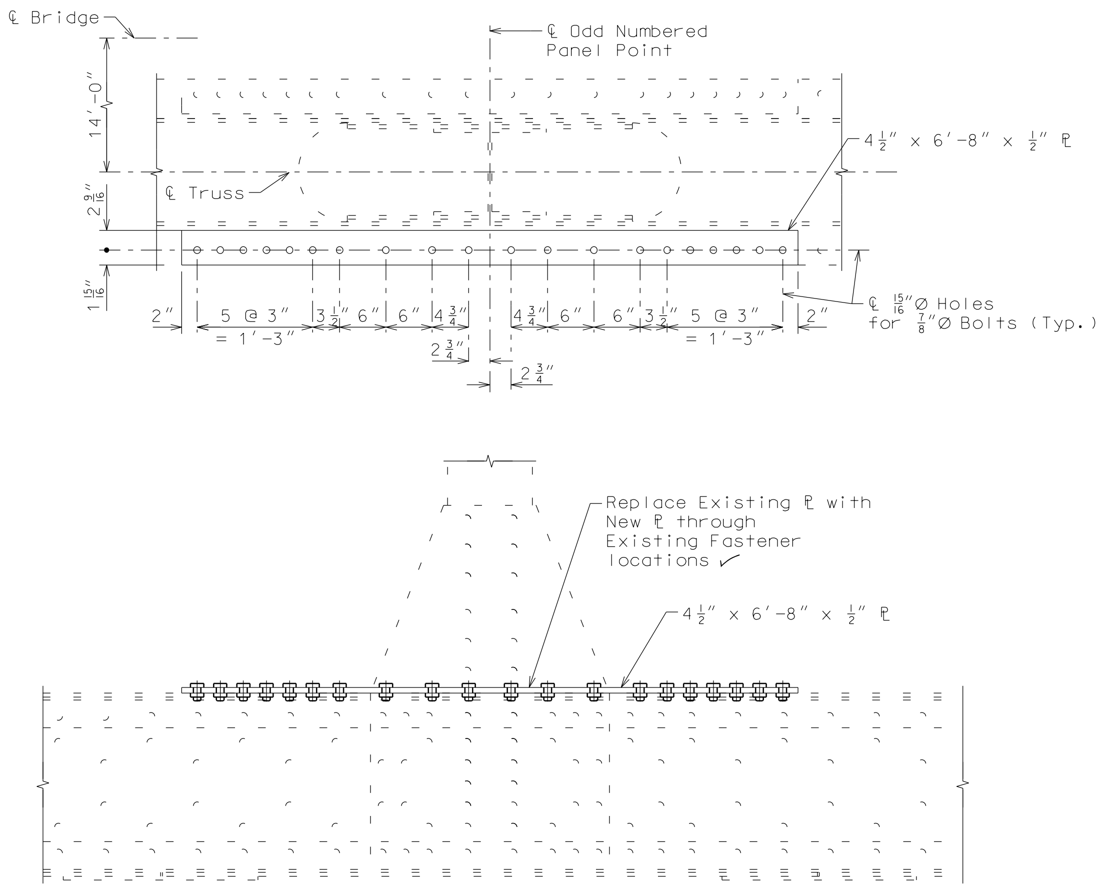


REPAIR P ✓

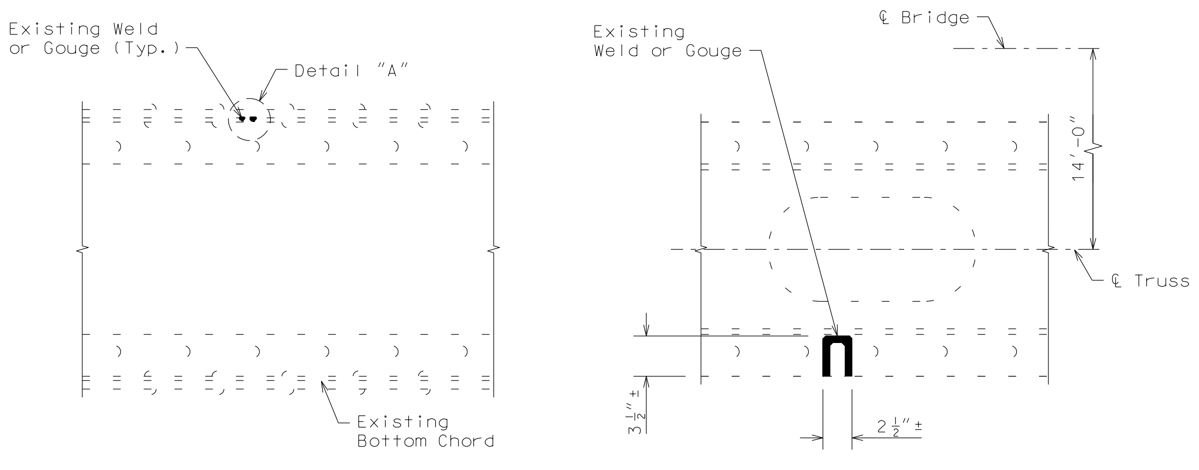
(Location L4 shown, others similar)



SECTION A-A ✓



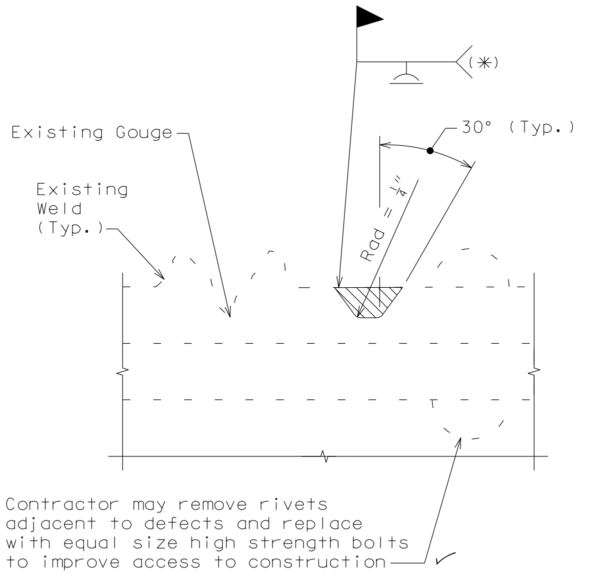
REPAIR Q ✓



ELEVATION ✓

PLAN ✓

REPAIR R ✓



Contractor may remove rivets adjacent to defects and replace with equal size high strength bolts to improve access to construction ✓

DETAIL "A" ✓

* = Prepare existing defect as shown, ✓ fill with weld and grind smooth. ✓

Notes:

New Structural Steel for Repairs P and Q shall be ASTM A709 Grade 50. ✓

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements. ✓

All dimensions should be field verified prior to fabrication of new structural steel. ✓

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interferences in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt. ✓

All equipment, labor and materials necessary to complete Repair P shall be considered completely covered by the contract unit price for Structural Steel Repair P per each. ✓

All equipment, labor and materials necessary to complete Repair Q shall be considered completely covered by the contract unit price for Structural Steel Repair Q per each. ✓

All equipment, labor and materials necessary to complete Repair R shall be considered completely covered by the contract unit price for Structural Steel Repair R per each. ✓

REPAIR P,Q & R DETAILS ✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 23 of 57 ✓

FINAL PLANS ✓
DATE PREPARED 8/23/2012 ✓
ROUTE 136 ✓
STATE MO ✓
DISTRICT BR ✓
SHEET NO. 23 ✓
COUNTY ATCHISON ✓
JOB NO. J1P2161 ✓
CONTRACT ID. 090724-101 ✓
PROJECT NO. ARRA-136-1(59) ✓
BRIDGE NO. L00982 ✓

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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MoDOT

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Certificate of Authority: 000856

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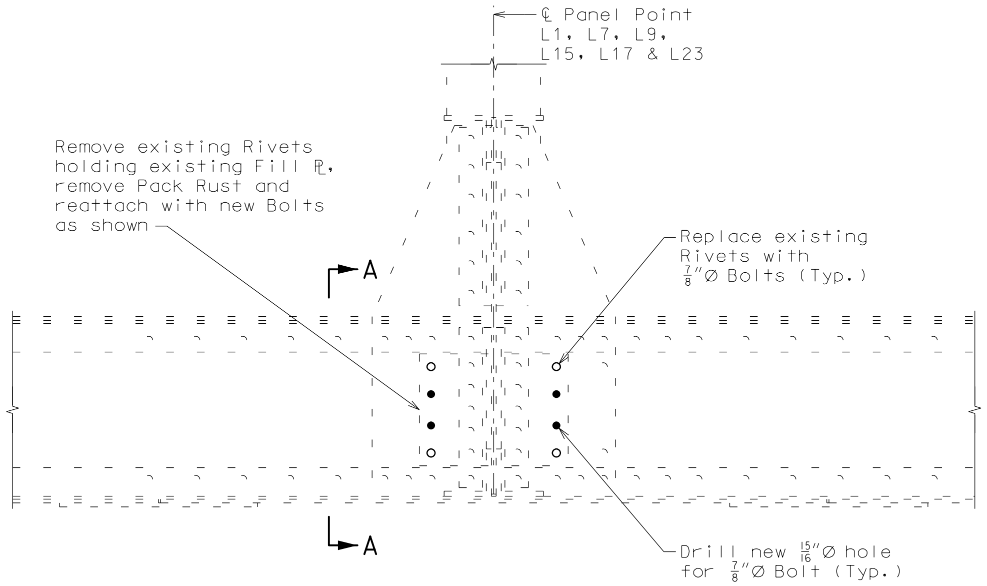
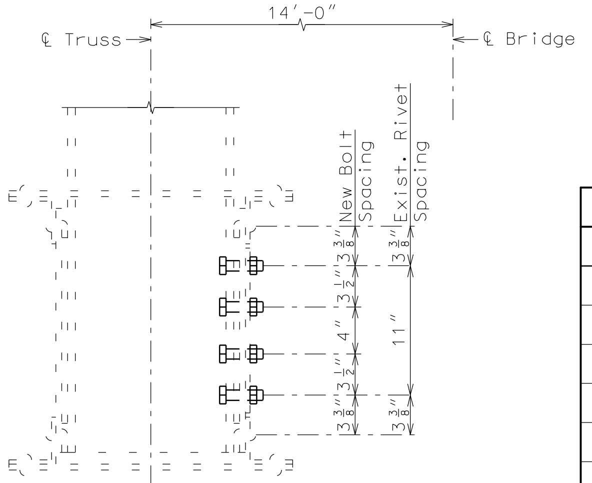

℄ Panel Point
L1, L7, L9,
L15, L17 & L23
Remove existing Rivets holding existing Fill ℙ, remove Pack Rust and reattach with new Bolts as shown
Replace existing Rivets with 7/8"Ø Bolts (Typ.)
A
A
Drill new 15/16"Ø hole for 7/8"Ø Bolt (Typ.)

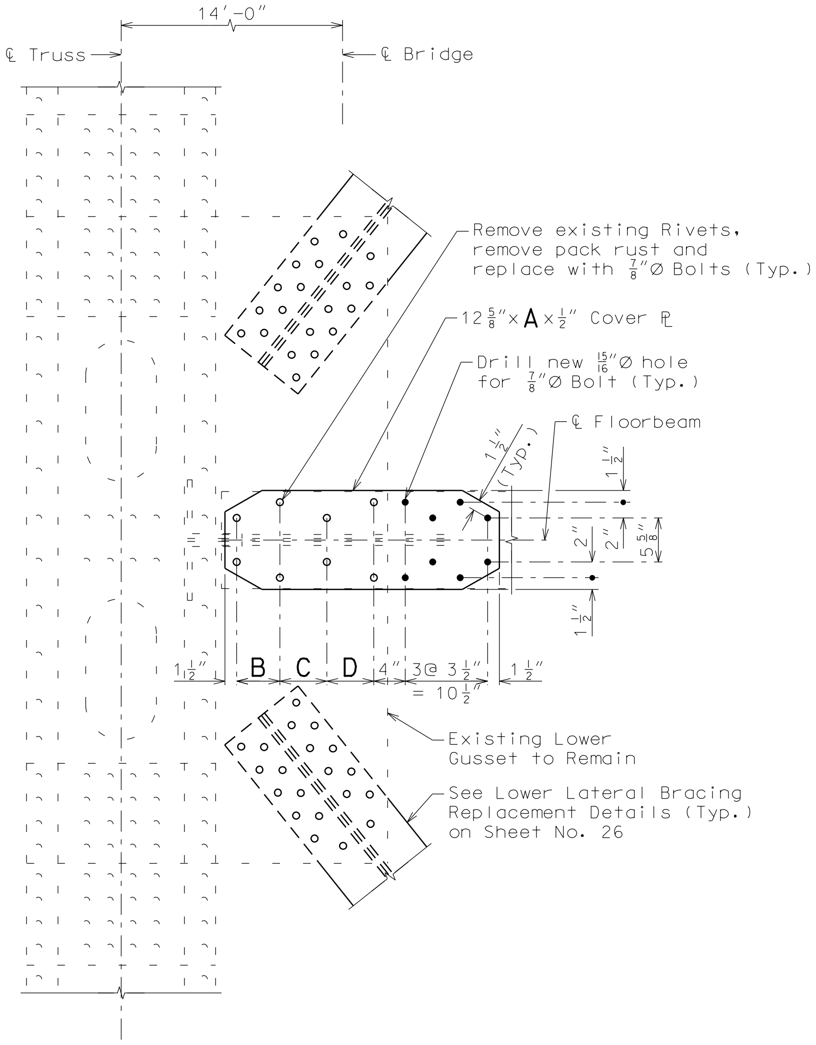
REPAIR T✓



SECTION A-A✓

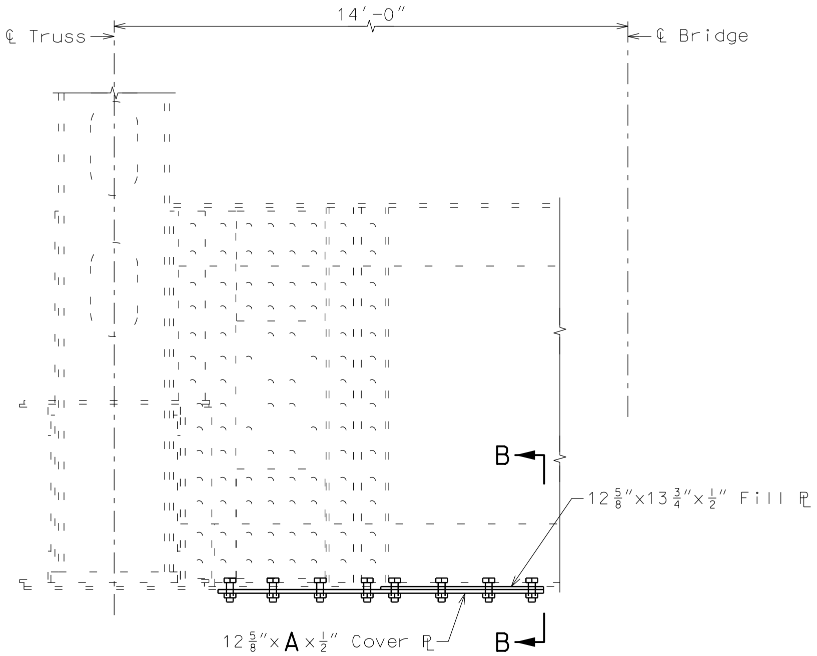
(Floorbeam Connection not shown for clarity)✓

REPAIR S DIMENSIONS✓				
LOCATION	A	B	C	D
L1, L23	3'-6"	5½"	6"	6"
L2, L22	3'-3"	5"	5"	4½"
L3, L21	3'-3"	5"	5"	4½"
L4, L20	3'-3"	5"	5"	4½"
L5, L19	3'-3"	5"	5"	4½"
L6, L18	3'-3"	5"	5"	4½"
L7, L17	3'-6"	5½"	6"	6"
L8, L16	3'-6"	5½"	6"	6"
L9, L15	3'-6"	5½"	6"	6"
L10, L14	3'-6"	5½"	6"	6"
L11, L13	3'-2"	4½"	4½"	4½"

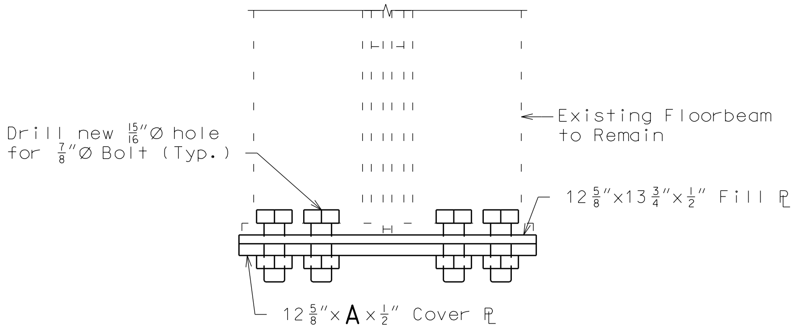

14'-0"
℄ Truss
℄ Bridge
Remove existing Rivets, remove pack rust and replace with 7/8"Ø Bolts (Typ.)
12 5/8"×A×1/2" Cover ℙ
Drill new 15/16"Ø hole for 7/8"Ø Bolt (Typ.)
℄ Floorbeam
1 1/2" (Typ.)
1 1/2"
2"
2"
5 5/8"
1 1/2"
1 1/2"
B
C
D
4"
3@ 3 1/2" = 10 1/2"
1 1/2"
Existing Lower Gusset to Remain
See Lower Lateral Bracing Replacement Details (Typ.) on Sheet No. 26

PLAN BOTTOM FLANGE REPAIR S✓

(View From Below Truss)✓



ELEVATION REPAIR S✓


Drill new 15/16"Ø hole for 7/8"Ø Bolt (Typ.)
Existing Floorbeam to Remain
12 5/8"×13 3/4"×1/2" Fill ℙ
12 5/8"×A×1/2" Cover ℙ

SECTION B-B✓

Notes:

New Structural Steel for Repair S shall be ASTM A709 Grade 36.✓

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.✓

All dimensions should be field verified prior to fabrication of new structural steel.✓

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interferences in fit-up, the holes may be reamed to 1 1/16"Ø for a 1"Ø bolt.✓

All equipment, labor and materials necessary to complete Repair S shall be considered completely covered by the contract unit price for Structural Steel Repair S per each.✓

All equipment, labor and materials necessary to complete Repair T shall be considered completely covered by the contract unit price for Structural Steel Repair T per each.✓

REPAIR S & T DETAILS✓

Detailed April 2009✓
Checked April 2009✓

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

Sheet No. 24 of 57✓

FINAL PLANS✓

DATE PREPARED 8/23/2012✓	
ROUTE 136✓	STATE MO✓
DISTRICT BR✓	SHEET NO. 24✓
COUNTY ATCHISON✓	
JOB NO. J1P2161✓	
CONTRACT ID. 090724-101✓	
PROJECT NO.✓ ARRA-136-1(59)	
BRIDGE NO. L00982✓	

DESCRIPTION

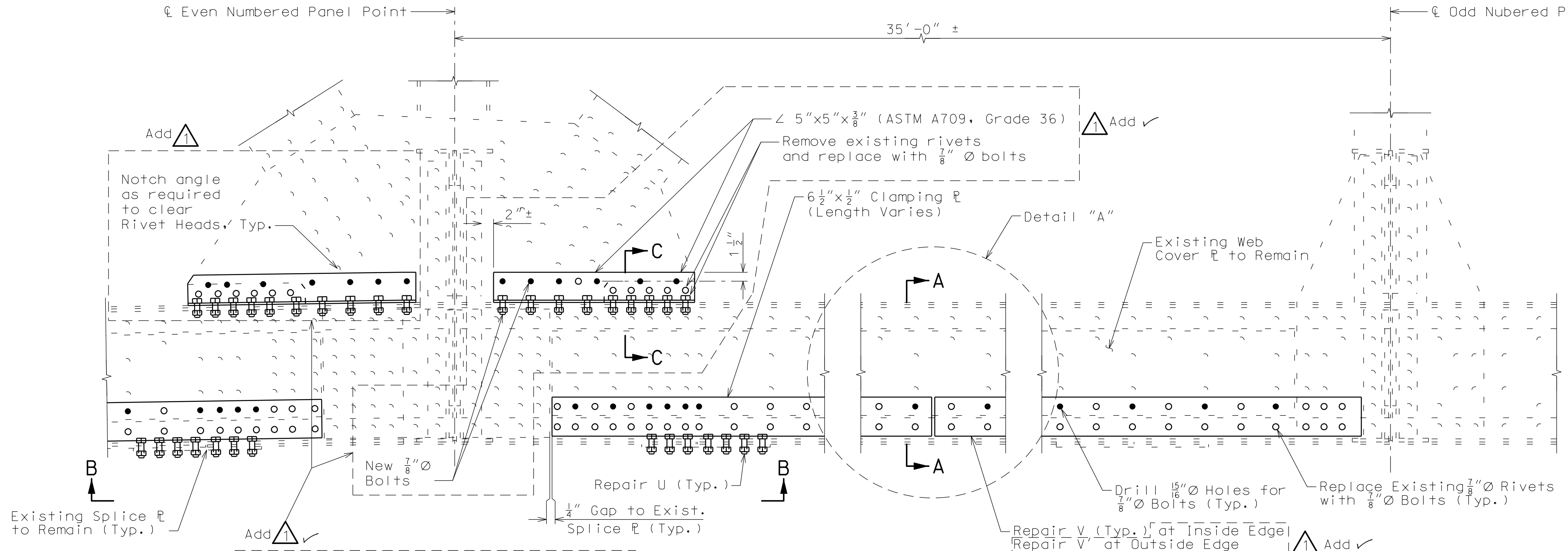
DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

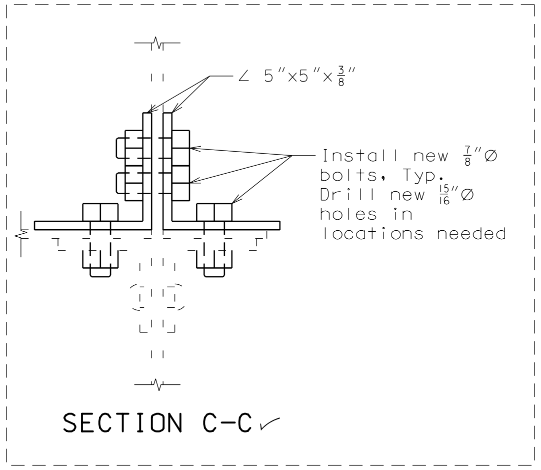
REV.


℄ Even Numbered Panel Point
35'-0" ±
℄ Odd Nubered Panel Point
Add △1
Notch angle as required to clear Rivet Heads, Typ.
∠ 5"x5"x3/8" (ASTM A709, Grade 36)
Remove existing rivets and replace with 7/8" Ø bolts
△1 Add ✓
6 1/2"x1/2" Clamping ⅊ (Length Varies)
Detail "A"
2" ±
1 1/2"
C
C
A
A
Existing Web Cover ⅊ to Remain
B
B
New 7/8"Ø Bolts
Repair U (Typ.)
1/4" Gap to Exist. Splice ⅊ (Typ.)
Drill 15/16"Ø Holes for 7/8"Ø Bolts (Typ.)
Replace Existing 7/8"Ø Rivets with 7/8"Ø Bolts (Typ.)
Repair V (Typ.) at Inside Edge
Repair V' at Outside Edge
△1 Add ✓
Existing Splice ⅊ to Remain (Typ.)
Add △1 ✓

Repair W:
Remove existing rivets and angle on inside of truss as shown. Install new angle in existing and new 15/16"Ø holes. Match existing hole spacing where possible. Provide fill plates as required. Remove & install only one angle at a time with traffic reduced to one lane away from truss being repaired. ✓

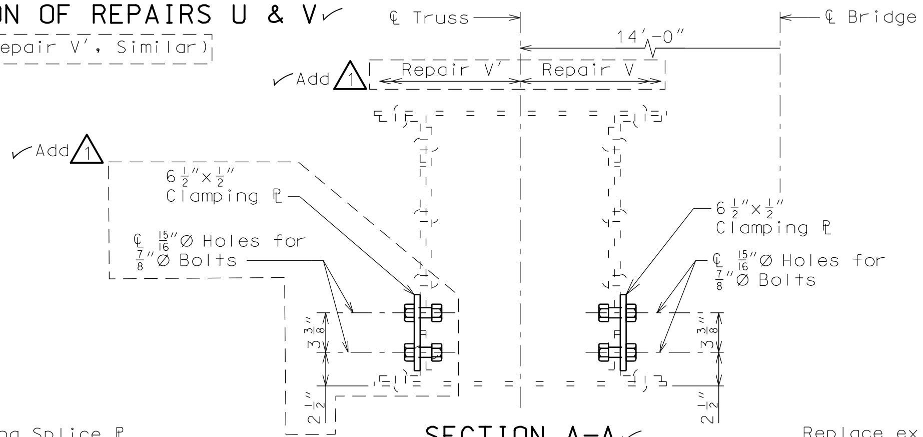
ELEVATION OF REPAIRS U & V ✓

✓ Add △1 (Repair V', Similar)

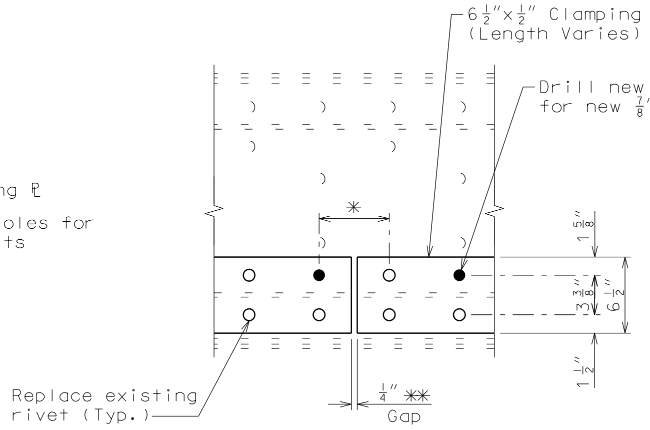

∠ 5"x5"x3/8"
Install new 7/8"Ø bolts, Typ. Drill new 15/16"Ø holes in locations needed

SECTION C-C ✓

Add △1 ✓



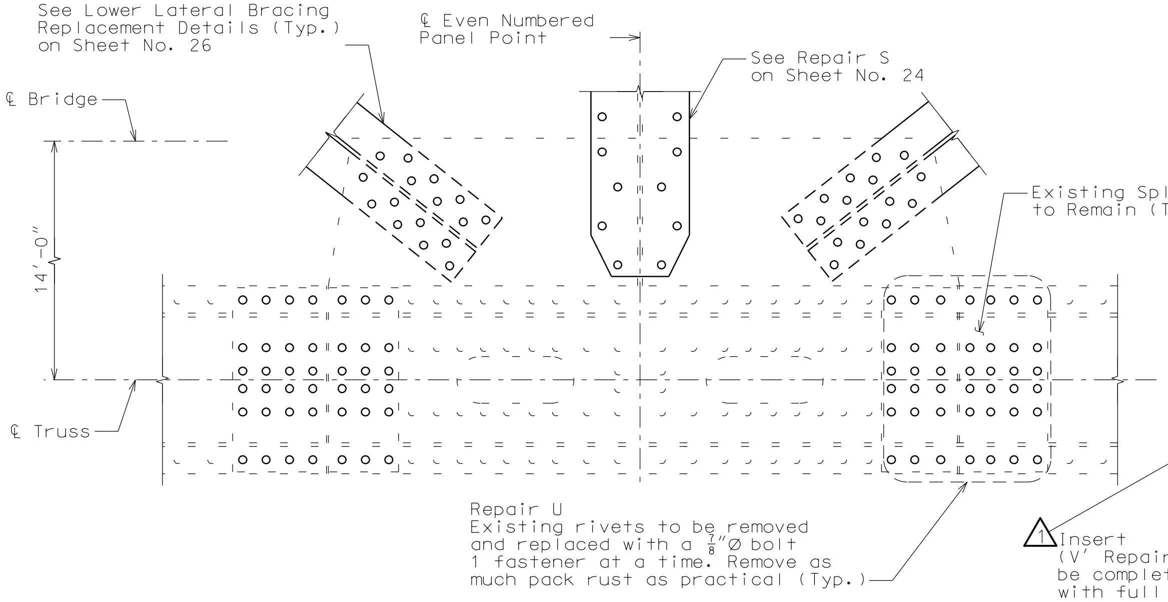
SECTION A-A ✓


6 1/2"x1/2" Clamping ⅊ (Length Varies)
Drill new 15/16"Ø Hole for new 7/8"Ø Bolt (Typ.)
*
1 5/8"
3 3/8"
6 1/2"
1 1/2"
1/4" **
Gap
Replace existing rivet (Typ.)

DETAIL "A" ✓

* - Spacing varies, 6" Max. Match existing condition except where existing fastener spacing exceeds 6", drill a 15/16" Hole for a 7/8" Bolt. ✓

** - The Contractor shall break the clamping plate near the mid-point of each Truss bay. ✓


See Lower Lateral Bracing Replacement Details (Typ.) on Sheet No. 26
℄ Even Numbered Panel Point
See Repair S on Sheet No. 24
℄ Bridge
14'-0"
Existing Splice ⅊ to Remain (Typ.)
℄ Truss
Repair U
Existing rivets to be removed and replaced with a 7/8"Ø bolt 1 fastener at a time. Remove as much pack rust as practical (Typ.)

VIEW B-B ✓

△1 Insert
(V' Repairs may be completed with full slab in place but traffic must be limited to the opposite side of the structure.) ✓

Add △1

For Repair W, Contractor shall take field measurements for length of angle and bolt hole locations. ✓

All equipment, labor and materials necessary to complete Repair W shall be considered completely covered by the contract unit price for Structural Steel Repair W per each. ✓

Notes:

△1 Insert (and V') ✓

Repairs U & V shall be completed when traffic is limited to the opposite side of the structure and half of the slab is removed. ✓

△1 Insert (and V') ✓

New Structural Steel for Repairs V shall be ASTM A709 Grade 50. ✓

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements. ✓

All dimensions should be field verified prior to fabrication of new structural steel. ✓

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt. ✓

Repair U shall consist of removing existing rivets in the splice plate and bottom flange of the lower chord, removing pack rust, coating existing steel with inorganic zinc primer and reassembling with 7/8"Ø A325 bolts. ✓

All equipment, labor and materials necessary to complete Repair U shall be considered completely covered by the contract unit price for Structural Steel Repair U per each. ✓

△1 Insert (and V') ✓

Repair V shall consist of removing existing rivets in the web cover plate and the bottom flange connection angles, removing pack rust, coating existing steel with inorganic zinc primer, placing new clamping plate, field drilling additional holes as needed and reassembling with 7/8"Ø A325 bolts. ✓

The contractor shall only work on half of a truss bay in each span at a time. Rivets shall only be removed at the repair location being worked on, not in advance of the repair. All repairs must be completed and new bolts must be installed prior to leaving the work unattended. ✓

All equipment, labor and materials necessary to complete Repair V shall be considered completely covered by the contract price for Structural Steel Repair V lump sum.

△1 Insert (and V') ✓

△1 Insert (and V' Lump Sum, respectively) ✓

REPAIR U & V DETAILS ✓

Detailed April 2009 ✓
Checked April 2009 ✓

△1 Revised 10/12/10 ✓

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

Sheet No. 25 of 57 ✓

FINAL PLANS ✓

DATE PREPARED	
8/24/2012 ✓	
ROUTE	STATE
136 ✓	MO ✓
DISTRICT	SHEET NO.
BR ✓	25 ✓
COUNTY	
ATCHISON ✓	
JOB NO.	
J1P2161 ✓	
CONTRACT ID.	
090724-101 ✓	
PROJECT NO.	
ARRA-136-1(59) ✓	
BRIDGE NO.	
L00982 ✓	

REV.	DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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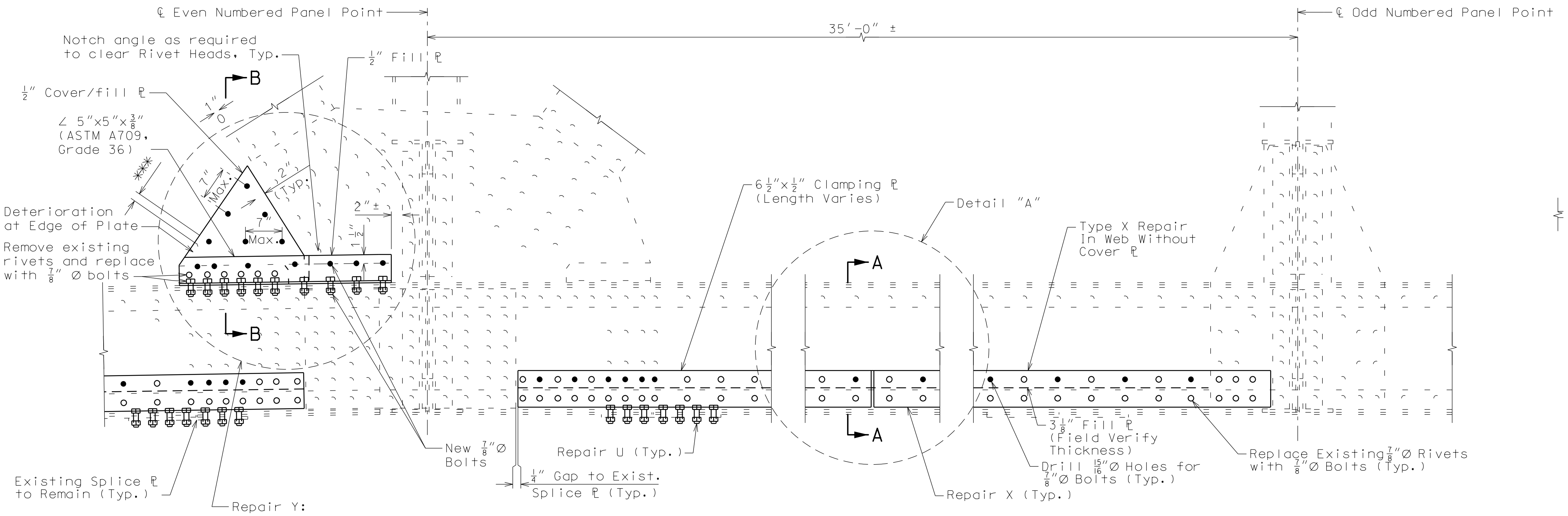
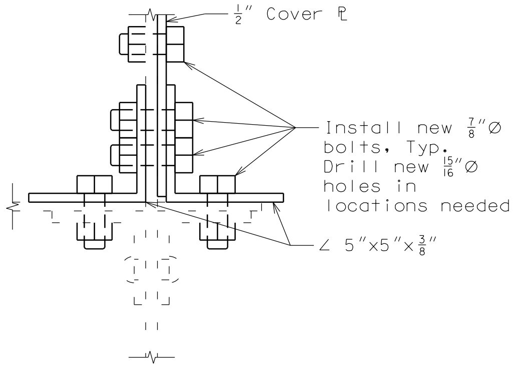
816-360-2700
Certificate of Authority: 000856


℄ Even Numbered Panel Point
35'-0" ±
℄ Odd Numbered Panel Point
Notch angle as required to clear Rivet Heads, Typ.
1/2" Fill ⅊
B
1/2" Cover/fill ⅊
∠ 5"x5"x3/8" (ASTM A709, Grade 36)
***
1"
7" Max.
2" (Typ.)
7" Max.
2"±
1/2"
Deterioration at Edge of Plate
Remove existing rivets and replace with 7/8" Ø bolts
B
6 1/2"x1/2" Clamping ⅊ (Length Varies)
Detail "A"
A
Type X Repair In Web Without Cover ⅊
A
Existing Splice ⅊ to Remain (Typ.)
New 7/8"Ø Bolts
Repair U (Typ.)
1/4" Gap to Exist. Splice ⅊ (Typ.)
3 1/8" Fill ⅊ (Field Verify Thickness)
Drill 15/16"Ø Holes for 7/8"Ø Bolts (Typ.)
Replace Existing 7/8"Ø Rivets with 7/8"Ø Bolts (Typ.)
Repair X (Typ.)

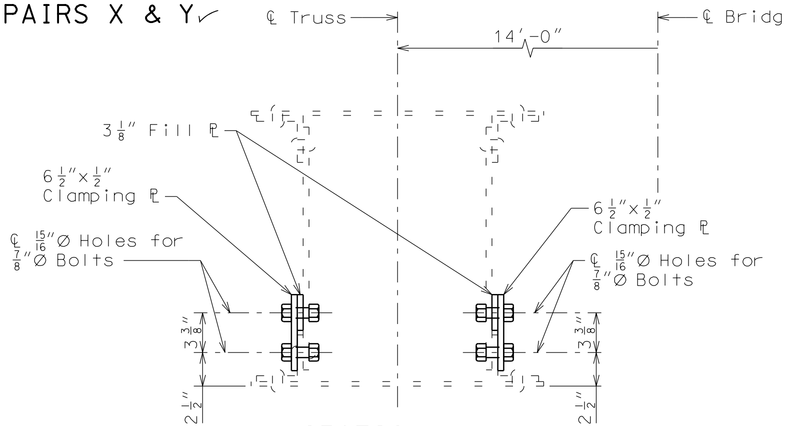
Repair Y:
Remove existing rivets and angle on inside and outside of truss as shown. Install new angle and 7/8"Ø bolts in existing and new 15/16"Ø holes. Match existing hole spacing where possible. Contractor shall take field measurements for length of angle and bolt hole locations. Provide fill plates as required. Remove & install only one angle at a time with traffic reduced to one lane away from truss being repaired. ✓

*** - 1 1/2" Min. to edge of deterioration.

ELEVATION OF REPAIRS X & Y ✓

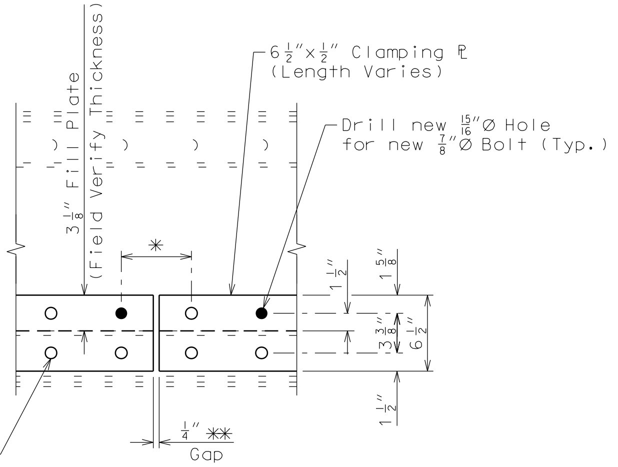

1/2" Cover ⅊
Install new 7/8"Ø bolts, Typ. Drill new 15/16"Ø holes in locations needed
∠ 5"x5"x3/8"

SECTION B-B ✓



SECTION A-A ✓

* - Spacing varies, 6" Max. Match existing condition except where existing fastener spacing exceeds 6", drill a 15/16"Ø Hole for a 7/8"Ø Bolt. ✓


3 1/8" Fill Plate (Field Verify Thickness)
6 1/2"x1/2" Clamping ⅊ (Length Varies)
Drill new 15/16"Ø Hole for new 7/8"Ø Bolt (Typ.)
*
1 1/2"
1 5/8"
3 3/8"
6 1/2"
1 1/2"
1/4" ** Gap
Replace existing rivet (Typ.)

DETAIL "A" ✓

** - The Contractor shall break the clamping plate and fill plate near the mid-point of each Truss bay. ✓

Notes:
Repairs X & Y shall be completed when traffic is limited to the opposite side of the structure. ✓

New Structural Steel for Repairs X shall be ASTM A709 Grade 50. ✓

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements. ✓

All dimensions should be field verified prior to fabrication of new structural steel. ✓

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt. ✓

All equipment, labor and materials necessary to complete Repair Y shall be considered completely covered by the contract unit price for Structural Steel Repair Y per each. ✓

Repair X shall consist of removing existing rivets in the web plate and the bottom flange connection angles, removing pack rust, coating existing steel with inorganic zinc primer, placing new clamping plate and fill plate, field drilling additional holes as needed and reassembling with 7/8"Ø A325 bolts. ✓

The contractor shall only work on half of a truss bay in each span at a time. Only one side of the chord shall be worked on at any time. Rivets shall only be removed at the repair location being worked on, not in advance of the repair. All repairs must be completed and new bolts must be installed prior to leaving the work unattended. ✓

All equipment, labor and materials necessary to complete Repair X shall be considered completely covered by the contract price for Structural Steel Repair X lump sum. ✓

REPAIR X & Y DETAILS ✓

Detailed July 2010 ✓
Checked July 2010 ✓

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

Sheet No. 25A of 57 ✓

⚠1 New Sheet 10/12/10 ✓

FINAL PLANS ✓
DATE PREPARED
8/23/2012 ✓
ROUTE 136 ✓
STATE MO ✓
DISTRICT BR ✓
SHEET NO. 25A ✓
COUNTY
ATCHISON ✓
JOB NO.
J1P2161 ✓
CONTRACT ID.
090724-101 ✓
PROJECT NO. ✓
ARRA-136-1(59)
BRIDGE NO.
L00982 ✓

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
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816-360-2700
Certificate of Authority: 000856

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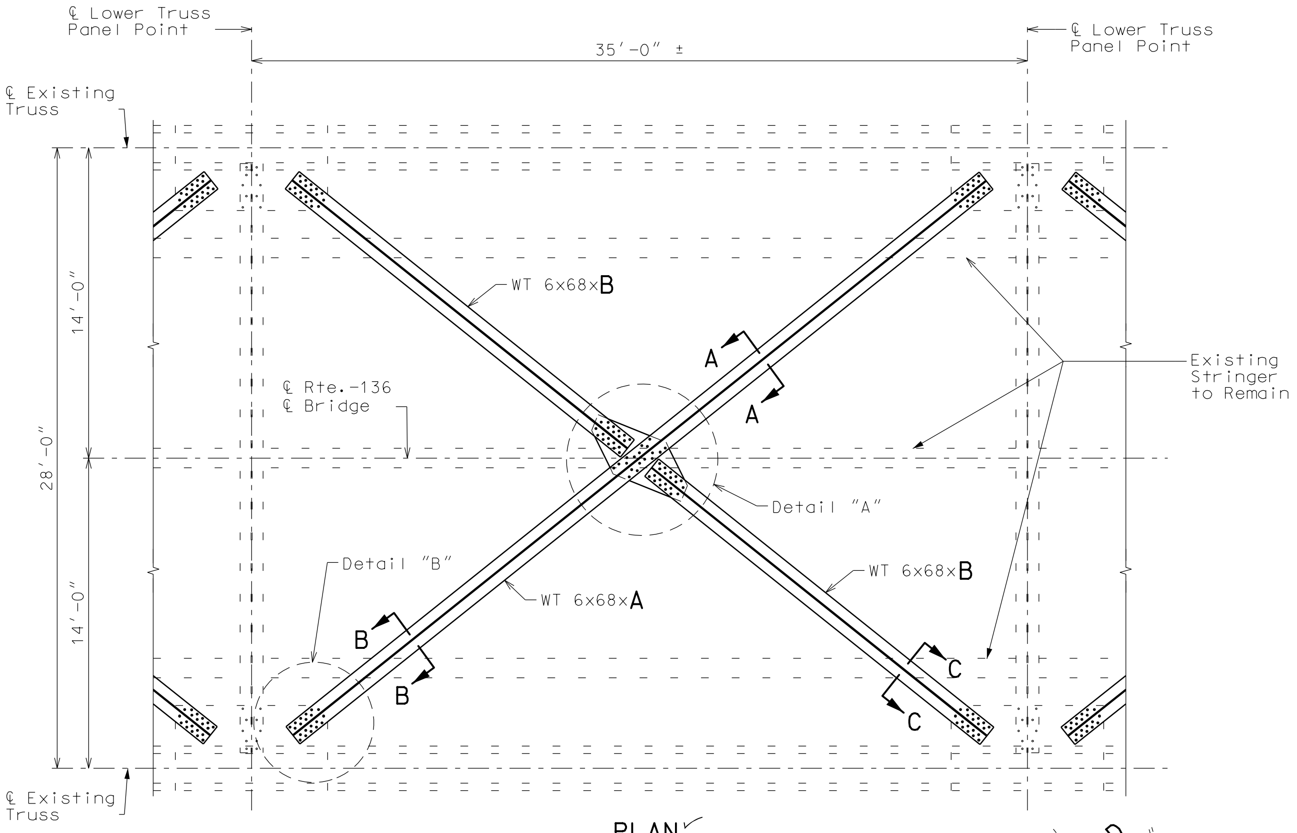
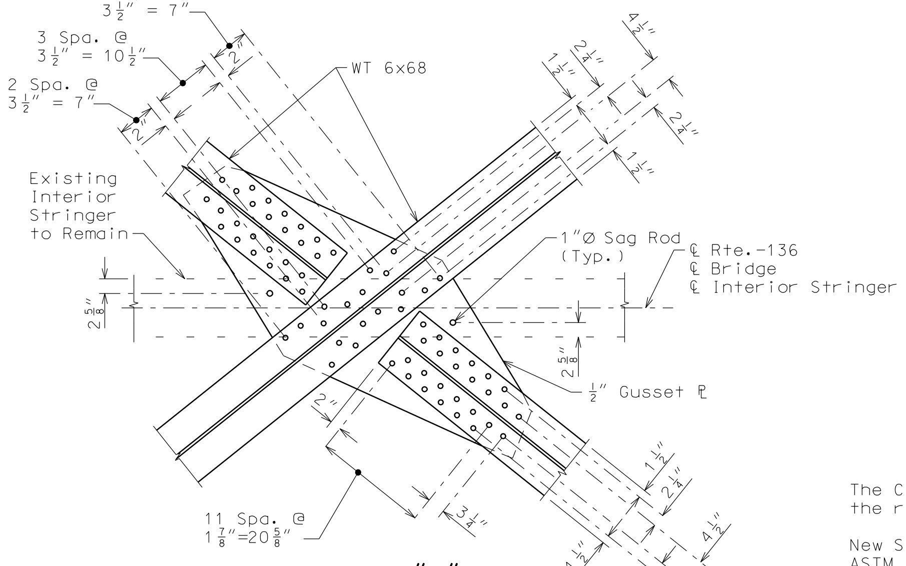
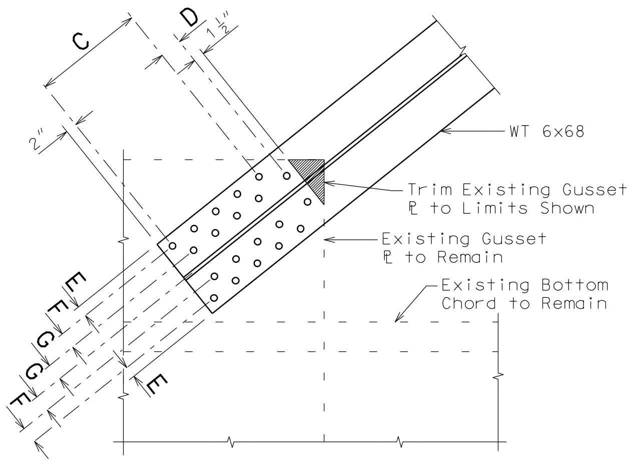


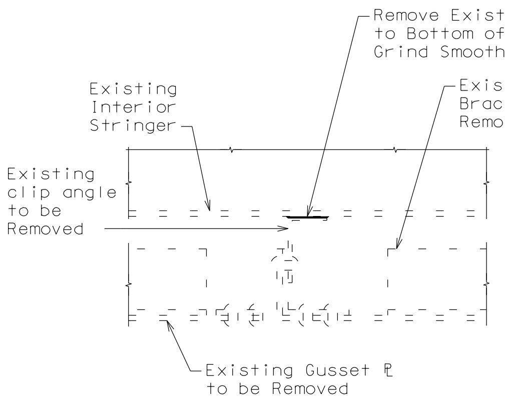
PLAN



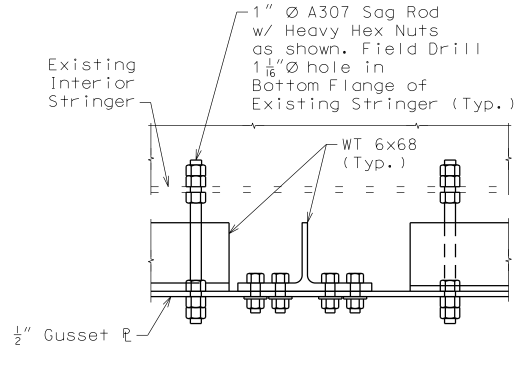
DETAIL "A"


C
D
1½″
2″
WT 6x68
Trim Existing Gusset ℗ to Limits Shown
Existing Gusset ℗ to Remain
Existing Bottom Chord to Remain
E
F
G
F
E

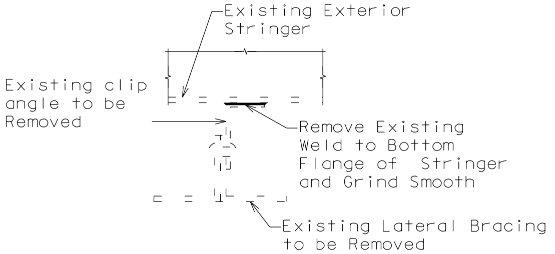
DETAIL "B"


Remove Existing Weld to Bottom of Stringer Grind Smooth
Existing Interior Stringer
Existing Lateral Bracing to be Removed (Typ.)
Existing clip angle to be Removed
Existing Gusset ℗ to be Removed

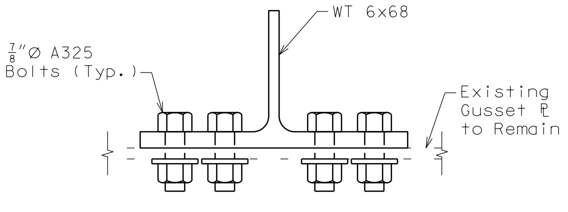
SECTION A-A
(Existing Condition)


1″ Ø A307 Sag Rod w/ Heavy Hex Nuts as shown. Field Drill 1 1/16″Ø hole in Bottom Flange of Existing Stringer (Typ.)
Existing Interior Stringer
WT 6x68 (Typ.)
½″ Gusset ℗

SECTION A-A
(Modified Condition)


Existing Exterior Stringer
Existing clip angle to be Removed
Remove Existing Weld to Bottom Flange of Stringer and Grind Smooth
Existing Lateral Bracing to be Removed

SECTION B-B
(Existing Condition Shown)



SECTION C-C

Notes:
The Lower Lateral Bracing system shall be replaced one truss bay at a time. The contractor shall ensure repairs to the active bay are completed with all bolts fully tensioned prior to beginning removal in another bay.

No portion of the truss may be draped for painting while the Lower Lateral Bracing is being replaced.

No bay of the Lower Lateral Bracing system shall be removed if winds are projected to be over 20 mph for the duration of the replacement operation.

The Contractor shall provide temporary lateral bracing or cabling to stabilize the truss as required to allow replacement of the lateral bracing. The Contractor is responsible for maintaining stability of the truss at all times.

The Contractor shall provide wind monitoring equipment during the replacement of the Lower Lateral Bracing.

New Structural Steel for Truss Lower Lateral Bracing shall be ASTM A709 Grade 50.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8″Ø Grade A325 high-strength bolts in 15/16″Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16″ for a 1″Ø bolt.

All equipment, labor and materials necessary to complete the Truss Lower Lateral Bracing replacement shall be considered completely covered by the contract lump sum price for Replace Truss Lower Lateral Bracing System.

LOWER LATERAL BRACING DIMENSIONS

LOCATION	A	B	C	D	E	F	G
L0-L1, L23-L24	39′-9½″	19′-0½″	8 @ 1⅞″	3″	1 11/16″	2¼″	2¼″
L1-L2, L22-L23	39′-9½″	19′-0½″	8 @ 1⅞″	3″	1 11/16″	2¼″	2¼″
L2-L3, L21-L22	39′-9½″	19′-0½″	8 @ 1⅞″	3″	1 11/16″	2¼″	2¼″
L3-L4, L20-L21	40′-0½″	19′-2¼″	6 @ 2⅛″	3″	2 7/16″*	2″	1¾″
L4-L5, L19-L20	40′-0½″	19′-2¼″	6 @ 2⅛″	3″	2 7/16″*	2″	1¾″
L5-L6, L18-L19	40′-0½″	19′-2¼″	6 @ 2⅛″	3″	2 7/16″*	2″	1¾″
L6-L7, L17-L18	39′-9½″	19′-0½″	8 @ 1⅞″	3″	1 11/16″	2¼″	2¼″
L7-L8, L16-L17	39′-9½″	19′-0½″	8 @ 1⅞″	3″	1 11/16″	2¼″	2¼″
L8-L9, L15-L16	39′-9½″	19′-0½″	8 @ 1⅞″	3″	1 11/16″	2¼″	2¼″
L9-L10, L14-L15	39′-9½″	19′-0½″	8 @ 1⅞″	3″	1 11/16″	2¼″	2¼″
L10-L11, L13-L14	39′-9½″	19′-0½″	10 @ 1⅞″	3¼″	1 11/16″	2¼″	2¼″
L11-L12, L12-L13	39′-9½″	19′-0½″	11 @ 1⅞″	3¼″	1 11/16″	2¼″	2¼″

* Clip corner of new WT 6x68 to clear existing floorbeam and bottom chord of truss.

LOWER LATERAL BRACING REPLACEMENT - UNIT NO. 2

Detailed April 2009
Checked April 2009

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

Sheet No. 26 of 57

FINAL PLANS
DATE PREPARED 8/23/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 26
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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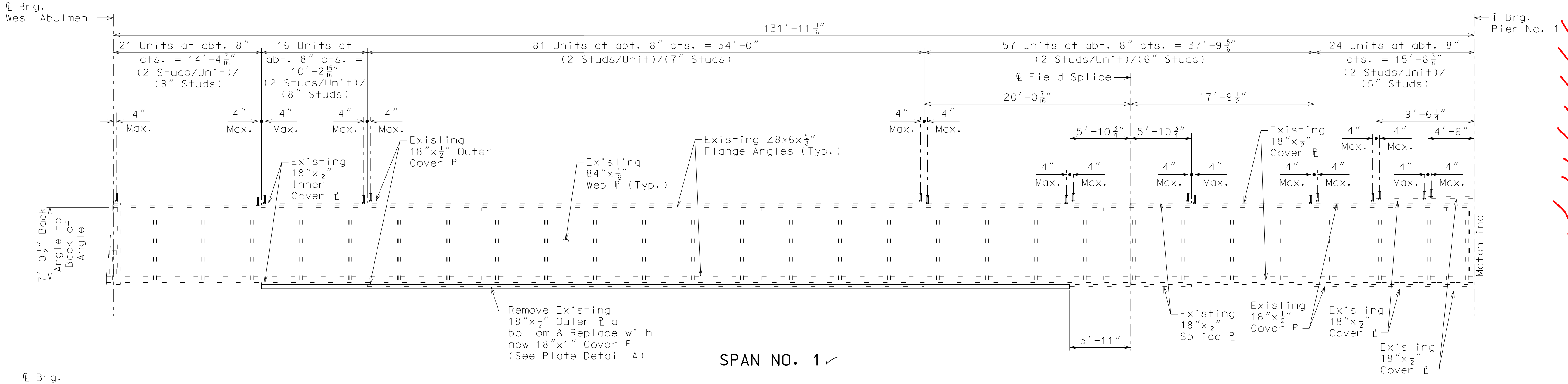
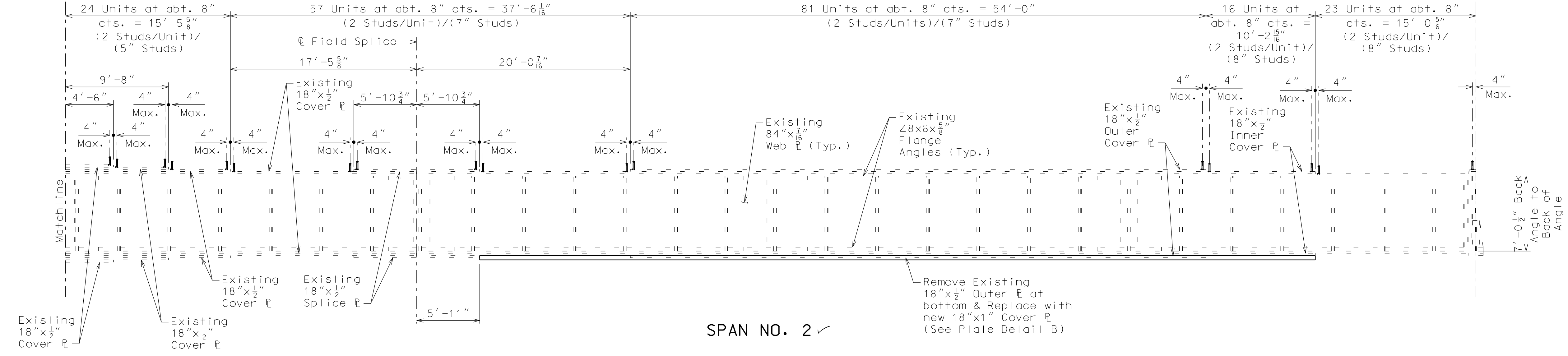


℄ Brg. West Abutment
℄ Brg. Pier No. 1
131'-11 11/16"
21 Units at abt. 8" cts. = 14'-4 7/16" (2 Studs/Unit)/ (8" Studs)
16 Units at abt. 8" cts. = 10'-2 15/16" (2 Studs/Unit)/ (8" Studs)
81 Units at abt. 8" cts. = 54'-0" (2 Studs/Unit)/(7" Studs)
57 units at abt. 8" cts. = 37'-9 15/16" (2 Studs/Unit)/(6" Studs)
24 Units at abt. 8" cts. = 15'-6 3/8" (2 Studs/Unit)/ (5" Studs)
℄ Field Splice
20'-0 7/16"
17'-9 1/2"
9'-6 1/4"
4'-6"
5'-10 3/4"
5'-10 3/4"
4" Max.
Existing 18"x1/2" Outer Cover ℙ
Existing 18"x1/2" Inner Cover ℙ
Existing 84"x7/16" Web ℙ (Typ.)
Existing ∠8x6x5/8" Flange Angles (Typ.)
Existing 18"x1/2" Cover ℙ
7'-0 1/2" Back to Back of Angle
Matchline
Remove Existing 18"x1/2" Outer ℙ at bottom & Replace with new 18"x1" Cover ℙ (See Plate Detail A)
5'-11"
Existing 18"x1/2" Splice ℙ
Existing 18"x1/2" Cover ℙ
Existing 18"x1/2" Cover ℙ
Existing 18"x1/2" Cover ℙ

SPAN NO. 1✓



℄ Brg. Pier No. 1
℄ Brg. Pier No. 2
132'-3 9/16"
24 Units at abt. 8" cts. = 15'-5 5/8" (2 Studs/Unit)/ (5" Studs)
57 Units at abt. 8" cts. = 37'-6 1/16" (2 Studs/Unit)/(7" Studs)
81 Units at abt. 8" cts. = 54'-0" (2 Studs/Units)/(7" Studs)
16 Units at abt. 8" cts. = 10'-2 15/16" (2 Studs/Unit)/ (8" Studs)
23 Units at abt. 8" cts. = 15'-0 15/16" (2 Studs/Unit)/ (8" Studs)
℄ Field Splice
17'-5 5/8"
20'-0 7/16"
9'-8"
4'-6"
5'-10 3/4"
5'-10 3/4"
4" Max.
Existing 18"x1/2" Cover ℙ
Existing 84"x7/16" Web ℙ (Typ.)
Existing ∠8x6x5/8" Flange Angles (Typ.)
Existing 18"x1/2" Outer Cover ℙ
Existing 18"x1/2" Inner Cover ℙ
Matchline
7'-0 1/2" Back to Back of Angle
Existing 18"x1/2" Cover ℙ
Existing 18"x1/2" Splice ℙ
5'-11"
Existing 18"x1/2" Cover ℙ
Existing 18"x1/2" Cover ℙ
Remove Existing 18"x1/2" Outer ℙ at bottom & Replace with new 18"x1" Cover ℙ (See Plate Detail B)

SPAN NO. 2✓

Notes:
New Cover Plates shall be ASTM A36 (Fy=36,000 psi) steel. All New Plates shall be subject to charpy V-Notch Testing Requirements.✓

The Cover Plates shall be replaced with no live load or construction loads present within the unit. The slab above the girder shall be removed prior to beginning any Cover Plate replacement work. This work shall be completed during a scheduled weekend closure.✓

Existing 18"x1/2" Bottom Outer Plates in Spans No. 1 & No. 2 shall be discarded. Existing 18"x1/2" Bottom Inner Plates in Spans No. 1 & No. 2 shall be temporarily secured in place with drift pins and clamps or temporary fasteners at a maximum spacing of 4'-0" to each flange angle leg.✓

The bottom of existing 18"x1/2" Bottom Inner Plates in Spans No. 1 & No. 2 shall be cleaned and coated according to the special provisions prior to installation of new cover plates.✓

The cost of supplying and installing shear connectors will be considered completely covered by the contract unit price for Shear Connectors per each.✓

Shear connectors shall be in accordance with Sec. 712, 1037 & 1080.✓

The cost of all labor, equipment and material to remove, clean, repaint, paint, rebolt, bolt, weld and splice the cover plates as shown on this sheet shall be included in the contract lump sum price for "Strengthening Existing Girders".✓

Optional Field Splices may be used by the Contractor for handling & ease of installation. Minimum spacing of Optional Field Splices shall be 30'-0". Contractor shall determine optional Field Splice location & geometry & submit to engineer for approval.✓

The Contractor shall field verify the dimensions & bolt locations prior to fabrication of the replacement and new cover plates.✓

Existing 7/8"Ø rivets shall be replaced with 7/8"Ø A325 fully tensioned bolts within the limits of the new cover plates unless noted otherwise.✓

Stud heights shown have been estimated. The Contractor shall verify stud heights based on Field Survey to maintain 3" min. penetration into deck and 3 1/4" clear from top of deck.✓

See Sheet No. 28 for Plate Details A & B.✓

ELEVATION OF STRUCTURAL STEEL - UNIT NO. 1✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 27 of 57✓

FINAL PLANS✓	
DATE PREPARED	8/23/2012✓
ROUTE	136✓
STATE	MO✓
DISTRICT	BR✓
SHEET NO.	27✓
COUNTY	ATCHISON✓
JOB NO.	J1P2161✓
CONTRACT ID.	090724-101✓
PROJECT NO.	ARRA-136-1(59)✓
BRIDGE NO.	L00982✓

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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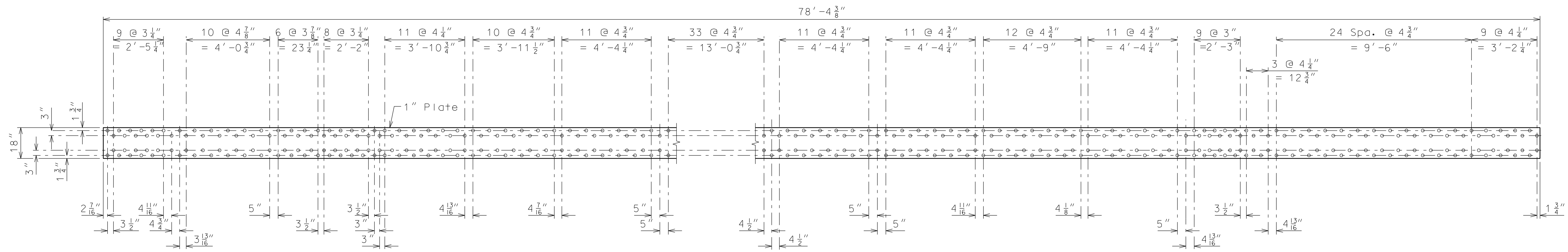


PLATE DETAIL A ✓

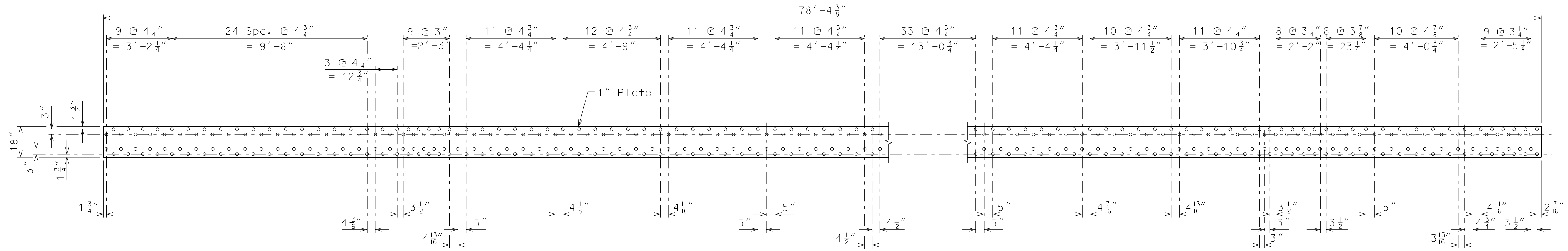
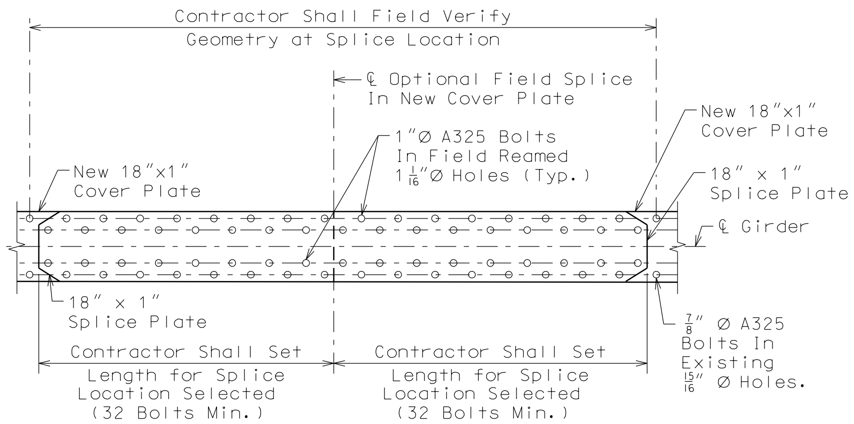
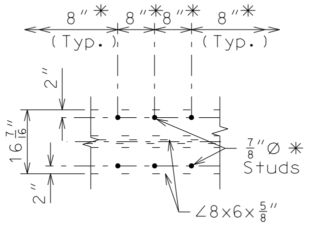


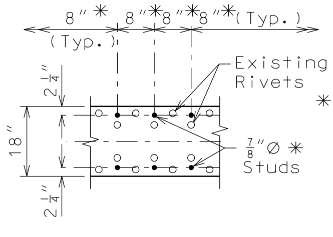
PLATE DETAIL B ✓


Contractor Shall Field Verify Geometry at Splice Location
℄ Optional Field Splice In New Cover Plate
New 18″×1″ Cover Plate
1″Ø A325 Bolts In Field Reamed 1 1/16″Ø Holes (Typ.)
New 18″×1″ Cover Plate
18″ × 1″ Splice Plate
℄ Girder
18″ × 1″ Splice Plate
7/8″ Ø A325 Bolts In Existing 15/16″ Ø Holes.
Contractor Shall Set Length for Splice Location Selected (32 Bolts Min.)
Contractor Shall Set Length for Splice Location Selected (32 Bolts Min.)

OPTIONAL COVER PLATE FIELD SPLICE ✓



SHEAR STUD PLACEMENT ON FLANGE ANGLES ✓



✳Space studs as required to clear rivets & obstructions. Add studs adjacent to obstructions where necessary. ✓

SHEAR STUD PLACEMENT ON COVER PLATES ✓

FINAL PLANS ✓
8/23/2012 ✓

MISCELLANEOUS STEEL DETAILS - UNIT NO. 1 ✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 28 of 57 ✓

FINAL PLANS ✓
DATE PREPARED 8/23/2012 ✓
ROUTE 136 ✓
STATE MO ✓
DISTRICT BR ✓
SHEET NO. 28 ✓
COUNTY ATCHISON ✓
JOB NO. J1P2161 ✓
CONTRACT ID. 090724-101 ✓
PROJECT NO. ARRA-136-1(59) ✓
BRIDGE NO. L00982 ✓

DESCRIPTION
DATE

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

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4435 Main Street
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Certificate of Authority: 000856

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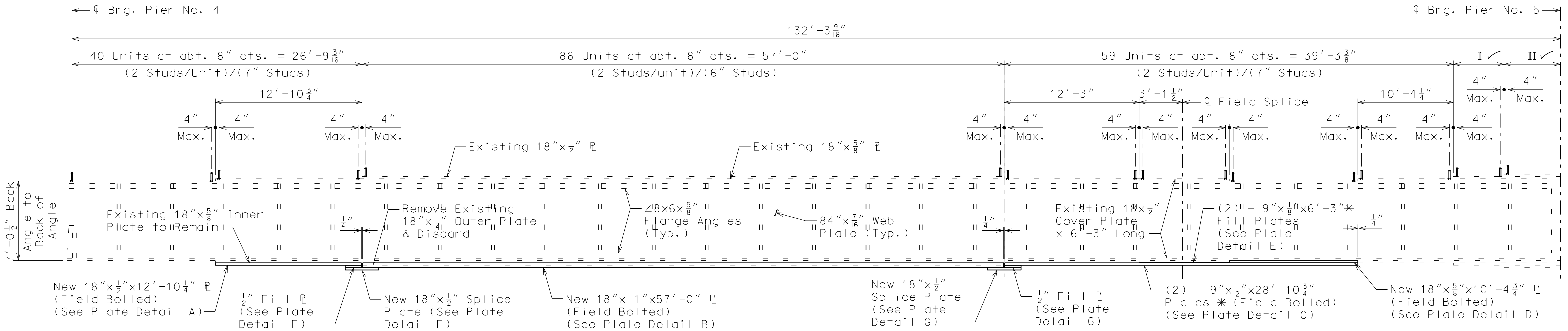
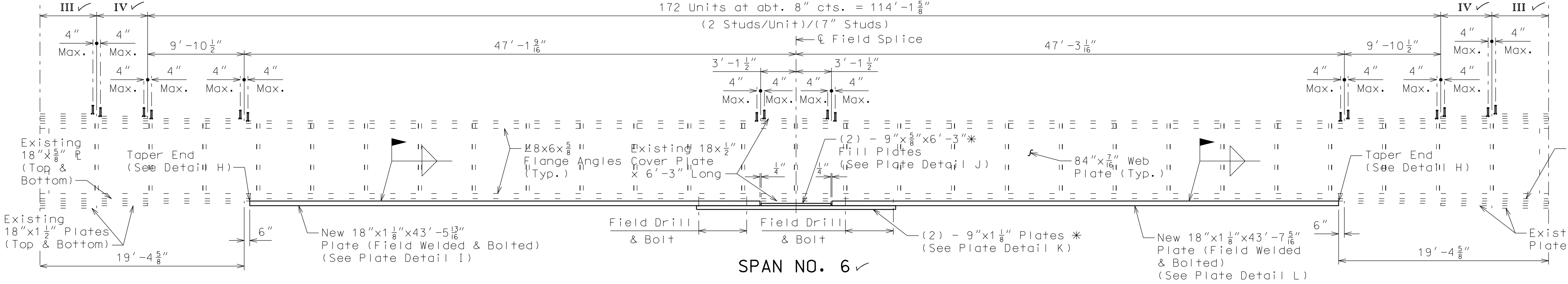
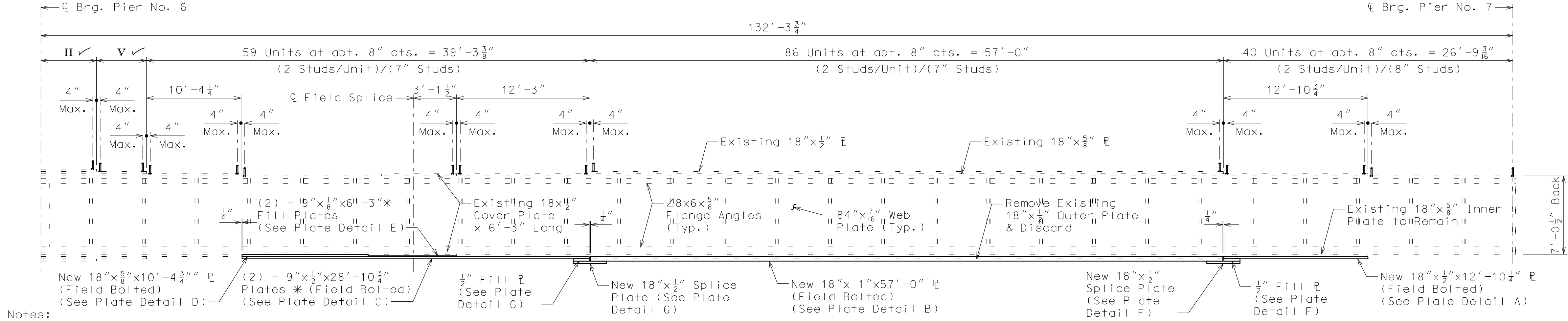

℄ Brg. Pier No. 4
℄ Brg. Pier No. 5
132′-3 9/16″
40 Units at abt. 8″ cts. = 26′-9 3/16″
(2 Studs/Unit)/(7″ Studs)
86 Units at abt. 8″ cts. = 57′-0″
(2 Studs/unit)/(6″ Studs)
59 Units at abt. 8″ cts. = 39′-3 3/8″
(2 Studs/Unit)/(7″ Studs)
I ✓
II ✓
12′-10 3/4″
12′-3″
3′-1 1/2″
℄ Field Splice
10′-4 1/4″
4″ Max.
Existing 18″x1/2″ ⅊
Existing 18″x5/8″ ⅊
7′-0 1/2″ Back to Back of Angle
Existing 18″x5/8″ Inner Plate to Remain
1/4″
Remove Existing 18″x1/2″ Outer Plate & Discard
L8x6x5/8″ Flange Angles (Typ.)
84″x7/16″ Web Plate (Typ.)
Existing 18x1/2″ Cover Plate x 6′-3″ Long
(2) - 9″x1/2″x6′-3″✳ Fill Plates (See Plate Detail E)
New 18″x1/2″x12′-10 1/4″ ⅊ (Field Bolted) (See Plate Detail A)
1/2″ Fill ⅊ (See Plate Detail F)
New 18″x1/2″ Splice Plate (See Plate Detail F)
New 18″x 1″x57′-0″ ⅊ (Field Bolted) (See Plate Detail B)
New 18″x1/2″ Splice Plate (See Plate Detail G)
1/2″ Fill ⅊ (See Plate Detail G)
(2) - 9″x1/2″x28′-10 3/4″ Plates ✳ (Field Bolted) (See Plate Detail C)
New 18″x5/8″x10′-4 3/4″ ⅊ (See Plate Detail D)

SPAN NO. 5 ✓


℄ Brg. Pier No. 5
℄ Brg. Pier No. 6
133′-1 7/8″
III ✓
IV ✓
172 Units at abt. 8″ cts. = 114′-1 5/8″
(2 Studs/Unit)/(7″ Studs)
℄ Field Splice
9′-10 1/2″
47′-1 9/16″
47′-3 1/16″
3′-1 1/2″
4″ Max.
Existing 18″x5/8″ ⅊ (Top & Bottom)
Taper End (See Detail H)
L8x6x5/8 Flange Angles (Typ.)
Existing 18x1/2″ Cover Plate x 6′-3″ Long
(2) - 9″x5/8″x6′-3″✳ Fill Plates (See Plate Detail J)
1/4″
84″x7/16″ Web Plate (Typ.)
Existing 18″x1 1/2″ Plates (Top & Bottom)
6″
19′-4 5/8″
New 18″x1 1/8″x43′-5 13/16″ Plate (Field Welded & Bolted) (See Plate Detail I)
Field Drill & Bolt
(2) - 9″x1 1/8″ Plates ✳ (See Plate Detail K)
New 18″x1 1/8″x43′-7 5/16″ Plate (Field Welded & Bolted) (See Plate Detail L)

SPAN NO. 6 ✓


℄ Brg. Pier No. 6
℄ Brg. Pier No. 7
132′-3 3/4″
II ✓
V ✓
59 Units at abt. 8″ cts. = 39′-3 3/8″
(2 Studs/Unit)/(7″ Studs)
86 Units at abt. 8″ cts. = 57′-0″
(2 Studs/Unit)/(7″ Studs)
40 Units at abt. 8″ cts. = 26′-9 3/16″
(2 Studs/Unit)/(8″ Studs)
10′-4 1/4″
℄ Field Splice
3′-1 1/2″
12′-3″
12′-10 3/4″
4″ Max.
Existing 18″x1/2″ ⅊
Existing 18″x5/8″ ⅊
1/4″
(2) - 9″x1/2″x6′-3″✳ Fill Plates (See Plate Detail E)
Existing 18x1/2″ Cover Plate x 6′-3″ Long
L8x6x5/8″ Flange Angles (Typ.)
84″x7/16″ Web Plate (Typ.)
Remove Existing 18″x1/2″ Outer Plate & Discard
Existing 18″x5/8″ Inner Plate to Remain
7′-0 1/2″ Back to Back of Angle
New 18″x5/8″x10′-4 3/4″″ ⅊ (Field Bolted) (See Plate Detail D)
(2) - 9″x1/2″x28′-10 3/4″ Plates ✳ (Field Bolted) (See Plate Detail C)
1/2″ Fill ⅊ (See Plate Detail G)
New 18″x1/2″ Splice Plate (See Plate Detail G)
New 18″x 1″x57′-0″ ⅊ (Field Bolted) (See Plate Detail B)
New 18″x1/2″ Splice Plate (See Plate Detail F)
1/2″ Fill ⅊ (See Plate Detail F)
New 18″x1/2″x12′-10 1/4″ ⅊ (Field Bolted) (See Plate Detail A)

SPAN NO. 7 ✓

I - 7 Units at abt. 8″ cts. = 4′-6″ (2 Studs/Unit)/(6″ Studs) ✓

II - 8 Units at abt. 8″ cts. = 4′-11 7/8″ (2 Studs/Unit)/(6″ Studs) ✓

III - 8 Units at abt. 8″ cts. = 5′-1 1/8″ (2 Studs/Unit)/(6″ Studs) ✓

IV - 7 Units at abt. 8″ cts. = 4′-5″ (2 Studs/Unit)/(6″ Studs) ✓

V - 7 Units at abt. 7″ cts. = 4′-6″ (2 Studs/Unit)/(6″ Studs) ✓

✳ 9″ Plates and 9″ Fill Plates shall be installed one at a time to maintain one half of bolts in splice plates at all time. ✓

Notes:

New Cover Plates shall be ASTM A36 (Fy=36,000 psi) steel. All New Plates shall be subject to charpy V-Notch Testing Requirements. ✓

The Cover Plates shall be replaced with no live load or construction loads present within the unit. The slab above the girder shall be removed prior to beginning any Cover Plate replacement work. This work shall be completed during a scheduled weekend closure. ✓

Existing 18″x 1/2″ Bottom Outer Plates in Spans No. 5 & No. 7 shall be discarded. Existing 18″x 5/8″ Bottom Inner Plates in Spans No. 5 & No. 7 shall be temporarily secured in place with drift pins and clamps or temporary fasteners at a maximum spacing of 4′-0″ to each flange angle leg. ✓

The bottom of existing 18″x 5/8″ Bottom Inner Plates in Spans No. 5 & No. 7 will be cleaned and coated according to the special provisions prior to installation of new cover plates. ✓

The cost of all labor, equipment and material to remove, clean, repaint, paint, rebolt, bolt, weld and splice the cover plates as shown on this sheet shall be included in the contract lump sum price for "Strengthening Existing Girders". ✓

Optional Field Splices may be used by the Contractor for handling & ease of installation. Minimum spacing of Optional Field Splices shall be 30′-0″. Contractor shall determine optional Field Splice location & geometry & submit to engineer for approval. ✓

The Contractor shall field verify the dimensions & bolt locations prior to fabrication of the replacement and new cover plates. ✓

Existing 7/8″Ø rivets shall be replaced with 7/8″Ø A325 fully tensioned bolts within the limits of the new cover plates unless noted otherwise. ✓

Stud heights shown have been estimated. The Contractor shall verify stud heights based on Field Survey to maintain 3″ min. penetration into deck and 3 1/4″ clear from top of deck. ✓

See Sheet No. 31 & 32 for Plate Details A to L. ✓

The cost of supplying and installing shear connectors will be considered completely covered by the contract unit price for Shear Connectors per each. ✓

Shear connectors shall be in accordance with Sec. 712, 1037 & 1080. ✓

ELEVATION OF STRUCTURAL STEEL - UNIT NO. 3 ✓

Detailed April 2009 ✓
Checked April 2009 ✓

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

Sheet No. 29 of 57 ✓

FINAL PLANS ✓

DATE PREPARED	8/23/2012 ✓
ROUTE	136 ✓
STATE	MO ✓
DISTRICT	BR ✓
SHEET NO.	29 ✓
COUNTY	ATCHISON ✓
JOB NO.	J1P2161 ✓
CONTRACT ID.	090724-101 ✓
PROJECT NO.	ARRA-136-1(59) ✓
BRIDGE NO.	L00982 ✓

DESCRIPTION

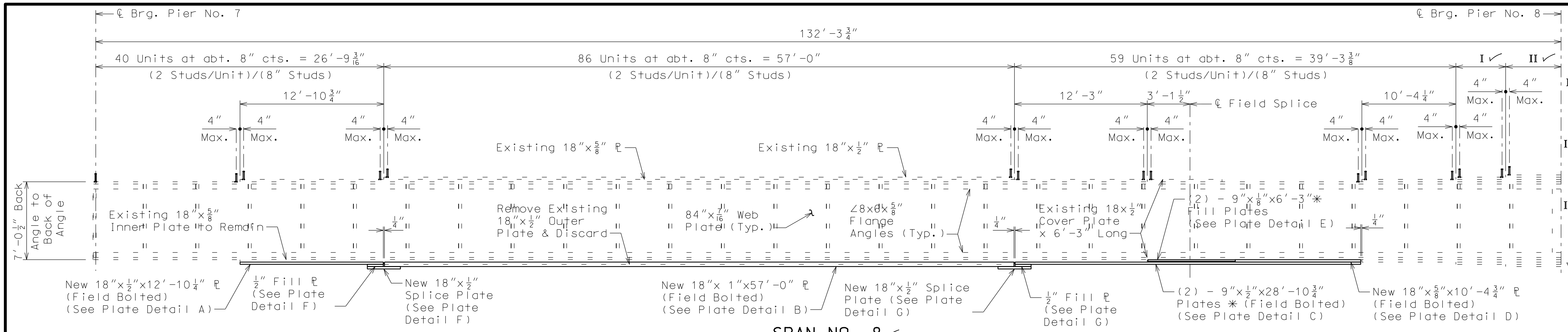
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

B_L00982_029_J1P2161.DGN 10:04:42 AM 3/27/2013



℄ Brg. Pier No. 7
℄ Brg. Pier No. 8
132′-3 3/4″
40 Units at abt. 8″ cts. = 26′-9 3/16″
(2 Studs/Unit)/(8″ Studs)
86 Units at abt. 8″ cts. = 57′-0″
(2 Studs/Unit)/(8″ Studs)
59 Units at abt. 8″ cts. = 39′-3 3/8″
(2 Studs/Unit)/(8″ Studs)
I
II
12′-10 3/4″
12′-3″
3′-1 1/2″
℄ Field Splice
10′-4 1/4″
4″ Max.
Existing 18″x5/8″ ℄
Existing 18″x1/2″ ℄
7′-0 1/2″ Back Angle to Back of Angle
Existing 18″x5/8″ Inner Plate to Remain
Remove Existing 18″x1/2″ Outer Plate & Discard
84″x7/16″ Web Plate (Typ.)
∠8x8x5/8″ Flange Angles (Typ.)
Existing 18x1/2″ Cover Plate x 6′-3″ Long
(2) - 9″x5/8″x6′-3″✱ Fill Plates (See Plate Detail E)
1/4″
New 18″x1/2″x12′-10 1/4″ ℄ (Field Bolted) (See Plate Detail A)
1/2″ Fill ℄ (See Plate Detail F)
New 18″x1/2″ Splice Plate (See Plate Detail F)
New 18″x 1″x57′-0″ ℄ (Field Bolted) (See Plate Detail B)
New 18″x1/2″ Splice Plate (See Plate Detail G)
1/2″ Fill ℄ (See Plate Detail G)
(2) - 9″x1/2″x28′-10 3/4″ Plates ✱ (Field Bolted) (See Plate Detail C)
New 18″x5/8″x10′-4 3/4″ ℄ (Field Bolted) (See Plate Detail D)

SPAN NO. 8✓

I - 7 Units at abt. 8″ cts. = 4′-6″ (2 Studs/Unit)/ (7″ Studs)✓

II - 8 Units at abt. 8″ cts. = 4′-11 7/8″ (2 Studs/Unit)/ (7″ Studs)✓

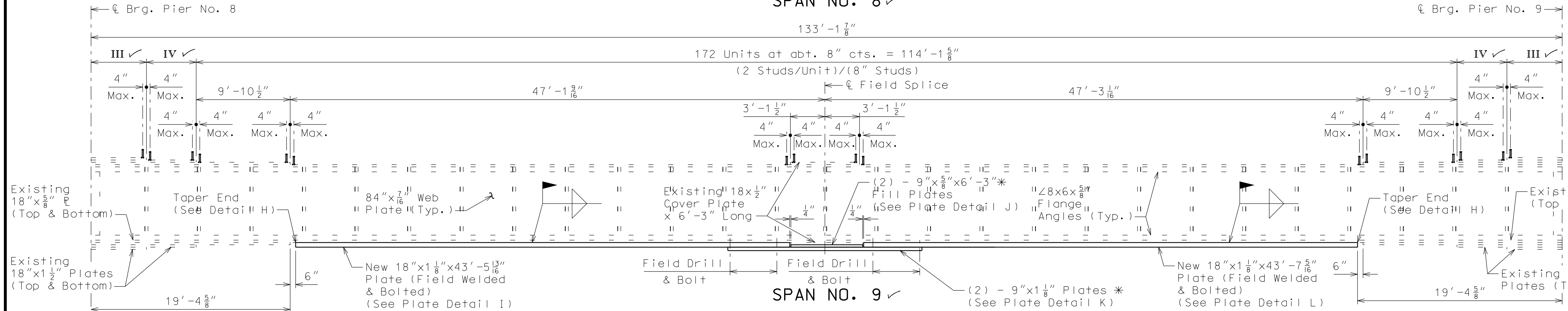
III - 8 Units at abt. 8″ cts. = 5′-1 1/8″ (2 Studs/Unit)/ (7″ Studs)✓

IV - 7 Units at abt. 8″ cts. = 4′-5″ (2 Studs/Unit)/ (7″ Studs)✓

V - 7 Units at abt. 7″ cts. = 4′-6″ (2 Studs/Unit)/ (8″ Studs)✓

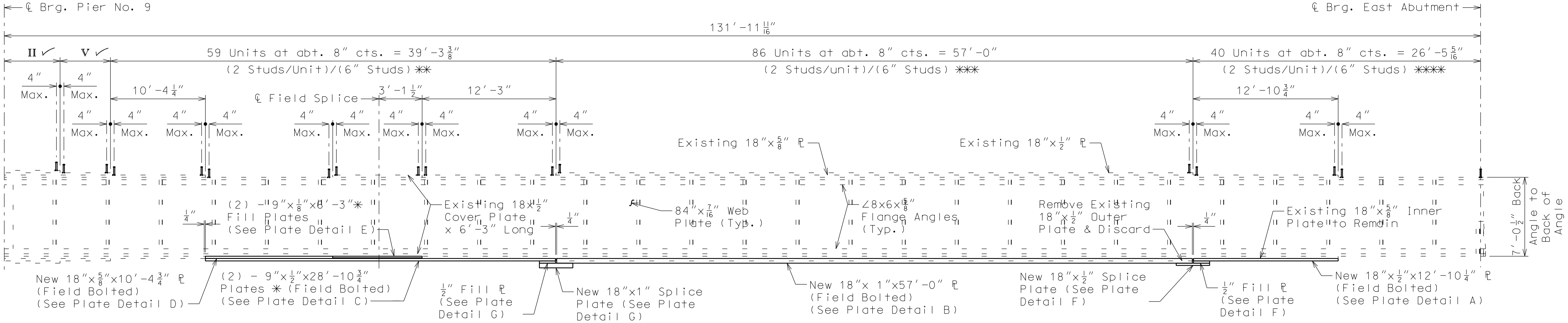
✱ 9″ Plates and 9″ Fill Plates shall be installed one at a time to maintain one half of bolts in splice plates at all time.✓

✱✱, ✱✱✱, ✱✱✱✱ - Hairpin Bars required according to survey, see Details on Sheet No. 31, space with studs as shown.✓



℄ Brg. Pier No. 8
℄ Brg. Pier No. 9
133′-1 7/8″
III
IV
172 Units at abt. 8″ cts. = 114′-1 5/8″
(2 Studs/Unit)/(8″ Studs)
℄ Field Splice
9′-10 1/2″
47′-1 9/16″
47′-3 1/16″
3′-1 1/2″
4″ Max.
Existing 18″x5/8″ ℄ (Top & Bottom)
Taper End (See Detail H)
84″x7/16″ Web Plate (Typ.)
Existing 18x1/2″ Cover Plate x 6′-3″ Long
(2) - 9″x5/8″x6′-3″✱ Fill Plates (See Plate Detail J)
∠8x6x5/8″ Flange Angles (Typ.)
1/4″
Existing 18″x1 1/2″ Plates (Top & Bottom)
6″
19′-4 5/8″
New 18″x1 1/8″x43′-5 13/16″ Plate (Field Welded & Bolted) (See Plate Detail I)
Field Drill & Bolt
(2) - 9″x1 1/8″ Plates ✱ (See Plate Detail K)
New 18″x1 1/8″x43′-7 5/16″ Plate (Field Welded & Bolted) (See Plate Detail L)

SPAN NO. 9✓



℄ Brg. Pier No. 9
℄ Brg. East Abutment
131′-11 11/16″
II
V
59 Units at abt. 8″ cts. = 39′-3 3/8″
(2 Studs/Unit)/(6″ Studs)✱✱
86 Units at abt. 8″ cts. = 57′-0″
(2 Studs/unit)/(6″ Studs)✱✱✱
40 Units at abt. 8″ cts. = 26′-5 5/16″
(2 Studs/Unit)/(6″ Studs)✱✱✱✱
10′-4 1/4″
℄ Field Splice
3′-1 1/2″
12′-3″
12′-10 3/4″
4″ Max.
Existing 18″x5/8″ ℄
Existing 18″x1/2″ ℄
(2) - 9″x5/8″x6′-3″✱ Fill Plates (See Plate Detail E)
Existing 18x1/2″ Cover Plate x 6′-3″ Long
84″x7/16″ Web Plate (Typ.)
∠8x8x5/8″ Flange Angles (Typ.)
Remove Existing 18″x1/2″ Outer Plate & Discard
Existing 18″x5/8″ Inner Plate to Remain
1/4″
7′-0 1/2″ Back Angle to Back of Angle
New 18″x5/8″x10′-4 3/4″ ℄ (Field Bolted) (See Plate Detail D)
(2) - 9″x1/2″x28′-10 3/4″ Plates ✱ (Field Bolted) (See Plate Detail C)
1/2″ Fill ℄ (See Plate Detail G)
New 18″x1″ Splice Plate (See Plate Detail G)
New 18″x 1″x57′-0″ ℄ (Field Bolted) (See Plate Detail B)
New 18″x1/2″ Splice Plate (See Plate Detail F)
1/2″ Fill ℄ (See Plate Detail F)
New 18″x1/2″x12′-10 1/4″ ℄ (Field Bolted) (See Plate Detail A)

SPAN NO. 10✓

Notes:

New Cover Plates shall be ASTM A36 (Fy=36,000 psi) steel. All New Plates shall be subject to charpy V-Notch Testing Requirements.✓

The Cover Plates shall be replaced with no live load or construction loads present within the unit. The slab above the girder shall be removed prior to beginning any Cover Plate replacement work. This work shall be completed during a scheduled weekend closure.✓

Existing 18″x1/2″ Bottom Outer Plates in Spans No. 8 & No. 10 shall be discarded. Existing 18″x5/8″ Bottom Inner Plates in Spans No. 8 & No. 10 shall be temporarily secured in place with drift pins and clamps or temporary fasteners at a maximum spacing of 4′-0″ to each flange angle leg.✓

The bottom of existing 18″x5/8″ Bottom Inner Plates in Spans No. 8 & No. 10 shall be cleaned and coated according to the special provisions prior to installation of new cover plates.✓

The cost of all labor, equipment and material to remove, clean, repaint, paint, rebolt, bolt, weld and splice the cover plates as shown on this sheet shall be included in the contract lump sum price for "Strengthening Existing Girders".✓

Optional Field Splices may be used by the Contractor for handling & ease of installation. Minimum spacing of Optional Field Splices shall be 30′-0″. Contractor shall determine optional Field Splice location & geometry & submit to engineer for approval.✓

The Contractor shall field verify the dimensions & bolt locations prior to fabrication of the replacement and new cover plates.✓

Existing 7/8″Ø rivets shall be replaced with 7/8″Ø A325 fully tensioned bolts within the limits of the new cover plates unless noted otherwise.✓

Stud heights shown have been estimated. The Contractor shall verify stud heights based on Field Survey to maintain 3″ min. penetration into deck and 3 1/4″ clear from top of deck.✓

See Sheet No. 31 & 32 for Plate Details A to L.✓

The cost of supplying and installing shear connectors will be considered completely covered by the contract unit price for Shear Connectors per each.✓

Shear connectors shall be in accordance with Sec. 712, 1037 & 1080.✓

ELEVATION OF STRUCTURAL STEEL - UNIT NO. 4✓

Detailed April 2009✓
Checked April 2009✓

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

Sheet No. 30 of 57✓

FINAL PLANS✓
DATE PREPARED 8/23/2012✓
ROUTE 136✓
STATE MO✓
DISTRICT BR✓
SHEET NO. 30✓
COUNTY ATCHISON✓
JOB NO. J1P2161✓
CONTRACT ID. 090724-101✓
PROJECT NO. ARRA-136-1(59)✓
BRIDGE NO. L00982✓

DESCRIPTION
DATE
REV.

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

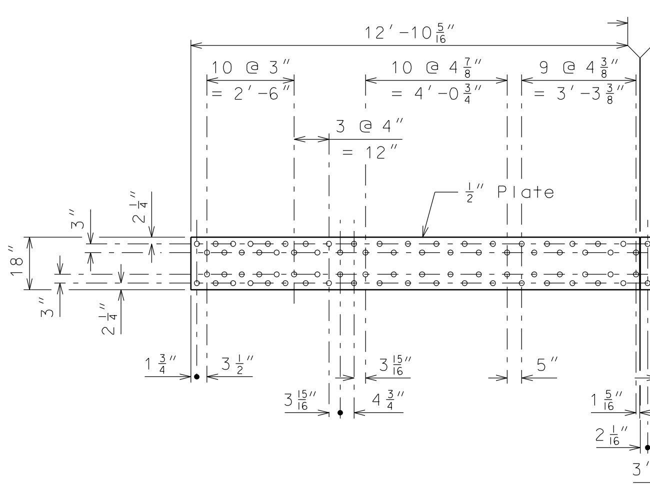


PLATE DETAIL A✓
(Unit No. 3 - Span No. 5, Span No. 7 Opposite Hand)✓
(Unit No. 4 - Similar)✓

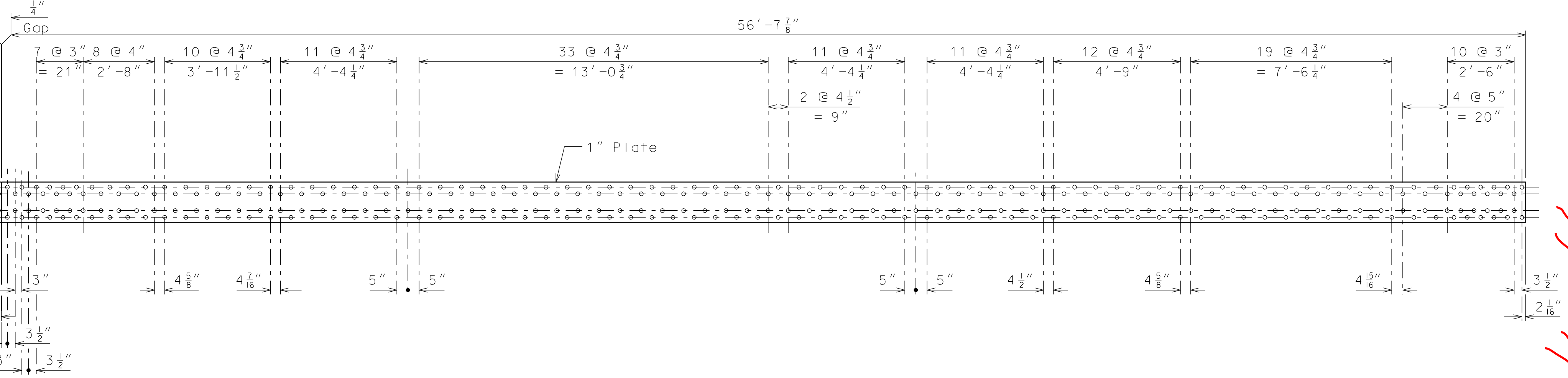


PLATE DETAIL B✓
(Unit No. 3 - Span No. 5, Span No. 7 Opposite Hand)✓
(Unit No. 4 - Similar)✓

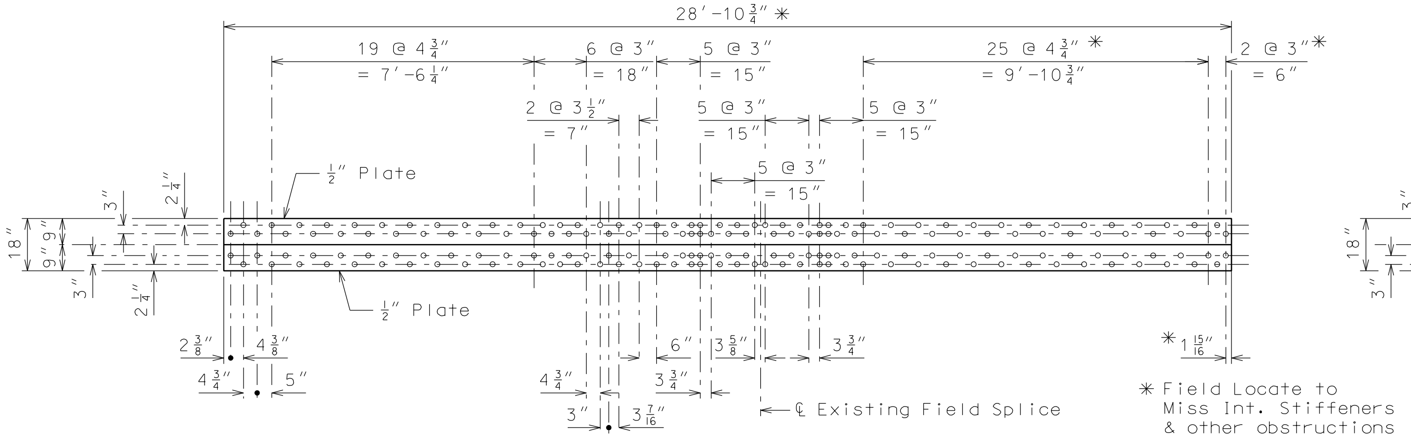


PLATE DETAIL C✓
(Unit No. 3 - Span No. 5, Span No. 7 Opposite Hand)✓
(Unit No. 4 - Similar)✓

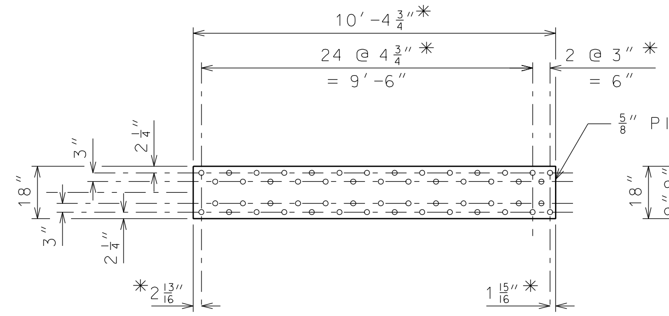


PLATE DETAIL D✓
(Unit No. 3 - Span No. 5,
Span No. 7 Opposite Hand)✓
(Unit No. 4 - Similar)✓

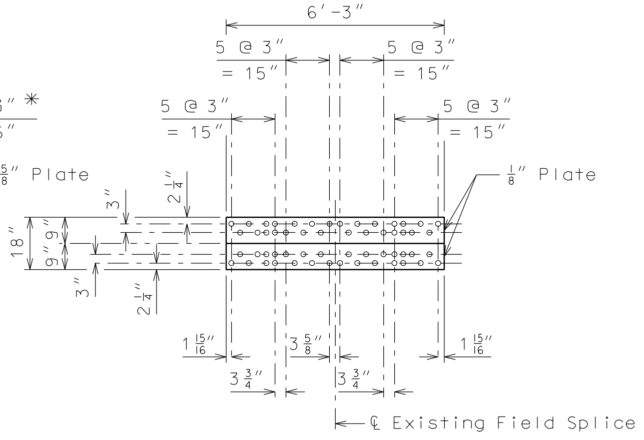


PLATE DETAIL E✓
(Unit No. 3 - Span No. 5,
Span No. 7 Opposite Hand)✓
(Unit No. 4 - Similar)✓

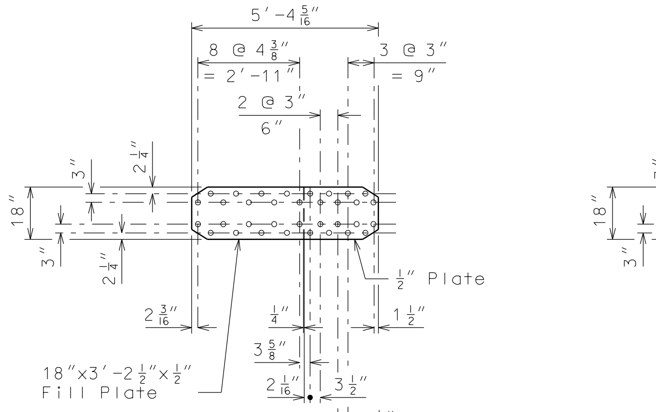


PLATE DETAIL F✓
(Unit No. 3 - Span No. 5,
Span No. 7 Opposite Hand)✓
(Unit No. 4 - Similar)✓

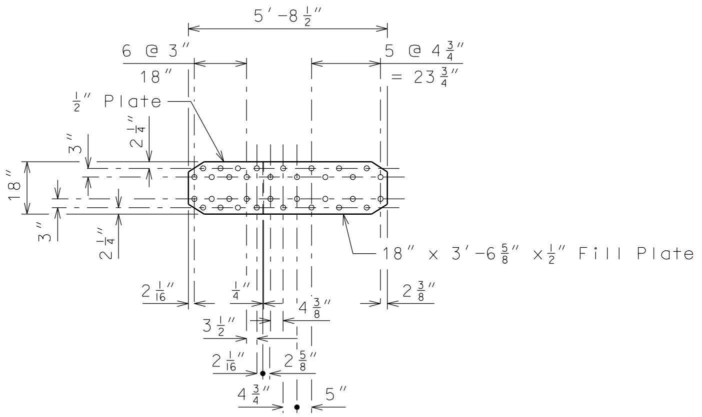
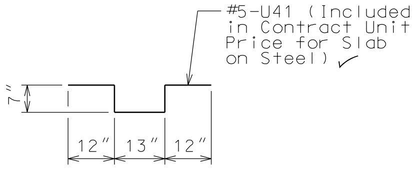
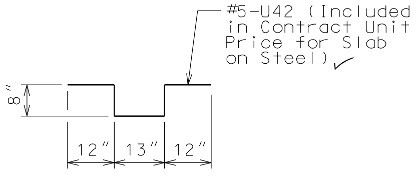


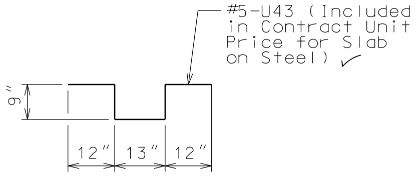
PLATE DETAIL G✓
(Unit No. 3 - Span No. 5,
Span No. 7 Opposite Hand)✓
(Unit No. 4 - Similar)✓



✱✱ - 6" STUDS W/#5-U41 ✓



✱✱✱ - 6" STUDS W/#5-U42 ✓



✱✱✱✱ - 6" STUDS W/#5-U43 ✓

HAUNCH REINFORCEMENT BARS - UNIT NO. 4✓

Notes: For locations of studs and haunch reinforcement bars, see Sheet No. 30. Haunch reinforcement bars shall be placed at each stud location as shown.✓

MISCELLANEOUS STEEL DETAILS - UNIT NO. 3 & 4✓

Detailed April 2009✓
Checked April 2009✓

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

Sheet No. 31 of 57✓

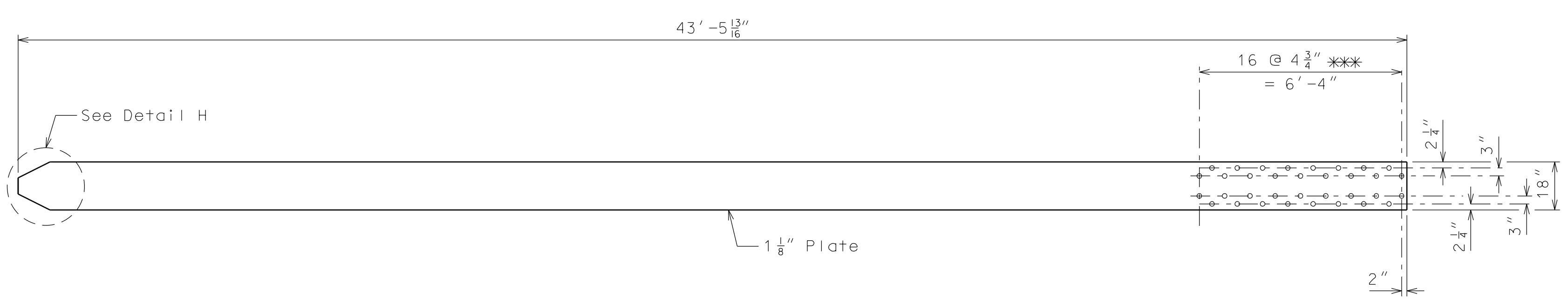
FINAL PLANS✓
DATE PREPARED
8/23/2012✓
ROUTE 136✓
STATE MO✓
DISTRICT BR✓
SHEET NO. 31✓
COUNTY
ATCHISON✓
JOB NO.
J1P2161✓
CONTRACT ID.
090724-101✓
PROJECT NO. ✓
ARRA-136-1(59)
BRIDGE NO.
L00982✓

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.



*** - Field Locate to miss Int. Stiffeners & other obstructions✓

PLATE DETAIL I✓

(Unit No. 3 - Span No. 6)✓
(Unit No. 4 - Similar)✓

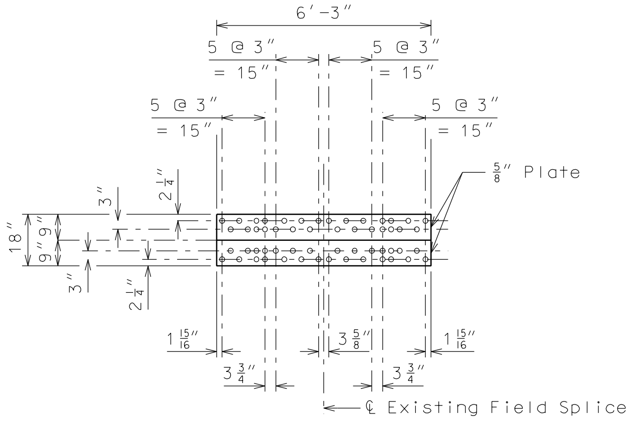


PLATE DETAIL J✓

(Unit No. 3 - Span No. 6)✓
(Unit No. 4 - Similar)✓

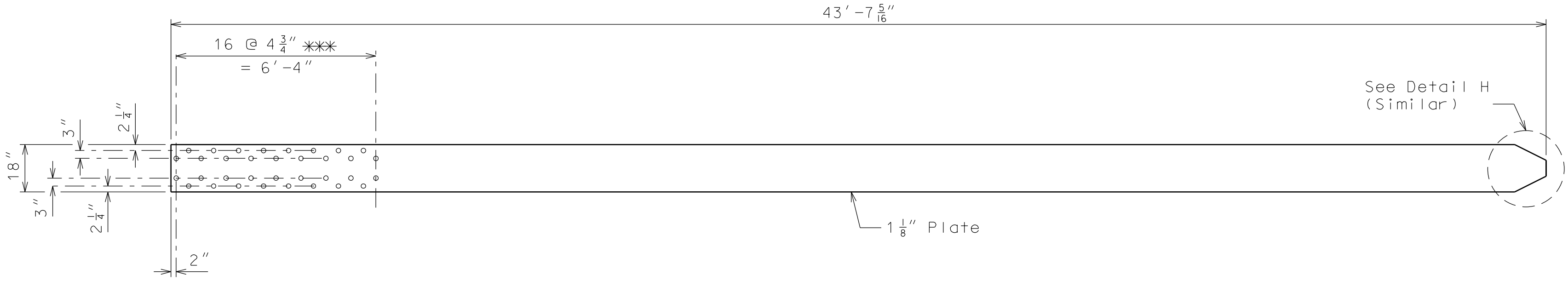


PLATE DETAIL L✓

(Unit No. 3 - Span No. 6)✓
(Unit No. 4 - Similar)✓

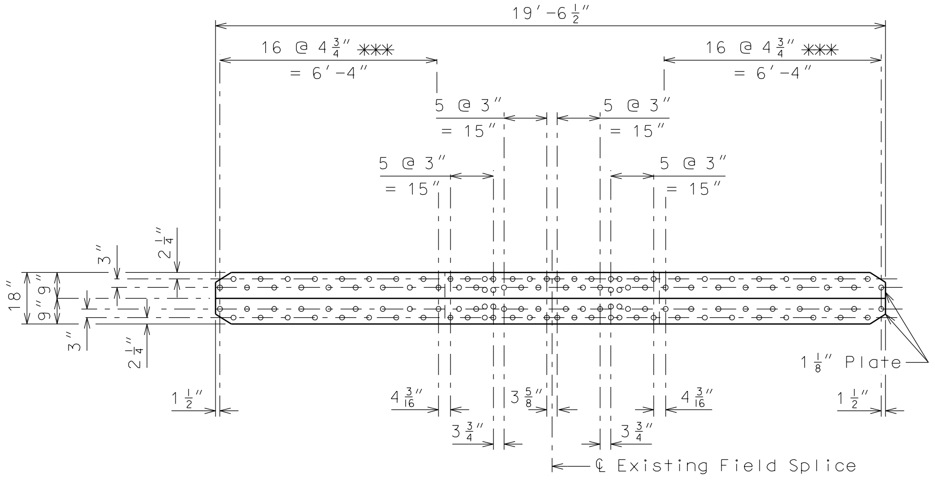
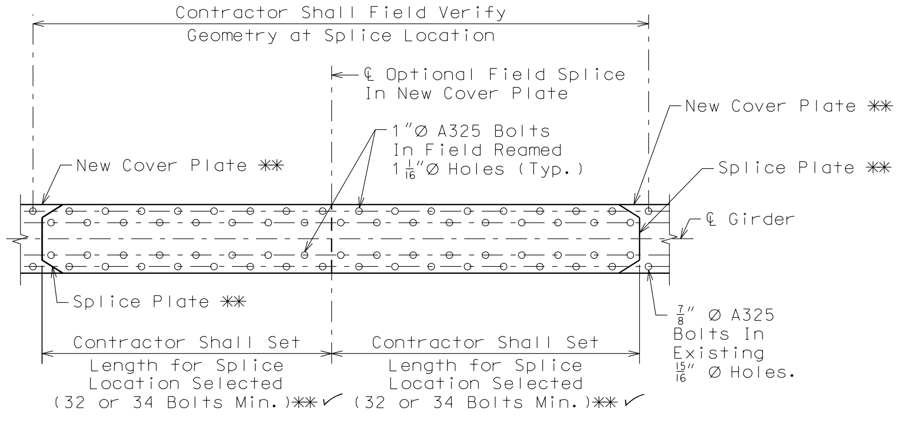


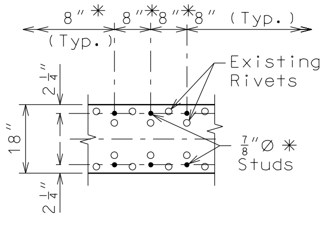
PLATE DETAIL K✓

(Unit No. 3 - Span No. 6)✓
(Unit No. 4 - Similar)✓



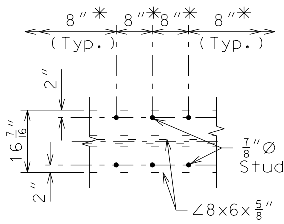
OPTIONAL COVER PLATE✓
FIELD SPLICE 18"x1" & 18"x1 1/8"✓

** (18"x1" w/32 Bolts; 18"x1 1/8" w/34 Bolts)✓

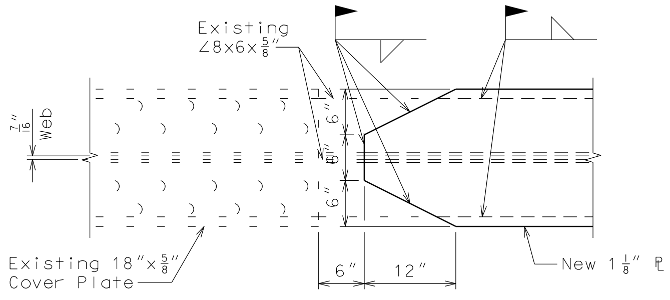


SHEAR STUD PLACEMENT✓
ON COVER PLATES

*Space studs as required to clear rivets & obstructions. Add studs adjacent to obstructions where necessary.✓



SHEAR STUD PLACEMENT✓
ON FLANGE ANGLES



DETAIL H✓

MISCELLANEOUS STEEL DETAILS - UNIT NO. 3 & 4✓

Detailed April 2009✓
Checked April 2009✓

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

Sheet No. 32 of 57✓

FINAL PLANS✓
DATE PREPARED 8/23/2012✓
ROUTE 136✓
STATE MO✓
DISTRICT BR✓
SHEET NO. 32✓
COUNTY ATCHISON✓
JOB NO. J1P2161✓
CONTRACT ID. 090724-101✓
PROJECT NO. ARRA-136-1(59)✓
BRIDGE NO. L00982✓

DESCRIPTION
DATE

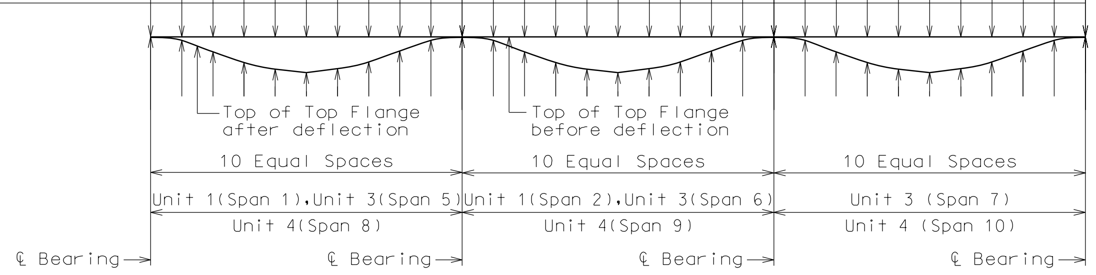
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

B_L00982_032_J1P2161.DGN 7:19:40 AM 3/29/2013

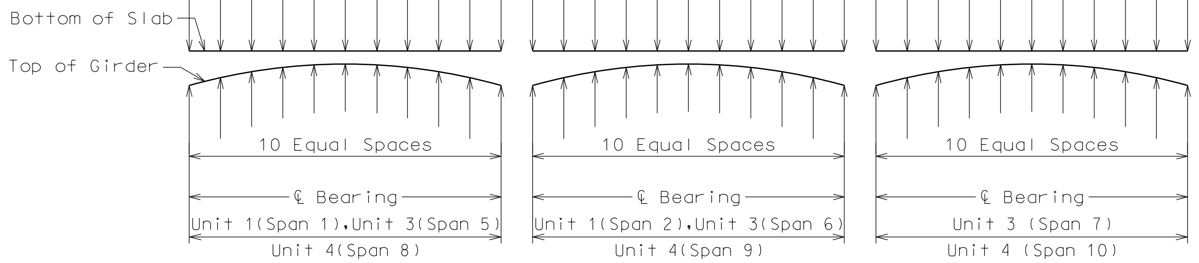
(Unit 1) Girders 1 & 2	0"	5/16"	1/2"	11/16"	3/4"	3/4"	5/8"	7/16"	1/4"	1/16"	0"	1/16"	1/4"	7/16"	5/8"	3/4"	3/4"	11/16"	9/16"	5/16"	0"										
(Unit 3) Girders 1 & 2	0"	3/8"	5/8"	13/16"	15/16"	15/16"	13/16"	5/8"	3/8"	3/16"	0"	-1/16"	0"	1/8"	3/16"	3/16"	3/16"	1/8"	0"	-1/16"	0"	3/16"	3/8"	5/8"	13/16"	15/16"	15/16"	13/16"	5/8"	3/8"	0"
(Unit 4) Girders 1 & 2	0"	3/8"	5/8"	13/16"	15/16"	15/16"	13/16"	5/8"	3/8"	3/16"	0"	-1/16"	0"	1/8"	3/16"	3/16"	3/16"	1/8"	0"	-1/16"	0"	3/16"	3/8"	5/8"	13/16"	15/16"	15/16"	13/16"	5/8"	3/8"	0"



DEAD LOAD DEFLECTION - UNITS NO. 1, 3 & 4✓

Notes: Dead load deflection includes weight of concrete slab and barrier curbs.✓

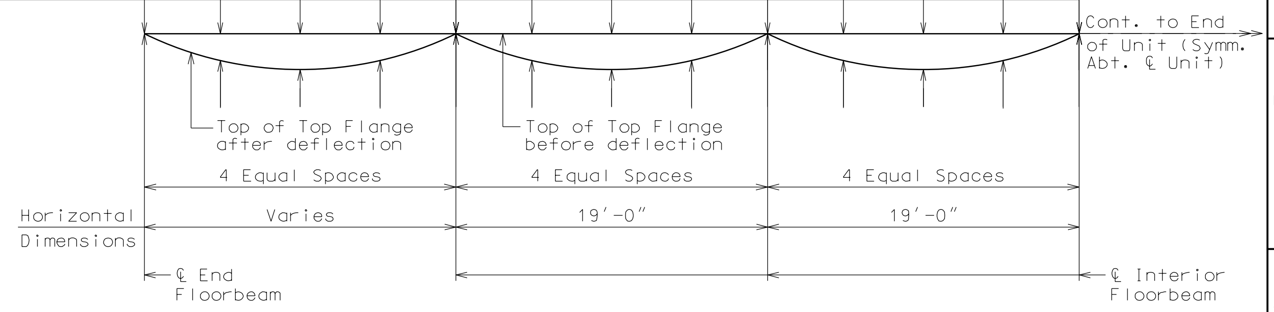
(Unit 1) Girders 1 & 2	4 9/16"	4 7/16"	4 1/8"	2 15/16"	2 13/16"	2 1/2"	2 15/16"	2 13/16"	2 9/16"	1 13/16"	13/16"	13/16"	1 7/8"	2 9/16"	2 13/16"	3"	2 9/16"	2 7/8"	3 1/16"	4 1/4"	4 1/2"	4 11/16"											
(Unit 3) Girders 1 & 2	4 1/8"	4 1/16"	3 5/16"	2 13/16"	2 13/16"	2 11/16"	2 3/4"	3 1/4"	3 13/16"	3 3/16"	2 1/4"	2 1/4"	3 3/16"	3 15/16"	4"	4 1/16"	4"	4 3/16"	4 1/4"	4 1/4"	3 11/16"	2 13/16"	2 13/16"	3 3/4"	4 7/16"	3 7/8"	3 7/16"	3 5/16"	3 1/2"	3 1/2"	4 1/16"	4 13/16"	4 13/16"
(Unit 4) Girders 1 & 2	4 15/16"	4 7/8"	4 1/8"	3 9/16"	3 9/16"	3 3/8"	3 7/16"	3 15/16"	4 7/16"	3 13/16"	2 13/16"	2 13/16"	3 13/16"	4 9/16"	4 5/8"	4 11/16"	4 11/16"	4 13/16"	4 15/16"	5"	4 3/8"	3 9/16"	3 9/16"	4 5/8"	5 1/2"	5 1/16"	4 3/4"	4 13/16"	5 1/8"	5 5/16"	6"	6 15/16"	7 1/8"



ESTIMATED HAUNCH - UNITS NO. 1, 3 & 4✓

(Field Verify)✓

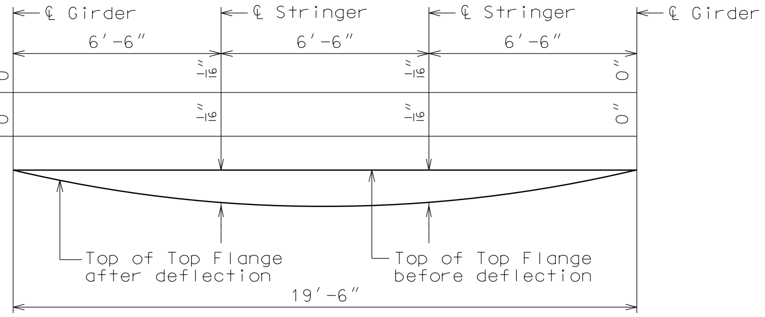
Approach Stringers	0"	0"	1/16"	0"	0"	0"	0"	0"	0"	0"	0"	0"	0"



STRINGER DEAD LOAD DEFLECTION - UNITS NO. 1, 3 & 4✓

Notes: Dead load deflection includes weight of concrete slab. Local deflections have been shown. Deflections are additive to the local floorbeam deflections and girder deflections. Staged construction effects have not been included in the deflections shown.✓

End Floorbeam	0"	1/16"	1/16"	0"
Interior Floorbeam	0"	1/16"	1/16"	0"


℄ Girder
℄ Stringer
℄ Stringer
℄ Girder
6'-6"
6'-6"
6'-6"
Top of Top Flange after deflection
Top of Top Flange before deflection
19'-6"

FLOORBEAM DEAD LOAD DEFLECTION - UNITS NO 1, 3 & 4✓

Notes: Dead load deflection includes weight of concrete slab. Local deflections have been shown. Deflections are additive to the girder deflections. Staged construction effects have not been included in the deflections shown.✓

Theoretical Bottom of Slab Elevations at ℄ of Girder✓ (Prior to Forming for Slab) ✳✳✓

Unit 1		Span No. 1 (131'-8¼" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	934.09	934.76	935.42	936.08	936.72	937.36	938.00	938.62	939.25	939.88	940.51
		Span No. 2 (132'-1⅛" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	940.51	941.16	941.82	942.47	943.13	943.78	944.43	945.06	945.69	946.31	946.93
Unit 3		Span No. 5 (132'-2⅛" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	946.90	946.29	945.67	945.04	944.41	943.76	943.11	942.45	941.79	941.13	940.47
		Span No. 6 (133'-0⅛" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	940.47	939.82	939.18	938.54	937.90	937.26	936.61	935.96	935.30	934.65	934.01
		Span No. 7 (132'-2⅝" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	934.01	933.38	932.76	932.14	931.51	930.87	930.23	929.58	928.92	928.25	927.58
Unit 4		Span No. 8 (132'-1½" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	927.50	926.89	926.27	925.65	925.01	924.37	923.72	923.06	922.40	921.74	921.08
		Span No. 9 (133'-0⅛" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	921.08	920.43	919.79	919.15	918.51	917.86	917.21	916.56	915.91	915.26	914.61
		Span No. 10 (131'-9¼" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	914.61	913.99	913.38	912.77	912.15	911.52	910.89	910.25	909.60	908.94	908.28

✳✳ Elevations are based on a constant slab thickness of 8" and include allowance for theoretical dead load deflections for staged construction due to weight of slab and barrier curb.✓

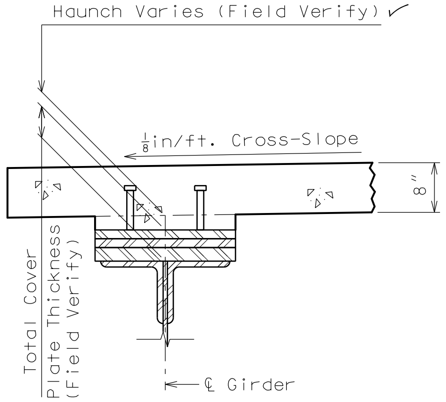
Notes:
No payment will be made for any adjustment in forming or additional concrete required for variation in haunching.✓

Span Lengths are Horizontal Dimensions Based on Survey Data.✓

Total Top Cover Plate Thickness (in.)✓

Unit 1		Span No. 1 (131'-8¼" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	0.000	0.000	0.000	1.000	1.000	1.000	0.500	0.500	0.500	1.000	2.000
		Span No. 2 (132'-1⅛" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	2.000	1.000	0.500	0.500	0.500	1.000	1.000	1.000	0.000	0.000	0.000
Unit 3		Span No. 5 (132'-2⅛" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	0.000	0.000	0.625	1.125	1.125	1.125	1.125	0.625	0.000	0.625	1.625
		Span No. 6 (133'-0⅛" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	1.625	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	1.625
		Span No. 7 (132'-2⅝" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	1.625	0.625	0.000	0.625	1.125	1.125	1.125	1.125	0.625	0.000	0.000
Unit 4		Span No. 8 (132'-1½" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	0.000	0.000	0.625	1.125	1.125	1.125	1.125	0.625	0.000	0.625	1.625
		Span No. 9 (133'-0⅛" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	1.625	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625	1.625
		Span No. 10 (131'-9¼" ℄ Brg - ℄ Brg.)										
		℄ Brg.	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	℄ Brg.
	Girders 1 & 2	1.625	0.625	0.000	0.625	1.125	1.125	1.125	1.125	0.625	0.000	0.000

Span Lengths are Horizontal Dimensions Based on Survey Data.✓


Haunch Varies (Field Verify)✓
⅛in/ft. Cross-Slope
8"
Total Cover Plate Thickness (Field Verify)
℄ Girder

HAUNCH DETAIL - UNITS NO. 1,3 & 4✓

DEAD LOAD DEFLECTION AND SLAB ELEVATIONS - UNIT NO. 1, 3 & 4✓

Detailed April 2009✓
Checked April 2009✓

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

Sheet No. 33 of 57✓

FINAL PLANS✓
DATE PREPARED 8/23/2012✓
ROUTE 136✓ STATE MO✓
DISTRICT BR✓ SHEET NO. 33✓
COUNTY ATCHISON✓
JOB NO. J1P2161✓
CONTRACT ID. 090724-101✓
PROJECT NO. ARRA-136-1(59)✓
BRIDGE NO. L00982✓

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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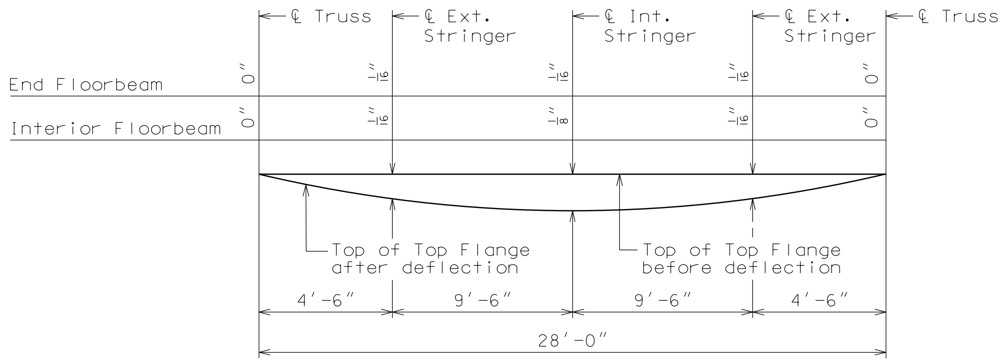

℄ Truss
℄ Ext. Stringer
℄ Int. Stringer
℄ Ext. Stringer
℄ Truss
End Floorbeam 0" 1/16" 1/16" 1/16" 0"
Interior Floorbeam 0" 1/16" 1/8" 1/16" 0"
Top of Top Flange after deflection
Top of Top Flange before deflection
4'-6" 9'-6" 9'-6" 4'-6"
28'-0"

FLOORBEAM DEAD LOAD DEFLECTION - UNIT NO. 2✓

Notes: Dead load deflection includes weight of concrete slab and barrier curbs.
The barrier weight has been included in the exterior stringers deflections only.
Local deflections have been shown. Deflections are additive to the truss deflections.

Unit 2✓														
		Span No. 3 (419'-10 3/4" ℄ Brg - ℄ Brg.)												
		L0	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12
	Trusses 1 & 2	947.11	948.74	950.12	951.27	952.16	952.80	953.19	953.44	953.63	953.77	953.86	953.91	953.91
		Span No. 4 (419'-10 5/8" ℄ Brg - ℄ Brg.)												
		L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24
	Trusses 1 & 2	953.91	953.91	953.86	953.77	953.63	953.44	953.18	952.78	952.13	951.24	950.10	948.71	947.08

Theoretical Bottom of Slab Elevations at ℄ of Floorbeam & ℄ Bridge✓
(Prior to Forming for Slab) ✻✻

✻✻ Elevations are based on a constant slab thickness of 7 1/2" and include allowance for theoretical dead load deflections for staged construction due to weight of slab and barrier curb.

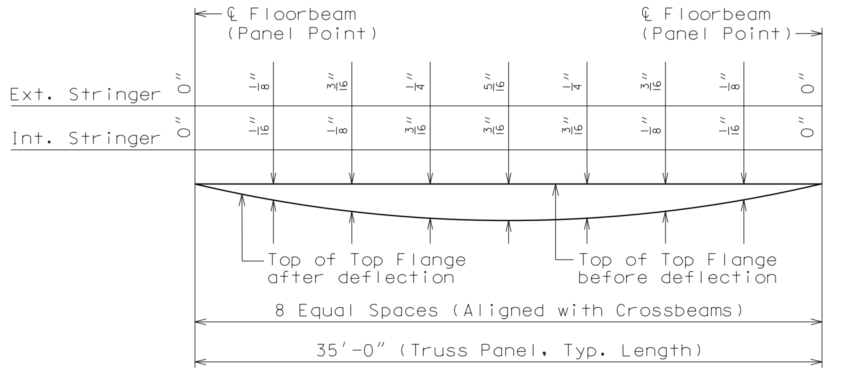
Notes:✓
No payment will be made for any adjustment in forming or additional concrete required for variation in haunching.

Span Lengths are Horizontal Dimensions based on Survey Data.

FINAL PLANS✓
DATE PREPARED
8/23/2012✓
ROUTE 136✓
STATE MO✓
DISTRICT BR✓
SHEET NO. 34✓
COUNTY ATCHISON✓
JOB NO. J1P2161✓
CONTRACT ID. 090724-101✓
PROJECT NO. ARRA-136-1(59)✓
BRIDGE NO. L00982✓

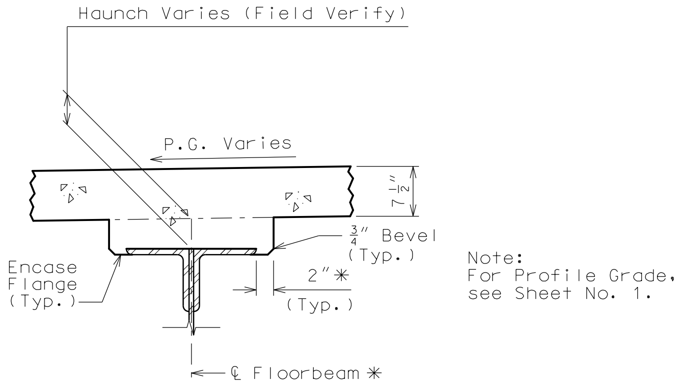
DESCRIPTION
DATE

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


℄ Floorbeam (Panel Point)
℄ Floorbeam (Panel Point)
Ext. Stringer 0" 1/8" 3/16" 1/4" 5/16" 1/4" 3/16" 1/8" 0"
Int. Stringer 0" 1/16" 1/8" 3/16" 3/16" 3/16" 1/8" 1/16" 0"
Top of Top Flange after deflection
Top of Top Flange before deflection
8 Equal Spaces (Aligned with Crossbeams)
35'-0" (Truss Panel, Typ. Length)

STRINGER DEAD LOAD DEFLECTION - UNIT NO. 2✓

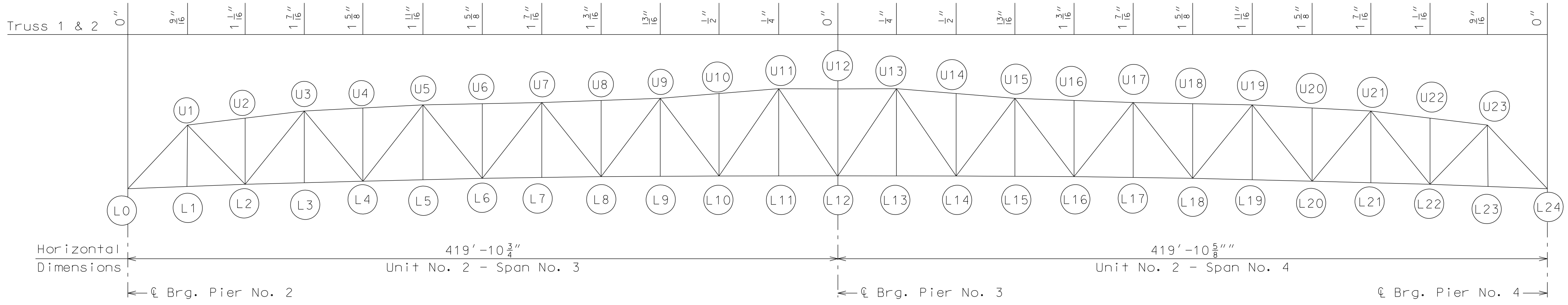
Notes: Dead load deflection includes weight of concrete slab and barrier curbs.
Local defelctions have been shown. Deflections are additive to the truss deflections and local floorbeam deflections.



Note:
For Profile Grade, see Sheet No. 1.

HAUNCH DETAIL - UNIT NO. 2✓

✻ Extend Haunch to bottom of Top Flange of Crossbeams as well as at all Floorbeam locations in Unit No. 2.


Truss 1 & 2 0" 9/16" 1 1/16" 1 7/16" 1 5/8" 1 11/16" 1 5/8" 1 7/16" 1 3/16" 13/16" 1/2" 1/4" 0" 1/4" 1/2" 13/16" 1 3/16" 1 7/16" 1 5/8" 1 11/16" 1 5/8" 1 7/16" 1 1/16" 9/16" 0"
U1 U2 U3 U4 U5 U6 U7 U8 U9 U10 U11 U12 U13 U14 U15 U16 U17 U18 U19 U20 U21 U22 U23
L0 L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L16 L17 L18 L19 L20 L21 L22 L23 L24
Horizontal Dimensions
419'-10 3/4"
Unit No. 2 - Span No. 3
419'-10 5/8""
Unit No. 2 - Span No. 4
℄ Brg. Pier No. 2
℄ Brg. Pier No. 3
℄ Brg. Pier No. 4

TRUSS DEAD LOAD DEFLECTION - UNIT NO. 2✓

Notes: Dead load deflection includes weight of concrete slab and barrier curbs.
Staged construction effects have been included in the deflections shown.

DEAD LOAD DEFLECTION AND SLAB ELEVATIONS - UNIT NO. 2✓

Detailed April 2009
Checked April 2009

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

Sheet No. 34✓ of 57✓

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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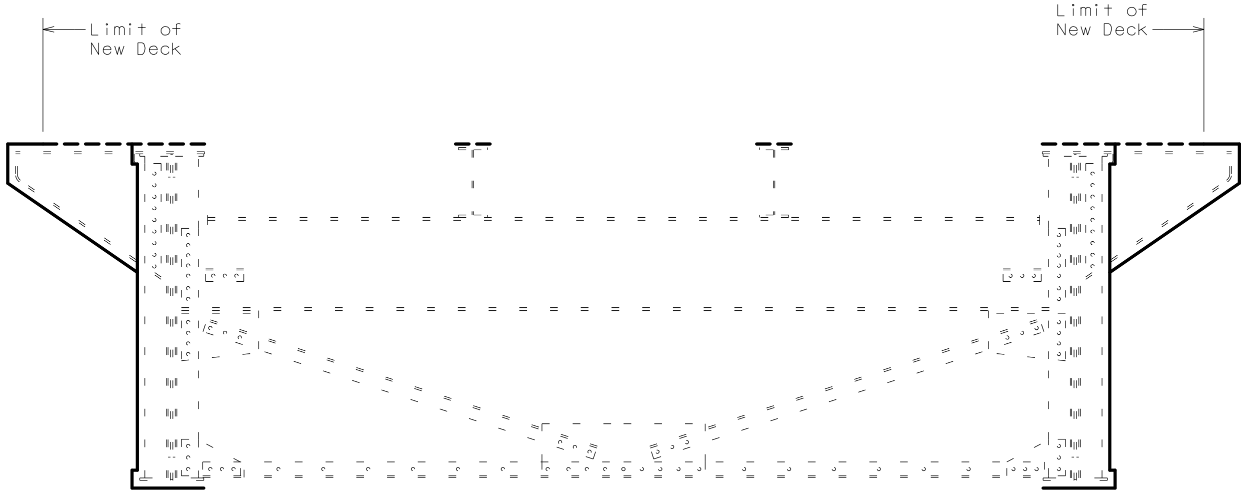
——— Limit of Surface Preparation for Recoating Structural Steel and Repaint with System G (Gray).

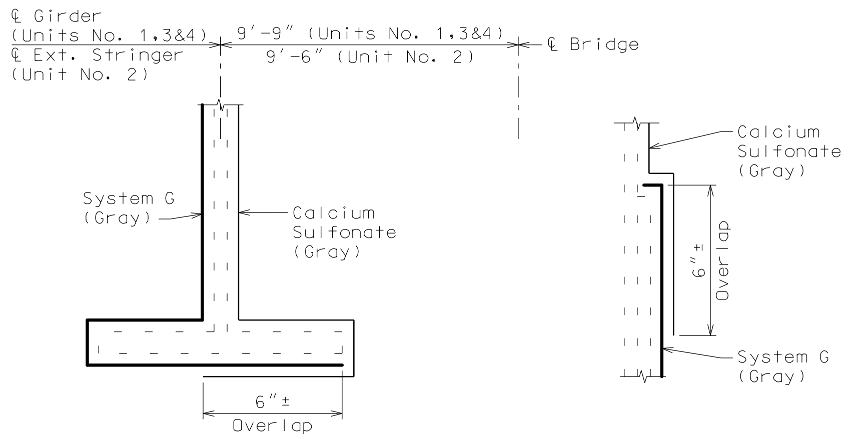
- - - - Limit of Surface Preparation for Recoating Structural Steel and coating with zinc rich primer prior to deck placement.

Remaining Structural Steel shall be prepared and overcoated with Calcium Sulfonate (Gray).



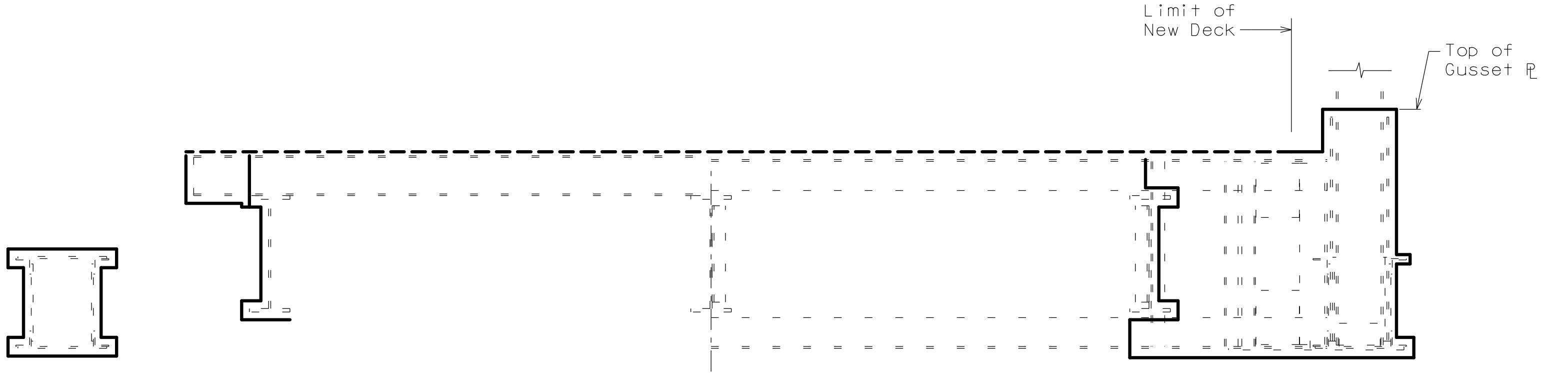
SECTION THRU UNITS NO. 1, 3 & 4

(Deck Not Shown for Clarity)



BOTTOM FLANGE EXT. GIRDER OR STRINGER **OTHER LOCATIONS**

PAINTING SYSTEM OVERLAP DETAIL



HALF SECTION NEAR MID-PANEL **HALF SECTION NEAR FLOORBEAM**

SECTION THRU UNIT NO. 2

(Deck Not Shown for Clarity)

Notes:

Approach Spans (Units No. 1, 3 & 4):

Prepare the exterior face of the girders, to the limits shown, to include the support brackets, in accordance with the requirements of Sec 1081 for Surface Preparation for Recoating Structural Steel and repaint with System G (Gray).

Additionally, all structural steel within 15' of the expansion joints at the East and West Abutments and at Pier Nos. 2 and 4 and 15' each side of Pier No. 7 shall be prepared in accordance with Sec 1081 for Surface Preparation for Recoating Structural Steel and repainted with System G (Gray).

Through Truss Spans (Unit No. 2):

Prepare the truss and floor system below the top of the bottom gusset plates and outside of the exterior stringer to the limits shown in accordance with the requirements of Sec 1081 for Surface Preparation for Recoating Structural Steel and repaint with System G (Gray). This area shall include all interior surfaces of the bottom chord as well as the surfaces of the verticals, diagonals and gusset plates inside each lower truss joint.

Additionally, all structural steel within 15' of the expansion joints at Piers No. 2 and 4 and within 15' to each side of the expansion joints at panel point L4, L8, L16 and L20 shall be prepared in accordance with Sec 1081 for Surface Preparation for Recoating Structural Steel and repainted with System G (Gray).

Structural Steel Repairs:

All new material used to complete structural steel repairs as detailed in these plans shall be coated with System G (Gray).

All faces of existing structural steel exposed during the repairs as detailed in these plans shall be cleaned of all loose material by the best method available and as directed by the engineer and coated with zinc rich primer prior to being reassembled.

All existing structural steel not coated with System G shall be treated with a rust penetrating sealer where needed and a prime coat and top coat of Calcium Sulfonate (Gray).

See General Notes and Missouri Standard Specifications for additional details of System G and Calcium Sulfonate coatings.

PAINTING LIMIT DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 35 of 57

FINAL PLANS
DATE PREPARED 8/23/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 35
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION
DATE

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

MoDOT

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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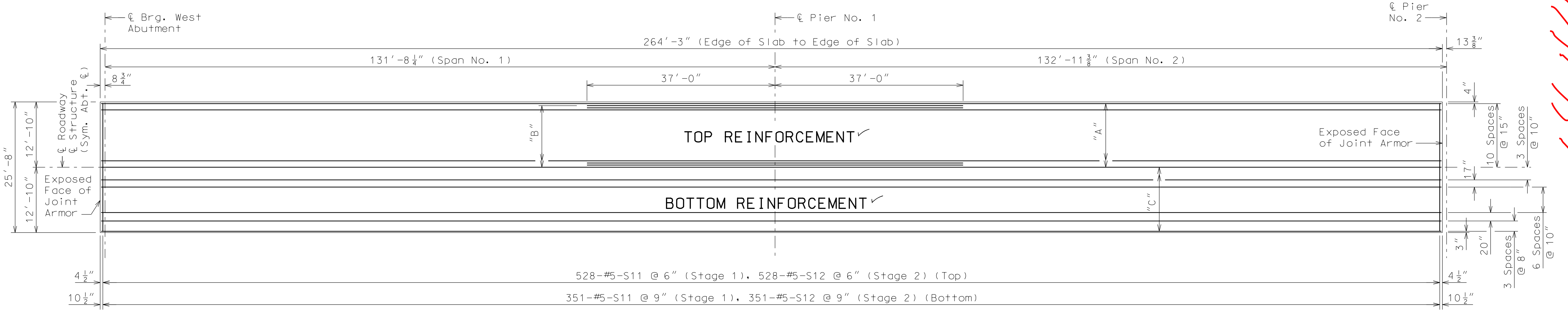
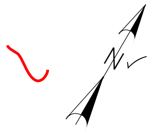
FINAL PLANS
DATE PREPARED 8/23/2012
ROUTE 136 STATE MO
DISTRICT BR SHEET NO. 36
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

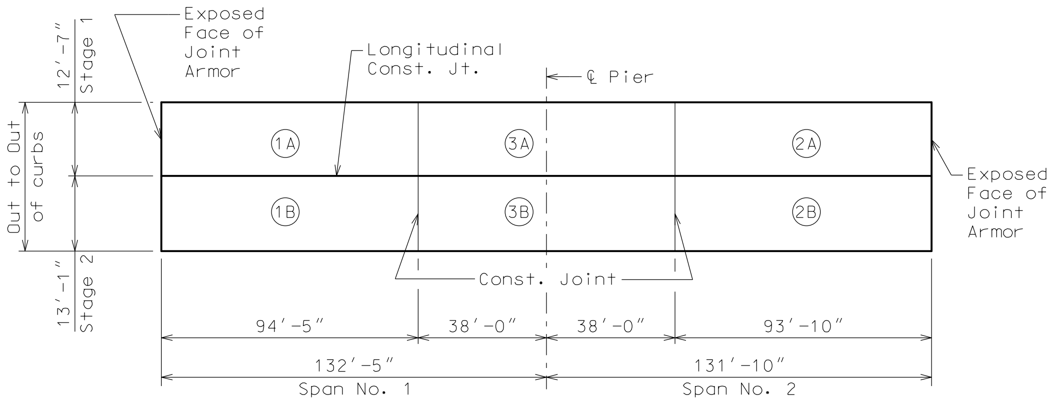


PLAN - UNIT NO. 1

Construction Joints not shown for clarity, see Slab Pouring Sequence.

Longitudinal Slab Reinforcing		
"A"	21-#5-S14	Spa. as Shown 5 Units @ 55'-5" Min. Lap = 3'-3"
"B"	40-#6-S15 and 40-#6-S16	@ 5" Between #5-S14 Alternate Splices Min. Lap = 3'-10"
"C"	29-#5-S13	Spa. as Shown 5 Units @ 54'-11" Min. Lap = 2'-7"





<table>
<tr><th rowspan="2"></th><th colspan="3">Sequence of Pours</th><th colspan="2">Min. rate of pour cu. yds./hr.</th></tr>
<tr><th colspan="3">Direction</th><th>With retarder</th><th>No retarder</th></tr>
<tr><td rowspan="2">Basic sequence</td><td>1</td><td>2</td><td>3</td><td rowspan="2">25</td><td rowspan="2">25</td></tr>
<tr><td colspan="3">Either direction</td></tr>
<tr><td colspan="6">Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.</td></tr>
<tr><td rowspan="2">Alternate "A" pours</td><td>1</td><td colspan="2">3 + 2</td><td rowspan="2">25</td><td rowspan="2">25</td></tr>
<tr><td>End to 3</td><td colspan="2">1 to End</td></tr>
<tr><td rowspan="2">Alternate "B" pours</td><td colspan="3">1 + 3 + 2</td><td rowspan="2">25</td><td rowspan="2">25</td></tr>
<tr><td colspan="3">End to End</td></tr>
</table>

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE - UNIT NO. 1

Notes:
The contractor shall use a mechanical bar splice for #5-S11 & #5-S12 bars at the specified location during Stage 2 Construction. 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 of any additional bar lengths required for the mechanical bar splices. Mechanical bar splices shall be in accordance with Sec 706.

For details of Strip Seal at the West Abutment, see Sheet No. 41.

For details of Strip Seal at Pier No. 7, see Sheet No. 44.

For details of Slab Drains, see Sheet No. 45 & 46.

For Typical Section, see Sheet No. 40.

All dimensions are horizontal.
Longitudinal dimensions are based on 2 1/2" expansion gap at 60° near the West Abutment and Pier No. 2.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the strip seal expansion joint.

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

PART PLAN OF SLAB SHOWING REINFORCEMENT - UNIT NO. 1

Detailed April 2009
Checked April 2009

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

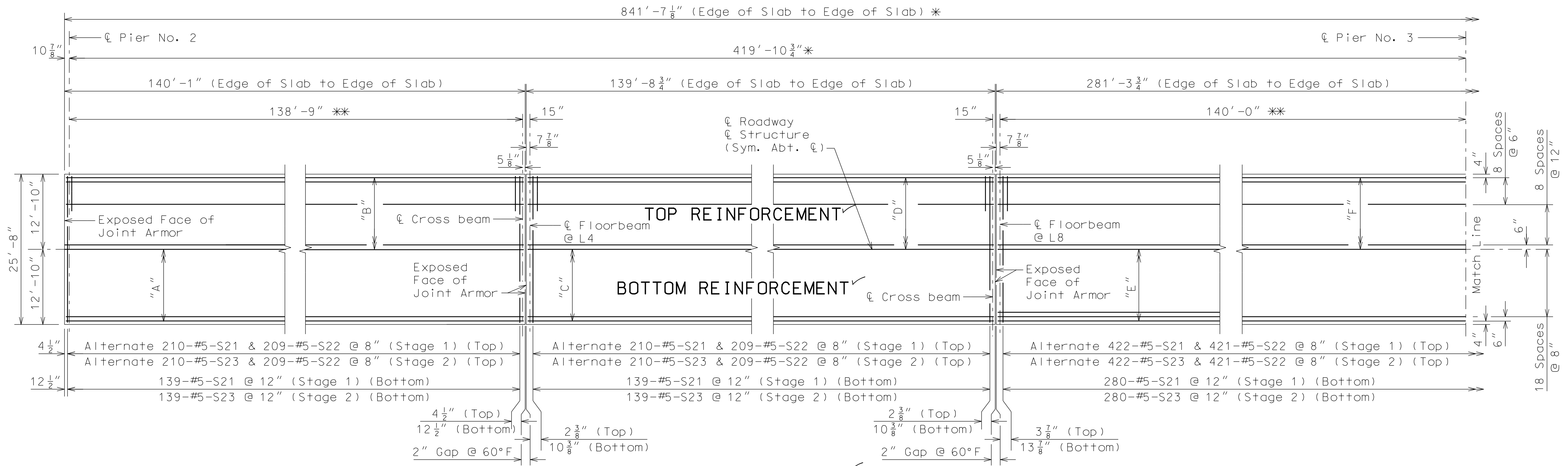
REV.

FINAL PLANS

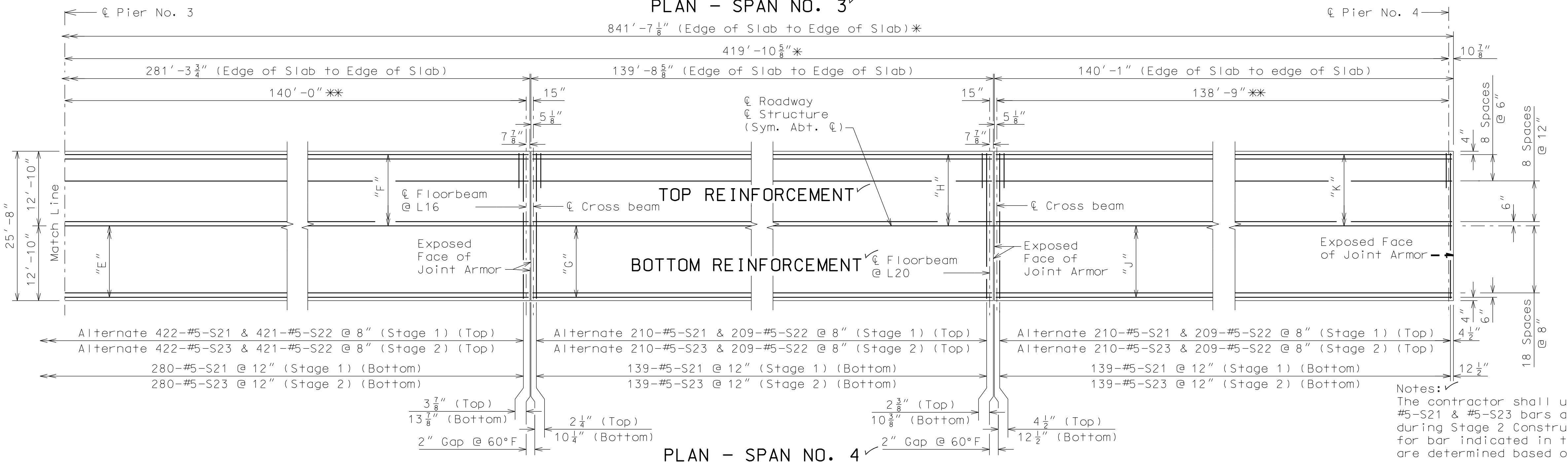
DATE PREPARED	
8/24/2012	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 37
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID. 090724-101	
PROJECT NO. ARRA-136-1(59)	
BRIDGE NO. L00982	

DESCRIPTION

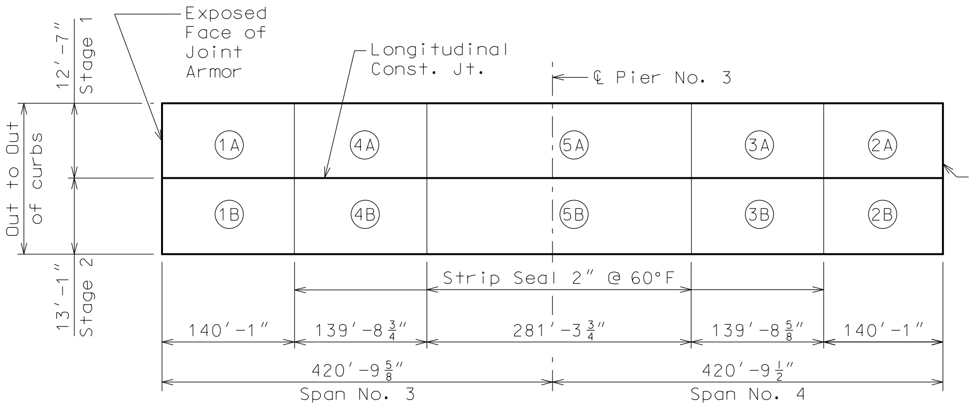
DATE


841′-7⅛″ (Edge of Slab to Edge of Slab) ✳
℄ Pier No. 2
℄ Pier No. 3
10⅞″
419′-10¾″✳
140′-1″ (Edge of Slab to Edge of Slab)
139′-8¾″ (Edge of Slab to Edge of Slab)
281′-3¾″ (Edge of Slab to Edge of Slab)
138′-9″ ✳✳
15″
15″
140′-0″ ✳✳
5⅛″
7⅞″
5⅛″
7⅞″
℄ Roadway
℄ Structure
(Sym. Abt. ℄)
4″
8 Spaces @ 6″
8 Spaces @ 12″
6″
Match Line
18 Spaces @ 8″
4″
6″
12′-10″
25′-8″
12′-10″
Exposed Face of Joint Armor
"B"
℄ Cross beam
℄ Floorbeam @ L4
TOP REINFORCEMENT
"D"
℄ Floorbeam @ L8
"F"
Exposed Face of Joint Armor
"A"
"C"
BOTTOM REINFORCEMENT
℄ Cross beam
Exposed Face of Joint Armor
"E"
4½″
Alternate 210-#5-S21 & 209-#5-S22 @ 8″ (Stage 1) (Top)
Alternate 210-#5-S23 & 209-#5-S22 @ 8″ (Stage 2) (Top)
12½″
139-#5-S21 @ 12″ (Stage 1) (Bottom)
139-#5-S23 @ 12″ (Stage 2) (Bottom)
Alternate 210-#5-S21 & 209-#5-S22 @ 8″ (Stage 1) (Top)
Alternate 210-#5-S23 & 209-#5-S22 @ 8″ (Stage 2) (Top)
139-#5-S21 @ 12″ (Stage 1) (Bottom)
139-#5-S23 @ 12″ (Stage 2) (Bottom)
Alternate 422-#5-S21 & 421-#5-S22 @ 8″ (Stage 1) (Top)
Alternate 422-#5-S23 & 421-#5-S22 @ 8″ (Stage 2) (Top)
280-#5-S21 @ 12″ (Stage 1) (Bottom)
280-#5-S23 @ 12″ (Stage 2) (Bottom)
4½″ (Top)
12½″ (Bottom)
2⅜″ (Top)
10⅜″ (Bottom)
2″ Gap @ 60°F
2⅜″ (Top)
10⅜″ (Bottom)
3⅞″ (Top)
13⅞″ (Bottom)
2″ Gap @ 60°F

PLAN - SPAN NO. 3


℄ Pier No. 3
℄ Pier No. 4
841′-7⅛″ (Edge of Slab to Edge of Slab)✳
419′-10⅝″✳
10⅞″
281′-3¾″ (Edge of Slab to Edge of Slab)
139′-8⅝″ (Edge of Slab to Edge of Slab)
140′-1″ (Edge of Slab to edge of Slab)
140′-0″✳✳
15″
15″
138′-9″✳✳
5⅛″
5⅛″
7⅞″
7⅞″
℄ Roadway
℄ Structure
(Sym. Abt. ℄)
4″
8 Spaces @ 6″
8 Spaces @ 12″
6″
18 Spaces @ 8″
4″
6″
12′-10″
25′-8″
12′-10″
Match Line
"F"
℄ Floorbeam @ L16
℄ Cross beam
TOP REINFORCEMENT
"H"
℄ Cross beam
"K"
"E"
Exposed Face of Joint Armor
"G"
BOTTOM REINFORCEMENT
℄ Floorbeam @ L20
Exposed Face of Joint Armor
"J"
Exposed Face of Joint Armor
Alternate 422-#5-S21 & 421-#5-S22 @ 8″ (Stage 1) (Top)
Alternate 422-#5-S23 & 421-#5-S22 @ 8″ (Stage 2) (Top)
280-#5-S21 @ 12″ (Stage 1) (Bottom)
280-#5-S23 @ 12″ (Stage 2) (Bottom)
Alternate 210-#5-S21 & 209-#5-S22 @ 8″ (Stage 1) (Top)
Alternate 210-#5-S23 & 209-#5-S22 @ 8″ (Stage 2) (Top)
139-#5-S21 @ 12″ (Stage 1) (Bottom)
139-#5-S23 @ 12″ (Stage 2) (Bottom)
Alternate 210-#5-S21 & 209-#5-S22 @ 8″ (Stage 1) (Top)
Alternate 210-#5-S23 & 209-#5-S22 @ 8″ (Stage 2) (Top)
139-#5-S21 @ 12″ (Stage 1) (Bottom)
139-#5-S23 @ 12″ (Stage 2) (Bottom)
4½″
12½″
3⅞″ (Top)
13⅞″ (Bottom)
2¼″ (Top)
10¼″ (Bottom)
2″ Gap @ 60°F
2⅜″ (Top)
10⅜″ (Bottom)
2″ Gap @ 60°F
4½″ (Top)
12½″ (Bottom)

PLAN - SPAN NO. 4



	Sequence of Pours					Min. rate of pour cu. yds./hr.	
	Direction					With retarder	No retarder
Basic sequence	1	2	3	4	5	26	43
	Either direction						
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.							

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE - UNIT NO. 2

✳ - Dimension taken from January 2009 Survey

✳✳ - Dimension taken from As-Built Plans

Longitudinal Slab Reinforcing	
"A"	39-#5-S24 Spa. as Shown 3 Units @ 48′-4″ Min. Lap = 2′-7″
"B"	34-#5-S24 Spa. as Shown 3 Units @ 48′-4″ Min. Lap = 2′-7″
"C"	39-#5-S25 Spa. as Shown 3 Units @ 48′-3″ Min. Lap = 2′-7″
"D"	34-#5-S25 Spa. as Shown 3 Units @ 48′-3″ Min. Lap = 2′-7″
"E"	39-#5-S26 Spa. as Shown 5 Units @ 58′-4″ Min. Lap = 2′-7″
"F"	34-#5-S26 Spa. as Shown 5 Units @ 58′-4″ Min. Lap = 2′-7″
"G"	39-#5-S25 Spa. as Shown 3 Units @ 48′-3″ Min. Lap = 2′-7″
"H"	34-#5-S25 Spa. as Shown 3 Units @ 48′-3″ Min. Lap = 2′-7″
"J"	39-#5-S24 Spa. as Shown 3 Units @ 48′-4″ Min. Lap = 2′-7″
"K"	34-#5-S24 Spa. as Shown 3 Units @ 48′-4″ Min. Lap = 2′-7″

Notes:

The contractor shall use a mechanical bar splice for #5-S21 & #5-S23 bars at the specified location during Stage 2 Construction. The total bar lengths for bar 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.

For details of Strip Seal at Pier No. 2 and 4, see Sheet No. 42.

For details of Strip Seal at Floorbeams L4, L8, L16, and L20 see Sheet No. 43.

For details of Slab Drains, see Sheet No. 45 & 46.

For Typical Section, see Sheet No. 40.

All dimensions are horizontal. Longitudinal dimensions are based on 2 1/2″ expansion gap at 60° at Pier No. 2 and 4, and a 2″ gap at Floorbeams L4, L8, L16, and L20.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1″ from vertical leg of the steel armor at the strip seal expansion joints.

PART PLAN OF SLAB SHOWING REINFORCEMENT - UNIT NO. 2

Detailed April 2009
Checked April 2009

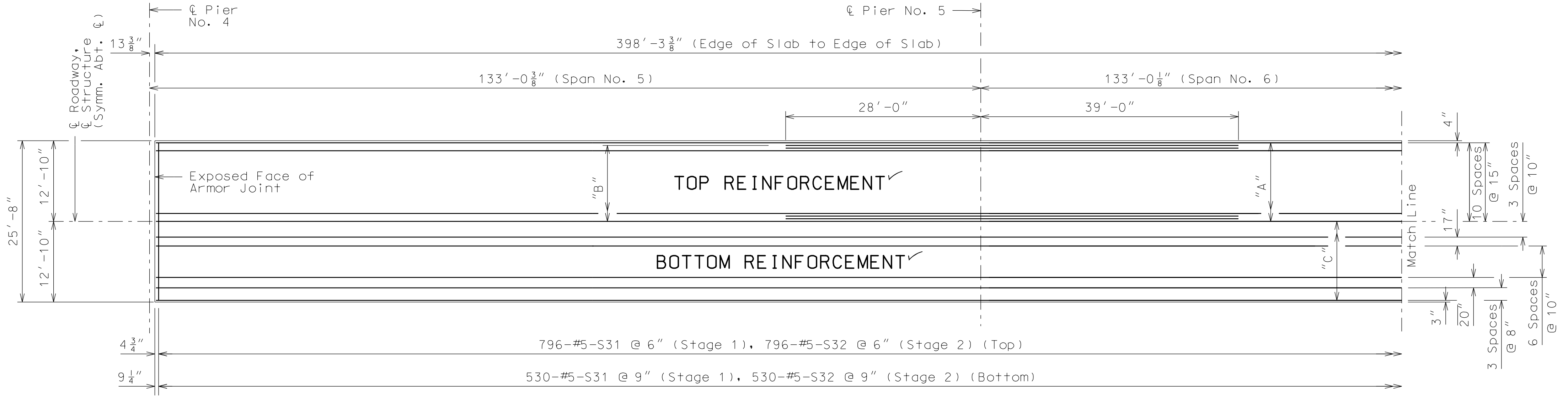
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 37 of 57

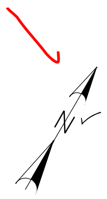
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

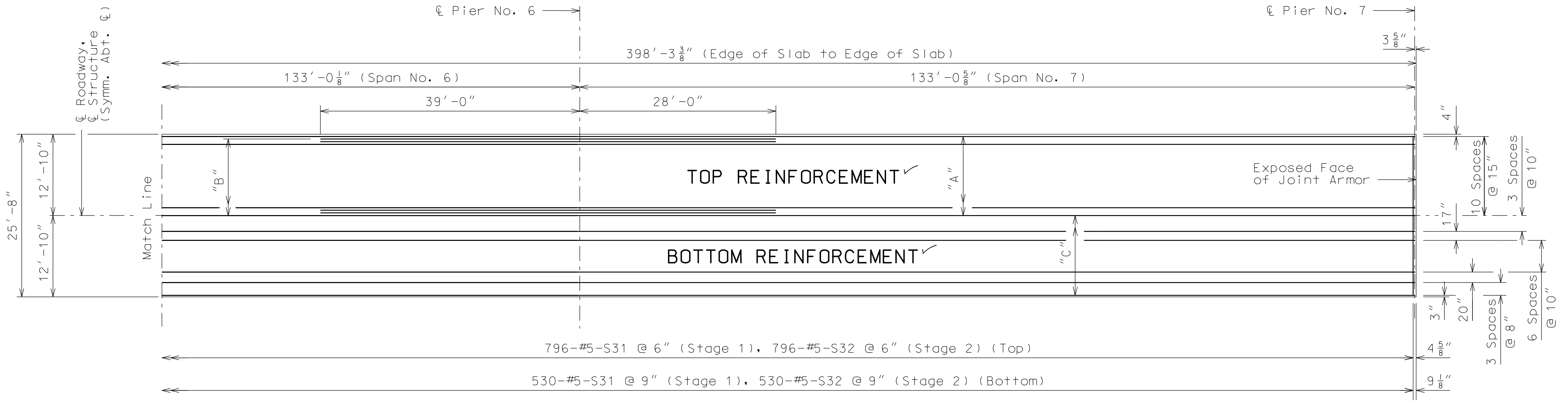
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.



PLAN - UNIT NO. 3

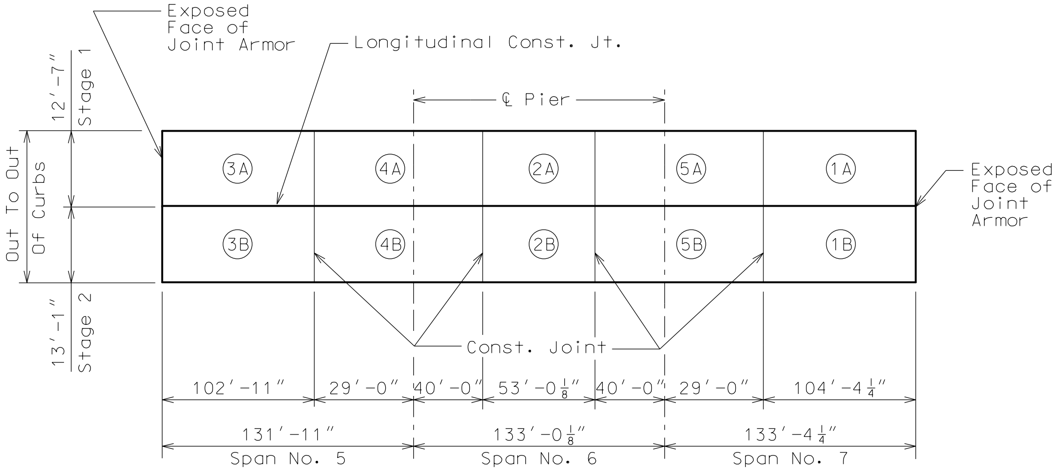




PLAN - UNIT NO. 3

Construction Joints not shown for clarity, see Slab Pouring Sequence.

Longitudinal Slab Reinforcing		
"A"	21-#5-S34	Spa. as Shown 7 Units @ 59'-8" Min. Lap = 3'-3"
"B"	40-#6-S35 and 40-#6-S36	@ 5" Between #5-S34 Alternate Splices Min. Lap = 3'-10"
"C"	29-#5-S33	Spa. as Shown 7 Units @ 59'-1" Min. Lap = 2'-7"



	Sequence of Pours					Min. rate of pour cu. yds./hr.	
	Direction					With retarder	No retarder
Basic sequence	1	2	3	4	5	25	25
	Either direction						
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.							
Alternate "A" pours	1	5 + 2		4 + 3		25	25
	End to 5	1 to 4		2 to End			
Alternate "B" pours	1 + 5 + 2			4 + 3		25	25
	End to 4			2 to End			
Alternate "C" pours	1 + 5 + 2 + 4 + 3					25	25
	End to End						

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE - UNIT NO. 3

Notes:
The contractor shall use a mechanical bar splice for #5-S31 & #5-S32 bars at the specified location during Stage 2 Construction. The total bar lengths for bar 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.

For details of Strip Seal at Pier No. 4, see Sheet No. 42.

For details of Strip Seal at Pier 7, see Sheet No. 44.

For details of Slab Drains, see Sheet No. 46.

For Typical Section, see Sheet No. 40.

All dimensions are horizontal.
Longitudinal dimensions are based on 2 1/2" expansion gap at 60° at Piers No. 4 and 7.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the strip seal expansion joint.

PART PLAN OF SLAB SHOWING REINFORCEMENT - UNIT NO. 3

Detailed April 2009
Checked April 2009

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

Sheet No. 38 of 57

FINAL PLANS
DATE PREPARED
8/24/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 38
COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.
090724-101
PROJECT NO.
ARRA-136-1(59)
BRIDGE NO.
L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

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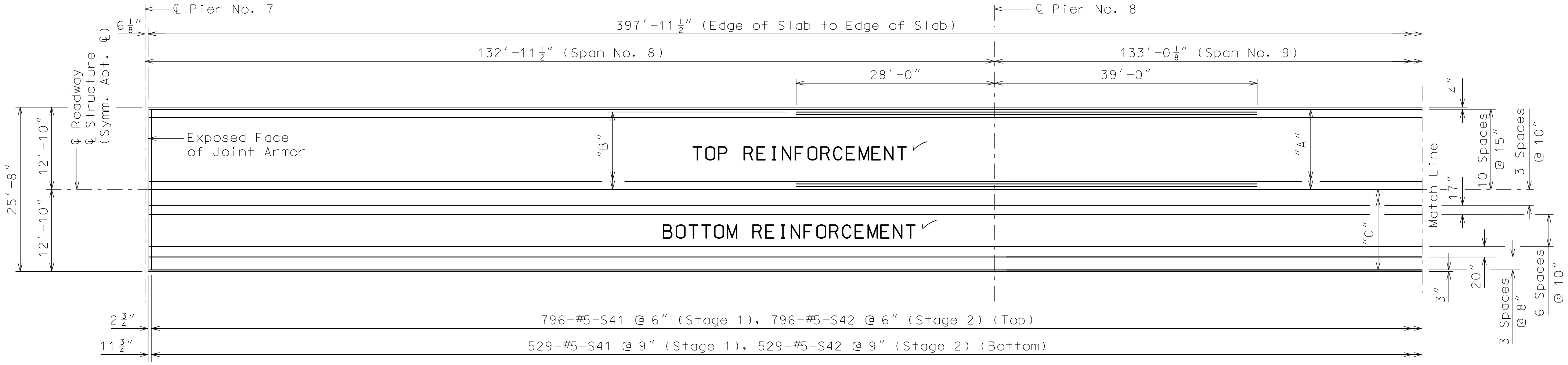
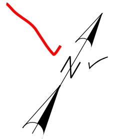
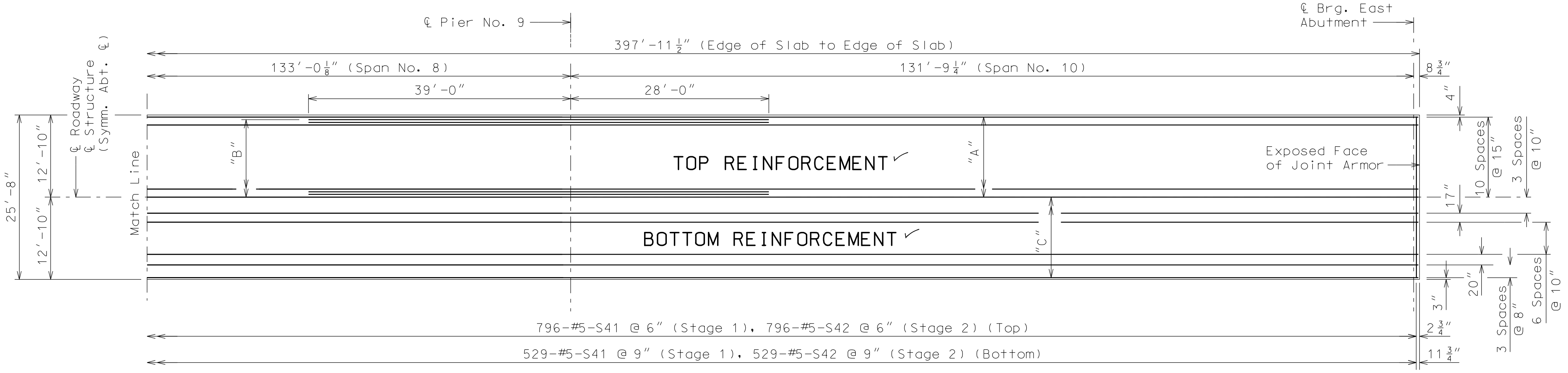


PLAN - UNIT NO. 4

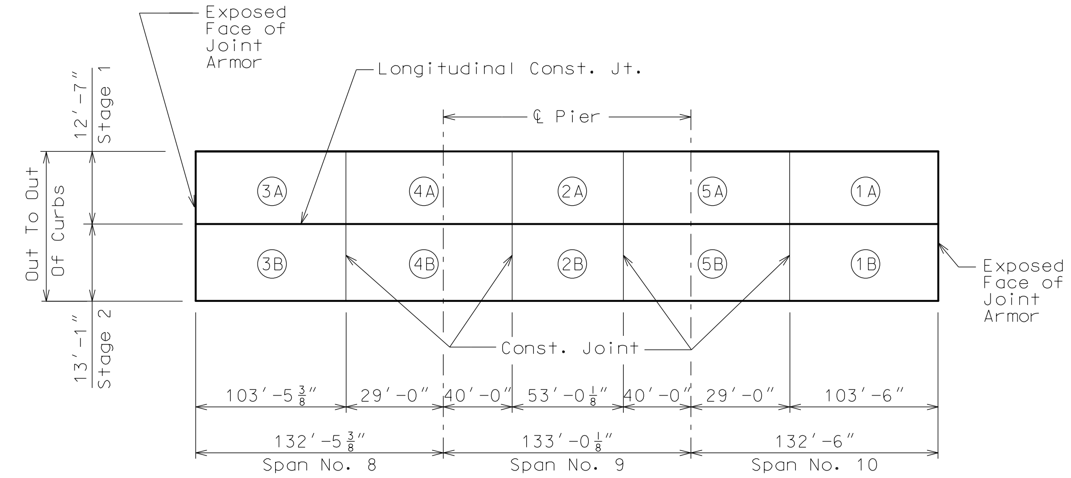




PLAN - UNIT NO. 4

Construction Joints not shown for clarity, see Slab Pouring Sequence.

Longitudinal Slab Reinforcing		
"A"	21-#5-S44	Spa. as Shown 7 Units @ 59′-8″ Min. Lap = 3′-3″
"B"	40-#6-S45 and 40-#6-S46	@ 5″ Between #5-S44 Alternate Splices Min. Lap = 3′-10″
"C"	29-#5-S43	Spa. as Shown 7 Units @ 59′-1″ Min. Lap = 2′-7″



	Sequence of Pours					Min. rate of pour cu. yds./hr.	
	Direction					With retarder	No retarder
Basic sequence	1	2	3	4	5	25	25
	Either direction						
Alternate pours to the basic skip sequence are subject to the approval of the engineer in accordance with Sec 703.							
Alternate "A" pours	1	5 + 2	4 + 3			25	25
	End to 5	1 to 4	2 to End				
Alternate "B" pours	1 + 5 + 2	4 + 3				25	25
	End to 4	2 to End					
Alternate "C" pours	1 + 5 + 2 + 4 + 3					25	25
	End to End						

Note: The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

SLAB POURING SEQUENCE - UNIT NO. 4

Notes:

The contractor shall use a mechanical bar splice for #5-S41 & #5-S42 bars at the specified location during Stage 2 Construction. The total bar lengths for bar 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.

For details of Strip Seal at Pier No. 7, see Sheet No. 44.

For details of Strip Seal at East Abutment, see Sheet No. 41.

For details of Slab Drains, see Sheet No. 46.

For Typical Section, see Sheet No. 40.

All dimensions are horizontal.
Longitudinal dimensions are based on 2 1/2″ expansion gap at 60° at Pier No. 7 and the East Abutment.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1″ from vertical leg of the steel armor at the strip seal expansion joint.

PART PLAN OF SLAB SHOWING REINFORCEMENT - UNIT NO. 4

Detailed April 2009
Checked April 2009

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

Sheet No. 39 of 57

FINAL PLANS
DATE PREPARED 8/24/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 39
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

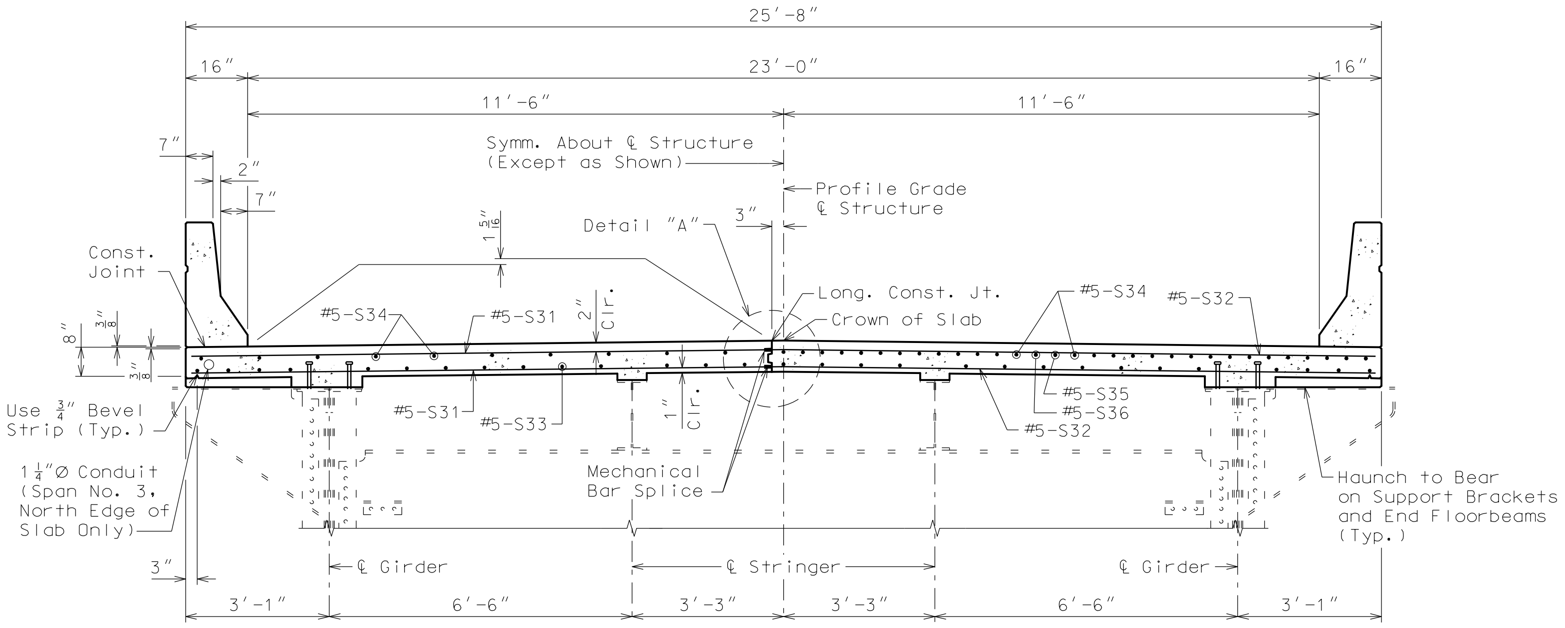
DESCRIPTION
DATE

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

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

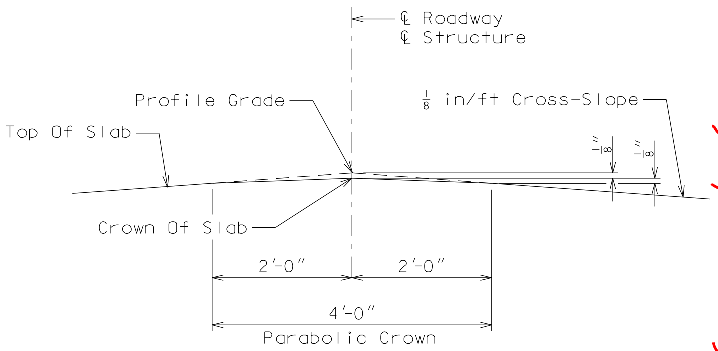
B_L00982_039_J1P2161.DGN 9:33:08 AM 3/29/2013



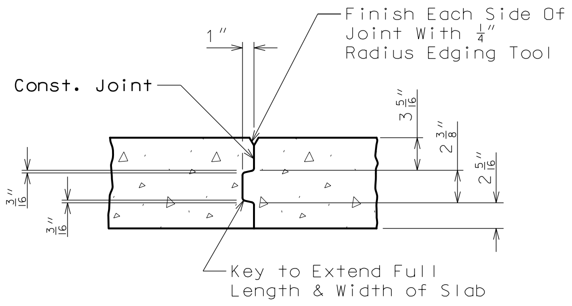
HALF SECTION NEAR ℄ SPAN✓ HALF SECTION NEAR PIER✓

TYPICAL SECTION THRU UNIT NOS. 1, 3 & 4✓

(Unit No. 3 Shown, Units No. 1 & 4 Similar)



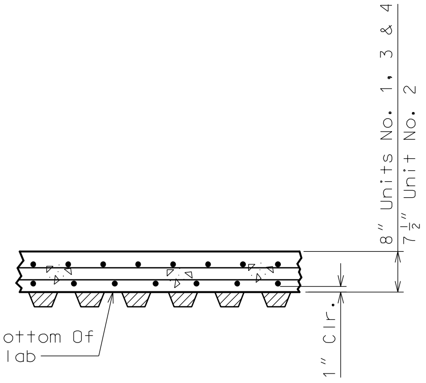
DETAIL "A"✓


1"
Finish Each Side Of Joint With 1/4" Radius Edging Tool
Const. Joint
3 5/16"
2 3/8"
2 5/16"
3/16"
3/16"
Key to Extend Full Length & Width of Slab

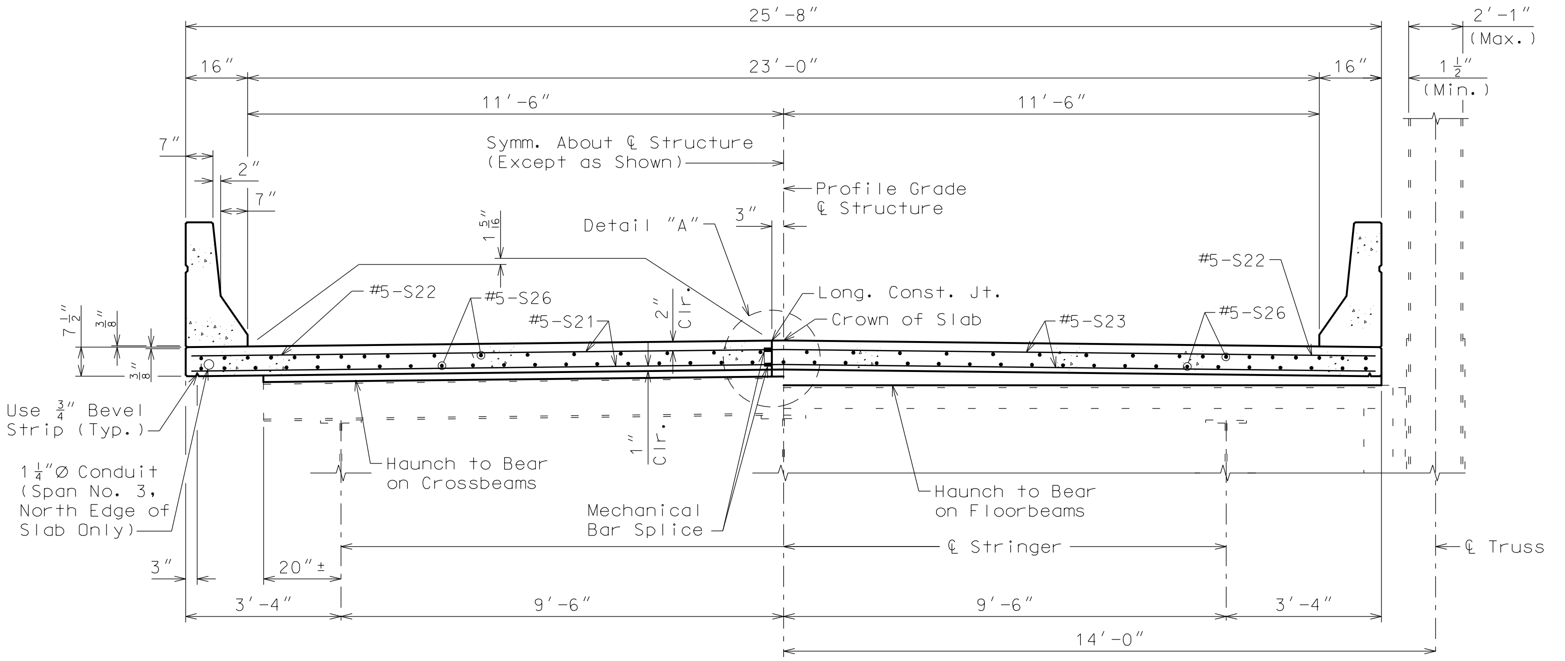
TYPICAL C.I.P. CONST JOINT✓

(Units No. 1, 3 & 4 Only)

(Long. and Transverse Joints)



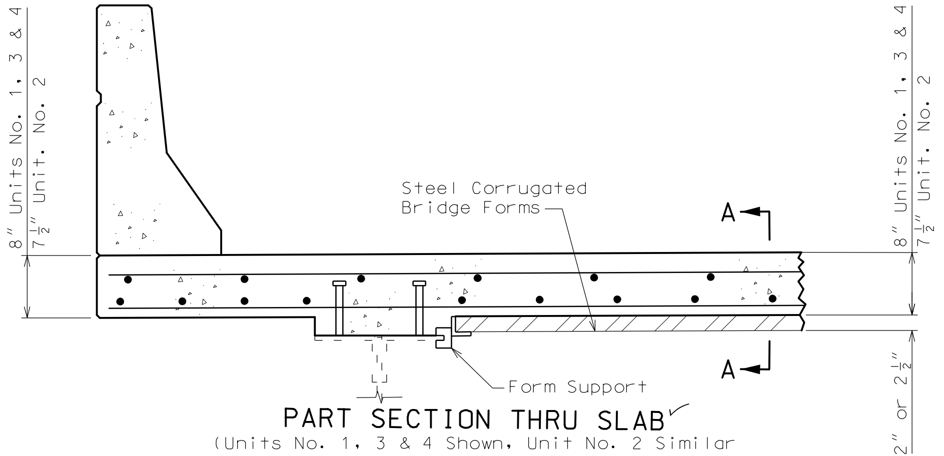
SECTION A-A✓



HALF SECTION NEAR ℄ PANEL✓ HALF SECTION NEAR FLOORBEAM✓

TYPICAL SECTION THRU UNIT NO. 2✓

(Section near Pier No. 3 Shown, remainder of Unit is Similar)



PART SECTION THRU SLAB✓

(Units No. 1, 3 & 4 Shown, Unit No. 2 Similar with Form Direction switched)

Notes:✓

If the contractor elects to use stay-in-place forms, the corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

The stay-in-place forms shall be a minimum of 22 gauge and shall be limited to less than 1/2" of deflection under the weight of the wet concrete and 50 psf construction loading. (See additional notes on Sheet No. 3)

For details and reinforcement of Safety Barrier Curb, see Sheet No. 48 & 49.
For details of Slab Drains, see Sheet No. 45 & 46.
For Part Plan of Slab showing reinforcement and Slab Pouring Sequence, see Sheet No. 36 thru 39.

MISCELLANEOUS SLAB DETAILS AND TYPICAL SECTIONS✓

Detailed April 2009
Checked April 2009

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

Sheet No. 40✓ of 57✓

FINAL PLANS✓

DATE PREPARED	
8/24/2012✓	
ROUTE	STATE
136✓	MO✓
DISTRICT	SHEET NO.
BR✓	40✓

COUNTY
ATCHISON✓
JOB NO.
J1P2161✓
CONTRACT ID.
090724-101✓
PROJECT NO.
ARRA-136-1(59)
BRIDGE NO.
L00982✓

DESCRIPTION
DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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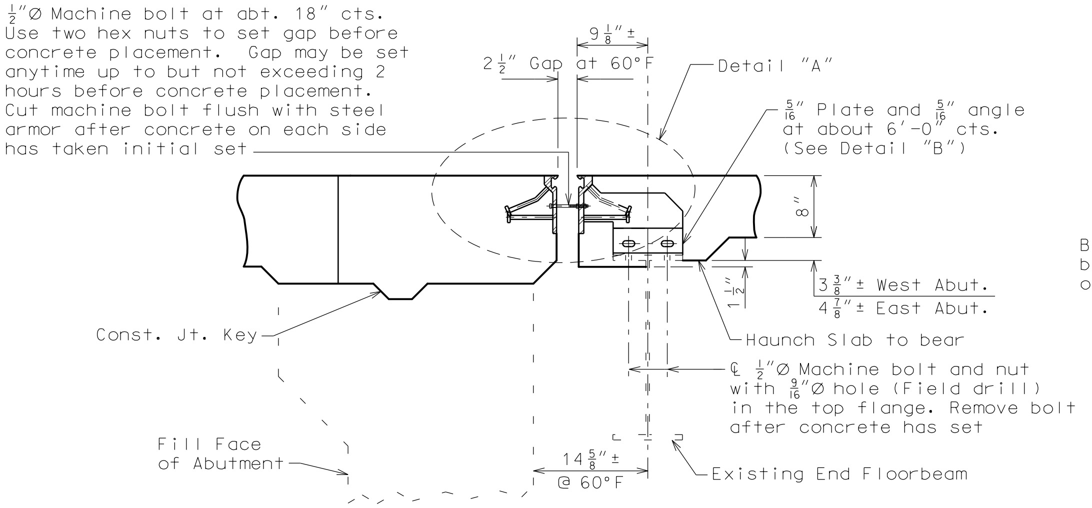
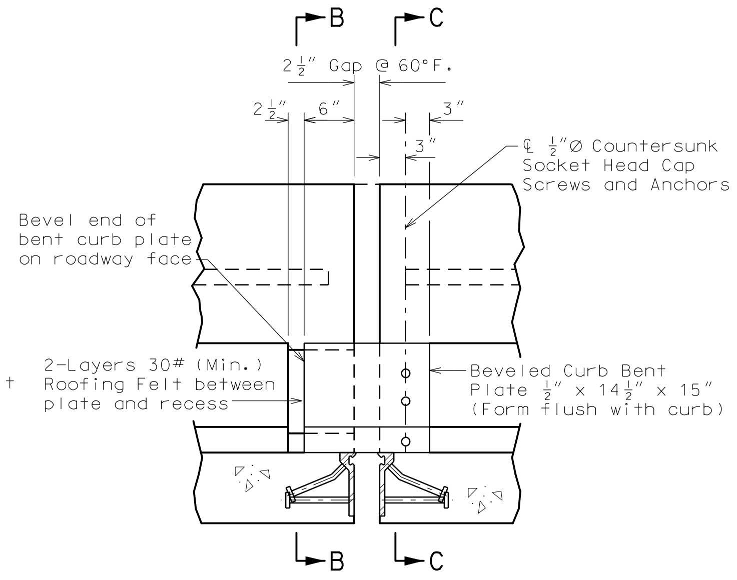
816-360-2700
Certificate of Authority: 000856

REV.


$\frac{1}{2}$"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
9 $\frac{1}{8}$"±
2 $\frac{1}{2}$" Gap at 60°F
Detail "A"
$\frac{5}{16}$" Plate and $\frac{5}{16}$" angle at about 6'-0" cts. (See Detail "B")
8"
3 $\frac{3}{8}$"± West Abut.
4 $\frac{7}{8}$"± East Abut.
1 $\frac{1}{2}$"
Const. Jt. Key
Haunch Slab to bear
℄ $\frac{1}{2}$"Ø Machine bolt and nut with $\frac{9}{16}$"Ø hole (Field drill) in the top flange. Remove bolt after concrete has set
Fill Face of Abutment
14 $\frac{5}{8}$"± @ 60°F
Existing End Floorbeam

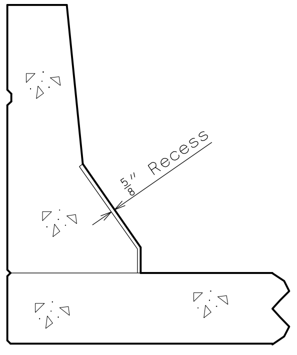
Note: Strip seal gland not shown for clarity.

SECTION A-A

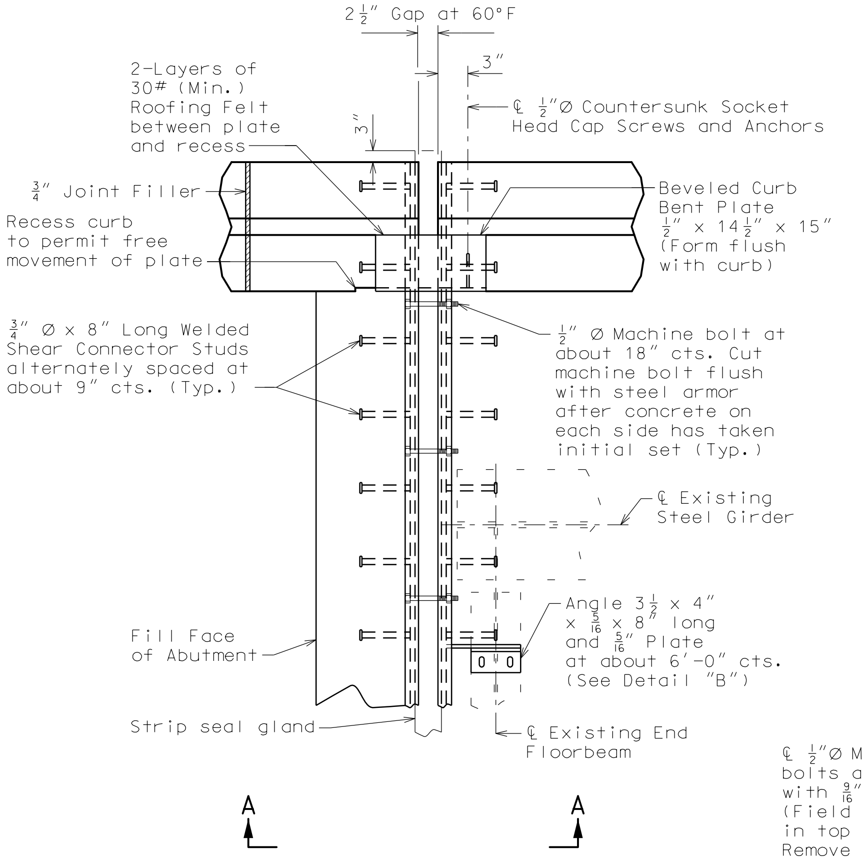

B
C
2 $\frac{1}{2}$" Gap @ 60°F.
2 $\frac{1}{2}$"
6"
3"
3"
℄ $\frac{1}{2}$"Ø Countersunk Socket Head Cap Screws and Anchors
Bevel end of bent curb plate on roadway face
2-Layers 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate $\frac{1}{2}$" x 14 $\frac{1}{2}$" x 15" (Form flush with curb)
B
C

Note: Strip seal gland not shown for clarity.

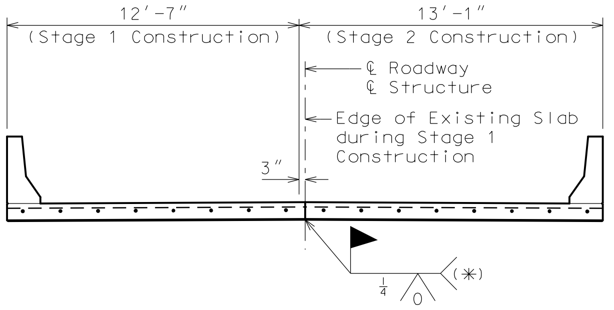
PART ELEVATION OF BARRIER CURB



PART SECTION B-B

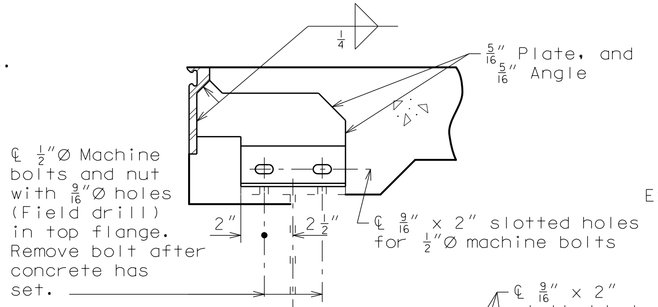

2 $\frac{1}{2}$" Gap at 60°F
3"
3"
2-Layers of 30# (Min.) Roofing Felt between plate and recess
℄ $\frac{1}{2}$"Ø Countersunk Socket Head Cap Screws and Anchors
$\frac{3}{4}$" Joint Filler
Recess curb to permit free movement of plate
Beveled Curb Bent Plate $\frac{1}{2}$" x 14 $\frac{1}{2}$" x 15" (Form flush with curb)
$\frac{3}{4}$" Ø x 8" Long Welded Shear Connector Studs alternately spaced at about 9" cts. (Typ.)
$\frac{1}{2}$" Ø Machine bolt at about 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set (Typ.)
℄ Existing Steel Girder
Angle 3 $\frac{1}{2}$ x 4" x $\frac{5}{16}$ x 8" long and $\frac{5}{16}$" Plate at about 6'-0" cts. (See Detail "B")
Fill Face of Abutment
Strip seal gland
℄ Existing End Floorbeam
A
A

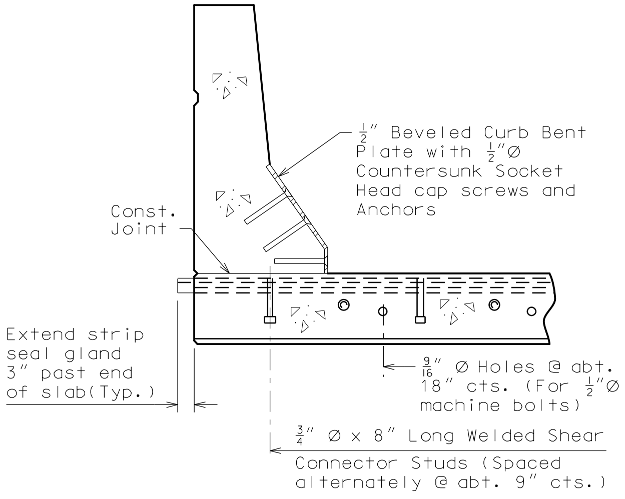
PART PLAN



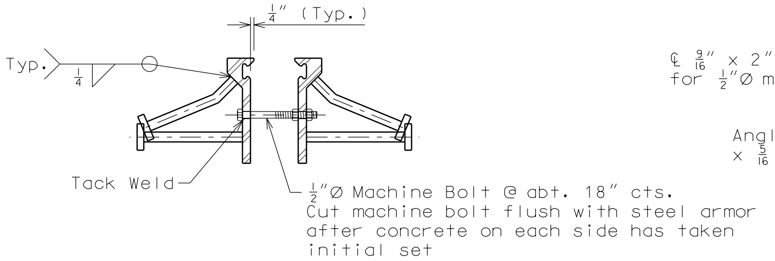
SECTION SHOWING JOINT SPLICE

(*) Weld after steel extrusion for Stage 2 is properly located. Repair galvanizing adjacent to the welds by the zinc alloy stick method. Coat the welds using the same method.

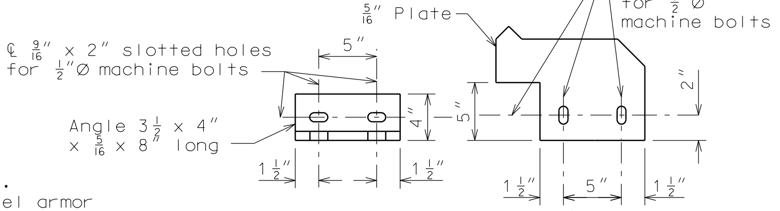

$\frac{1}{4}$
$\frac{5}{16}$" Plate, and $\frac{5}{16}$" Angle
℄ $\frac{1}{2}$"Ø Machine bolts and nut with $\frac{9}{16}$"Ø holes (Field drill) in top flange. Remove bolt after concrete has set.
2"
2 $\frac{1}{2}$"
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts


$\frac{1}{2}$" Beveled Curb Bent Plate with $\frac{1}{2}$"Ø Countersunk Socket Head cap screws and Anchors
Const. Joint
Extend strip seal gland 3" past end of slab(Typ.)
$\frac{9}{16}$" Ø Holes @ abt. 18" cts. (For $\frac{1}{2}$"Ø machine bolts)
$\frac{3}{4}$" Ø x 8" Long Welded Shear Connector Studs (Spaced alternately @ abt. 9" cts.)

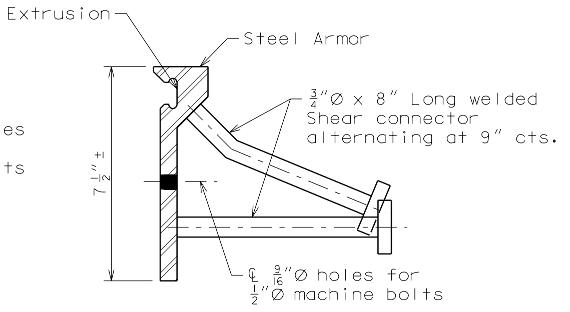
PART SECTION C-C


$\frac{1}{4}$" (Typ.)
Typ.
$\frac{1}{4}$
Tack Weld
$\frac{1}{2}$"Ø Machine Bolt @ abt. 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set

DETAIL "A"


$\frac{5}{16}$" Plate
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts
℄ $\frac{9}{16}$" x 2" slotted holes for $\frac{1}{2}$"Ø machine bolts
Angle 3 $\frac{1}{2}$ x 4" x $\frac{5}{16}$ x 8" long
5"
4"
5"
2"
1 $\frac{1}{2}$"
1 $\frac{1}{2}$"
1 $\frac{1}{2}$"
5"
1 $\frac{1}{2}$"

DETAIL "B"


Extrusion
Steel Armor
$\frac{3}{4}$"Ø x 8" Long welded Shear connector alternating at 9" cts.
7 $\frac{1}{2}$"±
℄ $\frac{9}{16}$"Ø holes for $\frac{1}{2}$"Ø machine bolts

DETAIL OF JOINT ARMOR

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. No gland shall be installed during Stage 1 Construction, the gland shall be installed full width of bridge after the completion of Stage 2 Construction.

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.

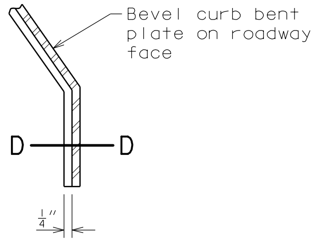
Structural steel for the expansion joint system and curb plate shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from over spray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 3/16" (West Abut.) or 5/16" (East Abut.) for each 10° fall or rise in temperature at installation.

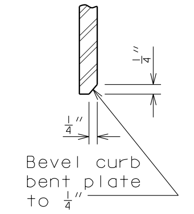
Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the expansion joint system.

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

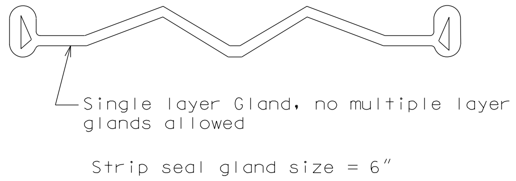
Curb plate anchors shall be a drilled cone expansion or a cast-in-place wing type threaded insert. The minimum ultimate pullout capacity for these anchors shall be 2700 lbs in f'c = 4000 psi concrete. Lead anchors will not be permitted. Holes in the barrier curb for anchors shall not be drilled until the concrete is at least 7 days old.



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION D-D



Strip seal gland size = 6"

DETAIL OF GLAND

DETAILS OF STRIP SEAL AT ABUTMENTS

Detailed April 2009
Checked April 2009

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

Sheet No. 41 of 57

FINAL PLANS

DATE PREPARED	
8/24/2012	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	41
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
090724-101	
PROJECT NO.	
ARRA-136-1(59)	
BRIDGE NO.	
L00982	

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

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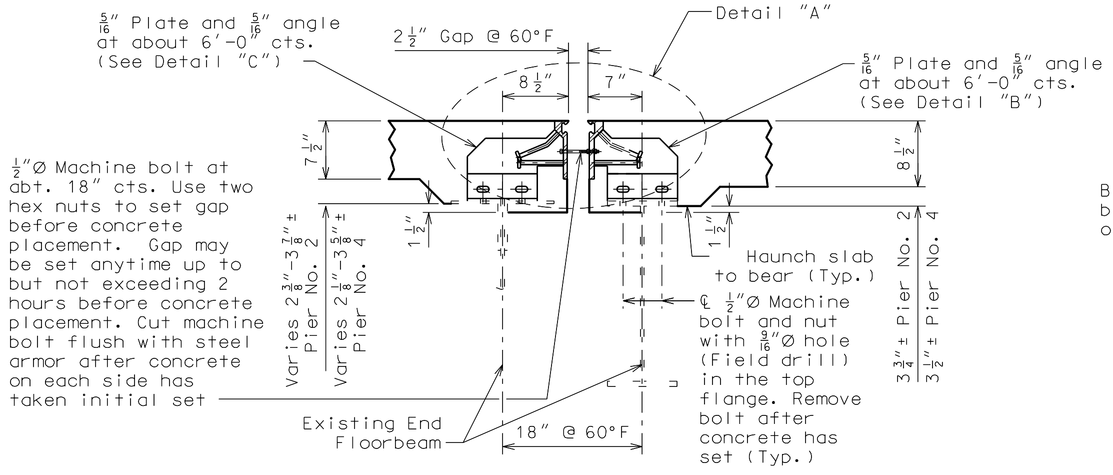
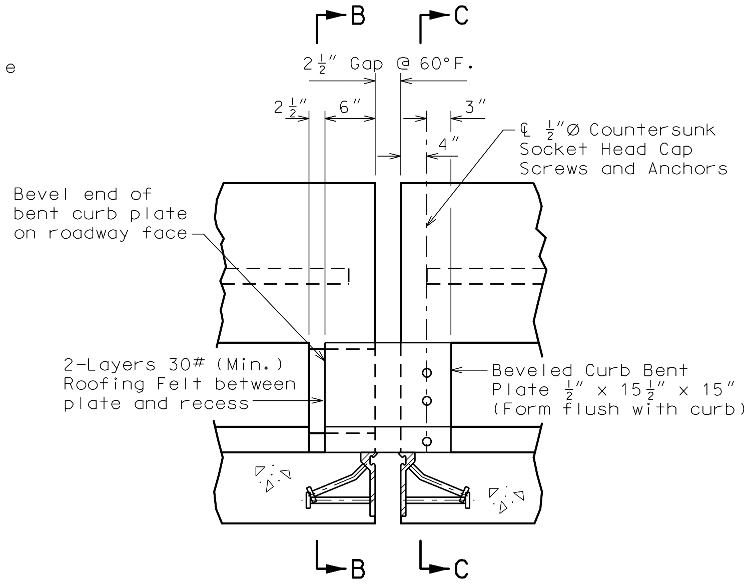

5/16" Plate and 5/16" angle at about 6'-0" cts. (See Detail "C")
2½" Gap @ 60°F
Detail "A"
8½"
7"
5/16" Plate and 5/16" angle at about 6'-0" cts. (See Detail "B")
7½"
8½"
1½"
1½"
½"Ø Machine bolt at abt. 18" cts. Use two hex nuts to set gap before concrete placement. Gap may be set anytime up to but not exceeding 2 hours before concrete placement. Cut machine bolt flush with steel armor on each side has taken initial set
Varies 2⅜"-3⅞"± Pier No. 2
Varies 2⅛"-3⅝"± Pier No. 4
Haunch slab to bear (Typ.)
℄ ½"Ø Machine bolt and nut with 9/16"Ø hole (Field drill) in the top flange. Remove bolt after concrete has set (Typ.)
3¾"± Pier No. 2
3½"± Pier No. 4
Existing End Floorbeam
18" @ 60°F

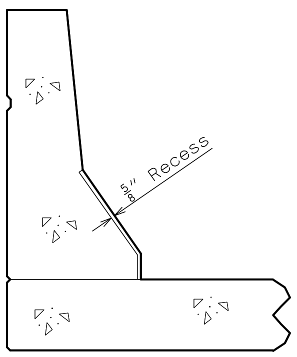
Note: Strip seal gland not shown for clarity.

SECTION A-A


B
C
2½" Gap @ 60°F.
2½"
6"
3"
4"
℄ ½"Ø Countersunk Socket Head Cap Screws and Anchors
Bevel end of bent curb plate on roadway face
2-Layers 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate ½" x 15½" x 15" (Form flush with curb)
B
C

Note: Strip seal gland not shown for clarity.

PART ELEVATION OF BARRIER CURB



PART SECTION B-B

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. No gland shall be installed during Stage 1 Construction, the gland shall be installed full width of bridge after completion of Stage 2 Construction.

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.

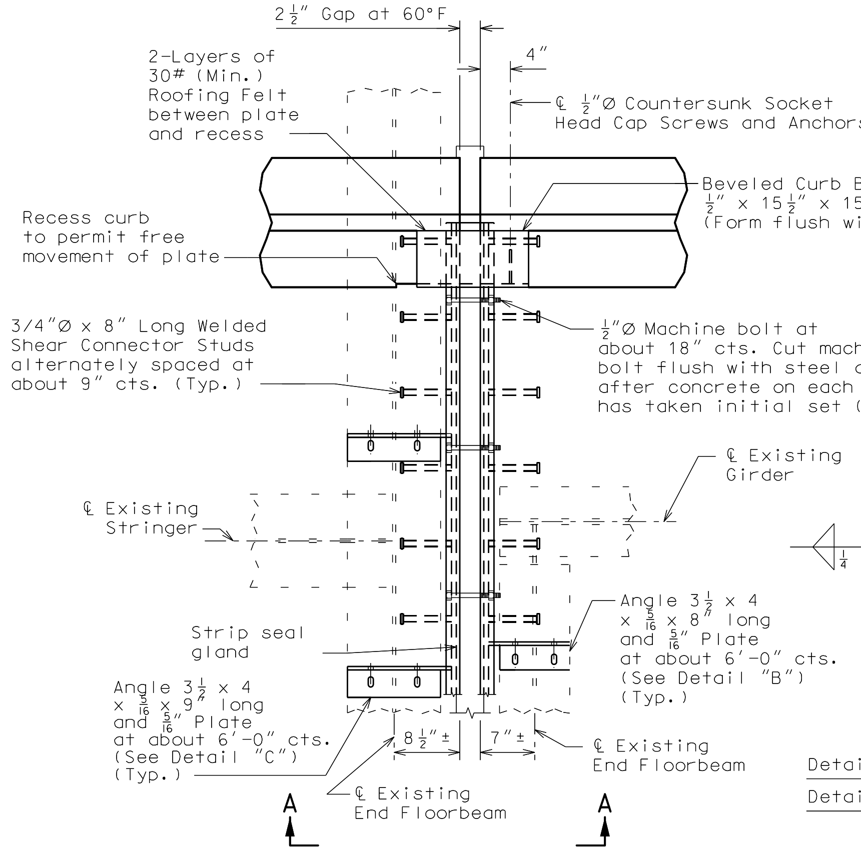
Structural steel for the expansion joint system and curb plate shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from over spray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 5/16" for each 10° fall or rise in temperature at installation.

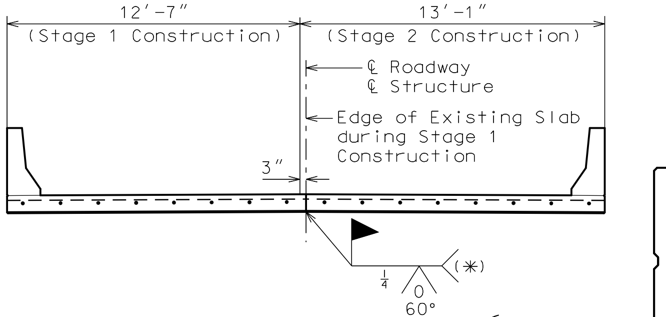
Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the expansion joint system.

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

Curb plate anchors shall be a drilled cone expansion or a cast-in-place wing type threaded insert. The minimum ultimate pullout capacity for these anchors shall be 2700 lbs in f'c = 4000 psi concrete. Lead anchors will not be permitted. Holes in the barrier curb for anchors shall not be drilled until the concrete is at least 7 days old.

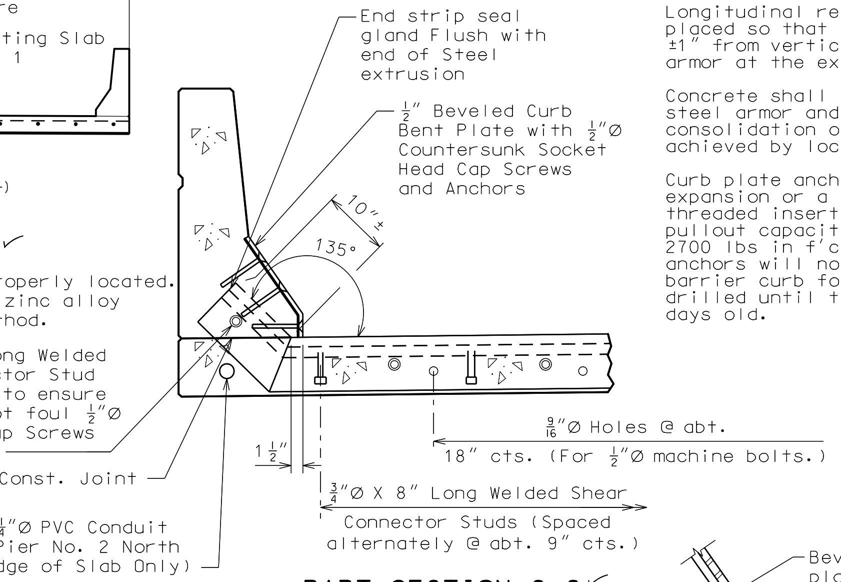

2½" Gap at 60°F
4"
2-Layers of 30# (Min.) Roofing Felt between plate and recess
℄ ½"Ø Countersunk Socket Head Cap Screws and Anchors
Beveled Curb Bent Plate ½" x 15½" x 15" (Form flush with curb)
Recess curb to permit free movement of plate
3/4"Ø x 8" Long Welded Shear Connector Studs alternately spaced at about 9" cts. (Typ.)
½"Ø Machine bolt at about 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set (Typ.)
℄ Existing Girder
℄ Existing Stringer
Strip seal gland
Angle 3½ x 4 x 5/16 x 8" long and 5/16" Plate at about 6'-0" cts. (See Detail "B") (Typ.)
Angle 3½ x 4 x 5/16 x 9" long and 5/16" Plate at about 6'-0" cts. (See Detail "C") (Typ.)
8½"±
7"±
℄ Existing End Floorbeam
℄ Existing End Floorbeam
A
A

PART PLAN

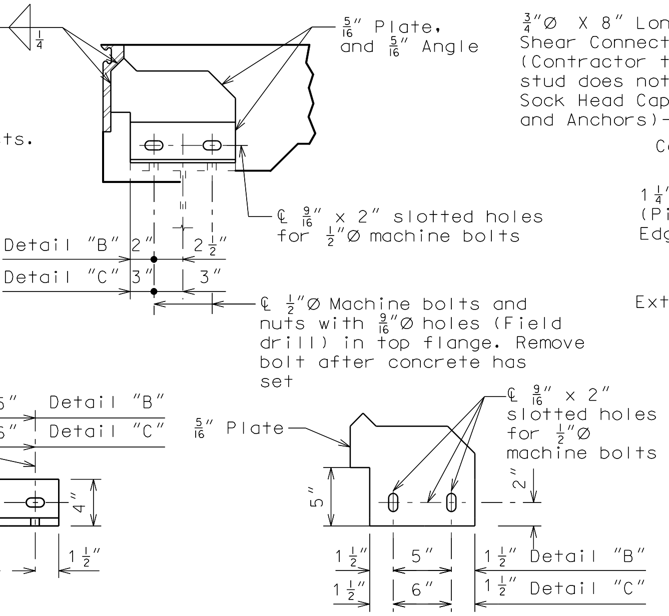


SECTION SHOWING JOINT SPLICE

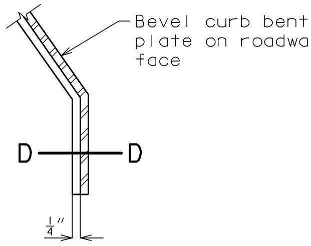
(*) Weld after steel extrusion for Stage 2 is properly located. Repair galvanizing adjacent to the welds by the zinc alloy stick method. Coat the welds using the same method.


End strip seal gland Flush with end of Steel extrusion
½" Beveled Curb Bent Plate with ½"Ø Countersunk Socket Head Cap Screws and Anchors
10"±
135°
¾"Ø X 8" Long Welded Shear Connector Stud (Contractor to ensure stud does not foul ½"Ø Sock Head Cap Screws and Anchors)
Const. Joint
1¼"Ø PVC Conduit (Pier No. 2 North Edge of Slab Only)
1½"
9/16"Ø Holes @ abt. 18" cts. (For ½"Ø machine bolts.)
¾"Ø X 8" Long Welded Shear Connector Studs (Spaced alternately @ abt. 9" cts.)

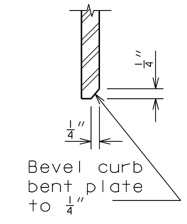
PART SECTION C-C


¼
5/16" Plate, and 5/16" Angle
Angle 3½ x 4 x 5/16 x 8" long and 5/16" Plate at about 6'-0" cts. (See Detail "B") (Typ.)
℄ 9/16" x 2" slotted holes for ½"Ø machine bolts
Detail "B" 2" 2½"
Detail "C" 3" 3"
℄ ½"Ø Machine bolts and nuts with 9/16"Ø holes (Field drill) in top flange. Remove bolt after concrete has set
℄ 9/16" x 2" slotted holes for ½"Ø machine bolts
5" Detail "B"
6" Detail "C"
Angle 3½ x 4" x 5/16
4"
1½"
1½"
5/16" Plate
5"
℄ 9/16" x 2" slotted holes for ½"Ø machine bolts
2"
1½" 5" 1½" Detail "B"
1½" 6" 1½" Detail "C"

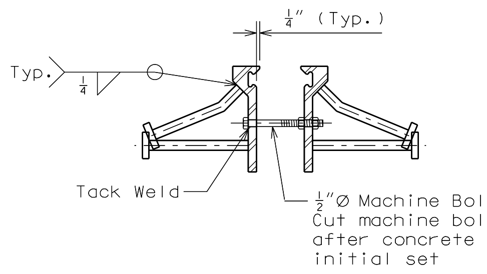
DETAILS "B" & "C"



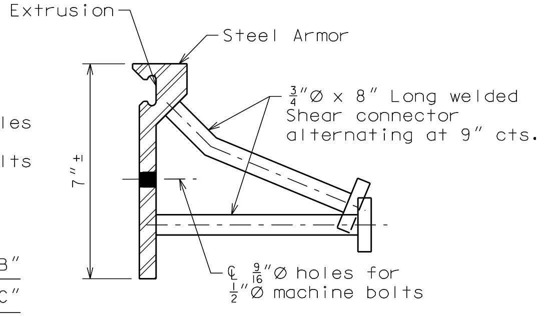
PART ELEVATION AT END OF BEVELED CURB BENT PLATE



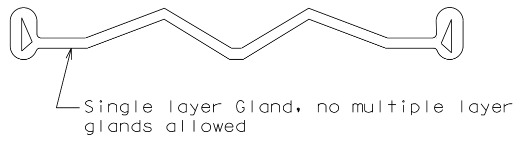
SECTION D-D


¼" (Typ.)
Typ.
¼
Tack Weld
½"Ø Machine Bolt @ abt. 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set

DETAIL "A"


Extrusion
Steel Armor
¾"Ø x 8" Long welded Shear connector alternating at 9" cts.
7"±
2"
℄ 9/16"Ø holes for ½"Ø machine bolts

DETAIL OF JOINT ARMOR



Strip seal gland size = 6"

DETAIL OF GLAND

DETAILS OF STRIP SEAL AT PIERS NO. 2 & 4

Detailed April 2009
Checked April 2009

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

Sheet No. 42 of 57

FINAL PLANS

DATE PREPARED	
8/24/2012	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	42
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
090724-101	
PROJECT NO.	
ARRA-136-1(59)	
BRIDGE NO.	
L00982	

DESCRIPTION

DATE

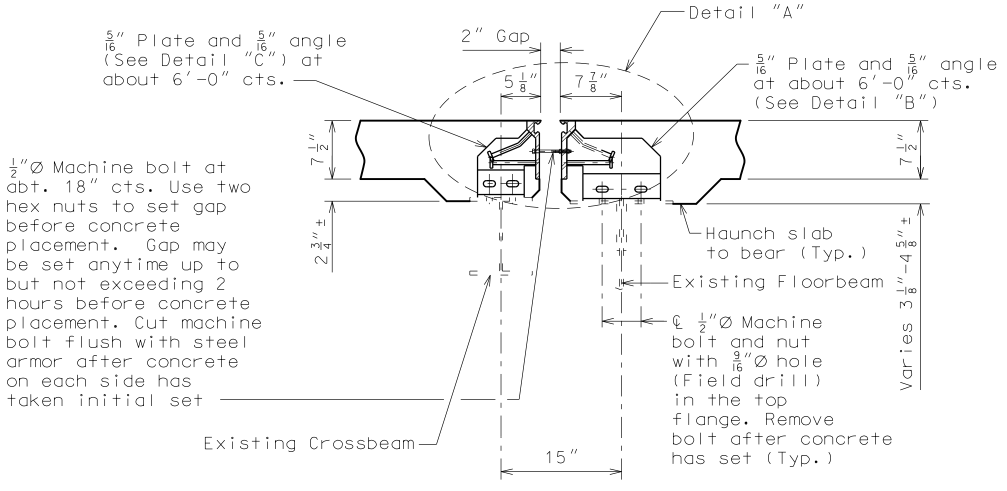
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

MoDOT

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

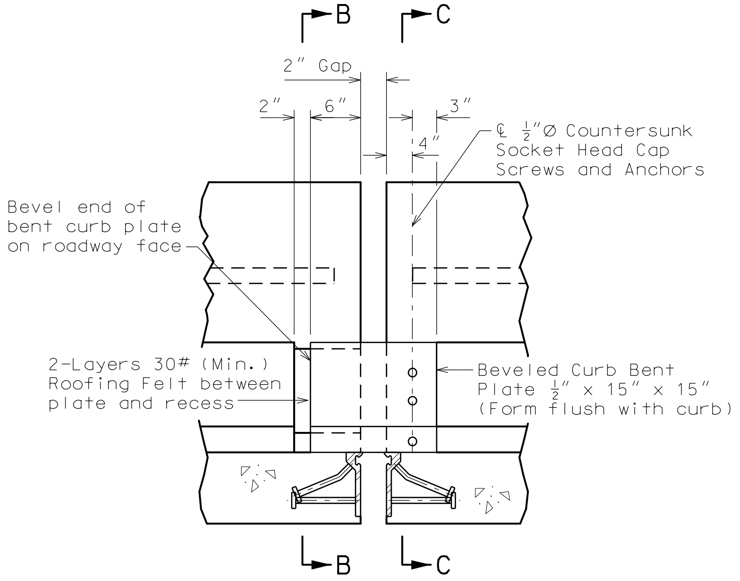
REV.

B_L00982_042_J1P2161.DGN 1:50:48 PM 3/29/2013


5/16″ Plate and 5/16″ angle (See Detail "C") at about 6′-0″ cts.
2″ Gap
Detail "A"
5/16″ Plate and 5/16″ angle at about 6′-0″ cts. (See Detail "B")
5 1/8″
7 7/8″
7 1/2″
7 1/2″
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
2 3/4″±
Haunch slab to bear (Typ.)
Existing Floorbeam
℄ 1/2″Ø Machine bolt and nut with 9/16″Ø hole (Field drill) in the top flange. Remove bolt after concrete has set (Typ.)
Varies 3 1/8″ - 4 5/8″±
Existing Crossbeam
15″

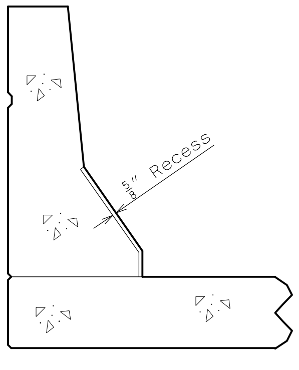
Note: Strip seal gland not shown for clarity.

SECTION A-A

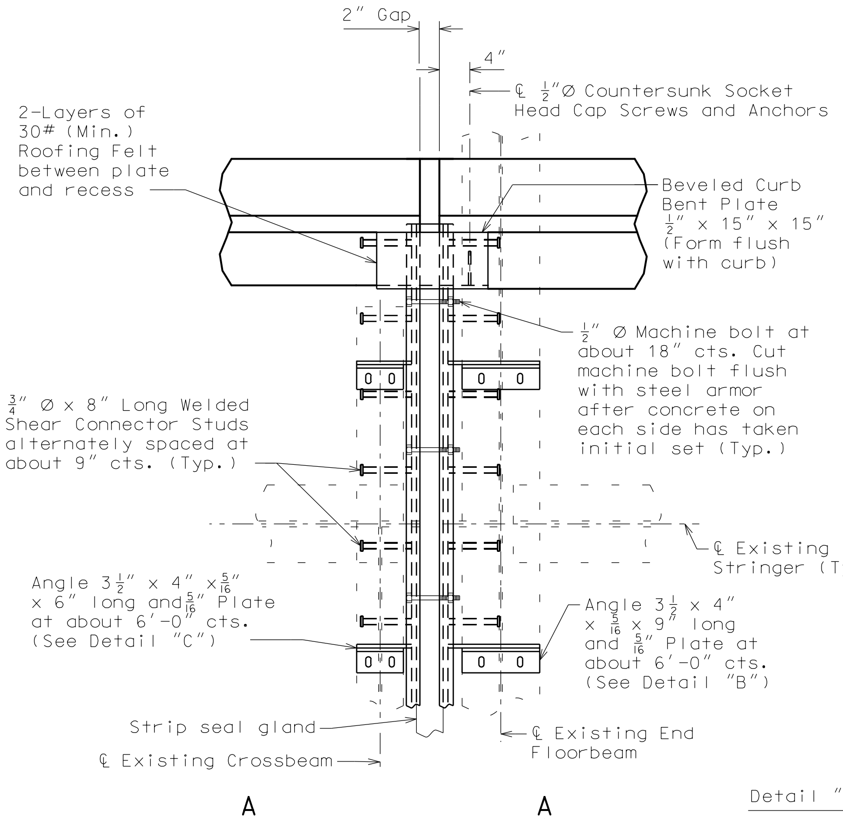

B
C
2″ Gap
2″
6″
3″
4″
℄ 1/2″Ø Countersunk Socket Head Cap Screws and Anchors
Bevel end of bent curb plate on roadway face
2-Layers 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate 1/2″ x 15″ x 15″ (Form flush with curb)
B
C

Note: Strip seal gland not shown for clarity.

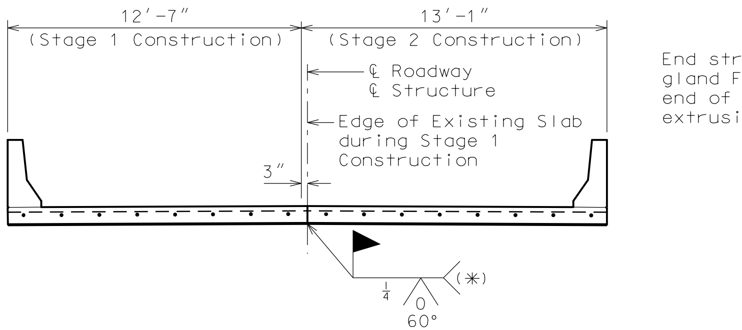
PART ELEVATION OF BARRIER CURB



PART SECTION B-B

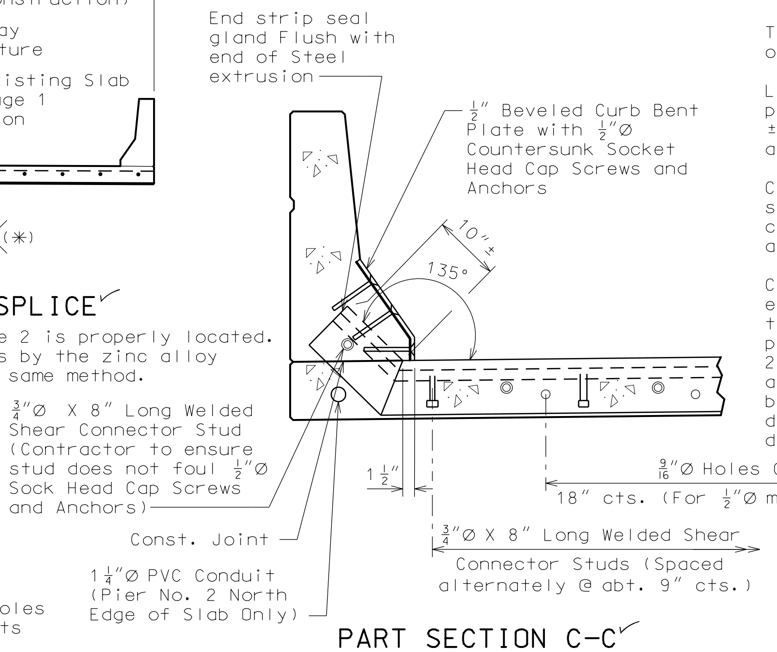

2″ Gap
4″
℄ 1/2″Ø Countersunk Socket Head Cap Screws and Anchors
2-Layers of 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate 1/2″ x 15″ x 15″ (Form flush with curb)
1/2″ Ø Machine bolt at about 18″ cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set (Typ.)
3/4″ Ø x 8″ Long Welded Shear Connector Studs alternately spaced at about 9″ cts. (Typ.)
℄ Existing Stringer (Typ.)
Angle 3 1/2″ x 4″ x 5/16″ x 6″ long and 5/16″ Plate at about 6′-0″ cts. (See Detail "C")
Angle 3 1/2″ x 4″ x 5/16″ x 9″ long and 5/16″ Plate at about 6′-0″ cts. (See Detail "B")
Strip seal gland
℄ Existing End Floorbeam
℄ Existing Crossbeam
A
A

PART PLAN

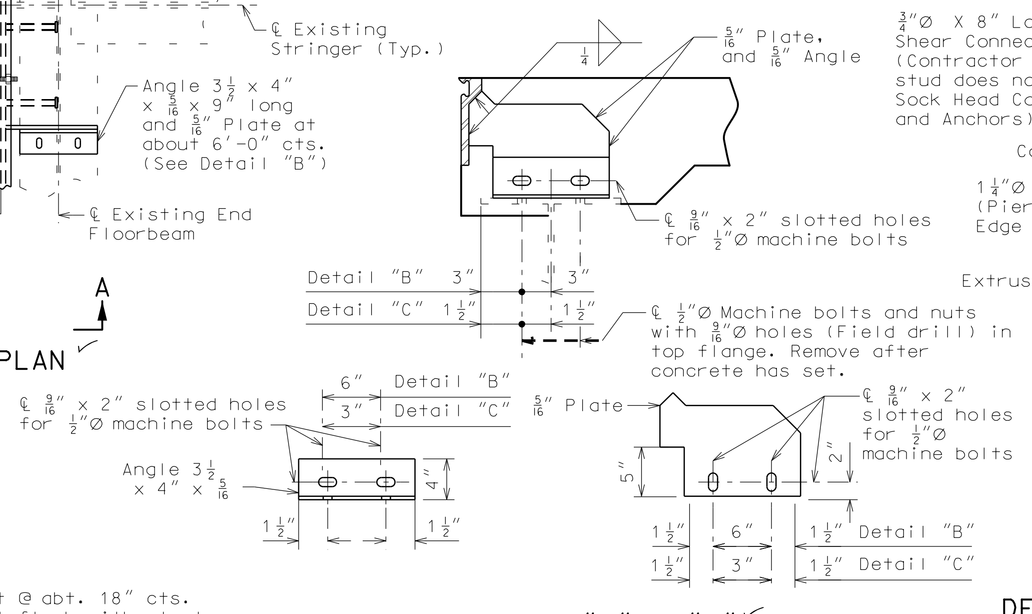


SECTION SHOWING JOINT SPLICE

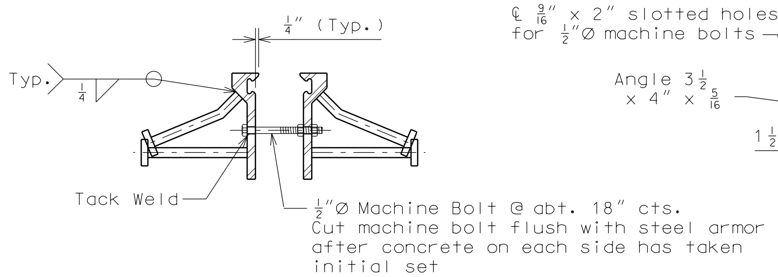
(✱) Weld after steel extrusion for Stage 2 is properly located. Repair galvanizing adjacent to the welds by the zinc alloy stick method. Coat the welds using the same method.


End strip seal gland Flush with end of Steel extrusion
1/2″ Beveled Curb Bent Plate with 1/2″Ø Countersunk Socket Head Cap Screws and Anchors
10″±
135°
3/4″Ø X 8″ Long Welded Shear Connector Stud (Contractor to ensure stud does not foul 1/2″Ø Sock Head Cap Screws and Anchors)
1 1/2″
9/16″Ø Holes @ abt.
18″ cts. (For 1/2″Ø machine bolts.)
Const. Joint
3/4″Ø X 8″ Long Welded Shear Connector Studs (Spaced alternately @ abt. 9″ cts.)
1 1/4″Ø PVC Conduit (Pier No. 2 North Edge of Slab Only)

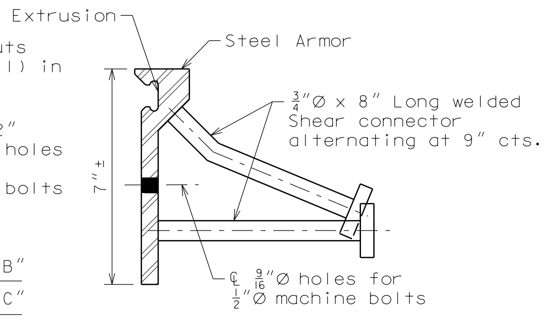
PART SECTION C-C


1/4
5/16″ Plate, and 5/16″ Angle
℄ 9/16″ x 2″ slotted holes for 1/2″Ø machine bolts
Detail "B" 3″
Detail "C" 1 1/2″
3″
1 1/2″
℄ 1/2″Ø Machine bolts and nuts with 9/16″Ø holes (Field drill) in top flange. Remove after concrete has set.
℄ 9/16″ x 2″ slotted holes for 1/2″Ø machine bolts
6″ Detail "B"
3″ Detail "C"
Angle 3 1/2 x 4″ x 5/16
4″
1 1/2″
1 1/2″
5/16″ Plate
5″
℄ 9/16″ x 2″ slotted holes for 1/2″Ø machine bolts
2″
1 1/2″ 6″ 1 1/2″ Detail "B"
1 1/2″ 3″ 1 1/2″ Detail "C"

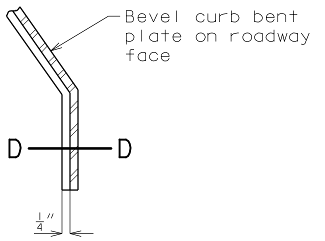
DETAILS "B" & "C"


1/4″ (Typ.)
Typ.
1/4
Tack Weld
1/2″Ø Machine Bolt @ abt. 18″ cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set

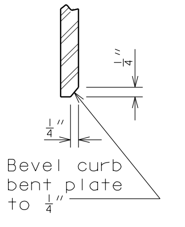
DETAIL "A"


Extrusion
Steel Armor
3/4″Ø x 8″ Long welded Shear connector alternating at 9″ cts.
7″±
℄ 9/16″Ø holes for 1/2″Ø machine bolts

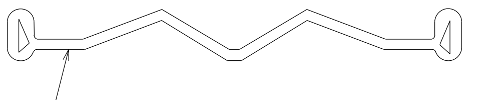
DETAIL OF JOINT ARMOR



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION D-D



Strip seal gland size = 3″

DETAIL OF GLAND

GENERAL NOTES:

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

The strip seal gland shall be installed in joints in one continuous piece without field splices. Factory splicing will be permitted for joints in excess of 53 feet. No gland shall be installed during Stage 1 Construction, the gland shall be installed full width of bridge after completion of Stage 2 Construction.

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 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 over spray.

The expansion gap shall be set at 2″ regardless of temperature at the time of installation.

Longitudinal reinforcing steel shall be placed 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.

Curb plate anchors shall be a drilled cone expansion or a cast-in-place wing type threaded insert. The minimum ultimate pullout capacity for these anchors shall be 2700 lbs in f′c = 4000 psi concrete. Lead anchors will not be permitted. Holes in the barrier curb for anchors shall not be drilled until the concrete is at least 7 days old.

FINAL PLANS
DATE PREPARED 8/24/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 43
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION
DATE

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

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

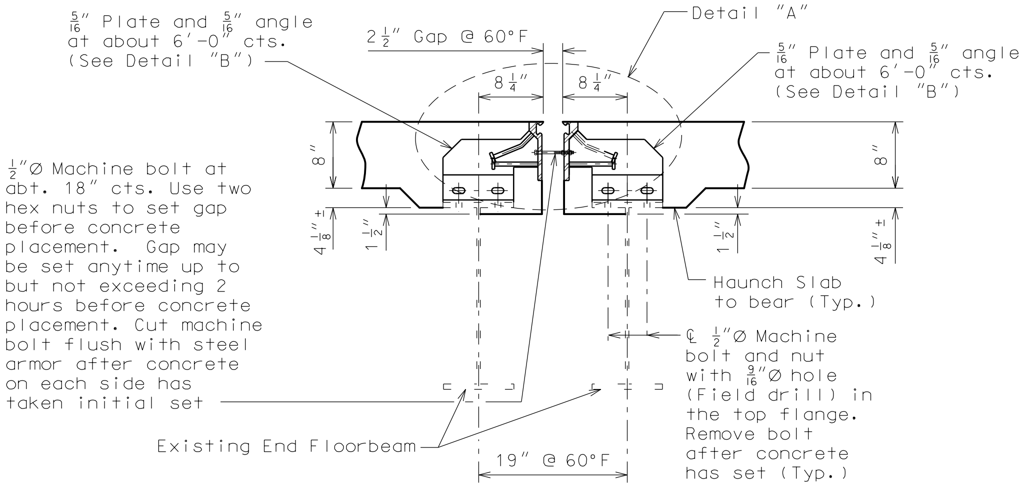
REV.

DETAILS OF STRIP SEAL AT PANEL POINTS L4, L8, L16, & L20

Detailed April 2009
Checked April 2009

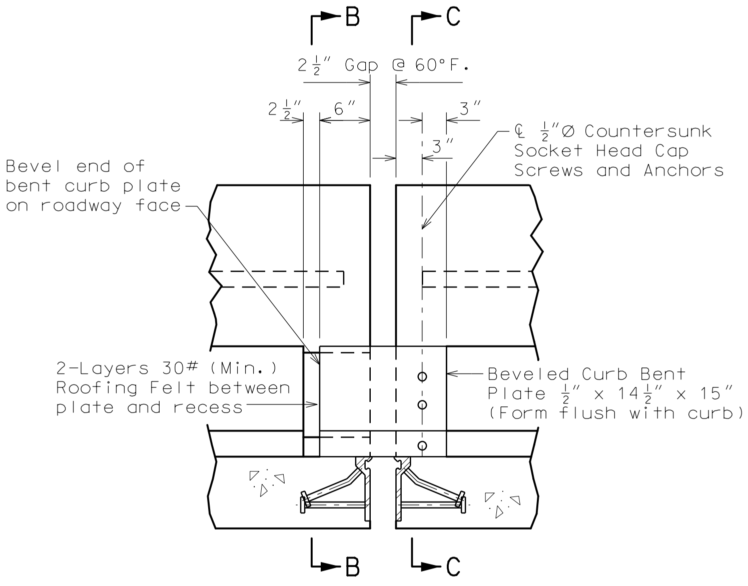
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 43 of 57


5/16" Plate and 5/16" angle at about 6'-0" cts. (See Detail "B")
Detail "A"
2 1/2" Gap @ 60°F
8 1/4"
8 1/4"
5/16" Plate and 5/16" angle at about 6'-0" cts. (See Detail "B")
8"
8"
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
4 1/8"
1 1/2"
1 1/2"
4 1/8" ±
Haunch Slab to bear (Typ.)
℄ 1/2"Ø Machine bolt and nut with 9/16"Ø hole (Field drill) in the top flange. Remove bolt after concrete has set (Typ.)
Existing End Floorbeam
19" @ 60°F

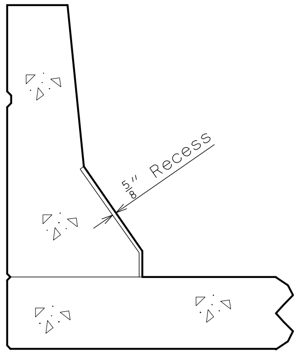
Note: Strip seal gland not shown for clarity.

SECTION A-A


B
C
2 1/2" Gap @ 60°F.
2 1/2"
6"
3"
3"
℄ 1/2"Ø Countersunk Socket Head Cap Screws and Anchors
Bevel end of bent curb plate on roadway face
2-Layers 30# (Min.) Roofing Felt between plate and recess
Beveled Curb Bent Plate 1/2" x 14 1/2" x 15" (Form flush with curb)
B
C

Note: Strip seal gland not shown for clarity.

PART ELEVATION OF BARRIER CURB



PART SECTION B-B

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. No gland shall installed during Stage 1 Construction, the gland shall be installed full width of bridge after completion of Stage 2 Construction.

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.

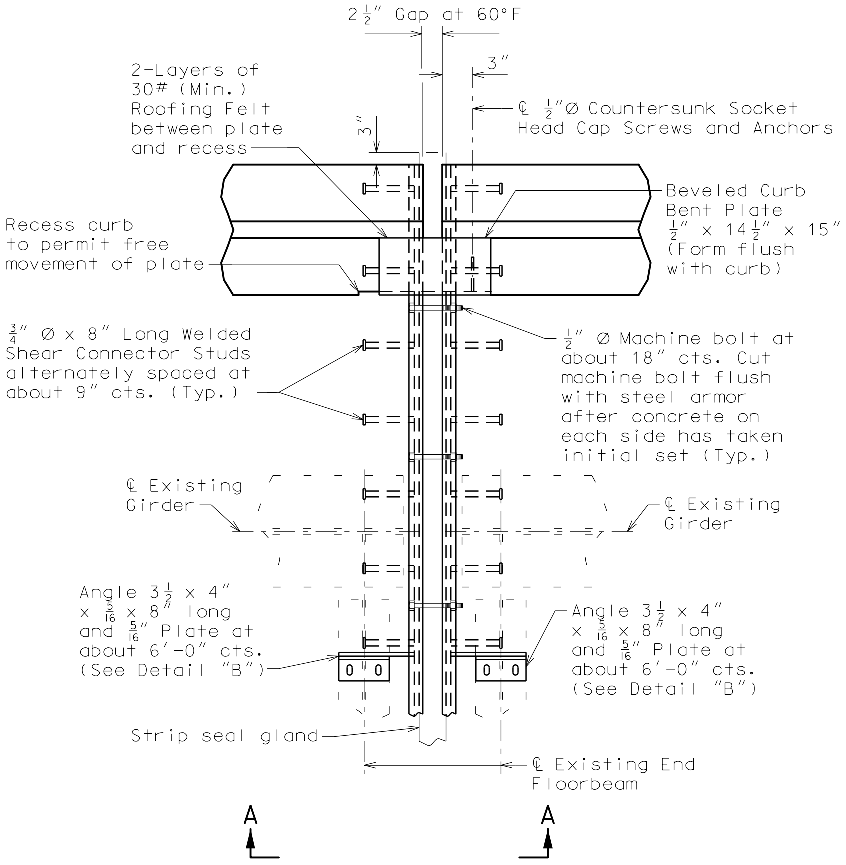
Structural steel for the expansion joint system and curb plate shall be coated with a minimum of two coats of inorganic zinc primer (5 mils minimum) or galvanized in accordance with ASTM A123. Anchors need not be protected from over spray.

Plan dimensions are based on installation at 60°F. The expansion gap and other dimensions shall be increased or decreased 5/16" for each 10° fall or rise in temperature at installation.

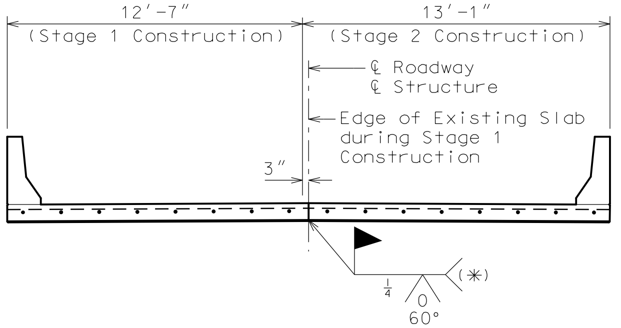
Longitudinal reinforcing steel shall be placed so that ends shall not be more than ±1" from vertical leg of the steel armor at the expansion joint system.

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

Curb plate anchors shall be a drilled cone expansion or a cast-in-place wing type threaded insert. The minimum ultimate pullout capacity for these anchors shall be 2700 lbs in f'c = 4000 psi concrete. Lead anchors will not be permitted. Holes in the barrier curb for anchors shall not be drilled until the concrete is at least 7 days old.

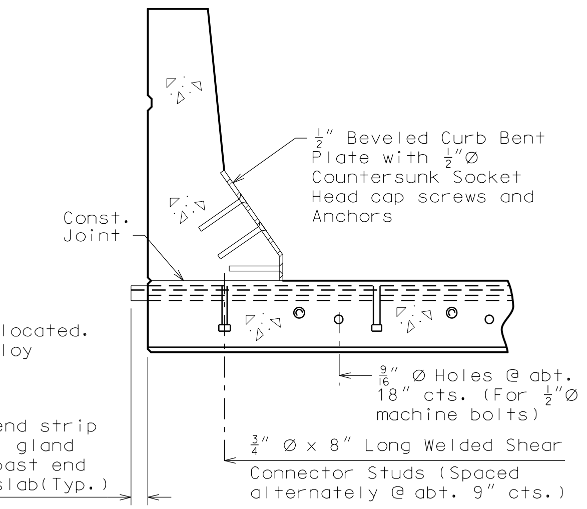

2 1/2" Gap at 60°F
3"
2-Layers of 30# (Min.) Roofing Felt between plate and recess
3"
℄ 1/2"Ø Countersunk Socket Head Cap Screws and Anchors
Beveled Curb Bent Plate 1/2" x 14 1/2" x 15" (Form flush with curb)
Recess curb to permit free movement of plate
3/4" Ø x 8" Long Welded Shear Connector Studs alternately spaced at about 9" cts. (Typ.)
1/2" Ø Machine bolt at about 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set (Typ.)
℄ Existing Girder
℄ Existing Girder
Angle 3 1/2 x 4" x 5/16 x 8" long and 5/16" Plate at about 6'-0" cts. (See Detail "B")
Angle 3 1/2 x 4" x 5/16 x 8" long and 5/16" Plate at about 6'-0" cts. (See Detail "B")
Strip seal gland
℄ Existing End Floorbeam
A
A

PART PLAN

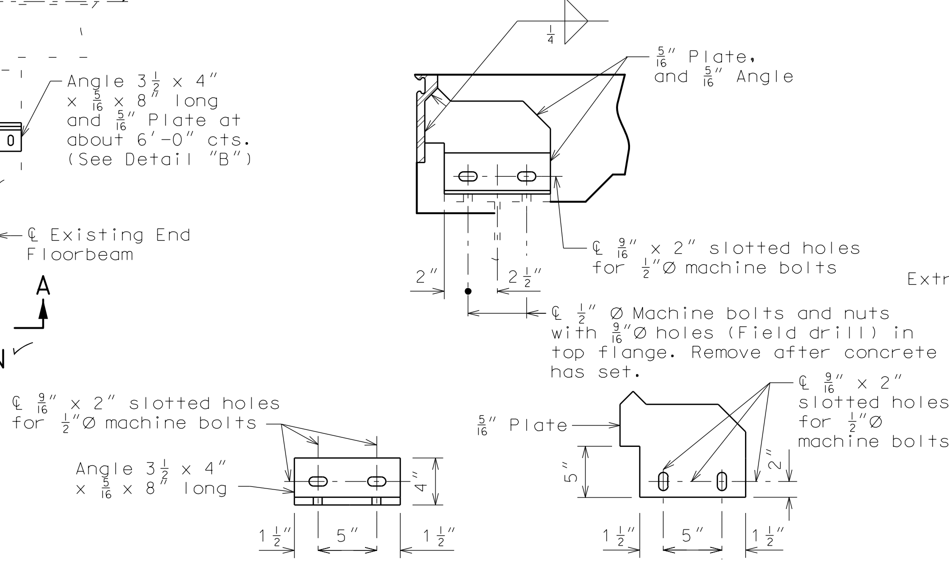


SECTION SHOWING JOINT SPLICE

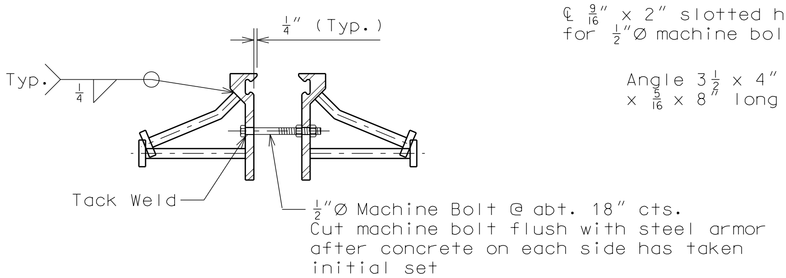
(*) Weld after steel extrusion for Stage 2 is properly located. Repair galvanizing adjacent to the welds by the zinc alloy stick method. Coat the welds using the same method.


1/2" Beveled Curb Bent Plate with 1/2"Ø Countersunk Socket Head cap screws and Anchors
Const. Joint
9/16" Ø Holes @ abt. 18" cts. (For 1/2"Ø machine bolts)
3/4" Ø x 8" Long Welded Shear Connector Studs (Spaced alternately @ abt. 9" cts.)
Extend strip seal gland 3" past end of slab(Typ.)

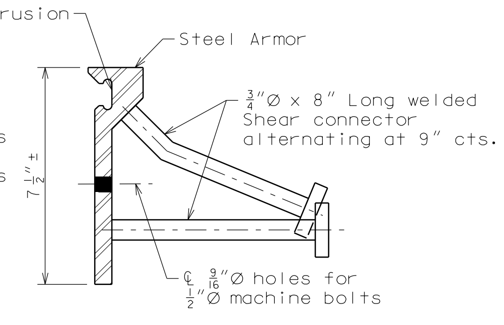
PART SECTION C-C


1/4
5/16" Plate, and 5/16" Angle
℄ 9/16" x 2" slotted holes for 1/2"Ø machine bolts
2"
2 1/2"
℄ 1/2" Ø Machine bolts and nuts with 9/16"Ø holes (Field drill) in top flange. Remove after concrete has set.
℄ 9/16" x 2" slotted holes for 1/2"Ø machine bolts
Angle 3 1/2 x 4" x 5/16 x 8" long
4"
1 1/2"
5"
1 1/2"
5/16" Plate
℄ 9/16" x 2" slotted holes for 1/2"Ø machine bolts
5"
2"
1 1/2"
5"
1 1/2"

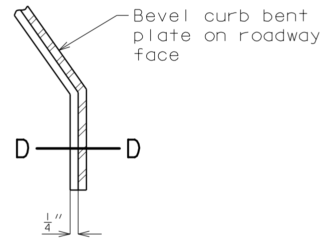
DETAIL "B"


1/4" (Typ.)
Typ.
1/4
Tack Weld
1/2"Ø Machine Bolt @ abt. 18" cts. Cut machine bolt flush with steel armor after concrete on each side has taken initial set

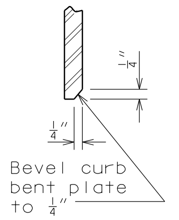
DETAIL "A"


Extrusion
Steel Armor
3/4"Ø x 8" Long welded Shear connector alternating at 9" cts.
7 1/2" ±
2"
℄ 9/16"Ø holes for 1/2"Ø machine bolts

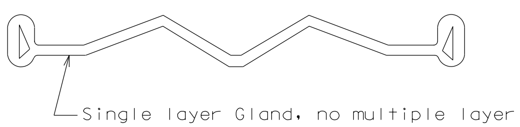
DETAIL OF JOINT ARMOR



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION D-D



Strip seal gland size = 6"

DETAIL OF GLAND

DETAILS OF STRIP SEAL AT PIERS NO. 7

Detailed April 2009
Checked April 2009

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

Sheet No. 44 of 57

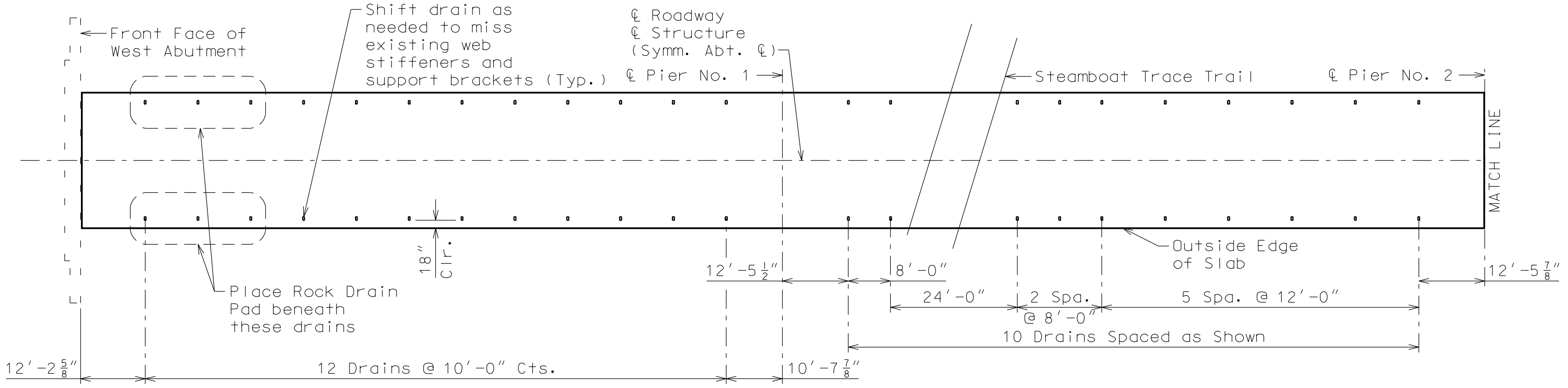
FINAL PLANS
DATE PREPARED 8/24/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 44
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION
DATE

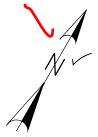
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

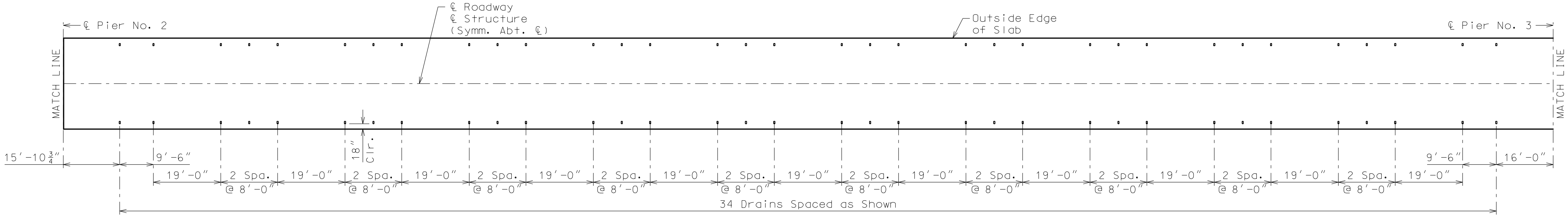
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

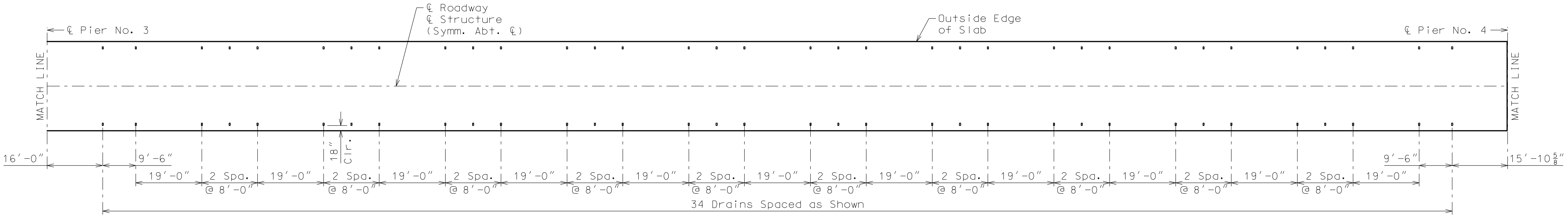


PLAN UNIT NO. 1✓





PLAN UNIT NO. 2 – SPAN NO. 3✓



PLAN UNIT NO. 2 – SPAN NO. 4✓

Note:✓
For details of Slab Drains & Rock Drain Pads, see Sheet No. 46.

SLAB DRAIN LAYOUT✓

Detailed April 2009
Checked April 2009

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

Sheet No. 45✓ of 57✓

FINAL PLANS✓

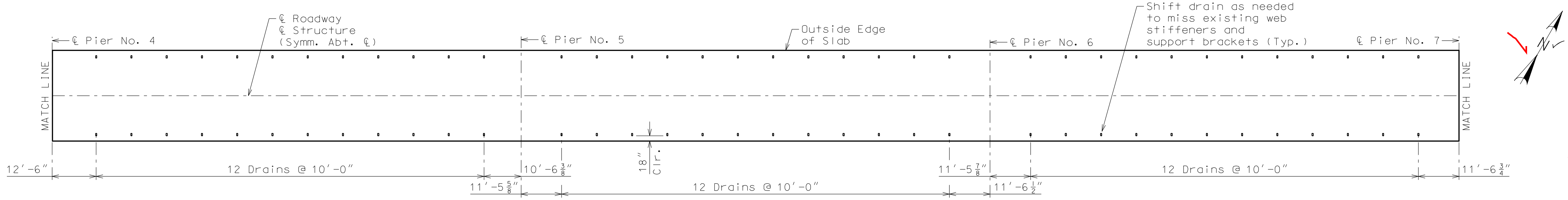
DATE PREPARED 8/24/2012✓	
ROUTE 136✓	STATE MO✓
DISTRICT BR✓	SHEET NO. 45✓
COUNTY ATCHISON✓	
JOB NO. J1P2161✓	
CONTRACT ID. 090724-101✓	
PROJECT NO. ARRA-136-1(59)✓	
BRIDGE NO. L00982✓	

DESCRIPTION
DATE

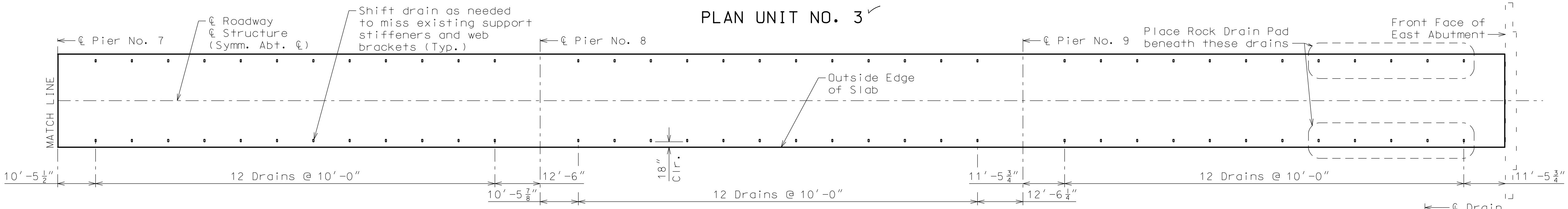
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

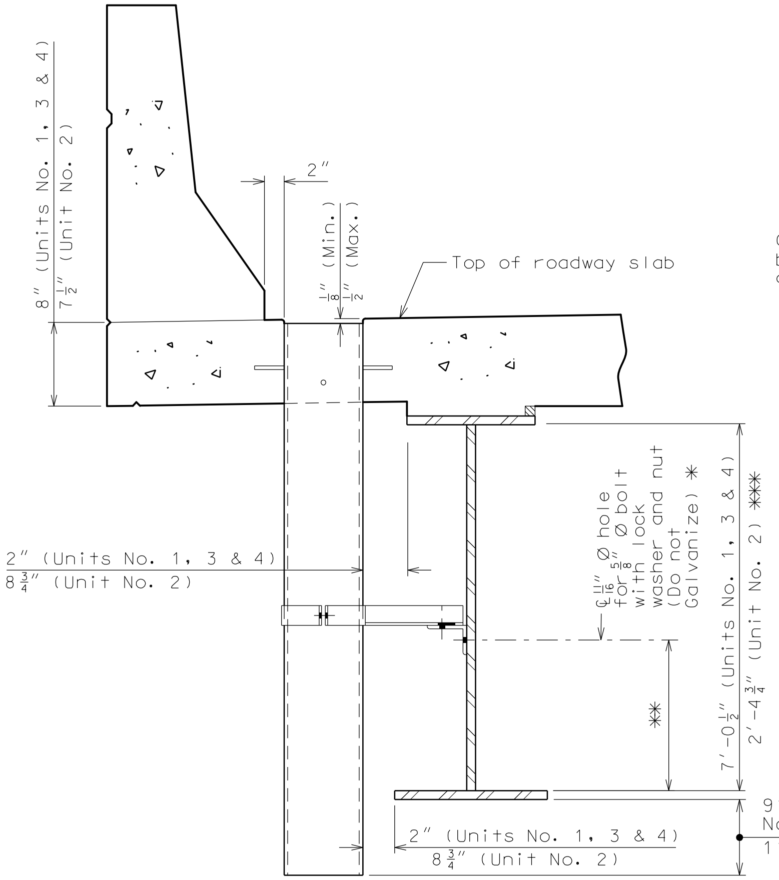
REV.



PLAN UNIT NO. 3



PLAN UNIT NO. 4

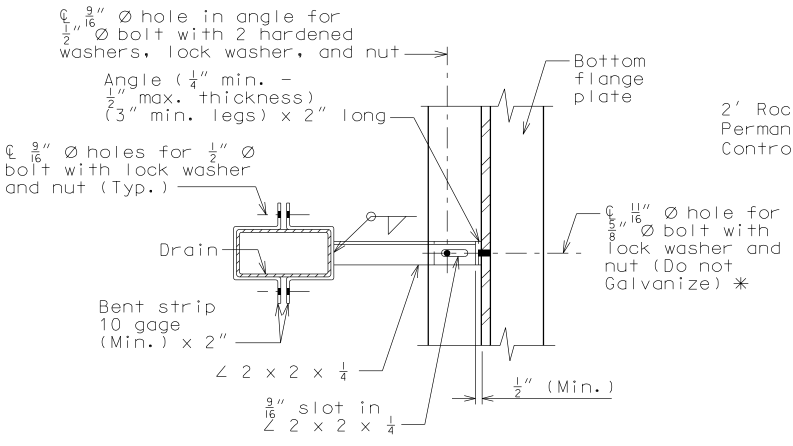


PART SECTION NEAR DRAIN

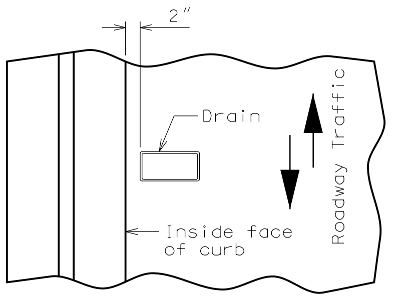
(See Sec. 1080.4.4.2 For Additional Coating Requirement)

✱✱ 14″ (Units No. 1, 3 & 4)
5″ (Unit No. 2)

✱✱✱ 4′-1½″ to Bottom of Floorbeam

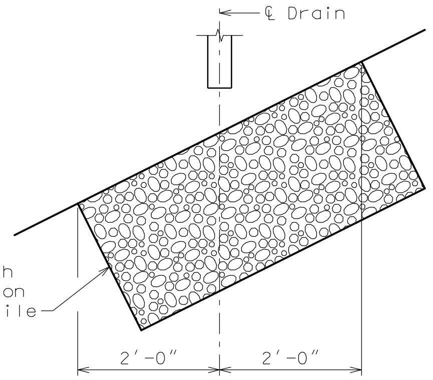

℄ 9/16″ Ø hole in angle for ½″ Ø bolt with 2 hardened washers, lock washer, and nut
Angle (¼″ min. - ½″ max. thickness) (3″ min. legs) x 2″ long
Bottom flange plate
℄ 9/16″ Ø holes for ½″ Ø bolt with lock washer and nut (Typ.)
Drain
Bent strip 10 gage (Min.) x 2″
∠ 2 x 2 x ¼
9/16″ slot in ∠ 2 x 2 x ¼
℄ 11/16″ Ø hole for ⅝″ Ø bolt with lock washer and nut (Do not Galvanize) ✱
½″ (Min.)

PART SECTION SHOWING BRACKET ASSEMBLY

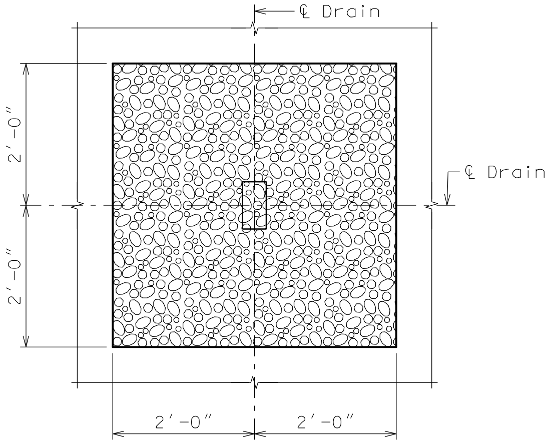


PART PLAN OF SLAB AT DRAIN

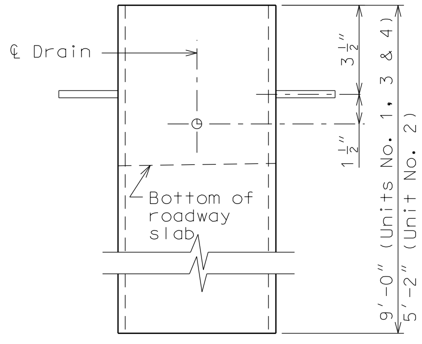
DETAILS OF DRAINS TRANSVERSE TO ROADWAY



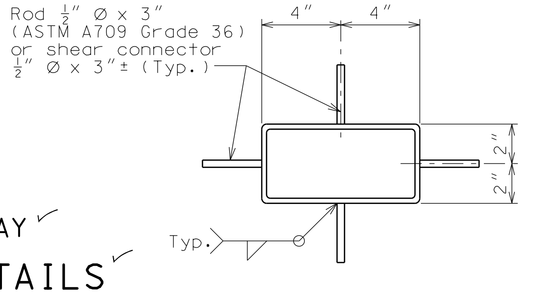
ELEVATION OF DRAIN PAD



PLAN OF DRAIN PAD



ELEVATION OF DRAIN


Rod ½″ Ø x 3″ (ASTM A709 Grade 36) or shear connector ½″ Ø x 3″± (Typ.)
4″
4″
2″
2″
Typ.

PLAN OF DRAIN

Notes:

Slab drains may be fabricated of either ¼″ welded sheets of ASTM A709 Grade 36 steel or from ¼″ structural steel tubing ASTM A500 or A501.

Slab drain bracket assembly shall be ASTM A709 Grade 36 steel.

Outside dimensions of drains are 8″ x 4″.

Locate drains in slab by dimensions shown in Part Section Near Drain. Shift reinforcing steel in field where necessary to clear drains.

The drains and bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with ASTM A153, except as shown.

Shop drawings will not be required for the slab drains and the bracket assembly.

The bolt hole for the bracket assembly attachment shall be field located on the existing girders.
✱ See Sec 1080.4

For Plan of Slab Drains from West Abutment to Pier No. 4, see Sheet No. 45.

Cost of Drain Pads and Geotextile complete in place shall be included with bid item Slab Drain per Each.

SLAB DRAIN DETAILS

Sheet No. 46 of 57

Detailed April 2009
Checked April 2009

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

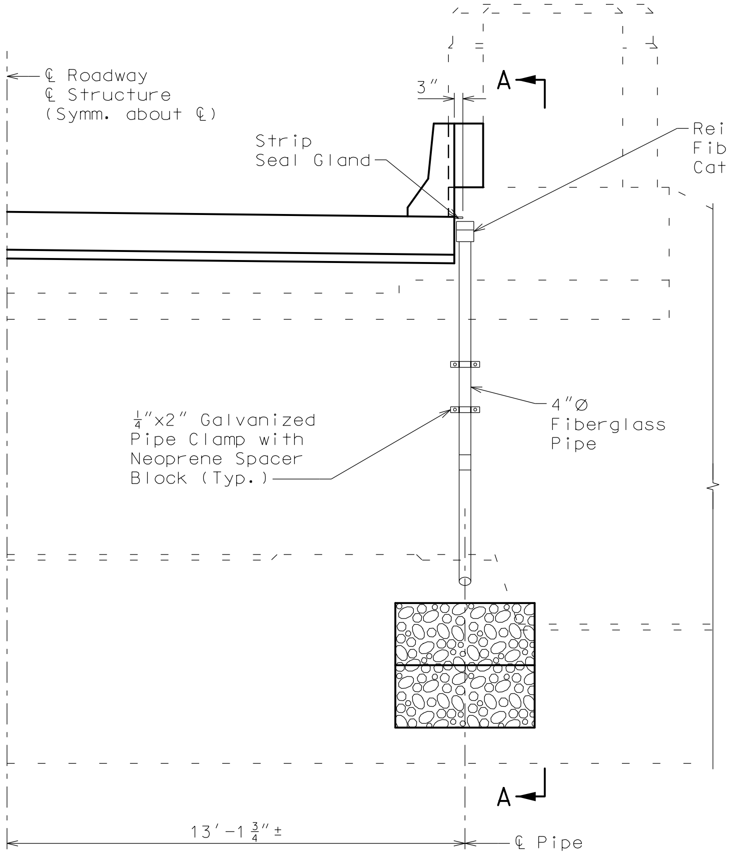
FINAL PLANS
DATE PREPARED 8/24/2012
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 46
COUNTY ATCHISON
JOB NO. J1P2161
CONTRACT ID. 090724-101
PROJECT NO. ARRA-136-1(59)
BRIDGE NO. L00982

DESCRIPTION	DATE

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

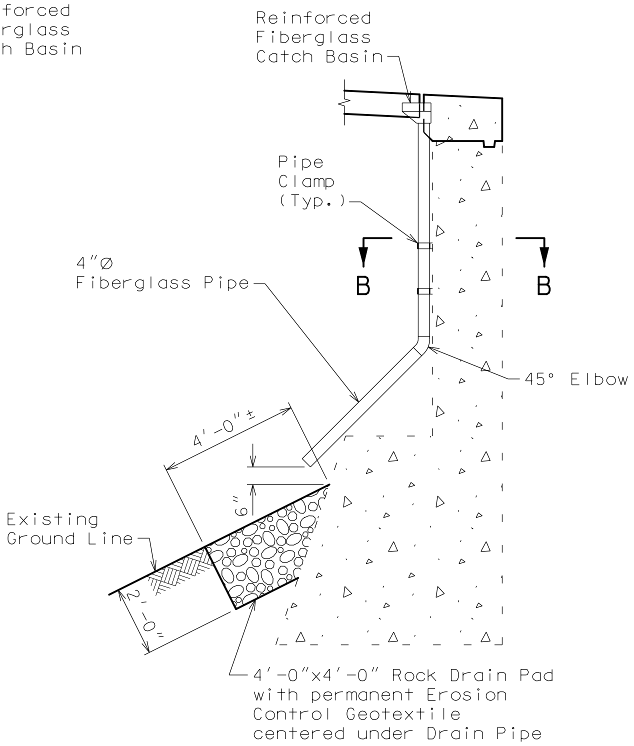
HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.



℄ Roadway
℄ Structure
(Symm. about ℄)
3"
A
Strip Seal Gland
Reinforced Fiberglass Catch Basin
¼"x2" Galvanized Pipe Clamp with Neoprene Spacer Block (Typ.)
4"Ø Fiberglass Pipe
A
13'-1¾"±
℄ Pipe

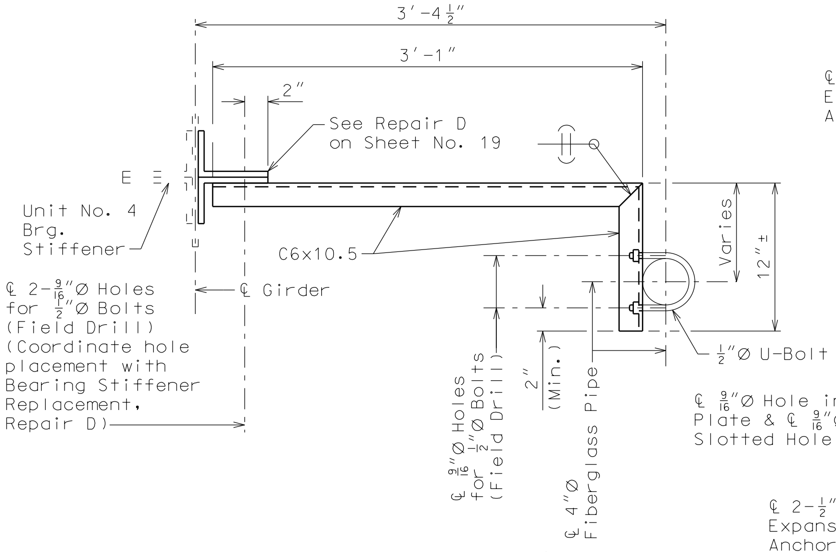
ABUTMENT ELEVATION



Reinforced Fiberglass Catch Basin
Pipe Clamp (Typ.)
B
B
4"Ø Fiberglass Pipe
45° Elbow
4'-0"±
6"
Existing Ground Line
2'-0"
4'-0"x4'-0" Rock Drain Pad with permanent Erosion Control Geotextile centered under Drain Pipe

SECTION A-A

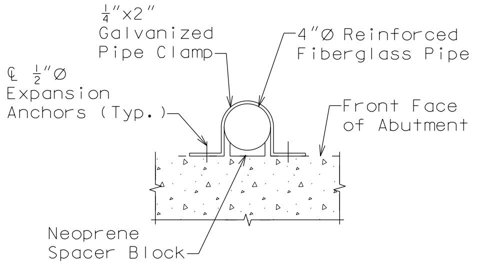
(Barrier Curb not shown)



3'-4½"
3'-1"
2"
See Repair D on Sheet No. 19
E
Unit No. 4 Brg. Stiffener
C6x10.5
℄ Girder
Varies
12"±
℄ 2-9/16"Ø Holes for ½"Ø Bolts (Field Drill) (Coordinate hole placement with Bearing Stiffener Replacement, Repair D)
½"Ø U-Bolt
2" (Min.)
℄ 9/16"Ø Holes for ½"Ø Bolts (Field Drill)
℄ 4"Ø Fiberglass Pipe

SECTION C-C

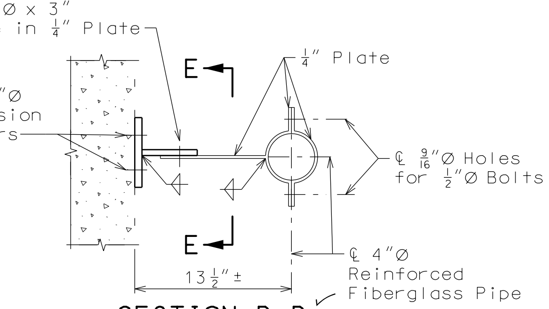
Note:
The cost of all equipment, labor and materials required to install the Drainage System at the Abutments and Pier No. 7 shall be included in the contract lump sum price for Drainage System (On Structure).



¼"x2" Galvanized Pipe Clamp
4"Ø Reinforced Fiberglass Pipe
℄ ½"Ø Expansion Anchors (Typ.)
Front Face of Abutment
Neoprene Spacer Block

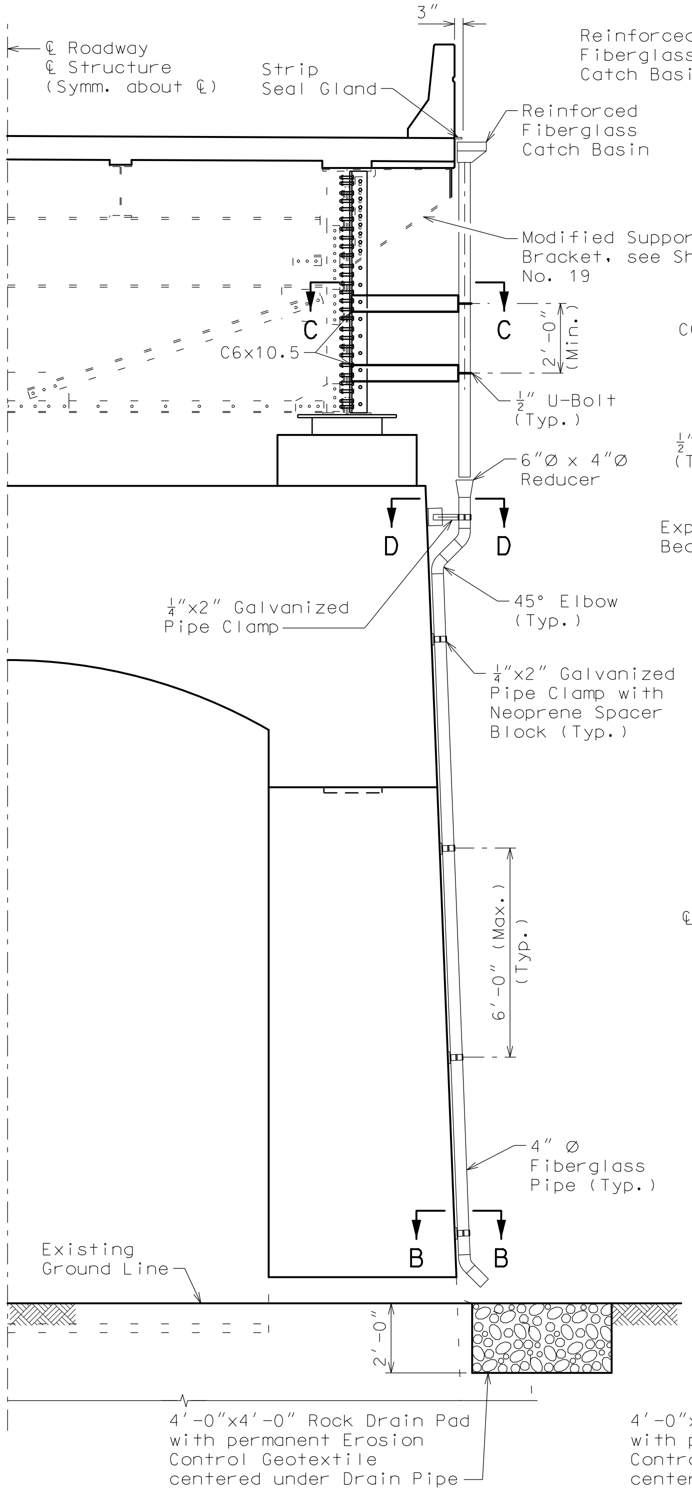
SECTION B-B

(Abutment Shown, Pier No. 7 Similar)



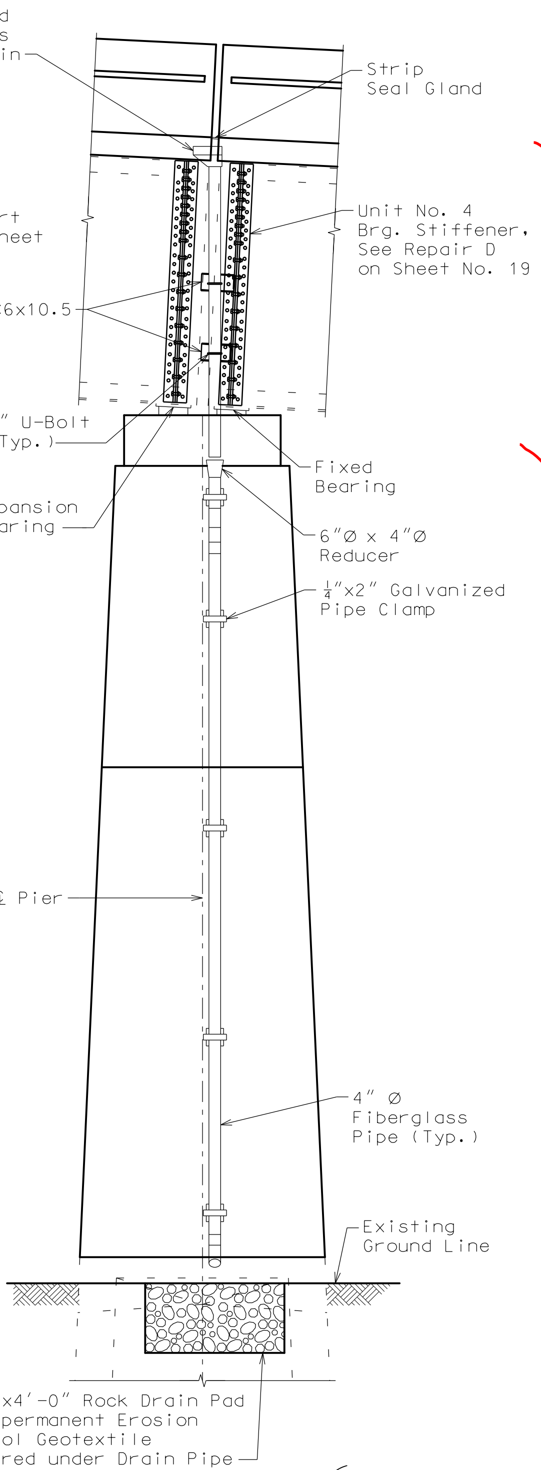
℄ 9/16"Ø Hole in ½" Plate & ℄ 9/16"Ø x 3" Slotted Hole in ¼" Plate
E
¼" Plate
℄ 2-½"Ø Expansion Anchors
℄ 9/16"Ø Holes for ½"Ø Bolts
E
13½"±
℄ 4"Ø Reinforced Fiberglass Pipe

SECTION D-D



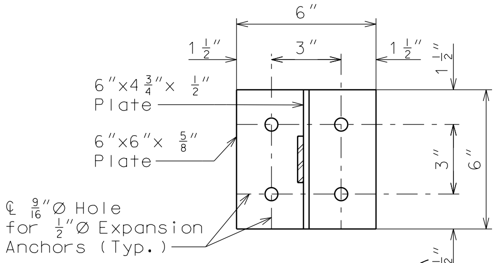
3"
℄ Roadway
℄ Structure
(Symm. about ℄)
Strip Seal Gland
Reinforced Fiberglass Catch Basin
Modified Support Bracket, see Sheet No. 19
C
C
C6x10.5
2'-0" (Min.)
½" U-Bolt (Typ.)
6"Ø x 4"Ø Reducer
D
D
¼"x2" Galvanized Pipe Clamp
45° Elbow (Typ.)
¼"x2" Galvanized Pipe Clamp with Neoprene Spacer Block (Typ.)
6'-0" (Max.) (Typ.)
4" Ø Fiberglass Pipe (Typ.)
Existing Ground Line
B
B
2'-0"
4'-0"x4'-0" Rock Drain Pad with permanent Erosion Control Geotextile centered under Drain Pipe

PIER NO. 7 ELEVATION

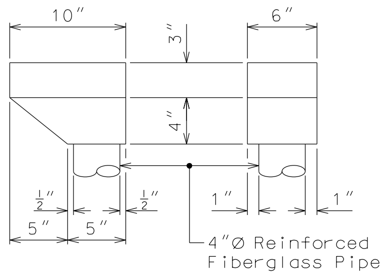


Reinforced Fiberglass Catch Basin
Strip Seal Gland
Unit No. 4 Brg. Stiffener, See Repair D on Sheet No. 19
C6x10.5
½" U-Bolt (Typ.)
Expansion Bearing
Fixed Bearing
6"Ø x 4"Ø Reducer
¼"x2" Galvanized Pipe Clamp
℄ Pier
4" Ø Fiberglass Pipe (Typ.)
Existing Ground Line
4'-0"x4'-0" Rock Drain Pad with permanent Erosion Control Geotextile centered under Drain Pipe

END ELEVATION



SECTION E-E



CATCH BASIN DETAILS

DRAIN DETAILS AT EXPANSION JOINTS

Detailed April 2009
Checked April 2009

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

Sheet No. 47 of 57

FINAL PLANS

DATE PREPARED	8/24/2012
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 47
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	090724-101
PROJECT NO.	ARRA-136-1(59)
BRIDGE NO.	L00982

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

B_L00982_047_J1P2161.DGN 6:36:36 AM 4/1/2013

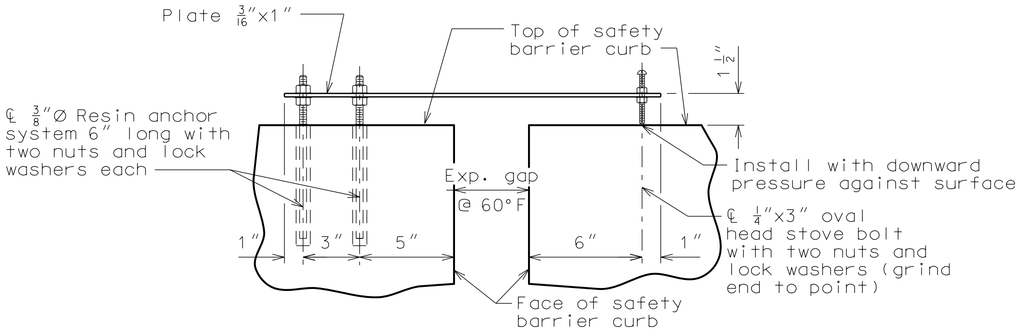
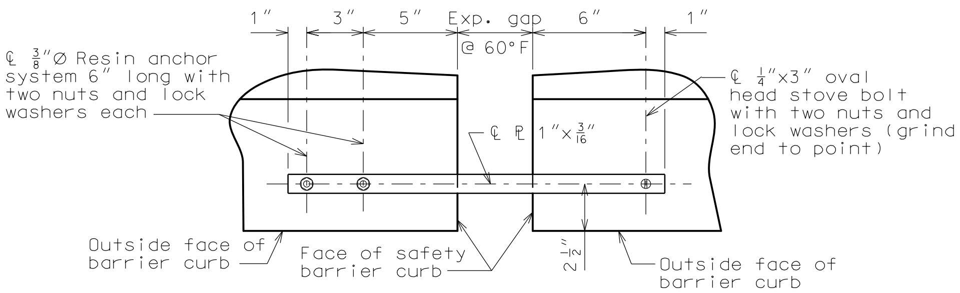


Plate $\frac{3}{16}$"x1"
Top of safety barrier curb
1 $\frac{1}{2}$"
℄ $\frac{3}{8}$"Ø Resin anchor system 6" long with two nuts and lock washers each
Install with downward pressure against surface
Exp. gap @ 60°F
℄ $\frac{1}{4}$"x3" oval head stove bolt with two nuts and lock washers (grind end to point)
1"
3"
5"
6"
1"
Face of safety barrier curb

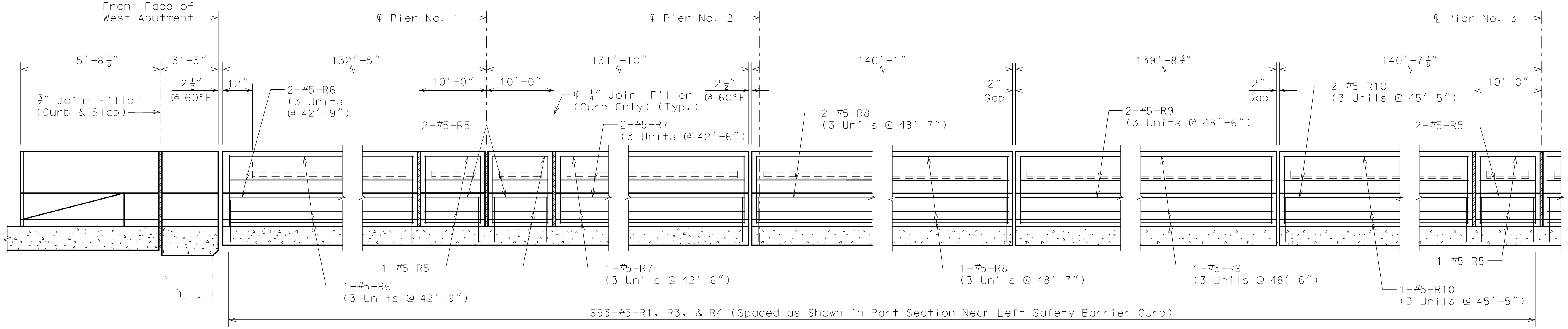
PART ELEVATION OF BARRIER CURB SHOWING MOVEMENT GAUGE

(At Each Exp. Joint)


1"
3"
5"
Exp. gap @ 60°F
6"
1"
℄ $\frac{3}{8}$"Ø Resin anchor system 6" long with two nuts and lock washers each
℄ $\frac{1}{4}$"x3" oval head stove bolt with two nuts and lock washers (grind end to point)
℄ ℙ 1"x$\frac{3}{16}$"
Outside face of barrier curb
Face of safety barrier curb
2 $\frac{1}{2}$"
Outside face of barrier curb

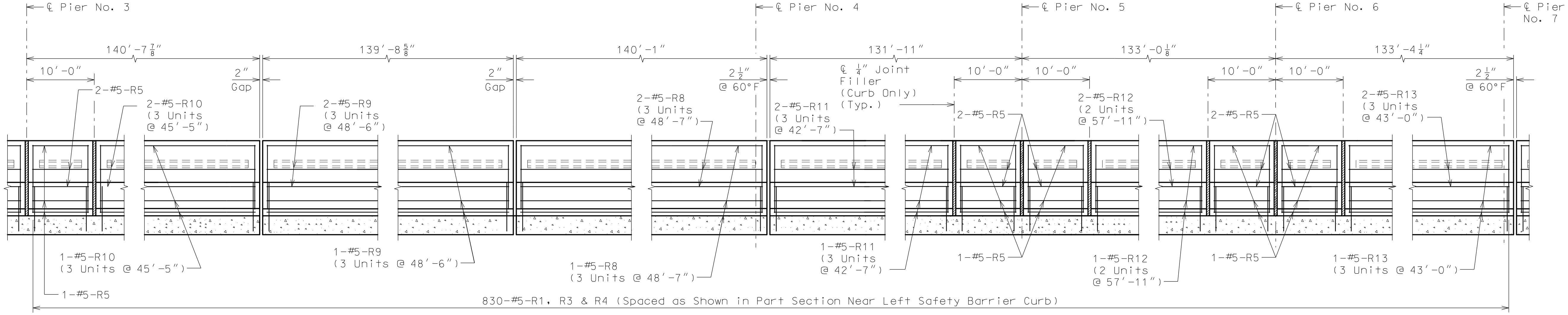
PART PLAN OF BARRIER CURB SHOWING MOVEMENT GAUGE

(At Each Exp. Joint)


Front Face of West Abutment
℄ Pier No. 1
℄ Pier No. 2
℄ Pier No. 3
5'-8 $\frac{7}{8}$"
3'-3"
132'-5"
131'-10"
140'-1"
139'-8 $\frac{3}{4}$"
140'-7 $\frac{7}{8}$"
$\frac{3}{4}$" Joint Filler (Curb & Slab)
2 $\frac{1}{2}$" @ 60°F
12"
2-#5-R6 (3 Units @ 42'-9")
10'-0"
10'-0"
℄ $\frac{1}{4}$" Joint Filler (Curb Only) (Typ.)
2 $\frac{1}{2}$" @ 60°F
2" Gap
2" Gap
10'-0"
2-#5-R5
2-#5-R7 (3 Units @ 42'-6")
2-#5-R8 (3 Units @ 48'-7")
2-#5-R9 (3 Units @ 48'-6")
2-#5-R10 (3 Units @ 45'-5")
2-#5-R5
1-#5-R5
1-#5-R6 (3 Units @ 42'-9")
1-#5-R7 (3 Units @ 42'-6")
1-#5-R8 (3 Units @ 48'-7")
1-#5-R9 (3 Units @ 48'-6")
1-#5-R5
1-#5-R10 (3 Units @ 45'-5")
693-#5-R1, R3, & R4 (Spaced as Shown in Part Section Near Left Safety Barrier Curb)

SECTION NEAR LEFT SAFETY BARRIER CURB – UNITS NO. 1 & 2

(Right Barrier Curb Is Similar)
(Curb Bent Plates not shown for clarity)


℄ Pier No. 3
℄ Pier No. 4
℄ Pier No. 5
℄ Pier No. 6
℄ Pier No. 7
140'-7 $\frac{7}{8}$"
139'-8 $\frac{5}{8}$"
140'-1"
131'-11"
133'-0 $\frac{1}{8}$"
133'-4 $\frac{1}{4}$"
10'-0"
2-#5-R5
2-#5-R10 (3 Units @ 45'-5")
2" Gap
2-#5-R9 (3 Units @ 48'-6")
2" Gap
2-#5-R8 (3 Units @ 48'-7")
2 $\frac{1}{2}$" @ 60°F
℄ $\frac{1}{4}$" Joint Filler (Curb Only) (Typ.)
2-#5-R11 (3 Units @ 42'-7")
10'-0"
10'-0"
2-#5-R5
2-#5-R12 (2 Units @ 57'-11")
10'-0"
10'-0"
2-#5-R5
2-#5-R13 (3 Units @ 43'-0")
2 $\frac{1}{2}$" @ 60°F
1-#5-R10 (3 Units @ 45'-5")
1-#5-R5
1-#5-R9 (3 Units @ 48'-6")
1-#5-R8 (3 Units @ 48'-7")
1-#5-R11 (3 Units @ 42'-7")
1-#5-R5
1-#5-R12 (2 Units @ 57'-11")
1-#5-R5
1-#5-R13 (3 Units @ 43'-0")
830-#5-R1, R3 & R4 (Spaced as Shown in Part Section Near Left Safety Barrier Curb)

SECTION NEAR LEFT SAFETY BARRIER CURB – UNITS NO. 2 & 3

(Right Barrier Curb Is Similar)
(Curb Bent Plates not shown for clarity)

Note:

For Part Sections Near Left Safety Barrier Curb, see Sheet No. 49.

For details of Barrier Curb on the Approach Slab, see Sheet No. 50.

For details of Barrier Curb above the Abutment Backwall, see Sheet No. 7.

Longitudinal dimensions are horizontal.

DETAILS OF SAFETY BARRIER CURB

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

Sheet No. 48 of 57

Detailed April 2009
Checked April 2009

FINAL PLANS

DATE PREPARED	8/24/2012
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	48
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	090724-101
PROJECT NO.	ARRA-136-1(59)
BRIDGE NO.	L00982

DESCRIPTION

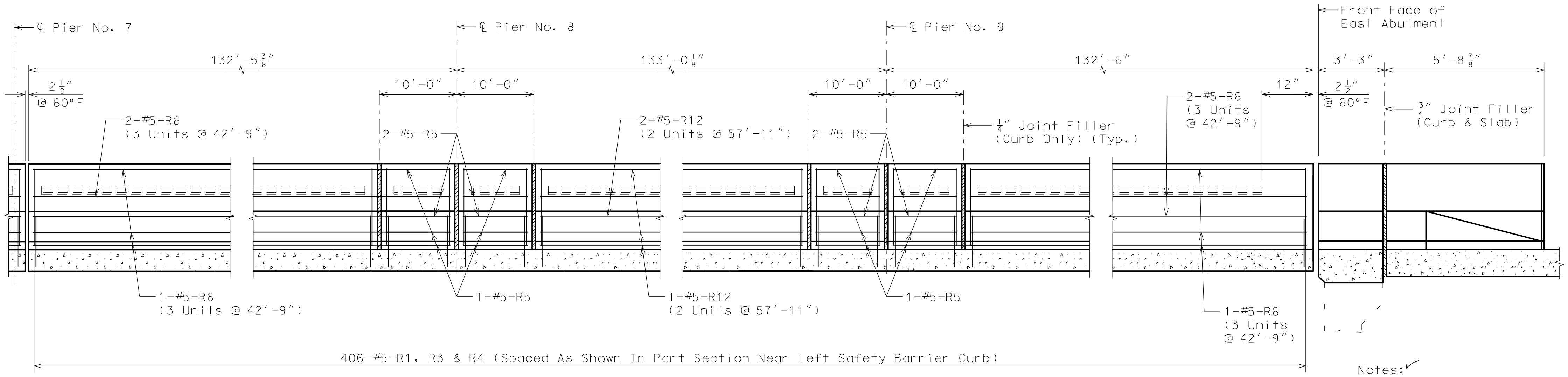
DATE

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

MoDOT

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

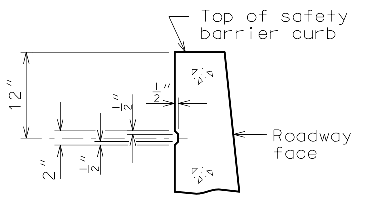
REV.



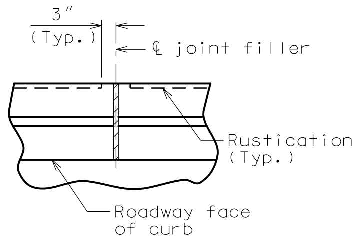
℄ Pier No. 7
℄ Pier No. 8
℄ Pier No. 9
Front Face of East Abutment
132'-5 3/8"
133'-0 1/8"
132'-6"
3'-3"
5'-8 7/8"
10'-0"
10'-0"
10'-0"
10'-0"
12"
2 1/2" @ 60°F
2 1/2" @ 60°F
2-#5-R6 (3 Units @ 42'-9")
2-#5-R5
2-#5-R12 (2 Units @ 57'-11")
2-#5-R5
1/4" Joint Filler (Curb Only) (Typ.)
2-#5-R6 (3 Units @ 42'-9")
3/4" Joint Filler (Curb & Slab)
1-#5-R6 (3 Units @ 42'-9")
1-#5-R5
1-#5-R12 (2 Units @ 57'-11")
1-#5-R5
1-#5-R6 (3 Units @ 42'-9")
406-#5-R1, R3 & R4 (Spaced As Shown In Part Section Near Left Safety Barrier Curb)

SECTION NEAR LEFT SAFETY BARRIER CURB - UNIT NO. 4

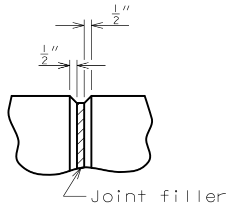
(Right Barrier Curb Is similar)
(Curb Bent Plates not shown for clarity)



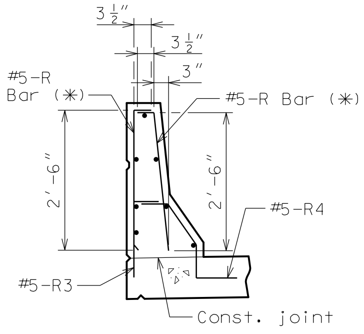
PART SECTION SHOWING RUSTICATION DETAILS



PART PLAN SHOWING SAFETY BARRIER CURB JOINT

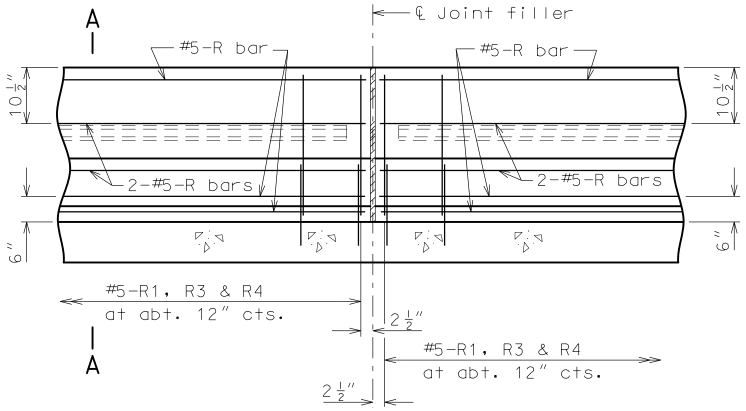


FILLED JOINT DETAIL

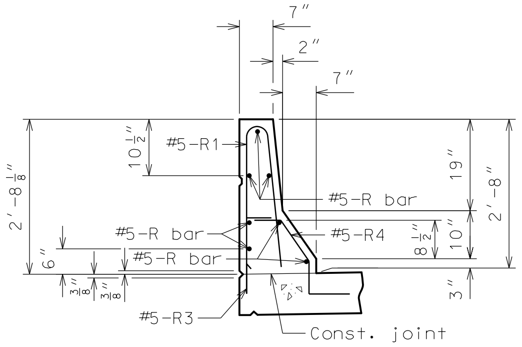


R-BAR PERMISSIBLE ALTERNATE SHAPE

(✻) The R1 bar may be separated into two bars as shown, at the contractor's option, only when slip forming is not used. (All dimensions are out to out.)



PART SECTION NEAR LEFT SAFETY BARRIER CURB (CAST-IN-PLACE CONVENTIONAL FORMING OPTION)



PART SECTION A-A

Notes:

Use a minimum lap of 2'-11" for #5 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 2.27 sq. ft.

Notes:

Top of safety barrier curb shall be built parallel to grade with barrier curb joints (except at end bents) normal to grade.

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

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

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

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of curb to end of curb except for portion above abutment backwall.

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

A movement gauge shall be provided on one side of the bridge at all safety barrier curb expansion joints. All steel shall be galvanized.

Cost of movement gauge complete-in-place will be considered completely covered by the contract unit price for Safety Barrier Curb per Lin. Ft.

For Section near Left Safety Barrier Curb from West Abutment to Pier No. 7, see Sheet 48.

For details of Barrier Curb on the Approach Slab, see Sheet No. 50.

For details of Barrier Curb above the Abutment Backwall, see Sheet No. 7.

For details of Curb Bent Plates, see Strip Seal Details. Cost of furnishing and installing Curb Bent Plates at Abutments and Piers No. 2, 4 & 7 shall be considered completely covered by the contract unit price for Safety Barrier Curb per linear foor.

Longitudinal dimensions are horizontal.

DETAILS OF SAFETY BARRIER CURB

Detailed April 2009
Checked April 2009

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

Sheet No. 49 of 57

FINAL PLANS

DATE PREPARED	
8/24/2012	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	49
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
090724-101	
PROJECT NO.	
ARRA-136-1(59)	
BRIDGE NO.	
L00982	

DESCRIPTION

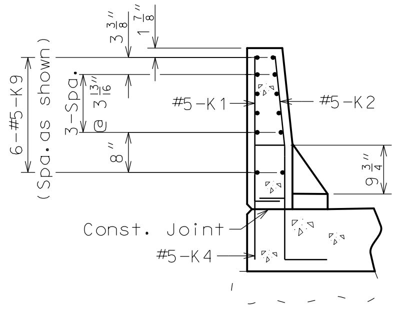
DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

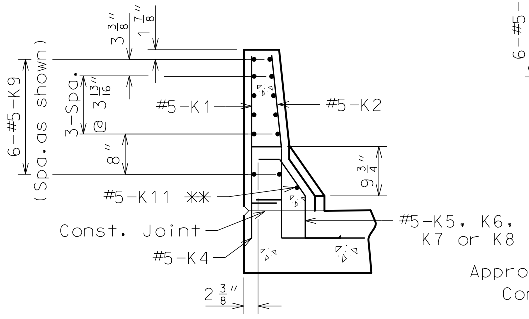
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

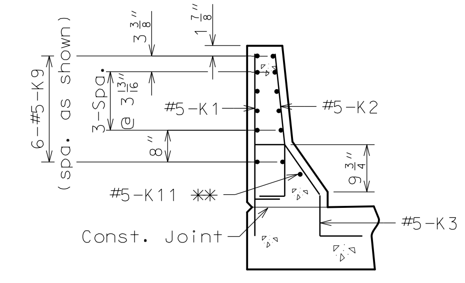
REV.



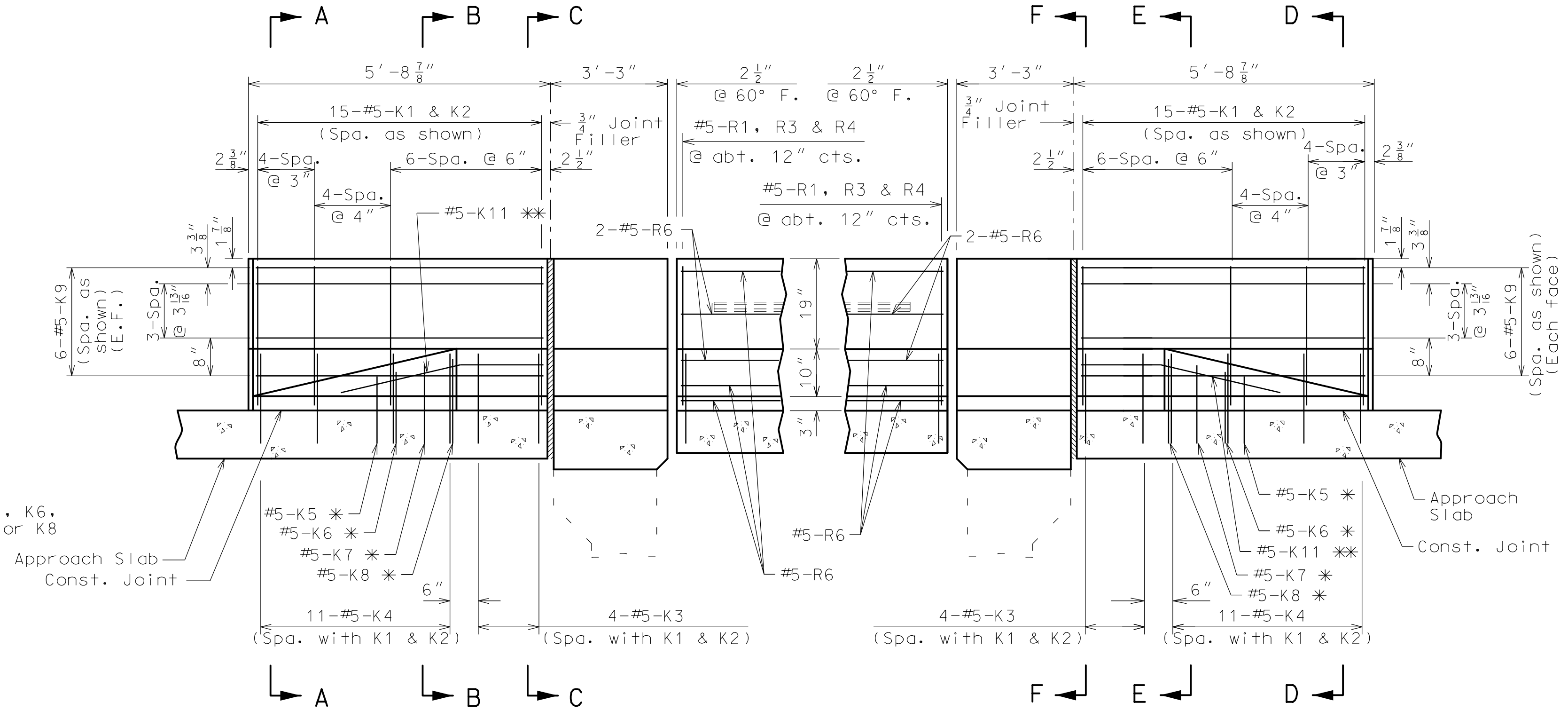
SECTION A-A



SECTION B-B



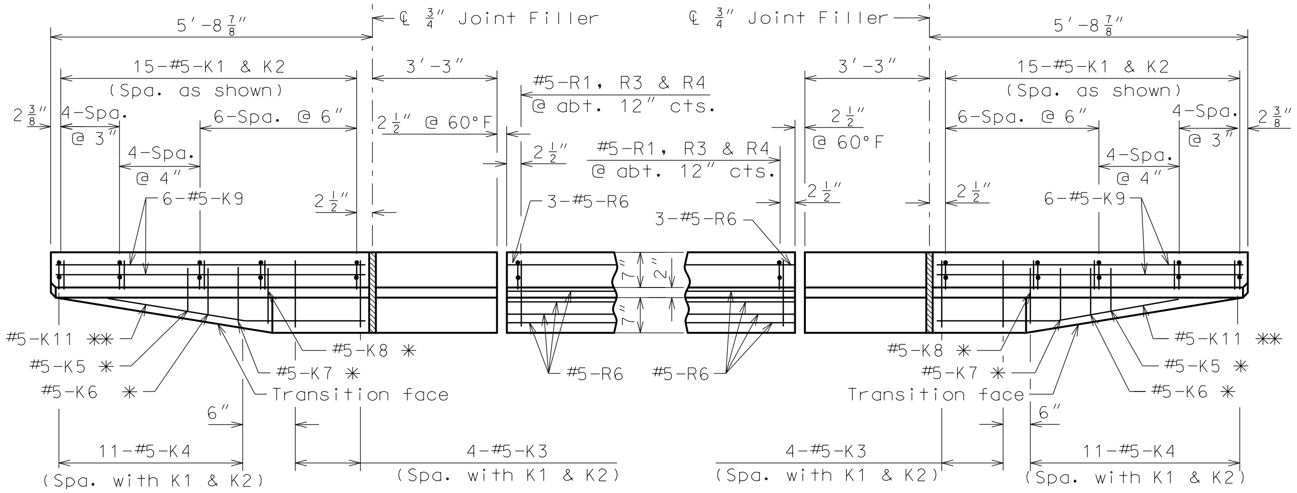
SECTION C-C



ELEVATION

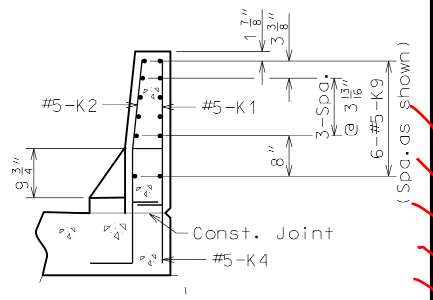
ELEVATION

✱ Spaced with #5-K4 bars.
✱✱ Fit bar to follow transition face of curb.

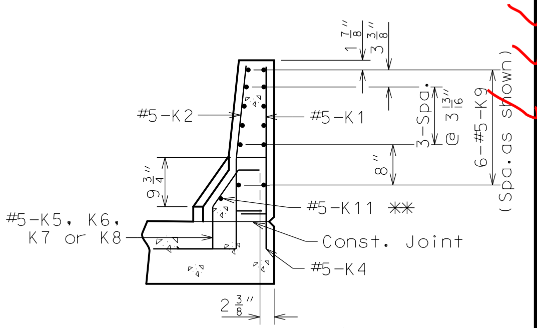


PLAN

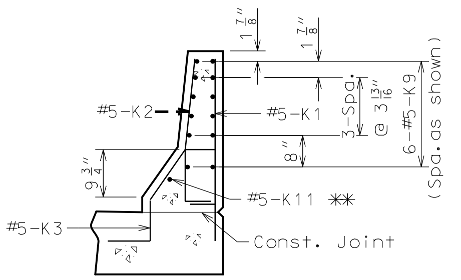
PLAN



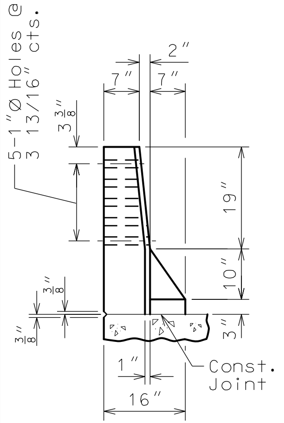
SECTION D-D



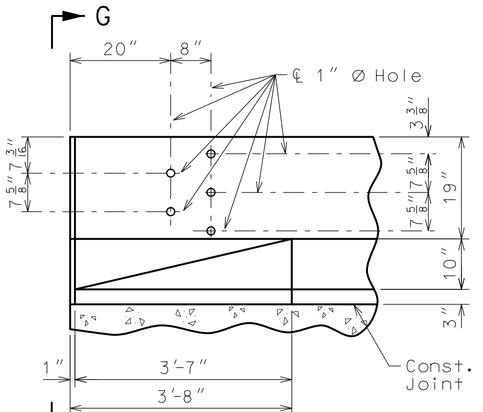
SECTION E-E



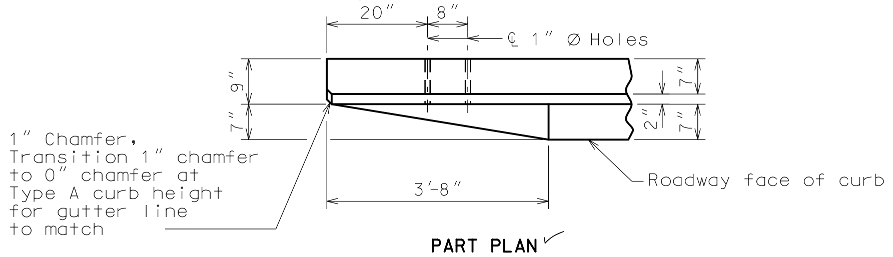
SECTION F-F



PART ELEVATION G-G



PART ELEVATION


20"
8"
℄ 1" Ø Holes
9"
7"
1" Chamfer, Transition 1" chamfer to 0" chamfer at Type A curb height for gutter line to match
3'-8"
Roadway face of curb

PART PLAN

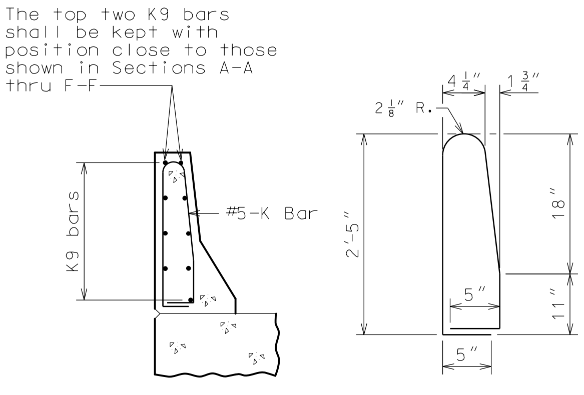
DETAILS OF GUARD RAIL ATTACHMENT

Notes:

Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".

For details of the Barrier Curb above the Abutment Backwall, see Sheet No. 7.

The top two K9 bars shall be kept with position close to those shown in Sections A-A thru F-F



(K3 or K4 thru K8 bars not shown for clarity)

K1-K2 BAR PERMISSIBLE ALTERNATE SHAPE (✱✱✱)

(✱✱✱) The K1 and K2 bar combination may be furnished as one bar as shown, at the contractor's option.

DETAILS OF SAFETY BARRIER CURB AT ABUTMENTS

(Left barrier curb shown: right barrier curb similar)

Detailed April 2009
Checked April 2009

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

Sheet No. 50 of 57

FINAL PLANS

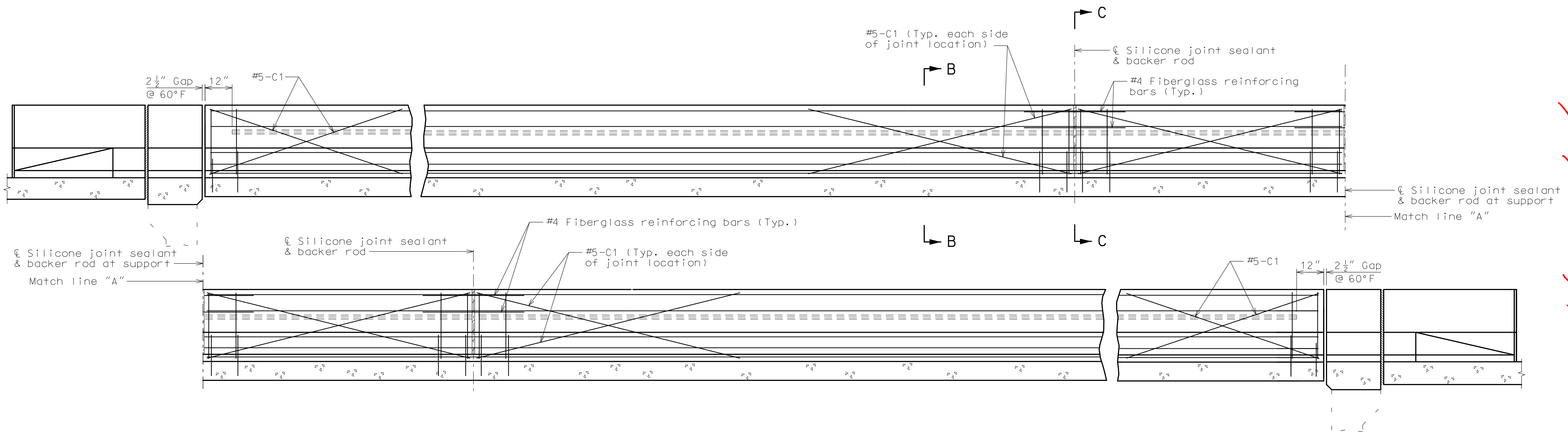
DATE PREPARED	
8/24/2012	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	50
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
090724-101	
PROJECT NO.	
ARRA-136-1(59)	
BRIDGE NO.	
L00982	

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.


2½″ Gap @ 60°F
12″
#5-C1
#5-C1 (Typ. each side of joint location)
C
B
℄ Silicone joint sealant & backer rod
#4 Fiberglass reinforcing bars (Typ.)
℄ Silicone joint sealant & backer rod at support
Match line "A"
B
C
℄ Silicone joint sealant & backer rod at support
Match line "A"
℄ Silicone joint sealant & backer rod
#4 Fiberglass reinforcing bars (Typ.)
#5-C1 (Typ. each side of joint location)
#5-C1
12″
2½″ Gap @ 60°F

TYPICAL SECTION NEAR LEFT SAFETY BARRIER CURB AT SUPPORT LOCATIONS ✓ (OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB)

Notes: ✓

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

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

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

Measurement of safety barrier curb is to the nearest linear foot for each structure, measured along the outside top of slab from end of curb to end of curb.

The curb shall be cured by application of Type 1-D or Type 2 Liquid Membrane-Forming Compound in accordance with Sec 1055. Surface sealing for concrete in accordance with Sec 703 is not required. Application of linseed oil at the contractor's expense is permitted.

Notes: ✓

Joint sealant and backer rods shall be used on all slip-form barrier curbs instead of joint filler and shall be in accordance with Sec 717 for silicone joint sealant for saw cut and formed joints.

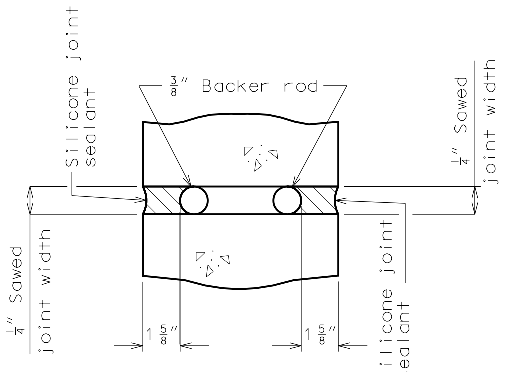
Plastic waterstop shall not be used with slip-form option.

C Bars (Slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

For Slip-Form option, all sides of the safety barrier curb shall have a vertically broomed finish and the curb top shall have a transversely broomed finish.

Cost of silicone joint sealant and backer rod complete-in-place will be considered completely covered by the contract unit price for Safety Barrier Curb per Lin. Ft.

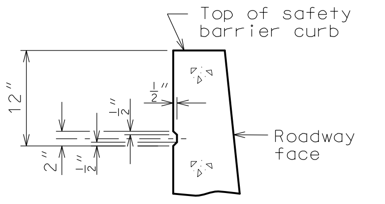
Concrete traffic barrier delineators shall be placed on top of the safety barrier curb as shown on Missouri Standard Plans 617.10 and in accordance with Sec 617. Concrete traffic barrier delineators will be considered completely covered by the contract unit price for "Safety Barrier Curb".



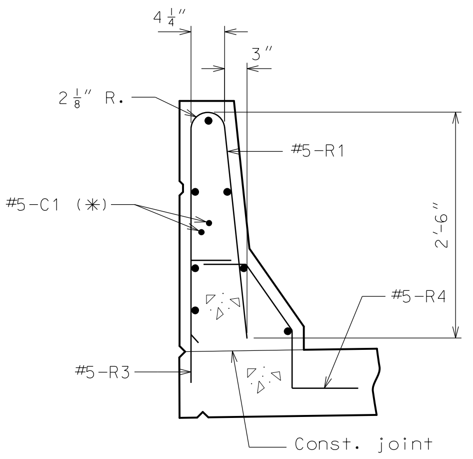
SECTION A-A ✓

Note:

Cost of silicone joint sealant and backer rod, complete-in-place, will be considered completely covered by the contract unit price for Safety Barrier Curb.

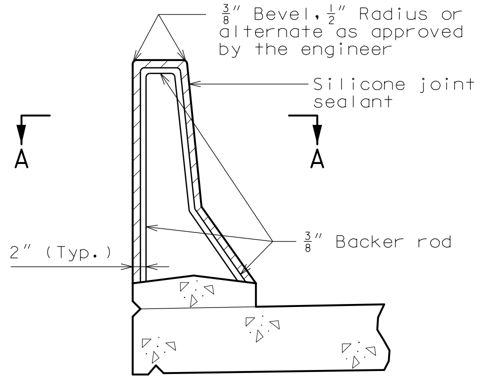


PART SECTION SHOWING RUSTICATION DETAILS ✓

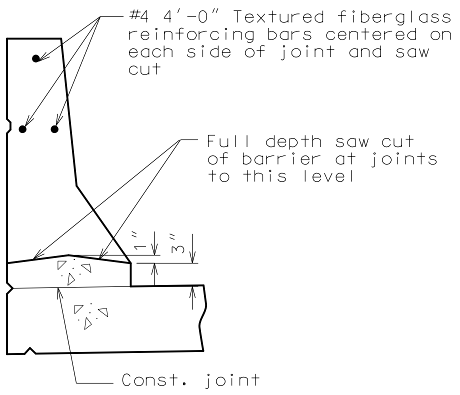


PART SECTION B-B ✓

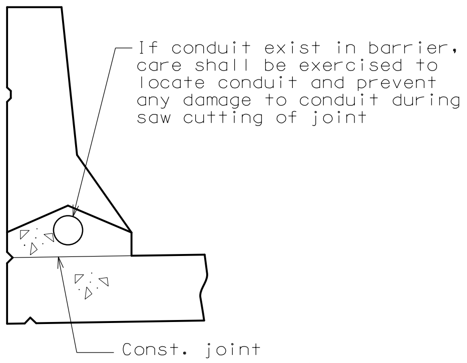
(✱) Each side of joint location.


⅜″ Bevel, ½″ Radius or alternate as approved by the engineer
Silicone joint sealant
A
A
2″ (Typ.)
⅜″ Backer rod

SECTION THRU JOINT ✓


#4 4′-0″ Textured fiberglass reinforcing bars centered on each side of joint and saw cut
Full depth saw cut of barrier at joints to this level
1″
3″
Const. joint

PART SECTION C-C ✓


If conduit exist in barrier, care shall be exercised to locate conduit and prevent any damage to conduit during saw cutting of joint
Const. joint

PART SECTION C-C ✓
(Use when conduit required)

OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB ✓

(Left barrier curb shown, right barrier curb similar.)

Detailed April 2009
Checked April 2009

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

Sheet No. 51 ✓ of 57 ✓

FINAL PLANS ✓

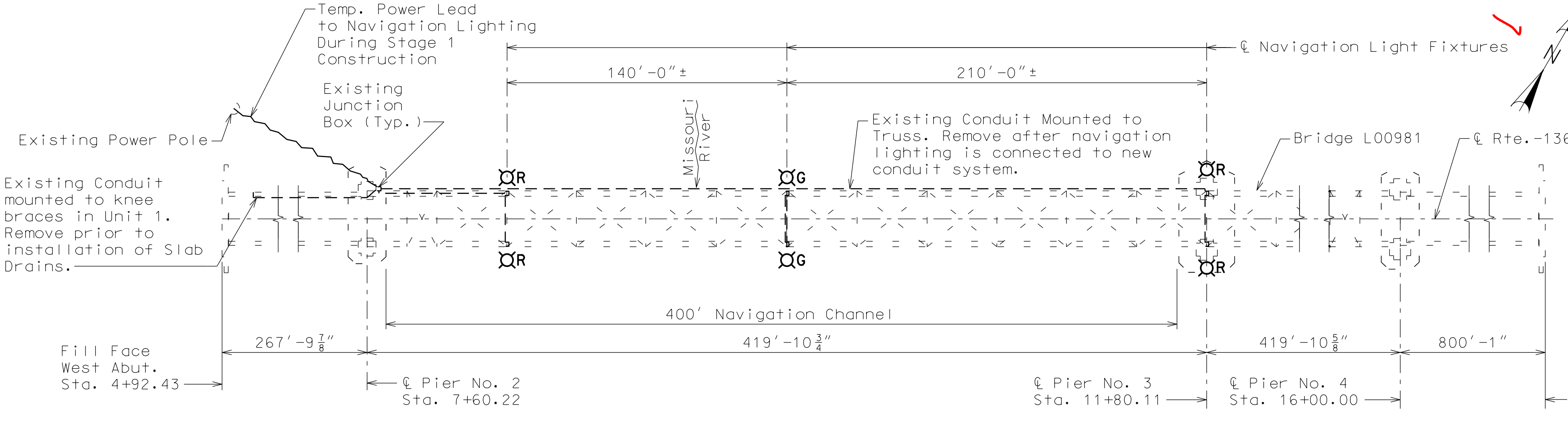
DATE PREPARED 8/24/2012 ✓	
ROUTE 136 ✓	STATE MO ✓
DISTRICT BR ✓	SHEET NO. 51 ✓
COUNTY ATCHISON ✓	
JOB NO. J1P2161 ✓	
CONTRACT ID. 090724-101 ✓	
PROJECT NO. ARRA-136-1(59 ✓)	
BRIDGE NO. L00982 ✓	

DESCRIPTION
DATE

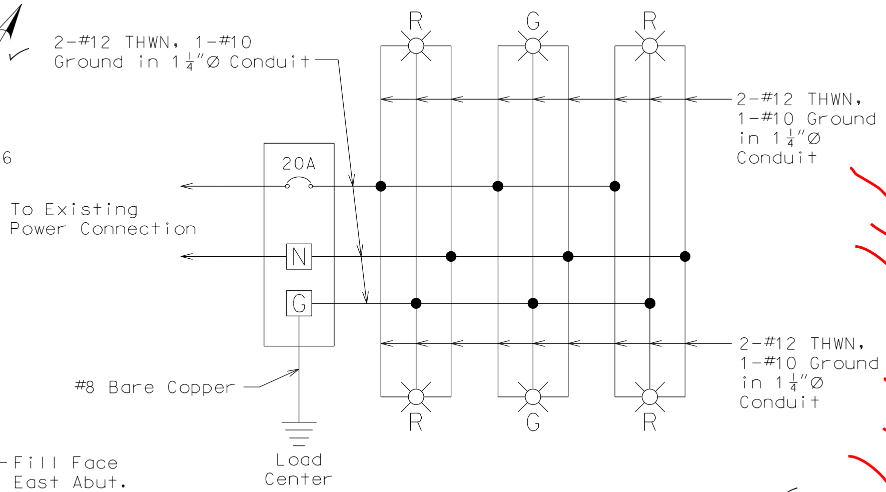
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

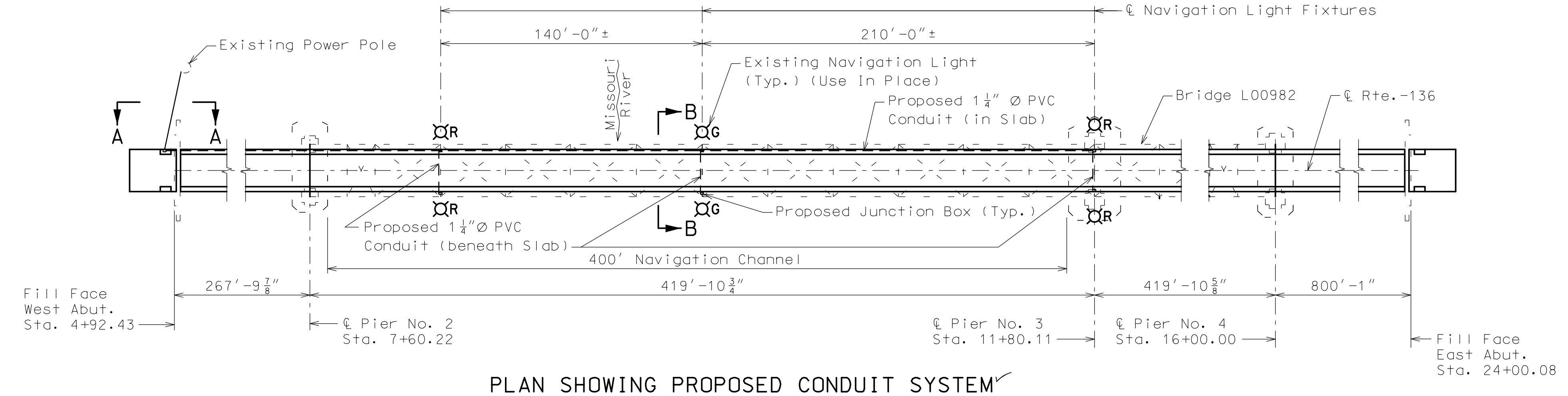
REV.


Temp. Power Lead to Navigation Lighting During Stage 1 Construction
Existing Junction Box (Typ.)
Existing Power Pole
Existing Conduit mounted to knee braces in Unit 1. Remove prior to installation of Slab Drains.
140′-0″±
210′-0″±
℄ Navigation Light Fixtures
Missouri River
Existing Conduit Mounted to Truss. Remove after navigation lighting is connected to new conduit system.
Bridge L00981
℄ Rte.-136
R
G
R
400′ Navigation Channel
267′-9 7/8″
419′-10 3/4″
419′-10 5/8″
800′-1″
Fill Face West Abut. Sta. 4+92.43
℄ Pier No. 2 Sta. 7+60.22
℄ Pier No. 3 Sta. 11+80.11
℄ Pier No. 4 Sta. 16+00.00
Fill Face East Abut. Sta. 24+00.08

PLAN SHOWING EXISTING CONDUIT SYSTEM


2-#12 THWN, 1-#10 Ground in 1 1/4″Ø Conduit
R
G
R
20A
N
G
To Existing Power Connection
2-#12 THWN, 1-#10 Ground in 1 1/4″Ø Conduit
2-#12 THWN, 1-#10 Ground in 1 1/4″Ø Conduit
#8 Bare Copper
Load Center

NAVIGATION LIGHTING SCHEMATIC


℄ Navigation Light Fixtures
140′-0″±
210′-0″±
Existing Power Pole
Missouri River
Existing Navigation Light (Typ.) (Use In Place)
Proposed 1 1/4″ Ø PVC Conduit (in Slab)
Bridge L00982
℄ Rte.-136
A
A
B
B
R
G
R
Proposed 1 1/4″Ø PVC Conduit (beneath Slab)
Proposed Junction Box (Typ.)
400′ Navigation Channel
267′-9 7/8″
419′-10 3/4″
419′-10 5/8″
800′-1″
Fill Face West Abut. Sta. 4+92.43
℄ Pier No. 2 Sta. 7+60.22
℄ Pier No. 3 Sta. 11+80.11
℄ Pier No. 4 Sta. 16+00.00
Fill Face East Abut. Sta. 24+00.08

PLAN SHOWING PROPOSED CONDUIT SYSTEM

Notes: All conduit for Navigation Lighting wiring shall be rigid, non-metallic, Schedule 40, heavy wall, PVC (polyvinyl chloride) plastic. Each section of conduit shall bear the Underwriter's Laboratories, Inc. (UL) label.

Conduit shall be embedded in the slab or barrier where shown. Shift reinforcing steel in the field where necessary to clear conduit and junction boxes.

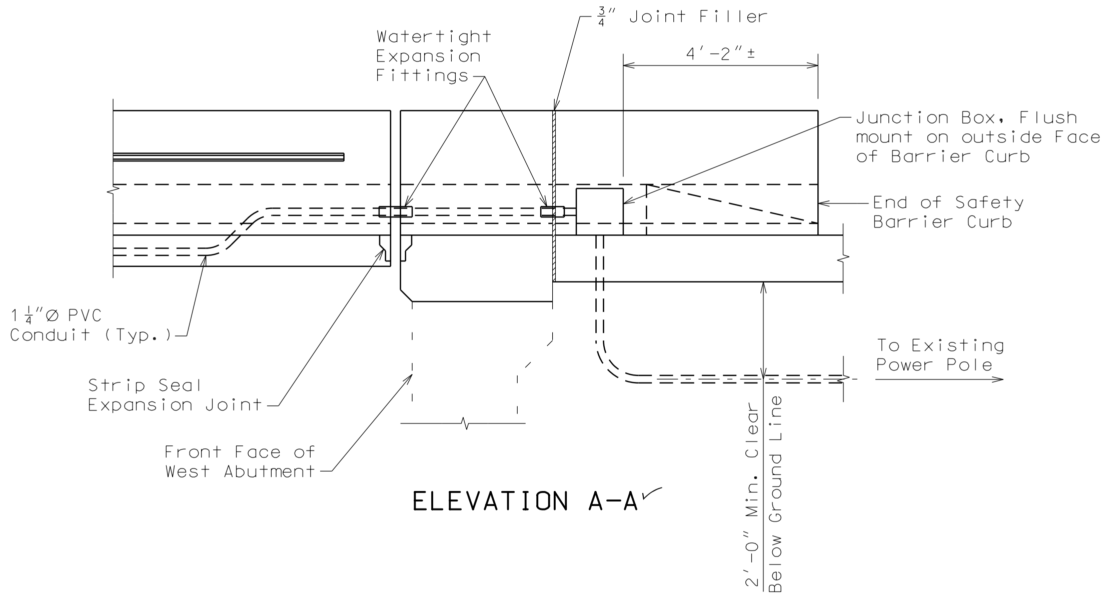
A watertight expansion fitting shall be provided at the expansion joints at the West Abutment and Pier No. 2 to accommodate a minimum movement in either direction of 3 inches. Gap between the slabs at 60° F. is 2 1/2". Movement per 10° F. temperature change is approximately 5/16". A watertight expansion fitting shall be provided at the expansion joints at Panel Points L4 & L8 in Span No. 3 to accomodate a minimum movement in either direction of 1 inch. Gap between the slabs shall be 2" regardless of the temperature at the time of installation. The expansion fitting shall be equal to Carlon Electrical Construction Products or Cantex, Inc.

Weepholes shall be provided at appropriate locations to drain any moisture in the conduit system.

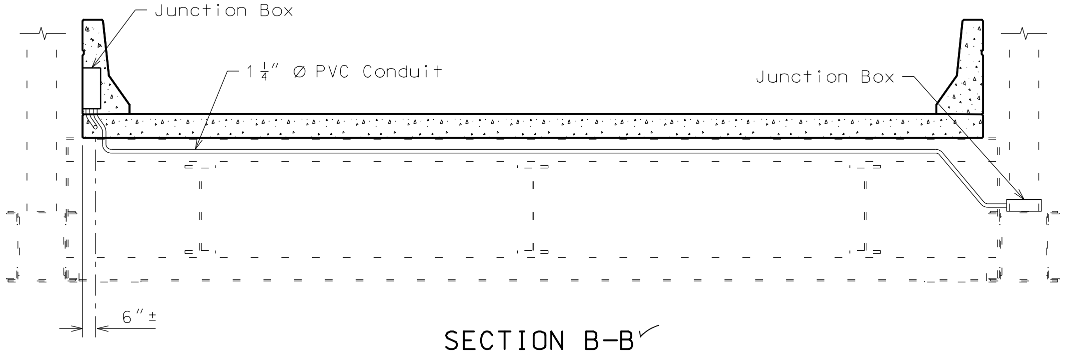
All junction boxes shall be PVC molded flush mounted in barrier or surface mounted on truss and equal to Carlon Electrical Construction Products or Cantex, Inc. The conduit terminations shall be permanent or separable. The terminations and covers shall be of watertight construction and shall meet requirements for NEMA 4 enclosure.

Cost of permanent Navigation Lighting, including furnishing and installing conduit, expansion fittings, wiring, junction boxes, connection to permanent power source, connection to existing lights and testing of the lighting system shall be paid for at the contract unit price for "Navigation Lighting System", Lump Sum.

See special provisions for wiring and additional requirements.


3/4″ Joint Filler
Watertight Expansion Fittings
4′-2″±
Junction Box, Flush mount on outside Face of Barrier Curb
End of Safety Barrier Curb
1 1/4″Ø PVC Conduit (Typ.)
Strip Seal Expansion Joint
Front Face of West Abutment
To Existing Power Pole
2′-0″ Min. Clear Below Ground Line

ELEVATION A-A



SECTION B-B

Flexible cable connection from Junction Boxes to Existing Navigation Lights not shown for clarity.

PERMANENT NAVIGATION LIGHTING REPAIR DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 52 of 57

FINAL PLANS

DATE PREPARED	8/24/2012
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	52
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	090724-101
PROJECT NO.	ARRA-136-1(59)
BRIDGE NO.	L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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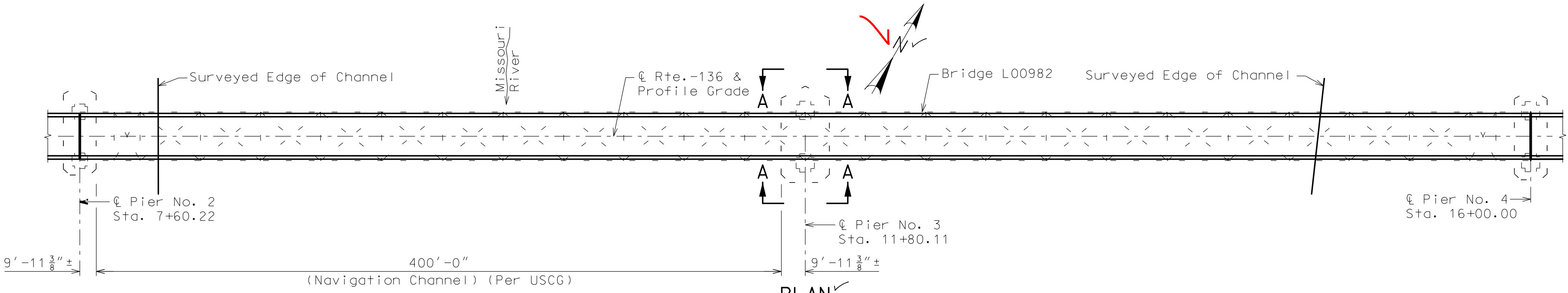
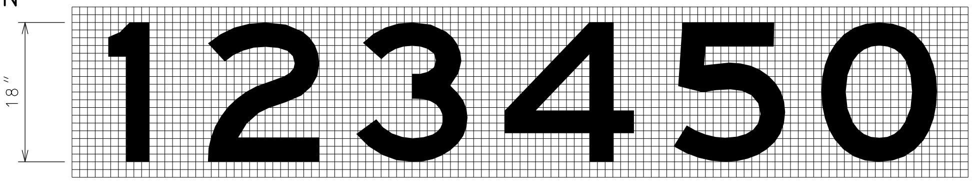
B_L00982_052_J1P2161.DGN 6:46:56 AM 4/1/2013

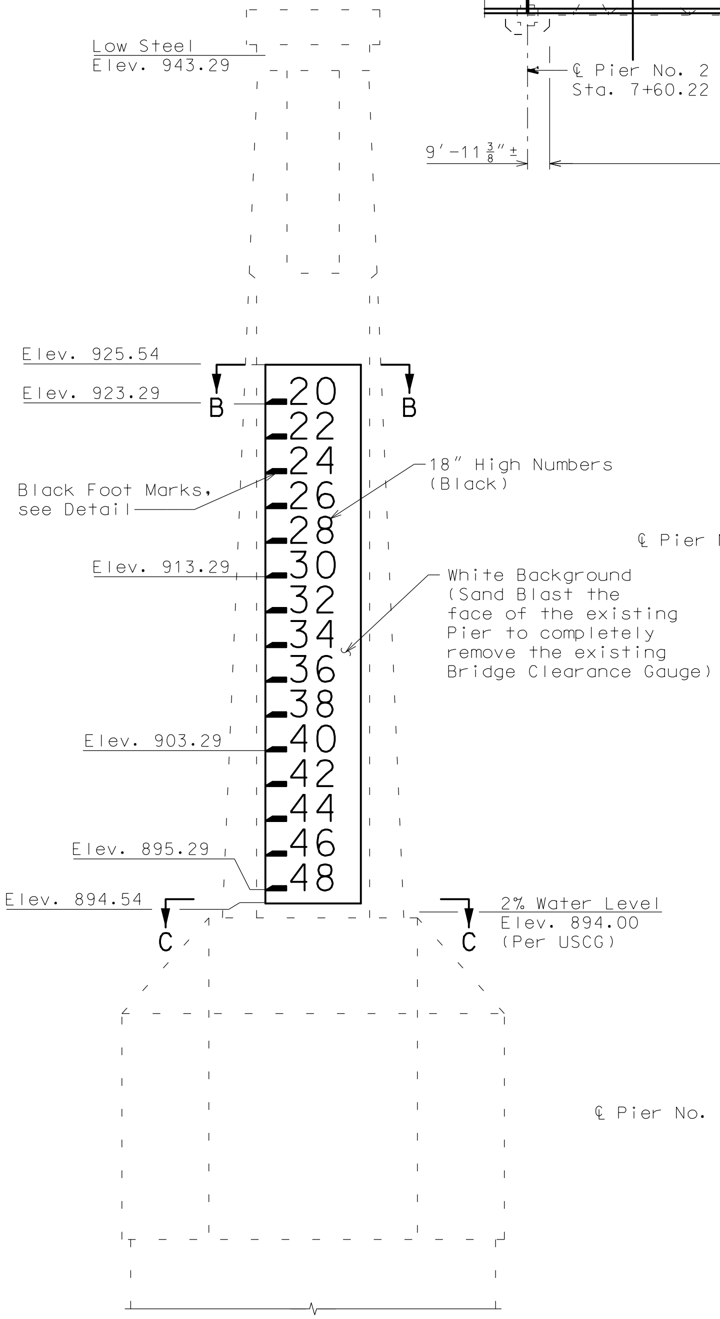


PLAN



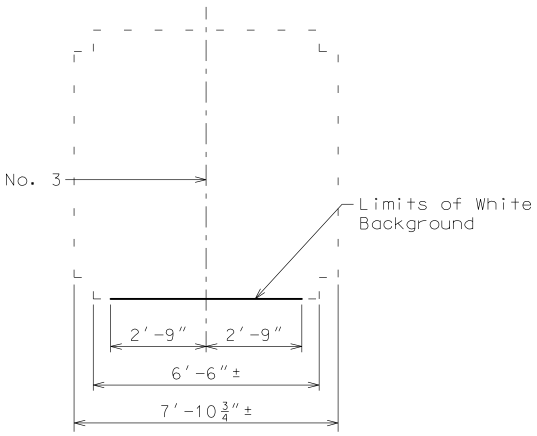
NUMBERS DETAIL

NOTE:
Series B Type Numbers



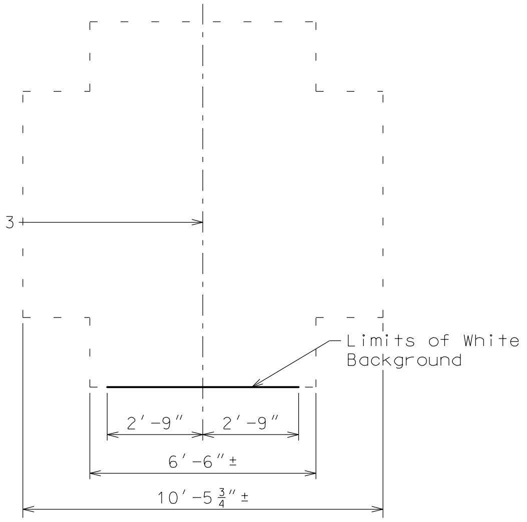
ELEVATION A-A

Downstream Face Shown, Upstream Face Similar



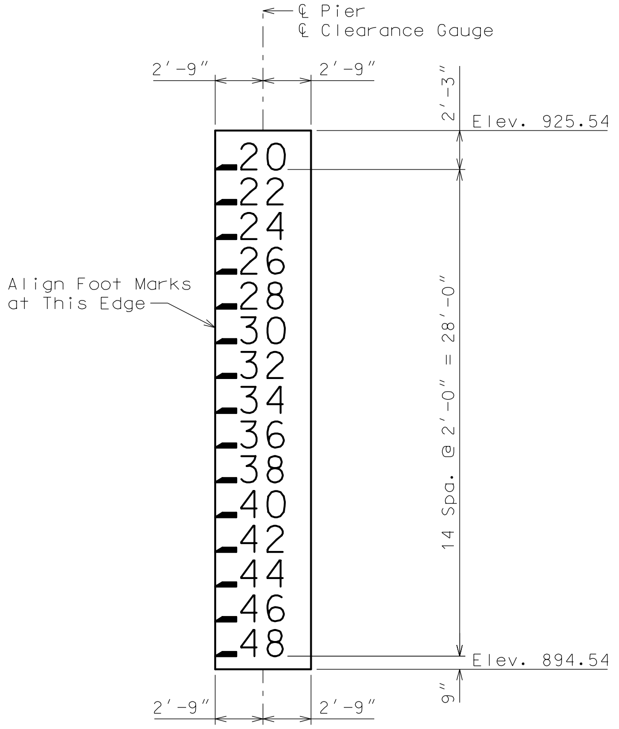
SECTION B-B

(South Column Shown, North Column Similar)

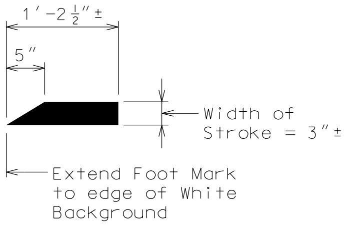


SECTION C-C

(South Column Shown, North Column Similar)



DEVELOPED GAUGE ELEVATION



FOOT MARK DETAIL

Notes:
Gauges to be painted on upstream and downstream face of Pier No. 3. (See Special Provisions.)

The width of stroke for the numerals and Foot Marks shall be approximately 3 inches.

The width of the numerals shall be proportionate to the height as detailed for Series "B" Type numerals.

The horizontal distance between the numeral and nearest edge of the white background shall be no less than one-half the width of a single numeral.

The furnishing of and the installation of materials for the Bridge Clearance Gauges on the Pier shall be considered completely covered by the contract price for Clearance Gauge, Lump Sum.

BRIDGE CLEARANCE GAUGE

Detailed April 2009
Checked April 2009

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

Sheet No. 53 of 57

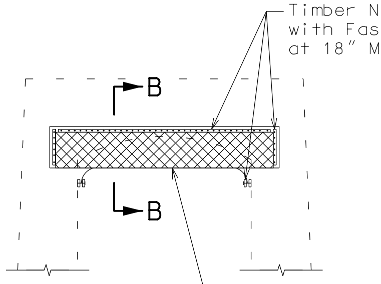
FINAL PLANS	
DATE PREPARED 8/24/2012	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 53
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID. 090724-101	
PROJECT NO. ARRA-136-1(59)	
BRIDGE NO. L00982	

DESCRIPTION
DATE

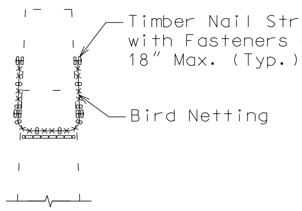
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

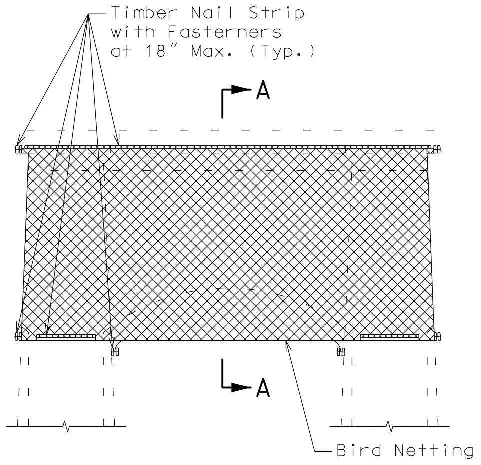
REV.



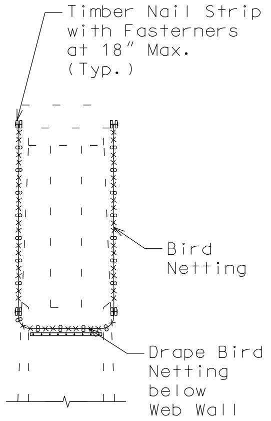
ELEVATION SHOWING
BIRD NETTING
(PIERS NO. 1, 5, 6, 8 & 9)



SECTION B-B✓



ELEVATION SHOWING✓
BIRD NETTING
(PIERS NO. 2, 3 & 4)



SECTION A-A✓

Notes:✓

There is evidence of a substantial colony of migratory birds on the existing bridge with nests under the bridge deck and under the pier caps and pier cap overhangs. The contractor shall avoid disturbance seasonally by restricting work on nesting areas of the bridge between April 15 and July 15 or installation of netting to prevent bird access to nesting areas during this timeframe.

To prevent adverse impacts to the migratory bird population, the contractor shall remove nests found on the underside of the deck and install all bird netting as shown in the details on this sheet. This work shall be completed, with all bird netting in place, between the date that the contractor is given notice to proceed with the project and April 15.

The contractor may elect to complete deck removals without removing nests from the underside of the deck as long as the Stage 1 deck is completely removed prior to April 15 and the bird netting under the remaining existing deck is completely in place prior to April 15.

The contractor shall maintain the bird netting in a manner that prevents bird entry to the satisfaction of the engineer between April 15 and July 15. Any work that requires entry into the netting between April 15 and July 15 shall be done with caution and with countermeasures in place to prevent bird entry.

Bird netting is not required under the new deck constructed during the first stage. Any nests that are constructed between April 15 and July15 under the new deck constructed during the first stage shall be avoided and protected from damage as directed by the engineer from April 15 to July 15.

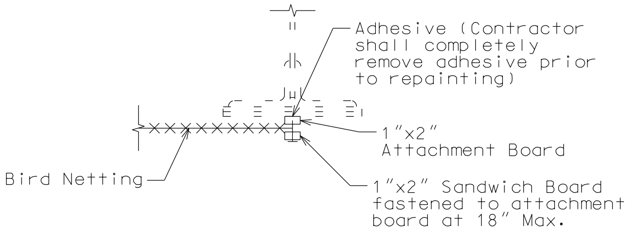
Bird netting shall be installed on the existing cap at Pier No. 7 if the demolition is not complete prior to April 15. Bird netting shall be installed on any portion of the new cap at Pier No. 7 that is completed prior to August 1.

The bird netting shall be installed as shown in the details on this sheet and according to the bird netting manufacturer's instructions. The bird netting shall have a maximum opening size of 1/2″ x 1/2″.

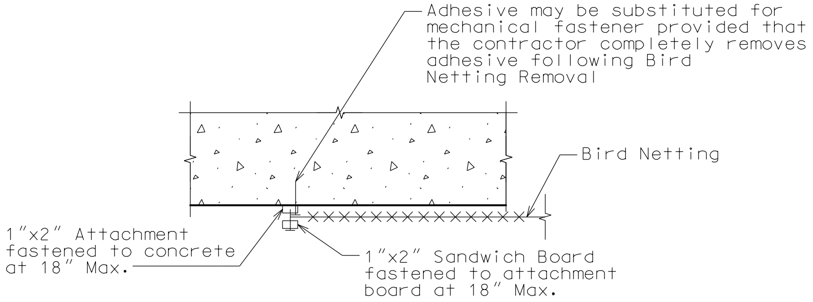
The contractor shall submit sketches, plans, materials samples, attachment details, and splicing details to the engineer for review a minimum of 4 weeks prior to beginning bird net installation. The information submitted shall be of sufficient detail to fully explain the contractor's bird netting installation and maintenance approach.

Alternate netting approaches can be submitted by the contractor for review but must be effective in preventing migratory bird nesting on portions of the bridge that will be disturbed by the contractor's operations between April 15 and July 15.

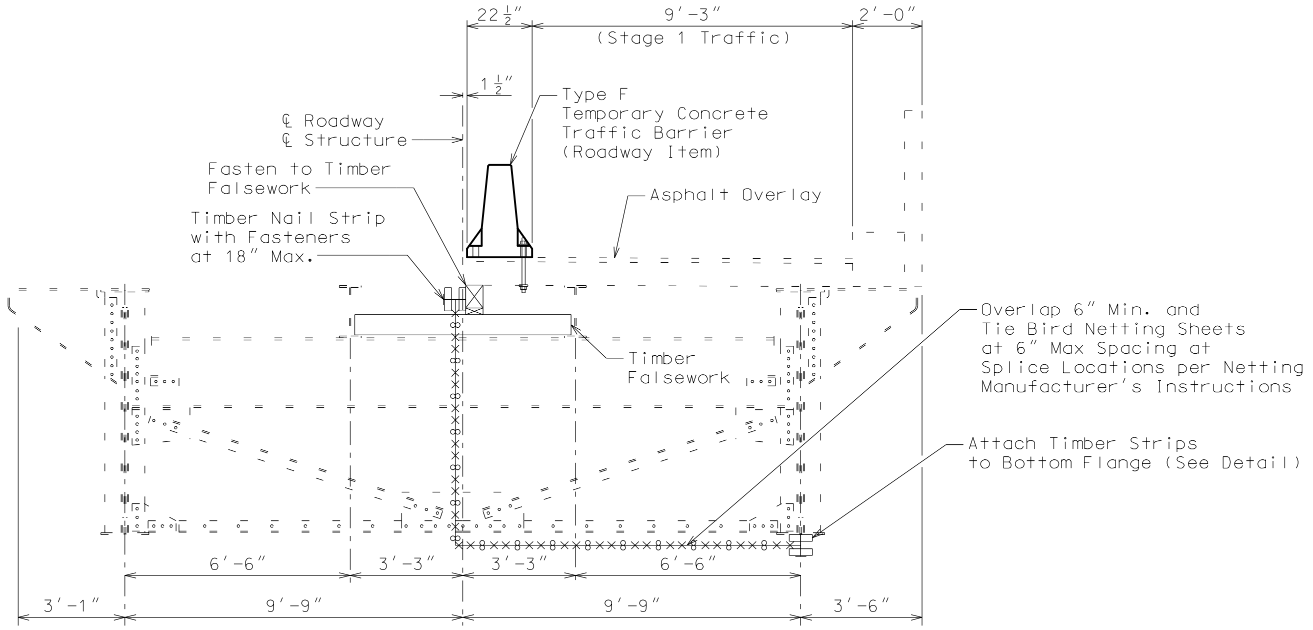
The cost of installing, maintaining, and removing the bird netting as shown and as directed by the engineer, including all labor, equipment and materials, shall be included in the contract lump sum price for Migratory Bird Nesting Prevention Netting.



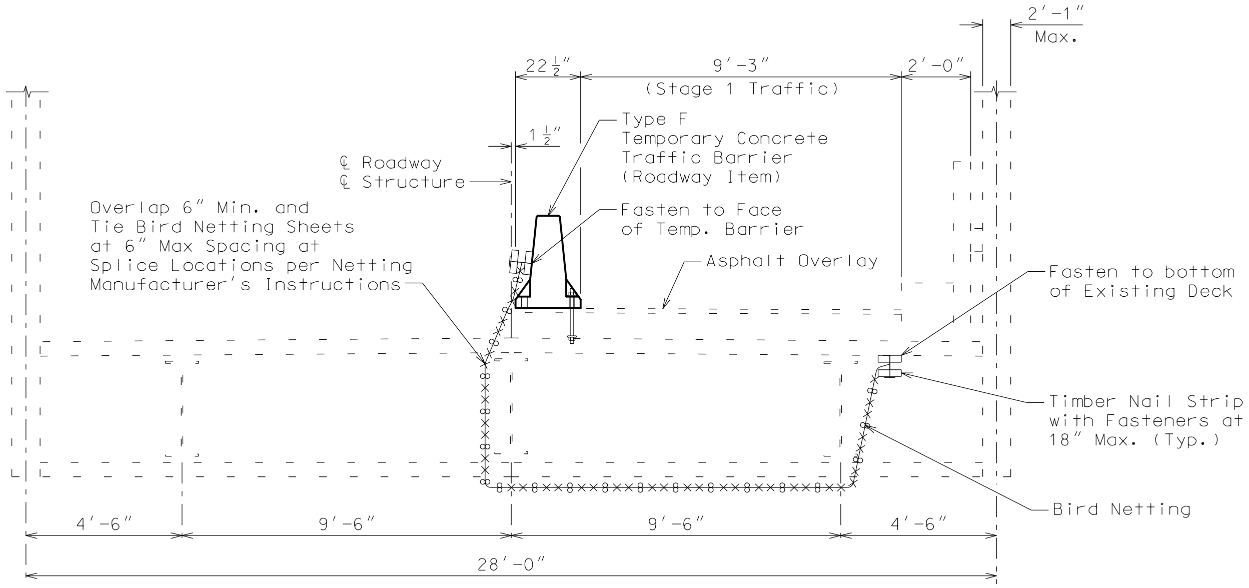
APPROACH GIRDER ATTACHMENT DETAIL✓



CONCRETE ATTACHMENT DETAIL✓



BIRD NETTING INSTALLATION - UNITS NO. 1, 3 & 4✓



BIRD NETTING INSTALLATION - UNIT NO. 2✓

MIGRATORY BIRD NESTING PREVENTION NETTING✓

Detailed April 2009
Checked April 2009

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

Sheet No. 54✓ of 57✓

FINAL PLANS✓
DATE PREPARED
8/24/2012✓
ROUTE 136✓
STATE MO✓
DISTRICT BR✓
SHEET NO. 54✓
COUNTY
ATCHISON✓
JOB NO.
J1P2161✓
CONTRACT ID.
090724-101✓
PROJECT NO.
ARRA-136-1(59)
BRIDGE NO.
L00982✓

DATE	DESCRIPTION
7/14/09	Revised Bird Netting Dates

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

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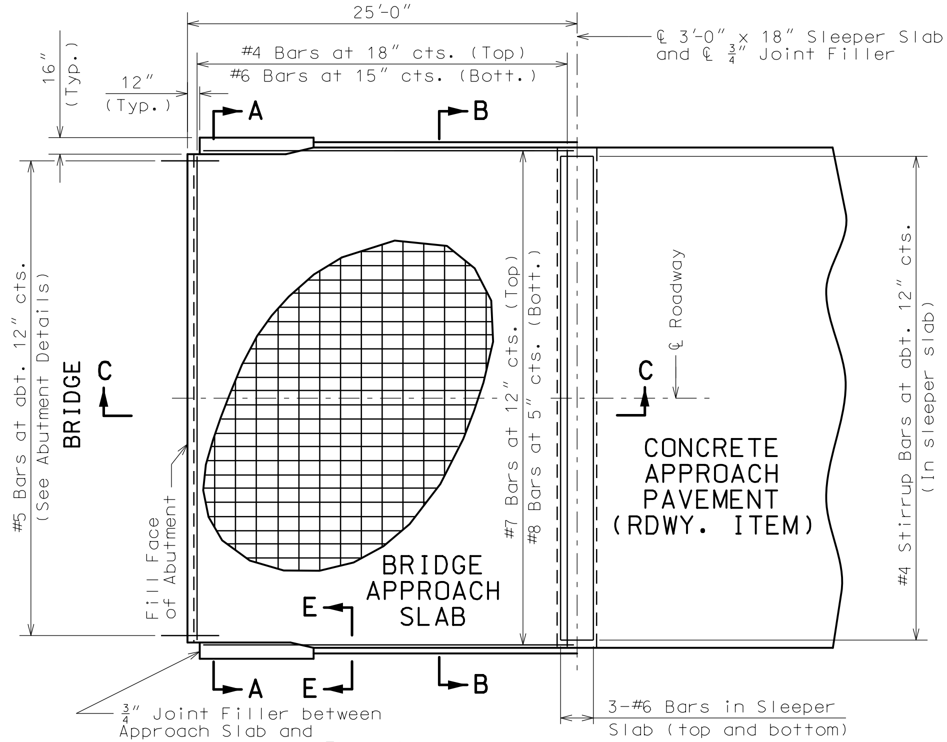
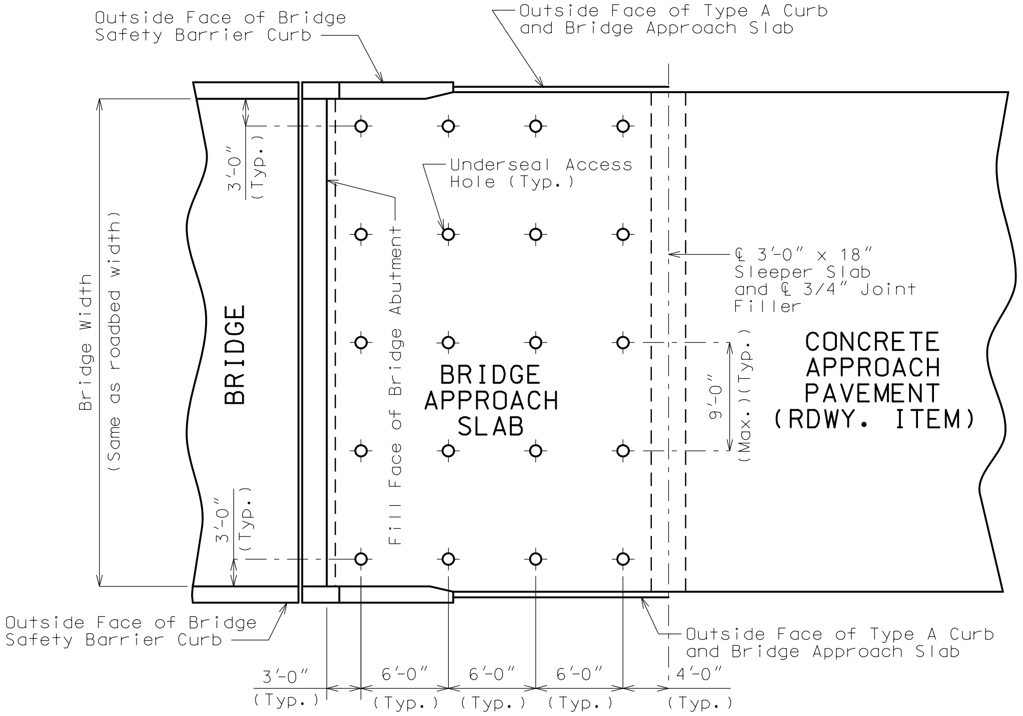
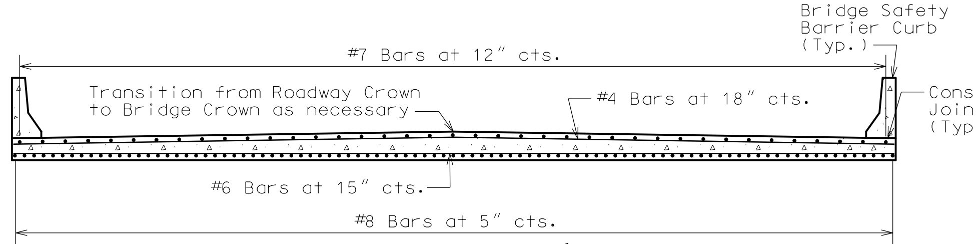

25'-0"
16" (Typ.)
12" (Typ.)
#4 Bars at 18" cts. (Top)
#6 Bars at 15" cts. (Bott.)
℄ 3'-0" x 18" Sleeper Slab and ℄ ¾" Joint Filler
A
B
C
E
#5 Bars at abt. 12" cts. (See Abutment Details)
BRIDGE
Fill Face of Abutment
#7 Bars at 12" cts. (Top)
#8 Bars at 5" cts. (Bott.)
℄ Roadway
CONCRETE APPROACH PAVEMENT (RDWY. ITEM)
BRIDGE APPROACH SLAB
#4 Stirrup Bars at abt. 12" cts. (In sleeper slab)
¾" Joint Filler between Approach Slab and Abutment at curb (Typ.)(✳)
3-#6 Bars in Sleeper Slab (top and bottom)

PART PLAN SHOWING REINFORCEMENT

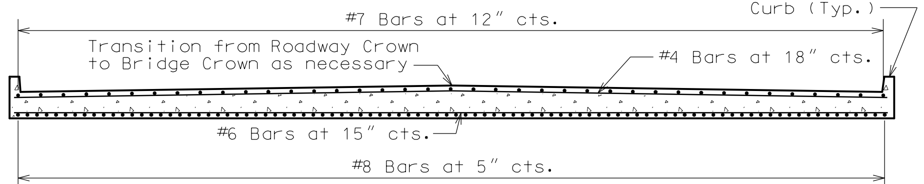

Outside Face of Bridge Safety Barrier Curb
Outside Face of Type A Curb and Bridge Approach Slab
3'-0" (Typ.)
Underseal Access Hole (Typ.)
℄ 3'-0" x 18" Sleeper Slab and ℄ 3/4" Joint Filler
Bridge Width (Same as roadbed width)
BRIDGE
Fill Face of Bridge Abutment
BRIDGE APPROACH SLAB
9'-0" (Max.)(Typ.)
CONCRETE APPROACH PAVEMENT (RDWY. ITEM)
Outside Face of Bridge Safety Barrier Curb
Outside Face of Type A Curb and Bridge Approach Slab
3'-0" (Typ.)
6'-0" (Typ.)
6'-0" (Typ.)
6'-0" (Typ.)
4'-0" (Typ.)

PART PLAN

(SHOWING TYPICAL UNDERSEAL ACCESS HOLE LOCATIONS)

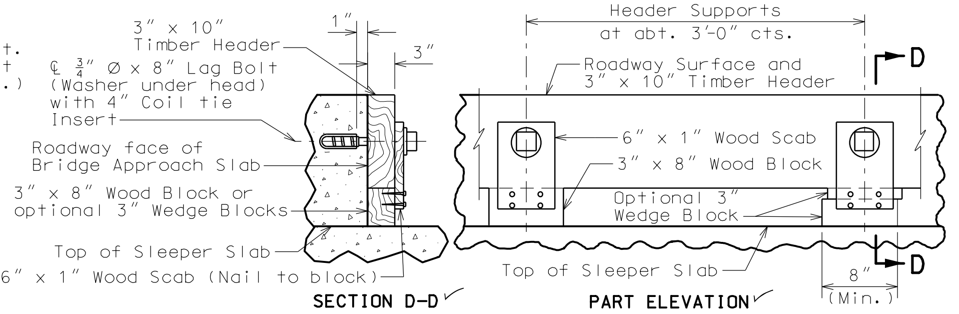


SECTION A-A


Type A Barrier Curb (Typ.)
#7 Bars at 12" cts.
Transition from Roadway Crown to Bridge Crown as necessary
#4 Bars at 18" cts.
#6 Bars at 15" cts.
#8 Bars at 5" cts.

SECTION B-B

Note: With the approval of the engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.

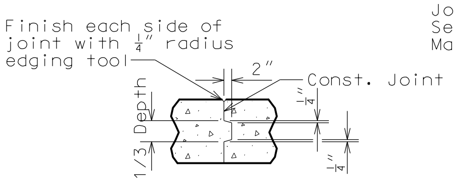

3" x 10" Timber Header
1"
3"
℄ ¾" Ø x 8" Lag Bolt (Washer under head) with 4" Coil tie Insert
Roadway face of Bridge Approach Slab
3" x 8" Wood Block or optional 3" Wedge Blocks
Top of Sleeper Slab
6" x 1" Wood Scab (Nail to block)
Header Supports at abt. 3'-0" cts.
Roadway Surface and 3" x 10" Timber Header
D
6" x 1" Wood Scab
3" x 8" Wood Block
Optional 3" Wedge Block
Top of Sleeper Slab
8" (Min.)
D

SECTION D-D

PART ELEVATION

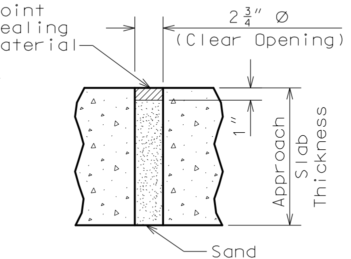
Note: Remove timber header when concrete pavement is placed.

DETAILS OF TIMBER HEADER

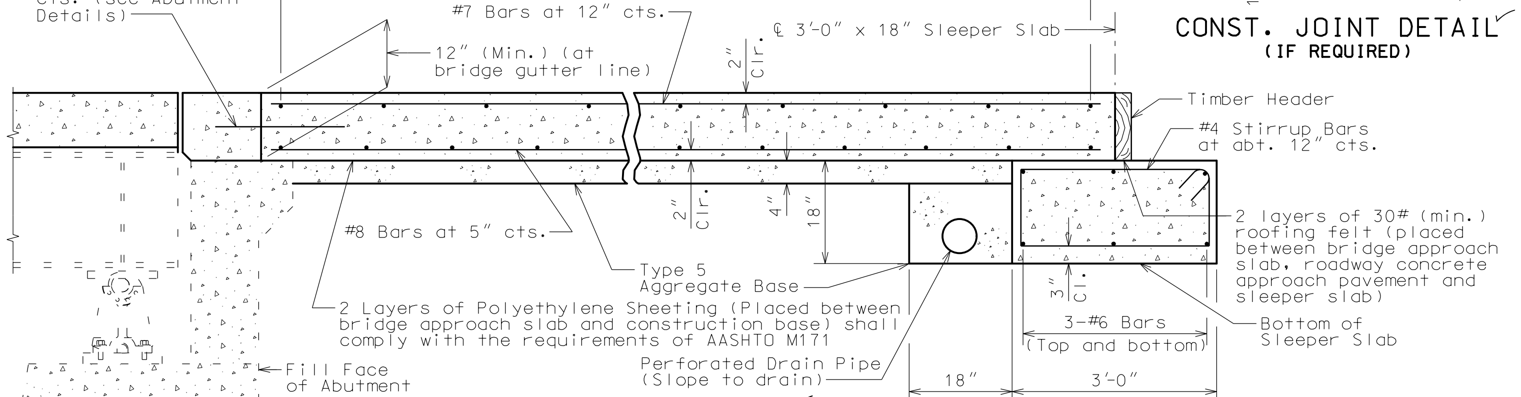


CONST. JOINT DETAIL

(IF REQUIRED)

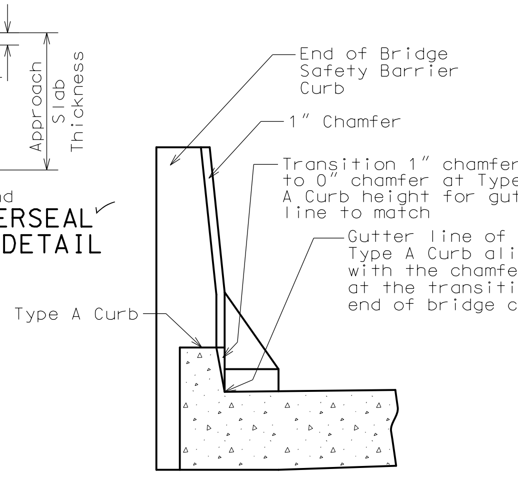


TYPICAL UNDERSEAL ACCESS HOLE DETAIL

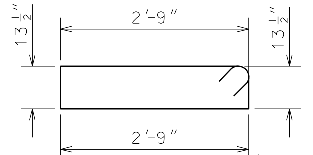

#4 Bars at 18" cts. (Top)
#6 Bars at 15" cts. (Bott.)
#5 Bars at abt. 12" cts. (see Abutment Details)
#7 Bars at 12" cts.
℄ 3'-0" x 18" Sleeper Slab
12" (Min.) (at bridge gutter line)
2" Clr.
Timber Header
#4 Stirrup Bars at abt. 12" cts.
#8 Bars at 5" cts.
2" Clr.
4"
18"
2 layers of 30# (min.) roofing felt (placed between bridge approach slab, roadway concrete approach pavement and sleeper slab)
Type 5 Aggregate Base
2 Layers of Polyethylene Sheeting (Placed between bridge approach slab and construction base) shall comply with the requirements of AASHTO M171
3" Cl.
3-#6 Bars (Top and bottom)
Bottom of Sleeper Slab
Fill Face of Abutment
Perforated Drain Pipe (Slope to drain)
18"
3'-0"

SECTION C-C

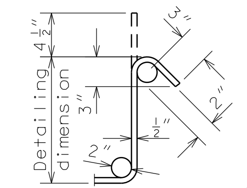
BRIDGE APPROACH SLAB


End of Bridge Safety Barrier Curb
1" Chamfer
Transition 1" chamfer to 0" chamfer at Type A Curb height for gutter line to match
Gutter line of Type A Curb aligns with the chamfer at the transition end of bridge curb
Type A Curb

SECTION E-E



#4 STIRRUP BAR
(ACTUAL LENGTH = 8'-3")



TYPICAL 135° STIRRUP HOOK DIMENSIONS BENDING DIAGRAM

Note:
Nominal lengths are based on out to out dimensions shown in bending diagram and are listed for fabricators use (nearest inch).

GENERAL NOTES:

All concrete for the bridge approach slab and sleeper slab shall be in accordance with Sec 503 (f'c = 4,000 psi).

All joint filler shall be in accordance with Sec 1057 for preformed fiber expansion joint filler, except as noted.

The reinforcing steel in the bridge approach slab and the sleeper slab shall be epoxy coated Grade 60 with Fy = 60,000 psi.

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

The reinforcing steel in the bridge approach slab and the sleeper slab shall be continuous. The transverse reinforcing steel may be made continuous by lap splicing the #4 & #6 bars 18" and 2'-2", respectively.

Mechanical bar splices shall be in accordance with Sec 706.

(✳) Seal joint between vertical face of Approach Slab Barrier and Barrier above Abutment Backwall with "Silicone Joint Sealant for Saw Cut and Formed Joints" in accordance with Sec. 717.

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

The contractor shall pour and satisfactorily finish the bridge or semi-deep slab before pouring the bridge approach slabs.

Longitudinal construction joints in approach slab and sleeper slab shall be aligned with longitudinal construction joints in bridge or semi-deep slab.

Payment for furnishing all materials, labor and excavation necessary to construct the approach slab, including the timber header, sleeper slab, underdrain, Type 5 aggregate base, joint filler and all other appurtenances and incidental work as shown on this sheet, complete in place, will be considered completely covered by the contract unit price for Bridge Approach Slab (Bridge) per Sq. Yd.

For Concrete Approach Pavement details, see roadway plans.

See Missouri Standard Plans Drawing 609.00 for details of Type A Curb.

At the contractor's option, Grade 40 reinforcement may be substituted for the Grade 60 #5 dowel bars connecting the bridge approach slab to the bridge abutment. No additional payment will be made for this substitution.

When Grade 40 reinforcement is substituted for the Grade 60 #5 dowel bars connecting the bridge approach slab to the bridge abutment, the reinforcement may be bent up to 90 degrees with a 2" minimum radius near the abutment to allow compaction of the backfill material near the abutment. Damage to epoxy coating shall be repaired in accordance with Sec 710.

Drain pipe may be either 6" diameter corrugated metallic-coated pipe underdrain, 4" diameter corrugated polyvinyl chloride (PVC) drain pipe, or 4" diameter corrugated polyethylene (PE) drain pipe.

FINAL PLANS	
DATE PREPARED	8/24/2012
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	55
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	090724-101
PROJECT NO.	ARRA-136-1(59)
BRIDGE NO.	L00982

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

MoDOT

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

REV.

Detailed April 2009
Checked April 2009

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

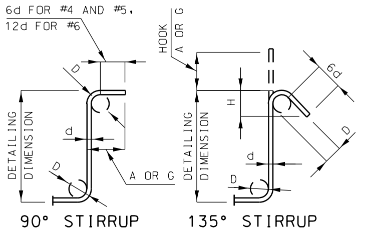
Sheet No. 55 of 57

BILL OF REINFORCING STEEL

NO. REQ'D	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B		C		D		E		F		H		K		NOMINAL LENGTH		ACTUAL LENGTH		WEIGHT
										FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	LBS.
			West Abutment																									
7	6	H11	Backwall	E	20		X			12	3.000													12	3	12	3	129
5	6	H12	Backwall	E	20		X			12	9.000													12	9	12	9	96
23	5	H13	Backwall	E	20		X			3	0.000													3	0	3	0	72
2	5	R14	Backwall	E	26	S	X			2	6.000		4.250	2	6.250					2	6.000		3.000	5	3	5	3	11
8	5	R15	Backwall	E	27	S	X				10.750		9.000		12.250		4.750				7.000		10.000	3	1	2	11	24
6	5	R16	Backwall	E	21	S	X			2	4.750				10.000									3	3	3	2	20
8	5	R17	Backwall	E	20	S	X			3	0.000													3	0	3	0	25
23	5	U11	Backwall	E	21	S	X				22.500		11.625		10.375						22.500		1.250	3	9	3	6	84
27	5	U12	Backwall	E	19	S	X				18.000		10.000											2	4	2	3	63
4	5	U13	Backwall	E	21	S	X			2	9.000		11.625							2	9.000		1.750	3	9	3	7	15
4	5	U14	Backwall	E	19	S	X				17.000		10.000											2	3	2	2	9
			Pier No. 7																									
12	5	H701	Cap	E	20		X			13	2.000													13	2	13	2	165
20	5	H702	Cap	E	20		X			13	3.000													13	3	13	3	276
16	5	H703	Cap	E	20		X			13	5.000													13	5	13	5	224
26	5	H704	Cap	E	20		X			12	2.000													12	2	12	2	330
12	6	H705	Pedestal	E	20		X			3	9.000													3	9	3	9	68
2	4	P701	Column		13	S	X			4	2.625	4	11.250	4	2.625	4	11.250							19	1	18	10	25
2	4	P702	Column		13	S	X			4	3.125	5	0.250	4	3.125	5	0.250							19	4	19	1	25
2	4	P703	Column		13	S	X			4	3.625	5	1.250	4	3.625	5	1.250							19	7	19	4	26
2	4	P704	Column		13	S	X			4	4.125	5	2.250	4	4.125	5	2.250							19	10	19	7	26
2	4	P705	Column		13	S	X			4	4.625	5	3.250	4	4.625	5	3.250							20	1	19	10	26
2	4	P706	Column		13	S	X			4	5.125	5	4.250	4	5.125	5	4.250							20	4	20	1	27
2	4	P707	Column		13	S	X			4	5.625	5	5.250	4	5.625	5	5.250							20	7	20	4	27
2	4	P708	Column		13	S	X			4	6.125	5	6.250	4	6.125	5	6.250							20	10	20	7	27
2	4	P709	Column		13	S	X			4	6.625	5	7.250	4	6.625	5	7.250							21	1	20	10	28
2	4	P710	Column		13	S	X			4	7.125	5	8.250	4	7.125	5	8.250							21	4	21	1	28
2	4	P711	Column		13	S	X			4	7.625	5	9.250	4	7.625	5	9.250							21	7	21	4	29
2	4	P712	Column		13	S	X			4	8.125	5	10.250	4	8.125	5	10.250							21	10	21	7	29
2	4	P713	Column		13	S	X			4	8.625	5	11.250	4	8.625	5	11.250							22	1	21	10	29
2	4	P714	Column		13	S	X			4	9.125	6	0.250	4	9.125	6	0.250							22	4	22	1	30
2	4	P715	Column		13	S	X			4	9.625	6	1.250	4	9.625	6	1.250							22	7	22	4	30
2	4	P716	Column		13	S	X			4	10.125	6	2.250	4	10.125	6	2.250							22	10	22	7	30
2	4	P717	Column		13	S	X			4	10.625	6	3.250	4	10.625	6	3.250							23	1	22	10	31
2	4	P718	Column		13	S	X			4	11.125	6	4.250	4	11.125	6	4.250							23	4	23	1	31
72	4	P719	Column		10	S	X					4	3.000	2	8.000									11	2	11	0	529
72	4	P720	Column		10	S	X					3	6.000	2	11.000									9	11	9	9	469
28	5	U701	Cap	E	13	S	X			2	11.125	4	9.125	3	1.375	4	9.000							16	6	16	2	472
4	5	U702	Cap	E	13	S	X			2	11.125	5	2.125	3	1.750	5	2.000							17	4	17	0	71
4	5	U703	Cap	E	13	S	X			2	11.125	5	5.375	3	1.875	5	5.250							17	11	17	7	73
4	5	U704	Cap	E	13	S	X			2	11.125	5	9.625	3	2.125	5	9.500							18	7	18	3	76
4	5	U705	Cap	E	13	S	X			2	11.125	6	2.875	3	2.250	6	2.750							19	6	19	2	80
4	5	U706	Cap	E	13	S	X			2	11.125	6	9.250	3	2.500	6	9.125							20	7	20	3	84
28	5	U707	Cap	E	19	S	X			3	8.000		22.000											5	6	5	5	158
18	4	U708	Pedestal	E	10	S	X					2	0.000	4	2.000									8	2	8	0	96
4	4	U709	Pedestal	E	10	S	X					3	2.000	3	9.000									10	1	9	11	26
24	7	V701	Column		20		X			21	7.000													21	7	21	7	1059
30	4	V702	Column		20		X			21	7.000													21	7	21	7	433
20	4	V703	Column		20		X			3	9.000													3	9	3	9	50
4	W5	W701	Pedestal	E	22		X				18.000		9.125											30	10	30	10	21
4	W5	W702	Pedestal	E	22		X			2	1.000		9.125											39	8	39	8	27

BILL OF REINFORCING STEEL

NO. REQ'D	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B		C		D		E		F		H		K		NOMINAL LENGTH		ACTUAL LENGTH		WEIGHT
										FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	LBS.
			East Abutment																									
5	6	H21	Backwall	E	20		X			12	3.000													12	3	12	3	92
5	6	H22	Backwall	E	20		X			12	9.000													12	9	12	9	96
23	5	H23	Backwall	E	20		X			3	0.000													3	0	3	0	72
2	5	R14	Backwall	E	26	S	X			2	6.000		4.250	2	6.250					2	6.000		3.000	5	3	5	3	11
8	5	R15	Backwall	E	27	S	X				10.750		9.000		12.250		4.750				7.000		10.000	3	1	2	11	24
6	5	R16	Backwall	E	21	S	X			2	4.750				10.000									3	3	3	2	20
8	5	R17	Backwall	E	20	S	X			3	0.000													3	0	3	0	25
23	5	U21	Backwall	E	21	S	X				22.500		13.125		11.875						22.500		1.250	4	0	3	9	90
27	5	U22	Backwall	E	19	S	X				20.000		10.000											2	6	2	5	68
4	5	U23	Backwall	E	21	S	X			2	9.000		13.125							2	9.000		1.750	3	10	3	9	16
4	5	U24	Backwall	E	19	S	X				18.000		10.000											2	4	2	3	9
			Slab																									
879	5	S11	Slab	E	20					12	5.000													12	5	12	5	11384
879	5	S12	Slab	E	20					12	11.000													12	11	12	11	11842
145	5	S13	Slab	E	20					54	11.000													54	11	54	11	8305
105	5	S14	Slab	E	20					55	5.000													55	5	55	5	6069
40	6	S15	Slab	E	20					50	0.000													50	0	50	0	3004
40	6	S16	Slab	E	20					27	10.000													27	10	27	10	1672
2098	5	S21	Slab	E	20					12	5.000													12	5	12	5	27170
2514	5	S22	Slab	E	20					6	0.000													6	0	6	0	15733
2098	5	S23	Slab	E	20					12	11.000													12	11	12	11	28264
438	5	S24	Slab	E	20					48	4.000													48	4	48	4	22080
438	5	S25	Slab	E	20					48	3.000													48	3	48	3	22042
365	5	S26	Slab	E	20					58	4.000													58	4	58	4	22207
1326	5	S31	Slab	E	20					12	5.000													12	5	12	5	17172
1326	5	S32	Slab	E	20					12	11.000													12	11	12	11	17864
203	5	S33	Slab	E	20					59	1.000													59	1	59	1	12510
147	5	S34	Slab	E	20					59	8.000													59	8	59	8	9148
80	6	S35	Slab	E	20					50	0.000													50	0	50	0	6008
80	6	S36	Slab	E	20					20	10.000													20	10	20	10	2504
1325	5	S41	Slab	E	20					12	5.000													12	5	12	5	17160
1325	5	S42	Slab	E	20					12	11.000													12	11	12	11	17851
203	5	S43	Slab	E	20					59	1.000													59	1	59	1	12510
147	5	S44	Slab	E	20					59	8.000													59	8	59	8	9148
80	6	S45	Slab	E	20					50	0.000													50	0	50	0	6008
80	6	S46	Slab	E	20					20	10.000													20	10	20	10	2504
118	5	U41	Slab	E	10	S					12.000		7.000		13.000		12.000							4	3	3	10	472
172	5	U42	Slab	E	10	S					12.000		8.000		13.000		12.000							4	5	4	0	718
80	5	U43	Slab	E	10	S					12.000		9.000		13.000		12.000							4	7	4	2	348



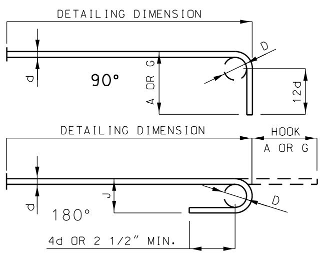
90° STIRRUP   135° STIRRUP

STIRRUP HOOK DIMENSIONS

GRADES 40 - 50 - 60 KSI

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

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



END HOOK DIMENSIONS

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

TWO ADDITIONAL H11, H704 & U708 ARE INCLUDED IN THE BAR BILL FOR TESTING.

NOTE:

ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

E = EPOXY COATED REINFORCEMENT.

S = STIRRUP.

X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.

V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.

NO. EA. = NUMBER OF BARS OF EACH LENGTH.

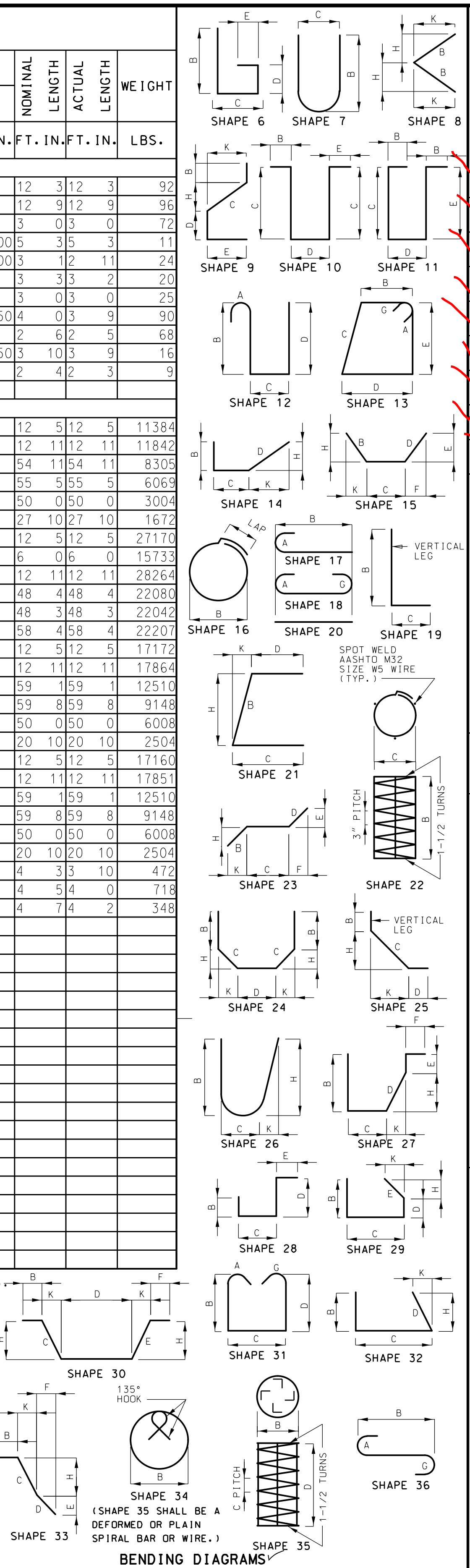
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)

ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.

REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.



BENDING DIAGRAMS

Detailed April 2009
Checked April 2009

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

Sheet No. 56 of 57

FINAL PLANS

DATE PREPARED
8/24/2012

ROUTE 136
STATE MO

DISTRICT BR
SHEET NO. 56

COUNTY
ATCHISON

JOB NO.
J1P2161

CONTRACT ID.
090724-101

PROJECT NO.
ARRA-136-1(59)

BRIDGE NO.
L00982

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

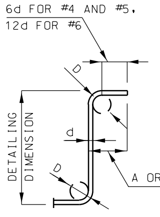
REV.

BILL OF REINFORCING STEEL

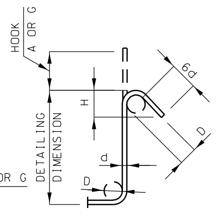
NO. REQ'D.	MARK NO.		LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS														NOMINAL LENGTH		ACTUAL LENGTH		WEIGHT
	SIZE	MARK								B		C		D		E		F		H		K						
										FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	LBS.
			Barrier																									
3858	5	R1	Barrier	E	26					2	6.000		4.250							2	6.000		3.000	5	3	5	3	21125
3858	5	R3	Barrier	E	19	S					17.000		6.000											1	11	1	10	7377
3858	5	R4	Barrier	E	27	S							6.000		11.250		7.000		12.000		9.250		6.375	3	0	2	10	11401
168	5	R5	Barrier	E	20					9	9.000													9	9	9	9	1708
126	5	R6	Barrier	E	20					42	9.000													42	9	42	9	5618
42	5	R7	Barrier	E	20					42	6.000													42	6	42	6	1862
84	5	R8	Barrier	E	20					48	7.000													48	7	48	7	4256
84	5	R9	Barrier	E	20					48	6.000													48	6	48	6	4249
84	5	R10	Barrier	E	20					45	5.000													45	5	45	5	3979
42	5	R11	Barrier	E	20					42	7.000													42	7	42	7	1865
56	5	R12	Barrier	E	20					57	11.000													57	11	57	11	3383
42	5	R13	Barrier	E	20					43	0.000													43	0	43	0	1884
60	5	K1	Barrier	E	19	S				2	5.000		5.125											2	10	2	9	172
60	5	K2	Barrier	E	14	S					5.125		11.125		18.000						2.000		17.875	2	10	2	9	172
16	5	K3	Barrier	E	27	S					18.250		5.125		12.000		8.375		12.000		9.875		6.875	4	8	4	5	74
44	5	K4	Barrier	E	10	S					12.000	1	6.250		6.000									4	7	4	3	195
4	5	K5	Barrier	E	27	S							4.375		6.875		12.750		12.000		5.500		4.000	3	0	2	10	12
4	5	K6	Barrier	E	27	S							4.375		7.875		11.750		12.000		6.500		4.500	3	0	2	10	12
4	5	K7	Barrier	E	27	S							4.375		9.625		10.375		12.000		7.875		5.500	3	0	2	10	12
4	5	K8	Barrier	E	27	S							4.375		11.250		9.000		12.000		9.250		6.500	3	1	2	11	12
48	5	K9	Barrier	E	20					5	5.000													5	5	5	5	271
4	5	K11	Barrier	E	8					2	2.125													4	4	4	4	18
160	5	C1	Slip Form	E	20					10	0.000													10	0	10	0	1669

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO.		LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS														NOMINAL LENGTH		ACTUAL LENGTH		WEIGHT
	SIZE	MARK								B		C		D		E		F		H		K						
										FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	LBS.
			Totals																									
4																												1985
4				E																								122
5				E																								364032
6				E																								22181
7																												1059
W5				E																								48
			Slab on Steel																									
5				E																								289997
6				E																								21700
			Reinforcing Steel (Bridges)																									
4																												1985
7																												1059
			Reinforcing Steel (Epoxy Coated)																									
4				E																								122
5				E																								2667
6				E																								481
			Barriers																									
5				E																								71326



90° STIRRUP



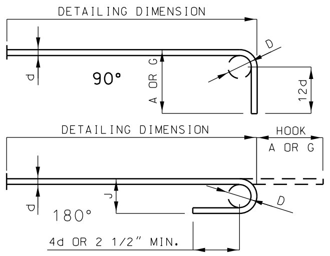
135° STIRRUP

STIRRUP HOOK DIMENSIONS

GRADES 40 - 50 - 60 KSI

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

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



END HOOK DIMENSIONS

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

NOTE:

ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

E = EPOXY COATED REINFORCEMENT.

S = STIRRUP.

X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.

V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.

NO. EA. = NUMBER OF BARS OF EACH LENGTH.

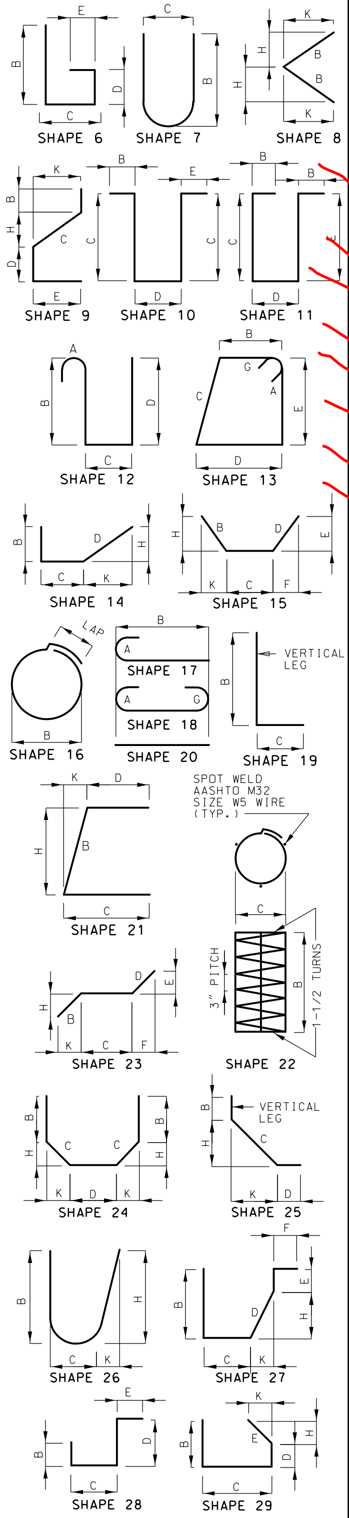
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)

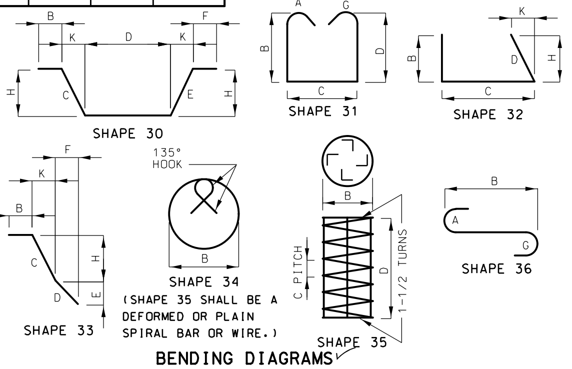
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.

REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.





BENDING DIAGRAMS

FINAL PLANS

DATE PREPARED
8/24/2012

ROUTE 136
STATE MO

DISTRICT BR
SHEET NO. 57

COUNTY
ATCHISON

JOB NO.
J1P2161

CONTRACT ID.
090724-101

PROJECT NO.
ARRA-136-1(59)

BRIDGE NO.
L00982

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
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Certificate of Authority: 000856

REV.

Detailed April 2009
Checked April 2009

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

Sheet No. 57 of 57

MEMORANDUM

Missouri Department of Transportation
Bridge Division
Central Office

TO: Larry Jacobson-1

CC/ATT: Dave Alhvers-cm
Don Wichern-1
Dean Franke-br
Chad Daniel-br
Kent Nelson-br (2)

FROM: Kurt Gribble, P.E. KG
Structural Liaison Engineer

DATE: March 4, 2010

SUBJECT: Change Order
Bridge Number L00982
Job No. J1P2161, Route 136
Atchison County

Attached are six half-size sets of revised sheet numbers 3, 56 and 57 on Bridge Number L00982 for the subject project.

Changes were made to the estimated quantities for slab on steel and the bar list sheets due to a couple of bar list mistakes by the consultant.

If you have any questions or comments, please do not hesitate to call me at (573) 526-0248.

kg
j:\gribbk\CON-CHAN\L00982-1.doc
Attachments

ESTIMATED QUANTITIES

Item	Unit	Substr.	Superstr.	Total
Temporary Supports	Lump Sum			1
Removal of Existing Bridge Decks	Sq. Ft.		42832	42832
Partial Removal of Substructure Concrete	Lump Sum			1
Removal of Existing Bridge Rails	Lin. Ft.		3807	3807
Bridge Approach Slab (Bridge)	Sq. Yd.		135	135
Water Transportation for Engineer	Lump Sum			1
Class B-1 Concrete (Substructure)	Cu. Yd.	68.0		68.0
Slab on Steel	Sq. Yd.		5424	5424
* Safety Barrier Curb	Lin. Ft.		3830	3830
Migratory Bird Nesting Prevention Netting	Lump Sum			1
Clearance Gauge	Lump Sum			1
Substructure Repair (Formed)	Sq. Ft.	1269		1269
Substructure Repair (Unformed)	Sq. Ft.	1295		1295
Reinforcing Steel (Bridges)	Lbs.	3040		3040
Mechanical Bar Splice	Each	10	5628	5638
Reinforcing Steel (Epoxy Coated)	Lbs.	3320		3320
Protective Coating - Concrete Bents & Piers (Urethane)	Lump Sum			1
Cleaning & Coating Existing Bearings	Each		10	10
Rehabilitate Bearing	Each		4	4
Slab Drain	Each		324	324
Drainage System (On Structure)	Lump Sum			1
Surface Preparation for Recoating Structural Steel	Sq. Ft.		95700	95700
Surface Preparation for Overcoating Structural Steel	Sq. Ft.		158600	158600
Field Application of Inorganic Zinc Primer	Sq. Ft.		95700	95700
Intermediate Field Coat (System G)	Sq. Ft.		88900	88900
Finish Field Coat (System G)	Sq. Ft.		88900	88900
Calcium Sulfonate Rust Penetrating Sealer	Lump Sum			1
Calcium Sulfonate Primer	Sq. Ft.		158600	158600
Calcium Sulfonate Topcoat	Sq. Ft.		158600	158600
Replace Truss Lower Lateral Bracing System	Lump Sum			1
Heat Straightening	Lump Sum			1
Strengthening Existing Girders	Lump Sum			1
Shear Connectors	Each		6416	6416
Structural Steel Repair A	Each		6	6
Structural Steel Repair B	Each		1	1
Structural Steel Repair C	Each		8	8
Structural Steel Repair D	Each		14	14
Structural Steel Repair E	Each		20	20
Structural Steel Repair F	Each		1	1
Structural Steel Repair G	Each		1	1
Structural Steel Repair H	Each		1	1
Structural Steel Repair J	Each		8	8
Structural Steel Repair K	Each		4	4
Structural Steel Repair L	Each		24	24
Structural Steel Repair M	Each		14	14
Structural Steel Repair N	Each		8	8
Structural Steel Repair P	Each		20	20
Structural Steel Repair Q	Each		12	12
Structural Steel Repair R	Each		50	50
Structural Steel Repair S	Each		44	44
Structural Steel Repair T	Each		12	12
Structural Steel Repair U	Each		13	13
Structural Steel Repair V	Lump Sum			1
Laminated Neoprene Bearing Pad Assembly	Each		2	2
Type N PTFE Bearing	Each		2	2
Strip Seal Expansion Joint System	Lin. Ft.		228	228
Navigation Lighting System	Lump Sum			1

* Safety Barrier Curb shall be Cast-In-Place or Slip-form Option.

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2002 - AASHTO 17th Edition
Load Factor Design
Seismic Performance Category = A.

DESIGN LOADING:
HS20-44 (New Construction)
35#/Sq. Ft. Future Wearing Surface

DESIGN UNIT STRESSES:

Class B-2 Concrete (Superstructure, except Safety Barrier Curb)	f'c = 4,000 psi.
Class B-1 Concrete (Substructure)	f'c = 4,000 psi.
Class B-1 Concrete Safety Barrier Curb	f'c = 4,000 psi.
Reinforcing Steel (Grade 60)	fy = 60,000 psi.
Structural Carbon Steel (ASTM A709 Grade 36)	fy = 36,000 psi.
Structural Steel (ASTM A709 Grade 50)	fy = 50,000 psi.

GENERAL NOTES (CONTINUED):

FABRICATED STEEL CONNECTIONS:
Field connections shall be made with 7/8" diameter high strength bolts and 15/16" diameter holes, except as noted.
All bolts shall be fully tensioned.
Rivit removal method shall be in accordance with the Special Provisions

JOINT FILLER:
All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion and partition joint filler, except as noted.

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

STRUCTURAL STEEL PROTECTIVE COATINGS:
For Painting Limit Detail, see Sheet No. 35.

Protective Coating: System G in accordance with Sec 1081.

Surface Preparation: Surface Preparation of the existing steel shall be in accordance with Sec 1081 for "Recoating of Structural Steel (System G)". 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: For existing structural steel to remain in place, 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.

Prime Coat: For portions of the structural steel to be replaced, the prime coat shall be applied in the fabrication shop. The cost of the prime coat will be considered completely covered by the contract unit price for the Fabricated Structural Steel.

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)".

For the duration of cleaning and recoating the truss spans, the truss span superstructure in any span shall not be draped with an impermeable surface subject to wind loads for a length any longer than 1/4 the span length at any one time regardless of height of coverage. Simultaneous work in adjacent spans is permissible using the specified limits in each span. No portion of the truss spans shall be draped during the replacement of the lower lateral bracing.

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

Rust Penetrating Sealer: The rust penetrating sealer shall be applied to the surfaces of all bearings, overlapping steel plates, pin connections, pin and hanger connections and other locations where rust bleeding, pack rust and layered rust is occurring. The cost of the rust penetrating sealer will be considered completely covered by the contract lump sum price for "Calcium Sulfonate Rust Penetrating Sealer".

Prime Coat: The cost of the prime coat will be completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Primer"

Topcoat: The color of the topcoat shall be Gray (Federal Standard #26373). The cost of the topcoat will be considered completely covered by the contract unit price per sq. foot for "Calcium Sulfonate Topcoat".

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.

MISCELLANEOUS:
Traffic over structure to be maintained during construction unless otherwise noted. See Roadway plans for traffic control.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Sec 106 and Field Section (FS-712) from Materials Manual.

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

Bridge seats for Laminated Neoprene Bearing Pad Assemblies and Type N PTFE Bearings shall be finished to a smooth even surface and shall be finished to within 1/8" above plan elevation and shall be dressed to a uniform, level bearing with a Carborundum brick or power grinder after the concrete has set sufficiently to fix the larger particles of sand. The deviation of the bearing seat from a true level surface shall not exceed 1/16".

Heat Straightening shall be in accordance with the Special Provisions.

Removal and Storage of Existing Bridge Rail shall be in accordance with the Special Provisions.

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

GENERAL NOTES (CONTINUED):

RESIN ANCHORS (East & West Abutments & Pier No. 7):
The Contractor shall use one of the qualified resin anchor systems in accordance with Sec 1039.

Cost of furnishing and installing the resin anchor system complete-in-place at the Abutments will be considered completely covered by the contract unit price for Slab on Steel.

Cost of furnishing and installing the resin anchor system complete-in-place at Pier No. 7 will be considered completely covered by the contract unit price for Class B-1 Concrete (Substructure).

The minimum embedment depth in concrete with f'c = 3,000 psi for the resin anchor system shall be that required to meet the minimum ultimate pullout strength in accordance with Sec 1039 but shall not be less than 6".

An epoxy coated #5 Grade 60 reinforcing bar shall be substituted for the 5/8"Ø threaded rod.

A #4 Grade 60 reinforcing bar 3'-9" long shall be substituted for the 1/2"Ø threaded rod.

ESTIMATED QUANTITIES:

CONCRETE:
Concrete above the upper construction joint in backwall at Abutments is included with Class B-2 Concrete (Slab on Steel) Quantities.
The cost of concrete removal above the upper construction joint in the abutments is included in the plan quantity for Removal of Existing Bridge Decks.
Cost of any required excavation for bridge will be considered completely covered by the contract unit price for other items.

NEOPRENE BEARING PADS:
Laminated Neoprene Bearing Pads shall be in accordance with Sec 716.

ESTIMATED QUANTITIES FOR SLAB ON STEEL

⚠1 Change to 311700

Item	Cu. Yds.	Total
Class B-2 Concrete	Cu. Yd.	1272.9
Reinforcing Steel (Epoxy Coated)	Lbs.	303190

The table of Estimated Quantities for Slab on Steel represents the quantities used by the State in preparing the cost estimate for concrete slabs. The area of the concrete slab will be measured to the nearest square yard with the horizontal dimensions as shown on the plan of slab. Payment for stay-in-place forms, conventional forms, all concrete and coated reinforcing steel will be considered completely covered by the contract unit price for the slab. Variations may be encountered in the estimated quantities but the variations cannot be used for an adjustment in the contract unit price.

Method of forming the slabs shall be as shown on the plans and in accordance with Sec. 703. All hardware for forming the slab to be left in place as a permanent part of the structure shall be coated in accordance with ASTM A123 or ASTM B633 with a thickness class SC 4 and a finish type I, II or III.

Slab shall be cast-in-place with conventional forming or stay-in-place corrugated metal forms. Precast prestressed panels will not be permitted.

Permanent steel bridge deck forms, supports closure elements and accessories shall be in accordance with grade requirement and coating designation G165 of ASTM A653. Complete shop drawings of the permanent steel deck forms shall be required in accordance with Sec. 1080.

Corrugations of stay-in-place forms shall be filled with an expanded polystyrene material. The polystyrene material shall be placed in the forms with an adhesive in accordance with the manufacturer's recommendations.

Form sheets shall not rest directly on the top of girders, stringers, crossbeams or floorbeam flanges. Sheets shall be securely fastened to form supports with a minimum bearing length of one inch on each end. Form supports shall be placed in direct contact with the flange. Welding on or drilling holes in the flanges of the girders, stringers, crossbeams or floorbeams will not be permitted. All steel fabrication and construction shall be in accordance with Sec's 1080 and 712.

CORY MICHAEL IMHOFF
NUMBER PE-2002016689

DATE PREPARED	3/1/10
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	3
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DATE	DESCRIPTION

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

GENERAL NOTES AND SUMMARY OF QUANTITIES

Detailed April 2009
Checked April 2009

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

Sheet No. 3 of 57 ⚠1 Revised 3/1/10

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BILL OF REINFORCING STEEL

NO. REQ'D.	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
West Abutment																												
7	6	H11	Backwall	E	20		X			12	3.000													12	3	12	3	129
5	6	H12	Backwall	E	20		X			12	9.000													12	9	12	9	96
23	5	H13	Backwall	E	20		X			3	0.000													3	0	3	0	72
2	5	R14	Backwall	E	26	S	X			2	6.000		4.250	2	6.250					2	6.000		3.000	5	3	5	3	11
8	5	R15	Backwall	E	27	S	X				10.750		9.000		12.250		4.750				7.000		10.000	3	1	2	11	24
6	5	R16	Backwall	E	21	S	X			2	4.750				10.000									3	3	3	2	20
8	5	R17	Backwall	E	20	S	X			3	0.000													3	0	3	0	25
23	5	U11	Backwall	E	21	S	X				22.500		11.625		10.375						22.500		1.250	3	9	3	6	84
27	5	U12	Backwall	E	19	S	X				18.000		10.000											2	4	2	3	63
4	5	U13	Backwall	E	21	S	X			2	9.000		11.625							2	9.000		1.750	3	9	3	7	15
4	5	U14	Backwall	E	19	S	X				17.000		10.000											2	3	2	2	9
Pier No. 7																												
12	5	H701	Cap	E	20		X			13	2.000													13	2	13	2	165
20	5	H702	Cap	E	20		X			13	3.000													13	3	13	3	276
16	5	H703	Cap	E	20		X			13	5.000													13	5	13	5	224
26	5	H704	Cap	E	20		X			12	2.000													12	2	12	2	330
12	6	H705	Pedestal	E	20		X			3	9.000													3	9	3	9	68
2	4	P701	Column		13	S	X			4	2.625	4	11.250	4	2.625	4	11.250							19	1	18	10	25
2	4	P702	Column		13	S	X			4	3.125	5	0.250	4	3.125	5	0.250							19	4	19	1	25
2	4	P703	Column		13	S	X			4	3.625	5	1.250	4	3.625	5	1.250							19	7	19	4	26
2	4	P704	Column		13	S	X			4	4.125	5	2.250	4	4.125	5	2.250							19	10	19	7	26
2	4	P705	Column		13	S	X			4	4.625	5	3.250	4	4.625	5	3.250							20	1	19	10	26
2	4	P706	Column		13	S	X			4	5.125	5	4.250	4	5.125	5	4.250							20	4	20	1	27
2	4	P707	Column		13	S	X			4	5.625	5	5.250	4	5.625	5	5.250							20	7	20	4	27
2	4	P708	Column		13	S	X			4	6.125	5	6.250	4	6.125	5	6.250							20	10	20	7	27
2	4	P709	Column		13	S	X			4	6.625	5	7.250	4	6.625	5	7.250							21	1	20	10	28
2	4	P710	Column		13	S	X			4	7.125	5	8.250	4	7.125	5	8.250							21	4	21	1	28
2	4	P711	Column		13	S	X			4	7.625	5	9.250	4	7.625	5	9.250							21	7	21	4	29
2	4	P712	Column		13	S	X			4	8.125	5	10.250	4	8.125	5	10.250							21	10	21	7	29
2	4	P713	Column		13	S	X			4	8.625	5	11.250	4	8.625	5	11.250							22	1	21	10	29
2	4	P714	Column		13	S	X			4	9.125	6	0.250	4	9.125	6	0.250							22	4	22	1	30
2	4	P715	Column		13	S	X			4	9.625	6	1.250	4	9.625	6	1.250							22	7	22	4	30
2	4	P716	Column		13	S	X			4	10.125	6	2.250	4	10.125	6	2.250							22	10	22	7	30
2	4	P717	Column		13	S	X			4	10.625	6	3.250	4	10.625	6	3.250							23	1	22	10	31
2	4	P718	Column		13	S	X			4	11.125	6	4.250	4	11.125	6	4.250							23	4	23	1	31
72	4	P719	Column		10	S	X					4	3.000	2	8.000									11	2	11	0	529
72	4	P720	Column		10	S	X					3	6.000	2	11.000									9	11	9	9	469
28	5	U701	Cap	E	13	S	X			2	11.125	4	9.125	3	1.375	4	9.000							16	6	16	2	472
4	5	U702	Cap	E	13	S	X			2	11.125	5	2.125	3	1.750	5	2.000							17	4	17	0	71
4	5	U703	Cap	E	13	S	X			2	11.125	5	5.375	3	1.875	5	5.250							17	11	17	7	73
4	5	U704	Cap	E	13	S	X			2	11.125	5	9.625	3	2.125	5	9.500							18	7	18	3	76
4	5	U705	Cap	E	13	S	X			2	11.125	6	2.875	3	2.250	6	2.750							19	6	19	2	80
4	5	U706	Cap	E	13	S	X			2	11.125	6	9.250	3	2.500	6	9.125							20	7	20	3	84
28	5	U707	Cap	E	19	S	X			3	8.000		22.000											5	6	5	5	158
18	4	U708	Pedestal	E	10	S	X					2	0.000	4	2.000									8	2	8	0	96
4	4	U709	Pedestal	E	10	S	X					3	2.000	3	9.000									10	1	9	11	26
24	7	V701	Column		20		X			21	7.000													21	7	21	7	1059
30	4	V702	Column		20		X			21	7.000													21	7	21	7	433
20	4	V703	Column		20		X			3	9.000													3	9	3	9	50
4	W5	W701	Pedestal	E	22		X				18.000		9.125											30	10	30	10	21
4	W5	W702	Pedestal	E	22		X			2	1.000		9.125											39	8	39	8	27

BILL OF REINFORCING STEEL

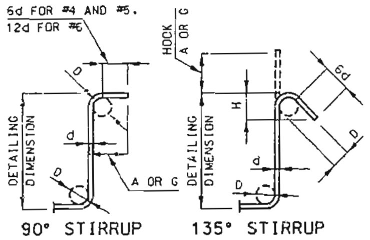
NO. REQ'D.	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
East Abutment																												
5	6	H21	Backwall	E	20		X			12	3.000													12	3	12	3	92
5	6	H22	Backwall	E	20		X			12	9.000													12	9	12	9	96
23	5	H23	Backwall	E	20		X			3	0.000													3	0	3	0	72
2	5	R14	Backwall	E	26	S	X			2	6.000		4.250	2	6.250					2	6.000		3.000	5	3	5	3	11
8	5	R15	Backwall	E	27	S	X				10.750		9.000		12.250		4.750				7.000		10.000	3	1	2	11	24
6	5	R16	Backwall	E	21	S	X			2	4.750				10.000									3	3	3	2	20
8	5	R17	Backwall	E	20	S	X			3	0.000													3	0	3	0	25
23	5	U21	Backwall	E	21	S	X				22.500		13.125		11.875						22.500		1.250	4	0	3	9	90
27	5	U22	Backwall	E	19	S	X				20.000		10.000											2	6	2	5	68
4	5	U23	Backwall	E	21	S	X			2	9.000		13.125							2	9.000		1.750	3	10	3	9	16
4	5	U24	Backwall	E	19	S	X				18.000		10.000											2	4	2	3	9
Slab																												
879	5	S11	Slab	E	20					12	5.000													12	5	12	5	11384
879	5	S12	Slab	E	20					12	11.000													12	11	12	11	11842
145	5	S13	Slab	E	20					54	11.000													54	11	54	11	8305
105	5	S14	Slab	E	20					55	5.000													55	5	55	5	6069
40	6	S15	Slab	E	20					50	0.000													50	0	50	0	3004
40	6	S16	Slab	E	20					27	10.000													27	10	27	10	1672
2098	5	S21	Slab	E	20					12	5.000													12	5	12	5	27170
2514	5	S22	Slab	E	20					6	0.000													6	0	6	0	15733
2098	5	S23	Slab	E	20					12	11.000													12	11	12	11	28264
438	5	S24	Slab	E	20					48	4.000													48	4	48	4	22080
438	5	S25	Slab	E	20					48	3.000													48	3	48	3	22042
365	5	S26	Slab	E	20					58	4.000													58	4	58	4	22207
1326	5	S31	Slab	E	20					12	5.000													12	5	12	5	17172
1326	5	S32	Slab	E	20					12	11.000													12	11	12	11	17864
203	5	S33	Slab	E	20					59	1.000													59	1	59	1	12510
147	5	S34	Slab	E	20					59	8.000													59	8	59	8	9148
㊵	6	S35	Slab	E	20					50	0.000													50	0	50	0	(3004)
㊵	6	S36	Slab	E	20					20	10.000													20	10	20	10	(1252)
1325	5	S41	Slab	E	20					12	5.000													12	5	12	5	17160
1325	5	S42	Slab	E	20					12	11.000													12	11	12	11	17851
203	5	S43	Slab	E	20					59	1.000													59	1	59	1	12510
147	5	S44	Slab	E	20					59	8.000													59	8	59	8	9148
㊵	6	S45	Slab	E	20					50	0.000													50	0	50	0	(3004)
㊵	6	S46	Slab	E	20					20	10.000													20	10	20	10	(1252)
118	5	U41	Slab	E	10	S					12.000		7.000		13.000		12.000							4	3	3	10	472
172	5	U42	Slab	E	10	S					12.000		8.000		13.000		12.000							4	5	4	0	718
80	5	U43	Slab	E	10	S					12.000		9.000		13.000		12.000							4	7	4	2	348

△1 Change to 80

△1 Change to 6008

△1 Change to 2504

TWO ADDITIONAL H11, H704 & U708 ARE INCLUDED IN THE BAR BILL FOR TESTING.



90° STIRRUP

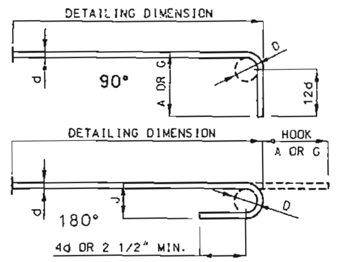
135° STIRRUP

STIRRUP HOOK DIMENSIONS

GRADES 40 - 50 - 60 KSI

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

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



END HOOK DIMENSIONS

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

NOTE:

ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

E = EPOXY COATED REINFORCEMENT.

S = STIRRUP.

X = BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.

V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.

NO. EA. = NUMBER OF BARS OF EACH LENGTH.

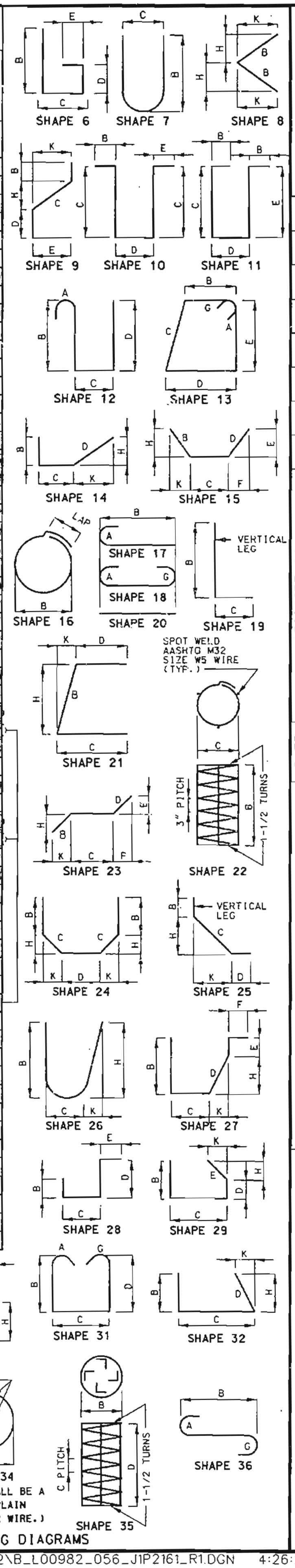
NOMINAL LENGTHS ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)

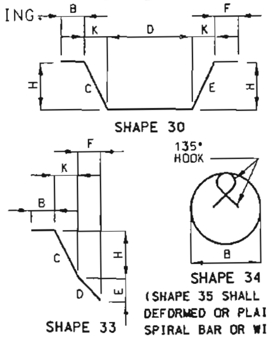
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.

PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.

REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.





BENDING DIAGRAMS

CORY MICHAEL IMHOFF
NUMBER PE-2002016069

DATE PREPARED 3/1/10

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	56

COUNTY ATCHISON

JOB NO. J1P2161

CONTRACT ID.

PROJECT NO.

BRIDGE NO. L00982

DESCRIPTION

DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

Detailed April 2009
Checked April 2009

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

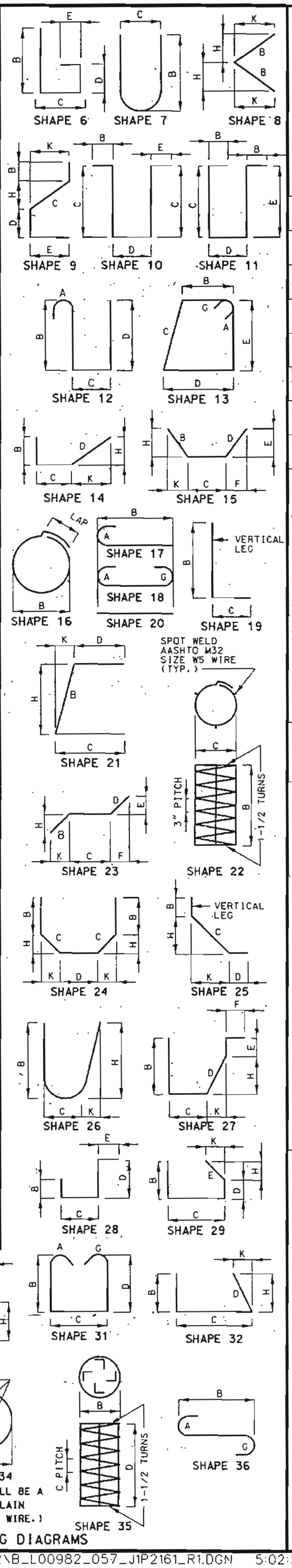
Sheet No. 56 of 57 △1 Revised 3/1/10

BILL OF REINFORCING STEEL

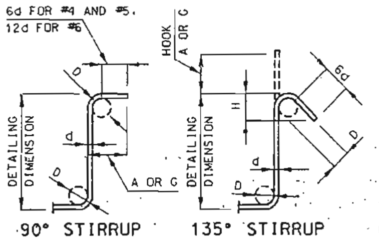
NO. REQ'D.	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
			Barrier																
3858	5	R1	Barrier	E	26					2 6.000	4.250				2 6.000	3.000	5 3	5 3	21125
3858	5	R3	Barrier	E	19	S				17.000	6.000						1 11	1 10	7377
3858	5	R4	Barrier	E	27	S					6.000	11.250	7.000	12.000	9.250	6.375	3 0	2 10	11401
168	5	R5	Barrier	E	20					9 9.000							9 9	9 9	1708
126	5	R6	Barrier	E	20					42 9.000							42 9	42 9	5618
42	5	R7	Barrier	E	20					42 6.000							42 6	42 6	1862
84	5	R8	Barrier	E	20					48 7.000							48 7	48 7	4256
84	5	R9	Barrier	E	20					48 6.000							48 6	48 6	4249
84	5	R10	Barrier	E	20					45 5.000							45 5	45 5	3979
42	5	R11	Barrier	E	20					42 7.000							42 7	42 7	1865
56	5	R12	Barrier	E	20					57 11.000							57 11	57 11	3383
42	5	R13	Barrier	E	20					43 0.000							43 0	43 0	1884
60	5	K1	Barrier	E	19	S				2 5.000	5.125						2 10	2 9	172
60	5	K2	Barrier	E	14	S				5.125	11.125	18.000			2.000	17.875	2 10	2 9	172
16	5	K3	Barrier	E	27	S				18.250	5.125	12.000	8.375	12.000	9.875	6.875	4 8	4 5	74
44	5	K4	Barrier	E	10	S				12.000	1 6.250	6.000					4 7	4 3	195
4	5	K5	Barrier	E	27	S					4.375	6.875	12.750	12.000	5.500	4.000	3 0	2 10	12
4	5	K6	Barrier	E	27	S					4.375	7.875	11.750	12.000	6.500	4.500	3 0	2 10	12
4	5	K7	Barrier	E	27	S					4.375	9.625	10.375	12.000	7.875	5.500	3 0	2 10	12
4	5	K8	Barrier	E	27	S					4.375	11.250	9.000	12.000	9.250	6.500	3 1	2 11	12
48	5	K9	Barrier	E	20					5 5.000							5 5	5 5	271
4	5	K11	Barrier	E	8					2 2.125							4 4	4 4	18
160	5	C1	Slip Form	E	20					10 0.000							10 0	10 0	1669

BILL OF REINFORCING STEEL

NO. REQ'D.	SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
			Totals																
4																			1985
4				E															122
5				E													△1 Change		364032
6				E													to	22181	13669
7																			1059
W5				E															48
			Slab on Steel																
5				E													△1 Change		289997
6				E													to	21700	13188
			Reinforcing Steel (Bridges)																
4																			1985
7																			1059
			Reinforcing Steel (Epoxy Coated)																
4				E															122
5				E															2667
6				E															481
			Barriers																
5				E															71326



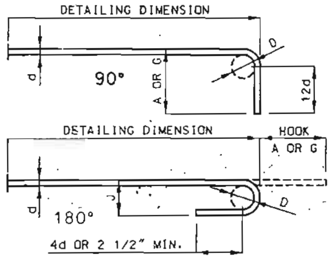
BENDING DIAGRAMS



90° STIRRUP   135° STIRRUP

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

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



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

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

Detailed April 2009
Checked April 2009

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

Sheet No. 57 of 57 △1 Revised 3/1/10

CORY MICHAEL IMHOFF
NUMBER PE-2002016689

DATE PREPARED
3/1/10

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	57

COUNTY
ATCHISON
JOB NO.
J1P2161
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
L00982

DESCRIPTION
DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

C:\PWworking\OMA\d0367232\B_L00982_057_J1P2161_R1.DGN 5:02:53 PM 3/1/2010

MEMORANDUM

Missouri Department of Transportation
Bridge Division
Central Office

TO: Larry Jacobson-1

CC/ATT: Dave Alhvers-cm
Don Wichern-1
Dean Franke-br
Chad Daniel-br
Kent Nelson-br (2)

FROM: Kurt Gribble, P.E. KG
Structural Liaison Engineer

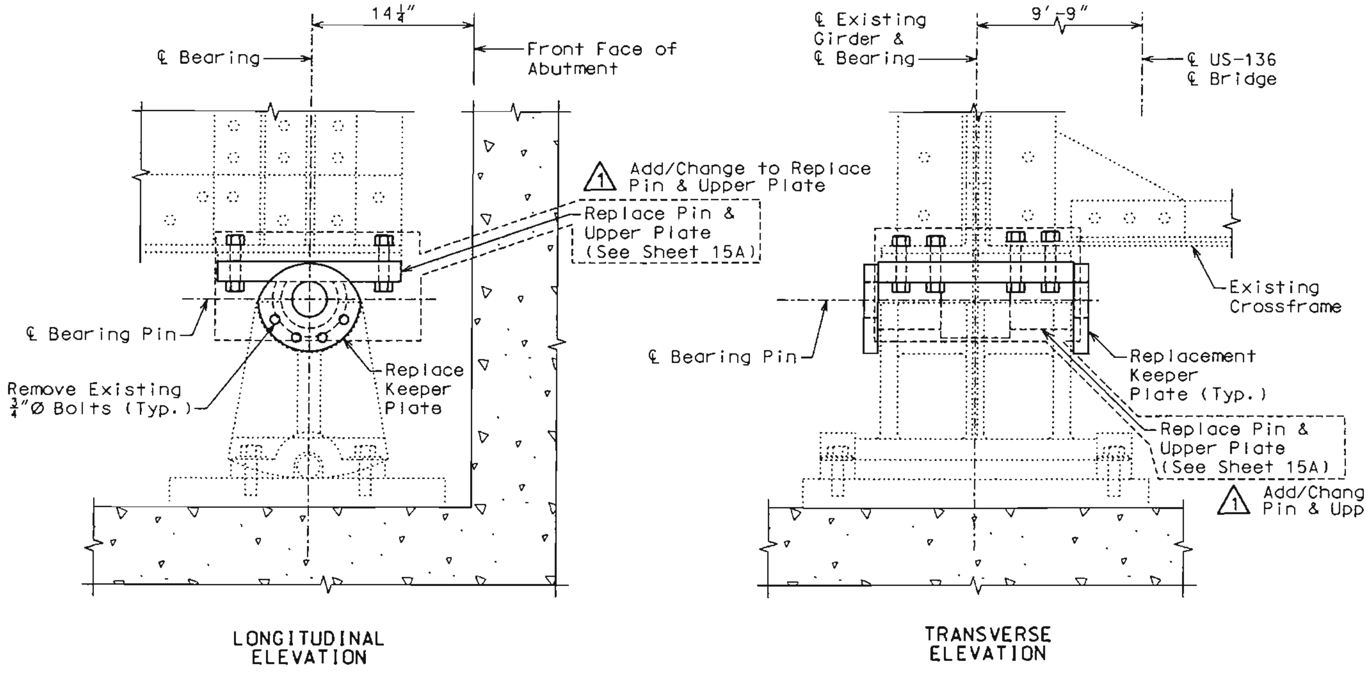
DATE: December 14, 2009

SUBJECT: Change Order
Bridge Number L00982
Job No. J1P2161, Route 136
Atchison County

Attached are six half-size sets of revised sheet number 15 and added sheet number 15A on Bridge Number L00982 for the subject project.

The existing abutment bearings were deteriorated more extensively than originally thought so the replacement of the pin and upper plate was added to their rehabilitation. If you have any questions or comments, please do not hesitate to call me at (573) 526-0248.

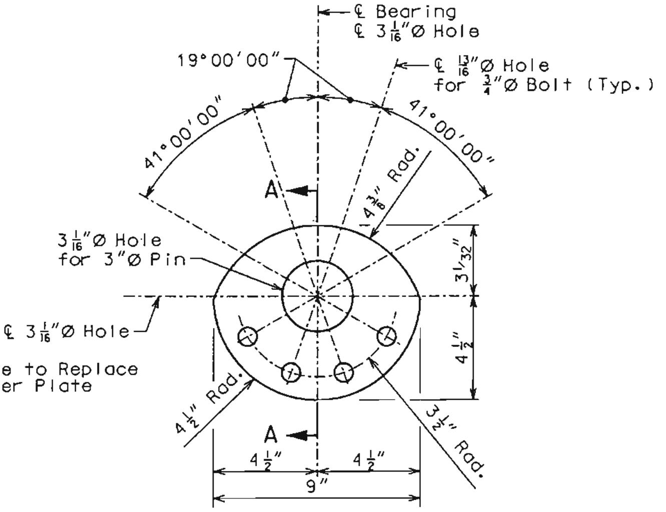
kg
j:\gribbk\CON-CHAN\L00982-1.doc
Attachments


14¼"
℄ Bearing
Front Face of Abutment
Add/Change to Replace Pin & Upper Plate
Replace Pin & Upper Plate (See Sheet 15A)
℄ Bearing Pin
Remove Existing ¾"Ø Bolts (Typ.)
Replace Keeper Plate
℄ Existing Girder & ℄ Bearing
9'-9"
℄ US-136 ℄ Bridge
Existing Crossframe
℄ Bearing Pin
Replacement Keeper Plate (Typ.)
Replace Pin & Upper Plate (See Sheet 15A)
Add/Change to Replace Pin & Upper Plate

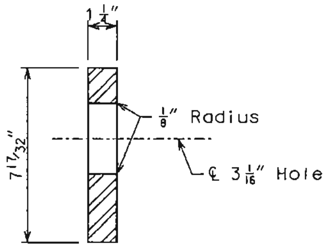
LONGITUDINAL ELEVATION

TRANSVERSE ELEVATION

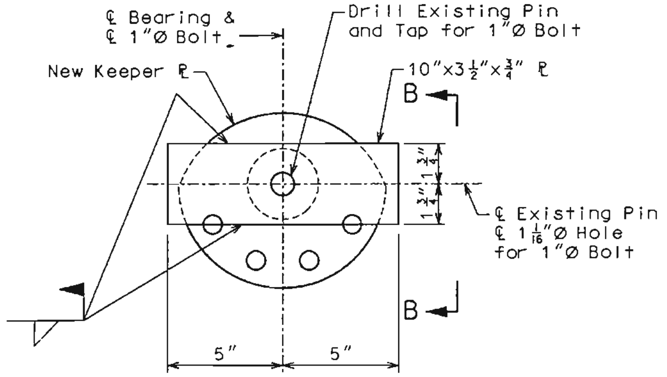
EXPANSION SHOE - AT ABUTMENTS



ELEVATION OF KEEPER PLATE

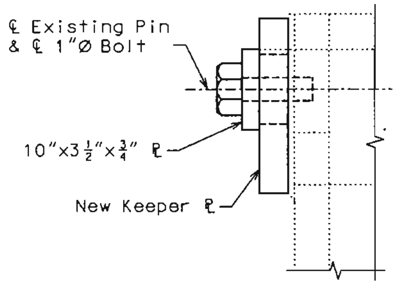


SECTION A-A


℄ Bearing & ℄ 1"Ø Bolt
Drill Existing Pin and Tap for 1"Ø Bolt
New Keeper ℙ
10"x3½"x¾" ℙ
B
1¾"
1¾"
℄ Existing Pin ℄ 1 1/16"Ø Hole for 1"Ø Bolt
B
5"
5"

OPTIONAL KEEPER PLATE ATTACHMENT

(To be used only in the event the existing ¾"Ø attachment holes are unusable)



VIEW B-B

Notes:

New structural steel for Keeper Plates and Optional Attachment Plate shall be ASTM A709 Grade 36.

All dimensions are approximate and were taken from "As-Built" drawings and limited Field Measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

New bolts for standard attachment are 3/4"Ø Grade A325 high-strength bolts through 13/16"Ø holes. New bolts for optional attachment are 1"Ø Grade A325 high-strength bolts through 1 1/16"Ø holes.

All equipment, labor and materials necessary to complete the keeper plate replacement and clean and lubricate the bearings at the East and West Abutments shall be considered completely covered by the contract unit price for Rehabilitate Bearings per each.

Additional rocker bearings at Piers No. 1, 5, 6, 8 & 9 shall be cleaned and coated. All equipment, labor and materials necessary to complete the clean and recoat shall be considered completely covered by the contract unit price for Cleaning and Coating Existing Bearings per each.

ROCKER BEARING REHABILITATION

Detailed December 2009
Checked December 2009

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

Sheet No. 15 of 57

⚠1 Revised 12/11/09

C:\PWworking\OMA\d0367232\B_L00982_015_J1P2161_R1.dgn 3:07:30 PM 12/11/2009

CORY MICHAEL IMHOFF
NUMBER PE-2002016689

DATE PREPARED
12/11/09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	15

COUNTY
ATCHISON

JOB NO.
J1P2161

CONTRACT ID.

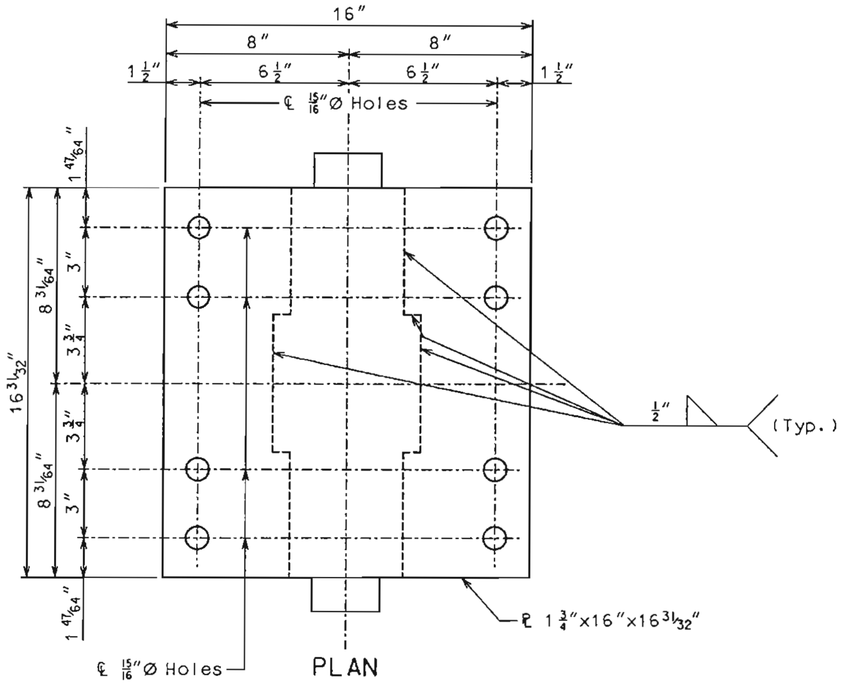
PROJECT NO.

BRIDGE NO.
L00982

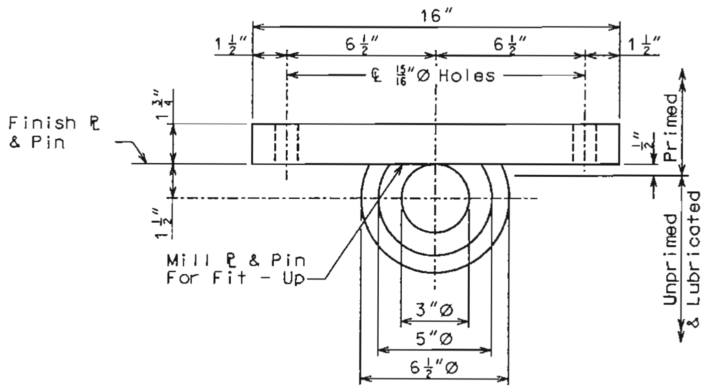
DATE	DESCRIPTION

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

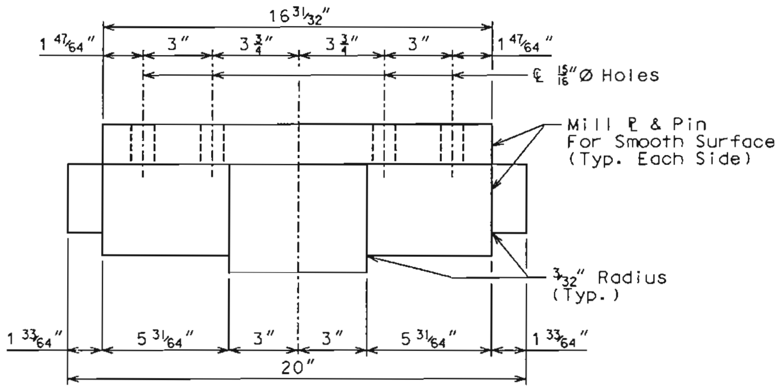
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856



PLAN



ELEVATION



SIDE ELEVATION

Notes:

New structural steel for the Top Plate shall be ASTM A709 Grade 36.
New structural steel for the Pin shall be ASTM A668 Grade 33.

All dimensions are approximate and were taken from "As-Built" shop drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

New bolts are 7/8 "Ø Grade A325 high-strength bolts through 15/16 "Ø holes.

The surface of the Top Plate shall be coated with an inoganic zinc primer in the shop. The limits of the preparation and prime coat shall extend 1/2 " onto the new pin. The remaining pin surface shall be lubricated in the shop and just prior to installation. The intermediate and finish field coats (System G) shall be applied after the bearings have been reset and the plates & pins installed.

ROCKER BEARING REHABILITATION

Detailed December 2009
Checked December 2009

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

Sheet No. 15A of 57

⚠1 New Sheet 12/11/09

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED
12/11/09

ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	15A

COUNTY
ATCHISON

JOB NO.
J1P2161

CONTRACT ID.

PROJECT NO.

BRIDGE NO.
L00982

DESCRIPTION

DATE

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

MoDOT

HDR
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

MEMORANDUM

Missouri Department of Transportation
Bridge Division
Central Office

TO: Larry Jacobson-1

CC/ATT: Dave Alhvers-cm
Don Wichern-1
Dean Franke-br
Chad Daniel-br
Kent Nelson-br (2)

FROM: Kurt Gribble, P.E. KG
Structural Liaison Engineer

DATE: October 12, 2010

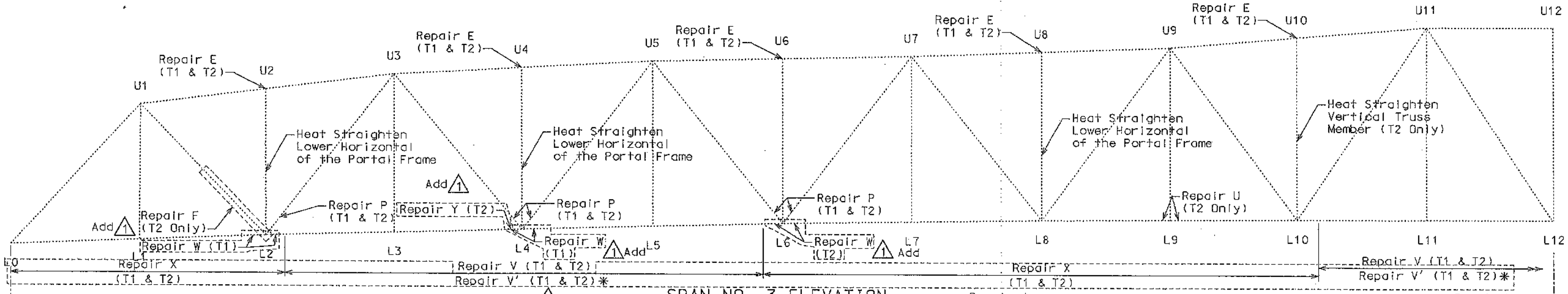
SUBJECT: Change Order
Bridge Number L00982
Job No. J1P2161, Route 136
Atchison County

Attached are six half-size sets of revised sheet numbers 17 and 25 and added sheet number 25A on Bridge Number L00982 for the subject project.

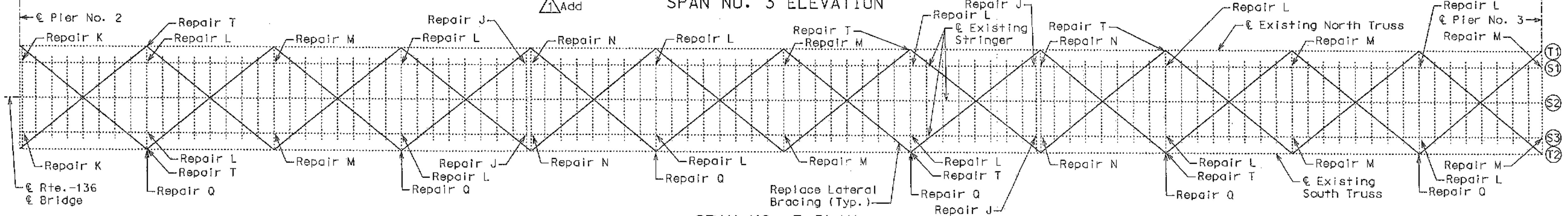
The changes are for additional superstructure repairs. More deterioration to the lower chord and gusset plates was discovered during construction requiring additional superstructure repairs.

If you have any questions or comments, please do not hesitate to call me at (573) 526-0248.

kg
j:\gribbk\CON-CHAN\L00982-4.doc
Attachments

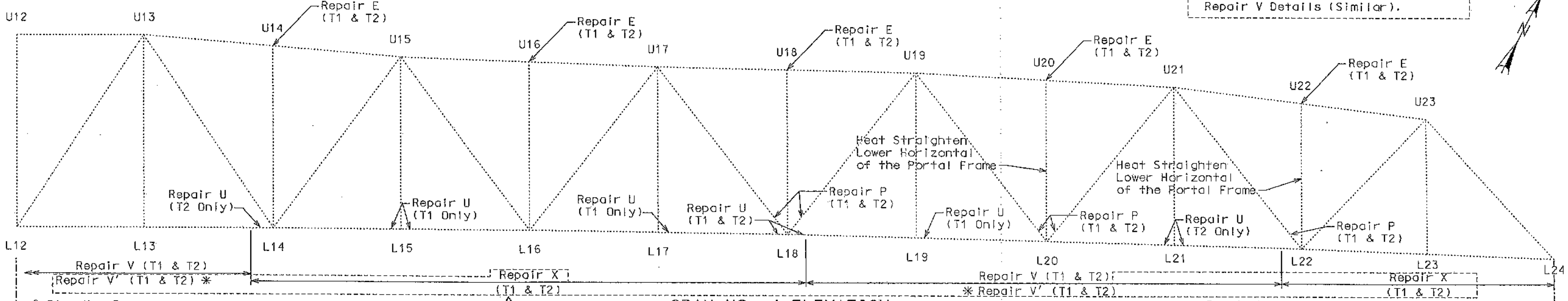


SPAN NO. 3 ELEVATION

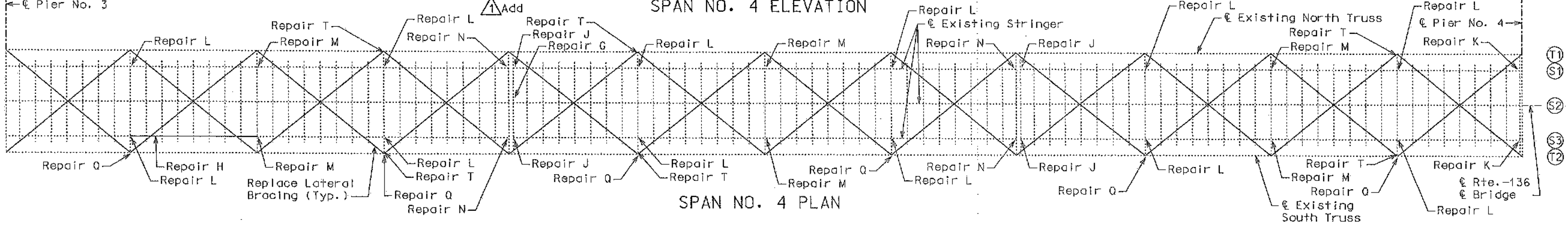


SPAN NO. 3 PLAN

*Repair V' Is Application of Repair V 1 Add
To The Outside Bottom Edge of the
Bottom Chords of T1 & T2. See
Repair V Details (Similar).



SPAN NO. 4 ELEVATION



SPAN NO. 4 PLAN

Notes:
Repair R occurs along the outside edge of T2 at approximately 25 locations in Span No. 3 & 25 locations in Span No. 4.

Repair S occurs at all Floorbeam to Truss connections except at L0, L12 & L24 along T1 & T2.

PLAN OF STRUCTURAL STEEL REPAIR LOCATIONS - UNIT NO. 2

Detailed April 2009
Checked April 2009

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

Sheet No. 17 of 57

1 Revised 10/12/10

CORY MICHAEL IMHOFF
NUMBER PE-2002016669

DATE PREPARED 10/12/10

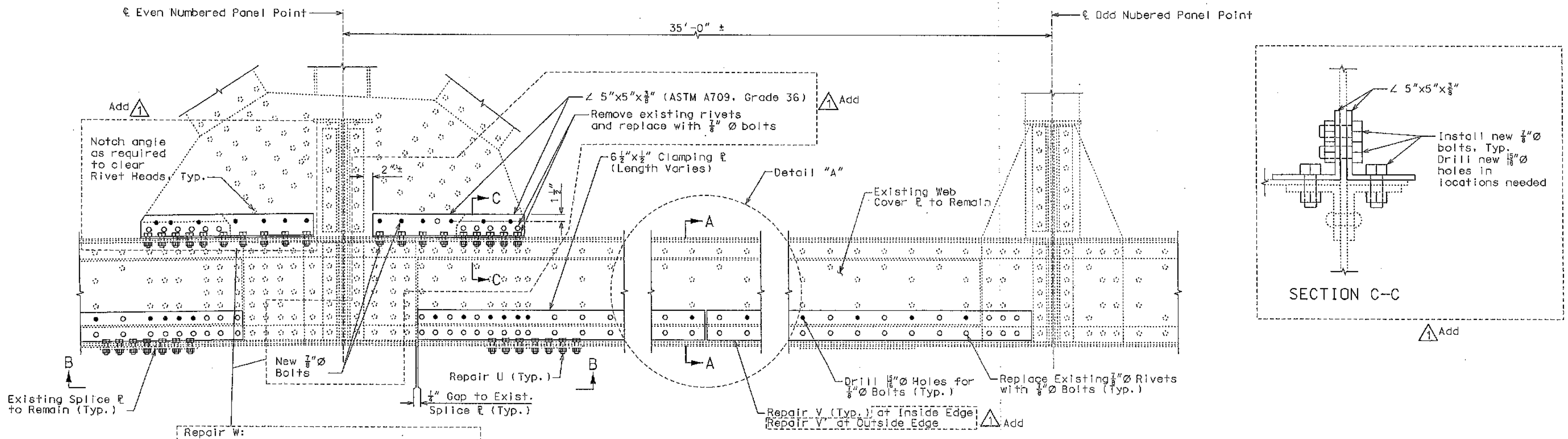
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 17
COUNTY ATCHISON	
JOB NO. J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00982	

DESCRIPTION

DATE

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

HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

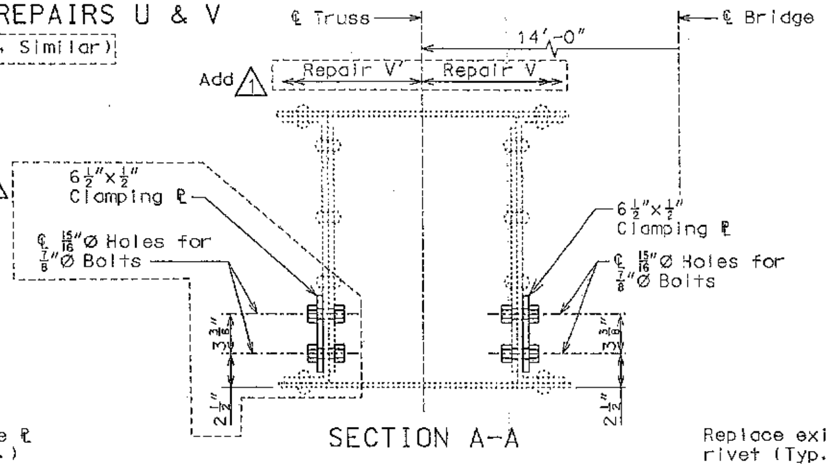

℄ Even Numbered Panel Point
35'-0" ±
℄ Odd Nubered Panel Point
Add △1
Notch angle as required to clear Rivet Heads, Typ.
∠ 5"x5"x⅜" (ASTM A709, Grade 36)
Remove existing rivets and replace with ⅞" Ø bolts
△1 Add
6½"x½" Clamping ℄ (Length Varies)
Detail "A"
2"±
1½"
C
C
A
A
Existing Web Cover ℄ to Remain
B
B
New ⅞"Ø Bolts
Repair U (Typ.)
¼" Gap to Exist. Splice ℄ (Typ.)
Existing Splice ℄ to Remain (Typ.)
Drill 15/16"Ø Holes for ⅞"Ø Bolts (Typ.)
Replace Existing ⅞"Ø Rivets with ⅞"Ø Bolts (Typ.)
Repair V (Typ.) at Inside Edge
Repair V' at Outside Edge
△1 Add
∠ 5"x5"x⅜"
Install new ⅞"Ø bolts, Typ.
Drill new 15/16"Ø holes in locations needed
△1 Add

ELEVATION OF REPAIRS U & V

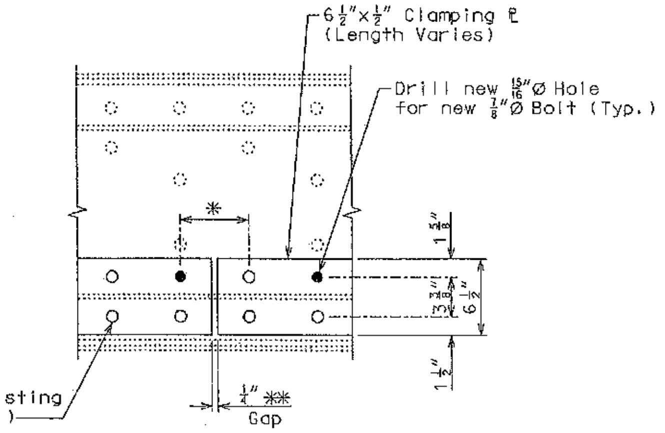
Add △1 (Repair V', Similar)

SECTION C-C

Add △1
Repair W:
Remove existing rivets and angle on inside of truss as shown. Install new angle in existing and new 15/16"Ø holes. Match existing hole spacing where possible. Provide fill plates as required. Remove & install only one angle at a time with traffic reduced to one lane away from truss being repaired.

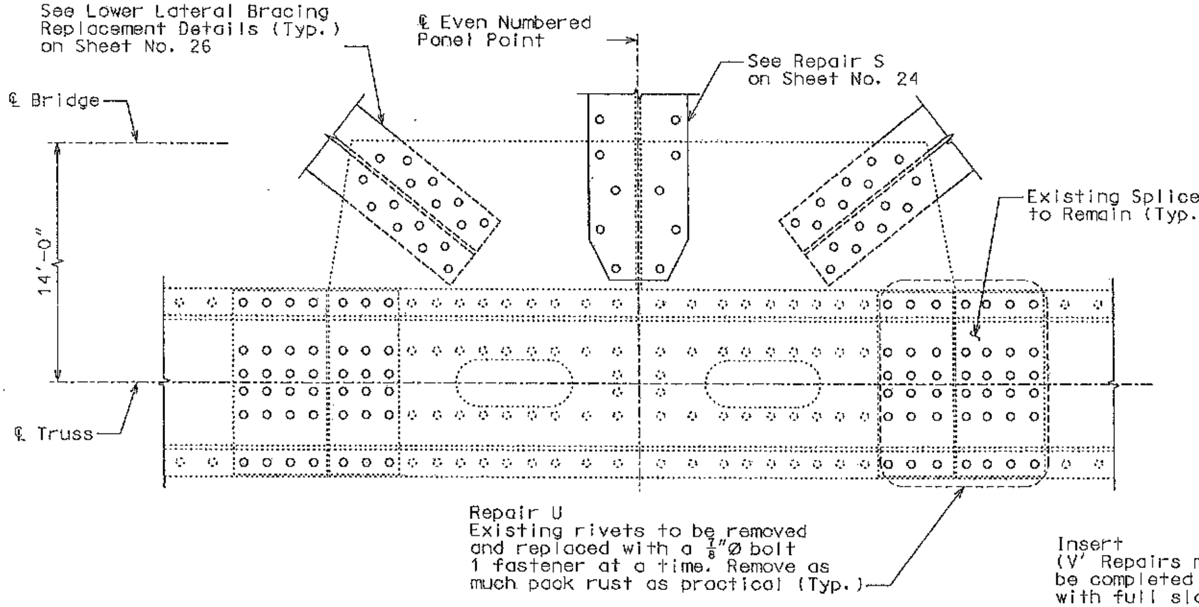


SECTION A-A


6½"x½" Clamping ℄ (Length Varies)
Drill new 15/16"Ø Hole for new ⅞"Ø Bolt (Typ.)
*
1⅝"
3⅜"
6½"
1½"
½" **
Gap

Replace existing rivet (Typ.)

DETAIL "A"


See Lower Lateral Bracing Replacement Details (Typ.) on Sheet No. 26
℄ Even Numbered Panel Point
See Repair S on Sheet No. 24
℄ Bridge
14'-0"
℄ Truss
Existing Splice ℄ to Remain (Typ.)

Repair U
Existing rivets to be removed and replaced with a ⅞"Ø bolt 1 fastener at a time. Remove as much pack rust as practical (Typ.)

VIEW B-B

* - Spacing varies, 6" Max. Match existing condition except where existing fastener spacing exceeds 6", drill a 15/16"Ø Hole for a 7/8"Ø Bolt.

** - The Contractor shall break the clamping plate near the mid-point of each Truss bay.

Add △1
For Repair W, Contractor shall take field measurements for length of angle and bolt hole locations.

All equipment, labor and materials necessary to complete Repair W shall be considered completely covered by the contract unit price for Structural Steel Repair W per each.

Insert
(V' Repairs may be completed with full slab in place but traffic must be limited to the opposite side of the structure.) △1

Notes:

△1 Insert (and V')

Repairs U & V shall be completed when traffic is limited to the opposite side of the structure and half of the slab is removed.

△1 Insert (and V')

New Structural Steel for Repairs V shall be ASTM A709 Grade 50.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are 7/8"Ø Grade A325 high-strength bolts in 15/16"Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to 1 1/16" for a 1"Ø bolt.

Repair U shall consist of removing existing rivets in the splice plate and bottom flange of the lower chord, removing pack rust, coating existing steel with inorganic zinc primer and reassembling with 7/8"Ø A325 bolts.

All equipment, labor and materials necessary to complete Repair U shall be considered completely covered by the contract unit price for Structural Steel Repair U per each.

△1 Insert (and V')

Repair V shall consist of removing existing rivets in the web cover plate and the bottom flange connection angles, removing pack rust, coating existing steel with inorganic zinc primer, placing new clamping plate, field drilling additional holes as needed and reassembling with 7/8"Ø A325 bolts.

The contractor shall only work on half of a truss bay in each span at a time. Rivets shall only be removed at the repair location being worked on, not in advance of the repair. All repairs must be completed and new bolts must be installed prior to leaving the work unattended.

All equipment, labor and materials necessary to complete Repair V shall be considered completely covered by the contract price for Structural Steel Repair V lump sum.

△1 Insert (and V')

△1 Insert (and V' Lump Sum, respectively)

REPAIR U & V DETAILS

Detailed April 2009
Checked April 2009

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

Sheet No. 25 of 57

△1 Revised 10/12/10

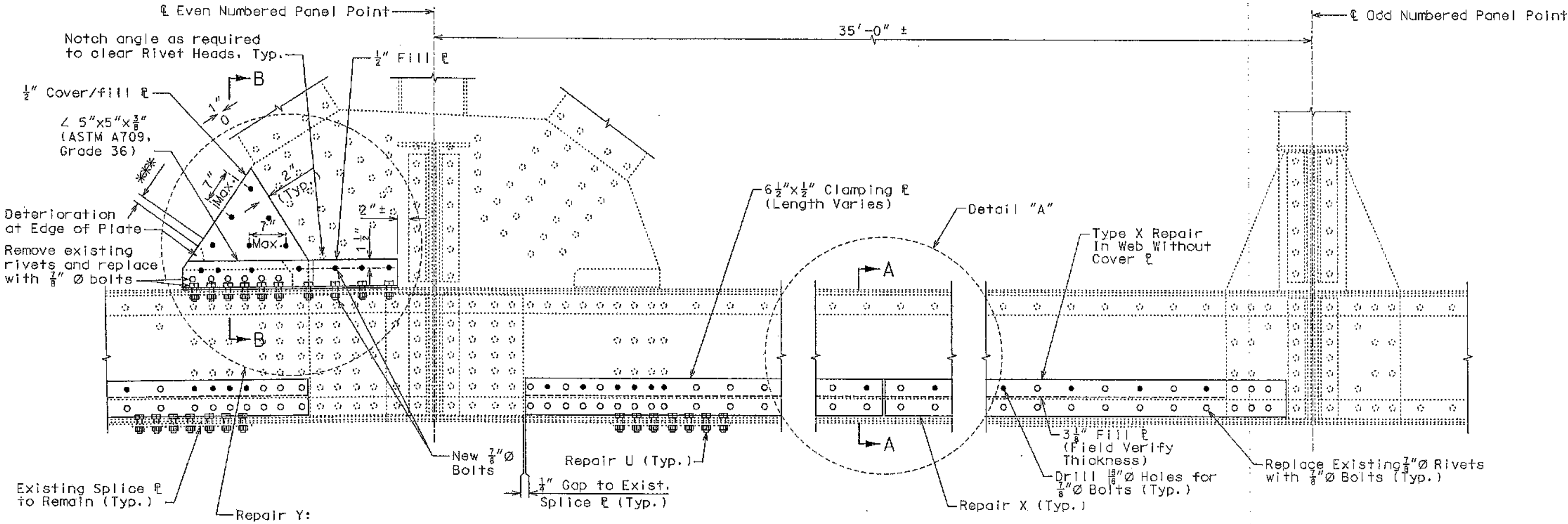
PE-2002016669
CORY MICHAEL IMHOFF

DATE PREPARED	10/12/10
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	25
COUNTY	ATCHISON
JOB NO.	J1P2161
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00982

DATE
DESCRIPTION

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

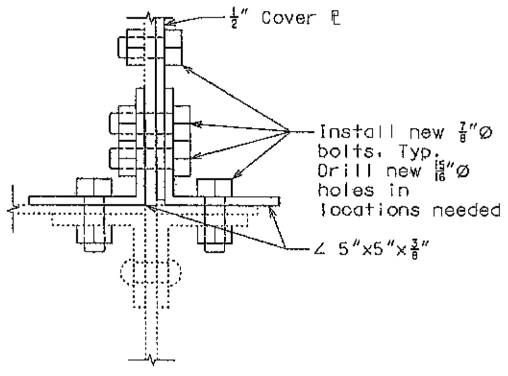
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856


℄ Even Numbered Panel Point
35'-0" ±
℄ Odd Numbered Panel Point
Notch angle as required to clear Rivet Heads, Typ.
$\frac{1}{2}$" Fill ℄
$\frac{1}{2}$" Cover/fill ℄
B
1"
0
∠ 5"x5"x$\frac{3}{8}$" (ASTM A709, Grade 36)
7" Max.
2" (Typ.)
2" ±
7" Max.
$1\frac{1}{2}$"
Deterioration at Edge of Plate
Remove existing rivets and replace with $\frac{7}{8}$" Ø bolts
B
6$\frac{1}{2}$"x$\frac{1}{2}$" Clamping ℄ (Length Varies)
Detail "A"
A
A
Type X Repair In Web Without Cover ℄
New $\frac{7}{8}$"Ø Bolts
Repair U (Typ.)
Existing Splice ℄ to Remain (Typ.)
$\frac{1}{4}$" Gap to Exist. Splice ℄ (Typ.)
3$\frac{1}{8}$" Fill ℄ (Field Verify Thickness)
Drill $\frac{15}{16}$"Ø Holes for $\frac{7}{8}$"Ø Bolts (Typ.)
Replace Existing $\frac{7}{8}$"Ø Rivets with $\frac{7}{8}$"Ø Bolts (Typ.)
Repair X (Typ.)

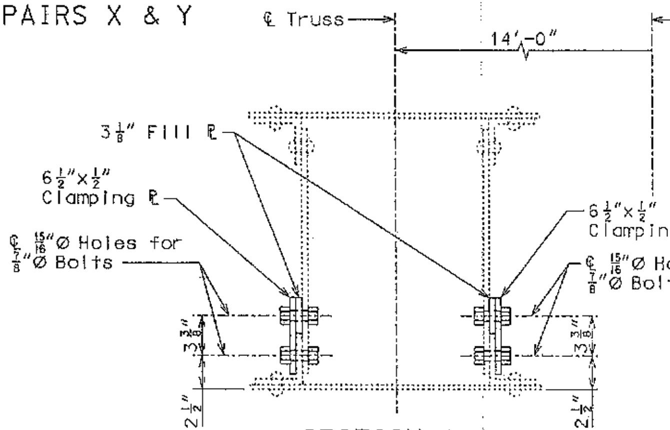
ELEVATION OF REPAIRS X & Y

Repair Y:
Remove existing rivets and angle on inside and outside of truss as shown. Install new angle and $\frac{7}{8}$"Ø bolts in existing and new $\frac{15}{16}$"Ø holes. Match existing hole spacing where possible. Contractor shall take field measurements for length of angle and bolt hole locations. Provide fill plates as required. Remove & install only one angle at a time with traffic reduced to one lane away from truss being repaired.

✱✱✱ - $1\frac{1}{2}$" Min. to edge of deterioration.

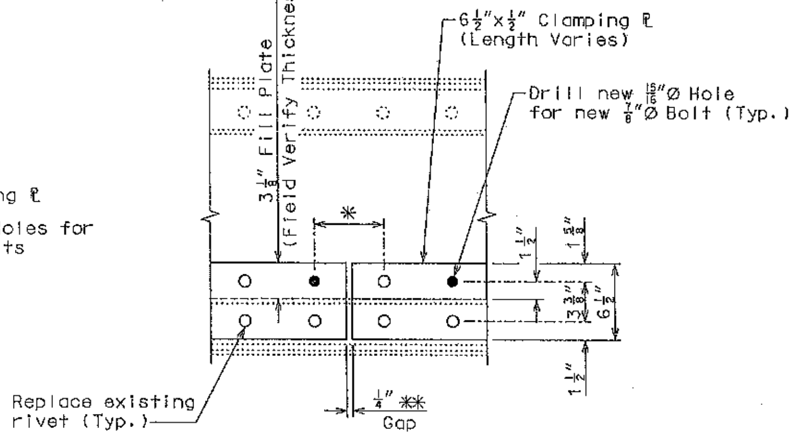

$\frac{1}{2}$" Cover ℄
Install new $\frac{7}{8}$"Ø bolts, Typ. Drill new $\frac{15}{16}$"Ø holes in locations needed
∠ 5"x5"x$\frac{3}{8}$"

SECTION B-B


℄ Truss
℄ Bridge
14'-0"
3$\frac{1}{8}$" Fill ℄
6$\frac{1}{2}$"x$\frac{1}{2}$" Clamping ℄
℄ $\frac{15}{16}$"Ø Holes for $\frac{7}{8}$"Ø Bolts
6$\frac{1}{2}$"x$\frac{1}{2}$" Clamping ℄
℄ $\frac{15}{16}$"Ø Holes for $\frac{7}{8}$"Ø Bolts
3$\frac{3}{8}$"
3$\frac{3}{8}$"
2$\frac{1}{2}$"
2$\frac{1}{2}$"

SECTION A-A

✱ - Spacing varies, 6" Max. Match existing condition except where existing fastener spacing exceeds 6", drill a 15/16"Ø Hole for a 7/8"Ø Bolt.


3$\frac{1}{8}$" Fill Plate (Field Verify Thickness)
6$\frac{1}{2}$"x$\frac{1}{2}$" Clamping ℄ (Length Varies)
Drill new $\frac{15}{16}$"Ø Hole for new $\frac{7}{8}$"Ø Bolt (Typ.)
✱
$1\frac{1}{2}$"
$1\frac{5}{8}$"
$3\frac{3}{8}$"
6$\frac{1}{2}$"
$1\frac{1}{2}$"
Replace existing rivet (Typ.)
$\frac{1}{4}$" ✱✱ Gap

DETAIL "A"

✱✱ - The Contractor shall break the clamping plate and fill plate near the mid-point of each Truss bay.

Notes:
Repairs X & Y shall be completed when traffic is limited to the opposite side of the structure.

New Structural Steel for Repairs X shall be ASTM A709 Grade 50.

All dimensions are approximate and were taken from "As-Built" drawings and limited field measurements.

All dimensions should be field verified prior to fabrication of new structural steel.

All new bolts are $\frac{7}{8}$"Ø Grade A325 high-strength bolts in $\frac{15}{16}$"Ø holes. If the Contractor encounters interference in fit-up, the holes may be reamed to $1\frac{1}{16}$" for a 1"Ø bolt.

All equipment, labor and materials necessary to complete Repair Y shall be considered completely covered by the contract unit price for Structural Steel Repair Y per each.

Repair X shall consist of removing existing rivets in the web plate and the bottom flange connection angles, removing pack rust, coating existing steel with inorganic zinc primer, placing new clamping plate and fill plate, field drilling additional holes as needed and reassembling with $\frac{7}{8}$"Ø A325 bolts.

The contractor shall only work on half of a truss bay in each span at a time. Only one side of the chord shall be worked on at any time. Rivets shall only be removed at the repair location being worked on, not in advance of the repair. All repairs must be completed and new bolts must be installed prior to leaving the work unattended.

All equipment, labor and materials necessary to complete Repair X shall be considered completely covered by the contract price for Structural Steel Repair X lump sum.

REPAIR X & Y DETAILS

Detailed July 2010
Checked July 2010

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

Sheet No. 25A of 57

△ New Sheet 10/12/10

CORY MICHAEL IMHOFF
NUMBER PE-2002016689

DATE PREPARED	
10/12/10	
ROUTE	STATE
136	MO
DISTRICT	SHEET NO.
BR	25A
COUNTY	
ATCHISON	
JOB NO.	
J1P2161	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	
L00982	

DESCRIPTION

DATE

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

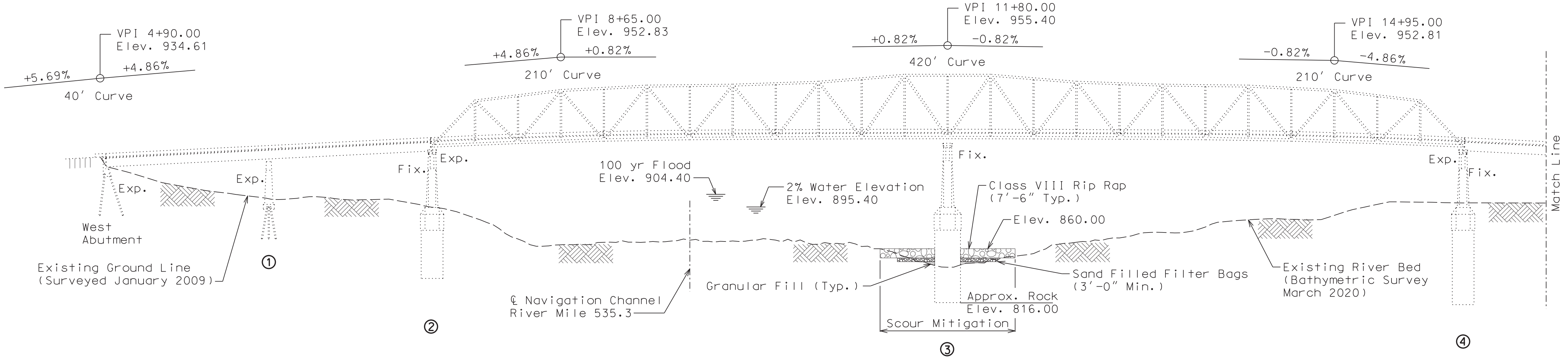
HDR Engineering, Inc.
4435 Main Street
Suite 1000
Kansas City, MO 64111-1856
816-360-2700
Certificate of Authority: 000856

c:\pwworking\omo\d0367232\B_L00982_025A_J1P2161_R1.DGN 8:20:57 AM 10/12/2010

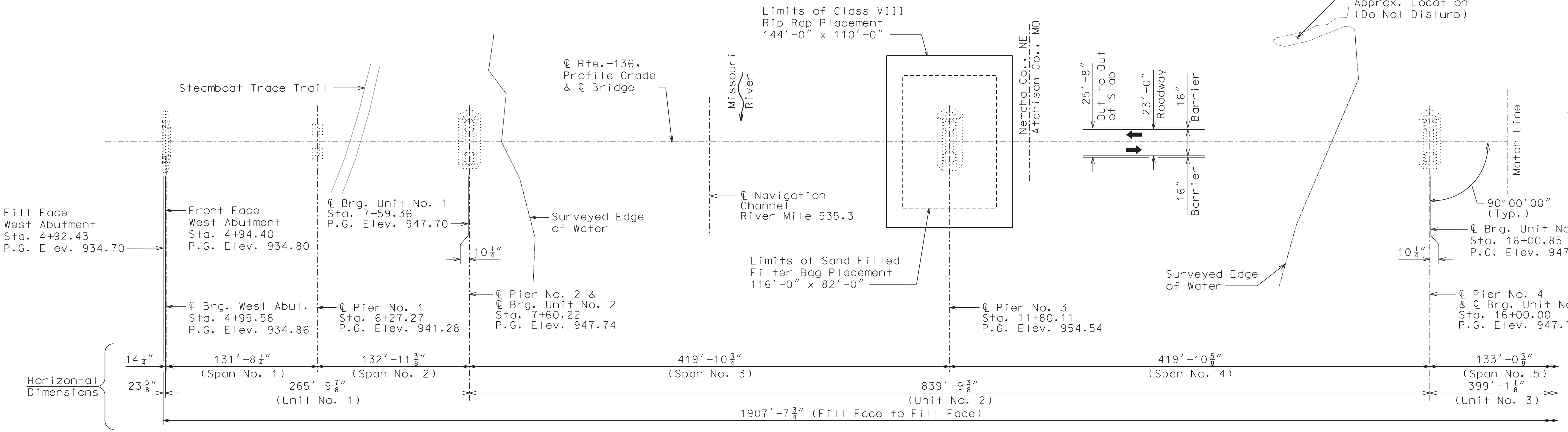
SEC/SUR 33 TWP 65N RGE 42W

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

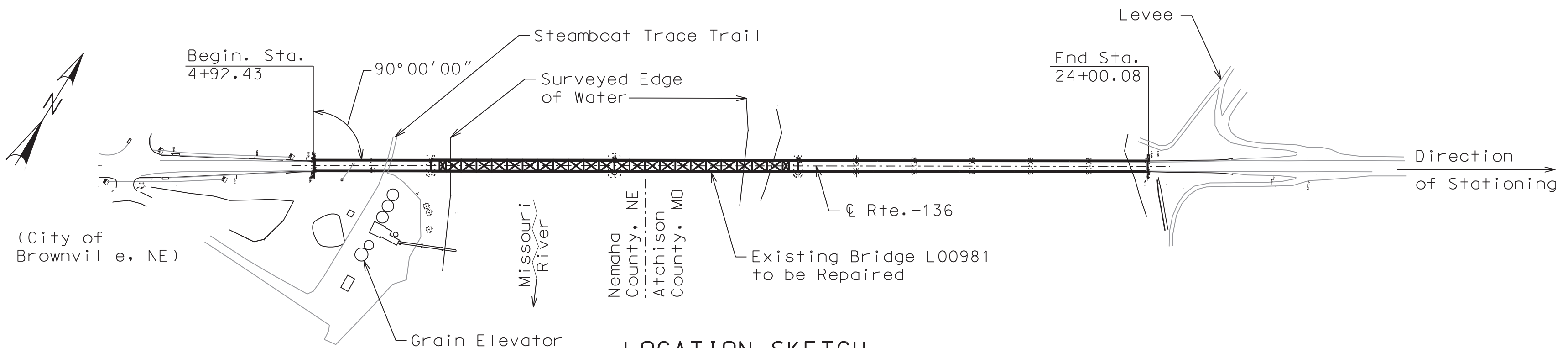
SCOUR MITIGATION OF EXISTING (133'-133') CONTINUOUS GIRDER SPANS (420'-420') CONTINUOUS THROUGH TRUSS SPANS (133'-133'-133')(133'-133'-133') CONTINUOUS GIRDER SPANS



ELEVATION


Existing Spur Dike, Approx. Location (Do Not Disturb)
Limits of Class VIII Rip Rap Placement 144'-0" x 110'-0"
℄ Rte.-136, Profile Grade & ℄ Bridge
Steamboat Trace Trail
Missouri River
Nemaha Co., NE
Atchison Co., MO
25'-8" Out to Out of Slab
23'-0" Roadway
16" Barrier
16" Barrier
Match Line
Fill Face West Abutment Sta. 4+92.43 P.G. Elev. 934.70
Front Face West Abutment Sta. 4+94.40 P.G. Elev. 934.80
℄ Brg. Unit No. 1 Sta. 7+59.36 P.G. Elev. 947.70
Surveyed Edge of Water
℄ Navigation Channel River Mile 535.3
90°00'00" (Typ.)
℄ Brg. Unit No. 3 Sta. 16+00.85 P.G. Elev. 947.67
10¼"
10¼"
Limits of Sand Filled Filter Bag Placement 116'-0" x 82'-0"
Surveyed Edge of Water
℄ Brg. West Abut. Sta. 4+95.58 P.G. Elev. 934.86
℄ Pier No. 1 Sta. 6+27.27 P.G. Elev. 941.28
℄ Pier No. 2 & ℄ Brg. Unit No. 2 Sta. 7+60.22 P.G. Elev. 947.74
℄ Pier No. 3 Sta. 11+80.11 P.G. Elev. 954.54
℄ Pier No. 4 & ℄ Brg. Unit No. 2 Sta. 16+00.00 P.G. Elev. 947.71
Horizontal Dimensions
14¼"
131'-8¼" (Span No. 1)
132'-11⅜" (Span No. 2)
419'-10¾" (Span No. 3)
419'-10⅝" (Span No. 4)
133'-0⅜" (Span No. 5)
23⅝"
265'-9⅞" (Unit No. 1)
839'-9⅜" (Unit No. 2)
399'-1⅛" (Unit No. 3)
1907'-7¾" (Fill Face to Fill Face)

PLAN



LOCATION SKETCH

BM -½" REBAR, 381.2' NE OF WEST ABUTMENT, 302.5' NE OF NE CORNER OF PIER 1, 297.8' NW OF CHISELED SQUARE ON THE SE CORNER OF PIER 2, 294' NE OF THE NORTH FACE OF NORTHERN MOST GRAIN SILO, ELEV. 898.51.

BM -½" REBAR, 1118.6' SE OF WEST ABUTMENT, 1094.9' SE OF SE CORNER OF PIER 1, 1078.7' SE OF CHISELED SQUARE ON THE SE CORNER OF PIER 2, 1044.7' SE OF THE SOUTH FACE OF SOUTHERN MOST GRAIN SILO, ELEV. 891.91.

REPAIRS TO BRIDGE OVER THE MISSOURI RIVER

STATE ROAD FROM RTE. D TO NEBRASKA STATE LINE

ABOUT 1.7 MILES WEST OF RTE. D

STA. 4+92.43 (MATCH EXISTING)

GENERAL ELEVATION AND PLAN

Detailed June 2020
Checked June 2020

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

Sheet No. 1 of 19

STD. 616.10

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 1
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

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

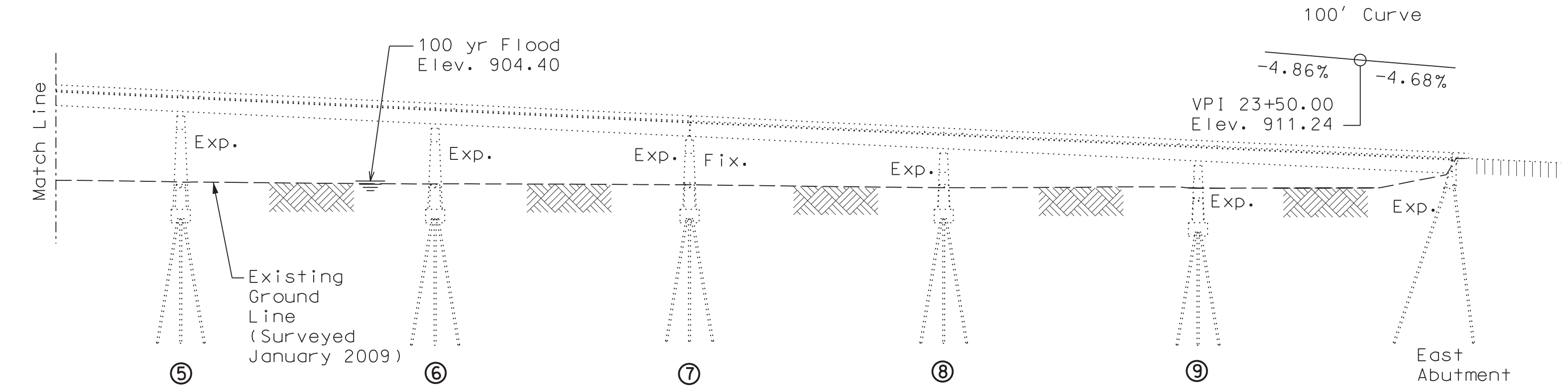
HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

THADDEUS KOSMICKI
NUMBER PE-2008000074

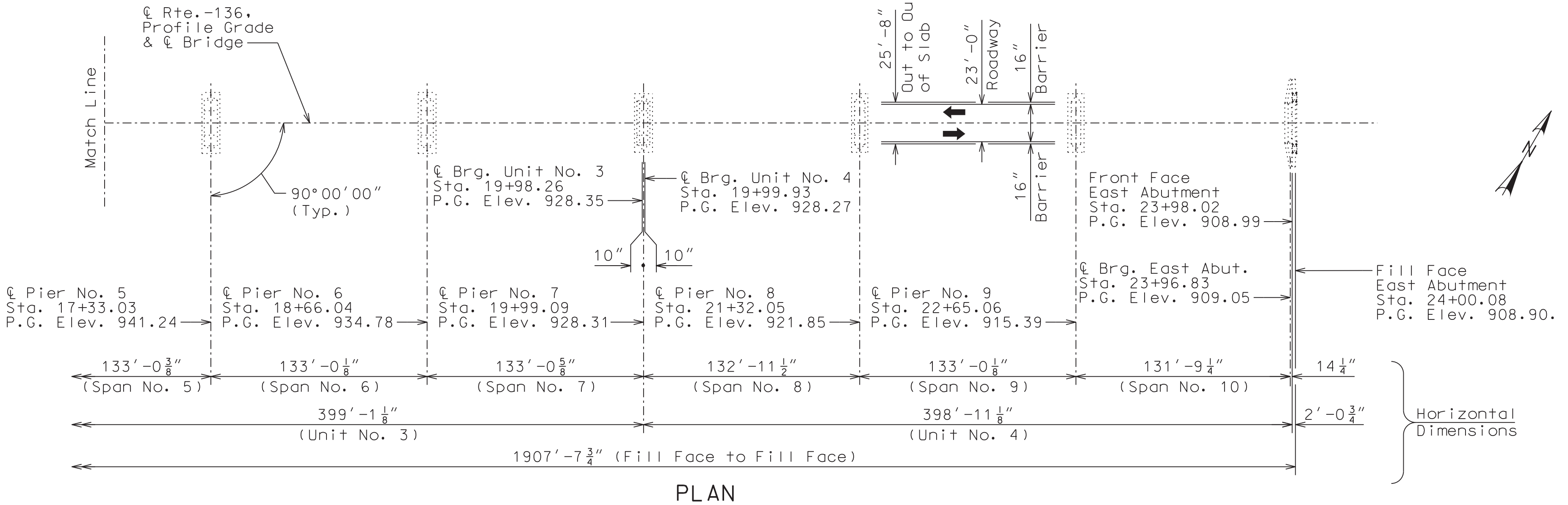
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED	6/26/2020
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 2
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DESCRIPTION	DATE



ELEVATION



PLAN

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

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GENERAL ELEVATION AND PLAN

Detailed June 2020
Checked June 2020

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

Sheet No. 2 of 19

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ESTIMATED QUANTITIES

Item	Unit	Substr.	Superstr.	Total
Underwater Excavation	CY			2,489
Class VIII Rip Rap	CY			4,208
Granular Fill Material	CY			190
Sand Filled Filter Bags	CY			980
Water Transportation for the Engineer	LS			1
Hydrographic Survey	LS			1

GENERAL NOTES:

SCOUR MITIGATION:

Limits of Granular Fill, Filter Bags and Rip Rap are shown on sheets 4 thru 19.

Temporary Traffic Control Devices for Waterways shall be in accordance with Missouri Standard Plans 616.10.

The contractor shall provide adequate means and methods to place sand filled bags and rip rap in between and round the existing caisson and ice breaker piling.

Variations of the actual river bed surface to the surface shown in these plans may be encountered. The contractor shall fill the river bottom to elevation 849.50 at the bottom of the designed filter with either additional sand filled bags or granular fill material, see Job Special Provisions.

See Job Special Provisions for material specifications and construction requirements.

MISCELLANEOUS:

Traffic over structure to be maintained during construction.

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

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

All existing dimensions shown were taken from as-built drawings or limited field measurements.

UTILITIES:

Contractor to locate, and where necessary, coordinate the protection of all utilities prior to commencing construction activities.

THADDEUS KOSMICKI
PE-2008000074

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DATE PREPARED 6/26/2020
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 3
COUNTY ATCHISON
JOB NO. J1P3384
CONTRACT ID.
PROJECT NO.
BRIDGE NO. L00983

DESCRIPTION	DATE

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

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Detailed June 2020
Checked June 2020

GENERAL NOTES AND SUMMARY OF QUANTITIES

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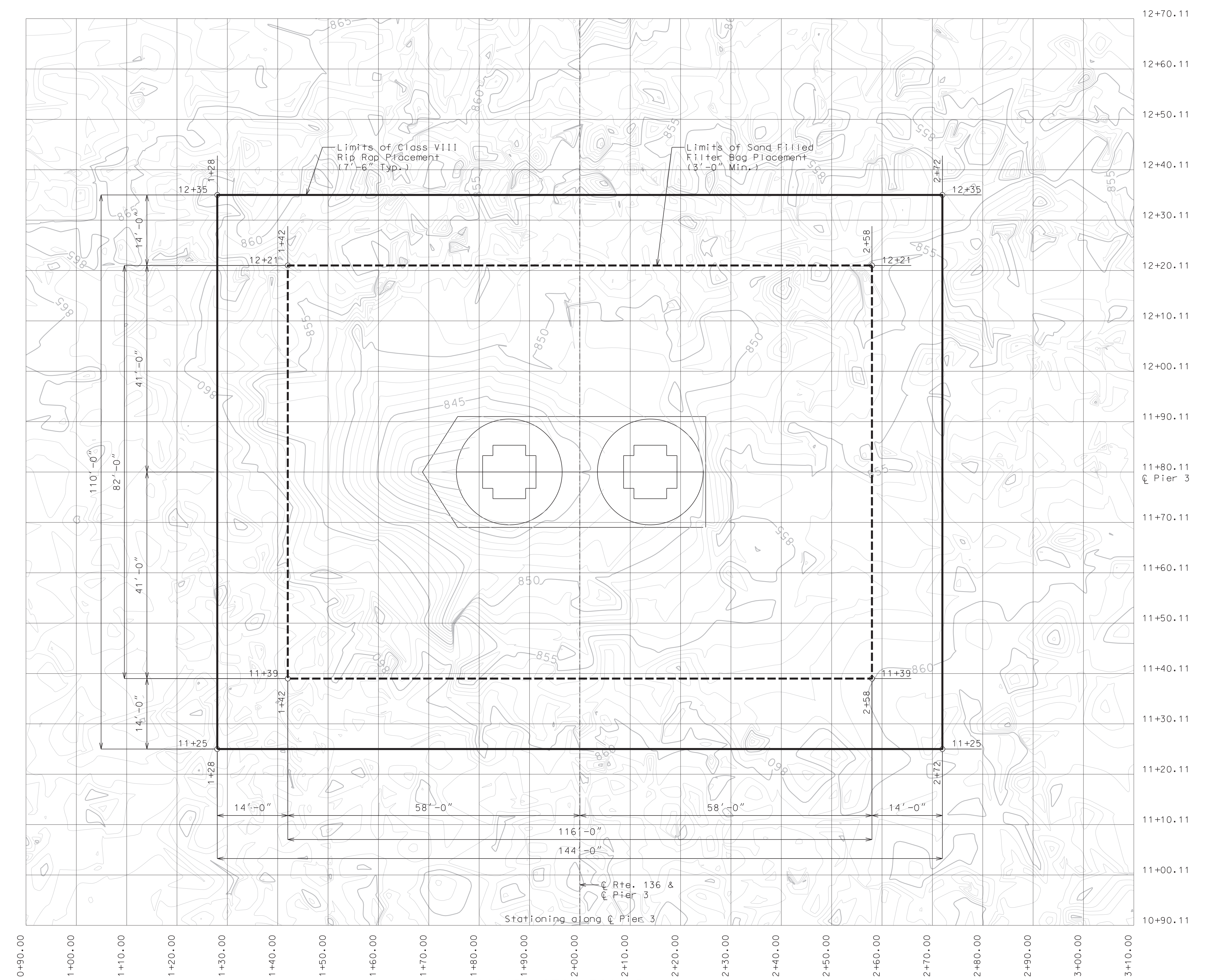

SCOUR MITIGATION PLAN

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

Sheet No. 4 of 19

Detailed June 2020
Checked June 2020

Notes:
See Sheets 5 through 19 for cross sections and details of scour mitigation.

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 4
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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THADDEUS KOSMICKI
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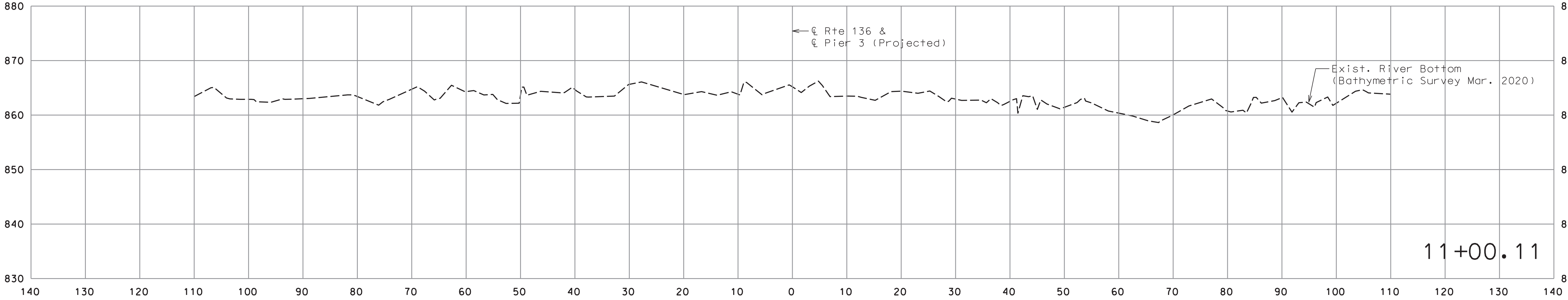
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

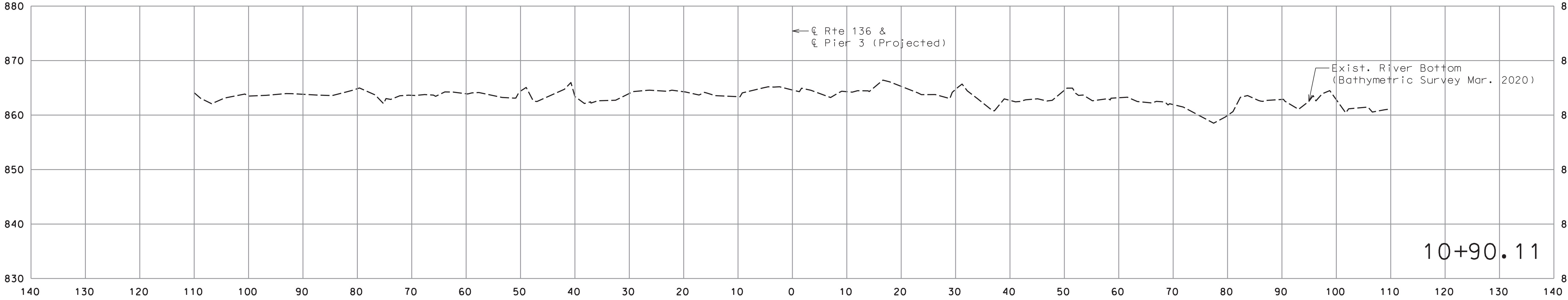
DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 5
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

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





SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 5 of 19

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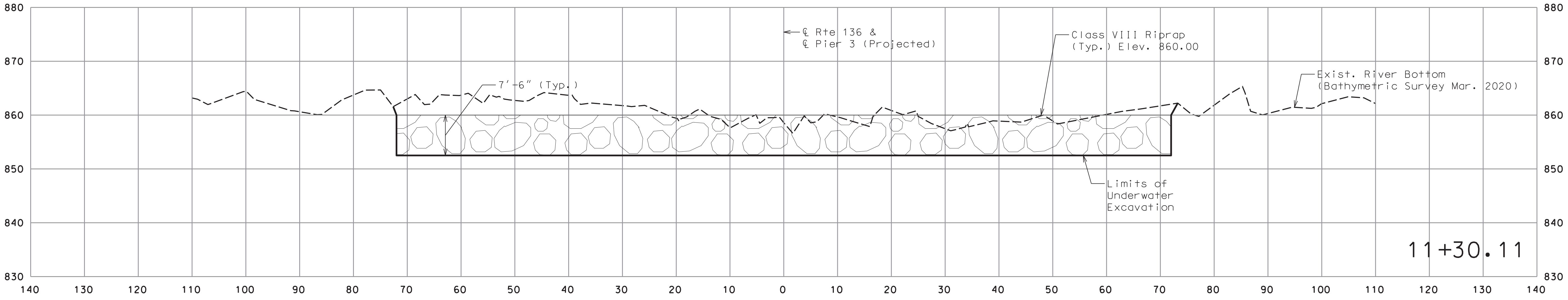

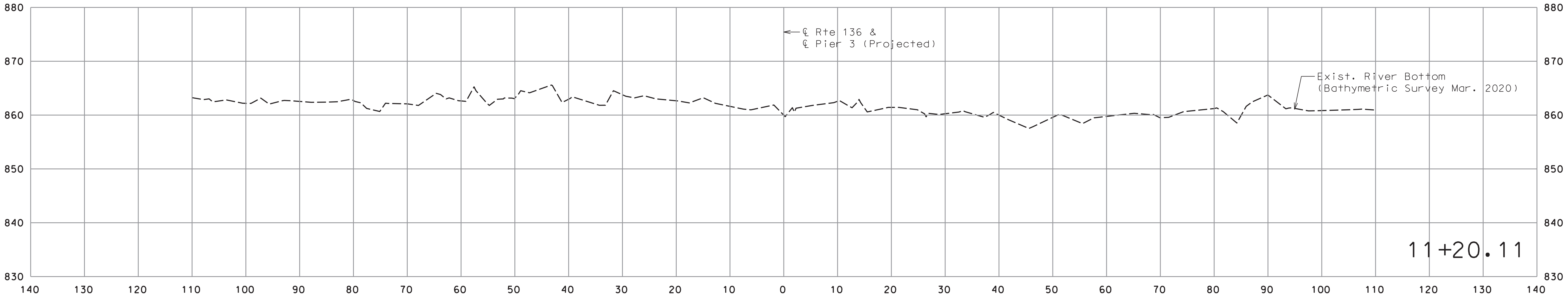

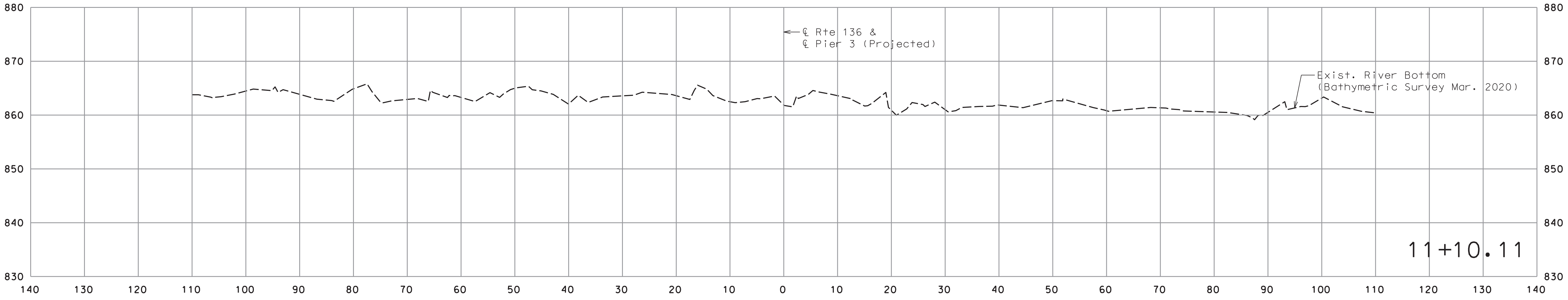

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 6 of 19

THADDEUS KOSMICKI
PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 6
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

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

HDR Engineering, Inc.
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816-360-2700
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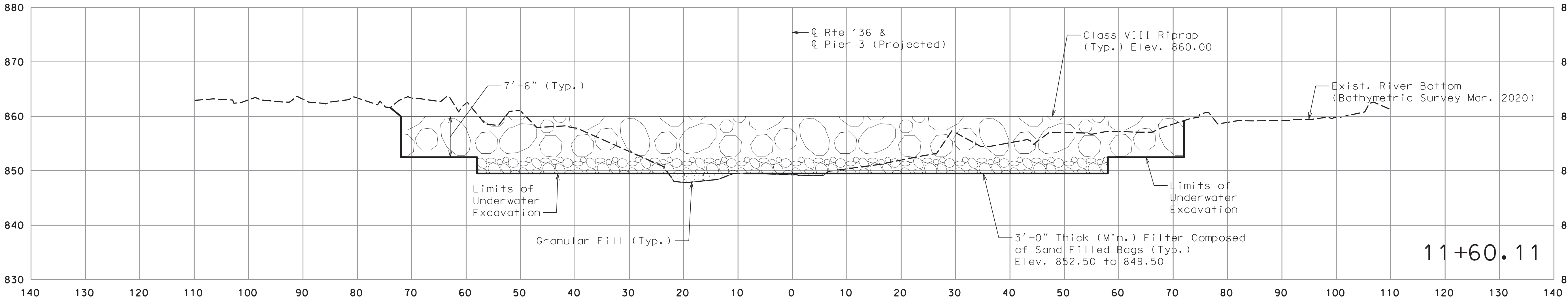
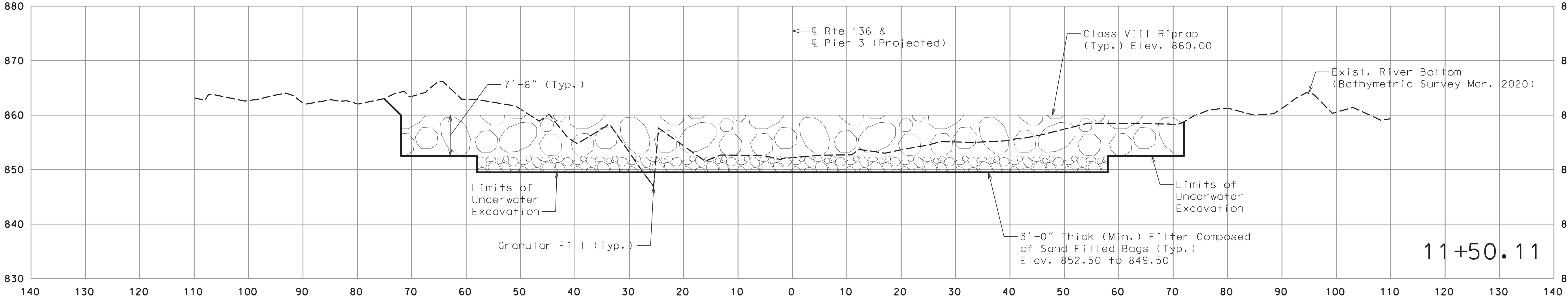
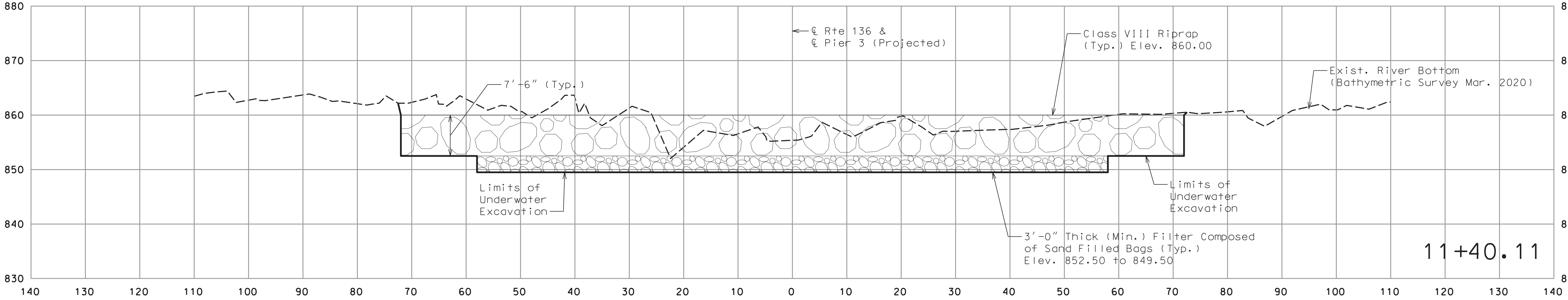


11+60.11



11+50.11



11+40.11

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 7 of 19

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED	6/26/2020
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	7
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DATE	DESCRIPTION

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

HDR Engineering, Inc.
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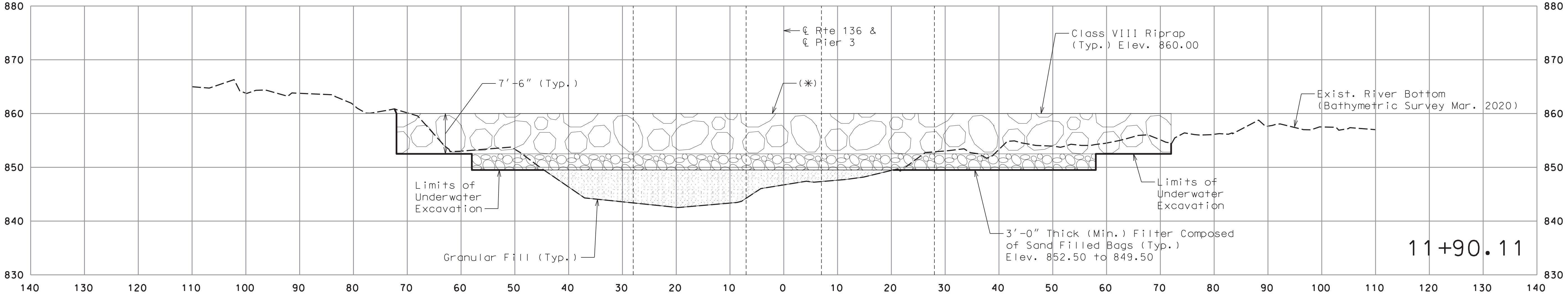
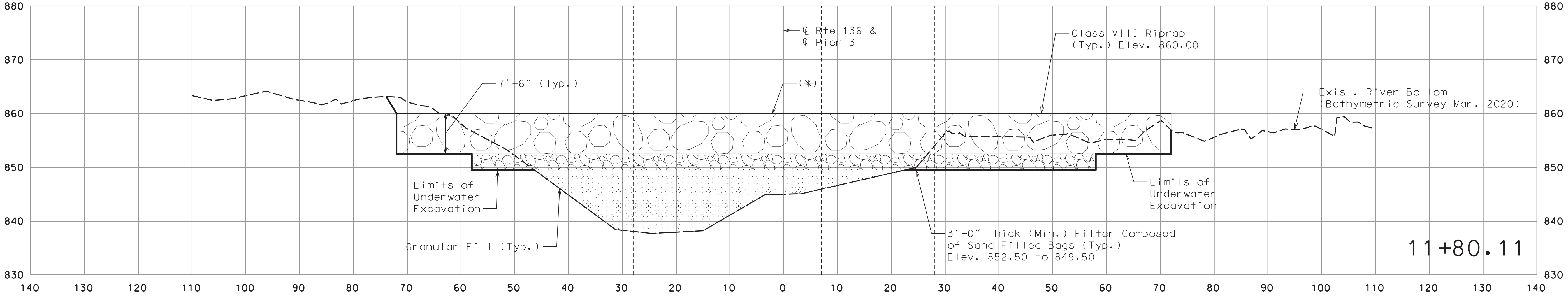
(✱) Contractor shall fill the area between the existing caissons. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.



880
870
860
850
840
830
℄ Rte 136 &
℄ Pier 3
Class VIII Riprap (Typ.) Elev. 860.00
7'-6" (Typ.)
(✱)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Granular Fill (Typ.)
11+90.11
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140



880
870
860
850
840
830
℄ Rte 136 &
℄ Pier 3
Class VIII Riprap (Typ.) Elev. 860.00
7'-6" (Typ.)
(✱)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
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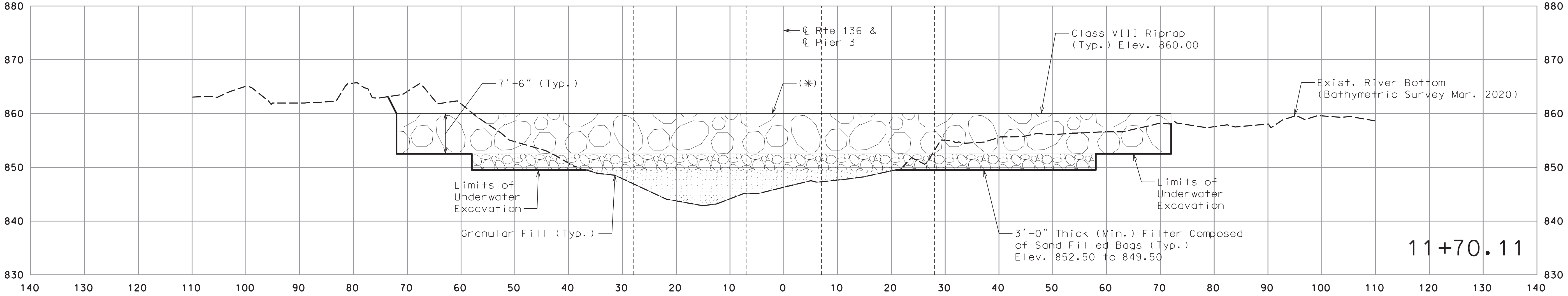
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Granular Fill (Typ.)
11+80.11
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140



880
870
860
850
840
830
℄ Rte 136 &
℄ Pier 3
Class VIII Riprap (Typ.) Elev. 860.00
7'-6" (Typ.)
(✱)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Granular Fill (Typ.)
11+70.11
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 8 of 19

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 8
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION
DATE

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

HDR Engineering, Inc.
10450 Holmes Road
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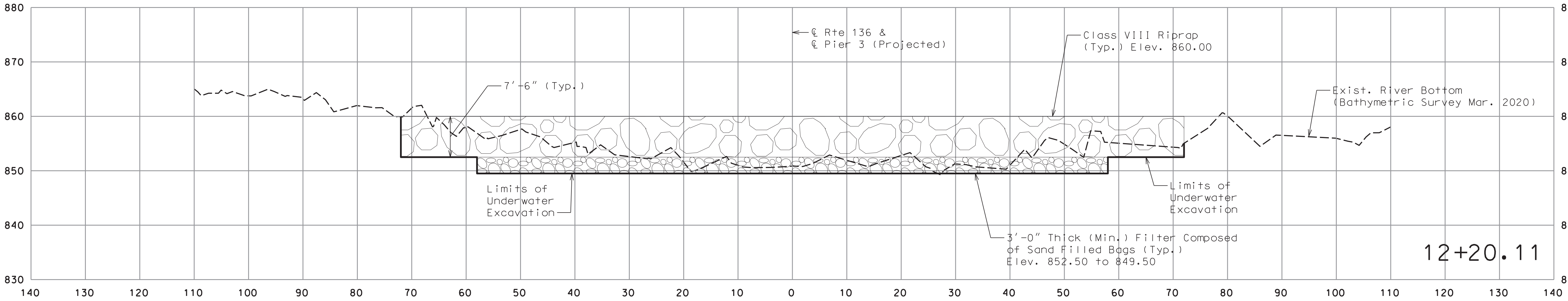
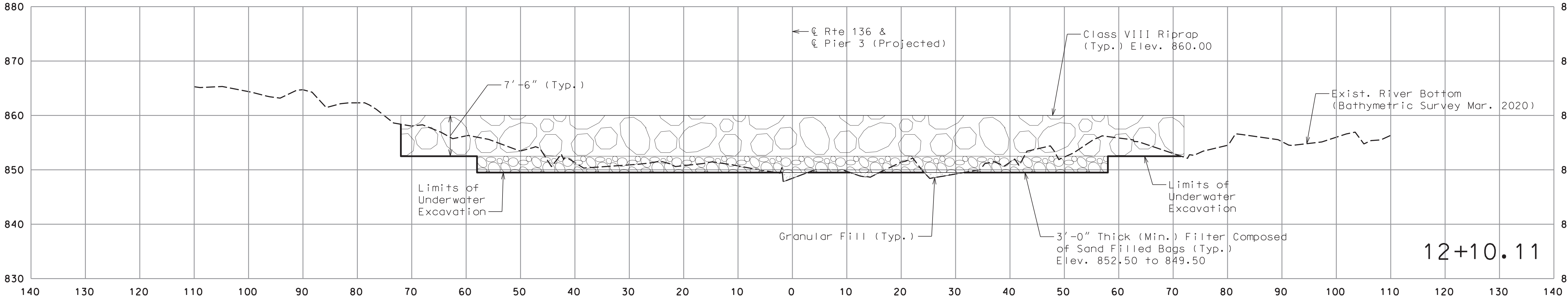
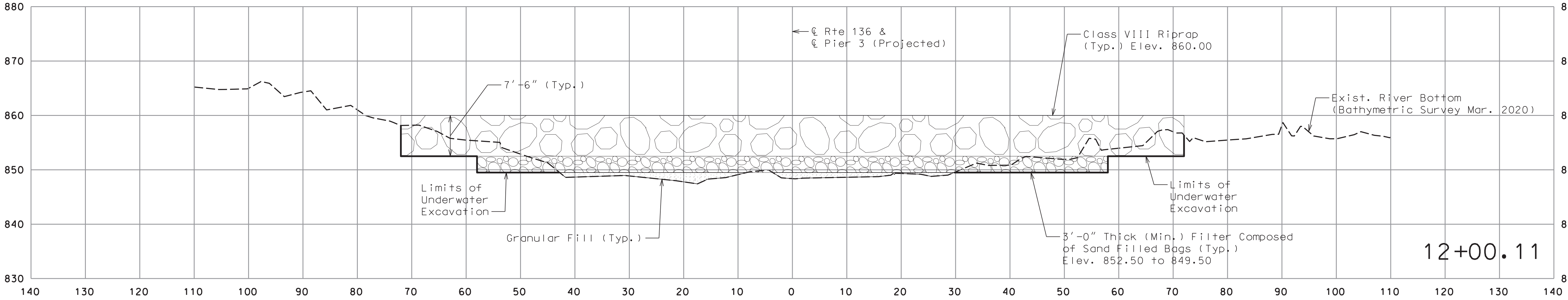


12+20.11



12+10.11



12+00.11

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 9 of 19

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 9
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
10450 Holmes Road
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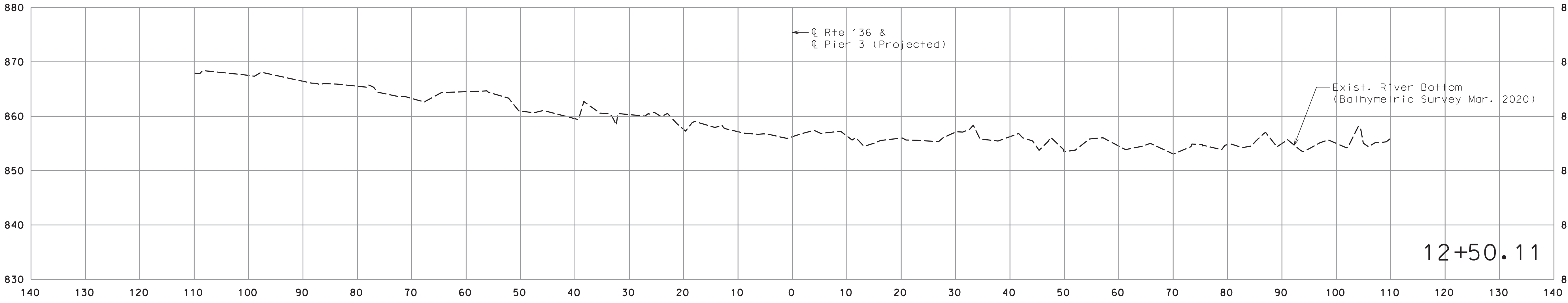

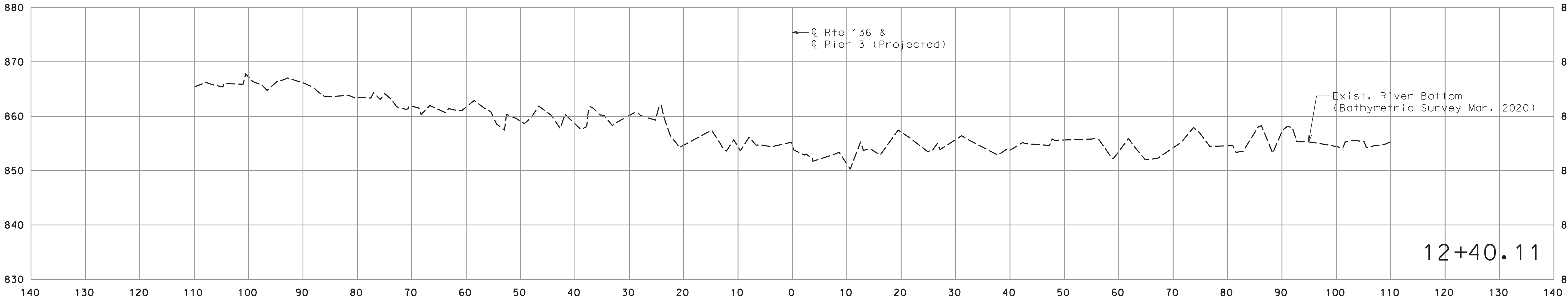

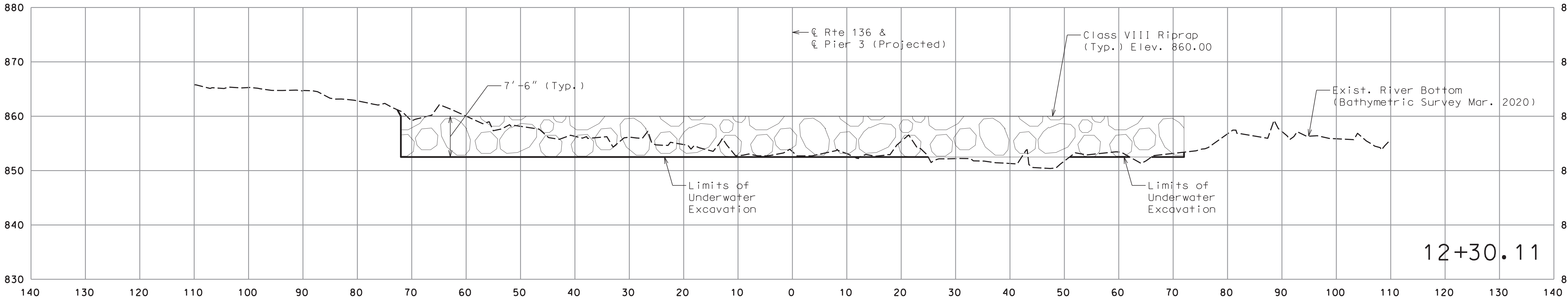

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 10 of 19

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED	
6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 10
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

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

HDR Engineering, Inc.
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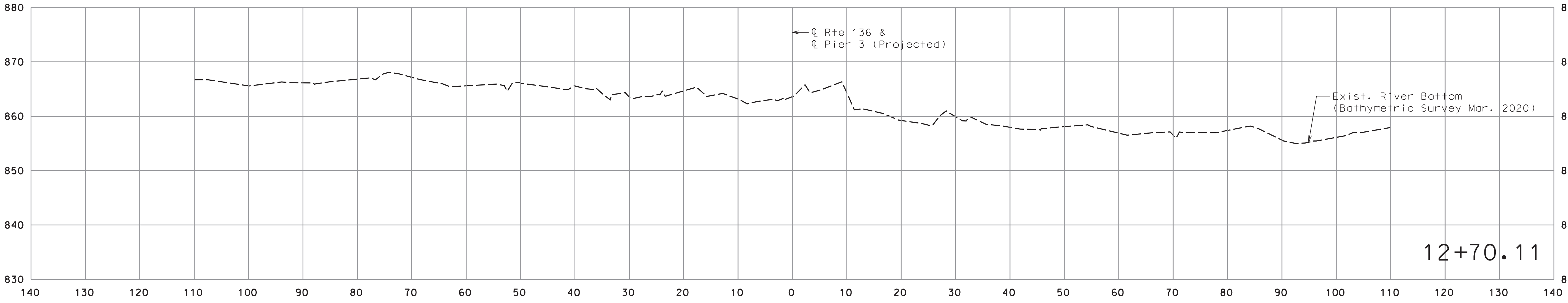

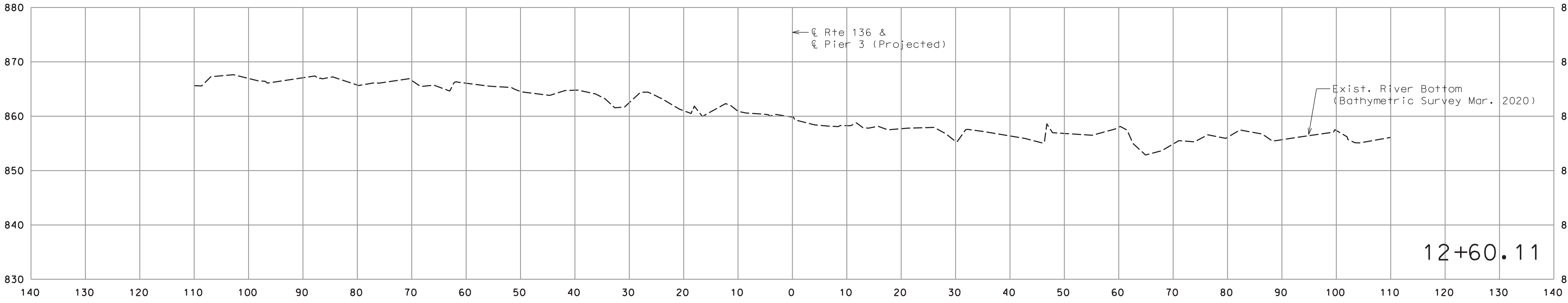

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 11 of 19

THADDEUS KOSMICKI
PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 11
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

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

HDR Engineering, Inc.
10450 Holmes Road
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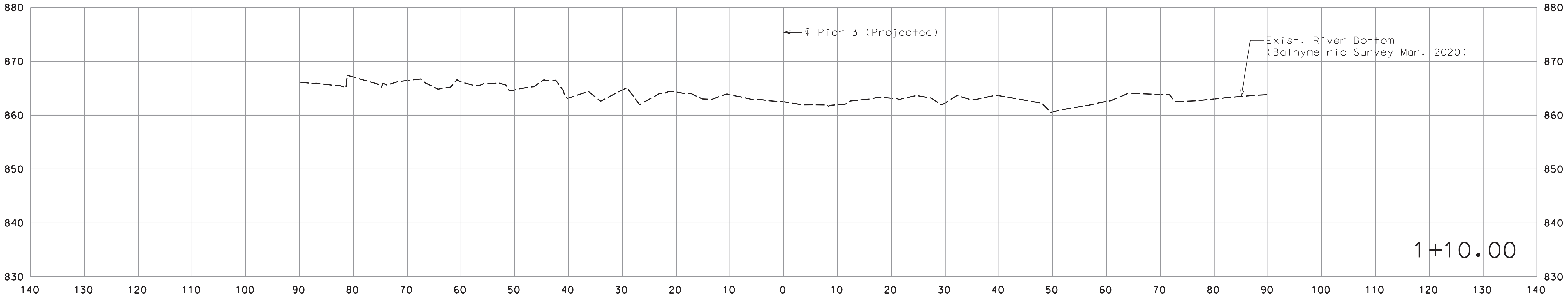

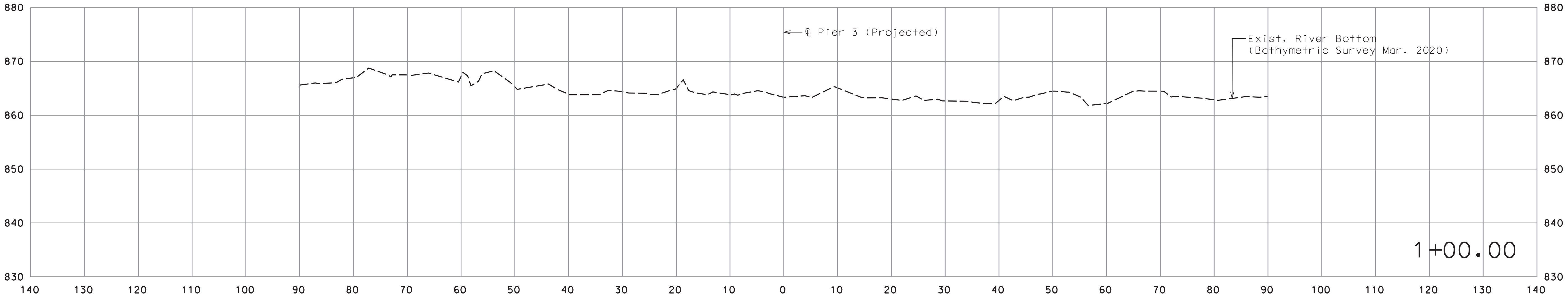

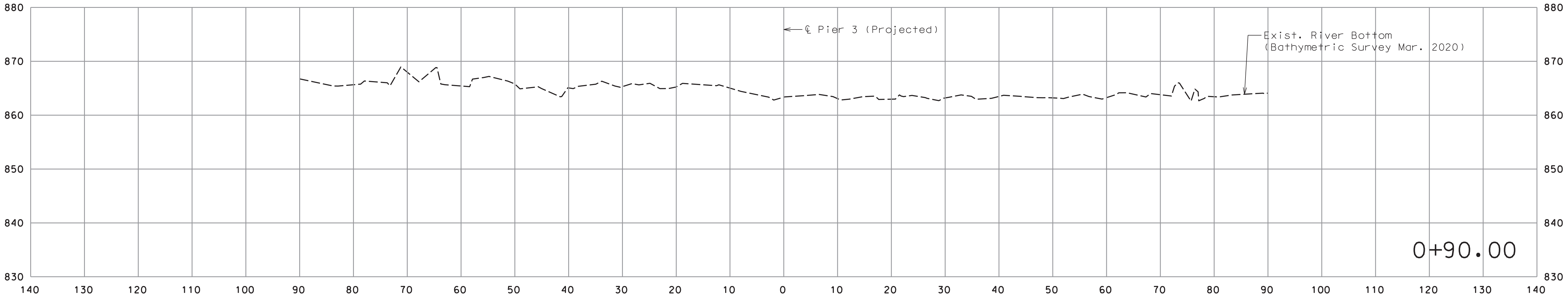

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 12 of 19

THADDEUS KOSMICKI
NUMBER
PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED: 6/26/2020
ROUTE: 136
STATE: MO
DISTRICT: BR
SHEET NO.: 12
COUNTY: ATCHISON
JOB NO.: J1P3384
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: L00983

DESCRIPTION
DATE

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

HDR Engineering, Inc.
10450 Holmes Road
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816-360-2700
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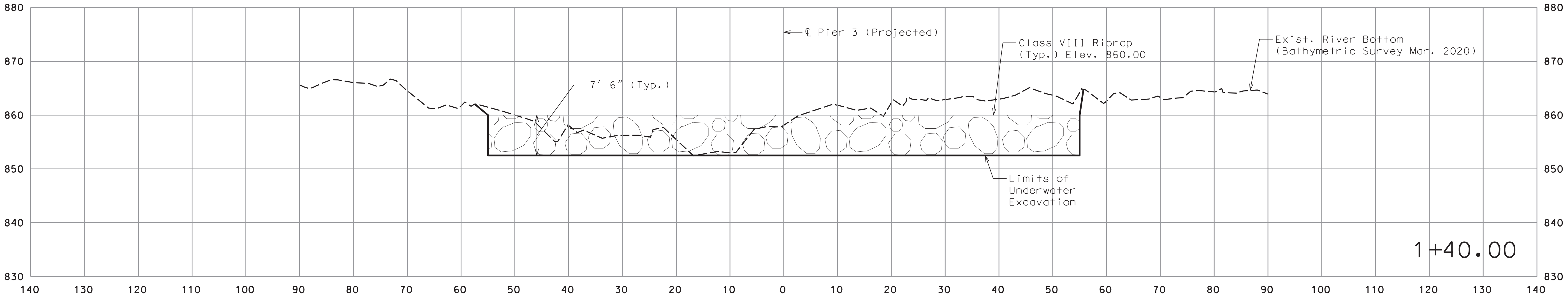

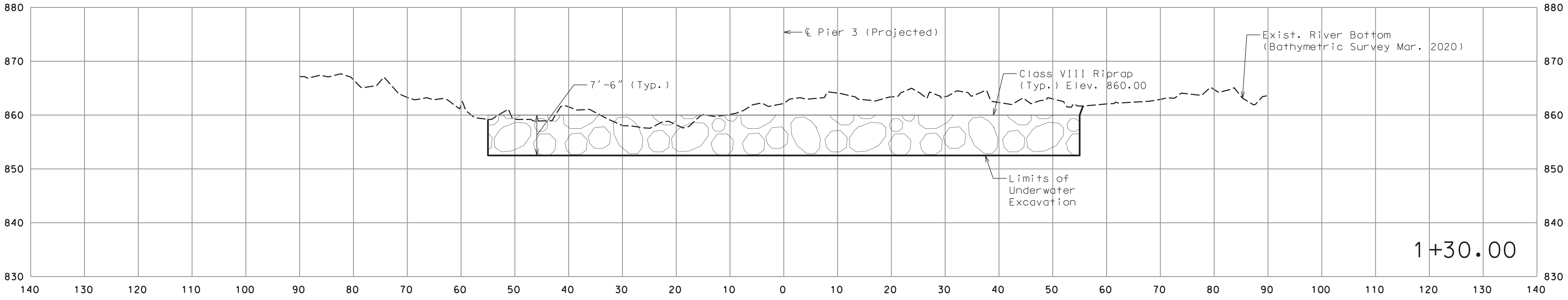

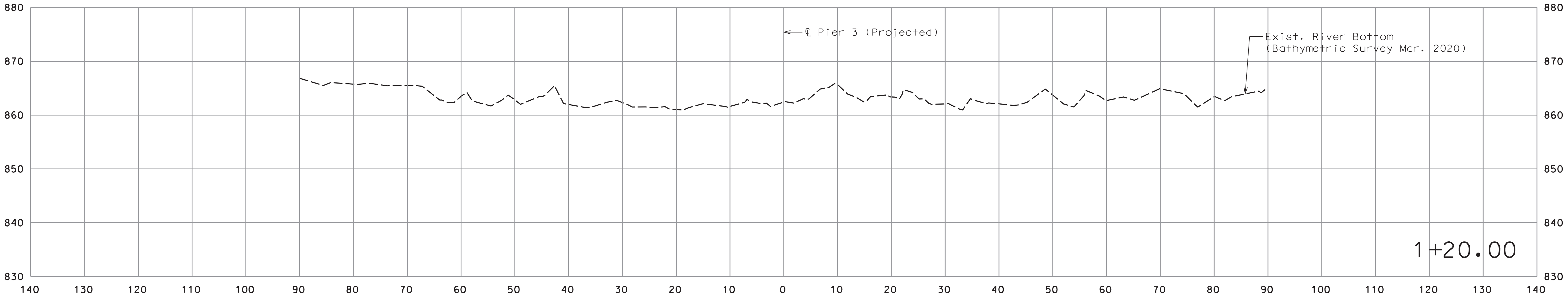

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 13 of 19

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 13
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

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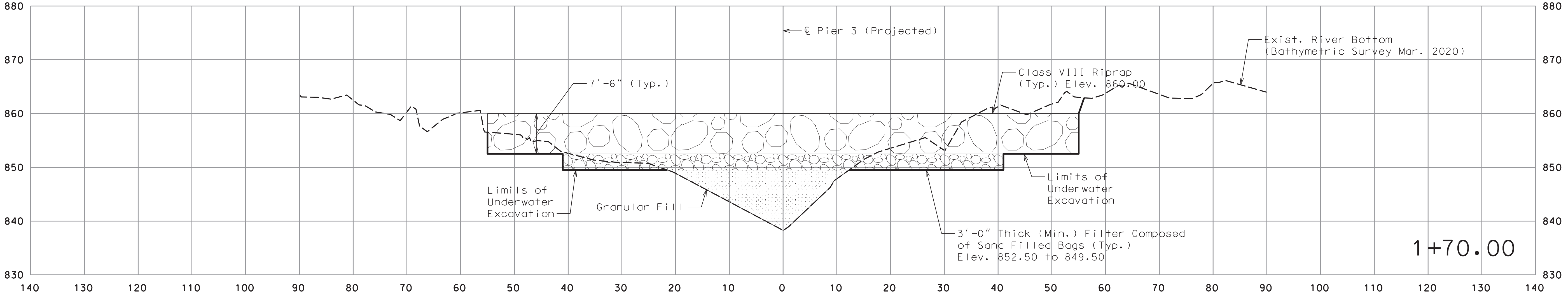
816-360-2700
Certificate of Authority: 000856


880
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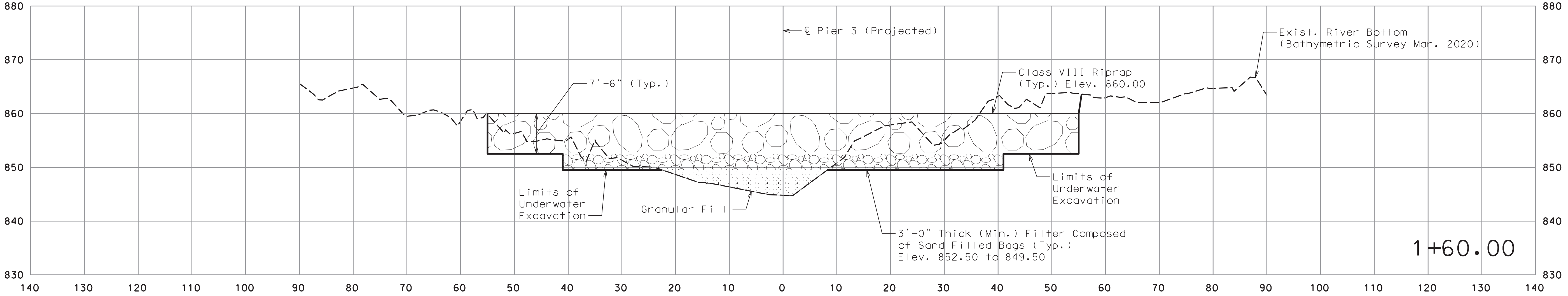
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
1+70.00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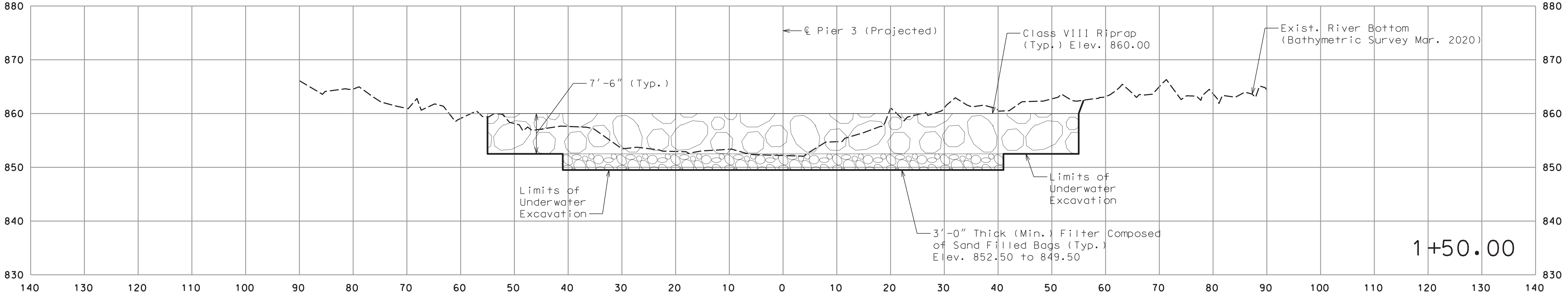
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
1+60.00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℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 860.00
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7'-6" (Typ.)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
1+50.00

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 14 of 19

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 14
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DESCRIPTION

DATE

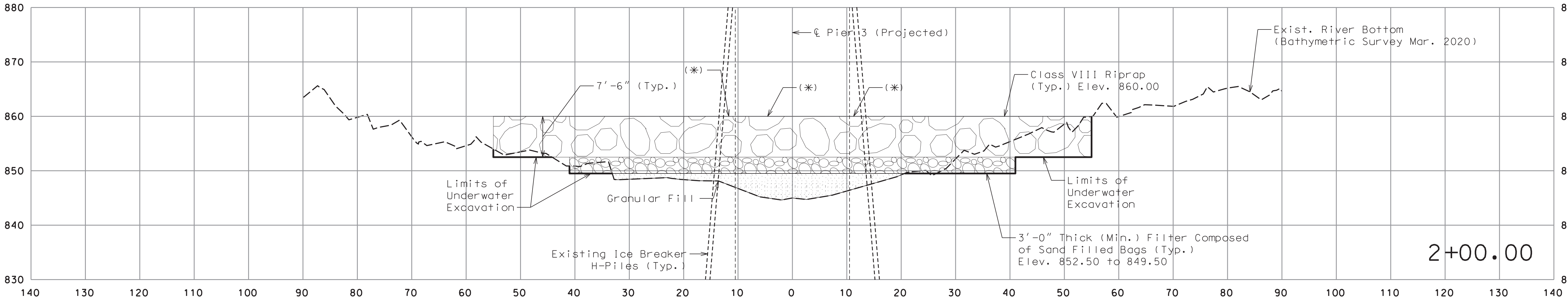
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

MoDOT

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

(✱) Contractor shall fill the area between the existing caissons and the area between the existing piling. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.



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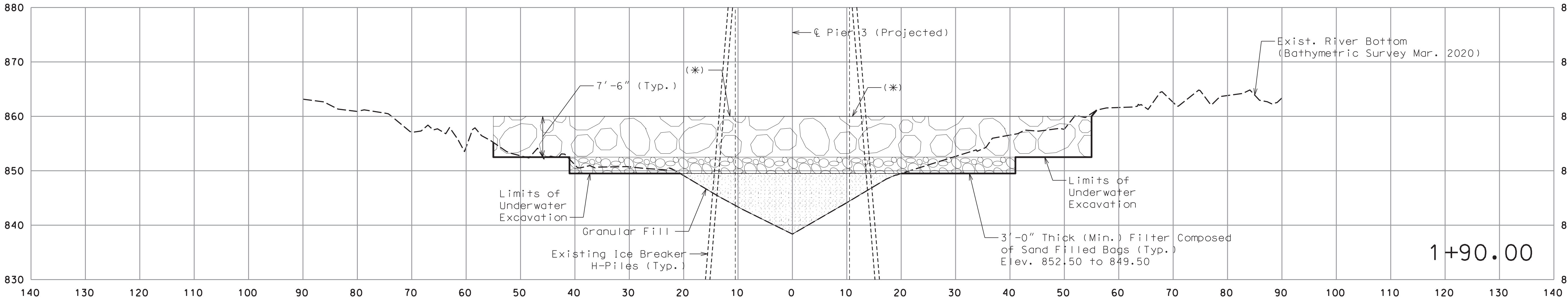
℄ Pier 3 (Projected)
(✱)
7'-6" (Typ.)
(✱)
(✱)
Class VIII Riprap (Typ.) Elev. 860.00
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Existing Ice Breaker H-Piles (Typ.)

2+00.00



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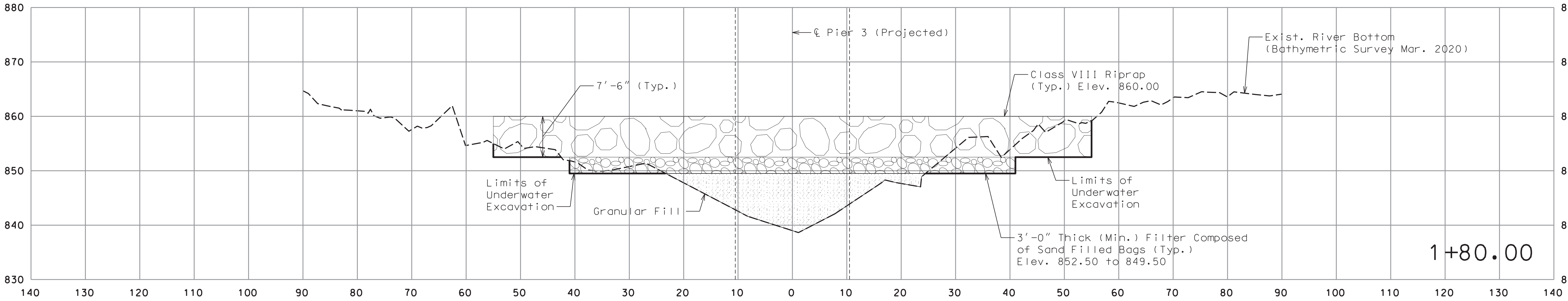
℄ Pier 3 (Projected)
(✱)
7'-6" (Typ.)
(✱)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Limits of Underwater Excavation
Granular Fill
Existing Ice Breaker H-Piles (Typ.)
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50

1+90.00



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℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50

1+80.00

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 15 of 19

THADDEUS KOSMICKI
PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 15
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

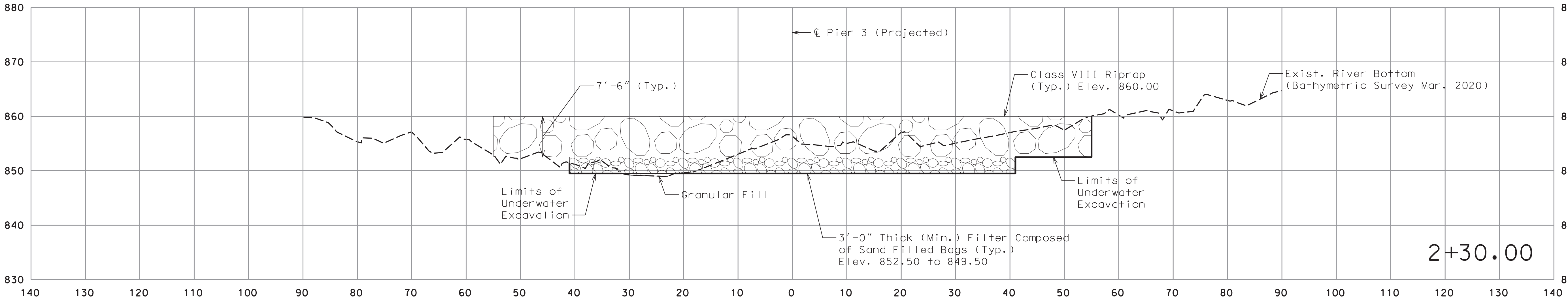
DESCRIPTION

DATE

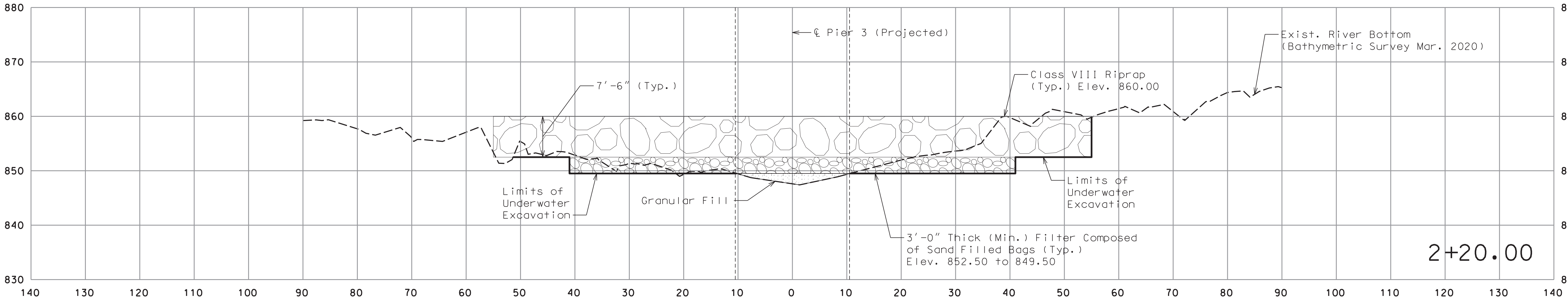
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

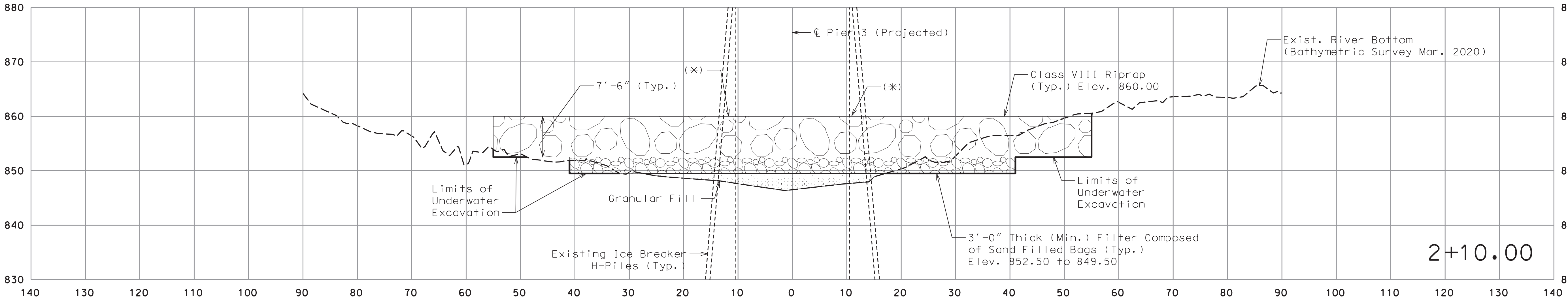
(✱) Contractor shall fill the area between the existing caissons and the area between the existing piling. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.



2+30.00
℄ Pier 3 (Projected)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
880
870
860
850
840
830
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140



2+20.00
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
880
870
860
850
840
830
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140



2+10.00
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
(✱)
(✱)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
Existing Ice Breaker H-Piles (Typ.)
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
880
870
860
850
840
830
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 16 of 19

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

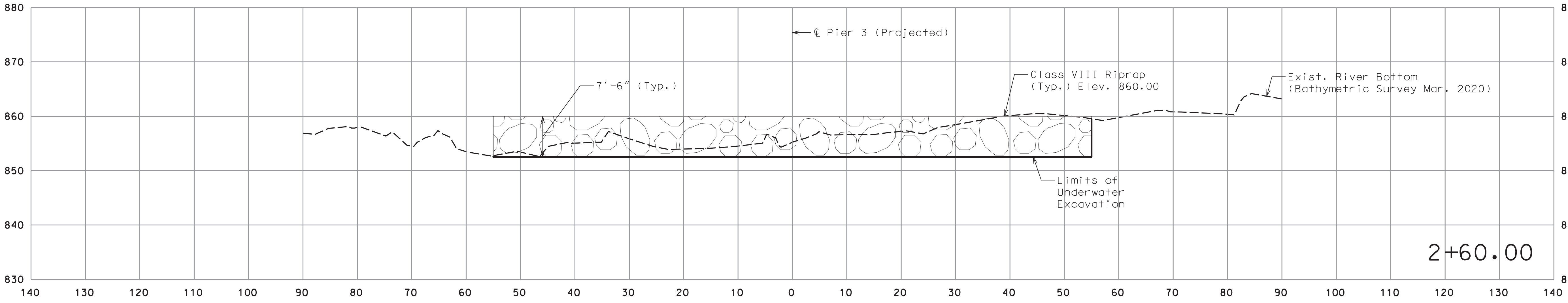
DATE PREPARED	6/26/2020
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	16
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856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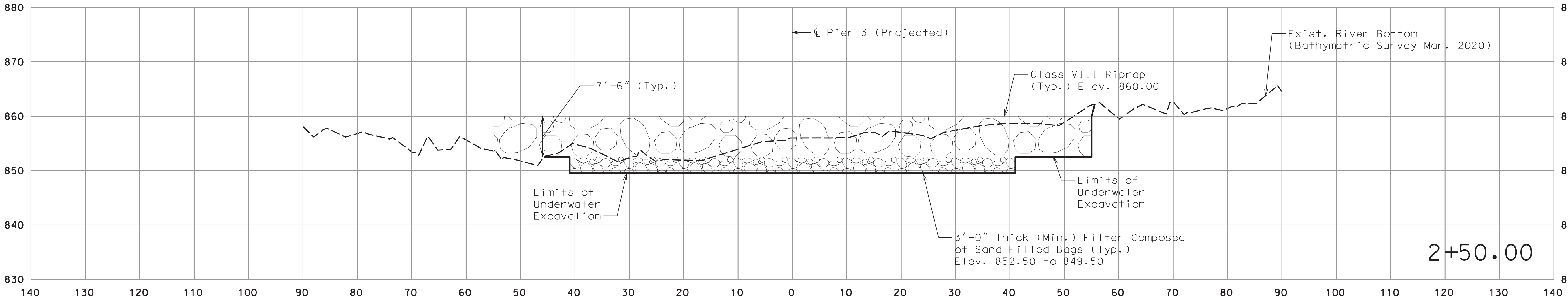
870
860
850
840
830
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
℄ Pier 3 (Projected)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation

2+60.00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870
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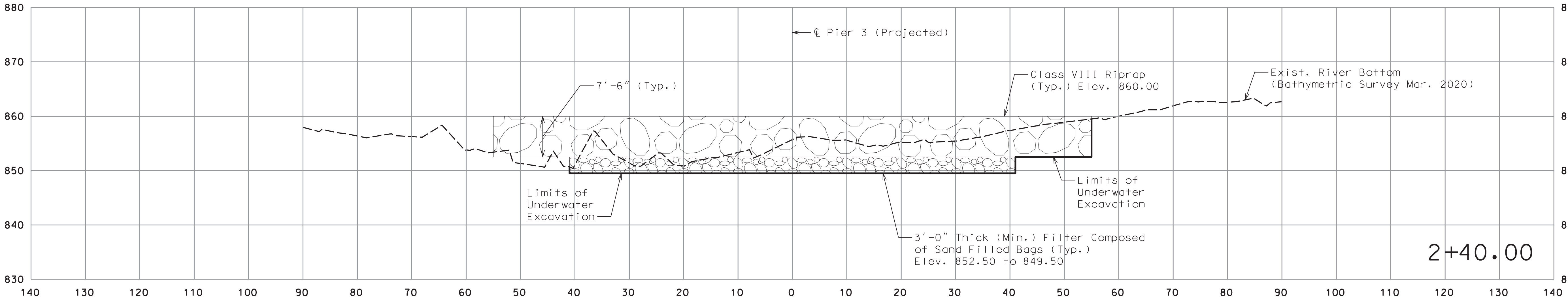
120
110
100
90
80
70
60
50
40
30
20
10
0
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50

2+50.00


880
870
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100
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80
70
60
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0
℄ Pier 3 (Projected)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50

2+40.00

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 17 of 19

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED	6/26/2020
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	17
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DESCRIPTION

DATE

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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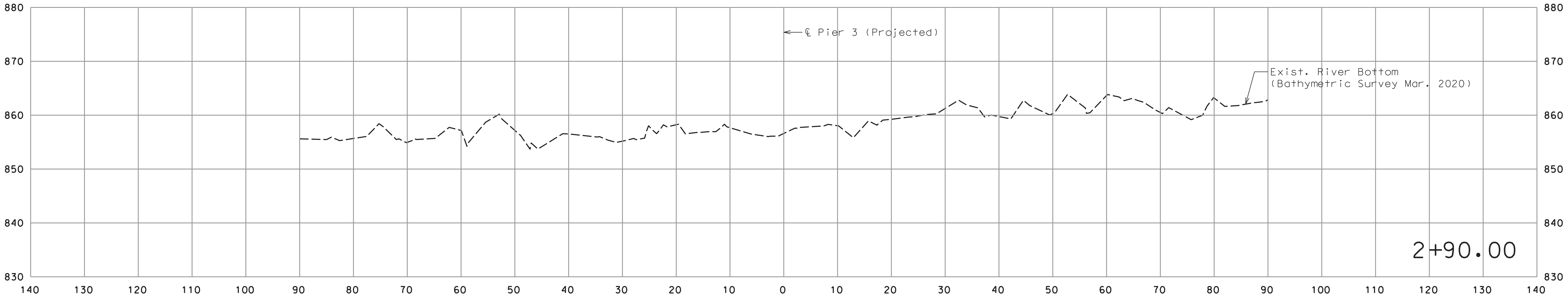

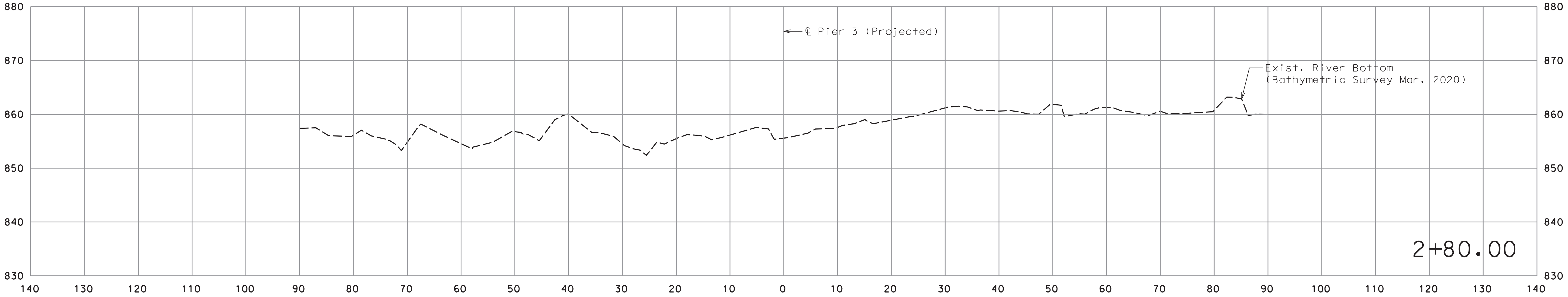

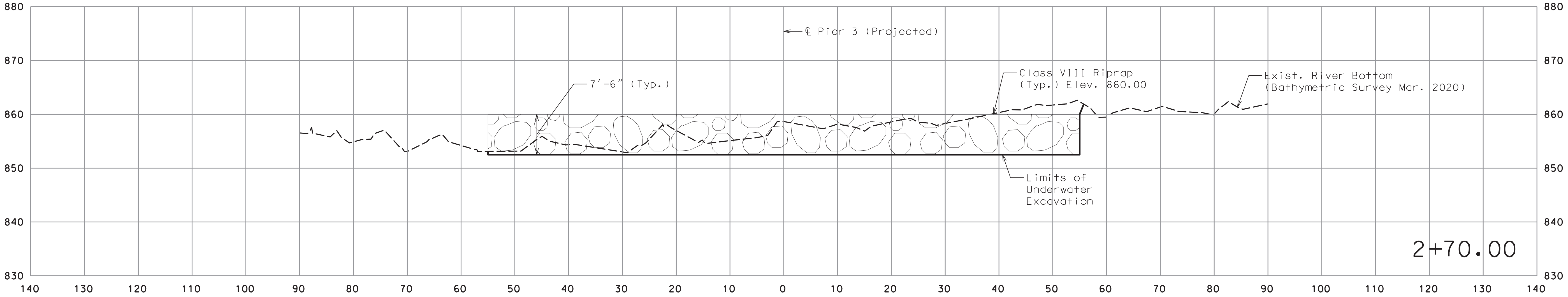

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 18 of 19

THADDEUS
KOSMICKI
NUMBER
PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED
6/26/2020
ROUTE 136
STATE MO
DISTRICT BR
SHEET NO. 18
COUNTY
ATCHISON
JOB NO.
J1P3384
CONTRACT ID.
PROJECT NO.
BRIDGE NO.
L00983

DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

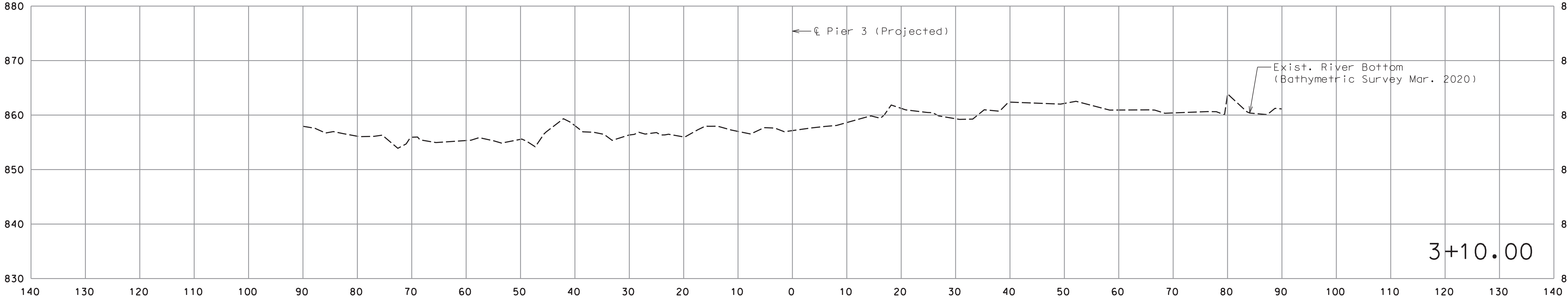
DATE PREPARED 6/26/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 19
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

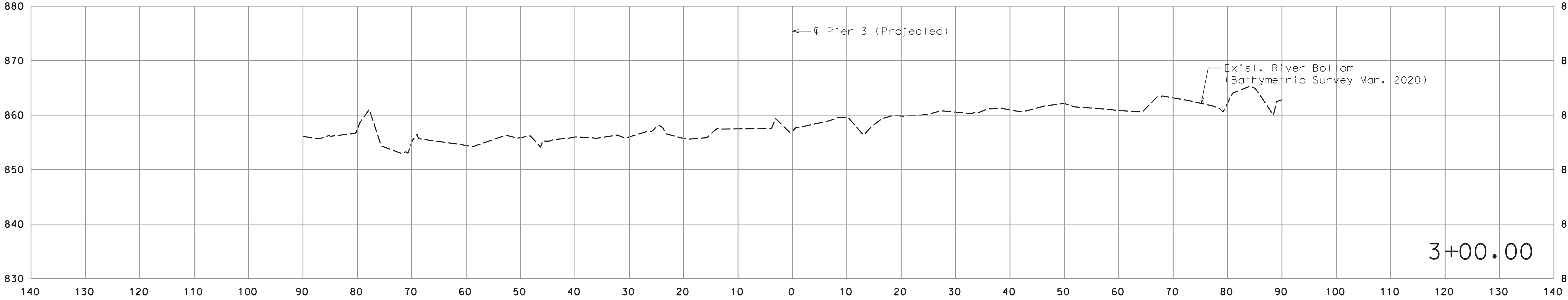
DESCRIPTION

DATE

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856





SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

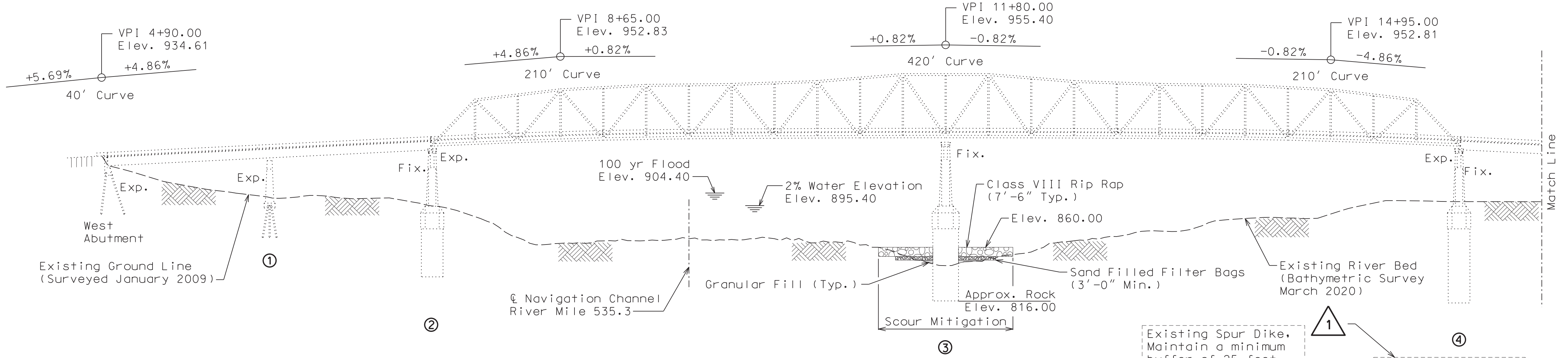
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 19 of 19

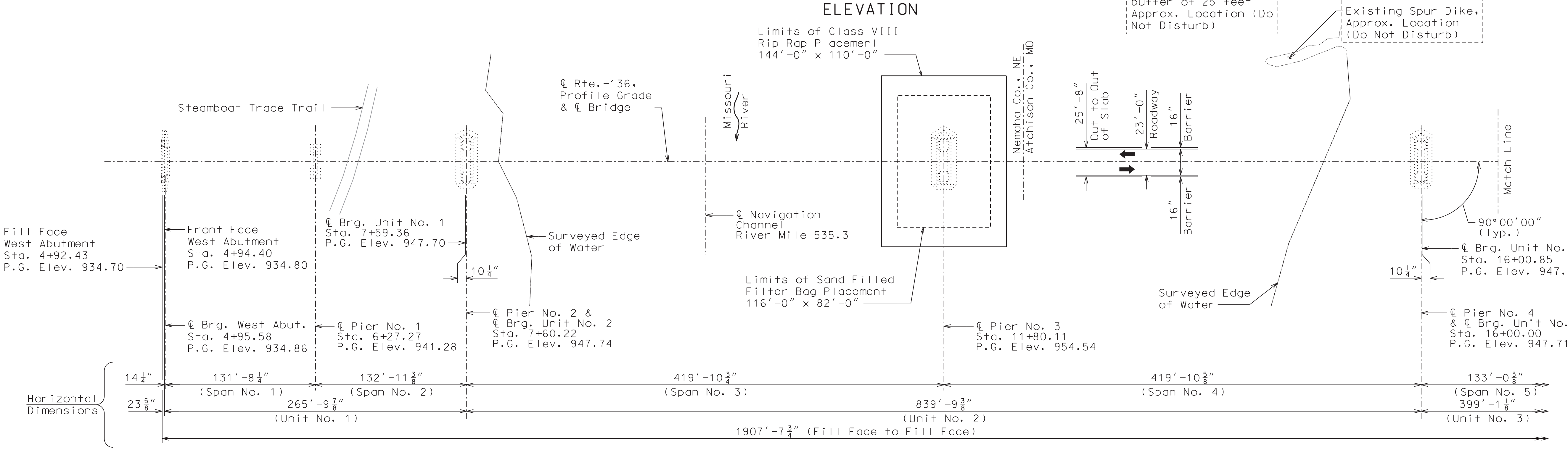
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

SCOUR MITIGATION OF EXISTING (133'-133') CONTINUOUS GIRDER SPANS (420'-420') CONTINUOUS THROUGH TRUSS SPANS (133'-133'-133')(133'-133'-133') CONTINUOUS GIRDER SPANS

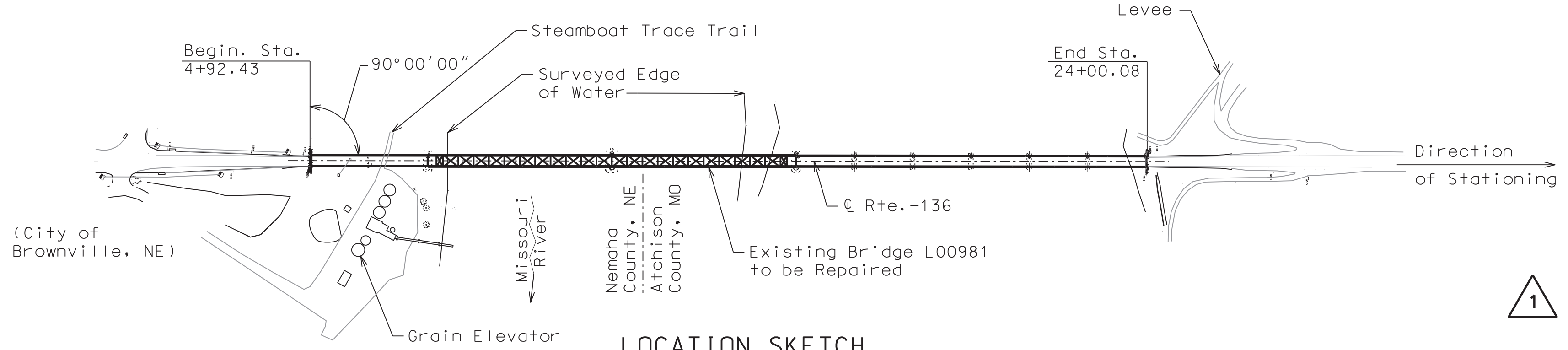
SEC/SUR 33 TWP 65N RGE 42W



ELEVATION


Existing Spur Dike. Maintain a minimum buffer of 25 feet Approx. Location (Do Not Disturb)
1
Existing Spur Dike. Approx. Location (Do Not Disturb)
Limits of Class VIII Rip Rap Placement 144'-0" x 110'-0"
Nemaha Co., NE
Atchison Co., MO
℄ Rte.-136, Profile Grade & ℄ Bridge
Missouri River
Steamboat Trace Trail
25'-8" Out to Out of Slab
23'-0" Roadway
16" Barrier
16" Barrier
Match Line
Fill Face West Abutment Sta. 4+92.43 P.G. Elev. 934.70
Front Face West Abutment Sta. 4+94.40 P.G. Elev. 934.80
℄ Brg. Unit No. 1 Sta. 7+59.36 P.G. Elev. 947.70
Surveyed Edge of Water
℄ Navigation Channel River Mile 535.3
90°00'00" (Typ.)
℄ Brg. Unit No. 3 Sta. 16+00.85 P.G. Elev. 947.67
10¼"
10¼"
Limits of Sand Filled Filter Bag Placement 116'-0" x 82'-0"
Surveyed Edge of Water
℄ Brg. West Abut. Sta. 4+95.58 P.G. Elev. 934.86
℄ Pier No. 1 Sta. 6+27.27 P.G. Elev. 941.28
℄ Pier No. 2 & ℄ Brg. Unit No. 2 Sta. 7+60.22 P.G. Elev. 947.74
℄ Pier No. 3 Sta. 11+80.11 P.G. Elev. 954.54
℄ Pier No. 4 & ℄ Brg. Unit No. 2 Sta. 16+00.00 P.G. Elev. 947.71
Horizontal Dimensions
14¼"
131'-8¼" (Span No. 1)
132'-11⅜" (Span No. 2)
419'-10¾" (Span No. 3)
419'-10⅝" (Span No. 4)
133'-0⅜" (Span No. 5)
23⅝"
265'-9⅞" (Unit No. 1)
839'-9⅜" (Unit No. 2)
399'-1⅛" (Unit No. 3)
1907'-7¾" (Fill Face to Fill Face)

PLAN



LOCATION SKETCH

BM - ½" REBAR, 381.2' NE OF WEST ABUTMENT, 302.5' NE OF NE CORNER OF PIER 1, 297.8' NW OF CHISELED SQUARE ON THE SE CORNER OF PIER 2, 294' NE OF THE NORTH FACE OF NORTHERN MOST GRAIN SILO, ELEV. 898.51.

BM - ½" REBAR, 1118.6' SE OF WEST ABUTMENT, 1094.9' SE OF SE CORNER OF PIER 1, 1078.7' SE OF CHISELED SQUARE ON THE SE CORNER OF PIER 2, 1044.7' SE OF THE SOUTH FACE OF SOUTHERN MOST GRAIN SILO, ELEV. 891.91.

REPAIRS TO BRIDGE OVER THE MISSOURI RIVER

STATE ROAD FROM RTE. D TO NEBRASKA STATE LINE

ABOUT 1.7 MILES WEST OF RTE. D

STA. 4+92.43 (MATCH EXISTING)

1 REVISED

GENERAL ELEVATION AND PLAN

STATE OF MISSOURI
THADDEUS KOSMICKI
NUMBER PE-2008000074
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 10/2/2020	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 1
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
10/02/20	1 - REV. NOTE REVISED

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

Detailed June 2020
Checked June 2020

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

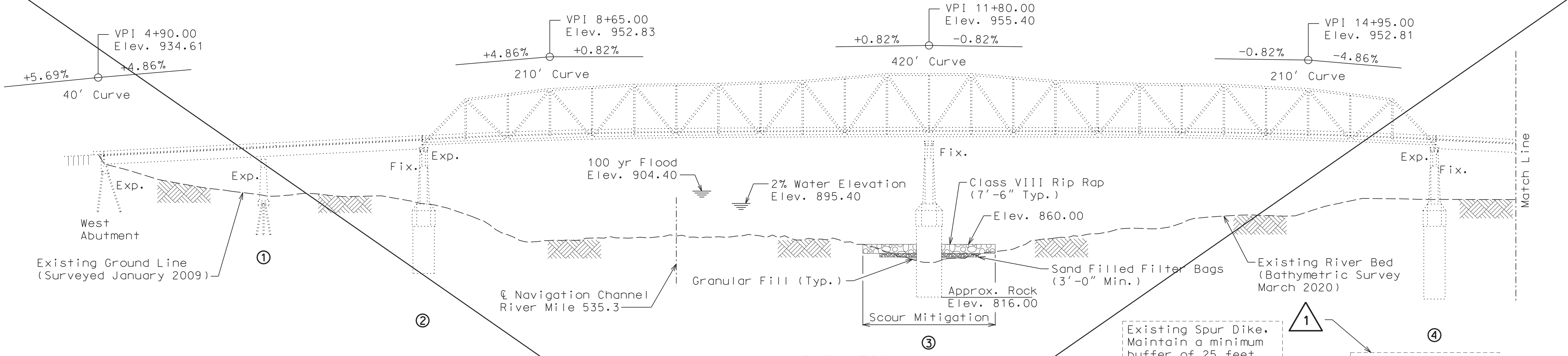
Sheet No. 1 of 19

STD. 616.10

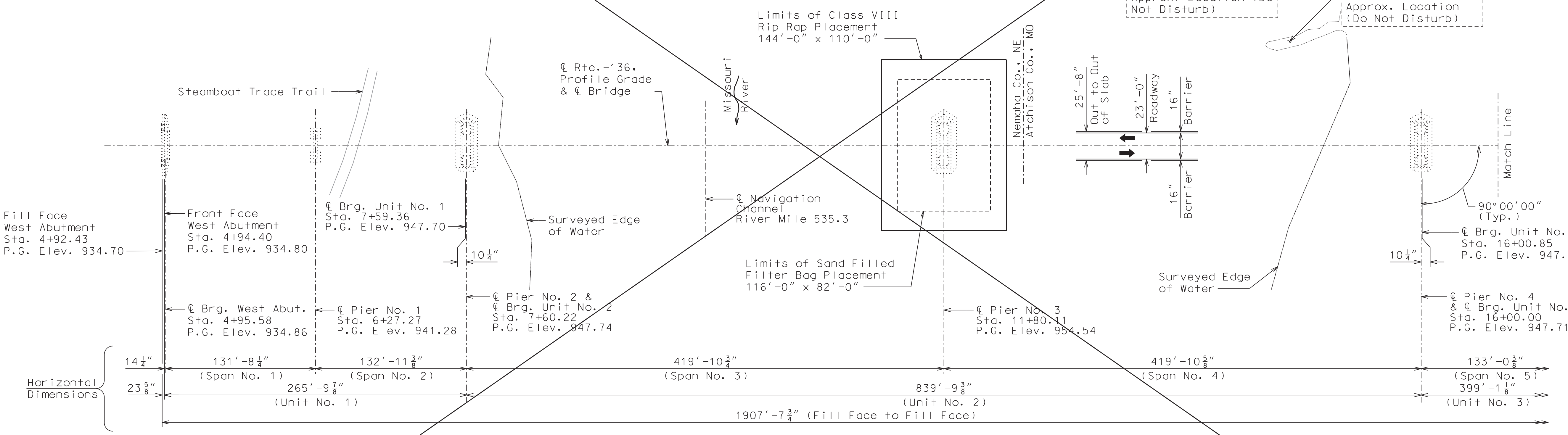
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

SCOUR MITIGATION OF EXISTING (133'-133') CONTINUOUS GIRDER SPANS (420'-420') CONTINUOUS THROUGH TRUSS SPANS (133'-133'-133')(133'-133'-133') CONTINUOUS GIRDER SPANS

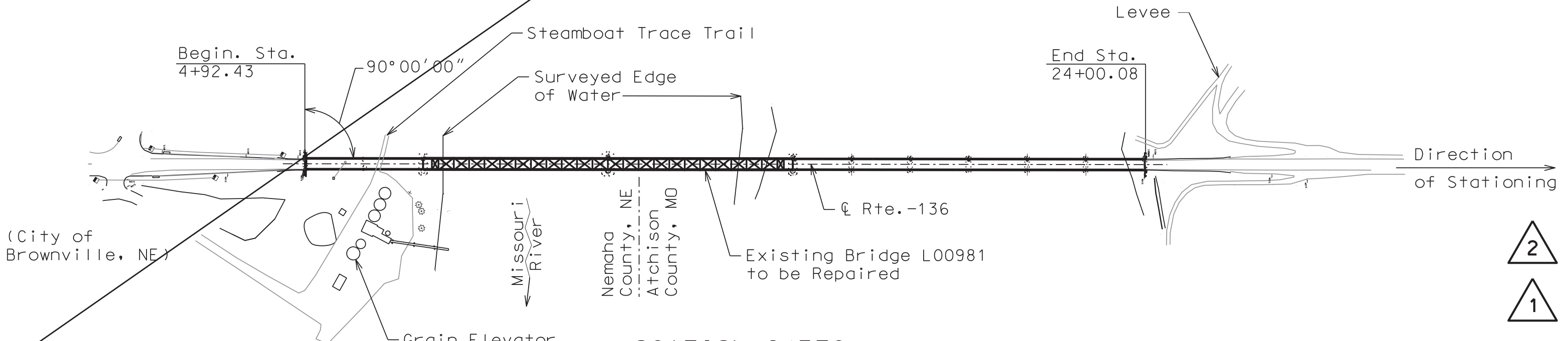
SEC/SUR 33	TWP 65N	RGE 42W


VPI 4+90.00
Elev. 934.61
+5.69%
+4.86%
40' Curve
VPI 8+65.00
Elev. 952.83
+4.86%
+0.82%
210' Curve
VPI 11+80.00
Elev. 955.40
+0.82%
-0.82%
420' Curve
VPI 14+95.00
Elev. 952.81
-0.82%
-4.86%
210' Curve
Exp.
Exp.
Fix.
Exp.
Fix.
Exp.
Fix.
West Abutment
100 yr Flood Elev. 904.40
2% Water Elevation Elev. 895.40
Class VIII Rip Rap (7'-6" Typ.)
Elev. 860.00
Existing Ground Line (Surveyed January 2009)
① ② ③ ④
℄ Navigation Channel River Mile 535.3
Granular Fill (Typ.)
Sand Filled Filter Bags (3'-0" Min.)
Approx. Rock Elev. 816.00
Scour Mitigation
Existing River Bed (Bathymetric Survey March 2020)
Match Line
1
Existing Spur Dike. Maintain a minimum buffer of 25 feet Approx. Location (Do Not Disturb)
Existing Spur Dike. Approx. Location (Do Not Disturb)

ELEVATION


Limits of Class VIII Rip Rap Placement 144'-0" x 110'-0"
℄ Rte.-136, Profile Grade & ℄ Bridge
Steamboat Trace Trail
Missouri River
Nemaha Co., NE
Atchison Co., MO
25'-8" Out to Out of Slab
23'-0" Roadway
16" Barrier
16" Barrier
Match Line
Fill Face West Abutment Sta. 4+92.43 P.G. Elev. 934.70
Front Face West Abutment Sta. 4+94.40 P.G. Elev. 934.80
℄ Brg. Unit No. 1 Sta. 7+59.36 P.G. Elev. 947.70
Surveyed Edge of Water
℄ Navigation Channel River Mile 535.3
90°00'00" (Typ.)
℄ Brg. Unit No. 3 Sta. 16+00.85 P.G. Elev. 947.67
10¼"
10¼"
Limits of Sand Filled Filter Bag Placement 116'-0" x 82'-0"
Surveyed Edge of Water
℄ Brg. West Abut. Sta. 4+95.58 P.G. Elev. 934.86
℄ Pier No. 1 Sta. 6+27.27 P.G. Elev. 941.28
℄ Pier No. 2 & ℄ Brg. Unit No. 2 Sta. 7+60.22 P.G. Elev. 947.74
℄ Pier No. 3 Sta. 11+80.11 P.G. Elev. 954.54
℄ Pier No. 4 & ℄ Brg. Unit No. 2 Sta. 16+00.00 P.G. Elev. 947.71
Horizontal Dimensions
14¼"
131'-8¼" (Span No. 1)
132'-11⅜" (Span No. 2)
419'-10¾" (Span No. 3)
419'-10⅝" (Span No. 4)
133'-0⅜" (Span No. 5)
23⅝"
265'-9⅞" (Unit No. 1)
839'-9⅜" (Unit No. 2)
399'-1⅛" (Unit No. 3)
1907'-7¾" (Fill Face to Fill Face)

PLAN



LOCATION SKETCH

BM - ½" REBAR, 381.2' NE OF WEST ABUTMENT, 302.5' NE OF NE CORNER OF PIER 1, 297.8' NW OF CHISELED SQUARE ON THE SE CORNER OF PIER 2, 294' NE OF THE NORTH FACE OF NORTHERN MOST GRAIN SILO, ELEV. 898.51.

BM - ½" REBAR, 1118.6' SE OF WEST ABUTMENT, 1094.9' SE OF SE CORNER OF PIER 1, 1078.7' SE OF CHISELED SQUARE ON THE SE CORNER OF PIER 2, 1044.7' SE OF THE SOUTH FACE OF SOUTHERN MOST GRAIN SILO, ELEV. 891.91.

2 SHEET DELETED

1 REVISED

REPAIRS TO BRIDGE OVER THE MISSOURI RIVER

STATE ROAD FROM RTE. D TO NEBRASKA STATE LINE

ABOUT 1.7 MILES WEST OF RTE. D

STA. 4+92.43 (MATCH EXISTING)

GENERAL ELEVATION AND PLAN

Detailed June 2020
Checked June 2020

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

Sheet No. 1 of 19

STD. 616.10

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 1
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
10/02/20	1 - REV. NOTE REVISED
08/06/21	2 - SHEET DELETED

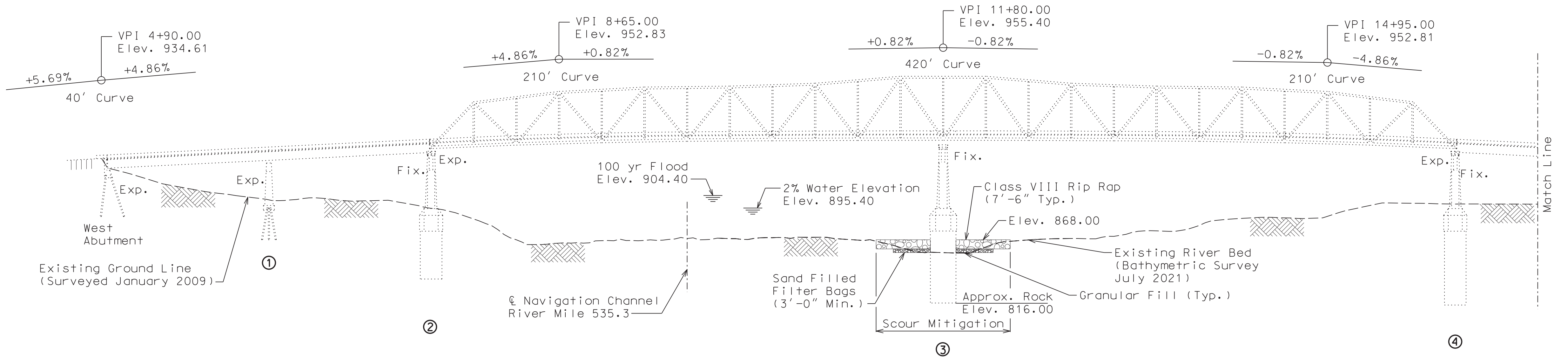
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

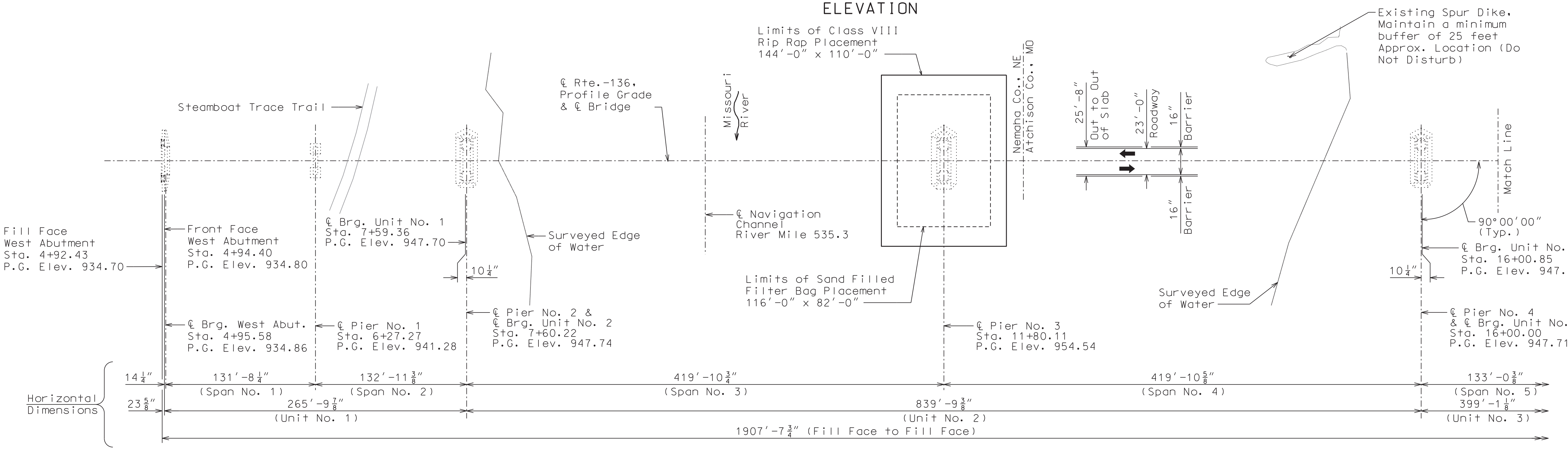
SEC/SUR 33	TWP 65N	RGE 42W

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

SCOUR MITIGATION OF EXISTING (133'-133') CONTINUOUS GIRDER SPANS (420'-420') CONTINUOUS THROUGH TRUSS SPANS (133'-133'-133')(133'-133'-133') CONTINUOUS GIRDER SPANS

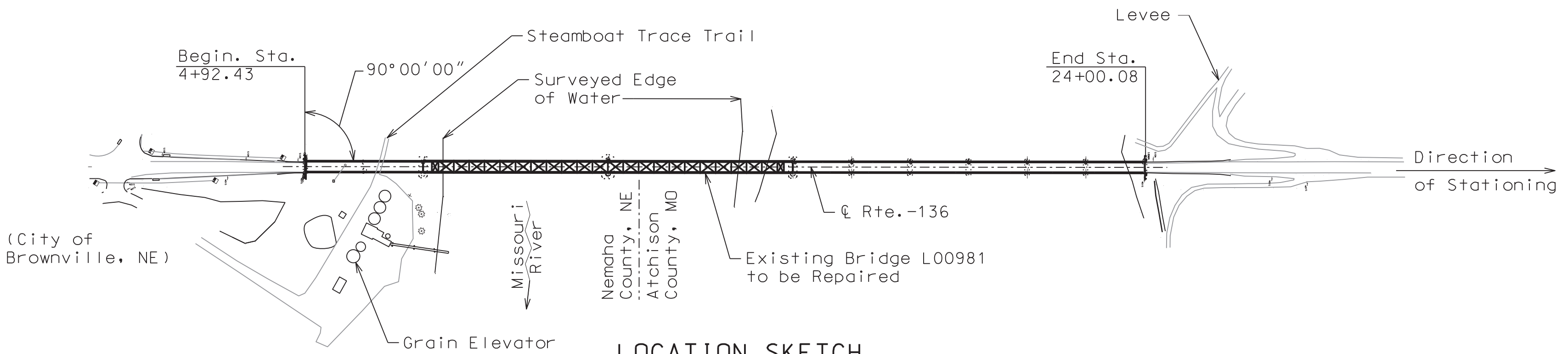


ELEVATION



Limits of Class VIII Rip Rap Placement 144'-0" x 110'-0"
Existing Spur Dike, Maintain a minimum buffer of 25 feet Approx. Location (Do Not Disturb)
Steamboat Trace Trail
℄ Rte.-136, Profile Grade & ℄ Bridge
Missouri River
Nemaha Co., NE
Atchison Co., MO
25'-8" Out to Out of Slab
23'-0" Roadway
16" Barrier
16" Barrier
Match Line
Fill Face West Abutment Sta. 4+92.43 P.G. Elev. 934.70
Front Face West Abutment Sta. 4+94.40 P.G. Elev. 934.80
℄ Brg. Unit No. 1 Sta. 7+59.36 P.G. Elev. 947.70
Surveyed Edge of Water
℄ Navigation Channel River Mile 535.3
90°00'00" (Typ.)
℄ Brg. Unit No. 3 Sta. 16+00.85 P.G. Elev. 947.67
10¼"
10¼"
Limits of Sand Filled Filter Bag Placement 116'-0" x 82'-0"
Surveyed Edge of Water
℄ Brg. West Abut. Sta. 4+95.58 P.G. Elev. 934.86
℄ Pier No. 1 Sta. 6+27.27 P.G. Elev. 941.28
℄ Pier No. 2 & ℄ Brg. Unit No. 2 Sta. 7+60.22 P.G. Elev. 947.74
℄ Pier No. 3 Sta. 11+80.11 P.G. Elev. 954.54
℄ Pier No. 4 & ℄ Brg. Unit No. 2 Sta. 16+00.00 P.G. Elev. 947.71
Horizontal Dimensions
14¼"
131'-8¼" (Span No. 1)
132'-11⅜" (Span No. 2)
419'-10¾" (Span No. 3)
419'-10⅝" (Span No. 4)
133'-0⅜" (Span No. 5)
23⅝"
265'-9⅞" (Unit No. 1)
839'-9⅜" (Unit No. 2)
399'-1⅛" (Unit No. 3)
1907'-7¾" (Fill Face to Fill Face)

PLAN



LOCATION SKETCH

BM -½" REBAR, 381.2' NE OF WEST ABUTMENT, 302.5' NE OF NE CORNER OF PIER 1, 297.8' NW OF CHISELED SQUARE ON THE SE CORNER OF PIER 2, 294' NE OF THE NORTH FACE OF NORTHERN MOST GRAIN SILO, ELEV. 898.55.

BM -½" REBAR, 1118.6' SE OF WEST ABUTMENT, 1094.9' SE OF SE CORNER OF PIER 1, 1078.7' SE OF CHISELED SQUARE ON THE SE CORNER OF PIER 2, 1044.7' SE OF THE SOUTH FACE OF SOUTHERN MOST GRAIN SILO, ELEV. 891.91.

REPAIRS TO BRIDGE OVER THE MISSOURI RIVER

STATE ROAD FROM RTE. D TO NEBRASKA STATE LINE

ABOUT 1.7 MILES WEST OF RTE. D

STA. 4+92.43 (MATCH EXISTING)

GENERAL ELEVATION AND PLAN

Detailed August 2021
Checked August 2021

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

Sheet No. 1A of 19

⚠1 SHEET ADDED

STD. 616.10

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 1A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED, REVISED ELEVATIONS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 0000856

ESTIMATED QUANTITIES

Item	Unit	Substr.	Superstr.	Total
Underwater Excavation	CY			2,489
Class VIII Rip Rap	CY	3,103	△1	4,208
Granular Fill Material	CY			190
Sand Filled Filter Bags	CY	96	△1	980
Water Transportation for the Engineer	LS			1
Hydrographic Survey	LS			1

GENERAL NOTES:

SCOUR MITIGATION:

Limits of Granular Fill, Filter Bags and Rip Rap are shown on sheets 4 thru 19.

Temporary Traffic Control Devices for Waterways shall be in accordance with Missouri Standard Plans 616.10.

The contractor shall provide adequate means and methods to place sand filled bags and rip rap in between and round the existing caisson and ice breaker piling.

Variations of the actual river bed surface to the surface shown in these plans may be encountered. The contractor shall fill the river bottom to elevation 849.50 at the bottom of the designed filter with either additional sand filled bags or granular fill material, see Job Special Provisions.

△1

Variations of the actual river bed surface to the surface shown in these plans may be encountered. The contractor shall fill the river bottom to elevation 857.50 at the bottom of the designed filter with either additional sand filled bags or granular fill material, see Job Special Provisions.

See Job Special Provisions for material specifications and construction requirements.

MISCELLANEOUS:

Traffic over structure to be maintained during construction.

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

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

All existing dimensions shown were taken from as-built drawings or limited field measurements.

UTILITIES:

Contractor to locate, and where necessary, coordinate the protection of all utilities prior to commencing construction activities.

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 3
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - REVISED QUANTITIES

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

Detailed August 2021
Checked August 2021

GENERAL NOTES AND SUMMARY OF QUANTITIES

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

Sheet No. 3 of 19

△1 REVISED SHEET

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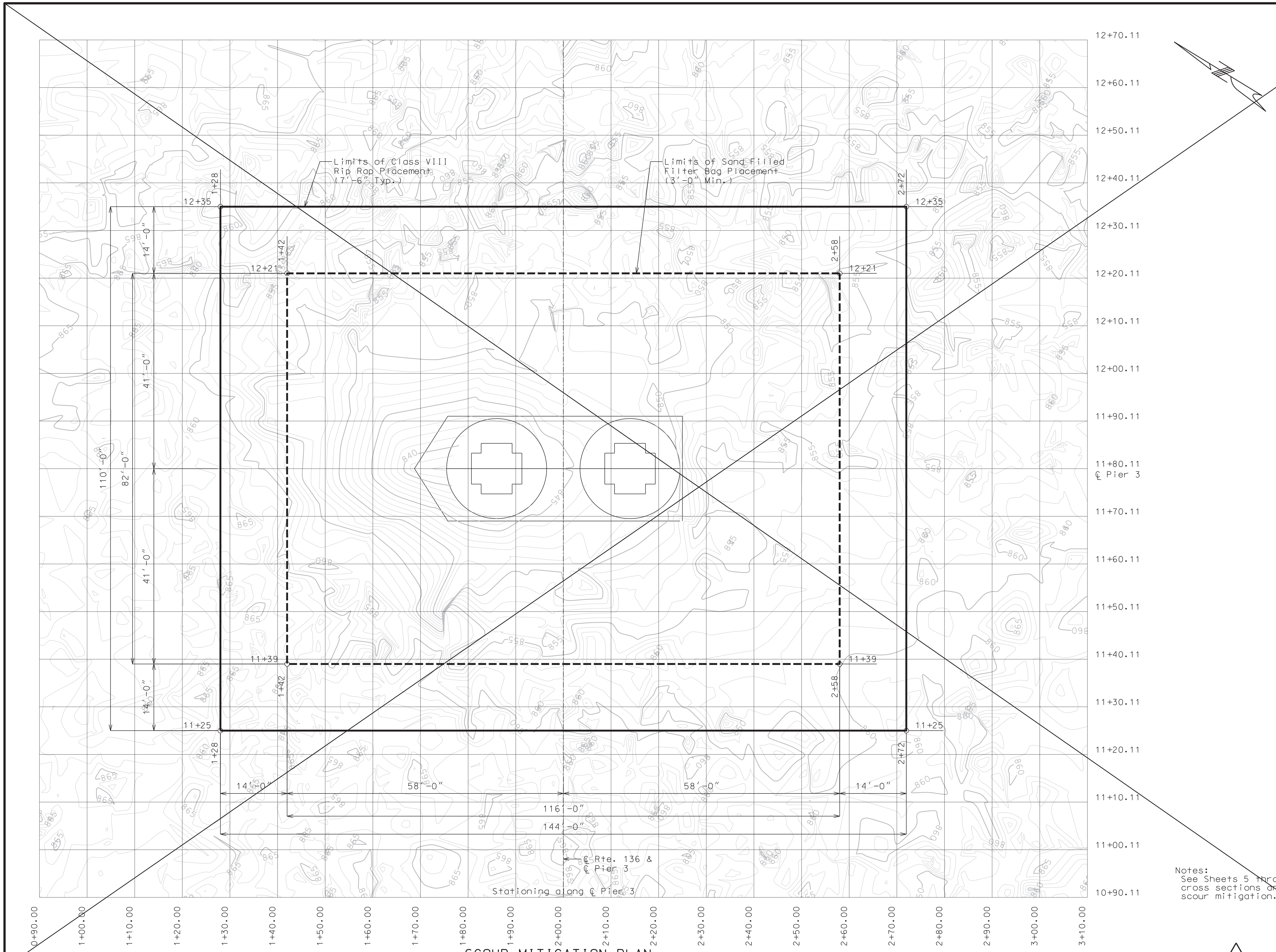

Notes:
See Sheets 5 through 19 for cross sections and details of scour mitigation.

SCOUR MITIGATION PLAN

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

Detailed June 2020
Checked June 2020

Sheet No. 4 of 19

1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 4
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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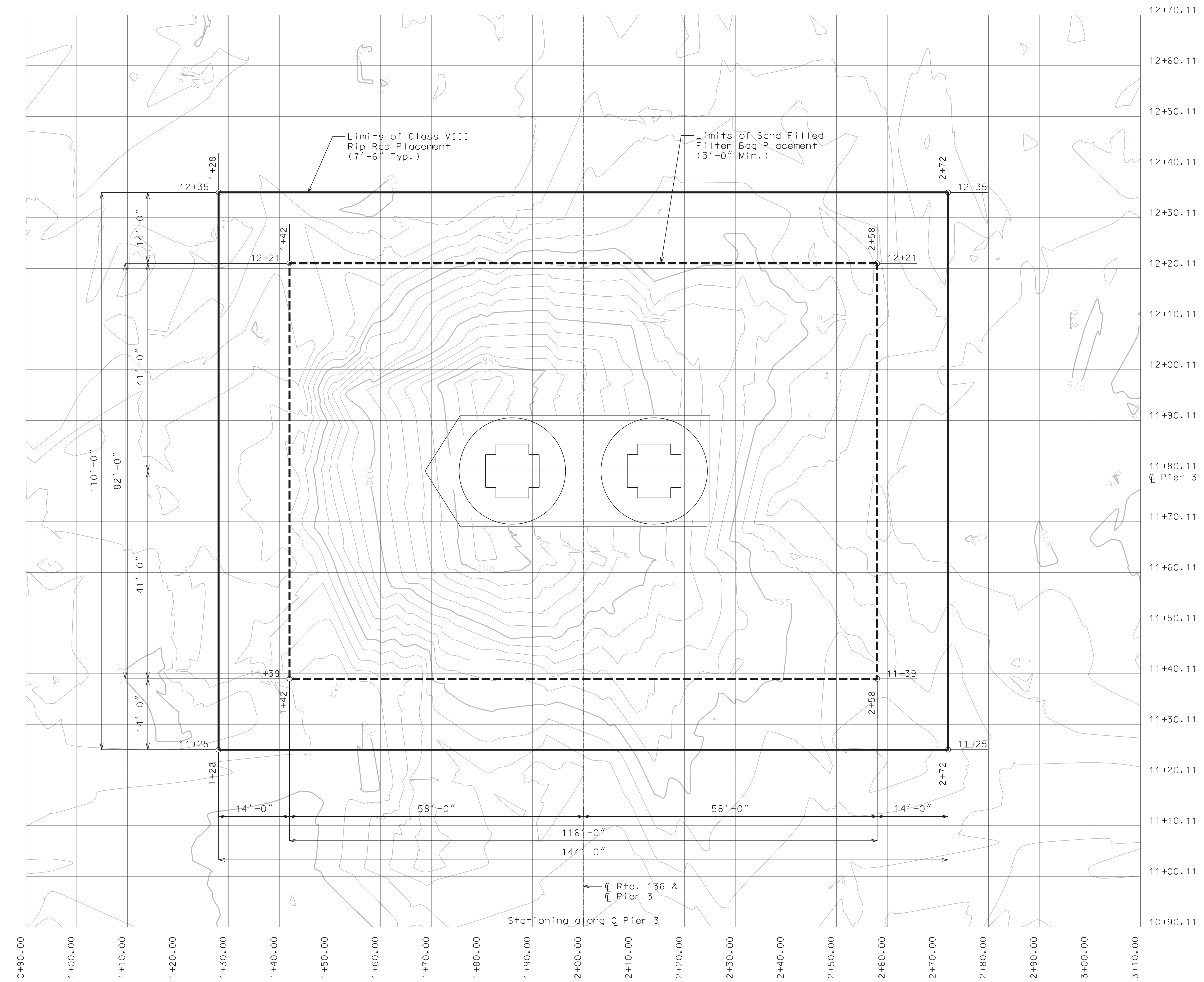


SCOUR MITIGATION PLAN

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

Notes:
See Sheets 5A through 19A for cross sections and details of scour mitigation.

Detailed August 2021
Checked August 2021

Sheet No. 4A of 19

1 SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 4A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED CONTOURS

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

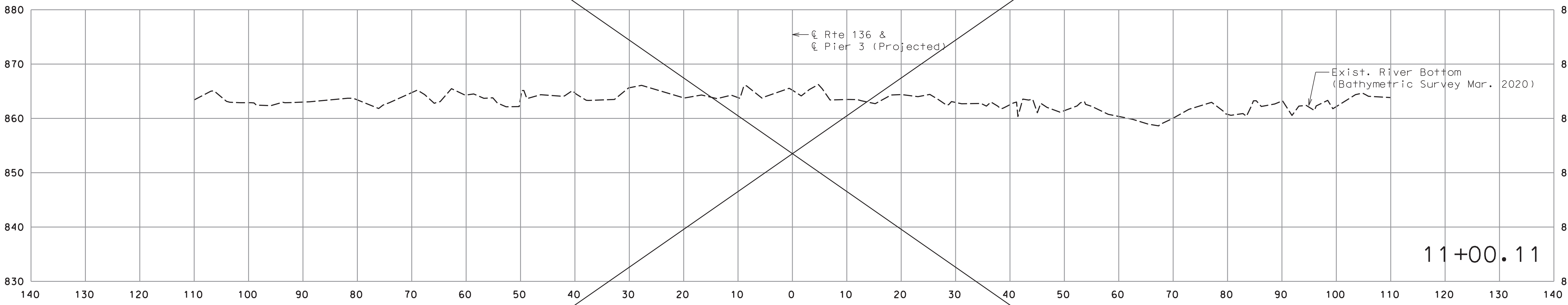
DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 5
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

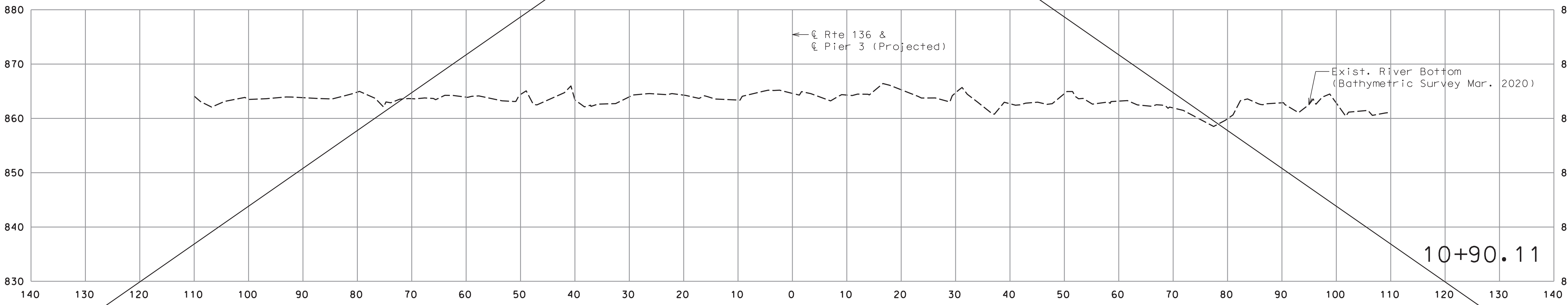
DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856





SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 5 of 19

△1 SHEET DELETED

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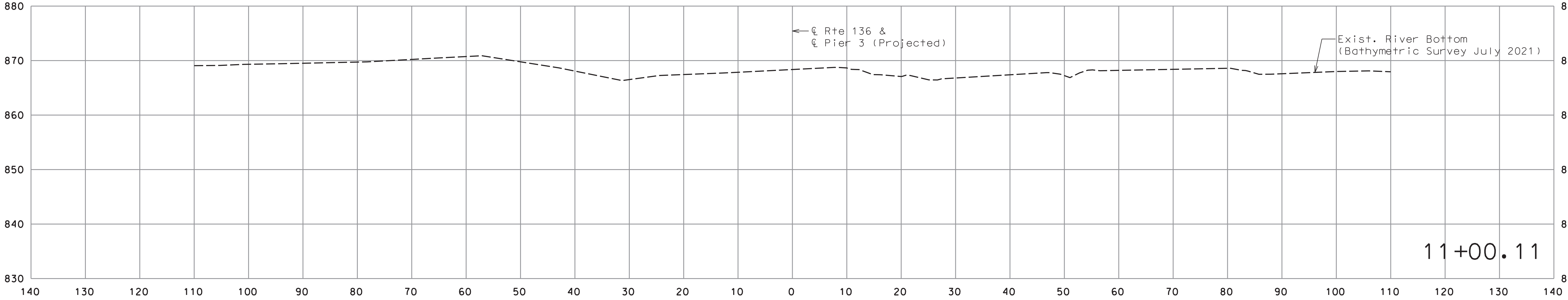
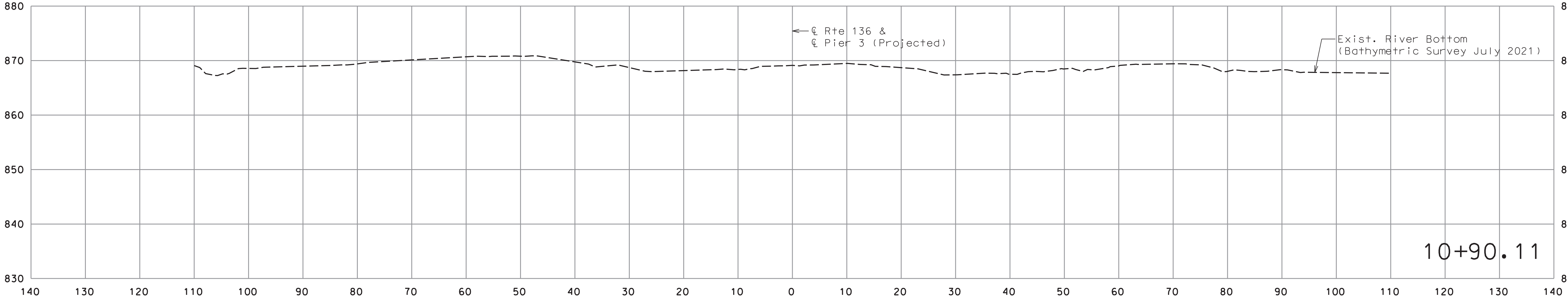




SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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

Sheet No. 5A of 19

1 SHEET ADDED

STATE OF MISSOURI
THADDEUS KOSMICKI
NUMBER
PE-2008000074
PROFESSIONAL ENGINEER

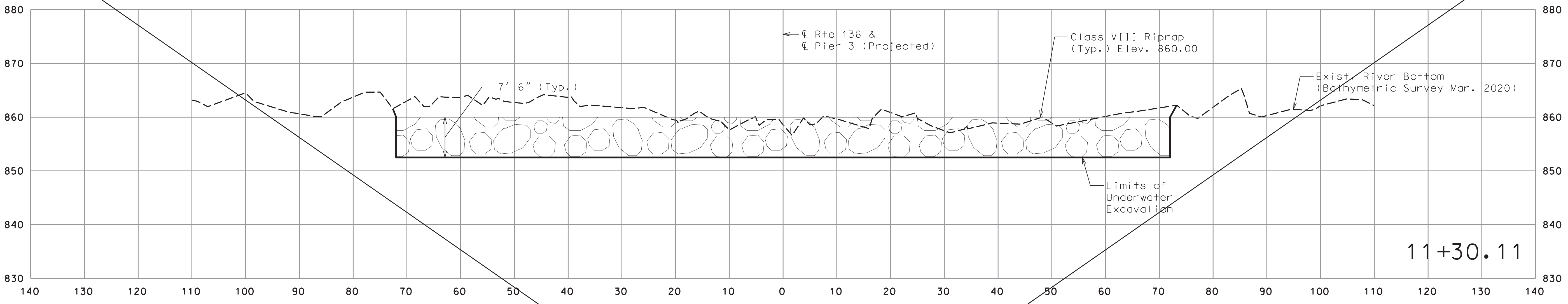
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 5A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

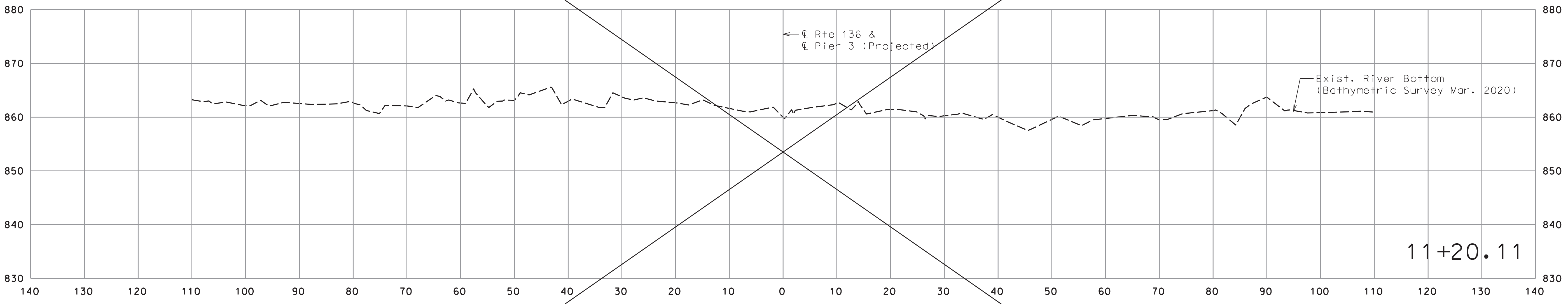
DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

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

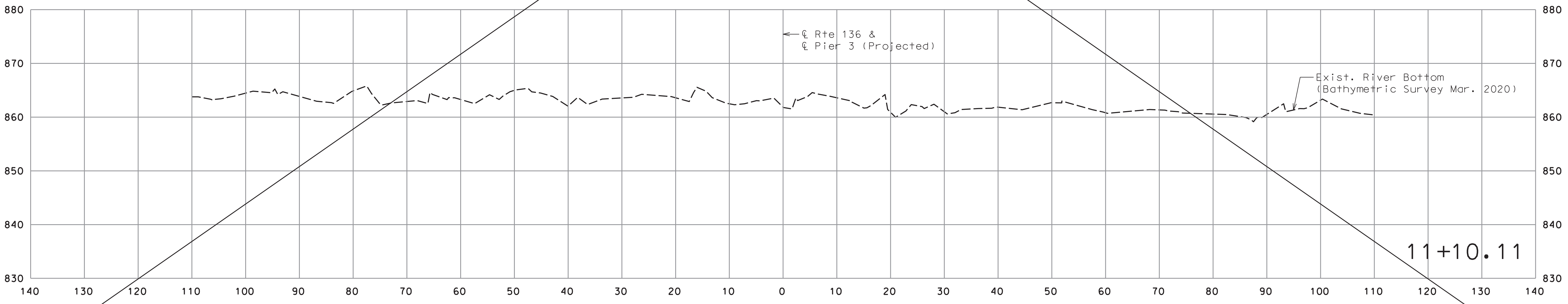
HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856



11+30.11



11+20.11



11+10.11

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 6 of 19

1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

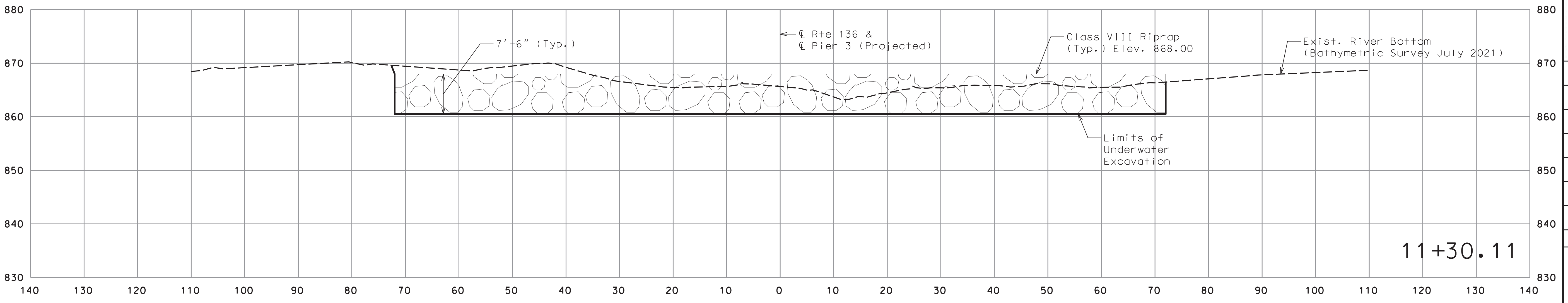
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

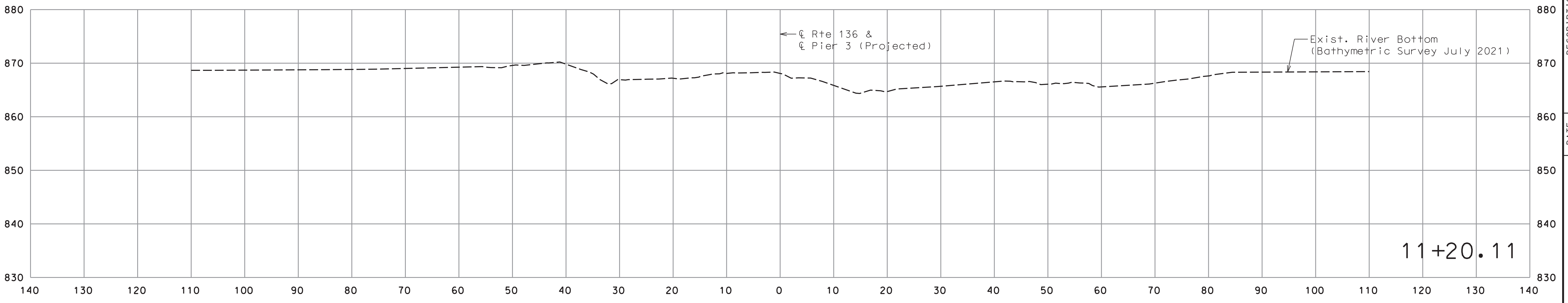
DATE PREPARED	8/6/2021
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	6
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

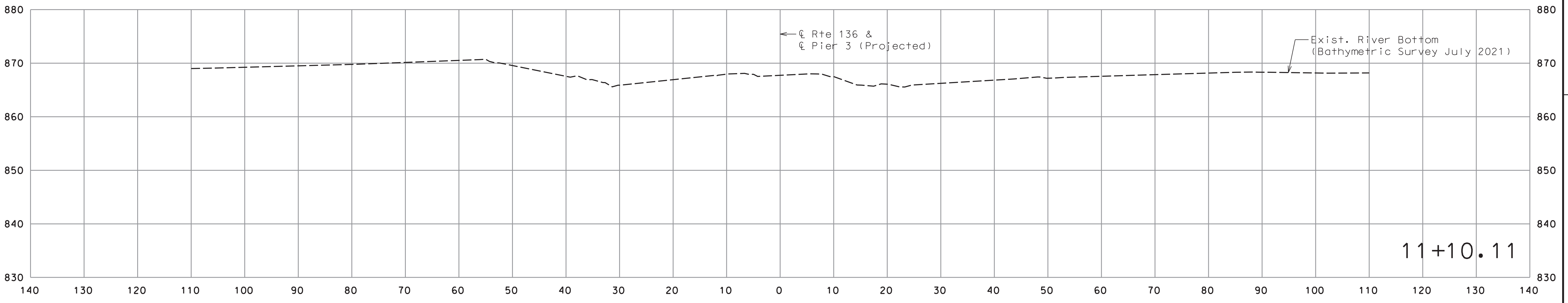
DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856







SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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

Sheet No. 6A of 19

△1 SHEET ADDED

THADDEUS KOSMICKI
PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 6A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS.

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

HDR Engineering, Inc.
10450 Holmes Road
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816-360-2700
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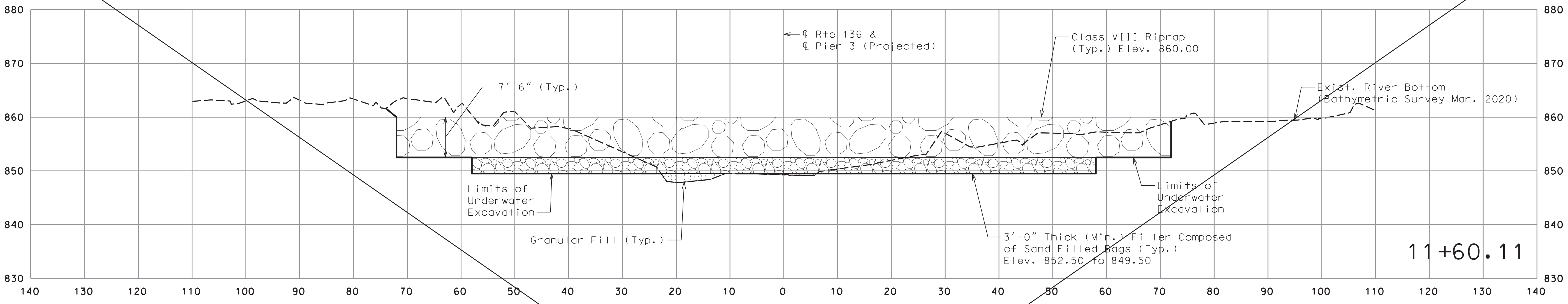

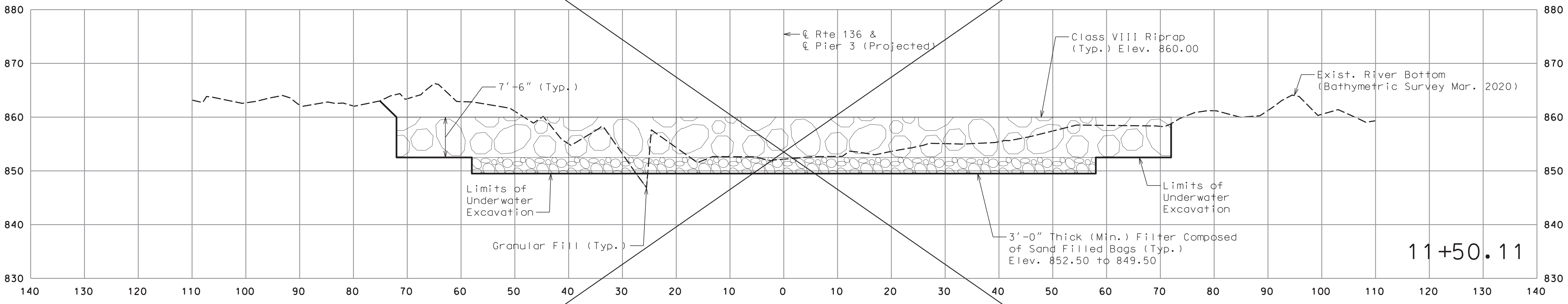

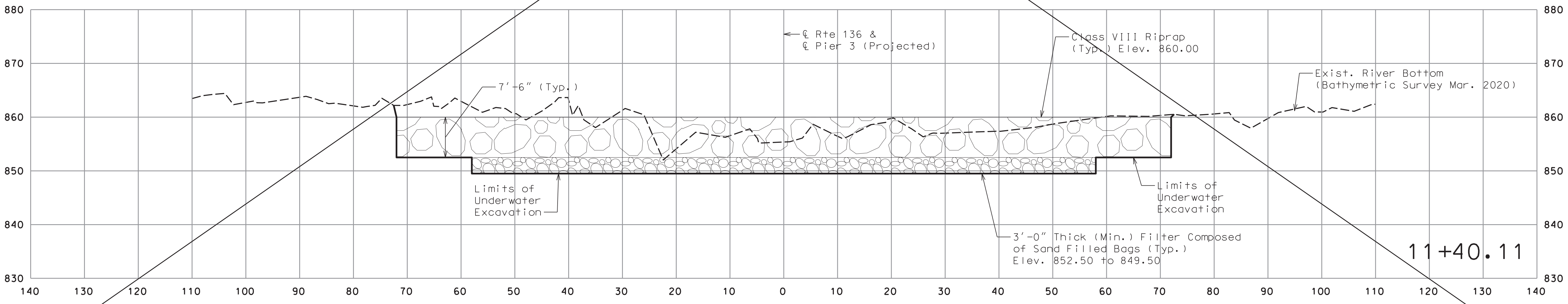

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 7 of 19

1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 7
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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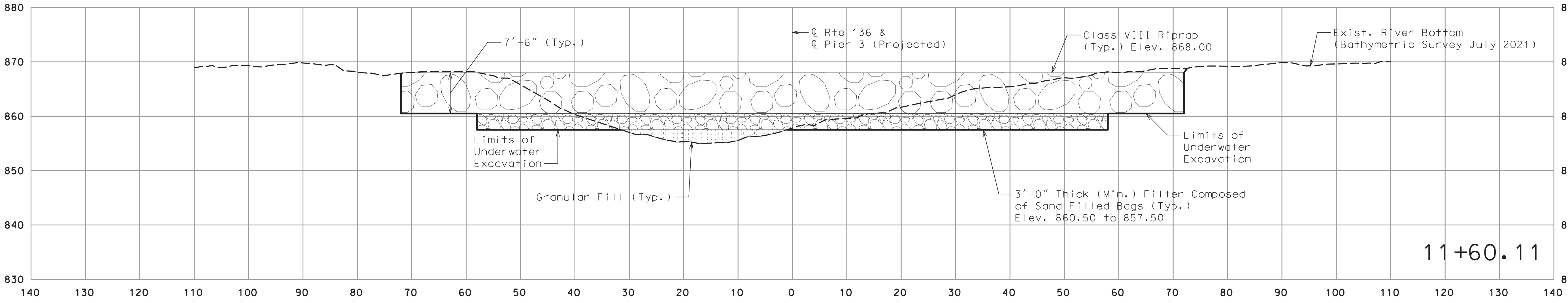
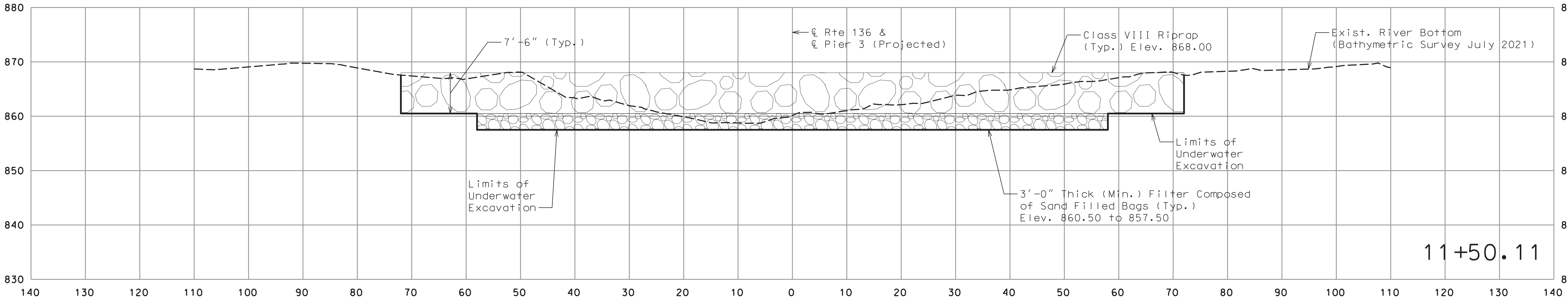
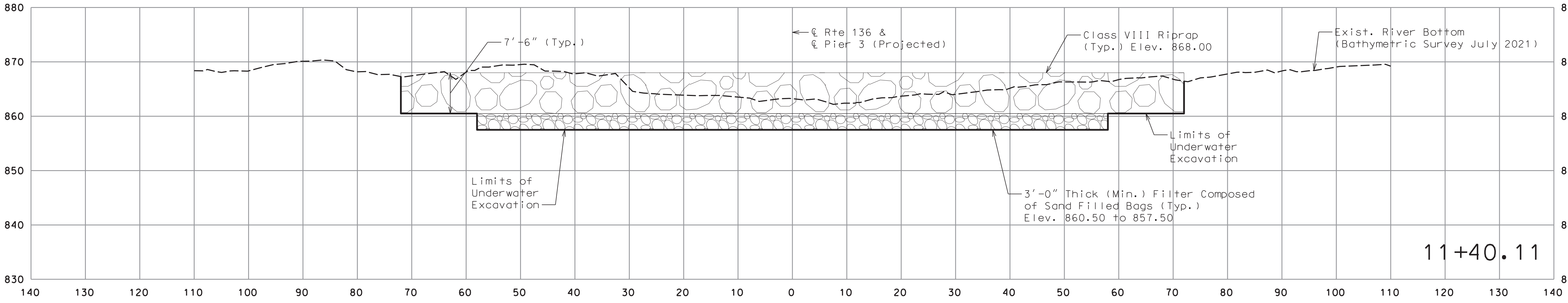






SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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

Sheet No. 7A of 19

1 SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

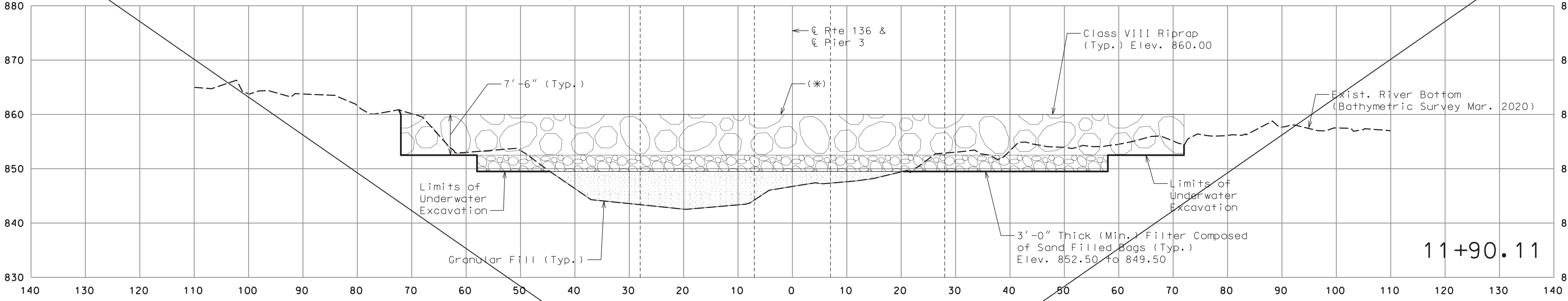
DATE PREPARED	8/6/2021
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 7A
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

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

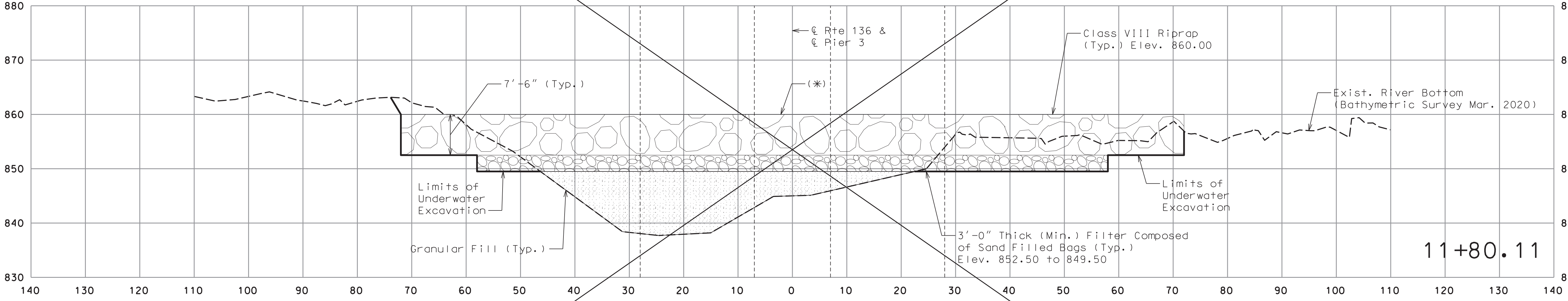
HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

(✱) Contractor shall fill the area between the existing caissons. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.



880
870
860
850
840
830
℄ Rte 136 &
℄ Pier 3
Class VIII Riprap (Typ.) Elev. 860.00
7'-6" (Typ.)
(✱)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Granular Fill (Typ.)
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

11+90.11



880
870
860
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℄ Rte 136 &
℄ Pier 3
Class VIII Riprap (Typ.) Elev. 860.00
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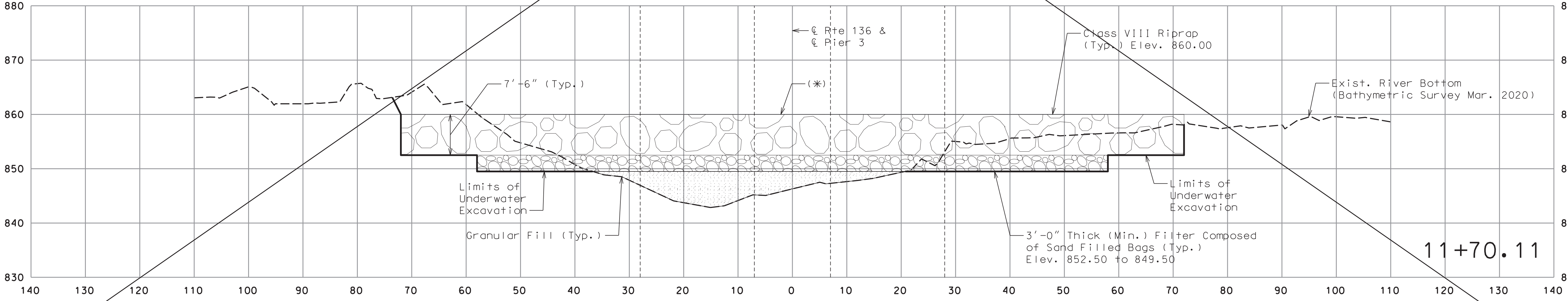
Granular Fill (Typ.)
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

11+80.11



880
870
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830
℄ Rte 136 &
℄ Pier 3
Class VIII Riprap (Typ.) Elev. 860.00
7'-6" (Typ.)
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3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Granular Fill (Typ.)
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

11+70.11

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 8 of 19

⚠1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 8
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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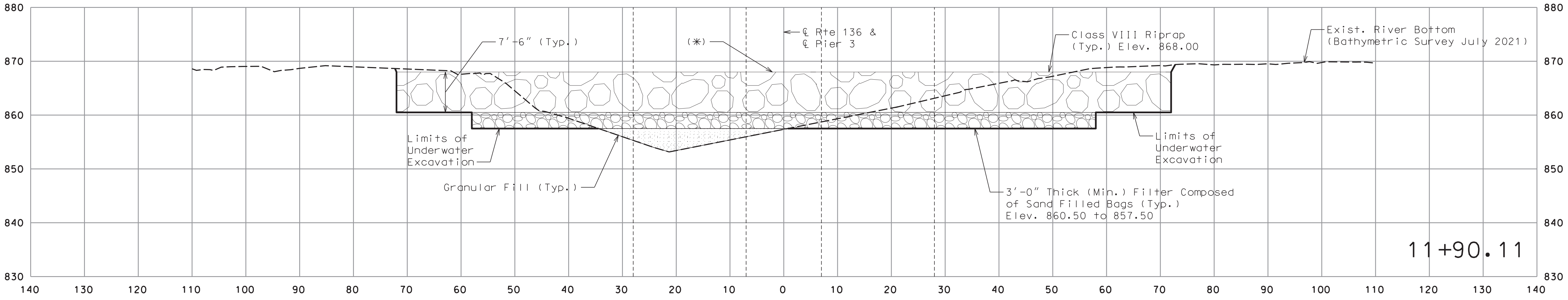
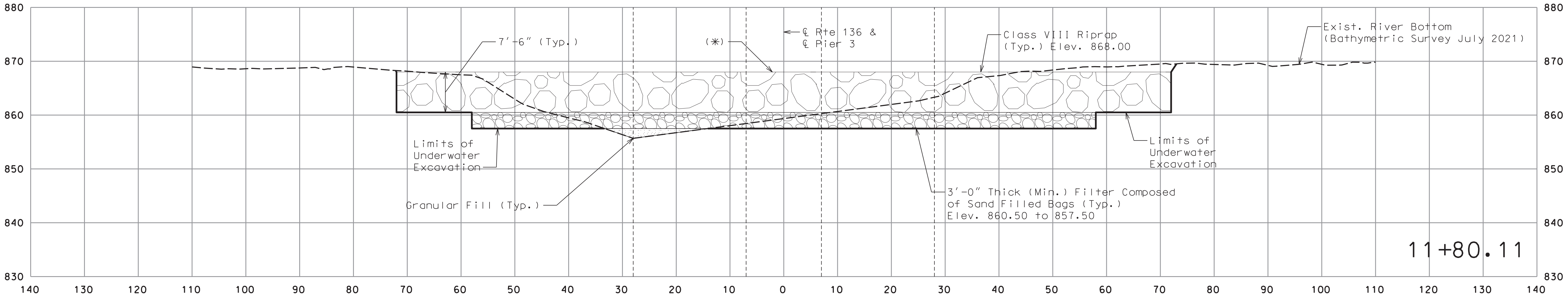
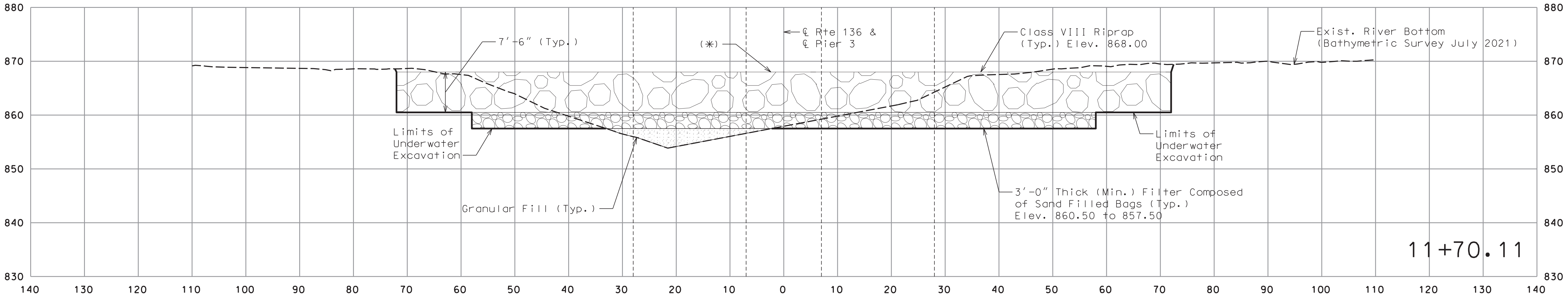
(✳) Contractor shall fill the area between the existing caissons. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.







SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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

Sheet No. 8A of 19

△1 SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 8A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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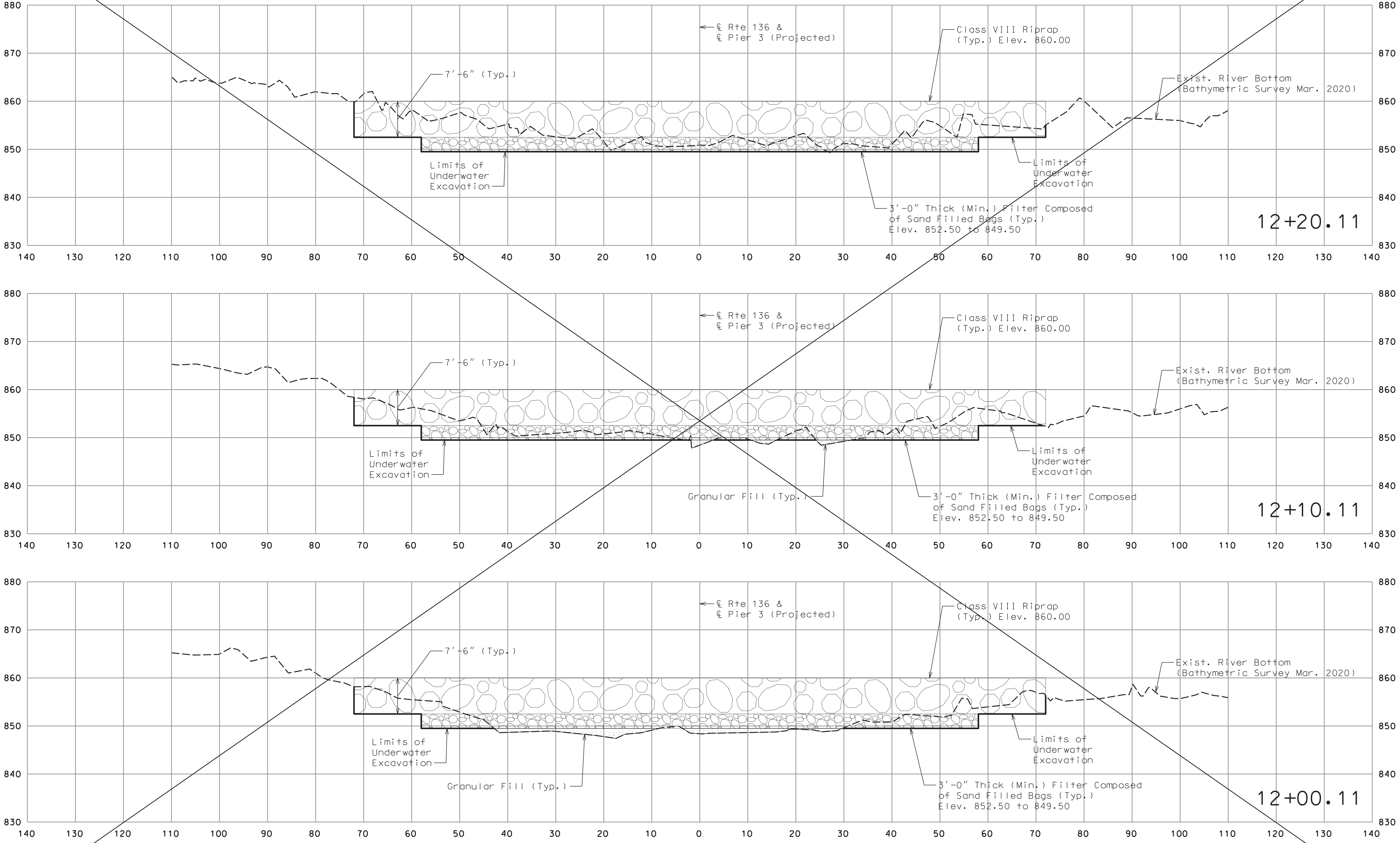

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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Sheet No. 9 of 19

① SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 9
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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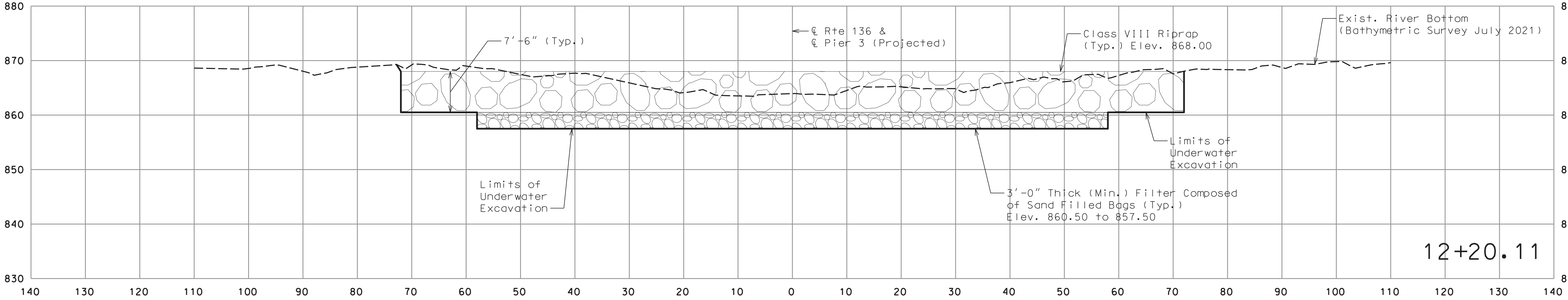

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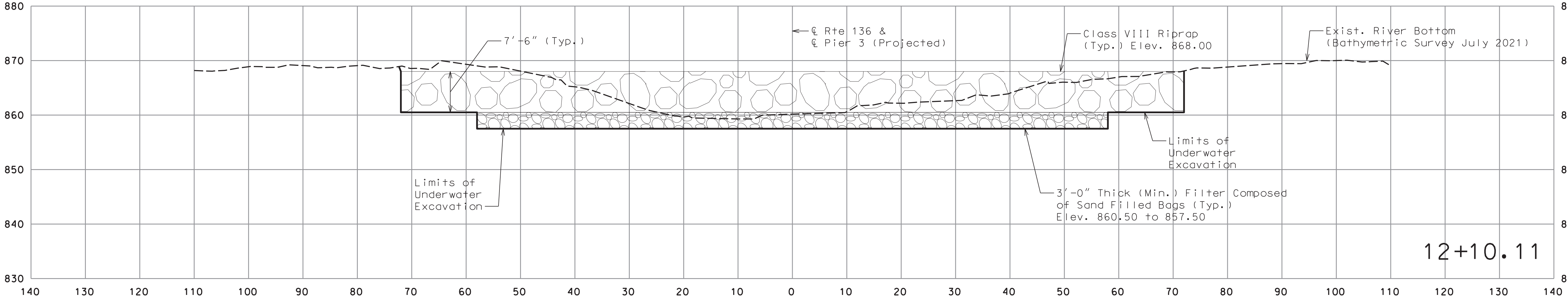

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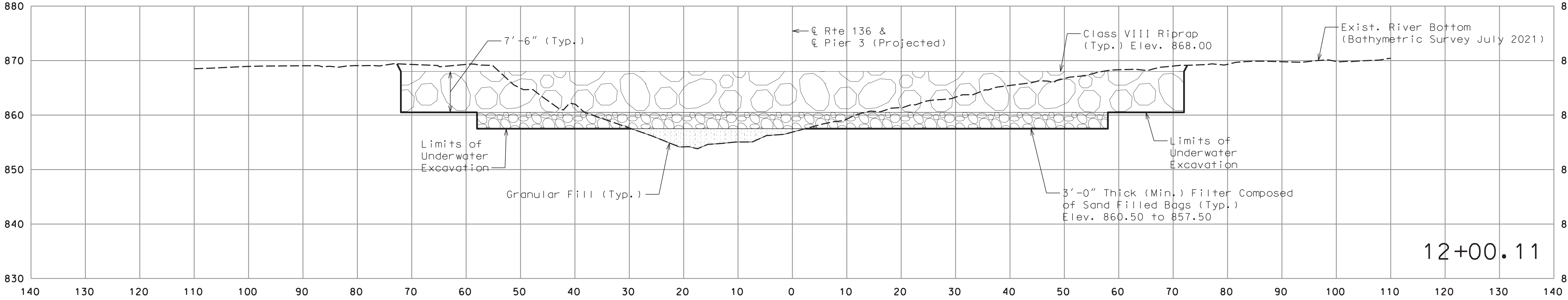

12+00.11

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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Sheet No. 9A of 19

(1) SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED	8/6/2021
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	9A
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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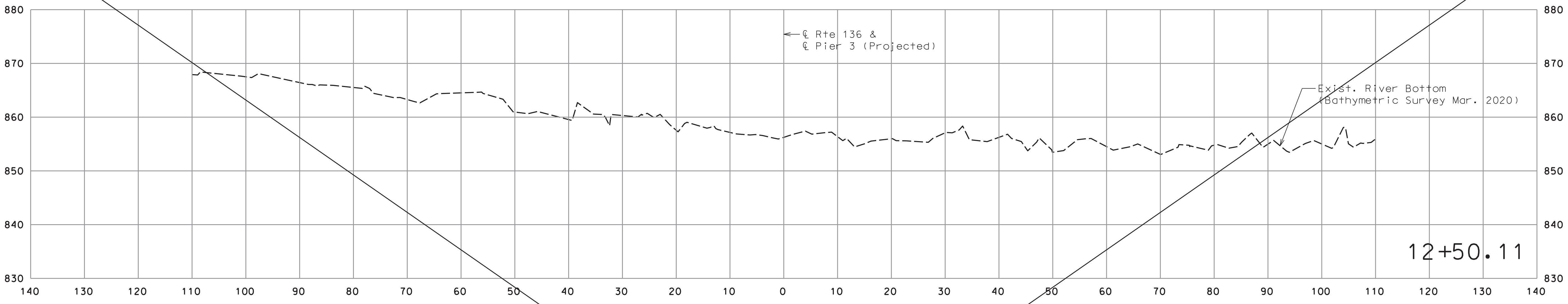

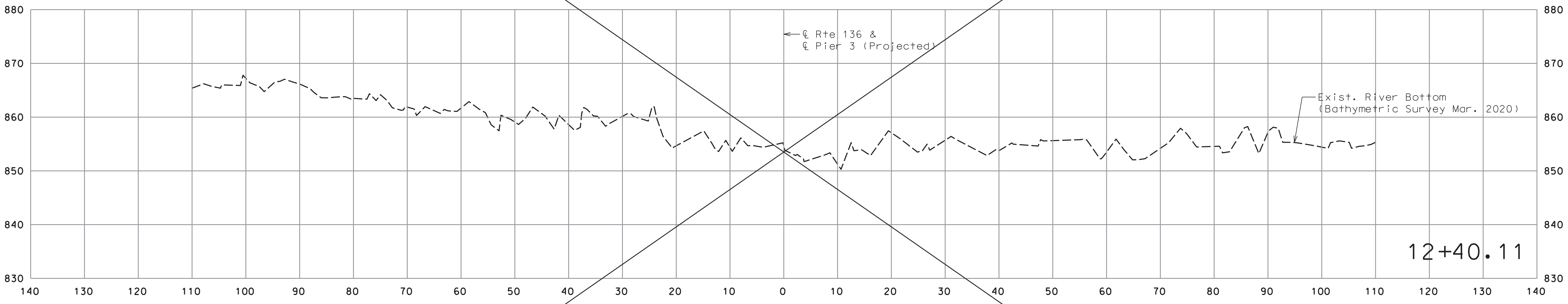

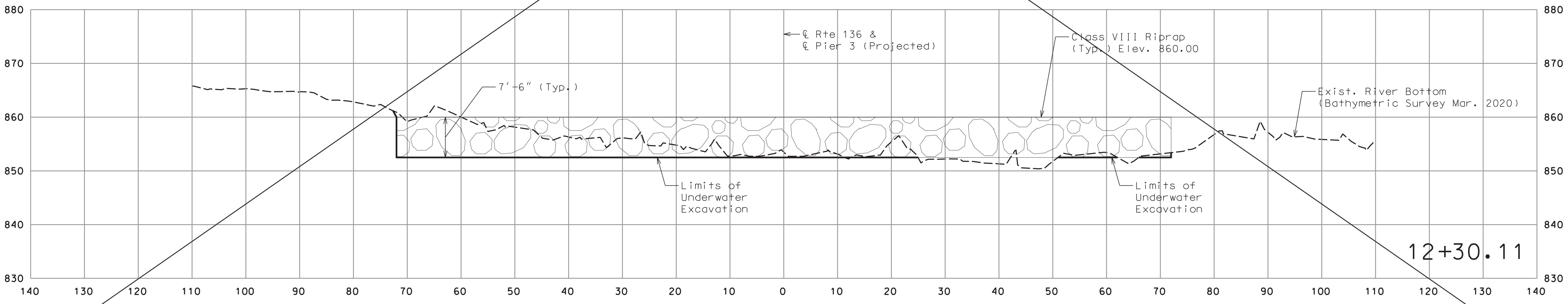

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 10 of 19

(1) SHEET DELETED

THADDEUS KOSMICKI
NUMBER
PE-2008000074

THIS SHEET HAS BEEN
SIGNED, SEALED AND DATED
ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 10
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION
105 WEST CAPITOL
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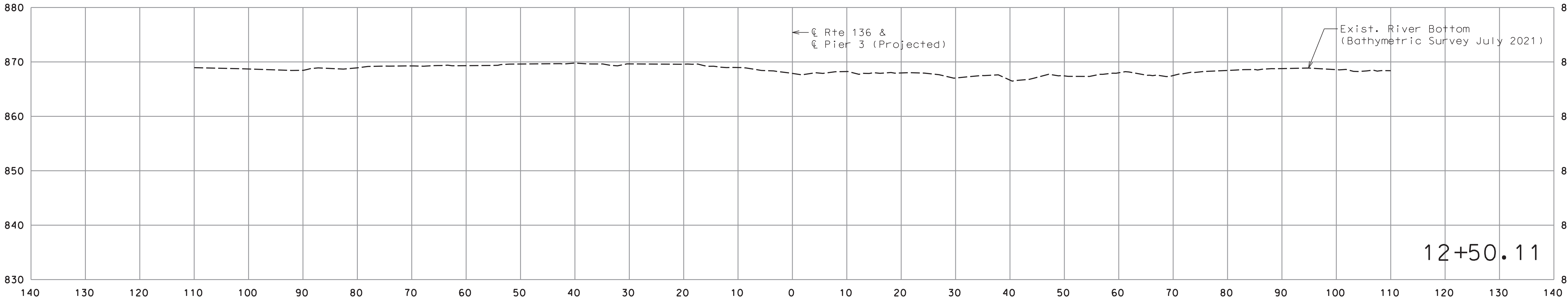

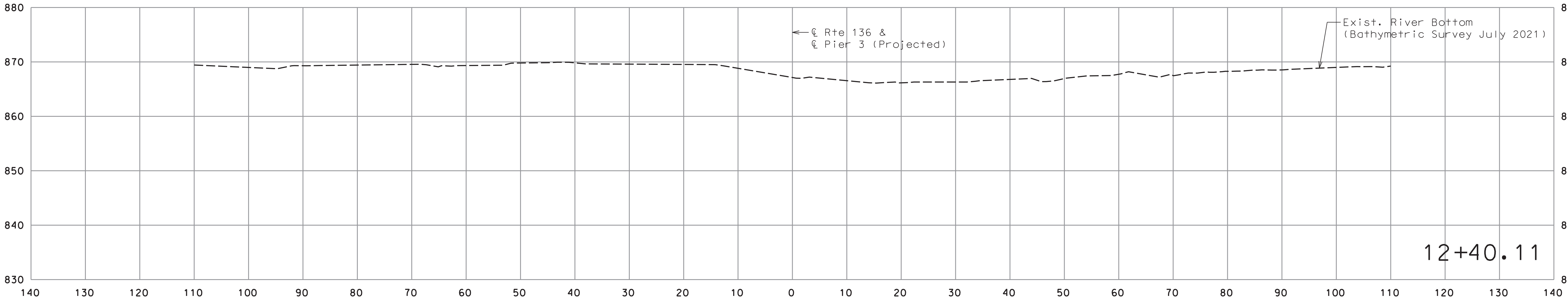

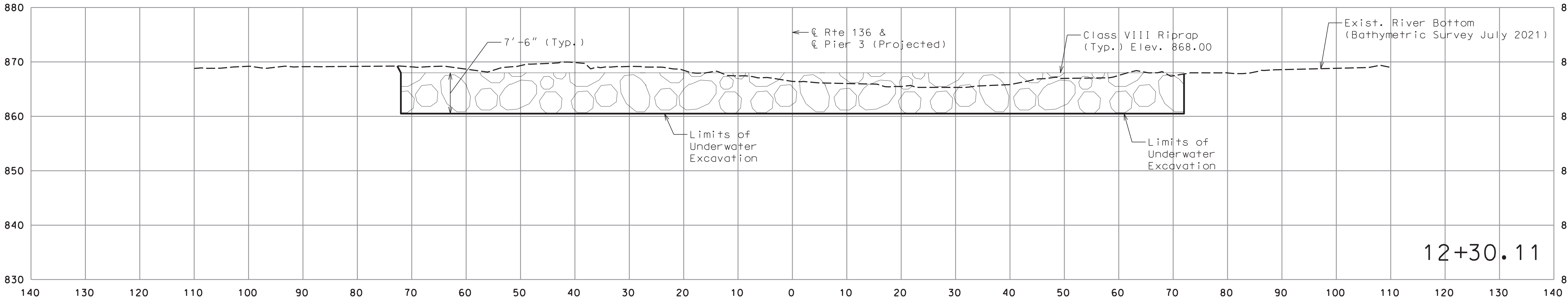

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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Sheet No. 10A of 19

(1) SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 10A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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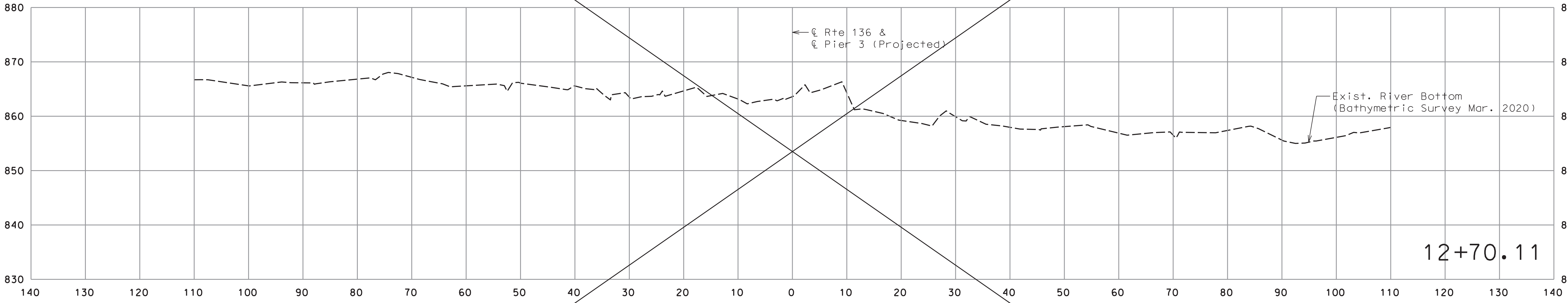

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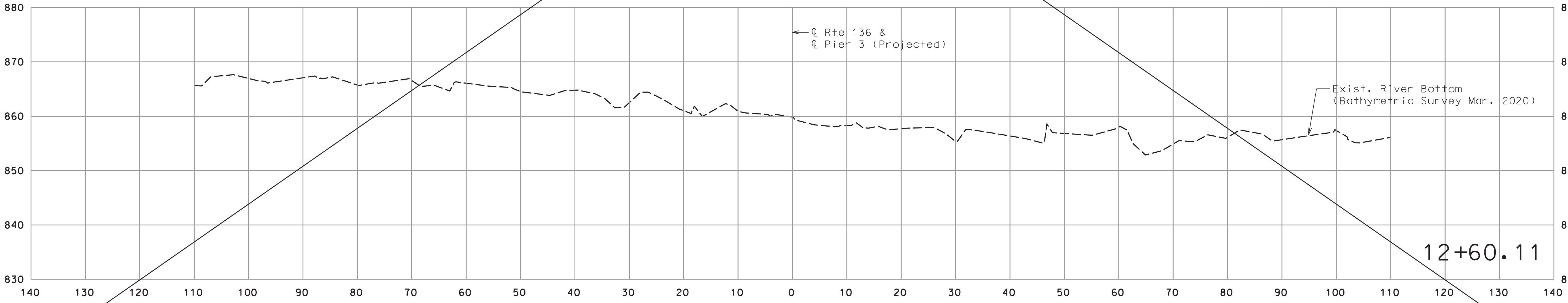

12+60.11

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 11 of 19

1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 11
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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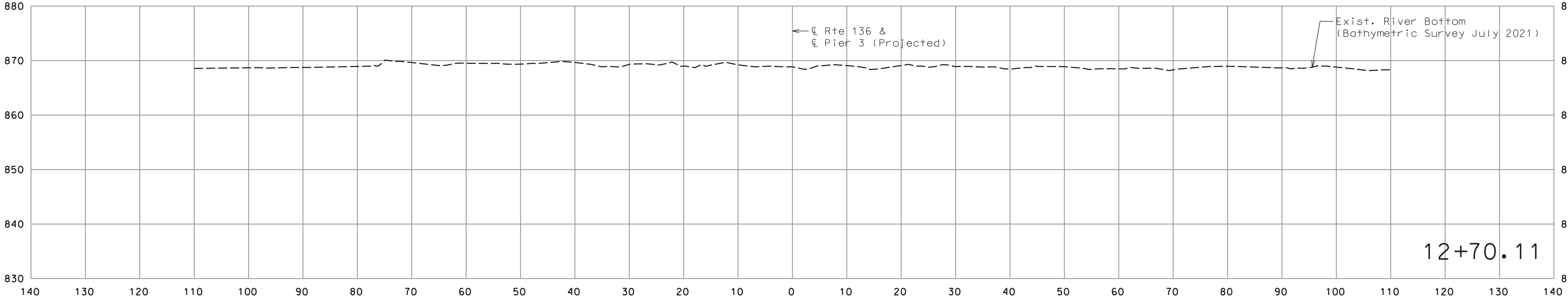

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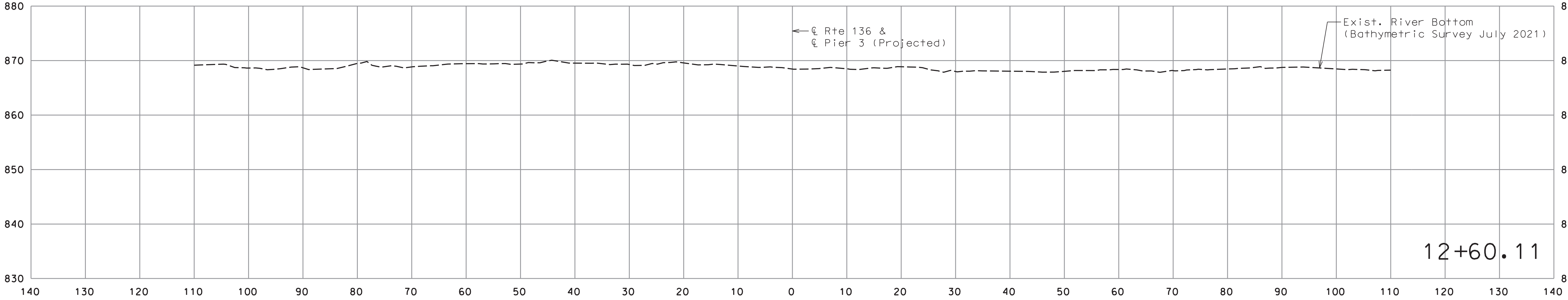

12+60.11

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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Sheet No. 11A of 19

1 SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 11A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

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

HDR Engineering, Inc.
10450 Holmes Road
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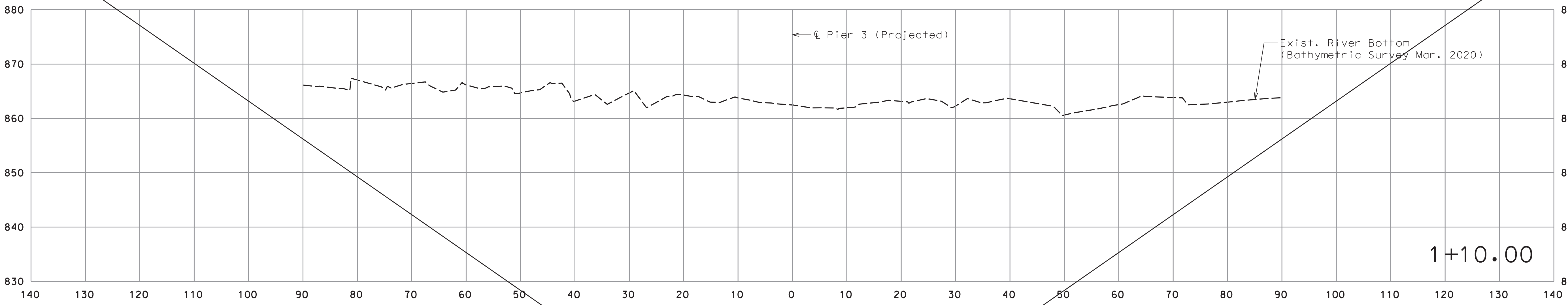

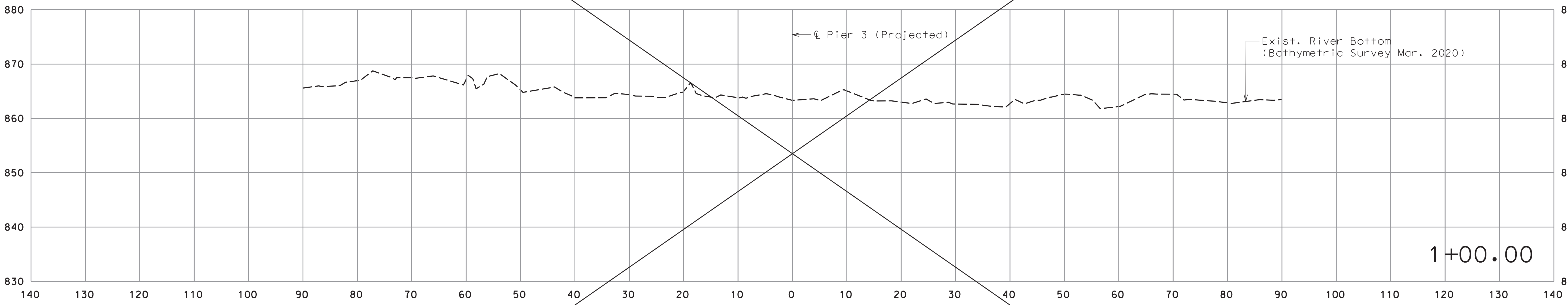

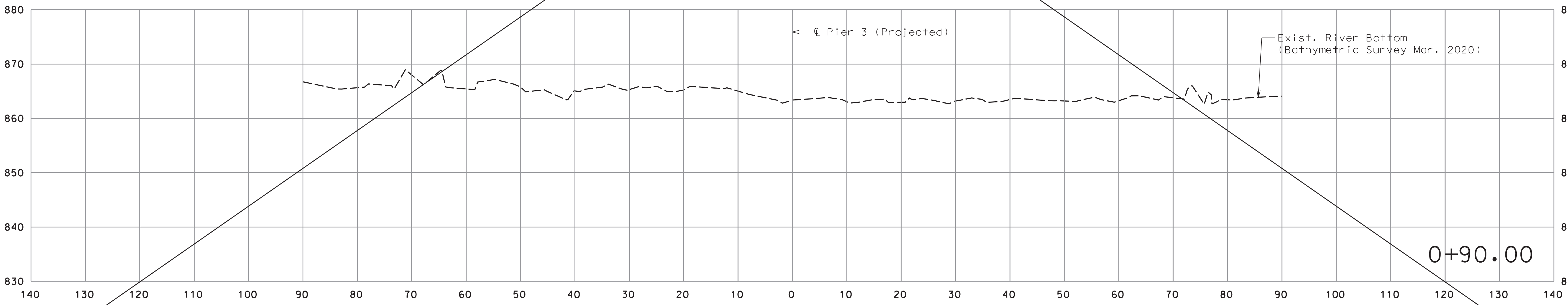

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 12 of 19

1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 12
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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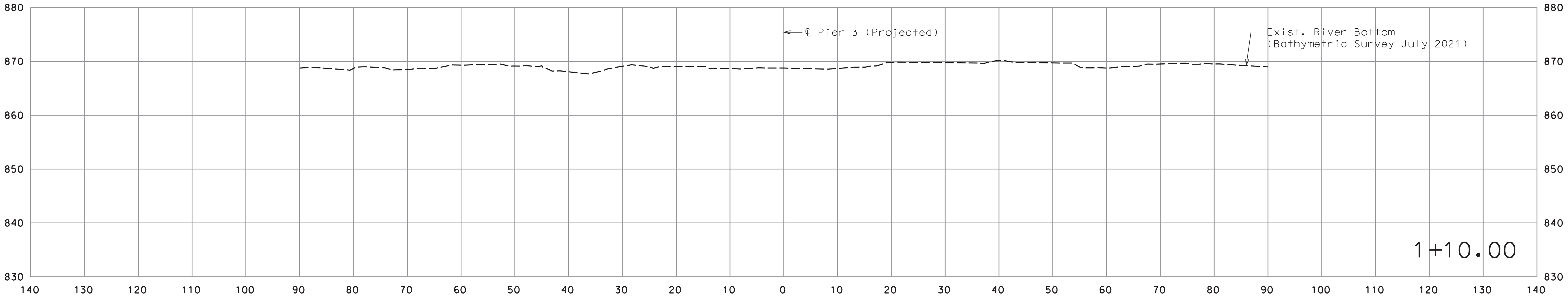

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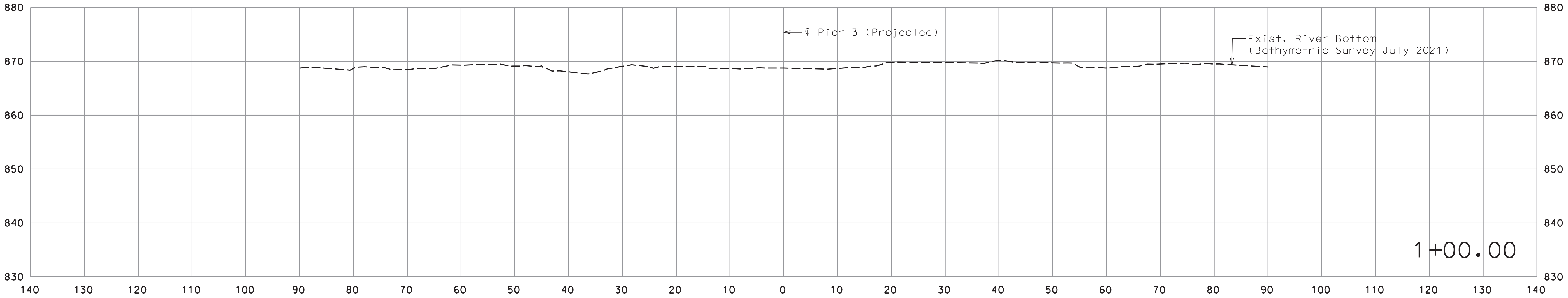

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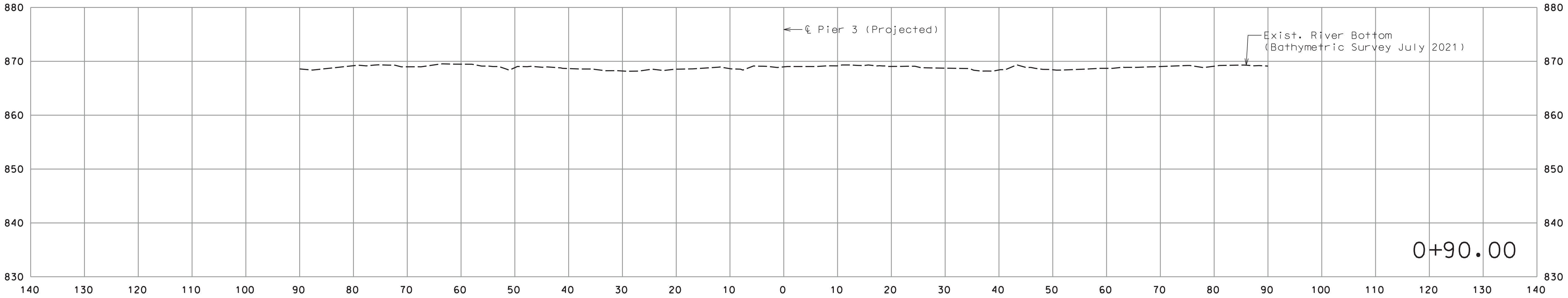

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SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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Sheet No. 12A of 19

1 SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 12A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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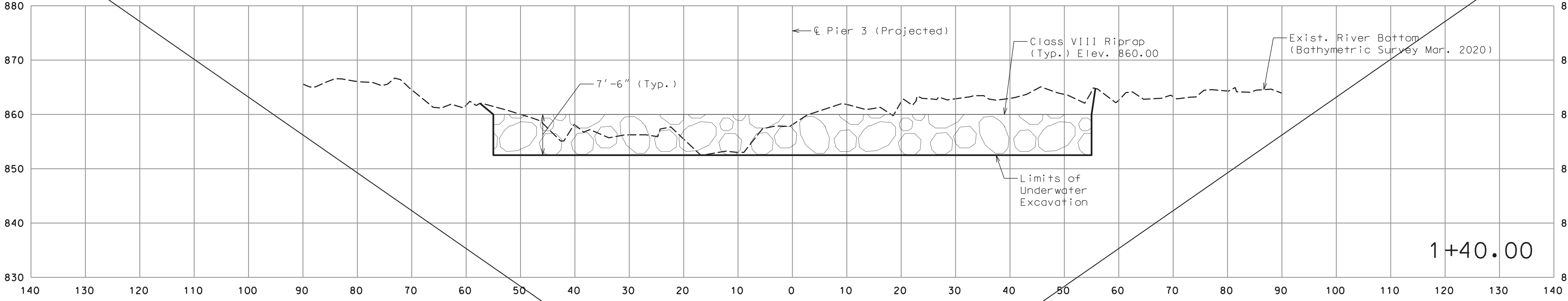

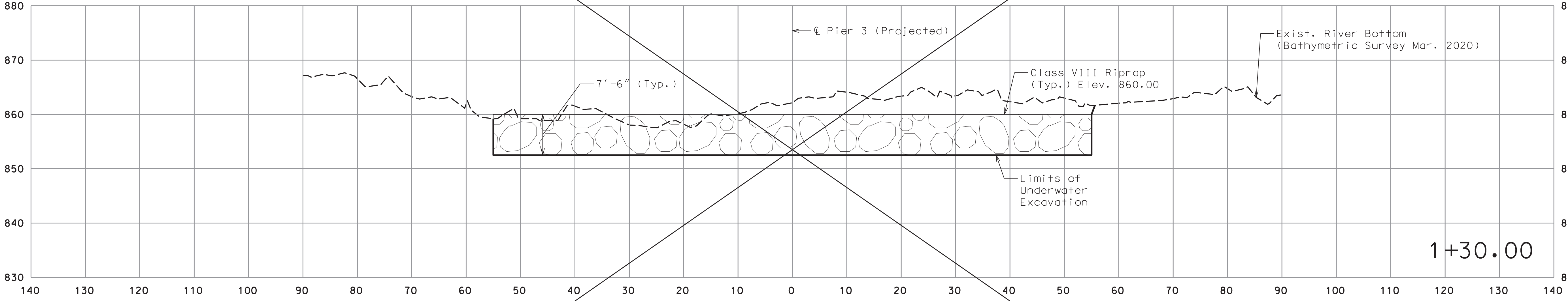

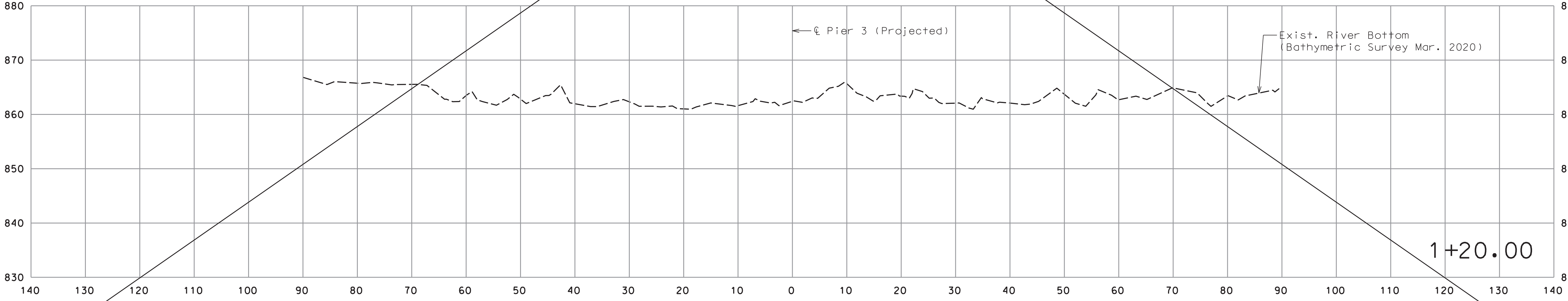

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 13 of 19

△1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 13
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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10450 Holmes Road
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Certificate of Authority: 000856

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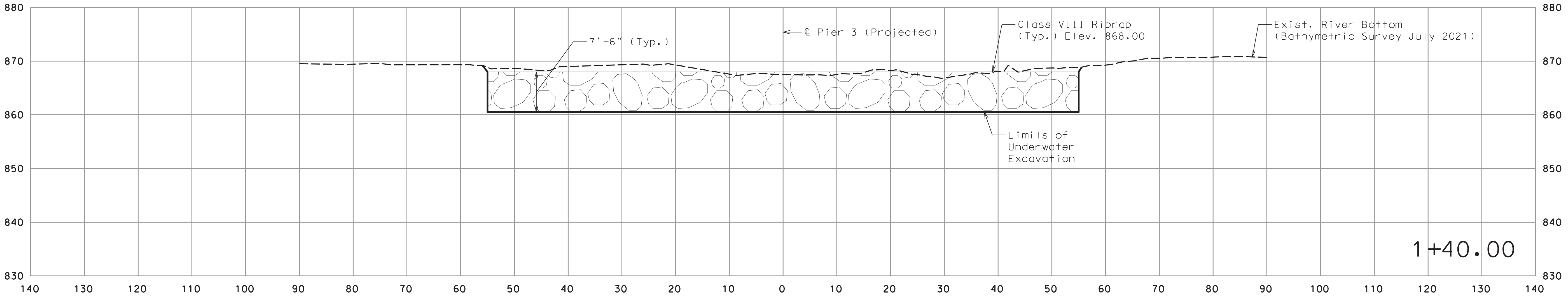

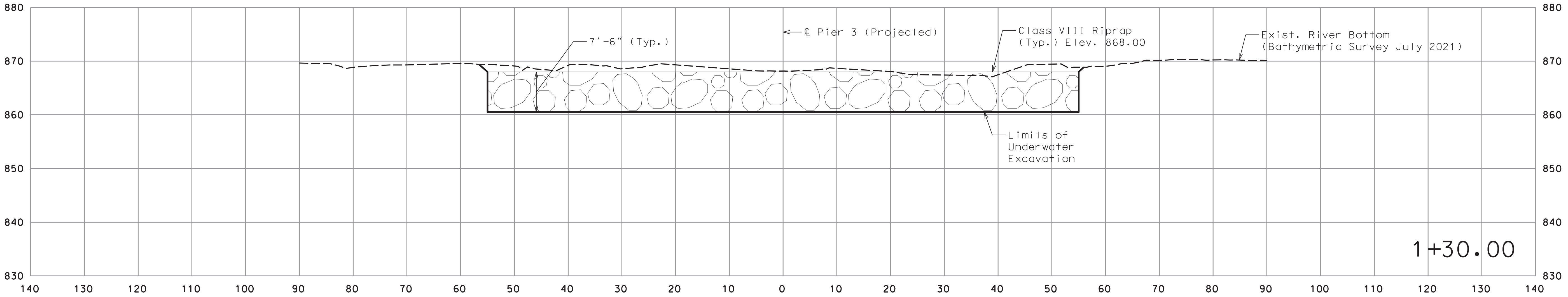

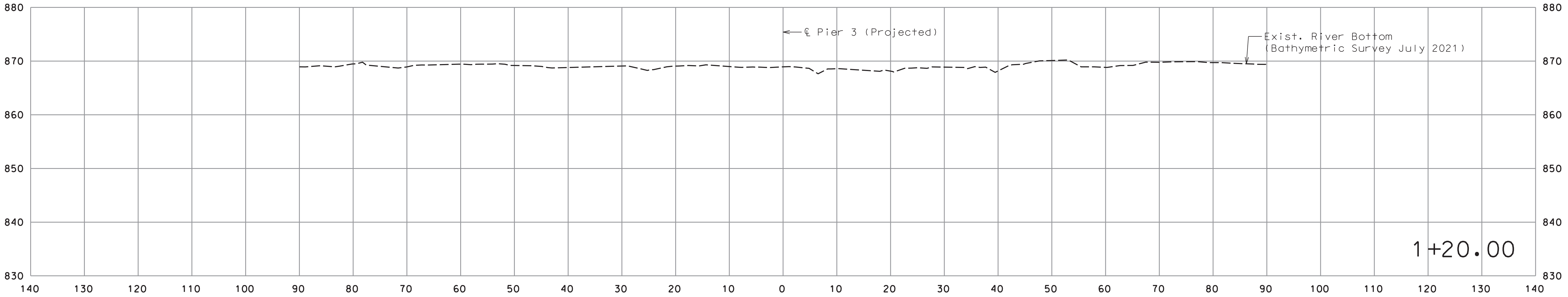

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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Sheet No. 13A of 19

1 SHEET ADDED

THADDEUS KOSMICKI
PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED	8/6/2021
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	13A
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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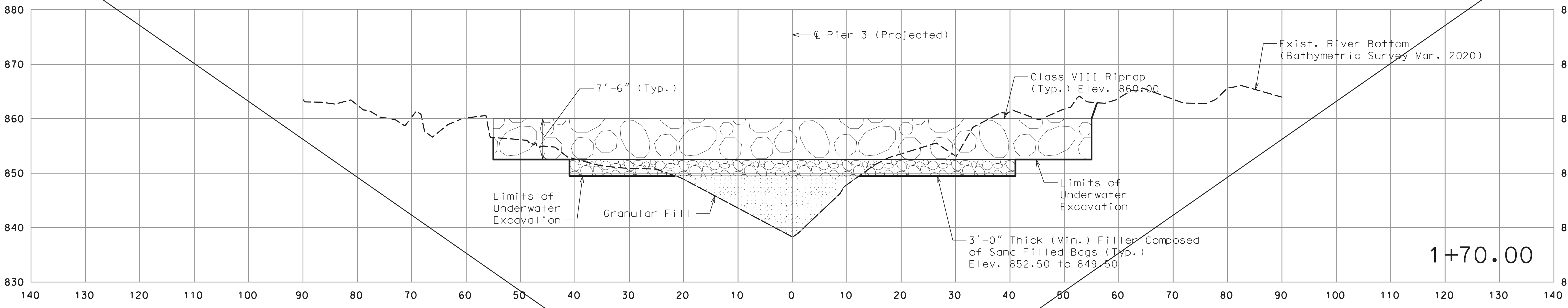
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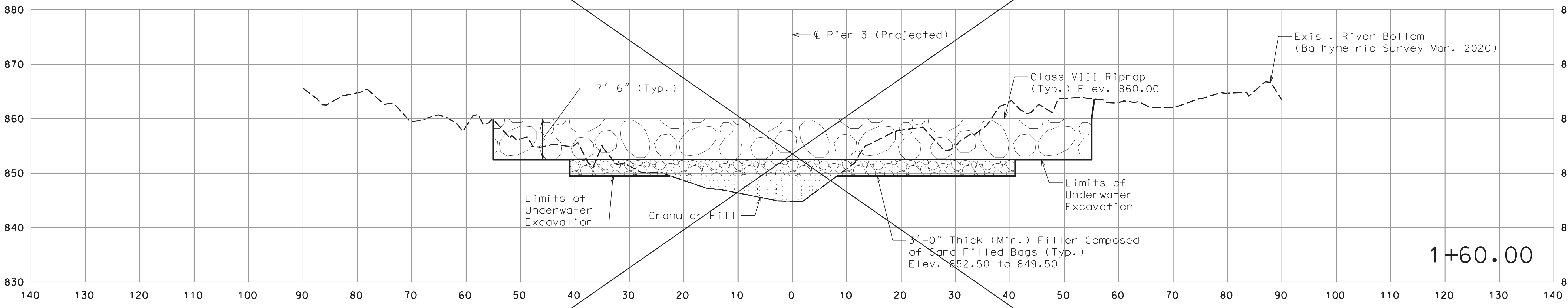
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Class VIII Riprap (Typ.) Elev. 860.00
7'-6" (Typ.)
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
1+70.00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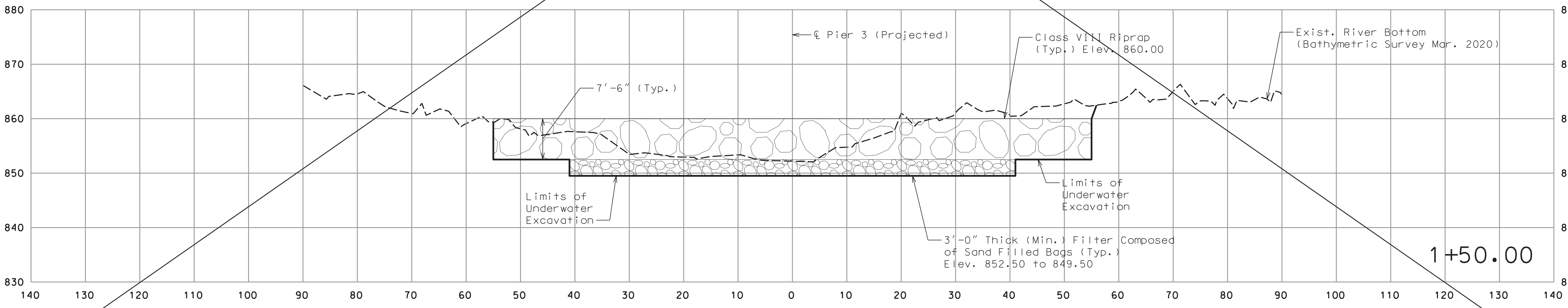
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Class VIII Riprap (Typ.) Elev. 860.00
7'-6" (Typ.)
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
1+60.00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℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 860.00
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7'-6" (Typ.)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
1+50.00

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 14 of 19

1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED	8/6/2021
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 14
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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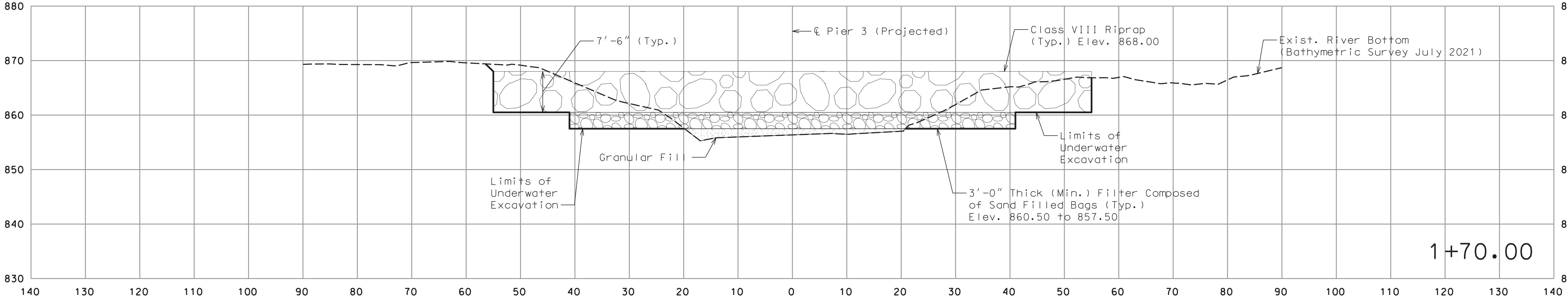
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7'-6" (Typ.)
℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
1+70.00
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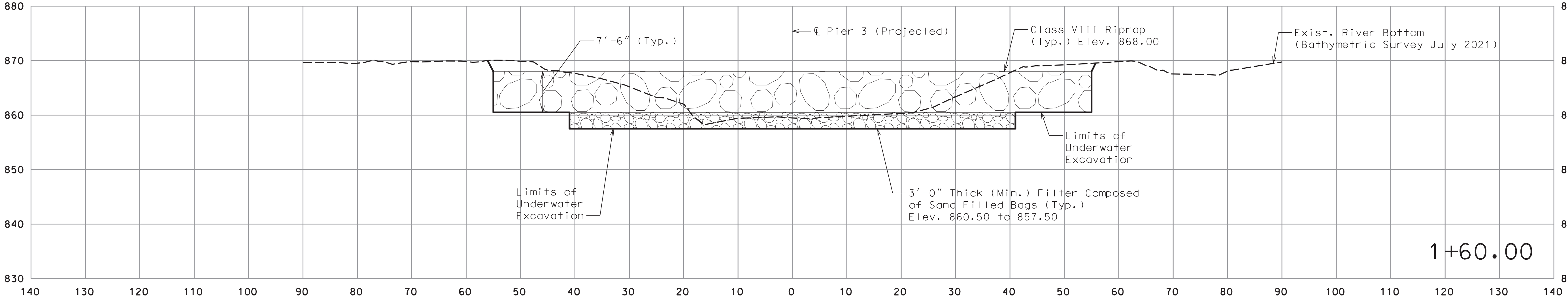
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7'-6" (Typ.)
℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
1+60.00
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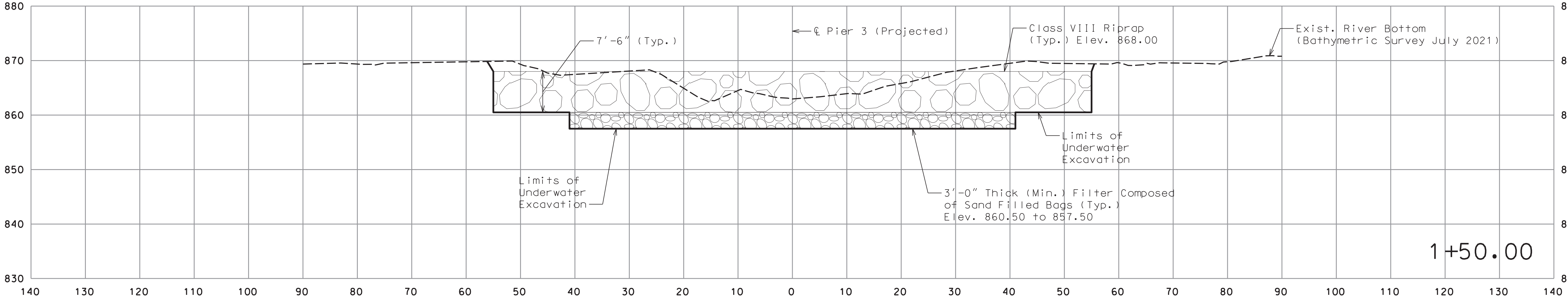
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7'-6" (Typ.)
℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
1+50.00
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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

Sheet No. 14A of 19

1 SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

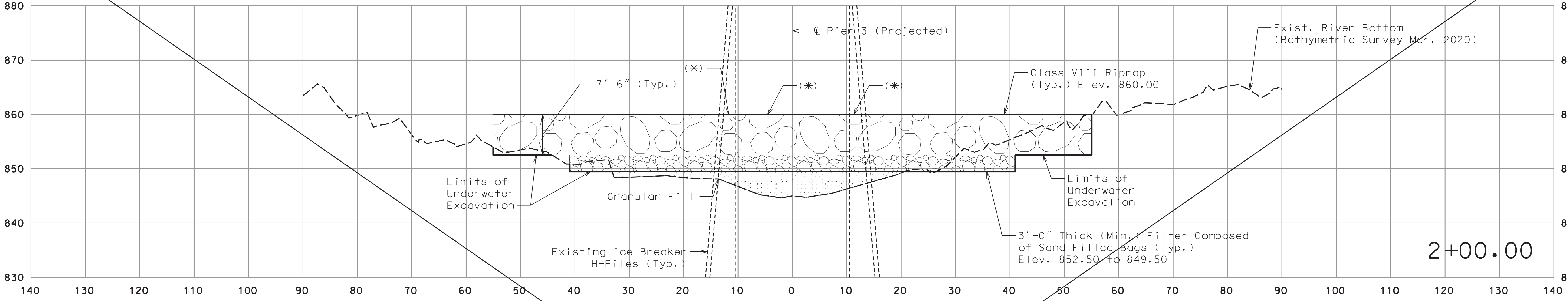
DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 14A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

(✻) Contractor shall fill the area between the existing caissons and the area between the existing piling. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.



2+00.00

880
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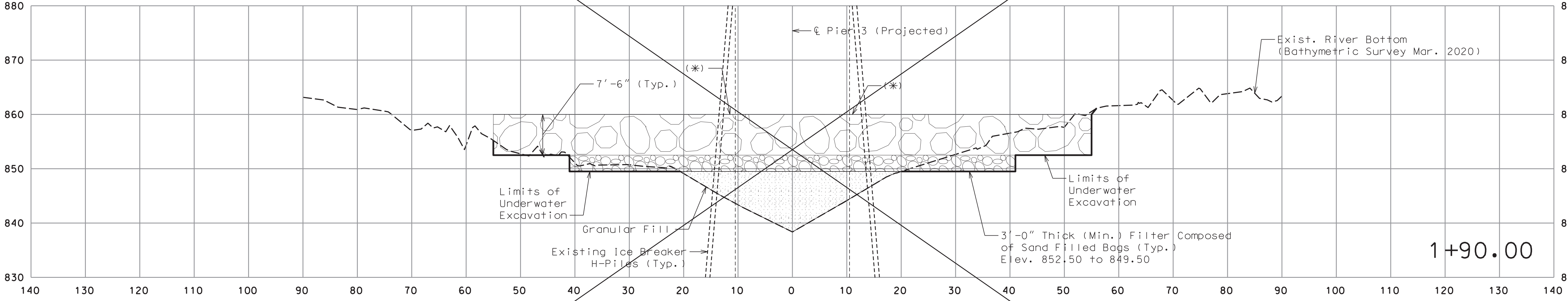
830
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
(✻)
7'-6" (Typ.)
(✻)
(✻)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Existing Ice Breaker H-Piles (Typ.)
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140



1+90.00

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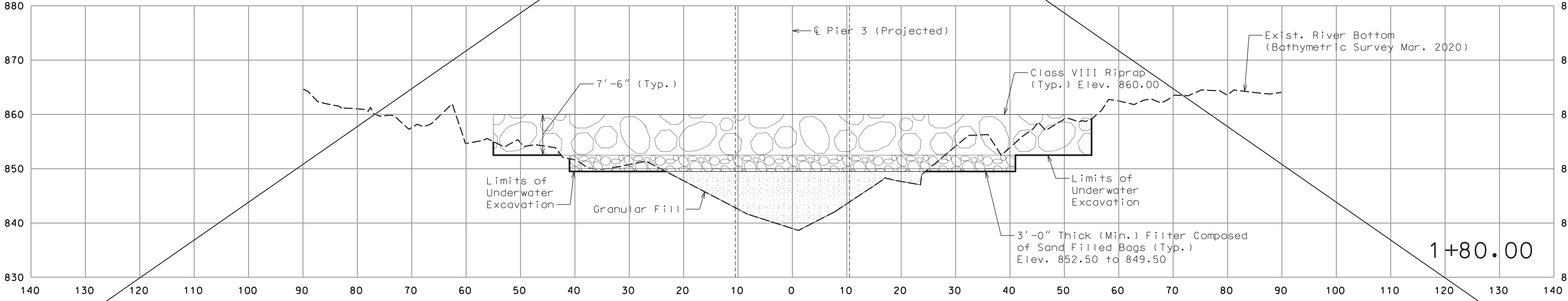
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
(✻)
7'-6" (Typ.)
(✻)
Limits of Underwater Excavation
Limits of Underwater Excavation
Granular Fill
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Existing Ice Breaker H-Piles (Typ.)
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140



1+80.00

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℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 15 of 19

1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 15
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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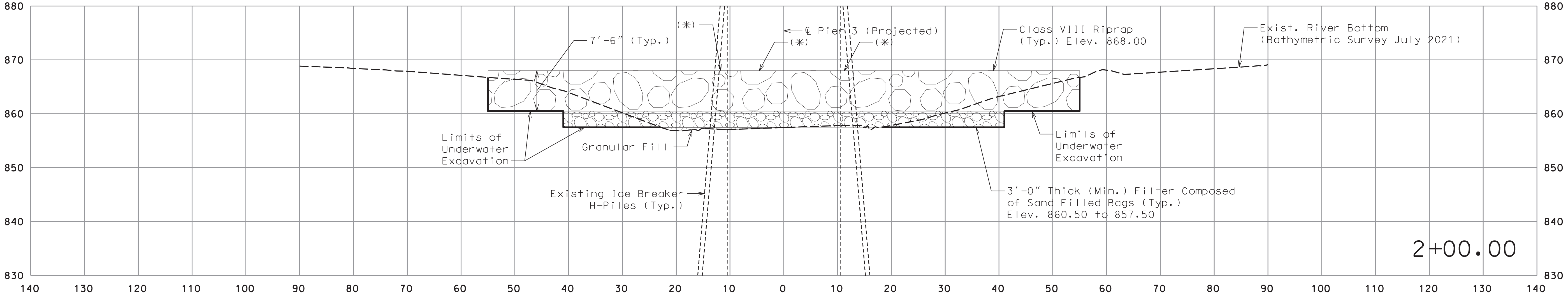
(✱) Contractor shall fill the area between the existing caissons and the area between the existing piling. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.



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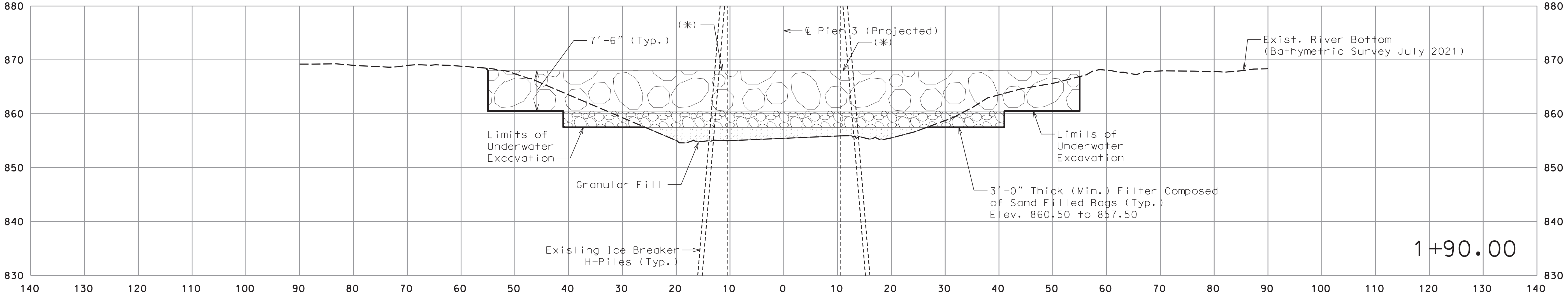
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
7′-6″ (Typ.)
(✱)
℄ Pier 3 (Projected)
(✱)
(✱)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
Existing Ice Breaker H-Piles (Typ.)
3′-0″ Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
2+00.00



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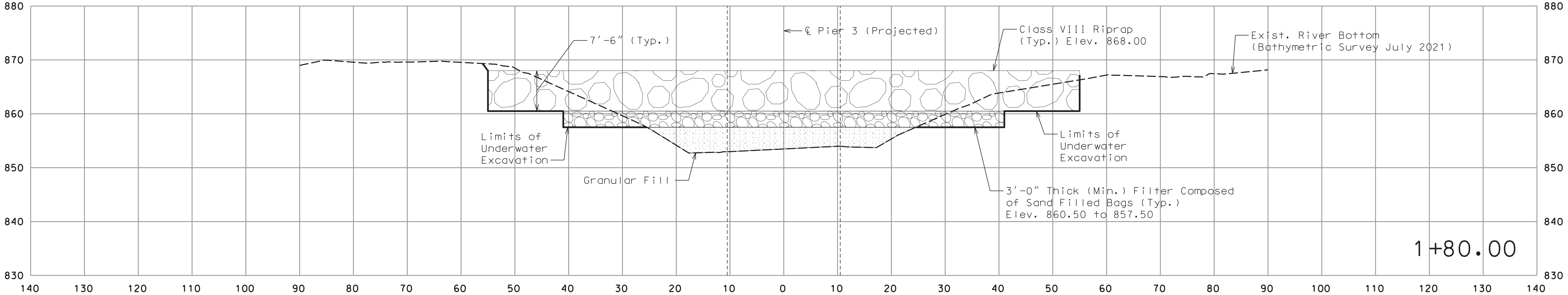
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
(✱)
℄ Pier 3 (Projected)
(✱)
7′-6″ (Typ.)
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
Granular Fill
3′-0″ Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
Existing Ice Breaker H-Piles (Typ.)
1+90.00



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140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 868.00
7′-6″ (Typ.)
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
Granular Fill
3′-0″ Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
1+80.00

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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

Sheet No. 15A of 19

△1 SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

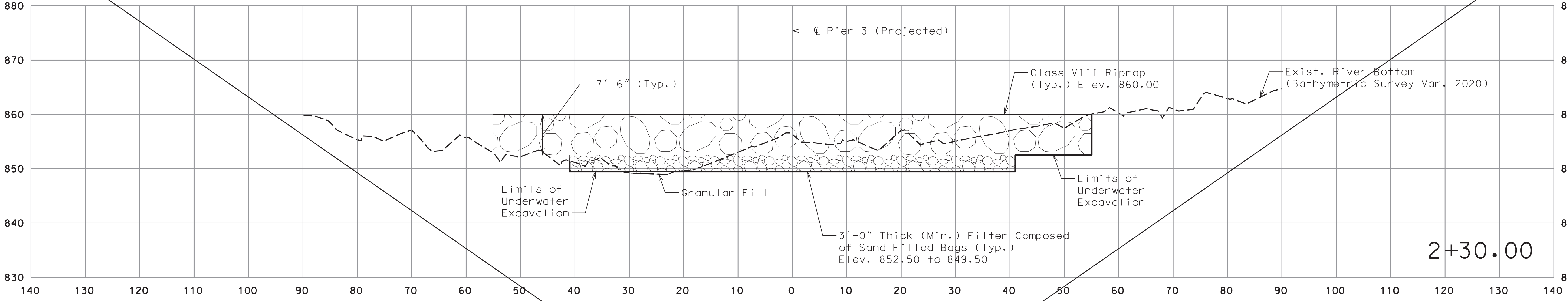
DATE PREPARED	
8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 15A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

(✱) Contractor shall fill the area between the existing caissons and the area between the existing piling. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.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℄ Pier 3 (Projected)
7′-6″ (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
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Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3′-0″ Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
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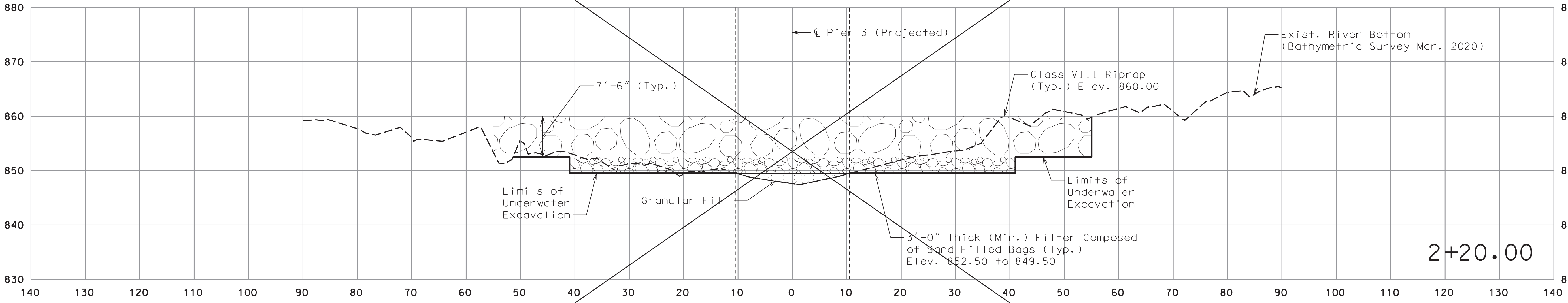
2+30.00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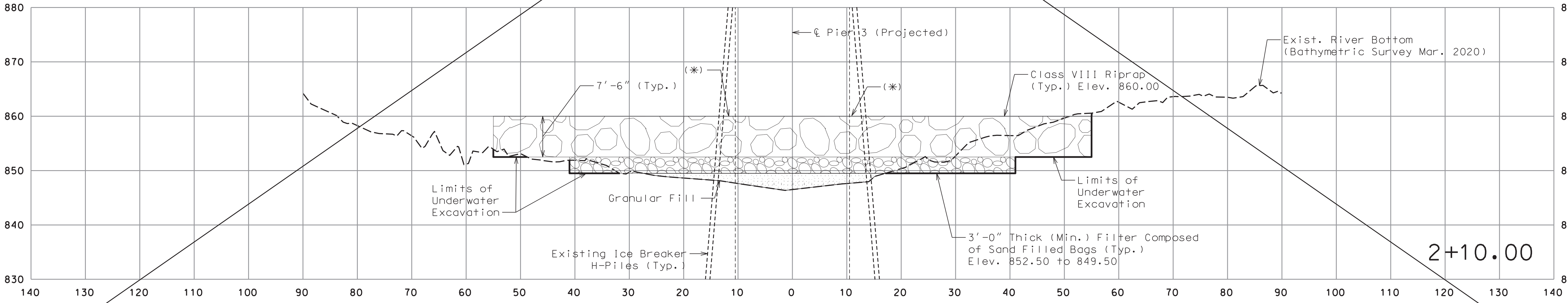
℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
7′-6″ (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3′-0″ Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

2+20.00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℄ Pier 3 (Projected)
Exist. River Bottom (Bathymetric Survey Mar. 2020)
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(✱)
7′-6″ (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Limits of Underwater Excavation
Granular Fill
Limits of Underwater Excavation
3′-0″ Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
Existing Ice Breaker H-Piles (Typ.)
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

2+10.00

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 16 of 19

1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED	8/6/2021
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 16
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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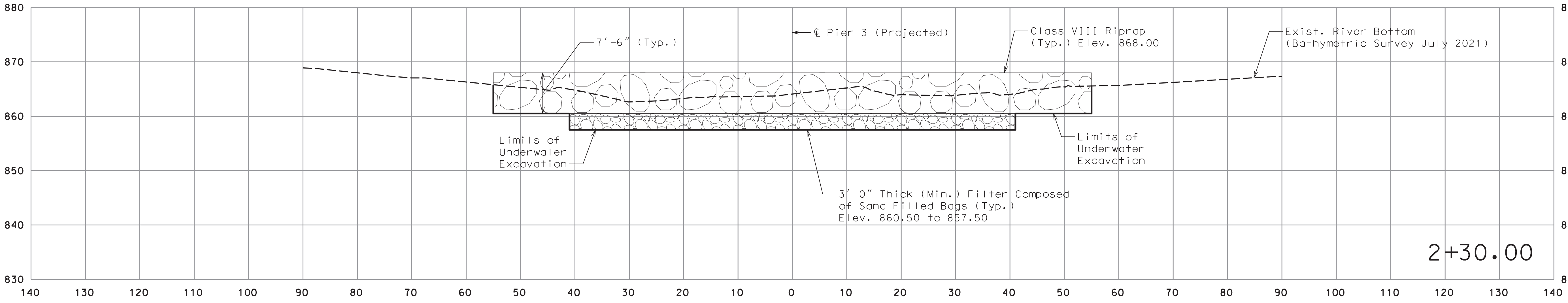
(✱) Contractor shall fill the area between the existing caissons and the area between the existing piling. The method of placement of sand filled bags and riprap shall be submitted to the Engineer at least two weeks prior to beginning the work.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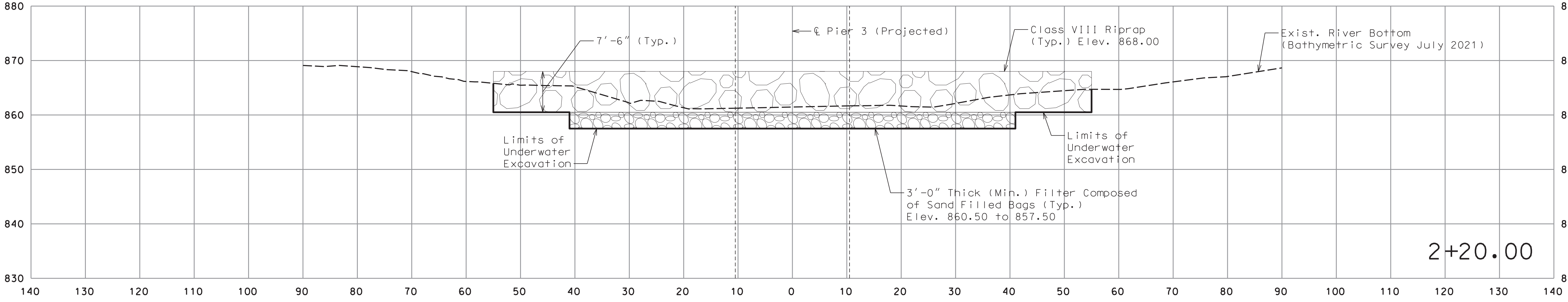
7'-6" (Typ.)
℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
2+30.00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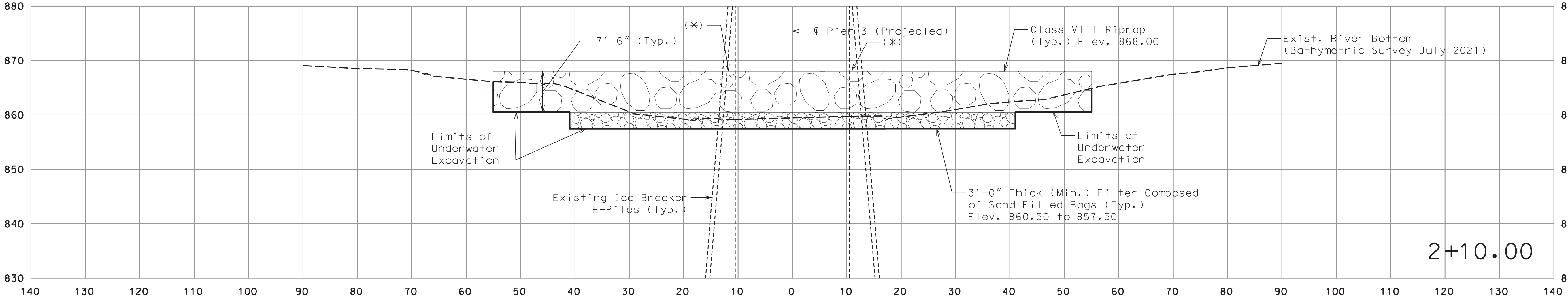
7'-6" (Typ.)
℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
2+20.00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140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
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7'-6" (Typ.)
℄ Pier 3 (Projected)
(✱)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
Existing Ice Breaker H-Piles (Typ.)
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50
2+10.00

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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

Sheet No. 16A of 19

△1 SHEET ADDED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 16A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

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

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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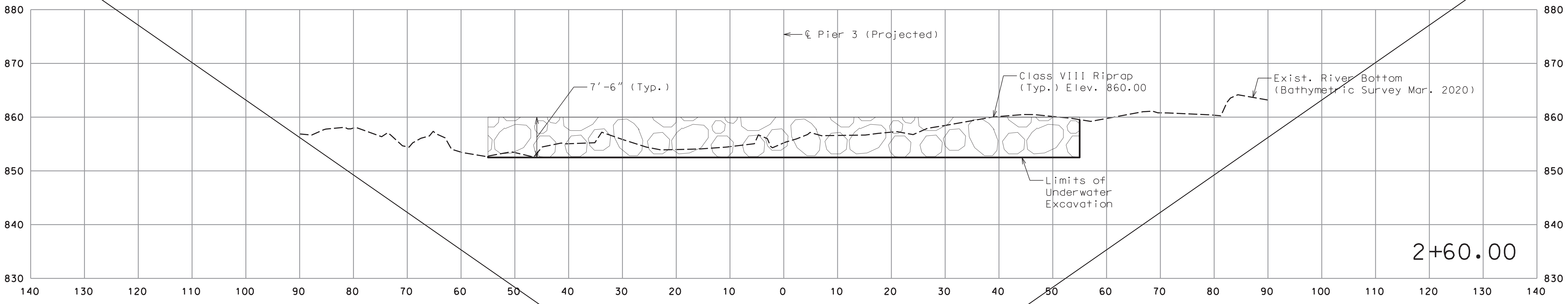
THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

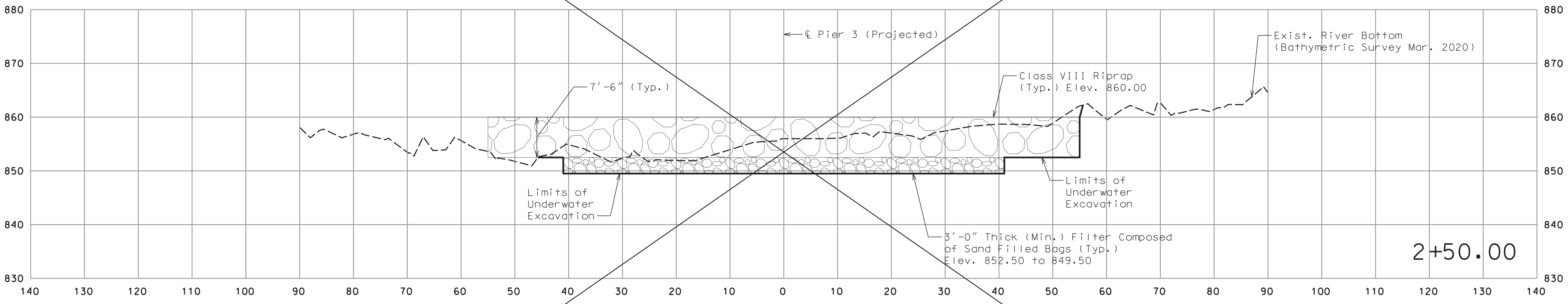
DATE PREPARED	8/6/2021
ROUTE	136
STATE	MO
DISTRICT	BR
SHEET NO.	17
COUNTY	ATCHISON
JOB NO.	J1P3384
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	L00983

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

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



2+60.00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℄ Pier 3 (Projected)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
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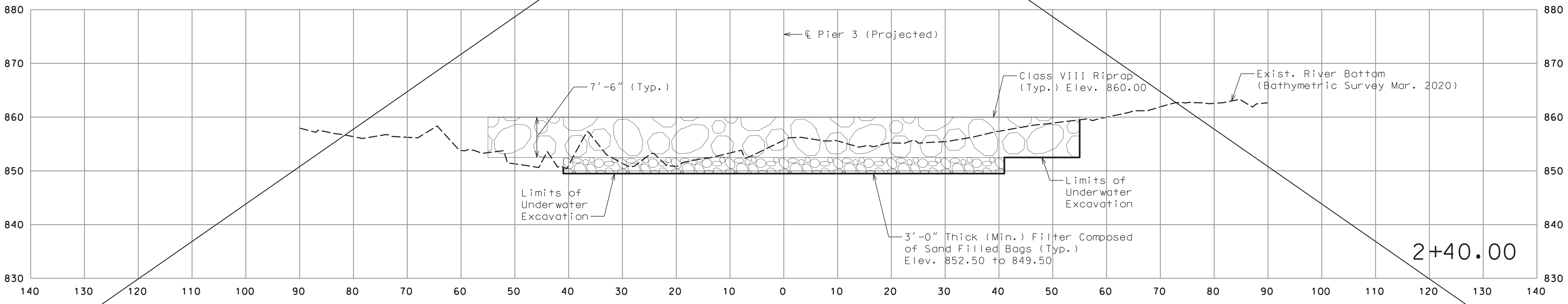
2+50.00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℄ Pier 3 (Projected)
7'-6" (Typ.)
Class VIII Riprap (Typ.) Elev. 860.00
Exist. River Bottom (Bathymetric Survey Mar. 2020)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 852.50 to 849.50
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

2+40.00

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 17 of 19

(1) SHEET DELETED

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

THADDEUS KOSMICKI
NUMBER PE-2008000074

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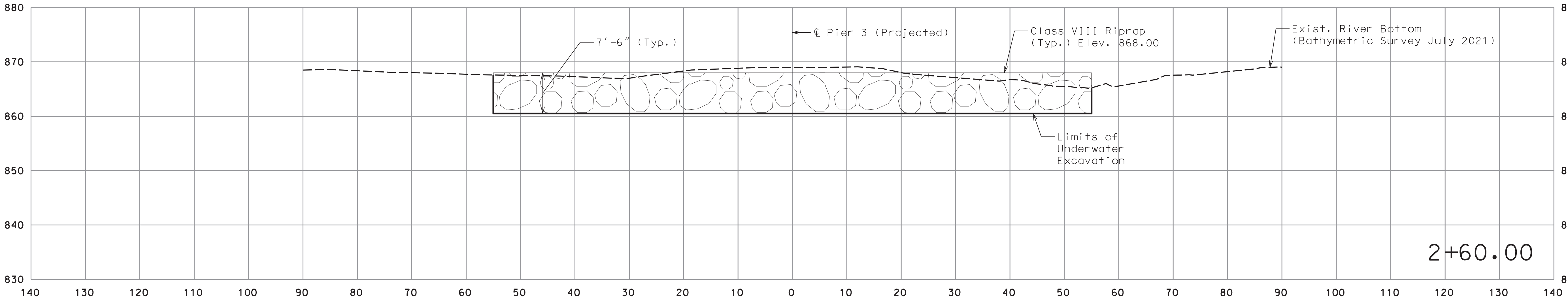
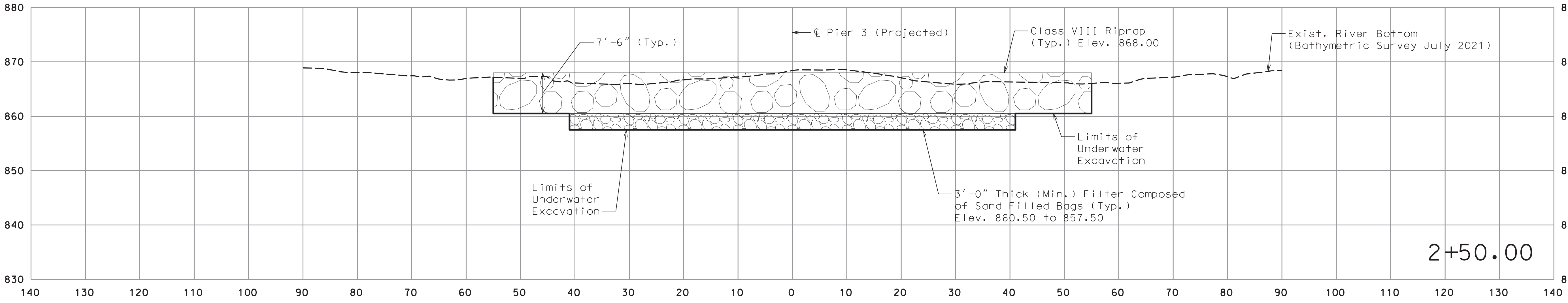
DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 17A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

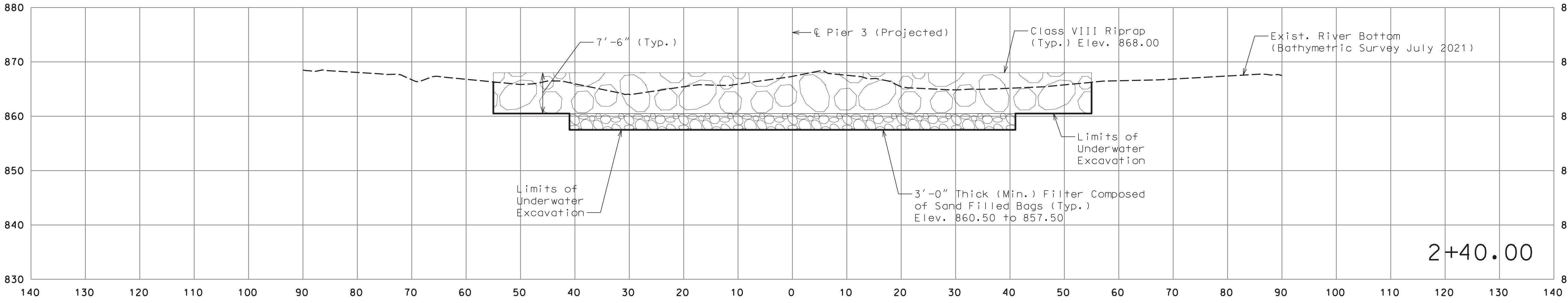
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



2+60.00


880
870
860
850
840
830
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
7'-6" (Typ.)
℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50

2+50.00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870
860
850
840
830
140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
7'-6" (Typ.)
℄ Pier 3 (Projected)
Class VIII Riprap (Typ.) Elev. 868.00
Exist. River Bottom (Bathymetric Survey July 2021)
Limits of Underwater Excavation
Limits of Underwater Excavation
3'-0" Thick (Min.) Filter Composed of Sand Filled Bags (Typ.) Elev. 860.50 to 857.50

2+40.00

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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

Sheet No. 17A of 19

① SHEET ADDED

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131
816-360-2700
Certificate of Authority: 000856

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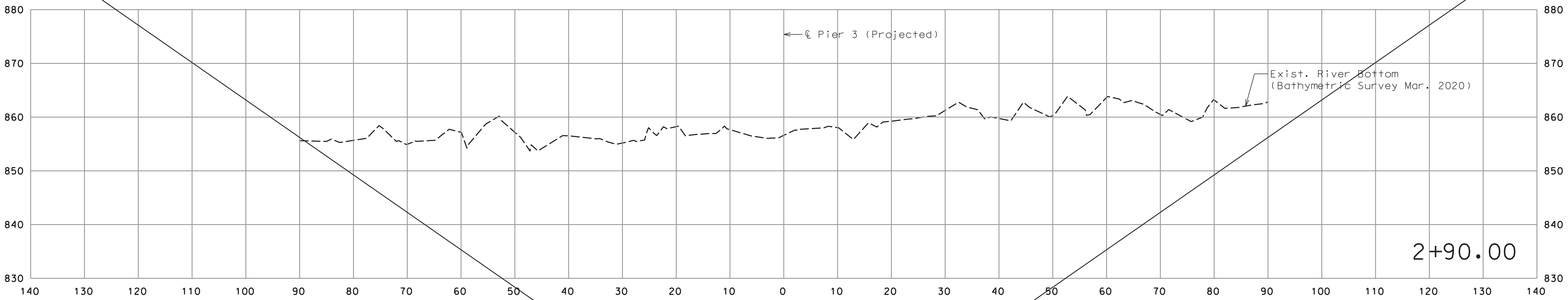

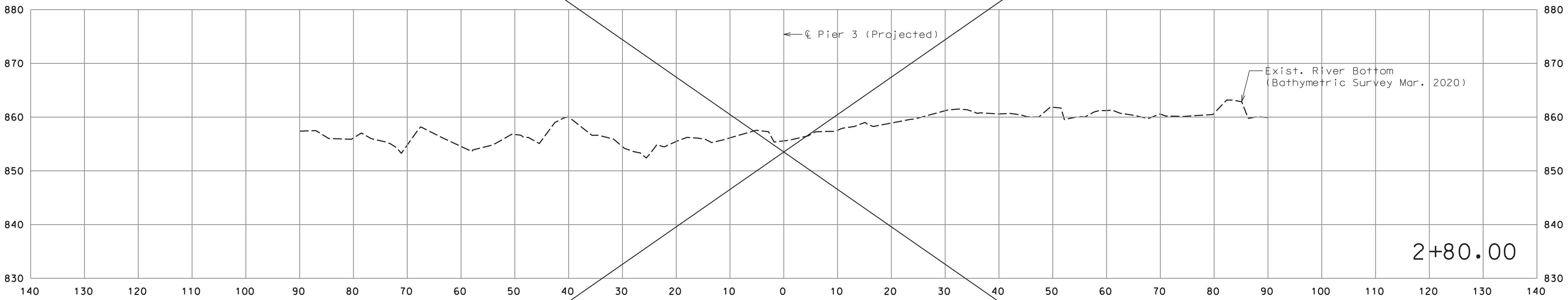

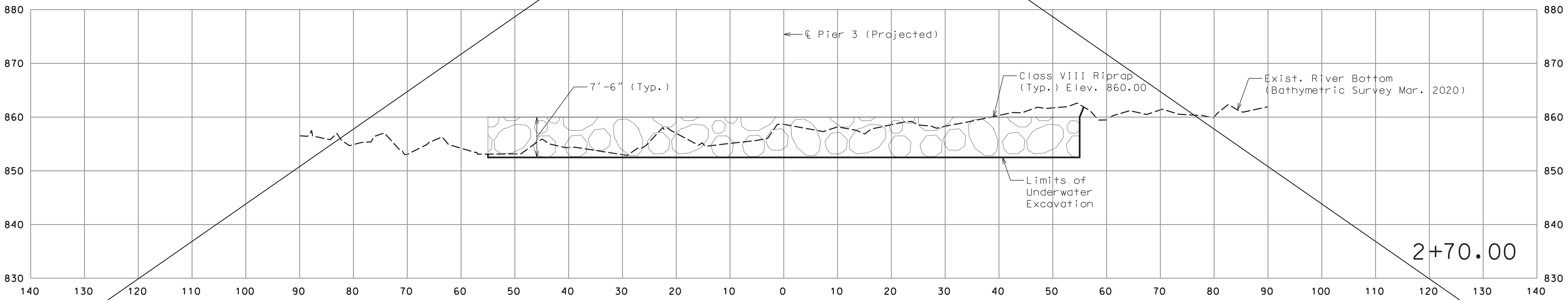

SCOUR MITIGATION DETAILS

Detailed June 2020
Checked June 2020

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

Sheet No. 18 of 19

△1 SHEET DELETED

THADDEUS KOSMICKI
NUMBER PE-2008000074

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 18
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET DELETED

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

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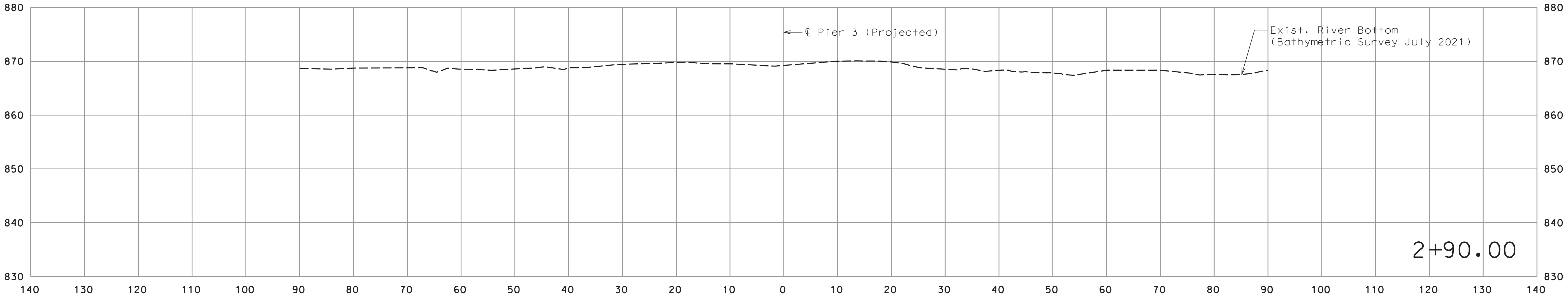

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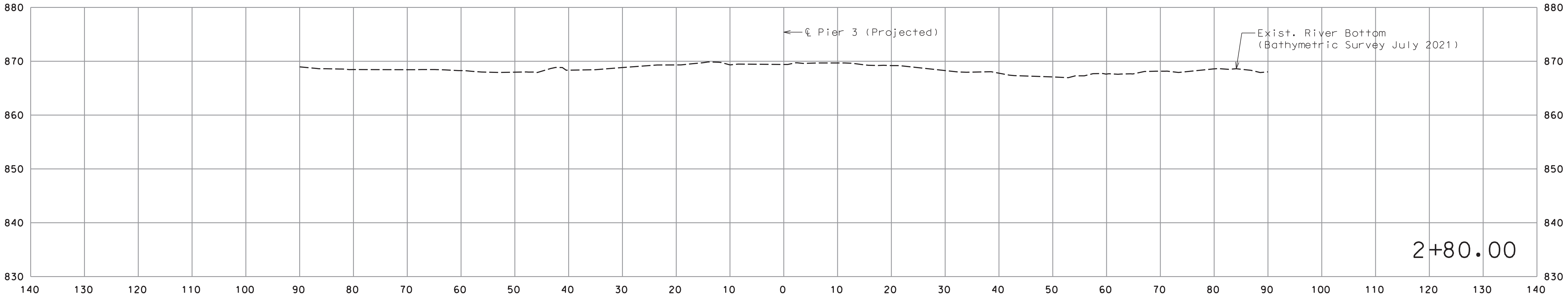
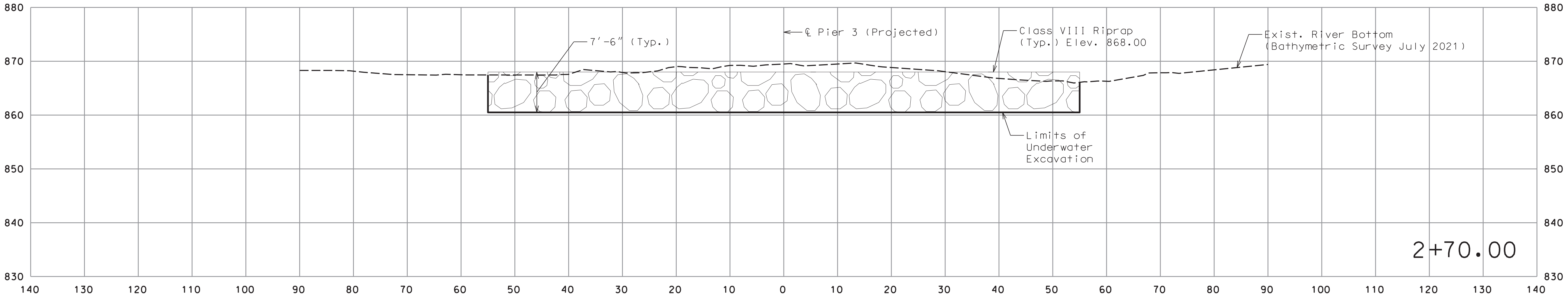


2+80.00



2+70.00

SCOUR MITIGATION DETAILS

Detailed August 2021
Checked August 2021

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Sheet No. 18A of 19

△1 SHEET ADDED

STATE OF MISSOURI
THADDEUS KOSMICKI
NUMBER PE-2008000074
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 18A
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

DATE	DESCRIPTION
08/06/21	1 - SHEET ADDED. REVISED SECTIONS

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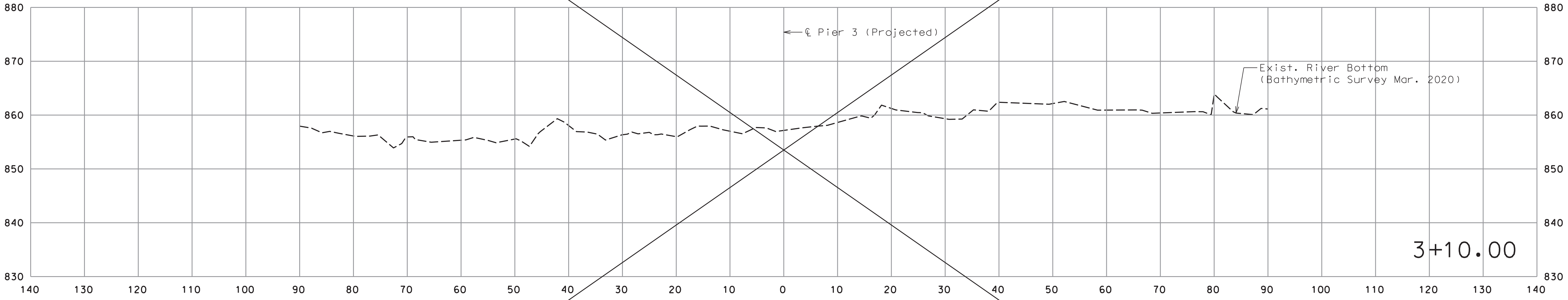

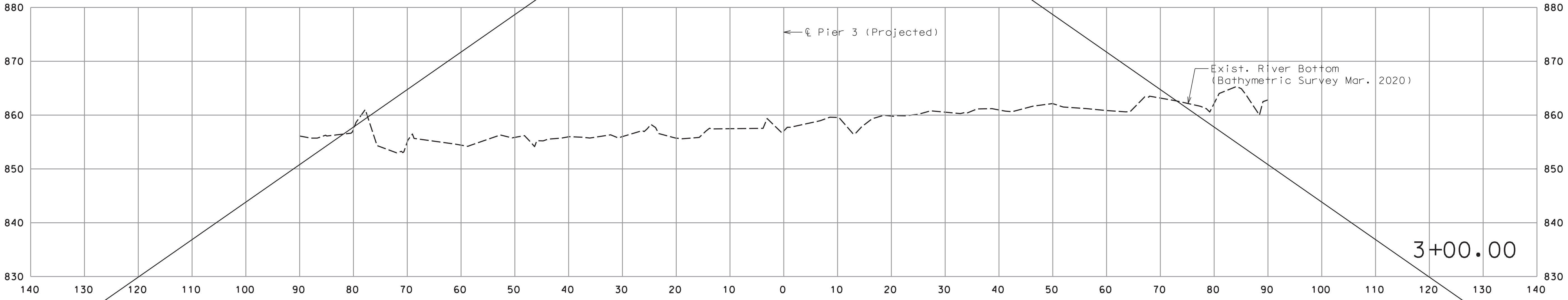

SCOUR MITIGATION DETAILS

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Sheet No. 19 of 19

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THADDEUS KOSMICKI
PE-2008000074

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DATE PREPARED 8/6/2021	
ROUTE 136	STATE MO
DISTRICT BR	SHEET NO. 19
COUNTY ATCHISON	
JOB NO. J1P3384	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO. L00983	

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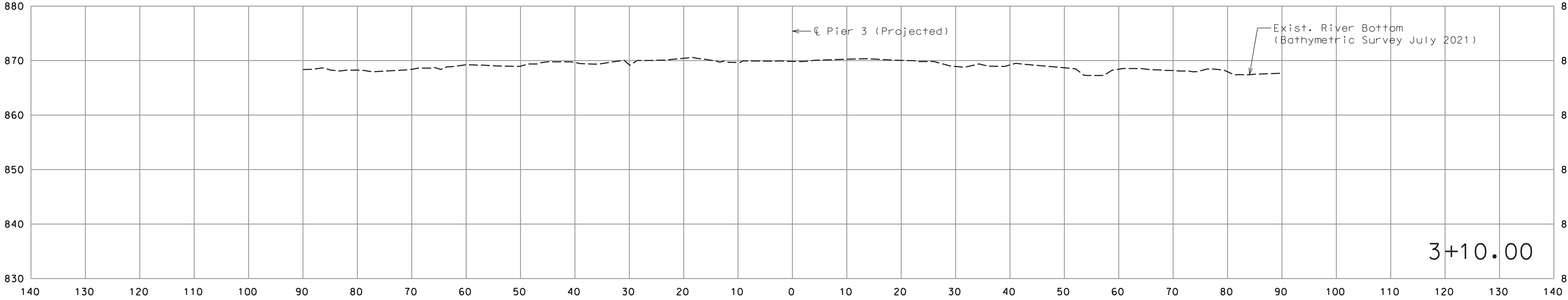

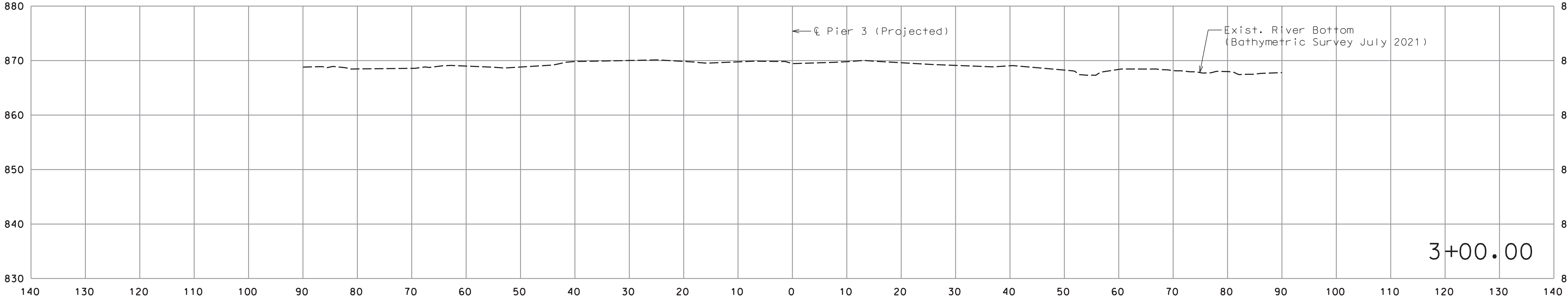

SCOUR MITIGATION DETAILS

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Sheet No. 19A of 19

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STATE OF MISSOURI
THADDEUS KOSMICKI
NUMBER PE-2008000074
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