

ARKANSAS STATE HIGHWAY COMMISSION

JOB NO. 11634

MISSISSIPPI STATE HIGHWAY DEPARTMENT

MISSISSIPPI RIVER BRIDGE

FEDERAL AID PROJECT U-F-018-5 (2)

HOUSING AND HOME FINANCE AGENCY PROJECT PFL-V-3-91

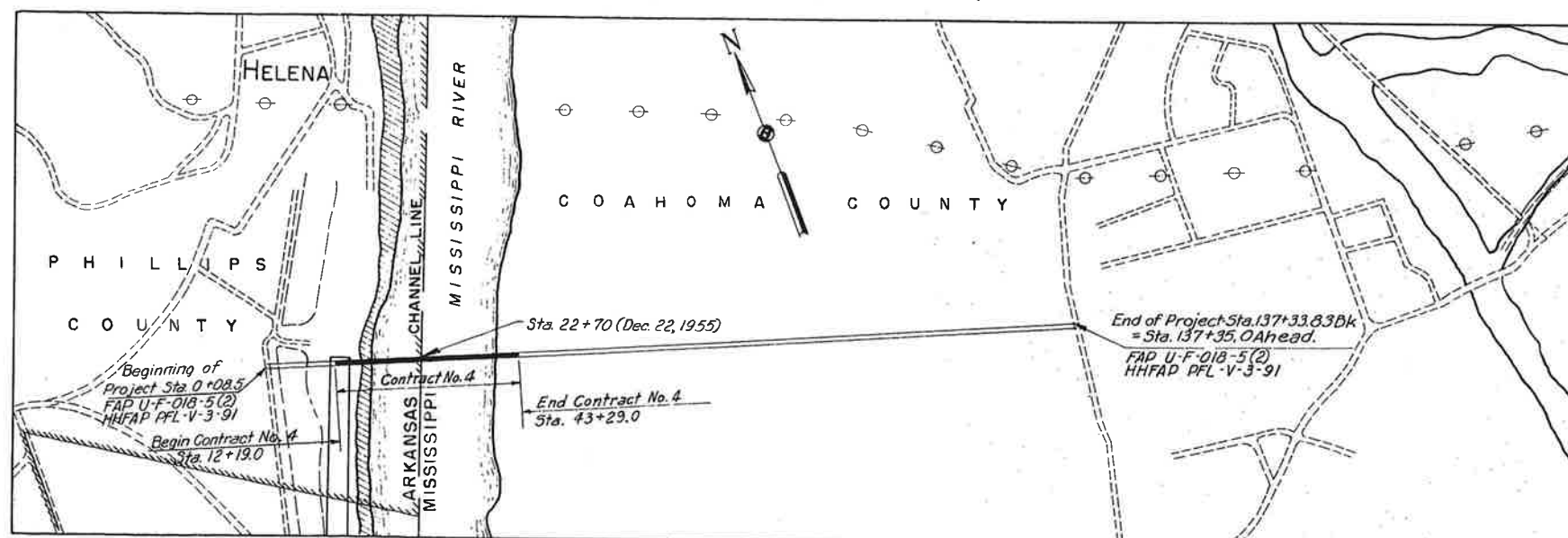
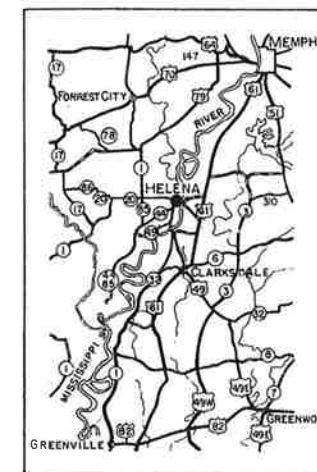
NEAR HELENA ARKANSAS

PHILLIPS COUNTY, ARKANSAS

COAHOMA COUNTY, MISSISSIPPI

CONTRACT NO. 4 RIVER BRIDGE SUPERSTRUCTURE

(SPANS 11 THROUGH 15)



ACCEPTED John F. Bradley Const. Co. - Dallas, Texas
CONTRACTOR - CITY AND STATE

DATE 4/27/53 BY John F. Bradley - PRESIDENT
TITLE

APPROVED W. A. Orth
DATE 8/14/53 ENGINEERING BRANCH - HOUSING AND HOME FINANCE AGENCY
APPROVED W. A. Orth
DATE REGIONAL COUNCIL - HOUSING AND HOME FINANCE AGENCY
APPROVED W. A. Orth
DATE 8/14/53 CHIEF ENGINEER - ARKANSAS STATE HIGHWAY COMMISSION
APPROVED W. A. Orth
DATE 8/14/53 DIRECTOR - MISSISSIPPI STATE HIGHWAY DEPARTMENT
APPROVED W. A. Orth
DATE 8/14/53 DIVISION ENGINEER - BUREAU OF PUBLIC ROADS

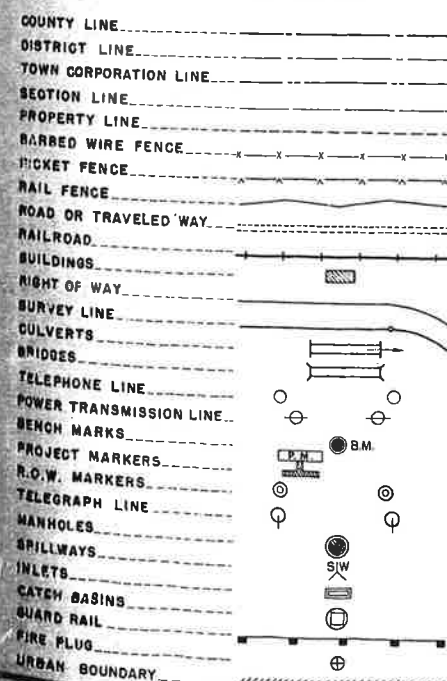
PREPARED AND RECOMMENDED BY
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

LAYOUT

Scale: 1" = 1500'

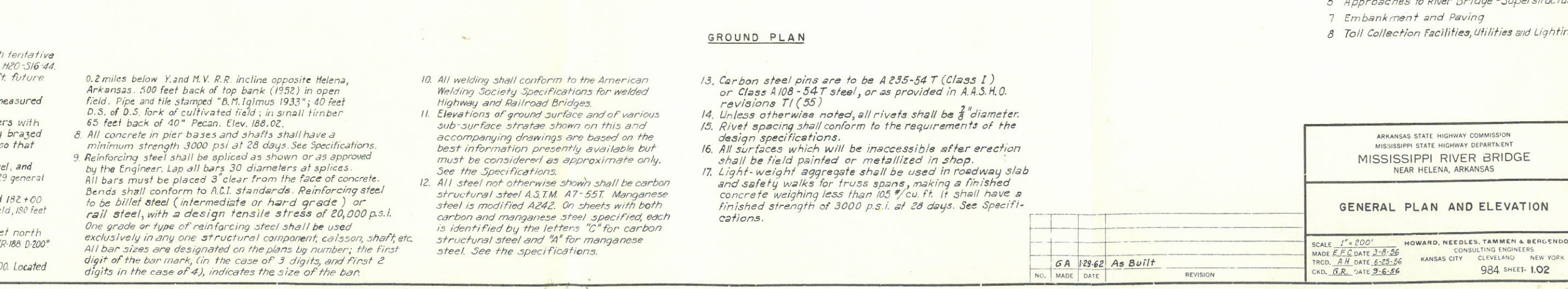
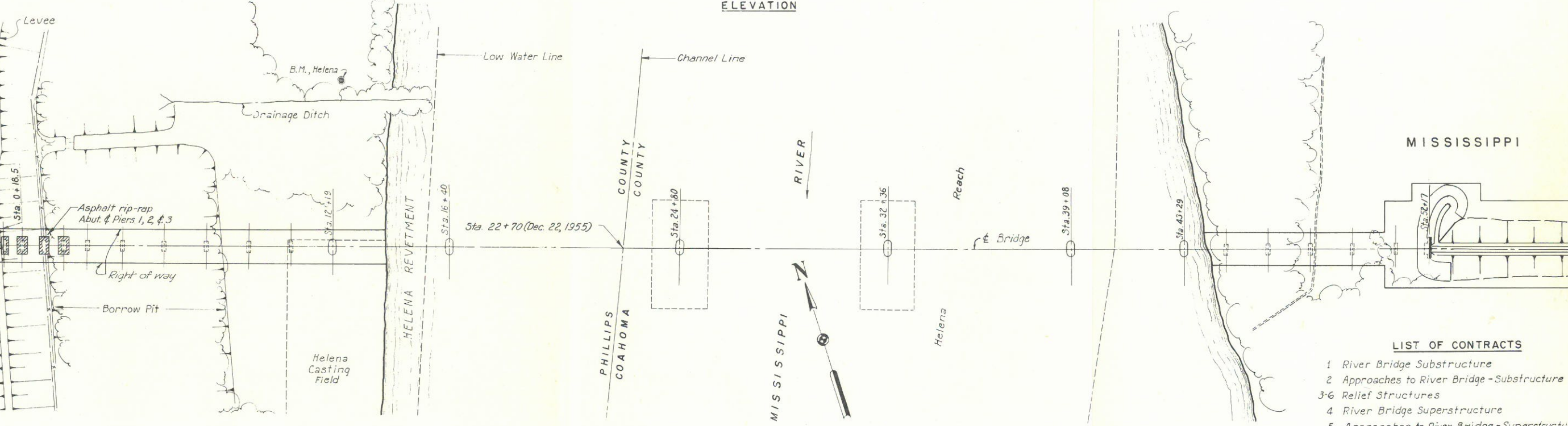
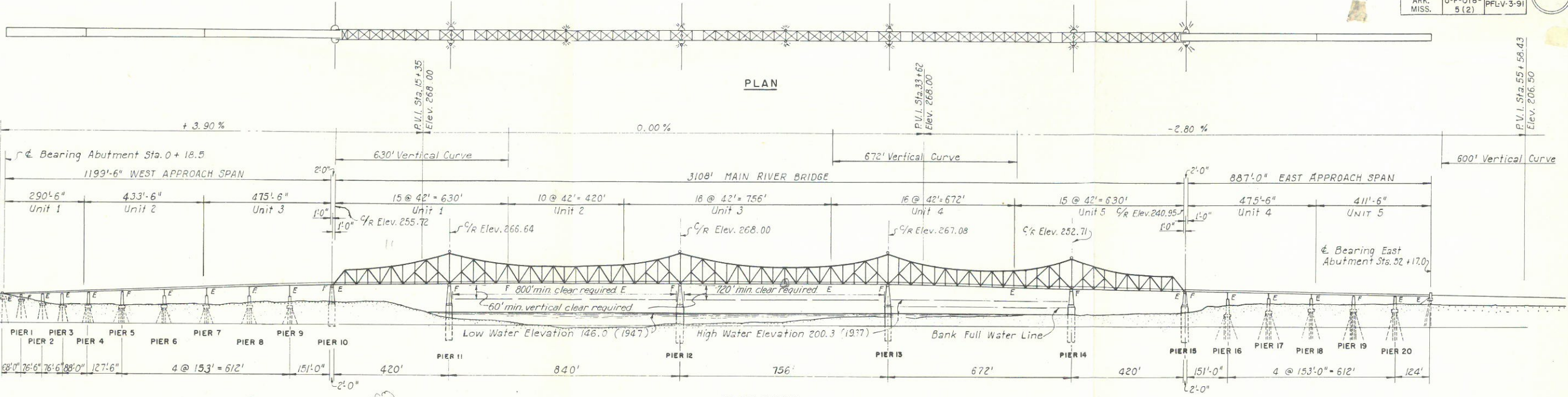
GROSS LENGTH OF PROJECT	13725.05 FEET OR 2.599 MILES
NET LENGTH OF PROJECT	13725.05 FEET OR 2.599 MILES
ROADWAY	0.00 " 0.000 "
BRIDGES	3110.00 " 0.589 "
CONTRACT NO. 4	3110.00 " 0.589 "

CONVENTIONAL SIGNS



LIST OF DRAWINGS

4.01 COVER SHEET	4.17 STRESS SHEET UNIT 3	4.33 TRUSSES PANEL POINTS 40-43
1.02 GENERAL PLAN AND ELEVATION	4.18 STRESS SHEET UNIT 4	4.34 TRUSSES PANEL POINTS 44-47
1.03 RIVER STAGES	4.19 STRESS SHEET UNIT 5	4.35 TRUSSES PANEL POINTS 48-50
1.04 BORINGS	4.20 SWAY FRAMES AND TOP LATERALS	4.36 TRUSSES PANEL POINTS 51-54
4.05 FLOOR FRAMING PLANS	4.21 PORTALS	4.37 TRUSSES PANEL POINTS 55-58
4.06 FLOORBEAMS AND STRINGER CONNECTIONS	4.22 BOTTOM LATERAL WIND SHEAR CONNECTIONS	4.38 TRUSSES PANEL POINT 59
4.07 FLOORBEAMS AND HANDRAIL	4.23 TRUSSES PANEL POINTS 0-3	4.39 TRUSSES PANEL POINTS 60-63
4.08 ROADWAY EXPANSION JOINTS PIERS 10 AND 15	4.24 TRUSSES PANEL POINTS 4-7	4.40 TRUSSES PANEL POINTS 64-66
4.09 ROADWAY EXPANSION JOINTS SPANS 12, 13, 14	4.25 TRUSSES PANEL POINTS 8-10	4.41 TRUSSES PANEL POINTS 67-70
4.10 CURB DETAILS	4.26 TRUSSES PANEL POINTS 10-12	4.42 TRUSSES PANEL POINTS 71-74
4.11 ROADWAY SLAB REINFORCING	4.27 TRUSSES PANEL POINTS 13-14	4.43 LADDERS, ETC.
4.12 ROADWAY SLAB REINFORCING	4.28 TRUSSES PANEL POINTS 15, 16, 25	
4.13 ROADWAY SLAB REINFORCING	4.29 DETAILS AT U15	
4.14 SHOES	4.30 TRUSSES PANEL POINTS 17-20	
4.15 STRESS SHEET UNIT 1	4.31 TRUSSES PANEL POINTS 32-35	
4.16 STRESS SHEET UNIT 2	4.32 TRUSSES PANEL POINTS 36-39	



- LIST OF CONTRACTS**
- 1 River Bridge Substructure
 - 2 Approaches to River Bridge - Substructure
 - 3-6 Relief Structures
 - 4 River Bridge Superstructure
 - 5 Approaches to River Bridge - Superstructure
 - 7 Embankment and Paving
 - 8 Toll Collection Facilities, Utilities and Lighting

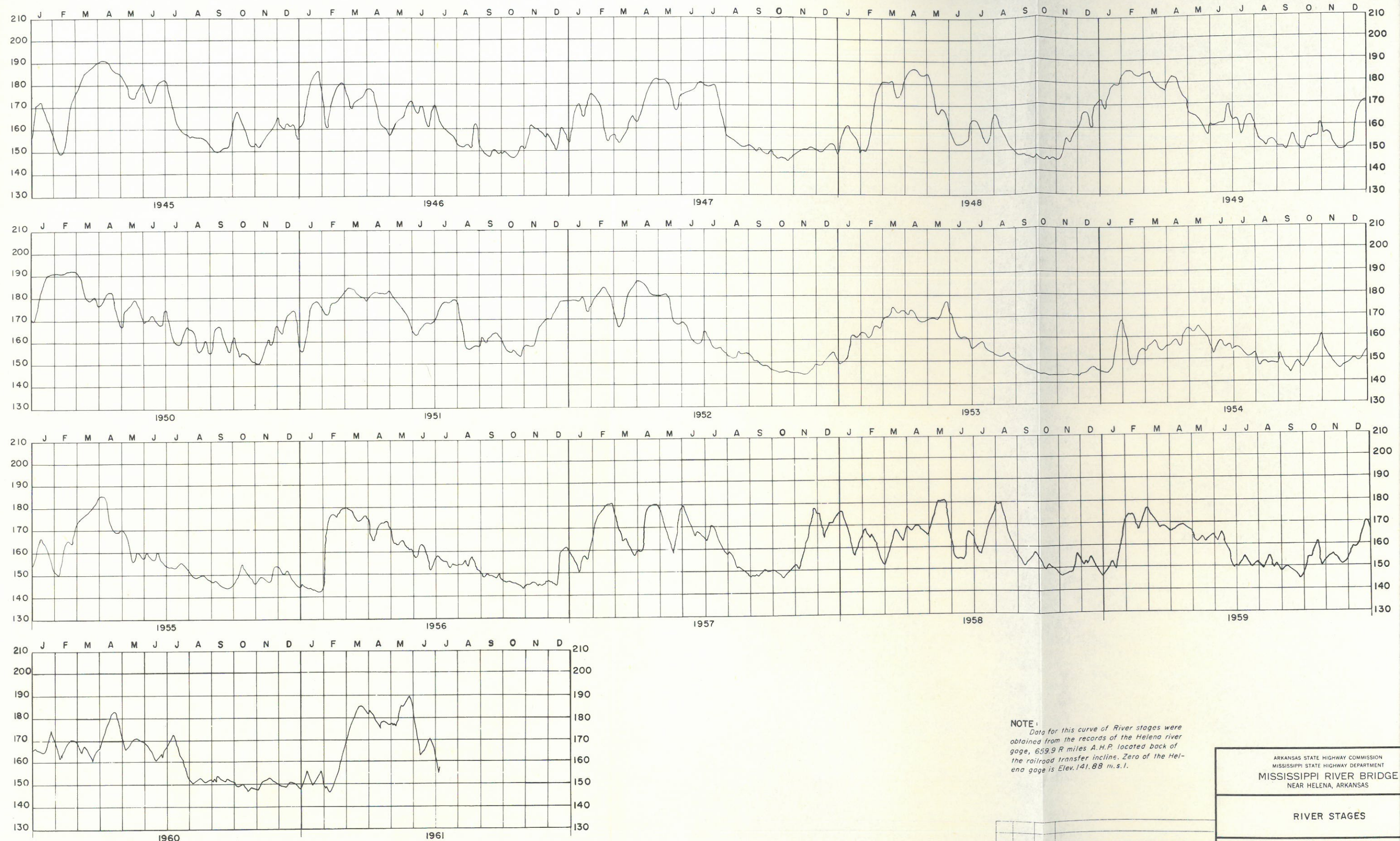
ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

GENERAL PLAN AND ELEVATION

SCALE 1"=200'
MADE E.F.C. DATE 3-8-56
TRCD. A.H. DATE 6-25-56
CKD. G.R. DATE 9-6-56

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

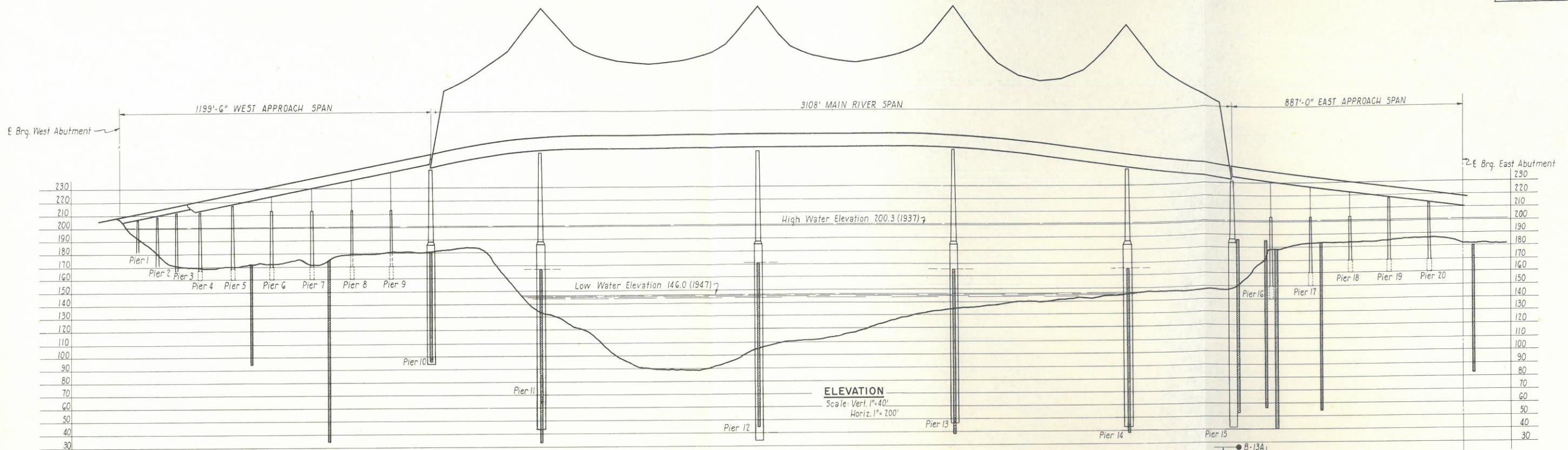
984 SHEET- 1.02



NOTE:
Data for this curve of River stages were obtained from the records of the Helena river gage, 639.9 R miles A.H.P. located back of the railroad transfer incline. Zero of the Helena gage is Elev. 141.88 m.s.l.

ARKANSAS STATE HIGHWAY COMMISSION MISSISSIPPI STATE HIGHWAY DEPARTMENT	
MISSISSIPPI RIVER BRIDGE NEAR HELENA, ARKANSAS	
RIVER STAGES	
SCALE 1" = 20'-0"	HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK
MADE J.L.U. DATE 2-15-56	TRCD. A.H. DATE 4-10-56
CKD. E.P.C. DATE 4-15-56	984 SHEET- 1.03

NO.	MADE	DATE	REVISION
1	M.A.C.	10-27-61	AS BUILT



GROUND PLAN
Scale: 1" = 200'

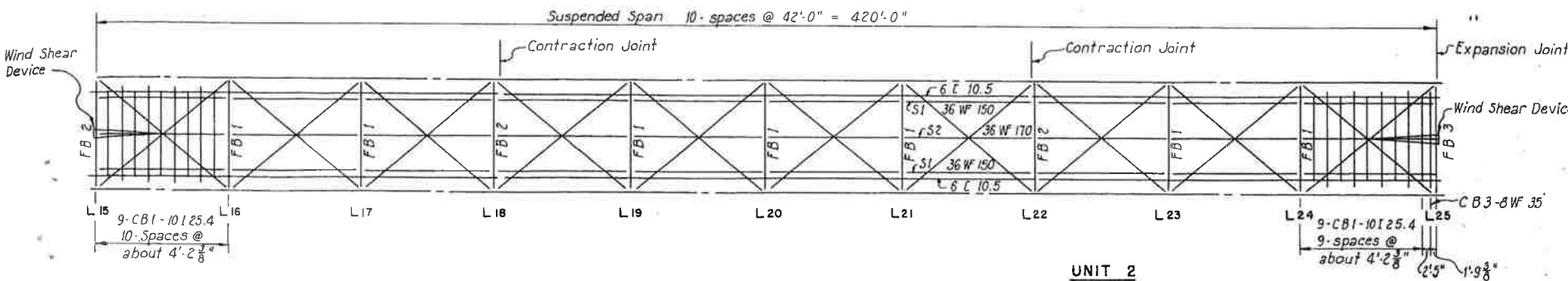
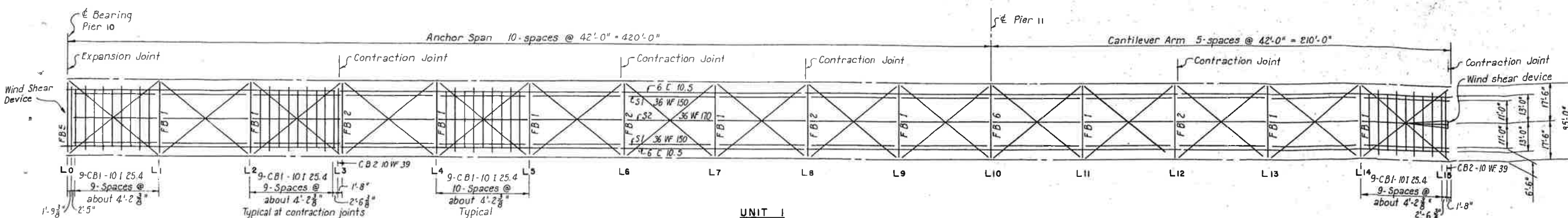
Note:
Borings made in February, March, April, 1956, by National Soil Services, Houston, Texas.
Borings B-5, B-9 and B-12 were wash type borings. Cores and/or semi-undisturbed samples taken in all other borings with 2" O.D. Split-spoon and Shelby tube samplers.
Numbers to left of borings are the number of blows of a 140" hammer falling thirty inches required to drive a 2" O.D. Split-spoon sampler one foot after first being driven six inches.
Samples of lignite layer obtained by driving 3" Shelby Tube sampler.
Log is of material encountered in the particular hole bored and is not guaranteed to represent material actually encountered in the excavation.

BORING SIGNS AND ABBREVIATIONS

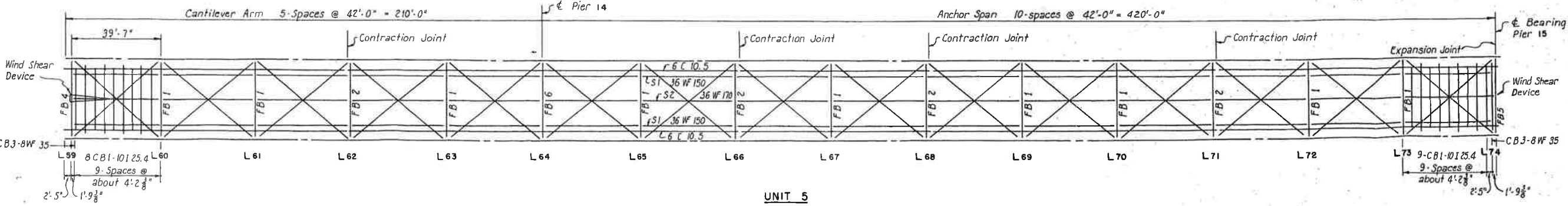
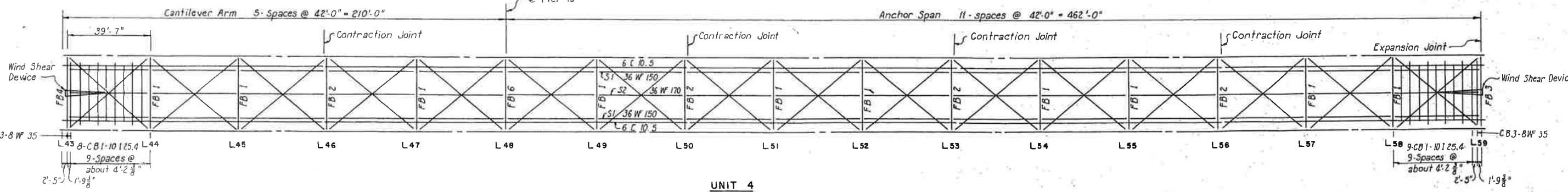
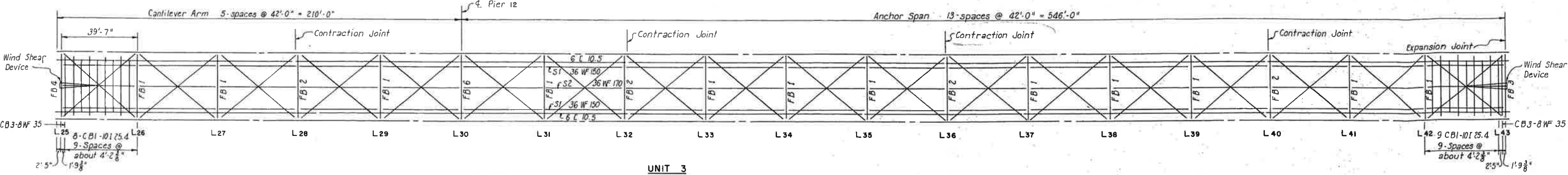
+	and	lgy	lignitic
→	becomes	lt	light
↓	below, after	ls	loose
-	to	me	medium
l	with	oc	occasional, some
br	brown	sa	sand
chg	changing	say	sandy
cl	clay	sf	stiff
clay	clayey	sh	shale
cn	clean	shy	shaley
co	coarse	si	silt
dn	dense	siy	silty
dk	dark	sk(s)	streak(s)
fi	fine	sl	slightly
fm	firm	sm(s)	seam(s)
gr	gray	so	soft
gv	gravel	ss	siltstone
gvq	gravelly	th	thin
hd	hard	tr(s)	trace(s)
lg	lignite	v	very

ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SUBSTRUCTURE BORINGS

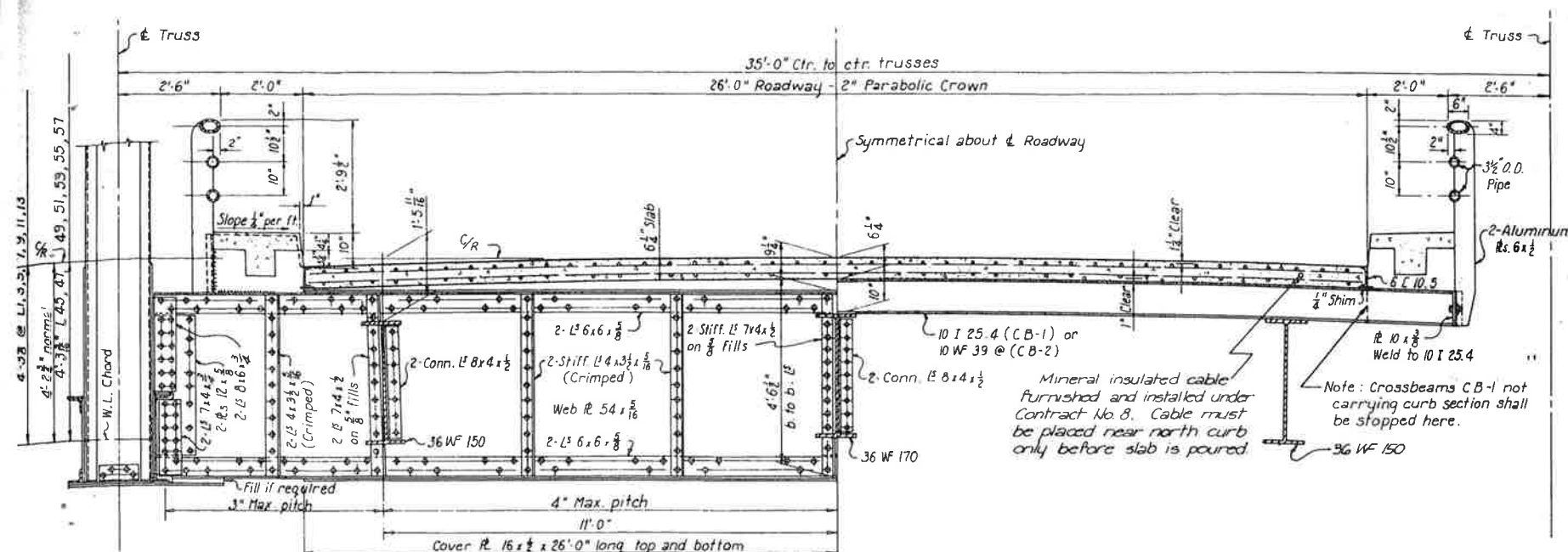


Note:
For details of floorbeams see sheet 4.06 and 4.07.
For details of lower laterals see sheet 4.22.
For lower strut at L15 see sheets 4.06 and 4.22.
Handrail posts to be located at floorbeams and fifth points between floorbeams.
Truss verticals are normal to grade line.
For distance between profile grade and bottom chords see sheets 4.06 and 4.07.
Panel lengths shown are measured on horizontal at normal temperature. The effect of grade and vertical curve should be taken account of in determining stringer lengths and crossbeam spacing.



ARKANSAS STATE HIGHWAY COMMISSION MISSISSIPPI STATE HIGHWAY DEPARTMENT MISSISSIPPI RIVER BRIDGE NEAR HELENA, ARKANSAS	
RIVER BRIDGE SPANS 11 - 15 FLOOR FRAMING PLANS	
SCALE 1" = 25'-0"	HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK
MADE 5-28-60 DATE 7-17-55 TRCD. A.H. DATE 4-16-56 CKD. C.E.D. DATE 7-27-56	984 SHEET-4.05

NO.	MADE	DATE	REVISION
1.	MAC	5-28-60	As Built

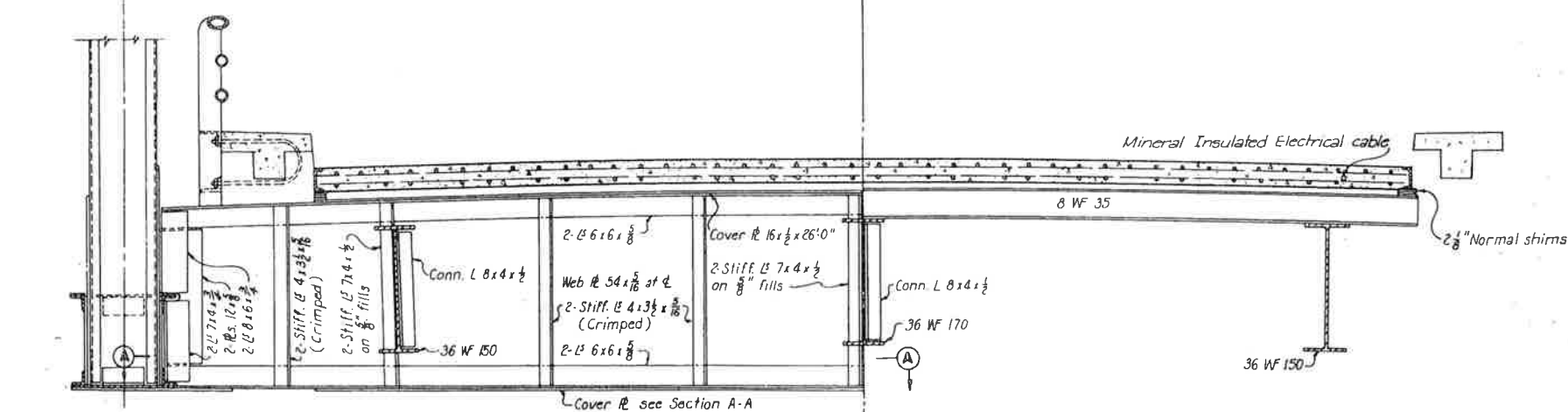


HALF SECTION AT FLOOR BEAM F B-1

Floor beam F B-2 similar

Scale: $\frac{1}{2}'' = 1'-0''$

HALF SECTION AT CROSS BEAMS C B-1 AND C B-2



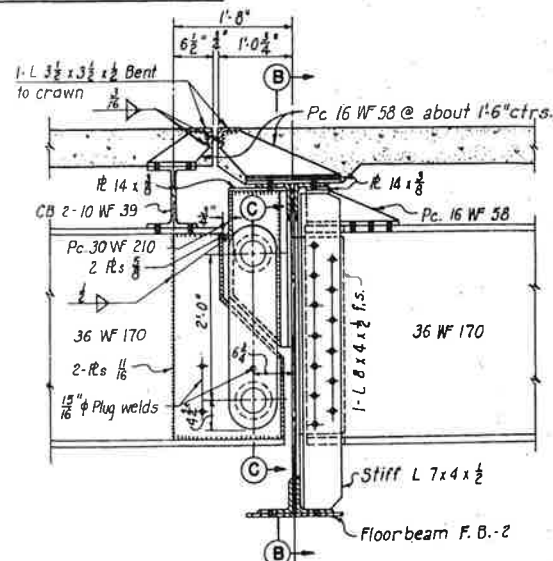
HALF SECTION AT FLOOR BEAM F B-3

Floor beam F B-4 similar

Scale: $\frac{1}{2}'' = 1'-0''$

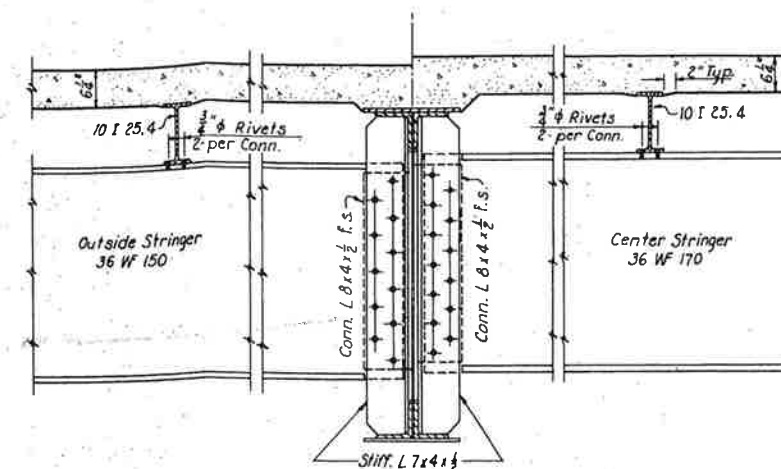
HALF SECTION AT CROSS BEAM C B-3

Note: Floor beams F B-3 and F B-4 to have a 2" parabolic haunch in top flange to match crown of roadway. Details not shown to be similar to floor beam F B-1.



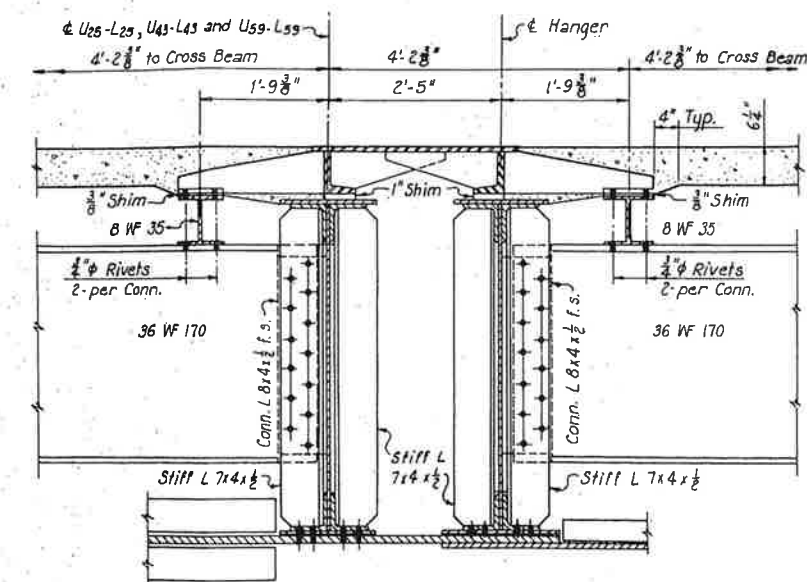
STRINGER CONNECTION AT CONTRACTION JOINT

Scale: $\frac{3}{4}'' = 1'-0''$



TYPICAL STRINGER CONNECTION TO FLOORBEAMS

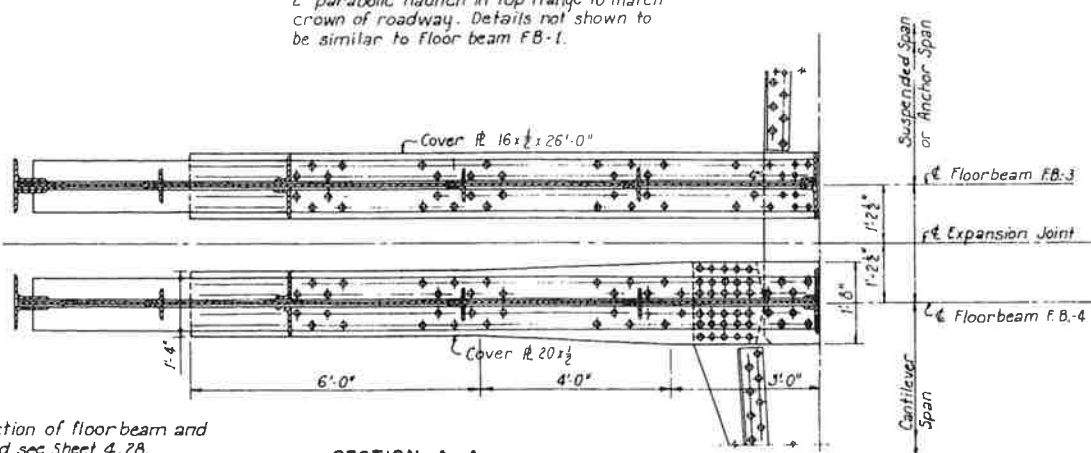
Scale: $\frac{1}{4}'' = 1'-0''$



STRINGER CONNECTION AT EXPANSION JOINT

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

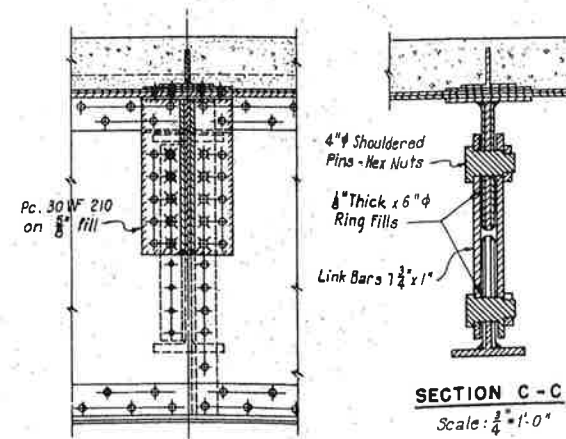
Note: For detail of Expansion Joint Casting see Sheet 4.09



SECTION A-A

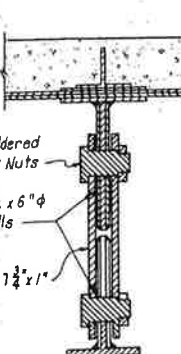
Scale: $\frac{1}{2}'' = 1'-0''$

Note: For connection of floor beam and truss chord see Sheet 4.28.



SECTION B-B

Scale: $\frac{3}{4}'' = 1'-0''$



SECTION C-C

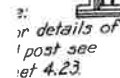
Scale: $\frac{1}{4}'' = 1'-0''$

Note: Pins will be made from A 235-54T (Class 1) or A 108-54T steel.

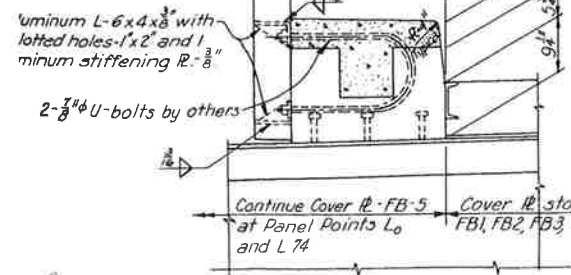
ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SPANS II - 15
FLOOR BEAMS AND STRINGER CONNECTIONS

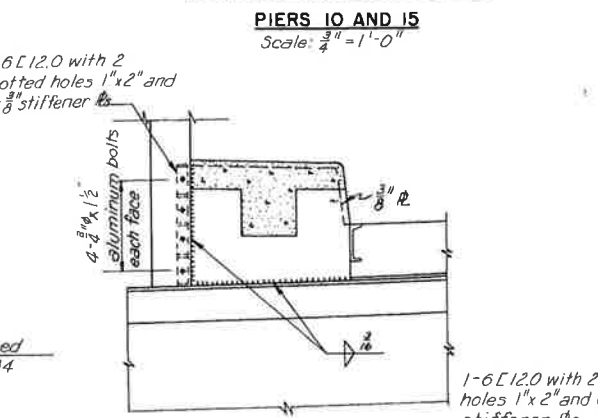
SCALE: As noted
MADE: 11-1-56
TRCD: 11-1-56
CKD: 11-1-56
HOWARD, NEEDLE, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
984-SHEET-4.06



HALF SECTION END FLOORBEAM FB-5

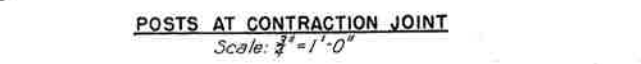


POSTS AT EXPANSION JOINTS
Scale: $\frac{3}{4}" = 1'-0"$

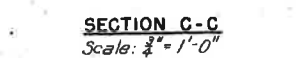


POSTS AT EXPANSION JOINTS

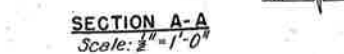
PIERS 10 AND 15
Scale: $\frac{3}{4}" = 1'-0"$



POSTS AT CONTRACTION JOINT
Scale: $\frac{3}{4}" = 1'-0"$



SECTION C-C
Scale: $\frac{3}{4}" = 1'-0"$



SECTION A-A
Scale: $\frac{1}{2}'' = 1'-0''$



WIND SHEAR DEVICE
Scale: 1" = 1'-0"



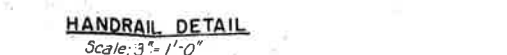
TYPICAL POST AT CROSSBEAM

TYPICAL SECTION AT FLOORBEAM 1

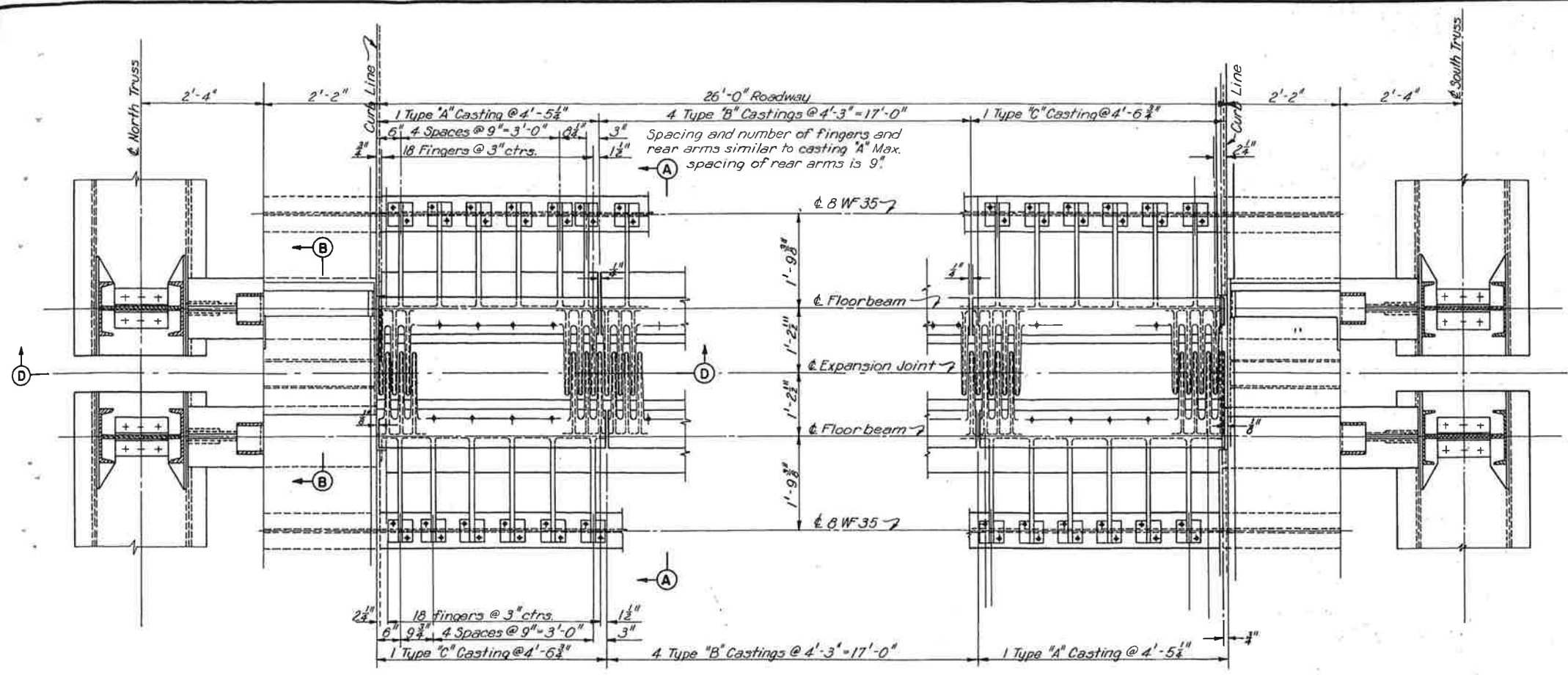
Notes:
Handrail posts to be spaced at about 8'-4 3/4" centers except as shown at joints.
Railing shall be fabricated in Units of 2, 3, or 4 Panels.
Wall thickness of rails shall be 1/2". All aluminum surfaces in contact with concrete or steel shall be coated with Aluminastic compound or equal.
Handrail and posts are aluminum. See the Specifications.



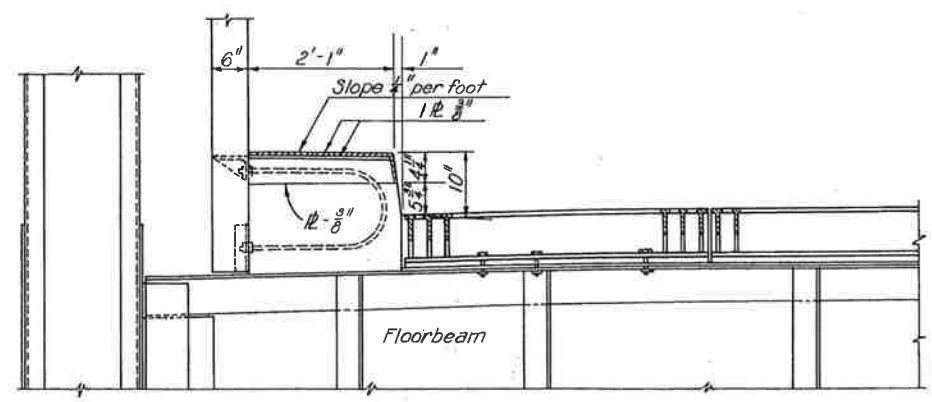
SECTION G-G
Scale: $\frac{3}{4}'' = 1'-0''$



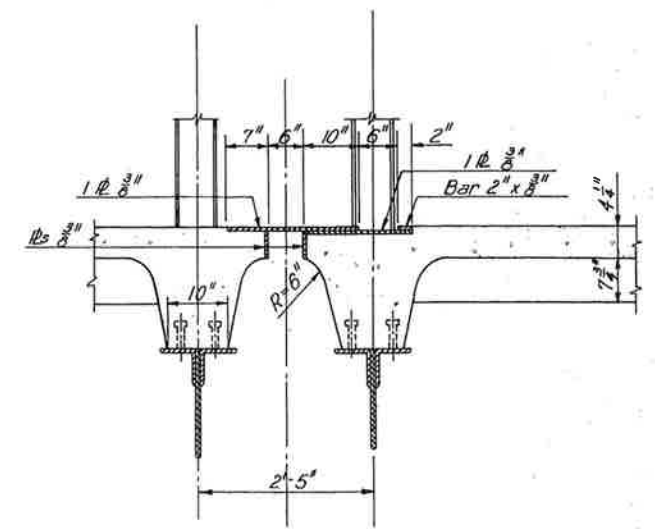
HANDRAIL DETAIL
Scale: 3" = 1'-0"



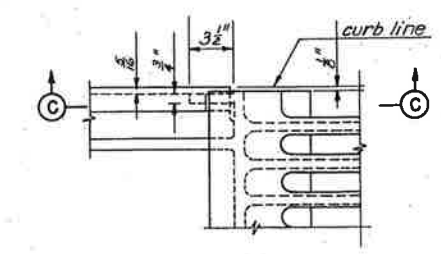
PLAN
Scale: 3/4" = 1'-0"



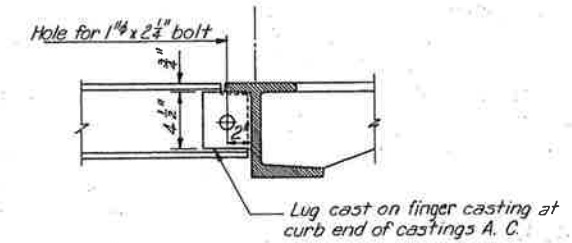
SECTION D-D
Scale: 3/4" = 1'-0"



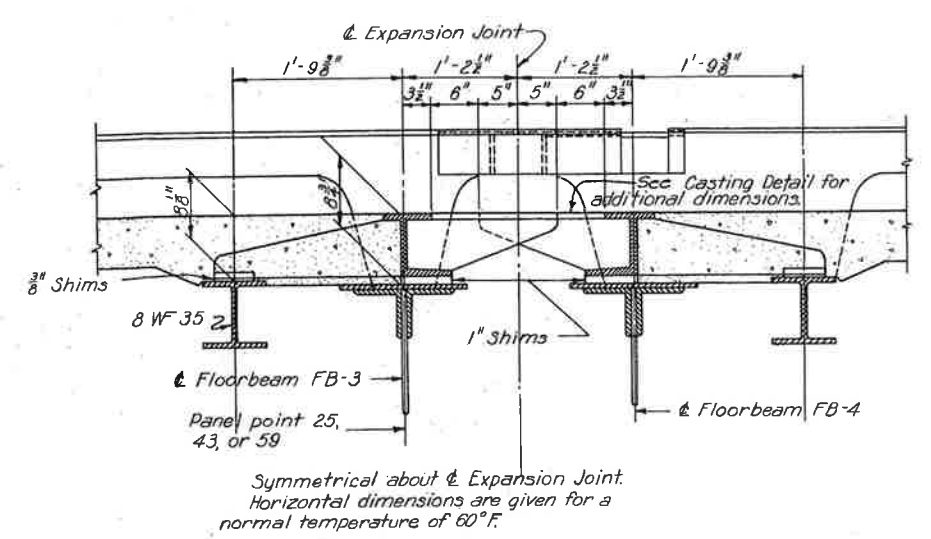
SECTION B-B
Scale: 3/4" = 1'-0"



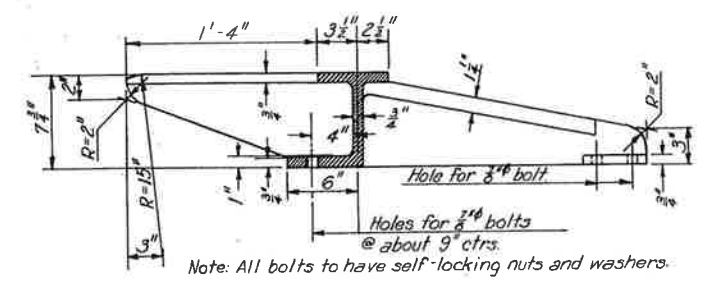
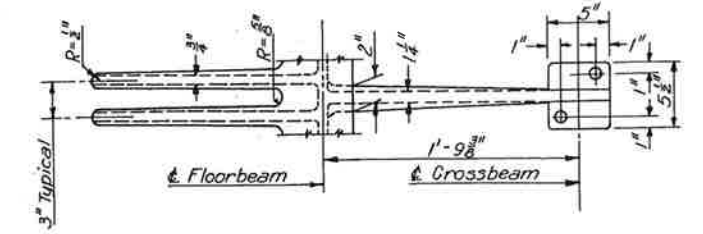
SECTION C-C



LUG DETAIL
Scale: 1 1/2" = 1'-0"



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



CASTING DETAIL
Scale: 1 1/2" = 1'-0"

NOTE ON CASTINGS

Roadway castings shall be of high strength steel and galvanized or metallized after shop assembly. They shall be machined to a smooth finish on all surfaces in contact with metal and shall have at least one machine cutting over the tops of the extended fingers.

ARKANSAS STATE HIGHWAY COMMISSION MISSISSIPPI STATE HIGHWAY DEPARTMENT	
MISSISSIPPI RIVER BRIDGE NEAR HELENA, ARKANSAS	
RIVER BRIDGE SPANS 11 - 15 ROADWAY EXPANSION JOINTS SPANS 12, 13, 14	
SCALE As Shown	HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK
MADE DME DATE 4-25-56	TRCD GJK DATE 8-28-56
CKD GR DATE 9-13-56	984 SHEET 4.09

NO.	MADE	DATE	REVISION
1.	M.A.C.	5-28-62	As Built

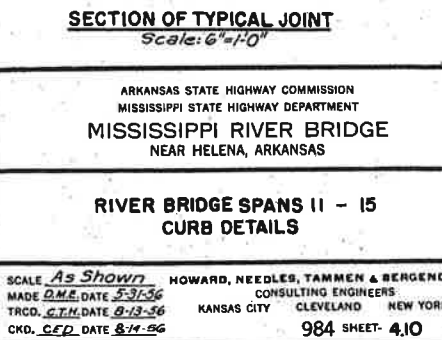
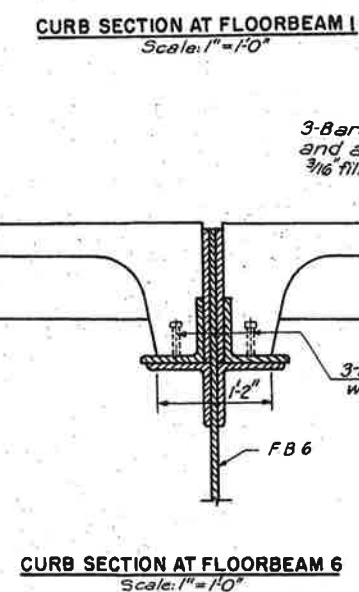
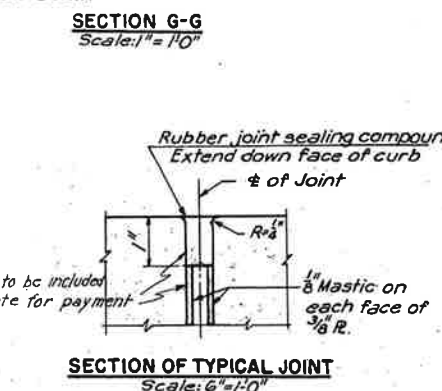
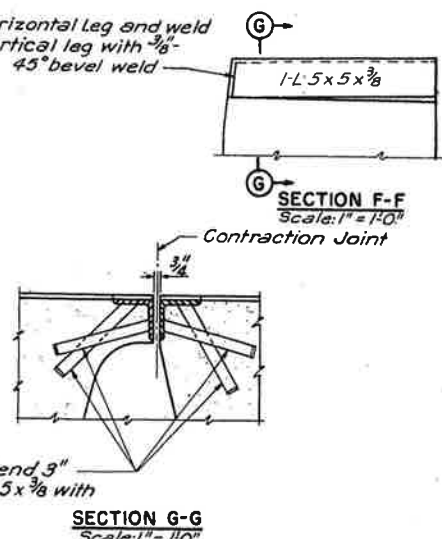
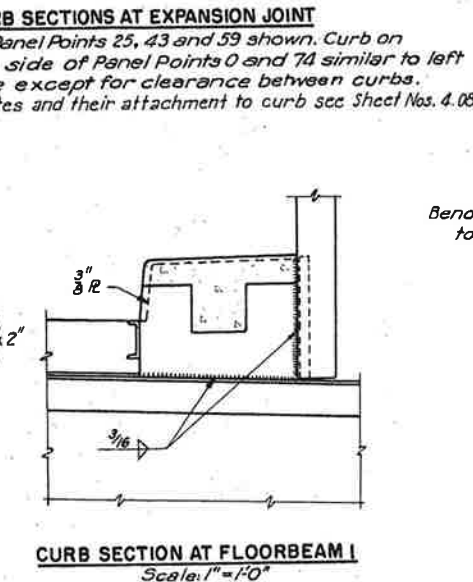
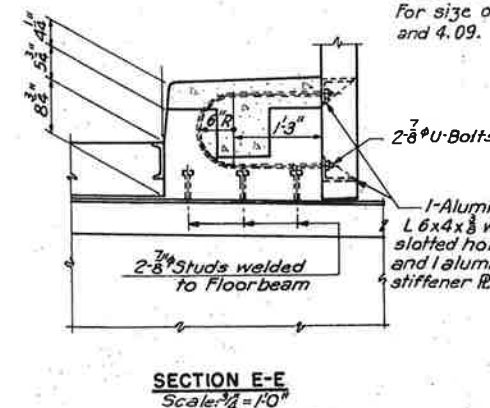
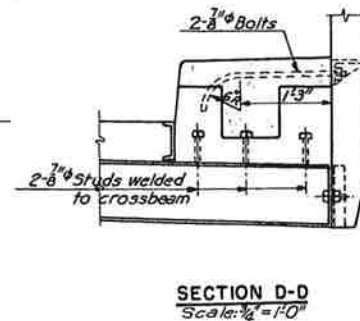
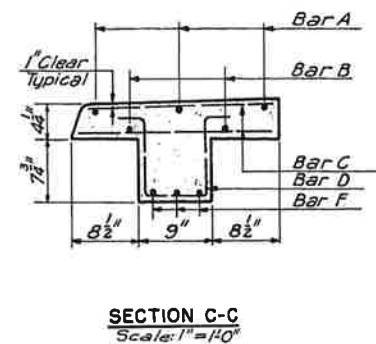
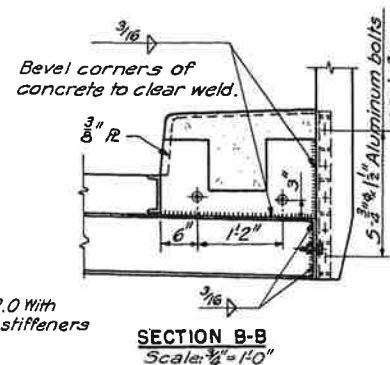
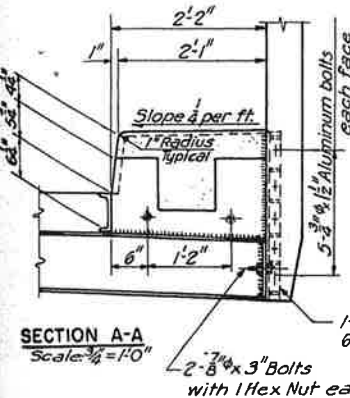
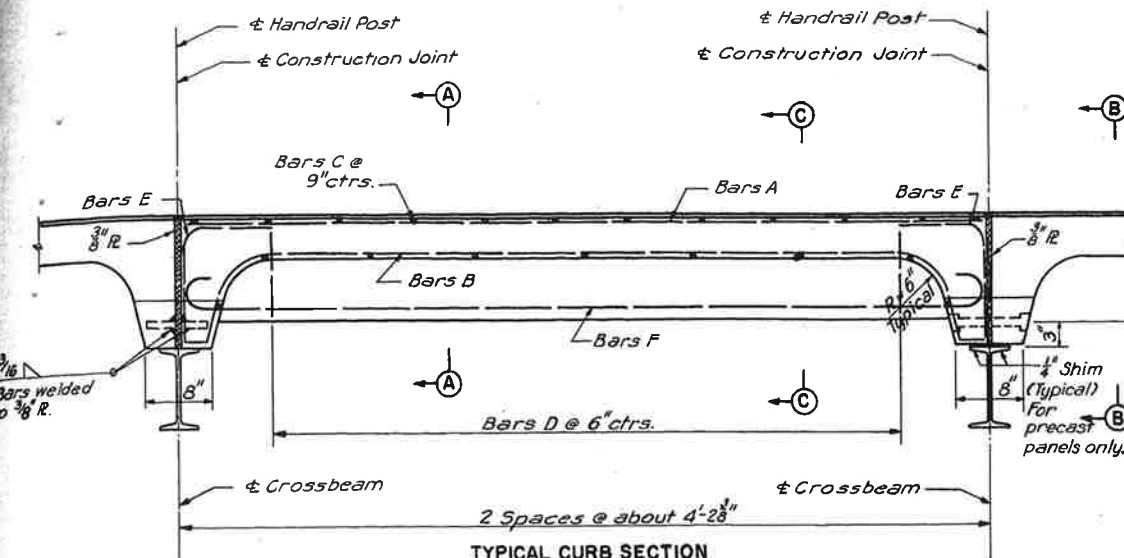
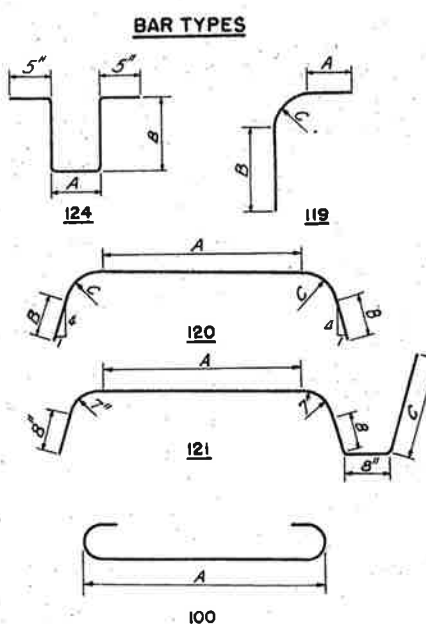


TABLE OF CURB REINFORCING BARS										
UNIT	E, C B OR T	DIMENSIONS		NO.	REINFORCING BARS EACH SECTION					
		C-C BRACKETS	NO. BRACKET TO EDGE OF SLAB		A	B	C	D	E	F
UNIT 1	E	8'-4 3/4"	1'-0 1/2"	2	3-406	2-412	23-403	14-404	3-405	3-702
	T	8'-4 3/4"	—	126	3-401	2-402	21-403	14-404	6-405	3-701
	B	8'-4 3/4"	—	4	3-401	2-413	21-403	14-404	6-405	3-705
	C	8'-4 3/4"	1'-0 3/4"	8	3-406	2-410	23-403	14-404	3-405	3-702
	C	6'-8 3/4"	0'-6 1/2"	10	3-407	2-408	18-403	10-404	3-405	3-703
UNIT 2	C	8'-4 3/4"	1'-0 3/4"	6	3-406	2-410	23-403	14-404	3-405	3-702
	C	6'-8 3/4"	0'-6 1/2"	4	3-407	2-408	18-403	10-404	3-405	3-703
	T	8'-4 3/4"	—	88	3-401	2-402	21-403	14-404	6-405	3-701
	E	8'-4 3/4"	0'-11 1/2"	2	3-406	2-412	21-403	14-404	3-405	3-702
	E	5'-11 3/4"	0'-11 1/2"	2	3-409	2-411	18-403	9-404	3-405	3-704
UNIT 3	T	8'-4 3/4"	—	156	3-401	2-402	21-403	14-404	6-405	3-701
	B	8'-4 3/4"	—	4	3-401	2-413	21-403	14-404	6-405	3-705
	C	6'-8 3/4"	0'-6 1/2"	8	3-407	2-408	18-403	10-404	3-405	3-703
	C	8'-4 3/4"	1'-0 3/4"	8	3-406	2-410	23-403	14-404	3-405	3-702
	E	8'-4 3/4"	0'-11 1/2"	2	3-406	2-412	21-403	14-404	3-405	3-702
UNIT 4	E	5'-11 3/4"	0'-11 1/2"	2	3-409	2-411	18-403	9-404	3-405	3-704
	T	8'-4 3/4"	—	136	3-401	2-402	21-403	14-404	6-405	3-701
	B	8'-4 3/4"	—	4	3-401	2-413	21-403	14-404	6-405	3-701
	C	6'-8 3/4"	0'-6 1/2"	8	3-407	2-408	18-403	10-404	3-405	3-703
	C	8'-4 3/4"	1'-0 3/4"	8	3-406	2-410	23-403	14-404	3-405	3-702
UNIT 5	E	8'-4 3/4"	0'-11 1/2"	2	3-406	2-412	21-403	14-404	3-405	3-702
	E	5'-11 3/4"	0'-11 1/2"	2	3-409	2-411	18-403	9-404	3-405	3-704
	T	8'-4 3/4"	—	126	3-401	2-402	21-403	14-404	6-405	3-701
	B	8'-4 3/4"	—	4	3-401	2-413	21-403	14-404	6-405	3-705
	C	6'-8 3/4"	0'-6 1/2"	8	3-407	2-408	18-403	10-404	3-405	3-703
	C	8'-4 3/4"	1'-0 3/4"	8	3-406	2-410	23-403	14-404	3-405	3-702
	F	8'-4 3/4"	1'-0 1/2"	2	3-406	2-412	21-403	14-404	3-405	3-702

REINFORCEMENT SCHEDULE										
MARK	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5	LENGTH	TYPE	DIMENSION		
								A	B	C
401	390	264	480	420	390	8'-0"	Str.			
402	252	176	312	272	252	9'-2"	120	6'-5"	8"	
403	3140	2100	3766	3346	3136	1'-9"	Str.			
404	2060	1384	2478	2198	2058	2'-10"	124	6"	9"	
405	840	564	1020	900	840	2'-0"	119	8"	12"	3"
406	30	24	30	30	30	9'-3"	Str.			
407	30	12	24	24	24	7'-0"	Str.			
408	20	8	16	16	16	9'-4"	121	4'-8"	8"	1'-3"
409			6	6	6	6'-9"	Str.			
410	16	12	16	16	16	11'-2"	121	6'-4"	9"	1'-4"
411			4	4	4	8'-11"	121	3'-11"	10"	1'-5"
412	4	4	4	4	4	11'-6"	121	6'-4"	10"	1'-5"
413	8		8	8	8	9'-0"	120	6'-2"	8"	
701	378	264	468	408	378	10'-0"	100	8'-2"		
702	30	24	30	30	30	10'-6"	100	8'-8"		
703	30	12	24	24	24	9'-0"	100	7'-2"		
704			6	6	6	8'-3"	100	6'-5"		
705	12		12	12	12	9'-10"	100	8'-0"		



Notes:
For Expansion Joint Details see Sheet Nos. 4.08 and 4.09
For Handrail Details see Sheet No. 4.07
For location of Expansion Joints and Contraction Joints see Sheet No. 4.05
Curb panels next to contraction or expansion joints are cast-in-place whether the other panels are precast or not.

Curbs are to be made with light weight aggregate, maximum weight of concrete of 105 lbs. per cubic foot.

NO.	MADE	DATE	REVISION
1.	MAG	5-28-62	As Built

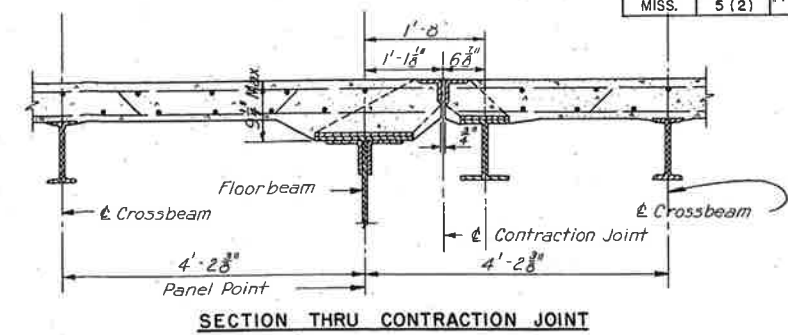
ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SPANS II - 15
CURB DETAILS

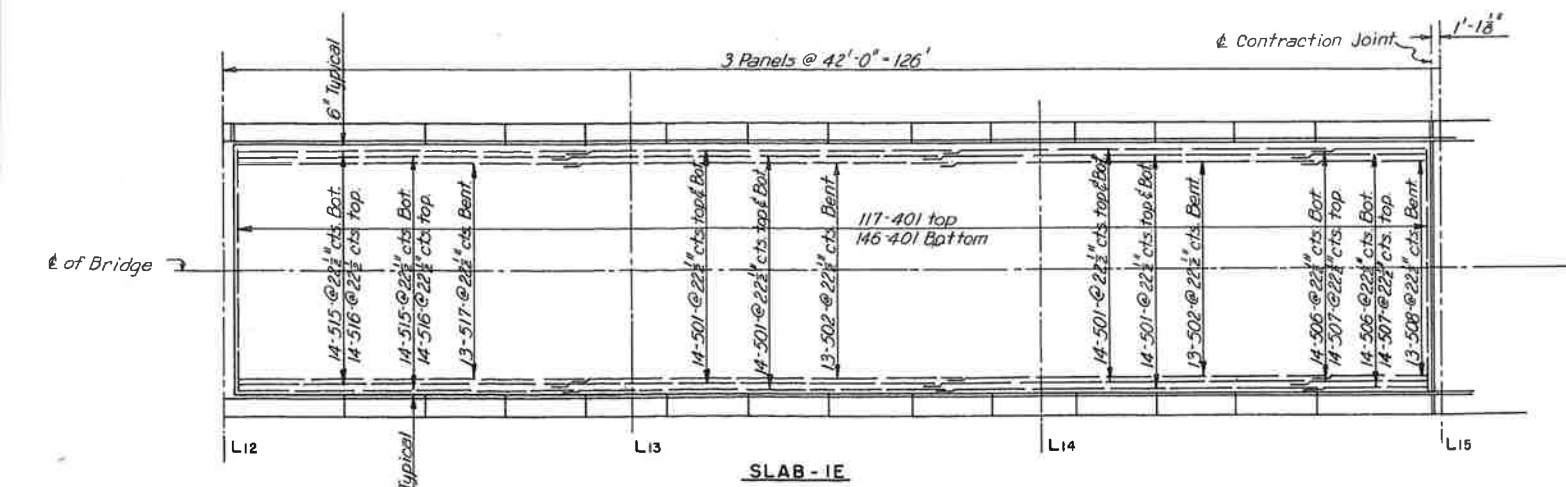
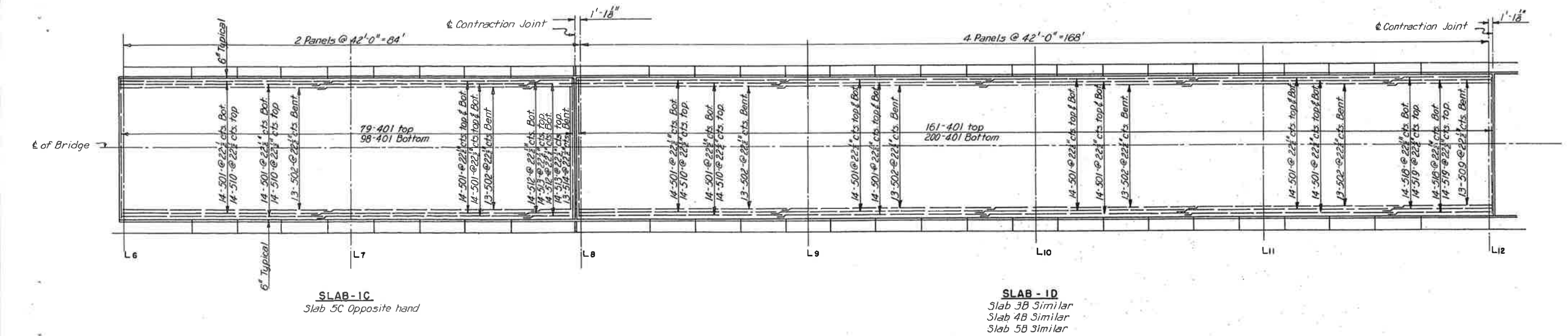
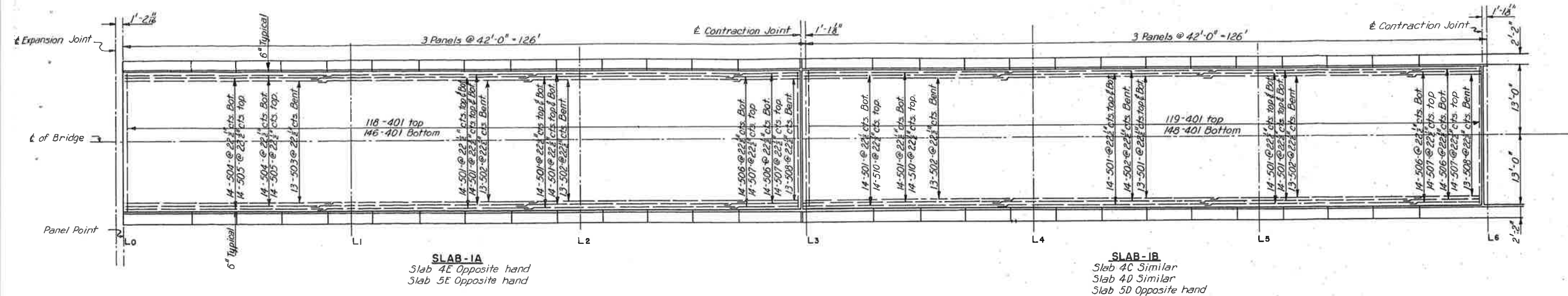
SCALE: As Shown
MADE: 5-28-62
TRCD: 6-13-56
CKD: 6-13-56

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

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SCALE $\frac{3}{4}'' = 1' - 0''$ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE EFC DATE 2-27-56 CONSULTING ENGINEERS
TRCD. GJK DATE 4-19-56 KANSAS CITY CLEVELAND NEW YORK
CKD. DER DATE 4-17-56 984 SHEET-4.11

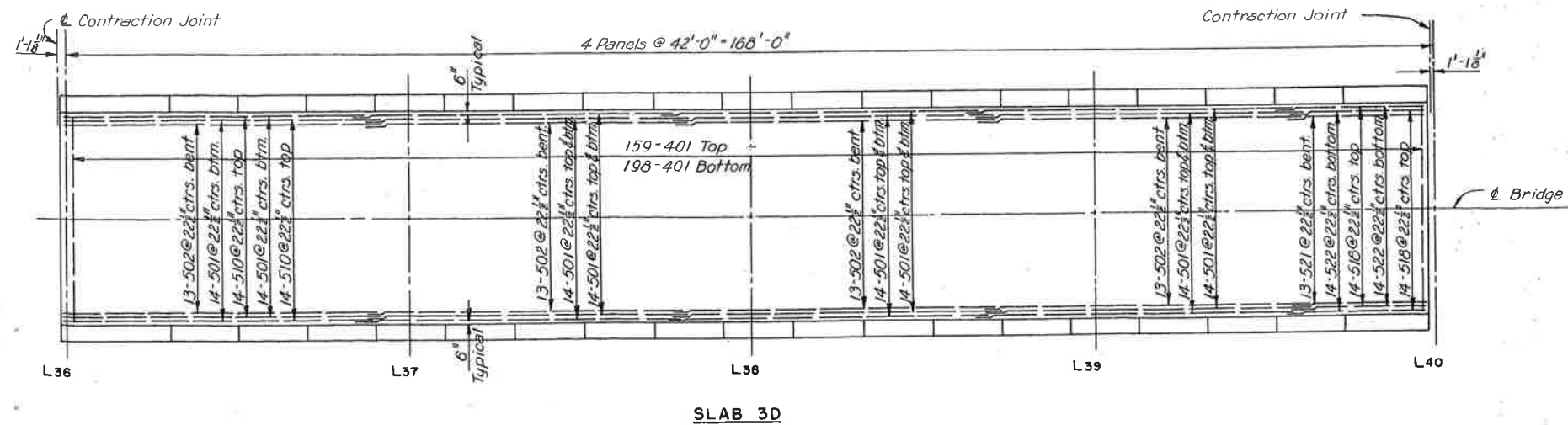
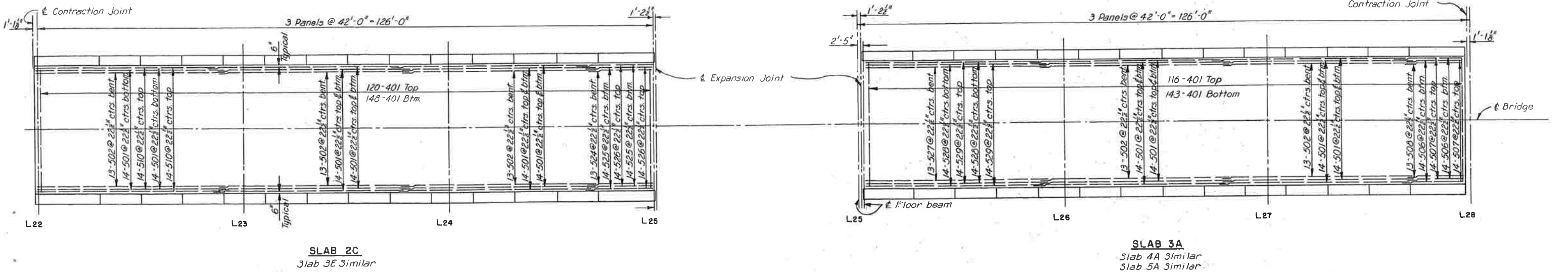
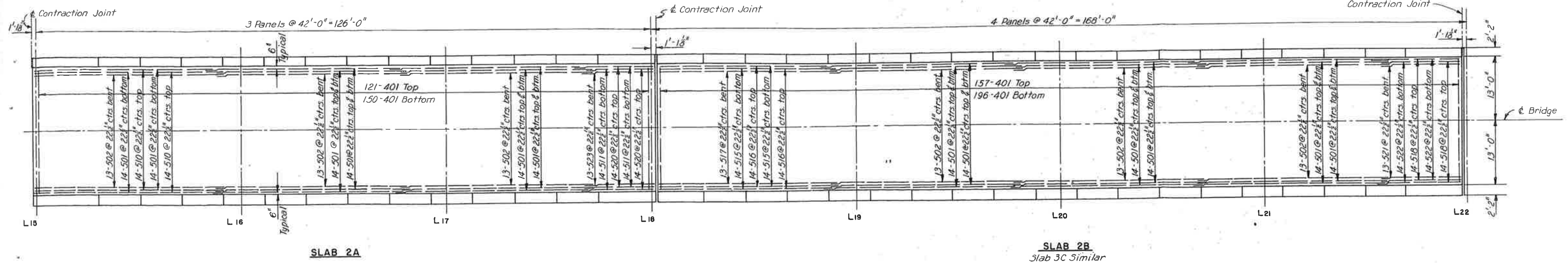


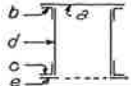
ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SPANS II - 15
ROADWAY SLAB REINFORCING

1.	M.A.C. 5286	As Built	
NO.	MADE	DATE	REVISION

SCALE 1" = 10'-0"
MADE H.A.K. DATE 2-21-56
TRCD. G.J.K. DATE 4-14-56
CKD. D.E.R. DATE 4-12-56
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
984 SHEET 4.12

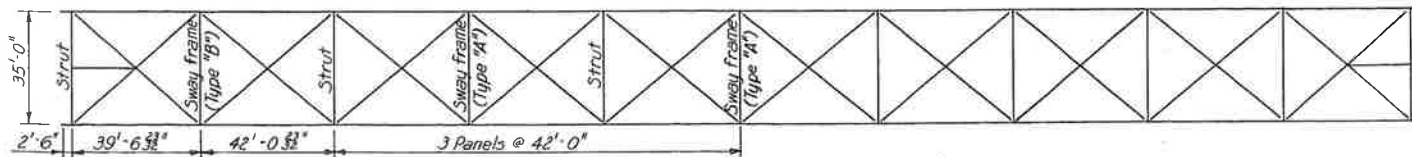


Line	MEMBER	TOP CHORD												BOTTOM CHORD											
		U15 U16	U16 U17	U17 U18	U18 U19	U19 U20	U20 U21	U21 U22	U22 U23	U23 U24	U24 U25	L15 L16	L16 L17	L17 L18	L18 L19	L19 L20	L20 L21	L21 L22	L22 L23	L23 L24	L24 L25				
1	Dead Load	-366	-366	-879	-879	-1043	-1043	-879	-879	-366	-366	0	672	672	1001	1001	1001	1001	672	672	0				
2	Rdwy. LL + I Tension												221	221	332	332	332	332	221	221					
3	Rdwy. LL + I Compression	-119	-119	-289	-289	-345	-345	-289	-289	-119	-119														
4	Direct Design Stress	-485	-485	-1168	-1168	-1388	-1388	-1168	-1168	-485	-485	*3	893	893	1333	1333	1333	1333	893	893	*3				
5	Reverse Design Stress																								
6	100 % T.W. (75%)	±109	±109	±196	±196	±213	±213	±196	±196	±109	±109	±83	±332	±332	±440	±440	±440	±440	±332	±332	±83				
7	100 % L.W. (65%)	±3	±3	±3	±3	±2	±2	±3	±3	±3	±3	±193	±165	±165	±126	±126	±126	±126	±165	±165	±193				
8	100 % Q.W. (47% T, 41% L)	±70	±70	±125	±125	±134	±134	±125	±125	±70	±70	±173	±312	±312	±356	±356	±356	±356	±312	±312	±173				
9	Dead Load + 100 % Wind	-475	-475	-1075	-1075	-1256	-1256	-1075	-1075	-475	-475		1004	1004	1441	1441	1441	1441	1004	1004					
10	30 % T.W. (22.5%) 0.3 TC 0.438 B.C.	±33	±33	±59	±59	±64	±64	±59	±59	±33	±33	±36	±146	±146	±193	±193	±193	±193	±146	±146	±36				
11	30 % L.W. (19.5%)	±1	±1	±1	±1	±1	±1	±1	±1	±1	±1	±58	±50	±50	±38	±38	±38	±38	±50	±50	±58				
12	30 % Q.W. (14.1% T, 5.85% L)	±22	±22	±38	±38	±41	±41	±38	±38	±22	±22	±59	±123	±123	±145	±145	±145	±145	±123	±123	±59				
13	D+L+I+30 % Wind	-518	-518	-1227	-1227	-1452	-1452	-1227	-1227	-518	-518		1039	1039	1526	1526	1526	1526	1039	1039					
14																									
SECTIONS																									
		a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 1/2 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	See L24 L25 a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2	a-Cov. Pl. 31 x 3/8 b-c-b 4 x 4 x 3/8 d-2 Pls. 24 x 3/8 e-Pl. 31 x 1/2					
15	Length	504.7	504.7	504	504	504	504	504	504	504.7	504.7	504									504				
16	Min Radius of Gyration	10.52	10.52	10.48	10.48	10.45	10.45	10.48	10.48	10.52	10.52	10.42									10.42				
17	Allowable Stress psi	14420	14420	14420	14420	20700	20700	14420	14420	14420	14420	14410	18000	18000	27000	27000	27000	27000	18000	18000	14410				
18	Actual Gross Area Sq. In.	75.95	75.95	87.44	87.44	83.88	83.88	87.44	87.44	75.95	75.95	64.94	64.07	64.07	64.07	64.07	64.07	64.07	64.07	64.07	64.94				
19	Net Area Sq. In.	74.62	74.62	87.44	87.44	80.38	80.38	87.44	87.44	74.62	74.62	58.19	53.57	53.57	53.57	53.57	53.57	53.57	53.57	53.57	58.19				
20	Actual Unit Stress psi #2	6490	6490	13360	13360	17270	17270	13360	13360	6490	6490	16670	16670	16670	24900	24900	24900	24900	16670	16670					
21	Material	C	C	C	C	A	A	C	C	C	C	C	C	C	A	A	A	A	C	C	C				

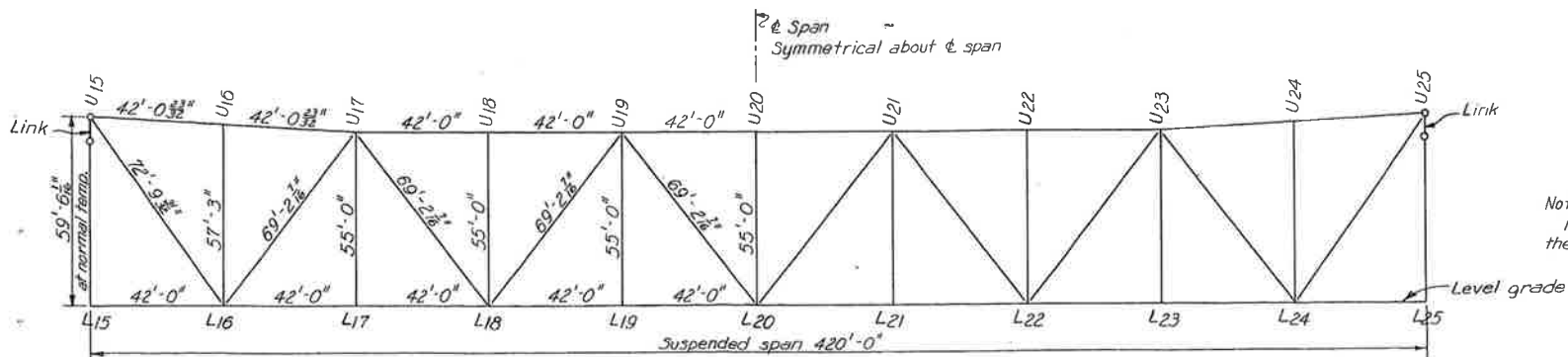
Line		MEMBER	DIAGONALS										POSTS					HANGERS							
			U15 L16	L16 U17	U17 L18	L18 U19	U19 L20	L20 U21	U21 L22	L22 U23	U23 L24	L24 U25	U16 L16	U18 L18	U20 L20	U22 L22	U24 L24	U15 L15	U17 L17	U19 L19	U21 L21	U23 L23	U25 L25		
1	Dead Load		634	-504	342	-201	88	88	-201	342	-504	634													
2	Rdwy. LL+I Tension		217	4	138	34	79	79	34	138	4	217													
3	Rdwy. LL+I Compression			-183	-18	-106	-55	-55	-106	-18	-183														
4	Direct Design Stress		851	-687	480	-307	147	147	-307	480	-687	851													
5	Reverse Design Stress																								
6	100 % T.W. (75%)																								
7	100 % L.W. (65%)		±11	±11	±11	±11	±11	±11	±11	±11	±11														
8	100 % Q.W. (47% T 41% L)																								
9	Dead Load + 100 % Wind																								
10	30 % T.W. (22.5%) 0.3 TC 0.438 B.C.																								
11	30 % L.W. (19.5%)		±3	±3	±3	±3	±3	±3	±3	±3	±3														
12	30 % Q.W. (14.1% T 5.85% L)																								
13	D+L+I + 30 % Wind																								
14																									
SECTIONS																									
		2 C 18 x 51.9 2 Pls. 24 x 3/8	2 C 18 x 45.8 2 Pls. 24 x 3/8	2 C 18 x 42.7 2 Pls. 22 x 3/8	2 C 18 x 42.7 2 Pls. 22 x 3/8	2 C 18 x 42.7 2 Pls. 22 x 3/8	2 C 18 x 42.7 2 Pls. 22 x 3/8	2 C 18 x 42.7 2 Pls. 22 x 3/8	2 C 18 x 45.8 2 Pls. 24 x 3/8	2 C 18 x 51.9 2 Pls. 24 x 3/8		2-12 L3 x 25 1-Web pl. 3/8 #1		2-12 L3 x 25.0 1-Web pl. 3/8 #1											
15	Length		740		750			750		740															
16	Min. Radius of Gyration		7.68		7.05			7.05		7.68															
17	Allowable Stress psi		27000	16790	18000	12170	18000	18000	12170	18000	16790	27000													
18	Actual Gross Area Sq. In.		53.16	50.76	38.81	38.81	36.06	36.06	38.81	38.81	50.76	53.16	21.57	21.57	21.57	21.57	21.57	21.57	21.57	21.57	21.57	21.57			
19	Net Area Sq. In.		45.66	46.07	32.81	35.31	30.56	30.56	35.31	32.81	46.07	45.66													
20	Actual Unit Stress psi #2		18640	14920	14630	8700	4820	4820	8700	14630	14920	18640													
21	Material		A	A	C	C	C	C	C	A	A		C	C	C	C	C	C	C	C	C	C			

*1 Width of web is determined by distance between gusset plates.
*2 Actual unit stresses were derived from direct design stresses.
*3 L15 L16 and L24 L25 governed by erection stresses.

TRUSS REACTIONS		
Point Of Support	Dead Load	Live Load + Impact
Pier 10	+102 ^k	+190 ^k
Pier 11	+2395 ^k	+616 ^k
Link U-15	+572 ^k	+190 ^k
Link U-25	+572 ^k	+190 ^k
Pier 12	+2457 ^k	+627 ^k
Link U-43	+396 ^k	+233 ^k
Pier 13	+2096 ^k	+147 ^k
Link U-59	+296 ^k	+205 ^k
Pier 14	+1914 ^k	+696 ^k
Pier 15	+240 ^k	+243 ^k



TOP LATERALS



ELEVATION

Span on level grade

Note: Figures on Stress Sheet do not include the DL stresses for future paving.

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MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

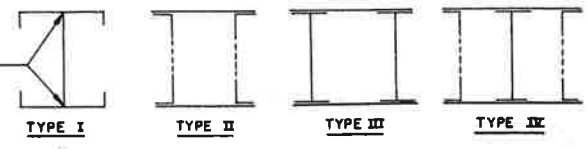
RIVER BRIDGE SPANS 11 - 15
STRESS SHEET UNIT 2

SCALE 1" = 30'
MADE 1/10/56 DATE 3-27-56
TRCD. G.H. DATE 4-27-56
CKD. G.H. DATE 9-17-56

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

984 SHEET 4.16

1.	MAC, 522962	As Built
NO.	MADE	DATE
		REVISION

[illegible][illegible]

ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

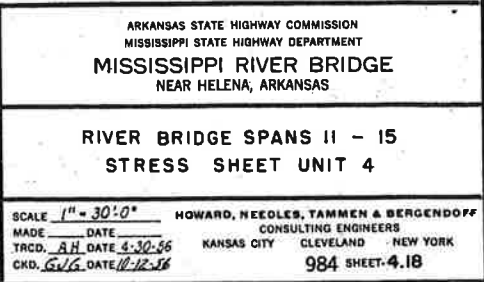
RIVER BRIDGE SPANS 11 - 15
STRESS SHEET UNIT 3

SCALE $1" = 30' 0"$
MADE 10-14 DATE 8-15-56
TRCD 4-18-56 DATE 5-1-56
CKD EFC DATE 10-17-56

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
984 SHEET-4.17

[illegible]

*1 - For reinforcement see details.
*2 - Section varies see details.
*3 - Width of web is determined by distance between gusset plates.
*4 - Actual unit stress derived from direct design stress.

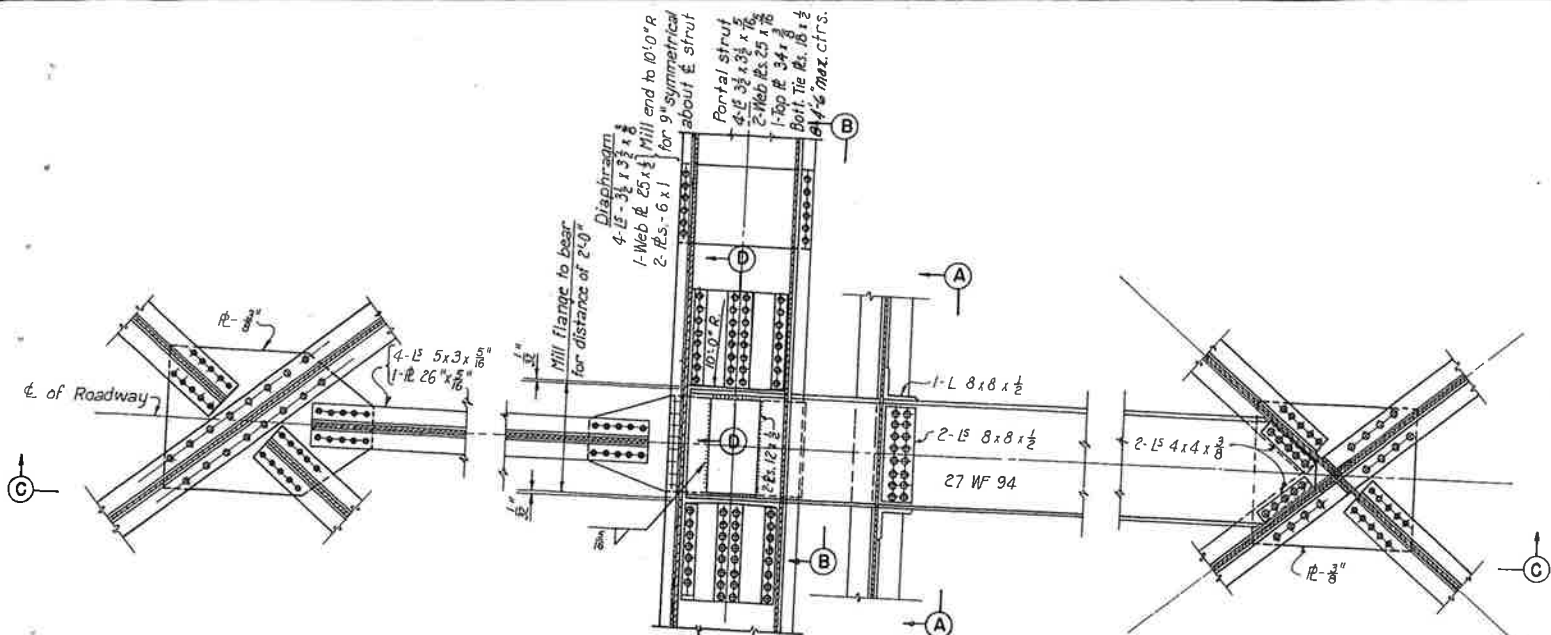


Line		TOP CHORD														BOTTOM CHORD															
		MEMBER	U59 U60	U60 U61	U61 U62	U62 U63	U63 U64	U64 U65	U65 U66	U66 U67	U67 U68	U68 U69	U69 U70	U70 U71	U71 U72	U72 U73	L59 L60	L60 L61	L61 L62	L62 L63	L63 L64	L64 L65	L65 L66	L66 L67	L67 L68	L68 L69	L69 L70	L70 L71	L71 L72	L72 L73	L73 L74
1	Dead Load		+ 237	+ 237	+ 237	+1235	+1235	+1235	+ 310	+ 310	+ 310	- 72	- 72	- 200	- 200	0	- 684	- 684	- 662	- 668	- 699	- 699	- 715	- 715	- 101	- 101	+ 177	+ 177	+ 143	+ 143	
2	Roadway LL + I Tension		+ 154	+ 154	+ 154	+ 604	+ 604	+ 604	+ 575	+ 575	+ 575	+ 444	+ 444	+ 231	+ 231	0	+ 207	+ 207	+ 222	+ 222	+ 409	+ 409	+ 416	+ 416	+ 525	+ 525	+ 419	+ 419	+ 165	+ 165	
3	Roadway LL + I Compression		- 86	- 86	- 86	- 274	- 274	- 274	- 500	- 500	- 500	- 487	- 487	- 305	- 305	0	- 399	- 399	- 414	- 414	- 612	- 612	- 612	- 612	- 533	- 533	- 347	- 347	- 116	- 116	
4	Direct Design Stress		+ 391	+ 391	+ 391	+1839	+1839	+1839	+ 980	+ 980	+ 980	- 745	- 745	- 521	- 521	0	-1083	-1083	-1082	-1082	-1311	-1311	-1312	-1327	- 846	- 846	+ 681	+ 681	+ 308	+ 308	
5	Reverse Design Stress		-	-	-	-	-	-	- 285	- 285	- 285	+ 558	+ 558	+ 47	+ 47	-	-	-	-	-	-	-	-	-	+ 636	+ 636	- 255	- 255	-	-	
6	100 % T.W. (75 #)		+ 48	+ 153	+ 276	+ 343	+ 354	+ 352	+ 343	+ 390	+ 341	+ 291	+ 240	+ 192	+ 112	+ 63	+ 90	+ 292	+ 538	+ 824	+ 1151	+ 759	+ 679	+ 597	+ 514	+ 408	+ 418	+ 398	+ 335	+ 252	+ 117
7	100 % L.W. (65 #)		+ 4	+ 1	+ 9	+ 7	+ 1	+ 11	+ 20	+ 11	+ 17	+ 22	+ 16	+ 20	+ 9	+ 13	+ 5	+ 44	+ 58	+ 73	+ 88	+ 198	+ 182	+ 168	+ 153	+ 120	+ 109	+ 75	+ 64	+ 29	+ 18
8	100 % Q.W. (47 # T, 41 # L)		+ 33	+ 97	+ 179	+ 220	+ 223	+ 229	+ 228	+ 249	+ 224	+ 196	+ 160	+ 133	+ 76	+ 48	+ 60	+ 211	+ 374	+ 562	+ 778	+ 600	+ 540	+ 480	+ 419	+ 332	+ 331	+ 297	+ 250	+ 176	+ 85
9	Dead Load + 100 % Wind		+ 285	+ 390	+ 513	+1578	+1589	+1587	+1578	+ 700	+ 651	+ 601	- 312	- 264	- 312	- 263	+ 90	- 976	-1222	-1492	-1819	-1458	-1378	-1312	-1224	- 509	- 519	+ 575	+ 512	+ 395	+ 260
10	30 % T.W. (22.5 #) 0.3 T.C. 0.427 B.C.		+ 14	+ 46	+ 83	+ 103	+ 106	+ 106	+ 103	+ 117	+ 102	+ 88	+ 72	+ 58	+ 34	+ 19	+ 39	+ 125	+ 230	+ 352	+ 495	+ 324	+ 290	+ 255	+ 220	+ 175	+ 179	+ 170	+ 143	+ 108	+ 50
11	30 % L.W. (19.5 #)		+ 1	0	+ 3	+ 2	0	+ 3	+ 6	+ 3	+ 5	+ 7	+ 5	+ 6	+ 3	+ 4	+ 2	+ 13	+ 17	+ 22	+ 26	+ 59	+ 55	+ 50	+ 46	+ 36	+ 33	+ 23	+ 19	+ 9	+ 5
12	30 % Q.W. (14.1 # T, 12.3 # L)		+ 10	+ 29	+ 53	+ 66	+ 67	+ 69	+ 69	+ 75	+ 607	+ 59	+ 48	+ 40	+ 23	+ 14	+ 26	+ 87	+ 155	+ 234	+ 327	+ 240	+ 216	+ 191	+ 167	+ 133	+ 133	+ 121	+ 102	+ 73	+ 35
13	D + L + I + 30 % Wind		+ 405	+ 437	+ 474	+1942	+1945	+1945	+1942	+1097	+1082	+1068	- 817	- 803	- 555	- 540	+ 39	-1208	-1313	-1434	-1577	-1635	-1601	-1582	-1547	-1021	-1025	+ 851	+ 824	+ 416	+ 358
14																															

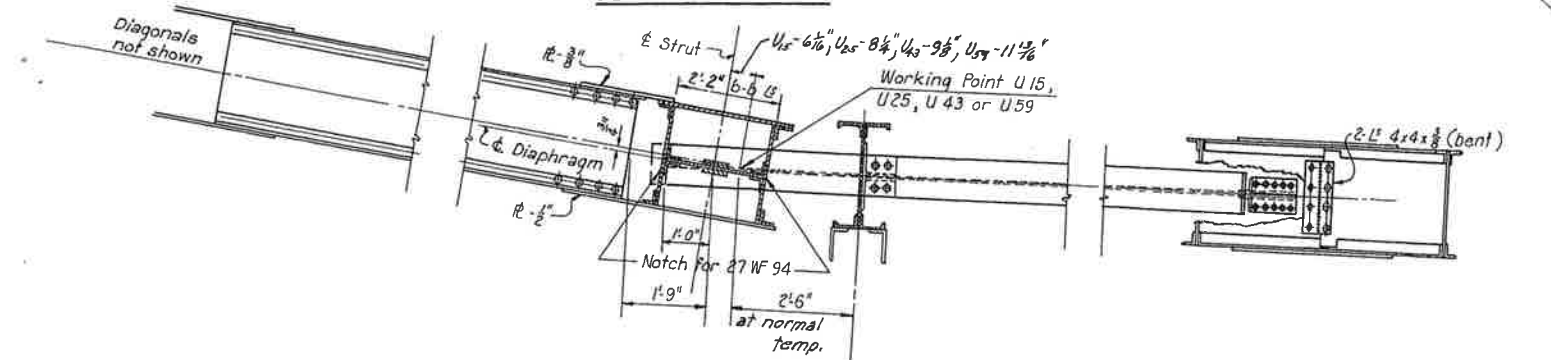
SECTIONS																																									
		(a) 1-lt. 31 x 1 1/2 (b,c) 4-lt. 4 x 4 x 1/2 (d) 2-lt. 24 x 3/8 (e) 1-lt. 31 x 1 1/2					(a) 1-lt. 33 x 1 1/2 (b,c) 4-lt. 5 x 5 x 5/8 (d) 2-lt. 24 x 3/8 (e) 1-lt. 33 x 1 1/2					(a) 1-lt. 31 x 3/8 (b,c) 4-lt. 4 x 4 x 1/2 (d) 2-lt. 24 x 3/8 (e) 1-lt. 31 x 3/8					(a) 1-lt. 31 x 1/2 (b,c) 4-lt. 4 x 4 x 1/2 (d) 2-lt. 24 x 3/8 (e) 1-lt. 31 x 1/2					(a) 1-lt. 31 x 5/8 (b,c) 4-lt. 4 x 4 x 1/2 (d) 2-lt. 24 x 3/8 (e) 1-lt. 31 x 5/8					(a) 1-lt. 31 x 5/8 (b,c) 4-lt. 4 x 4 x 1/2 (d) 2-lt. 24 x 3/8 (e) 1-lt. 31 x 5/8					(a) 1-lt. 31 x 3/8 (b,c) 4-lt. 4 x 4 x 1/2 (d) 2-lt. 24 x 3/8 (e) 1-lt. 31 x 3/8					(a) 1-lt. 31 x 1/2 (b,c) 4-lt. 4 x 4 x 1/2 (d) 2-lt. 24 x 3/8 (e) 1-lt. 31 x 1/2				
15	Length	514	514	514	529	529	529	512	512	512	505	505	505	505	504	504	504	504	504	504	504	504	504	504	504	504	504	504	504	504	504	504	504	504							
16	Minimum Radius of Gyration	10.3	10.3	10.3	10.5	10.5	10.5	10.3	10.3	10.3	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41	10.41							
17	Allowable Stress psi	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000	27,000							
18	Actual Gross Area Sq. In.	61.07	61.07	61.07	84.94	84.94	84.94	84.94	61.07	61.07	61.07	64.94	64.94	64.94	64.94	64.94	64.94	81.95	81.95	88.81	104.81	104.81	88.81	81.95	81.95	72.61	72.61	61.07	61.07	61.07	61.07	61.07	61.07								
19	Net Area Sq. In.	51.07	51.07	51.07	71.69	71.69	71.69	71.69	51.07	51.07	51.07	58.69	58.69	58.69	58.69	58.69	58.69	80.43	80.43	85.24	101.24	101.24	85.24	80.43	80.43	70.19	70.19	51.07	51.07	51.07	51.07	51.07	51.07								
20	Actual Unit Stress psi *4	7,650	7,650	7,650	25,650	25,650	25,650	25,650	19,200	19,200	19,200	12,700	12,700	12,700	8,870	8,870	8,870	13,470	13,470	12,700	10,700	10,700	12,960	15,360	16,500	16,500	12,050	12,050	13,350	13,350	6,040	6,040	6,040								
21	Material	A	A	A	A	A	A	A	A	A	A	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C								

Line	MEMBER	DIAGONALS														VERTICALS																
		U59 L60	L60 M61	M61 U62	M61 L62	L62 M63	U62 M63	M63 L64	L64 M65	M65 U66	M65 L66	L66 M67	U66 M67	M67 L68	L68 U69	U69 L70	L70 U71	U71 L72	L72 U73	U73 L74	U59 L59	M61 L61	M63 L63	M65 L65	M67 L67	U69 L69	U71 L71	U73 L73	U60 L60	U61 M61	U62 L62	U63 M63
1	Dead Load	-403	+635	+715	-80	-103	-610	-713	-670	-588	-102	-80	+656	+576	-354	+290	-163	+38	+95	-235	+48	+75	+80	+80	+76	+75	+75	+74	-26	-17	+220	-22
2	Roadway L.L. + I Tension	+152	+364	+385			+76	+76	+51	+51			+243	+224	+37	+204	+149	+204	+245	+196	+56	+71	+71	+71	+71	+71	+71	+71			+102	
3	Roadway L.L. + I Compression	-262	-177	-177	-51	-51	-250	-278	-253	-227	-51	-51	-32	-37	-157	-123	-188	-209	-198	-284												
4	Direct Design Stress	-665	+999	+1100	-131	-154	-860	-991	-923	-795	-153	-131	+899	+800	-511	+494	-351	+328	+392	-519	+104	+146	+151	+151	+147	+146	+146	+145	-26	-17	+322	-22
5	Reverse Design Stress																															
6	100 % T.W. (75 #)																															
7	100 % L.W. (65 #)	+15	+19	+20	+1	+2	+17	+19	+15	+14	+2	+1	+16	+15	+12	+15	+16	+17	+17	+17	0	0	0	0	0	0	0	0	+1	+2	+2	+3
8	100 % Q.W. (47 # T 41 # L)																															
9	Dead Load + 100 % Wind																															
10	30 % T.W. (22.5 #) 0.3 T.C. 0.427 B.C.																															
11	30 % L.W. (19.5 #)																															
12	30 % Q.W. (14.1 # T 5.85 # L)																															
13	D + L + I + 30 % Wind																															
14																																

SECTIONS																															
		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70		2-18 18 x 70	
15	Length	784				637	637	648	648	648	637	637			800																
16	Minimum Radius of Gyration	8.5				7.05	7.05	8.05	8.05	8.05	7.05	7.05			7.76																
17	Allowable Stress psi	17,240	27,000	27,000	12,960	12,960	18,370	18,370	18,370	18,370	12,960	12,960	27,000	27,000	16,060	18,000	12,170	12,170	12,170	14,460	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	
18	Actual Gross Area Sq. In.	70.02	46.56	50.76	38.81	38.81	78.42	85.92	78.42	78.42	38.81	38.81	40.56	40.56	43.56	36.06	38.81	38.81	38.81	78.14	21.57	21.57	21.57	21.57	21.57	21.57	21.57	21.57	21.57	21.57	
19	Net Area Sq. In.	65.92	39.56	43.26	35.31	35.31	73.14	80.92	73.14	73.14	35.31	35.31	34.56	34.56	36.56	30.56	35.31	35.31	35.31	73.14	19.57	19.57	19.57	19.57	19.57	19.57	19.57	19.57	19.57	19.57	
20	Actual Unit Stress p.s.i. *4	10,100	25,3																												

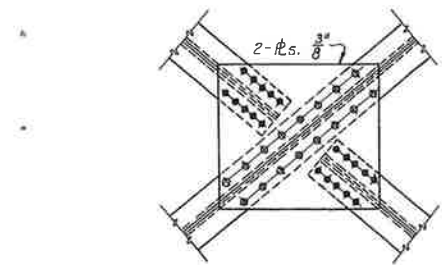


SECTIONAL PLAN



SECTION C-C

WIND SHEAR CONNECTION AT PANEL POINTS U15, U25, U43 AND U59

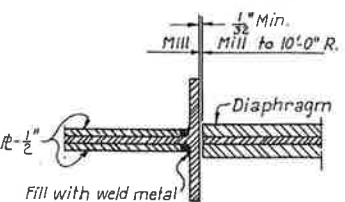


TYPICAL TOP LATERAL DIAGONAL INTERSECTION

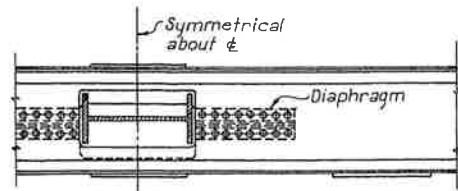


TYPICAL TOP DIAGONAL TYPICAL TOP STRUT

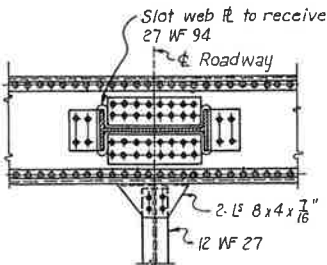
Note: Web R width may vary with b-b L distance.
Top Struts at Panel Points U₅, U₆, U₇, U₃₃, U₃₄, U₃₅, U₅₁, U₅₂, U₅₃, U₆₇, U₆₈ and U₆₉ to be fabricated with 1/16" draw.



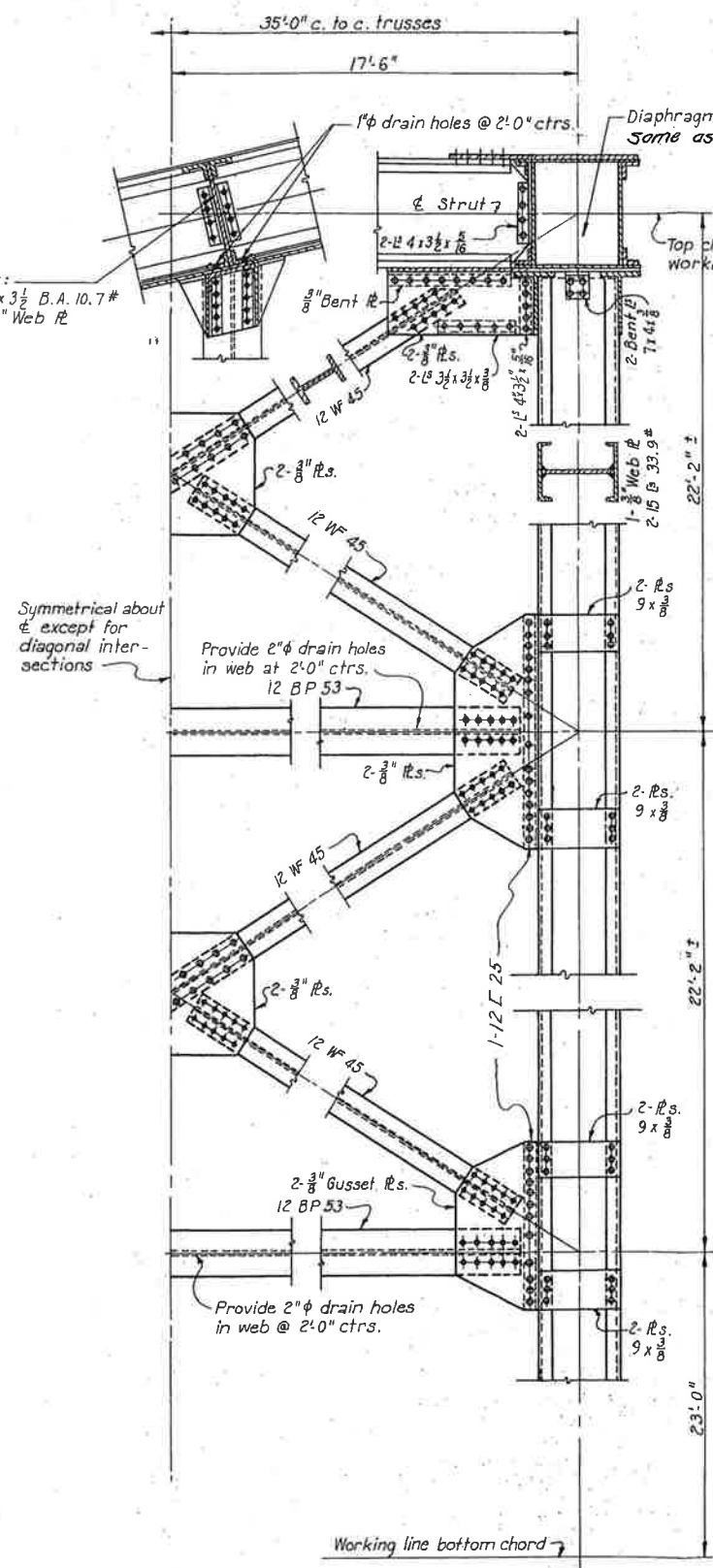
SECTION D-D



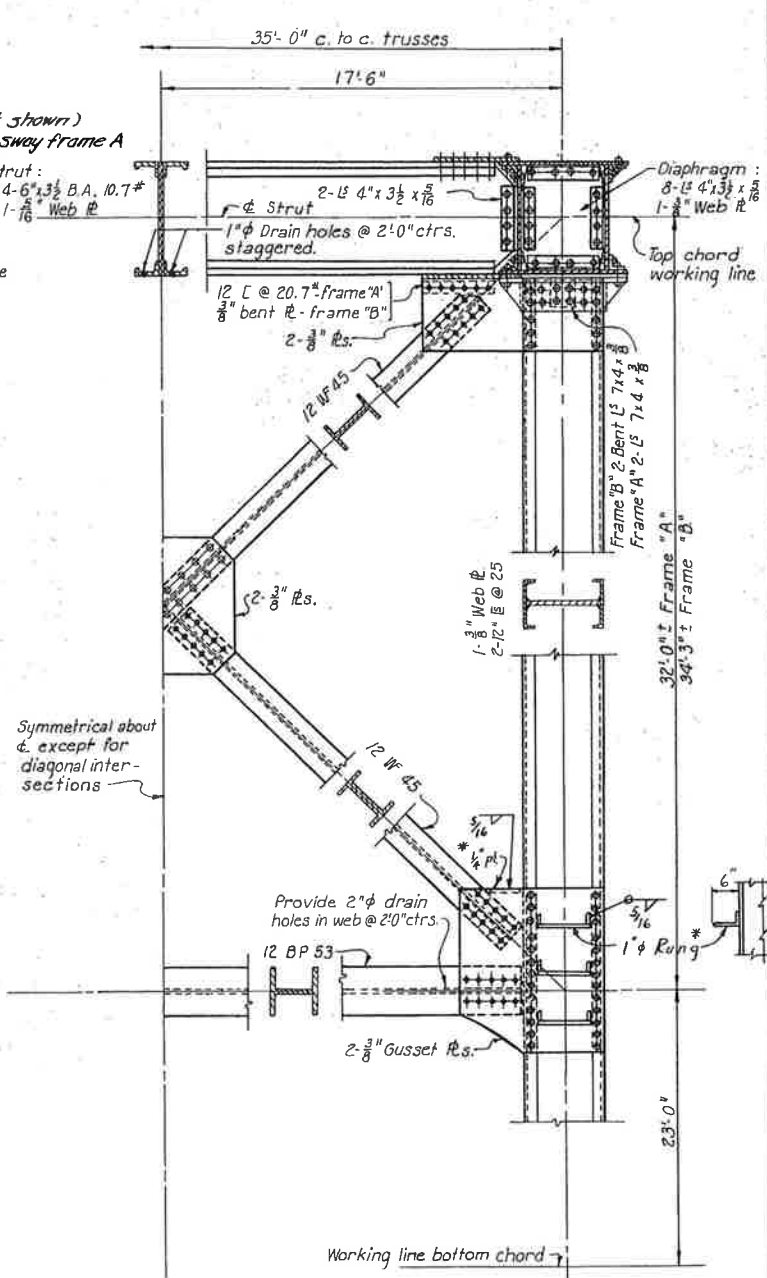
SECTION B-B



SECTION A-A



SWAY FRAMES "C"
U6-L6, U14-L14, U26-L26, U34-L34
U44-L44, U62-L62, U80-L80, U98-L98



SWAY FRAMES "A"
U2-L2, U18-L18, U20-L20, U22-L22
U38-L38, U40-L40, U56-L56, U72-L72

SWAY FRAMES "B"
U4-L4, U16-L16, U24-L24, U36-L36
U42-L42, U54-L54, U58-L58, U70-L70

Notes:
All material in sway frames is structural carbon steel.
For truss dimensions see Sheets 4.15 through 4.19
All material in top laterals is carbon steel.
* Plate and rungs are on U20-L20 only.

NO.	MADE	DATE	REVISION
1.	MAC	5/20/62	As Built

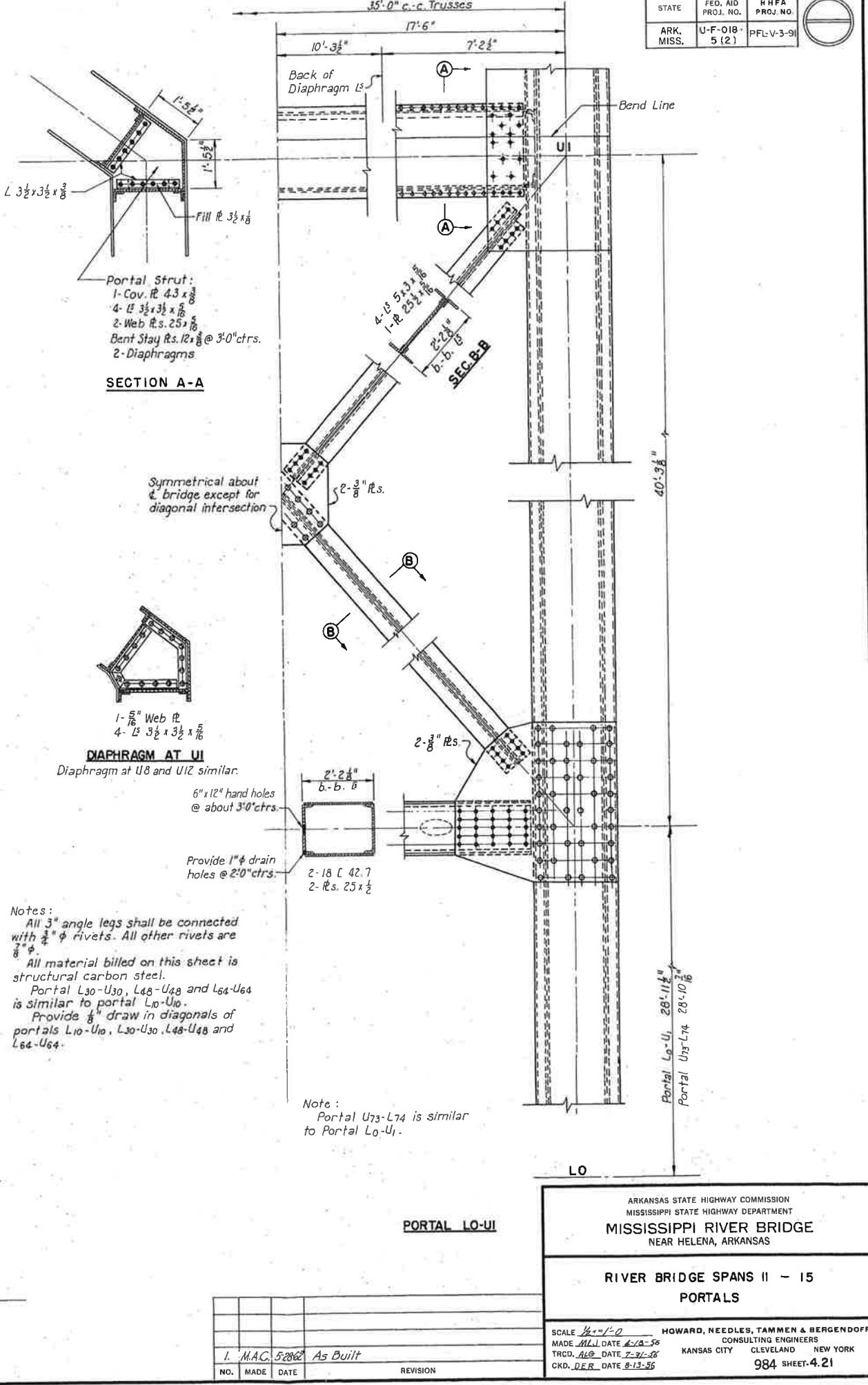
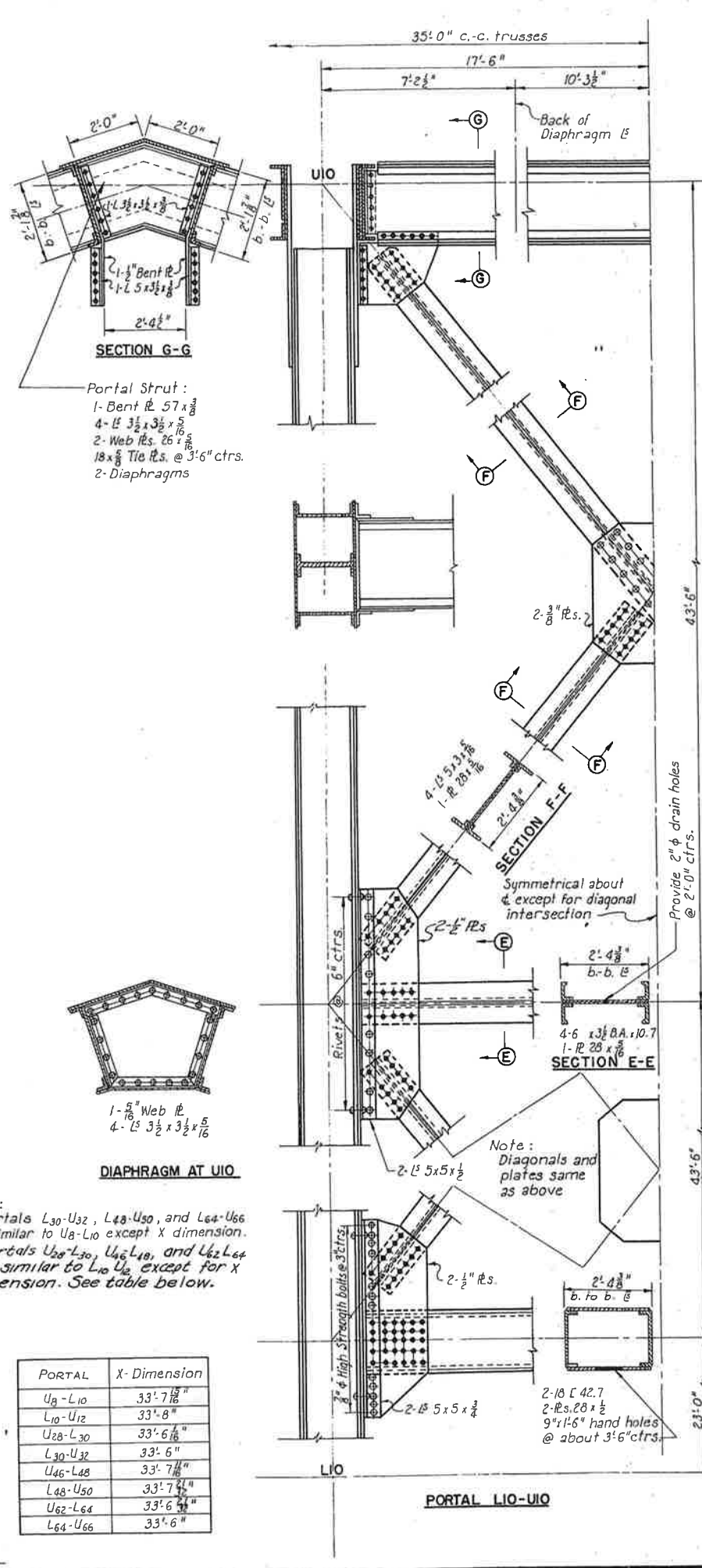
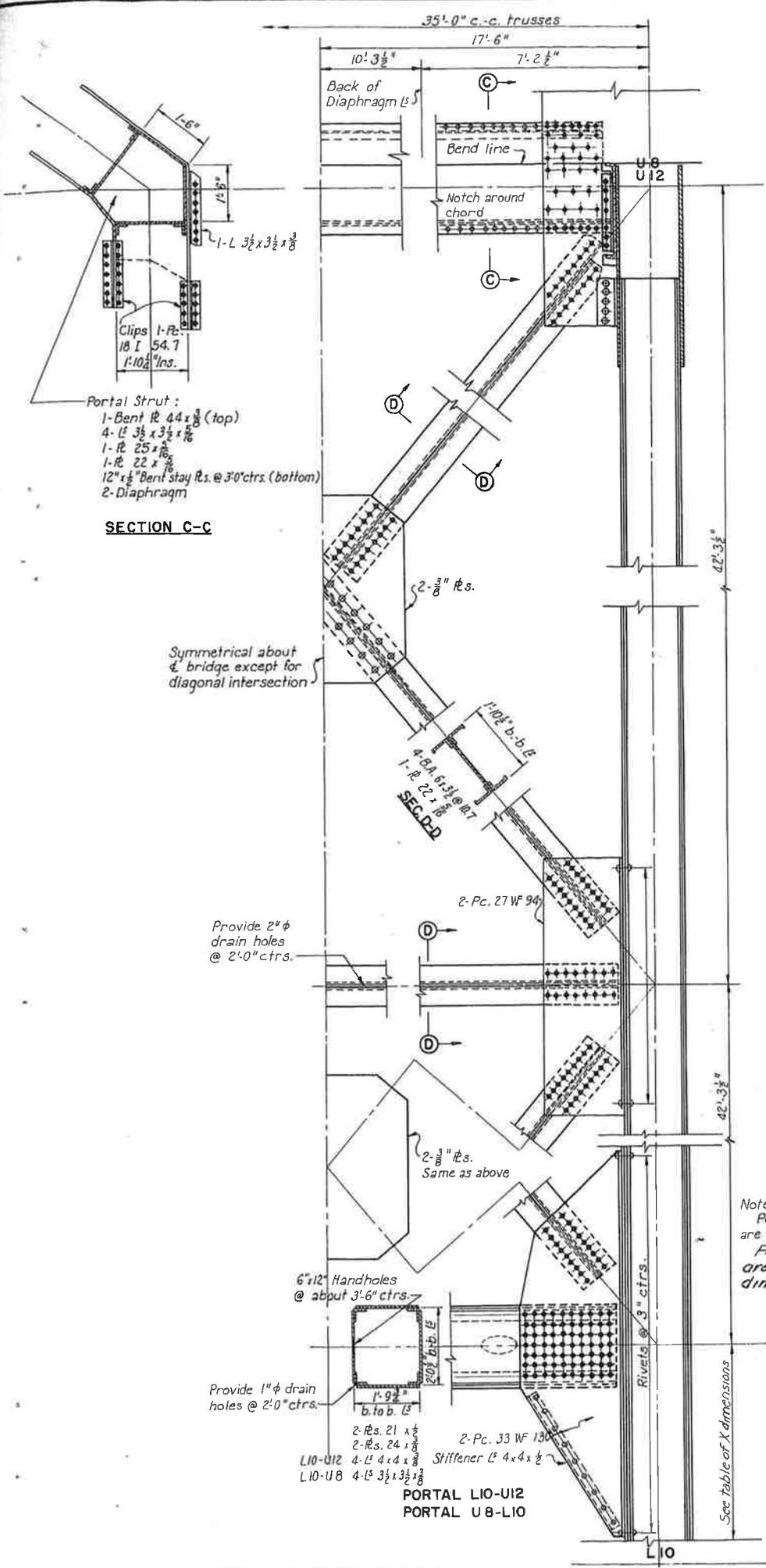
ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SPANS II - 15
SWAY FRAMES AND TOP LATERALS

SCALE 1/4" = 1'-0"
MADE 5/20/62 DATE 1-5-56
TRCD. 1/2 DATE 6-1-56
CKD. D.E.R. DATE 8-10-56

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

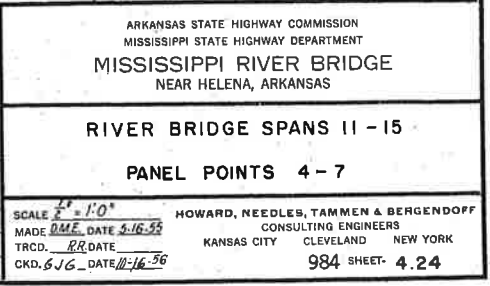
984 SHEET-4.20



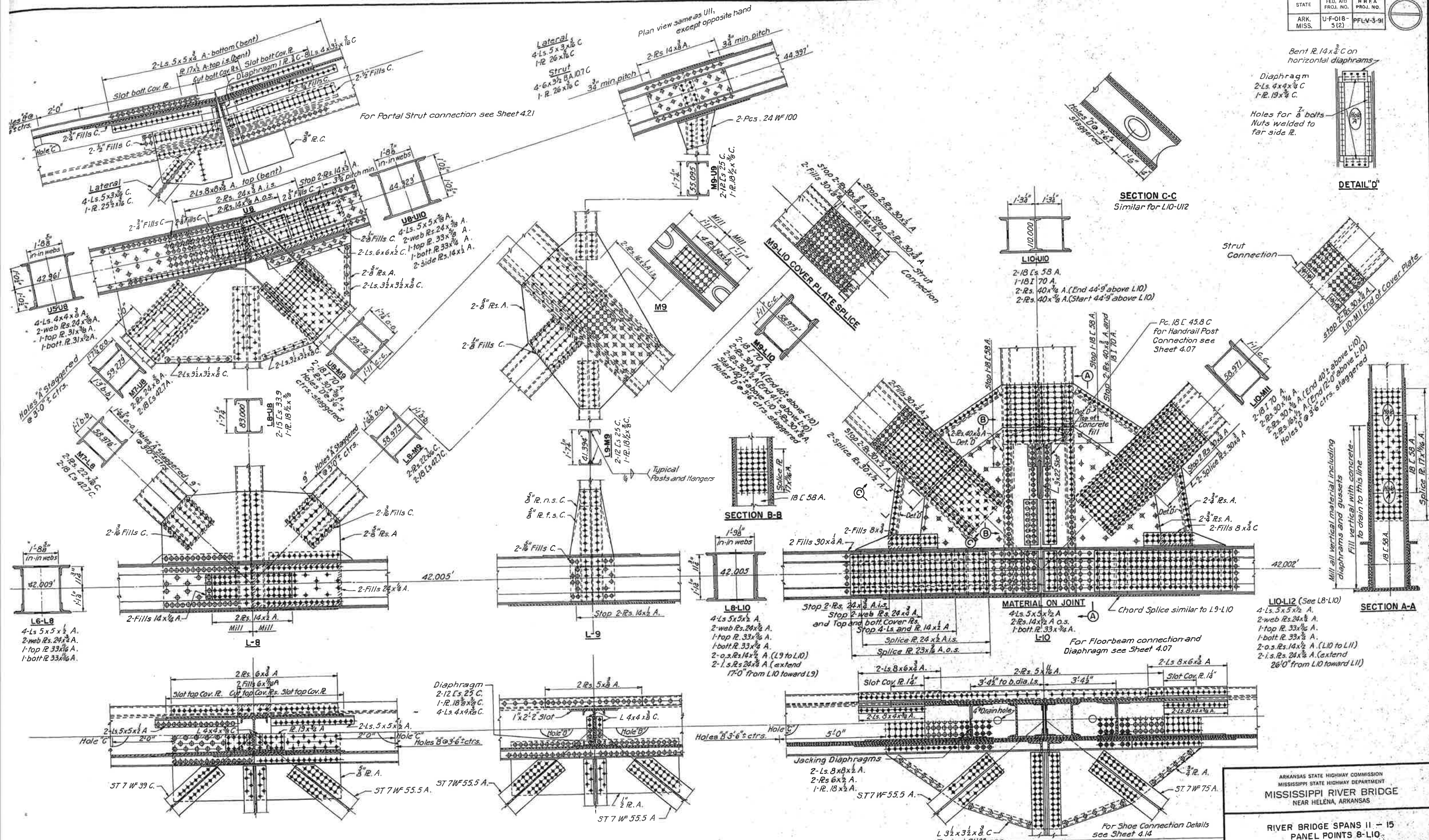
Note:
 Portals L30-U32, L48-U50, and L64-U66 are similar to U8-L10 except X dimension.
 Portals U28-L30, U46-L48, and U62-L64 are similar to L10-U12 except for X dimension. See table below.

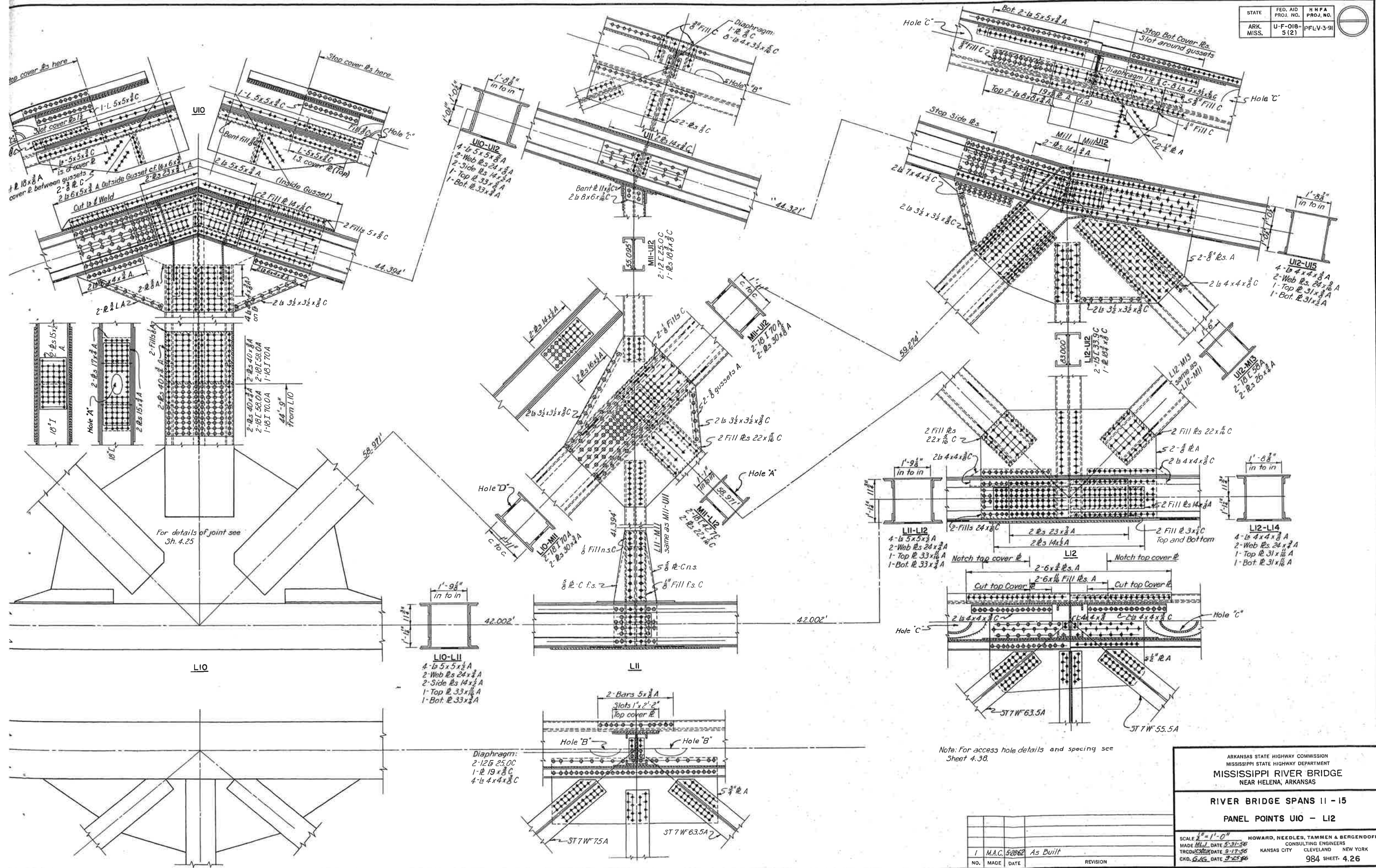
PORTAL	X- Dimension
U9-L10	33'-7 1/2"
L10-U12	33'-8"
U28-L30	33'-6 1/2"
L30-U32	33'-6"
U46-L48	33'-7 1/2"
L48-U50	33'-7 1/2"
U62-L64	33'-6 1/2"
L64-U66	33'-6"

NO.	MADE	DATE	REVISION
1.	M.A.C.	5-28-62	As Built



1.	M.A.C.	5-28-62	As Built
NO.	MADE	DATE	REVISION



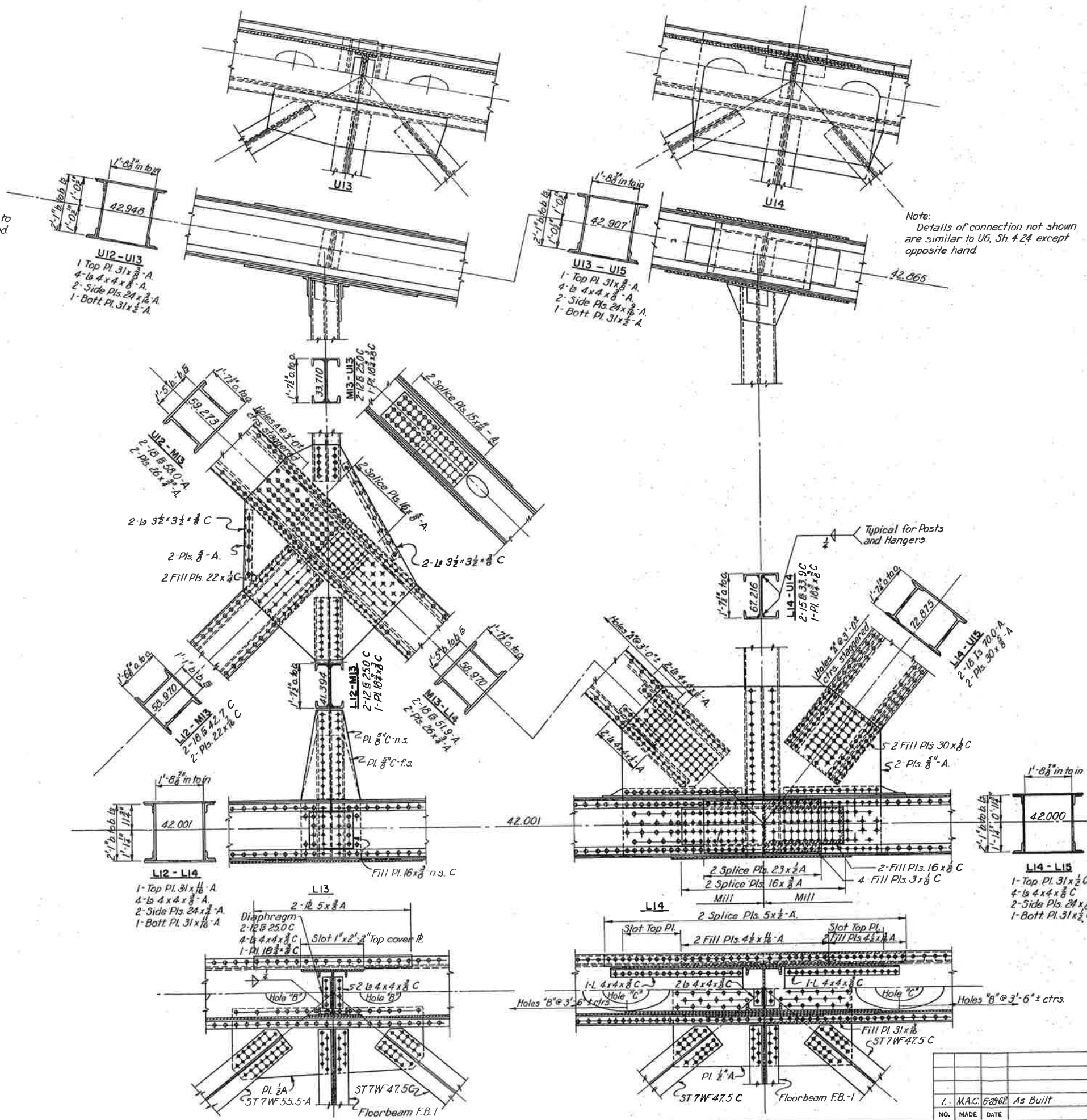


Note: For access hole details and spacing see Sheet 4.38.



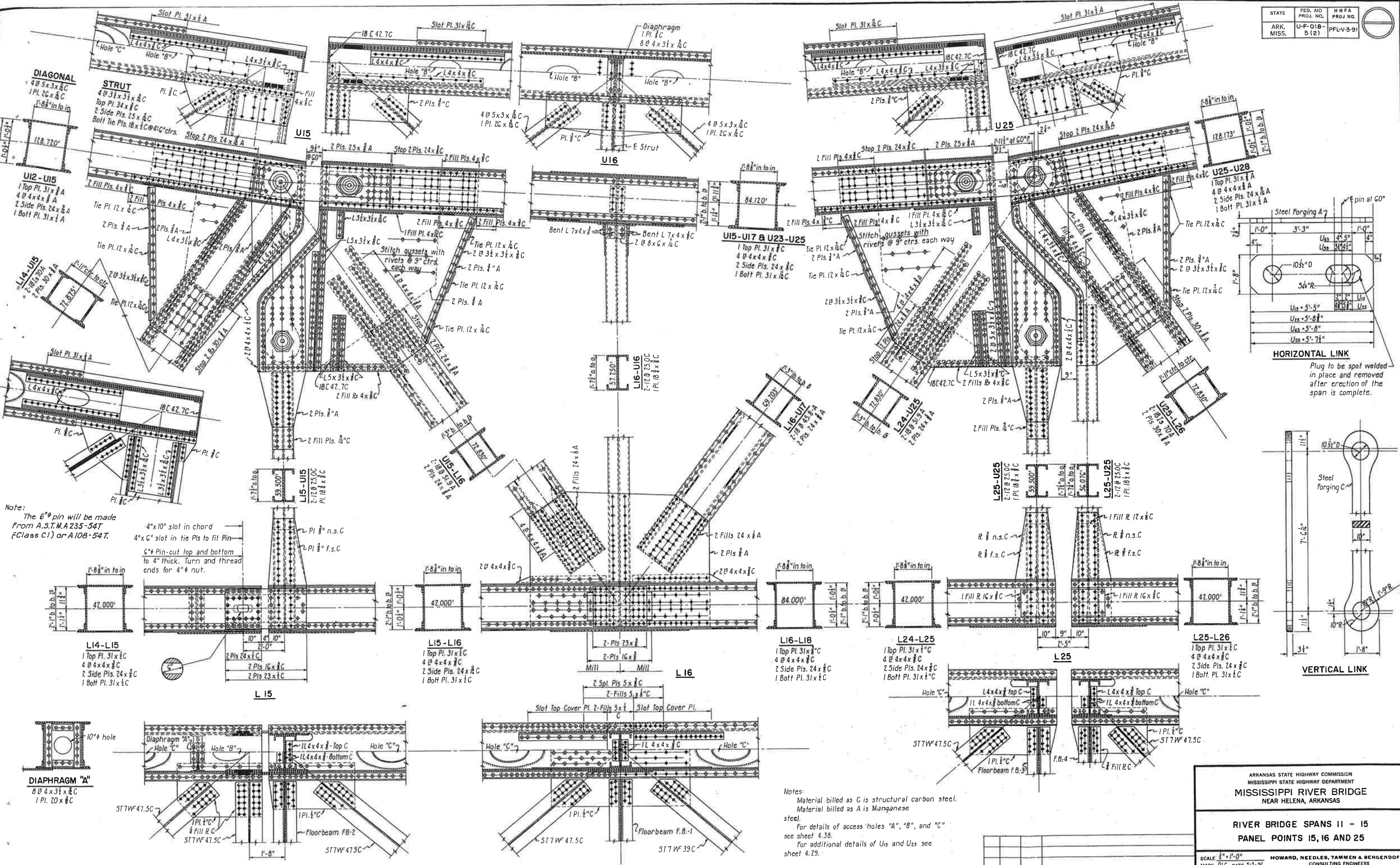
Note:
Details not shown are similar to
U7, Sh. 4.24 except opposite hand.

Note:
Details of connection not shown
are similar to U6, Sh. 4.24 except
opposite hand.



Note: For access hole details see sheet 4.38.

ARKANSAS STATE HIGHWAY COMMISSION MISSISSIPPI STATE HIGHWAY DEPARTMENT MISSISSIPPI RIVER BRIDGE NEAR HELENA, ARKANSAS	
RIVER BRIDGE SPANS 11 - 15 PANEL POINTS 13 AND 14	
SCALE: 1/2" = 1'-0" MADE: 5-25-56 TRCD: 6-11-56 CKD: 6-11-56	HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK 984 SHEET 4.27



Note:
The 6" pin will be made from A.S.T.M. A235-54T (Class C) or A108-54T.

4"x10" slot in chord
4"x4" slot in tie Pls to fill Pin
6" Pin-cut top and bottom to 4" thick. Turn and thread ends for 4" nut.

Notes:
Material billed as C is structural carbon steel.
Material billed as A is Manganese steel.
For details of access holes "A", "B", and "C" see sheet 4.38.
For additional details of U15 and U25 see sheet 4.29.

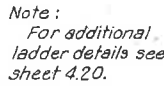
ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SPANS 11 - 15
PANEL POINTS 15, 16 AND 25

SCALE 1/4" = 1'-0"
MADE D.C. DATE 5-2-36
TRCD. JAV. DATE 10-9-36
CKD. DER. DATE 10-9-36

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
984 SHEET 4.28

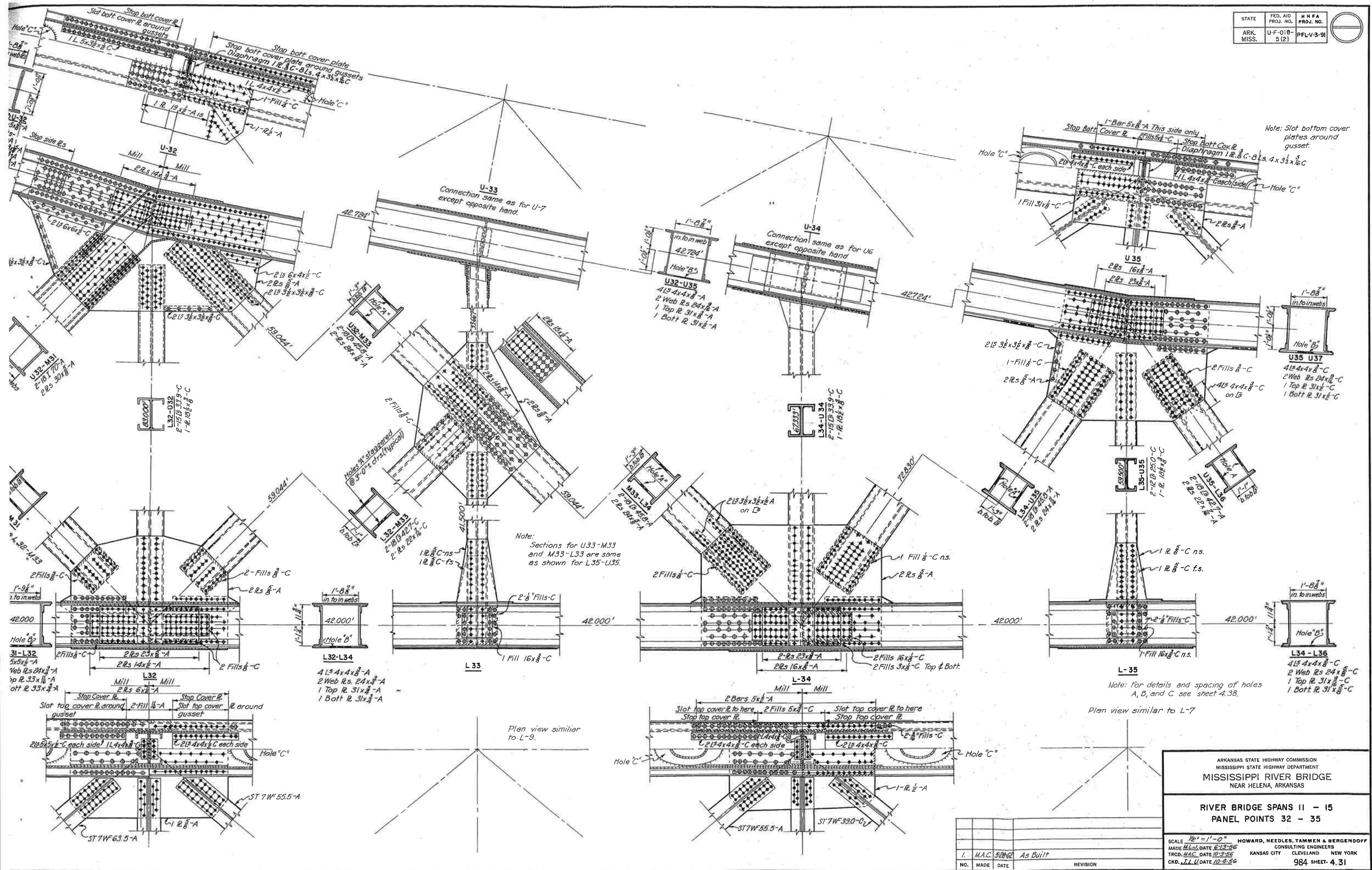
NO.	MADE	DATE	REVISION
1	M.A.C.	5-28-36	As Built



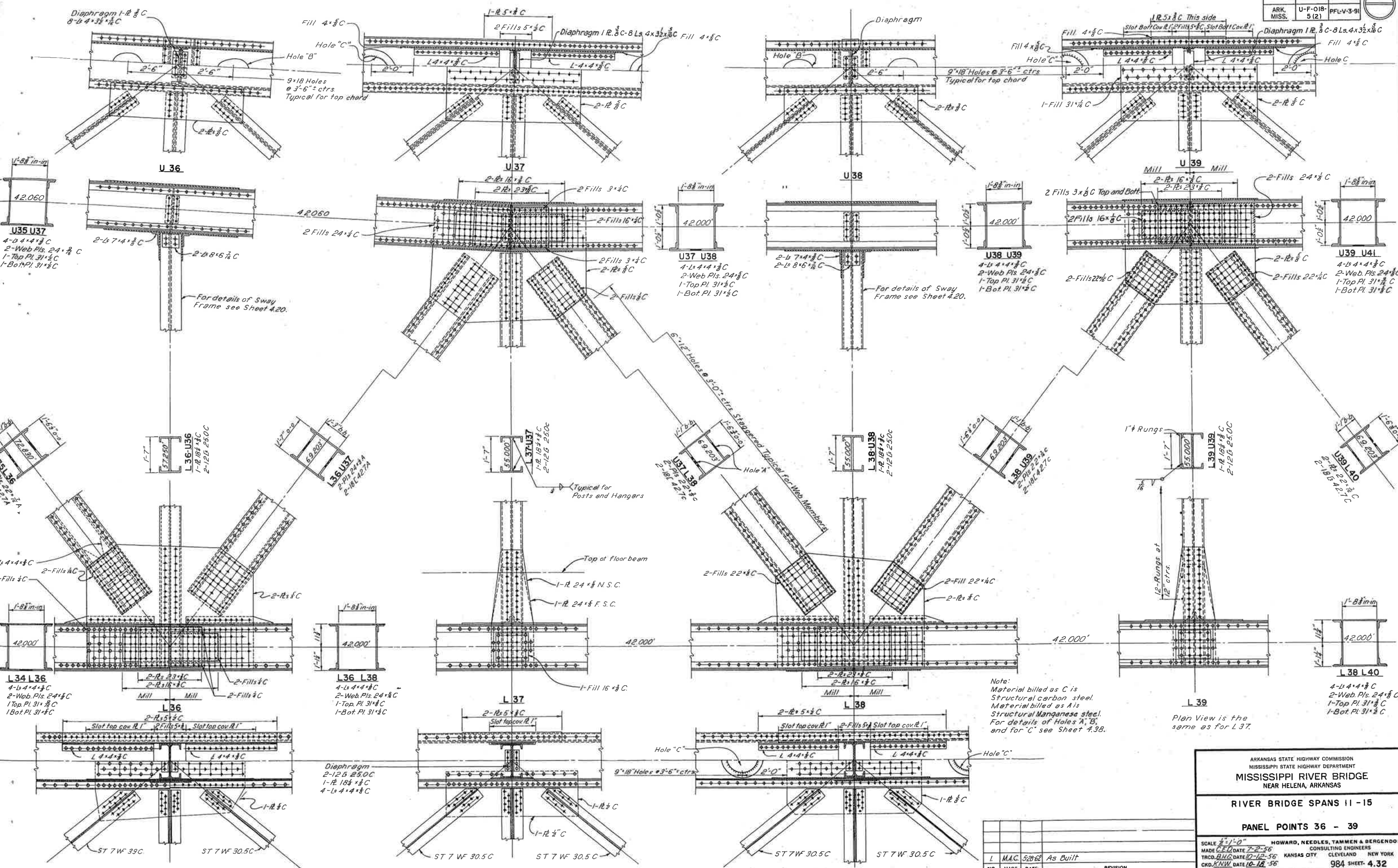
RIVER BRIDGE SPANS 11 - 15
PANEL POINTS 17 - 20

1.	M.A.C.	52062	As Built	
NO.	MADE	DATE	REVISION	

SCALE $\frac{1}{8"} = 1'-0"$ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.O.F. DATE 3-22-56 CONSULTING ENGINEERS
TRCD. R.R. DATE 9-17-56 KANSAS CITY CLEVELAND NEW YORK
CKD. G.R. DATE 9-22-56 984 SHEET- 4.30

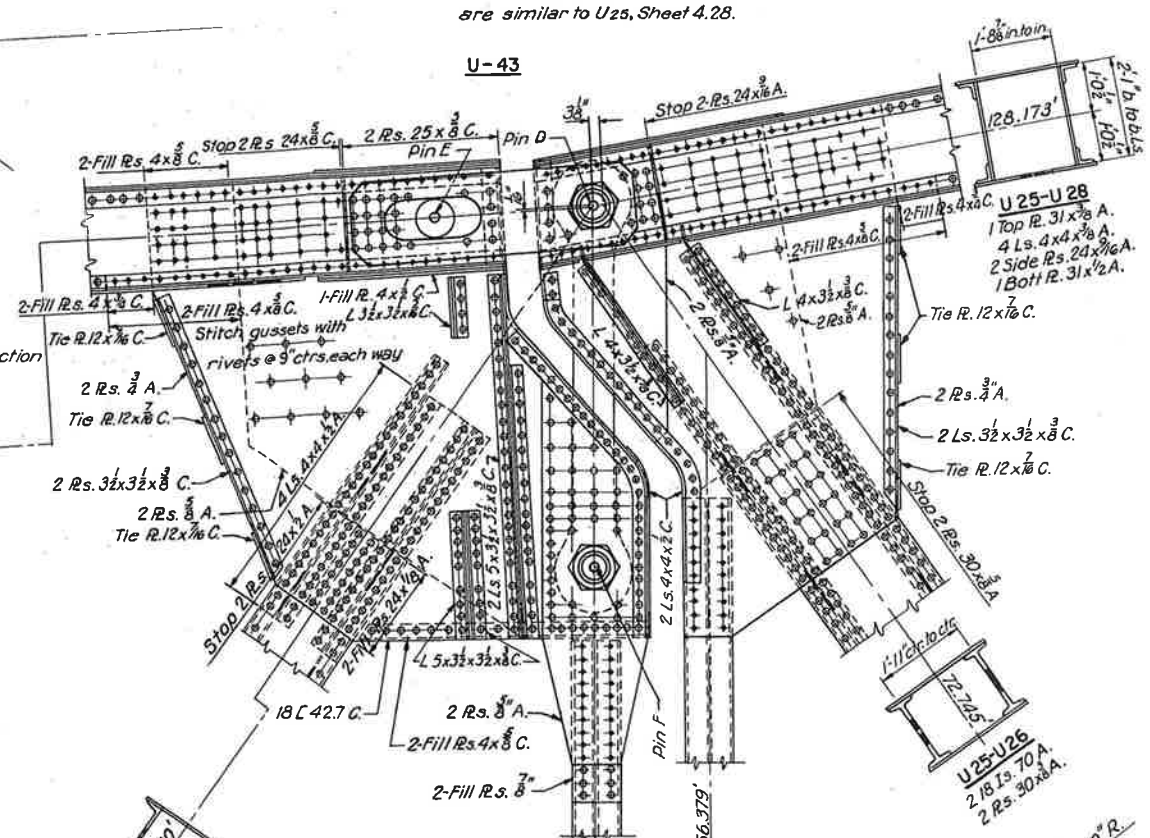


ARKANSAS STATE HIGHWAY COMMISSION MISSISSIPPI STATE HIGHWAY DEPARTMENT MISSISSIPPI RIVER BRIDGE NEAR HELENA, ARKANSAS	
RIVER BRIDGE SPANS 11 - 15 PANEL POINTS 32 - 35	
SCALE 1/2" = 1'-0" MADE M.C. DATE 6-13-56 TRCD. M.C. DATE 10-3-56 CKD. J.L. DATE 10-4-56	HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK 984 SHEET 4.31



Note:
Details of connection not shown
are similar to U25, Sheet 4.28.

U-43



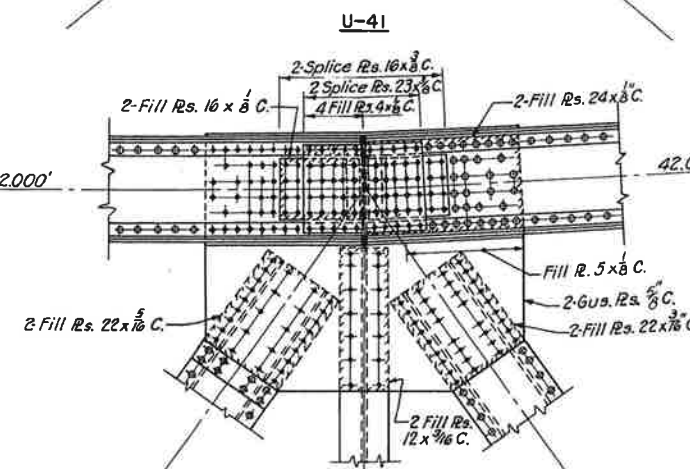
Note:
For details of connection
U42 see U6 Sheet 4.28.

U-42



U41-U43
1-Top R. 31x7/8 C.
4-Ls. 4x4x3/8 C.
2-Rs. 24x7/8 C.
1-Bott R. 31x7/8 C.

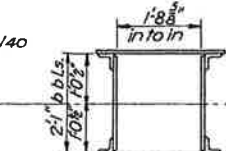
U-41



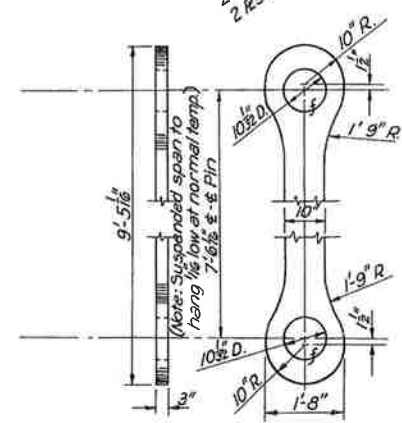
U39-U41
1-Top R. 31x7/8 C.
4-Ls. 4x4x3/8 C.
2-Rs. 24x7/8 C.
1-Bott R. 31x7/8 C.

U-40

Note:
For details of connection U40
see U6 Sheet 4.30.



VERTICAL LINK



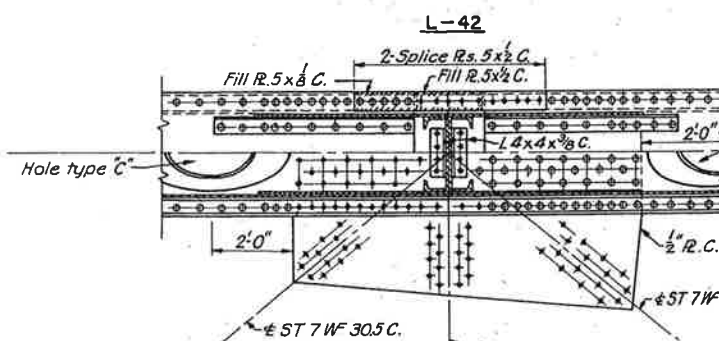
Note:
Details of connection not shown
are similar to L25 sheet 4.28.

L-43



L42-L43
1-Top R. 31x7/8 C.
4-Ls. 4x4x3/8 C.
2-Rs. 24x7/8 C.
1-Bott R. 31x7/8 C.
Hole type C

L-42



Note:
For details of connection L41
see L3 sheet 4.24.

L-41

L40-L42
1-Top R. 31x7/8 C.
4-Ls. 4x4x3/8 C.
2-Rs. 24x7/8 C.
1-Bott R. 31x7/8 C.

L-40

Note:
Details of L40 are same as
L38 sheet 4.32, except opposite hand.

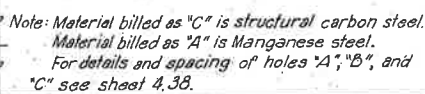
Note:
For details of horizontal link see Sheet 4.28.
For details of pins see Sheet 4.29.
Material billed as A is manganese steel.
Material billed as C is structural carbon steel.
Vertical links are to be forged carbon steel.
For details of access holes types A, B and C see Sheet 4.38

NO.	MADE	DATE	REVISION
1.	M.A.C.	5-28-60	As Built

ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

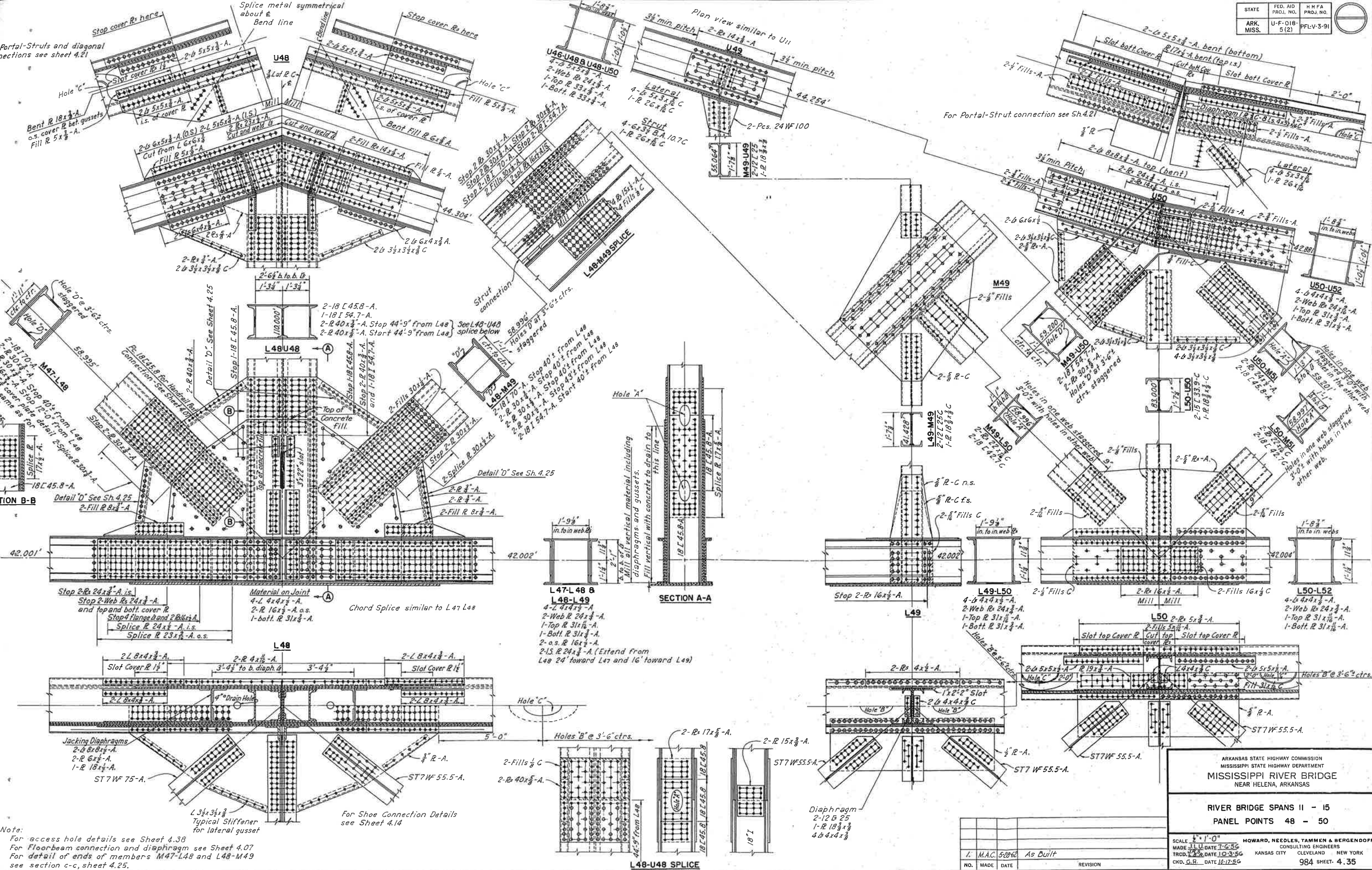
RIVER BRIDGE SPANS 11 - 15
PANEL POINTS 40, 41, 42 AND 43

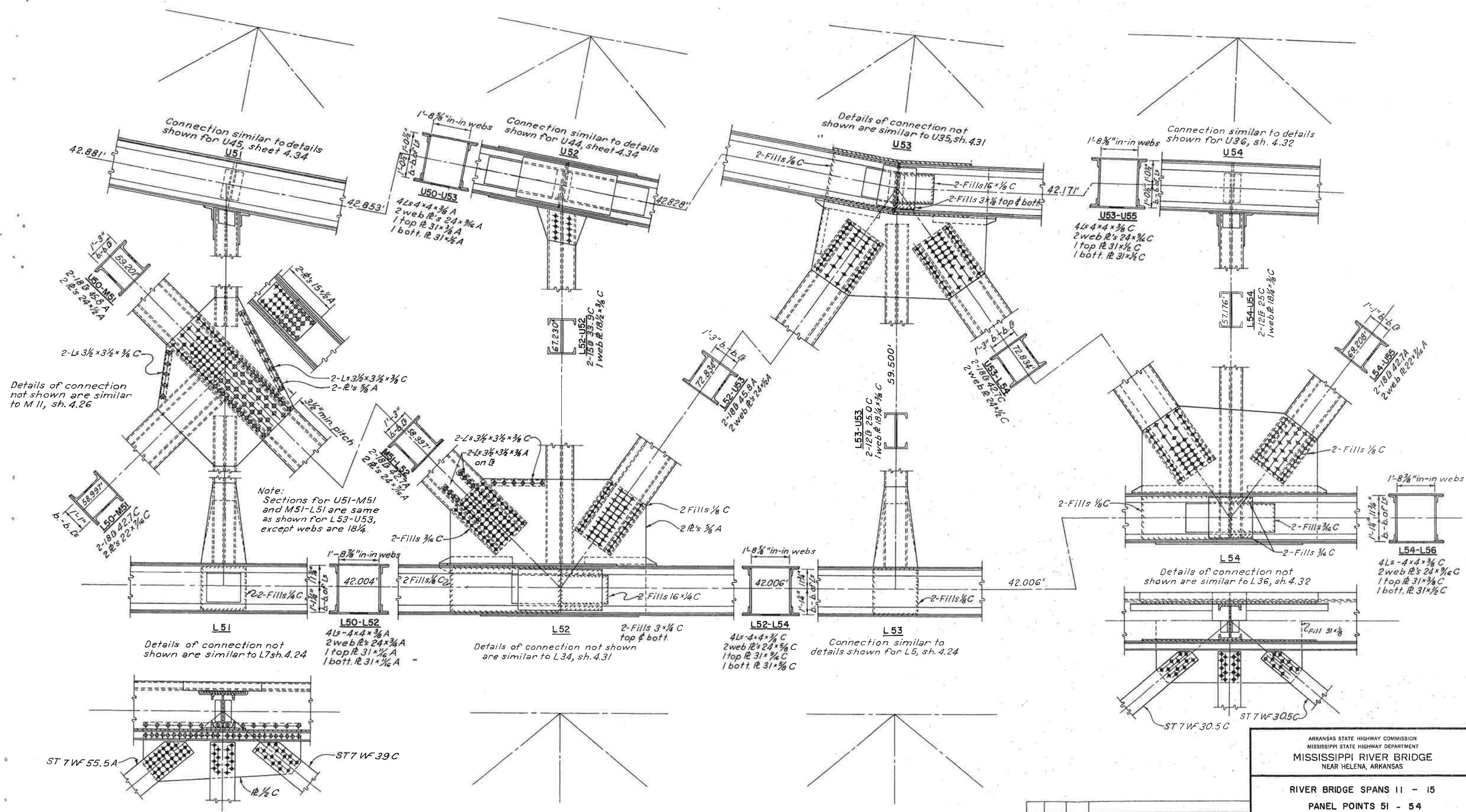
SCALE 1/2" = 1'-0"
MADE 6-29-56
TRCD. 6-29-56
CKD. 6-29-56
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
984 SHEET 4.33



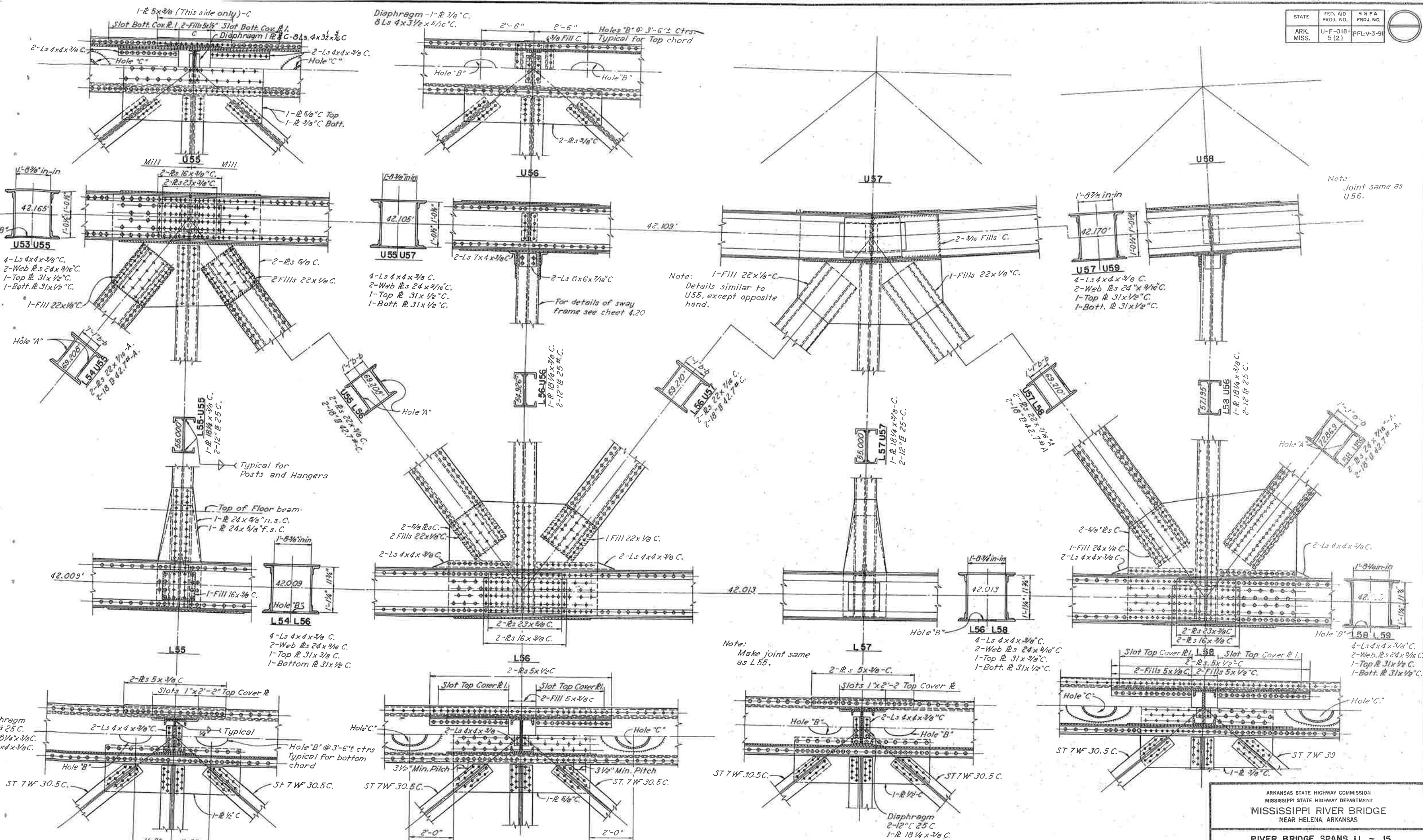
RIVER BRIDGE SPANS 11 - 15

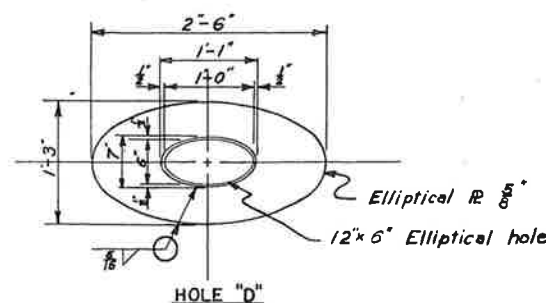
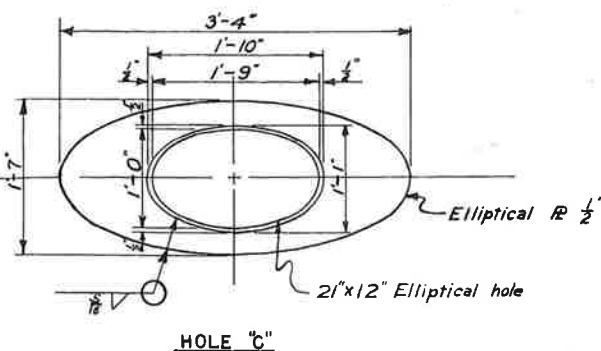
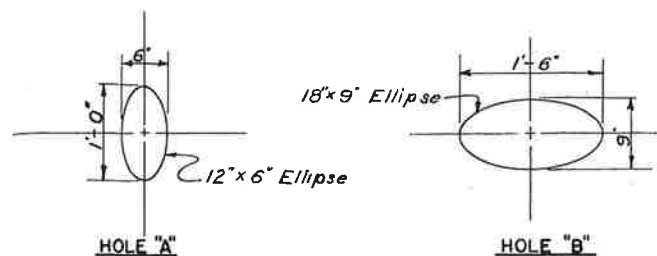
SCALE 1"=1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDO
MADE BUC DATE 7-11-56 CONSULTING ENGINEERS
TRCD. CPW DATE 11-6-56 KANSAS CITY CLEVELAND NEW YORK
CKD. KNW DATE 11-12-56 984 SHEET- 4 34





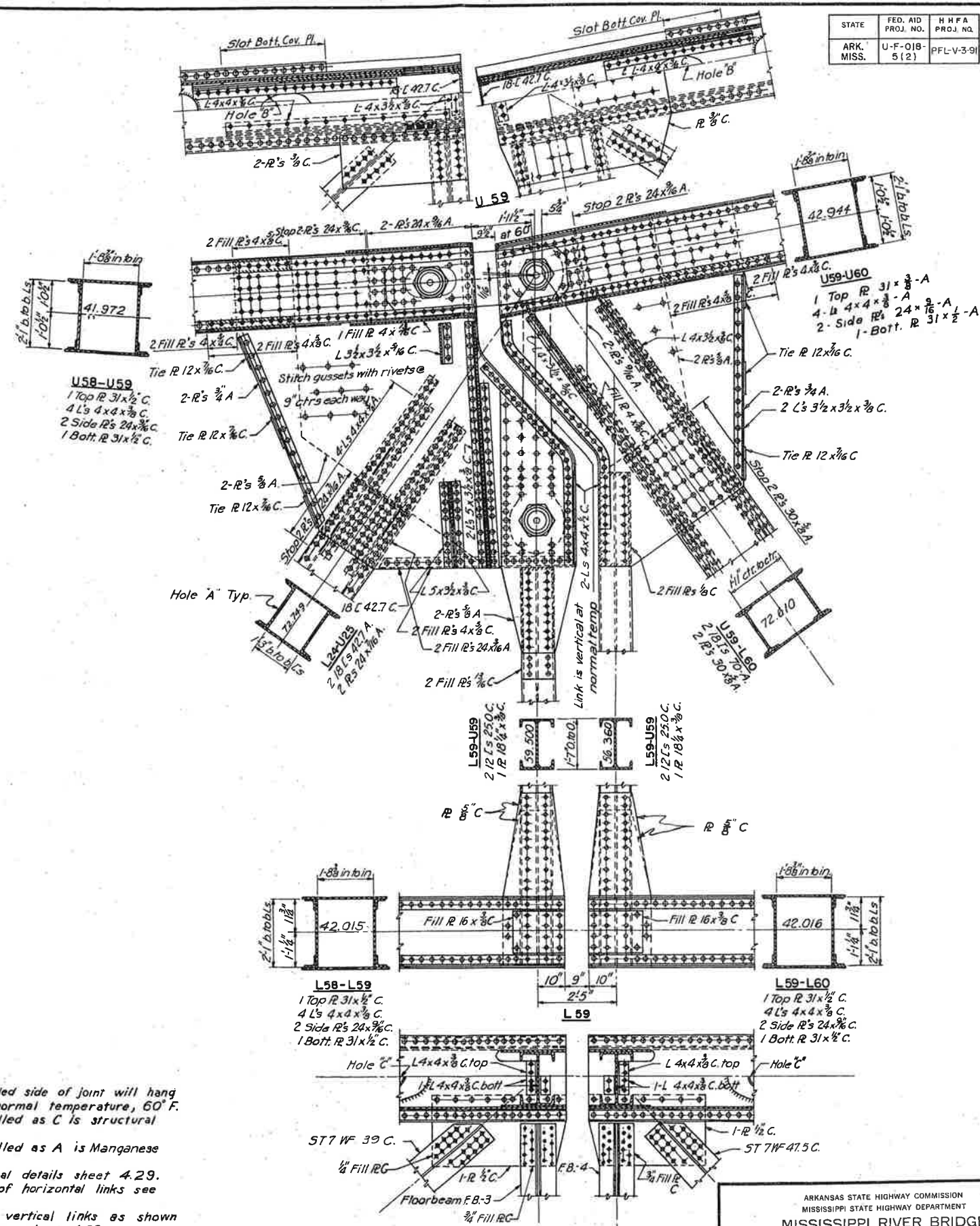
NO.	MADE	DATE	REVISION
1.	M.A.C.	5-28-62	As Built





Notes:
Holes 'A' are in diagonals at 3'-0" ctrs. staggered.
Holes 'B' are intermediate holes in chords at 3'-6" ctrs.
Holes 'C' are next to splices in chord only.
Reinforcing R for hole 'C' and 'D' is to be same material as member.
Holes 'D' are at 3'-6" ctrs. staggered.

Notes:
The suspended side of joint will hang 1/8" low at normal temperature, 60° F.
Material billed as C is structural carbon steel.
Material billed as A is Manganese steel.
For additional details sheet 4.29.
For detail of horizontal links see sheet 4.28.
Use same vertical links as shown at U-43, see sheet 4.33.

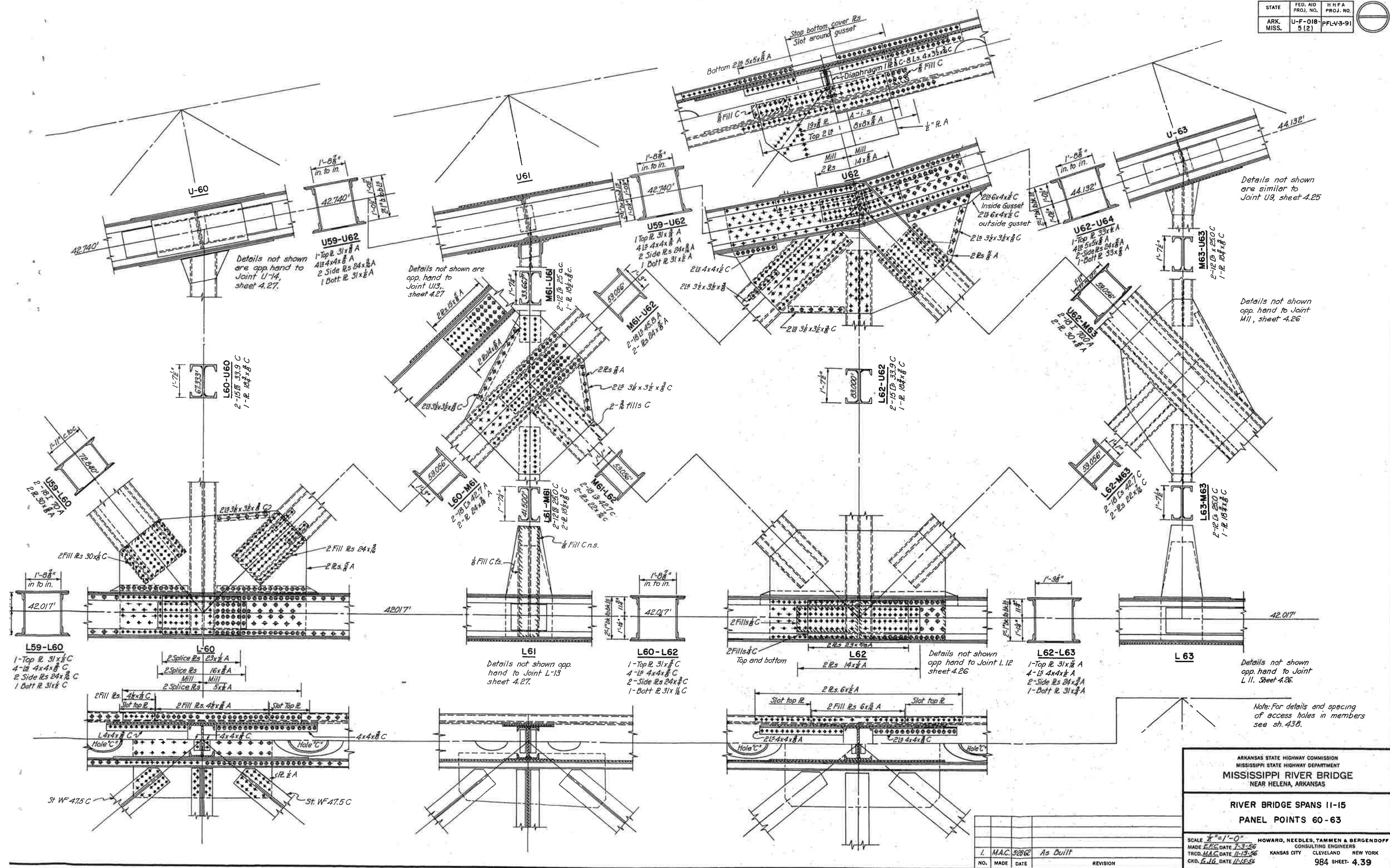


ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SPANS 11 - 15
PANEL POINT 59

SCALE: 1/4" = 1'-0"
MADE: 5-2-56
TRCD: 8-12-56
CKD: 9-14-56
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
984 SHEET 438

1.	M.A.C.	5286	As Built
NO.	MADE	DATE	REVISION



Details of connection not shown
are similar to U48, sheet 4.35.

U64

Details of connection not shown
are similar to U49, sheet 4.35.

U65

Details of connection not shown
are similar to U50, sheet 4.35.

U66

U62-U64
Same as U64-U66

U64-U66
4-15 5x5x $\frac{3}{8}$ -A
2-Web R's 24x $\frac{3}{8}$ -A
1-Top R 33x $\frac{3}{8}$ -A
1-Bott R 33x $\frac{3}{8}$ -A

M65-U65
2-12 L 20x $\frac{3}{8}$ C
1-12 10x $\frac{3}{8}$ C

M65-U66
2-12 L 20x $\frac{3}{8}$ -A
2-12 L 20x $\frac{3}{8}$ -A

U66-U69
4-15 4x4x $\frac{3}{8}$ -A
2-Web R's 24x $\frac{3}{8}$ -A
1-Top R 31x $\frac{3}{8}$ -A
1-Bott R 31x $\frac{3}{8}$ -A

U66-M67
2-12 L 20x $\frac{3}{8}$ -A
2-12 L 20x $\frac{3}{8}$ -A

L66-M67
Same as M65-L66

L66-L68
4-15 4x4x $\frac{3}{8}$ -A
2-Web R's 24x $\frac{3}{8}$ -A
1-Top R 31x $\frac{3}{8}$ -A
1-Bott R 31x $\frac{3}{8}$ -A

2-18 L 45x $\frac{3}{8}$ -A
1-18 I 54x $\frac{3}{8}$ -A
2 R 40x $\frac{3}{8}$ -A Stop 44'-9" from L-64
2 R 40x $\frac{3}{8}$ -A Start 44'-9" from L-64

Note: Splice L64-U64 same
as L48-U48, sheet 4.35

Cover plate splice L64-M65
same as shown for M9L10 sheet 4.25

L64-M65
2-18 I 70x $\frac{3}{8}$ -A
2-12 30x $\frac{3}{8}$ -A
2 R 40x $\frac{3}{8}$ -A Stop 40'-4" from L-64
2 R 30x $\frac{3}{8}$ -A
2 R 30x $\frac{3}{8}$ -A Start 40'-4" from L-64

L65-M65
Same as M 65-L65

M65-L66
2-12 L 20x $\frac{3}{8}$ C
2-12 L 20x $\frac{3}{8}$ C

L65-L66
4-15 4x4x $\frac{3}{8}$ -A
2-Web R's 24x $\frac{3}{8}$ -A
1-Top R 31x $\frac{3}{8}$ -A
1-Bott R 31x $\frac{3}{8}$ -A

L66

Details of connection not shown
are similar to L50, sheet 4.35.

ST 7W55.5A
ST 7W39C

Note:
For details and spacing of holes
A, B, C, and D see sheet 4.38.

L63-L64 &
L64-L65

4-L 4x4x $\frac{3}{8}$ -A
2-Web R 24x $\frac{3}{8}$ -A
1-Top R 31x $\frac{3}{8}$ -A
1-Bott R 31x $\frac{3}{8}$ -A
2 o.s. R 16x $\frac{3}{8}$ -A
2 i.s. R 24x $\frac{3}{8}$ -A (Extend from L64
21' toward L63 and
12' toward L65)

Connection similar to details
shown for L49, sheet 4.35.

For access hole details
see sheet 4.38.

Details not shown are
similar to L48, sheet 4.35.

For shoe connection details
see sheet 4.14.

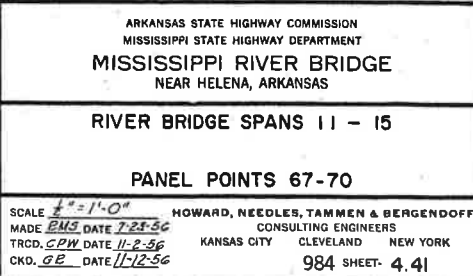
For floorbeam connection
and diaphragm see sheet 4.07.

ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

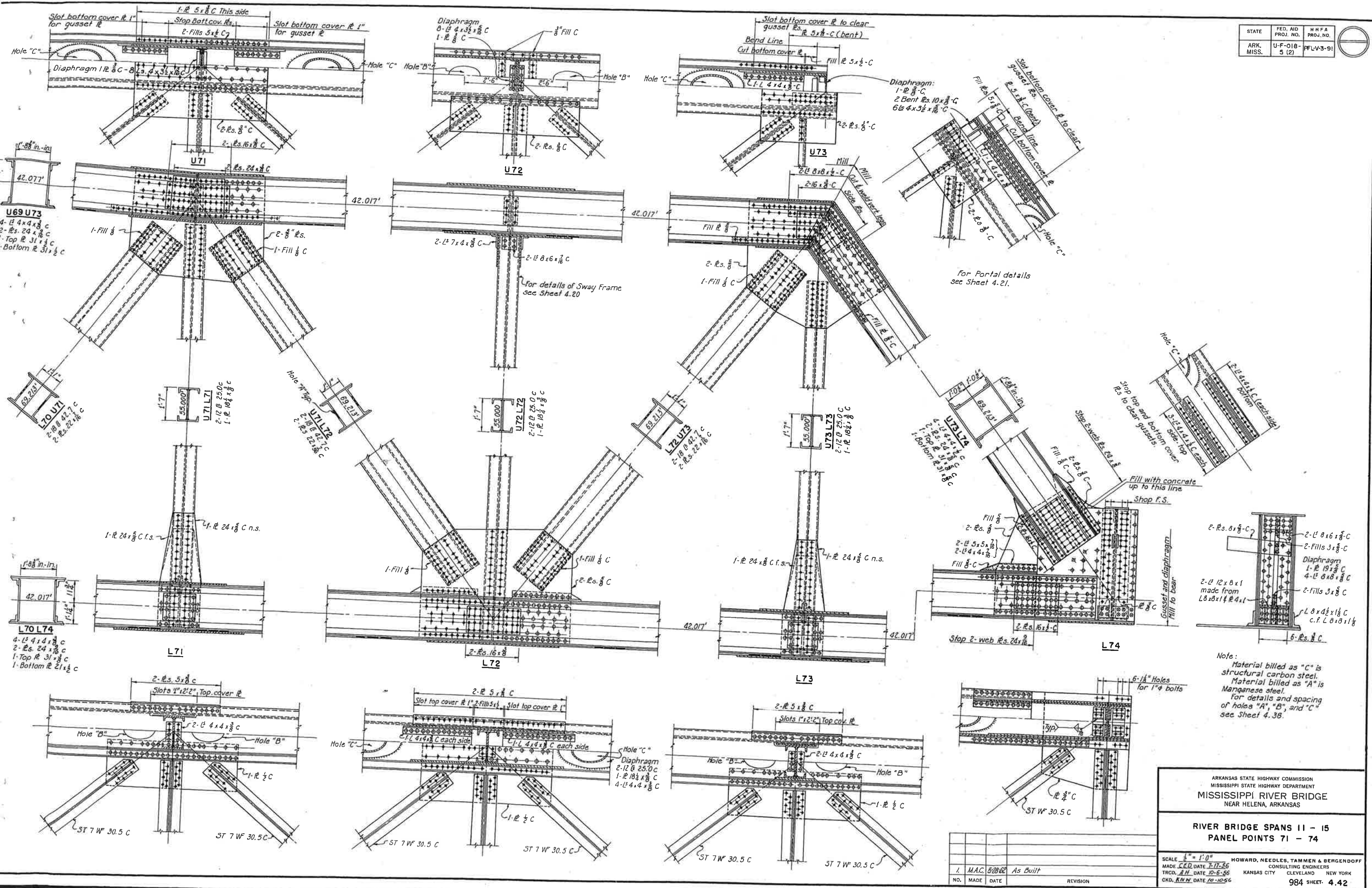
RIVER BRIDGE SPANS II - 15
PANEL POINTS 64 - 66

SCALE $\frac{1}{2}" = 1'-0"$
MADE G.R. DATE 7-5-56
TRCD, M.A.C. DATE 9-8-56
CKD, J.L.D. DATE 11-18-56
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
984 SHEET 4.40

NO.	MADE	DATE	REVISION
1.	M.A.C.	5-28-56	As Built



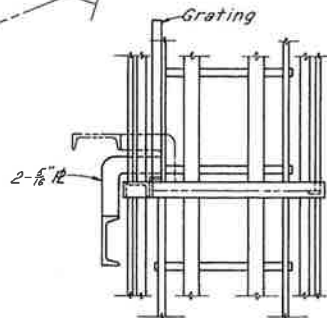
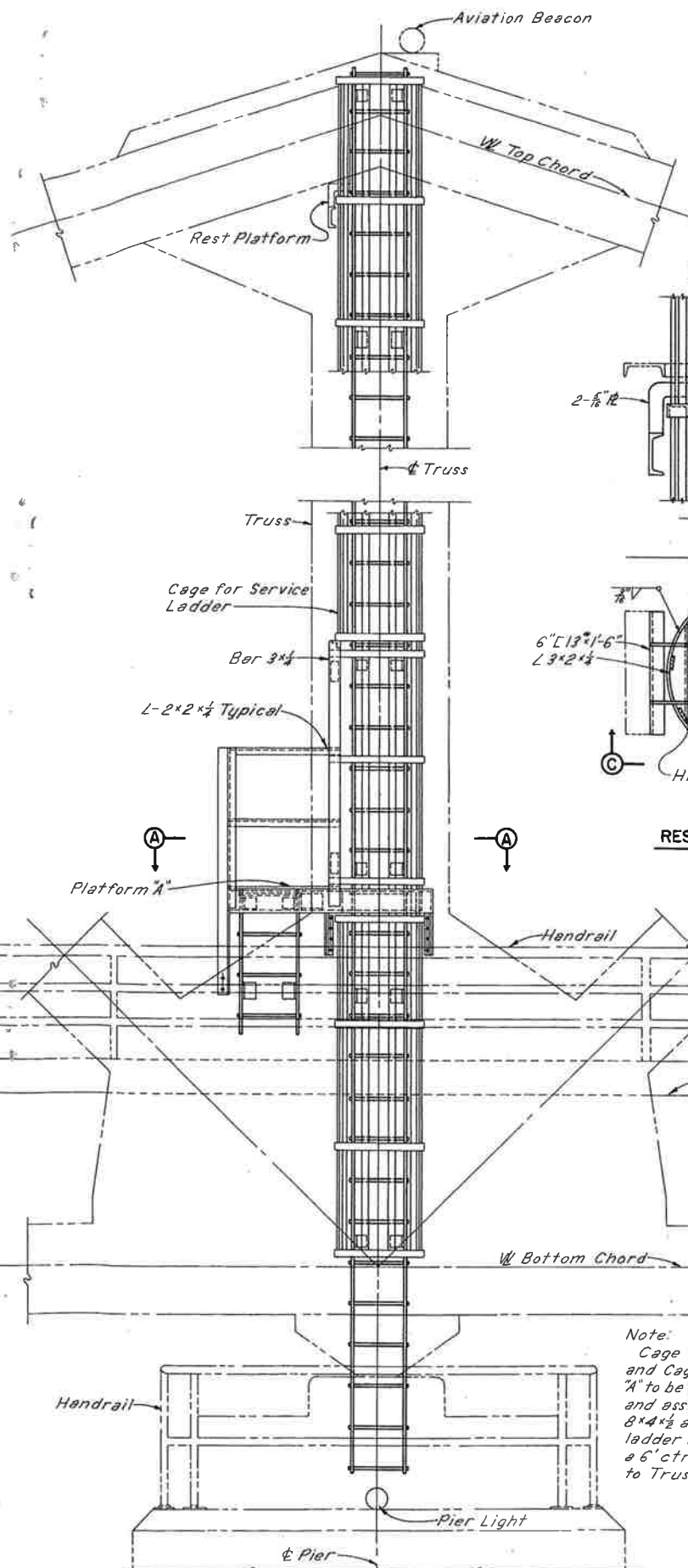
1.	M.A.C.	52862	As Built
NO.	MADE	DATE	REVISION



Note:
Material billed as "C" is structural carbon steel.
Material billed as "A" is manganese steel.
For details and spacing of holes "A", "B", and "C" see Sheet 4.38.

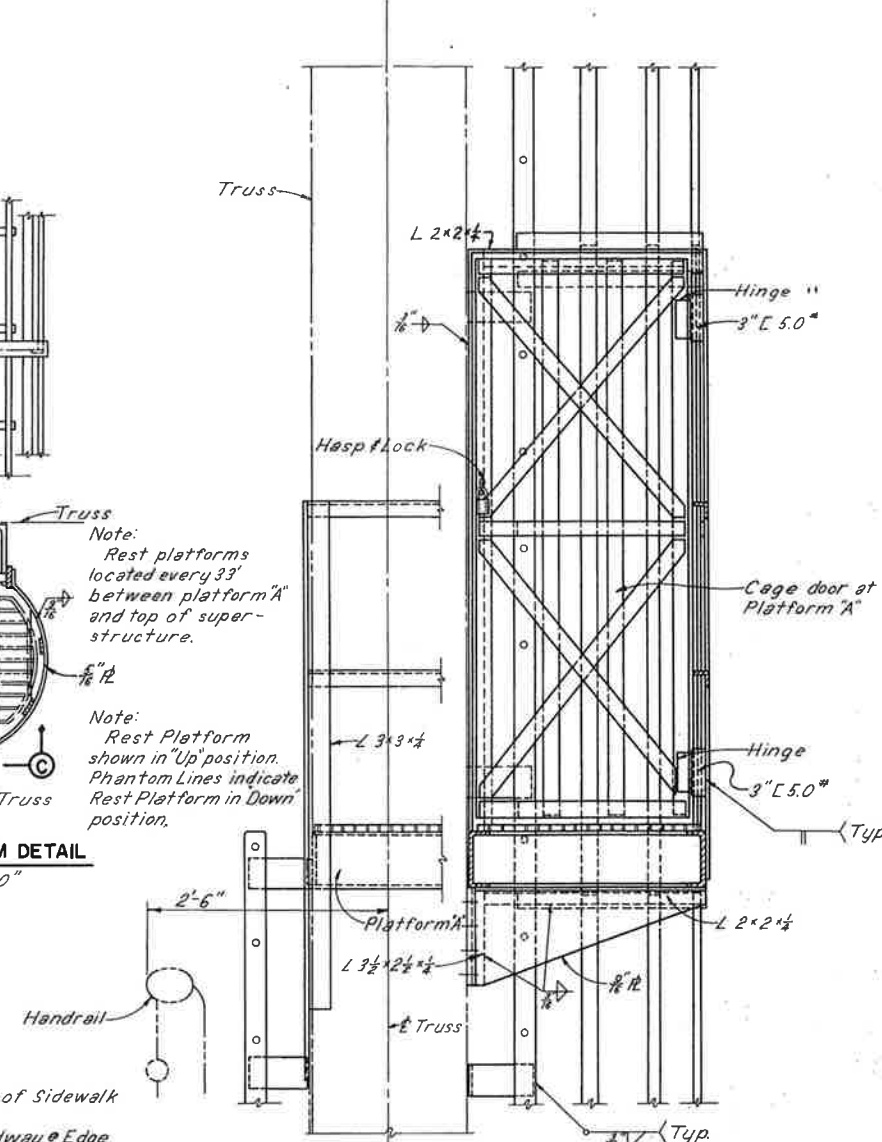
ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SPANS 11 - 15
PANEL POINTS 71 - 74



VIEW C-C
Note: Rest platforms located every 33' between platform 'A' and top of super-structure.
Note: Rest Platform shown in 'Up' position. Phantom Lines indicate Rest Platform in 'Down' position.

REST PLATFORM DETAIL
Scale: 1"=1'-0"



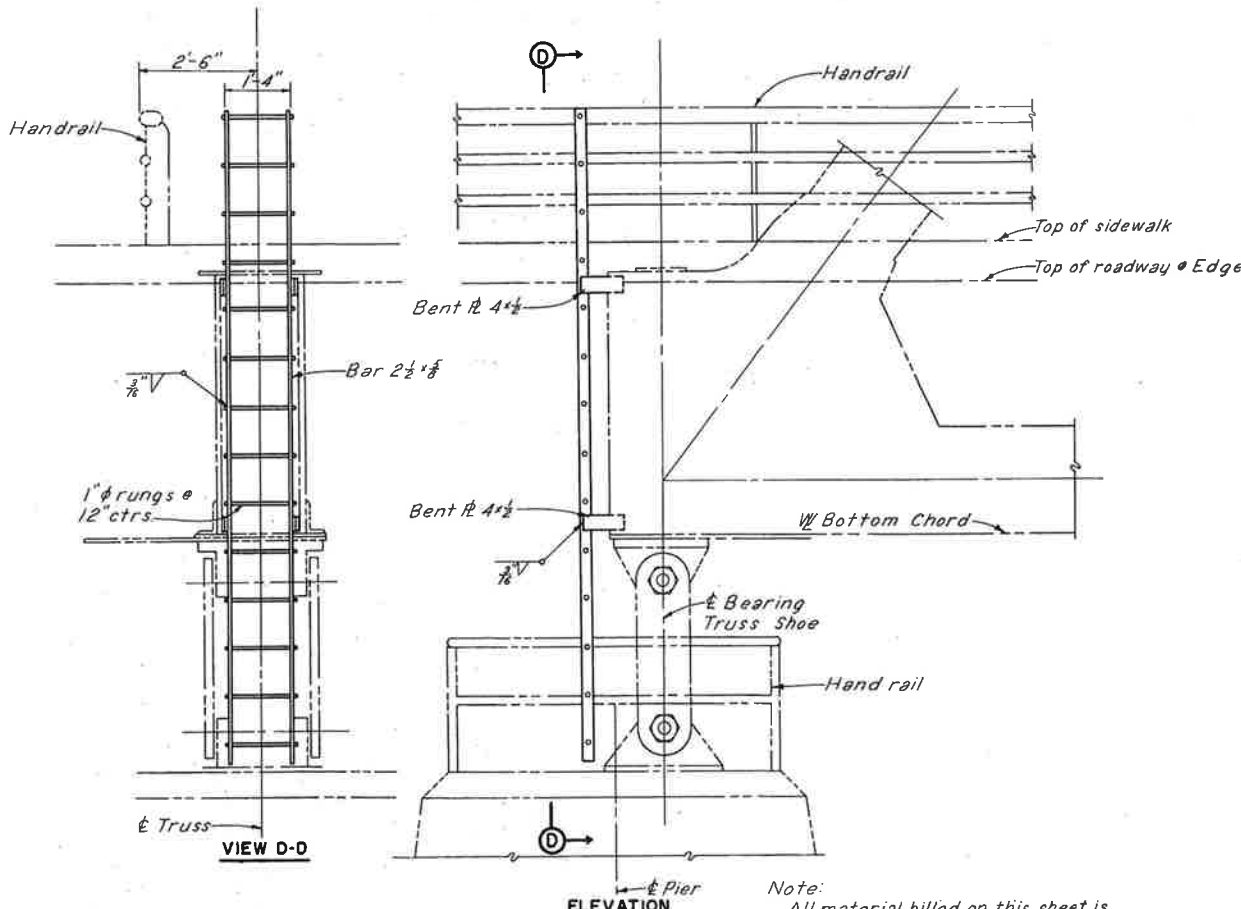
SECTION B-B
Scale: 1"=1'-0"

Note: Cage for service ladder and cage door at Platform 'A' to be made of Bars 2x4 and assembled with 1/2" weld. 8x4 1/2 angle supports for ladder are to be spaced @ 6' ctrs. and connected to Truss with 3/8" Rivets.

Note: Service Ladder located on outside face of North Truss at Piers 11 and 13, and on outside face of South Truss at piers 12 and 14

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

Note: Grating for Platform 'A' and Rest Platforms shall be equal to 1/2" x 1/2" grating with abrasive embedded filling. Gratings at Platform 'A' shall be anchored Kerrigan type K-3 anchors @ 12" ctrs.



SERVICE LADDER AT PIERS 10 AND 15
Scale: 1/2"=1'-0"

Note: All material billed on this sheet is structural carbon steel.

SERVICE LADDER FOR AVIATION AND NAVIGATION LIGHTS
(4 Required)
Scale: 1/2"=1'-0"

ARKANSAS STATE HIGHWAY COMMISSION
MISSISSIPPI STATE HIGHWAY DEPARTMENT
MISSISSIPPI RIVER BRIDGE
NEAR HELENA, ARKANSAS

RIVER BRIDGE SPANS 11 - 15
SERVICE LADDERS

SCALE As Shown
MADE K.M.W. DATE 9-17-56
TRCD. B.H.G. DATE 11-2-56
CKD. D.E.R. DATE 11-6-56
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
984 SHEET- 4.43

NO.	MADE	DATE	REVISION
1.	MAC	5/28/62	