

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
0	ARK.	196-A	1925	1	10

OUACHITA RIVER MONTGOMERY CO. S. 11 W. 46 DR. 288

STATE OF ARKANSAS
STATE HIGHWAY DEPARTMENT

PLAN OF PROPOSED BRIDGE
OVER
OUACHITA RIVER
MONTGOMERY COUNTY.

6 MILES, No. WEST OF MOUNT IDA., STATE HIGHWAY No. 6.

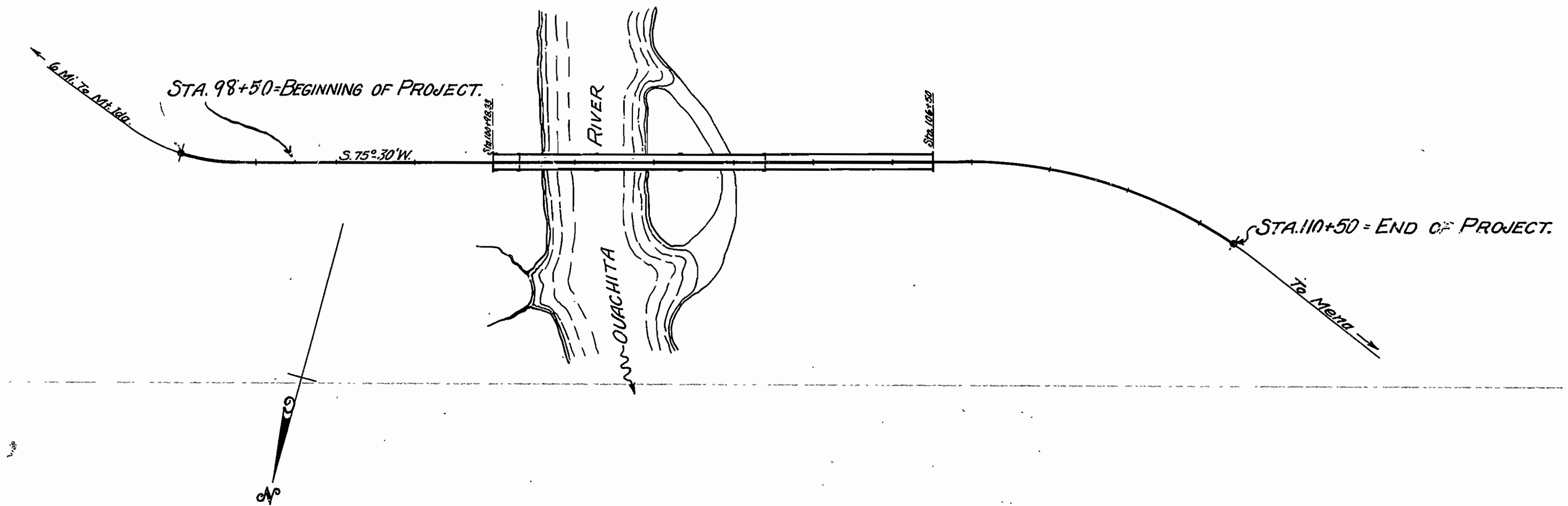
FEDERAL AID PROJECT No. 196~A

INDEX OF SHEETS

- SHEET No. 1 TITLE SHEET AND TABULATION OF QUANTITIES.
- " " 2 GENERAL LAYOUT.
- " " 3 ELEVATION, EAST HALF OF ARCH SPANS.
- " " 4 " WEST " " " "
- " " 5 DETAILS, EAST " " " "
- " " 6 " WEST " " " "
- " " 7 SECTIONS, ROADWAY SLAB, ARCH RINGS AND ETC.
- " " 8 DETAILS, TIMBER TRESTLE, STATE STD. No. F-T7-A.
- " " 9 PLAN AND PROFILE
- " " 10 CROSS SECTION.

QUANTITIES

ITEM No.	Description	Quantity	Unit
12	ROADWAY EXCAVATION - LOOSE ROCK	400	Cu. Yds.
12	" " " " EARTH	1955	" "
13	DRY EXCAVATION FOR STRUCTURES	500	" "
13	WET " " " "	188	" "
13	SOLID ROCK EXCAVATION FOR STRUCTURES	75	" "
52	UNTREATED BRIDGE TIMBER	19,200	Ft. B.M.
52	TREATED " " " "	17,230	" "
54	CONCRETE, CLASS 'A' (1:2:4 Mix)	4806	Cu. Yds.
54	" " " 'S' (1:2:3 Mix)	4047	" "
55	REINFORCING, STEEL	105,750	LBS.
67	TREATED TIMBER PILING	1560	Lin. Ft.
69	RIP RAP (1-Ft. THICK.)	125	Sq. Yds.
74	CONCRETE RAILING FOR STRUCTURES	682	Lin. Ft.



Specifications approved by Chief, Bureau of Public Roads September 28, 1925, and adopted by State Highway Commission May 30, 1925, and special Provisions.

LAYOUT

Scale: 1" = 100'

GROSS LENGTH OF PROJECT = 1200 FT.
NET LENGTH OF PROJECT = 1200 FT.

APPROVED
COMMISSIONER, STATE LANDS, HIGHWAYS AND IMPROVEMENTS

APPROVED
STATE HIGHWAY ENGINEER

RECOMMENDED FOR APPROVAL
DISTRICT ENGINEER - U. S. BUREAU OF PUBLIC ROADS

RECOMMENDED FOR APPROVAL
CHIEF ENGINEER - U. S. BUREAU OF PUBLIC ROADS

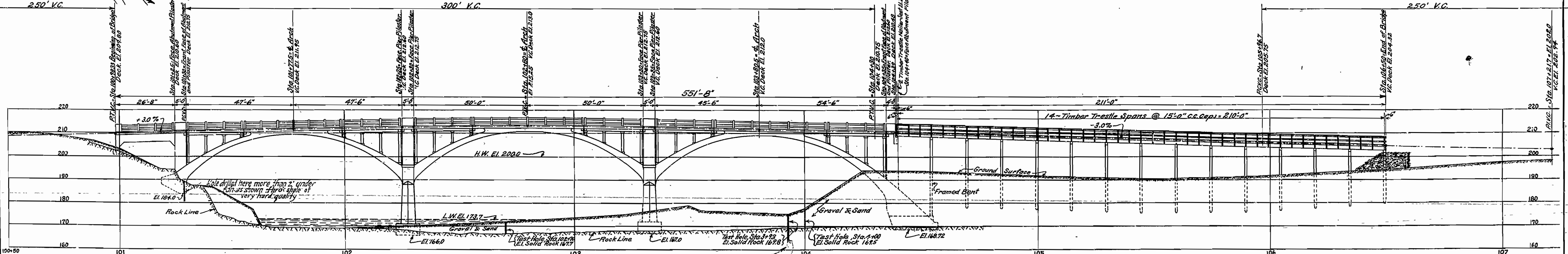
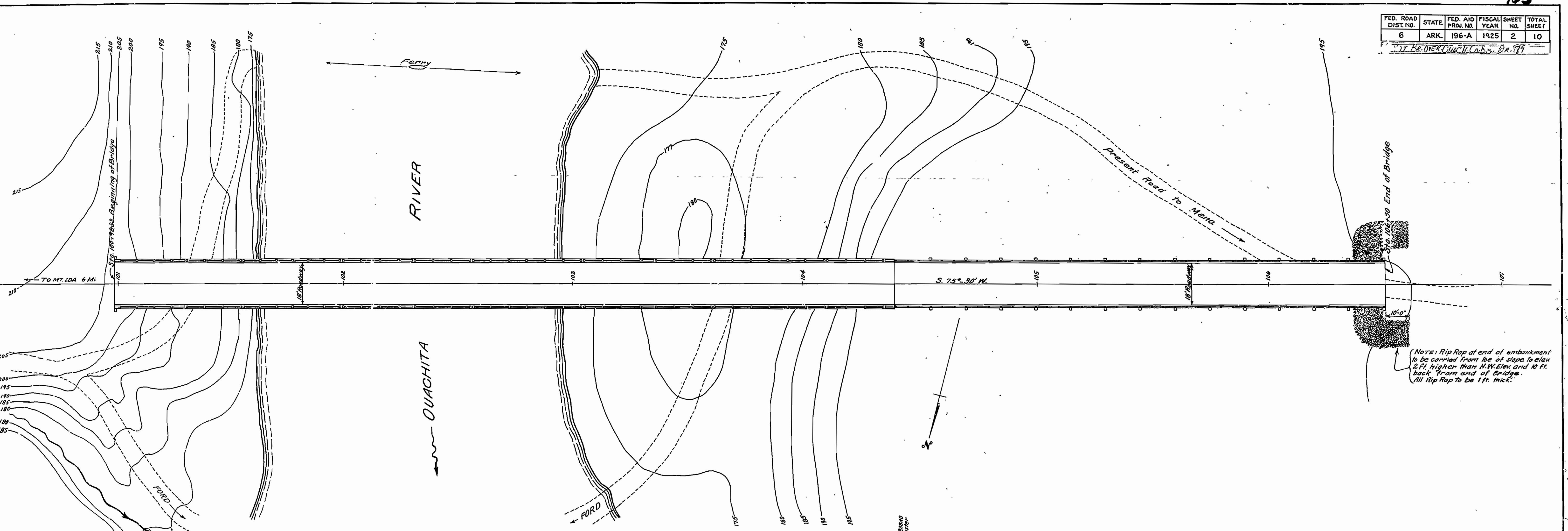
RECOMMENDED FOR APPROVAL
STATE HIGHWAY BRIDGE ENGINEER

APPROVED
DIRECTOR - U. S. BUREAU OF PUBLIC ROADS

Drawing No. 288

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	ARK.	196-A	1925	2	10

J. B. OVERCROW, C.E., D.R. 99

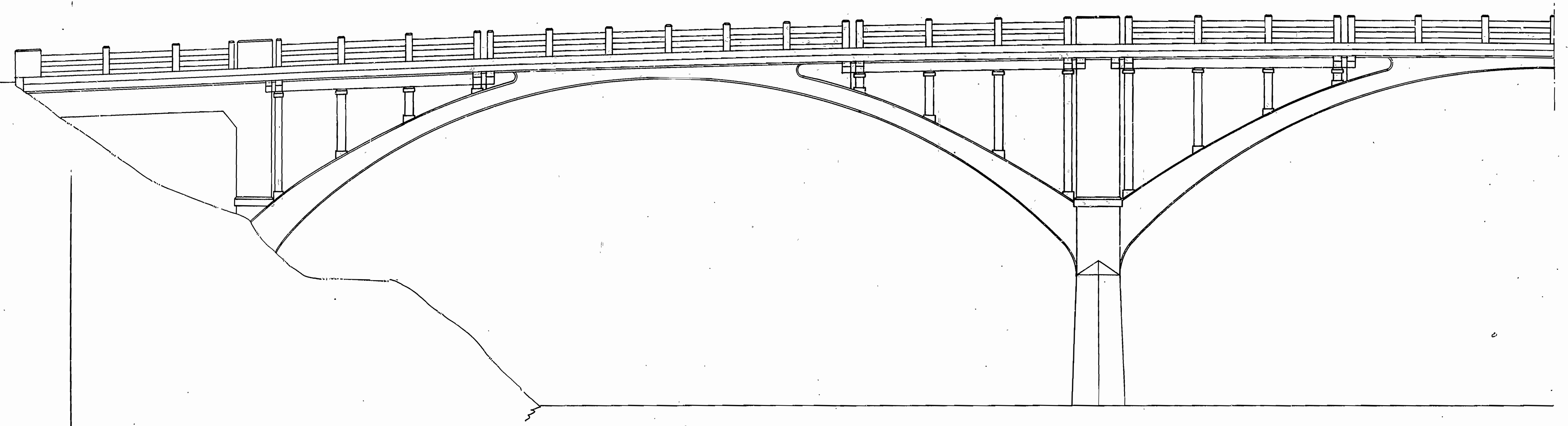


ARKANSAS STATE HIGHWAY DEPARTMENT
 LAYOUT
 BRIDGE OVER
 OUACHITA RIVER
 NEAR MT. IDA, MONTGOMERY CO., STATE HIGHWAY NO. 6
 FEDERAL AID PROJECT NO. 196 A
 LITTLE ROCK, ARK.
 MAY 1926

166

Fed. Road Dist. No.	State	Proj. No.	Fiscal Year	Sheet No.	Total Sheets
6	ARK.	196-A	1926	3	10

REINFORCED CONCRETE BRIDGE OVER OUACHITA R.

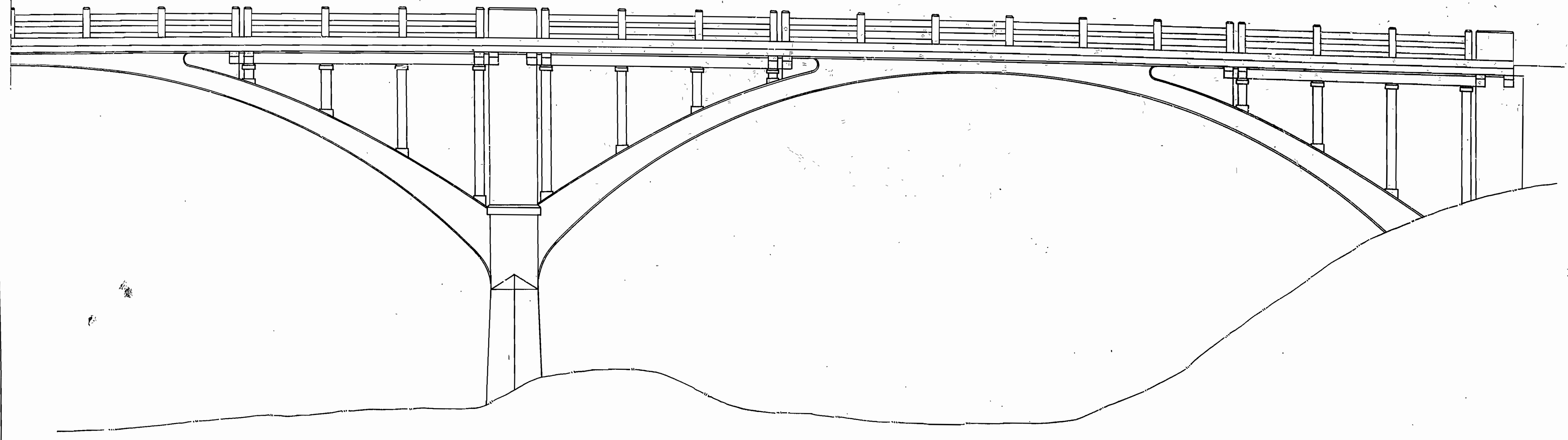


ELEVATION - EAST HALF OF BRIDGE

PROPOSED
REINFORCED CONCRETE BRIDGE
OVER OUACHITA RIVER
6 MILES WEST OF MT. IDA
STATE HIGHWAY NO. 6
MONTGOMERY COUNTY, ARK.
Apr. 16 1926
Scale: 3/16" = 1'-0"

167

Proj. Road	Dist.	Pub. Act	Facial	Sheet	Total
6	ARK.	1926	4	10	
REINFORCED CONCRETE BRIDGE OVER OUACHITA RIVER					



ELEVATION - WEST HALF OF BRIDGE

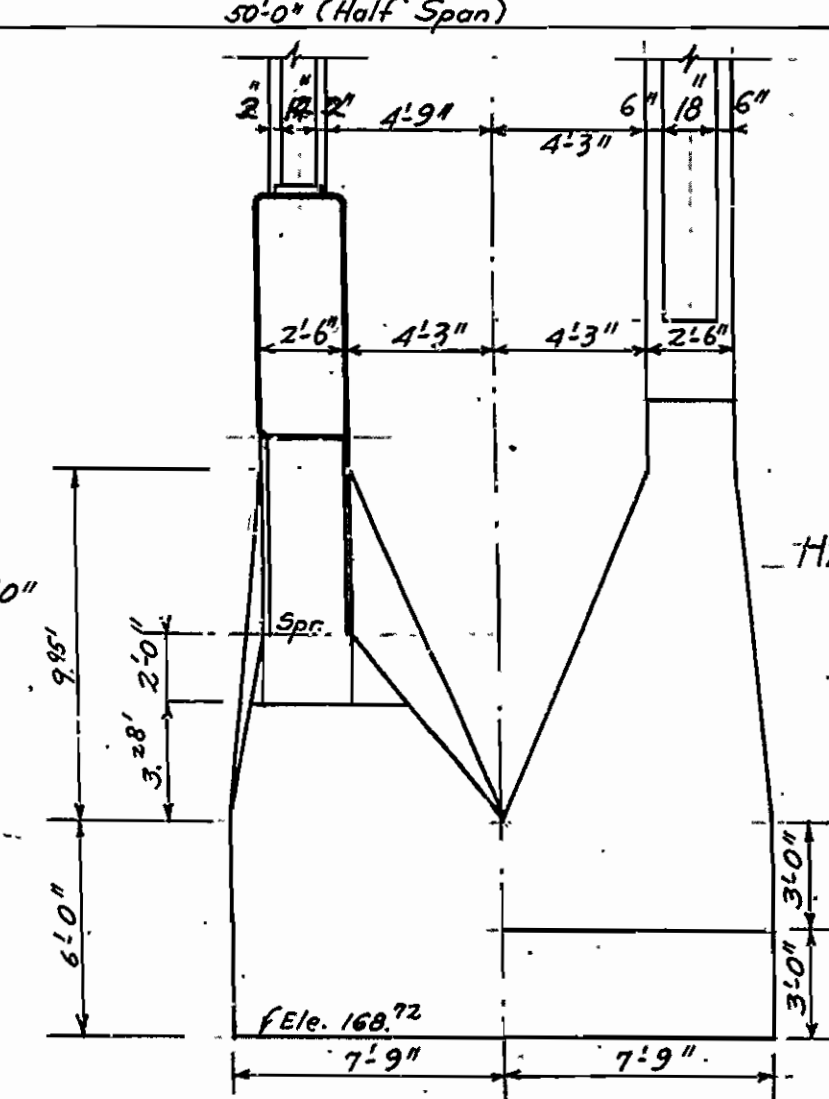
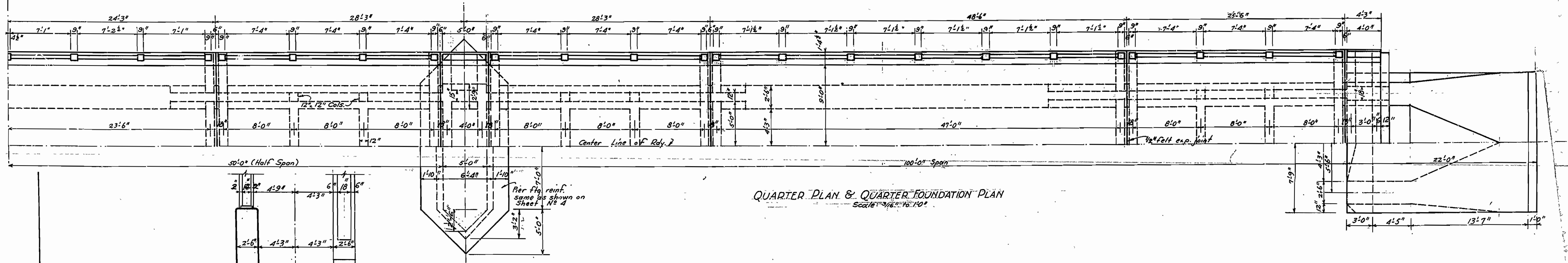
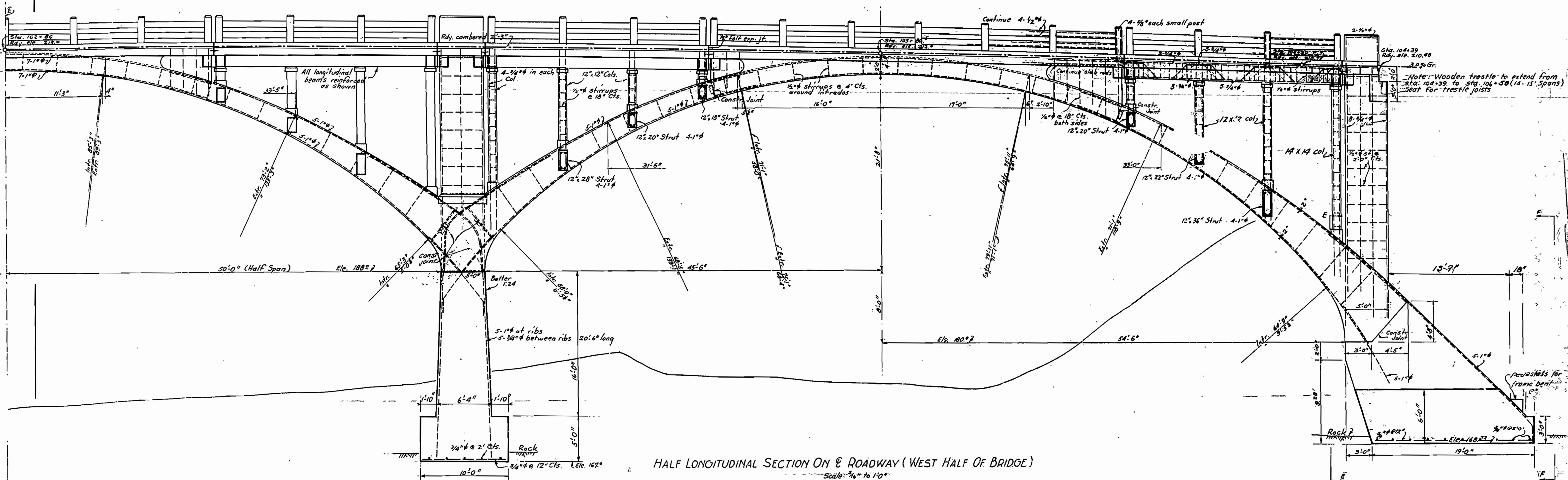
PROPOSED
REINFORCED CONCRETE BRIDGE
 OVER OUACHITA RIVER
 6 MILES WEST OF MT. IDA
 STATE HIGHWAY No. 6
 MONTGOMERY COUNTY, ARK.

Apr. 16, 1926
 Scale 1/4" = 1'-0"

DRAWING No. 291
 SHEET 4 of 10
 Drawing No.

Proj. No.	State	Proj. No.	Year	Sheet No.	Total Sheets
G	ARK.	196-A	1926	6	10
REIN. CONC. BRIDGE OVER QUACHITA RIVER					

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PROPOSED
REINFORCED CONCRETE BRIDGE
 OVER QUACHITA RIVER
 6 MILES WEST OF MT. IDA
 STATE HIGHWAY NO. 6
 MONTGOMERY COUNTY, ARK.

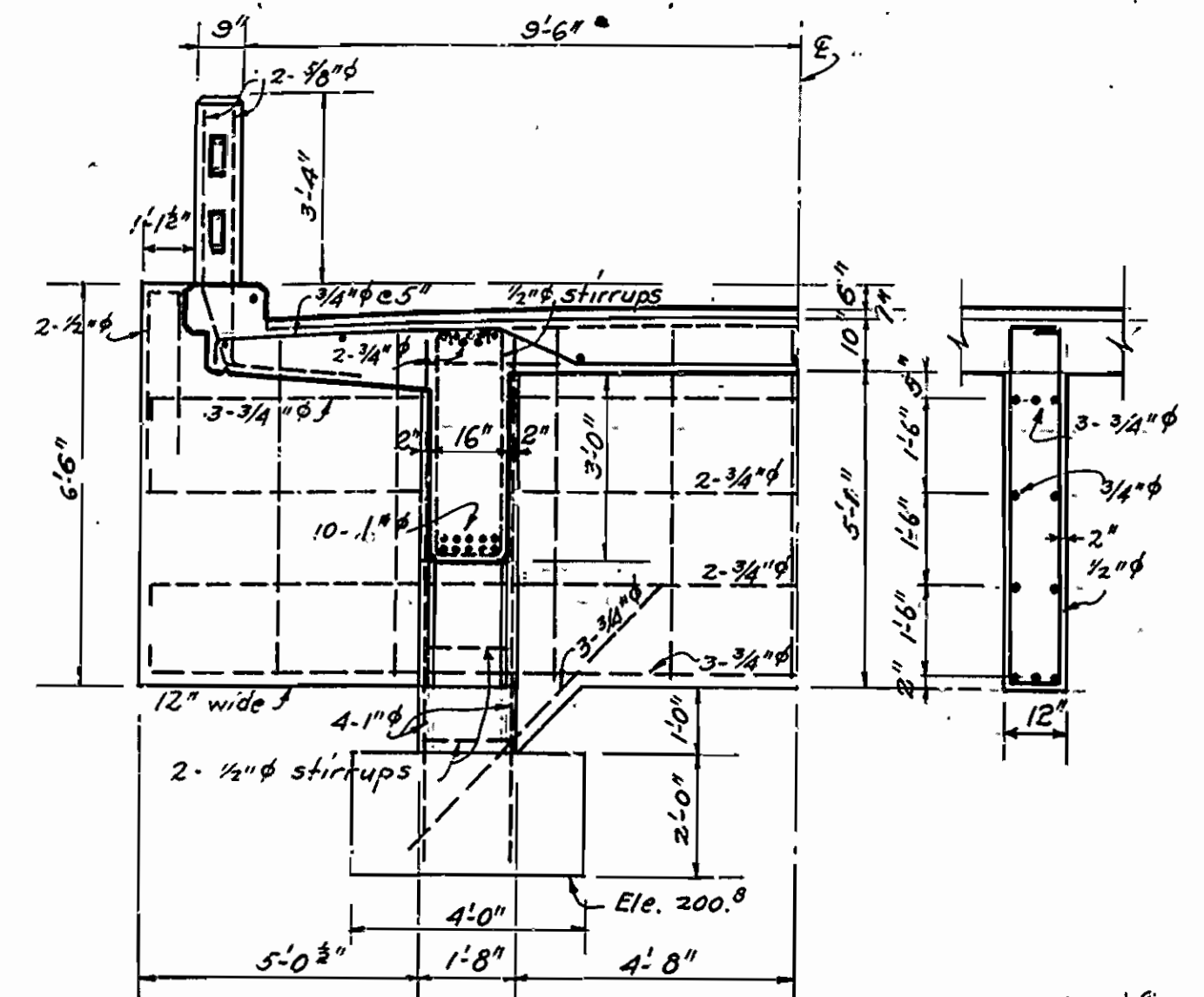
Apr. 16, 1926
 Scales As Noted

DRAWING NO. 393

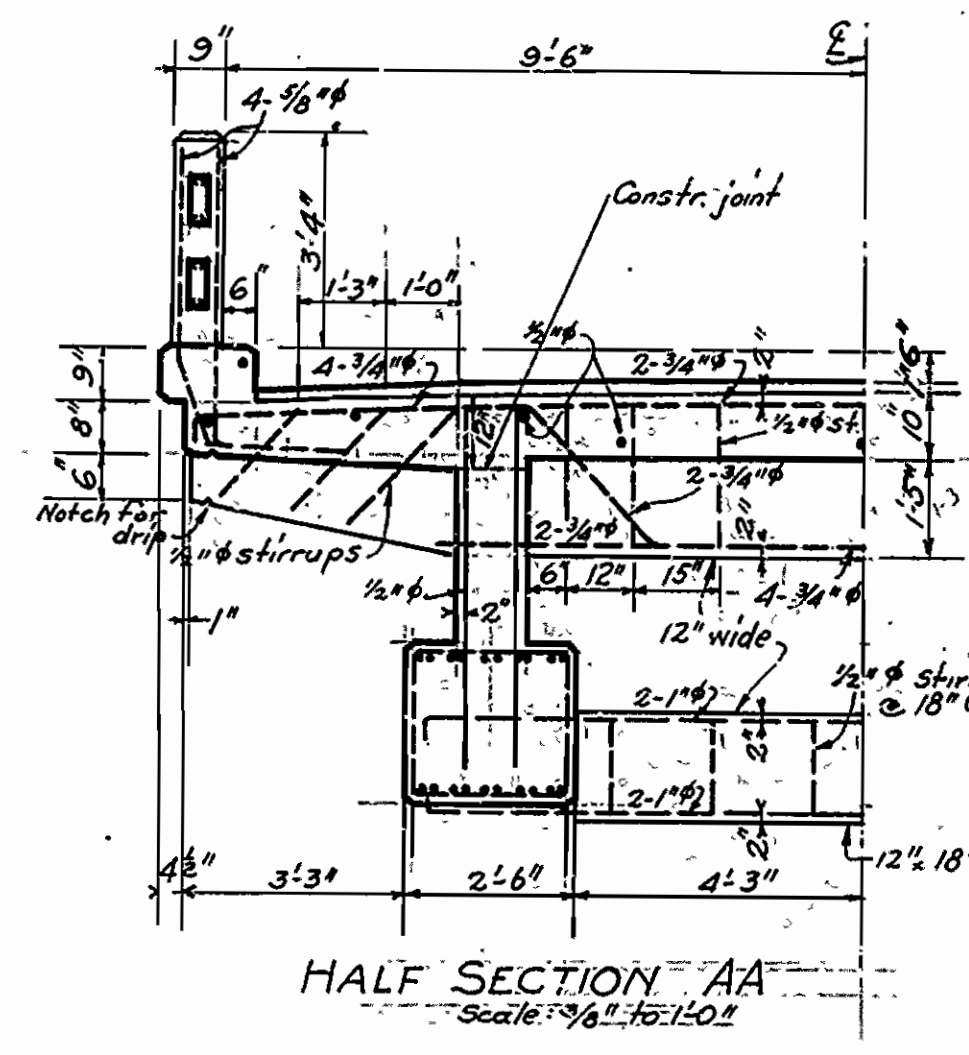
SHEET 6 OF 10
 Drawing N

Revised 7-23-26 R.A.

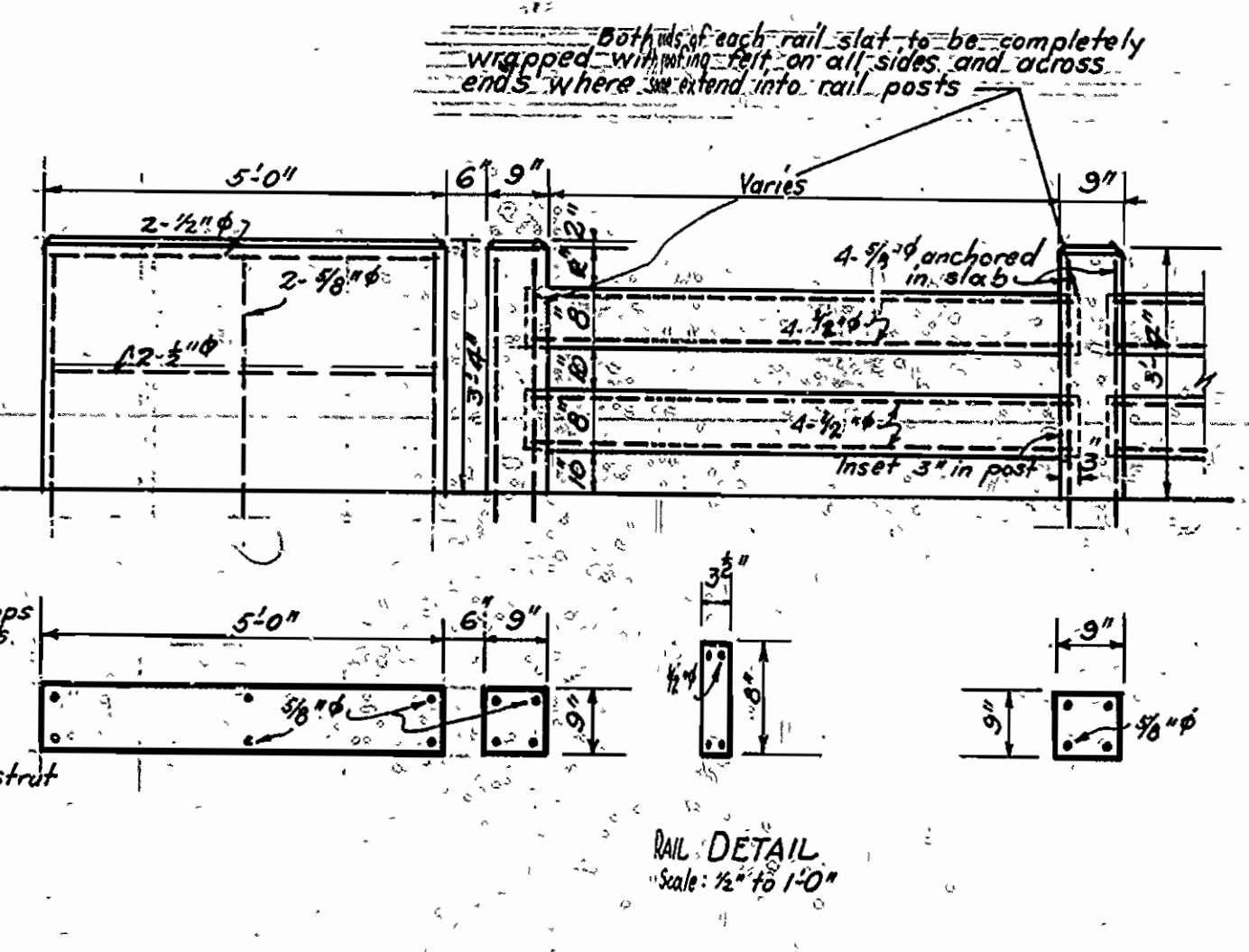
Fed. Road Dist. No.	State	Fed. Aid Proviso	Fiscal Year	Sheet No.	Total Sheets
6	ARK	196-A	1926	7	10



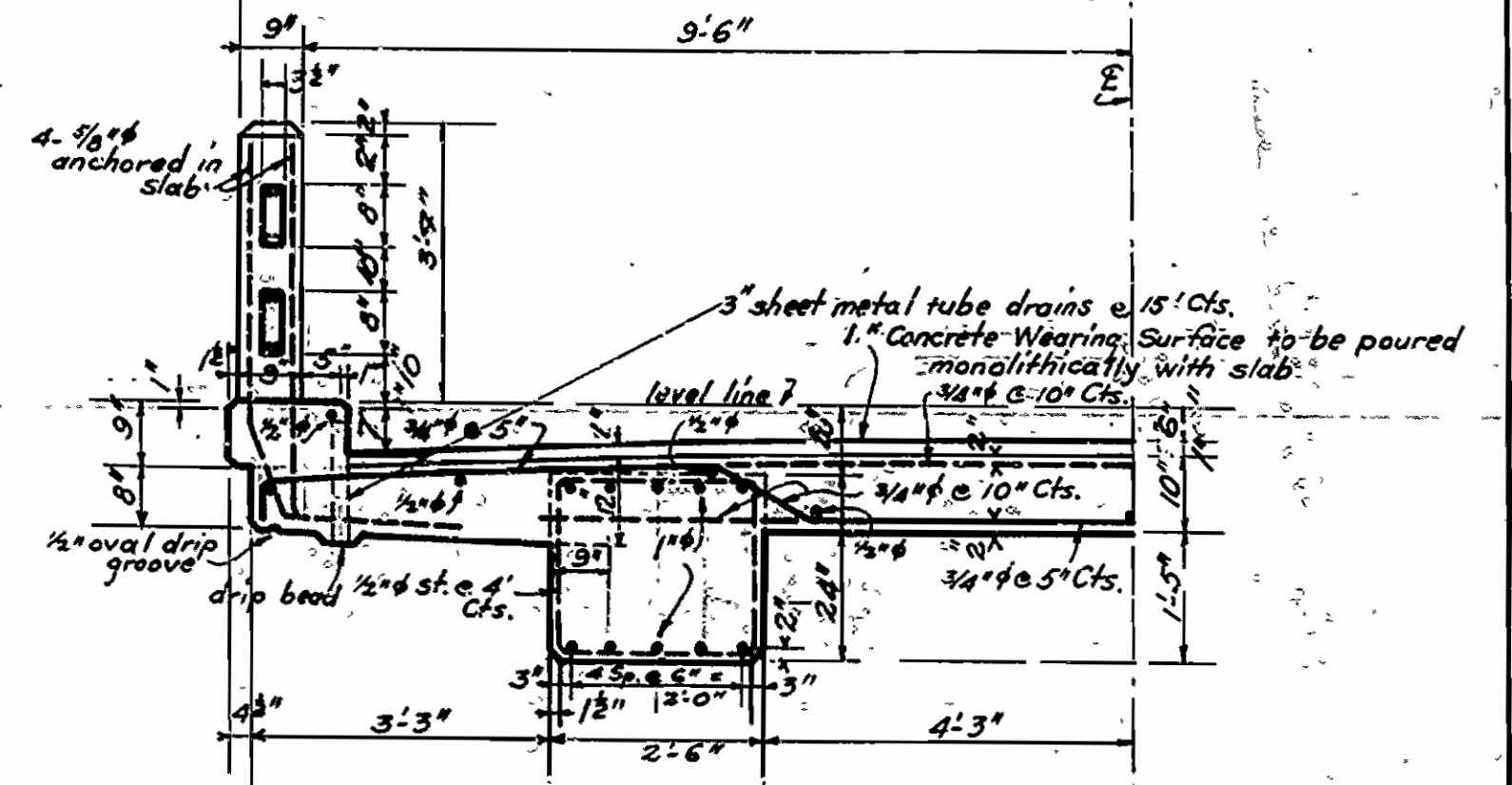
HALF SECTION BB
Scale: 3/8" to 1'-0"



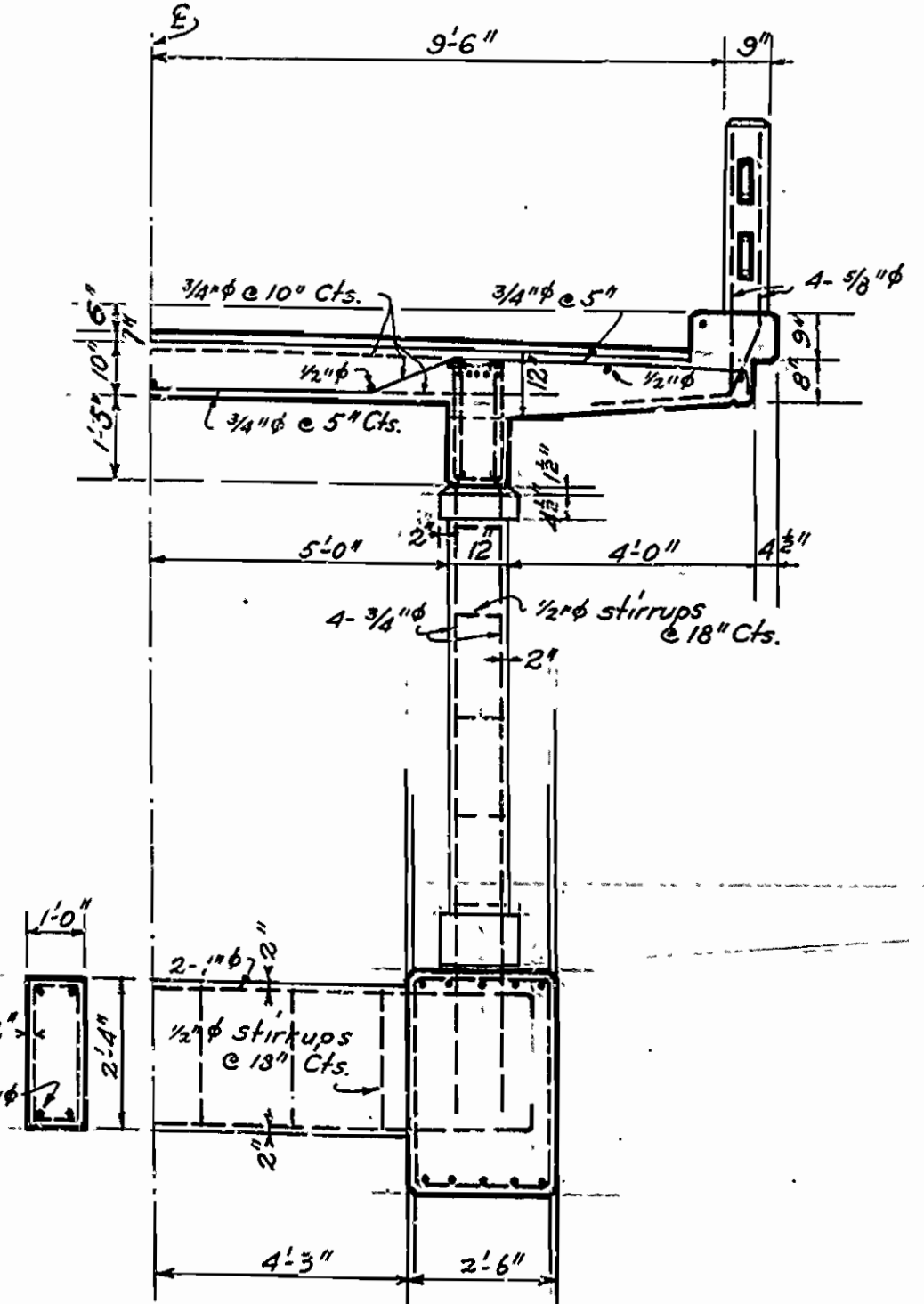
HALF SECTION AA
Scale: 3/8" to 1'-0"



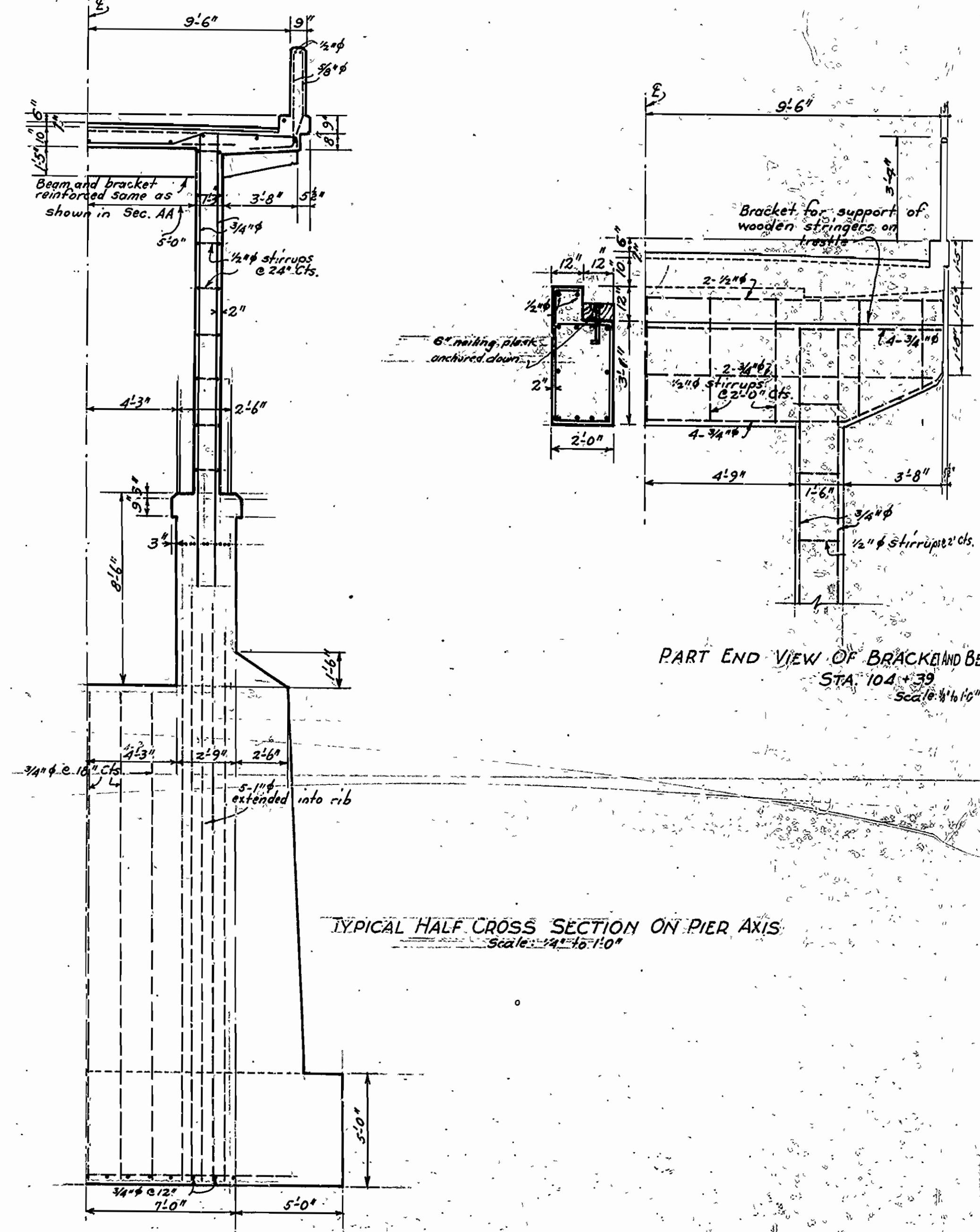
RAIL DETAIL
Scale: 1/2" to 1'-0"



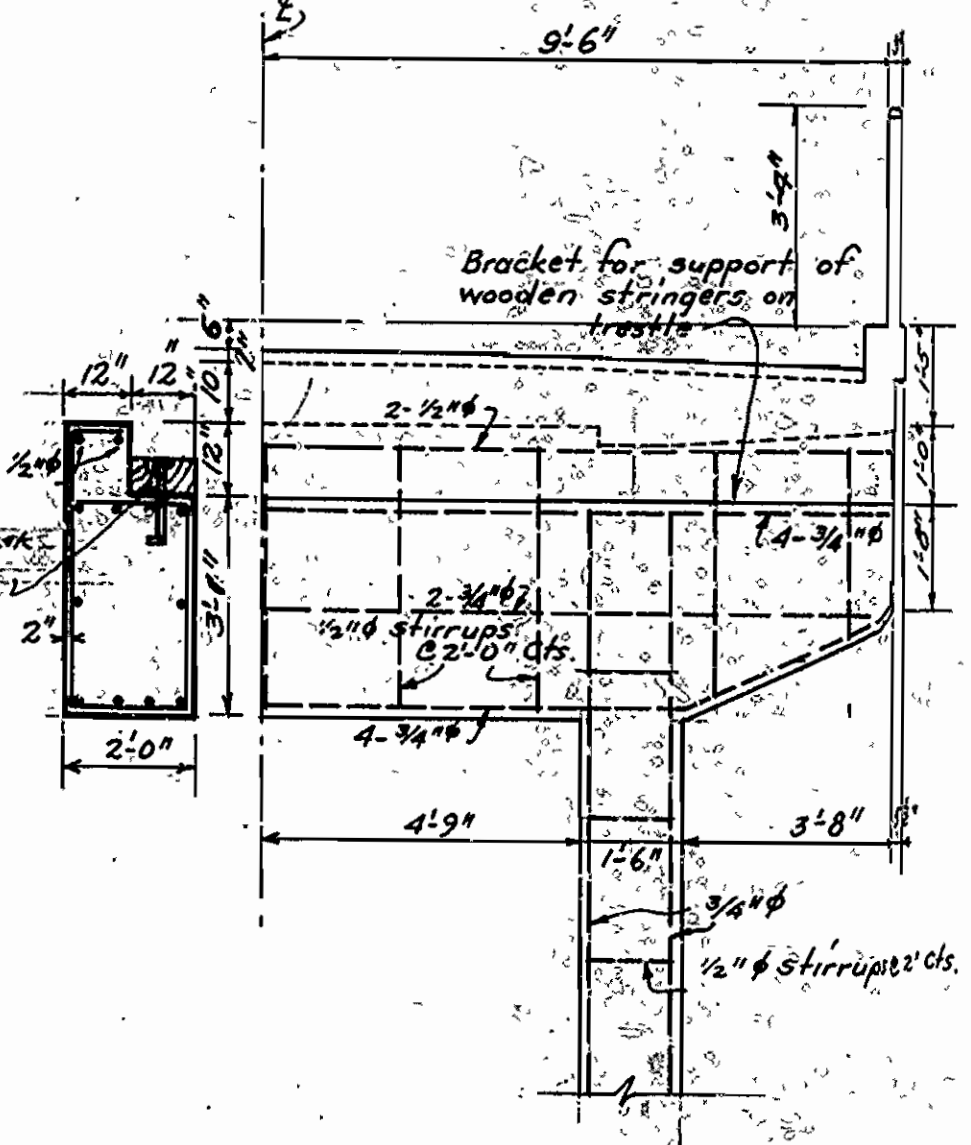
TYPICAL HALF CROSS SECTION AT CROWN
Scale: 1/2" to 1'-0"



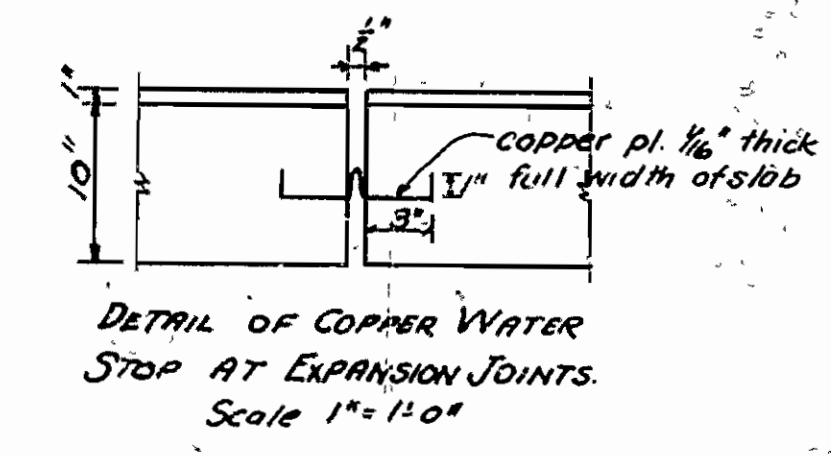
HALF SECTION CC
Scale: 3/8" to 1'-0"



TYPICAL HALF CROSS SECTION ON PIER AXIS
Scale: 1/4" to 1'-0"



PART END VIEW OF BRACKEND BEAM
STA. 104 + 39
Scale: 1/4" to 1'-0"



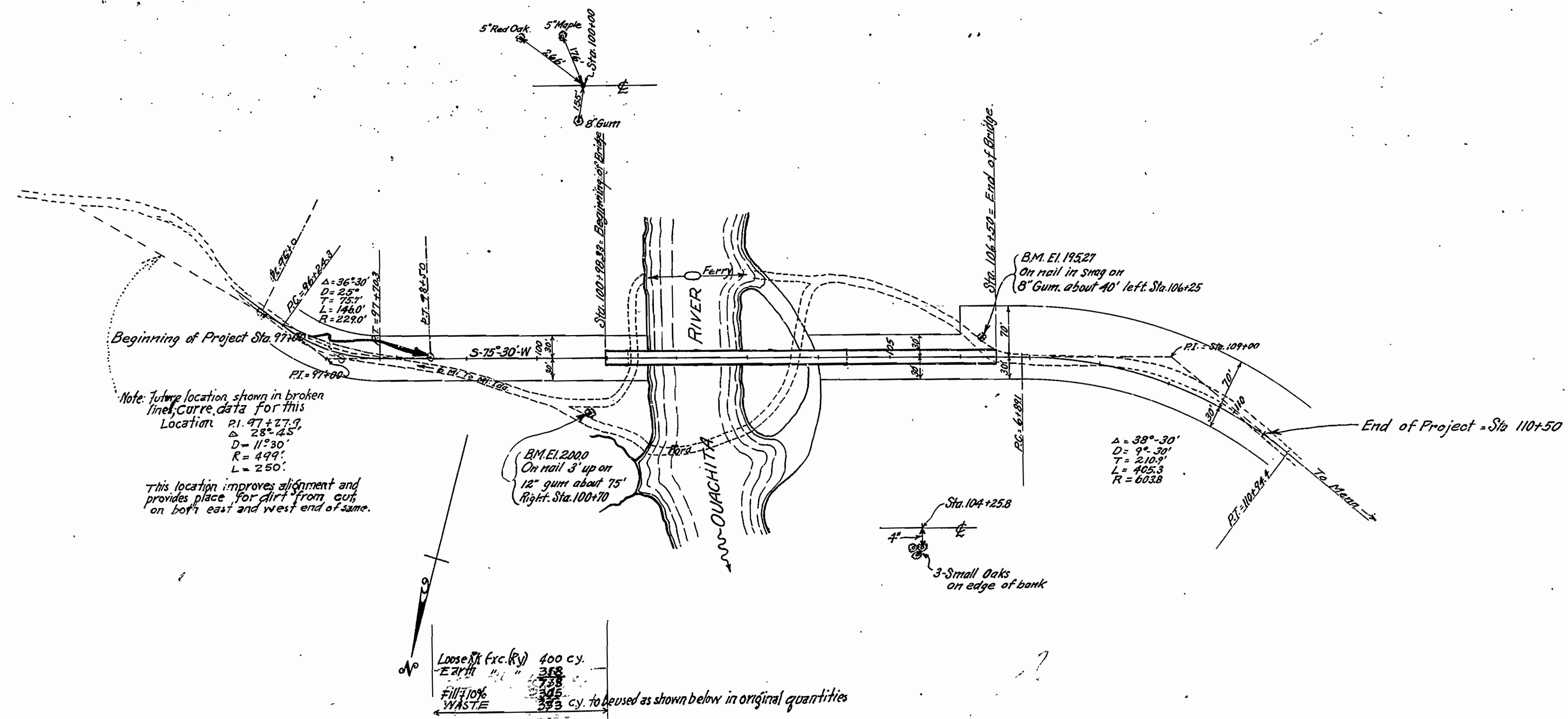
DETAIL OF COPPER WATER STOP AT EXPANSION JOINTS
Scale: 1" = 1'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	ARK	196-A	1925	9	10

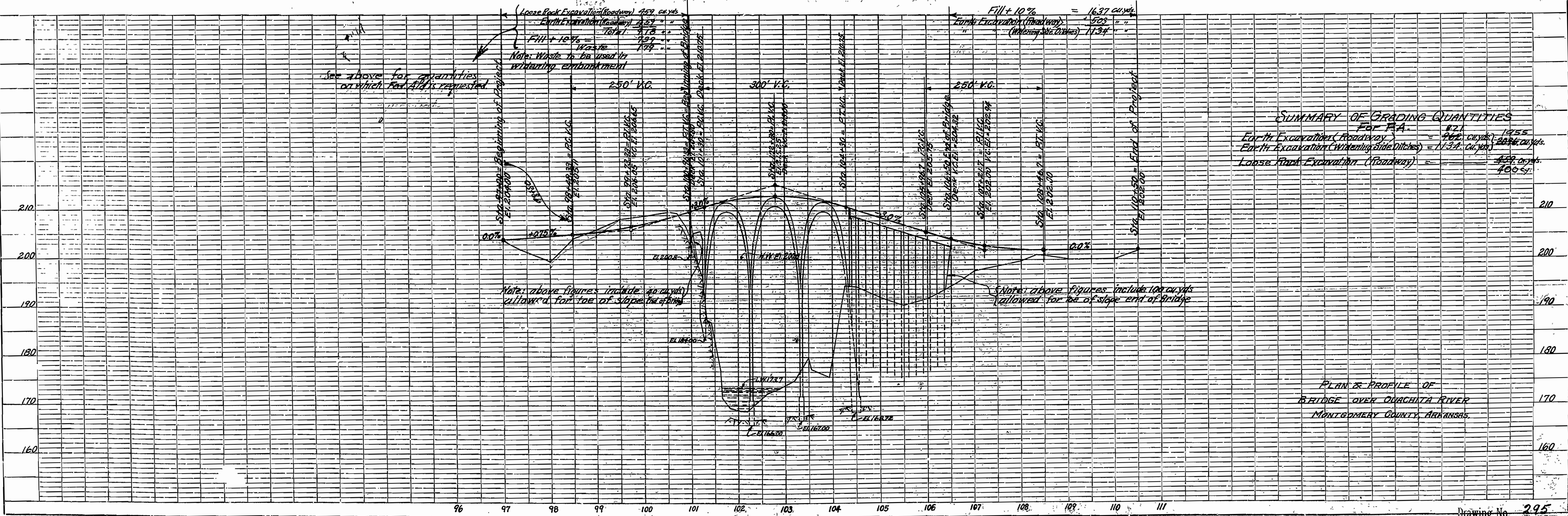
PLAN & PROF. BR. OVER OUCHITA R. DA-295

PLAN
 CHECKED BY: _____
 DATE: _____
 NOTE: ROAD GRADES CHECKED AT 25' INTERVALS

PROFILE
 CHECKED BY: _____
 DATE: _____
 NOTE: ROAD GRADES CHECKED AT 25' INTERVALS



Loose Rock Exc. (Ry)	400 cy.
Earth	318
Fill 10%	355
WASTE	355 cy. to be used as shown below in original quantities



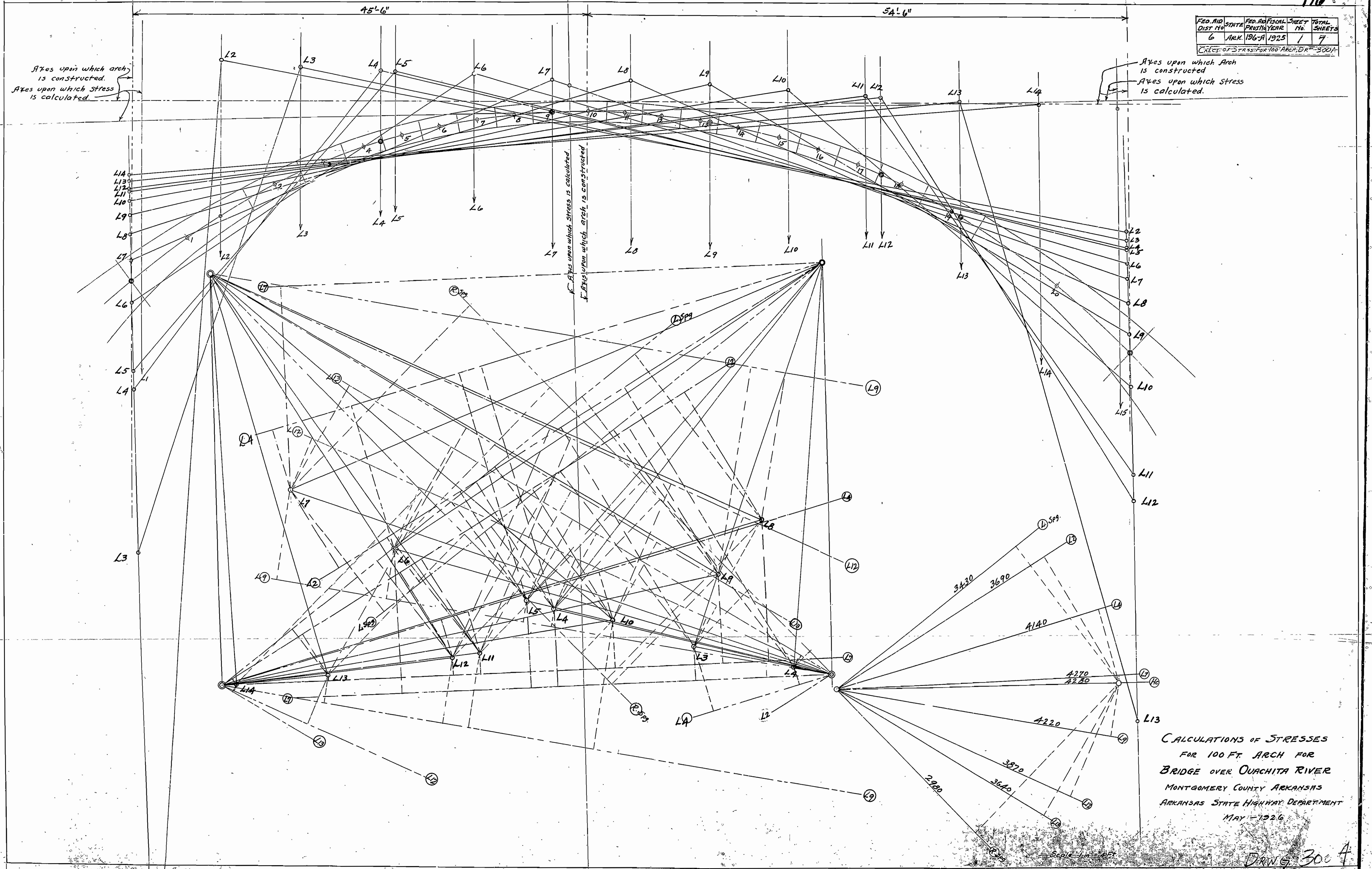
SUMMARY OF GRADING QUANTITIES

Item	Quantity
Loose Rock Excavation (Roadway)	400 cy.
Earth Excavation (Roadway)	318 cy.
Earth Excavation (Widening Side Ditches)	11.34 cy.
Fill 10%	355 cy.
Waste	355 cy.
Loose Rock Excavation (Roadway)	400 cy.

PLAN & PROFILE OF BRIDGE OVER OUCHITA RIVER MONTGOMERY COUNTY, ARKANSAS.

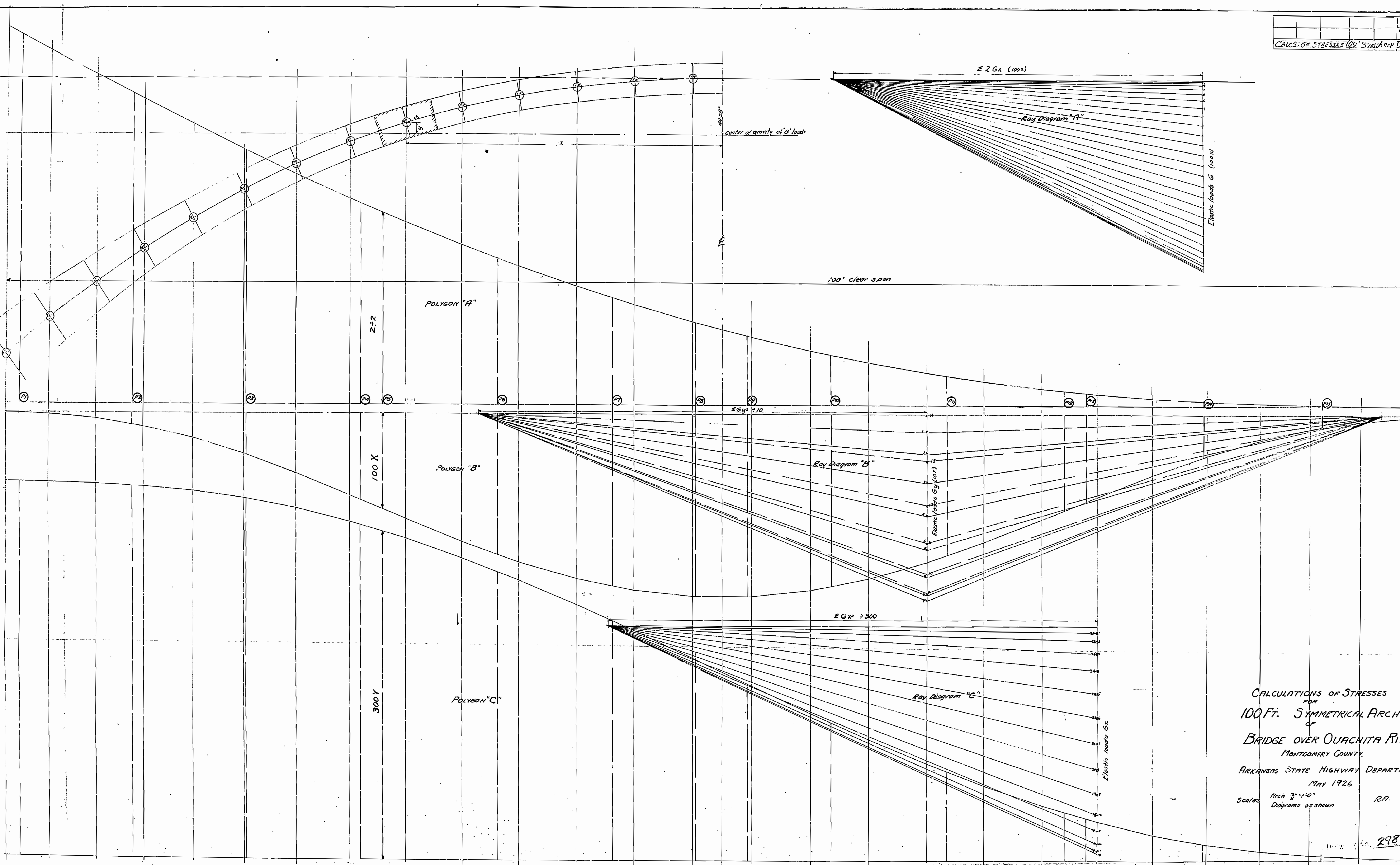
FED. AID DIST. NO.	STATE	FED. AID PROJ. YEAR	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	ARK.	196-A	1935	1	7

CALCULATIONS OF STRESSES FOR 100 FT. ARCH, D.R. 300A



CALCULATIONS OF STRESSES
 FOR 100 FT. ARCH FOR
 BRIDGE OVER OUACHITA RIVER
 MONTGOMERY COUNTY ARKANSAS
 ARKANSAS STATE HIGHWAY DEPARTMENT
 MAY - 1926

DRWG. 300A



CALCULATIONS OF STRESSES
FOR
100 FT. SYMMETRICAL ARCH
OF
BRIDGE OVER OUCHITA RIVER
MONTGOMERY COUNTY
ARKANSAS STATE HIGHWAY DEPARTMENT
MAY 1926
Scales Arch $\frac{3}{8}'' = 1'-0''$ RA
Diagrams as shown

STRESSES AT LEFT SPRINGING										STRESSES AT L2										STRESSES AT L4										STRESSES AT L7													
Load Point	Hc	Vd	M = HcVd	N	D.L.	MxD.L.	NxD.L.	L.L.	MxL.L.	NxL.L.	Load Point	Hc	Vd	M = HcVd	N	D.L.	MxD.L.	NxD.L.	L.L.	MxL.L.	NxL.L.	Load Point	Hc	Vd	M = HcVd	N	D.L.	MxD.L.	NxD.L.	L.L.	MxL.L.	NxL.L.	Load Point	Hc	Vd	M = HcVd	N	D.L.	MxD.L.	NxD.L.	L.L.	MxL.L.	NxL.L.
L2	0.0957	-74.30	-7.1105	0.660	11485	-81664	7580	3600	-25598	2376	L2	0.0957	+1520	+14524	0.580	11485	+16706	6661	3600	+5237	2088	L2	0.0957	+4.95	+4.8137	0.088	11485	+5440	1011	3600	+1705	317	L2	0.0957	-1.00	-0.9957	0.098	11485	-1099	1126	3600	-343	353
L3	0.3438	-26.38	-9.094	0.827	10000	-32694	8270	3600	-32650	2977	L3	0.3438	-8.40	-2.8874	0.767	10000	-28879	7670	3600	-10376	2161	L3	0.3438	+5.60	+1.9253	0.310	10000	+19253	3100	3600	+6931	1116	L3	0.3438	-0.70	-0.2487	0.341	10000	-2487	3410	3600	-866	1228
L4	0.6887	-10.50	-7.2314	1.045	6375	-46100	6662	2115	-15294	2210	L4	0.6887	-5.30	-3.6501	1.014	6375	-23269	6464	2115	-7720	2145	L4	0.6887	+6.90	+4.7520	0.888	6375	+32924	5661	2115	+10050	1878	L4	0.6887	+0.15	+0.1033	0.686	6375	+659	4373	2115	+218	1451
L5	0.7575	-8.75	-6.6281	1.088	5755	-38145	6261	2115	-14024	2301	L5	0.7575	-5.85	-4.4314	1.060	5755	-25503	6100	2115	-9372	2242	L5	0.7575	+5.15	+3.9011	0.944	5755	+22451	5433	2115	+8251	1997	L5	0.7575	+0.30	+0.2272	0.751	5755	+1308	4322	2115	+481	1588
L6	1.0824	-2.08	-2.2514	1.270	8120	-18281	10312	3524	-7934	4475	L6	1.0824	-2.55	-2.7601	1.275	8120	-22412	10353	3524	-9727	4493	L6	1.0824	+0.55	+0.5953	1.223	8120	+4834	9931	3524	+2078	4310	L6	1.0824	+1.60	+1.7318	1.074	8120	+14062	8721	3524	+6103	3785
L7	1.3364	+2.00	+2.6728	1.385	7820	+20901	10831	3524	+9419	4881	L7	1.3364	-0.55	-0.7350	1.418	7820	-5748	11089	3524	-2590	4997	L7	1.3364	-1.18	-1.5770	1.428	7820	-12332	11167	3524	-5557	5032	L7	1.3364	+3.15	+4.2097	1.348	7820	+32920	10541	3524	+14835	4750
L8	1.3573	+4.55	+6.1757	1.312	7840	+48417	10286	3524	+21738	4623	L8	1.3573	+0.97	+1.3168	1.362	7840	+10322	10678	3524	+4640	4800	L8	1.3573	-1.50	-2.0360	1.408	7840	-15962	11039	3524	-7115	4962	L8	1.3573	+0.75	+1.0180	1.367	7840	+7981	10717	3524	+3587	4817
L9	1.2399	+6.40	+7.9354	1.145	8140	+64594	9320	3524	+27933	4035	L9	1.2399	+2.10	+2.6038	1.190	8140	+4195	9757	3524	+9176	4227	L9	1.2399	-1.65	-2.0458	1.268	8140	-16653	10241	3524	-7209	4468	L9	1.2399	-0.70	-0.8679	1.250	8140	-7065	10175	3524	-3050	4405
L10	0.9797	+7.80	+7.6417	0.869	9250	+70686	8038	3524	+26899	3062	L10	0.9797	+3.00	+2.9391	0.916	9250	+27187	8473	3524	+10357	3228	L10	0.9797	-1.65	-1.6165	0.982	9250	-14952	9084	3524	-5697	3461	L10	0.9797	-1.70	-1.6655	0.982	9250	-15406	9084	3524	-5869	3461
L11	0.6448	+8.70	+5.6090	0.557	6230	+34949	3470	2115	+11865	1178	L11	0.6448	+3.55	+2.2890	0.590	6230	+14260	3676	2115	+4841	1248	L11	0.6448	-1.65	-1.0639	0.640	6230	-6628	3987	2115	-2250	1354	L11	0.6448	-2.35	-1.5153	0.645	6230	-9440	4018	2115	-3205	1364
L12	0.5782	+9.00	+5.2038	0.497	6440	+33512	3201	2115	+11066	1057	L12	0.5782	+3.75	+2.1683	0.578	6440	+13964	3400	2115	+4586	1117	L12	0.5782	-1.65	-0.9540	0.571	6440	-6144	3677	2115	-2018	1208	L12	0.5782	-2.45	-1.4166	0.579	6440	-9123	3729	2115	-2996	1225
L13	0.2655	+9.70	+2.5775	0.223	10940	+28175	2440	3600	+9271	803	L13	0.2655	+4.20	+1.1187	0.240	10940	+17199	2626	3600	+4014	864	L13	0.2655	-1.50	-0.3983	0.263	10940	-4357	2877	3600	-1434	947	L13	0.2655	-2.78	-0.7381	0.267	10940	-8075	2921	3600	-2657	961
L14	0.0346	+10.35	+0.3591	0.030	12800	+4584	384	3600	+1289	108	L14	0.0346	+4.70	+0.1626	0.030	12800	+2081	384	3600	+585	108	L14	0.0346	-1.35	-0.4649	0.037	12800	-598	414	3600	-168	133	L14	0.0346	-2.83	-0.9719	0.035	12800	-1253	448	3600	-352	126

$t = 4.44' = 53.52''$ $p = 0.49\%$ $M = 150354 \times 1.7 = 255601.8$ $N = 87055$ $40^\circ \text{ Rise} = 19741$ $\% = \frac{150354}{115 \times 12 \times 53.52} = 1.41$ $\% = \frac{87055}{4.46} = 0.316$ $K = 0.69$ $L = 0.115$ $f_c = \frac{150354 \times 1.7}{115 \times 12 \times 53.52} = 456 \#/\text{sq}''$	$t = 2.78' = 33.36''$ $p = 0.78\%$ $M = 105001 \times 1.8 = 189001.8$ $N = 87326$ $40^\circ \text{ Rise} = 17675$ $\% = \frac{105001}{12 \times 24 \times 33.36} = 1.07$ $\% = \frac{87326}{2.78} = 0.190$ $F' = 1.80$ $f_c = \frac{105001 \times 1.8}{12 \times 24 \times 33.36} = 473 \#/\text{sq}''$	$t = 2.05' = 24.60''$ $p = 1.06\%$ $M = 17287380 \times 1.2 = 20744856$ $N = 87762$ $40^\circ \text{ Rise} = 9618$ $\% = \frac{17287380}{114 \times 12 \times 24.60} = 508 \#/\text{sq}''$ $\% = \frac{87762}{2.05} = 0.188$ $F' = 1.72$ $f_c = \frac{17287380}{114 \times 12 \times 24.60} = 508 \#/\text{sq}''$	$t = 2.00' = 24''$ $p = 1.08\%$ $M = 15989976 \times 1.2 = 19187971.2$ $N = 87380$ $40^\circ \text{ Rise} = 6004$ $\% = \frac{15989976}{119 \times 12 \times 24} = 497 \#/\text{sq}''$ $\% = \frac{87380}{2.00} = 0.158$ $F' = 1.59$ $f_c = \frac{15989976}{119 \times 12 \times 24} = 497 \#/\text{sq}''$
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STRESSES AT L9										STRESSES AT L12										STRESSES AT L13										STRESSES AT RIGHT SPRINGING													
Load Point	Hc	Vd	M = HcVd	N	D.L.	MxD.L.	NxD.L.	L.L.	MxL.L.	NxL.L.	Load Point	Hc	Vd	M = HcVd	N	D.L.	MxD.L.	NxD.L.	L.L.	MxL.L.	NxL.L.	Load Point	Hc	Vd	M = HcVd	N	D.L.	MxD.L.	NxD.L.	L.L.	MxL.L.	NxL.L.	Load Point	Hc	Vd	M = HcVd	N	D.L.	MxD.L.	NxD.L.	L.L.	MxL.L.	NxL.L.
L2	0.0957	-3.00	-0.2871	0.098	11485	-3297	26	3600	-1034	353	L2	0.0957	-1.00	-0.0957	0.096	11485	-1099	1103	3600	-345	346	L2	0.0957	+1.63	+0.1560	0.090	11485	+1792	1034	3600	+562	324	L2	0.0957	+1.80	+1.1293	0.080	11485	+12970	1034	3600	+4065	288
L3	0.3438	-3.00	-1.0314	0.352	10000	-10314	520	3600	-3713	1267	L3	0.3438	-1.40	-0.4813	0.343	10000	-4813	3430	3600	-1733	1235	L3	0.3438	+1.13	+0.3885	0.333	10000	+3885	3330	3600	+1399	1199	L3	0.3438	+1.05	+3.7646	0.294	10000	+37646	2940	3600	+13553	1058
L4	0.6887	-2.55	-1.7562	0.710	6375	-11196	4526	2115	-3714	1502	L4	0.6887	-1.40	-0.9642	0.678	6375	-6147	4450	2115	-2039	1476	L4	0.6887	+0.85	+0.5854	0.678	6375	+3732	4329	2115	+1238	1434	L4	0.6887	+1.02	+3.0247	0.604	6375	+44782	3851	2115	+14857	1277
L5	0.7575	-2.43	-1.8407	0.780	5755	-10593	4489	2115	-3893	1650	L5	0.7575	-1.40	-1.0605	0.768	5755	-6103	4420	2115	-2243	1624	L5	0.7575	+0.75	+0.5681	0.746	5755	+5755	4293	2115	+1202	1578	L5	0.7575	+1.00	+7.5750	0.665	5755	+43574	3827	2115	+16021	1406
L6	1.0824	-1.85	-2.0024	1.123	8120	-16259	919	3524	-7056	3957	L6	1.0824	-1.60	-1.7318	1.120	8120	-14062	7094	3524	-6103	3947	L6	1.0824	+0.25	+0.2706	1.094	8120	+2197	8883	3524	+954	3855	L6	1.0824	+8.70	+9.4178	0.987	8120	+74472	8014	3524	+33188	3474
L7	1.3364	-1.15	-1.5369	1.400	7820	-12019	10948	3524	-5416	4934	L7	1.3364	-1.60	-2.1455	1.411	7820	-1811	11034	3524	-8477	4972	L7	1.3364	-0.40	-0.5346	1.387	7820	-4181	10846	3524	-1884	4888	L7	1.3364	+7.20	+9.6221	1.268	7820	+5416	9916	3524	+33908	4468
L8	1.3573	+0.78	+1.0597	1.448	7840	+8300	11352	3524	+3731	5103	L8	1.3573	-1.70	-2.3074	1.493	7840	-18090	11705	3524	-8121	5261	L8	1.3573	-1.05	-1.4292	1.482	7840	-1174	11619	3524	-5022	5223	L8	1.3573	+4.80	+6.5150	1.388	7840	+8300	10882	3524	+22959	4891
L9	1.2399	+6.40	+7.9354	1.364	8140	+37343	11103	3524	+16167	4807	L9	1.2399	-1.15	-1.4257	1.488	8140	-11607	11787	3524	-5025	5103	L9	1.2399	-1.60	-1.9838	1.453	8140	-16148	11827	3524	-6791	5120	L9	1.2399	+1.80	+2.8318	1.405	8140	+18167	11437	3524	+7865	4951
L10	0.9797	+1.90	+1.8614	0.937	9250	+17218	8667	3524	+6560	3302	L10	0.9797	+0.35	+0.3429	1.252	9250	+3172	11581	3524	+1208	4412	L10	0.9797	-2.20	-2.1553	1.283	9250	-1937	11868	3524	-7595	4521	L10	0.9797	-3.34	-3.2722	1.298	9250	-30268	12007	3524	-11531	4574
L11	0.6448	+0.60	+0.3869	0.623	6230	+2410	3881	2115	+418	1318	L11	0.6448	+5.60	+3.6109	0.980	6230	+22496	6105	2115	+7637	2073	L11	0.6448	-1.30	-0.8882	1.038	6230	-5222	6467	2115	-773	2195	L11	0.6448	-1.85	-2.6409	1.121	6230	-47663	6984	2115	-16161	2371
L12	0.5782	+0.38	+0.2197	0.553	6440	+1415	3594	2115	+465	1180	L12	0.5782	+7.50	+4.3368	0.922	6440	+27927	5938	2115	+9127	1950	L12	0.5782	-0.70	-0.4047	0.985	6440	-2606	6343	2115	-356	2083	L12	0.5782	-1.40	-1.3261	1.081	6440	-53620	6962	2115	-17618	2286
L13	0.2655	-0.30	-0.0797	0.259	10940	-872	2833	3600	-287	932	L13	0.2655</																															

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	ARK.	196-A	1925	7	7

CALCULATED STRESSES 100 FT ARCH DR. 322

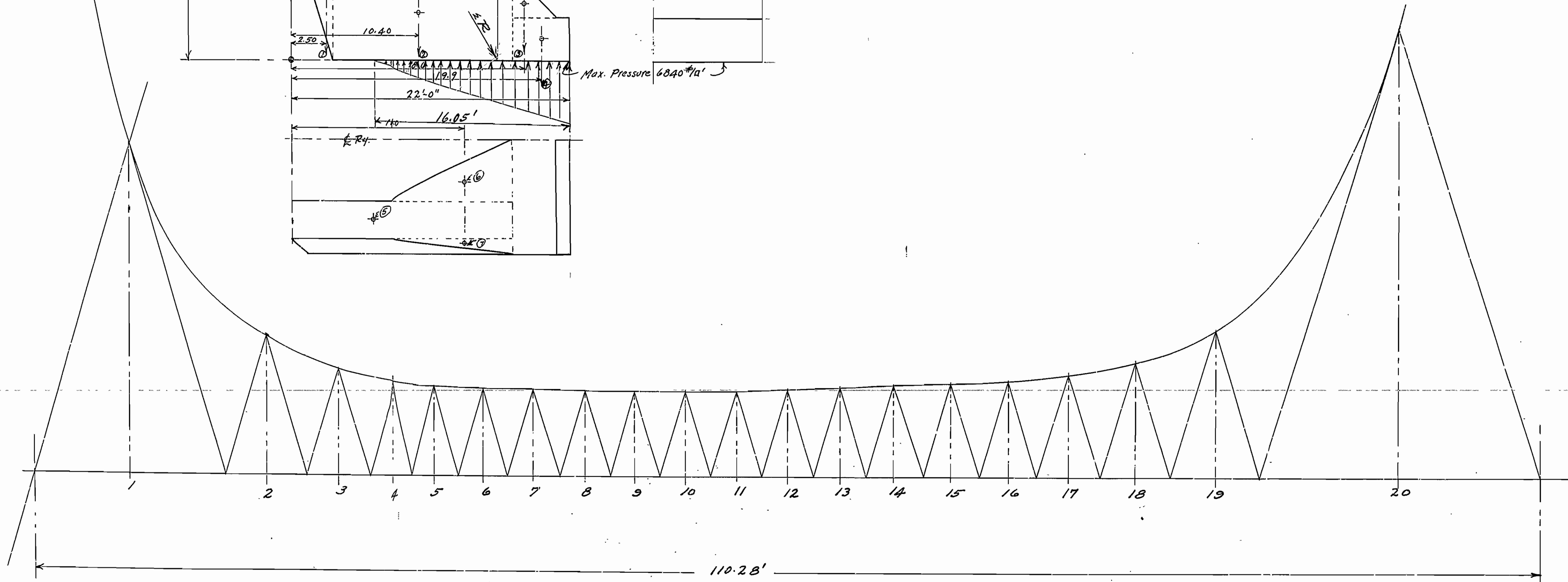
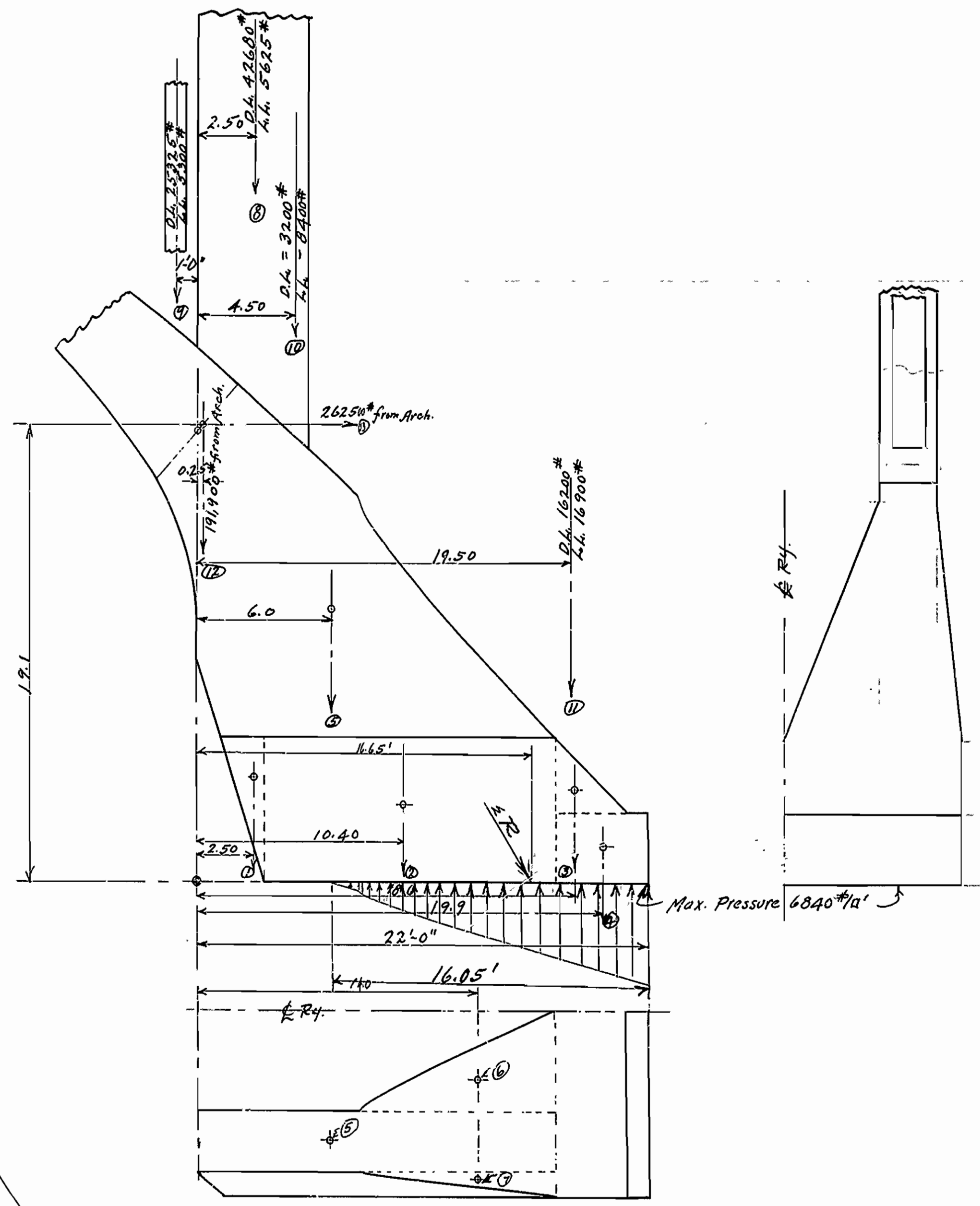
STRESS IN FOUNDATION
- LOADING -
Full Dead Load & Full Live Load.

Sect 1	4060	x	2.50	=	10200	lb
2	6020	x	10.40	=	626000	
3	3050	x	18.6	=	56700	
4	8550	x	19.9	=	170000	
5	31200	x	6.0	=	187200	
6	9300	x	14.0	=	130000	
7	2100	x	14.0	=	30500	
8	48205	x	2.5	=	120763	
9	30625	x	-1.0	=	-30625	
10	11640	x	4.50	=	52380	
11	33100	x	19.5	=	645400	
12	19100	x	0.25	=	4775	
13	262500	x	19.1	=	5013750	

$\Sigma = 7,060,293 \text{ lb}$

$\bar{x} = \frac{7,060,293 \text{ lb}}{424,110 \#} = 16.65'$

$f_c = \frac{2 \times 424,110}{3 \times 5.35 \times 19.75} = 6840 \text{ lb/in}^2$



DIVISION OF ARCH RING FOR CONSTANT $\frac{3}{2}$

CALCULATIONS OF STRESSES
FOR 100 FT ARCH FOR
BRIDGE OVER QUACHITA RIVER
MONTGOMERY COUNTY ARKANSAS