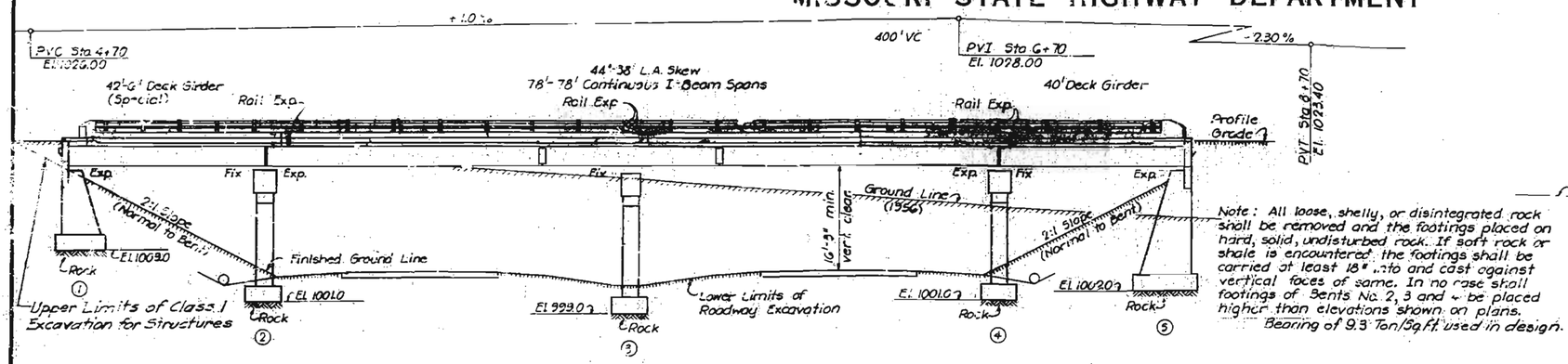
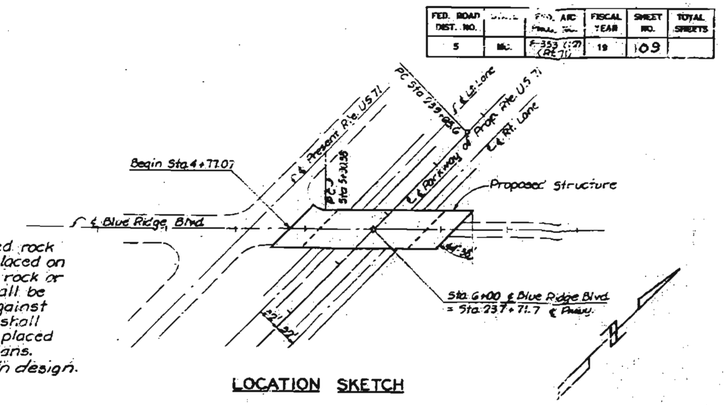
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	Mo.	F-353 (25) (RE 71)	19	109	

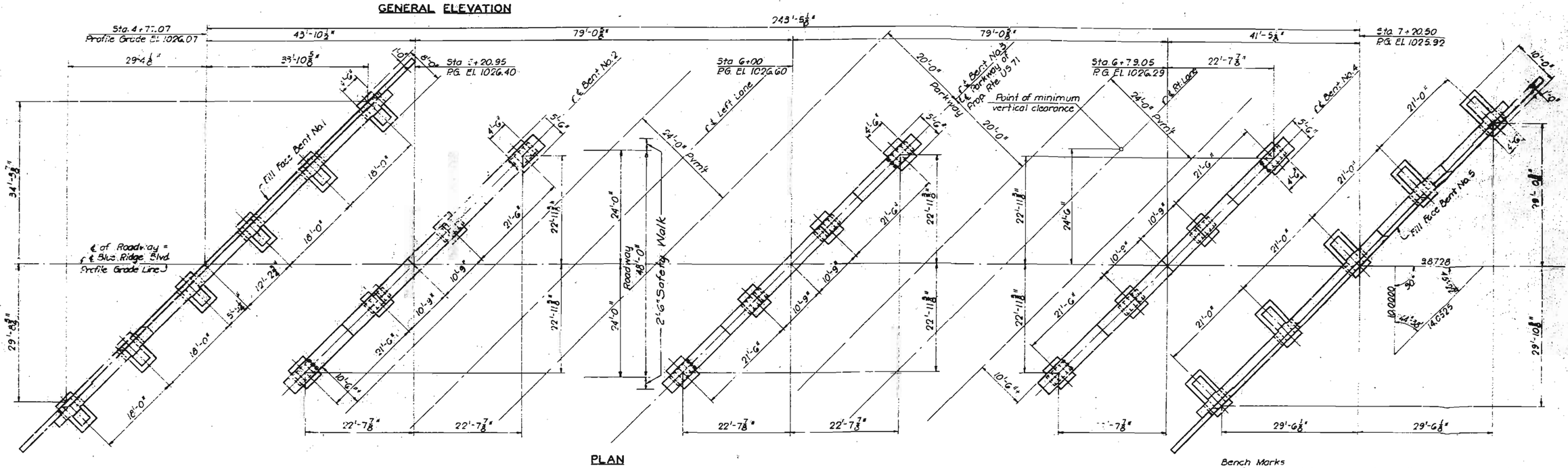


Note: All loose, shelly, or disintegrated rock shall be removed and the footings placed on hard, solid, undisturbed rock. If soft rock or shale is encountered the footings shall be carried at least 18" into and cast against vertical faces of same. In no case shall footings of Bents No. 2, 3 and 4 be placed higher than elevations shown on plans. Bearing of 9.3 Ton/Sq.ft. used in design.

GENERAL ELEVATION



LOCATION SKETCH



PLAN

ESTIMATED QUANTITIES

Item		Substr.	Superstr.	Totals
Class 1 Excavation for Structures	Cu.Yds.	480		480
Class "B" Concrete	Cu.Yds.	3491		3491
Class "B1" Concrete	Cu.Yds.		503.0	503.0
* Fabricated Structural Steel	Lbs.		290,080	290,080
Steel Castings	Lbs.		3100	3100
Reinforcing Steel	Lbs.	48,290	124,650	172,940
Aluminum Alloy Handrail	Lin.Ft.		450	450

All excavation shall be paid for as Class 1 Excavation for Structures and shall include only that amount below the Roadway Excavation.
Concrete in end posts is included in Estimated Quantity for Superstr. Concrete.
* Final pay weight for fabricated Structural Steel will be based on using field rivets and includes all bearing devices except castings at Bent No. 3.

Drawn May 1956 by SAH
Checked Aug. 1956 by FMC Jr

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

GENERAL NOTES

Design Specifications : AASHO 1953
Loading : H20-44
Design Stresses : Reinforcing Steel 20,000 psi
Class "B" & "B-1" Concrete 1200 psi
Structural Steel 18,000 psi

Concrete : Concrete for superstructure shall be Class "B-1"; air-entrained.
Concrete for substructure shall be Class "B", air-entrained. If the Contractor desires, he may use Class "B-1" in lieu of Class "B" Concrete in substructure with payment made on the basis of Class "B" Concrete.
All joint filler shall conform with the requirements for Gray Rubber Compound. Joints as given in Section 59-22D of the Standard Specifications.

Rivets $\frac{3}{4}$" ϕ ; holes $\frac{13}{16}$" ϕ except as noted.
Qualification of welding operators will be required.
Superstructure deck to be waterproofed. See Special Provisions.

Field connections shall be riveted or if the contractor desires he may use high tensile steel bolts with hardened washers in place of rivets. See Standard Specifications.

Paint : Shop, Bearings except surfaces in contact with concrete, one coat of red lead ; Field, contact surfaces of bolted field connections, except where high tensile bolts are used, one coat of red lead and surfaces inaccessible after erection, three coats of red lead. All other exposed surfaces, first coat red lead (except Bearings), second coat brown, third coat aluminum. Payment for paint, cleaning and painting such surfaces will be included in the price bid for items painted. See Special Provisions for Aluminum Paint Materials.
Design includes provision for 15 lbs/sq.ft. future wearing surface.
Permits must be obtained for all truck loads over legal length.

FINISHED

Sheet No. 1 of 2

Bench Marks
BM #10 - Z on NW corner W. headwall 170' Lt. of Sta 214+25 El. 995.82
BM #11 - Z on SW corner W. headwall 135' Lt. of Sta 243+45 El. 1017.47

FINISHED

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353 (25) (RTE 71) STA. 237+71.7

JACKSON COUNTY FINISHED

Submitted by J. A. Wilkerson Date 11-19-1957
Approved by Roy M. Whitt Date 11-19-1957

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

STD C-10R7
L-929

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SEE FIN. PLANS BROWN-LINES

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	110	

SUBSTRUCTURE-BILL OF REINFORCING STEEL

No.	Size	Length	Mark	Shape	Location	O	A	B	C	D
					End Bent No. 1					
60	7	4'-9"	D1	—	Footing					
2	6	12'-6"	H11	—	Wing Walls					
14	6	14'-6"	H12	—	do					
3	6	14'-0"	H13	‡ —	do					
1	5	11'-0"	H14	—	do					
1	5	5'-0"	H15	—	do					
4	5	11'-0"	H16	—	do					
2	6	13'-0"	H17	3	do	12'-11½"	12'-0"	1½"	12"	4"
2	6	30'-6"	H22	—	Backwall					
6	10	32'-0"	H26	—	Beam					
12	10	37'-3"	H27	—	do					
18	5	34'-3"	H28	—	do					
12	9	40'-6"	H29	—	do					
6	9	24'-0"	H30	—	do					
4	6	26'-6"	H31	—	Backwall					
2	6	9'-0"	H32	—	do					
2	6	33'-0"	H33	—	do					
1	5	9'-0"	H34	—	Wing Walls					
1	5	3'-0"	H35	—	do					
1	6	12'-6"	H36	3	do	12'-5¾"	12'-0"	5¾"	6"	2"
1	6	14'-0"	H37	3	do	13'-11"	12'-0"	1'-11"	2'-0"	8"
52	5	12'-6"	T11	2	Beam	2'-5"	3'-0"	1'-8"		
21	5	12'-0"	T12	2	do	2'-5"	2'-8"	1'-10"		
93	5	4'-9"	U3	1	Backwall	6"	2'-1½"	2'-1½"		
45	4	4'-6"	U5	1	Beam	2'-5"	1'-0½"	1'-0½"		
2	4	3'-0"	U6	—	do					
30	3	16'-3"	U7	‡ 1	Columns	2'-2"	Vary	Vary		
24	6	8'-0"	V1	3	do	7'-8½"	7'-0"	8½"	1'-0"	8½"
13	5	10'-0"	V5	‡ —	Wing Walls					
7	5	10'-0"	V6	‡ —	do					
3	5	7'-0"	V10	—	do					
24	7	10'-0"	V11	—	Columns					
36	4	9'-6"	V12	—	do					
36	7	9'-6"	V13	—	do					

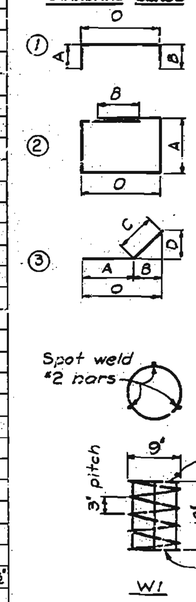
No.	Size	Length	Mark	Shape	Location	O	A	B	C	D
					Intermediate Bents No. 2 & 4					
64	7	4'-9"	D1	—	Footings					
56	5	5'-0"	F1	—	do					
32	5	9'-0"	F2	—	do					
32	7	19'-9"	H1	—	Beam					
16	10	19'-3"	H2	—	do					
16	10	23'-0"	H3	—	do					
8	6	37'-9"	H4	—	do					
32	9	27'-6"	H5	—	do					
16	7	24'-6"	H6	—	do					
16	5	15'-0"	T1	2	do	3'-2"	3'-5"	1'-10"		
18	5	15'-3"	T2	2	do	3'-2"	3'-7"	1'-5"		
18	5	14'-5"	T3	2	do	3'-2"	3'-3½"	1'-10"		
32	5	14'-6"	T4	2	do	3'-2"	3'-2"	1'-10"		
18	5	14'-9"	T5	2	do	3'-2"	3'-4"	1'-10"		
18	5	15'-6"	T6	2	do	3'-2"	3'-7½"	1'-10½"		
16	5	15'-0"	T7	2	do	3'-2"	3'-0"	1'-8"		
104	3	9'-9"	T8	2	Columns	2'-2"	2'-2"	1'-4"		
64	4	5'-9"	U1	1	Beams	3'-2"	1'-0½"	1'-0½"		
64	6	8'-0"	V1	3	do	7'-8½"	7'-0"	8½"	1'-0"	8½"
32	7	18'-0"	V2	—	Cols. Bt. 2					
32	7	17'-9"	V4	—	Cols. Bt. 4					
32	2	19'-9"	W1	Spiral	Bolt Wells					
					Intermediate Bent No. 3					
32	7	4'-9"	D1	—	Footings					
28	5	5'-0"	F1	—	do					
16	5	4'-0"	F2	—	do					
4	6	37'-9"	H4	—	Beam					
18	10	20'-6"	H7	—	do					
9	11	39'-0"	H8	—	do					
8	9	24'-9"	H9	—	do					
16	10	27'-9"	H10	—	do					
60	3	9'-9"	T8	2	Columns	2'-2"	2'-2"	1'-1"		
38	5	13'-6"	T9	2	Beam	2'-8"	3'-2"	1'-10"		
59	5	13'-9"	T10	2	do	2'-9"	3'-4"	1'-6"		
14	4	4'-9"	U2	1	do	2'-8"	1'-0½"	1'-0½"		
32	6	8'-0"	V1	3	do	7'-8½"	7'-0"	8½"	1'-0"	8½"
32	7	19'-3"	V3	—	Columns					
16	2	19'-9"	W1	Spiral	Bolt Wells					

No.	Size	Length	Mark	Shape	Location	O	A	B	C	D
					End Bent No. 5					
50	7	4'-9"	D1	—	Footing					
2	6	12'-6"	H11	—	Wing Walls					
14	6	14'-6"	H12	—	do					
3	6	14'-0"	H13	‡ —	do					
1	5	11'-0"	H14	—	do					
1	5	5'-0"	H15	—	do					
4	5	11'-0"	H16	—	do					
2	6	13'-0"	H17	3	do	12'-11½"	12'-0"	1½"	12"	4"
6	11	54'-6"	H18	—	Beam					
6	11	42'-3"	H19	—	do					
12	10	48'-3"	H20	—	do					
18	5	32'-3"	H21	—	do					
4	6	30'-6"	H22	—	Backwall					
2	6	10'-0"	H23	—	do					
2	6	13'-6"	H24	—	do					
2	6	35'-6"	H25	—	do					
1	5	9'-0"	H34	—	Wing Walls					
1	5	3'-0"	H35	—	do					
1	6	12'-6"	H36	3	do	12'-5¾"	12'-0"	5¾"	6"	2"
1	6	14'-0"	H37	3	do	13'-11"	12'-0"	1'-11"	2'-0"	8"
28	5	12'-0"	T12	2	Beam	2'-5"	2'-8"	1'-10"		
40	5	13'-0"	T13	2	do	2'-5"	3'-2½"	1'-3½"		
86	5	4'-9"	U3	1	Backwall	6"	2'-1½"	2'-1½"		
60	3	18'-3"	U4	‡ 1	Columns	2'-2"	Vary	Vary		
40	4	4'-6"	U5	1	Beam	2'-5"	1'-0½"	1'-0½"		
4	4	3'-0"	U6	—	do					
20	6	8'-0"	V1	3	Columns	7'-8½"	7'-0"	8½"	1'-0"	8½"
13	5	10'-0"	V5	‡ —	Wing Walls					
7	5	10'-0"	V6	‡ —	do					
30	7	16'-6"	V7	—	Columns					
20	7	17'-0"	V8	—	do					
30	4	16'-6"	V9	—	do					
3	5	7'-0"	V10	—	Wing Walls					

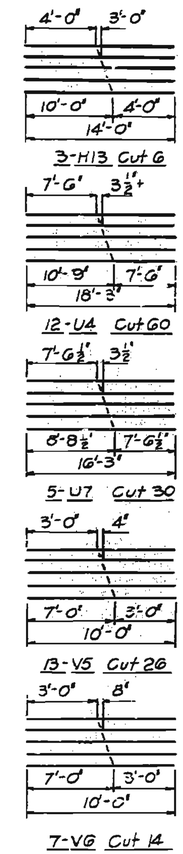
‡ See cutting diagram

CUTTING & BENDING DIAGRAMS

STANDARD BENDS



SPECIAL BENDING



NOTE
All bar dimensions are out to out of bar.

FINISHED

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353 (25) (RTE. 71) STA. 237+71.7

JACKSON COUNTY

FINISHED

FINISHED

Drawn June 1956 by D.M.S.
Checked Aug. 1956 by W.B.H.

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

Sheet No. 2 of 15

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

57

MISSOURI STATE HIGHWAY DEPARTMENT

DIST. NO.			
5	NO.		19

SUPERSTRUCTURE - BILL OF REINFORCING STEEL

No.	Size	Length	Mark	Shape	Location	O	A	B	C	D
1	9	19'-6"	B1		Framing Grdr.	18'-3"	17'-9"			
1	9	22'-0"	B2		do	20'-9"	20'-3"			
1	9	24'-0"	B3		do	22'-9"	22'-3"			
574	4	8'-3"	B4		Girders					
4	11	45'-0"	B5		Grdr. 1-Sp. 1-2	42'-4"	41'-2"			
2	11	32'-0"	B6		do					
2	11	24'-0"	B7		do					
2	7	24'-0"	B8		do					
28	11	46'-0"	B9		Grdr. 2-8, Sp. 1-2	43'-4"	42'-2"			
14	11	30'-0"	B10		do					
7	11	20'-0"	B11		do					
4	11	42'-6"	B12		Grdr. 8-Sp. 4-5	39'-10"	38'-8"			
28	11	43'-6"	B13		Grdr. 1-7-Sp. 4-5	40'-10"	39'-8"			
6	11	12'-0"	B14		Grdr. 2-7-Sp. 4-5					
16	11	26'-0"	B15		Grdr. 1-8-Sp. 4-5					
18	4	5'-3"	B16	1	Girders 1-8	1'-2"	2'-0 1/2"	2'-0 1/2"		
48	4	7'-0"	B17		Girders 2-7					
456	4	4'-9"	C1	1	Curbs	7 1/2"	2'-0 1/2"	2'-0 1/2"		
484	5	5'-6"	C2		do					
6	5	39'-0"	C3		Span 4-5-Curbs					
6	5	30'-0"	C4		do					
6	5	41'-6"	C5		Span 1-2-Curbs					
2	5	34'-6"	C6		do					
2	5	35'-3"	C7		do					
1	5	36'-3"	C8		do					
1	5	37'-0"	C9		do					
3	5	6'-0"	C10		Sps. 1-2 & 5-Curbs					
3	5	6'-9"	C11		do					
3	5	8'-0"	C12		do					
3	5	9'-3"	C13		do					
48	5	40'-3"	C14		Sps. 2-3 & 3-4-Curbs					
24	6	4'-3"	R1		End Post					
6	4	6'-6"	R2		do					
6	4	5'-9"	R3		do					
5	4	6'-0"	R4		do					
69	5	41'-9"	S1	*	Span 4-5 Slab					
82	5	48'-3"	S2	*	do					
52	5	41'-6"	S3		do					

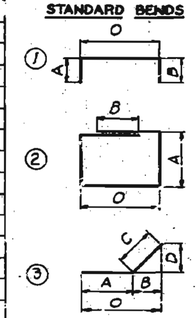
No.	Size	Length	Mark	Shape	Location	O	A	B	C	D
6	5	4'-9"	S4		Span 4-5 Slab					
6	5	3'-6"	S5		do					
20	5	6'-0"	S6		Spt. 2 & 4-5 Slab					
2	5	37'-6"	S7		Span 4-5 Slab					
2	5	38'-6"	S8		do					
2	5	39'-6"	S9		do					
2	5	44'-3"	S10		do					
2	5	43'-3"	S11		do					
2	5	42'-3"	S12		do					
91	5	43'-6"	S13		Span 1-2-Slab					
91	5	41'-0"	S17		Span 4-5 Slab					
65	5	39'-9"	S18	*	Span 1-2-Slab					
87	5	50'-9"	S19	*	do					
60	5	44'-0"	S20		do					
2	5	34'-6"	S21		do					
2	5	35'-3"	S22		do					
2	5	24'-0"	S23		do					
2	5	25'-0"	S24		do					
2	5	42'-3"	S25		do					
2	5	46'-9"	S27		do					
2	5	45'-9"	S28		do					
2	5	44'-9"	S29		do					
12	5	13'-6"	S30	*	do					
12	5	7'-0"	S31	*	do					
6	5	15'-0"	S32		do					
2	5	17'-0"	S33		do					
8	5	34'-6"	S34		Steel Beam Slab					
12	5	5'-3"	S35	3	do	4'-8 3/8"	3'-6"	1'-2 3/8"	1'-9"	1'-2 3/8"
136	5	44'-6"	S36	*	do					
23	5	35'-9"	S37	*	do					
267	5	29'-3"	S38		do					
23	5	30'-3"	S39	*	do					
267	5	31'-9"	S40		do					
221	5	27'-6"	S41		do					
221	5	24'-9"	S42		do					
500	5	33'-0"	S43		do					
69	5	24'-0"	S44		do					

No.	Size	Length	Mark	Shape	Location	O	A	B	C	D
4	4	47'-0"	W2		End Web-Bent 1					
137	5	8'-9"	W3		do	9 3/4"	2'-0 1/4"	3'-1"	2'-10"	
6	7	32'-0"	W4		do					
126	5	8'-0"	W5		End Web-Bents 2 & 4	10"	2'-1 1/8"	2'-7 3/8"	2'-4 3/4"	
3	5	8'-9"	W6		End Web-Bent 1	9"	2'-1"	3'-1"	2'-10"	
24	5	10'-0"	W7		End Web-Bents 1 & 5	1'-0 3/8"	2'-5 3/4"	3'-4"	3'-4"	
24	5	10'-6"	W8		do					
8	5	5'-0"	W9		End Web-Bent 1					
6	5	29'-9"	W10		End Web-Bent 8					
6	4	29'-9"	W11		do					
6	7	30'-0"	W12		do					
8	5	35'-6"	W13		End Web-Bents 2 & 4					
8	4	35'-6"	W14		do					
8	7	35'-6"	W15		do					
84	4	10'-6"	W16		Int. Web					
28	6	9'-6"	W17		do					
28	4	8'-0"	W18		do					
4	5	47'-0"	W19		End Web-Bent 1					
8	6	4'-6"	R5		End Post					
8	6	3'-9"	R6		" "					
8	6	3'-6"	R7		" "					
8	6	3'-3"	R8		" "					
2	6	6'-3"	R9		" "					
3	6	6'-9"	R10		" "					

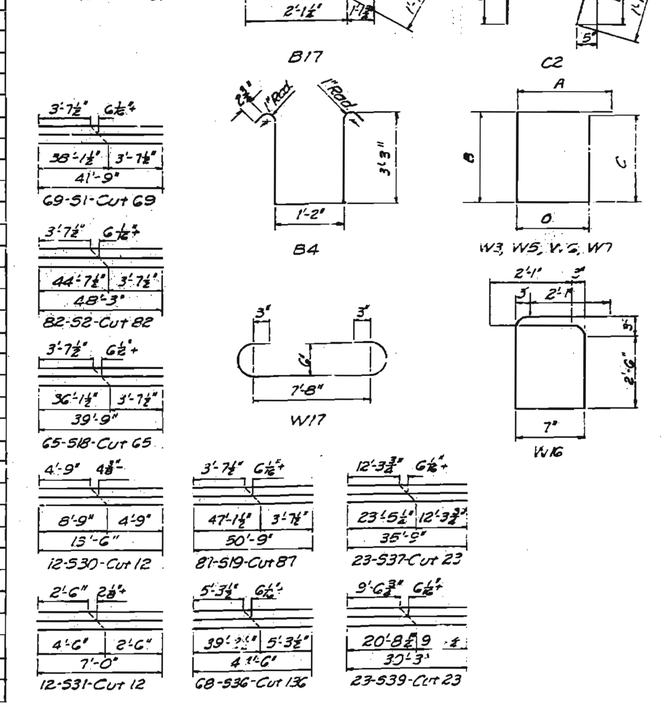
*See cutting diagram

CUTTING & BENDING DIAGRAMS

STANDARD BENDS



SPECIAL BENDING



NOTE
All bar dimensions are out to out of bar.

FINISHED

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25) (RTE. 71) STA. 237+71.7

FINISHED JACKSON COUNTY FINISHED

Drawn July 1956 by K.K.D.
Checked Aug. 1956 by M.R.H.&

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

Sheet No. 3 of 15

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

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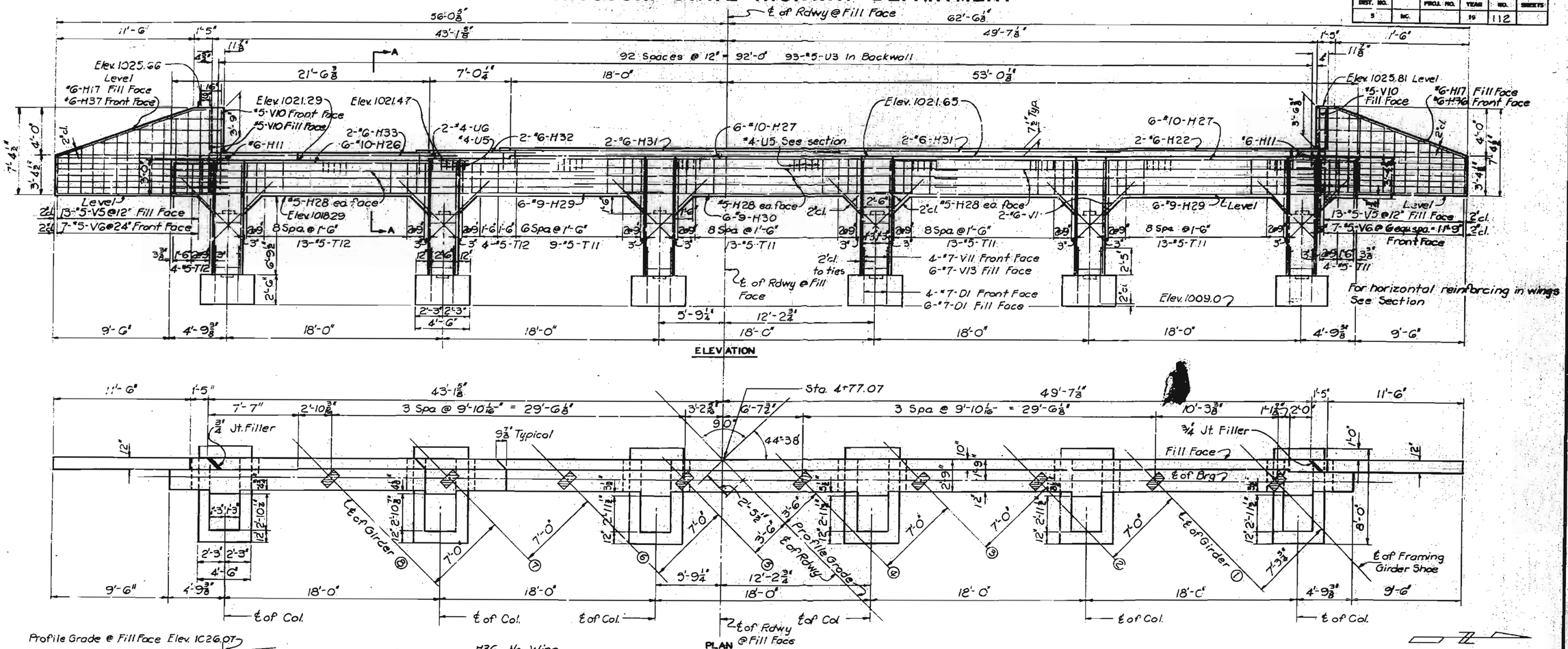
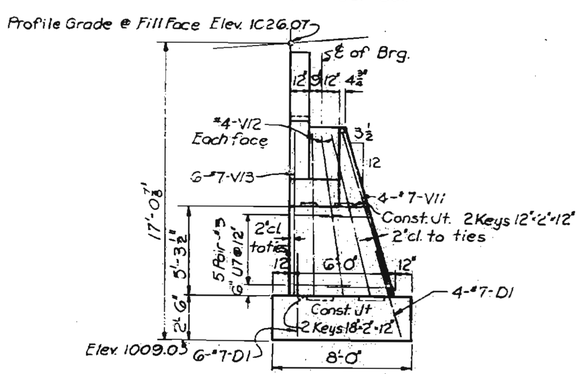
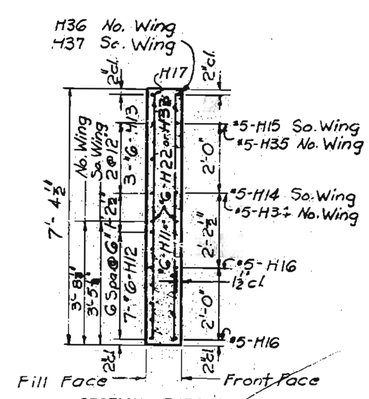
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	112	

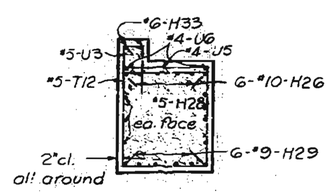




END ELEVATION



SECTION THROUGH WING WALLS



5-#4-U5 @ 6" max. center under each bearing device Use #4-U6 bars as shown in elevation view.

SECTION A-A

Note: Bearing Pls on End Bent No. 1 are 8"x17"

Fill at End Bent 1 shall not be carried above bottom of beam and wings until superstructure Span (1-2) is in place.

FINISHED

BRIDGE—BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25) (RTE. 71) STA. 237+71.7

JACKSON COUNTY

FINISHED

DETAILS OF END BENT NO. 1

Drawn May 1956 by D.M.S.
Checked Aug. 1956 by W.B.H.

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

Sheet No. 4 of 15

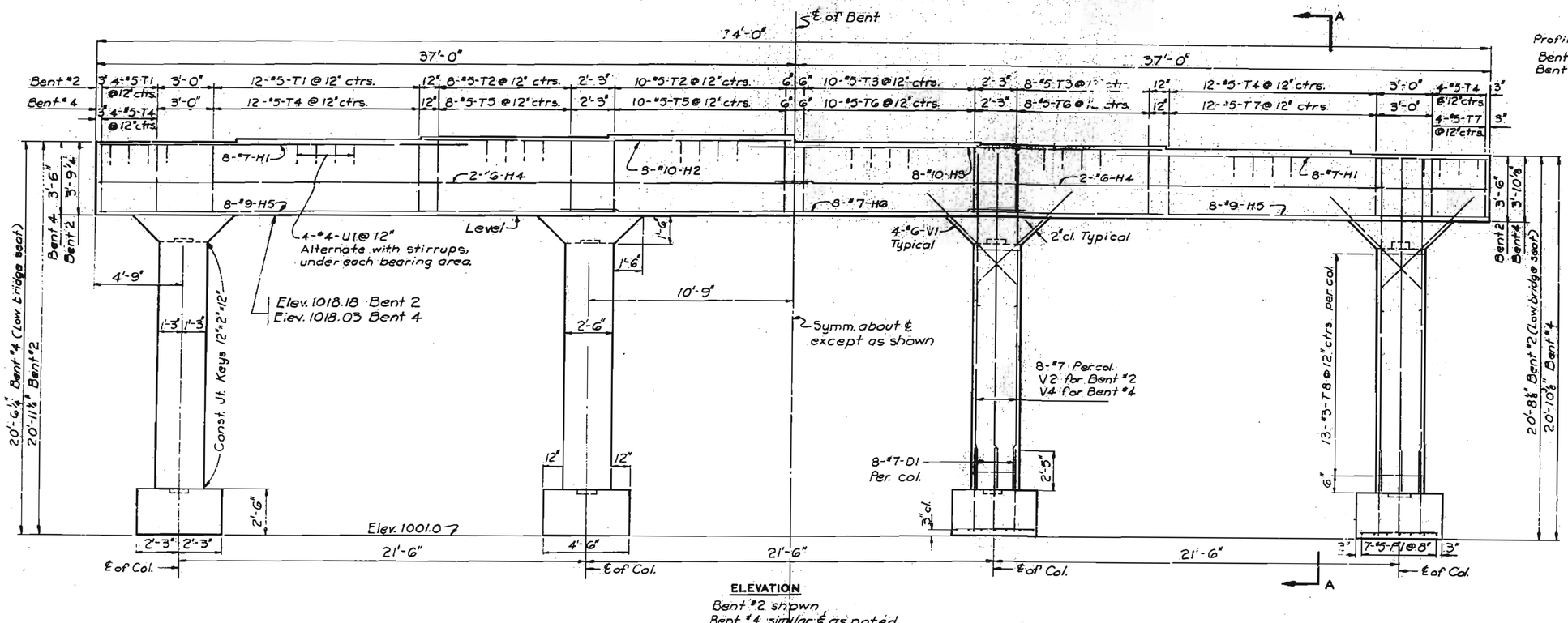
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

SEE FINAL PLANS BROWN-LINES

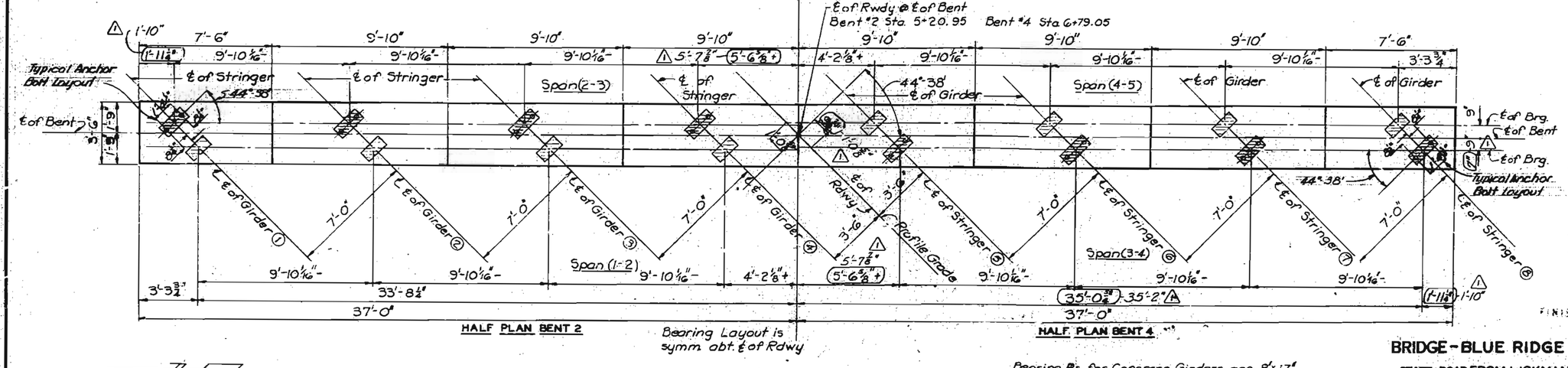
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	113	



ELEVATION

Bent #2 shown
Bent #4 similar ℄ as noted



BRIDGE SEAT ELEVATIONS		
Bearing No.	Bent #2	Bent #4
①	1021.94	1021.52
②	1022.03	1021.61
③	1022.10	1021.68
④	1022.18	1021.76
⑤	1021.88	1022.01
⑥	1021.81	1022.00
⑦	1021.75	1021.94
⑧	1021.67	1021.86

Bearing ℞s for Concrete Girders are 8"x17"
Bearing ℞s for Steel Stringers are 8"x 20"

DETAILS OF INTERMEDIATE BENTS 2 & 4

FINISHED

BRIDGE - BLUE RIDGE BLVD. UNDER PASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25)(RTE. 71) STA. 237+71.7

JACKSON COUNTY

FINISHED

Drawn May 1956 by DMS
Checked Aug. 1956 by WBH

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

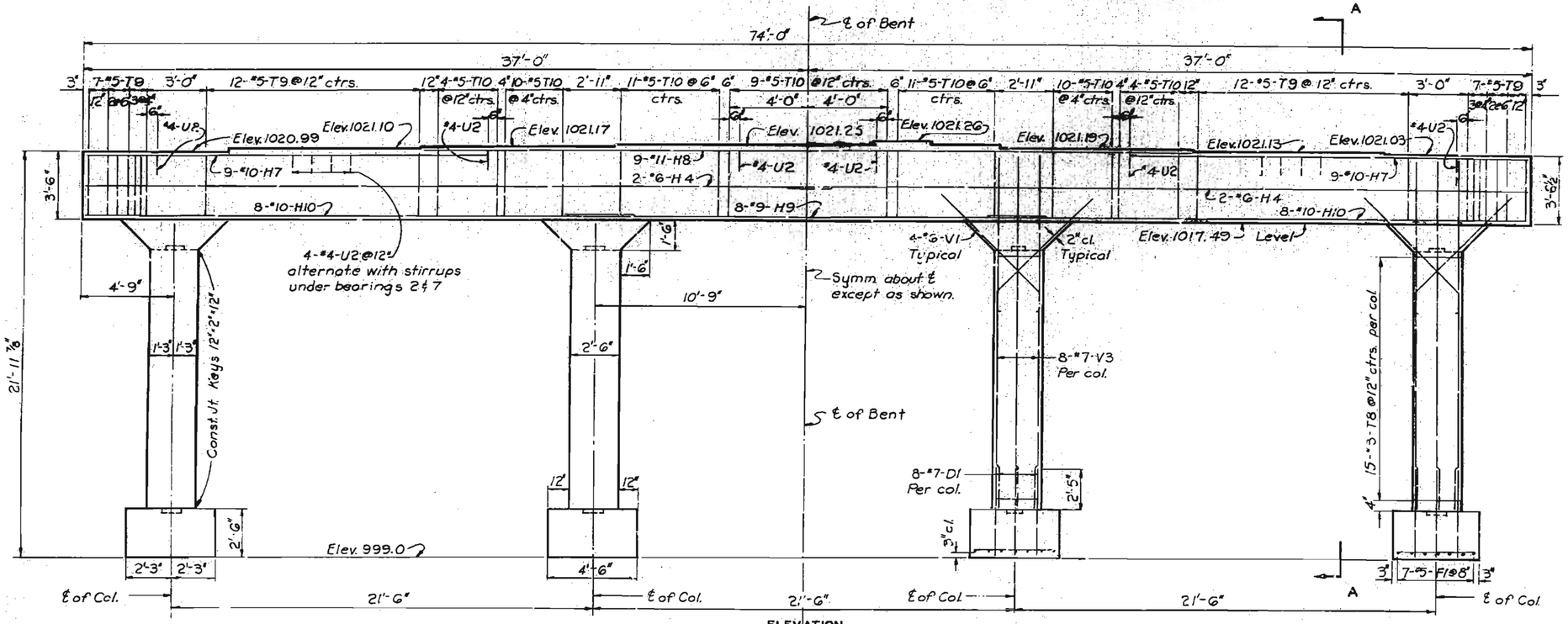
Sheet No. 5 of 15 △1 Rev. 3-17-60

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

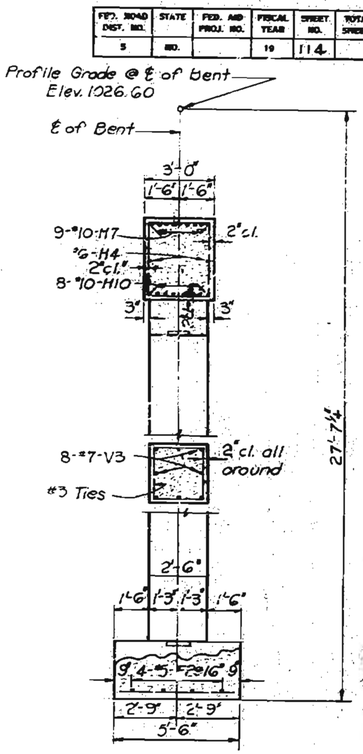
L-929

MISSOURI STATE HIGHWAY DEPARTMENT

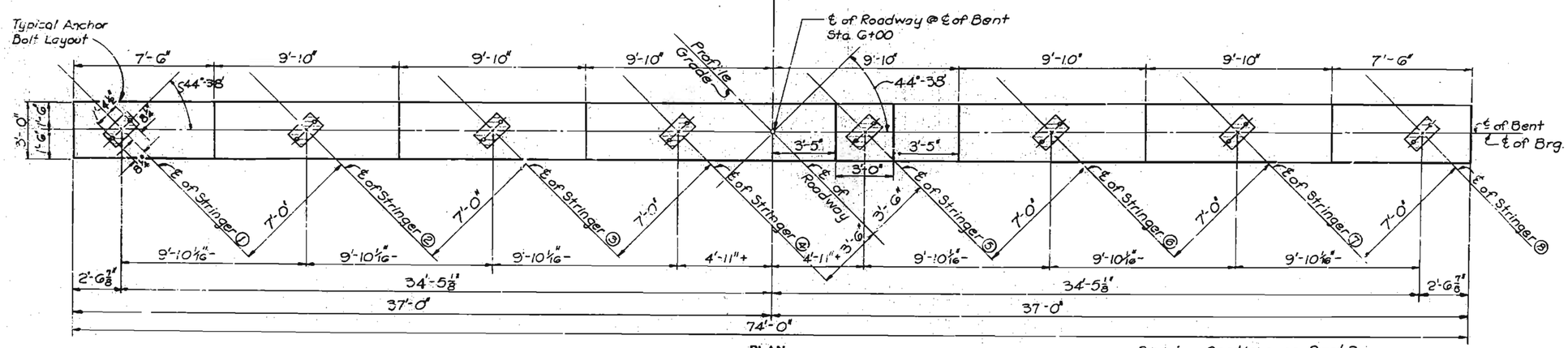
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	114	



ELEVATION

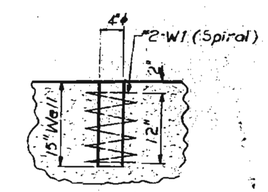


SECTION A-A



PLAN

Bearing Castings on Bent 3 are 12"x20 1/2"



Note: Anchor bolts for Bent #3 may be set in wells as shown or in holes drilled into concrete substructure. See Special Provisions for setting Anchor Bolts.

DETAIL OF SPIRAL AROUND ANCHOR BOLTS

DETAILS OF INTERMEDIATE BENT 3

BRIDGE – BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE

ABOUT 2 MILES S. OF HICKMAN MILLS

PROJECT NO. F-353(25)(RTE. 71) STA. 237+71.7

JACKSON COUNTY

Drawn May 1956 by C.M.S.
Checked Aug. 1956 by W.B.H.

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

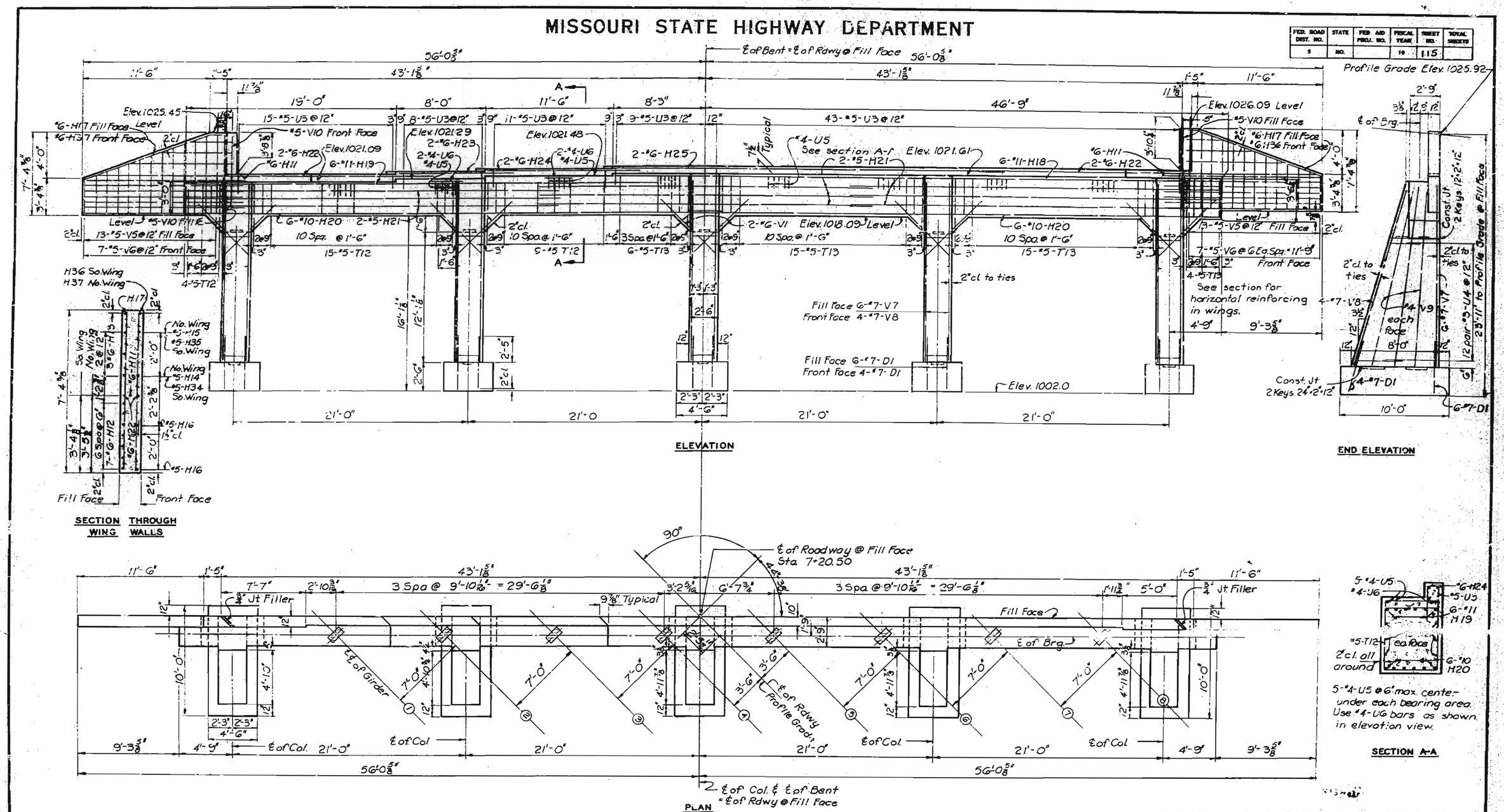
Sheet No. 6 of 15

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	115	



Note: Bearing Pl's on End Bent 5 are 8"×17"
Fill at End Bent 5 shall not be carried above bottom of beam and wings until superstructure Span (4-5) is in place.

DETAILS OF END BENT NO. 5

BRIDGE – BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25)(RTE. 71) STA. 237+71.7

JACKSON COUNTY

FINISHED

Drawn May 1956 by D.M.S.
Checked Aug. 1956 by W.B.H.

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

Sheet No. 7 of 15

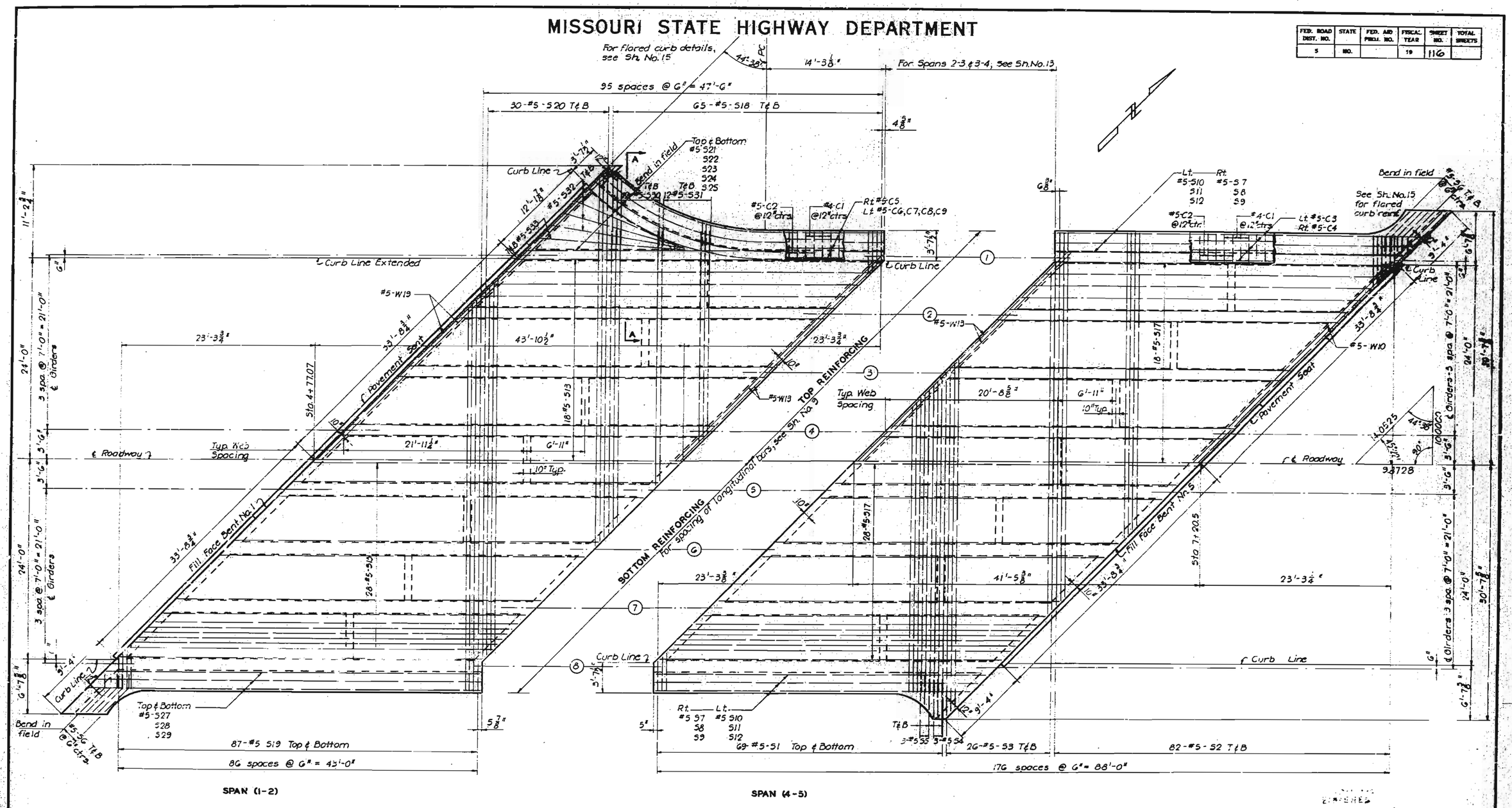
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

SEE FINAL PLANS BROWN-LINES

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	116	



PART PLAN OF SLAB SHOWING REINFORCEMENT

See Sh. No. 9 for Section A-A.

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE

ABOUT 2 MILES S. OF HICKMAN MILLS

PROJECT NO. F-353(25)(RTE. 71) STA. 237+71.7

JACKSON COUNTY

FINISHED

Drawn May 1956 by SAH

Checked Aug. 1956 by M.C.H.

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

Sheet No. 8 of 15

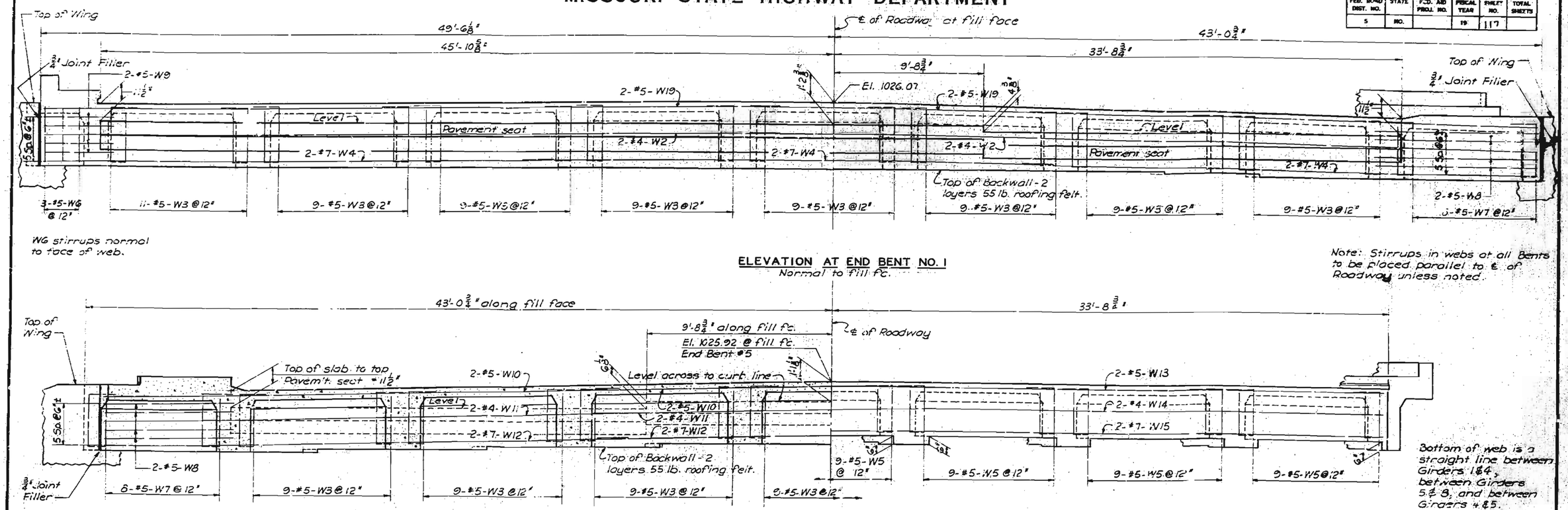
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

NO CONSTRUCTION CHANGES

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	117	



ELEVATION AT END BENT NO. 1

Normal to fill fc.

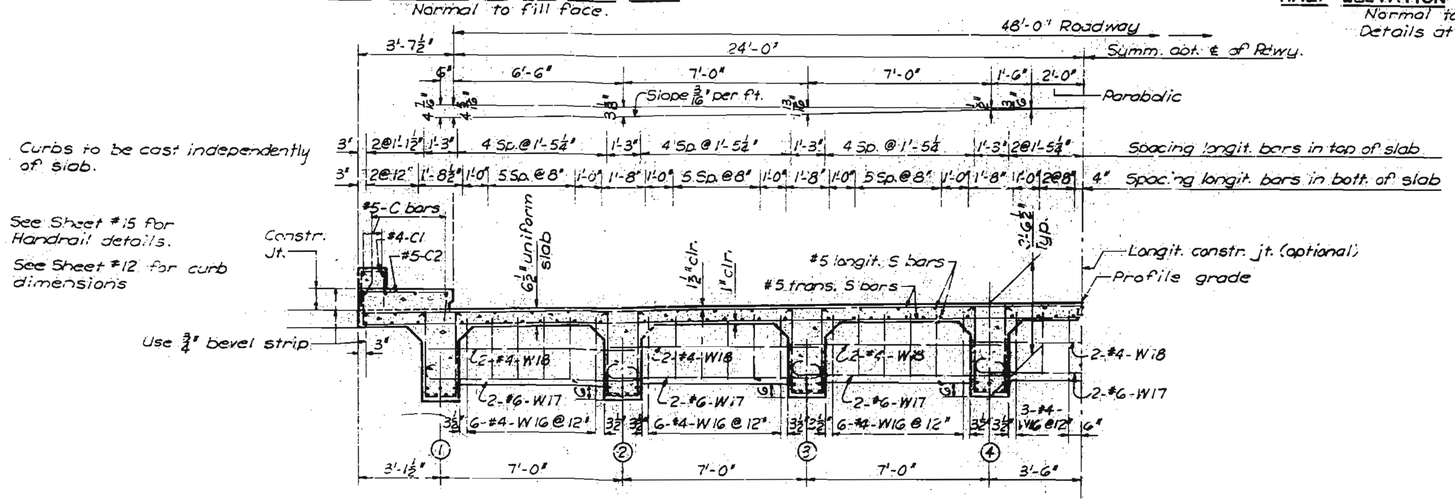
Note: Stirrups in webs of all Bents to be placed parallel to ℄ of Roadway unless noted.

HALF SECTION AT END BENT NO. 5

Normal to fill face.

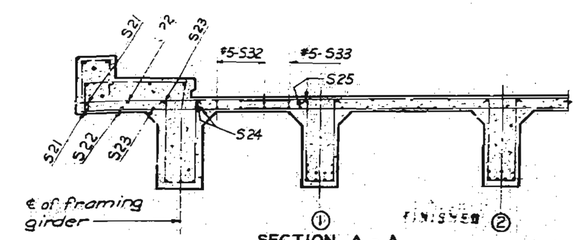
HALF ELEVATION AT INTERMEDIATE BENT - TYPICAL

Normal to ℄ Bent. Continuous span not shown. Details at Bent 4 shown; details at Bent 2 same.



Note: Bottom of web is level.

HALF SECTION AT INTERMEDIATE WEB - TYPICAL



SECTION A - A

See Sheet No. 8 for location of Sect. A-A

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25)(RTE. 71) STA. 237+717

JACKSON COUNTY

FINISHED

Drawn May 1956 by F.J.D.
Checked Aug. 1956 by M.E.H.

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

Sheet No. 9 of 15

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-989

NO CONSTRUCTION CHANGES

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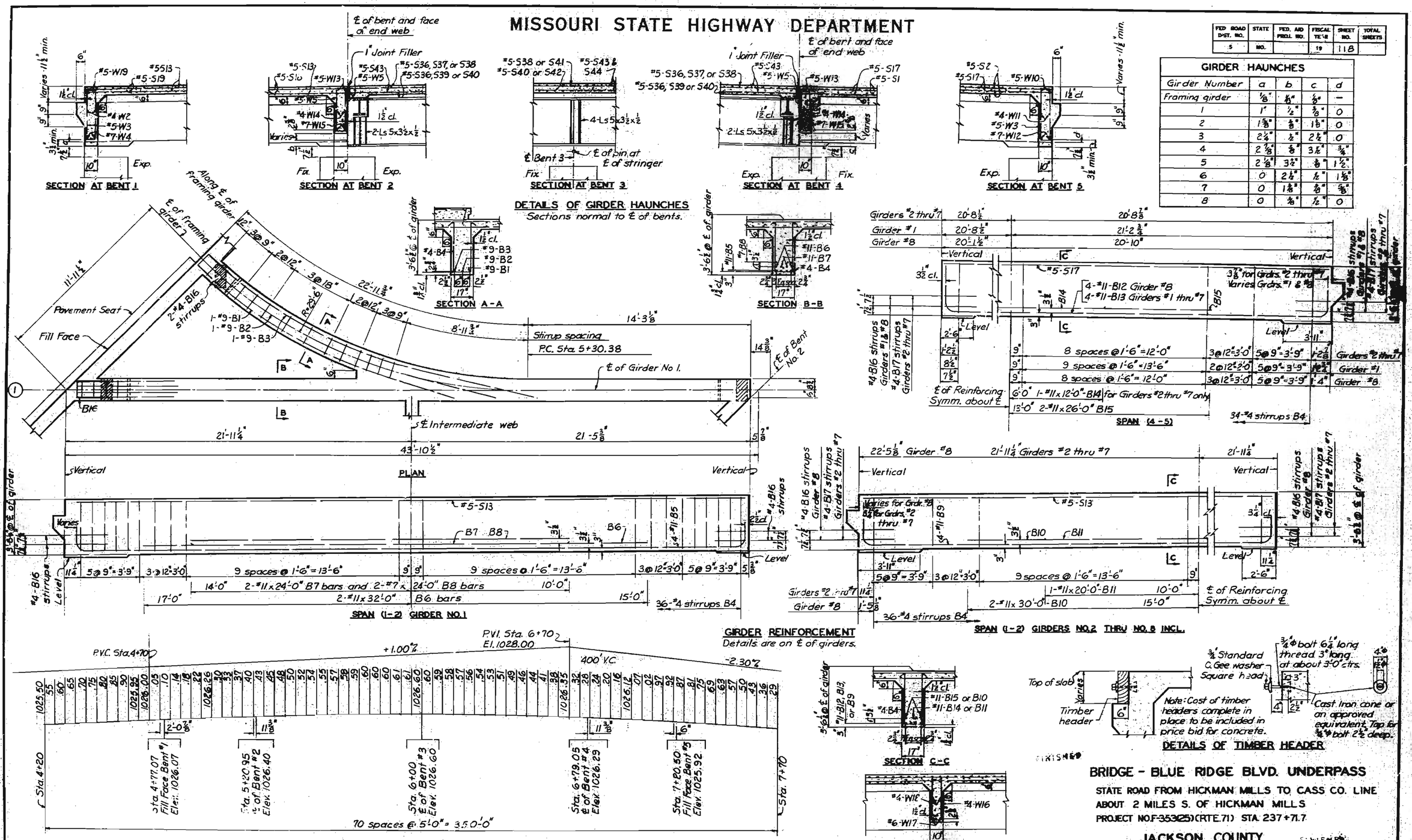
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD D-ST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	118	



GIRDER HAUNCHES				
Girder Number	a	b	c	d
Framing girder	⅛"	¼"	⅛"	—
1	1"	½"	⅜"	0
2	1⅜"	⅝"	1⅛"	0
3	2¼"	½"	2⅛"	0
4	2⅛"	⅝"	3⅛"	¾"
5	2⅛"	3½"	⅝"	1½"
6	0	2½"	½"	1⅝"
7	0	1⅝"	⅝"	⅝"
8	0	⅝"	½"	0

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25) (RTE. 71) STA. 237+71.7

JACKSON COUNTY

Drawn May 1956 by C.V.J.
Checked July 1956 by M.R.H.

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

Sheet No. 10 of 15

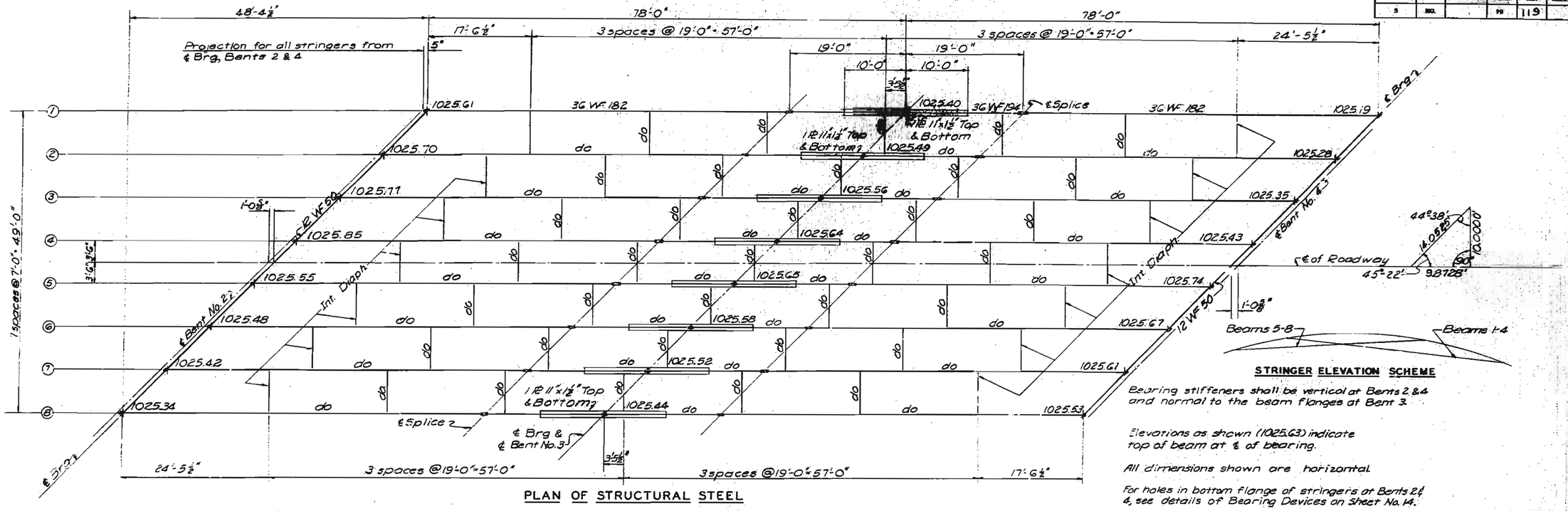
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-9292

NO CONSTRUCTION CHANGES

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	119	



STRINGER ELEVATION SCHEME

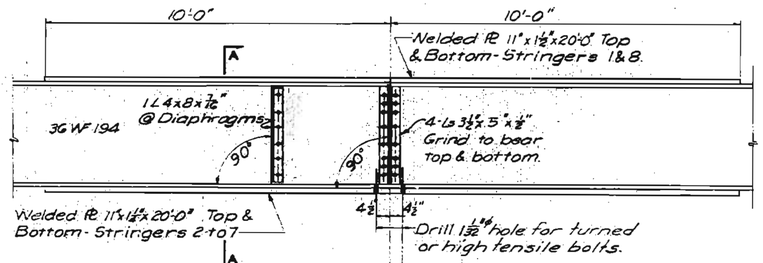
Bearing stiffeners shall be vertical at Bents 2 & 4 and normal to the beam flanges at Bent 3.

Elevations as shown (1025.63) indicate top of beam at ℄ of bearing.

All dimensions shown are horizontal.

For holes in bottom flange of stringers at Bents 2 & 4, see details of Bearing Devices on Sheet No. 14.

PLAN OF STRUCTURAL STEEL



DETAIL AT ℄ BEARING STRINGERS

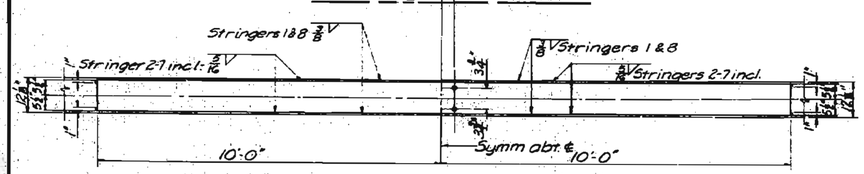
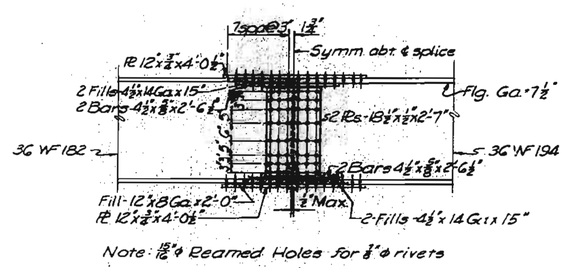


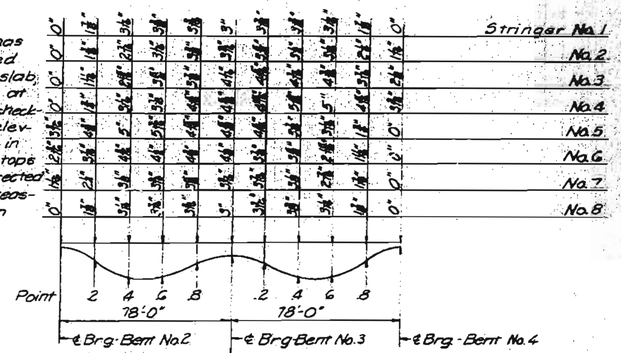
PLATE ON TOP FLANGE **PLATE ON BOTTOM FLANGE**



Note: 13/16" ϕ Reamed Holes for ⅞" ϕ rivets

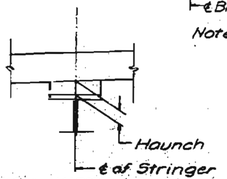
DETAILS OF FIELD SPLICES

After all structural steel has been erected and riveted and before forming for slab, elevations shall be taken at tops of all stringers and checked against theoretical elevations. Any discrepancies in theoretical elevations of tops of stringers shall be corrected for by increasing or decreasing slab haunches shown to the right.



Note: Slab shall be built parallel to grade and to a uniform thickness of 6½". Concrete D.L. deflection and vertical curve shall be taken care of by haunching to stringers by the amounts shown above. This additional concrete is included in "Estimated Quantities".

SLAB HAUNCHING DIAGRAM



TYPICAL HAUNCH DETAIL

WELDING DETAILS FOR PLATES ON STRINGERS AT BENT NO. 3

Preheating will be required in accordance with the American Welding Society Specifications. This will apply to the welding of plates to the top and bottom flanges of beams.

FINISHED

FINISHED

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25) (RTE. 71) STA. 237+71.7 FINISHED

JACKSON COUNTY

Drawn April 1956 by K.L.D.
Checked Aug. 1956 by FMC Jr.

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

Sheet No. 11 of 15

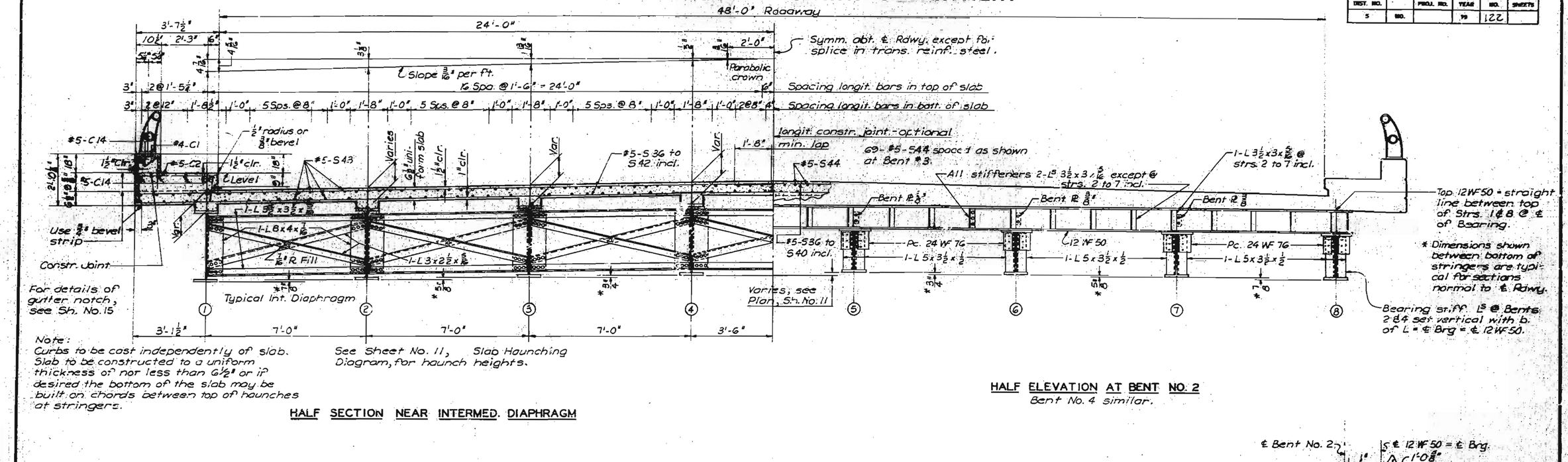
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-920

NO CONSTRUCTION CHANGES

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	122	

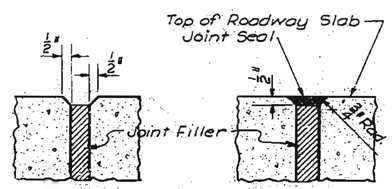


Note:
Curbs to be cast independently of slab. Slab to be constructed to a uniform thickness of not less than 6½" or if desired the bottom of the slab may be built on chords between top of haunches at stringers.

See Sheet No. 11, Slab Haunching Diagram, for haunch heights.

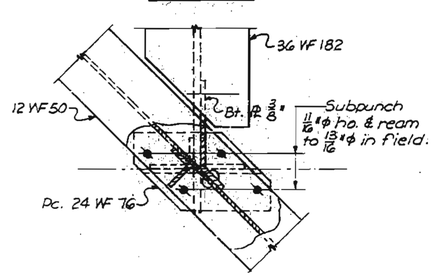
HALF SECTION NEAR INTERMED. DIAPHRAGM

HALF ELEVATION AT BENT NO. 2
Bent No. 4 similar.

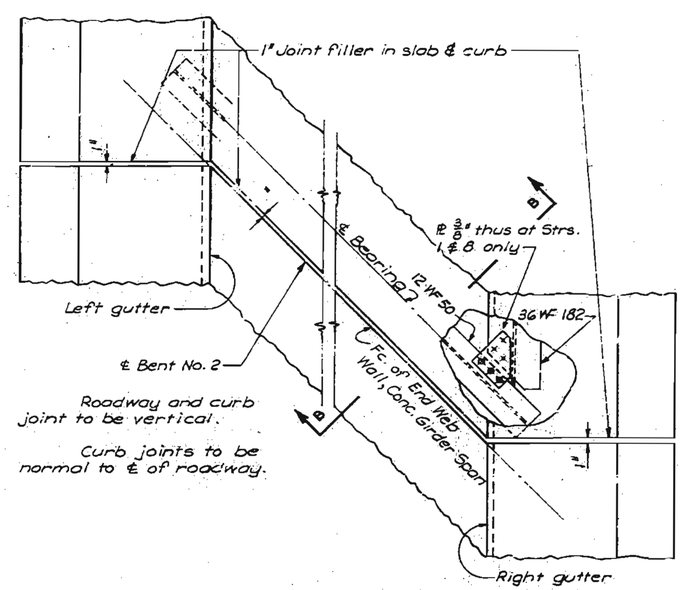


Note: Use bevel as shown for exposed faces of all filled joints except at top surface of roadway slab. Use edging tool with 3/4" radius at top surface of roadway slab each side of joint and fill with joint seal as shown.

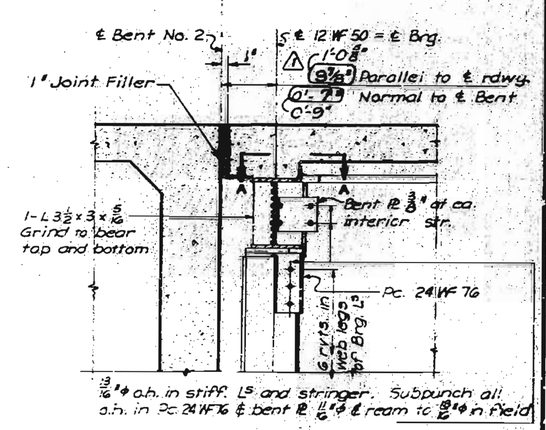
DETAIL OF BEVEL FOR FILLED JOINT



SECTION A-A
For Strs. 2 to 7 incl.



ROADWAY JOINT DETAIL FOR CURBS AT BENTS NO. 2 & 4
Rdwy. joint detail at Bent No. 2 shown; joint detail at Bent No. 4 is similar.



PART SECTION B-B

FINISHED

FINISHED

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25) (RTE. 71) STA. 237+717

JACKSON COUNTY

Drawn May 1956 by F.J.D.
Checked Aug 1956 by FHCjr.

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

Sheet No. 12 of 15 △ Rev. 3-17-60

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-859

NO CONSTRUCTION CHANGES

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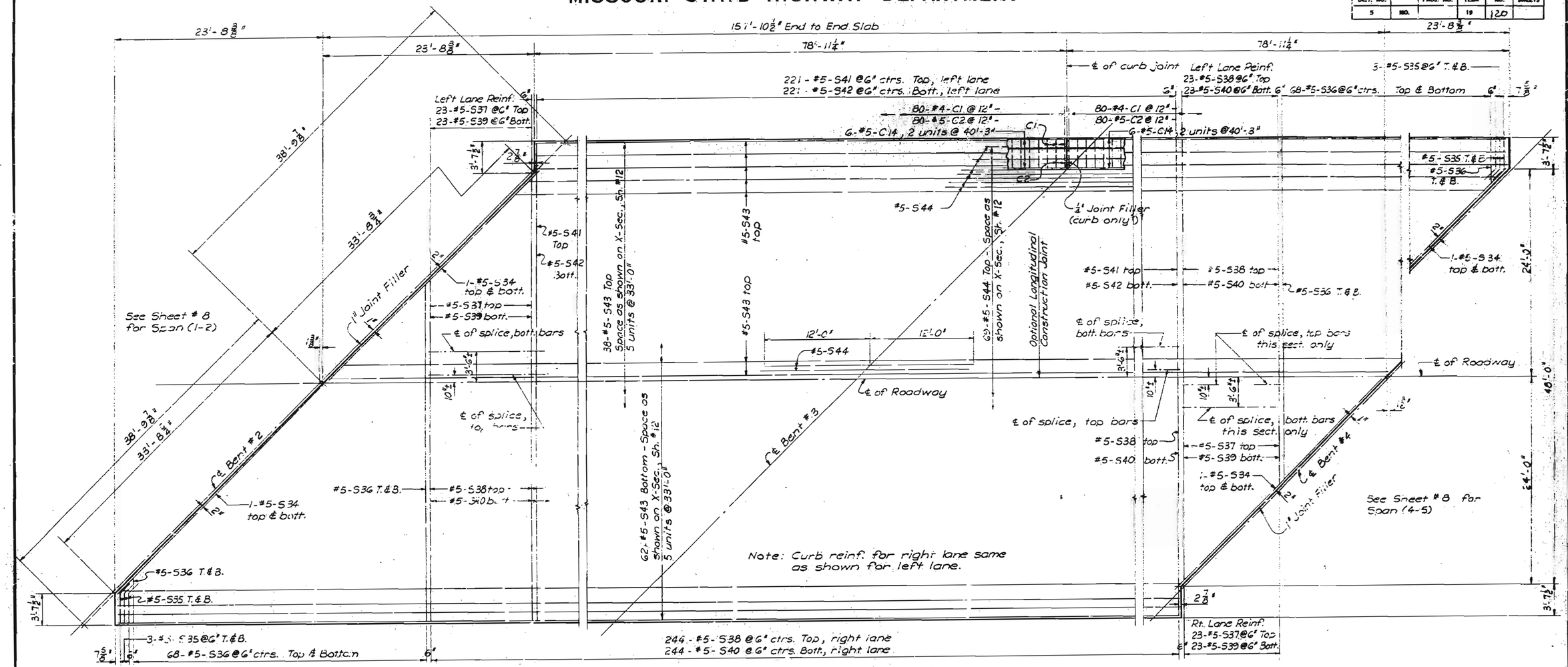
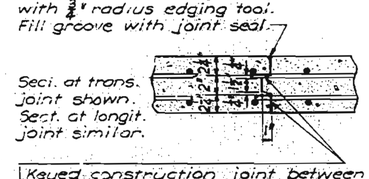
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	120	



PLAN OF SLAB CONTINUOUS SPANS SHOWING REINFORCEMENT

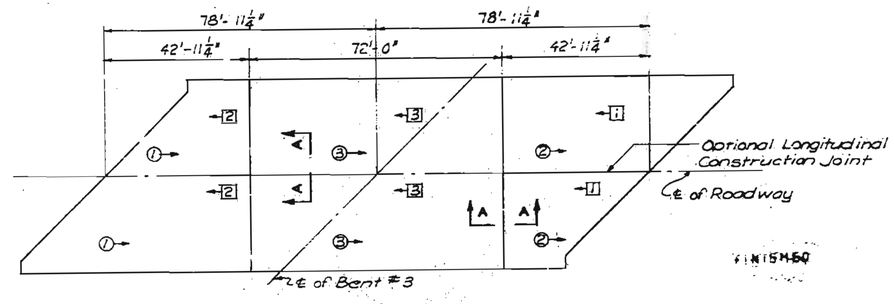


Keyed construction joint between sections. Key to extend full width of slab at transverse joints. If optional longitudinal construction joint is used, key to extend full length of slab.

SECTION A-A

Note: The slab shall be poured in sections of the lengths shown at the right and in the sequence indicated by the numbers ①, ②, ③ or as an alternate by the numbers 1, 2 & 3. The seperate pours shall progress in the direction indicated by the arrows.

The above pouring sequence and the number of construction joints may be altered by the Engineer in order to obtain a more satisfactory surface finish. See Section 16.36 of the Supplemental Specifications.



CONTINUOUS SLAB POURING SEQUENCE

Minimum lap for all bar splices to be 1'-8"

See Sheet No. 12 for spacing of longitudinal joints.

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE

ABOUT 2 MILES S. OF HICKMAN MILLS

PROJECT NO. F-353(25)(RTE.71) STA. 237+71.7

JACKSON COUNTY

Drawn May 1956 by F.J.D.

Checked Aug. 1956 by FMCjr.

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

Sheet No. 13 of 15

HARRINGTON AND CORTELYOU CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

NO CONSTRUCTION CHANGES

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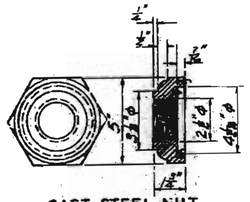
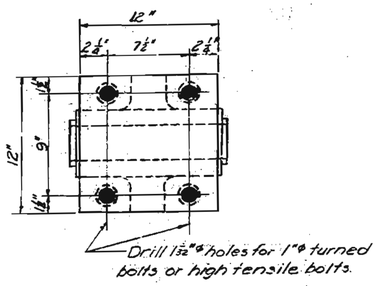
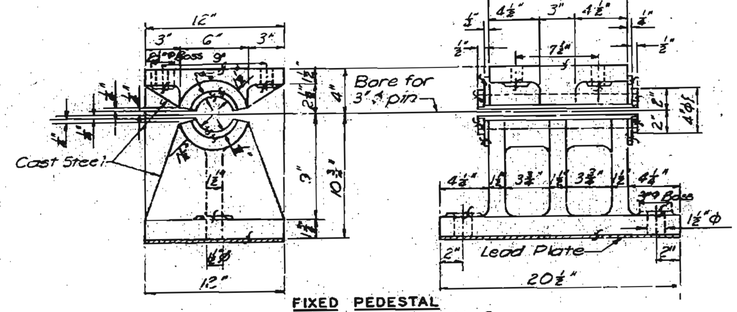
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	121	



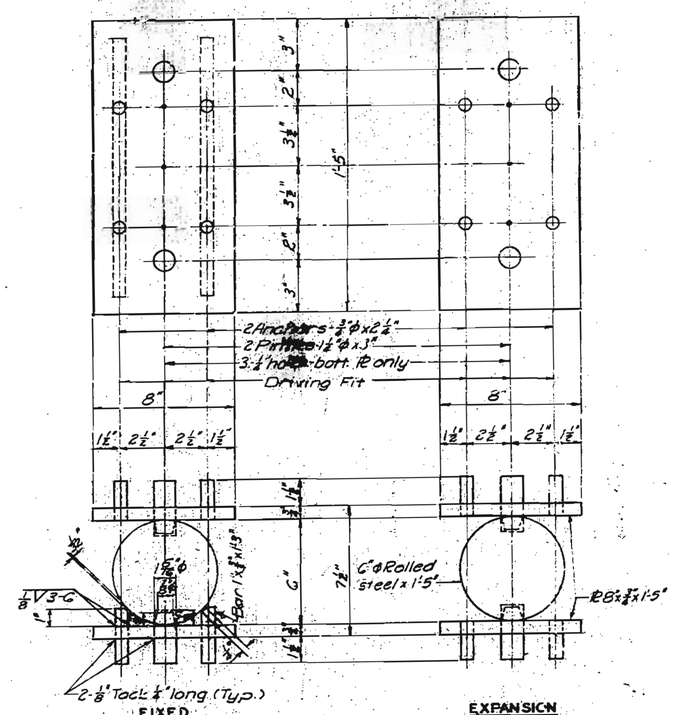




FIXED PEDESTAL
8 Required for Bent No. 3

DETAILS OF BEARING CASTING - BENT NO. 3

Notes:
Finish all surfaces marked "f".
All fillets for castings shall have 3/4" radius.
Material for castings shall be cast steel.
All pins, bolts, nuts and pipe sleeves shall be paid for as Structural Steel.
Anchor bolts shall be 1 1/4"φ swedged bolts with hex. nuts and shall extend 12" into concrete.
Lead plates under bearings shall be approximately 1/8" thick and weigh 8#/sq. ft. Cost of lead plates shall [illegible] other items.
See Details of Intermediate Bent No. 3 sh. no. 6 for Anchor Bolt Layout and detail of anchor bolt well.

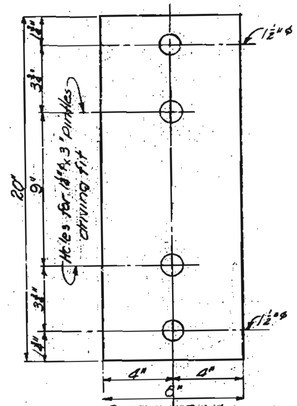


FIXED
8 Required for Bent No. 2
8 Required for Bent No. 4

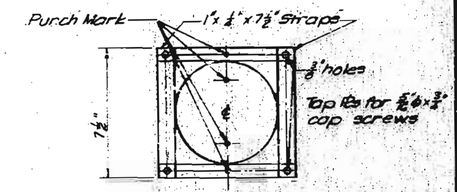
EXPANSION
9 Required for Bent No. 1
8 Required for Bent No. 5

BEARING DEVICES FOR CONCRETE GIRDER SPANS ONLY

Notes:
Material for plates and 1"x3/4" bars shall be U.S.S. T-1 alloy steel or equivalent. Material for rollers and pintles shall be cold finished carbon steel A.I.S.I.-C-1042 or A.I.S.I.-C-1045 (turned and polished).
E6015 or E6016 welding electrodes shall be used.
Paint: Shop: One coat of red lead, except surfaces in contact with concrete.
Bearing devices shall be paid for as Structural Steel.
Lead plates under bearings shall be approximately 1/8" thickness and weigh 8#/sq. ft. Cost of lead plates shall be included in price bid for other items.
Anchor bolts shall be 1 1/4"φ swedged bolts with hex. nuts and shall extend 18" into concrete.



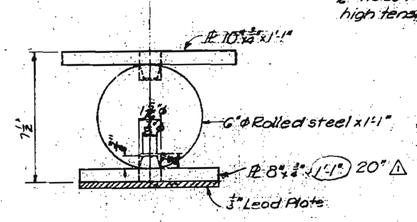
Bottom Plate
3 Required for Bent No. 2
8 Required for Bent No. 4



Remove straps after concrete has set

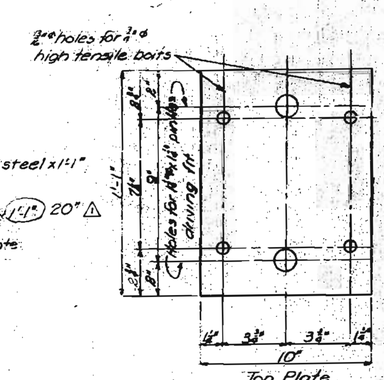
ASSEMBLY DETAIL FOR CONCRETE GIRDER SPANS ONLY

Note: Centerline of bearing shall be indicated on each end of plates and rollers by punch marks located as shown in assembly detail.



EXPANSION
8 Required for Bent No. 2
8 Required for Bent No. 4

BEARING DEVICES FOR STEEL BEAM SPANS ONLY



Top Plate
8 Required for Bent No. 2
8 Required for Bent No. 4

BRIDGE - BLUE RIDGE BLVD. UNDERPASS
STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25)(RTE. 71) STA. 237+71.7
JACKSON COUNTY (FINISHED)

Drawn May 1956 by K.K.D.
Checked Aug. 1956 by FMCy & M.Z.H.

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

Sheet No. 14 of 15 △ Rev. 3-17-60

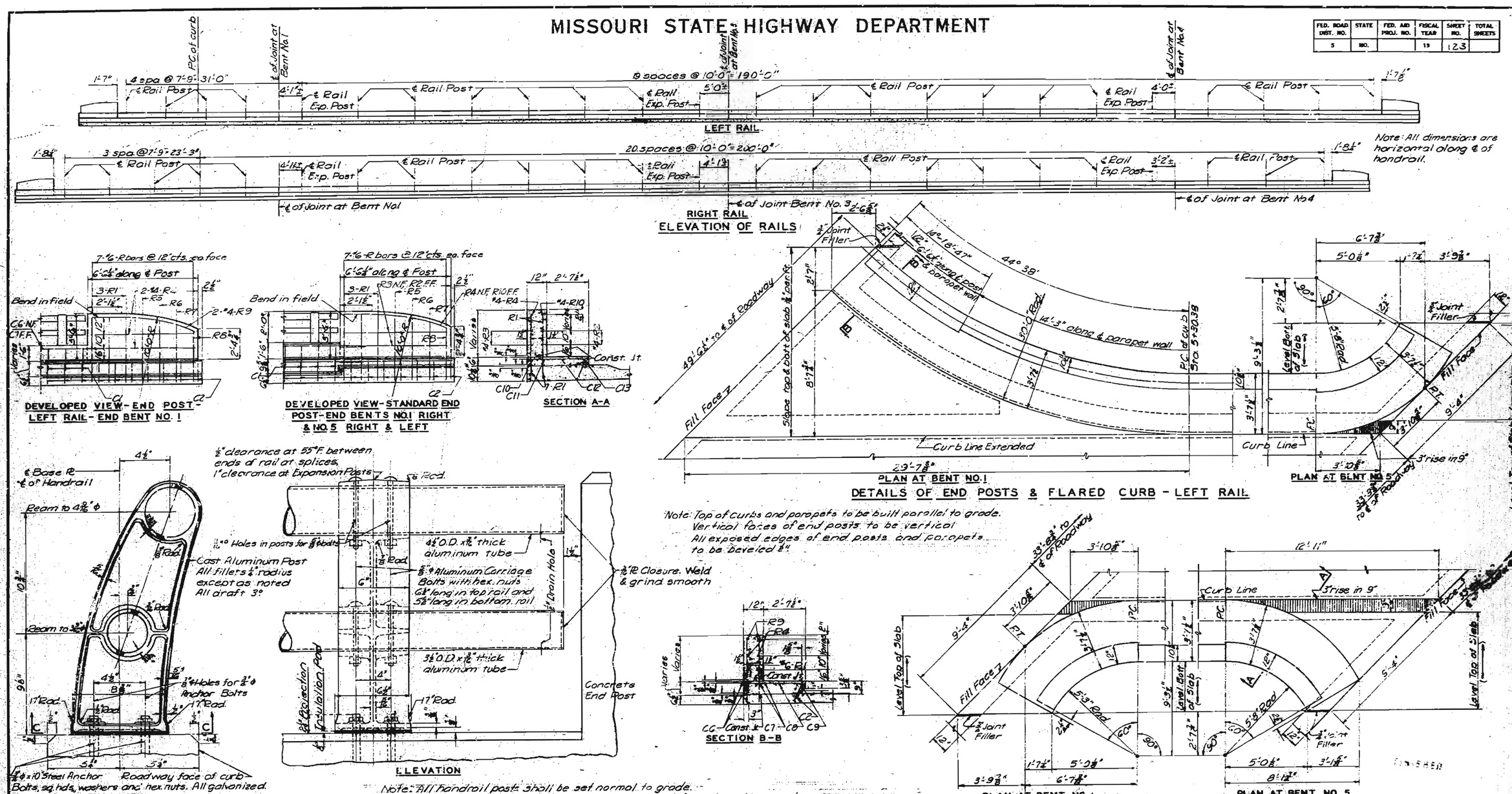
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-[illegible]

NO CONSTRUCTION CHANGES

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	123	

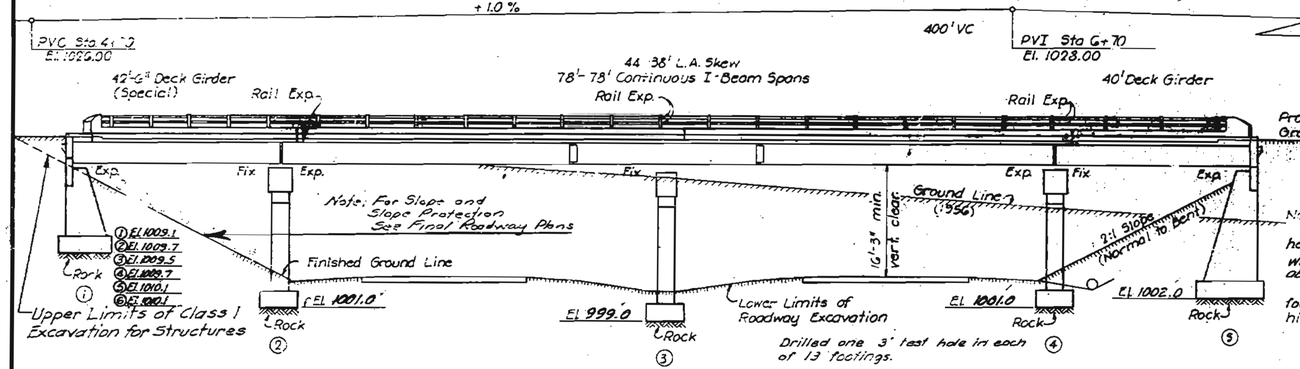


NO CONSTRUCTION CHANGES

MISSOURI STATE HIGHWAY DEPARTMENT

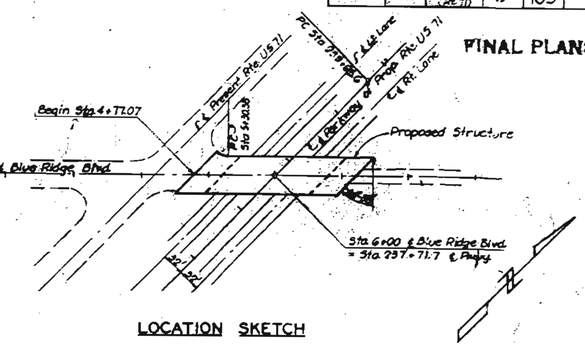
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	F-353 (17) (25-71)	19	109	

FINAL PLANS

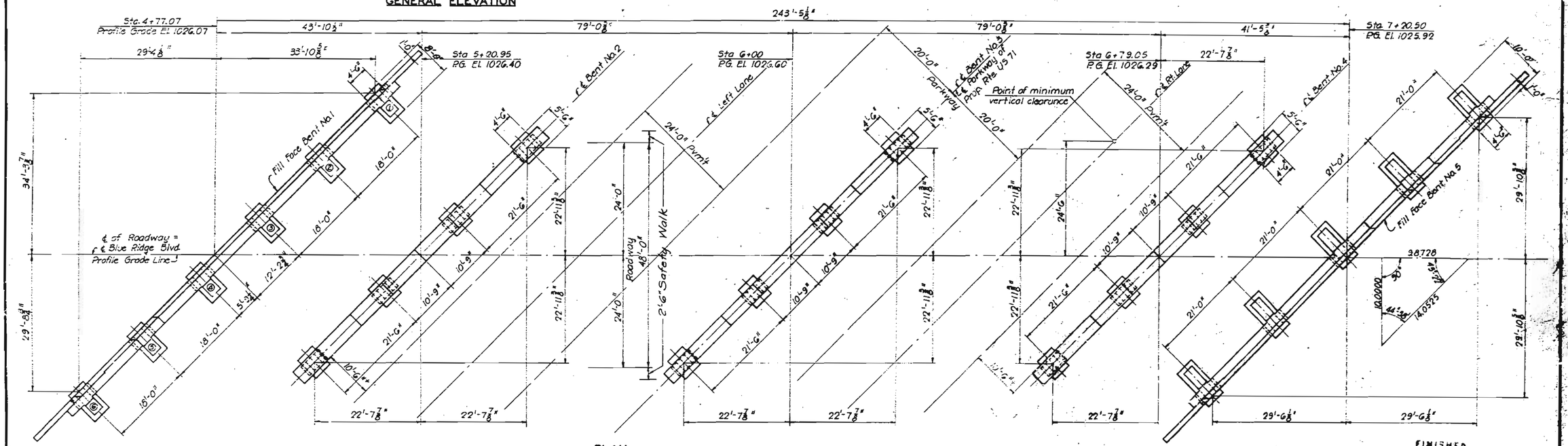


GENERAL ELEVATION

Note: All loose, shelly, or disintegrated rock was removed and the footings placed on hard, solid, undisturbed rock. All footings were cast against sides of Rock or Shale above grade of which footings were set. In no case were footings of Bents No. 2, 3 and 4 placed higher than elevations shown on plans. Bearing of 9.3 Ton/Sq.ft. used in design.



LOCATION SKETCH



PLAN

Bench Marks

Bolt set in top of S.W. wing 30' Rt. Sta 4+47 (Blue Ridge) Elev. 1025.70

FINAL PLANS QUANTITIES

Item		Substr.	Superstr.	Totals
Class 1 Excavation for Structures	Cu.Yds.	476.5		476.5
Class "B" Concrete	Cu.Yds.	353.0		353.5
Class "B-1" Concrete	Cu.Yds.		503.0	503.0
* Fabricated Structural Steel	Lbs.		289500	289500
Steel Castings	Lbs.		3020	3020
Reinforcing Steel	Lbs.	48290	124650	172940
Aluminum Alloy Handrail	Lin.Ft.		450	450
Class 2 Excav. for Str. (Below Plan Grade)	C.Y.	0.5		0.5
Foundation Test Holes	Lin.Ft.	57		57

All excavation was paid for as Class 1 Excavation for Structures and did include only that amount below the Roadway Excavation.
Concrete in end posts is included in Estimated Quantity for Superstr. Concrete.
* Final pay weight for Fabricated Structural Steel was based on using field rivets and includes all bearing devices except castings at Bent No. 3.

Drawn May 1956 by SAH
Checked Aug. 1956 by FMCjr

GENERAL NOTES

Design Specifications : AASHO 1953
Loading : H20-44
Design Stresses : Reinforcing Steel 20,000 psi
Class "B" & "B-1" Concrete 1200 psi
Structural Steel 18,000 psi

Concrete : Concrete for superstructure is Class "B-1", air-entrained.
Concrete for substructure is Class "B", air-entrained. If the Contractor desires, he may use Class "B-1" in lieu of Class "B" Concrete in substructure with payment made on the basis of Class "B" Concrete.
All joint filler did conform with the requirements for Gray Rubber Compound Joints as given in Section 59-22D of the Standard Specifications.

Rivets 3/4"ϕ ; holes 13/16"ϕ except as noted
Qualification of welding operators was required.
Superstructure deck was waterproofed. See Special Provisions.

All field connections were made with high tensil steel bolts with hardened washers.

Paint : Shop, Bearings except surfaces in contact with concrete, one coat of red lead ; Field, contact surfaces of bolted field connections, except where high tensile bolts are used, one coat of red lead and surfaces inaccessible after erection, three coats of red lead. All other exposed surfaces, first coat red lead (except bearings), second coat brown, third coat aluminum. Payment for paint, cleaning and painting such surfaces was included in the price bid for items painted. See Special Provisions for Aluminum Paint Materials.
Design includes provision for 1½" future wearing surface.
Permits were obtained for all truck loads over legal length.

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

Sheet No. 4 of 5

BRIDGE - BLUE RIDGE BLVD. UNDERPASS
STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353 (25) (RTE 71) STA. 237+71.7
JACKSON COUNTY

FINISHED FINISHED

Submitted by J. A. Williams Date 11-19-1957
Approved by Rex M. Whitton Date 11-19-1957

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

STD. C-H10R7
L-928

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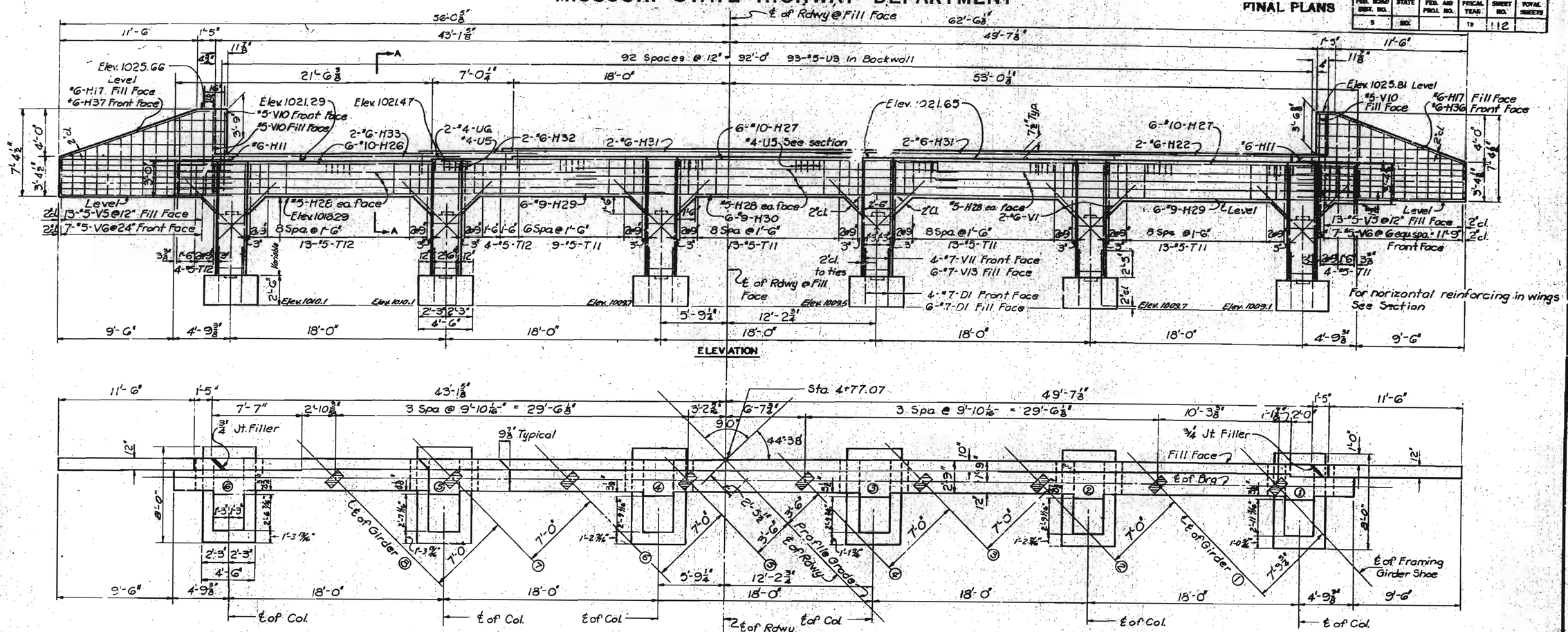
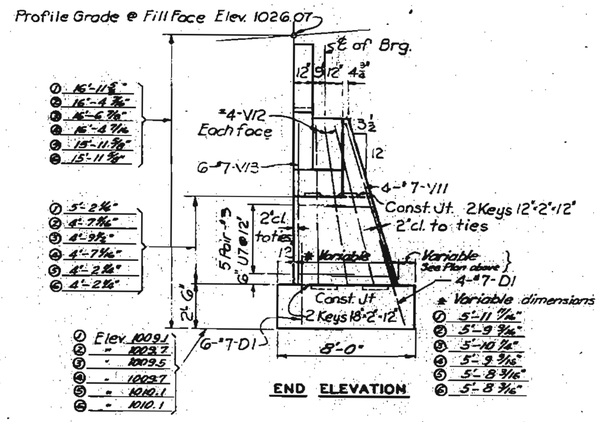
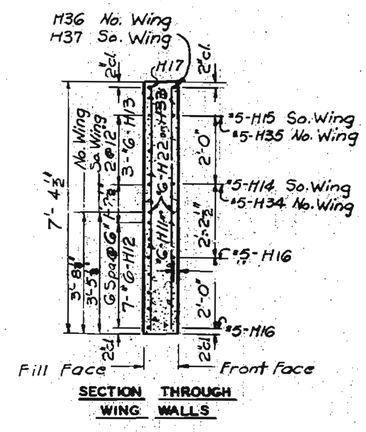
MISSOURI STATE HIGHWAY DEPARTMENT

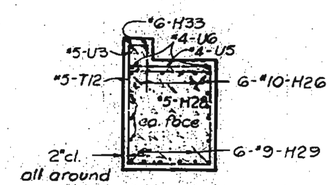
FINAL PLANS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	112	









Note: Bearing Rs. on End Bent No. 1 are 8"×17"
Fill at End Bent 1 was not carried above bottom of beam and wings until superstructure Span (1-2) was in place.

FINISHED

BRIDGE—BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(5) (XRTE. 71) STA. 237+71.7

JACKSON COUNTY

FINISHED

FINISHED

DETAILS OF END BENT NO. 1

Drawn May 1956 by D.M.S.
Checked Aug. 1956 by W.B.H.

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

Sheet No. 4 of 5

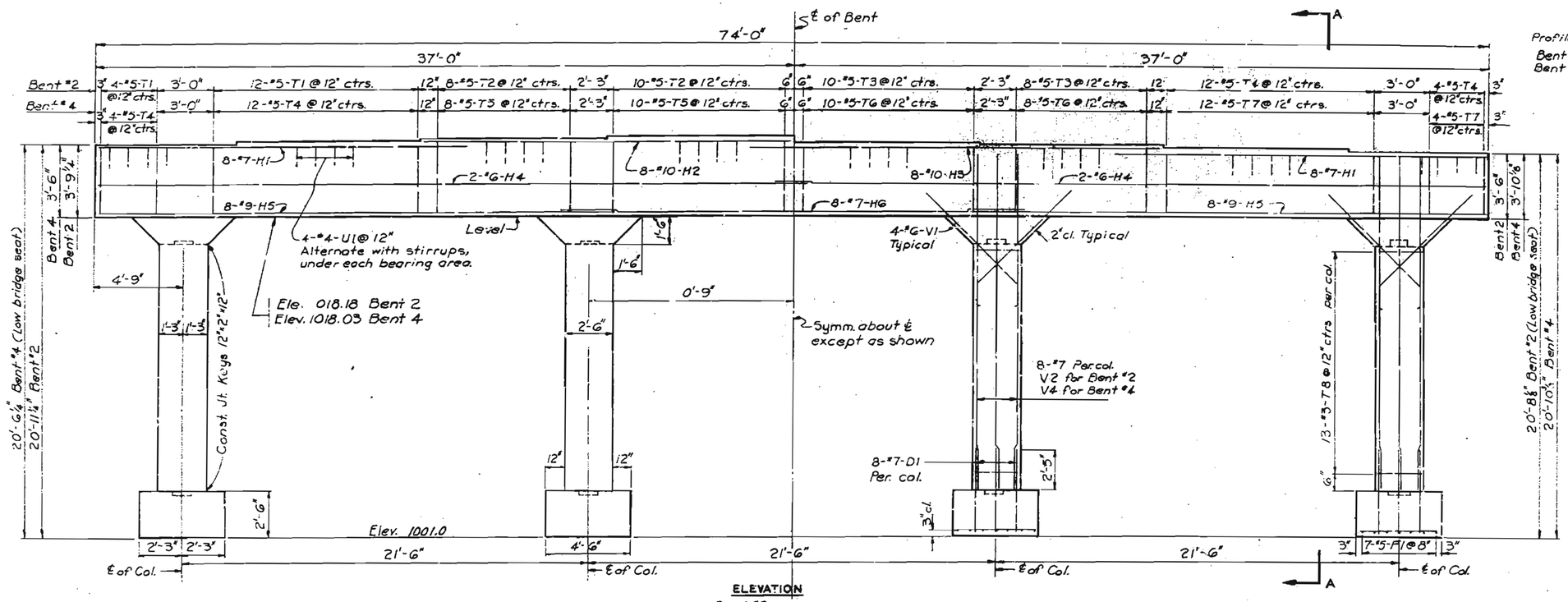
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

MISSOURI STATE HIGHWAY DEPARTMENT

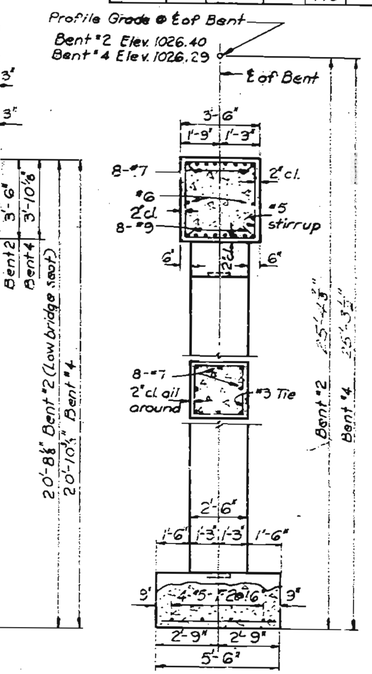
FINAL PLANS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	113	

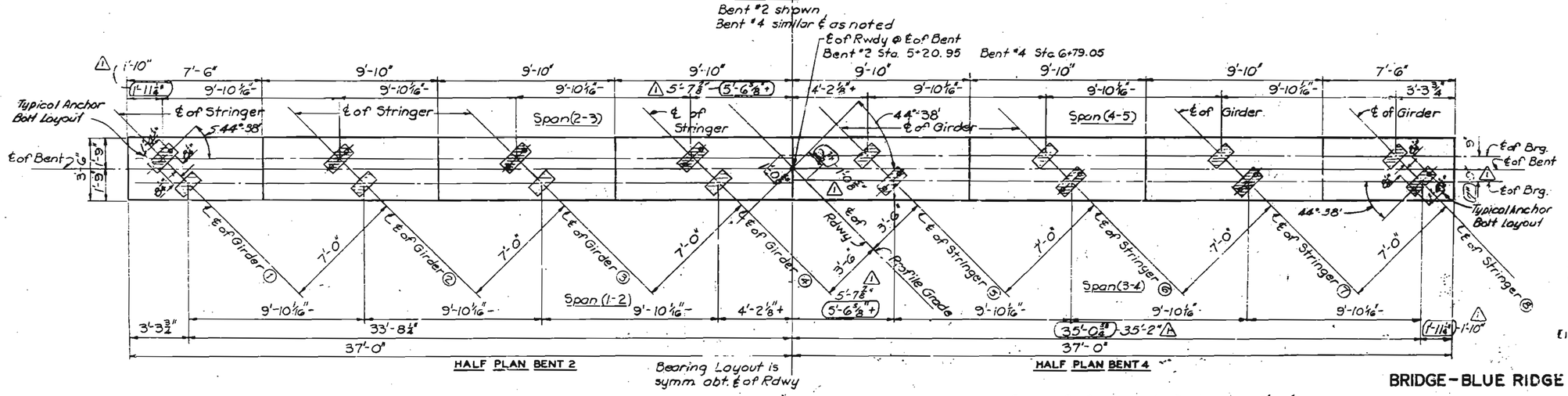


ELEVATION

Bent #2 shown
Bent #4 similar ℄ as noted



SECTION A-A



BRIDGE SEAT ELEVATIONS		
Bearing No.	Bent #2	Bent #4
①	1021.94	1021.52
②	1022.03	1021.61
③	1022.10	1021.68
④	1022.18	1021.76
⑤	1021.86	1022.07
⑥	1021.81	1022.00
⑦	1021.75	1021.94
⑧	1021.67	1021.86

Bearing Rs for Concrete Girders are 8"x17"
Bearing Rs for Steel Stringers are 8"x 20"

DETAILS OF INTERMEDIATE BENTS 2 & 4

FINISHED

BRIDGE – BLUE RIDGE BLVD. UNDER PASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25)(RTE. 71) STA. 237+71.7

JACKSON COUNTY

FINISHED

Drawn May 1956 by DMS
Checked Aug. 1956 by WBH

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

Sheet No. 54 of 5 △1 Rev. 3-17-60

HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

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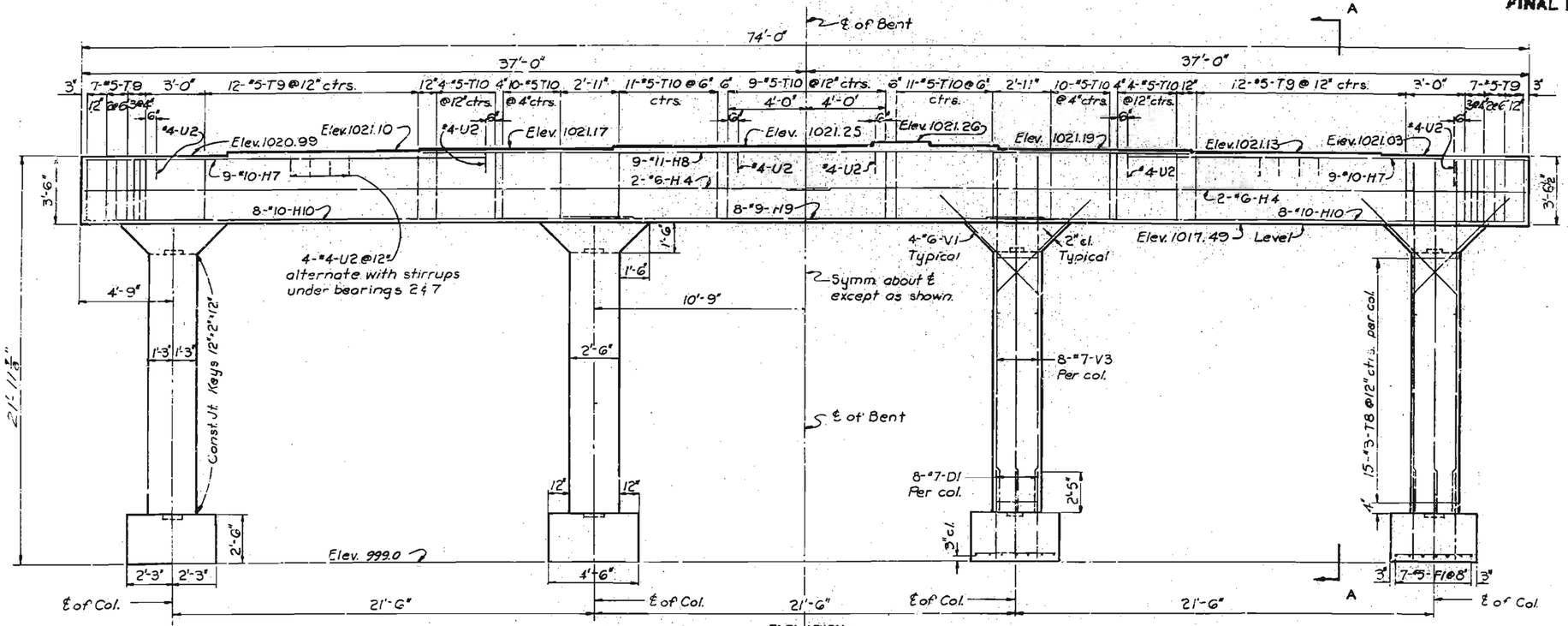
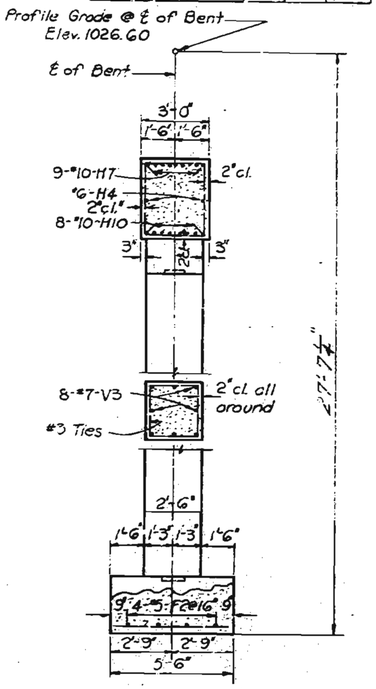
MISSOURI STATE HIGHWAY DEPARTMENT

FINAL PLANS

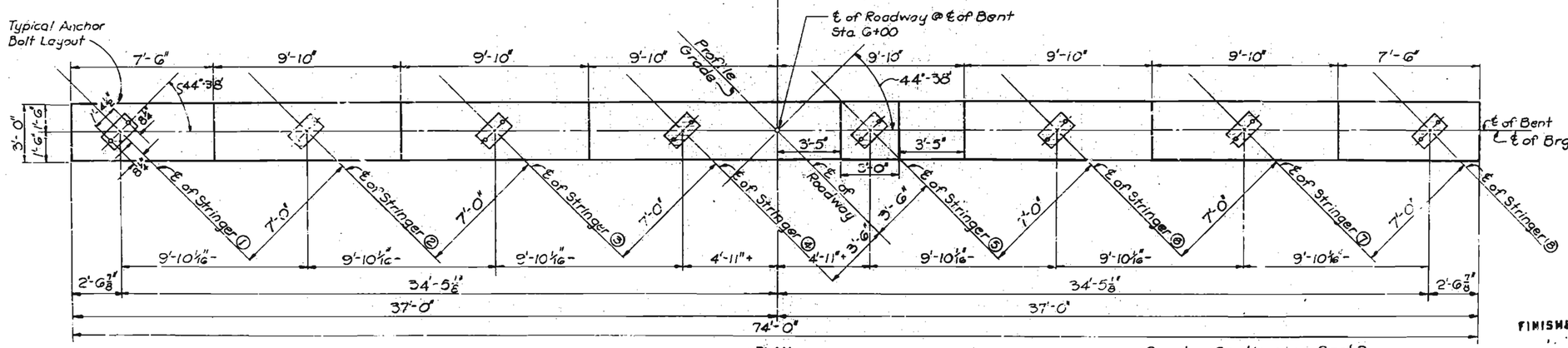
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	114	



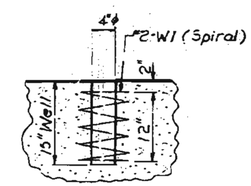
ELEVATION



SECTION A-A



PLAN



Note: Anchor bolts for Bent #3 were set in wells as shown in concrete substructure. See Special Provisions for setting Anchor Bolts.

DETAIL OF SPIRAL AROUND ANCHOR BOLTS

FINISHED

Bearing Castings on Bent 3 are 12"x20½"

DETAILS OF INTERMEDIATE BENT 3

FINISHED

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE

ABOUT 2 MILES S. OF HICKMAN MILLS

PROJECT NO. F-353(25)(RTE. 71) STA. 237+717

JACKSON COUNTY

FINISHED

Drawn May 1956 by D.M.S.
Checked Aug. 1956 by W.B.H.

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

Sheet No. 64 of 5

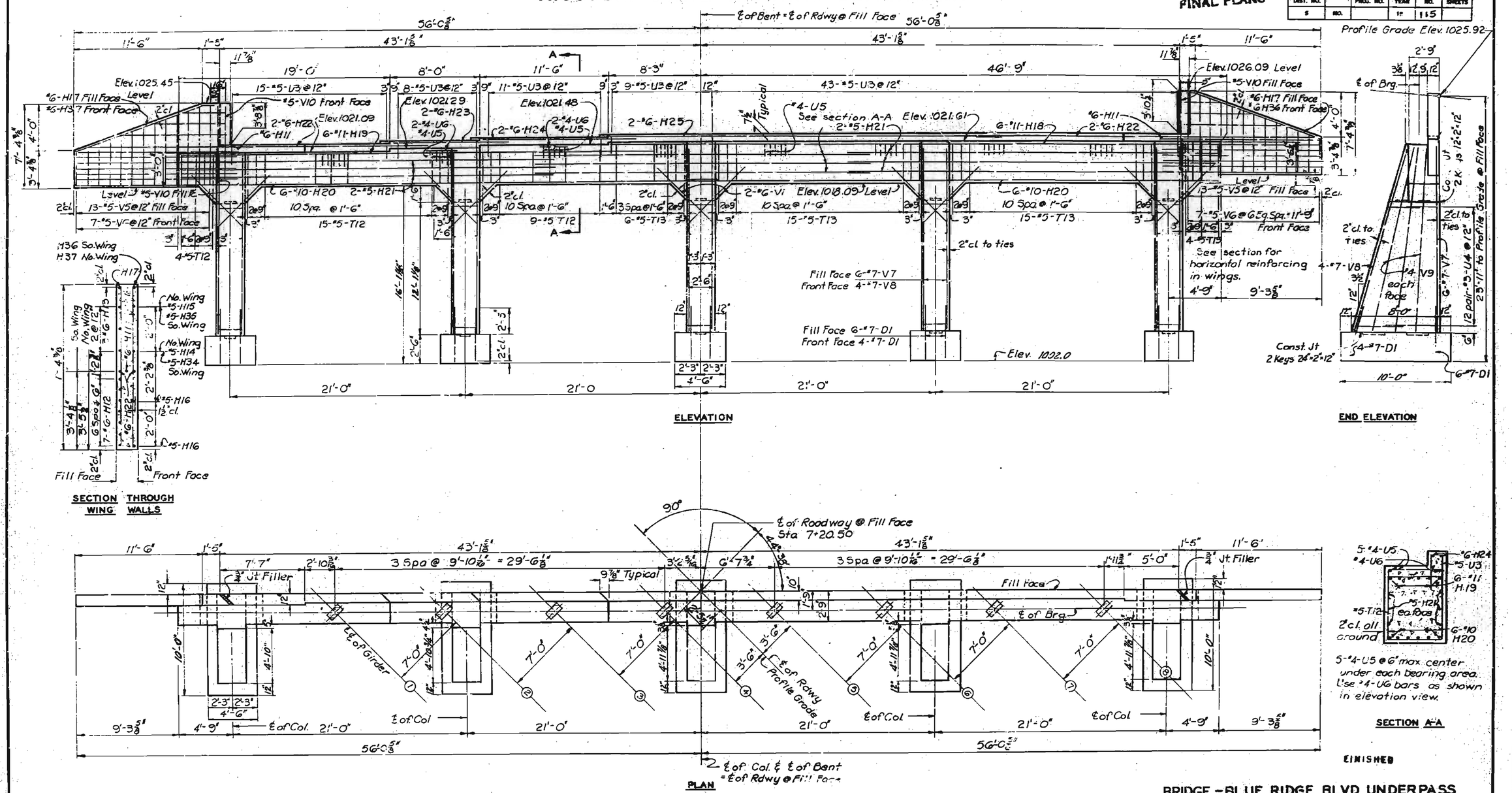
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

MISSOURI STATE HIGHWAY DEPARTMENT

FINAL PLANS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	115	



Note: Bearing Pls on End Bent 5 are 8"x17" Fill at End Bent 5 was not carried above bottom of beam and wings until superstructure Span (4-5) was in place.

DETAILS OF END BENT NO. 5

BRIDGE - BLUE RIDGE BLVD. UNDERPASS

STATE ROAD FROM HICKMAN MILLS TO CASS CO. LINE
ABOUT 2 MILES S. OF HICKMAN MILLS
PROJECT NO. F-353(25)(RTE. 71) STA. 237+71.7

JACKSON COUNTY

Drawn May 1956 by D.M.S.
Checked Aug. 1956 by W.B.H.

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

Sheet No. 7A of 5

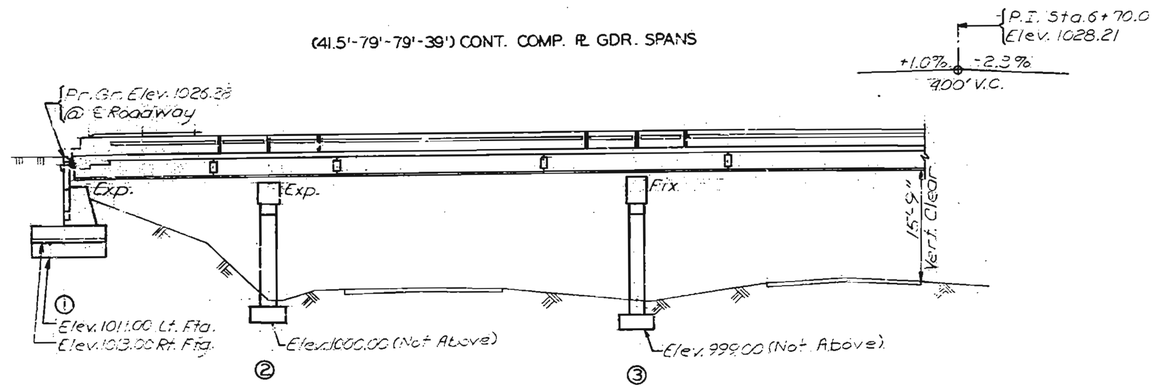
HARRINGTON AND CORTELYOU
CONSULTING ENGINEERS KANSAS CITY, MO.

L-929

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	198	

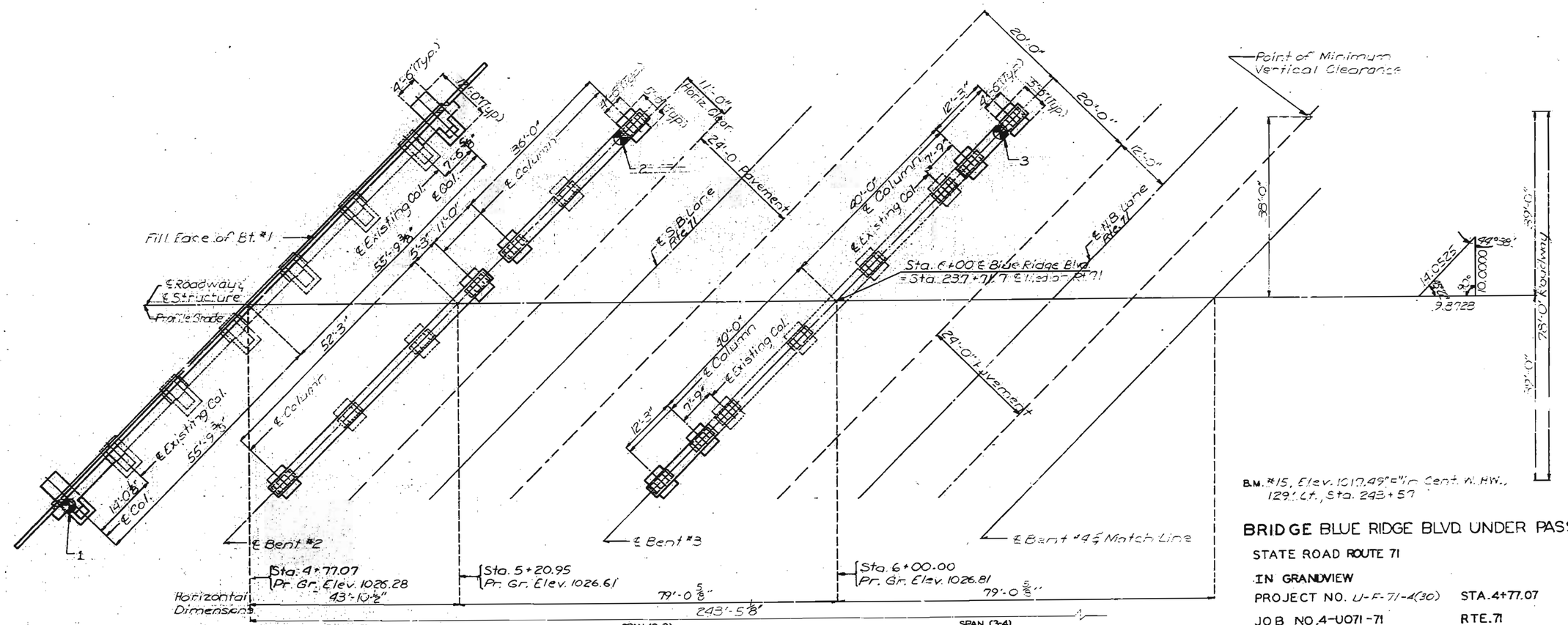
(41.5'-79'-79'-39') CONT. COMP. PL GDR. SPANS



Note: For limits of Const. see sheet No. 30

PART GENERAL ELEVATION

Indicates location of boring. For Boring Data, see Sheet No. 3.



PART PLAN

BRIDGE BLUE RIDGE BLVD. UNDER PASS

STATE ROAD ROUTE 71

IN GRANDVIEW

PROJECT NO. U-F-71-4(30) STA. 4+77.07

JOB NO. 4-U071-71 RTE. 71

JACKSON COUNTY

DATE 1-11-79

STD.

STD. 70635

L-929R

DETAILED DEC. 1978

CHECKED DEC. 1978

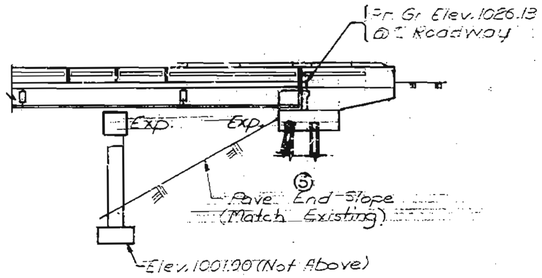
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 1 of 33.

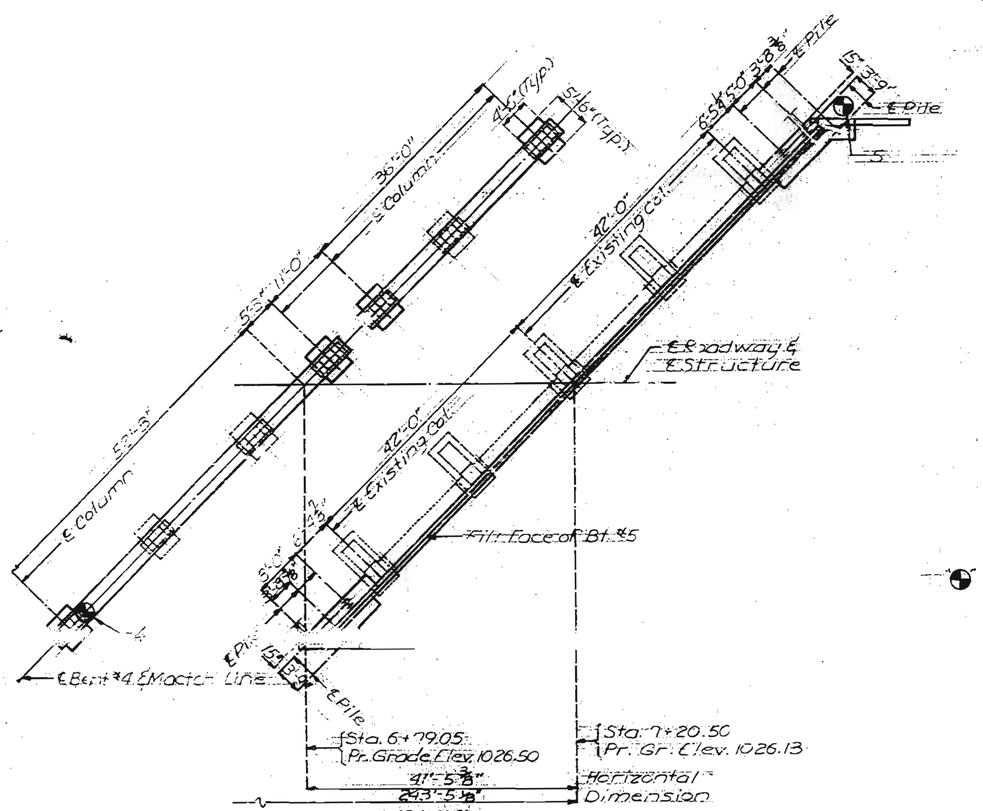
FINAL PLANS

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	99	



④
PART GENERAL ELEVATION



PART PLAN

ESTIMATED QUANTITIES

ITEM		SUBSTR.	SUPERSTR	TOTAL
Removal of Exist. Bridge Superstructure	Lump Sum		1	1
Class I Excavation	Cu.Yd.	21.5		21.5
Structural Steel Pile (10")	Lin.Ft.	102		102
Class B Concrete	Cu.Yd.	265.2		265.2
Class B1 Concrete	Cu.Yd.		604.3	604.3
Elastomeric Exp. Jt. Seal (20")	Lin.Ft.		220	220
Reinforcing Steel (Grade 60)	Lbs.	41,910	57,890	99,800
Reinforcing Steel (Grade 60) (Epoxy Coated)	Lbs.		70,040	70,040
Fabricated Structural Carbon Steel	Lbs.		425060	425060
Type N Elastomeric Bearings	Ea.		48	48
Painting (System A or B) Aluminum	Tons		209.6	209.6
Bridge Guard Rail (One Tube)	Lin.Ft.		502	502
Cleaning Existing Bearings	Ea.		8	8
Conduit System on Structure	Lump Sum			1
Protective Coating for Bents	Lump Sum	1		1
Special Work	Lump Sum			1
Substructure Repair	Sq. Ft.	105		105
Temporary Traffic Barrier (Bridges)	Lin. Ft.		244	244

Note: For Removal of Exist. Bridge Superstructure see Special Provisions.

FILE & FOOTING DATA

	BENT NO.	1	2	3	4	5
BEARING PILE	Pile Type and Size					HP10x42
	Number					6
	Approximate Length Ft.					17
	Design Bearing Tons					50
	Hammer Energy req'd. Ft.Lbs.					8000
SPREAD FOOTINGS	Foundation Material	Rock	Rock	Rock	Rock	
	Design Bearing Tons/Sq. Ft.	8.9	5.0	5.0	5.0	

Minimum energy requirement of hammer based on plan length and design bearing value of piles.
All pile shall be driven to practical refusal.

Note: A minimum vertical clearance of 14'-0" from crown of existing lanes and a minimum lateral clearance of 28'-0" centered on existing lanes shall be maintained during construction.

Indicates location of boring.
For Boring Data, see Sheet No. 3

GENERAL NOTES:
Design Specifications: A.A.S.H.T.O.-1973 Load Factor Design Superstructure

Design Loading:
HS20-44
15#/sq. ft. Future Wearing Surface
Modified 24,000# Tandem Axle
Earth 120#, Equivalent Fluid Pressure 30#
Fatigue Stress - Case I. 1974 Interim

Design Unit Stresses:
Class B Concrete (substructure) fc = 1200
Reinforcing Steel (Grade 60) fy 60,000 psi
Structural Carbon Steel fy = 36,000 psi
Steel Pile fb = 9,000 psi

Fabricated Steel:
Field connections, High Strength Bolts ¾"ø, holes 13/16"ø except as noted.

Paint, System A or B by contractor in accordance with Std. Spec. 712.12. (Color of the final field coat for System B shall be aluminum).

Miscellaneous:
Traffic over structure to be maintained during construction.
Minimum clearance to reinforcing steel shall be 1½" unless otherwise shown.
Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.
Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars.
Contractor shall verify all dimensions in field before ordering new steel.
Anchors shall be of the self drilling expansion type, made of casehardened and drawn carburized steel, with self-cutting annular broaching grooves.
Cost of furnishing and installing rock anchor bolt assemblies shall be included in price bid for concrete.

All reinforcing bars in tops of substructure beams or caps shall be spaced to clear anchor bolts for bearings by at least ½".
For Protective Coating of Bents See Special Provisions.

DETAILED DEC. 1978
CHECKED DEC. 1978

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

Sheet No. 2 of 33.

JACKSON COUNTY

L-929R

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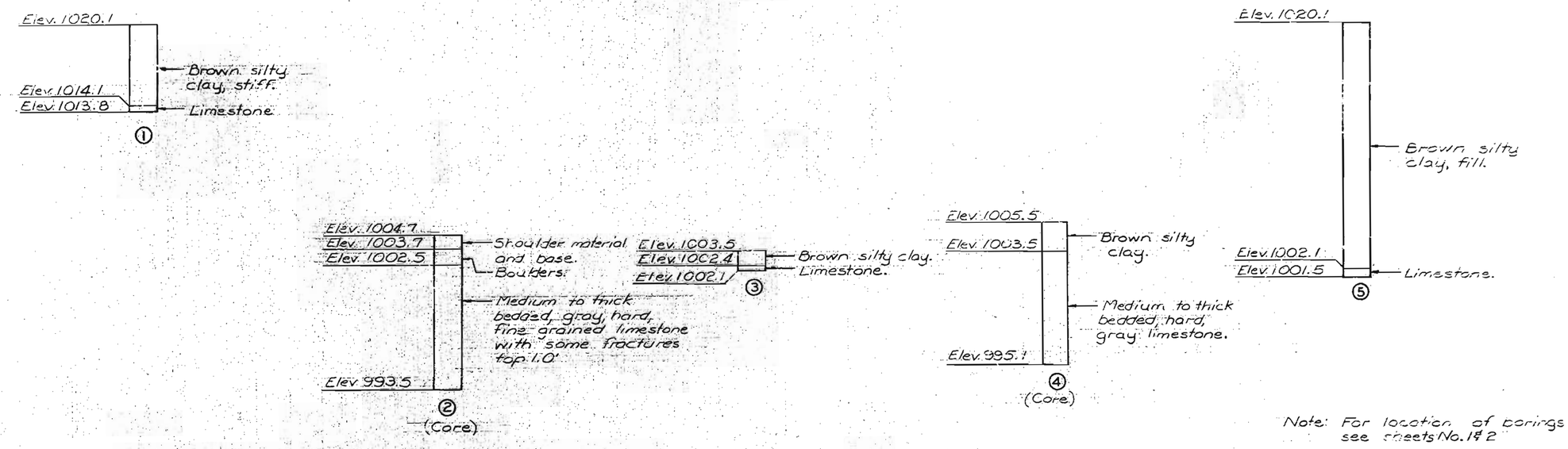
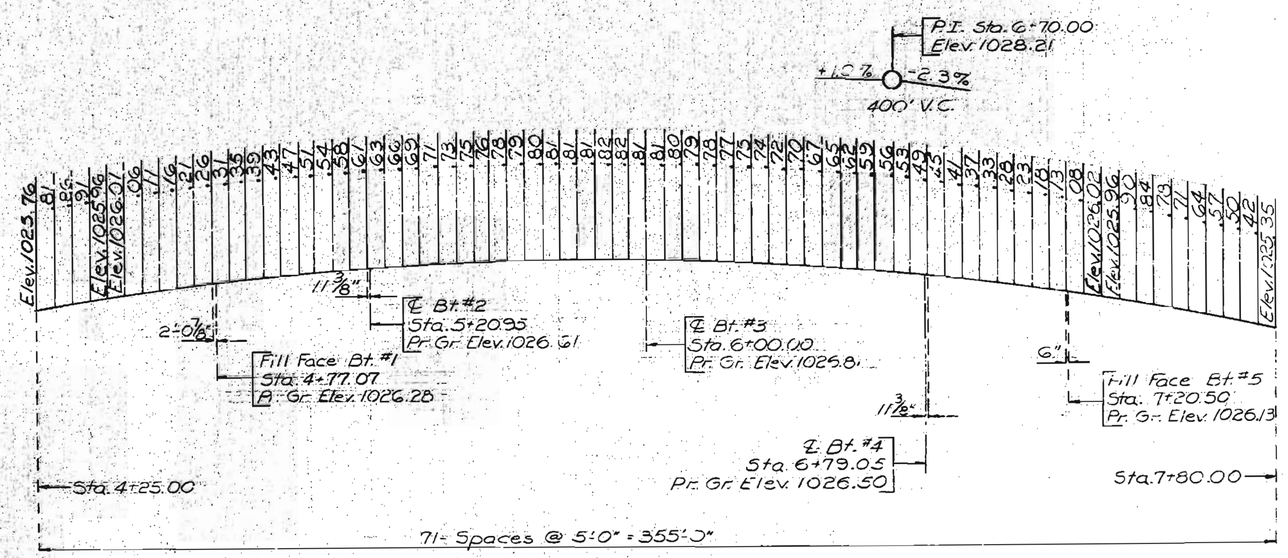
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	200	



BORING DATA



PROFILE GRADE ELEVATIONS

DETAILED Sept. 1978
CHECKED Nov. 1978

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

Sheet No. 3 of 33.

JACKSON COUNTY

L-929R

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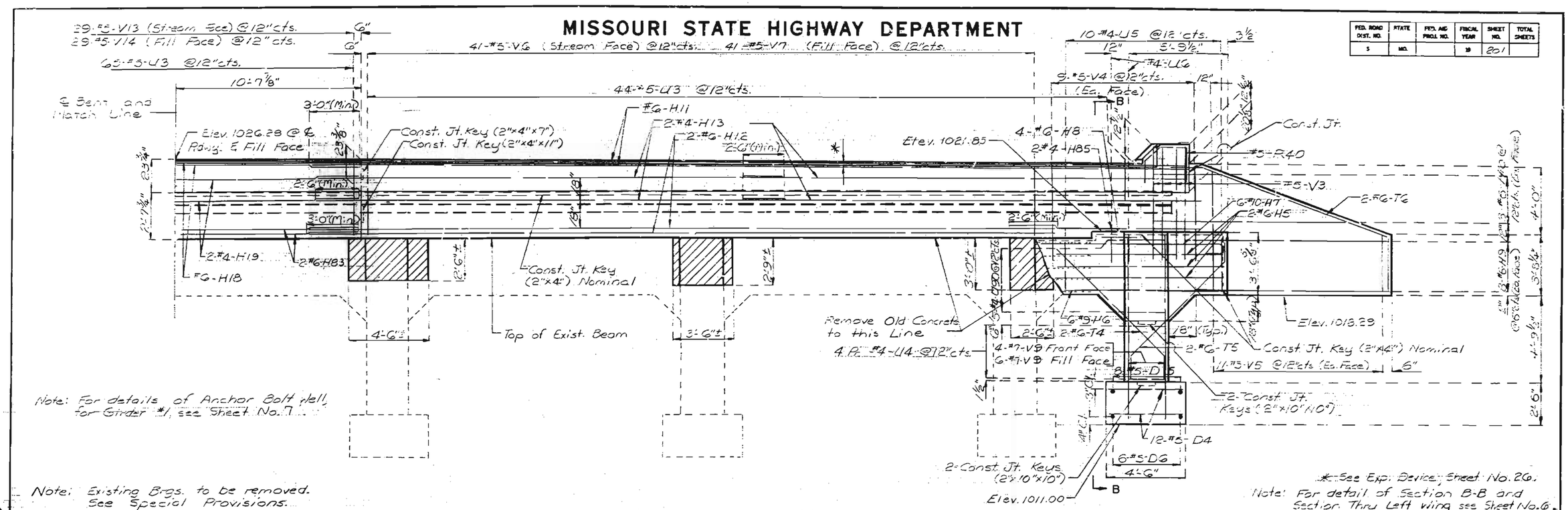
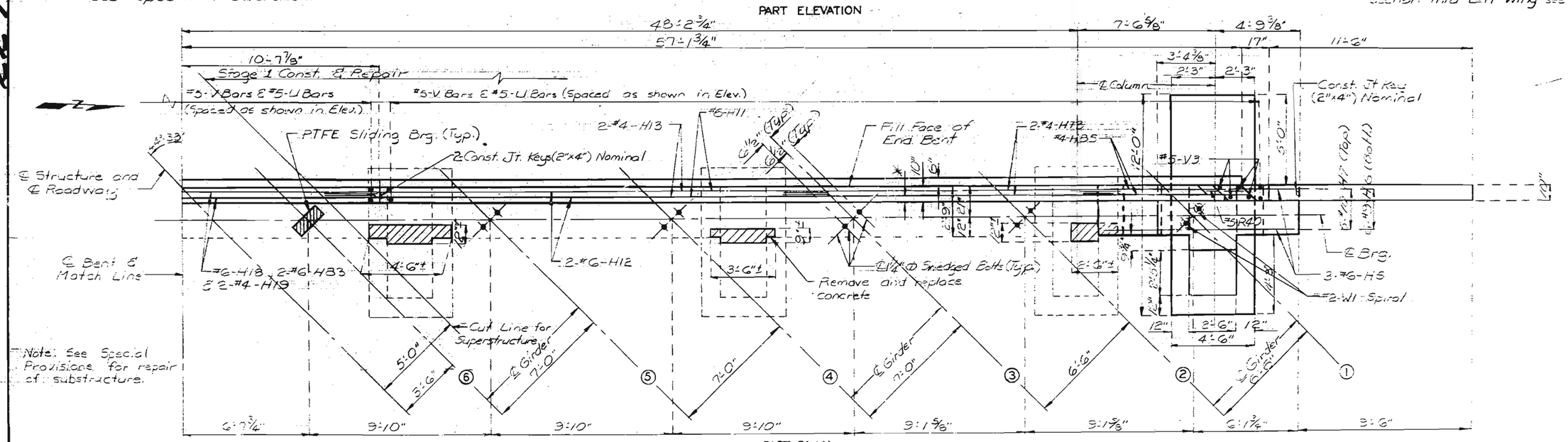
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	201	



PART ELEVATION



PART PLAN

DETAIL OF END BENT NO. 1

SEE FINAL PLANS

DETAILED Nov. 1978
CHECKED Dec. 1978

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

Sheet No. 4 of 33.

JACKSON COUNTY

L-929R

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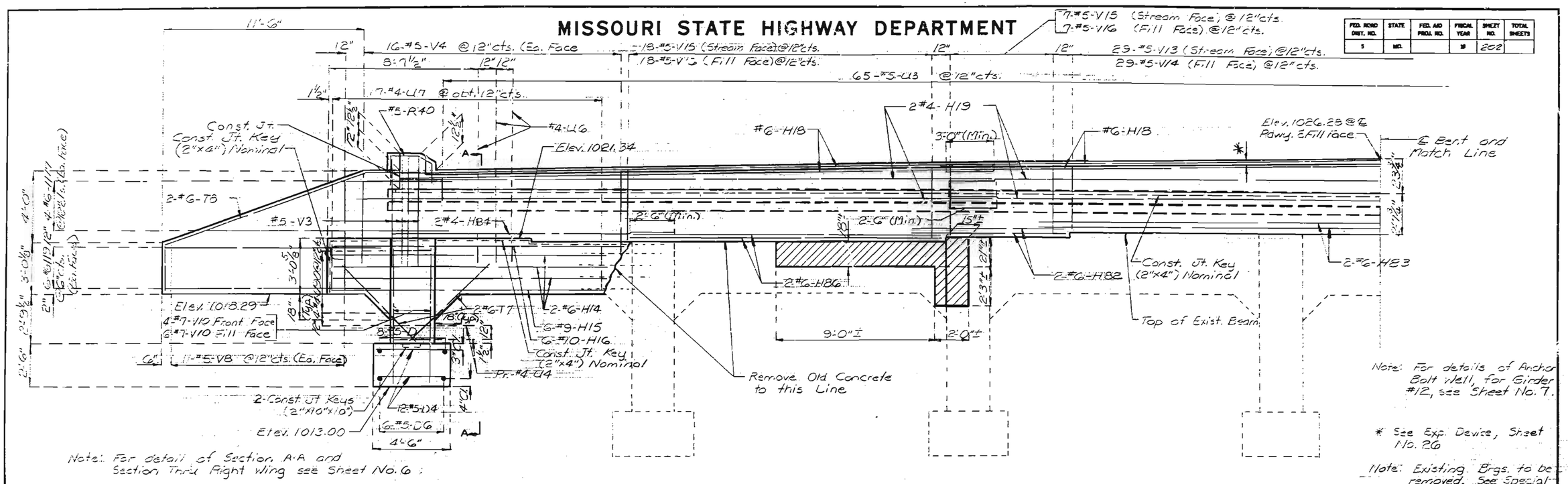
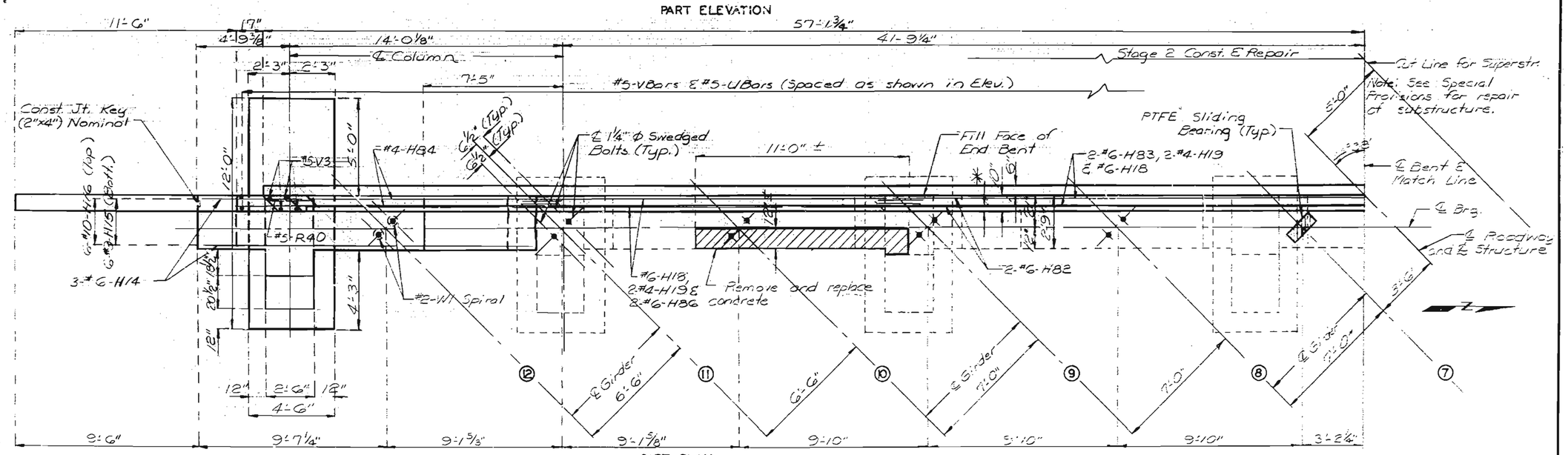
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	202	



PART ELEVATION



PART PLAN

DETAIL OF END BENT NO.1

DETAILED Nov. 1978
CHECKED Dec. 1978

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

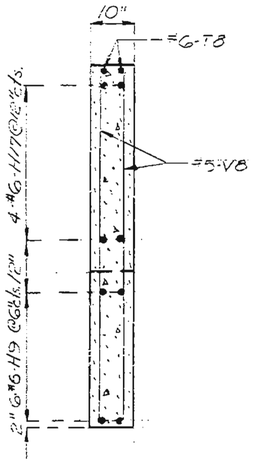
Sheet No. 5 of 33.

JACKSON COUNTY

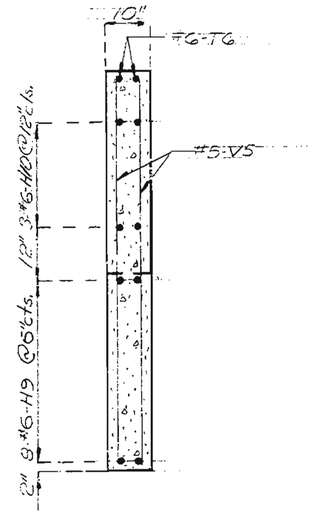
L-929 R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	MO.		19	203	



SECTION THRU
RIGHT WING

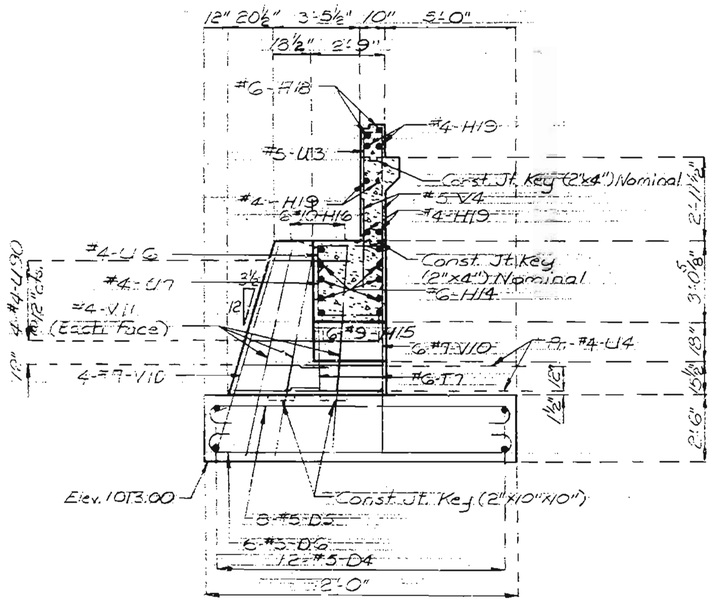


SECTION THRU
LEFT WING

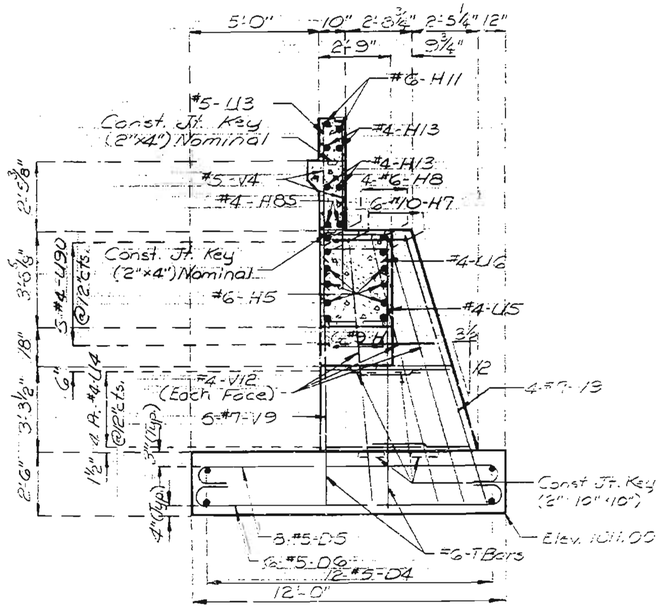
Note: For location of Section A-A see Sheet No. 5

Note: For location of Section B-B see Sheet No. 4

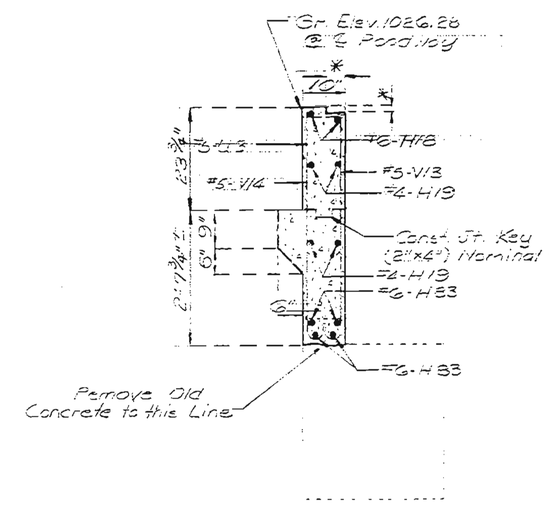
* See Exp. Device, Sheet No 26.



SECTION A-A



SECTION B-B



SECTION THRU BENT
AT ℄ BENT

DETAILED Nov. 1978
CHECKED Dec. 1978

DETAIL OF END BENT NO. 1

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

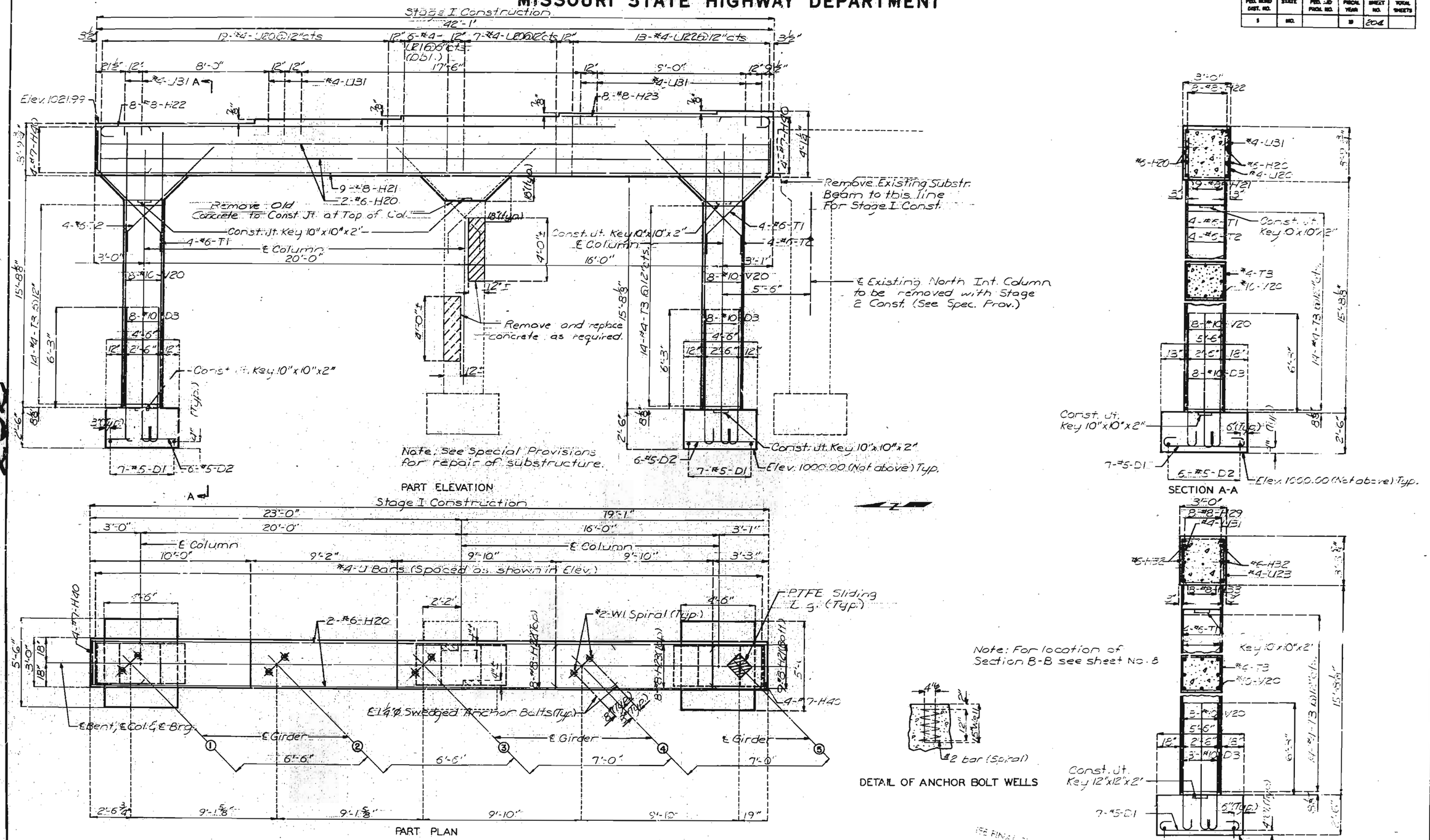
Sheet No. 6 of 33.

JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	204	



DETAILS OF INT. BENT NO. 2

DETAILED DEC. 1978
CHECKED DEC. 1978

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

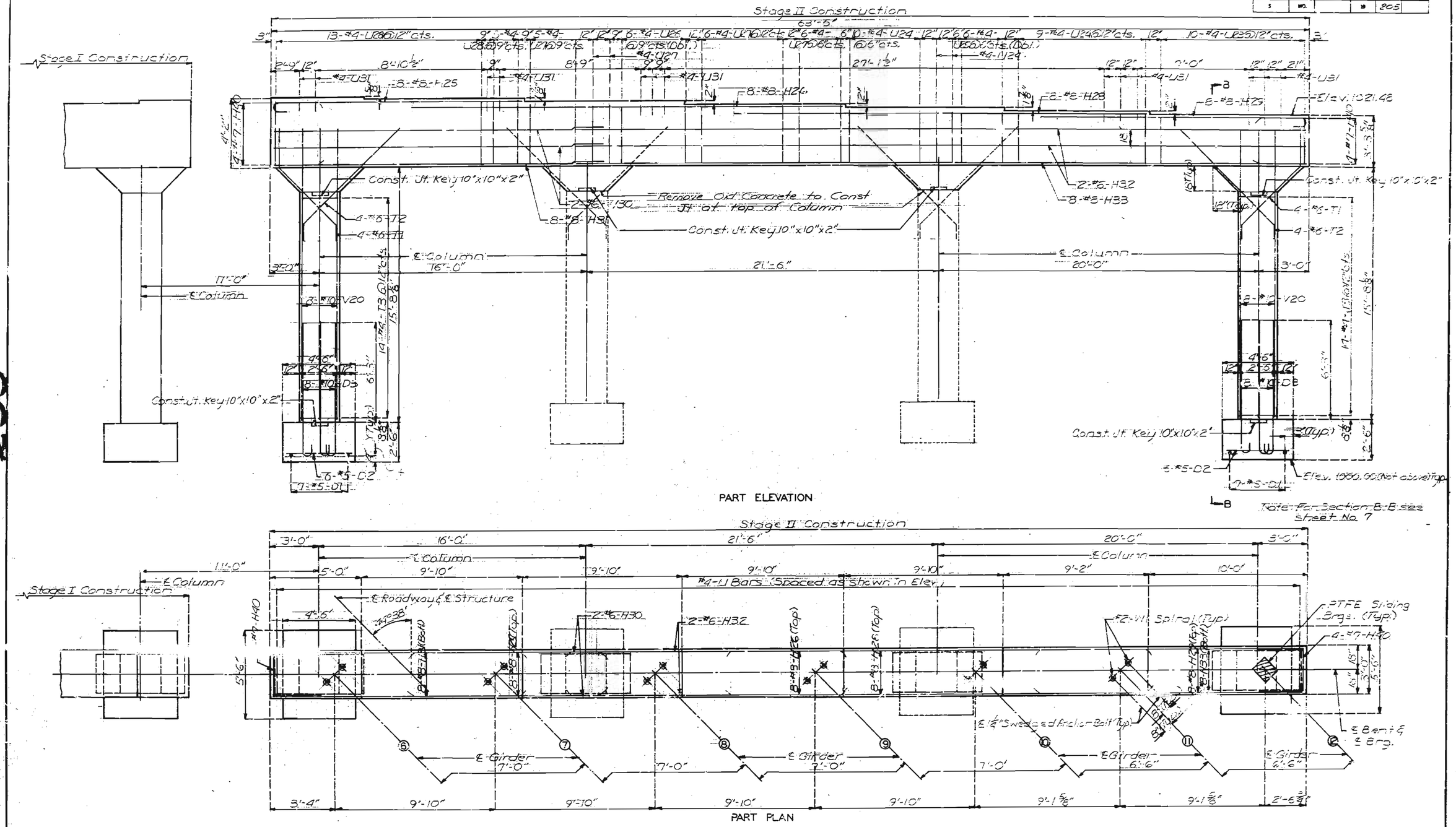
Sheet No. 7 of 33.

JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	205	



DETAILS OF INT. BENT NO. 2

DETAILED DEC. 1978
CHECKED DEC. 1978

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

Sheet No. 8 of 33.

JACKSON COUNTY

L-929R

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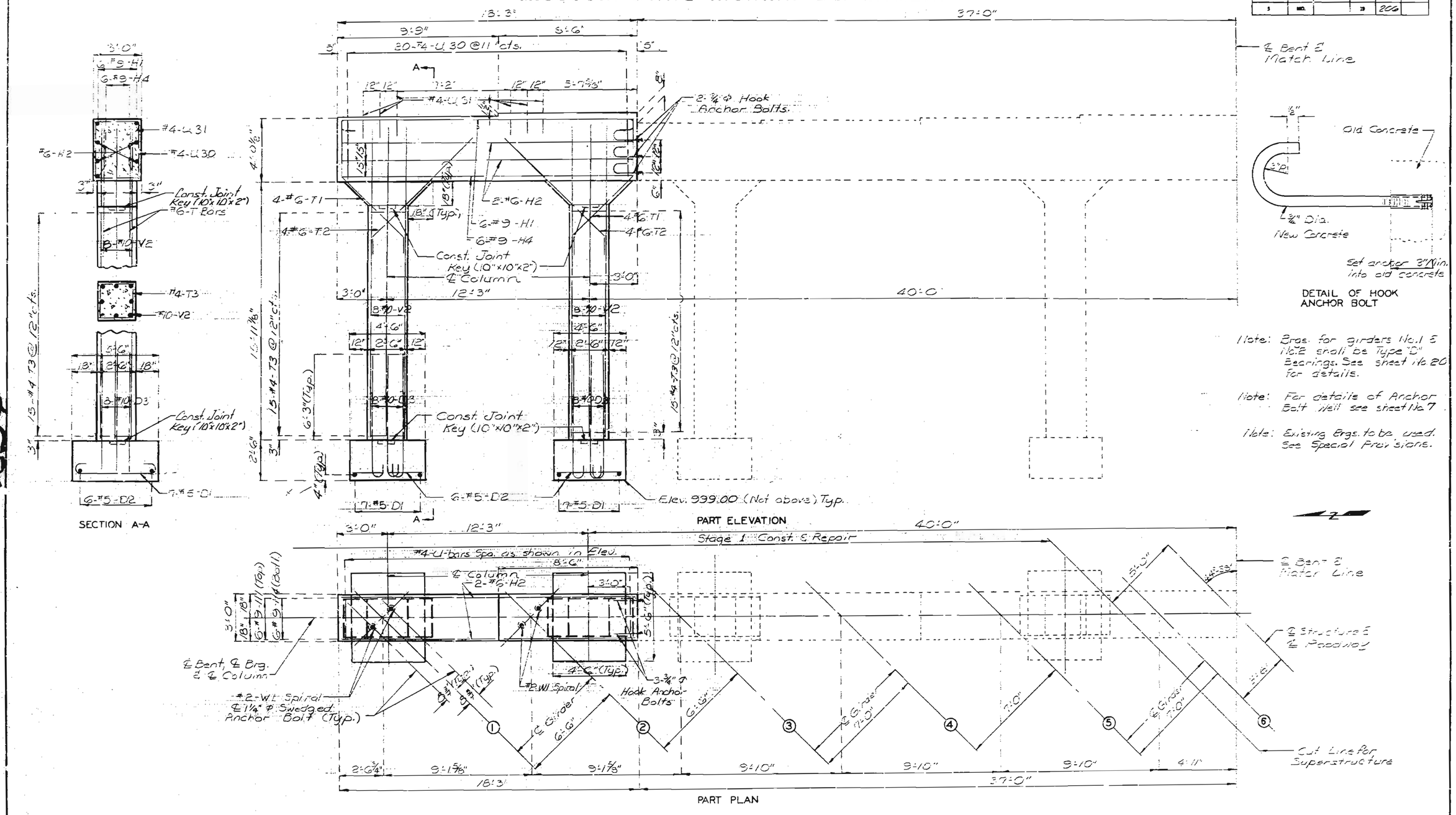
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	206	



DETAILS OF INT. BENT NO. 3

SEE FINAL PLANS

DETAILED Oct. 1978
CHECKED Nov. 1978

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

Sheet No. 9 of 23.

JACKSON COUNTY

L-929R

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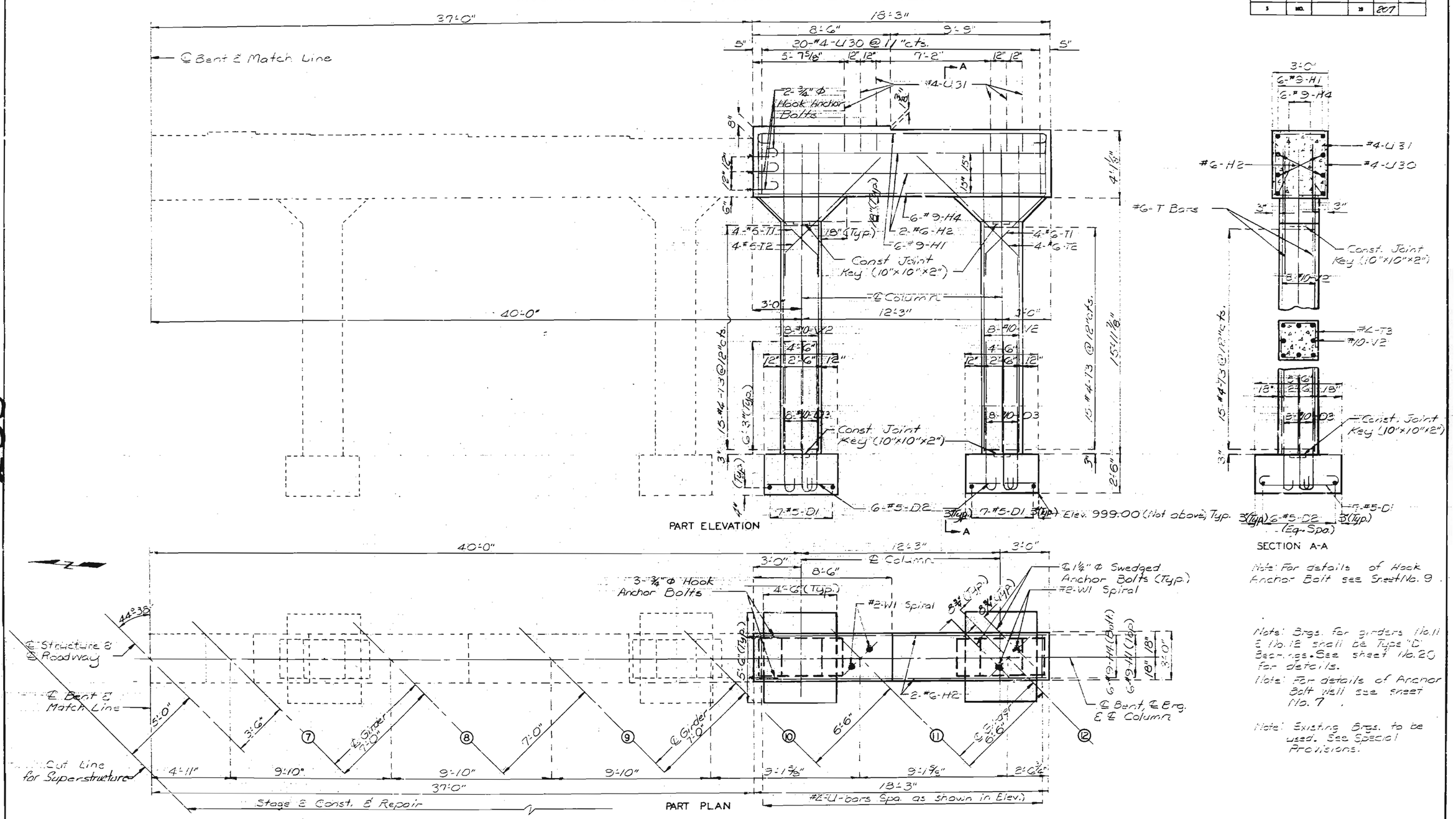
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	207	



Note: For details of Hook Anchor Bolt see Sheet No. 9.

Note: Brgs. for girders No. 11 & No. 12 shall be Type "D" Bearings. See sheet No. 20 for details.

Note: For details of Anchor Bolt well see sheet No. 7.

Note: Existing Brgs. to be used. See Special Provisions.

DETAILS OF INT. BENT NO. 3

DETAILED Oct. 1978
CHECKED Nov. 1978

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

SEE FINAL PLANS

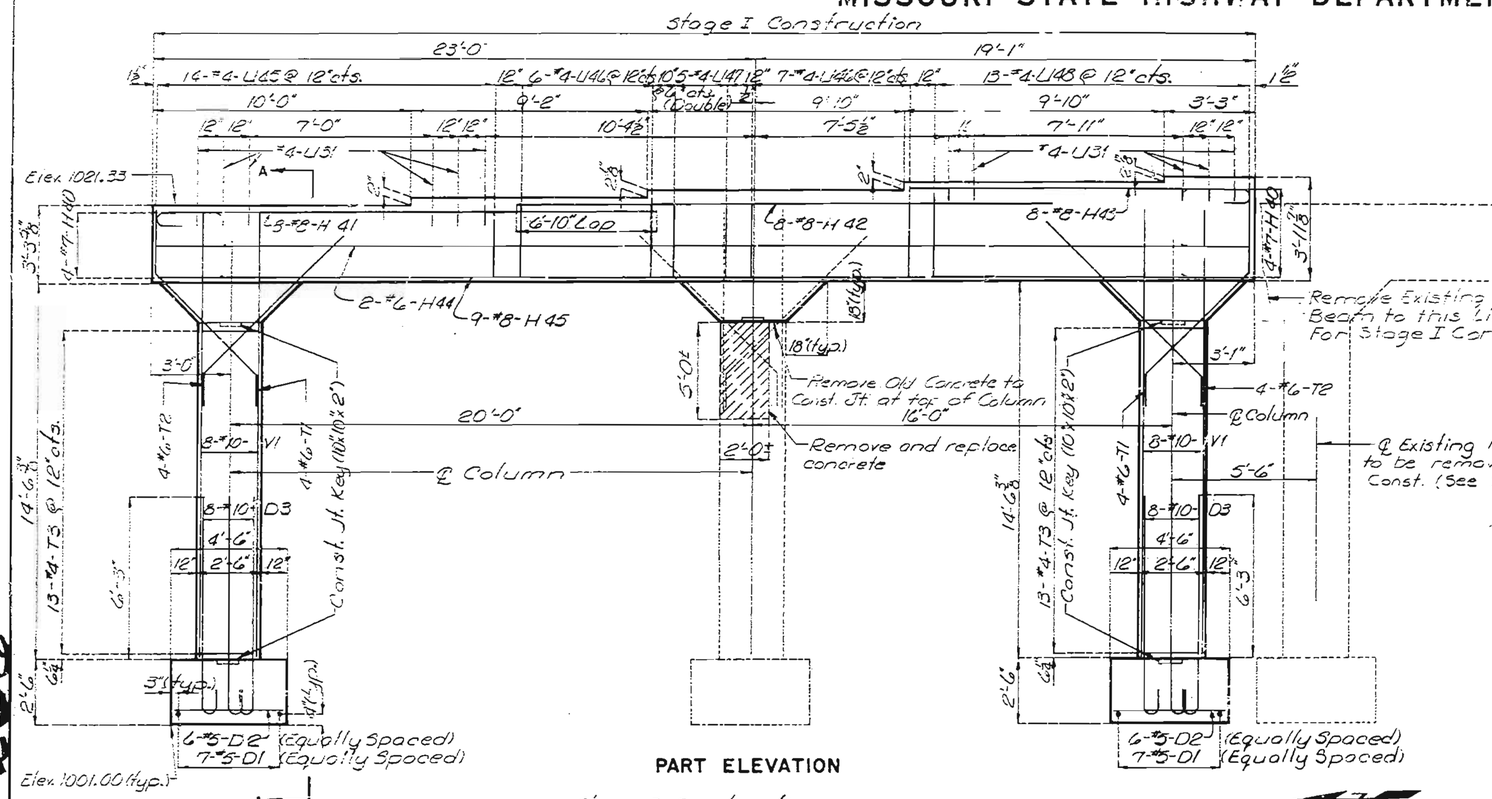
Sheet No. 10 of 33.

JACKSON COUNTY

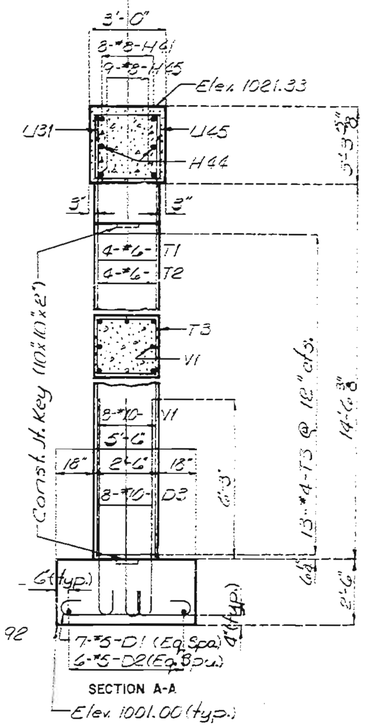
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

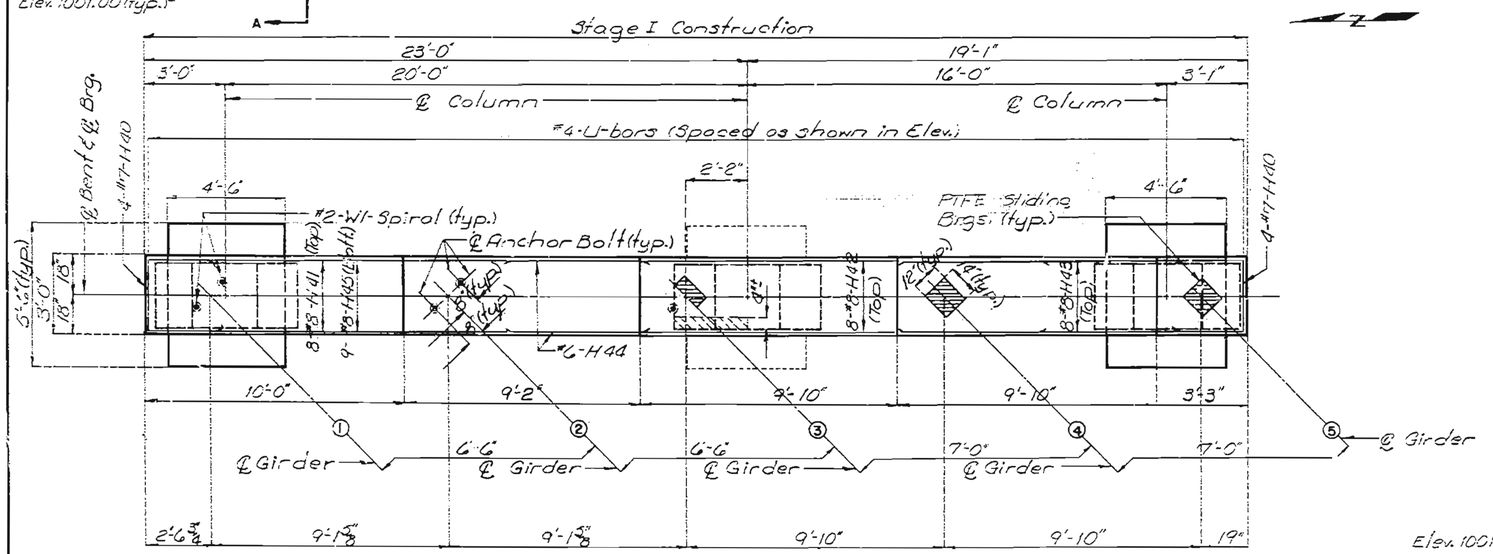
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	208	



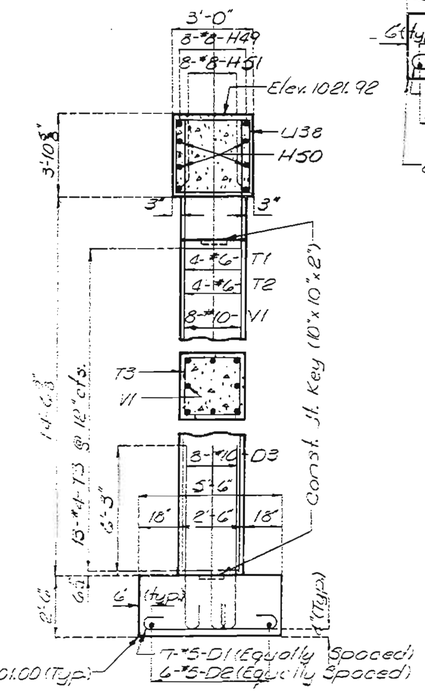
PART ELEVATION



SECTION A-A



PART PLAN



SECTION B-B

Note: For location of Section B-B see Sheet No. 12
Note: For details of Anc. Bolt Wells see sheet No. 7

DETAILED Dec. 19 78
CHECKED Dec. 19 78

DETAILS OF INT. BENT NO. 4

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

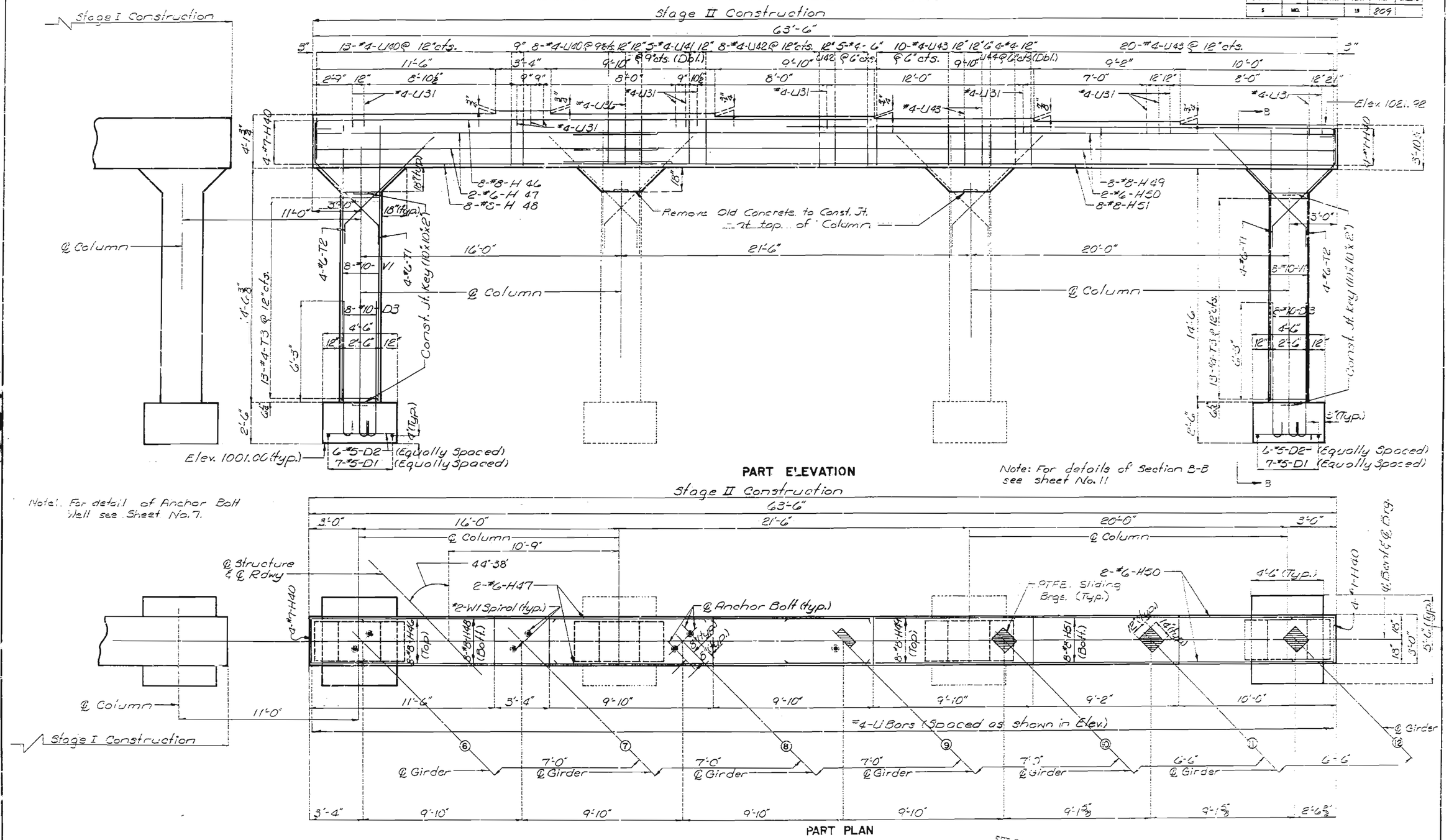
Sheet No. 11 of 33.

JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	809	



DETAILED Dec. 19 78
CHECKED Dec. 19 78

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

DETAILS OF INT. BENT NO. 4

Sheet No. 12 of 33

SEE FINAL PLANS

JACKSON COUNTY

L-929R

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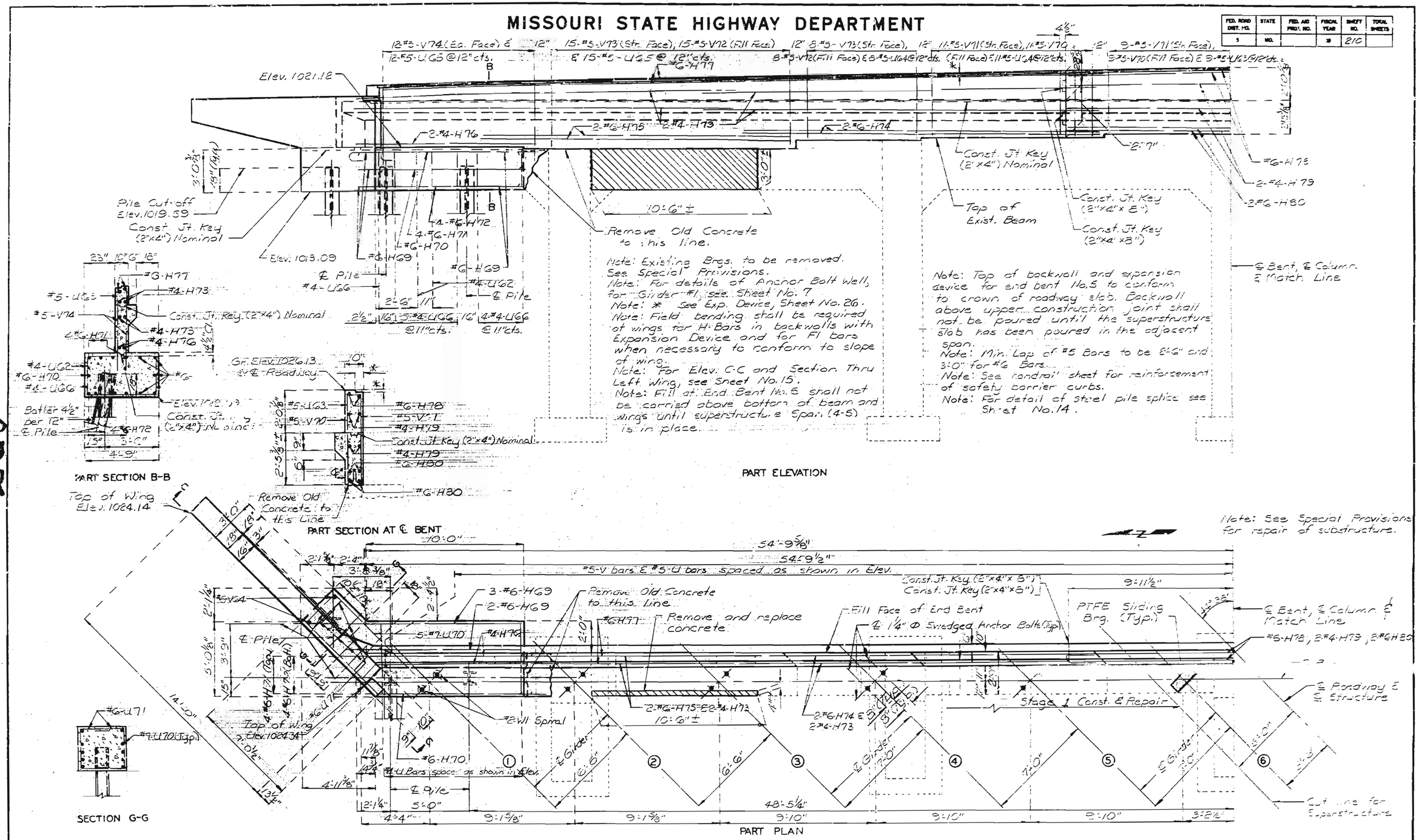
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	210	



DETAILS OF END BENT NO. 5

DETAILED Dec. 1978
CHECKED Dec. 1978

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

Sheet No. 13 of 33.

JACKSON COUNTY

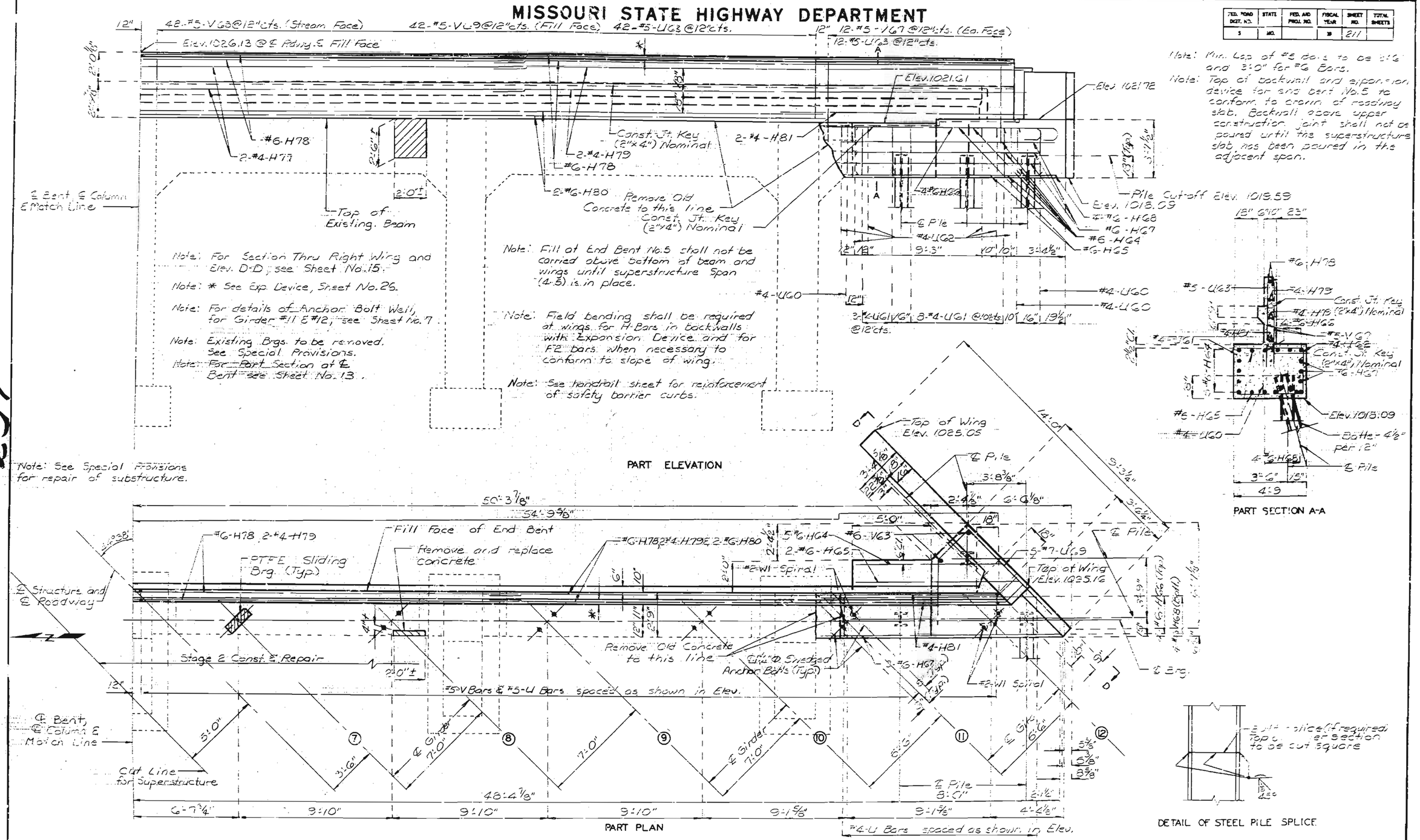
L-929 R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	211	

Note: Min. Lap of #5 Bars to be 2'-6" and 3'-0" for #6 Bars.

Note: Top of backwall and expansion device for end bent No.5 to conform to crown of roadway slab. Backwall above upper construction joint shall not be poured until the superstructure slab has been poured in the adjacent span.



DETAILS OF END BENT NO.5

DETAILED Dec. 1978
CHECKED Dec. 1978

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

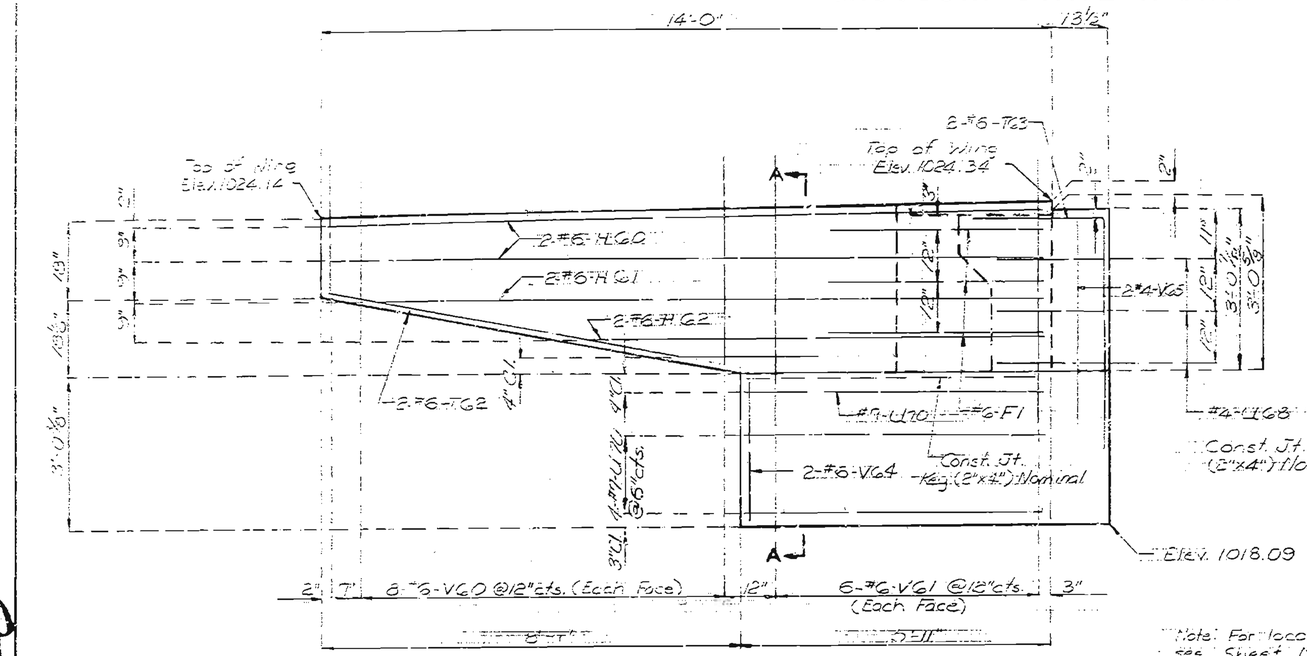
Sheet No. 14 of 33.

JACKSON COUNTY

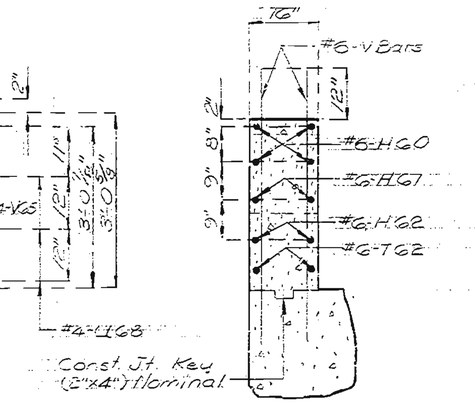
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	218	



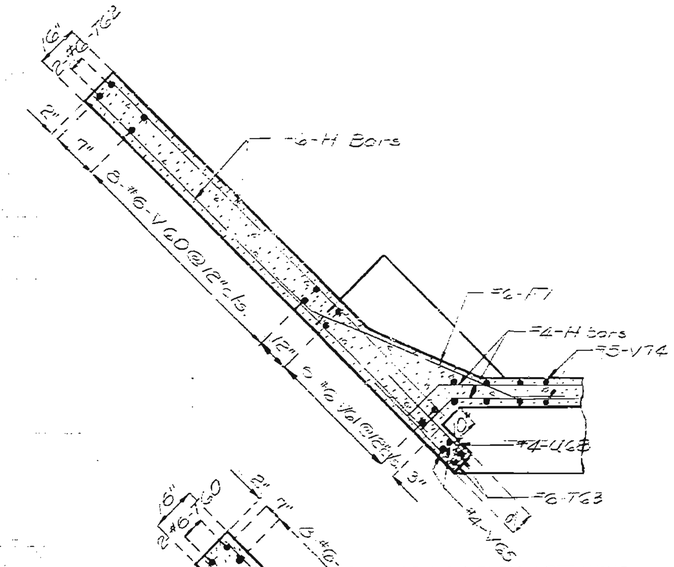
ELEVATION C-C



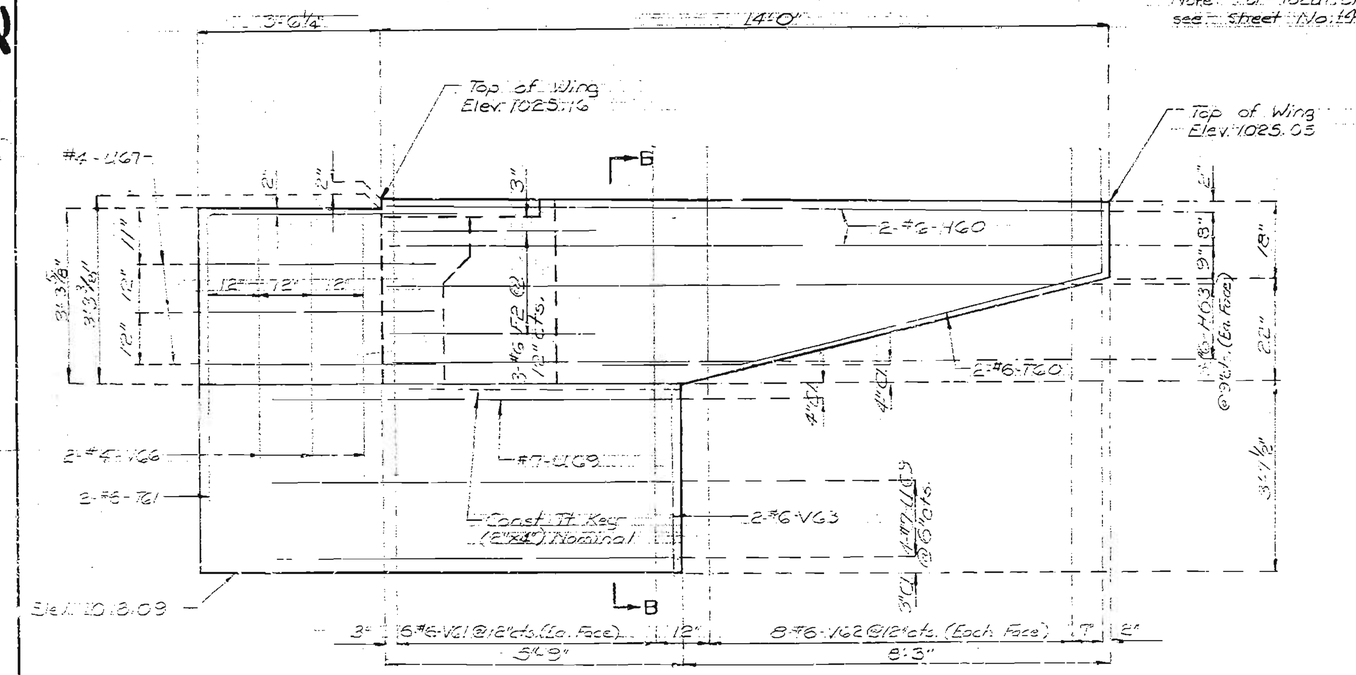
PART SECTION A-A

Note: For location of Elevation C-C see Sheet No. 13.

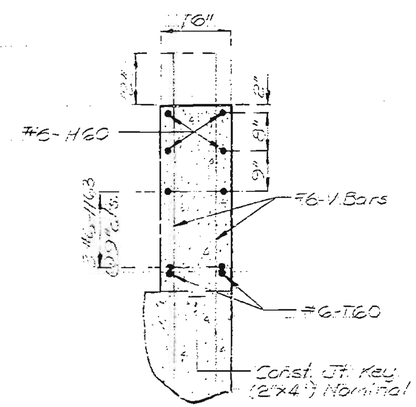
Note: For location of Elevation D-D see Sheet No. 19.



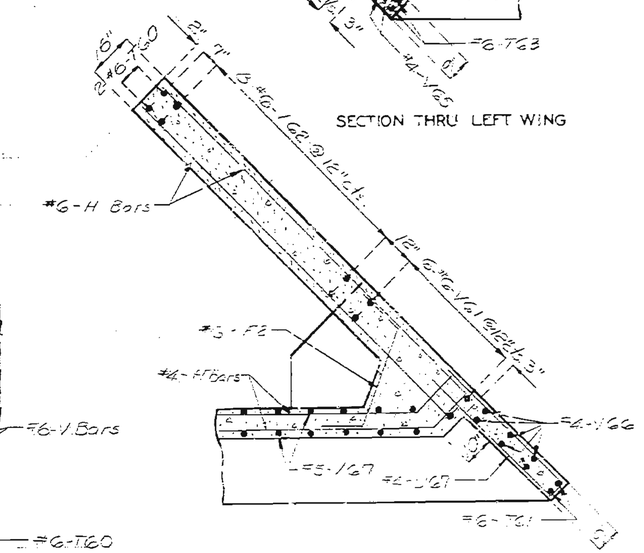
SECTION THRU LEFT WING



ELEVATION D-D



PART SECTION B-B



SECTION THRU RIGHT WING

DETAILED Nov. 1978
CHECKED Dec. 1978

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

DETAILS OF END BENT NO 5

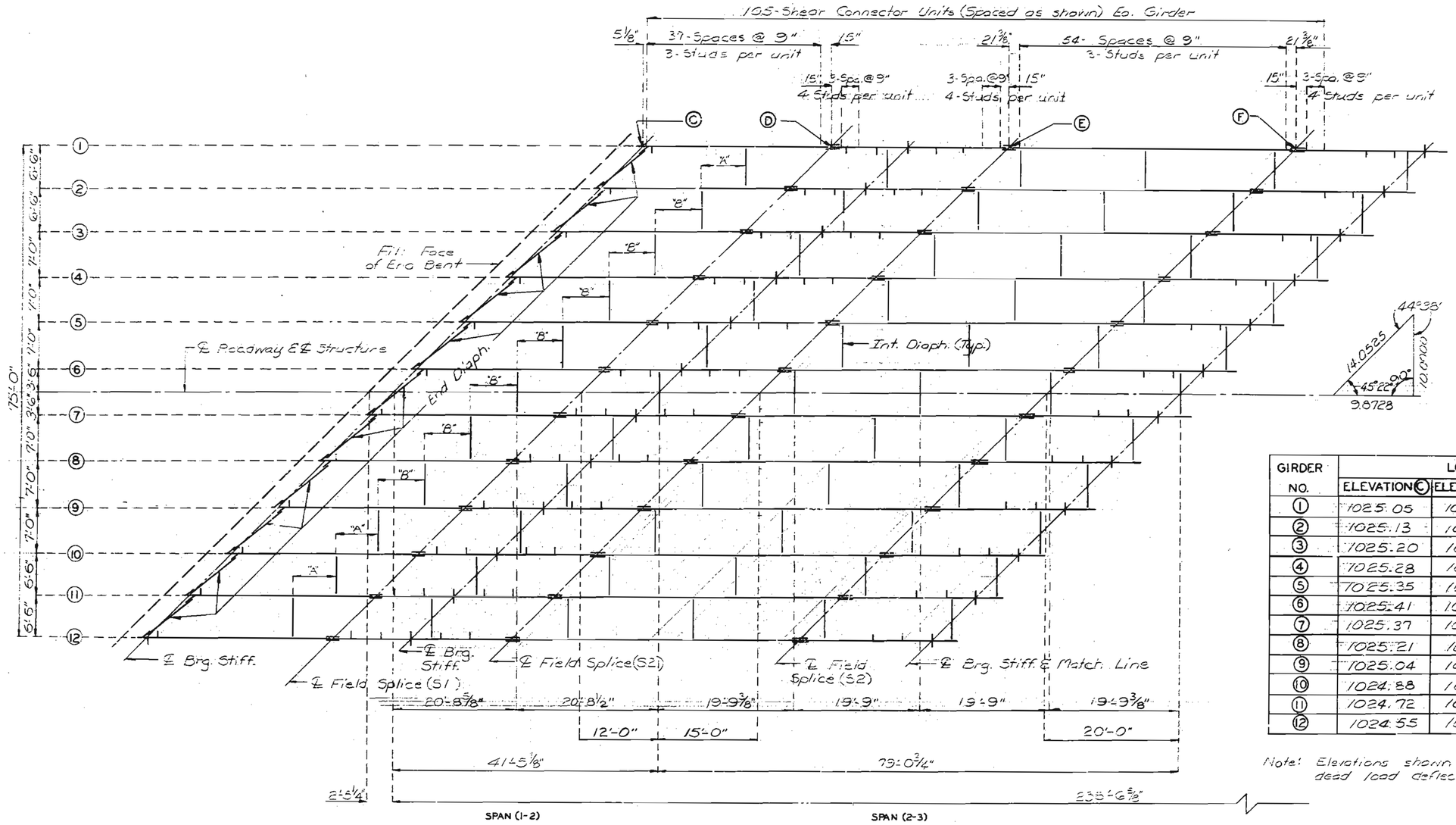
Sheet No. 16 of 33

JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	213	



PART PLAN OF STRUCTURAL STEEL

"A" = 6'-5"
"B" 6'-10 3/8"

GIRDER NO.	LOCATION			
	ELEVATION C	ELEVATION D	ELEVATION E	ELEVATION F
1	1025.05	1025.26	1025.37	1025.24
2	1025.13	1025.34	1025.44	1025.37
3	1025.20	1025.41	1025.52	1025.48
4	1025.28	1025.48	1025.59	1025.61
5	1025.35	1025.55	1025.66	1025.73
6	1025.41	1025.62	1025.73	1025.85
7	1025.37	1025.57	1025.68	1025.85
8	1025.21	1025.41	1025.52	1025.74
9	1025.04	1025.25	1025.36	1025.63
10	1024.88	1025.08	1025.19	1025.51
11	1024.72	1024.92	1025.03	1025.40
12	1024.55	1024.76	1024.86	1025.23

Note: Elevations shown are at top of webs before dead load deflections.

Note: Transverse web stiffeners shall be placed as detailed.

Note: Longitudinal dimensions are along top of webs. See longitudinal steel diagram, Sheet No. 19.

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DETAILED Oct. 1978
CHECKED Nov. 1978

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

Sheet No. 16 of 33.

JACKSON COUNTY

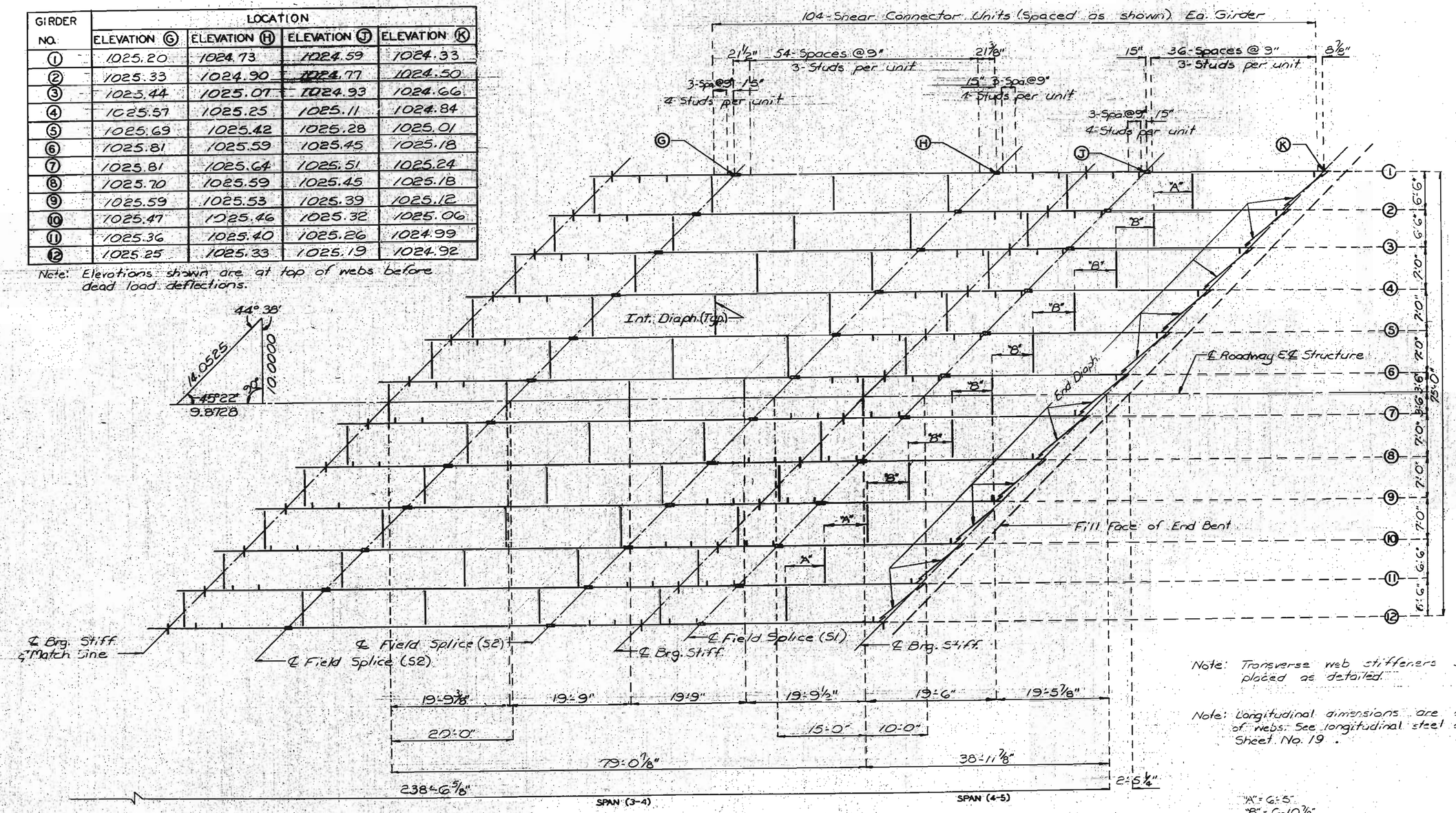
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	214	

GIRDER NO.	LOCATION			
	ELEVATION G	ELEVATION H	ELEVATION J	ELEVATION K
1	1025.20	1024.73	1024.59	1024.33
2	1025.33	1024.90	1024.77	1024.50
3	1025.44	1025.07	1024.93	1024.66
4	1025.57	1025.25	1025.11	1024.84
5	1025.69	1025.42	1025.28	1025.01
6	1025.81	1025.59	1025.45	1025.18
7	1025.81	1025.64	1025.51	1025.24
8	1025.70	1025.59	1025.45	1025.18
9	1025.59	1025.53	1025.39	1025.12
10	1025.47	1025.46	1025.32	1025.06
11	1025.36	1025.40	1025.26	1024.99
12	1025.25	1025.33	1025.19	1024.92

Note: Elevations shown are at top of webs before dead load deflections.



Note: Transverse web stiffeners shall be placed as detailed.

Note: Longitudinal dimensions are along top of webs. See longitudinal steel diagram, Sheet No. 19.

"A" = 6'-5"
"B" = 6'-10⅞"

PART PLAN OF STRUCTURAL STEEL

242

DETAILED Sept. 1978
CHECKED Nov. 1978

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

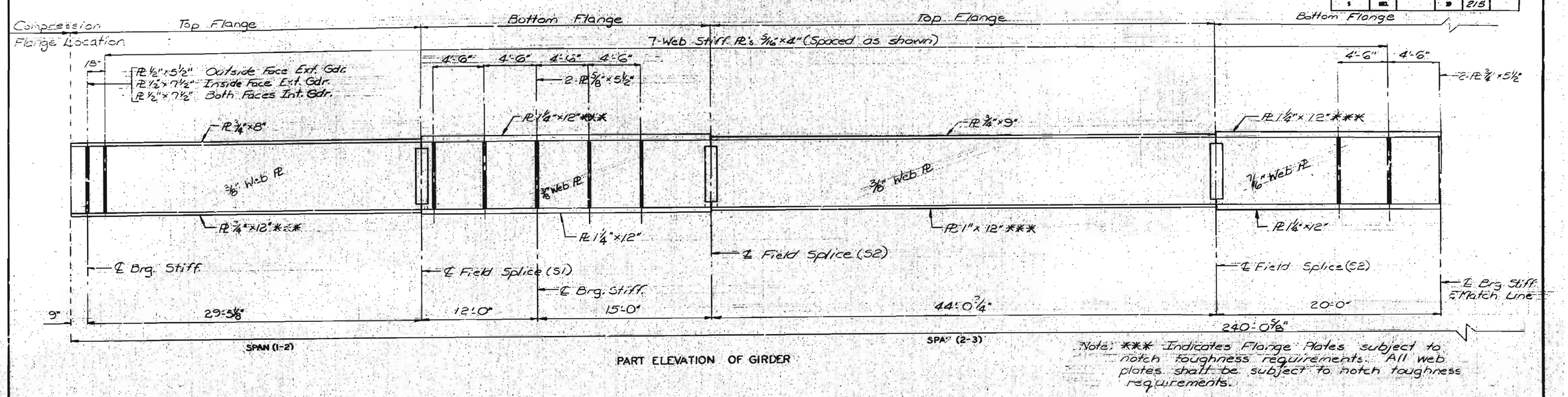
Sheet No. 17 of 33.

JACKSON COUNTY

L-929R

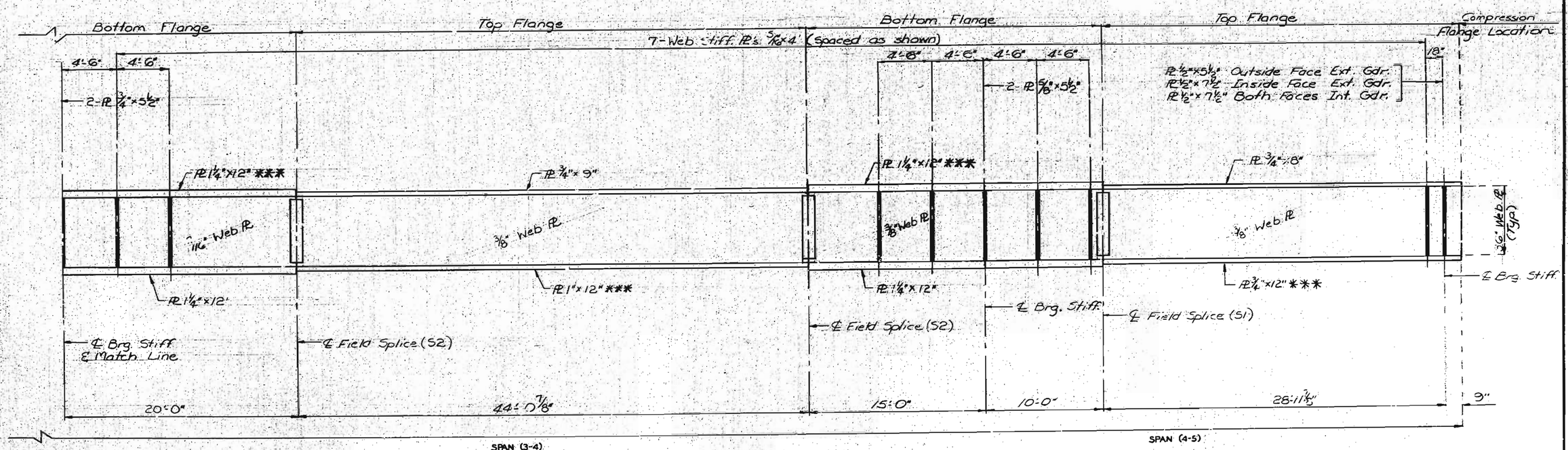
MISSOURI STATE HIGHWAY DEPARTMENT

FED. AID PROJ. SECT. NO.	STATE	FED. AID FINAL SECT.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
S	MO.		19	215	



PART ELEVATION OF GIRDER

Note: *** Indicates Flange Plates subject to notch toughness requirements. All web plates shall be subject to notch toughness requirements.



PART ELEVATION OF GIRDER

Note: Longitudinal dimensions are along top of webs. See longitudinal steel diagram, Sheet No. 19.

DETAILED Sept. 1978
CHECKED Nov. 1978

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

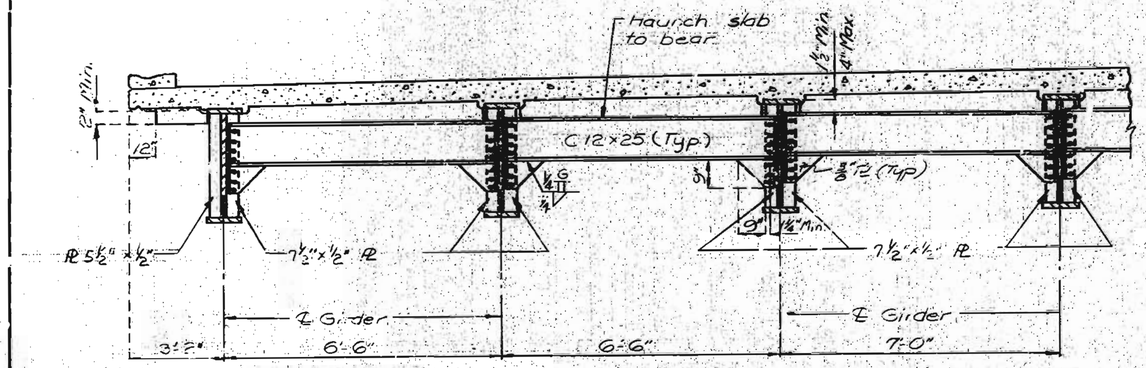
Sheet No. 18 of 33.

JACKSON COUNTY

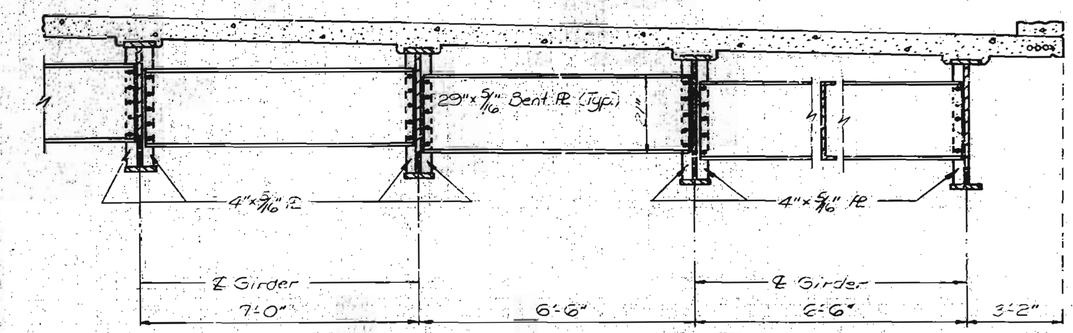
L-329R

MISSOURI STATE HIGHWAY DEPARTMENT

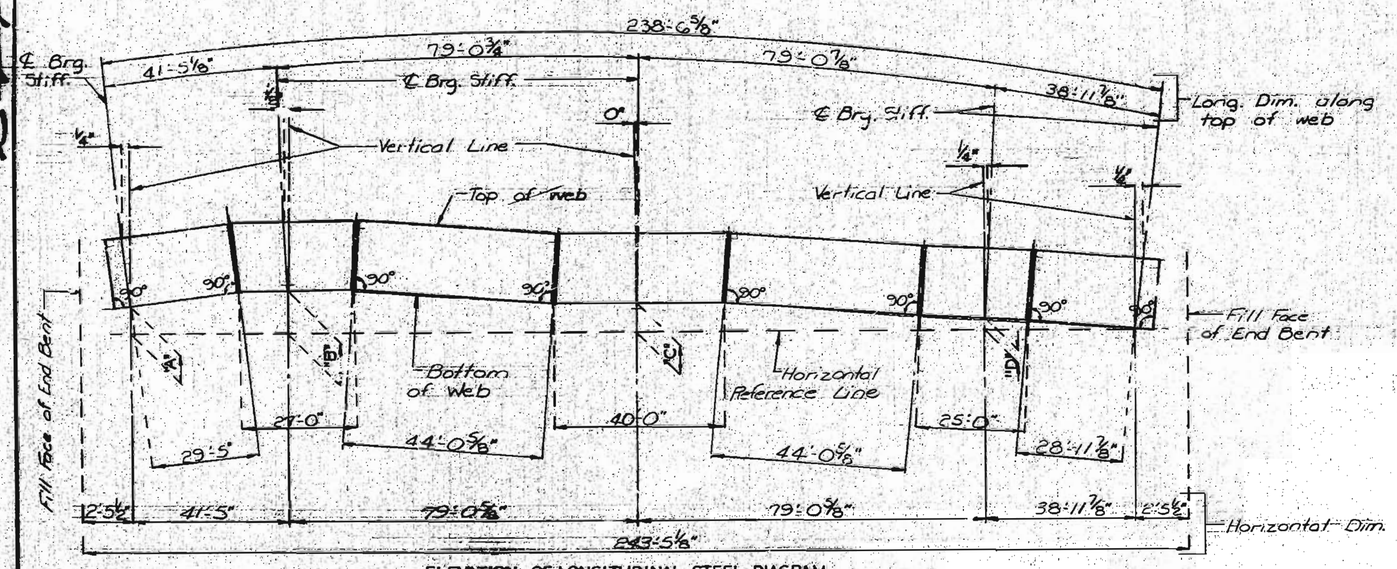
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	216	



TYP. PART SECTION SHOWING END DIAPHRAGMS



TYP. PART SECTION SHOWING INT. DIAPHRAGMS



ELEVATION OF LONGITUDINAL STEEL DIAGRAM

GIRDER NO.	DIMENSION "A"	"B"	"C"	"D"
1	8¾"	11¾"	10¾"	3⅞"
2	7⅝"	10⅝"	10⅛"	3⅞"
3	6½"	9½"	9⅝"	3⅞"
4	5¼"	8¼"	9"	3⅞"
5	4"	7"	8⅜"	3⅞"
6	2¾"	5¾"	7¾"	3⅞"
7	1½"	4⅝"	7⅛"	3⅞"
8	⅜"	3⅜"	6½"	3⅞"
9	-⅜"	2⅛"	5⅛"	3⅞"
10	-1½"	⅛"	4½"	3⅞"
11	-3¼"	-¼"	4⅝"	3⅞"
12	-4½"	-1⅜"	4⅛"	3⅞"

DETAILED Oct. 1978
CHECKED Nov. 1978

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

Sheet No. 19 of 33.

JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	217	

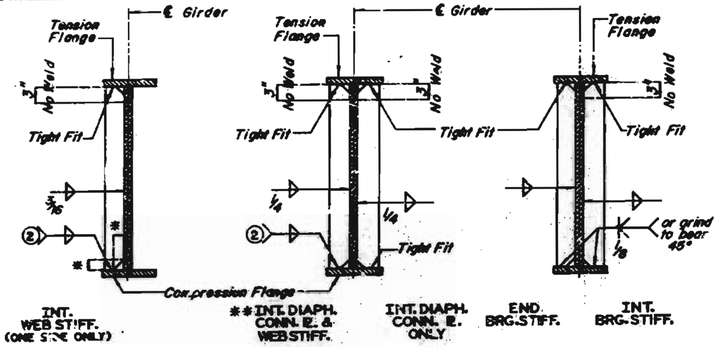
NOTES: TYPE "D" BEARINGS

ANCHOR BOLTS FOR TYPE "D" BEARINGS SHALL BE 1-1/4"ø SWEDGED BOLTS AND SHALL EXTEND 12" INTO CONCRETE, WITH HEXAGON NUTS AND PLAIN WASHERS FOR FIXED BEARINGS, NO NUTS FOR EXPANSION BEARINGS.

"ESTIMATED WEIGHT" DOES NOT INCLUDE WEIGHT OF ANCHOR BOLTS.

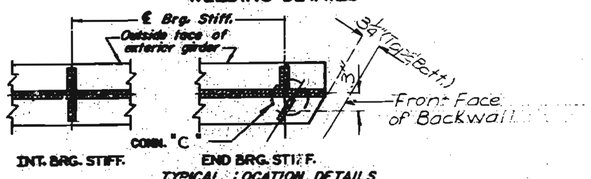
"✓" INDICATES MACHINE FINISH SURFACE.

SHOP DRAWINGS ARE NOT REQUIRED FOR LEAD PLATES AND/OR PREFORMED FABRIC PADS.

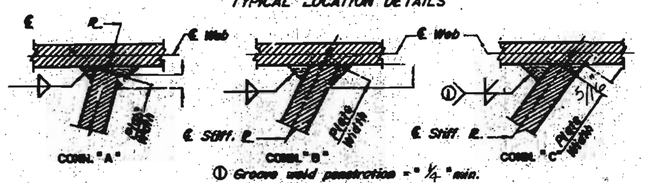


② Weld to compression flange as located on ELEVATION OF GIRDER.
* 1½" typical for all Int. Web Stiff., Int. Diaph. Conn. ℞. and Brg. Stiff..
** Weld may be omitted on interior girders, and Tight Fit used when Int. Diaph. Conn. ℞. is required on both sides.

WELDING DETAILS

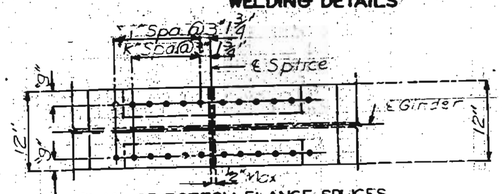


TYPICAL LOCATION DETAILS

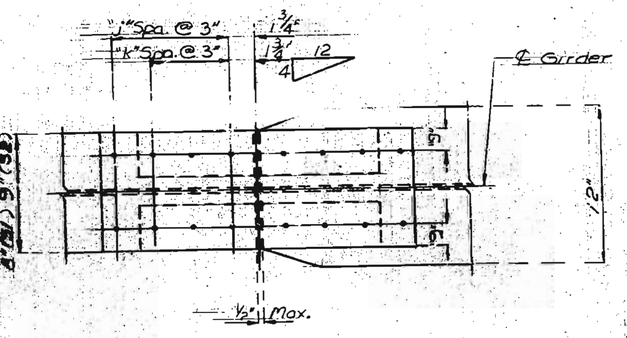


① Groove weld penetration = "¼" min.

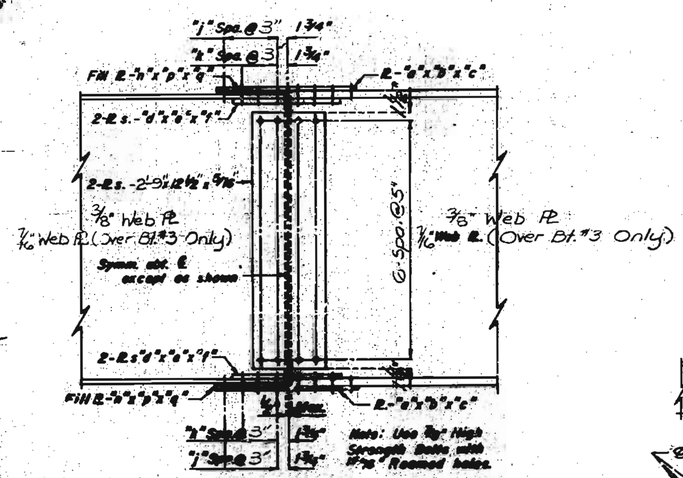
WELDING DETAILS



PLAN OF BOTTOM FLANGE SPLICES



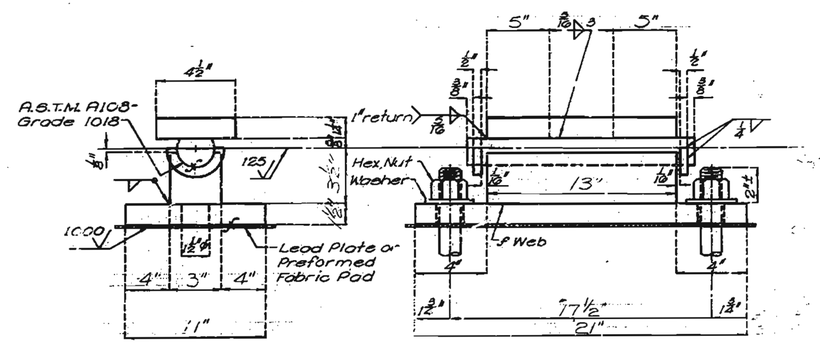
PLAN OF TOP FLANGE SPLICES



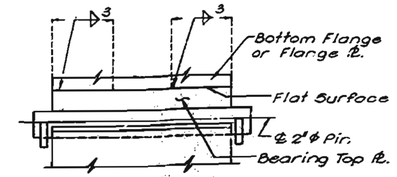
SPLICE LOCATION	TABLE OF DIMENSIONS — FIELD SPLICE											
	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"j"	"k"	"n"	"p"	"q"
S1 (Top)	8"	½"	18½"	3"	3/8"	18½"	1⅞"	2	2	8"	½"	9"
S1 (Bott.)	12"	⅞"	2'-6½"	5"	½"	2'-6½"	2⅞"	4	4	12"	½"	15"
S2 (Top)	9"	½"	2'-0½"	3½"	⅜"	18½"	1⅞"	3	2	9"	½"	12"
S2 (Bott.)	12"	½"	3'-6½"	5"	⅝"	3'-0½"	2⅛"	6	5	12"	¾"	21"

DETAILS OF FIELD SPLICE

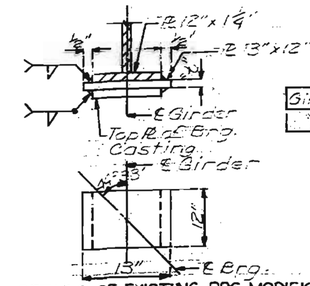
Note: This drawing is not to scale. Follow dimensions.



REQUIRED: 4 (Bt. #3) Gdrs. #1, #2, #11 & #12



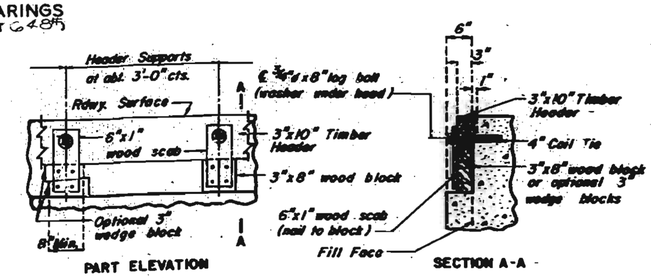
WELDING DETAILS AT GDRS. #1, 2, 11 & 12



Girder	#3	#4	#5	#6	#7	#8	#9	#10
"b"	1 1/16"	1 1/8"	2 1/8"	2 5/16"	2 3/8"	2 7/16"	1 3/16"	1 3/16"

DETAILS OF EXISTING BRG. MODIFICATION AT GDRS. #3 THRU #10 AT BT. #3

TYPE "D" BEARINGS
(ESTIMATED WEIGHT 6.4#)

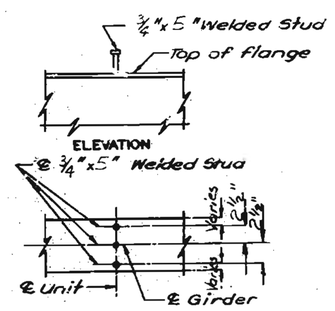


PART ELEVATION

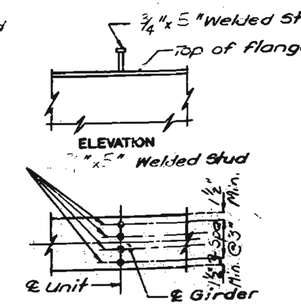
SECTION A-A

Note: Cost of timber headers complete in place to be included in price bid for concrete.

DETAILS OF TIMBER HEADER AT END BENTS



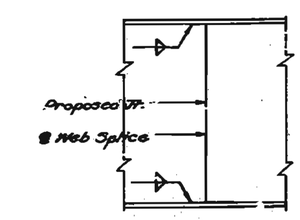
PLAN OF STUD CONN.



PLAN OF STUD CONN. 12" FLANGE

Note: Weight of 5893 Lbs of Shear Connectors is included in weight of Fabricated Structural Carbon Steel.

DETAILS OF SHEAR CONNECTORS



SHOP WEB SPLICE

245

STD.	D. B.	REVISED
FEB. 1985	OCT. 1977	

DETAILED Oct. 1978
CHECKED Dec. 1978

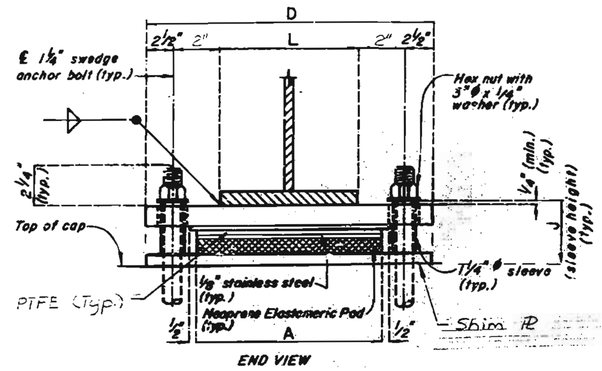
Sheet No. 20 of 33

JACKSON COUNTY

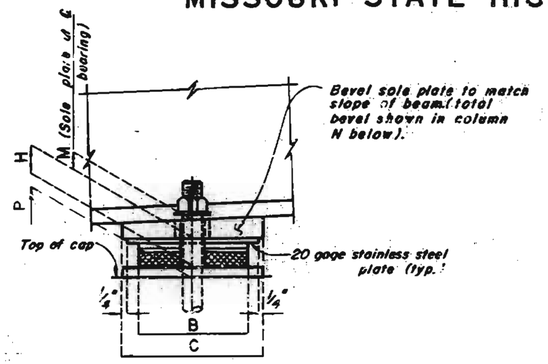
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	218	

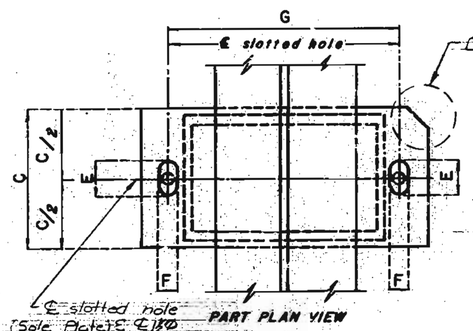


END VIEW

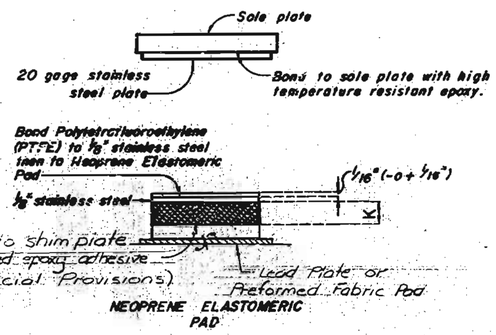


SIDE VIEW

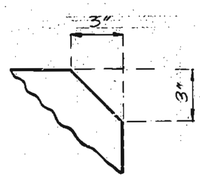
Note: The location of anchor bolts in relation to the slotted holes in the sole plate shall correspond with the temperature at the time of erection. At 60°F. the slotted holes should center on the anchor bolts.



PART PLAN VIEW



PTFE SLIDING BEARINGS



DETAIL "A"

PTFE SLIDING BEARINGS															
BENT NO.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	
1 (Gdr. #1)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	2"	½"	12"	1"	0"	—	*
1 (Gdr. #2)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	5⅛"	½"	12"	1"	0"	3¼"	
1 (Gdr. #3)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	6⅛"	½"	12"	1"	0"	4⅛"	
1 (Gdr. #4)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	7"	½"	12"	1"	0"	5"	
1 (Gdr. #5)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	7⅞"	½"	12"	1"	0"	5⅞"	
1 (Gdr. #6)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	5⅝"	½"	12"	1"	0"	6⅝"	
1 (Gdr. #7)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	5⅛"	½"	12"	1"	0"	6⅛"	
1 (Gdr. #8)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	6⅛"	½"	12"	1"	0"	4⅛"	
1 (Gdr. #9)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	6⅜"	½"	12"	1"	0"	4⅜"	
1 (Gdr. #10)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	6½"	½"	12"	1"	0"	4½"	
1 (Gdr. #11)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	4⅝"	½"	12"	1"	0"	2⅝"	
1 (Gdr. #12)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	2"	½"	12"	1"	0"	—	*
5 (Gdr. #1)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	2"	½"	12"	1"	0"	—	*
5 (Gdr. #2)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	4⅜"	½"	12"	1"	0"	2⅜"	
5 (Gdr. #3)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	6⅜"	½"	12"	1"	0"	4⅜"	
5 (Gdr. #4)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	6⅛"	½"	12"	1"	0"	4⅛"	
5 (Gdr. #5)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	5⅛"	½"	12"	1"	0"	3⅛"	
5 (Gdr. #6)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	6⅜"	½"	12"	1"	0"	4⅜"	
5 (Gdr. #7)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	7"	½"	12"	1"	0"	5"	
5 (Gdr. #8)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	6⅜"	½"	12"	1"	0"	4⅜"	
5 (Gdr. #9)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	5⅝"	½"	12"	1"	0"	3⅝"	
5 (Gdr. #10)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	4⅜"	½"	12"	1"	0"	2⅜"	
5 (Gdr. #11)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	4⅛"	½"	12"	1"	0"	2⅛"	
5 (Gdr. #12)	12"	6"	9"	21"	4¼"	1¾"	16"	¾"	2"	½"	12"	1"	0"	—	*

Number Required: 24

* No Lead Plates or Preformed Fabric Pad required. Neoprene Elastomeric Pad to be bonded to Brg. seat with approved epoxy adhesive. (See Special Provisions)

GENERAL NOTES:

ANCHOR BOLTS SHALL BE 1¼"ø SWEDGED BOLTS AND SHALL EXTEND 12" INTO CONCRETE WITH HEXAGON NUTS AND PLAIN WASHERS.

WEIGHT OF ANCHOR BOLTS FOR BEARINGS SHALL BE INCLUDED IN WEIGHT OF FABRICATED STRUCTURAL STEEL.

NEOPRENE ELASTOMERIC PADS SHALL BE 70 DUROMETERS.

THE SOLE PLATE SHALL BE FURNISHED WITH THE BEARING AND FIELD WELDED TO THE STRINGERS OR GIRDERS.

PAYMENT FOR THE SOLE PLATE WILL BE INCLUDED IN THE COST OF THE BEARING ASSEMBLY, SEE SPECIAL PROVISIONS.

Shop drawings are not required for Lead Plates and/or Preformed Fabric Pads. Payment for Shim Plate will be included in the cost of the Bearing Assembly, See Special Provisions.

"℄" Indicates machine finished surface.

TYPE "N" ELASTOMERIC BEARINGS BENTS NO. 1 & 5

DETAILED Dec. 1978
CHECKED Dec. 1978

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

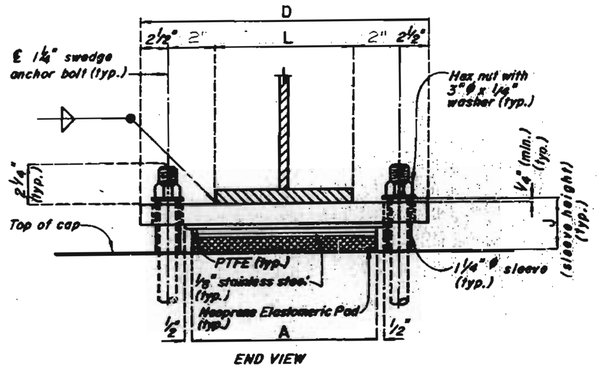
Sheet No. 21 of 33.

JACKSON COUNTY

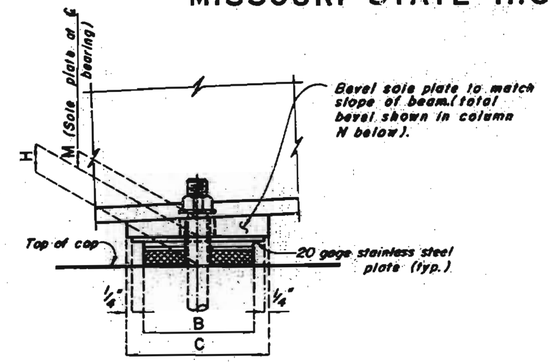
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	219	

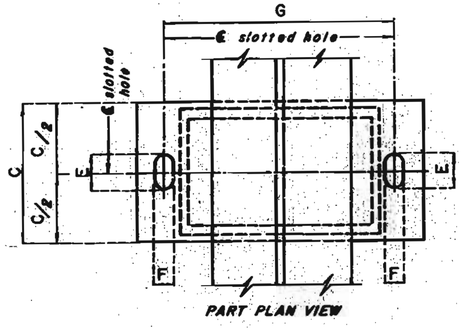


END VIEW

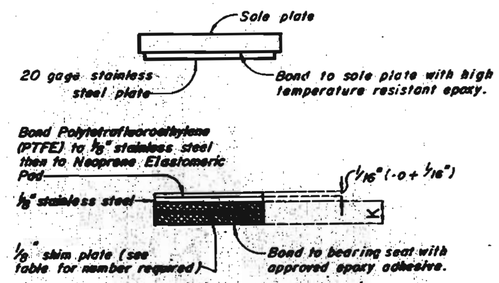


SIDE VIEW

Note: The location of anchor bolts in relation to the slotted holes in the sole plate shall correspond with the temperature at the time of erection. At 60° F. the slotted holes should center on the anchor bolts.



PART PLAN VIEW



NEOPRENE ELASTOMERIC PAD

PTFE SLIDING BEARINGS

BENTS NO.	A	B	C	D	E	F	G	H	J	K	L	M	N	NUMBER OF SHIM PLATES (#)
2 & 4	12"	14"	16½"	21"	3½"	1¾"	12"	1⅝"	2⅛"	1⅜"	12"	1"	0"	1

NUMBER REQUIRED: 24

(#) The required shim plates shall be placed between equal layers of elastomer and molded together to form an integral unit.

PTFE SLIDING BEARINGS

GENERAL NOTES:

ANCHOR BOLTS SHALL BE 1¼" ø SWEDGED BOLTS AND SHALL EXTEND 12" INTO CONCRETE WITH HEXAGON NUTS AND PLAIN WASHERS.

WEIGHT OF ANCHOR BOLTS FOR BEARINGS SHALL BE INCLUDED IN WEIGHT OF FABRICATED STRUCTURAL STEEL.

NEOPRENE ELASTOMERIC PADS SHALL BE 70 DUROMETERS.

THE SOLE PLATE SHALL BE FURNISHED WITH THE BEARING AND FIELD WELDED TO THE STRINGERS OR GIRDERS.

PAYMENT FOR THE SOLE PLATE WILL BE INCLUDED IN THE COST OF THE BEARING ASSEMBLY, SEE SPECIAL PROVISIONS.

TYPE "N" ELASTOMERIC BEARINGS BENTS NO. 2 & 4

DETAILED Dec. 1978
CHECKED Dec. 1978

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

Sheet No. 22 of 33.

JACKSON COUNTY

L-929R

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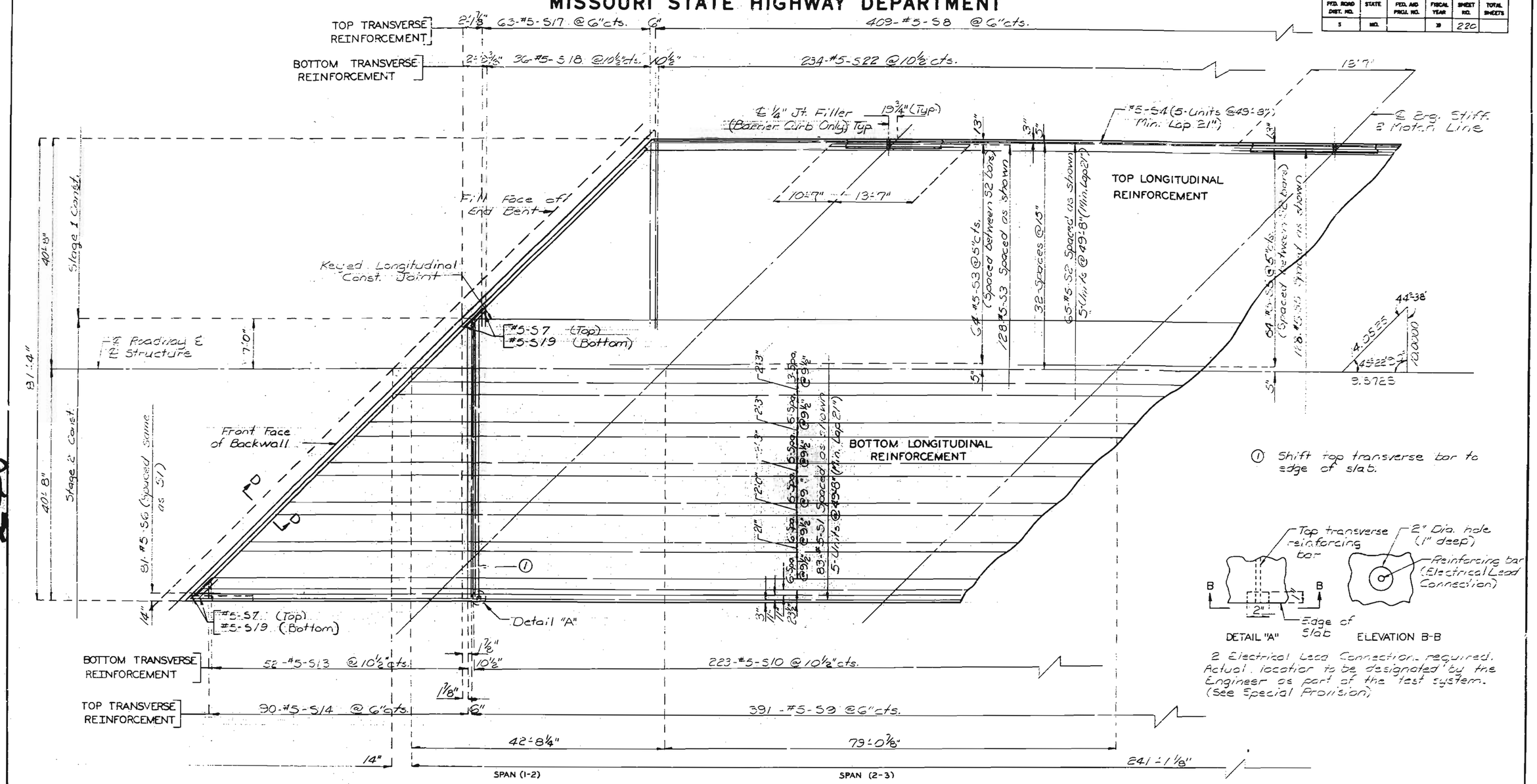
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	220	



Note: For Section D-D see Sheet No. 24.

PART PLAN OF SLAB SHOWING REINFORCEMENT

Note: Longitudinal dimensions shown are taken parallel to grade of crown of roadway.

DETAILED Oct. 1978
CHECKED Nov. 1978

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

Sheet No. 23 of 33.

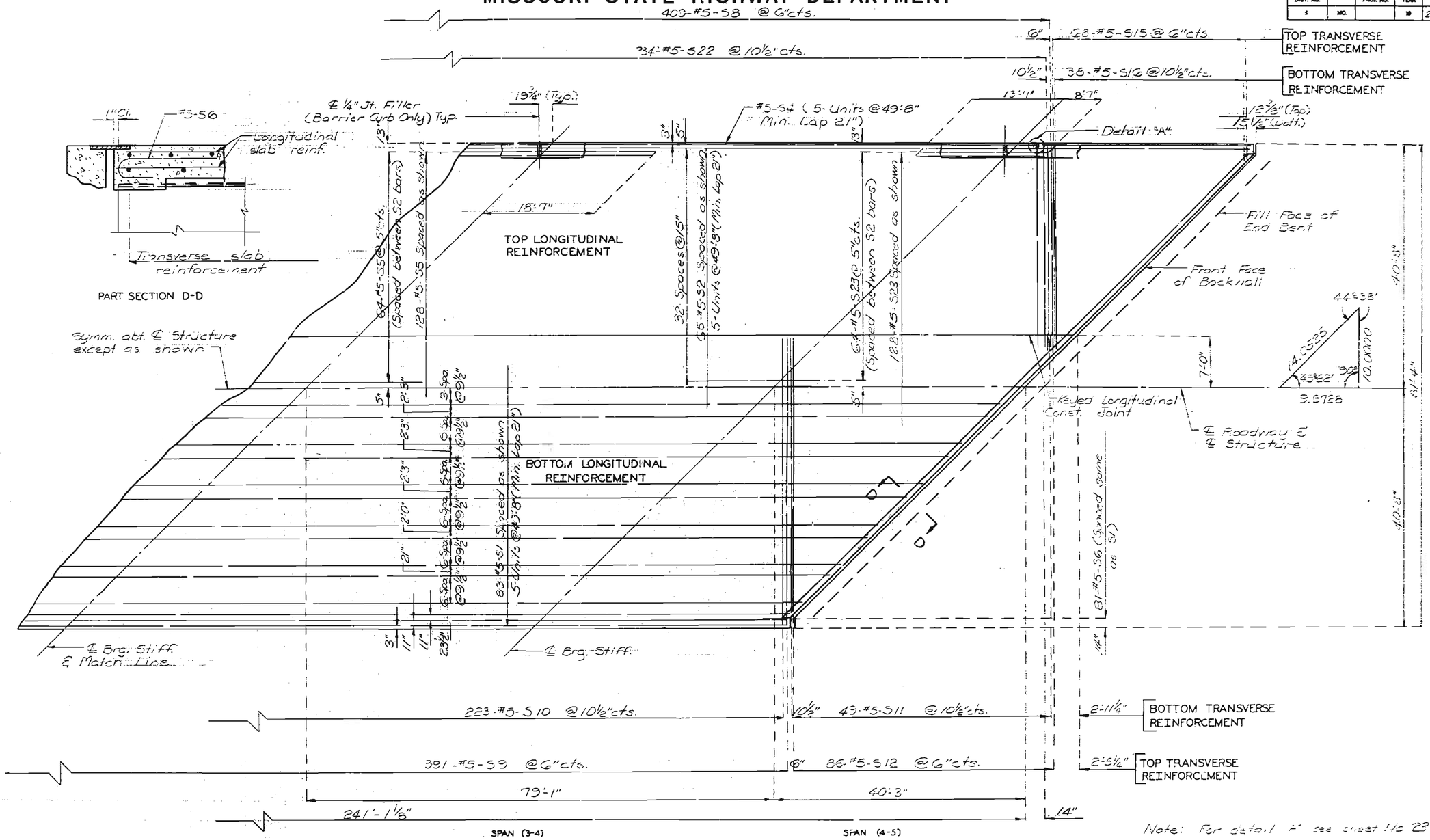
JACKSON COUNTY

L-929R

248

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	221	



PART PLAN OF SLAB SHOWING REINFORCEMENT

Note: For detail "A" see sheet No. 23.

Note: Longitudinal dimensions shown are taken parallel to grade at crown of roadway.

DETAILED Oct. 1978
CHECKED Nov. 1978

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

Sheet No. 24 of 33.

JACKSON COUNTY

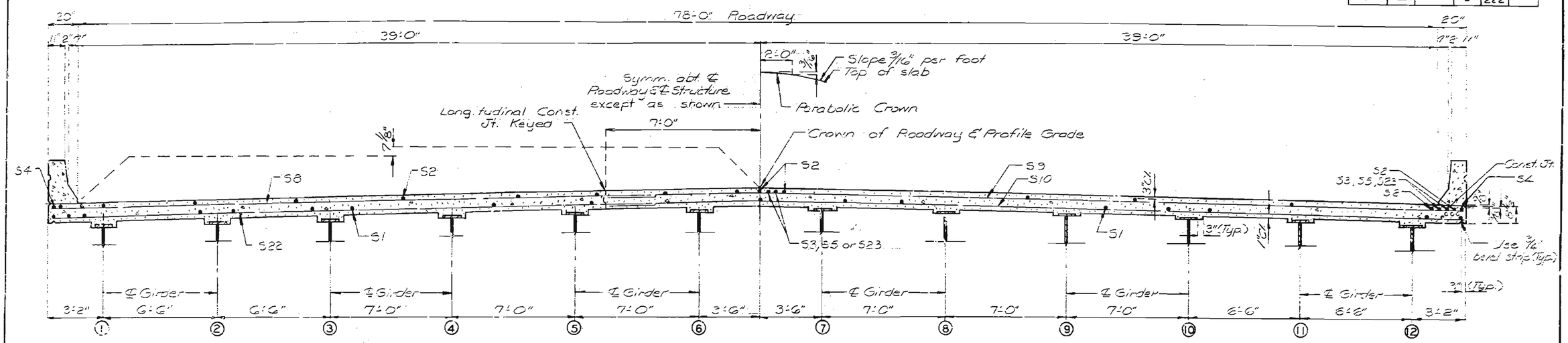
L-929R

249

250

MISSOURI STATE HIGHWAY DEPARTMENT

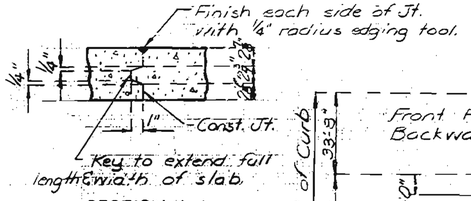
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	222	



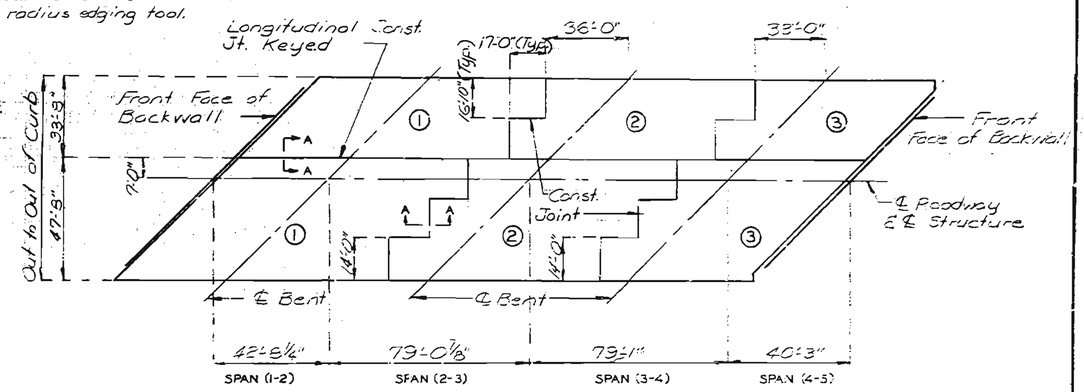
HALF SECTION NEAR CENTER SPAN

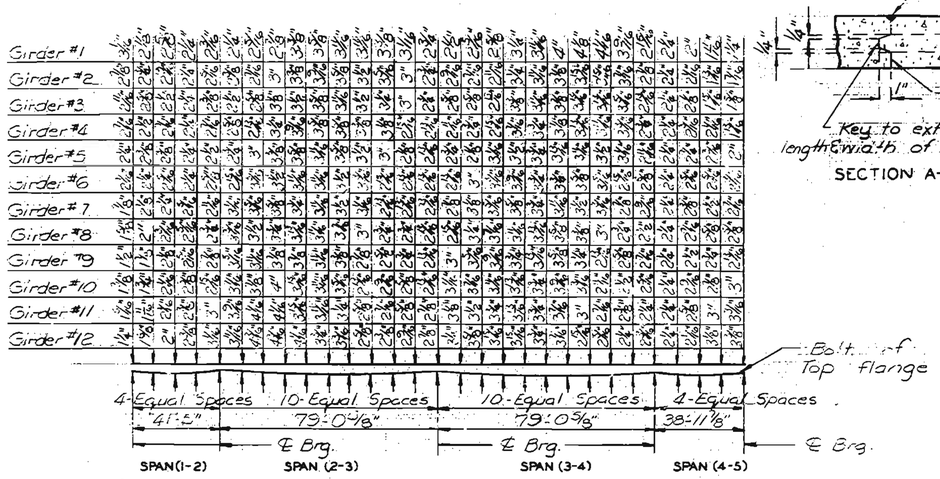
HALF SECTION NEAR INT. BENT

Note: For details of barrier curb not shown see Sheets No. 223.

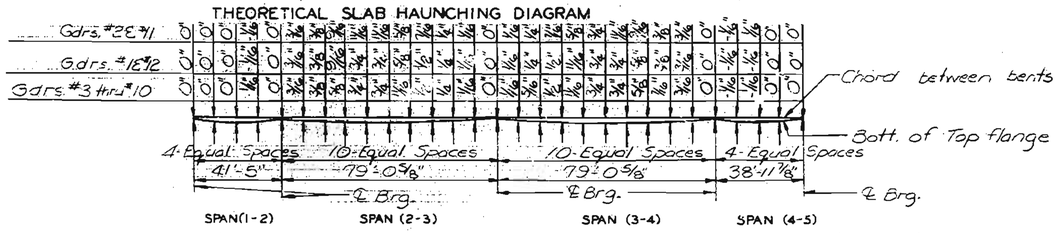


SECTION A-A





THEORETICAL SLAB HAUNCHING DIAGRAM



Note: .5% of dead load deflection due to weight of structural steel.

DEAD LOAD DEFLECTION

	SEQUENCE OF POURS		
	DIRECTION		
BASIC SEQUENCE	1	2	3
	END TO 2	1 TO 3	2 TO END
ALTERNATE "A" POURS	1 + 2		3
	END TO 3		2 TO END
ALTERNATE "B" POURS	1 + 2+3		
	END TO END		

The contractor shall pour and satisfactorily finish the slab pours at a rate of not less than 55 cubic yards per hour unless he elects to use an approved retarder to retard the set of the concrete to 2.5 hours in which case he may reduce his pouring and finishing rate to not less than 31 cubic yards per hour.

DETAILED Oct. 1978
CHECKED Dec. 1978

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

Sheet No. 25 of 33.

JACKSON COUNTY

L-929 R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	223	

TABLE OF DIMENSIONS

LOCATION	ACCEPTABLE ALTERNATE TYPES	EXP. GAP AT 60°	"A" AT 60°	"B"	"C"	"D"	"E"	"F"	ANCHOR STUDS SIZE	ANCHOR STUDS "G"
End Sts. #1 & #5	Fel-Span T2C	1 3/8"	11 3/8"	4 1/2"	1 5/8"	1"	1 7/16"	1 15/16"	1/2"	50
	On Flex 25	1/2"	11"	4 1/4"	1 5/8"	1 1/4"	1 1/16"	2 3/16"	1/2"	65
	Wabo-Elastoram 200	1 1/4"	11 1/4"	4 1/2"	1 5/8"	1"	1 7/16"	1 15/16"	1/2"	40

NOTE: *All dimensions are at right angles. Expansion gap and dimension "A" shall be increased 1/8" for each 10° fall in temperature and decreased 1/8" for each 10° rise in temperature.*

GENERAL NOTES:

THE EXPANSION JOINT SEAL SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS SHOWN ON THE SHOP DRAWINGS AND IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

THE NUTS ON THE ANCHOR STUDS SHALL BE TIGHTENED TO THE FOOT POUNDS "G" SPECIFIED IN THE TABLE OF DIMENSIONS. RETIGHTEN TO "G" FOOT POUNDS A MINIMUM OF 30 MINUTES AFTER INITIAL TIGHTENING. THE WELDED ANCHOR STUDS SHALL BE THE REDUCED BASE TYPE.

MATERIAL FOR THE ARMORED JOINT SHALL BE A36 STRUCTURAL GRADE STEEL. NO. 4 BARS FOR ANCHORS SHALL BE STRUCTURAL GRADE STEEL. APPROVED STUD WELDED ANCHORS OR DEFORMED BAR ANCHORS (ASTM A496) MAY BE USED IN LIEU OF NO. 4 BARS SHOWN.

SEE SPECIAL PROVISIONS FOR PAINTING.

ANCHOR BOLTS IN THE BARRIER CURB SHALL BE CAST-IN-PLACE, GROUTED OR CONE-EXPANSION TYPE. HOLES IN THE BARRIER CURB FOR ANCHORS SHALL NOT BE DRILLED UNTIL THE CONCRETE IS AT LEAST 7 DAYS OLD.

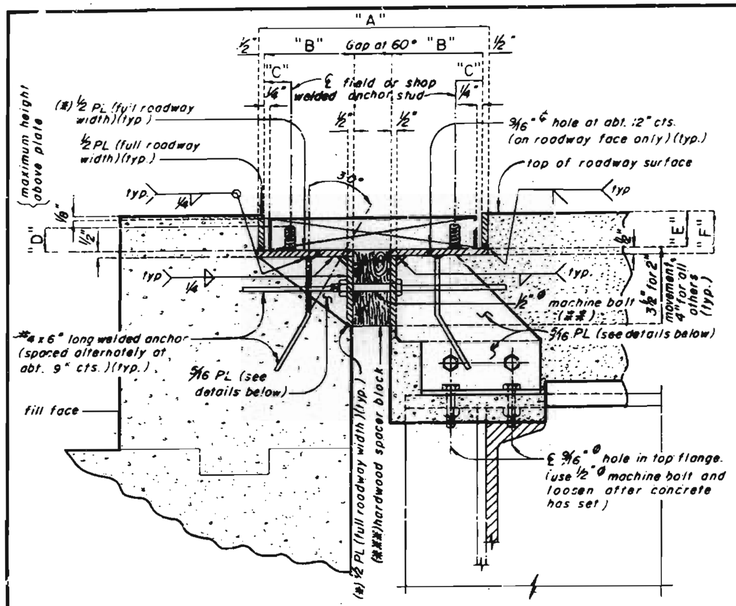
PLAN DIMENSIONS ARE BASED ON INSTALLATION AT 60°F. THE EXPANSION GAP AND OTHER DIMENSIONS SHALL BE ADJUSTED DURING INSTALLATION FOR COMPLIANCE WITH ANY TEMPERATURE CHANGE.

PLATES SHALL BE FIELD ADJUSTED BY ADDING OR REMOVING METAL SHIMS (2 x 3), AS REQUIRED FOR TEMPERATURE CORRECTION. THE EXPANSION GAP SHALL BE ADJUSTED FOR ANY TEMPERATURE CORRECTION PRIOR TO POURING TOP OF END BENT BACKWALL.

CONTACT SURFACE OF STEEL TO ALUMINUM SHALL BE INSULATED WITH THE MATERIAL SPECIFIED ON THE SHOP DRAWINGS.

FURNISHING AND INSTALLING THE ELASTOMERIC EXPANSION JOINT SEAL WILL BE PAID FOR AT THE CONTRACT BID PRICE PER LINEAR FOOT.

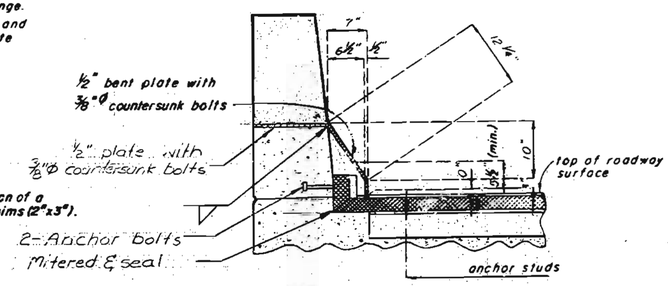
FURNISHING, PAINTING AND INSTALLING THE STRUCTURAL STEEL ARMORED JOINT WILL BE INCLUDED IN THE CONTRACT PRICE BID FOR OTHER ITEMS.



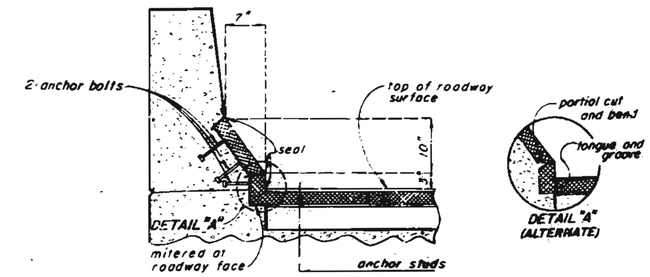
PART SECTION THRU ARMORED JOINT

(*) these plates may be one piece by using legs of equal or unequal angles.

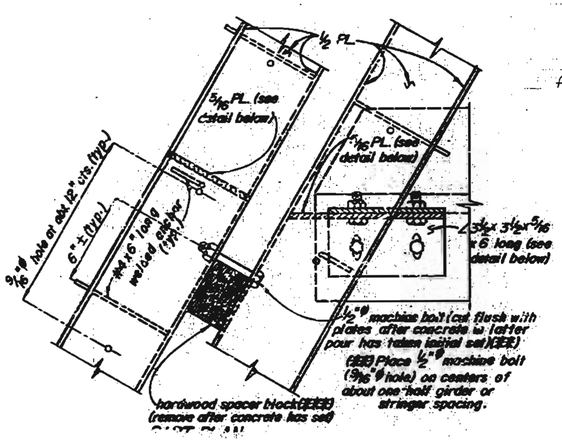
(***) spacer may be a combination of a hardwood block and metal shims (2"x3").



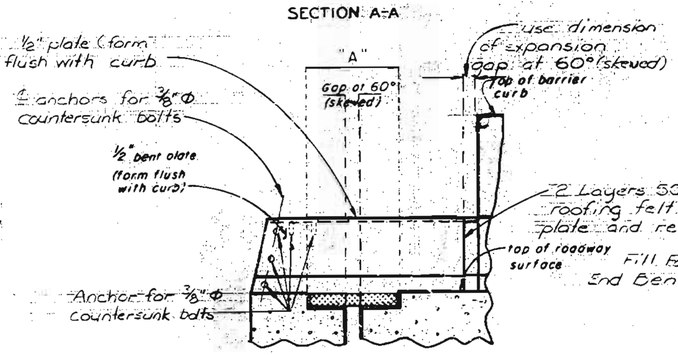
SECTION A-A



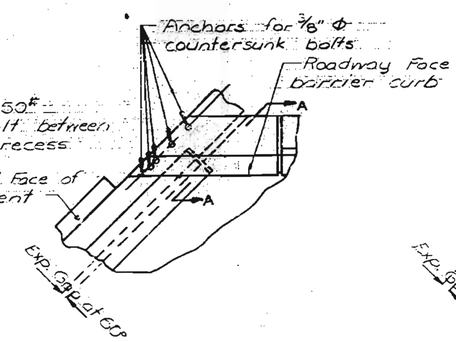
SECTION B-B



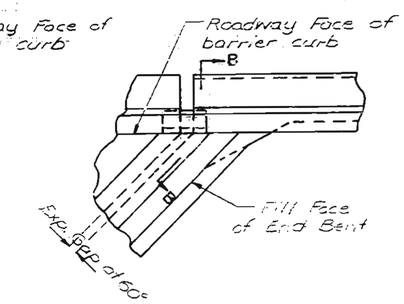
Note: 5/16 plates and angle placed at each girder or stringer.



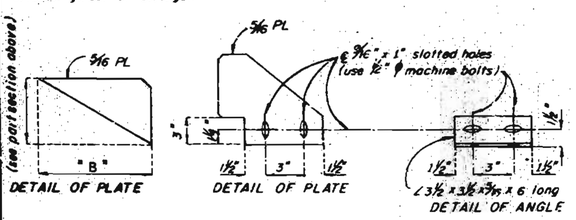
PART ELEVATION OF BARRIER CURB AT BENT NO. 1



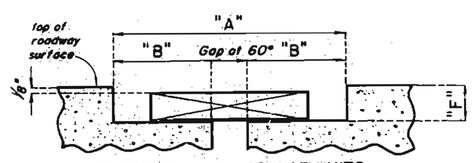
PART PLAN OF BENT NO. 1



PART PLAN OF BENT NO. 5



(see part section above)



BLOCKOUT FOR MODULAR UNITS

NOTE: WHEN MODULAR UNITS ARE SPECIFIED AS AN ALTERNATE STEEL CURB PLATE TREATMENTS ARE REQUIRED.

DETAILS OF ELASTOMERIC EXPANSION JOINT SEAL AT BENTS NO. 1 & 5

SPS-END-BT.	REVISED
FEB. 1978	AUG. 1978

DETAILED Sept. 1978
CHECKED Nov. 1978

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

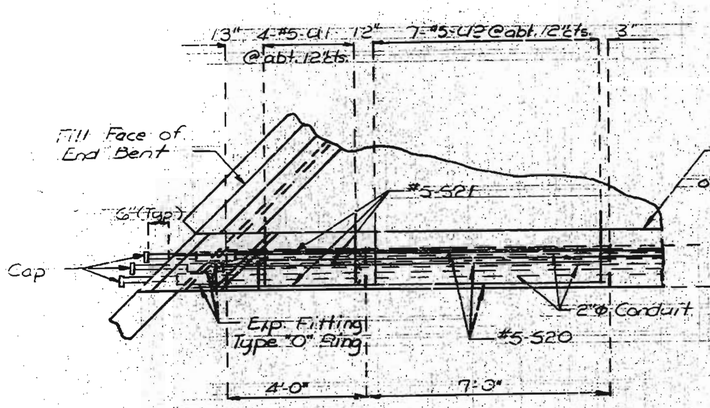
Sheet No. 26 of 33

JACKSON COUNTY

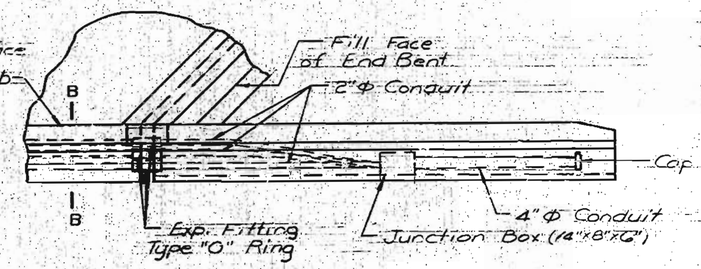
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	224	



PART PLAN AT END BENT NO. 1



PART PLAN AT END BENT NO. 5

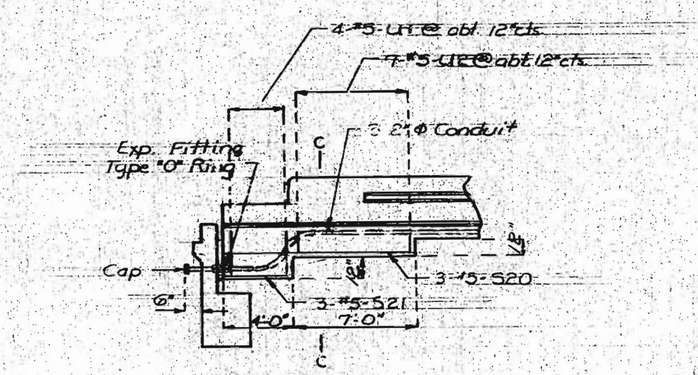
CONDUIT NOTES:

2"Φ conduit to be rigid non-metallic conduit (PVC) with 3" minimum cover in concrete.

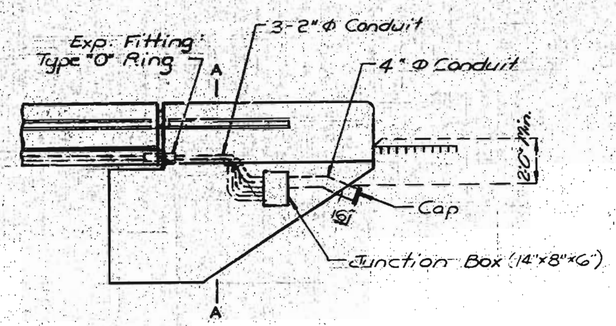
Shift reinforcing steel in field where necessary to clear conduit and junction boxes.

All end bent junction boxes shall be flush mounted and equal to O.Z. Gedney Co. type "YR" or Spring City Elec. Mfg. Co. type "ER". Wall thickness to be sufficient to provide 5 full threads for watertight conduit joint.

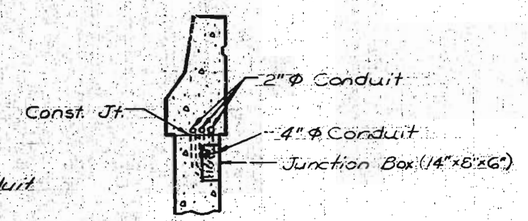
4"Φ conduit to be rigid galvanized conduit with 3" minimum cover in concrete.



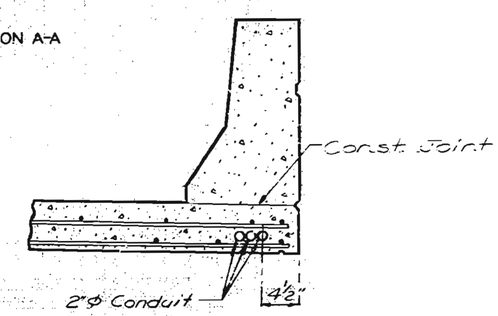
PART ELEVATION AT END BENT NO. 1



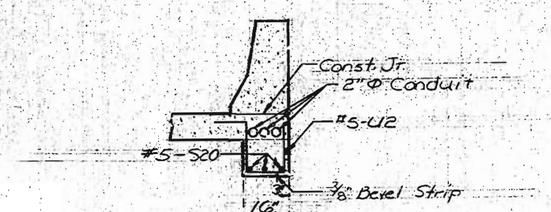
PART ELEVATION AT END BENT NO. 5



PART SECTION A-A



PART SECTION B-B



PART SECTION C-C

DETAILS OF CONDUIT BENTS NO. 1 & 5

DETAILED Oct. 1978
CHECKED Nov. 1978

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

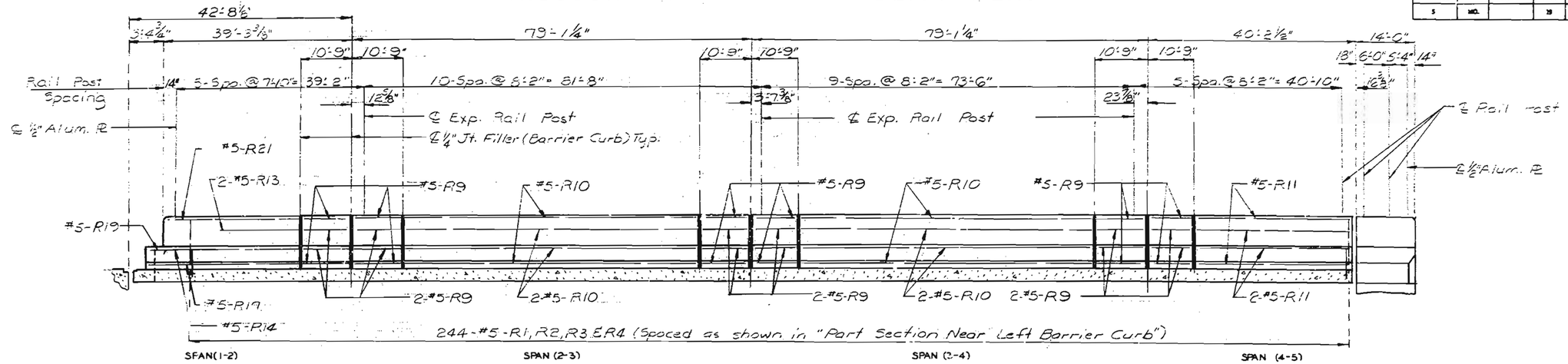
Sheet No. 27 of 53.

JACKSON COUNTY

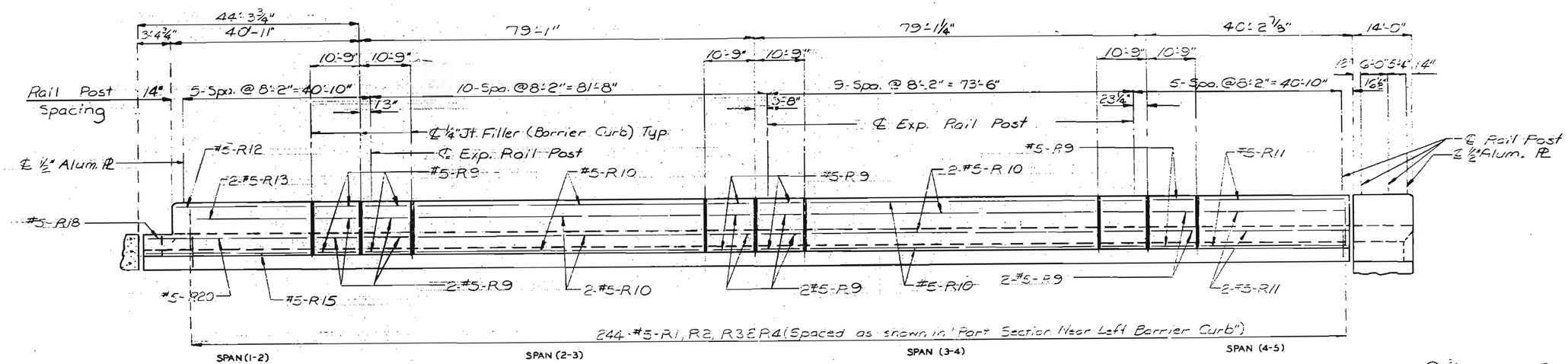
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	225	



PART SECTION NEAR LEFT BARRIER CURB

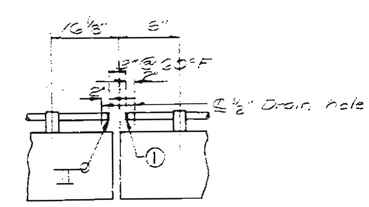


① 5/16" Closure ℄ or Alternate Cast End Cap.

PART ELEVATION NEAR RIGHT BARRIER CURB

Note: Longitudinal dimensions are along top of barrier curb parallel to grade.

Note: For details and reinforcement of barrier not shown, see sheet No. 29.



PART RAIL ELEVATION AT EXP GAP

DETAILED Oct. 1973
CHECKED Nov. 1973

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

Sheet No. 28 of 33.

JACKSON COUNTY

L-929 R

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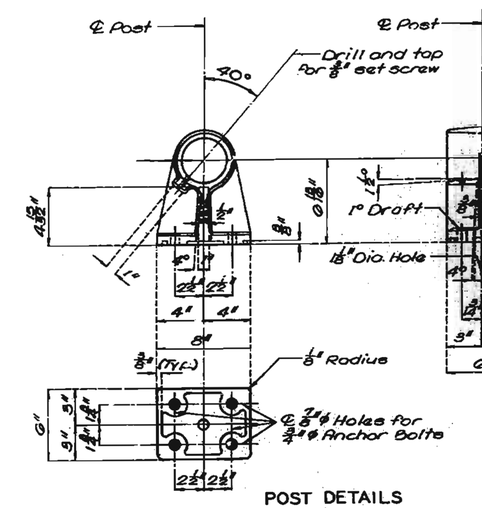
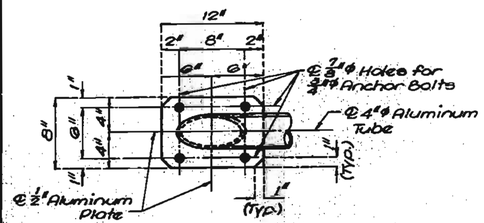
MISSOURI STATE HIGHWAY DEPARTMENT

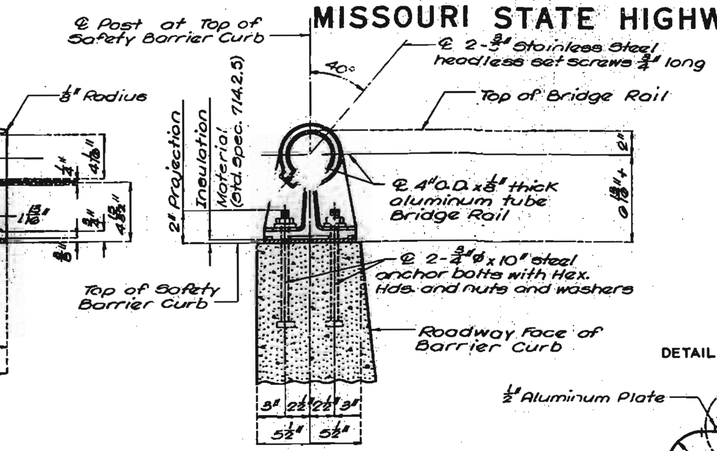
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	226	



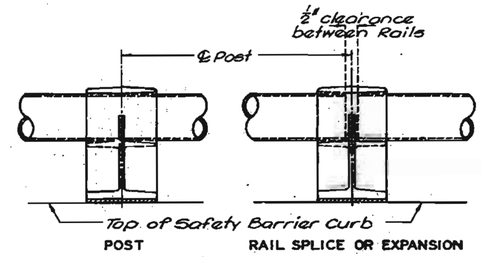
POST DETAILS



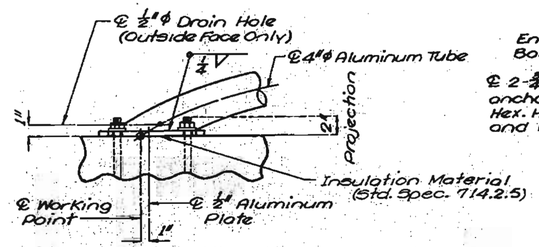
RAIL PLATE DETAILS



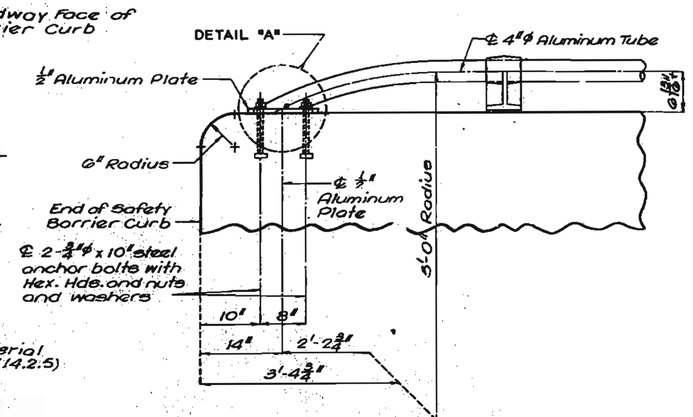
SECTION THRU BRIDGE RAIL



TYPICAL BRIDGE RAIL DETAILS



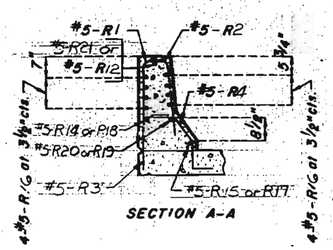
DETAIL "A"



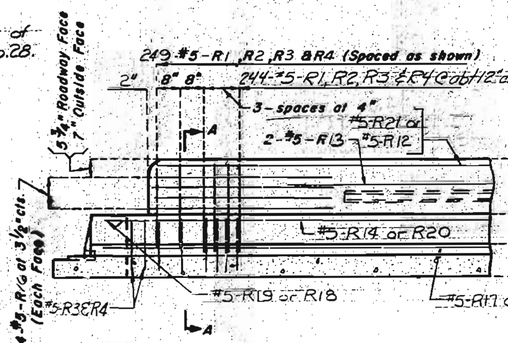
PART BRIDGE RAIL ELEVATION

ONE TUBE ALUMINUM RAILING

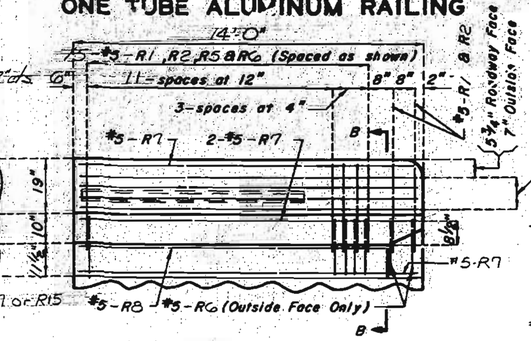
Note: For details and reinforcement of Barrier not shown, see Sheet No. 28.



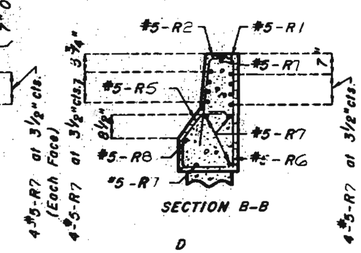
SECTION A-A



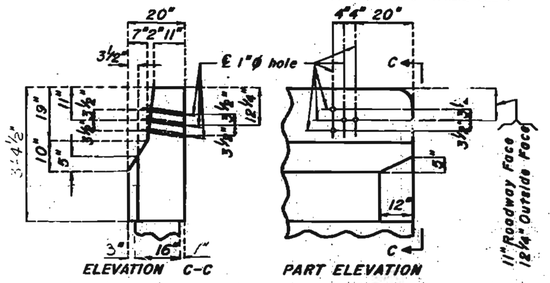
SECTION BT. NO. 1



ELEVATION BT. NO. 5



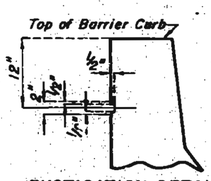
SECTION B-B



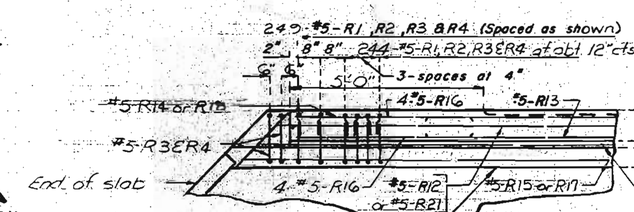
ELEVATION C-C

PART ELEVATION

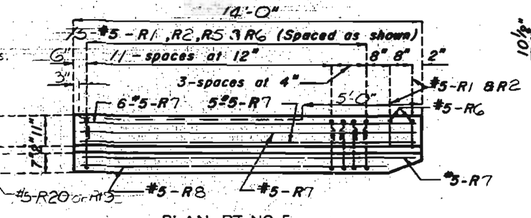
DETAILS OF GUARD RAIL ATTACHMENT AT BT. NO. 5



RUSTICATION DETAIL



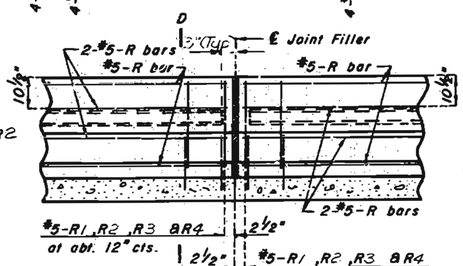
PLAN BT. NO. 1



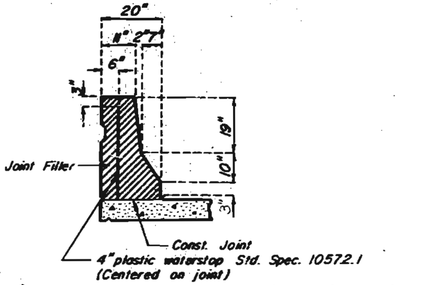
PLAN BT. NO. 5

DETAILS OF BARRIER CURB AT END BENTS

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



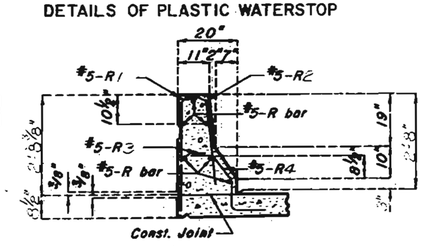
PART SECTION NEAR LEFT BARRIER CURB



Note: Plastic waterstop shall be placed in all safety barrier curb filled joints.

Cost of plastic waterstop complete in place to be included in unit price bid for concrete.

DETAILS OF PLASTIC WATERSTOP



SECTION D-D

Note: Use minimum lap of 17" for #5 horizontal barrier curb bars.

GENERAL BRIDGE RAIL NOTES:

ALL BRIDGE RAIL POSTS SHALL BE SET NORMAL TO GRADE.

ALUMINUM TUBE BRIDGE RAIL SHALL BE BENT TO CONFORM TO VERTICAL AND HORIZONTAL ALIGNMENT OF BARRIER CURB.

ALUMINUM WASHER SHIMS BETWEEN TOP OF BARRIER CURB AND POST BASE MAY BE USED FOR ADJUSTING BRIDGE RAIL ALIGNMENT. MAXIMUM THICKNESS OF SHIMS TO BE 1/8". WHERE MORE TILTING OF POST IS REQUIRED FOR PROPER ALIGNMENT, CONCRETE BEARING AREAS SHALL BE GROUND DOWN.

ALL PARTS OF BRIDGE RAIL, EXCEPT ANCHOR BOLTS, NUTS, WASHERS, AND SET SCREWS ARE TO BE OF ALUMINUM MATERIAL.

ALL FILLETS 1/4" EXCEPT AS NOTED.

ALL DRAFTS 3° EXCEPT AS NOTED.

OMIT SET SCREW IN SIDE OF RAIL POST ADJACENT TO FILLED JOINTS IN BARRIER CURB AT RAIL EXPANSION POINTS.

TOP OF BARRIER CURB TO BE BUILT PARALLEL TO GRADE WITH BARRIER CURB JOINTS (EXCEPT AT END BENTS) NORMAL TO GRADE.

ALL EXPOSED EDGES OF BARRIER CURB SHALL HAVE 1/2" RADIUS OR 3/8" BEVEL UNLESS OTHERWISE NOTED.

A THIN COATING OF MATERIAL SHALL BE APPLIED TO THE STAINLESS STEEL HEADLESS SET SCREWS TO PREVENT LOCKING TO ALUMINUM POSTS. THE COATING MATERIAL SHALL BE EQUAL TO WYNN OIL COMPANY'S "VISCOTEME", STAHL SPECIALTY COMPANY'S "PBC 516" OR NATIONAL CHEMSEARCH CORPORATION'S "THREAD EZE".

STD.	1-7-1	REVISED
NOV. 1974		JUNE 1977

DETAILED Sept 1978
CHECKED Nov. 1978

Sheet No. 29 of 33

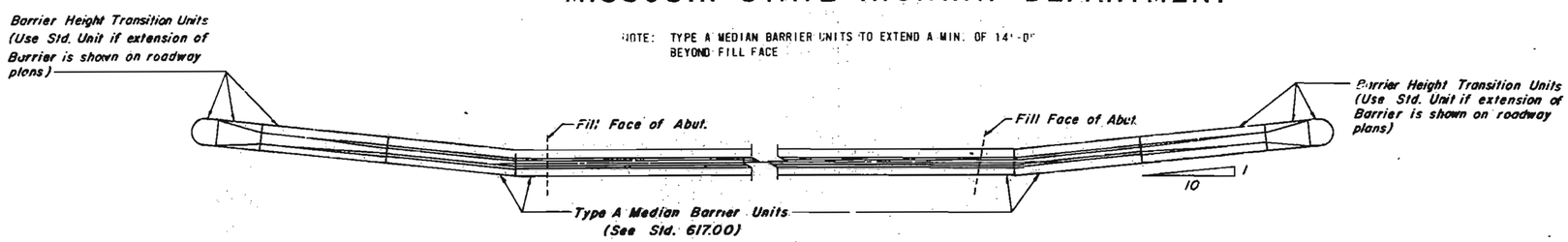
JACKSON COUNTY

L-929R

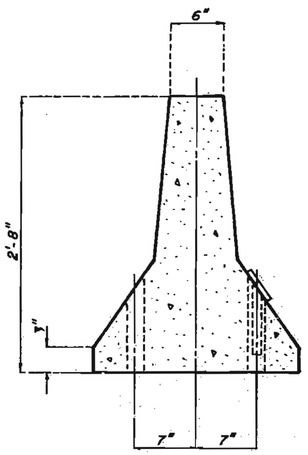
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	227	

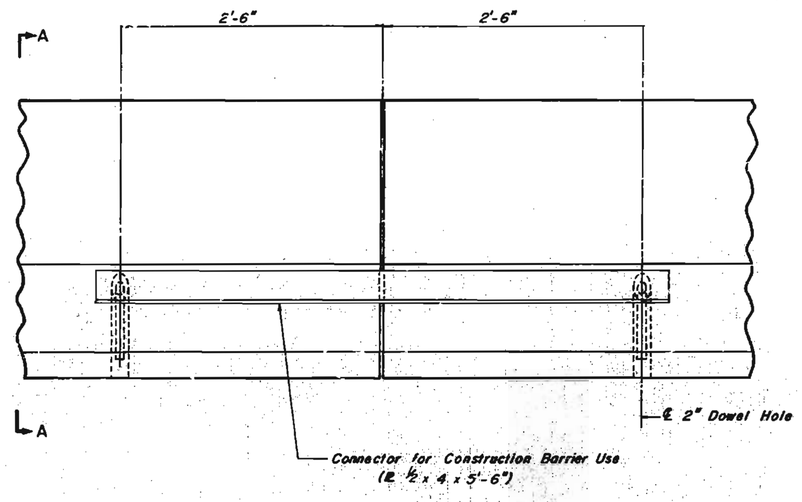
NOTE: TYPE A MEDIAN BARRIER UNITS TO EXTEND A MIN. OF 14'-0" BEYOND FILL FACE

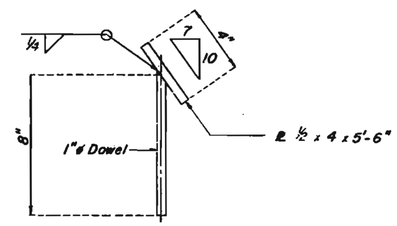


PLAN OF CONSTRUCTION AREA



SECTION A-A





SECTION THROUGH CONNECTOR

GENERAL NOTES:

UNITS SHALL BE ORIENTED SO CONNECTORS ARE ON SIDE AWAY FROM TRAFFIC

ALL UNITS OFF THE STRUCTURE SHALL BE DOWELLED INTO ROADWAY SURFACE.

HOLES DRILLED INTO ROADWAY SURFACE FOR DOWELS SHALL BE FILLED WITH GROUT OR BITUMINOUS MIXTURE AS APPROVED BY ENGINEER AFTER BARRIER IS REMOVED.

DOWELS WILL NOT BE PERMITTED ON BRIDGE DECK

UNITS OFF THE STRUCTURE SHALL BE FLARED AWAY FROM TRAFFIC AS SHOWN IN PLAN.

STEEL FOR CONNECTORS SHALL BE A-36.

ONE DELINEATOR SHALL BE INSTALLED ON THE FIRST STANDARD UNIT AT EACH END OF THE BRIDGE AND EVERY FOURTH UNIT THROUGHOUT THE LENGTH OF THE BRIDGE.

COST OF PROVIDING AND INSTALLING DELINEATORS SHALL BE INCLUDED IN COST OF PROVIDING TEMPORARY TRAFFIC BARRIERS.

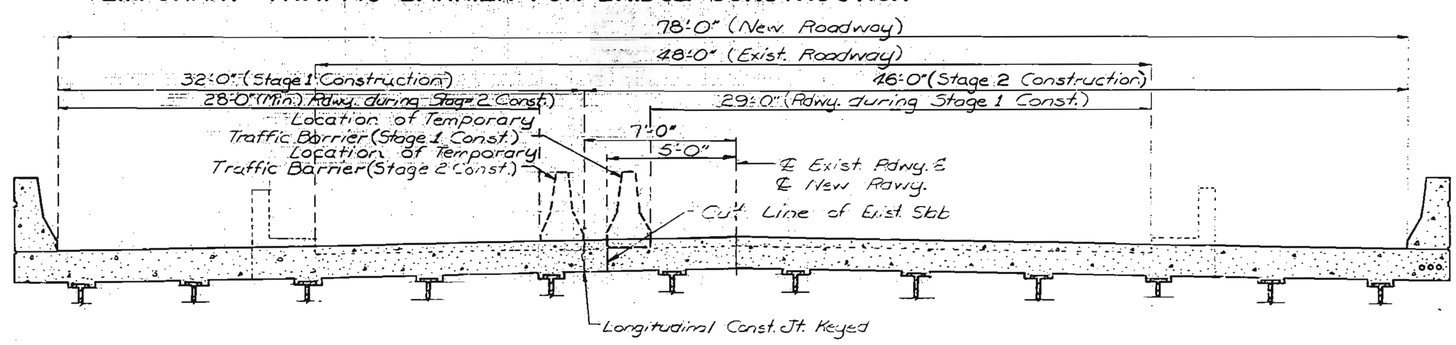
THE END OF THE TRAFFIC BARRIER FACING APPROACHING TRAFFIC SHALL BE EXTENDED TO THE EDGE OF THE PAVEMENT WITH THE 1 TO 10 SLOPE SHOWN.

QUANTITIES ARE BASED ON LONGEST REQUIRED STAGE LENGTH.

NO ADDITIONAL PAYMENT WILL BE MADE FOR RELOCATING UNITS IN ADDITIONAL STAGE LOCATIONS.

IF EXTENSION OF BARRIER IS SHOWN ON ROADWAY PLANS, ONLY THOSE UNITS ON OR PARTIALLY ON THE STRUCTURE WILL BE PAID FOR AS A BRIDGE ITEM.

TEMPORARY TRAFFIC BARRIER FOR BRIDGE CONSTRUCTION



SECTION SHOWING LOCATION OF TEMPORARY TRAFFIC BARRIER

DETAILED Sept. 1979
CHECKED Nov. 1978

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

JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

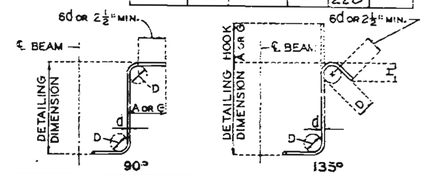
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	228	

COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO. (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.
		END BENT NO. 1																
48	5D4	FOOTINGS		20		X			4 3.000							4 3	4 3	218
16	5D5	FOOTINGS		15		X			11 9.000							12 11	12 11	276
12	5D6	FOOTINGS		18		X			11 9.000							12 11	12 11	162
6	6M5	BEAM		20		X			9 4.000							9 4	9 4	86
6	9M6	BEAM		20		X			9 4.000							9 4	9 4	190
6	10M7	BEAM		17		X			10 10.000							12 3	12 3	316
4	6M8	BEAM		20		X			2 0.000							2 0	2 0	12
28	6M9	WING		20		X			11 7.000							11 7	11 7	487
6	6M10	WING		20		X	V	2	5 11.000							5 11	5 11	
		INCR = 35.000 IN							11 9.000							11 9	11 9	80
2	6M11	BACKWALL		20		X			52 9.000							52 9	52 9	158
4	6M12	BACKWALL		20		X			45 0.000							45 0	45 0	270
6	4M13	BACKWALL		20		X			27 5.000							27 5	27 5	147
6	6M14	BEAM		20		X			15 9.000							15 9	15 9	142
6	9M15	BEAM		20		X			15 9.000							15 9	15 9	321
6	10M16	BEAM		17		X			17 3.000							18 8	18 8	482
8	6M17	WING		20		X	V	2	3 6.000							3 6	3 6	
		INCR = 34.375 IN							12 1.000							12 1	12 1	94
4	6M18	BACKWALL		20		X			36 1.000							36 1	36 1	217
8	4M19	BACKWALL		20		X			35 10.000							35 10	35 10	191
4	6M82	BACKWALL		20		X			10 0.000							10 0	10 0	60
4	6M83	BACKWALL		20		X			31 6.000							31 6	31 6	189
2	4M84	BACKWALL		20		X			18 0.000							18 0	18 0	24
2	4M85	BACKWALL		20		X			10 6.000							10 6	10 6	14
4	6M86	BACKWALL		20		X			18 0.000							18 0	18 0	108
2	5R40	WING		27		X			23.000	14.000	12.875	13.875		9.125	9.000	5 4	5 2	11
2	6T4	COLUMN		15		X			12.750	8 9.000				9.000	9.000	9 10	9 9	29
2	6T5	COLUMN		23		X			15.500	8 2.000	12.750	9.000	9.000	11.000	11.000	10 6	10 5	31
2	6T6	WING		25		X			3 5.000	11 11.000	2 6.000			3 11.000	11 3.000	17 10	17 9	53
4	6T7	COLUMN		20		X			7 0.000							7 0	7 0	42
2	6T8	WING		25		X			2 9.000	11 [illegible].000	2 6.000			3 11.000	11 3.000	17 2	17 1	51
109	5U3	BACKWALL		10	S	X				2 10.000	7.000					6 3	6 1	692
12	4U4	COLUMN		10	S	X				3 10.000	2 3.000					9 11	9 9	78
10	4U5	BEAM		13	S	X			2 6.000	3 0.000	2 6.000	3 0.000				11 9	11 6	77
5	4U6	BEAM		20	S	X				6.000	2 6.000					3 6	3 4	11
17	4U7	BEAM		13	S	X			2 6.000	2 8.000	2 6.000	2 8.000				11 1	10 10	123
3	4U8	COLUMN		10	S	X				2 0.000	2 3.000					8 3	8 1	49
8	5V3	BACKWALL		20		X			6 3.000							6 3	6 3	52
5[illegible]	5V4	BACKWALL		20		X			5 3.000							5 3	5 3	274
22	5V5	WING		20		X	V	2	3 6.000							3 6	3 6	
		INCR = 4.250 IN							7 0.000							7 0	7 0	120
41	5V6	BACKWALL		17		X	V	1	4 3.000							4 10	4 10	
		INCR = 0.125 IN							4 0.000							4 7	4 7	201
41	5V7	BACKWALL		17		X	V	1	4 5.000							5 0	5 0	
		INCR = 0.125 IN							4 2.000							4 9	4 9	208
22	5V8	WING		20		X	V	2	3 0.000							3 0	3 0	
		INCR = 4.250 IN							6 7.000							6 7	6 7	110
10	7V9	COLUMN		20		X			10 7.000							10 7	10 7	216
10	7V10	COLUMN		20		X			8 1.000							8 1	8 1	165
6	4V11	COLUMN		20		X			8 1.000							8 1	8 1	32
6	4V12	COLUMN		20		X			10 7.000							10 7	10 7	42
29	5V13	BACKWALL		17		X	V	1	4 1.000							4 8	4 8	
		INCR = 0.125 IN							4 3.000							4 10	4 10	144

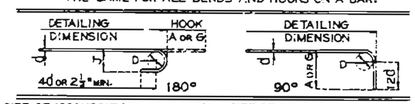
COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO. (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.
29	5V14	BACKWALL		17		X	V	1	4 3.000							4 10	4 10	
		INCR = 0.125 IN							4 5.000							5 0	5 0	189
25	5V15	BACKWALL		17		X			3 11.000							4 6	4 6	117
25	5V16	BACKWALL		17		X			4 1.000							4 8	4 8	122
4	2W1	A.B.WELLS		22		X			12.000	9.125						19 9	19 9	13
		BENT 2																
28	5 D1	FOOTING		18		X			5 3.000							6 5	6 5	187
24	5 D2	FOOTING		20		X			4 3.000							4 3	4 3	106
32	10 D3	FOOTING		17		X			7 10.000							9 3	9 3	1274
4	6 H20	BEAM		20		X			41 10.000							41 10	41 10	251
9	8 H21	BEAM		20		X			41 10.000							41 10	41 10	1005
8	8 H22	BEAM		17		X			35 10.000							36 9	36 9	735
8	8 H23	BEAM		17		X			12 10.000							13 9	13 9	294
8	8 H25	BEAM		17		X			14 7.000							15 6	15 6	331
8	8 H26	BEAM		20		X			26 6.000							26 6	26 6	566
8	8 H28	BEAM		20		X			25 10.000							25 10	25 10	552
8	8 H29	BEAM		17		X			16 10.000							17 9	17 9	379
4	6 H30	BEAM		20		X			20 7.000							20 7	20 7	124
8	8 H31	BEAM		20		X			20 7.000							20 7	20 7	440
4	6 H32	BEAM		20		X			46 1.000							46 1	46 1	277
8	8 H33	BEAM		20		X			46 1.000							46 1	46 1	984
16	7 H40	BEAM		10		X				3 0.000	2 7.000					8 7	8 3	270
16	6 T1	COLUMN		9	S	X			2 9.000	5 7.125	18.000			3 11.000	4 0.000	9 10	9 10	236
16	6 T2	COLUMN		23	S	X			8 3.000	18.000				5 10.000	5 10.000	9 9	9 9	234
64	4 T3	COLUMN		13	S	X			2 3.000	2 3.000	2 3.000	2 3.000				9 9	9 6	406
36	4 U20	BEAM		13	S	X			2 9.000	3 6.625	2 9.000	3 6.625				13 4	13 1	227
12	4 U21	BEAM		13	S	X			22.000	3 6.625	22.000	3 6.625				11 6	11 3	90
13	4 U22	BEAM		13	S	X			2 9.000	3 9.250	2 9.000	3 9.250				13 10	13 7	118
10	4 U23	BEAM		13	S	X			2 9.000	3 0.625	2 9.000	3 0.625				12 4	12 1	81
21	4 U24	BEAM		13	S	X			2 9.000	3 2.625	2 9.000	3 2.625				12 8	12 5	174
12	4 U25	BEAM		13	S	X			22.000	3 2.625	22.000	3 2.625				10 10	10 7	85
12	4 U26	BEAM		13	S	X			22.000	3 6.500	22.000	3 6.500				11 6	11 3	96
19	4 U27	BEAM		13	S	X			2 9.000	3 6.500	2 9.000	3 6.500				13 4	13 1	166
16	4 U28	BEAM		13	S	X			2 9.000	3 10.375	2 9.000	3 10.375				14 0	13 9	147
22	4 U31	BEAM		10	S	X				6.000	2 9.000					3 9	3 7	53
32	10 V20	COLUMN		20					18 8.000							18 8	18 8	2570
24	2 W1	BEAM		22		X			12.000	9.125						19 9	19 9	79
		BENT NO 3																
28	5 D1	FOOTING		18		X			5 3.000							6 5	6 5	187
24	5 D2	FOOTING		20		X			4 3.000							4 3	4 3	106
32	10 D3	FOOTING		17		X			7 10.000							9 3	9 3	1274
12	9 H1	BEAM		18		X			18 0.000							20 6	20 6	836
8	6 H2	BEAM		20		X			18 0.000							18 0	18 0	216
12	9 H4	BEAM		20		X			18 0.000							18 0	18 0	734
16	6 T1	COLUMN		9	S	X			2 9.000	5 7.125	18.000			3 11.000	4 0.000	[illegible]	[illegible] 10	236
16	6 T2	COLUMN		23	S	X			8 3.000	18.000				5 10.000	5 10.000	9 9	9 9	234
60	4 T3	COLUMN		13	S	X			2 3.000	2 3.000	2 3.000	2 3.000				9 9	9 6	381
48	4 U30	BEAM		13	S	X			2 9.000	3 9.500	2 9.000	3 9.500				13 10	13 7	363



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
#3	1-1/2"	4"	4"	2-1/2"
#4	2"	4-1/2"	4-1/2"	3"
#5	2-1/2"	6"	5-1/2"	3-3/4"
#6	4-1/2"	8"	7"	4-1/2"

NOTE: UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.

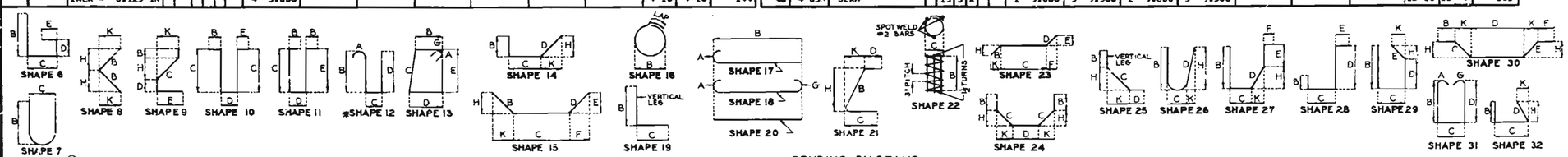


SIZE OF 180° HOOKS (GRADE 40 KSI)
D = 5d FOR #3 THRU #11
D = 10d FOR #14 AND #18

SIZE OF 90° HOOKS (ALL GRADES) AND 180° HOOKS (GRADE 60 KSI)
D = 6d FOR #3 THRU #8
D = 8d FOR #9, #10 AND #11
D = 10d FOR #14 AND #18

END HOOK DIMENSIONS					
BAR SIZE	180° HOOKS GRADE 40 A OR G	180° HOOKS GRADE 40 J	180° HOOKS GRADE 60 A OR G	180° HOOKS GRADE 60 J	90° HOOKS ALL GRADES A OR G
#3	5"	2-3/4"	5"	3"	6"
#4	6"	3-1/2"	6"	4"	8"
#5	7"	4-1/2"	7"	5"	10"
#6	8"	5-1/4"	8"	6"	12"
#7	9"	6-1/4"	10"	7"	14"
#8	10"	7"	11"	8"	16"
#9	12"	8"	15"	11-1/4"	19"
#10	13"	9"	17"	12-3/4"	22"
#11	14"	10"	19"	14-1/4"	2'-0"
#14	2'-2"	20-1/2"	2'-2"	20-1/2"	2'-7"
#18	2'-11"	2'-3"	2'-11"	2'-3"	3'-5"

NOTES:
- ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEG. TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEG. STD. 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.
- * ALL HOOKS AND BENDS FOR SHAPE NO. 12 – GRADE 40 (ONLY) ARE BASED ON D = 5d.



BENDING DIAGRAMS

STD. 90.8	REVISED
MAY 1974	OCT. 1978

DETAILED Dec. 1978
CHECKED Dec. 1978

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

Sheet No. 31 of 33

JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

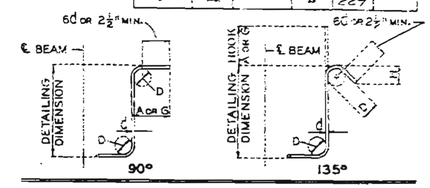
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	229	

COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO. (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.
12	4 U31	BEAM		10	S	X				6.000	2 9.000					3 9	3 7	29
32	10 V2	COLUMN		20		X			19 10.000							19 10	19 10	2731
8	2 W1			22		X			12.000	9.125						19 9	19 9	26
		BENT NO 4																
28	5 D1	FOOTING		18		X			5 3.000							6 5	6 5	187
24	5 D2	FOOTING		20		X			4 3.000							4 3	4 3	106
32	10 D3	FOOTING		17		X			7 10.000							9 3	9 3	1274
16	7 H40	BEAM		10		X				3 0.000	2 7.000					8 7	8 3	270
8	8 H41	BEAM		17		X			19 4.000							20 3	20 3	433
8	8 H42	BEAM		20		X			23 4.000							23 4	23 4	498
8	8 H43	BEAM		17		X			12 10.000							13 9	13 9	294
2	6 H44	BEAM		20		X			41 10.000							41 10	41 10	126
9	8 H45	BEAM		20		X			41 10.000							41 10	41 10	1005
8	8 H46	BEAM		17		X			34 3.000							35 2	35 2	751
4	6 H47	BEAM		20		X			20 5.000							20 5	20 5	123
8	8 H48	BEAM		20		X			21 9.000							21 9	21 9	465
8	8 H49	BEAM		17		X			35 10.000							36 9	36 9	785
4	6 H50	BEAM		20		X			45 11.000							45 11	45 11	276
8	8 H51	BEAM		20		X			47 3.000							47 3	47 3	1009
16	6 T1	COLUMN		9	S	X			2 9.000	5 7.125	18.000			3 11.000	4 0.000	9 10	9 10	236
16	6 T2	COLUMN		23	S	X			8 3.000	18.000				5 10.000	5 10.000	9 9	9 9	234
52	4 T3	COLUMN		13	S	X			2 3.000	2 3.000	2 3.000	2 3.000				9 9	9 6	330
22	4 U40	BEAM		13	S	X			2 9.000	3 10.750	2 9.000	3 10.750				14 1	13 10	203
10	4 U41	BEAM		13	S	X			22.000	3 10.750	22.000	3 10.750				12 3	12 0	80
12	4 U42	BEAM		13	S	X			2 9.000	3 10.000	2 9.000	3 10.000				13 11	13 8	119
32	4 U43	BEAM		13	S	X			2 9.000	3 7.625	2 9.000	3 7.625				13 6	13 3	283
8	4 U44	BEAM		13	S	X			22.000	3 7.625	22.000	3 7.625				11 8	11 5	61
14	4 U45	BEAM		13	S	X			2 9.000	3 0.625	2 9.000	3 0.625				12 6	12 1	113
13	4 U46	BEAM		13	S	X			2 9.000	3 2.625	2 9.000	3 2.625				12 8	12 5	108
10	4 U47	BEAM		13	S	X			22.000	3 2.625	22.000	3 2.625				10 10	10 7	71
13	4 U48	BEAM		13	S	X			2 9.000	3 6.750	2 9.000	3 6.750				13 5	13 2	114
26	4 U31	BEAM		10	S	X				6.000	2 9.000					3 9	3 7	62
32	10 V1	COLUMN		20		X			17 7.000							17 7	17 7	2421
24	2 W1			22		X			12.000	9.125						19 9	19 9	79
		END BENT NO.5																
3	6F1	BACKWALL & WING		15		X			14.125	7 9.000	14.125	5.500	13.000	5.500	13.000	10 1	10 1	45
3	6F2	BACKWALL & WING		15		X			14.625	3 6.000	14.625	13.500	5.500	13.500	5.500	5 11	5 9	26
8	6H60	WING		20		X			13 9.000							13 9	13 9	165
2	6H61	WING		20		X			12 9.000							12 9	12 9	38
2	6H62	WING		20		X			8 8.000							8 8	8 8	26
6	6H63	WING		20		X	V	2	12 11.000							12 11	12 11	
		INCR = 40.500 IN							6 2.000							6 2	6 2	86
5	6H64	BEAM		20		X			9 11.000							9 11	9 11	74
2	6H65	BEAM		20		X			10 11.000							10 11	10 11	33
4	6H66	BEAM		17		X	V	1	13 6.000							14 2	14 2	
		INCR = 7.375 IN							15 4.000							16 0	16 0	91

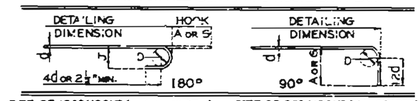
COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO. (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.
3	6H67	BEAM		20		X			13 10.000							13 10	13 10	68
4	6H68	BEAM		20		X	V	1	12 0.000							12 0	12 0	
		INCR = 7.375 IN							13 10.000							13 10	13 10	78
5	6H69	BEAM		20		X			11 7.000							11 7	11 7	87
1	6H70	BEAM		20		X			9 5.000							9 5	9 5	14
4	6H71	BEAM		17		X	V	1	13 4.000							14 0	14 0	
		INCR = 9.625 IN							10 11.000							11 7	11 7	77
4	6H72	BEAM		20		X	V	1	11 10.000							11 10	11 10	
		INCR = 9.625 IN							9 5.000							9 5	9 5	64
8	4H73	BACKWALL		20		X			25 3.000							25 3	25 3	135
4	6H74	BACKWALL		20		X			22 7.000							22 7	22 7	136
4	6H75	BACKWALL		20		X			20 1.000							20 1	20 1	121
2	4H76	BACKWALL		20		X			12 10.000							12 10	12 10	17
2	6H77	BACKWALL		20		X			49 9.000							49 9	49 9	149
4	6H78	BACKWALL		20		X			34 8.000							34 8	34 8	208
8	4H79	BACKWALL		20		X			34 1.000							34 1	34 1	182
4	6H80	BACKWALL		20		X			53 1.000							53 1	53 1	319
2	4H81	BACKWALL		20		X			15 0.000							15 0	15 0	20
2	6T60	WING		25		X			2 5.000	7 5.250	2 5.000					12 3	12 2	37
2	6T61	CURTAIN WALL		19		X			4 8.000	4 11.000						9 7	9 5	28
2	6T62	WING		25		X			2 5.000	6 11.500	2 7.000			20.000	7 3.000	12 0	11 10	36
2	6T63	CURTAIN WALL		19		X			4 5.000	2 6.000						6 11	6 9	20
3	4U60	BEAM		13	S	X			2 6.000	3 2.000	2 6.000	3 2.000				12 1	11 10	24
11	4U61	BEAM		13	S	X			4 6.000	3 2.000	4 6.000	3 2.000				16 1	15 10	116
8	4U62	BEAM		10	S	X				6.000	2 6.000					3 6	3 4	18
63	5U63	BACKWALL		10	S	X				2 11.000	7.000					6 5	6 3	411
19	5U64	BACKWALL		10	S	X				2 9.000	7.000					6 1	5 11	117
27	5U65	BACKWALL		10	S	X				2 6.000	7.000					5 7	5 3	153
10	4U66	BEAM		13	S	X			4 6.000	2 8.000	4 6.000	2 8.000				15 1	14 10	99
3	4U67	CURTAIN WALL		10	S	X				4 7.000	6.000					9 8	9 6	19
3	4U68	CURTAIN WALL		10	S	X				2 2.000	6.000					4 10	4 8	9
5	7U69	BEAM		14		X			5 0.000	3 0.000	21.250			15.000	15.000	9 9	9 7	98
5	7U70	BEAM		10		X				5 0.000	2 8.000					12 8	12 4	126
6	6U71	BEAM		10	S	X				21.000	2 9.000					6 3	5 11	53
16	6V60	WING		20		X	V	1	2 6.000							2 6	2 6	
		INCR = 1.250 IN							4 0.000							4 0	4 0	78
24	6V61	WING		20		X			5 10.000							5 10	5 10	210
16	6V62	WING		20		X	V	1	2 5.000							2 5	2 5	
		INCR = 1.500 IN							4 3.000							4 3	4 3	80
2	6V63	BEAM		20		X			3 4.000							3 4	3 4	10
2	6V64	BEAM		20		X			2 9.000							2 9	2 9	8
2	6V65	CURTAIN WALL		20		X			4 0.000							4 0	4 0	5
6	4V66	CURTAIN WALL		20		X			4 3.000							4 3	4 3	17
24	5V67	BACKWALL		20		X			5 1.000							5 1	5 1	127
42	5V68	BACKWALL		17		X	V	1	4 1.000							4 8	4 8	
		INCR = 0.125 IN							3 10.000							4 5	4 5	199
42	5V69	BACKWALL		17		X	V	1	4 3.000							4 10	4 10	
		INCR = 0.125 IN							4 0.000							4 7	4 7	296
20	5V70	BACKWALL		17		X			4 1.000							4 8	4 8	97
20	5V71	BACKWALL		17		X			3 11.000							4 6	4 6	94
23	5V72	BACKWALL		17		X			4 0.000							4 7	4 7	110
23	5V73	BACKWALL		17		X			3 10.000							4 5	4 5	106
24	5V74	BACKWALL		20		X			5 0.000							5 0	5 0	125
6	2W1	A.B. WELLS		22		X			12.000	9.125						19 9	19 9	28



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
#3	1-1/2"	4"	4"	2-1/2"
#4	2"	4-1/2"	4-1/2"	3"
#5	2-1/2"	5"	5-1/2"	3-3/4"
#6	2-1/2"	8"	7"	4-1/2"

NOTE: UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.

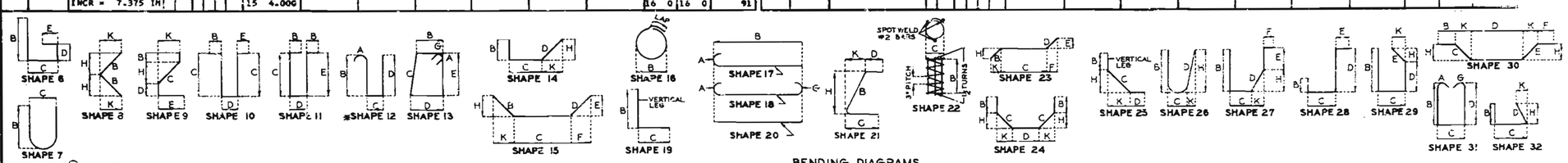


SIZE OF 180° HOOKS (GRADE 40 KSI)
D = 5d FOR #3 THRU #11
D = 10d FOR #14 AND #18

SIZE OF 90° HOOKS (ALL GRADES) AND 180° HOOKS (GRADE 60 KSI)
D = 6d FOR #3 THRU #8
D = 8d FOR #9, #10 AND #11
D = 10d FOR #14 AND #18

END HOOK DIMENSIONS						
BAR SIZE	180° HOOKS: GRADE 40 A OR G	180° HOOKS: GRADE 40 J	180° HOOKS: GRADE 60 A OR G	180° HOOKS: GRADE 60 J	90° HOOKS: ALL GRADES A OR G	90° HOOKS: ALL GRADES J
#3	5"	2-3/4"	5"	3"	6"	
#4	6"	3-1/2"	6"	4"	8"	
#5	7"	4-1/2"	7"	5"	10"	
#6	8"	5-1/4"	8"	6"	12"	
#7	9"	6-1/4"	10"	7"	14"	
#8	10"	7"	11"	8"	16"	
#9	12"	8"	15"	11-1/4"	19"	
#10	13"	9"	17"	12-3/4"	22"	
#11	14"	10"	19"	14-1/4"	2'-0"	
#14	2'-2"	20-1/2"	2'-2"	20-1/2"	2'-7"	
#18	2'-11"	2'-3"	2'-11"	2'-3"	3'-5"	

NOTES:
- ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEG. TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEG. STD. 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.
- * ALL HOOKS AND BENDS FOR SHAPE NO. 12 – GRADE 40 (ONLY) ARE BASED ON D = 5d.



BENDING DIAGRAMS

STD. 90.8	REVISED OCT. 1978
MAY 1974	

DETAILED Dec. 1978
CHECKED Dec. 1978

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

JACKSON COUNTY

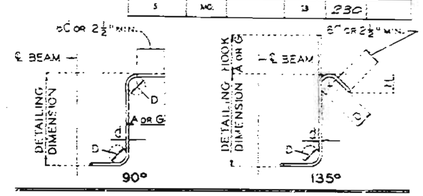
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	230	

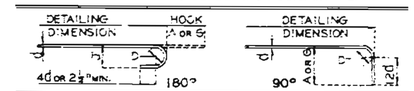
COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBST. (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.
			SUPER STRUCTURE																
532	5	R1	BARRIER CURB		19	S				2 6.000	6.000						5 6	2 11	1118
532	5	R2	BARRIER CURB		15	S				2 6.125	6.000				2 6.000	3.000	3 0	2 11	1628
498	5	R3	BARRIER CURB		19	S				17.000	9.000						2 2	2 1	1082
498	5	R4	BARRIER CURB		27	S					9.000	11.125	7.000	12.000	9.125	6.375	3 3	3 1	1682
30	5	R5	BARRIER CURB		27	S				17.000	9.375	12.125	9.000		6.375	9.125	3 4	3 4	104
34	5	R6	BARRIER CURB		19	S				18.000	9.000						2 3	2 2	77
24	5	R7	BARRIER CURB		20					13 8.000							13 8	13 8	342
2	5	R8	BARRIER CURB		20					12 8.000							12 8	12 8	26
72	5	R9	BARRIER CURB		20					10 6.000							10 6	10 6	789
24	5	R10	BARRIER CURB		20					57 4.000							57 4	57 4	1435
12	5	R11	BARRIER CURB		20					29 0.000							29 0	29 0	363
1	5	R12	BARRIER CURB		20					29 9.000							29 9	29 9	31
4	5	R13	BARRIER CURB		20					26 4.000							26 4	26 4	110
1	5	R14	BARRIER CURB		20					29 11.000							29 11	29 11	31
1	5	R15	BARRIER CURB		20					31 5.000							31 5	31 5	33
16	5	R16	BARRIER CURB		20					5 0.000							5 0	5 0	83
1	5	R17	BARRIER CURB		20					29 11.000							29 11	29 11	31
1	5	R18	BARRIER CURB		20					31 5.000							31 5	31 5	33
1	5	R19	BARRIER CURB		20					31 5.000							31 5	31 5	33
1	5	R20	BARRIER CURB		20					29 9.000							29 9	29 9	31
1	5	R21	BARRIER CURB		20					28 1.000							28 1	28 1	29
415	5	S1	SLAB		20					49 8.000							49 8	49 8	21498
325	5	S2	SLAB	E	20					49 8.000							49 8	49 8	16836
128	5	S3	SLAB	E	20					24 2.000							24 2	24 2	3226
10	5	S4	SLAB		20					49 8.000							49 8	49 8	518
128	5	S5	SLAB	E	20					37 2.000							37 2	37 2	4962
162	5	S6	SLAB	E	17					21.000							2 4	2 4	394
4	5	S7	SLAB	E	20					3 0.000							3 0	3 0	13
409	5	S8	SLAB	E	20					35 5.000							35 5	35 5	15108
391	5	S9	SLAB	E	20					47 5.000							47 5	47 5	19357
223	5	S10	SLAB		20					47 5.000							47 5	47 5	11029
49	5	S11	SLAB		20			V	1	45 0.000							45 0	45 0	
			INCR = 10.625 IN							2 6.000							2 6	2 6	1214
66	5	S12	SLAB	E	20			V	1	45 6.000							45 0	45 0	
			INCR = 6.125 IN							2 0.000							2 0	2 0	2108
52	5	S13	SLAB		20			V	1	47 4.000							47 4	47 4	
			INCR = 10.625 IN							2 2.000							2 2	2 2	1342
90	5	S14	SLAB	E	20			V	1	47 4.000							47 4	47 4	
			INCR = 6.125 IN							2 3.000							2 3	2 3	2327
68	5	S15	SLAB	E	20			V	1	36 5.000							36 5	36 5	
			INCR = 6.125 IN							2 3.000							2 3	2 3	1371
38	5	S16	SLAB		20			V	1	35 3.000							35 3	35 3	
			INCR = 10.625 IN							2 6.000							2 6	2 6	748
63	5	S17	SLAB	E	20			V	1	35 5.000							35 5	35 5	
			INCR = 6.125 IN							3 9.000							3 9	3 9	1287
36	5	S18	SLAB		20			V	1	35 6.000							35 6	35 6	
			INCR = 10.625 IN							4 5.000							4 5	4 5	749
4	5	S19	SLAB		20					3 0.000							3 0	3 0	13
234	5	S22	SLAB		20					35 6.000							35 6	35 6	8664
130	5	S23	SLAB	E	20					22 2.000							22 2	22 2	3006
3	5	S20	CONDUIT		20					10 9.000							10 9	10 9	34
3	5	S21	CONDUIT		20					3 9.000							3 9	3 9	12
4	5	U1	CONDUIT	E	10	S					2 5.500	13.000	12.000				7 0	6 8	28
7	5	U2	CONDUIT	E	10	S					17.500	13.000	12.000				5 0	4 8	34
			END OF BAR LIST																



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
#3	1-1/2"	4"	4"	2-1/2"
#4	2"	4-1/2"	4-1/2"	3"
#5	2 1/2"	6"	5-1/2"	3-3/4"
#6	4-1/2"	8"	7"	4-1/2"

NOTE: UNLESS OTHERWISE NOTED DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



SIZE OF 180° HOOKS (GRADE 60 KSI)

D = 5d FOR #3 THRU #11
D = 10d FOR #14 AND #18

SIZE OF 90° HOOKS (ALL GRADES) AND 180° HOOKS (GRADE 60 KSI)

D = 6d FOR #3 THRU #8
D = 8d FOR #9, #10 AND #11
D = 10d FOR #14 AND #18

END HOOK DIMENSIONS					
BAR SIZE	180° HOOKS GRADE 40 A OR G	180° HOOKS GRADE 40 J	180° HOOKS GRADE 60 A OR G	180° HOOKS GRADE 60 J	90° HOOKS ALL GRADES A OR G
#3	5"	2-3/4"	5"	3"	6"
#4	6"	3-1/2"	6"	4"	8"
#5	7"	4-1/2"	7"	5"	10"
#6	8"	5-1/4"	8"	6"	12"
#7	9"	6-1/4"	10"	7"	14"
#8	10"	7"	11"	8"	16"
#9	12"	8"	15"	11-1/4"	19"
#10	13"	9"	17"	12-3/4"	22"
#11	14"	10"	19"	14-1/4"	2'-0"
#14	2'-2"	20-1/2"	2'-2"	20-1/2"	2'-7"
#18	2'-11"	2'-3"	2'-11"	2'-3"	3'-5"

NOTES: ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEG. TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEG. STD. 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.

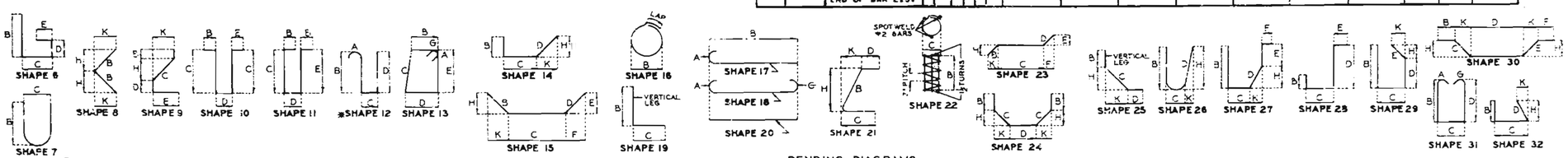
NO. EA. - NUMBER OF BARS OF EACH LENGTH.

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.

* ALL HOOKS AND BENDS FOR SHAPE NO. 12 - GRADE 40 ONLY ARE BASED ON D = 5d.

Two additional S33 are included in bar bill for testing. See Special Provisions.



BENDING DIAGRAMS

STD.	90.8.5	REVISED
MAY	1974	OCT. 1978

DETAILED Dec. 1978
CHECKED Dec. 1978

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

Sheet No. 33 of 33

JACKSON COUNTY

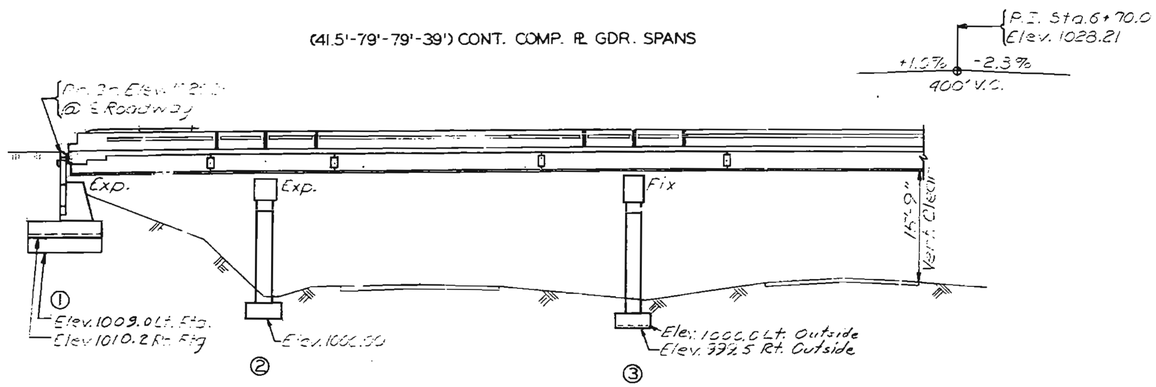
L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	178	

FINAL PLANS

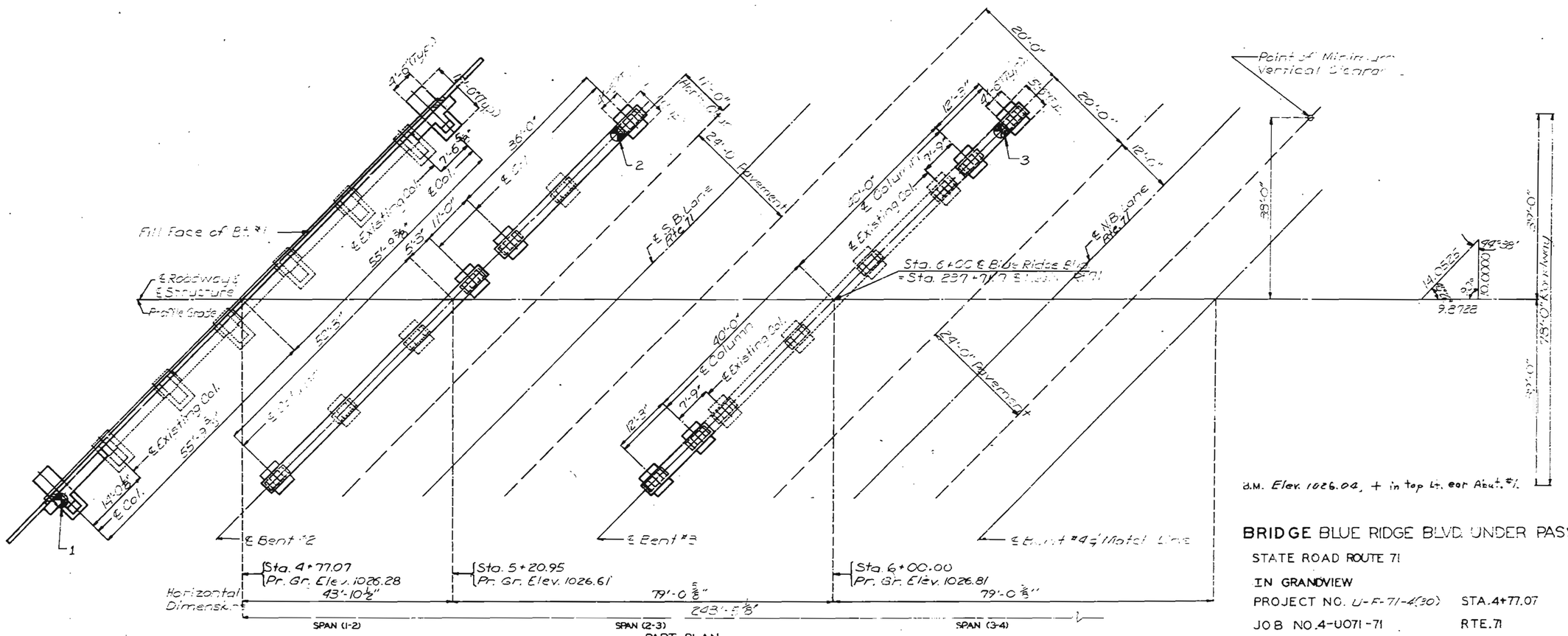
(41.5'-79'-79'-39') CONT. COMP. PL GDR. SPANS



Note: F = limits of Spread Footing see Sheet No. 30

PART GENERAL ELEVATION

Indicates location of boring. For Boring Data, see Sheet No. 3.



BRIDGE BLUE RIDGE BLVD. UNDER PASS

STATE ROAD ROUTE 71

IN GRANDVIEW

PROJECT NO. U-F-71-4(30) STA. 4+77.07

JOB NO. 4-U071-71 RTE. 71

JACKSON COUNTY

DATE 1-11-79

STD.
STD. 70635
L-929R

DETAILED DEC. 1978

CHECKED DEC. 1978

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

Sheet No. 12 of 33.

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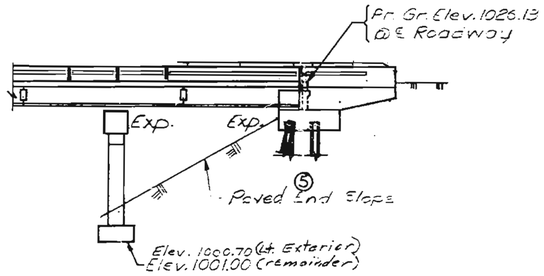
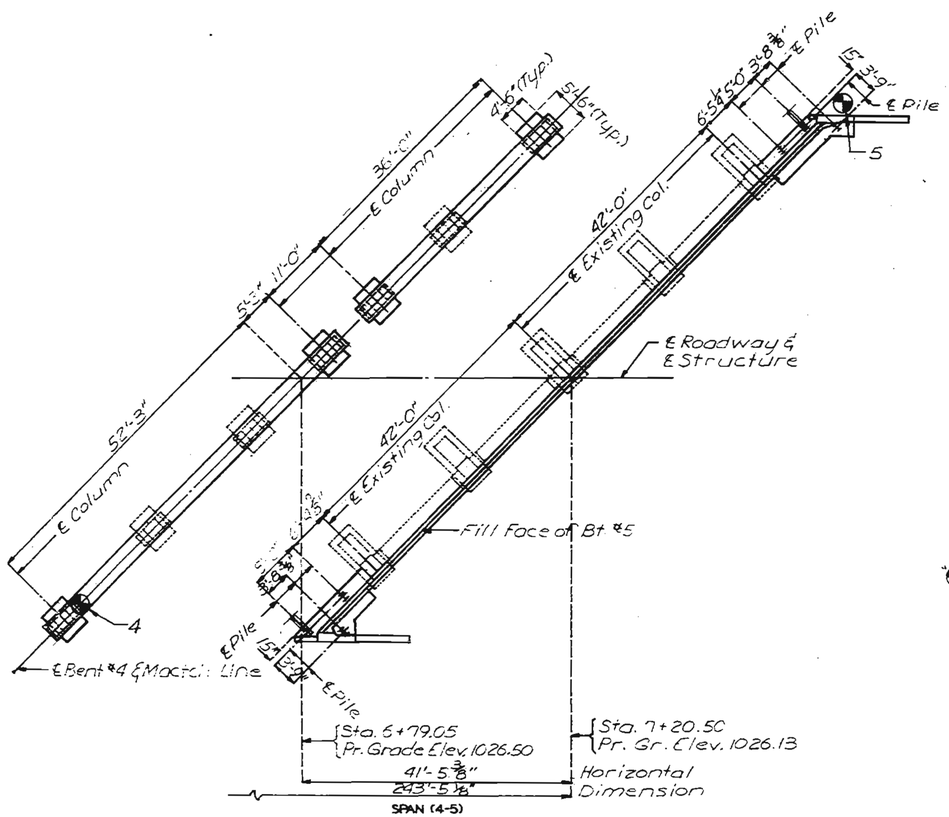
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	199	

FINAL PLANS



④
PART GENERAL ELEVATION



SPAN (4-5)
PART PLAN

QUANTITIES

ITEM		SUBSTR	SUPERSTR	TOTAL
Removal of Exist. Bridge Superstructure	Lump Sum		1	1
Class I Excavation	Cu.Yd.	199.0		199.0
Structural Steel Pile (10")	Lin.Ft.	100		100
Class B Concrete	Cu.Yd.	267.4		267.4
Class B1 Concrete	Cu.Yd.		604.3	604.3
Elastomeric Exp. Jt. Seal (2")	Lin.Ft.		220	220
Reinforcing Steel (Grade 60)	LBS.	42,160	58,010	100,170
Reinforcing Steel (Grade 60 X Epoxy Coated)	Lbs.		70,040	70,040
Fabricated Structural Carbon Steel	Lbs.		425010	425010
Type N Elastomeric Bearings	Ea.		48	48
Painting (System: A or B) Aluminum	Ton		209.6	209.6
Bridge Guard Rail (One Tube)	Lin.Ft.		502	502
Cleaning Existing Bearings	Ea.		8	8
Conduit System on Structure	Lump Sum			1
Protective Coating for Bents	Lump Sum	1		1
Special Work	Lump Sum			1
Substructure Repair	Sq. Ft.	221		221
Temporary Traffic Barrier (Bridges)	Lin. Ft.		244	244
CONTINGENT ITEMS				
CLASS I EXC. (BELOW PLAN ELEV.) 125%	Cu. Yds.	11.0		11.0
CREVICE CONCRETE	Cu. Yds.	0.1		0.1
TEST HOLES	Lin. Ft.	58		58

PILE & FOOTING DATA*

	BENT NO.	1	2	3	4	5
BEARING PILE	Pile Type and Size					HP10x42
	Number					6
	Approximate Length Ft.					17
	Design Bearing Tons					30
	Hammer Energy req'd Ft.Lbs					8000
SPREAD FOOTINGS	Foundation Material	Rock	Rock	Rock	Rock	
	Design Bearing Tons/Sq. Ft.	4.9	5.0	5.0	5.0	

Minimum energy requirement of hammer based on plan length and design bearing value of piles.
All pile were driven to practical refusal.

Note: A minimum vertical clearance of 14'-0" from crown of Existing lanes and a minimum lateral clearance of 28'-0" centered on existing lanes maintained during construction.

Indicates location of boring.
For boring Data, see Sheet No. 3

GENERAL NOTES:
Design Specifications: A.A.S.H.T.O.-1973 Load Factor Design Superstructure

Design Loading:
HS20-44
15#/sq. ft. Future Wearing Surface
Modified 24,000# Tandem Axle
Earth 120#, Equivalent Fluid Pressure 30#
Fatigue Stress - Case I 1974 Interim

Design Unit Stresses:
Class B Concrete (substructure) fc = 1200
Reinforcing Steel (Grade 60) fy 60,000 psi
Structural Carbon Steel fy = 36,000 psi
Steel Pile fb = 9,000 psi

Fabricated Steel:
Field connections, High Strength Bolts 3/4"ø, holes 13/16" ø except as noted.

Paint: System B by contractor in accordance with Std. Spec. 712.12. (Color of the final field coat for System B was aluminum).

Miscellaneous:
Traffic over structure was maintained during construction.
Minimum clearance to reinforcing steel is 1½" unless otherwise shown.
Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.
Bars bonded in old concrete not removed were cleanly stripped and embedded into new concrete where possible. If length available, old bars were extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars.
Contractor did verify all dimensions in field before ordering new steel.
Anchors was of the self drilling expansion type, made of casehardened and drawn carburized steel, with self-cutting annular broaching grooves.
Cost of furnishing and installing hook anchor bolt assemblies was included in price bid for concrete.

All reinforcing bars in tops of substructure beams or caps spaced to clear anchor bolts for bearings by at least ½".
For Protective Coating of Bents See Special Provisions.

DETAILED DEC. 1978
CHECKED DEC. 1978

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

Sheet No. 2 of 33.

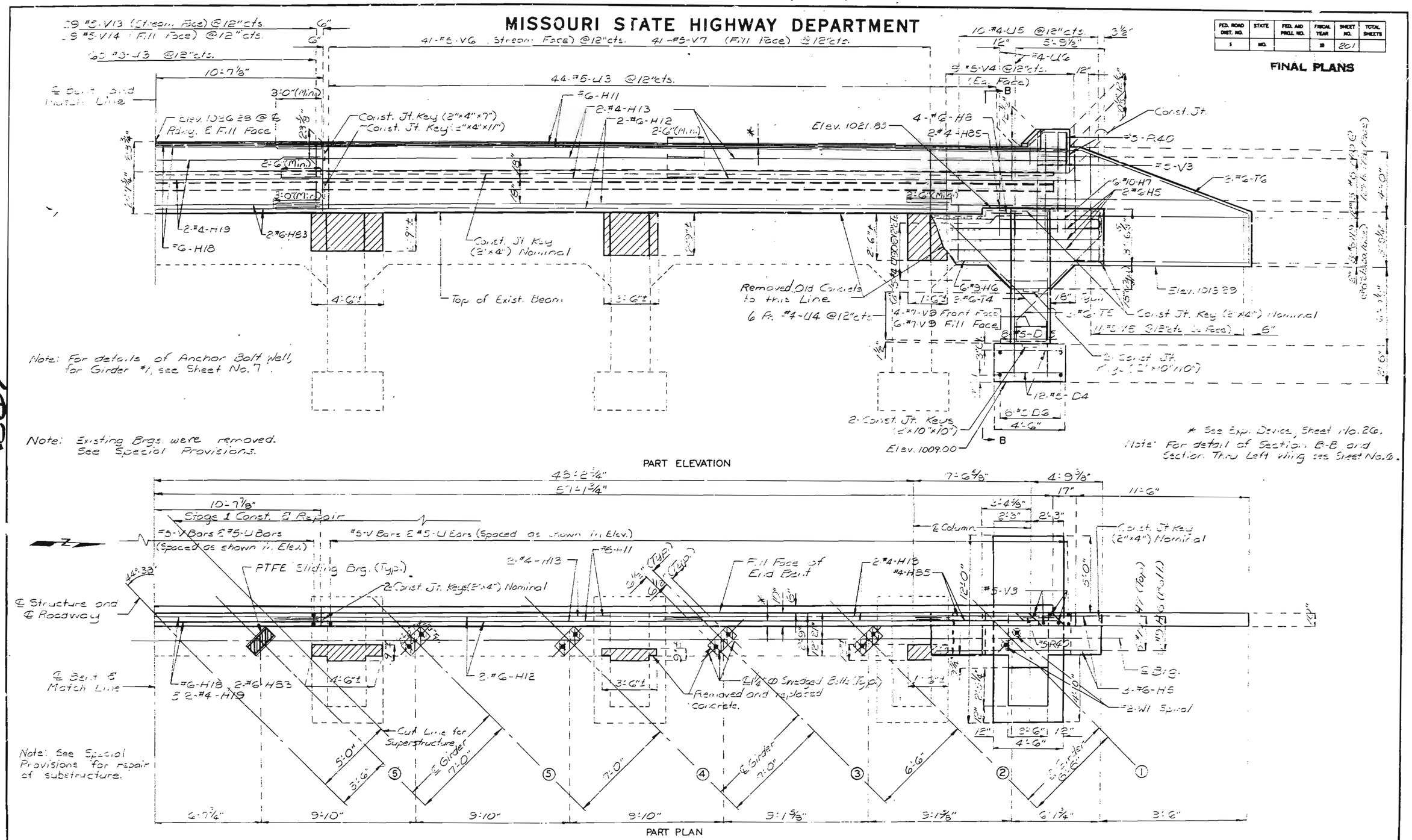
JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	201	

FINAL PLANS



DETAIL OF END BENT NO.1

DETAILED Nov. 1978
CHECKED Dec. 1978

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

Sheet No. 4 of 33.

JACKSON COUNTY

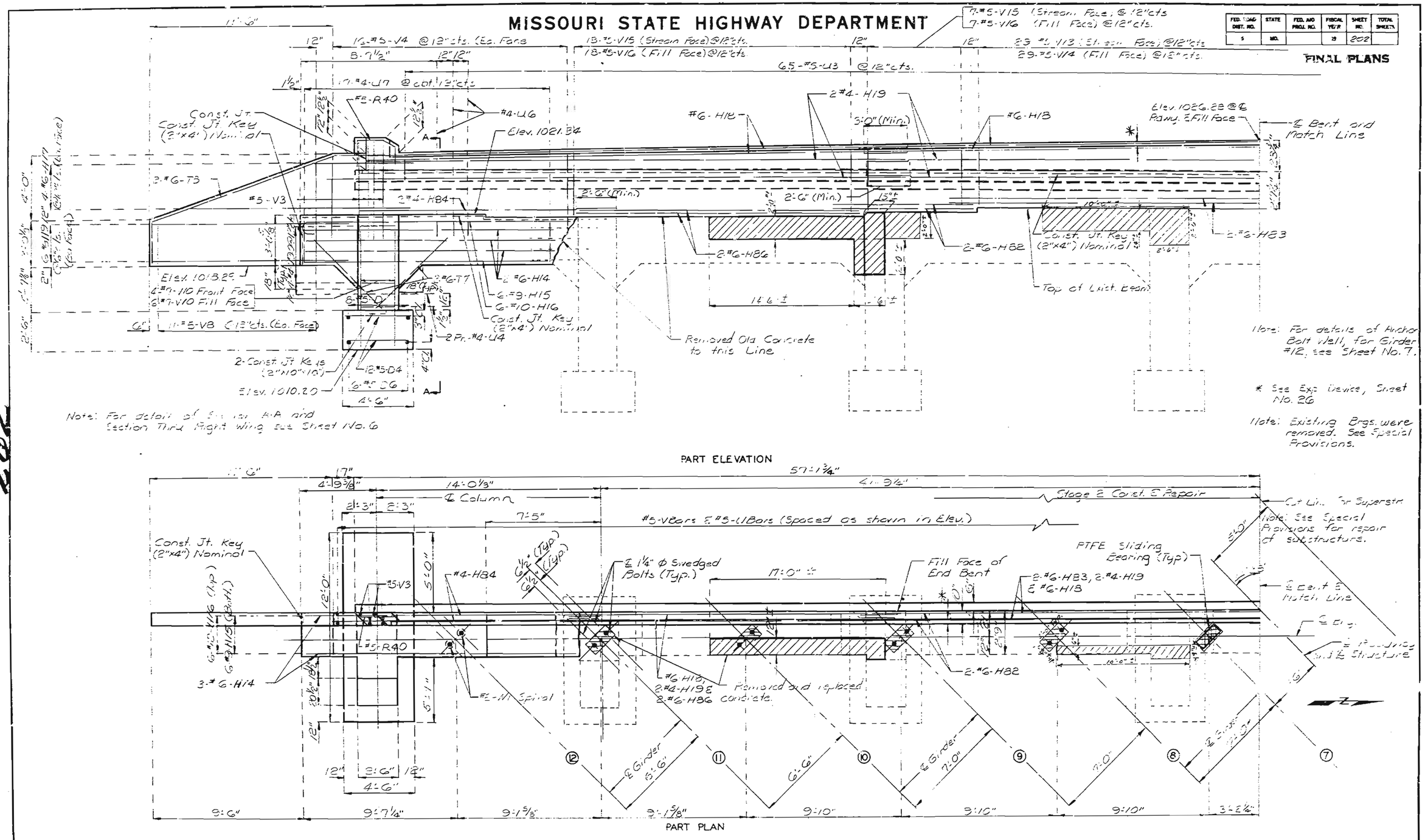
L-929R

201

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	202	

FINAL PLANS



Note: For details of Section A-A and Section Third Right Wing see Sheet No. 6

Note: For details of Anchor Bolt Well, for Girder #12, see Sheet No. 7.

* See Exp. Device, Sheet No. 26

Note: Existing Brgs. were removed. See Special Provisions.

Note: See Special Provisions for repair of substructure.

DETAIL OF END BENT NO. 1

DETAILED Nov. 1978
CHECKED Dec. 1978

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

Sheet No. 5 of 33.

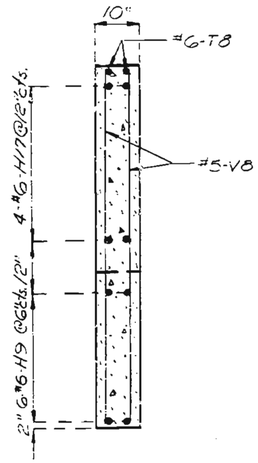
JACKSON COUNTY

L-929R

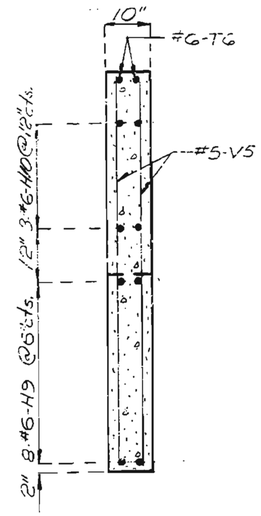
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	203	

FINAL PLANS



SECTION THRU
RIGHT WING

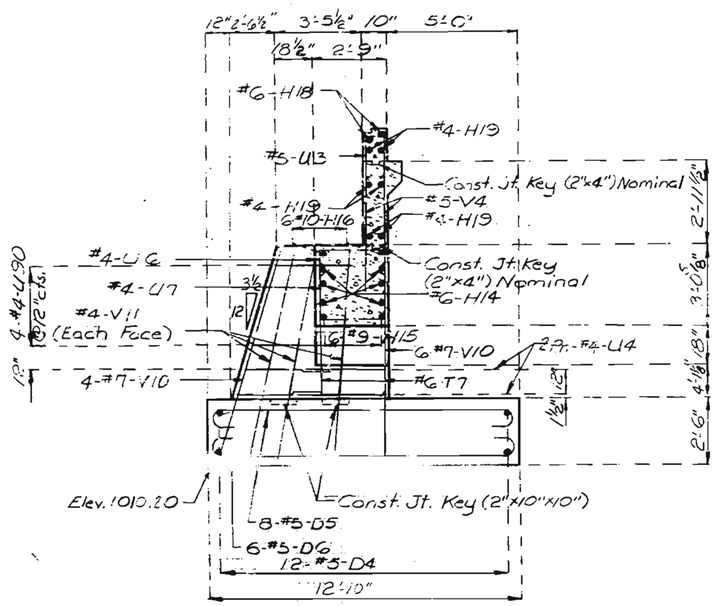


SECTION THRU
LEFT WING

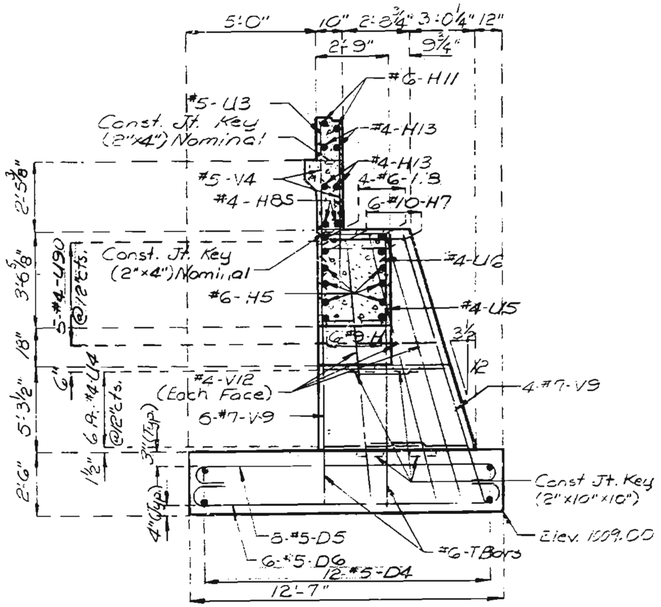
Note: For location of Section A-A see Sheet No. 5

Note: For location of Section B-B see Sheet No. 4 .

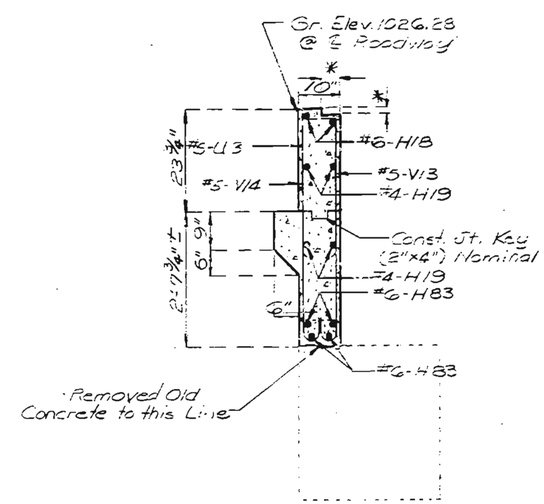
* See Exp. Device, Sheet No. 26.



SECTION A-A



SECTION B-B



SECTION THRU BENT
AT ℄ BENT

DETAIL OF END BENT NO. 1

DETAILED Nov. 1978
CHECKED Dec. 1978

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

Sheet No. 6 of 33.

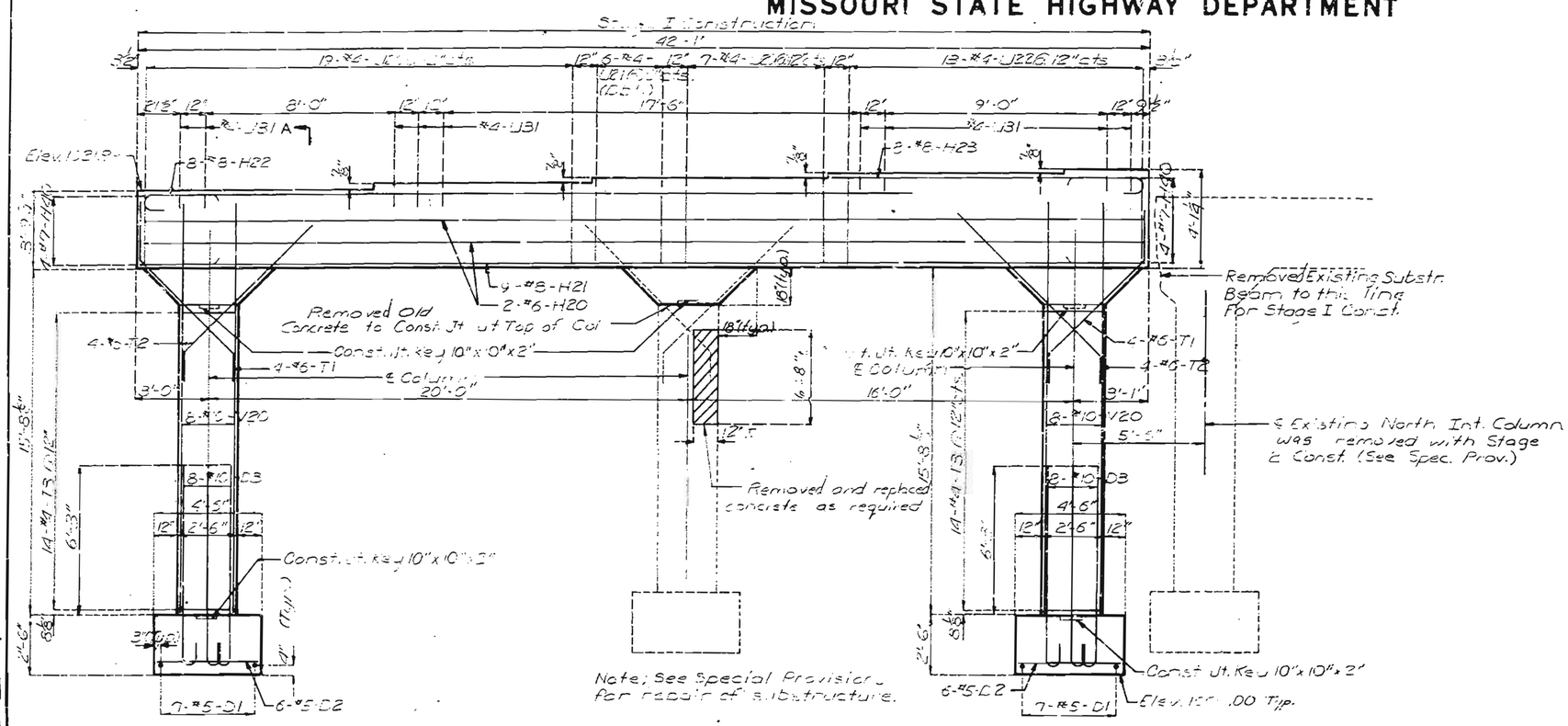
JACKSON COUNTY

L-929R

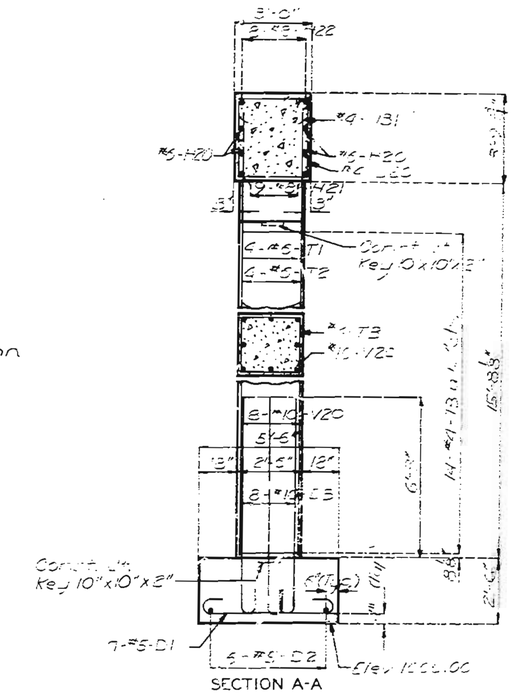
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	204	

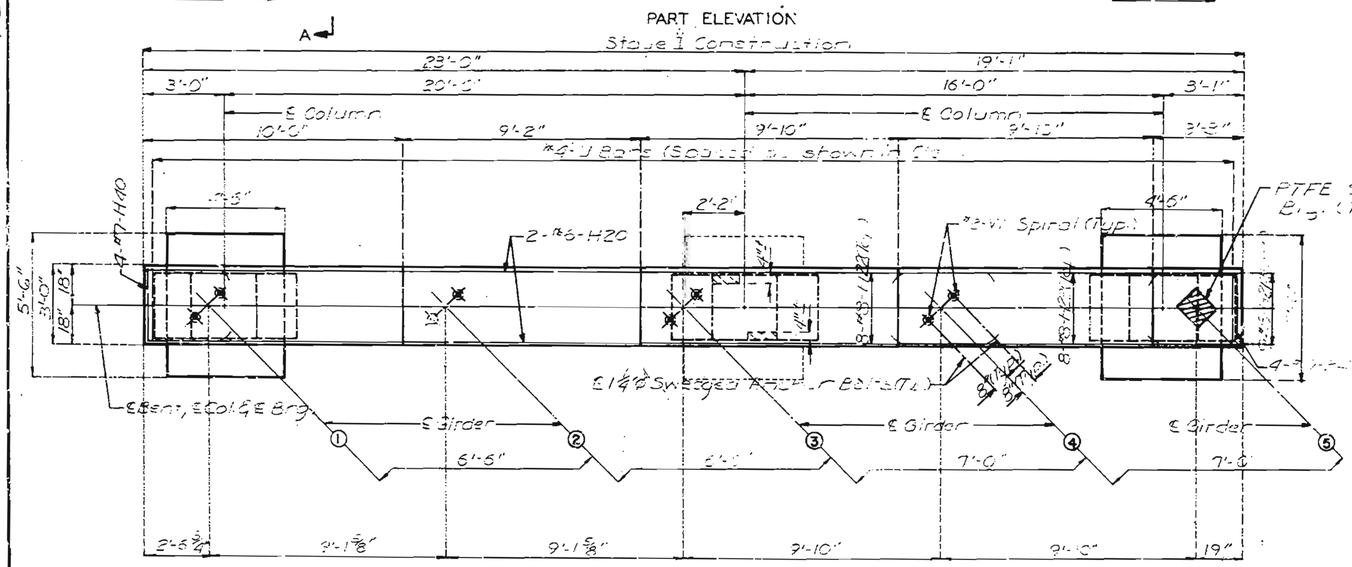
FINAL PLANS

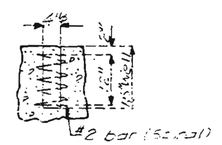


PART ELEVATION



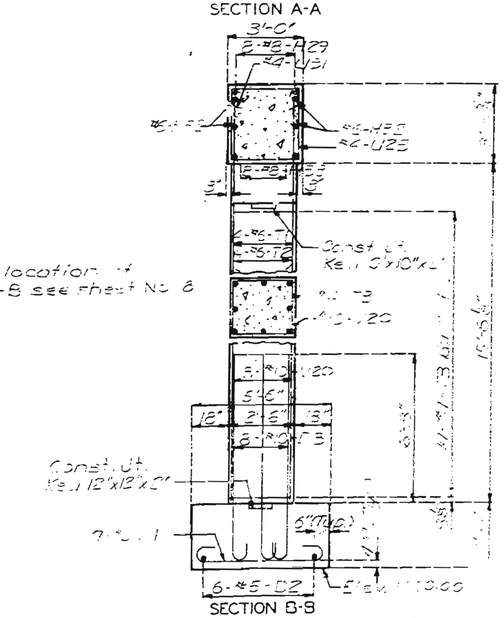
SECTION A-A





DETAIL OF ANCHOR BOLT WELLS

Note: For location of Section B-B see Sheet No. 8



SECTION B-B

DETAILS OF INT. BENT NO. 2

DETAILED DEC. 1978
CHECKED DEC. 1978

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

Sheet No. 7 of 35.

JACKSON COUNTY

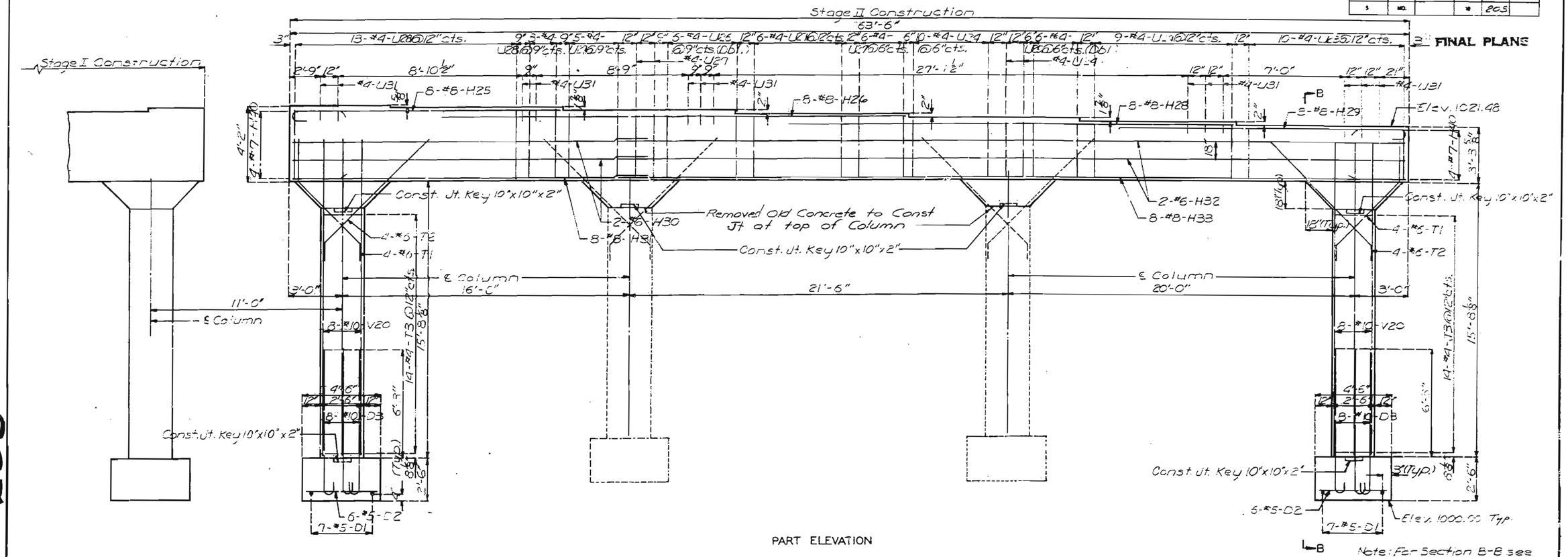
L-929R

204

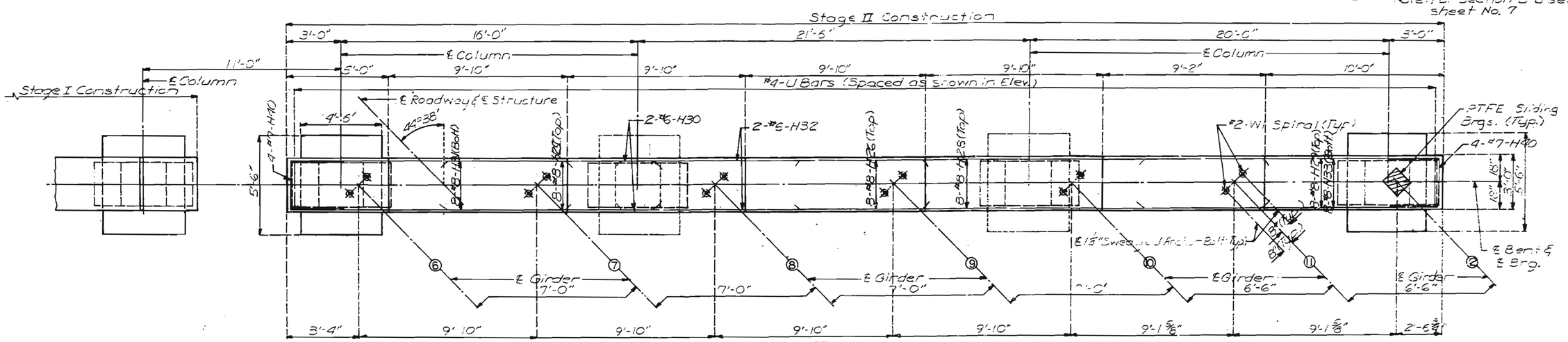
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	205	

FINAL PLANS



PART ELEVATION



PART PLAN

DETAILS OF INT. BENT NO. 2

DETAILED DEC. 1978
CHECKED DEC. 1978

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

Sheet No. 8 of 33.

JACKSON COUNTY

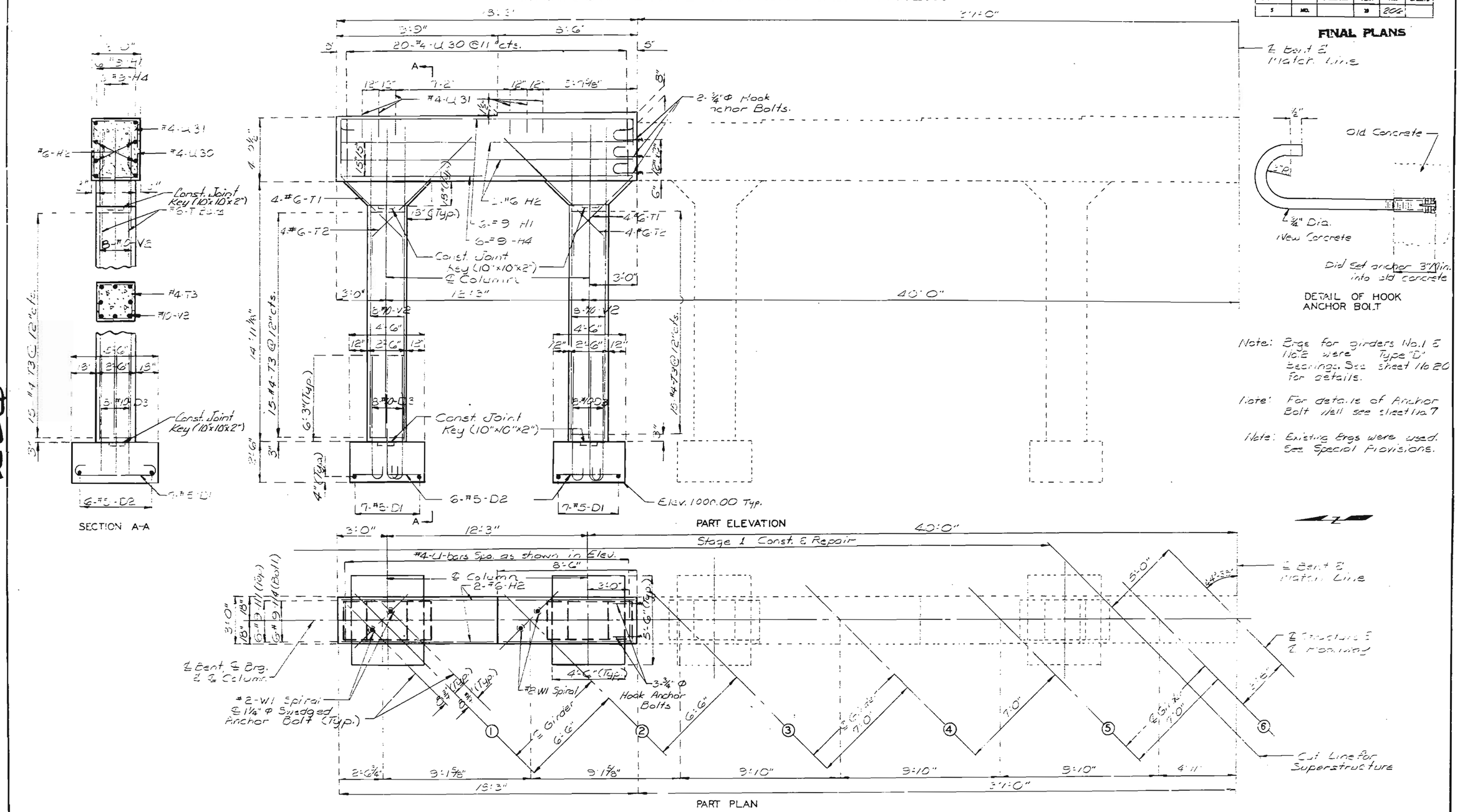
L-929R

205

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	204	

FINAL PLANS



DETAILS OF INT. BENT NO. 3

DETAILED Oct. 1978
CHECKED Nov. 1978

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

Sheet No. 94 of 93.

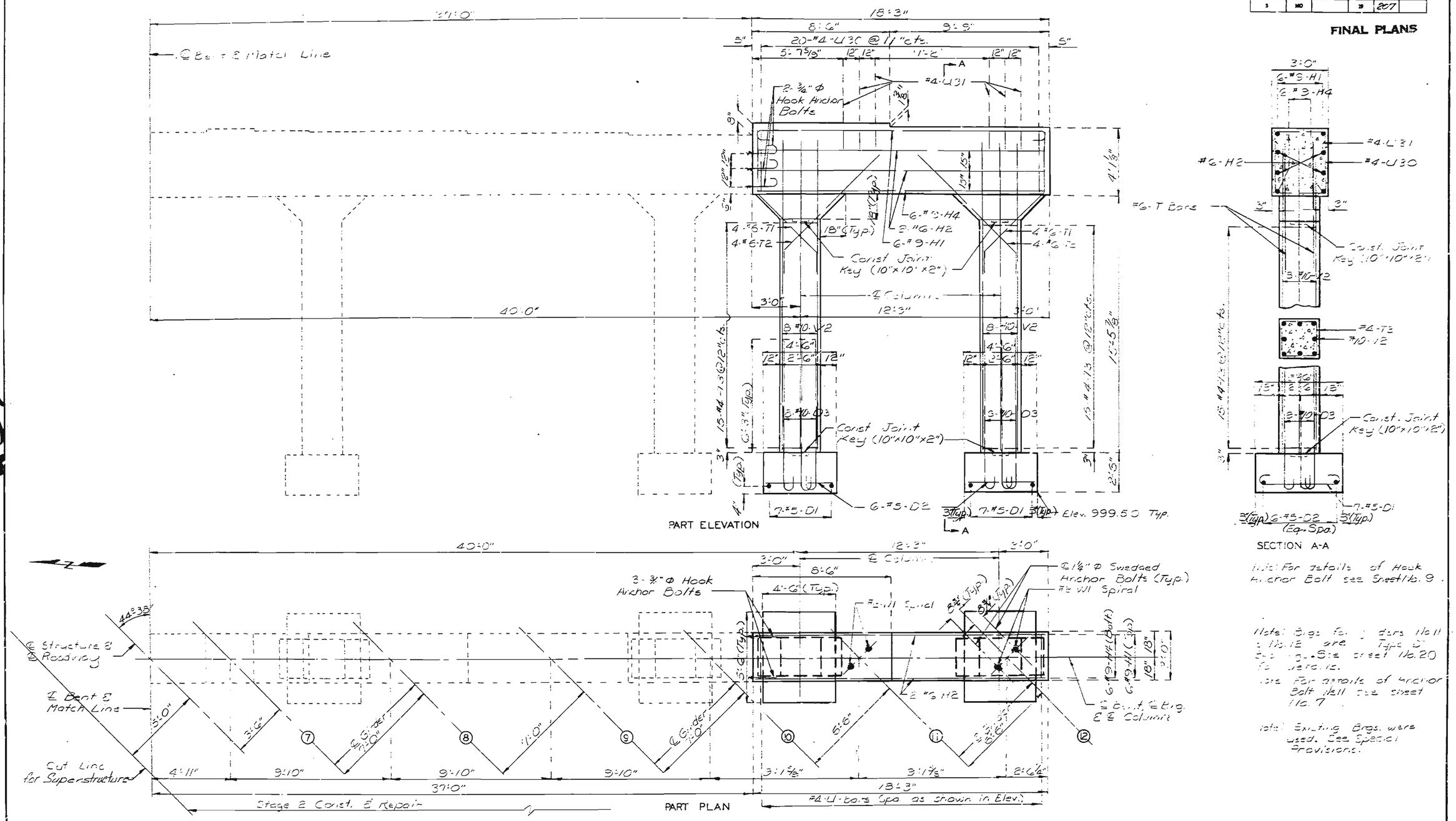
JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO		19	207	

FINAL PLANS



DETAILS OF INT. BENT NO. 3

DETAILED Oct. 1978
CHECKED Nov. 1978

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

Sheet No. 10 of 33.

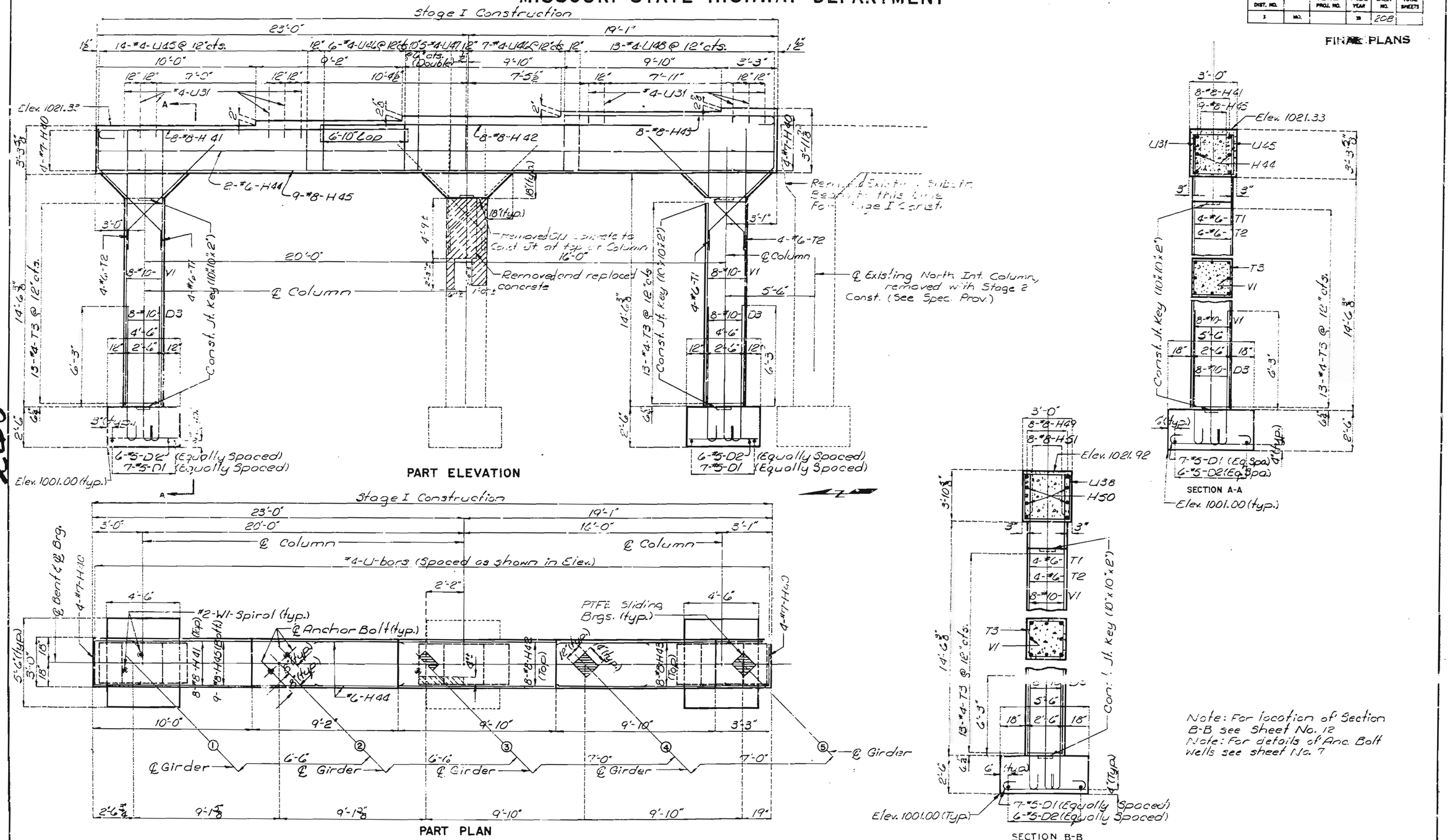
JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	208	

FINAL PLANS



DETAILED Dec. 19 78
CHECKED Dec. 19 78

DETAILS OF INT. BENT NO. 4

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

Sheet No. 112 of 33.

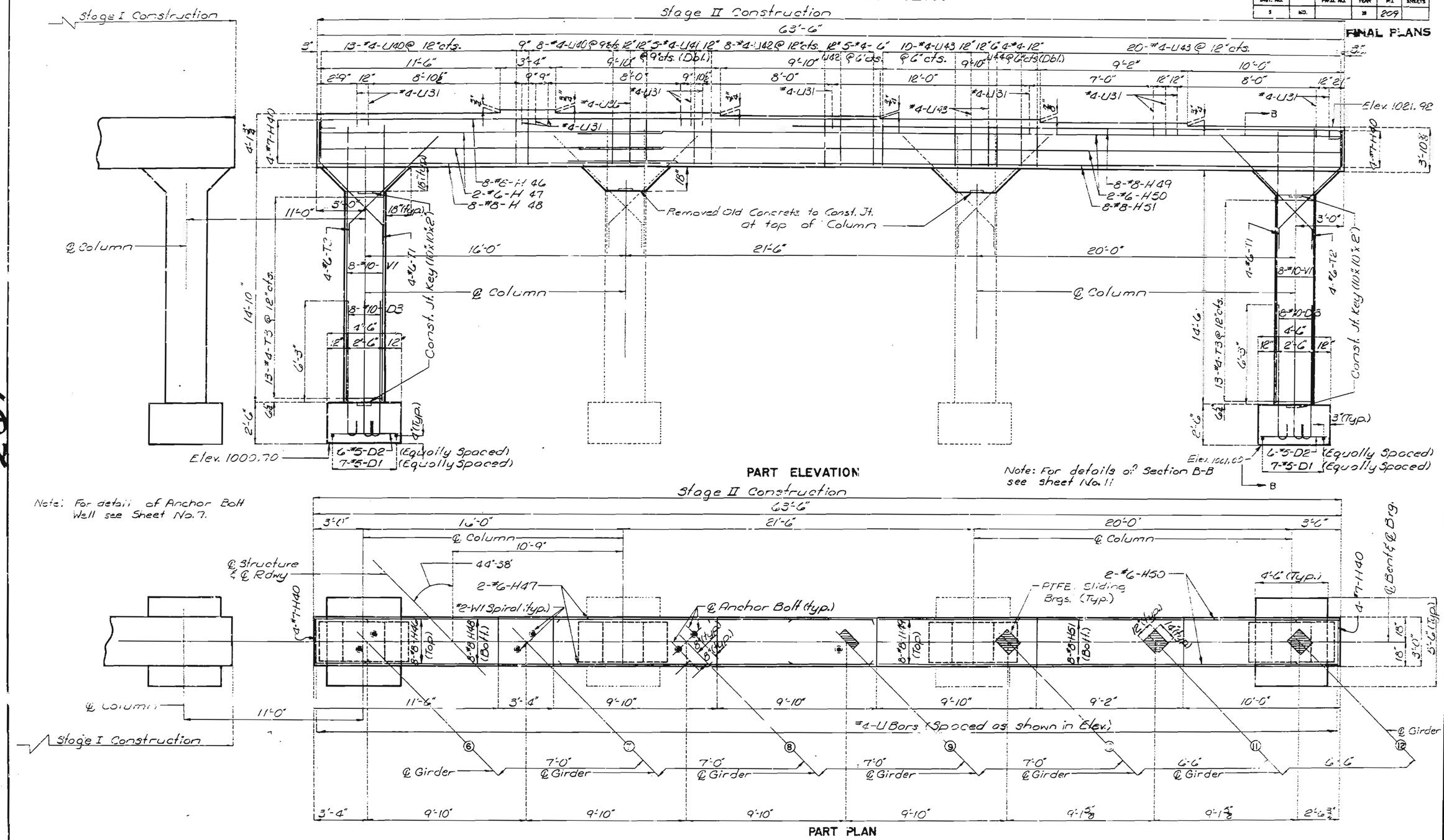
JACKSON COUNTY

L-929R

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	209	

FINAL PLANS



DETAILED Dec. 19 78
CHECKED Dec. 19 78

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

DETAILS OF INT. BENT NO. 4

Sheet No. 12 of 33

JACKSON COUNTY

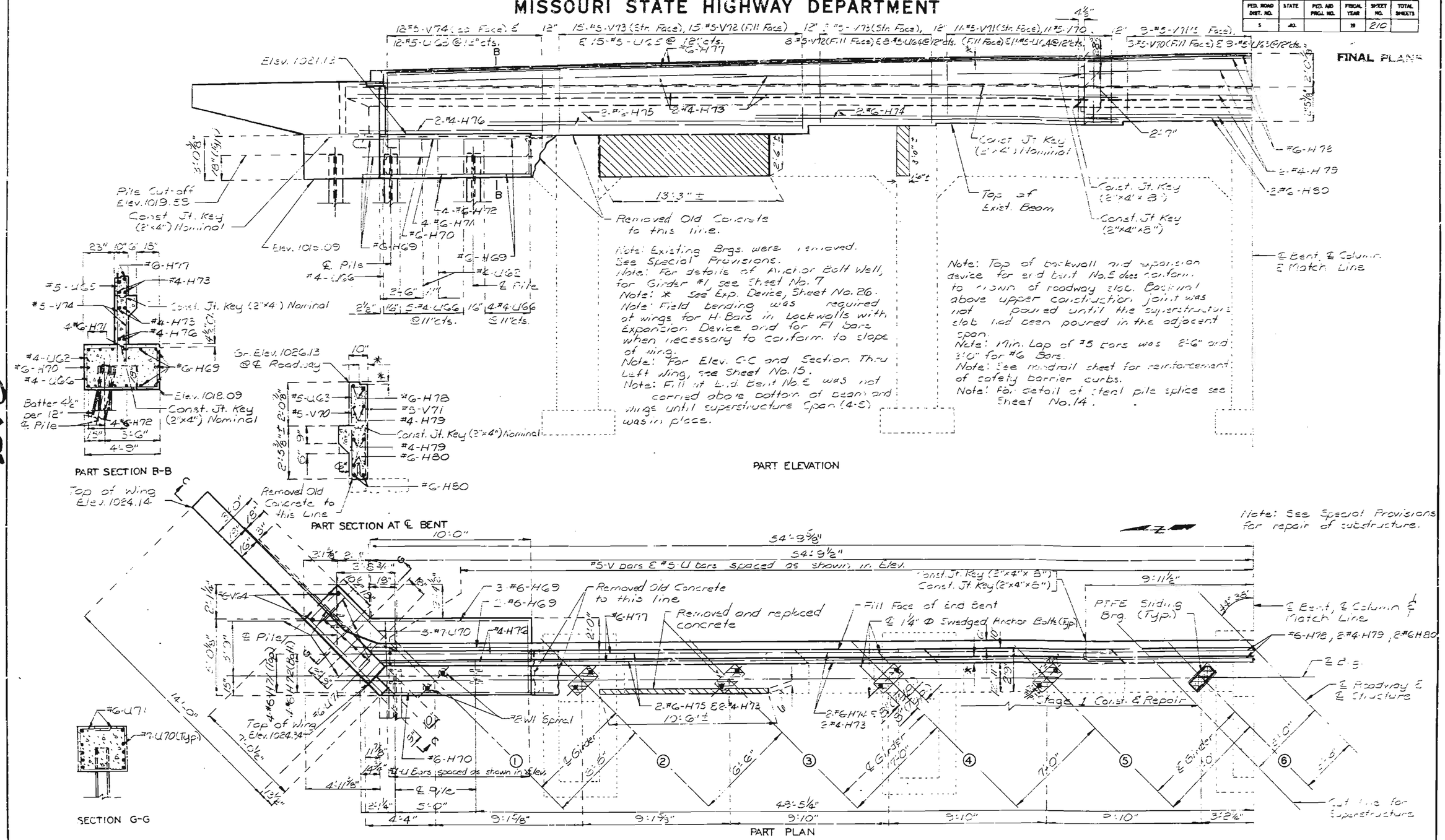
L-929R

209

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	210	

FINAL PLANS



DETAILS OF END BENT NO. 5

DETAILED Dec. 1979
CHECKED Dec. 1979

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

Sheet No. 13 of ...

JACKSON COUNTY

L-929 R

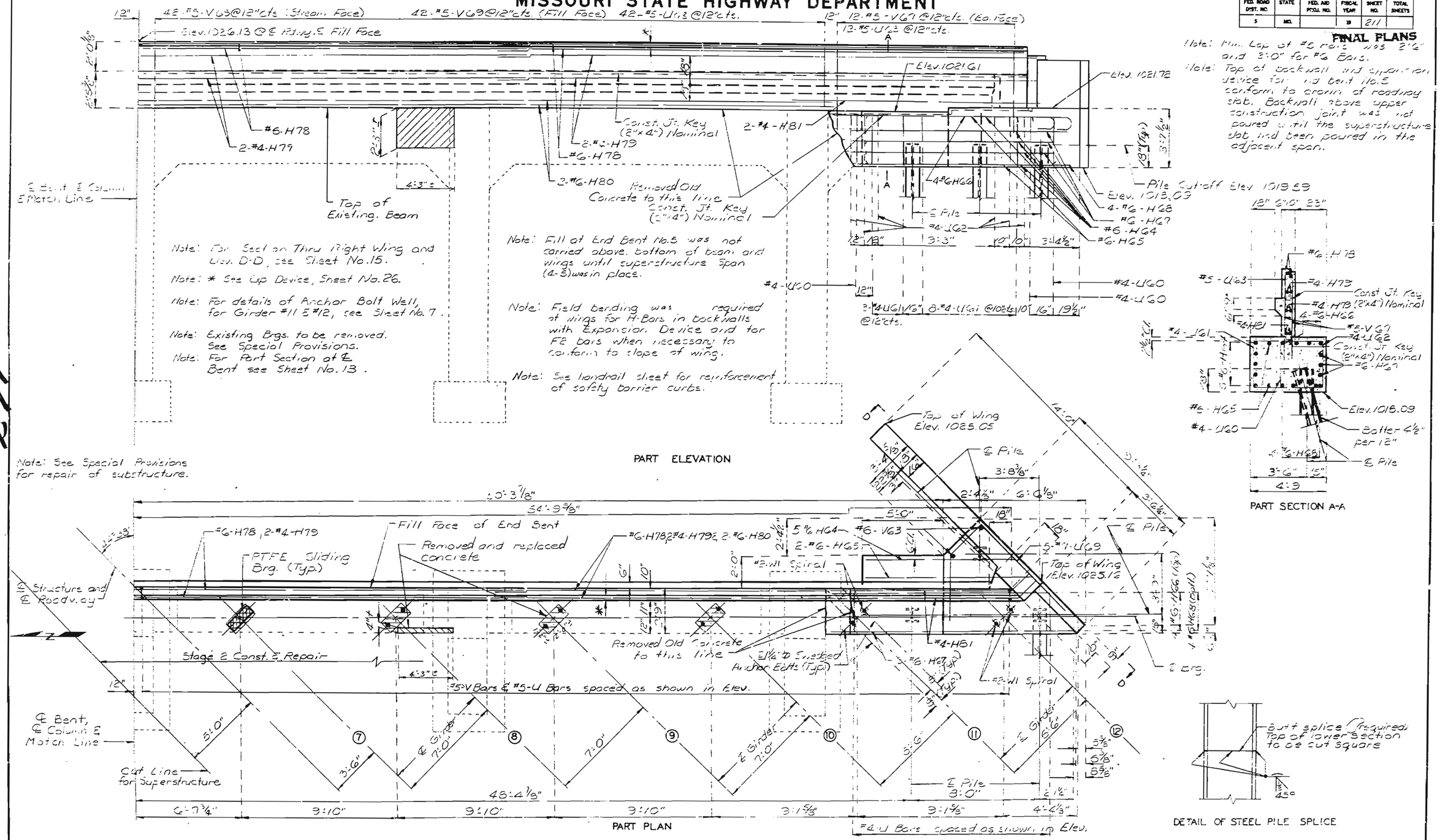
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	211	

FINAL PLANS

Note: Min. Lap of #5 rebars was 2'6" and 3'0" for #6 Bars.

Note: Top of backwall and expansion device for end bent No.5 conform to crown of roadway slab. Backwall above upper construction joint was not poured until the superstructure slab had been poured in the adjacent span.



DETAILS OF END BENT NO.5

DETAILED Dec. 1978
CHECKED Dec. 1978

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

Sheet No. 141 of 33.

JACKSON COUNTY

L-929R