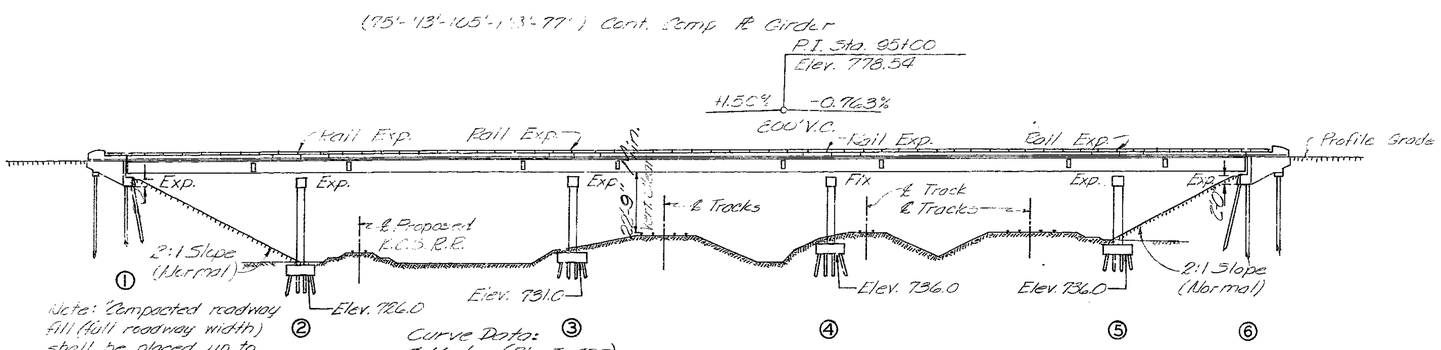
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	48	

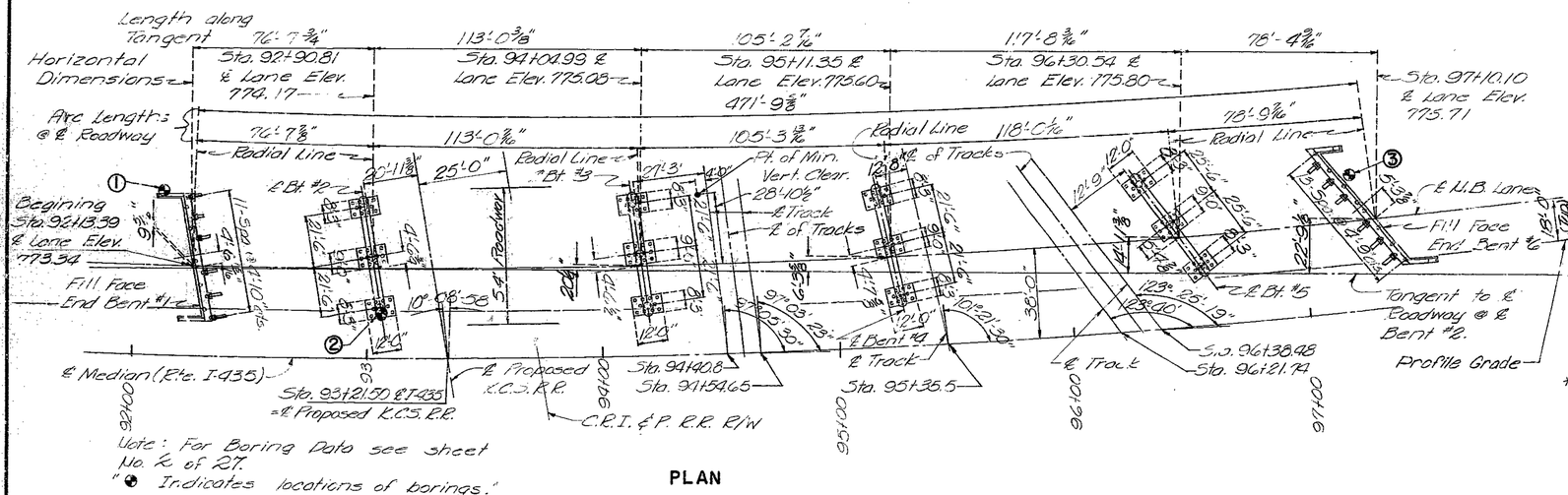


ELEVATION

Note: "Compacted roadway fill (full roadway width) shall be placed up to elevation of bottom of concrete beam in front of and not less than 25'0" in back of End Bents before piles are driven. 'Bents No. 1 & 6. Where holes thru compacted fill for piles at Bents No. 1 & 6. Cost for preboring and back-filling shall be included in unit price bid for piles in place.

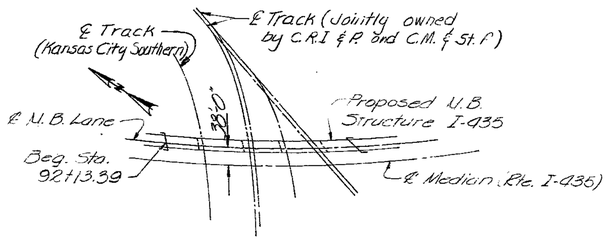
Curve Data:
℄ Median (Rte. I-435)
P.I. - 85+18.13
Δ - 20°-56' Lt.
D - 1°-30'
T. - 1425.64'
L. - 2728.89'
R. - 3819.83'
S.E. - .041' (60 M.P.H.)
(Chord Definition)

Note: No payment for excavation will be allowed at End Bents No. 1 & 6.



Note: For Boring Data see sheet No. 2 of 27.
"● Indicates locations of borings."

PLAN



LOCATION SKETCH

GENERAL NOTES

DESIGN SPECIFICATION:
A.A.S.H.O. - 1965

DESIGN LOADING:
H S 20-44 Military Loading
(15 #/sq. ft. Future Wearing Surface)
Earth - 120# Equivalent Fluid Pressure 30#
Fatigue Divis 2.0-66 Formulae 13b & 16b

DESIGN UNIT STRESSES:
Class B Concrete (Substructure) f_c = 4,200 p.s.i.
Class B1 Concrete (Superstructure) f_c = 4,600 p.s.i.
Reinforcing Steel f_s = 20,000 p.s.i.
Structural Steel (A.S.T.M. A36-66) f_s = 20,000 p.s.i.

SURFACE SEAL:
Superstructure deck to be surface sealed.

FABRICATED STEEL:
Field connections, High Strength Bolts 7/8" Ø, holes 1 3/16" Ø except as noted.

PAINTING:
Paint: Shop, none: Field, by contractor in accordance with Std. Spec. 554.10.

CONSTRUCTION CLEARANCE:
A minimum vertical clearance of 21'6 from top of rails and a minimum lateral clearance of 25'-0" centered on tracks shall be maintained during construction.

WELDING:
Details of welded joints shown are for manual arc welding except as noted.
The minimum size of fillet welds shall be in accordance with AWS D2.0-66, Article 217(b) except the minumum size fillet weld connecting parts carrying primary stress shall be 1/4".

PILE DATA

BENT NO.	1	2	3	4	5	6
Type	Foundation	Foundation	Foundation	Foundation	Foundation	Foundation
Kind	C.I.P. 14"	C.I.P. 14"	C.I.P. 14"	C.I.P. 14"	C.I.P. 14"	C.I.P. 14"
Number	14	32	33	33	33	16
Approximate Length Ft.	80	40	45	50	50	80
Design Bearing Tons	30.0	29.8	29.7	29.7	29.7	29.1
Min. Tip Penetration Elev.	691.0	710.0	710.0	710.0	710.0	691.0
Pile *Standard	52.02	52.02	52.02	52.02	52.02	52.02
Hammer Energy Req. Ft. Lbs.	8,000	8,000	8,000	8,000	8,000	8,000

*Note: See Special Provisions for optional use of Precast Concrete, Prestressed Concrete, or 15" Treated Timber piles on interior bents only. Minimum hammer energy required for Precast Concrete piles, or Prestressed Concrete piles is 8,000 Ft. Lbs., except at Bents No. 4 & No. 5 where the Minimum hammer energy is 8,300 Ft. Lbs.

ESTIMATED QUANTITIES.

	ITEM		SUBSTR.	SUPERSTR.	TOTAL
	Class 1 Excavation for Structures	Cu. Yds.	470		470
*	Cast-in-Place Concrete Piles	Lin. Ft.	8,420		8,420
	Class B Concrete	Cu. Yds.	453.2		453.2
	Class B1 Concrete	Cu. Yds.		752.0	752.0
	Reinforcing Steel	Lbs.	37,940	245,920	343,860
	Painting	Tons		303	303
	Fabricated Structural Carbon Steel	Lbs.		609,830	609,830
	Bridge Rail (Simple Tube Type)	Lin. Ft.		1,011	1,011
	Conduit System (On Structure)	Lump Sum			1

Note: No payment for excavation will be allowed at End Bent No. 1 and 6.
All concrete and reinforcement in end posts, parapets and curbs is included with superstructure quantities.

B.M. #6 Elev. 731.75. Bolt in P.P. 183' Rt. Sta. 98+67.

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & S.T.P. R.R.S.

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435)STA. 92+13.39 N. B. L.

JACKSON COUNTY

SUBMITTED BY W. A. Carne, BRIDGE ENGINEER DATE Feb 23, 1968

APPROVED BY M. J. Snider, CHIEF ENGINEER DATE Feb. 23, 1968

STD. 52.01
STD. 52.02
STD. 54.00
A-2249

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED J. Carter
DESIGN CK. D. Albert	DETAIL CK. C. Page

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

Sheet No. 1 of 27.

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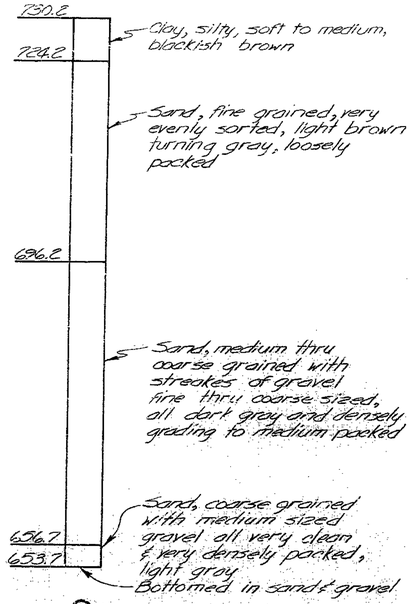
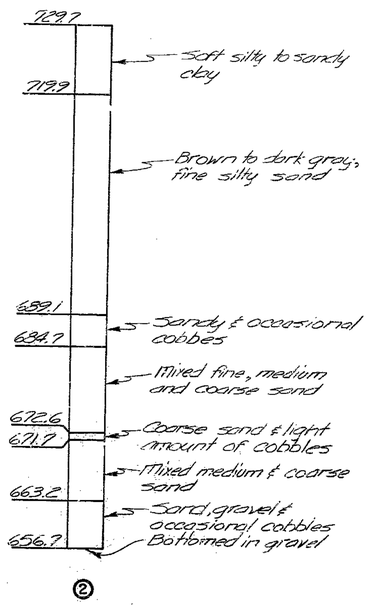
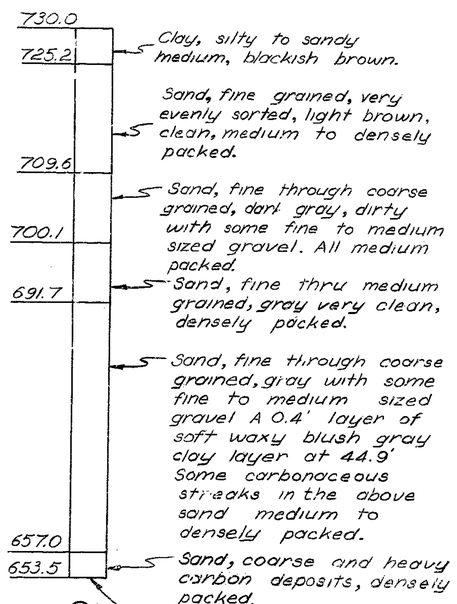
MISSOURI STATE HIGHWAY DEPARTMENT

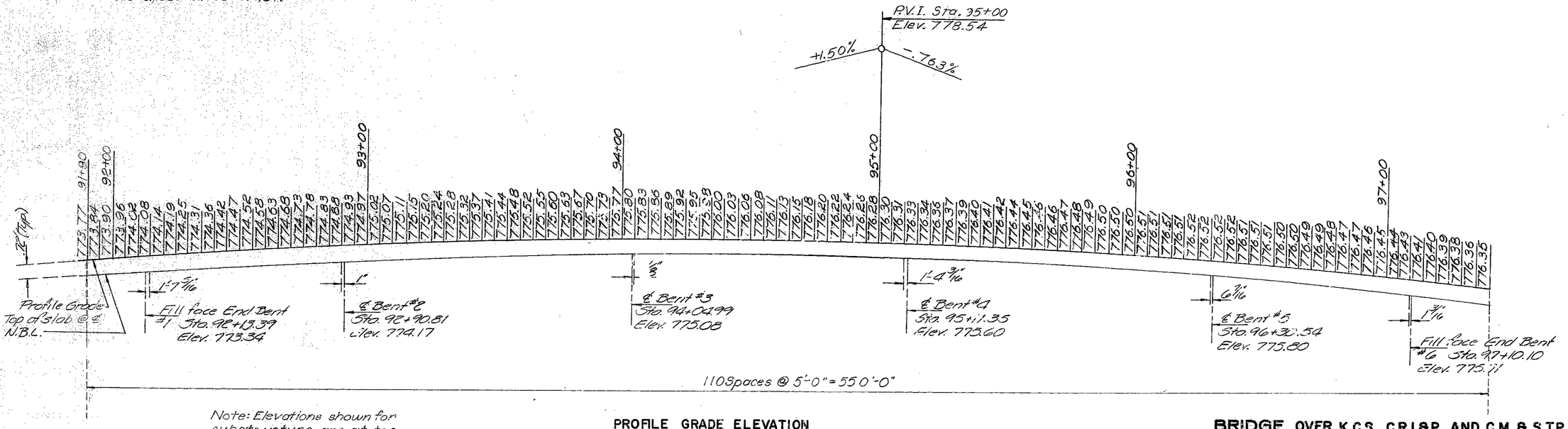
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	49	



Note:
For location of borings see sheet No. 1 of 27.







Note: Elevations shown for substructure are at top of slab along ℄ N.B. Lane. All elevations on N.B. Lane are .72' lower than the elevation at the same station on profile grade.

PROFILE GRADE ELEVATION
(and top of Slab @ ℄ N.B. Lane.)

BRIDGE OVER K.C.S., C.R.I.&P. AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. IG-435-1(52)(RTE. I-435) STA. 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED J. Phillips | DETAILED C. McDavell

DESIGN CK. R.S. Latham | DETAIL. CK. J. Kettler

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

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	50	

BILL OF REINFORCING STEEL

NO.	SIZE	LENGTH	MARK	LOCATION
END BENT NO. 1.				
12	5	4'-3"	D101	Footing
16	4	2'-9"	D102	"
8	4	10'-0"	D103	"
				"
16	7	30'-6"	H104	"
4	6	29'-0"	H105	"
				"
4	6	28'-9"	H107	Backwall
16	4	28'-9"	H108	"
4	6	14'-9"	H109	Wing
12	6	9'-3"	H110	"
12	4	8'-0"	H111	"
7	6	7'-0"	H113	Wing
7	6	6'-3"	H114	"
6	7	24'-9"	H115	"
4	6	19'-6"	T101	Wing
4	6	11'-9"	T102	"
46	9	12'-3"	U101	Beam
2	4	12'-6"	U108	"
18	4	4'-0"	U109	"
12	6	2'-9"	U110	"
12	7	14'-0"	U111	"
6	7	6'-3"	U112	"
114	5	8'-3"	V101	Backwall
4	4	10'-3"	V102	"
28	4	12'-6"	V103	Wing
4	4	7'-6"	V104	
12	2	19'-9"	W1	A.B.Wells
BENT NO. 2.				
4	9	21'-6"	D201	Footing
16	9	11'-9"	D202	"
8	10	11'-9"	D203	"
16	7	8'-0"	D204	"
2	11	22'-3"	D205	"
8	7	8'-9"	D206	"
60	11	7'-3"	D207	"

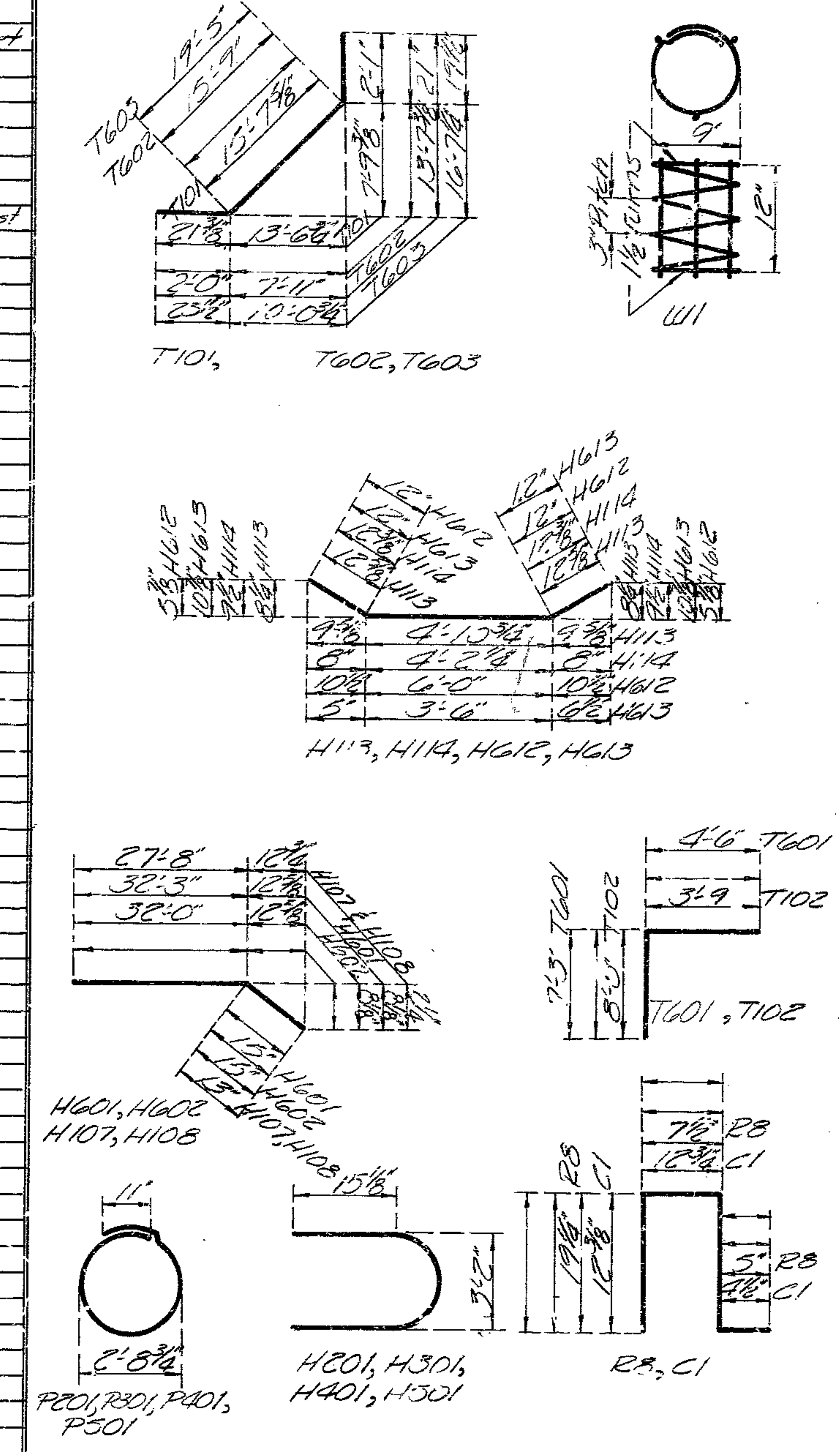
NO.	SIZE	LENGTH	MARK	LOCATION
BENT NO. 2. (CONT'D)				
10	7	7'-3"	H201	Beam
5	11	14'-6"	H202	"
4	10	14'-3"	H203	"
7	11	13'-0"	H204	"
2	10	13'-0"	H205	"
10	10	12'-9"	H206	"
9	9	7'-0"	H207	"
2	9	8'-9"	H208	"
4	9	9'-9"	H209	"
3	9	10'-3"	H210	"
6	6	26'-3"	H211	"
2	6	19'-0"	H212	"
14	11	28'-3"	H213	"
4	9	28'-3"	H214	"
102	3	9'-6"	P201	Column
14	5	14'-3"	U200	Beam
20	6	14'-0"	U201	Beam
14	6	14'-9"	U202	"
40	5	13'-6"	U203	"
6	6	16'-6"	U204	"
5	6	17'-3"	U205	"
8	6	18'-0"	U206	"
2	4	3'-6"	U207	"
2	4	4'-0"	U208	"
5	4	4'-3"	U209	"
60	11	36'-6"	V201	Column
12	2	19'-9"	W1	A.B.Wells
BENT NO 3.				
58	11	7'-3"	D301	Footing
16	9	11'-9"	D302	"
8	7	8'-9"	D303	"
2	11	22'-9"	D304	"
16	7	8'-0"	D305	"
4	9	21'-6"	D306	"
8	10	11'-9"	D307	"
10	7	7'-6"	H301	Beam
5	11	14'-6"	H302	"
10	10	12'-6"	H303	"
9	11	12'-9"	H304	"
9	9	6'-6"	H305	"
3	9	10'-9"	H306	"
2	9	10'-6"	H307	"
2	9	9'-3"	H308	"
16	6	25'-9"	H309	"
2	6	15'-6"	H310	"
2	6	12'-3"	H311	"
17	11	26'-6"	H312	"
2	9	10'-3"	H313	"
4	10	14'-6"	H314	"
90	3	9'-6"	P301	Column
14	5	14'-3"	U300	Beam
20	6	14'-0"	U301	"
15	6	14'-9"	U302	"
38	5	13'-6"	U303	"
6	6	16'-3"	U304	"

NO.	SIZE	LENGTH	MARK	LOCATION
BENT NO. 3. (CONT'D)				
5	6	17'-3"	U305	Beam
9	6	13'-0"	U306	"
2	4	3'-6"	U307	"
2	4	4'-0"	U308	"
6	4	4'-3"	U309	"
58	11	32'-6"	V301	Column
12	2	19'-9"	W1	A.B.Wells
BENT NO. 4.				
66	11	7'-3"	D401	Footing
16	9	11'-9"	D402	"
4	9	21'-6"	D403	"
2	11	22'-3"	D404	"
9	7	8'-9"	D405	"
16	7	8'-0"	D406	"
8	11	11'-9"	D407	"
10	7	7'-6"	H401	Beam
5	11	14'-6"	H402	"
4	10	14'-0"	H403	"
14	10	12'-9"	H404	"
5	11	13'-0"	H405	"
4	10	7'-9"	H406	"
5	9	7'-9"	H407	"
2	10	9'-0"	H408	"
4	9	9'-6"	H409	"
3	9	10'-0"	H410	"
6	6	26'-6"	H411	"
10	11	28'-0"	H412	"
8	10	28'-0"	H413	"
2	6	12'-0"	H414	"
2	6	18'-6"	H415	"
78	3	9'-6"	P401	
12	5	14'-3"	U400	Beam
20	6	14'-0"	U401	"
15	6	14'-9"	U402	"
40	5	13'-6"	U403	"
7	6	16'-3"	U404	"
6	6	17'-3"	U405	"
9	6	18'-0"	U406	"
2	4	3'-6"	U407	"
2	4	4'-0"	U408	"
5	4	4'-3"	U409	"
66	11	28'-3"	V401	Column
12	2	19'-9"	W1	A.B.Wells
BENT NO. 5.				
50	11	7'-3"	D501	Footing
16	9	11'-9"	D502	"
[illegible]	7	8'-0"	D503	"
4	9	21'-6"	D504	"
8	11	11'-9"	D505	"
9	7	8'-9"	D506	"
2	11	22'-3"	D507	"

NO.	SIZE	LENGTH	MARK	LOCATION
BENT NO. 5. (CONT'D)				
10	7	7'-3"	H501	Beam
9	10	15'-6"	H502	"
10	10	14'-3"	H503	"
10	11	14'-9"	H504	"
9	9	7'-0"	H505	"
2	6	9'-6"	H506	"
2	9	10'-9"	H507	"
2	9	11'-6"	H508	"
2	9	11'-9"	H509	"
2	9	12'-0"	H510	"
1	9	12'-3"	H511	"
2	6	20'-0"	H512	"
6	6	31'-0"	H513	"
18	11	32'-0"	H514	"
75	3	9'-6"	P501	Column
21	6	15'-0"	U501	Beam
15	6	15'-9"	U502	"
23	6	16'-6"	U503	"
16	6	17'-3"	U504	"
4	6	18'-0"	U505	"
10	6	18'-9"	U506	"
2	4	3'-6"	U507	"
2	4	4'-0"	U508	"
5	[illegible]	4'-3"	U509	"
50	11	28'-0"	V501	Column
12	2	19'-9"	W1	A.B.Wells
BENT NO. 6.				
12	5	5'-0"	D601	Wing Ftg.
16	4	2'-9"	D602	"
8	4	10'-0"	D603	"
4	6	33'-6"	H601	Beam
16	4	33'-3"	H602	"
4	5	33'-9"	H610	"
16	7	34'-6"	H611	"
6	6	8'-0"	H612	"
6	6	5'-6"	H613	"
4	6	14'-9"	H614	Wing Wall
2	6	17'-9"	H615	"
20	6	12'-0"	H616	"
10	4	9'-6"	H617	"
6	7	25'-6"	H619	"
4	6	11'-9"	T601	
4	6	19'-6"	T602	

NO.	SIZE	LENGTH	MARK	LOCATION
BENT NO.6. (CONT'D)				
2	4	12'-6"	U601	Beam
53	4	12'-3"	U602	"
19	4	4'-0"	U609	"
7	7	10'-3"	U610	"
14	6	2'-9"	U611	"
14	(4) 7	14'-0"	U612	"
132	5	8'-6"	V601	Beam
28	4	12'-6"	V602	Wingwall
4	4	10'-3"	V603	"
4	4	6'-9"	V606	"
12	2	19'-9"	W1	A.B.Wells
SUPERSTRUCTURE.				
*1017 (1010)	5	3'-6"	C1	Curb
8	5	14'-9"	C2	"
6	5	26'-3"	C3	"
2	5	33'-3"	C4	"
8	6	41'-6"	C5	"
6	6	34'-6"	C6	"
4	6	33'-3"	C7	"
2	5	39'-9"	C8	"
6	5	26'-9"	C9	"
2	5	17'-9"	C10	"
6	5	26'-0"	C11	"
2	5	32'-3"	C12	"
6	6	37'-3"	C13	"
6	6	32'-3"	C14	"
2	5	36'-3"	C15	"
6	5	26'-9"	C16	"
6	5	4'-0"	L1	
6	5	2'-6"	L2	
2	5	5'-9"	L3	
2	5	6'-0"	L4	
2	5	6'-3"	L5	
2	5	6'-3"	L6	
8	5	4'-9"	R1	End Post
4	5	5'-6"	R2	"
4	5	6'-0"	R3	"
4	5	6'-	R4	"
4	5	6'-9"	R5	"
8	5	7'-0"	R6	"
986	5	5'-3"	R7	Parapet
95	5	4'-3"	R8	"
16	5	11'-3"	R9	"
8	5	33'-3"	R10	"
24	5	31'-6"	R11	"
12	5	27'-6"	R12	"
12	5	28'-9"	R13	"
8	5	34'-9"	R14	"
4	5	17'-3"	R15	"

NO.	SIZE	LENGTH	MARK	LOCATION
16	5	10'-3"	R16	Parapet
40	5	9'-9"	R17	"
8	5	32'-6"	R18	"
12	5	30'-3"	R19	"
12	5	37'-0"	R20	"
8	5	34'-3"	R21	"
8	5	10'-9"	R22	"
16	6	10'-0"	R23	End Post
4	5	5'-9"	R24	" "
4	5	6'-3"	R25	" "
636	6	40'-0"	S1	Slab
896	4	30'-3"	S2	"
3814	6	28'-6"	S3	"
10	6	28'-0"	S4	"
10	6	29'-7"	S5	"
220	4	16'-0"	S6	"
35	6	30'-3"	S7	"
34	6	30'-3"	S8	"
28	4	36'-6"	S9	"
4	6	52'-3"	S10	"
9	6	52'-6"	S11	"
9	6	49'-9"	S12	"
9	6	27'-6"	S13	"



Note: All dimensions are out to out of bars.
Hooks and bends shall be in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Structures (A.C.I.-315-65)

BRIDGE OVER K.C.S., C.R.I.& P., AND C.M. & ST.P. RR.S

STATE ROAD INTERSTATE ROUTE 435.

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE.I-435) **STA.** 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED C. Phillips — DETAILED J.R. Kettler
DESIGN CK. A.G. Latham — DETAIL CK. Moon & Carter

* additional C-1 bars necessary due to closing curb outlets - Lt. on 6:
1st " N. bent 5
2nd " N. bent 5

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

Sheet No. 3 of 27.

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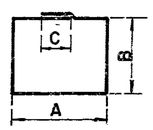
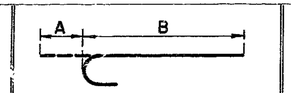
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAL DIST. NO.	ST TE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	51	

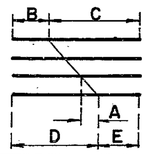
BILL OF REINFORCING STEEL (CONT'D)



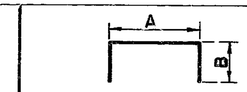
MARK	A	B	C
U101	3'-0"	2'-7⅛"	12"
U108	3'-0⅜"	2'-8"	12⅛"
U201	3'-3"	3'-3"	12"
U202	3'-3"	3'-7⅜"	12⅛"
U203	3'-3"	4'-0⅛"	13¾"
U204	3'-3"	4'-5"	14"
U205	3'-3"	4'-9⅞"	13¼"
U206	3'-3"	5'-2⅜"	12⅛"
U200	2'-2"	4'-5"	13"
U300	2'-2"	4'-4½"	14"
U301	3'-3"	3'-3"	12"
U302	3'-3"	3'-7⅛"	12⅛"
U303	2'-2"	3'-11¾"	14⅛"
U304	3'-3"	4'-4½"	12"
U305	3'-3"	4'-9⅜"	14⅛"
U306	3'-3"	5'-2⅛"	13¾"
U400	2'-2"	4'-4⅜"	14⅛"
U401	3'-3"	3'-3"	12"
U402	3'-3"	3'-7⅛"	12¾"
U403	2'-2"	3'-11⅝"	14¾"
U404	3'-3"	4'-4⅜"	12⅛"
U405	3'-3"	4'-9⅛"	14⅜"
U406	3'-3"	5'-1⅞"	14⅛"
U501	3'-3"	3'-0"	12"
U502	3'-3"	4'-1⅛"	12¾"
U503	3'-3"	4'-5¾"	12½"
U504	3'-3"	4'-10⅛"	12⅜"
U505	3'-3"	5'-2⅛"	12¼"
U506	3'-3"	5'-7⅛"	12"
D603	2'-9"	2'-1"	12"
U601	3'-1"	2'-8"	12"
U602	3'-0"	2'-8"	11"



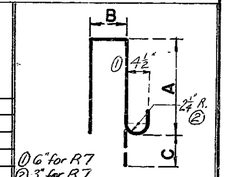
MARK	A	B
H104	10"	24'-8"
D207	21½"	5'-5½"
H202	21½"	12'-8½"
H203	19½"	12'-7½"
H308	15"	7'-6"
H309	15"	8'-6"
H210	15"	9'-0"
D301	21½"	5'-5½"
H302	21½"	12'-8½"
H304	15"	9'-6"
H307	15"	9'-3"
H308	15"	8'-0"
H313	15"	9'-0"
D401	21½"	5'-5½"
H402	21½"	12'-8½"
H403	19½"	12'-6½"
H408	22½"	7'-2½"
H409	15"	8'-3"
H410	15"	8'-9"
D501	21½"	5'-5½"
H502	19½"	13'-10½"
H507	15"	9'-6"
H508	15"	10'-3"
H509	15"	10'-6"
H510	15"	10'-7"
H511	15"	11'-0"
H611	10"	33'-8"
H314	19⅛"	12'-10½"



REMARKS	A	B	C	D	E
5H110 Cut 10	21"	13½"	8'-1½"	8'-1½"	13½"
4V1103 Cut 28	7"	2'-5½"	10'-0½"	10'-0½"	2'-5½"
4U1111 Cut 12	3"	6'-7⅛"	7'-4½"	7'-4½"	6'-7"
3H1115 Cut 6	16⅛"	11'-5¼"	13'-5⅝"	13'-8⅛"	11'-0⅛"
5H1616 Cut 10	20⅛"	2'-7⅛"	9'-4½"	9'-4½"	2'-7⅛"
3H1619 Cut 6	20⅛"	11'-0¾"	14'-5⅛"	14'-5⅛"	11'-0¾"
3B1612 Cut 11	3"	7'-4⅛"	6'-7⅛"	7'-1¼"	6'-10⅛"
4V1602 Cut 28	7"	2'-5⅛"	10'-0⅛"	10'-0⅛"	2'-5⅛"
10 S4 Cut 10	2'-6"	3'-0"	25'-6"	25'-6"	3'-0"
10 S5 Cut 10	2'-9"	2'-6"	27'-3"	27'-3"	2'-6"
3S37 Cut 35	9⅛"	20"	28'-7"	28'-7"	20"
3S38 Cut 34	9⅛"	2'-0⅜"	28'-2⅜"	28'-2⅜"	2'-0⅜"
3S39 Cut 28	6"	4'-6"	32'-0"	18'-0"	18'-6"
4S10 Cut 4	5⅛"	0'-5⅛"	42'-3⅛"	11'-9⅛"	30'-11⅛"
9S11 Cut 9	6⅜"	3'-0"	39'-11⅜"	17'-4⅜"	35'-7⅜"
9S12 Cut 9	6⅜"	18"	33'-3⅜"	22'-7⅜"	29'-7⅜"



MARK	A	B
H111	6"	3'-9"
U109	3'-0"	6"
U111	20¾"	Varies
U112	20¾"	2'-3⅛"
D201	11'-5"	5'-0½"
D205	11'-5"	5'-8"
U207	2'-6"	6"
U208	3'-0"	6"
U209	3'-3"	6"
D304	11'-5"	5'-8"
D306	11'-5"	5'-0½"
U307	2'-6"	6"
U308	3'-0"	6"
U309	3'-3"	6"
D403	11'-5"	5'-0½"
D404	11'-5"	5'-8"
U407	2'-6"	6"
U408	3'-0"	6"
U409	3'-3"	6"
D504	11'-5"	5'-0½"
D507	11'-5"	5'-8"
U507	2'-6"	6"
U508	3'-0"	6"
U509	3'-3"	6"
U617	6"	4'-6"
U609	3'-0"	6"
U610	20¾"	Varies
U612	20¾"	20¾"
E23	7½"	4'-8½"



MARK	A	B	C
E24	2'-3"	9"	6"
R2	2'-1⅞"	9"	6¾"
R3	2'-4½"	9"	6½"
R4	2'-7⅞"	9"	6¾"
R5	2'-9"	9"	6"
R6	2'-9⅝"	9"	7⅛"
R7	23⅝"	7½"	8⅛"
R8	19⅞"	7½"	4½"
R25	2'-6⅛"	9"	5¾"

Note: All dimensions are out to out of bars. Hooks and bends shall be in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Structures (A.C.I. 315-65).

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BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED C. Phillips | DETAILED J.R. Kethler
DESIGN CK. D. Albert | DETAIL CK. Hoad & Carter

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

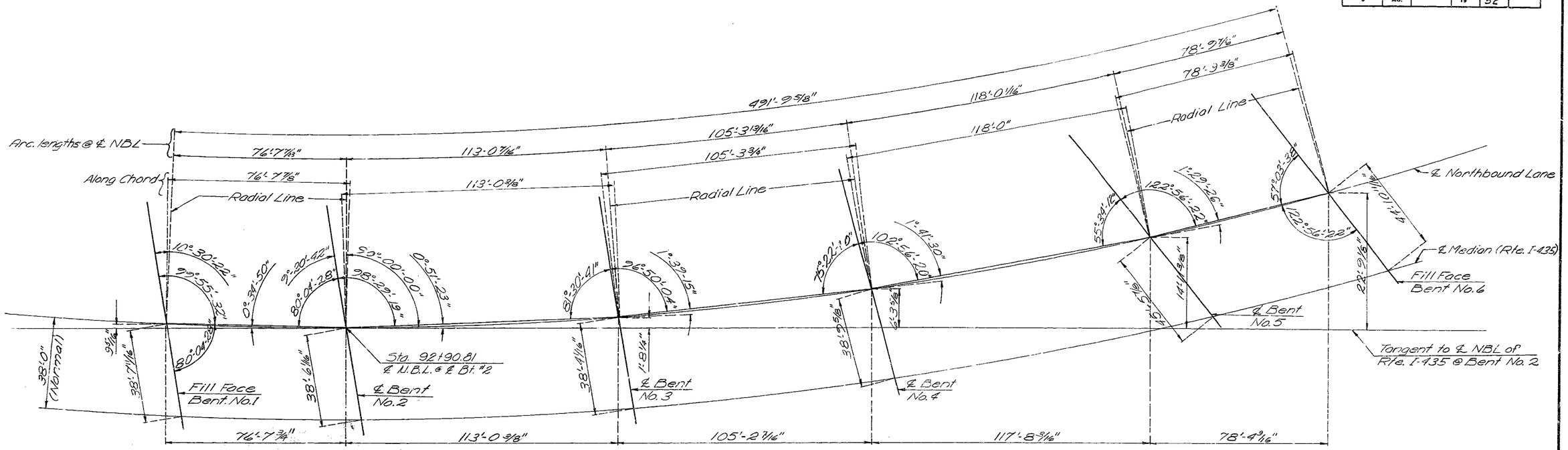
Sheet No. 4 of 27.

BRIDGE OVER K.C.S., C.R.I.&P. AND C.M. & S.T.P. R.R.S.
STATE ROAD INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I IG 435 1(52)(RTE I 435) STA. 92 13.39 N B L.
JACKSON COUNTY

A-2249

MISSOURI STATE HIGHWAY DEPARTMENT

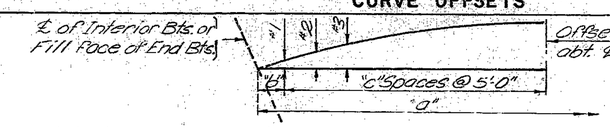
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	52	



SUBSTRUCTURE LAYOUT

Note: Bents cannot be accurately located from the reference point on the tangent by conventional survey methods based on 100' Chords. All bents are not parallel.

CURVE OFFSETS



Outside Face of Left Curb					
Span	1-2	2-3	3-4	4-5	5-6
"a"	76'-8 1/8"	113-0 5/8	100'-9 7/16	103'-5 5/8	79'0 1/8"
"b"	3'-9 1/16"	18 3/16"	4'-7/8"	20 1/4"	4'-6 7/16"
"c"	7	11	10	10	7
Offset #1	3/16"	1/4"	0	1/4"	1/2"
" #2	7/8"	1 1/8"	7/8"	1"	1"
" #3	1 3/8"	1 7/8"	1 1/2"	1 3/4"	1 1/2"
" #4	1 3/4"	2 1/2"	2 1/8"	2 3/8	1 7/8"
" #5	2"	3 1/8"	2 3/8"	2 7/8	2 1/8"
" #6	2 1/4"	3 5/8"	3 1/8"	3 1/4"	2 3/8"
" #7	2 3/8"	4 1/8"	3 3/8"	3 3/8"	2 1/2"
" #8	2 3/8"	4 1/8"	3 3/4"	3 7/8"	2 1/2"
" #9		4 3/4"	3 7/8"	4 1/8	
" #10		5"	4"	4 1/4	
" #11		5 1/8"	4 1/8"	4 1/4	
" #12		5 1/8"			
" #13					

Outside Face of Right Curb					
Span	1-2	2-3	3-4	4-5	5-6
"a"	76'-7 3/4"	113'-0 5/8	105'-7"	168'-4 1/8	78'7"
"b"	3'-3 1/8"	21 1/8"	4'-3 1/8"	4'-2 7/16	4'-3 1/8"
"c"	7	11	10	12	7
Offset #1	3/8"	1/4"	3/4"	1 1/8"	1/2"
" #2	7/8"	1 1/8"	1 1/4"	1 3/4"	1"
" #3	1 3/8"	1 7/8"	2 1/8"	2 1/8"	1 1/2"
" #4	1 5/8"	2 1/2"	2 3/4"	3 1/4"	1 3/4"
" #5	2	3 1/8"	3 1/4"	4"	2 1/8"
" #6	2 1/8"	3 3/8"	3 7/8"	4 3/8"	2 1/4"
" #7	2 1/4"	4"	4"	5 1/8"	2 3/8"
" #8	2 3/8"	4 3/8"	4 1/4"	5 1/8"	2 3/8"
" #9		4 3/8"	4 1/2"	5 1/8	
" #10		4 1/8"	4 3/8"	6 1/8"	
" #11		5"	4 3/8	6 3/8"	
" #12		5"		6 1/2"	
" #13				6 1/2"	

BRIDGE OVER K.C.S., C.R.I.&P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. HG-435-1(52)(RTE. I-435) STA. 92+ 13.39 N.B.L.

JACKSON COUNTY

A-2249

BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED C.B. Phillips | DETAILED C. Page
DESIGN CK. C.D. Albert | DETAIL CK. C.D. Albert

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

Sheet No. 5 of 27.

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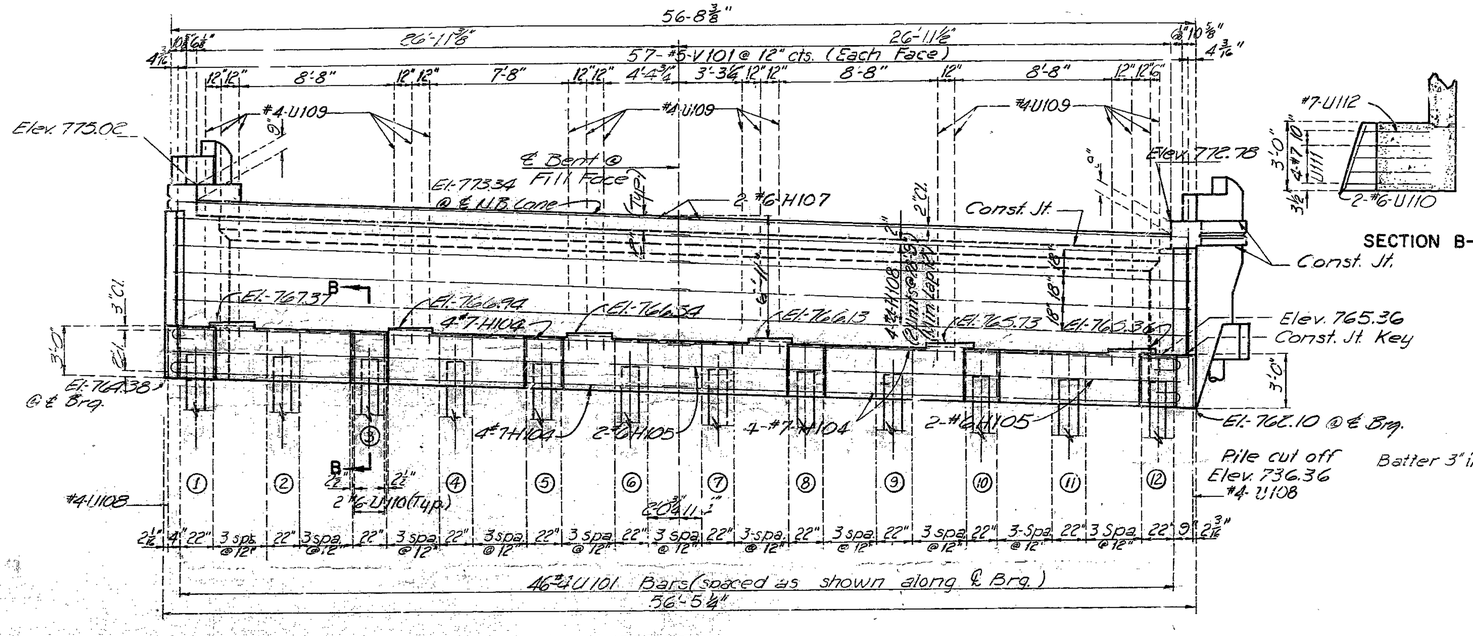
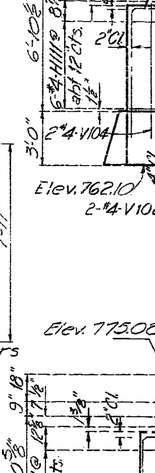
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	53	



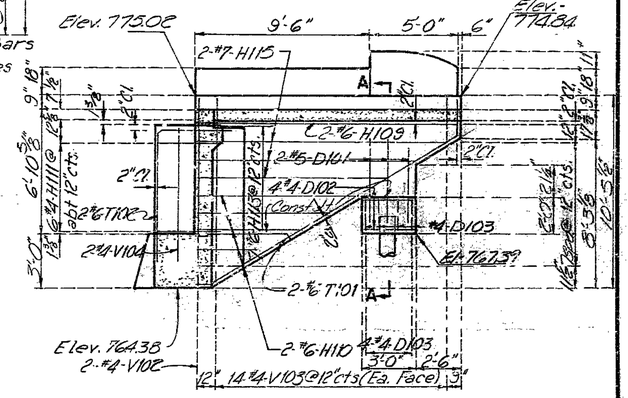
ELEVATION

PILE CUTOFF ELEVATIONS											
Pile No.	1	2	3	4	5	6	7	8	9	10	11	12
Elev.	763.82	765.63	763.93	765.24	765.04	764.85	764.65	764.46	764.26	764.07	763.87	763.68

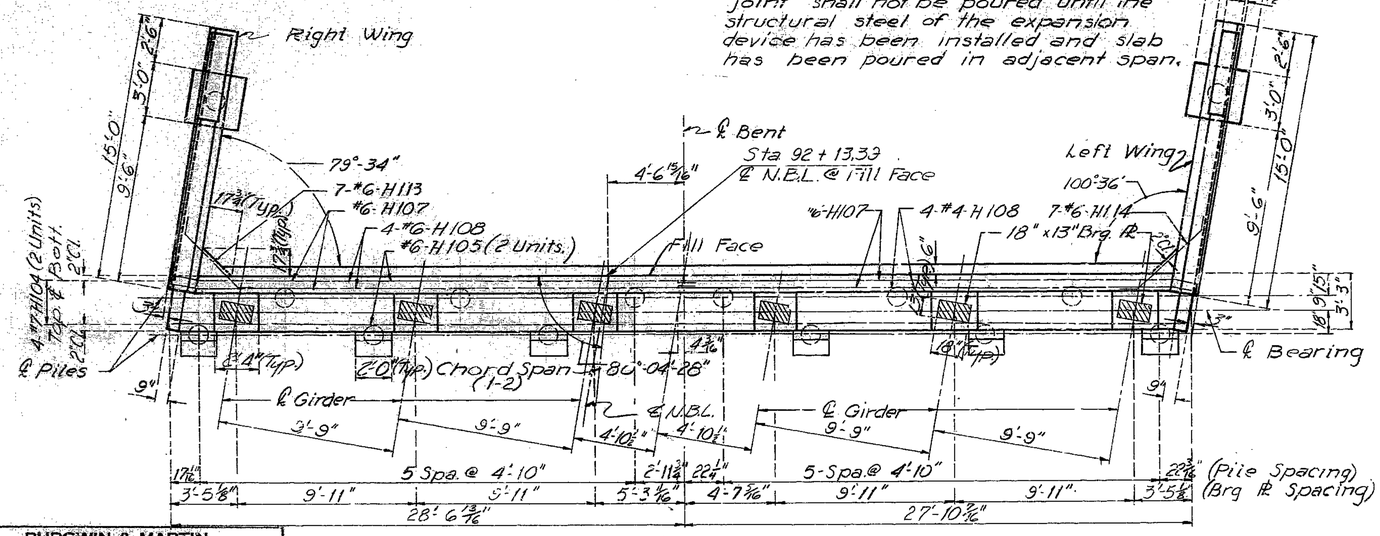


SECTION AT ℄ BENT

ELEVATION LEFT WING



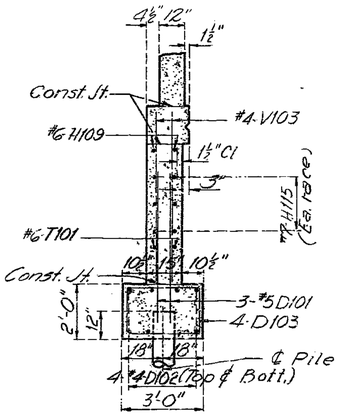
ELEVATION RIGHT WING



PLAN

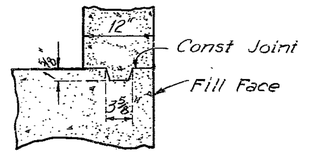
Note:
Top of backwall and expansion device for end bent No. 1 to conform to crown of roadway slab.
Backwall above upper construction joint shall not be poured until the structural steel of the expansion device has been installed and slab has been poured in adjacent span.

DETAILS OF END BENT NO. 1.



SECTION A-A.

Note: Fill at end bent shall not be carried above bottom of beam and wings until adjacent superstructure span is in place.



DETAIL OF KEYED CONSTRUCTION JOINT.

Note: For handrail, parapet and end post details see sheet No. 27 of 27

BRIDGE OVER K.C.S., C.R.I. & P. AND C.M. & ST.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435.

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435) **STA.** 92 + 13.39 N.B.L.

JACKSON **COUNTY**

A-2249

BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED C. Phillips	DETAILED GL Moon
DESIGN CK. C. Page	DETAIL CK. C. Page

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

Sheet No. 6 of 27.

NO CONSTRUCTION CHANGES

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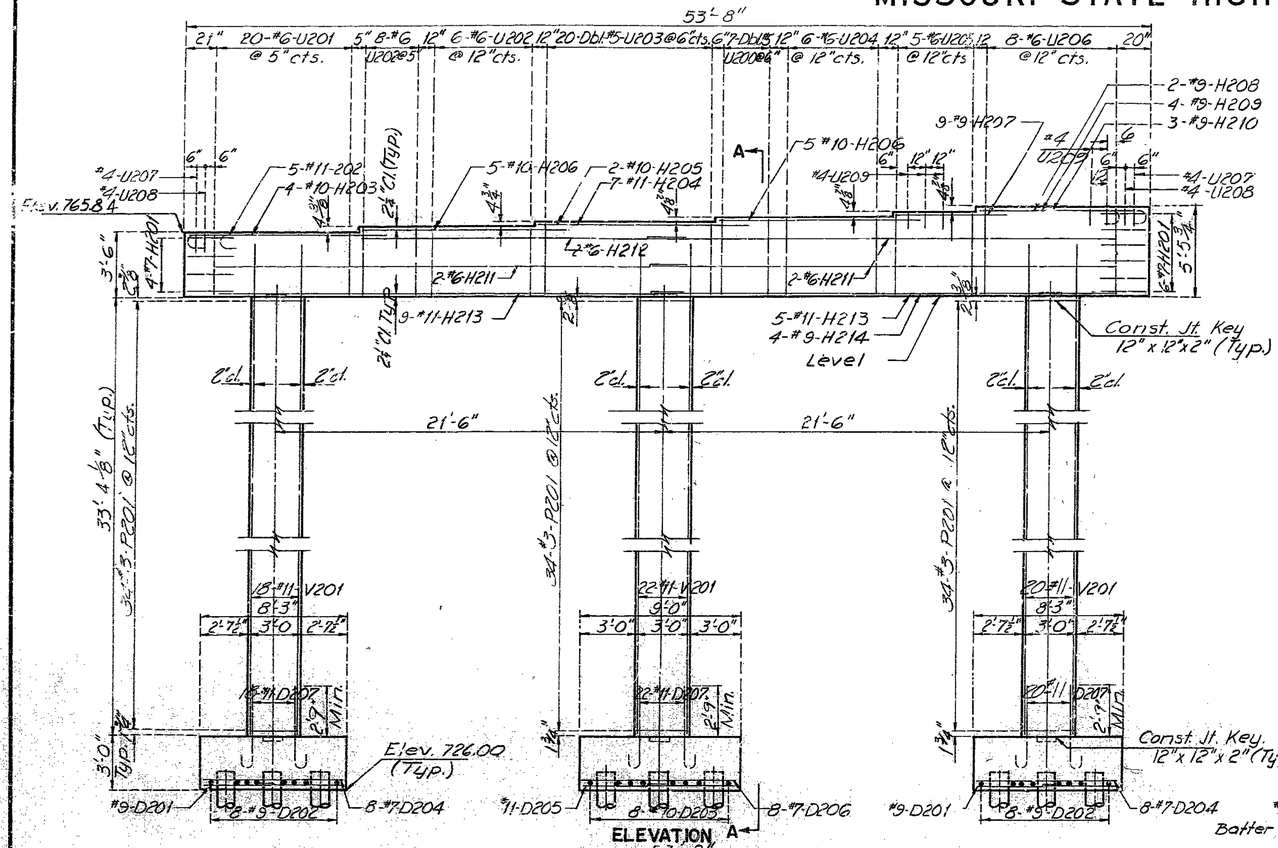
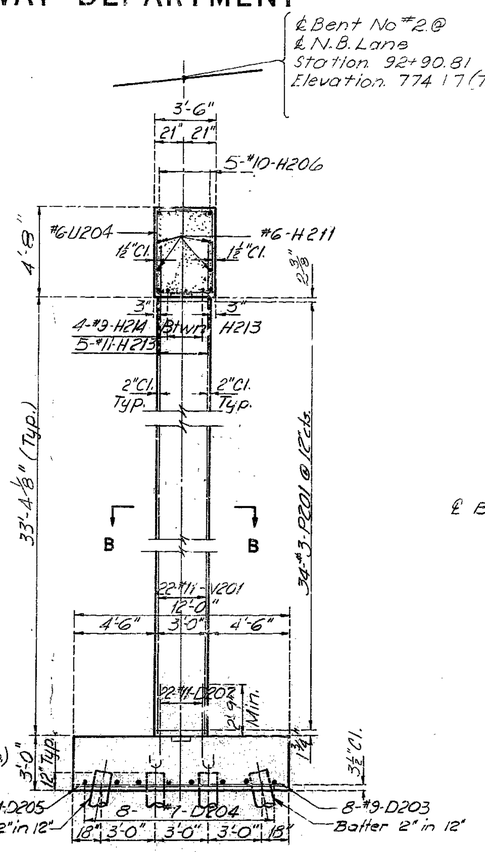
MISSOURI STATE HIGHWAY DEPARTMENT

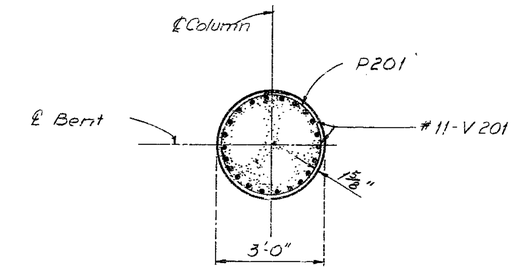
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	54	



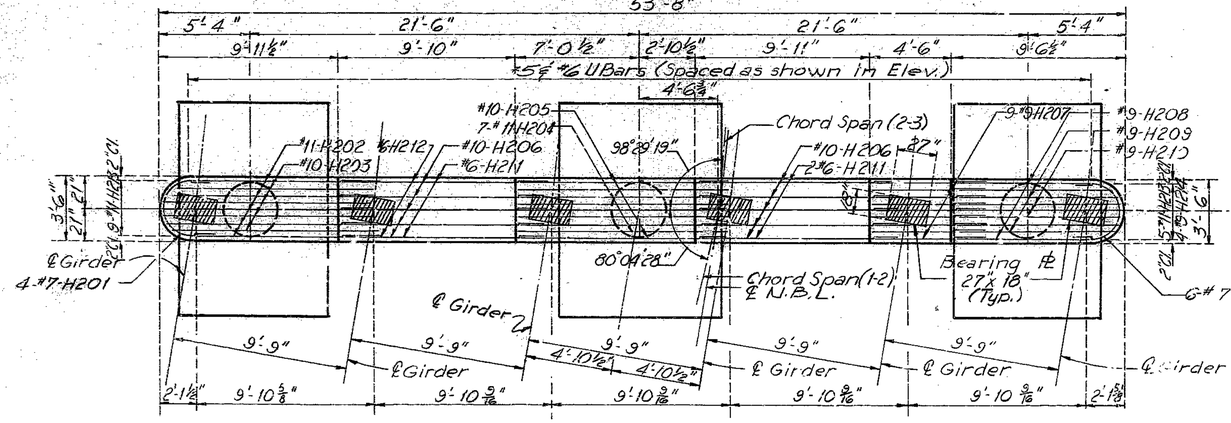
ELEVATION A



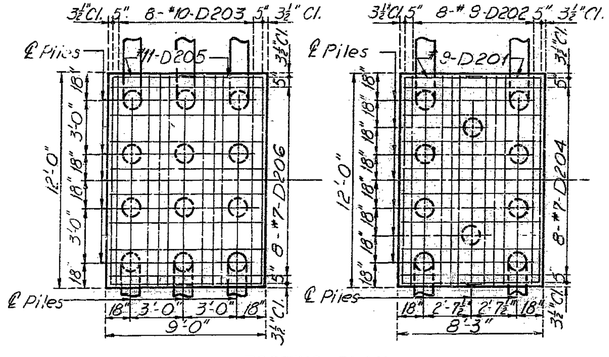
SECTION A A



SECTION B B



PLAN



INT FOOTING PLAN EXT

BRIDGE OVER K.C.S., C.R.I. & P. AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. IHG-435-1(52)XRTE I-435 **STA.** 92+1339 N.B.L.

JACKSON COUNTY

DETAILS OF INT BENT NO 2

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED GL Moon
DESIGN CK. A.G. Lattran	DETAIL CK. C. Page

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

Sheet No. 7 of 27.

A-2249

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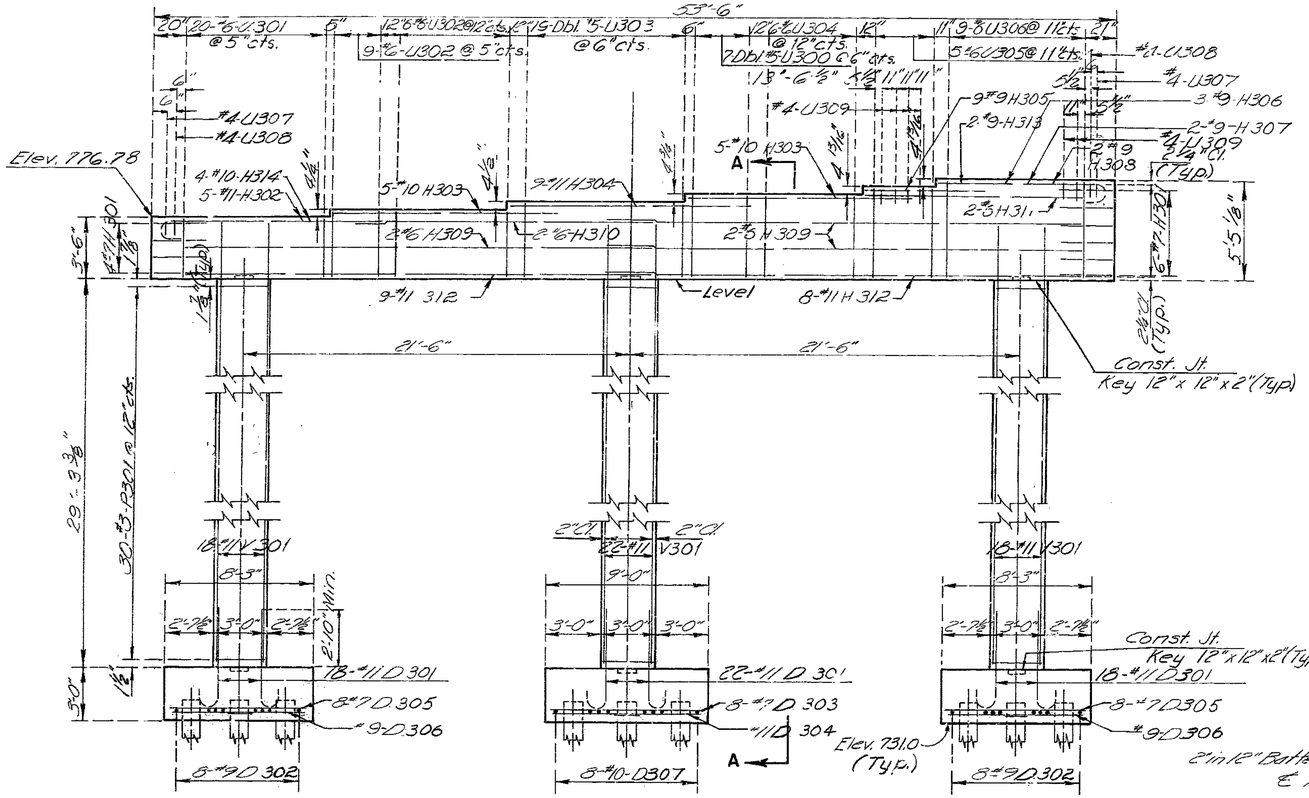
FOR INFORMATION ONLY

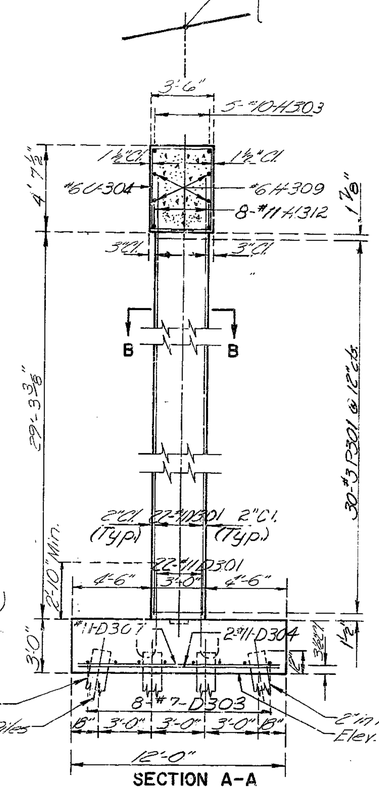
A22494, Sht. 14

MISSOURI STATE HIGHWAY DEPARTMENT

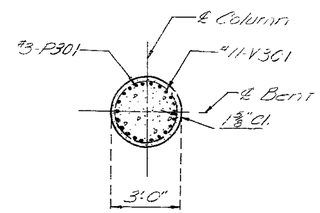
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	55	



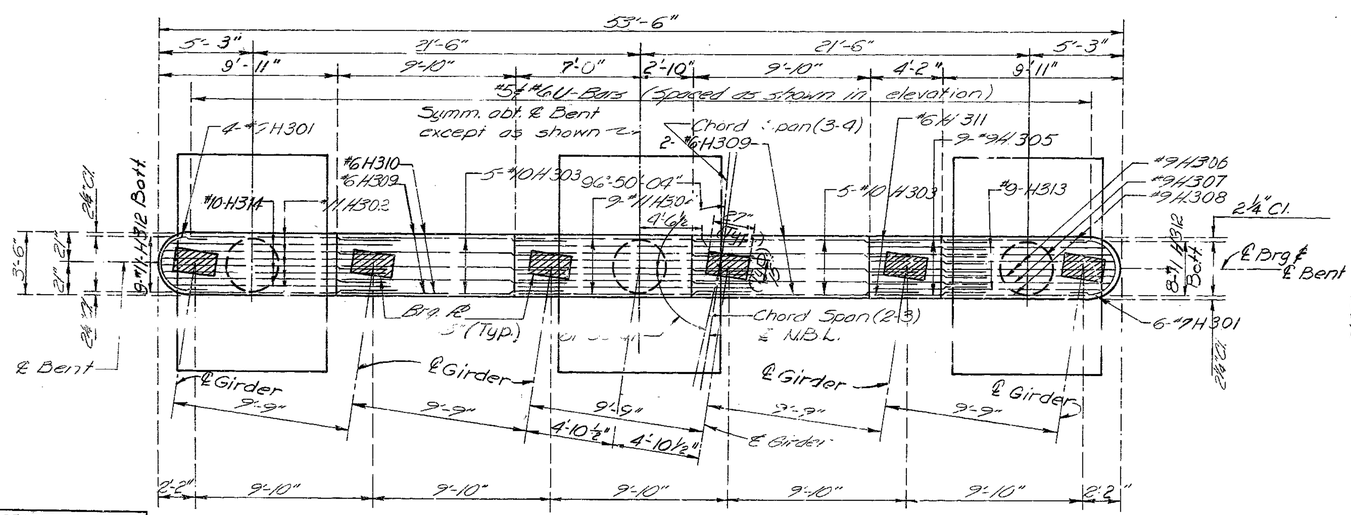
ELEVATION



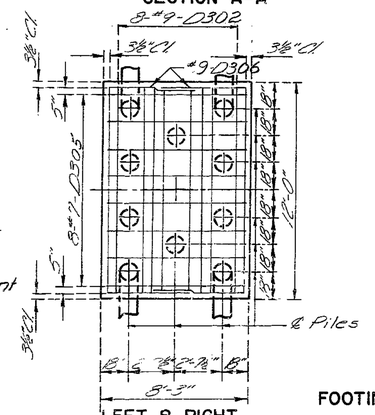
SECTION A-A



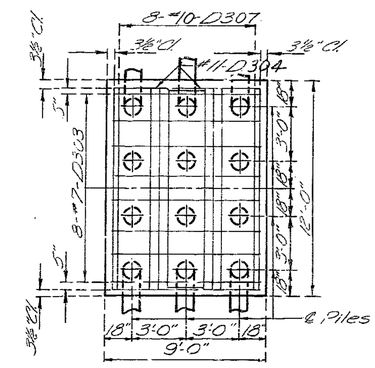
SECTION B-B



PLAN



LEFT & RIGHT FOOTING



CENTER FOOTING

FOOTING PLAN

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & ST.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435) STA. 92+13.39 N.B.L.

JACKSON COUNTY

DETAILS OF INT. BENT NO. 3

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED E. Hon
DESIGN CK. A.G. Latham	DETAIL CK. C. Page

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

Sheet No. 8 of 27.

A-2249

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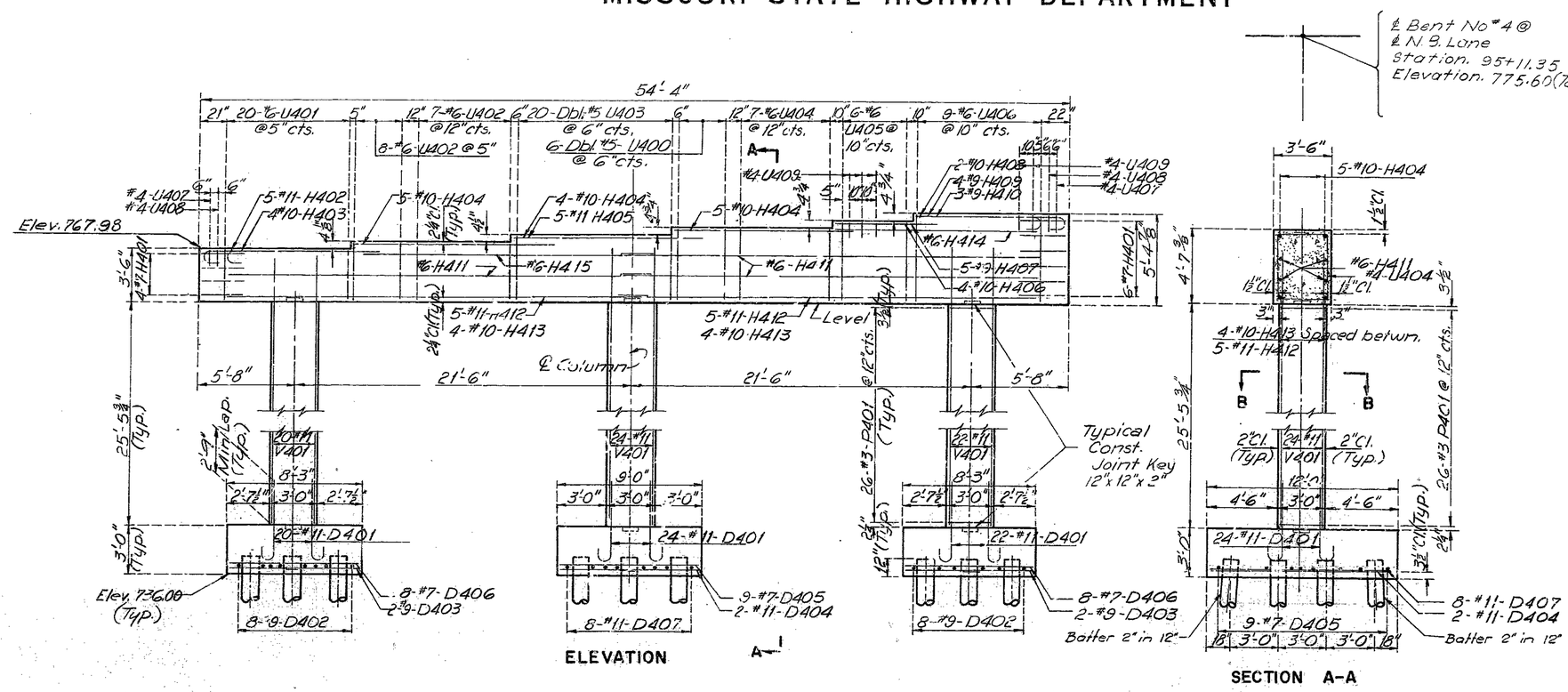
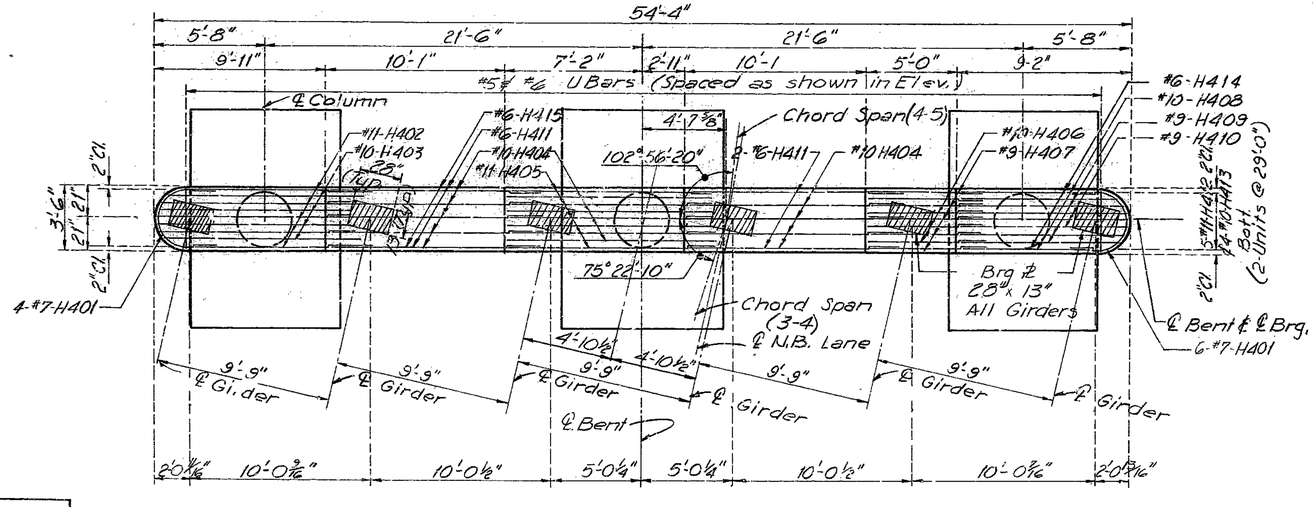
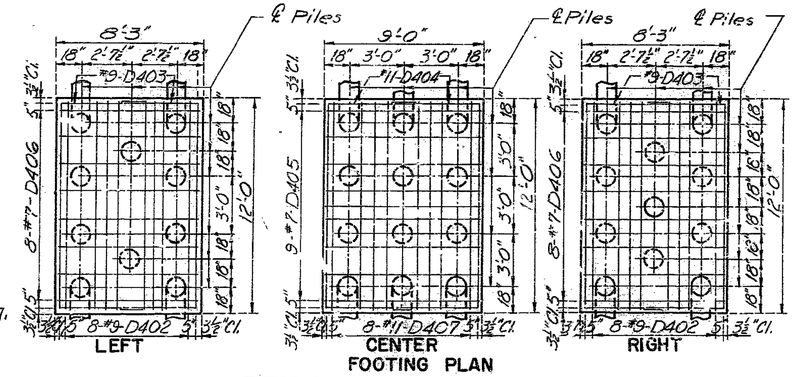
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	56	







DETAILS OF INT. BENT NO. 4

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE I-435) STA. 92+133 N.B.L.

JACKSON COUNTY.

BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED	A.G. Latham	DETAILED	G.L. Moon
DESIGN CK.	C. Phillips	DETAIL CK.	C. Page

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

Sheet No. 9 of 27.

A 2249

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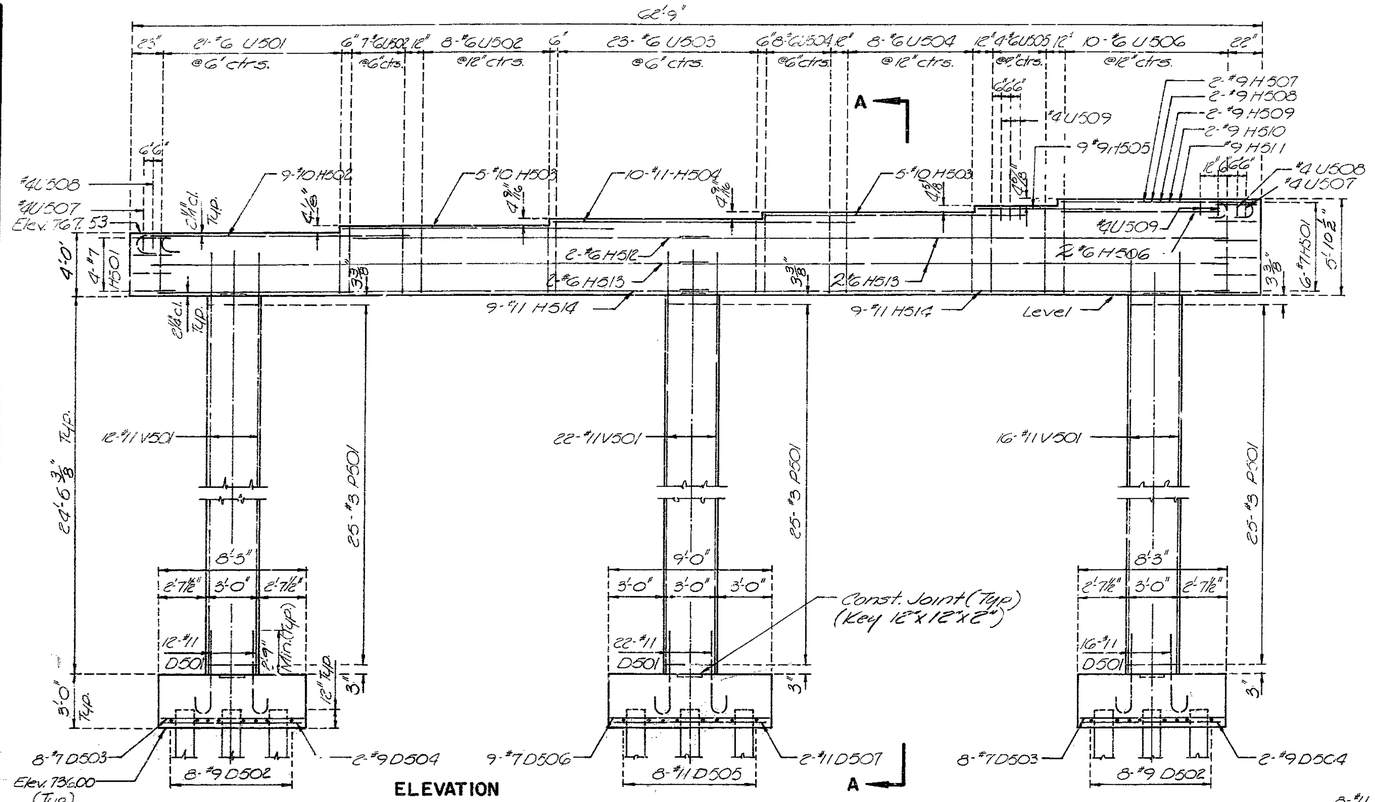
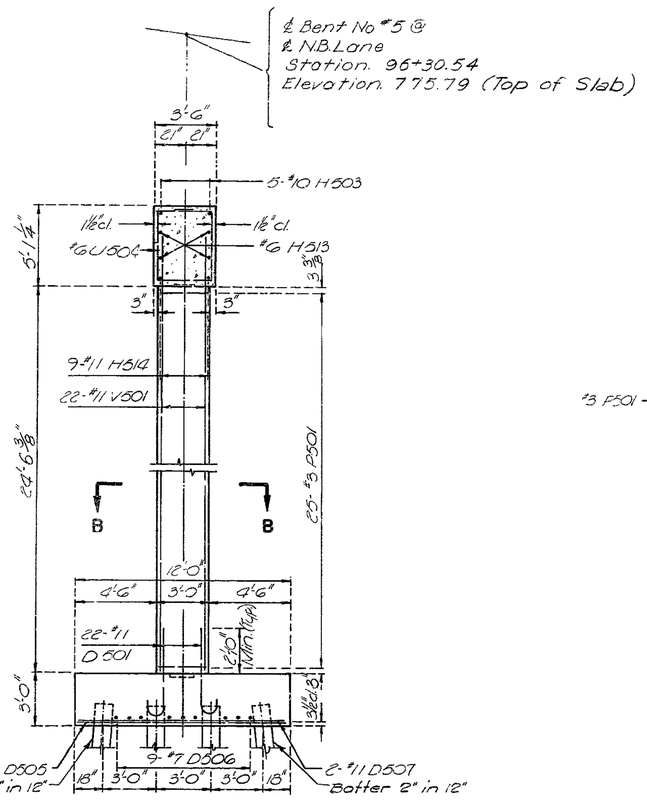
MISSOURI STATE HIGHWAY DEPARTMENT

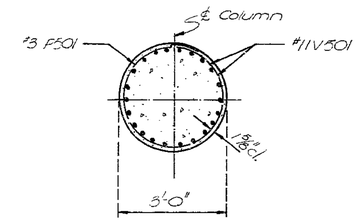
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	57	



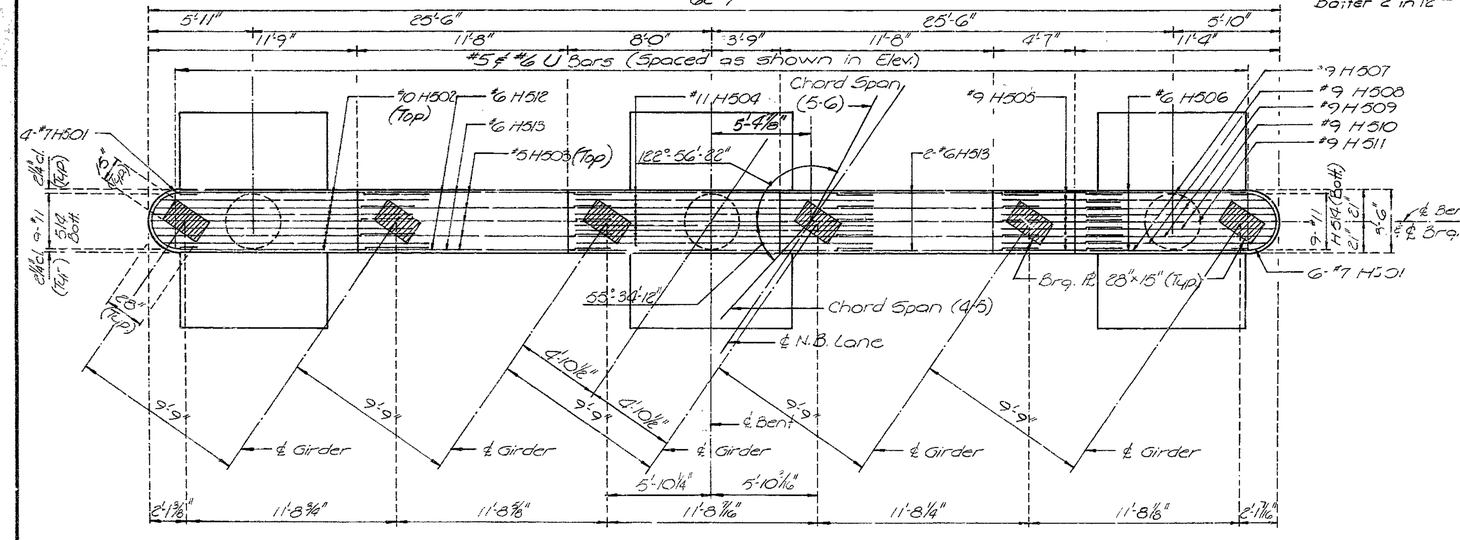
ELEVATION



SECTION A-A

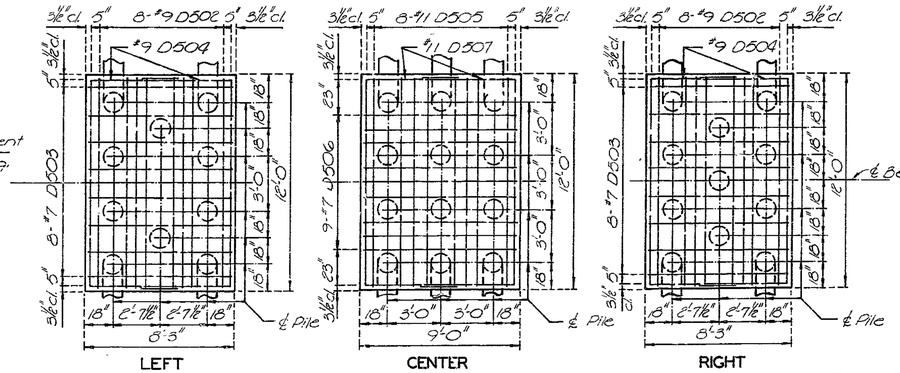


SECTION B-B



PLAN

DETAILS OF INT. BENT NO.5



FOOTING PLAN

BRIDGE OVER K.C.S., C.R.I.&P., AND C.M. & ST.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-[G-435-1(52)(RTE. I-435)STA. 92+13.39 N.B.L.

JACKSON COUNTY

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED F. Rogers
DESIGN CK. A.G. Latham	DETAIL CK. C. Page

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

Sheet No. 10 of 27.

A-2249

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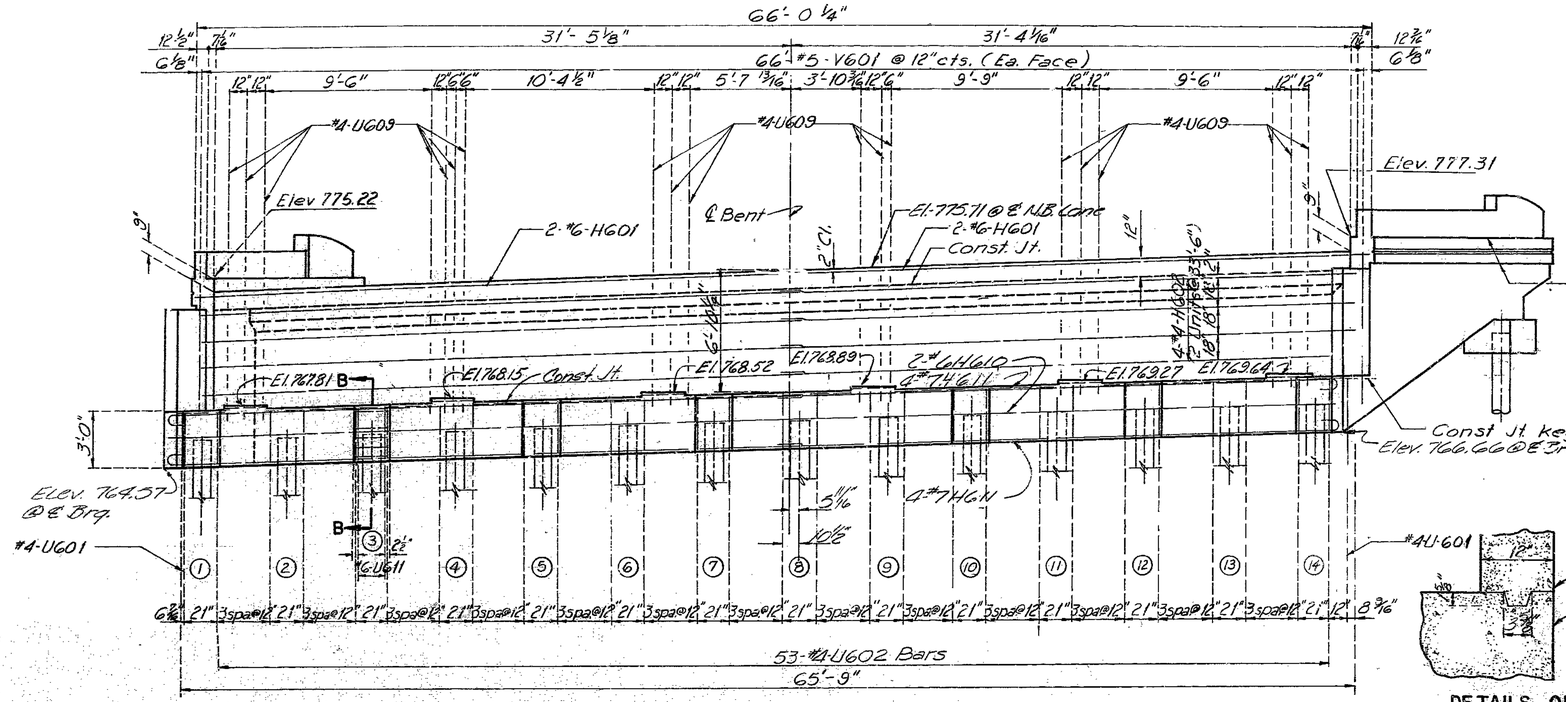
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	58	

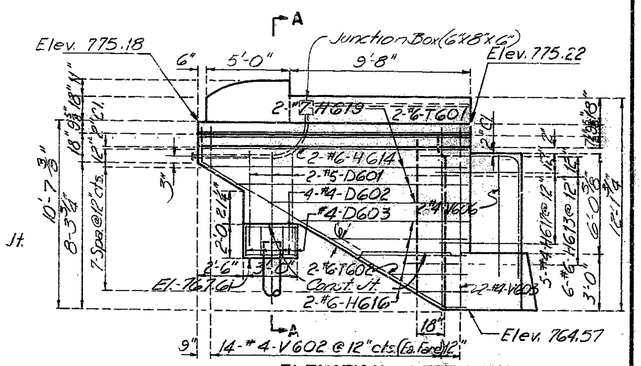


ELEVATION

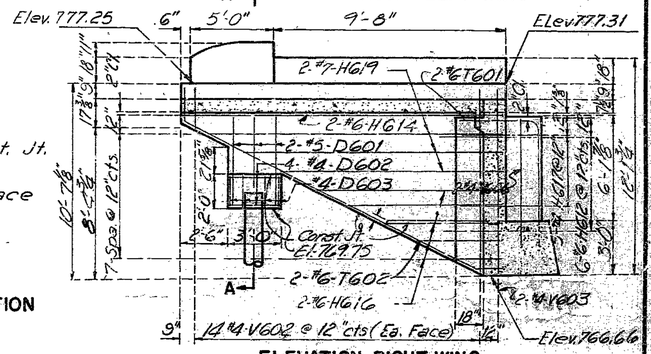
Note: Top of backwall and expansion device for end bent No. 6 to conform to crown of roadway slab.

Backwall above upper construction joint shall not be poured until the structural steel of the expansion device has been installed and slab has been poured in adjacent span.

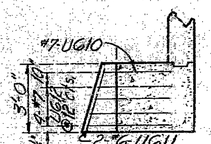
DETAILS OF KEYED CONSTRUCTION JOINT



ELEVATION LEFT WING



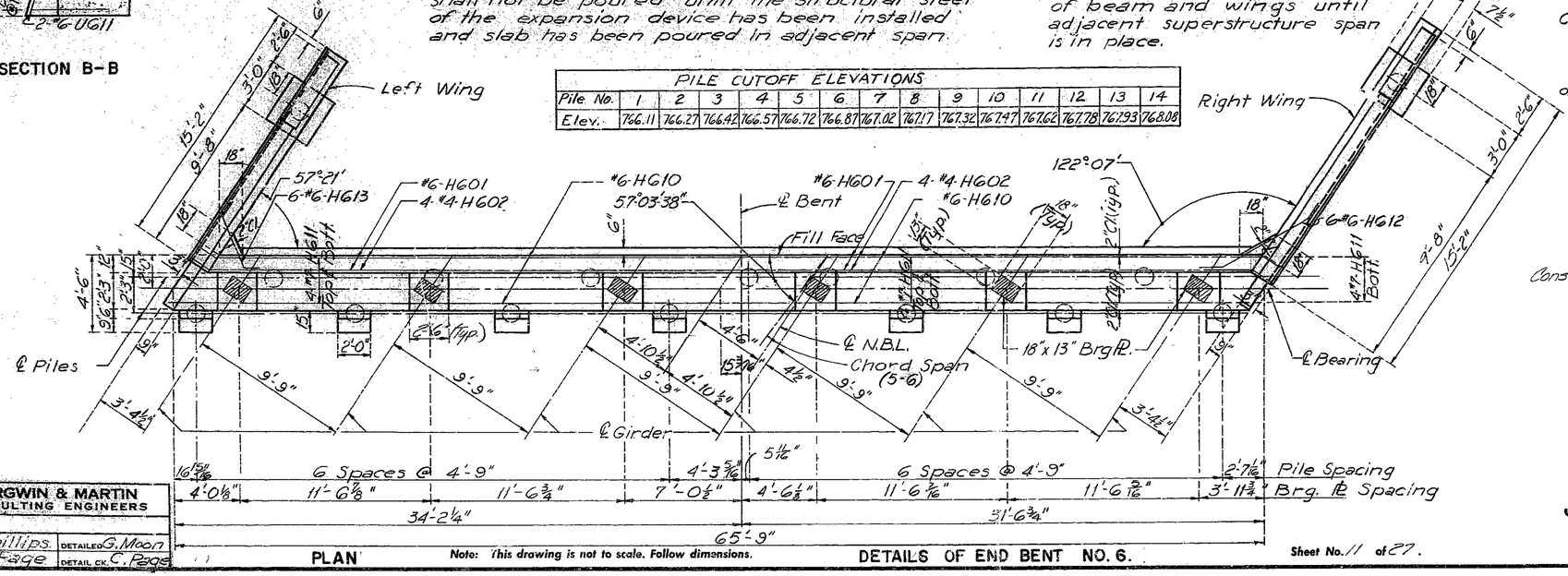
ELEVATION RIGHT WING



SECTION B-B

PILE CUTOFF ELEVATIONS														
Pile No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Elev.	766.11	766.27	766.42	766.57	766.72	766.87	767.02	767.17	767.32	767.47	767.62	767.78	767.93	768.08

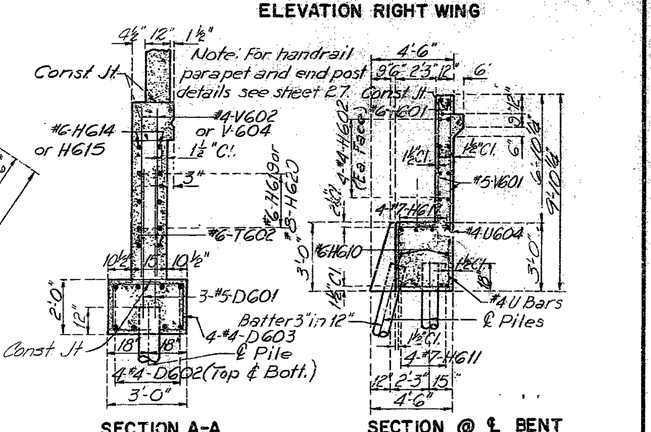
Note: Fill at end bent shall not be carried above bottom of beam and wings until adjacent superstructure span is in place.



PLAN

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

DETAILS OF END BENT NO. 6.



Note: For handrail parapet and end post details see sheet 27.

SECTION A-A

SECTION @ ℄ BENT

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE I-435) STA. 92+13.39 N.B.L.

JACKSON COUNTY

BURGWIN & MARTIN CONSULTING ENGINEERS			
DESIGNED C. Phillips.	DETAILED G. Moon	Sheet No. 11 of 27.	A-2249
DESIGN CK. C. Page	DETAIL CK. C. Page		

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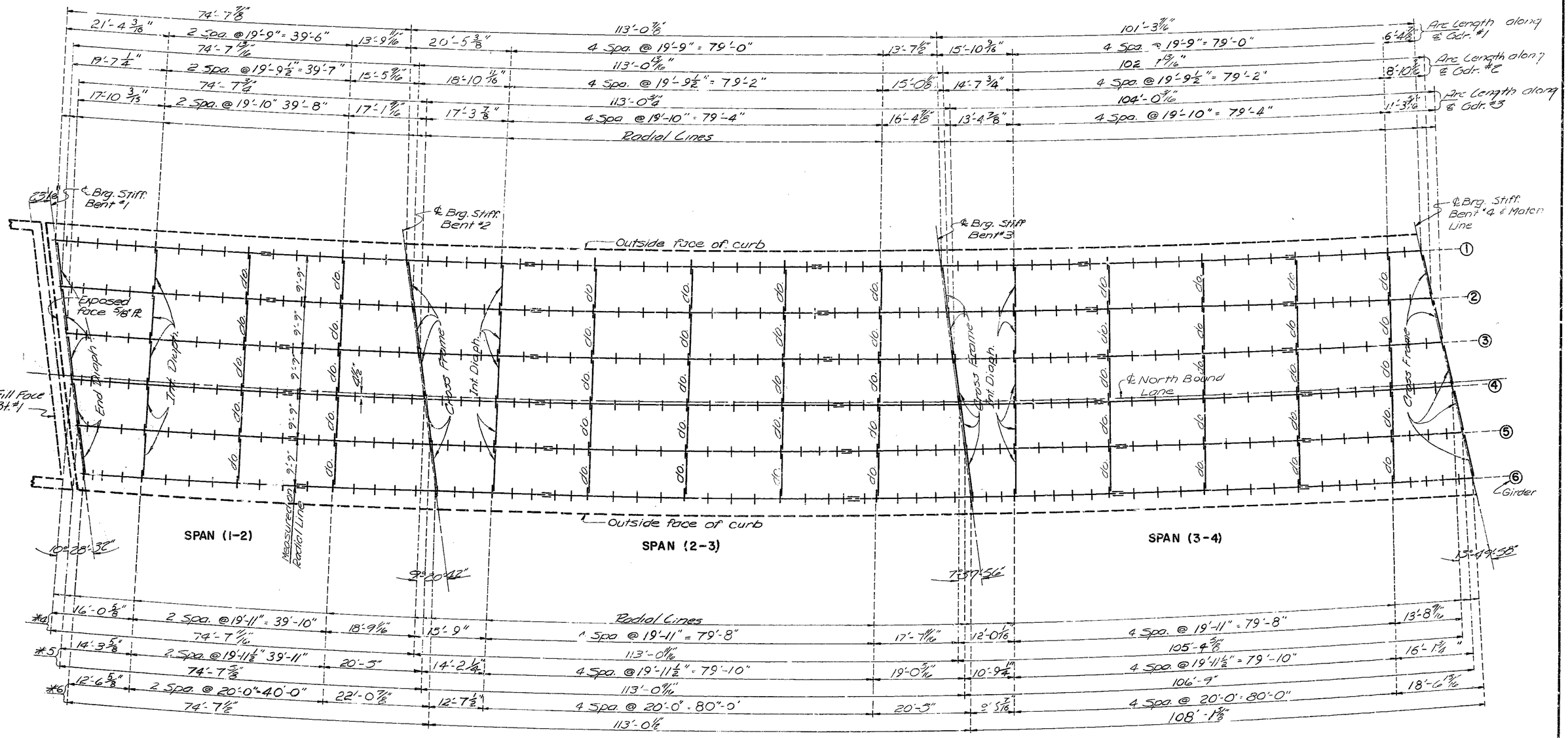
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	52	



*4 Arc Lengths along ℄ Gdr. #4
*5 Arc Lengths along ℄ Gdr. #5
*6 Arc Lengths along ℄ Gdr. #6

Note: Longitudinal dimensions shown are parallel to grade of roadway. Girders are on concentric curves. Diaphragms and crossframes are on radial lines except as shown.

PLAN OF STRUCTURAL STEEL

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & ST.P. R.R.S
STATE ROAD INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52)(RTE. I-435) STA. 92+13.39 N.B.L.
JACKSON COUNTY

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C.B. Phillips	DETAILED C. H. McDowell
DESIGN CK. C.D. Albert	DETAIL CK. C. Page

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

Sheet No. 12 of 27.

A-2249

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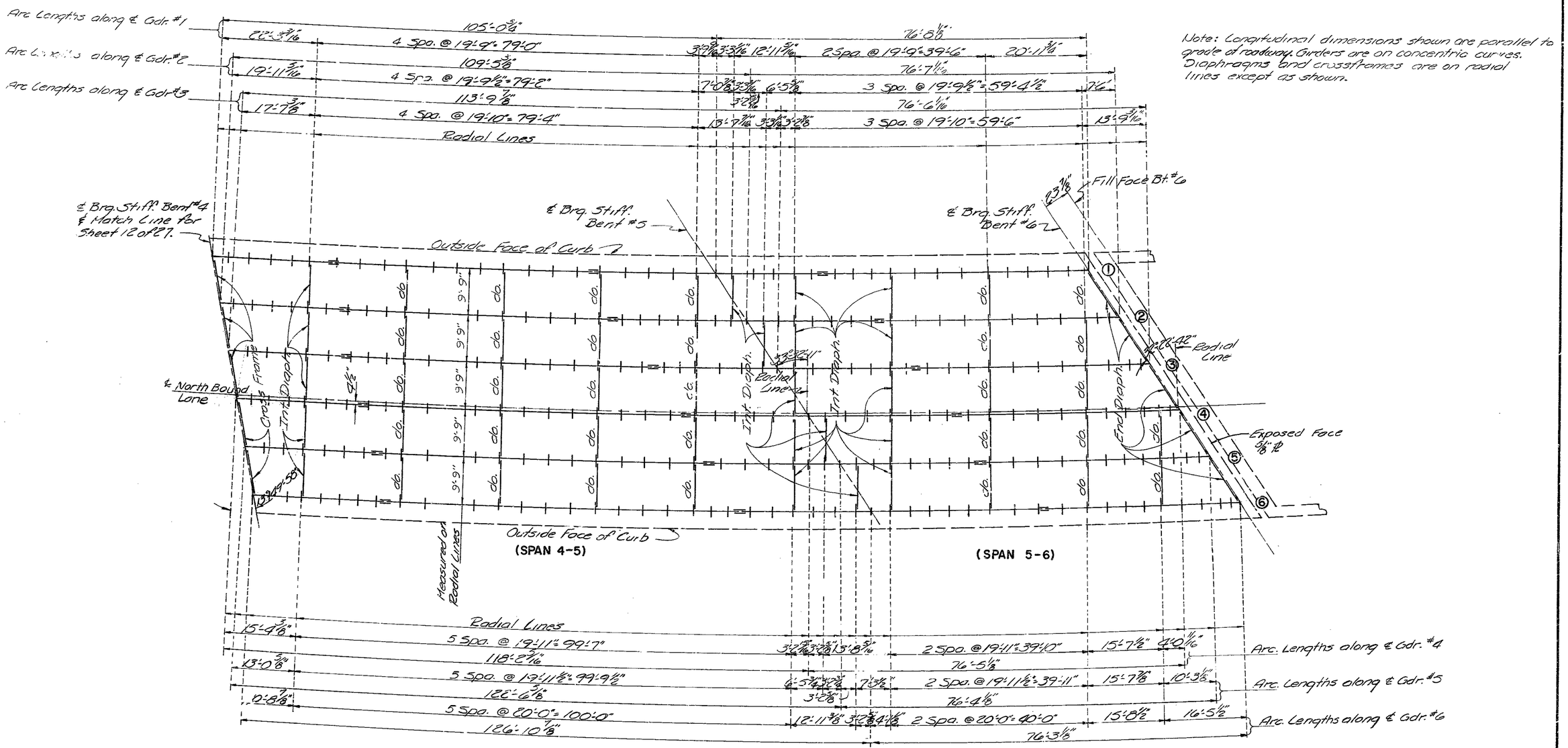
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	60	



PLAN OF STRUCTURAL STEEL (CONT'D)

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & ST.P. R.R.S
STATE ROAD INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52)(RTE. I-435)STA. 92+13.39 N.B.L.
JACKSON COUNTY

A-2249

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. B. Phillips	DETAILED J. Kettler
DESIGN CK. C. O. Albert	DETAIL CK. C. Fage

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

Sheet No. 13 of 27.

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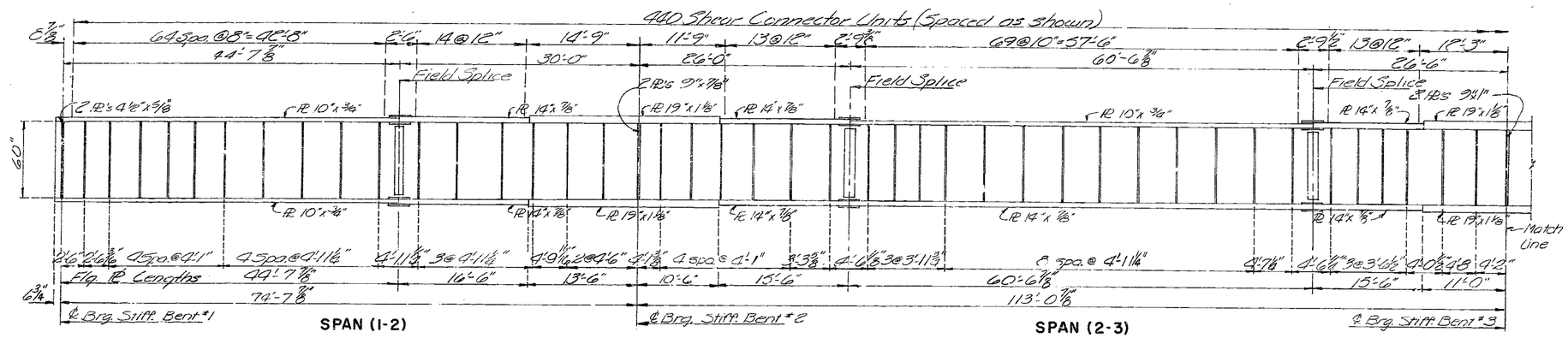
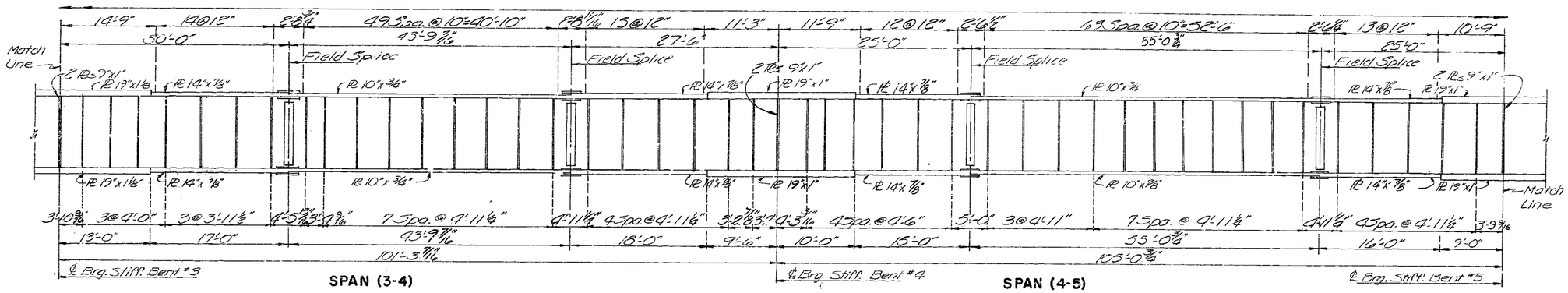
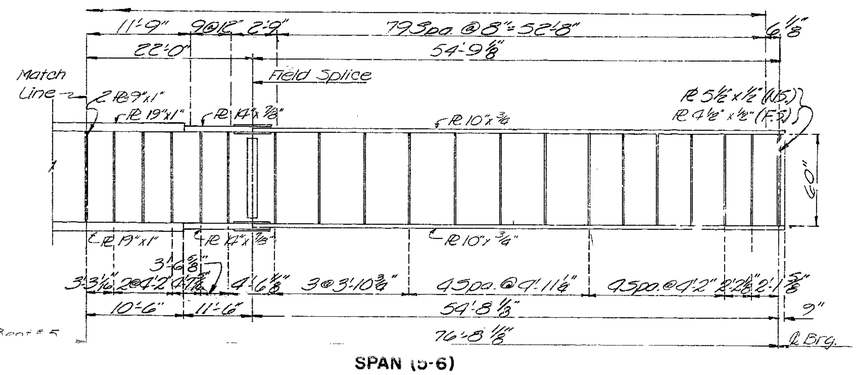
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	G1	







NO. 1 GIRDER ELEVATION

Note: The following welds will be subject to radiographic inspection.
Shop: All butt welded flange plates.
At least 1/3 of each butt welded web splice beginning at points of maximum tension.
Field: None
The following welds will be subject to inspection by the magnetic particle procedure.
Shop: At least 10% of each size and type of fillet welds, web to flanges and bearing stiffeners, and bearing devices.
The tests shall be located at random in the members so as to be typical for each size and type of weld.
This test procedure may also be used for examination of weld passes and miscellaneous welds not specifically set out, at the discretion of the engineer.
Field: None

Note: Shop welded web splices may be fabricated by the contractor when detailed on the shop drawings and approved by the Engineer. No additional payment will be made for optional shop welded web splices.

Note: All longitudinal dimensions shown are are lengths parallel to grade of roadway.
All intermediate stiffeners are 4"x 3/16" and shall be placed on both sides of all girders. All stiffeners are on radial lines except as shown.
All web plates are 3/8".
All girders shall be fabricated to conform with the Camber Diagram shown on Sht. #21 of 27.
For welding details, see Sht. #22 of 27.
By approval of the engineer the contractor may omit any shop flange splice, if desired, by extending the heavier flange plate and providing approved modifications of details at field flange splices and elsewhere as required. Payweight in any case will be based on material shown on design plans.

Girders shall be fabricated on horizontal curves. The radius of curve for girder No. 1 is 3752.96 ft.

BRIDGE OVER K.C.S., C.R.I.&P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435)STA. 92+13.39 N.B.L.

JACKSON COUNTY

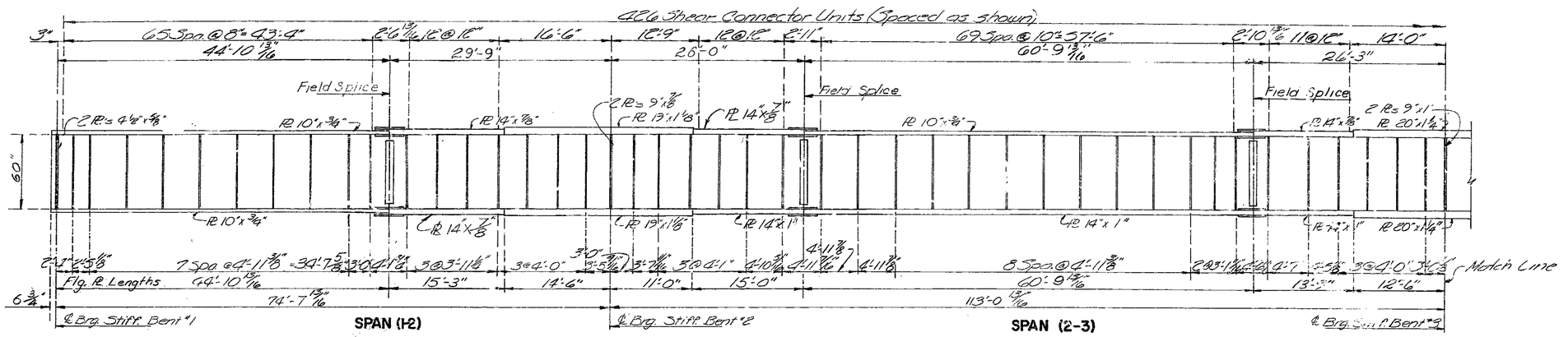
A-2249

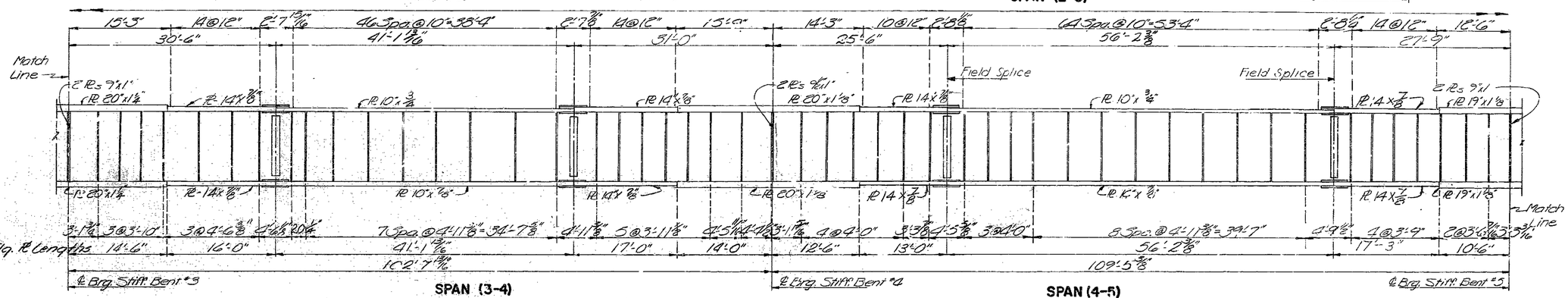
BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED D. Albert	DETAILED B. Thurn
DESIGN CK. A.G. Latham	DETAIL CK. J. Carter

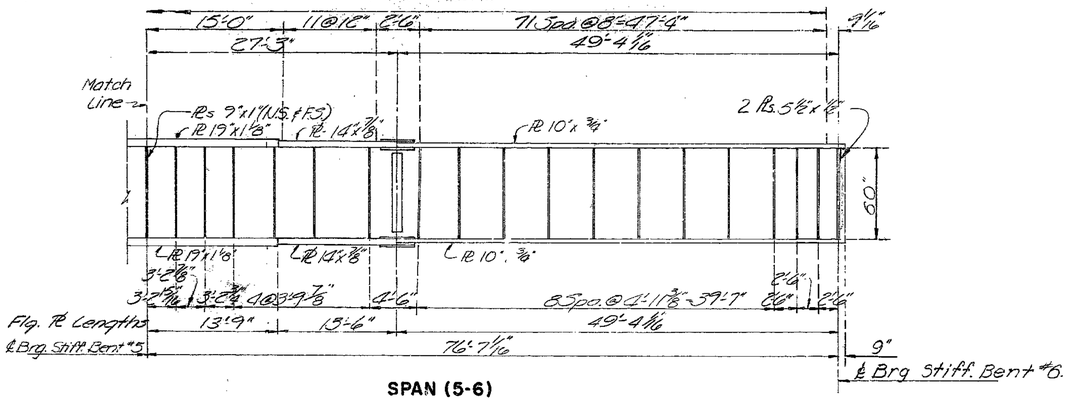
Note: This drawing is not to scale. Follow dimensions.

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	02	







NO. 2 GIRDER ELEVATION

Note: See girder elevation No. 1 on Sht. No. 14 of 27 for radiographic inspection note and general girder note.

Girders shall be fabricated on horizontal curves. The radius of curve for girder No. 2 is 3762.71 ft.

BRIDGE OVER K.C.S., C.R.I.&P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435) **STA.** 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

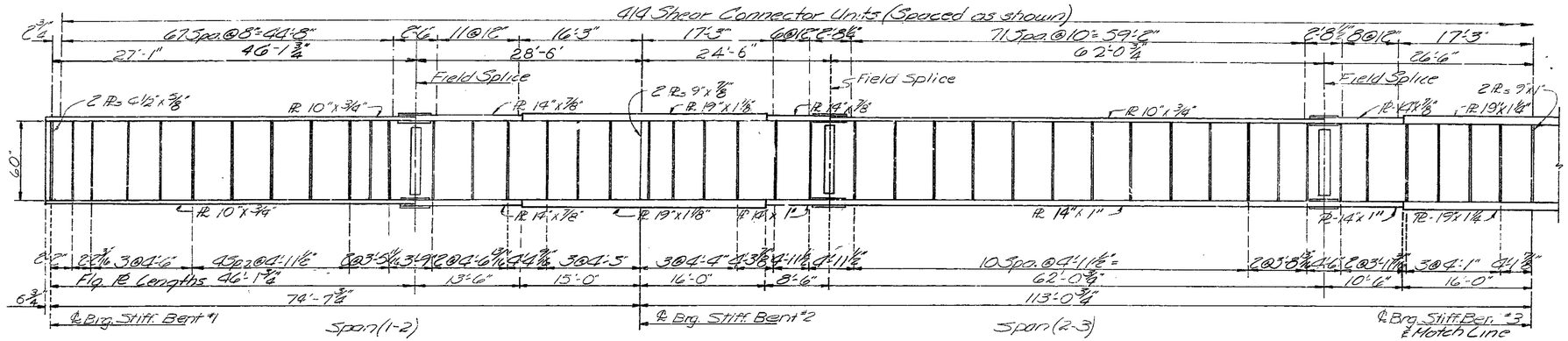
BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED D.Albert	DETAILED B.Thurn
DESIGN CK. A.G.Lathrom	DETAIL CK. J. Carter

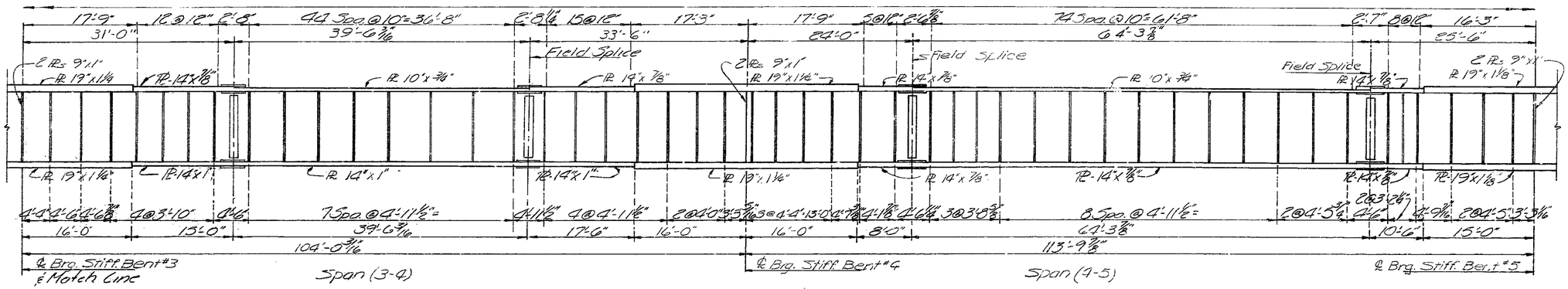
Note: This drawing is not to scale. Follow dimensions.

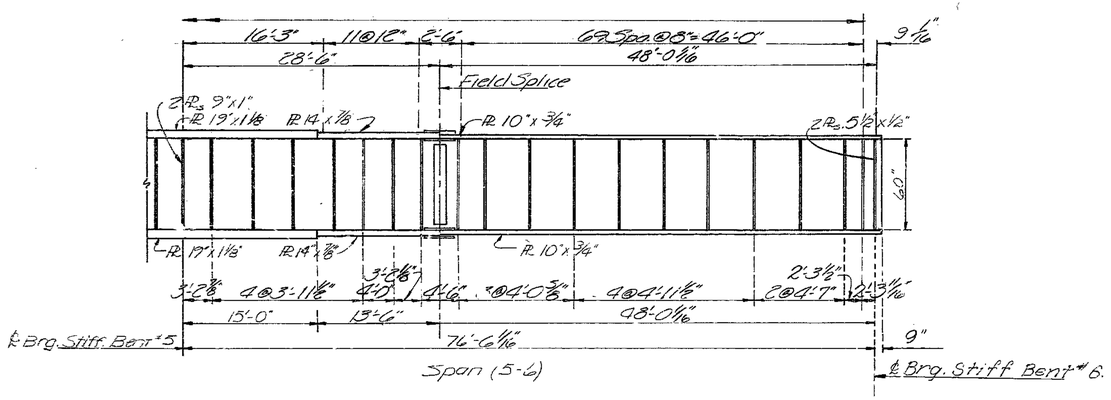
199

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	63	







NO. 3 GIRDER ELEVATION

Note: See girder elevation No. 1 on Sht. #14 of 27 for radiographic inspection note, magnetic particle inspection note and general girder note.

Girders shall be fabricated on horizontal curves. The radius of curve for gdr. No 3 is 3772.96 ft.

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & S.T.P. R.R.'S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435) **STA.** 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

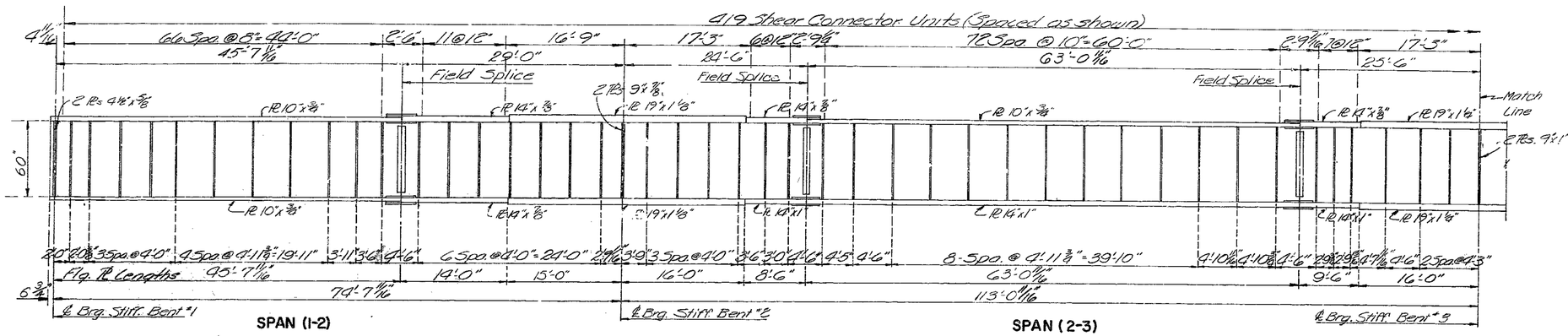
BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED B. Thurn
DESIGN CK. A.G. Latham	DETAIL CK. J. Carter

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

2961

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	G4	



NO. 4 GIRDER ELEVATION

Note: See girder elevation No. 1 on Sht. 14 of 27 for radiographic inspection note, magnetic particle inspection note and general girder note.

Girders shall be fabricated on horizontal curves. The radius of curve for gdr. No 4 is 3782.21 Ft.

BRIDGE OVER K.C.S., C.R.I.&P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435) **STA.** 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

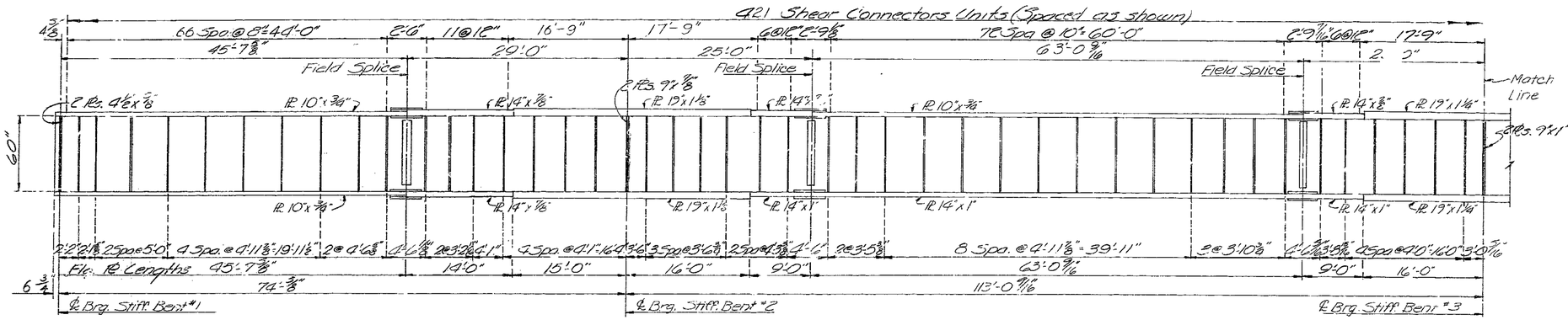
BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED B. Thurn
DESIGN CK. C.D. Albert	DETAIL CK. J. Carter

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

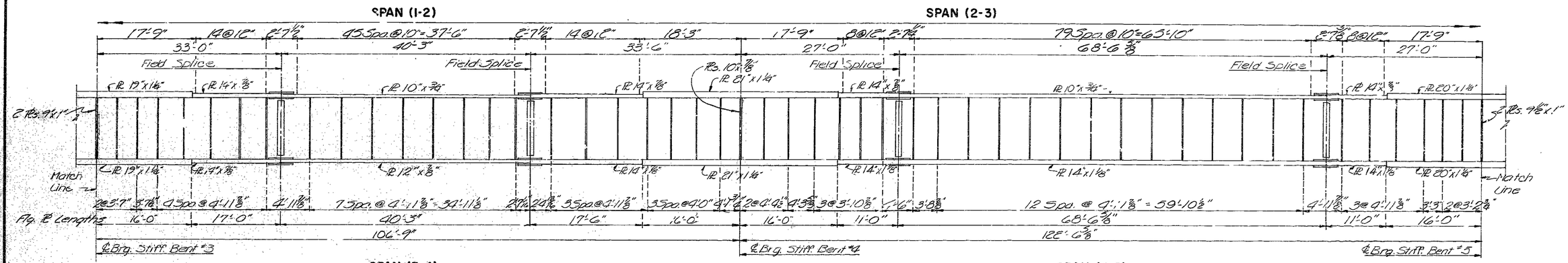
Sheet No. 17 of 27.

MISSOURI STATE HIGHWAY DEPARTMENT

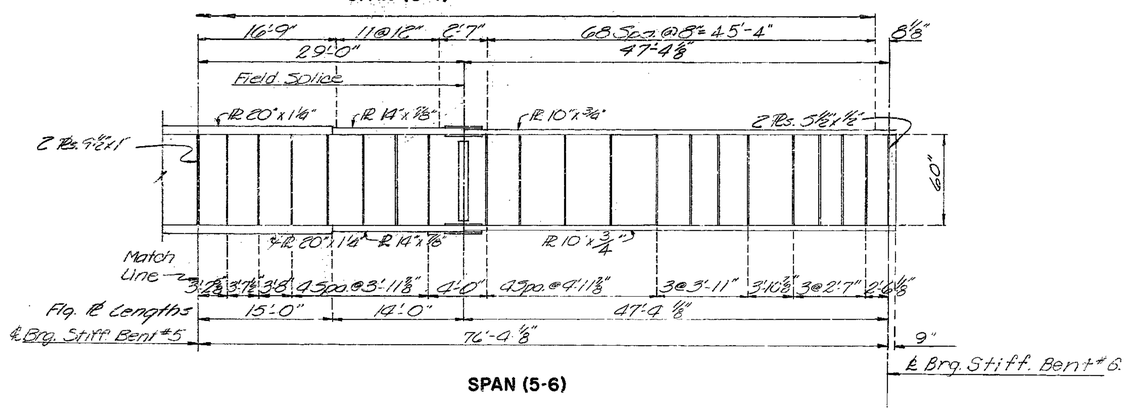
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	MO.		19	65	



SPAN (1-2) **SPAN (2-3)**



SPAN (3-4) **SPAN (4-5)**



SPAN (5-6)

NO. 5 GIRDER ELEVATION

Note: See girder elevation No. 1 on sht. No. 14 of 27 for radiographic inspection note and general note.

Girders shall be fabricated on horizontal curves. The radius of curve for girder No. 5 is 3791.96 Ft.

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435)STA. 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED B. Thurn
DESIGN CK. C.D. Albert	DETAIL CK. J. Carter

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

Sheet No. 18 of 27.

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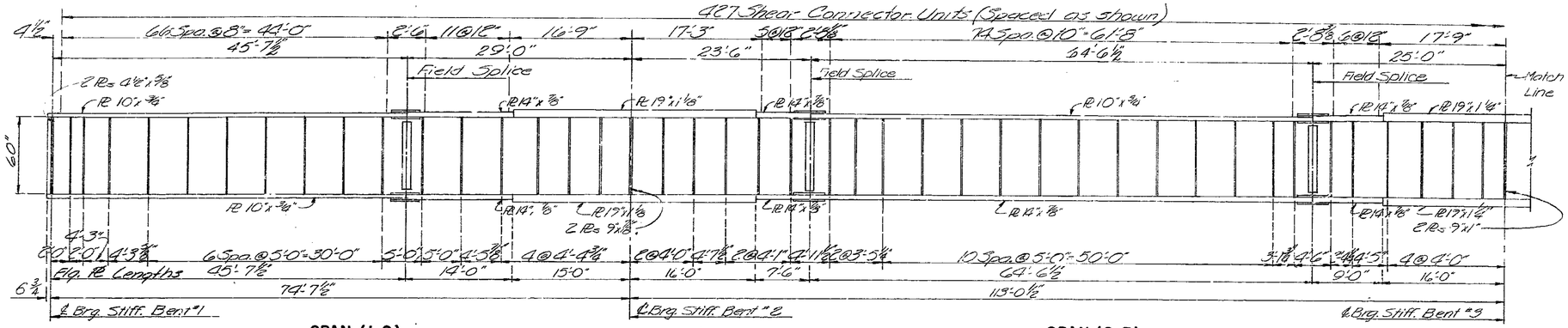
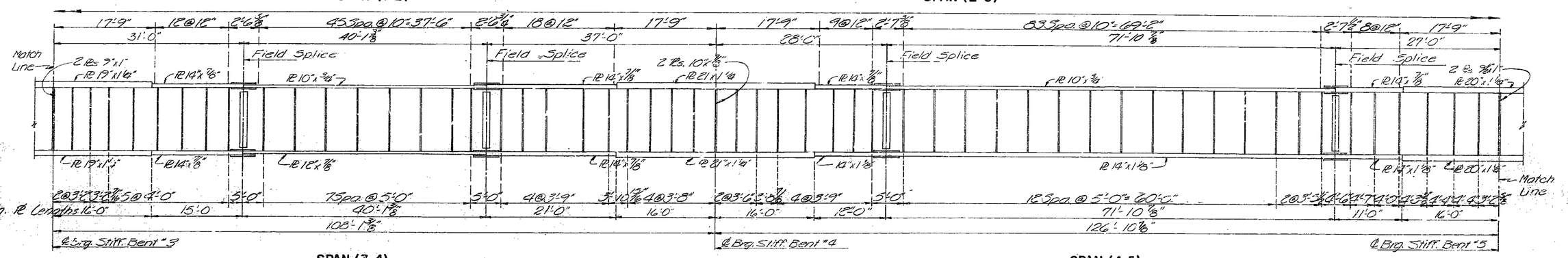
MISSOURI STATE HIGHWAY DEPARTMENT

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



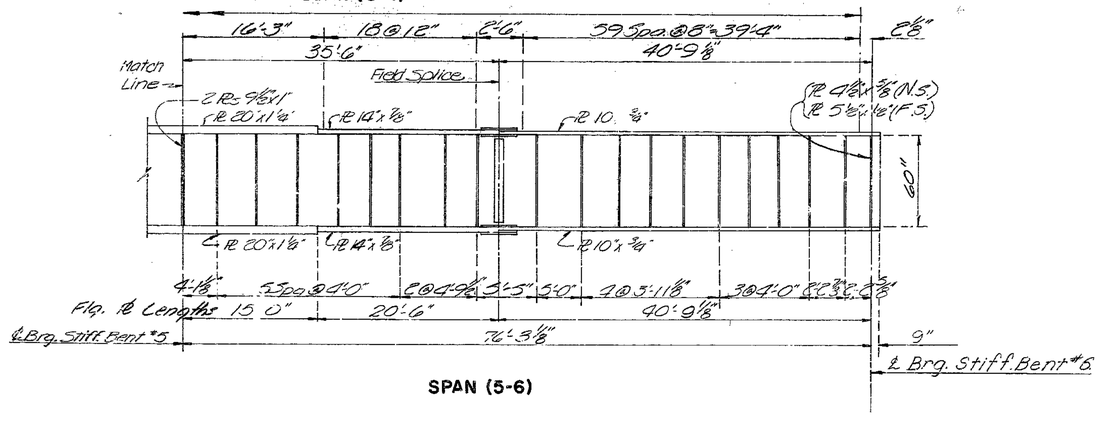
SPAN (1-2)

SPAN (2-3)



SPAN (3-4)

SPAN (4-5)



SPAN (5-6)

NO. 6 GIRDER ELEVATION

Note: See girder elevation No. 1 on Sht. 19 of 27 for radiographic inspection note, magnetic particle inspection note and general girder note.

Girders shall be fabricated on horizontal curves. The radius of curve for Gdr. No 6 is 3801.71 Ft.

BRIDGE OVER K.C.S., C.R.I. & P., AND C.M. & ST.P R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435) **STA.** 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED B. Thurn
DESIGN CK. C.D. Albert	DETAIL CK. J. Carter

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

Sheet No. 1 of 27.

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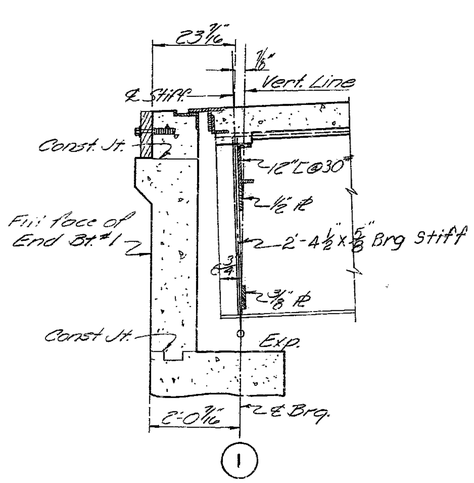
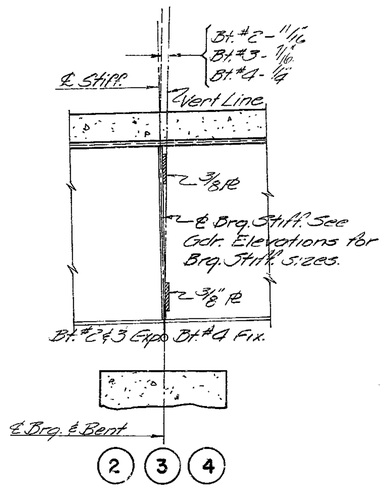
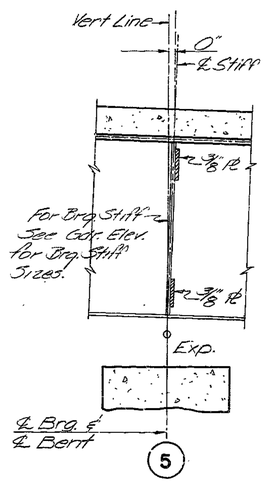
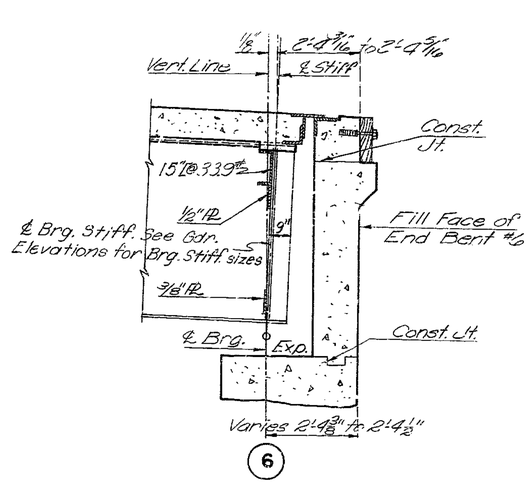
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	67	

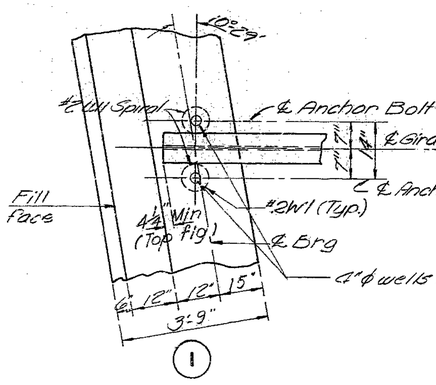


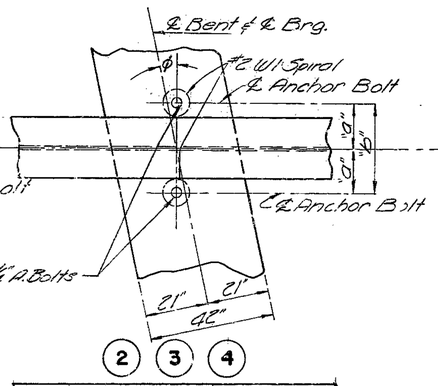


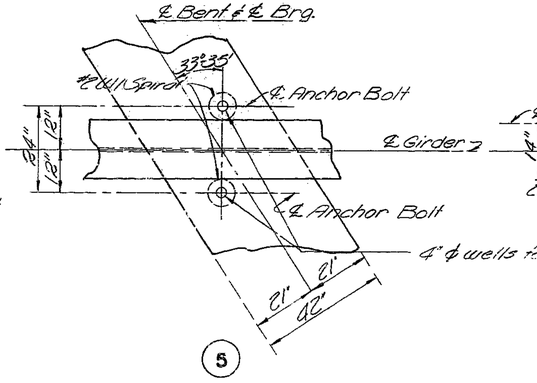


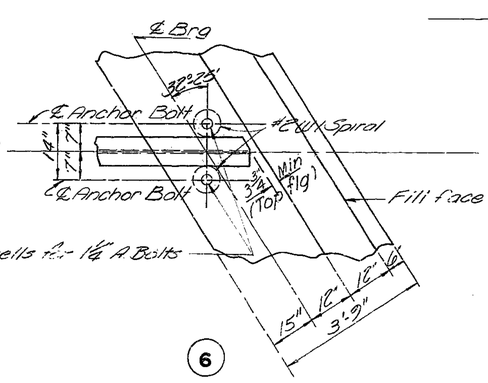


PART. LONGITUDINAL SECTION

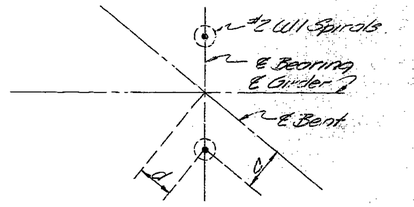








Brgs. @ Bt. angles to chord from fixed Brg.

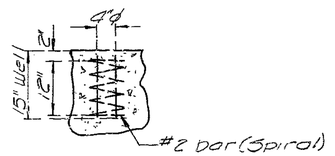


Loc.	Dimensions	
Bt. No.	c	d
1	11 1/2"	6 7/16"
2	11 1/2"	11 7/16"
3	12"	11 7/16"
4	2'-0"	11 7/16"
5	6 7/16"	10"
6	3 7/16"	3 7/16"

ANCHOR BOLT LOCATION DIMENSIONS

	Dimensions		Angle
BENT No.	a	b	ϕ
2	11 1/2"	23"	9°-21'
3	11 1/2"	23"	7°-33'
4	12 1/2"	2'-0 1/2"	13°-50'

PARTIAL ANCHOR BOLT PLAN



ANCHOR BOLT WELL DETAIL

BRIDGE OVER K.C.S., C.R.I.&P., AND G.M. & S.T.P. R.R.S.
STATE ROAD INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52)(RTE I-435 STA. 92+13.39 N.B.L.
JACKSON COUNTY

201

BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED C. Phillips	DETAILED J.R. Kettler
DESIGN CK. C.D. Albert	DETAIL CK. C.R. Poag

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

A-2249

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	68	

NOTES: TYPE "D" BEARINGS

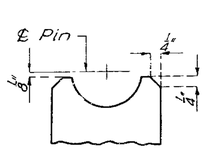
Lead plates under bearings shall be approximately 1/8" thickness and weigh 8#/sq. ft. Cost of lead plates shall be included in price bid for other items.

"Estimated weight" does not include weight of anchor bolts.

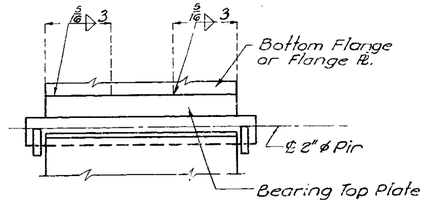
Rockers and pedestals shall be machined after welding.

Where flat surface is indicated, tolerance shall be .003 in/in in any direction.

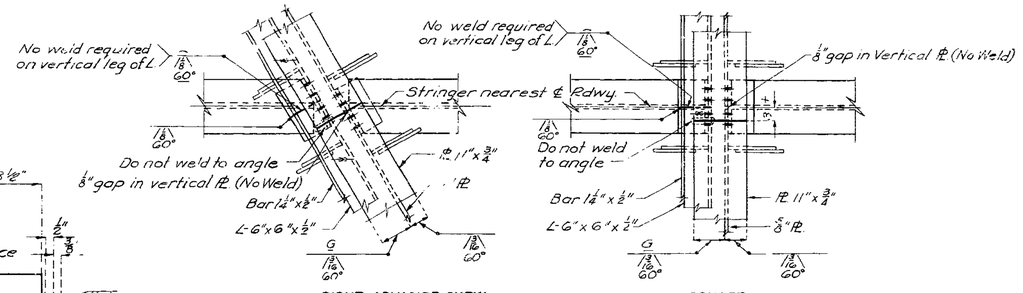
Anchor Bolts for Type "D" Bearings shall be 1 1/4"ø swedged bolts and shall extend 12" into concrete, with hexagon nuts and plain washers for Fixed Bearings, no nuts for Expansion Bearings.



END VIEW OF WEB EXPANSION BEARING



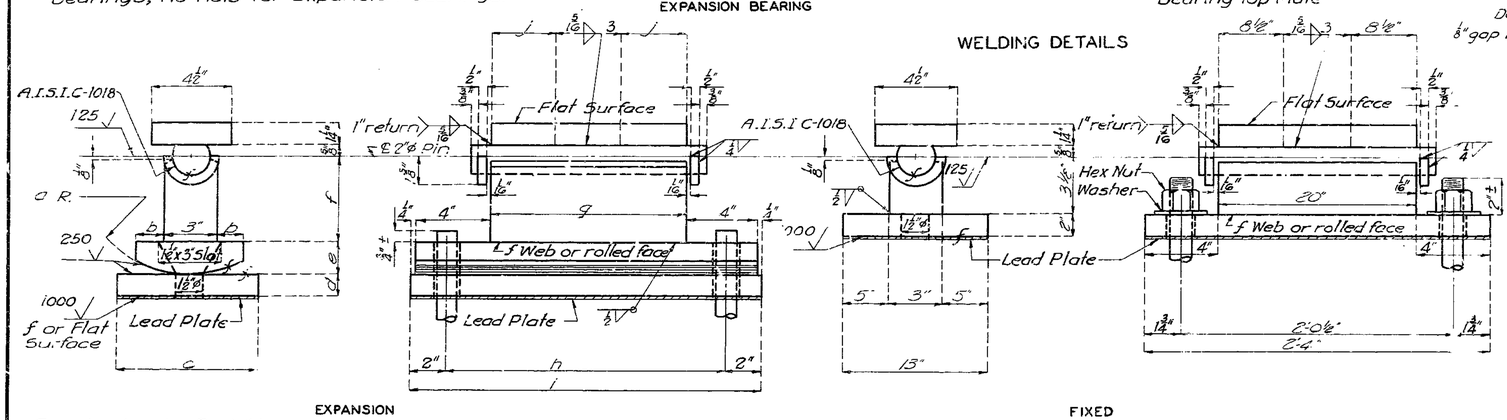
WELDING DETAILS



RIGHT ADVANCE SKEW (Left Advance Similar)

SQUARE

PERMISSIBLE FIELD SPLICE AT END BENT



EXPANSION

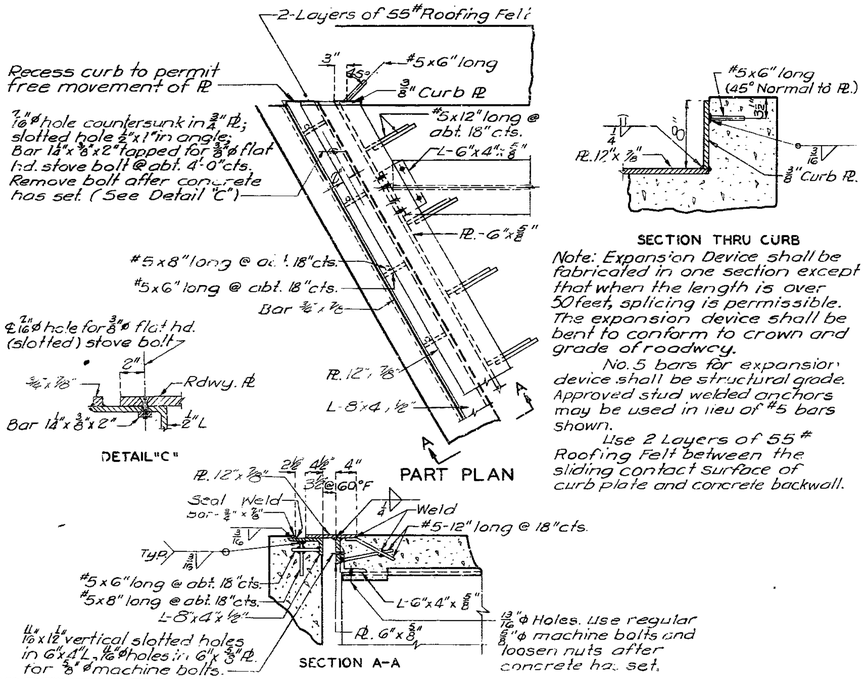
FIXED

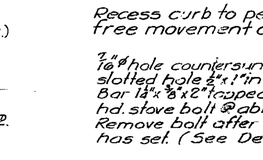
Required: 6 @ Bent #1
6 @ Bent #2
6 @ Bent #3
6 @ Bent #5
6 @ Bent #6

Required: 6 (at Bt. 4 only)

TYPE "D" BEARINGS
(Estimated Weight 15,345)

EXP BEARING DIMENSIONS										
Bent	a	b	c	d	e	f	g	h	i	j
1	7 1/2"	1 1/2"	15"	2"	2"	5 1/2"	9 1/2"	10"	18"	3 1/4"
2	10 1/2"	1 1/2"	15"	2 3/4"	2 1/8"	8 3/8"	18 1/2"	23"	27"	7 1/2"
3	10 1/2"	1 1/2"	15"	2 3/4"	2 1/8"	8 3/8"	18 1/2"	23"	27"	7 1/2"
5	10 1/2"	1 1/2"	15"	2 3/4"	2 1/8"	8 3/8"	19 1/2"	24"	28"	8 1/4"
6	7 1/2"	1 1/2"	13"	2"	2"	5 1/2"	9 1/2"	14"	18"	3 1/4"





SECTION THRU CURB

Note: Expansion Device shall be fabricated in one section except that when the length is over 50 feet, splicing is permissible. The expansion device shall be bent to conform to crown and grade of roadway.

No. 5 bars for expansion device shall be structural grade. Approved stud welded anchors may be used in lieu of #5 bars shown.

Use 2 Layers of 55# Roofing Felt between the sliding contact surface of curb plate and concrete backwall.

EXPANSION DEVICE AT END BENT NO. 1

SECTION THRU CURB

Note: Expansion Device shall be fabricated in one section except that when the length is over 50 feet, splicing is permissible. The expansion device shall be bent to conform to crown and grade of roadway.

No. 5 bars for expansion device shall be structural grade. Approved stud welded anchors may be used in lieu of #5 bars shown.

Use 2 Layers of 55# Roofing Felt between the sliding contact surface of curb plate and concrete backwall.

EXPANSION DEVICE AT END BENT NO. 6

BRIDGE OVER K.C.S., C.R.I.&P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435)STA. 92+13.39N.B.L.

JACKSON COUNTY

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Phillips	DETAILED J. Kettler
DESIGN CK. D. Albert	DETAIL CK. C. Page

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

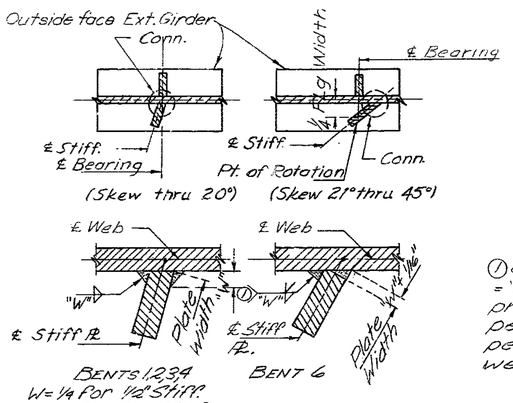
Sheet No. 21 of 27.

A-2249

202

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	69	

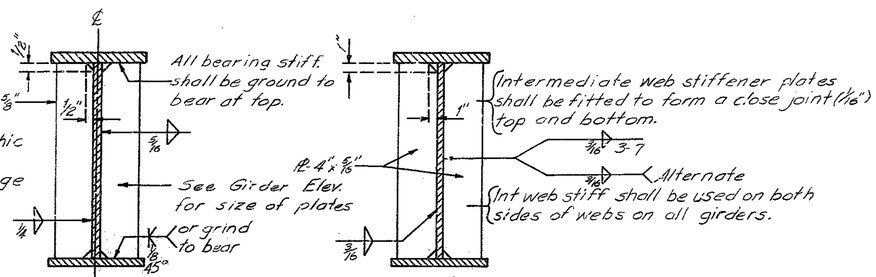


W = 1/4 for 1/2" Stiff.
W = 1/4 for 5/8" Stiff.
W = 5/16 for 7/8", 1", & 1 1/8" Stiff.

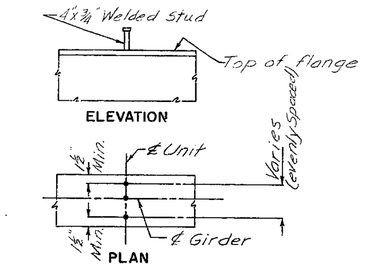
All Int. stiffeners normal to ℄ Girder. Brg. stiffeners @ Bent 5 are normal to ℄ Girder.

① Groove weld penetration = "W" Min. Only welding processes having good penetration will be permitted on groove welds.

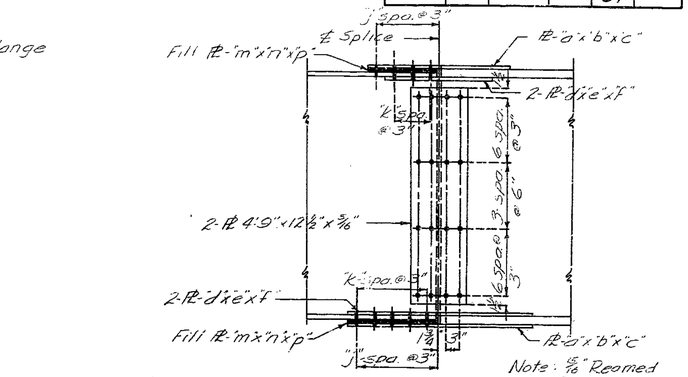
Note: "The following welds will be subject to radiographic inspection."
Shop: "All butt welded flange plates.
Field: None

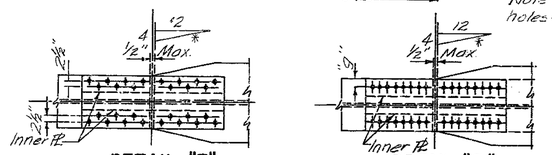


WELDING DETAILS PLATE GIRDER



SHEAR CONNECTOR DETAILS





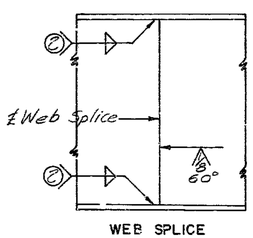
DETAILS OF GIRDER FIELD SPLICE

*Bevel flange when difference in plate widths exceeds 2".

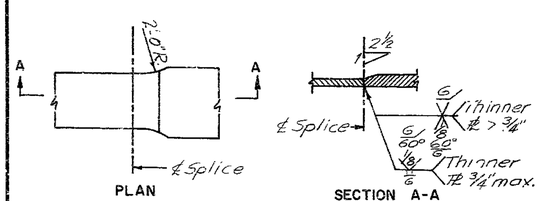
"*" Use Detail "F" for these flange sizes.

TABLE OF FIELD FLANGE SPLICES

	Flange	to	Flange	a	b	c	d	e	f	g	j	k	m	n	p
	10" x 3/4"		14" x 7/8"	10"	3/8"	2'-0 1/2"	4"	1 1/8"	2'-0 1/2"	2"	3	3	10"	1 1/2"	12"
	10" x 1/2"		14" x 1/2"	10"	1/2"	2'-6 1/2"	4"	1 1/2"	2'-0 1/2"	2"	4	3	–	–	–
	12" x 7/8"		14" x 7/8"	12"	1/2"	3'-0 1/2"	5"	1 1/2"	2'-6 1/2"	2 1/2"	5	4	–	–	–
*	14" x 7/8"		14" x 7/8"	14"	1/2"	4'-0 1/2"	6"	1 1/2"	3'-5 1/2"	1 1/2"	6	5	–	–	–
*	14" x 1"		14" x 1"	14"	1/2"	4'-0 1/2"	6	5/8"	4'-0 1/2"	1 1/2"	6	6	–	–	–
*	14" x 1 1/8"		14" x 1 1/8"	14"	1/2"	4'-0 1/2"	6"	5/8"	4'-0 1/2"	1 1/2"	6	6	–	–	–



② Note: See General Notes.

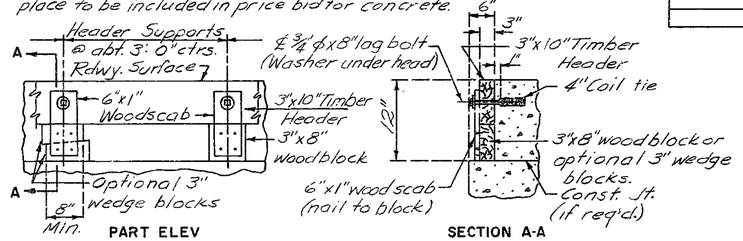


FLANGE SPLICE

MIN. ALLOWABLE FILLET WELDS	
MATERIAL THICKNESS	MIN. SIZE FILLET WELD
To 1/2" inclusive	3/16
Over 1/2" to 3/4"	1/4
Over 3/4" to 1 1/2"	5/16
Over 1 1/2" to 2 1/4"	3/8
Over 2 1/4" to 6"	1/2
Over 6"	5/8

WELDING DETAILS

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



TIMBER HEADER DETAILS

BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED B. Phillips | DETAILED E.R. Spencer
DESIGN CK. D. Albert | DETAIL CK. C. Page

BRIDGE OVER K.C.S., C.R.I. & P. AND C.M. & S.T.P. R.R.S
STATE ROAD INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52)(RTE. I-435) STA. 92+13.39 N.B.L.
JACKSON COUNTY

A-2249

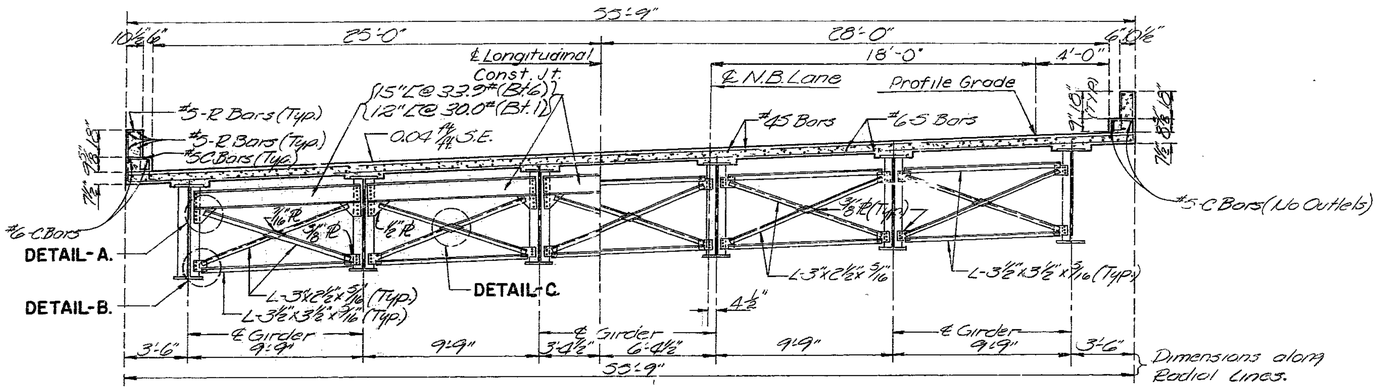
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 22 of 27.

203

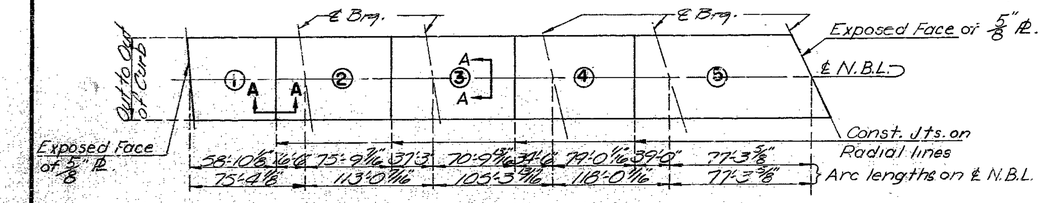
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	70	



HALF SECTION NEAR END DIAPHRAM TYP.

HALF SECTION NEAR INTERIOR DIAPHRAM & CROSS FRAME TYP.

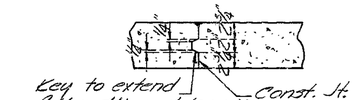


SPAN (1-2) SPAN (2-3) SPAN (3-4) SPAN (4-5) SPAN (5-6)

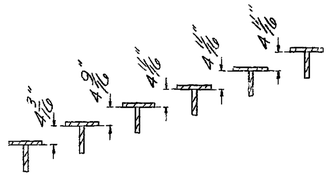
	SEQUENCE OF POURS				
	DIRECTION				
BASIC SEQUENCE	1 E.D.	2 1 TO 3	3 2 TO 4	4 3 TO 5	5 4 TO END
ALTERNATE "A" POURS	1 + 2 END TO 3		3 2 TO 4	4 + 5 3 TO END	
ALTERNATE "B" POURS	1 + 2 + 3 END TO 4			4 + 5 3 TO END	
ALTERNATE "C" POURS	1+2+3+4+5 END TO END				

The contractor shall use an approved oscillating screed type, self-propelled mechanical finishing machine and shall pour and satisfactorily finish the slab pours at a rate of not less than 42 cubic yards per hour unless he elects to use an approved retarder at his own expense 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 26 cubic yards per hour. The contractor shall observe the basic pouring sequence unless he can demonstrate to the engineer that he can pour and satisfactorily finish one of the longer alternate pours. Finishing machine loads will not be permitted on concrete less than 48 hours old.

Finish each side of joint with ¼" radius edging tool.

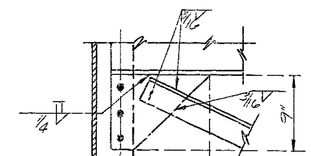


SECTION A-A.

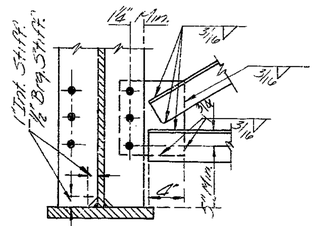


PART SECTION - ℄ GIRDER SPANS

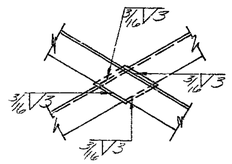
Note: For details and reinforcement of curb and parapet not shown see Sht. No. 26 of 27.



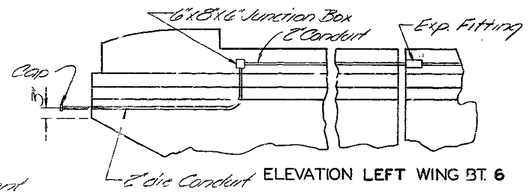
DETAIL A.



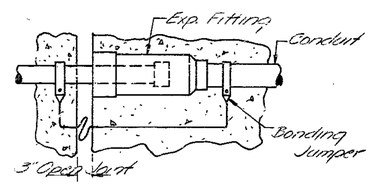
DETAIL B.



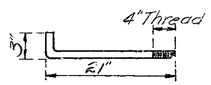
DETAIL C.



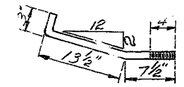
ELEVATION LEFT WING BT. 6



CONDUIT EXPANSION FITTING



Type 1 (4 Required)



Type 2 (4 Required)

ANCHOR BOLTS

Note: Cost of furnishing and placing conduit and anchor bolts for lighting standard shall be included in contract unit price of conduit system (on structures).

Light standards, wiring and fixtures to be furnished and installed by others.

All conduit to be rigid galvanized steel with 3" minimum cover in concrete.

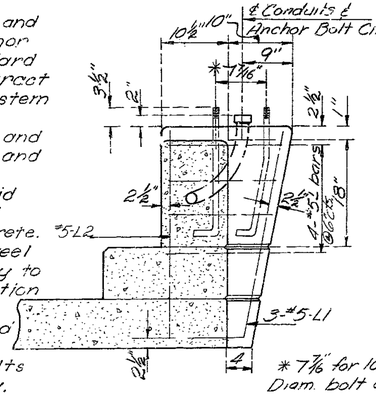
Shift reinforcing steel in field where necessary to clear conduit and junction boxes.

Top of light standard supports to be made horizontal, anchor bolts to be placed vertically.

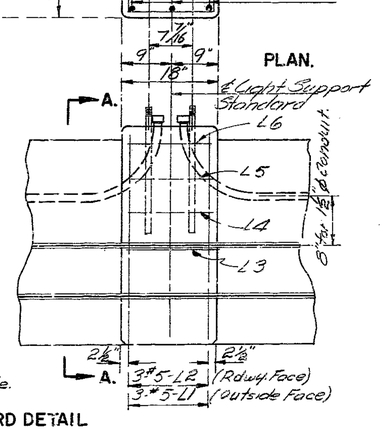
Galvanized Expansion fittings shall provide a minimum of ½" movement in either direction of "Q" at open joints and 1" at filled joints. Fittings shall be equal to O.Z. Elect. Co. Expansion Fittings "AX" and "EX" with approved bonding jumper.

All parapet junction boxes shall be flush mounted and equal to O.Z. Elect. Mfg. Co. Type "YR"

½" Drain holes shall be provided at low points of conduit and junctions boxes.



SECTION A-A.



LIGHT STANDARD DETAIL

ELEVATION.

BRIDGE OVER K.C.S, C.R.I.&P, AND C.M.& S.T.P. R.R.S.

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE I-435) STA. 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C.R. Page	DETAILED J.R. Kettler
DESIGN CK. W.G. Cottrom	DETAIL CK. C. Page

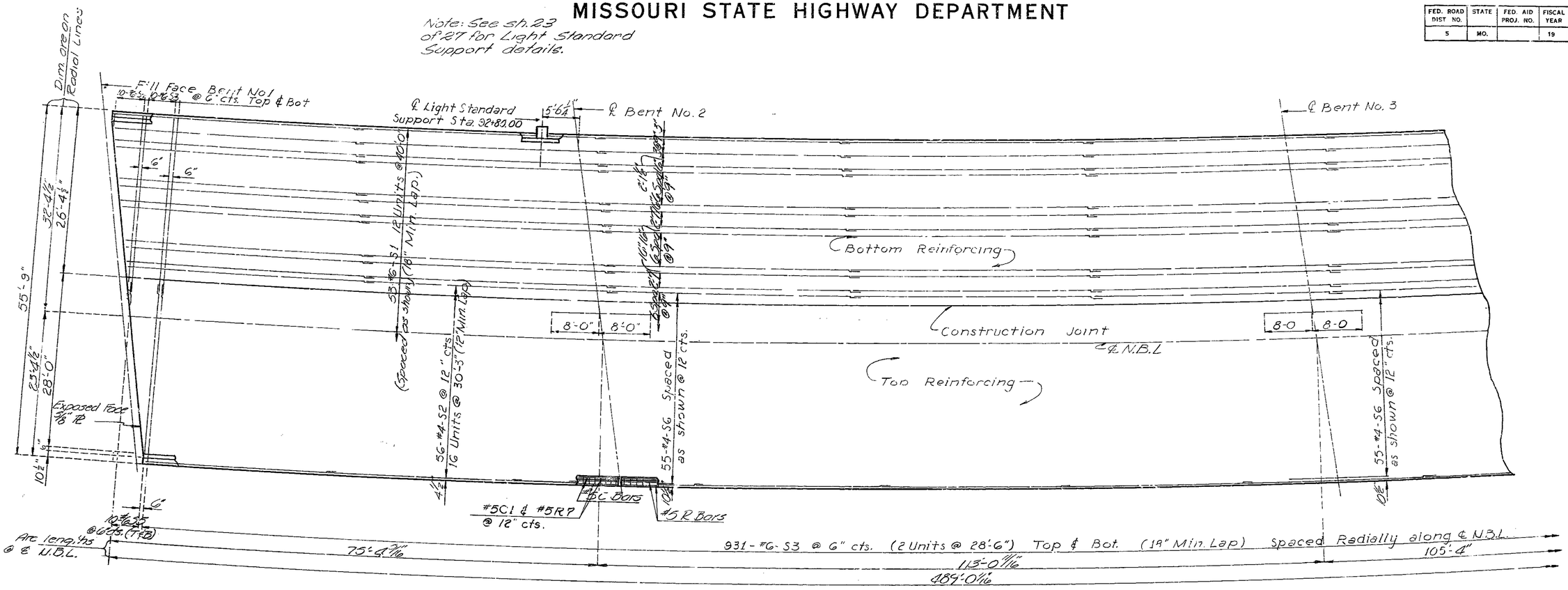
Note: This drawing is not to scale Follow dimensions.

202

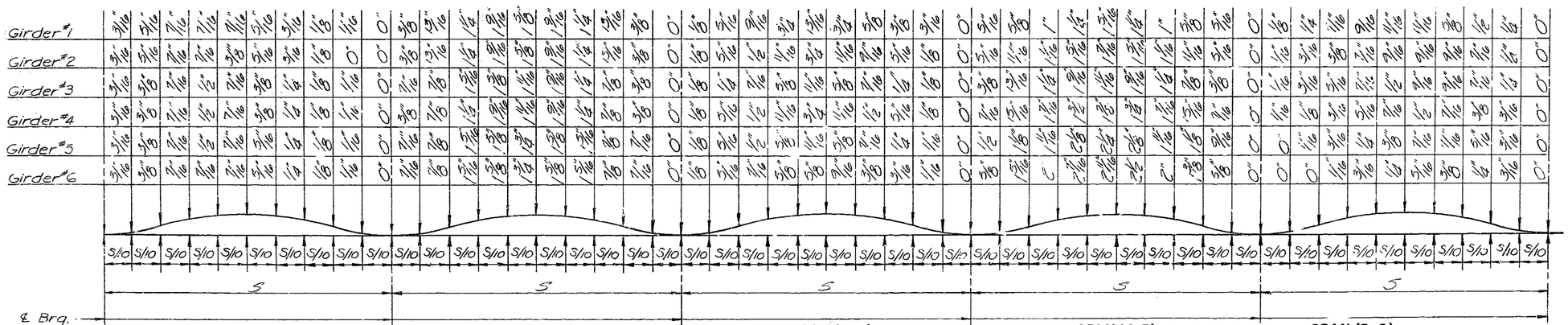
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19 71		

Note: See sh. 23 of 27 for Light Standard Support details.

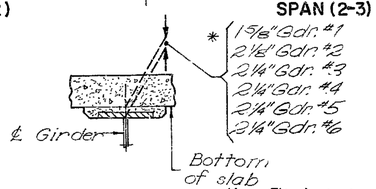


PLAN OF SLAB SHOWING REINFORCEMENT



Note:
Longitudinal dimensions shown are horizontal arc lengths @ ℄ N.B.L. Longitudinal reinforcing to be placed on arcs parallel to ℄ N.B.L. Transverse reinforcing to be placed on radial lines. For details and reinforcement of curbs and parapet not shown see sheet 26 of 27. See sheet 23 of 27 for typical sections through slab.

Note: S denotes lengths of spans. See individual girder elevation for proper lengths.



CAMBER DIAGRAM

Note: Camber includes allowance for dead load deflection for concrete slab, structural steel and vertical curve.
15% of dead load deflection due to weight of structural steel.

* Dimensions may vary if girder camber after erection differs from plan camber by more than the % of D.L. deflection due to weight of structural steel. No payment will be made for additional forming or concrete required for variable haunching.

BRIDGE OVER K.C.S., C.R.I. & P. AND C.M. & ST.P. R.R.S.

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435)STA. 92+13.39N. B.L.

JACKSON COUNTY

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Page	DETAILED G. Hoon
DESIGN CK. A.G. Lotham	DETAIL CK. C. Page

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

Sheet No. 29 of 27.

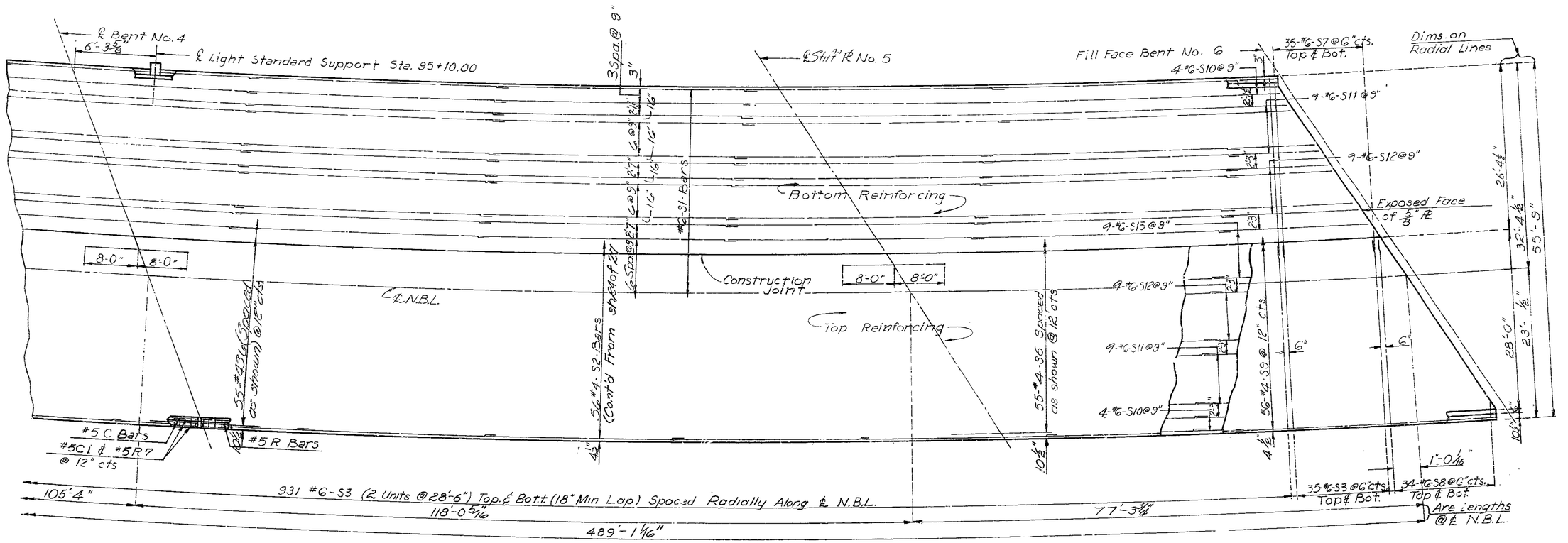
A-2249

205

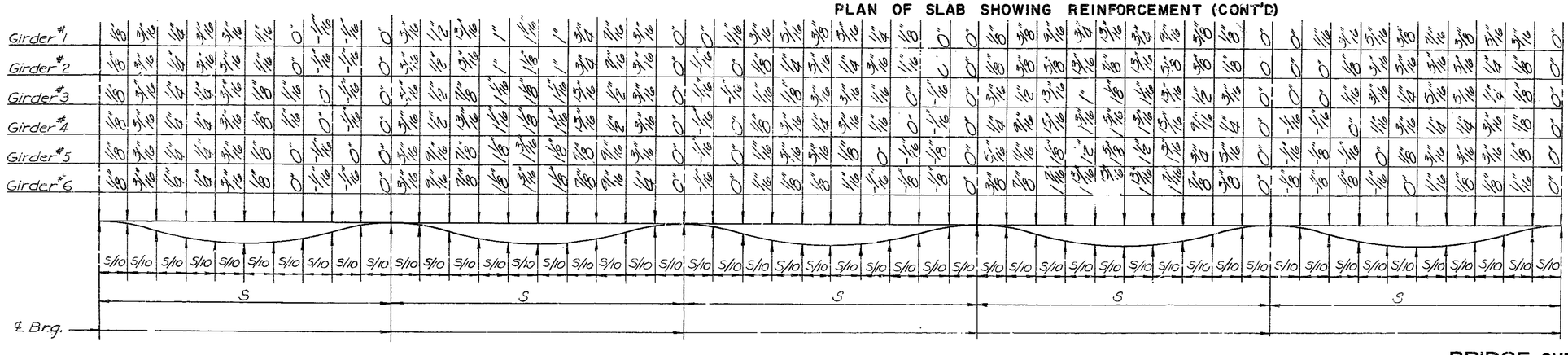
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	72	

Note: See Sh. 23 of 27 for Light Standard Support details.



PLAN OF SLAB SHOWING REINFORCEMENT (CONT'D)



SPAN (1-2) SPAN (2-3) SPAN (3-4) SPAN (4-5) SPAN (5-6)

15% Structural Steel DEAD LOAD DEFLECTION.

Note: S denotes lengths of spans. See individual girder elevations for proper lengths.

Note: Longitudinal dimensions shown are horizontal arc lengths @ ℄ N.B.L. Longitudinal reinforcing to be placed on arcs parallel to ℄ N.B.L. Transverse reinforcing to be placed on radial lines. For details and reinforcement of curbs and parapet not shown see sh. 26 of 27. See sh. 23 of 27 for typical sections through slab.

BRIDGE OVER K.C.S., C.R.I. & P. AND C.M. & S.T.P. R.R.S.

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE. I-435) STA. 92+13.39 N.B.L.

JACKSON COUNTY

A-2249

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Page	DETAILED G. Moon
DESIGN CK. A.G. Latham	DETAIL CK. C. Page

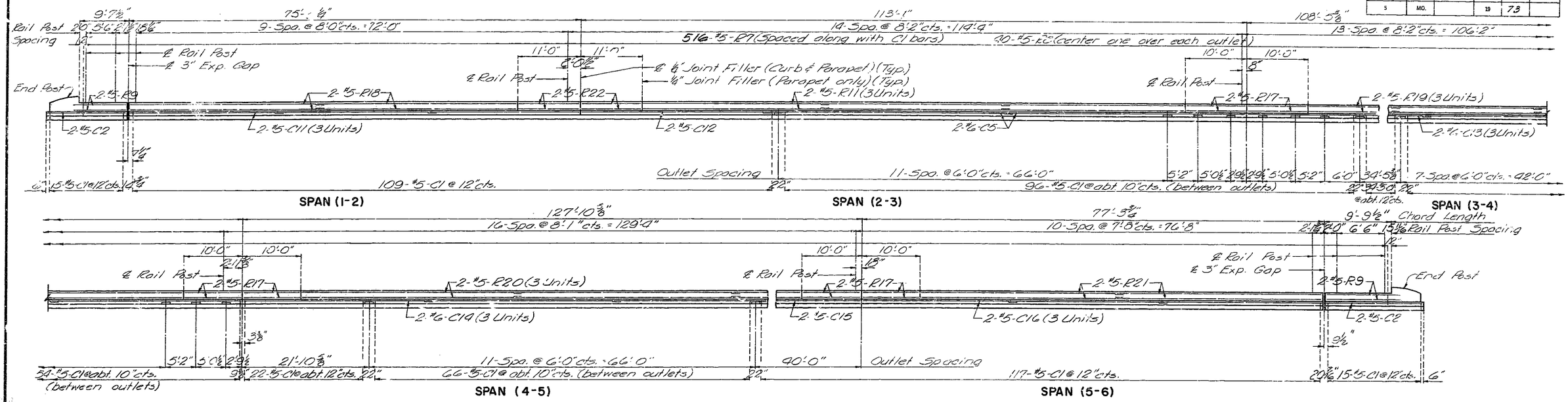
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 25 of 27

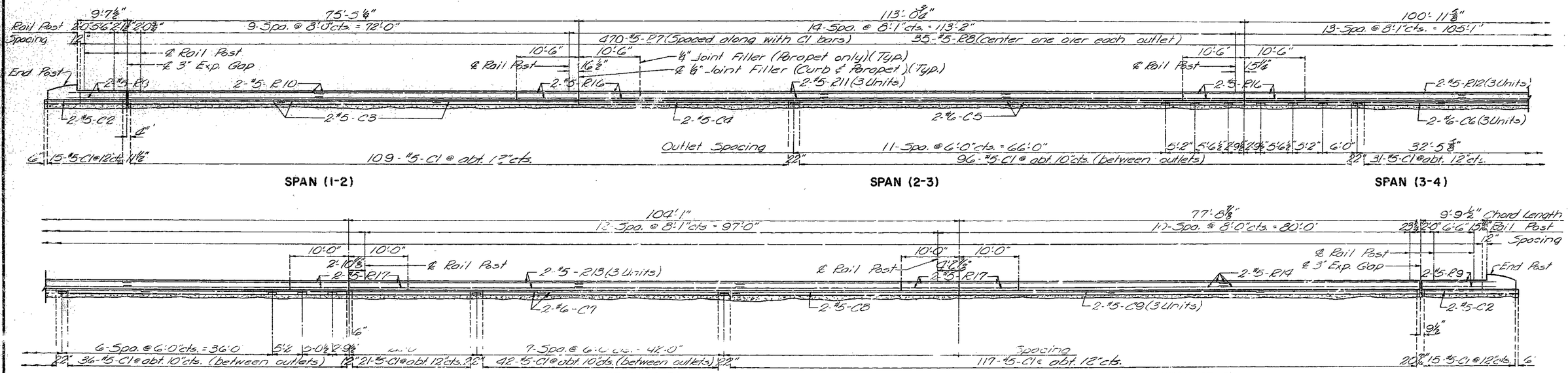
206

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19 73		



ELEVATION OF CURB AND PARAPET (Right Side)



ELEVATION OF CURB AND PARAPET (Left Side)

Note: For location and spacing of C1 bars see sheet No. 27 of 27.
Longitudinal dimensions shown are along & of handrail at top of parapet.

BRIDGE OVER K.C.S., C.R.I.&P., AND C.M. & S.T.P. R.R.S

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(52)(RTE)I-435) **STA.** 92+1339N B L

JACKSON COUNTY

BURGWIN & MARTIN CONSULTING ENGINEERS	
DESIGNED C. Page	DETAILED J. Carter
DESIGN CK. H.G. Latham	DETAIL CK. C. Page

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

Sheet No. 26 of 27.

A-2249

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FOR INFORMATION ONLY

A22494, Sht. 33

GENERAL NOTES:

All handrail posts shall be set normal to grade.

Aluminum tube handrail shall be bent to conform to vertical and horizontal alignment of parapet.

Aluminum washer shims between top of parapet and post base may be used for adjusting handrail alignment. Maximum thickness of shims to be ⅛". Where more tilting of post is required for proper alignment, concrete bearing areas shall be ground down.

All parts of handrail, except anchor bolts, nuts, washers, and set screws are to be of aluminum material.

The contract unit price per linear foot of "Bridge Rail" shall include furnishing and erecting the handrail complete with anchor bolts, shims and Insulating compound.

All fillets ¼" except as noted.

All drafts 3° except as noted.

Pipe rail to be fabricated in two or three panel lengths unless otherwise approved.

Omit set screw on side near filled joint in parapet at all expansion posts.

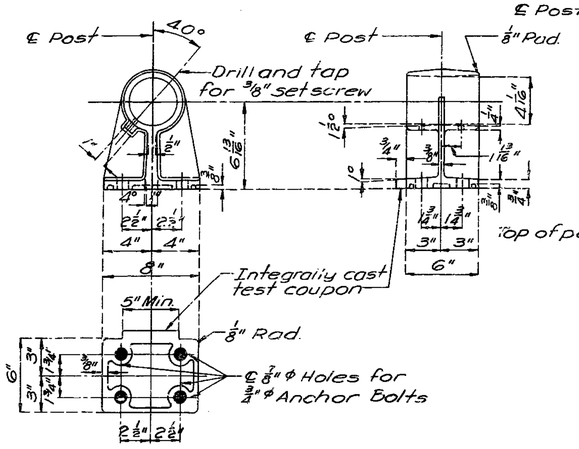
Top of curbs and parapets to be built parallel to grade. Vertical faces of end post to be vertical.

All exposed edges of end posts, parapets and curbs shall have ⅝" radius.

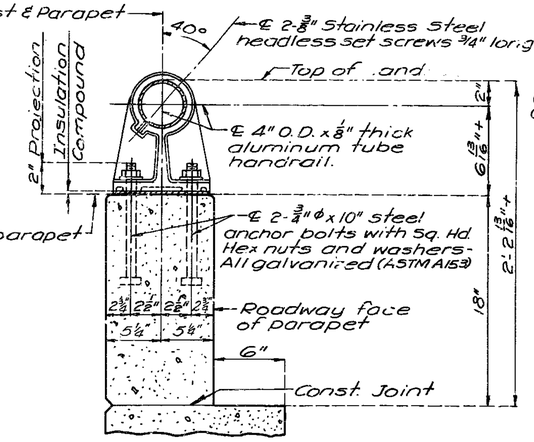
If the contractor desires, he may use drive fit cast aluminum end caps in lieu of welded aluminum closure plates.

MISSOURI STATE HIGHWAY DEPARTMENT

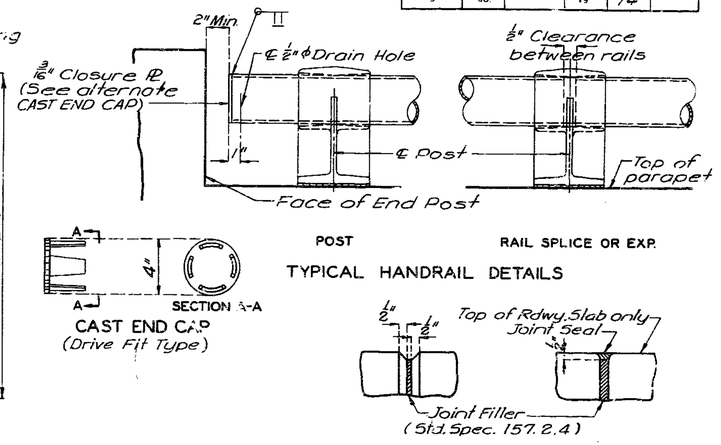
FED ROAD DIST. NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	74	



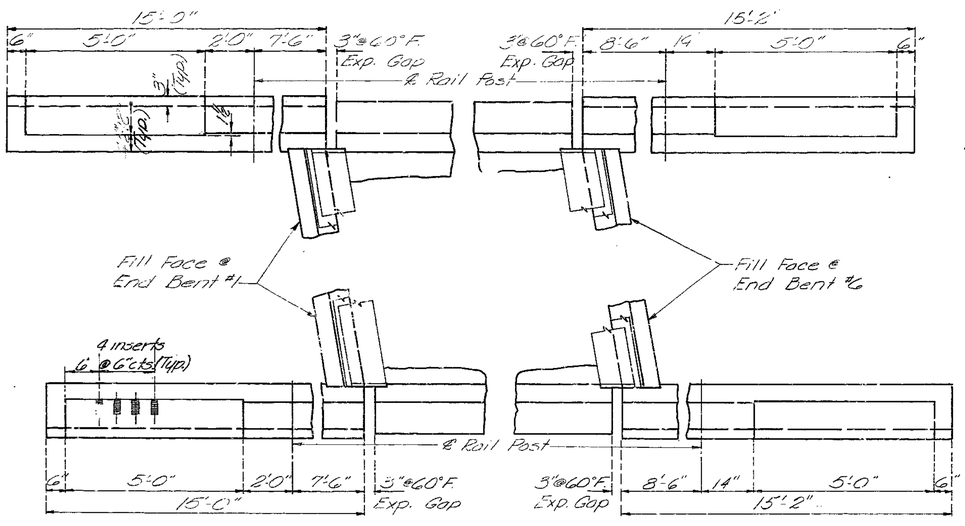
POST DETAILS



SECTION THRU HANDRAIL

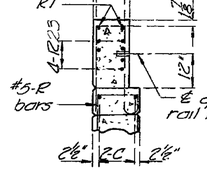


SINGLE TUBE ALUMINUM RAILING



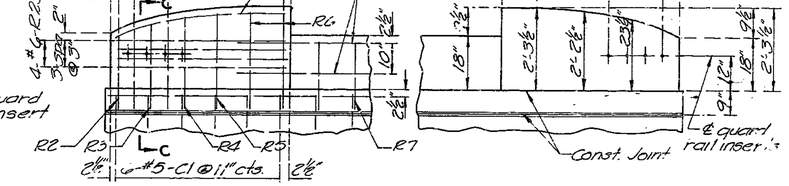
PLAN OF END POST

Note : For elevation of curb & parapet see Sheet No. 26 of 27.

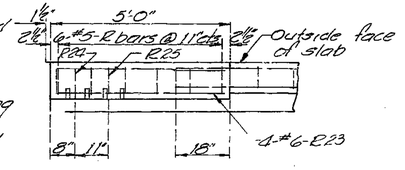


SECTION C-C

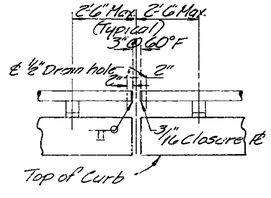
Note: Anchors for attaching guard rail shall be ¾" threaded malleable iron (Galv.) inserts having a Min. depth of 3½" and filled with a plastic closing plug. Cost for furnishing & installing inserts & plugs will be included in price bid for other items.



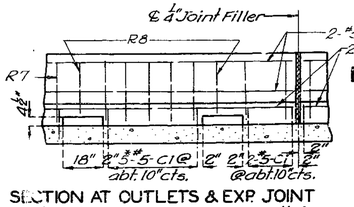
ELEVATION OF END POSTS



PLAN OF END POST



PART RAIL ELEVATION AT EXPANSION GAP



SECTION AT OUTLETS & EXP. JOINT

Note: Where there are no outlets use #5-C1 @ abt. 12" cts.

* 6-C1 bars for 6'-0" outlet spacings.

Sheet No. 27 of 27

BRIDGE OVER K.C.S., C.R.I. & P. AND C.M. & S.T.P. R.R.S.

STATE ROAD INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. HIG-435-1(52)(RTE 1435) STA. 92 + 13.39 N.B.L.

JACKSON COUNTY

A-2249

No.	Date	Revised
1,5,2	Nov 1963	Mar. 1965

BURGWIN & MARTIN
CONSULTING ENGINEERS

DESIGNED C. Page	DETAILED J. Carter
DESIGN CK. A.G. Latham	DETAIL CK. C. Page

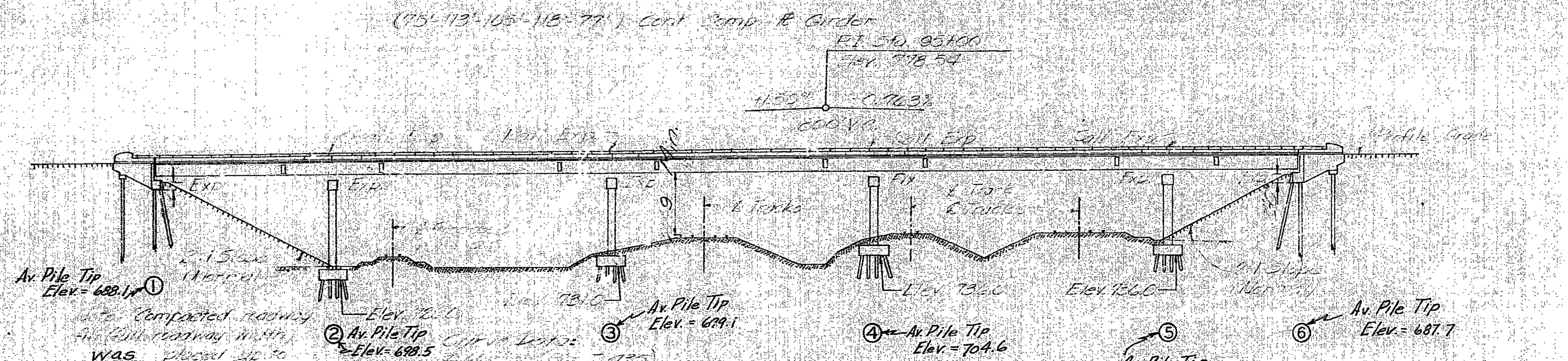
Note: This drawing is not to scale. Follow dimensions.

208

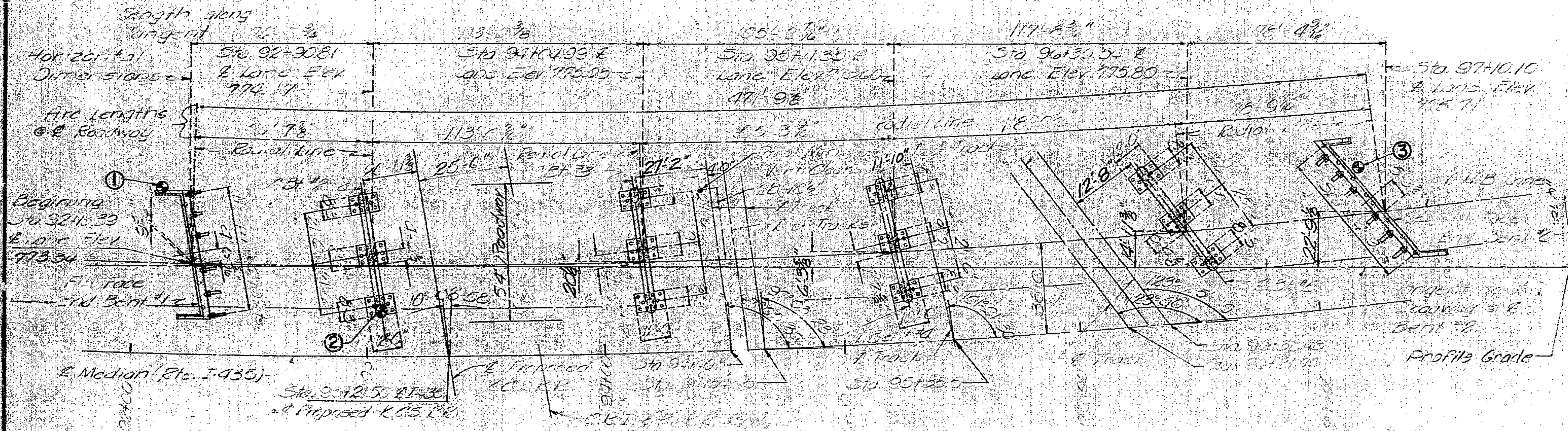
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	48	

FINAL PLANS

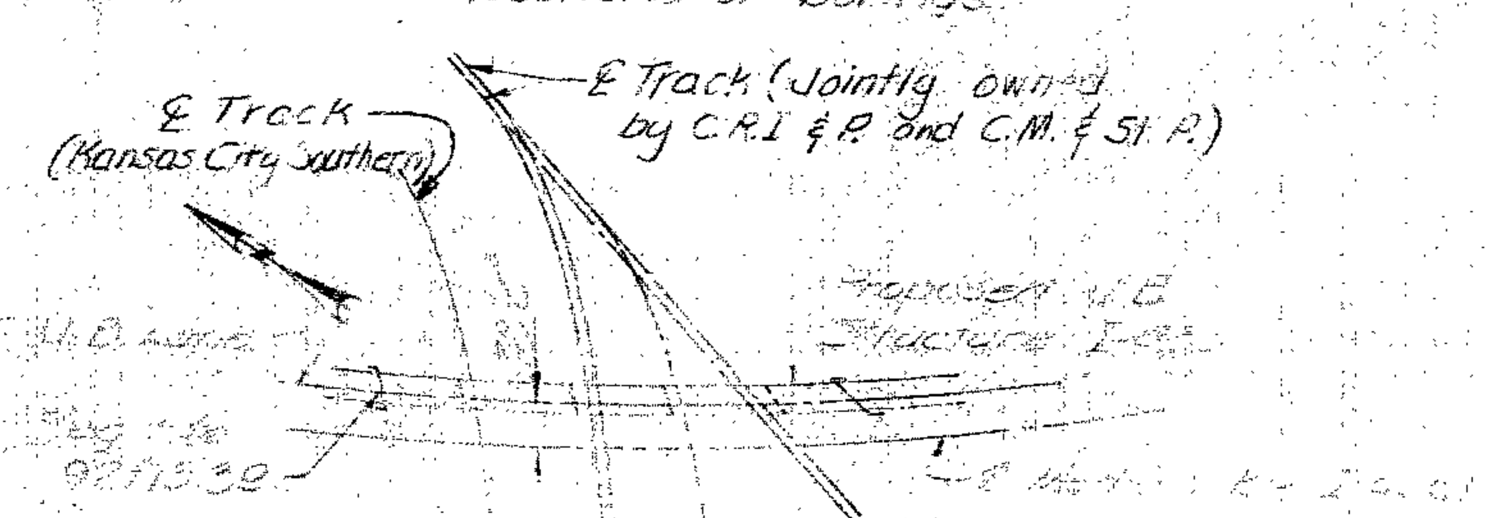


ELEVATION



Note: For Boring Data see sheet No. 2 of 127.
"●" Indicates locations of borings.

PLAN



LOCATION SKETCH

GENERAL NOTES

DESIGN SPECIFICATION:
A.A.S.H.O. 1965

DESIGN LOADING:
H-20-44 Military Loading
Earth 120# Equivalent Fluid Pressure 30#

DESIGN UNIT STRESSES:
[illegible]

SURFACE SEAL:
Superstructure deck was surface sealed.

FABRICATED STEEL:
Field connections, High Strength Bolts [illegible]

PAINTING:
Prime: Shop, none; Field, by contractor in accordance with Std. Spec. [illegible]

CONSTRUCTION CLEARANCE:
A minimum vertical clearance of [illegible] of rails and a minimum lateral clearance of 25'-0" centered on tracks was maintained during construction.

WELDING:
Details of welded joints shown are for manual arc welding except as noted.
The minimum size of fillet welds was in accordance with AWS D2.0-66, Article 217(b) except the minimum size fillet weld connecting parts carrying primary stress shall be [illegible]".

PILE DATA						
BENT NO.	1	2	3	4	5	6
[illegible]	10BP42	15" Tr. Timber	15" Tr. Timber	15" Tr. Timber	15" Tr. Timber	10BP42
[illegible]	14	32	32	33	33	16
Average Length	76.9	28.5	31.9	31.4	29.6	79.7
[illegible]	300	29.8	29.7	29.7	29.7	28.1
[illegible]	691.0	710.0	710.0	710.0	710.0	691.0
Hammer Energy Furnished Ft-Lb	39,800	15,000	15,000	15,000	15,000	39,800

*Note: See Special Provisions for [illegible] 15" Treated Timber [illegible] is 8000 Ft. Lbs. except at Bents No. 4 & No. 5 where [illegible]

B.M. - □ in S.W. Cor. of Rt. End Wing Curb Abut. No. 6
14± Lt. of Sta. 97+47 ~ Elev. = 777.23

FINAL QUANTITIES		TOTALS
[illegible]		432.0
15" Treated Timber Piles		3941
[illegible]		453.2
[illegible]		752.1
[illegible]		344,360
[illegible]	Tons	301.5
[illegible]		607,720
[illegible]		1011
[illegible]		1
C.I.P. Piles End Bents only		0
CONTINGENTS		
10BP42 Pile* (506.01)	Lump Sum	1

*Actual No. of Feet-In-Place - 2351'

BRIDGE OVER K.C.S., C.R.I.&P., AND C.M.&S.T.P. R.R.S.
STATE ROAD INTERSTATE ROUTE 435 FINISHED
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52)(RTE. I-435) STA. 92+13.39 N.B.L.
JACKSON COUNTY

SUBMITTED BY W. R. Caine, BRIDGE ENGINEER — DATE Feb. 23, 1968
APPROVED BY M. J. Snider, CHIEF ENGINEER — DATE Feb. 23, 1968

STD. 54.00
A-2249

BURGWIN & MARTIN
CONSULTING ENGINEERS

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

Sheet No. 1A of 1

FINAL PLANS

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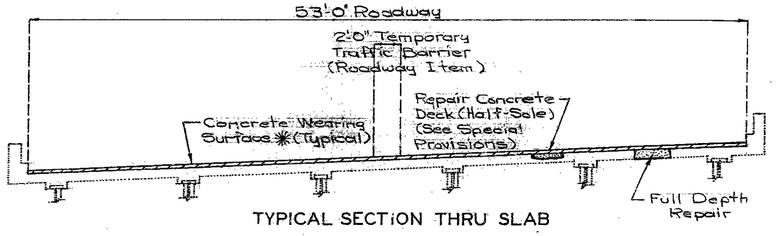
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ. NO.	SHEET NO.
MO.		18
SEC 25	TWP. 50N RGE. 33W	

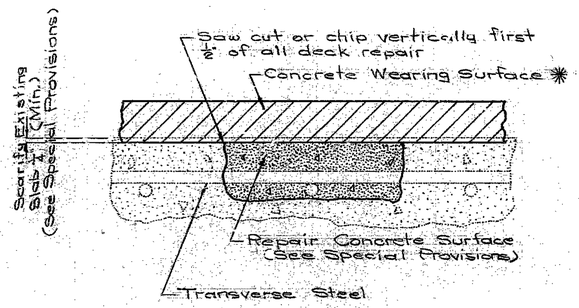


TYPICAL SECTION THRU SLAB

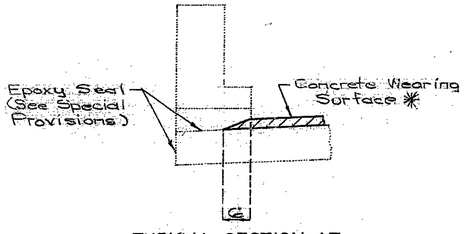
✱ 1¾" (Min.) for latex modified concrete
2¼" (Min.) for low slump concrete

Note: Outline of old work is indicated by light dotted lines.
Heavy lines indicate new work.
Contractor to maintain two lanes of traffic during construction. (See Road Plans)
Bars bonded in old concrete not removed shall be cleanly stripped and reused.

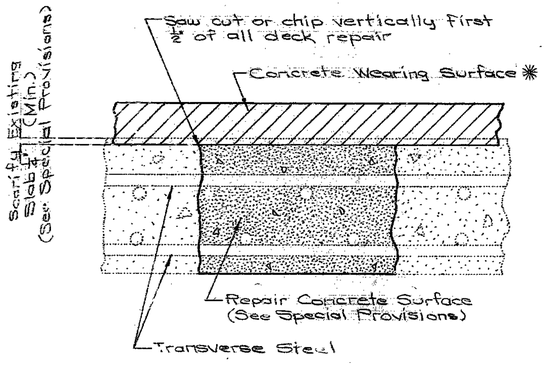
ESTIMATED QUANTITIES		
ITEM		TOTALS
Replacement Of Expansion Device And Adjacent Concrete	Lin. Ft.	117
Repairing Concrete Deck (Half-Soling)	Sq. Ft.	901
Full Depth Repair	Sq. Ft.	248
Elastomeric Expansion Joint Seal (4")	Lin. Ft.	54
Elastomeric Expansion Joint Seal (2½")	Lin. Ft.	63
Concrete Wearing Surface ✱ (See Special Provisions)	Sq. Yd.	2752



HALF-SOLED AREA



TYPICAL SECTION AT CURB SHOWING OUTLET



FULL DEPTH REPAIR

GENERAL NOTES:

Design Specifications: A.A.S.H.T.O. - 1983 and Interim 1984

Design Unit Stresses:
Class B2 Concrete f'c = 4,000 psi
Reinforcing Steel fy = 60,000 psi

Minimum clearance to reinforcing steel shall be 1½", unless otherwise shown.

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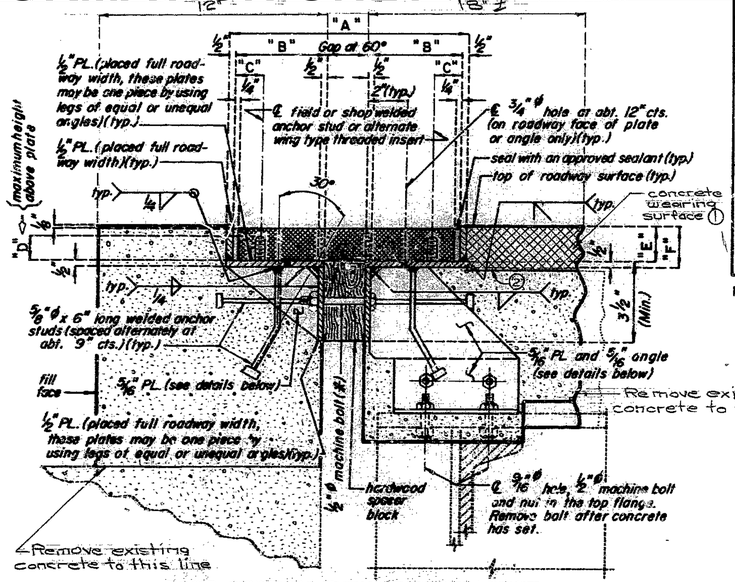
REPAIRS TO
BRIDGE OVER K.C.S., ST. LOUIS SOUTHWESTERN & SOO LINE R.R.S.
STATE ROAD INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. IR-IRG-435-1(181) **STA.** 92+13.39 N.B. LANE
JOB NO. 4-1435-686 **RTE.** 1-435 **STD.** STD.
JACKSON **COUNTY** A-2249R
DATE 4/23/86

DESIGNED Oct. 1985
DETAILED Oct. 1985
CHECKED Dec. 1985

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

SEE FINAL PLAN
Sheet No. 1 **of** 2

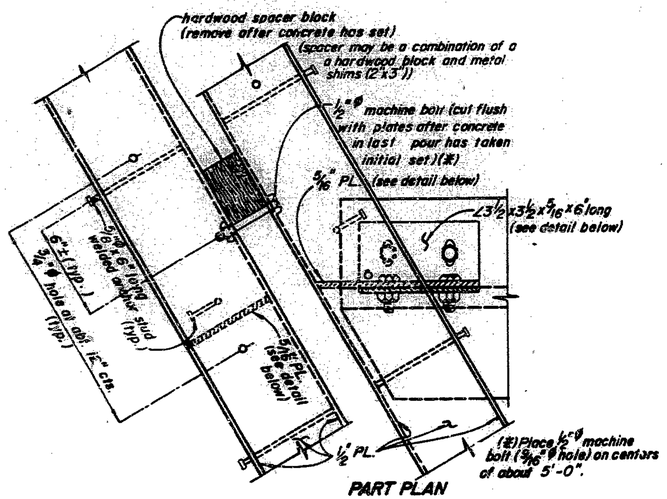
STATE	PROJ NO	SHEET NO
MO		19



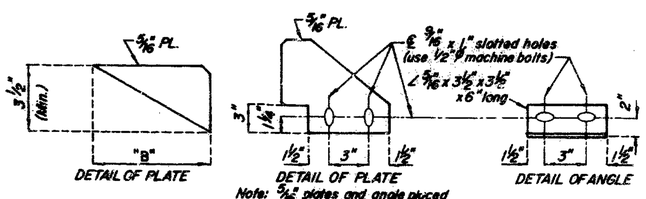
PART SECTION THRU ARMORED JOINT

② Very rough surface by wire comb or other approved texturing device.

① 3½" (Min.) for latex modified concrete
2¾" (Min.) for low slump concrete



PART PLAN



Note: ⅝" plates and angle placed at each girder or stringer.

LOCATION	ACCEPTABLE ALTERNATE TYPES	EXP. GAP AT 60°	"A" AT 60°	"B"	"C"	"D"	"E"	"F"	ANCHOR STUDS SIZE	ANCHOR STUDS SPA.	ANCHOR STUDS "G"
Bt.#1	On Flex 45	2½"	11¾"	4¼"	1⅝"	1½"	2⅜"	3¼"	½"	12"	65
	Wabo Bendoflex 450	2½"	12"	4¼"	1⅝"	1½"	2¼"	3¼"	½"	12"	50
	Fel-Span T40A CS	2¼"	12¼"	4½"	1⅝"	1½"	2¼"	3¼"	½"	12"	50
	Acme Trojan TR400	2½"	12"	4¼"	1¾"	1⅝"	1⅝"	2¼"	½"	12"	40
	Delastiflex LM400	2⅝"	12⅛"	4⅛"	2⅜"	⅝"	2⅛"	2⅝"	½"	9"	45
	Gen-Strip CCL 4"	2½"	12"	4¼"	1¾"	1⅝"	1⅝"	2¼"	½"	12"	65
Bt.#6	Wabo Bendoflex 250	2"	11½"	4¼"	1¾"	1¼"	1⅝"	2⅜"	½"	12"	50
	Acme Trojan TR300	2"	11½"	4¼"	1¾"	1⅝"	1⅝"	2¼"	½"	12"	40
	Gen-Strip CCL 2½"	2¼"	11¾"	4¼"	1¾"	1⅝"	1¾"	2¼"	½"	12"	65
	Delastiflex LM300	2"	12⅜"	4⅛"	2⅜"	⅝"	2⅛"	2⅝"	½"	9"	45
	Fel-Span T30A CS	1⅜"	11⅜"	4½"	1⅜"	1¼"	1⅝"	2⅜"	½"	12"	50
	On-Flex 25	1½"	11"	4¼"	1⅜"	1¼"	1⅜"	2⅛"	½"	12"	65

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

✳✳ ¼" Bt.#1
✳✳ ⅛" Bt.#6

GENERAL NOTES:

THE CERTIFIED NUTS AND BOLTS FOR THE ANCHOR STUDS OR WING TYPE THREADED INSERTS 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. ANCHORS FOR THE ARMORED JOINT SHALL BE APPROVED STUD WELDED ANCHORS (C1010 THRU C1020).

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.

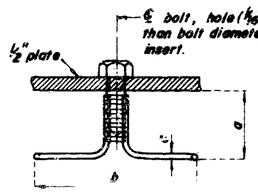
CONTACT SURFACE OF STEEL TO ALUMINUM SHALL BE INSULATED WITH THE MATERIAL SPECIFIED ON THE SHOP DRAWINGS.

FURNISHING, PAINTING AND INSTALLING THE STRUCTURAL STEEL ARMORED JOINT AND CURB PLATES SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR EXPANSION JOINT SEAL.

BOLT CAVITIES TO BE FILLED WITH APPROVED SEALANT IN COMPLIANCE WITH MANUFACTURER'S CERTIFICATION.

Plates shall be field adjusted by adding or removing metal shims (2"x3"), as required for temperature correction. The expansion gap shall be adjusted for any temperature correction prior to pouring top of end bent backwall.

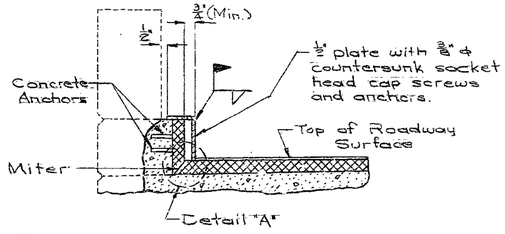
Alternate methods of supporting expansion device may be submitted to the engineer for approval.



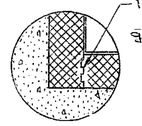
Bolt Diameter	Safe Load Tension (lbs.)(min.)	Approx. Ult. Cap. Tension (lbs.)(min.)	Dimensions a (min.)	b	c
1/2"	800	8,000	1-5/8"	5"	.218"
5/8"	1,300	9,200	1-5/8"	5"	.218"
3/4"	1,800	13,200	2-1/4"	6"	.262"
7/8"	2,000	16,200	2-1/2"	6-1/2"	.306"
1"	2,000	16,200	2-1/2"	6-1/2"	.306"

DETAILS OF ALTERNATE WING TYPE THREADED INSERT

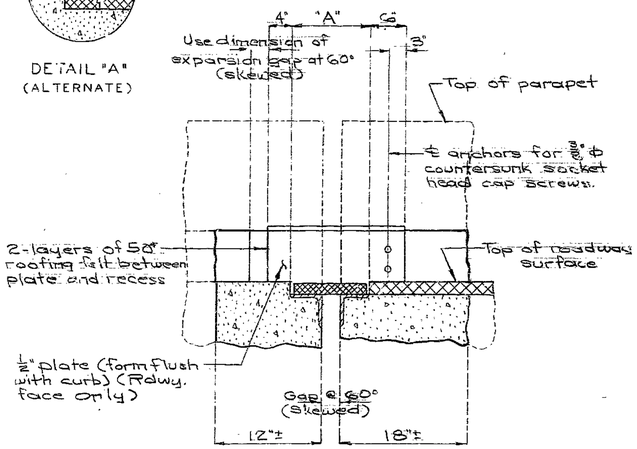
(Machine bolts need only be used to secure the Wing Type Threaded Inserts to the steel plate until the concrete has attained 3,000 p.s.i.)



CURB TREATMENT



DETAIL "A" (ALTERNATE)



PART ELEVATION OF CURB & PARAPET

326

DETAILS OF ELASTOMERIC EXPANSION JOINT SEAL AT BENTS NO. 1 & 6

DETAILED Oct. 1985
CHECKED Dec. 1985

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

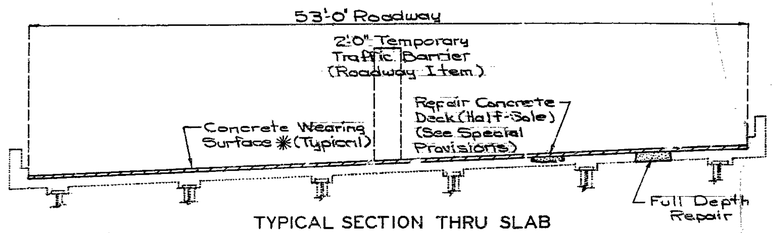
Sheet No. 2 of 2

JACKSON **COUNTY**

A-2249P

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ NO	SHEET NO
MO.		16
SEC 25	TWP 50N RGE 33W	



TYPICAL SECTION THRU SLAB

✱ 1¾" (Min.) for latex modified concrete
2¼" (Min.) for low slump concrete

Note: Outline of old work is indicated by light dotted lines.
Heavy lines indicate new work.
Contractor to maintain two lanes of traffic during construction. (See Road Plans)
Bars bonded in old concrete not removed shall be cleanly stripped and reused.

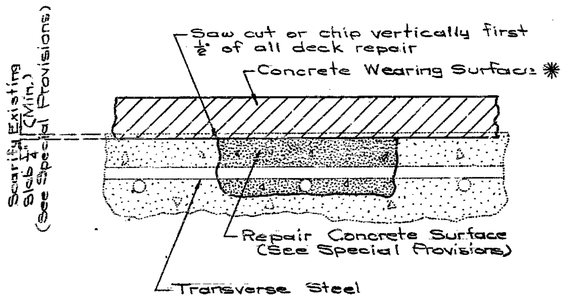
ESTIMATED QUANTITIES		
ITEM		TOTALS
Replacement Of Expansion Device And Adjacent Concrete	Lin. Ft.	17
Repairing Concrete Deck (Half-Soling)	Sq. Ft.	119
Full Depth Repair	Sq. Ft.	0
Elastomeric Expansion Joint Seal (4")	Lin. Ft.	54
Elastomeric Expansion Joint Seal (2½")	Lin. Ft.	63
Concrete Wearing Surface ✱ (See Special Provisions)	Sq. Yd.	2752
503.01 CONTINGENT: LIABILITY INSURANCE	LUMP SUM	1

GENERAL NOTES:

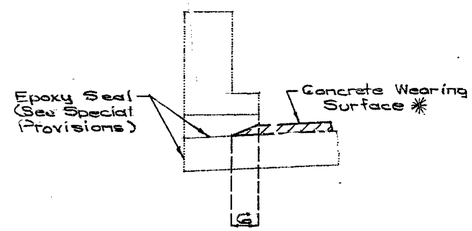
Design Specifications: A.A.S.H.T.O. - 1983 and Interim 1984

Design Unit Stresses:
Class B2 Concrete f'c = 4,000 psi
Reinforcing Steel fy = 60,000 psi

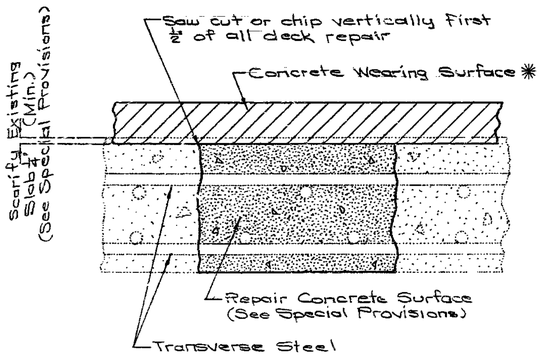
Minimum clearance to reinforcing steel shall be 1½" unless otherwise shown.



HALF-SOLED AREA



TYPICAL SECTION AT CURB SHOWING OUTLET



FULL DEPTH REPAIR

327

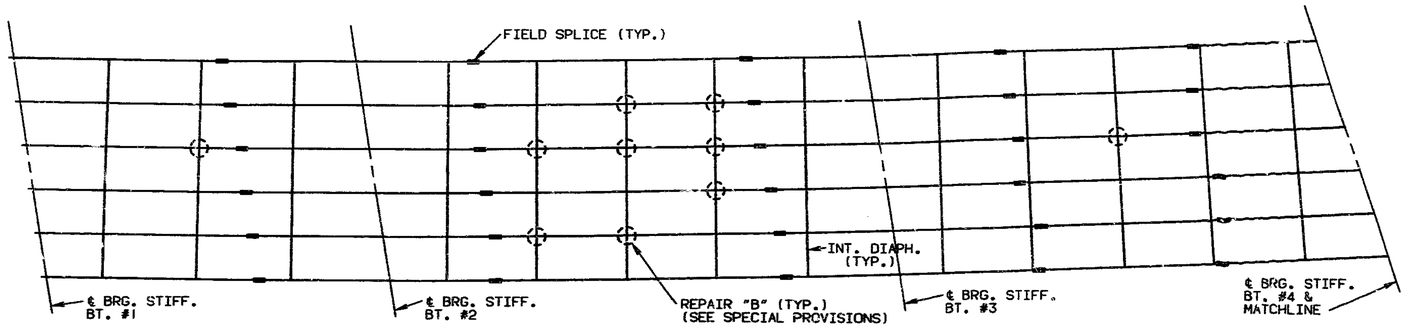
REPAIRS TO
BRIDGE OVER K.C.S., ST. LOUIS SOUTHWESTERN & SOO LINE R.R.S.
STATE ROAD: INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. IR-IRG-435-1(181) STA. 92+13.39 N.B. LANE
JOB NO. 4-I435-686 RTE. I-435 STD.
JACKSON COUNTY STD.
DATE 4/23/86 A-2249R

DESIGNED Oct. 1985
DETAILED Oct. 1985
CHECKED Dec. 1985

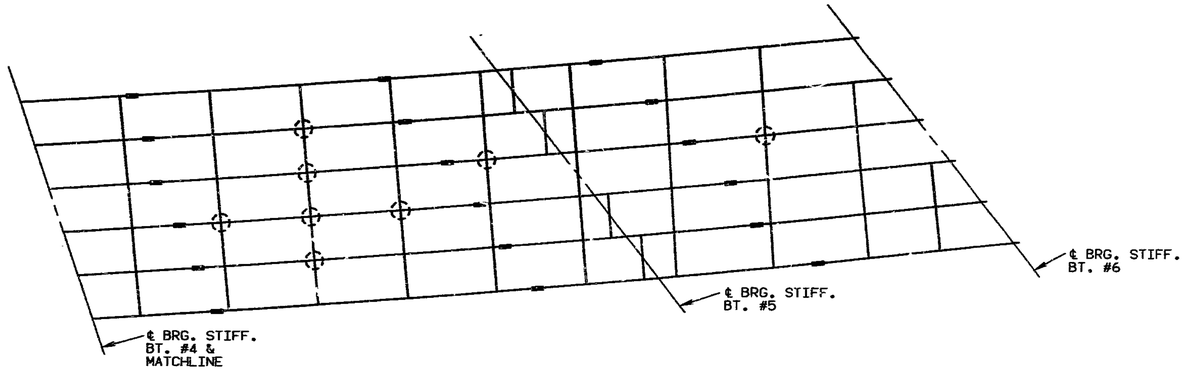
Note: This drawing is not to scale. Follow dimensions.

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ. NO.	SHEET NO.
MO.	F.A.-450-1(250)	53
SEC./SUR. 25 TWP. 50N RGE. 33W		



PART PLAN OF STRUCTURAL STEEL SHOWING REPAIR AREAS



PART PLAN OF STRUCTURAL STEEL SHOWING REPAIR AREAS

GENERAL NOTES:

DESIGN UNIT STRESSES:
STRUCTURAL CARBON STEEL FY=36,000 PSI.

FABRICATED STEEL CONNECTIONS:
FIELD CONNECTIONS, HIGH STRENGTH BOLTS 3/4"Ø, HOLES 13/16"Ø, EXCEPT AS NOTED.

PAINTING:
CALCIUM SULFONATE PAINT SYSTEM BY CONTRACTOR IN ACCORDANCE WITH SPECIAL PROVISIONS. (COLOR OF THE FINAL FIELD COAT FOR CALCIUM SULFONATE PAINT SYSTEM SHALL BE GRAY).

TRAFFIC MAINTAINED:
TWO LANES OF TRAFFIC OVER STRUCTURE TO BE MAINTAINED DURING CONSTRUCTION.

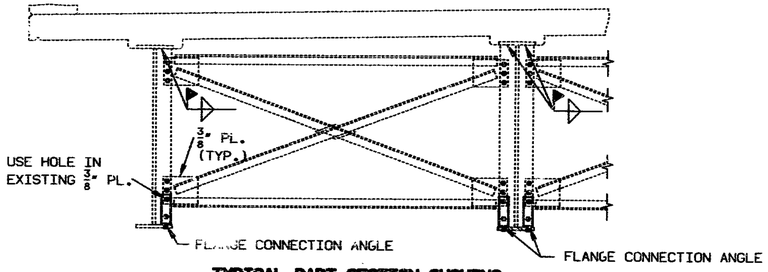
CONSTRUCTION CLEARANCE:
SEE SPECIAL PROVISIONS FOR MINIMUM VERTICAL AND HORIZONTAL CLEARANCE.

NOTE: CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD BEFORE ORDERING NEW STEEL.

ESTIMATED QUANTITIES

ITEM		TOTAL
MOBILIZATION	LUMP SUM	1
REPAIR "A"	EACH	230
REPAIR "B"	LIN. IN.	180
REPAINTING (CALCIUM SULFONATE SYSTEM)	LUMP SUM	1

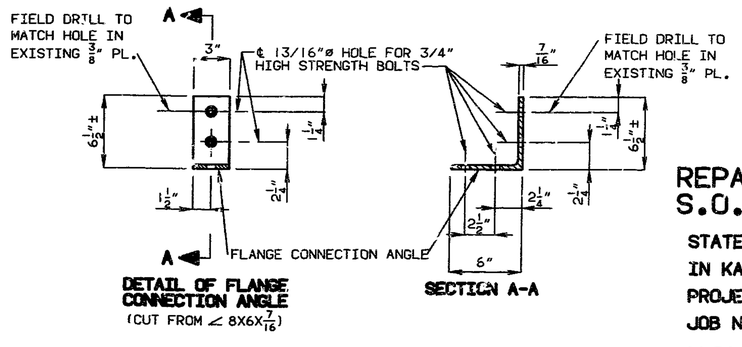
NOTE: SEE SPECIAL PROVISIONS FOR MORE INFORMATION PERTAINING TO EACH BID ITEM.



TYPICAL PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS REPAIR "A"

NOTE: OUTLINE OF OLD WORK IS INDICATED BY LIGHT DASHED LINES. HEAVY LINES INDICATE NEW WORK.

NOTE: THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS.



DETAIL OF FLANGE CONNECTION ANGLE (CUT FROM ∠ 8X6X7/16)

SECTION A-A

SEE FINAL PLANS

SHEET NO. 1 OF 1.

REPAIRS TO BRIDGE OVER K.C.S., S.O.O. AND C.N.W. R.R.

STATE ROAD: INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. F.A.-~~450~~ 435-1(250) STA. 92+13.39

JOB NO. 4I 1026-435 RTE. I-435

JACKSON COUNTY

DATE 6/5/91

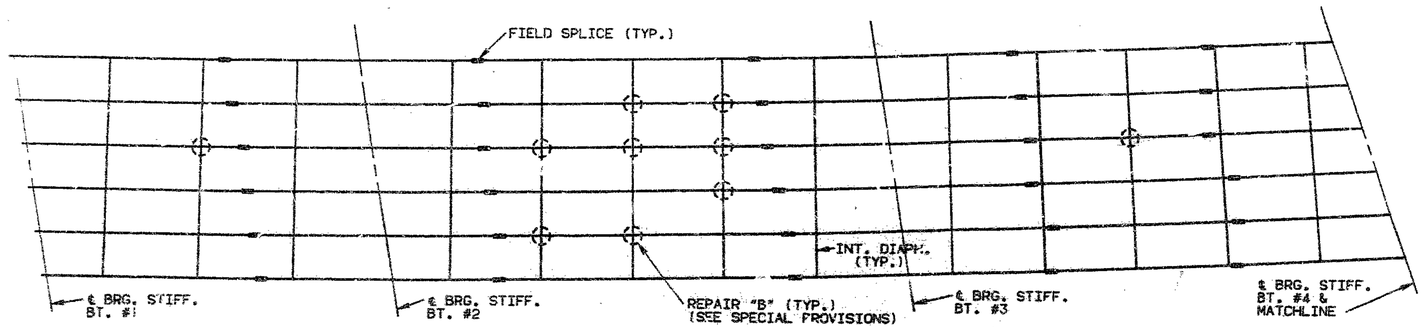
A-2249R1

DETAILED APR. 1991
CHECKED APR. 1991

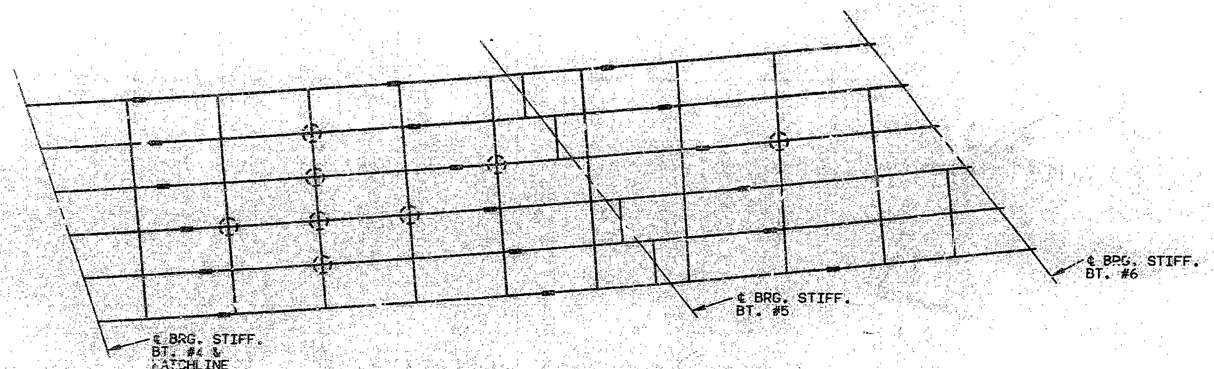
22494

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ. NO.	SHEET NO.
MO.	F.A.-435-1(250)	
SEC./SUR. 25	TWP. 50N RGE. 33W	



PART PLAN OF STRUCTURAL STEEL SHOWING REPAIR AREAS



PART PLAN OF STRUCTURAL STEEL SHOWING REPAIR AREAS

GENERAL NOTES:

DESIGN UNIT STRESSES:
STRUCTURAL CARBON STEEL FY=36,000 PSI.

FABRICATED STEEL CONNECTIONS:
FIELD CONNECTIONS, HIGH STRENGTH BOLTS 3/4"Ø, HOLES 13/16"Ø, EXCEPT AS NOTED.

PAINTING:
CALCIUM SULFONATE PAINT SYSTEM BY CONTRACTOR IN ACCORDANCE WITH SPECIAL PROVISIONS. (COLOR OF THE FINAL FIELD COAT FOR CALCIUM SULFONATE PAINT SYSTEM SHALL BE GRAY).

TRAFFIC MAINTAINED:
TWO LANES OF TRAFFIC OVER STRUCTURE TO BE MAINTAINED DURING CONSTRUCTION.

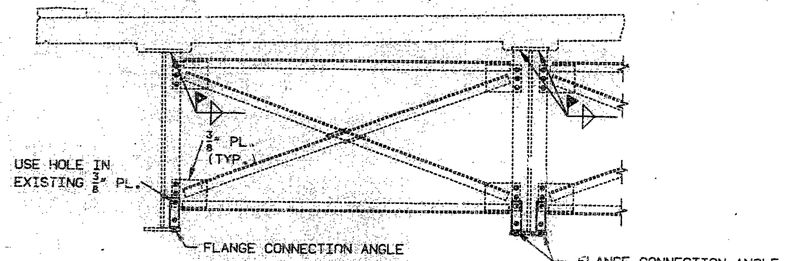
CONSTRUCTION CLEARANCE:
SEE SPECIAL PROVISIONS FOR MINIMUM VERTICAL AND HORIZONTAL CLEARANCE.

NOTE: CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD BEFORE ORDERING NEW STEEL.

FINAL ~~ESTIMATED~~ QUANTITIES

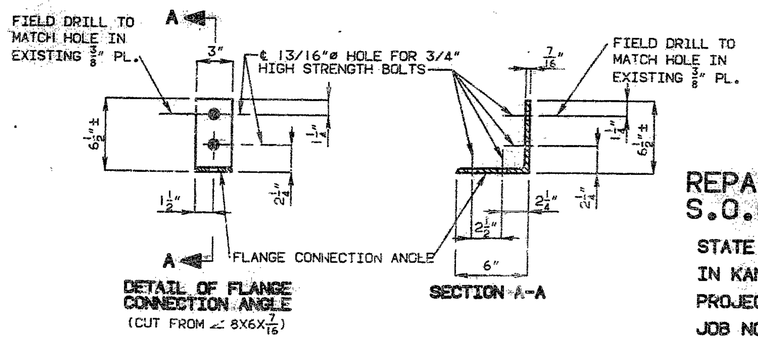
ITEM		TOTAL
MOBILIZATION	LUMP SUM	1
REPAIR "A"	EACH	230
REPAIR "B"	LIN. IN.	155
REPAINTING (CALCIUM SULFONATE SYSTEM)	LUMP SUM	1

NOTE: SEE SPECIAL PROVISIONS FOR MORE INFORMATION PERTAINING TO EACH BID ITEM.



TYPICAL PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS REPAIR "A"

NOTE: OUTLINE OF OLD WORK IS INDICATED BY LIGHT DASHED LINES. HEAVY LINES INDICATE NEW WORK.



DETAIL OF FLANGE CONNECTION ANGLE
(CUT FROM ∠ 8X6X7/16)

SECTION A-A

REPAIRS TO BRIDGE OVER K.C.S., S.O.O. AND C.N.W. R.R.

STATE ROAD: INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. F.A.-435-1(250) STA. 92+13.39
JOB NO. 4I 1026-435 RTE. I-435
JACKSON COUNTY

DETAILED APR. 1991
CHECKED APR. 1991

NOTE: THIS DRAWING IS NOT TO SCALE FOLLOW DIMENSIONS.

SHEET NO. 1A OF 1.

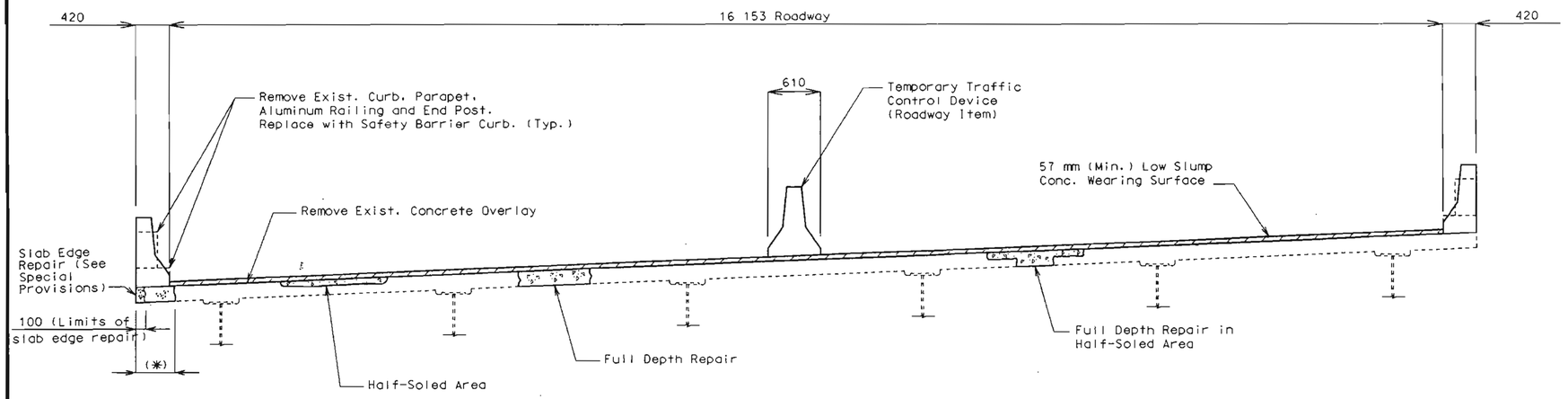
DATE 6/5/91

A-2249R1

22496

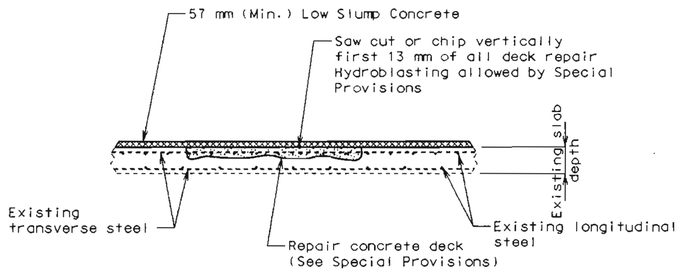
State	Proj. No.	Sheet No.
MO		87
SEC/SUR 25	TWP 50N	RGE 33W

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

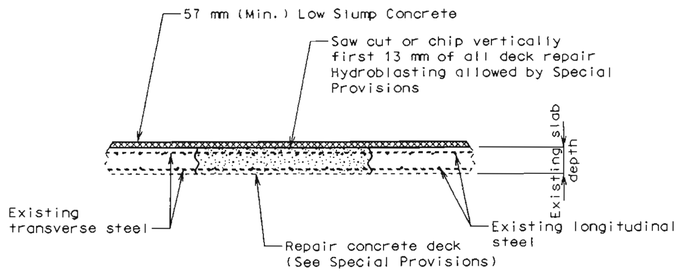


TYPICAL SECTION THRU SLAB

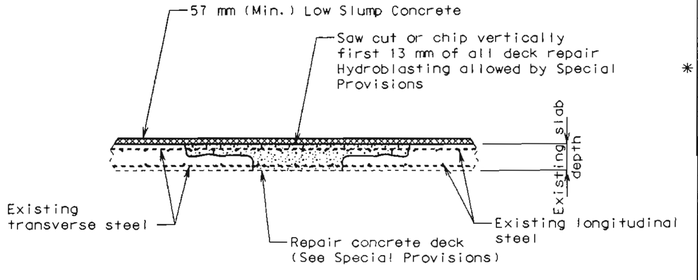
(*) If the dimension exceeds 100 mm the repair extending to the edge of slab shall be made and paid for as "Full Depth Repair" per square meter. (See Special Provisions).



HALF-SOLED AREA



FULL DEPTH REPAIR



FULL DEPTH REPAIR IN HALF-SOLED AREA

ESTIMATED QUANTITIES

	ITEM		TOTAL
	Curb Removal (Bridges) - Metric	meter	315.5
	Removal of Low Slump Concrete Wearing Surface - Metric	sq. meter	2408
*	Safety Barrier Curb - Metric	meter	315.5
	Repairing Concrete Deck (Half-Soling) - Metric	sq. meter	120
	Full Depth Repair - Metric	sq. meter	25
	Slab Edge Repair (Bridges) - Metric	meter	76
	Low Slump Concrete Wearing Surface - Metric	sq. meter	2408
	Strip Seal Expansion Device - Metric	meter	35.5
	Modification of Existing Expansion Joint - Metric	meter	35.5
	Slab Drain	each	19

* Safety Barrier Curb - Metric shall be Cast-in-Place option or Slip-Form Option.

General Notes:

Design Specifications:
AASHTO - 1996

Design Unit Stresses:
Class B1 Concrete (Safety Barrier Curb) f'c=28 MPa
Reinforcing Steel (Grade 420) fy=420 MPa

Joint Filler:
All joint filler shall meet the requirements of Section 1057.2.4 of the Missouri Standard Specifications (Metric), except as noted.

Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 40 mm, unless otherwise shown

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars, unless otherwise noted.

Old Work:
Outline of old work is indicated by dashed lines. Heavy lines indicate new work.

Maintain Traffic:
See Roadway Plans for traffic control during construction.

Verify Dimensions:
Contractor shall verify all dimensions in field before ordering materials.

Roadway Surfacing:
Roadway surfacing adjacent to bridge ends to match bridge overlay. (See Roadway Plans)

Maintain Grade:
In order to maintain grade and a minimum thickness of overlay as shown on plan, it may be necessay to use additional quantities of overlay at various locations throughout the structure. No payment will be allowed for additional labor, materials or equipment for variations in thickness of overlay.

Miscellaneous:

All dimensions are shown in millimeters (mm) unless otherwise specified.

Drawings are not to scale. Follow dimensions.

Kansas City Southern Railroad tracks shall have a minimum vertical clearance of 6.553 meters from top of rails and minimum lateral clearance of 3.048 meters from the centerline of track to nearest temporary construction falsework shall be maintained during construction.

I & M Rail Link tracks shall have a minimum vertical clearance of 7.010 meters from top of rails and minimum lateral clearance of 3.048 meters from the centerline of track to nearest temporary construction falsework shall be maintained during construction.

REPAIRS TO BRIDGE OVER KCS AND I & M RAIL LINK RAILROADS

STATE ROAD I-435 FROM RTE. 24 TO MISSOURI RIVER

IN KANSAS CITY

PROJECT NO. STA. 2+808.241 (match exist.)

JOB NO. J4I1250 RTE. I-435 NB

REGISTERED STATE OF MISSOURI Stacy L McMillen NUMBER E-25873

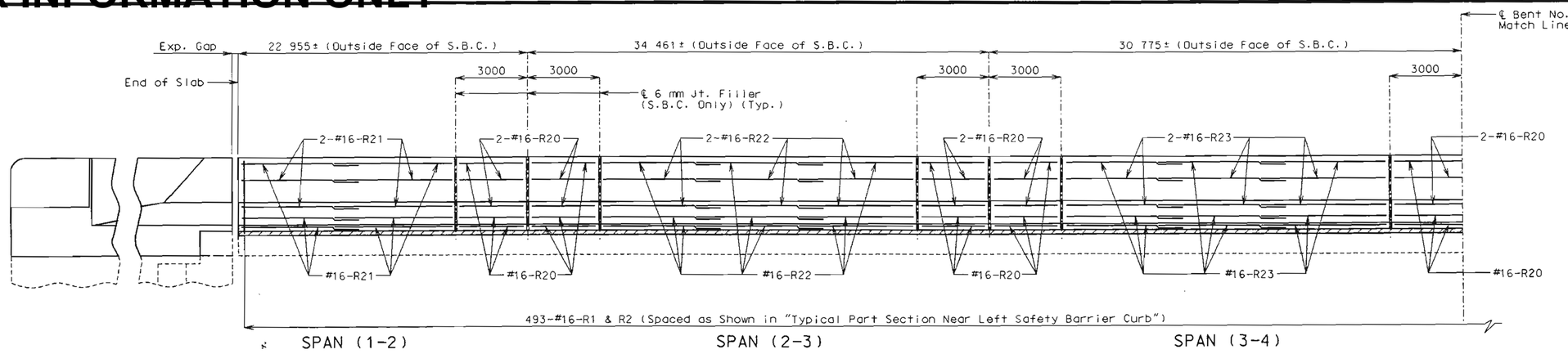
DATE 4-6-98

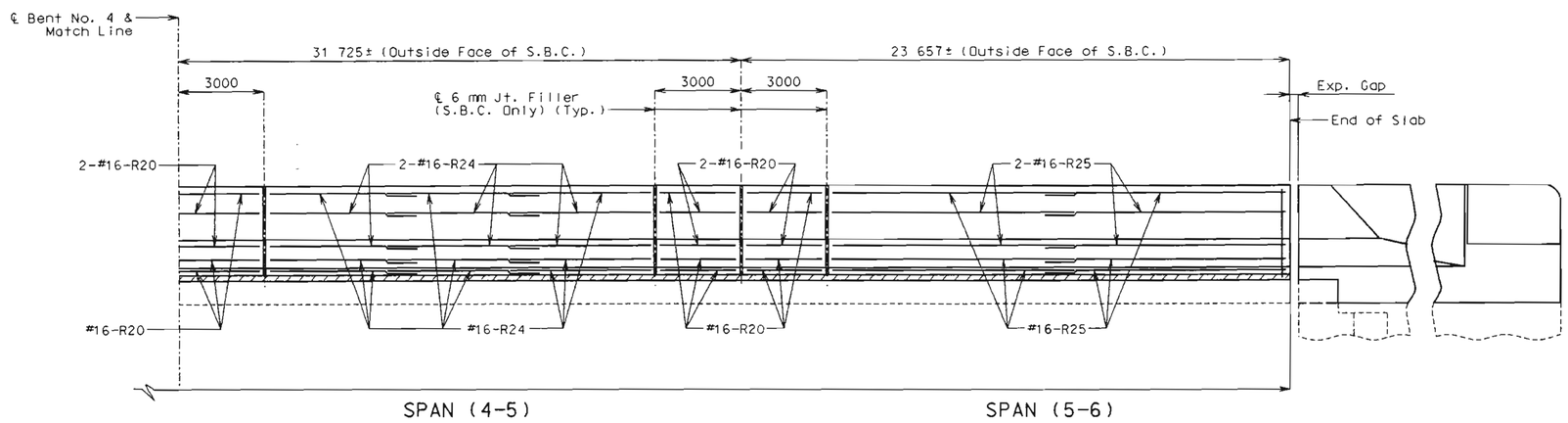
Designed Jan. 98
Detailed Jan. 98
Checked Mar. 98

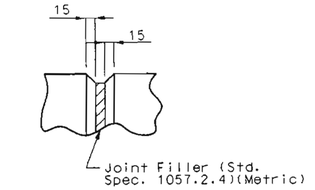
JACKSON COUNTY
Date: 4/7/98

STD. M 706.35
A22493

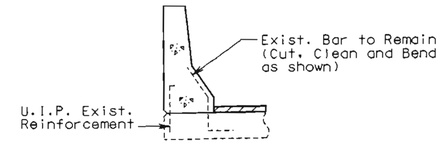
State	Proj. No.	Sheet No.
MO		88



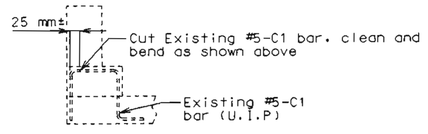




FILLED JOINT DETAIL

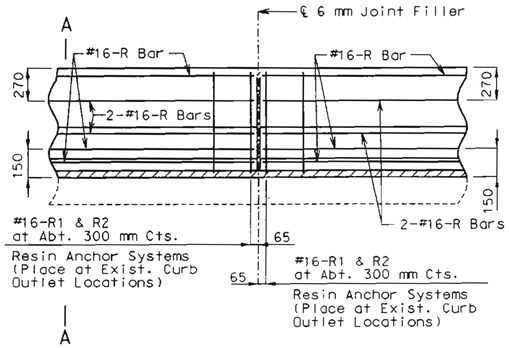


PART SECTION SHOWING EXISTING REINFORCEMENT

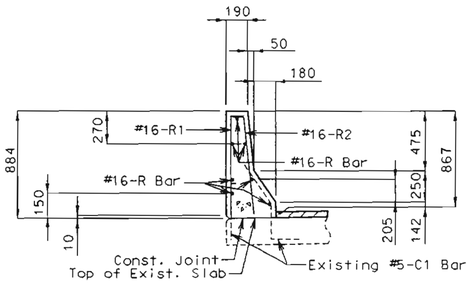


SECTION THRU EXISTING CURB
(Showing #5-C1 Bar)

SECTION THRU SLAB SHOWING SAFETY BARRIER CURB (LEFT SIDE)



TYPICAL PART SECTION NEAR LEFT SAFETY BARRIER CURB

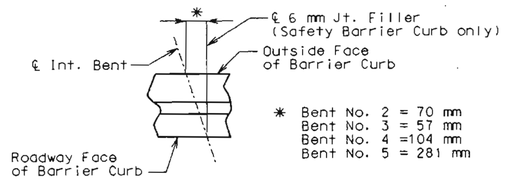


PART SECTION A-A
(Showing #5-C1 Bar)

Note:

Use a minimum lap of 925 mm for #16 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 247 835 sq. mm.



BARRIER CURB OFFSETS
(Left Barrier Curb)

NOTE:

Top of safety barrier curb shall be built parallel to grade with safety barrier curb joints (except at end bents) normal to grade.

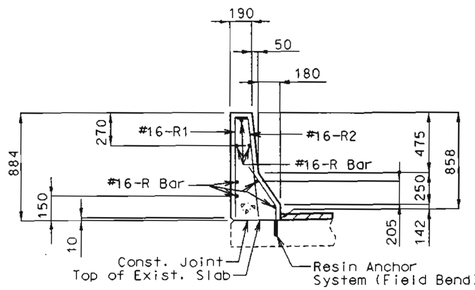
All exposed edges of safety barrier curb shall have either a 15 mm radius or a 10 mm bevel, unless otherwise noted.

When the safety barrier curb is bid per meter, the contract unit price shall include the cost of all concrete, reinforcement and resin anchor systems complete-in-place.

Concrete in the safety barrier curb shall be Class B1.

Measurement of safety barrier curb is to the nearest half meter for each structure, measured along the outside top of slab from end of wing to end of wing.

For details of expansion device movement gauge, see sheet No. 10.



PART SECTION A-A
(At Exisiting Curb Outlets)

Note: Center one Resin Anchor System @ each curb outlet.

For additional Resin Anchor System notes and details, see sheet no. 5.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER

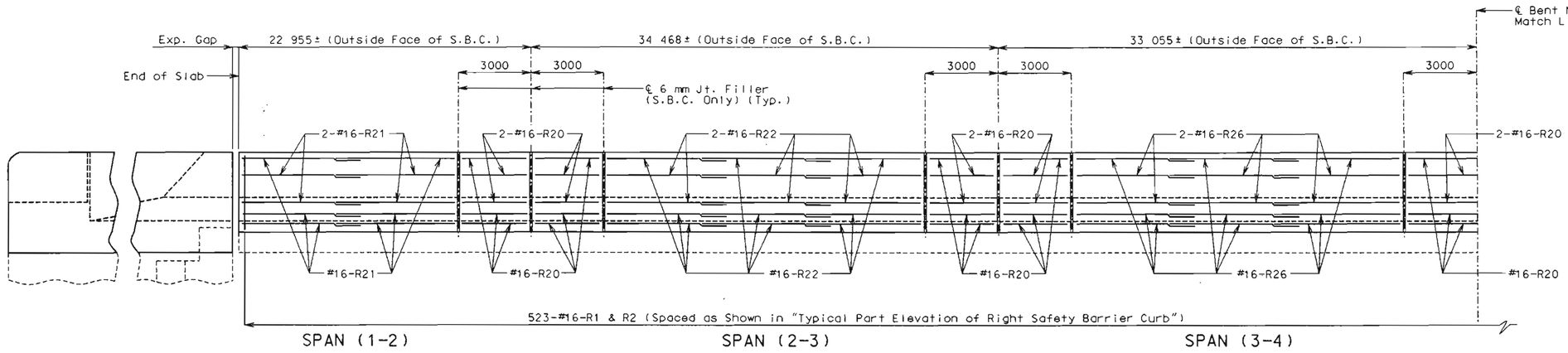
DATE 4-6-98

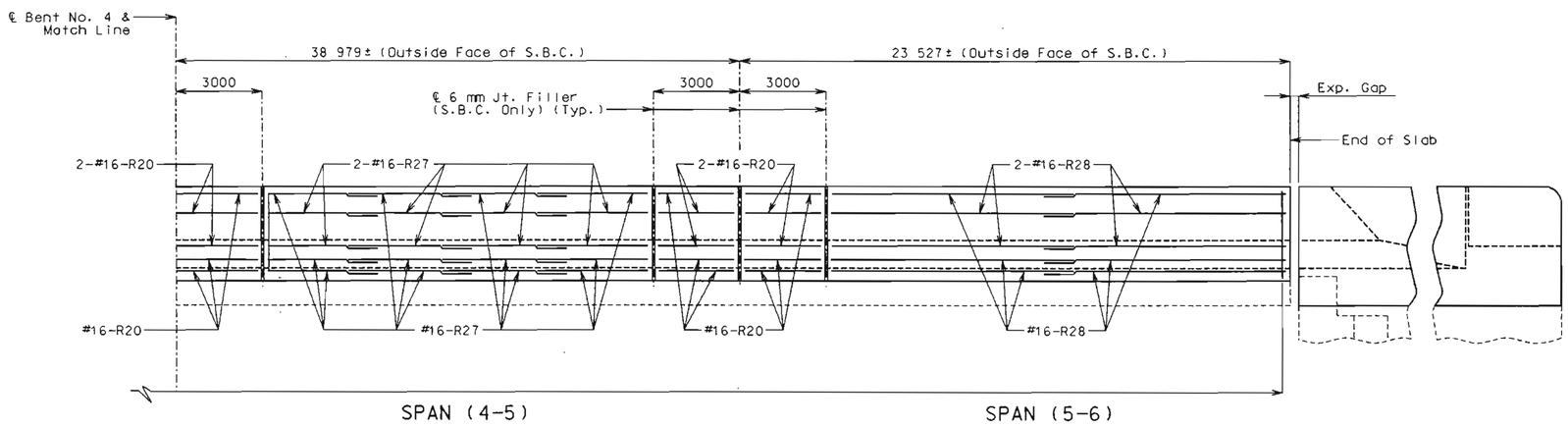
Detailed Mar. 98
Checked Mar. 98

JACKSON COUNTY

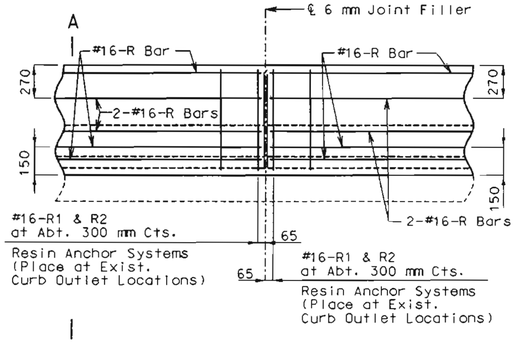
A22493

State	Proj. No.	Sheet No.
MO		89

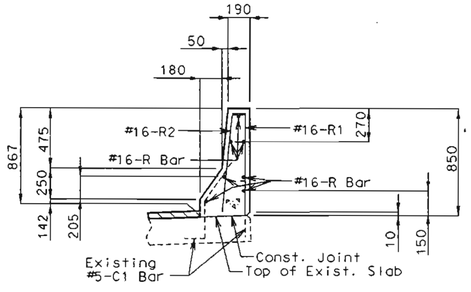




ELEVATION OF SAFETY BARRIER CURB (RIGHT SIDE)



TYPICAL PART ELEVATION OF RIGHT SAFETY BARRIER CURB

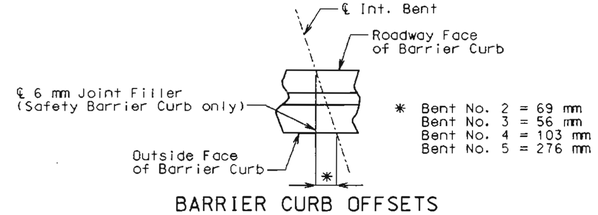


PART SECTION A-A
(Showing #5-C1 Bar)

Note:

Use a minimum lap of 925 mm for #16 horizontal safety barrier curb bars.

The cross-sectional area above the slab = 240 695 sq. mm.



BARRIER CURB OFFSETS
(Right Barrier Curb)

NOTE:

Top of safety barrier curb shall be built parallel to grade with safety barrier curb joints (except at end bents) normal to grade.

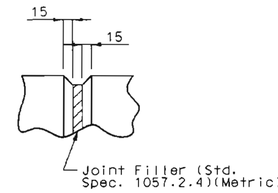
All exposed edges of safety barrier curb shall have either a 15 mm radius or a 10 mm bevel, unless otherwise noted.

When the safety barrier curb is bid per meter, the contract unit price shall include the cost of all concrete, reinforcement and resin anchor systems complete-in-place.

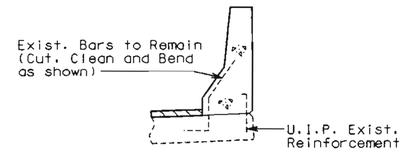
Concrete in the safety barrier curb shall be Class B1.

Measurement of safety barrier curb is to the nearest half meter for each structure, measured along the outside top of slab from end of wing to end of wing.

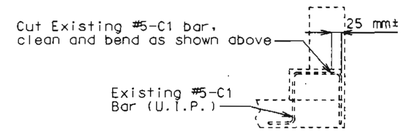
For details of expansion device movement gauge, see sheet No. 10.



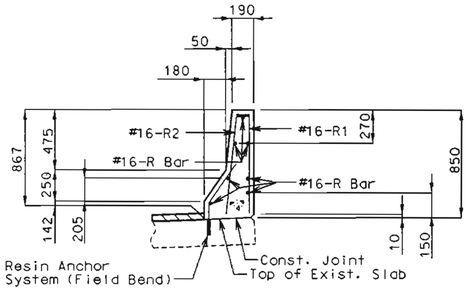
FILLED JOINT DETAIL



PART SECTION SHOWING EXISTING REINFORCEMENT



SECTION THRU EXISTING CURB
(Showing #5-C1 Bar)



PART SECTION A-A

Note: Center one Resin Anchor System @ each curb outlet.

For additional Resin Anchor System notes and details, see sheet no. 5.

STATE OF MISSOURI
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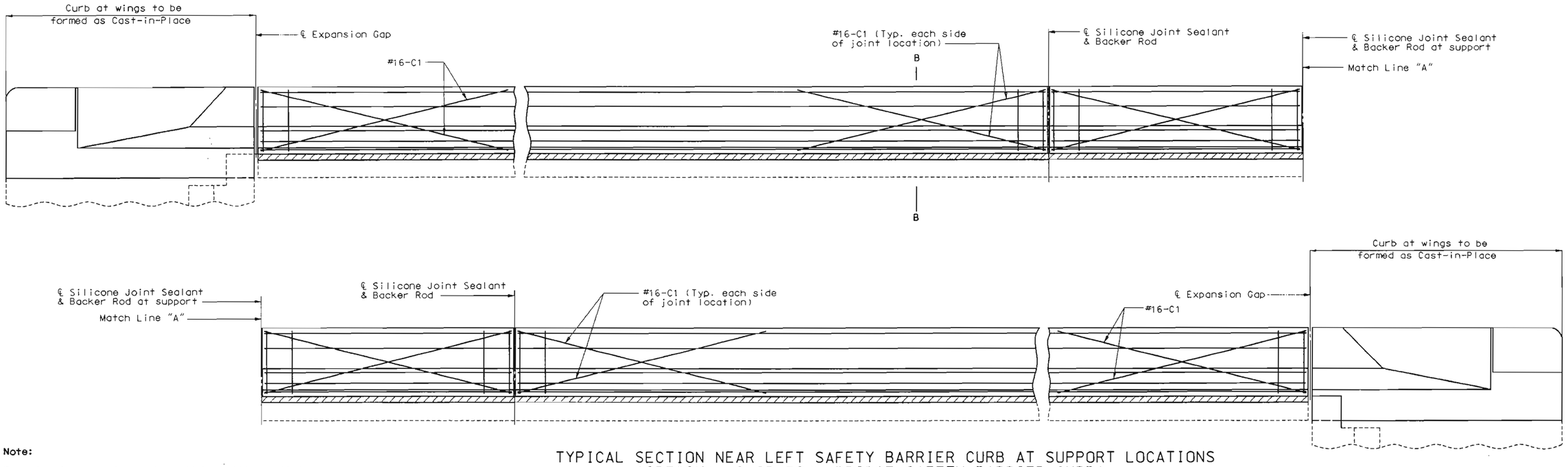


TYPICAL SECTION NEAR LEFT SAFETY BARRIER CURB AT SUPPORT LOCATIONS
(OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB)

Note:

Top of safety barrier curb shall be built parallel to grade with safety barrier curb joints (except at end bents) normal to grade.

When the safety barrier curb is bid per meter, the contract unit price shall include the cost of all concrete, reinforcement and resin anchor systems, complete-in-place.

Concrete in the safety barrier curb shall be Class B1 with f'c = 28 MPa.

Measurement of safety barrier curb is to the nearest half meter for each structure, measured along the outside top of slab from end of wing to end of wing.

Note:

Joint sealant and backer rods shall be used on all slip-form bridge safety barrier curbs instead of joint filler, except at end bents.

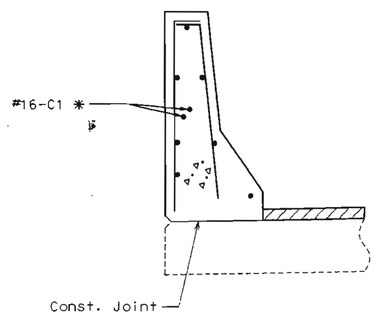
Barrier curbs at end bents shall be cast-in-place, slip form option is not allowed.

C Bars (slip-form option only) shall be used in addition to cast-in-place conventional forming reinforcement for bridge safety barrier curb.

Note:

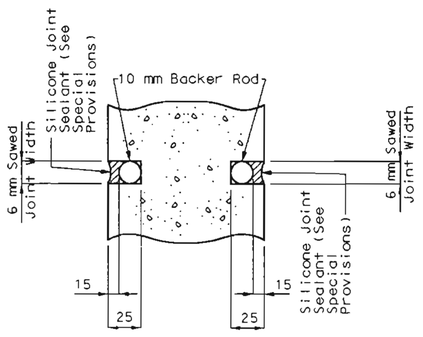
For details showing exist. reinforcement and resin anchor systems, see sheet No. 2 & 3.

For details of expansion device movement gauge, see sheet No. 10.



PART SECTION B-B

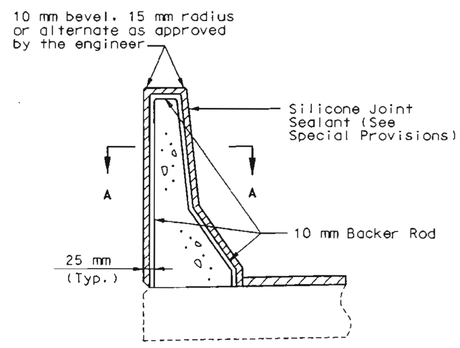
Note: * Each side of joint location.



SECTION A-A

Note:

Cost of silicone joint sealant and backer rod complete in place to be included in the contract unit price for safety barrier curb.



SECTION THRU JOINT

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
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OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB

(Left barrier curb shown; right barrier curb similar.)

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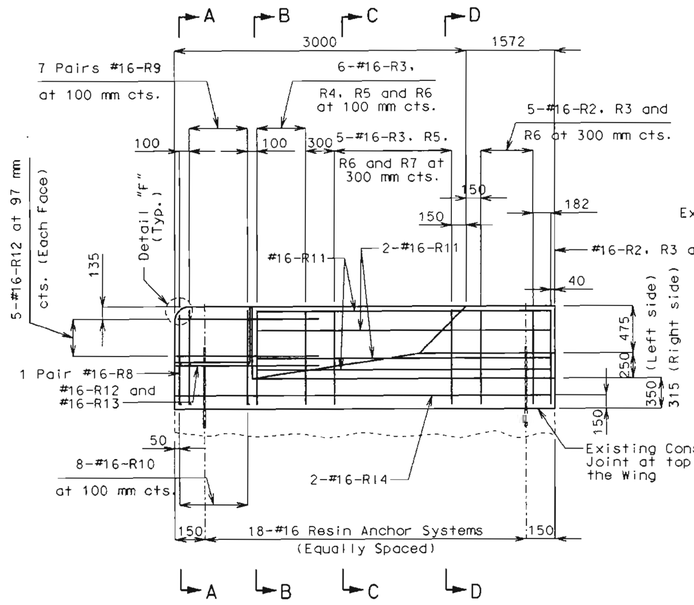
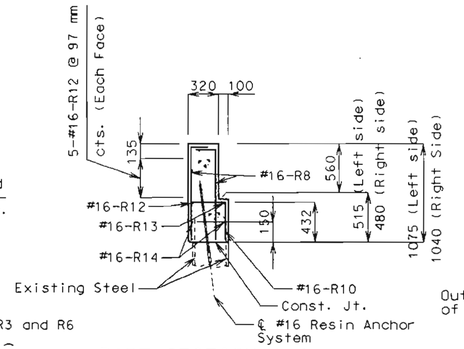
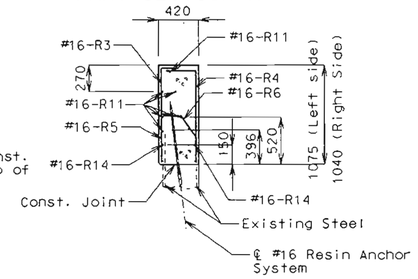


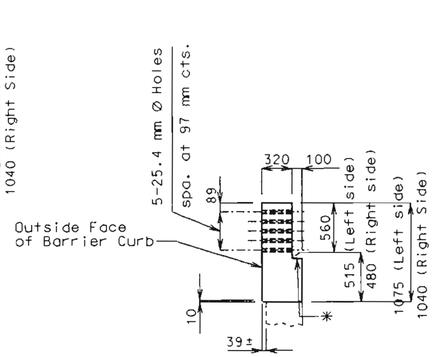
ELEVATION



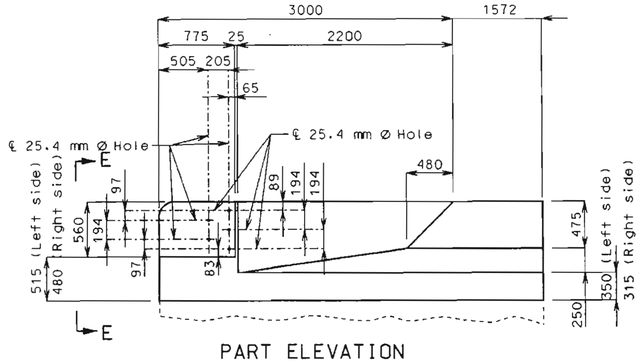
PART SECTION A-A



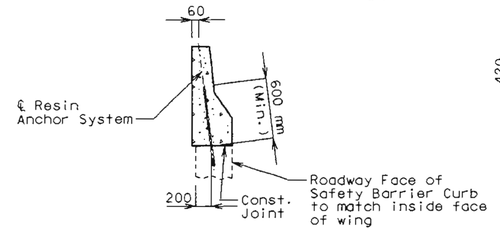
PART SECTION B-B



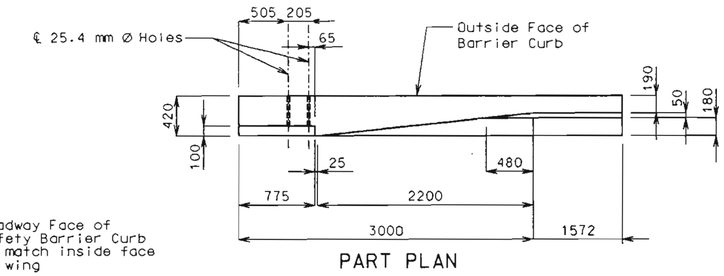
PART ELEVATION E-E



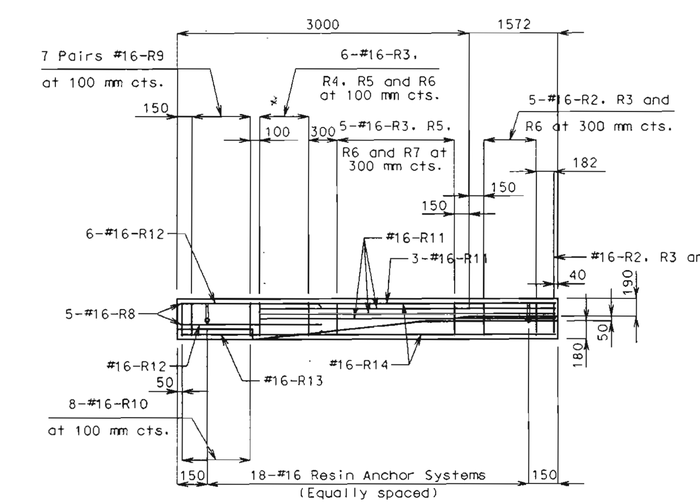
PART ELEVATION



SECTION THRU BARRIER CURB
SHOWING RESIN ANCHOR SYSTEM

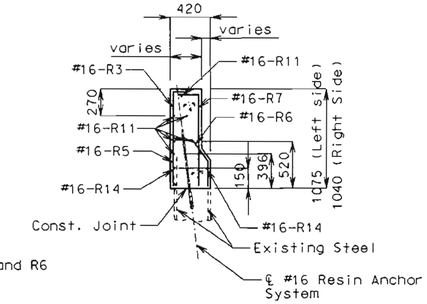


PART PLAN

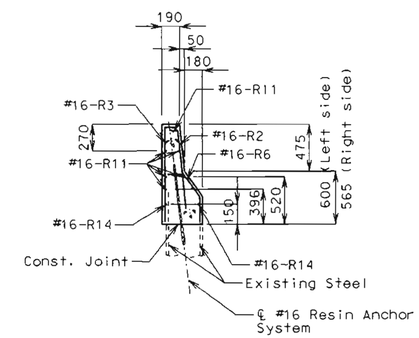


PLAN

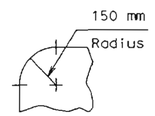
Note: Slip-form option is not allowed for Barrier Curb at end bents.



PART SECTION C-C

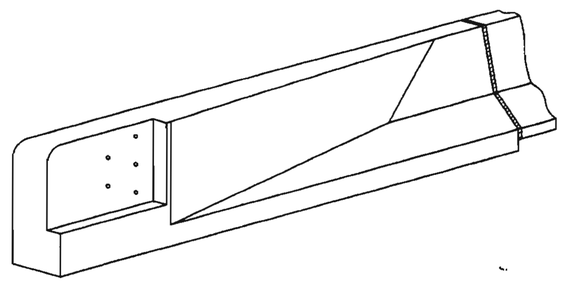


PART SECTION D-D



DETAIL "F"

DETAILS OF GUARD RAIL ATTACHMENT



AUXILIARY VIEW OF SAFETY BARRIER CURB

NOTES FOR THE RESIN ANCHOR SYSTEM

The contractor shall use one of the Resin Anchor Systems listed in the Job Special Provisions for the Safety Barrier Curb.

Resin Anchor Systems shall be installed according to the manufacturer's specifications, except as modified by the Job Special Provisions.

The cost of furnishing and installing the Resin Anchor System Complete-in-Place, shall be included in the price bid for Safety Barrier Curb.

The 15.9 mm dia. Resin Anchor Systems shall have a minimum ultimate pullout strength of 68.9 kN in concrete with f'c = 28 MPa.

An epoxy coated #16 (Grade 420) reinforcing bar shall be substituded for the 15.9 mm ø threaded rod stud.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER

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SAFETY BARRIER CURB AT END BENT NO. 1

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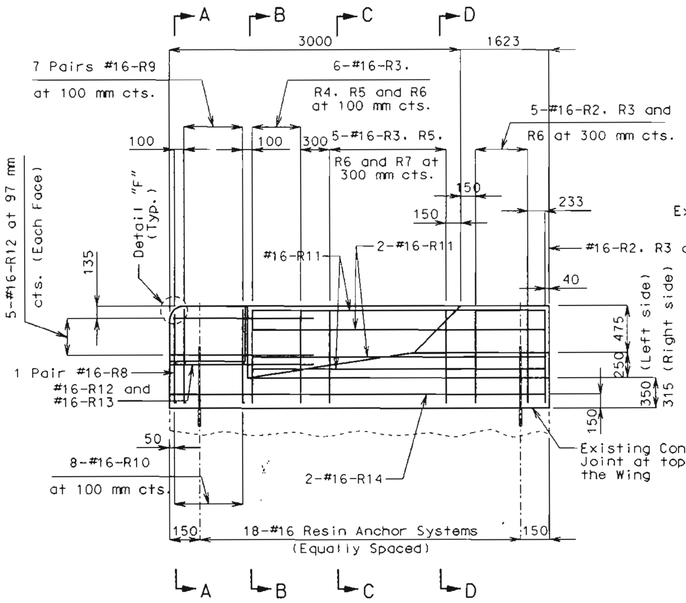
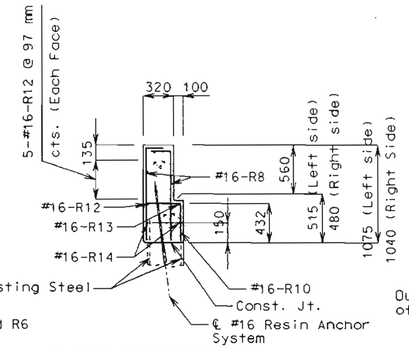
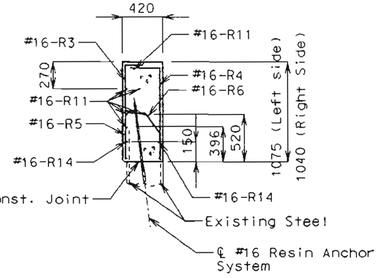


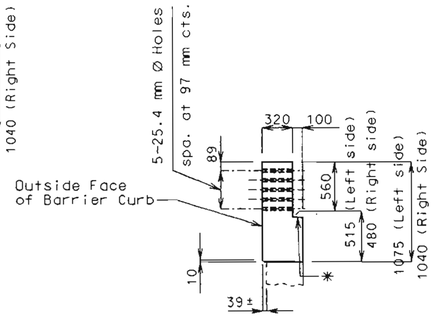
ELEVATION



PART SECTION A-A

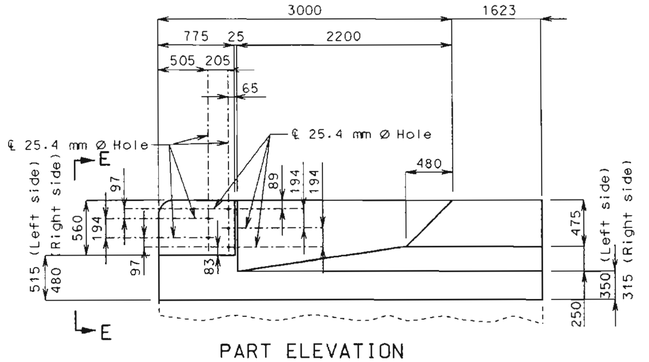


PART SECTION B-B

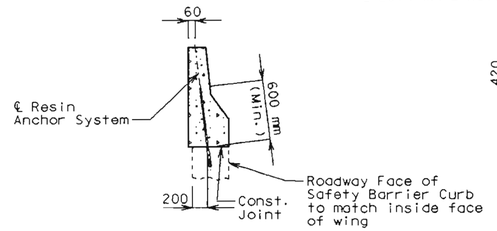


✱ Slope 6 mm toward roadway

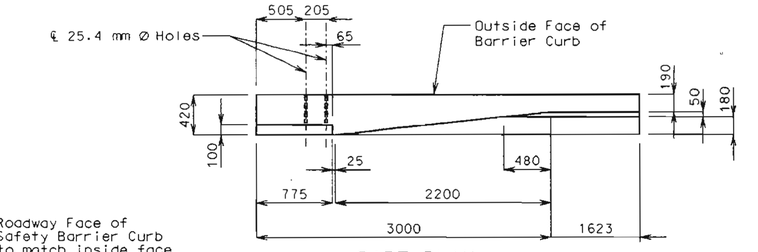
PART ELEVATION E-E



PART ELEVATION

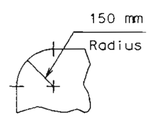


SECTION THRU BARRIER CURB
SHOWING RESIN ANCHOR SYSTEM

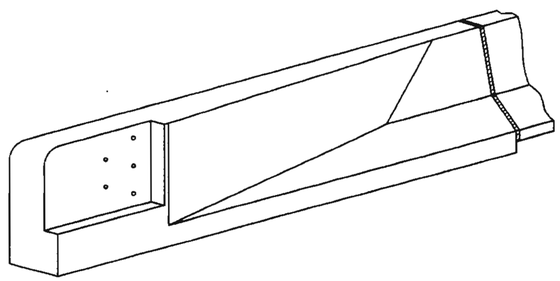


PART PLAN

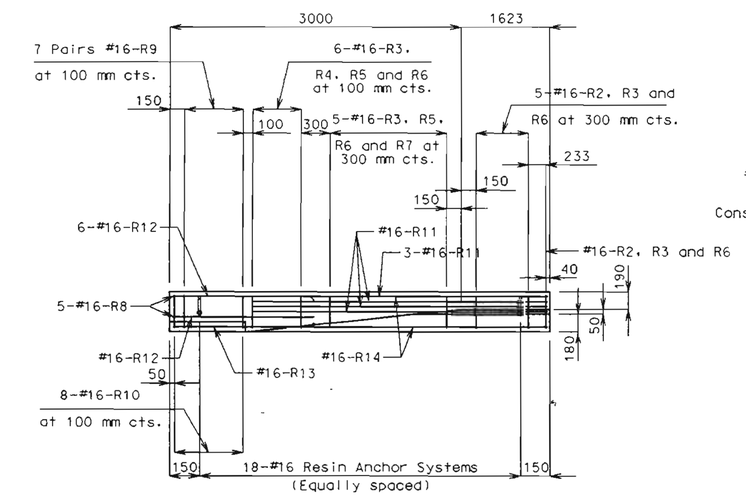
DETAILS OF GUARD RAIL ATTACHMENT



DETAIL "F"

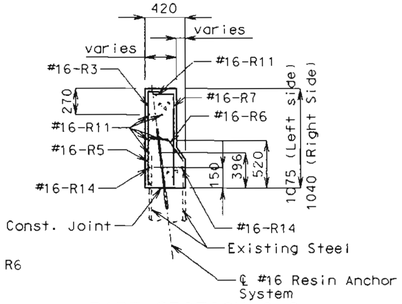


AUXILIARY VIEW OF SAFETY BARRIER CURB

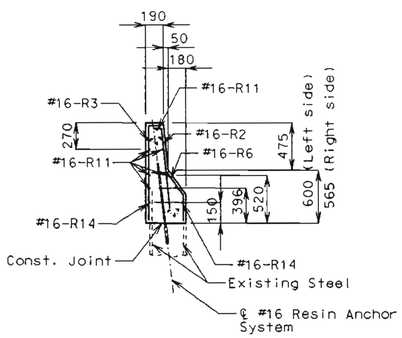


PLAN

Note: Slip-form option is not allowed for Barrier Curb at end bents.



PART SECTION C-C



PART SECTION D-D

NOTES FOR THE RESIN ANCHOR SYSTEM

The contractor shall use one of the Resin Anchor Systems listed in the Job Special Provisions for the Safety Barrier Curb.

Resin Anchor Systems shall be installed according to the manufacturer's specifications, except as modified by the Job Special Provisions.

The cost of furnishing and installing the Resin Anchor System Complete-in-Place, shall be included in the price bid for Safety Barrier Curb.

The 15.9 mm dia. Resin Anchor Systems shall have a minimum ultimate pullout strength of 68.9 kN in concrete with f'c = 28 MPa.

An epoxy coated #16 (Grade 420) reinforcing bar shall be substituded for the 15.9 mm Ø threaded rod stud.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
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SAFETY BARRIER CURB AT END BENT NO. 6

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Checked Mar. 98

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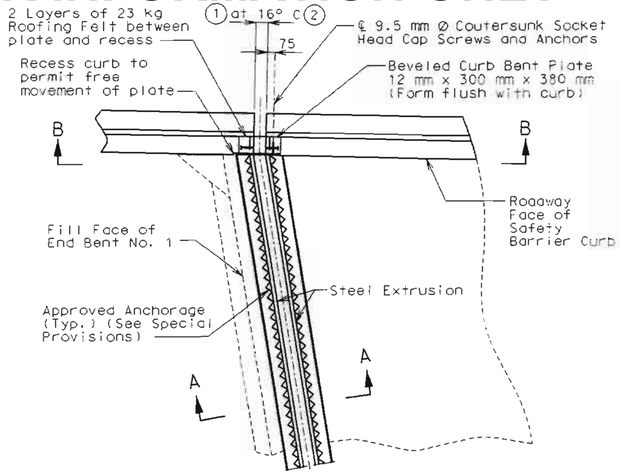
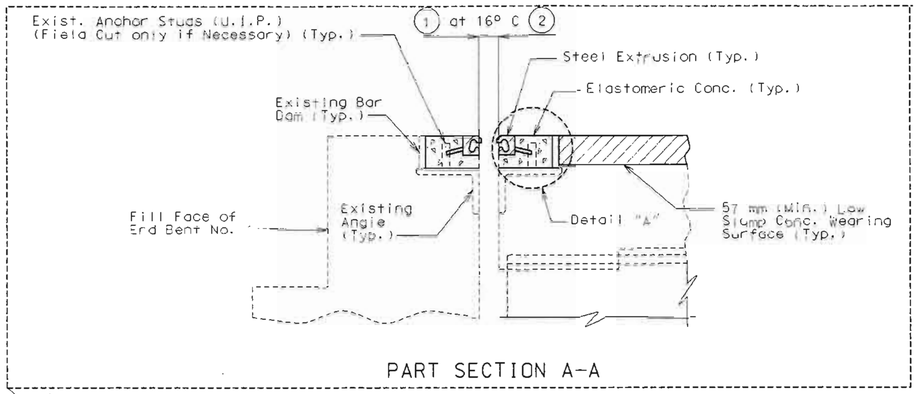
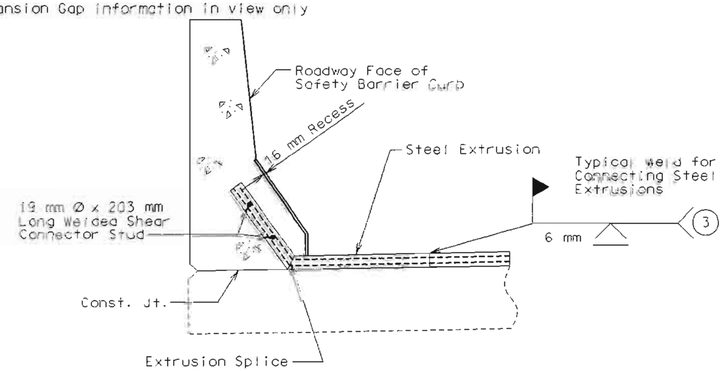


PART PLAN

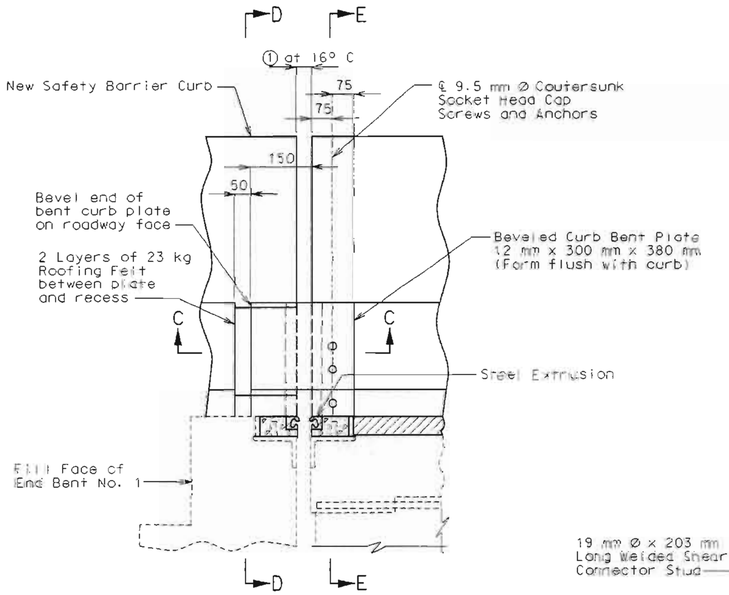


PART SECTION A-A

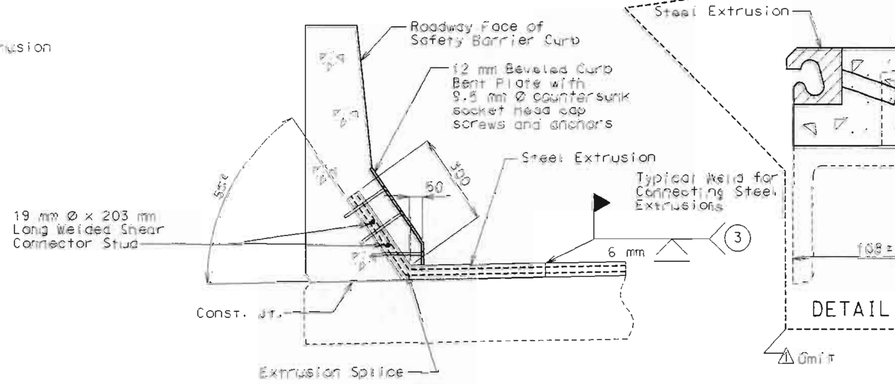
⚠ Use expansion Gap information in view only



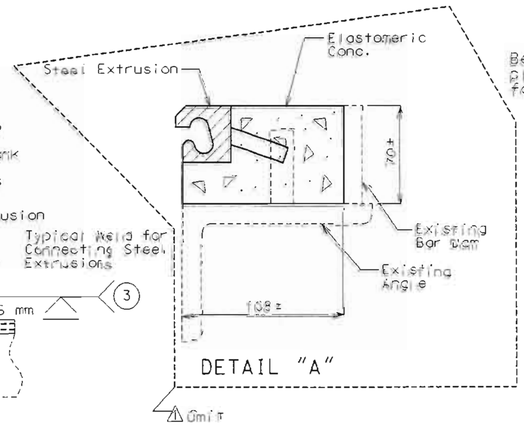
PART SECTION D-D



PART SECTION B-B

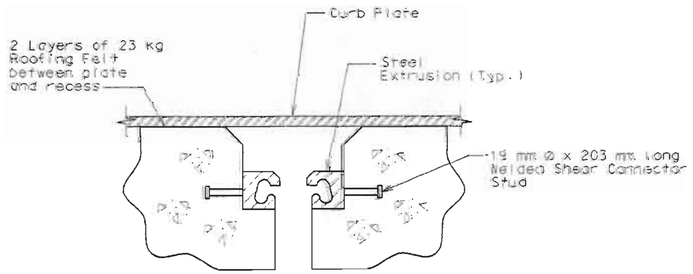


PART SECTION E-E

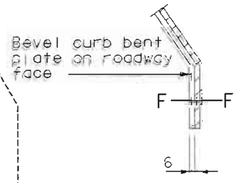


DETAIL "A"

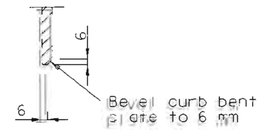
⚠ Omit



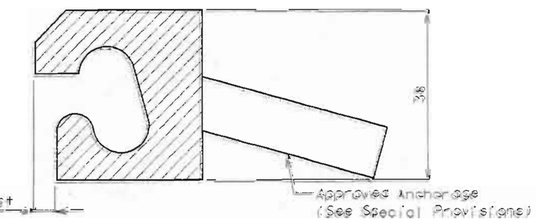
PART SECTION C-C



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION F-F



DETAIL OF STEEL EXTRUSION

STRIP SEAL GLAND
MOVEMENT RATING 102 mm

NOTE:

The expansion device shall be fabricated and installed in accordance with the recommendations of the manufacturer, and as set forth in the Special Provisions.

The contractor must verify all dimensions prior to fabrication.

All welds shall conform to Section 712 of the Standard Specifications (Metric).

All steel shall be ASTM A709M Grade 250, except steel extrusions shall be ASTM A709M Grade 345W or Grade 250.

Neoprene Strip Seal shall meet ASTM D-2628.

Anchors for the extrusions or armor shall be approved welded studs (C1010 through C1020).

Payment for steel extrusions, curb plate and neoprene strip seal shall be made under the contract unit price for Strip Seal Expansion Device.

Structural Steel for the expansion device and curb plate shall be coated with a minimum of two coats of inorganic zinc primer (125 micrometers minimum thickness) or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

Payment for furnishing, coating or galvanizing and placing Strip Seal Expansion Device shall be included in the contract unit price for Strip Seal Expansion Device.

Gap for new strip seal expansion device can not be less than the existing gap.

① Min. = 47 mm
Max. = 69 mm

Note: Dimension ② shall be increased 5 mm for each 5° C fall in temperature and decreased 5 mm for each 5° C rise in temperature at installation.

③ Extrusions shall be welded top and back.

STATE OF MISSOURI
Stacy L. McMillan
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DATE 7-23-99

DETAILS OF STRIP SEAL EXPANSION DEVICE REPLACEMENT AT BENT NO. 1

Detailed Mar. 98
Checked Mar. 98

⚠ Revised 7/1/2/99

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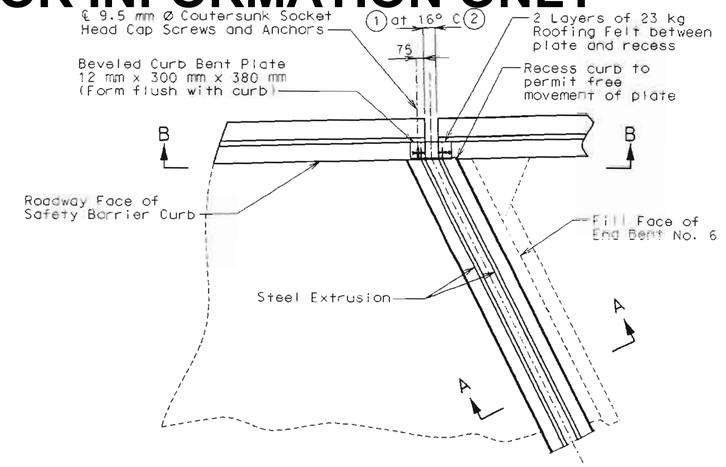
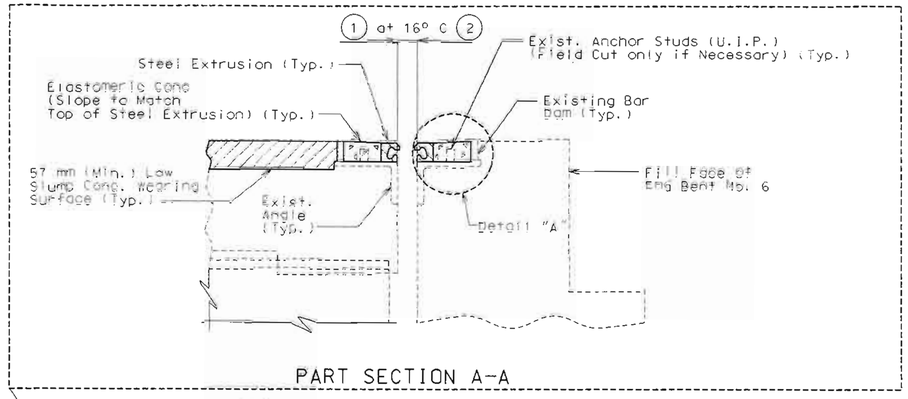
Mo		

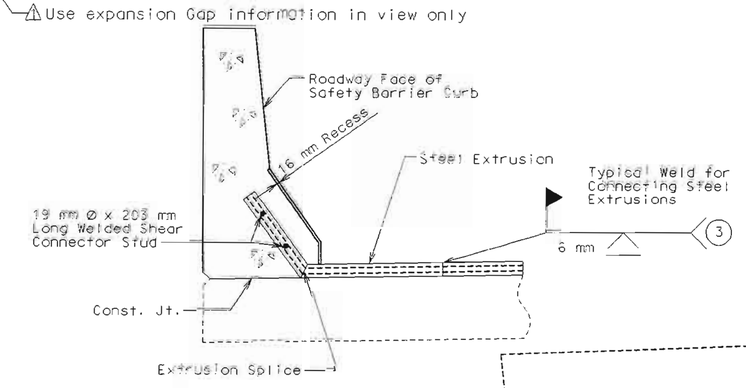


PART PLAN

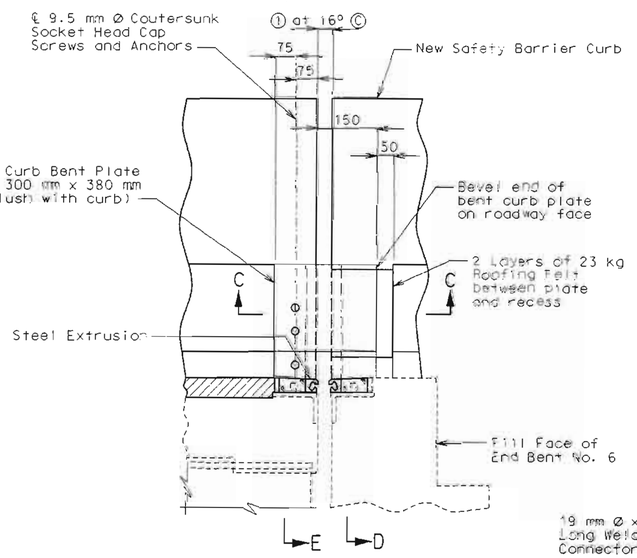


PART SECTION A-A

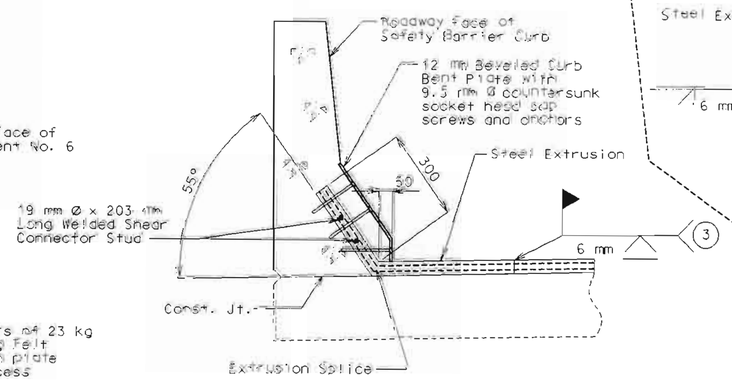
⚠ Use expansion Gap information in view only



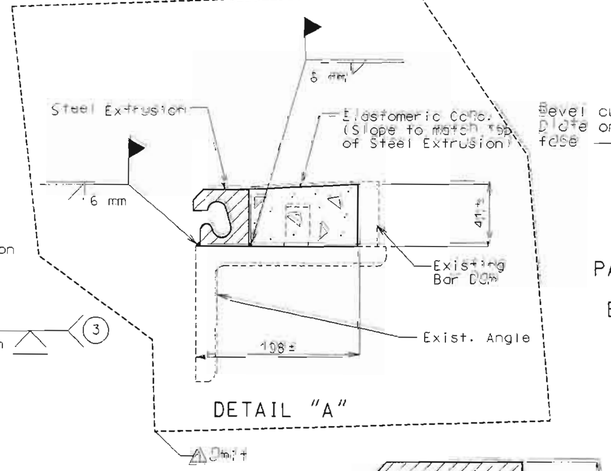
PART SECTION D-D



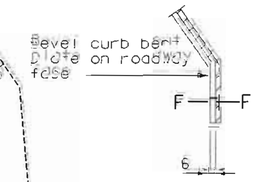
PART SECTION B-B



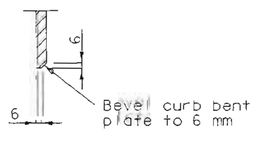
PART SECTION E-E



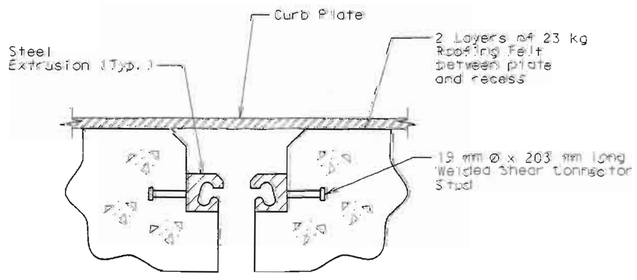
DETAIL "A"



PART ELEVATION AT END OF BEVELED CURB BENT PLATE

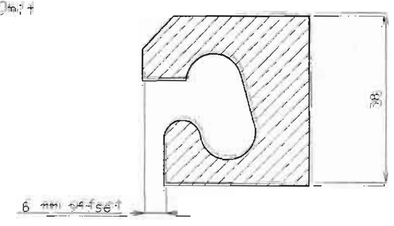


SECTION F-F



PART SECTION C-C

STRIP SEAL GLAND
MOVEMENT RATING 102 mm



DETAIL OF STEEL EXTRUSION

NOTE:

The expansion device shall be fabricated and installed in accordance with the recommendations of the manufacturer and as set forth in the Special Provisions.

The contractor must verify all dimensions prior to fabrication.

All welds shall conform to Section 712 of the Standard Specifications (Metric).

All steel shall be ASTM A709M Grade 250, except steel extrusions shall be ASTM A709M Grade 345W or Grade 250.

Neoprene Strip Seal shall meet ASTM D-2628.

Anchors for the extrusions or armor shall be approved welded studs (C1010 through C1020).

Payment for steel extrusions, curb plate and neoprene strip seal shall be made under the contract unit price for Strip Seal Expansion Device.

Structural Steel for the expansion device and curb plate shall be coated with a minimum of two coats of inorganic zinc primer (125 micrometers minimum thickness) or galvanized in accordance with ASTM A123. Anchors need not be protected from overspray.

Payment for furnishing, coating or galvanizing and placing Strip Seal Expansion Device shall be included in the contract unit price for Strip Seal Expansion Device.

Gap for new strip seal expansion device can not be less than the existing gap.

① Min. = 32 mm
Max. = 88 mm

Note: Dimension ② shall be increased 3 mm for each 5° C fall in temperature and decreased 3 mm for each 5° C rise in temperature at installation.

③ Extrusions shall be welded top and back.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 7-23-99

DETAILS OF STRIP SEAL EXPANSION DEVICE REPLACEMENT AT BENTS NO. 6

Detailed: Mar. 98
Checked: Mar. 98

⚠ Revised 7/12/99 Sheet No. 8 of 11

JACKSON COUNTY

A22493

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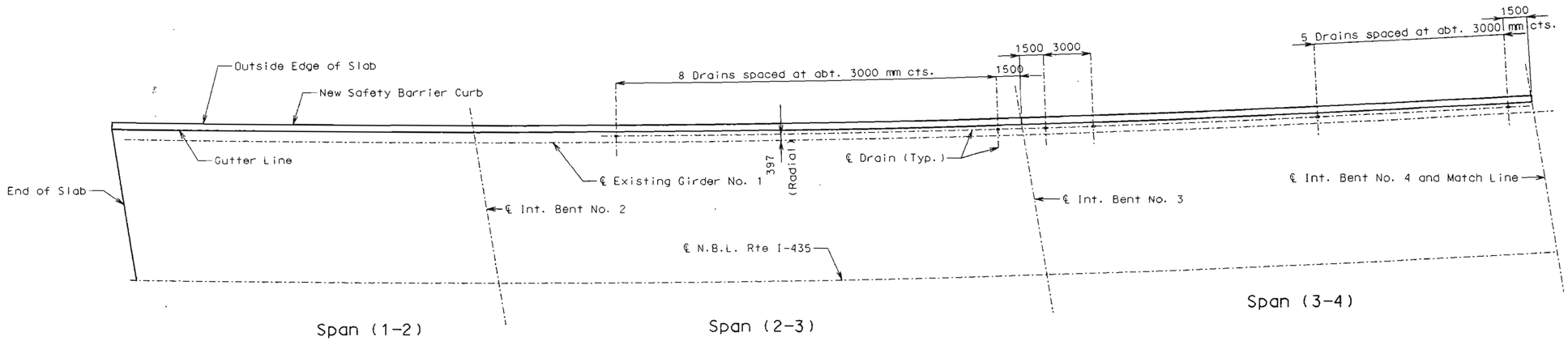
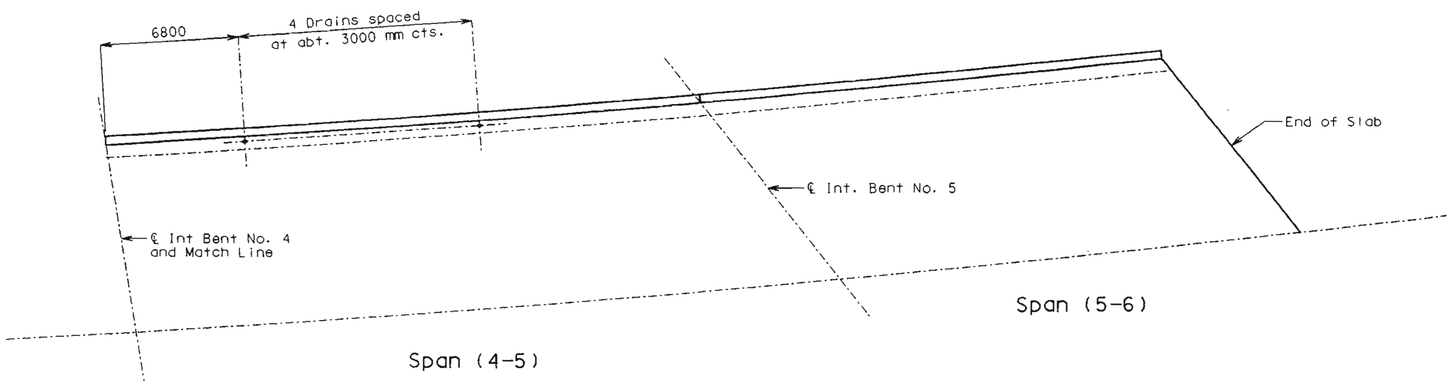
MO		95





Note: For details of Slab Drains See sheet no. 10.

Note: Shift slab drain locations the minimum extent necessary to allow for field drilling hole in web of girder for bracket assembly attachment.

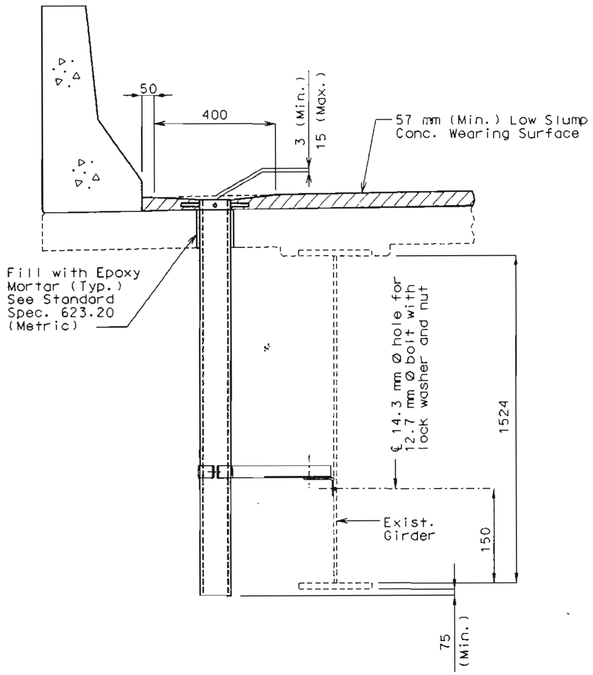
STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER

DATE 4-6-98

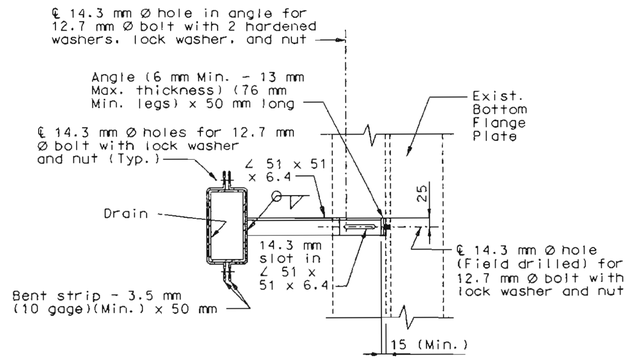
PART PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS

Detailed Mar. 98
Checked Mar. 98

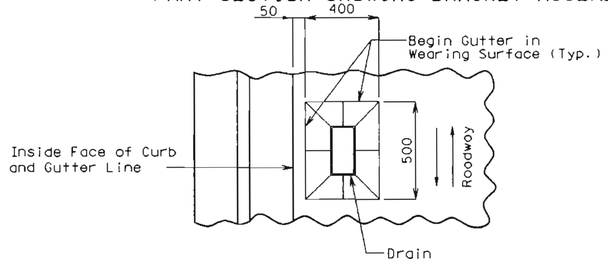
State	Proj. No.	Sheet No.
MO		96



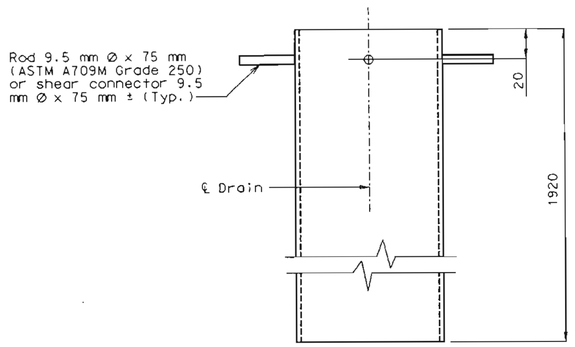
PART SECTION NEAR DRAIN



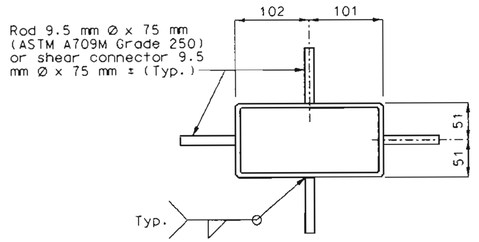
PART SECTION SHOWING BRACKET ASSEMBLY



PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF DRAIN

GENERAL NOTES:

Slab drains may be fabricated of either 6 mm welded sheets of ASTM A709M Grade 250 steel or from 6.4 mm structural steel tubing ASTM A500 or A501.

Outside dimensions of drains are 203 mm x 102 mm.

Locate drains in the slab by dimensions shown in Part Section Near Drain.

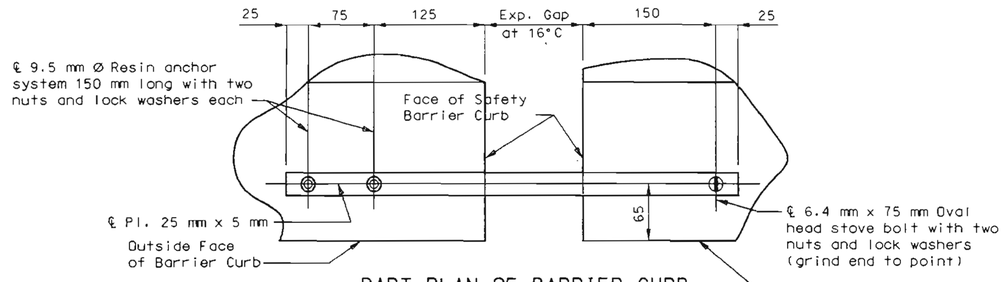
The drains and bracket assembly shall be galvanized in accordance with ASTM A123.

All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with ASTM A153.

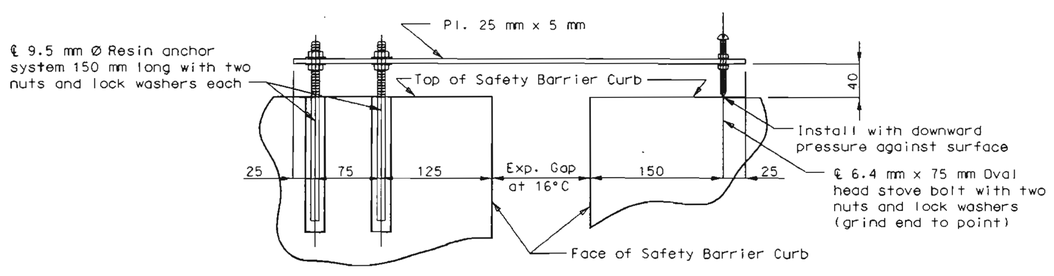
Shop drawings will not be required for slab drains and the bracket assembly.

Payment for slab removal for drain installation and backfilling with epoxy mortar is included in the unit price for Slab Drain, per Each.

SLAB DRAIN DETAILS



PART PLAN OF BARRIER CURB SHOWING MOVEMENT GAUGE



PART ELEVATION OF BARRIER CURB SHOWING MOVEMENT GAUGE

Note:

A movement gauge shall be provided on one side of bridge at all safety barrier curb expansion joints.

All steel shall be galvanized.

Cost of movement gauge complete in place shall be included in contract unit price bid for Safety Barrier Curb.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER

DATE 4-6-98

Detailed Mar. 98
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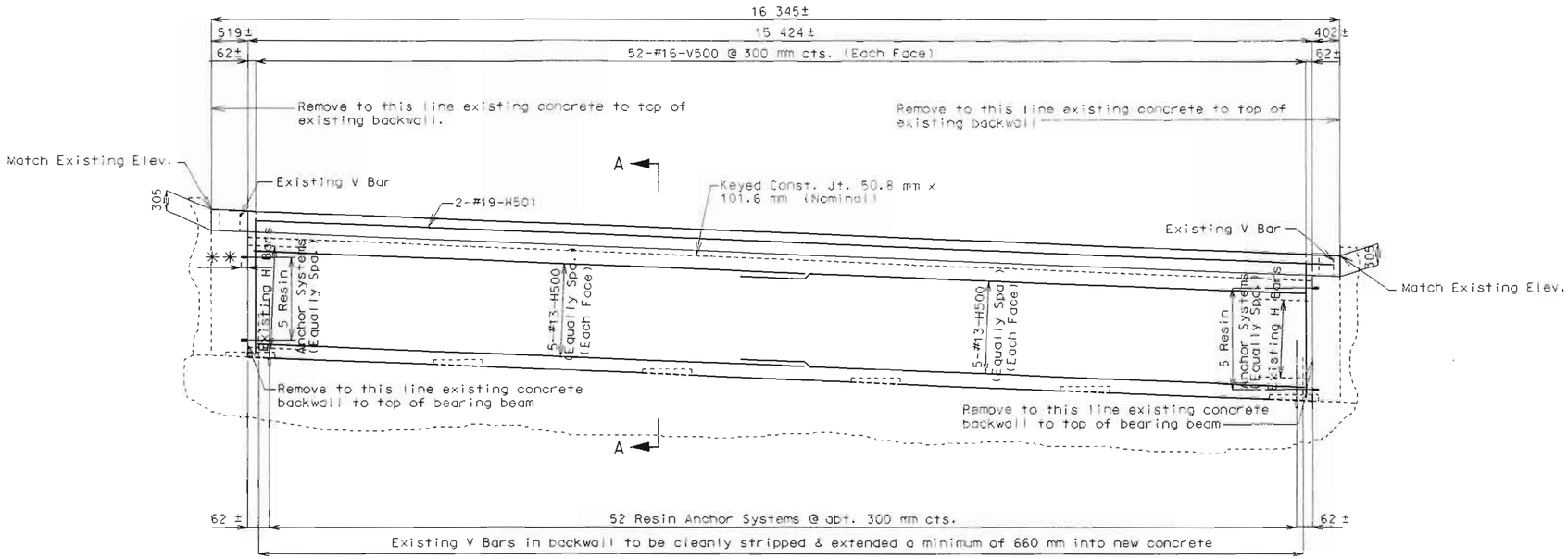
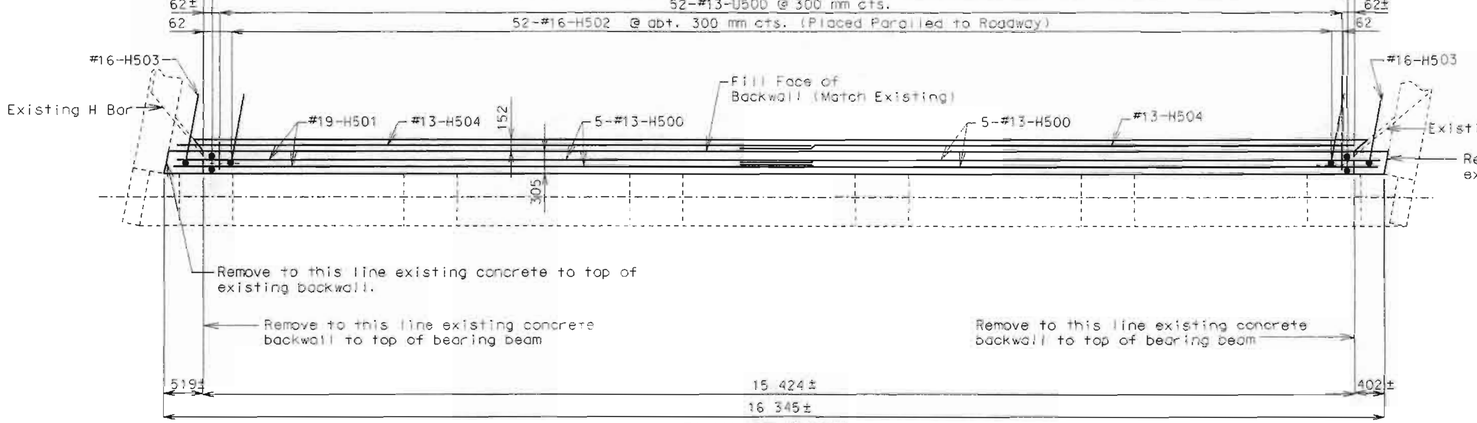


ELEVATION OF BACKWALL

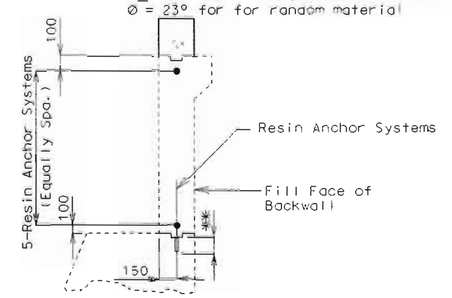
** Manufactures embedment length

Note: For resin anchor notes see sheet No. 6.

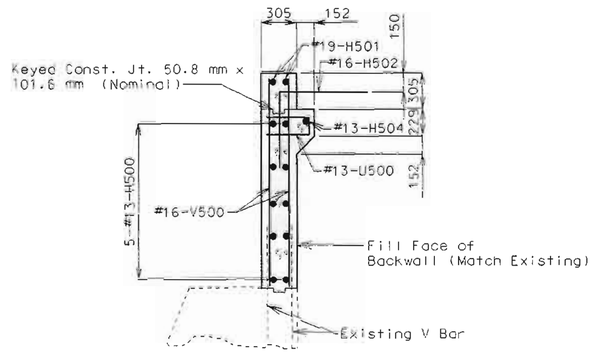


PLAN OF BACKWALL

Design Unit Stresses:
Class B1 Concrete f'c = 28 MPa
Reinforcing Steel (Grade 420) fy = 420 MPa
$\phi \geq 34°$ for select granular backfill
$\phi = 23°$ for for random material



TYPICAL DETAIL SHOWING RESIN ANCHOR PLACEMENT



SECTION A-A

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 7-23-99

ESTIMATED QUANTITIES		
ITEM		TOTAL
Class B1 Concrete-Metric	Cu. Meter	9.2
Reinforcing Steel (Epoxy Coated)-Metric	Kilogram	760

Note: Outline of old work is indicated by dashed lines Heavy lines indicated new work.

Contractor shall verify all dimensions in field before ordering new steel.

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars, unless otherwise noted.

DETAILS OF END BENT NO. 1 ON NORTHBOUND LANE SHOWING BACKWALL REPLACEMENT

Detailed July 1999
Checked July 1999

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

⚠1 7/12/99 Added Sheet

Sheet No. 10A of 11

JACKSON COUNTY A22493 REV.

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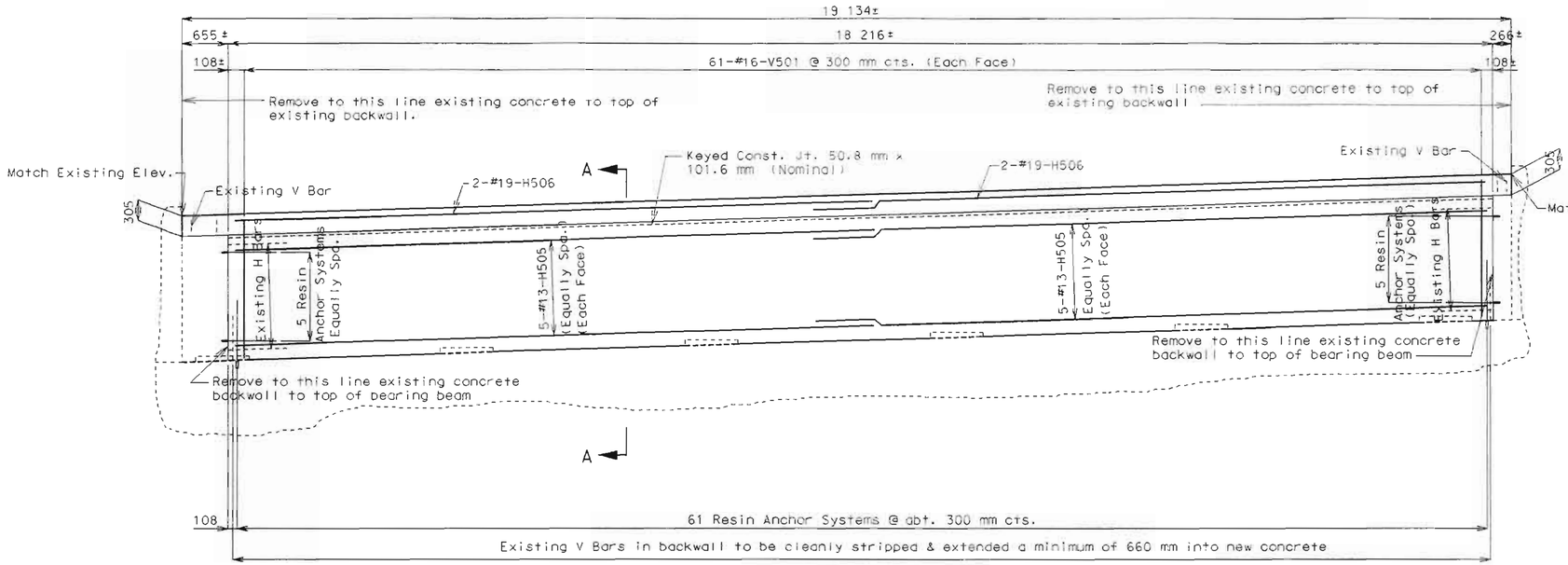
MO		

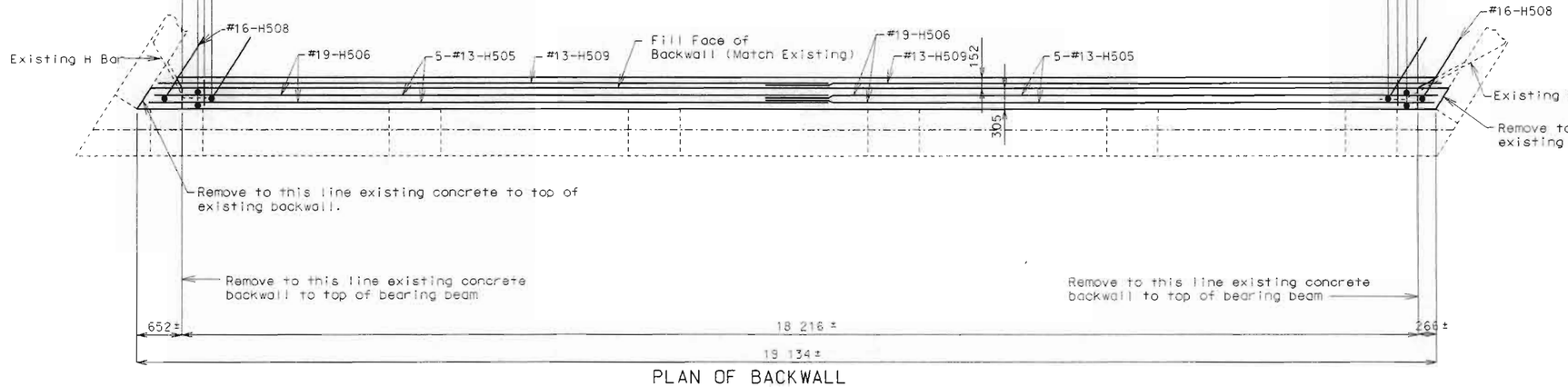
Design Unit Stresses:
Class B1 Concrete f'c = 28 MPa
Reinforcing Steel (Grade 420) fy = 420 MPa
Ø≥34° for select granular backfill
Ø = 23° for for random material



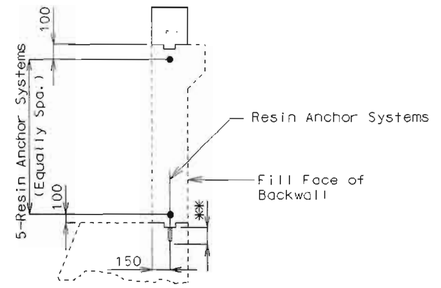
ELEVATION OF BACKWALL

** Manufactures embedment length

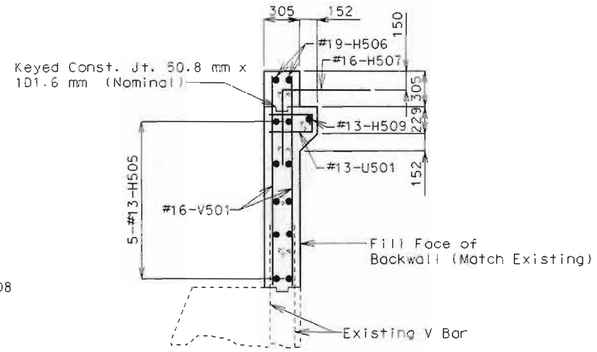
Note: For resin anchor notes see sheet No. 6.



PLAN OF BACKWALL



TYPICAL DETAIL SHOWING RESIN ANCHOR PLACEMENT



SECTION A-A

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 7-23-99

ESTIMATED QUANTITIES		
ITEM		TOTAL
Class B1 Concrete-Metric	Cu. Meter	10.8
Reinforcing Steel (Epoxy Coated)-Metric	Kilogram	680

Note: Outline of old work is indicated by dashed lines Heavy lines indicated new work.

Contractor shall verify all dimensions in field before ordering new steel.

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars, unless otherwise noted.

DETAILS OF END BENT NO. 6 ON NORTHBOUND LANE SHOWING BACKWALL REPLACEMENT

Detailed July 1999
Checked July 1999

⚠ 7/12/99 Added Sheet

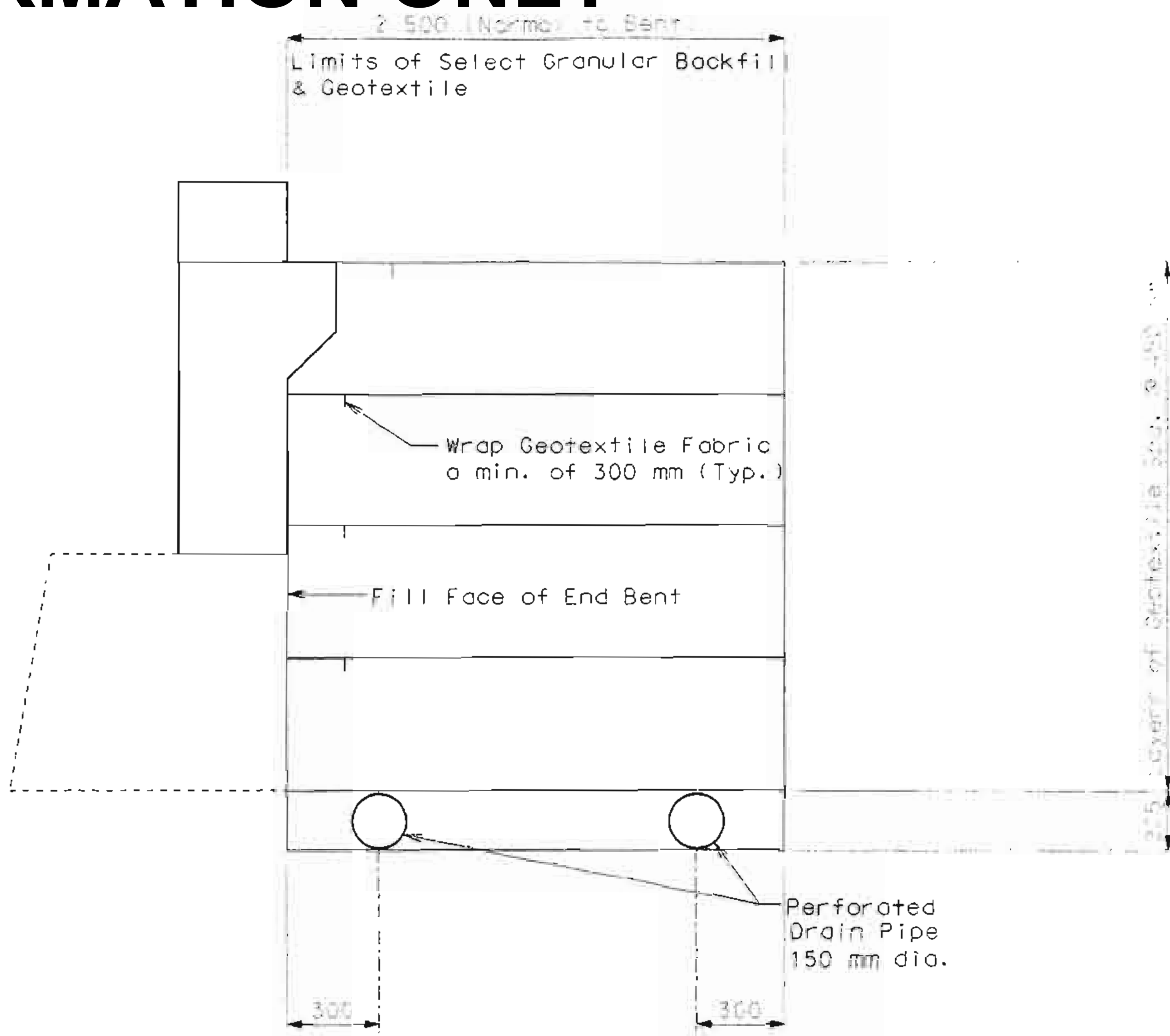
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 10Bof 11

JACKSON COUNTY A22493

REV.

STATE	PROJ. NO.	SHEET NO.
MO.		



SECTION A-A

Note: Geotextile to be placed between select backfill & random material includes wings

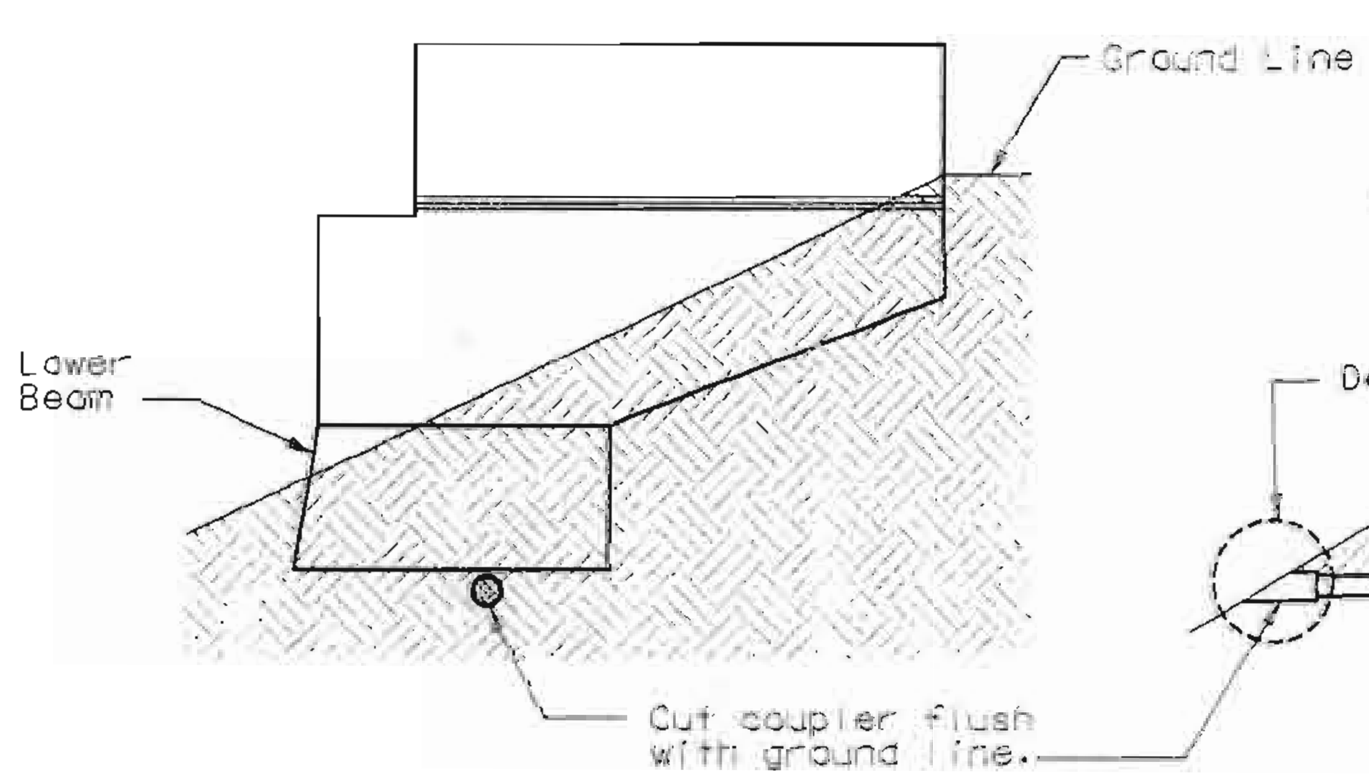
REINFORCED SOIL MASS

Notes:

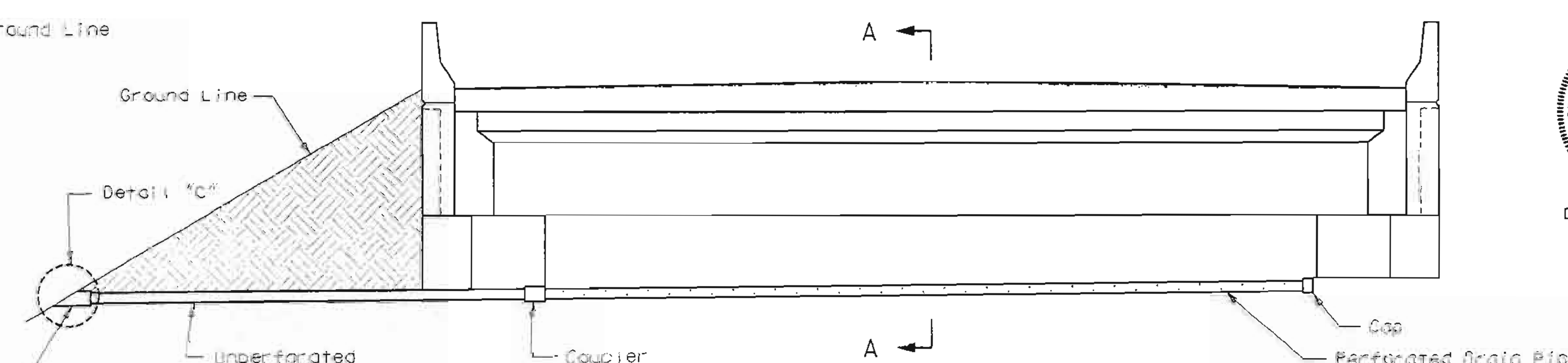
Drain pipe to be 150 mm diameter corrugated metallic-coated steel pipe underdrain.

Slope to lowest grade of ground line.

Perforated pipe shall be placed along granular backfill limits to the exit at the bottom of end bent and plain pipe shall be to ground line.

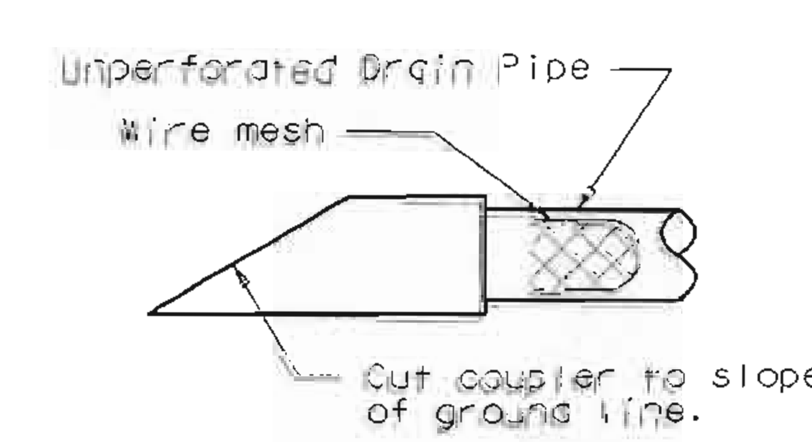


ELEVATION OF WING



ELEVATION AT END BENT

REINFORCED SOIL MASS



DETAIL "C"

Notes:

GEOSYNTHETIC MATERIAL:

All Geotextile Material is to conform to AASHTO M288.

Tallowable(wide witdth tensile strength) > 5840 N/m

With the approval of the Engineer, the Contractor is allowed to substitute a geogrid for the geotextile fabric, provided the contractor wraps the face constructed against the backwall with a geotextile.

The geosynthetic reinforcement is to be placed in continuous longintudinal strips normal to the abutment. Minimum overlap of strips shall be 300 mm.

SELECT GRANULAR BACKFILL:

The maximum lift thickness shall be 225 mm

To insure proper functioning of the structure, the selected backfill materials used in the structure volume shall conform to the following gradation limits and be obtained from natural sources:

Sieve Size	Percent Passing
4 inches	100
No. 40	0-60
No. 200	0-5

The backfill material shall be homogenous throughout.

The backfill material shall conform to all of the following additional requirements:

a. The Plasticity Index (P. I.), as determined by AASHTO T-90, shall not exceed 6.

b. The angle of internal friction shall not be less than 34 degrees as determined by one of the following:

(1) The direct shear test - AASHTO T-236, utilizing a sample of the material compacted to 95 percent of maximum density as determined by AASHTO T-99 Methods C or D (with oversize correction, as outlined in Note 7) at optimum moisture content;

(2) The triaxial compression test - T 234; or

(3) Other means meeting the approval of the engineer. Tests will ordinarily be waived for crushed stone products where 80 percent of the particles exceed 3/4 inch in size.

c. The dry unit weight of the backfill material shall not be less than 105 pounds per cubic foot as determined by AASHTO T-19, unit weight by rodding or jigging.

d. The material shall substantially be free of shale or other soft, poor durability particles and shall have a magnesium sulfate soundness loss of less than 30 percent after (4) cycles as determined by AASHTO T-104.

e. Selected granular backfill materials shall also meet the following electrochemical requirements:

Methods	Requirements	Test
	Resistivity >	5000
ohm centimeters	California DOT 643	
	pH 4.5-9.5 California	
DOT 643		
	pH 5.0-8.0 for	
polyester geogrids	California DOT 643	
California DOT 643	Organic Content < 1%	

Soils with resistances of less than 5000 ohm-cm but greater than 2000 ohm-cm may be accepted if they meet the following additional criteria:

	Chlorides ≤ 100 parts
per million	California DOT 422
	Sulfates ≤ 200 parts
per million	California DOT 417

Excepting pH and organic content requirements, the electrochemical requirements are waived for wall systems with a totally non-metallic reinforcement and connecting system to the wall units.

Backfill not conforming to this specification shall not be used without written consent of the engineer.

The contractor shall furnish to the engineer a Certificate of Compliance certifying the selected granular backfill material complies with this section of the specifications. A copy of all test results performed by the contractor or his/her supplier necessary to assure contract compliance shall also be furnished to the engineer.

Acceptance will be based on the Certificate of Compliance, accompanying test reports, and any applicable tests performed by the engineer.

The frequency of sampling of selected granular backfill, necessary to assure gradation control throughout construction, shall be as directed by the engineer.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 7-23-99

Detailed July 1999
Checked July 1999

⚠ 7/12/99 Added Sheet

Sheet No. 10C of 11.

JACKSON COUNTY

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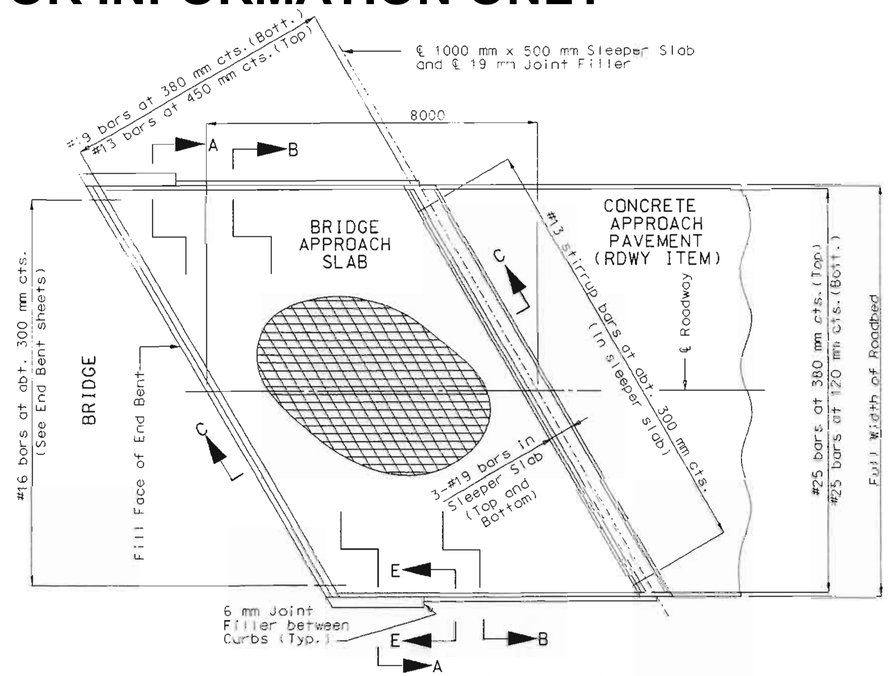
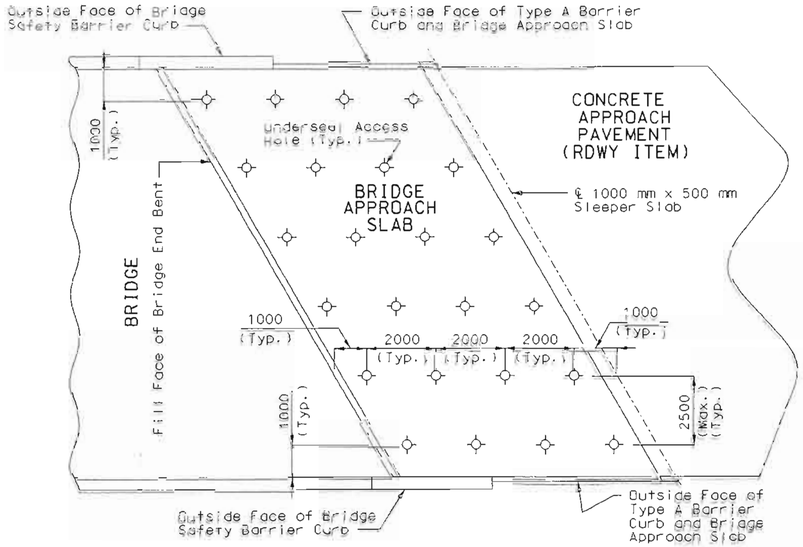
STATE	PROJ. NO.	SHEET NO.
Mo.		



PART PLAN SHOWING REINFORCEMENT



PART PLAN
(SHOWING TYPICAL UNDERSEAL ACCESS HOLE LOCATIONS)

GENERAL NOTES:

All concrete for the bridge approach slab and sleeper slab shall be in accordance with Section 503 (f'c = 28 MPa) of the Missouri Standard Specifications (Metric).

All joint filler shall meet the requirements of Section 1057.2.5 of Missouri Standard Specifications (Metric), except as noted.

The reinforcing steel in the bridge approach slab and the sleeper slab shall be epoxy coated Grade 420 with Fy = 420 MPa.

Minimum clearance to reinforcing steel shall be 40 mm, unless otherwise shown.

The reinforcing steel in the bridge approach slab and the sleeper slab shall be continuous. The transverse reinforcing steel may be made continuous by lap splicing the #13 & #19 bars 700 mm and 1055 mm respectively.

Mechanical bar splices will be permitted and shall develop at least 125 percent of the specified yield strength of the reinforcing bars being spliced. The contractor shall furnish the Engineer the manufacturer's certification that this requirement is met and is required to follow the manufacturer's recommendation for installation.

Mechanical bar splices shall be epoxy coated in accordance with Section 710 of the Missouri Standard Specifications(Metric).

When a lap splice is required for the use of a mechanical bar splice, the minimum lap length shall be 1055 mm for transverse approach slab bar splices.

Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures, Stirrup and Tie Dimensions.

The contractor shall pour and satisfactorily finish the bridge slab before pouring the bridge approach slabs.

Longitudinal construction joints in approach slab and sleeper slab shall be aligned with longitudinal construction joints in bridge slab.

Payment for furnishing all materials, labor and excavation necessary to construct the approach slab, including the timber header, sleeper slab, undergrain, Type 5 aggregate base and all other appurtenances and incidental work as shown on this sheet, complete in place, shall be considered as completely covered under the contract unit price for Bridge Approach Slab (Bridge), per square meter.

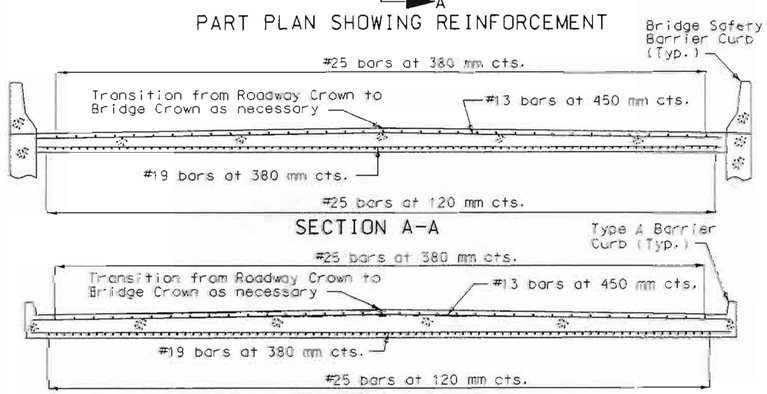
For Concrete Approach Pavement details, see roadway plans.

See Missouri Standard Plans Drawing M609.00 for details of Type A Barrier Curb.

At the contractor's option, Grade 300 reinforcement may be substituted for the Grade 420 #16 dowel bars connecting the bridge approach slab to the bridge abutment. No additional payment will be made for this substitution.

When Grade 300 reinforcement is substituted for the Grade 420 #16 dowel bars connecting the bridge approach slab to the bridge abutment, the reinforcement may be bent up to 90 degrees with a 50 mm minimum radius near the abutment to allow compaction of the backfill material near the abutment. Damage to epoxy coating shall be repaired according to Section 710.3.3 of the Missouri Standard Specifications(Metric).

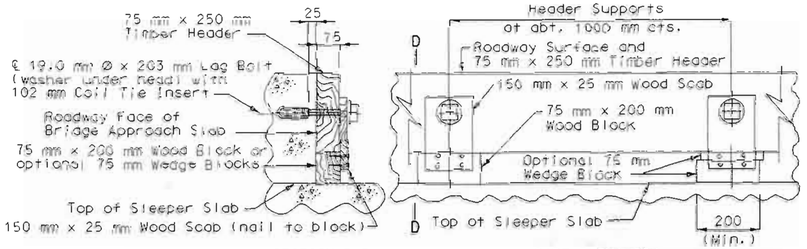
Drain pipe may be either 150 mm diameter corrugated metallic-coated steel pipe underdrain, 100 mm diameter corrugated polyvinyl chloride (PVC) drain pipe, or 100 mm diameter corrugated polyethylene (PE) drain pipe.



SECTION A-A

SECTION B-B

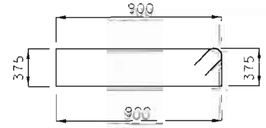
Note: With the approval of the Engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.



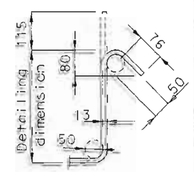
SECTION D-D PART ELEVATION

Note: Remove timber header when concrete pavement is placed.

DETAILS OF TIMBER HEADER

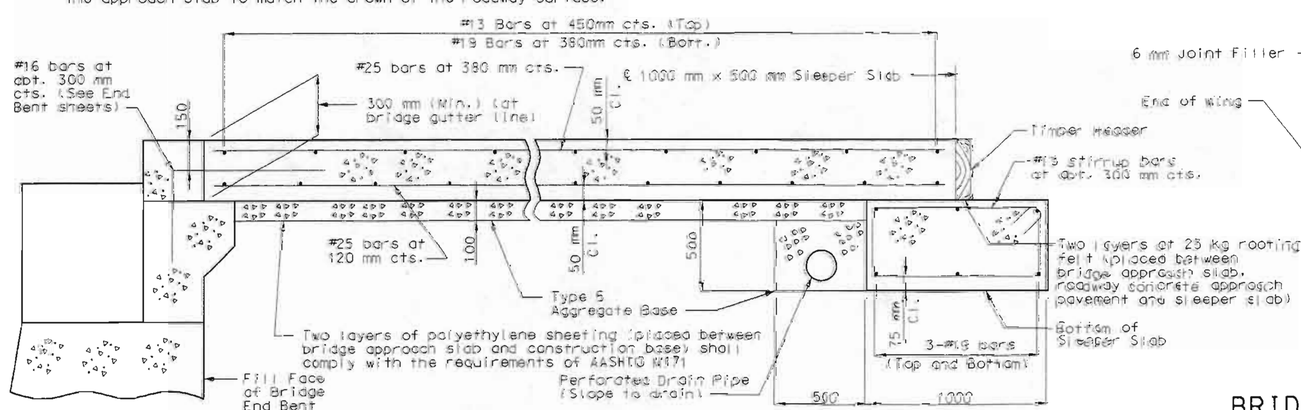


#13 STIRRUP BAR (ACTUAL LENGTH = 2750 mm)

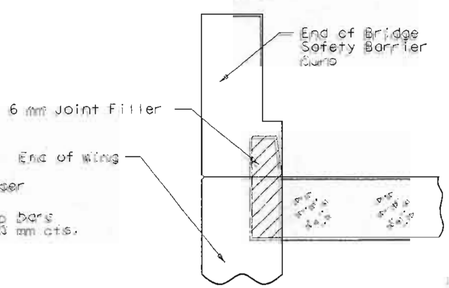


TYPICAL 135° STIRRUP HOOK DIMENSIONS BENDING DIAGRAM

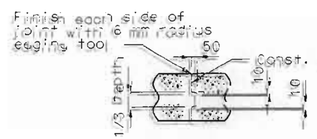
Note:
Nominal lengths are based on cut to cut dimensions shown in bending diagram and are listed for fabrication use (nearest 10 mm).



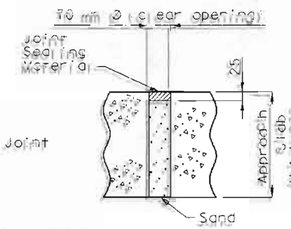
SECTION C-C



SECTION E-E
(BETWEEN CURBS)



CONST. JOINT DETAIL
(IF REQUIRED)



TYPICAL UNDERSEAL ACCESS HOLE DETAIL

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 7-23-99

Detailed July 1999
Checked July 1999

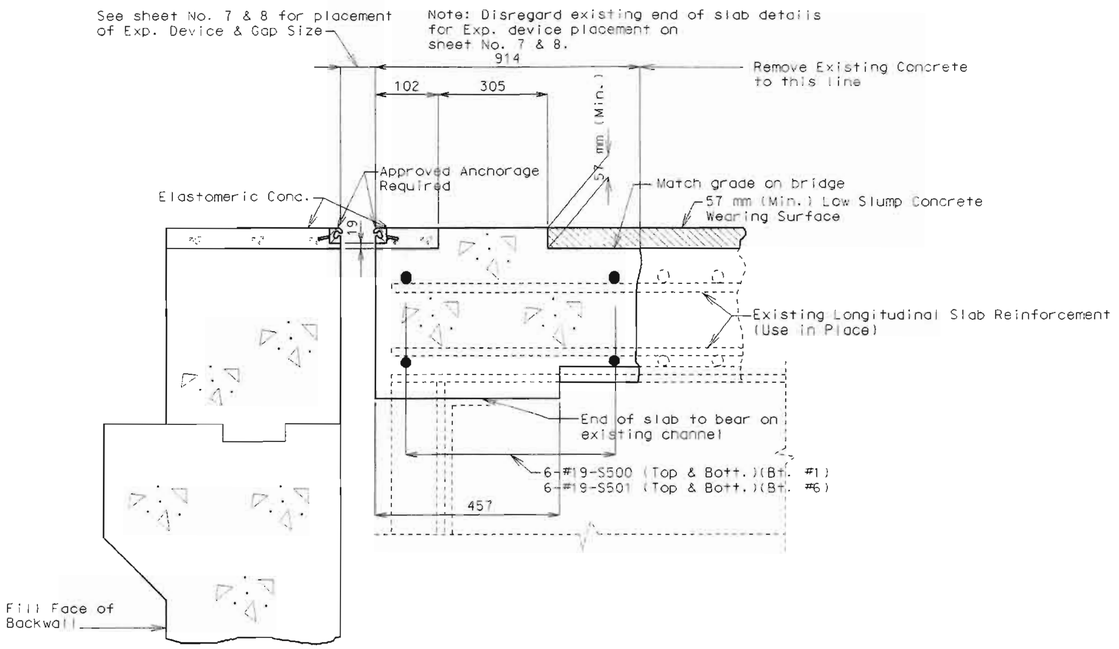
BRIDGE APPROACH SLAB

1/12/99 Added Sheet Sheet No. 100 of 11.

JACKSON COUNTY

A22493

State	Proj. No.	Sheet No.
MO		

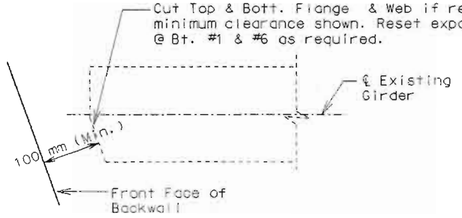


PART SECTION THRU END OF SLAB AT BENT NO. 1

Note: Bent No. 6 similar.

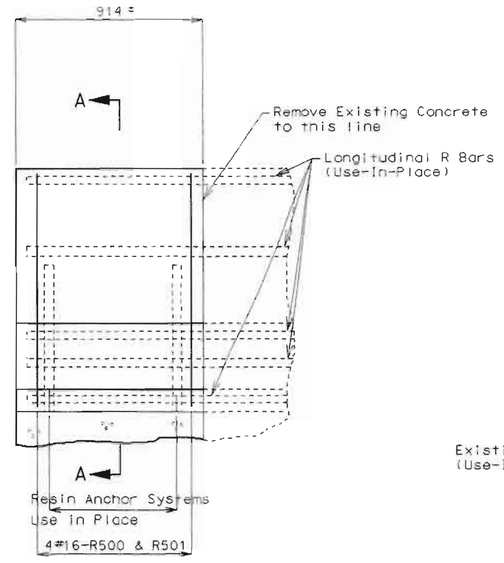
MODIFICATION OF EXISTING EXPANSION DEVICE

Note: All concrete above the upper construction joint in the backwall shall be Class B1 & paid for with the contract unit price for Modification of Existing Expansion Device.



TYPICAL DETAIL OF EXISTING GIRDERS AT END BENTS

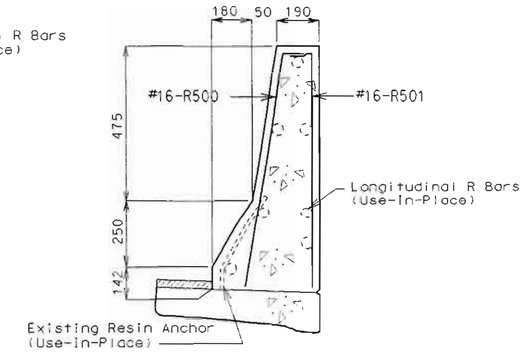
Note: Payment for modification of existing girder ends will be included in the contract unit price for Modification of Existing Expansion Device per meter.



DETAIL OF CURB END REPLACEMENT AT END BENTS (IF REQUIRED)

Note: For placement of curb plate & Exp. Device in curb see sheet No. 7 & 8.

Design Unit Stresses:
Class B1 Concrete f'c = 28 MPa
Reinforcing Steel (Grade 420) fy = 420 MPa



SECTION A-A

ESTIMATED QUANTITIES		
ITEM		TOTAL
Bridge Approach Slab (Bridge)-Metric	Sq. Meter	264
Modification of Existing Expansion Device-Metric	Meter	37
Reinforced Soil Mass	Lump Sum	1

Note: Outline of old work is indicated by dashed lines Heavy lines indicated new work.

Contractor shall verify all dimensions in field before ordering new steel.

Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars, unless otherwise noted.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 7-23-99

DETAILS OF END OF SLAB REPLACEMENT ON NORTHBOUND LANE

Detailed July 1999
Checked July 1999

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

⚠1 7/12/99 Added Sheet

Sheet No. 10Eof 11

JACKSON COUNTY A22493 REV.

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BILL OF REINFORCING STEEL

No. Req'd.	Mark No. Size	Mark No. Mark	Location	Epoxy (E)	Shape No.	Stirrup (S)	Substr. (X)	Varies (V)	No. Each	Dimensions B mm	C mm	D mm	E mm	F mm	H mm	K mm	Nominal Length mm	Actual Length mm	Mass kg
			BAR. CURB																
72	16	C1	BAR. CURB	E	20					3025							3025	3025	338
1016	16	R1	BAR. CURB	E	19	S				810	100						910	875	1380
1040	16	R2	BAR. CURB	E	15	S				815	100				810	80	915	885	1428
68	16	R3	BAR. CURB	E	19	S				960	100						1060	1025	108
24	16	R4	BAR. CURB	E	19	S				985	285						1270	1235	46
44	16	R5	BAR. CURB	E	19	S				525	150						675	640	44
68	16	R6	BAR. CURB	E	25	S				265	275	150			225	160	690	675	71
20	16	R7	BAR. CURB	E	19	S		V	4	985	255						1240	1205	
			INCREMENT =							985	120						1105	1070	35
			35 MM																
8	16	R8	BAR. CURB	E	19	S				900	205						1105	1070	13
56	16	R9	BAR. CURB	E	19	S				960	205						1165	1130	98
32	16	R10	BAR. CURB	E	10	S					415	340					1170	1105	55
24	16	R11	BAR. CURB	E	20					3720							3720	3720	139
44	16	R12	BAR. CURB	E	20					1525							1525	1525	104
4	16	R13	BAR. CURB	E	20					1060							1060	1060	7
8	16	R14	BAR. CURB	E	20					4495							4495	4495	56
114	16	R20	BAR. CURB	E	20					2920							2920	2920	517
28	16	R21	BAR. CURB	E	20					10400							10400	10400	452
42	16	R22	BAR. CURB	E	20					10080							10080	10080	657
21	16	R23	BAR. CURB	E	20					8850							8850	8850	288
21	16	R24	BAR. CURB	E	20					9165							9165	9165	299
14	16	R25	BAR. CURB	E	20					10755							10755	10755	234
21	16	R26	BAR. CURB	E	20					9610							9610	9610	313
28	16	R27	BAR. CURB	E	20					8920							8920	8920	388
14	16	R28	BAR. CURB	E	20					10690							10690	10690	232

BILL OF REINFORCING STEEL

No. Req'd.	Mark No. Size	Mark No. Mark	Location	Epoxy (E)	Shape No.	Stirrup (S)	Substr. (X)	Varies (V)	No. Each	Dimensions B mm	C mm	D mm	E mm	F mm	H mm	K mm	Nominal Length mm	Actual Length mm	Mass kg

State	Proj. No.	Sheet No.
MO		97

Shape 6

Shape 7

Shape 8

Shape 9

Shape 10

Shape 11

Shape 12

Shape 13

Shape 14

Shape 15

Shape 16

Shape 17

Shape 18

Shape 20

Shape 19

Shape 21

Shape 23

Shape 24

Shape 22

Shape 25

Shape 26

Shape 27

Shape 28

Shape 29

Shape 31

Shape 30

Shape 32

Shape 33

Shape 34

Shape 35

Shape 36

6d for #10, #13, & #16
12d for #19

90° Stirrup

135° Stirrup

Detailed Mar. 98
Checked Mar. 98

STIRRUP HOOK DIMENSIONS (mm) Grades 300 & 420 MPa				
Bar Size	D	90° Hook A or G	135° Hook A or G	135° Hook Approx. H
#13	50	115	115	80
#16	65	155	140	95
#19	115	305	205	115

Note: Unless otherwise noted, diameter "D" is the same for all bends and hooks on a bar.

180°

4d or 64 mm min.

END HOOK DIMENSIONS (mm)				
Bar Size	D	All Grades 180° Hooks A or G	180° Hooks J	90° Hook A or G
#10	60	125	80	150
#13	80	150	105	200
#16	95	175	130	250
#19	115	200	155	300
#22	135	250	180	375
#25	155	275	205	425
#29	240	375	300	475
#32	275	425	335	550
#36	305	475	375	600
#43	465	675	550	775

Two additional #16-R20 are included in the bar bill for testing.

Note:

All standard hooks and bends other than 180 degree to be bent with the same procedure as for 90 degree standard hooks.
Hooks and bends shall be in accordance with the procedures as shown on this sheet.
E = epoxy coated reinforcement
S = stirrup
X = bar is included in substructure quantities
V = bar dimensions vary in equal increments between dimensions shown on this line and the following line.
No. Ea. = number of bars of each length
Nominal lengths are based on out to out dimensions shown in bending diagrams and are listed for fabricator's use (nearest 5 mm).
Actual lengths are measured along centerline bar to the nearest 5 mm.
Payweights are based on actual lengths.
Four angle or channel spacers are required for each column spiral. Spacers are to be placed on inside of spirals. Length and mass of column spirals do not include splices or spacers.
Reinforcing steel (Grade 420) = FY 420 MPa

Spot weld AASHTO M32 size W5 wire (typ.)

(Shape 35 shall be a smooth bar or wire.)

BENDING DIAGRAMS

Stacy L. McMillan NUMBER E-26873 REGISTERED PROFESSIONAL ENGINEER STATE OF MISSOURI

DATE 4-6-98

JACKSON COUNTY

A22493

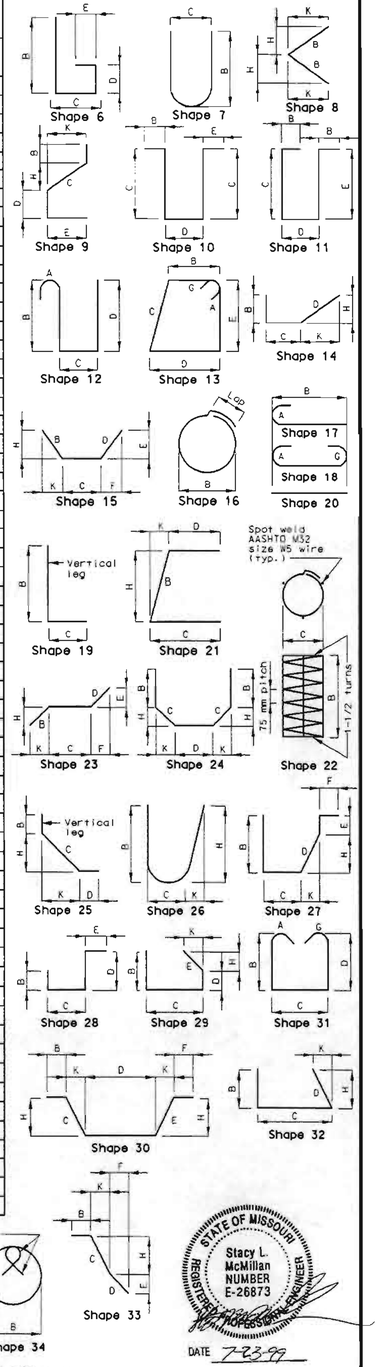
BILL OF REINFORCING STEEL

No. Req'd.	Mark No. Size	Mark No. Mark	Location	Epoxy (E)	Shape No.	Stirrup (S)	Substr. (X)	Varies (V)	No. Each	Dimensions B mm	C mm	D mm	E mm	F mm	H mm	K mm	Nominal Length mm	Actual Length mm	Mass kg
			END BENT 1																
20	13	H500	BACKWALL	E	20					8060							8060	8060	160
2	19	H501	BACKWALL	E	20					16245							16245	16245	73
52	19	H502	BACKWALL	E	19	S				610	610						1220	1170	136
2	19	H503	BACKWALL	E	19	S				110	610						720	670	3
2	13	H504	APR. HAUNCH	E	20					8060							8060	8060	16
52	13	U500	APR. HAUNCH	E	10	S					381	152					915	860	44
104	16	V500	BACKWALL	E	20					2020							2020	2020	326
			END BENT 6																
20	13	H505	BACKWALL	E	20					9450							9450	9450	188
4	19	H506	BACKWALL	E	20					10090							10090	10090	90
61	16	H507	BACKWALL	E	19	S				610	610						1220	1185	112
2	16	H508	BACKWALL	E	19	S				110	610						720	685	2
2	13	H509	APR. HAUNCH	E	20					9450							9450	9450	19
61	16	U501	APR. HAUNCH	E	10	S					381	152					915	845	80
122	16	V501	BACKWALL	E	20					2025							2025	2025	384
			BRIDGE SLAB																
6	19	S500	SLAB	E	20					17100							17100	17100	229
12	19	S501	SLAB	E	20					10510							10510	10510	282
			CURB																
16	16	R500	CURB	E	15	S				780	110				775	80	890	860	21
16	16	R501	CURB	E	19	S				765	110						875	840	21

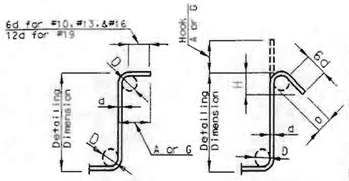
BILL OF REINFORCING STEEL

No. Req'd.	Mark No. Size	Mark No. Mark	Location	Epoxy (E)	Shape No.	Stirrup (S)	Substr. (X)	Varies (V)	No. Each	Dimensions B mm	C mm	D mm	E mm	F mm	H mm	K mm	Nominal Length mm	Actual Length mm	Mass kg

State	Proj. No.	Sheet No.
MD		



6d for #10, #13, & #16
12d for #19

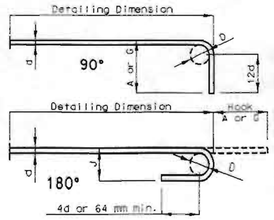


90° Stirrup 135° Stirrup

Detailed July 1999
Checked July 1999

STIRRUP HOOK DIMENSIONS (mm)				
Grades 300 & 420 MPa				
Bar Size	D	90° Hook	135° Hook	
		Hook A or G	Hook A or G	Approx. H
#13	50	115	115	80
#16	65	155	140	95
#19	115	305	205	115

Note: Unless otherwise noted, diameter "D" is the same for all bends and hooks on a bar.



END HOOK DIMENSIONS (mm)				
Bar Size	D	All Grades		
		180° Hooks		90° Hook
		A or G	J	A or G
#10	60	125	80	150
#13	80	150	105	200
#16	95	175	130	250
#19	115	200	155	300
#22	135	250	180	375
#25	155	275	205	425
#29	240	375	300	475
#32	275	425	335	550
#36	305	475	375	600
#43	465	675	550	775

Note:
All standard hooks and bends other than 180 degree to be bent with the same procedure as for 90 degree standard hooks.
Hooks and bends shall be in accordance with the procedures as shown on this sheet.
E = epoxy coated reinforcement
S = stirrup
X = bar is included in substructure quantities
V = bar dimensions vary in equal increments between dimensions shown on this line and the following line.
No. Ea. = number of bars of each length
Nominal lengths are based on out to out dimensions shown in bending diagrams and are listed for fabricator's use (nearest 5 mm).
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Four angle or channel spacers are required for each column spiral. Spacers are to be placed on inside of spirals. Length and mass of column spirals do not include splices or spacers.
Reinforcing steel (Grade 420) = FY 420 MPa

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 7-23-99

BENDING DIAGRAMS

⚠1 7/12/99 Added Sheet Sheet No. 11A of 11

JACKSON COUNTY

A22493