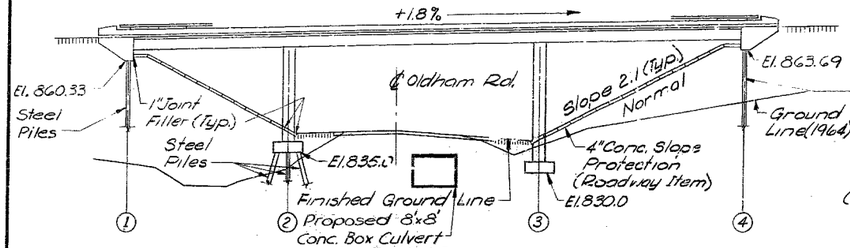
FOR INFORMATION ONLY

A16405 & A16406, Sht. 1

MISSOURI STATE HIGHWAY DEPARTMENT

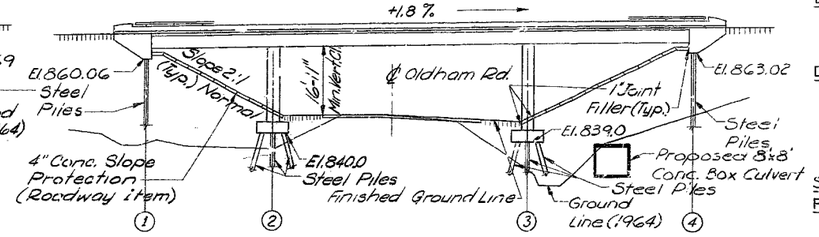
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	1&3	

(48'-75-11') Cont. Conc. Box Girder Spans
Skew 16°58' R.A.



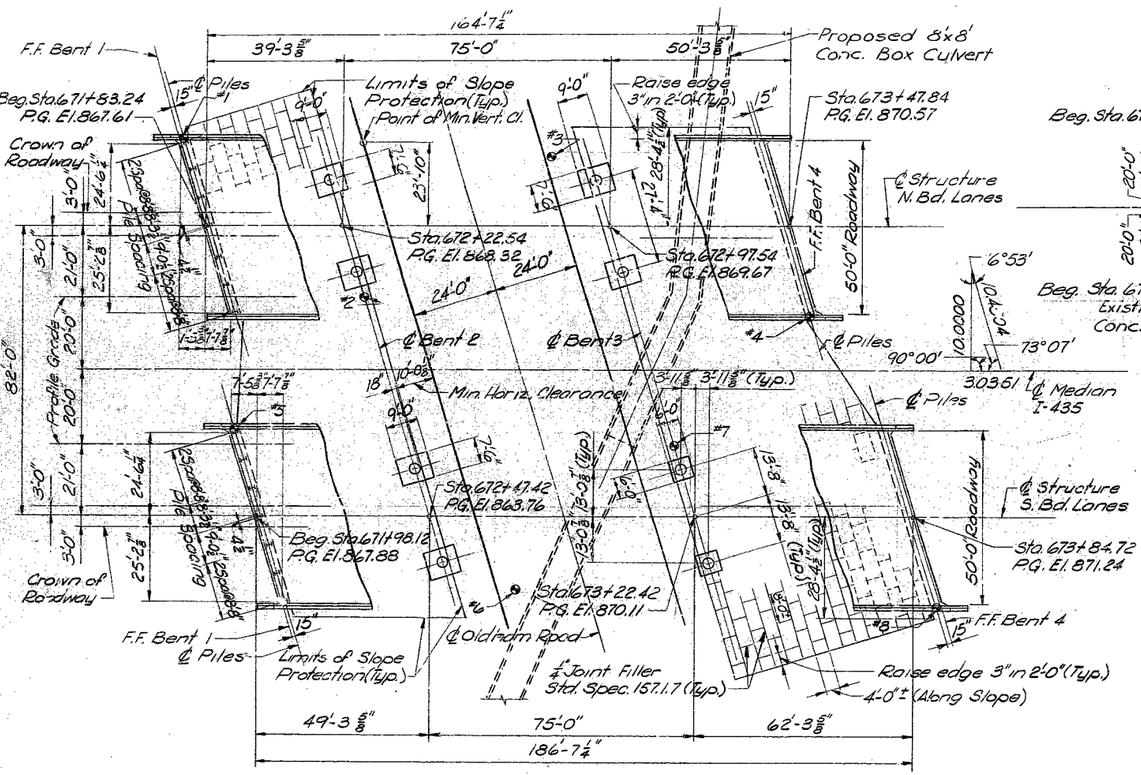
SOUTHBOUND

(38'-75'-49') Cont. Conc. Box Girder Spans
Skew 16°53' R.A.

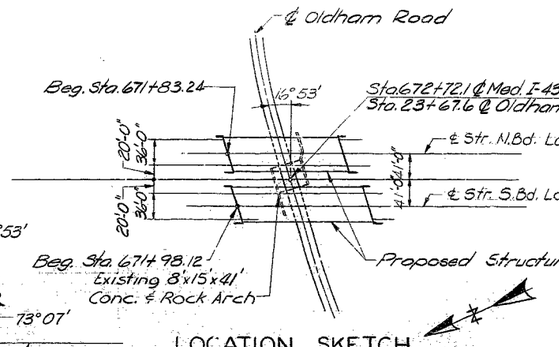


NORTHBOUND

GENERAL ELEVATIONS



PLAN



LOCATION SKETCH

MISCELLANEOUS NOTES:

Compacted roadway P.I. (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 steel piles are driven.

For Boring Data see Sheet No. 12 of 13.

"B" indicates location of borings.

A minimum vertical clearance of 13'-6" from crown of existing lanes and a minimum lateral clearance of 25'-0" centered on existing lanes shall be maintained during construction.

GENERAL NOTES:

DESIGN SPECIFICATIONS: A.A.S.H.O.-1961

DESIGN LOADING:
HS 20-44; 15#/sq. ft. Future Wearing Surface; Modified 24,000# Tandem Axle; Earth 120#; Equivalent Fluid Pressure 30#.

DESIGN UNIT STRESSES:
Class B Concrete (substructure) fc = 1,200 p.s.i.
Class B1 Concrete (superstructure) fc = 1,600 p.s.i.
Reinforcing Steel fs = 20,000 p.s.i.
Structural Steel (A.S.T.M. A36-63T) fs = 20,000 p.s.i.
Steel Pile (A.S.T.M. A36-63T) fb = 9,000 p.s.i.

SURFACE SEAL: Superstructure deck to be surface sealed.

PAINTING:
Structural Steel access doors shall be cleaned and painted in the field or may be cleaned and painted one coat of red lead in the shop with the two remaining coats applied in the field except that final coat on access doors and frames shall be gray. In lieu of painting, the contractor may, if he prefers, galvanize this material. All galvanizing shall be done after fabrication. Cost of painting or galvanizing to be included in price bid for other items.

PILE AND FOOTING DATA									
BENT NO.		1		2		3		4	
LANES		N.Bd.	S.Bd.	N.Bd.	S.Bd.	N.Bd.	S.Bd.	N.Bd.	S.Bd.
BEARING PILE	Pile Type and Size	10BP42	10BP42	12BP53	12BP53	12BP53		10BP42	10BP42
	Number	7	7	6 ft. c. to c.	12	12		7	7
	Approximate Length Ft.	32	37	17.8 ft. c. to c.	12	17		27	27
	Design Bearing Tons	44	44	64	67	68		44	44
	Hammer Energy Required Ft.-lbs.	9900	9900	15100	15800	16,000		9900	9900
SPREAD FOOTINGS	Foundation Material						Rock		
	Design Bearing Tons/Sq.Ft.						11.8		

PILE AND FOOTING NOTES:
Footings shall be carried 6" into hard, solid, undisturbed rock or 18" into soft rock or shale and cast against vertical faces of same.
Minimum energy requirement of hammer based on plan length and design bearing value of piles. Increase by the factor (W+w)/2W when the weight of the ram (W) is less than the weight of the pile (w).
All pile shall be driven to practical refusal.

ESTIMATED QUANTITIES				
ITEM		Substr.	Superstr.	Total
Class 1 Excavation For Structures	Cu. Yds.	65	–	65
10" Steel Piles in place	Lin. Ft.	861	–	861
12" Steel Piles in place	Lin. Ft.	522	–	522
Class B Concrete	Cu. Yds.	60.5	–	60.5
Class B1 Concrete	Cu. Yds.	–	1265.3	1265.3
Reinforcing Steel	Lbs.	2160	181,680	183,840
Bridge Rail (Single Tube Type)	Lin. Ft.	–	722	722

QUANTITY NOTES:
All concrete and reinforcement above footings is included in superstructure quantities.
No payment for excavation will be allowed at End Bents 1 & 4.
Payment for furnishing and installing access doors and frames shall be made and considered fully covered under price bid for other items.

BENCH MARK:
U.S.G.S. Datum - Spike in p.p. 80' Rt. Sta. 673+30 Elev. 839.24

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE-I-435) **STA.** 671+83.24 (N.BD.LANES) 671+98.12 (S.BD.LANES)

JACKSON **COUNTY**

STATE OF MISSOURI — EUGENE L. FIELDHAMMER NUMBER E-10795 — REGISTERED PROFESSIONAL ENGINEER

SUBMITTED BY
REGISTERED PROFESSIONAL ENGINEER
MISSOURI NO. E-10795

SUBMITTED BY ____ BRIDGE ENGINEER DATE 12/5/66

APPROVED BY ____ CHIEF ENGINEER DATE 12/12/66

STD. 5.4.00

A-1640

DESIGNED MAY 1966 BY YANG
DETAILED MAY 1966 BY HERD, VIEHLAND
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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

Sheet No. 1 of 13.

398

SEE FINAL PLANS FOR REVISIONS

MISSOURI STATE HIGHWAY DEPARTMENT

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

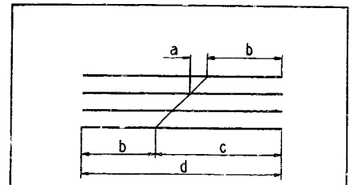
COMPLETE BILL OF REINFORCING STEEL

NO.	SIZE	LENGTH	MARK	LOCATION
SUPERSTR. NORTHBOUND				
61	#11	39'-9"	S1	Top Slab
60	#9	15'-3"	S2	"
61	#5	15'-6"	S3	"
61	#5	42'-3"	S4	"
61	#11	39'-3"	S5	"
60	#9	16'-6"	S6	"
61	#5	27'-9"	S7	"
122	#6	7'-3"	S8	"
588	#6	31'-0"	S9	"
588	#6	25'-3"	S10	"
300	#5	33'-6"	S11	"
55	#5	22'-6"	S22	Bott. Slab
252	#5	28'-3"	S30	"
197	#5	27'-6"	S31	"
24	#6	6'-0"	S32	"
55	#9	26'-9"	S33	"
55	#11	57'-0"	S34	"
46	#7	46'-3"	S35	"
8	#11	46'-3"	S36	"
8	#9	30'-0"	S37	"
55	#9	38'-6"	S38	"
46	#5	30'-0"	S39	"
126	#4	5'-0"	G4	Diaphrm
12	#6	25'-6"	G5	"
1450	#6	6'-6"	G6	Webs
592	#5	6'-6"	G7	"
42	#8	55'-3"	G8	"
70	#5	33'-6"	G9	"
120	#5	7'-0"	G16	"
8	#5	4'-9"	R1	End Posts
4	#5	5'-6"	R2	"
4	#5	6'-3"	R3	"
4	#5	6'-9"	R4	"
4	#5	7'-0"	R5	"
8	#5	7'-3"	R6	"
170	#5	5'-3"	R7	Parapets
76	#5	7'-3"	R8	"
8	#5	29'-0"	R9	"
32	#5	9'-9"	R10	"
16	#5	28'-0"	R11	"
8	#5	40'-0"	R12	"
328	#5	3'-6"	C1	Curbs
36	#5	3'-0"	C2	"
8	#6	7'-9"	C3	"
4	#5	39'-0"	C4	"
8	#5	38'-3"	C5	"
8	#5	25'-9"	C6	"

NO.	SIZE	LENGTH	MARK	LOCATION
SUPERSTR. SOUTHBOUND				
122	#6	7'-3"	S8	Top Slab
676	#6	31'-0"	S9	"
676	#6	25'-3"	S10	"
61	#5	26'-9"	S12	"
61	#11	41'-6"	S13	"
60	#9	16'-3"	S14	"
61	#5	35'-6"	S15	"
61	#11	43'-3"	S16	"
60	#11	22'-0"	S17	"
61	#5	39'-6"	S18	"
300	#5	38'-0"	S19	"
46	#5	28'-9"	S20	Bott. Slab
55	#9	38'-0"	S21	"
110	#5	22'-6"	S22	"
55	#11	55'-3"	S23	"
46	#7	42'-9"	S24	"
8	#11	47'-9"	S25	"
8	#9	28'-9"	S26	"
55	#11	52'-0"	S27	"
46	#7	39'-3"	S28	"
8	#11	39'-3"	S29	"
226	#5	23'-3"	S30	"
226	#5	27'-6"	S31	"
24	#6	6'-0"	S32	"
126	#4	5'-0"	G4	Diaphrm.
12	#6	25'-6"	G5	"
1730	#6	6'-6"	G6	Webs
704	#5	6'-6"	G7	"
56	#8	47'-6"	G10	"
70	#5	38'-0"	G11	"
120	#5	7'-0"	G16	"
8	#5	4'-9"	R1	End Posts
4	#5	5'-6"	R2	"
4	#5	6'-3"	R3	"
4	#5	6'-9"	R4	"
4	#5	7'-0"	R5	"
8	#5	7'-3"	R6	"
192	#5	5'-3"	R7	Parapets
16	#5	7'-3"	R8	"
32	#5	9'-9"	R10	"
16	#5	28'-0"	R11	"
8	#5	39'-0"	R13	"
16	#5	26'-9"	R14	"
372	#5	3'-6"	C1	Curbs
36	#5	3'-0"	C2	"
8	#6	7'-9"	C3	"
8	#5	38'-3"	C5	"
8	#5	31'-9"	C8	"

NO.	SIZE	LENGTH	MARK	LOCATION
SUPERSTR. END BTS. 1&4 N.B.				
40	#6	54'-9"	H1	Beam
208	#5	12'-3"	U1	"
28	#6	14'-6"	H2	Wingwalls
10	#6	6'-9"	H3	"
10	#6	8'-6"	H4	"
8	#6	13'-6"	T1	"
24	#4	10'-6"	V6	"
16	#4	8'-0"	V7	"
SUPERSTR. INT. BTS. 2&3 N.B.				
32	#145	54'-0"	G1	Beam
34	#11	49'-6"	G2	"
16	#6	25'-6"	G3	"
236	#6	11'-6"	U2	"
90	#3	9'-6"	V1	Columns
24	#11	24'-6"	V2	"
16	#11	27'-0"	V3	"
SUPERSTR. END BTS. 1&4 S.B.				
40	#6	54'-9"	H1	Beam
208	#5	12'-3"	U1	"
28	#6	14'-6"	H2	Wingwalls
10	#6	6'-9"	H3	"
10	#6	8'-6"	H4	"
8	#6	13'-6"	T1	"
24	#4	10'-6"	V6	"
16	#4	8'-0"	V7	"
SUPERSTR. INT. BTS. 2&3 S.B.				
32	#145	54'-0"	G1	Beam
34	#11	49'-6"	G2	"
16	#6	25'-6"	G3	"
236	#6	11'-6"	U2	"
114 (12)	#3	9'-6"	V1	Columns
16	#10	30'-0"	V4	"
16	#10	36'-9"	V5	"
SUBSTR. INT. BTS. 2&3 N.B.				
40	#5	2'-9"	D1	Footings
24	#5	7'-0"	D2	"
24	#9	8'-6"	D3	"
8	#9	16'-0"	D4	"
SUBSTR. INT. BTS. 2&3 S.B.				
32	#5	2'-9"	D1	Footings
24 (12)	#5	7'-0"	D2	"
8	#6	8'-6"		
8 (4)	#9	16'-0"	D4	"

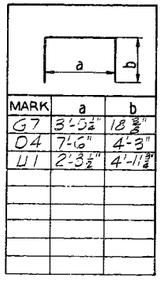
BENDING SKETCHES & CUTTING DIAGRAMS



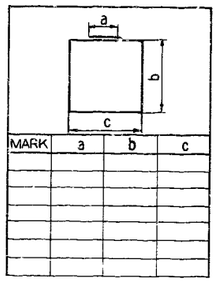
*BEND AS SHOWN

CUTTING SCHEDULE

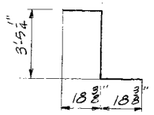
REMARKS	a	b	c	d
7H2 Cut 56	11"	4'-6"	10'-0"	14'-6"
6V6 Cut 48	12"	2'-9"	7'-9"	10'-6"



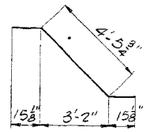
MARK	a	b
G7	3'-5½"	18⅝"
D4	7'-6"	4'-3"
U1	2'-3½"	4'-11⅜"



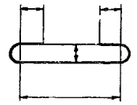
MARK	a	b	c

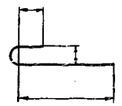


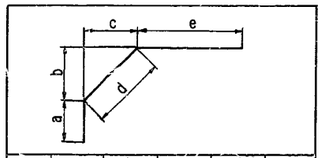
G6



G16



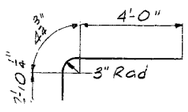




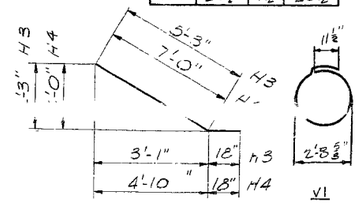
MARK	a	b	c	d	e
T1	20"	6'-0"	6'-2"	8'-7½"	3'-2½"

MARK	a	b	c
R2	2'-1"	7½"	22"
R3	2'-5½"	7½"	2'-2½"
R4	2'-8½"	7½"	2'-5½"
R5	2'-10"	7½"	2'-7"
R6	2'-11½"	7½"	2'-8½"
R7	2'-3½"	7½"	2'-0½"

C1

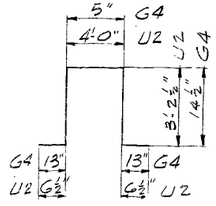


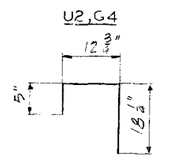
S8



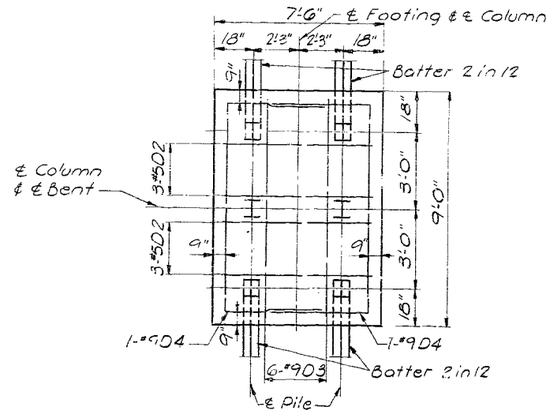
H3 H4

V1





C2



FOOTING PLAN

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE. I-435) **STA.** 671+83.24 (N.BD. LANES)
671+98.12 (S.BD. LANES)

JACKSON COUNTY

A-1640

399

No. 904	Revised
Aug. 1963	Dec. 1964

DETAILED JULY 1966 BY MURPH

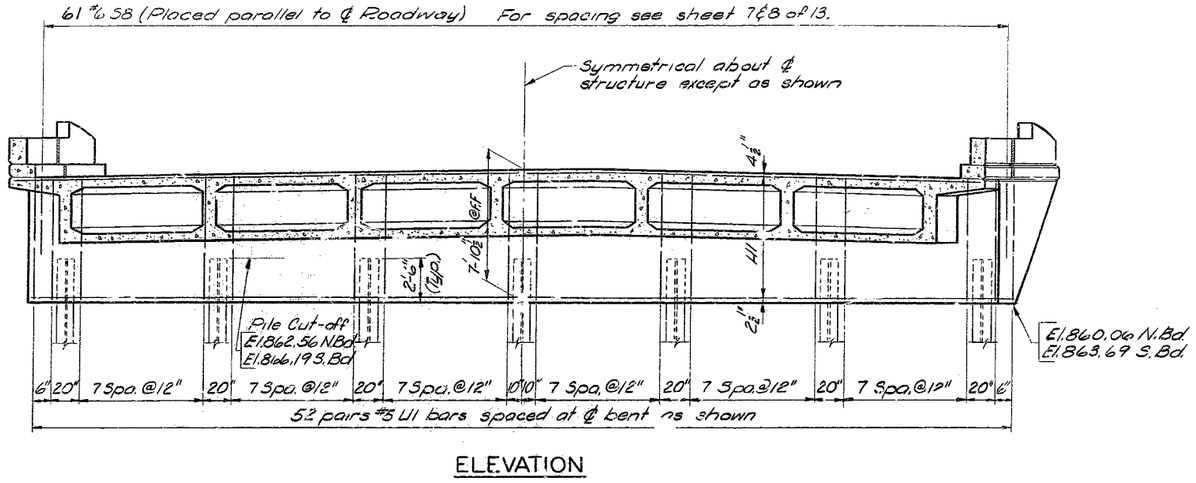
CHECKED JULY 1966 BY MISSLER

R. W. LOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

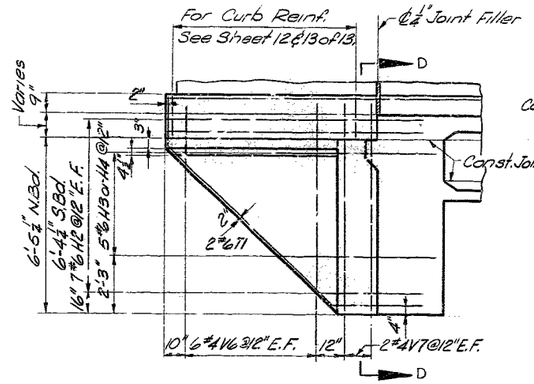
Note: This drawing is not to scale. Follow dimensions.

MISSOURI STATE HIGHWAY DEPARTMENT

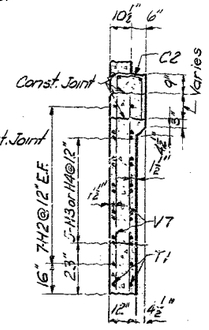
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	111	



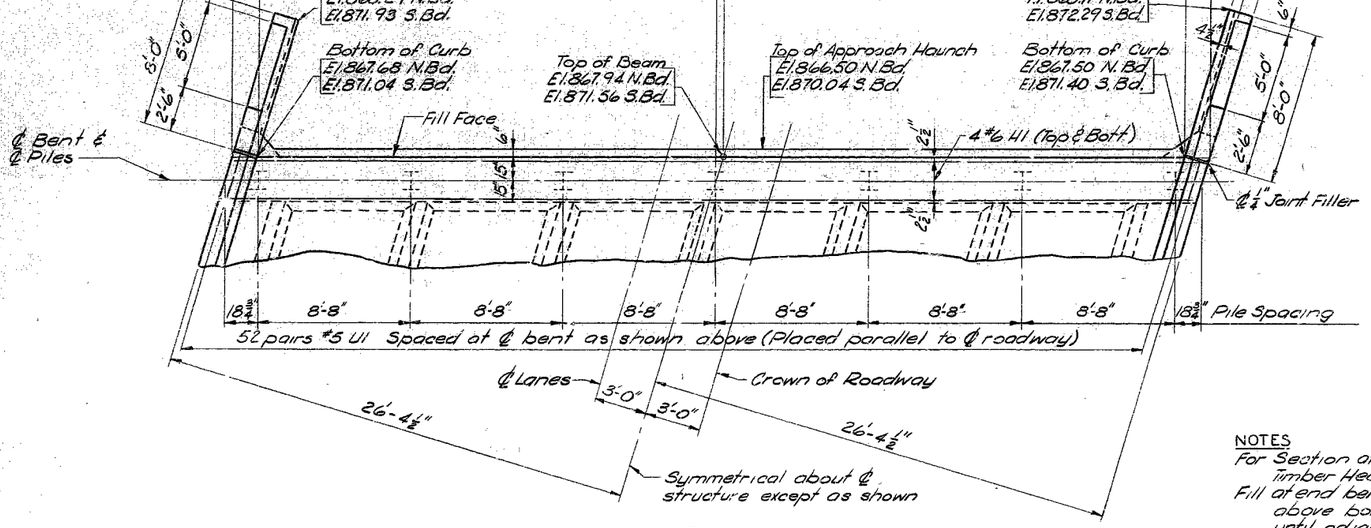
ELEVATION



SECTION B-B
(Section C-C opposite hand)

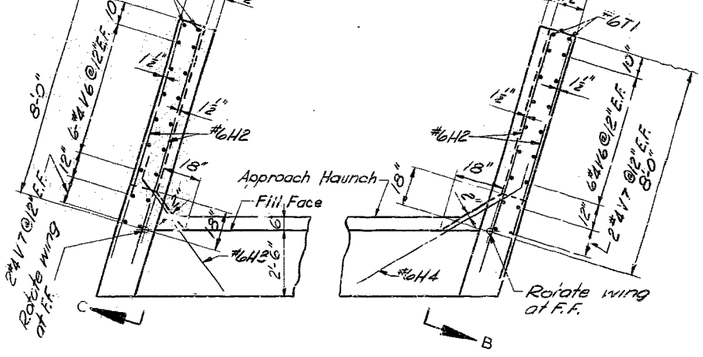


SECTION D-D



PLAN

END BENT 1 NORTHBOUND
END BENT 4 SOUTHBOUND



PLAN OF WINGWALLS

NOTES
For Section at ℄, Pile Splice Detail and Timber Header Detail see Sheet No 4 of 13.
Fill at end bents shall not be carried above bottom of beam and wings until adjacent superstructure span is in place.

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58) (RTE: I-435) **STA.** 671+83.24 (N.BD. LANES)
671+98.12 (S.BD. LANES)

JACKSON COUNTY

A-1640

400

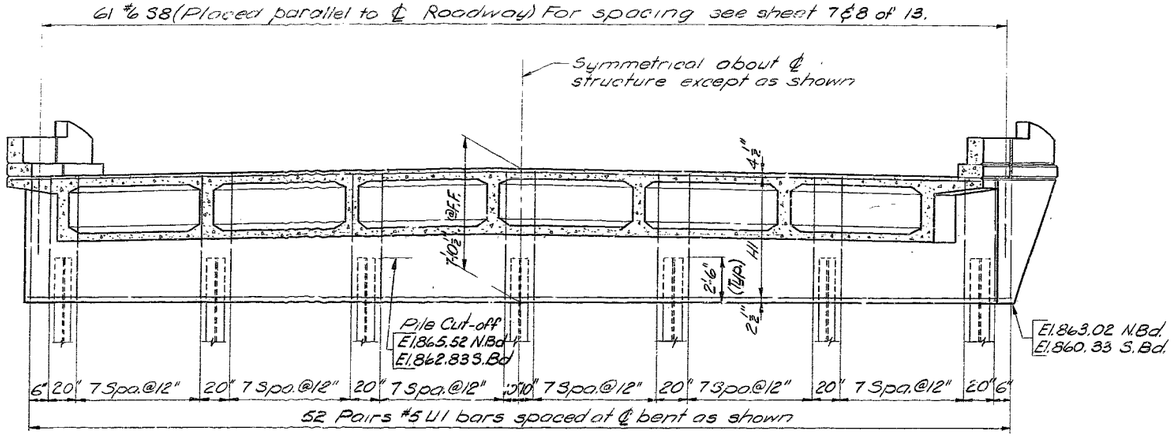
DETAILED JUNE 1966 BY HERD
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

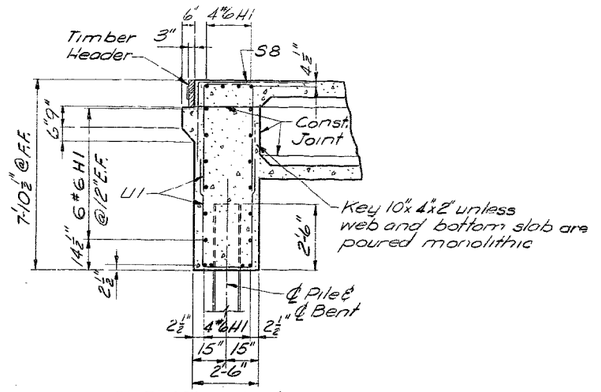
Note: This drawing is not to scale. Follow dimensions.

MISSOURI STATE HIGHWAY DEPARTMENT

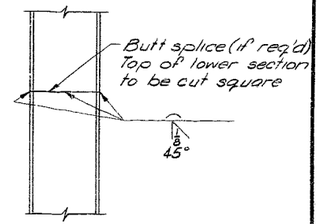
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	112	



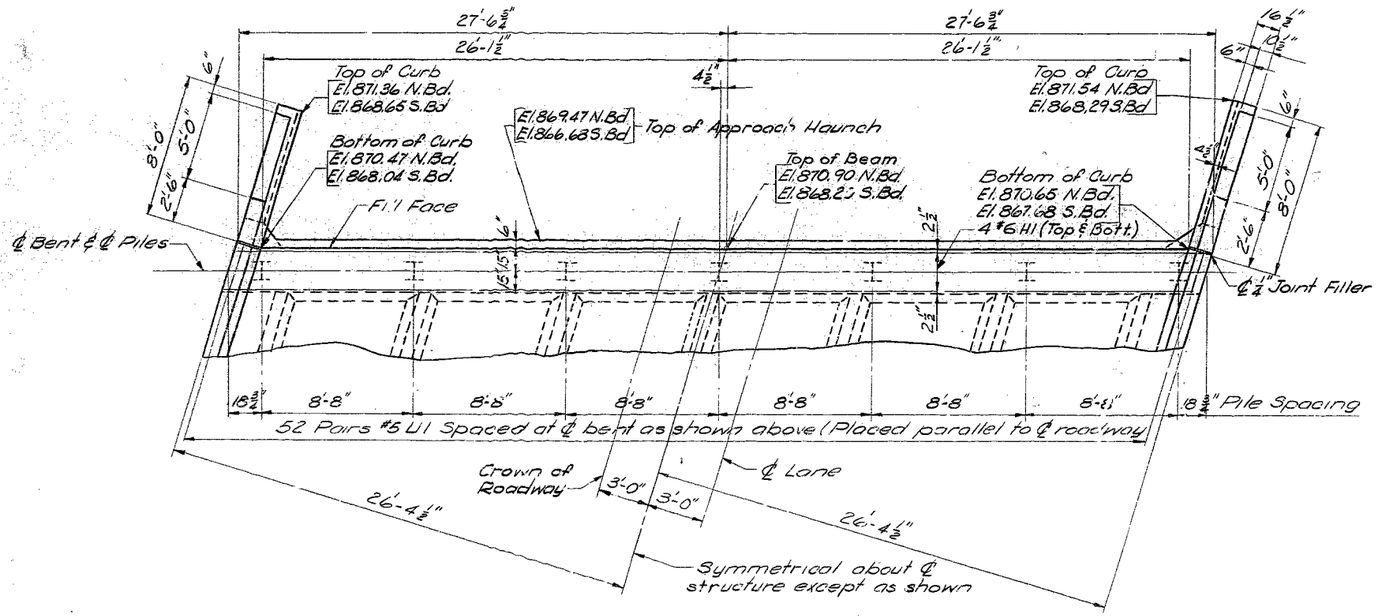
ELEVATION



SECTION AT ℄

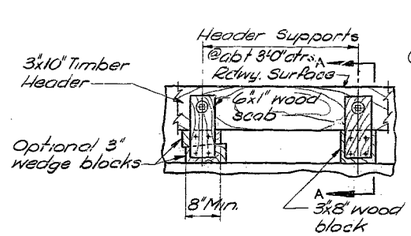


STEEL PILE SPLICE

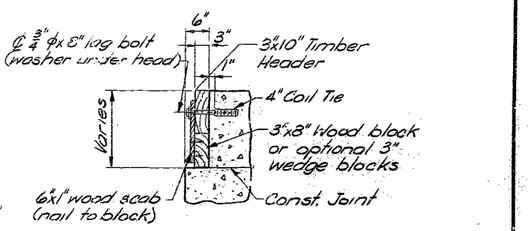


PLAN

END BENT 1 SOUTH BOUND
END BENT 4 NORTH BOUND



PART ELEVATION



SECTION A-A

TIMBER HEADER DETAIL

NOTES:
For details and reinforcement in wings see Sheet No. 3 of 13.
Fill at end bents shall not be carried above bottom of beam and wings until adjacent superstructure span is in place.
Cost of timber headers complete in place to be included in price bid for concrete.

401

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE-I-435) **STA.** 671+83.24 (N.BD. LANES) 671+98.12 (S.BD. LANES)

JACKSON COUNTY

A-1640

DETAILED MAY 1966 BY HERD
CHECKED JUNE 1966 BY R. PARIKH

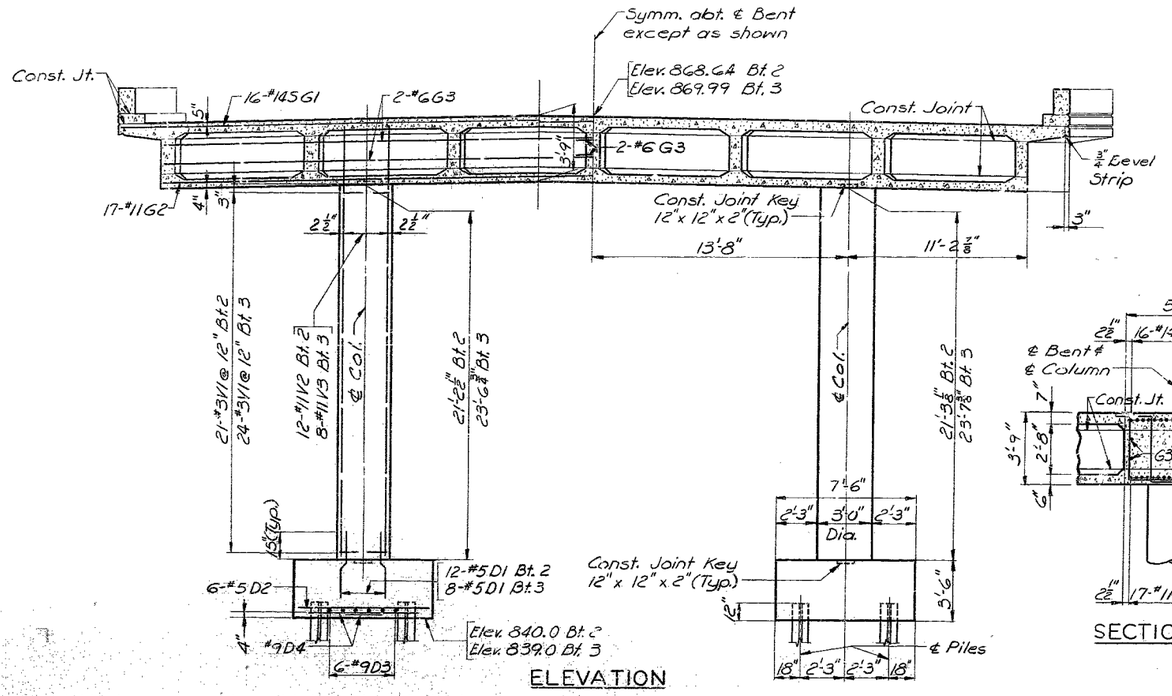
R. W. BOCKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

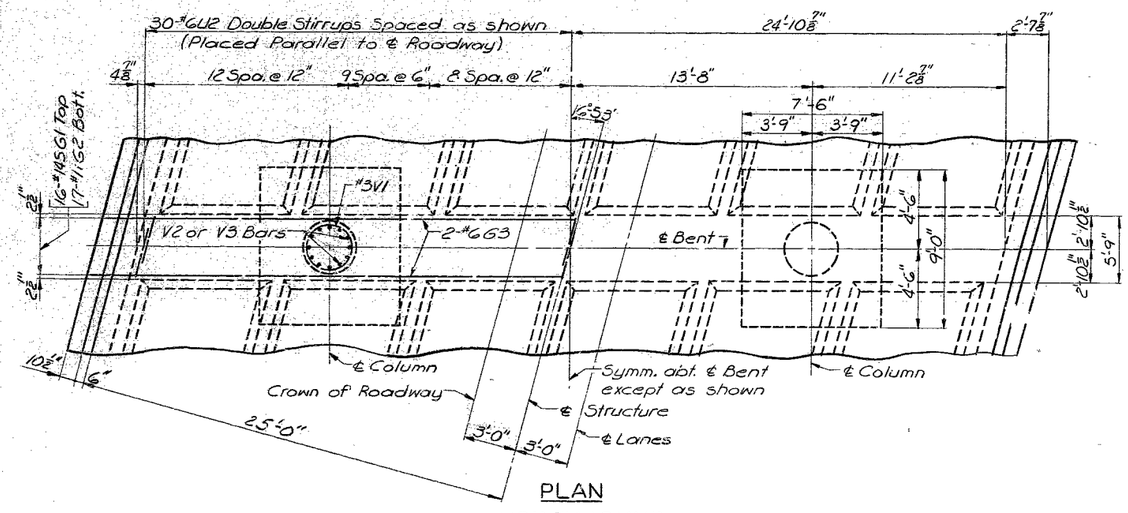
Note: This drawing is not to scale. Follow dimensions.

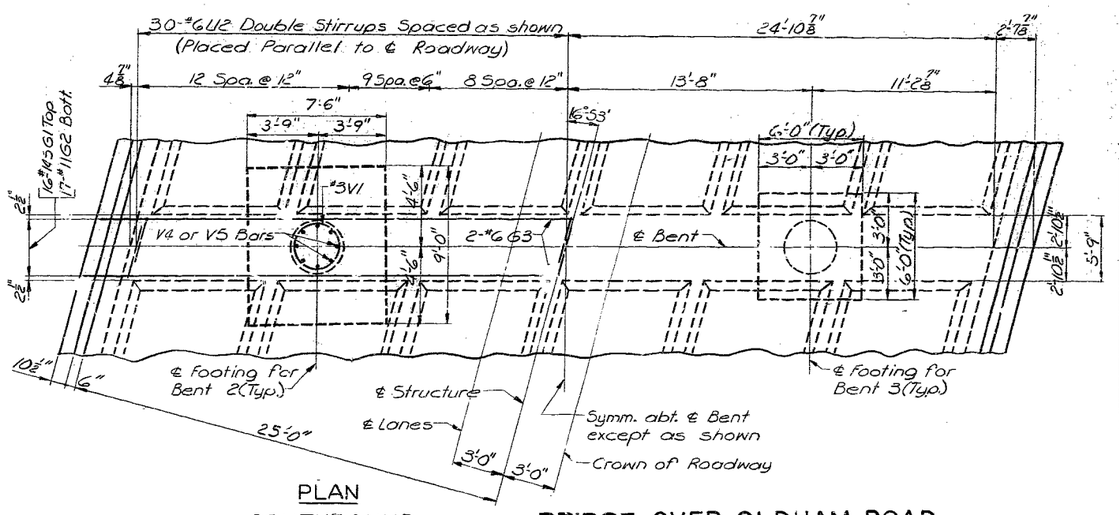
Sheet No. 4 of 13.

MISSOURI STATE HIGHWAY DEPARTMENT

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







NOTE:
For footing reinforcement see sheet No. 2 of 13.

INT. BENTS NO. 2 & 3

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE. I-435) **STA.** 671+83.24 (N.BD. LANES)
671+98.12 (S.BD. LANES)

JACKSON **COUNTY**

A-1640

DETAILED MAY 1966 BY HOHLT & SHANK
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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

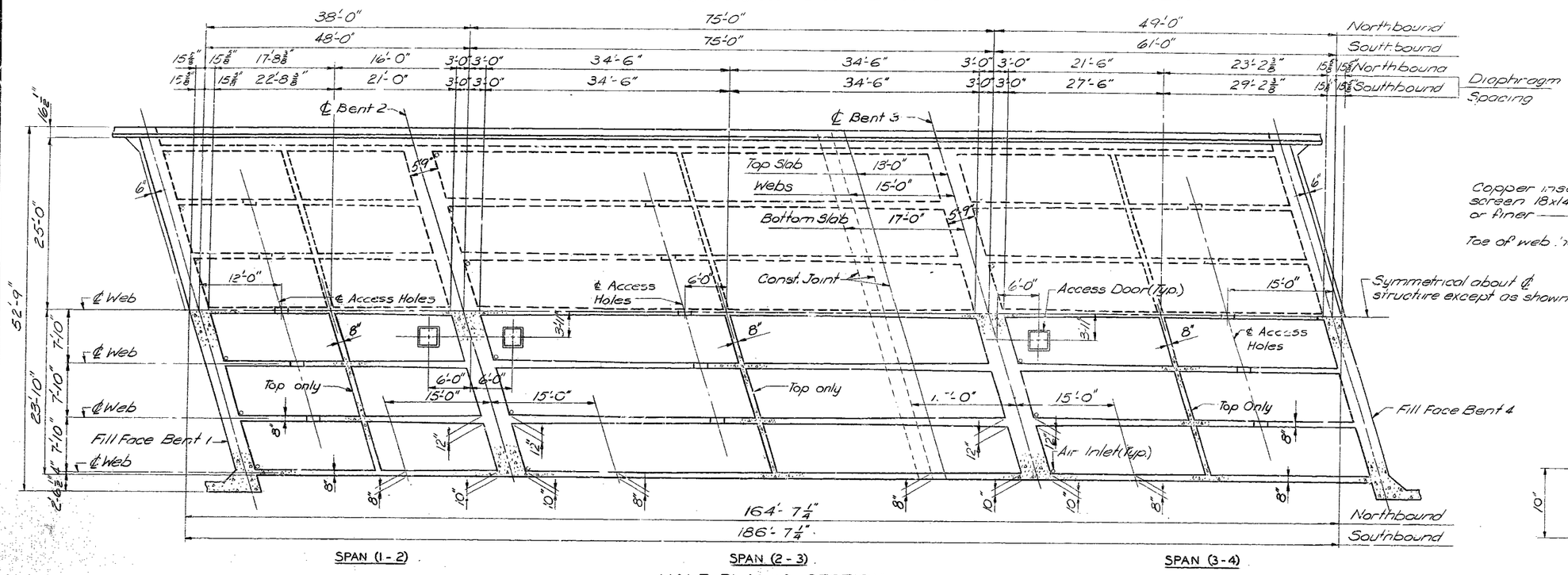
Sheet No. 5 of 13.

SEE FINAL PLANS BROWN-LINES

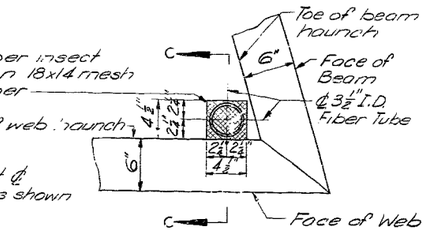
402

MISSOURI STATE HIGHWAY DEPARTMENT

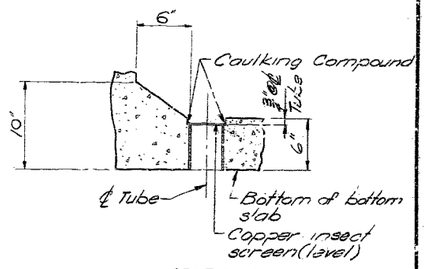
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	114	



HALF PLAN & SECTION

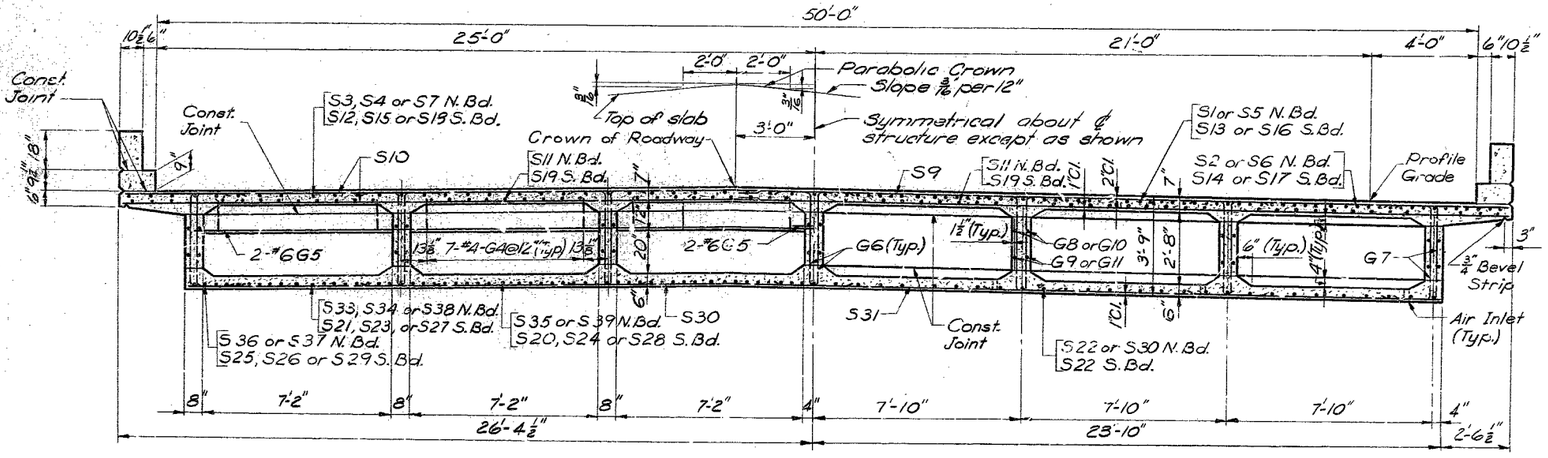


PLAN



SECTION C-C

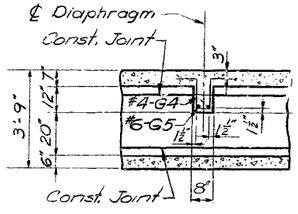
AIR INLET DETAIL



HALF SECTION NEAR DIAPHRAGM

HALF SECTION NEAR INT. BENT

Northbound Lanes shown
Southbound Lanes opposite hand



SECTION A-A

NOTES:

For Access Door Details & Access Holes in web, see sheet No. 11 of 13.
Payment for furnishing and placing fiber tube, copper screen and caulking compound shall be included in price bid for other items of work.

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)&TE-I-435) **STA.** 671+83.24 (N.BD. LANES)
671+98.12 (S.BD. LANES)

JACKSON **COUNTY**

A-1640

403

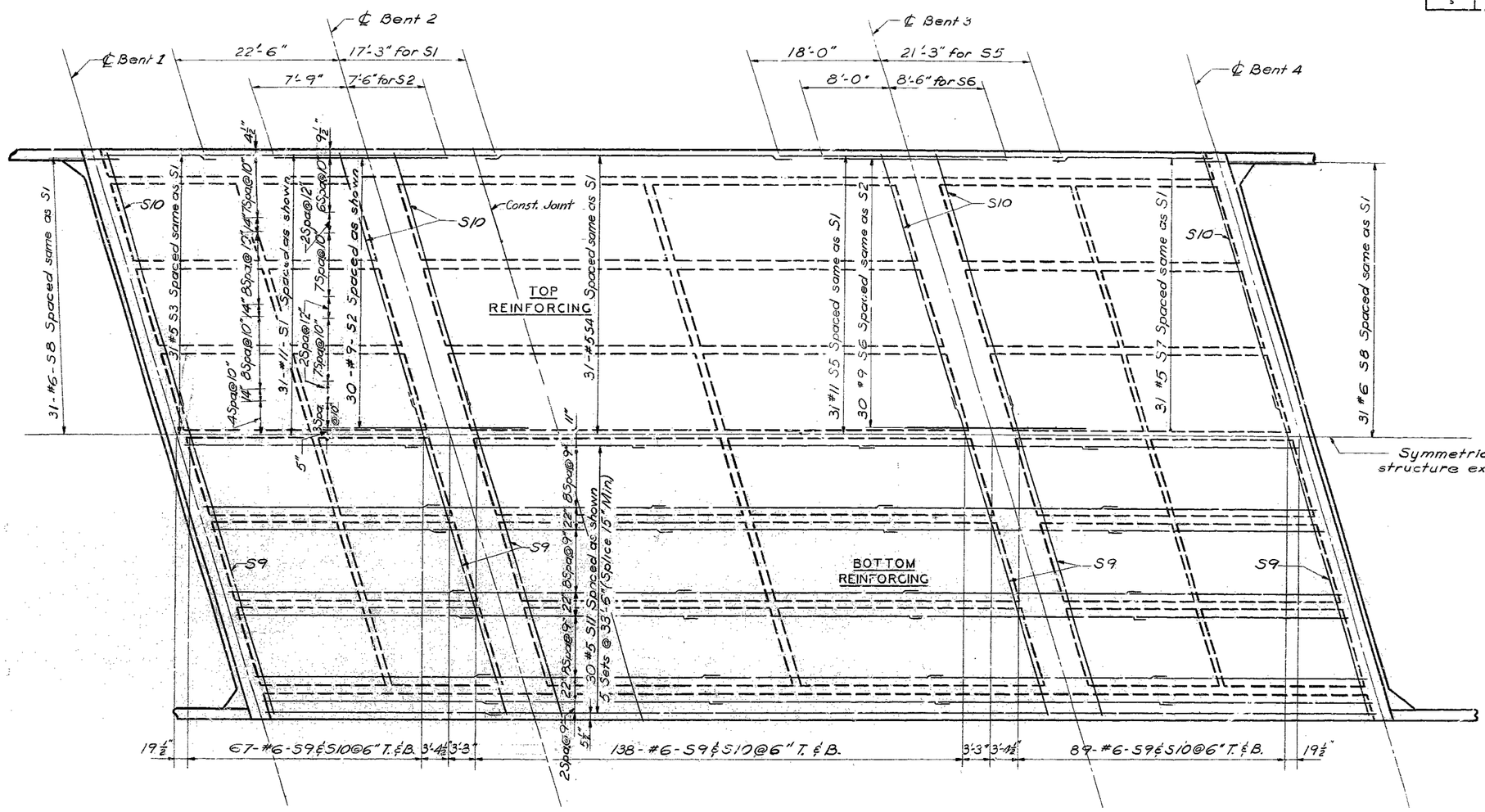
DETAILED MAY 1966 BY HERO
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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	115	



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

TOP SLAB PLAN
NORTHBOUND LANES

404

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE-I-435) **STA.** 671+83.24 (N.BD. LANES) 671+98.12 (S.BD. LANES)

JACKSON **COUNTY**

A-1640

DETAILED JUNE 1966 BY TURPIN

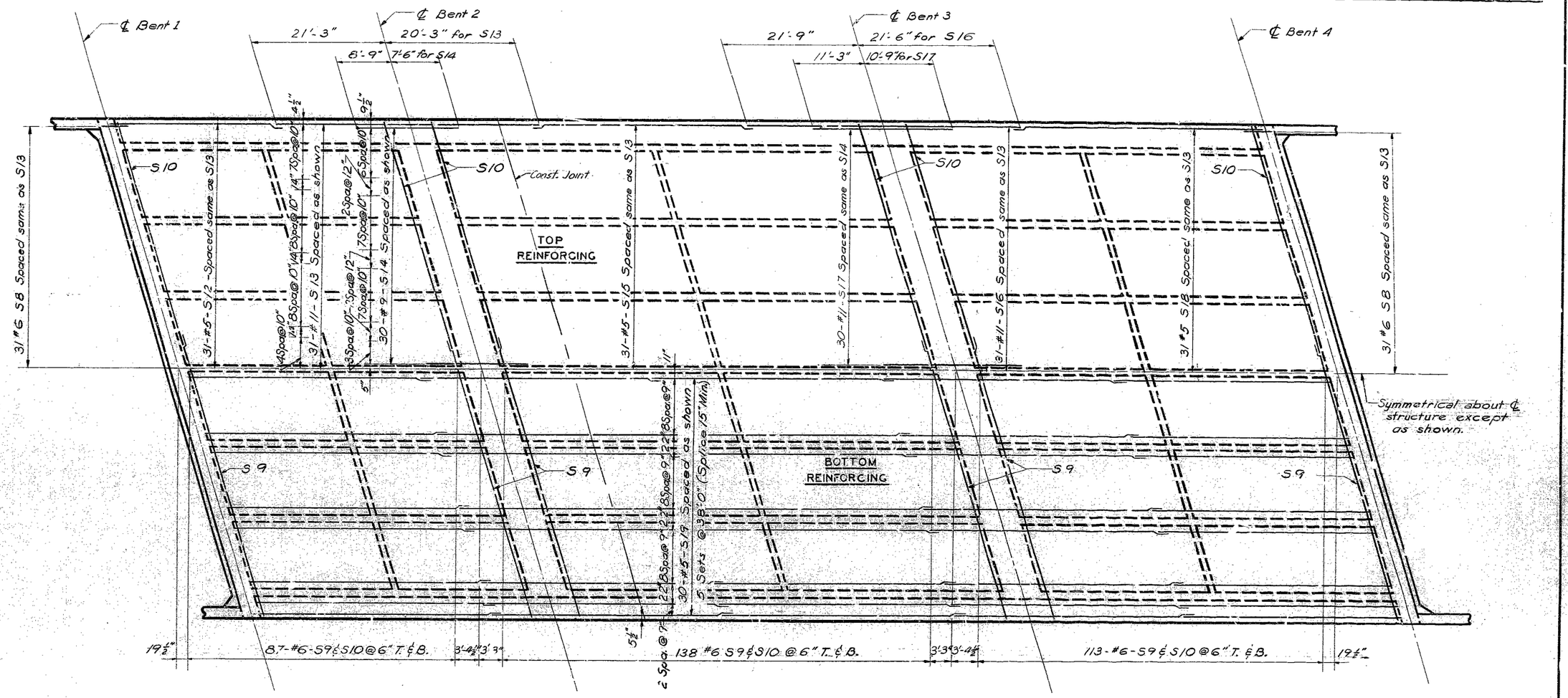
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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	116	



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

TOP SLAB PLAN
SOUTHBOUND LANES

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58) (RTE: I-435) **STA.** 671+83.24 (N.BD. LANES) 671+98.12 (S.BD. LANES)

JACKSON **COUNTY**

A-1640

DETAILED JUNE 1966 BY TURPIN

CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

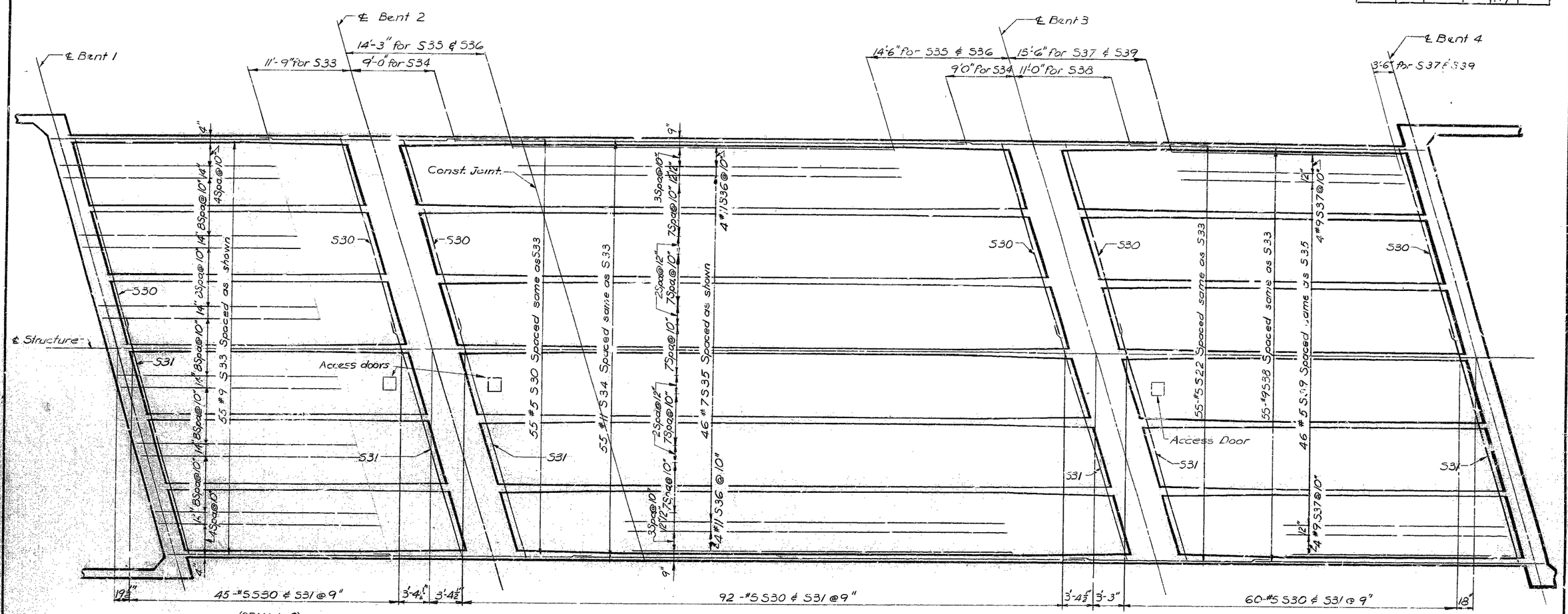
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 8 of 13.

405

MISSOURI STATE HIGHWAY DEPARTMENT

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



BOTTOM SLAB PLAN
NORTH BOUND LANES

NOTES:
For reinforcing around Access Doors see sheet No. 10 of 13.
For Location of Access Doors & Section Through slab see sheet No. 6 of 13.
Bottom slab Reinforcing shall be cut in field to allow Access Door installation.

406

BRIDGE OVER OLDHAM ROAD
STATE ROAD INTERSTATE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(58)(RTE-I-435) **STA.** 671+83.24 (N.BD. LANES)
671+98.12 (S.BD. LANES)
JACKSON **COUNTY**

A-1640

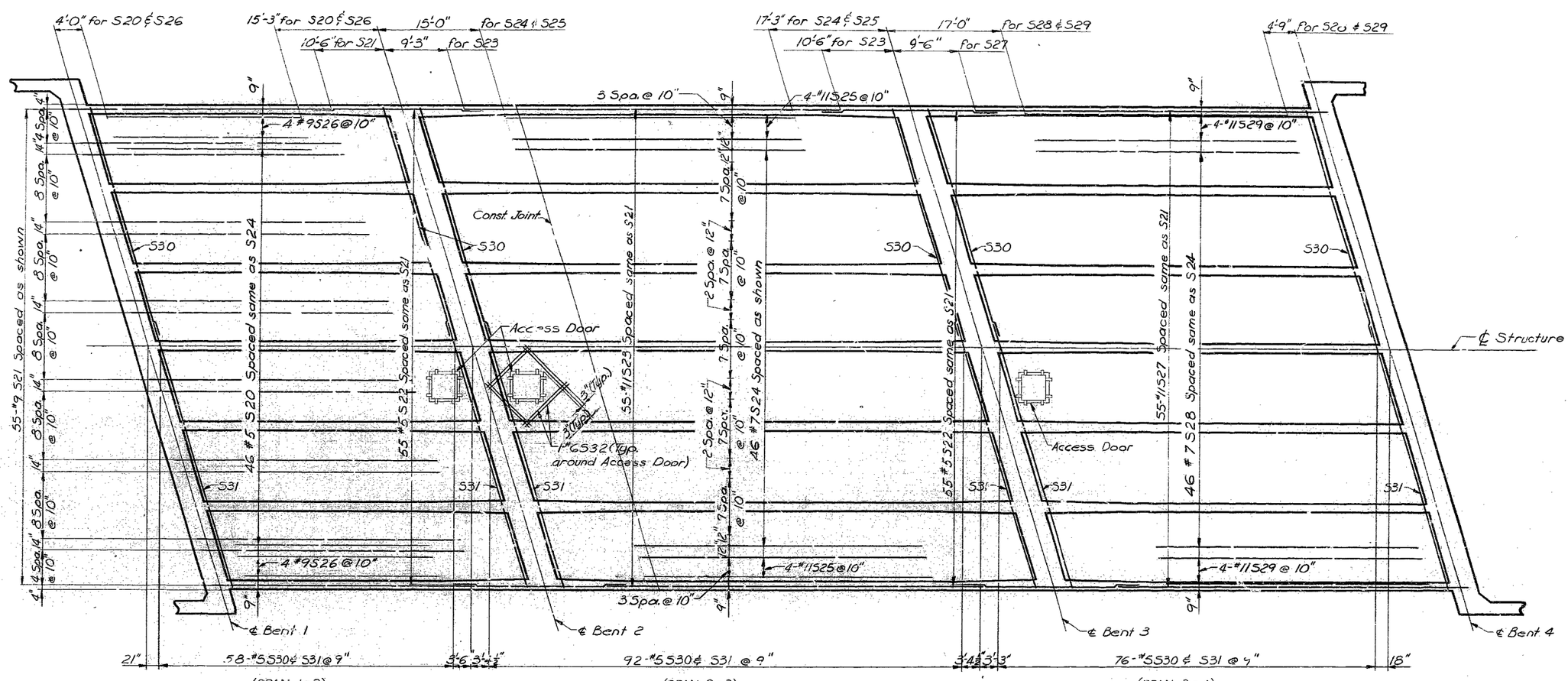
DETAILED JUNE 1966 BY DINESH MALI
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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	118	



BOTTOM SLAB PLAN
SOUTH BOUND LANES

NOTES:
Bottom slab reinforcing shall be cut in field to allow Access Door installation
For location of access doors & section through slab see sheet No. 6 of 13.

BRIDGE OVER OLDHAM ROAD
STATE ROAD INTERSTATE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(58)(RTE: I-435) **STA.** 671+83.24 (N.BD. LANES)
671+98.12 (S.BD. LANES)
JACKSON **COUNTY**

A-1640

DETAILED JUNE 1966 BY SHANK
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

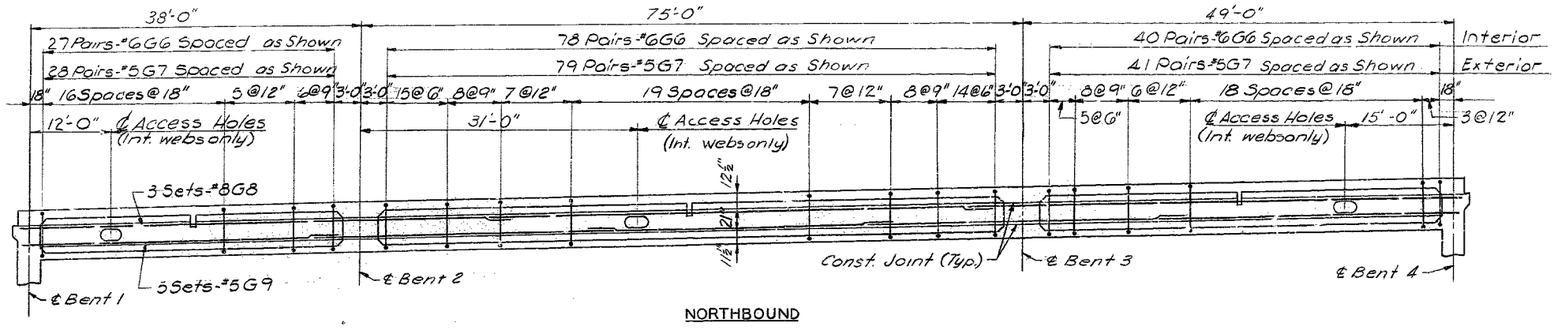
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 10 of 13.

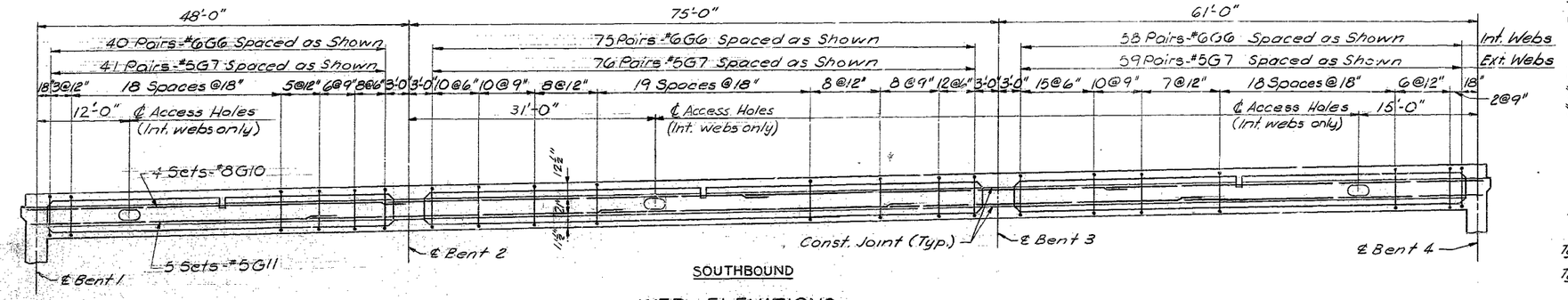
407

MISSOURI STATE HIGHWAY DEPARTMENT

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

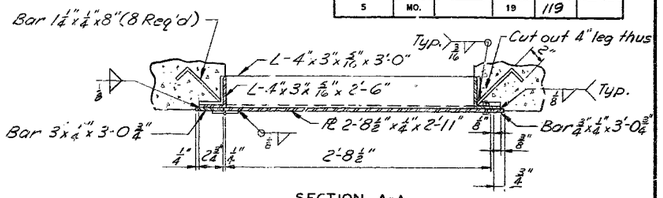


NORTHBOUND

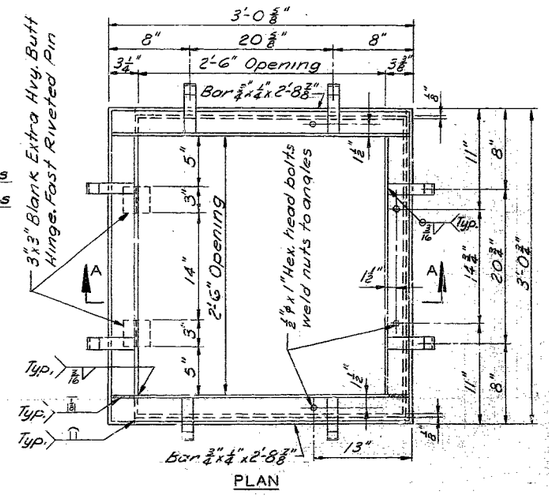


SOUTHBOUND

WEB ELEVATIONS



SECTION A-A



PLAN

ACCESS DOOR DETAILS

NOTES:

Numbers in circles indicate the basic pouring sequence. Longitudinal joints in roadway slabs, unless specifically on plans, will not be permitted.

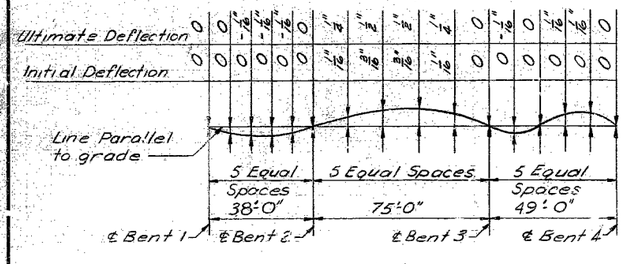
The contractor shall use an approved oscillating screed type, self-propelled mechanical finishing machine and shall pour roadway slabs at a rate of not less than 26 cubic yards per hour. He shall observe the basic pouring sequence unless he can demonstrate to the engineer that he can pour and satisfactorily finish the superstructure concrete at a rate which will permit the combining of such of the basic pours as may be specifically designated by the engineer as being compatible with design. Finishing machine loads will not be permitted on concrete less than 48 hours old.

With use of forms and basic falsework meeting the approval of the engineer, the girder webs and diaphragms may be poured with the bottom slab sections on which they bear.

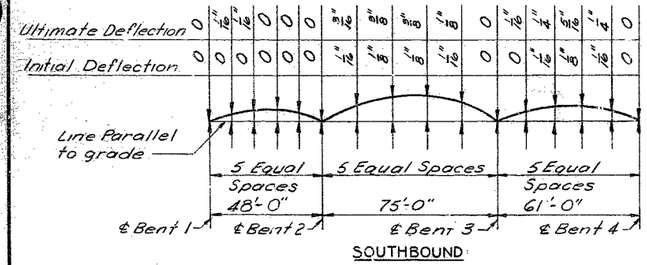
All forms shall be removed from the interior of box girders except top slab forms which may be left in place.

Omit one pair of G6 bars at access holes.

Access doors to be assembled and in place while slab is being poured. Bottom surface of door to be flush with bottom slab. For location of access door see sheet No. 6 of 13

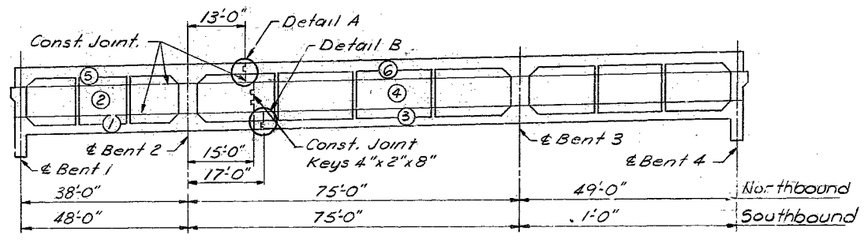


NORTHBOUND

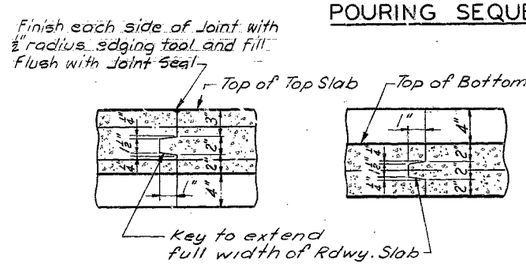


SOUTHBOUND

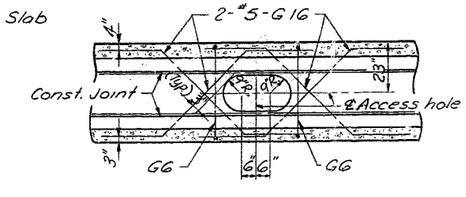
CAMBER DIAGRAMS



POURING SEQUENCE



DETAIL "A" DETAIL "B"



ACCESS HOLE IN WEB

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE: I-435) **STA.** 671+83.24 (N.BD. LANES) 671+98.12 (S.BD. LANES)

JACKSON **COUNTY**

A-1640

408

DETAILED APR. 1966 BY YIEHLAND

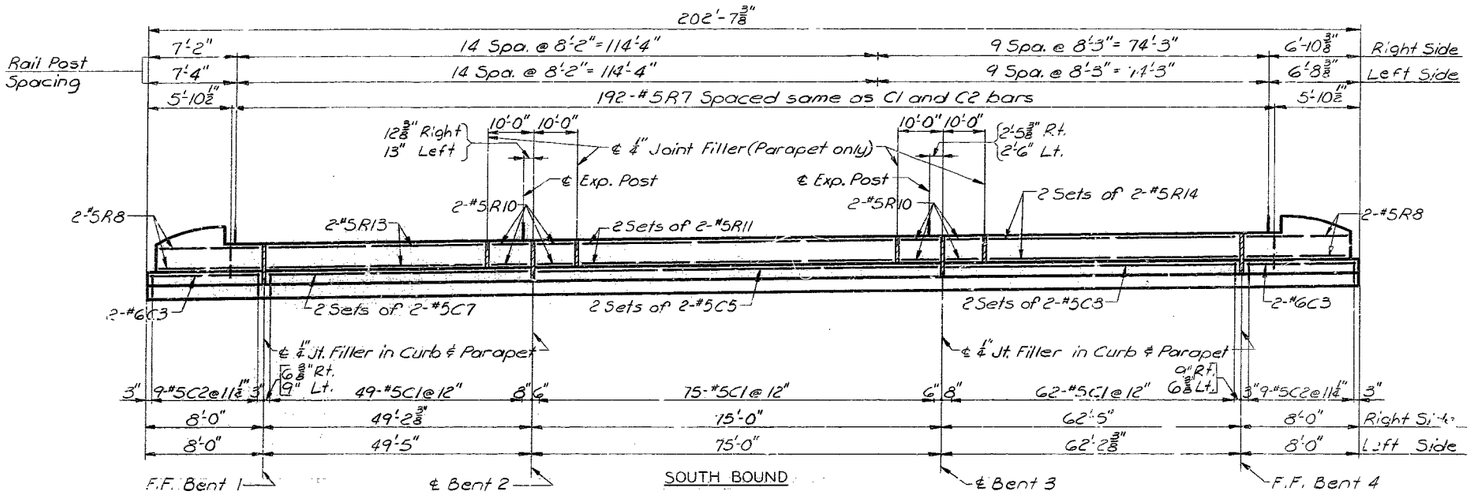
CHECKED JUNE 1966 BY PALICH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

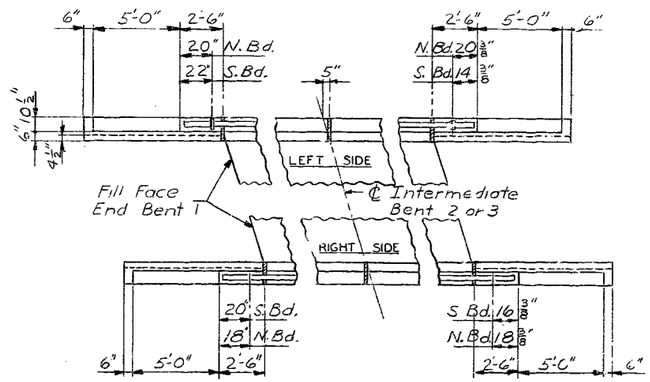
Note: This drawing is not to scale. Follow dimensions.

MISSOURI STATE HIGHWAY DEPARTMENT

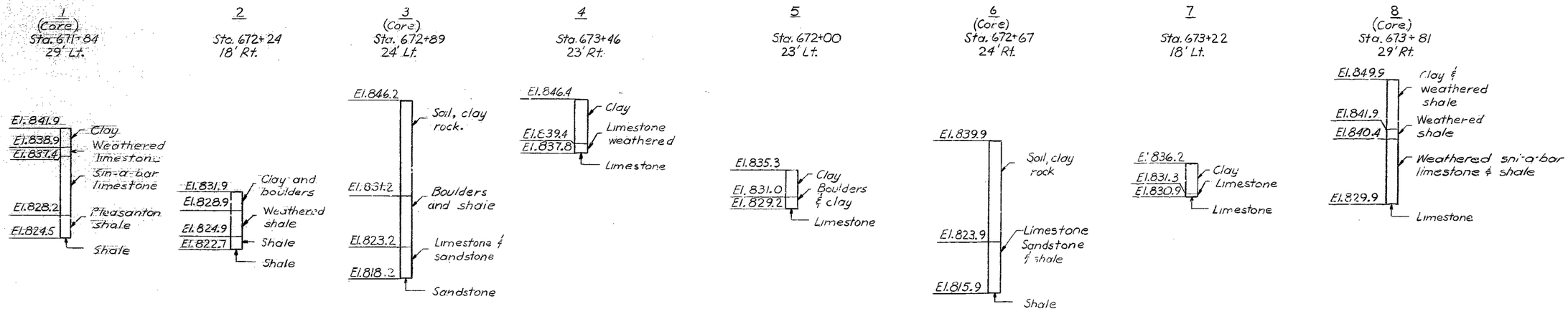
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	120	



CURB & PARAPET ELEVATION



PLAN OF END POSTS



BORING DATA

NOTES:
Core Drill Equipment: 2 1/8" Double Tube Core Bbl.
For Details of End Posts and Plastic Water Stops see Sheet No 13 of 13.

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE-I-435) **STA.** 671+83.24 (N.BD. LANES)
671+98.12 (S.BD. LANES)

JACKSON **COUNTY**

A-1640

409

DETAILED JUNE 1966 BY SHANK
CHECKED JULY 1966 BY MISSLER

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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	121	

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.

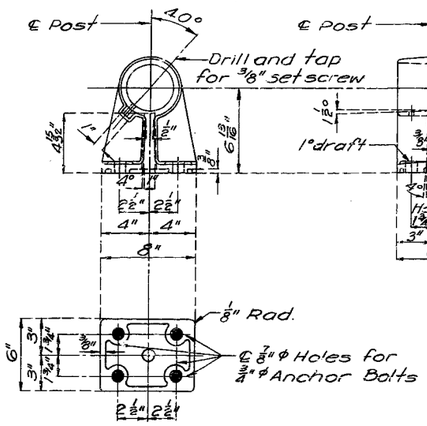
Top of curbs and parapets to be built parallel to grade with curb and parapet joints (except at end posts) normal to grade.

All exposed edges of end posts shall have ½" bevel. All exposed edges of curbs and parapets shall have ½" radius or ⅜" bevel.

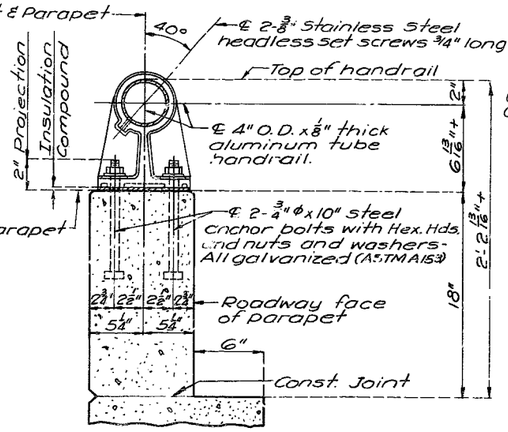
If the contractor desires, he may use drive fit cast aluminum end caps in lieu of welded aluminum closure plates.

Integrally cast test coupons and a coat of clear lacquer specified in Std. Spec. 56.2.4 and 56.3.5 respectively will not be required for these rail posts.

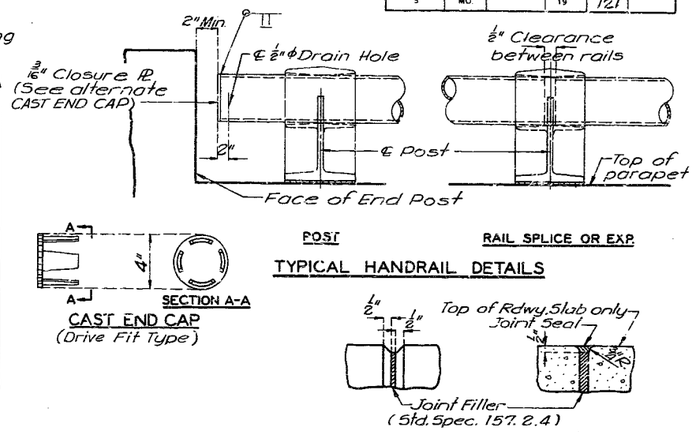
Concrete end posts to be vertical.



POST DETAILS

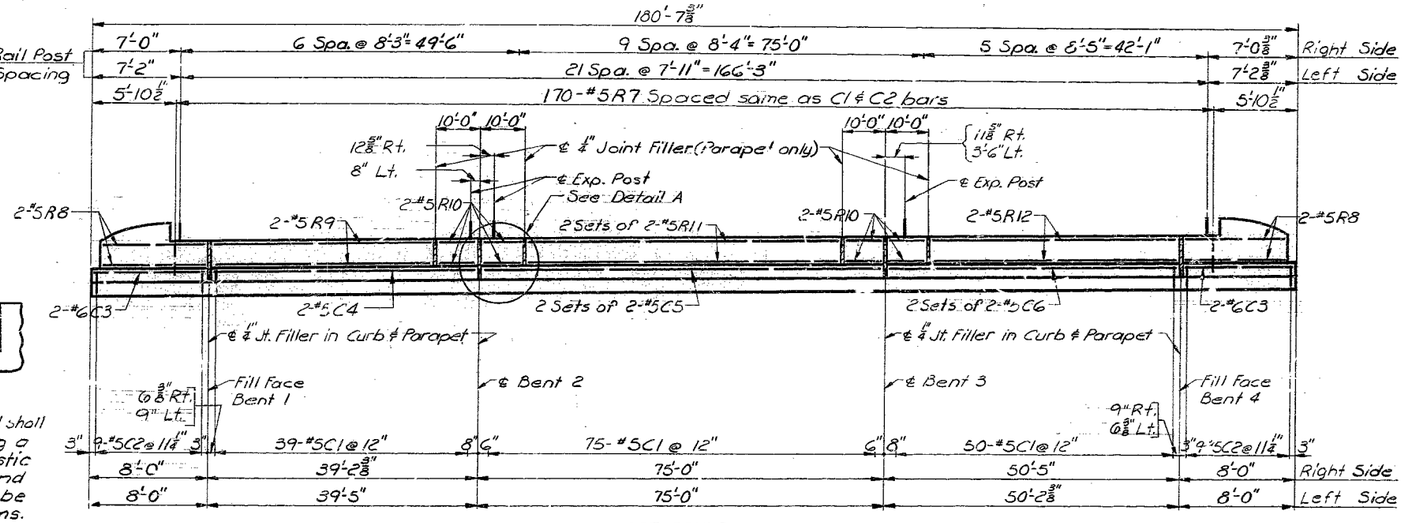


SECTION THRU HANDRAIL



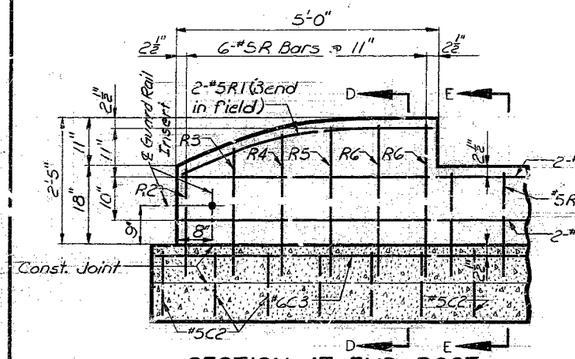
FILLED JOINT DETAILS

SINGLE TUBE ALUMINUM RAILING

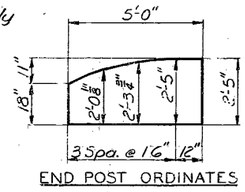


NORTHBOUND

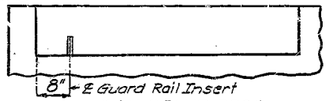
CURB & PARPET ELEVATION



SECTION AT END POST

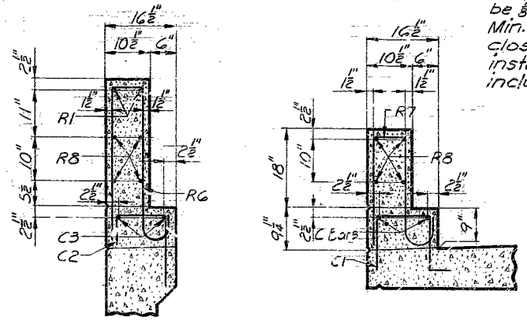


END POST ORDINATES



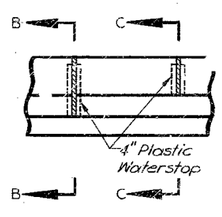
PLAN OF END POST

Note: Anchors for attaching guard rail shall be ⅝" threaded (Galv.) inserts having a Min. depth of 4" and filled with a plastic closing plug. cost for furnishing and installing the insert and plug will be included in price bid for other items.

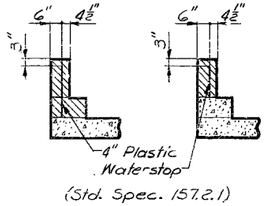


SECTION D-D

SECTION E-E



DETAIL A



SECTION B-B SECTION C-C

PLASTIC WATERSTOPS

NOTES:

For Plan of End Post, see Sheet No. 12 of 13.

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

Plastic waterstops shall be placed in all parapet and curb filled joints.

All longitudinal dimensions shown are along the outside face of parapet.

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58) **(RTE: I-435) STA.** 671+83.24 (N.BD. LANES) 671+98.12 (S.BD. LANES)

JACKSON COUNTY

A-1640

410

No.	Revised
15.2	Oct. 1965
Nov. 1965	

DETAILED MAY 1966 BY SHANK

CHECKED JULY 1966 BY MISSLER

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

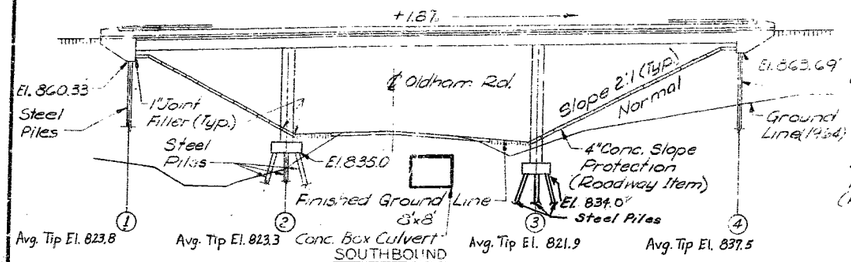
Note: This drawing is not to scale. Follow dimensions.

MISSOURI STATE HIGHWAY DEPARTMENT

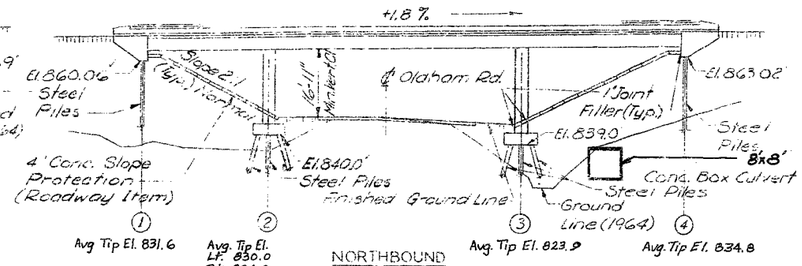
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	109	

FINAL PLANS

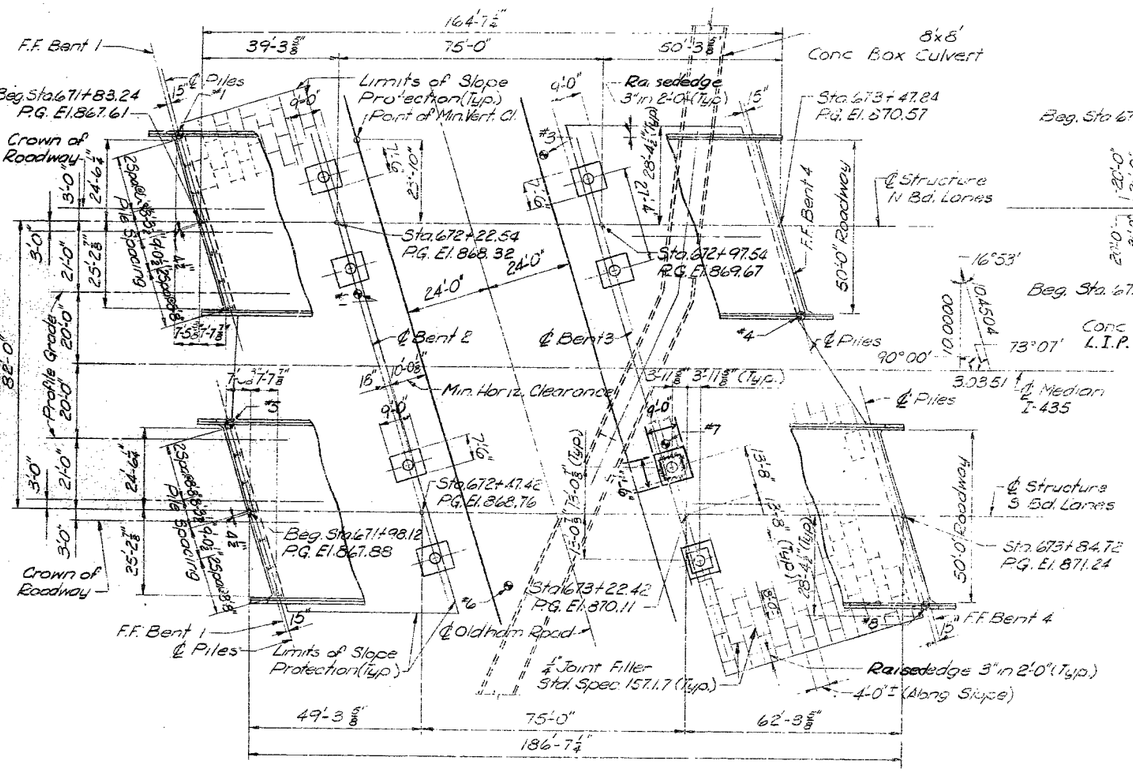
(48-75'-6") Cont Conc. Box Girder Spans
Skew 16°55' R.A.



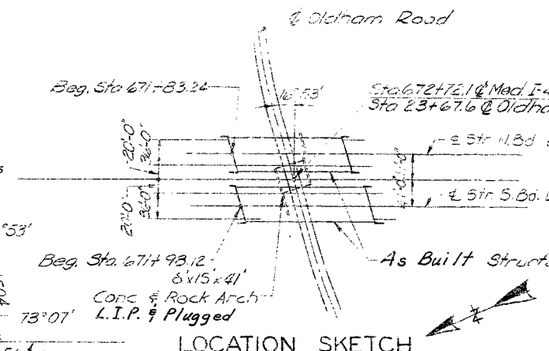
(38'-75'49") Cont. Conc. Box Girder Spans
Skew 16°53' R.A.



GENERAL ELEVATIONS



PLAN



LOCATION SKETCH

MISCELLANEOUS NOTES:

Compacted roadway fill (full roadway width) was placed up to elevation of bottom of concrete beam in front of and not less than 25'-0" in back of End Bents before steel piles were driven.

For Boring Data see Sheet No. 12 of 13.

● Indicates location of borings.

A minimum vertical clearance of 13'-6" from crown of existing lanes and a minimum lateral clearance of 28'-0" centered on existing lanes was maintained during construction.

GENERAL NOTES:

DESIGN SPECIFICATIONS: A.A.S.H.O.-1961

DESIGN LOADING:
H S 20-44; 15#/sq. ft. Future Wearing Surface; Modified 24,000# Tandem Axle; Earth 120#; Equivalent Fluid Pressure 30#.

DESIGN UNIT STRESSES:
Class B Concrete (substructure) fc = 1,200 p.s.i.
Class B1 Concrete (superstructure) fc = 1,600 p.s.i.
Reinforcing Steel fs = 20,000 p.s.i.
Structural Steel (A.S.T.M. A36-63T) fs = 20,000 p.s.i.
Steel Pile (A.S.T.M. A36-63T) fb = 1,000 p.s.i.

SURFACE SEAL: Superstructure deck was surface sealed.

PAINTING:
Structural Steel access doors were cleaned and galvanized.

In lieu of painting, the contractor preferred to galvanize this material. All galvanizing was done after fabrication. Cost of galvanizing was included in price bid for other items.

PILE AND FOOTING DATA

	BENT NO.		1		2		3		4	
	LANES		N Bd	S. Bd.	N Bd	S. Bd.	N Bd	S. Bd.	N Bd	S. Bd.
BEARING PILE	Pile Type and Size		10BP42	10BP42	12BP53	12BP53	12BP53	12BP53	10BP42	10BP42
	Number		7	7	6	6	12	12	7	7
	Approximate Length	Ft.	31	39	17	13	16	13	31	29
	Design Bearing	Tons	44	44	64	67	68	68	44	44
	Hammer Energy Required	Ft./lbs	9900	9900	15,100	15,800	16,000	16,000	9900	9900

PILE NOTES:

Minimum energy requirement of hammer based on plan length and design bearing value of piles. Increase by the factor (W+w)/2W when the weight of the ram (W) is less than the weight of the pile (w).

All pile were driven to practical refusal.

QUANTITIES

ITEM		Substr.	Superstr.	Total
Class 1 Excavation for Structures	Cu. Yds.	91.0	–	91.0
10" Steel Piles in place	Lin. Ft.	906	–	906
12" Steel Piles in place	Lin. Ft.	574	–	574
Class B Concrete	Cu. Yds.	70.0	–	70.0
Class B1 Concrete	Cu. Yds.	–	1262.9	1262.9
Reinforcing Steel	Lbs.	2810	481,680	484,490
Bridge Rail (Single Tube Type)	Lin. Ft.	–	721	721
CONTINGENT ITEMS				
Class 1 Excavation +25%	Cu. Yds.	13.0		13.0
Test Holes	Lin. Ft.	10		10
12" Steel Piles (Adjust Charge)	Lin. Ft.	91		91

QUANTITY NOTES:

No payment for excavation was allowed at End Bents 1 & 4. Payment for furnishing and installing access doors and frames was made and considered fully covered under price bid for other items.

All concrete and reinforcement above footings is included in superstructure quantities.

BENCH MARK: Elev. 868.03, P.K. Nail on Curb, N.E. Wingwall, Bt #1, Sta. 671+70 NBL

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE-I-435) **STA.** 671+83.24 (N.BD. LANES) 671+98.12 (S.BD. LANES)

JACKSON **COUNTY**

SUBMITTED

STATE OF MISSOURI — EUGENE L. FIELDHAMMER — NUMBER E-10795 — REGISTERED PROFESSIONAL ENGINEER

SUBMITTED BY _____ REGISTERED PROFESSIONAL ENGINEER
MISSOURI NO E-10795

SUBMITTED BY _____ BRIDGE ENGINEER DATE _____

APPROVED BY _____ CHIEF ENGINEER DATE _____

DESIGNED MAY 1966 BY YANG
DETAILED MAY 1966 BY HERD, VIEHLAND
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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

Sheet No. 1A of 2

FINAL PLANS

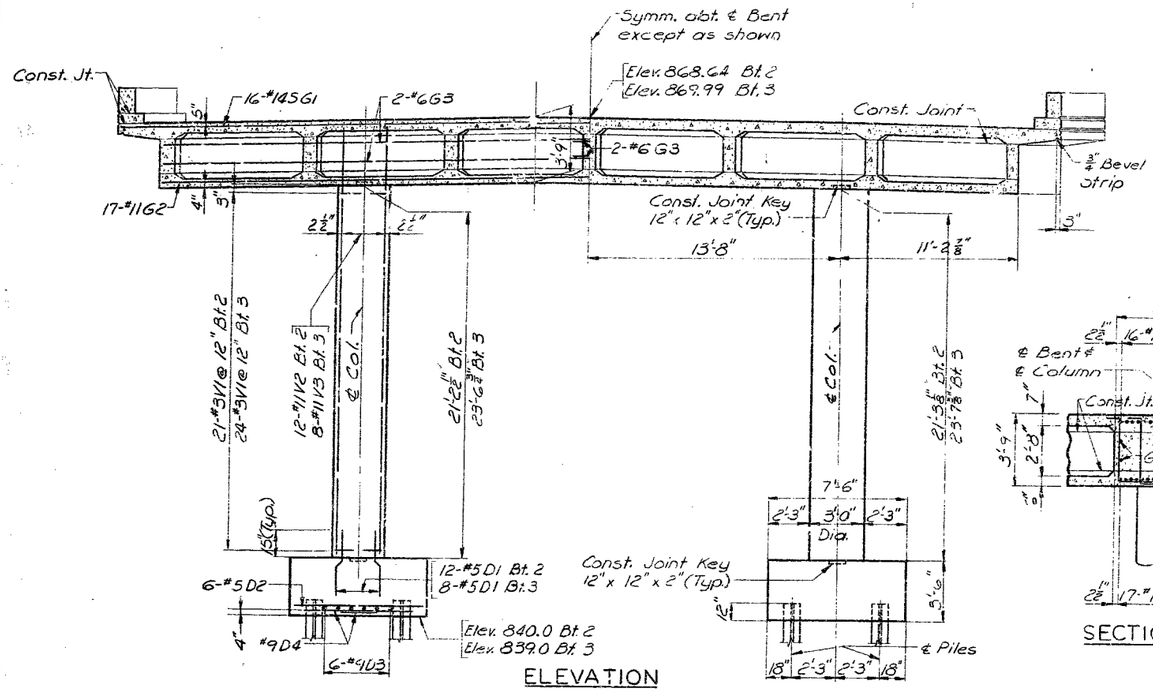
STD. 54.00

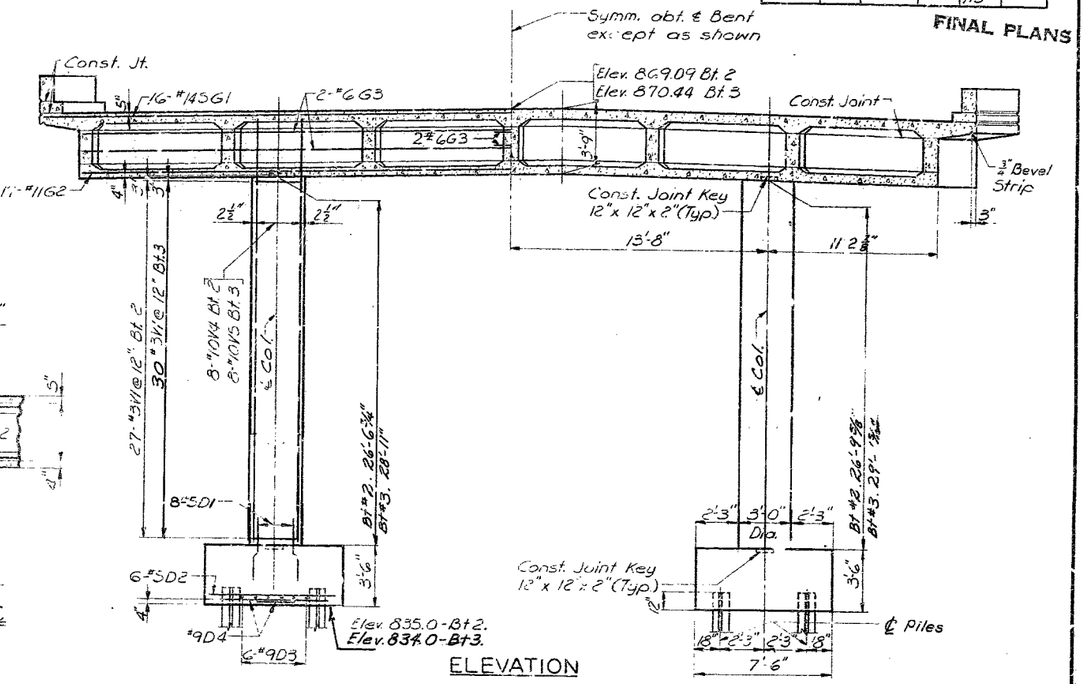
A-1640

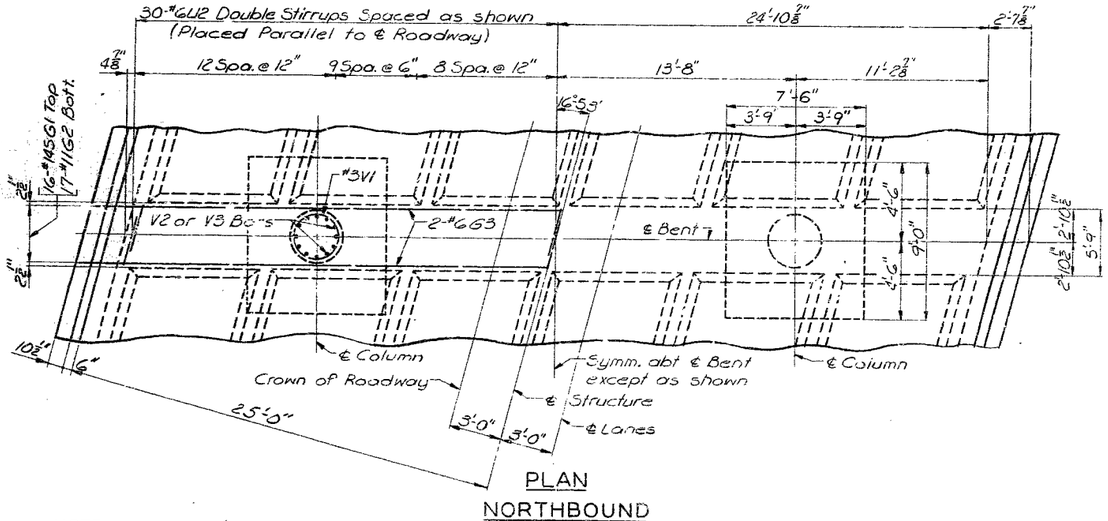
MISSOURI STATE HIGHWAY DEPARTMENT

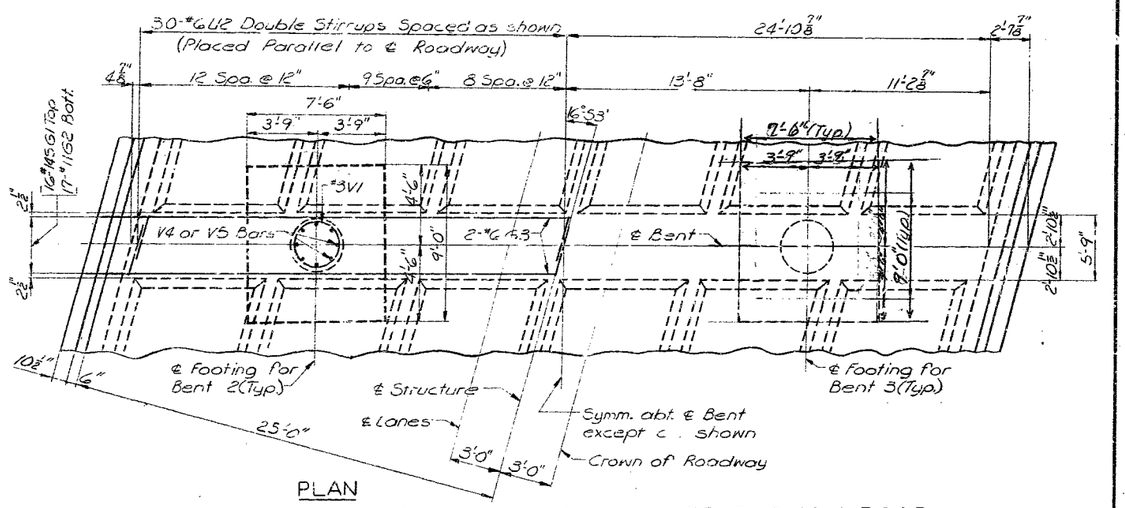
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.		19	113	

FINAL PLANS









NOTE:
For footing reinforcement see sheet No. 2 of 13.

INT. BENTS NO. 2 & 3

BRIDGE OVER OLDHAM ROAD

STATE ROAD INTERSTATE 435

IN KANSAS CITY

PROJECT NO. I-IG-435-1(58)(RTE-I-435) **STA.** 671+83.24 (N.BD.LANES)
671+98.12 (S.BD.LANES)

JACKSON **COUNTY**

DETAILED MAY 1966 BY HOHLT & SHANK
CHECKED JUNE 1966 BY R. PARIKH

R. W. BOOKER & ASSOCIATES, INC.
CONSULTING ENGINEERS
215 NORTH ELEVENTH ST.
ST. LOUIS 1, MISSOURI

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

Sheet No. 5A of 13 Sheets

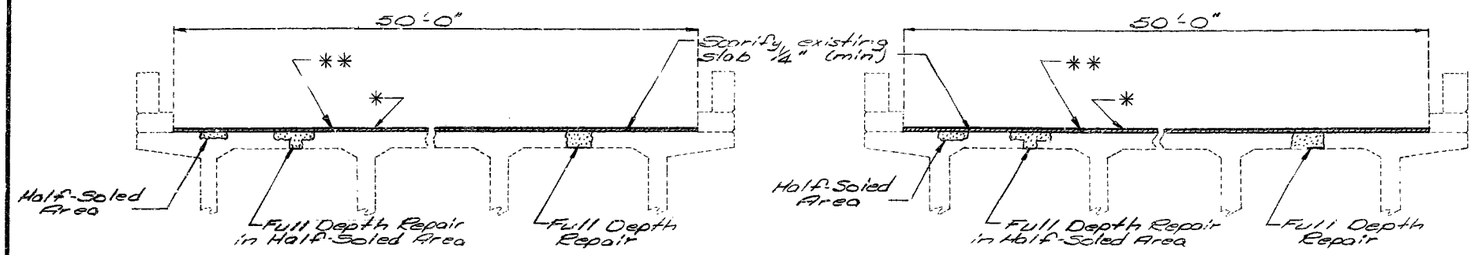
A-1640

FINAL PLANS

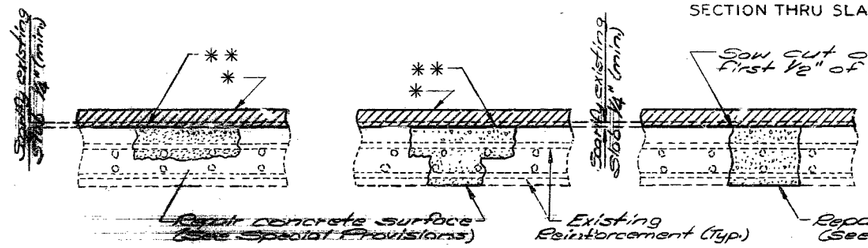
214

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ NO	SHEET NO.
MO.		19
SEC/SUR 13	TWP 48N RGE 33W	



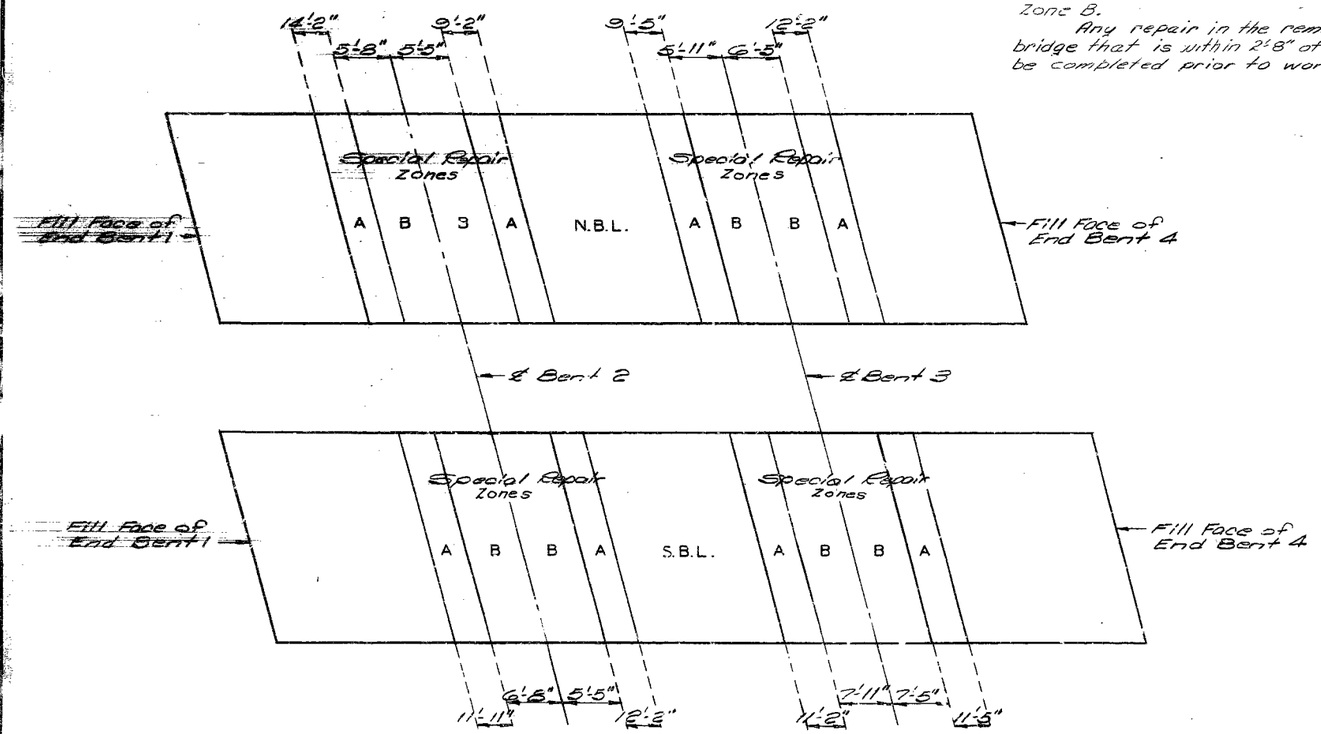
SECTION THRU SLAB



HALF-SOLED AREA | FULL DEPTH REPAIR IN HALF-SOLED AREA | FULL DEPTH REPAIR

Note: * Apply 1 3/4" Latex Modified or 2 1/4" Low Slump Concrete Overlay.
** Install Cathodic Protection System

Note: Zones with the same letter designation may be repaired at the same time. Zone A is to be completed before Zone B.
Any repair in the remainder of the bridge that is within 2'-8" of Zone A shall be completed prior to work in Zone A.



PLAN OF SLAB
SHOWING SPECIAL REPAIR ZONES

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

GENERAL NOTES:

Design Specifications: A.A.S.H.T.O. - 1983 and Interims thru 1986

Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.

Roadway surfacing adjacent to bridge ends to match Bridge Overlay. (Roadway Item)

Traffic over structure to be maintained during construction. See Sht. 2 for stage construction.

Reinforcing Steel (Grade 60) f_y = 60,000 p.s.i.
Reinforcing Steel: Minimum clearance to reinforcing steel shall be 1½" unless otherwise shown.
Class B1 Concrete f'_c = 4,000 psi
Joint Filler: All joint filler shall meet the requirement of Std. Spec. 1057.2.4.

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.

ESTIMATED QUANTITIES		
ITEM		TOTAL
REPAIRING CONCRETE DECK (HALF-SOLING)	SQ. FT.	6201
FULL DEPTH REPAIR	SQ. FT.	1054
SUPERSTRUCTURE REPAIR (UNFORMED) (SEE SPEC. PROV.)	SQ. FT.	25
CONCRETE WEARING SURFACE (SEE SPEC. PROV.)	SQ. YD.	1951
CATHODIC PROTECTION SYSTEM	LUMP SUM.	1
CLASS B1 CONCRETE	CU. YD.	6.6
REINFORCING STEEL	LBS.	830
SPECIAL WORK	LUMP SUM.	1

REPAIRS TO BRIDGE OVER OLDHAM ROAD

STATE ROAD FROM RTE 350 TO RTE 71
IN KANSAS CITY

PROJECT NO. IR-435-1(224)
JOB NO. 4-I 435 557 D
JACKSON

STA. 671+98.12 S.B.L.
671+83.24 N.B.L.
RTE. I--435
COUNTY

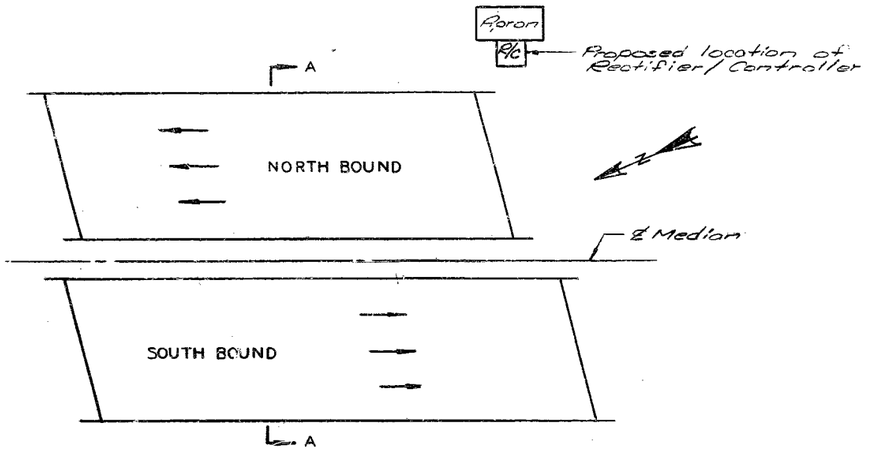
DATE 1/15/88

DESIGNED DEC. 1987
DETAILED JAN. 1988
CHECKED Feb 1988

STD.
STD.
A-1640 R

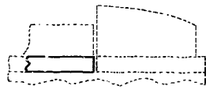
SHT 425

STATE	PROJ. NO	SHEET NO.
MO		20

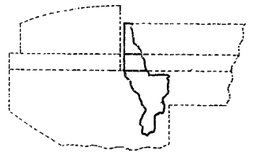


PLAN

DETAIL OF OUTSIDE FACE OF SOUTHEAST WING & CURB AT END BENT, NO 4 SOUTHBOUND LANE



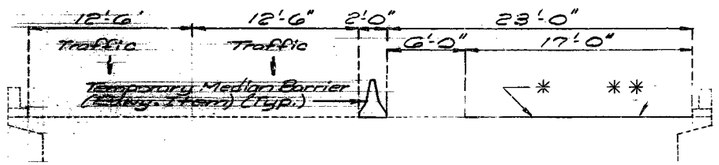
DETAIL OF INSIDE FACE OF SOUTHEAST CURB AT END BENT NO. 4 SOUTHBOUND LANE

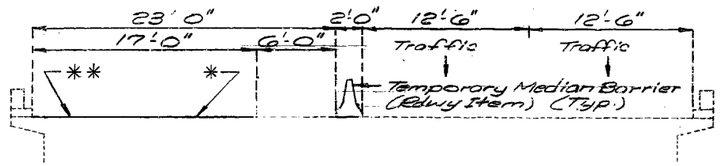


DETAIL OF OUTSIDE FACE OF SOUTHEAST WING CURB AND PARAPET AT END BENT NO. 4 NORTHBOUND LANE

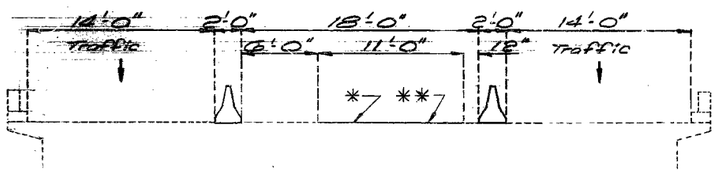
UNFORMED SUPERSTRUCTURE REPAIR

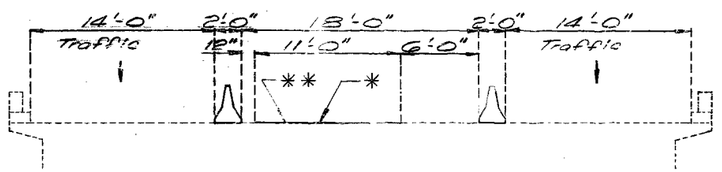
Note: * Apply 1¾" Latex Modified or 2½" Low Slump Concrete Overlay.
** Install Cathodic Protection System.



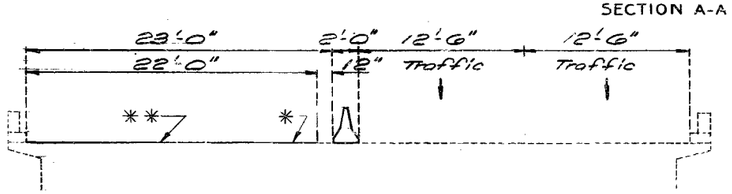


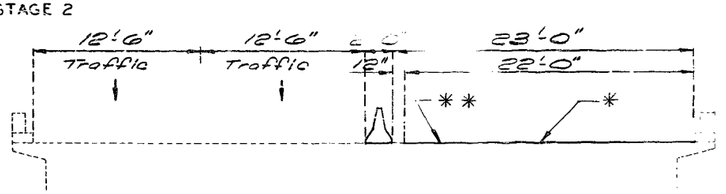
SECTION A-A STAGE 1



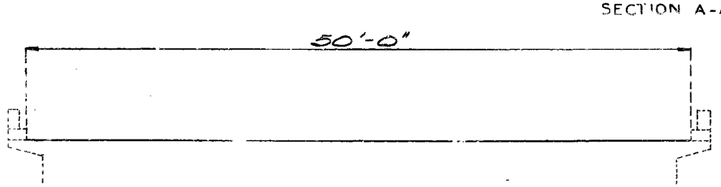


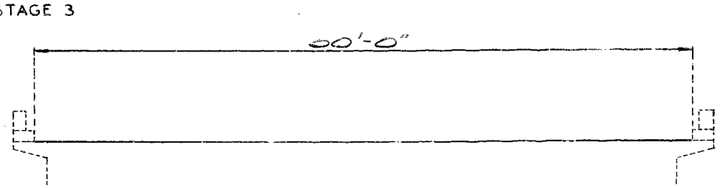
SECTION A-A STAGE 2





SECTION A-A STAGE 3





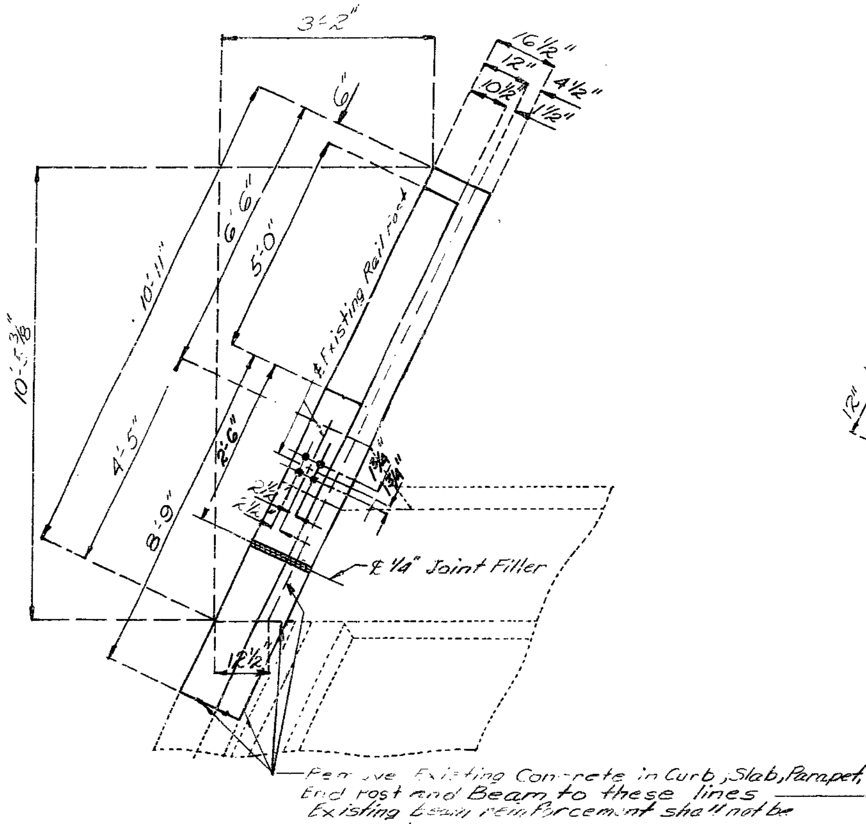
SECTION A-A FINAL STAGE

928 426

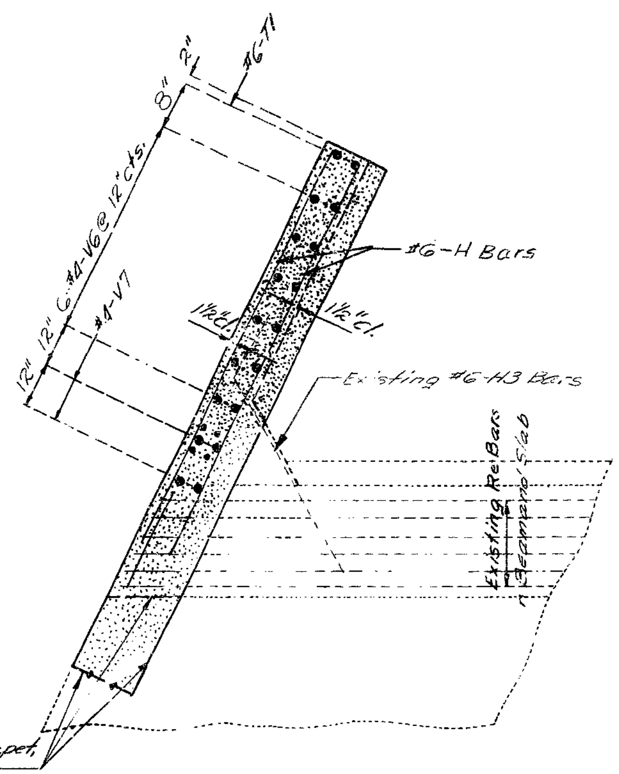
DRAWN Jan. 1988
CHECKED Feb. 1988

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

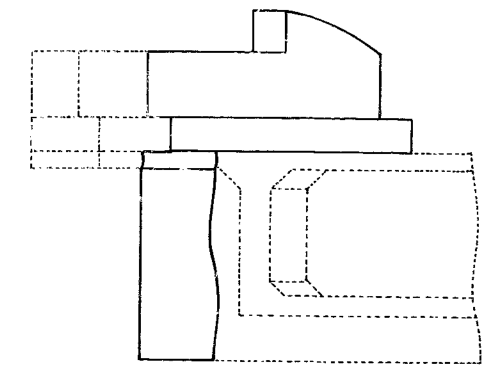
STATE	PROJ. NO.	SHEET NO.
MO.		21



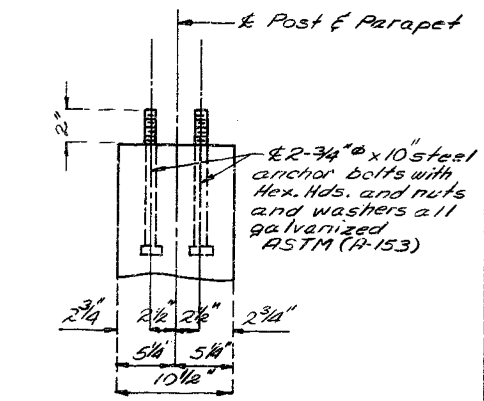
PART PLAN SHOWING NEW NORTHWEST WING



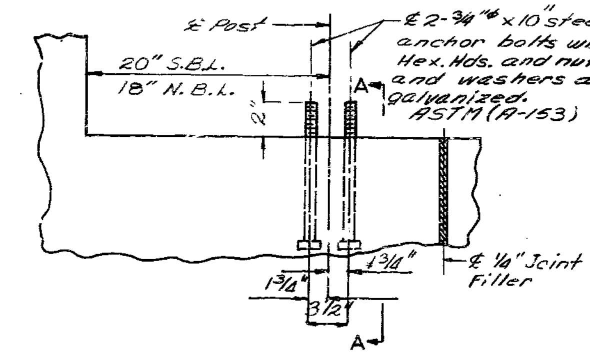
PART PLAN SHOWING NEW NORTHWEST WING WITH NEW AND EXISTING REINFORCING STEEL



PART ELEVATION SHOWING NORTHWEST WING REMOVAL AND NEW WING CONSTRUCTION



SECTION A-A

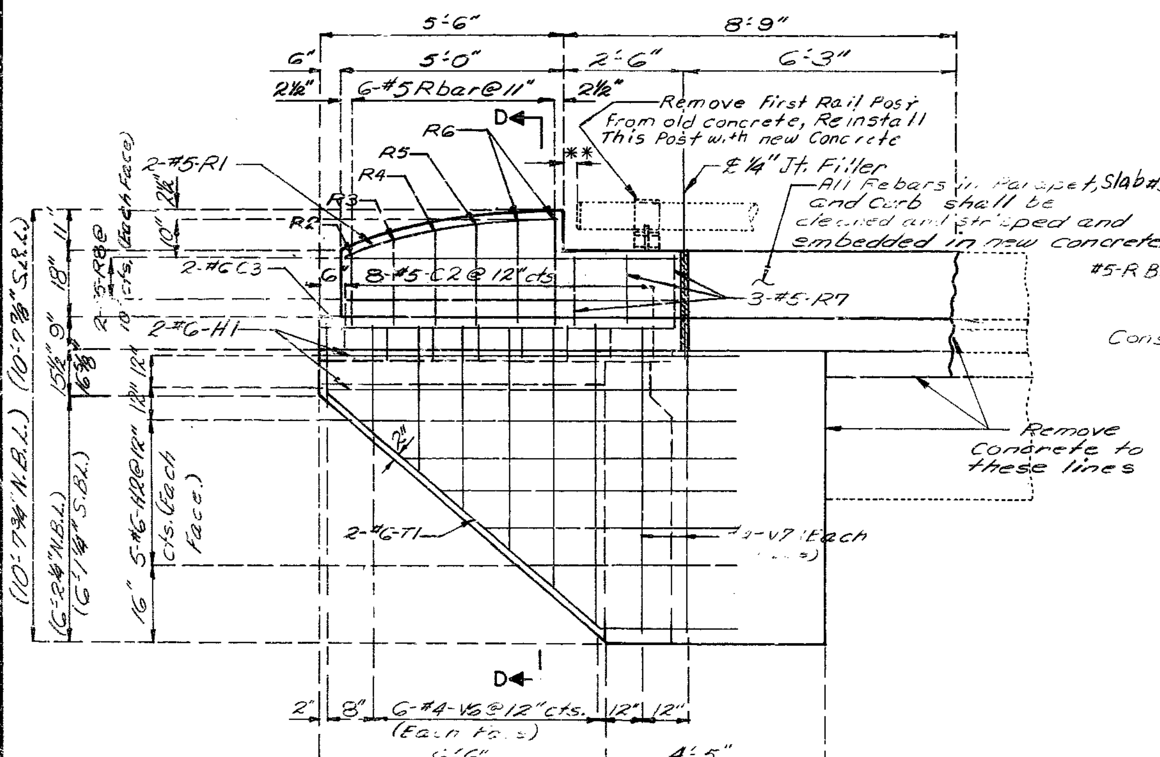


PART ELEVATION SHOWING ANCHOR BOLT LOCATION FOR RAIL POST

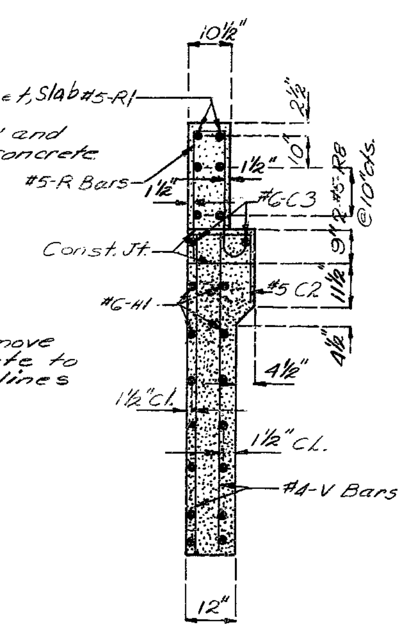
Note: Both Northbound and Southbound lanes at End Bent No. 1 shall have the old Northwest wing removed and a new wing shall be constructed. (See Special Provisions)

** Note: 2" Min.

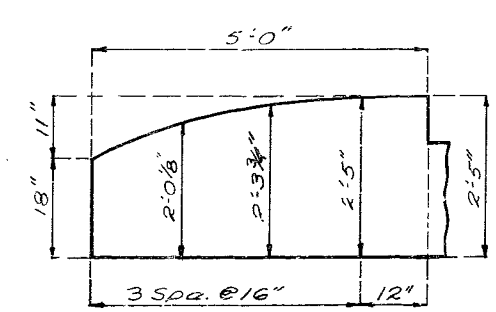
Note: Cost of any Excavation Required for Construction of New wings shall be included in price bid for other Items.



ELEVATION SHOWING NEW NORTHWEST WING



SECTION D-D



END POST ORDINATES

DETAILS OF END BENT NO. 1 SHOWING NEW NORTHWEST WING

SOUTHBOUND LANE SHOWN NORTHBOUND LANE SIMILAR

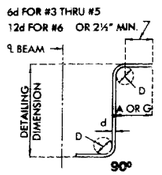
DETAILED JAN. 1988
CHECKED Feb. 1988

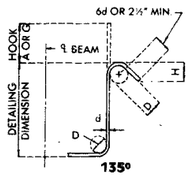
Note: This drawing is not to scale. Follow dimensions.

Sheet No. 3 of 9

JACKSON COUNTY

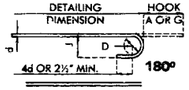
A-1640R1





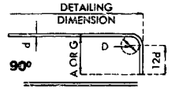
STIRRUP HOOK DIMENSIONS				
GRADES 40-50-60 KSI				
BAR SIZE	D (IN.)	90° HOOK	135° HOOK	
		HOOK A OR G	HOOK A OR G	APPROX H
#3	1½"	4"	4"	2½"
#4	2"	4½"	4½"	3"
#5	2½"	6"	5½"	3¾"
#6	4½"	12"	7¾"	4½"

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



SIZE OF 180° HOOKS (GRADE 40 KSI)

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



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

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

END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	180° HOOKS ALL GRADES		90° HOOKS ALL GRADES
		A OR G	J	A OR G
#3	2¼"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3¾"	7"	5"	10"
#6	4½"	8"	6"	12"
#7	5¼"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9½"	15"	11⅜"	19"
#10	10¾""	17"	13¼"	22"
#11	12"	19"	15⅜"	2'-0"
#14	18¼"	2'-3"	21⅜"	2'-7"

NOTES:

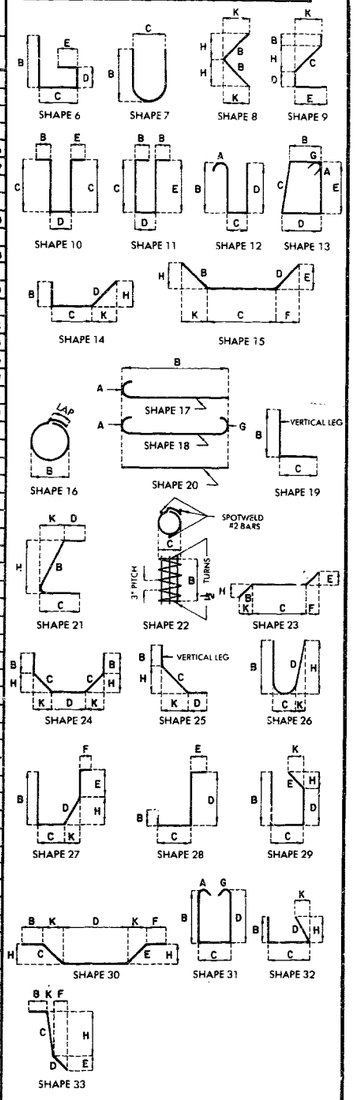
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEG. TO BE BENT WITH SAME PROCEDURE AS FOR 90 DEG. STD. HOOKS.

HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.

E - EPOXY COATED REINFORCEMENT.
S - STIRRUP
X - BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES.
V - BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE.
NO. EA. - NUMBER OF BARS OF EACH LENGTH.
NOMINAL LENGTHS - ARE BASED ON OUT TO OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
ACTUAL LENGTHS - ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.

COMPLETE BILL OF REINFORCING STEEL

NO. REQD.	MARK NO. SIZE MARK	LOCATION	(E) EPOXY	SHAPE NO.	(S) STIRRUP	(X) SUBSTR.	(V) VARIES	NO. EACH	DIMENSIONS B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
16	5C2	CURB		6	S				18.250	12.750	5.000					3 0	2 9	44
4	6C3	CURB		20					7 9.000							7 9	7 9	47
8	6H1	WINGWALL		20					10 0.000							10 0	10 0	120
20	6H2	WINGWALL		20			V	4	4 6.000							4 6	4 6	
		INCR = 16.500 IN							10 0.000							10 0	10 0	218
4	5R1	END POST		20					4 9.000							4 9	4 9	20
2	5R2	END POST		12					2 1.000	7.500	2 1.000					5 5	5 2	11
2	5R3	END POST		12					2 5.500	7.500	2 5.500					6 2	5 11	12
2	5R4	END POST		12					2 8.500	7.500	2 8.500					6 8	6 5	13
2	5R5	END POST		12					2 10.000	7.500	2 10.000					6 11	6 8	14
4	5R6	END POST		12					2 11.250	7.500	2 11.250					7 1	6 10	29
6	5R7	PARAPET & CURB		12					23.500	7.500	23.500					5 2	4 11	31
8	5R8	END POST,PARAPET		20					7 3.000							7 3	7 3	60
4	6T1	WING		25					20.000	8 7.250	3 2.750			6 0.000	6 2.000	13 6	13 5	81
24	4V6	WINGWALL		20			V	4	2 9.000							2 9	2 9	
		INCR = 12.000 IN							7 9.000							7 9	7 9	84
8	4V7	WINGWALL		20					8 0.000							8 0	8 0	43
		END OF BAR LIST																



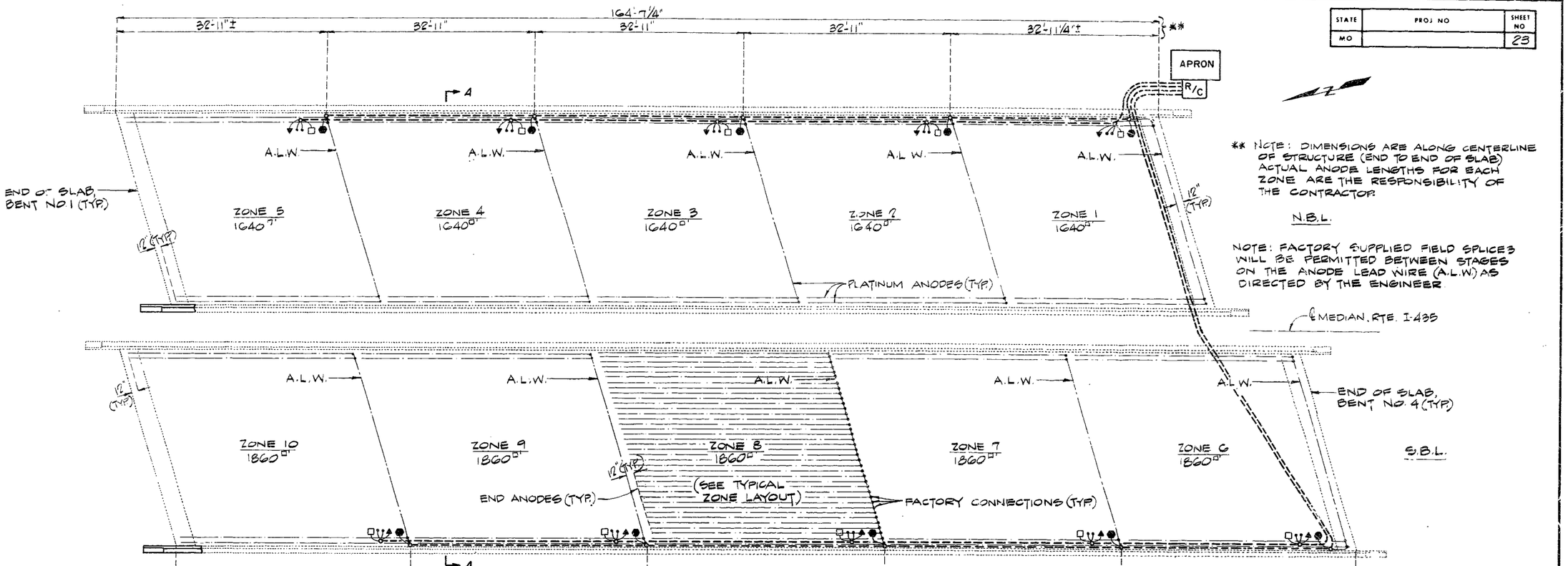
BENDING DIAGRAMS

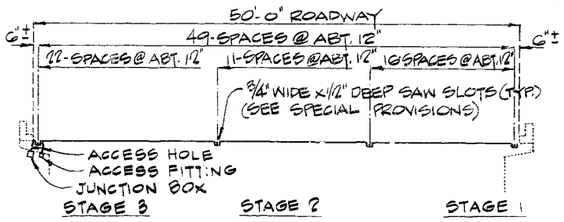
STATE	PROJ NO	SHEET NO
MO		22

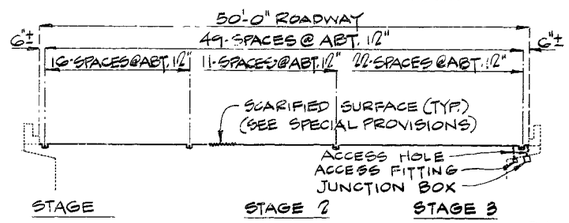
STD. 90.8.5 MAY 1974 | REVISED JUNE 1988

DETAILED FEB. 1988
CHECKED FEB. 1988

STATE	PROJ NO	SHEET NO
MO		23

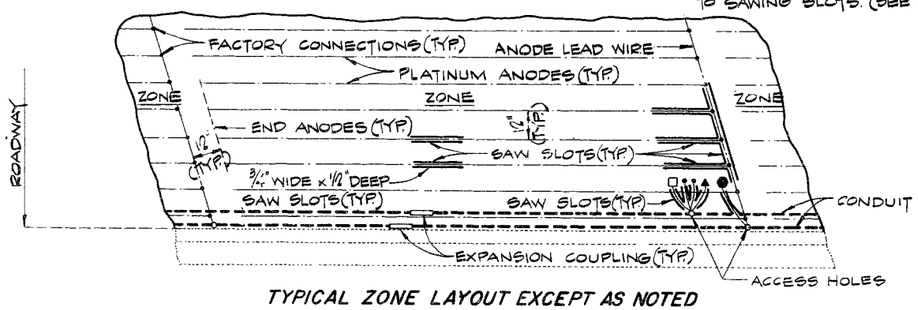






SECTION A-A

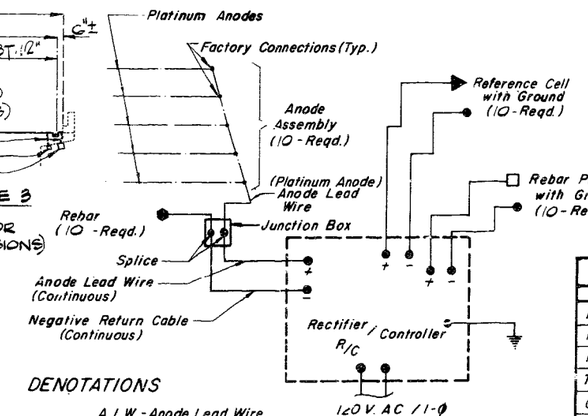
NOTE: SLAB SHALL BE SCARIFIED PRIOR TO SAWING SLOTS. (SEE SPECIAL PROVISIONS)



TYPICAL ZONE LAYOUT EXCEPT AS NOTED

Note: Anodes shall be placed as shown with a minimum tolerance of plus or minus three inches.

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



PARTIAL SCHEMATIC

DENOTATIONS

- A.L.W. - Anode Lead Wire (Platinum Anode)
- Platinum Anode
- System Negatives Connection
- Reference Cell
- Rebar Probe (Corrosometer)
- Grounds
- Conduit

NOTE: The anode leads and system negative return leads shall be routed in the same conduit.

The reference cell, reference cell ground leads, rebar probe and probe ground leads shall be routed in the same conduit.

Reference cells are to be placed between anodes.

Reference cell ground shall be welded to top rebar within one foot of reference cell.

All zones are similar with varying widths (see Section A-A).

Anode assembly number must match zone number.

ESTIMATED QUANTITIES *

ITEM	UNIT	QUANTITY
Platinum Anodes	Lin. Ft.	17,480
Reference Cells	Each	10
Rebar Probes	Each	10
Thermite Welds	Each	30
Conduit 2"ϕ PVC	Lin. Ft.	1000

* For information only

Note: Platinum anodes and conduit lengths are approximate. Actual lengths are the responsibility of the contractor.

PLATINUM CATHODIC SYSTEM (ALTERNATE "A")

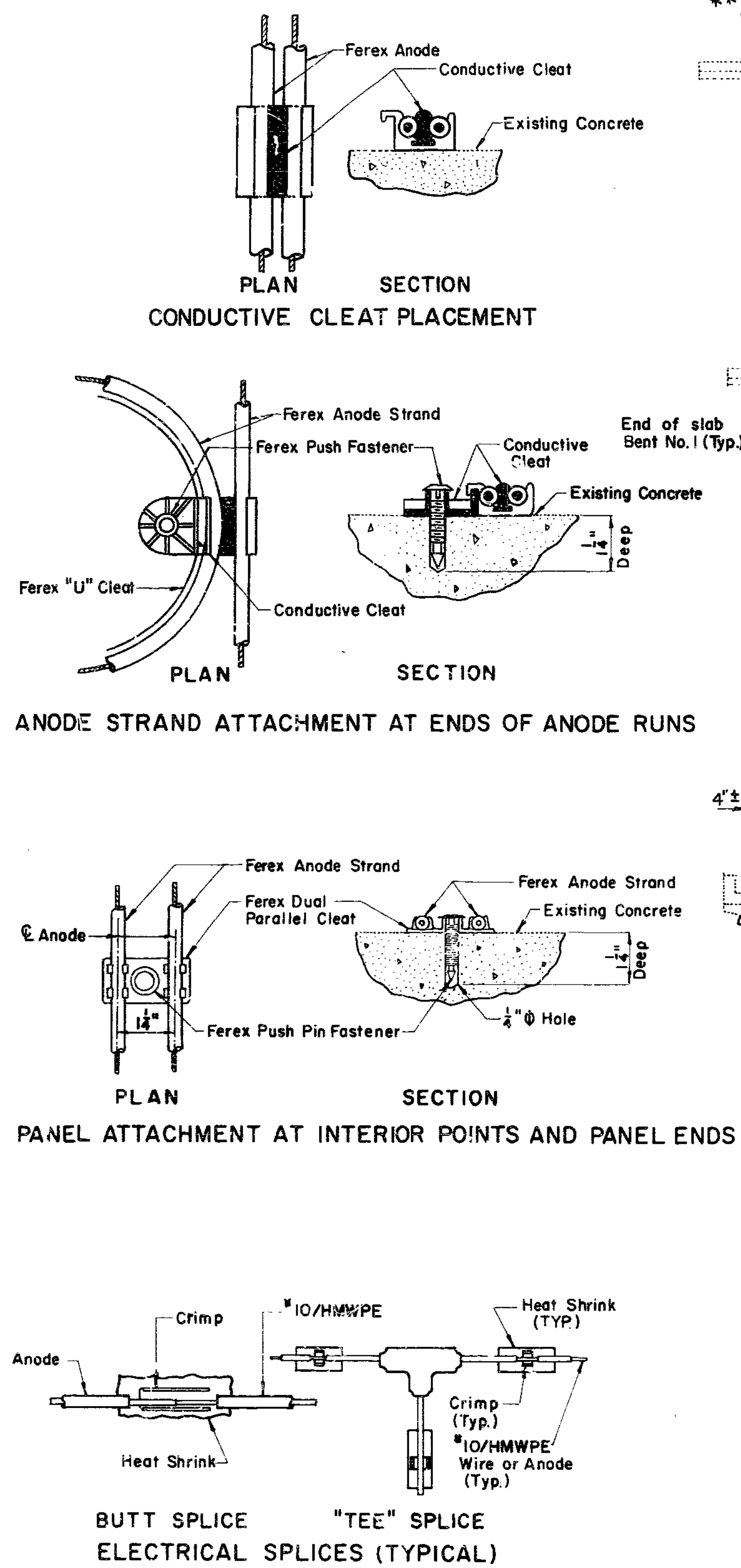
JACKSON COUNTY

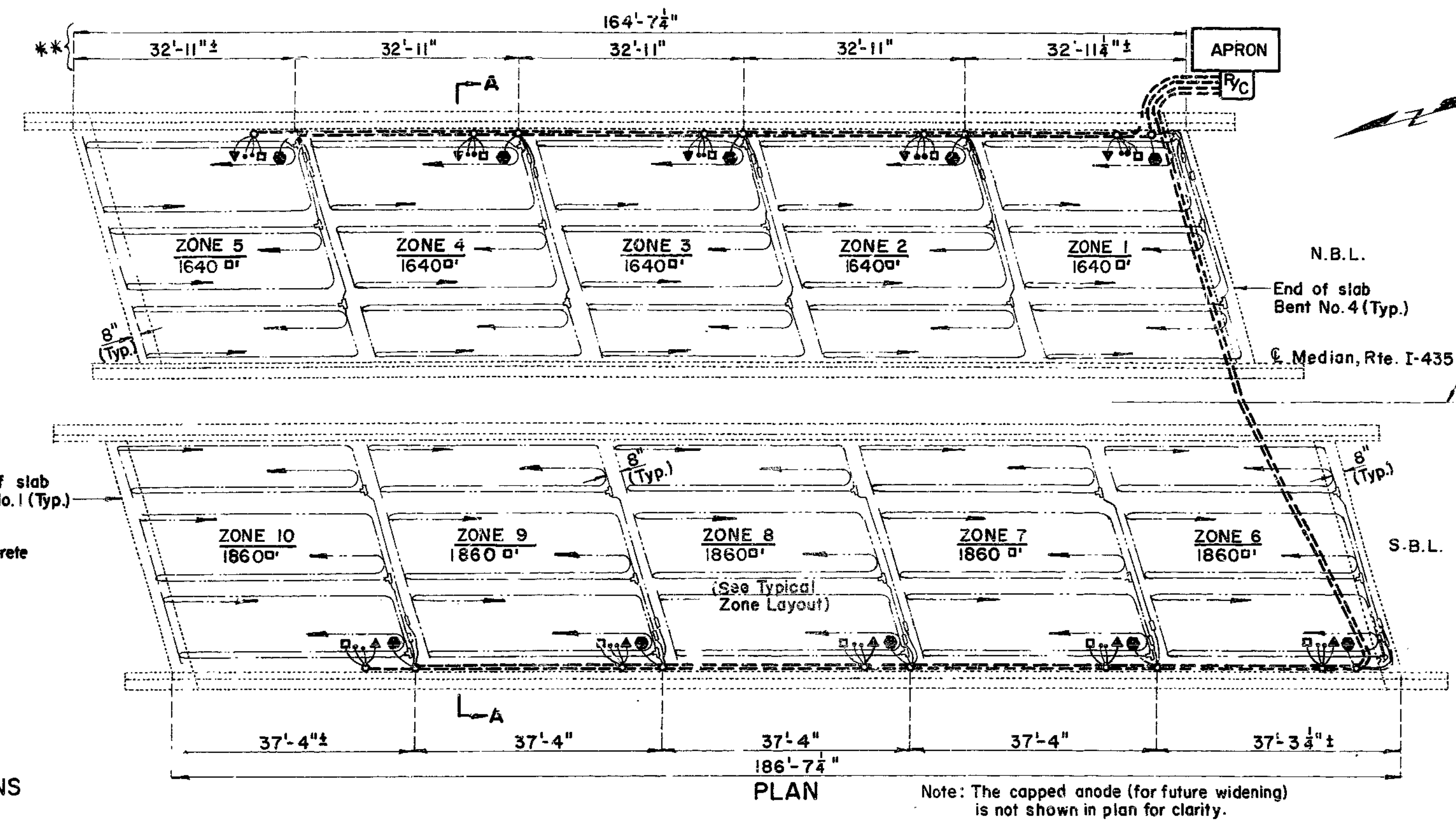
A-1640RI

DETAILED FEB 1987
CHECKED FEB. 1987

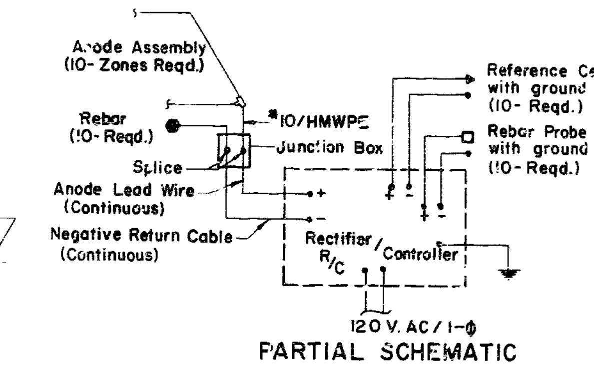
STATE	PROJ NO	SHEET NO
MO	·	24

** Note: Dimensions are along centerline of structure (end to end of slab). Actual anode lengths for each zone are the responsibility of the contractor.

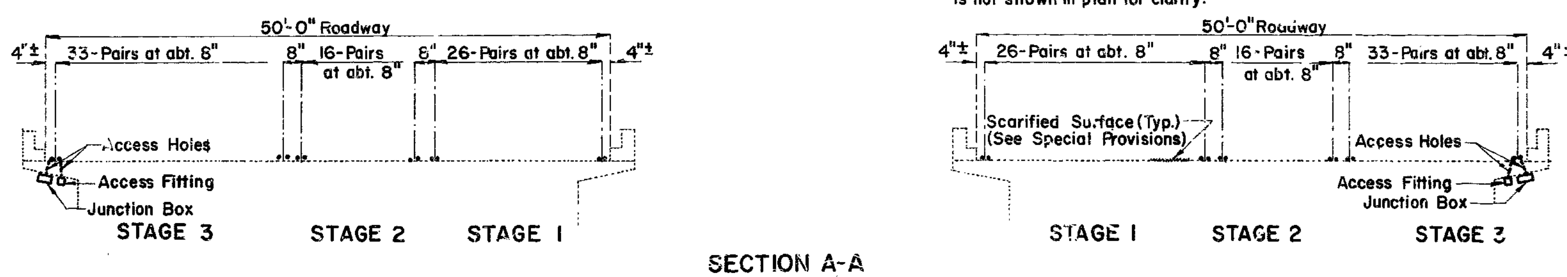




Note: The capped anode (for future widening) is not shown in plan for clarity.

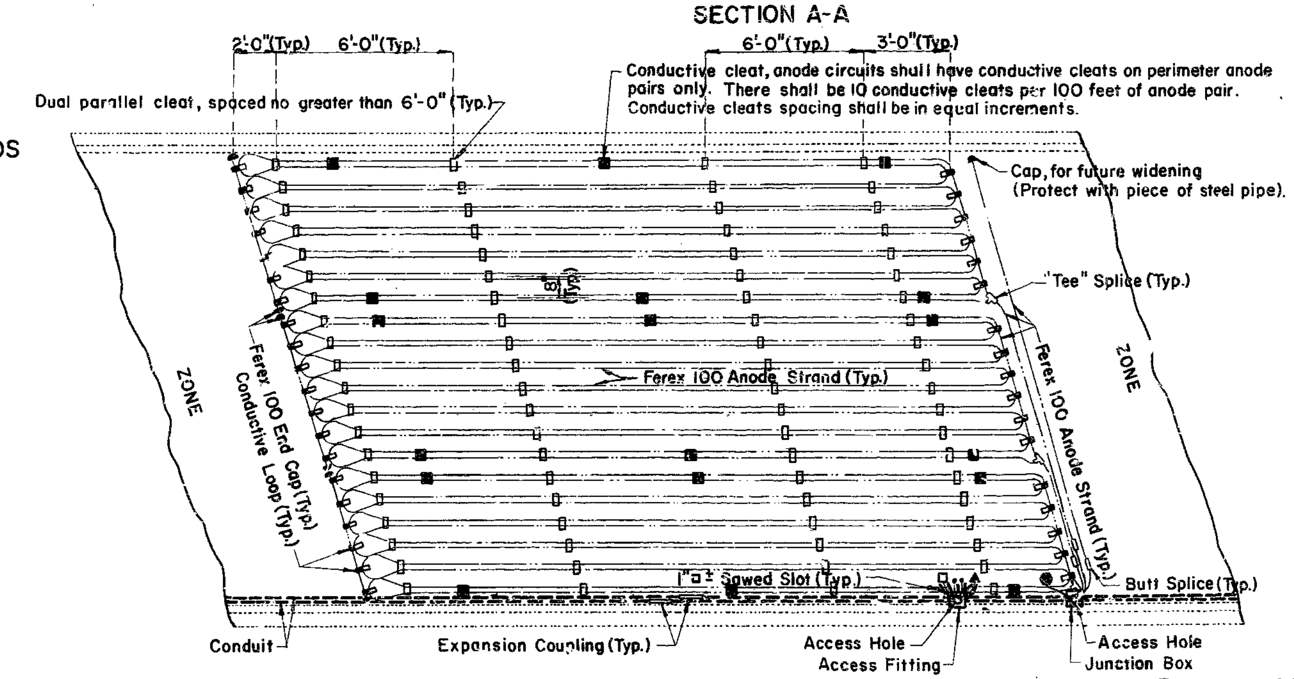


Note: The anode leads and system negative return leads shall be routed in the same conduit.
The reference cell, reference cell ground leads, rebar probe and probe ground leads shall be routed in the same conduit.
Reference cell ground shall be welded to top rebar within one foot of reference cell.
All zones are similar with varying widths (See Section A-A).
Anode assembly number must match zone number.



DENOTATIONS

- Ferex 100 Anode
- System Negatives Connection
- Reference Cell
- Rebar Probe (Corrosometer)
- Grounds
- Conduit
- Ferex 100 factory preassembled "T" splice
- Ferex 100 Butt Splice
- Ferex 100 dual parallel cleat with push pin
- Ferex 100 conductive cleat
- Ferex 100 end cap
- Ferex 100 conductive loop



TYPICAL ZONE LAYOUT EXCEPT AS NOTED

Note: Anodes shall be placed as shown with a minimum tolerance of plus or minus three inches.

ESTIMATED QUANTITIES *

ITEM	UNIT	QUANTITY
(Ferex 100) Anode Strands	Lin. Ft.	54,100
Reference Cells	Each	10
Rebar Probes	Each	10
Thermite Welds	Each	30
Conduit 2"Φ PVC	Lin. Ft.	1,000

* For information only.
Note: Anode and conduit lengths are approximate. Actual lengths are the responsibility of the contractor.

RAYCHEM (FEREX 100) CATHODIC SYSTEM (ALTERNATE "B")

DETAILED Dec. 1987
CHECKED Jan. 1988

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

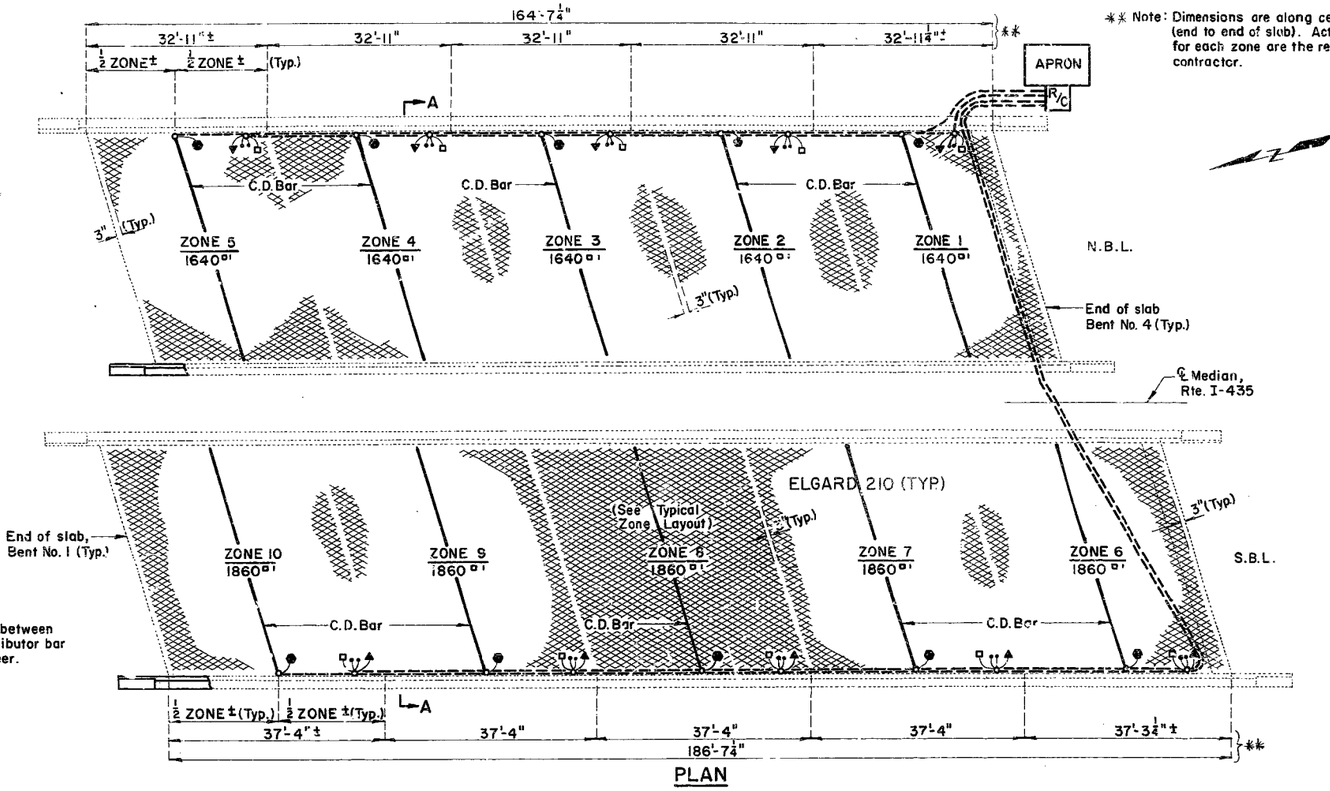
Sheet No. 6 of 9

JACKSON COUNTY

A-1640R1

774 430

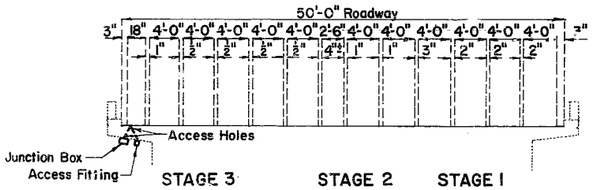
STATE	PROJ NO	SHEET NO
MO		25

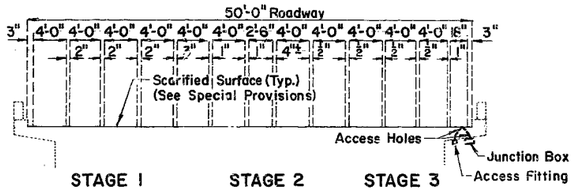


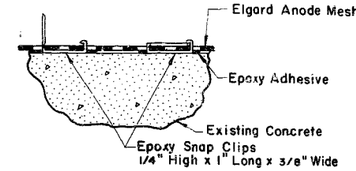
PLAN

** Note: Dimensions are along centerline of structure (end to end of slab). Actual anode lengths for each zone are the responsibility of the contractor.

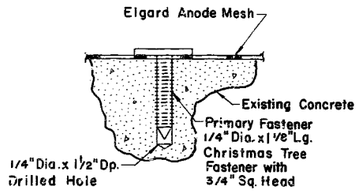
Note: Splicing will be permitted between stages on the current distributor bar as directed by the engineer.







DETAIL "A"
EPOXY SNAP CLIP



DETAIL "B"
CHRISTMAS TREE CLIP

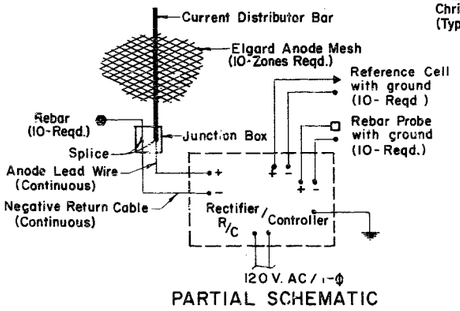
DENOTATIONS

- Elgard Anode Mesh
- System Negatives Connection
- Reference Cell
- Rebar Probe (Corrosometer)
- Grounds
- Conduit

Note: The anode leads and system negative return leads shall be routed in the same conduit.
The reference cell, reference cell ground leads, rebar probe and probe ground leads shall be routed in the same conduit.
Reference cell ground shall be welded to top rebar within one foot of reference cell.
All zones are similar with varying widths (See Section A-A).
Anode assembly number must match zone number.

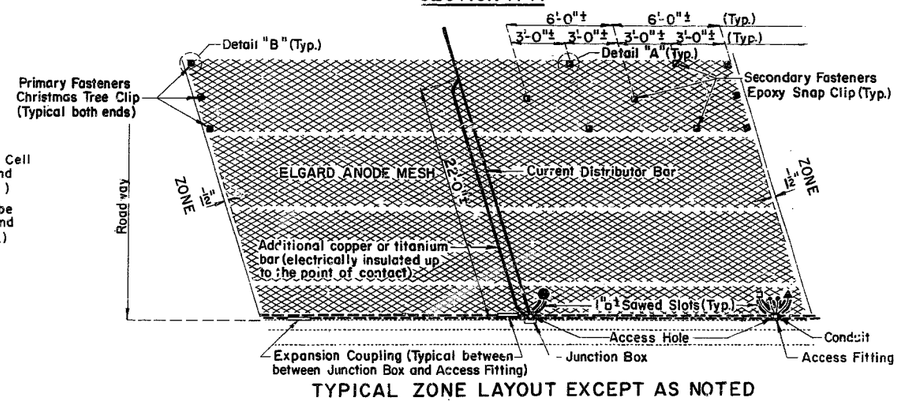
ESTIMATED QUANTITIES *		
ITEM	UNIT	QUANTITY
Elgard Anode Mesh(210)	Sq. Ft.	16,710
Reference Cells	Each	10
Rebar Probes	Each	10
[illegible]site Welds	Each	30
Conduit 2"ϕ PVC	Lin. Ft.	1,040

* For information only.
Note: Anode and conduit lengths are approximate. Actual lengths are the responsibility of the contractor.



PARTIAL SCHEMATIC

SECTION A-A



TYPICAL ZONE LAYOUT EXCEPT AS NOTED

(ELGARD ANODE MESH) CATHODIC SYSTEM (ALTERNATE "C")

DETAILED Dec. 1987
CHECKED Jan. 1988

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

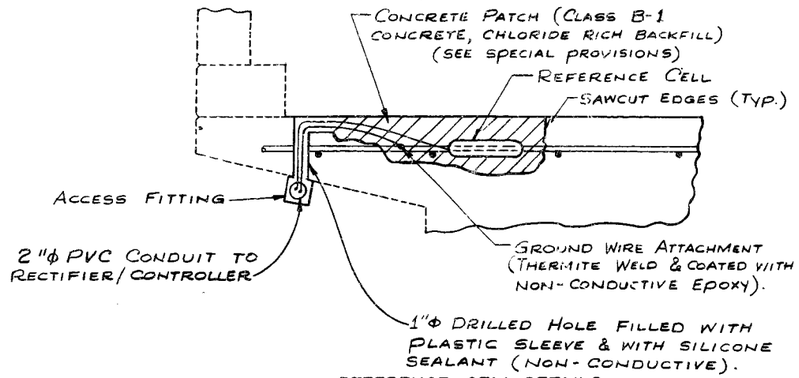
JACKSON COUNTY

A-1640RI

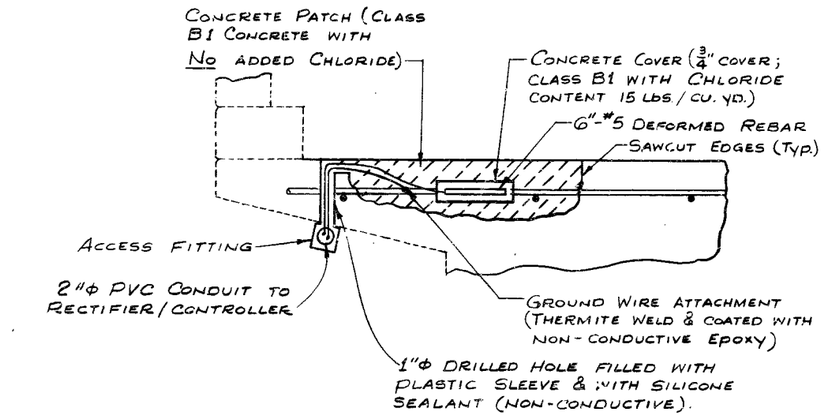
235 431

STATE	PROJ. NO	SHEET NO
MO		26

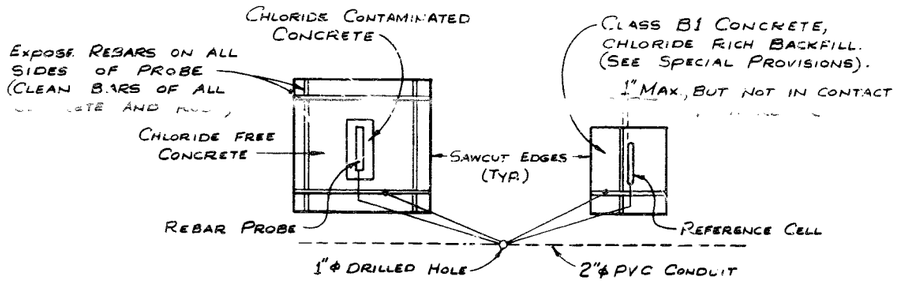
NOTE: THE REFERENCE CELL SHALL BE PLACED IN THE EXCAVATED AREA WITHIN 1" BUT NOT IN DIRECT CONTACT OF TOP-MAT REINFORCING STEEL.



REFERENCE CELL DETAILS

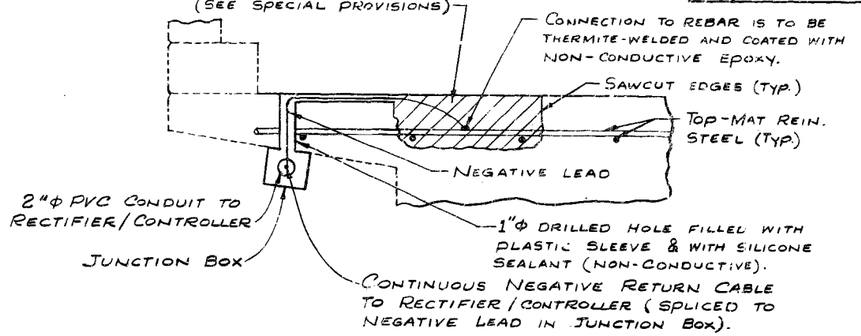


REBAR PROBE DETAILS

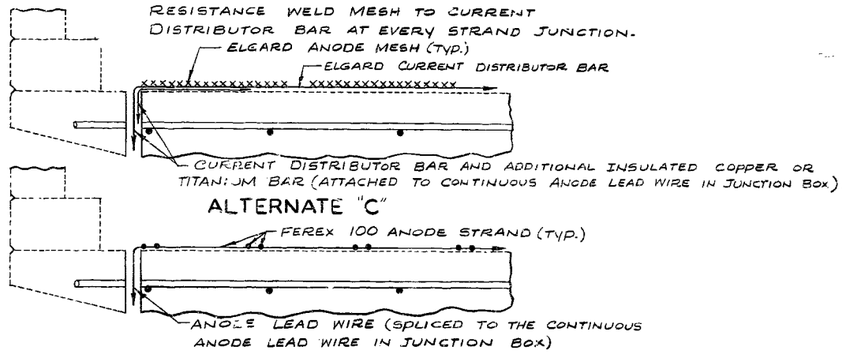


PLAN OF REBAR PROBE AND REFERENCE CELL

CONCRETE PATCH (CLASS B1 CONCRETE CHLORIDE RICH BACKFILL) (SEE SPECIAL PROVISIONS)

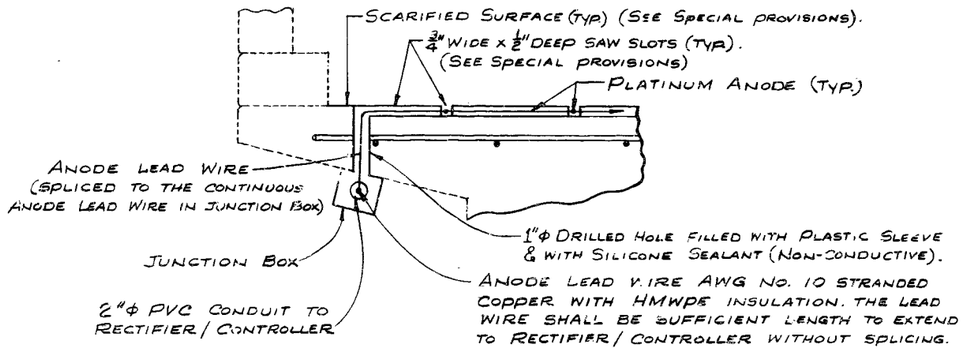


SYSTEM NEGATIVES CONNECTION DETAIL



ALTERNATE "C"

ALTERNATE "B"



ALTERNATE "A"

ANODE TO ANODE LEAD WIRE DETAILS

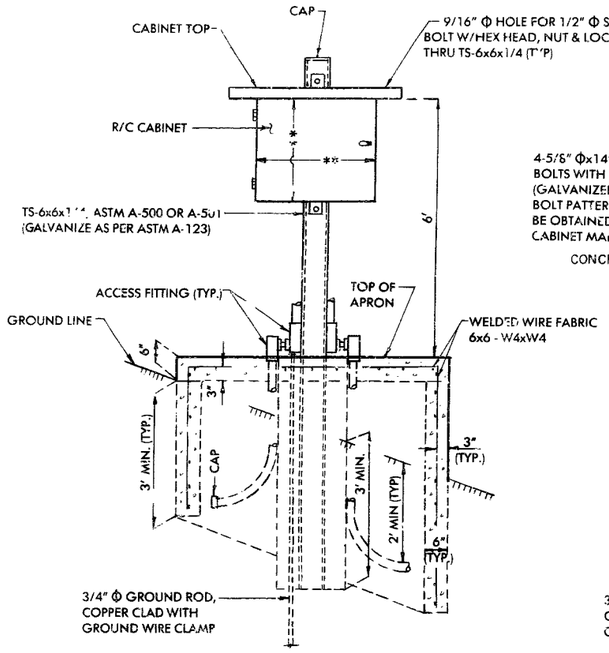
Note: All concrete removal shall be initiated by saw cutting the first ½"

Notes: Conduit shall be schedule 40 Heavy Wall PVC (Polyvinyl Chloride Plastic) Each section of conduit shall bear the Underwriters Laboratories, Inc. (U.L.) label.
Conduit shall be secured to concrete with clamps at abt. 5'-0" cts., (Galv./AASHTO M111)
Weepholes shall be provided at appropriate locations to drain any moisture in the conduit lines.
Expansion couplings shall be installed on conduit lines between all junction boxes and access fittings as approved by the engineer.
The location and direction of conduit may be shifted to meet field conditions as directed by the engineer.
The junction boxes shall be PVC molded, surface mounted, size 6"x 6"x 4". They shall be equal to "Carlon" Electrical Construction Products or "Triangle" Conduit & Cable Co. Inc. The conduit terminations and cover shall be of water tight construction.

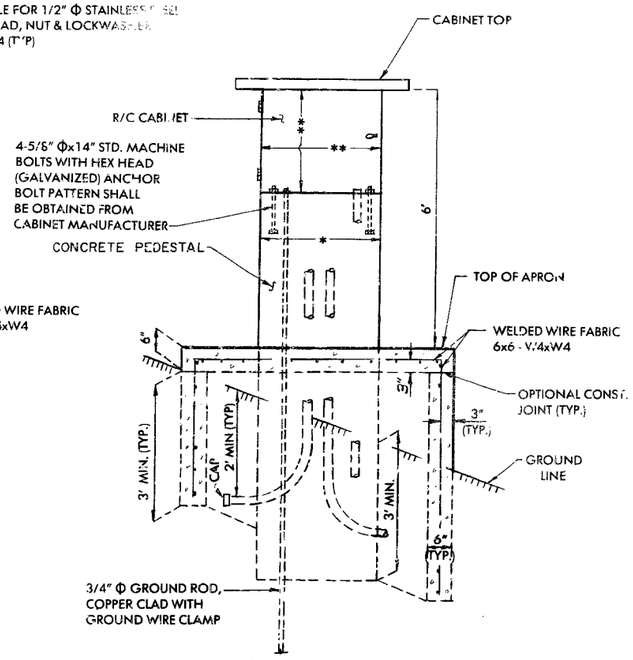
DETAILED OCT. 1987
CHECKED OCT. 1987

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

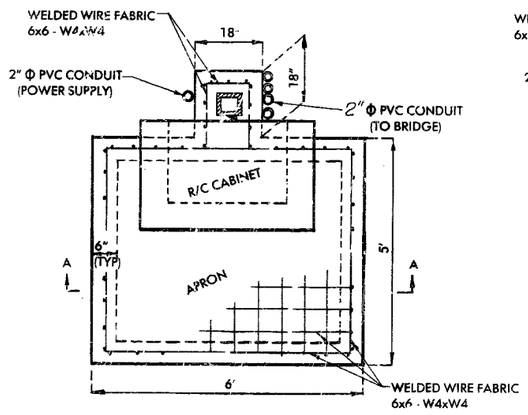
STATE	PROJ NO	SHEET NO
MO		27



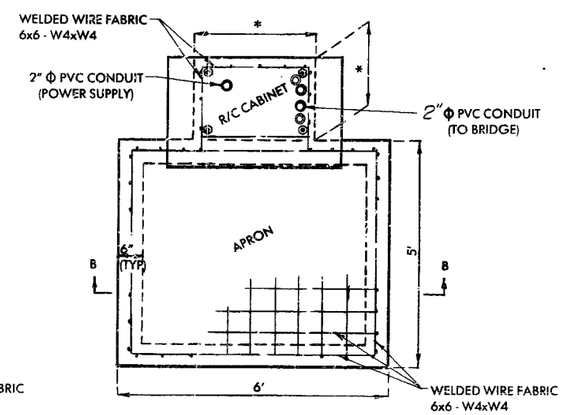
SECTION A-A



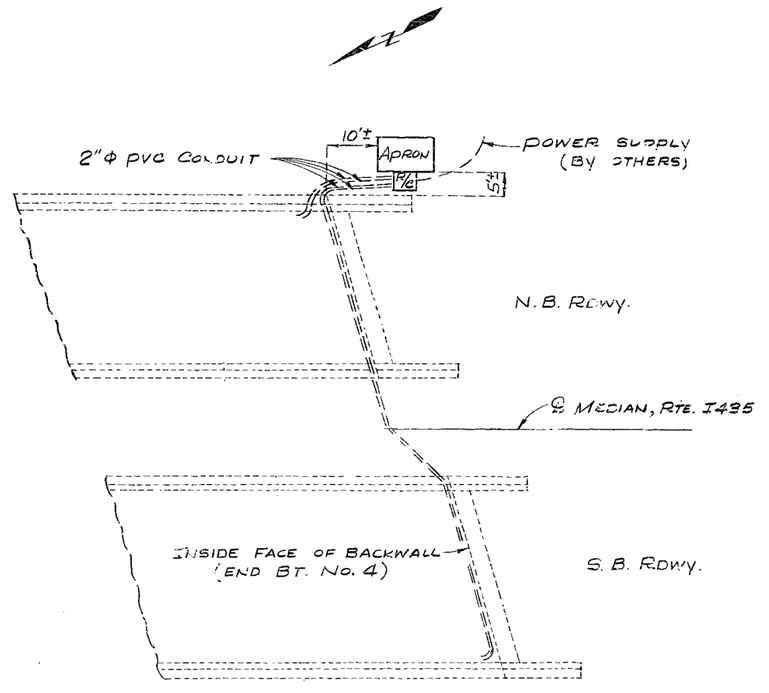
SECTION B-B



PLAN
OPTION "A"



PLAN
OPTION "B"



PLAN LOCATION OF RECTIFIER/CONTROLLER

**DIMENSIONS ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
*DIMENSIONS ACCORDING TO MANUFACTURED CABINET.

Note: The 3/4" Φ ground rods shall be sufficient length to extend a minimum of 10'-0" below bottom of concrete pedestal.

Ground wire shall be No. 6 AWG minimum.

Knockouts or drilled holes shall be provided in cabinets for all conduit. Locations of such are the responsibility of the contractor and cabinet manufacturer.

DETAILED DEC. 1987
CHECKED DEC. 1987

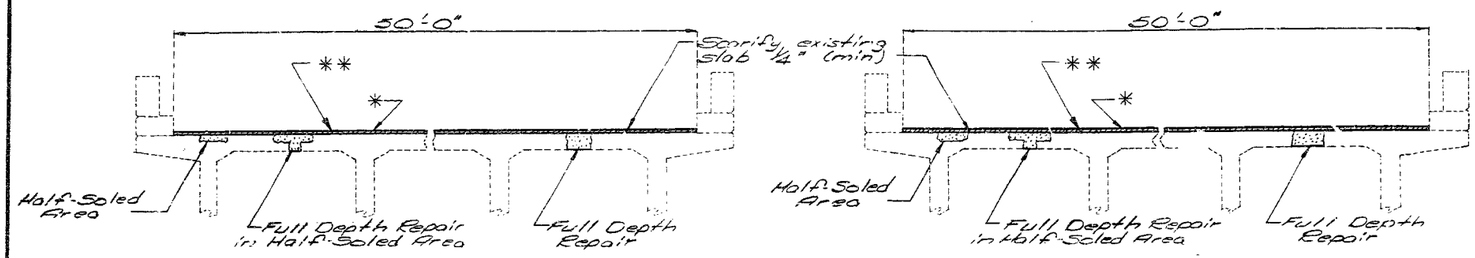
Note: This drawing is not to scale. Follow dimensions.

27 433

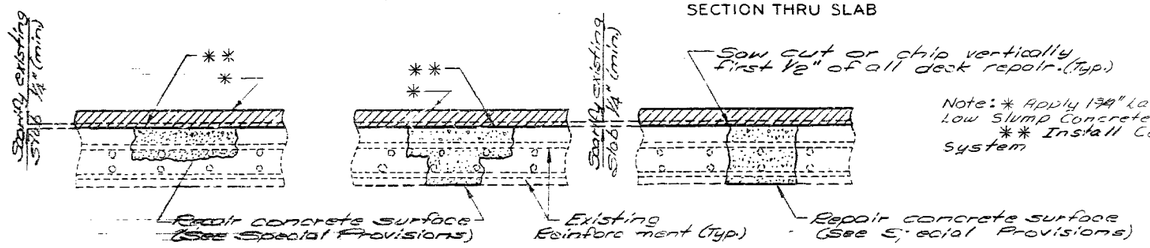
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ NO	SHEET NO
MO	IR-435-1(224)	49
SEC/SUB 13	TWP 48N RGE 33W	

FINAL PLANS



SECTION THRU SLAB



HALF-SOLED AREA | FULL DEPTH REPAIR IN HALF-SOLED AREA | FULL DEPTH REPAIR

Note: * Apply 1½" Latex Modified or 2¼" Low Slump Concrete Overlay.
** Install Catnodic Protection System

GENERAL NOTES:

Design Specifications: A.A.S.H.T.O. - 1983 and Interims thru 1986

Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.

Roadway surfacing adjacent to bridge ends to match Bridge overlay. (Roadway Item)

Traffic over structure to be maintained during construction. See Sht. 2 for Stage construction.

Reinforcing Steel (Grade 60) f_y = 60,000 p.s.i.
Reinforcing Steel: Minimum clearance to reinforcing steel shall be 1½" unless otherwise shown.
Class B1 Concrete f'_c = 4,000 psi
Joint Filler: All Joint filler shall meet the requirement of Std. Spec. 1057.2.4.

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.

PLAN OF SLAB
SHOWING SPECIAL REPAIR ZONES

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

Note: Zones with the same letter designation may be repaired at the same time. Zone A is to be completed before Zone B.
Any repair in the remainder of the bridge that is within 2'-8" of Zone A shall be completed prior to work in Zone A.

ESTIMATED QUANTITIES		
ITEM		TOTAL
REPAIRING CONCRETE DECK (HALF-SOLING)	SQ. FT.	7589
FULL DEPTH REPAIR	SQ. FT.	27
SUPERSTRUCTURE REPAIR (UNFORMED) (SEE SPEC. PROV.)	SQ. FT.	80
CONCRETE WEARING SURFACE (SEE SPEC. PROV.)	SQ. YD.	1051
CATHODIC PROTECTION SYSTEM	LUMP SUM	1
CLASS B1 CONCRETE	CU. YD.	6.6
REINFORCING STEEL	LBS.	830
SPECIAL WORK	LUMP SUM	1

REPAIRS TO
BRIDGE OVER OLDHAM ROAD
STATE ROAD FROM RTE 350 TO RTE 71
IN KANSAS CITY
PROJECT NO. IR-435-1(224) STA. 671+98.12 S.B.L. 671+83.24 N.B.L.
JOB NO. 4-I435 557 D RTE I-435
JACKSON **COUNTY**
DATE 2/18/88

STD.
STD.
A-1640 RI

DESIGNED DEC. 1987
DETAILED JAN. 1988
CHECKED Feb 1988

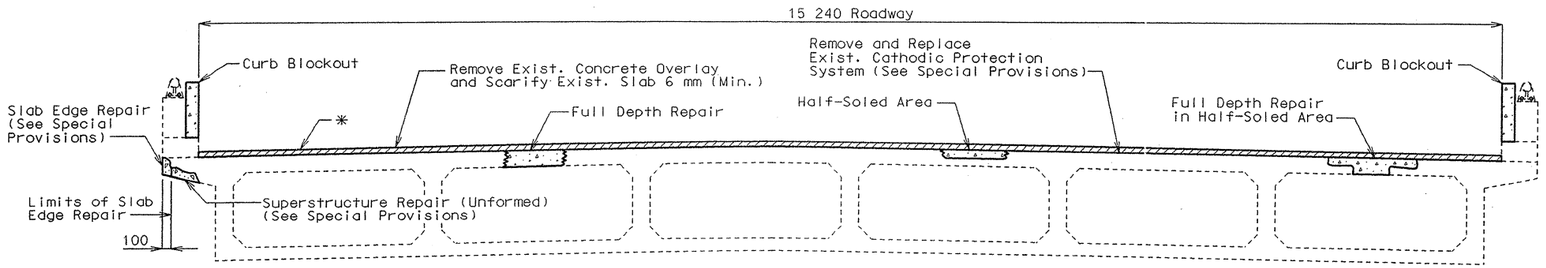
Sheet No. 1A of 9

A16405 & A16406

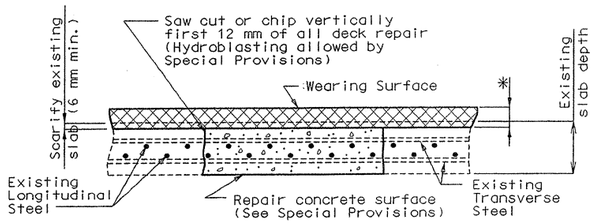
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	367
Sec. SUF. 13	Twp. 48N.	Rge. 33W

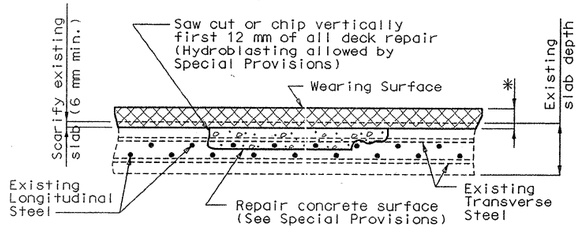
JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4



SECTION THRU SLAB

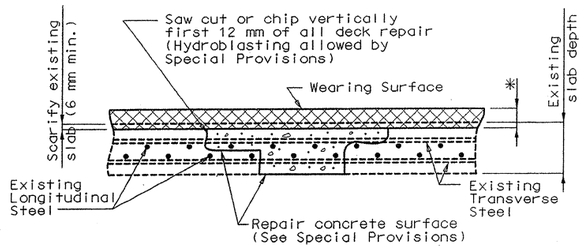


FULL DEPTH REPAIR



HALF-SOLED AREA

* 63 mm (Min.) Low Slump Concrete Wearing Surface

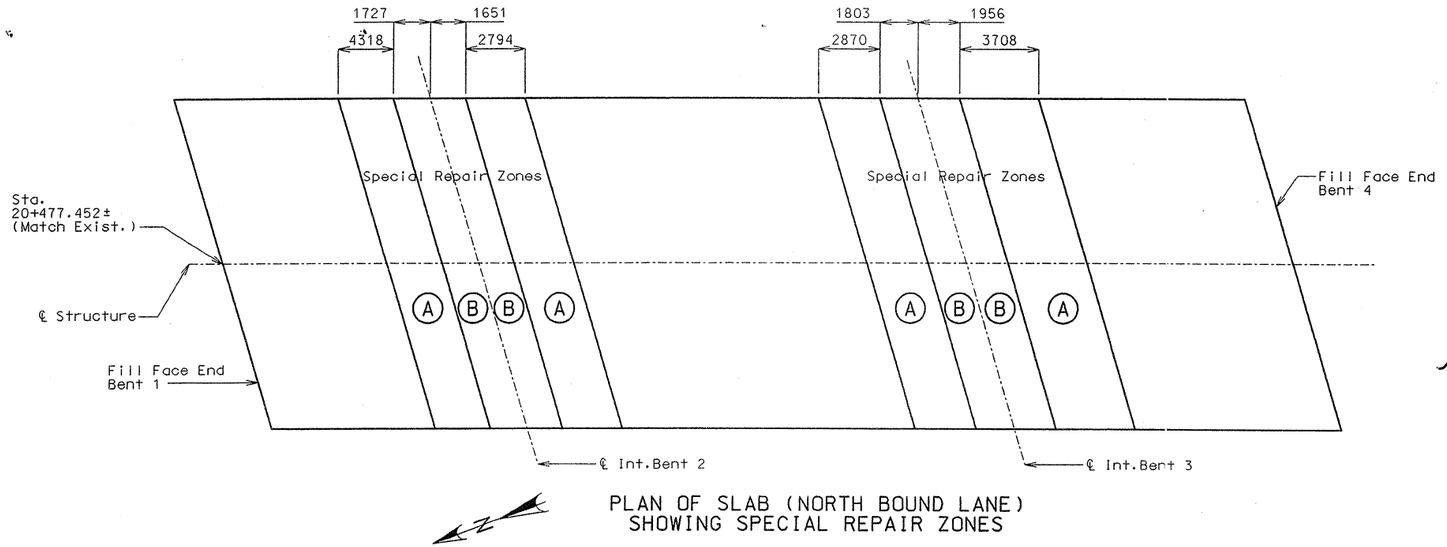


FULL DEPTH REPAIR
IN HALF-SOLED AREA

NOTE:
Zone A is to be completed before Zone B.

Any repair in the remainder of the bridge that is within 600 mm of Zone A shall be completed before removing old concrete in Zone A.

Zones with the same letter designation may be repaired at the same time.



PLAN OF SLAB (NORTH BOUND LANE)
SHOWING SPECIAL REPAIR ZONES

General Notes:

Design Specifications:
AASHTO 1996 and Interim 1997.

Design Unit Stresses:
Class B1 Concrete (Curb Blockout) 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.

Dimensions:
All dimensions are shown in millimeters (mm) unless otherwise specified.
Drawings are not to scale. Follow dimensions.

Miscellaneous:
Traffic over structure to be maintained during construction. See sheet No. 2 for details of stage construction. (See roadway plans for traffic control).

Outline of old work is indicated by dashed lines. Heavy lines indicate 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.

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

Roadway surfacing adjacent to bridge ends to match bridge overlay (Roadway Item).

FINAL ~~ESTIMATED~~ QUANTITIES

ITEM		TOTAL
Curb Removal (Bridges) - Metric	meter	7.0
Removal of Low Slump Concrete Wearing Surface - Metric	sq. meter	764.6
Partial Removal of Cathodic Protection System	lump sum	1
Substructure Repair (Unformed) - Metric	sq. meter	3.0
Superstructure Repair (Unformed) - Metric	sq. meter	2.0
Curb Blockout - Metric	meter	110.0
Repairing Concrete Deck (Half-Soling) - Metric	sq. meter	30.0
Full Depth Repair - Metric	sq. meter	5
Slab Edge Repair (Bridges) - Metric	meter	1.0
Low Slump Concrete Wearing Surface - Metric	sq. meter	765
Cathodic Protection System	lump sum	1
CURB REPAIR "5002"	meter	114

Final Plans

I certify that this plan sheet accurately depicts the configuration and location of the roadway and all its appurtenant features, to the best of my knowledge, as I and my staff have observed the contractor's construction of this project. I specifically disclaim any responsibility for the design of this project, except as I and my staff may have modified or authorized the modification of the project design during its construction; and I disclaim responsibility for the contractor's actual construction of the project, except as I and my staff may have directed or ordered that the project be constructed.

Karsten M. Sommerhauser — Signature
5/25/05 — Date

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

REPAIRS TO BRIDGE OVER OLDHAM ROAD

STATE ROAD FROM GREGORY BLVD. TO BANNISTER RD.
ABOUT 1.6 km SW OF GREGORY BLVD.

PROJECT NO.
JOB. NO. J4I1299

STA. 20+477.452± (Match Exist.)
RTE. I-435 (N.B.L.)

JACKSON COUNTY
Date: 11/19/98

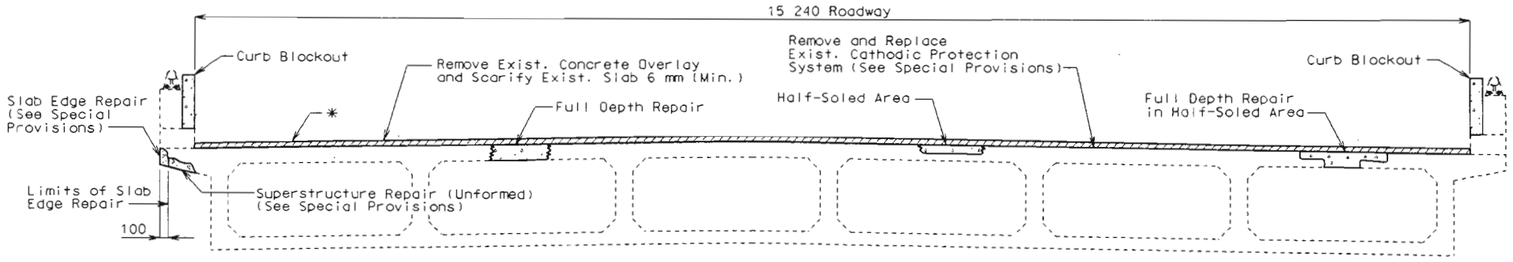
STD.	
STD.	
STD.	
STD. M706.35	
A16403	

Designed Oct. 1998
Detailed Oct. 1998
Checked Oct. 1998

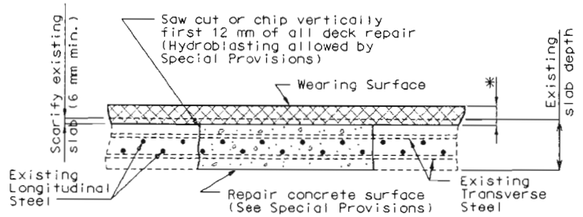
Sheet No. 1 of 12

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

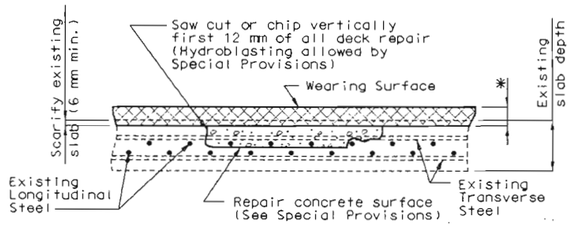
State	Proj. No.	Sheet No.
MO		347
Sec./Sur. 13	Twp. 48N	Rge. 33W



SECTION THRU SLAB

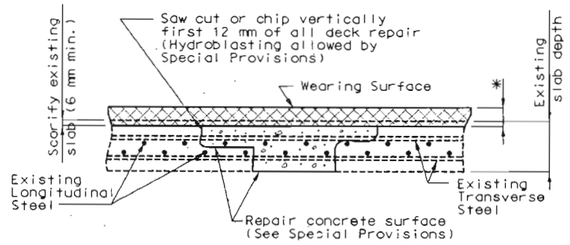


FULL DEPTH REPAIR



HALF-SOLED AREA

* 63 mm (Min.) Low Slump Concrete Wearing Surface

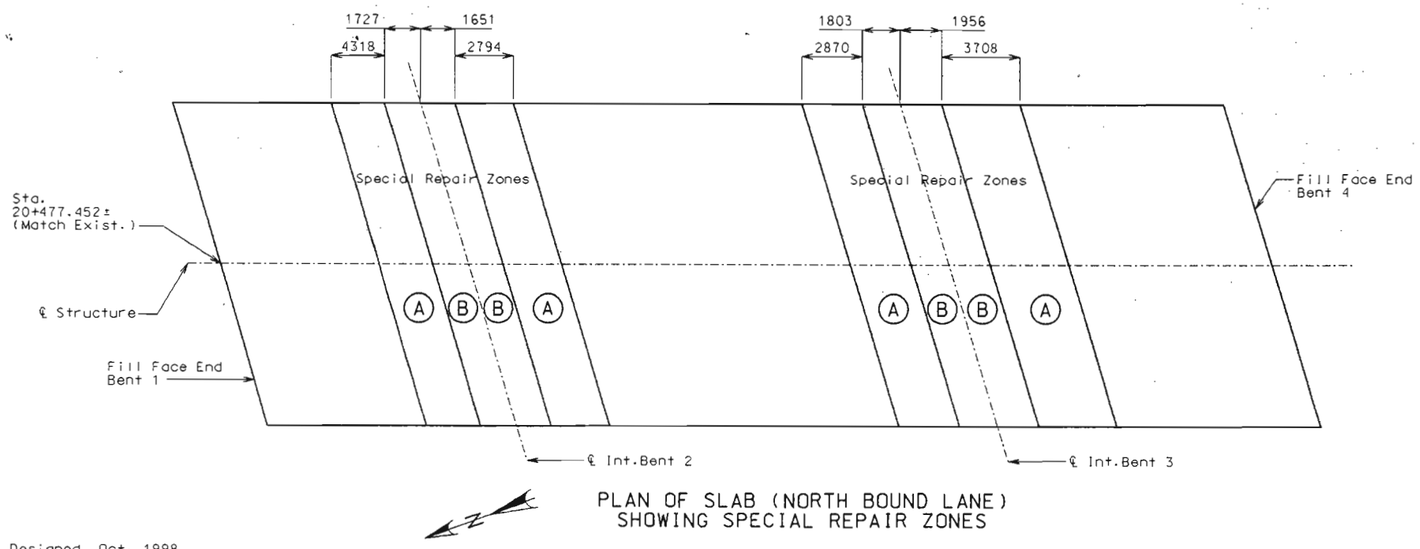


FULL DEPTH REPAIR
IN HALF-SOLED AREA

NOTE:
Zone A is to be completed before Zone B.

Any repair in the remainder of the bridge that is within 600 mm of Zone A shall be completed before removing old concrete in Zone A.

Zones with the same letter designation may be repaired at the same time.



PLAN OF SLAB (NORTH BOUND LANE)
SHOWING SPECIAL REPAIR ZONES

General Notes:

Design Specifications:
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Design Unit Stresses:
Class B1 Concrete (Curb Blockout) 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.

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

Roadway surfacing adjacent to bridge ends to match bridge overlay (Roadway Item).

ESTIMATED QUANTITIES

ITEM		TOTAL
Curb Removal (Bridges) - Metric	meter	7.0
Removal of Low Slump Concrete Wearing Surface - Metric	sq. meter	764.6
Partial Removal of Cathodic Protection System	lump sum	1
Substructure Repair (Unformed) - Metric	sq. meter	2.0
Superstructure Repair (Unformed) - Metric	sq. meter	2.0
Curb Blockout - Metric	meter	110.0
Repairing Concrete Deck (Half-Soling) - Metric	sq. meter	45
Full Depth Repair - Metric	sq. meter	5
Slab Edge Repair (Bridges) - Metric	meter	1.0
Low Slump Concrete Wearing Surface - Metric	sq. meter	765
Cathodic Protection System	lump sum	1

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23578
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

Designed Oct. 1998
Detailed Oct. 1998
Checked Oct. 1998

Sheet No. 1 of 12

REPAIRS TO BRIDGE OVER OLDHAM ROAD

STATE ROAD FROM GREGORY BLVD. TO BANNISTER RD.
ABOUT 1.6 km SW OF GREGORY BLVD.

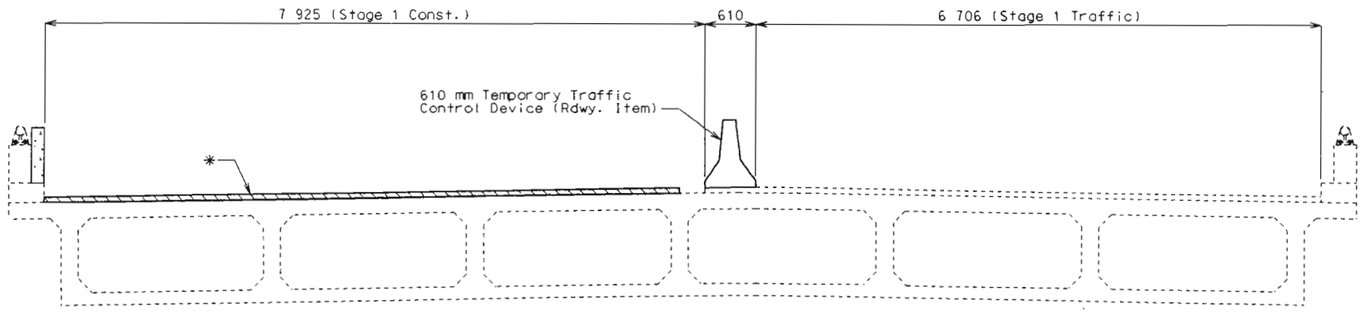
PROJECT NO.
JOB. NO. J4I1299

STA. 20+477.452 ± (Match Exist.)
RTE. I-435 (N.B.L.)

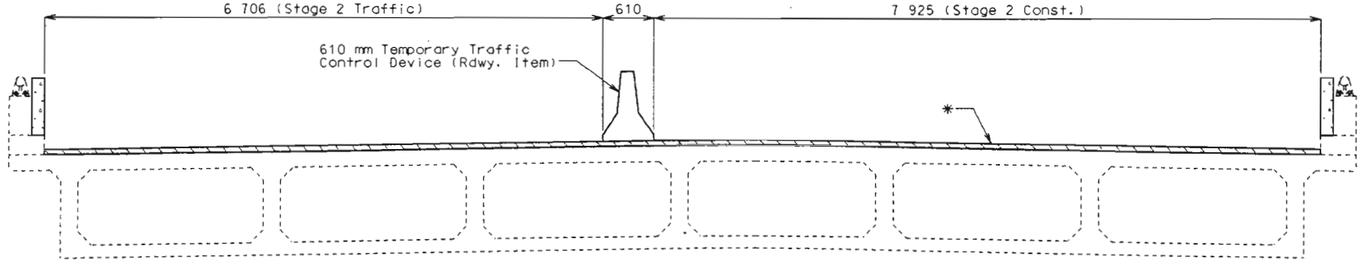
JACKSON COUNTY
Date: 11/19/98

STD.	
STD.	
STD.	
STD. M706.35	
A16403	

State	Proj. No.	Sheet No.
MO		368



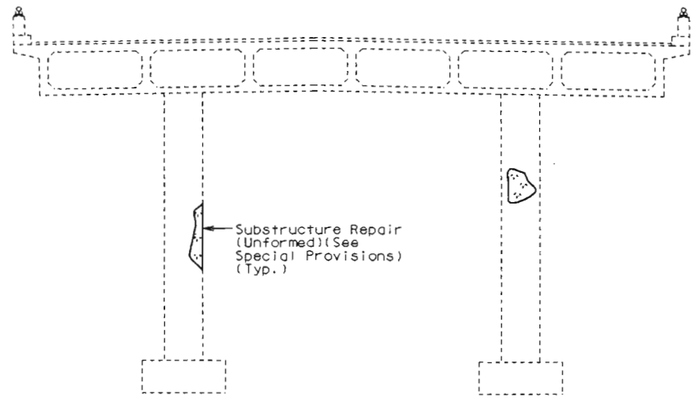
STAGE 1 CONSTRUCTION



STAGE 2 CONSTRUCTION

DETAILS OF STAGE CONSTRUCTION

* Remove existing Concrete overlay and Cathodic Protection System. Scarify concrete deck 6 mm and install a new Cathodic Protection System covered with a 63 mm (Min.) Low Slump Concrete wearing surface.



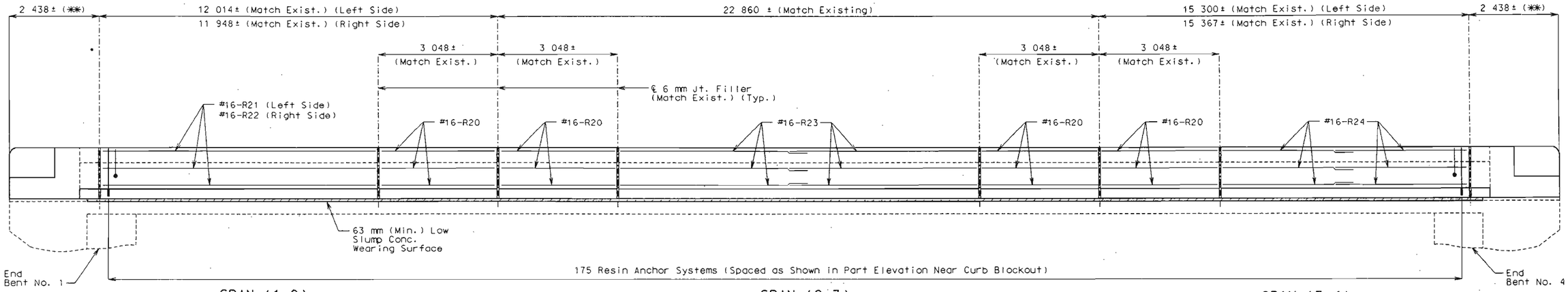
TYPICAL DETAIL SHOWING SUBSTRUCTURE REPAIR AREAS

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

Detailed Oct. 1998
Checked Oct. 1998

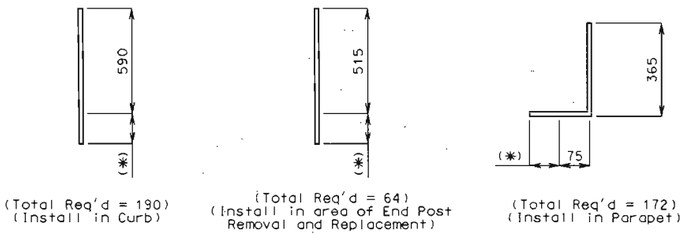
State	Proj. No.	Sheet No.
MO		1369



SPAN (1-2)

SPAN (2-3)

SPAN (3-4)



(Total Req'd = 190)
(Install in Curb)

(Total Req'd = 64)
(Install in area of End Post Removal and Replacement)

(Total Req'd = 172)
(Install in Parapet)

DETAILS OF RESIN ANCHORS

SECTION NEAR LEFT CURB BLOCKOUT (RIGHT SIDE SIMILAR, EXCEPT AS SHOWN)

NOTE: (**) For End Post details, see sheet No. 4.

NOTE: (*) Manufacturer's embedment length.

(***) Shift resin anchor systems to clear Exist. steel anchor bolts for tube rail.

NOTES FOR CURB BLOCKOUT:

Concrete in curb blockout shall be Class B1 with f'c = 28 MPa.

Measurement of curb blockout is to the nearest half meter measured at the gutter line from end of wing to end of wing.

All exposed edges of curb blockout shall have either a 15 mm radius or a 10 mm bevel, unless otherwise shown.

Payment for concrete, reinforcing steel, resin anchor systems and any other work incidental to the curb blockouts complete in place shall be included in the contract unit price for the "Curb Blockout" per meter.

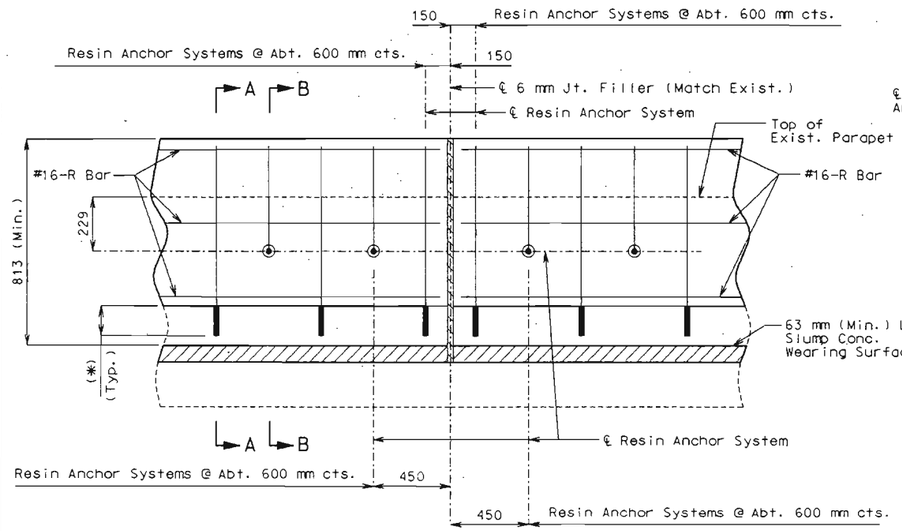
Use a minimum lap of 925 mm for #16 horizontal Curb Blockout bars.

Cost of any concrete curb and parapet repair shall be considered completely covered in the unit price bid for Curb Blockout.

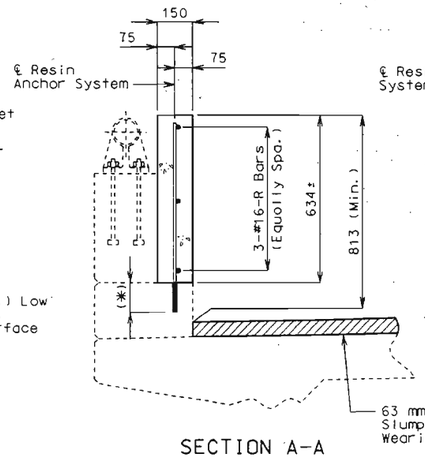
NOTES FOR RESIN ANCHOR SYSTEM:

The contractor shall use one of the resin anchor systems listed in the job special provisions. These resin anchor systems shall be installed according to the manufacturer's specifications, except as modified by the job special provisions and that a #16 Grade 420 (Epoxy Coated) reinforcing bar as shown shall be substituted for the 15.9 mm diameter threaded rod stud.

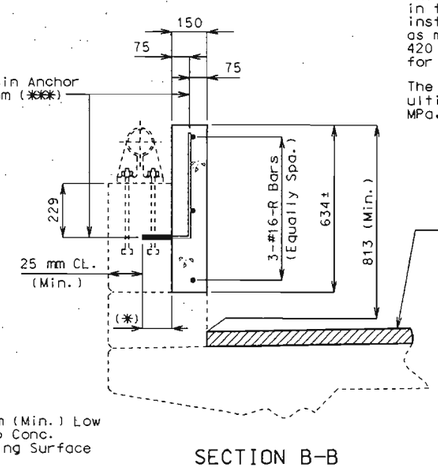
The 15.9 mm diameter resin anchor systems shall have a minimum ultimate pullout strength of 68.9 KN in concrete with f'c = 28 MPa, see special provisions.



PART ELEVATION NEAR CURB BLOCKOUT

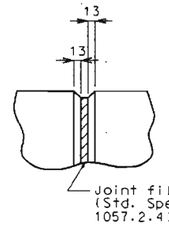


SECTION A-A



SECTION B-B

DETAILS OF CURB BLOCKOUT



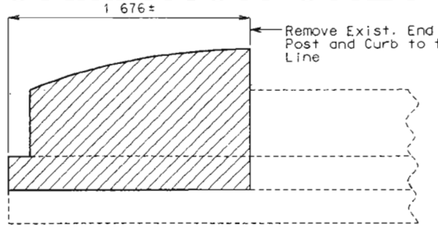
FILLED JOINT DETAIL

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23578
REGISTERED PROFESSIONAL ENGINEER

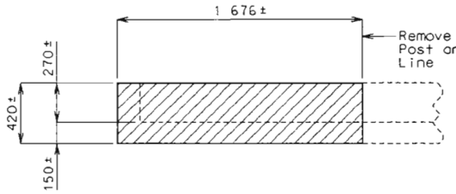
DATE 11-19-98

Detailed Oct. 1998
Checked Oct. 1998

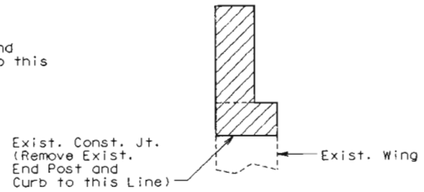
State	Proj. No.	Sheet No.
MO		B 70



ELEVATION SHOWING END POST REMOVAL



PLAN SHOWING END POST REMOVAL



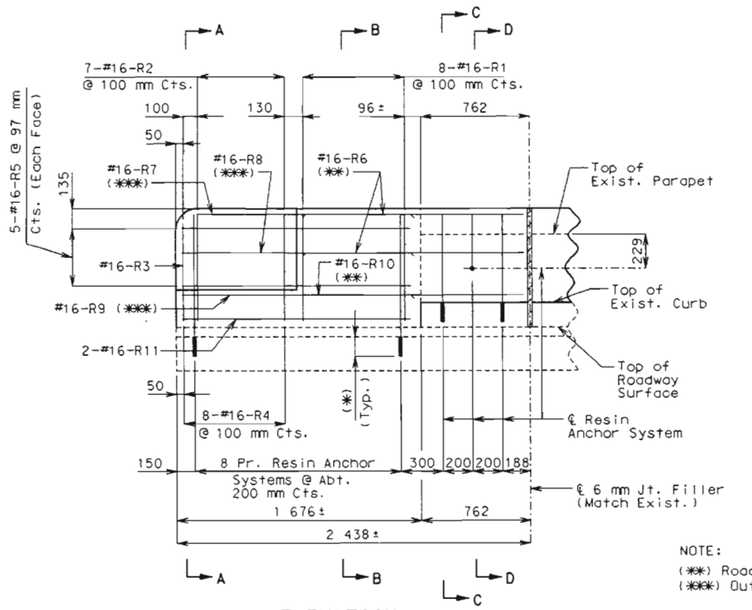
SECTION SHOWING END POST REMOVAL

NOTE:

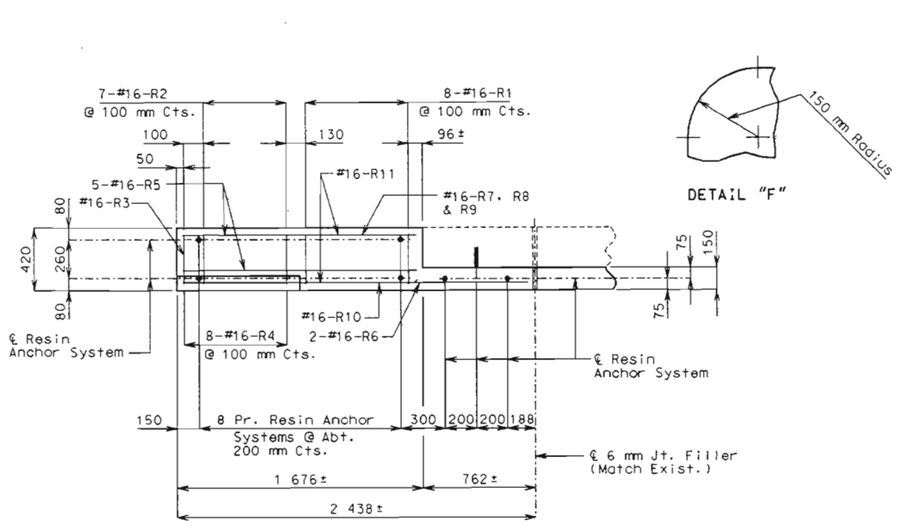
For notes on Curb Blockout and Resin Anchor Systems, see sheet No. 3.

(✱) Manufacturer's embedment length.

Payment for removal of existing end post and curb concrete is included in the contract unit price for "Curb Removal (Bridges) - Metric" per meter.



ELEVATION

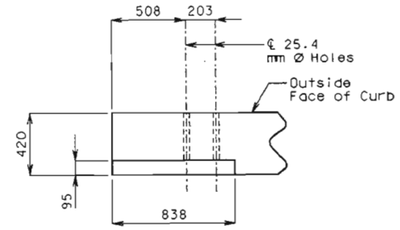


PLAN

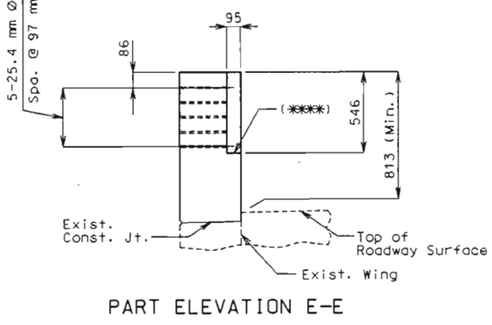
DETAIL "F"

NOTE:

(✱✱) Roadway Face
(✱✱✱) Outside Face

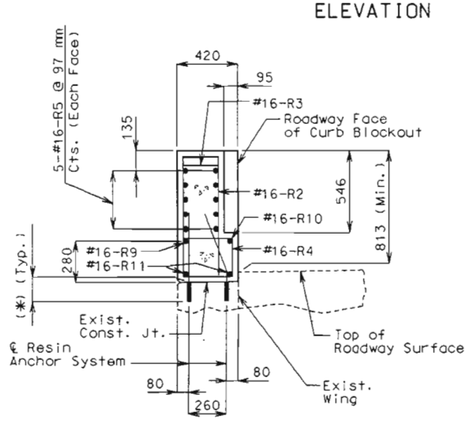


PART PLAN



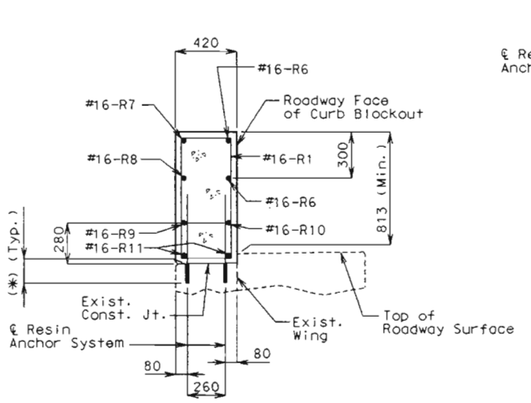
PART ELEVATION E-E

(✱✱✱✱) Slope 6 mm toward Roadway



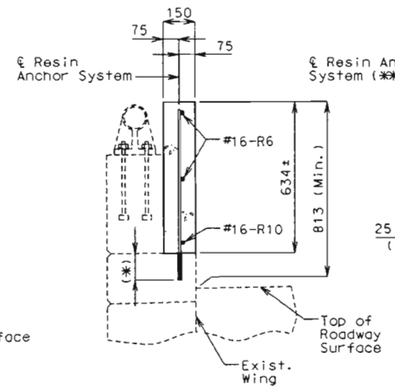
SECTION A-A

NOTE: #16-R6, R7 & R8 Bars not shown for clarity.

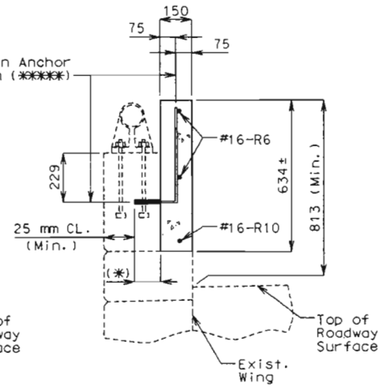


SECTION B-B

NOTE: #16-R5 Bars not shown for clarity.



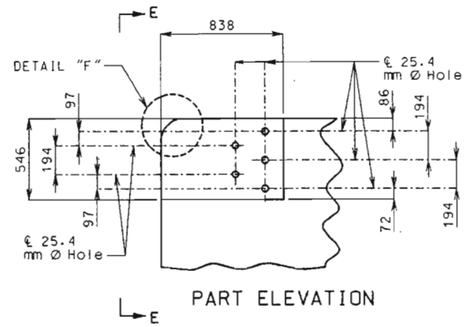
SECTION C-C



SECTION D-D

NOTE:

(✱✱✱✱✱) Shift resin anchor systems to clear Exist. steel anchor bolts for tube rail.



PART ELEVATION

DETAILS OF GUARD RAIL ATTACHMENT

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

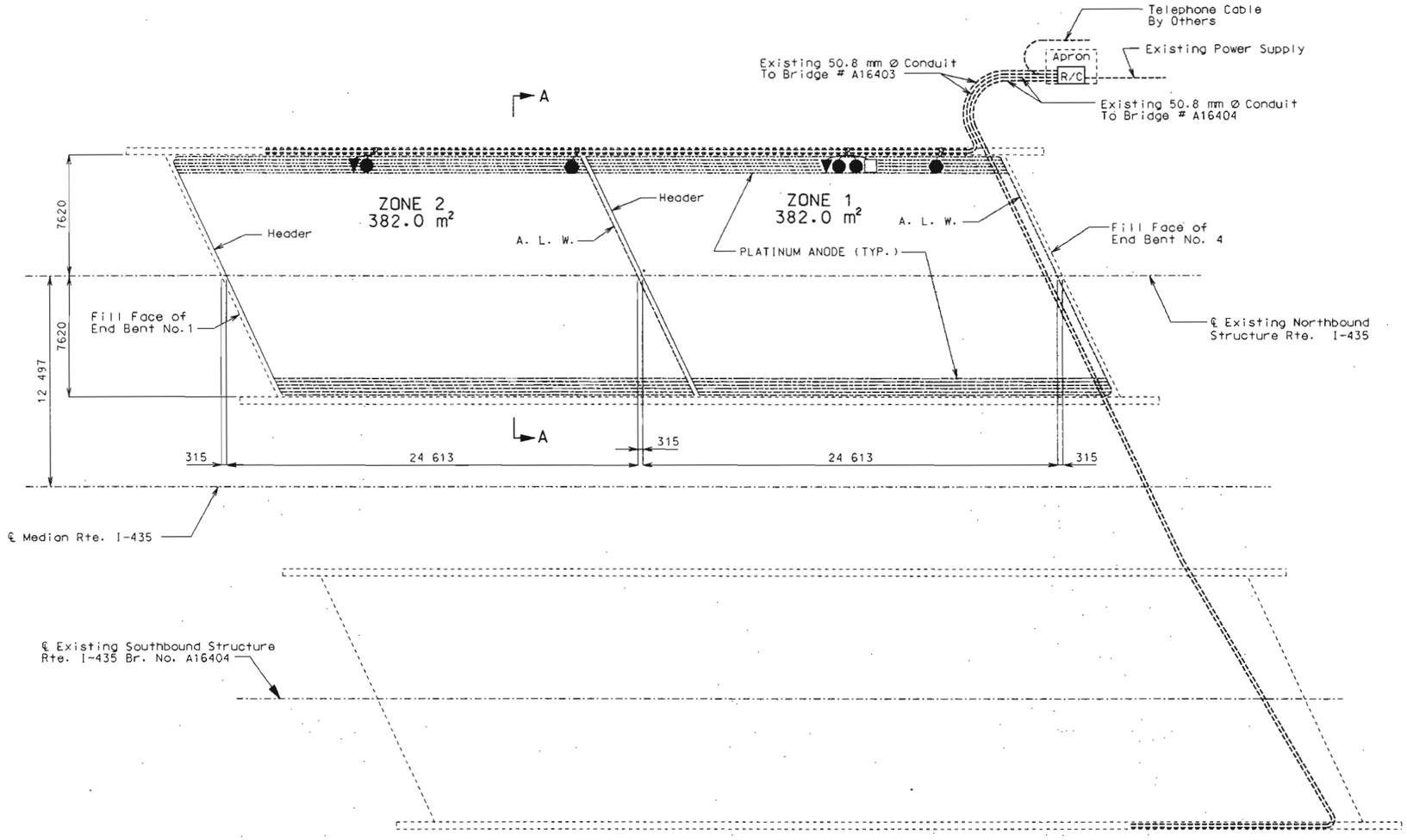
TYPICAL DETAILS OF CURB BLOCKOUT AT END POST

Detailed Oct. 1998
Checked Oct. 1998

JACKSON COUNTY

A16403

State	Proj. No.	Sheet No.
MO		137



PART PLAN OF SLAB SHOWING PLATINUM CATHODIC PROTECTION SYSTEM (ALTERNATE "A")

Note:

For Section A-A, typical zone layout and partial electrical schematic, see sheet no. 7.

Dimensions are along ℄ of structure (end of slab to end of slab).

The anode lead wire and header shall be 6.0 mm² stranded copper wire with HMWPE insulation.

Factory supplied field splices will be permitted between stages on the anode lead wire (A.L.W.) and header as directed by the engineer.

Existing overlay and cathodic protection system shall be removed and the deck scarified prior to sawing slots. (see special provisions).

DENOTATIONS

- A.L.W. (ANODE LEAD WIRE)
- HEADER
- PLATINUM ANODE
- SYSTEM NEGATIVE CONNECTION
- REFERENCE CELL
- GROUNDS
- NULL PROBE (CORROSOMETER)
- EXISTING CONDUIT

NOTE:

The anode leads, system negative return leads, reference cell, reference cell ground lead, null probe and null probe ground lead shall be routed in one of the existing conduits.

All existing wiring in the deck and conduits shall be removed and replaced with new.

The telephone cable shall be routed into the rectifier through one of the unused existing conduits.

Reference cells are to be placed between anodes.

U.I.P. existing conduit, access fittings and junction boxes.

The reference cell ground lead shall be welded to the top rebar within 300 mm of the reference cell.

Anode assembly number must match zone number.

Existing access holes through deck not used with the new cathodic protection system shall have its plastic sleeve and silicon sealant removed, hole cleaned and plugged with a nonmetallic expansive mortar in accordance with Std. Spec. 1066.

ESTIMATED QUANTITIES	For information only	
ITEM	UNIT	QUANTITY
Anode Lead Wire & Header	Meters	101
Platinum Anodes	Meters	3741
Reference Cells	Each	2
Null Probes	Each	1
Thermite Welds	Each	5

Note: Anode lengths are approximate, actual lengths are the responsibility of the contractor.
No direct payment shall be made for any additional conduit, junction boxes, access fittings, additional material, labor and modification to existing conduit.

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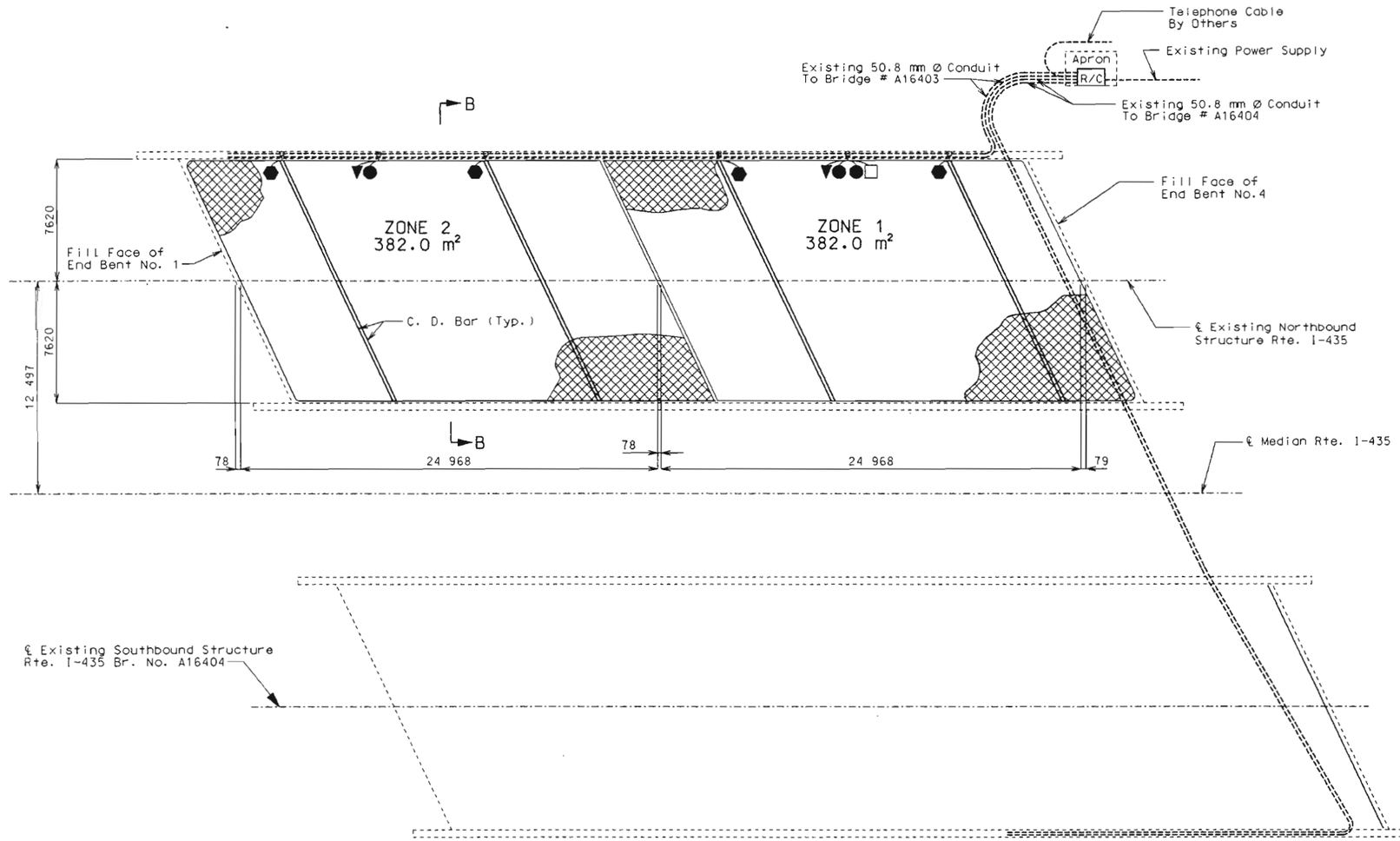
State	Proj. No.	Sheet No.
MO		G 72



DENOTATIONS

- ELGARD ANODE MESH
- SYSTEM NEGATIVE CONNECTION
- REFERENCE CELL
- GROUNDS
- NULL PROBE (CORROSOMETER)
- EXISTING CONDUIT

NOTE:
The anode leads, system negative return leads, reference cell, reference cell ground lead, null probe and null probe ground lead shall be routed in one of the existing conduits.

All existing wiring in the deck and conduits shall be removed and replaced with new.

The telephone cable shall be routed into the rectifier through one of the unused existing conduits.

Reference cells are to be placed between anodes.

U.I.P. existing conduit, access fittings and junction boxes.

The reference cell ground lead shall be welded to the top rebar within 300 mm of the reference cell.

Anode assembly number must match zone number.

Existing access holes through deck not used with the new cathodic protection system shall have its plastic sleeve and silicon sealant removed, hole cleaned and plugged with a nonmetallic expansive mortar in accordance with Std. Spec. 1066.

ESTIMATED QUANTITIES	For information only	
ITEM	UNIT	QUANTITY
Elgard Anode Mesh (210)	Sq. Meters	761
Reference Cells	Each	2
Null Probes	Each	1
Thermite Welds	Each	7

Note: Anode lengths are approximate, actual lengths are the responsibility of the contractor.
No direct payment shall be made for any additional conduit, junction boxes, access fittings, additional material, labor and modification to existing conduit.

PART PLAN OF SLAB SHOWING ELGARD MESH CATHODIC PROTECTION SYSTEM (ALTERNATE "B")

Note:
For Section B-B, typical zone layout and partial electrical schematic, see sheet no. 8.

Dimensions are along ℄ of structure (end of slab to end of slab).

Existing overlay and cathodic protection syatem shall be removed and the deck scarified prior to sawing slots. (see special provisions)

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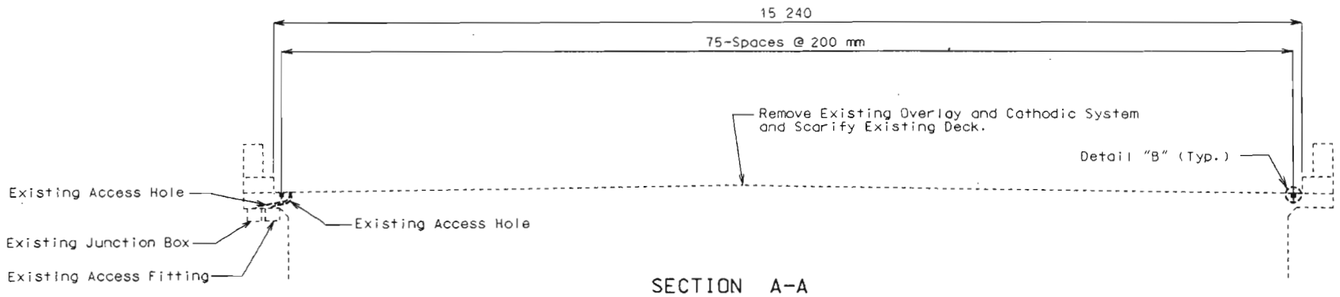
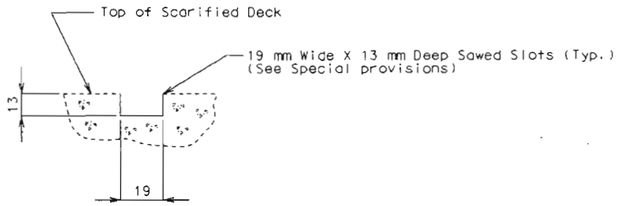
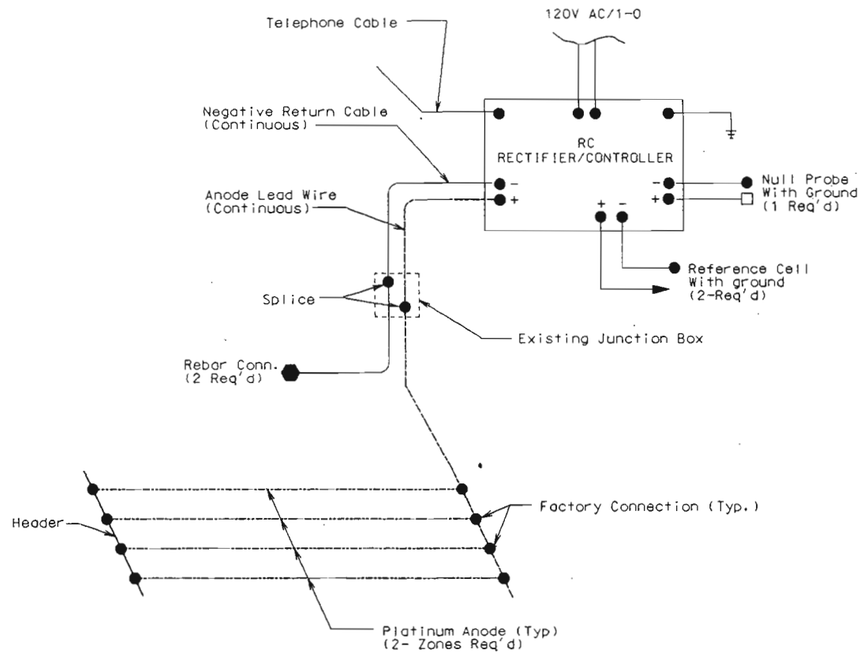
MO		373



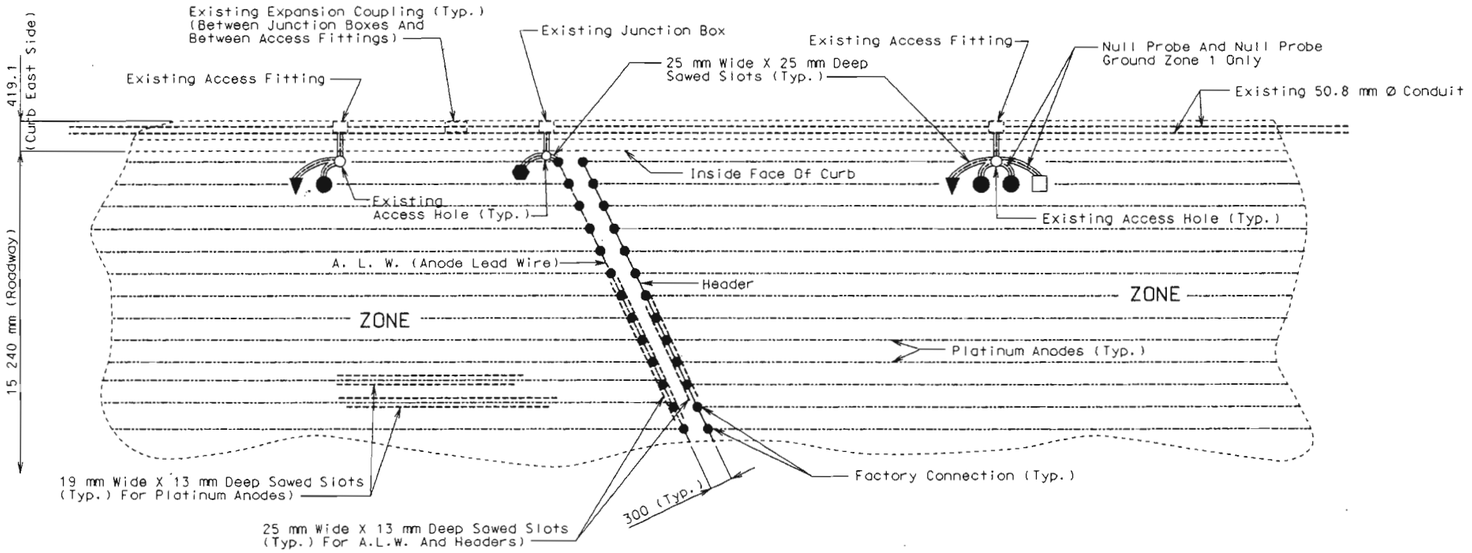
SECTION A-A
(At Alternate "A")
Note: For location of section A-A see sheet no. 5.



DETAIL "B"



PARTIAL SCHEMATIC
(ALTERNATE "A")



TYPICAL ZONE LAYOUT, EXCEPT AS NOTED, FOR (ALTERNATE "A") SYSTEM

Note: Anodes shall be placed as shown with a minimum tolerance of plus or minus 75 mm. Use existing access holes, access fittings and junction boxes where acceptable as determined by the engineer.

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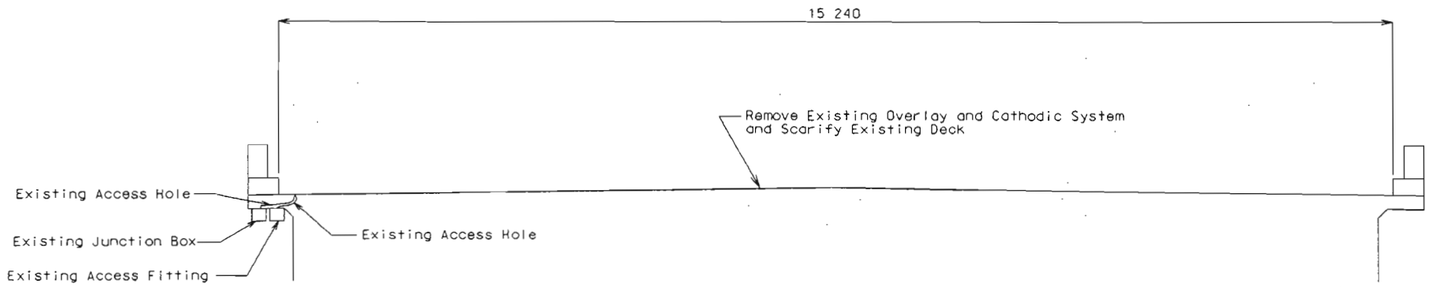
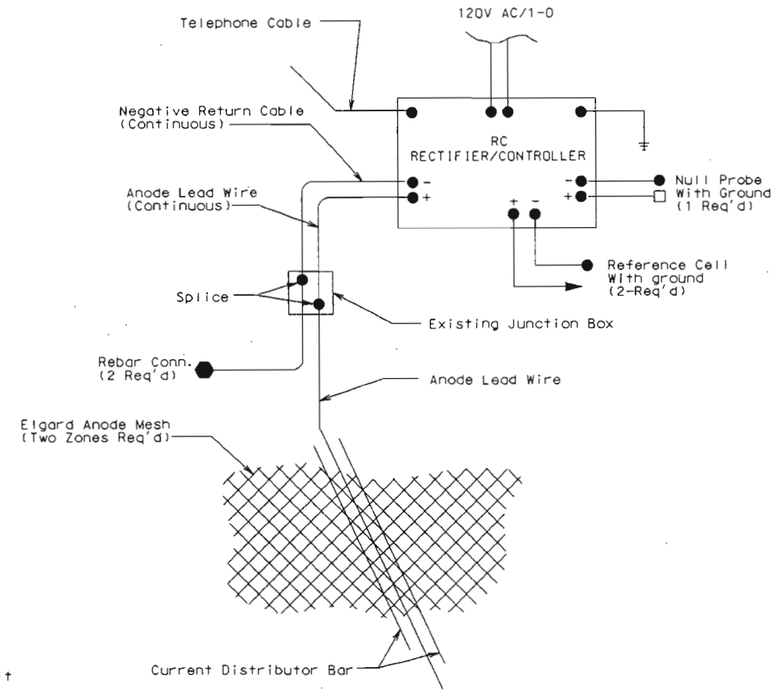
State	Proj. No.	Sheet No.
MO		37f



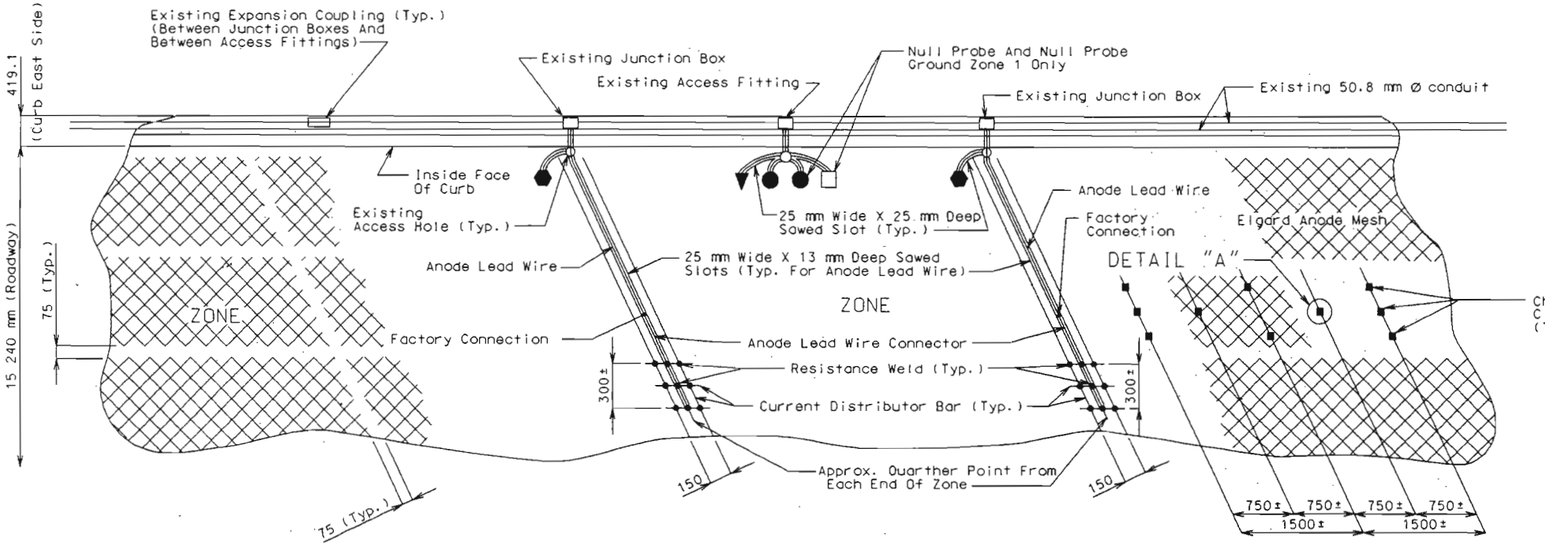
SECTION B-B

(At Alternate "B")

Note: For location of section B-B see sheet no. 6.

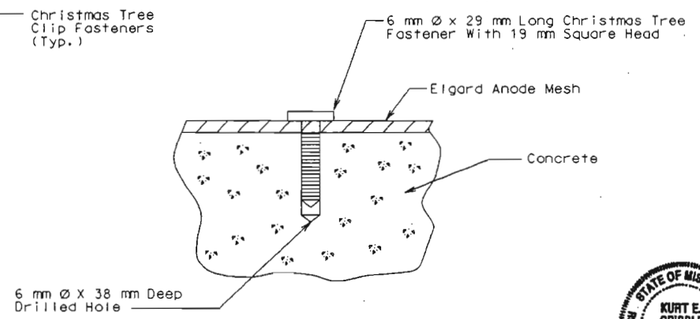


PARTIAL SCHEMATIC
(ALTERNATE "B")



TYPICAL ZONE LAYOUT, EXCEPT AS NOTED, FOR (ALTERNATE "B") SYSTEM

Note: Use existing access holes, access fittings and junction boxes where acceptable as determined by the engineer.



DETAIL "A"

(Christmas Tree Clip)

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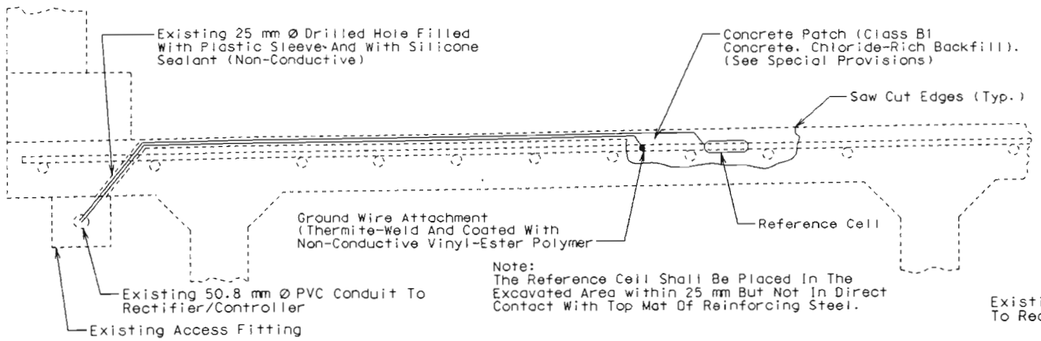
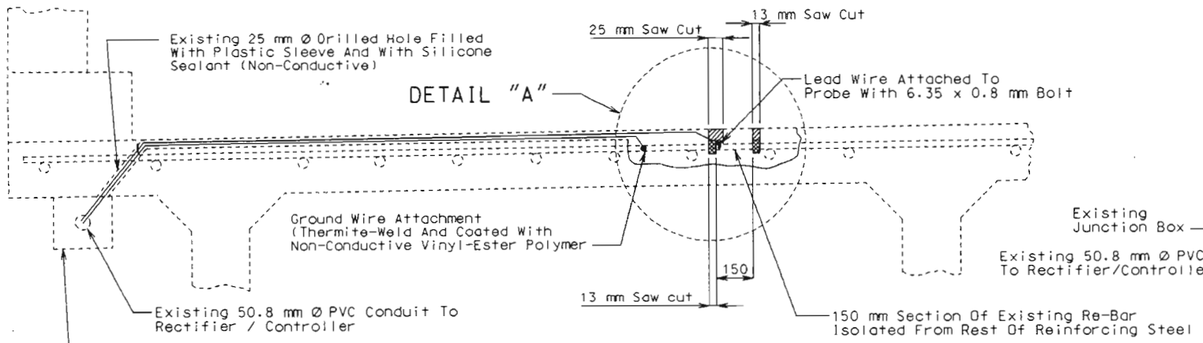
State	Proj. No.	Sheet No.
MO		1375

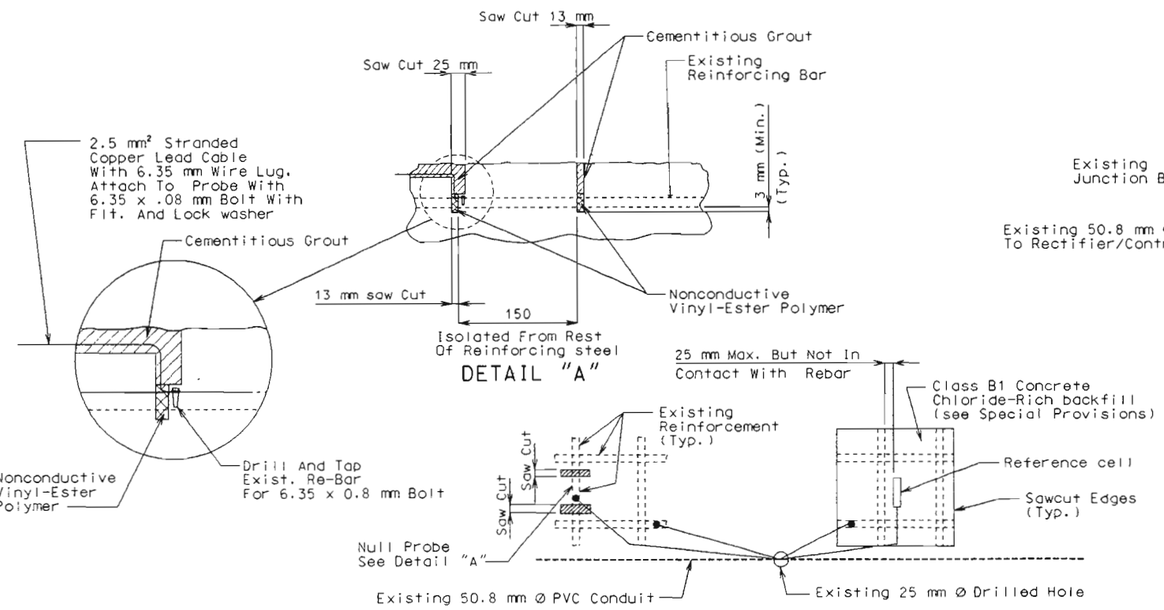


REFERENCE CELL DETAILS

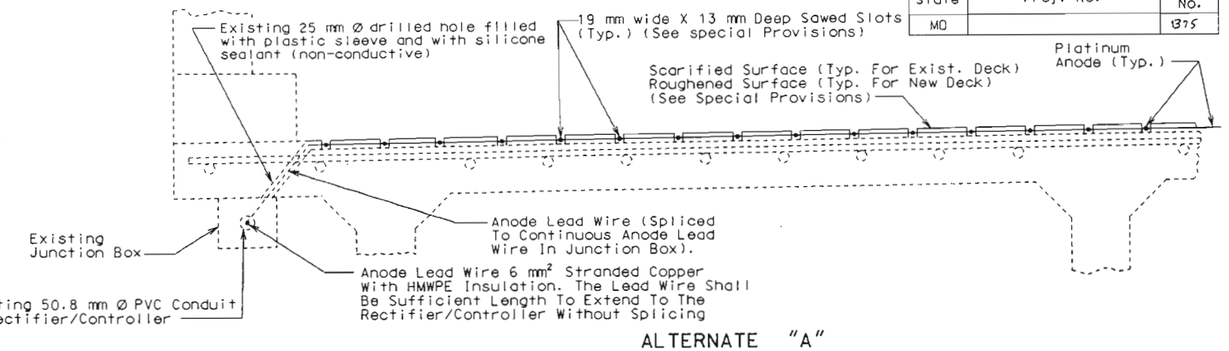
Note:
All concrete removal shall be intiated by saw cutting the first 13 mm.



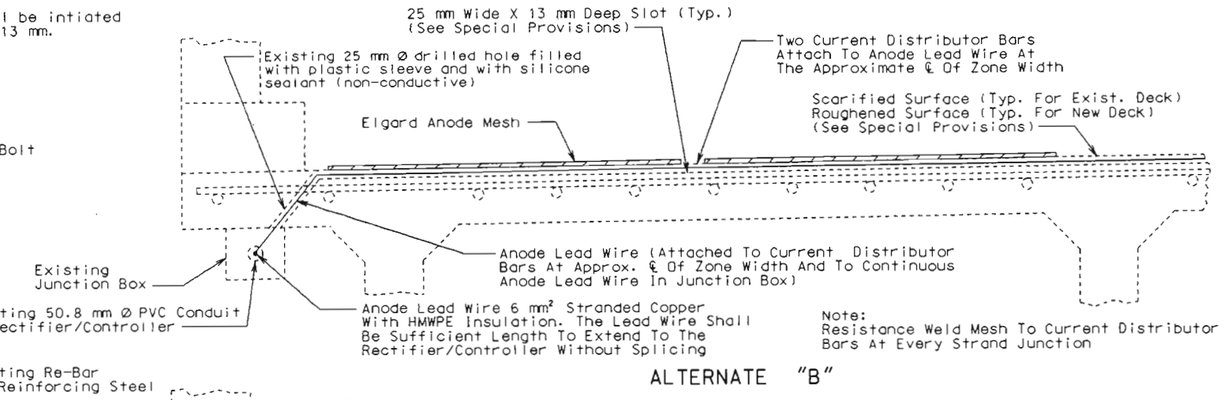
NULL PROBE DETAILS



PLAN OF NULL PROBE AND REFERENCE CELL

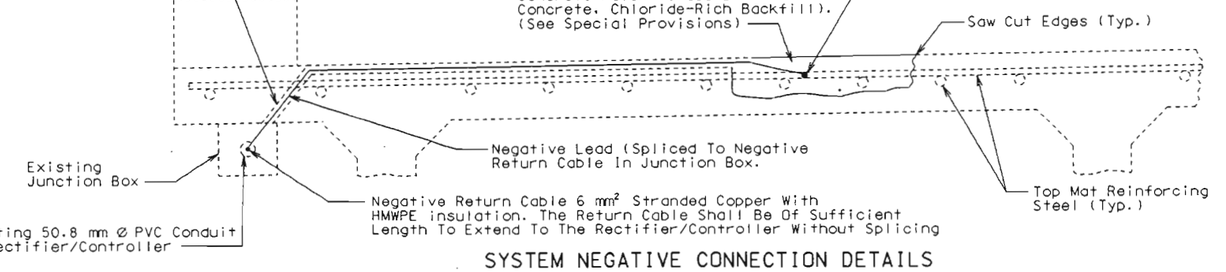


ALTERNATE "A"



Note:
Resistance Weld Mesh To Current Distributor Bars At Every Strand Junction

ALTERNATE "B"



SYSTEM NEGATIVE CONNECTION DETAILS

Notes for New Conduit and Appurtenances (if required):
Conduit shall be schedule 40 heavy wall PVC (Polyvinyl Chloride Plastic). Each section of conduit shall bear the underwriters laboratories, inc. (UL) label.

Conduit shall be secured to concrete with clamps (galvanized/AASHTO M111) at abt. 1500 mm cts. Concrete anchors for clamps shall meet federal specification FF-S-325, group II, type 4, class I and shall be galvanized in accordance with ASTM A-153, B695-91 class 50 or stainless steel. Minimum embedment in concrete shall be 45 mm. The supplier shall furnish a manufacturers certification that the concrete anchors meet the required material and galvanizing specifications.

Weepholes shall be provided at appropriate locations to drain any moisture in the conduit lines.

Expansion couplings shall be installed on conduit lines between all junction boxes and between all access fittings as approved by the engineer.

The location and direction of conduit may be shifted to meet field conditions as directed by the engineer.

All junction boxes shall be PVC molded, surface mounted, size 200 mm x 200 mm x 175 mm and equal to Carlon Electrical Construction products or Triangle Conduit and Cable company Inc.. The terminations shall be permanent or seperable.

The terminations and covers shall be of watertight construction.

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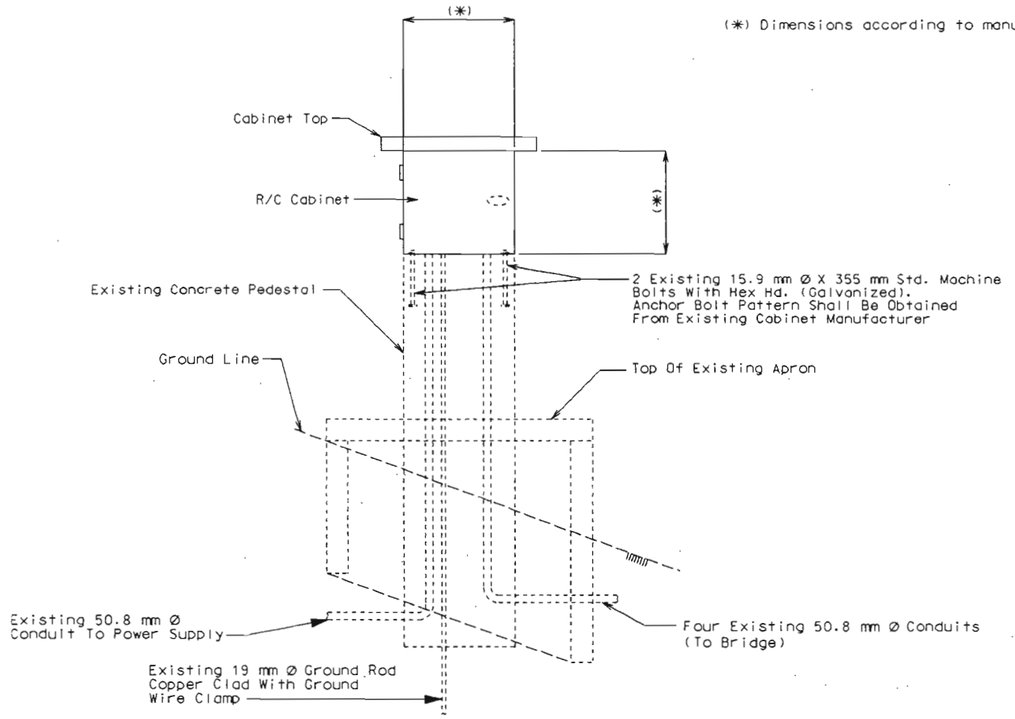
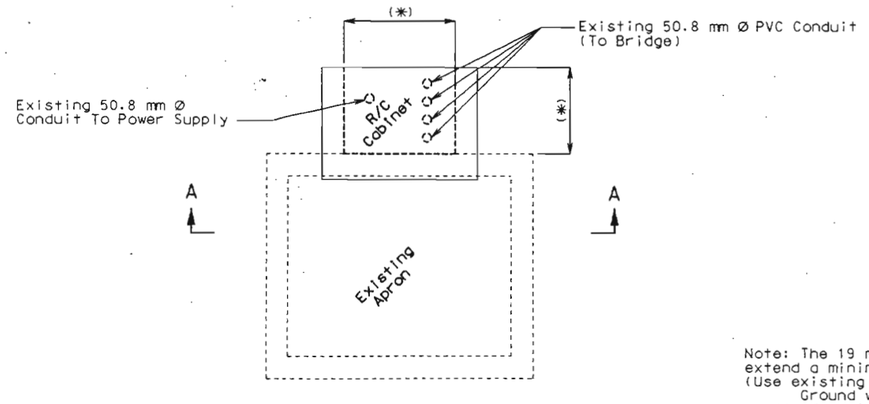


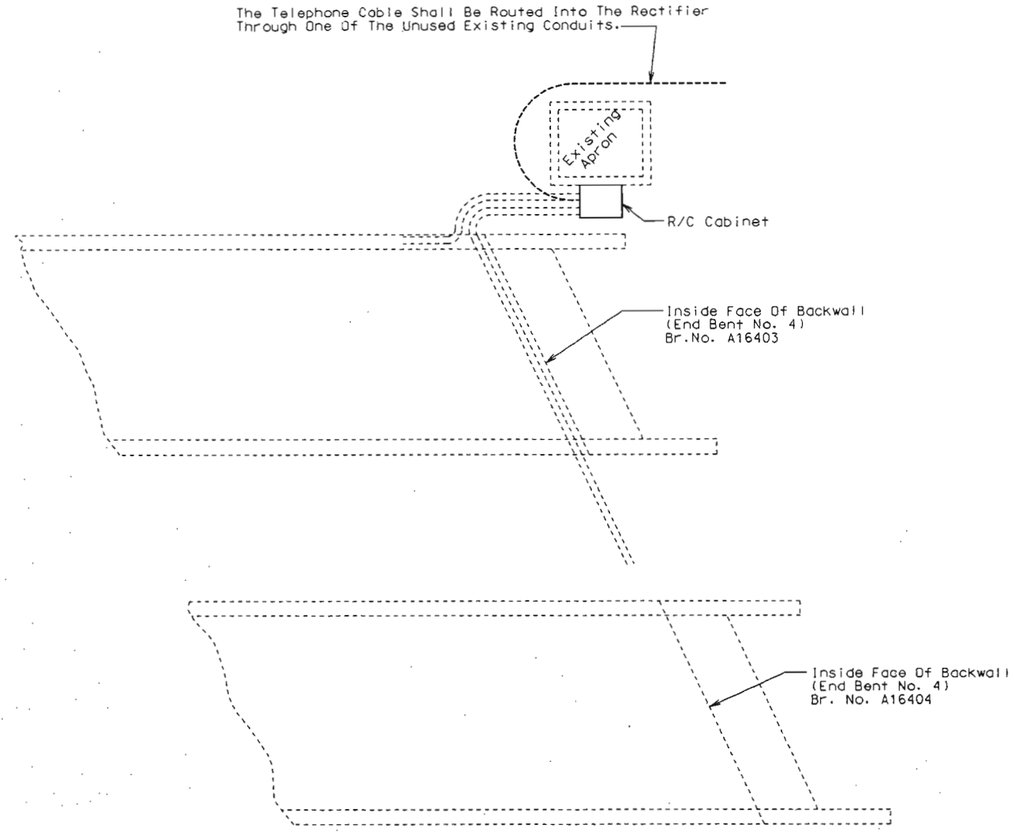
SECTION A-A

(*) Dimensions according to manufactured cabinet.



PLAN

Note: The 19 mm Ø ground rod shall be of sufficient length to extend a minimum of 3050 mm below bottom of concrete pedestal. (Use existing if approved by the engineer).
Ground wire shall be 16 mm² minimum (Use existing if approved by the engineer.
Knockouts or drilled holes shall be provided in cabinets for all conduit. Locations of these holes are the responsibility of the contractor and cabinet manufacturer.



PLAN LOCATION OF RECTIFIER/CONTROLLER

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KURT E. GRIBBLE NUMBER E-23576
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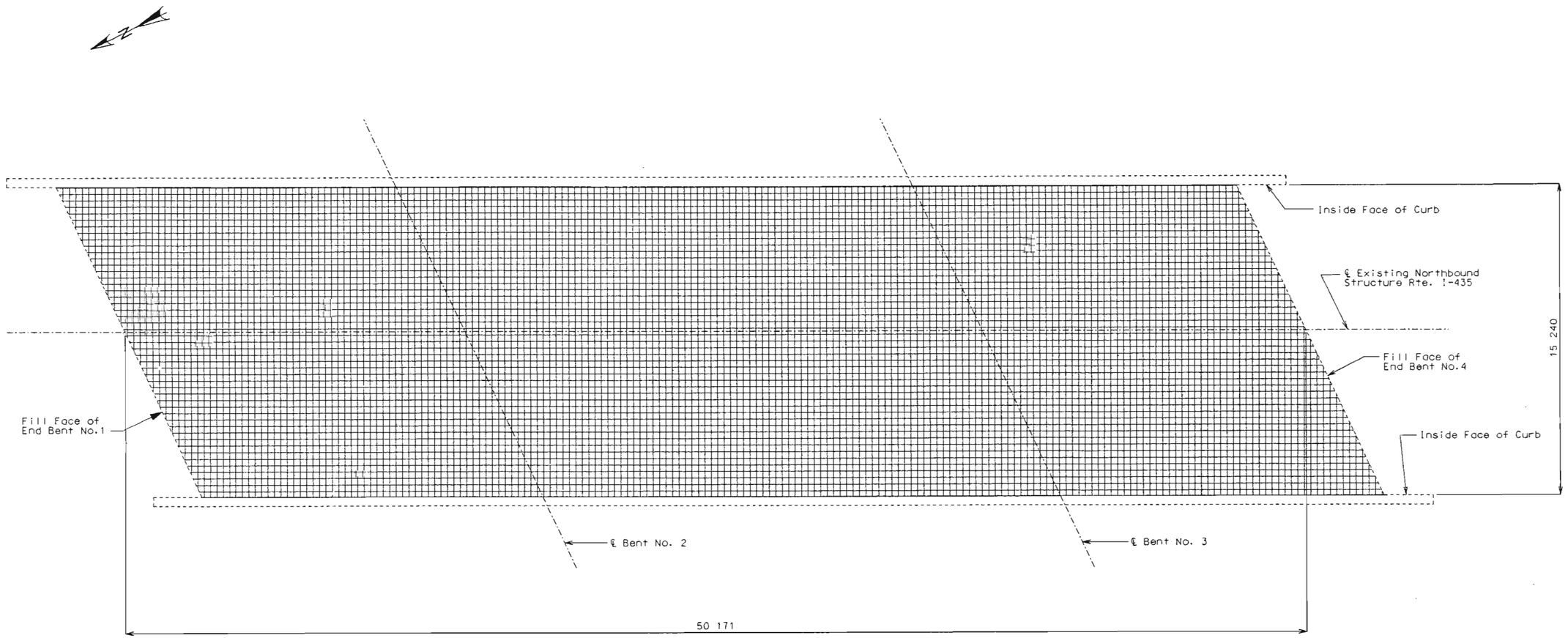
MO		37



PLAN OF CONCRETE DECK SHOWING GRID

(For location of deck repair, reference cells and null probes)

Note: This sheet is to be completed by MoDOT construction personnel.

Note: Grid = Approx. 310 mm Squares
Drawing Scale = 1:100 mm/mm

REPAIRS TO BRIDGE A-1640 (N.B.L.)
OVER OLDHAM ROAD

STATE OF MISSOURI
KURT E. GRIBBLE
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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
			CURB																
			BLOCKOUT																
32	16	R1	BLOCKOUT	E	13	S				340	795	340	795				2550	2450	122
28	16	R2	BLOCKOUT	E	13	S				245	795	245	795				2360	2260	98
4	16	R3	BLOCKOUT	E	13	S				245	730	245	730				2230	2130	13
32	16	R4	BLOCKOUT	E	13	S				340	250	340	250				1460	1360	68
40	16	R5	BLOCKOUT	E	20					1595							1595	1595	99
8	16	R6	BLOCKOUT	E	20					1520							1520	1520	19
4	16	R7	BLOCKOUT	E	20					1485							1485	1485	9
4	16	R8	BLOCKOUT	E	20					1595							1595	1595	10
4	16	R9	BLOCKOUT	E	20					1595							1595	1595	10
4	16	R10	BLOCKOUT	E	20					2355							2355	2355	15
8	16	R11	BLOCKOUT	E	20					1595							1595	1595	20
24	16	R20	BLOCKOUT	E	20					2965							2965	2965	110
3	16	R21	BLOCKOUT	E	20					8885							8885	8885	41
3	16	R22	BLOCKOUT	E	20					8820							8820	8820	41
12	16	R23	BLOCKOUT	E	20					8805							8805	8805	164
14	16	R24	BLOCKOUT	E	20					6585							6585	6585	143

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

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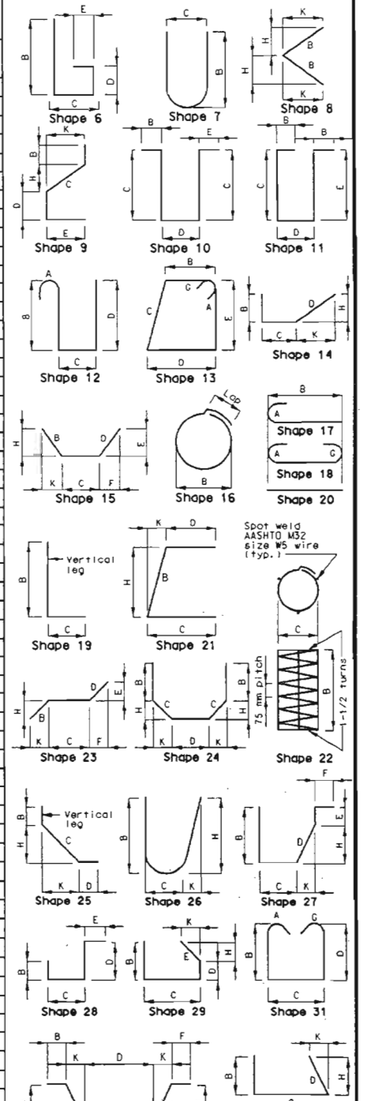
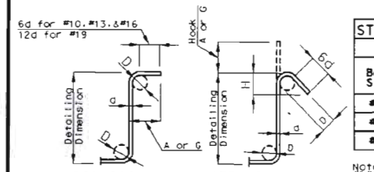


BENDING DIAGRAMS



Detailed Oct. 1998
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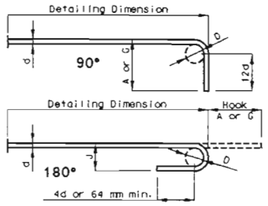
STIRRUP HOOK DIMENSIONS (mm) Grades 300 & 420 MPa				
Bar Size	D	90° Hook A or G	135° Hook A or G	135° Hook Approx. H
#13	50	115	115	80
#16	65	155	140	95
#19	115	305	205	115

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



END HOOK DIMENSIONS (mm)				
		All Grades		
Bar Size	D	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	206	425
#29	240	375	300	475
#32	275	426	335	550
#36	305	475	375	600
#43	465	675	550	775

Two additional #16-R24 Bars 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

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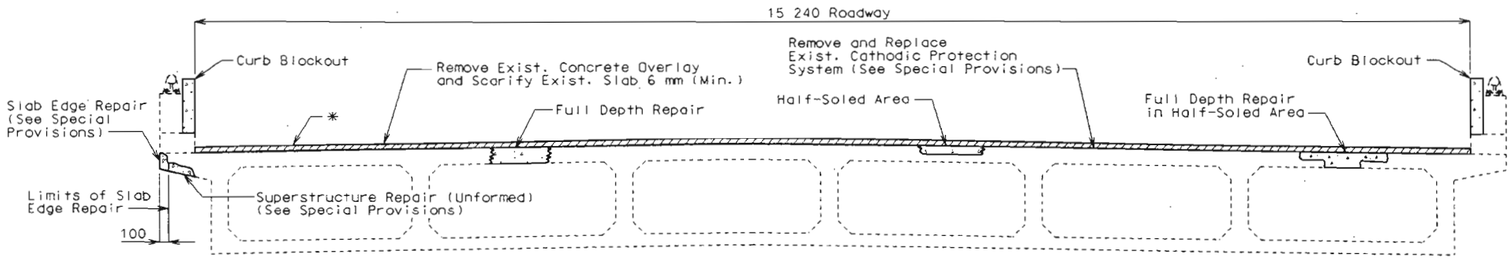
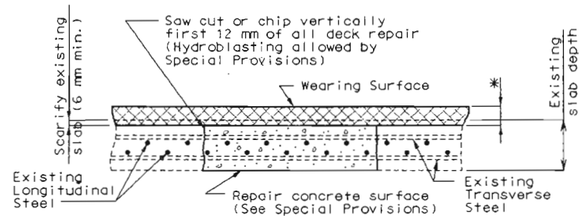
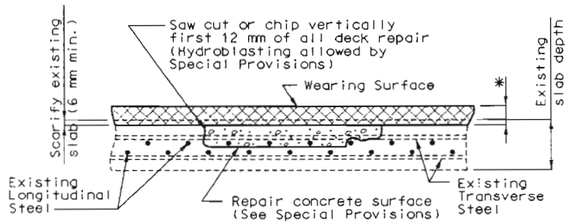


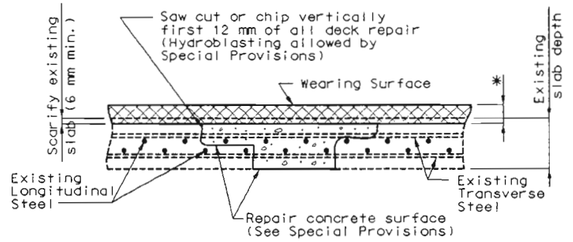
SECTION THRU SLAB



FULL DEPTH REPAIR



HALF-SOLED AREA



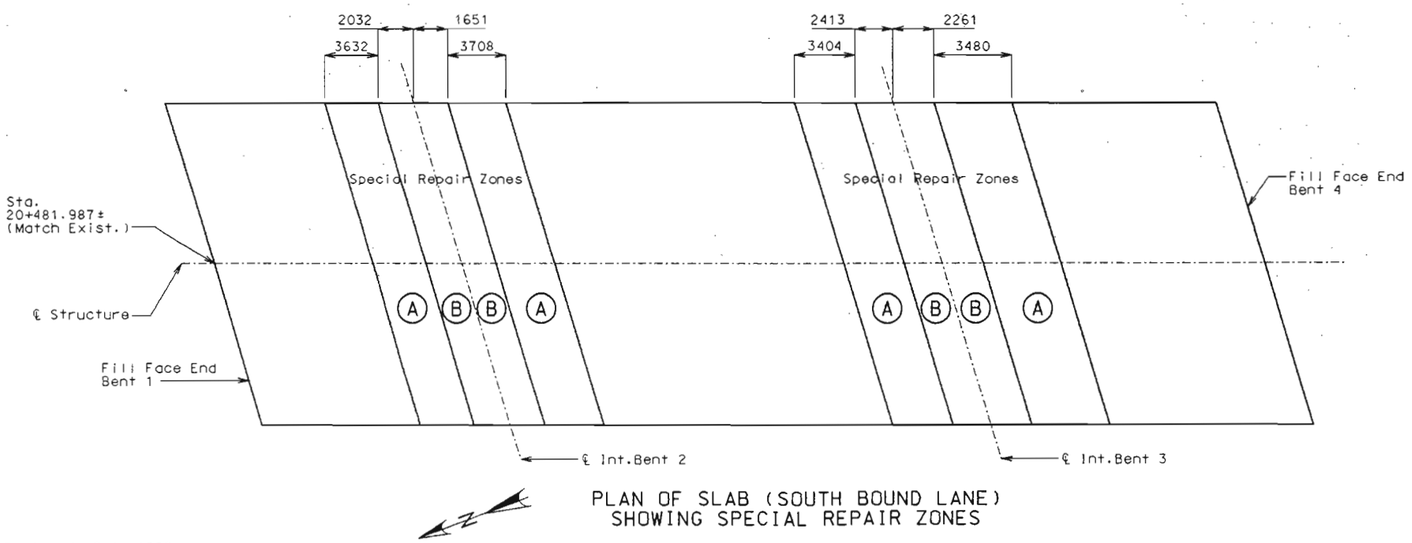
FULL DEPTH REPAIR
IN HALF-SOLED AREA

* 63 mm (Min.) Low Slump Concrete Wearing Surface

NOTE:
Zone A is to be completed before Zone B.

Any repair in the remainder of the bridge that is within 600 mm of Zone A shall be completed before removing old concrete in Zone A.

Zones with the same letter designation may be repaired at the same time.



PLAN OF SLAB (SOUTH BOUND LANE)
SHOWING SPECIAL REPAIR ZONES

General Notes:

Design Specifications:

AASHTO 1996 and Interim 1997.

Design Unit Stresses:

Class B1 Concrete (Curb Blockout) 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.

Dimensions:

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

Drawings are not to scale. Follow dimensions.

Miscellaneous:

Traffic over structure to be maintained during construction. See sheet No. 2 for details of stage construction. (See roadway plans for traffic control).

Outline of old work is indicated by dashed lines. Heavy lines indicate 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.

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

Roadway surfacing adjacent to bridge ends to match bridge overlay (Roadway item).

ESTIMATED QUANTITIES

ITEM		TOTAL
Curb Removal (Bridges) - Metric	meter	7.0
Removal of Low Slump Concrete Wearing Surface - Metric	sq. meter	866.7
Partial Removal of Cathodic Protection System	lump sum	1
Substructure Repair (Unformed) - Metric	sq. meter	2.0
Superstructure Repair (Unformed) - Metric	sq. meter	2.0
Curb Blockout - Metric	meter	123.5
Repairing Concrete Deck (Half-Soling) - Metric	sq. meter	45
Full Depth Repair - Metric	sq. meter	5
Slab Edge Repair (Bridges) - Metric	meter	1.0
Low Slump Concrete Wearing Surface - Metric	sq. meter	867
Cathodic Protection System	lump sum	1

STATE OF MISSOURI
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REPAIRS TO BRIDGE OVER OLDHAM ROAD

STATE ROAD FROM GREGORY BLVD TO BANNISTER RD.

ABOUT 1.6 km SW OF GREGORY BLVD.

PROJECT NO.

JOB. NO. J4I1299

STA. 20+481.987± (Match Exist.)

RTE. I-435 (S.B.L.)

JACKSON COUNTY

Date: 11/19/98

STD.	
STD.	
STD.	
STD.	M706.35
A16404	

Designed Oct. 1998
Detailed Oct. 1998
Checked Oct. 1998

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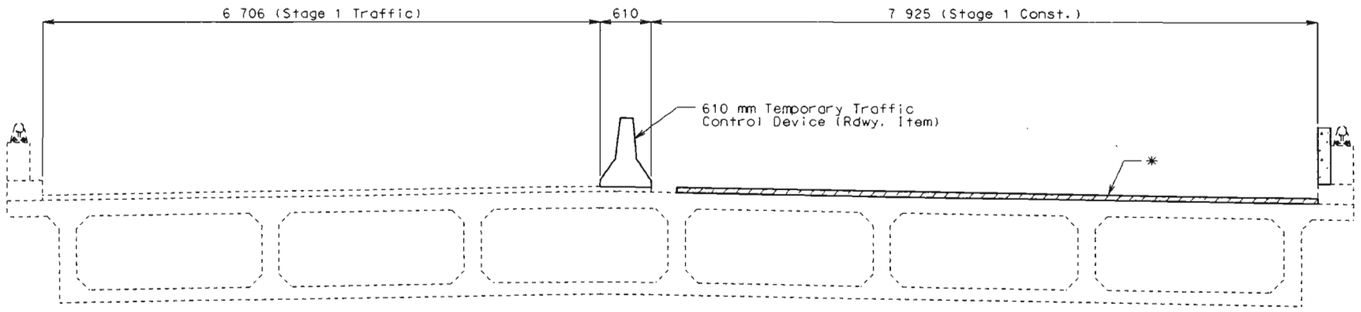
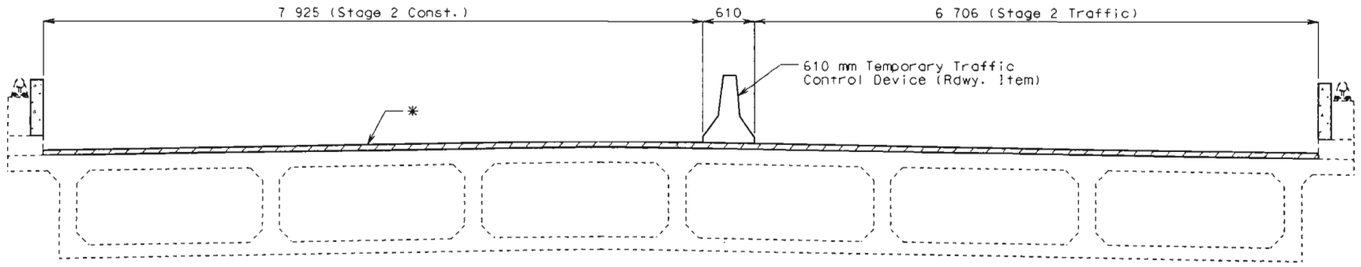
MO		1399



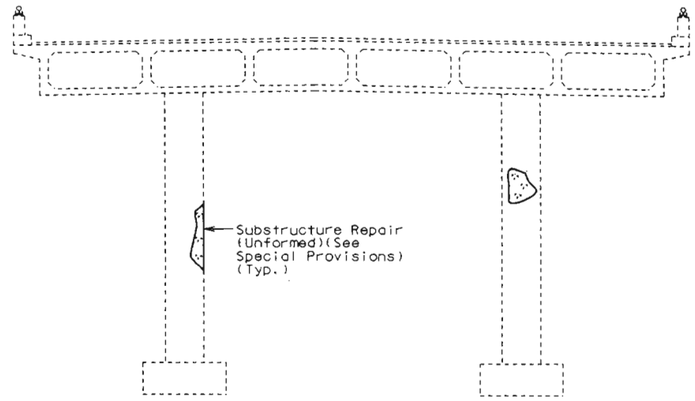
STAGE 1 CONSTRUCTION



STAGE 2 CONSTRUCTION

DETAILS OF STAGE CONSTRUCTION

* Remove existing Concrete overlay and Cathodic Protection System. Scarify concrete deck 6 mm and install a new Cathodic Protection System covered with a 63 mm (Min.) Low Slump Concrete wearing surface.



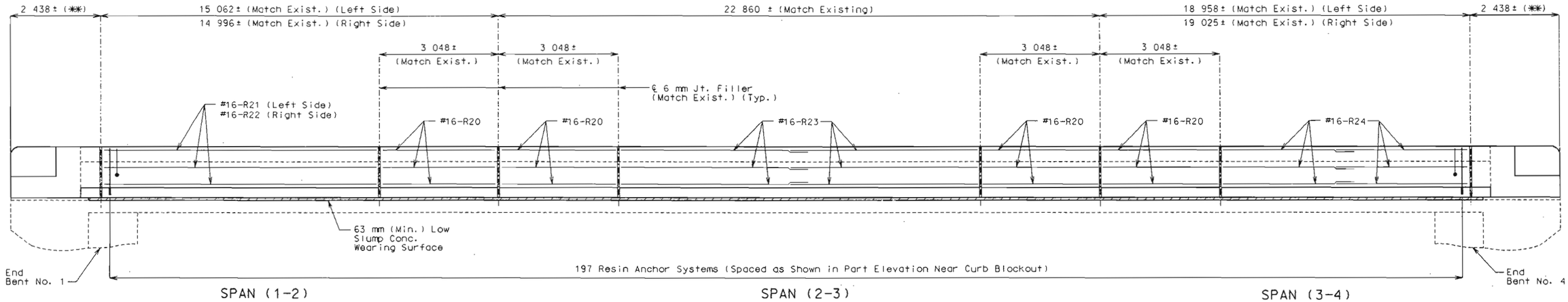
TYPICAL DETAIL SHOWING SUBSTRUCTURE REPAIR AREAS

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

Detailed Oct. 1998
Checked Oct. 1998

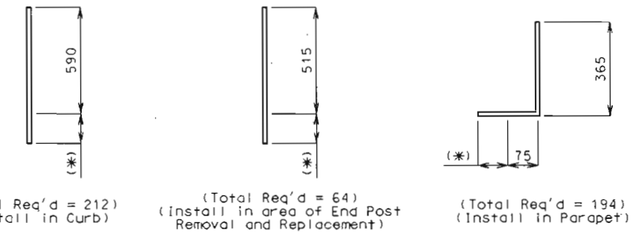
State	Proj. No.	Sheet No.
MO		B 100



SPAN (1-2)

SPAN (2-3)

SPAN (3-4)



(Total Req'd = 212)
(Install in Curb)

(Total Req'd = 64)
(Install in area of End Post Removal and Replacement)

(Total Req'd = 194)
(Install in Parapet)

DETAILS OF RESIN ANCHORS

SECTION NEAR LEFT CURB BLOCKOUT
(RIGHT SIDE SIMILAR, EXCEPT AS SHOWN)

NOTE: (***) For End Post details, see sheet No. 4.

NOTE: (*) Manufacturer's embedment length.

(***) Shift resin anchor systems to clear Exist. steel anchor bolts for tube rail.

NOTES FOR CURB BLOCKOUT:

Concrete in curb blockout shall be Class B1 with f'c = 28 MPa.

Measurement of curb blockout is to the nearest half meter measured at the gutter line from end of wing to end of wing.

All exposed edges of curb blockout shall have either a 15 mm radius or a 10 mm bevel, unless otherwise shown.

Payment for concrete, reinforcing steel, resin anchor systems and any other work incidental to the curb blockouts complete in place shall be included in the contract unit price for the "Curb Blockout" per meter.

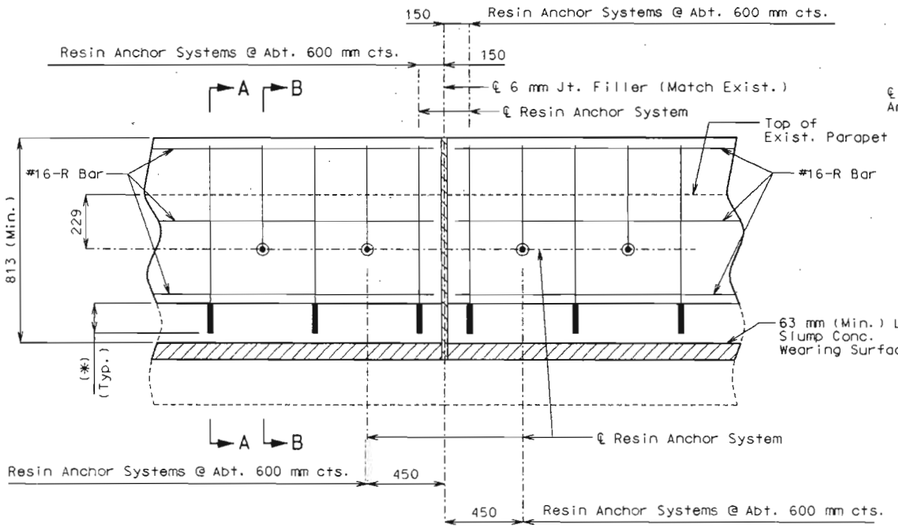
Use a minimum lap of 925 mm for #16 horizontal Curb Blockout bars.

Cost of any concrete curb and parapet repair shall be considered completely covered in the unit price bid for Curb Blockout.

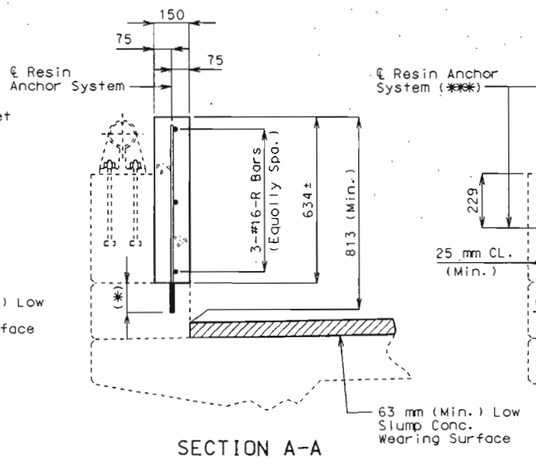
NOTES FOR RESIN ANCHOR SYSTEM:

The contractor shall use one of the resin anchor systems listed in the job special provisions. These resin anchor systems shall be installed according to the manufacturer's specifications, except as modified by the job special provisions and that a #16 Grade 420 (Epoxy Coated) reinforcing bar as shown shall be substituted for the 15.9 mm diameter threaded rod stud.

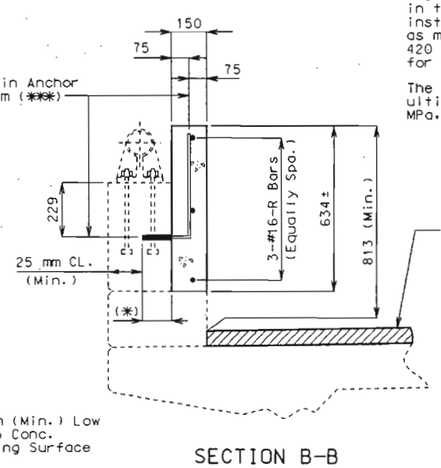
The 15.9 mm diameter resin anchor systems shall have a minimum ultimate pullout strength of 68.9 kN in concrete with f'c = 28 MPa, see special provisions.



PART ELEVATION NEAR CURB BLOCKOUT

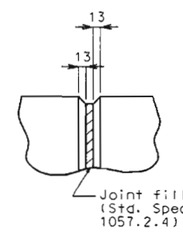


SECTION A-A



SECTION B-B

DETAILS OF CURB BLOCKOUT



FILLED JOINT DETAIL

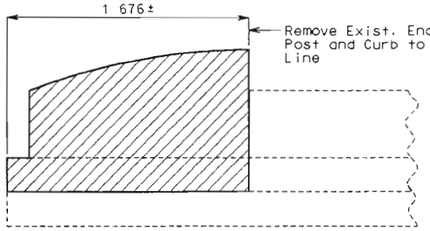
STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

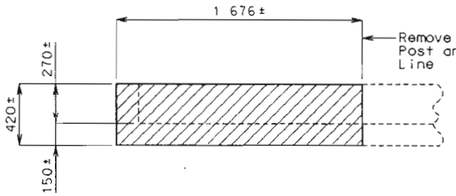
Detailed Oct. 1998
Checked Oct. 1998

JACKSON COUNTY A16404

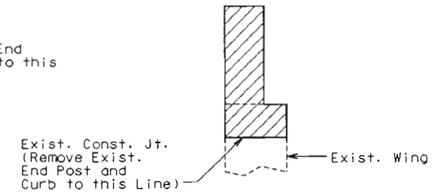
State	Proj. No.	Sheet No.
MO		B101



ELEVATION SHOWING END POST REMOVAL



PLAN SHOWING END POST REMOVAL



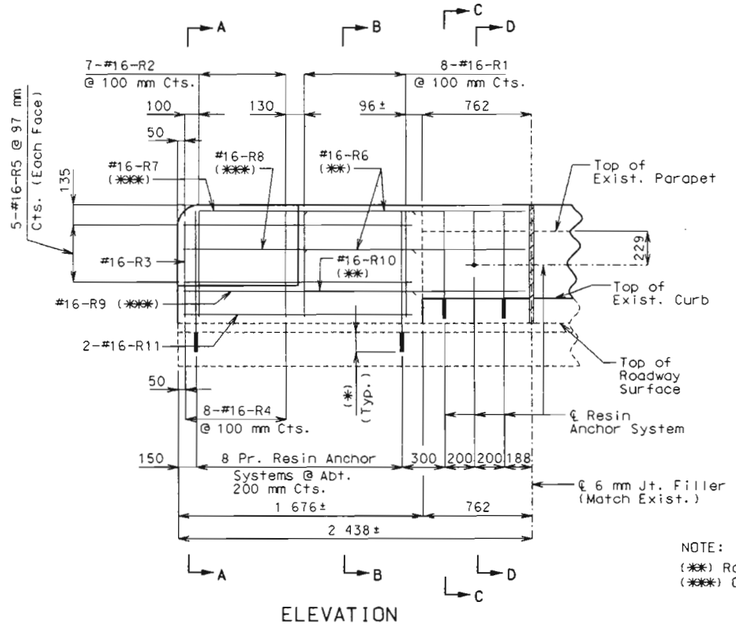
SECTION SHOWING END POST REMOVAL

NOTE:

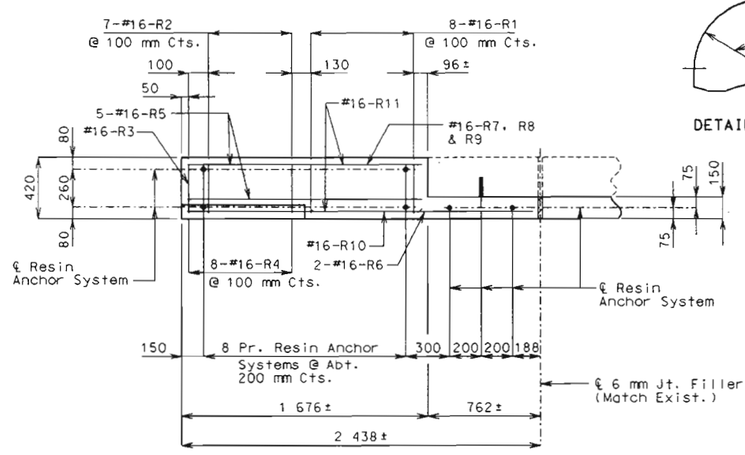
For notes on Curb Blockout and Resin Anchor Systems, see sheet No. 3.

(✱) Manufacturer's embedment length.

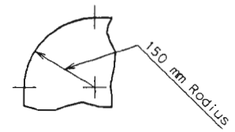
Payment for removal of existing end post and curb concrete is included in the contract unit price for "Curb Removal (Bridges) - Metric" per meter.



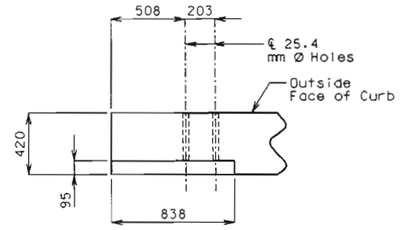
ELEVATION



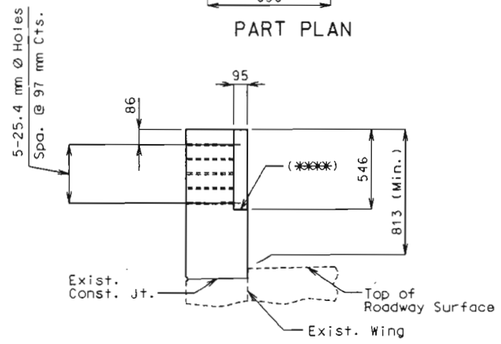
PLAN



DETAIL "F"



PART PLAN

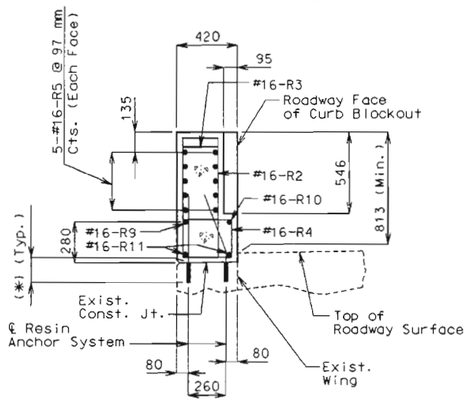


PART ELEVATION E-E

(✱✱✱✱) Slope 6 mm toward Roadway

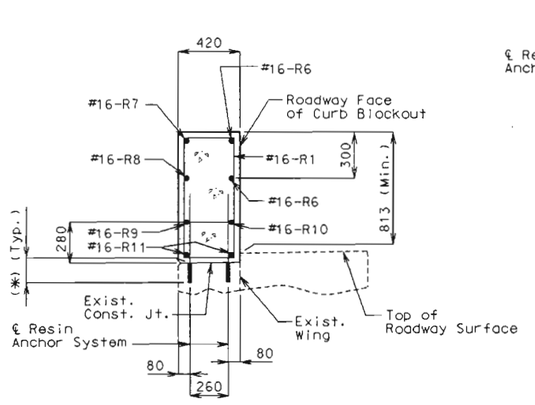
NOTE:

(✱✱) Roadway Face
(✱✱✱) Outside Face



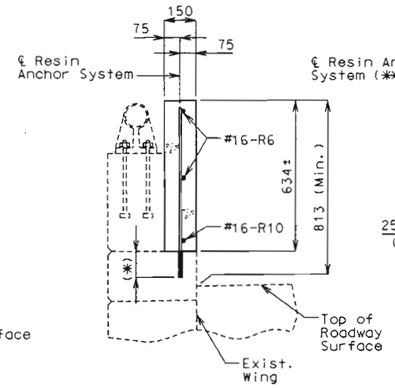
SECTION A-A

NOTE: #16-R6, R7 & R8 Bars not shown for clarity.

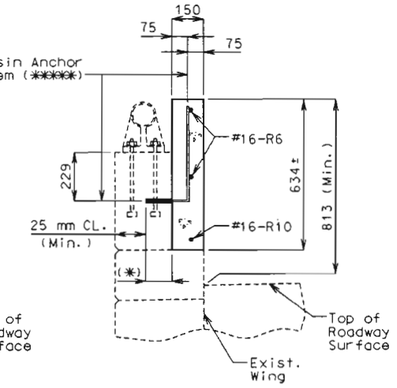


SECTION B-B

NOTE: #16-R5 Bars not shown for clarity.



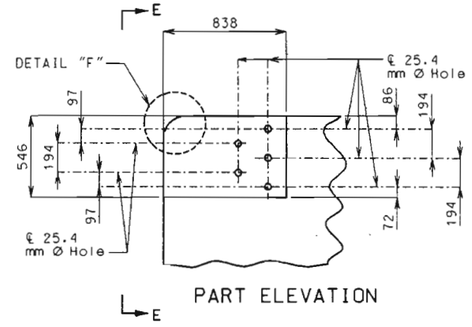
SECTION C-C



SECTION D-D

NOTE:

(✱✱✱✱✱) Shift resin anchor systems to clear Exist. steel anchor bolts for tube rail.



PART ELEVATION

DETAILS OF GUARD RAIL ATTACHMENT

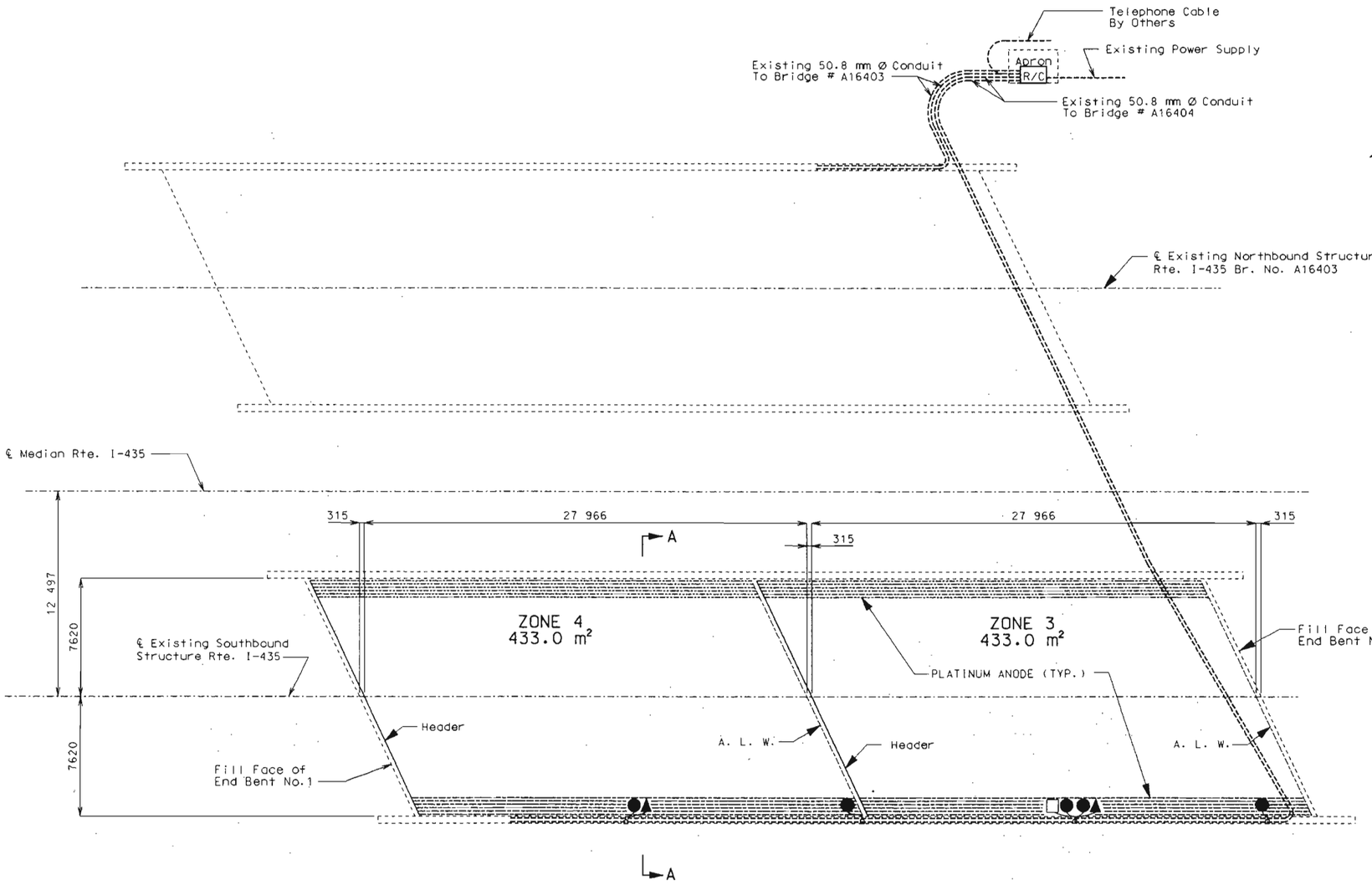
STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

TYPICAL DETAILS OF CURB BLOCKOUT AT END POST

Detailed Oct. 1998
Checked Oct. 1998

State	Proj. No.	Sheet No.
MO		B102



PART PLAN OF SLAB SHOWING PLATINUM CATHODIC PROTECTION SYSTEM (ALTERNATE "A")

DENOTATIONS

- A.L.W. (ANODE LEAD WIRE)
- HEADER
- PLATINUM ANODE
- SYSTEM NEGATIVE CONNECTION
- REFERENCE CELL
- GROUNDS
- NULL PROBE (CORROSOMETER)
- EXISTING CONDUIT

NOTE:

The anode leads, system negative return leads, reference cell, reference cell ground lead, null probe and null probe ground lead shall be routed in one of the existing conduits.

All existing wiring in the deck and conduits shall be removed and replaced with new.

The telephone cable shall be routed into the rectifier through one of the unused existing conduits.

Reference cells are to be placed between anodes.

U.I.P. existing conduit, access fittings and junction boxes.

The reference cell ground lead shall be welded to the top rebar within 300 mm of the reference cell.

Anode assembly number must match zone number.

Existing access holes through deck not used with the new cathodic protection system shall have its plastic sleeve and silicon sealant removed, hole cleaned and plugged with a nonmetallic expansive mortar in accordance with Std. Spec. 1066.

ESTIMATED QUANTITIES	For information only	
ITEM	UNIT	QUANTITY
Anode Lead Wire & Header	Meters	104
Platinum Anodes	Meters	4251
Reference Cells	Each	2
Null Probes	Each	1
Thermite Welds	Each	5

Note: Anode lengths are approximate, actual lengths are the responsibility of the contractor.
No direct payment shall be made for any additional conduit, junction boxes, access fittings, additional material, labor and modification to existing conduit.

Note:

For Section A-A, typical zone layout and partial electrical schematic, see sheet no. 7.

Dimensions are along ℄ of structure (end of slab to end of slab).

The anode lead wire and header shall be 6.0 mm² stranded copper wire with HMWPE insulation.

Factory supplied field splices will be permitted between stages on the anode lead wire (A.L.W.) and header as directed by the engineer.

Existing overlay and cathodic protection system shall be removed and the deck scarified prior to sawing slots. (see special provisions)

STATE OF MISSOURI
KURT E. GRIBBLE
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REGISTERED PROFESSIONAL ENGINEER

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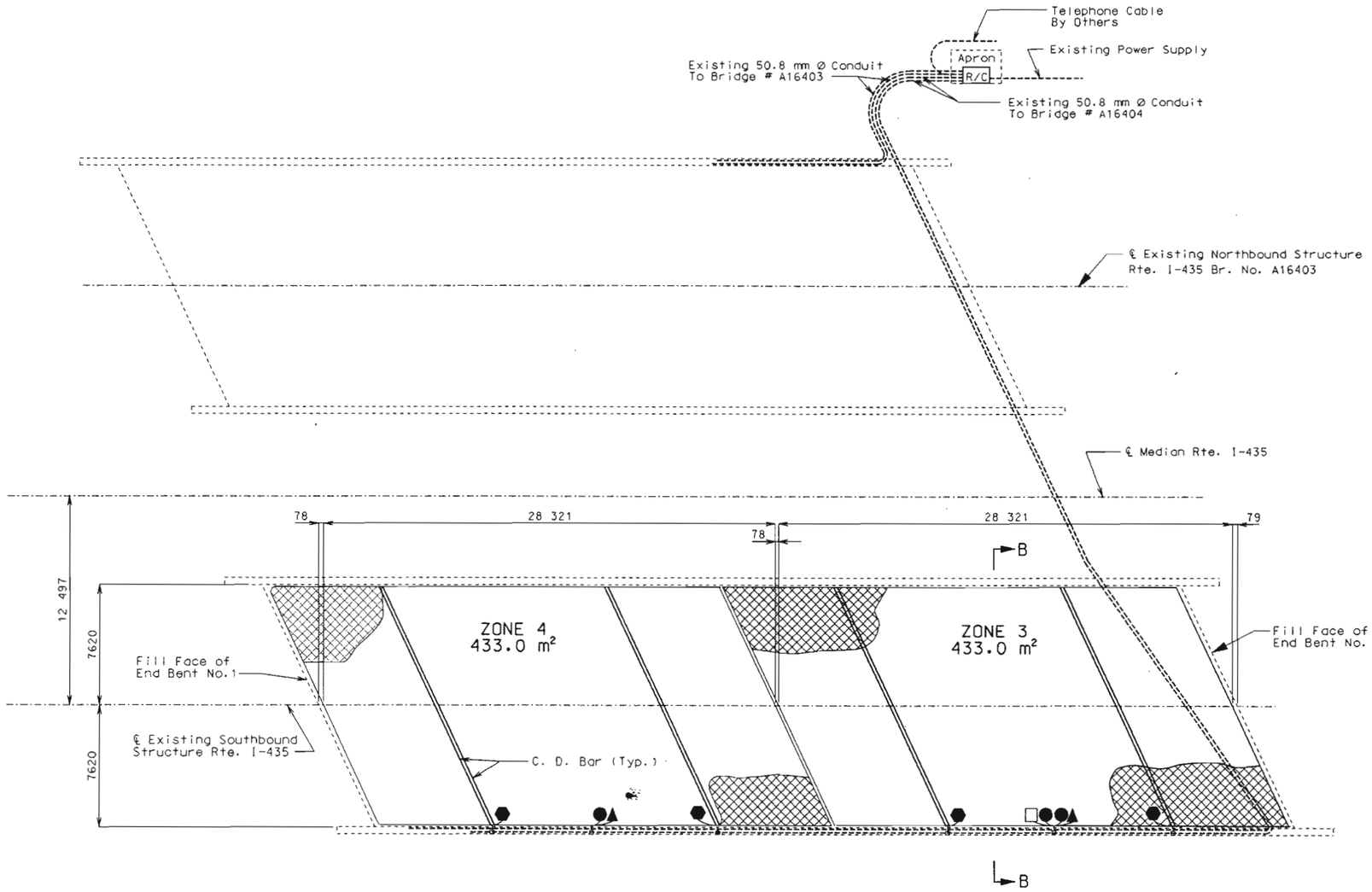
State	Proj. No.	Sheet No.
MO		B103



PART PLAN OF SLAB SHOWING ELGARD MESH CATHODIC PROTECTION SYSTEM (ALTERNATE "B")

Note:
For Section B-B, typical zone layout and partial electrical schematic, see sheet no. 8.

Dimensions are along ℄ of structure (end of slab to end of slab).

Existing overlay and cathodic protection system shall be removed and the deck scarified prior to sawing slots. (see special provisions)

DENOTATIONS

- ELGARD ANODE MESH
- SYSTEM NEGATIVE CONNECTION
- REFERENCE CELL
- GROUNDS
- NULL PROBE (CORROSOMETER)
- EXISTING CONDUIT

NOTE:

The anode leads, system negative return leads, reference cell, reference cell ground lead, null probe and null probe ground lead shall be routed in one of the existing conduits.

All existing wiring in the deck and conduits shall be removed and replaced with new.

The telephone cable shall be routed into the rectifier through one of the unused existing conduits.

U.I.P. existing conduit, access fittings and junction boxes.

The reference cell ground lead shall be welded to the top rebar within 300 mm of the reference cell.

Anode assembly number must match zone number.

Existing access holes through deck not used with the new cathodic protection system shall have its plastic sleeve and silicon sealant removed, hole cleaned and plugged with a nonmetallic expansive mortar in accordance with Std. Spec. 1066.

ESTIMATED QUANTITIES

For information only

ITEM	UNIT	QUANTITY
Elgard Anode Mesh (210)	Sq. Meters	863
Reference Cells	Each	2
Null Probes	Each	1
Thermite Welds	Each	7

Note: Anode lengths are approximate, actual lengths are the responsibility of the contractor.
No direct payment shall be made for any additional conduit, junction boxes, access fittings, additional material, labor and modification to existing conduit.

STATE OF MISSOURI
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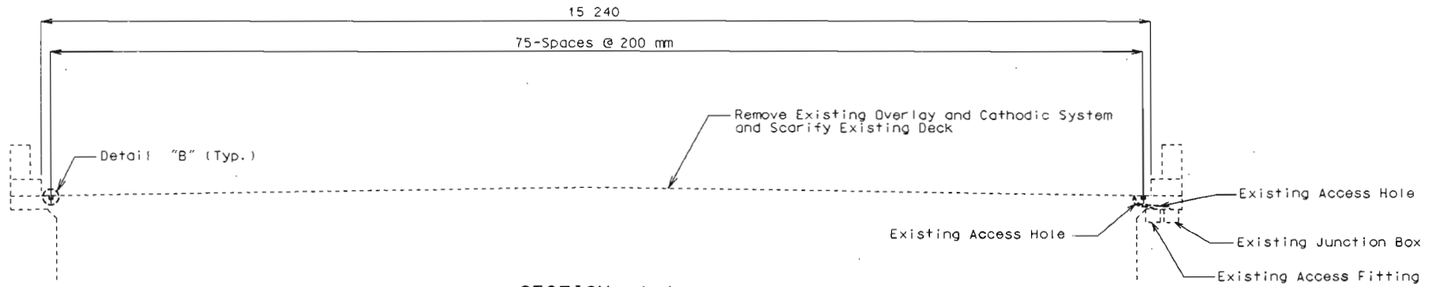
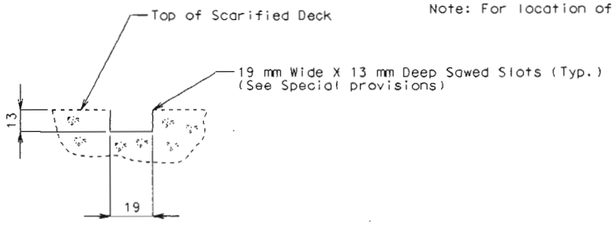
State	Proj. No.	Sheet No.
MO		B104

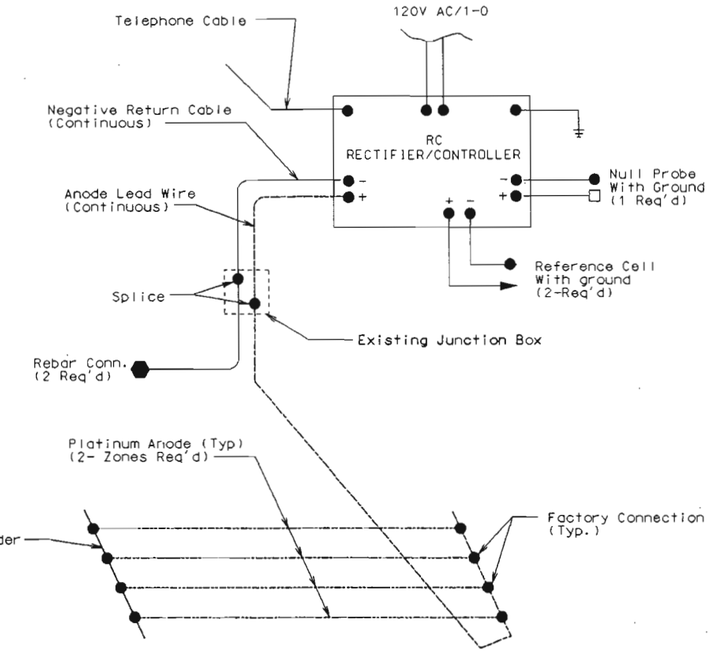


SECTION A-A
(At Alternate "A")

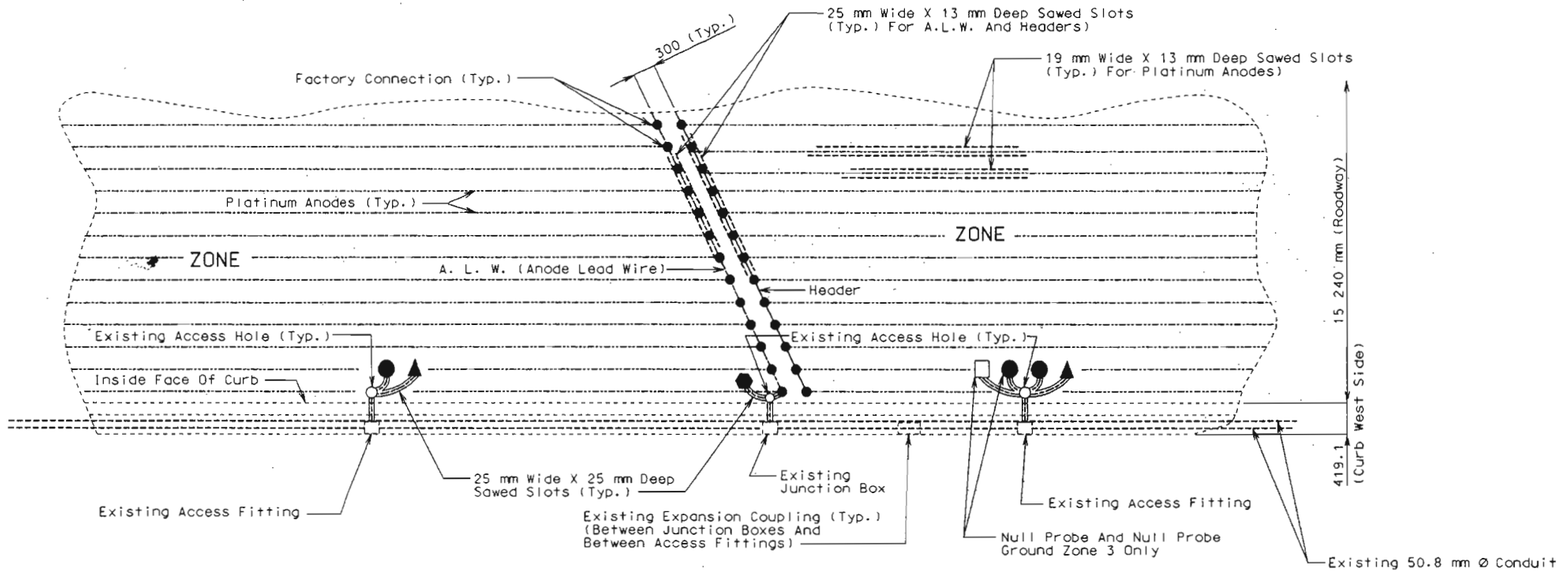
Note: For location of section A-A see sheet no. 5.



DETAIL "B"



PARTIAL SCHEMATIC
(ALTERNATE "A")



TYPICAL ZONE LAYOUT, EXCEPT AS NOTED, FOR (ALTERNATE "A") SYSTEM

Note: Anodes shall be placed as shown with a minimum tolerance of plus or minus 75 mm. Use existing access holes, access fittings and junction boxes where acceptable as determined by the engineer.

STATE OF MISSOURI
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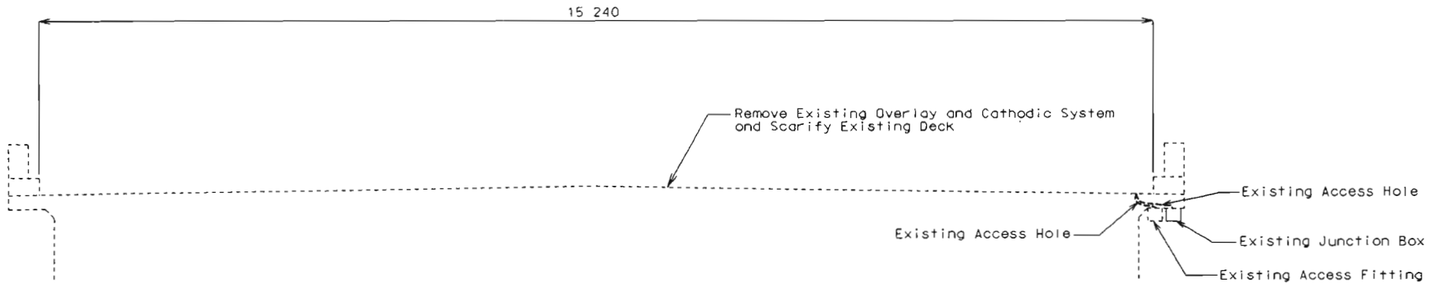
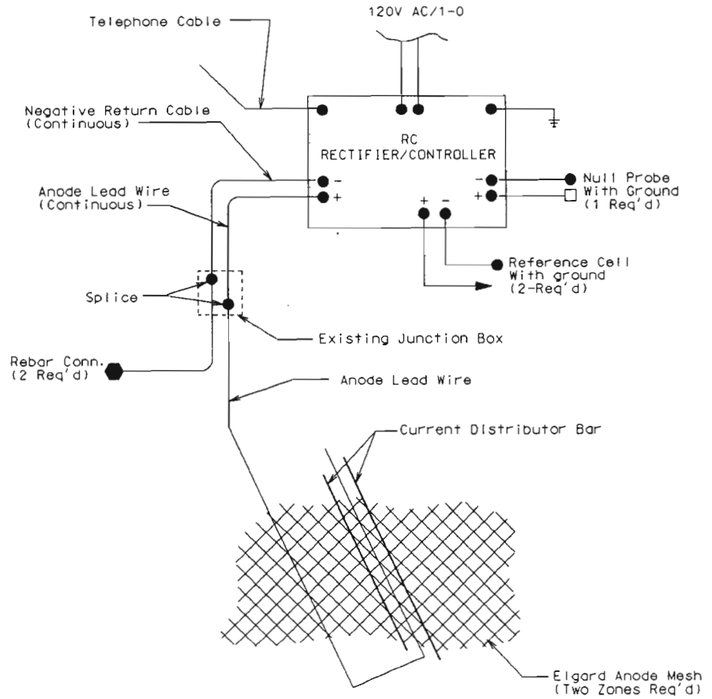
MO		B105



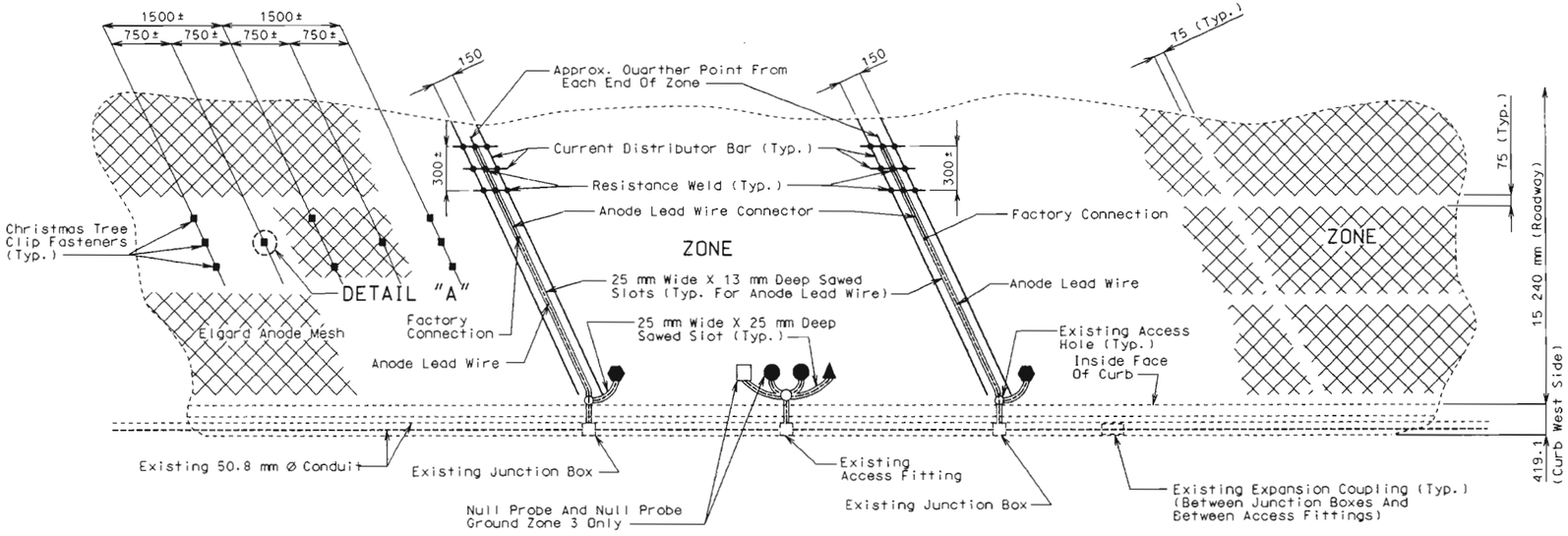
SECTION B-B

(At Alternate "B")

Note: For location of section B-B see sheet no. 6

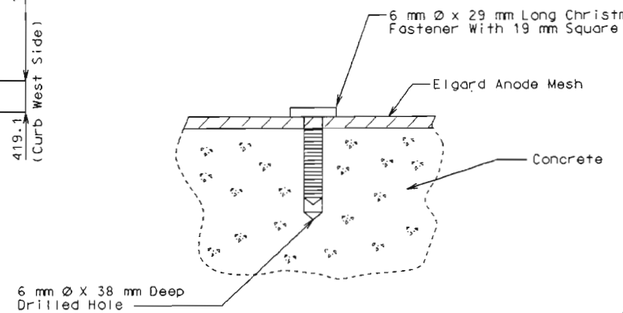


PARTIAL SCHEMATIC
(ALTERNATE "B")



TYPICAL ZONE LAYOUT, EXCEPT AS NOTED, FOR (ALTERNATE "B") SYSTEM

Note: Use existing access holes, access fittings and junction boxes where acceptable as determined by the engineer.



DETAIL "A"

(Christmas Tree Clip)

STATE OF MISSOURI
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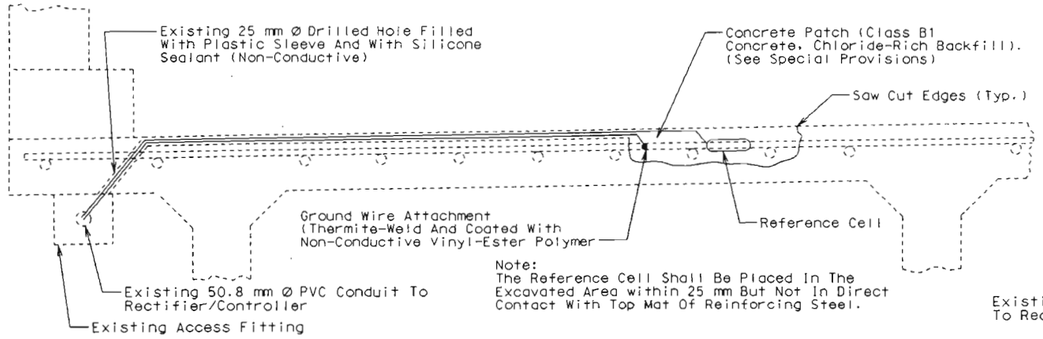
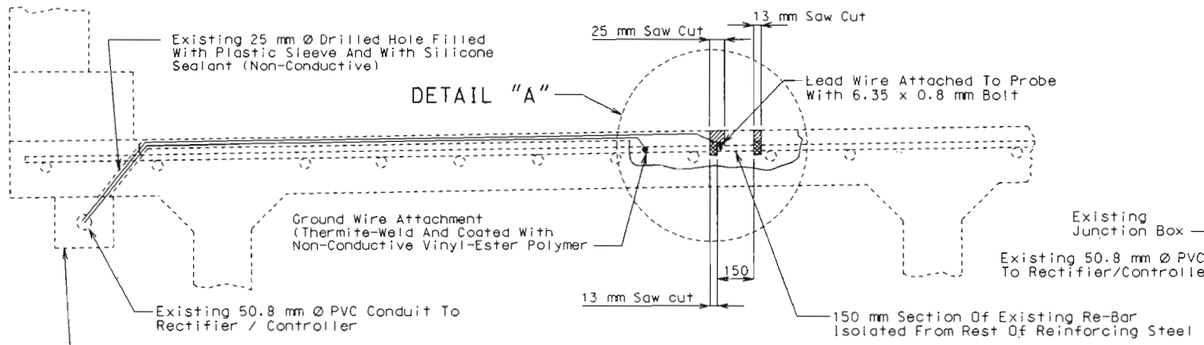
MO		13106

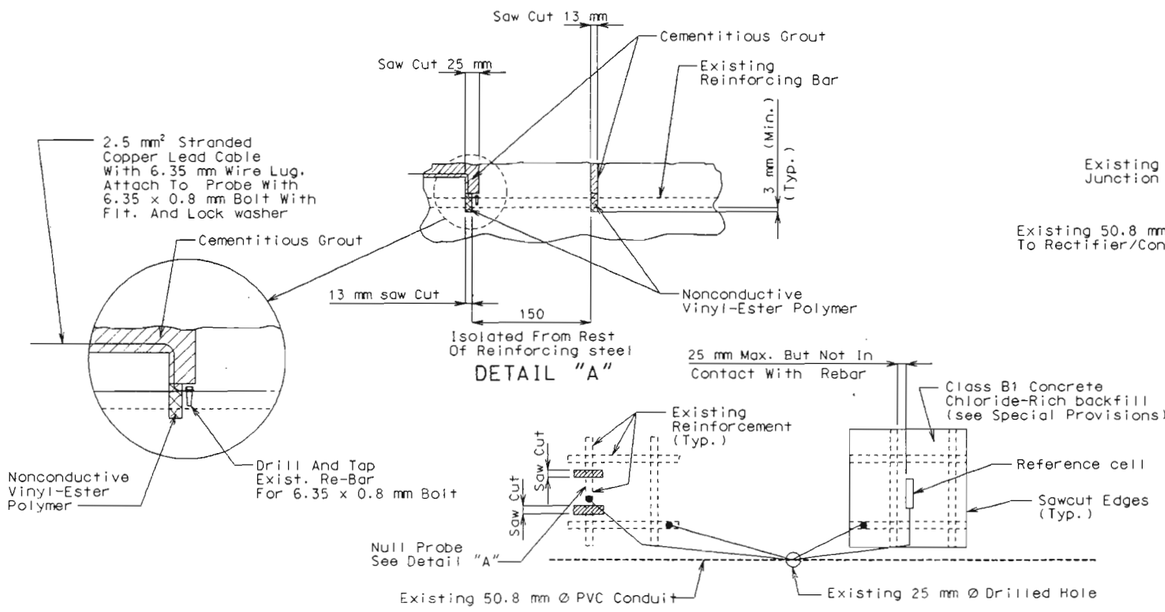


REFERENCE CELL DETAILS

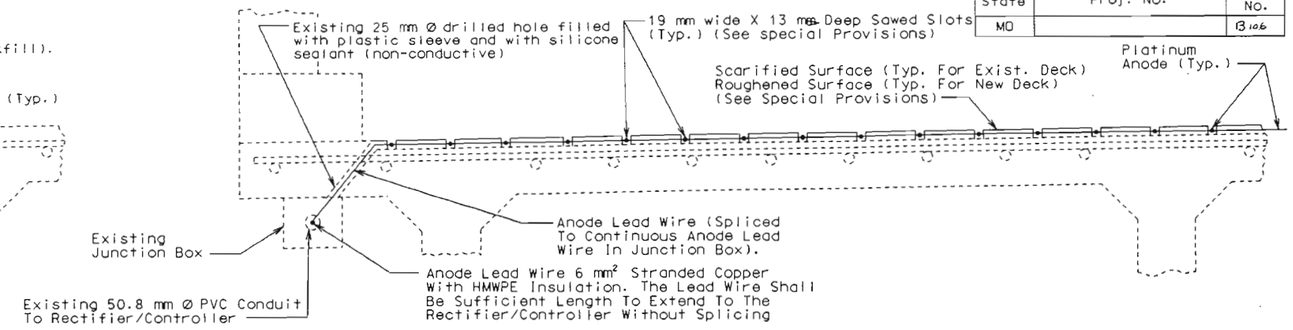
Note:
All concrete removal shall be intiated by saw cutting the first 13 mm.



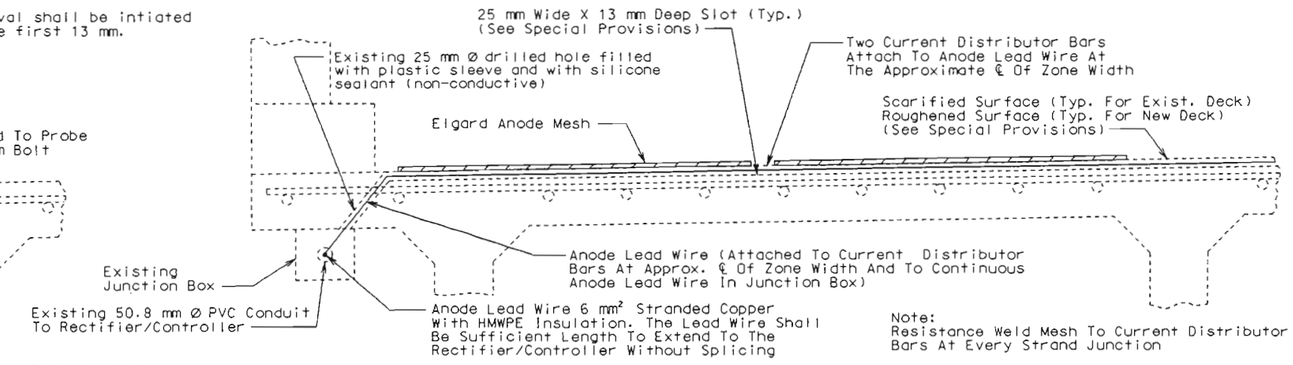
NULL PROBE DETAILS



PLAN OF NULL PROBE AND REFERENCE CELL

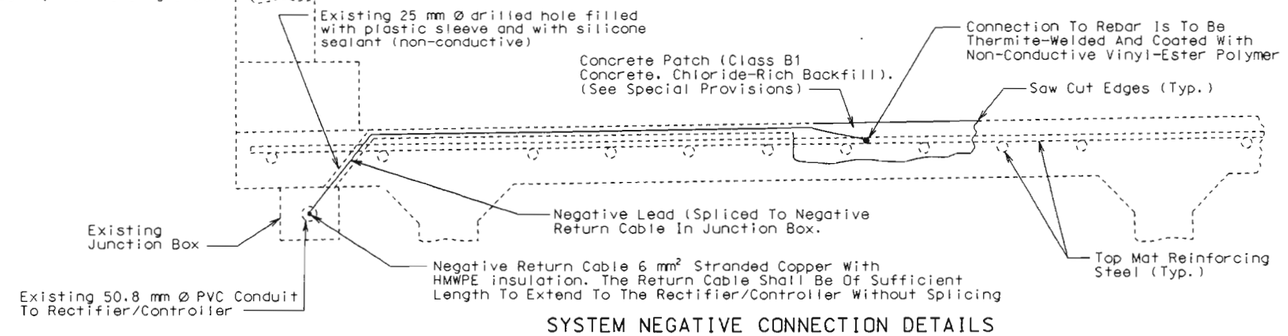


ALTERNATE "A"



Note:
Resistance Weld Mesh To Current Distributor Bars At Every Strand Junction

ALTERNATE "B"



SYSTEM NEGATIVE CONNECTION DETAILS

Notes for New Conduit and Appurtenances (if required):
Conduit shall be schedule 40 heavy wall PVC (Polyvinyl Chloride Plastic). Each section of conduit shall bear the underwriters laboratories, inc. (UL) label.

Conduit shall be secured to concrete with clamps (galvanized/AASHTO M111) at abt. 1500 mm cts. Concrete anchors for clamps shall meet federal specification FF-S-325, group II, type 4, class 1 and shall be galvanized in accordance with ASTM A-153, B695-91 class 50 or stainless steel. Minimum embedment in concrete shall be 45 mm. The supplier shall furnish a manufacturers certification that the concrete anchors meet the required material and galvanizing specifications.

Weepholes shall be provided at appropriate locations to drain any moisture in the conduit lines.

Expansion couplings shall be installed on conduit lines between all junction boxes and between all access fittings as approved by the engineer.

The location and direction of conduit may be shifted to meet field conditions as directed by the engineer.

All junction boxes shall be PVC molded, surface mounted, size 200 mm x 200 mm x 175 mm and equal to Carlon Electrical Construction products or Triangle Conduit and Cable company Inc.. The terminations shall be permanent or seperable.

The terminations and covers shall be of watertight construction.

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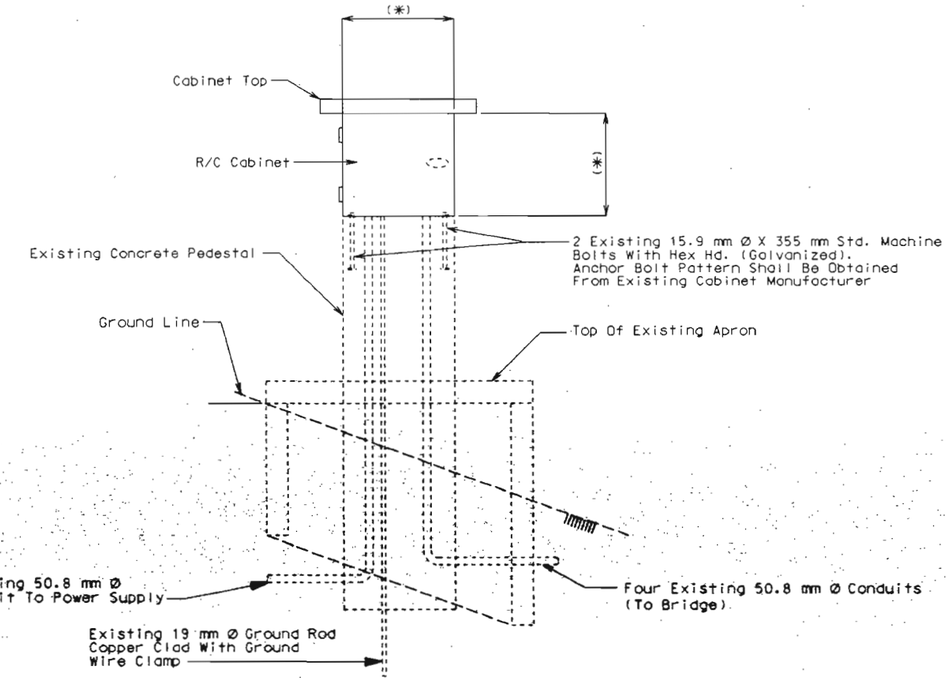
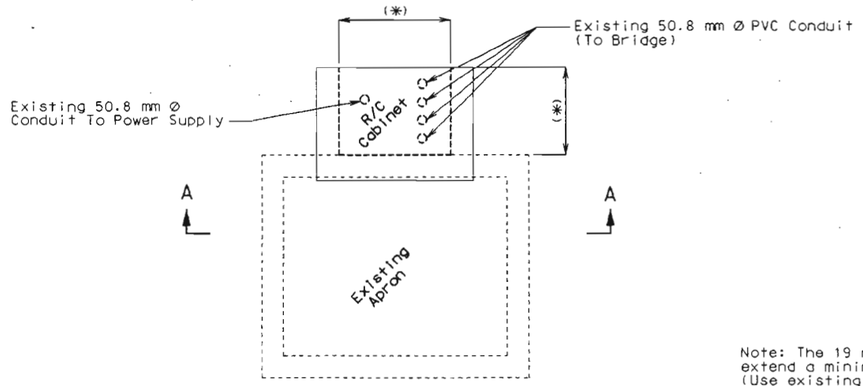
(*) Dimensions according to manufactured cabinet.



SECTION A-A

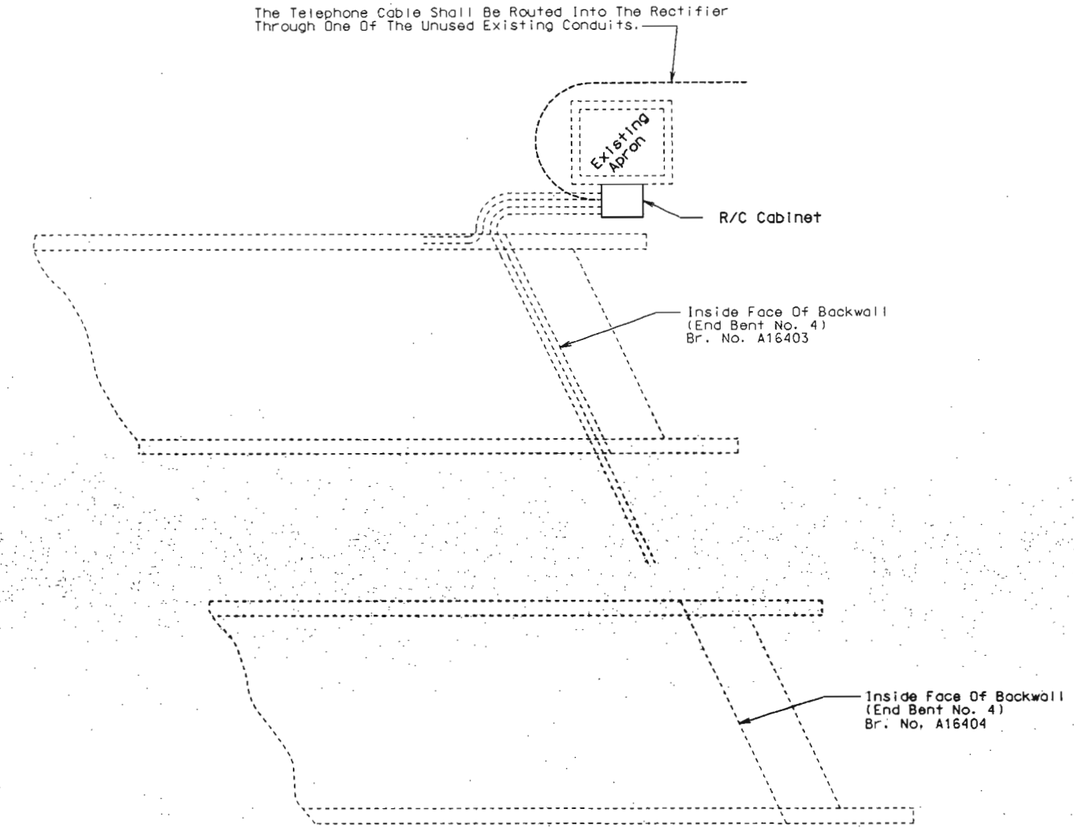


PLAN

Note: The 19 mm Ø ground rod shall be of sufficient length to extend a minimum of 3050 mm below bottom of concrete pedestal. (Use existing if approved by the engineer).

Ground wire shall be 16 mm² minimum (Use existing if approved by the engineer).

Knockouts or drilled holes shall be provided in cabinets for all conduit. Locations of these holes are the responsibility of the contractor and cabinet manufacturer.



PLAN LOCATION OF RECTIFIER/CONTROLLER

STATE OF MISSOURI
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REGISTERED PROFESSIONAL ENGINEER

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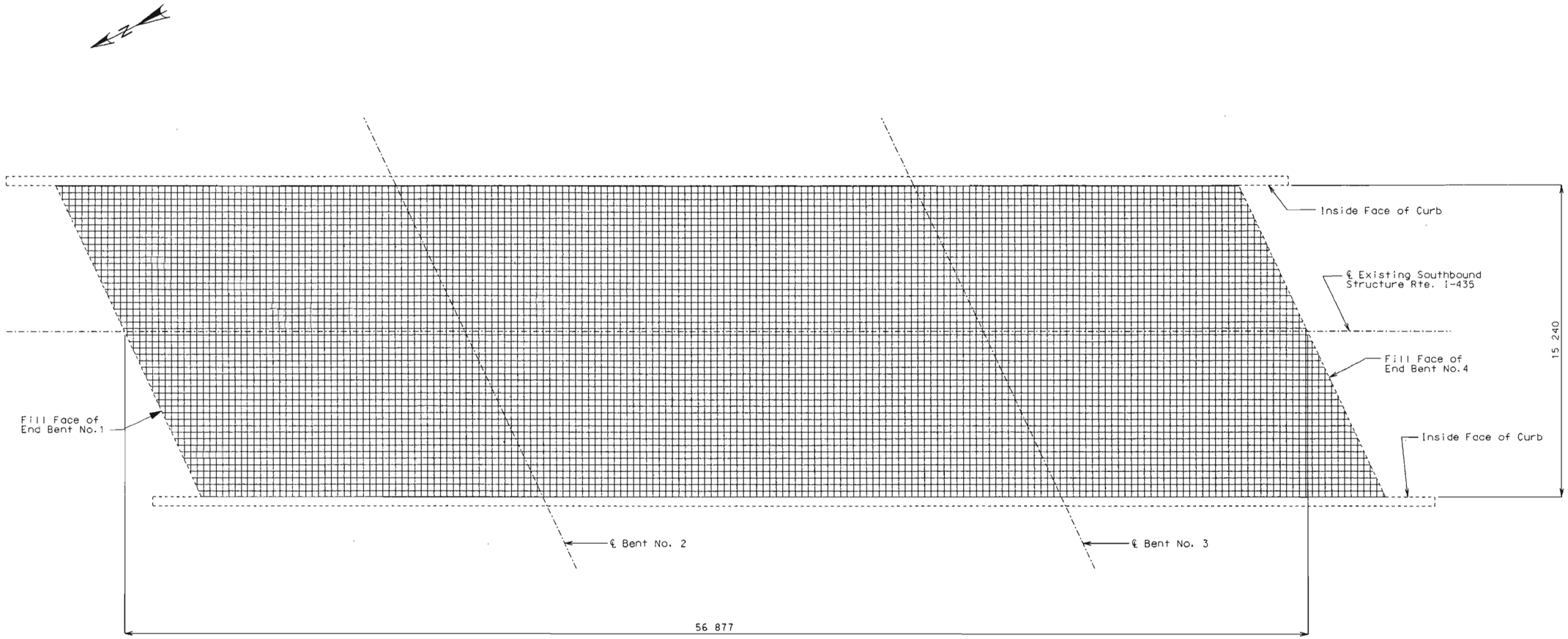
State	Proj. No.	Sheet No.
MO		B 108



PLAN OF CONCRETE DECK SHOWING GRID

(For location of deck repair, reference cells and null probes)

Note: This sheet is to be completed by MoDOT construction personnel.

Note: Grid = Approx. 310 mm Squares
Drawing Scale = 1:100 mm/mm

REPAIRS TO BRIDGE A-1640 (S.B.L.)
OVER OLDHAM ROAD

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

Detailed Sept. 1998
Checked Oct. 1998

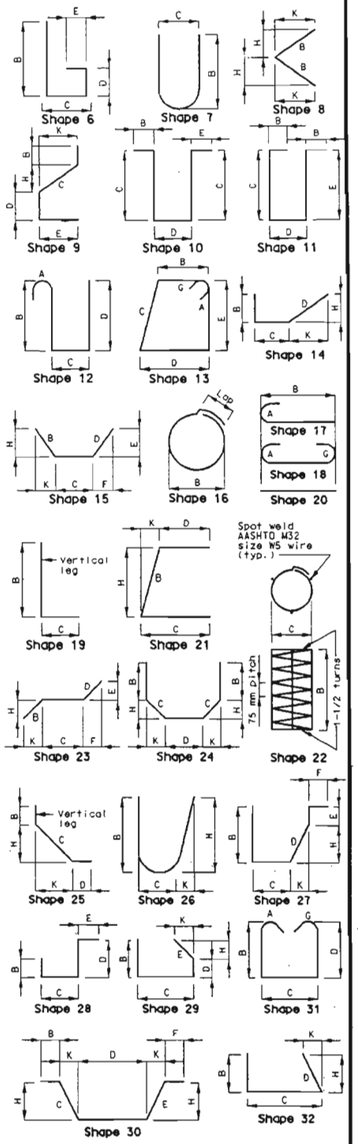
BILL OF REINFORCING STEEL

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
			CURB																
			BLOCKOUT																
32	16	R1	BLOCKOUT	E	13	S				340	795	340	795				2550	2450	122
28	16	R2	BLOCKOUT	E	13	S				245	795	245	795				2360	2260	98
4	16	R3	BLOCKOUT	E	13	S				245	730	245	730				2230	2130	13
32	16	R4	BLOCKOUT	E	13	S				340	250	340	250				1460	1360	68
40	16	R5	BLOCKOUT	E	20					1595							1595	1595	99
8	16	R6	BLOCKOUT	E	20					1520							1520	1520	19
4	16	R7	BLOCKOUT	E	20					1485							1485	1485	9
4	16	R8	BLOCKOUT	E	20					1595							1595	1595	10
4	16	R9	BLOCKOUT	E	20					1595							1595	1595	10
4	16	R10	BLOCKOUT	E	20					2355							2355	2355	15
8	16	R11	BLOCKOUT	E	20					1595							1595	1595	20
24	16	R20	BLOCKOUT	E	20					2965							2965	2965	110
3	16	R21	BLOCKOUT	E	20					11930							11930	11930	56
3	16	R22	BLOCKOUT	E	20					11865							11865	11865	55
12	16	R23	BLOCKOUT	E	20					8805							8805	8805	164
14	16	R24	BLOCKOUT	E	20					8415							8415	8415	183

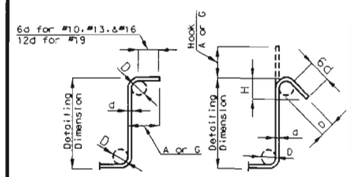
BILL OF REINFORCING STEEL

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		B109



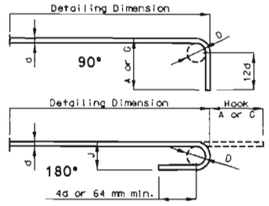
Two additional #16-R24 Bars are included in the bar bill for testing.



Detailed Oct. 1998
Checked Oct. 1998

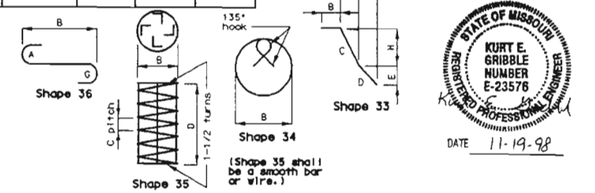
STIRRUP HOOK DIMENSIONS (mm) Grades 300 & 420 MPa				
Bar Size	D	90° Hook	135° Hook	
		Hook A or G	Hook A or G	Approx. H
#13	50	115	115	80
#16	65	155	140	95
#19	115	305	205	115

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).
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



BENDING DIAGRAMS

KURT E. GRIBBLE NUMBER E-23576 REGISTERED PROFESSIONAL ENGINEER
STATE OF MISSOURI
DATE 11-19-98

Sheet No. 12 of 12

JACKSON COUNTY

A16404

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

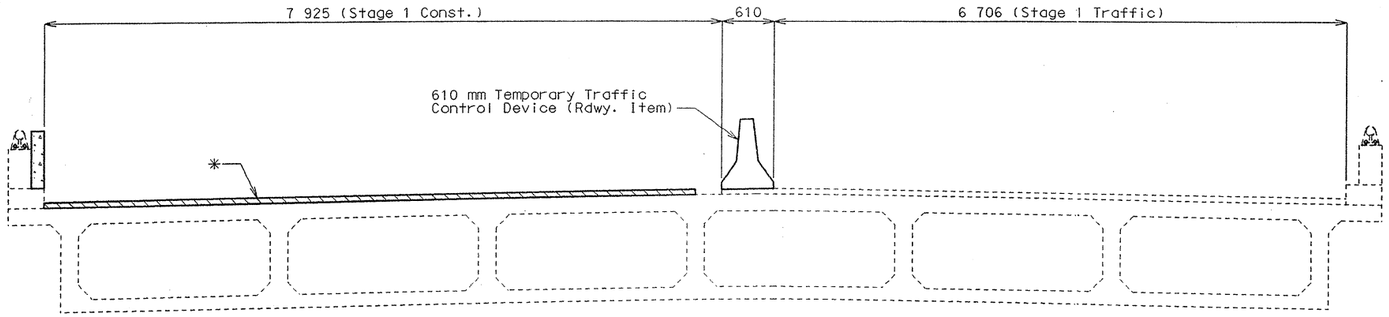
Final Plans

I certify that this plan sheet accurately depicts the configuration and location of the roadway and all its appurtenant features, to the best of my knowledge, as I and my staff have observed the contractor's construction of this project. I specifically disclaim any responsibility for the design of this project, except as I and my staff may have modified or authorized the modification of the project design during its construction; and I disclaim responsibility for the contractor's actual construction of the project, except as I and my staff may have directed or ordered that the project be constructed. .

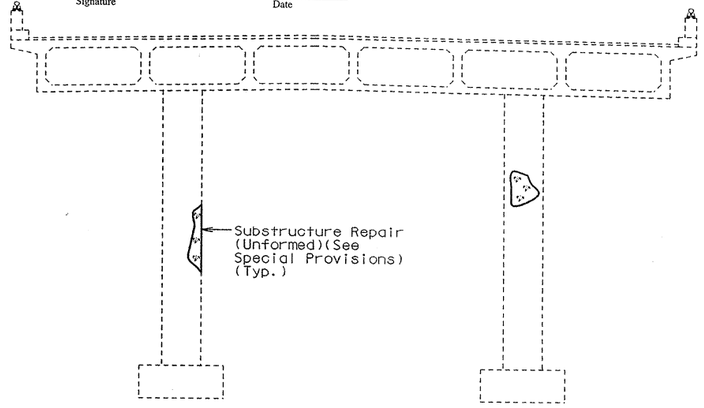
Karsten M. Sommerhauser — Signature
5/25/05 — Date

State	Proj. No.	Sheet No.
MO	FAI-435-1(268)	B68

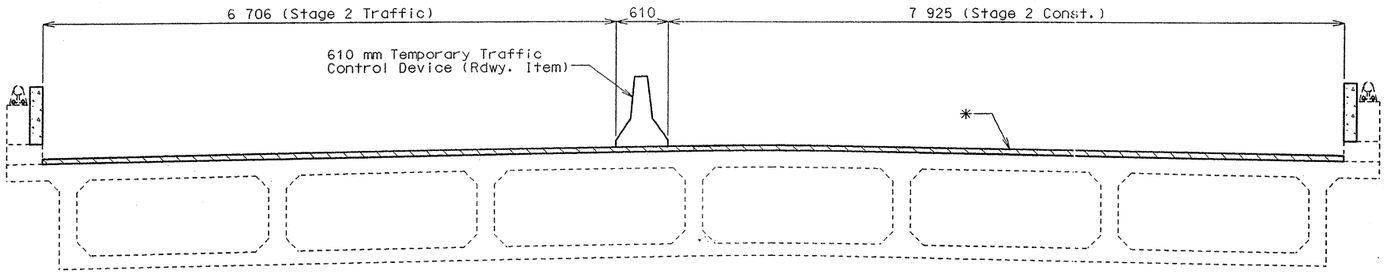
JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4



STAGE 1 CONSTRUCTION



TYPICAL DETAIL SHOWING SUBSTRUCTURE REPAIR AREAS



STAGE 2 CONSTRUCTION

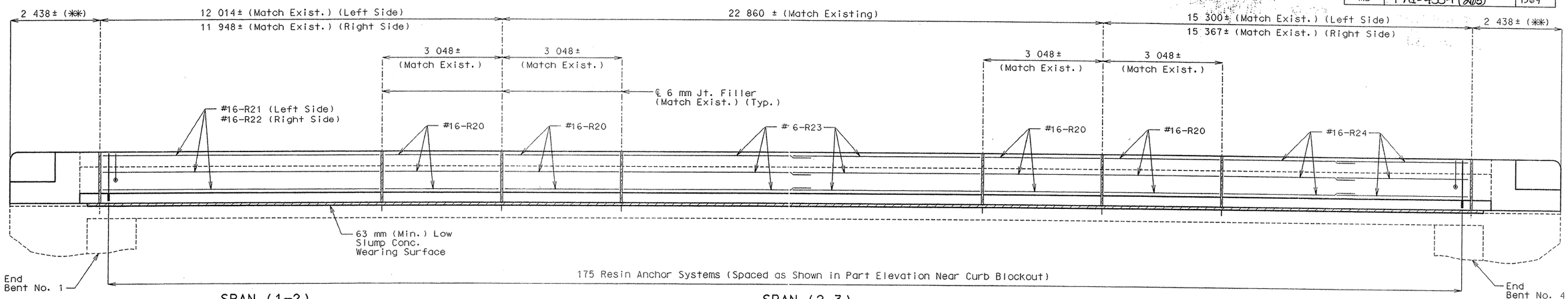
DETAILS OF STAGE CONSTRUCTION

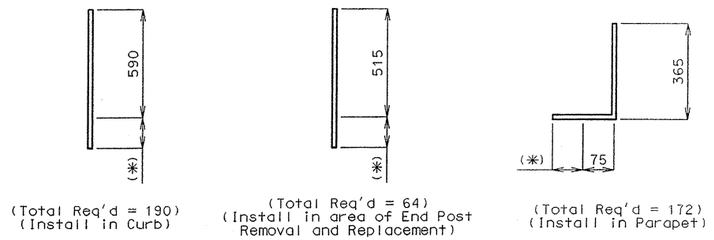
* Remove existing Concrete overlay and Cathodic Protection System. Scarify concrete deck 6 mm and install a new Cathodic Protection System covered with a 63 mm (Min.) Low Slump Concrete wearing surface.

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	1369





(Total Req'd = 190)
(Install in Curb)

(Total Req'd = 64)
(Install in area of End Post Removal and Replacement)

(Total Req'd = 172)
(Install in Parapet)

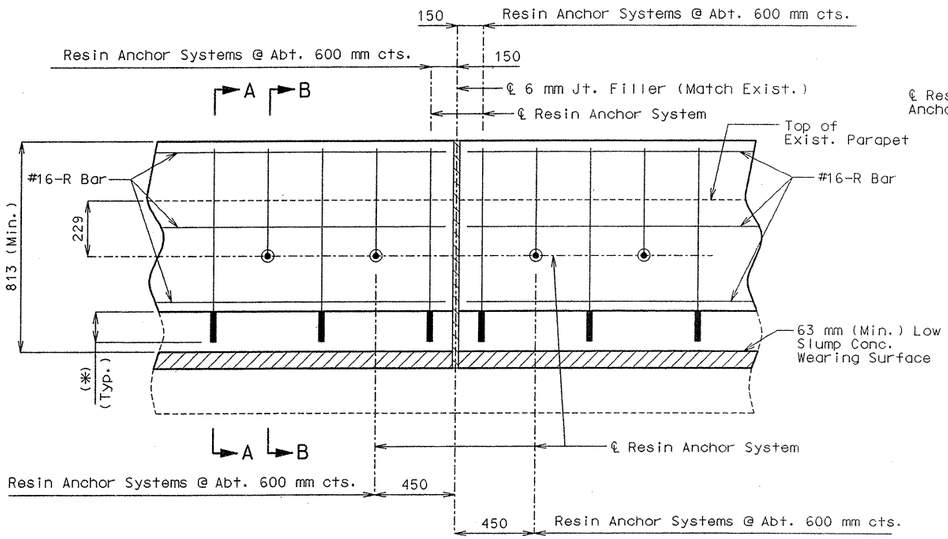
DETAILS OF RESIN ANCHORS

SECTION NEAR LEFT CURB BLOCKOUT
(RIGHT SIDE SIMILAR, EXCEPT AS SHOWN)

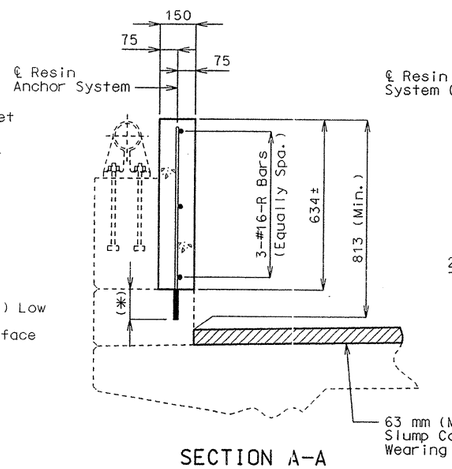
NOTE: (**) For End Post details, see sheet No. 4.

NOTE: (*) Marufacturer's embedment length.

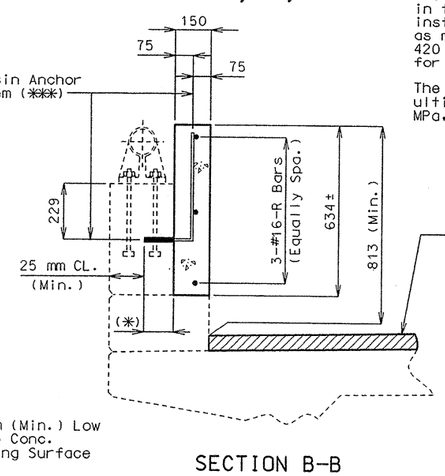
(***) Shift resin anchor systems to clear Exist. steel anchor bolts for tube rail.



PART ELEVATION NEAR CURB BLOCKOUT



SECTION A-A



SECTION B-B

DETAILS OF CURB BLOCKOUT

NOTES FOR CURB BLOCKOUT:

Concrete in curb blockout shall be Class B1 with f'c = 28 MPa.

Measurement of curb blockout is to the nearest half meter measured at the gutter line from end of wing to end of wing.

All exposed edges of curb blockout shall have either a 15 mm radius or a 10 mm bevel, unless otherwise shown.

Payment for concrete, reinforcing steel, resin anchor systems and any other work incidental to the curb blockouts complete in place shall be included in the contract unit price for the "Curb Blockout" per meter.

Use a minimum lap of 925 mm for #16 horizontal Curb Blockout bars.

Cost of any concrete curb and parapet repair shall be considered completely covered in the unit price bid for Curb Blockout.

NOTES FOR RESIN ANCHOR SYSTEM:

The contractor shall use one of the resin anchor systems listed in the job special provisions. These resin anchor systems shall be installed according to the manufacturer's specifications, except as modified by the job special provisions and that a #16 Grade 420 (Epoxy Coated) reinforcing bar as shown shall be substituted for the 15.9 mm diameter threaded rod stud.

The 15.9 mm diameter resin anchor systems shall have a minimum ultimate pullout strength of 68.9 kN in concrete with f'c = 28 MPa, see special provisions.

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

Final Plans

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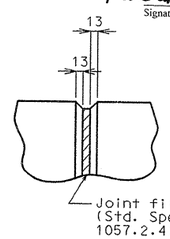
Karsten M. Sommerhauser 5/25/05
Signature Date



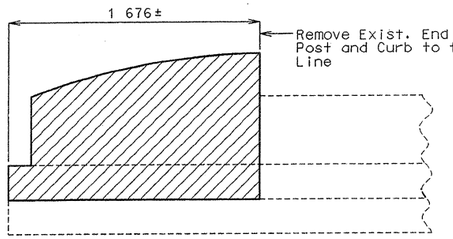
FILLED JOINT DETAIL

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

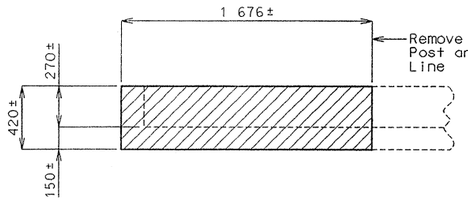
Detailed Oct. 1998
Checked Oct. 1998

JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4

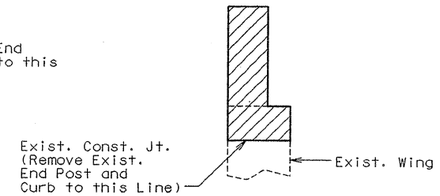
State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	13 70



ELEVATION SHOWING END POST REMOVAL



PLAN SHOWING END POST REMOVAL



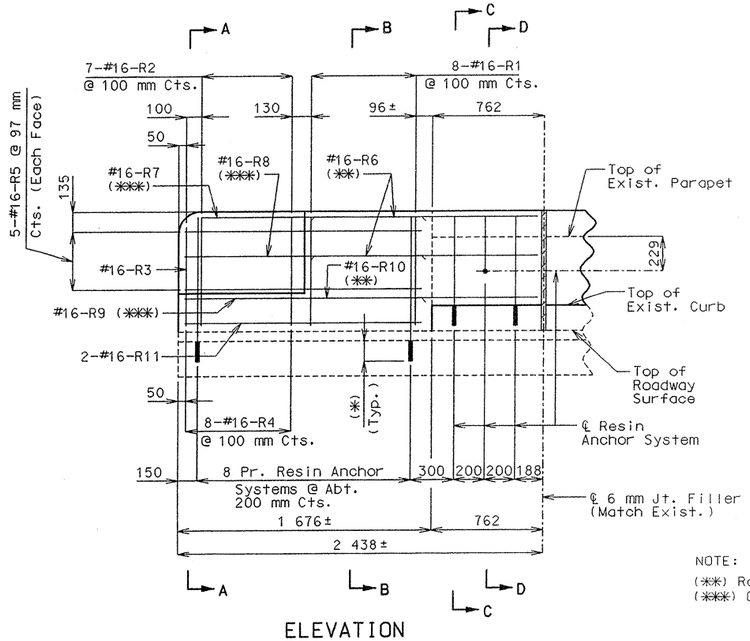
SECTION SHOWING END POST REMOVAL

NOTE:

For notes on Curb Blockout and Resin Anchor Systems, see sheet No. 3.

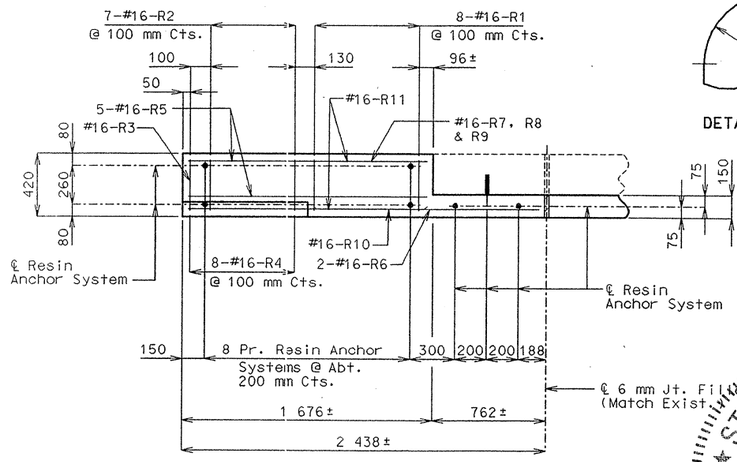
(*) Manufacturer's embedment length.

Payment for removal of existing end post and curb concrete is included in the contract unit price for "Curb Removal (Bridges) - Metric" per meter.

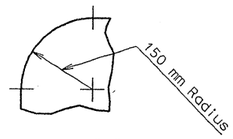


ELEVATION

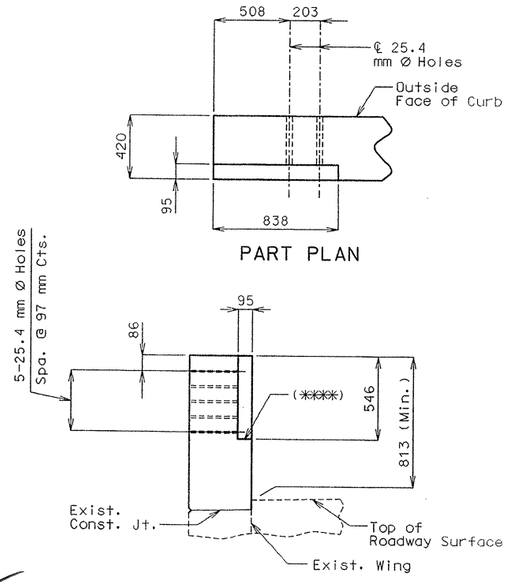
NOTE:
(**) Roadway Face
(***) Outside Face



PLAN



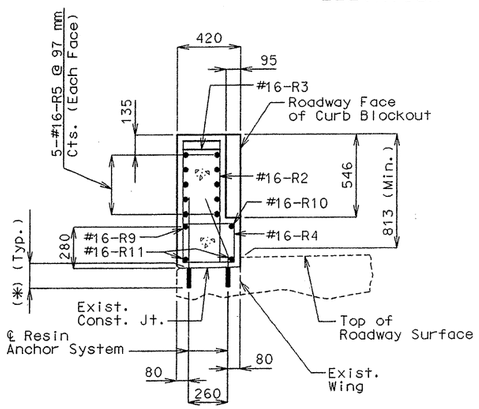
DETAIL "F"



PART PLAN

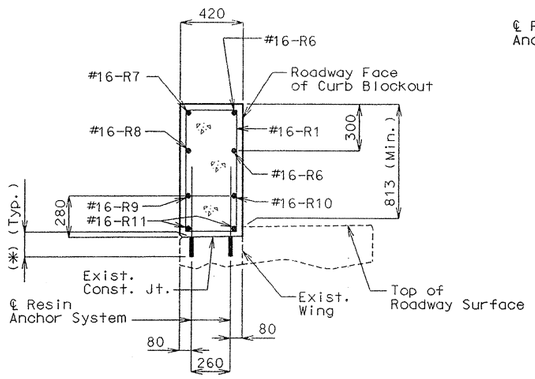
PART ELEVATION E-E

(****) Slope 6 mm toward Roadway



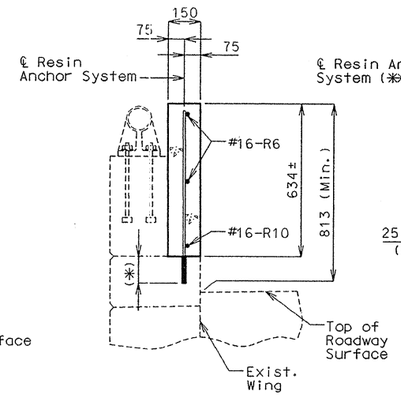
SECTION A-A

NOTE: #16-R6, R7 & R8 Bars not shown for clarity.

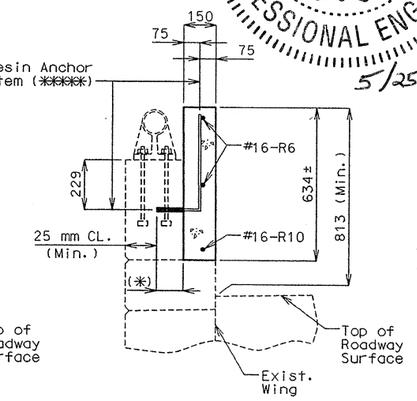


SECTION B-B

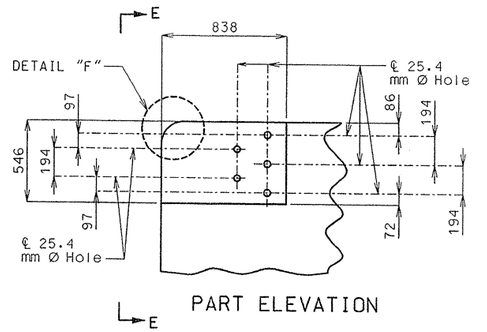
NOTE: #16-R5 Bars not shown for clarity.



SECTION C-C



SECTION D-D



PART ELEVATION

DETAILS OF GUARD RAIL ATTACHMENT

NOTE:
(*****) Shift resin anchor systems to clear Exist. steel anchor bolts for tube rail.

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER 2004017247
PROFESSIONAL ENGINEER
5/25/05

Final Plans

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Karsten M. Sommerhauser 5/25/05
Signature Date

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

TYPICAL DETAILS OF CURB BLOCKOUT AT END POST

Detailed Oct. 1998
Checked Oct. 1998

FOR INFORMATION ONLY

A16405 & A16406, Sht. 54

Final Plans

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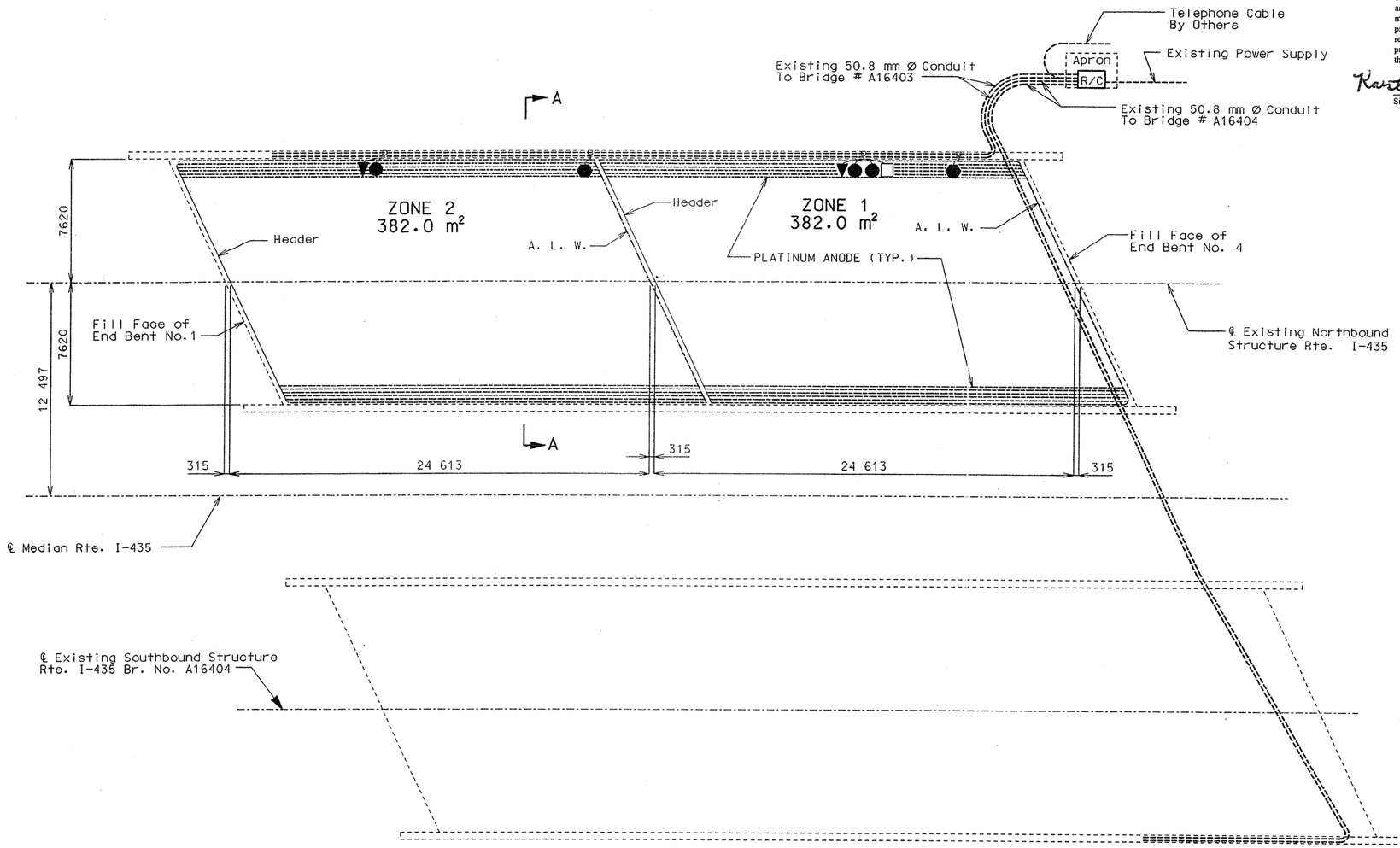
Karsten M. Sommerhauser — Signature — 5/25/05 — Date

JOB NO. J4I1399 DIST. 4

State	Proj. No.	Sheet No.
MO	~~FAI-435-4(263)~~	137

CONTRACT NO. 991022-403



PART PLAN OF SLAB SHOWING PLATINUM CATHODIC PROTECTION SYSTEM (ALTERNATE "A")

Note:

For Section A-A, typical zone layout and partial electrical schematic, see sheet no. 7.

Dimensions are along ℄ of structure (end of slab to end of slab).

The anode lead wire and header shall be 6.0 mm² stranded copper wire with HMWPE insulation.

Factory supplied field splices will be permitted between stages on the anode lead wire (A.L.W.) and header as directed by the engineer.

Existing overlay and cathodic protection system shall be removed and the deck scarified prior to sawing slots. (see special provisions).

DENOTATIONS

- A.L.W. (ANODE LEAD WIRE)
- HEADER
- PLATINUM ANODE
- SYSTEM NEGATIVE CONNECTION
- REFERENCE CELL
- GROUNDS
- NULL PROBE (CORROSOMETER)
- EXISTING CONDUIT

NOTE:

The anode leads, system negative return leads, reference cell, reference cell ground lead, null probe and null probe ground lead shall be routed in one of the existing conduits.

All existing wiring in the deck and conduits shall be removed and replaced with new.

The telephone cable shall be routed into the rectifier through one of the unused existing conduits.

Reference cells are to be placed between anodes.

U.I.P. existing conduit, access fittings and junction boxes.

The reference cell ground lead shall be welded to the top rebar within 300 mm of the reference cell.

Anode assembly number must match zone number.

Existing access holes through deck not used with the new cathodic protection system shall have its plastic sleeve and silicon sealant removed, hole cleaned and plugged with a nonmetallic expansive mortar in accordance with Std. Spec. 1066.

FINAL

~~ESTIMATED~~ QUANTITIES — For information only

ITEM	UNIT	QUANTITY
Anode Lead Wire & Header	Meters	101
Platinum Anodes	Meters	3741
Reference Cells	Each	2
Null Probes	Each	1
Thermite Welds	Each	5

Note: Anode lengths are approximate, actual lengths are the responsibility of the contractor.
No direct payment shall be made for any additional conduit, junction boxes, access fittings, additional material, labor and modification to existing conduit.

STATE OF MISSOURI — KARSTEN M. SOMMERHAUSER — NUMBER PE-2004017247 — PROFESSIONAL ENGINEER — 5/25/05

STATE OF MISSOURI — KURT E. GRIBBLE NUMBER E-23576 — REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

Detailed Sept. 1998
Checked Oct. 1998

Sheet No. 5 of 12

JACKSON COUNTY A16403

Final Plans

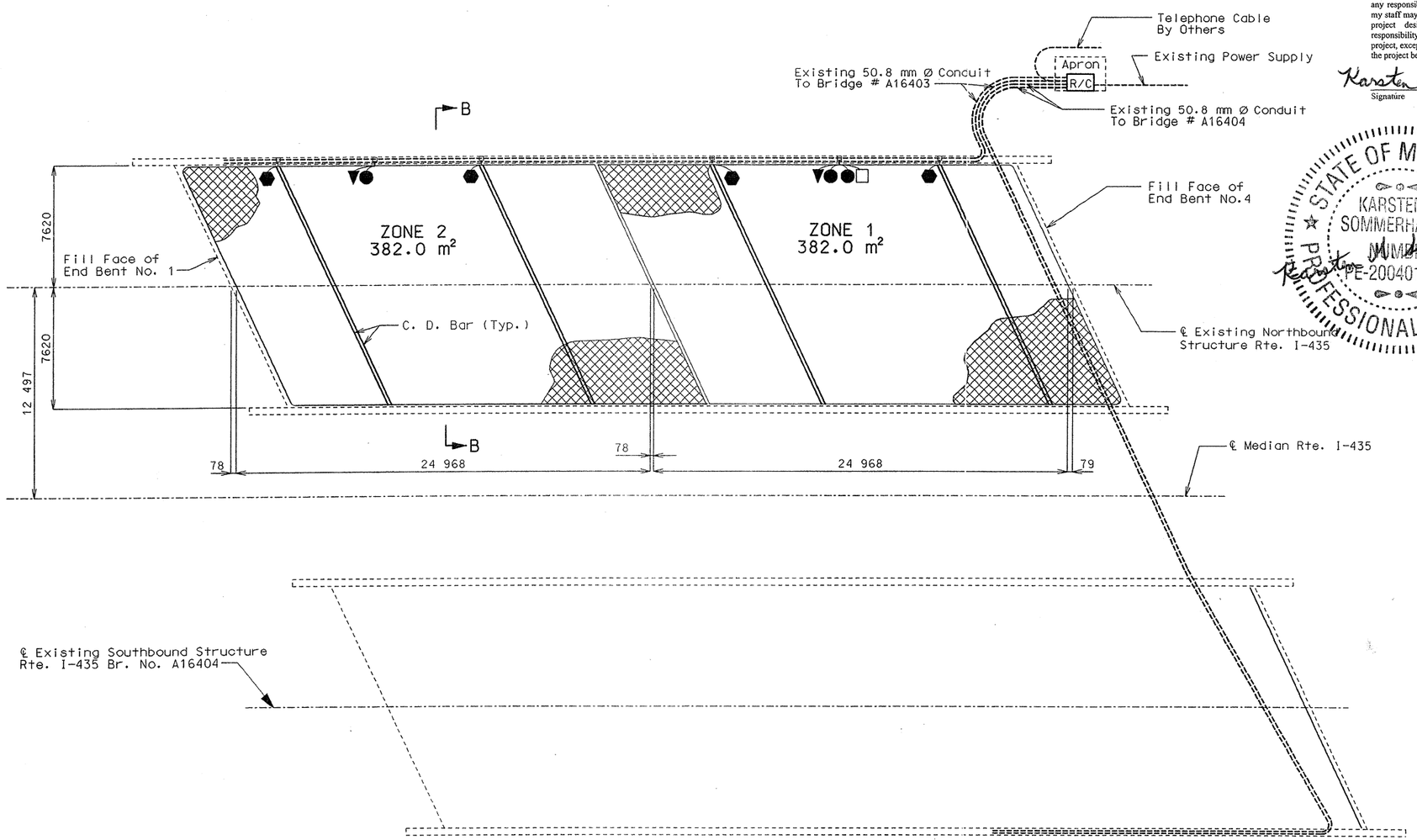
I certify that this plan sheet accurately depicts the configuration and location of the roadway and all its appurtenant features, to the best of my knowledge, as I and my staff have observed the contractor's construction of this project. I specifically disclaim any responsibility for the design of this project, except as I and my staff may have modified or authorized the modification of the project design during its construction; and I disclaim responsibility for the contractor's actual construction of the project, except as I and my staff may have directed or ordered that the project be constructed. .

Karsten M. Sommerhauser 5/25/05
Signature Date

JOB NO. J4I1299 DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	B 72

CONTRACT NO. 991022-403



PART PLAN OF SLAB SHOWING ELGARD MESH CATHODIC PROTECTION SYSTEM (ALTERNATE "B")

Note:
For Section B-B, typical zone layout and partial electrical schematic, see sheet no. 8.

Dimensions are along ℄ of structure (end of slab to end of slab).

Existing overlay and cathodic protection syatem shall be removed and the deck scarified prior to sawing slots. (see special provisions)

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

DENOTATIONS

- ELGARD ANODE MESH
- SYSTEM NEGATIVE CONNECTION
- REFERENCE CELL
- GROUNDS
- NULL PROBE (CORROSOMETER)
- EXISTING CONDUIT

NOTE:
The anode leads, system negative return leads, reference cell, reference cell ground lead, null probe and null probe ground lead shall be routed in one of the existing conduits.

All existing wiring in the deck and conduits shall be removed and replaced with new.

The telephone cable shall be routed into the rectifier through one of the unused existing conduits.

Reference cells are to be placed between anodes.

U.I.P. existing conduit, access fittings and junction boxes.

The reference cell ground lead shall be welded to the top rebar within 300 mm of the reference cell.

Anode assembly number must match zone number.

Existing access holes through deck not used with the new cathodic protection system shall have its plastic sleeve and silicon sealant removed, hole cleaned and plugged with a nonmetallic expansive mortar in accordance with Std. Spec. 1066.

FINAL

~~ESTIMATED~~ QUANTITIES — For information only

ITEM	UNIT	QUANTITY
Elgard Anode Mesh (210)	Sq. Meters	761
Reference Cells	Each	2
Null Probes	Each	1
Thermite Welds	Each	7

Note: Anode lengths are approximate, actual lengths are the responsibility of the contractor.
No direct payment shall be made for any additional conduit, junction boxes, access fittings, additional material, labor and modification to existing conduit.

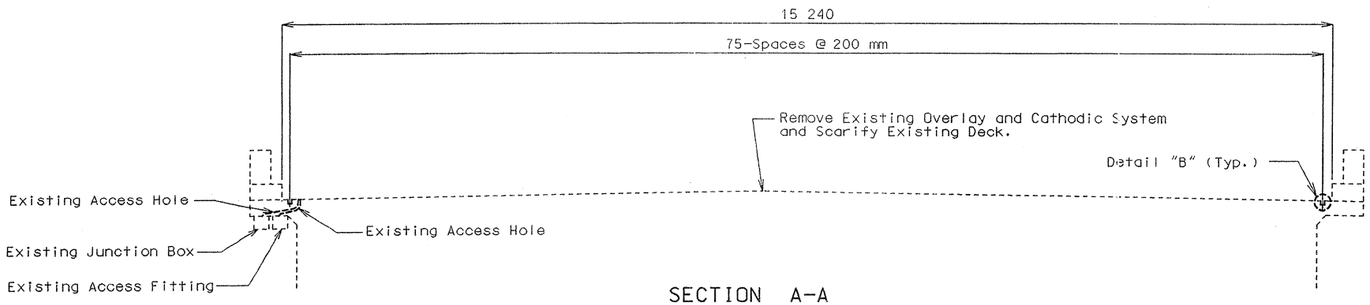
STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

JOB NO. J4I1299 DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	373

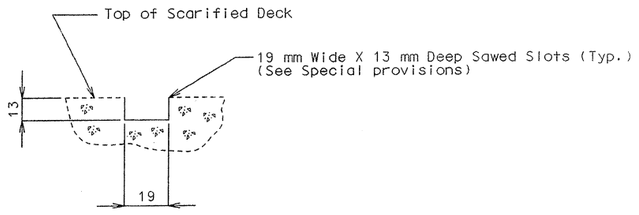
CONTRACT NO. 991022-403



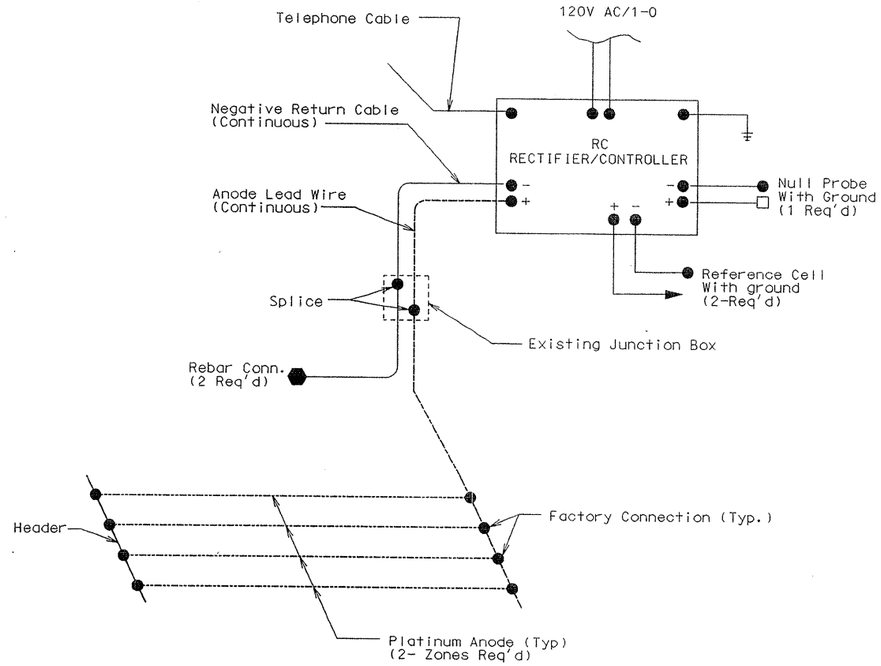
SECTION A-A

(At Alternate "A")

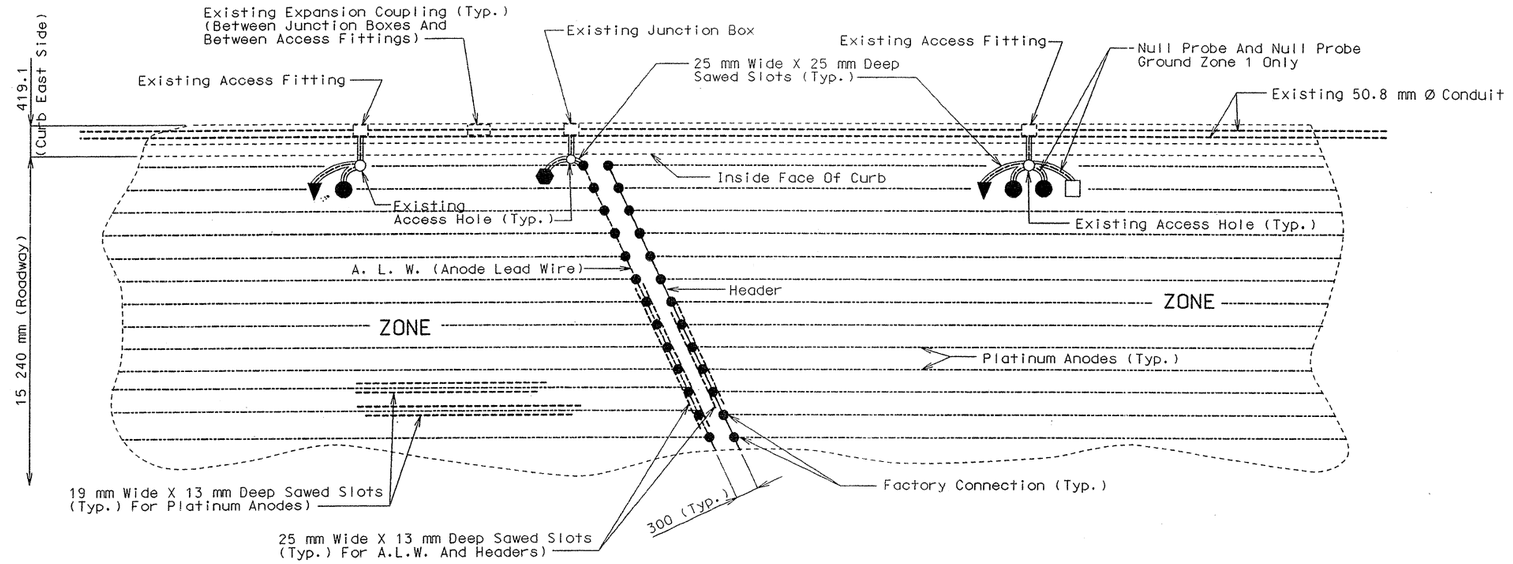
Note: For location of section A-A see sheet no. 5.



DETAIL "B"



PARTIAL SCHEMATIC
(ALTERNATE "A")



TYPICAL ZONE LAYOUT, EXCEPT AS NOTED, FOR (ALTERNATE "A") SYSTEM

Note: Anodes shall be placed as shown with a minimum tolerance of plus or minus 75 mm. Use existing access holes, access fittings and junction boxes where acceptable as determined by the engineer.

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

Final Plans

I certify that this plan sheet accurately depicts the configuration and location of the roadway and all its appurtenant features, to the best of my knowledge, as I and my staff have observed the contractor's construction of this project. I specifically disclaim any responsibility for the design of this project, except as I and my staff may have modified or authorized the modification of the project design during its construction; and I disclaim responsibility for the contractor's actual construction of the project, except as I and my staff may have directed or ordered that the project be constructed.

Karsten M Sommerhauser — 5/25/05
Signature — Date

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

Final Plans

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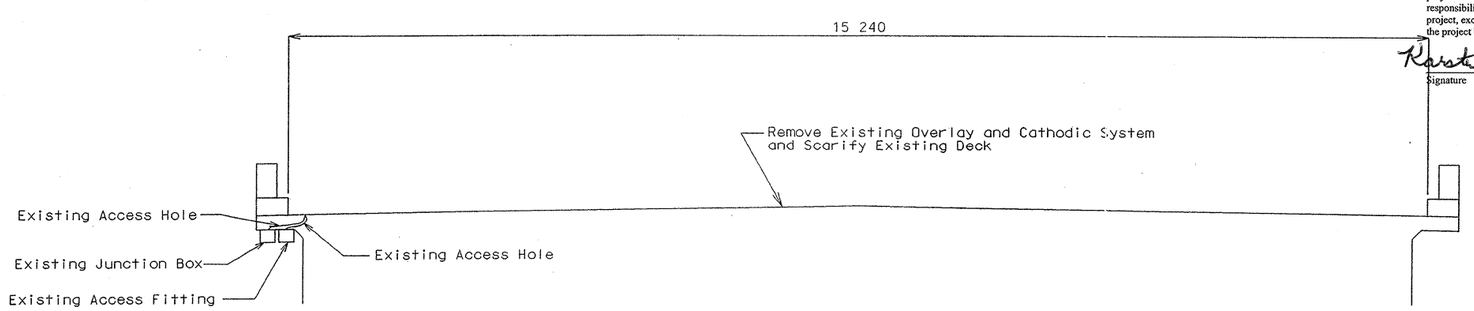
Karsten M. Sommerhauser — Signature

5/25/05 — Date

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	374

JOB NO. J4I1299
CONTRACT NO. 991022-483
DIST. 4

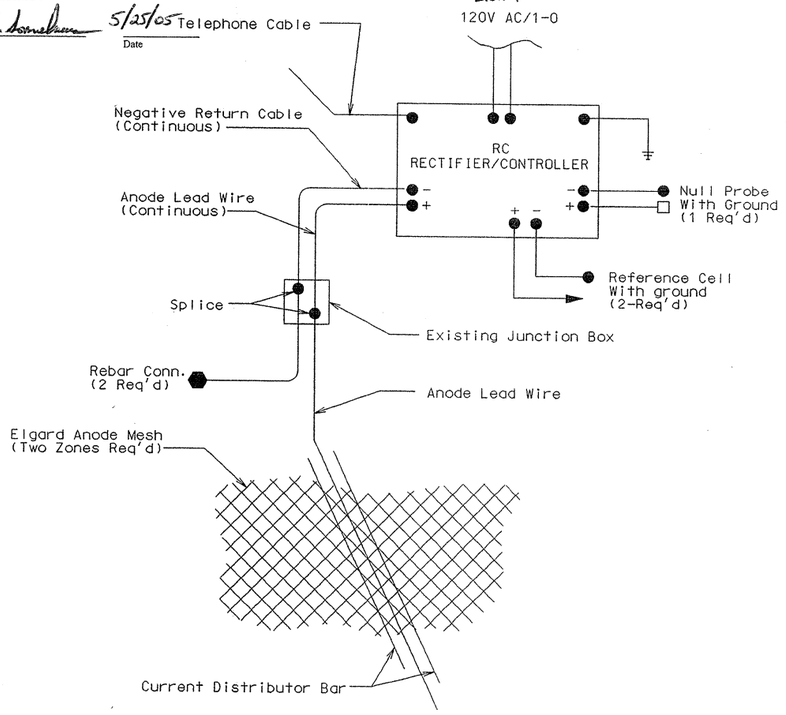


SECTION B-B

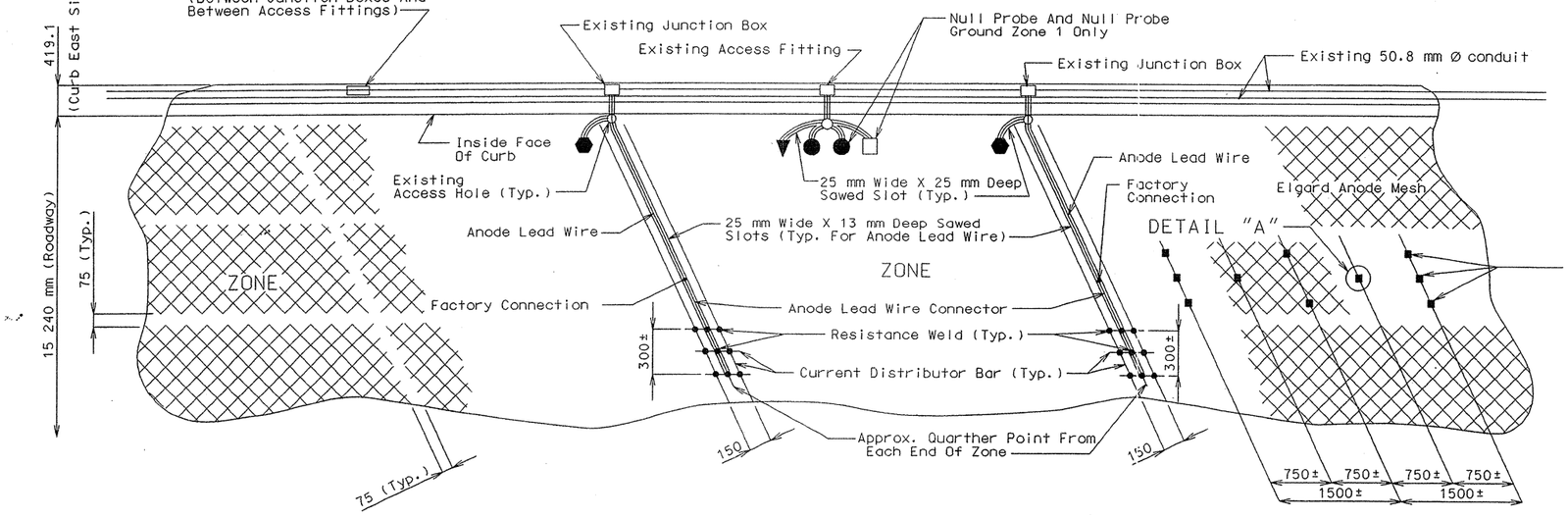
(At Alternate "B")

Note: For location of section B-B see sheet no. 6.

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER
PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

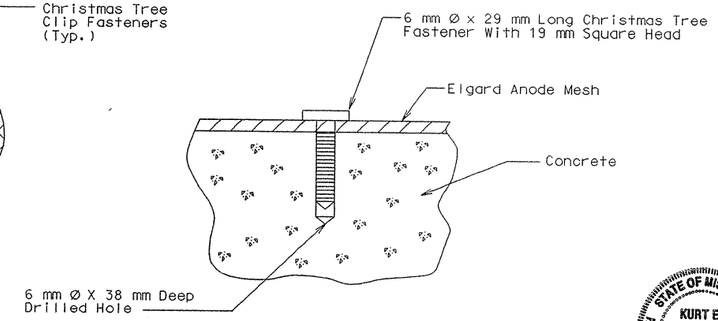


PARTIAL SCHEMATIC
(ALTERNATE "B")



TYPICAL ZONE LAYOUT, EXCEPT AS NOTED, FOR (ALTERNATE "B") SYSTEM

Note: Use existing access holes, access fittings and junction boxes where acceptable as determined by the engineer.



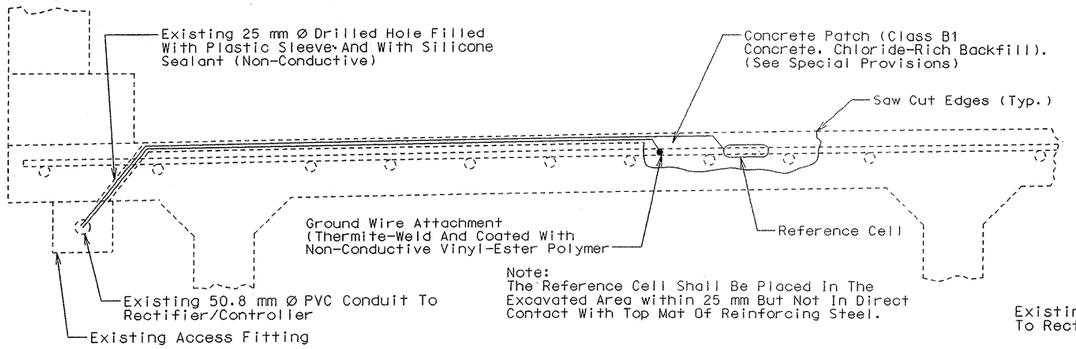
DETAIL "A"
(Christmas Tree Clip)

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

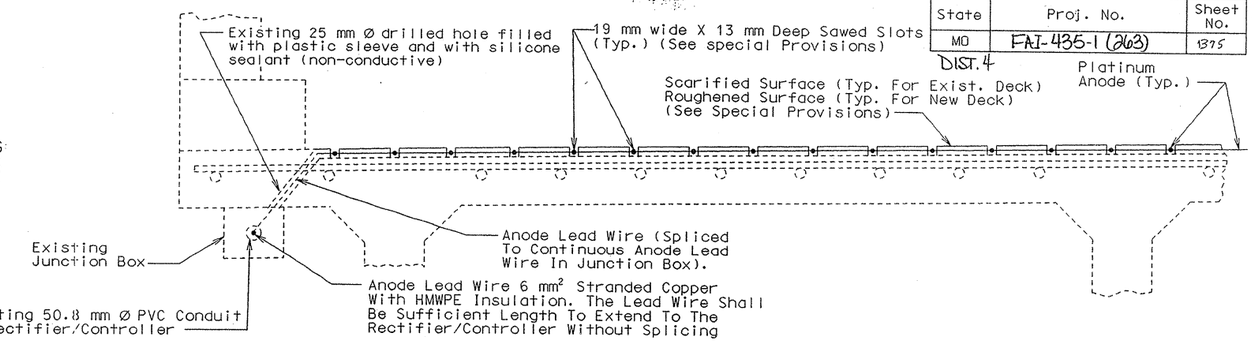
Detailed Sept. 1998
Checked Oct. 1998

JOB NO. J4I1399 CONTRACT NO. 991022-403

State	Proj. No.	Sheet No.
MO	FAI-435-1 (263)	1395
DIST. 4		

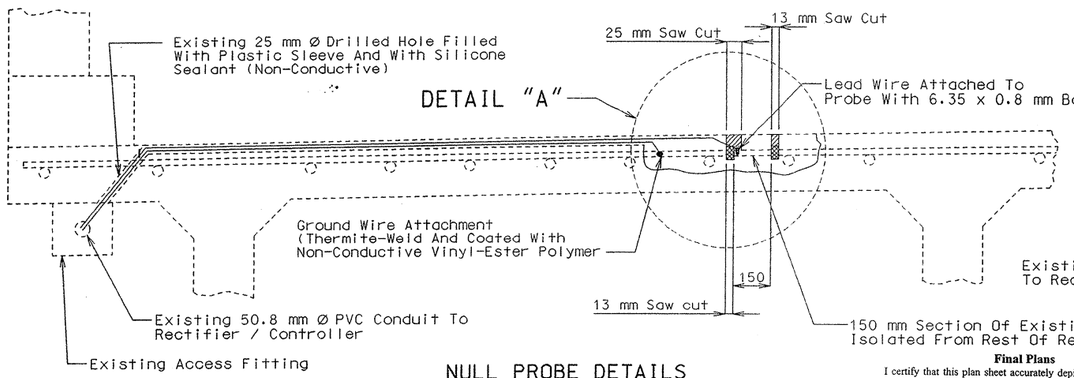


REFERENCE CELL DETAILS

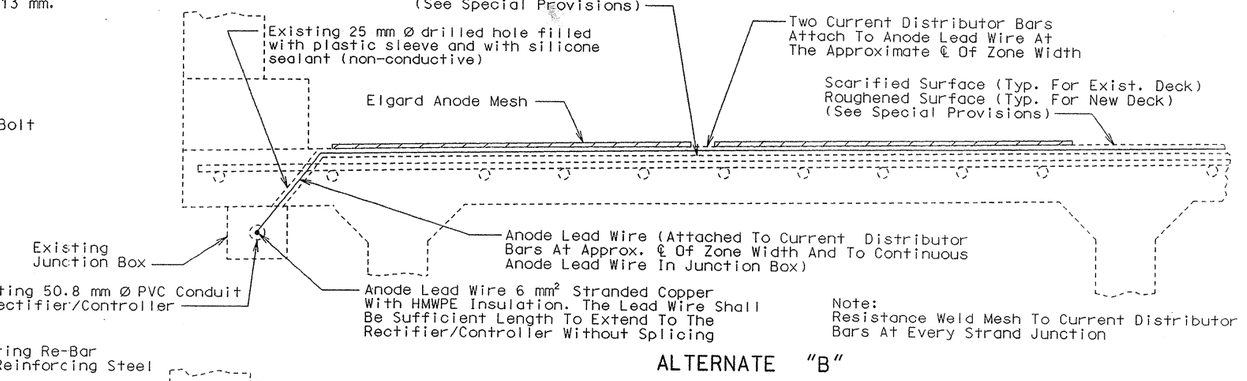


ALTERNATE "A"

Note:
All concrete removal shall be initiated by saw cutting the first 13 mm.



NULL PROBE DETAILS



ALTERNATE "B"

Note:
Resistance Weld Mesh To Current Distributor Bars At Every Strand Junction

Final Plans

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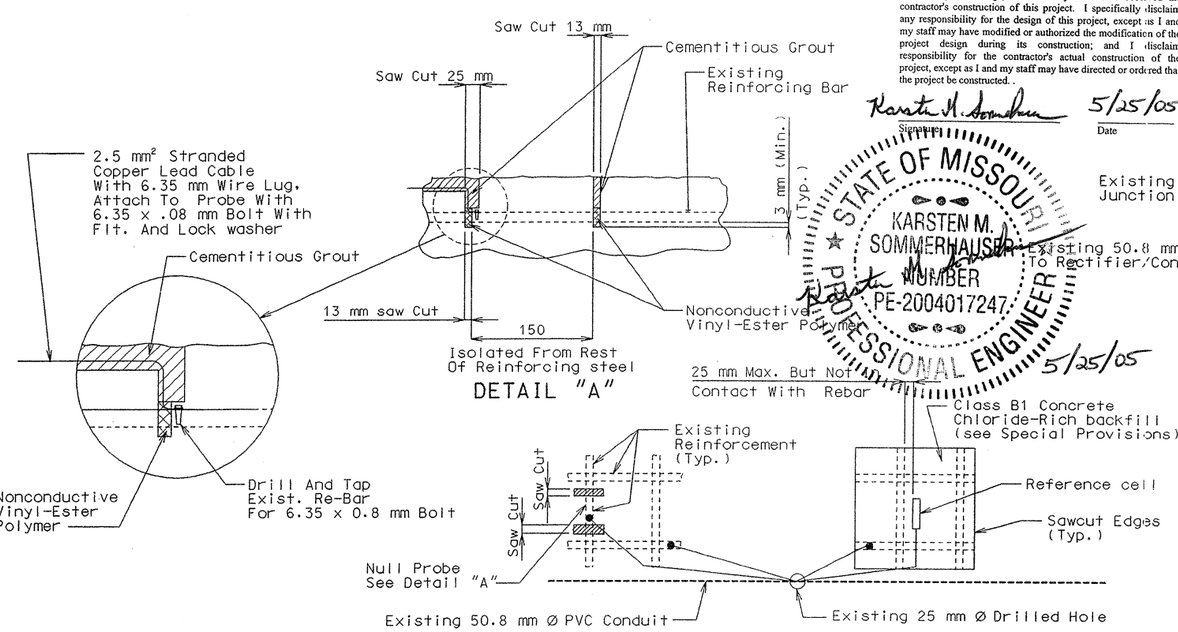
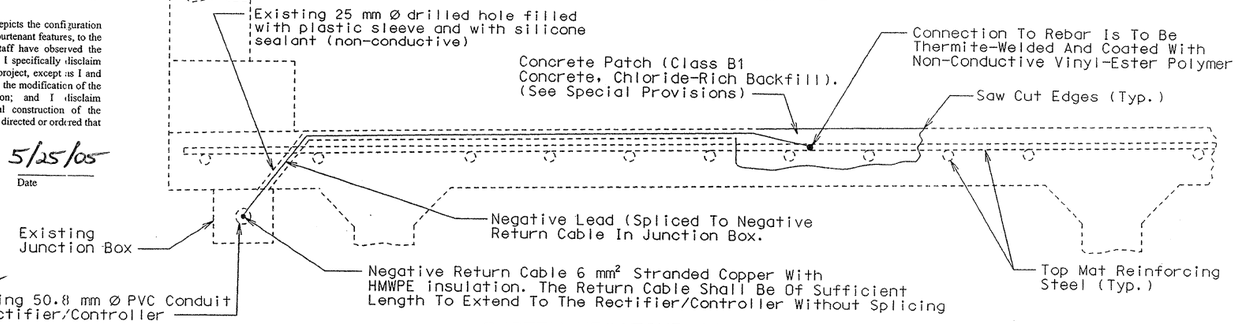
Karsten M. Sommerhauser 5/25/05
Signature Date

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05



PLAN OF NULL PROBE AND REFERENCE CELL



SYSTEM NEGATIVE CONNECTION DETAILS

Notes for New Conduit and Appurtenances (if required):
Conduit shall be schedule 40 heavy wall PVC (Polyvinyl Chloride Plastic). Each section of conduit shall bear the underwriters laboratories, inc. (UL) label.

Conduit shall be secured to concrete with clamps (galvanized/AASHTO M111) at abt. 1500 mm cts. Concrete anchors for clamps shall meet federal specification FF-S-325, group II, type 4, class I and shall be galvanized in accordance with ASTM A-153, B695-91 class 50 or stainless steel. Minimum embedment in concrete shall be 45 mm. The supplier shall furnish a manufacturers certification that the concrete anchors meet the required material and galvanizing specifications.

Weepholes shall be provided at appropriate locations to drain any moisture in the conduit lines.

Expansion couplings shall be installed on conduit lines between all junction boxes and between all access fittings as approved by the engineer.

The location and direction of conduit may be shifted to meet field conditions as directed by the engineer.

All junction boxes shall be PVC molded, surface mounted, size 200 mm x 200 mm x 175 mm and equal to Carlon Electrical Construction products or Triangle Conduit and Cable company Inc.. The terminations shall be permanent or seperable.

The terminations and covers shall be of watertight construction.

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

JOB NO. J4I1299
CONTRACT NO. 991032-403
DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	877

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

Final Plans

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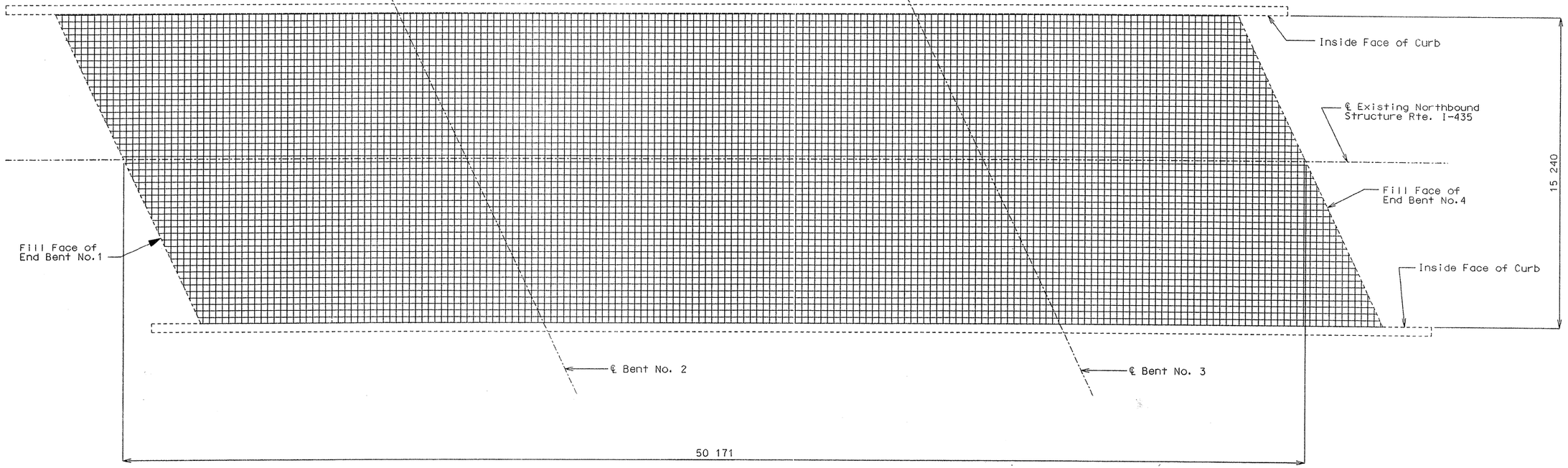
Karsten M. Sommerhauser — Signature — 5/25/05 — Date



PLAN OF CONCRETE DECK SHOWING GRID

(For location of deck repair, reference cells and null probes)

Note: This sheet is to be completed by MoDOT construction personnel.

Note: Grid = Approx. 310 mm Squares
Drawing Scale = 1:100 mm/mm

REPAIRS TO BRIDGE A-1640 (N.B.L.)
OVER OLDHAM ROAD

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

Detailed Sept. 1998
Checked Oct. 1998

JACKSON COUNTY A16403

FOR INFORMATION ONLY

A16405 & A16406, Sht. 60

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
			CURB																
			BLOCKOUT																
32	16	R1	BLOCKOUT	E	13	S				340	795	340	795				2550	2450	122
28	16	R2	BLOCKOUT	E	13	S				245	795	245	795				2360	2260	98
4	16	R3	BLOCKOUT	E	13	S				245	730	245	730				2230	2130	13
32	16	R4	BLOCKOUT	E	13	S				340	250	340	250				1460	1360	68
40	16	R5	BLOCKOUT	E	20					1595							1595	1595	99
8	16	R6	BLOCKOUT	E	20					1520							1520	1520	19
4	16	R7	BLOCKOUT	E	20					1485							1485	1485	9
4	16	R8	BLOCKOUT	E	20					1595							1595	1595	10
4	16	R9	BLOCKOUT	E	20					1595							1595	1595	10
4	16	R10	BLOCKOUT	E	20					2355							2355	2355	15
8	16	R11	BLOCKOUT	E	20					1595							1595	1595	20
24	16	R20	BLOCKOUT	E	20					2965							2965	2965	110
3	16	R21	BLOCKOUT	E	20					8885							8885	8885	41
3	16	R22	BLOCKOUT	E	20					8820							8820	8820	41
12	16	R23	BLOCKOUT	E	20					8805							8805	8805	164
14	16	R24	BLOCKOUT	E	20					6585							6585	6585	143

BILL OF REINFORCING STEEL

JOB NO. J4I1299
CONTRACT NO. 991022-403

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

Final Plans

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Karsten M. Sommerhauser 5/25/05
Signature Date

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

State	Job No. J4I1299 Contract I.D. 991022-403 Proj. No.	Sheet No.
MO	FAI-435-1(263) DIST. 4	1378

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 22 · Shape 23 · Shape 24 · Shape 25 · Shape 26 · Shape 27 · Shape 28 · Shape 29 · Shape 31 · Shape 30 · Shape 32 · Shape 33 · Shape 34 · Shape 35 · Shape 36

Spot weld AASHTO M32 size W5 wire (typ.)

Two additional #16-R24 Bars are included in the bar bill for testing.

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

90° Stirrup · 135° Stirrup

Detailed Oct. 1998
Checked Oct. 1998

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.

Detailing Dimension · 90° · 180° · 4d or 64 mm min. · 12d

END HOOK DIMENSIONS (mm)				
Bar Size	D	All Grades 180° Hooks A or G	All Grades 180° Hooks J	All Grades 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

Notes:
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

BENDING DIAGRAMS

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

Sheet No. 12 of 12

JACKSON COUNTY

A16403

142

Signature Date

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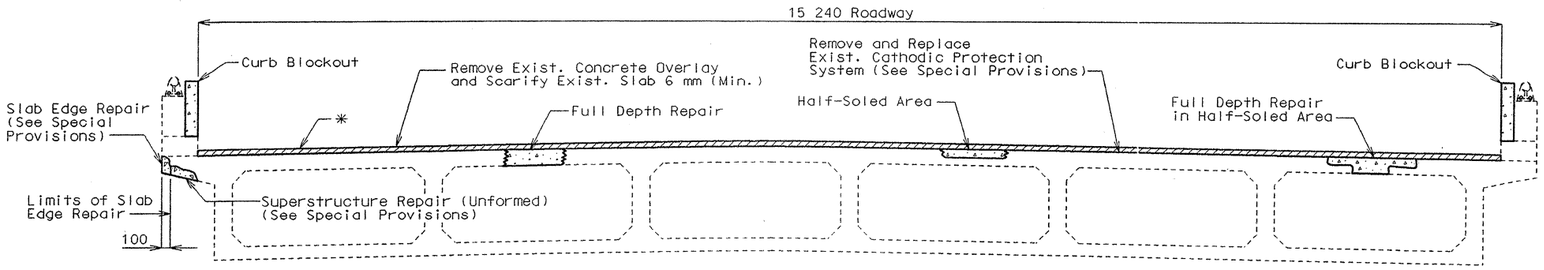
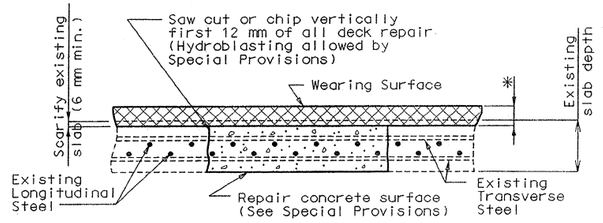
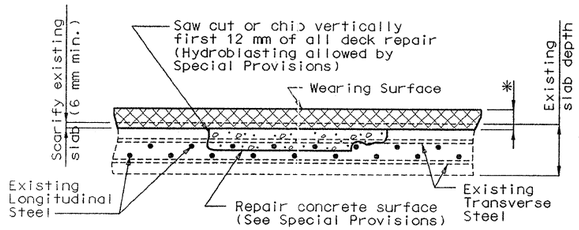
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION



SECTION THRU SLAB

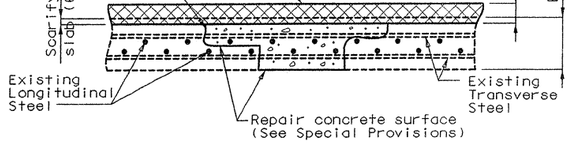


FULL DEPTH REPAIR



HALF-SOLED AREA

* 63 mm (Min.) Low Slump Concrete Wearing Surface

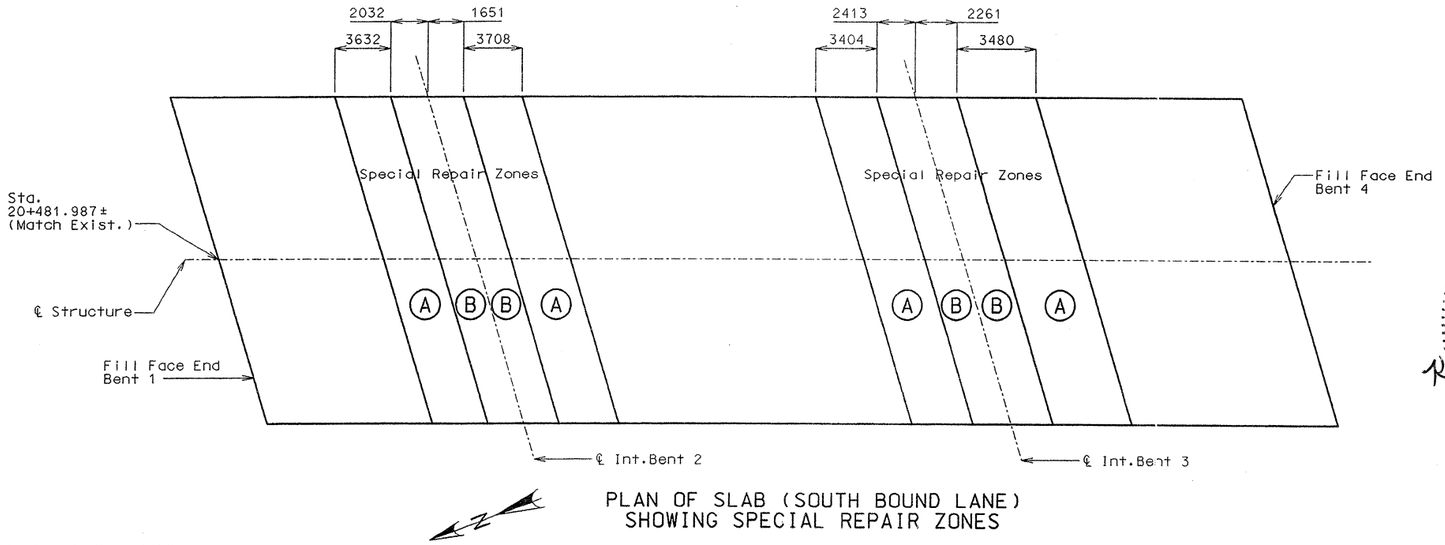


FULL DEPTH REPAIR
IN HALF-SOLED AREA

NOTE:
Zone A is to be completed before Zone B.

Any repair in the remainder of the bridge that is within 600 mm of Zone A shall be completed before removing old concrete in Zone A.

Zones with the same letter designation may be repaired at the same time.



PLAN OF SLAB (SOUTH BOUND LANE)
SHOWING SPECIAL REPAIR ZONES

General Notes:

Design Specifications:

AASHTO 1996 and Interim 1997.

Design Unit Stresses:

Class B1 Concrete (Curb Blockout) 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.

Dimensions:

All dimensions are shown in millimeters (mm) unless otherwise specified.
Drawings are not to scale. Follow dimensions.

Miscellaneous:

Traffic over structure to be maintained during construction. See sheet No. 2 for details of stage construction. (See roadway plans for traffic control).

Outline of old work is indicated by dashed lines. Heavy lines indicate 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.

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

Roadway surfacing adjacent to bridge ends to match bridge overlay (Roadway item).

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	898
Sec./Sur. 13	Twp. 48N	Rge. 33W

JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4

FINAL ~~ESTIMATED~~ QUANTITIES

ITEM		TOTAL
Curb Removal (Bridges) - Metric	meter	7.0
Removal of Low Slump Concrete Wearing Surface - Metric	sq. meter	866.7
Partial Removal of Cathodic Protection System	lump sum	1
Substructure Repair (Unformed) - Metric	sq. meter	2.0
Superstructure Repair (Unformed) - Metric	sq. meter	2.0
Curb Blockout - Metric	meter	123.5
Repairing Concrete Deck (Half-Soling) - Metric	sq. meter	83.0
Full Depth Repair - Metric	sq. meter	5
Slab Edge Repair (Bridges) - Metric	meter	1.0
Low Slump Concrete Wearing Surface - Metric	sq. meter	867
Cathodic Protection System	lump sum	1

Final Plans

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Karsten M. Sommerhauser 5/25/05
Signature Date

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

REPAIRS TO BRIDGE OVER OLDHAM ROAD

STATE ROAD FROM GREGORY BLVD TO BANNISTER RD.
ABOUT 1.6 km SW OF GREGORY BLVD.

PROJECT NO.
JOB. NO. J4I1299

STA. 20+481.987± (Match Exist.)
RTE. I-435 (S.B.L.)

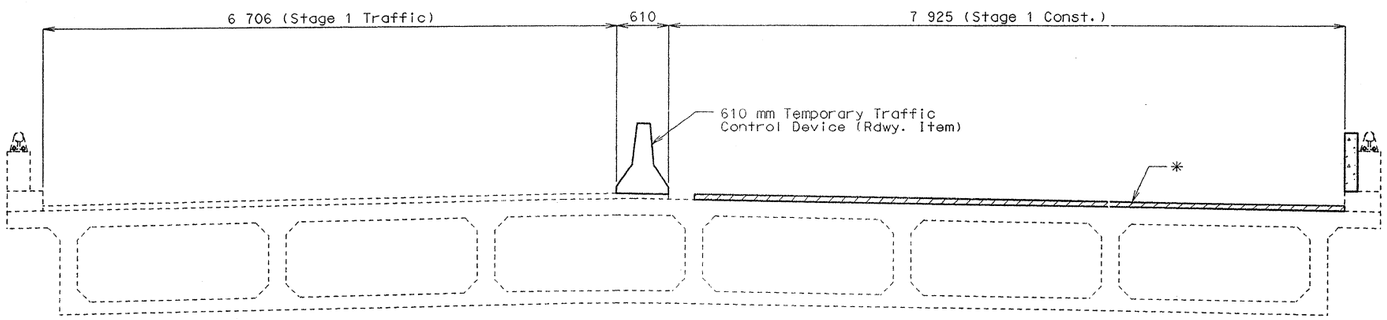
JACKSON COUNTY
Date: 11/19/98

STD.	
STD.	
STD.	
STD. M706.35	
A16404	

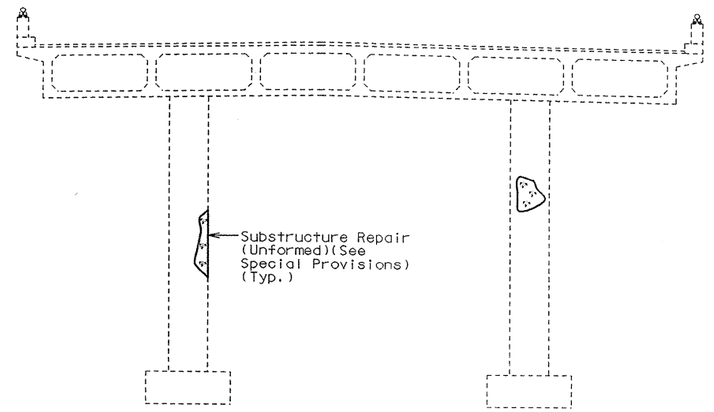
Designed Oct. 1998
Detailed Oct. 1998
Checked Oct. 1998

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	1399

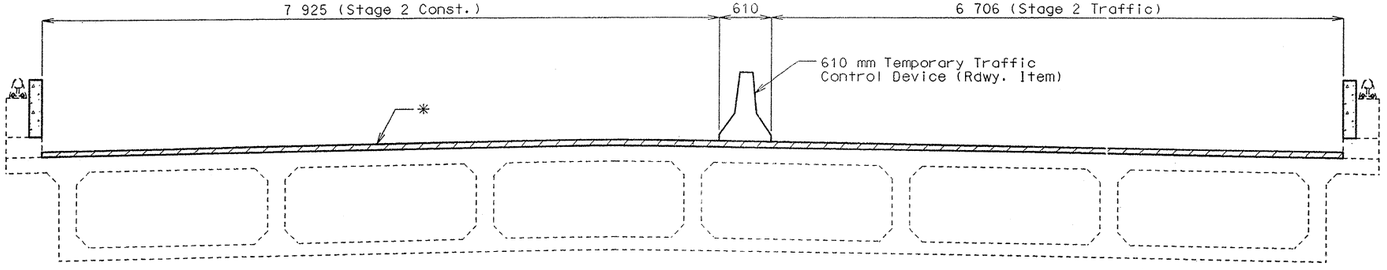
JOB NO. J4I1299
CONTRACT NO. 991032-403
DIST. 4



STAGE 1 CONSTRUCTION



TYPICAL DETAIL SHOWING SUBSTRUCTURE REPAIR AREAS



STAGE 2 CONSTRUCTION

DETAILS OF STAGE CONSTRUCTION

* Remove existing Concrete overlay and Cathodic Protection System. Scarify concrete deck 6 mm and install a new Cathodic Protection System covered with a 63 mm (Min.) Low Slump Concrete wearing surface.

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER 2004017247
PROFESSIONAL ENGINEER
5/25/05

Final Plans

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Karsten M. Sommerhauser 5/25/05
Signature Date

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

CONTRACT NO. 99102.2403
DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1 (263)	87

Final Plans

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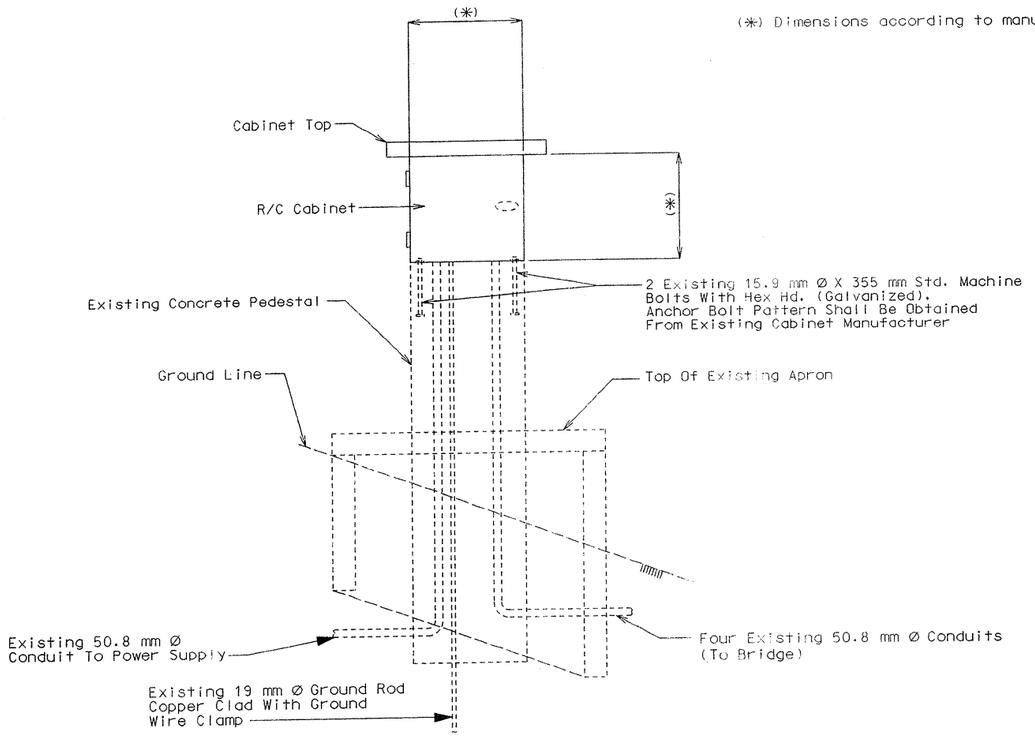
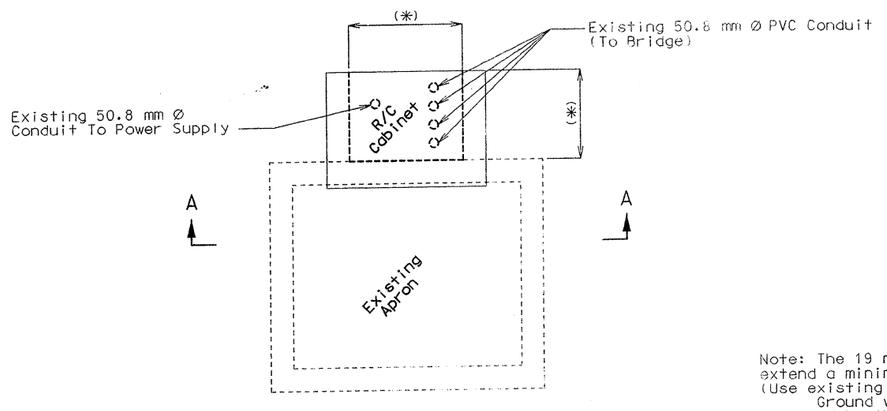
Karsten M. Sommerhauser — Signature — 5/25/05 — Date

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

(*) Dimensions according to manufactured cabinet.



SECTION A-A



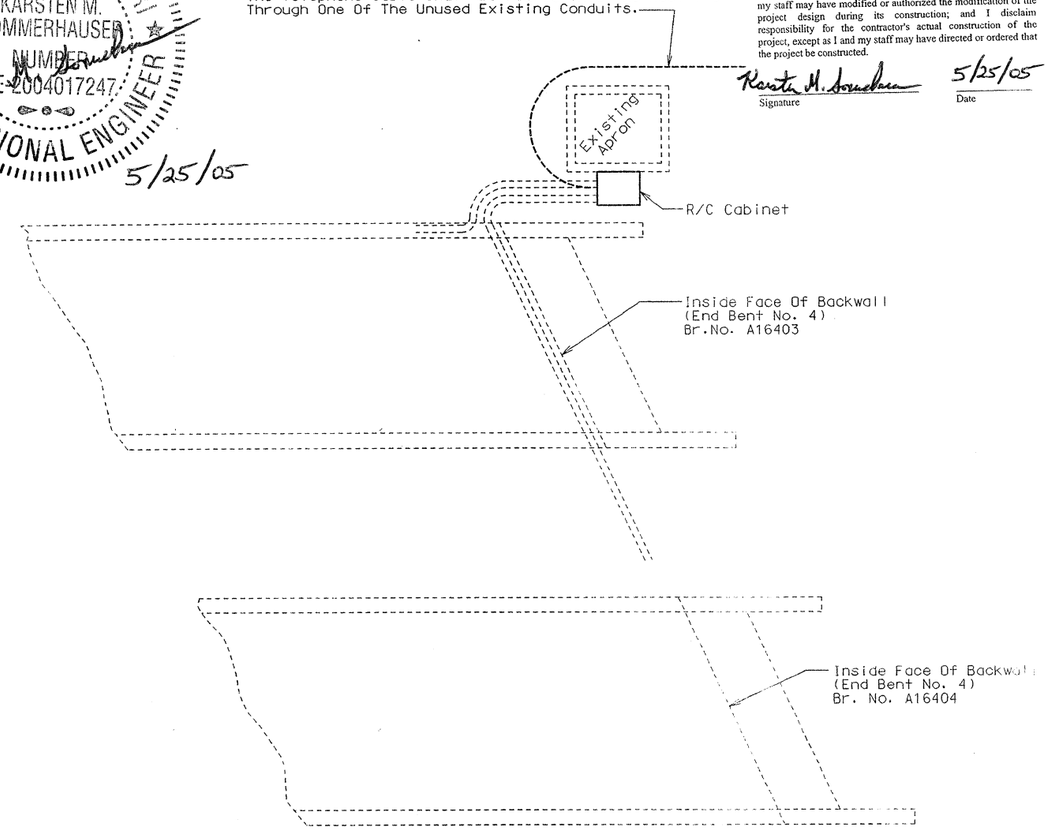
PLAN

Note: The 19 mm Ø ground rod shall be of sufficient length to extend a minimum of 3050 mm below bottom of concrete pedestal. (Use existing if approved by the engineer).

Ground wire shall be 16 mm² minimum (Use existing if approved by the engineer.

Knockouts or drilled holes shall be provided in cabinets for all conduit. Locations of these holes are the responsibility of the contractor and cabinet manufacturer.

The Telephone Cable Shall Be Routed Into The Rectifier Through One Of The Unused Existing Conduits.

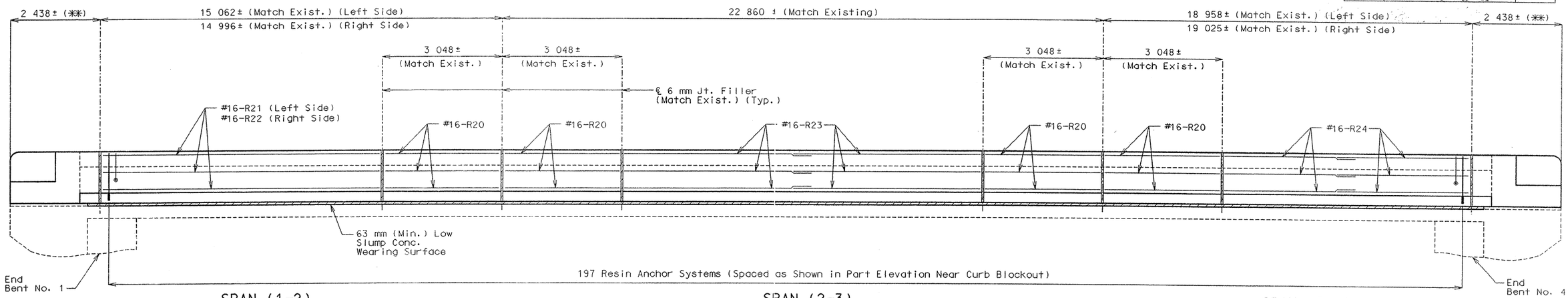


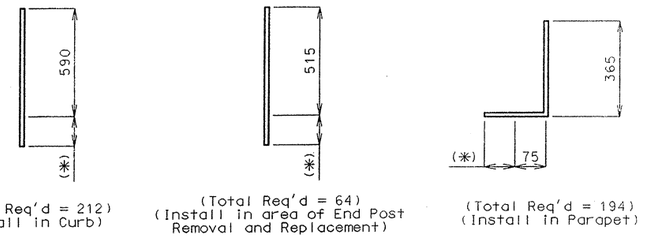
PLAN LOCATION OF RECTIFIER/CONTROLLER

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1 (263)	B 100





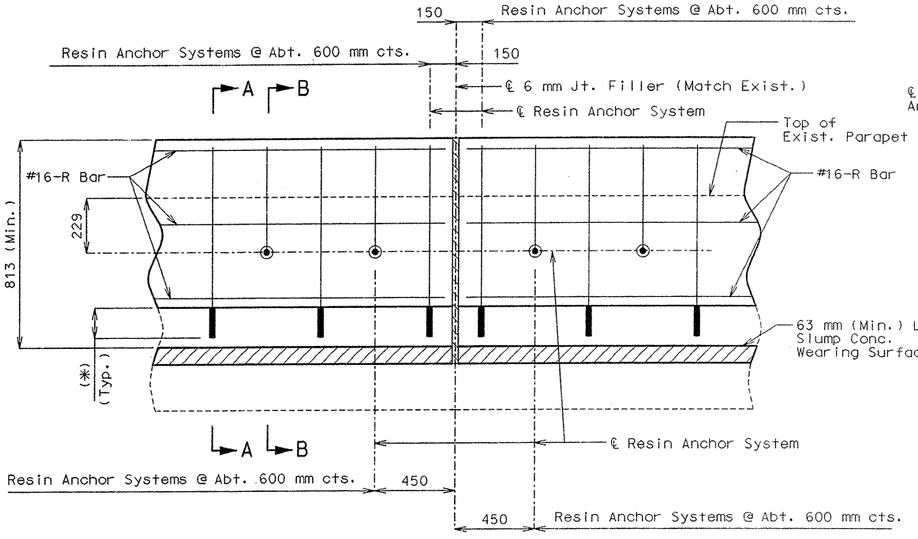
DETAILS OF RESIN ANCHORS

SECTION NEAR LEFT CURB BLOCKOUT (RIGHT SIDE SIMILAR, EXCEPT AS SHOWN)

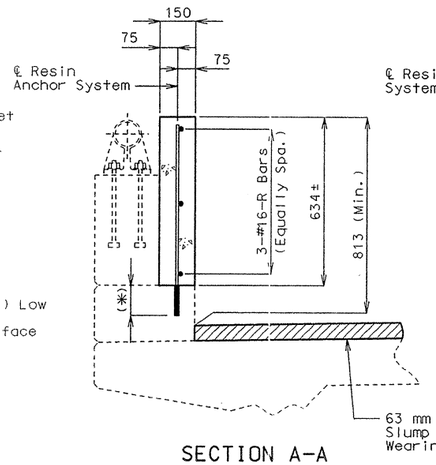
NOTE: (**) For End Post details, see sheet No. 4.

NOTE: (*) Manufacturer's embedment length.

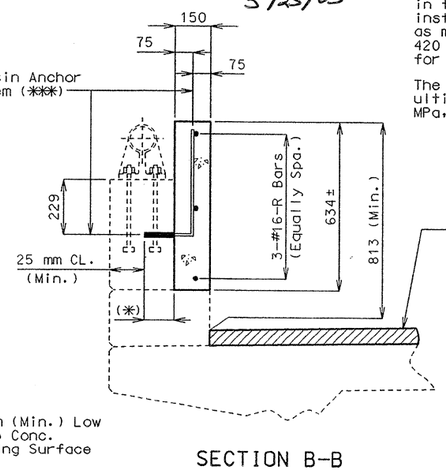
(***) Shift resin anchor systems to clear Exist. steel anchor bolts for tube rail.



PART ELEVATION NEAR CURB BLOCKOUT



SECTION A-A



SECTION B-B

DETAILS OF CURB BLOCKOUT

NOTES FOR CURB BLOCKOUT:

Concrete in curb blockout shall be Class B1 with f'c = 28 MPa.

Measurement of curb blockout is to the nearest half meter measured at the gutter line from end of wing to end of wing.

All exposed edges of curb blockout shall have either a 15 mm radius or a 10 mm bevel, unless otherwise shown.

Payment for concrete, reinforcing steel, resin anchor systems and any other work incidental to the curb blockouts complete in place shall be included in the contract unit price for the "Curb Blockout" per meter.

Use a minimum lap of 925 mm for #16 horizontal Curb Blockout bars.

Cost of any concrete curb and parapet repair shall be considered completely covered in the unit price bid for Curb Blockout.

NOTES FOR RESIN ANCHOR SYSTEM:

The contractor shall use one of the resin anchor systems listed in the job special provisions. These resin anchor systems shall be installed according to the manufacturer's specifications, except as modified by the job special provisions and that a #16 Grade 420 (Epoxy Coated) reinforcing bar as shown shall be substituted for the 15.9 mm diameter threaded rod stud.

The 15.9 mm diameter resin anchor systems shall have a minimum ultimate pullout strength of 68.9 kN in concrete with f'c = 28 MPa, see special provisions.

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

Final Plans

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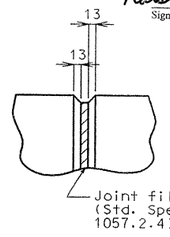
Karsten M. Sommerhauser — Signature — 5/25/05 — Date



FILLED JOINT DETAIL

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

Detailed Oct. 1998
Checked Oct. 1998

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	B101

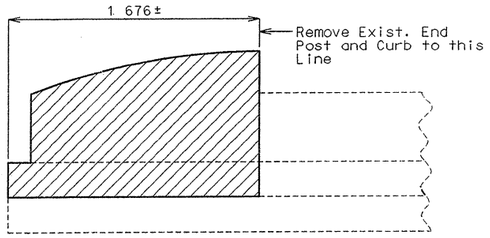
JOB NO. J4I1299 DIST. 4
CONTRACT NO. 9910-22-403

NOTE:

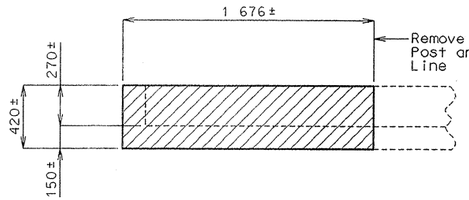
For notes on Curb Blockout and Resin Anchor Systems, see sheet No. 3.

(*) Manufacturer's embedment length.

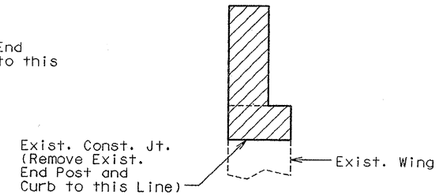
Payment for removal of existing end post and curb concrete is included in the contract unit price for "Curb Removal (Bridges) - Metric" per meter.



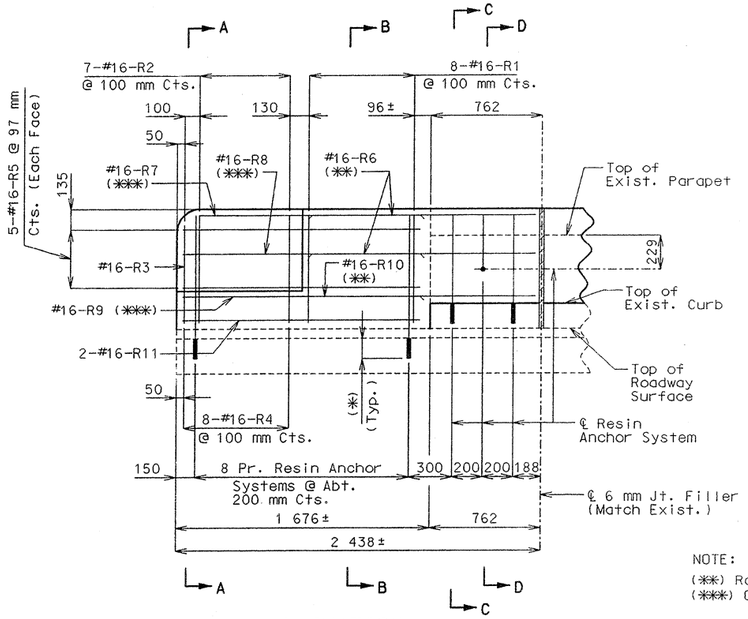
ELEVATION SHOWING END POST REMOVAL



PLAN SHOWING END POST REMOVAL

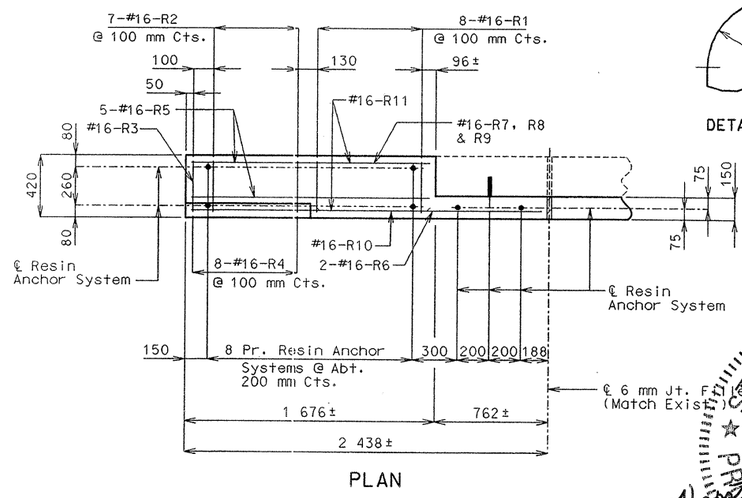


SECTION SHOWING END POST REMOVAL

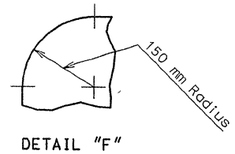


ELEVATION

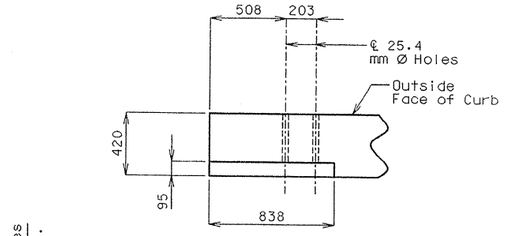
NOTE:
(**) Roadway Face
(***) Outside Face



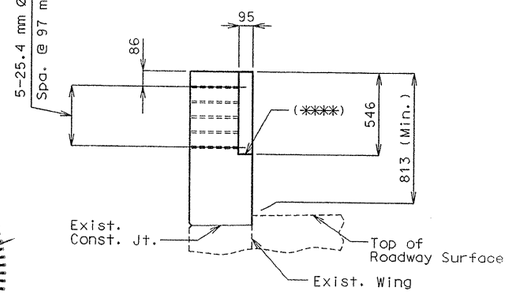
PLAN



DETAIL "F"

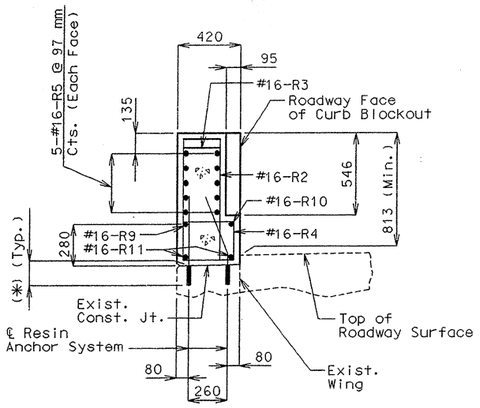


PART PLAN



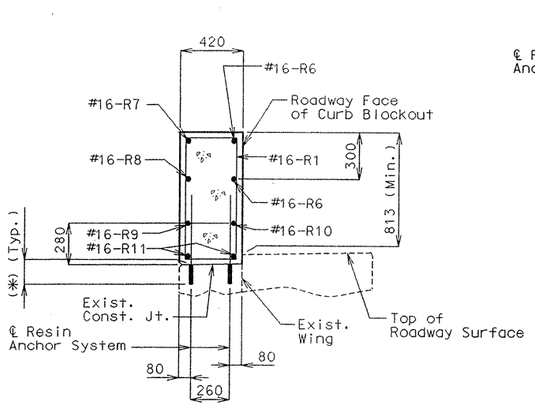
PART ELEVATION E-E

(****) Slope 6 mm toward Roadway



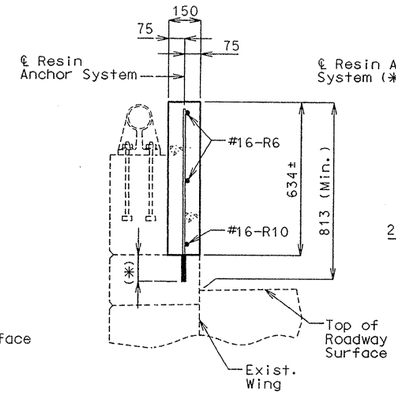
SECTION A-A

NOTE: #16-R6, R7 & R8 Bars not shown for clarity.

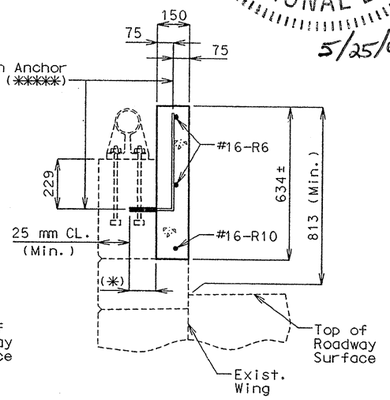


SECTION B-B

NOTE: #16-R5 Bars not shown for clarity.



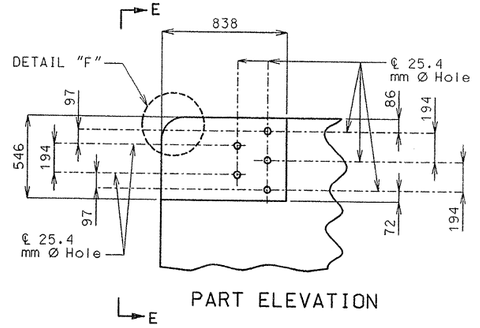
SECTION C-C



SECTION D-D

NOTE:

(*****) Shift resin anchor systems to clear Exist. steel anchor bolts in tube rail.



PART ELEVATION

DETAILS OF GUARD RAIL ATTACHMENT

Final Plans

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Kurt E. Gribble
Signature

5/25/05
Date

DATE 11-19-98

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

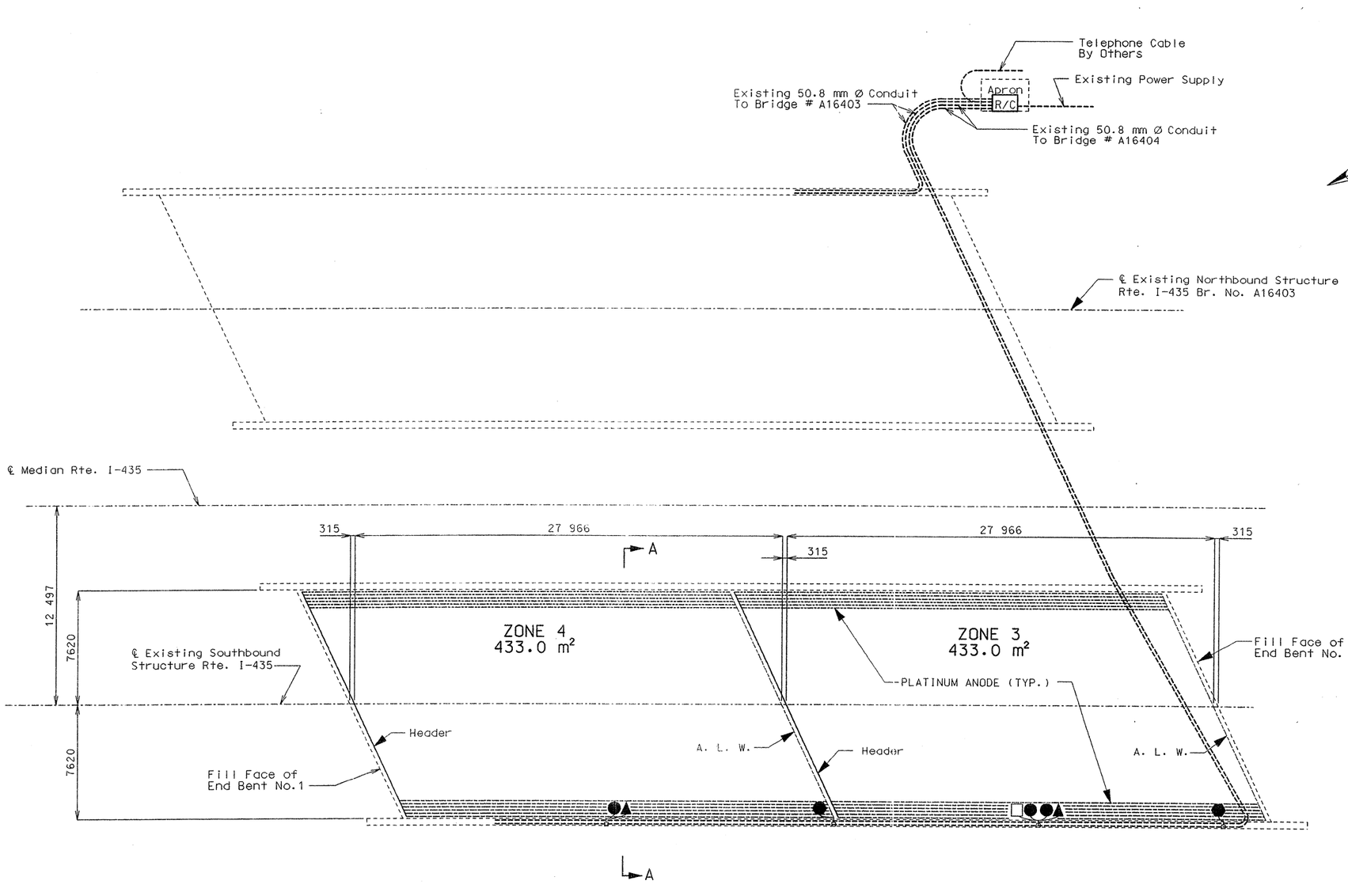
STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER

5/25/05

TYPICAL DETAILS OF CURB BLOCKOUT AT END POST

State	Proj. No.	Sheet No.
MO	FAI-435-1 (263)	B102

JOB NO. J4I1299 DIST. 4
CONTRACT NO. 991022-403



PART PLAN OF SLAB SHOWING PLATINUM CATHODIC PROTECTION SYSTEM (ALTERNATE "A")

DENOTATIONS

- A.L.W. (ANODE LEAD WIRE)
- HEADER
- PLATINUM ANODE
- SYSTEM NEGATIVE CONNECTION
- REFERENCE CELL
- GROUNDS
- NULL PROBE (CORROSOMETER)
- EXISTING CONDUIT

NOTE:

The anode leads, system negative return leads, reference cell, reference cell ground lead, null probe and null probe ground lead shall be routed in one of the existing conduits.

All existing wiring in the deck and conduits shall be removed and replaced with new.

The telephone cable shall be routed into the rectifier through one of the unused existing conduits.

Reference cells are to be placed between anodes.

U.I.P. existing conduit, access fittings and junction boxes.

The reference cell ground lead shall be welded to the top rebar within 300 mm of the reference cell.

Anode assembly number must match zone number.

Existing access holes through deck not used with the new cathodic protection system shall have its plastic sleeve and silicon sealant removed, hole cleaned and plugged with a nonmetallic expansive mortar in accordance with Std. Spec. 1066.

FINAL

~~ESTIMATED~~ QUANTITIES — For information only

ITEM	UNIT	QUANTITY
Anode Lead Wire & Header	Meters	104
Platinum Anodes	Meters	4251
Reference Cells	Each	2
Null Probes	Each	1
Thermite Welds	Each	5

Note: Anode lengths are approximate, actual lengths are the responsibility of the contractor.
No direct payment shall be made for any additional conduit, junction boxes, access fittings, additional material, labor and modification to existing conduit.

Note:

For Section A-A, typical zone layout and partial electrical schematic, see sheet no. 7.

Dimensions are along ℄ of structure (end of slab to end of slab).

The anode lead wire and header shall be 6.0 mm² stranded copper wire with HMWPE insulation.

Factory supplied field splices will be permitted between stages on the anode lead wire (A.L.W.) and header as directed by the engineer.

Existing overlay and cathodic protection system shall be removed and the deck scarified prior to sawing slots. (see special provisions)

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

Final Plans

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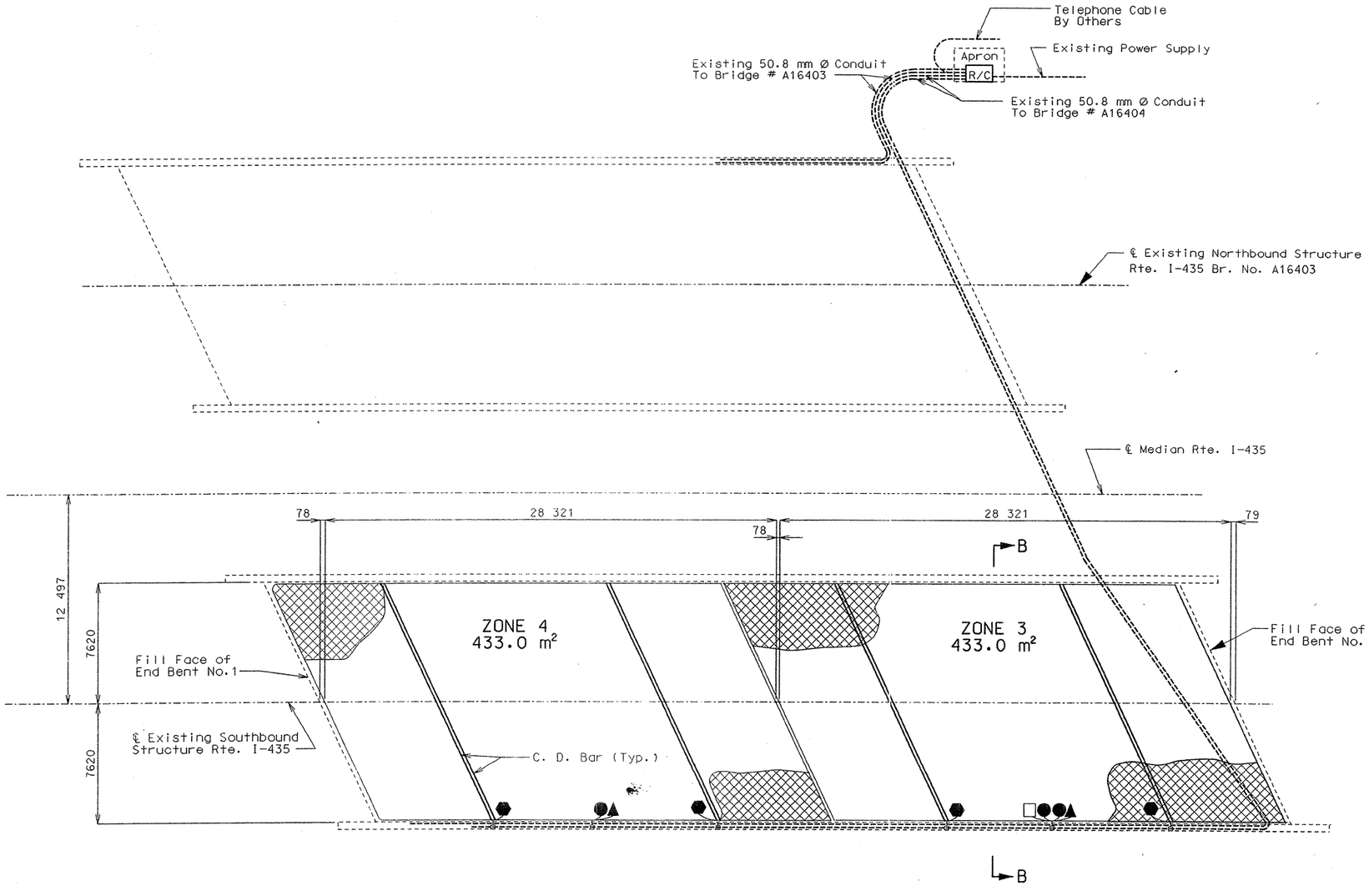
Karsten M. Sommerhauser — 5/25/05
Signature — Date

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

JOB NO. J4I1399
CONTRACT NO: 991022-403
DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1 (263)	B103



DENOTATIONS

- ELGARD ANODE MESH
- SYSTEM NEGATIVE CONNECTION
- REFERENCE CELL
- GROUNDS
- NULL PROBE (CORROSOMETER)
- EXISTING CONDUIT

NOTE:

The anode leads, system negative return leads, reference cell, reference cell ground lead, null probe and null probe ground lead shall be routed in one of the existing conduits.

All existing wiring in the deck and conduits shall be removed and replaced with new.

The telephone cable shall be routed into the rectifier through one of the unused existing conduits.

U.I.P. existing conduit, access fittings and junction boxes.

The reference cell ground lead shall be welded to the top rebar within 300 mm of the reference cell.

Anode assembly number must match zone number.

Existing access holes through deck not used with the new cathodic protection system shall have its plastic sleeve and silicon sealant removed, hole cleaned and plugged with a nonmetallic expansive mortar in accordance with Std. Spec. 1066.

FINAL

~~ESTIMATED~~ QUANTITIES — For information only

ITEM	UNIT	QUANTITY
Elgard Anode Mesh (210)	Sq. Meters	863
Reference Cells	Each	2
Null Probes	Each	1
Thermite Welds	Each	7

Note: Anode lengths are approximate, actual lengths are the responsibility of the contractor.
No direct payment shall be made for any additional conduit, junction boxes, access fittings, additional material, labor and modification to existing conduit.

PART PLAN OF SLAB SHOWING ELGARD MESH CATHODIC PROTECTION SYSTEM (ALTERNATE "B")

Note:
For Section B-B, typical zone layout and partial electrical schematic, see sheet no. 8.

Dimensions are along ℄ of structure (end of slab to end of slab).

Existing overlay and cathodic protection system shall be removed and the deck scarified prior to sawing slots. (see special provisions)

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

Final Plans

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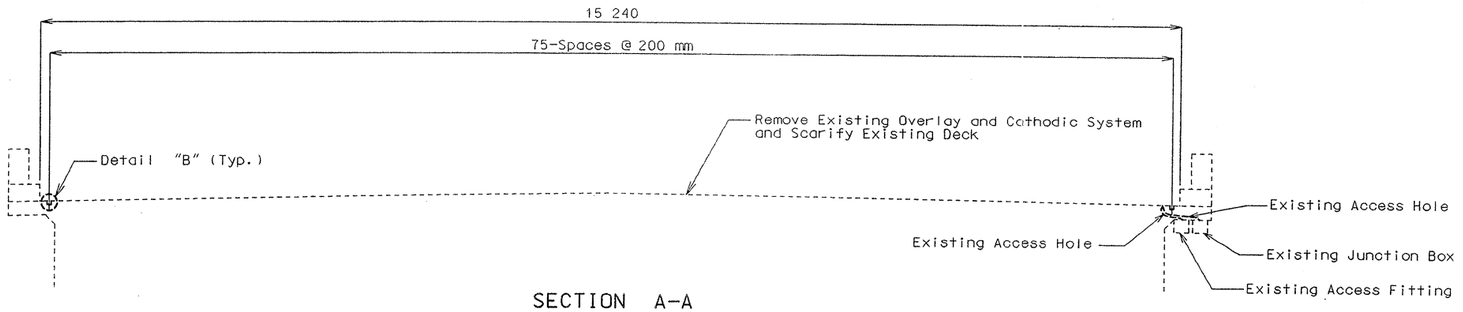
Karsten M. Sommerhauser — 5/25/05
Signature — Date

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

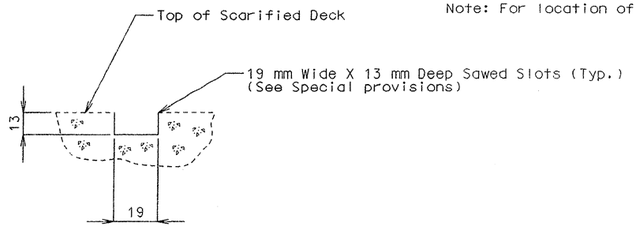
DATE 11-19-98

JOB NO. J4I1299
CONTRACT NO. 991622-403
DIST. 4

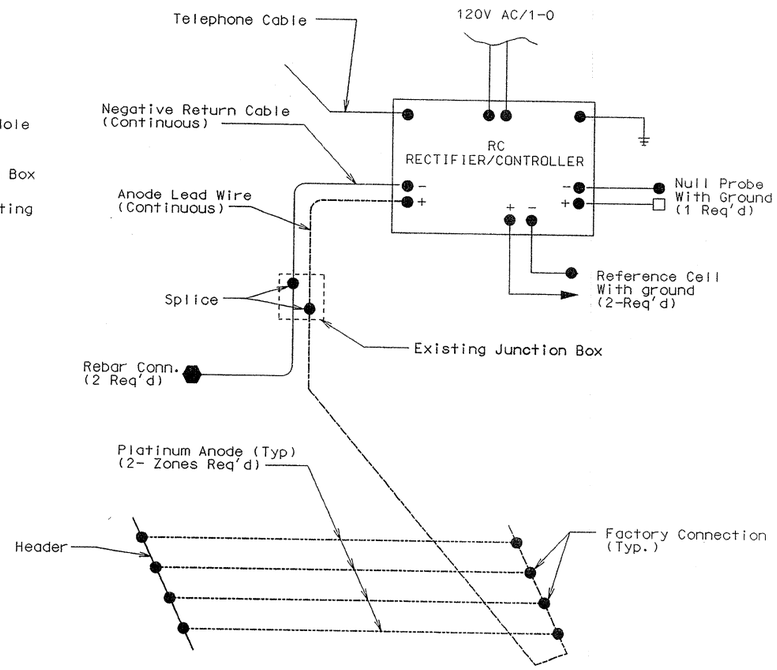
State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	B104



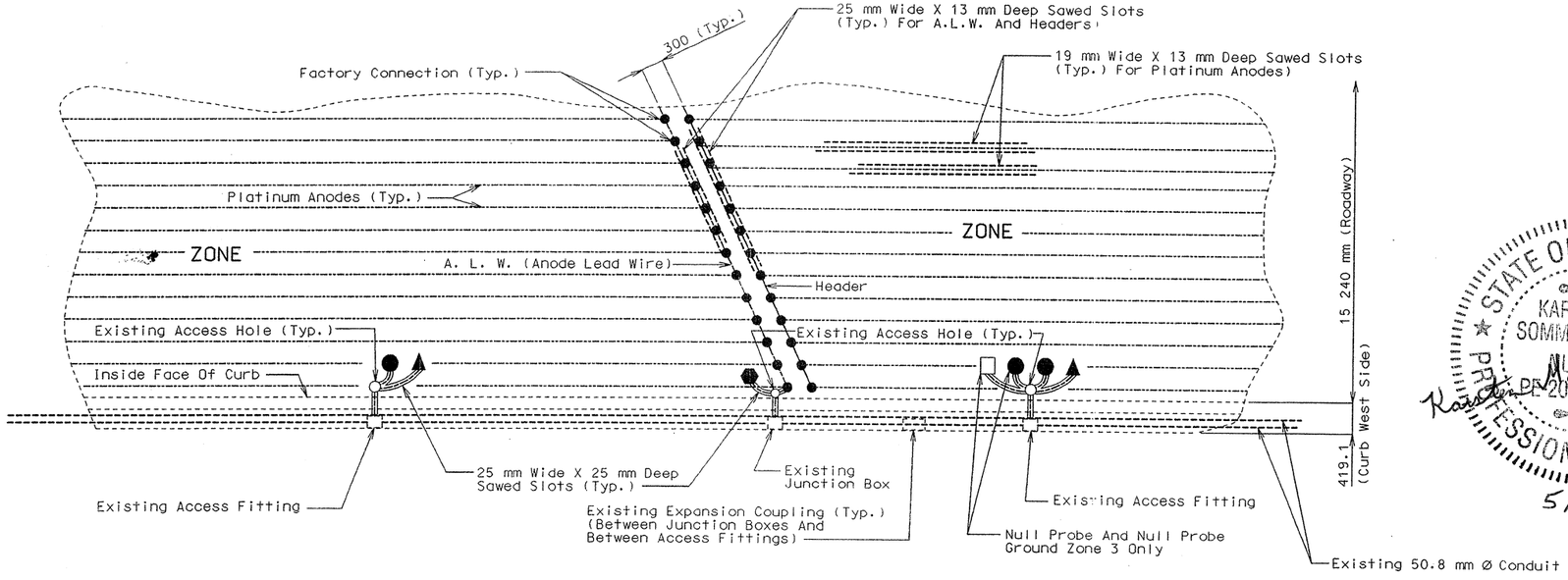
SECTION A-A
(At Alternate "A")
Note: For location of section A-A see sheet no. 5.



DETAIL "B"



PARTIAL SCHEMATIC
(ALTERNATE "A")



TYPICAL ZONE LAYOUT, EXCEPT AS NOTED, FOR (ALTERNATE "A") SYSTEM

Note: Anodes shall be placed as shown with a minimum tolerance of plus or minus 75 mm. Use existing access holes, access fittings and junction boxes where acceptable as determined by the engineer.

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

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Karsten M. Sommerhauser — Signature
5/25/05 — Date

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

Final Plans

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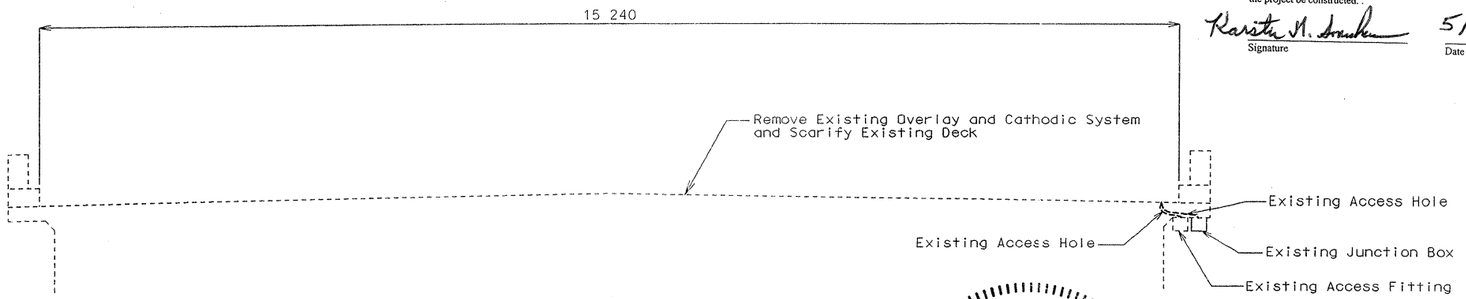
Karsten M. Sommerhauser — Signature — 5/25/05 — Date

JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1 (263)	B105

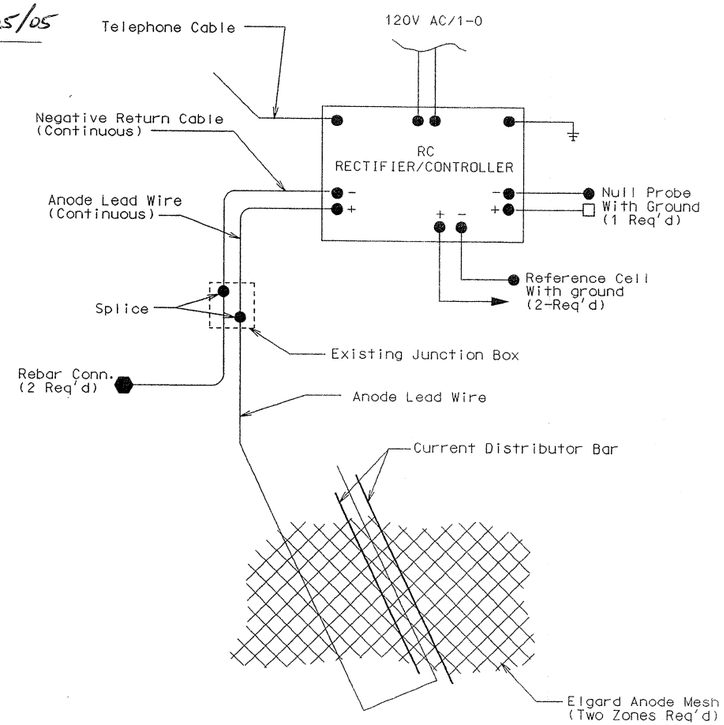


SECTION B-B

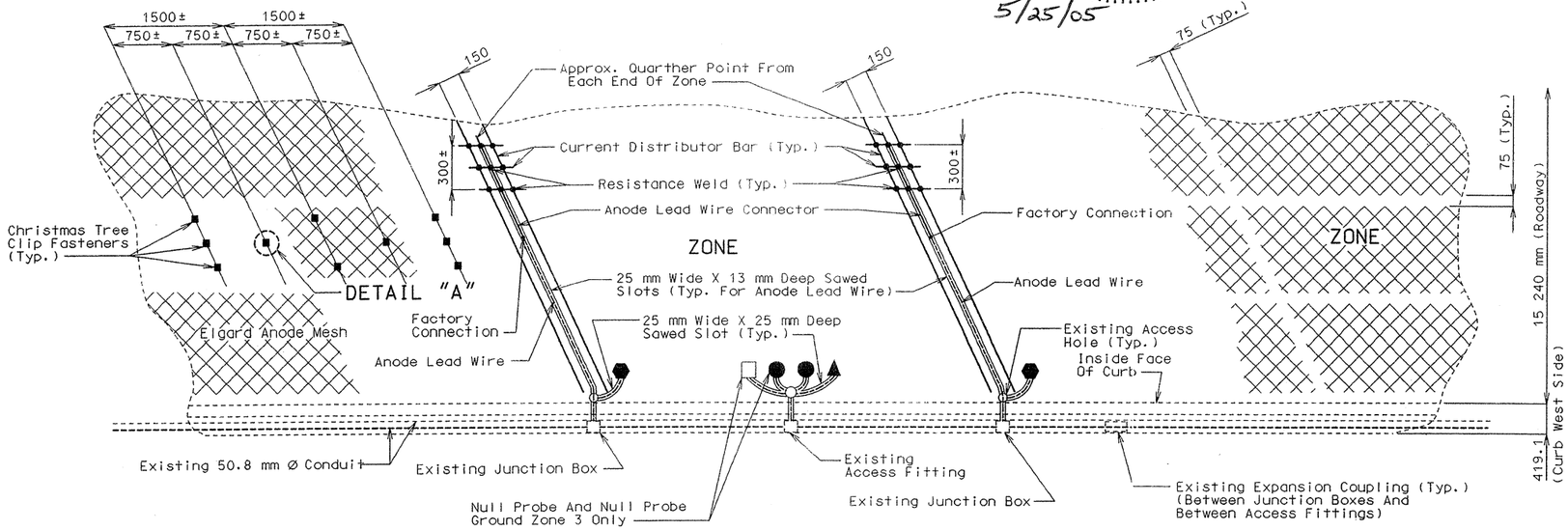
(At Alternate "B")

Note: For location of section B-B see sheet no. 6

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05

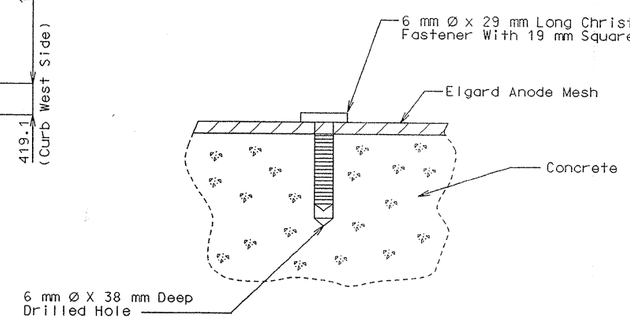


PARTIAL SCHEMATIC
(ALTERNATE "B")



TYPICAL ZONE LAYOUT, EXCEPT AS NOTED, FOR (ALTERNATE "B") SYSTEM

Note: Use existing access holes, access fittings and junction boxes where acceptable as determined by the engineer.



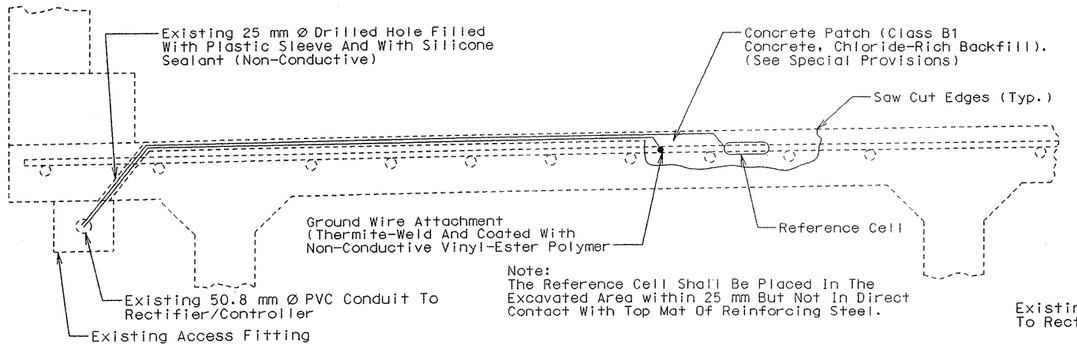
DETAIL "A"
(Christmas Tree Clip)

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

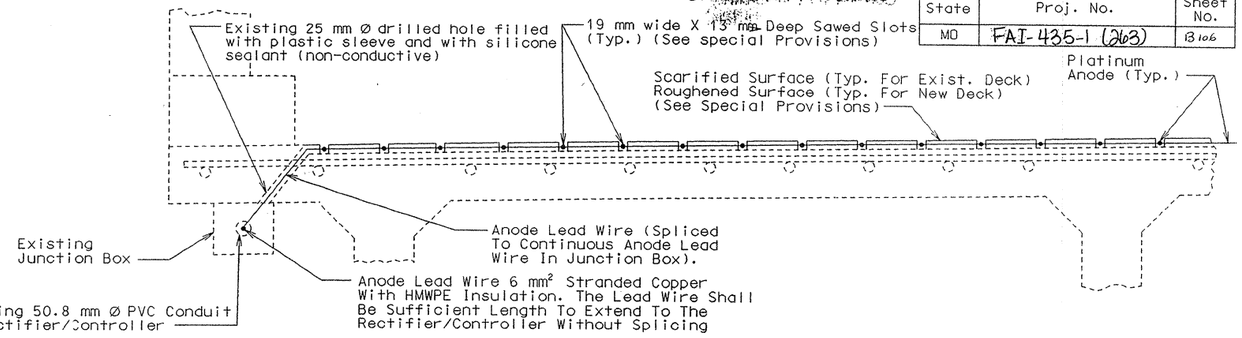
JOB NO. J4I1299
CONTRACT NO. 991022-403

DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1 (263)	B106

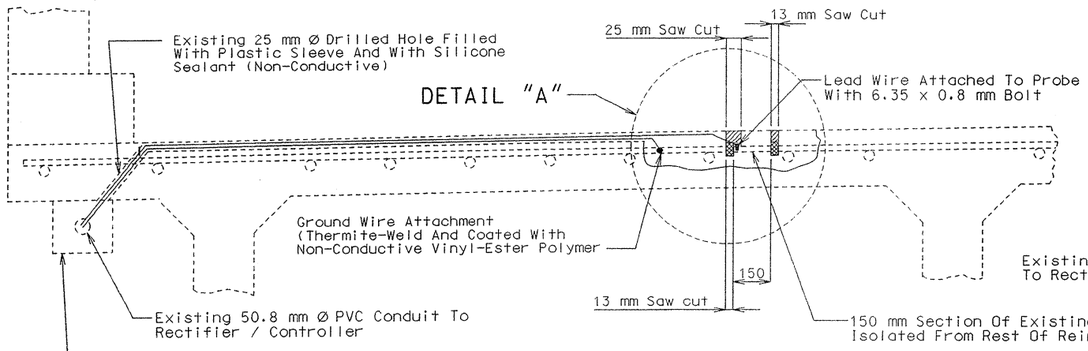


REFERENCE CELL DETAILS

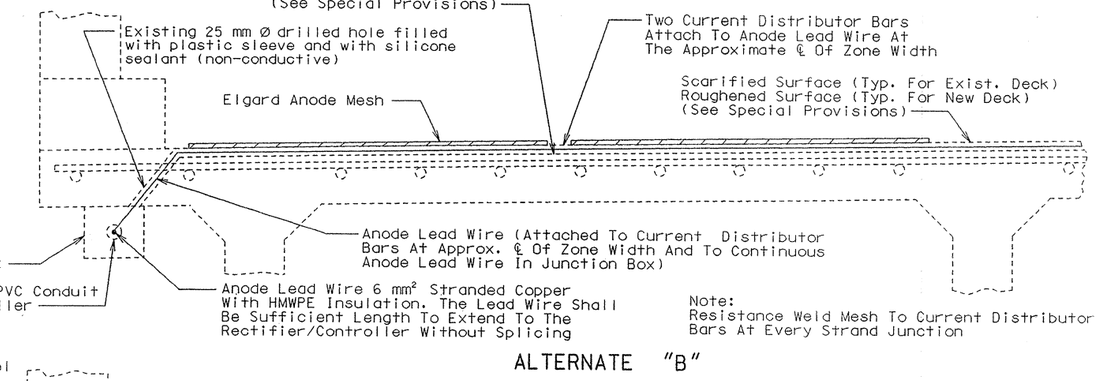


ALTERNATE "A"

Note:
All concrete removal shall be intiated by saw cutting the first 13 mm.



NULL PROBE DETAILS



Note:
Resistance Weld Mesh To Current Distributor Bars At Every Strand Junction

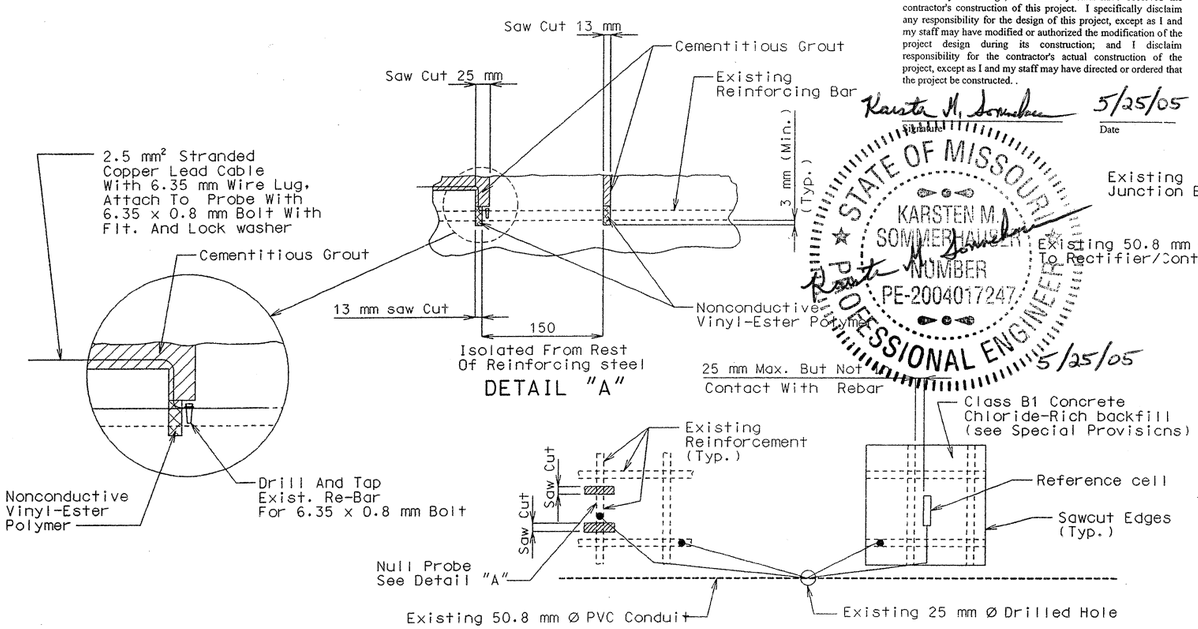
ALTERNATE "B"

Final Plans

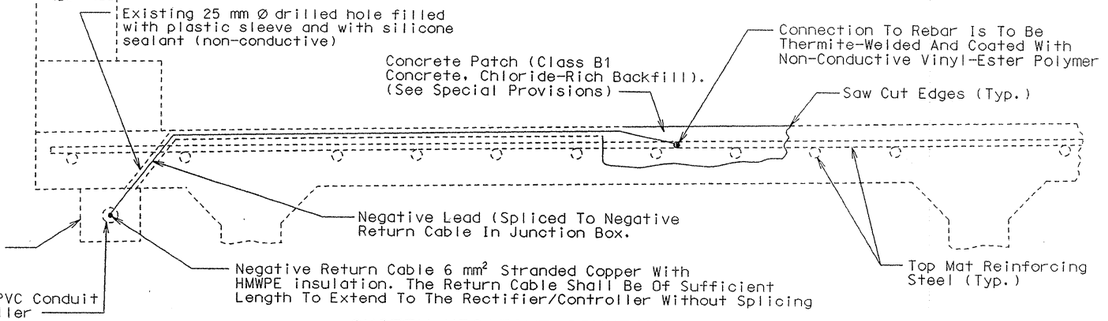
I certify that this plan sheet accurately depicts the configuration and location of the roadway and all its appurtenant features, to the best of my knowledge, as I and my staff have observed the contractor's construction of this project. I specifically disclaim any responsibility for the design of this project, except as I and my staff may have modified or authorized the modification of the project design during its construction; and I disclaim responsibility for the contractor's actual construction of the project, except as I and my staff may have directed or ordered that the project be constructed.

Karsten M. Sommerhauser — 5/25/05
Signature — Date

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05



PLAN OF NULL PROBE AND REFERENCE CELL



SYSTEM NEGATIVE CONNECTION DETAILS

Notes for New Conduit and Appurtenances (if required):
Conduit shall be schedule 40 heavy wall PVC (Polyvinyl Chloride Plastic). Each section of conduit shall bear the underwriters laboratories, inc. (UL) label.

Conduit shall be secured to concrete with clamps (galvanized/AASHTO M111) at abt. 1500 mm cts. Concrete anchors for clamps shall meet federal specification FF-S-325, group II, type 4, class I and shall be galvanized in accordance with ASTM A-153, B695-91 class 50 or stainless steel. Minimum embedment in concrete shall be 45 mm. The supplier shall furnish a manufacturers certification that the concrete anchors meet the required material and galvanizing specifications.

Weepholes shall be provided at appropriate locations to drain any moisture in the conduit lines.

Expansion couplings shall be installed on conduit lines between all junction boxes and between all access fittings as approved by the engineer.

The location and direction of conduit may be shifted to meet field conditions as directed by the engineer.

All junction boxes shall be PVC molded, surface mounted, size 200 mm x 200 mm x 175 mm and equal to Carlon Electrical Construction products or Triangle Conduit and Cable company Inc.. The terminations shall be permanent or seperable.

The terminations and covers shall be of watertight construction.

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER

DATE 11-19-98

JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	B107

Final Plans

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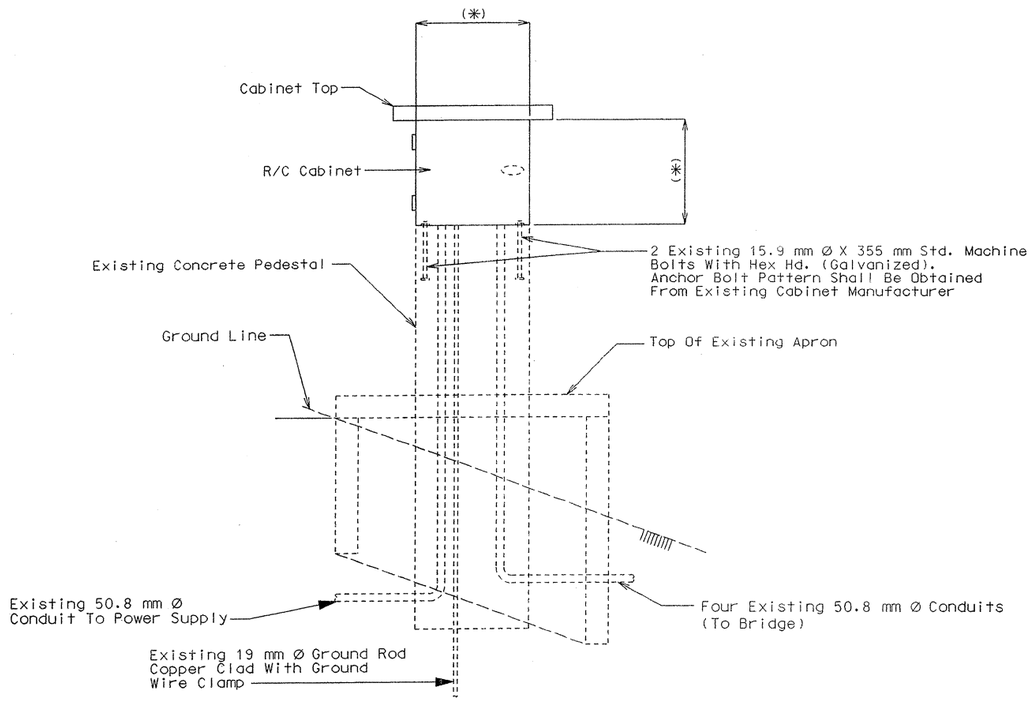
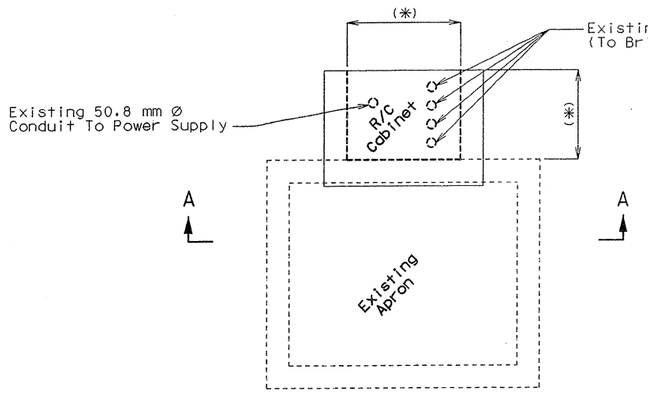
Karsten M. Sommerhauser — Signature — 5/25/05 — Date

(*) Dimensions according to manufactured cabinet.



SECTION A-A



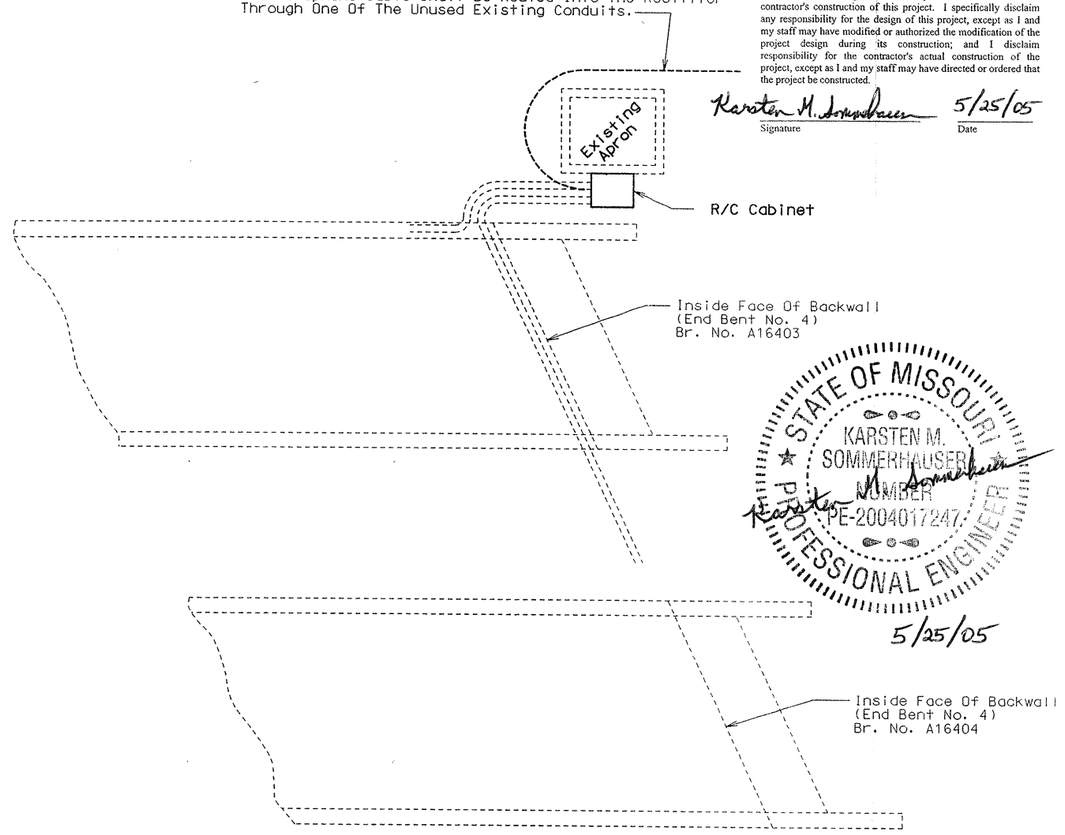
PLAN

Note: The 19 mm Ø ground rod shall be of sufficient length to extend a minimum of 3050 mm below bottom of concrete pedestal. (Use existing if approved by the engineer).

Ground wire shall be 16 mm² minimum (Use existing if approved by the engineer).

Knockouts or drilled holes shall be provided in cabinets for all conduit. Locations of these holes are the responsibility of the contractor and cabinet manufacturer.

The Telephone Cable Shall Be Routed Into The Rectifier Through One Of The Unused Existing Conduits.



PLAN LOCATION OF RECTIFIER/CONTROLLER

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
Karsten M. Sommerhauser
5/25/05

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

Detailed Sept. 1998
Checked Oct. 1998

JOB NO. J4I1299
CONTRACT NO. 991022-403
DIST. 4

State	Proj. No.	Sheet No.
MO	FAI-435-1 (263)	B 108

Final Plans

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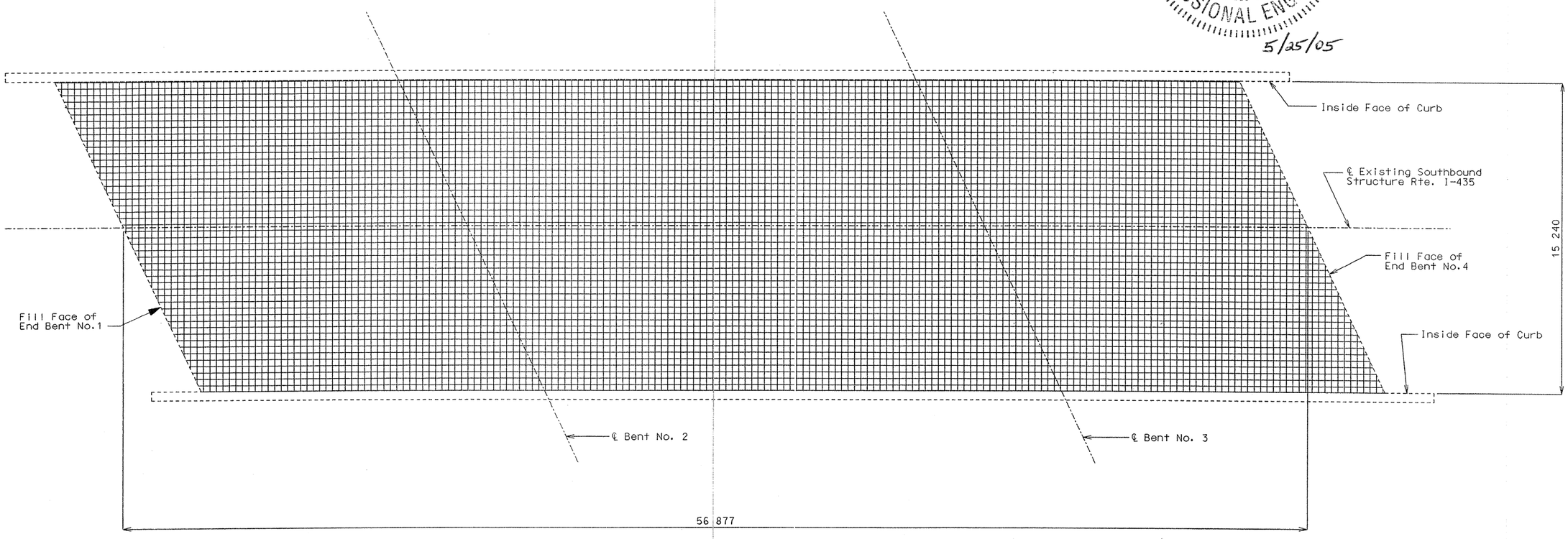
Karsten M. Sommerhauser 5/25/05
Signature Date

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017247
PROFESSIONAL ENGINEER
5/25/05



PLAN OF CONCRETE DECK SHOWING GRID

(For location of deck repair, reference cells and null probes)

Note: This sheet is to be completed by MoDOT construction personnel.

Note: Grid = Approx. 310 mm Squares
Drawing Scale = 1:100 mm/mm

REPAIRS TO BRIDGE A-1640 (S.B.L.)
OVER OLDHAM ROAD

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98

Detailed Sept. 1998
Checked Oct. 1998

FOR INFORMATION ONLY

A16405 & A16406, Sht. 73

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
			CURB																
			BLOCKOUT																
32	16	R1	BLOCKOUT	E	13	S				340	795	340	795				2550	2450	122
28	16	R2	BLOCKOUT	E	13	S				245	795	245	795				2360	2260	98
4	16	R3	BLOCKOUT	E	13	S				245	730	245	730				2230	2130	13
32	16	R4	BLOCKOUT	E	13	S				340	250	340	250				1460	1360	68
40	16	R5	BLOCKOUT	E	20					1595							1595	1595	99
8	16	R6	BLOCKOUT	E	20					1520							1520	1520	19
4	16	R7	BLOCKOUT	E	20					1485							1485	1485	9
4	16	R8	BLOCKOUT	E	20					1595							1595	1595	10
4	16	R9	BLOCKOUT	E	20					1595							1595	1595	10
4	16	R10	BLOCKOUT	E	20					2355							2355	2355	15
8	16	R11	BLOCKOUT	E	20					1595							1595	1595	20
24	16	R20	BLOCKOUT	E	20					2965							2965	2965	110
3	16	R21	BLOCKOUT	E	20					11930							11930	11930	56
3	16	R22	BLOCKOUT	E	20					11865							11865	11865	55
12	16	R23	BLOCKOUT	E	20					8805							8805	8805	164
14	16	R24	BLOCKOUT	E	20					8415							8415	8415	183

BILL OF REINFORCING STEEL

JOB NO. J4I1299
CONTRACT NO. 991022-403

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

Final Plans

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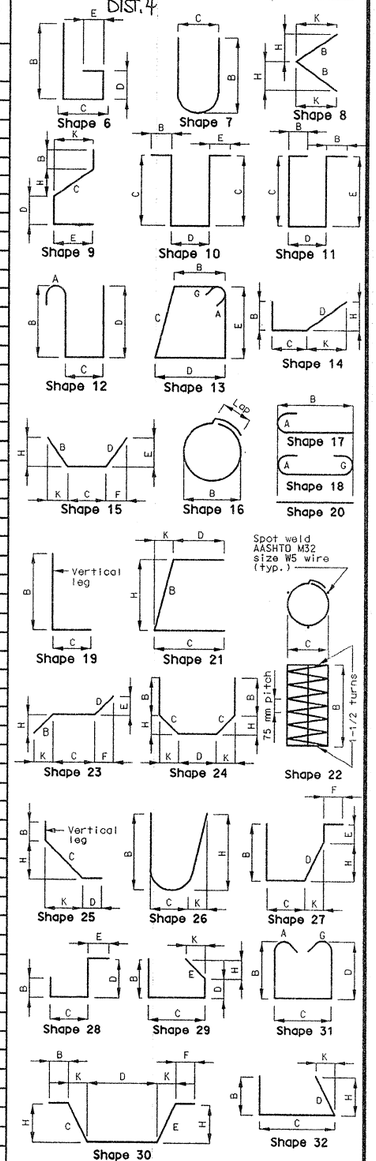
Karsten M. Sommerhauser 5/25/05
Signature Date

STATE OF MISSOURI
KARSTEN M. SOMMERHAUSER
NUMBER PE-2004017241
PROFESSIONAL ENGINEER
5/25/05

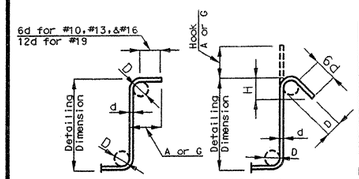
State	Proj. No.	Sheet No.
MO	FAI-435-1(263)	B109

DIST. 4



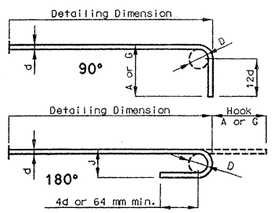
BENDING DIAGRAMS

STATE OF MISSOURI
KURT E. GRIBBLE
NUMBER E-23576
REGISTERED PROFESSIONAL ENGINEER
DATE 11-19-98



STIRRUP HOOK DIMENSIONS (mm) Grades 300 & 420 MPa				
Bar Size	D	90° Hook Hook A or G	135° Hook 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.



END HOOK DIMENSIONS (mm) All Grades				
Bar Size	D	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-R24 Bars 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

Detailed Oct. 1998
Checked Oct. 1998

Sheet No. 12 of 12

JACKSON COUNTY A16404