MISSOURI STATE HIGHWAY DEPARTMENT

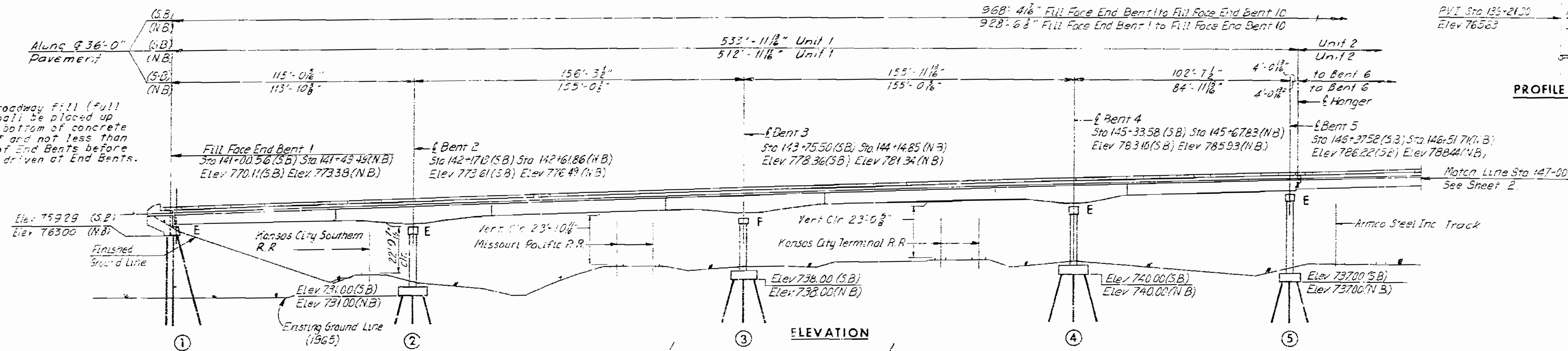
FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO			139	

DIST. NO.	COUNTY	ROUTE	SEC.
4	JACKSON		

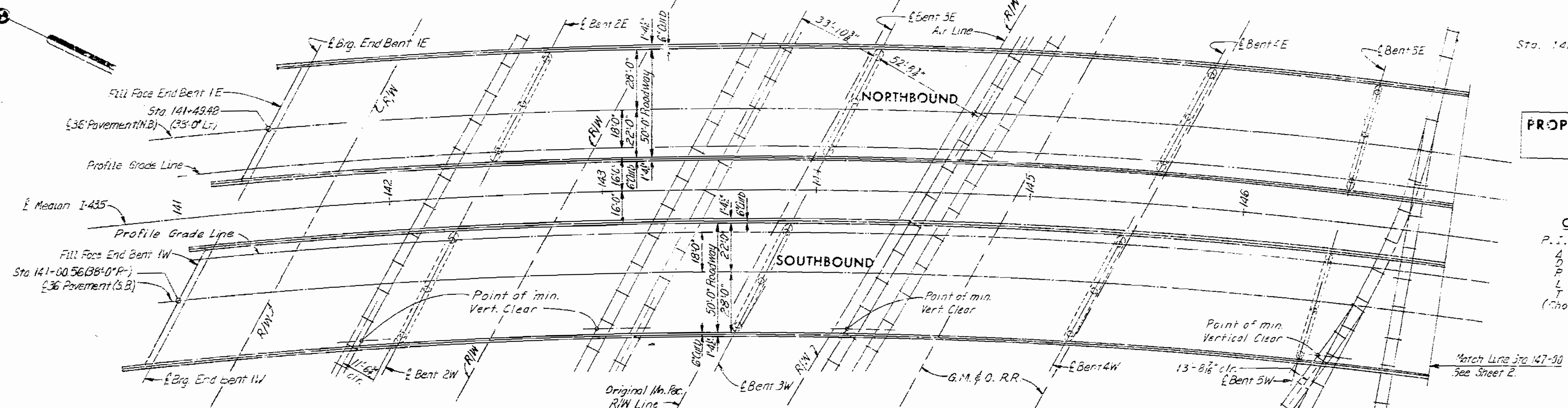
CONTINUOUS PLATE GIRDER SPANS
115',156',156',103',4' SPANS (SOUTHBOUND)
114',155',155',85',4' SPANS (NORTHBOUND)

Note: Elevations shown in Elevation are Top of slab at ℄ 36' Pavement. Stations shown in Elevation are at ℄ 36' Pavement and along ℄ Median I-435.

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

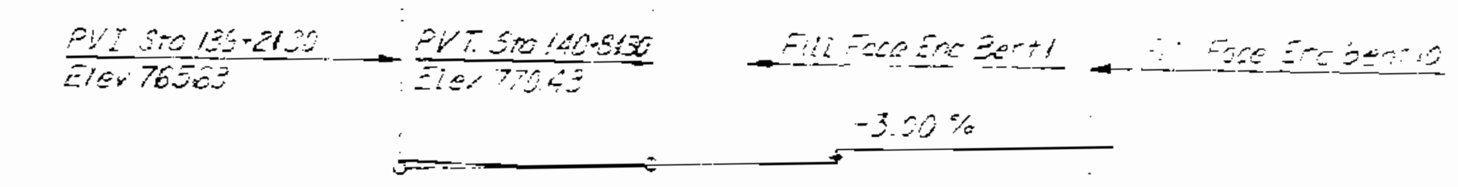


ELEVATION

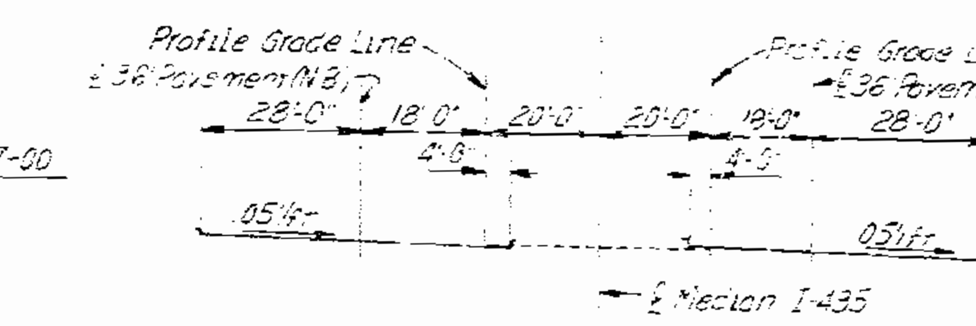


PLAN

Note: Stations in Plan and Elevation are to ℄ 36'-0" Pavements 38'-0" Rt. (S.B.) or 38'-0" Lt. (N.B.) of ℄ Median I-435.



PROFILE GRADE 20'-0" RT OR LT ℄ MEDIAN I-435

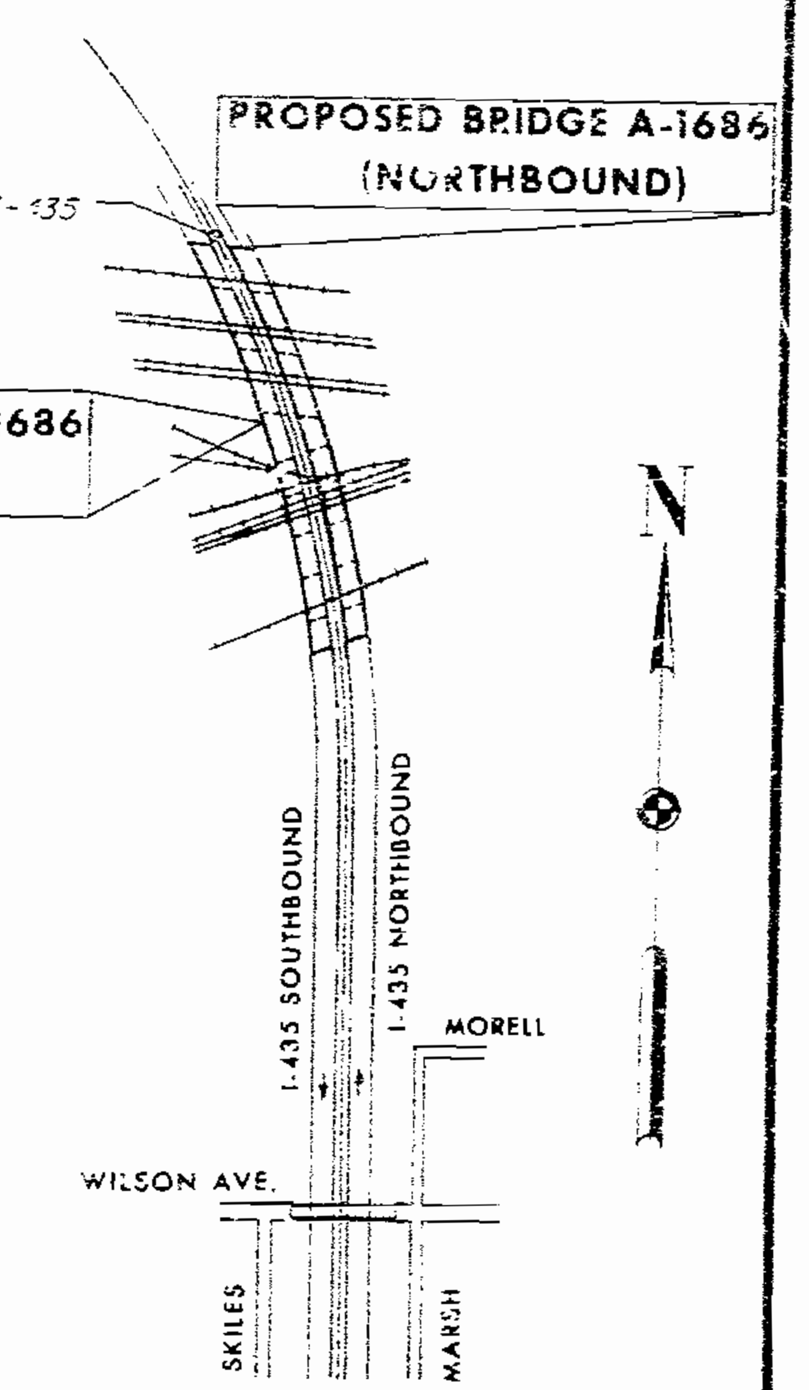


CROSS SLOPE

Sta. 141+00.56 ℄ Median I-435

PROPOSED BRIDGE A-1686 (NORTHBOUND)

PROPOSED BRIDGE A-1686 (SOUTHBOUND)



LOCATION SKETCH

CURVE DATA

P.I. Sta. 144+71.45
Δ = 41°13'30"
D = 2°00'00"
R = 2864.93'
L = 2061.25'
T = 1077.57'
(Chord Definition)

ESTIMATED QUANTITIES

ITEM	UNIT	UNIT 1 NORTHBOUND SUB-STRUCTURE	UNIT 1 NORTHBOUND SUPER-STRUCTURE	UNIT 1 NORTHBOUND TOTAL	UNIT 2 NORTHBOUND SUB-STRUCTURE	UNIT 2 NORTHBOUND SUPER-STRUCTURE	UNIT 2 NORTHBOUND TOTAL	UNIT 1 SOUTHBOUND SUB-STRUCTURE	UNIT 1 SOUTHBOUND SUPER-STRUCTURE	UNIT 1 SOUTHBOUND TOTAL	UNIT 2 SOUTHBOUND SUB-STRUCTURE	UNIT 2 SOUTHBOUND SUPER-STRUCTURE	UNIT 2 SOUTHBOUND TOTAL	TOTAL
Class 1 Excavation for Structures	Cu. Yd.	270		270	395		395	230		230	205		205	1,100
Steel Piles in Place (10BP42)	Lin. Ft.	744		744	2,370		2,370	819		819	2,922		2,922	6,855
Steel Piles in Place (12BP53)	Lin. Ft.	5,138		5,138				4,760		4,760	243		243	10,141
Class B Concrete	Cu. Yd.	430.3		430.3	413.3		413.3	416.1		416.1	386.5		386.5	1,646.2
Class B1 Concrete	Cu. Yd.	5.7	754.6	760.3	5.3	610.4	615.7	5.7	788.2	793.9	5.3	640.9	646.[illegible]	2,816.0
Reinforcing Steel	Lb.	97,980	245,480	343,460	107,670	201,020	308,690	91,650	267,830	359,480	102,450	237,240	339,690	1,351,320
Fabricated Structural Carbon Steel *	Lb.		739,590	739,590		429,040	429,040		75[illegible],290	756,290		465,900	465,900	2,39[illegible],820
Fabricated Structural Steel Bearings	Lb.	13,980			10,930			14,850			10,930			50,690
Painting	Ton		370	370		214	214		378	378		233	233	1,195
Bridge Rail (Single Tube Type)	Lin. Ft.	16	1,021	1,037	14	328	342	16	1,067	1,083	14	868	882	3,844
Conduit System on Structure	L.S.													1

* Includes 670,670 # of Low Alloy Steel

Quantity Notes:
All excavation for bridge will be paid for as Class 1 Excavation for Structures. Sketches show excavation for pay purposes, see Sheet 8.
All concrete in end posts, parapets and curbs is included with superstructure quantities.

BENCH MARKS

BM #7 Elev. 742.12
U.S.C.& G.S.BM.-Sta. Tablet SW Bridge Seat Mo. Pac. RR Br. #2776 over Big Blue River 790'Rt. Sta. 127+10.

BM #8 Elev. 741.12
N.W. Cor. Conc. Base for Signal Light 240' East of ℄ and 10' South of Track at Sta. 142+21.18.

TBM #9 Elev. 768.80
Top of N.W. Bolt in Cable Pole Foundation 10' N. ℄ of Track approx. 2' Rt. Sta. 149+80.

LEGEND:
S.B. - Southbound
N.B. = Northbound
E = Expansion
F = Fixed

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1909-21-01

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

MADE P.E.K. DATE 3-20-67 CHECKED A.W.H. DATE 8-4-67

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

GENERAL PLAN AND ELEVATION SHEET 1 OF 49

SUBMITTED BY: R. N. Bergendoff
REGISTERED PROFESSIONAL ENGINEER
MISSOURI NO. E-253

STATE OF MISSOURI — R. N. BERGENDOFF — NUMBER E-253 — REGISTERED PROFESSIONAL ENGINEER

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE. I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SUBMITTED BY [signature] BRIDGE ENGINEER DATE Feb. 23, 1968
APPROVED BY [signature] CHIEF ENGINEER DATE Feb. 23, 1968

STD 54.00

A-1686

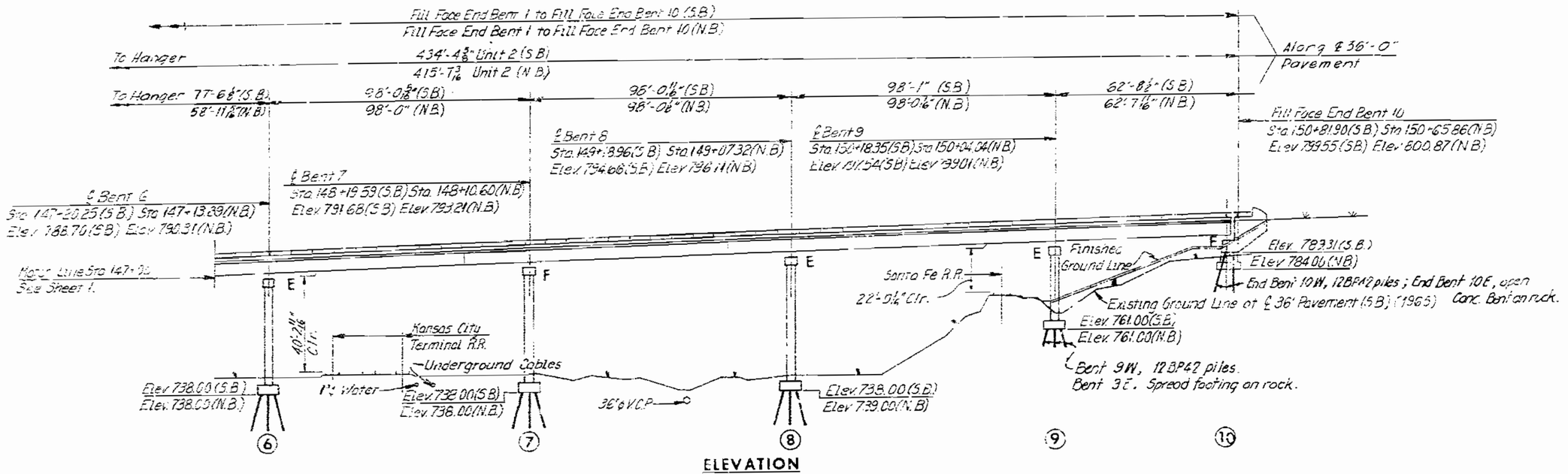
MISSOURI STATE HIGHWAY DEPARTMENT

FOR INFORMATION ONLY

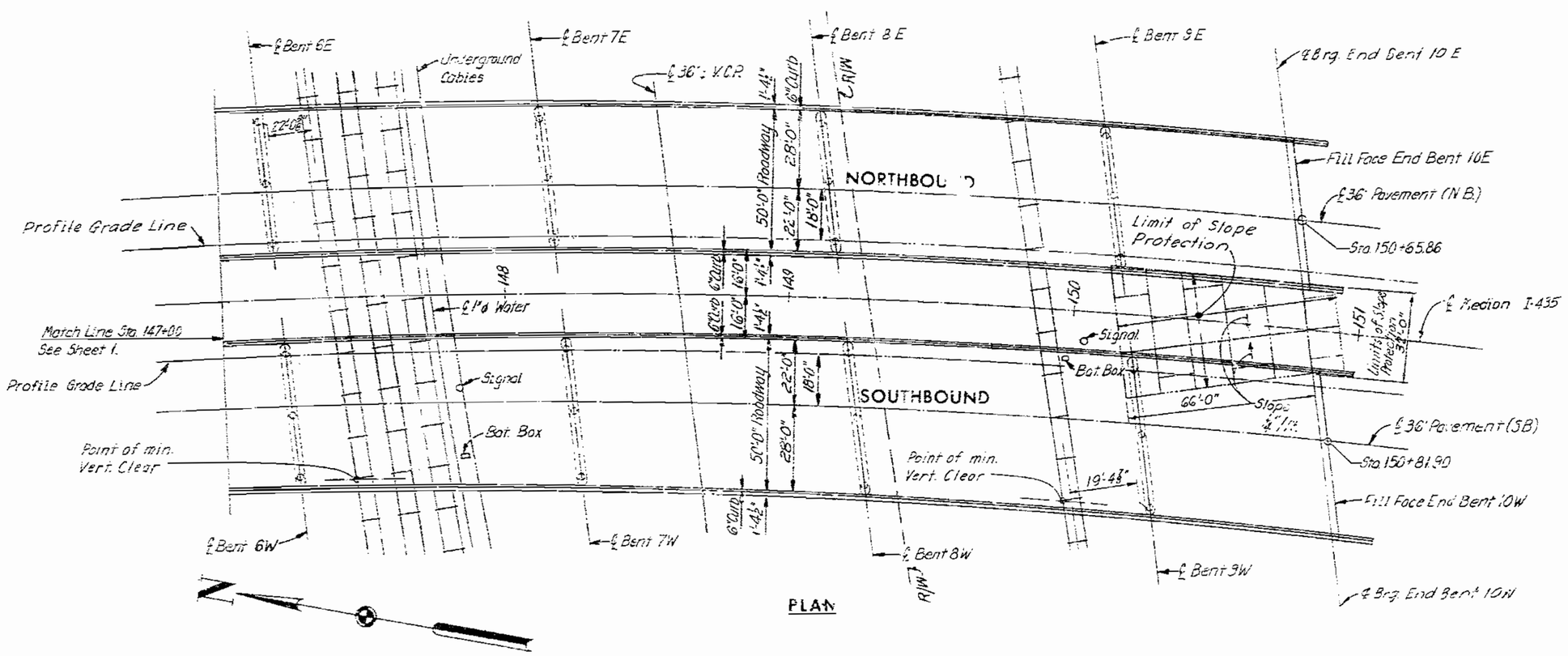
FED. ROAD STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
5 MO	I 435		
DIST. NO.	CO. NO.	COUNTY	
4		JACKSON	

Note: Elevations shown in Elevation are top of slab at ℄ 36' Pavement. Stations shown in Elevation & at ℄ 36' Pavement and along ℄ Median I-435.

CONTINUOUS PLATE GIRDER SPANS
77',98',98',98',63' SPANS (SOUTHBOUND)
59',98',98',98',63' SPANS (NORTHBOUND)



ELEVATION



PLAN

Legend:
S.B. = Southbound
N.B. = Northbound
E = Expansion
F = Fixed

GENERAL NOTES:

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

DESIGN LOADING: HS20-44 and Alternate Military Loading with 15 lbs./sq. ft. future wearing surface. Earth Press. lbs./sq. ft. Equivalent Fluid Pressure 30 lbs./cu. ft.
Fatigue Loading: A.W.S. D2.0-66 Formulae 15b & 16b

CONSTRUCTION SPECIFICATIONS: Missouri Standard Specifications for State Roads, Materials, Bridges, Culverts, and Incidental Structures-1961.

DESIGN UNIT STRESSES:

Class B1 Concrete (Superstructure)	fc =	1,600 psi.
Class B Concrete (Substructure)	fc =	1,200 psi.
Reinforcing Steel	fs =	20,000 psi.
Structural Steel		
(A.S.T.M. A36-66)	fs =	20,000 psi.
(A.S.T.M. A441-66) 3" and under	fs =	27,000 psi.
(Modified A441) 4" and under	fs =	27,000 psi.
Steel Pile (A.S.T.M. A36-66)	fb =	9,000 psi.

CONCRETE:
Concrete for superstructure shall be Class B1.
Concrete for substructure shall be Class B.

REINFORCING STEEL:
All splices in reinforcing steel shall be 24 bar diameters minimum.
Bar sizes are designated on the plans by numbers. The first digit after the letter in three digit marks and the first two digits after the letter in four digit marks indicate the size of the bar.
Dimensions shown on the plans from the reinforcing steel to the outside edge of concrete are clear dimensions unless otherwise indicated.
All bending dimensions are "out to out" of bars.

SEALING OF DECKS: Superstructure deck to be surface sealed.

UTILITIES: All utilities, unless shown otherwise, shall be removed or relocated by others. The Contractor will notify the owner of the utilities of his work schedule sufficiently in advance to allow time for disposition of utilities.

WELDING: Details of welded joints shown are for manual arc welding except as noted.

By approval of the Engineer the contractor may omit any shop splice, if desired, by extending the heavier flange plate and providing approved modification of details of field flange splices and elsewhere as required. Payweight in any case will be based on material shown on design plans.

The following shop welds will be subject to radiographic inspection.
All butt welded flange plates.
[illegible] of each girder [illegible] splice beginning at a point of maximum tension.

The following shop welds will be subject to inspection by magnetic particle procedure.
At least 10% of each size and type of fillet welds, web to flanges and bearing stiffeners, and bearing devices.
The tests shall be located at random in the members so as to be typical for each size and type of weld.
This test procedure may also be used for examination of weld passes and miscellaneous welds not specifically set out, at the discretion of the Engineer.

STRUCTURAL STEEL:
All structural steel shall be ASTM A36-66 unless noted otherwise.
Bolts shall be ASTM A325, ¾" with ⅞" holes unless otherwise shown.

PAINTING: Structural Steel shall be cleaned and painted one coat of Red Lead in the shop. Field painting shall consist of one [illegible] coat of red lead on unpainted and damaged areas, one coat of brown and the final coat Aluminum all in accordance with Std. Spec. 33.4.10.

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

MADE R.E.M. DATE 3-20-67 CHECKED [illegible] DATE 3-22-67

NOTE: This drawing is not to scale Follow dimensions.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.
STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(32) (RTE. I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

GENERAL PLAN AND ELEVATION; GENERAL NOTES

SHEET 2 OF 9

A-1686

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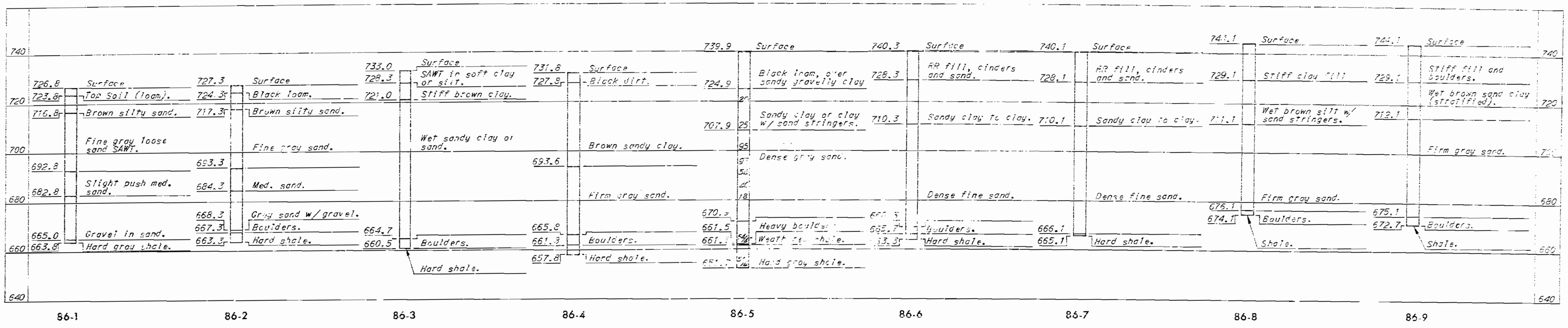
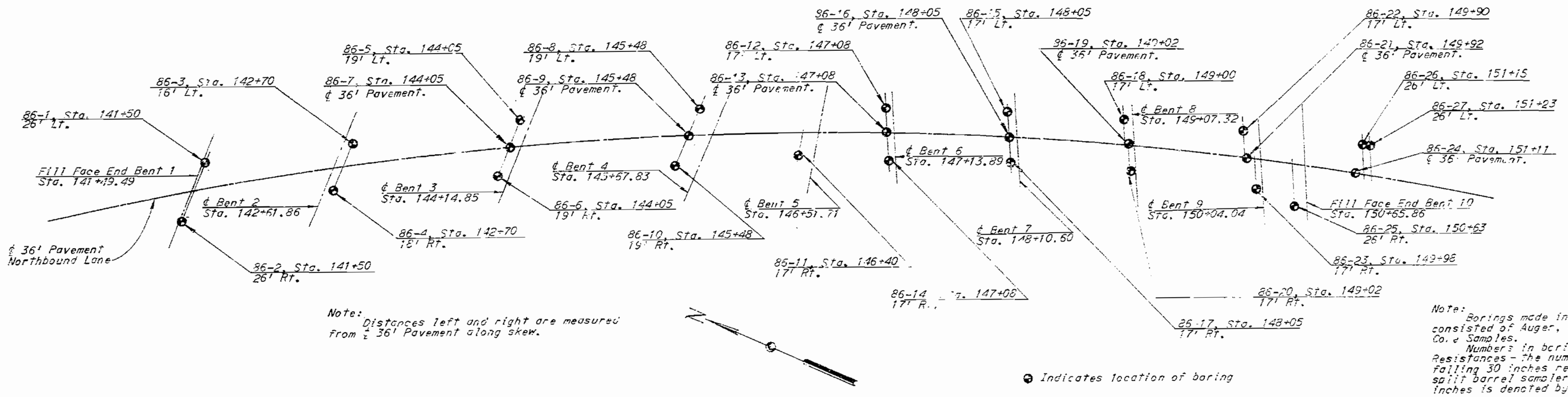
A16866, Sht. 9

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO.	STATE: FEDERAL PROJECT NO. & SEC.	ITEM NO.	SHEET NO.	TOTAL SHEETS
5	MO			
DIST. NO.	COUNTY		ROUTE NO.	
4	JACKSON			





BORING LOCATION SKETCH (N.B. LANE)

Note: Borings made in August and September, 1965 consisted of Auger, Standard Penetration Tests, and Core Samples.
Numbers in boring columns are Standard Penetration Resistances - The number of blows of a 140 pound hammer falling 30 inches required to drive a 2" O.D. 1⅜" I.D. split barrel sampler 12". Penetration less than 12 inches is denoted by 60/3" (Blows / Penetration).

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA 141+49.28 N.B.L.
141+00.55 S.B.L.
JACKSON COUNTY

BORINGS-NORTHBOUND LANE SHEET 3 OF 49 A-1686

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE M.H.H. DATE 3-6-67 CHECKED J.E.K. DATE 4-10-67

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

40

1969 11 01

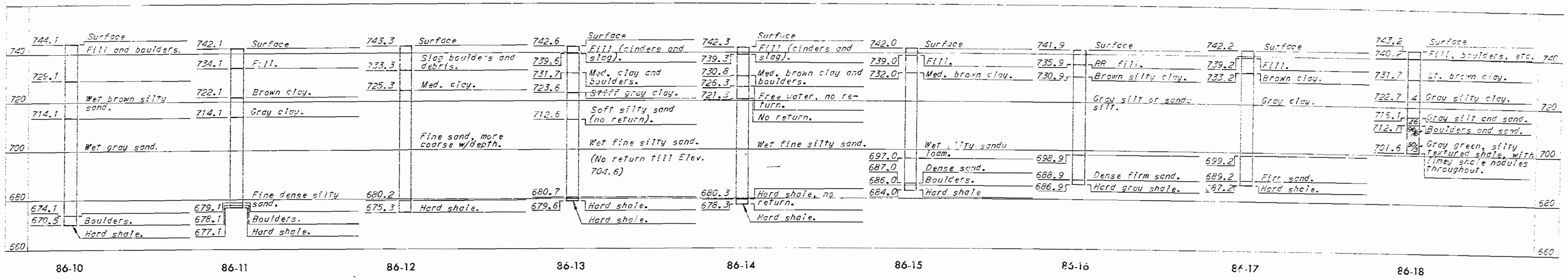
FOR INFORMATION ONLY

A16866, Sht. 10

MISSOURI STATE HIGHWAY DEPARTMENT

STATE ROAD-STATE FEDERAL PROJECT NO. & SEC	SHEET NO.	TOTAL SHEETS
5 MO	142	
DIST. NO.	COUNTY	ROUTE SEC.
4	JACKSON	

FOR INFORMATION ONLY



Note:
Borings made in August and September, 1965 consisted of Auger, Standard Penetration Tests, and Core Samples.
Numbers in boring columns are Standard Penetration Resistances-the number of blows of a 140 pound hammer falling 30 inches required to drive a 2" O.D. 1⅜" I.D. split barrel sampler for 12". Penetration less than 12 inches is denoted by 50/3" (Blows/Penetration).
For boring locations, see Sheet 3.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

BORINGS-NORTHBOUND LANE

SHEET 4 OF 49

A-1686

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE MHH DATE 3-6-67 CHECKED [illegible] DATE 4-26-67

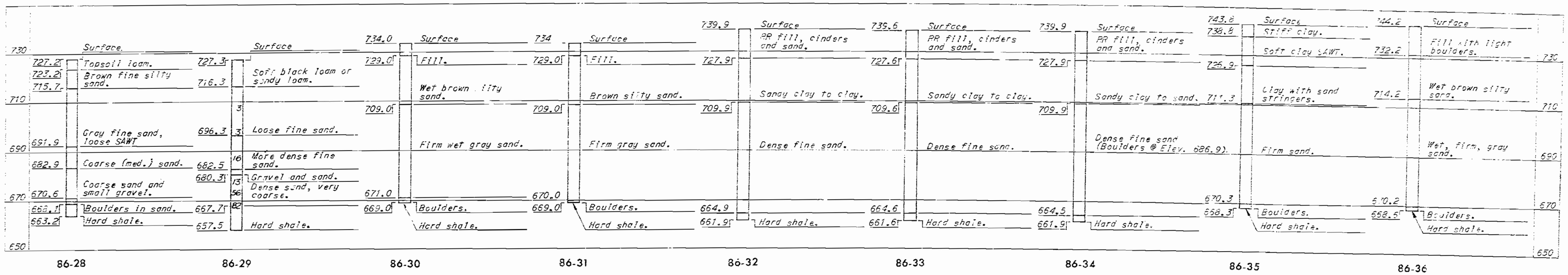
NOTE: This drawing is not to scale. Follow dimensions.

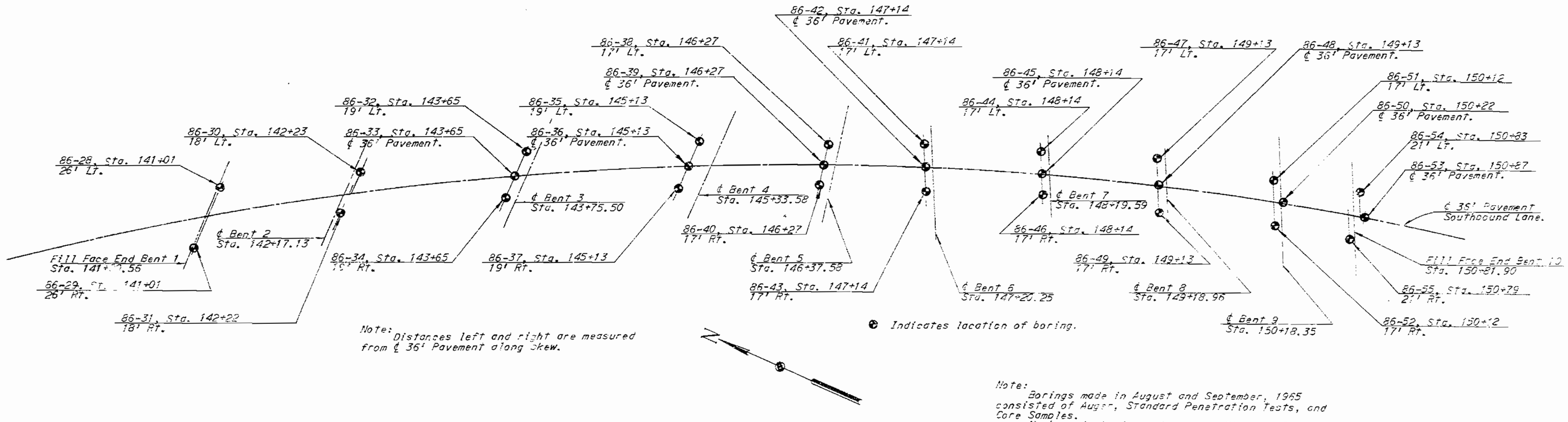
11-9-21 ed

A16866, Sht. 11

MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO. & SEC.	FISCAL SHEET TOTAL FOR NO. SHEETS
5 MO		149
DIST. NO.	COUNTY	ROUTE SEC.
4	JACKSON	





BORING LOCATION SKETCH (S.B. LANE)

Note:
Borings made in August and September, 1965 consisted of Augur, Standard Penetration Tests, and Core Samples.
Numbers in boring columns are Standard Penetration Resistances-the number of blows of a 140 pound hammer falling 30 inches required to drive a 2" O.D. 1⅜" I.D. split barrel sampler 12". Penetration less than 12 inches is denoted by 50/3" (Blows/ Penetration).

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE J.H.H. DATE 2-8-67 CHECKED J.H.H. DATE 2-10-67

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

BORING SOUTHBOUND LANE SHEET 5 OF 49 A-1686

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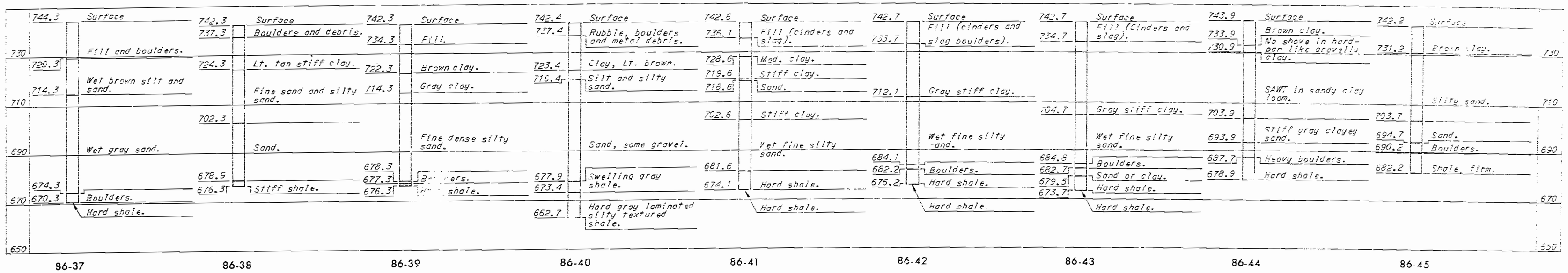
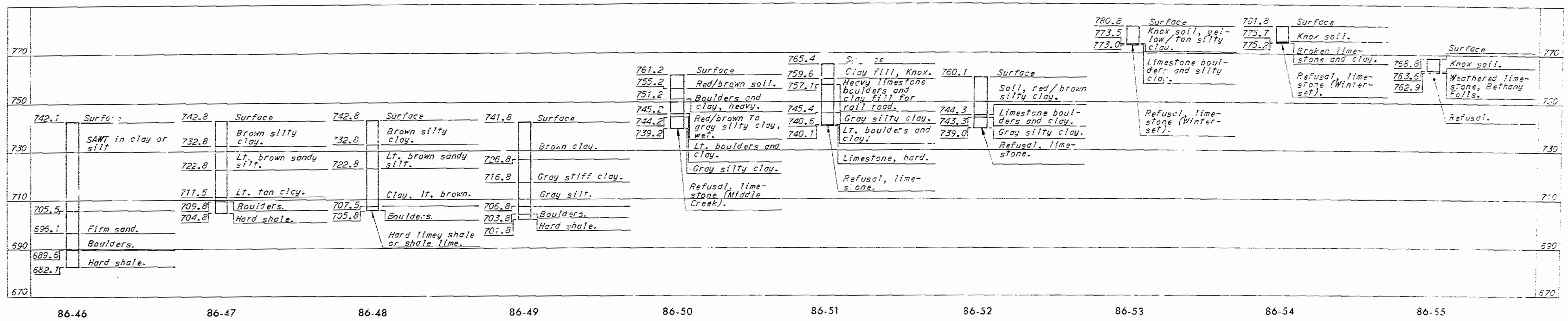
FOR INFORMATION ONLY

A16866, Sht. 12

MISSOURI STATE HIGHWAY DEPARTMENT

FED. RD. DIST. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
5	MO			144
DIST. NO.	COUNTY			
4	JACKSON			





Note:
Boring made in August and September, 1965 consisted of Auger, Standard Penetration Tests, and Core Samples.
For location of borings, see Sheet 5.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L.
141+80.57 S.B.L.

JACKSON COUNTY

SHEET 6 OF 49

A-1686

BORINGS-SOUTHBOUND LANE

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

MADE K.F.H.H. DATE 3-6-67 CHECKED J.E.H. DATE 4-10-67

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

FOR INFORMATION ONLY

A16866, Sht. 13

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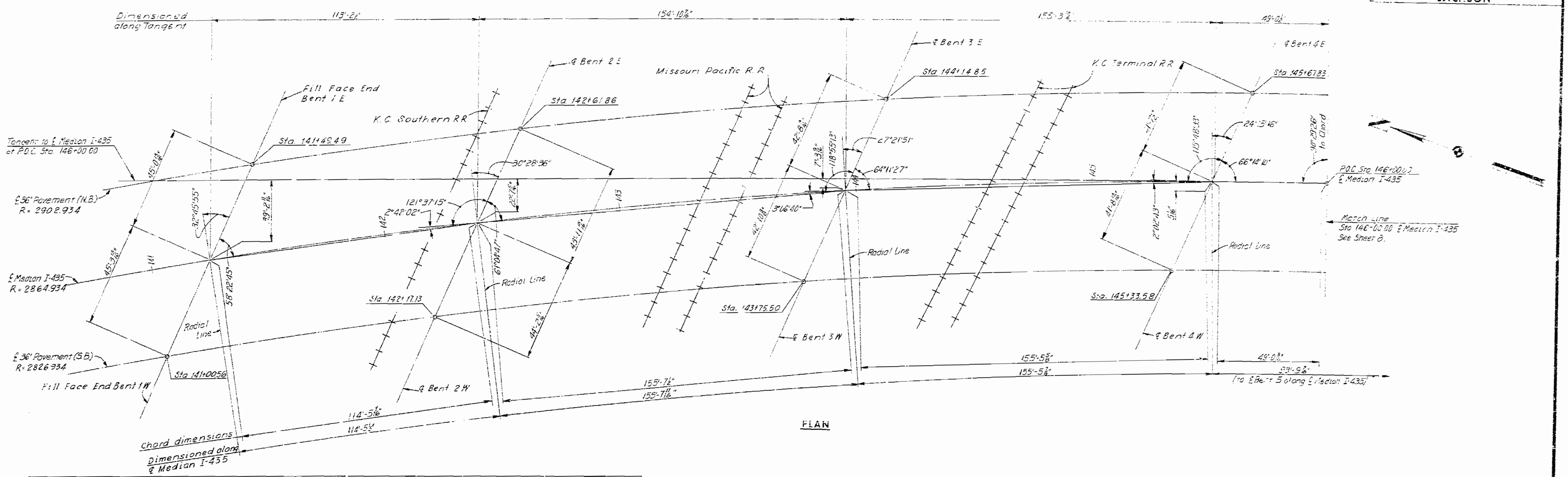
1969-12-01

MISSOURI STATE HIGHWAY DEPARTMENT

ROUTE	STATE	FEDERAL PROJECT NO.	SEC.	SHEET NO.	TOTAL SHTS.
	5	MO.		1-25	
DIST. NO.	COUNTY			YEAR	SEC.
	4	JACKSON			



PLAN

PILE AND FOOTING DATA (NORTHBOUND)									
SPREAD FOOTING	Bent No.							9E	10E
	Foundation Material							Limestone	Limestone
	Design Bearing (Tons/sq.ft.)							9.3	5.4
STEEL BEARING PILES	Bent No.	1E	2E	3E	4E	5E	6E	7E	8E
	Pile Type and Size	12BP53	12BP53	12BP53	12BP53	10BP42	10BP42	10BP42	10BP42
	Number	11	19	19	16	12	13	19	18
	Design Bearing Value (Tons)	60	69	69	69	51	55	55	53
	Hammer Energy Required (Ft. Lbs.)	16,700	17,000	17,000	17,000	12,500	14,000	13,800	13,000
	Approximate Average Length (Ft.)	105	72	77	72	62	62	52	32

17 JAM 4-25-68

PILE DATA (SOUTHBOUND)										
STEEL BEARING PILES	Bent No.	1W	2W	3W	4W	5W	6W	7W	8W	9W	10W
	Pile Type and Size	12BP53	12BP53	12BP53	12BP53	10BP42	10BP42	10BP42	10BP42	10BP42	12BP53
	Number	11	17	13	(13)	13	16	19	18	13	9
	Design Bearing Value (Tons)	61	[illegible]	[illegible]	61	48	51	55	54	55	66
	Hammer Energy Required (Ft. Lbs.	15,400	[illegible]	[illegible]	16,400	11,800	12,500	14,000	13,300	13,800	16,200
	Approximate Average Length (Ft.)	97	65	77	75	63	62	52	35	24	27

Note: Minimum energy requirement of hammer based on plan length and design bearing value of piles. Increase by the factor (W+.4P)/W when the weight of ram (W) is less than the weight of pile (P). All pile shall be driven to practical refusal.

Note: Spread footings shall be carried 6" into hard, solid undisturbed rock or 1'-6" into soft rock or shale, and cast against vertical faces of same.

Note: Angles at bents are from chord to ℄ bent, chord to chord or radial line to ℄ bent. Stationing is based on chord definition.

10 MAY 24

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

MADE RSM DATE 3-21-67 CHECKED AJMH DATE 6-13-67

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

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

SUBSTRUCTURE LAYOUT

SHEET 7 OF 29

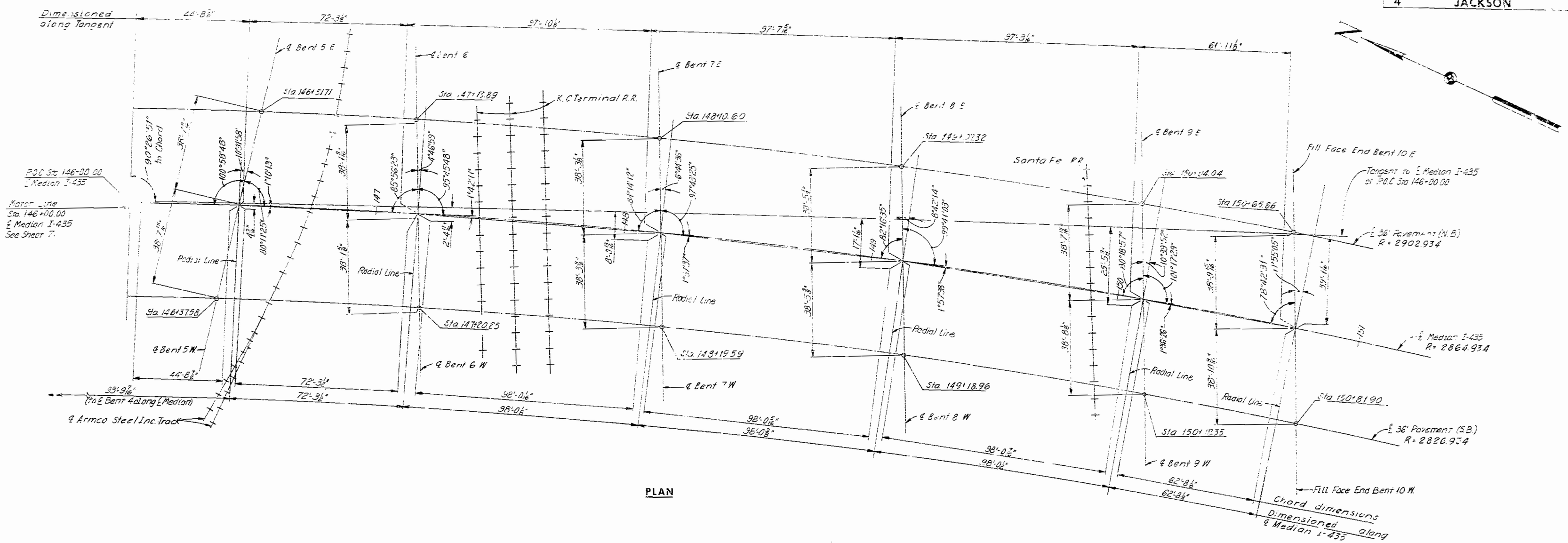
A-1686

FOR INFORMATION ONLY

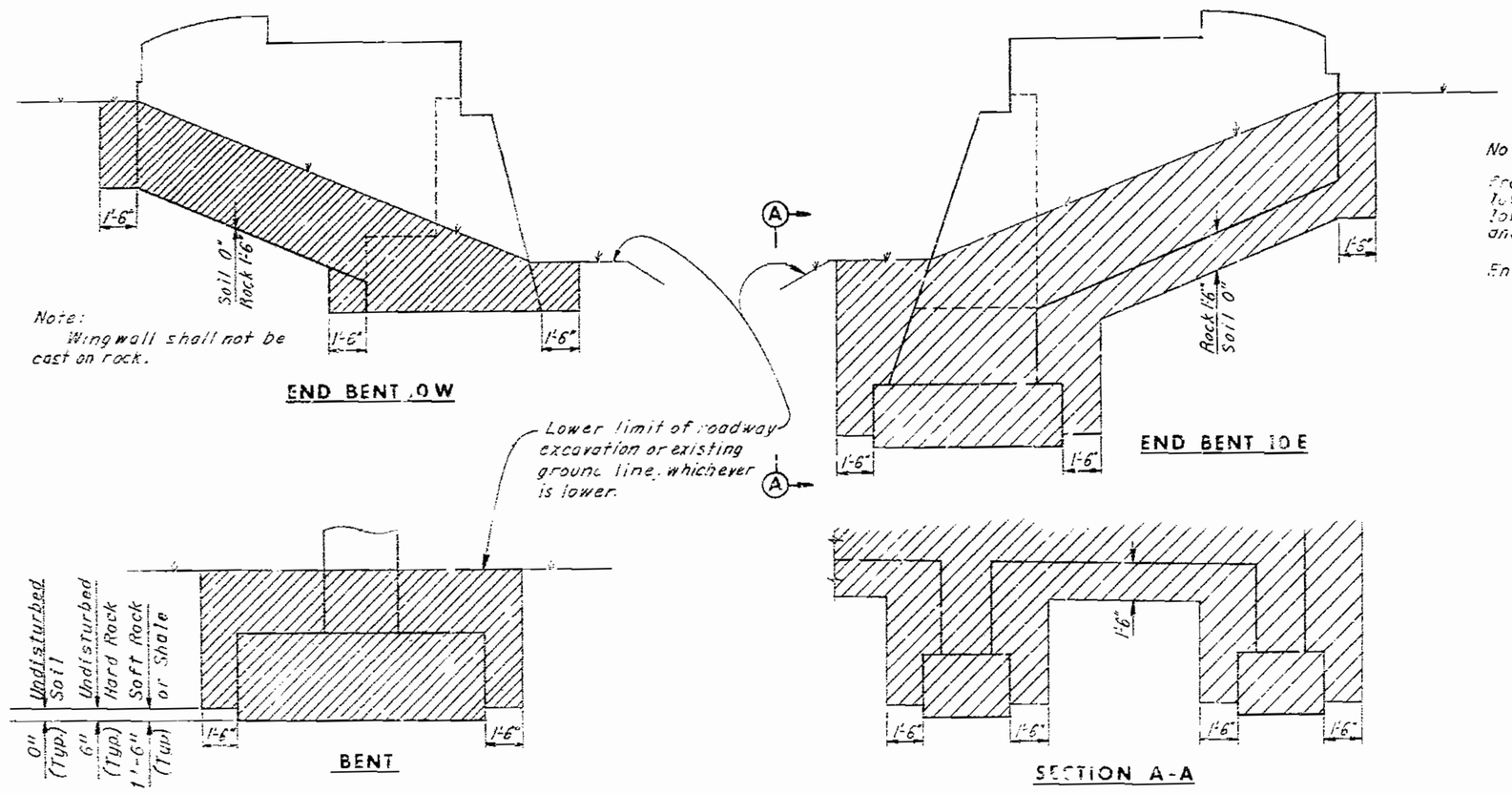
A16866, Sht. 14

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD STATE	FED. PROJECT NO.	SEC.	FISCAL SHT. NO.	TOTAL SHTS. NO.
5 MO				146
DIST. NO.	COUNTY		ROUTE SEC.	
4	JACKSON			



PLAN



LIMITS OF EXCAVATION

Note: Excavation for Structures will be computed from the original ground line (1965) or from the lower limits of roadway excavation, whichever is lower regardless of the sequence of operations and the method of removal. No payment for excavation will be allowed at End Bent 1.

Note: Angles at bents are from chord to ℄ bent, chord to chord or radial line to ℄ bent. Stationing is based on chord definition.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE. I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 8 OF 49

A-1686

SUBSTRUCTURE LAYOUT

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

MADE PEM DATE 4-7-67 CHECKED AMH DATE 4-7-67

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

45

10-11-68

FOR INFORMATION ONLY

A16866, Sht. 15

MISSOURI STATE HIGHWAY DEPARTMENT

BILL OF REINFORCEMENT				
NO.	MARK	LENGTH	SHAPE	LOCATION
	NORTHBOUND LANE - END BENT 1			
12	A201	19'- 9"	129	Anchor Bolts
30	H401	4'- 2"	105	Pads
18	H402	5'- 8"	105	Pads
5	H404	6'- 7"	131	Maskwall
5	H405	9'-11"	131	Maskwall
8	H501	32'- 0"	Str.	Backwall
8	H502	31'- 8"	108	Backwall
4	H504	8'-10"	Str.	Parapet
4	H505	4'- 9"	Str.	End Post
4	H506	10'-10"	Str.	Parapet
8	H601	32'- 0"	Str.	Barrel
4	H603	10'- 6"	Str.	Wingwall
6	H604	10'- 0"	108	Fillet
5	H605	7'- 5"	130	Fillet
2	H607	7'-10"	Str.	Wingwall
1	H610	12'- 0"	Str.	Wingwall
1	H611	9'- 9"	Str.	Wingwall
1	H612	10'- 2"	Str.	Wingwall
11	H613	12'- 8"	Str.	Wingwall
8	H614	14'- 8"	Str.	Wingwall
3	H617	9'- 4"	Str.	Wingwall
2	H621	3'- 0"	Str.	Wingwall
1	H622	5'- 9"	Str.	Wingwall
2	H632	4'- 8"	101	Footing
1	H633	6'-10"	Str.	Wingwall
2	H634	4'- 6"	Str.	Wingwall
2	H635	13'- 0"	Str.	Wingwall
1	H636	8'- 6"	Str.	Wingwall
6	H638	3'-10"	100	Footing
4	H639	7'- 8"	101	Footing
2	H640	3'- 4"	100	Footing
1	H641	4'- 8"	100	Footing
1	H642	4'-11"	100	Footing
2	H643	6'- 5"	101	Footing
8	H646	10'- 3"	105	End Post
16	H1001	32'- 5"	Str.	Barrel
2	V401	9'- 0"	108	Maskwall
2	V402	6'- 3"	Str.	Maskwall
57	V501	13'- 9"	123	Barrel
1	V502	15'- 0"	123	Barrel
2	V503	14'- 6"	123	Barrel
120	V504	7'- 2"	Str.	Backwall
28	V506	4'- 3"	124	Curb
18	V507	5'- 6"	105	Parapet
4	V508	6'- 7"	105	End Post
2	V509	6'-11"	105	End Post
2	V510	7'- 3"	105	End Post
4	V511	7'- 5"	105	End Post
2	V513	4'- 0"	Str.	Wingwall
6	V514	12'- 0"	Series	Wingwall
4	V515	8'- 0"	104	Fillet
4	V516	9'- 0"	Str.	Wingwall
1	V521	13'- 8"	109	Barrel
3	V522	9'- 6"	Str.	Wingwall
2	V523	8'- 6"	104	Fillet
6	V524	11'- 4"	Series	Wingwall
4	V528	5'-11"	105	End Post

BILL OF REINFORCEMENT				
NO.	MARK	LENGTH	SHAPE	LOCATION
	SOUTHBOUND LANE - END BENT 1			
12	A201	19'- 9"	129	Anchor Bolts
30	H401	4'- 2"	105	Pads
18	H402	5'- 8"	105	Pads
5	H404	6'- "	131	Maskwall
5	H405	9'-11"	131	Maskwall
8	H501	32'- 0"	Str.	Backwall
8	H502	31'- 8"	108	Backwall
4	H504	8'-10"	Str.	Parapet
4	H505	4'- 9"	Str.	End Post
4	H506	10'-10"	Str.	Parapet
8	H601	32'- 0"	Str.	Barrel
4	H603	10'- 6"	Str.	Wingwall
6	H604	10'- 0"	108	Fillet
5	H605	7'- 5"	130	Fillet
2	H607	7'-10"	Str.	Wingwall
1	H610	12'- 0"	Str.	Wingwall
1	H611	9'- 9"	Str.	Wingwall
1	H612	10'- 2"	Str.	Wingwall
11	H613	12'- 8"	Str.	Wingwall
8	H614	14'- 8"	Str.	Wingwall
3	H617	9'- 4"	Str.	Wingwall
2	H621	3'- 0"	Str.	Wingwall
1	H622	5'- 9"	Str.	Wingwall
2	H632	4'- 8"	101	Footing
1	H633	6'-10"	Str.	Wingwall
2	H634	4'- 6"	Str.	Wingwall
2	H635	13'- 0"	Str.	Wingwall
1	H636	8'- 6"	Str.	Wingwall
6	H638	3'-10"	100	Footing
4	H639	7'- 8"	101	Footing
2	H640	3'- 4"	100	Footing
1	H641	4'- 8"	100	Footing
1	H642	4'-11"	100	Footing
2	H643	6'- 5"	101	Footing
8	H646	10'- 3"	105	End Post
16	H1001	32'- 6"	Str.	Barrel
4	V401	9'- 0"	108	Maskwall
8	V402	6'- 3"	Str.	Maskwall
57	V501	13'- 9"	123	Barrel
1	V502	15'- 0"	123	Barrel
2	V503	14'- 6"	123	Barrel
122	V504	7'- 2"	Str.	Backwall
28	V506	4'- 3"	124	Curb
18	V507	5'- 6"	105	Parapet
4	V508	6'- 7"	105	End Post
2	V509	6'-11"	105	End Post
2	V510	7'- 3"	105	End Post
4	V511	7'- 5"	105	End Post
2	V513	4'- 0"	Str.	Wingwall
6	V514	12'- 0"	Series	Wingwall
4	V515	8'- 0"	104	Fillet
4	V516	9'- 0"	Str.	Wingwall
1	V521	13'- 8"	109	Barrel
3	V522	9'- 6"	Str.	Wingwall
2	V523	8'- 6"	104	Fillet
6	V524	11'- 4"	Series	Wingwall
4	V528	5'-11"	105	End Post

BILL OF REINFORCEMENT				
NO.	MARK	LENGTH	SHAPE	LOCATION
	NORTH BOUND LANE - END BENT 10			
12	A201	19'- 5"	129	Anchor Bolts
45	F601	3'- 2"	Str.	Footing
20	F602	9'- 6"	130	Footing
50	F603	4'- 2"	101	Footing
10	F604	6'- 1"	101	Footing
30	H401	4'- 2"	105	Pads
12	H403	5'- 2"	105	Pads
2	H406	5'-10"	105	Maskwall
4	H407	15'- 0"	105	Maskwall
8	H503	27'- 5"	Str.	Backwall
8	H504	8'-10"	Str.	Parapet
4	H505	4'- 9"	Str.	End Post
8	H507	27'- 4"	108	Backwall
8	H602	27'- 6"	Str.	Barrel
2	H606	7'- 0"	Str.	Wingwall
2	H609	5'- "	Str.	Wingwall
12	H613	12'- 8"	Str.	Wingwall
6	H617	9'- 4"	Str.	Wingwall
12	H618	2'- 6"	108	Fillet
4	H619	15'- 7"	108	Fillet
	H620	15'- 3"	Str.	Wingwall
2	H633	7'- 0"	Str.	Wingwall
5	H635	12'- 5"	118	Column
1	H636	15'- "	109	Column
5	H637	15'-11"	105	Column
1	H638	13'- 3"	109	Column
1	H642	16'- 5"	109	Column
2	H630	16'- 9"	109	Column
1	H631	17'- 1"	109	Column
8	H646	10'- 3"	105	End Post
8	H1002	53'- 4"	Str.	Barrel
4	V401	9'- 0"	108	Maskwall
8	V402	6'- 3"	Str.	Maskwall
108	V504	7'- 2"	Str.	Backwall&Fillet
26	V506	4'- 3"	124	Curb
16	V507	5'- 6"	105	Parapet
4	V508	6'- 7"	105	End Post
2	V509	6'-11"	105	End Post
2	V510	7'- 3"	105	End Post
4	V511	7'- 5"	105	End Post
54	V517	15'- 0"	123	Barrel
2	V518	6'- 3"	Str.	Wingwall
2	V519	10'- 3"	Str.	Wingwall
2	V520	7'- 9"	Str.	Wingwall
4	V526	10'- 0"	Series	Wingwall
8	V527	13'- 9"	Series	Wingwall
4	V528	5'-11"	105	End Post
10	V601	5'- 7"	Str.	Column
10	V602	6'- 2"	Str.	Column
10	V603	5'- 8"	Str.	Column
10	V604	7'- 3"	Str.	Column
10	V605	7'- 8"	Str.	Column

BILL OF REINFORCEMENT				
NO.	MARK	LENGTH	SHAPE	LOCATION
	SOUTH BOUND LANE - END BENT 10			
12	A201	19'- 9"	129	Anchor Bolts
30	H401	4'- 2"	105	Pads
18	H403	5'- 2"	105	Pads
2	H406	5'-10"	105	Maskwall
4	H407	15'- 0"	105	Maskwall
8	H503	27'- 5"	Str.	Backwall
8	H504	8'-10"	Str.	Parapet
4	H505	4'- 9"	Str.	End Post
8	H507	27'- 4"	108	Backwall
3	H602	27'- 6"	Str.	Barrel
1	H603	10'- 6"	Str.	Wingwall
2	H606	8'- 0"	Str.	Wingwall
7	H612	10'- 2"	Str.	Wingwall
13	H613	12'- 8"	Str.	Wingwall
5	H615	8'- 0"	108	Fillet
5	H616	7'- 0"	108	Fillet
2	H622	5'- 9"	Str.	Wingwall
		7'- 6"	Str.	Wingwall
2	H624	5'- 3"	101	Footing
2	H632	4'- 3"	101	Footing
4	H634	4'- 6"	Str.	Wingwall
4	H635	13'- 0"	Str.	Wingwall
1	H636	8'- 6"	Str.	Wingwall
4	H637	5'- 8"	101	Footing
4	H638	3'-10"	100	Footing
2	H644	3'- 7"	100	Footing
2	HL45	4'- 4"	100	Footing
3	H646	10'- 3"	105	End Post
8	H1002	53'- 4"	Str.	Barrel
4	V401	9'- 0"	108	Maskwall
8	V402	6'- 3"	Str.	Maskwall
104	V504	7'- 2"	Str.	Backwall
52	V505	15'- 5"	123	Barrel
26	V506	4'- 3"	124	Curb
16	V507	5'- 6"	105	Parapet
4	V508	6'- 7"	105	End Post
2	V509	6'-11"	105	End Post
2	V510	7'- 3"	105	End Post
4	V511	7'- 3"	105	End Post
6	V512	9'- 3"	Str.	Wingwall
12	V524	11'- 4"	Series	Wingwall
4	V525	8'- 2"	104	Fillet
4	V526	5'-11"	105	End Post

TABLE OF BENDING DIMENSIONS			
MARK	A	B	C
SHAPE 108			
V401	6'- 6"	2'- 5"	2'- 5"
H502	30'- 7"	1'- 1"	7"
H507	26'- 3"	1'- 1"	2 3/4"
H604	9'- 1"	1'- 0"	5"
H615	7'- 0"	1'- 0"	5"
H616	6'- 0"	1'- 0"	11"
H612	7'- 0"	1'- 6"	1'- 5"
H619	13'- 6"	1'- 6"	9"
SHAPE 109			
V521	9"	3'- 6"	2'- 7"
H625	10 1/2"	4'- 2"	2'- 2"
H626	10 1/2"	4'- 6"	2'- 2"
H627	10 1/2"	4'-11"	2'- 2"
H628	10 1/2"	5'- 1"	2'- 2"
H629	10 1/2"	5'- 2"	2'- 2"
H630	10 1/2"	5'- 4"	2'- 2"
H631	10 1/2"	5'- 5"	2'- 2"
SHAPE 131			
H404	3'- 0"	7"	6"
H405	4'- 8"	7"	6"

TABLE OF BENDING DIMENSIONS				
MARK	A	B	C	D
SHAPE 123				
V501	3'- 2"	2'- 8"	3'-10"	2'- 7"
V502	3'- 9"	2'- 8"	4'- 6"	2'- 7"
V503	3'- 6"	2'- 8"	4'- 3"	2'- 7"
V505	4'- 0"	2'- 8"	4'- 6"	2'- 7"
V517	3'- 2"	3'- 3"	3'-11"	3'- 2"

BENDING DIMENSIONS		
MARK	A	B
SHAPE 100		
F502	2'- 2"	8"
H538	2'- 6"	8"
H640	2'- 0"	8"
H641	3'- 4"	8"
H542	3'- 7"	8"
H644	2'- 3"	8"
H645	3'- 0"	8"
SHAPE 101		
F503	4'- 0"	8"
F504	5'- 5"	8"
H624	4'- 7"	8"
H632	4'- 0"	8"
H637	5'- 0"	8"
H639	7'- 0"	8"
H643	5'- 0"	8"
SHAPE 104		
V515	7'- 3"	9"
V523	7'- 9"	9"
V525	7'- 5"	9"
SHAPE 105		
H401	2'- 2"	1'- 0"
H402	2'- 8"	1'- 0"
H403	3'- 2"	1'- 0"
H406	6"	2'- 8"
H407	6"	3'-0?64-0"
V507	7 3/4"	2'-5 1/4"
V508	9"	2'-11"
V509	9"	3'- 1"
V510	9"	3'- 3"
V511	9"	3'- 4"
V528	9"	2'- 7"
H646	9"	4'- 9"

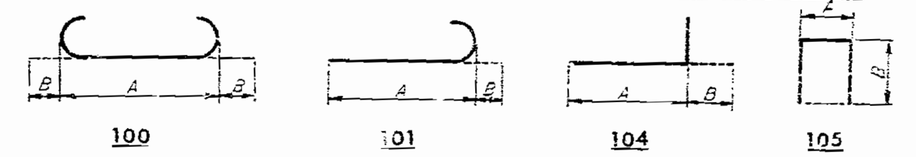
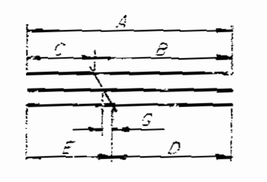


TABLE OF CUTTING DIAGRAM DIMENSIONS								
MARK	A	B	C	D	E	G	H	J
H407	15'- 0"	8'- 5"	6'- 6"	7'-10"	7'- 2"	8"	2	8*
H620	15'- 3"	10'- 6"	4'- 9"	8'- 7"	5'- 8"	1'-11"	2	4
V514	12'- 0"	7'- 6"	4'- 6"	6'- 3½"	5'-8½"	7½"	3	12
V524	11'- 4"	7'- 2"	4'- 0"	5'- 0"	5'- 4"	8 "	3	24
V525	10'- 2"	6'- 2"	4'- 2"	5'- 2⅜"	4'-11⅜"	9⅜"	2	4
V527	13'- 9"	9'- 1"	4'- 2"	7'- 3½"	6'- 5⅜"	3½"	4	8

*Bend 15-H407

H = No. of Bars.
J = Cut



CUTTING DIAGRAM

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L.
141+00.56 S.B.L.

JACKSON COUNTY

SUBSTRUCTURE REINFORCING SCHEDULE SHEET 9 OF 49 A-1686

FED. ROAD DIST. NO.	STATE	FEDERAL	PROJECT NO. & SEC.	FISCAL SHEET NO.	TOTAL SHEETS IN THIS SET
5	MO				147
DIST. NO.	COUNTY			ROUTE NO.	
4	JACKSON				

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE A.M.H. DATE 5-16-67 CHECKED D.E.S. DATE 5-18-67

BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.

NOTE: This drawing is not to scale. Follow dimensions

Note: Hooks and bends shall be in accordance with the A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI-315-65). Two diameter bends shall not be used unless specified in bending diagrams.

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Submitted by Kbrug 10-12-67

FOR INFORMATION ONLY

A16866, Sht. 16

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO. | STATE | FEDERAL PROJECT NO. & SEC. | FISCAL SHEET TOTAL | SHEET NO. | SHEETS
5 | MO | | | 149

DIST. NO. | COUNTY | ROUTE, SEC.
4 | JACKSON

BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
	NORTHBOUND LANE - BENT 2E			
12	A201	19'- 9"	129	Anchor Bolts
36	B401	5'- 4"	105	Pads
36	B402	3'- 0"	Str.	Pads
2	B403	5'- 2"	105	Pads
2	B404	4'-11"	105	Pads
2	B405	'- 0"	105	Pads
2	B601	15'-11"	109	Cap Beam
36	B602	16'- 0"	109	Cap Beam
49	B603	18'- 1"	109	Cap Beam
8	B604	27'- 2"	Str.	Cap Beam
2	B701	9'- 9"	132	Cap Beam
11	B1101	40' 9"	104	Cap Beam
11	B1102	21'- 9"	104	Cap Beam
2	B1103	14'- 8"	Str.	Cap Beam
7	B1104	24'- 9"	Str.	Cap Beam
7	B1105	34'- 2"	Str.	Cap Beam
12	B1106	18'- 5"	Str.	Cap Beam
84	C301	12'- 9"	119	Column
20	C1101	32'- 5"	Str.	Column
20	C1002	31'- 0"	Str.	Column
20	C1103	29'- 6"	Str.	Column
20	F601	6'-10"	100	Footing
12	F801	10'- 8"	100	Footing
16	F901	11'- 0"	100	Footing
20	F1001	6'- 9"	104	Footing
14	F1003	11'- 9"	100	Footing
40	F1101	7'- 1"	104	Footing
	NORTHBOUND LANE - BENT 3E			
12	A201	19'- 9"	129	Anchor Bolts
36	B401	5'- 4"	105	Pads
36	B402	3'- 0"	Str.	Pads
2	B403	5'- 2"	105	Pads
2	B404	4'-11"	105	Pads
2	B405	4'- 0"	105	Pads
2	B601	15'-11"	109	Cap Beam
36	B602	16'- 0"	109	Cap Beam
53	B603	18'- 1"	109	Cap Beam
8	B604	26'- 5"	Str.	Cap Beam
8	B701	9'- 9"	132	Cap Beam
11	B1101	39'-10"	104	Cap Beam
11	B1102	21'- 4"	104	Cap Beam
2	B1103	14'- 8"	Str.	Cap Beam
7	B1104	24'- 3"	Str.	Cap Beam
7	B1105	33'- 5"	Str.	Cap Beam
12	B1106	18'- 0"	Str.	Cap Beam

BILL OF REINFORCEMENT

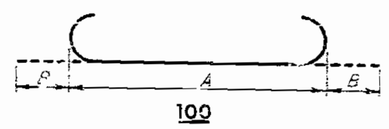
NO.	MARK	LENGTH	SHAPE	LOCATION
	NORTHBOUND LANE - BENT 3E(CON'T)			
77	C301	12'- 9"	119	Column
24	C1101	30'- 2"	Str.	Column
24	C1103	27'- 6"	Str.	Column
20	C1401	29'- 3"	Str.	Column
20	F601	6'-10"	100	Footing
12	F801	10'- 8"	100	Footing
16	F1003	11'- 9"	100	Footing
43	F1101	7'- 1"	104	Footing
14	F1102	12'- 1"	100	Footing
20	F1401	8'- 2"	104	Footing
	NORTHBOUND LANE - BENT 4E			
12	A201	19'- 9"	129	Anchor Bolts
36	B401	5'- 4"	105	Pads
36	B402	3'- 0"	Str.	Pads
2	B403	5'- 2"	105	Pads
2	B404	4'-11"	105	Pads
2	B405	4'- 0"	105	Pads
2	B601	15'-11"	109	Cap Beam
32	B602	15'- 0"	109	Cap Beam
45	B603	18'- 1"	109	Cap Beam
8	B604	26'- 5"	Str.	Cap Beam
8	B701	9'- 9"	132	Cap Beam
7	B1101	39'-10"	104	Cap Beam
7	B1102	21'- 4"	104	Cap Beam
4	B1103	14'- 8"	Str.	Cap Beam
7	B1104	24'- 3"	Str.	Cap Beam
7	B1105	33'- 5"	Str.	Cap Beam
8	B1106	18'- 0"	Str.	Cap Beam
85	C301	12'- 9"	119	Column
20	C1001	32'- 8"	Str.	Column
16	C1002	31'- 4"	Str.	Column
20	C1003	30'- 0"	Str.	Column
30	F601	6'-10"	100	Footing
56	F1001	6'- 9"	104	Footing
16	F1002	11'- 0"	100	Footing
8	F1003	11'- 9"	100	Footing

BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
	NORTHBOUND LANE - BENT 5E			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
12	B606	12'- 8"	109	Cap Beam
47	B607	15'- 1"	109	Cap Beam
8	B608	24'- 5"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
6	B1107	37'-10"	104	Cap Beam
6	B1108	20'- 2"	104	Cap Beam
6	B1109	23'- 6"	Str.	Cap Beam
6	B1110	30'- 4"	Str.	Cap Beam
2	B1113	13'- 6"	Str.	Cap Beam
4	B1115	16'- 6"	Str.	Cap Beam
113	C302	11'- 3"	119	Column
16	C1101	41'- 9"	Str.	Column
16	C1102	40'- 7"	Str.	Column
16	C1103	39'- 5"	Str.	Column
30	F601	6'-10"	100	Footing
16	F701	9'-11"	100	Footing
8	F802	10'- 5"	100	Footing
48	F1103	7'- 4"	104	Footing
	NORTHBOUND LANE - BENT 6E			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
28	B606	12'- 8"	109	Cap Beam
41	B607	15'- 1"	109	Cap Beam
8	B608	24'- 3"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
6	B1107	37'- 6"	104	Cap Beam
6	B1108	20'- 0"	104	Cap Beam
5	B1109	23'- 8"	Str.	Cap Beam
6	B1110	29'-10"	Str.	Cap Beam
4	B1112	15'- 5"	104	Cap Beam
4	B1113	13'- 6"	Str.	Cap Beam
12	B1115	14'- 9"	Str.	Cap Beam
120	C302	11'- 3"	119	Column

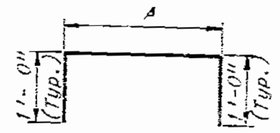
BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
	NORTHBOUND LANE - BENT 6E(CON'T)			
16	C1101	43'-10"	Str.	Column
16	C1102	42'-10"	Str.	Column
16	C1103	41'-10"	Str.	Column
30	F601	6'-10"	100	Footing
24	F801	10'- 8"	100	Footing
48	F1103	7'- 4"	104	Footing
	NORTHBOUND LANE - BENT 7E			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
32	B606	12'- 8"	109	Cap Beam
45	B607	15'- 1"	109	Cap Beam
8	B608	24'- 3"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
5	B1107	37'- 6"	104	Cap Beam
6	B1108	20'- 0"	104	Cap Beam
6	B1109	23'- 8"	Str.	Cap Beam
6	B1110	29'-10"	Str.	Cap Beam
8	B1112	15'- 5"	104	Cap Beam
6	B1113	13'- 6"	Str.	Cap Beam
2	B1114	42'- 0"	Str.	Cap Beam
8	B1115	14'- 9"	Str.	Cap Beam
2	B1115	13'- 0"	Str.	Cap Beam
129	C302	11'- 3"	119	Column
16	C1201	48'- 8"	104	Column
20	C1402	47'- 9"	104	Column
16	C1403	46 - 9"	104	Column
20	F601	6'-10"	100	Footing
10	F803	11'- 2"	100	Footing
10	F901	11'- 0"	100	Footing
16	F902	11'- 6"	100	Footing
52	F1402	8'- 5"	104	Footing



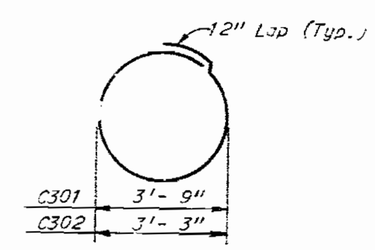
100

100		
MARK	A	B
F601	5'- 6"	8"
F701	8'- 3"	10"
F801	8'- 6"	1'- 1"
F802	8'- 3"	1'- 1"
F803	9'- 0"	1'- 1"
F901	8'- 5"	1'- 3"
F902	9'- 0"	1'- 3"
F1002	7'- 9"	1'-7½"
F1003	8'- 6"	1'-7½"
F1102	8'- 6"	1'-9½"

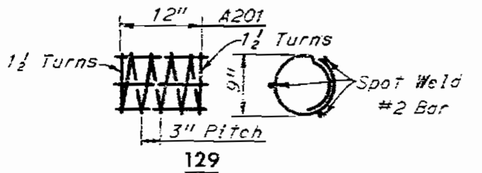


105

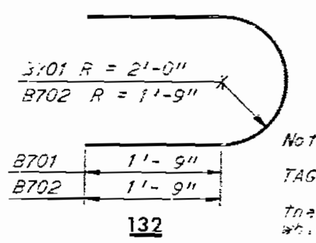
105	
MARK	A
B401	3'- 4"
B403	3'- 2"
B404	2'-11"
B405	2'- 0"
B406	3'- 0"
B408	2'- 8"
B409	1'- 9"



119



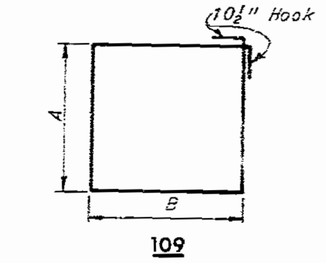
129



132

104

104		
MARK	A	B
B2E-B1101	39'- 0"	11'- 9"
B2E-B1102	20'- 0"	11'- 9"
B2E-F1001	5'- 2"	11'- 7"
B2E-F1101	5'- 4"	11'- 5"
B3E-B1101	38'- 1"	11'- 9"
B3E-B1102	19'- 7"	11'- 9"
B3E-F1101	5'- 4"	11'- 9"
B3E-F1401	6'- 1"	21'- 1"
B4E-B1101	32'- 1"	11'- 9"
B4E-B1102	19'- 7"	11'- 3"
B4E-F1001	5'- 2"	11'- 7"
B5E-B1107	36'- 1"	11'- 9"
B5E-B1108	18'- 5"	11'- 9"
B5E-F1103	5'- 7"	11'- 9"
B6E-B1107	35'- 9"	11'- 9"
B6E-B1108	18'- 3"	11'- 9"
B6E-B1112	13'- 8"	11'- 9"
B6E-F1103	5'- 7"	11'- 9"
B7E-B1107	35'- 9"	11'- 9"
B7E-B1108	18'- 3"	11'- 9"
B7E-B1112	13'- 8"	11'- 9"
B7E-C1401	46'- 7"	21'- 1"
B7E-C1402	45'- 3"	21'- 1"
B7E-C1403	44'- 8"	21'- 1"
B7E-F1402	6'- 4"	21'- 1"



109

109		
MARK	A	B
B601	4'- 2"	2'-11"
B602	4'- 2"	2'-11½"
B603	4'- 2"	4'- 0"
B605	3'- 2"	2'- 8"
B606	3'- 2"	2'- 3½"
B607	3'- 2"	3'- 6"

Note: BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.
The designation preceding the bar mark in the Bending Diagrams, indicates the unit in which the bar will be placed. (B2E=Bent 2 East)

Note:
Hooks and bends shall be in accordance with the A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI-315-65). Two diameter bends shall not be used unless specified in bending diagrams.

BRIDGE OVER K.C.S. R.R. , M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L.
141+00.56 S.B.L.

JACKSON COUNTY

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

MADE J.E.J. DATE 5-15-67 CHECKED M.H.H. DATE 5-18-67

NOTE: This drawing is not to scale. Follow dimensions

SUBSTRUCTURE REINFORCING SCHEDULE SHEET 10 OF 49

A-1686

1509-21-01

FOR INFORMATION ONLY

A16866, Sht. 17

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD STATE DIV. NO.	FEDERAL PROJECT NO. & SEC	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5 MO			147	
DIST. NO.	COUNTY		ROUT. SEC.	
4	JACKSON			

FOR INFORMATION ONLY

BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
	NORTHBOUND LANE - BENT 2E			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
12	B606	12'- 8"	109	Cap Beam
28	B607	15'- 1"	109	Cap Beam
9	B608	24'- 3"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
6	B1107	37'- 6"	104	Cap Beam
6	B1108	20'- 0"	104	Cap Beam
6	B1109	23'- 8"	Str.	Cap Beam
6	B1110	29'-10"	Str.	Cap Beam
8	B1112	15'- 5"	104	Cap Beam
6	B1113	13'- 6"	Str.	Cap Beam
2	B1114	42'- 0"	Str.	Cap Beam
2	B1115	15'- 3"	Str.	Cap Beam
2	B1116	13'- 5"	Str.	Cap Beam
135	C302	11'- 3"	119	Column
16	C1401	50'- 1"	104	Column
18	C1402	49'- 2"	104	Column
16	C1403	48'- 3"	104	Column
30	F601	5'-10"	100	Footing
24	F903	11'- 9"	100	Footing
50	F1402	8'- 5"	104	Footing
	NORTHBOUND LANE - BENT 9E			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
28	B606	12'- 8"	109	Cap Beam
41	B607	15'- 1"	109	Cap Beam
8	B608	24'- 3"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
6	B1107	37'- 6"	104	Cap Beam
6	B1108	20'- 0"	104	Cap Beam
6	B1109	23'- 8"	Str.	Cap Beam
6	B1110	29'-10"	Str.	Cap Beam
4	B1112	15'- 5"	104	Cap Beam
4	B1113	13'- 6"	Str.	Cap Beam
8	B1115	15'- 3"	Str.	Cap Beam
78	C302	11'- 3"	119	Column
12	C1001	30'- 2"	Str.	Column
12	C1002	29'- 3"	Str.	Column
12	C1003	28'- 4"	Str.	Column
64	F501	6'- 2"	100	Footing
36	F1004	6'- 2"	104	Footing

BILL OF REINFORCEMENT

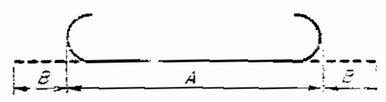
NO.	MARK	LENGTH	SHAPE	LOCATION
	SOUTHBOUND LANE - BENT 2W			
12	A201	19'- 9"	129	Anchor Bolts
36	B401	5'- 4"	105	Pads
36	B402	3'- 0"	Str.	Pads
2	B403	5'- 2"	105	Pads
2	B404	4'-11"	105	Pads
2	B405	4'- 0"	105	Pads
2	B601	15'-11"	109	Cap Beam
36	B602	16'- 0"	109	Cap Beam
51	B603	18'- 1"	109	Cap Beam
8	B604	27'- 5"	Str.	Cap Beam
8	B701	9'- 9"	132	Cap Beam
11	B1101	40'- 9"	104	Cap Beam
11	B1102	23'- 1"	104	Cap Beam
2	B1103	14'- 4"	Str.	Cap Beam
7	B1104	26'- 4"	Str.	Cap Beam
7	B1105	33'- 3"	Str.	Cap Beam
12	B1106	18'- 7"	Str.	Cap Beam
73	C301	12'- 9"	119	Column
16	C1001	28'-11"	Str.	Column
16	C1003	26'- 1"	Str.	Column
16	C1102	27'- 6"	Str.	Column
20	F601	6'-10"	100	Footing
12	F801	10'- 8"	100	Footing
32	F1001	6'- 8"	104	Footing
16	F1002	11'- 0"	100	Footing
14	F1003	11'- 9"	100	Footing
16	F1101	7'- 1"	104	Footing
	SOUTHBOUND LANE - BENT 3W			
12	A201	19'- 9"	129	Anchor Bolts
36	B401	5'- 4"	105	Pads
36	B402	3'- 0"	Str.	Pads
2	B403	5'- 2"	105	Pads
2	B404	4'-11"	105	Pads
2	B405	4'- 0"	105	Pads
2	B601	15'-11"	109	Cap Beam
40	B602	15'- 0"	109	Cap Beam
53	B603	18'- 1"	109	Cap Beam
8	B604	26'- 6"	Str.	Cap Beam
2	B701	9'- 9"	132	Cap Beam

BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
	SOUTHBOUND LANE - BENT 3W(CON'T)			
11	B1101	40'- 3"	104	Cap Beam
11	B1102	22'- 4"	104	Cap Beam
2	B1103	14'- 4"	Str.	Cap Beam
7	B1104	25'-11"	Str.	Cap Beam
7	B1105	32'- 5"	Str.	Cap Beam
2	B1106	18'- 3"	Str.	Cap Beam
68	C301	12'- 9"	119	Column
16	C1001	26'- 9"	Str.	Column
16	C1003	24'- 0"	Str.	Column
20	C1401	26'- 0"	Str.	Column
20	F601	5'-10"	100	Footing
12	F801	10'- 8"	100	Footing
32	F1001	5'- 8"	104	Footing
15	F1003	11'- 5"	100	Footing
14	F1102	12'- 1"	100	Footing
20	F1401	8'- 2"	104	Footing
	SOUTHBOUND LANE - BENT 4W			
12	A201	19'- 9"	129	Anchor Bolts
36	B401	5'- 4"	105	Pads
36	B402	3'- 0"	Str.	Pads
2	B403	5'- 2"	105	Pads
2	B404	4'-11"	105	Pads
2	B405	4'- 0"	105	Pads
2	B601	15'-11"	109	Cap Beam
36	B602	16'- 0"	109	Cap Beam
45	B603	18'- 1"	109	Cap Beam
8	B604	26'- 6"	Str.	Cap Beam
8	B701	9'- 9"	132	Cap Beam
7	B1101	40'- 3"	104	Cap Beam
7	B1102	22'- 4"	104	Cap Beam
4	B1103	14'- 4"	Str.	Cap Beam
7	B1104	25'-11"	Str.	Cap Beam
7	B1105	32'- 5"	Str.	Cap Beam
12	B1106	18'- 3"	Str.	Cap Beam
75	C301	12'- 9"	119	Column
16	C1002	27'- 0"	Str.	Column

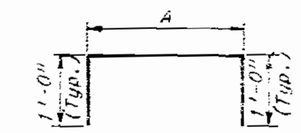
BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
	SOUTHBOUND LANE - BENT 4W(CON'T)			
20	C1101	29'- 5"	Str.	Column
20	C1103	26'- 9"	Str.	Column
20	F601	6'-10"	100	Footing
12	F801	10'- 8"	100	Footing
16	F1001	6'- 8"	104	Footing
16	F1002	11'- 0"	100	Footing
14	F1003	11'- 9"	100	Footing
40	F1101	7'- 1"	104	Footing
	SOUTHBOUND LANE - BENT 5W			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
12	B606	12'- 8"	109	Cap Beam
49	B607	15'- 1"	109	Cap Beam
8	B608	24'- 5"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
6	B1107	37'- 1"	104	Cap Beam
6	B1108	21'- 0"	104	Cap Beam
4	B1109	12'- 6"	Str.	Cap Beam
6	B1110	23'- 6"	Str.	Cap Beam
6	B1111	30'- 4"	Str.	Cap Beam
8	B1113	13'- 0"	Str.	Cap Beam
4	B1115	11'- 6"	104	Cap Beam
105	C302	11'- 3"	119	Column
16	C1101	39'- 5"	Str.	Column
20	C1102	38'- 4"	Str.	Column
16	C1103	37'- 2"	Str.	Column
30	F501	6'-10"	100	Footing
24	F702	9'- 5"	100	Footing
52	F1101	7'- 1"	104	Footing



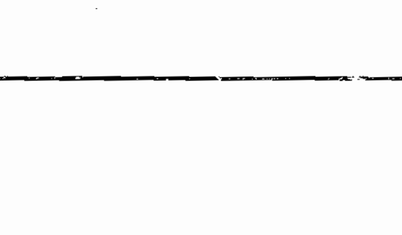
100

100		
MARK	A	B
F501	5'- 0"	7"
F601	5'- 6"	8"
F702	7'- 9"	10"
F801	8'- 6"	11'- 1"
F903	9'- 3"	1'- 3"
F1002	7'- 9"	1'-7½"
F1003	8'- 6"	1'-7½"
F1102	8'- 6"	1'-3½"



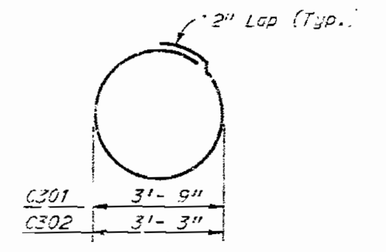
105

105	
MARK	A
B401	3'- 4"
B403	3'- 2"
B404	2'-11"
B405	2'- 0"
B406	3'- 0"
B408	2'- 8"
B409	1'- 9"

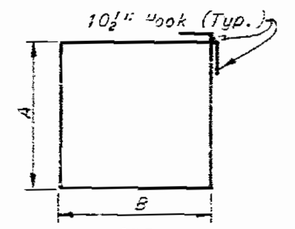


104

104		
MARK	A	B
B2E-B1107	35'- 9"	1'- 9"
B8E-B1108	18'- 3"	1'- 9"
B3E-B1112	13'- 8"	1'- 9"
B2E-C1401	46'- 0"	2'- 1"
B8E-C1402	47'- 1"	2'- 1"
B8E-C1403	46'- 2"	2'- 1"
B8E-F1402	6'- 4"	2'- 1"
B9E-B1107	35'- 9"	1'- 9"
B9E-B1108	18'- 3"	1'- 9"
B9E-B1112	13'- 8"	1'- 9"
B9E-F1004	4'- 7"	1'- 7"
B2W-B1101	39'- 0"	1'- 9"
B2W-B1102	21'- 4"	1'- 9"
B2W-F1001	5'- 1"	1'- 7"
B2W-F1101	5'- 4"	1'- 9"
B3W-B1101	38'- 5"	1'- 9"
B3W-B1102	20'- 7"	1'- 9"
B3W-F1001	5'- 1"	1'- 7"
B3W-F1401	6'- 1"	2'- 1"
B4W-B1101	38'- 6"	1'- 9"
B4W-B1102	20'- 7"	1'- 9"
B4W-F1001	5'- 1"	1'- 7"
B4W-F1101	5'- 4"	1'- 9"
B5W-B1107	35'- 4"	1'- 9"
B5W-B1108	19'- 3"	1'- 9"
B5W-B1115	9'- 9"	1'- 9"
B5W-F1101	5'- 4"	1'- 9"

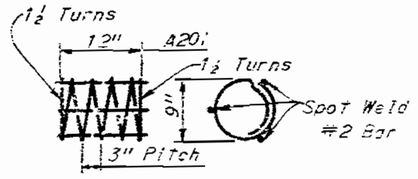


119

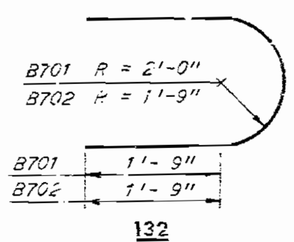


109

109		
MARK	A	B
B501	4'- 2"	2'-11"
B602	4'- 2"	2'-11½"
B603	4'- 2"	4'- 0"
B605	3'- 2"	2'- 8"
B606	3'- 2"	2'-3½"
B607	3'- 2"	3'- 5"



129



132

Note:
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.
The designation preceeding the bar mark in the Bending Diagrams, indicates the unit in which the bar will be placed. (B2E=Bent 2 East)

Note:
Hooks and bends shall be in accordance with the A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI-315-65). Two diameter bends shall not be used unless specified in bending diagrams.

BRIDGE OVER K.C.S. R.R. , M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L.
141+00.56 S.B.L.

JACKSON COUNTY

A-1686

SUBSTRUCTURE REINFORCING SCHEDULE SHEET 11 OF 49

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

MADE S.F.H. DATE 6-15-67 CHECKED M.H.H. DATE 6-19-67

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

1909-21-01

A16866, Sht. 18

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.	MISCEL. SHEET NO.	TOTAL SHEETS
5	MO			152
DIST. NO.	COUNTY		ROUTE NO.	
4	JACKSON			

FOR INFORMATION ONLY

BILL OF REINFORCEMENT

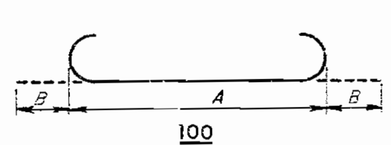
NO.	MARK	LENGTH	SHAPE	LOCATION
	SOUTHBOUND LANE - BENT 6W			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
32	B606	12'- 8"	109	Cap Beam
41	B607	15'- 1"	109	Cap Beam
8	B608	24'- 2"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
6	B1107	36'- 9"	104	Cap Beam
6	B1108	20'- 8"	104	Cap Beam
6	B1109	12'- 6"	Str.	Cap Beam
6	B1110	23'- 2"	Str.	Cap Beam
6	B1111	30'- 0"	Str.	Cap Beam
2	B1112	46'- 9"	Str.	Cap Beam
8	B1113	15'- 4"	Str.	Cap Beam
2	B1114	13'- 7"	Str.	Cap Beam
8	F1115	12'- 9"	104	Cap Beam
114	C302	11'- 3"	119	Column
16	C1101	41'-11"	Str.	Column
18	C1102	40'-11"	Str.	Column
16	C1103	39'-11"	Str.	Column
30	F601	6'-10"	100	Footing
24	F801	10'- 8"	100	Footing
50	F1103	7'- 4"	104	Footing
	SOUTHBOUND LANE - BENT 7W			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
32	B606	12'- 8"	109	Cap Beam
41	B607	15'- 1"	109	Cap Beam
8	B608	24'- 2"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam

BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
	SOUTHBOUND LANE - BENT 7W(CON'T)			
6	B1107	36'- 9"	104	Cap Beam
6	B1108	20'- 8"	104	Cap Beam
6	B1109	12'- 6"	Str.	Cap Beam
6	B1110	23'- 2"	Str.	Cap Beam
6	B1111	30'- 0"	Str.	Cap Beam
2	B1112	46'- 9"	Str.	Cap Beam
8	B1113	14'-10"	Str.	Cap Beam
2	B1114	13'- 1"	Str.	Cap Beam
8	B1115	12'- 9"	104	Cap Beam
123	C302	11'- 3"	119	Column
20	C1101	45'- 4"	Str.	Column
20	C1103	43'- 5"	Str.	Column
20	C1402	45'-10"	104	Column
20	F601	6'-10"		Footing
10	F804	10'-11"		Footing
10	F901	11'- 0"	100	Footing
16	F904	11'- 3"	100	Footing
40	F1103	7'- 4"	104	Footing
20	F1402	8'- 5"	104	Footing
	SOUTHBOUND LANE - BENT 8W			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5	109	Cap Beam
32	B606	12'- 8"	109	Cap Beam
41	B607	15'- 1"	109	Cap Beam
8	B608	24'- 2"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
6	B1107	36'- 9"	104	Cap Beam
6	B1108	20'- 8"	104	Cap Beam
6	B1109	12'- 6"	Str.	Cap Beam
6	B1110	23'- 2"	Str.	Cap Beam
6	B1111	30'- 0"	Str.	Cap Beam
2	B1112	46'- 9"	Str.	Cap Beam
8	B1113	15'- 4"	Str.	Cap Beam
2	B1114	13'- 7"	Str.	Cap Beam
8	B1115	12'- 9"	104	Cap Beam
132	C302	11'- 3"	119	Column

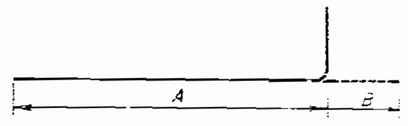
BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
	SOUTHBOUND LANE - BENT 8W(CON'T)			
16	C1401	49'- 4"	104	Column
18	C1402	48'- 5"	104	Column
16	C1403	47'- 6"	104	Column
30	F601	6'-10"	100	Footing
24	F502	11'- 6"	100	Footing
50	F1402	8'- 5"	104	Footing
	SOUTHBOUND LANE - BENT 9W			
12	A201	19'- 9"	129	Anchor Bolts
38	B406	5'- 0"	105	Pads
36	B407	3'- 0"	Str.	Pads
2	B408	4'- 8"	105	Pads
2	B409	3'- 9"	105	Pads
2	B605	13'- 5"	109	Cap Beam
28	B606	12'- 8"	109	Cap Beam
39	B607	15'- 1"	109	Cap Beam
8	B608	24'- 2"	Str.	Cap Beam
8	B702	9'- 0"	132	Cap Beam
6	B1107	36'- 9"	104	Cap Beam
6	B1108	20'- 8"	104	Cap Beam
4	B1109	12'- 6"	Str.	Cap Beam
6	B1110	23'- 2"	Str.	Cap Beam
6	B1111	30'- 0"	Str.	Cap Beam
8	B1113	13'-10"	Str.	Cap Beam
4	B1115	12'- 9"	104	Cap Beam
72	C302	11'- 3"	119	Column
12	C1001	28'- 1"	Str.	Column
12	C1002	27'- 2"	Str.	Column
12	C1003	26'- 3"	Str.	Column
6	F501	6'-2"		Footing (2)
26	F601	6'-10"	100	Footing
12	F602	7'-10"	100	Footing
8	F805	9'-11"	100	Footing
36	F1001	6'- 8"	104	Footing



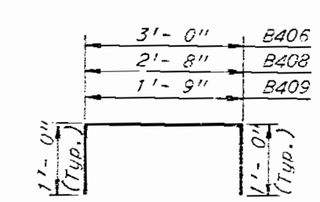
100

100		
MARK	A	B
F601	5'- 6"	8"
F602	6'- 6"	8"
F801	8'- 6"	1'- 1"
F804	8'- 9"	1'- 1"
F805	7'- 9"	1'- 1"
F901	8'- 5"	1'- 3"
F904	8'- 3"	1'- 3"



104

104		
MARK	A	B
B6W-B1107	35'- 0"	1'- 9"
B6W-B1108	18'-11"	1'- 9"
B6W-B1115	11'- 0"	1'- 9"
B6W-F1103	5'- 7"	1'- 9"
B7W-B1107	35'- 0"	1'- 9"
B7W-B1108	18'-11"	1'- 9"
B7W-B1115	11'- 0"	1'- 9"
B7W-C1402	43'- 9"	2'- 1"
B7W-F1103	5'- 7"	1'- 9"
B7W-F1402	6'- 4"	2'- 1"
B8W-B1107	35'- 0"	1'- 9"
B8W-B1108	18'-11"	1'- 9"
B8W-B1115	11'- 0"	1'- 9"
B8W-C1401	47'- 3"	2'- 1"
B8W-C1402	46'- 4"	2'- 1"
B8W-C1403	45'- 5"	2'- 1"
B8W-F1402	5'- 4"	2'- 1"
B9W-B1107	35'- 0"	1'- 9"
B9W-B1108	18'-11"	1'- 9"
B9W-B1115	11'- 0"	1'- 9"
B9W-F1001	5'- 1"	1'- 7"



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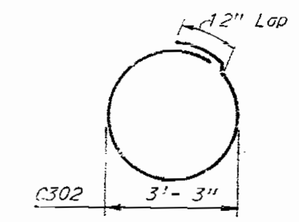

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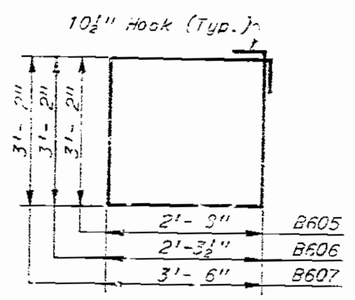

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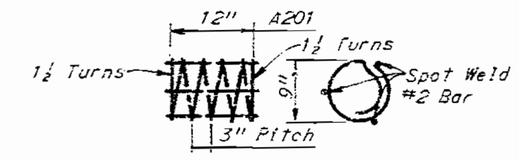

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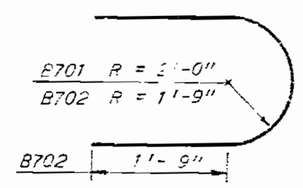

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Note:
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.
The designation preceeding the bar mark in the Bending Diagrams, indicates the unit in which the bar will be placed. (B2E=Bent 2 East)

Note:
Hooks and bends shall be in accordance with The A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI-315-65). Two diameter bends shall not be used unless specified in bending diagrams.

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

MADE J.E.H. DATE 6-15-67 CHECKED A.H.H. DATE 6-19-67

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

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.
STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. IIG-435-1(52) (R.E.I.-435) STA. 141+48.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

SUBSTRUCTURE REINFORCING SCHEDULE SHEET 12 OF 49

A-1686

49

19-09-21-01

A16866, Sht. 19

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO			45	
DIST. NO.	COUNTY			ROUTE NO.	SEC.
4	JACKSON				

BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
		NORTHBOUND LANE-UNIT 1		
12	P501	35'- 5"	Str.	Parapet
14	P502	6'- 8"	Str.	Parapet
40	P503	9'- 8"	Str.	Parapet
32	P504	9'- 2"	Str.	Parapet
24	P505	39'- 4"	Str.	Parapet
8	P506	29'-10"	Str.	Parapet
8	P507	3'- 7"	Str.	Parapet
20	P508	32'- 8"	Str.	Parapet
24	P509	39'- 6"	Str.	Parapet
16	P510	5'- 8"	Str.	Parapet
1026	P517	5'- 2"	127	Parapet
48	P518	4'- 3"	128	Parapet
1057	S401	30'- 0"	Str.	Slab
26	S403	32'-11"	Series	Slab
52	S404	12'- 9"	Str.	Slab
52	S405	18'- 6"	Str.	Slab
52	S407	8'- 9"	Str.	Slab
52	S408	17'- 0"	Str.	Slab
1	S410	21'- 7"	Str.	Slab
852	S501	40'- 0"	Str.	Slab
71	S502	17'- 6"	Str.	Slab
35	S503	56'-10"	Series	Slab
1	S506	32'- 9"	Str.	Slab
1980	S601	27'- 0"	Str.	Slab
987	S602	29'- 9"	Str.	Slab
991	S603	24'- 3"	Str.	Slab
2	S604	47'- 9"	Series	Slab
52	S605	54'- 1"	Series	Slab
261	S606	6'- 3"	Str.	Slab
9	S607	52'- 1"	Series	Slab
9	S608	54'- 1"	Series	Slab
2	S609	27'- 5"	Str.	Slab
2	S610	32'- 2"	Str.	Slab
2	S613	52'- 3"	Series	Slab
6	W501	38'- 1"	Str.	Curb
16	W502	39'- 7"	Str.	Curb
4	W503	39'- 9"	Str.	Curb
2	W504	3'- 7"	Str.	Curb
1018	W505	3'- 5"	128	Curb
8	W513	5'- 7"	109	Curb
5	W601	38'- 5"	Str.	Curb
16	W602	40'- 0"	Str.	Curb
4	W603	45'- 8"	Str.	Curb
2	W604	3'- 7"	Str.	Curb
2	L501	6'- 5"	109	Light Std. Supt.
2	L502	6'- 3"	109	Light Std. Supt.
2	L503	6'- 1"	109	Light Std. Supt.
2	L504	6'-11"	109	Light Std. Supt.
2	L505	7'- 2"	105	Light Std. Supt.
6	L506	5'- 3"	108	Light Std. Supt.
6	L507	2'- 6"	Str.	Light Std. Supt.

BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
		NORTHBOUND LANE-UNIT 2		
4	P502	6'- 8"	Str.	Parapet
42	P510	5'- 8"	Str.	Parapet
834	P517	5'- 2"	127	Parapet
54	P518	4'- 3"	128	Parapet
8	P519	23'- 0"	Str.	Parapet
48	P520	6'- 2"	Str.	Parapet
48	P521	37'- 2"	Str.	Parapet
8	P522	7'- 8"	Str.	Parapet
16	P523	27'- 2"	Str.	Parapet
8	P524	28'- 4"	Str.	Parapet
4	P525	8'- 2"	Str.	Parapet
689	S401	30'- 0"	Str.	Slab
26	S411	34'- 9"	Series	Slab
53	S412	20'- 0"	Str.	Slab
52	S413	25'- 0"	Str.	Slab
104	S414	29'- 6"	Str.	Slab
53	S415	24'- 0"	Str.	Slab
710	S501	40'- 0"	Str.	Slab
35	S504	51'-11"	Series	Slab
1	S506	32'- 9"	Str.	Slab
1628	S601	27'- 0"	Str.	Slab
813	S602	29'- 9"	Str.	Slab
817	S603	24'- 3"	Str.	Slab
349	S606	6'- 3"	Str.	Slab
2	S615	47'- 9"	Series	Slab
2	S616	51'- 5"	Series	Slab
9	S618	51'-10"	Series	Slab
9	S619	50'- 4"	Series	Slab
3	S620	7'- 0"	Str.	Slab
3	S621	6'- 0"	Str.	Slab
2	S622	27'- 5"	Str.	Slab
18	W507	33'- 4"	Str.	Curb
834	W508	3'- 5"	128	Curb
4	W509	26'- 6"	Str.	Curb
4	W510	31'- 2"	Str.	Curb
4	W608	32'- 9"	Str.	Curb
12	W609	49'- 9"	Str.	Curb
4	W610	31'- 3"	Str.	Curb
1	L501	6'- 5"	109	Light Std. Supt.
1	L502	6'- 3"	109	Light Std. Supt.
1	L503	6'- 1"	108	Light Std. Supt.
1	L504	6'-11"	109	Light Std. Supt.
1	L505	7'- 2"	105	Light Std. Supt.
3	L506	5'- 3"	108	Light Std. Supt.
3	L507	2'- 6"	Str.	Light Std. Supt.

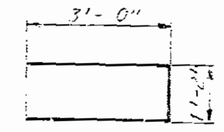
BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
		SOUTHBOUND LANE-UNIT 1		
40	P502	6'- 8"	Str.	Parapet
32	P503	9'- 8"	Str.	Parapet
32	P504	9'- 2"	Str.	Parapet
8	P507	3'- 7"	Str.	Parapet
8	P510	5'- 8"	Str.	Parapet
12	P511	33'-10"	Str.	Parapet
36	P512	39'-10"	Str.	Parapet
8	P513	36'- 3"	Str.	Parapet
12	P514	34'- 1"	Str.	Parapet
12	P515	39'-11"	Str.	Parapet
12	P516	27'-10"	Str.	Parapet
1073	P517	5'- 2"	127	Parapet
53	P518	4'- 3"	128	Parapet
1057	S401	30'- 0"	Str.	Slab
53	S402	23'- 6"	Str.	Slab
26	S403	32'-11"	Series	Slab
52	S404	12'- 9"	Str.	Slab
52	S405	18'- 6"	Str.	Slab
52	S406	19'- 8"	Str.	Slab
52	S409	11'- 3"	Str.	Slab
1	S410	21'- 7"	Str.	Slab
923	S501	40'- 0"	Str.	Slab
35	S503	56'-10"	Series	Slab
1	S506	32'- 9"	Str.	Slab
2068	S601	27'- 0"	Str.	Slab
1035	S602	29'- 9"	Str.	Slab
1032	S603	24'- 3"	Str.	Slab
2	S604	47'- 9"	Series	Slab
341	S606	6'- 3"	Str.	Slab
9	S607	52'- 1"	Series	Slab
9	S608	54'- 1"	Series	Slab
2	S609	27'- 5"	Str.	Slab
2	S610	32'- 2"	Str.	Slab
52	S611	56'- 9"	Series	Slab
18	S612	8'- 9"	Str.	Slab
2	S614	43'- 3"	Series	Slab
2	W504	3'- 7"	Str.	Curb
6	W505	38'- 6"	Str.	Curb
16	W506	39'-11"	Str.	Curb
6	W507	33'- 4"	Str.	Curb
1065	W508	3'- 5"	128	Curb
8	W513	5'- 7"	109	Curb
2	W604	3'- 7"	Str.	Curb
6	W605	38'-11"	Str.	Curb
16	W606	40'- 3"	Str.	Curb
6	W607	37'- 3"	Str.	Curb
2	L501	6'- 5"	109	Light Std. Supt.
2	L502	6'- 3"	109	Light Std. Supt.
2	L503	6'- 1"	109	Light Std. Supt.
2	L504	6'-11"	109	Light Std. Supt.
2	L505	7'- 2"	105	Light Std. Supt.
6	L506	5'- 3"	108	Light Std. Supt.
6	L507	2'- 6"	Str.	Light Std. Supt.

BILL OF REINFORCEMENT

NO.	MARK	LENGTH	SHAPE	LOCATION
		SOUTHBOUND LANE-UNIT 2		
4	P504	9'- 2"	Str.	Parapet
56	P510	5'- 8"	Str.	Parapet
871	P517	5'- 2"	127	Parapet
47	P518	4'- 3"	128	Parapet
48	P520	6'- 2"	Str.	Parapet
49	P521	37'- 2"	Str.	Parapet
8	P522	7'- 8"	Str.	Parapet
8	P526	31'- 9"	Str.	Parapet
16	P527	27'- 4"	Str.	Parapet
8	P528	36'- 6"	Str.	Parapet
742	S401	30'- 0"	Str.	Slab
53	S409	11'- 3"	Str.	Slab
26	S411	34'- 9"	Series	Slab
104	S414	29'- 6"	Str.	Slab
53	S415	24'- 0"	Str.	Slab
52	S416	28'- 0"	Str.	Slab
710	S501	40'- 0"	Str.	Slab
35	S504	51'-11"	Series	Slab
71	S505	21'- 7"	Str.	Slab
1	S506	32'- 9"	Str.	Slab
1710	S601	27'- 0"	Str.	Slab
858	S602	29'- 9"	Str.	Slab
854	S603	24'- 3"	Str.	Slab
160	S606	6'- 3"	Str.	Slab
2	S615	47'- 9"	Series	Slab
2	S617	40'- 5"	Series	Slab
9	S618	51'-10"	Series	Slab
9	S619	50'- 4"	Series	Slab
3	S620	7'- 0"	Str.	Slab
3	S621	6'- 0"	Str.	Slab
2	S622	27'- 5"	Str.	Slab
18	W507	33'- 4"	Str.	Curb
* 871	W508	3'- 5"	128	Curb
4	W511	35'- 6"	Str.	Curb
4	W512	31'- 3"	Str.	Curb
* 4	W528	3'- 0"		Curb
12	W609	49'- 9"	Str.	Curb
4	W611	42'- 8"	Str.	Curb
4	W612	31'- 5"	Str.	Curb
2	L501	6'- 5"	109	Light Std. Supt.
2	L502	6'- 3"	109	Light Std. Supt.
2	L503	6'- 1"	109	Light Std. Supt.
2	L504	6'-11"	109	Light Std. Supt.
2	L505	7'- 2"	105	Light Std. Supt.
6	L506	5'- 3"	108	Light Std. Supt.
6	L507	2'- 6"	Str.	Light Std. Supt.

* This bar spliced to dowel from footing (Type B)



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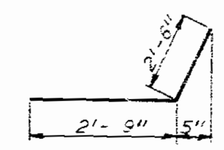

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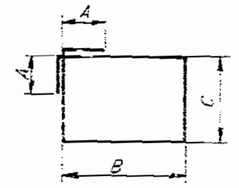

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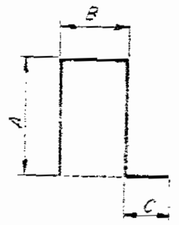

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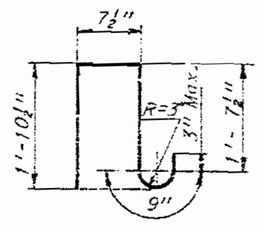

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TABLE OF BENDING DIMENSIONS

MARK	A	B	C
	SHAPE 109		
W513	9"	1'- 1"	11½"
L501	9"	1'- 2"	1'- 3½"
L502	9"	1'- 2"	1'- 2½"
L503	9"	1'- 2"	1'- 1½"
L504	9"	1'- 2"	1'- 6½"
	SHAPE 128		
P518	1'- 7"	7½"	5½"
W508	11½"	1'- 1"	5"

BENDING DIAGRAMS

A= No. Bars
J= Cut

CUTTING DIAGRAM

TABLE OF CUTTING DIAGRAM DIMENSIONS

MARK	A	B	C	D	E	G	H	J
S403	32'-11"	23'- 1"	9'-10"	16'-6⅞"	16'-4⅛"	3⅛"	26	52
S411	34'- 9"	23'- 9"	11'- 0"	17'- 6"	17'- 3"	3"	26	52
S503	56'-10"	35'- 3"	21'- 7"	28'-6½"	28'-3⅜"	2⅜"	35	70
S504	51'-11"	32'- 5"	19'- 6"	26'-0½"	25'-10⅜"	2¼"	33	70
S604	47'- 9"	25'- 0"	22'- 9"	24'- 3"	23'- 6"	9"	2	4
S605	54'- 1"	47'- 6"	6'- 7"	27'-5⅜"	25'-7⅜"	9⅜"	26	52
S607	52'- 1"	49'- 1"	3'- 0"	27'- 5"	24'- 8"	2'-0½"	9	18
S608	54'- 1"	50'- 1"	4'- 0"	28'- 5"	25'- 8"	2'-0½"	9	18
S611	56'- 9"	47'- 6"	9'- 3"	28'- 9"	28'- 0"	9"	26	52
S613	52'- 3"	27'- 3"	25'- 0"	25'- 5"	25'- 9"	9"	2	2
S614	43'- 3"	22'- 9"	20'- 6"	22'- 0"	21'- 3"	9"	2	2
S615	47'- 9"	27'- 0"	20'- 9"	24'-11"	22'-10"	2'-1"	2	4
S616	51'- 5"	28'-10"	22'- 7"	26'- 9"	24'- 8"	2'-1"	2	2
S617	40'- 5"	23'- 4"	17'- 1"	21'- 3"	19'- 2"	2'-1"	2	2
S618	51'-10"	43'- 4"	8'- 6"	26'-11"	24'-11"	2'-0⅜"	9	18
S619	50'- 4"	42'- 7"	7'- 9"	26'- 2"	24'- 2"	2'-0⅜"	9	18

Note:
Hooks and bends shall be in accordance with The A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI-315-65). Two diameter bends shall not be used unless specified on bending diagrams.

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

MADE D.E.S. DATE 4-24-67 CHECKED M.H.H. DATE 5-15-67

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

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SUPERSTRUCTURE REINFORCING SCHEDULE SHEET 13 OF 49

A-1686

Superstructure Reinforcement Schedule
1909-21-01-000-B54

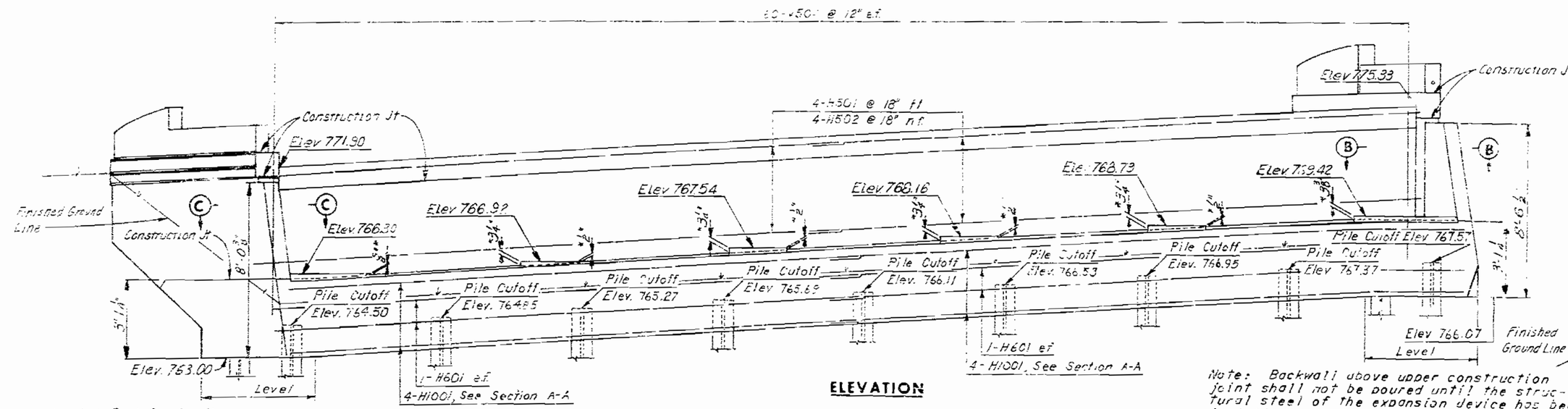
FOR INFORMATION ONLY

A16866, Sht. 20

MISSOURI STATE HIGHWAY DEPARTMENT

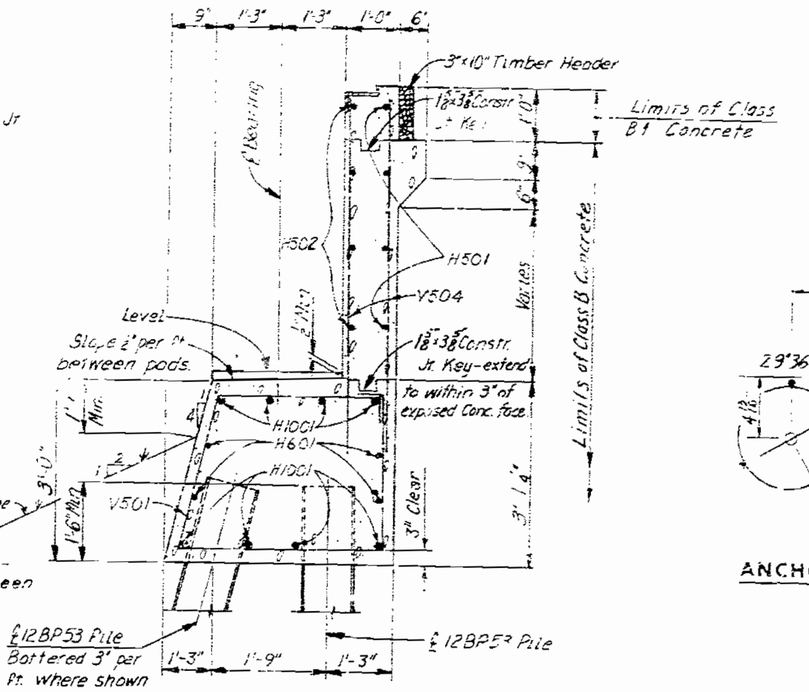
FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO	I-52			
DIST. NO.	COUNTY		ROUTE SEC.		
4	JACKSON				

FOR INFORMATION ONLY

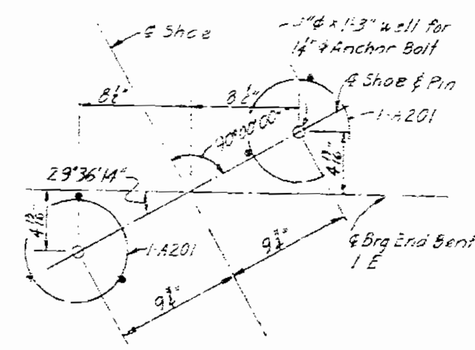


ELEVATION

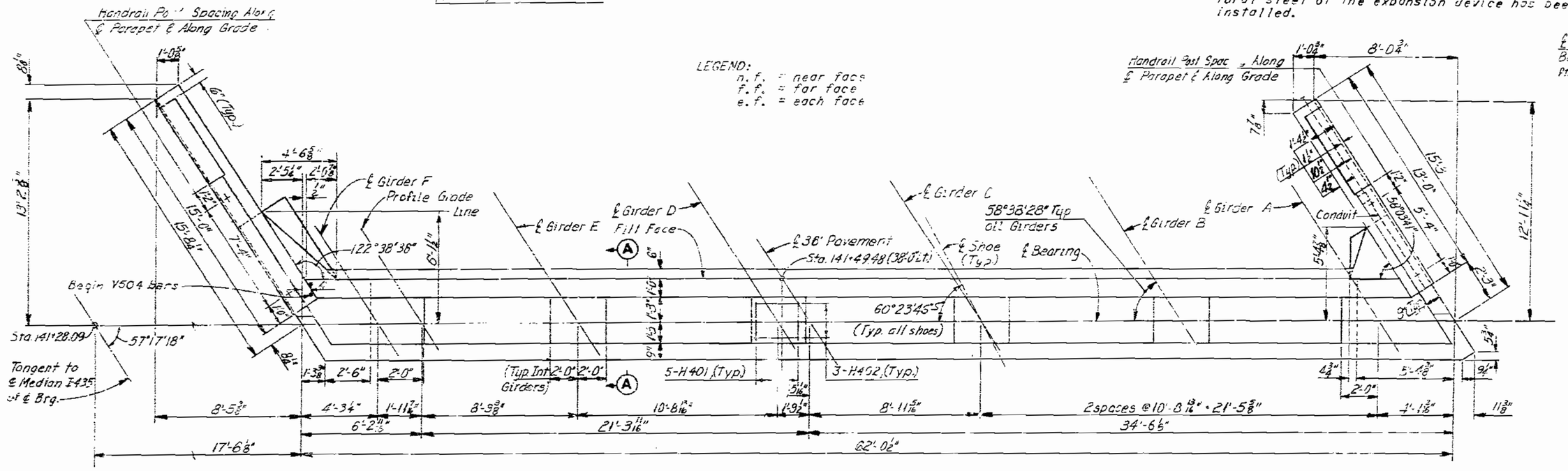
Note: Backwall above upper construction joint shall not be poured until the structural steel of the expansion device has been installed.



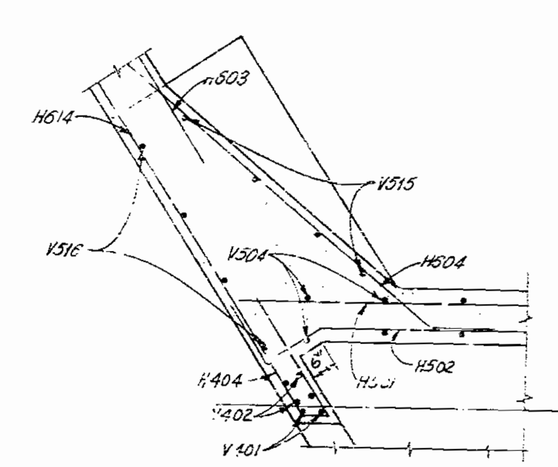
SECTION A-A



ANCHOR BOLT SETTING PLAN

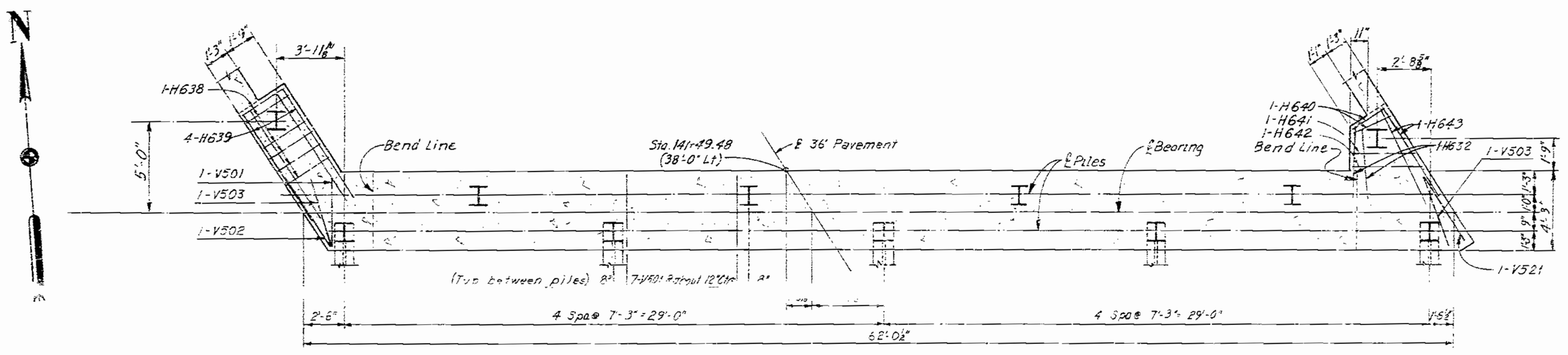


PLAN



SECTION C-C

SECTION B-B



FOOTING PLAN

Notes: Use 2" clear on substructure reinforcing except as shown.
Elevations and dimensions denoted thus • are at front face of backwall.
For details of wingwalls, see Sheet 15.
For Reinforcing Schedule, see Sheet 9.
For End Post Detail, see Sheet 16.
For Timber Header Detail, see Sheet 16.
All piles shall be 12BP53.
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.

BRIDGE OVER K.C.S. R.R. , M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG 435-1(52) (RTE I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

END BENT 1 E (NORTHBOUND LANE) SHEET 14 OF 49 A-1386

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

MADE R.E.M. DATE 3-23-67 CHECKED J.E.H. DATE 4-26-67

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

51

A16866, Sht. 21

MISSOURI STATE HIGHWAY DEPARTMENT

U.S. ROAD	STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
	5 MO			
DIST. NO.	COUNTY		ROUTE NO.	
4	JACKSON			

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (INTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 15 OF 49 — A-1686

END BENT 1 W (SOUTHBOUND LANE)

ANCHOR BOLT SETTING PLAN

SECTION A-A

SECTION B-B

SECTION C-C

Notes: Use 2" clear on substructure reinforcing except as shown.
Elevations and dimensions denoted thus •
are at front face of backwall.
For details of wingwalls, see Sheet 15.
For Reinforcing Schedule, see Sheet 9.
For End Post Detail, see Sheet 16.
For Timber Header Detail, see Sheet 16.
All piles shall be 12BP53.
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.

ELEVATION

LEGEND: n.f. = near face, f.f. = far face, e.f. = each face

Note: Backwall above upper construction joint shall not be poured until the structural steel of the expansion device has been installed.

PLAN

FOOTING PLAN

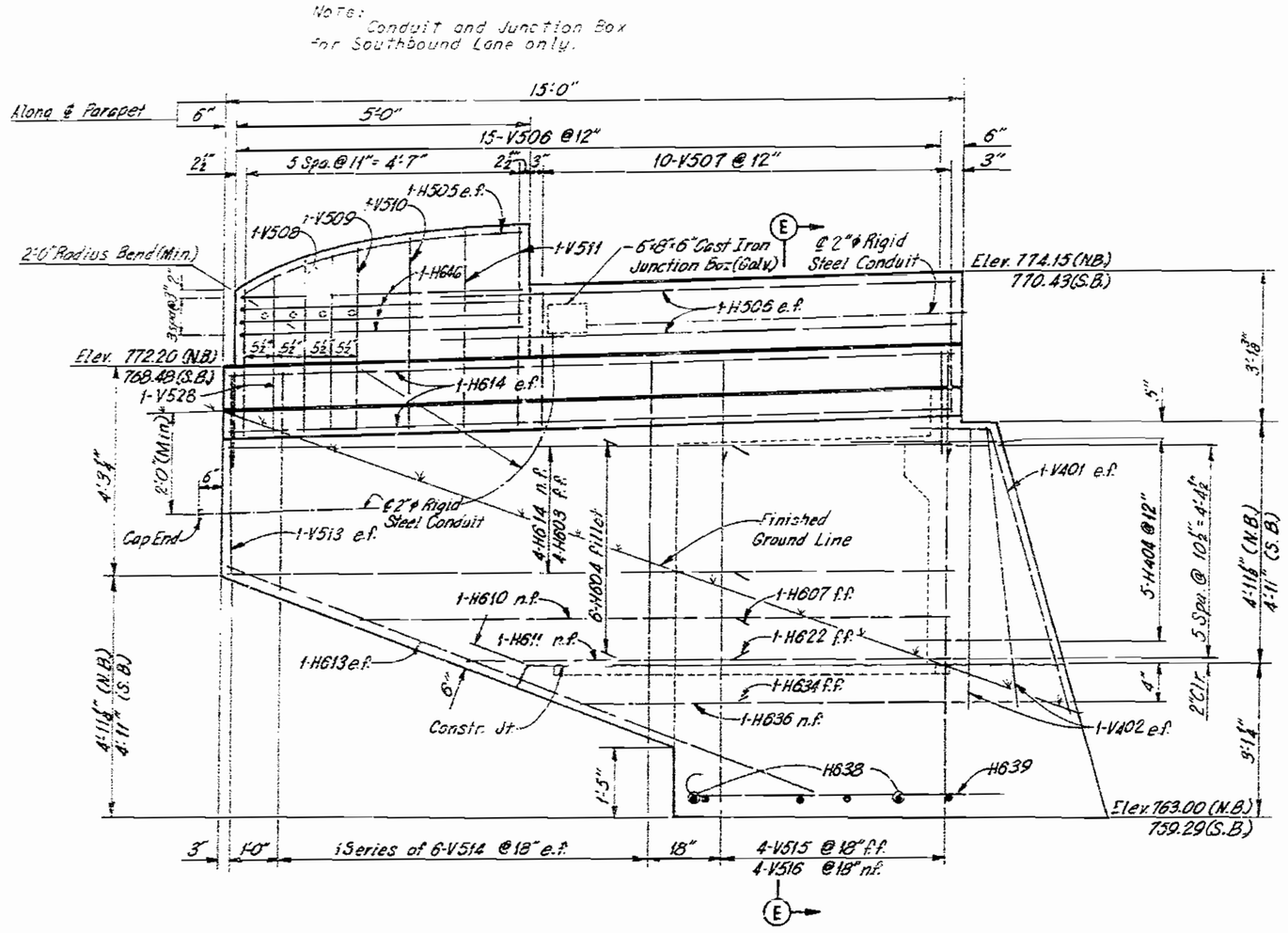
NOTE: This drawing is not to scale. Follow dimensions.

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

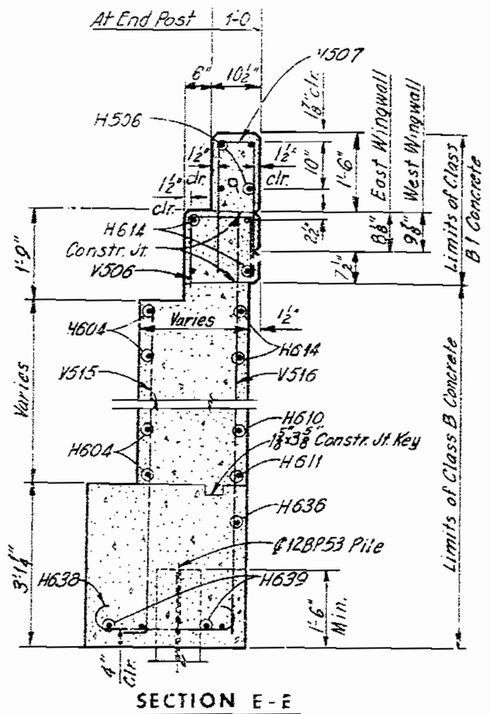
MADE REM DATE 3-27-67 | CHECKED ANH DATE 4-26-67

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO		1968		
DIST. NO.	COUNTY		ROUTE	SEC.	
4	JACKSON				

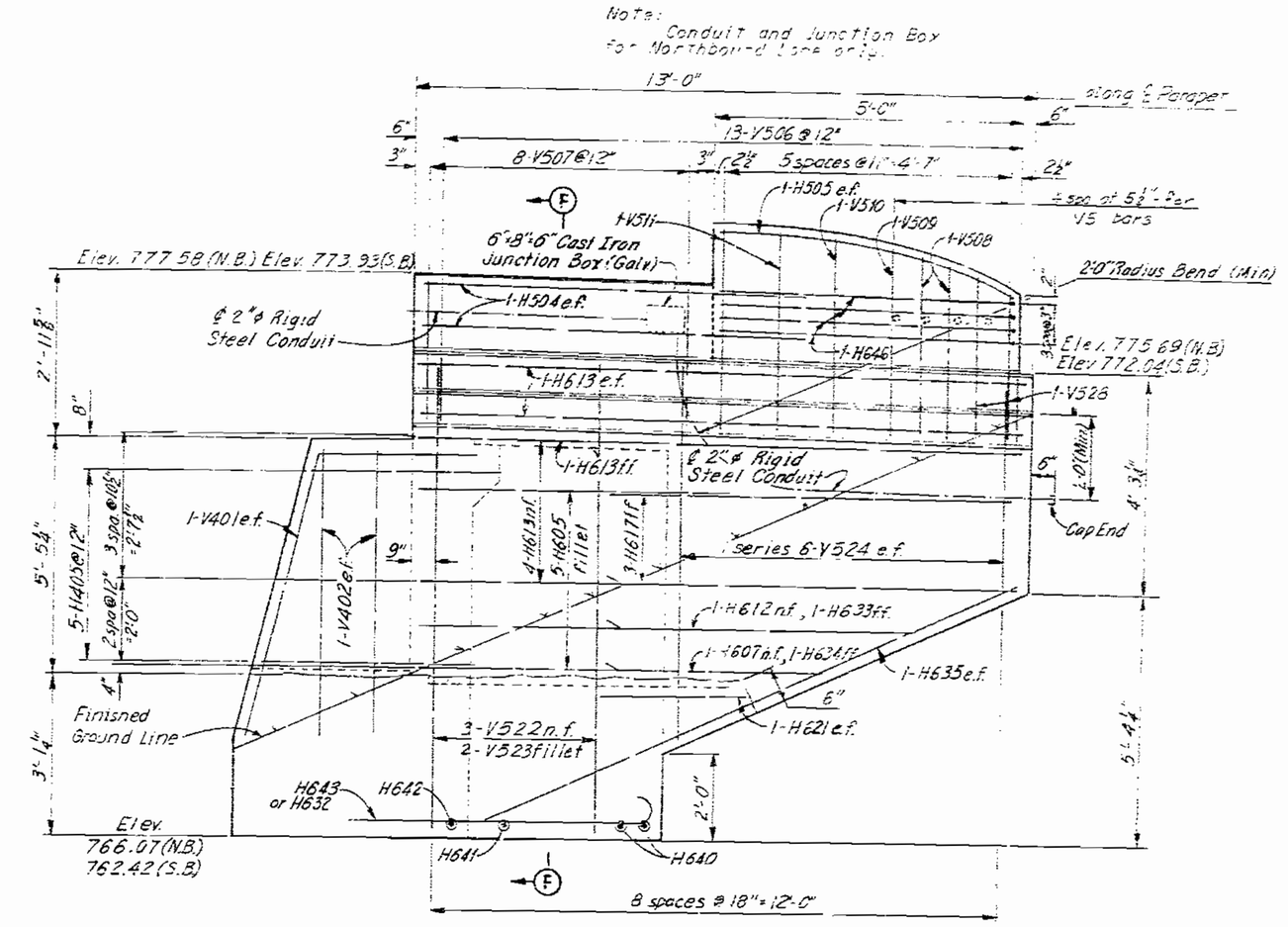


WEST WINGWALL ELEVATION (NORTHBOUND) (SOUTHBOUND)

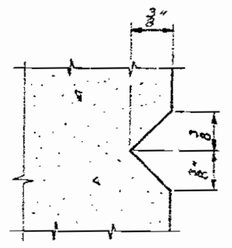


SECTION E-E

Section F-F opposite hand.



EAST WINGWALL ELEVATION (NORTHBOUND) (SOUTHBOUND)

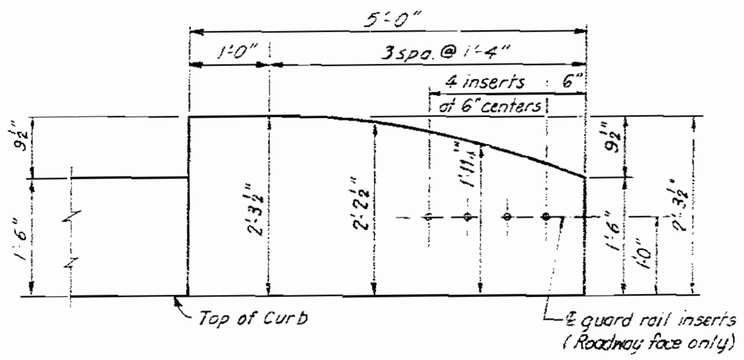


RUSTICATION DETAIL

LEGEND:

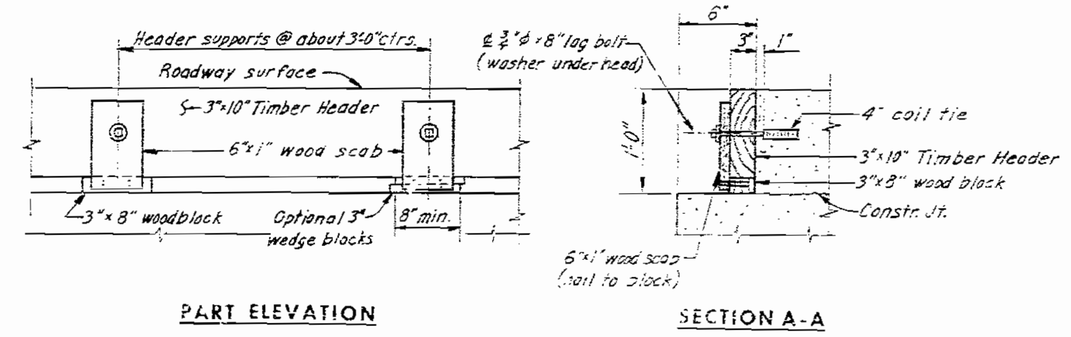
n.f. = near face
f.f. = far face
e.f. = each face
(N.B.) = Northbound Lane
(S.B.) = Southbound Lane

Notes:
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown.
For Reinforcement Schedule, see Sheet 3.
For Plan of Northbound Lane, End Bent 1, see Sheet 14.
For Plan of Southbound Lane, End Bent 1, see Sheet 15.
For Handrail Detail see Sheet 49.



END POST ORDINATES

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



PART ELEVATION

SECTION A-A

TIMBER HEADER DETAIL

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

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KAN. CITY NEW YORK

MADE REH DATE 3-24-67 CHECKED A.H.H. DATE 6-25-67

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

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE. I-435) STA. 141-49.48 N.B.L. 141-00.56 S.B.L.
JACKSON COUNTY

END BENT 1 E AND 1 W DETAILS SHEET 16 OF 49 A-1686

53

10-27-67

FOR INFORMATION ONLY

A16866, Sht. 23

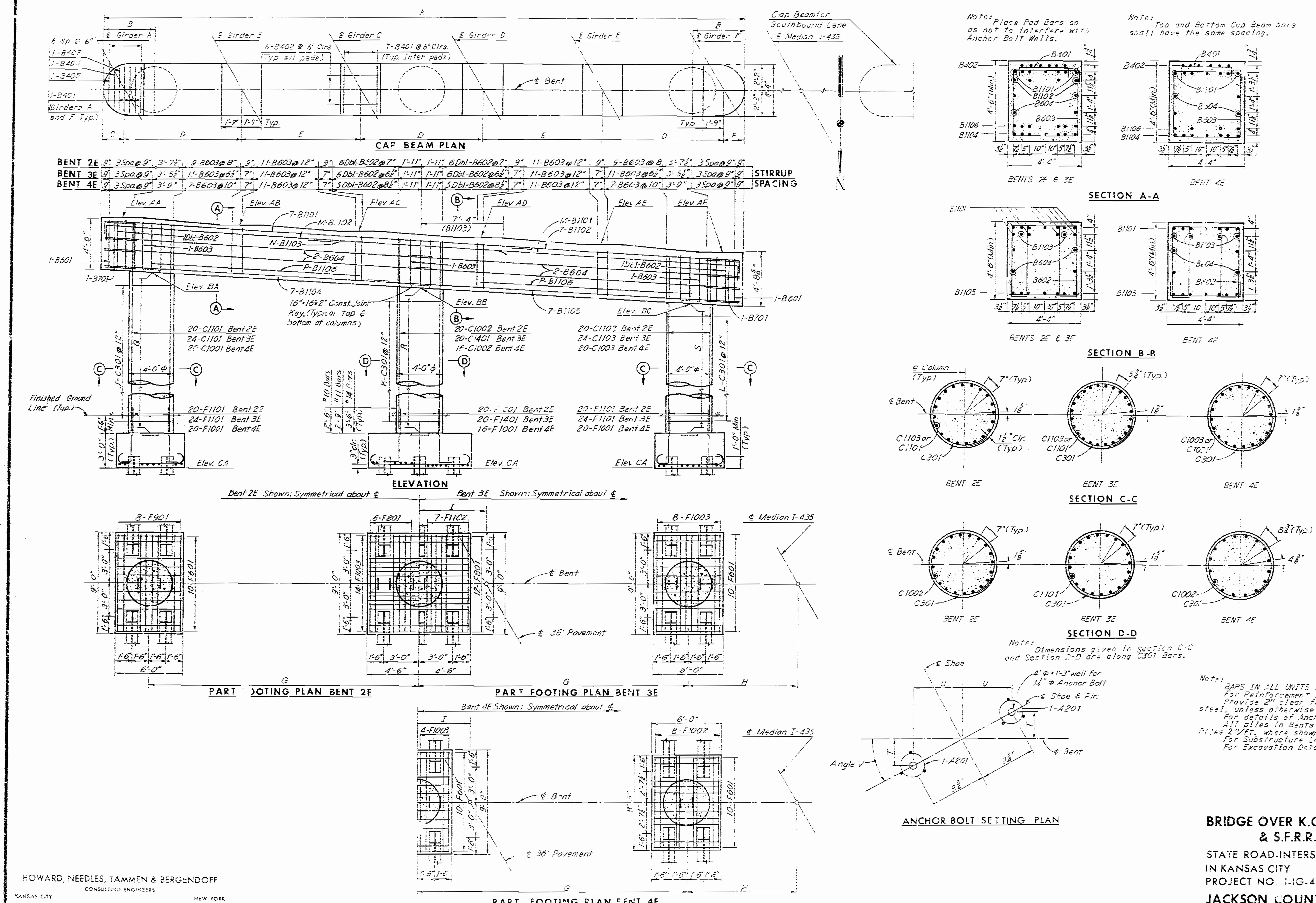


TABLE OF DIMENSIONS			
CODE	BENT 2E	BENT 3E	BENT 4E
A	55'-7"	55'-4"	55'-4"
B	4'-7 1/2"	4'-6"	4'-6"
C	2'-0 1/4"	1'-11 1/2"	1'-11 1/2"
D	10'-5 1/8"	10'-3 7/16"	10'-3 7/16"
E	10'-6 1/8"	10'-3 3/8"	10'-3 3/8"
F	2'-0 1/4"	1'-11 7/16"	1'-11 7/16"
G	23'-8"	23'-2"	23'-2"
H	23'-4 5/8"	22'-4 5/16"	21'-6 5/16"
I	3'-0 11/16"	2'-10 3/8"	3'-1 7/16"
J	29	27	30
K	28	26	28
L	27	24	27
M	4	4	0
N	2	2	4
O	—	—	—
P	6	6	4
Q	28'-4 1/2"	27'-0 3/8"	29'-5 1/2"
R	28'-0"	25'-8 3/8"	28'-2 5/8"
S	26'-7 5/8"	24'-4 1/4"	26'-10 3/8"
T	4 5/8"	4 7/16"	4"
U	3 9/16"	2 11/16"	8 13/16"
V	28°30'23"	26°57'18"	25°26'48"
AA	768.14	772.79	777.30
AB	767.53	772.20	776.71
AC	766.92	771.60	776.10
AD	766.31	771.01	775.51
AE	765.70	770.41	774.31
AF	765.09	769.81	774.32
BA	763.37	768.03	772.54
BB	762.00	766.69	771.20
BC	760.63	765.35	769.86
CA	731.00	738.00	740.00

Note: BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY. For Reinforcement Schedule, see Sheet 10. Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown. For details of Anchor Bolt Wells, see Sheet 41. All piles in Bents 2E, 3E and 4E shall be 12BP53. Batter Piles 2 1/2" /ft. where shown in Footing Plan. For Substructure Layout, see Sheets 7 and 8. For Excavation Details, see Sheet 8.

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

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141-49.48 N.B.L. / 141-00.56 S.B.L.

JACKSON COUNTY

SHEET 17 OF 49

BENTS 2E, 3E AND 4E (... THBOUND LANE)

A-1686

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

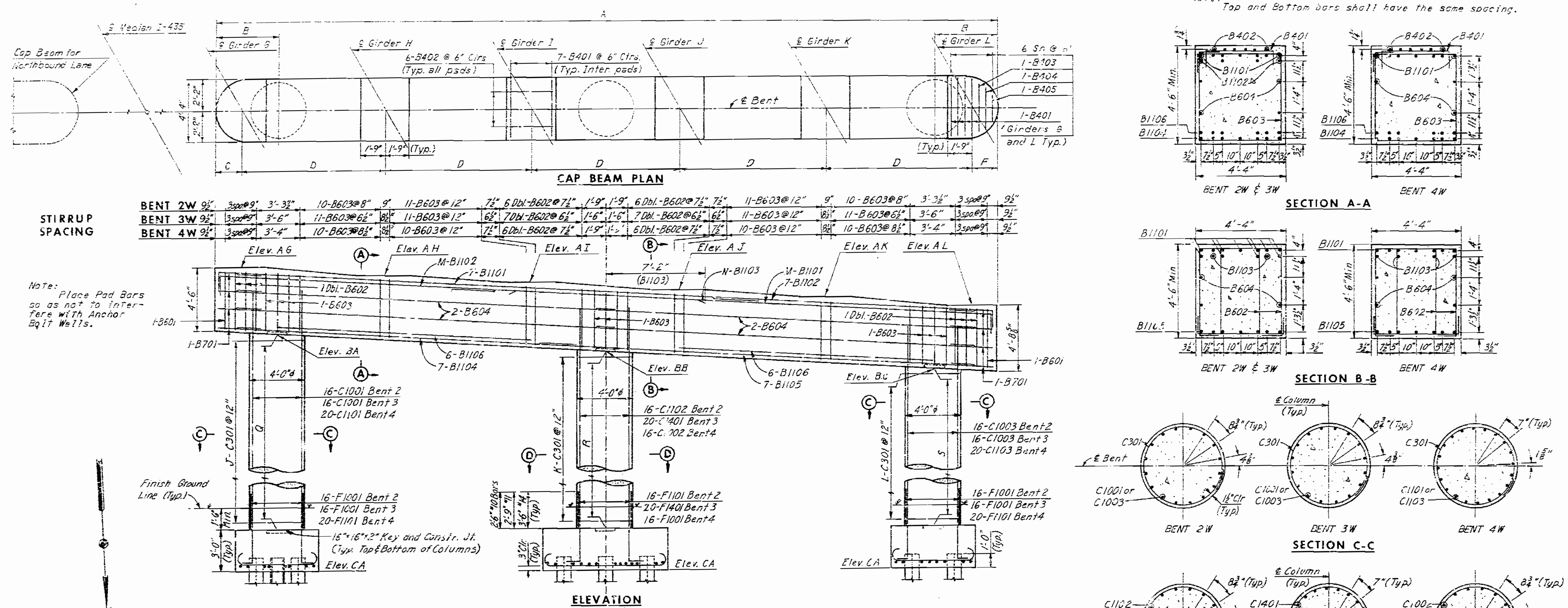
MADE R.A.H.H. DATE 6-7-67 CHECKED J.F.H. DATE 6-12-67

52

1909-21-01

DIV	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	MO			156	
DIST. NO. 4		COUNTY JACKSON		ROUTE	SEC

MISSOURI STATE HIGHWAY DEPARTMENT



STIRRUP SPACING

BENT 2W	9½"	3spa@9"	3'-3½"	10-B603@8"	9"	11-B603@12"	7½"	6Dbl-B602@7½"	1'-9"	1'-9"	6Dbl-B602@7½"	7½"	11-B603@12"	9"	10-B603@8"	3'-3½"	3spa@9"	9½"
BENT 3W	9½"	3spa@9"	3'-6"	11-B603@6½"	8½"	11-B603@12"	6½"	7Dbl-B602@6½"	1'-6"	1'-6"	7Dbl-B602@6½"	6½"	11-B603@12"	8½"	11-B603@6½"	3'-6"	3spa@9"	9½"
BENT 4W	9½"	3spa@9"	3'-4"	10-B603@8½"	8½"	10-B603@12"	7½"	6Dbl-B602@7½"	1'-9"	1'-9"	6Dbl-B602@7½"	7½"	10-B603@12"	8½"	10-B603@8½"	3'-4"	3spa@9"	9½"

Note: Place Pad Bars so as not to interfere with Anchor Bolt Wells.

Note: Top and Bottom bars shall have the same spacing.

Note: Dimensions given in Section C-C and Section D-D are along C301 bar.

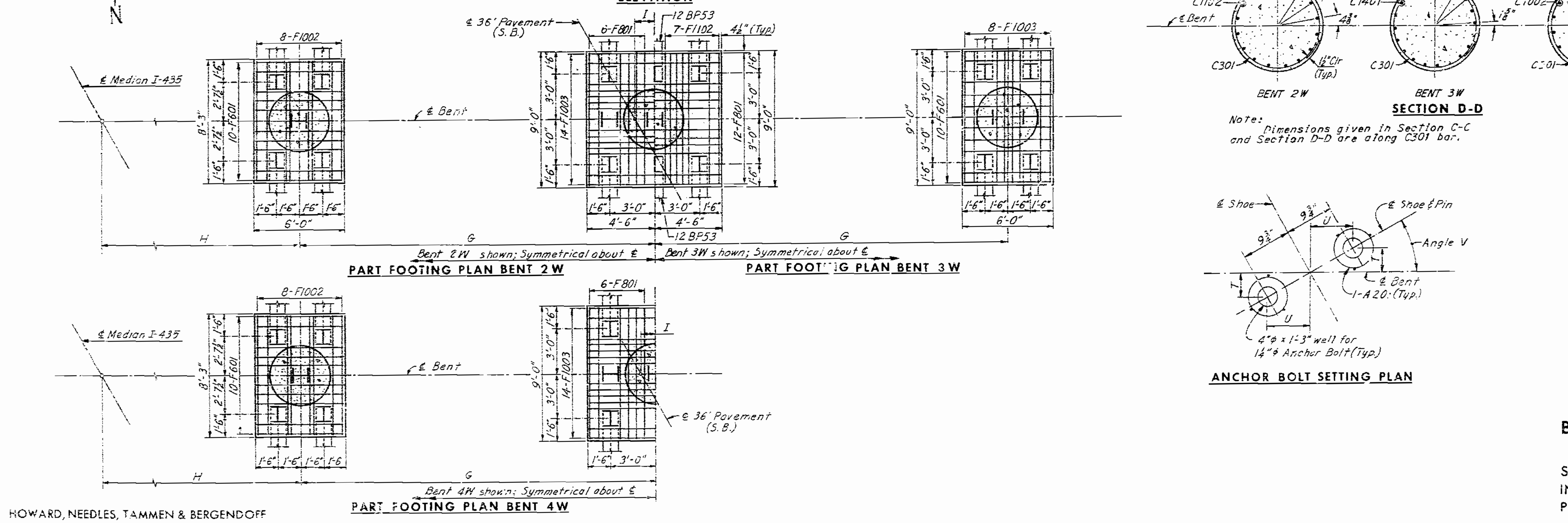


TABLE OF DIMENSIONS

CODE	BENT 2W	BENT 3W	BENT 4W
A	57'-2"	55'-11"	55'-11"
B	4'-8"	4'-7"	4'-7"
C	2'-0 3/8"	2'-0 3/8"	2'-0 3/8"
D	10'-7 7/8"	10'-4 7/16"	10'-4 7/16"
E	-	-	-
F	2'-0 7/16"	2'-0 7/16"	2'-0 7/16"
G	23'-11"	23'-4 1/2"	23'-4 1/2"
H	24'-1 15/16"	23'-3 1/16"	21'-10 1/16"
I	3'-10 5/8"	3'-9 3/4"	3'-5 1/4"
J	26	24	26
K	24	23	25
L	23	21	24
M	4	4	0
N	2	2	4
O	-	-	-
P	-	-	-
Q	25'-10 1/4"	23'-8 1/4"	26'-3 7/8"
R	24'-5 3/8"	22'-4"	24'-11 5/8"
S	23'-0 3/4"	20'-11 5/8"	23'-7 1/2"
T	4 3/4"	4 9/16"	4 5/16"
U	8 1/2"	8 5/8"	8 3/4"
V	23°20'50"	22°51'45"	25°10'58"
AG	764.62	769.45	774.09
AH	763.99	768.85	774.49
AI	763.37	768.24	772.89
AJ	762.75	767.64	772.28
AK	762.12	767.03	771.68
AL	761.51	766.42	771.08
BA	759.85	764.69	769.32
BB	758.45	763.33	767.97
BC	757.06	761.97	[illegible]5.62
CA	731.0	732.0	740.0

Note:
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.
For Reinforcement Schedule, see Sheet 11.
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown - substructure.
For details of Anchor Bolt Wells, see Sheet 41.
All piles in Bents 2W, 3W and 4W shall be 12BP53. Batter piles 2"/ft. where shown in Footing Plan.
For Substructure Layout, see Sheets 7 and 8.
For Excavation Details, see Sheet 9.

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

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE A.M.H. DATE 5-26-67 CHECKED J.E.H. DATE 6-9-67

BENTS 2W, 3W AND 4W (SOUTHBOUND LANE)

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE I-435) STA. 141+49.48 N.B.L. / 141+00.56 S.B.L.
JACKSON COUNTY

SHEET 18 OF 49

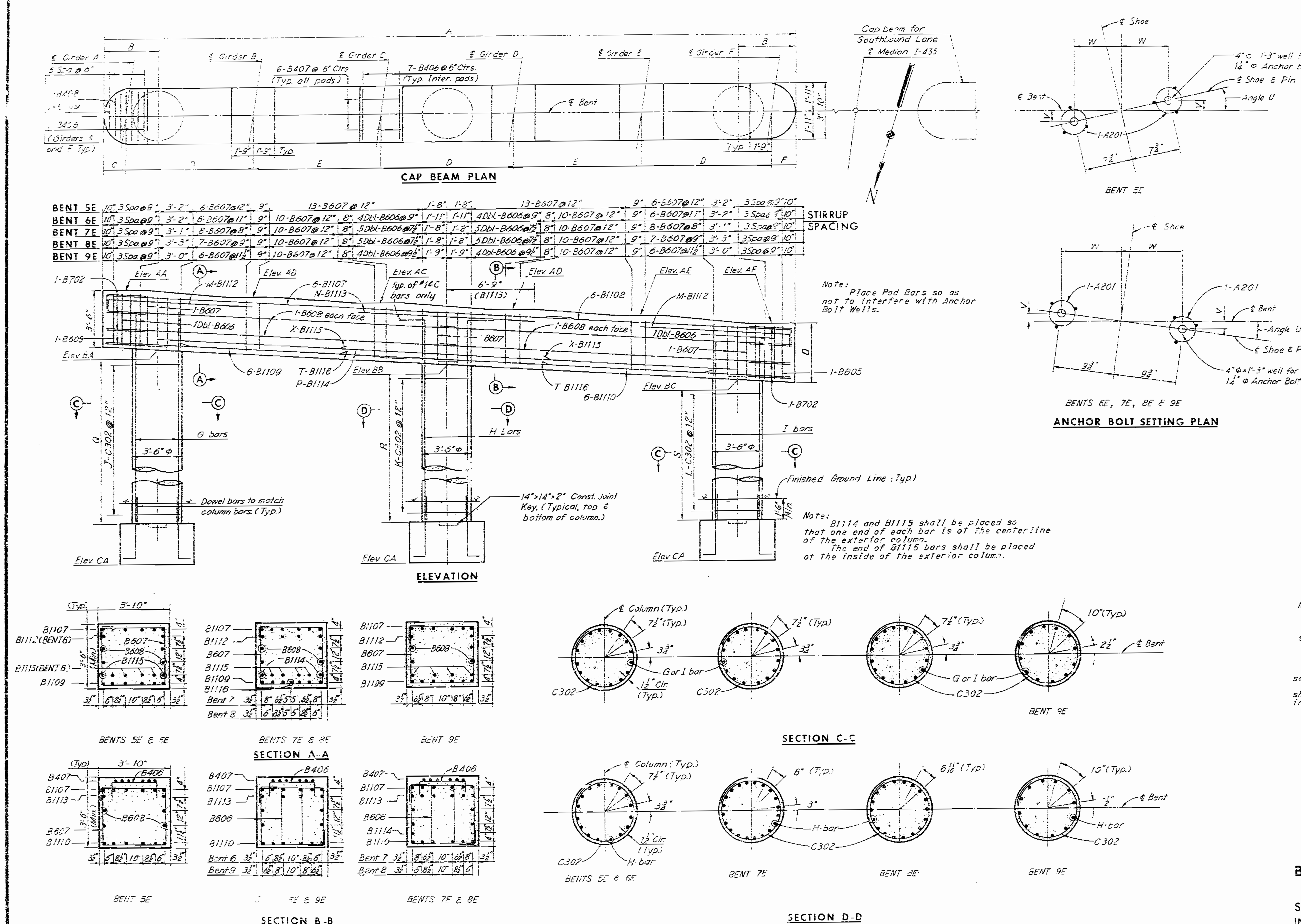
A-1686

1909-21-01

55

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.
5	MO	
DIST. NO.	COUNTY	
4	JACKSON	



Note: Place Pad Bars so as not to interfere with Anchor Bolt Wells.

Note: B1114 and B1115 shall be placed so that one end of each bar is of the centerline of the exterior column. The end of B1116 bars shall be placed of the inside of the exterior column.

Note: Top and Bottom cap beam bars shall have the same spacing.

Note: Dimensions given in Section C-C and Section D-D are along C-302 bars.

TABLE OF DIMENSIONS					
CODE	BENT 5E	BENT 6E	BENT 7E	BENT 8E	BENT 9E
A	51'-4"	50'-10"	50'-10"	50'-10"	50'-10"
B	4'-5"	4'-5"	4'-5"	4'-5"	4'-5"
C	2'-0 5/8"	2'-0 5/16"	2'-0 5/16"	2'-0 5/16"	2'-0 5/16"
D	9'-5 3/8"	9'-4 1/16"	9'-4 1/16"	9'-4 1/16"	9'-4 1/16"
E	9'-5 3/8"	9'-4"	9'-4"	9'-4"	9'-4"
F	2'-0 1/2"	2'-0 7/8"	2'-0 7/8"	2'-0 7/8"	2'-0 7/8"
G	16-C1101	16-C1101	16-C1401	16-C1401	12-C1001
H	16-C1102	16-C1102	20-C1402	18-C1402	12-C1002
I	16-C1103	16-C1103	16-C1403	16-C1403	12-C1003
J	39	41	44	46	27
K	38	40	43	45	26
L	36	39	42	44	25
M	0	2	4	4	2
N	2	4	6	6	4
O	3'-8 1/2"	3'-8 1/2"	3'-8 1/8"	3'-8"	3'-8"
P	0	0	2	2	0
Q	38'-8 1/2"	40'-9 5/8"	44'-1"	45'-6 1/2"	27'-2 1/8"
R	37'-6 5/8"	39'-9 5/8"	43'-1 1/2"	44'-7 1/8"	26'-3 1/4"
S	36'-4 3/4"	38'-9 3/4"	42'-1 3/4"	43'-7 3/4"	25'-4 1/4"
T	0	0	1	1	0
U	12°45'43"	5°41'14"	7°11'51"	7°37'19"	8°35'20"
V	1 11/16"	5/16"	1 1/4"	1 5/16"	1 7/16"
W	7 9/16"	9 11/16"	9 11/16"	9 11/16"	9 5/8"
X	2	5	4	4	4
AA	782.70	785.76	789.03	791.48	794.37
AB	782.17	785.31	788.60	791.05	793.96
AC	781.66	784.87	788.17	790.53	793.55
AD	781.14	784.42	787.74	790.21	793.14
AE	780.53	783.97	787.31	789.79	792.74
AF	780.11	783.53	786.88	789.37	792.33
BA	778.96	782.05	785.33	787.78	790.68
BB	777.80	781.05	784.37	786.84	789.77
BC	776.55	780.06	783.40	785.90	788.85
CA	737.00	738.00	738.00	739.00	761.00

Note:
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.
For Reinforcement Schedule, see Sheets 10 and 11.
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown.
For details of Anchor Bolt Wells, see Sheet 41.
For Substructure Layout, see Sheets 7 and 8.
For Excavation Details, see Sheet 8.
For footing size, location and reinforcement, see Sheet 20.
All piles in Bents 5E, 6E, 7E, 8E and 9E shall be 10BP42. Batter piles 2"/ft. where shown in footing plan, see Sheet 20.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.43 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

BENTS 5E, 6E, 7E, 8E AND 9E (NORTHBOUND LANE)

SHEET 19 OF 49

A-1686

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
M.H.H. DATE 6-12-67 CHECKED J.E.H. DATE 6-13-67

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

1909-21-01

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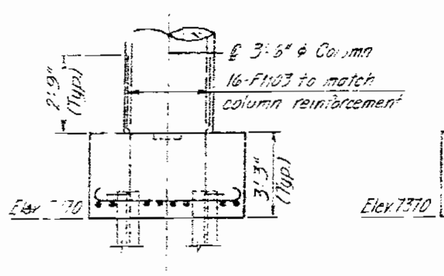
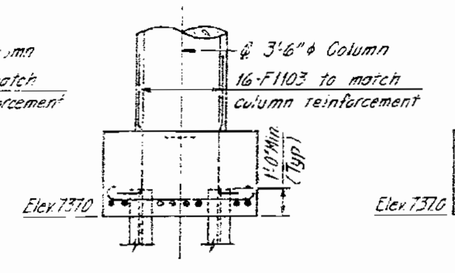
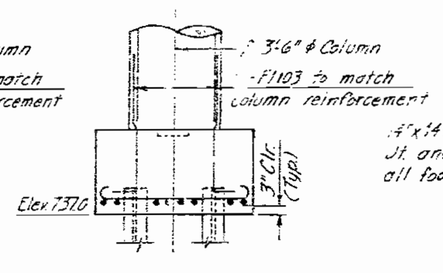
MISSOURI STATE HIGHWAY DEPARTMENT

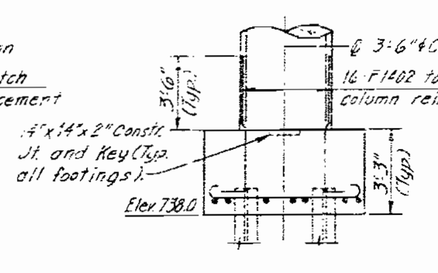
FED. ROAD STATE FEDERAL PROJECT NO.	SEC.	FISCAL SHEET NO.
S MO		128
DIST.	COUNTY	CITY
4	JACKSON	

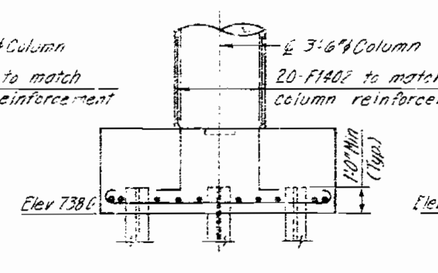


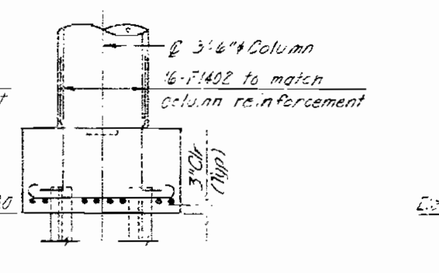




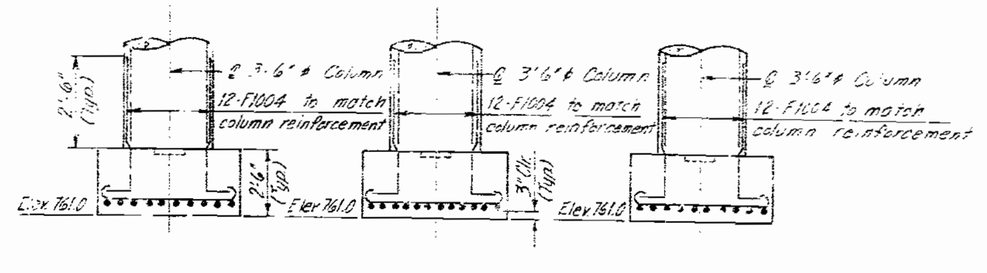
FOOTING ELEVATION BENT 5E



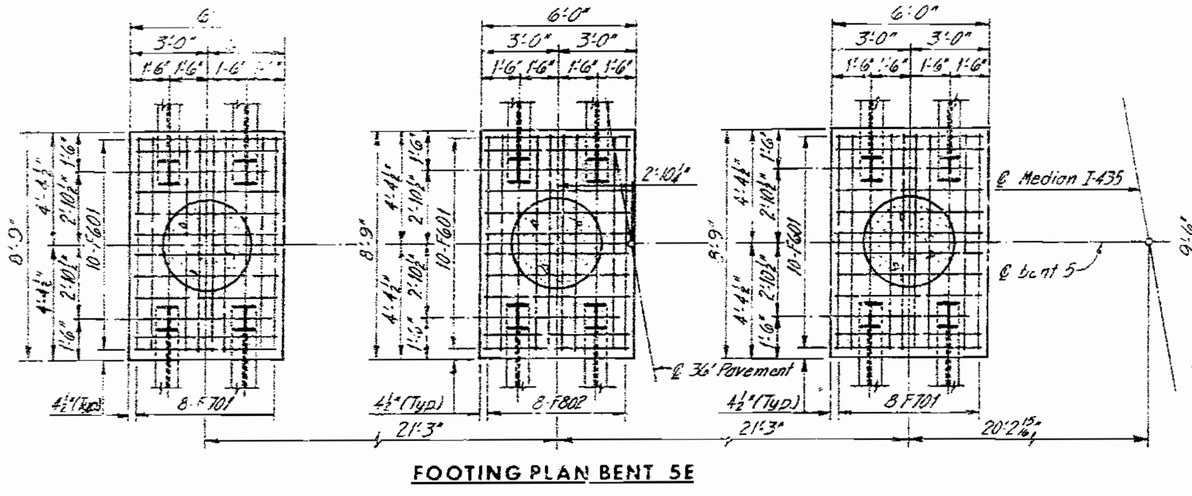




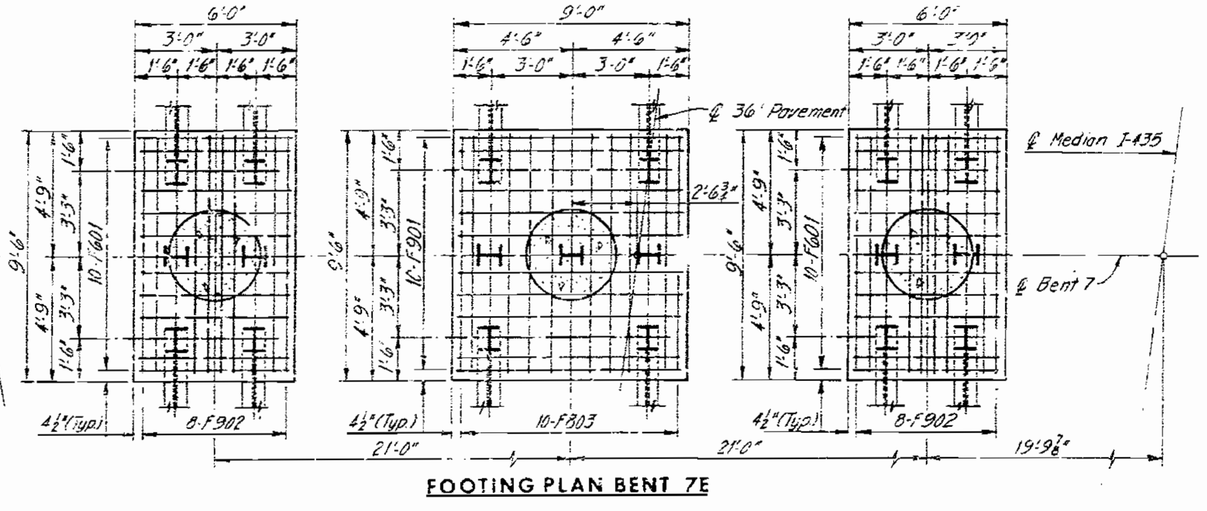
FOOTING ELEVATION BENT 7E



FOOTING ELEVATION BENT 9E



FOOTING PLAN BENT 5E



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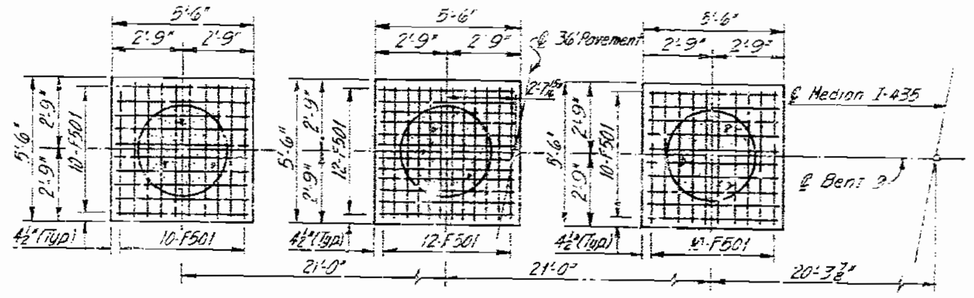
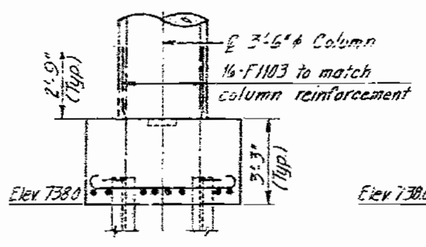
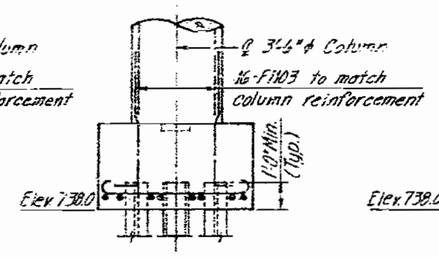
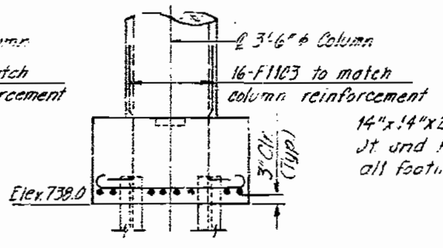


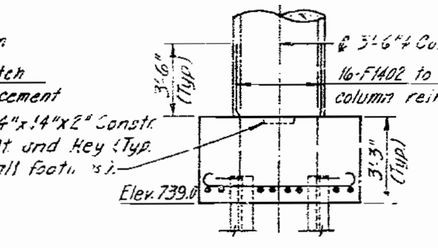
FOOTING PLAN BENT 9E

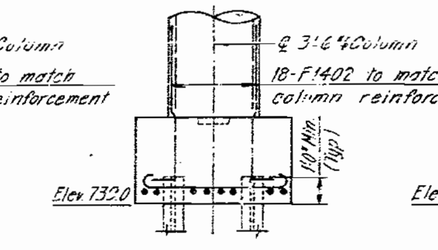


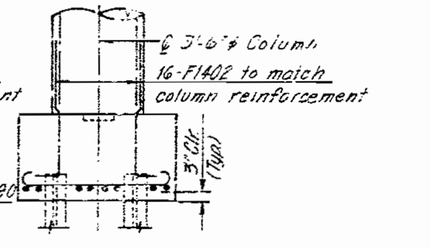




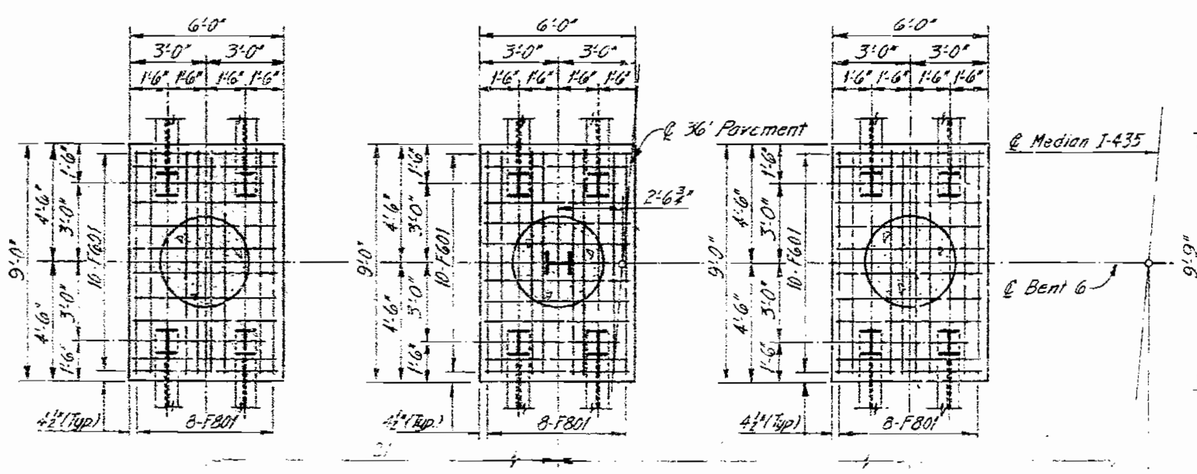
FOOTING ELEVATION BENT 6E



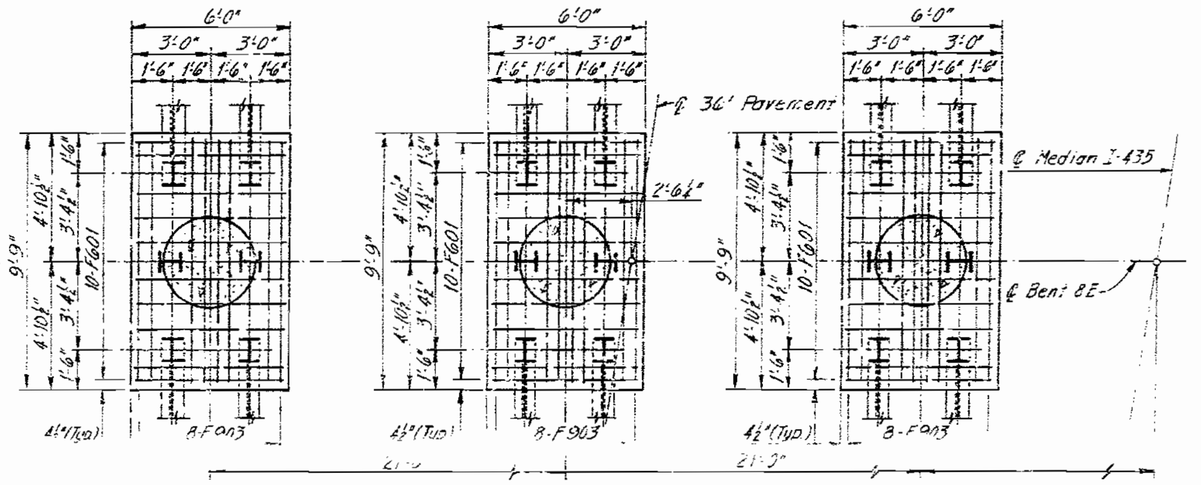




FOOTING ELEVATION BENT 8E



FOOTING PLAN BENT 6E



FOOTING PLAN BENT 8E

Note:
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown - substructure.
All piles in Bents 5E, 6E, 7E and 8E shall be 10BP42. Batter piles 2" per foot where shown.
Dowel bars shall match column reinforcement for spacing, see Section C-C and Section D-D Sheet 19.
For details of Bents, see Sheet 19.
For Reinforcement Schedule, see Sheets 10 and 11.
For Substructure Layout, see Sheets 7 and 8.
For Excavation Details, see Sheet 8.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+47.48 N.B.L.
141+30.56 S.B.L.
JACKSON COUNTY

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE JEH DATE 6-6-67 CHECKED M.H.H. DATE 6-9-67

NOTE This drawing is not to scale Follow dimensions

FOOTING PLAN - BENTS 5E, 6E, 7E, 8E, AND 9E (NORTHBOUND LANE) SHEET 20 OF 49

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909 21-01

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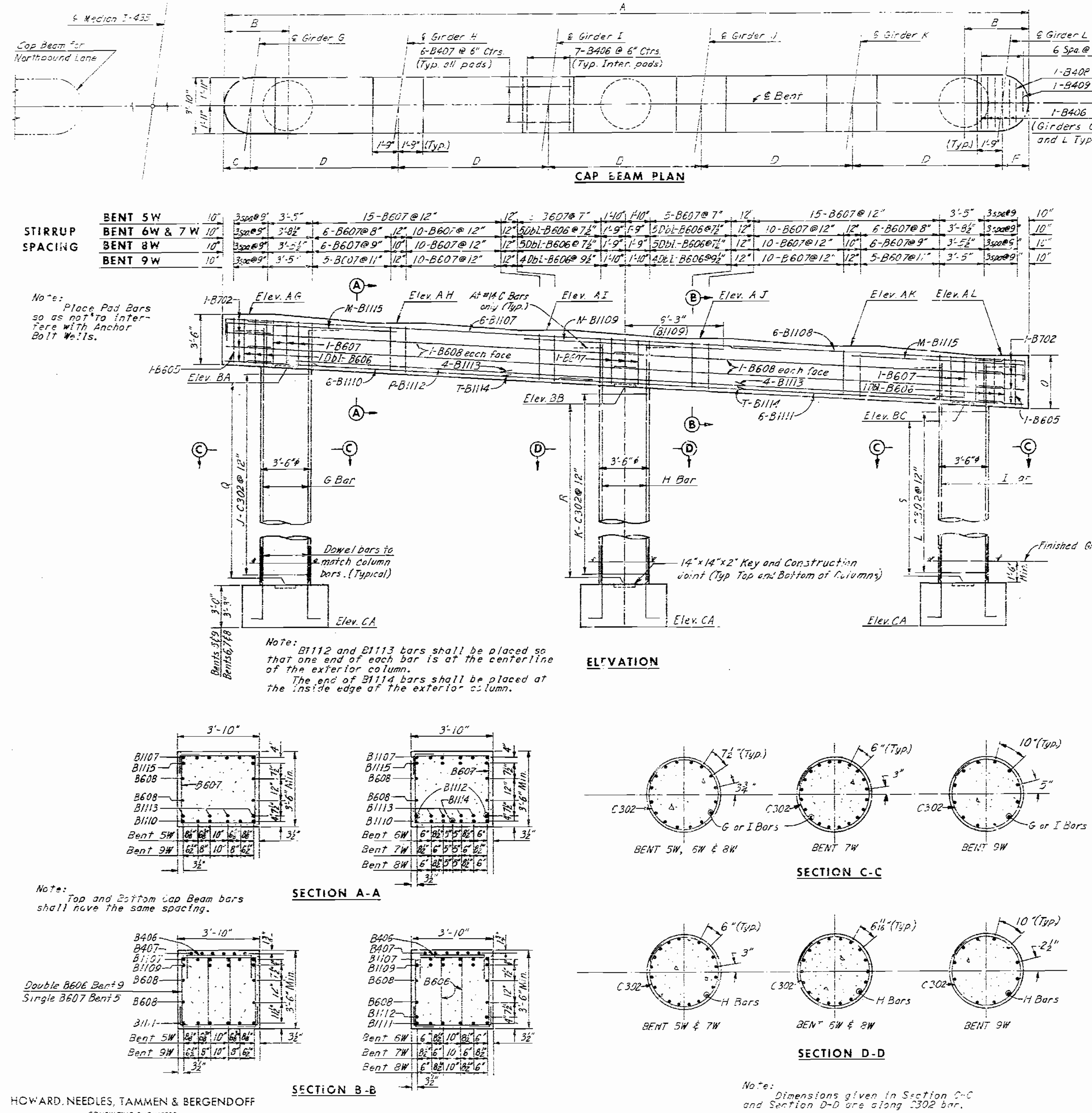
FOR INFORMATION ONLY

A16866, Sht. 27

MISSOURI STATE HIGHWAY DEPARTMENT

5 MO | 4 | JACKSON



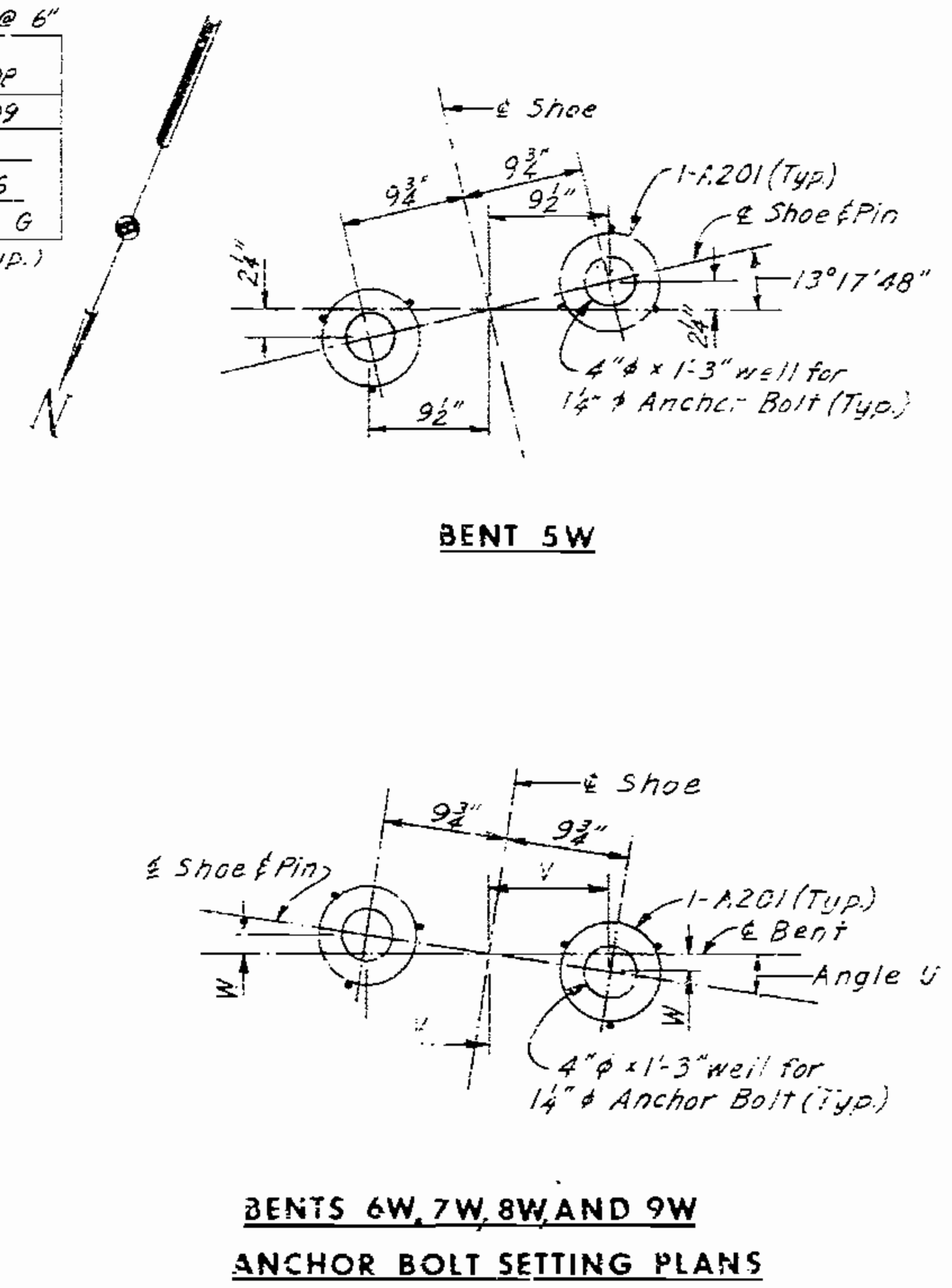


TABLE OF DIMENSIONS					
CODE	BENT 5W	BENT 6W	BENT 7W	BENT 8W	BENT 9W
A	51'-4"	50'-9"	50'-9"	50'-9"	50'-9"
B	4'-5"	4'-4 1/2"	4'-4 1/2"	4'-4 1/2"	4'-4 1/2"
C	2'-0 1/8"	2'-0 3/8"	2'-0 3/8"	2'-0 3/8"	2'-0 3/8"
D	9'-5 9/16"	9'-4 1/8"	9'-4 1/8"	9'-4 1/8"	9'-4 1/8"
E	-	-	-	-	-
F	2'-0 1/16"	2'-0 3/16"	2'-0 3/16"	2'-0 3/16"	2'-0 3/16"
G	16-C1101	16-C1101	20-C1101	16-C1401	12-C1001
H	20-C1102	18-C1102	20-C1402	18-C1402	12-C1002
I	16-C1103	16-C1103	20-C1103	16-C1403	12-C1003
J	36	39	42	45	25
K	35	38	41	44	24
L	34	37	40	43	23
M	2	4	4	[illegible]	2
N	4	6	6	6	4
O	3'-8 1/2"	3'-8 1/8"	3'-8 1/8"	3'-8 1/2"	3'-8 1/2"
P	0	2	2	2	0
Q	36'-4 7/8"	38'-10 3/4"	42'-3 3/8"	44'-9 5/8"	25'-0 1/2"
R	35'-3 1/8"	37'-10 3/4"	41'-3 7/8"	43'-10 1/2"	24'-1 1/2"
S	34'-1 1/4"	36'-10 3/4"	40'-4 1/4"	42'-[illegible] 1/8"	23'-2 3/4"
T	0	1	1	1	0
U	-	5°50'27"	7°17'06"	7°49'41"	8°49'19"
V	-	9 11/16"	9 11/16"	9 11/16"	9 5/8"
W	-	1	1 1/4"	1 5/16"	1 1/2"
AG	780.15	783.85	787.23	789.74	792.73
AH	779.63	783.40	786.80	789.33	792.32
AI	779.11	782.96	786.37	788.91	791.92
AJ	778.59	782.52	785.94	788.49	791.51
AK	778.08	782.08	785.51	788.07	791.11
AL	777.57	781.63	785.09	787.59	790.74
BA	776.41	780.15	7[illegible]53	786.05	789.04
BB	775.26	779.15	782.57	785.12	788.13
BC	774.10	778.15	781.60	784.18	787.23
CA	737.0	738.0	738.0	738.0	761.0

Note:
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.
For Reinforcement Schedule, see Sheets 11 and 12.
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown-Substructure.
For details of Anchor Bolt Wells, see Sheet 41.
For footing size, location and reinforcement, see Sheet 22.
All piles in Bents 5W, 6W, 7W, 8W and 9W shall be 10BP42. Batter piles 2"/ft. where shown in Footing Plan, Sheet 22.
For Substructure Layout, see Sheets 7 and 8.
For Excavation Details, see Sheet 8.

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

BENTS 5W, 6W, 7W, 8W AND 9W (SOUTHBOUND LANE)

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY — NEW YORK
MADE [illegible] DATE 6-5-67 CHECKED J.E.H. DATE 6-12-67

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 21 OF 49

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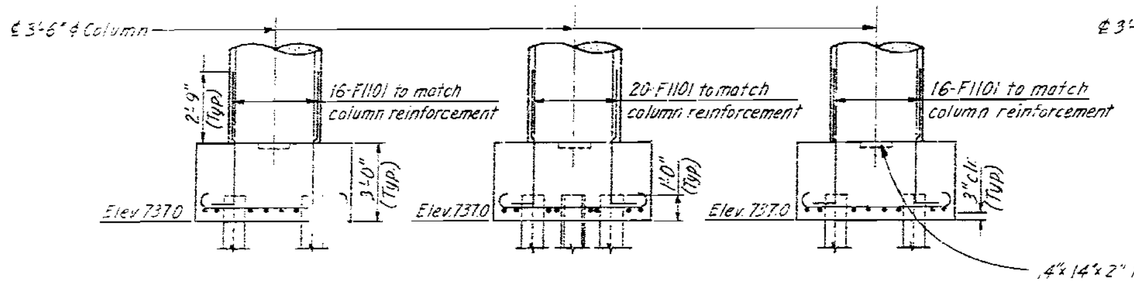
MISSOURI STATE HIGHWAY DEPARTMENT

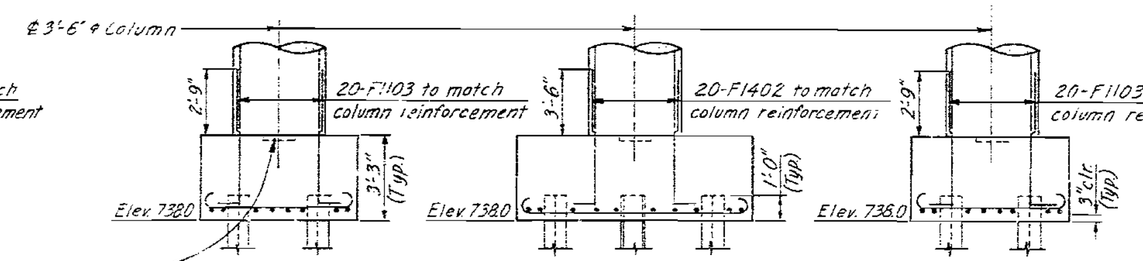
FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO				

DIST. NO.	COUNTY	ROUTE, SEC.
4	JACKSON	

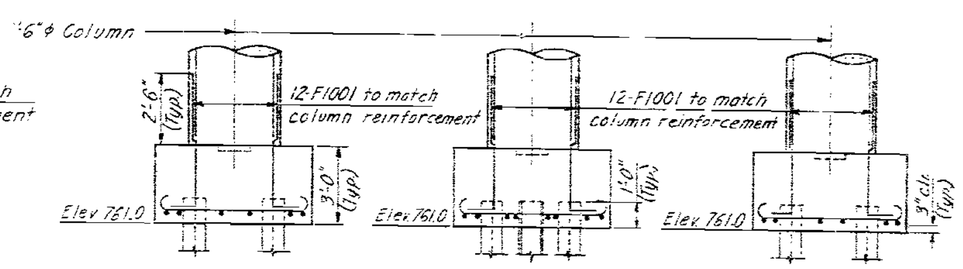
FOR INFORMATION ONLY



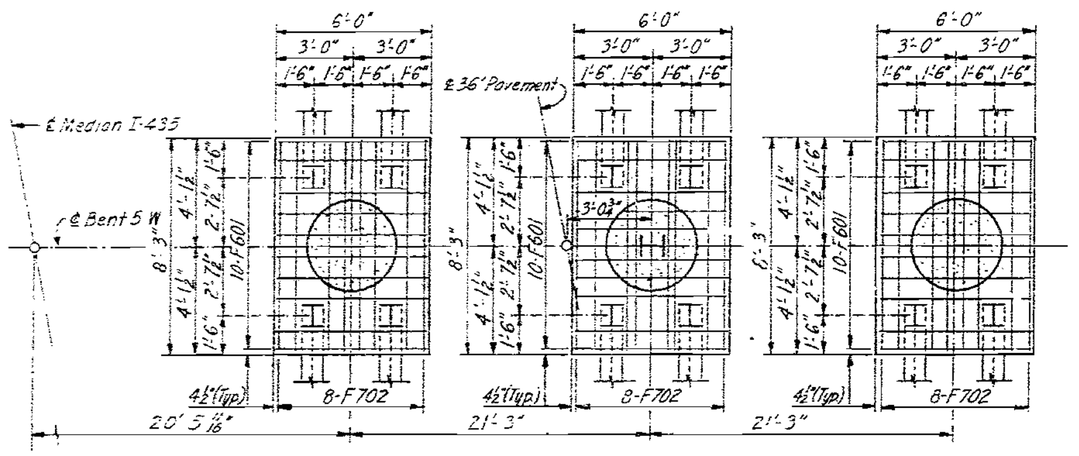
FOOTING ELEVATION BENT 5W



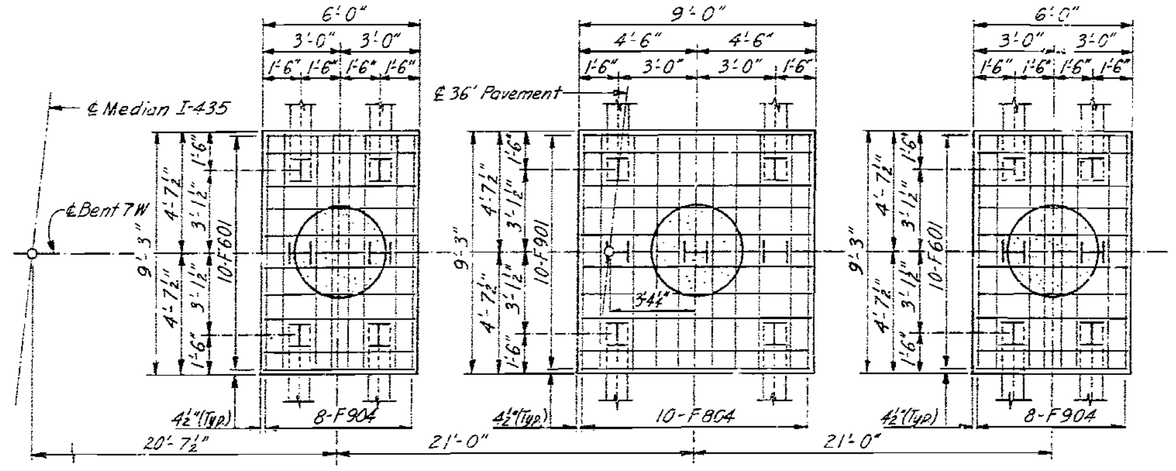
FOOTING ELEVATION BENT 7W



FOOTING ELEVATION BENT 9W



FOOTING PLAN BENT 5W



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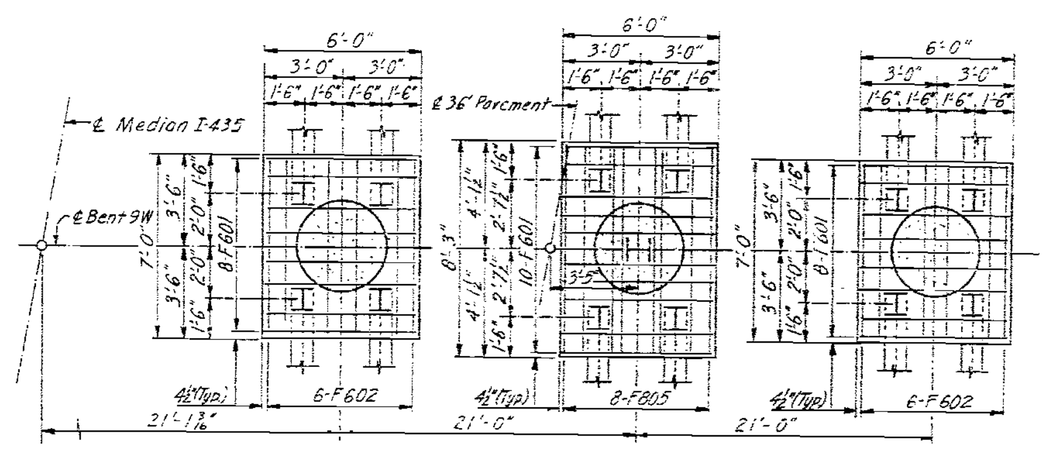
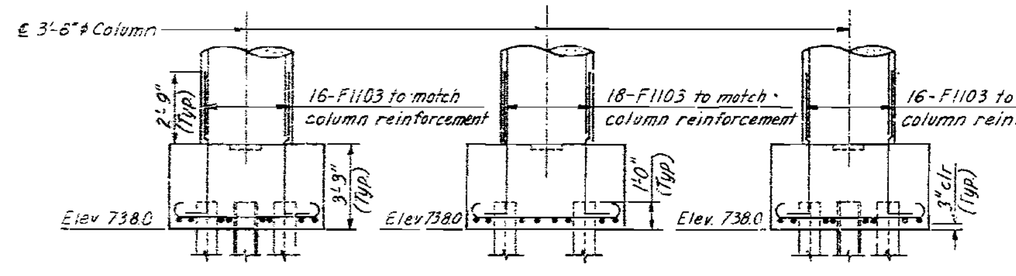
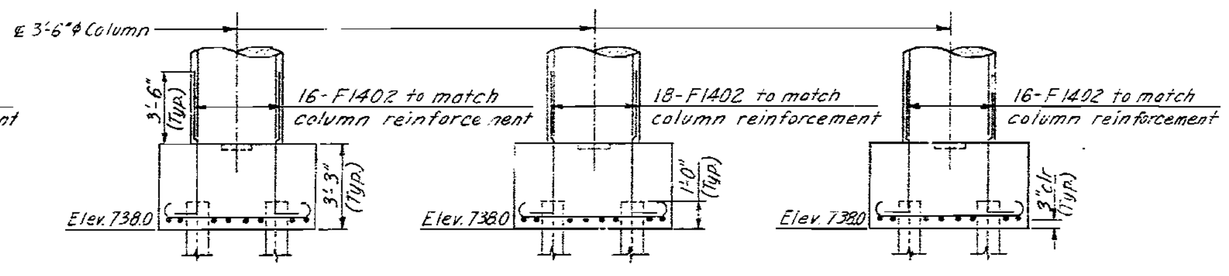


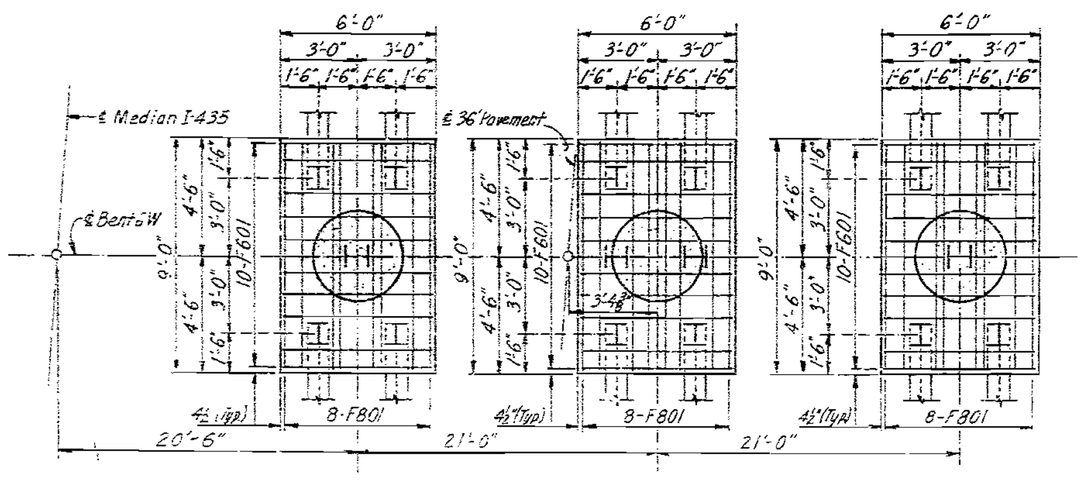
FOOTING PLAN BENT 9W



FOOTING ELEVATION BENT 6W



FOOTING ELEVATION BENT 8W



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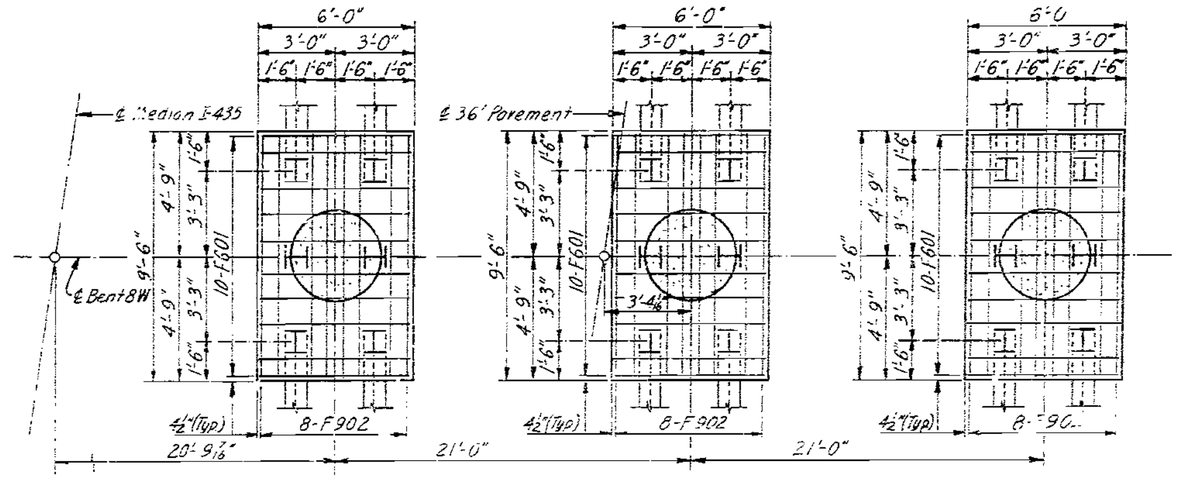
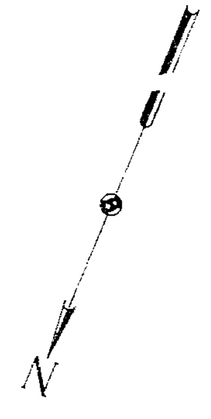


FOOTING PLAN BENT 8W



Note:
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown - substructure.
All piles in Bents 5W, 6W, 7W and 8W shall be 10BP42. Batter piles 2½" per foot where shown.
Dowel bars shall match column reinforcement. For spacing, see Section C-C and Section D-D Sheet 21.
For details of Bents, see Sheet 21.
For Reinforcement Schedule, see Sheets 11 and 12.
For Substructure Layout, see Sheets 7 and 8.
For Excavation Details, see Sheet 8.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 22 OF 49

A-1686

FOOTING PLAN - BENTS 5W, 6W, 7W, 8W AND 9W (SOUTHBOUND LANE)

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE A.M.H. DATE 5-8-67 CHECKED M.E.H. DATE 6-12-67

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

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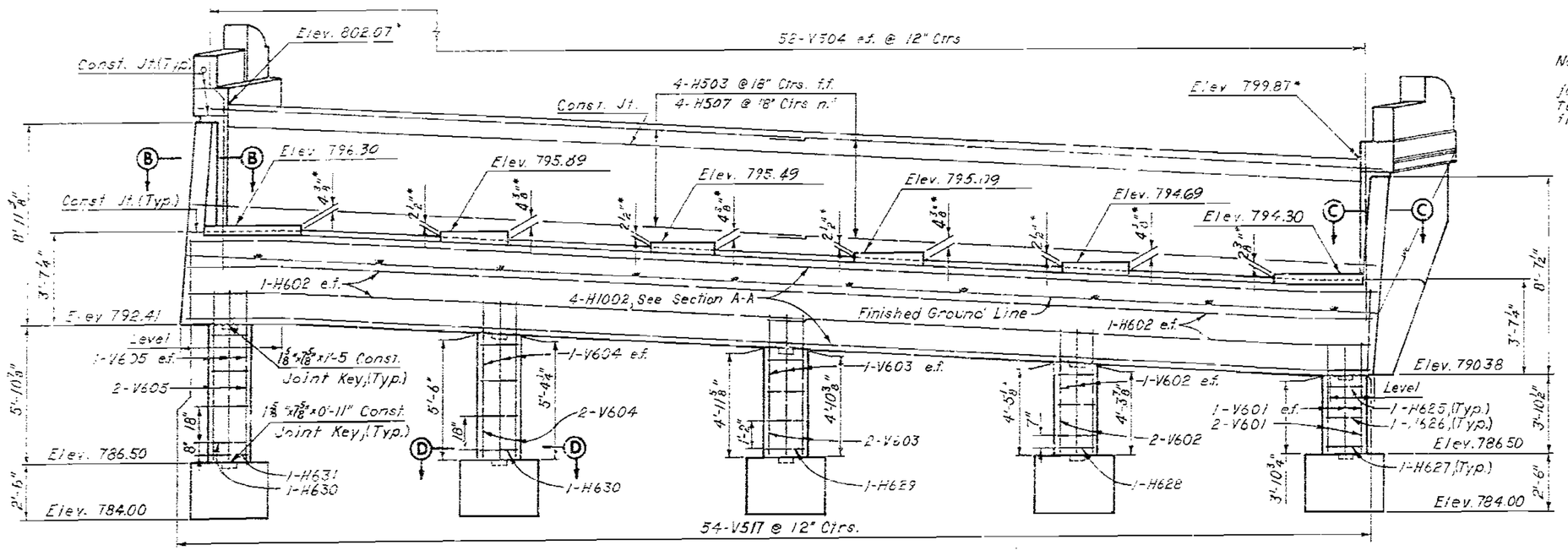
1909 27-01

A16866, Sht. 29

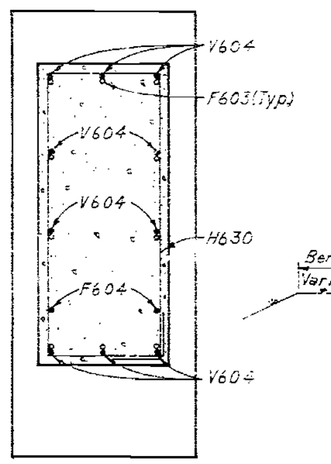
MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
5 MO	141		
4 JACKSON			

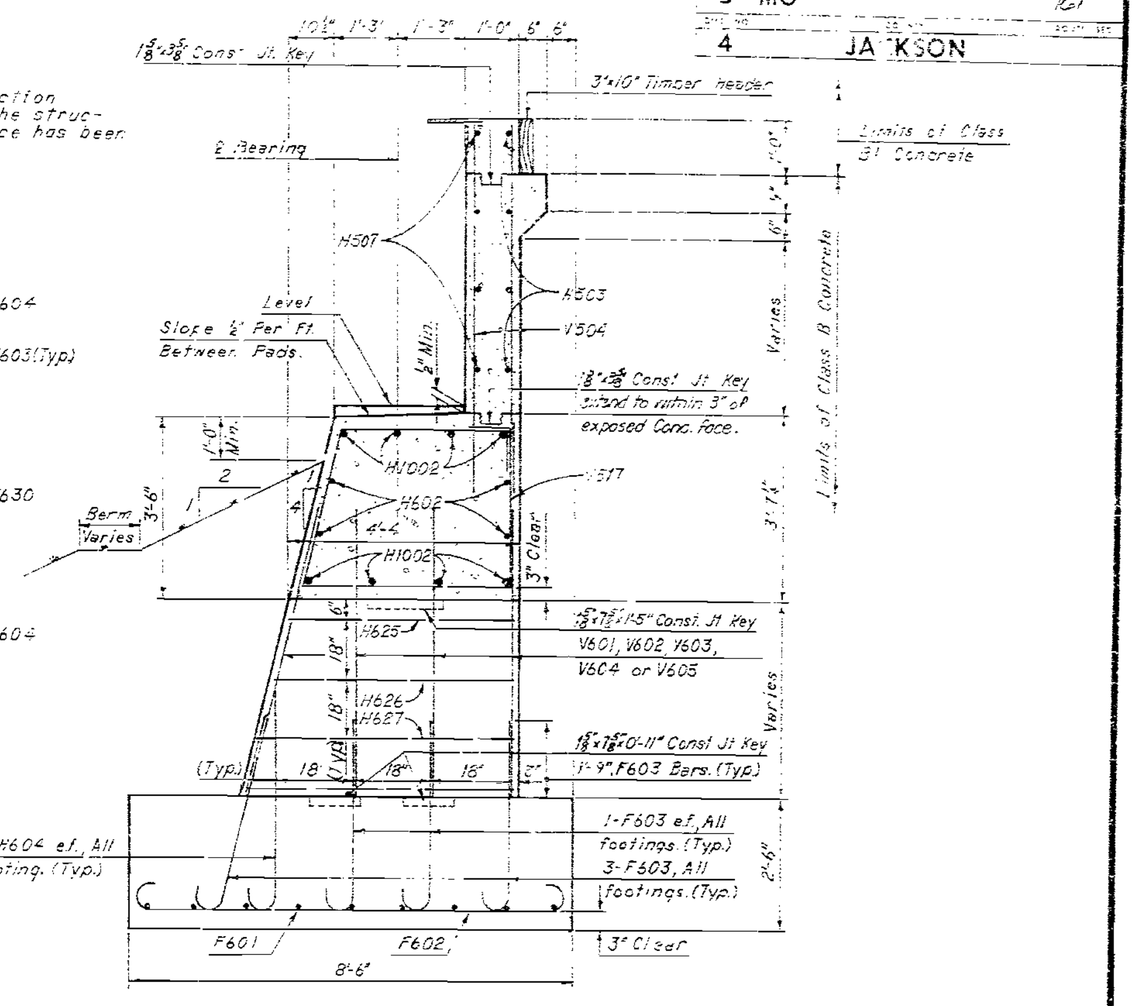


ELEVATION

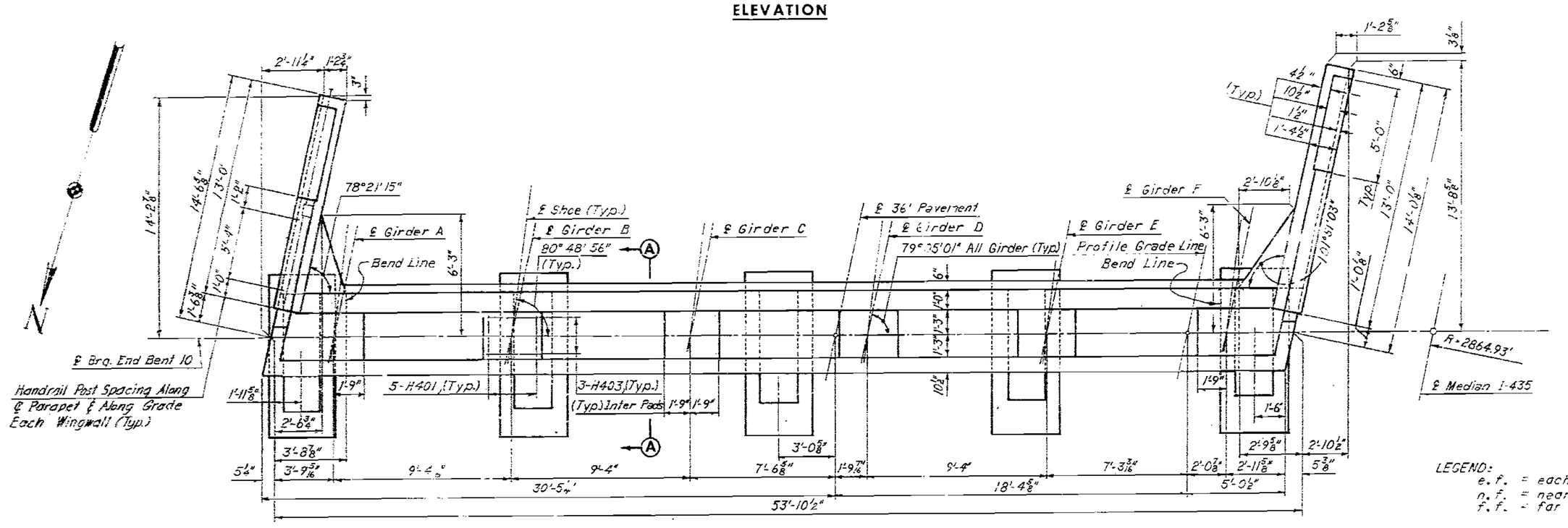
Note: Backwall above upper construction joint shall not be poured until the structural steel of the expansion device has been installed.



SECTION D-D

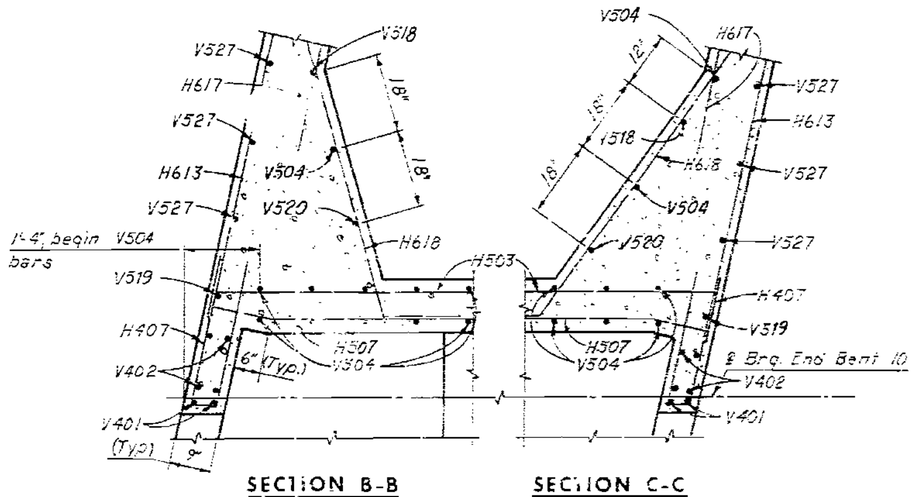


SECTION A-A



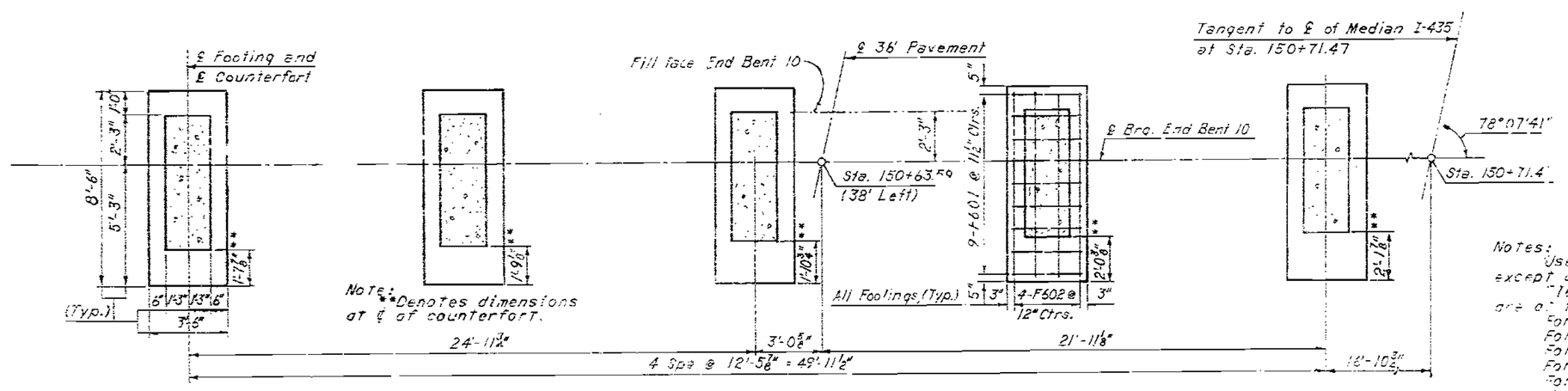
PLAN

LEGEND:
e.f. = each face
n.f. = near face
f.f. = far face



SECTION B-B

SECTION C-C



FOOTING PLAN

Notes:
Use 2" clear on substructure reinforcing except as shown.
Elevations and dimensions denoted thus * are at front face of backwall.
For details of wingwalls, see Sheet 25.
For Reinforcing Schedule, see Sheet 9.
For End Post Detail, see Sheet 15.
For Timber Header Detail, see Sheet 16.
For Anchor Bolt Setting Plan, see Sheet 25.
Handrail Post spacing is along grade and along ℄ Parapet.
Top of Curb and Parapet wall to be built parallel to Grade.
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.

END BENT 10E (NORTHBOUND LANE)

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

SHEET 23 OF 49

A-1686

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

MADE J.H.B. DATE 4-24-67 CHECKED C.W.G. DATE 4-25-67

NOTE: This drawing is not to scale Follow dimensions

60

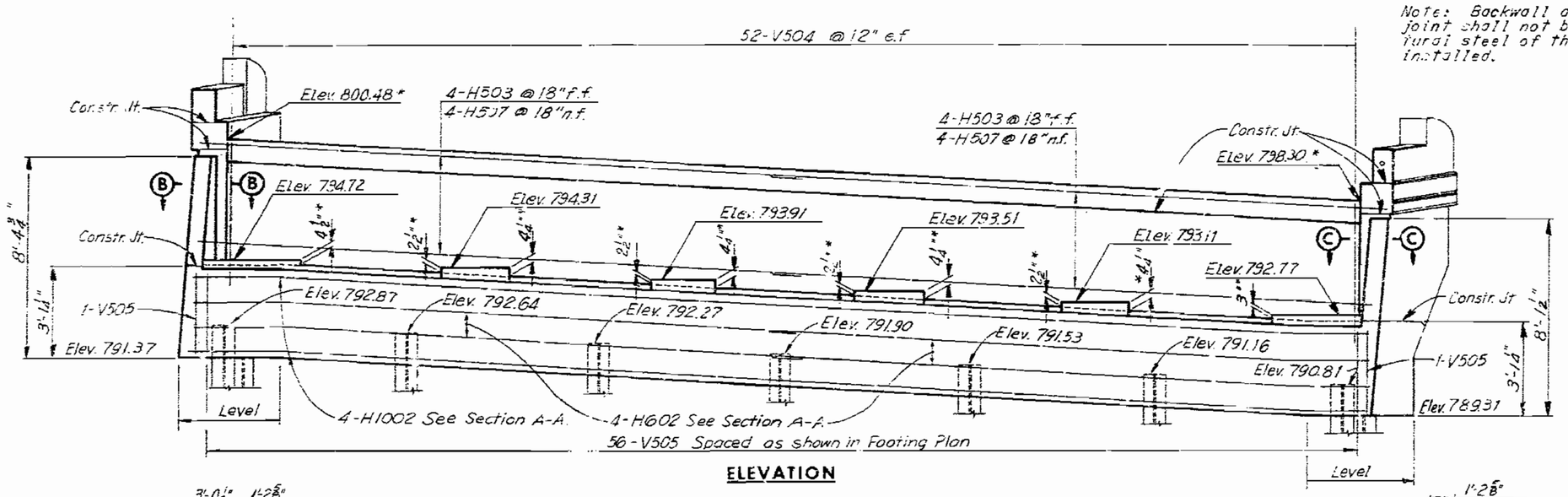
10-12-67 1357

FOR INFORMATION ONLY

A16866, Sht. 30

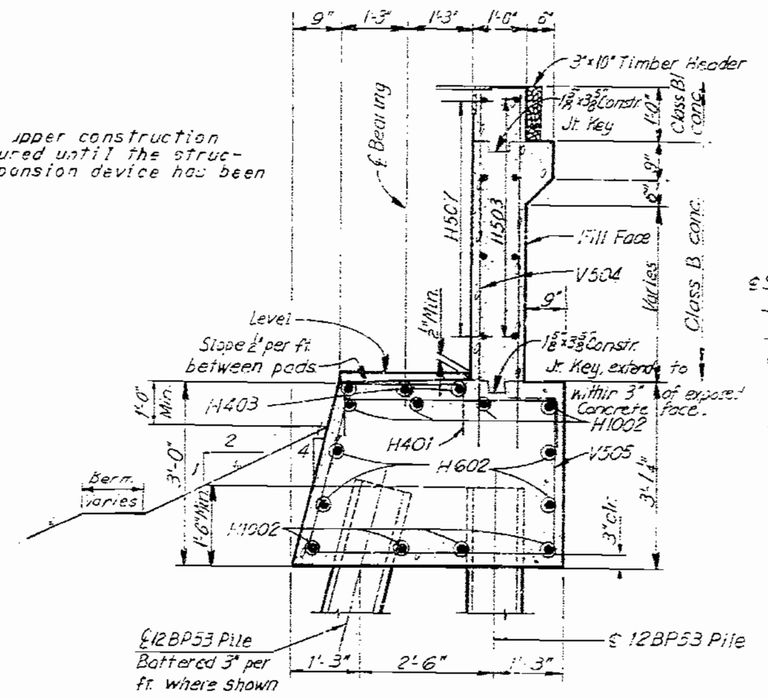
MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO. & SEC	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
MO				
DIST. NO.	COUNTY	ROUTE SEC.		
4	JACKSON			

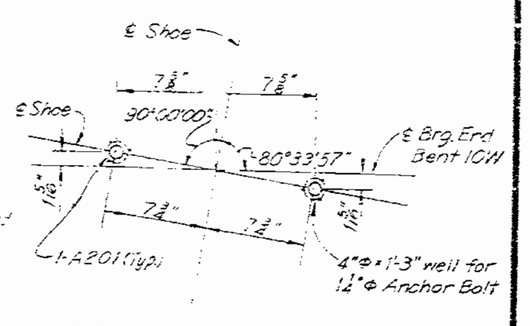


ELEVATION

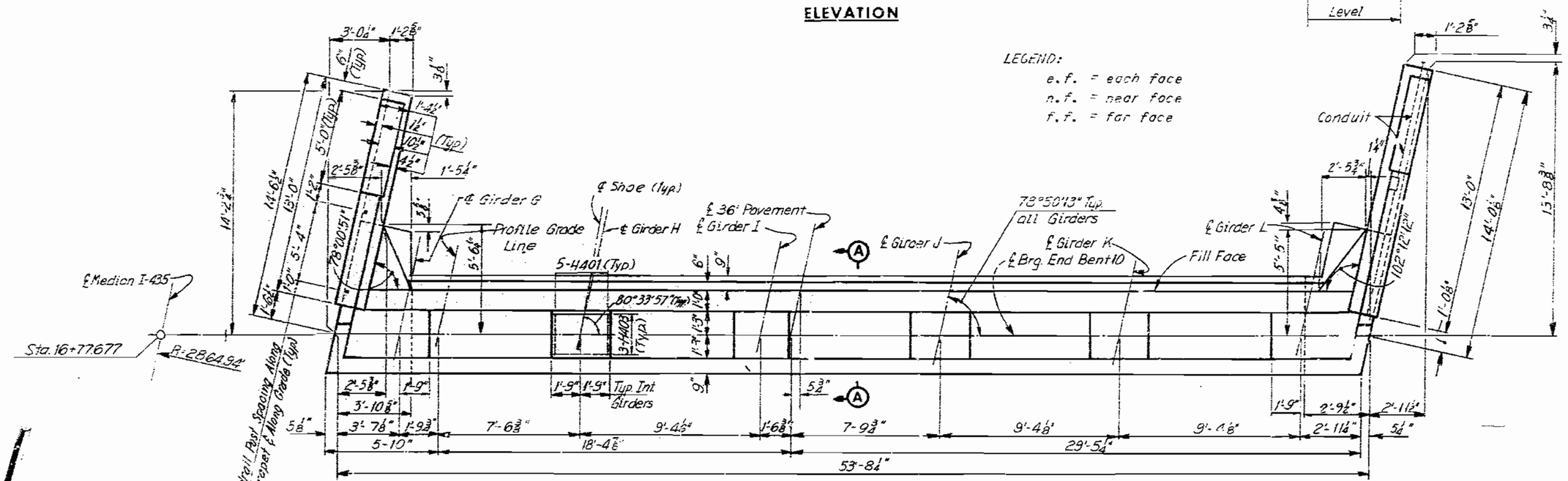
Note: Backwall above upper construction joint shall not be poured until the structural steel of the expansion device has been installed.



SECTION A-A

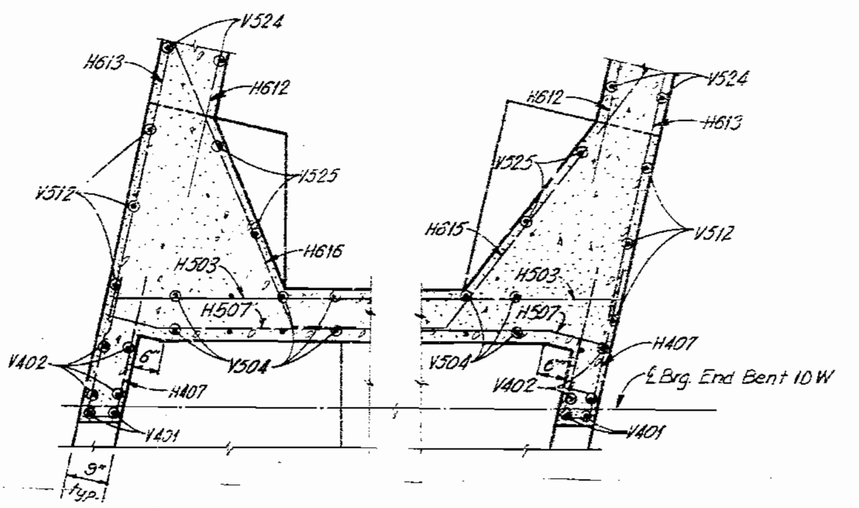


ANCHOR BOLT SETTING PLAN

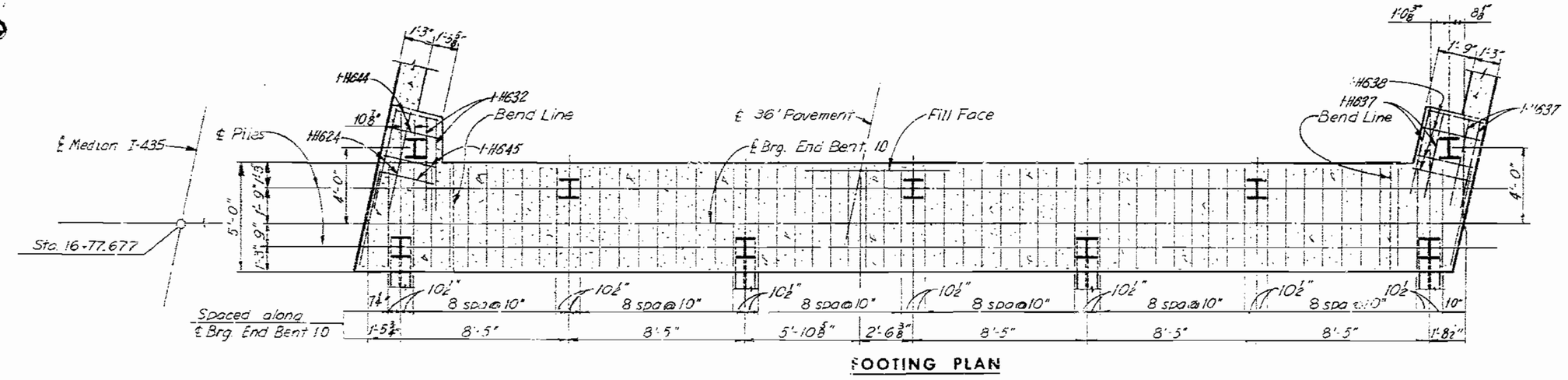


PLAN

LEGEND:
e.f. = each face
n.f. = near face
f.f. = far face



SECTION B-B SECTION C-C



FOOTING PLAN

Notes: Use 2" clear on substructure reinforcing except as shown.
Elevations and dimensions denoted thus * are at front face of backwall.
For details of wingwalls, see Sheet 25.
For Reinforcing Schedule, see Sheet 9.
For End Post Detail, see Sheet 16.
For Timber Header Detail, See Sheet 16.
All piles shall be 12BP53.
BARS IN ALL UNITS WILL BE BILLED AND TAGGED SEPARATELY.

BRIDGE OVER K.C.S R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

END BENT 10 W (SOUTHBOUND LANE) SHEET 24 OF 49 A-1686

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

MADE R.E.M. DATE 3-29-67 CHECKED S.S.H. DATE 4-28-67

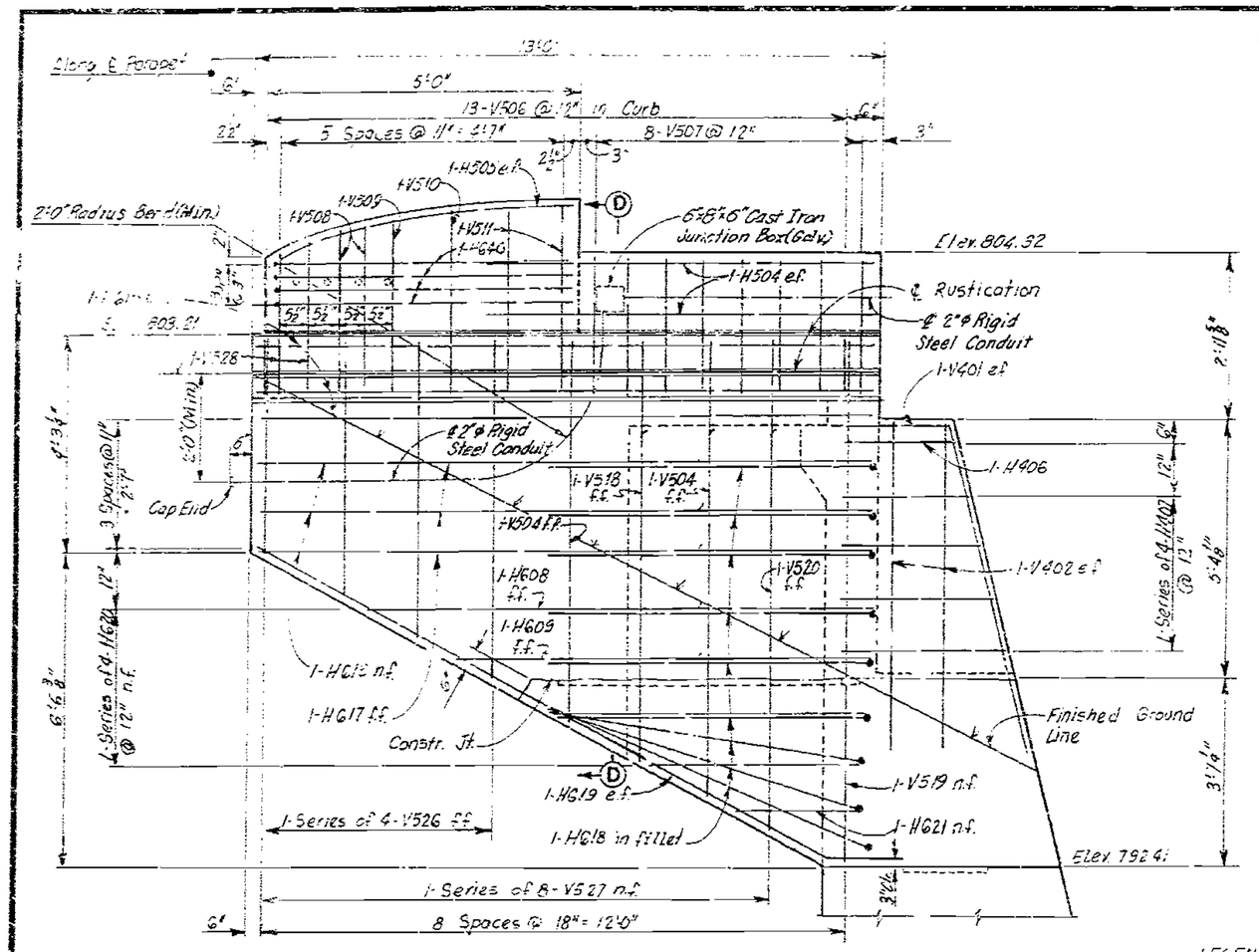
NOTE: This drawing is not to scale. Follow dimensions.

1909-21-01

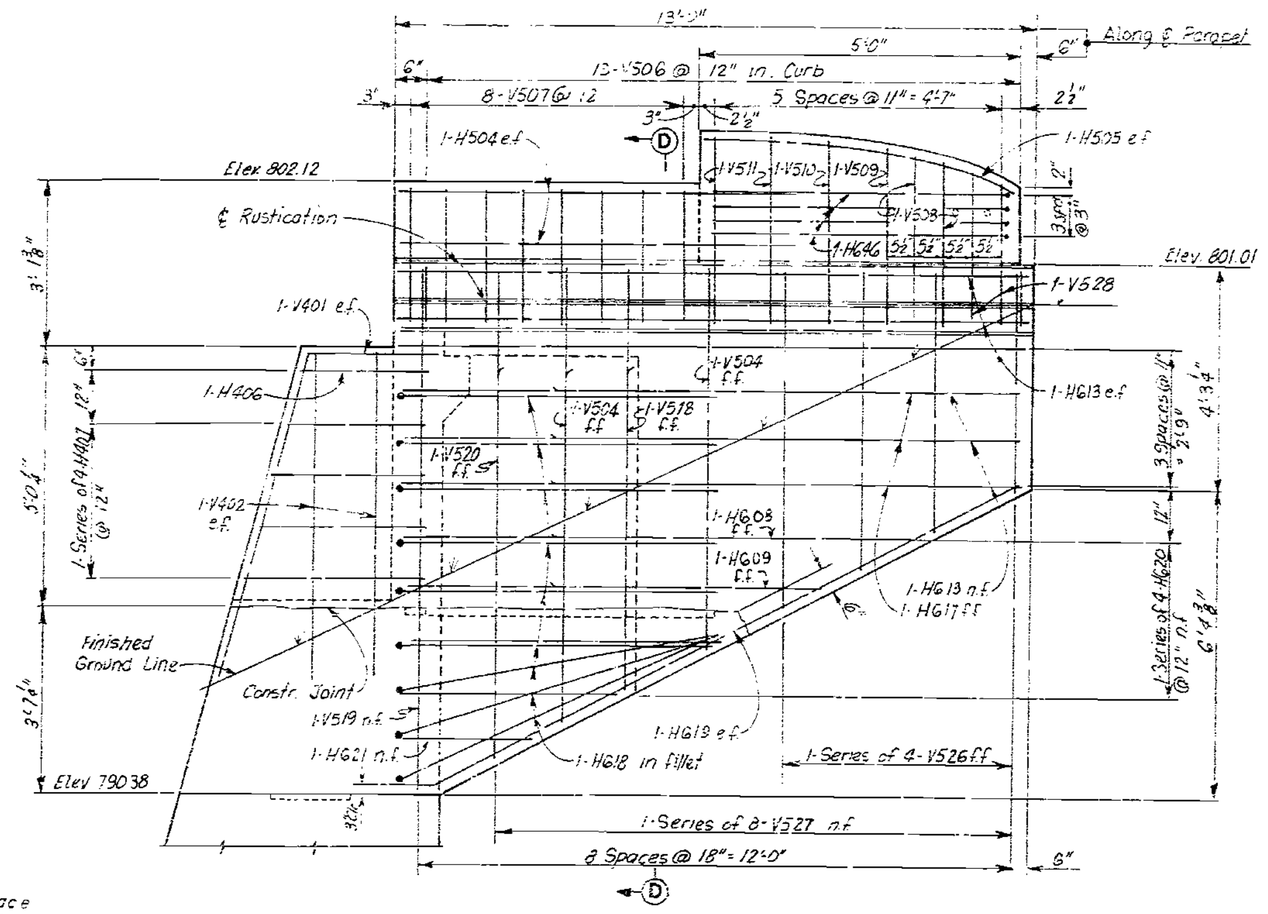
FOR INFORMATION ONLY

A16866, Sht. 31

MISSOURI STATE HIGHWAY DEPARTMENT

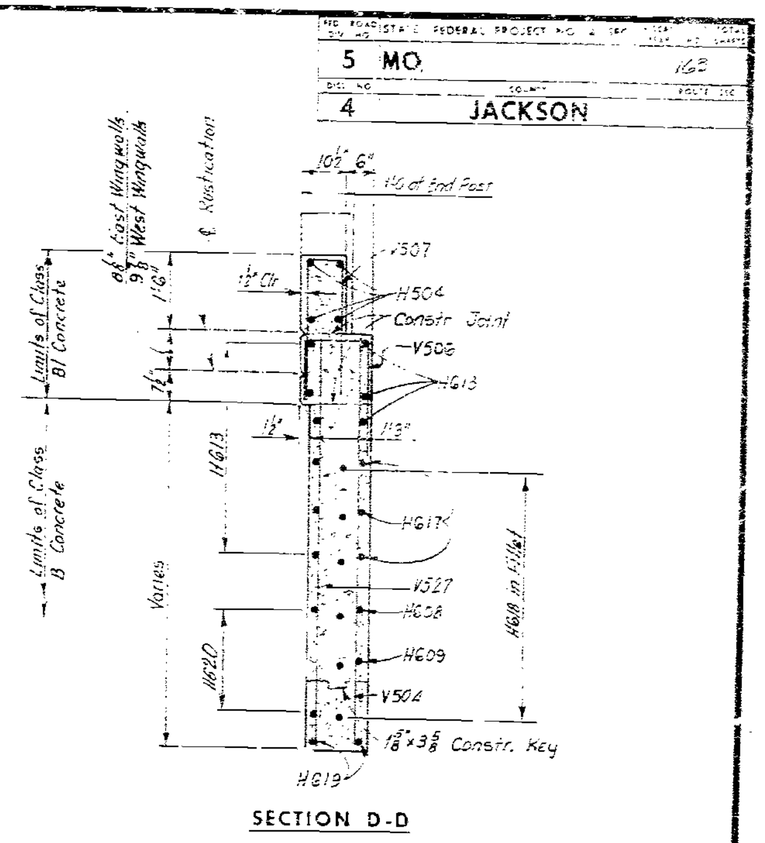


EAST WINGWALL ELEVATION (NORTHBOUND)

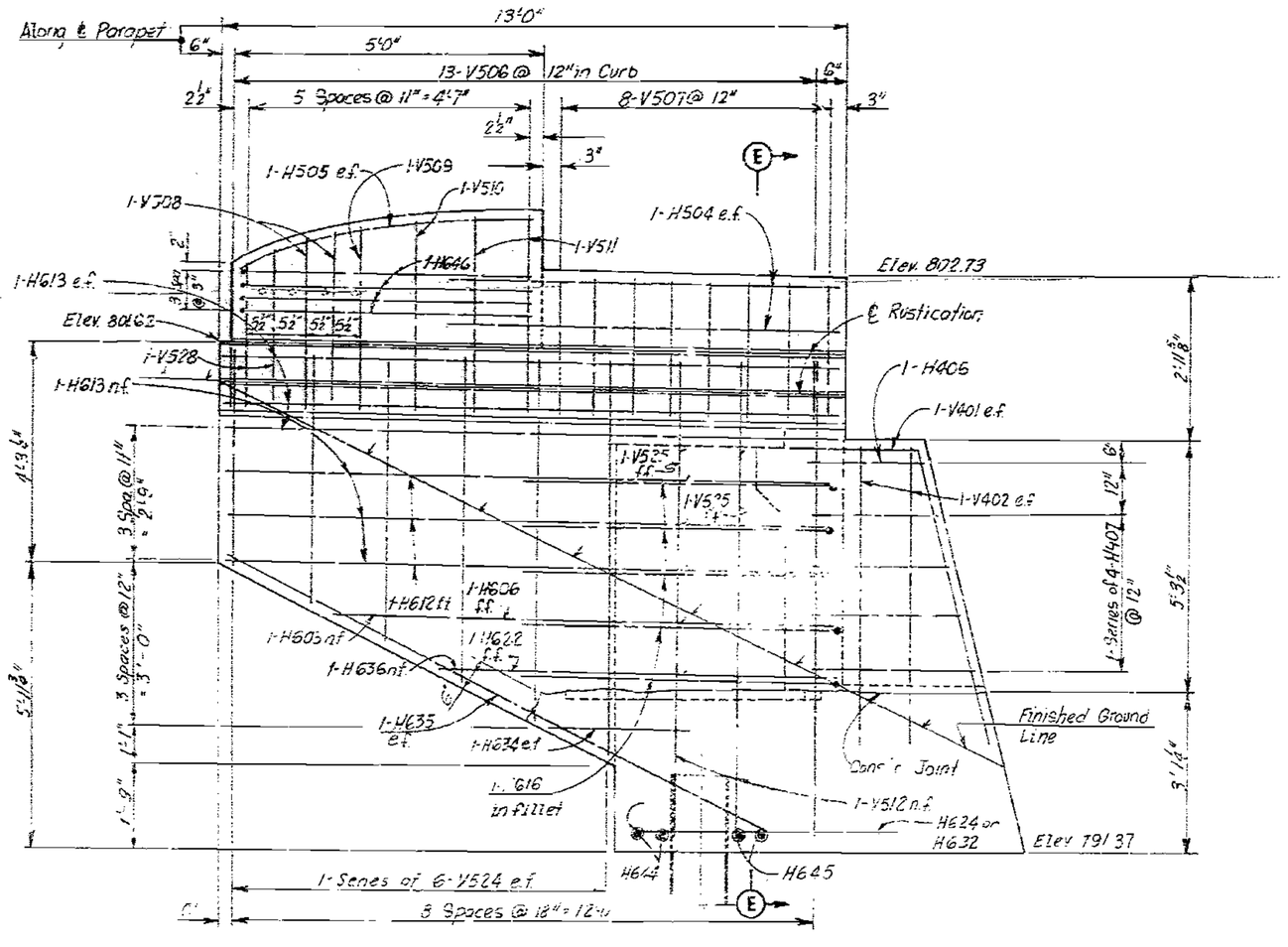


WEST WINGWALL ELEVATION (NORTHBOUND)

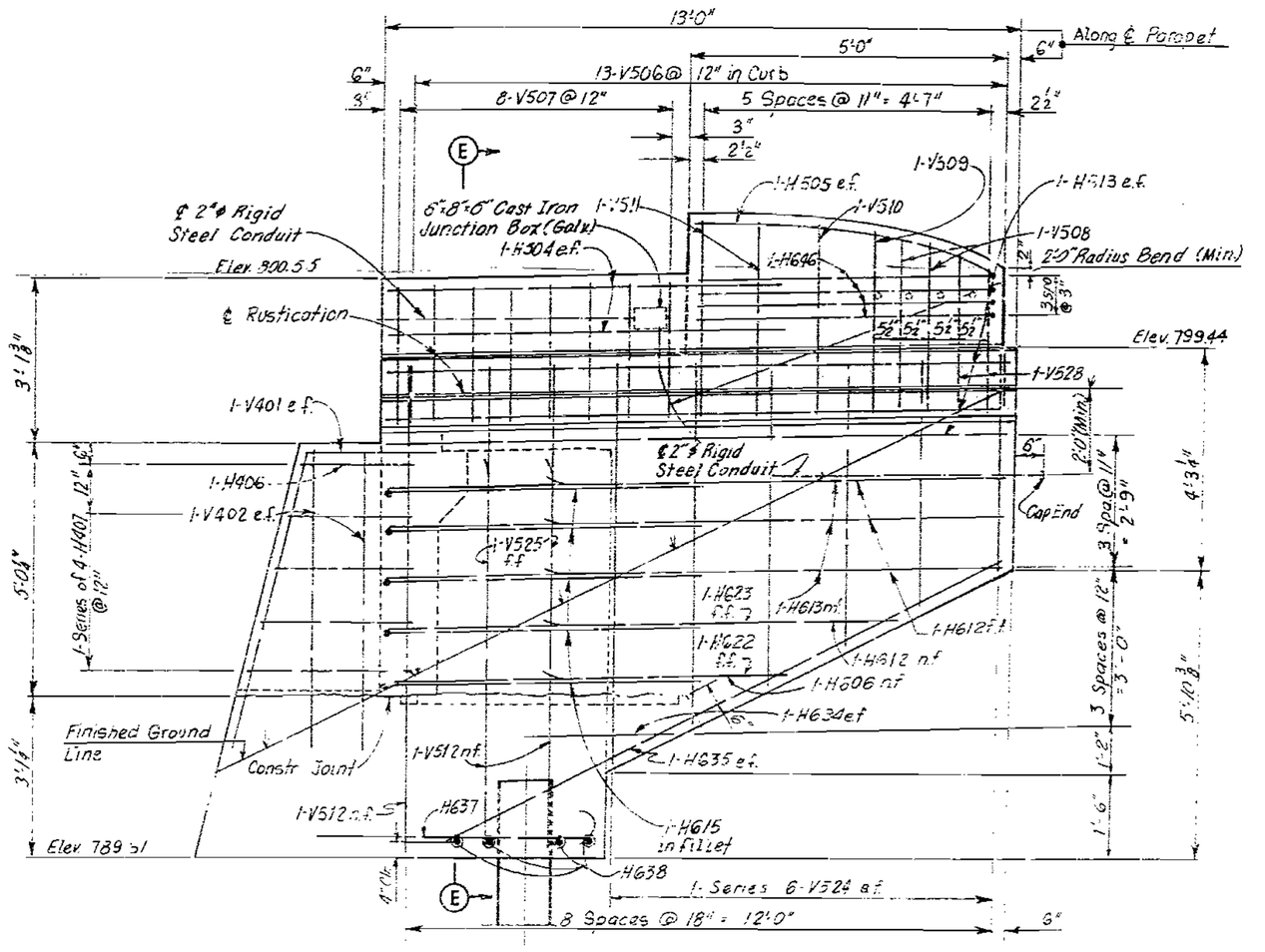
LEGEND:
e.f. = each face
f.f. = far face
n.f. = near face



SECTION D-D

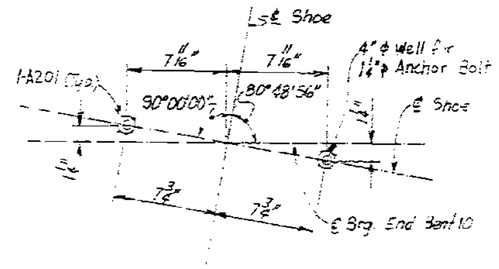


EAST WINGWALL ELEVATION (SOUTHBOUND)



WEST WINGWALL ELEVATION (SOUTHBOUND)

Notes:
For reinforcement Schedule, see Sheet 9
For placement of reinforcing in fillets, see Sections B-B and C-C, Sheet 23 or 24.
For Rustication Details, see Sheet 16.
Provide 2" clear from face of Concrete to reinforcing steel, unless otherwise shown.
For Concrete End Post Details, see Sheet 15
For Section E-E similar to Section E-E End Bent 1, see Sheet 16.



ANCHOR BOLT SETTING PLAN
END BENT 10 (NORTHBOUND LANE)

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

MADE: CWG DATE: 4-19-27 CHECKED: MATH DATE OF REVISION:

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

END BENT 10E AND 10W DETAILS

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE. I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 23 OF 49

A-1686

FOR INFORMATION ONLY

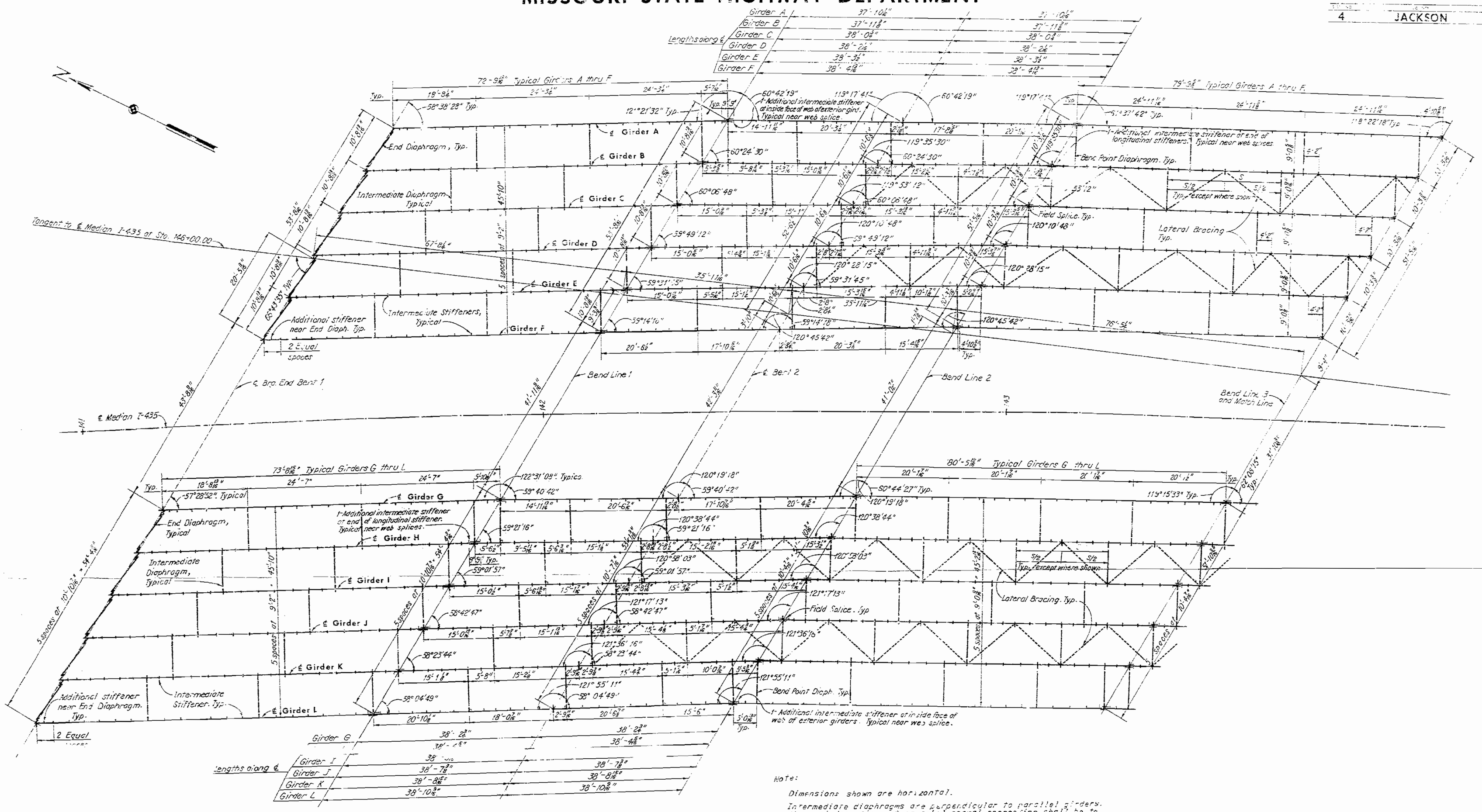
A16866, Sht. 32

29

1909 21.01
853

MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
5	MO		1-4
4	JACKSON		



Note:

Dimensions shown are horizontal.

Intermediate diaphragms are perpendicular to parallel girders. Where girders are not parallel, normal connection shall be to girder marked ⊥.

Intermediate stiffeners are equally spaced as shown, between intermediate diaphragms, between intermediate diaphragms and bearing stiffeners and between lateral connection stiffeners and intermediate diaphragm connection plates.

For stiffener sizes see Girder Elevation Sheet 30.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE JSH DATE 4-11-67 CHECKED JHC DATE 4-12-67

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

FRAMING PLAN
END BENT 1 TO BEND LINE 3

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

SHEET 26 OF 49

A-1686

63

1100-11-1

FOR INFORMATION ONLY

A16866, Sht. 33

MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO.	SHEET NO.
5 MO		165
DIST. NO.	COUNTY	SEC. OF SHEETS
4	JACKSON	

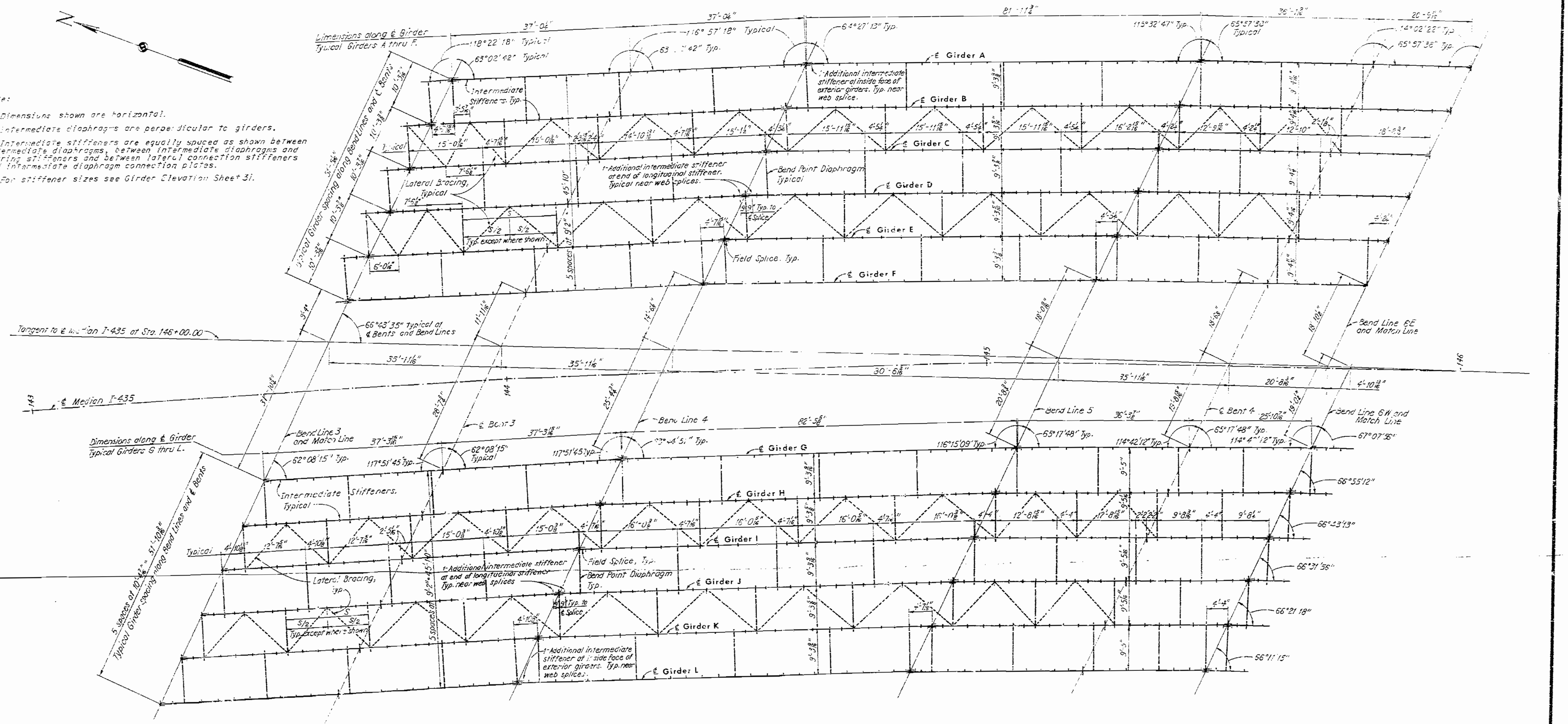
Note:

Dimensions shown are horizontal.

Intermediate diaphragms are perpendicular to girders.

Intermediate stiffeners are equally spaced as shown between intermediate diaphragms, between intermediate diaphragms and bearing stiffeners and between lateral connection stiffeners and intermediate diaphragm connection plates.

For stiffener sizes see Girder Elevation Sheet 31.



HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY — NEW YORK
ADS. JSH DATE 4-12-67 CHECKED L.W.R. DATE 5-10-67

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

FRAMING PLAN
BEND LINE 3 TO BEND LINE 6

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 27 OF 49

A-1686

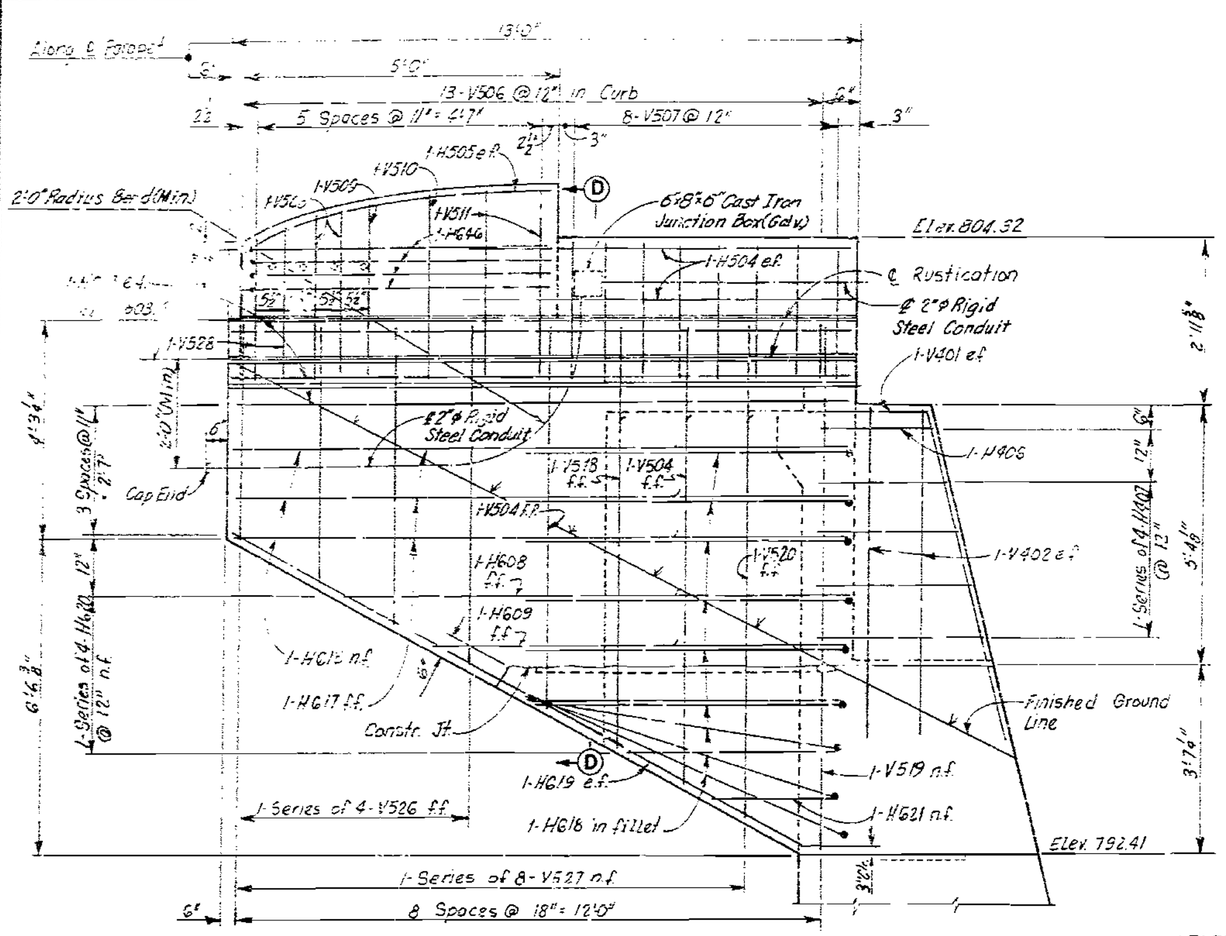
64

10-12-01

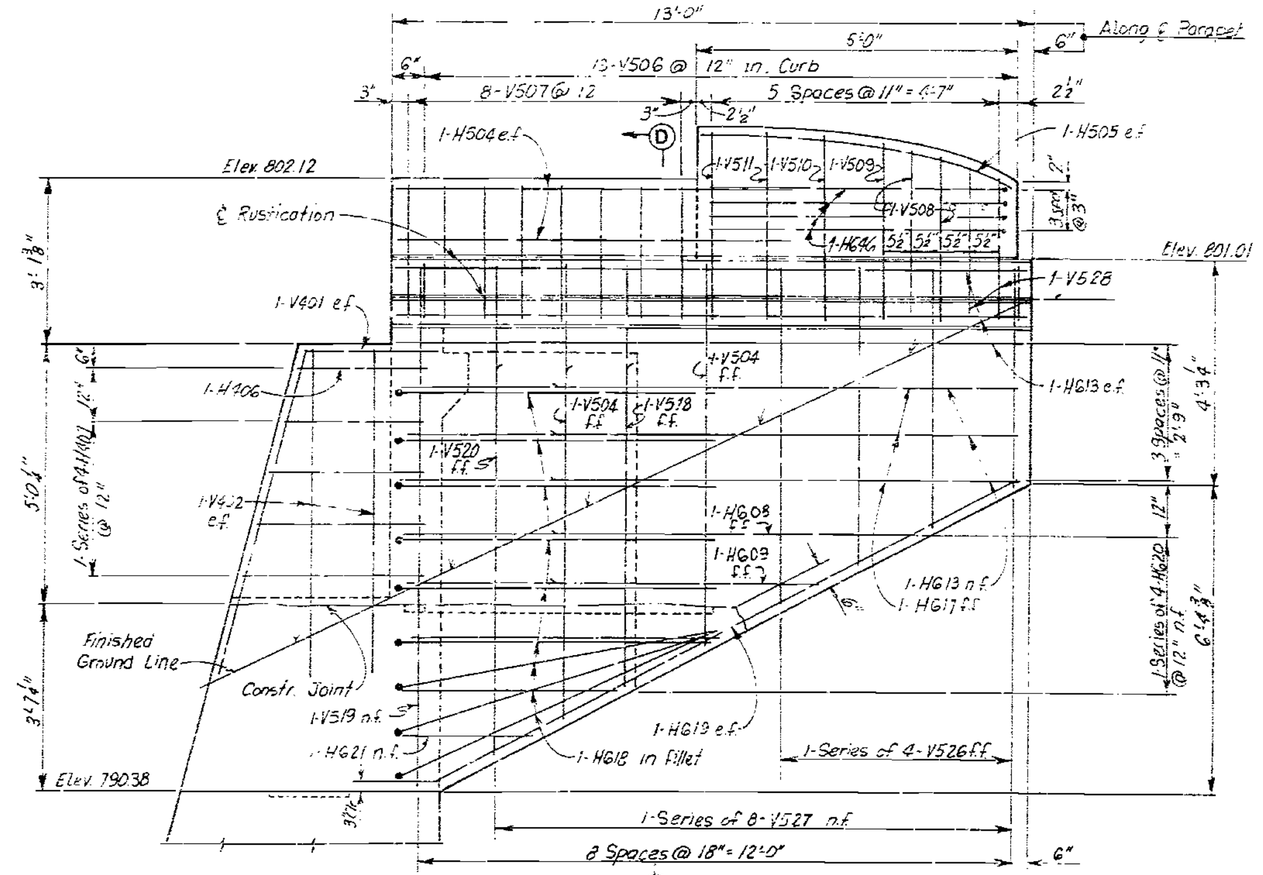
FOR INFORMATION ONLY

A16866, Sht. 34

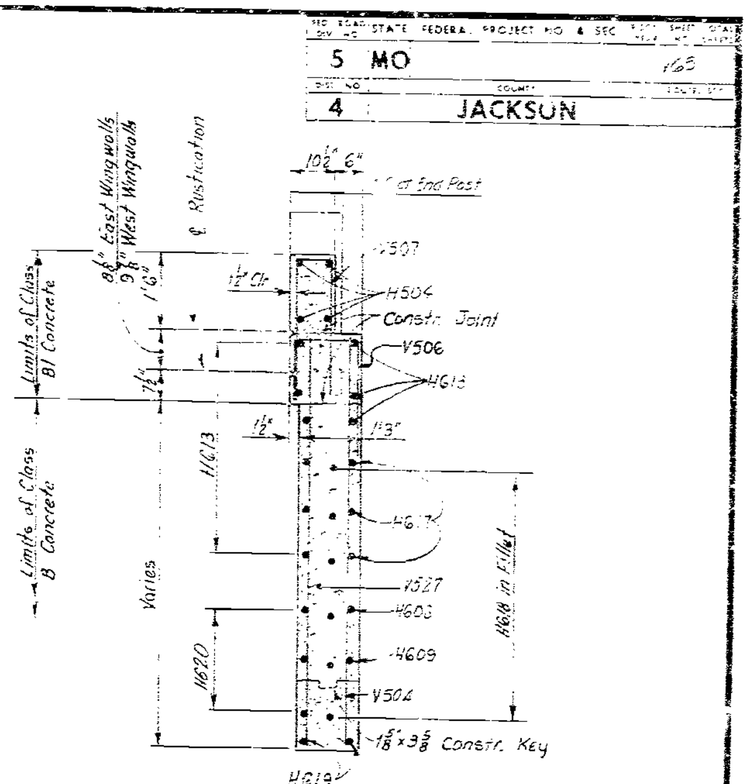
MISSOURI STATE HIGHWAY DEPARTMENT



EAST WINGWALL ELEVATION (NORTHBOUND)

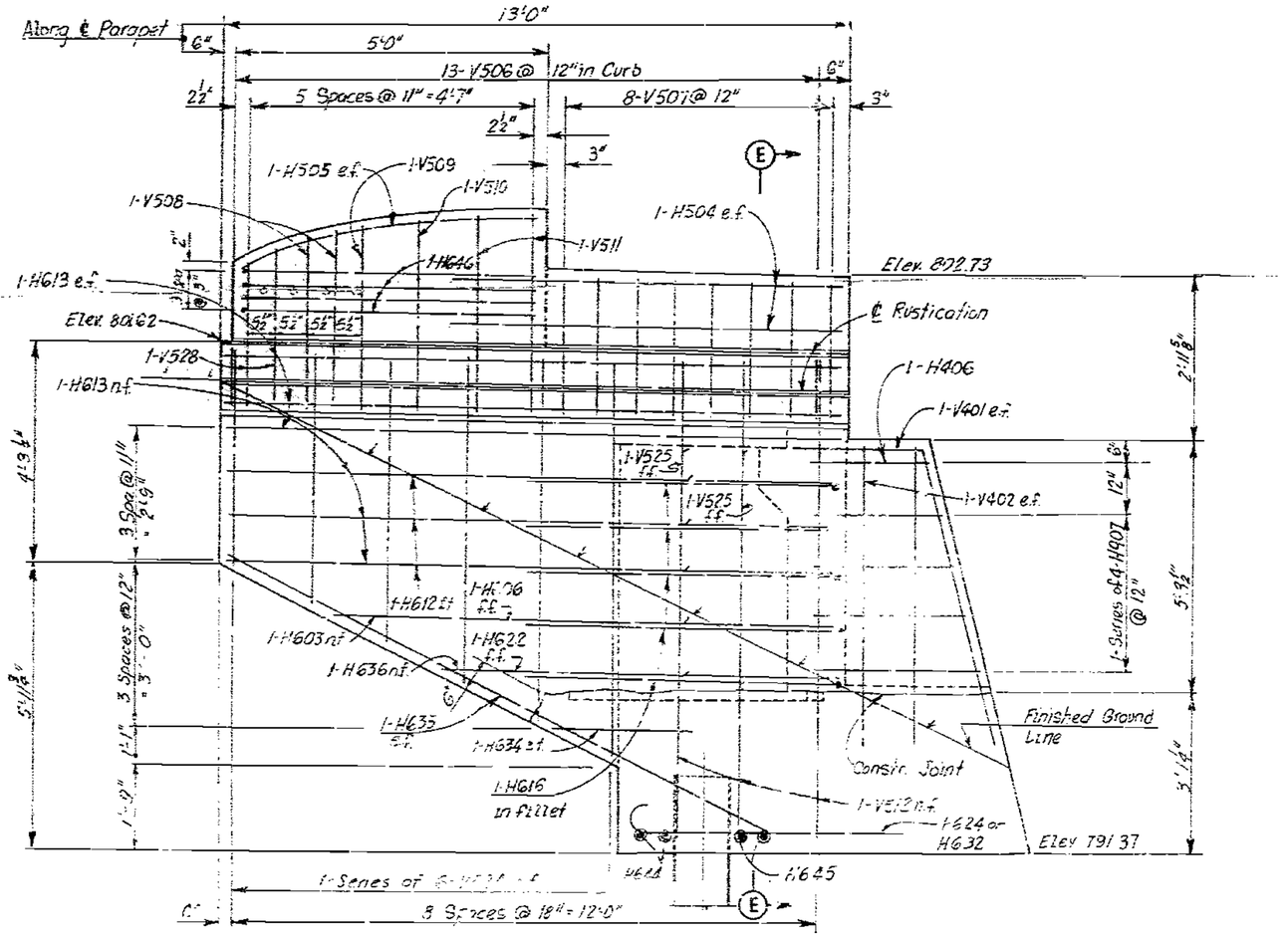


WEST WINGWALL ELEVATION (NORTHBOUND)

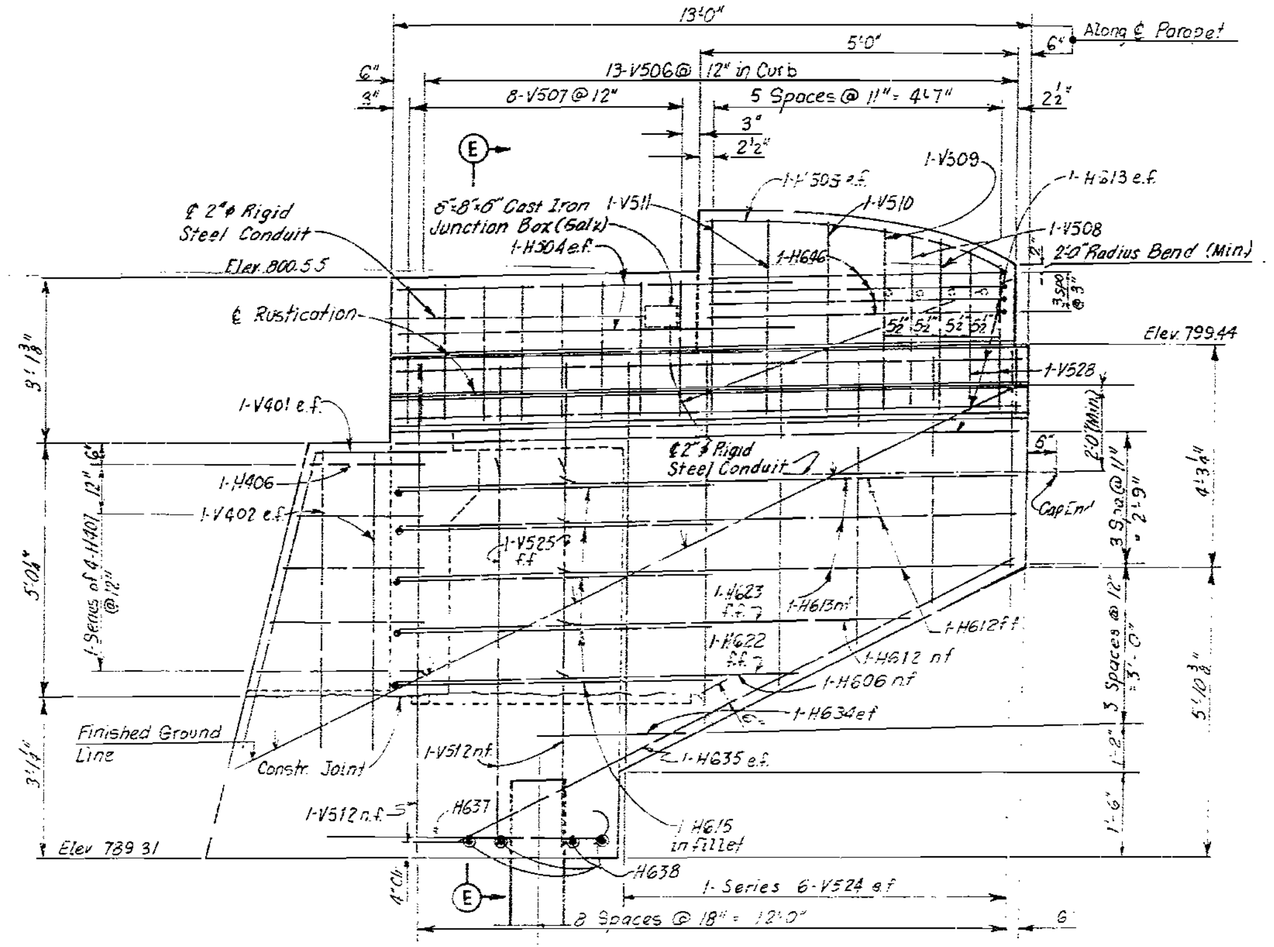


SECTION D-D

LEGEND:
e.f. = each face
f.f. = far face
n.f. = near face

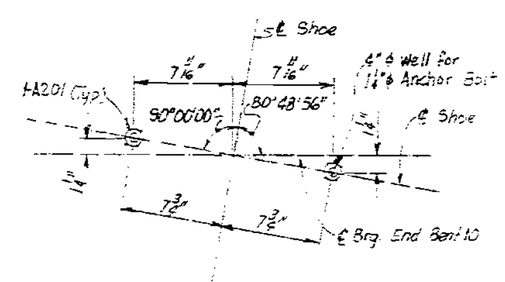


EAST WINGWALL ELEVATION (SOUTHBOUND)



WEST WINGWALL ELEVATION (SOUTHBOUND)

Notes:
For reinforcement Schedule, see Sheet 9
For placement of reinforcing in fillets, see Sections B-E and C-C, Sheet 23 or 24.
For Rustication Details, see Sheet 16.
Provide 2" clear from face of Concrete to reinforcing steel, unless otherwise shown.
For Concrete End Post Details, see Sheet 15
For Section E-E similar to Section E-E End Bent 1, see Sheet 16.



ANCHOR BOLT SETTING PLAN
END BENT 10 (NORTHBOUND LANE)

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L.
141+00.56 S.B.L.

JACKSON COUNTY

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

MADE DWG DATE 4-13-67 CHECKED AHH DATE 12-26-67. NOTE: This drawing is not to scale. Follow dimensions.

END BENT 10E AND 10W DETAILS

SHEET 25 OF 49

A-1686

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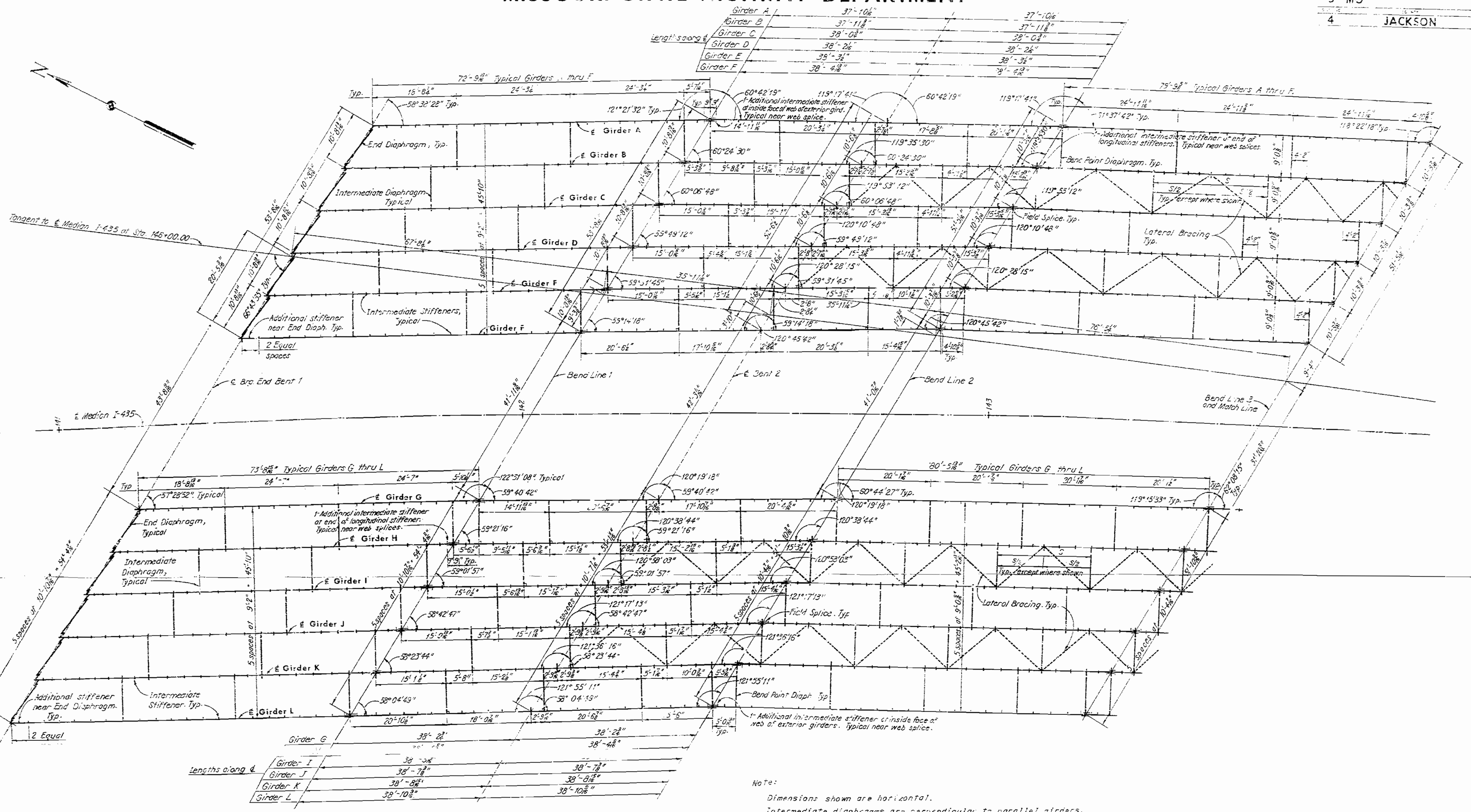
92

FOR INFORMATION ONLY

A16866, Sht. 35

MISSOURI STATE HIGHWAY DEPARTMENT

5	MO
4	JACKSON



Note:

Dimensions shown are horizontal.

Intermediate diaphragms are perpendicular to parallel girders. Where girders are not parallel, normal connection shall be to girder marked 1.

Intermediate stiffeners are equally spaced as shown between intermediate diaphragms, between intermediate diaphragms and bearing stiffeners and between lateral connection stiffeners and intermediate diaphragm connection plates.

For stiffener sizes see Girder Elevation Sheet 30.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE JSH DATE 4-11-67 CHECKED JAE DATE 4-12-67

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

FRAMING PLAN
END BENT 1 TO BEND LINE 3

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+44.49 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

SHEET 26 OF 49

A-1686

63

10-09-21

FOR INFORMATION ONLY

A16866, Sht. 36

MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
5 MO		165	
DIST. NO.	COUNTY	ROUTE SEC.	
4	JACKSON		

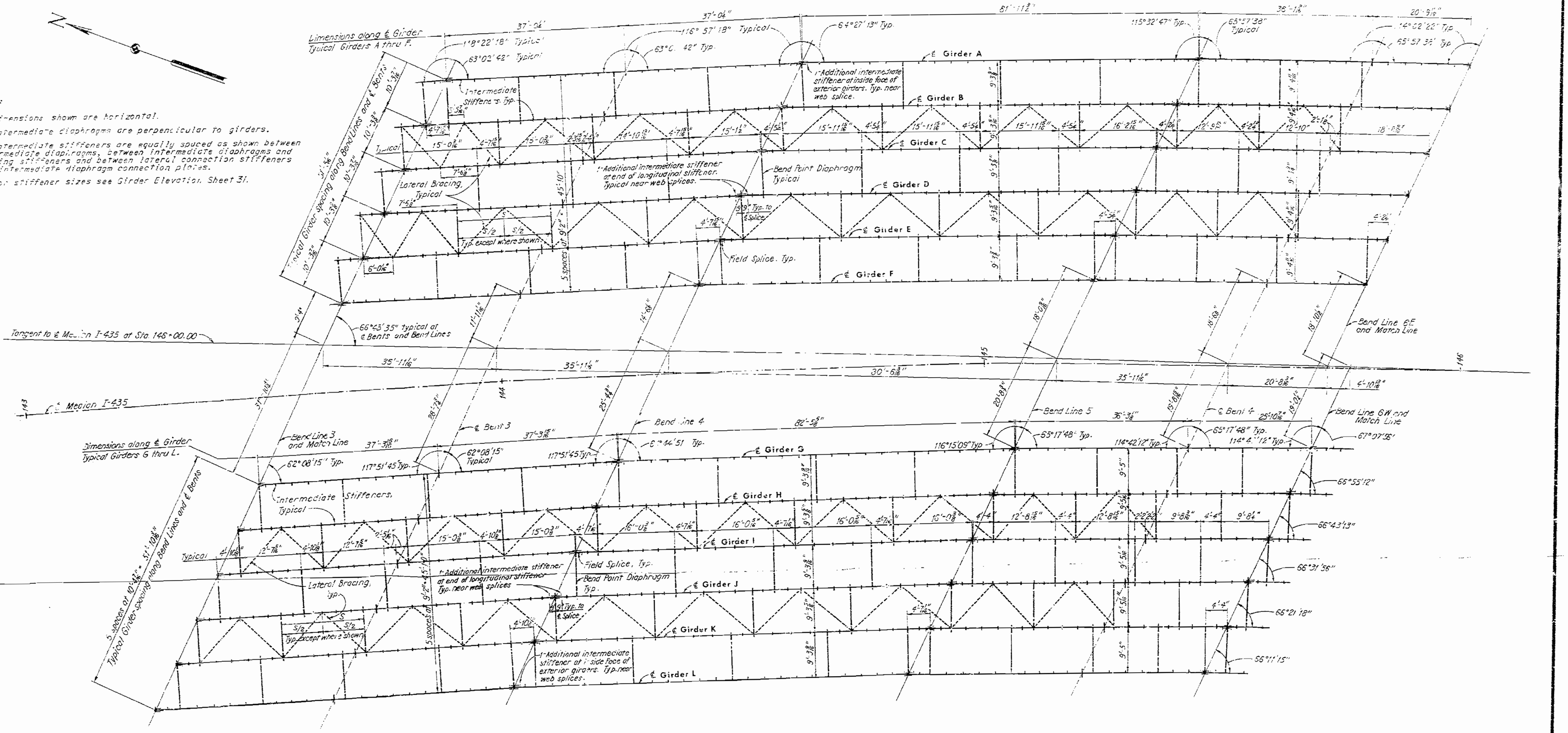
Note:

Dimensions shown are horizontal.

Intermediate diaphragms are perpendicular to girders.

Intermediate stiffeners are equally spaced as shown between intermediate diaphragms, between intermediate diaphragms and bearing stiffeners and between lateral connection stiffeners and intermediate diaphragm connection plates.

For stiffener sizes see Girder Elevation, Sheet 31.



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

DRAWN	DATE	CHECKED	DATE
JSH	4-12-67	L.J.B.	5-10-67

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

FRAMING PLAN
BEND LINE 3 TO BEND LINE 6

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 27 OF 49

A-1686

19 of 31 of 64

FOR INFORMATION ONLY

A16866, Sht. 37

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD STATE PROJECT NO. & SEC. LOCAL SHEET TOTAL SHEET NO. DESIGN
5 MC 4 JACKSON

BRIDGE OVER K.C.S. R.R. , M.P.R.R., K.C.TERM. & S.F.R.R.
STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1[52] (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY
SHEET 28 OF 49
A-1686

FRAMING PLAN
BEND LINE 6 TO BEND LINE 9

Note:
Dimensions shown are horizontal.
Intermediate stiffeners are equally spaced as shown between intermediate diaphragms or between intermediate diaphragms and bearing stiffeners. For stiffener sizes see Girder Elevation Sheet 32.
For girder details near hanger, see Sheet 40.

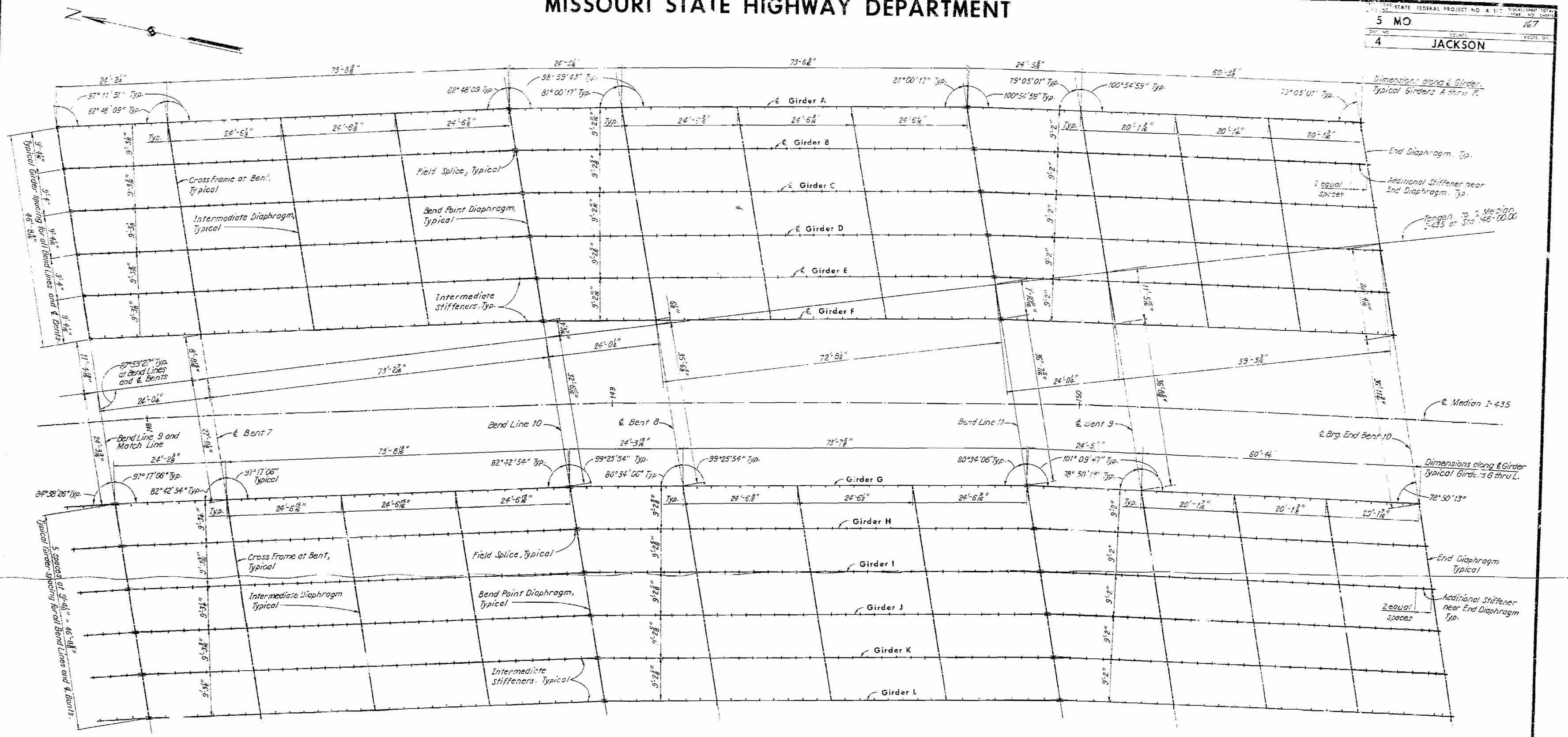
NOTE: This drawing is not to scale. Follow dimensions.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE JSH DATE 12-19-67 CHECKED J.E.H. DATE 6-9-67

MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
5 MO			67

DIST. NO.	COUNTY	ROUTE NO.
4	JACKSON	



Note:

Dimensions shown are horizontal.

Intermediate stiffeners are equally spaced as shown between intermediate diaphragms or between intermediate diaphragms and bearing stiffeners.

For stiffener sizes see Girder Elevation Sheet 33.

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

MADE JSH DATE 6-13-67 CHECKED S S H DATE 5-9-67

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

FRAMING PLAN
BEND LINE 9 TO END BENT 10

BRIDGE OVER K.C.S. R.R. , M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.18 N.B.L. 141+00.06 S.B.L.

JACKSON COUNTY

SHEET 29 OF 49

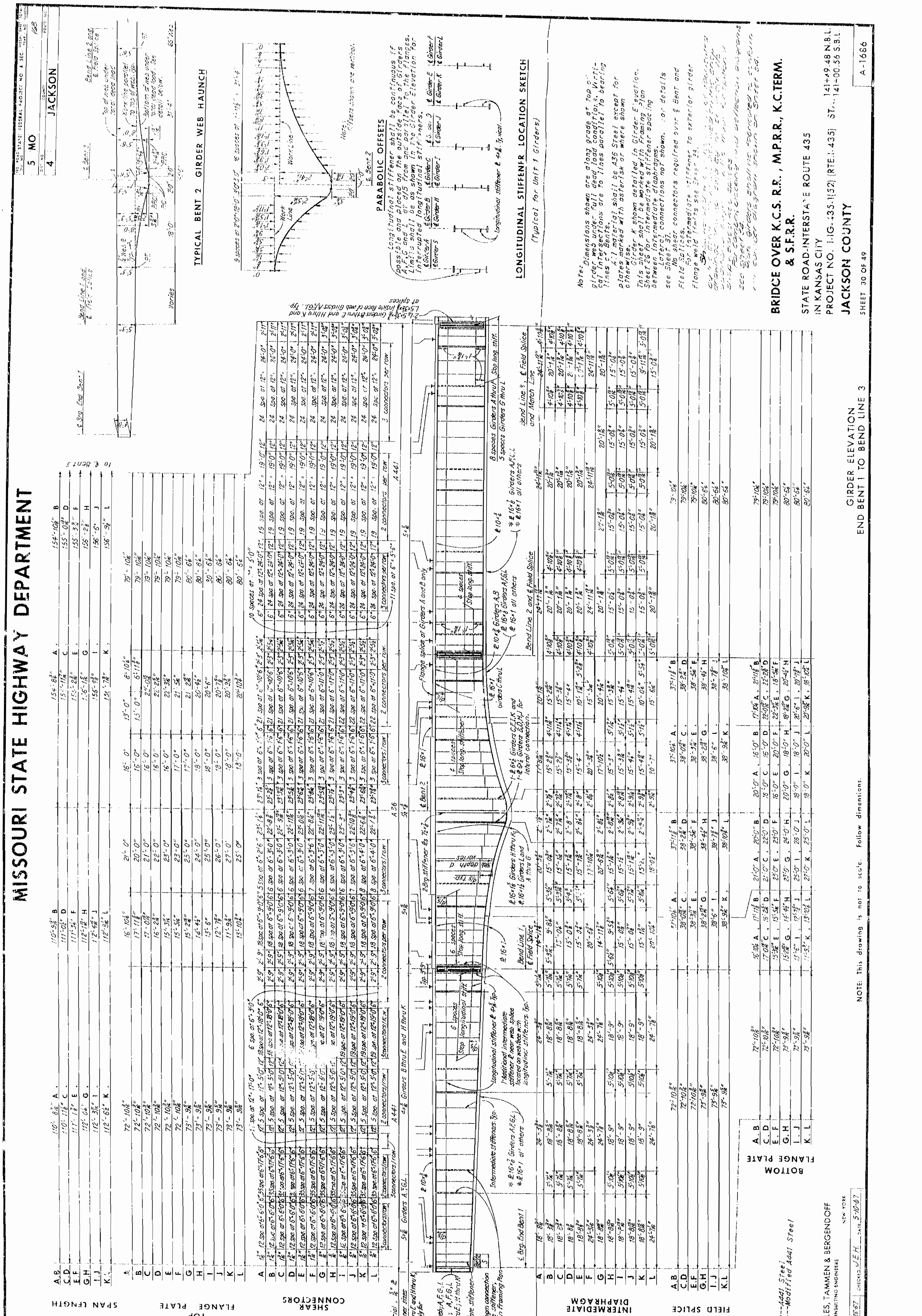
A-1686

99

FOR INFORMATION ONLY

A16866, Sht. 39

FOR INFORMATION ONLY **A16866, Sht. 40**

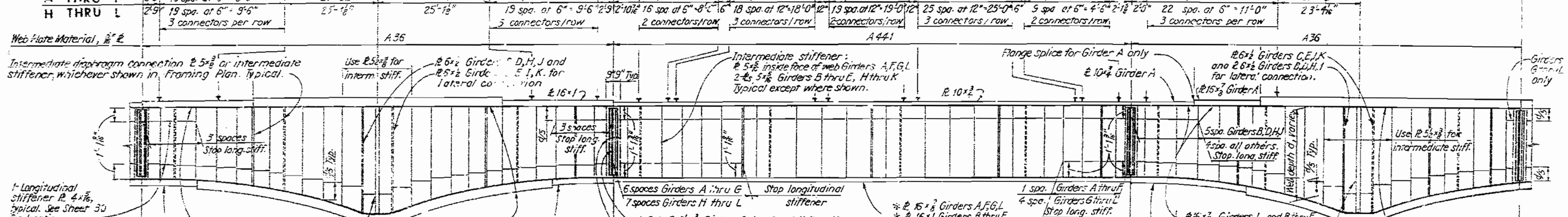


MISSOURI STATE HIGHWAY DEPARTMENT

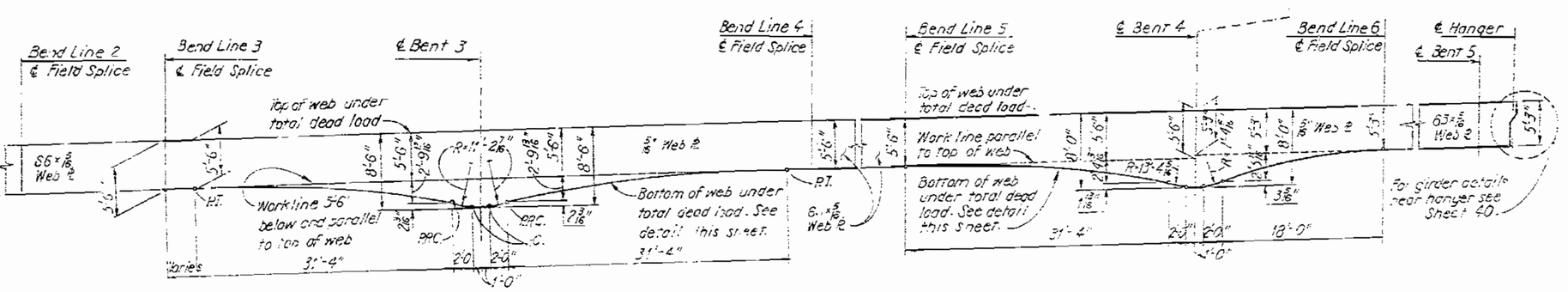
STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
5 MO			169
COUNTY			ROUTE NO.
4 JACKSON			

FOR INFORMATION ONLY

SPAN LENGTH		Bend Line 3 & Field Splice and Match Line		℄ Bent 3				℄ Bent 4		Bend Line 6 & Field Splice and Match Line
A THRU F		Dimension to ℄ Bent 2 varies.				155'-2⅜"				Dimension to ℄ Bent 5 varies.
G THRU L		See Girder Elevation Sheet				156'-2¼"				See Girder Elevation Sheet
TOP FLANGE PLATE	A	13'-0⅞"	26'-0"	26'-0"	13'-0⅛"	82'-0⅜"	7'-1⅞" 13'-0"	16'-0"		20'-9⅛"
	B	13'-0⅞"	26'-0"	26'-0"	13'-0⅛"	82'-0⅛"		16'-0"		20'-9⅛"
	C	13'-0⅞"	26'-0"	26'-0"	13'-0⅛"	82'-0⅛"		16'-0"		20'-9⅛"
	D,E	13'-0⅞"	26'-0"	26'-0"	13'-0⅛"	82'-0⅛"		16'-0"		20'-9⅛"
	F	13'-0⅛"	26'-0"	26'-0"	13'-0⅛"	82'-0⅜"		16'-0"		20'-9⅛"
	G	13'-4⅝"	24'-0"	24'-0"	13'-4⅝"	82'-6⅛"		16'-0"		25'-10⅜"
	H,I	10'-4⅝"	27'-0"	27'-0"	10'-4⅝"	82'-6⅛"		16'-0"		25'-10⅜"
	J	10'-4⅝"	27'-0"	27'-0"	10'-4⅝"	82'-5⅛"		16'-0"		25'-10⅜"
	K	10'-4⅝"	27'-0"	27'-0"	10'-4⅝"	82'-5⅛"		16'-0"		25'-10⅜"
	L	13'-4⅝"	24'-0"	24'-0"	13'-4⅝"	82'-6⅛"		16'-0"		25'-10⅜"
BOTTOM FLANGE PLATE	A	9'-0⅞"	28'-0"	28'-0"	9'-0⅞"	82'-0⅜"		16'-0"		20'-9⅛"
	B	11'-0⅞"	26'-0"	26'-0"	11'-0⅛"	82'-0⅜"		16'-0"		20'-9⅛"
	C	11'-0⅞"	26'-0"	26'-0"	11'-0⅛"	82'-0⅛"		16'-0"		20'-9⅛"
	D,E	11'-0⅞"	26'-0"	26'-0"	11'-0⅛"	82'-0⅛"		16'-0"		20'-9⅛"
	F	9'-0⅞"	28'-0"	28'-0"	9'-0⅞"	82'-0⅛"		16'-0"		20'-9⅛"
	G	9'-4⅝"	28'-0"	28'-0"	9'-4⅝"	82'-6⅛"		16'-0"		25'-10⅛"
	H,I	10'-4⅝"	27'-0"	27'-0"	10'-4⅝"	82'-6⅛"		16'-0"		25'-10⅛"
	J	10'-4⅝"	27'-0"	27'-0"	10'-4⅝"	82'-6⅛"		16'-0"		25'-10⅛"
	K	10'-4⅝"	27'-0"	27'-0"	10'-4⅝"	82'-6⅛"		16'-0"		25'-10⅛"
	L	9'-4⅝"	28'-0"	28'-0"	9'-4⅝"	82'-6⅛"		16'-0"		25'-10⅛"
SHEAR CONNECTORS										
A THRU F		2-9" 19 spa. at 6"= 9'-6"	24'-9⅞"	24'-9⅛"	19 spa. at 6"= 9'-6" 2-9" 2-10⅜" 13 spa. at 6"= 6'-6" 6" 22 spa. at 12"=22'-0" 12" 14 spa. at 12"=14'-0" 12"	25 spa. at 12"=25'-0" 6"	13 spa. at 6"= 6'-6" 2-1⅝" 2'-0"	22 spa. at 6" = 11'-0"		23'-1½"
H THRU L		2-9" 19 spa. at 6"= 9'-6"	23'-1⅝"	25'-1⅜"	19 spa. at 6"= 9'-6" 2-9" 2-10⅜" 16 spa. at 6"= 8'-0" 16 18 spa. at 12"=18'-0" 12"	13 spa. at 12"=19'-0" 12"	25 spa. at 12"=25'-0" 6"	5 spa. at 6"= 2-1⅜" 2'-0"	22 spa. at 6" = 11'-0"	23'-4⅞"
		3 connectors per row		5 connectors/row	2 connectors/row 3 connectors/row	2 connectors/row	3 connectors/row	2 connectors/row	3 connectors per row	
Web Plate Material, ⅜" ℄		A36		A441					A36	



FIELD SPLICE										
A THRU F		37'-0⅛"		37'-0⅛"		82'-0⅜"		36'-12"		20'-9⅛"
G THRU L		37'-4⅜"		37'-4⅜"		82'-5⅛"		36'-4⅜"		25'-10⅜"
INTERMEDIATE DIAPHRAGM	A	15'-0¼"	13'-8½"	17'-2⅞"	19'-9⅝"	20'-5⅜"	20'-5⅜"	20'-5⅜"	20'-6½"	17'-0⅝" 17'-0⅝" 2'-1⅝" 20'-9⅜"
	B	4'-7⅛" 10'-4⅝" 4'-8"	15'-0¼"	2'-5⅜" 2'-4"	14'-10⅜"	4'-5⅛"	15'-1⅜"	4'-5¼"	16'-0⅛"	4'-5¼" 16'-0⅛" 4'-5¼" 16'-3" 4'-2¼" 12'-10⅜" 4'-2⅝" 12'-10⅜" 2'-1⅝" 2'-1⅝" 18'-8⅛"
	C,D	15'-0¼"	4'-8" 15'-0¼"	2'-4"	14'-10⅜"	4'-5⅛"	15'-1⅜"	4'-5¼"	16'-0⅛"	4'-5¼" 16'-0⅛" 4'-5¼" 16'-3" 4'-2¼" 12'-10⅜" 4'-2⅝" 12'-10⅜" 2'-1⅝" 2'-1⅝" 18'-8⅛"
	E	15'-0¼"	4'-8" 15'-0¼"	2'-4"	14'-10⅜"	4'-0" 10'-5⅜" 4'-1⅛"		4'-5¼"	16'-0⅛"	4'-5¼" 16'-0⅛" 4'-5¼" 11'-9⅜" 4'-2¼" 12'-10⅜" 4'-2⅝" 12'-10⅜" 2'-1⅝" 2'-1⅝" 14'-6⅛" 4'-2⅝"
	F	13'-8⅜"	17'-5⅛"	13'-6⅜"	15'-1⅜"	4'-5¼"	20'-5⅜"	20'-5⅜"	16'-3"	4'-2¼" 17'-0⅝" 14'-11⅝" 2'-1⅝" 18'-8⅛"
	G	17'-5½"	17'-5½"	11'-5½"	19'-10⅝"	20'-7½"	20'-7½"	20'-7½"	20'-7⅞"	17'-1" 17'-1¼" 2'-2" 11'-10⅝" 14'-0⅝"
	H,I,J	4'-10⅛" 12'-7⅜" 4'-10⅜"	12'-7⅜"	2'-5¼" 15'-0⅛"	4'-10⅛" 15'-0⅛"	4'-7⅛"	16'-0⅛"	4'-7⅛"	16'-0⅛"	4'-4" 12'-9" 4'-4⅛" 12'-9" 2'-2" 2'-2" 9'-8⅝" 4'-4" 9'-8⅝"
	K	4'-10⅜" 12'-7⅜" 4'-10⅜"	12'-7⅜"	2'-5¼" 15'-0⅛"	4'-10⅛" 10'-2⅜" 4'-10⅜"	4'-7⅛"	16'-0⅛"	4'-7⅛"	16'-0⅛"	4'-4" 11'-5⅜" 4'-4" 12'-9" 4'-4⅛" 12'-9" 2'-2" 2'-2" 9'-8⅝" 4'-4" 5'-4⅝" 4'-4"
	L	4'-10⅜" 17'-5⅜"	15'-0⅛"	2'-5¼" 19'-10⅝"	15'-0⅛"	4'-7⅛"	20'-7⅛"	20'-7⅛"	16'-0⅛"	4'-4" 17'-1⅛" 14'-11" 2'-2" 14'-0⅛" 9'-8⅛"



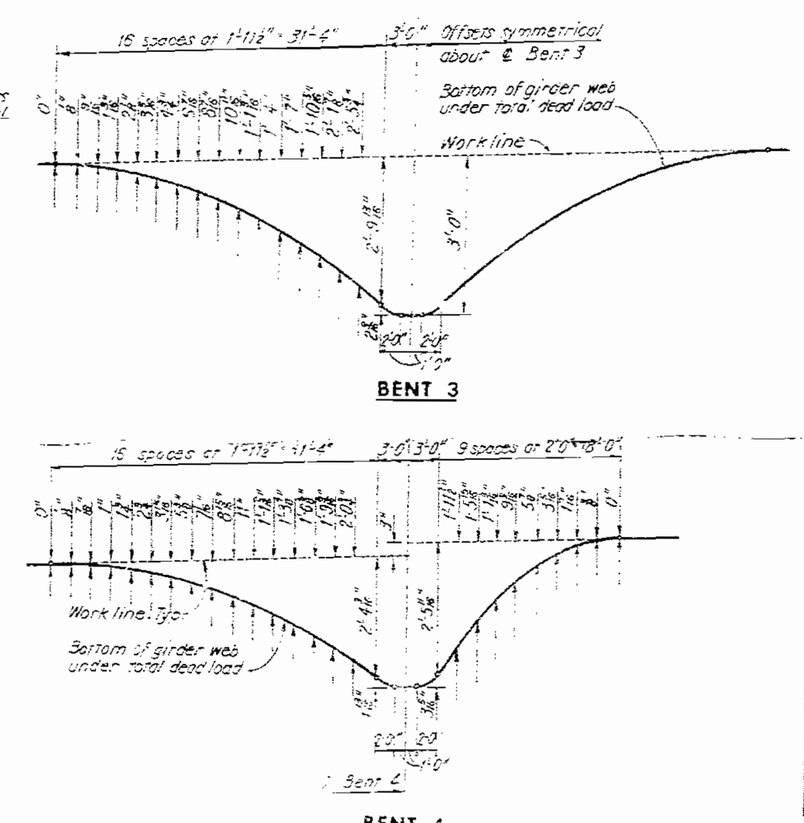
LEGEND

** ---A441 Steel

* ---Modified A441 Steel

TYPICAL BENT 3 AND BENT 4 GIRDER WEB HAUNCH

GIRDER ELEVATION
BEND LINE 3 TO BEND LINE 6



Note:
Offsets shown are vertical.

PARABOLIC OFFSETS

Note:
Dimensions shown are along grade at top of girder web under full dead load conditions. Vertical intersections are to lines parallel to bearing lines at Bents.

All material shall be A36 Steel except for plates marked with asterisk or where shown otherwise.

Girder K shown detailed on Girder Elevation. This sheet shall be worked with Framing Plan Sheet 27 for intermediate stiffener spacing between intermediate diaphragms.

Lateral connections not shown. For details see Sheet 29.

No shear connectors required over ℄ Bent and Field Splices

For girder web haunch details see Unit 1 Typical Girder Web Details, Sheets 30 and 31.

For intermediate stiffener to exterior girder flange weld limits see Sheet 33.

One shop welded girder web splice will be permitted in any girder which requires a web plate length greater than 50'-0". See Sheet 28 for details of shop welded web splice.

For Camber, Blocking and Deflection Diagram see Sheet 34.

Plate girders shall be fabricated to conform with Camber Diagram shown on Sheet 34.

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

MADE J.S.H. DATE 4-17-67 CHECKED A.N.H. DATE 5-10-67

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 31 OF 49 A-1686

1969 11-01

A16866, Sht. 41

MISSOURI STATE HIGHWAY DEPARTMENT

FOR INFORMATION ONLY

FED. ROAD STATE	FEDERAL PROJECT NO.	SEC	MISCELLANEOUS FEDERAL NO.	SHEETS NO.
5 MO				175
DIST. NO.	COUNTY			RELATIVE NO.
4	JACKSON			

LEGEND

* ..... Modified A441 Steel

** ..... A441 Steel

PT ..... Shop Web Splice radiographic Testing. See Welding Notes, Sheet 38.

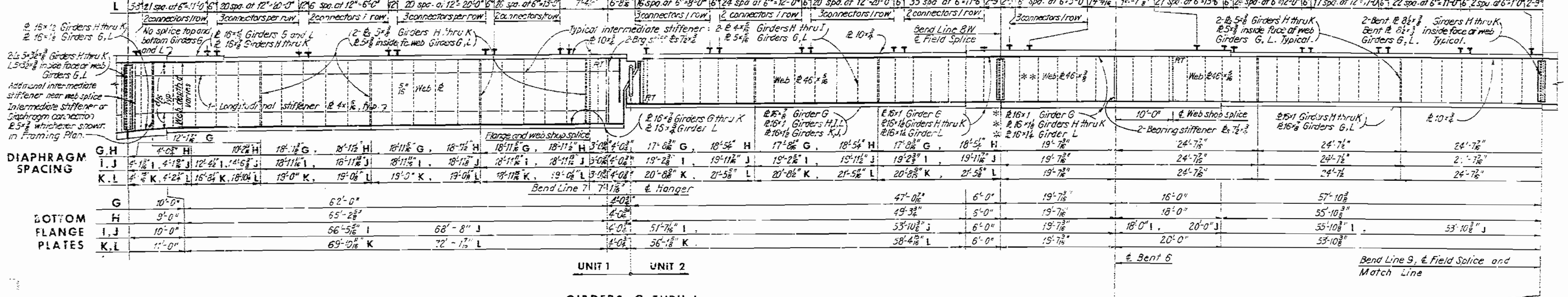
Bend Line 5A & Field Splice and Match Line — To ℄ Bent 4 — ℄ Bent 5 — ℄ Bent 7

SPAN LENGTH	G.H	97'-10⅜" G.	100'-1⅞" H	76'-8⅜" G.	76'-11⅛" H	96'-0⅜"			
	I.J	102'-5⅜" I.	104'-5⅛" J	81'-3" I.	83'-6⅛" J	99'-0⅜"			
	K.L	106'-3⅛" K.	105'-7" L	85'-3⅜" K.	88'-0" L	98'-0⅜"			
FIELD SPLICE	G.H	72'-0" G.	74'-2⅛" H	4'-0⅜" 53'-0⅜" G.	55'-3⅞" H	17'-7⅛"	73'-10⅛"		
	I.J	76'-5⅛" I.	78'-6" J	4'-0⅜" 57'-7⅛" I.	59'-10⅜" J	19'-7⅛"	73'-10⅜"		
	K.L	80'-10⅛" K.	83'-1⅜" L	4'-0⅜" 62'-1⅝" K.	64'-4⅝" L	19'-7⅛"	73'-10⅜"		
TOP FLANGE PLATES	G.H	20'-0" 9'-0" H 10'-0"	52'-0" G.	55'-2⅛" H	4'-0⅜" 47'-0⅜" G.	4'-9⅜" H 6'-0"	19'-7⅛"	18'-0" G. 20'-0" H	55'-10⅜" G. 53'-10⅜" H
	I.J	10'-0" 10'-0"	56'-5⅛" I.	58'-8" J	4'-0⅜" 51'-7⅛" I.	5'-7⅜" J 6'-0"	19'-7⅛"	22'-0" I. 24'-0" J	51'-10⅛" I. 49'-10⅛" J
	K.L	11'-0" 10'-0"	55'-10⅜" K.	62'-1⅞" L	4'-0⅜" 56'-1⅝" K.	5'-0" 58'-4⅝" L 6'-0"	19'-7⅛"	24'-0"	49'-10⅜"

SHEAR CONNECTOR SPACING

	G	3-3.21 spa. at 6"=1'-0" 6"	37 spa. at 12"=37'-0"	6" 26 spa. at 6"=13'-0"	7'-3"	6"-6⅝" 16 spa. at 6"=8'-0" 6"	24 spa. at 6"=12'-0" 6"	9 spa. at 12"=9'-0" 6" 36 spa. at 6"=18'-0" 2'-3" 6 spa. at 6"=3'-0" 14⅛"	14'-7⅞" 21 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	H	3-3.21 spa. at 6"=1'-0" 6"	39 spa. at 12"=39'-0"	6" 26 spa. at 6"=13'-0"	7'-5⅝"	6"-7⅛" 16 spa. at 6"=8'-0" 6"	24 spa. at 6"=12'-0" 6"	11 spa. at 12"=11'-0" 6" 35 spa. at 6"=17'-6" 2'-3" 5 spa. at 6"=3'-0" 14⅛"	14'-7⅞" 21 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	I	3-3.21 spa. at 6"=1'-0" 6"	41 spa. at 12"=41'-0"	6" 25 spa. at 6"=12'-6"	7'-8⅜"	6"-7⅝" 17 spa. at 6"=8'-6" 6"	24 spa. at 6"=12'-0" 6"	13 spa. at 12"=13'-0" 6" 35 spa. at 6"=17'-6" 2'-3" 6 spa. at 6"=3'-0" 14⅛"	14'-7⅞" 21 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	J	3-3.21 spa. at 6"=1'-0" 6"	43 spa. at 12"=43'-0"	6" 26 spa. at 6"=13'-0"	7'-11⅜"	6"-8⅛" 17 spa. at 6"=8'-6" 6"	24 spa. at 6"=12'-0" 6"	15 spa. at 12"=15'-0" 6" 35 spa. at 6"=17'-6" 2'-3" 6 spa. at 6"=3'-0" 14⅛"	14'-7⅞" 21 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	K	3-3.21 spa. at 6"=1'-0" 6" 20 spa. at 12"=20'-0" 6"	4 spa. at 12"=4'-0" 6" 20 spa. at 12"=20'-0" 6"	25 spa. at 6"=12'-6" 6"	7'-11⅝"	6"-8⅜" 16 spa. at 6"=8'-0" 6"	24 spa. at 6"=12'-0" 6"	18 spa. at 12"=18'-0" 6" 35 spa. at 6"=17'-6" 2'-3" 6 spa. at 6"=3'-0" 14⅛"	14'-7⅞" 21 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	L	3-3.21 spa. at 6"=1'-0" 6" 20 spa. at 12"=20'-0" 6"	6 spa. at 12"=6'-0" 6" 20 spa. at 12"=20'-0" 6"	26 spa. at 6"=13'-0" 6"	8'-0⅛"	6"-8⅝" 16 spa. at 6"=8'-0" 6"	24 spa. at 6"=12'-0" 6"	20 spa. at 12"=20'-0" 6" 35 spa. at 6"=17'-6" 2'-3" 6 spa. at 6"=3'-0" 14⅛"	14'-7⅞" 21 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"

2 connectors/row | 3 connectors/row | 2 connectors/row | 3 connectors/row | 2 connectors/row | 2 connectors/row | 3 connectors/row | 2 connectors/row | 3 connectors/row | 2 connectors/row | 3 connectors/row



DIAPHRAGM SPACING

	G.H	4'-0" H 19'-7⅛" H	18'-1⅜" G. 18'-11⅝" H	18'-11⅝" G. 18'-11⅝" H	3'-0⅜" 4'-0⅜" G. 17'-0⅛" G. 18'-5⅝" H	17'-0⅛" G. 18'-5⅝" H	19'-7⅛"	24'-7⅛"	24'-7⅛" 24'-7⅛"
	I.J	4'-1⅜" 4'-1⅜" J 12'-6⅝" 14'-5⅜" J	18'-11⅝" I. 18'-11⅝" J	18'-11⅝" I. 18'-11⅝" J	3'-0⅜" 4'-0⅜" I. 19'-2⅝" I. 19'-11⅝" J	19'-2⅝" I. 19'-11⅝" J	19'-7⅛"	24'-7⅛"	24'-7⅛" 2'-1⅜"
	K.L	4'-2⅜" K. 4'-2⅜" L 16'-8⅜" K. 18'-0⅜" L	19'-0" K. 19'-0⅜" L	19'-0" K. 19'-0⅜" L	3'-0⅜" 4'-0⅜" K. 20'-8⅜" K. 21'-5⅜" L	20'-8⅜" K. 21'-5⅜" L	19'-7⅛"	24'-7⅛"	24'-7⅛"

Bend Line 7 — 7'-1⅛" — ℄ Hanger

BOTTOM FLANGE PLATES	G	10'-0"	62'-0"	2'-0⅜"		47'-0⅞"	6'-0"	19'-7⅛"	16'-0" 57'-10⅜"
	H	9'-0"	65'-2⅝"	4'-0⅜"		49'-3⅜"	5'-0"	19'-7⅛"	16'-0" 55'-10⅜"
	I.J	10'-0" 10'-0"	56'-5⅝" I. 68'-8" J	4'-0⅜" 51'-7⅛" I.		53'-10⅜" J	6'-0"	19'-7⅛"	18'-0" I. 20'-0" J 55'-10⅜" I. 53'-10⅜" J
	K.L	11'-0" 10'-0"	69'-10⅛" K 72'-1⅞" L	4'-0⅜" 56'-1⅝" K.		58'-4⅝" L	6'-0"	19'-7⅛"	20'-0" 53'-10⅜"

UNIT 1 | UNIT 2

GIRDERS G THRU L

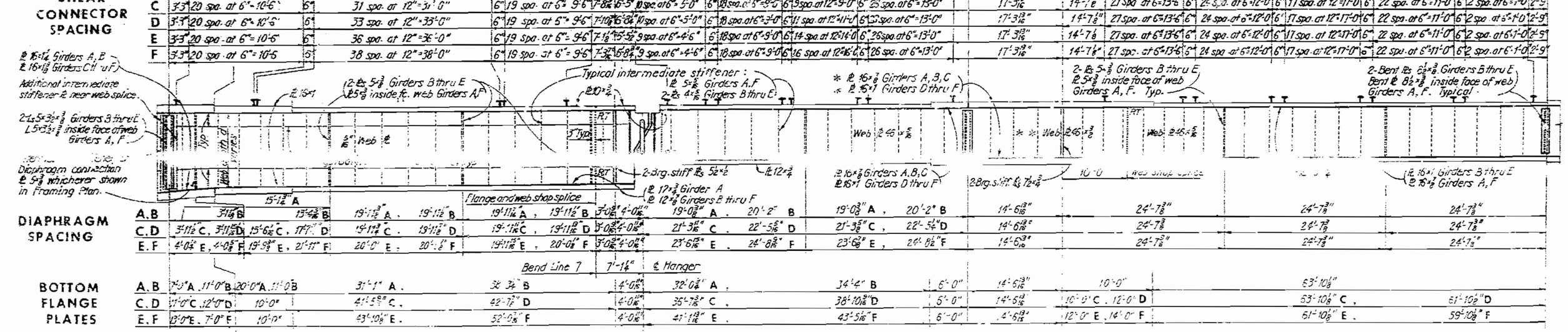
Bend Line 6E & Field Splice and Match Line — To ℄ Bent 4 — ℄ Bent 5 — Bend Line 8E & Field Splice — ℄ Bent 6 — To ℄ Bent 7

SPAN LENGTH	A.B	78'-10⅛" A.	81'-1⅛" B	36'-8½" A.	38'-11⅝" B				
	C.D	83'-3⅜" C.	85'-5⅛" D	61'-2⅜" C.	63'-6¼" D	98'-0½"			
	E.F	87'-7⅛" E.	89'-10¼" F	65'-9⅛" E.	68'-0⅝" F	98'-0½"			
FIELD SPLICE	A.B	58'-1" A.	60'-3¼" B	4'-0⅛" 38'-0⅜" A.	40'-4" B	14'-6⅛"	73'-10⅛"		
	C.D	62'-5⅛" C.	64'-7⅞" D	4'-0⅛" 42'-7⅝" C.	44'-10⅛" D	14'-6⅛"	73'-10⅛"		
	E.F	66'-10⅛" E.	69'-0⅛" F	4'-0⅛" 47'-1⅛" E.	49'-5⅜" F	14'-6⅛"	73'-10⅛"		
TOP FLANGE PLATES	A.B	7'-0" A. 11'-0" B 20'-0" A. 11'-0" B	31'-1" A.	33'-3½" B	4'-0⅛" 32'-0⅜" A.	34'-4" B 6'-0"	14'-6⅛"	10'-0"	63'-10⅛"
	C.D	11'-6"C. 12'-0" D 10'-0"	41'-5⅜" C.	42'-7⅞" D	4'-0⅛" 36'-7⅜" C.	38'-10⅛" D 6'-0"	14'-6⅛"	10'-0" C. 12'-0" D	63'-10⅛" C. 61'-10⅛" D
	E.F	13'-6"E. 7'-0" F 10'-0" E. 20'-6"F	43'-10⅛" E.	42'-10⅞" F	4'-0⅛" 41'-1⅛" E.	43'-5⅛" F 6'-0"	14'-6⅛"	14'-0" E. 16'-0" F	55'-10⅛" E 57'-10⅛" F

2 connectors per row | 3 connectors per row | 2 connectors / row | 3 connectors / row | 3 connectors / row | 2 connectors / row | 3 connectors / row | 2 connectors / row | 3 connectors / row | 2 connectors / row | 3 connectors / row

SHEAR CONNECTOR SPACING

	A	3-3.20 spa. at 6"=1'-6" 6"	27 spa. at 12"=27'-0"	6" 19 spa. at 6"=9'-6"	7'-4"	6"-6⅜" 9 spa. at 6"=4'-6" 6"	18 spa. at 6"=9'-0" 6" 5 spa. at 12"=5'-0" 6" 26 spa. at 6"=13'-0"	17'-3⅛"	14'-7⅝" 27 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	B	3-3.20 spa. at 6"=1'-6" 6"	23 spa. at 12"=23'-0"	6" 19 spa. at 6"=9'-6"	7'-6⅛"	6"-6⅜" 9 spa. at 6"=4'-6" 6"	18 spa. at 6"=9'-0" 6" 17 spa. at 12"=17'-0" 6" 26 spa. at 6"=13'-0"	17'-3⅛"	14'-7⅝" 27 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	C	3-3.20 spa. at 6"=1'-6" 6"	31 spa. at 12"=31'-0"	6" 19 spa. at 6"=9'-6"	7'-8⅝"	6"-6⅝" 9 spa. at 6"=4'-6" 6"	18 spa. at 6"=9'-0" 6" 11 spa. at 12"=11'-0" 6" 25 spa. at 6"=13'-0"	17'-3⅛"	14'-7⅝" 27 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	D	3-3.20 spa. at 6"=1'-6" 6"	33 spa. at 12"=33'-0"	6" 19 spa. at 6"=9'-6"	7'-11⅝"	6"-6⅝" 9 spa. at 6"=4'-6" 6"	18 spa. at 6"=9'-0" 6" 11 spa. at 12"=11'-0" 6" 25 spa. at 6"=13'-0"	17'-3⅛"	14'-7⅝" 27 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	E	3-3.20 spa. at 6"=1'-6" 6"	36 spa. at 12"=36'-0"	6" 19 spa. at 6"=9'-6"	7'-11⅞"	6"-6⅝" 9 spa. at 6"=4'-6" 6"	18 spa. at 6"=9'-0" 6" 14 spa. at 12"=14'-0" 6" 26 spa. at 6"=13'-0"	17'-3⅛"	14'-7⅝" 27 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"
	F	3-3.20 spa. at 6"=1'-6" 6"	38 spa. at 12"=38'-0"	6" 19 spa. at 6"=9'-6"	7'-11⅞"	6"-6⅝" 9 spa. at 6"=4'-6" 6"	18 spa. at 6"=9'-0" 6" 16 spa. at 12"=16'-0" 6" 26 spa. at 6"=13'-0"	17'-3⅛"	14'-7⅝" 27 spa. at 6"=13'-6" 6" 24 spa. at 6"=12'-0" 6" 17 spa. at 12"=17'-0" 6" 22 spa. at 6"=11'-0" 6" 2 spa. at 6"=1'-0" 2'-9"



DIAPHRAGM SPACING

	A.B	3'-1⅛" 15'-1⅛" B 13'-6⅛" B	19'-1⅜" A. 19'-11⅛" B	19'-11⅛" A. 19'-11⅝" B	3'-0⅜" 4'-0⅛" A. 19'-10⅞" A. 20'-2" B	19'-10⅞" A. 20'-2" B	14'-6⅛"	24'-7⅞"	24'-7⅞" 24'-7⅞"
	C.D	3'-11⅛" C. 3'-11⅝" D 15'-6⅝" C. 17'-7" D	19'-11⅛" C. 19'-11⅝" D	19'-11⅛" C. 19'-11⅝" D	3'-0⅜" 4'-0⅛" C. 21'-3⅜" C. 22'-5⅝" D	21'-3⅜" C. 22'-5⅝" D	14'-6⅛"	24'-7⅞"	24'-7⅞" 24'-7⅞"
	E.F	4'-0⅛" E. 4'-0⅛" F 19'-5⅜" E. 21'-1⅞" F	20'-0" E. 20'-3" F	19'-11⅛" E. 20'-0⅛" F	3'-0⅜" 4'-0⅛" E. 23'-6⅛" E. 24'-8⅜" F	23'-6⅛" E. 24'-8⅜" F	14'-6⅛"	24'-7⅞"	24'-7⅞" 24'-7⅞"

Bend Line 7 — 7'-1⅛" — ℄ Hanger

BOTTOM FLANGE PLATES	A.B	7'-0" A. 11'-0" B 20'-0" A. 11'-0" B	31'-1" A.	33'-3½" B	4'-0⅛" 32'-0⅜" A.	34'-4" B 6'-0"	14'-6⅛"	10'-0"	63'-10⅛"
	C.D	11'-6" C. 12'-0" D 10'-0"	41'-5⅜" C.	42'-7⅞" D	4'-0⅛" 36'-7⅜" C.	38'-10⅛" D 5'-0"	14'-5⅛"	10'-9" C. 12'-0" D	63'-10⅛" C. 61'-10⅛" D
	E.F	13'-6" E. 7'-0" F 10'-0"	43'-10⅛" E.	42'-10⅞" F	4'-0⅛" 41'-1⅛" E.	43'-5⅜" F 6'-0"	14'-6⅛"	12'-0" E. 14'-0" F	61'-10⅛" E. 59'-10⅛" F

UNIT 1 | UNIT 2

GIRDERS A THRU F

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

Note: Dimensions shown are along grade at top of girder web under full dead load conditions. Vertical intersections are to lines parallel to bearing lines at Bents.

All material shall be A36 Steel except for plates marked with asterisk.

Girders F and L detailed in Girder Elevation. This sheet shall be worked with Framing Plan Sheet 28 for intermediate stiffener spacing between intermediate diaphragms.

For girder web haunch details see Unit 1 Typical Girder Web Details, Sheets 30 and 31. For girder details near hanger, see Sheet 40. No shear connectors required at Bent and Field Splices.

For intermediate stiffener to ex. ior girder flange weld limits see Sheet 33.

One shop welded girder web splice will be permitted in any girder which requires a web plate length greater than 30'-0". See Sheet 38 for details of shop welded web splice.

For Camber, Blocking and Deflection Diagram see Sheet 35.

Plan: girders shall be fabricated to conform with Camber Diagram shown on Sheet 35.

GIRDER ELEVATION
BEND LINE 6 TO BEND LINE 9

BRIDGE OVER K.C.S. R.R., M.P.R.P., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

SHEET 32 OF 49

A-1686

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

MADE J.C.H. DATE 5-27-67 CHECKED J.E.H. DATE 5-10-67

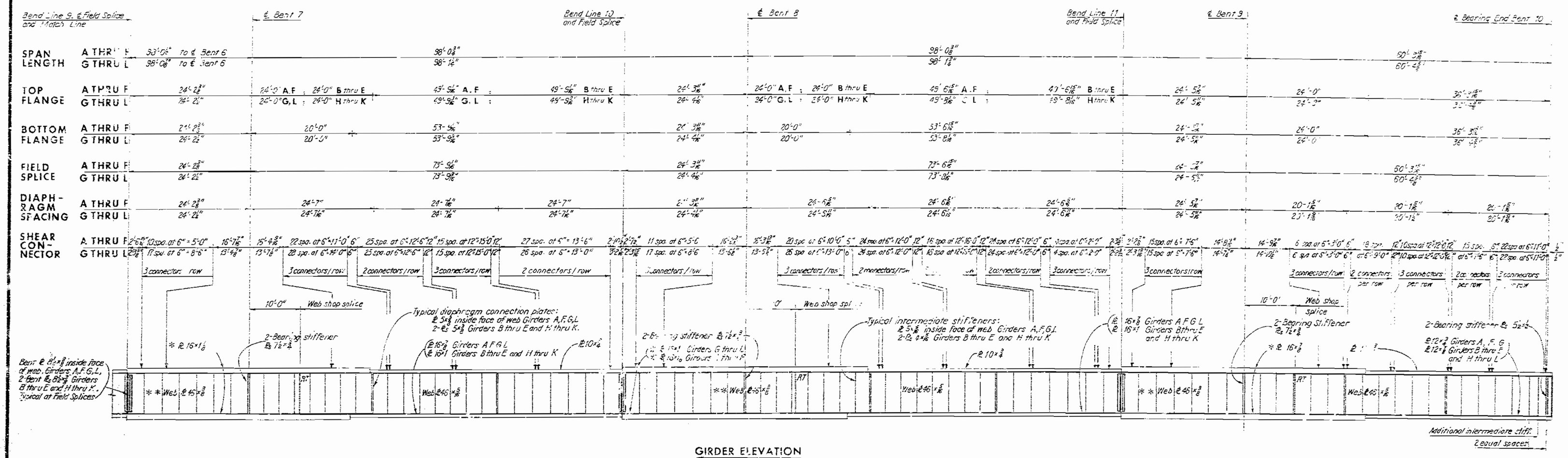
1969 ST 14

96

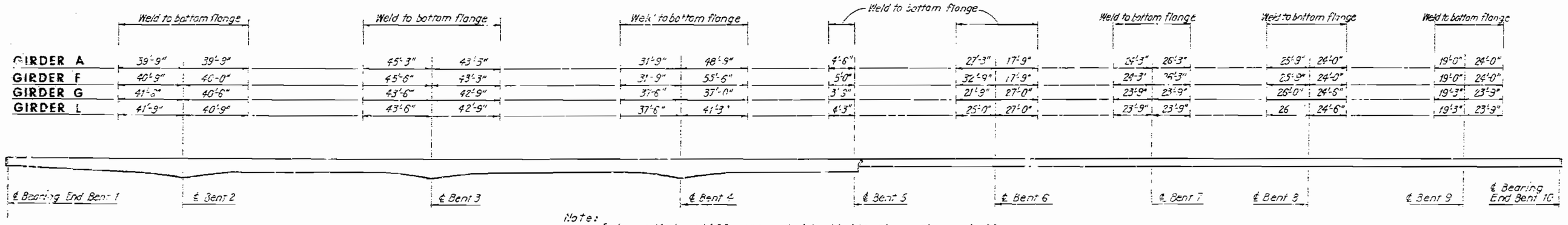
A16866, Sht. 42

MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
MO				
DIST. NO.	COUNTY		ROUTE NO.	
4	JACKSON			



GIRDER ELEVATION



Note: Intermediate stiffeners outside limits shown above shall be welded to top flange.

LIMITS OF INTERMEDIATE STIFFENER TO EXTERIOR GIRDER FLANGE WELD

LEGEND

* ..... Modified A441 Steel

** ..... A441 Steel

RT ..... Shop Web Splice radiographic testing. See Welding Notes, Sheet 38.

Note:
Dimensions shown are along grade at top of girder web under full dead load conditions. Vertical intersections are to lines parallel to bearing lines of Bents.
All material shall be A36 Steel except for plates marked with asterisk.
Girder E shown detailed in Girder Elevation. This sheet shall be worked with Framing Plan Sheet 29 for intermediate stiffener spacing between intermediate diaphragms.

No shear connectors required at ℄ Bent and Field Splices.
One shop welded girder web splice will be permitted in any girder which requires a web plate length greater than 50'-0". See Sheet 38 for details of shop welded web splice.
For Camber, Blocking and Deflection Diagram see Sheet 35.
Plate girders shall be fabricated to conform with Camber Diagram shown on Sheet 35.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 33 OF 49

A-1686

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE JSH DATE 5-22-67 CHECKED JEH DATE 5-24-67

NOTE: This drawing is not to scale. Follow dimensions

GIRDER ELEVATION
BEND LINE 9 TO END BENT 10

20

FOR INFORMATION ONLY

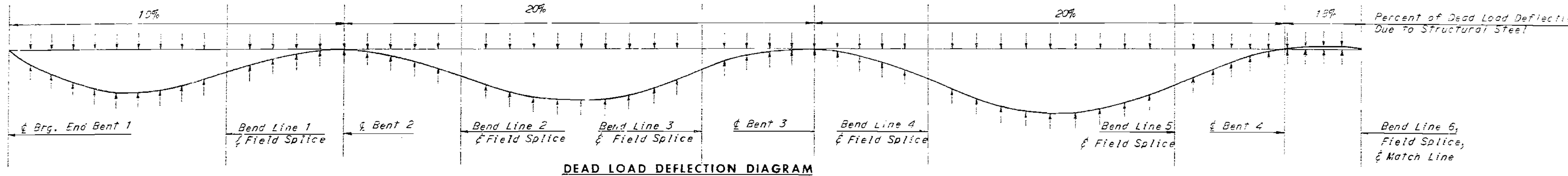
A16866, Sht. 43

FOR INFORMATION ONLY

A16866, Sht. 44

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO				172
DIST. NO.	COUNTY				ROUTE SEC.
4	JACKSON				



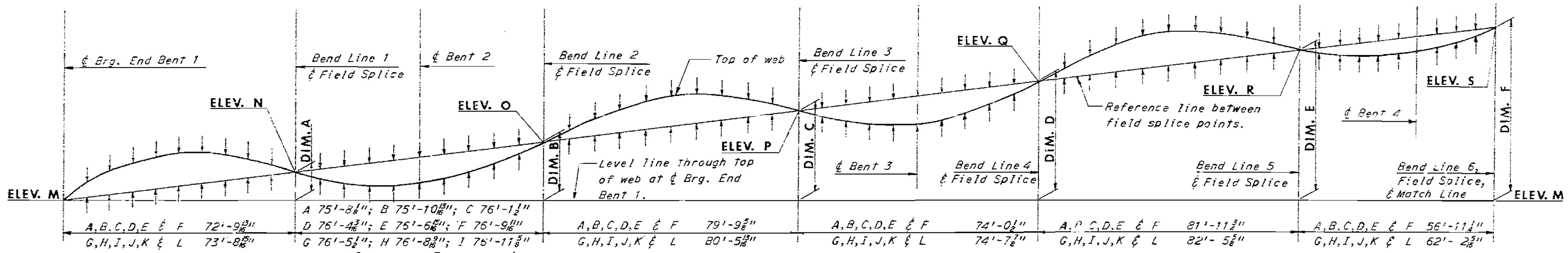
DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEFLECTIONS

GIRDER	EB1	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.1 ℄ F.S.	.1	.2	.3	.4	B2 .5	.6	.7	.8	.9	B.L.2 ℄ F.S.
A	0	1/2	15/16	1 5/16	1 9/16	1 11/16	1 3/4	1 5/8	1 7/16	1 3/16	15/16	5/8	3/8	3/16	1/16	0	1/16	3/16	3/8	9/16	7/8
B	0	7/16	13/16	1 1/8	1 5/16	1 7/16	1 7/16	1 5/16	1 3/16	15/16	3/4	1/2	5/16	1/8	1/16	0	1/16	1/8	5/16	1/2	3/4
C	0	7/16	13/16	1 1/8	1 5/16	1 7/16	1 7/16	1 5/16	1 3/16	15/16	3/4	1/2	5/16	1/8	1/16	0	1/16	1/8	5/16	1/2	3/4
D	0	7/16	13/16	1 1/8	1 5/16	1 7/16	1 7/16	1 5/16	1 3/16	15/16	3/4	1/2	5/16	1/8	1/16	0	1/16	1/8	5/16	1/2	3/4
E	0	7/16	13/16	1 1/8	1 5/16	1 7/16	1 7/16	1 5/16	1 3/16	15/16	3/4	1/2	5/16	1/8	1/16	0	1/16	1/8	5/16	1/2	3/4
F	0	1/2	15/16	1 1/4	1 1/2	1 5/8	1 5/8	1 9/16	1 3/8	1 1/8	7/8	9/16	3/8	3/16	1/16	0	1/8	5/16	9/16	13/16	1 3/16
G	0	1/2	15/16	1 1/4	1 1/2	1 5/8	1 5/8	1 9/16	1 3/8	1 1/8	7/8	9/16	3/8	3/16	1/16	0	1/8	5/16	9/16	13/16	1 3/16
H	0	7/16	13/16	1 1/8	1 3/8	1 7/16	1 7/16	1 3/8	1 3/16	1	3/4	1/2	5/16	1/8	1/16	0	1/16	3/16	3/8	5/8	7/8
I	0	7/16	13/16	1 1/8	1 3/8	1 7/16	1 7/16	1 3/8	1 3/16	1	3/4	1/2	5/16	1/8	1/16	0	1/16	3/16	3/8	5/8	7/8
J	0	7/16	13/16	1 1/8	1 3/8	1 7/16	1 7/16	1 3/8	1 3/16	1	3/4	1/2	5/16	1/8	1/16	0	1/16	3/16	3/8	5/8	7/8
K	0	7/16	13/16	1 1/8	1 3/8	1 7/16	1 7/16	1 3/8	1 3/16	1	3/4	1/2	5/16	1/8	1/16	0	1/16	3/16	3/8	5/8	7/8
L	0	1/2	[illegible]	1 1/4	1 1/2	1 5/8	1 5/8	1 9/16	1 3/8	1 1/8	7/8	9/16	3/8	3/16	1/16	0	1/8	5/16	9/16	13/16	1 3/16

GIRDER	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.3 ℄ F.S.	.1	.2	.3	.4	B3 .5	.6	.7	.8	.9	B.L.4 ℄ F.S.
A	1 1/8	1 3/8	1 9/16	1 11/16	1 11/16	1 9/16	1 3/8	1 1/8	7/8	9/16	5/16	3/16	1/16	0	0	1/8	5/16	9/16	7/8	1 1/4
B	1 1/16	1 1/8	1 7/16	1 9/16	1 9/16	1 7/16	1 5/16	1 1/16	13/16	1/2	5/16	1/8	0	0	0	1/16	1/4	7/16	3/4	1 1/16
C	1 1/16	1 1/8	1 7/16	1 9/16	1 9/16	1 7/16	1 5/16	1 1/16	13/16	1/2	5/16	1/8	0	0	0	1/16	1/4	7/16	3/4	1 1/16
D	1 1/16	1 1/8	1 7/16	1 9/16	1 9/16	1 7/16	1 5/16	1 1/16	13/16	1/2	5/16	1/8	0	0	0	1/16	1/4	7/16	3/4	1 1/16
E	1 1/16	1 1/8	1 7/16	1 9/16	1 9/16	1 7/16	1 5/16	1 1/16	13/16	1/2	5/16	1/8	0	0	0	1/16	1/4	7/16	3/4	1 1/16
F	1 1/2	1 13/16	2 1/16	2 3/16	2 3/16	2 1/8	1 15/16	1 5/8	1 3/8	1	11/16	7/16	1/4	1/16	0	1/8	5/16	9/16	7/8	1 3/16
G	1 1/2	1 13/16	2 1/16	2 3/16	2 3/16	2 1/8	1 15/16	1 5/8	1 3/8	1	11/16	7/16	1/4	1/16	0	1/8	5/16	9/16	7/8	1 3/16
H	1 3/16	1 7/16	1 5/8	1 3/4	1 3/4	1 11/16	1 1/2	1 1/4	1	11/16	1/2	1/4	1/8	0	0	1/16	[illegible]	7/16	11/16	15/16
I	1 3/16	1 7/16	1 5/8	1 3/4	1 3/4	1 11/16	1 1/2	1 1/4	1	11/16	1/2	1/4	1/8	0	0	1/16	3/16	7/16	11/16	15/16
J	1 3/16	1 7/16	1 5/8	1 3/4	1 3/4	1 11/16	1 1/2	1 1/4	1	11/16	1/2	1/4	1/8	0	0	1/16	3/16	7/16	11/16	15/16
K	1 3/16	1 7/16	1 5/8	1 3/4	1 3/4	1 11/16	1 1/2	1 1/4	1	11/16	1/2	1/4	1/8	0	0	1/16	3/16	7/16	11/16	15/16
L	1 1/2	1 13/16	2 1/16	2 3/16	2 3/16	2 1/8	1 15/16	1 5/8	1 3/8	1	11/16	7/16	1/4	1/16	0	1/8	5/16	9/16	7/8	1 3/16

GIRDER	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.5 ℄ F.S.	.1	.2	.3	.4	.5	B4	.6	.7	.8	.9	B.L.6 ℄ F.S.	GIRDER
A	1 5/8	2 1/16	2 7/16	2 11/16	2 13/16	2 13/16	2 11/16	2 7/16	2 1/8	1 11/16	1 3/8	1 1/8	13/16	1/2	5/16	0	1/16	-1/8	-1/4	-5/16	-3/8	A
B	1 7/16	1 13/16	2 1/8	2 5/16	2 7/16	2 7/16	2 3/8	2 1/8	1 13/16	1 7/16	1 3/16	15/16	5/8	7/16	1/4	0	1/16	-1/8	-3/16	-5/16	-5/16	B
C	1 7/16	1 13/16	2 1/8	2 5/16	2 7/16	2 7/16	2 3/8	2 1/8	1 13/16	1 3/8	1 1/8	7/8	5/8	7/16	3/16	0	1/16	-1/8	-3/16	-5/16	-5/16	C
D	1 7/16	1 13/16	2 1/8	2 5/16	2 7/16	2 7/16	2 3/8	2 1/8	1 13/16	1 3/8	1 1/8	7/8	5/8	3/8	3/16	0	1/16	-1/8	-3/16	-1/4	-5/16	D
E	1 7/16	1 13/16	2 1/8	2 5/16	2 7/16	2 7/16	2 3/8	2 1/8	1 13/16	1 3/8	1 1/8	7/8	5/8	3/8	3/16	0	1/16	-1/16	-3/16	-1/4	-5/16	E
F	1 5/8	1 15/16	2 5/16	2 1/2	2 9/16	2 9/16	2 3/8	2 1/8	1 13/16	1 11/16	1 3/8	1 1/16	3/4	1/2	1/4	0	1/16	-1/8	-3/16	-1/4	-5/16	F
G	1 5/8	1 15/16	2 5/16	2 1/2	2 9/16	2 9/16	2 3/8	2 1/8	1 13/16	1 9/16	1 1/4	15/16	5/8	3/8	1/8	0	0	-1/16	-1/8	-1/8	-1/16	G
H	1 5/16	1 5/8	1 15/16	2 1/8	2 3/16	2 3/16	2 1/16	1 13/16	1 1/2	1 3/16	15/16	11/16	7/16	1/4	1/8	0	0	-1/16	-1/8	-1/8	-1/16	H
I	1 5/16	1 5/8	1 15/16	2 1/8	2 3/16	2 3/16	2 1/16	1 13/16	1 1/2	1 3/16	15/16	11/16	7/16	1/4	1/8	0	0	-1/16	-1/8	-1/16	-1/16	I
J	1 5/16	1 5/8	1 15/16	2 1/8	2 3/16	2 3/16	2 1/16	1 13/16	1 1/2	1 3/16	15/16	11/16	7/16	1/4	1/8	0	0	-1/16	-1/16	-1/16	0	J
K	1 5/16	1 5/8	1 15/16	2 1/8	2 3/16	2 3/16	2 1/16	1 13/16	1 1/2	1 1/8	7/8	11/16	7/16	1/4	1/8	0	0	-1/16	-1/16	-1/16	0	K
L	1 5/8	1 15/16	2 5/16	2 1/2	2 9/16	2 9/16	2 3/8	2 1/8	1 13/16	1 3/8	1 1/16	13/16	1/2	5/16	1/8	0	0	0	0	1/8	1/4	L



CAMBER AND BLOCKING DIAGRAM

Note:
Deflections and cambering offsets are given at one tenth points between field splices.
Negative deflections are above the reference line.
Negative cambering offsets are below the reference line.
Elevations shown are at top of web with Total Dead Load applied.
Blocking dimensions are for no applied Dead Load.
Letter preceding dimensions denotes the girder for which they are to be used.
Top of girder web shall be fabricated to conform to offsets given, and bottom of girder web shall be parallel to top of web except as shown on Girder Elevations.
The reference line shown in Camber and Blocking Diagram is between top of web at field splice points.
Deflection and Camber dimensions are in inches.

TABLE OF CAMBERING DIMENSIONS

GIRDER	EB1	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.1 ℄ F.S.	.1	.2	.3	.4	B2 .5	.6	.7	.8	.9	B.L.2 ℄ F.S.
A	0	3/8	3/4	15/16	1 1/8	1 1/8	1 1/16	7/8	5/8	5/16	0	-5/16	-11/16	-7/8	-1	-1 1/16	-15/16	-13/16	-3/4	-3/8	0
B	0	5/16	5/8	3/4	7/8	15/16	7/8	11/16	9/16	1/4	0	-5/16	-9/16	-3/4	-13/16	-7/8	-13/16	-3/4	-9/16	-5/16	0
C	0	5/16	5/8	3/4	7/8	15/16	7/8	11/16	9/16	1/4	0	-5/16	-9/16	-3/4	-13/16	-7/8	-13/16	-3/4	-9/16	-5/16	0
D	0	5/16	5/8	3/4	7/8	15/16	7/8	11/16	9/16	1/4	0	-5/16	-9/16	-3/4	-13/16	-7/8	-13/16	-3/4	-9/16	-5/16	0
E	0	5/16	5/8	3/4	7/8	15/16	7/8	11/16	9/16	1/4	0	-5/16	-9/16	-3/4	-13/16	-7/8	-13/16	-3/4	-9/16	-5/16	0
F	0	3/8	5/8	7/8	1 1/16	1 1/16	1	13/16	9/16	5/16	0	-3/8	-11/16	-7/8	-1 1/8	-1 3/16	-1 1/8	-7/8	-11/16	-3/8	0
G	0	3/8	5/8	7/8	1 1/16	1 1/16	1	13/16	9/16	5/16	0	-3/8	-11/16	-7/8	-1 1/8	-1 3/16	-1 1/8	-7/8	-11/16	-3/8	0
H	0	5/16	9/16	13/16	15/16	15/16	7/8	11/16	1/2	1/4	0	-5/16	-5/8	-3/4	-15/16	-1	-15/16	-3/4	-5/8	-5/16	0
I	0	5/16	9/16	13/16	15/16	15/16	7/8	11/16	1/2	1/4	0	-5/16	-5/8	-3/4	-15/16	-1	-15/16	-3/4	-5/8	-5/16	0
J	0	5/16	9/16	13/16	15/16	15/16	7/8	11/16	1/2	1/4	0	-5/16	-5/8	-3/4	-15/16	-1	-15/16	-3/4	-5/8	-5/16	0
K	0	5/16	9/16	13/16	15/16	15/16	7/8	11/16	1/2	1/4	0	-5/16	-5/8	-3/4	-15/16	-1	-15/16	-3/4	-5/8	-5/16	0
L	0	3/8	5/8	7/8	1 1/16	1 1/16	1	13/16	9/16	5/16	0	-3/8	[illegible]	-7/8	-1 1/8	-1 3/16	-1 1/8	-7/8	-11/16	-3/8	0

GIRDER	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.3 ℄ F.S.	.1	.2	.3	.4	B3 .5	.6	.7	.8	.9	B.L.4 ℄ F.S.
A	1/4	9/16	3/4	15/16	15/16	7/8	11/16	1/2	1/4	0	-5/16	-1/2	-11/16	-7/8	-15/16	-7/8	-3/4	-9/16	-5/16	0
B	1/4	7/16	5/8	11/16	3/4	11/16	9/16	3/8	3/16	0	-5/16	-9/16	-13/16	-7/8	-15/16	-7/8	-3/4	-9/16	-5/16	0
C	1/4	7/16	5/8	11/16	3/4	11/16	9/16	3/8	3/16	0	-5/16	-9/16	-13/16	-7/8	-15/16	-7/8	[illegible]	-9/16	-5/16	0
D	1/4	7/16	5/8	11/16	3/4	11/16	9/16	3/8	3/16	0	-5/16	-9/16	-13/16	-7/8	-15/16	-7/8	-3/4	-9/16	-5/16	0
E	1/4	7/16	5/8	11/16	3/4	11/16	9/16	3/8	3/16	0	-5/16	-9/16	-13/16	-7/8	-15/16	-7/8	-3/4	-9/16	-5/16	0
F	5/16	9/16	13/16	15/16	15/16	7/8	13/16	1/2	5/16	0	-3/8	-3/4	-15/16	-1 1/8	-1 3/16	-1 1/8	-15/16	-3/4	-3/8	0
G	5/16	9/16	13/16	15/16	15/16	7/8	13/16	1/2	5/16	0	-3/8	-3/4	-15/16	-1 1/8	-1 3/16	-1 1/8	-15/16	-3/4	-3/8	0
H	1/4	1/2	11/16	3/4	13/16	11/16	5/8	7/16	1/4	0	-5/16	-5/8	-13/16	-7/8	-15/16	-7/8	-13/16	-5/8	-5/16	0
I	1/4	1/2	11/16	3/4	13/16	11/16	5/8	7/16	1/4	0	-5/16	-5/8	-13/16	-7/8	-15/16	-7/8	-13/16	-5/8	-5/16	0
J	1/4	1/2	11/16	3/4	13/16	11/16	5/8	7/16	1/4	0	-5/16	-5/8	-13/16	-7/8	-15/16	-7/8	-13/16	-5/8	-5/16	0
K	1/4	1/2	11/16	3/4	13/16	11/16	5/8	7/16	1/4	0	-5/16	-5/8	-13/16	-7/8	-15/16	-7/8	-13/16	-5/8	-5/16	0
L	5/16	9/16	13/16	15/16	15/16	7/8	13/16	1/2	5/16	0	-3/8	-3/4	-15/16	-1 1/8	-1 3/16	-1 1/8	-15/16	-3/4	-3/8	0

GIRDER	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.5 ℄ F.S.	.1	.2	.3	.4	.5	B4	.6	.7	.8	.9	B.L.6 ℄ F.S.	GIRDER
A	5/16	11/16	1 1/16	1 1/4	1 5/16	1 5/16	1 1/8	13/16	1/2	0	-1/8	-1/8	-1/4	-3/8	-3/8	-1/2	-3/8	-7/16	-3/8	-3/16	0	A
B	5/16	9/16	15/16	15/16	1 1/16	1	15/16	5/8	3/8	0	-1/16	-1/4	-5/16	-3/8	-3/8	-3/8	-3/8	-3/8	-5/16	-1/8	0	B
C	5/16	9/16	13/16	15/16	1 1/16	1	15/16	5/8	3/8	0	-1/16	-1/4	-5/16	-3/8	-3/8	-3/8	-3/8	-3/8	-5/16	-1/8	0	C
D	5/16	9/16	13/16	15/16	1 1/16	1	15/16	5/8	3/8	0	-1/8	-1/4	-5/16	-3/8	-3/8	-3/8	-3/8	-3/8	-5/16	-1/8	0	D
E	5/16	9/16	13/16	15/16	1 1/16	1	15/16	5/8	3/8	0	[illegible]	-1/4	-5/16	-3/8	[illegible]	-3/8	-7/8	-3/8	-5/16	-1/8	0	E
F	5/16	5/8	7/8	1 1/16	1 1/8	1 1/16	7/8	11/16	3/8	0	-3/16	-1/4	-3/8	-7/16	-1/2	-1/2	-1/2	-7/16	-3/8	-1/4	0	F
G	5/16	5/8	7/8	1 1/16	1 1/8	1 1/16	7/8	11/16	3/8	0	-3/16	-3/8	-1/2	-5/8	-11/16	-11/16	-11/16	-9/16	-7/16	-1/4	0	G
H	5/16	1/2	11/16	7/8	15/16	15/16	3/4	9/16	5/16	0	-3/16	-5/16	-7/16	-9/16	-9/16	-9/16	-9/16	-7/16	-3/8	-1/4	0	H
I	5/16	1/2	11/16	7/8	15/16	15/16	3/4	9/16	5/16	0	-3/16	-5/16	-7/16	-9/16	-5/8	-9/16	-9/16	-1/2	-3/8	-1/4	0	I
J	5/16	1/2	11/16	7/8	15/16	15/16	3/4	9/16	5/16	0	-3/16	-5/16	-7/16	-9/16	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	0	J
K	5/16	1/2	11/16	7/8	15/16	15/16	3/4	9/16	5/16	0	-3/16	-5/16	-7/16	-9/16	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	0	K
L	5/16	5/8	7/8	1 1/16	1 1/8	1 1/16	7/8	11/16	3/8	0	-1/4	-3/8	-1/2	-11/16	-11/16	-11/16	-11/16	-5/8	-1/2	-1/4	0	L

TABLE OF BLOCKING DIMENSIONS AND ELEVATIONS

GIRDER	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E	DIM. F	ELEV. M	ELEV. N	ELEV. O	ELEV. P	ELEV. Q	ELEV. R	ELEV. S
A	2'- 2 1/16"	4'- 4 15/16"	6'- 8 13/16"	8'-11 13/16"	11'- 5 3/8"	12'-11 1/2"	774.34	776.49	778.68	781.03	783.22	785.65	787.33
B	2'- 2 1/2"	4'- 5 1/8"	6'- 9 1/8"	8'-11 15/16"	11'- 5 1/2"	12'-11 15/16"	773.72	775.87	778.09	780.44	782.63	785.06	786.74
C	2'- 2 1/2"	4'- 5 7/16"	6'- 9 7/16"	9'- 0 1/4"	11'- 5 3/4"	13'- 0 5/16"	773.10	775.24	777.49	779.84	782.03	784.47	786.15
D	2'- 2 1/2"	4'- 5 3/4"	6'- 9 3/4"	9'- 0 5/8"	11'- 6 1/8"	13'- 0 11/16"	772.48	774.62	776.89	779.25	781.44	783.87	785.56
E	2'- 2 1/2"	4'- 6 1/16"	6'-10 1/16"	9'- 0 15/16"	11'- 6 1/2"	13'- 1"	771.85	774.00	776.29	778.65	780.84	783.28	784.96
F	2'- 2 5/8"	4'- 6 13/16"	6'-10 7/8"	9'- 1 3/8"	11'- 7 1/8"	13'- 1 3/8"	771.23	773.37	775.70	778.05	780.24	782.68	784.37
G	2'- 3 13/16"	4'- 7 9/16"	7'- 0 5/8"	9'- 4 1/8"	11'-10 5/8"	13'- 7 5/8"	770.68	772.93	775.21	777.65	779.92	782.43	784.32
H	2'- 3 11/16"	4'- 7 9/16"	7'- 0 11/16"	9'- 4 1/2"	11'-10 5/8"	13'- 8"	770.04	772.29	774.60	777.04	779.32	781.83	783.72
I	2'- 3 11/16"	4'- 7 15/16"	7'- 1 1/16"	9'- 4 5/8"	11'-11"	13'- 8 7/16"	769.41	771.66	774.00	776.44	778.72	781.23	783.12
J	2'- 3 11/16"	4'- 8 5/8"	7'- 1 3/8"	9'- 5"	11'-11 3/8"	13'- 8 15/16"	768.77	771.02	773.39	775.83	778.11	780.62	782.52
K	2'- 3 11/16"	4'- 8 5/8"	7'- 1 3/4"	9'- 5 5/16"	11'-11 3/4"	13'- 9 5/16"	768.14	770.38	772.78	775.23	777.50	780.02	7[illegible].91
L	2'- 3 13/16"	4'- 9 5/16"	7'- 2 7/16"	9'- 5 15/16"	12'- 0 5/8"	13'- 10"	767.50	769.74	772.18	774.62	776.90	779.42	781.31

Legend:
B.L. = Bend Line
F.S. = Field Splice
S.S. = Shop Splice
B = Bent
EB = End Bent

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

MADE [illegible] DATE 5-12-67 CHECKED [illegible] DATE 5-12-67

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

DEFLECTION, CAMBER AND BLOCKING DIAGRAMS-END BENT 1 TO BEND LINE 6

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 34 OF 49

A-1686

1909-21-01

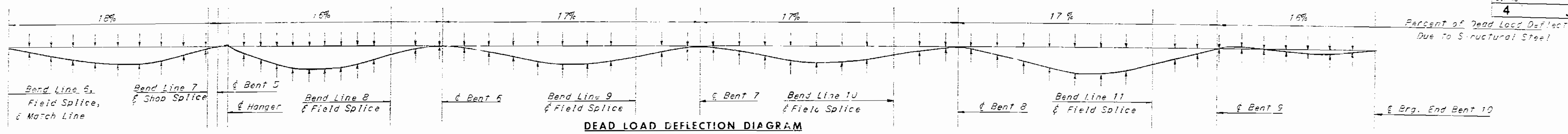
12

FOR INFORMATION ONLY

A16866, Sht. 45

FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO				173
DIST. NO.		COUNTY		ROUTE	SEC
4		JACKSON			

MISSOURI STATE HIGHWAY DEPARTMENT



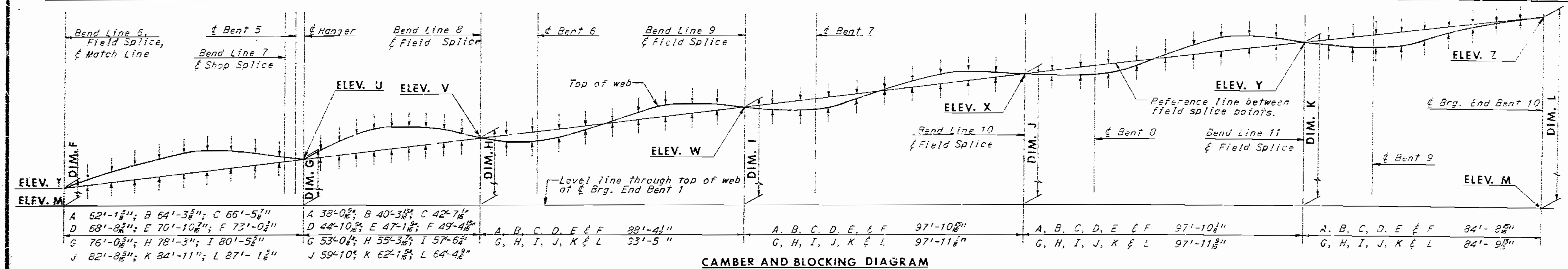
DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEFLECTIONS

GIRDER	B.L.6 ¢ F.S.	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.7 ¢ S.S.	B5	Hanger	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.8 ¢ F.S.
A	-3/8	-3/8	-3/8	-5/16	-1/4	-3/16	-1/8	-1/16	-1/16	0	0	0	0	1/16	1/16	1/16	1/16	1/16	0	0	0	-1/16	-1/16
B	-5/16	-5/16	-5/16	-1/4	-3/16	-1/8	-1/8	-1/16	0	0	0	0	0	1/16	1/16	1/16	1/16	1/16	0	0	0	-1/16	-1/16
C	-5/16	-5/16	-5/16	-1/4	-3/16	-1/8	-1/16	-1/16	0	0	0	0	0	1/16	1/16	1/16	1/16	1/16	1/16	1/16	0	0	-1/16
D	-5/16	-5/16	-5/16	-1/4	-3/16	-1/8	-1/16	0	0	0	0	0	0	1/16	1/16	1/8	1/8	1/8	1/8	1/16	1/16	0	0
E	-5/16	-5/16	-1/4	-3/16	-1/8	-1/16	0	0	0	0	0	0	0	1/16	1/8	1/8	3/16	3/16	1/8	1/8	1/16	0	0
F	-5/16	-5/16	-1/4	-3/16	-1/8	-1/16	0	0	0	0	0	0	0	1/16	3/16	3/16	1/4	1/4	1/4	3/16	1/8	[illegible]	0
G	-1/16	0	1/8	1/4	5/16	3/8	5/16	1/4	3/16	1/16	1/16	0	0	1/8	1/4	3/8	7/16	1/2	1/2	7/16	3/8	1/4	3/16
H	-1/16	0	1/8	1/4	5/16	3/8	3/8	5/16	3/16	1/16	1/16	0	0	3/16	5/16	7/16	1/2	9/16	9/16	1/2	7/16	5/16	1/4
I	-1/16	1/16	3/16	5/16	7/16	7/16	7/16	3/8	1/4	1/16	1/16	0	0	3/16	3/8	1/2	5/8	11/16	11/16	5/8	1/2	3/8	1/4
J	0	1/8	1/4	7/16	1/2	9/16	1/2	7/16	1/4	1/8	1/8	0	0	1/4	7/16	5/8	11/16	3/4	3/4	11/16	5/8	7/16	5/16
K	0	3/16	5/16	1/2	5/8	5/8	5/8	1/2	5/16	1/8	1/8	0	0	1/4	1/2	11/16	13/16	7/8	7/8	13/16	11/16	1/2	3/8
L	1/4	7/16	11/16	7/8	1	1	15/16	3/4	1/2	3/16	1/8	0	0	5/16	5/8	13/16	1	1 1/16	1 1/16	15/16	13/16	5/8	7/16

GIRDER	.1	.2	B6	.3	.4	.5	.6	.7	.8	.9	B.L.9 ¢ F.S.	.1	.2	B7	.3	.4	.5	.6	.7	.8	.9	B.L.10 ¢ F.S.
A	-1/16	1/16	0	3/16	11/16	15/16	1 1/8	1 3/16	1 1/8	15/16	5/8	5/16	1/16	0	0	1/8	5/16	1/2	5/8	5/8	1/2	5/16
B	-1/16	1/16	0	1/4	9/16	13/16	1	1 1/16	1	13/16	9/16	1/4	1/16	0	0	1/8	5/16	7/16	9/16	9/16	7/16	1/4
C	-1/16	1/16	0	1/4	9/16	13/16	15/16	1	15/16	13/16	9/16	1/4	1/16	0	0	1/8	5/16	7/16	9/16	9/16	7/16	1/4
D	-1/16	1/16	0	1/4	1/2	3/4	15/16	1	15/16	3/4	1/2	1/4	1/16	0	0	1/8	5/16	7/16	9/16	9/16	7/16	1/4
E	-1/16	1/16	0	1/4	1/2	3/4	7/8	15/16	15/16	3/4	1/2	1/4	1/16	0	0	1/8	5/16	7/16	9/16	9/16	7/16	1/4
F	0	1/16	0	1/4	1/2	3/4	15/16	1 1/16	1	13/16	9/16	5/16	1/16	0	0	1/8	5/16	1/2	5/8	5/8	1/2	5/16
G	0	0	0	1/8	5/16	9/16	13/16	7/8	7/8	3/4	1/2	3/16	1/16	0	0	3/16	3/8	9/16	5/8	5/8	1/2	5/16
H	1/16	0	0	1/16	1/4	1/2	11/16	13/16	3/4	5/8	7/16	3/16	1/16	0	0	3/16	3/8	9/16	5/8	5/8	1/2	5/16
I	1/16	0	0	1/16	1/4	7/16	5/8	3/4	3/4	5/8	7/16	3/16	1/16	0	0	3/16	3/8	9/16	5/8	5/8	1/2	5/16
J	1/8	0	0	1/16	1/4	7/16	5/8	3/4	11/16	5/8	3/8	3/16	1/16	0	0	3/16	3/8	9/16	5/8	5/8	1/2	5/16
K	1/8	0	0	1/16	3/16	7/16	9/16	11/16	11/16	9/16	3/8	3/16	1/16	0	0	3/16	3/8	9/16	5/8	5/8	1/2	5/16
L	3/16	0	0	0	3/16	3/8	9/16	11/16	11/16	5/8	3/8	3/16	1/16	0	0	3/16	3/8	9/16	5/8	5/8	1/2	5/16

GIRDER	.1	.2	B.8	.3	.4	.5	.6	.7	.8	.9	B.L.11 ¢ F.S.	.1	.2	B9	.3	.4	.5	.6	.7	.8	.9	EB10	GIRDER
A	1/8	0	0	1/16	5/16	5/8	7/8	1 1/16	1 1/8	15/16	11/16	7/16	3/16	0	0	-1/16	0	1/16	1/8	1/8	1/8	0	A
B	1/8	0	0	1/16	1/4	9/16	13/16	1	1	7/8	5/8	3/8	1/8	0	0	-1/16	0	1/16	1/8	1/8	1/16	0	B
C	1/8	0	0	1/16	1/4	9/16	13/16	1	1	7/8	5/8	3/8	1/8	0	0	-1/16	0	1/16	1/8	[illegible]	1/16	0	C
D	1/8	0	0	1/16	1/4	9/16	13/16	1	1	7/8	5/8	3/8	1/8	0	0	-1/16	0	1/16	1/8	1/8	1/16	0	D
E	1/8	0	0	1/16	1/4	9/16	13/16	1	1	7/8	5/8	3/8	1/8	0	0	-1/16	0	1/16	1/8	1/8	1/16	0	E
F	1/8	0	0	1/16	5/16	5/8	7/8	1 1/16	1 1/8	15/16	11/16	7/16	3/16	0	0	-1/16	0	1/16	1/8	1/8	1/8	0	F
G	1/8	0	0	1/16	5/16	5/8	7/8	1 1/16	1 1/8	1	11/16	7/16	3/16	0	0	-1/16	0	1/16	1/8	3/16	1/8	0	G
H	1/8	0	0	1/16	1/4	9/16	13/16	1	1	7/8	5/8	3/8	1/8	0	0	-1/16	0	1/16	1/8	1/8	1/16	0	H
I	1/8	0	0	1/16	1/4	9/16	13/16	1	1	7/8	5/8	3/8	1/8	0	0	-1/16	0	1/16	1/8	1/8	1/16	0	I
J	1/8	0	0	1/16	1/4	9/16	15/16	1	1	7/8	5/8	3/8	1/8	0	0	-1/16	0	1/16	1/8	1/8	1/16	0	J
K	1/8	0	0	1/16	1/4	9/16	13/16	1	1	7/8	5/8	3/8	1/8	0	0	-1/16	0	1/16	1/8	1/8	1/16	0	K
L	1/8	0	0	1/16	5/16	5/8	7/8	1 1/16	1 1/8	[illegible]	11/16	7/16	3/16	0	0	-1/16	0	1/16	1/8	3/16	1/8	0	L



CAMBER AND BLOCKING DIAGRAM

Note:
Deflections and cambering offsets are given at one tenth points between field splices.
Negative deflections are above the reference line.
Negative cambering offsets are below the reference line.
Elevations shown are at top of web with Total Dead Load applied.
Blocking dimensions are for no applied Dead Load.
Letter preceding dimensions denotes the girder for which they are to be used.
Top of girder web shall be fabricated to conform to offsets given, and bottom of girder web shall be parallel to top of web except as shown on Girder Elevations.
The reference line shown in Camber and Blocking Diagram is between top of web at field splice points.
Deflection and Camber dimensions are in inches.

TABLE OF CAMBERING DIMENSIONS

GIRDER	B.L.6 ¢ F.S.	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.7 ¢ S.S.	B5	Hanger	.1	.2	.3	.4	.5	.6	.7	.8	.9	B.L.8 ¢ F.S.
A	0	-1/8	-1/8	-1/8	-1/8	-1/16	-1/16	-1/16	0	0	0	0	0	0	1/16	0	0	0	0	-1/16	0	0	0
B	0	-1/8	-1/8	-1/8	-1/16	-1/16	-1/16	-1/16	0	0	0	0	0	0	1/16	0	0	0	0	0	0	0	0
C	0	-1/8	-1/8	-1/16	-1/16	-1/16	0	0	1/16	0	0	0	0	0	1/16	0	0	0	0	0	1/16	0	0
D	0	-1/8	-1/8	-1/16	-1/16	0	0	0	1/16	1/16	1/16	0	0	1/16	0	1/16	1/16	1/16	1/16	0	0	0	0
E	0	-1/16	-1/16	-1/16	0	0	0	0	1/16	1/16	1/16	0	0	1/16	1/16	1/16	1/8	1/8	1/16	1/16	0	1/16	0
F	0	-1/16	-1/16	-1/16	0	1/16	1/16	1/16	1/16	1/8	1/8	1/16	0	1/16	1/16	1/8	3/16	3/16	1/8	1/8	1/16	1/16	0
G	0	0	1/8	1/8	1/4	1/4	1/4	1/4	1/8	1/16	1/16	0	0	1/8	3/16	[illegible]	5/16	5/16	5/16	1/4	3/16	1/8	0
H	0	0	1/8	3/16	1/4	5/16	1/4	1/4	3/16	1/16	1/16	0	0	1/8	3/16	5/16	3/8	3/8	3/8	5/16	3/16	1/8	0
I	0	1/16	3/16	1/4	5/16	3/8	5/16	5/16	1/4	1/8	1/8	1/16	0	1/8	1/4	3/8	7/16	7/16	7/16	3/8	1/4	1/16	0
J	0	1/16	1/8	5/16	3/8	7/16	7/16	3/8	5/16	3/16	3/16	1/8	0	1/8	5/16	7/16	1/2	1/2	7/16	7/16	5/16	1/8	0
K	0	1/16	3/16	3/8	7/16	1/2	1/2	7/16	5/16	3/16	3/16	1/8	0	3/16	3/8	7/16	9/16	9/16	9/16	7/16	5/16	1/8	0
L	0	3/16	1/2	11/16	13/16	7/8	13/16	11/16	7/16	3/16	3/16	1/8	0	3/16	7/16	9/16	11/16	3/4	11/16	9/16	7/16	3/16	0

GIRDER	.1	.2	B6	.3	.4	.5	.6	.7	.8	.9	B.L.9 ¢ F.S.	.1	.2	B7	.3	.4	.5	.6	.7	.8	.9	B.L.10 ¢ F.S.
A	-1/8	-1/8	-1/8	0	1/4	1/2	5/8	5/8	1/2	5/16	0	-3/8	-3/8	-11/16	-3/4	-5/8	-3/8	-3/16	1/16	1/16	1/8	0
B	-1/8	-1/8	-1/8	-1/16	3/16	3/8	1/2	1/2	7/16	1/4	0	-5/16	-5/8	-5/8	-5/8	-9/16	-3/8	-3/16	0	1/16	0	0
C	-1/8	-1/8	-1/8	-1/16	3/16	3/8	1/2	1/2	7/16	1/4	0	-5/16	-5/8	-5/8	-5/8	-9/16	-3/8	-3/16	0	1/16	0	0
D	-1/8	-3/16	-3/16	1/16	1/8	5/16	7/16	7/16	3/8	1/4	0	-5/16	-5/8	-5/8	-5/8	-9/16	-3/8	-3/16	0	1/16	0	0
E	-1/8	-3/16	-3/16	-1/8	1/8	5/16	7/16	7/16	3/8	1/4	0	-5/16	-5/8	-5/8	-5/8	-9/16	-3/8	-3/16	0	1/16	0	0
F	-3/16	-3/16	-3/16	-1/8	1/16	5/16	7/16	7/16	3/8	1/4	0	-3/8	-5/8	-11/16	-3/4	-5/8	-3/8	-3/16	1/16	1/16	1/8	0
G	-1/4	-3/8	-3/8	-3/8	-3/16	0	1/4	5/16	5/16	3/16	0	-5/16	-9/16	-9/16	-9/16	-7/16	-1/4	-1/16	1/8	1/8	1/16	0
H	-1/4	-3/8	-3/8	-3/8	-3/16	-1/16	1/8	1/4	1/4	3/16	0	-5/16	-1/2	-1/2	-1/2	-7/16	-1/4	-1/16	1/8	1/8	1/16	1/4
I	-1/4	-7/16	-7/16	-7/16	-1/4	-1/8	1/8	3/16	1/4	1/8	0	-5/16	-1/2	-1/2	-1/2	-7/16	-1/4	-1/16	1/8	1/8	1/16	0
J	-1/4	-7/16	-7/16	-1/2	-3/8	-3/16	0	3/16	3/16	1/8	0	-5/16	-1/2	-1/2	-1/2	-7/16	-1/4	-1/16	1/8	1/8	1/16	0
K	-3/8	-1/2	-1/2	-1/2	-7/16	-3/16	0	1/8	3/16	1/8	0	-5/16	-1/2	-1/2	-1/2	-7/16	-1/4	-1/16	1/8	1/8	1/16	0
L	-3/8	-9/16	-9/16	-9/16	-1/2	-1/4	-1/16	1/8	3/16	1/8	0	-5/16	-9/16	-9/16	-9/16	-7/16	-1/4	-1/16	1/8	1/8	1/16	0

GIRDER	.1	.2	B.8	.3	.4	.5	.6	.7	.8	.9	B.L.11 ¢ F.S.	.1	.2	B9	.3	.4	.5	.6	.7	.8	.9	EB10	GIRDER
A	-5/16	-9/16	-9/16	-9/16	-7/16	-1/8	1/8	5/16	5/16	1/4	0	-1/4	-1/2	-11/16	-11/16	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	A
B	-1/4	-9/16	-1/2	-1/2	-3/8	-3/16	1/16	1/4	1/4	3/16	0	-1/4	-1/2	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	B
C	-1/4	-9/16	-1/2	-1/2	-3/8	-3/16	1/16	1/4	1/4	3/16	0	-1/4	-1/2	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	C
D	-1/4	-9/16	-1/2	-1/2	-3/8	-3/16	1/16	1/4	1/4	3/16	0	-1/4	-1/2	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	D
E	-1/4	-9/16	-1/2	-1/2	-3/8	-3/16	1/16	1/4	1/4	3/16	0	-1/4	-1/2	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	E
F	-5/16	-9/16	-9/16	-9/16	-7/16	-1/8	1/8	5/16	5/16	1/4	0	-1/4	-1/2	-11/16	-11/16	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	F
G	-3/8	-9/16	-9/16	-9/16	-7/16	-1/8	1/8	5/16	5/16	3/16	0	-1/4	-1/2	-11/16	-11/16	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	G
H	-3/8	-9/16	-9/16	-9/16	-7/16	-3/16	1/16	1/4	1/4	[illegible]	0	-1/4	-1/2	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	H
I	-3/8	-9/16	-9/16	-9/16	-7/16	-3/16	1/16	1/4	1/4	[illegible]	0	-1/4	-1/2	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	I
J	-3/8	-9/16	-9/16	-9/16	-7/16	-3/16	1/16	1/4	1/4	1/8	0	-1/4	-1/2	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	J
K	-3/8	-9/16	-9/16	-9/16	-7/16	-3/16	1/16	1/4	1/4	[illegible]	0	-1/4	-1/2	-5/8	-5/8	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	K
L	-3/8	-9/16	-9/16	-9/16	-7/16	-1/8	1/8	5/16	5/16	3/16	0	-1/4	-1/2	-11/16	-11/16	-5/8	-1/2	-3/8	-1/4	-1/8	-1/16	0	L

TABLE OF BLOCKING DIMENSIONS AND ELEVATIONS

GIRDER	DIM. F	DIM. G	DIM. H	DIM. I	DIM. J	DIM. K	DIM. L	ELEV. M	ELEV. T	ELEV. U	ELEV. V	ELEV. W	ELEV. X	ELEV. Y	ELEV. Z
A	12'-11 1/2"	14'-9 7/16"	15'-10 11/16"	18'-6 9/16"	21'-4 5/8"	24'-3 7/16"	26'-8 1/2"	774.34	787.33	789.13	790.24	792.84	795.70	798.58	801.05
B	12'-11 15/16"	14'-10 11/16"	15'-0 7/8"	18'-8 3/4"	21'-6 15/16"	24'-5 5/16"	26'-11 1/2"	773.72	786.74	788.61	789.80	792.41	795.28	798.16	800.65
C	13'-0 5/8"	15'-0"	16'-3"	18'-11"	21'-9 3/8"	24'-8 7/16"	27'-1 3/16"	773.10	786.15	788.10	789.35	791.97	794.86	797.75	800.25
D	13'-0 11/16"	15'-1 5/16"	16'-5 1/4"	19'-1 1/4"	21'-1 3/4"	24'-11"	27'-4 1/2"	772.48	785.56	787.58	788.91	791.54	794.43	797.34	799.85
E	13'-1"	15'-2 5/8"	16'-7 3/8"	19'-3 1/2"	22'-2 3/16"	25'-1 9/16"	27'-7 1/8"	771.85	784.96	787.07	788.47	791.10	794.01	796.93	799.45
F	13'-1 3/8"	15'-3 15/16"	16'-9 9/16"	19'-5 7/8"	22'-4 5/8"	25'-4 3/16"	27'-9 13/16"	771.23	784.37	786.55	788.02	790.67	793.59	796.52	799.05
G	[illegible]'-7 3/8"	15'-10 15/16"	17'-6 5/16"	20'-4 1/4"	23'-3 3/4"	25'-3 7/8"	28'-9 7/16"	770.68	784.32	786.59	788.19	791.01	793.97	795.91	799.47
H	13'-8"	16'-0 3/4"	17'-8 1/16"	20'-6 13/16"	23'-5 5/16"	26'-6 1/16"	29'-0 1/4"	770.04	783.72	786.07	787.75	790.58	793.55	796.50	799.07
I	13'-8 7/16"	16'-1 3/4"	17'-11"	20'-9 1/4"	23'-8 7/8"	26'-8 13/16"	29'-3 1/8"	769.41	783.12	785.56	787.[illegible]	790.15	793.12	795.09	798.67
J	13'-8 15/16"	16'-3 3/16"	18'-1 3/8"	20'-11 1/2"	23'-11 1/2"	26'-11 9/16"	29'-6"	768.77	782.52	785.04	786.86	789.71	792.70	795.58	798.27
K	13'-9 5/16"	16'-4 9/16"	18'-3 1/4"	21'-2 1/8"	24'-2 3/16"	27'-2 5/16"	29'-8 7/8"	768.14	781.91	784.52	786.42	789.28	792.28	795.28	797.88
L	13'-10"	16'-6"	18'-6 1/8"	21'-4 5/8"	24'-5 3/4"	27'-5 9/16"	30'-0 1/4"	767.50	781.31	784.00	785.97	788.85	791.90	794.91	797.52

Legend:
B.L. = Bend Line
F.S. = Field Splice
S.S. = Shop Splice
B = Bent
EB = End Bent

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

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

MADE J E H DATE 5-11-67 CHECKED M H H DATE 5-12-67

DEFLECTION, CAMBER AND BLOCKING DIAGRAMS-BEND LINE 6 TO END BENT 10

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.
STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L
JACKSON COUNTY
SHEET 35 OF 49

A-1686

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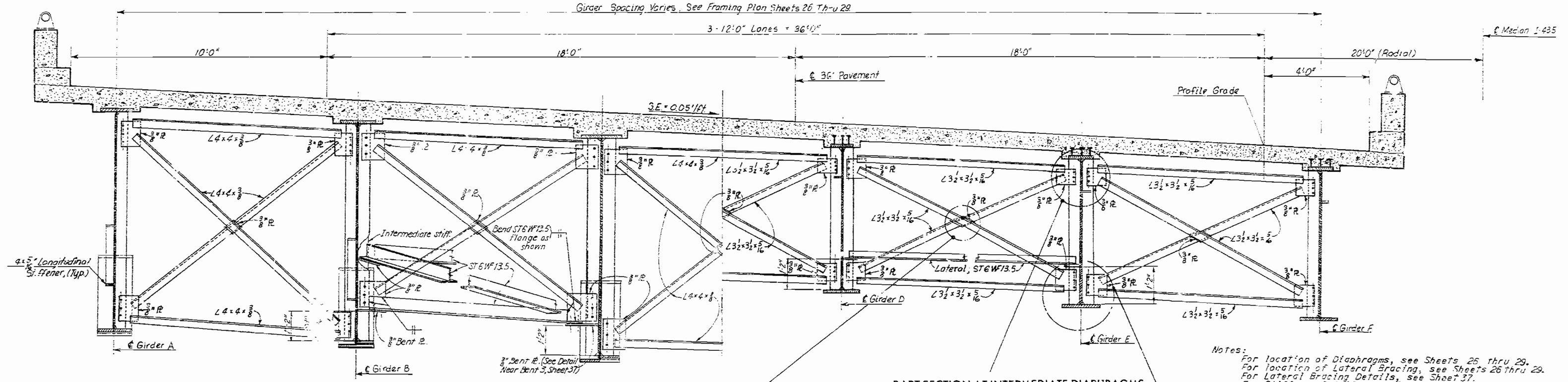
1909-21-01

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
5	MO			72
DIST. NO.	COUNTY		ROUTE NO.	
4	JACKSON			

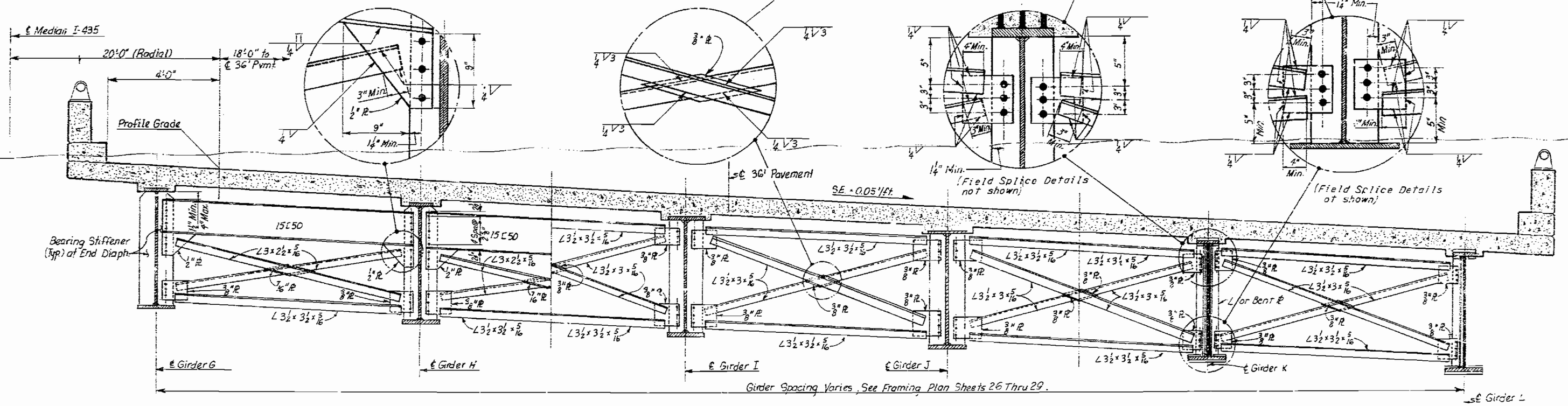


PART SECTION NEAR BENTS
(TYPICAL AT BENTS 2, 3 AND 4 AND FOR WEB DEPTHS OVER 76")

PART SECTION AT INTERMEDIATE DIAPHRAGMS

TRANSVERSE SECTION THRU NORTHBOUND LANE - UNIT 1
SOUTHBOUND LANE SIMILAR

Notes:
For location of Diaphragms, see Sheets 26 thru 29.
For location of Lateral Bracing, see Sheets 26 thru 29.
For Lateral Bracing Details, see Sheet 37.
For Stiffener Details, see Sheet 37.
For Welding Details, see Sheet 37.
For location of Bend Points, see Sheets 26 thru 29.
For Slab Section, see Sheets 42 and 45.
All bolts are 7/8" H.S. bolts, 1" holes.
For location of stiffener plates, see Sheets 30 thru 33.
For location and extent of longitudinal stiffeners see Sheets 30 thru 32.



PART SECTION AT END DIAPHRAGMS
(END BENTS 1 AND 10)

PART SECTION NEAR BENTS - UNIT 2
INTERMEDIATE DIAPHRAGMS SIMILAR

TRANSVERSE SECTION THRU SOUTHBOUND LANE
NORTHBOUND LANE SIMILAR

PART SECTION AT FIELD SPLICES

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.40 N.B.L.
141+00.56 S.B.L.
JACKSON COUNTY

DIAPHRAGM DETAILS

SHEET 36 OF 49

A-1686

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

MADE CWG DATE 4-6-67 CHECKED JFF DATE 5-5-67

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

1909-21-101

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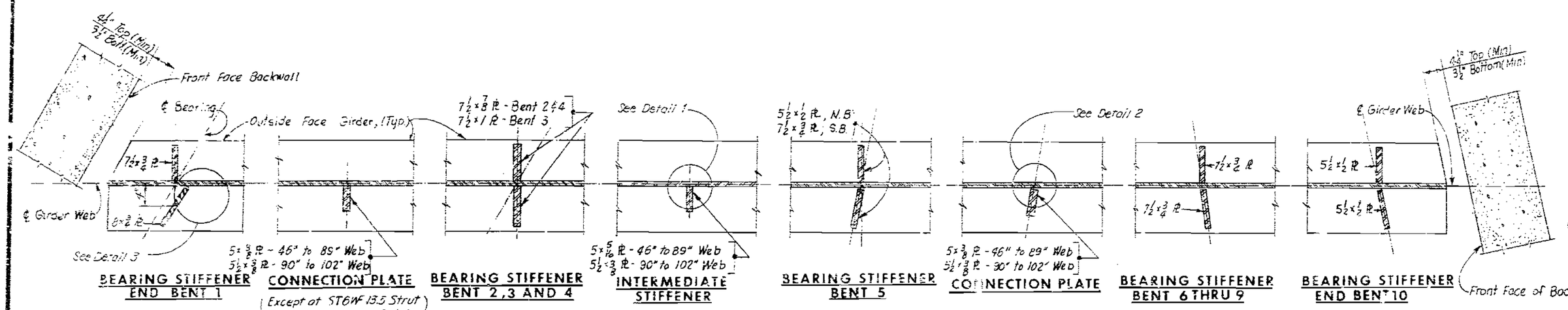
FOR INFORMATION ONLY

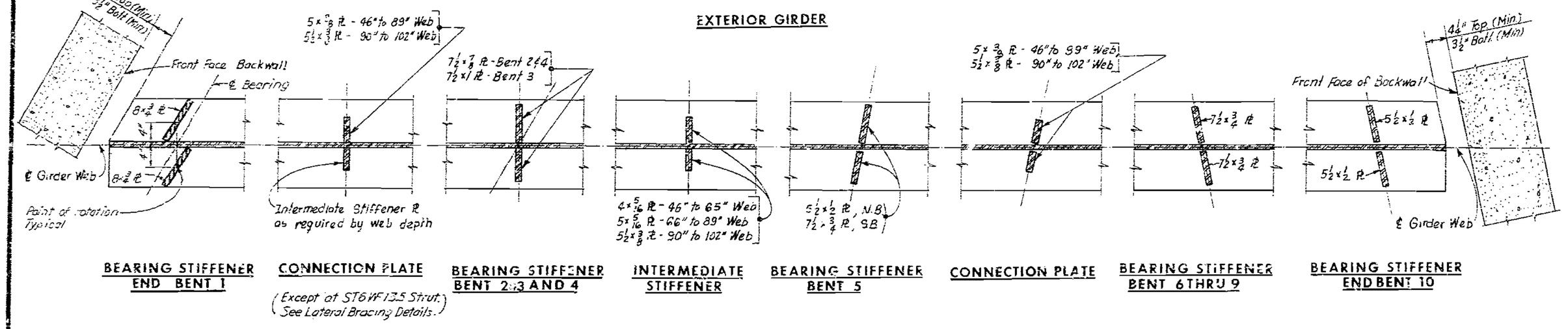
A16866, Sht. 46

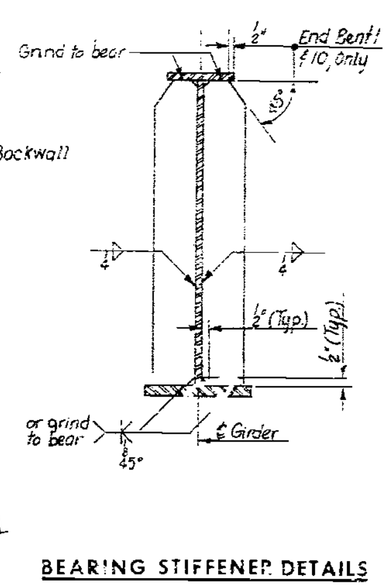
MISSOURI STATE HIGHWAY DEPARTMENT

STATE DIST. NO.	FEDERAL PROJECT NO. & SEC. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.			75
DIST. NO.	COUNTY		ROUTE NO.	
4	JACKSON			

FOR INFORMATION ONLY

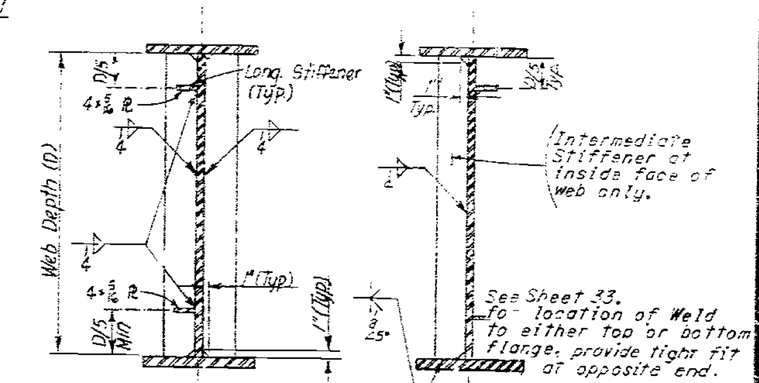






BEARING STIFFENER DETAILS

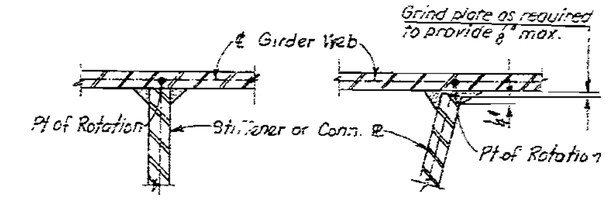
Note:
Longitudinal stiffeners, (4x⅜" Bar), to be placed on outside face of exterior girder web and on one side of interior girder web only at D/5 from compression flange, where D equals depth of web. For longitudinal limits of stiffener, see Girder Elevations, Sheets 30 thru 32.



Note:
Intercostal web stiffener plates on interior girders shall be fitted to form a close joint (⅛"), top and bottom.

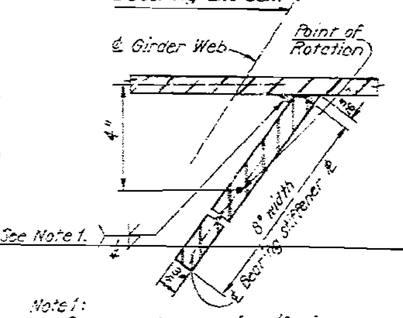
INTERIOR GIRDER EXTERIOR GIRDER

INTERMEDIATE STIFFENERS AND CONNECTION PLATE DETAILS



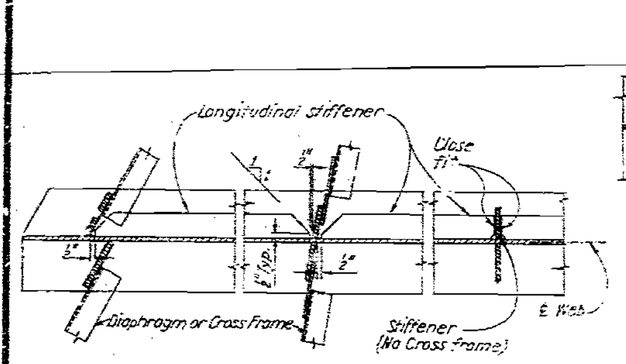
DETAIL 1 TYPE A CONNECTION

DETAIL 2 TYPE A CONNECTION



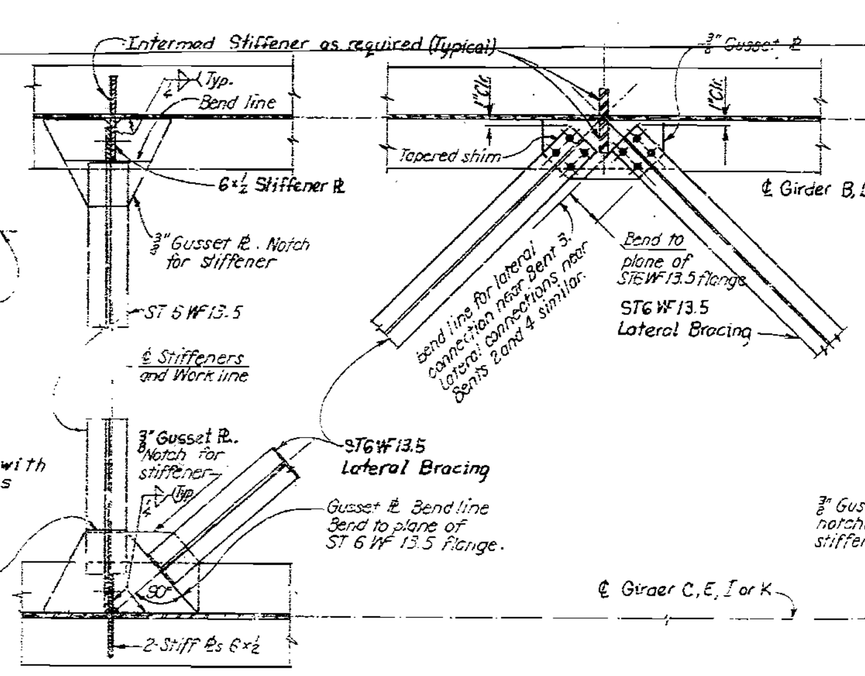
Note 1:
Groove weld penetration ¼" min. Only welding processes having good penetration will be permitted on groove welds.

DETAIL 3 TYPE C CONNECTION



LONGITUDINAL STIFFENER END TREATMENT

Note:
Whenever longitudinal stiffeners interfere with bolting the cross frames in place clip stiffeners as shown.

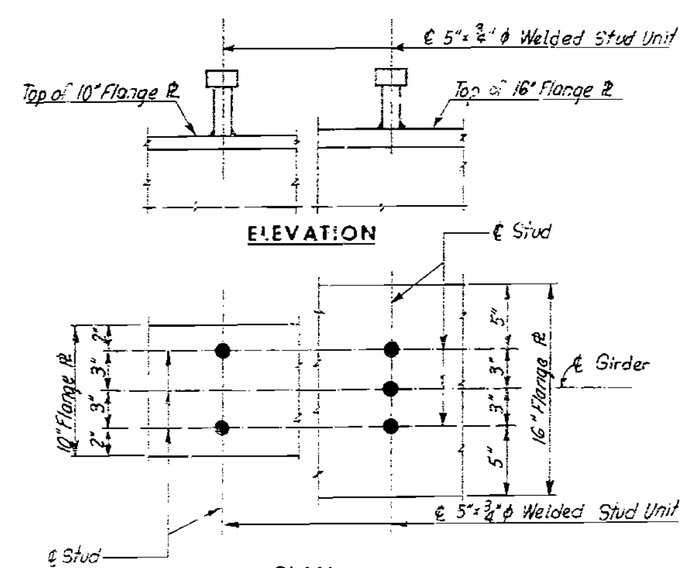


NEA JT 2 (Details near Joint 4 similar)

NEAR BENT 3

LATERAL BRACING DETAILS

LEGEND
S.B. denotes Southbound Lane
N.B. denotes Northbound Lane



SHEAR CONNECTOR DETAILS

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE CVS DATE 5-4-67 CHECKED VF DATE 5-9-67

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

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

SUPERSTRUCTURE DETAILS

SHEET 37 OF 49

A-1686

1909 21.01

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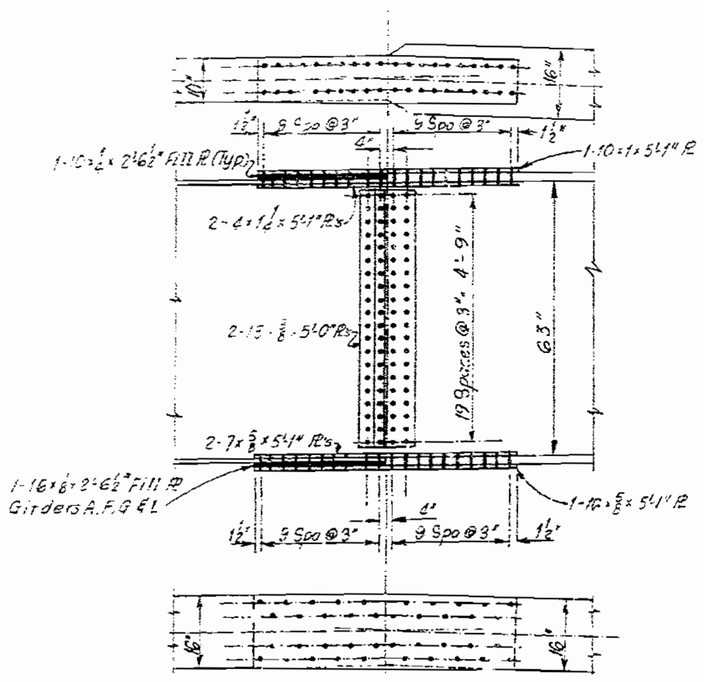
A16866, Sht. 47

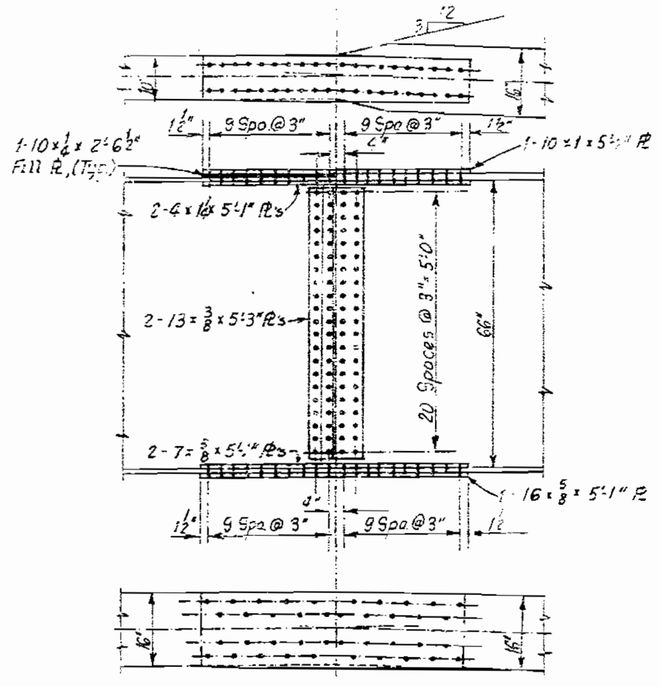
MISSOURI STATE HIGHWAY DEPARTMENT

FOR INFORMATION ONLY

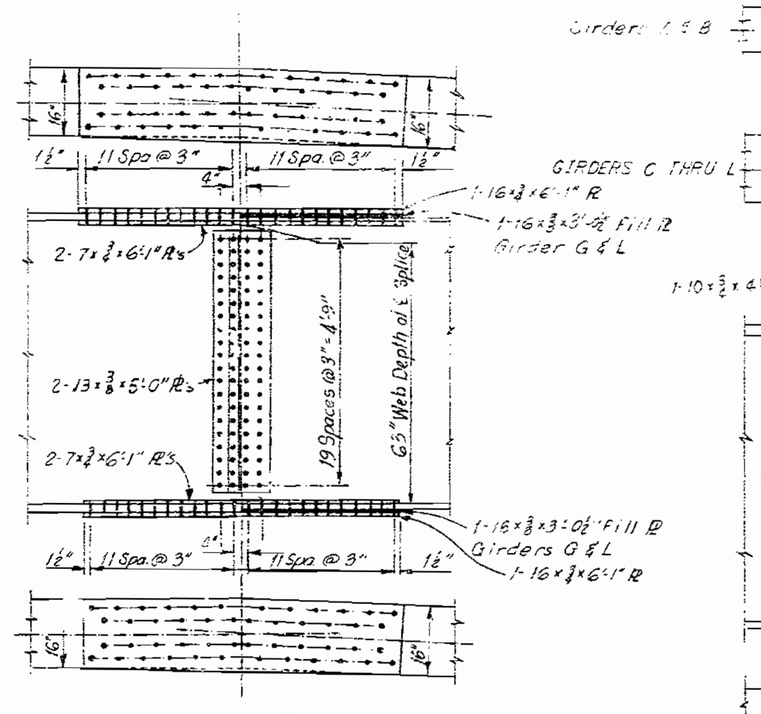
FED. ROAD STATE	FEDERAL PROJECT NO.	SEC.	ROUTE	SHEET NO.	TOTAL SHEETS
5	M				
DIST. NO.	COUNTY			TRAFFIC SEC.	
4	JACKSON				



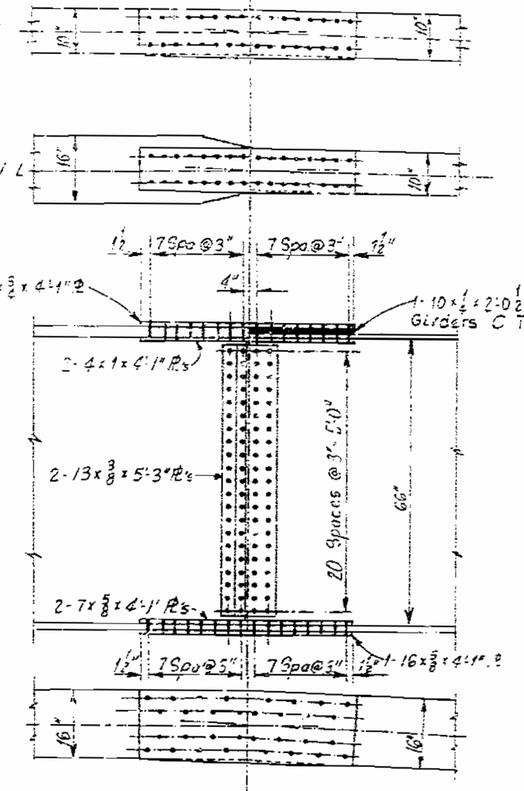
BEND POINT 1



BEND POINTS 3 AND 4



BEND POINT 6
(SOUTHBOUND LANE)



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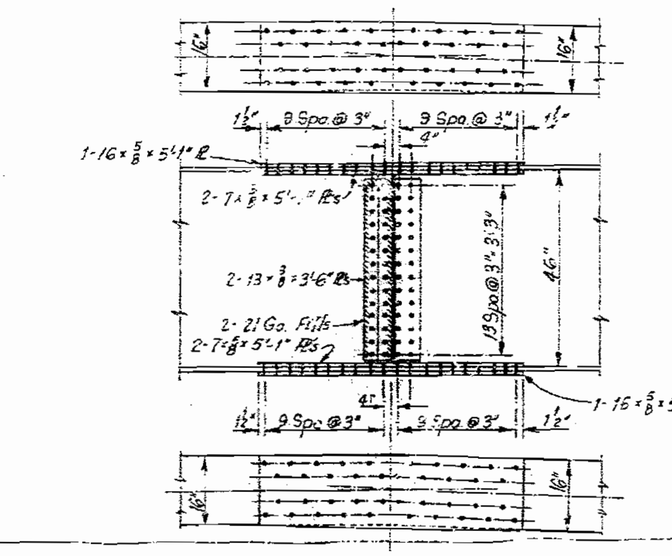
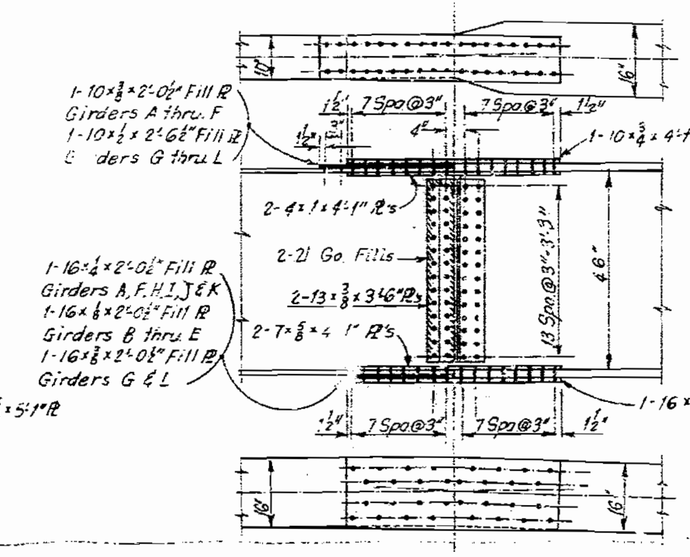
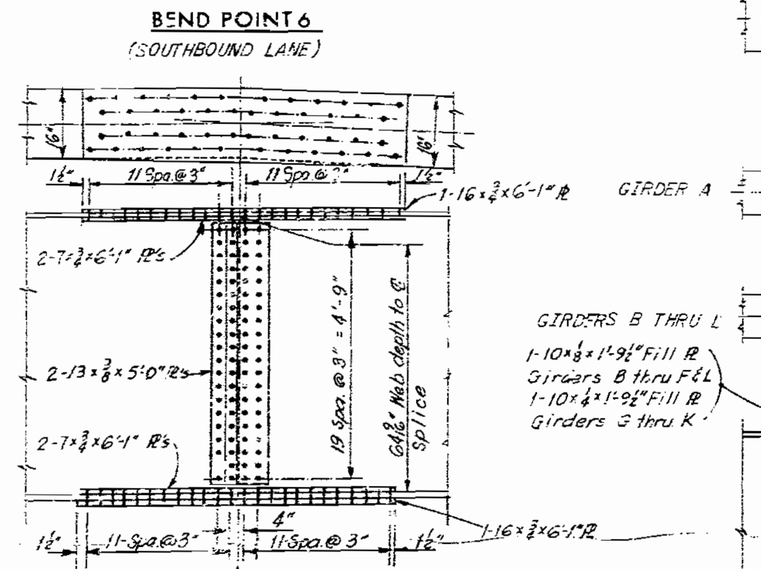


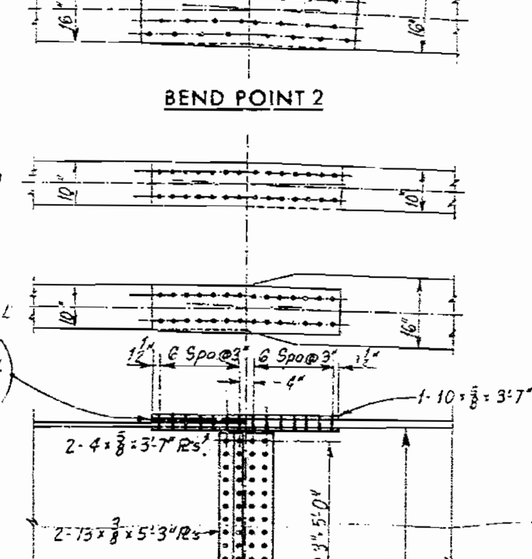
BEND POINT 8



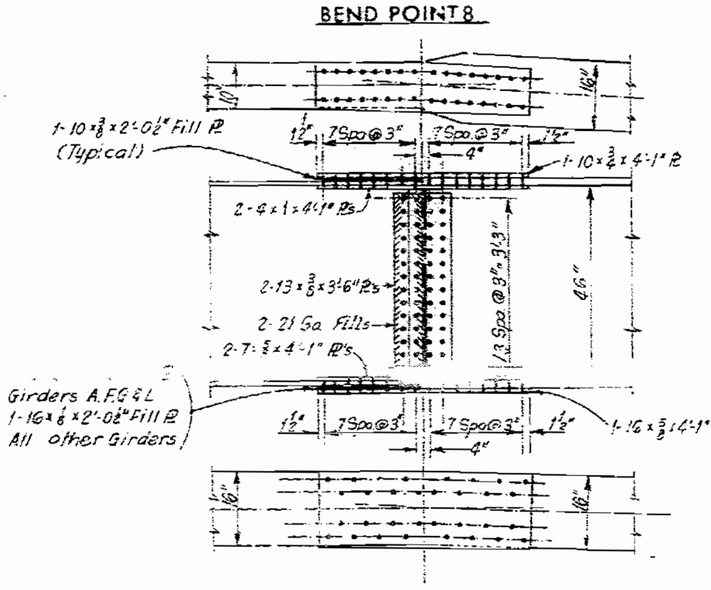
BEND POINT 10



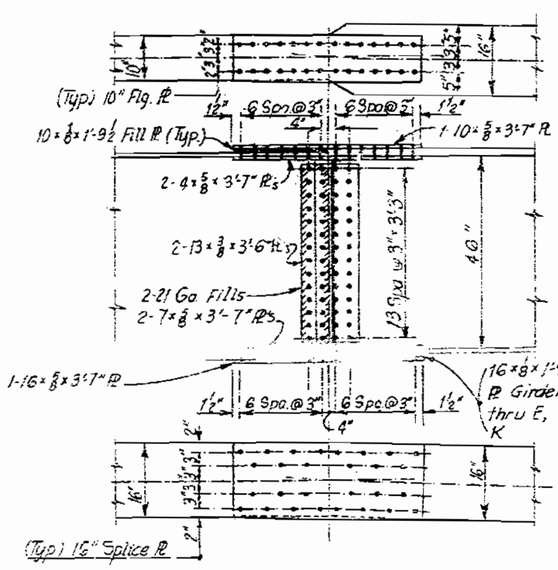
BEND POINT 6
(NORTHBOUND LANE)



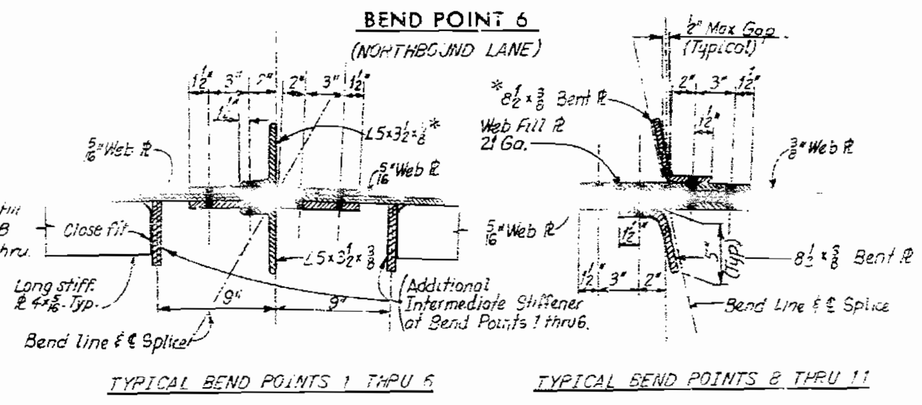
BEND POINT 5



BEND POINTS 9

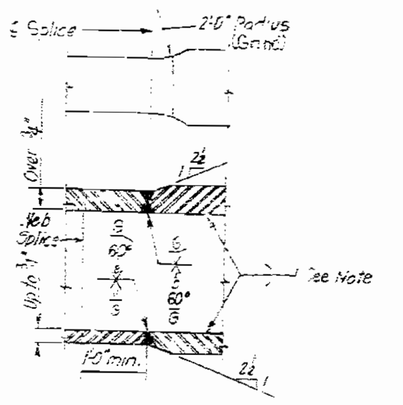


BEND POINT 11



* ..... Angle or bent plate to be omitted on outside face of exterior girders.

FIELD SPLICE DETAILS



FLANGE TO WEB WELD	
Flange Thickness	Min. Size Fillet Weld *
To 3/4" inclusive	1/4
over 3/4" to 1 1/4"	5/16
over 1 1/4" to 2 1/4"	3/8
over 2 1/4" to 6"	1/2

* Except that weld size need not exceed the thickness of the thinnest part being joined.

WELDING NOTES:
Fillet weld size for flange to web welds when submerged arc process is used shall be 1/4" for material to 3/4" thick, and in accordance with AWS recommended weld sizes for material over 3/4" thick.

Radiographic and or magnetic particle inspection of shop welds will be required. See General Notes.

RT, where shown on Girder Elevations, indicates location of shop web splice Radiographic testing.

SHOP WELDING DETAILS

Note: Splice Material shall be A.S.T.M. A36-66. Use 7/8" High Strength bolts and nuts with one hardened washer under the part to be turned in tightening. Holes to be reamed to 7/8". Reentry cuts will not be allowed on field splice plates.
See Girder Elevations, sheets 30 thru 33 for locations of field splices.
All dimensions are measured along ℄ girder.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IC-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

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

MADE CWS DATE 5-8-67 CHECKED JFP DATE 5-13-67

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

GIRDER SPLICE DETAILS

SHEET 38 OF 43

A-16866

1809 21 01

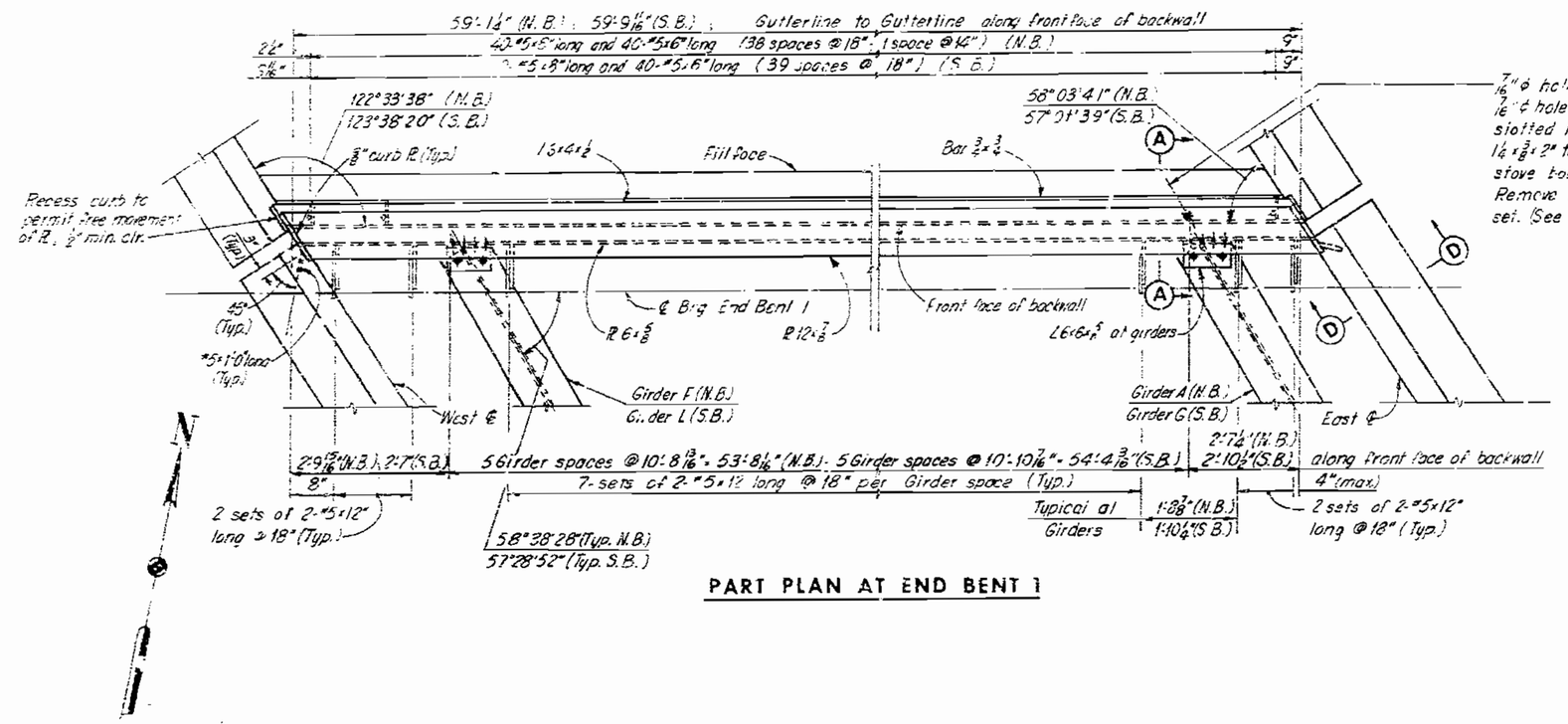
25

A16866, Sht. 48

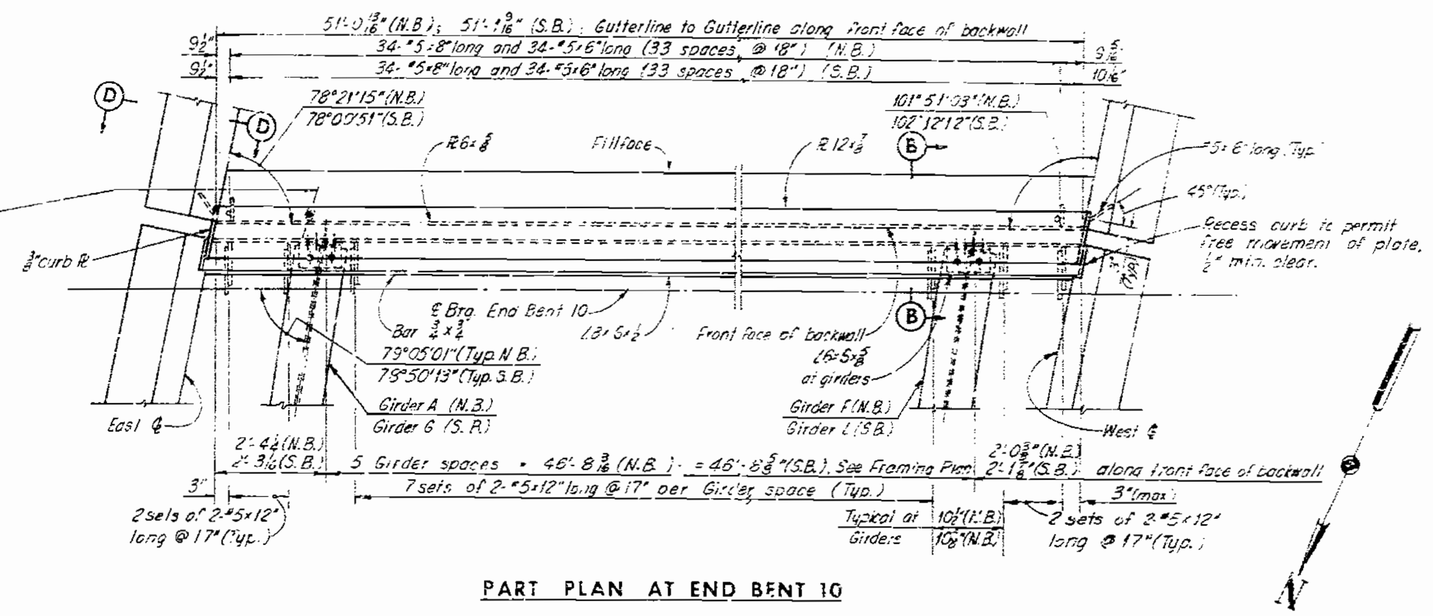
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD STATE	FEDERAL PROJECT NO. & SEC.	FISCAL SHEET NO.	FISCAL YEAR NO.
5	MO		
DIST. NO.	COUNTY		COUNTY SEC.
4	JACKSON		

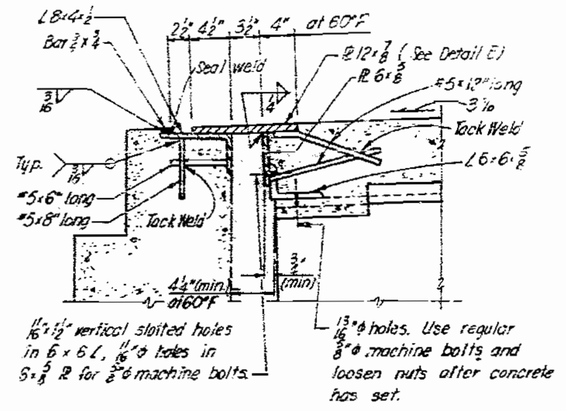
FOR INFORMATION ONLY



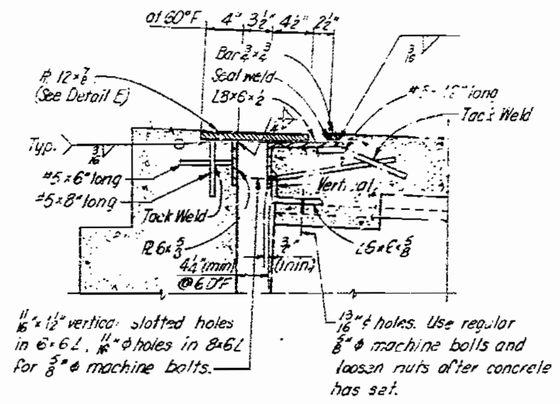
PART PLAN AT END BENT 1



PART PLAN AT END BENT 10

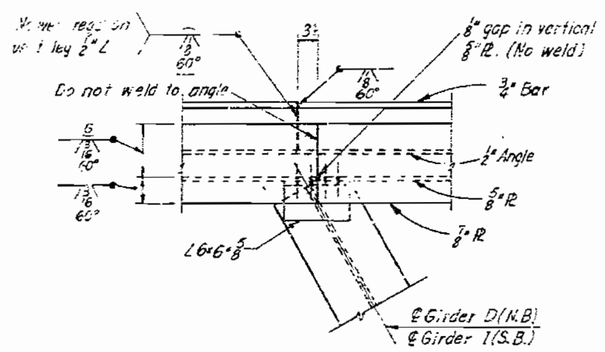


SECTION A-A

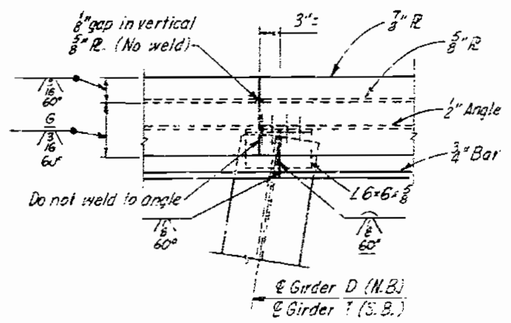


SECTION B-B

Note:
Dimensions in Sections A-A and B-B are given normal to front face of backwall. Grades shown are along ℄ Median I-435.



AT END BENT 1

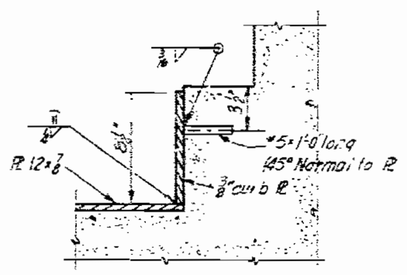


AT END BENT 10

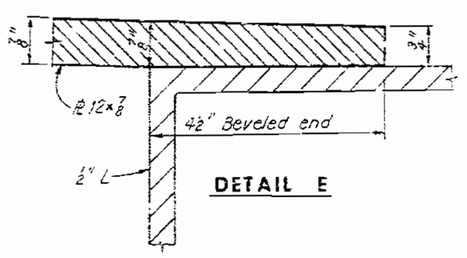
PERMISSIBLE FIELD SPLICE

Note:
Expansion devices shall be fabricated in one section, except that one field splice is permissible. The expansion devices shall be bent to conform to crown and grade of roadway.
#5 bars shall be structural grade.
Approved stud welded anchors may be used in lieu of #5 bars shown.
The expansion devices shall be ASTM A35.

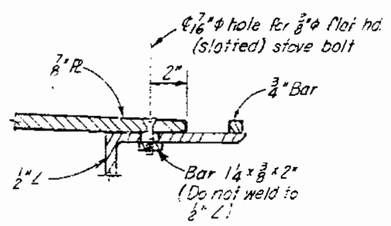
LEGEND
(N.B.) denotes Northbound Lane
(S.B.) denotes Southbound Lane



SECTION D-D



DETAIL E



DETAIL C

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY — NEW YORK
MADE P.D.M. DATE 2-3-67 CHECKED JFP DATE 4-20-67

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

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE. I-435) STA. 141+49.48 N.B.L. 141+00.36 S.B.L.
JACKSON COUNTY

EXPANSION DEVICE AT END BENTS

SHEET 39 OF 49

A-1686

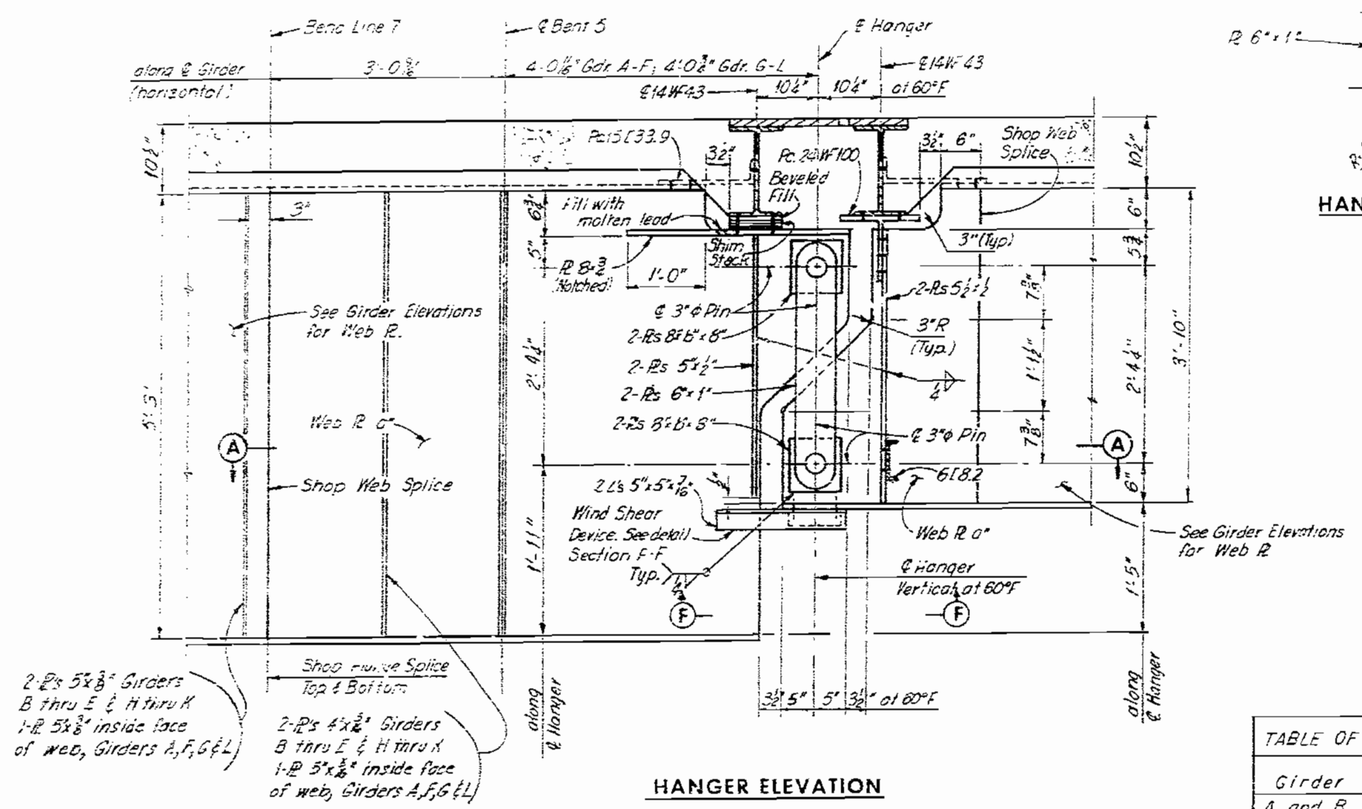
76

1509-21-01
B54

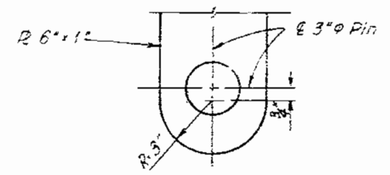
A16866, Sht. 49

MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
MO		172	
DIST. NO.	COUNTY		
4	JACKSON		

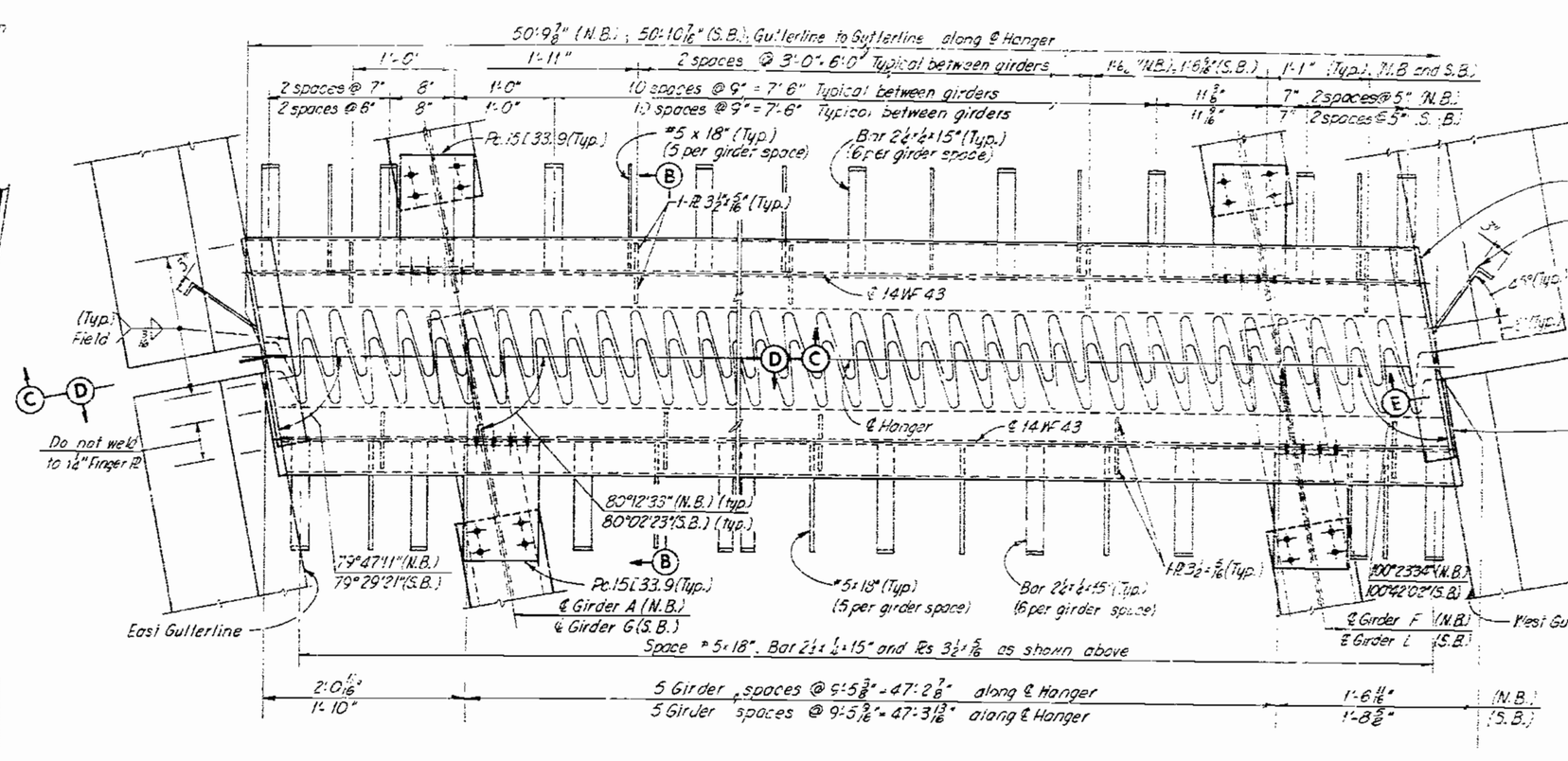


HANGER ELEVATION

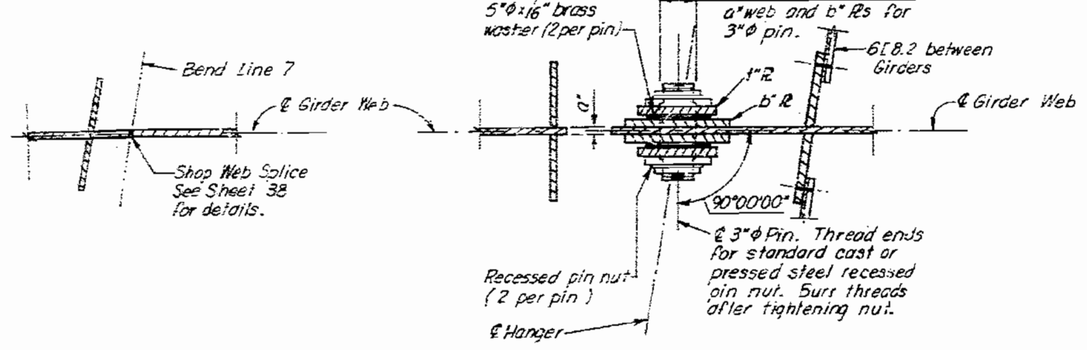


HANGER BAR DETAIL

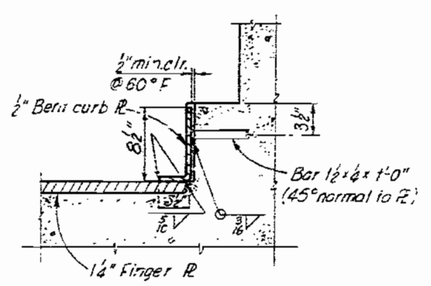
TABLE OF PLATE DIMENSIONS		
Girder	Web P_{l} a''	Pin P_{l} b''
A and B	7/16"	1/2"
C thru G	1/2"	1"
H thru L	5/8"	2"



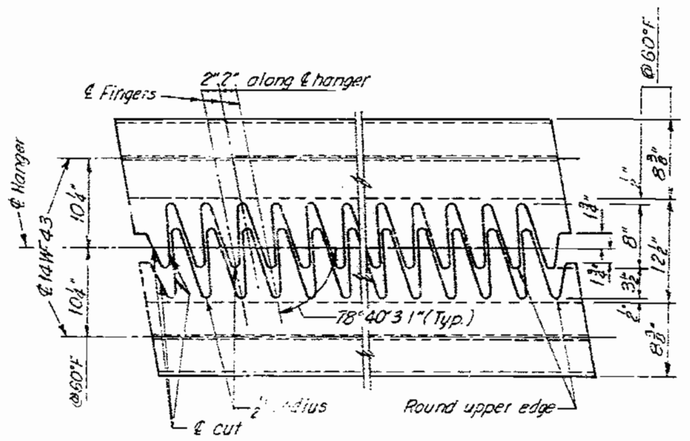
PART PLAN OF EXPANSION DEVICE AT HANGER



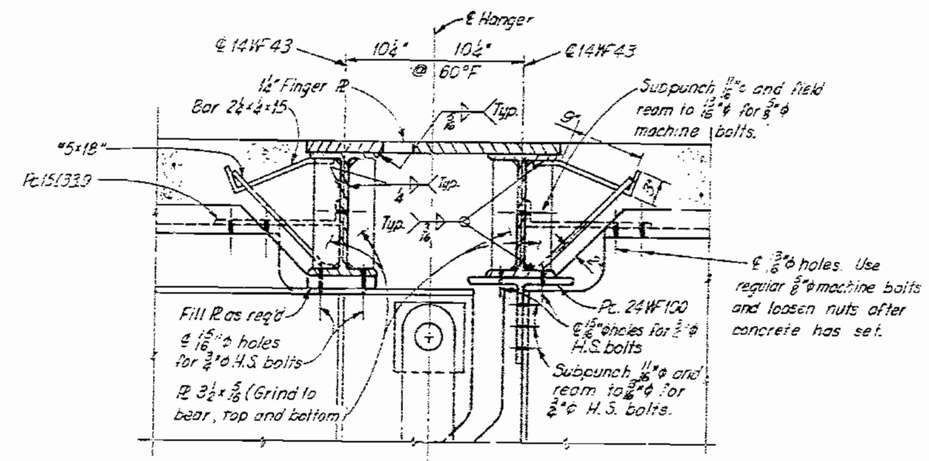
SECTION A-A



SECTION E-E

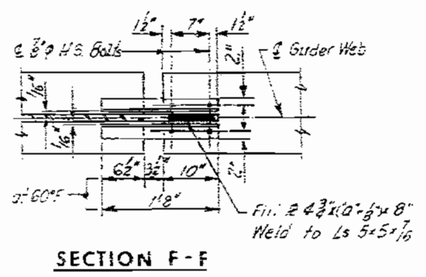


FINGER PLATE LAYOUT

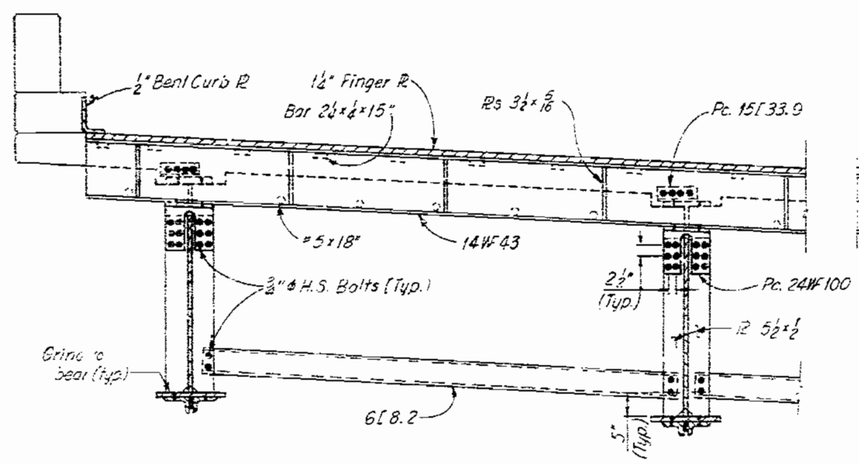


PART SECTION B-B

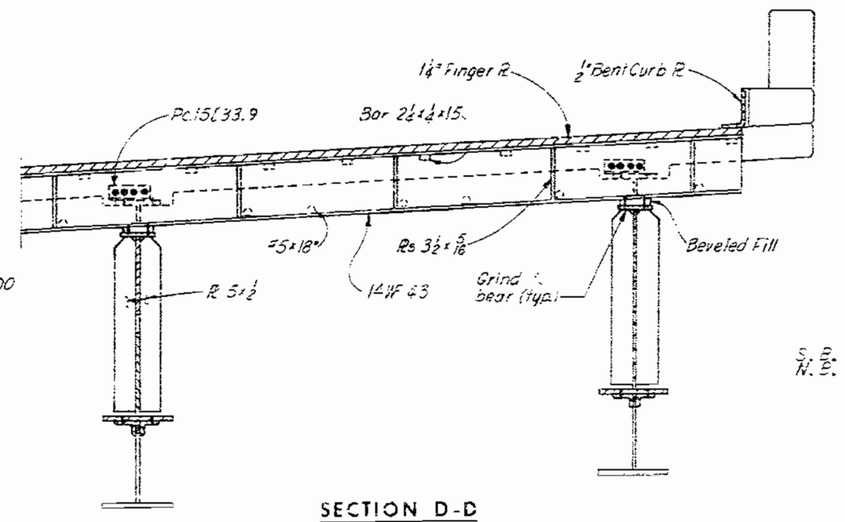
HANGER NOTES:
Pin shall be AISI C-1018.
Web plates a", pin plates b" shall be ASTM A441.
6"x1" hanger bar shall be ASTM Modified A441 Steel.
The surfaces of pins and pin holes shall be finished to ASA 1.25.
See Sheet 38 for shop web and flange splice details.



SECTION F-F



SECTION C-C



SECTION D-D

EXPANSION DEVICE NOTES:
Finger plates shall be cut with a gas torch from one plate 25½" x 14¼". The surface of cut shall be perpendicular to the surface of plate. The cut shall not exceed ⅜" in width. The centerline of cut shall not deviate more than ⅜" from the position of centerline of cut shown in Finger Plate Layout. No part of expansion device may be spliced.
The expansion device shall be ASTM A36.

LEGEND
S.B. denotes Southbound Lane
N.B. denotes Northbound Lane

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

HANGER DETAILS
EXPANSION DEVICE AT HANGER

SHEET 40 OF 49

A-1686

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

MADE F.D.M. DATE 6-14-67 CHECKED J.E.H. DATE 6-20-67

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

FOR INFORMATION ONLY

A16866, Sht. 50

MISSOURI STATE HIGHWAY DEPARTMENT

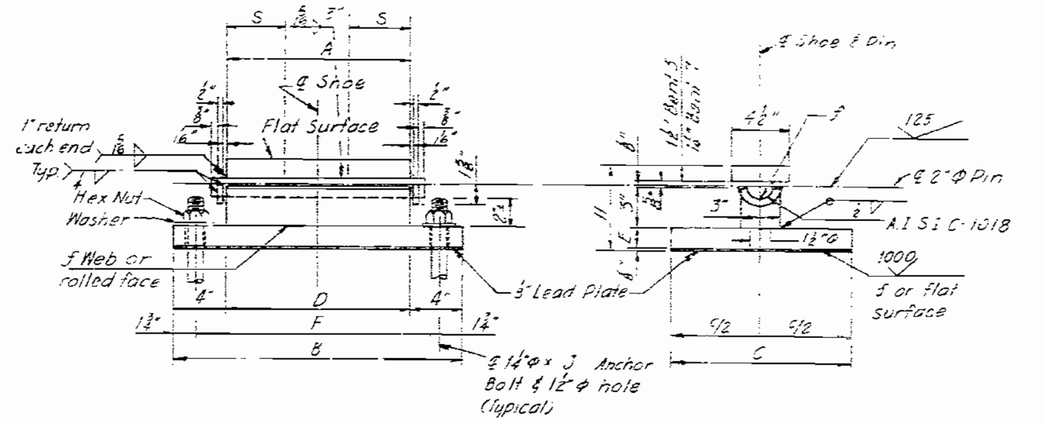
FED. ROAD DIST. NO.	STATE	FEDERAL PROJECT NO.	SEC. NO.	FISCAL SHEET NO.	TOTAL SHEETS
5	MO			YEAR	NO. SHEETS
				17?	
DIST. NO.	COUNTY			ROUTE NO.	
4	JACKSON				

DIMENSIONS FOR EXPANSION AND FIXED BEARINGS

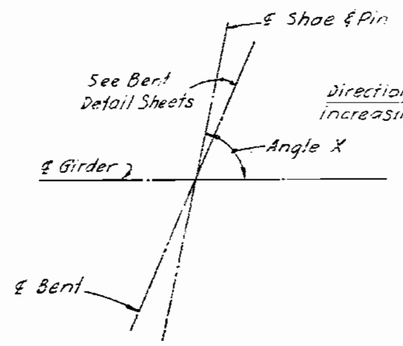
	Unit 1 North Bound Lane and South Bound Lane						Unit 2 North Bound Lane and South Bound Lane				
Dimension	End Bent 1 Exp.	Bent 2 Exp.	Bent 3 Fixed	Bent 4 Exp.	Bent 5 Exp. N.B.	Bent 5 Exp. S.B.	Bent 6 Exp.	Bent 7 Fixed	Bent 8 Exp.	Bent 9 Exp.	End Bent 10 Exp.
A	15"	15"	15"	15"	11"	15"	15"	15"	15"	15"	11"
B	23 1/2"	22 1/2"	23"	23 1/2"	19 1/2"	23 1/2"	23 1/2"	23"	23 1/2"	23 1/2"	19 1/2"
C	13"	20"	18"	20"	13"	17"	17"	12"	17"	17"	11"
D	15"	15"	15"	15"	11"	15"	15"	15"	15"	15"	11"
E	1 3/8"	3 1/4"	2 3/8"	3 1/4"	2 1/8"	2 1/8"	2 1/8"	1 3/8"	2 1/8"	2 1/8"	1 3/8"
F	19 1/2"	19 1/2"	19 1/2"	19 1/2"	15 1/2"	19 1/2"	19 1/2"	19 1/2"	19 1/2"	19 1/2"	15 1/2"
G	4 3/8"	8 3/8"		8 3/8"	5 3/8"	5 3/8"	5 3/8"		5 3/8"	5 3/8"	4 3/8"
H	10 1/2"	15 3/4"	8 1/4"	15 3/8"	12"	12"	12"	6 3/8"	12"	12"	10 1/4"
J	1'-3"	1'-4"	1'-5"	1'-4"	1'-4"	1'-4"	1'-4"	1'-4"	1'-4"	1'-4"	1'-3"
P	5 1/2"	10 1/2"		10 1/2"	7 1/2"	7 1/2"	7 1/2"		7 1/2"	7 1/2"	6 1/2"
S	5"	6"	5"	6"	4"	6"	6"	6"	6"	5"	4"
Required	12	12	12	12	6	6	12	12	12	12	12
Wt. (lbs)	315	652	394	652	317	461	461	205	461	461	234

SHOE SETTING ANGLE X

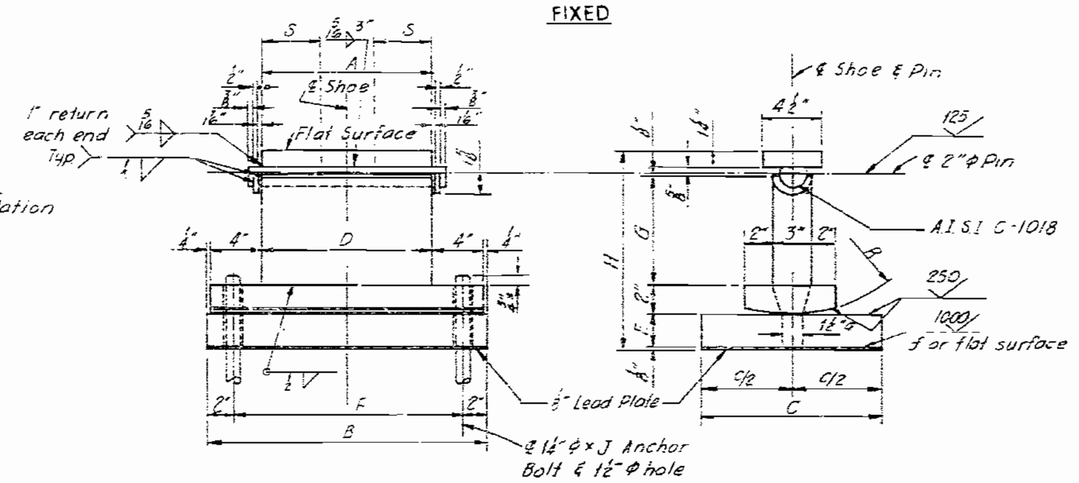
North Bound Lane			South Bound Lane		
End Bent 1		88°14'42"	End Bent 1		87°58'00"
Bent 2	A	89°12'42"	Bent 2	G	89°01'32"
	B	88°54'53"		H	88°42'05"
	C	88°37'11"		I	88°22'47"
	D	88°19'35"		J	88°03'38"
	E	88°02'08"		K	87°44'34"
	F	87°44'42"		L	87°25'39"
Bent 3		90°00'00"	Bent 3		90°00'00"
Bent 4		91°24'26"	Bent 4		91°28'46"
Bent 5		92°58'16"	Bent 5		93°20'11"
Bent 6		89°30'22"	Bent 6		89°31'07"
Bent 7		90°00'00"	Bent 7		90°00'00"
Bent 8		91°22'24"	Bent 8		91°36'13"
Bent 9		92°19'39"	Bent 9		92°20'28"
End Bent 10		91°43'55"	End Bent 10		91°43'04"



FIXED



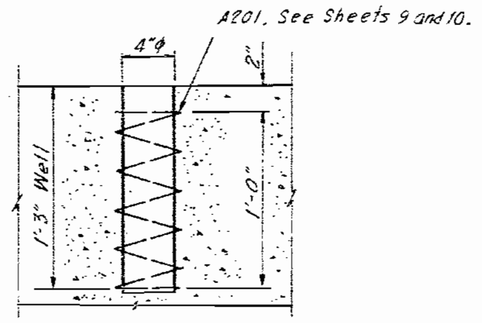
SHOE SETTING DIAGRAM



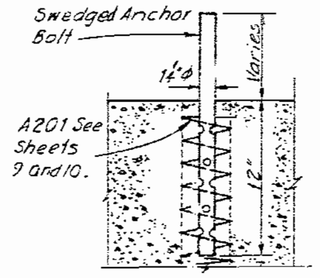
EXPANSION

TYPE D BEARING

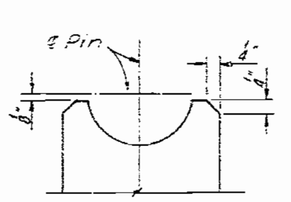
Notes:
Anchor bolts for Type D Bearings shall be 1 1/4"Φ swedged bolts and shall extend 12" into concrete, with hexagon nuts and plain washers for Fixed Bearings, no nuts for Expansion Bearings.
Lead plates under bearings shall be approximately 1/2" thickness and weigh 8 #/sq.ft. Cost of lead plates shall be included in price bid for other items.
Weight shown in table does not include weight of anchor bolts.
Rockers and pedestals shall be machined after welding, where flat surface is indicated, tolerance shall be 0.003"/in in any direction.
For Anchor Bolt Setting Plan, see Bent Detail Sheets.
Cost of Anchor Bolts shall be included in the price bid for Fabricated Structural Carbon Steel.



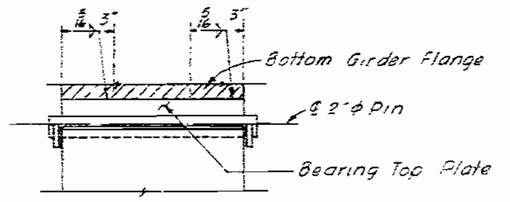
ANCHOR BOLT WELL DETAIL



ANCHOR BOLT



END VIEW OF WEB



WELDING DETAILS

TYPE D BEARING

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 41 OF 49

A-1686

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE S.S.W. DATE 4-12-67 CHECKED J.E.H. DATE 4-19-67

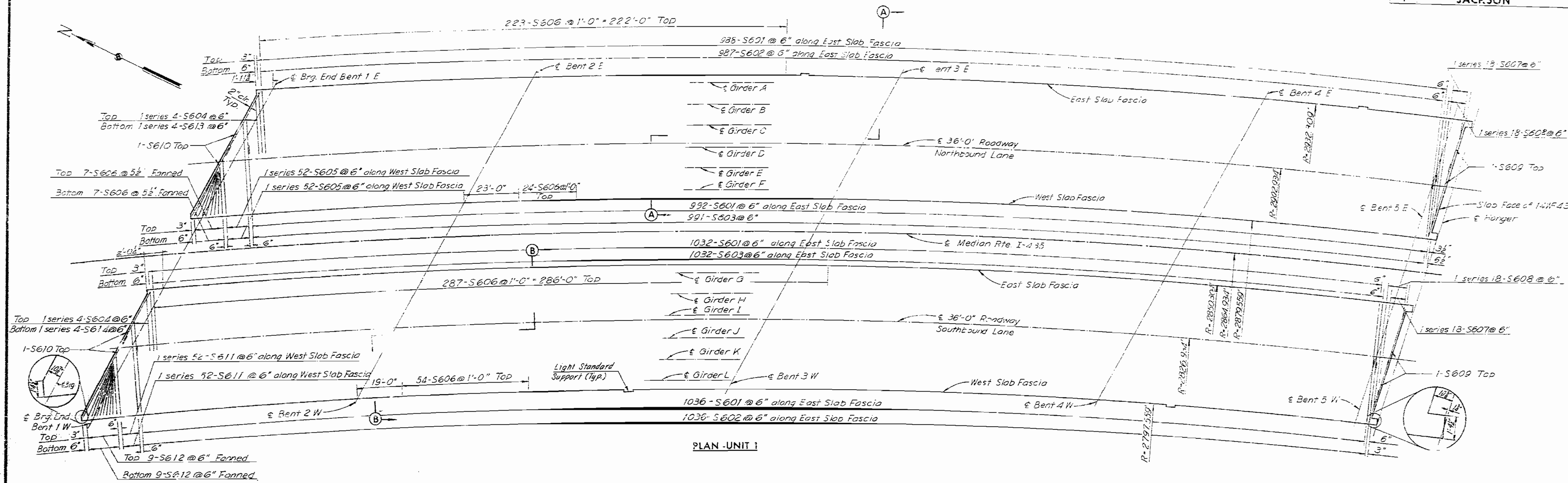
NOTE: This drawing is not to scale. Follow dimensions.

FOR INFORMATION ONLY

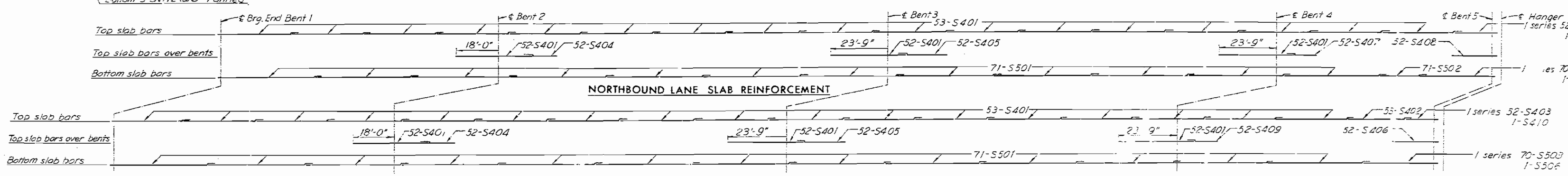
A16866, Sht. 51

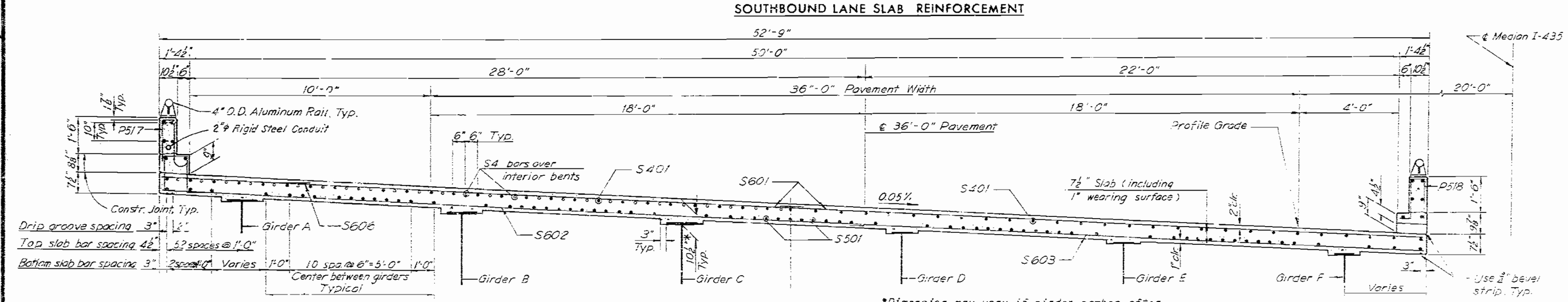
MISSOURI STATE HIGHWAY DEPARTMENT

SEC. ROAD SYSTEM DIV. NO.	STATE FEDERAL PROJECT NO. & SEC.	FISCAL SHEET TOTAL YEAR NO.	SHEET NO.
5	MO		150
DIST. NO.	COUNTY		SHEET SEC.
4	JACKSON		



PLAN - UNIT 1





SECTION A-A

Note:
Space transverse bars radially.

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

Note:
Section A-B similar to Section B-B, Sheet 45.
Lap = 4 bars 1'-0", #5 bars 1'-3" and #6 bars 1'-6".
Longitudinal Reinforcing Steel shall be placed so that ends shall not be more than 1½" from a plate or 14 WF @ 43# at Expansion Device.
Provide 1½" clear from face of concrete to reinforcing steel in the superstructure unless shown otherwise.
For Girder spacing see Framing Plan, Sheets 26, 27 & 28.
For location of Light Standard Supports, see Sheets 43 and 44.
For Light Standard Support Details, see Sheet 49.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE. I-435) STA. 141+49.48 N.B.L.
141+00.55 S.B.L.

JACKSON COUNTY

SHEET 42 OF 49

4-1686

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

MADE A.M.H. DATE 4-5-67 CHECKED A.M.H. DATE 4-14-67

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

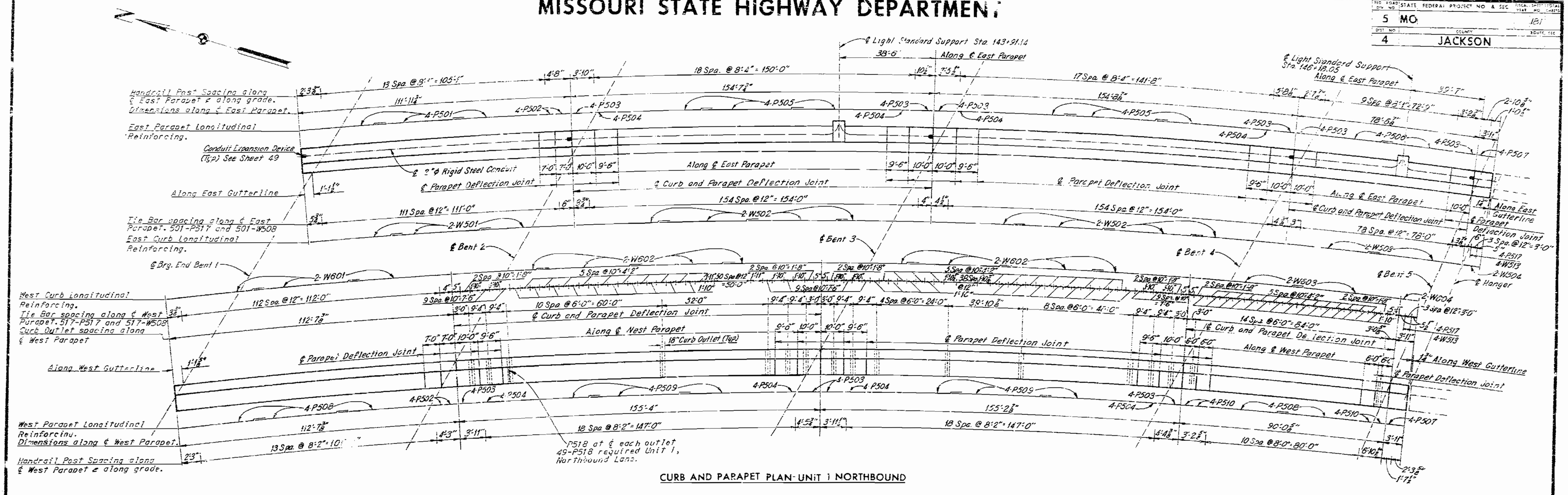
SLAB REINFORCEMENT UNIT 1

FOR INFORMATION ONLY

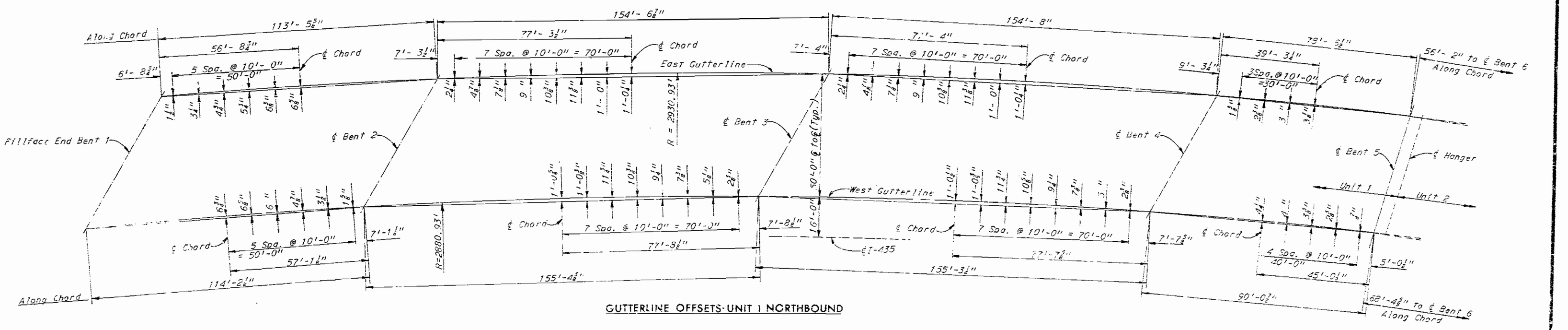
A16866, Sht. 52

MISSOURI STATE HIGHWAY DEPARTMENT

STATE	FEDERAL PROJECT NO.	SHEET NO.	TOTAL SHEETS
5 MO.			
DIST. NO.	COUNTY	ROUTE, SEC.	
4	JACKSON		



CURB AND PARAPET PLAN-UNIT 1 NORTHBOUND



GUTTERLINE OFFSETS-UNIT 1 NORTHBOUND

Notes:
Dimensions are horizontal unless otherwise shown.
For Reinforcement Schedule, see Sheet 43.
For location of Curb and Parapet reinforcing see Section A-A on Sheet 42.
Chord offsets to Gutterline are Symmetrical about ℄ Chord except as otherwise shown.
49 Curb Outlets required Unit 1 Northbound Lane.
Provide 1½" clear from face of concrete to reinforcing steel in the superstructure unless shown otherwise.
For Handrail Details, see Sheet 49.
For Light Standard Support Details, see Sheet 49.
For Conduit Details, see Sheet 49.

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

MADE DES DATE 4-11-67 CHECKED DWG DATE 4-12-67

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

CURB AND PARAPET PLAN; UNIT 1; NORTHBOUND LANE

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 43 OF 49

A-16866

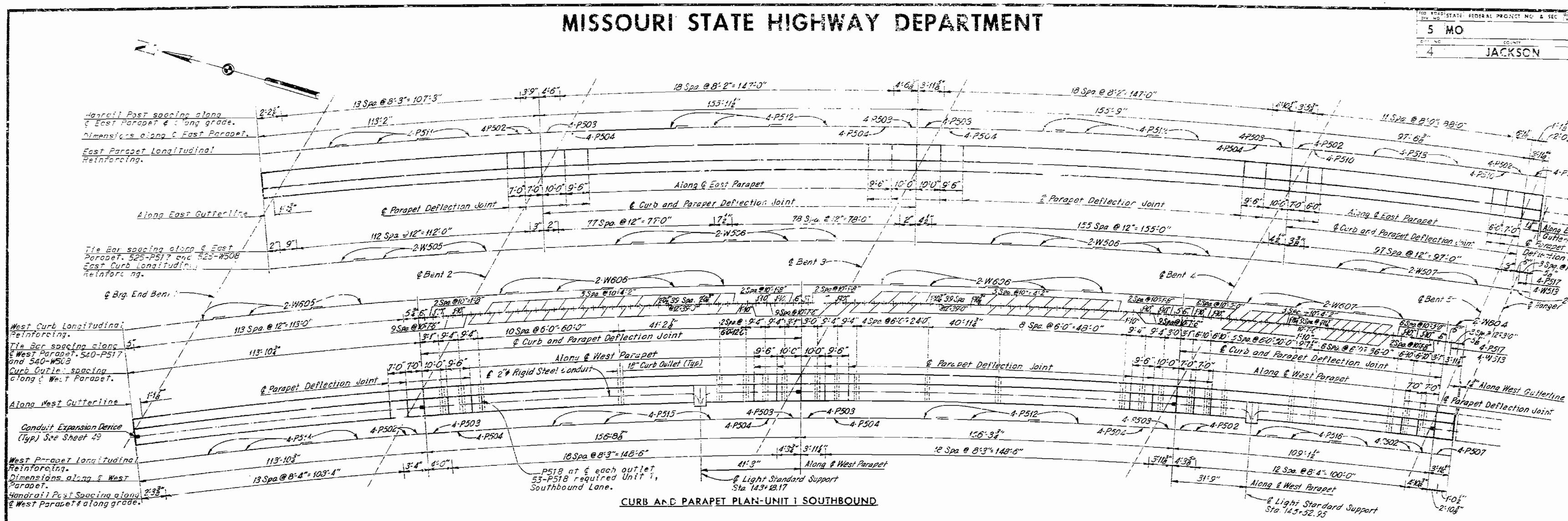
N.B. Unit 1
1609-21-08-(00-83)

FOR INFORMATION ONLY

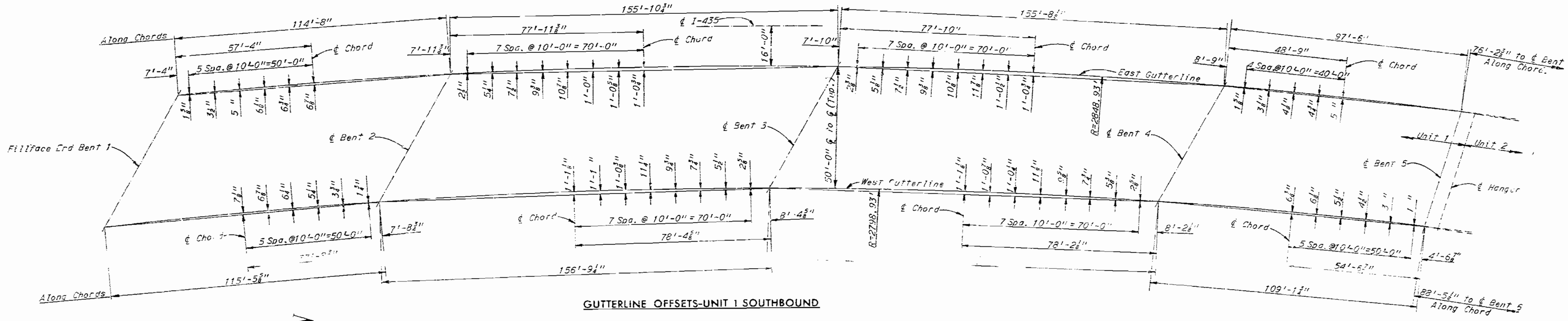
A16866, Sht. 53

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	TOTAL SHEETS
5	MO		68	
DIST. NO.	COUNTY		ROUTE SEC.	
4	JACKSON			



CURB AND PARAPET PLAN-UNIT 1 SOUTHBOUND



GUTTERLINE OFFSETS-UNIT 1 SOUTHBOUND

Notes:
Dimensions are horizontal unless otherwise shown.
For Reinforcement Schedule, see Sheet 13.
For location of Curb and Parapet reinforcing see Section B-B on Sheet 45.
Chord offsets to Gutterline are Symmetrical about ℄ Chord, except as otherwise shown.
53 Curb Outlets required Unit 1 Southbound Lane.
Provide 1½" clear from face of concrete to reinforcing steel in the superstructure unless shown otherwise.
For Handrail Details, see Sheet 49.
For Light Standard Support Details, see Sheet 49.
For Conduit Details, see Sheet 49.

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
DRAWN D.E.S. DATE 4-13-67 CHECKED S.S.W. DATE 4-19-67

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

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-G-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

CURB AND PARAPET PLAN; UNIT 1; SOUTHBOUND LANE

SHEET 44 OF 49

A-1686

S.B. Unit 1
1969-21-01-000-854

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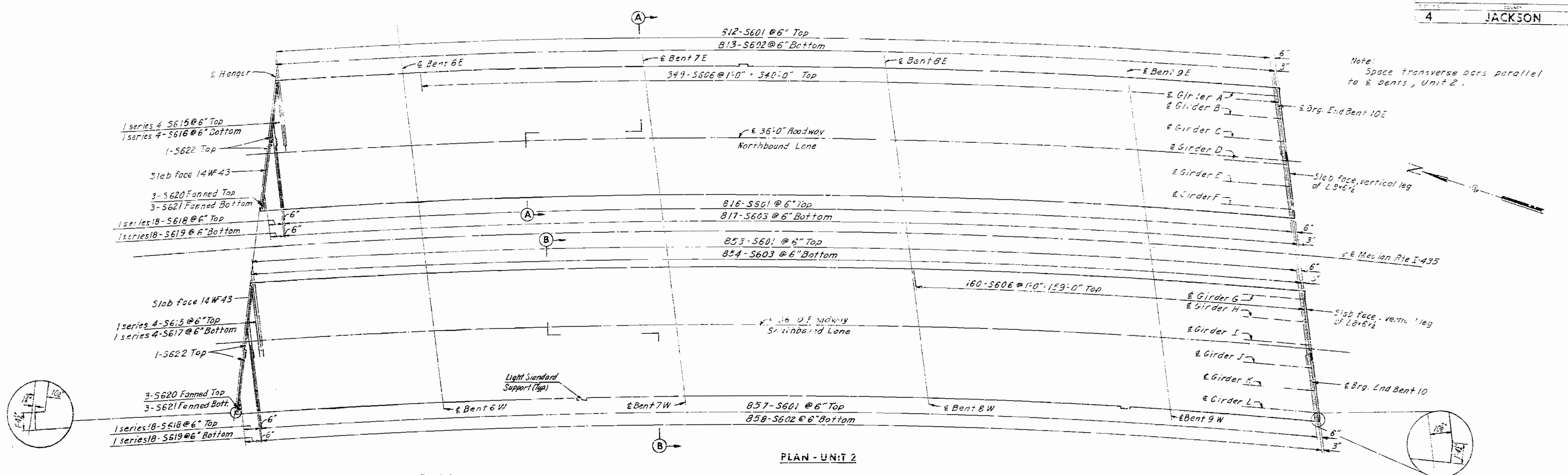
FOR INFORMATION ONLY

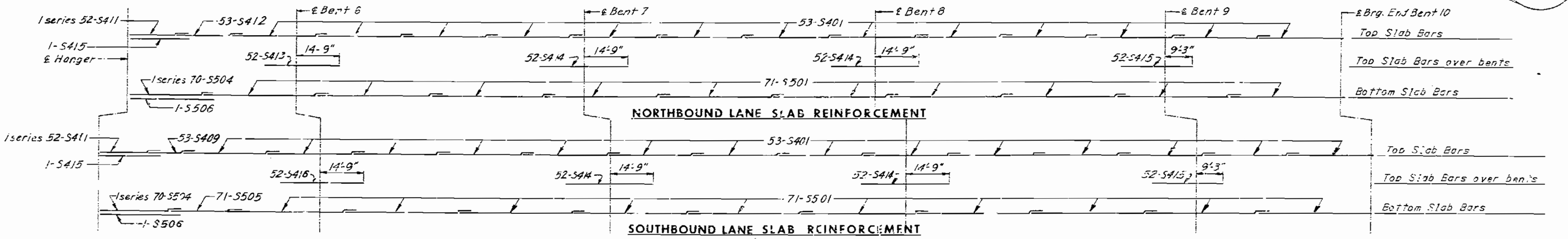
A16866, Sht. 54

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIV. NO.	STATE PROJECT NO. & SEC.	ALTERNATE PROJ. NO. & SEC.
5	MO 435	
DIST.	COUNTY	ROUTE SEC.
4	JACKSON	

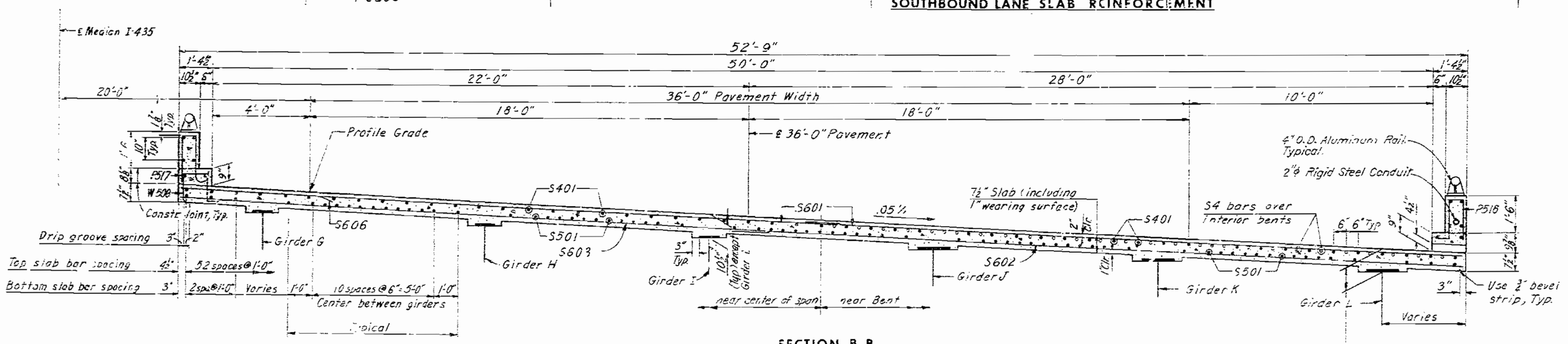


PLAN - UNIT 2



NORTHBOUND LANE SLAB REINFORCEMENT

SOUTHBOUND LANE SLAB REINFORCEMENT



SECTION B-B

Note:
Section A-4 similar to Section A-A, Sheet 42.
Lap #4 bars 1'-0", #5 bars 1'-3" and #6 bars 1'-6".
Longitudinal Reinforcing Steel shall be placed so that ends shall not be more than 1½ from L6x6½ or 14 WF 43# at Expansion Device.
Provide 1½" clear from face of concrete to reinforcing steel in the superstructure unless shown otherwise.
For Girder spacing see Framing Plan, Sheets 28 and 29.
For location of Light Standard Supports, see Sheets 43 and 44.
For Light Standard Support Details, see Sheet 49.

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

10¾"* ℄ Hanger to Bent Line 9.
Varies 10¾" to 10'-1" Bent Line 9 to Bent Line 10.
10'-1" Bent Line 10 to End Bent 10.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) [illegible].I-435] STA: 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

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

MADE AMH DATE 4-6-67 CHECKED AMH DATE 4-14-67

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

SLAB REINFORCEMENT UNIT 2

SHEET 45 OF 49

A-1686

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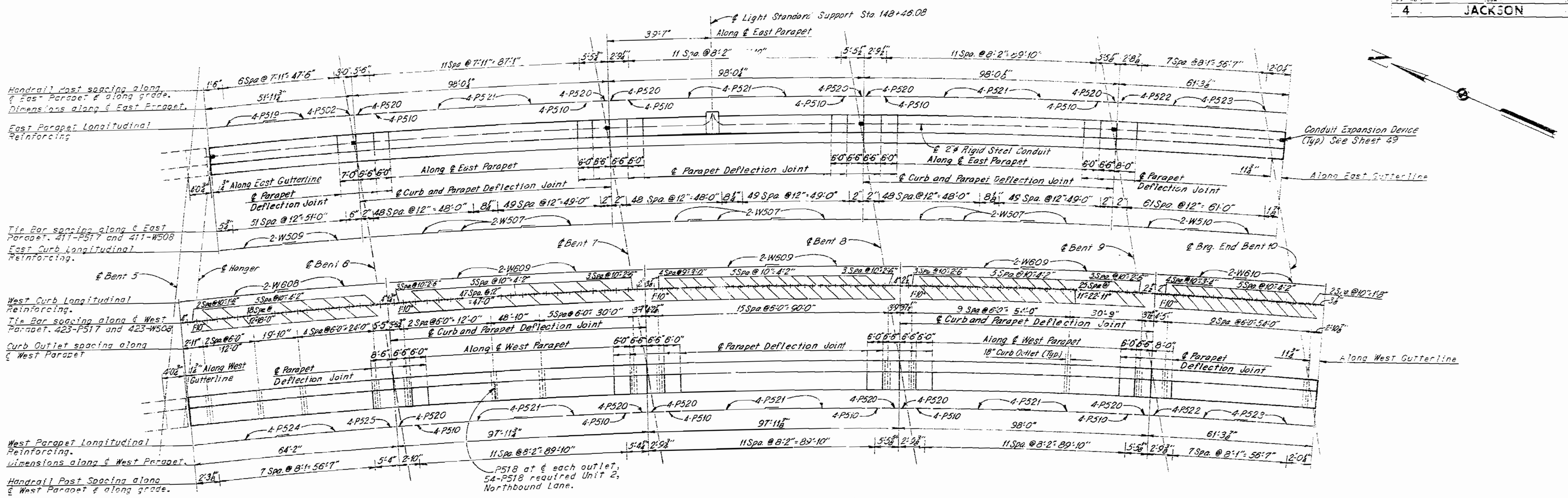
FOR INFORMATION ONLY

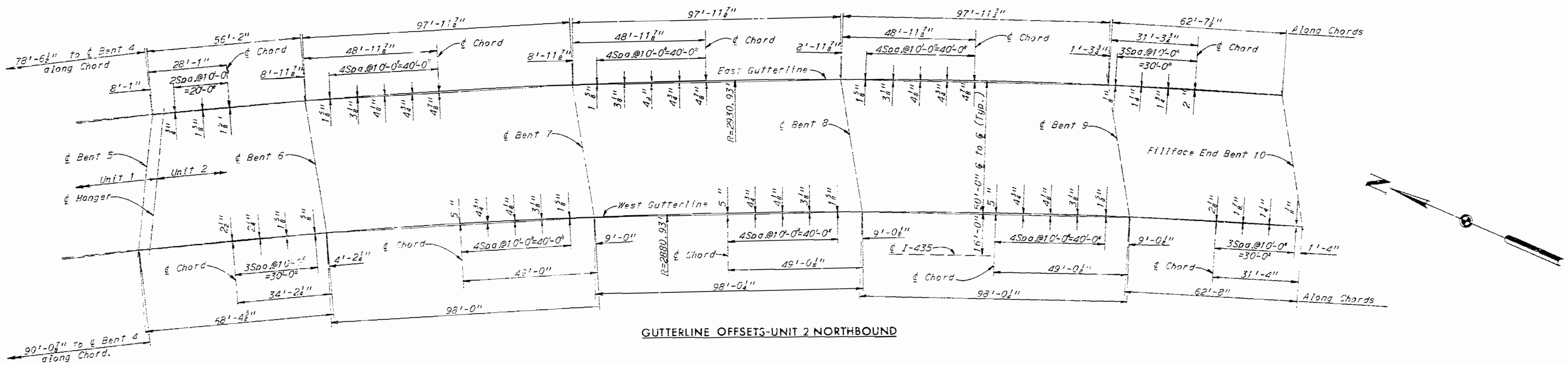
A16866, Sht. 55

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD STATE PROJECT NO.	SEC.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5 MO				
DIST. NO.	COUNTY		ROUTE NO.	
4	JACKSON			



CURB AND PARAPET PLAN-UNIT 2 NORTHBOUND



GUTTERLINE OFFSETS-UNIT 2 NORTHBOUND

Notes:
Dimensions are horizontal unless otherwise shown.
For Reinforcement schedule, see Sheet 13.
For location of Curb and Parapet reinforcing see Section A-A on Sheet 42.
Chord offsets to Gutterline are Symmetrical about ℄ Chord except as otherwise shown.
54 Curb Outlets required Unit 2 Northbound Lane.
Provide 1½" clear from face of concrete to reinforcing steel in the superstructure unless shown otherwise.
For Handrail Details, see Sheet 49.
For Light Standard Support Details, see Sheet 49.
For Conduit Details, see Sheet 49.

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

MADE D.E.S. DATE 4-17-67 CHECKED L.A.H.H. DATE 4-20-62

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

CURB AND PARAPET PLAN; UNIT 2; NORTHBOUND LANE

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

SHEET 46 OF 49

A-1686

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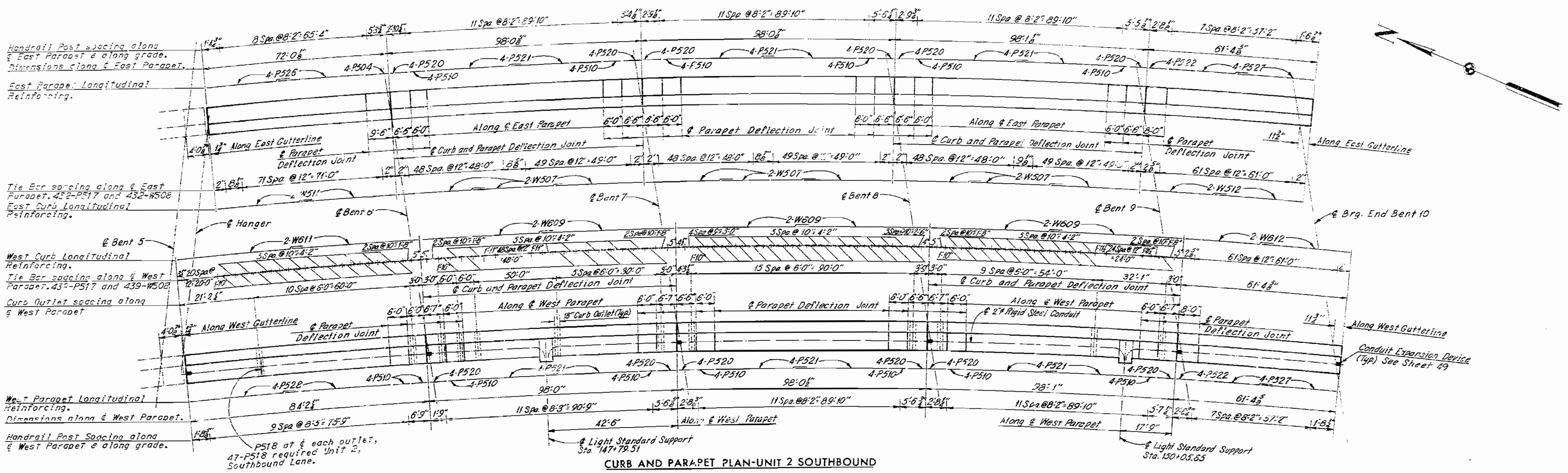
N.B. Unit 2
1909.21-01-000 B54

FOR INFORMATION ONLY

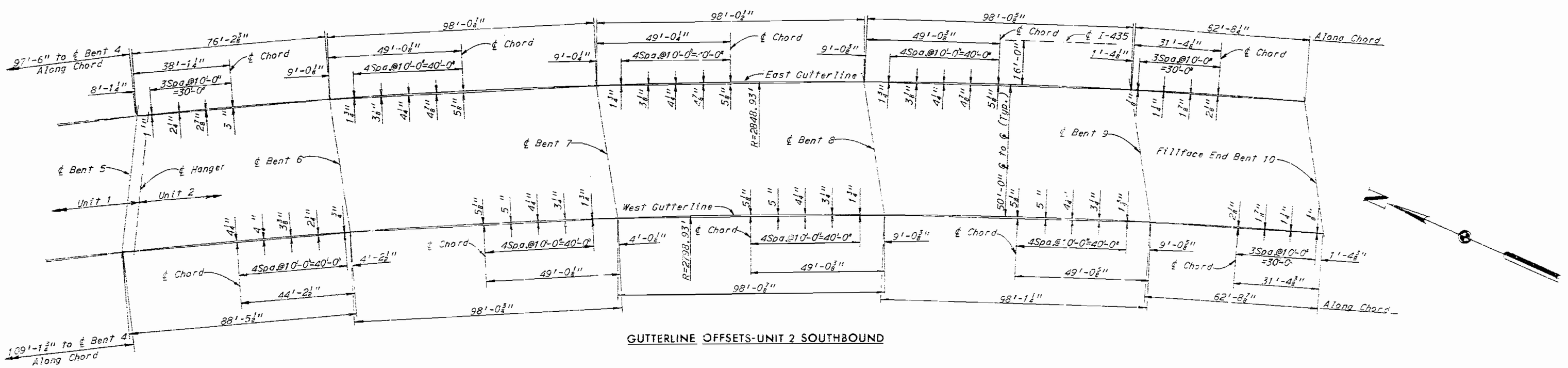
A16866, Sht. 56

MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD STATE	FEDERAL PROJECT NO. & SEC.	FISCAL YEAR	TOTAL SHEETS
5 MO			185
DIST. NO.	COUNTY	ROUTE, ETC.	
4	JACKSON		



CURB AND PARAPET PLAN-UNIT 2 SOUTHBOUND



GUTTERLINE OFFSETS-UNIT 2 SOUTHBOUND

Notes:
Dimensions are horizontal unless otherwise shown.
For Reinforcement Schedule, see Sheet 13.
For location of Curb and Parapet reinforcing see Section B-B on Sheet 45.
Chord offsets to Gutterline are Symmetrical about ℄ Chord, except as otherwise shown.
47 Curb Outlets required Unit 2 Southbound Lane.
Provide 1½" clear from face of concrete to reinforcing steel in the superstructure unless shown otherwise.
For Handrail Details, see Sheet 49.
For Light Standard Support Details, see Sheet 46
For Conduit Details, see Sheet 49.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE. I-435) STA 141+49.48 N.B.L. 141+00.56 S.B.L.
JACKSON COUNTY

CURB AND PARAPET PLAN; UNIT 2; SOUTHBOUND LANE

SHEET 47 OF 49

A-1686

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE D.E.S. DATE 4-18-67 CHECKED J.M.H. DATE 4-20-67

NOTE This drawing is not to scale. Follow dimensions.

FOR INFORMATION ONLY

A16866, Sht. 57

S.B. Unit 2
1909 21 01 0001 B54

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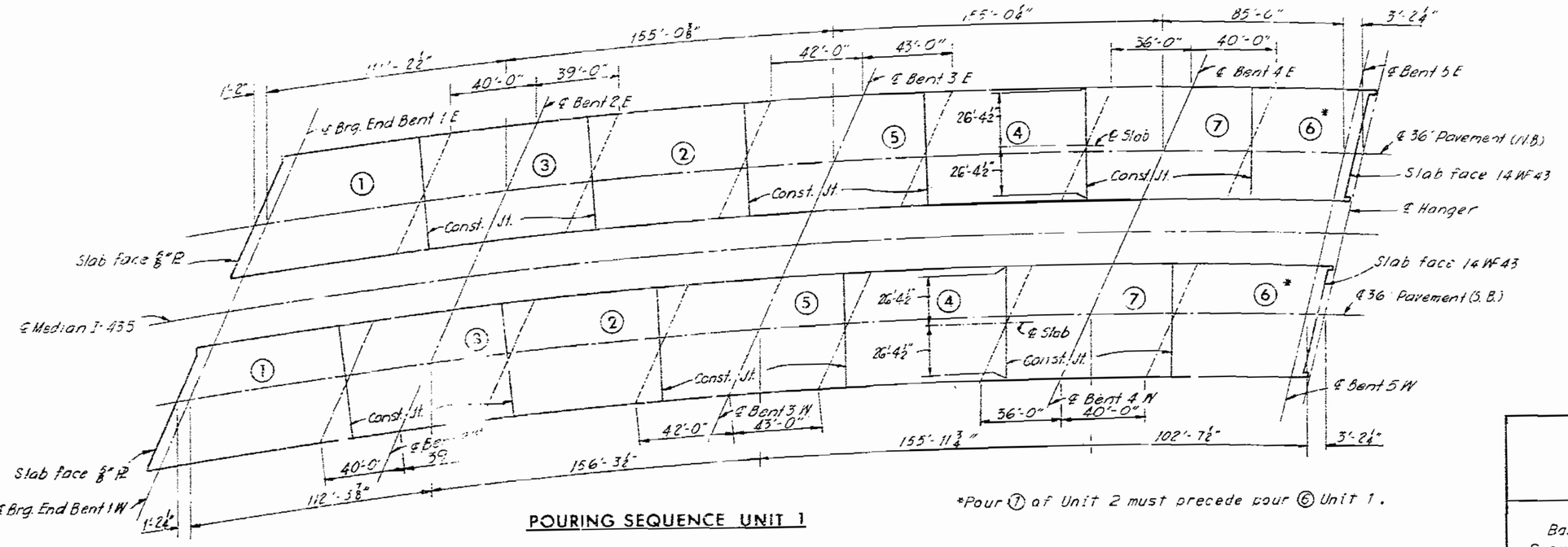
MISSOURI STATE HIGHWAY DEPARTMENT

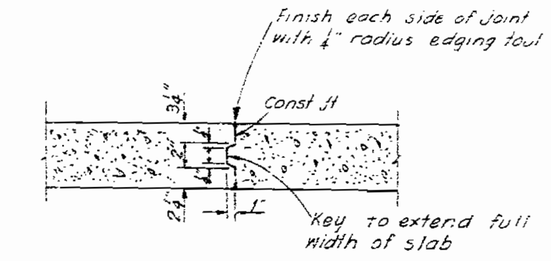
STATE	FEDERAL PROJECT NO.	SEC	FISCAL YEAR	TOTAL SHEETS
5 MO			1968	135
DIST. NO.	COUNTY			
4	JACKSON			

FOR INFORMATION ONLY



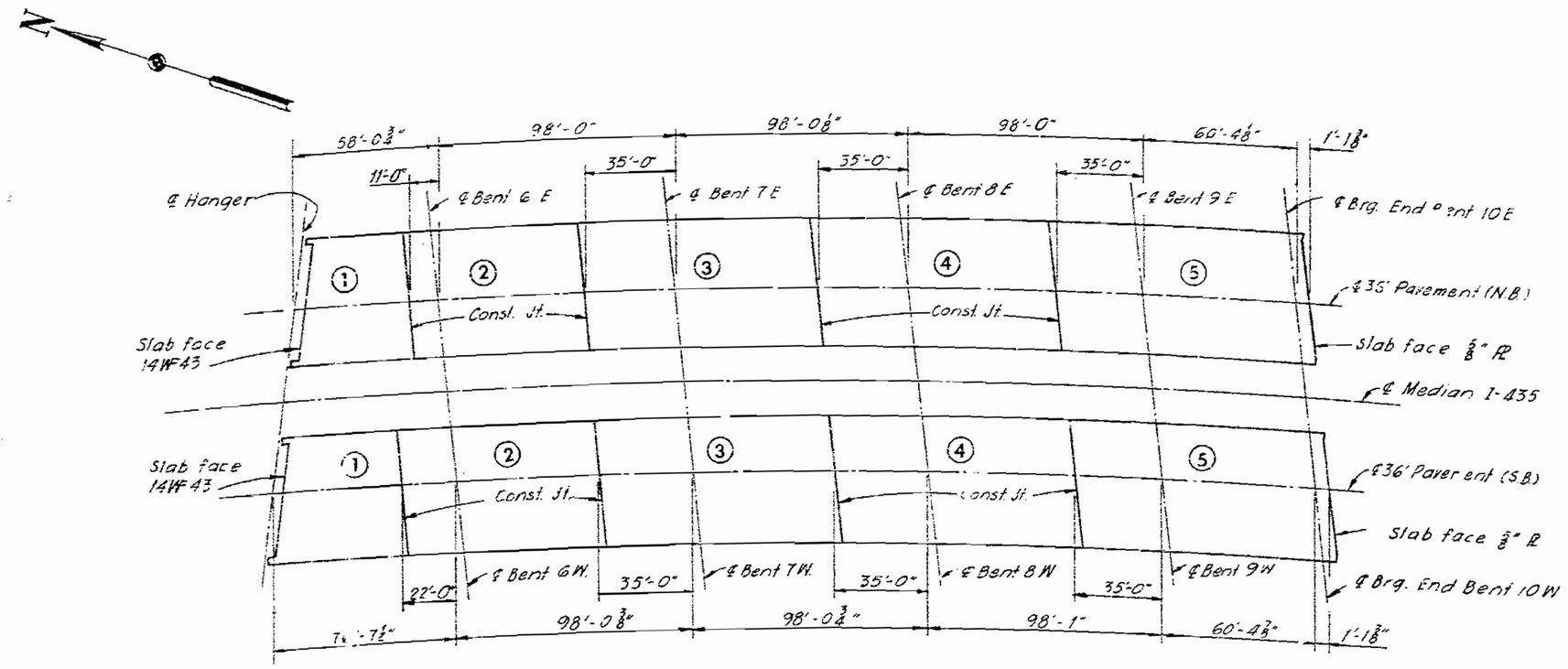
POURING SEQUENCE UNIT 1

*Pour ⑦ of Unit 2 must precede pour ⑥ Unit 1.



CONSTRUCTION JOINT DETAIL

	Sequence of Pours Unit 1 Southbound Lane or Northbound Lane						
	Direction						
Basic Sequence	1	2	3	4	5	6*	7
	End to 3	3 to 5	1 to 2	5 to 7	2 to 4	7 to End	4 to 6*
Alternate "A" Pours	1	3 + 2		5 + 4		7 + 6*	
	End to 3	5 to 1		7 to 2		End to 4	
Alternate "B" Pours	1 + 3 + 2			5 + 4		7 + 6*	
	End to 5			7 to 2		End to 4	
Alternate "C" Pours	1 + 3 + 2			5 + 4 + 7 + 6*			
	End to 5			2 to End			
Alternate "D" Pours	1 + 3 + 2 + 5 + 4 + 7 + 6*						
	End to End						



POURING SEQUENCE UNIT 2

	Sequence of Pours Unit 2 Southbound Lane or Northbound Lane				
	Direction				
Basic Sequence	1	2	3	4	5
	E. D.	3 to 1	4 to 2	5 to 3	End T. 4
Alternate "A" pours	1+2		3	4+5	
	3 to 1		4 to 2	3 to End	
Alternate "B" Pours	1 + 2 + 3			4+5	
	1 to 4			3 to End	
Alternate "C" Pours	1+2+3+4+5				
	End to End				

LEGEND

①	Pouring Sequence Number
(N.B.)	Northbound Lane
(S.B.)	Southbound Lane

The Contractor shall use an approved oscillating screed type, self-propelled mechanical finishing machine and shall pour and satisfactorily finish the slab pours at a rate of not less than 60 cubic yards per hour unless he elects to use an approved retarder at his own expense to retard the set of the concrete to 2.5 hours in which case he may reduce his pouring and finishing rate to not less than 35 cubic yards per hour. The Contractor shall observe the basic pouring sequence unless he can demonstrate to the engineer that he can pour and satisfactorily finish one of the longer alternate pours. Finishing machine loads will not be permitted on concrete less than 48 hours old.

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

MADE S.S.W. DATE 4-11-67 CHECKED A.M.H. DATE 4-2067

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

POURING SEQUENCE

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L.
141+00.56 S.B.L.
JACKSON COUNTY

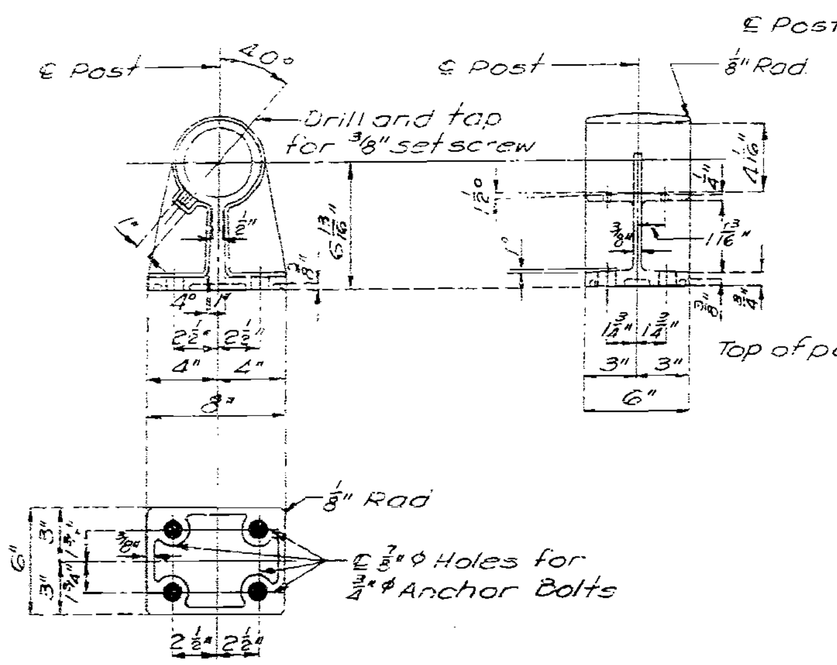
SHEET 48 OF 49

A-1686

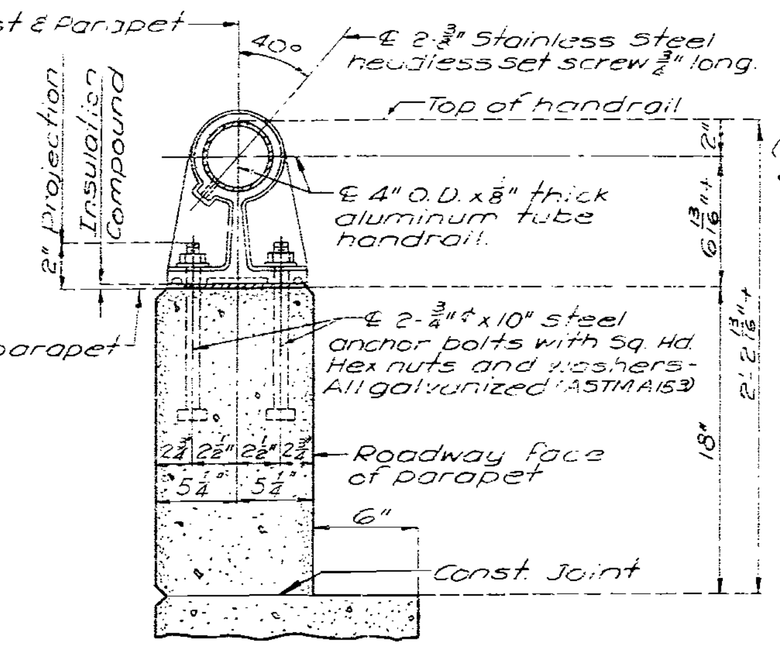
A16866, Sht. 58

MISSOURI STATE HIGHWAY DEPARTMENT

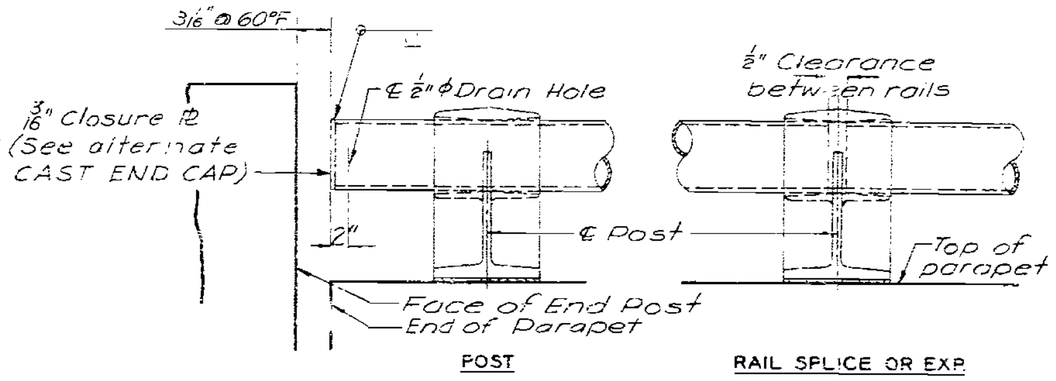
DIST. NO.	STATE	FEDERAL PROJECT NO. & SEC.	FISCAL SHEET TOTAL	STATE NO. SHEETS
5	MO.			
DIST. NO.	COUNTY		ROUTE SEC.	
4	JACKSON			



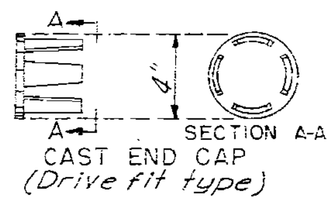
POST DETAILS



SECTION THRU HANDRAIL



TYPICAL HANDRAIL DETAILS



CAST END CAP
(Drive fit type)

SINGLE TUBE ALUMINUM RAILING

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 a minimum of two panel lengths.

Omit set screw on side adjacent to filled joint in parapet and curb at all expansion posts.

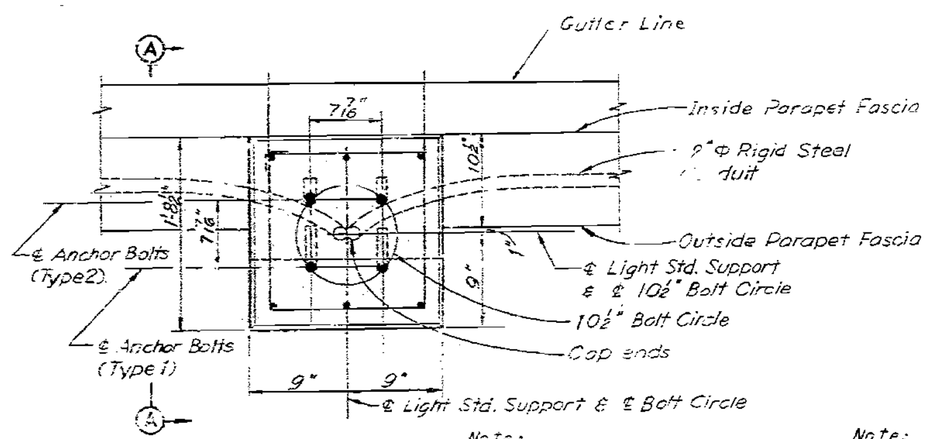
Top of curbs and parapets to be built parallel to grade with curb and parapet joints (except at end posts) normal to grade.

All exposed edges of end posts shall have ½" bevel. All exposed edges of curbs & parapets shall have ¾" radius or ¾" bevel unless otherwise noted.

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

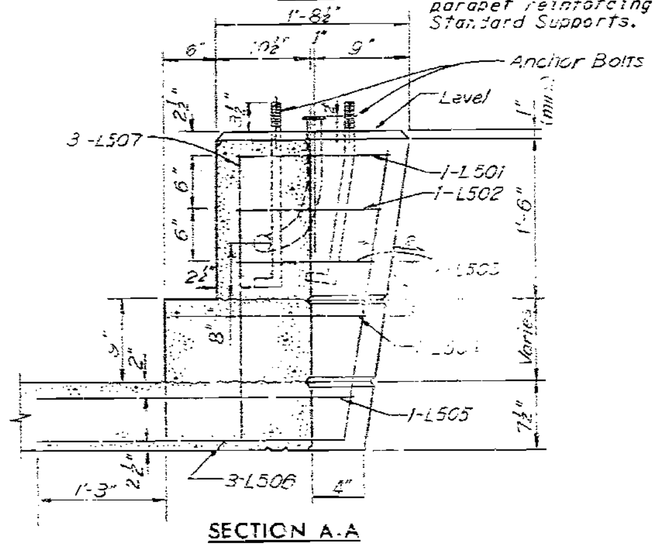
Concrete end posts to be vertical.

Integrally cast test coupons and a coat of clear lacquer specified in Std. Specs 836.2.4 and 1.3.3.5 respectively will not be required for these rail posts.



PLAN

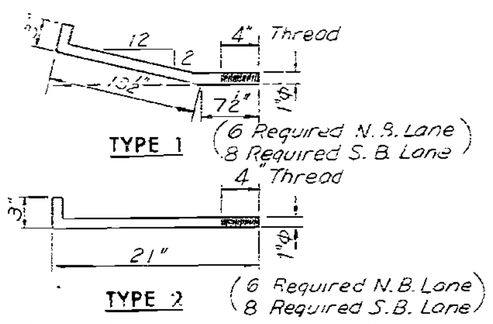
Note: Continue normal curb and parapet reinforcing thru Light Standard Supports.



SECTION A-A

LIGHT STANDARD SUPPORT DETAILS

(3 Light Standards Required N.B. Lane
4 Light Standards Required S.B. Lane)

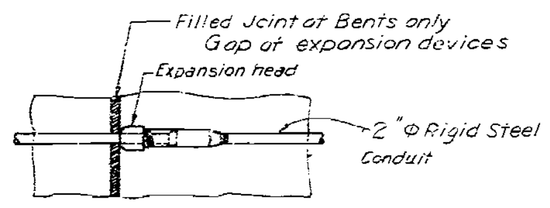


TYPE 1

TYPE 2

Note: Bolts shall be in accordance with Section 70.8 of Standard Specifications.
Payment for furnishing and installing bolts shall be included in price bid for other items.

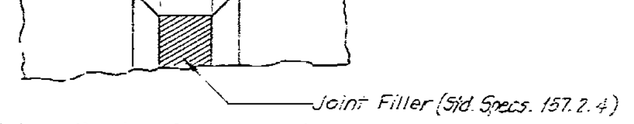
ANCHOR BOLTS



EXPANSION FITTING DETAIL

Note: Cost of furnishing and placing conduit, expansion fittings, junction boxes, and anchor bolts for light standard shall be included in contract unit price of Conduit System On Structures.
Light Standards, wiring and fixtures to be furnished and installed by others.
All conduit to be rigid galvanized steel with 3" minimum cover in concrete. All ends of conduit shall be capped.
Shift reinforcing steel in field where necessary to clear conduit and junction boxes.
Top of light standard supports to be made horizontal, anchor bolts to be placed vertically.
For details of light standards and wiring, see Electrical Plans.
Galvanized expansion fittings shall provide a minimum of movement in either direction of 4" at open joints and 1" at filled joints. Fittings shall be equal to O.Z. Elec. Mfg. Co. Expansion Fittings AX or DX.
Place 1" ϕ copper tube drains at low points in conduit and junction boxes. Drain tubes shall protrude 1" from bottom of slab.
All pull or junction boxes shall be Plowe mounted box equal to O.Z. Elec. Mfg. Co. Type "VP-4-NU".

Note: This drawing is not to scale. Follow dimensions



Note: Use bevel as shown for exposed faces of all filled joints.

DETAILS OF BEVEL FOR FILLED JOINTS

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

MADE HHF DATE 6-8-67 CHECKED DDM DATE 6-15-67

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

HANDRAIL DETAILS SHEET 49 OF 49 A-1686

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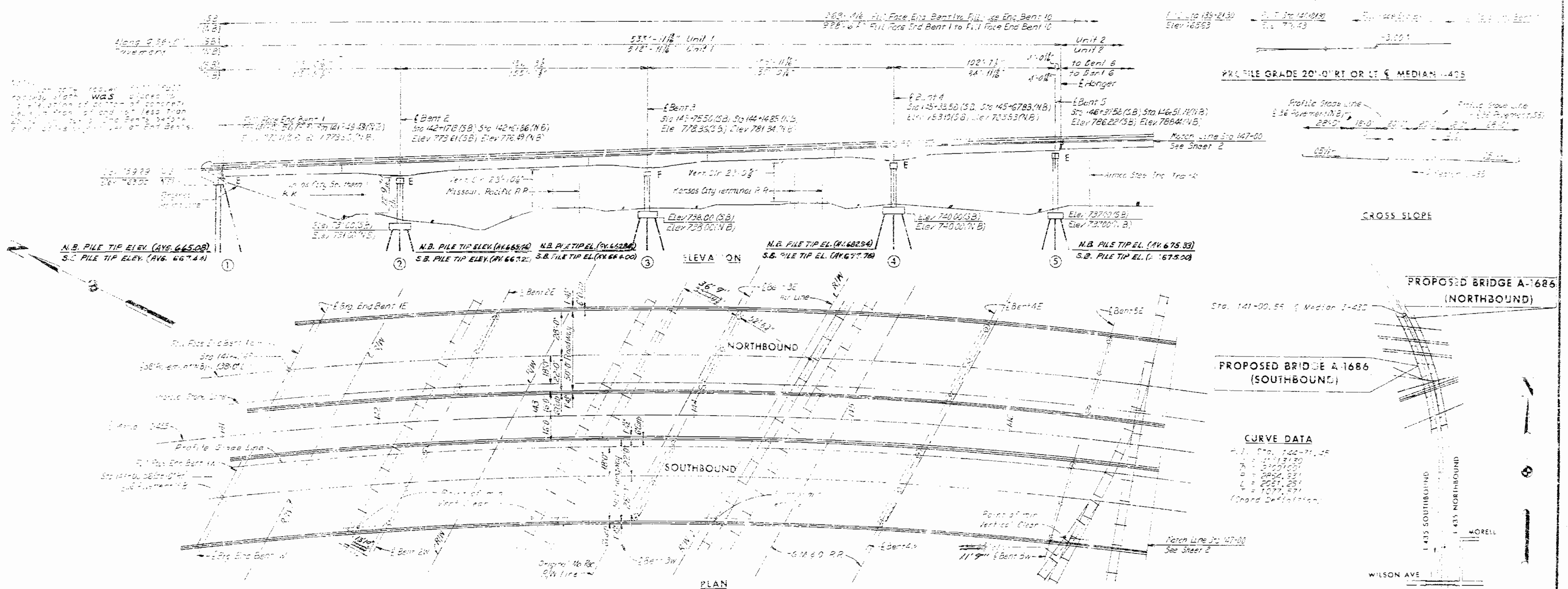
FOR INFORMATION ONLY

A16866, Sht. 59

MISSOURI STATE HIGHWAY DEPARTMENT

CONTINUOUS PLATE GIRDER SPANS
115',136',156',103',4' SPANS (SOUTHBOUND)
114',155',155',85',4' SPANS (NORTHBOUND)



ITEM	UNIT	UNIT 1 NORTHBOUND SUB STRUCTURE	UNIT 1 NORTHBOUND SUPER-STRUCTURE	UNIT 1 NORTHBOUND TOTAL	UNIT 2 NORTHBOUND SUB STRUCTURE	UNIT 2 NORTHBOUND SUPER-STRUCTURE	UNIT 2 NORTHBOUND TOTAL	UNIT 1 SOUTHBOUND SUB-STRUCTURE	UNIT 1 SOUTHBOUND SUPER-STRUCTURE	UNIT 1 SOUTHBOUND TOTAL	UNIT 2 SOUTHBOUND SUB-STRUCTURE	UNIT 2 SOUTHBOUND SUPER-STRUCTURE	UNIT 2 SOUTHBOUND TOTAL	TOTAL
Class 1 Excavation for Structures	Cu. Yd.	243.3		243.3	402.7		402.7	254.6		254.6	206.4		206.4	1107.0
Steel Piles in Place (HP12x53)	Lin. Ft.	740		740	2415		2415	806		806	2827		2827	6788
Structural Steel	Lb.	4938		4938				4562		4562	297		297	9797
Class B Concrete	Cu. Yd.	430.3		430.3	414.3		414.3	416.1		416.1	384.6		384.6	1645.3
Class A Concrete	Cu. Yd.	5.7	754.6	760.3	5.3	610.3	615.6	5.7	782.2	788.9	5.3	641.0	646.3	2816.1
Reinforcing Steel	Lb.	97,980	245,490	343,470	107,800	201,020	308,820	91,650	267,830	359,480	102,920	238,010	340,930	1,353,400
Equation Structure	Sta.			147+00			147+00			147+00			147+00	147+00
60" Culverts	Lin. Ft.	12,080		12,080	10,640		10,640	4,100		4,100	10,640		10,640	37,460
Fencing	Lin. Ft.		370.7	370.7		214.5	214.5		378.8	378.8		233.6	233.6	1197.6
Bridge Rail	Lin. Ft.													384.7
Permit System on Structures	Lump Sum													1
x Foundation Test Holes	L.F.													40
x Class 1 Excavation +25%	Cu. Yds.													3.5

x Contingent Item
* Includes 670,670 # of Low Alloy Steel

Quantity Notes: All excavation for bridge was paid for as "Class 1 Excavation for Structures." Sketches show excavation for all bridges, see Sheet 8.
All concrete in and above parapet and curbs is included with substructure quantities.

BENCH MARKS
Elev. 772.14
BM ⊡ On N.W. Corner, Rt. Curb on Rt. End Post, Bent = 1, N.B.B. 15' Lt. Sta. 141+19.

LEGEND:
S.B. = Southbound
N.B. = Northbound
E = Expansion
F = Fixed

SUBMITTED BY: K. L. Sigmund
REGISTERED PROFESSIONAL ENGINEER
MISSOURI NO. E-253

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) RTE. I-435 STA. 141+49.48 N.B.L. 142+00.58 S.B.L.
JACKSON COUNTY

SUBMITTED BY: _____ BRIDGE ENGINEER DATE: 7-28-64
APPROVED BY: _____ CHIEF ENGINEER DATE: JUL 29 1964

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

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

GENERAL PLAN AND ELEVATION SHEET 1A of 5

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A16866, Sht. 60

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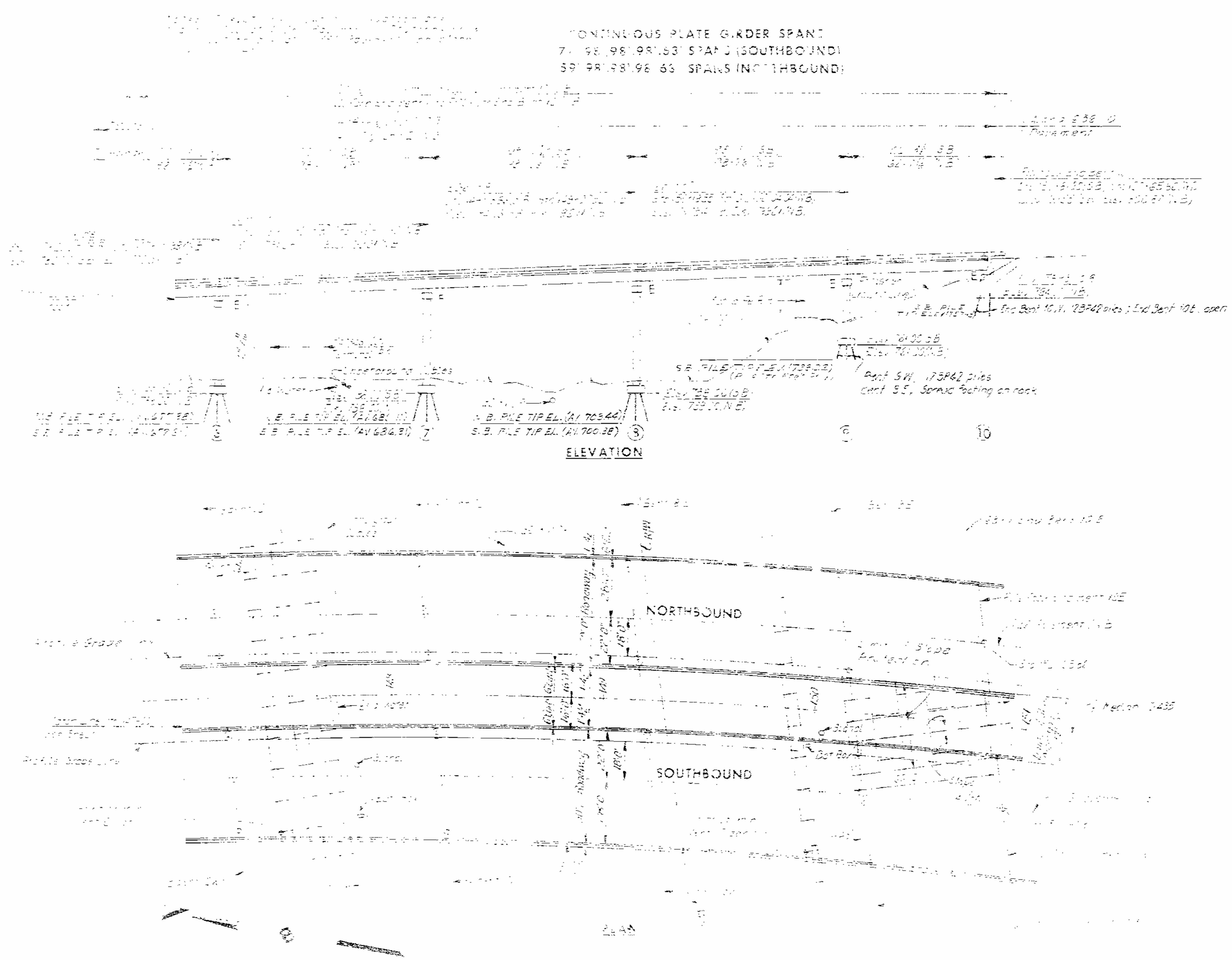
MISSOURI STATE HIGHWAY DEPARTMENT

JACKSON

FINAL PLANS



GENERAL NOTES:

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

DESIGN LOADING: HS20-44 and Alternate Military Loading with 35#/sq. ft. future wearing surface. Earth 120#/cu. ft. Equivalent Fluid Pressure 30#/cu. ft. Fatigue Loading: [illegible]

CONSTRUCTION SPECIFICATIONS: Missouri [illegible] Specifications for State Road [illegible], Bridges, Culverts and Incidental [illegible] 1961.

DESIGN UNIT STRESSES:
Class B1 Concrete (Superstructure) [illegible]
Class B Concrete (Substructure) [illegible]
Reinforcing Steel [illegible]
Structural Steel
(A.S.T.M. A36-60) [illegible]
(A.S.T.M. A441-66) [illegible] and under [illegible]
[illegible] and under [illegible]
Steel Piles (A.S.T.M. A36-63) [illegible]

CONCRETE:
Concrete for superstructure was Class B1.
Concrete for substructure was Class B.

REINFORCING STEEL:
All splices in reinforcing steel 24 bar diameters minimum.
Bar sizes are designated on the plans by numbers. The first digit after the letter in three digit marks and the first two digits after the letter in four digit marks indicate the size of the bar.
Dimensions shown on the plans from the reinforcing steel to the outside edge of concrete are clear dimensions unless otherwise indicated.
All bending dimensions are "out to out" of bars.

SEALING OF DECKS: Superstructure deck [illegible] surface sealed.

UTILITIES: All utilities, unless shown otherwise, were removed or relocated by others. The contractor shall notify the owner of the utilities of his work schedule sufficiently in advance to allow time for disposition of utilities.

[illegible]

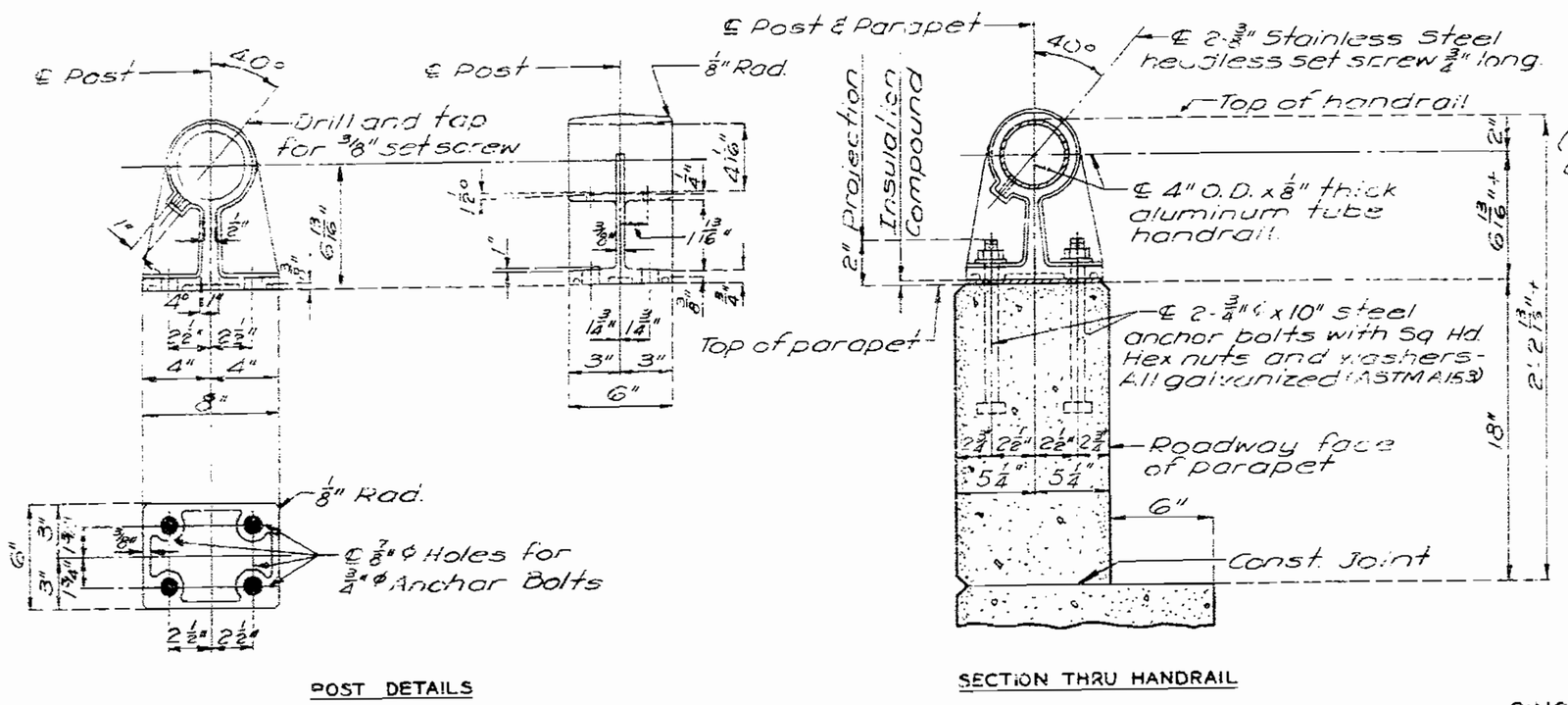
BRIDGE OVER [illegible]

JACKSON COUNTY

24 of 16

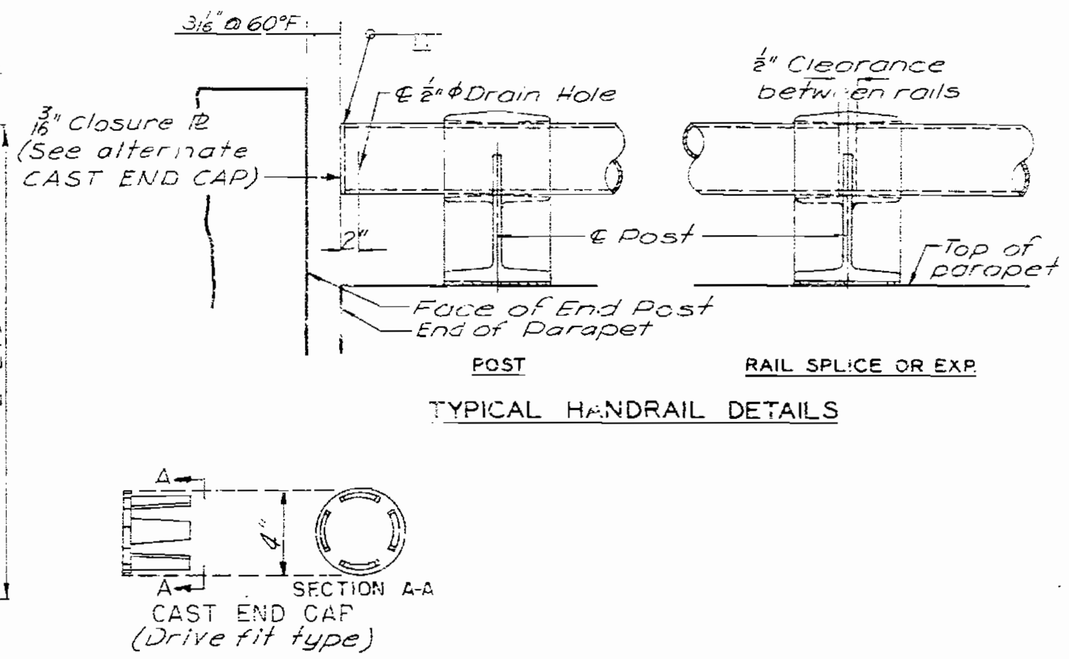
MISSOURI STATE HIGHWAY DEPARTMENT

FED. ROAD DIST. NO.	STATE	FEDERAL PROJECT NO. & SEC.	PROJECT SHEET TOTAL SHEETS INC.
5	MO.	157	
DIST. NO.	COUNTY		ROUTE INC.
4	JACKSON		



POST DETAILS

SECTION THRU HANDRAIL



TYPICAL HANDRAIL DETAILS

SINGLE TUBE ALUMINUM RAILING

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 ½" except as noted.

All drafts 3° except as noted.

Pipe Rail to be fabricated in a minimum of two panel lengths.

Omit set screw on side adjacent to filled joint in parapet or curb at all expansion posts.

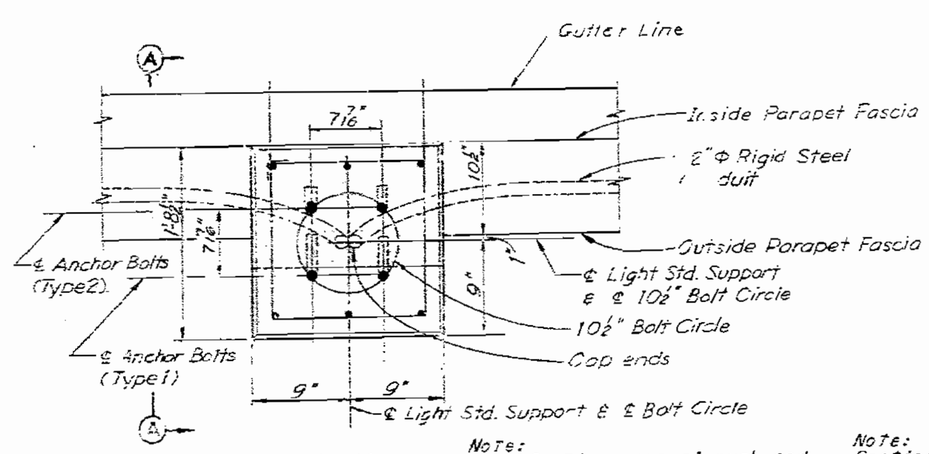
Top of curbs and parapets to be built parallel to grade with curb and parapet joints (except at end posts) normal to grade.

All exposed edges of end posts shall have ½" bevel. All exposed edges of curbs & parapets shall have ¾" radius or ¾" bevel unless otherwise noted.

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

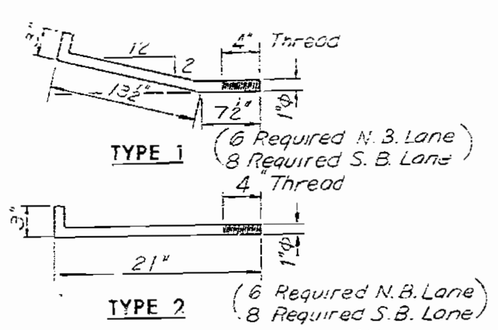
Concrete end posts to be vertical.

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



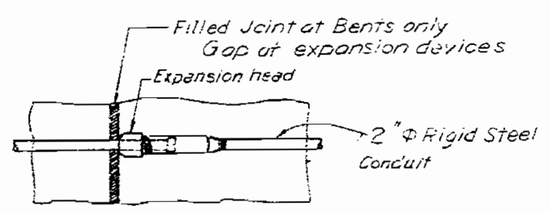
LIGHT STANDARD SUPPORT DETAILS

(2 Light Standards Required N.B. Lane
2 Light Standards Required S.B. Lane)



Note: Bolts shall be in accordance with Section 70.8 of Standard Specifications. Payment for furnishing and installing bolts shall be included in price bid for other items.

ANCHOR BOLTS



EXPANSION FITTING DETAIL

Note: Cost of furnishing and placing conduit, expansion fittings, junction boxes, and anchor bolts for light standard shall be included in contract unit price of Conduit System On Structures.

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

All conduit to be rigid galvanized steel with 3" minimum cover in concrete. All ends of conduit shall be capped.

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

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

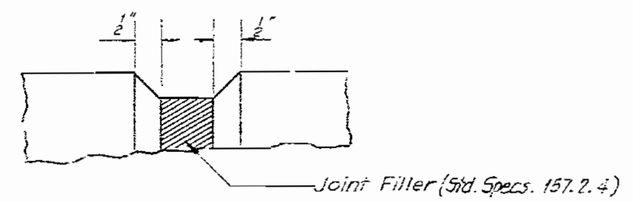
For details of light standards and wiring, see Electrical Plans.

Galvanized Expansion Fittings shall provide a minimum of movement in either direction of 4" at open joints and 1" at filled joints. Fittings shall be equal to O.Z. Elec. Mfg. Co. Expansion Fittings As Ordered.

Place ¾" ϕ copper tube drains at low points in conduit and junction boxes. Drain tubes shall protrude 1" from bottom of slab.

All parapet junction boxes shall be Pluvia mounted on equal & as Elec. Mfg. Co. Type "VP-8".

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



Note: Use bevel as shown for exposed faces of all filled joints.

DETAILS OF BEVEL FOR FILLED JOINTS

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY NEW YORK
MADE MHH DATE 4-8-47 CHECKED ELM DATE 4-15-47

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

HANDRAIL DETAILS SHEET 49 OF 49 A-1686

FOR INFORMATION ONLY

A16866, Sht. 62

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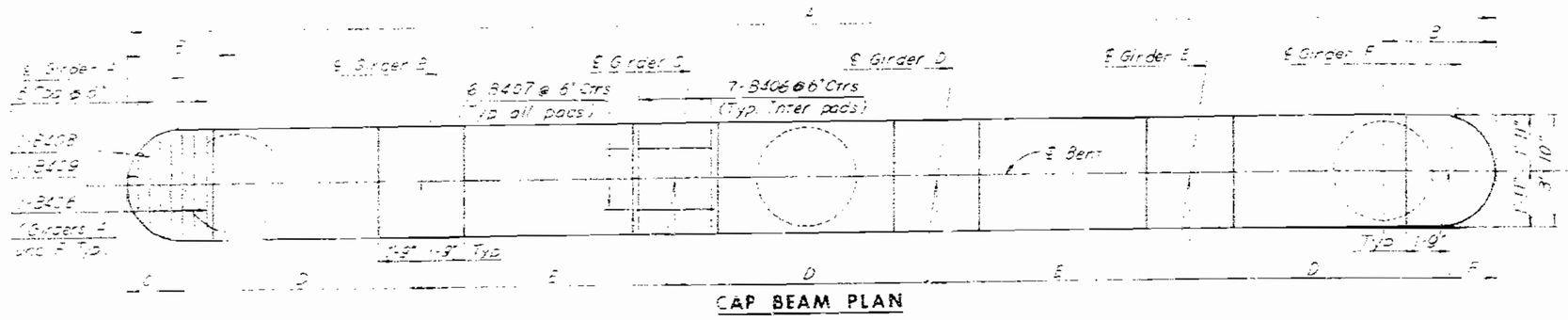
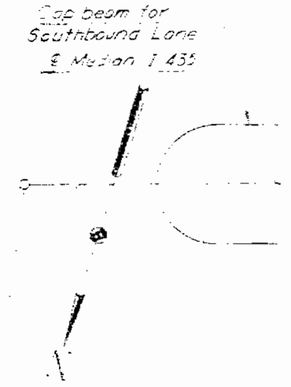
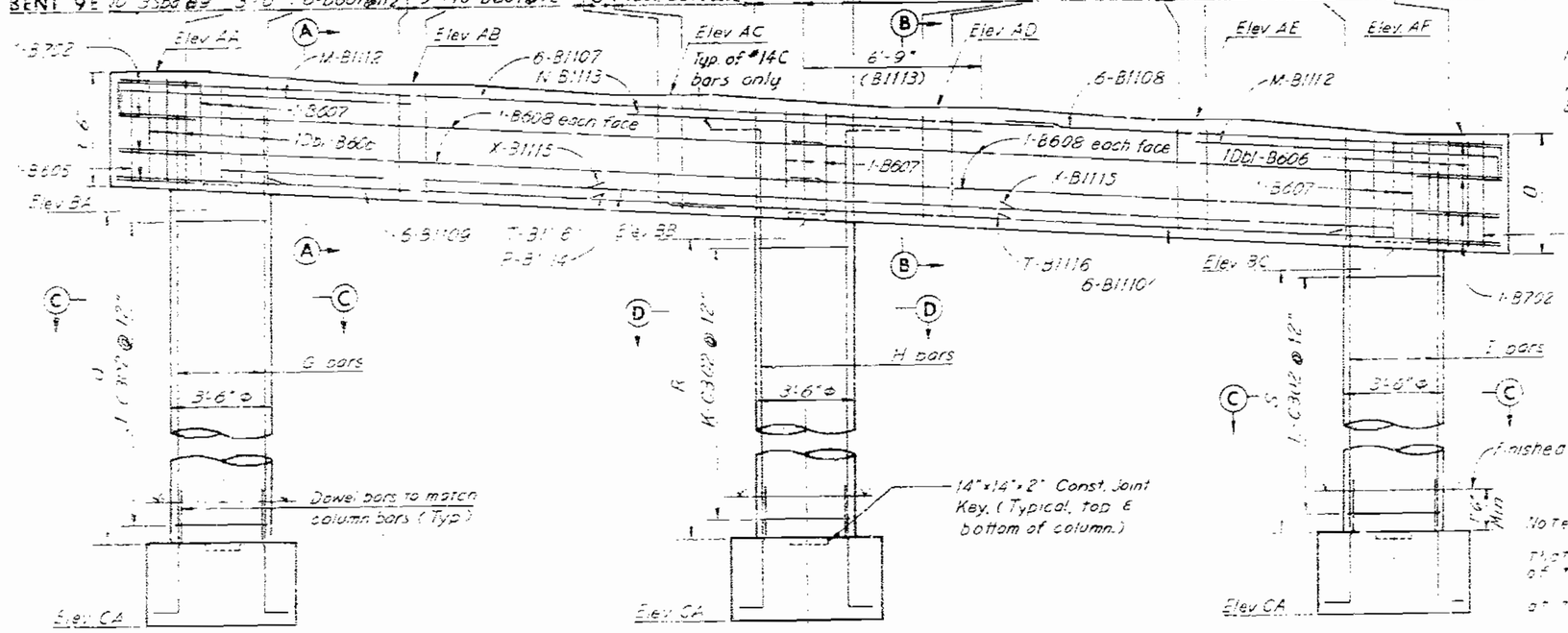
MISSOURI STATE HIGHWAY DEPARTMENT

3 MO
4 JACKSON





BENT 5E	10" 3 Spa @ 9"	3'-3"	6-B607@12"	9"	13-B607@12"	1'-8"	1'-8"	13-B607@12"	9"	6-B607@12"	3'-2"	3 Spa @ 9" 10"	STIRRUP SPACING
BENT 6E	10" 3 Spa @ 9"	3'-3"	6-B607@11"	9"	10-B607@12"	8"	4 Dbl-B606@9"	1'-11"	1'-11"	4 Dbl-B606@9"	8"	10-B607@12"	9"	6-B607@11"	3'-2"	3 Spa @ 9" 10"	
BENT 7E	10" 3 Spa @ 9"	3'-1"	6-B607@8"	9"	10-B607@12"	8"	5 Dbl-B606@7½"	1'-8"	1'-8"	5 Dbl-B606@7½"	8"	10-B607@12"	9"	8-B607@8"	3'-1"	3 Spa @ 9" 10"	
BENT 8E	10" 3 Spa @ 9"	3'-3"	7-B607@9"	9"	10-B607@12"	8"	5 Dbl-B606@7½"	1'-8"	1'-8"	5 Dbl-B606@7½"	8"	10-B607@12"	9"	7-B607@9"	3'-3"	3 Spa @ 9" 10"	
BENT 9E	10" 3 Spa @ 9"	3'-0"	6-B607@11½"	9"	10-B607@12"	8"	4 Dbl-B606@9½"	1'-9"	1'-9"	4 Dbl-B606@9½"	8"	10-B607@12"	9"	6-B607@11½"	3'-0"	35 (+) @ 9" 10"	



Note: B111 and B1115 were placed to that one end of each bar is at the centerline of the exterior column. The end of B1115 bars were placed at the inside of the exterior column

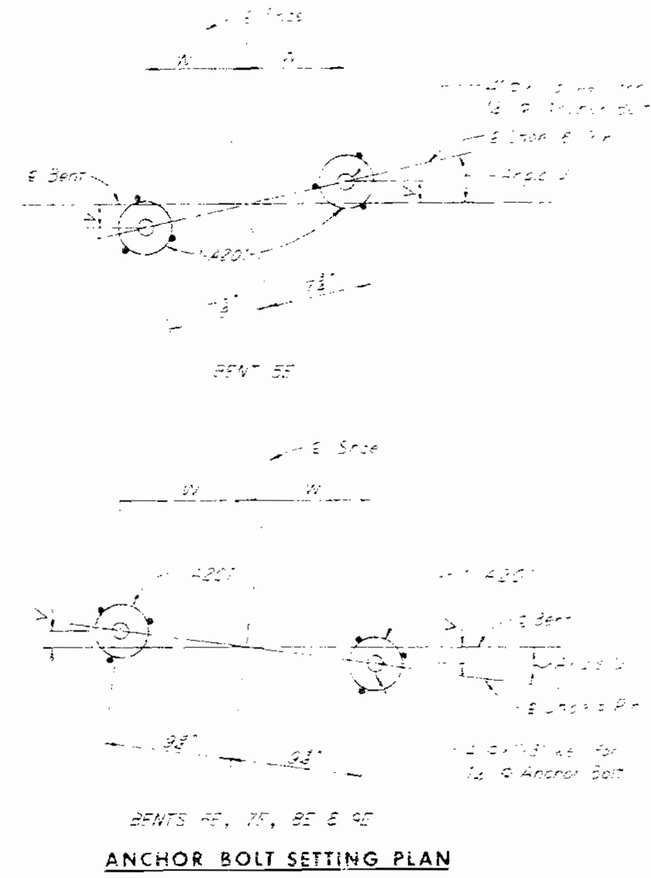
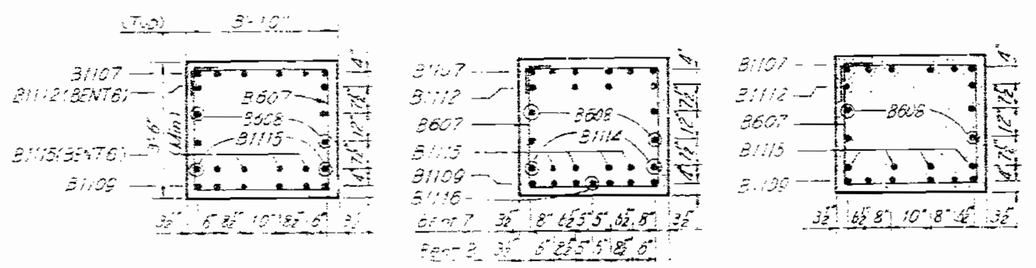
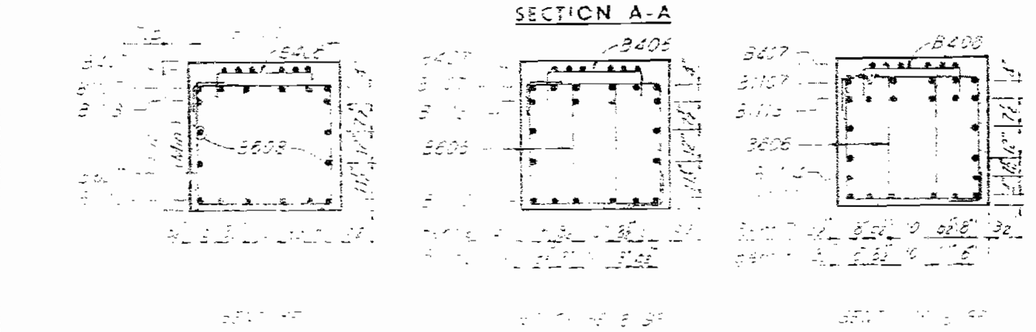
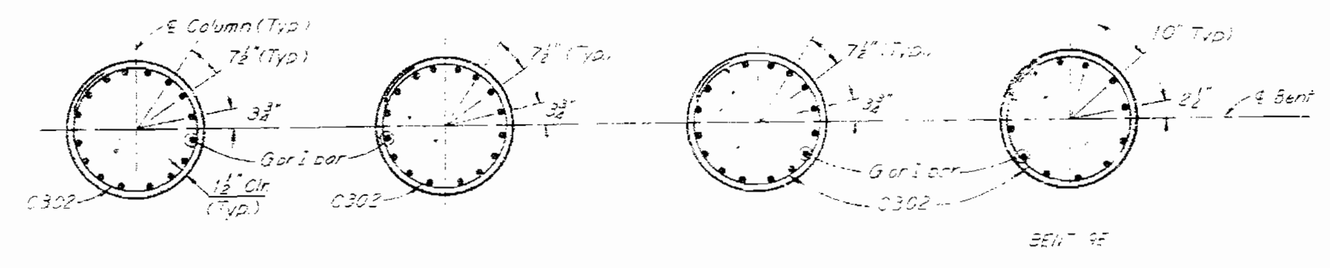


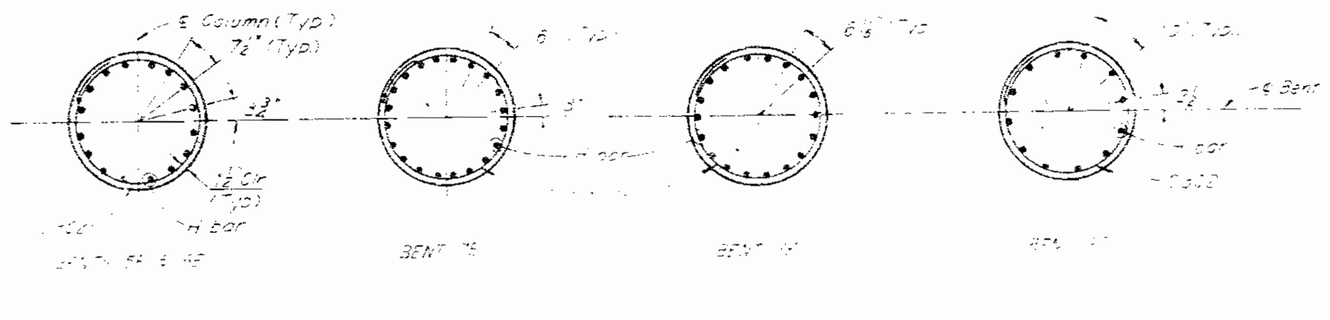
TABLE OF DIMENSIONS					
CODE	BENT 5E	BENT 6E	BENT 7E	BENT 8E	BENT 9E
A	511'-4"	511'-10"	512'-4"	512'-10"	513'-4"
B	44'-5"	44'-5"	44'-5"	44'-5"	44'-5"
C	21'-9"	21'-9"	21'-9"	21'-9"	21'-9"
D	44'-5"	44'-5"	44'-5"	44'-5"	44'-5"
E	21'-9"	21'-9"	21'-9"	21'-9"	21'-9"
F	44'-5"	44'-5"	44'-5"	44'-5"	44'-5"
G	21'-9"	21'-9"	21'-9"	21'-9"	21'-9"
H	44'-5"	44'-5"	44'-5"	44'-5"	44'-5"
I	21'-9"	21'-9"	21'-9"	21'-9"	21'-9"
J	44'-5"	44'-5"	44'-5"	44'-5"	44'-5"
K	21'-9"	21'-9"	21'-9"	21'-9"	21'-9"
L	44'-5"	44'-5"	44'-5"	44'-5"	44'-5"
M	2"	2"	2"	2"	2"
N	2"	2"	2"	2"	2"
O	511'-4"	511'-10"	512'-4"	512'-10"	513'-4"
P	2"	2"	2"	2"	2"
Q	5'-6"	5'-6"	5'-6"	5'-6"	5'-6"
R	5'-6"	5'-6"	5'-6"	5'-6"	5'-6"
S	511'-4"	511'-10"	512'-4"	512'-10"	513'-4"
T	511'-4"	511'-10"	512'-4"	512'-10"	513'-4"
U	2"	2"	2"	2"	2"
V	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"
W	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"
X	2"	2"	2"	2"	2"
Y	2"	2"	2"	2"	2"
Z	2"	2"	2"	2"	2"
AA	788.76'	785.76'	780.03'	781.48'	784.37'
AB	788.17'	785.31'	780.50'	781.06'	783.94'
AC	787.88'	784.87'	780.17'	780.93'	783.55'
AD	787.14'	784.42'	779.74'	780.21'	783.14'
AE	786.53'	783.11'	779.31'	779.79'	782.74'
AF	780.11'	783.53'	778.88'	779.37'	782.33'
BA	779.31'	782.05'	778.33'	778.78'	780.68'
BB	779.10'	781.05'	778.34'	778.94'	781.7'
BC	778.75'	780.25'	778.40'	778.50'	781.85'
CA	758.76'	758.02'	758.15'	758.00'	758.24' 152

Note:
Bars in all units are detailed and fabbed separately.
For reinforcement schedule, see Sheets 12 and 13.
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown.
For details of Anchor Bolt Wells, see Sheet 21.
For Construction Joints, see Sheets 7 and 8.
For Expansion Details, see Sheet 8.
For Footing Size, Location and Reinforcement, see Sheet 20.
For Piles in Bents 5E, 6E, 7E, 8E and 9E, see Sheet 20.
Where (Theor.) or (Actual) is not shown, use (Actual).









HOWARD NEEDLES TAMMEN & BERGENDOFF

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. IG-435(150) RTE 435 STA. L 148+48.9 B.L. L 150+56.5 B.L.

JACKSON COUNTY

BENTS 5E, 6E, 7E, 8E AND 9E NORTHBOUND LANE SHEET 19A OF 6

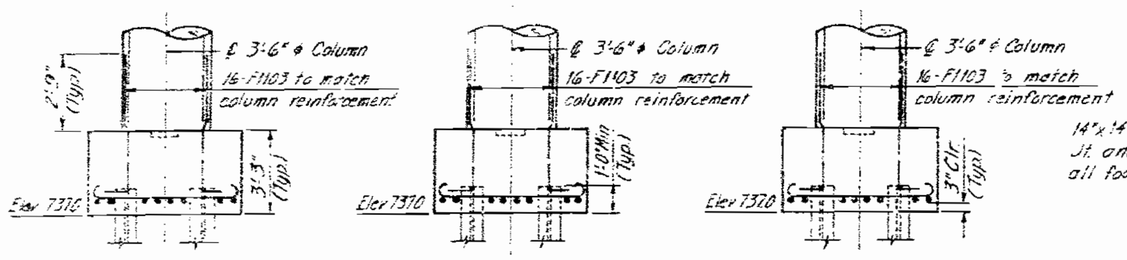
A 16866

FOR INFORMATION ONLY

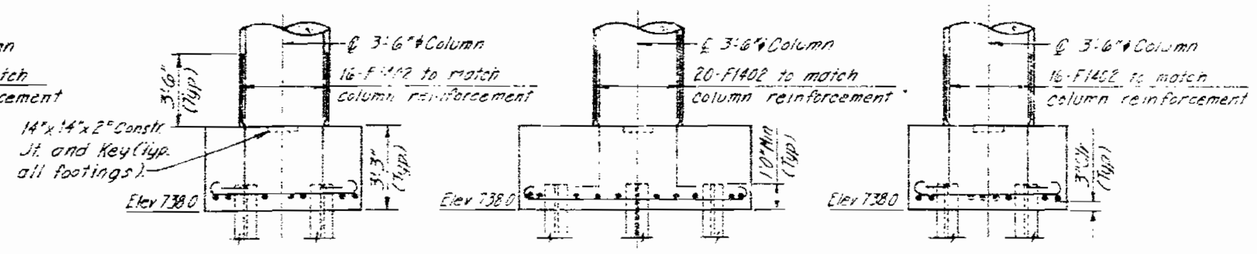
A16866, Sht. 63

MISSOURI STATE HIGHWAY DEPARTMENT

5 MO	
4	JACKSON
	FINAL PLANS



FOOTING ELEVATION BENT 5E



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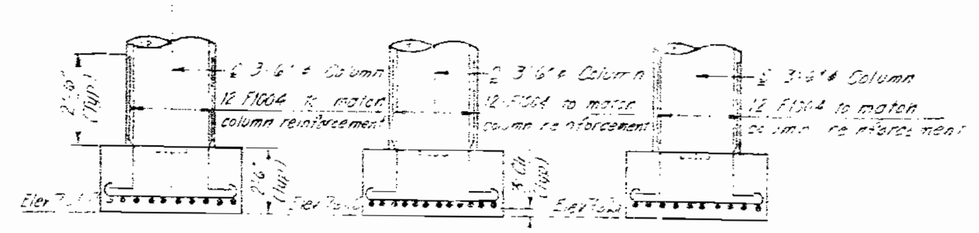
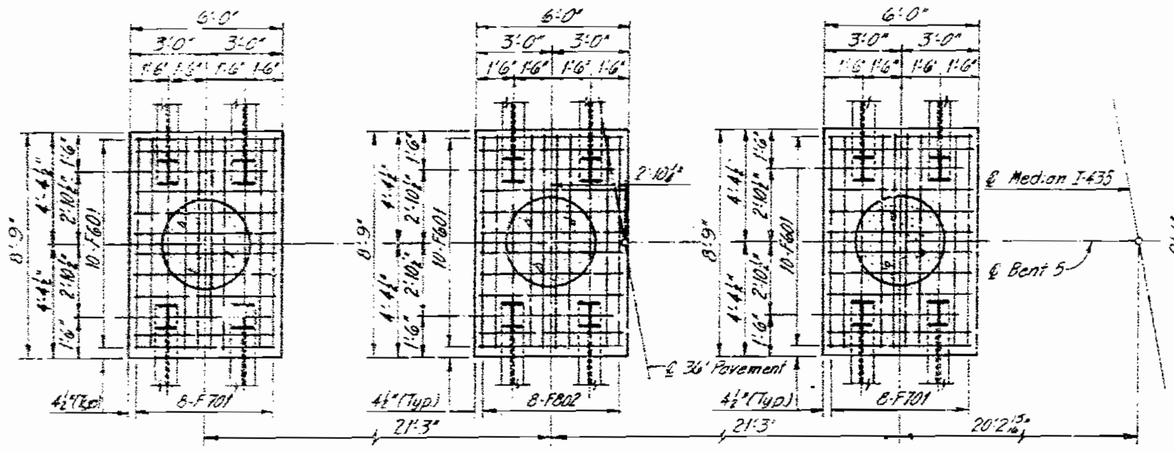
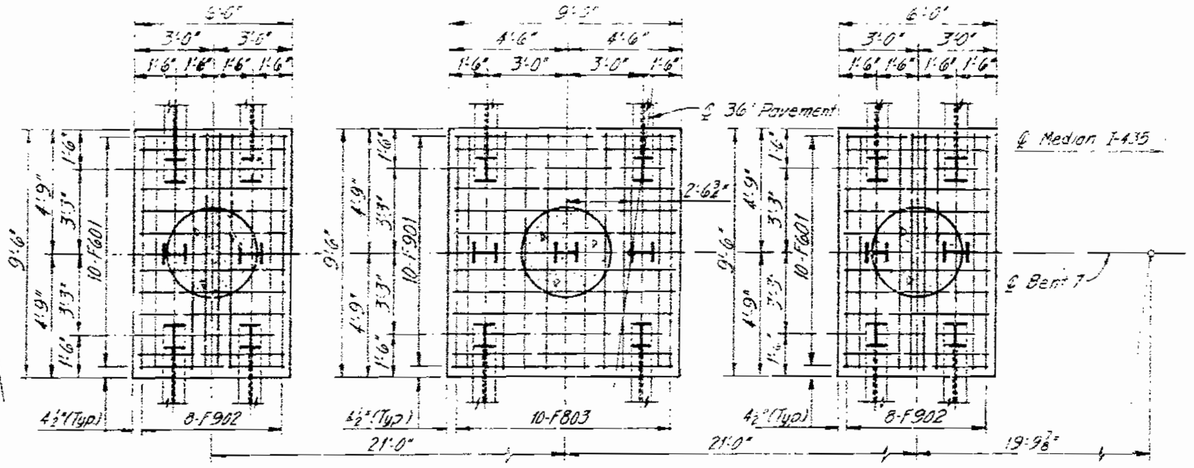


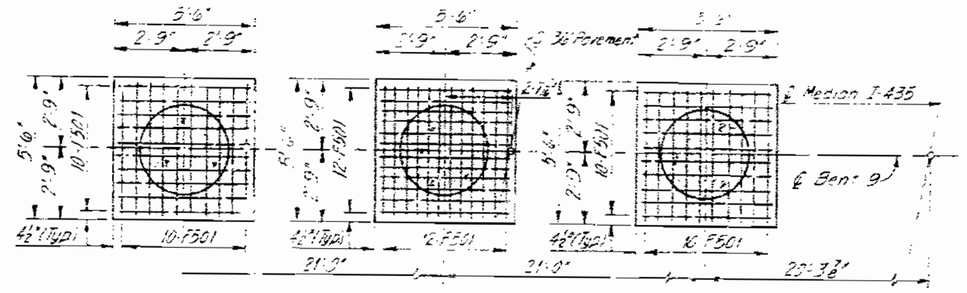
FOOTING ELEVATION BENT 9E



FOOTING PLAN BENT 5E

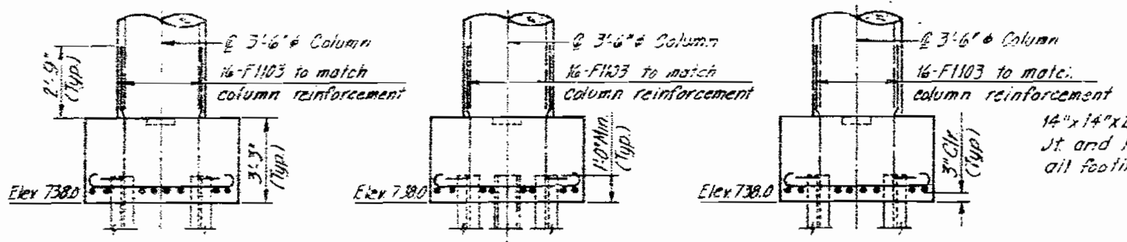


FOOTING PLAN BENT 7E

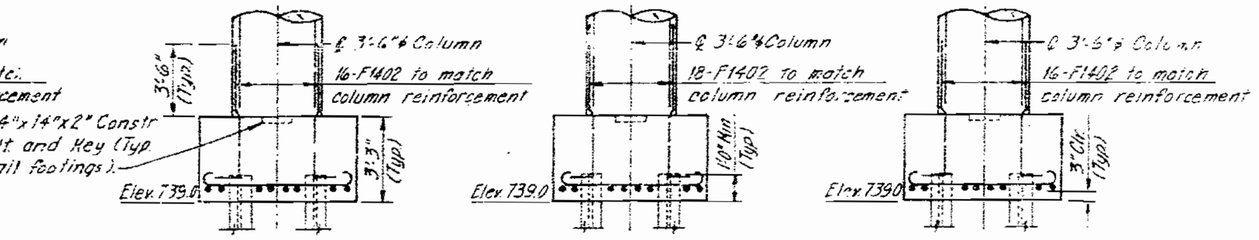


FOOTING PLAN BENT 9E

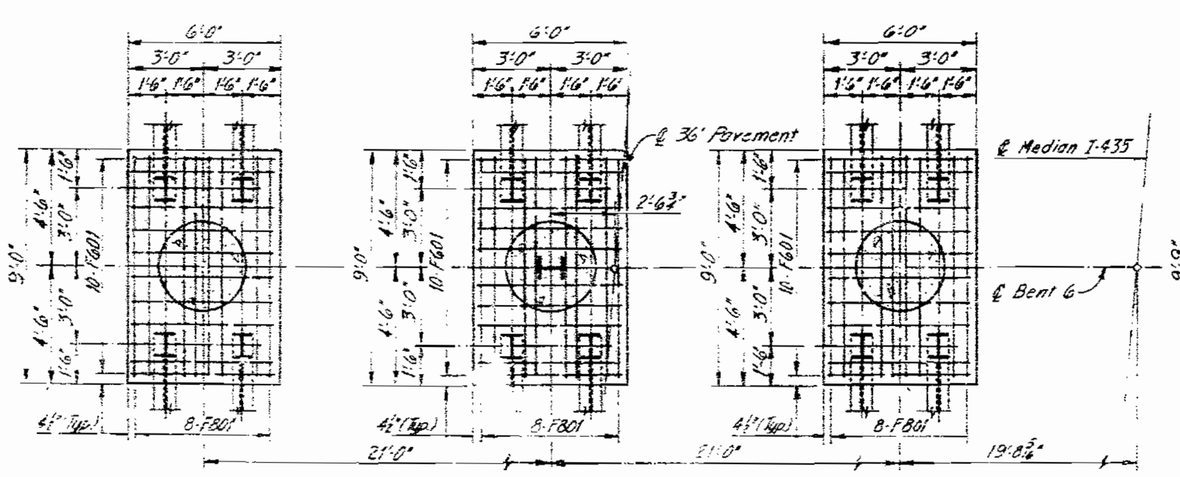
Note:
BARS IN ALL UNITS WHERE BILLED AND TAGGED SEPARATELY.
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown - substructure.
(1) piles in Bents 5E, 6E, 7E and 8E are 10E242. Batter piles 2" per foot where shown.
Dowel bars ____ match column reinforcement for spacing, see Section C-C and Section D-D Sheet 19.
For details of Bents, see Sheet 19.
For reinforcement Schedule, see Sheets 10 and 11.
For Substructure Layout, see Sheets 7 and 8.
For Excavation Details, see Sheet 9.



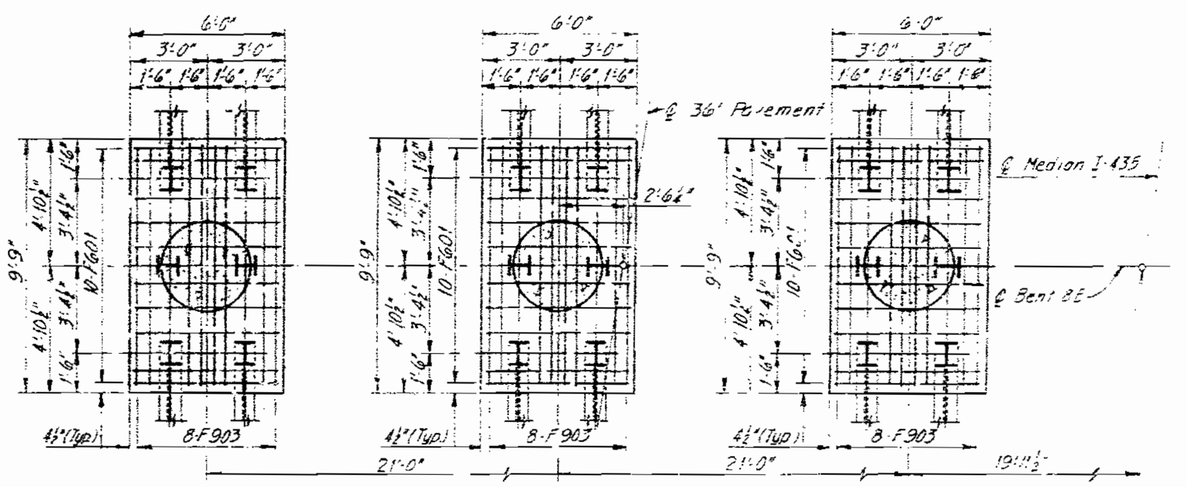
FOOTING ELEVATION BENT 6E



FOOTING ELEVATION BENT 8E



FOOTING PLAN BENT 6E



FOOTING PLAN BENT 8E

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

MADE J.S.T. DATE 6-5-67 CHECKED A.F. DATE 6-9-67

NOTE: This drawing is not to scale Follow dimensions.

FOOTING PLAN - BENTS 5E, 6E, 7E, 8E, AND 9E (NORTHBOUND LANE)

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE.I-435) STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 20A OF 6

A-1686

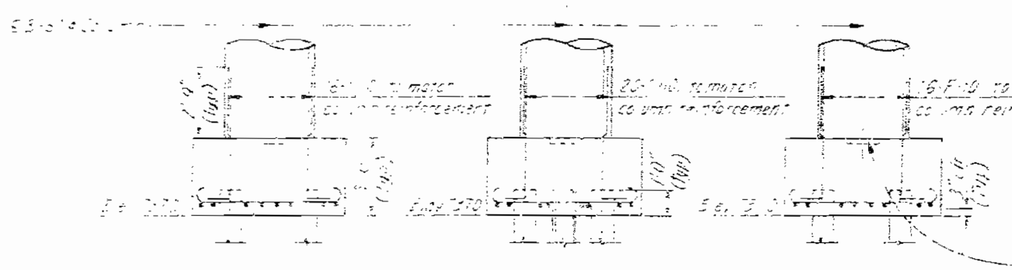
FOR INFORMATION ONLY

A16866, Sht. 64

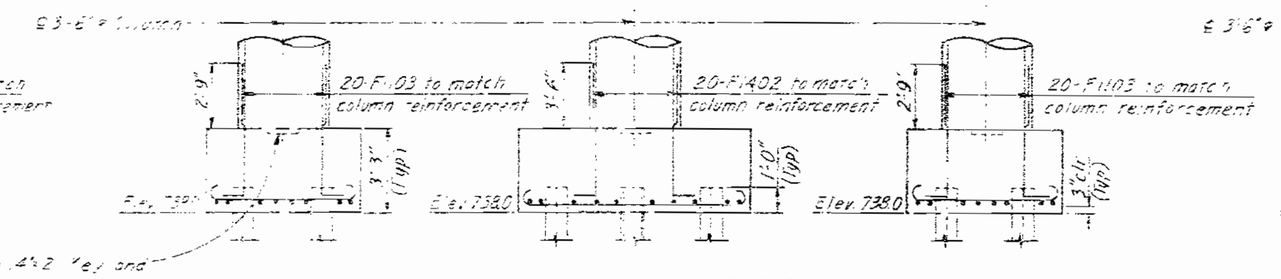
MISSOURI STATE HIGHWAY DEPARTMENT

NO. OF STATE HIGHWAY PROJECT NO.	NO. OF SHEETS
5 MO	160
COUNTY	ROUTE SEC.
4 JACKSON	

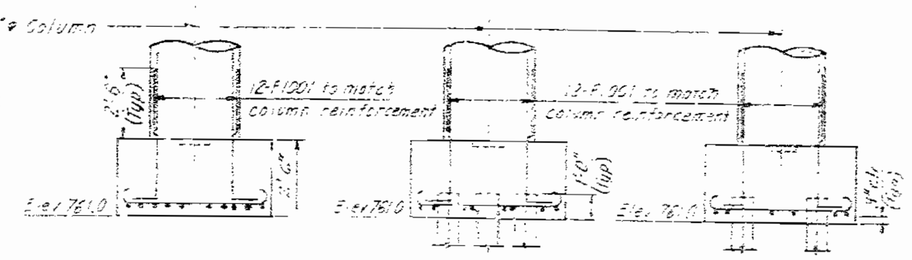
FINAL PLANS



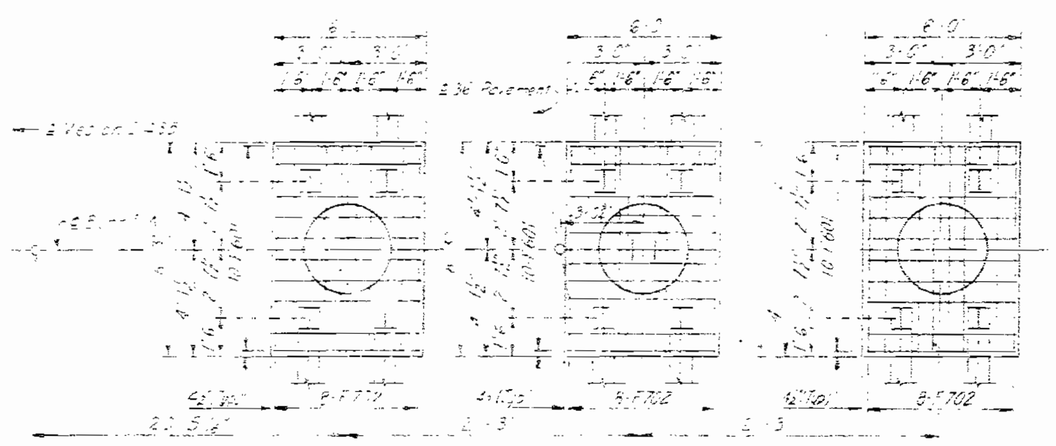
FOOTING ELEVATION BENT 5W



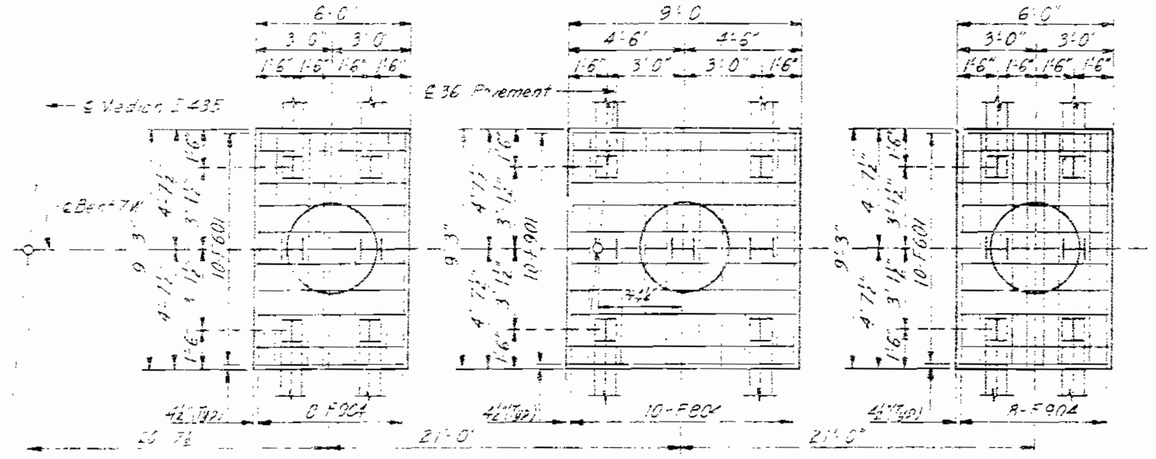
FOOTING ELEVATION BENT 7W



FOOTING ELEVATION BENT 9W



FOOTING PLAN BENT 5W



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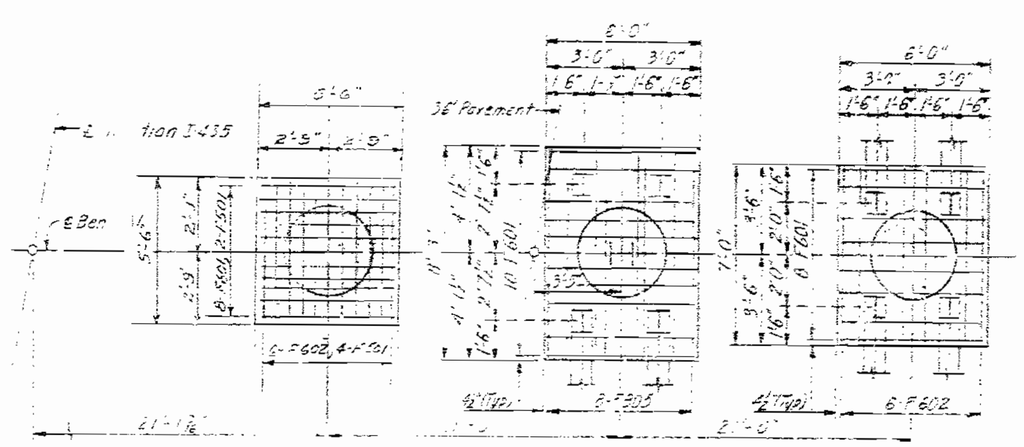

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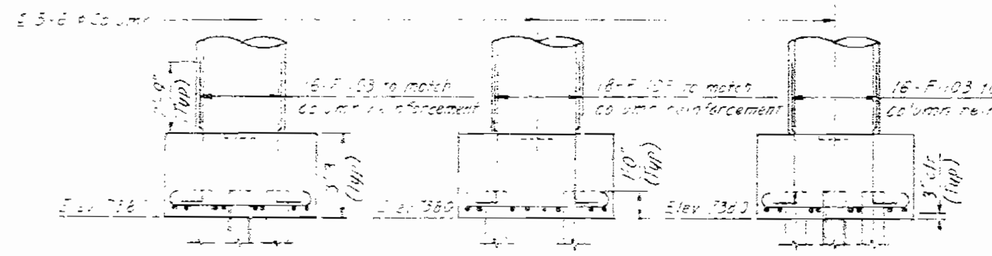

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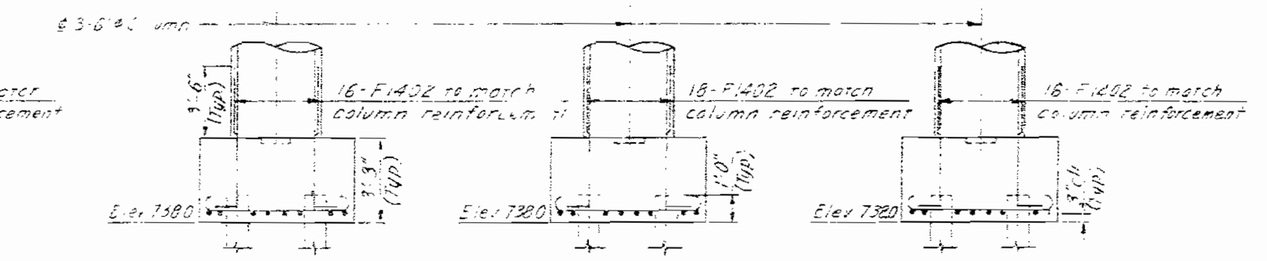
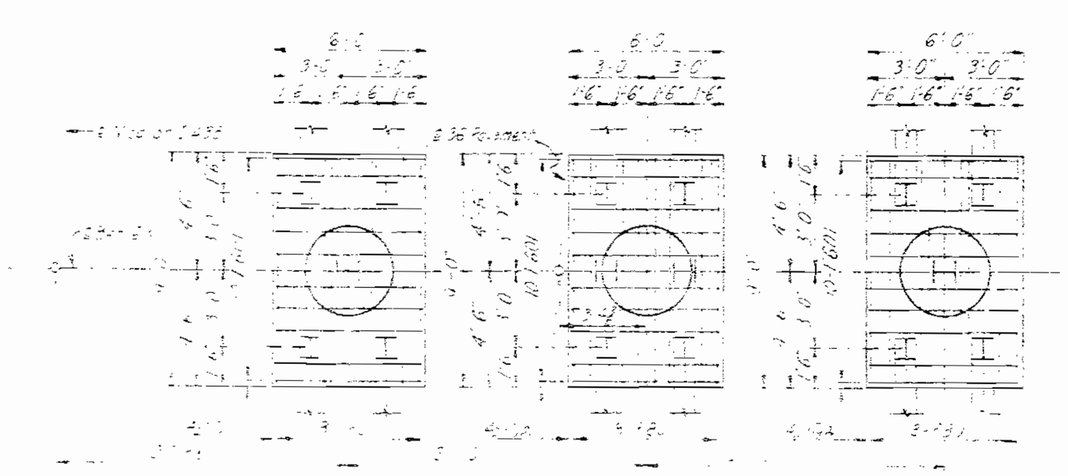
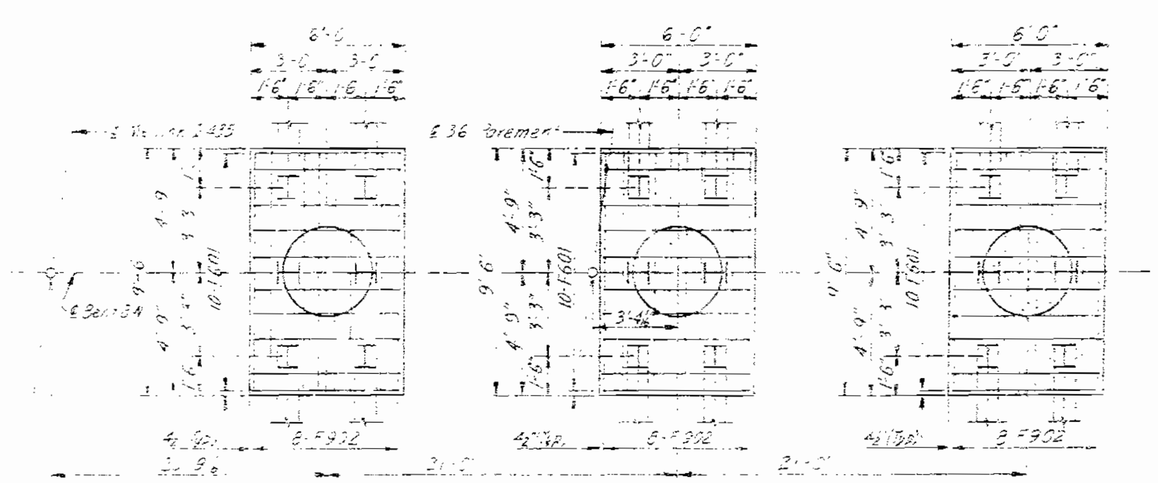


FOOTING ELEVATION BENT 8W



FOOTING PLAN BENT 6W



FOOTING PLAN BENT 8W

Note: BARS IN ALL UNITS ~~WHERE USED~~ BILLED AND TAGGED SEPARATELY.
Provide 2" clear from face of concrete to reinforcing steel, unless otherwise shown - substructure.
All piles in Bents 5W, 6W, 7W and 8W ~~are~~ HP10x42. Batter piles 2" per foot where shown.
Steel bars ~~used~~ noted as column reinforcement.
For spacing, see Section C-C and Section D-D Sheet 21.
For details of Bents, see Sheet 21.
For Reinforcement Schedule, see Sheets 11 and 12.
For Substructure Layout, see Sheets 7 and 8.
For Excavation Details, see Sheet 9.

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435 S...

N KANSAS CITY

PROJECT NO. I-IG-435(...)32, R.I...35 STA. 141+49.48 N.B.L. 141+00.56 S.B.L.

JACKSON COUNTY

SHEET 22A OF 160

A-16866

FOOTING PLAN - BENTS 5W, 6W, 7W, 8W AND 9W (SOUTHBOUND LANE)

FOR INFORMATION ONLY

A16866, Sht. 65

MISSOURI STATE HIGHWAY DEPARTMENT

BRIDGE OVER K.C.S. R.R., M.P.R.R., K.C.TERM. & S.F.R.R.

STATE ROAD-INTERSTATE ROUTE 435
IN KANSAS CITY
PROJECT NO. I-IG-435-1(52) (RTE I-435) STA 141+48.48 N.B.L. 141+00.36 S.B.L.

JACKSON COUNTY

SHEET 21 OF 26 SHEETS A-16866

END BENT 10E (NORTHBOUND LANE)

SECTION A-A

SECTION B-B

SECTION C-C

SECTION D-D

Note: Earthwall above upper construction joint was not poured until the structural steel of the expansion device was installed.

LEGEND: E. F. = each face; G. F. = each face; F. F. = each face

ELEVATION

PLAN

FOOTING PLAN

Notes: Steel in piers and abutments omitted for clarity. For additional details see Sheet 25. For footings and pilings see Sheet 16. For pier details see Sheet 15. For bearings see Sheet 24. For timber piles see Sheet 16. For footing elevations see Sheet 25. Horizontal dimensions along pier footings are measured parallel to the skew of the footing. Bars in wall are spaced 12" c-c measured along face of wall. Bars in wall are spaced 12" c-c measured along face of wall. Bars in wall are spaced 12" c-c measured along face of wall.

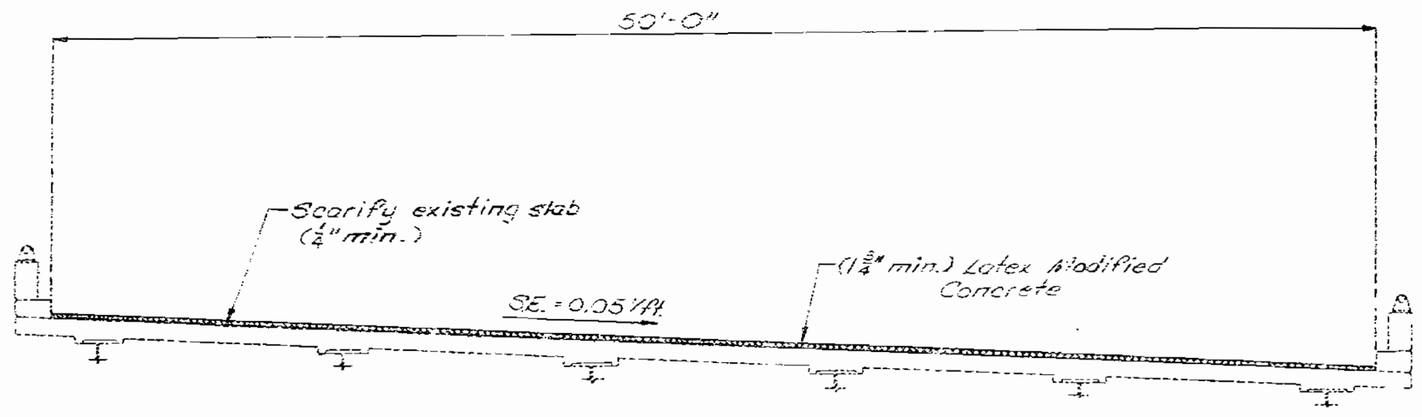
HOWARD NEEDLES TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY

NOTE: This drawing is not to scale. Follow dimensions

26

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ. NO.	SHEET NO.
MO.	I-IR-IRG-435-1(148)	5
SEC. / SUR. 31	TWP. 50 N	RGE. 32 W



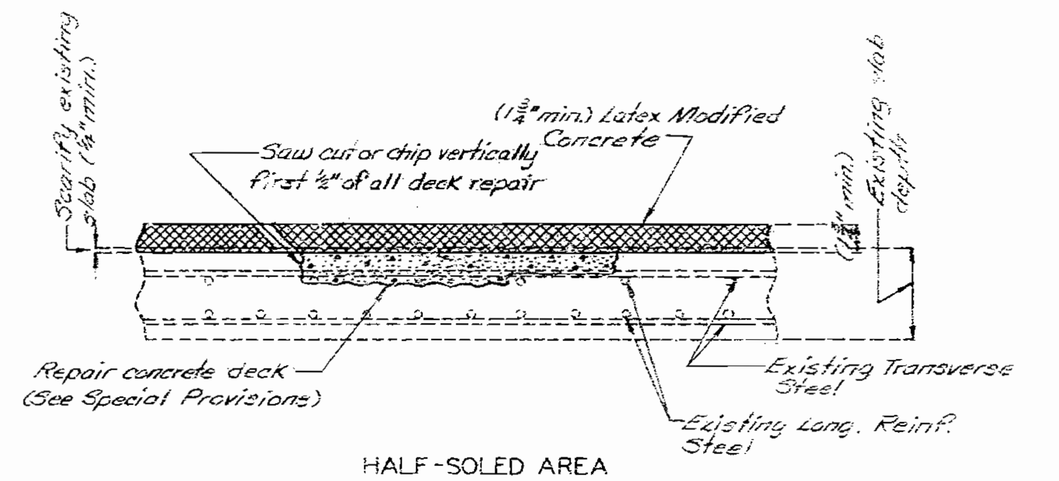
TYPICAL SECTION THRU SLAB
(NORTHBOUND)

Notes:

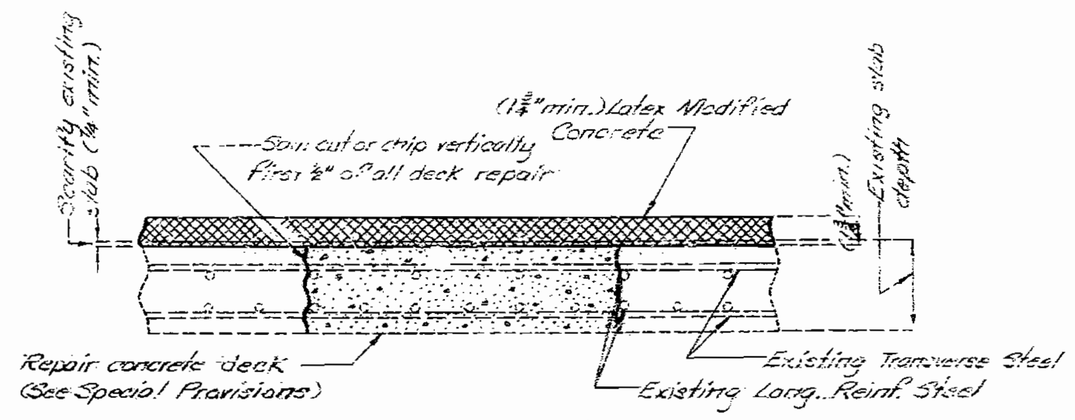
Outline of old work is indicated by light dotted lines. Heavy lines indicate new work.

Two lanes of thru traffic to be maintained over structure during construction.

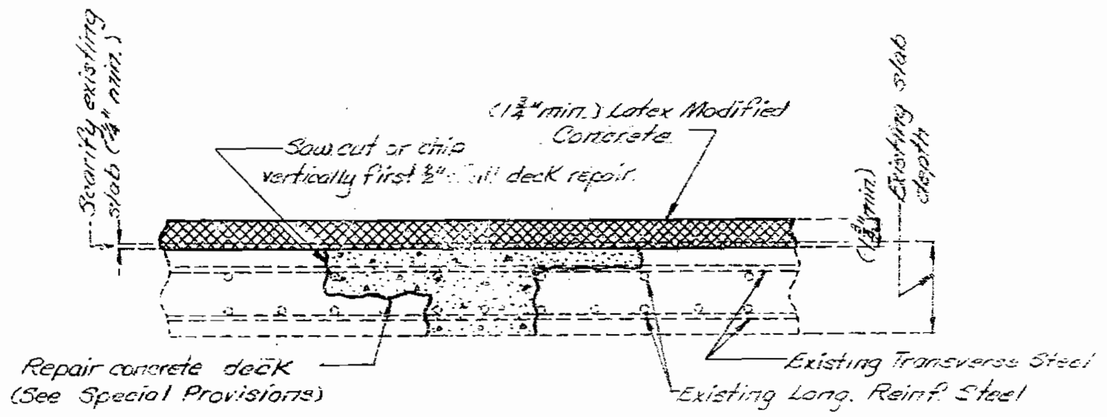
Contractor shall verify all dimensions in field before ordering new material.



HALF-SOLED AREA



FULL DEPTH REPAIR



FULL DEPTH REPAIR
HALF-SOLED AREA

ESTIMATED QUANTITIES		
ITEM		TOTAL
Latex Concrete Wearing Surface	Sq. Yd.	5149
Elastomeric Expansion Joint Seal (3.0 In.)	Lin. Ft.	110
Repairing Concrete Deck (Half-Soling)	Sq. Ft.	2317
Full Depth Repair	Sq. Ft.	927
Steel Bar Dam	Each	1

REPAIRS TO N.B.L. OF
BRIDGE OVER K.C.S.R.R., M.P.R.R., K.C. TERM. & B.N.R.R.

STATE ROAD - INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. STA. 141+49.48±

JOB NO. 4-I435-443 RTE. I-435 N.B.L.

JACKSON COUNTY

DATE FEBRUARY 25, 1985

STD.
STD.
A-1686 R

DESIGNED JAN. 1985
DETAILED JAN. 1985
CHECKED JAN. 1985

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

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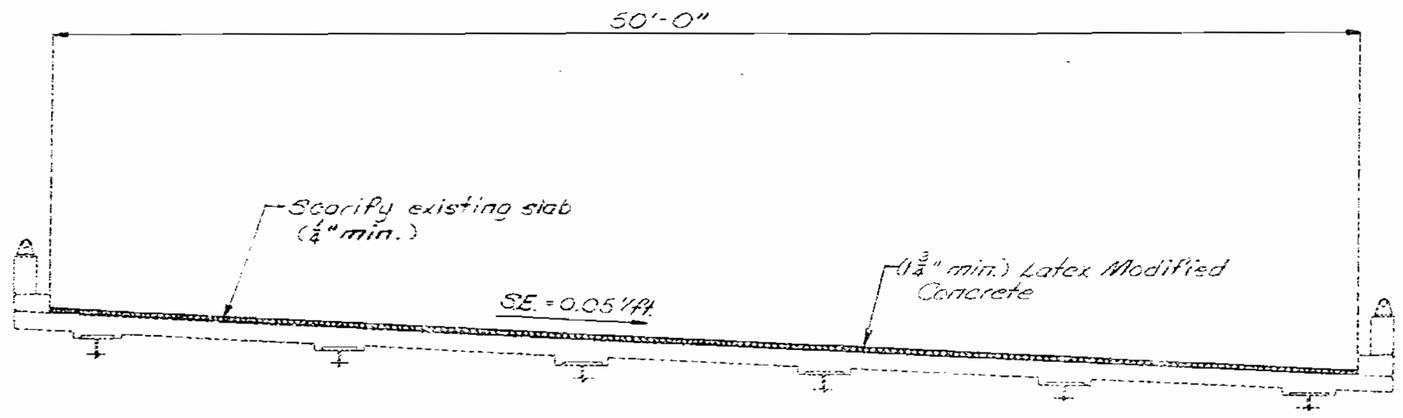
FOR INFORMATION ONLY

A16866, Sht. 67

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ NO	SHEET NO
MO	I-IR-IRG-435-1(148)	28
SEC/SUR 31	TWP 50N	RGE 32W



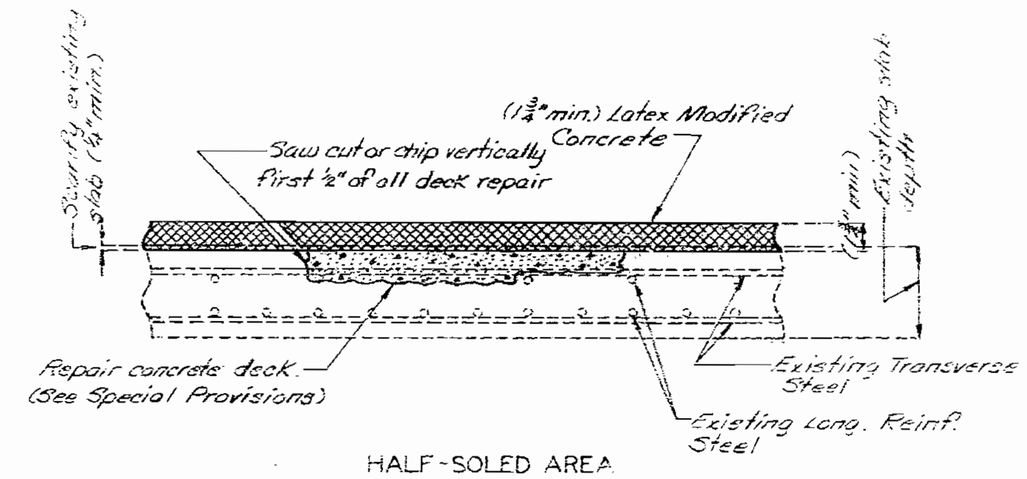
TYPICAL SECTION THRU SLAB
(SOUTHBOUND)

Notes:

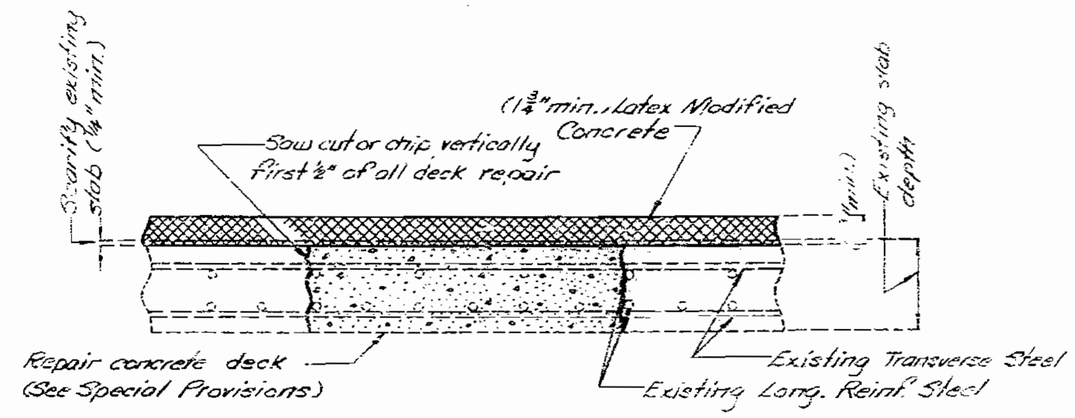
Outline of old work is indicated by light dotted lines. Heavy lines indicate new work.

Two lanes of thru traffic to be maintained over structure during construction.

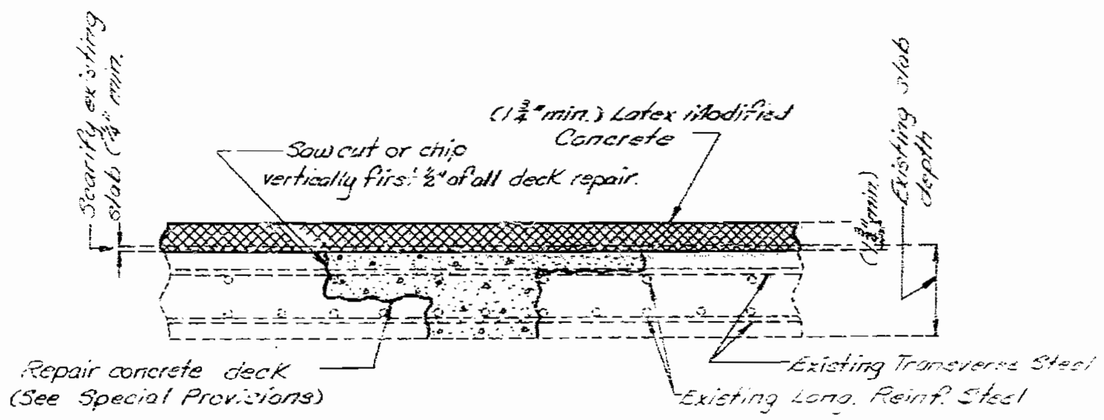
Contractor shall verify all dimensions in field before ordering new material.



HALF-SOLED AREA



FULL DEPTH REPAIR



FULL DEPTH REPAIR
HALF-SOLED AREA

ESTIMATED QUANTITIES		
ITEM		TOTAL
Latex Concrete Wearing Surface	Sq. Yd.	5370
Elastomeric Expansion Joint Seal (3.0 In.)	Lin. Ft.	111
Repairing Concrete Deck (Half-Soling)	Sq. Ft.	4825
Full Depth Repair	Sq. Ft.	967
Steel Bar Dam	Each	1

32/

REPAIRS TO S.B.L. OF
BRIDGE OVER K.C.S.R.R., M.P.R.R., K.C. TERM. & B.N.R.R.

STATE ROAD - INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO.

JOB NO. 4-I435-443

STA. 141+00.56±

RTE. I-435 S.B.L.

JACKSON **COUNTY**

DATE FEBRUARY 28, 1985

STD.	
STD.	
A-1686R1	

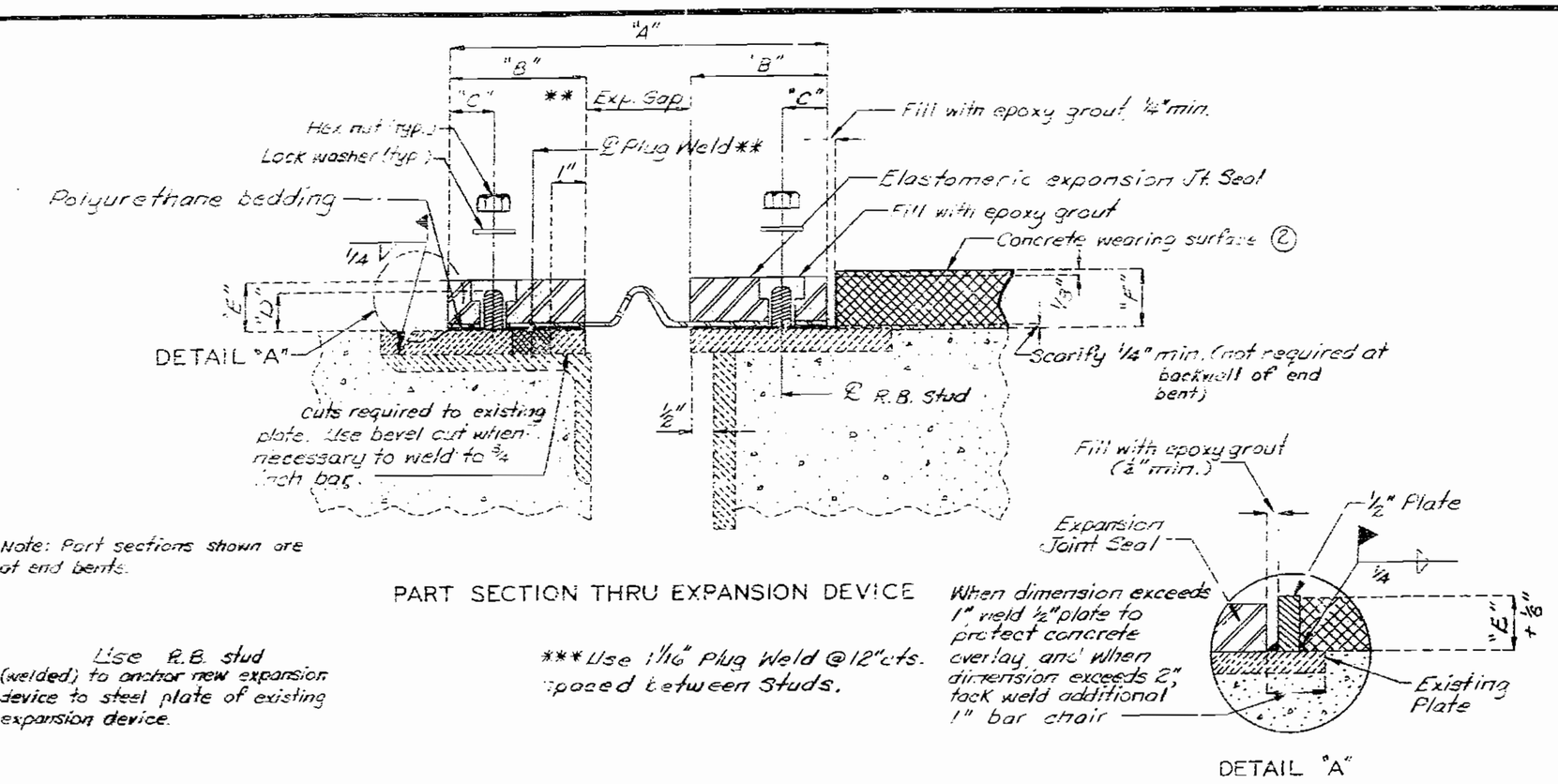
DESIGNED JAN. 1985
DETAILED JAN. 1985
CHECKED JAN. 1985

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

FOR INFORMATION ONLY

A16866, Sht. 68

STATE	PROJ NO	SHEET NO
MO	I-IR-IRG-435-1(148)	24



Note: Part sections shown are at end bents.

Use R.B. stud (welded) to anchor new expansion device to steel plate of existing expansion device.

PART SECTION THRU EXPANSION DEVICE

*** Use 1 1/16" Plug Weld @ 12" cts. spaced between Studs.

DETAIL "A"

TABLE OF DIMENSIONS									ANCHOR STUDS	
LOCATION	ACCEPTABLE ALTERNATE TYPES	EXP. GAP AT 60°	"A" AT 60°	"B"	"C"	"D"	"E"	"F"	SIZE	"G"
Bts "J" 10	Acme Trojan TR 400	2 1/2"	10 1/2"	4"	1 1/2"	18"	1 5/8"	2"	1/4"	40
Bts "J" 10	Gen-Strip CCL 3"	2 1/4"	10 1/2"	4"	1 1/2"	18"	1 5/8"	2"	3/8"	65
Bts "J" 10	On-Flex 40	2 1/2"	10 1/2"	4"	1 3/8"	18"	1 1/4"	1 7/8"	3/8"	65
Bts "J" 10	Fel-Span T40A or Knight-Field LP	2"	10 1/2"	4 1/2"	1 3/8"	7"	1 1/4"	1 5/8"	1/2"	50

Notes: All dimensions are at right angles.

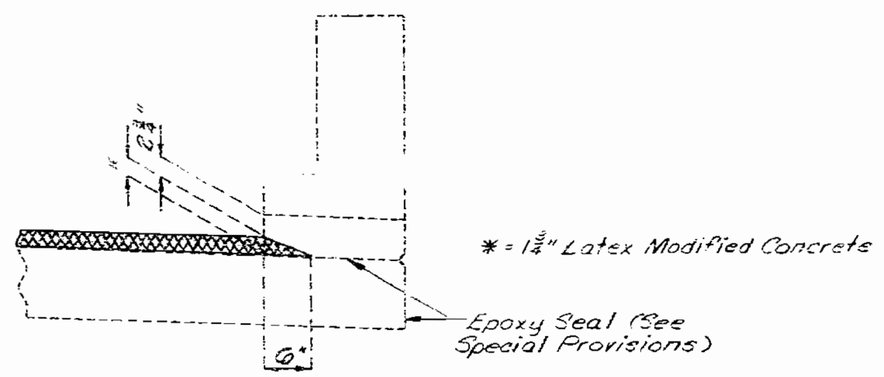
Expansion gap and dimension "A" shall be increased 3/16" for each 10° fall in temperature and decreased 3/16" for each 10° rise in temperature.

The certified nuts for the anchor studs shall be tightened to foot pounds ("G") specified in the table of dimensions. Retighten to ("G") foot pounds a minimum of 30 minutes after initial tightening.

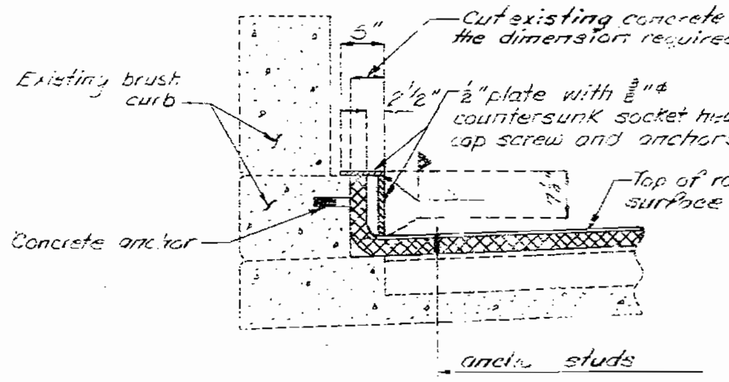
The welded anchor studs shall be reduced base (R.B.) Type.

** If existing expansion device has closed to less than expansion gap given in table, the expansion gap of the new device may be adjusted accordingly and installed in the same manner.

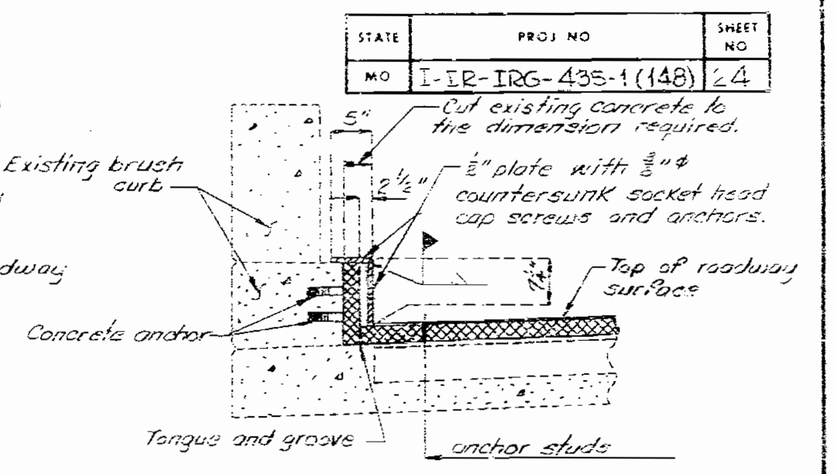
New material for the armored joint shall be A-36 structural grade.



TYPICAL SECTION AT CURB SHOWING OUTLETS



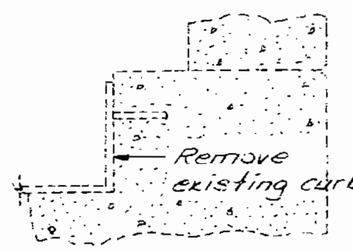
TYPE "E" CURB



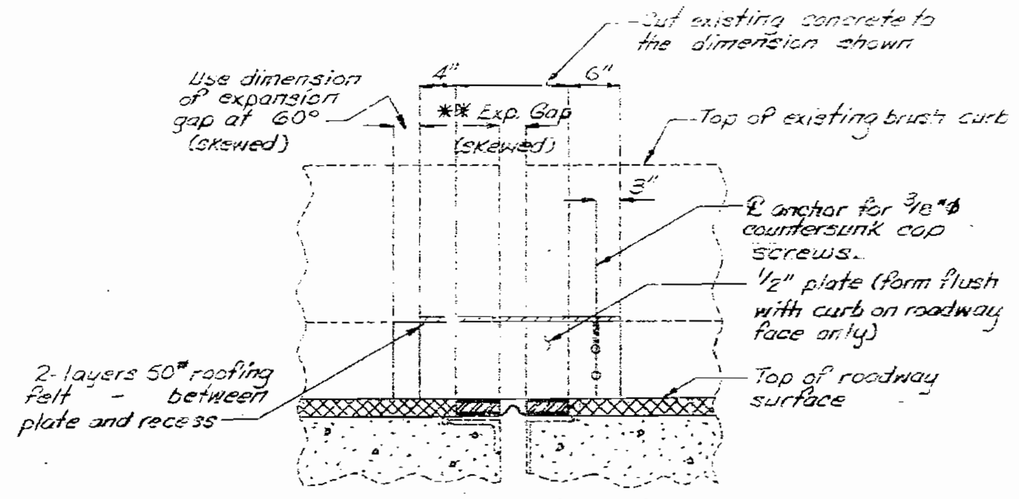
TYPE "G" CURB

ALTERNATE CURB TREATMENTS

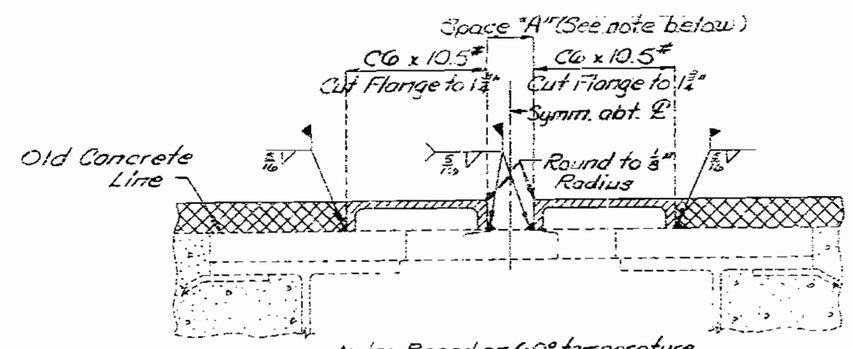
② Slope ⅛" in 10' to 1¾" min. thickness for latex concrete wearing surface. Curb plate (A.S.T.M.) shall be painted. (See Special Provisions)



PART SECTION THRU EXISTING CURB



PART ELEVATION OF CURB



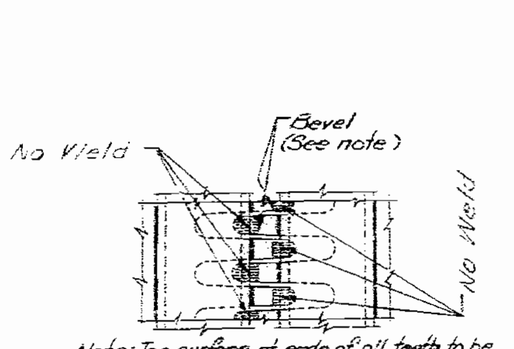
Note: Based on 60° temperature space "A" to be 2" for expansion joints designed for 200 feet or less of bridge expansion and this space increased ___ of additional expansion length up to maximum space of 2⅜"

Space "A" to be measured parallel to ℄ of roadway.

PART SECTION THRU EXPANSION DEVICE

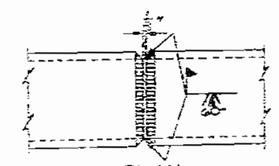
DAMS AT FINGER TYPE EXPANSION DEVICES

Note: Paint inside surface of channel 5.0 mils inorganic zinc. (System C Primer)

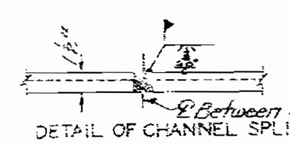


Note: Top surface at ends of all teeth to be beveled ⅛" in 1½" to permit free movement under new C6" channels.

PART PLAN AT EXPANSION DEVICE



PLAN



DETAIL OF CHANNEL SPLICE

GENERAL NOTES:

Structural Steel A.S.T.M. A-36

Qualification of welding operators will be required.

E-70, 16 or 18 welding electrodes shall be used.

The steel dams shall extend full roadway width between curbs but shall be installed in sections of such lengths to permit two thru lanes of traffic at all times. Before traffic is permitted to cross over sections of dams in place, sufficient bituminous surfacing shall be placed on roadway slab adjacent to both sides of expansion device to prevent any damage to either the steel dams or tires of vehicles.

Steel dams shall conform to crown of roadway.

Steel channels or bars on both sides of expansion joint, for full width of roadway, shall be considered as a steel dam assembly and paid for as one steel bar dam.

DETAILED JAN. 1985
CHECKED JAN. 1985

SHEET NO. 2 OF 2

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

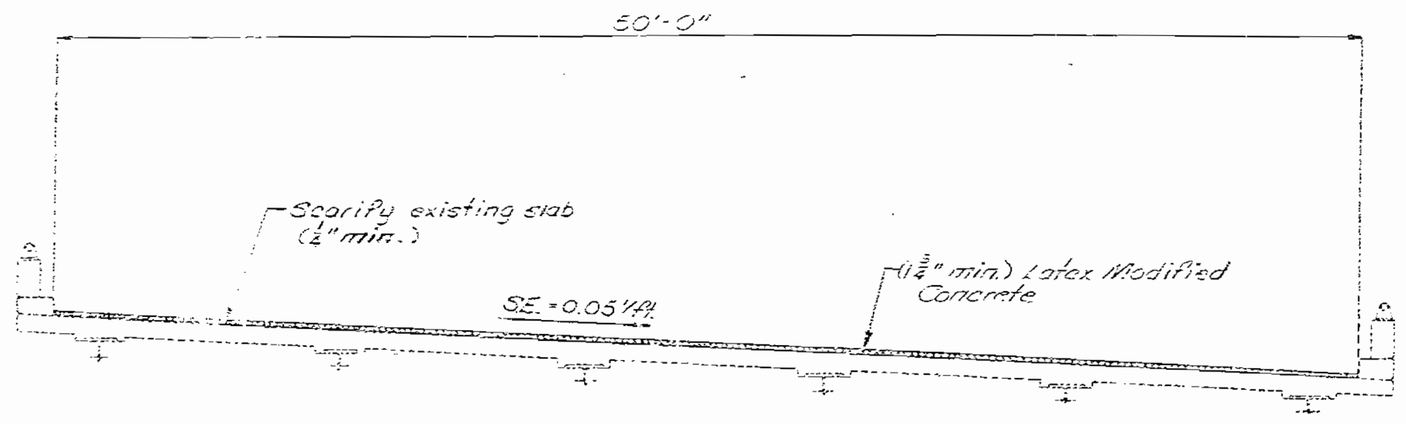
JACKSON COUNTY

A-1686R

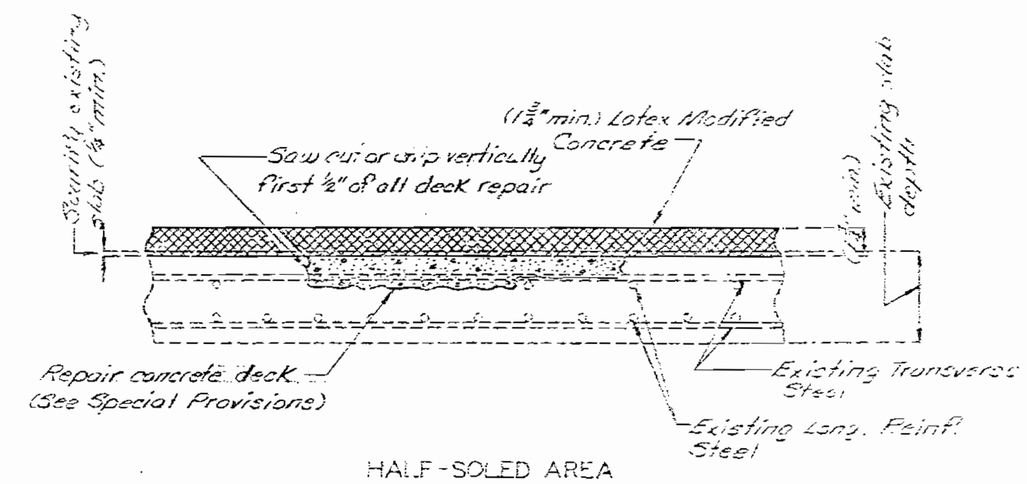
A16866, Sht. 69

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

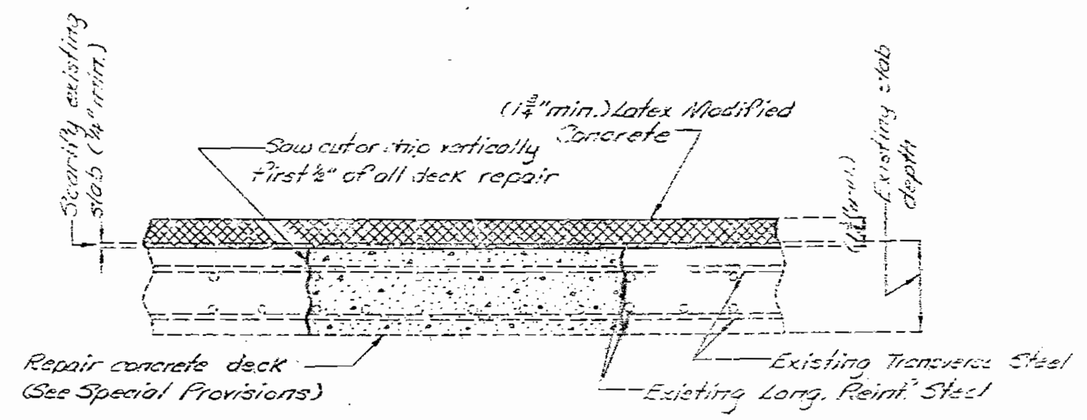
STATE	PROJ. NO	SHEET NO
MO	I-IR-IRG-435-1 (146)	23
SEC 31	TWP 50 N	RGE 32 W



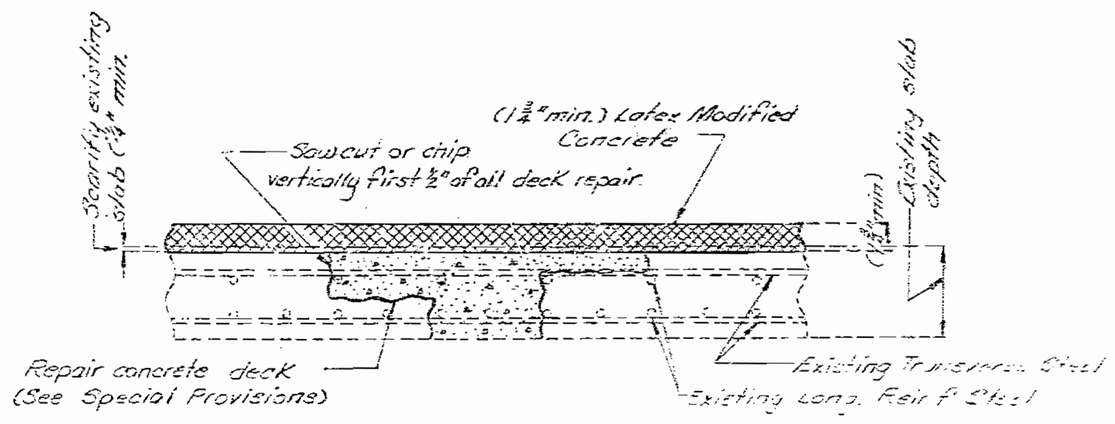
TYPICAL SECTION THRU SLAB
(SOUTHBOUND)



HALF-SOLED AREA



FULL DEPTH REPAIR



FULL DEPTH REPAIR
HALF-SOLED AREA

Notes:

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

Two lanes of thru traffic to be maintained over structure during construction.

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

ESTIMATED QUANTITIES		
ITEM		TOTAL
Latex Concrete Wearing Surface	Sq. Yd.	5370
Elastomeric Expansion Joint Seal (3.0 In.)	Lin. Ft.	111
Repairing Concrete Deck (Half-Soling)	Sq. Ft.	5666
Full Depth Repair	Sq. Ft.	0
Steel Bar Dam	Each	1

REPAIRS TO S.B.L. OF
BRIDGE OVER K.C.S.R.R., M.P.R.R., K.C. TERM. & B.N.R.R.

STATE ROAD - INTERSTATE ROUTE 435

IN KANSAS CITY

PROJECT NO. STA. 141+00.56 ℄

JOB NO. 4-I435-443 RTE. I-435 S.B.L.

JACKSON COUNTY

DATE FEBRUARY 25, 1985

STD.
STD.
A-1686R1

DESIGNED JAN. 1985
DETAILED JAN. 1985
CHECKED JAN. 1985

Sheet No. 1A of 2.

FOR INFORMATION ONLY

A16866, Sht. 70

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ. NO.	SHEET NO.
MO.	FA.-450-1(250)	37
SEC./SUR. 31	TWP. 50N RGE. 32W	

GENERAL NOTES:

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

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

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

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

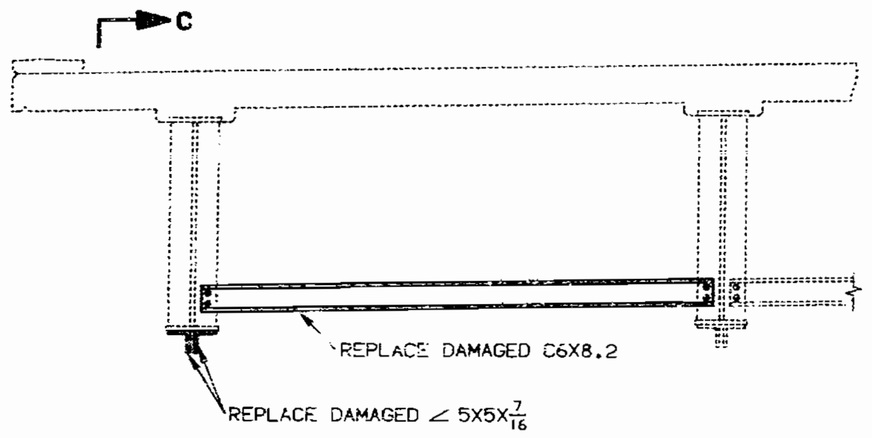
CONSTRUCTION CLEARANCE:
SEE SPECIAL PROVISIONS FOR MINIMUM VERTICAL AND HORIZONTAL CLEARANCE.

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

ESTIMATED QUANTITIES

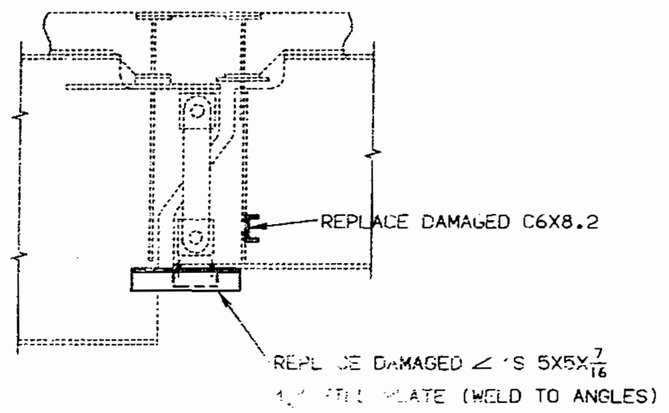
ITEM		TOTAL
MOBILIZATION	LUMP SUM	1
REPAIR "A"	EACH	804
REPAIR "B"	LIN. IN.	1100
REPAINTING (CALCIUM SULFONATE SYSTEM)	LUMP SUM	1

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



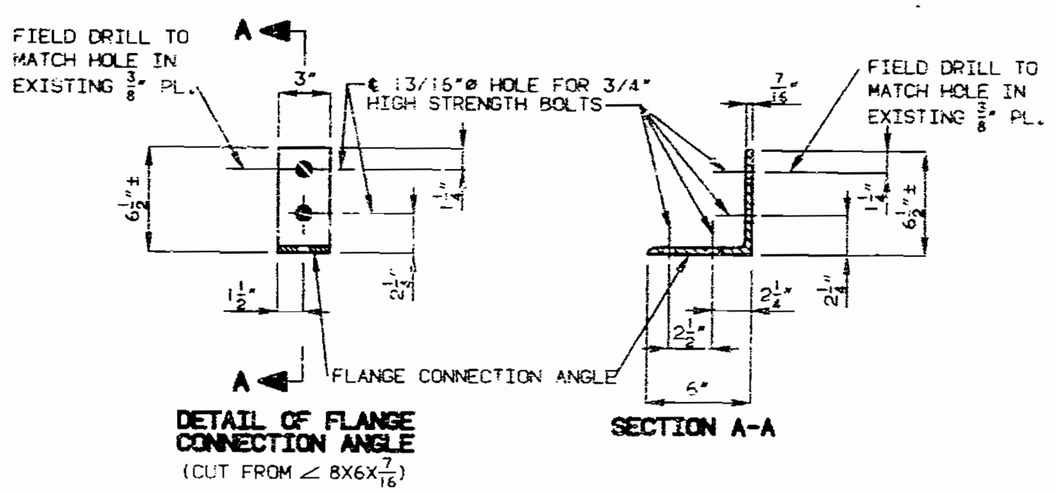
SECTION B-B

NOTE: FOR LOCATION OF SECTION B-B, SEE SHEET NO. 2. COST OF REPLACING DAMAGED CHANNEL AND ANGLES SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR OTHER ITEMS. (SEE SPECIAL PROVISIONS)



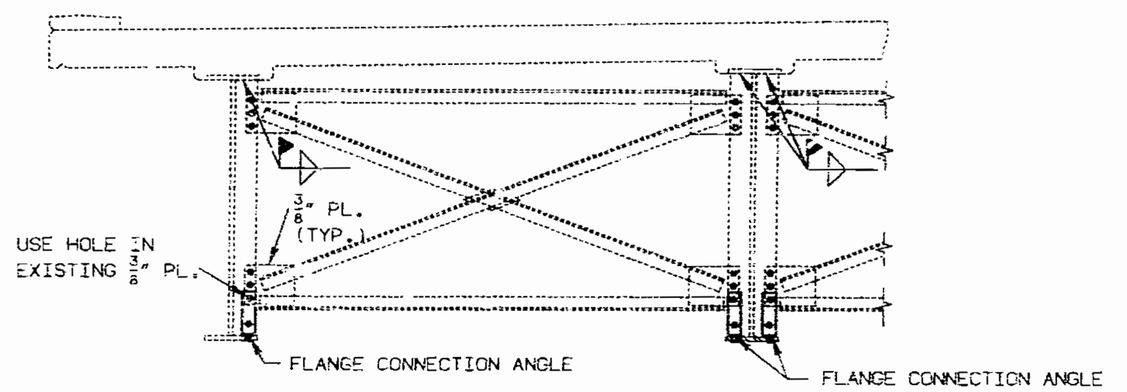
SECTION C-C

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



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

SECTION A-A



TYPICAL PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS REPAIR "A"

REPAIRS TO BRIDGE OVER K.C.S., M.P., K.C. TERM. ARMCO STEEL & A.T.S.F. R.R.

STATE ROAD: INTERSTATE ROUTE 435
IN KANSAS CITY 435
PROJECT NO. FA.-~~450~~-1(250)
JOB NO. 4I 1026-435

STA. 141+00.56 S.B.L.
STA. 141+49.48 N.B.L.
RTE. I-435

JACKSON COUNTY

DETAILED APR. 1991
CHECKED APR. 1991

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

SEE FINAL PLANS
SHEET NO. 1 OF 2.

DATE 6/5/91

A-1686R2

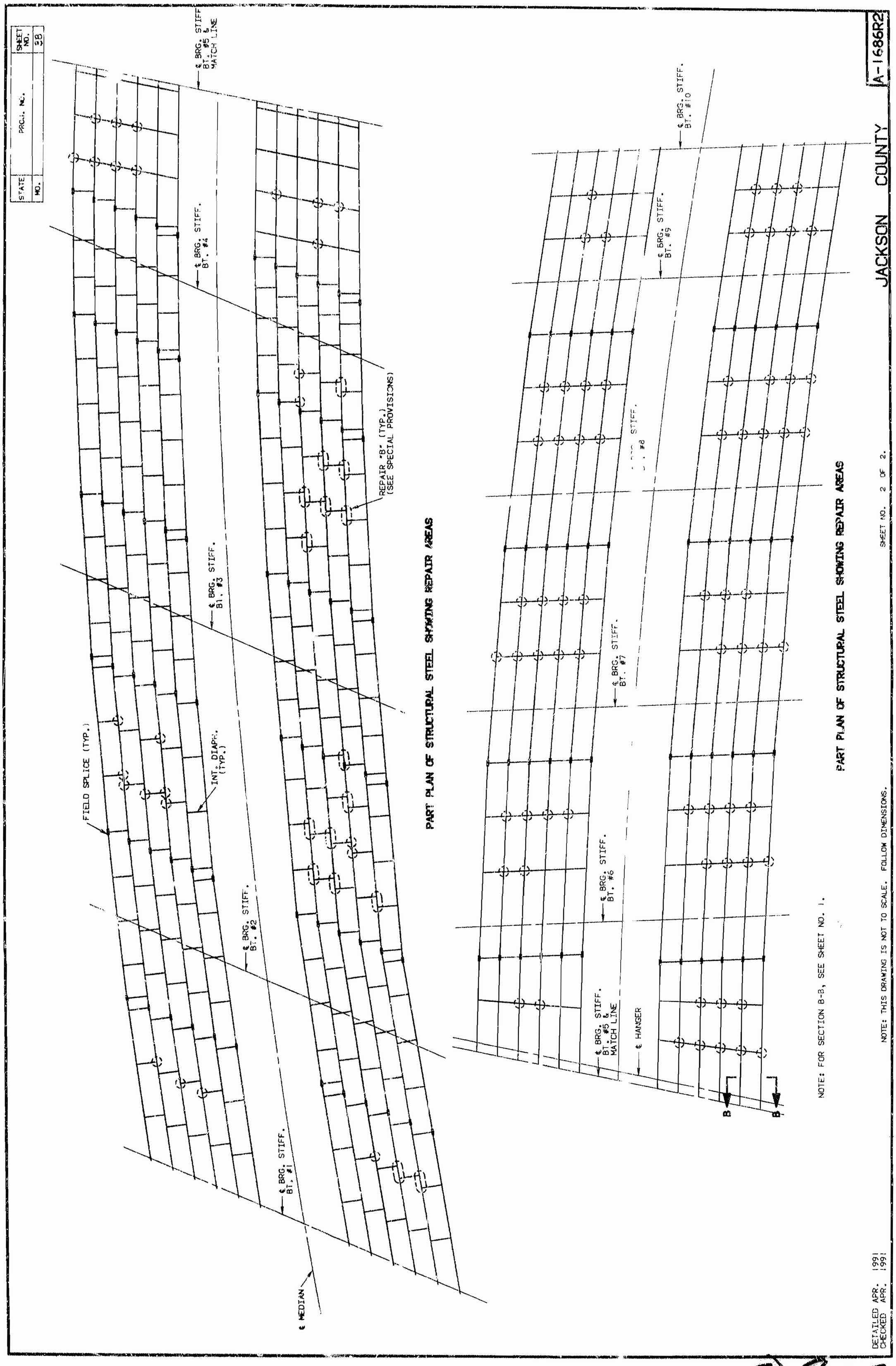
22/32

FOR INFORMATION ONLY

A16866, Sht. 71

STATE	PROJ. NO.	SHEET NO.
MO.		38

JACKSON COUNTY A-1686R2



PART PLAN OF STRUCTURAL STEEL SHOWING REPAIR AREAS

PART PLAN OF STRUCTURAL STEEL SHOWING REPAIR AREAS

SHEET NO. 2 OF 2.

NOTE: FOR SECTION B-B, SEE SHEET NO. 1.

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

DETAILED APR. 1991
CHECKED APR. 1991

FINAL PLAN

FOR INFORMATION ONLY

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ. NO.	SHEET NO.
MO.	FA-435-1(250)	.
SEC./SUR. 31	TWP. 50N	RGE. 32W

GENERAL NOTES:

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

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

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

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

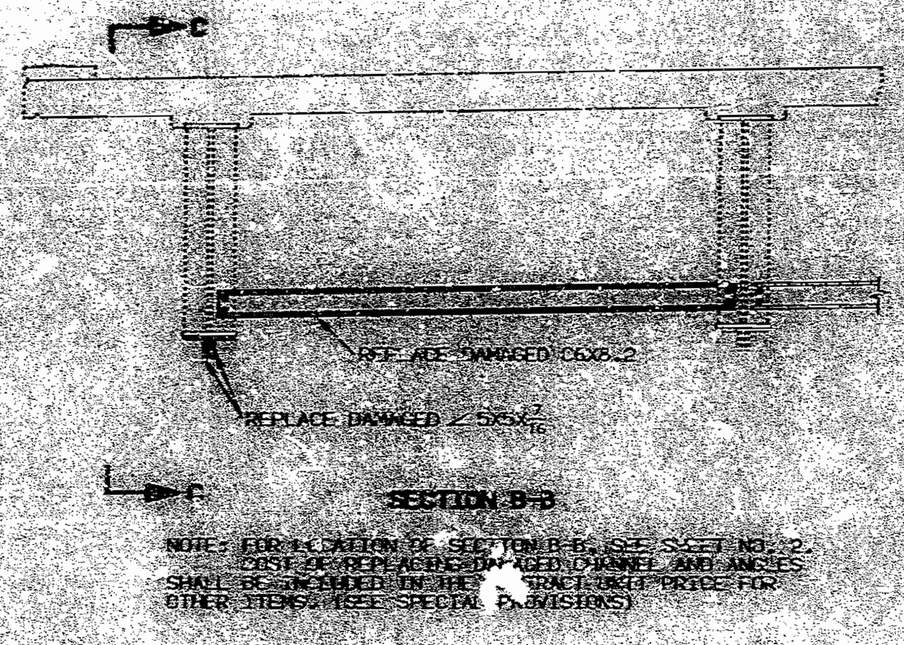
CONSTRUCTION CLEARANCE:
SEE SPECIAL PROVISIONS FOR MINIMUM VERTICAL AND HORIZONTAL CLEARANCE.

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

FINAL ~~ESTIMATED~~ QUANTITIES

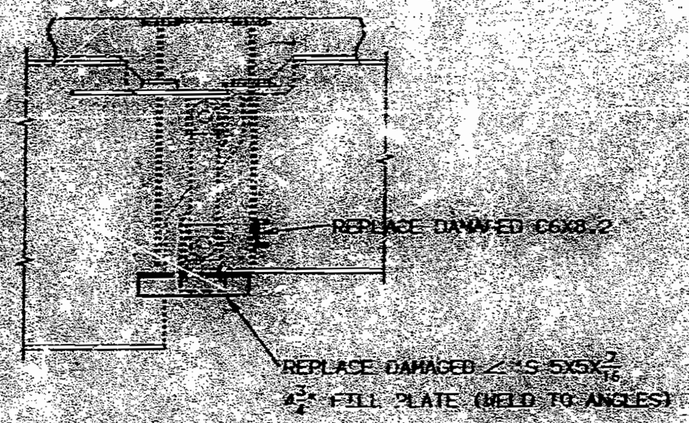
ITEM		TOTAL
MOBILIZATION	LUMP SUM	1
REPAIR "A"	EACH	580
REPAIR "B"	LIN. IN.	1682
REPAINTING (CALCIUM SULFONATE SYSTEM)	LUM. SUM	1

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



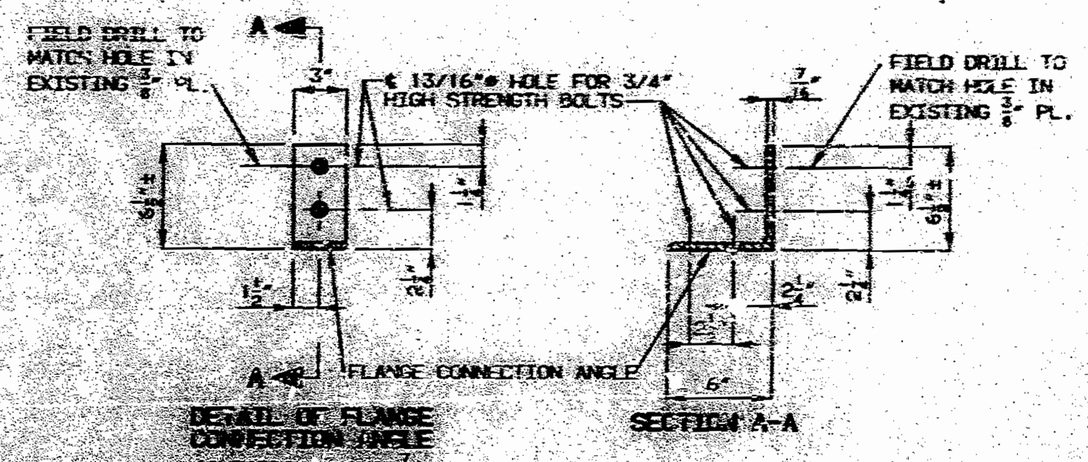
SECTION B-B

NOTE: FOR LOCATION OF SECTION B-B, SEE SHEET NO. 2. DAMAGED WEB PLATE, TOP FLANGE PLATE, CHANNEL AND ANGLES SHALL BE REMOVED IN ITEM "REPAIR A" PRICE FOR OTHER ITEMS, SEE SPECIAL PROVISIONS)



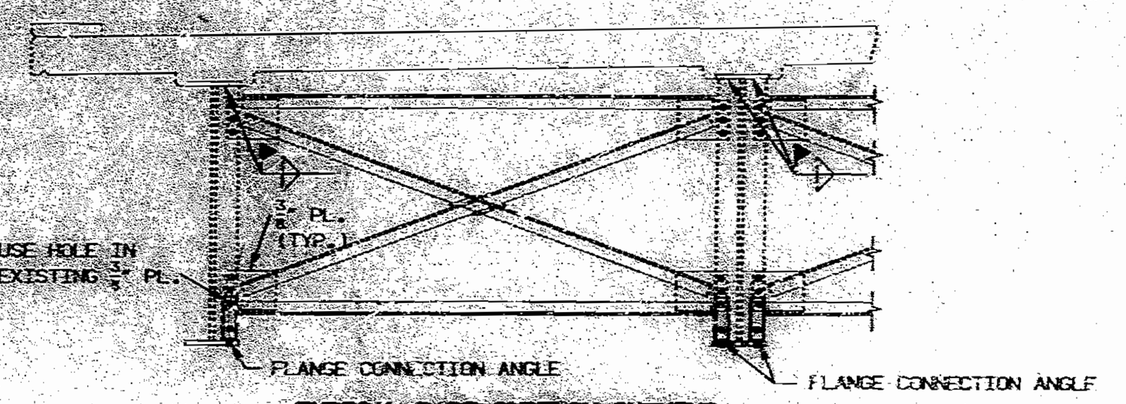
SECTION C-C

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



DETAIL OF FLANGE CONNECTION ANGLE
(CUT FROM ∠ 8"X6"X 7/16)

SECTION A-A



TYPICAL END SECTION SHOWING INTERMEDIATE DIAPHRAGMS REPAIR "A"

REPAIR "A" OMITTED ON DIAPHRAGMS CONNECTED AT A SPLICE

REPAIRS TO BRIDGE OVER K.C.S., M.P., K.C. TERM. ARMCO STEEL & A.T.S.F. R.R.

STATE ROAD: INTERSTATE ROUTE 435
IN KANSAS CITY — STA. 141+00.56 S.B.L.
PROJECT NO. FA-435-1(250) — STA. 141+49.48 N.B.L.
JOB NO. 41 1026-435 — RTE. I-435

JACKSON COUNTY

DETAILED APR. 1991
CHECKED APR. 1991

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

SHEET NO. 1 OF 2.

DATE 6/5/91

A-1686R2

A16866, Sht. 73

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

STATE	PROJ. NO.	SHEET NO.
MO.	FA-435-1(250)	2
SEC./SUR. 31	TWP. 50N	RGE. 32W

GENERAL NOTES:

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

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

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

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

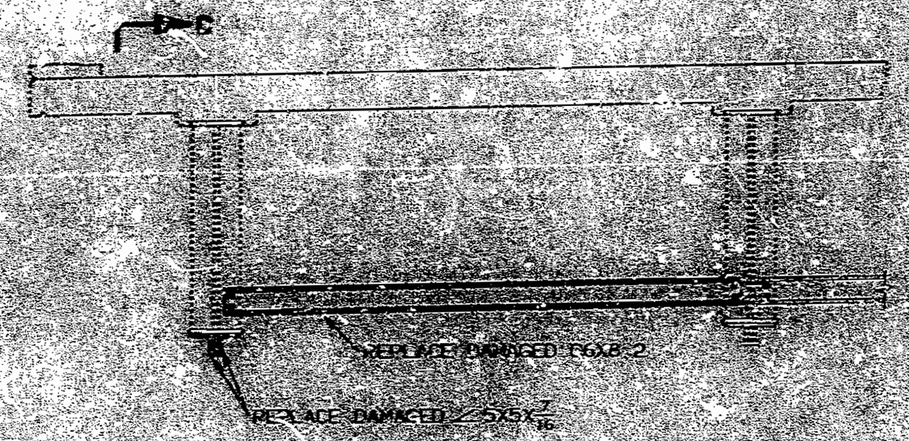
CONSTRUCTION CLEARANCE:
SEE SPECIAL PROVISIONS FOR MINIMUM VERTICAL AND HORIZONTAL CLEARANCE.

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

FINAL [illegible] QUANTITIES

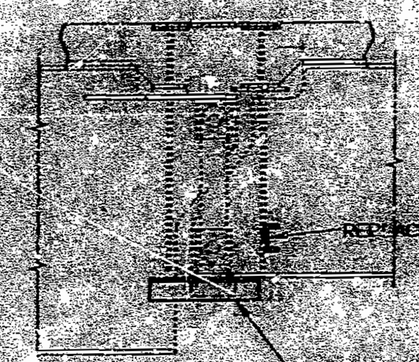
ITEM		TOTAL
MOBILIZATION	LUMP SUM	1
REPAIR "A"	EACH	580
REPAIR "B"	LIN. IN.	1082
RE-PAINTING (CALCIUM SULFONATE SYSTEM)	LUMP SUM	1

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



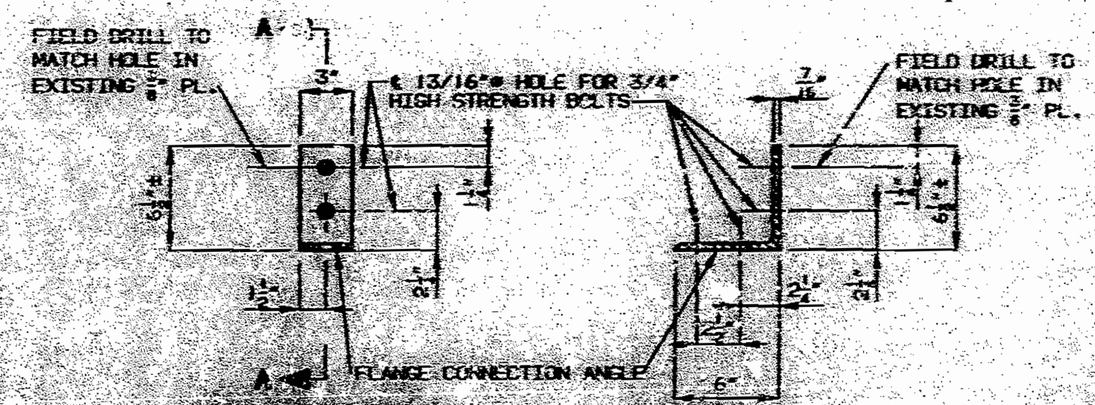
SECTION B-B

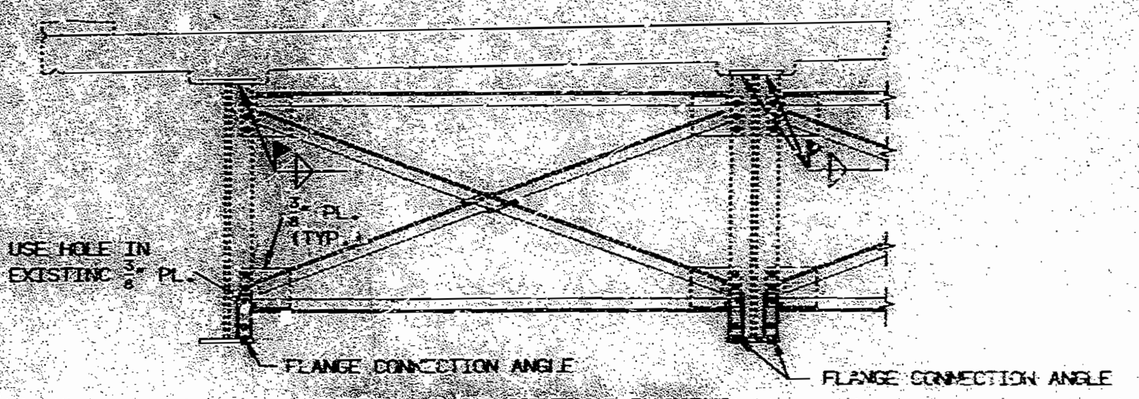
NOTE: FOR LOCATION OF SECTION B-B, SEE SHEET NO. 2. DESIGNATED ANGLES AND WIDE FLANGE BEAMS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR OTHER ITEMS. (SEE SPECIAL PROVISIONS).



SECTION C-C

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





TYPICAL PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS REPAIR "A"

REPAIR "A" OMITTED ON DIAPHRAGMS CONNECTED AT A-SPECE

REPAIRS TO BRIDGE OVER K.C.S., M.P., K.C. TERM., ARMCO STEEL & A.T.S.F. R.R.

STATE ROAD: INTERSTATE ROUTE 435
IN KANSAS CITY — STA. 141+00.56 S.B.L.
PROJECT NO. FA-435-1(250) STA. 141+49.48 N.B.L.
JOB NO. AI 1026-435 RTE. I-435

JACKSON COUNTY

A-1686R2

DETAILED APR. 1991
CHECKED APR. 1991

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

SHEET NO. 2 OF 2.

DATE 6/5/91

FOR INFORMATION ONLY

A16866, Sht. 74

STATE	PROJ. NO.	SHEET NO.
MO.		281
SEC./SUR. 31	TWP. 50N	RGE. 32W

Missouri Department of Transportation

No. Sheet Title

Estimated Quantities

	Item		Substr.	Superstr.	Total
	Partial Removal of Substructure Concrete	lump sum	1		1
	Removal of Existing Bridge Deck - Metric	sq. meter		4731.1	4731.1
	Substructure Repair (Formed) - Metric	sq. meter	8.3		8.3
	Protective Coating - Concrete Bents (Deleterious Agents)	lump sum	1		1
	Class B-1 Concrete (Substructure) - Metric	cu. meter	3.5		3.5
	Slab on Steel - Metric	sq. meter		4731	4731
*	Safety Barrier Curb - Metric	meter		606.0	606.0
	Type N PTFE Bearings	each		6	6
	Reinforcing Steel (Epoxy coated) - Metric	kilogram	470		470
	Expansion Device (Finger Plate) - Metric	meter		15.6	15.6
	Expansion Device (Flat Plate) - Metric	meter		33.9	33.9
	Fabricated Structural Carbon Steel (Misc) - Metric	kilogram		8230	8230
	Slab Drain	each		75	75
	Field Coat (System G) Gray - Metric	Megagram		8.2	8.2

Estimated Quantities for Slab on Steel

Item		Stage I	Stage II	Stage III	Total
Reinforcing Steel (Epoxy Coated)	kilogram	69 175	84 750	81 005	234 930
Concrete	cu. meter	327.6	378.7	424.9	1131.2

The table of estimated quantities for Slab on Steel represents the quantities used by the state in preparing the cost estimate for concrete slabs. Variations may be encountered in these estimated quantities but these variations cannot be used for an adjustment in the contract unit price per square meter of Slab on Steel.

Slab on steel shall be constructed using cast-in-place conventional forming.

* Safety barrier curb shall be cast-in-place option or slip-form option.

Construction Clearances

Railroad	Vertical (mm)	Lateral (mm)
GST Steel Company	7010	3048
UP	6553	4572
KCS	6553	3048
BNSF	6553	3048
KCT	7010	3048

General Notes:

Design Specifications:
ASHTO-1996 Load Factor Design
Seismic Performance Category A

Design Loading:
MS18 Modified
No Future Wearing Surface
Fatique Stress - Case I

Design Unit Stresses:

Class B1 Concrete (Substructure)	f'c = 28 MPa
Class B1 Concrete (Safety Barrier Curb)	f'c = 28 MPa
Class B2 Concrete (Superstructure, except Safety Barrier Curb)	f'c = 28 MPa
Reinforcing Steel (Grade 420)	fy = 420 MPa
Structural Carbon Steel (ASTM A709 Grade 250)	fy = 250 MPa

Fabricated Steel Connections
Field connections shall be made with 19.0 mm diameter high strength bolts and 20.6 mm diameter holes, except as noted.

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.

Protective Coating (New Steel Only)
System G by the contractor.

Prime Coat: The cost of the prime coat shall be included in the contract unit price of the Fabricated Structural Steel. Tint of the prime coat for System G shall be similar to the color of the field coat to be used.

Field Coat: The color of the finish coat shall be Gray (Federal Standard #26373). The cost of the intermediate and finish coats shall be included in the contract unit price per Megagram of Field Coat (System G) Gray.

Miscellaneous
See table for minimum vertical clearance from top of rails and minimum lateral clearance from the centerline of track to nearest temporary construction falsework to be maintained during construction.

Traffic over structure to be maintained during construction.

High strength bolts, nuts and washers will be sampled for quality assurance as specified in Section 106 of the Missouri Standard Specifications (Metric) and Field Section (FS-712) from Materials Manual.

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.

Contractor shall take all necessary precautions to prevent debris and other material from dropping onto the railroad tracks. See Special Provisions.

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

Drawings are not to scale. Follow dimensions.

Elevations
All elevations are specified in meters except as noted.

Hinge Modifications
Removal of existing structural steel in hinge areas as shown shall be included in the cost of Fabricated Structural Carbon Steel (Misc.) - Metric.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-3-98

Repairs to:
Bridge over GST Steel Company, UP, KCS, BNSF and KCT Railroads

State Road I-435 from Rte. 24 to Missouri River
In Kansas City
Project No. Sta. 4+297.851 (match existing)
Job No. J4I1250 Rte. I-435 (SB)

JACKSON COUNTY

Date: 4-7-98

BUCHER, WILLIS & RATLIFF CORPORATION
7950 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816-363-2555

DRAWN BY:	SAC	FEB. 1998
TRACED BY:	TWM	FEB. 1998
CHECKED BY:	DJM	FEB. 1998

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

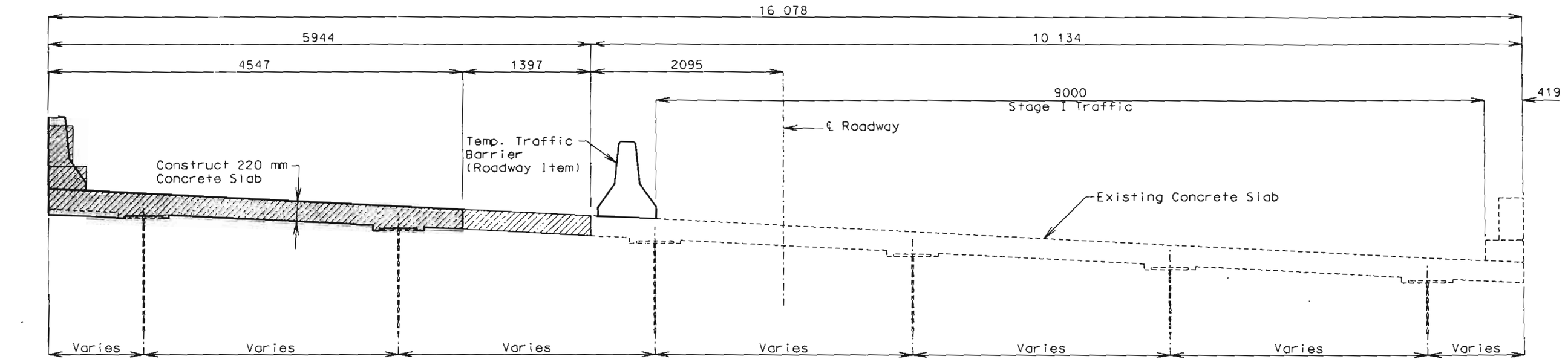
SHEET NO. 1 OF 29

A16864

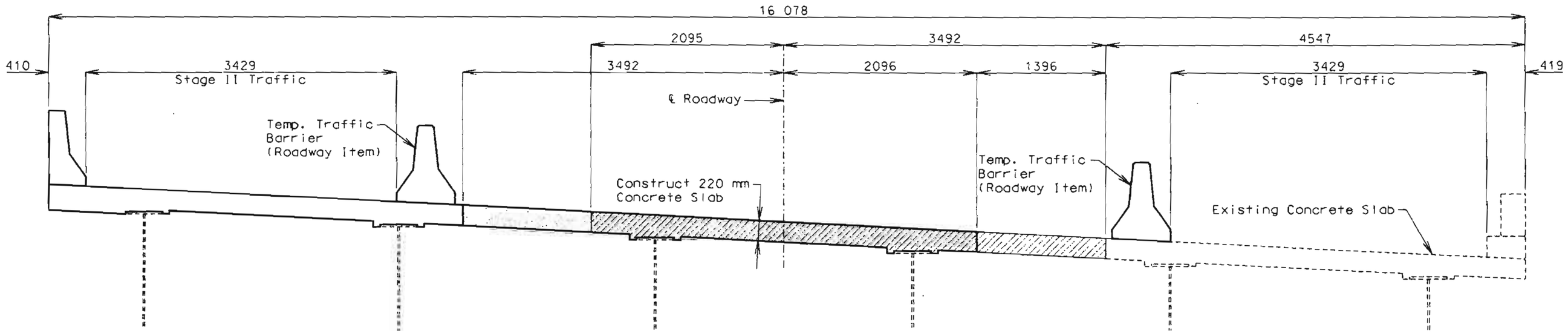
FOR INFORMATION ONLY

A16866, Sht. 75

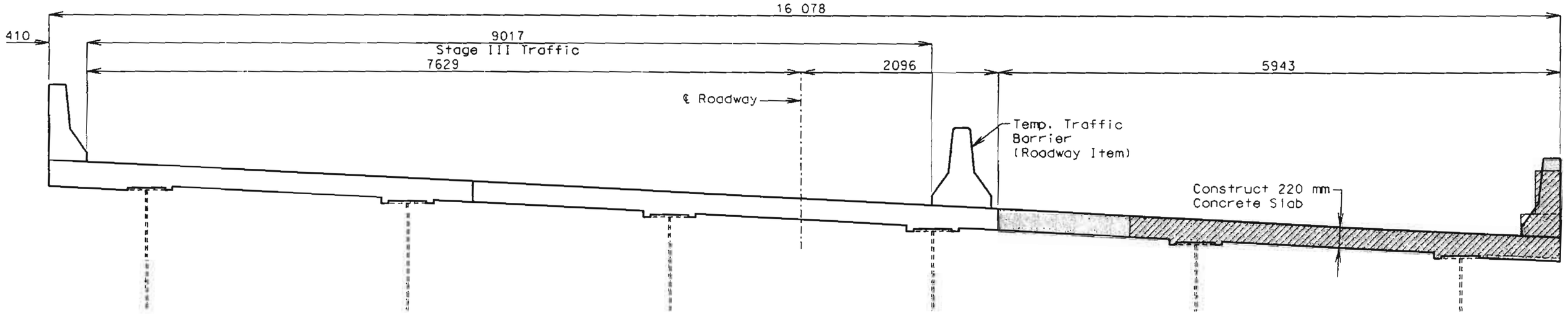
STATE	PROJ. NO.	SHEET NO.
MO.		282



STAGE I CONSTRUCTION



STAGE II CONSTRUCTION



STAGE III CONSTRUCTION

Legend

Staged Removal Limits

Staged Construction Limits

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
7620 6400 PARKWAY KANSAS CITY, MISSOURI 64114 816-363-2600

DRAWN BY:	DJM	JAN. 1998
TRACED BY:	JTC	JAN. 1998
CHECKED BY:	SAC	FEB. 1998

Note: This drawing is not to scale, follow dimensions.

JACKSON COUNTY

STAGED CONSTRUCTION SEQUENCE

SHEET NO. 2 OF 29

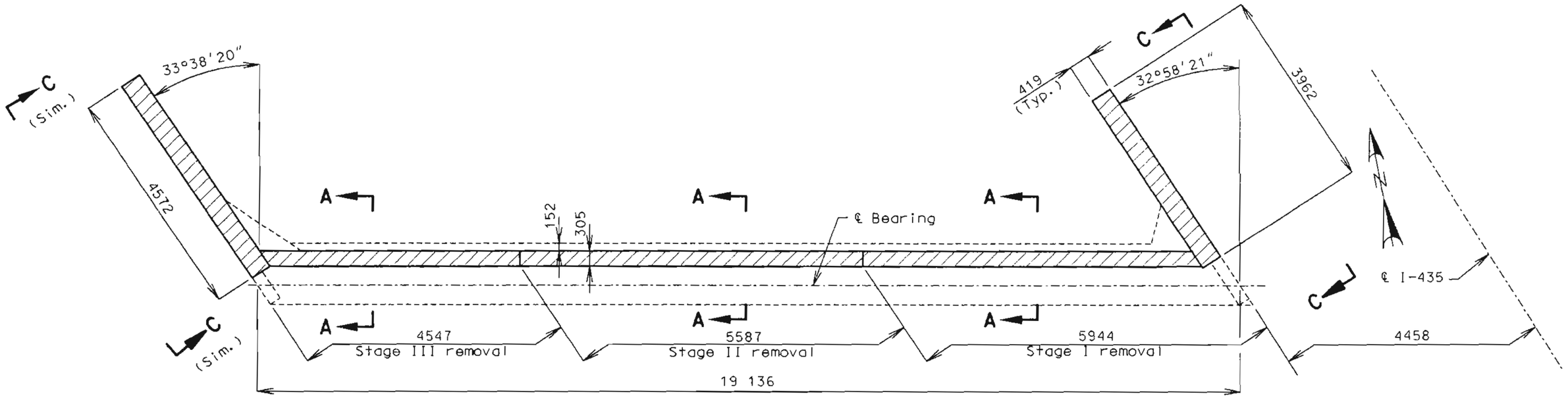
A16864

FOR INFORMATION ONLY

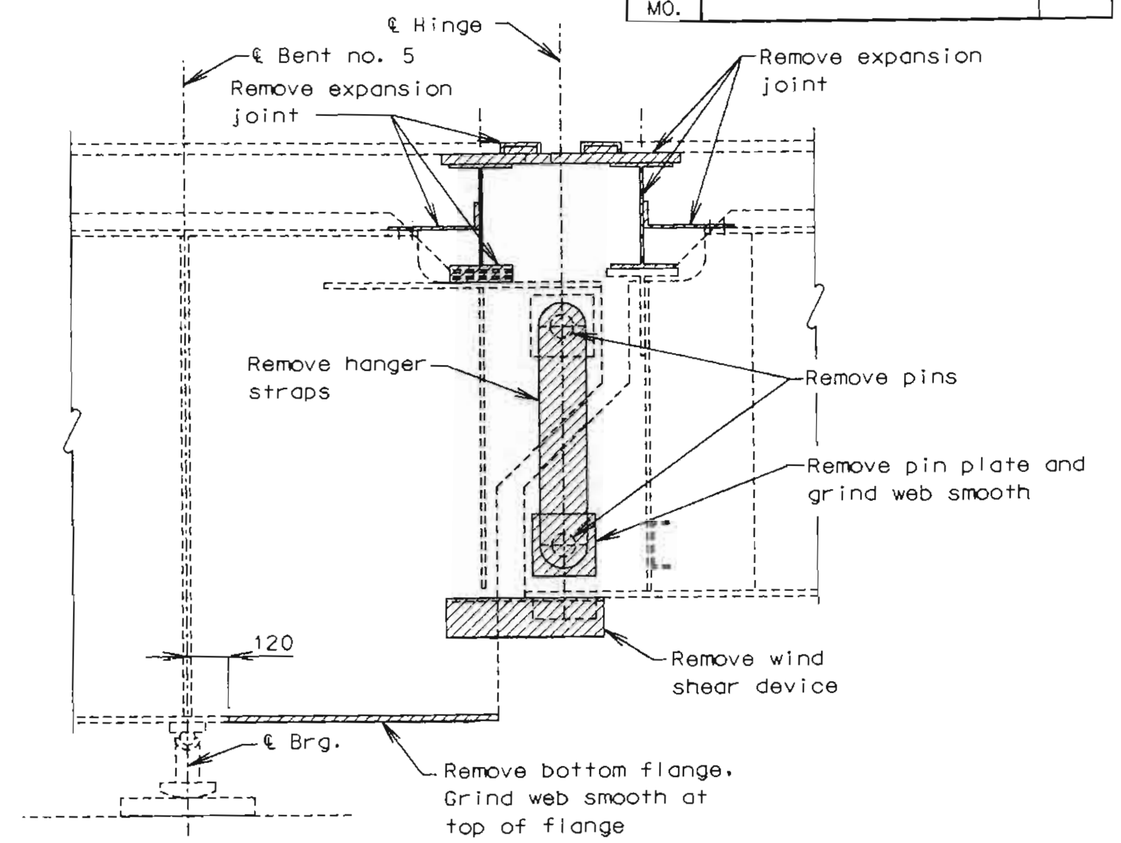
A16866, Sht. 76

PROJECT No. 98-047 PROJECT NAME: MoDOT Br. No. A0864-SB I-435 over Railroad Tracks S:\98047\STR\A0864\DGN\RRCONST.DGN

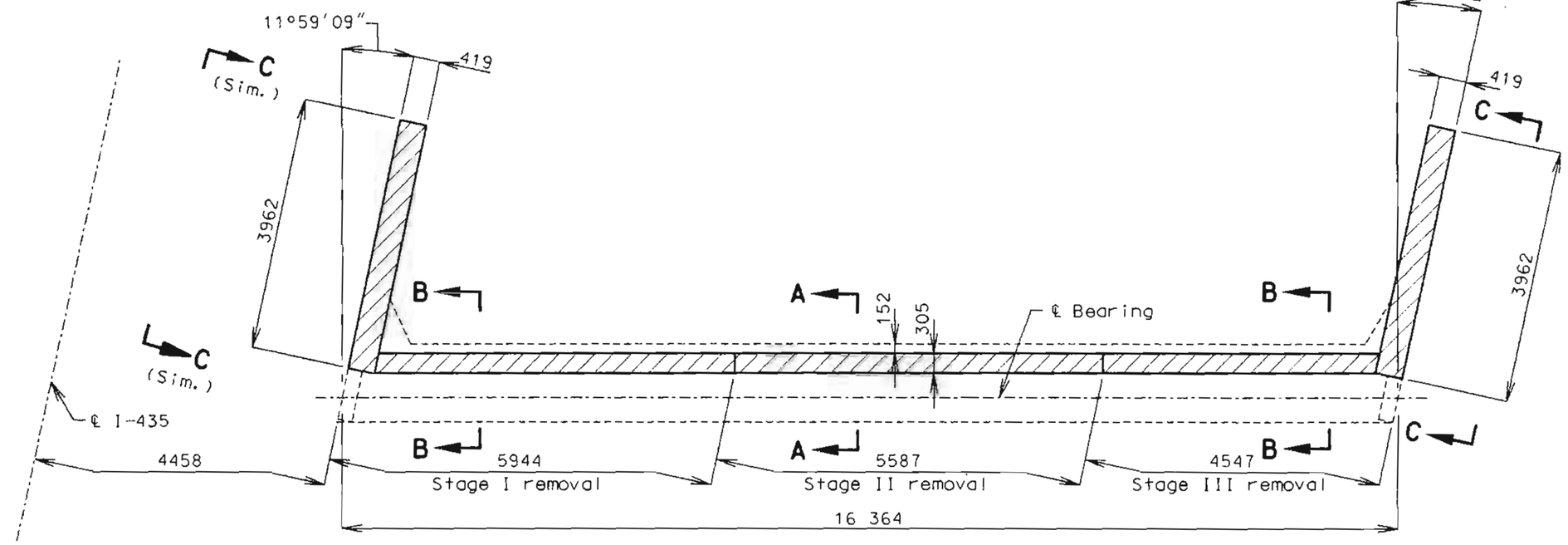
STATE	PROJ. NO.	SHEET NO.
MO.		



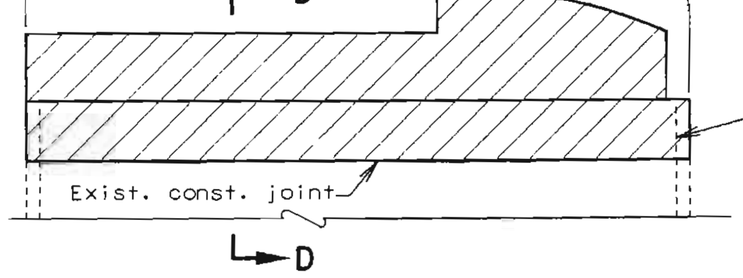
END BENT NO. 1 PLAN



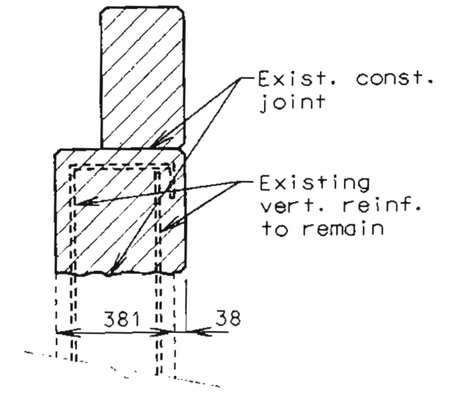
HINGE REMOVAL DETAIL



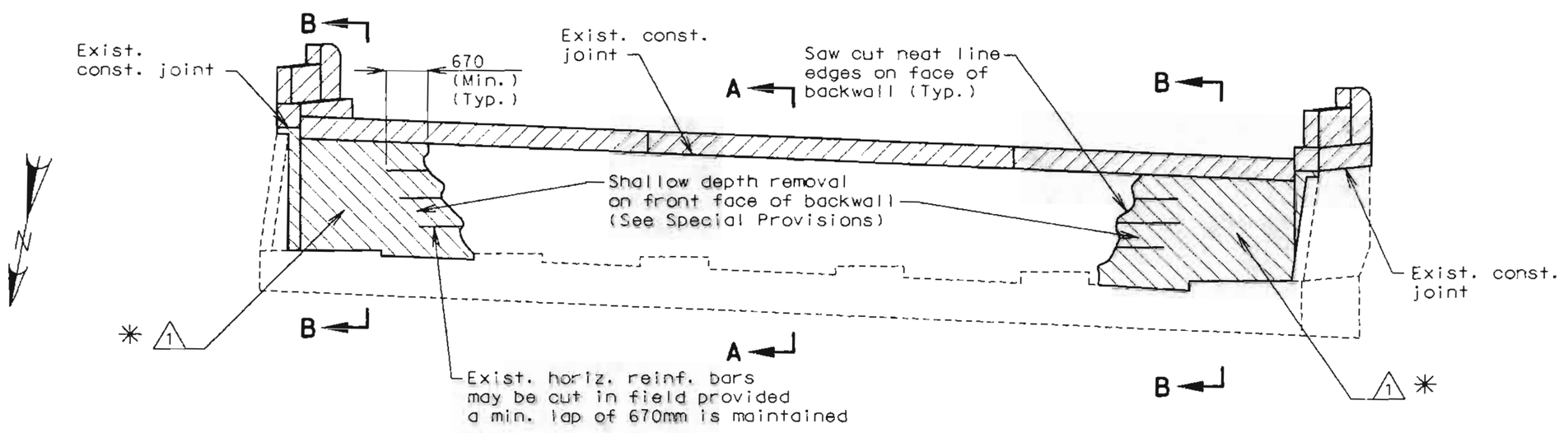
END BENT NO. 10 PLAN



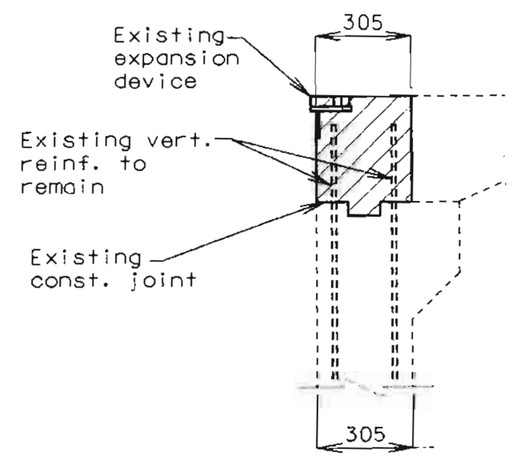
ELEVATION C-C



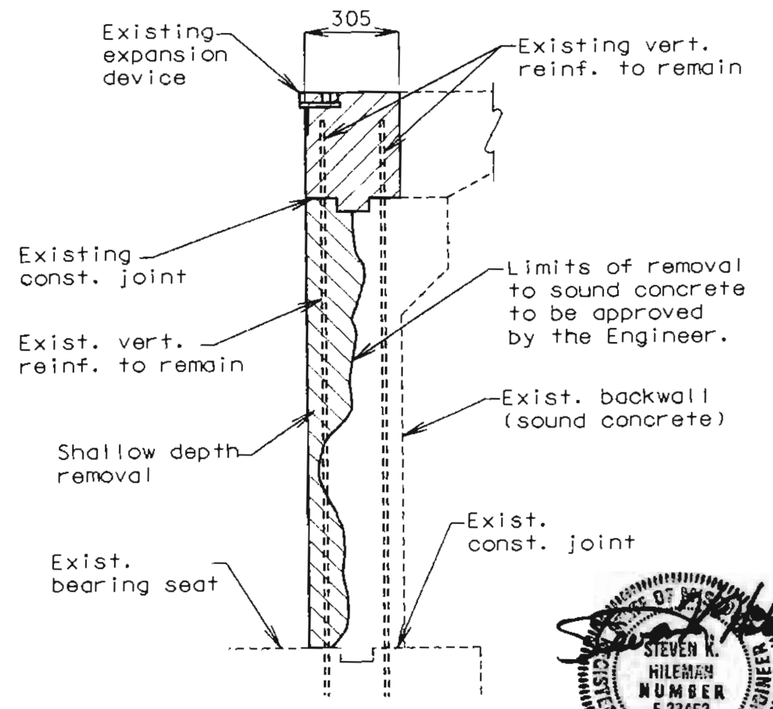
SECTION D-D



END BENT NO. 10 ELEVATION



SECTION A-A



SECTION B-B

STATE OF MISSOURI
STEVEN K. HILEMAN
NUMBER E-23452
REGISTERED PROFESSIONAL ENGINEER
10-14-98

BUCHER, WILLIS & RATLIFF CORPORATION

DRAWN BY:	SAC	JAN. 1998
TRACED BY:	KRB	JAN. 1998
CHECKED BY:	DJM	FEB. 1998

✳ Remove existing backwall to sound concrete as approved by the Engineer. see Sheet No. 4A for additional details of backwall removal.

Removal limits

1 Revised 10-14-98

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

JACKSON COUNTY

END BENT AND HINGE REMOVAL DETAILS

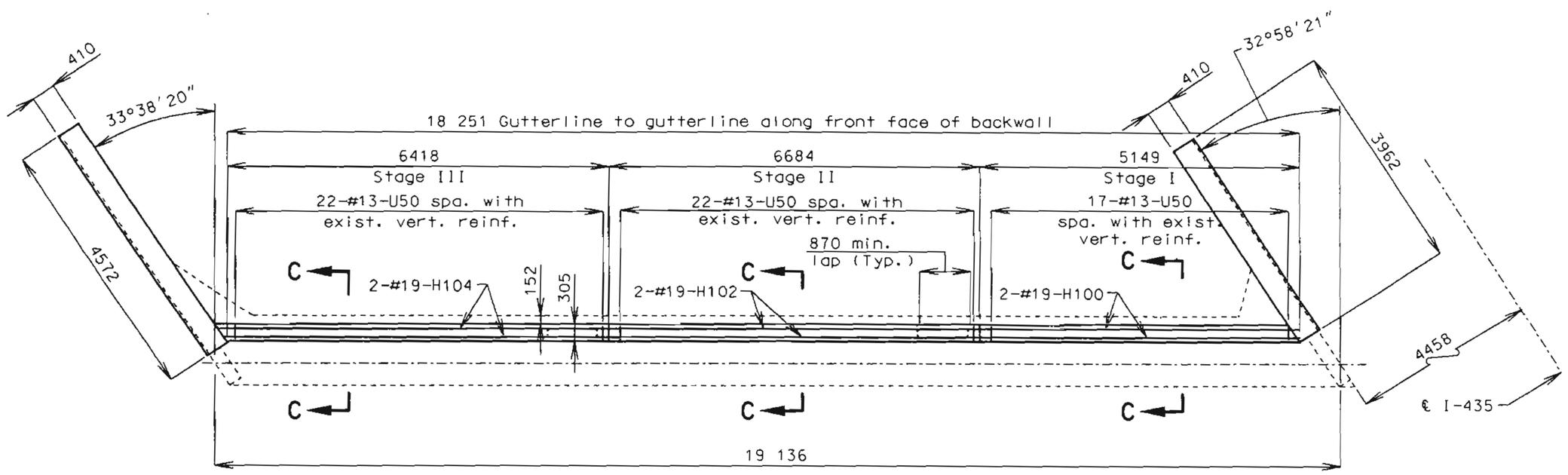
SHEET NO. 3 OF 29

A16864

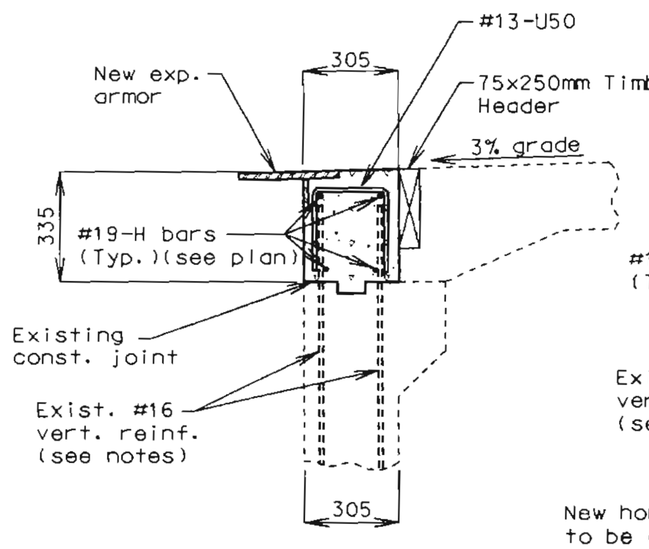
FOR INFORMATION ONLY

A16866, Sht. 77

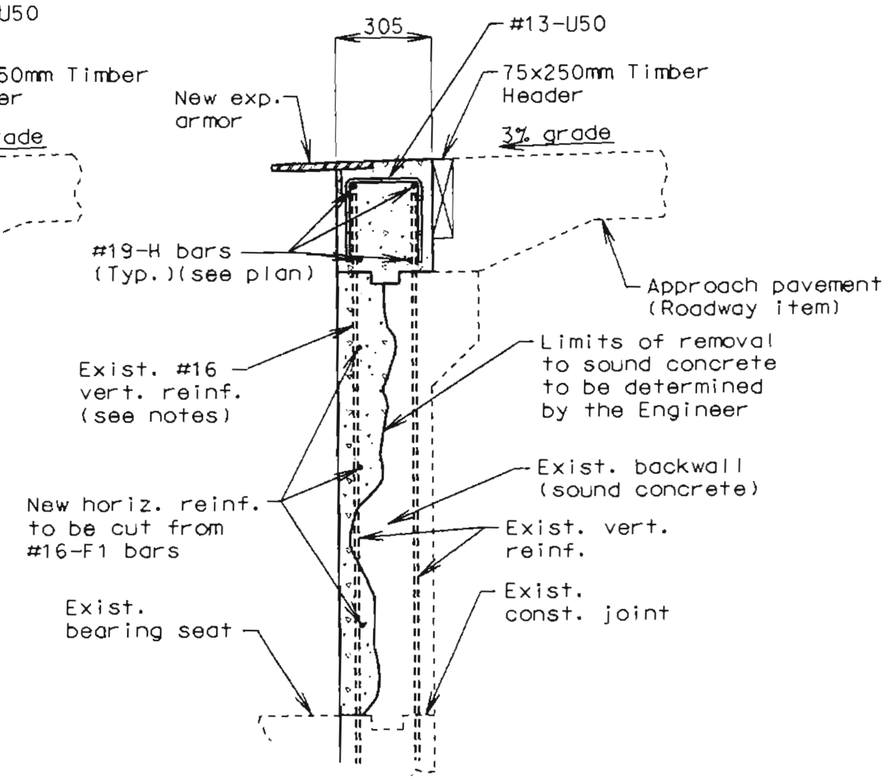
STATE	PROJ. NO.	SHEET NO.
MO.		



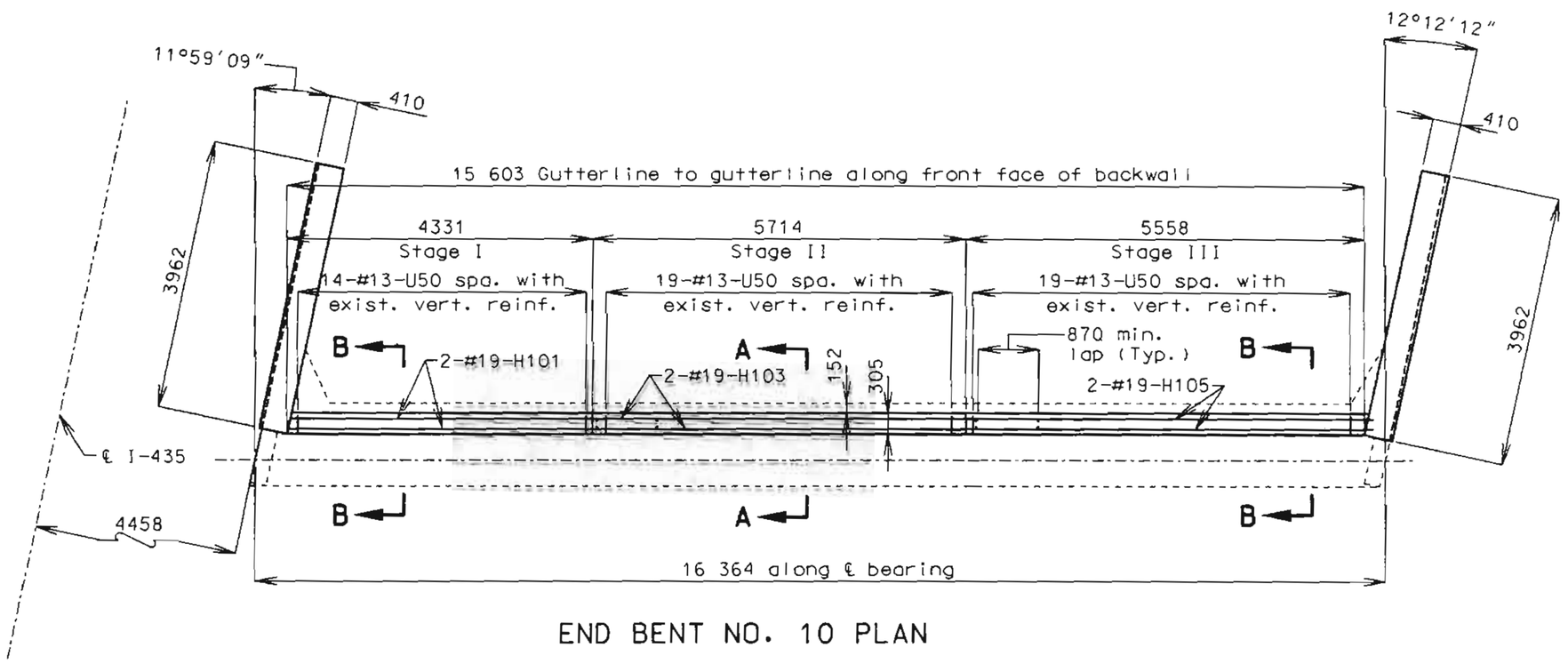
END BENT NO. 1 PLAN



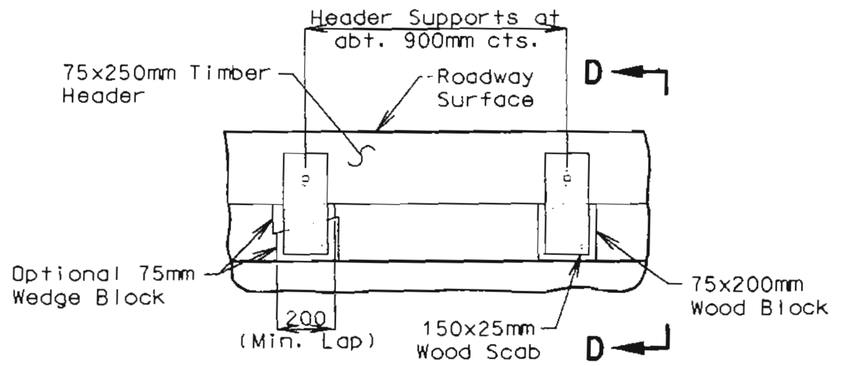
SECTION A-A



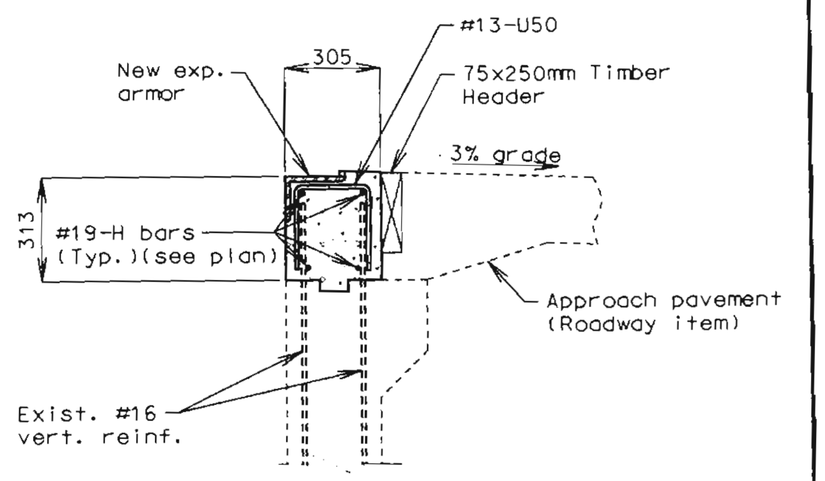
SECTION B-B



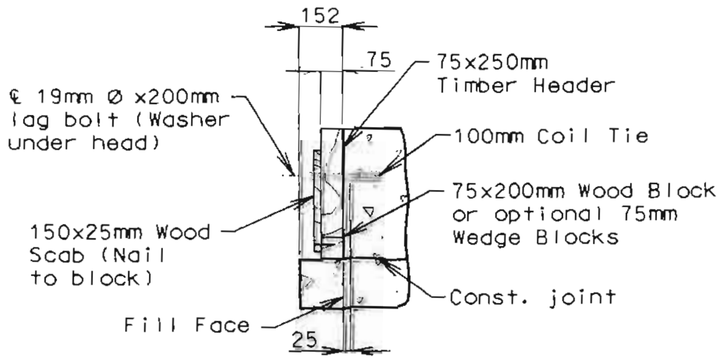
END BENT NO. 10 PLAN



PART ELEVATION

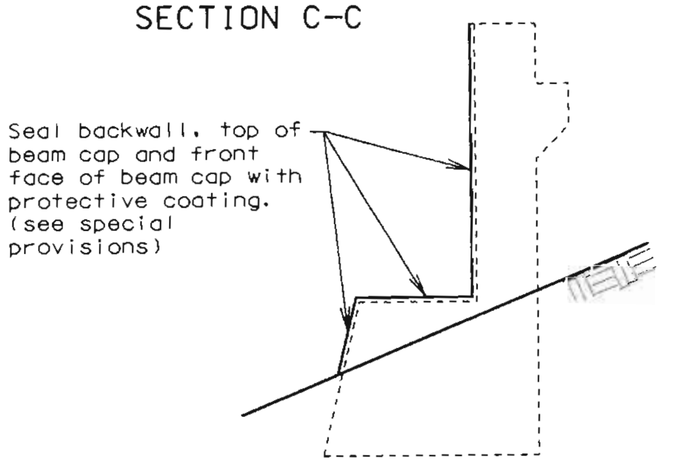


SECTION C-C

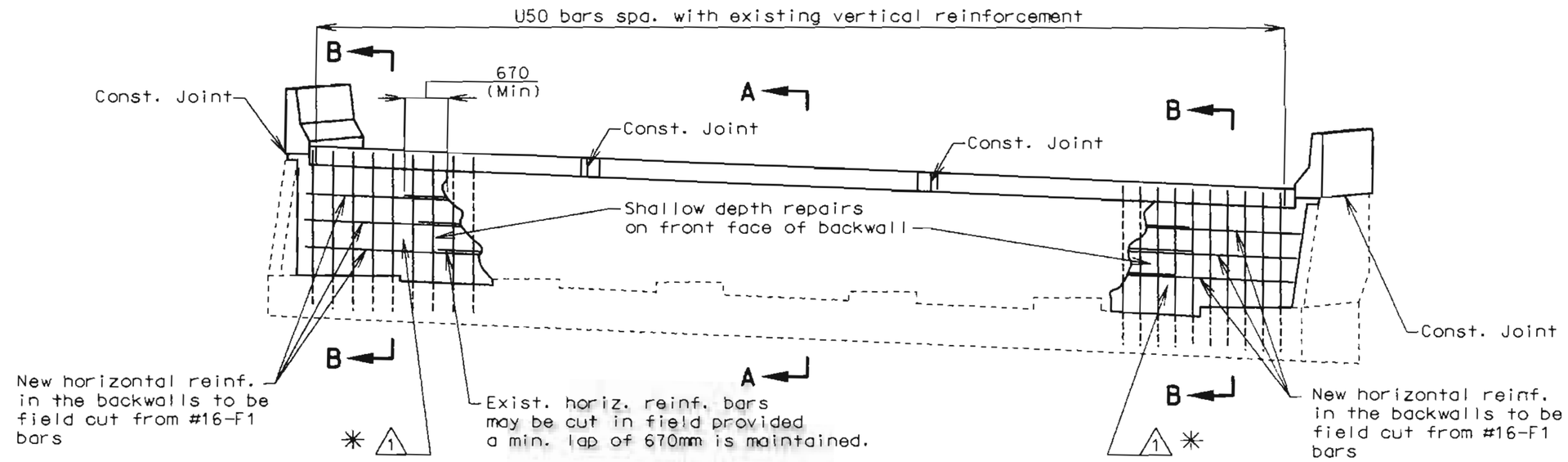


SECTION D-D

DETAILS OF TIMBER HEADER AT END BENTS NO. 1 AND 10



LIMITS OF PROTECTIVE COATING



END BENT NO. 10 ELEVATION

Notes:

Existing #16 vert. reinforcing in the backwall that is destroyed or damaged during the removal process may be spliced similar to the horiz. reinforcing.

See Sheet No. 26 for Barrier Curb at End Bents.

See Sheets No. 19 and 20 for Expansion Joint Details for End Bents.

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

Substructure Quantity Table for End Bents No. 1 and 10		
Item		Quantity
Class B-1 Concrete (Substructure)	cu. meter	3.5
Reinforcing Steel (Epoxy coated)	kilogram	470
Substructure Repair (Formed)	sq. meter	8.3
Protective Coating-Concrete Bents	lump sum	1

These quantities are included in the estimated quantities table on Sheet No. 1

✳ Remove existing backwall to sound concrete as approved by the Engineer. see Sheet No. 4A for additional details of backwall removal.

1 Revised 10-14-98

STEVEN K. HILEMAN NUMBER E-23462 REGISTERED PROFESSIONAL ENGINEER
10-14-98

BUCHER, WILLIS & RATLIFF CORPORATION

DRAWN BY:	SAC	FEB. 1998
TRACED BY:	KRB	FEB. 1998
CHECKED BY:	TAC	FEB. 1998

JACKSON COUNTY

END BENTS NO. 1 AND 10 MODIFICATIONS

SHEET NO. 4 OF 29

A16864

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

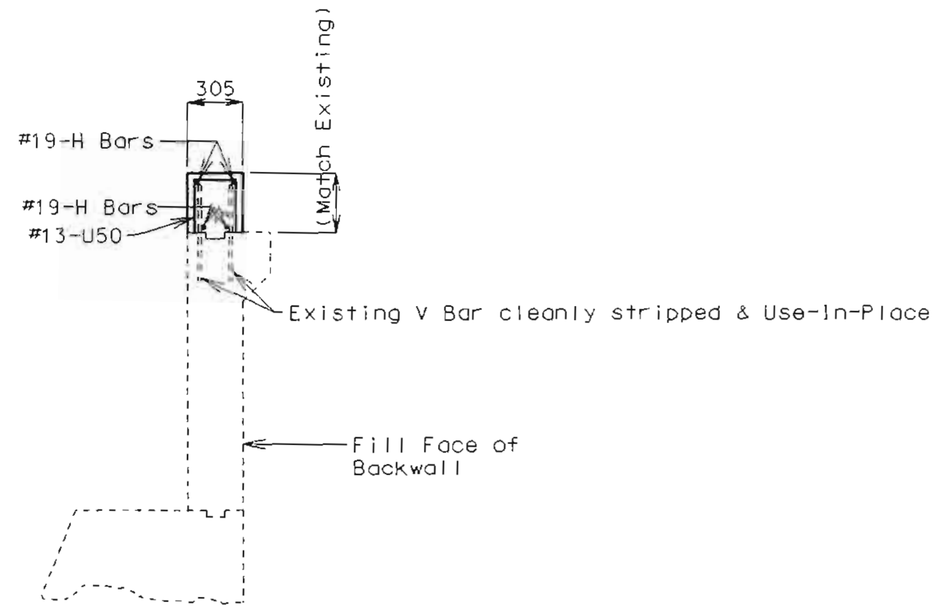
PROJECT No. 98-047 PRO.dgn MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A6864\DGN\RREBM.DGN

FOR INFORMATION ONLY

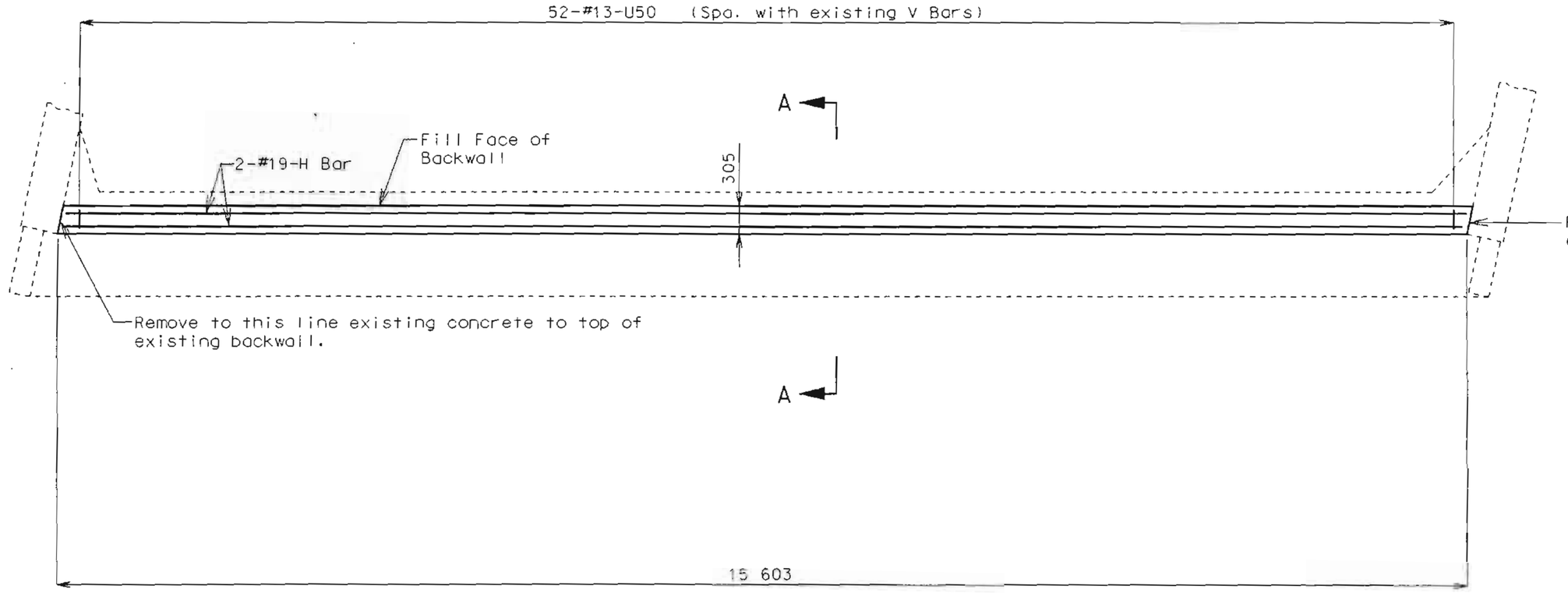
A16866, Sht. 78

State	Proj. No.	Sheet No.
MO		

Design Unit Stresses:
Class B2 Concrete f'c = 28 MPa
Reinforcing Steel (Grade 420) fy = 420 MPa



SECTION A-A



PLAN OF TOP OF BACKWALL

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 8-12-99

Note: The #19-H-bars placed in backwall shall be epoxy coated. The splice length (if needed) shall be 600 mm.

Note: Outline of old work is indicated by dashed lines Heavy lines indicated new work.
Contractor shall verify all dimensions in field before ordering new steel.
Bars bonded in old concrete not removed shall be cleanly stripped and embedded into new concrete where possible. If length is available, old bars shall extend into new concrete at least 40 diameters for smooth bars and 30 diameters for deformed bars, unless otherwise noted.

DETAILS OF END BENT NO. 10 ON SOUTHBOUND LANE SHOWING TOP OF BACKWALL REPLACEMENT

Detailed July 1999
Checked July 1999

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

2 8/12/99 Added Sheet

Sheet No. 4A of 29

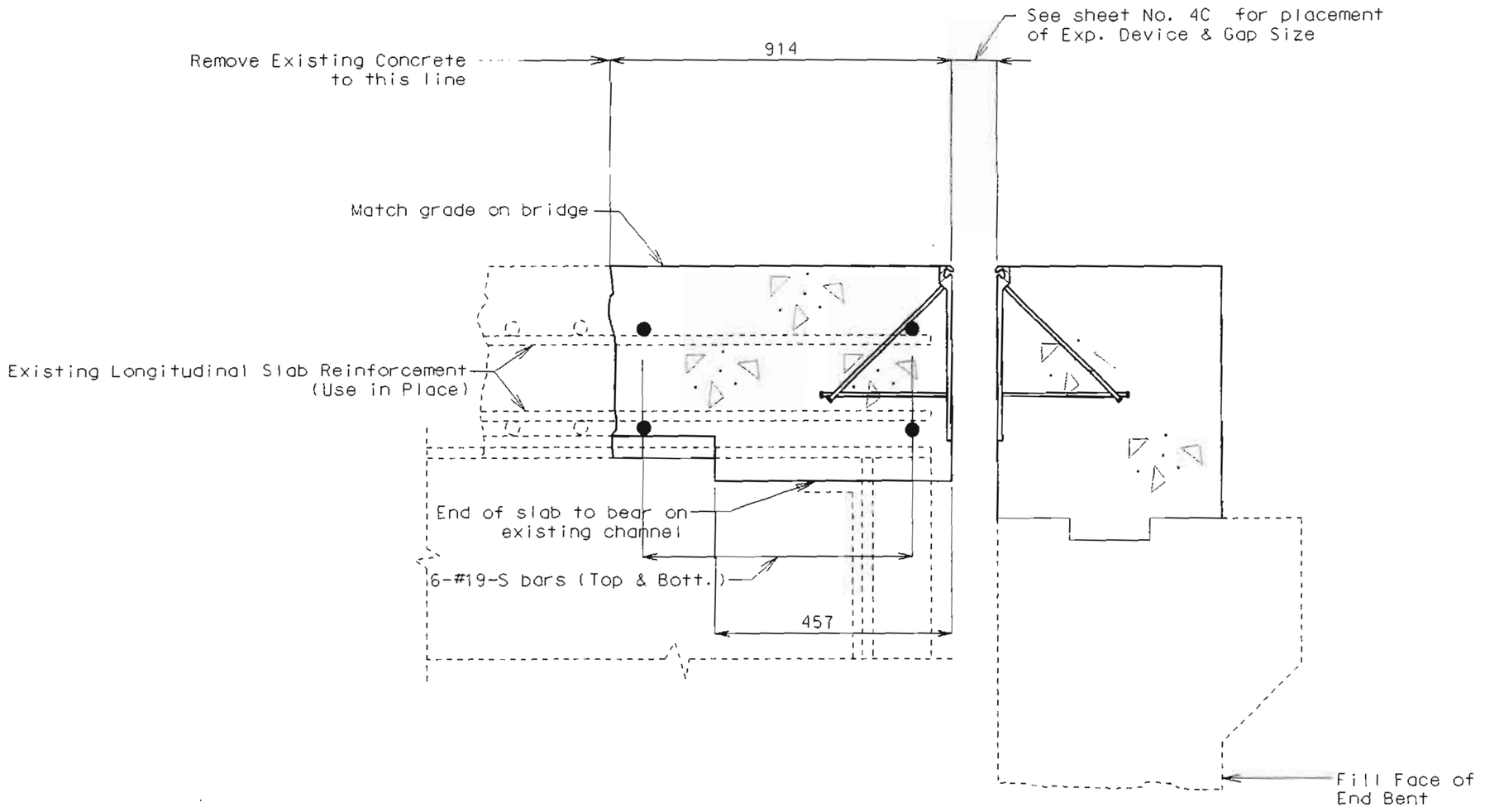
JACKSON COUNTY A16864

REV.

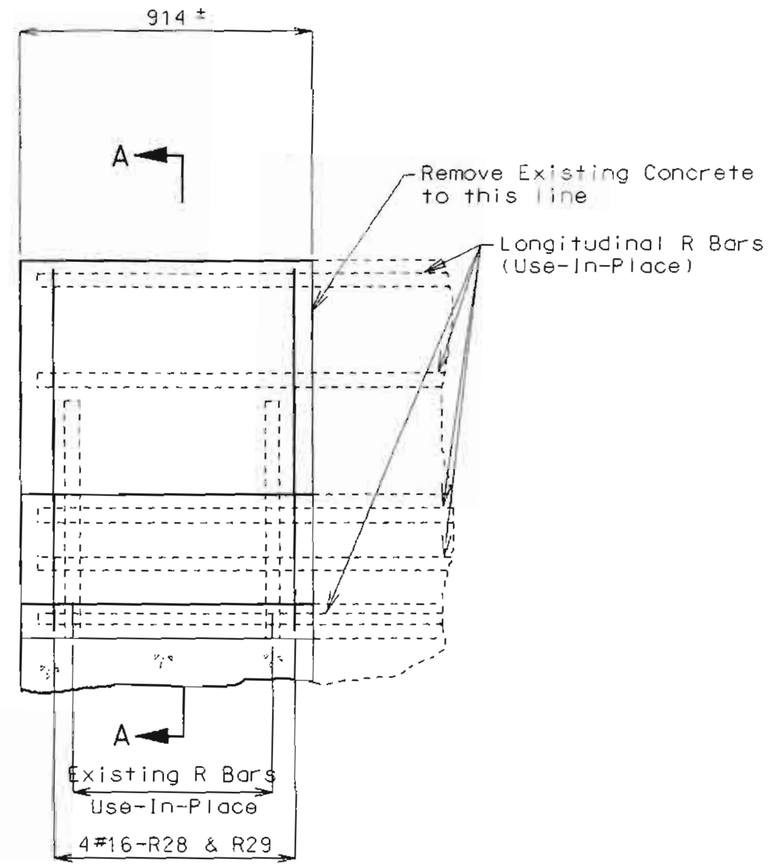
FOR INFORMATION ONLY

A16866, Sht. 79

State	Proj. No.	Sheet No.
MO		



PART SECTION THRU END OF SLAB
AT BENT NO. 10

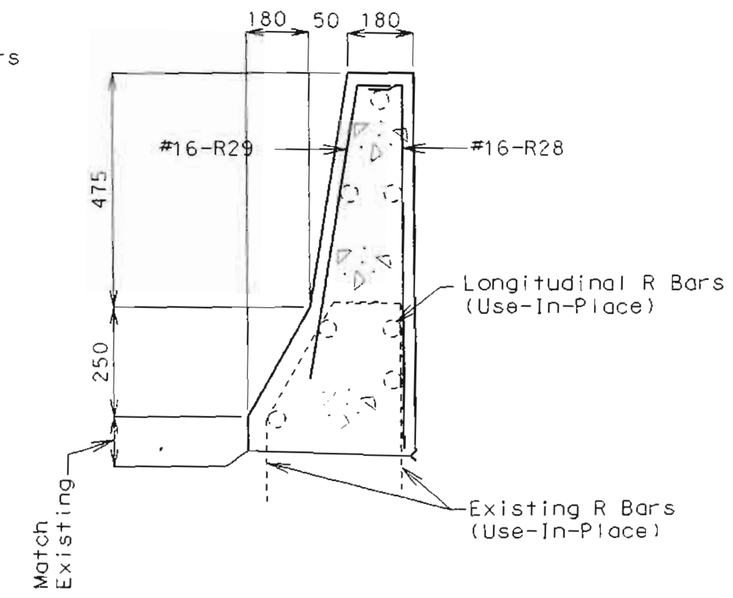


DETAIL OF CURB END REPLACEMENT AT END BENT 10

Note: For placement of curb plate & Exp. Device in curb see sheet No. 4C.

Note: The required lap splice length (if needed) for the #19-S-bars shall be 770 mm.

Design Unit Stresses:
Class B2 Concrete f'c = 28 MPa
Reinforcing Steel (Grade 420) fy = 420 MPa



SECTION A-A

ESTIMATED QUANTITIES		
ITEM		TOTAL
Modification of Existing Expansion Device-Metric	Meter	15.6

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

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

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

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 8-12-99

DETAILS OF END OF SLAB REPLACEMENT AT END BENT NO. 10 ON SOUTHBOUND LANE

Detailed July 1999
Checked July 1999

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

△2 8/12/99 Added Sheet

Sheet No. 4B of 29

JACKSON COUNTY A16864

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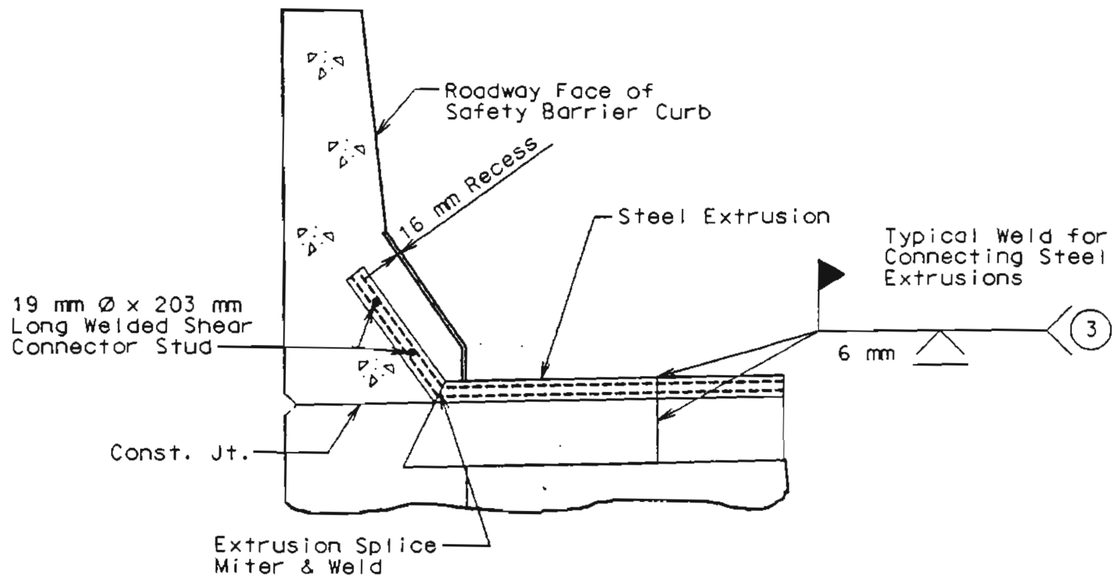
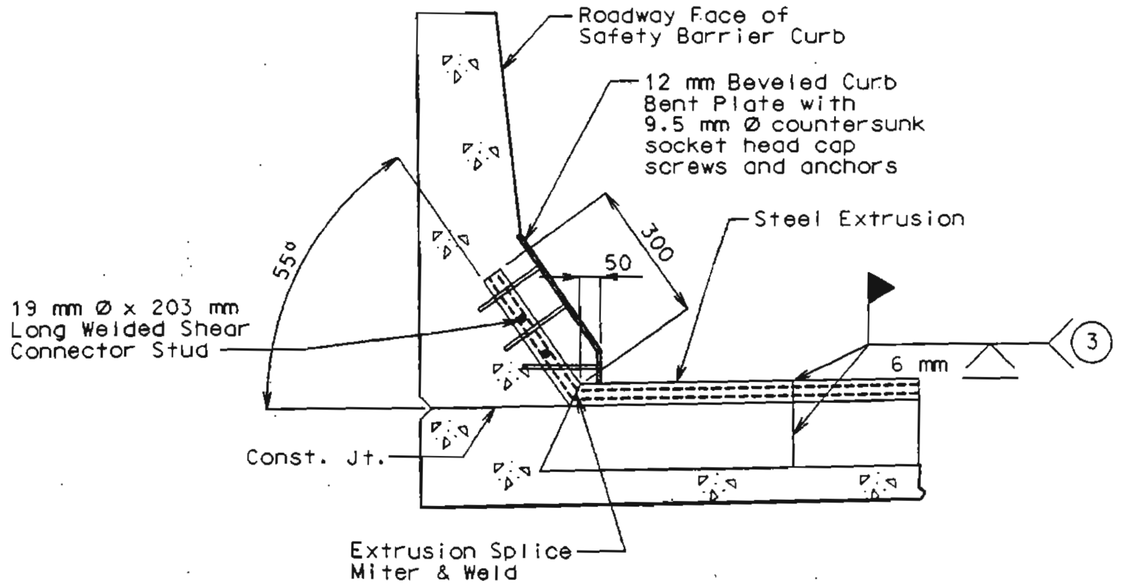
FOR INFORMATION ONLY

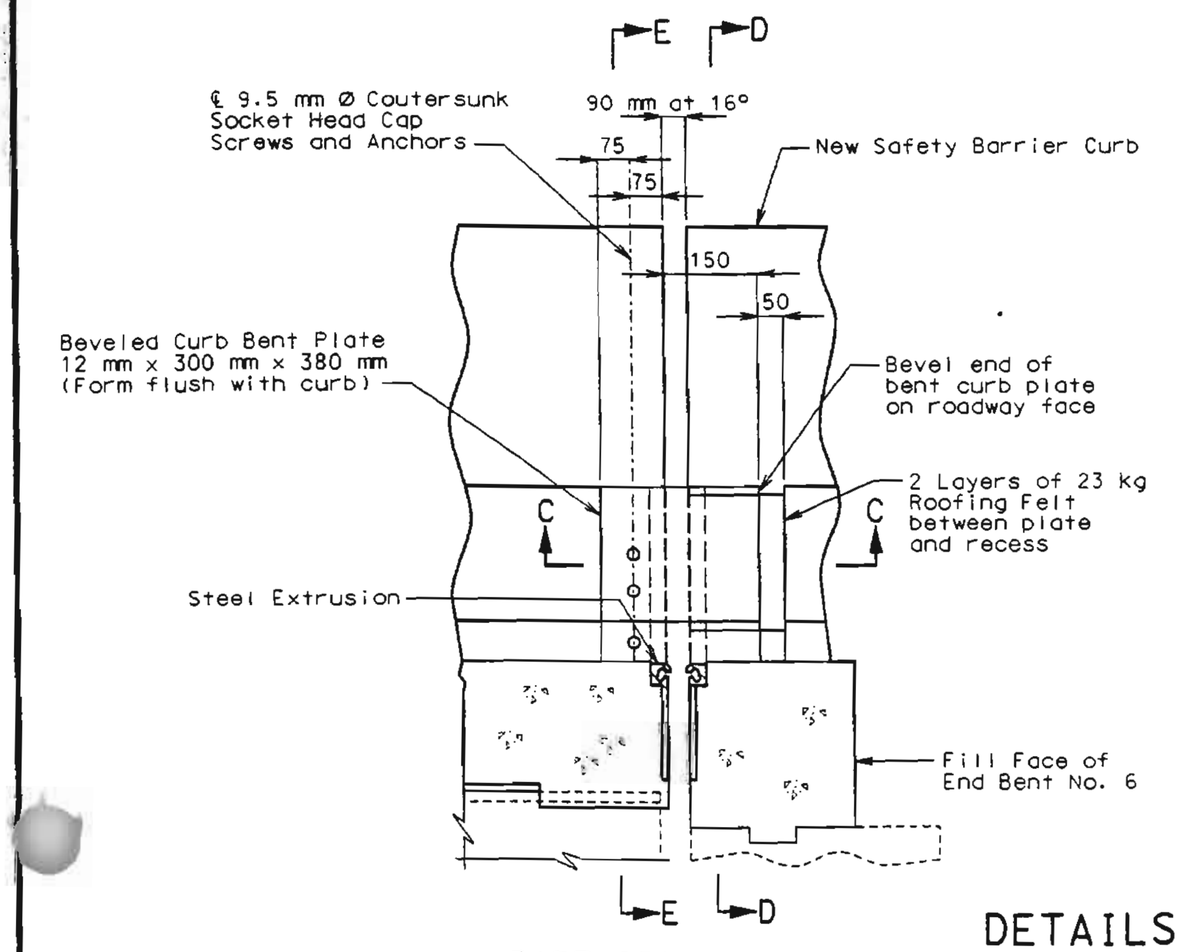
A16866, Sht. 80



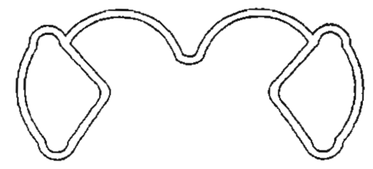
PART SECTION D-D



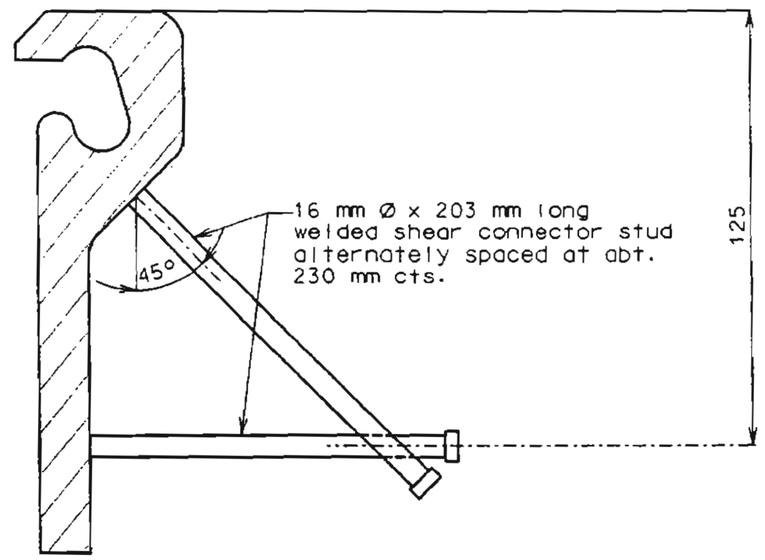
PART SECTION E-E



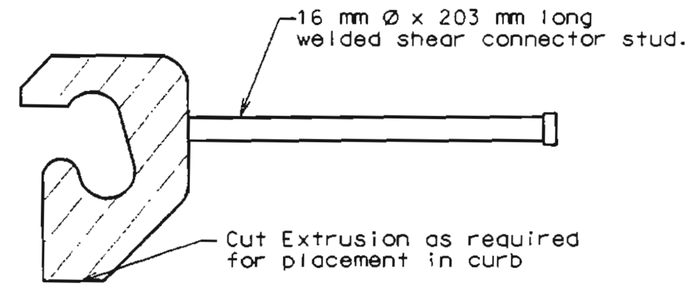
PART SECTION B-B



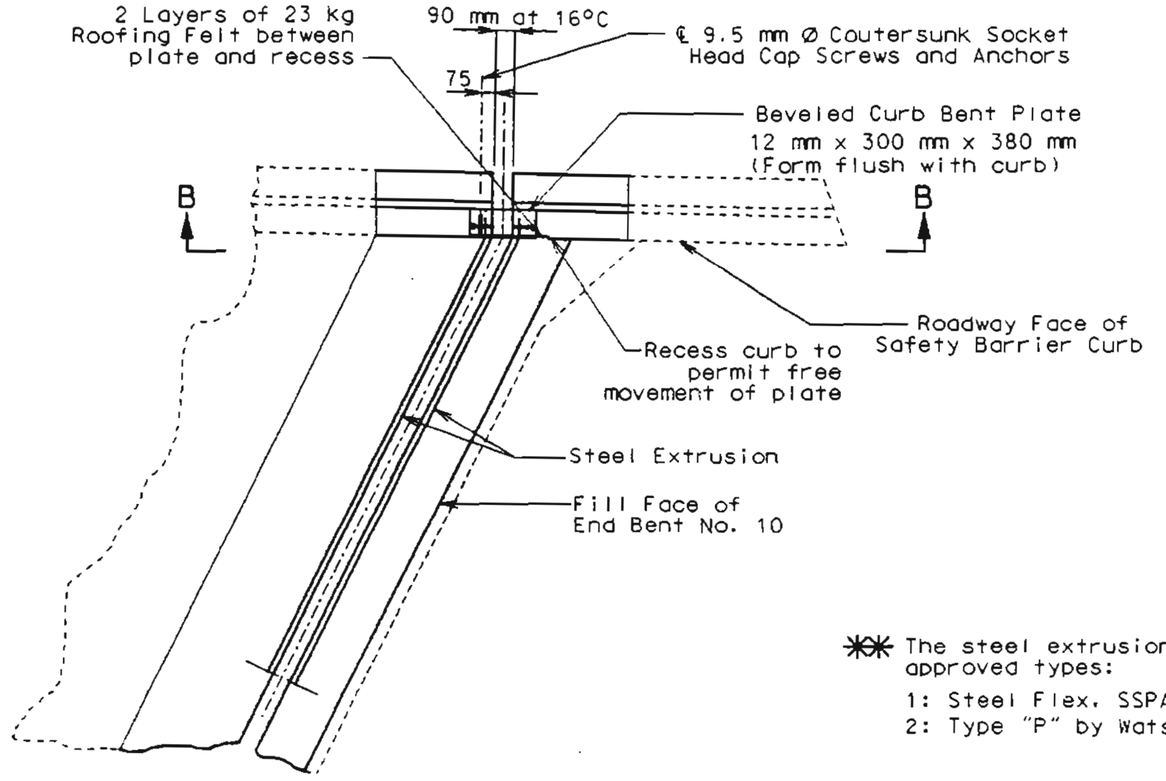
STRIP SEAL GLAND
MOVEMENT RATING 102 mm



DETAIL OF STEEL EXTRUSION ✳✳



DETAIL OF STEEL EXTRUSION IN CURB



PART PLAN

✳✳ The steel extrusion shall be one of the following approved types:

1: Steel Flex. SSPA by the D.S. Brown Company
2: Type "P" by Watson, Bowman, Acme

State	Proj. No.	Sheet NO.
MO		

NOTE:

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

The contractor must verify all dimensions prior to fabrication.

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

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

Neoprene Strip Seal shall meet ASTM D-2628.

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

Payment for steel extrusions, curb plate , neoprene strip seal & B2 Concrete, reinforcing steel & curb replacement shall be made under the contract unit price for Modification of Existing Expansion Device.

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

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

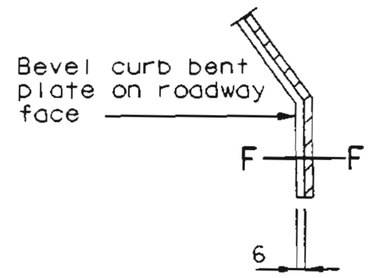
Note: The expansion gap dimension shall be increased 3 mm for each 5° C fall in temperature and decreased 3 mm for each 5° C rise in temperature at installation.

(3) Extrusions shall be welded top and back.

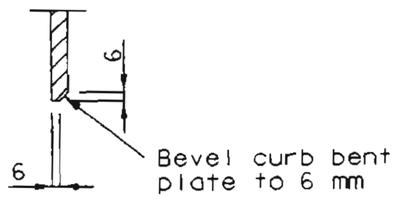
Concrete shall be forced under and around strip seal extrusions and studs. Proper consolidation of the concrete shall be achieved by localized internal vibration.

Contractor shall support the steel extrusions during placement of adjacent concrete, to assure accurate alignment of extrusions.

The Expansion Device shall conform to grade of roadway.



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION F-F

STATE OF MISSOURI
Stacy L. McMillen
MEMBER
E-28873
REGISTERED PROFESSIONAL ENGINEER

DATE 8-12-99

Detailed July 1999
Checked xxxx 1999

DETAILS OF STRIP SEAL EXPANSION DEVICE REPLACEMENT AT BENT NO. 10

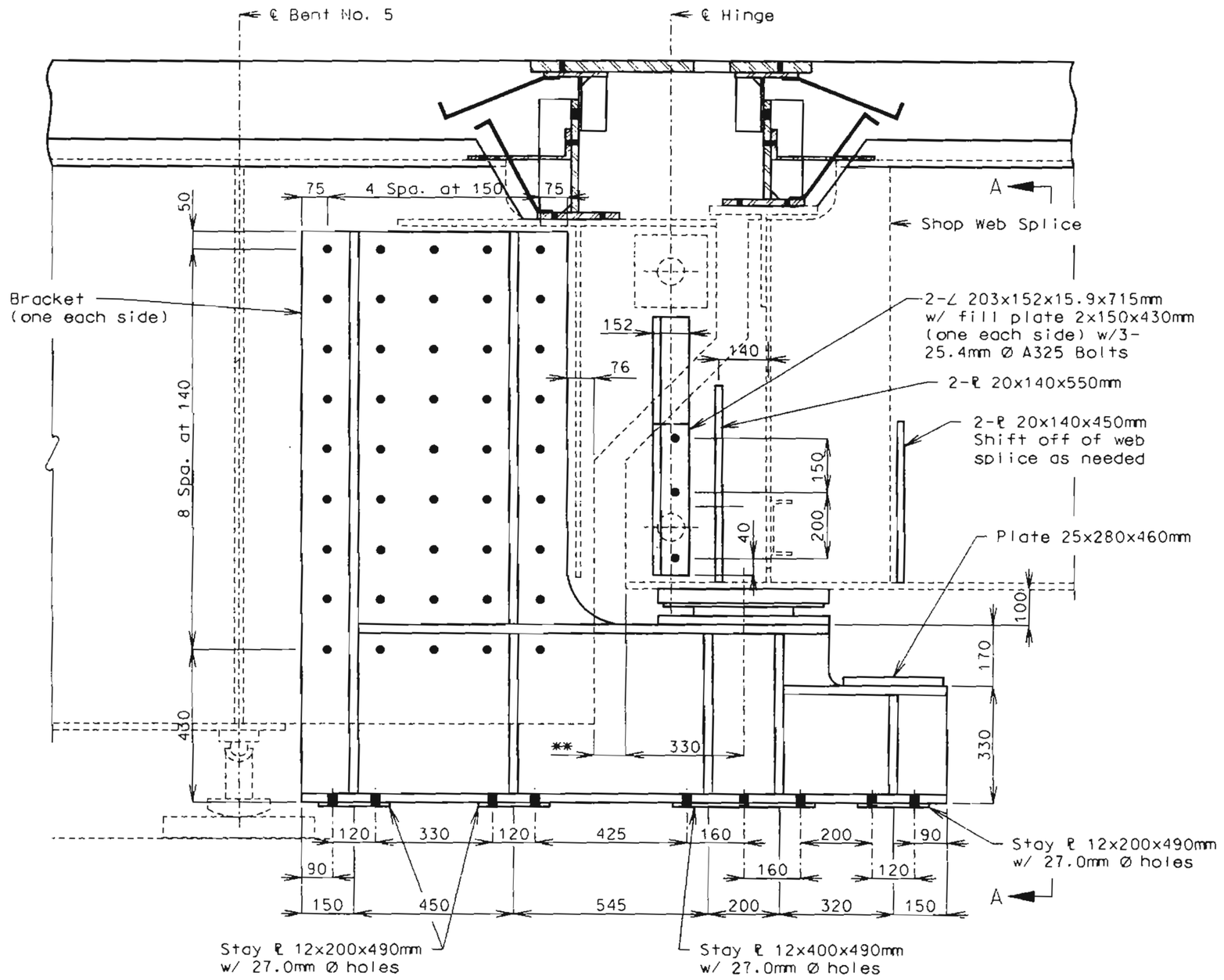
△Added Sheet 8/12/99 Sheet No. 4C of 29.

JACKSON COUNTY A16864

FOR INFORMATION ONLY

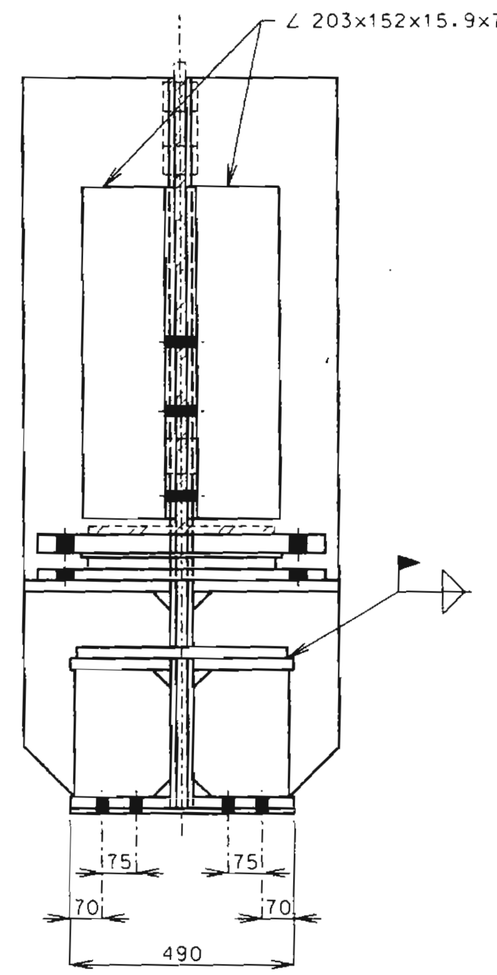
A16866, Sht. 81

STATE	PROJ. NO.	SHEET NO.
MO.		285



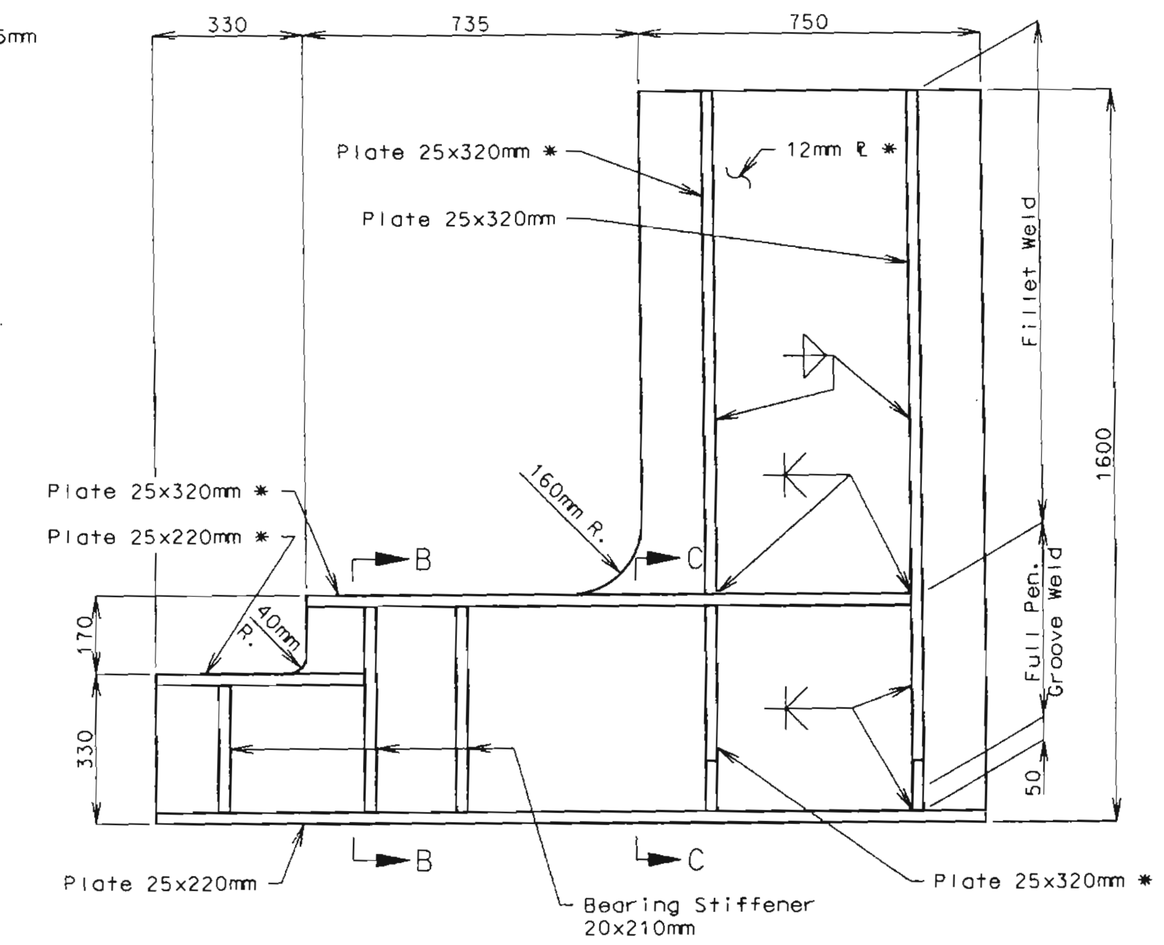
HINGE MODIFICATION DETAIL

** 89mm at 16°C (Based on original plan dimensions)



SECTION A-A

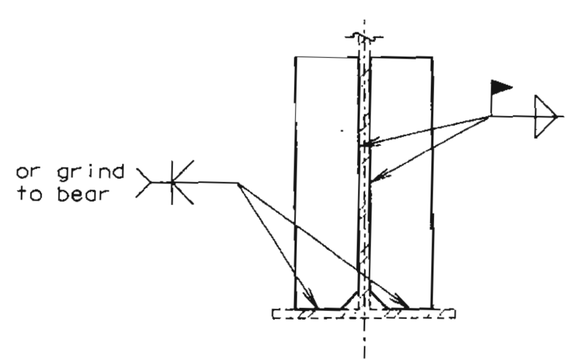
Note: Girder Stiffeners not shown for clarity.



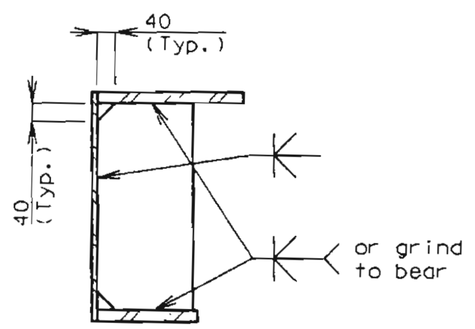
BRACKET DETAIL

Note: Bolt holes not shown for clarity.

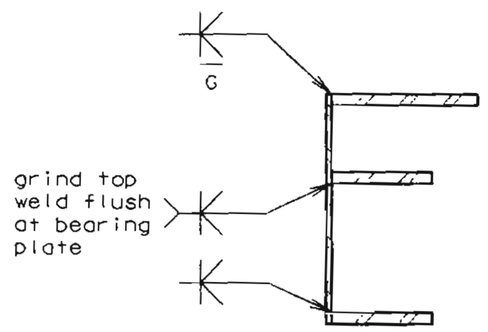
(6 req'd as shown, 6 req'd opp. hand)



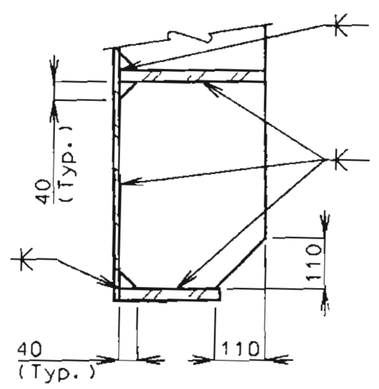
TYPICAL WELD DETAILS FOR STIFF. PLATES TO EXISTING GIRDER



TYPICAL BEARING STIFFENER DETAIL



SECTION B-B



SECTION C-C

Notes:

Position bracket 76mm from end of girder web as shown.

Material for the hinge modification shall be ASTM A709M Grade 250 structural steel.

Use 22.2mm Ø A325 bolts with 23.8mm Ø reamed holes, except as shown.

Back gouge all full penetration groove welds.

* Indicates plates subject to notch toughness requirements.

Field verify fill plate thicknesses required in field and adjust as necessary.

Complete hinge modifications before setting expansion joint fingers.

For hinge removal details, See Sheet No. 3.

For details of bearings, See Sheet No. 6.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

PROJECT No. 98-041 PROJECT NAME: MODOT-Br. No. A6864-58 I-435 over Railroad Tracks S:\1998\7\STR\A16864\DGN\XBRHINGE.DGN

BUCHER, WILLIS & RATLIFF CORPORATION
7920 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816 361-2535

DRAWN BY:	KLW	JAN. 1998
TRACED BY:	TWM	JAN. 1998
CHECKED BY:	MLJ	FEB. 1998

Note: This drawing is not to scale, follow dimensions.

JACKSON COUNTY

HINGE MODIFICATION DETAILS

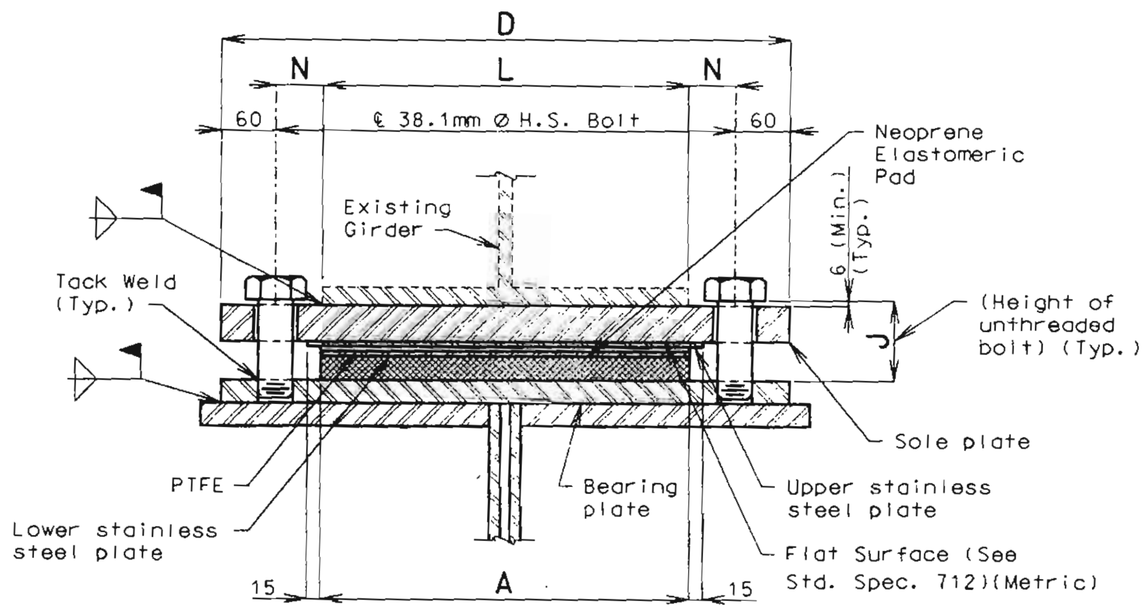
SHEET NO. 5 OF 29

A16864

FOR INFORMATION ONLY

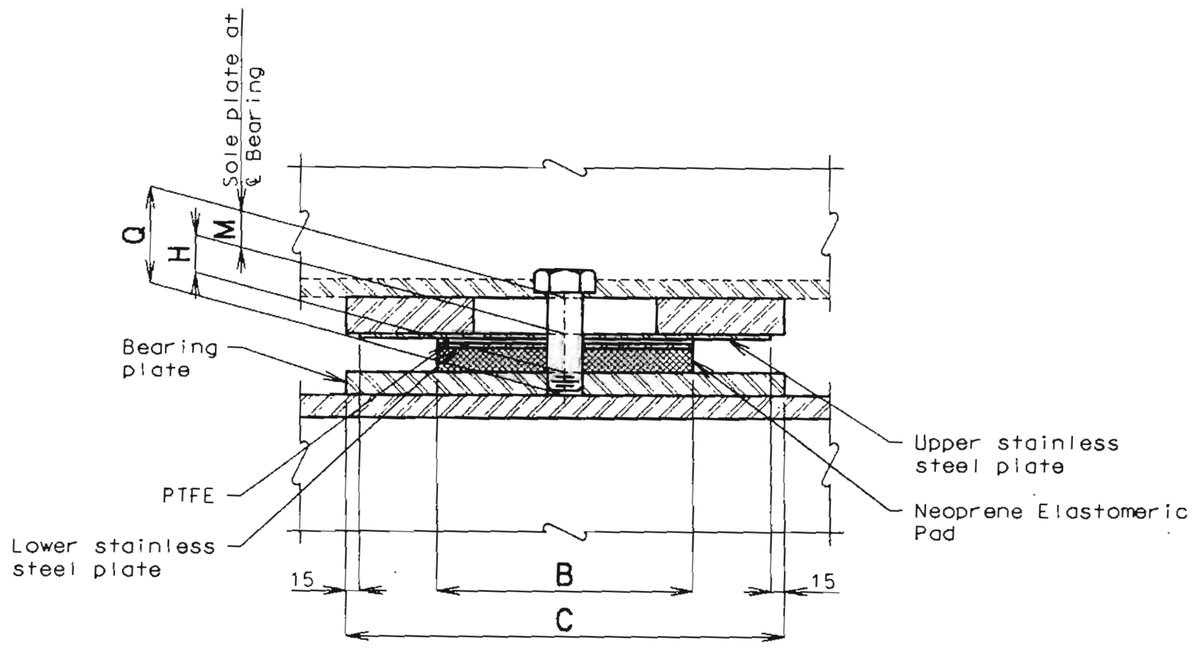
A16866, Sht. 82

STATE	PROJ. NO.	SHEET NO.
MO.		286



END VIEW

Note:
The location of 38.1mm Ø high strength bolts in relation to the slotted holes in the sole plate shall correspond with the temperature at the time of erection. At 16° C the slotted holes should center on the 38.1mm Ø high strength bolts.
Adjustment of 7mm for each 5° C temperature rise or fall shall be made.



SIDE VIEW

Note:
Bearing Plate to be tapped to receive 38.1mm Ø H.S. Bolts.

Notes:

Bolts shall be 38.1mm diameter, ASTM A325M bolts and shall extend 25mm into the bearing plate. Actual manufacturer's certified mill test reports (chemical and mechanical) shall be provided.

All high strength bolts shall be coated with a minimum of two coats of inorganic zinc primer (125 micrometers minimum thickness).

Neoprene Elastomeric Pads shall be 70 durometer.

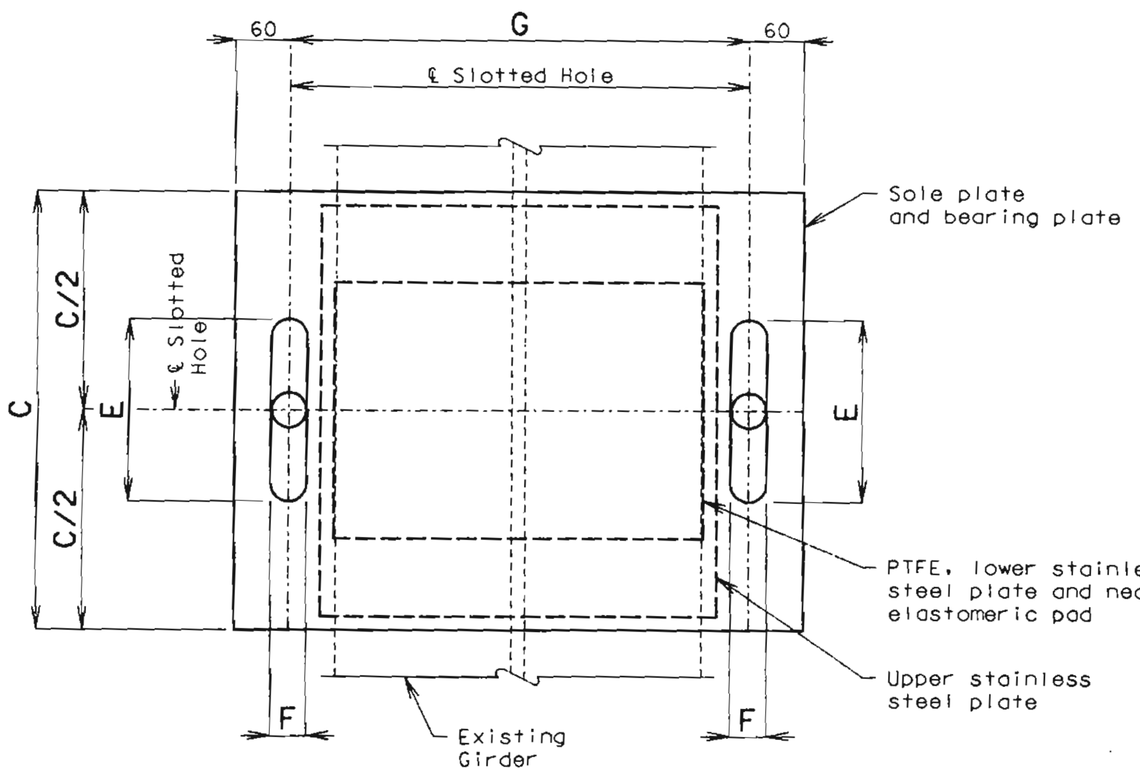
The upper and lower units shall be furnished bolted together as a single unit and field welded to the girder and retrofit bracket.

Structural steel for sole plate and bearing plate shall be ASTM A709M Grade 250 and shall be coated with a minimum of two coats of inorganic zinc primer (125 micrometers minimum thickness).

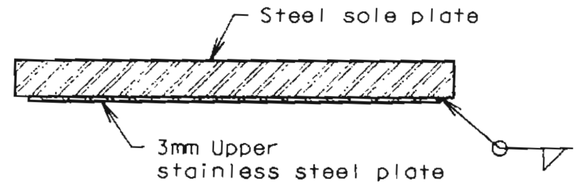
Payment for the sole plate, bearing plate and high strength bolts shall be included in the cost of the bearing assembly. See Special Provisions.

The accepted quantity of elastomeric bearing assemblies complete-in-place, will be paid for at the contract unit price for Type N PTFE Bearings, each.

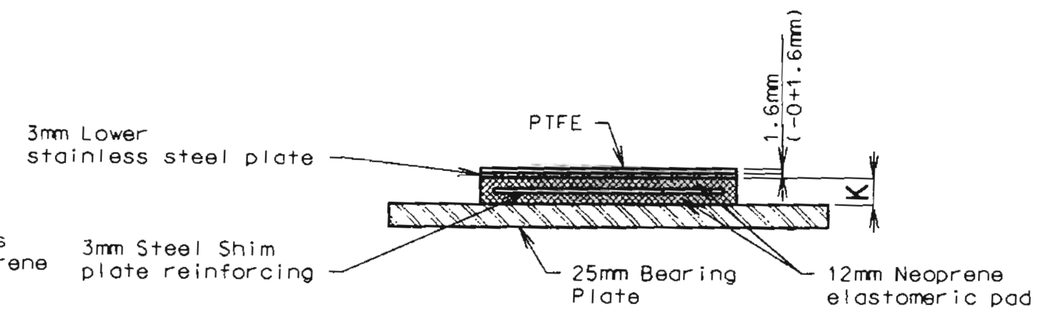
The bottom face of the 3mm stainless steel plate that is welded to the sole plate shall be lubricated with a lubricant that is approved by the bearing manufacturer.



PART PLAN VIEW



UPPER UNIT



LOWER UNIT

PTFE BEARING DEVICE

Bond Polytetrafluoroethylene (PTFE), lower stainless steel plate, neoprene elastomeric pad, and bearing plate together by Vulcanization to form an integral unit.

PTFE SLIDING BEARINGS																	
Bent No.	Girder	A	B	C	D	E	F	G	H	J	K	L	M	N	Q	Number of Shim Plates (*)	Number Required
5	ALL	410	280	480	630	190	41.3	510	35	81	27	406.4	40	51.8	100	1	6
																Total Bearings	6

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

BUCHER, WILLIS & RATLIFF CORPORATION
7020 AMBASSADOR WAY KANSAS CITY, MISSOURI 64114 816-363-2696

DRAWN BY:	KLW	JAN. 1998
TRACED BY:	TWM	JAN. 1998
CHECKED BY:	DJM	JAN. 1998

PROJECT NO. 98-047 PROJECT NAME: MODOT-Br. No. A16864-58 I-435 over Railroad Tracks S:\98047\STR\A16864\DGN\RRBEAR.DGN

JACKSON COUNTY

DETAILS OF TYPE 'N' PTFE BEARINGS

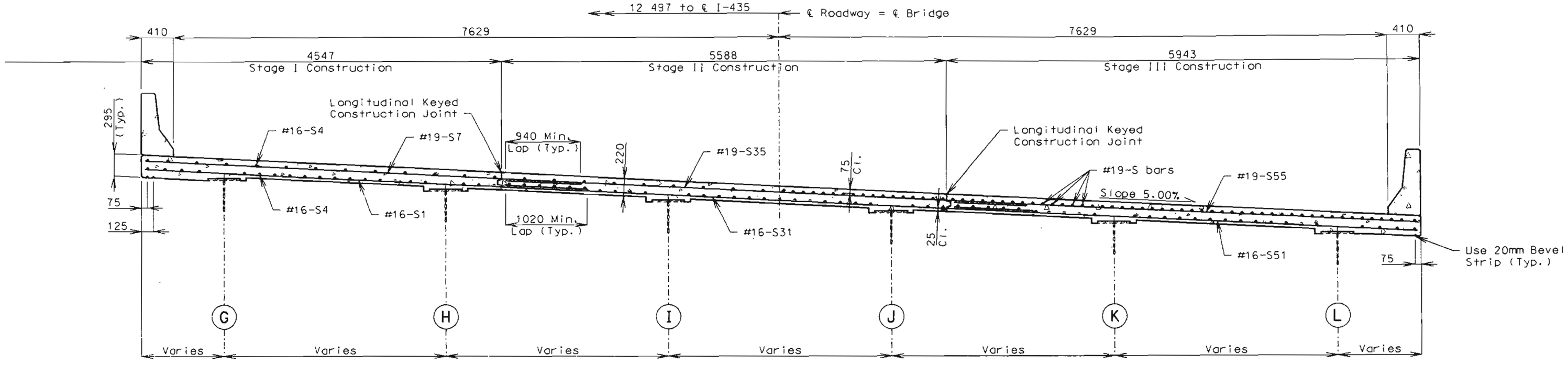
SHEET NO. 6 OF 29

A16864

FOR INFORMATION ONLY

A16866, Sht. 83

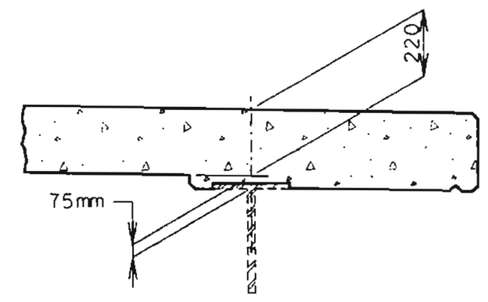
STATE	PROJ. NO.	SHEET NO.
MO.		287



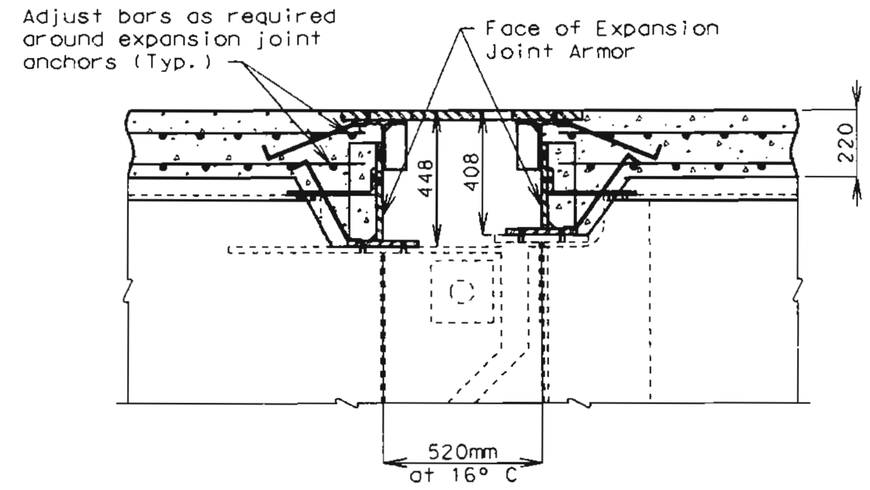
HALF SECTION NEAR ℄ SPAN

HALF SECTION NEAR INTERMEDIATE BENT

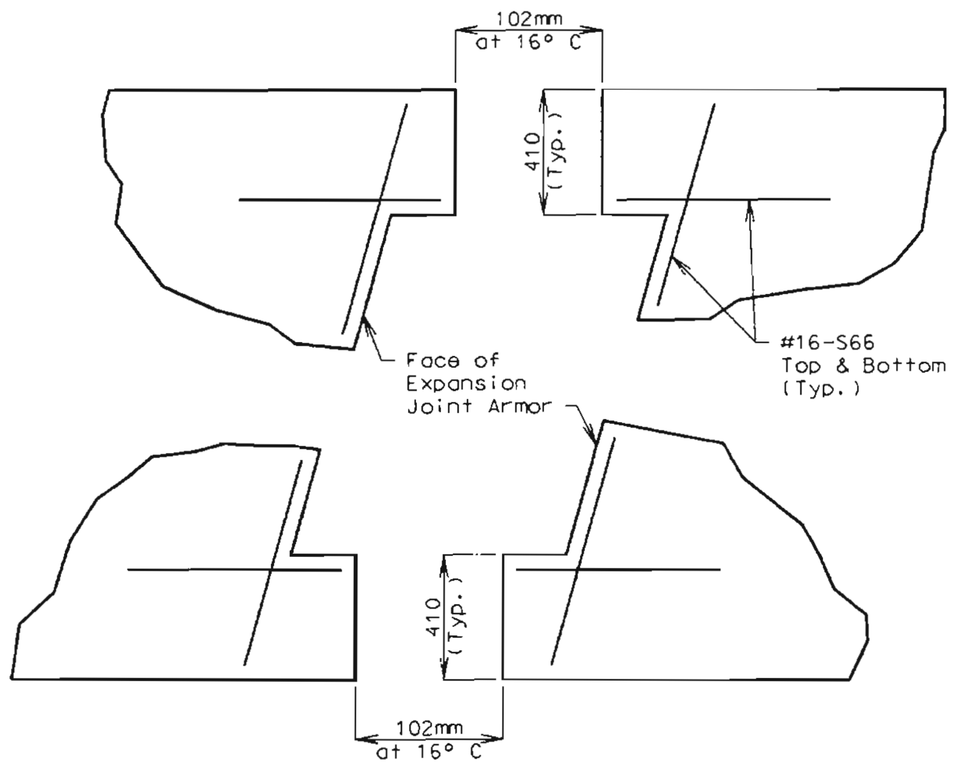
TYPICAL SLAB CROSS SECTION



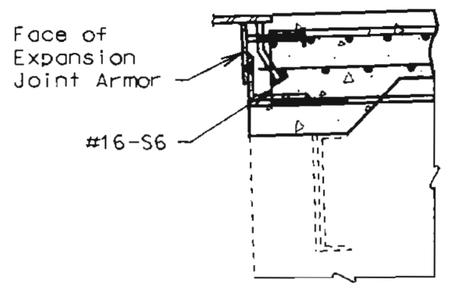
EXTERIOR GIRDER
TYPICAL HAUNCH



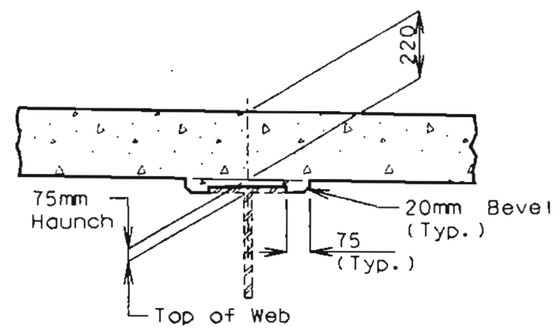
HAUNCH DETAIL AT HINGE NEAR BENT NO. 5



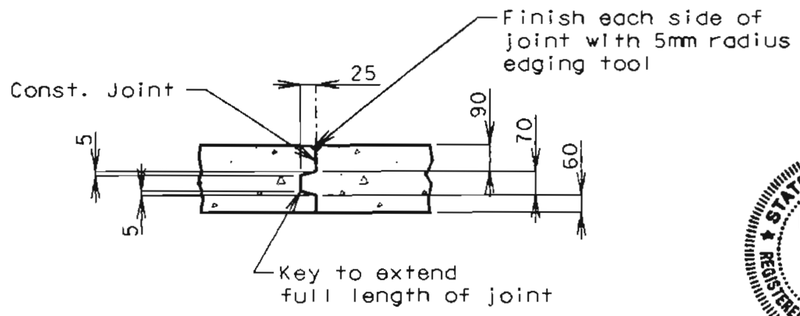
SLAB CORNER DETAIL AT HINGE NEAR BENT NO. 5



HAUNCH DETAIL AT END BENTS NO. 1 & 10



INTERIOR GIRDER
TYPICAL HAUNCH



TYPICAL JOINT

Note:

For reinforcing steel spacing and other slab notes. See Slab Plan Sheets.
For details of safety barrier curb not shown. see Sheet No's. 23, 24 and 25.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
7920 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816-363-2096

DRAWN BY:	KLW/TWM	FEB. 1998
TRACED BY:	TWM	FEB. 1998
CHECKED BY:	SAC	FEB. 1998

JACKSON COUNTY

SLAB CROSS SECTION
HAUNCH DETAILS

SHEET NO. 7 OF 29

A16864

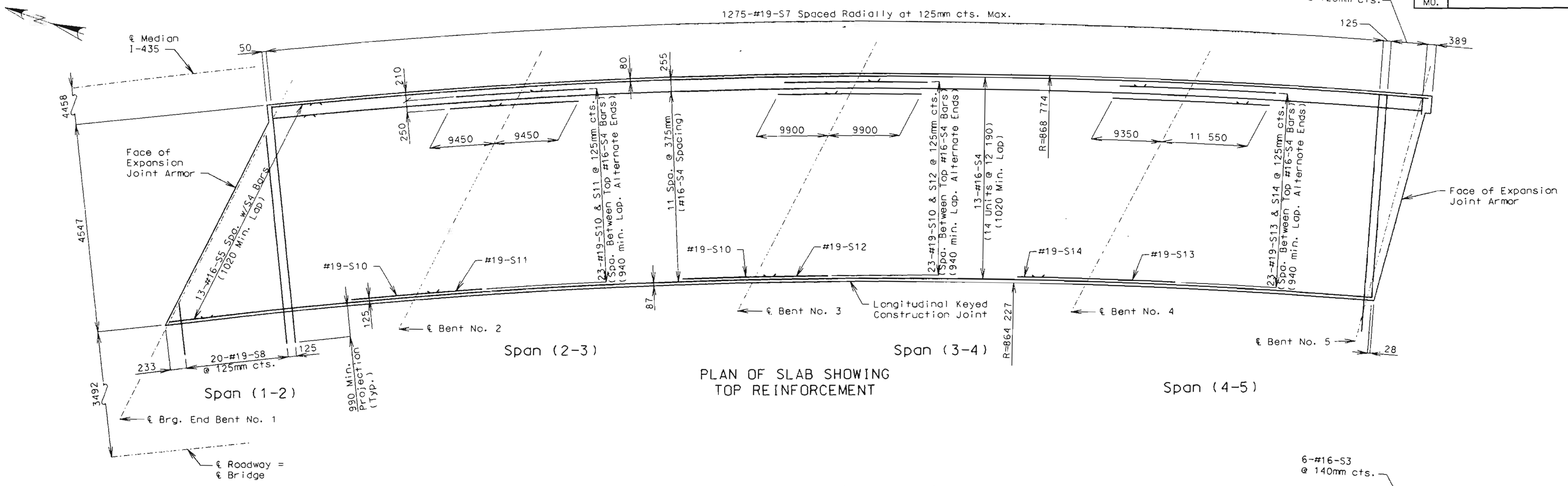
Note: This drawing is NOT to scale. Follow dimensions.

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A16864\DGN\RRSLBX.DGN

FOR INFORMATION ONLY

A16866, Sht. 84

STATE	PROJ. NO.	SHEET NO.
MO.		288



Notes:

For details of slab construction joint, see Sheet No. 7.

Longitudinal dimensions are horizontal arc at 16°C.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than 25 mm± from the vertical face of the expansion device armor.

BUCHER, WILLIS & RATLIFF CORPORATION
7920 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816-363-2695

DRAWN BY:	KLW	JAN. 1998
TRACED BY:	JHH	JAN. 1998
CHECKED BY:	SAC	FEB. 1998

STATE OF MISSOURI DONNA JUNE MADER NUMBER E-27011 REGISTERED PROFESSIONAL ENGINEER
4-1-98

JACKSON COUNTY

SLAB PLAN
STAGE I - UNIT 1

SHEET NO. 8 OF 29

A16864

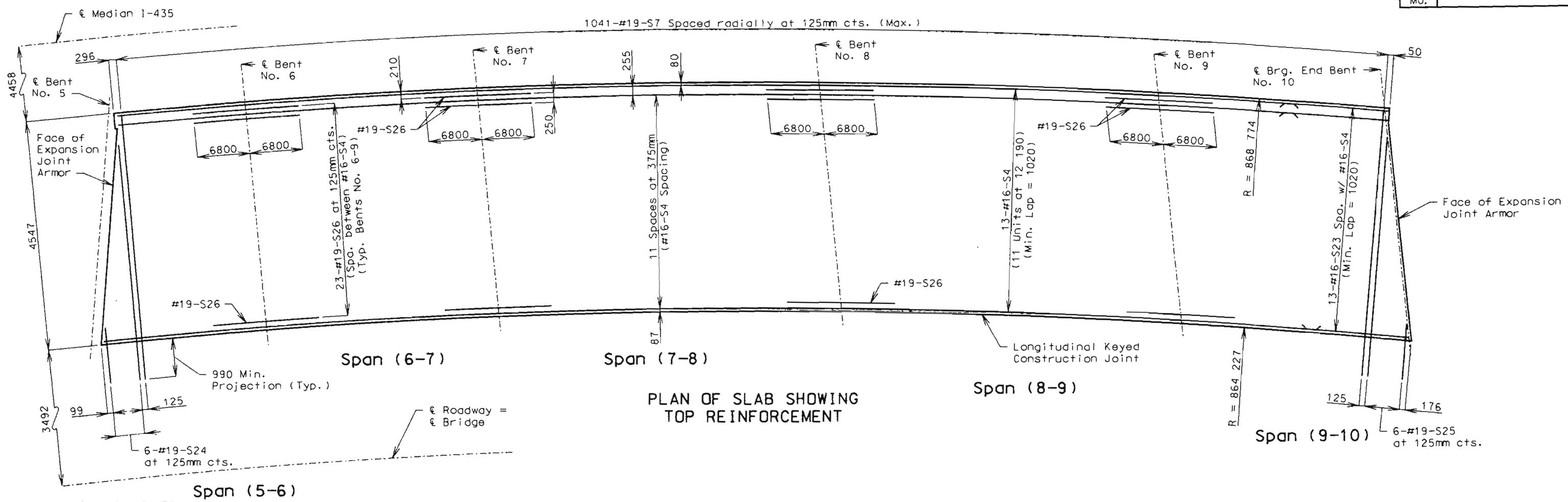
Note: This drawing is not to scale. Follow dimensions.

PROJECT NO. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A16864\DGN\RRPLN1.DGN

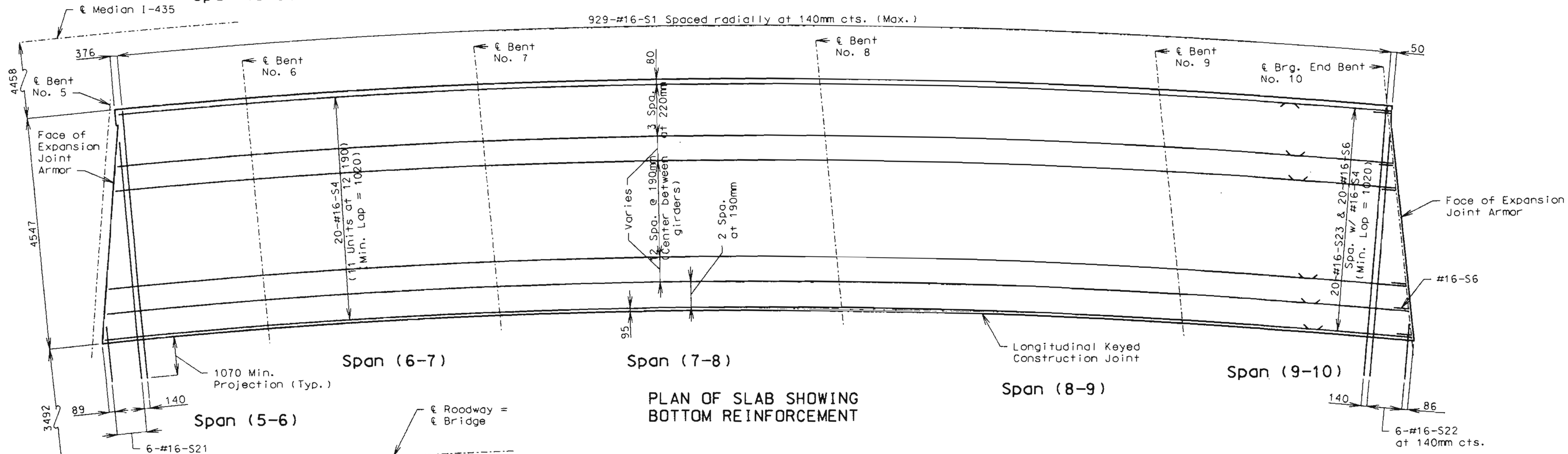
FOR INFORMATION ONLY

A16866, Sht. 85

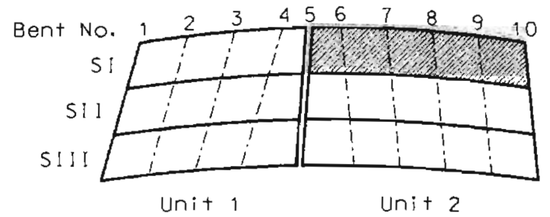
STATE	PROJ. NO.	SHEET NO.
MO.		289



PLAN OF SLAB SHOWING TOP REINFORCEMENT



PLAN OF SLAB SHOWING BOTTOM REINFORCEMENT



SCHEMATIC

Notes:

For details of slab construction joint, see Sheet No. 7.

Longitudinal dimensions are horizontal arc at 16°C.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than 25 mm± from the vertical face of the expansion device armor.

STATE OF MISSOURI
DONNA JUNE WADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna Wader 4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
1500 Main Street, Kansas City, Missouri 64105 | 816-363-2600

DRAWN BY:	KLW	JAN. 1998
TRACED BY:	TWM	JAN. 1998
CHECKED BY:	SAC	FEB. 1998

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

JACKSON COUNTY

SLAB PLAN
STAGE I - UNIT 2

SHEET NO. 9 OF 29

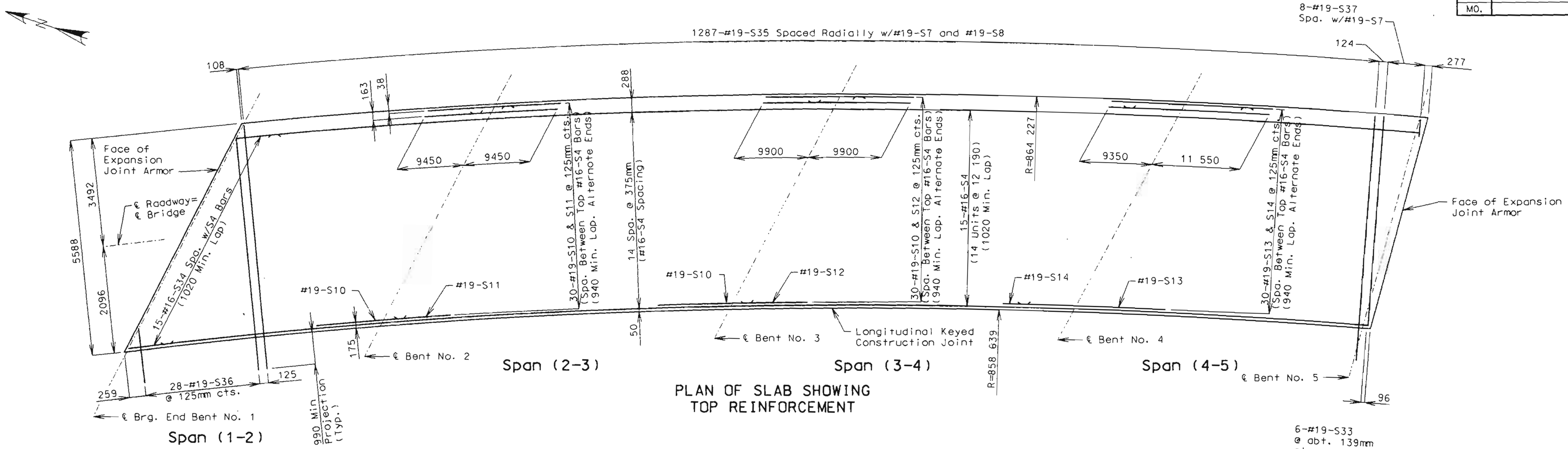
A16864

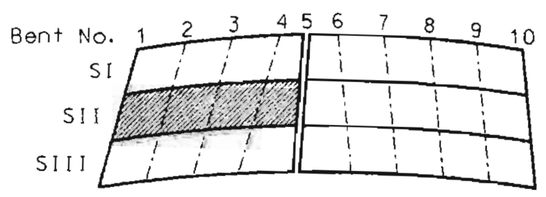
FOR INFORMATION ONLY

A16866, Sht. 86

PROJECT No. 98-047 PROJECT NAME: MoDOT Br. No. A6864-58 I-435 over Railroad Tracks S:\98047\STR\A6864\DGN\RPLN12.DGN

STATE	PROJ. NO.	SHEET NO.
MO.		300





SCHEMATIC

Notes:

For details of slab construction joint, see Sheet No. 7.

Longitudinal dimensions are horizontal arc at 16°C.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than 25 mm± from the vertical face of the expansion device armor.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
7920 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816-363-2696

DRAWN BY:	KLW	JAN. 1998
TRACED BY:	JHH	JAN. 1998
CHECKED BY:	SAC	FEB. 1998

JACKSON COUNTY

SLAB PLAN
STAGE II - UNIT 1

SHEET NO. 10 OF 29

A16864

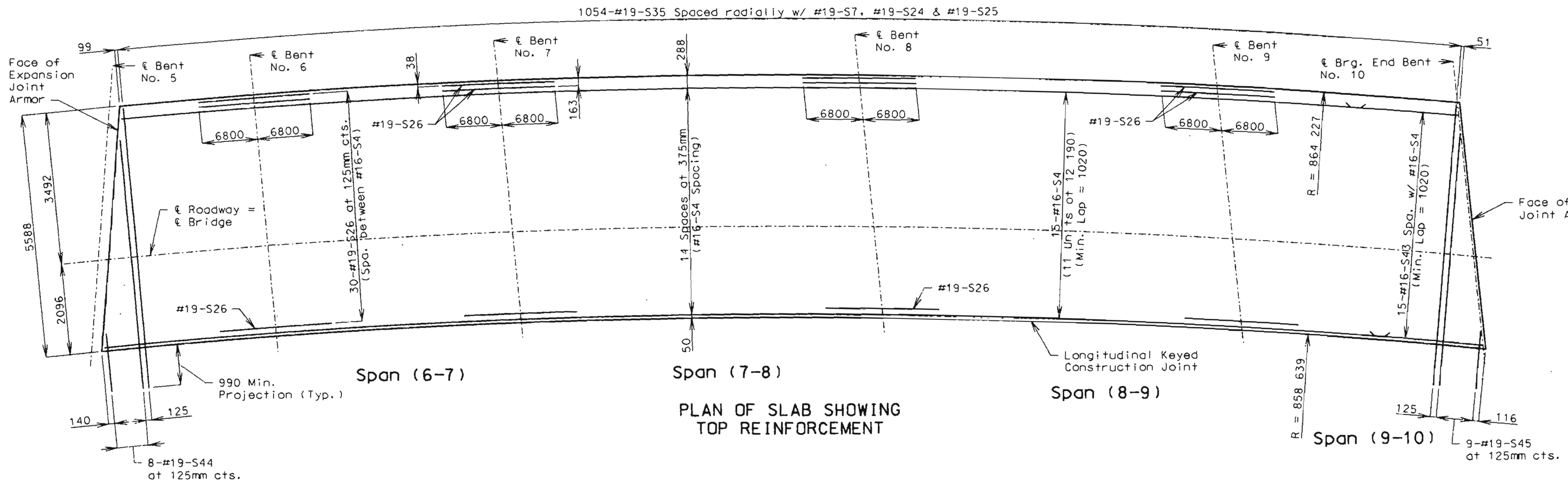
Note: This drawing is not to scale. Follow dimensions.

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A6864-UGN\RRPLN21.DGN

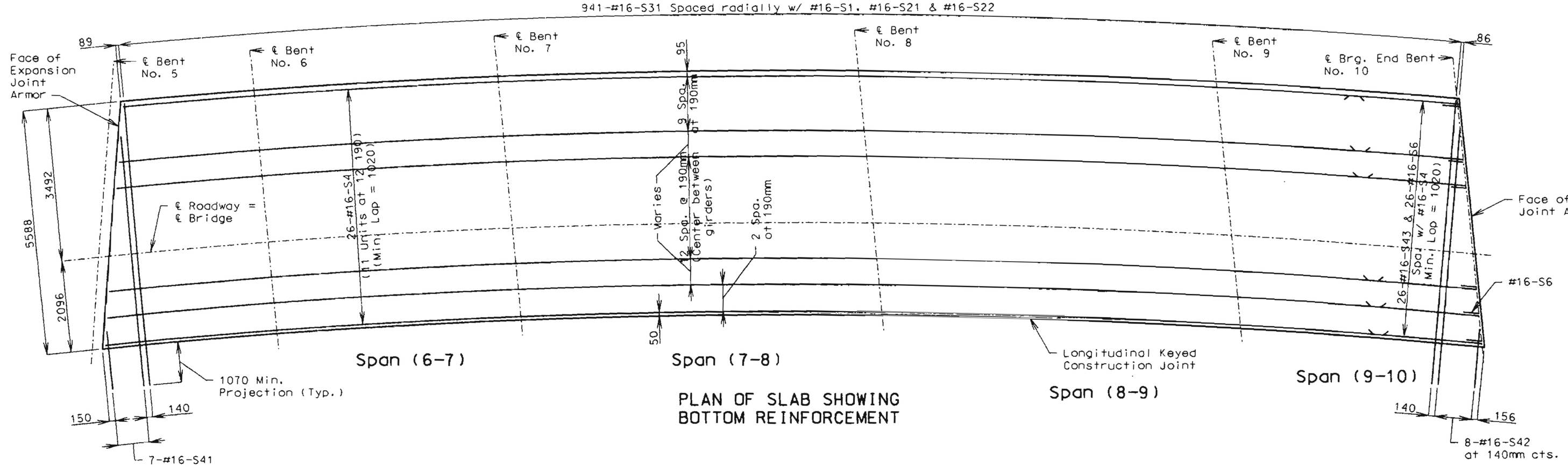
FOR INFORMATION ONLY

A16866, Sht. 87

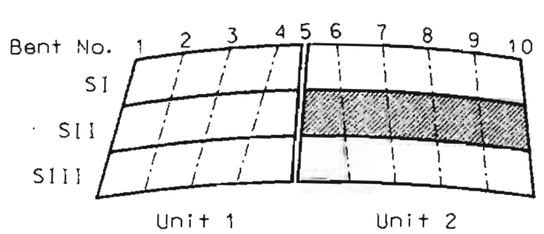
STATE	PROJ. NO.	SHEET NO.
MO.		30(



PLAN OF SLAB SHOWING TOP REINFORCEMENT



PLAN OF SLAB SHOWING BOTTOM REINFORCEMENT



SCHEMATIC

Notes:

For details of slab construction joint, see Sheet No. 7.

Longitudinal dimensions are horizontal arc at 16°C.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than 25 mm± from the vertical face of the expansion device armor.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
7920 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816-363-2696

DRAWN BY:	KLW	JAN. 1998
TRACED BY:	TWM	JAN. 1998
CHECKED BY:	SAC	FEB. 1998

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-58 I-435 over Railroad Tracks S:\98047\STR\A6864\DGN\RRPLN22.DGN

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

JACKSON COUNTY

SLAB PLAN
STAGE II - UNIT 2

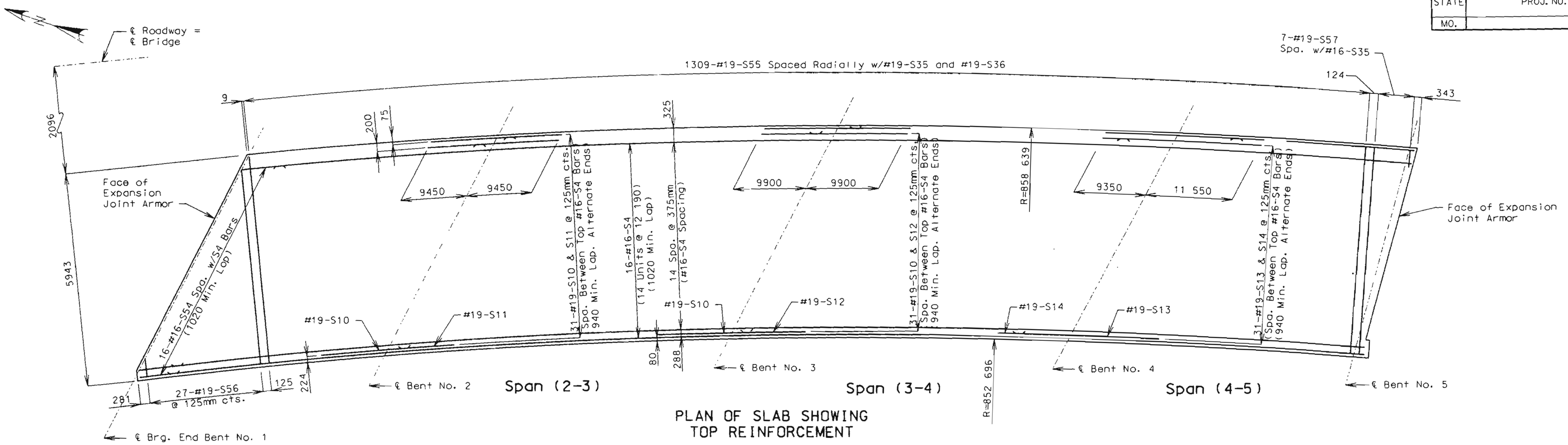
SHEET NO. 11 OF 29

AI6864

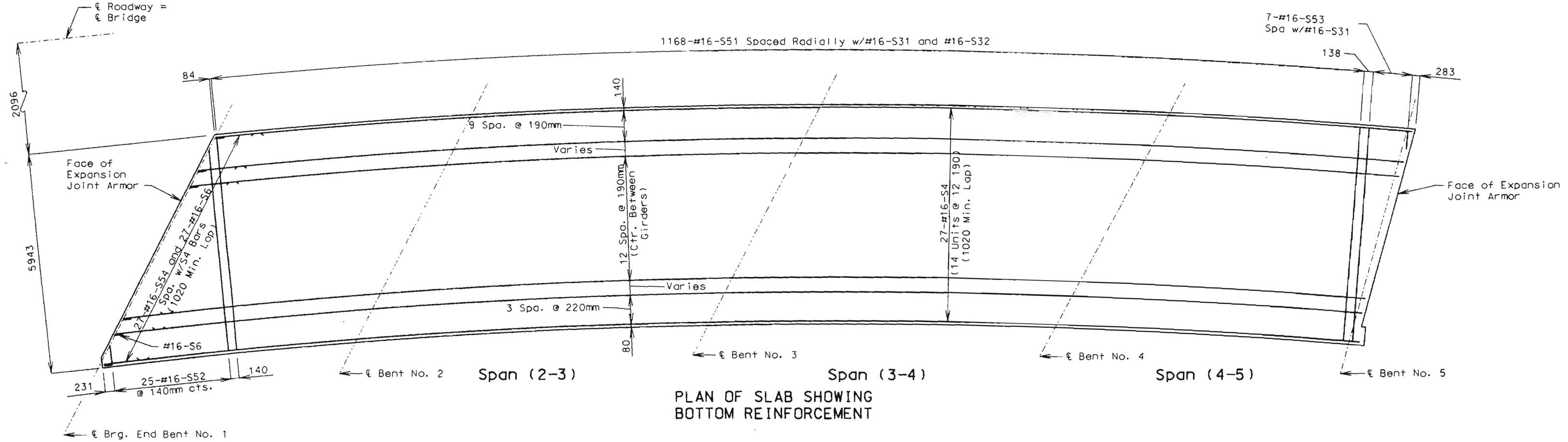
FOR INFORMATION ONLY

A16866, Sht. 88

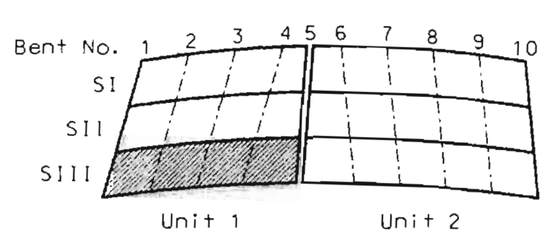
STATE	PROJ. NO.	SHEET NO.
MO.		302



PLAN OF SLAB SHOWING
TOP REINFORCEMENT



PLAN OF SLAB SHOWING
BOTTOM REINFORCEMENT



SCHEMATIC

Notes:

For details of slab construction joint, see Sheet No. 7.

Longitudinal dimensions are horizontal arc at 16°C.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than 25 mm± from the vertical face of the expansion device armor.

For location of slab drains see Sheet No. 17.

BUCHER, WILLIS & RATLIFF CORPORATION
7225 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816 361-2699

DRAWN BY:	KLW	JAN.	1998
TRACED BY:	JHH	JAN.	1998
CHECKED BY:	SAC	FEB.	1998

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
4-1-98

JACKSON COUNTY

SLAB PLAN
STAGE III - UNIT 1

SHEET NO. 12 OF 29

AI6864

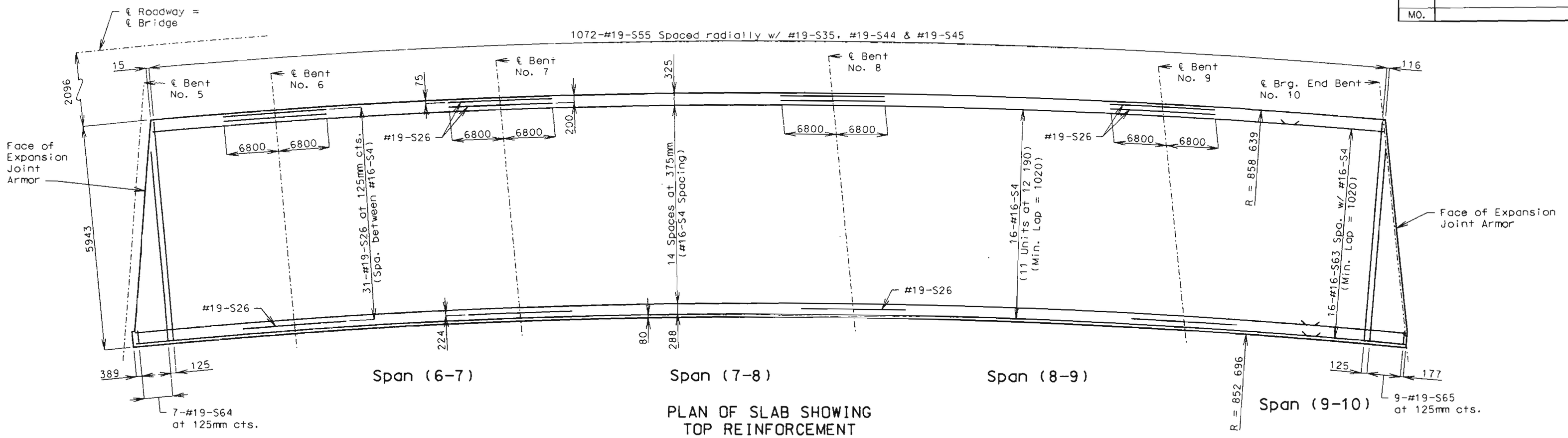
Note: This drawing is not to scale. Follow dimensions.

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A6864\DGN\RRPLN31.DGN

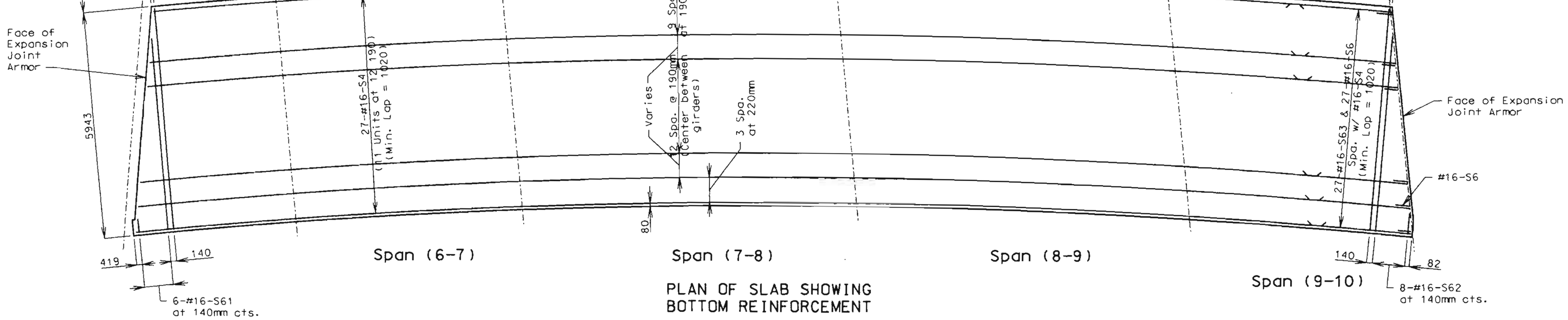
FOR INFORMATION ONLY

A16866, Sht. 89

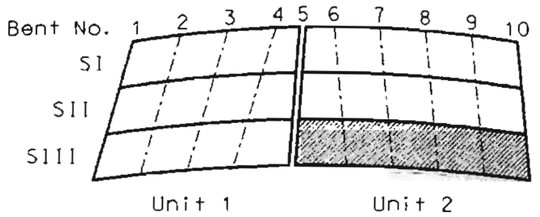
STATE	PROJ. NO.	SHEET NO.
MO.		303



PLAN OF SLAB SHOWING
TOP REINFORCEMENT



PLAN OF SLAB SHOWING
BOTTOM REINFORCEMENT



SCHEMATIC

Notes:

For details of slab construction joint, see Sheet No. 7.

Longitudinal dimensions are horizontal arc at 16°C.

Longitudinal reinforcing steel shall be placed so that ends shall not be more than 25 mm± from the vertical face of the expansion device armor.

For location of slab drains see Sheet No. 17.

BUCHER, WILLIS & RATLIFF CORPORATION
1920 MAIN PARKWAY KANSAS CITY, MISSOURI 64108 816-363-2666

DRAWN BY:	KLW	JAN. 1998
TRACED BY:	TWM	JAN. 1998
CHECKED BY:	SAC	FEB. 1998

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader 4-1-98

JACKSON COUNTY

SLAB PLAN
STAGE III - UNIT 2

SHEET NO. 13 OF 29

A16864

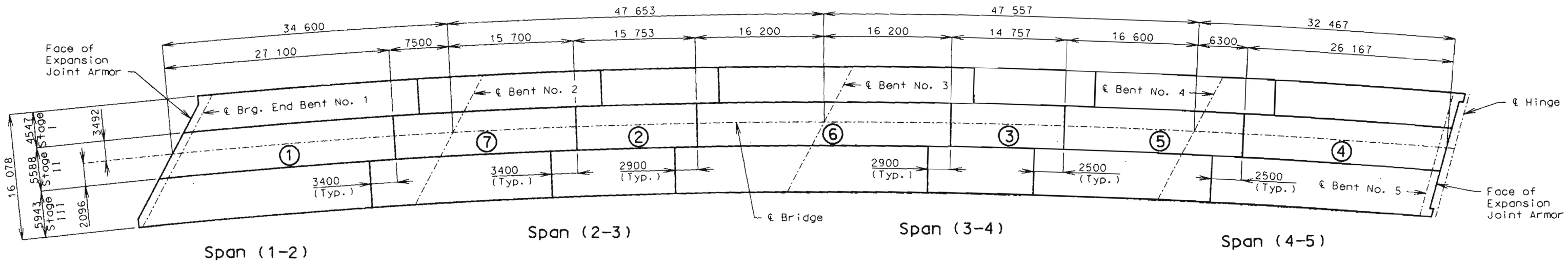
Note: This drawing is not to scale. Follow dimensions.

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\9804\STR\A6864\DGN\RRPLN32.DGN

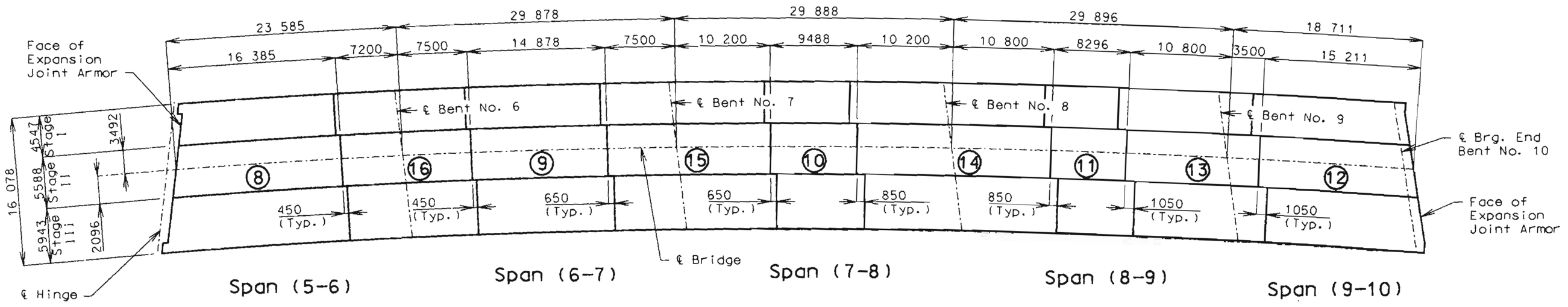
FOR INFORMATION ONLY

A16866, Sht. 90

STATE	PROJ. NO.	SHEET NO.
MO.		304



UNIT 1



UNIT 2

	Sequence of Pours							Min. Rate of Pour cu m/hr	
	Direction							With Retarder	No Retarder
Basic Sequence	1	2	3	4	5	6	7	20	20
	Either Direction								
Alternate pours to the Basic Skip Sequence are subject to the approval of the Engineer in accordance with Section 703.3.12.4 of Missouri Standard Specifications (Metric).									
Alternate "A" Pours	1		7 + 2		6 + 3		5 + 4	20	32
	End to 7		1 To 6		2 To 5		3 To End		
Alternate "B" Pours	1 + 7 + 2			6 + 3			5 + 4	20	32
	End to 6			2 to 5			3 to End		
Alternate "C" Pours	1 + 7 + 2				6 + 3 + 5 + 4			20	32
	End to 6				2 to End				
Alternate "D" Pours	1 + 7 + 2 + 6 + 3 + 5 + 4							20	32
	End to End								

Unit 1

	Sequence of Pours									Min. Rate of Pour cu m/hr	
	Direction									With Retarder	No Retarder
Basic Sequence	8	9	10	11	12	13	14	15	16	20	20
	Either Direction										
Alternate pours to the Basic Skip Sequence are subject to the approval of the Engineer in accordance with Section 703.3.12.4 of Missouri Standard Specifications (Metric).											
Alternate "A" Pours	8		16 + 9		15 + 10		14 + 11		13 + 12	20	20
	End to 16		8 To 15		9 To 14		10 To 13		11 To End		
Alternate "B" Pours	8 + 16 + 9			15 + 10			14 + 11+13 + 12			20	20
	End to 15			9 to 14			10 to End				
Alternate "C" Pours	8 + 16 + 9 + 15 + 10					14 + 11 + 13 + 12				20	20
	End to 14					10 to End					
Alternate "D" Pours	8 + 16 + 9 + 15 + 10 + 14 + 11 + 13 + 12									20	20
	End to End										

Unit 2

Notes:

The contractor shall pour and satisfactorily finish the slab pours at the rate given. Retarder, if used, shall be an approved type and retard the set of concrete to 2.5 hours.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader 4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
7222 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816-363-2666

DRAWN BY:	KLW/TWM	FEB. 1998
TRACED BY:	TWM	FEB. 1998
CHECKED BY:	SAC	FEB. 1998

Note: This drawing is not to scale, follow dimensions.

JACKSON COUNTY

SLAB POURING SEQUENCE

SHEET NO. 14 OF 29

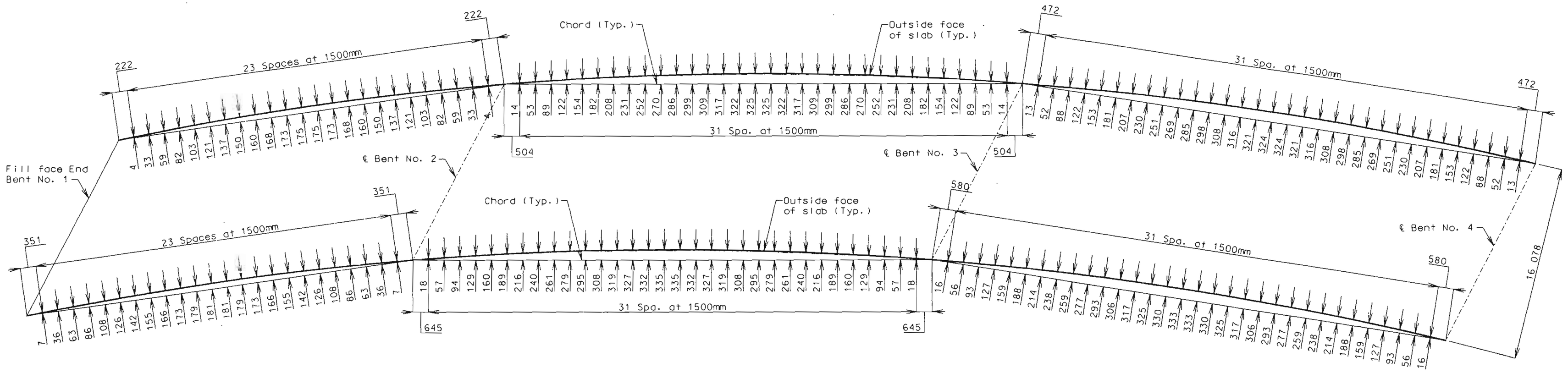
A16864

PROJECT No. 98-047 PROJECT NAME: MODOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A6864\DGN\RRPOUR.DGN

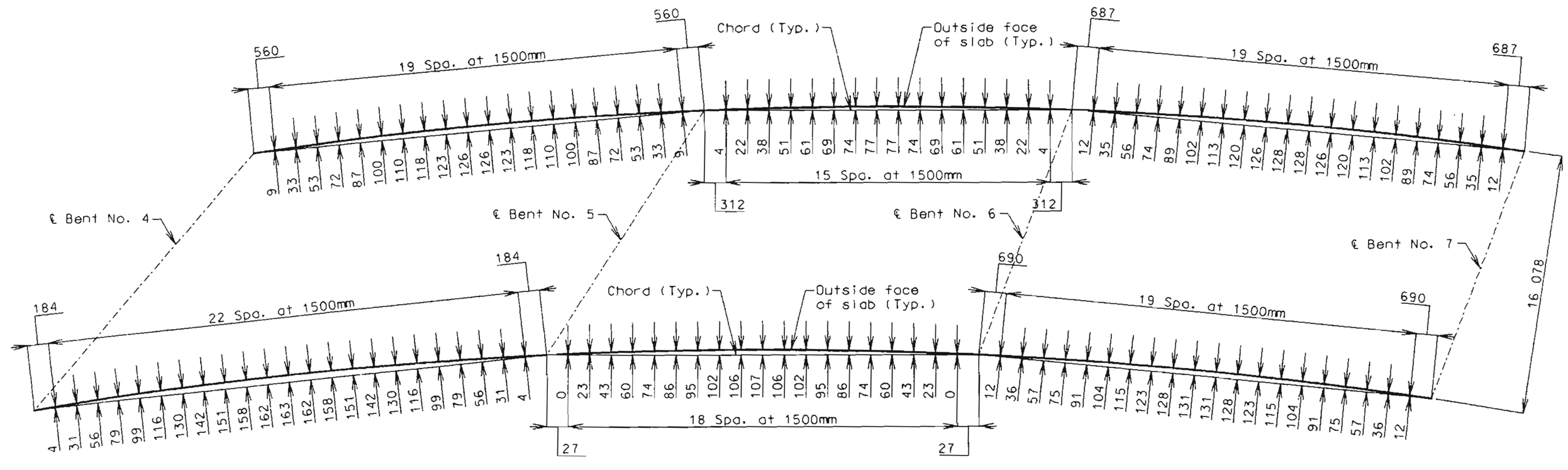
FOR INFORMATION ONLY

A16866, Sht. 91

STATE	PROJ. NO.	SHEET NO.
MO.		305



Span (1-2) Span (2-3) Span (3-4)



Span (4-5) Span (5-6) Span (6-7)

PLAN OF SLAB SHOWING CURVE ORDINATES

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader 4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
7920 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816 363-2600

DRAWN BY:	DJM	JAN. 1998
TRACED BY:	TAC	JAN. 1998
CHECKED BY:	KLW	FEB. 1998

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

JACKSON COUNTY

SLAB CURVE OFFSETS

SHEET NO. 15 OF 29

A16864

PROJECT NO. 98-1041 PROJECT NAME: MoDOT-Br. No. A6864-58 I-435 over Railroad Tracks S:\9801471\STR\A16864\DGN\RROFF1.DGN

FOR INFORMATION ONLY

A16866, Sht. 92

STATE	PROJ. NO.	SHEET NO.
MO.		306

STATE OF MISSOURI * REGISTERED PROFESSIONAL ENGINEER * DONNA JUNE MADER NUMBER E-27011

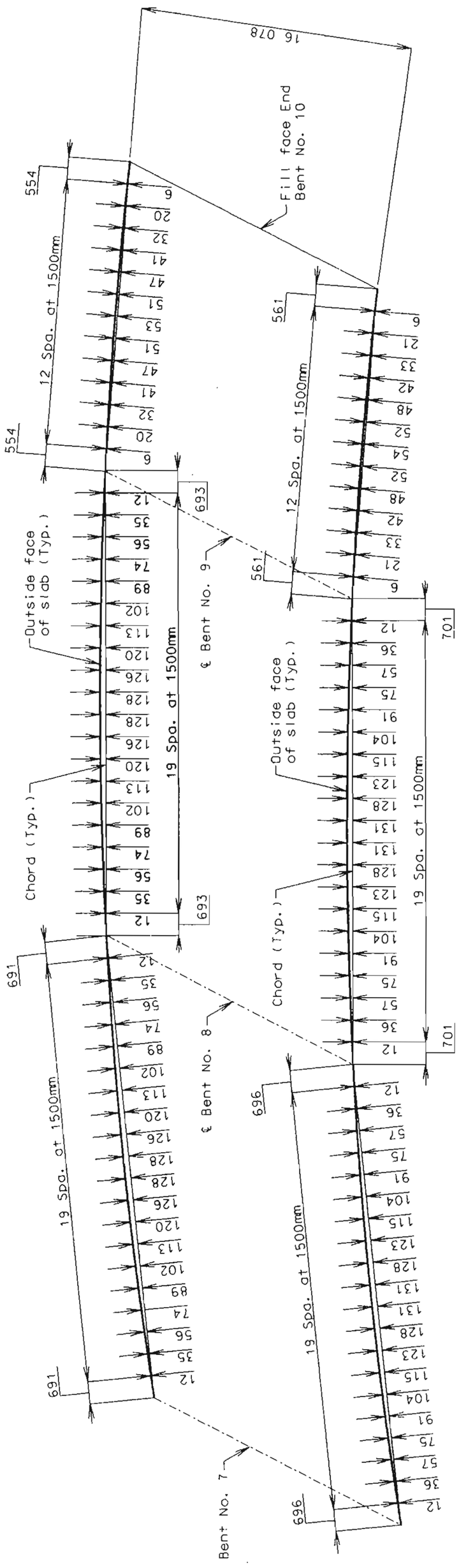
Donna J. Mader 4-1-98

A16864

SHEET NO. 16 OF 29

JACKSON COUNTY

SLAB CURVE OFFSETS



Span (9-10)

Span (8-9)

Span (7-8)

PLAN OF SLAB SHOWING CURVE ORDINATES

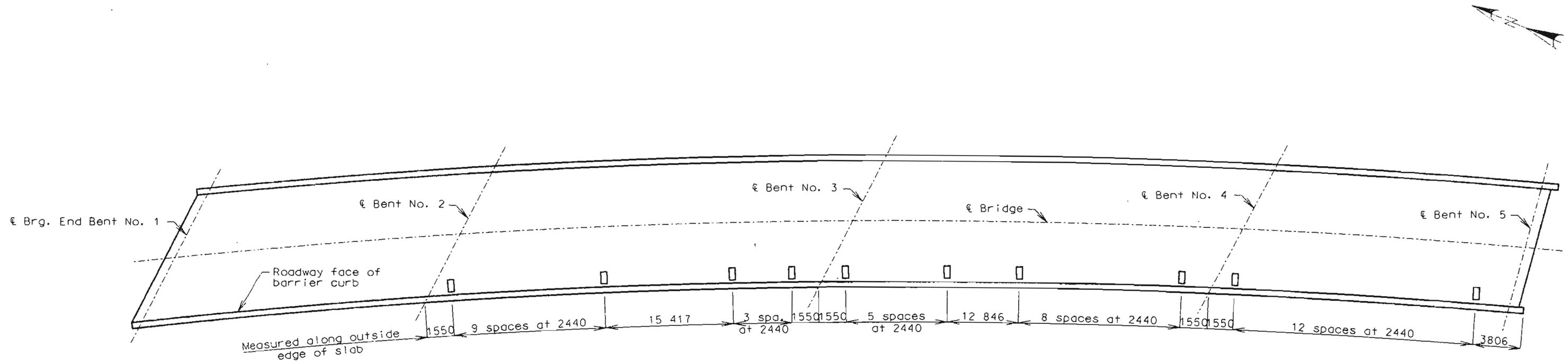
Note: This drawing is not to scale. Follow dimensions.

DRAWN BY:	DJM JAN. 1998
TRACED BY:	TAC JAN. 1998
CHECKED BY:	KLW FEB. 1998

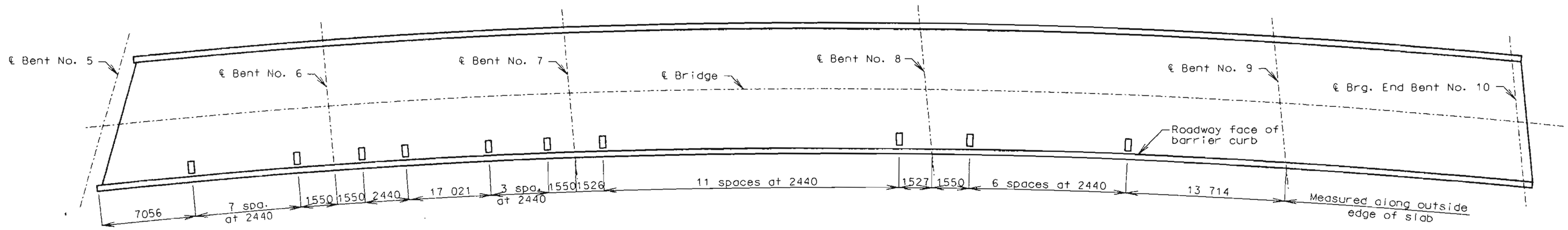
BUCHER, WILLIS & RATLIFF CORPORATION

PROJECT NO. 98-047 PROJECT NAME: NODOT-BR. NO. A16864-SB I-435 over Railroad Tracks S:\98047\STR\A16864\DGN\PROFF2.DGN

STATE	PROJ. NO.	SHEET NO.
MO.		307



Span (1-2) Span (2-3) Span (3-4) Span (4-5)



Span (5-6) Span (6-7) Span (7-8) Span (8-9) Span (9-10)

PLAN OF SLAB SHOWING LOCATION OF SLAB DRAINS

Note:

Longitudinal location of slab drains may be adjusted to prevent drains from spilling onto an existing track. Maintain minimum spacing between drains of 2000mm and at least 1525mm from centerline of bents.

BUCHER, WILLIS & RATLIFF CORPORATION
7020 AMBASSADOR KANSAS CITY, MISSOURI 816-353-2696

DRAWN BY:	DJM	JAN. 1998
TRACED BY:	MAH	JAN. 1998
CHECKED BY:	MLJ	FEB. 1998

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

JACKSON COUNTY

SLAB DRAIN LOCATIONS

SHEET NO. 17 OF 29

A16864

Note: This drawing is not to scale, follow dimensions.

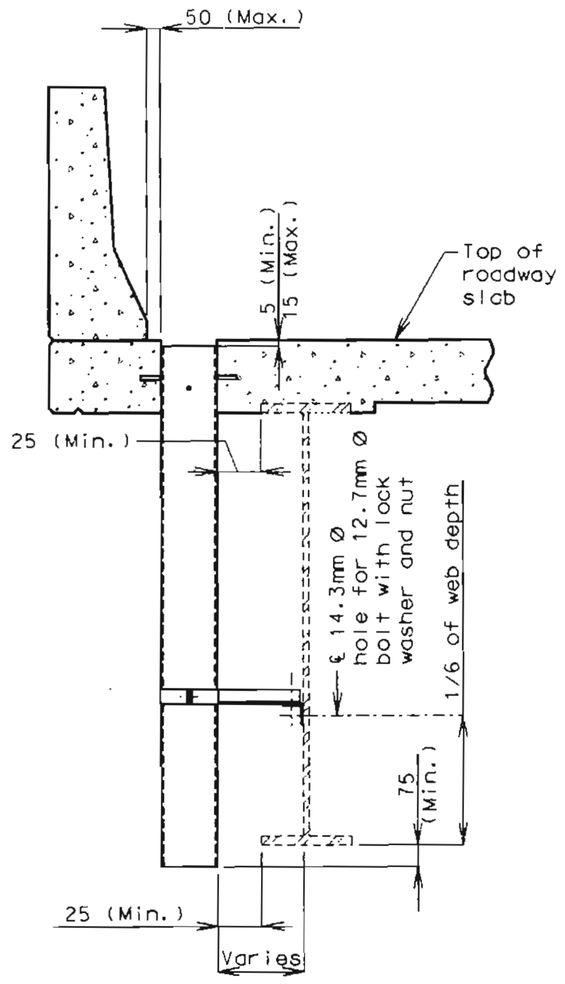
PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A16864\DGN\PRDRAN1.DGN

FOR INFORMATION ONLY

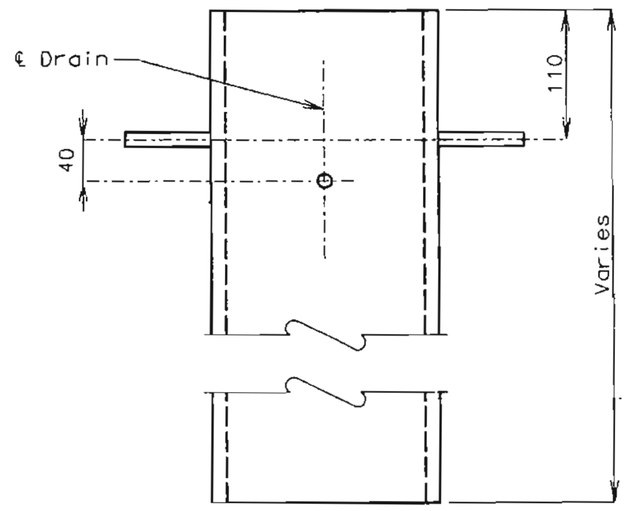
A16866, Sht. 94

STATE	PROJ. NO.	SHEET NO.
MO.		308

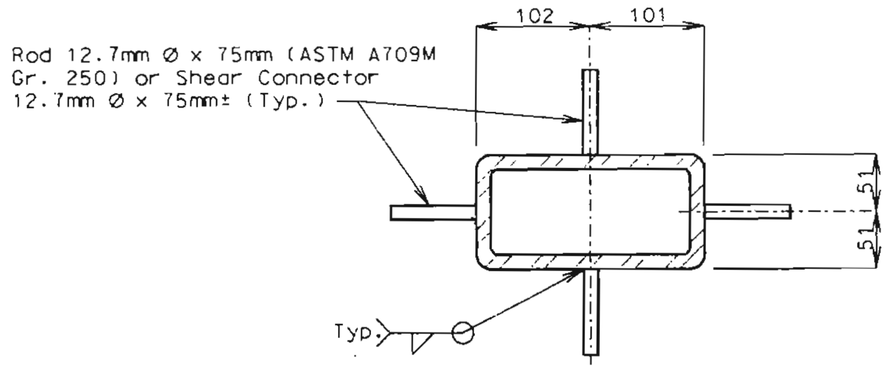
FOR INFORMATION ONLY



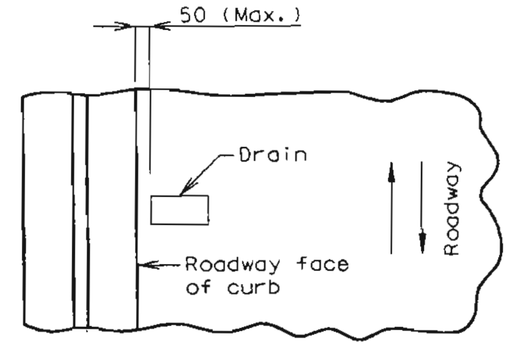
PART SECTION NEAR DRAIN



ELEVATION OF DRAIN



PLAN OF DRAIN



PART PLAN OF SLAB AT DRAIN

Notes:

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

Outside dimensions of drains are 203 mm x 102 mm.

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

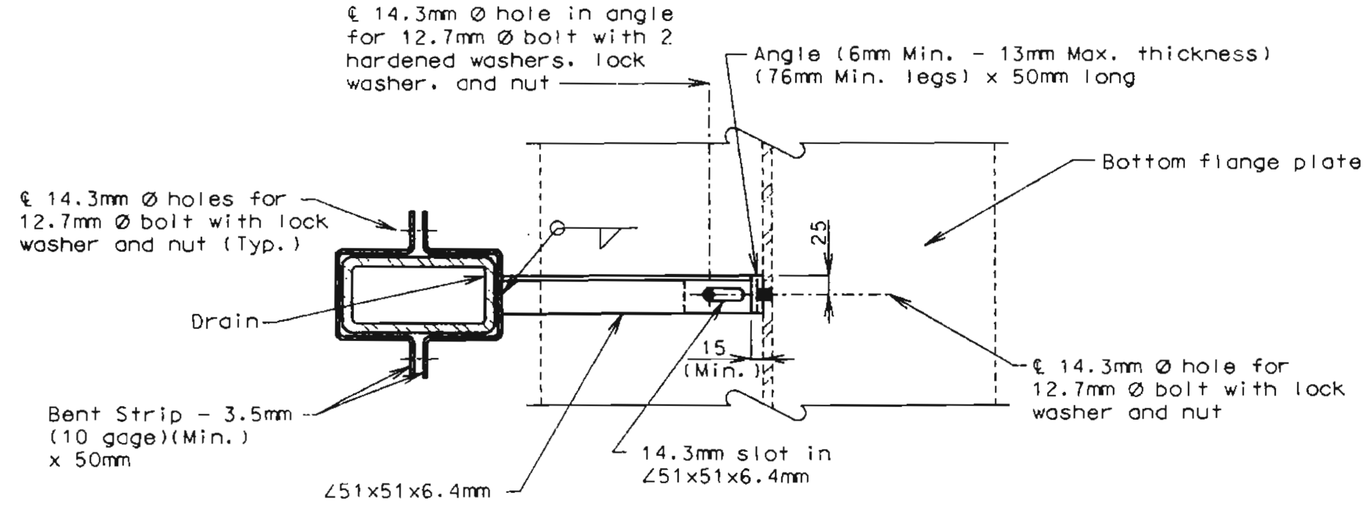
Shift reinforcing steel in field where necessary to clear drains.

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

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

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

See Sheet No. 17 for location of slab drains.



PART PLAN SHOWING BRACKET ASSEMBLY

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
1000 WALNUT PARKWAY KANSAS CITY, MISSOURI 64114 816 361 3600

DRAWN BY:	DJM	JAN. 1998
TRACED BY:	JTC	JAN. 1998
CHECKED BY:	MLJ	FEB. 1998

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-58 I-435 over Railroad Tracks S:\98047\STRV\A6864\DGN\RRDR##2.DGN

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

JACKSON COUNTY

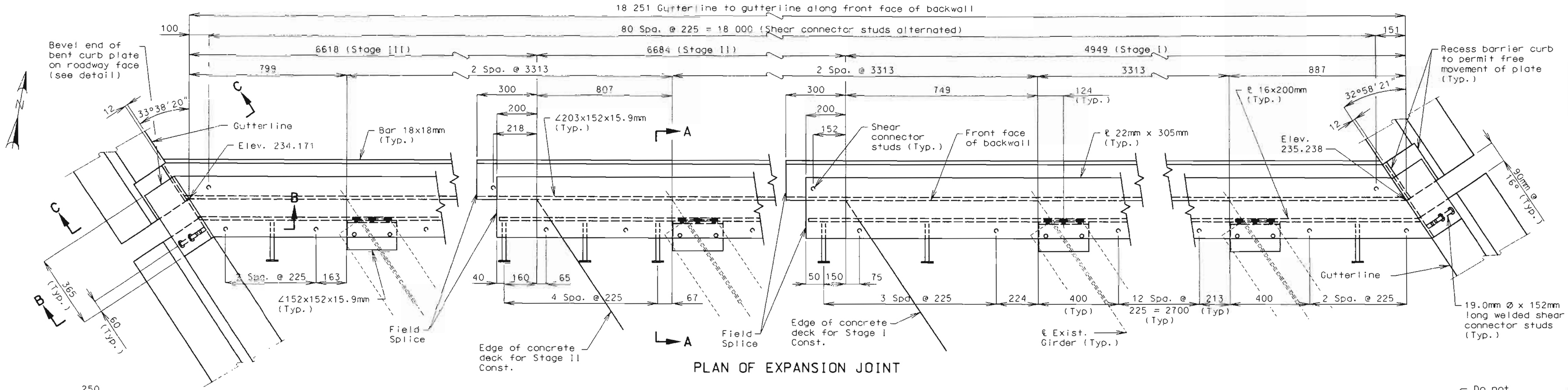
DETAILS OF SLAB DRAINS

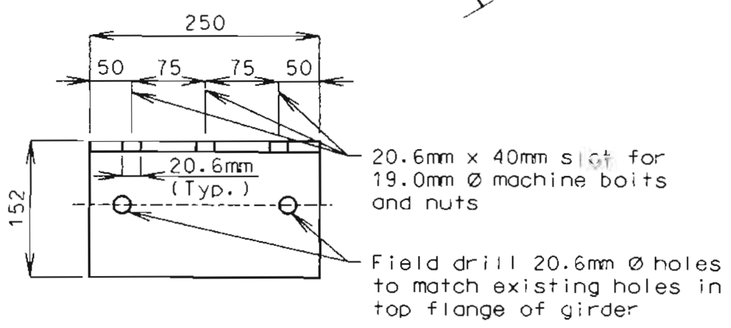
SHEET NO. 18 OF 29

A16864

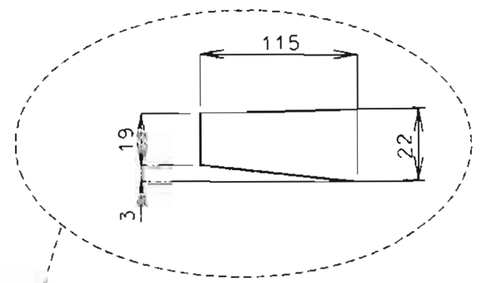
A16866, Sht. 95

STATE	PROJ. NO.	SHEET NO.
MO.		309

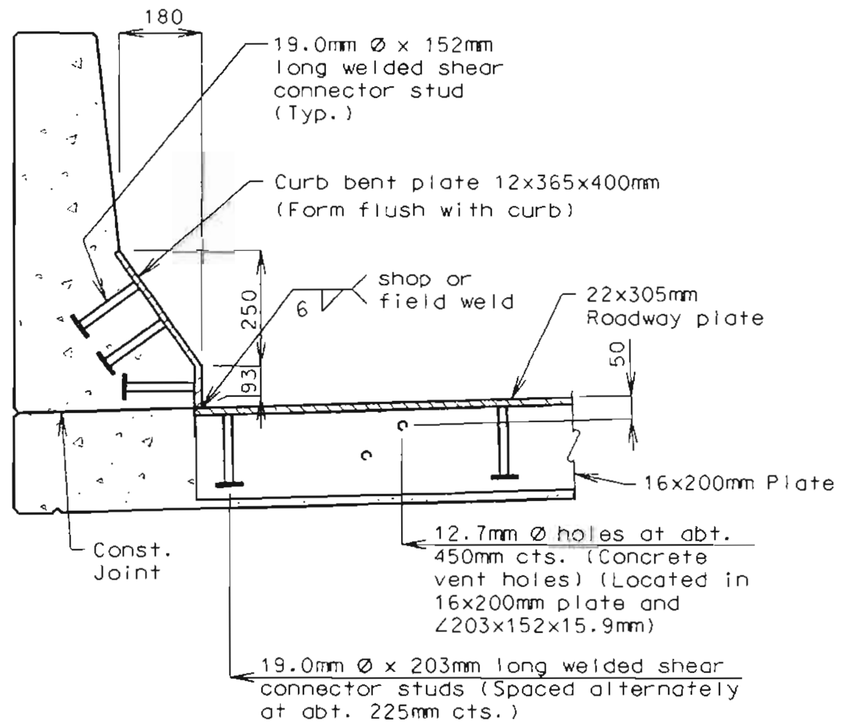




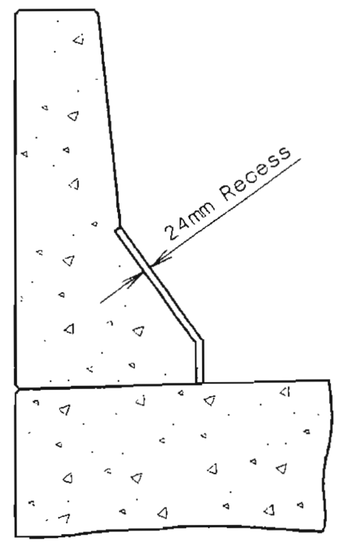
CLIP ANGLE DETAIL



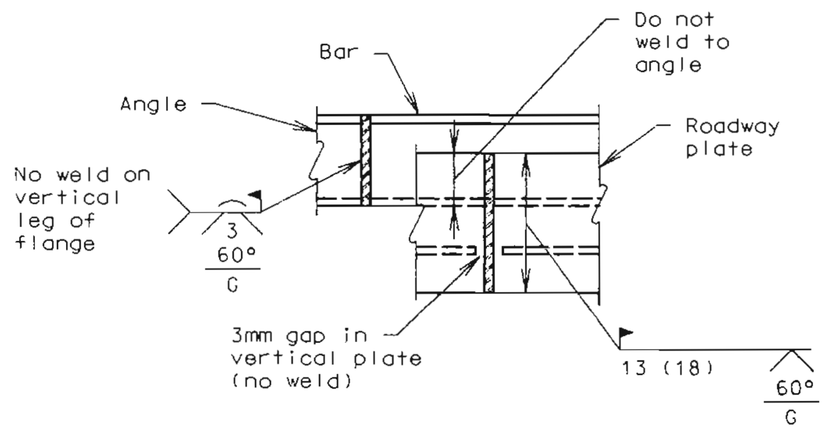
GRIND DETAIL



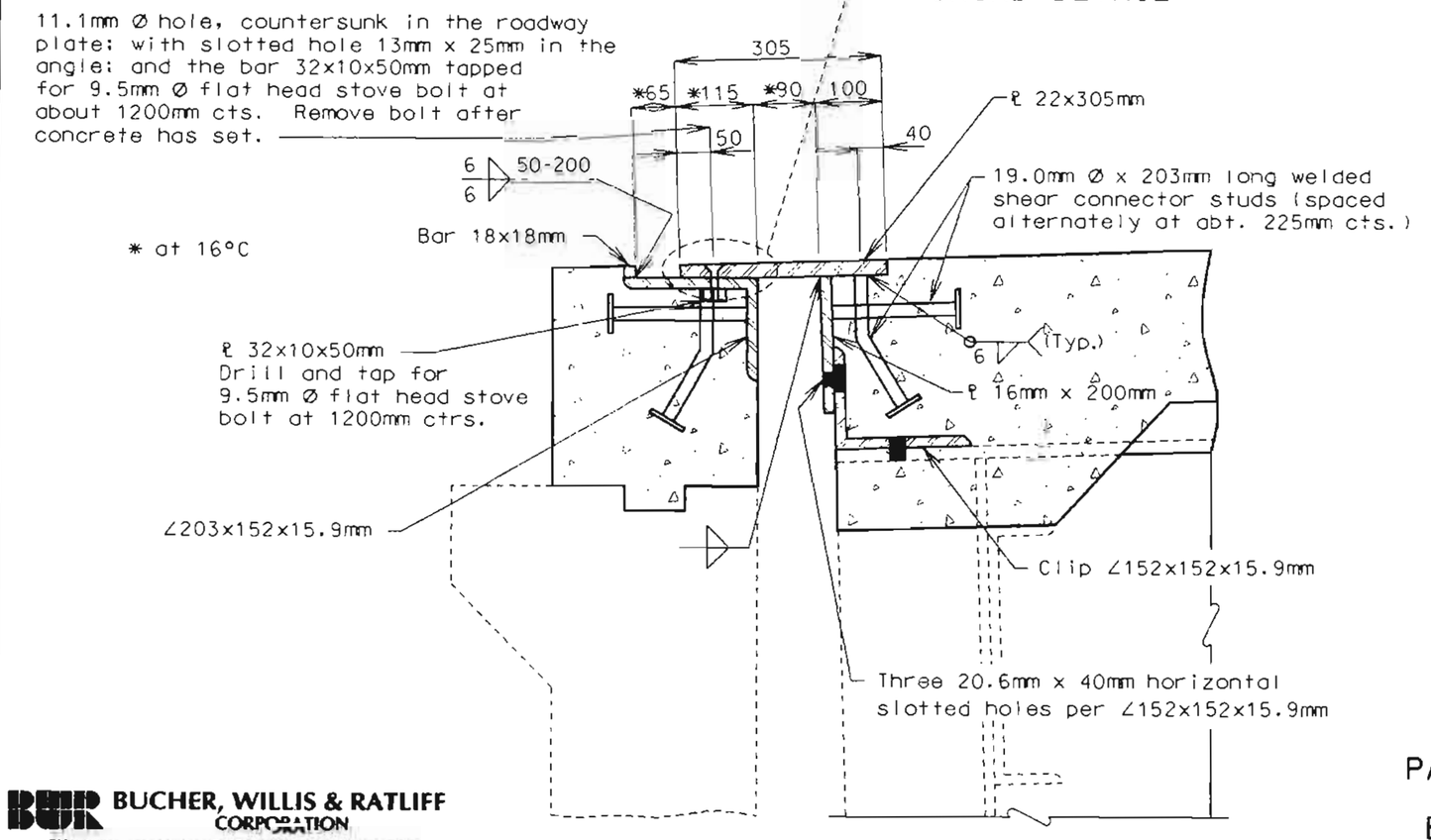
SECTION B-B



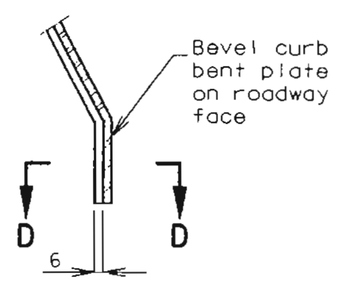
PART SECTION C-C



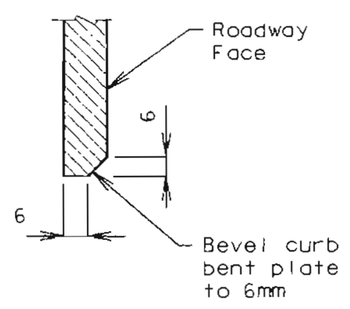
TYPICAL FIELD SPLICE PLAN



SECTION A-A



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION D-D

Notes:

The expansion device shall be fabricated to the grade and cross slope of the roadway.

Material for the expansion device shall be ASTM A709M Grade 250 structural steel. Anchors for the expansion device shall be approved stud-welded anchors (C1010 thru C1020).

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

Plan dimensions are based on installation at 16 degree Celsius. The expansion gap and other dimensions shall be increased 5mm for each 5 degree Celsius fall and decreased 5mm for each 5 degree Celsius rise in temperature at installation.

Furnishing, coating or galvanizing and installing the expansion device and barrier curb plates shall be included in the contract unit price for Expansion Device (Flat Plate).

Concrete shall be forced under and around flat plate, studs and angles. Proper consolidation of the concrete shall be achieved by localized internal vibration.

Dimensions shown are horizontal.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader 4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION

DRAWN BY:	SAC	JAN. 1998
TRACED BY:	KRB	JAN. 1998
CHECKED BY:	MLJ	FEB. 1998

JACKSON COUNTY

FLAT PLATE EXPANSION DEVICE DETAILS END BENT NO. 1

SHEET NO. 19 OF 29

A16864

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

PROJECT No. 98-041 PROJECT NAME: MoDOT-Str. No. A6864-SB 1-435 over Railroad Tracks S:\98041\STR\A6864\DGN\PREXEB1.DGN

FOR INFORMATION ONLY

A16866, Sht. 96

STATE	PROJ. NO.	SHEET NO.
MO.		

PLAN OF EXPANSION JOINT

PART SECTION C-C

SECTION B-B

TYPICAL FIELD SPLICE PLAN

SECTION A-A

PART ELEVATION AT END OF BEVELED CURB BENT PLATE

CLIP ANGLE DETAIL

GRIND DETAIL

Note:
See Sheet No. 19 for notes.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 8-12-99

JACKSON COUNTY

FLAT PLATE EXPANSION DEVICE DETAILS END BENT NO. 10

A16864

SHEET NO.20 OF 29

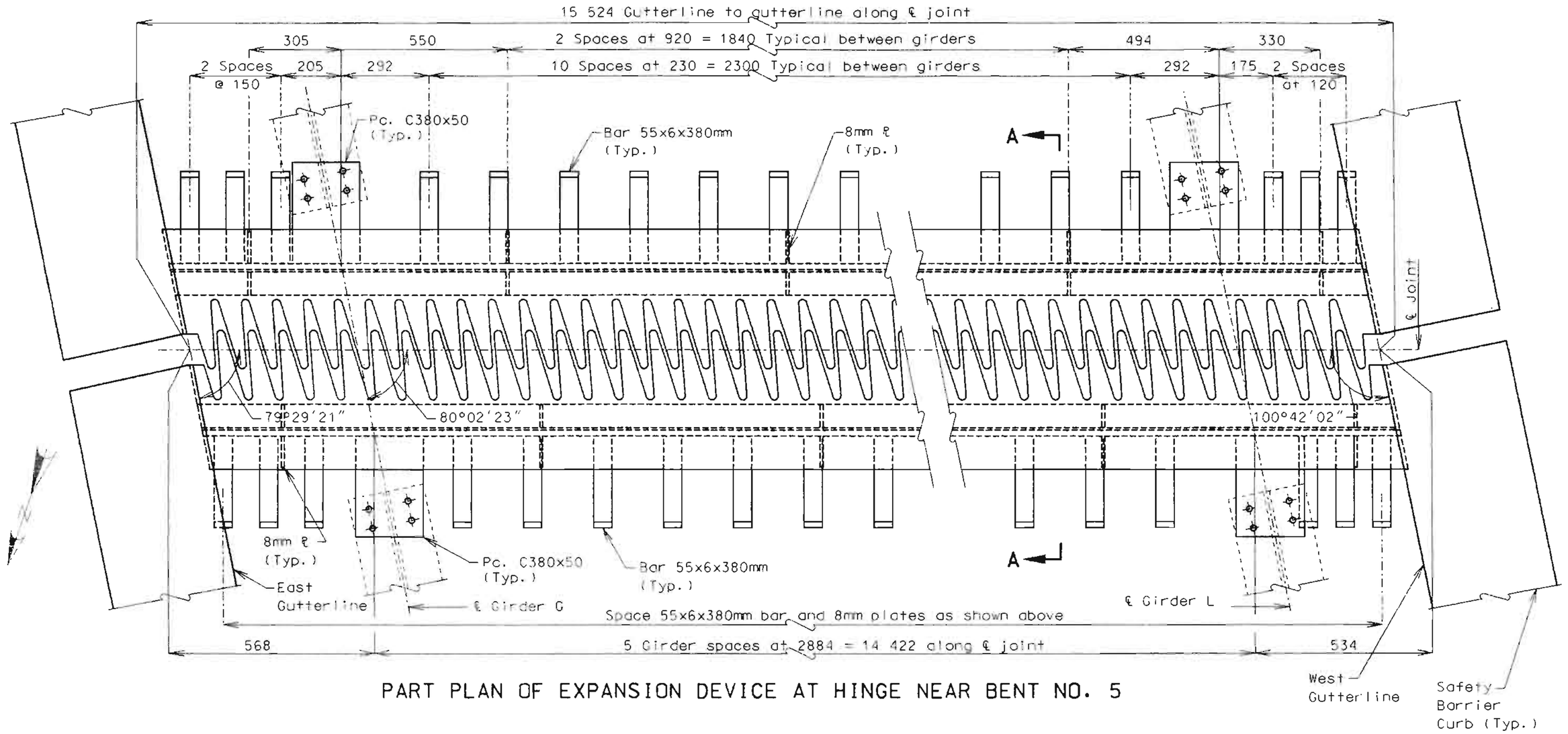
DRAWN BY:	SAC JAN. 1998
TRACED BY:	KRB JAN. 1998
CHECKED BY:	MLJ FEB. 1998

△ 8/12/99 Omit Sheet

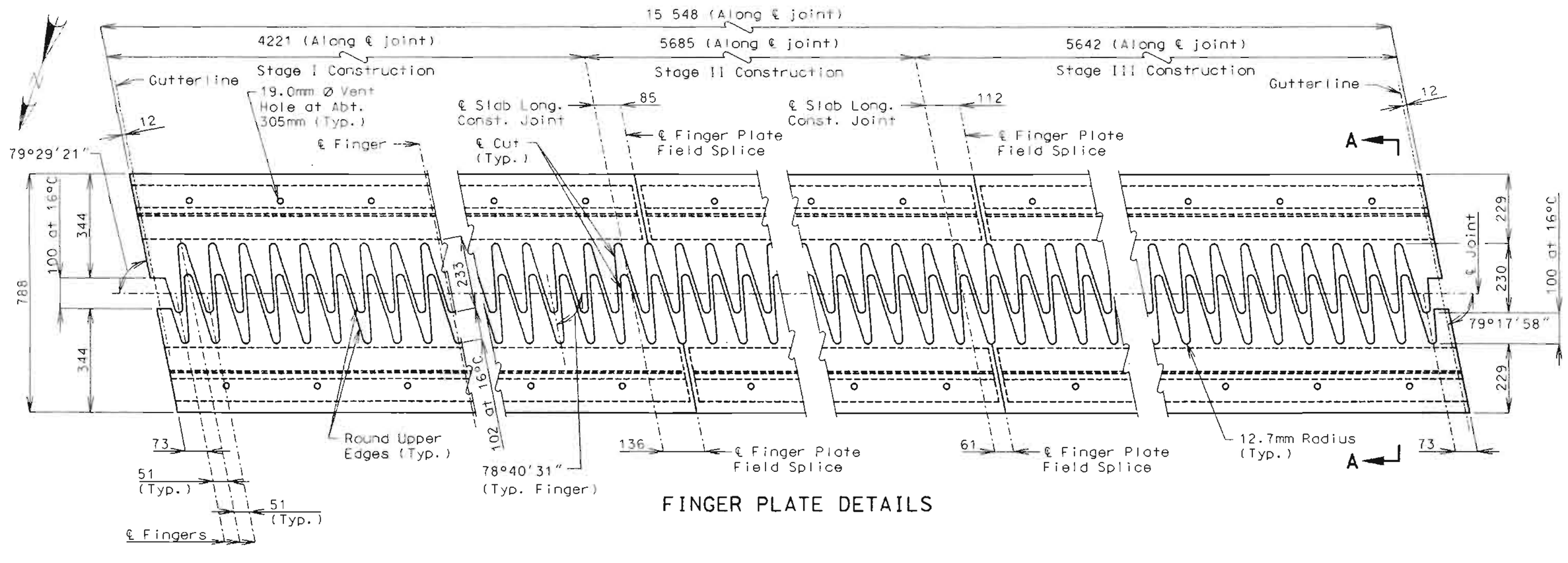
Note: This drawing is not to scale. Follow dimensions.

PROJECT NO. 98-047 PROJECT NAME: MoDOT Br. No. A16864-SB 1-435 over Rail road S:\98047\STR\A16864\DGN\RREXEB10.DGN

STATE	PROJ. NO.	SHEET NO.
MO.		311



PART PLAN OF EXPANSION DEVICE AT HINGE NEAR BENT NO. 5



FINGER PLATE DETAILS

Notes:

Finger skew is different than skew of plate ends. Skew of plate ends are not equal. See finger plate details this sheet.

Finger plate shall be cut with a machine guided gas torch from one plate. The plate from which fingers are cut may be spliced before fingers are cut. The surface of cut shall be perpendicular to the surface of plate. The cut shall not exceed 3mm in width. The centerline of cut shall not deviate more than 2mm from the position of centerline of cut shown. After fingers are cut, the plate shall then be cut into sections as shown for the staged construction.

Plan dimensions are based on installation at 16 degree Celsius. The expansion gap and other dimensions shall be increased 7mm for each 5 degree Celsius fall and decreased 7mm for each 5 degree Celsius rise in temperature at installation.

Material for the expansion device shall be ASTM A709M Grade 250 structural steel.

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

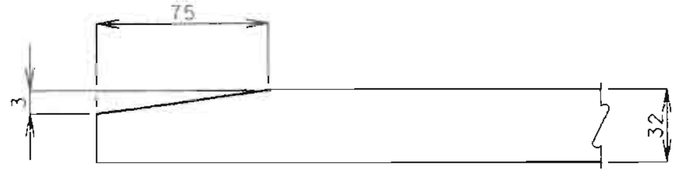
Payment for furnishing, coating or galvanizing, and installing structural steel for the expansion device will be made at the contract unit price for Expansion Device (Finger Plate) per meter.

Concrete shall be forced under and around finger plate supporting hardware, angles and bars. Proper consolidation shall be achieved by localized internal vibration.

Use 19.0mm diameter high strength bolts.

Adjust spacing of stiffener plates, flat bars and slotted holes as required to maintain 75mm clear to finger plate field splice.

For Section A-A, barrier curb plates and miscellaneous details, see Sheet No. 22.



FINGER DETAIL

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
7020 ROOE PARKWAY, KANSAS CITY, MISSOURI 64114 816-361-2888

DRAWN BY:	DJM	JAN. 1998
TRACED BY:	JHH	JAN. 1998
CHECKED BY:	KLW	FEB. 1998

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

JACKSON COUNTY

FINGER PLATE EXPANSION DEVICE DETAILS HINGE NEAR BENT NO. 5

SHEET NO. 21 OF 29

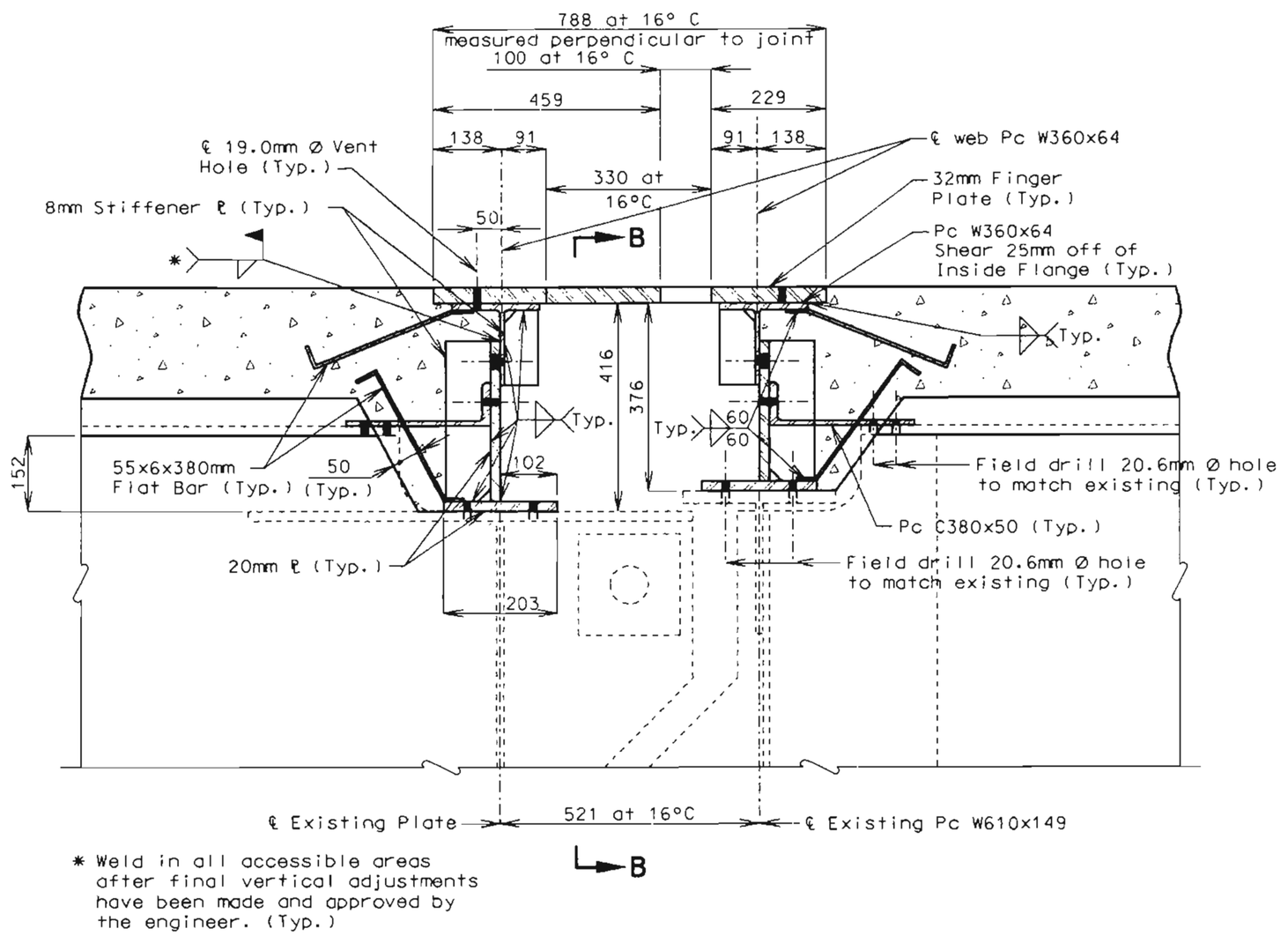
A16864

FOR INFORMATION ONLY

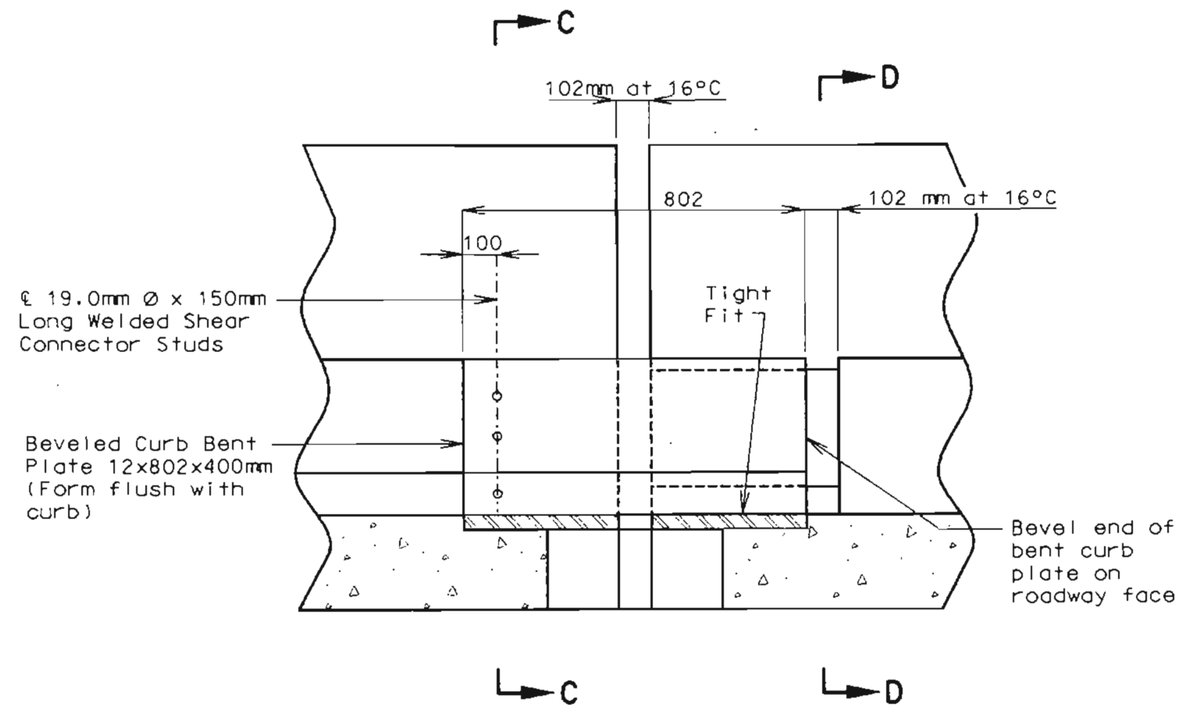
A16866, Sht. 98

PROJECT No. 98-041 PROJECT NAME: MODOT-Br. No. A6864-58 I-435 over Railroad Tracks S:\98047\STR\A16864\DGN\R02P.DGN

STATE	PROJ. NO.	SHEET NO.
MO.		312

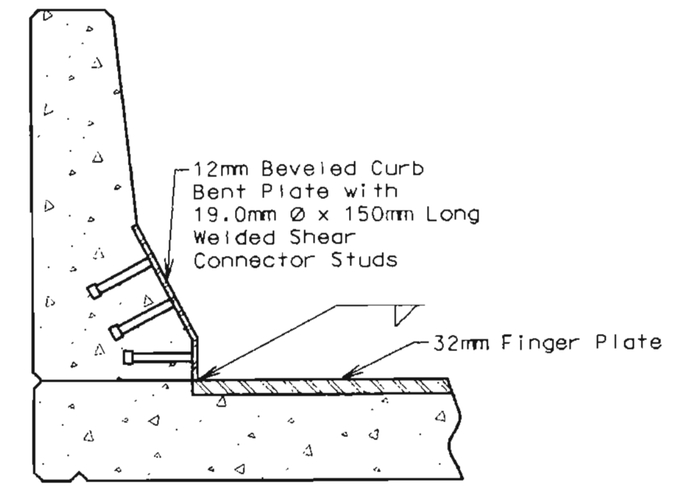


SECTION A-A

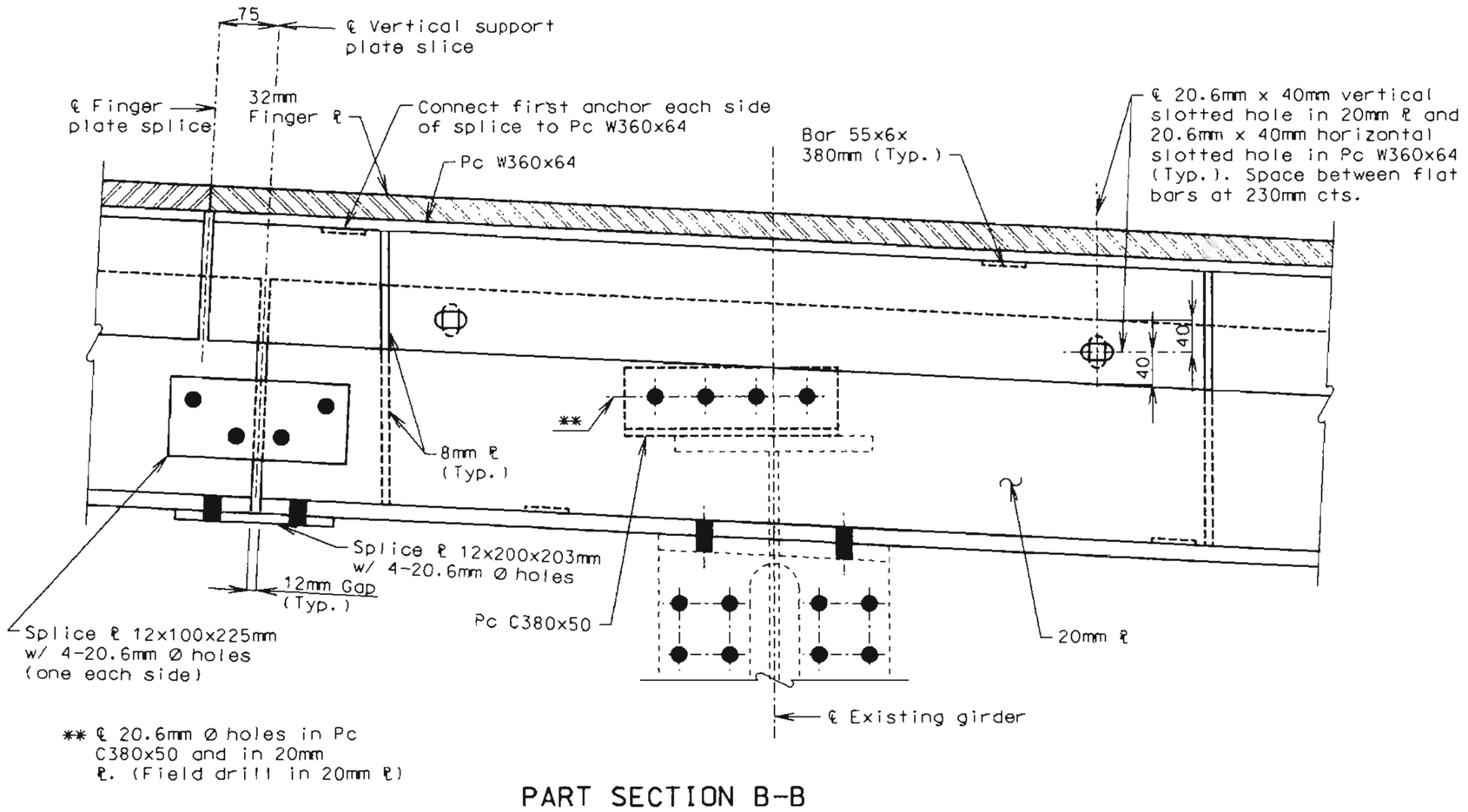


PART ELEVATION OF BARRIER CURB AT HINGE NEAR BENT NO. 5

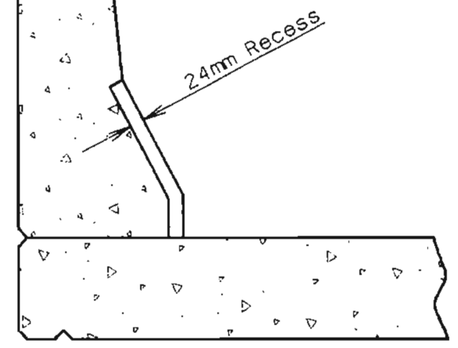
Left barrier shown, right barrier similar.



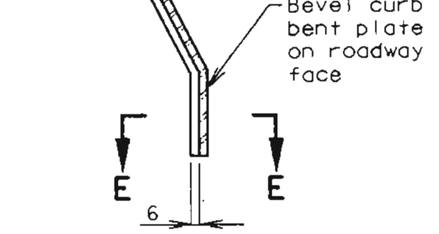
PART SECTION C-C



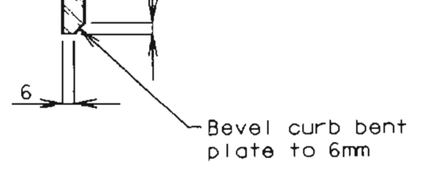
PART SECTION B-B



PART SECTION D-D



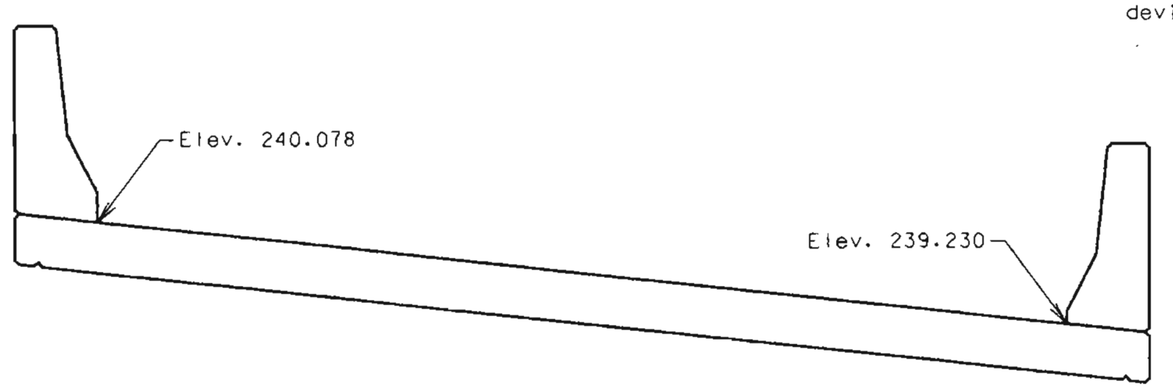
PART ELEVATION AT END OF BEVELED CURB BENT PLATE



SECTION E-E

Note:

For location of section A-A and expansion device notes, see Sheet No. 21.



SECTION ALONG ℄ HINGE

STATE OF MISSOURI
DONNA JUKE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION

DRAWN BY:	DJM	JAN. 1998
TRACED BY:	MAH	JAN. 1998
CHECKED BY:	KLW	FEB. 1998

JACKSON COUNTY

MISCELLANEOUS EXPANSION DEVICE DETAILS-HINGE NEAR BENT NO. 5

SHEET NO. 22 OF 29

A16864

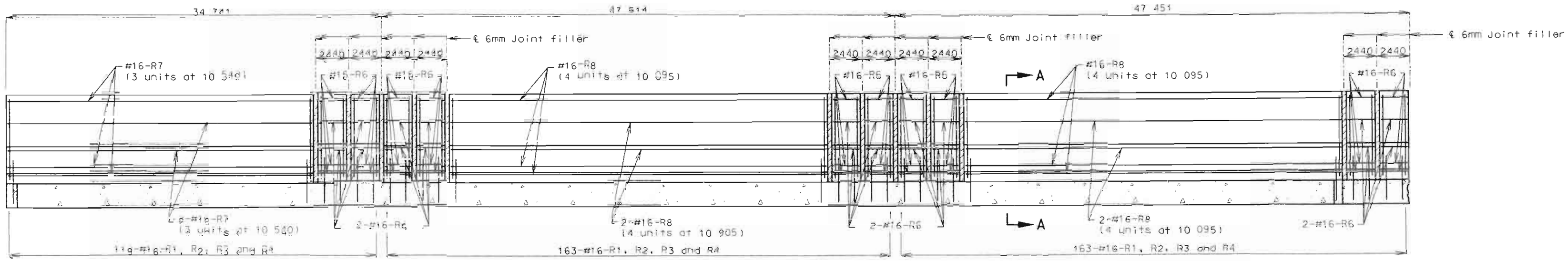
Note: This drawing is not to scale. Follow dimensions.

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A16864\DGN\BREXPSHS.DGN

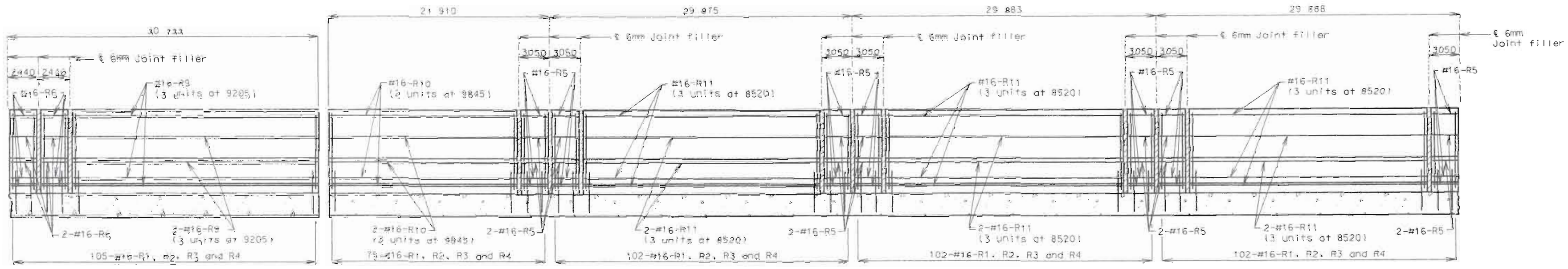
FOR INFORMATION ONLY

A16866, Sht. 99

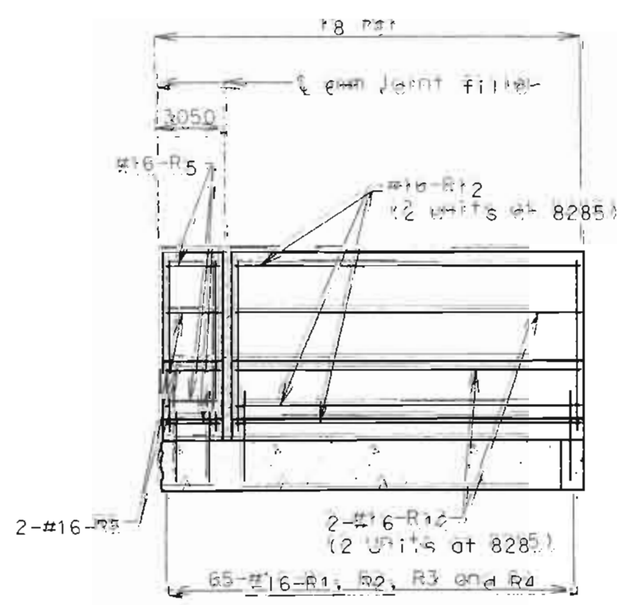
STATE	PROJ. NO.	SHEET NO.
MO.		313



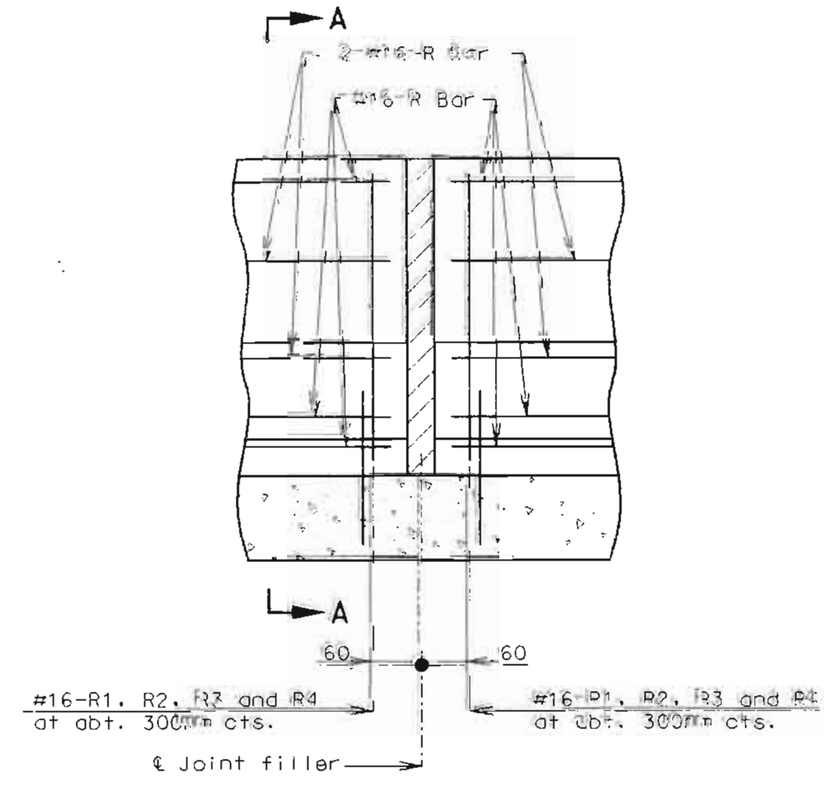
Span (1 - 2) Span (2 - 3) Span (3 - 4)



Span (4 - 5) Span (5 - 6) Span (6 - 7) Span (7 - 8) Span (8 - 9)



Span (9 - 10)



PART SECTION NEAR SAFETY BARRIER CURB

Notes:

Space R1, R2, R3 and R4 bars as shown in Part Section Near Safety Barrier Curb.

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

Longitudinal dimensions are taken from original construction plans and are along top of outside edge of slab parallel to grade.

See Sheet No. 25 for Section A-A and miscellaneous safety barrier curb details and notes.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION

DRAWN BY: DJM	JAN. 1998	
TRACED BY: KRB	JAN. 1998	
CHECKED BY: TAC	FEB. 1998	

JACKSON COUNTY

LEFT SAFETY BARRIER CURB DETAILS

SHEET NO. 23 OF 29

AI6864

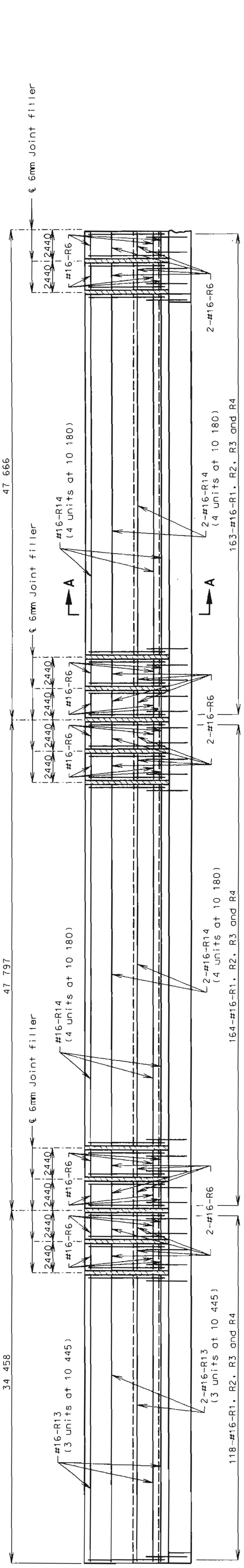
Note: This drawing is not to scale. Follow dimensions.

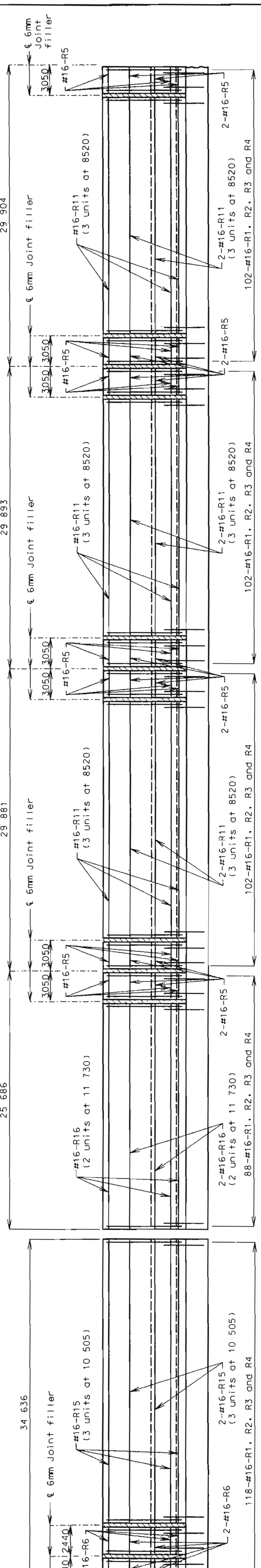
PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A16864-SB I-435 over Railroad Tracks S:\98047\STR\A16864.DGN

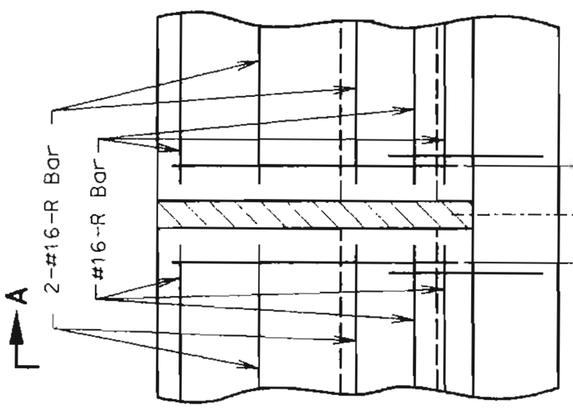
FOR INFORMATION ONLY

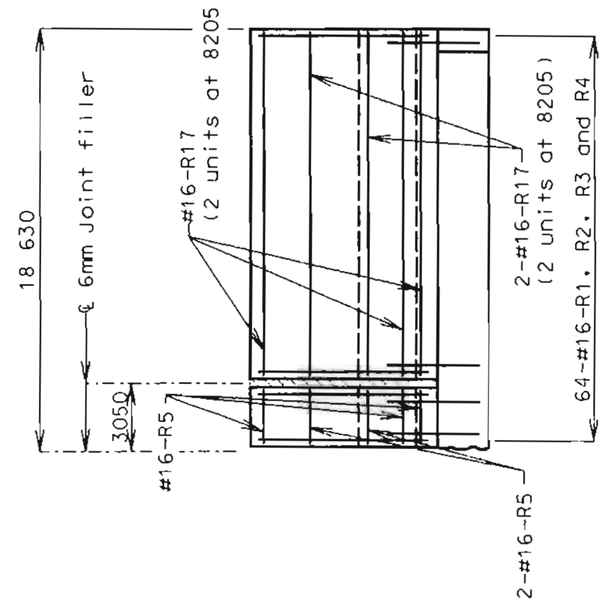
A16866, Sht. 100

STATE	PROJ. NO.	SHEET NO.
MO.		314









Notes:

Space R1. R2. R3 and R4 bars as shown in Part Section Near Safety Barrier Curb.

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

Longitudinal dimensions are taken from original construction plans and are along top of outside edge of slab parallel to grade.

See Sheet No. 25 for Section A-A and miscellaneous safety barrier curb details and notes.

STATE OF MISSOURI ★ DONNA JUNE MADER ★ NUMBER E-27011 ★ REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader 4-1-98

A16864

SHEET NO. 24 OF 29

JACKSON COUNTY

RIGHT SAFETY BARRIER CURB DETAILS

PART SECTION NEAR SAFETY BARRIER CURB

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

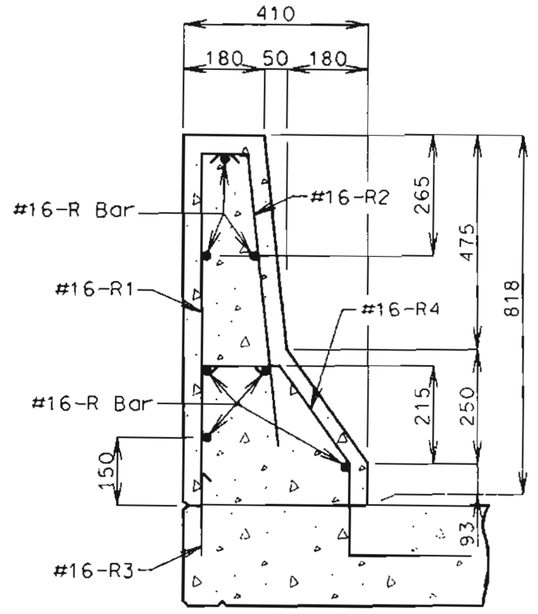
BUCHER, WILLIS & RATLIFF CORPORATION

DRAWN BY:	DJM	JAN. 1998
TRACED BY:	KRB	JAN. 1998
CHECKED BY:	TAC	FEB. 1998

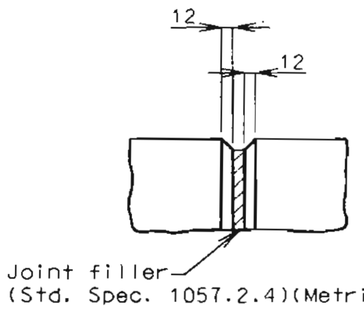
PROJECT No. 38-047 PROJECT NAME: MODOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\38047\STR\A16864\DGN\RRRTBAR.DGN

STATE	PROJ. NO.	SHEET NO.
MO.		315

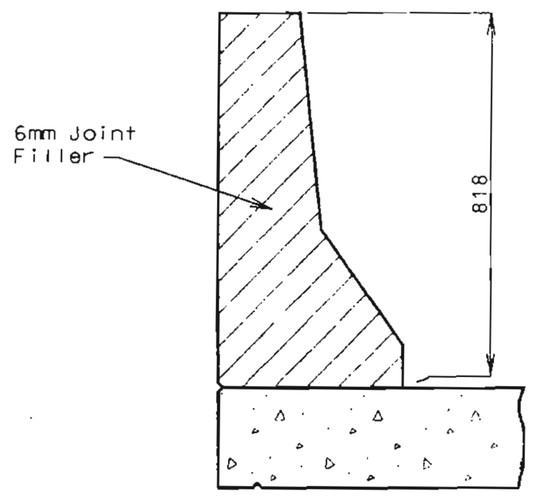
FOR INFORMATION ONLY



SECTION A-A

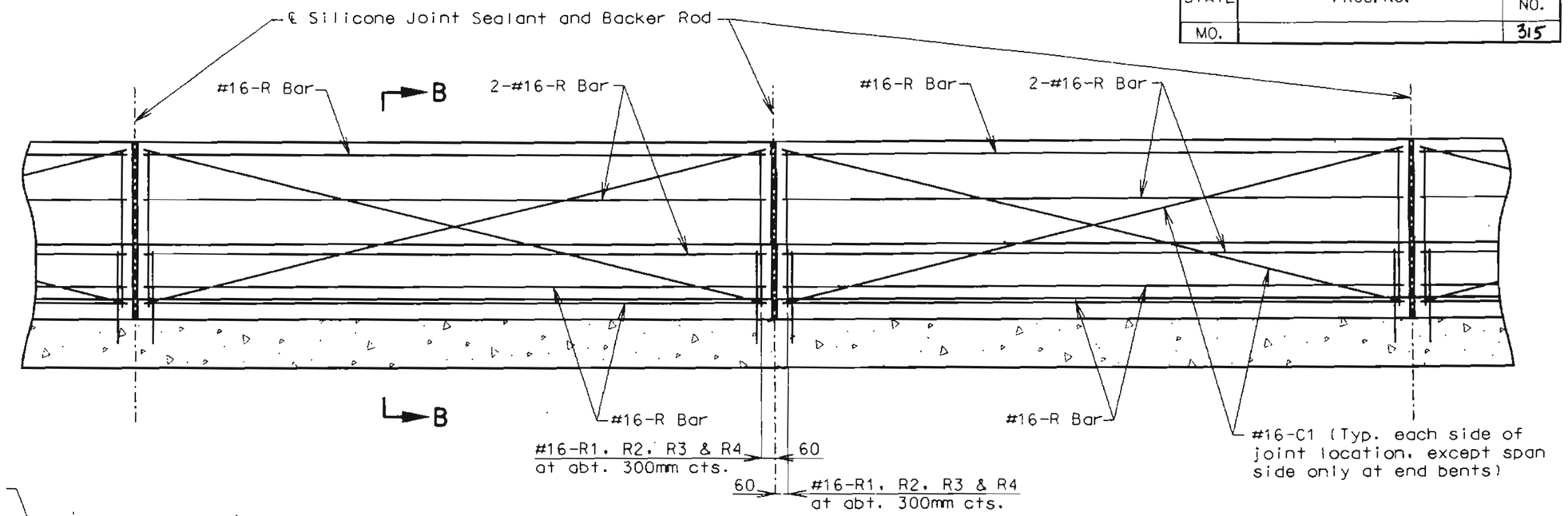


FILLED JOINT DETAIL

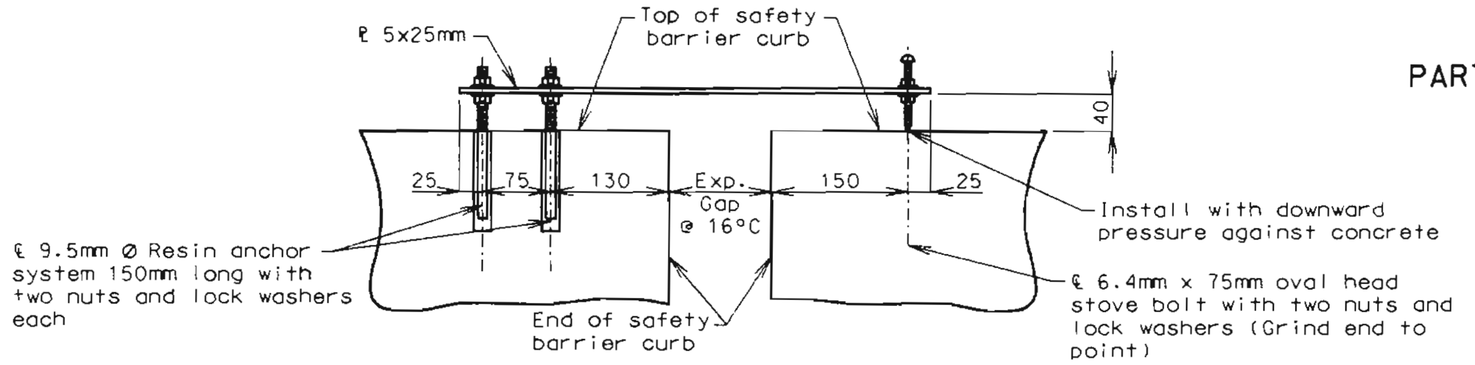


FILLED JOINT

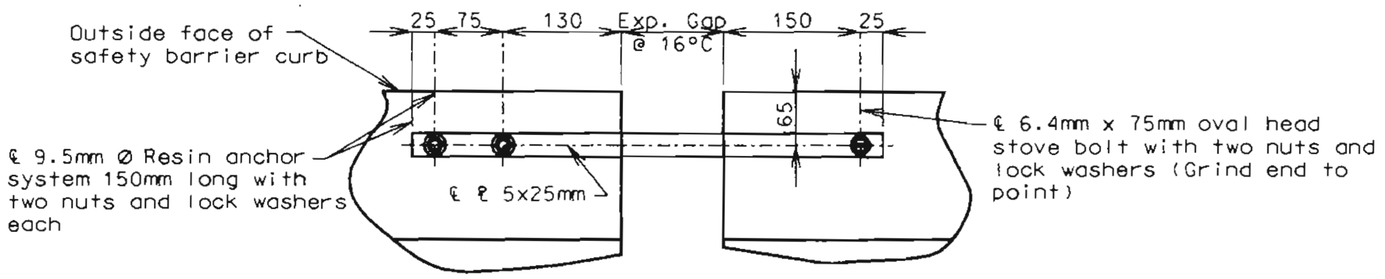
CAST-IN-PLACE BARRIER CURB DETAILS



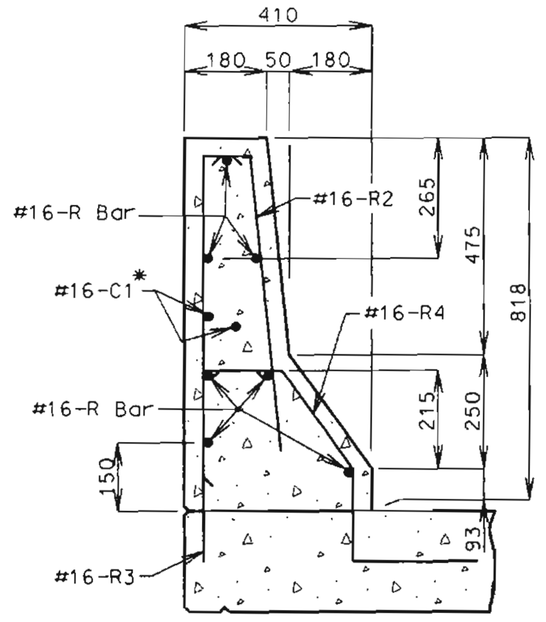
PART SECTION NEAR SAFETY BARRIER CURB
(OPTIONAL SLIP-FORM BARRIER)



PART ELEVATION OF BARRIER CURB
SHOWING MOVEMENT GAUGE

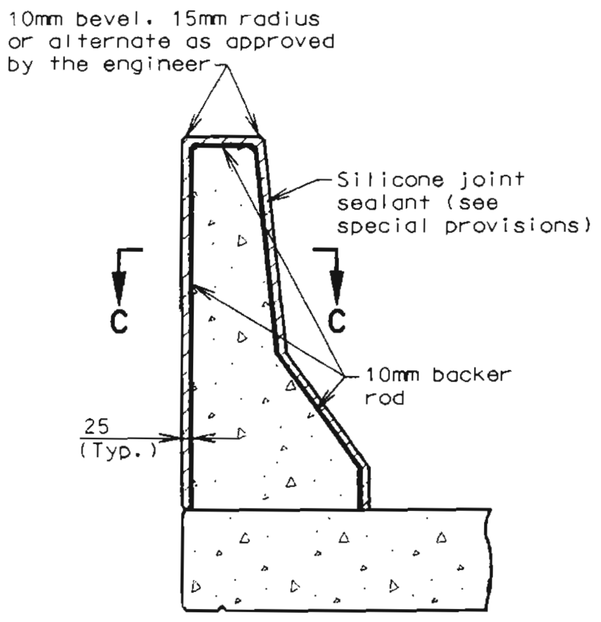


PART PLAN OF BARRIER CURB
SHOWING MOVEMENT GAUGE



SECTION B-B

* Each side of joint location, except
bridge side only at end bents



SECTION THRU JOINT

Notes:

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

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

Concrete in the safety barrier curb shall be class B1.

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

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

Joint sealant and backer rods shall be used on all slip-form safety barrier curbs instead of joint filler.

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

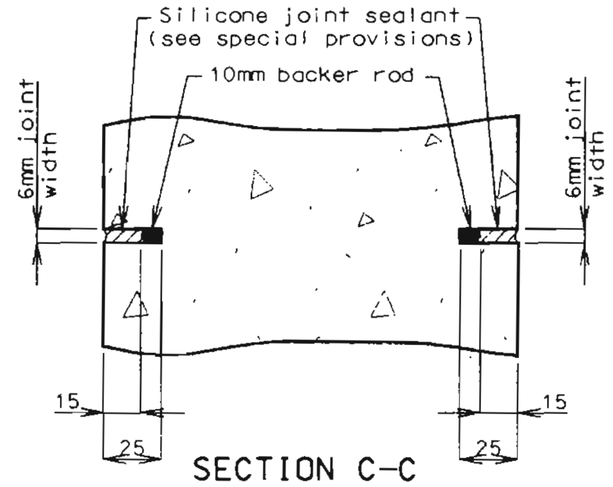
The cross-sectional area of the barrier curb above the slab = 212 225 sq. mm.

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

All steel for movement gauge shall be galvanized.

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

Field cut horizontal leg on R4 bars to allow clearance at end bents and finger joints.



SECTION C-C

SLIP-FORM BARRIER CURB DETAILS

JACKSON COUNTY

MISCELLANEOUS BARRIER CURB DETAILS

SHEET NO. 25 OF 29

A16864

BUCHER, Wwillis & RATLIFF CORPORATION

DRAWN BY:	DJM	JAN. 1998
TRACED BY:	MAH	JAN. 1998
CHECKED BY:	TAC	FEB. 1998

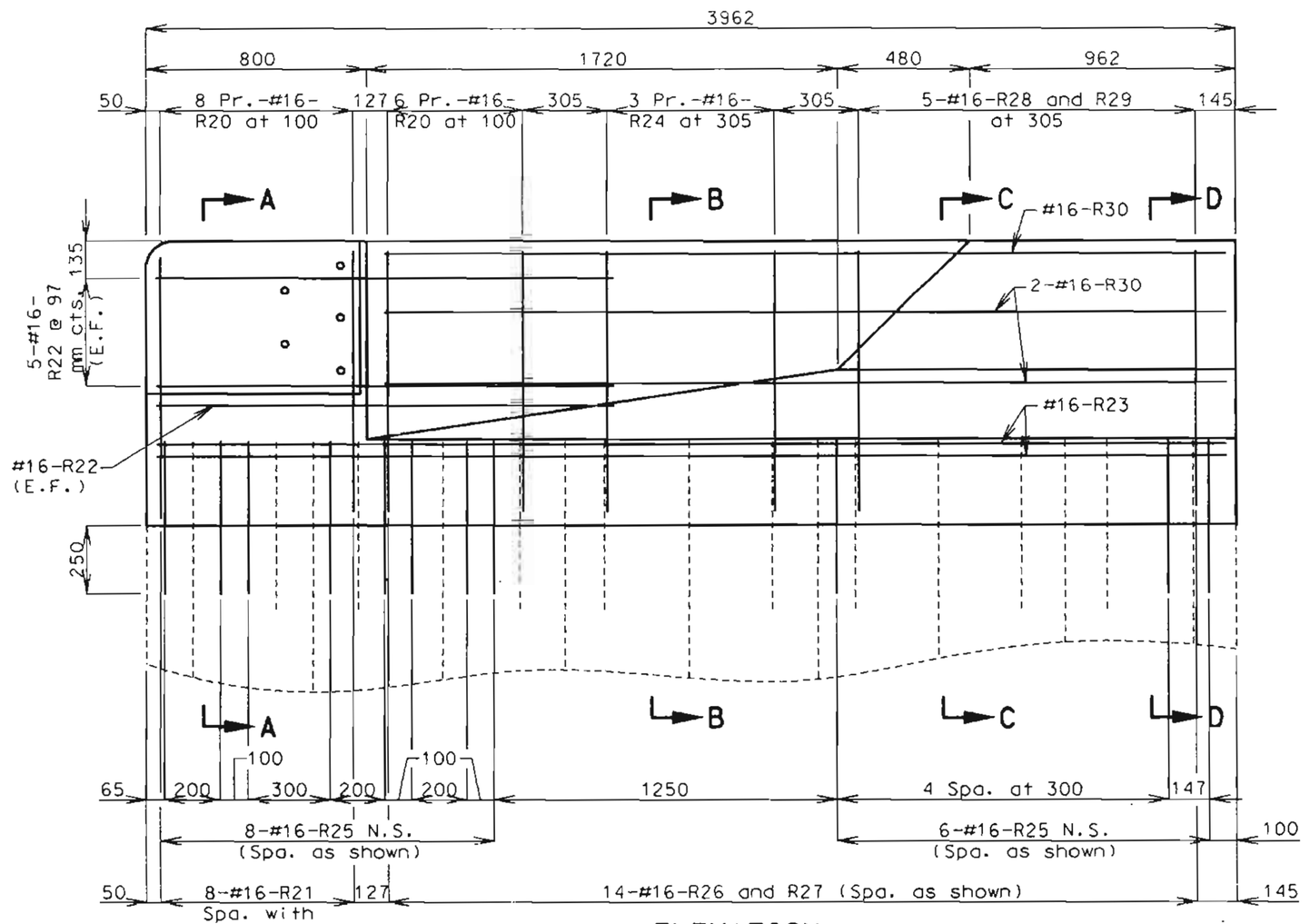
STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

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

PROJECT No. 98 041 PROJECT NAME: MoDOT-Br. No. A6864-SB I-435 over Railroad Tracks S:\98\41\STR\A6864\DGN\ARBARSEC.DGN

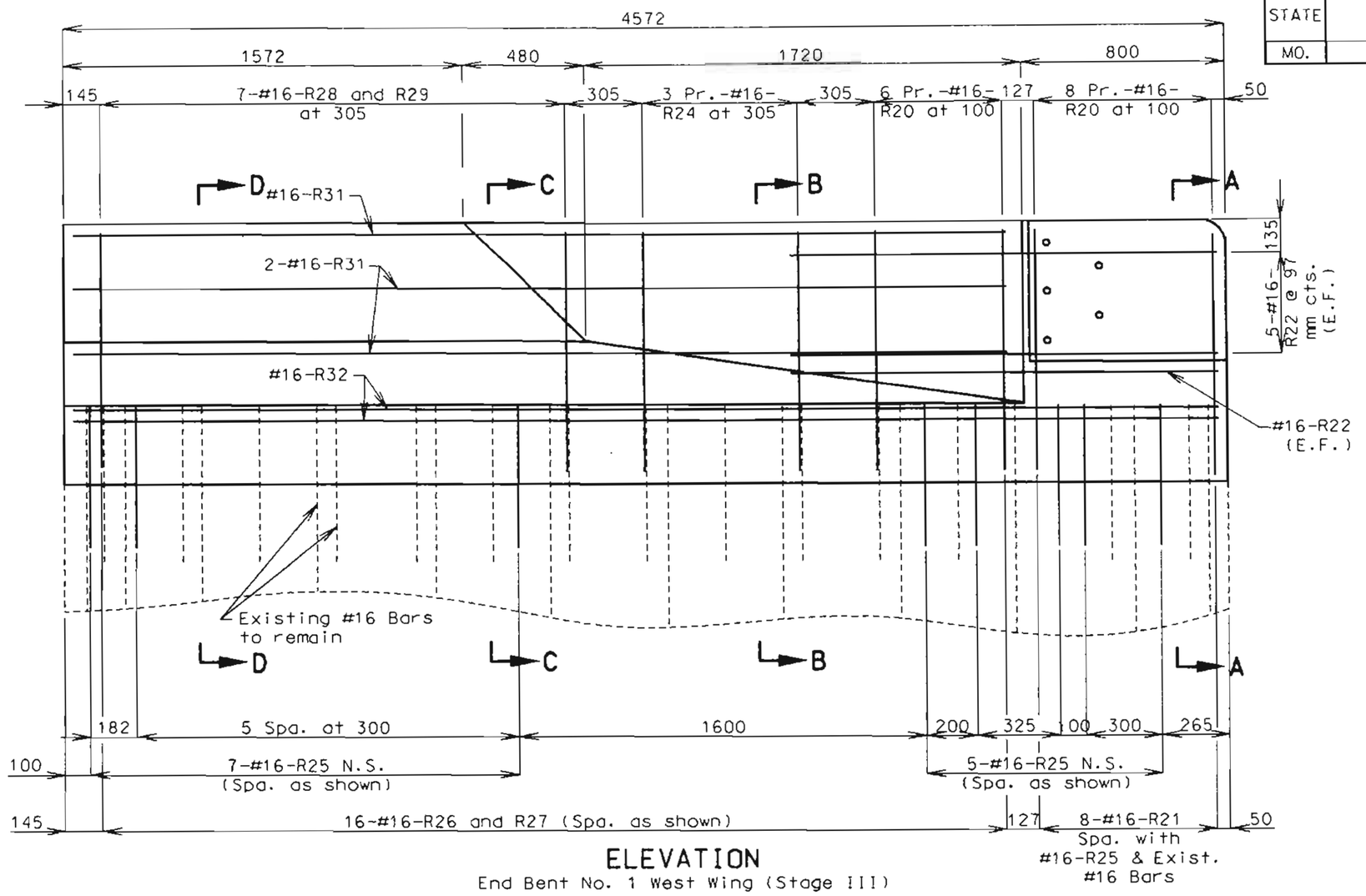
A16866, Sht. 102

STATE	PROJ. NO.	SHEET NO.
MO.		316



ELEVATION

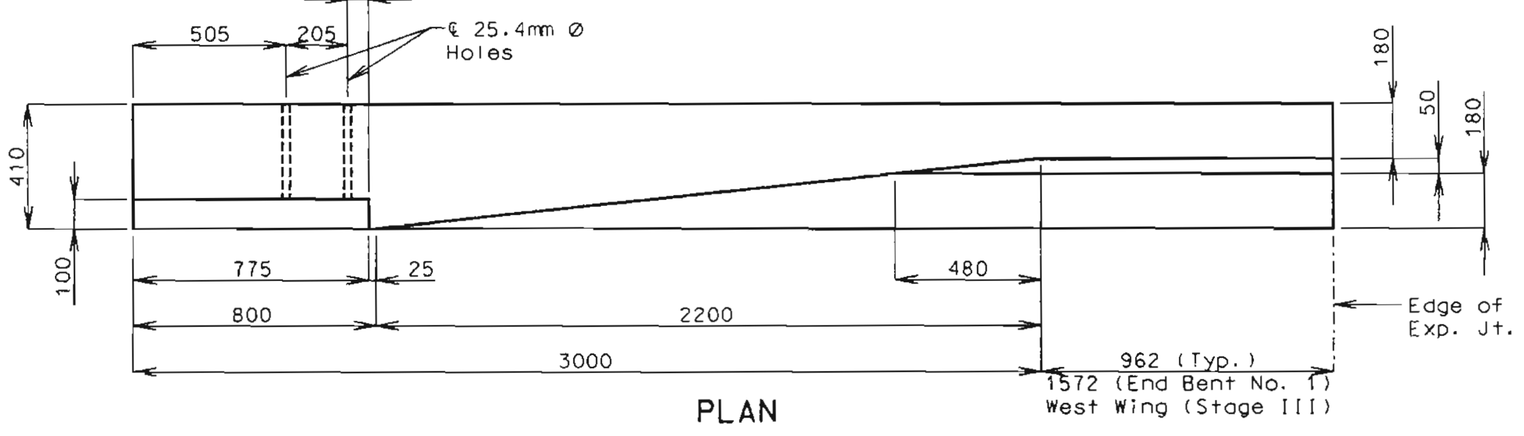
Typ. End Bent No. 1 East Wing (Stage I) and End Bent No. 10 East Wing (Stage I) and West Wing (Stage III)



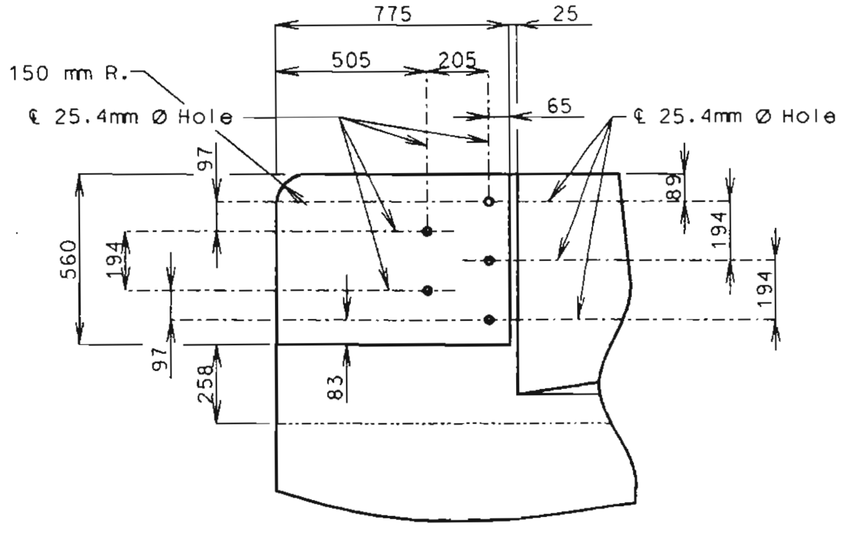
ELEVATION

End Bent No. 1 West Wing (Stage III)

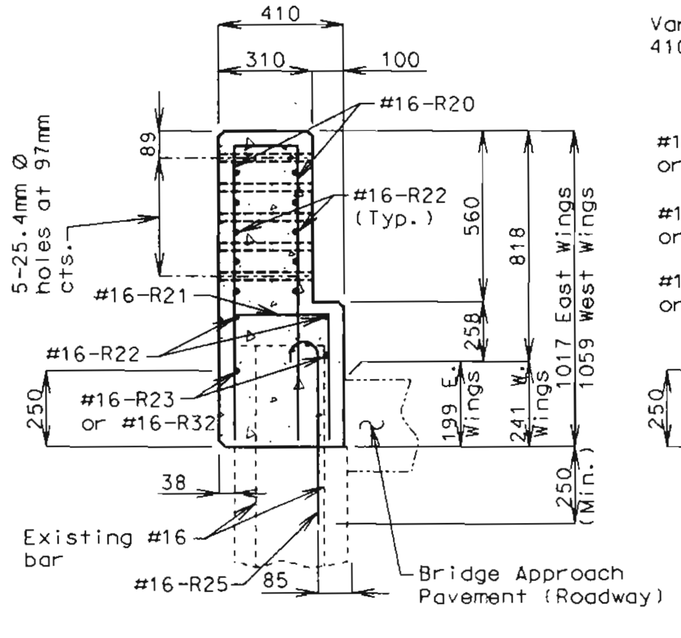
N.S. = Near Side
E.F. = Each Face



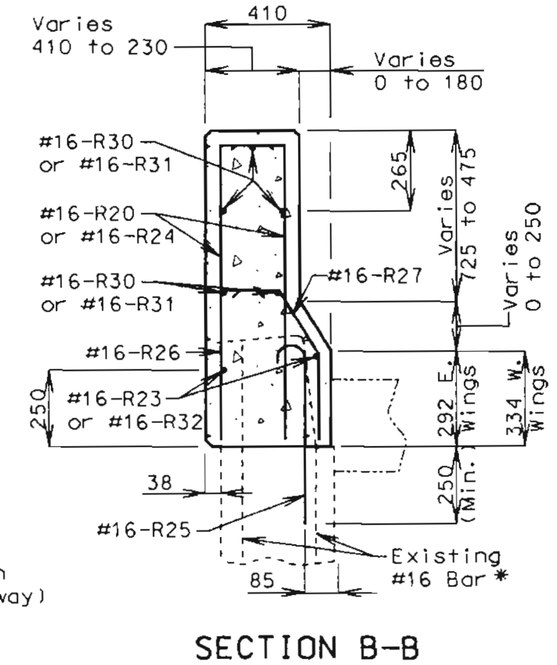
PLAN



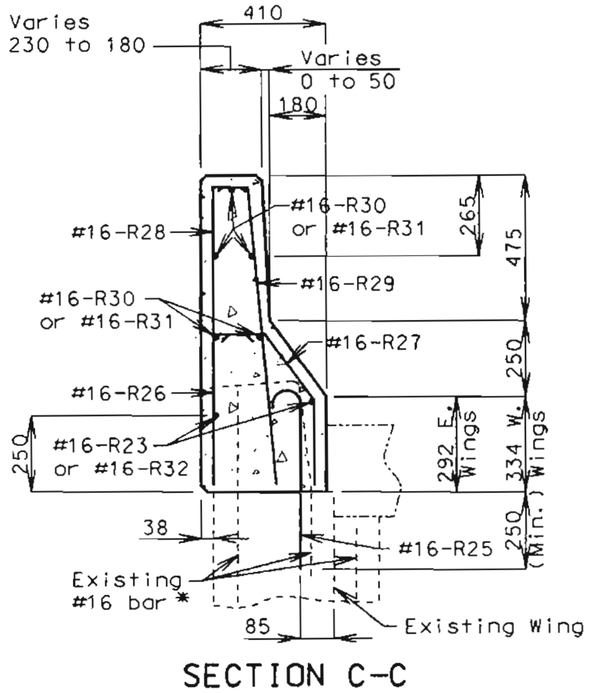
PART ELEVATION



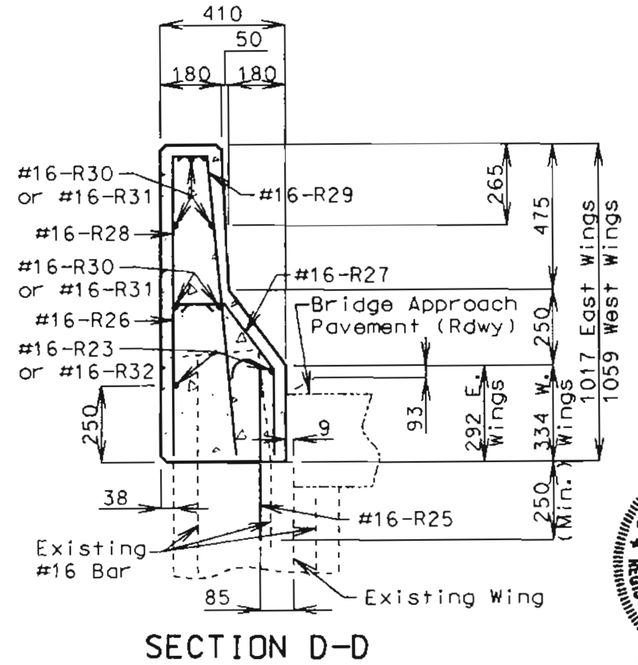
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

Notes:

* Cut and field bend existing bars as required to maintain 40mm clearance.

The contractor shall use one of the resin anchor systems listed in the job special provisions. These anchor systems shall be installed according to the manufacturer's specifications, except as modified by the job special provisions.

#16-R25 shall be used with the resin anchor system and shall have a minimum ultimate pullout strength of 68.9 kN in the existing concrete with f'c=21 MPa, see special provisions.

Cost of furnishing and installing #16-R25 and anchor system shall be included in the price bid for Safety Barrier Curb.

For additional barrier curb notes, see Sheet No. 25.

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna Mader 4-1-98

BUCHER, WILLIS & RATLIFF CORPORATION
1920 Main, Kansas City, Missouri 816 876-2500

DRAWN BY:	SAC	FEB. 1998
TRACED BY:	MAH	FEB. 1998
CHECKED BY:	KLW	FEB. 1998

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

JACKSON COUNTY

BARRIER CURB AT END BENTS

SHEET NO. 26 OF 29

A16864

PROJECT NO. 98-047 PROJECT NAME: MoDOT Br. No. A6864-58 I-435 over Railroad Tracks S:\98047\STR\A6864\DGN\RRBARBT.DGN

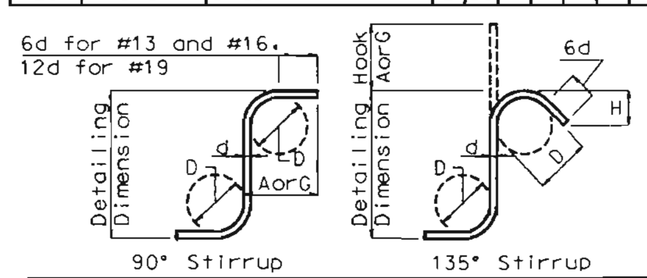
FOR INFORMATION ONLY

A16866, Sht. 103

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
Substructure																			
3		16-F1	Abut. Backwall	E	20		X			6095							6095	6095	28
4		19-H100	Abut. Backwall	E	20		X			6070							6070	6070	54
4		19-H101	Abut. Backwall	E	20		X			5250							5250	5250	47
31		13-U50	Abut. Backwall	E	10		X				250	225					725	675	21
Superstructure																			
76		16-C1	Slip Form Bar.	E	20					2450							2450	2450	289
996		16-R1	Barrier Curb	E	19	S				765	90						855	825	1275
996		16-R2	Barrier Curb	E	15	S				770	90				765	75	860	830	1283
996		16-R3	Barrier Curb	E	19	S				435	155						590	560	866
996		16-R4	Barrier Curb	E	27	S					155	290	220	305	230	170	970	910	1407
56		16-R5	Barrier Curb	E	20					2950							2950	2950	256
84		16-R6	Barrier Curb	E	20					2340							2340	2340	305
21		16-R7	Barrier Curb	E	20					10 540							10 540	10 540	344
56		16-R8	Barrier Curb	E	20					10 095							10 095	10 095	877
21		16-R9	Barrier Curb	E	20					9205							9205	9205	300
14		16-R10	Barrier Curb	E	20					9845							9845	9845	214
63		16-R11	Barrier Curb	E	20					8520							8520	8520	833
14		16-R12	Barrier Curb	E	20					8285							8285	8285	180
56		16-R20	Barrier Curb	E	19	S				930	230						1145	1110	96
16		16-R21	Barrier Curb	E	10	S					405	330					1140	1075	27
24		16-R22	Barrier Curb	E	20					1710							1710	1710	64
4		16-R23	Barrier Curb	E	20					3880							3880	3880	24
12		16-R24	Barrier Curb	E	19	S				960	170						1130	1100	20
28		16-R25	Barrier Curb	E	17					565							740	740	32
28		16-R26	Barrier Curb	E	19	S				480	150						630	600	26
28		16-R27	Barrier Curb	E	27	S					150	310	280		250	180	740	710	31
10		16-R28	Barrier Curb	E	19	S				960	90						1050	1020	16
10		16-R29	Barrier Curb	E	15	S				965	90				960	100	1055	1025	16
10		16-R30	Barrier Curb	E	20					3120							3120	3120	48
2069		16-S1	Slab	E	20					5570							5570	5570	17 886
17		16-S2	Slab	E	20			V	1	1540							1540	1540	86
			Inc. = 215							4980							4980	4980	
6		16-S3	Slab	E	20			V	1	690							690	690	24
			Inc. = 750							4440							4440	4440	
825		16-S4	Slab	E	20					12 190							12 190	12 190	15 608
33		16-S5	Slab	E	20					4930							4930	4930	252
40		16-S6	Slab	E	6					1500	220	250					1970	1890	117
2318		19-S7	Slab	E	20					5490							5490	5490	28 442
20		19-S8	Slab	E	20			V	1	1320							1320	1320	140
			Inc. = 190							4930							4930	4930	
6		19-S9	Slab	E	20			V	1	1140							1140	1140	37
			Inc. = 660							4440							4440	4440	
46		19-S10	Slab	E	20					12 190							12 190	12 190	1253
23		19-S11	Slab	E	20					7650							7650	7650	393
23		19-S12	Slab	E	20					8550							8550	8550	440
23		19-S13	Slab	E	20					18 290							18 290	18 290	940
23		19-S14	Slab	E	20					3550							3550	3550	182
6		16-S21	Slab	E	20			V	1	1375							1375	1375	30
			Inc. = 755							5150							5150	5150	
6		16-S22	Slab	E	20			V	1	1440							1440	1440	29
			Inc. = 660							4740							4740	4740	
33		16-S23	Slab	E	20					8230							8230	8230	422
6		19-S24	Slab	E	20			V	1	1475							1475	1475	42
			Inc. = 675							4850							4850	4850	
6		19-S25	Slab	E	20			V	1	1775							1775	1775	44
			Inc. = 590							4725							4725	4725	
92		19-S26	Slab	E	20					13 600							13 600	13 600	2796
8		16-S66	Slab	E	20					1030							1030	1030	13

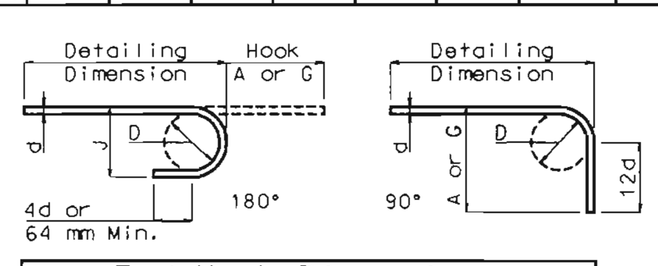
Two additional 16-S1 and 19-S7 are included in bar bill for testing.



Stirrup Hook Dimensions

Bar Size	D (mm)	All Grades 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.

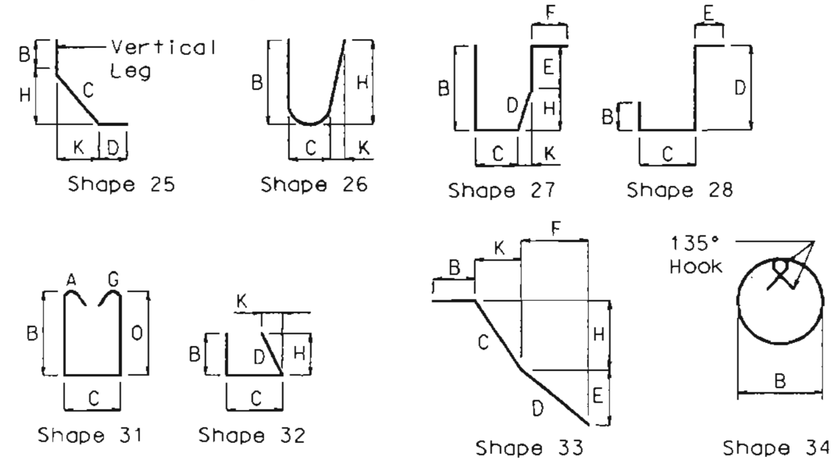


End Hook Dimensions

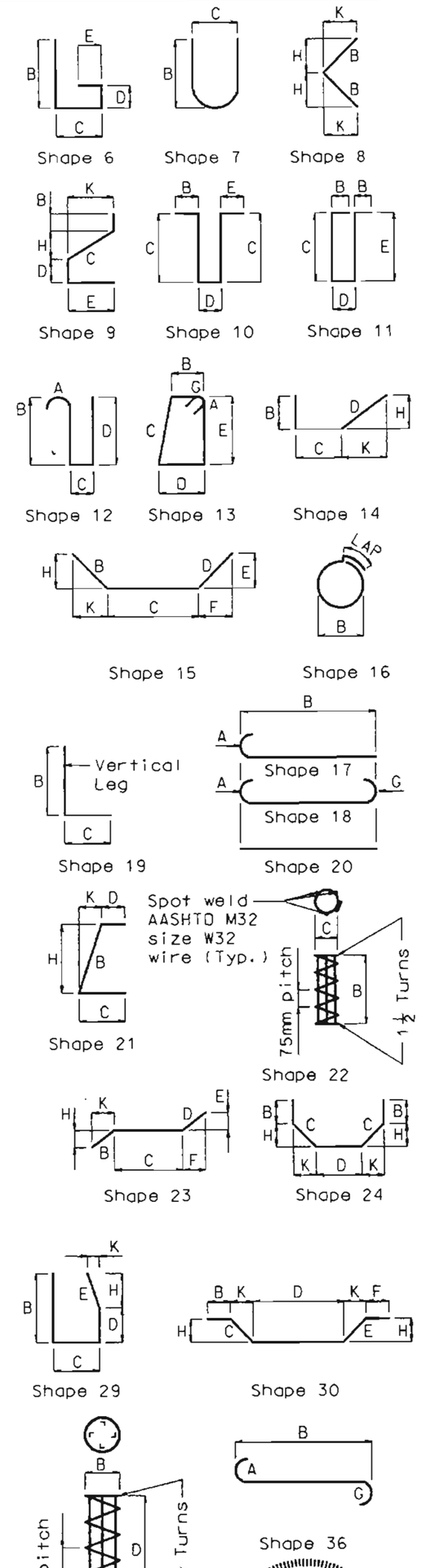
Bar Size	All Grades D (mm)	180° Hook A OR G	180° Hook J	90° Hook A OR G
#10	60	125	80	150
#13	80	150	105	200
#16	95	175	130	250
#19	115	200	155	300
#22	135	250	180	375
#25	155	275	205	425
#29	240	375	300	475
#32	275	425	335	550
#36	305	475	375	600
#43	465	675	550	775

Notes:

All standard hooks and bends other than 180 deg. are to be bent with same procedure as for 90 deg. 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 5mm)
Actual lengths are measured along centerline bar to the nearest 5mm.
Pay items 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 MO. | PROJ. NO. | SHEET NO. 317

FOR INFORMATION ONLY

A16866, Sht. 104

BUCHER, WILLIS & RATLIFF CORPORATION
2929 Baird Parkway Kansas City, Missouri 64114 816-363-2696

DRAWN BY:	MAH	FEB. 1998
TRACED BY:	MAH	FEB. 1998
CHECKED BY:	DJM	FEB. 1998

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

STATE OF MISSOURI
DONNA JUNE MADER
NUMBER E-27011
REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader
4-1-98

JACKSON COUNTY

BILL OF REINFORCING STEEL - STAGE I

SHEET NO. 27 OF 29

A16864

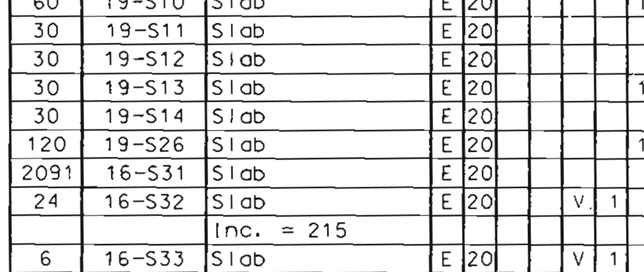
PROJECT No. 98-047 PROJECT NAME: MoDOT-Br.-No. A6864-SB I-435 over Railroad Tracks S:\98047\STR\A6864\DGN\RRBORI.DGN

Bill Of Reinforcing Steel

No. Req'd.	Mark No. Size	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
Substructure																			
4	19	H102	Abut. Backwall	E	20		X			7605							7605	7605	68
4	19	H103	Abut. Backwall	E	20		X			6635							6635	6635	59
41	13	U50	Abut. Backwall	E	10		X				250	225					725	675	28
Superstructure																			
1025	16	S4	Slab	E	20					12 190							12 190	12 190	19 392
52	16	S6	Slab	E	6					1500	220	250					1970	1890	153
60	19	S10	Slab	E	20					12 190							12 190	12 190	1635
30	19	S11	Slab	E	20					7650							7650	7650	513
30	19	S12	Slab	E	20					8550							8550	8550	573
30	19	S13	Slab	E	20					18 290							18 290	18 290	1226
30	19	S14	Slab	E	20					3550							3550	3550	238
120	19	S26	Slab	E	20					13 600							13 600	13 600	3648
2091	16	S31	Slab	E	20					6610							6610	6610	21 451
24	16	S32	Slab	E	20			V	1	1525							1525	1525	149
			Inc. = 215							6470							6470	6470	
6	16	S33	Slab	E	20			V	1	1860							1860	1860	35
			Inc. = 740							5560							5560	5560	
41	16	S34	Slab	E	20					6490							6490	6490	413
2341	19	S35	Slab	E	20					6530							6530	6530	34 166
28	19	S36	Slab	E	20			V	1	1340							1340	1340	244
			Inc. = 190							6470							6470	6470	
8	19	S37	Slab	E	20			V	1	940							940	940	58
			Inc. = 660							5560							5560	5560	
7	16	S41	Slab	E	20			V	1	1840							1840	1840	44
			Inc. = 750							6340							6340	6340	
8	16	S42	Slab	E	20			V	1	1740							1740	1740	50
			Inc. = 660							6360							6360	6360	
41	16	S43	Slab	E	20					9610							9610	9610	612
8	19	S44	Slab	E	20			V	1	1700							1700	1700	72
			Inc. = 670							6390							6390	6390	
9	19	S45	Slab	E	20			V	1	1510							1510	1510	77
			Inc. = 585							6190							6190	6190	

Bill Of Reinforcing Steel

No. Req'd.	Mark No. Size	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



Stirrup Hook Dimensions

Bar Size	D (mm)	All Grades 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

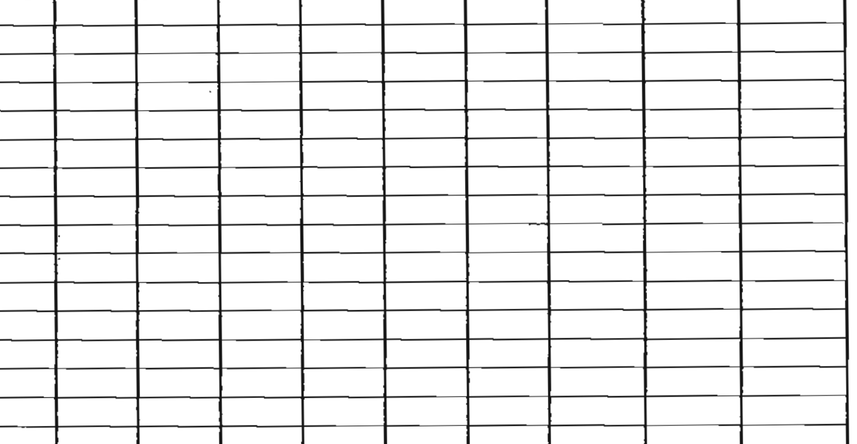
Note: Unless otherwise noted diameter "D" is the same for all bends and hooks on a bar.

End Hook Dimensions

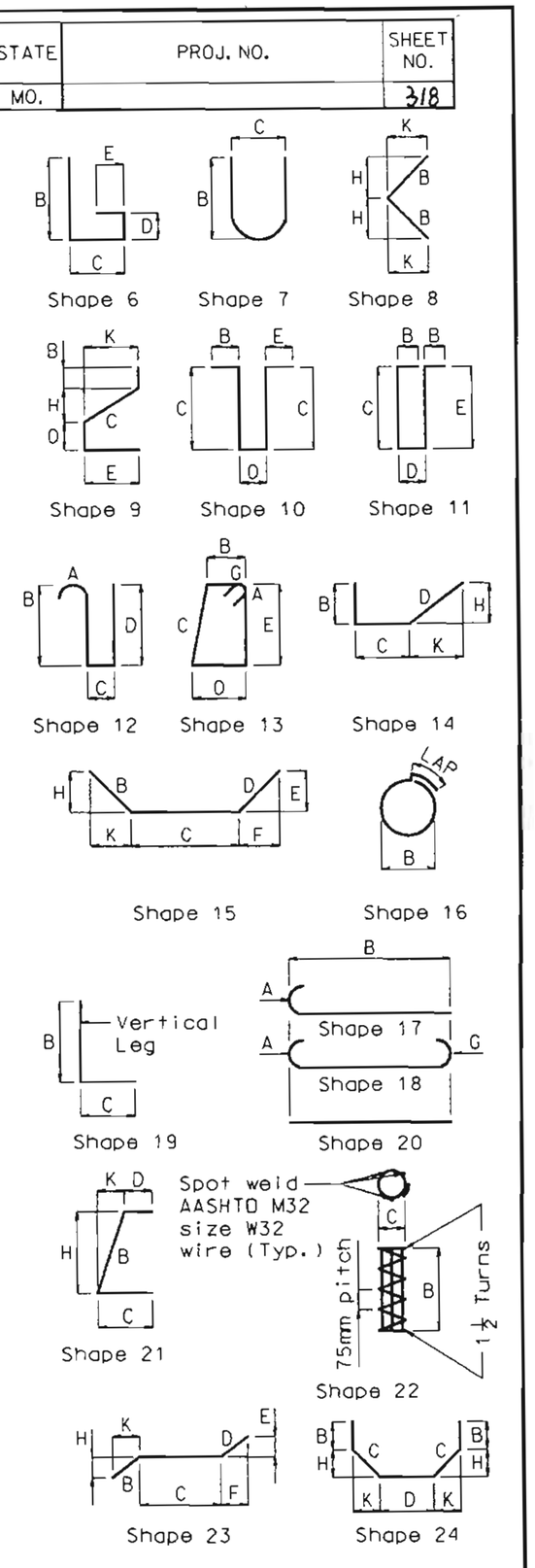
Bar Size	D (mm)	All Grades 180° Hook A OR G	180° Hook J	90° Hook A OR G
#10	60	125	80	150
#13	80	150	105	200
#16	95	175	130	250
#19	115	200	155	300
#22	135	250	180	375
#25	155	275	205	425
#29	240	375	300	475
#32	275	425	335	550
#36	305	475	375	600
#43	465	675	550	775

Notes:

All standard hooks and bends other than 180 deg. are to be bent with same procedure as for 90 deg. 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 dimensians shown in bending diagrams and are listed for fabricator's use. (Nearest 5mm)
Actual lengths are measured along centerline bar to the nearest 5mm.
Pay items 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 MO. | PROJ. NO. | SHEET NO. 3/8

JACKSON COUNTY

BILL OF REINFORCING STEEL - STAGE II

SHEET NO. 28 OF 29

AI6864

BUCHER, WILLIS & RATLIFF CORPORATION
7920 WARD PARKWAY KANSAS CITY, MISSOURI 64114 816-363-2666

DRAWN BY:	MAH	FEB. 1998
TRACED BY:	MAH	FEB. 1998
CHECKED BY:	DJM	FEB. 1998

STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER DONNA JUNE MADER NUMBER E-27011
Donna J. Mader 4-1-98

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

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A6864-SB 1-435 over Railroad Tracks S:\98047\STR\A6864\DGN\RRBDR2.DGN

FOR INFORMATION ONLY

A16866, Sht. 105

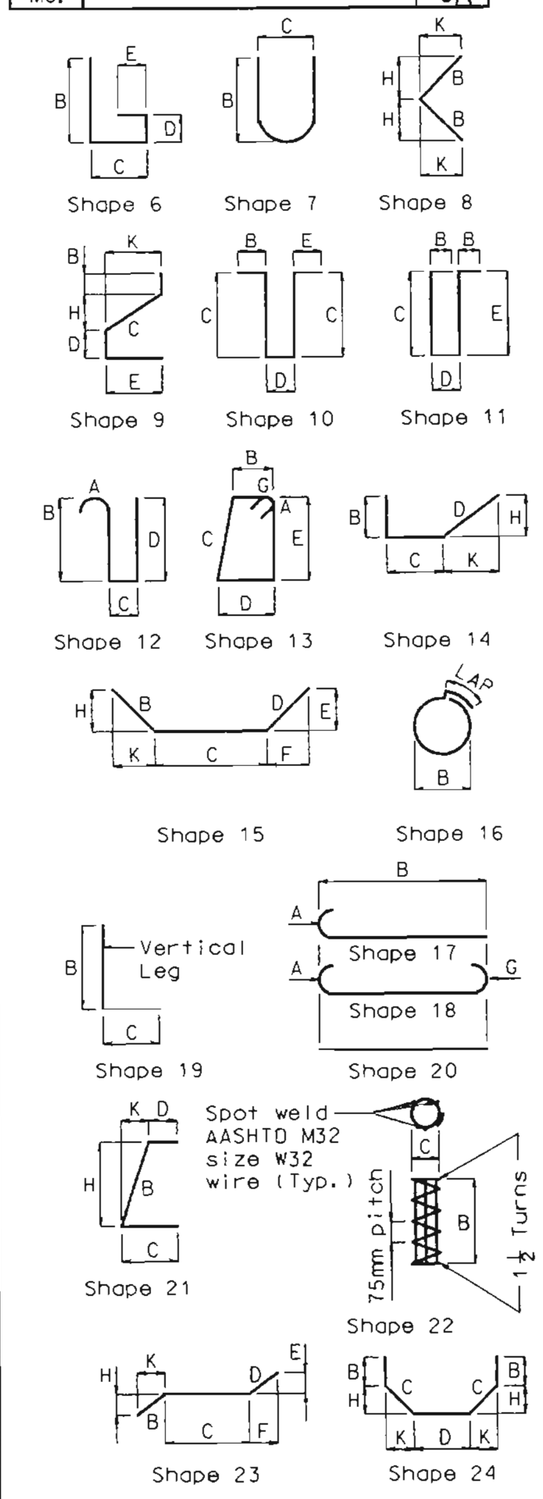
Bill Of Reinforcing Steel

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
Substructure																			
3	16	F1	Abut. Backwall	E	20		X			6095							6095	6095	28
4	19	H104	Abut. Backwall	E	20		X			6370							6370	6370	57
4	19	H105	Abut. Backwall	E	20		X			5510							5510	5510	49
41	13	U50	Abut. Backwall	E	10		X				250	225					725	675	28
Superstructure																			
76	16	C1	Slip Form Bar.	E	20					2450							2450	2450	289
1021	16	R1	Barrier Curb	E	19	S				765	90						855	825	1307
1021	16	R2	Barrier Curb	E	15	S				770	90				765	75	860	830	1315
1021	16	R3	Barrier Curb	E	19	S				435	155						590	560	887
1021	16	R4	Barrier Curb	E	27	S					155	290	220	305	230	170	970	910	1442
56	16	R5	Barrier Curb	E	20					2950							2950	2950	256
84	16	R6	Barrier Curb	E	20					2340							2340	2340	305
63	16	R11	Barrier Curb	E	20					8520							8520	8520	833
21	16	R13	Barrier Curb	E	20					10 445							10 445	10 445	340
56	16	R14	Barrier Curb	E	20					10 180							10 180	10 180	885
21	16	R15	Barrier Curb	E	20					10 505							10 505	10 505	342
14	16	R16	Barrier Curb	E	20					11 730							11 730	11 730	255
14	16	R17	Barrier Curb	E	20					8205							8205	8205	178
56	16	R20	Barrier Curb	E	19	S				930	230						1145	1110	96
16	16	R21	Barrier Curb	E	10	S					405	330					1140	1075	27
24	16	R22	Barrier Curb	E	20					1710							1710	1710	64
2	16	R23	Barrier Curb	E	20					3880							3880	3880	12
12	16	R24	Barrier Curb	E	19	S				960	170						1130	1100	20
26	16	R25	Barrier Curb	E	17					565							740	740	30
30	16	R26	Barrier Curb	E	19	S				480	150						630	600	28
30	16	R27	Barrier Curb	E	27	S					150	310	280		250	180	740	710	33
12	16	R28	Barrier Curb	E	19	S				960	90						1050	1020	19
12	16	R29	Barrier Curb	E	15	S				965	90				960	100	1055	1025	19
5	16	R30	Barrier Curb	E	20					3120							3120	3120	24
5	16	R31	Barrier Curb	E	20					3730							3730	3730	29
2	16	R32	Barrier Curb	E	20					4490							4490	4490	14
1075	16	S4	Slab	E	20					12 190							12 190	12 190	20 338
54	16	S6	Slab	E	6					1890	220	250					1970	1890	158
62	19	S10	Slab	E	20					12 190							12 190	12 190	1689
31	19	S11	Slab	E	20					7650							7650	7650	530
31	19	S12	Slab	E	20					8550							8550	8550	592
31	19	S13	Slab	E	20					18 290							18 290	18 290	1267
31	19	S14	Slab	E	20					3550							3550	3550	246
124	19	S26	Slab	E	20					13 600							13 600	13 600	3769
2126	16	S51	Slab	E	20					5860							5860	5860	19 335
25	16	S52	Slab	E	20			V	1	610							610	610	124
			Inc. = 215							5770							5770	5770	
7	16	S53	Slab	E	20			V	1	1350							1350	1350	38
			Inc. = 730							5730							5730	5730	

Bill Of Reinforcing Steel

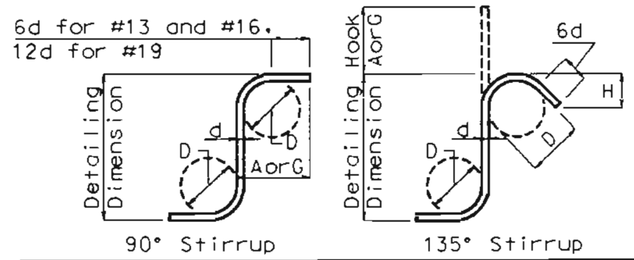
No. Req'd.	Mark No. Size	Mark No. Mark	Location	Epoxy (E)	Shape No.	Stirrup (S)	Substr. (X)	Varies (V)	No. Each	Dimensions B mm	C mm	D mm	E mm	F mm	H mm	K mm	Nominal Length mm	Actual Length mm	Mass kg
43	16	S54	Slab	E	20					8180							8180	8180	546
2381	19	S55	Slab	E	20					5860							5860	5860	31 184
27	19	S56	Slab	E	20			V	1	730							730	730	193
			Inc. = 190							5670							5670	5670	
7	19	S57	Slab	E	20			V	1	1670							1670	1670	57
			Inc. = 650							5570							5570	5570	
6	16	S61	Slab	E	20			V	1	1310							1310	1310	30
			Inc. = 750							5060							5060	5060	
8	16	S62	Slab	E	20			V	1	650							650	650	36
			Inc. = 650							5200							5200	5200	
43	16	S63	Slab	E	20					11 130							11 130	11 130	743
7	19	S64	Slab	E	20			V	1	1150							1150	1150	49
			Inc. = 670							5170							5170	5170	
9	19	S65	Slab	E	20			V	1	1050							1050	1050	68
			Inc. = 585							5730							5730	5730	
8	16	S66	Slab	E	20					1030							1030	1030	13

STATE	PROJ. NO.	SHEET NO.
MO.		3/9



FOR INFORMATION ONLY

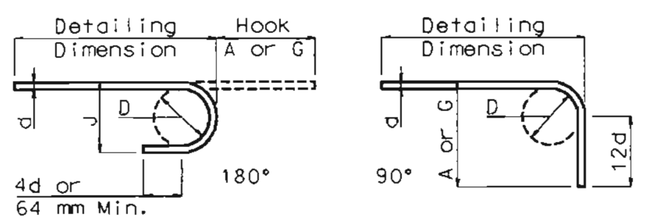
A16866, Sht. 106



Stirrup Hook Dimensions

Bar Size	D (mm)	All Grades 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.

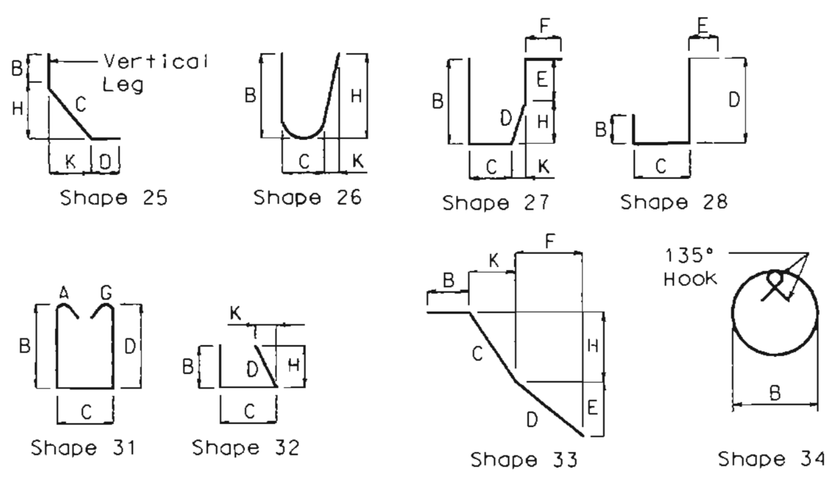


End Hook Dimensions

Bar Size	All Grades D (mm)	180° Hook A OR G	180° Hook 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

Notes:

All standard hooks and bends other than 180 deg. are to be bent with same procedure as for 90 deg. 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 5mm)
Actual lengths are measured along centerline bar to the nearest 5mm.
Pay items 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

BUCHER, WILLIS & RATLIFF CORPORATION

DRAWN BY:	MAH	FEB. 1998
TRACED BY:	MAH	FEB. 1998
CHECKED BY:	DJM	FEB. 1998

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

JACKSON COUNTY

BILL OF REINFORCING STEEL - STAGE III

SHEET NO. 29 OF 29

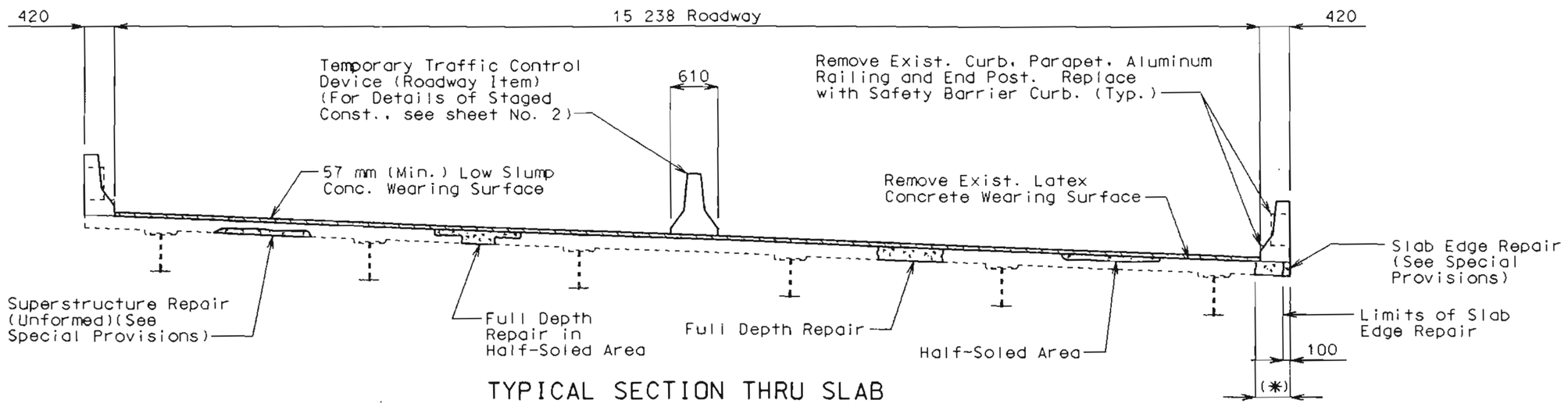
A16864

STATE OF MISSOURI DONNA JUNE MADER NUMBER E-27011 REGISTERED PROFESSIONAL ENGINEER
Donna J. Mader 4-1-98

PROJECT No. 98-047 PROJECT NAME: MoDOT-Br. No. A16864-SB I-435 over Railroad Tracks S:\98047\STR\A16864\DGN\RBEAR3.DGN

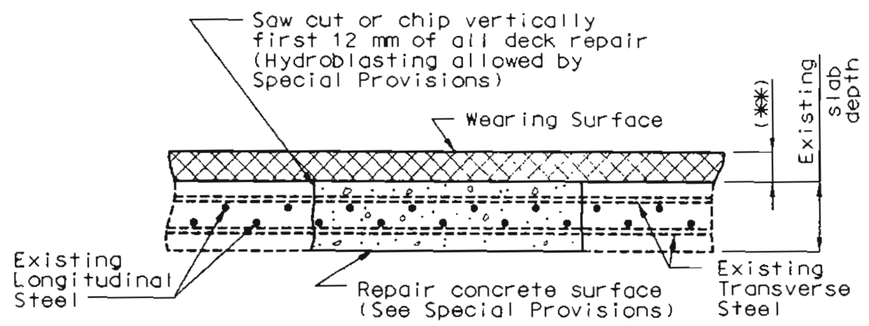
MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

State	Proj. No.	Sheet No.
MO		320
Sec./Sur. 31	Twp. 50N	Rge. 32W

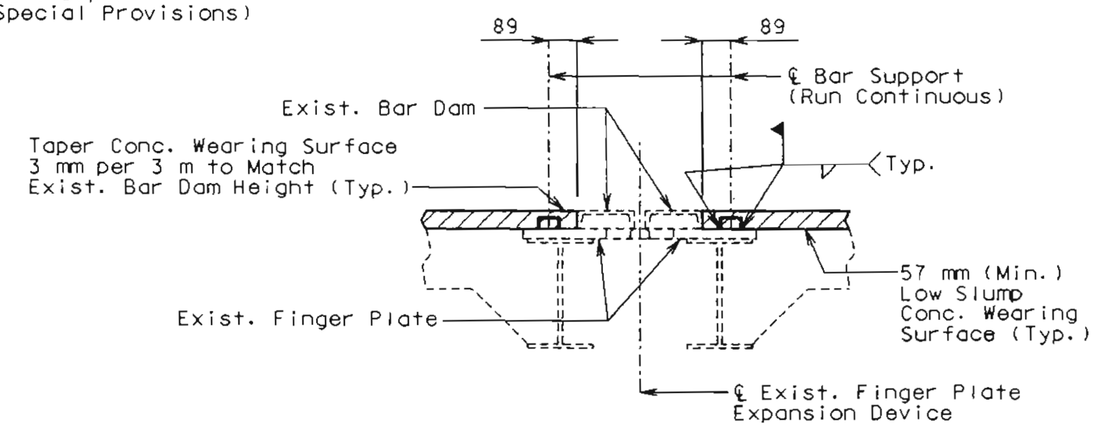


TYPICAL SECTION THRU SLAB

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

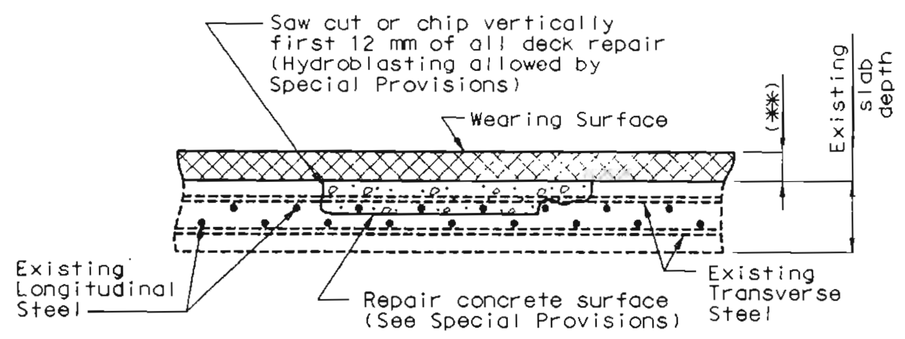


FULL DEPTH REPAIR

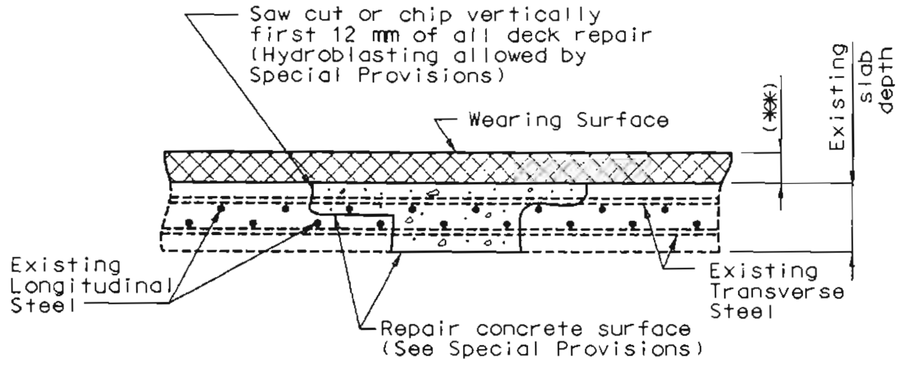


PART SECTION EXISTING FINGER PLATE EXPANSION DEVICE AT BENT NO. 5

NOTE: Payment for furnishing and installing bar supports complete in place, will be paid for at the contract unit price for Low Slump Concrete Wearing Surface - Metric.



HALF-SOLED AREA



FULL DEPTH REPAIR IN HALF-SOLED AREA

ESTIMATED QUANTITIES

	ITEM		TOTAL
	Curb Removal (Bridges) - Metric	meter	580
	Removal of Latex Concrete Wearing Surface - Metric	sq. meter	4298
	Substructure Repair (Unformed) - Metric	sq. meter	2
	Superstructure Repair (Unformed) - Metric	sq. meter	5
***	Safety Barrier Curb - Metric	meter	580
	Repairing Concrete Deck (Half-Soling) - Metric	sq. meter	345
	Full Depth Repair - Metric	sq. meter	85
	Slab Edge Repair (Bridges) - Metric	meter	84
	Low Slump Concrete Wearing Surface - Metric	sq. meter	4288
	Type N PTFE Bearings	each	6
	Strip Seal Expansion Device - Metric	meter	34.0
	Modification of Existing Expansion Joint - Metric	meter	34.0
	Fabricated Structural Carbon Steel (Misc.) - Metric	kilogram	7020
	Slab Drain	each	9
	Field Coat (System G) Gray - Metric	megagram	7.0

*** Safety Barrier Curb shall be Cast-In-Place option or Slip Form option, as shown.

General Notes:

Design Specifications:
AASHTO - 1996
Load Factor Design (Safety Barrier Curb).
Allowable Stress Design (Hanger Plate).

Design Loading:
MS18 Modified.

Design Unit Stresses:
Class B1 Concrete (Safety Barrier Curb) f'c = 28 MPa.
Reinforcing Steel (Grade 420) fy = 420 MPa.
Structural Steel (ASTM A709M Grade 250) fs = 150 MPa.

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

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

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

Coating: (New Steel Only)

Protective Coating: System G by the contractor.

Prime Coat: The cost of the prime coat shall be included in the contract unit price of the Fabricated Structural Steel. Tint of the prime coat for System G shall be similar to the color of the field coat to be used.

Field Coat: The color of the finish coat shall be Gray (Federal Standard #26373). The cost of the intermediate and finish coats shall be included in the contract unit price per Megagram of Field Coat (System G) Gray.

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

Maintain Traffic:
See roadway plans for traffic control during construction.

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

Roadway Surfacing:
Roadway Surfacing adjacent to bridge ends to match bridge overlay.

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

Miscellaneous:
All dimensions are shown in millimeters (mm) unless otherwise specified.
All elevations are specified in meters (m) except as noted.
Drawings are not to scale. Follow dimensions.
High strength bolts, nuts and washers will be sampled for quality assurance as specified in Section 106 of the Missouri Standard Specifications (Metric) and Field Section (FS-712) from Materials Manual.
A minimum vertical clearance of 6.553 m for Union Pacific, KCS and BNSF Railroads and 7.010 m for GST and KCT Railroads from top of rails and a minimum lateral clearance of 3.048 m for KCS, BNSF, GST and KCT Railroads and 4.572 m for Union Pacific Railroads from the centerline of track to nearest temporary construction falsework shall be maintained during construction.

STATE OF MISSOURI
Stacy L. McMillen
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 4-6-98

REPAIRS TO:
BRIDGE OVER GST STREET COMPANY, UNION PAC., KCS, BNSF, AND KCT RAILROADS

STATE ROAD INTERSTATE ROUTE 435 FROM RTE. 24 TO MISSOURI RIVER IN KANSAS CITY

PROJECT NO. STA. 4+312.762 (MATCH EXIST.)

JOB. NO. J411250 RTE. I-435 (N.B.L.)

JACKSON COUNTY

Date: 4/7/98

STD. M	
STD. M	
STD. M	
STD. M706.35	
A16865	

Designed Feb. 1998
Detailed Mar. 1998
Checked Mar. 1998

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

FOR INFORMATION ONLY

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State	Proj. No.	Sheet No.
MO		321

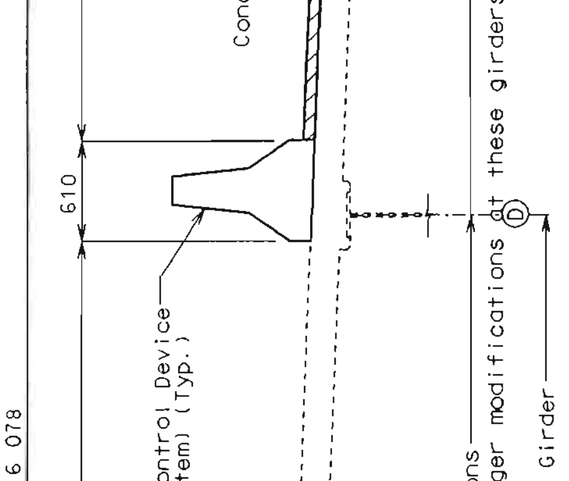
DATE 4-6-98

A16865

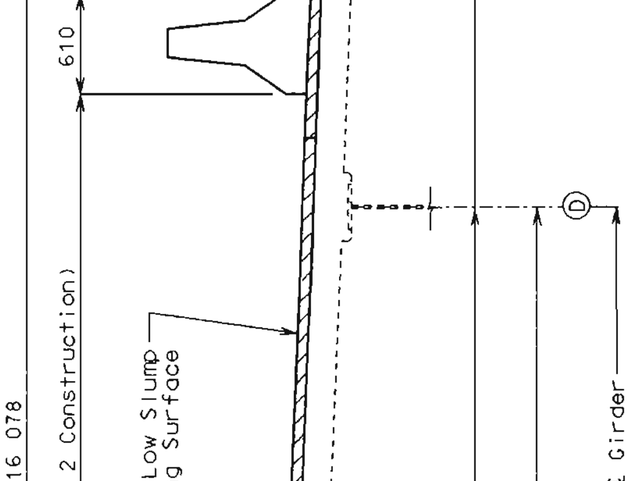
JACKSON COUNTY

DETAILS OF STAGED CONSTRUCTION

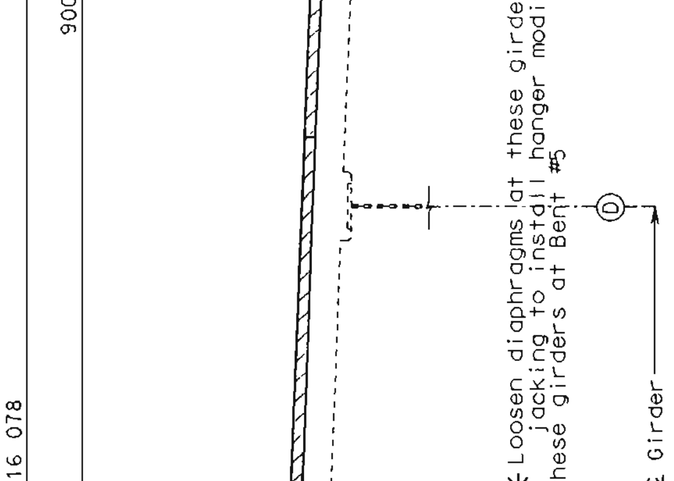
Sheet No. 2 of 17



STAGE 1 CONSTRUCTION



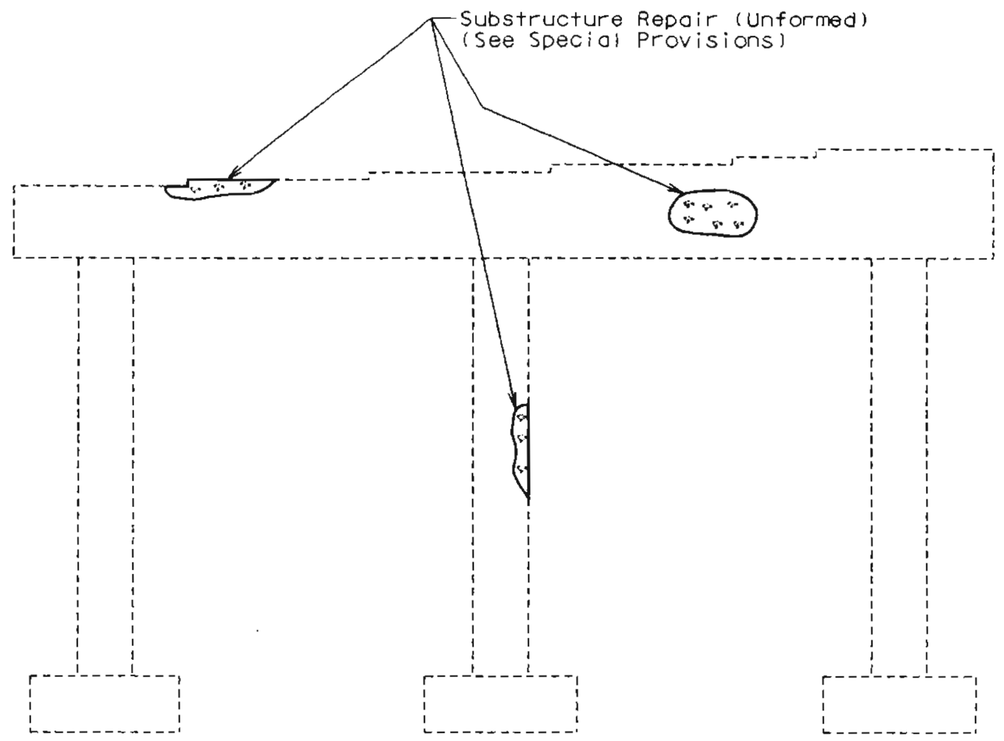
STAGE 2 CONSTRUCTION



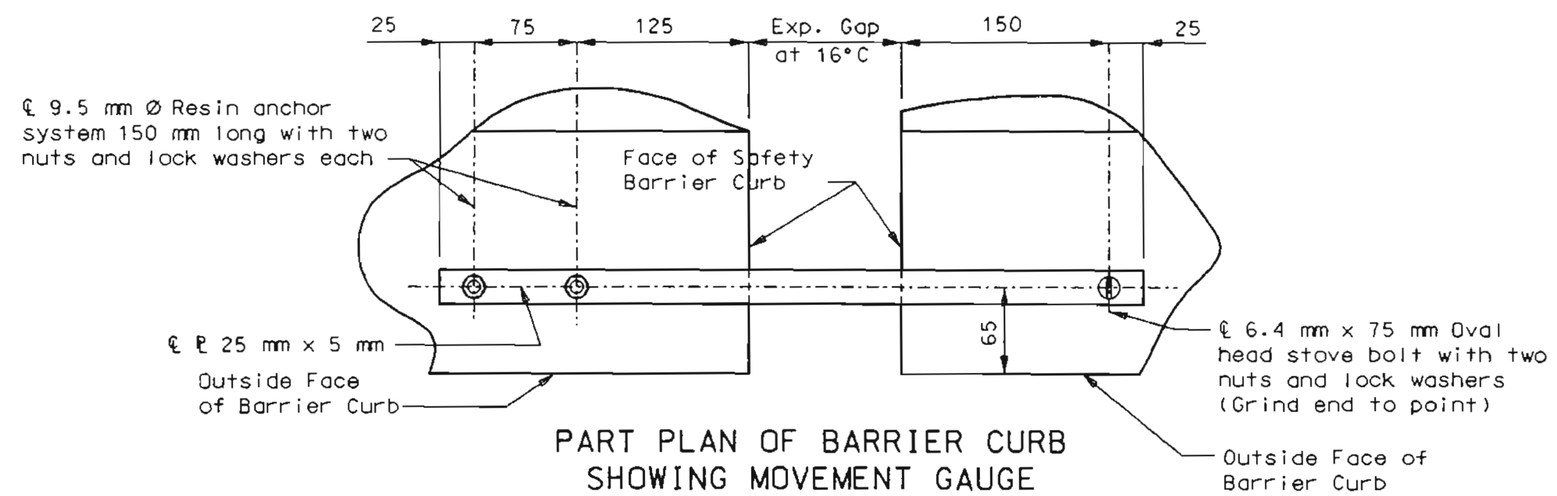
STAGE 3 CONSTRUCTION

Detailed Mar. 1998
Checked Mar. 1998

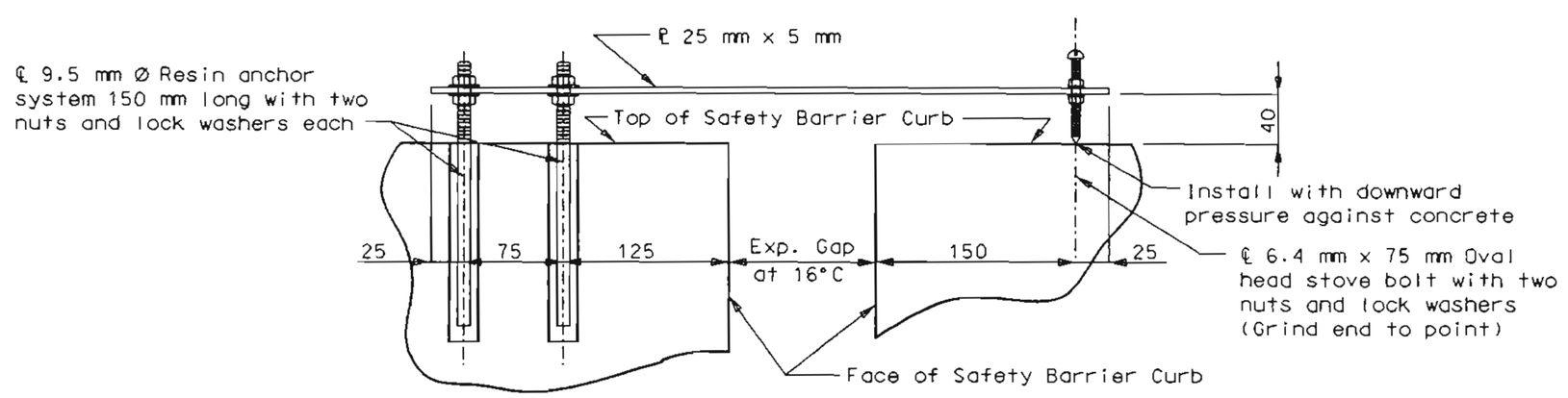
State	Proj. No.	Sheet No.
MO		322



TYPICAL DETAIL SHOWING SUBSTRUCTURE REPAIR (UNFORMED)



PART PLAN OF BARRIER CURB SHOWING MOVEMENT GAUGE



PART ELEVATION OF BARRIER CURB SHOWING MOVEMENT GAUGE

Note:

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

All steel shall be galvanized.

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

For details of Safety Barrier Curb, see sheet No. 10, 11, 12 & 13.

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

DATE 4-6-98

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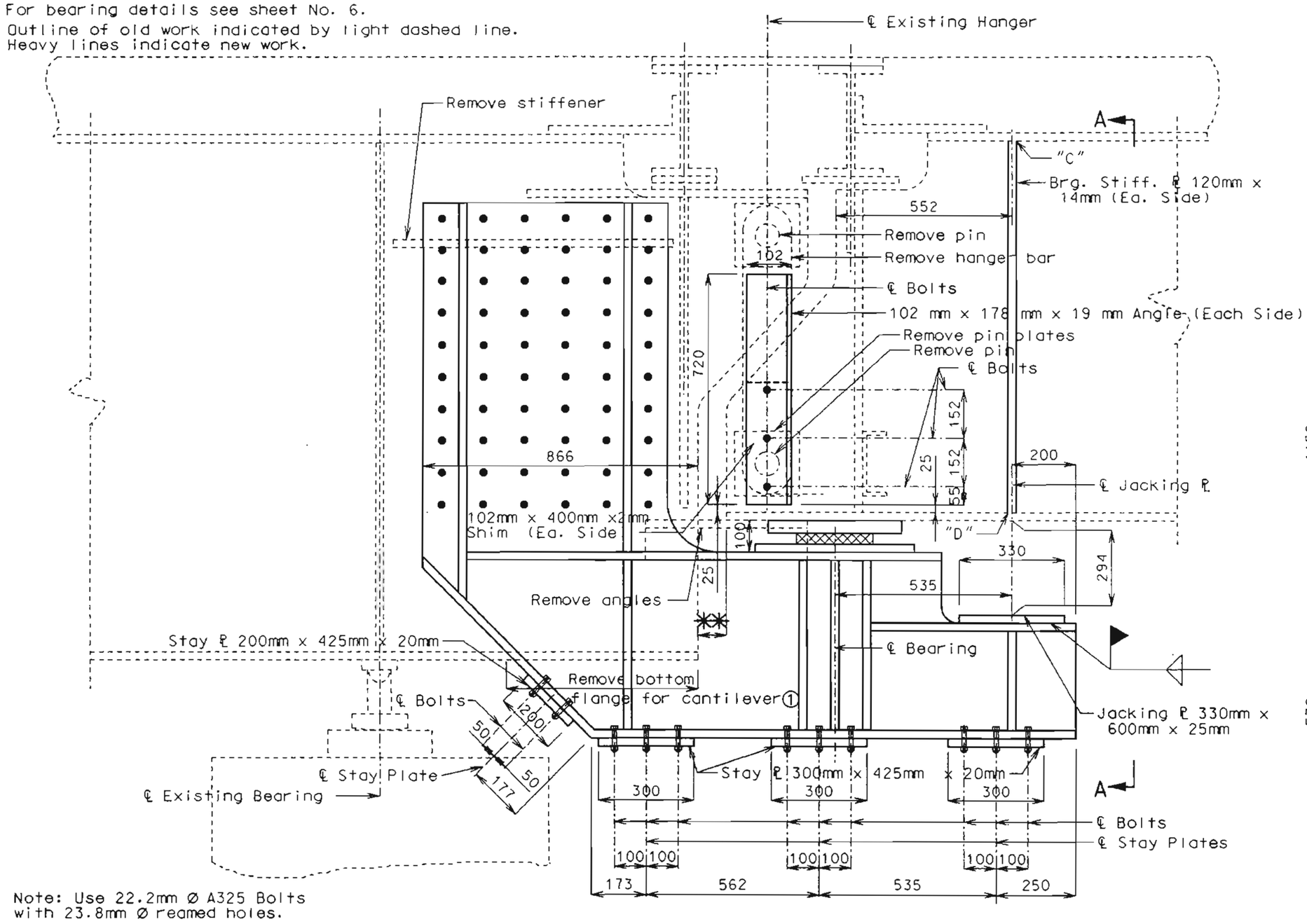
State	Proj. No.	Sheet No.
MO		323

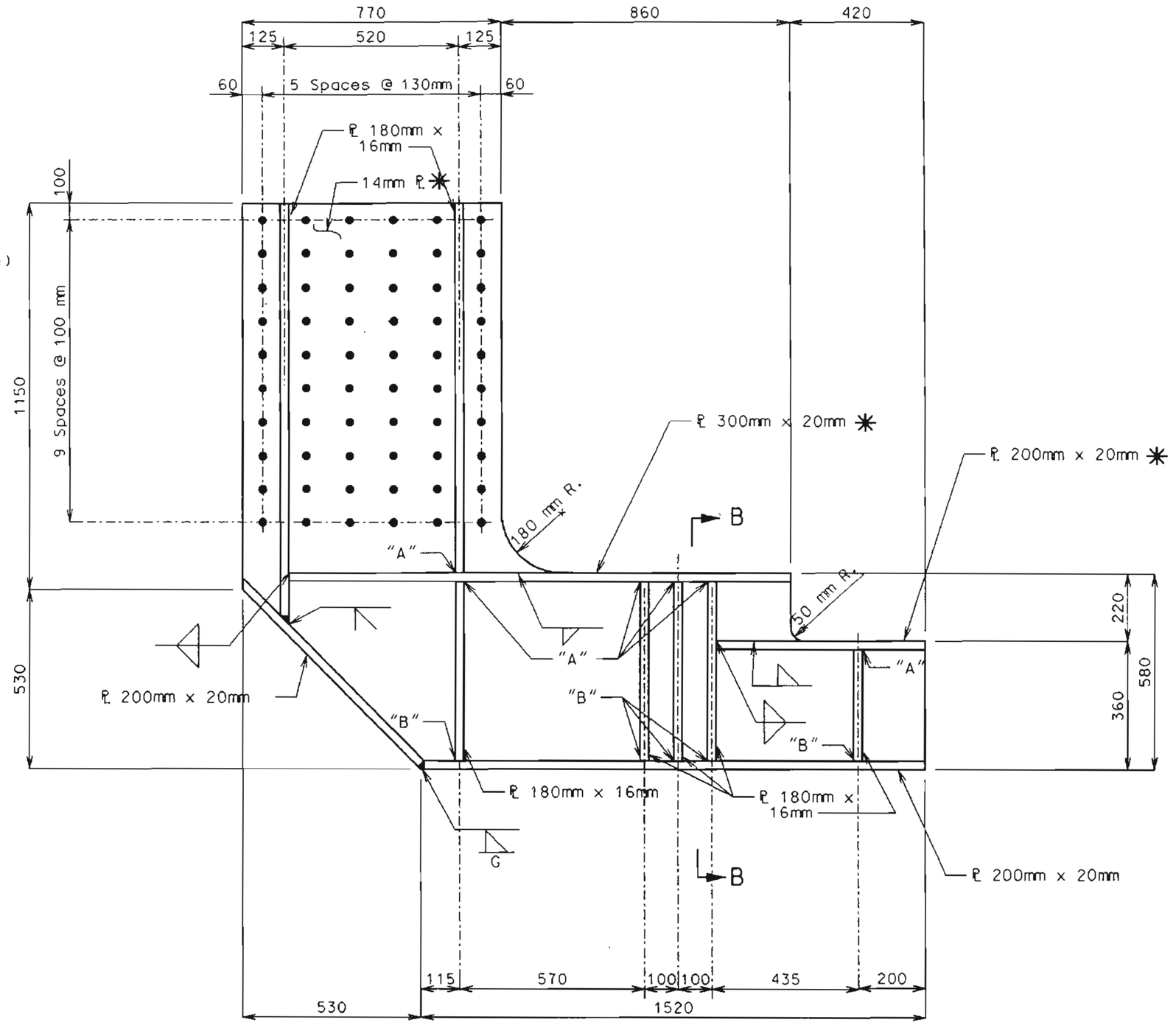
Note: For bearing details see sheet No. 6.
Outline of old work indicated by light dashed line.
Heavy lines indicate new work.



Note: Use 22.2mm Ø A325 Bolts with 23.8mm Ø reamed holes.

DETAIL OF HANGER MODIFICATION AT BENT NO. 5

① Remove flange by cutting and grinding web smooth at top of flange.
✳ Indicates plates subject to notch toughness requirements.
✳✳ 88.9 mm Gap @ 16° C. (Based on original plan dimensions.)



DETAIL OF HANGER PLATE

Note: For "A", "B", "C" & "D" see sheet No. 5.
For Section A-A & B-B see sheet No. 5.
For welding details not shown see sheet No. 5.

STATE OF MISSOURI
Stacy L. McMillen
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
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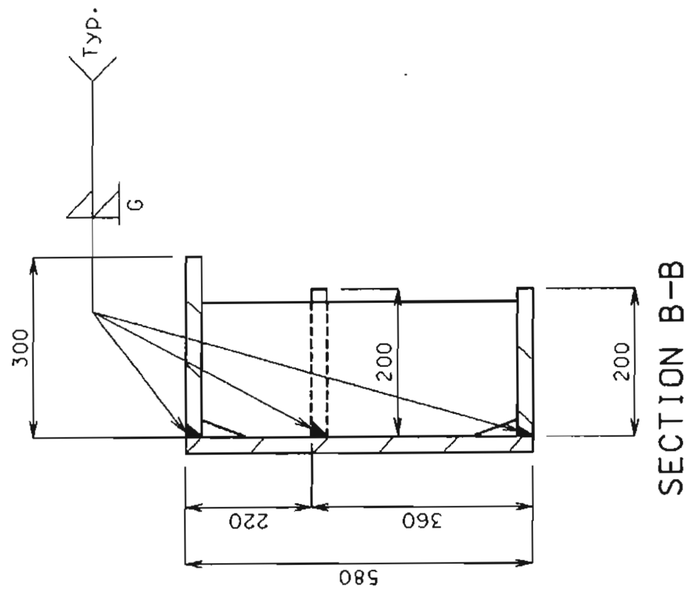
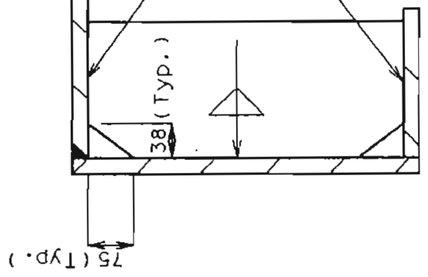
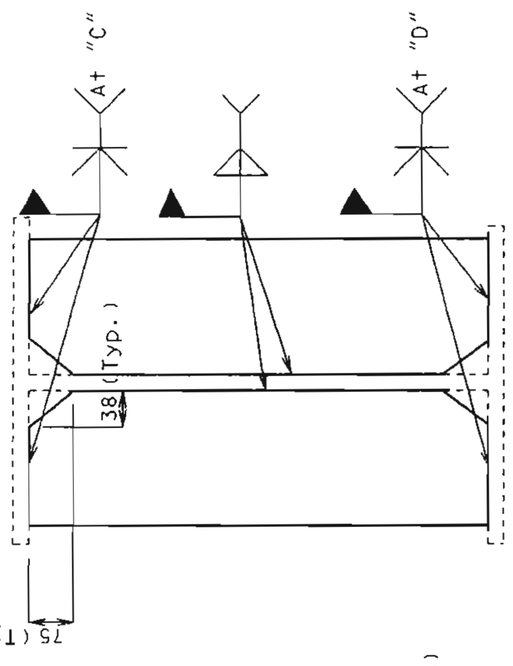
State	Proj. No.	Sheet No.
MO		324



SECTION B-B

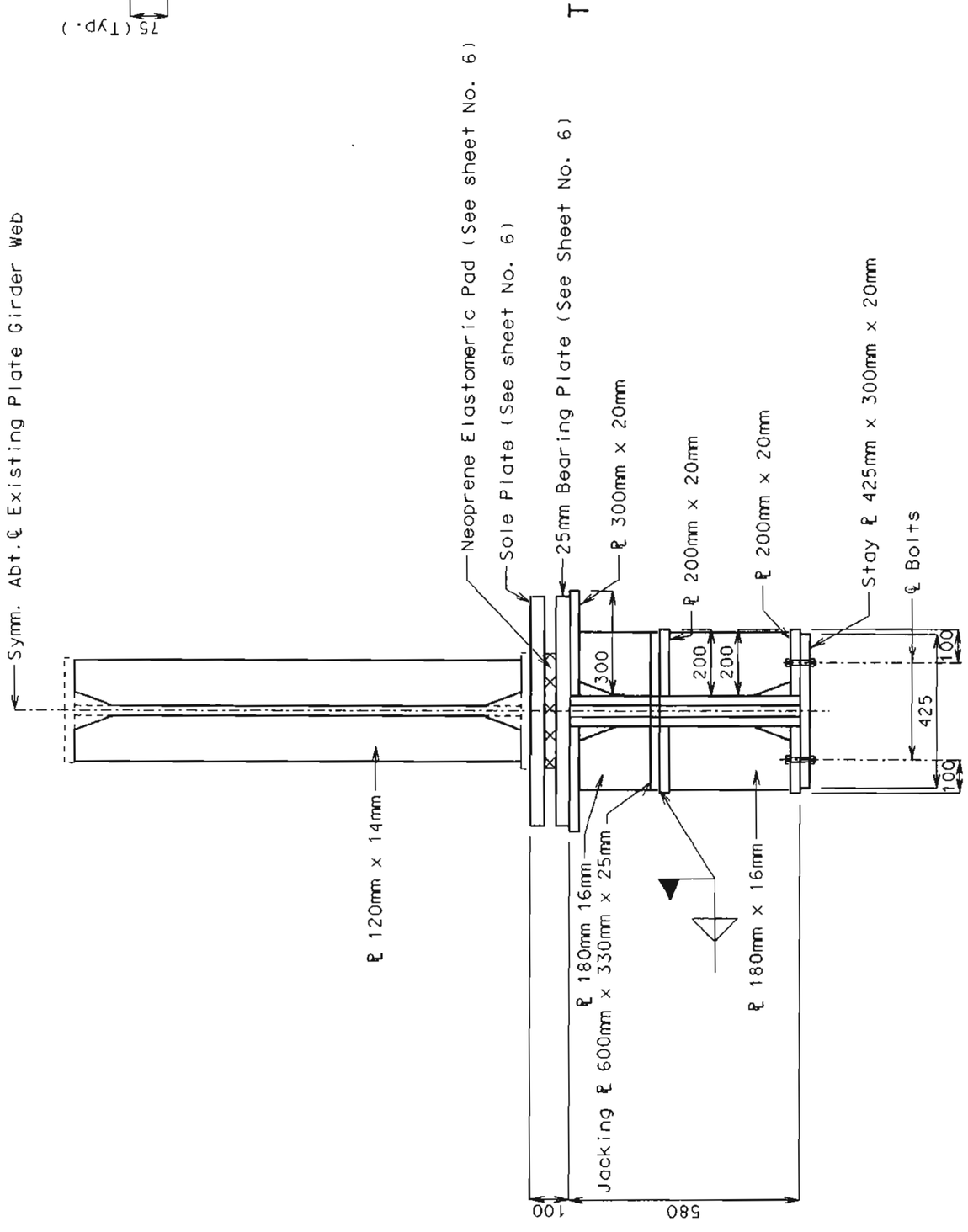


TYPICAL WELDING DETAILS
FOR STIFF. PLATES



TYPICAL WELDING DETAILS
FOR STIFF. PLATES TO
EXISTING GIRDER

Note: For location of stiffener and welds see sheet No. 4.



SECTION A-A

Note: For location of Section A-A & B-B see sheet No. 4.
Outline of old work indicated by light dashed line.
Heavy lines indicate new work.

STATE OF MISSOURI
Stacy L. Mahlandt
NUMBER E-28873
REGISTERED ENGINEER
DATE 4-6-98

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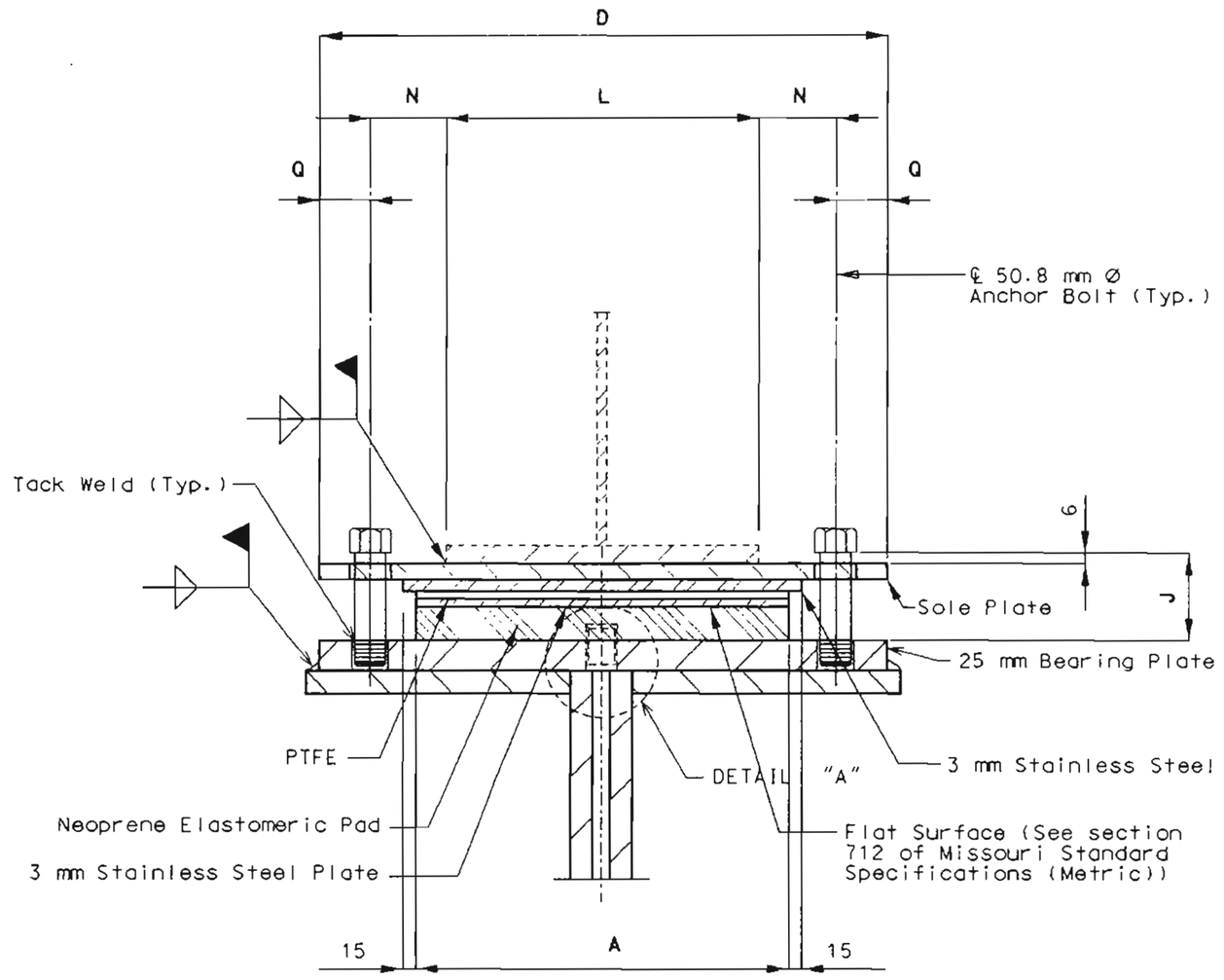
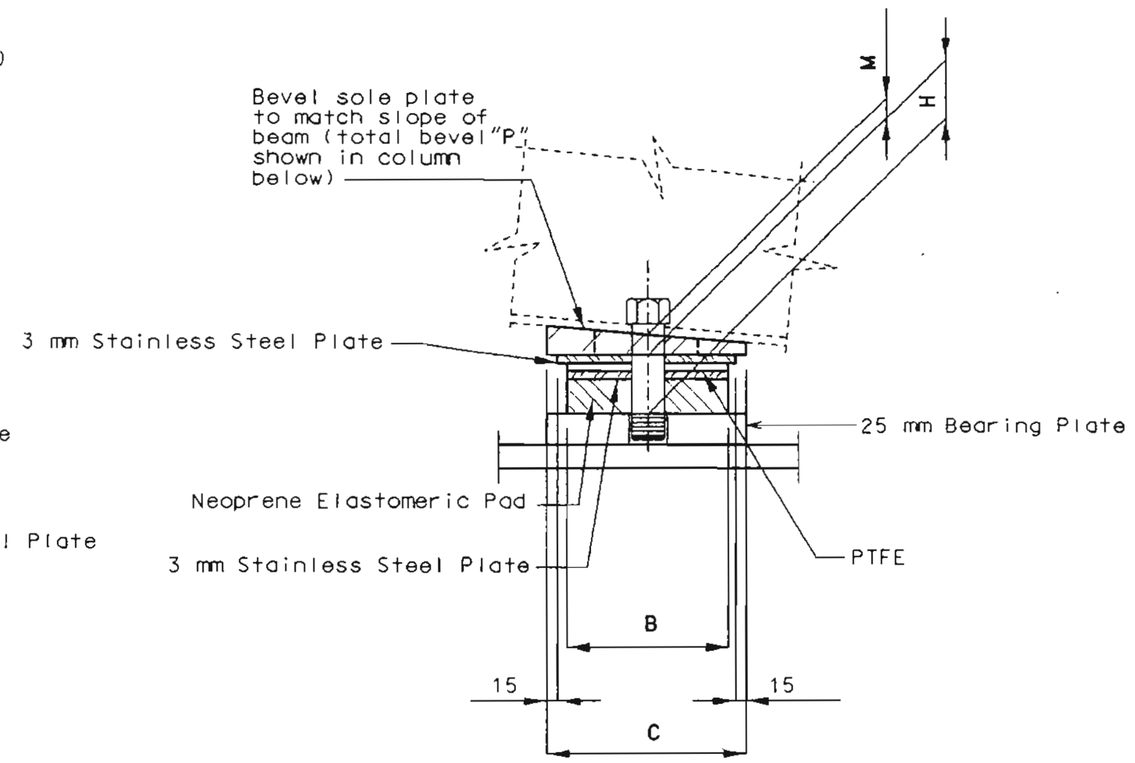
STATE	PROJ. NO.	SHEET NO.
		325



END VIEW



SIDE VIEW

GENERAL NOTES:

Anchor bolts shall be 50.8 mm diameter ASTM A325M steel bolts.

Actual manufacturer's certified mill test reports (chemical and mechanical)shall be provided.

All structural steel for the anchor bolts shall be coated with a minimum of two coats of inorganic zinc primer (125 micrometers minimum thickness) or galvanized in accordance with ASTM A153.

Neoprene Elastomeric Pads shall be 70 durometer.

The sole plate and bearing plate shall be furnished with the bearing and field welded to the stringers or girders.

Structural steel for the sole plate shall be ASTM A709M Grade 250 and shall be coated with a minimum of two coats of inorganic zinc primer (125 micrometers minimum thickness).

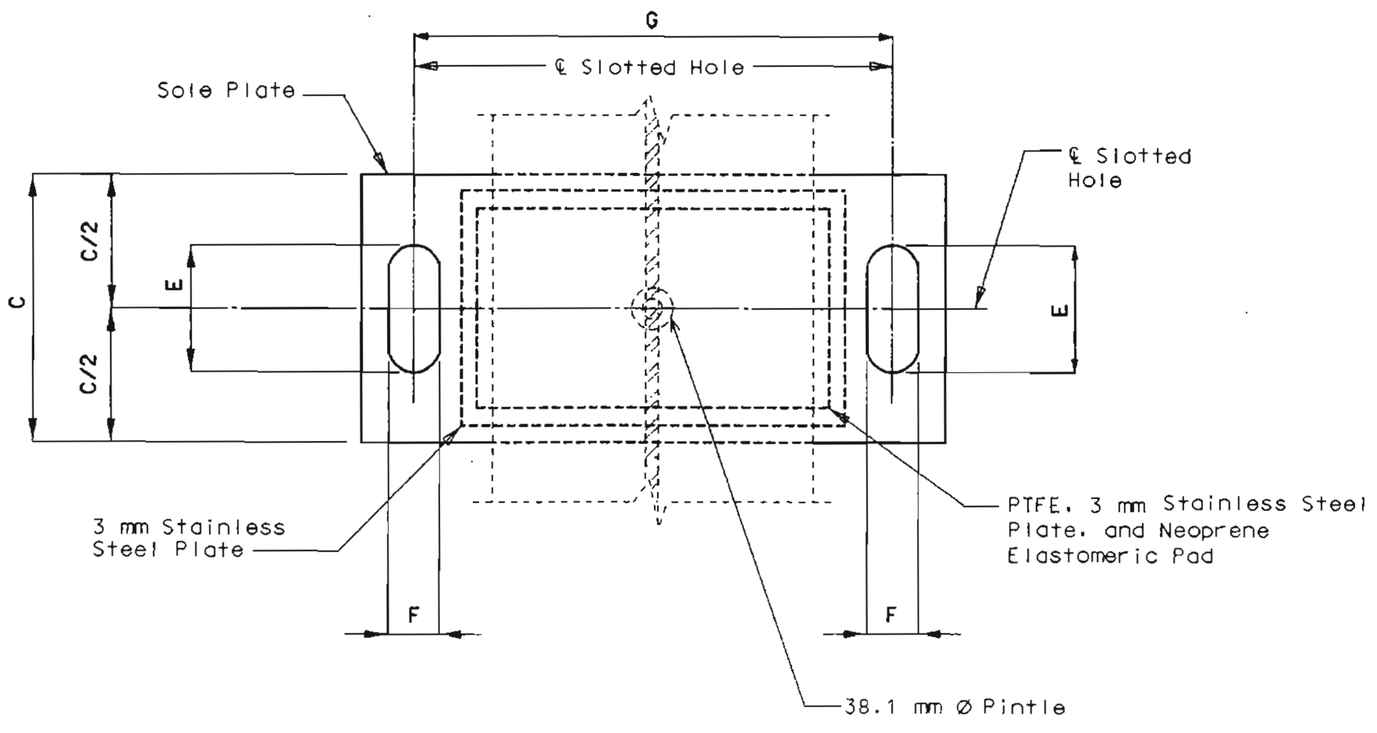
The accepted quantity of the elastomeric bearing assemblies, complete-in-place, will be paid for at the contract unit price for Type "N" PTFE Bearings, each.

Payment for the sole plate, bearing plate and anchor bolts shall be included in the cost of the bearing assembly. See Special Provisions.

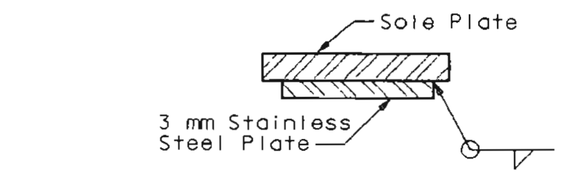
Outline of old work is indicated by light dashed lines. Heavy lines indicate new work.

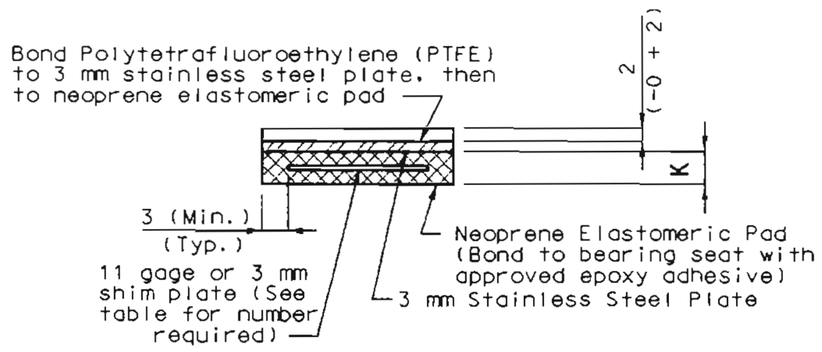
Note: 25mm bearing plate to be tapped to receive 50.8mm Ø H.S. Bolt

The location of the 50.8mm High Strength Bolts in relation to the slotted holes in the sole plate shall correspond with the temperature at the time of erection. At 16° C the slotted holes should center on the 50.8mm High Strength. Adjustments of 8mm for each 5° C temperature rise or fall shall be made.

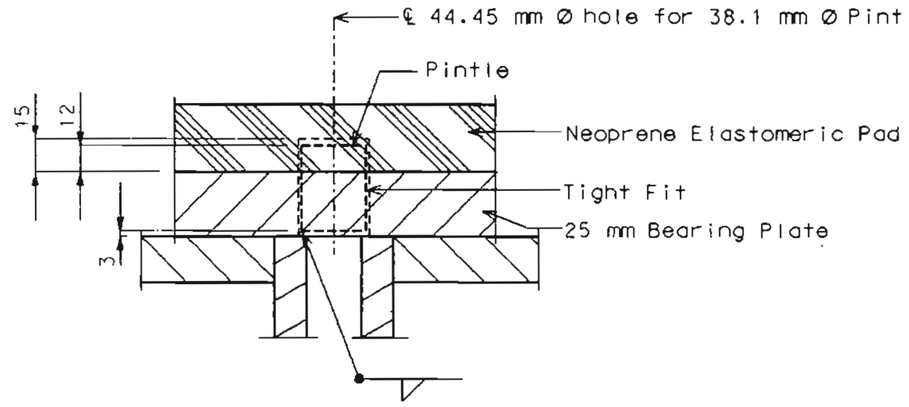


PART PLAN





NEOPRENE ELASTOMERIC PAD



DETAIL "A"

PTFE SLIDING BEARINGS																	
BENT NO.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	NUMBER OF SHIM PLATES(*)	NUMBER REQUIRED
5	300	240	420	600	190	55	440	35	81	27	304.5	40	67.75	--	80	1	6
																TOTAL BEARINGS	6

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

DETAILS OF TYPE "N" PTFE BEARINGS

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 4-6-98

Detailed Mar. 1998
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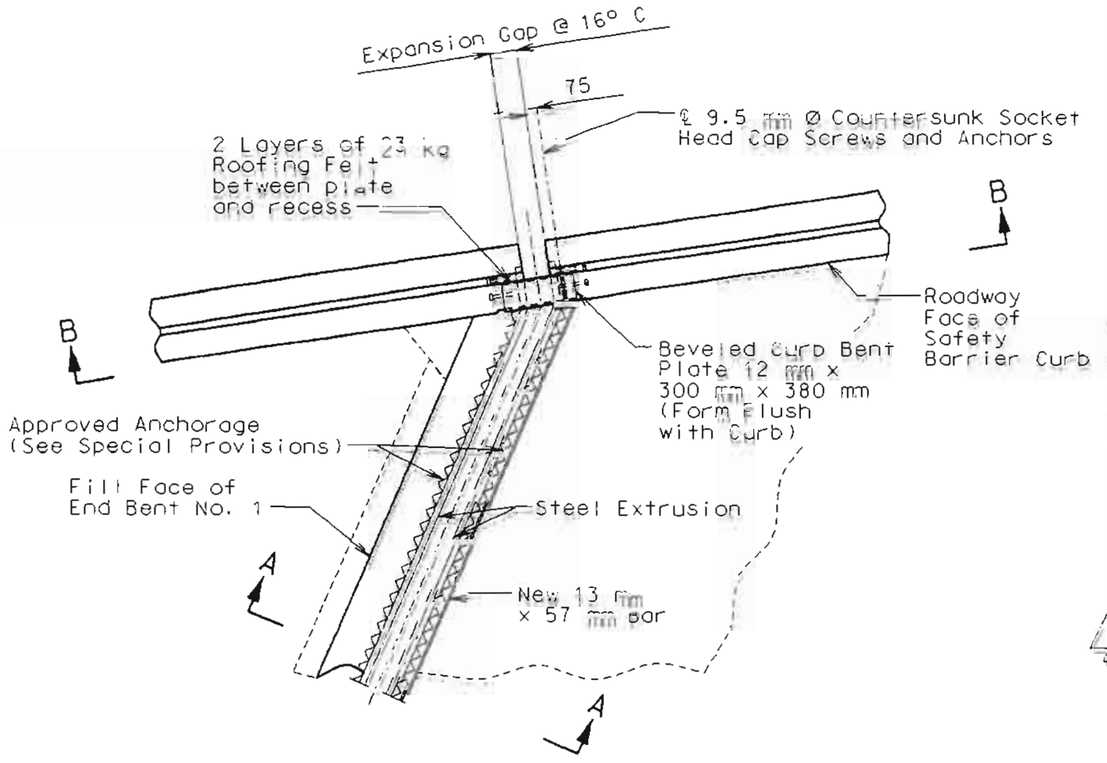
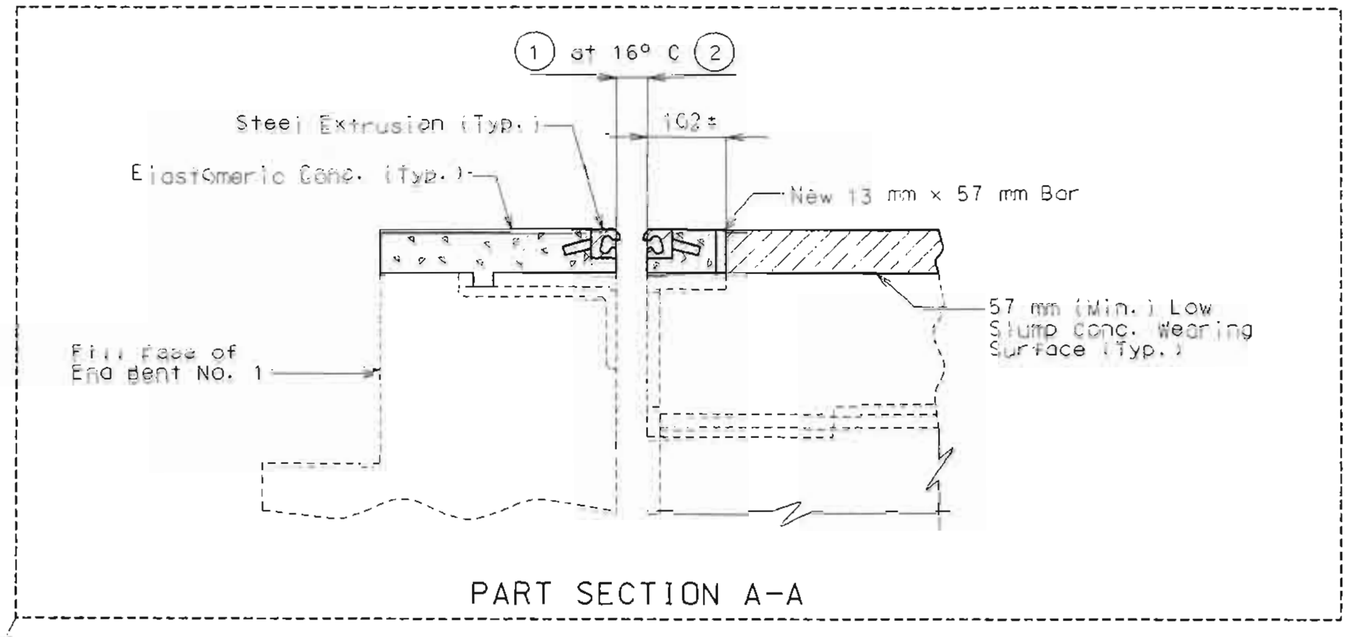
MO		



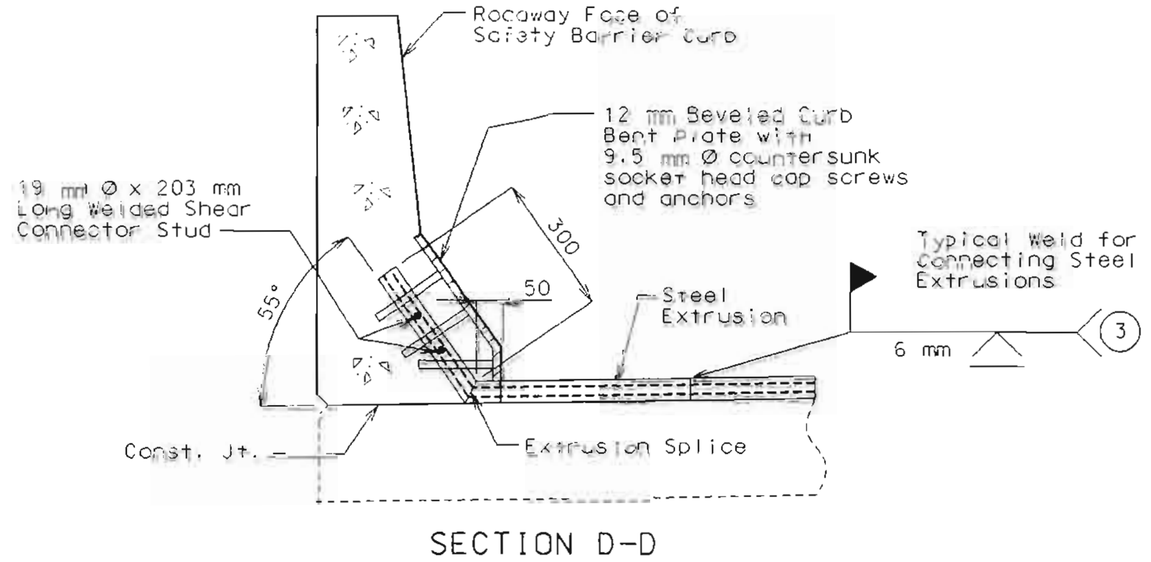
PART PLAN

NOTE: Details of left side shown. Right side is similar.

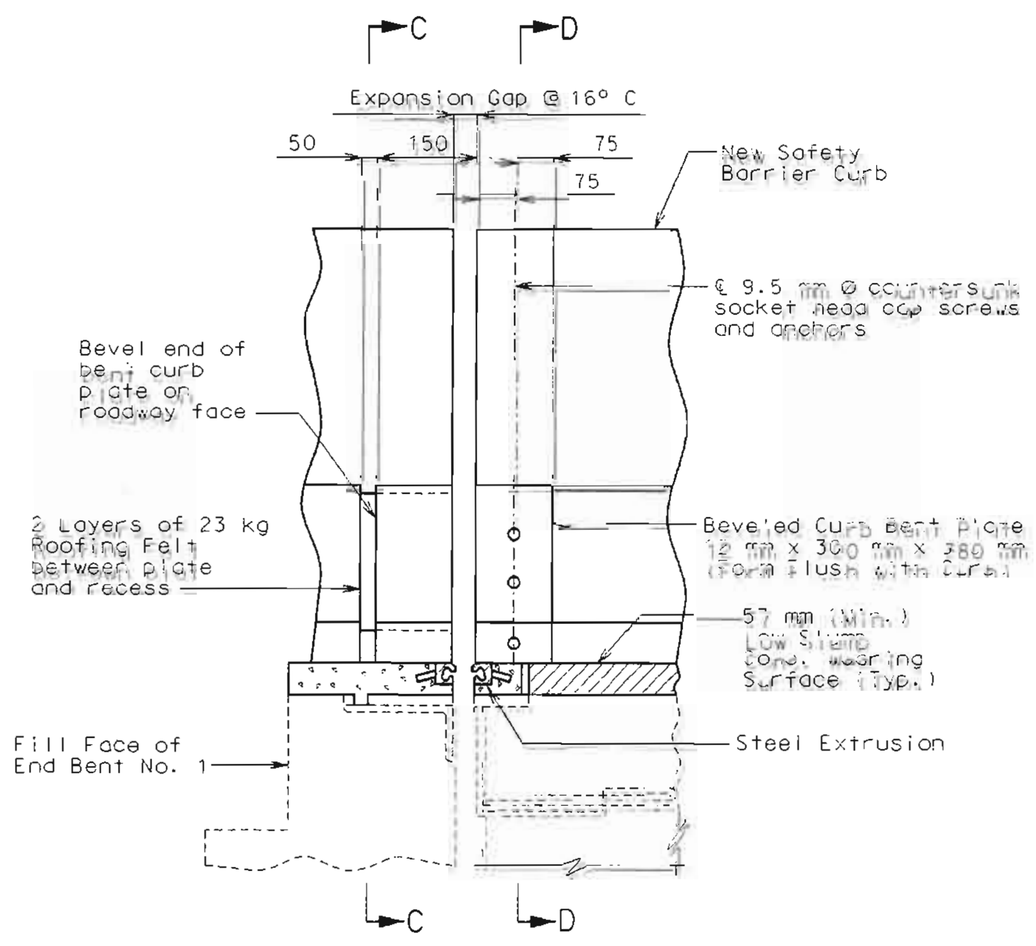


PART SECTION A-A

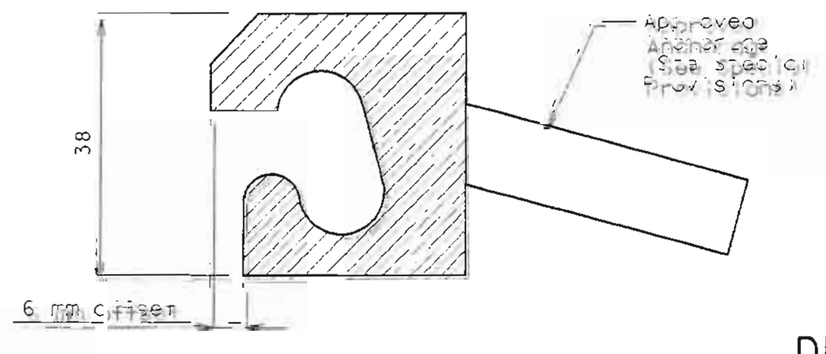
△Use expansion gap information in view only



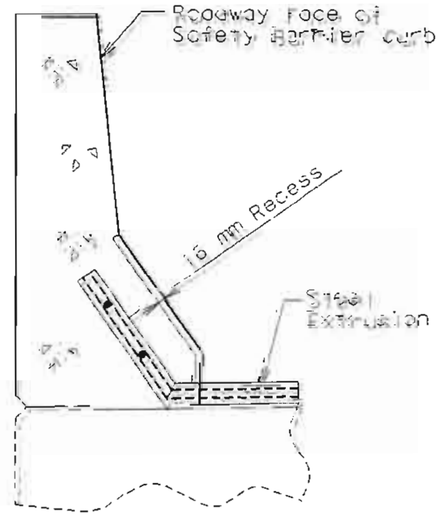
SECTION D-D



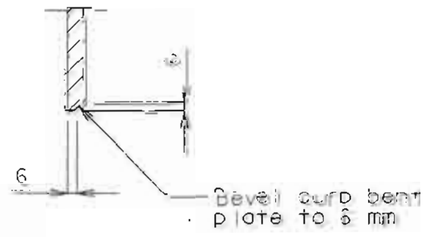
PART SECTION B-B



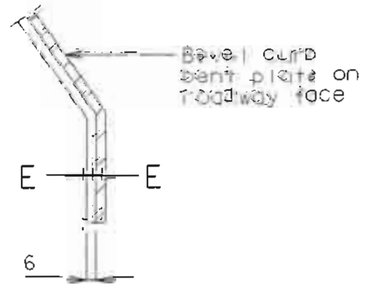
DETAIL OF STEEL EXTRUSION



SECTION C-C



SECTION E-E



PART ELEVATION AT END OF BEVELED CURB BENT PLATE

NOTE:

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

The contractor must verify all dimensions prior to fabrication.

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

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

Neoprene Strip Seal shall meet ASTM D-2628.

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

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

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

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

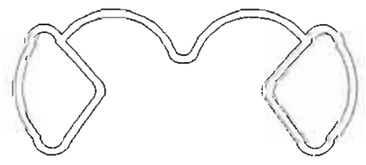
Gap for new strip seal expansion device can not be less than the existing.

Payment of removal of existing expansion device and preparation for installation of new expansion device shall be included in the contract unit price for Modification of Existing Expansion Joints. (See Special Provisions)

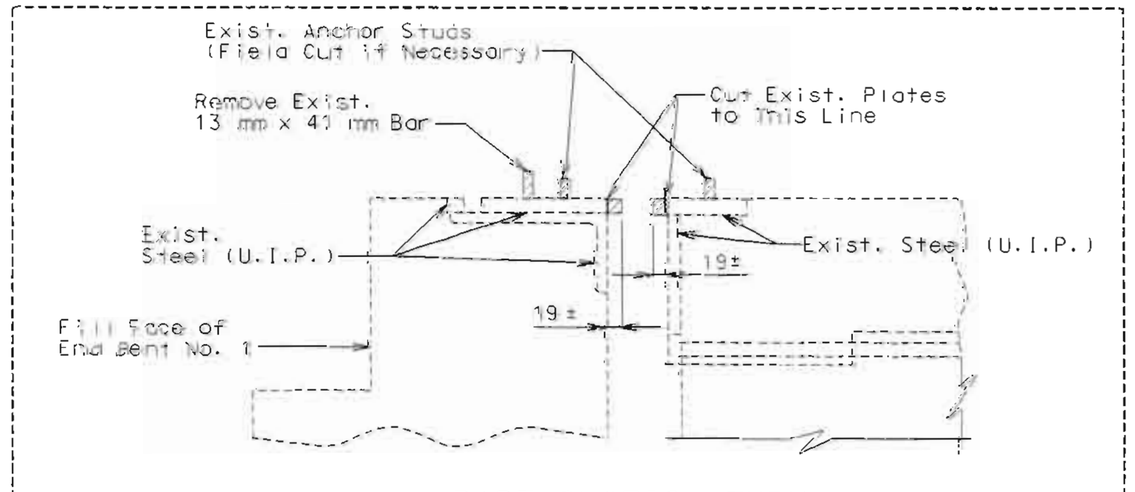
(1) Min. = 40 mm
Max. = 78 mm

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

(3) Extrusion shall be welded top and back.



STRIP SEAL GLAND
MOVEMENT RATING 102 mm



PART SECTION THRU
EXISTING EXPANSION DEVICE

△Omit

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

DATE 7-23-99

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

Detailed Mar. 1998
Checked Mar. 1998

△Revised 7/12/99 Sheet No. 7 of 17

JACKSON COUNTY

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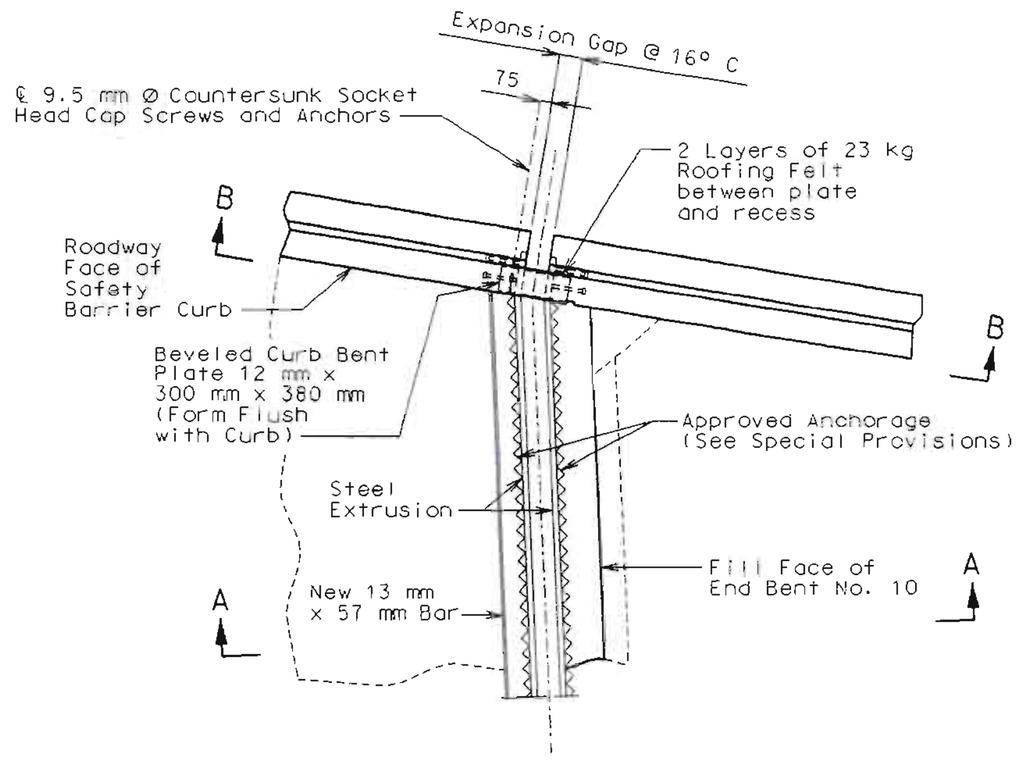
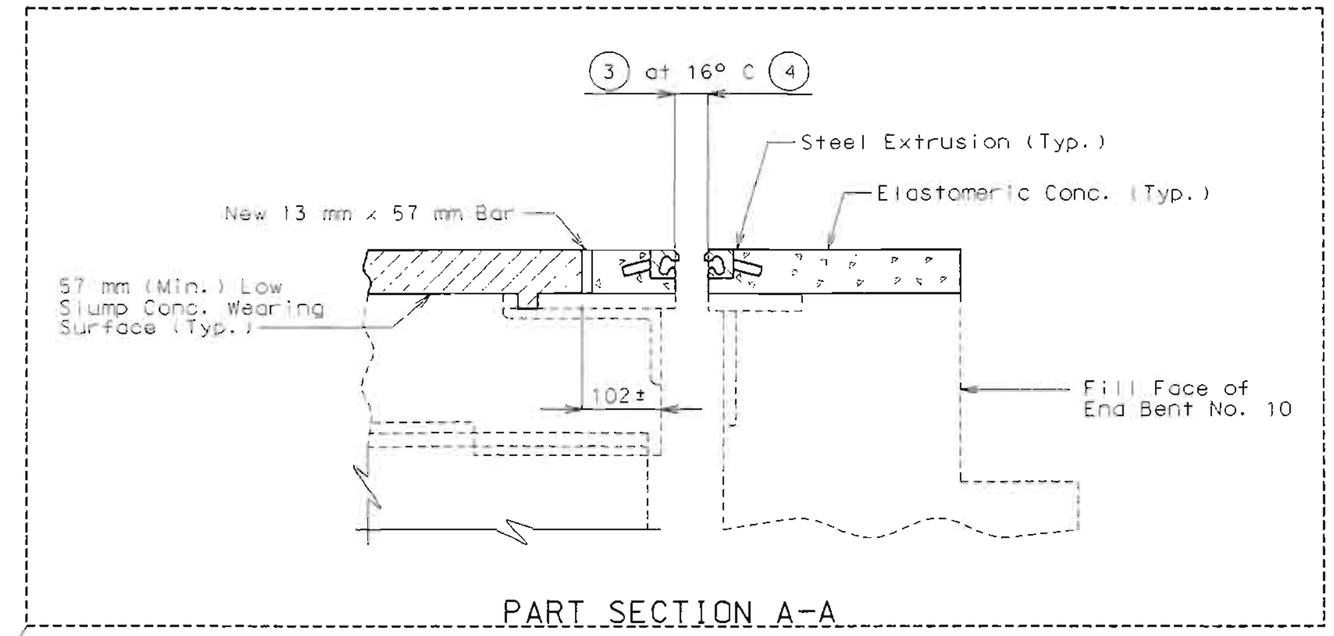
MO		



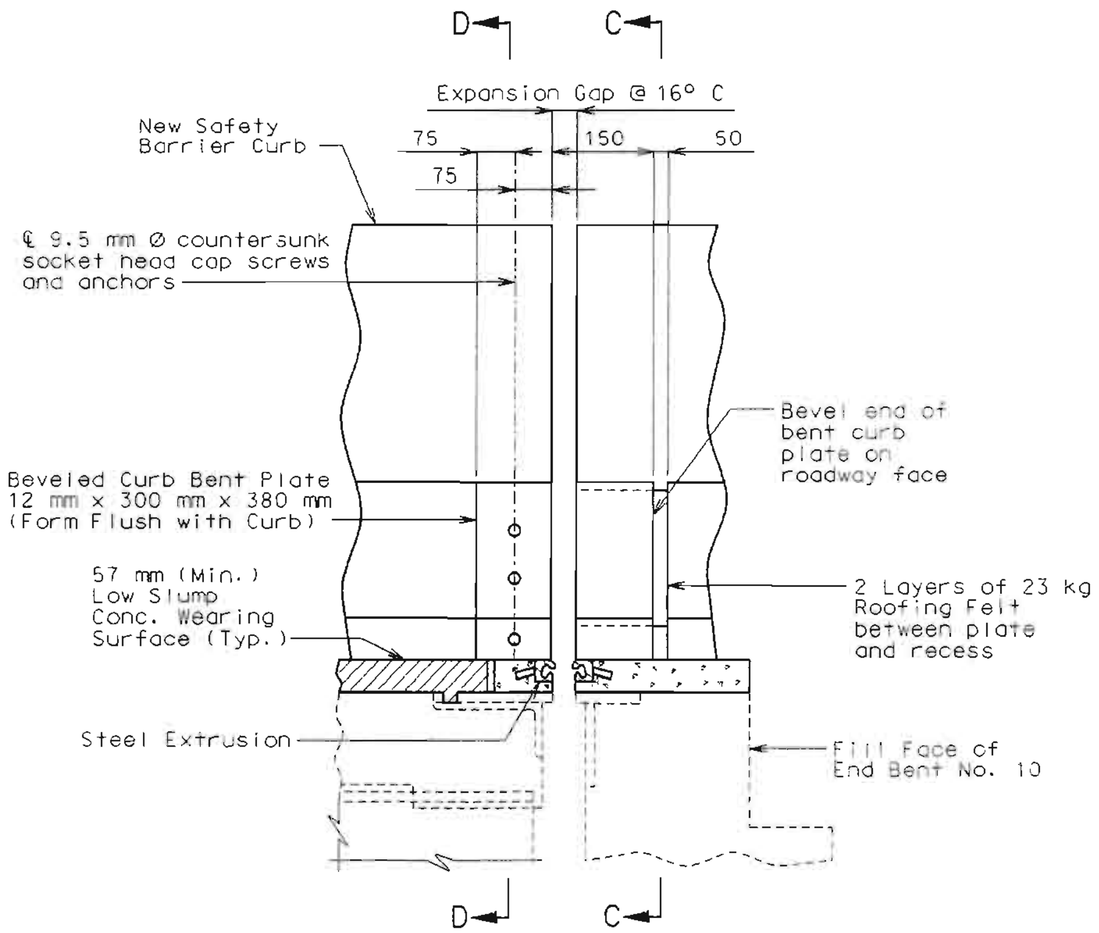
PART PLAN

NOTE: Details of left side shown. Right side is similar.

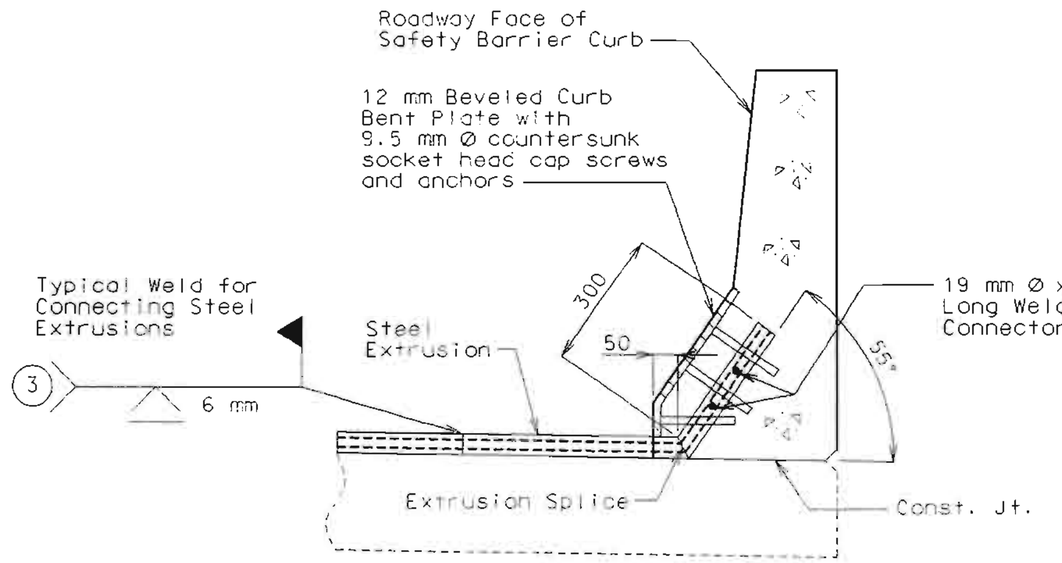


PART SECTION A-A

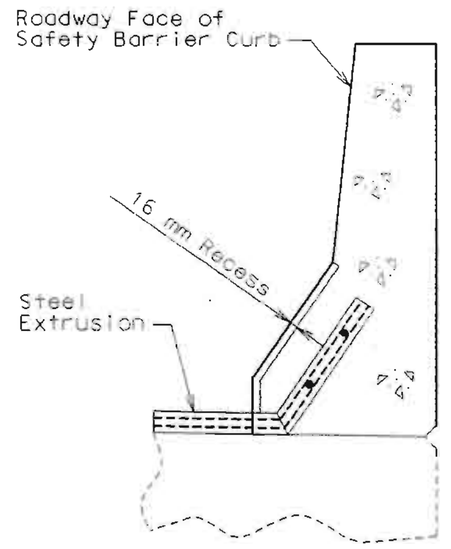
⚠ Use expansion Gap information in view only



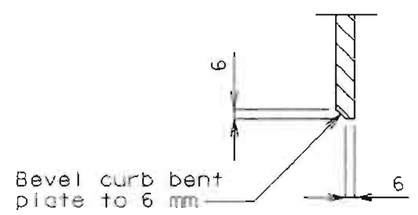
PART SECTION B-B



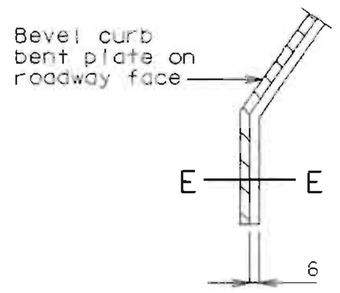
SECTION D-D



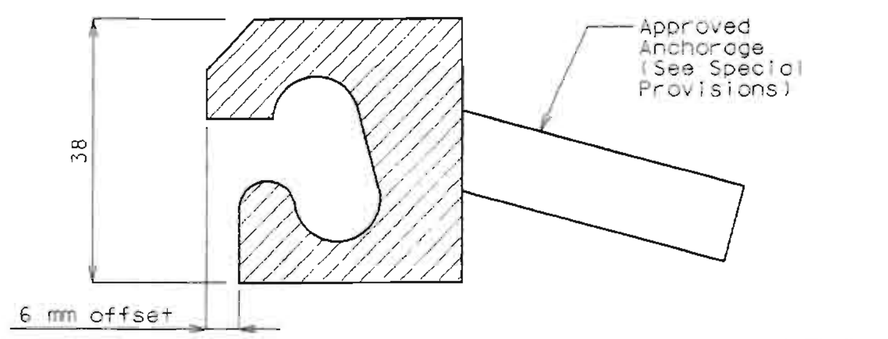
SECTION C-C



SECTION E-E



PART ELEVATION AT END OF BEVELED CURB BENT PLATE



DETAIL OF STEEL EXTRUSION

NOTE:

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

The contractor must verify all dimensions prior to fabrication.

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

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

Neoprene Strip Seal shall meet ASTM D-2628.

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

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

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

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

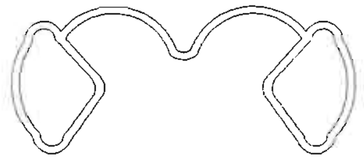
Gap for new strip seal expansion device can not be less than the existing.

Payment of removal of existing expansion device and preparation for installation of new expansion device shall be included in the contract unit price for Modification of Existing Expansion Joint. (See Special Provisions)

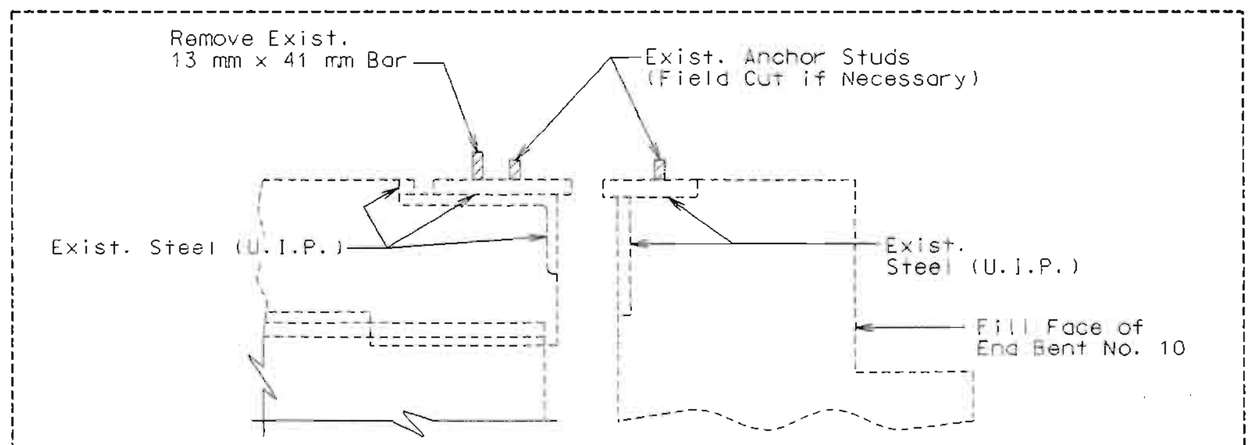
(1) Min. = 42 mm
Max. = 74 mm

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

(3) Extrusion shall be welded top and back.



STRIP SEAL GLAND
MOVEMENT RATING 102 mm



PART SECTION THRU
EXISTING EXPANSION DEVICE

⚠ Omit

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

Detailed Mar. 1998
Checked Mar. 1998

DETAILS OF STRIP SEAL EXPANSION DEVICE AT END BENT NO. 10

⚠ Revised 7/12/99 Sheet No. 8 of 17

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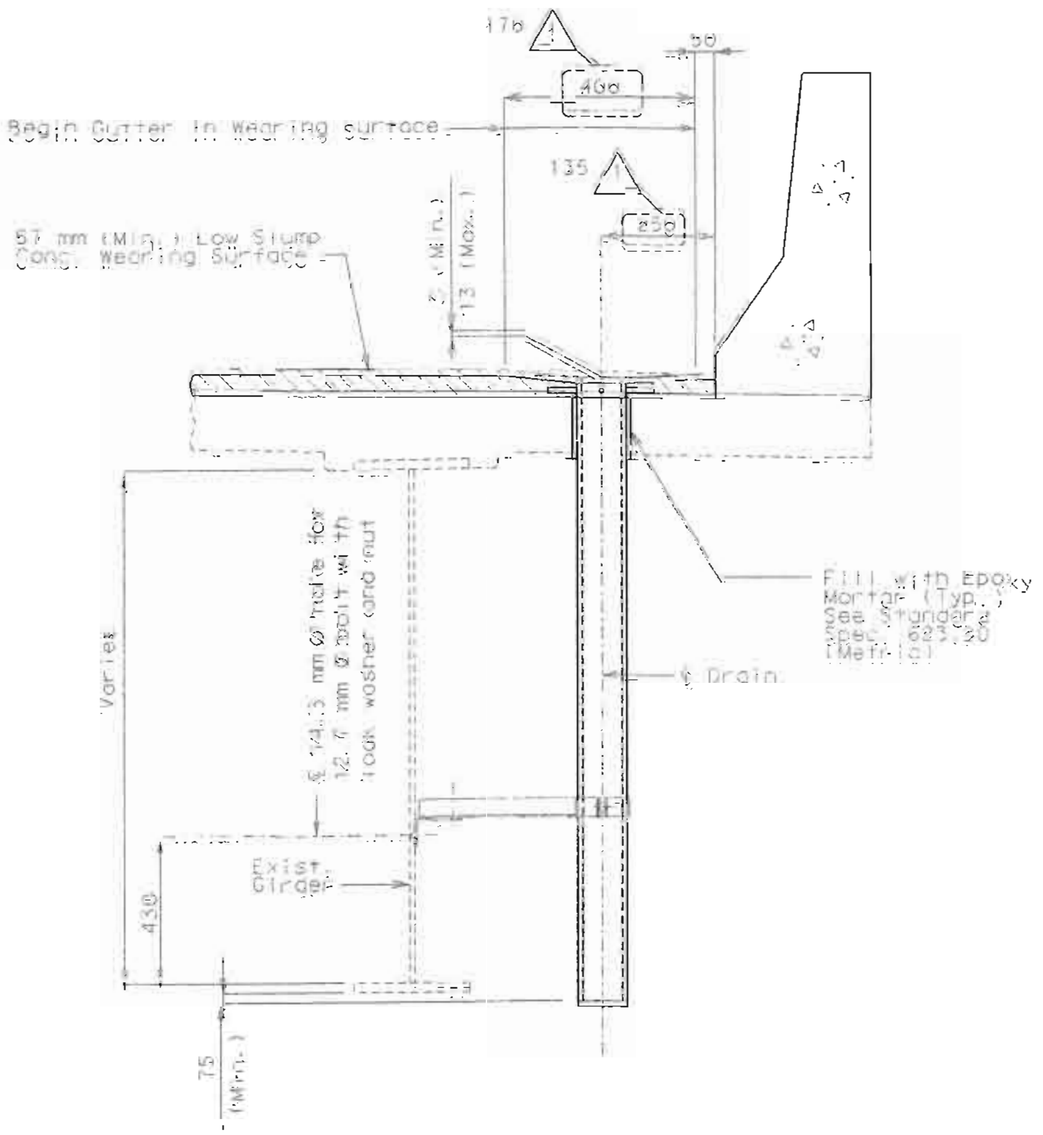
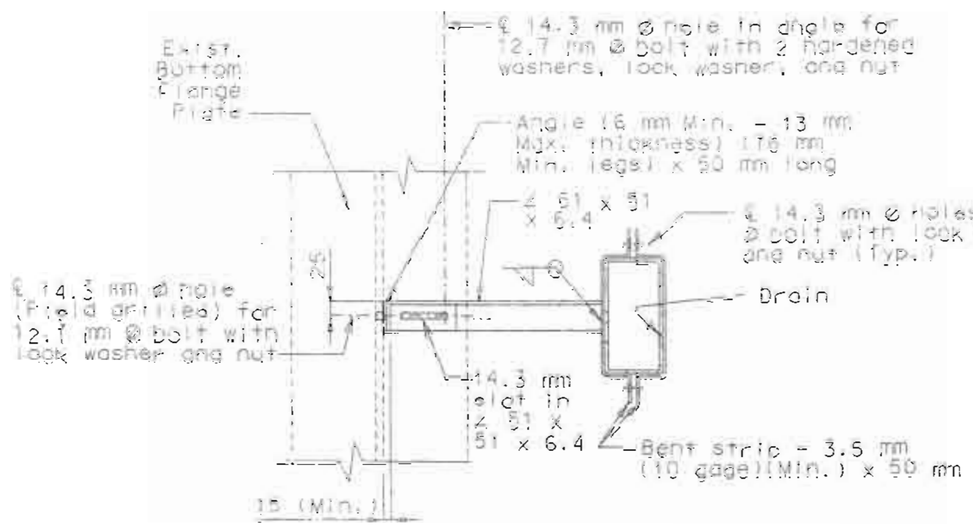
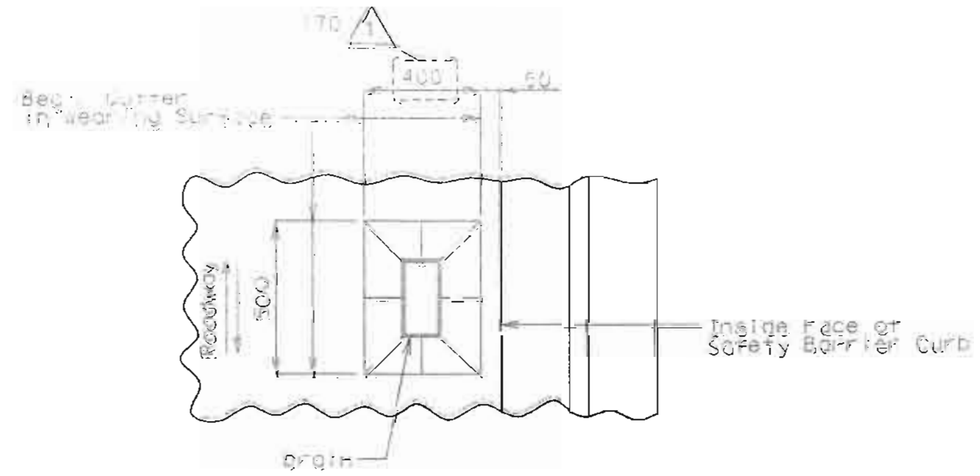


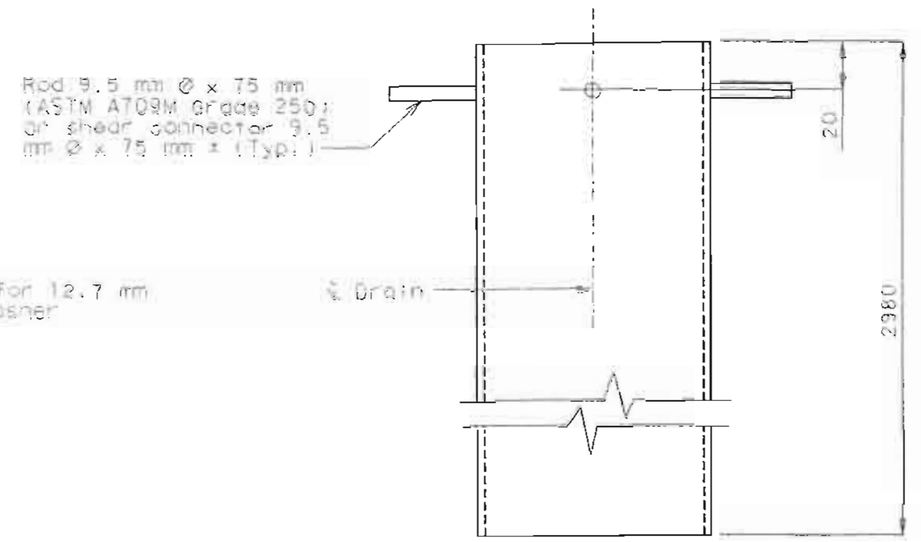
PART SECTION NEAR DRAIN



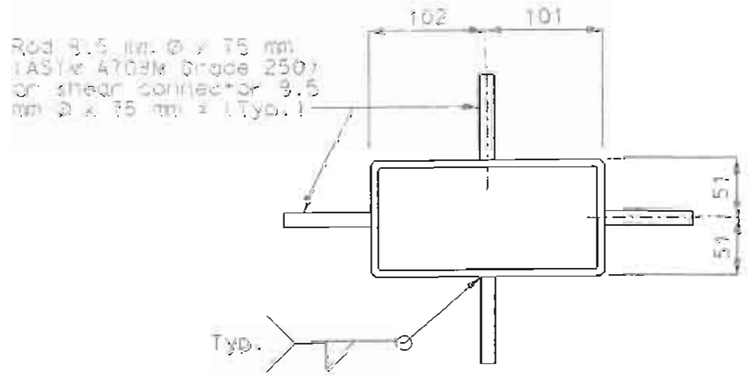
PART SECTION SHOWING BRACKET ASSEMBLY



PART PLAN OF SLAB AT DRAIN



ELEVATION OF DRAIN



PLAN OF DRAIN

GENERAL NOTES:

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

Outside dimensions of drains are 203 mm x 102 mm.

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

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

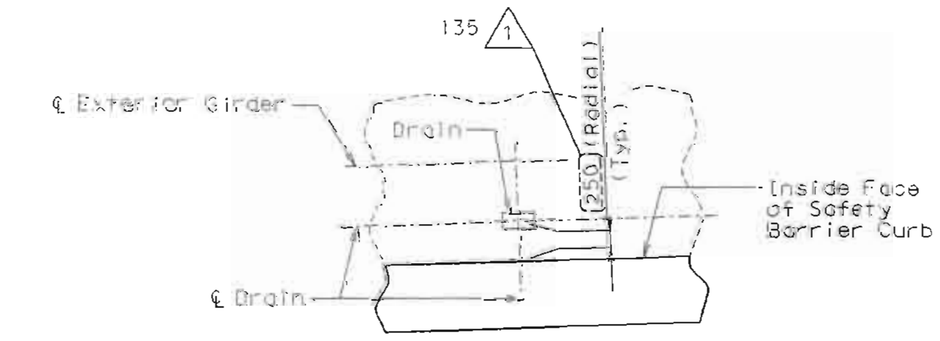
All bolts, hardened washers, lock washers and nuts shall be galvanized in accordance with ASTM A153.

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

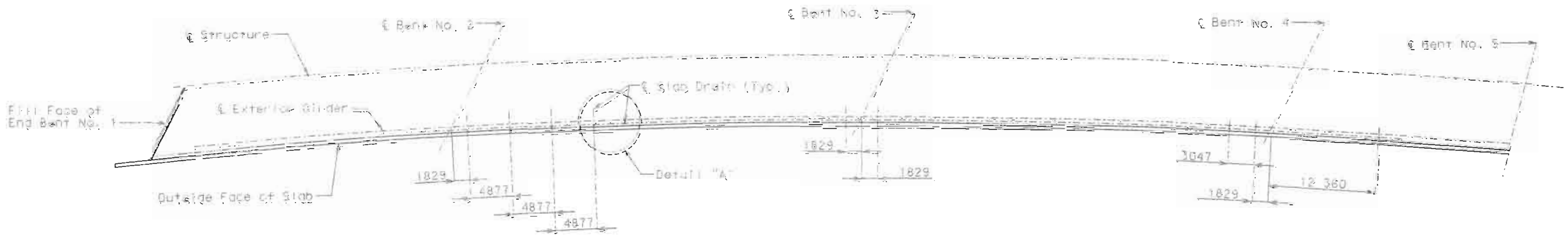
Shift slab drain locations the minimum extent necessary to allow for field drilling hole in web of girder for bracket assembly attachment.

Slab drain spacings are based on layout of original plans. The contractor shall field check the location and clearance of drains so they do not interfere with any existing objects or structures below the bridge.

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



DETAIL "A"



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

HALF PLAN OF SLAB SHOWING SLAB DRAIN LOCATIONS

NOTE: Dimensions showing slab drain locations are horizontal dimensions.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 8-12-98

DETAILS OF SLAB DRAINS (RIGHT SIDE ONLY)

Detailed Mar. 1998
Checked Mar. 1998

Revised 8-12-98

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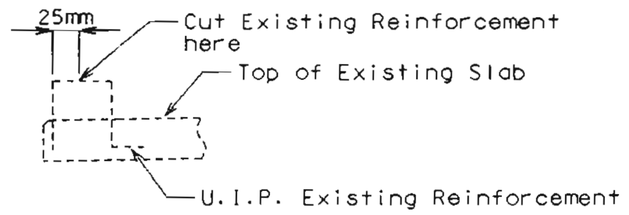
MO		329



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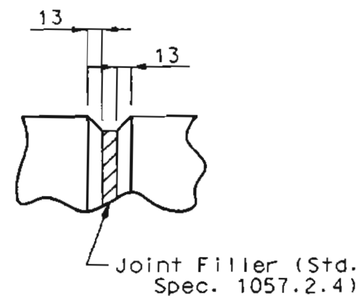
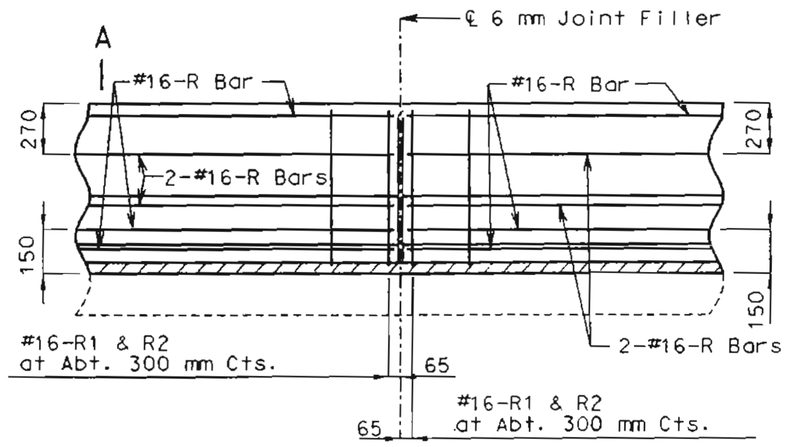
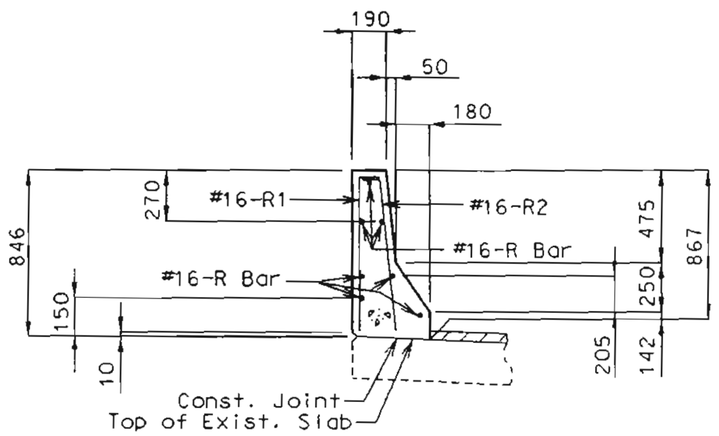


FILLED JOINT DETAIL



A TYPICAL PART SECTION NEAR LEFT SAFETY BARRIER CURB

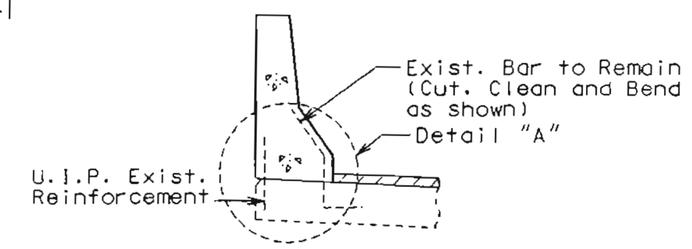


PART SECTION A-A

Note:

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

The cross-sectional area above the slab = 239 805 sq. mm.



PART SECTION SHOWING EXISTING REINFORCEMENT

NOTE:

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

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

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

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

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

For details of expansion device movement gauge, see sheet No. 3.

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

DATE 4-6-98

Detailed Mar. 1998
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DETAILS OF LEFT SAFETY BARRIER CURB

Sheet No. 10 of 17

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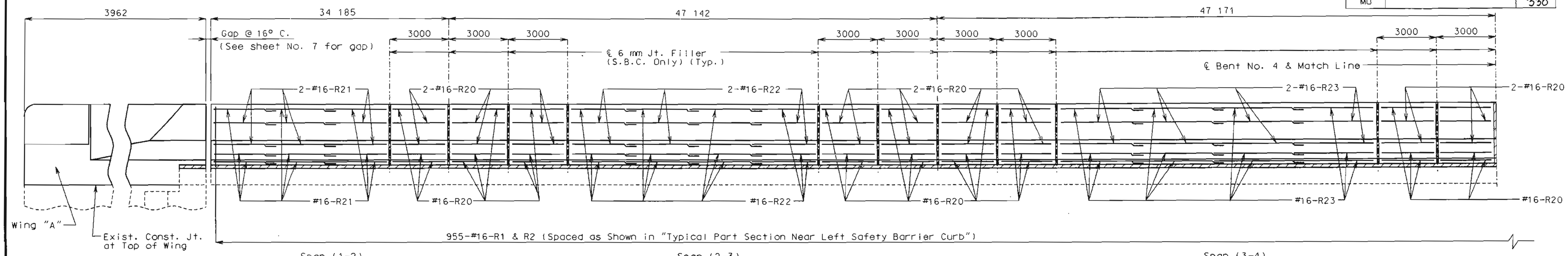

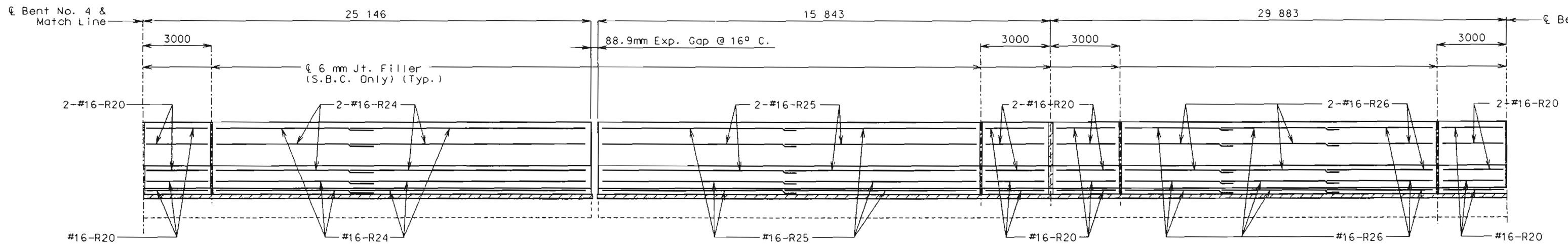

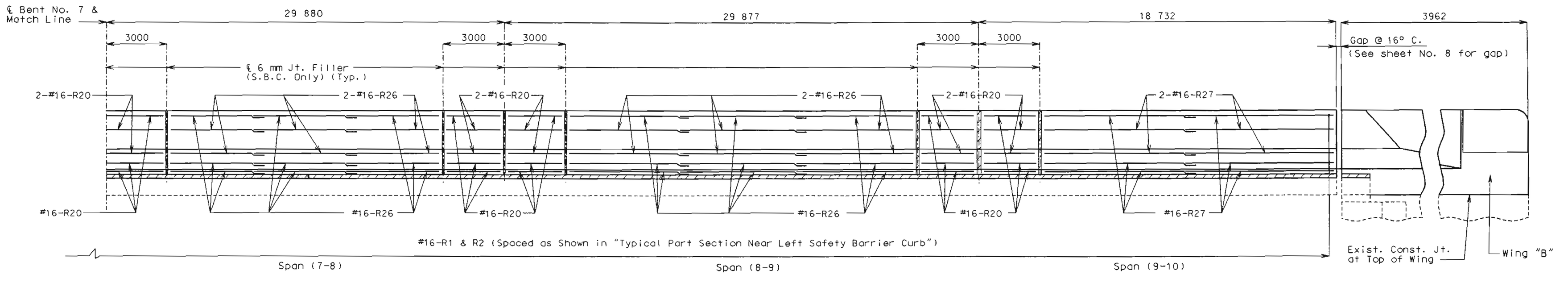

SECTION THRU SLAB SHOWING SAFETY BARRIER CURB (LEFT SIDE)

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

Longitudinal dimensions shown are horizontal arc dimensions along outside of slab.

For details of curb not shown see sheet No. 10.

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
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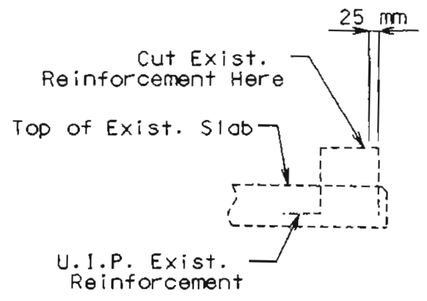
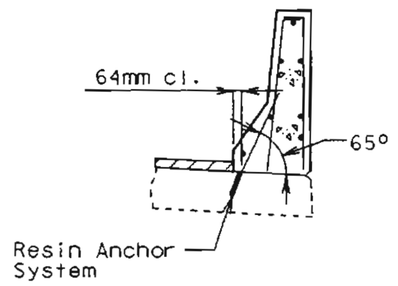
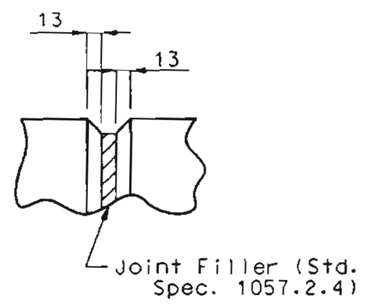
MO		331



DETAIL "A"



PART SECTION A-A
(OPTIONAL RESIN ANCHORING SYSTEM)



FILLED JOINT DETAIL

NOTE:

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 special provisions. except as modified by the job special provisions.

Cost of furnishing and installing the anchor systems complete in place shall be included in the price bid for Safety Barrier Curb per meter.

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.

An epoxy coated #16 Grade 420 reinforcing bar 690 mm long shall be substituted for the 15.9 Ø threaded rod stud.

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

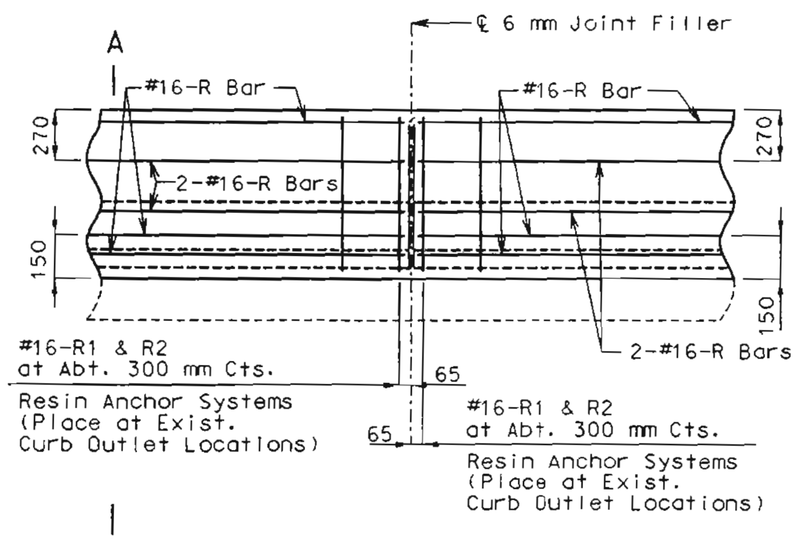
All exposed edges of safety barrier curb shall have either a 15 mm radius or a 10 mm bevel, unless otherwise noted.

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

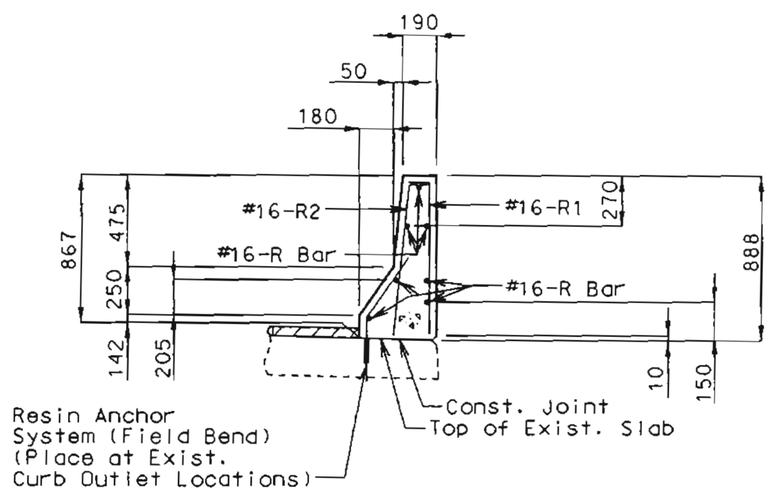
Concrete in the safety barrier curb shall be Class B1 with f'c=28MPa.

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

For details of expansion device movement gauge, see sheet No. 3.



TYPICAL PART ELEVATION OF RIGHT SAFETY BARRIER CURB

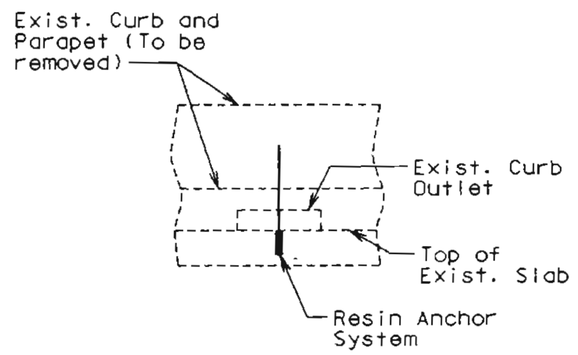


PART SECTION A-A

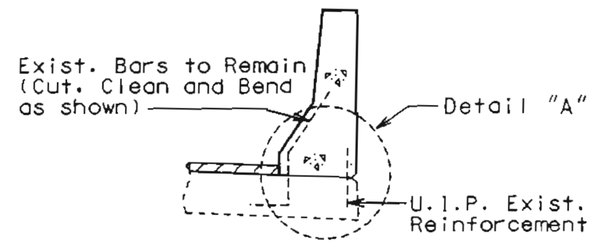
Note:

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

The cross-sectional area above the slab = 248 625 sq. mm.



DETAIL SHOWING LOCATION OF RESIN ANCHOR SYSTEMS



PART SECTION SHOWING EXISTING REINFORCEMENT

STATE OF MISSOURI
Stacy L. McMillan
NUMBER E-26873
REGISTERED PROFESSIONAL ENGINEER
DATE 4-6-98

Detailed Mar. 1998
Checked Mar. 1998

DETAILS OF RIGHT SAFETY BARRIER CURB

Sheet No. 12 of 17

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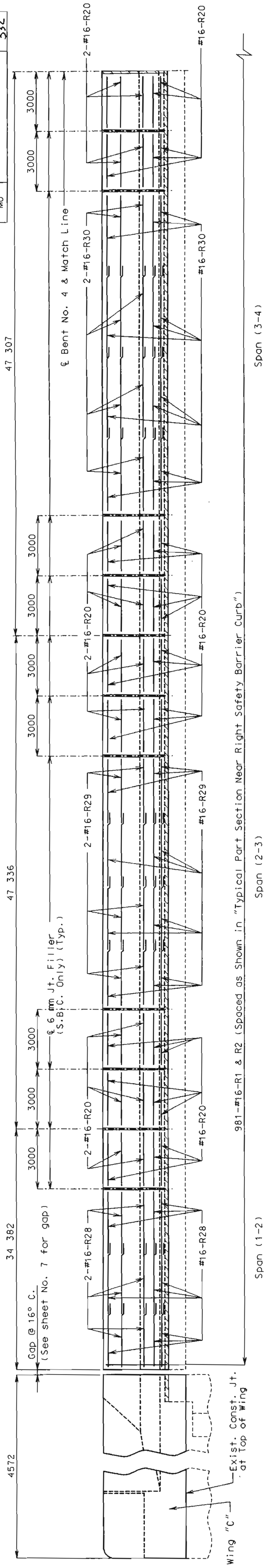
STATE OF MISSOURI — Stacy L McMillan NUMBER E-26873 REGISTERED PROFESSIONAL ENGINEER

DATE 4-6-98



ELEVATION OF SAFETY BARRIER CURB (RIGHT SIDE)

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

Longitudinal dimensions shown are horizontal arc dimensions along outside of slab.

For details of curb not shown see sheet No. 12.

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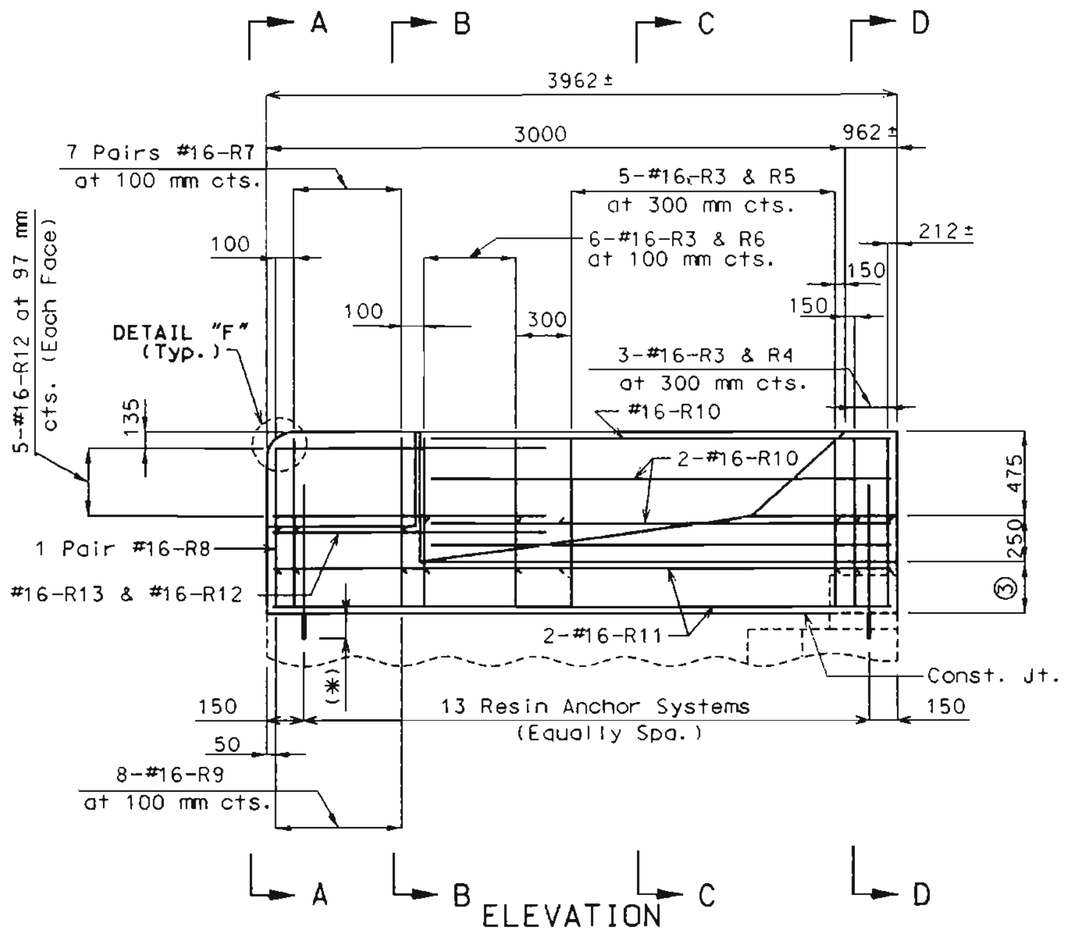
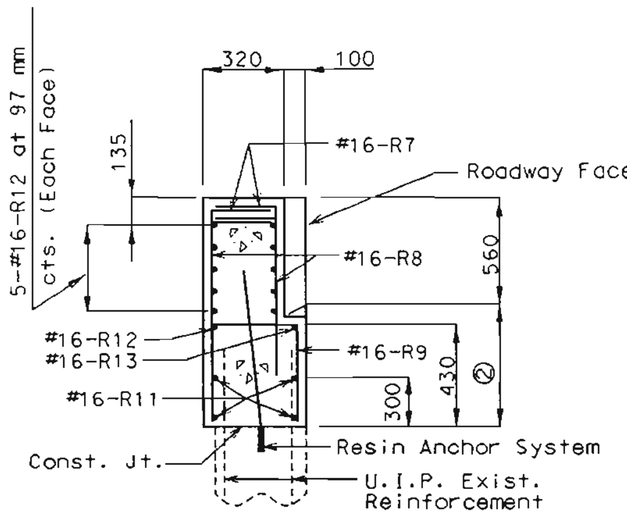
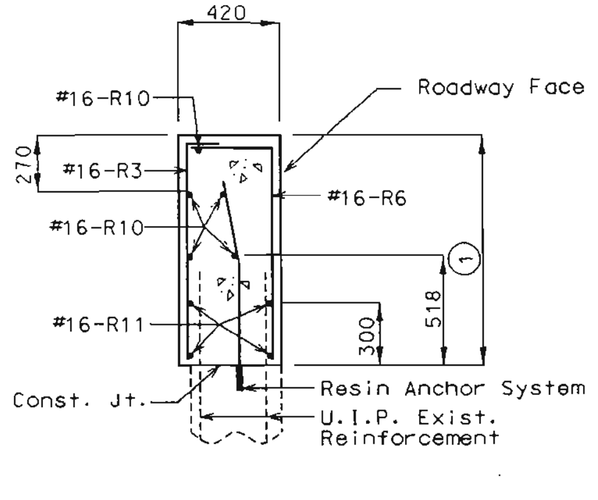
FOR INFORMATION ONLY



ELEVATION



PART SECTION A-A



PART SECTION B-B

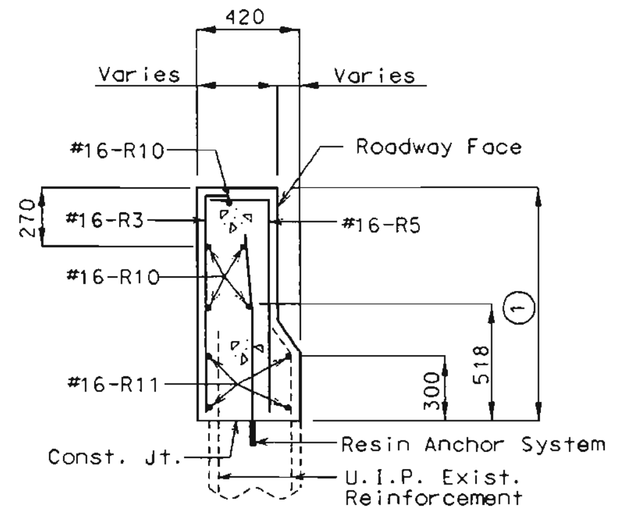
Note: #16-R12 & #16-R13 bars not shown for clarity

Table of Dimensions		
Dimension	Wing "A" & "B"	Wing "D"
①	1037	1079
②	477	519
③	312	354

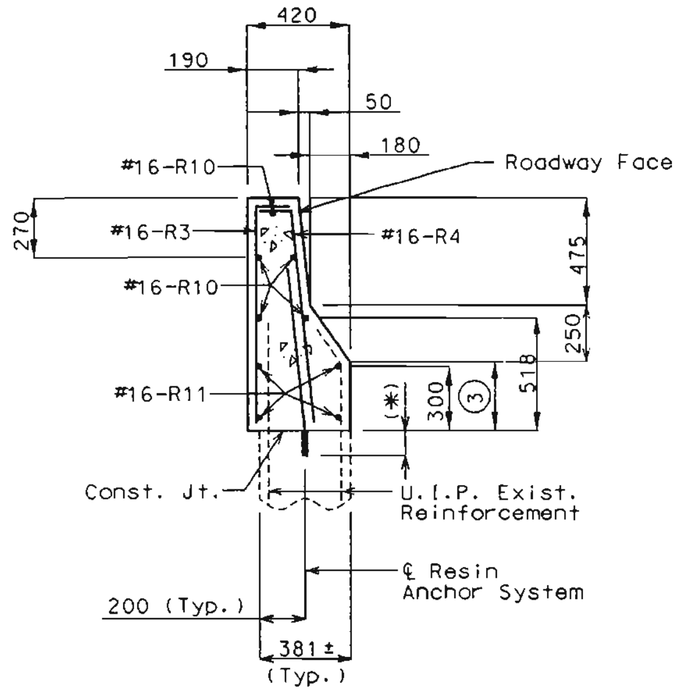
NOTE:

(*) Manufacturers Embedment Length (Typ.).

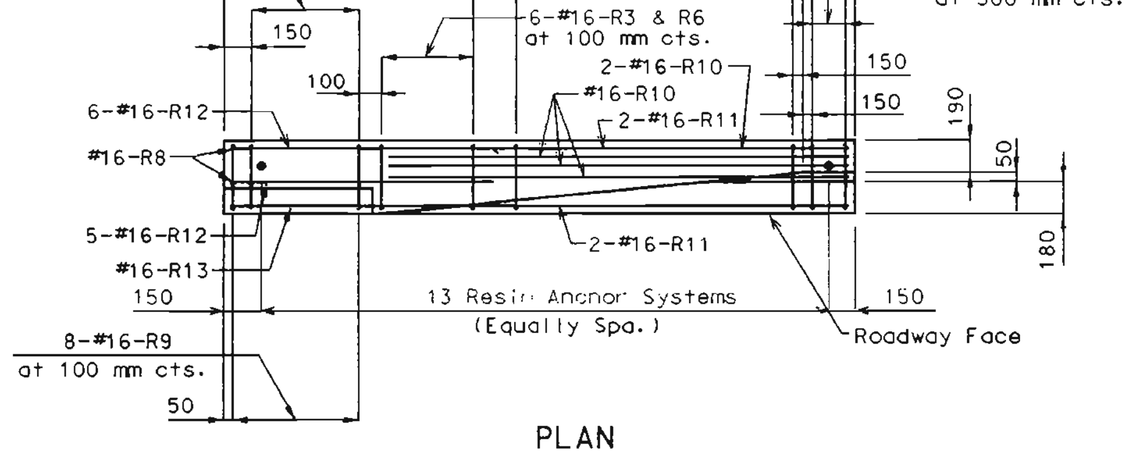
For General Notes on Safety Barrier Curb and Resin Anchor Systems, see sheet No. 12.



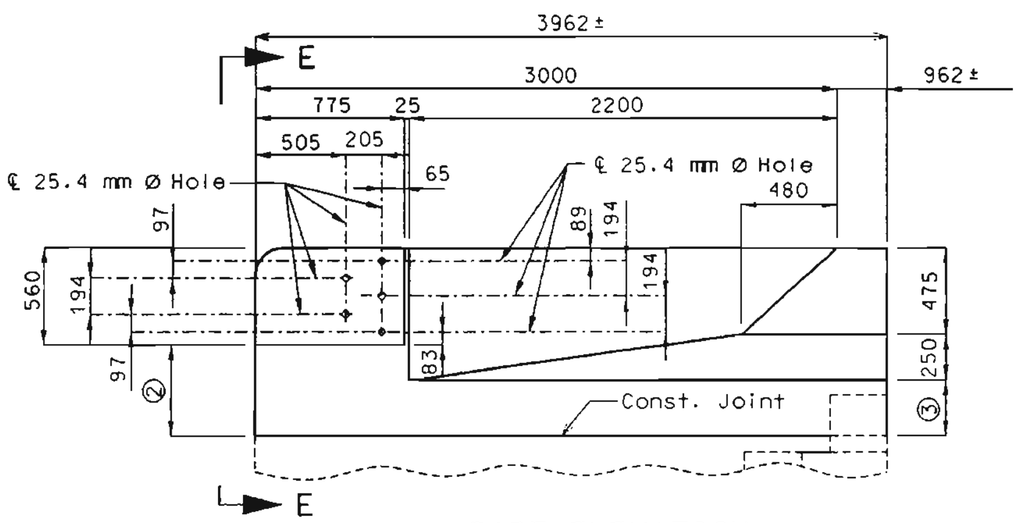
PART SECTION C-C



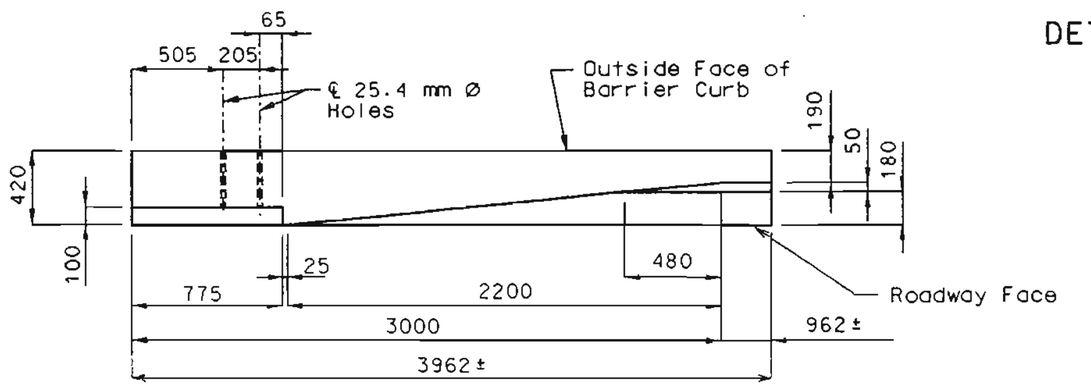
PART SECTION D-D



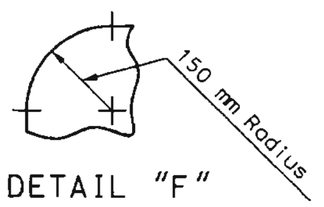
PLAN



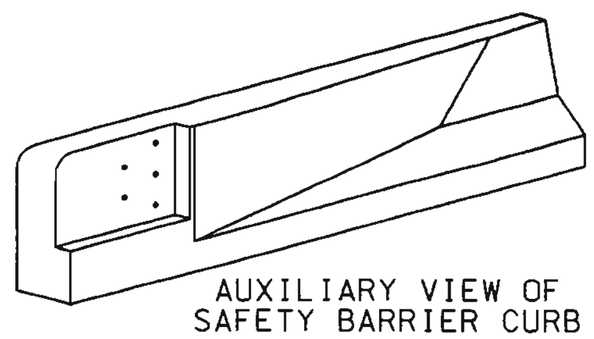
PART ELEVATION



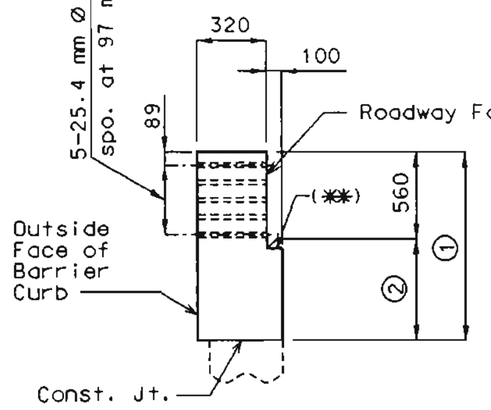
PART PLAN
DETAILS OF GUARD RAIL ATTACHMENT



DETAIL "F"



AUXILIARY VIEW OF SAFETY BARRIER CURB



PART ELEVATION E-E

(**) Slope 6 mm toward roadway

Note: Slip-form option is not allowed for barrier curb at end bents.

DETAILS OF SAFETY BARRIER CURB AT END BENTS ON WING "A", "B" & "D"

Note: For orientation and location of curb on Wing "A", "B" & "D" see sheet No. 11 & 13.

Detailed Mar. 1998
Checked Mar. 1998

JACKSON COUNTY A16865

A16866, Sht. 120

STATE	PROJ. NO.	SHEET NO.
MO.		334

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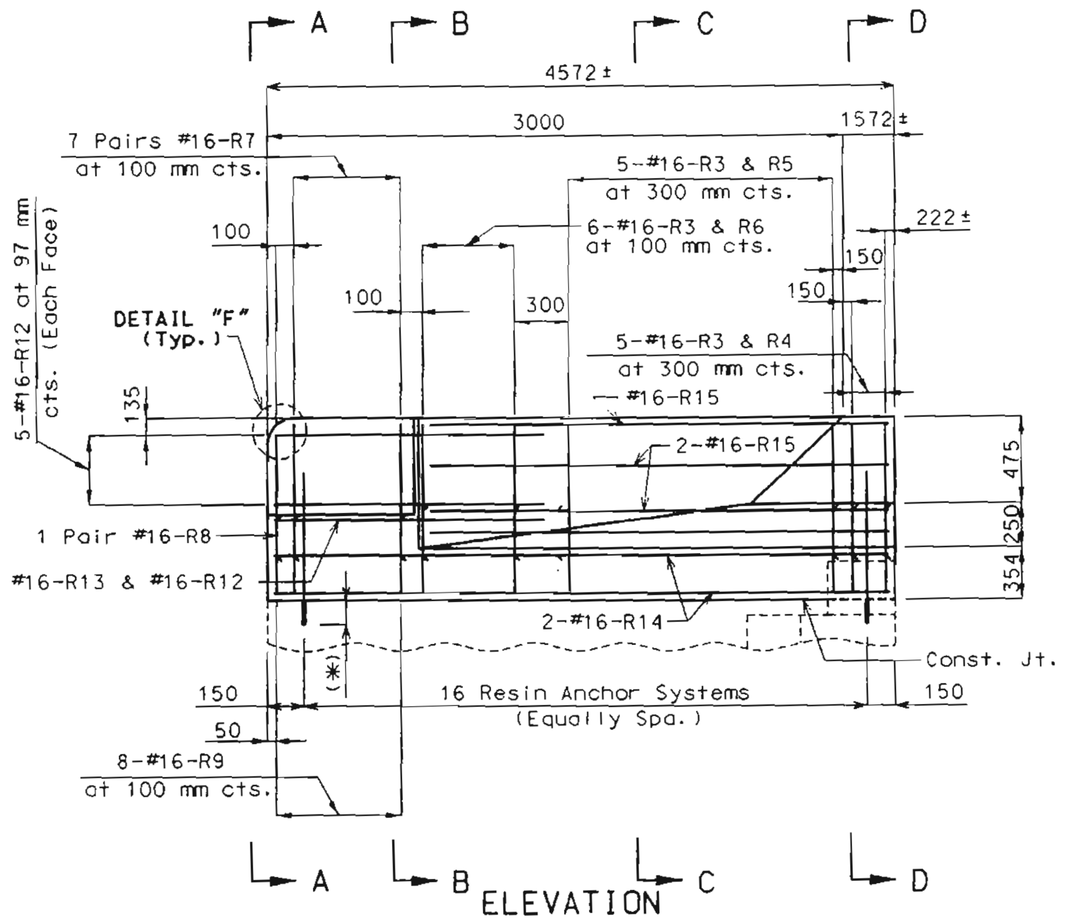
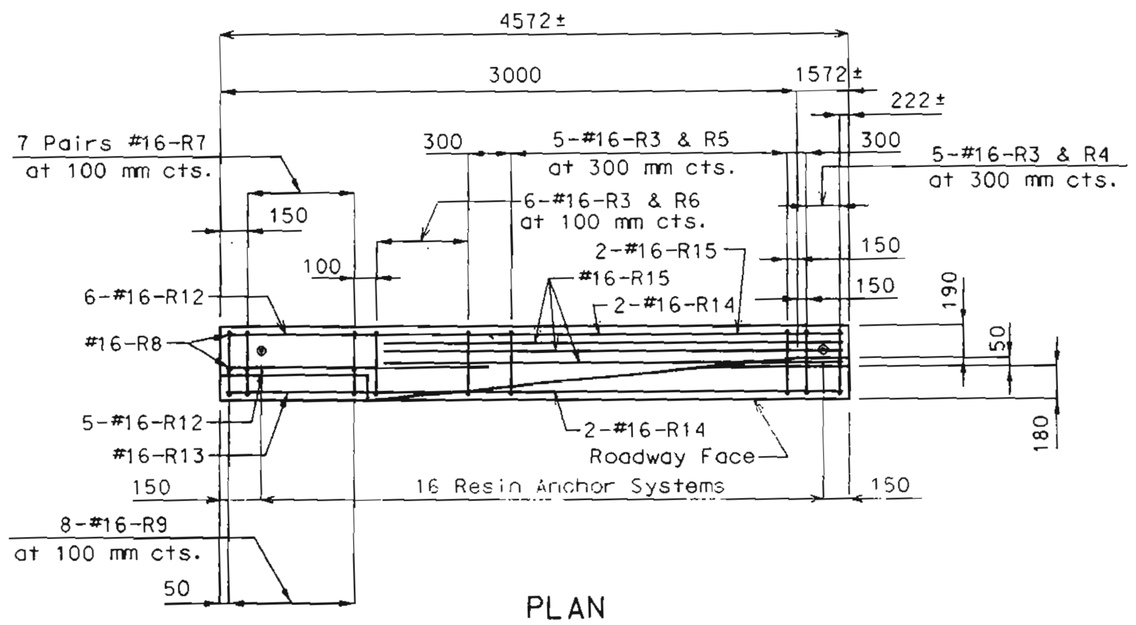
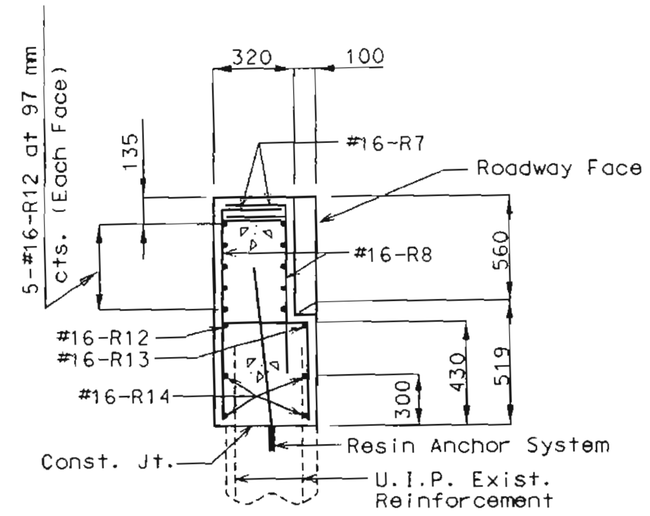


ELEVATION

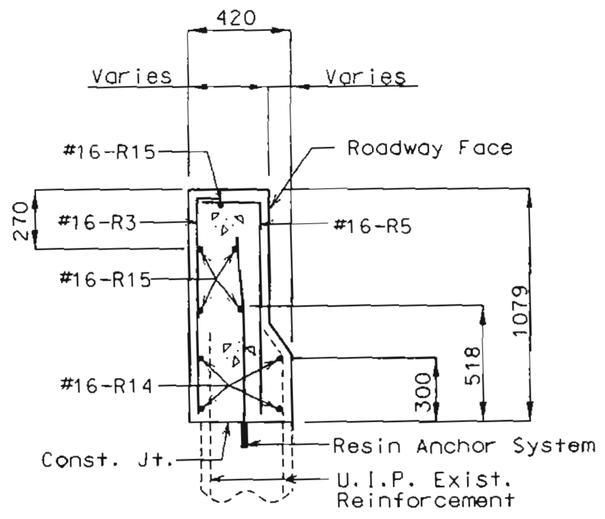


PLAN

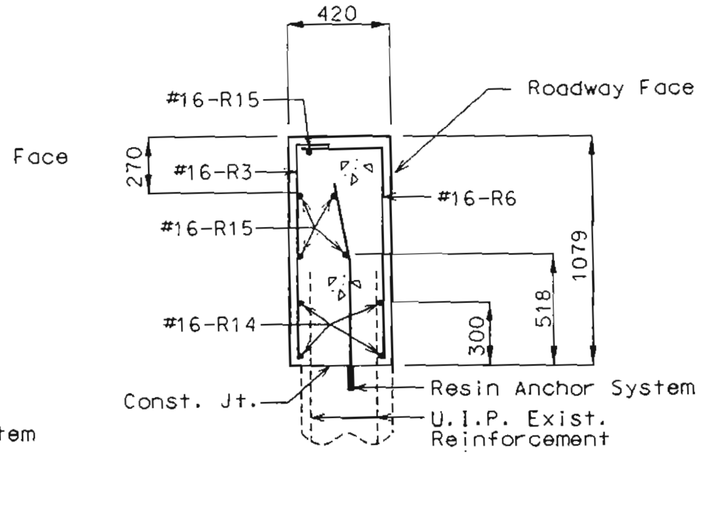
PART ELEVATION



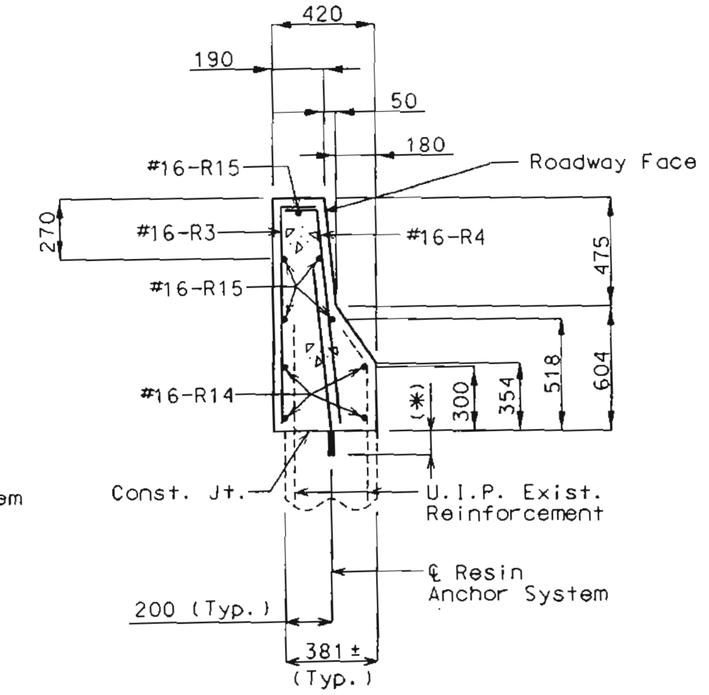
PART SECTION A-A



PART SECTION C-C



Note: #16-R12 & #16-R13 bars not shown for clarity

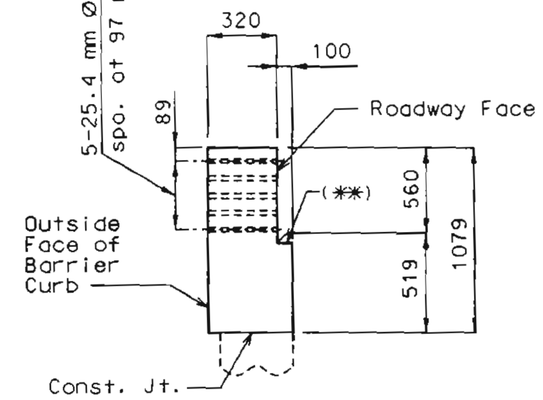


PART SECTION D-D

NOTE:

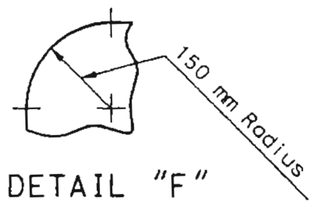
(*) Manufacturers Embedment Length (Typ.).

For General Notes on Safety Barrier Curb and Resin Anchor Systems, see sheet No. 12.

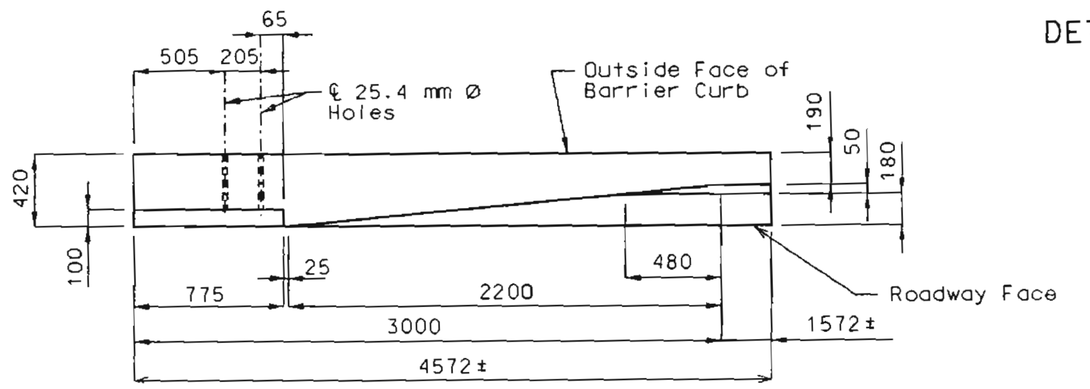


PART ELEVATION E-E

(**) Slope 6 mm toward roadway

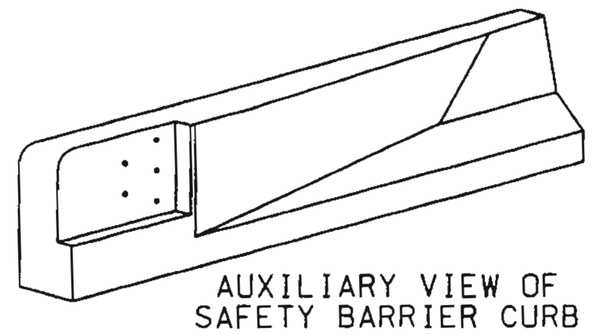


DETAIL "F"



PART PLAN

DETAILS OF GUARD RAIL ATTACHMENT



AUXILIARY VIEW OF SAFETY BARRIER CURB

Note: Slip-form option is not allowed for barrier curb at end bents.

DETAILS OF SAFETY BARRIER CURB AT END BENTS ON WING "C"

Note: For orientation and location of curb on Wing "C" see sheet No. 13.

Detailed Mar. 1998
Checked Mar. 1998

Sheet No. 15 of 17

JACKSON COUNTY A16865

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

DATE 4-6-98

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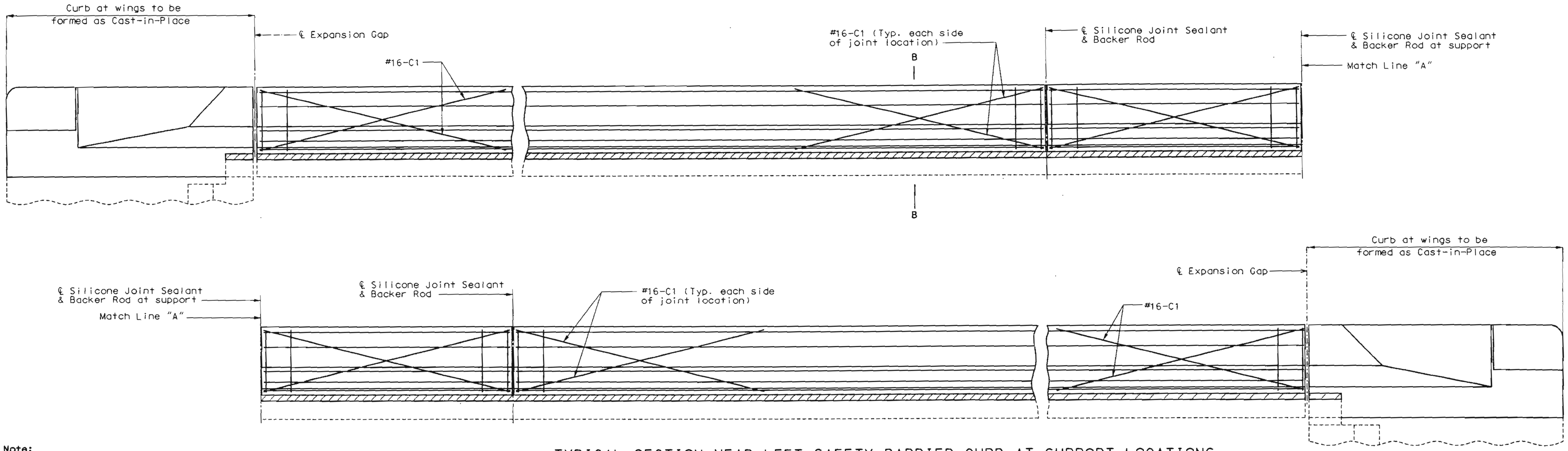
STATE	PROJ. NO.	SHEET NO.
MO.		335



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

Note:

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

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

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

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

Note:

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

Plastic waterstop shall not be used with slip-form option.

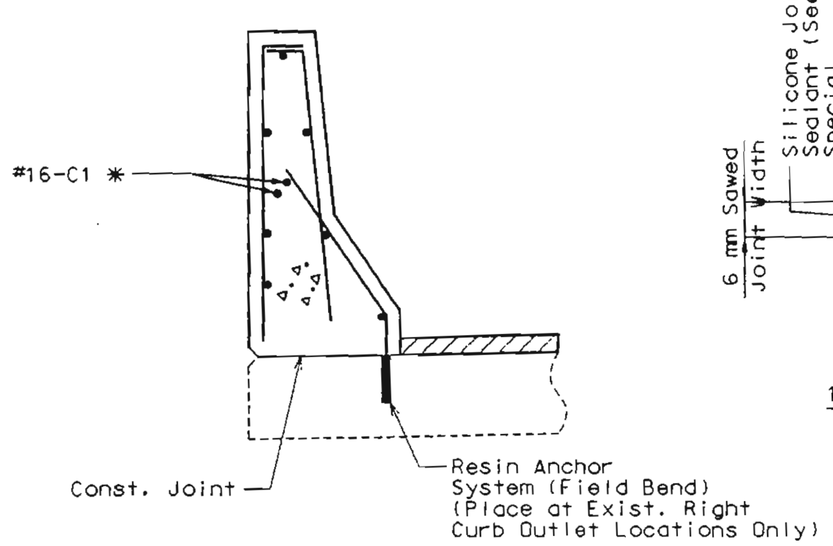
Barrier curbs at end bents shall be cast-in-place, slip form option is not allowed.

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

Note:

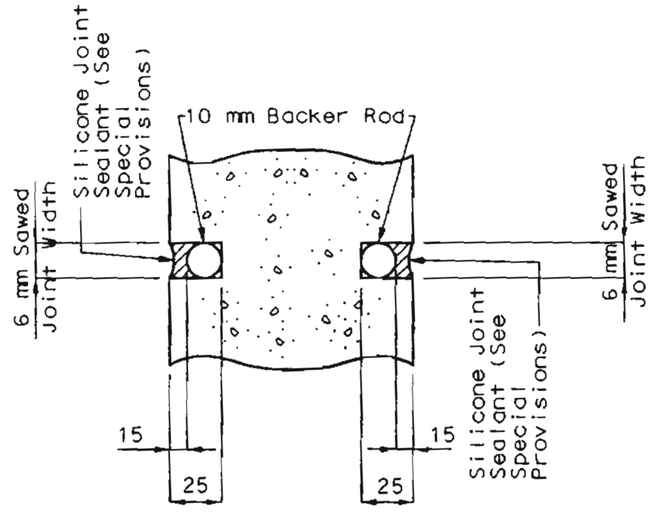
For details showing Exist. reinforcement and resin anchor systems, see sheet No. 12.

For details of expansion device movement gauge, see sheet No. 3.



PART SECTION B-B

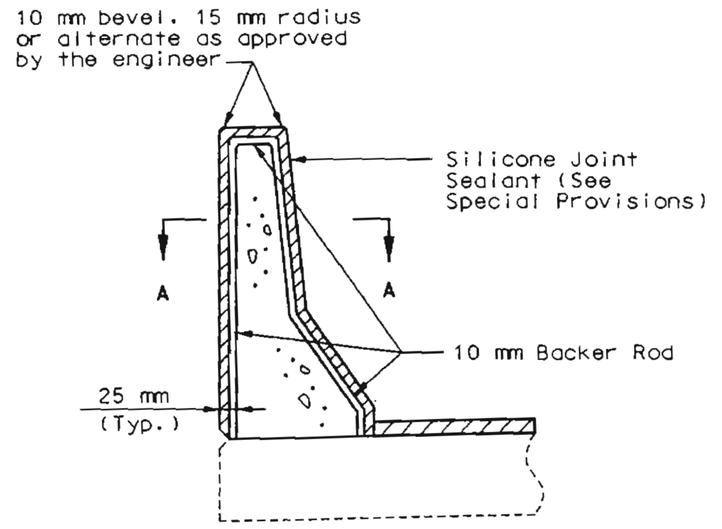
Note: * Each side of joint location.



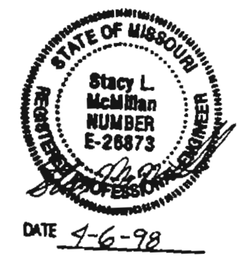
SECTION A-A

Note:

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



SECTION THRU JOINT



OPTIONAL SLIP-FORM BRIDGE SAFETY BARRIER CURB

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

Detailed Mar. 1998
Checked Mar. 1998

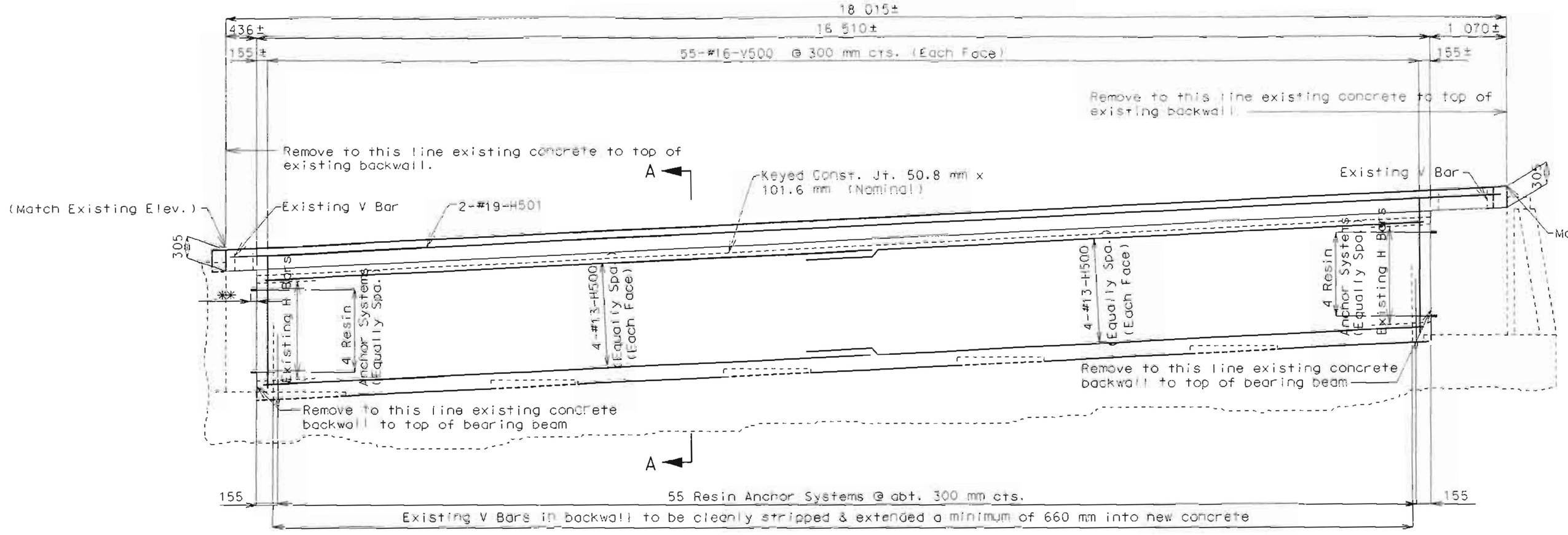
JACKSON COUNTY A16865

FOR INFORMATION ONLY

A16866, Sht. 122

State	Proj. No.	Sheet No.
MO		

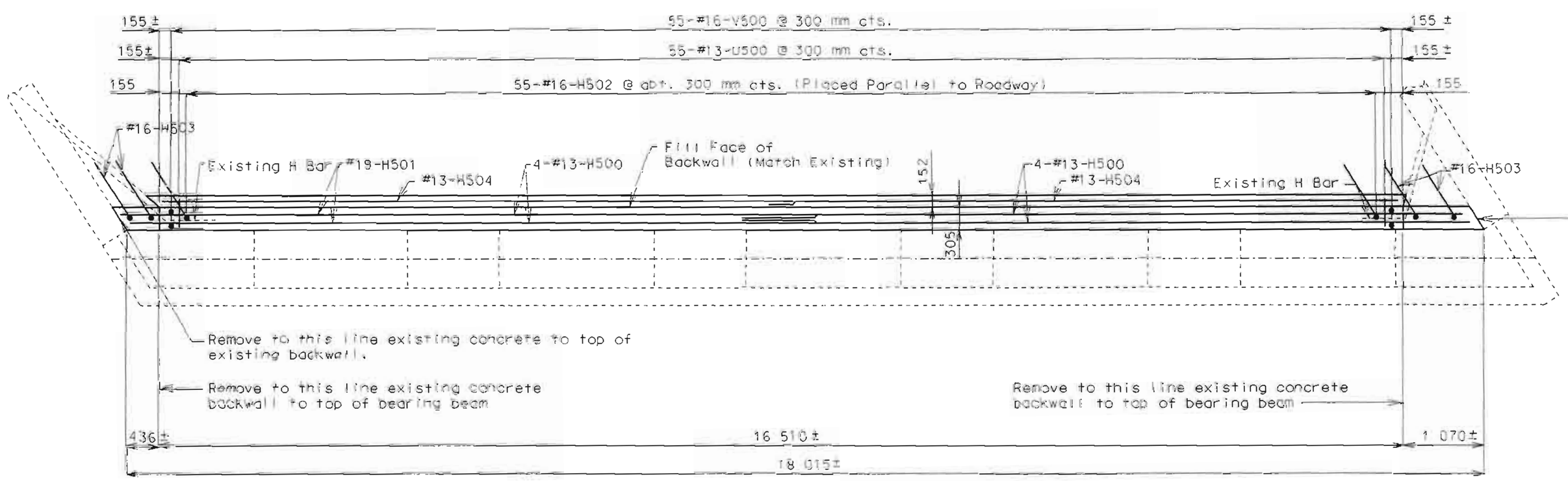
Design Unit Stresses:
Class B1 Concrete f'c = 28 MPa
Reinforcing Steel (Grade 420) fy = 420 MPa
Ø≥34° for select granular backfill
Ø = 23° for for random material



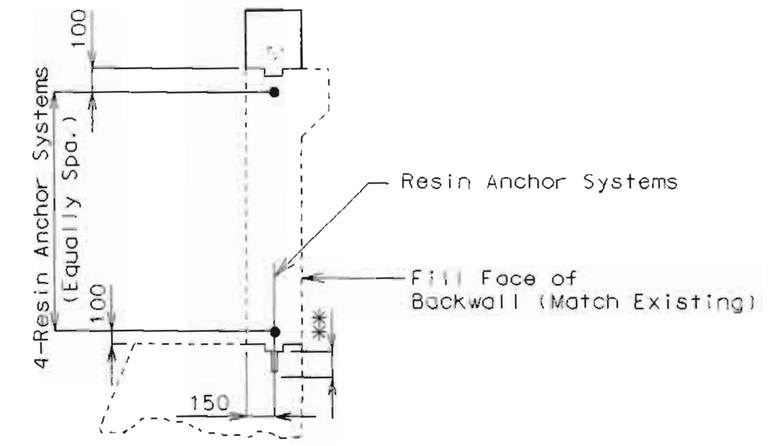
ELEVATION OF BACKWALL

** Manufactures embedment length

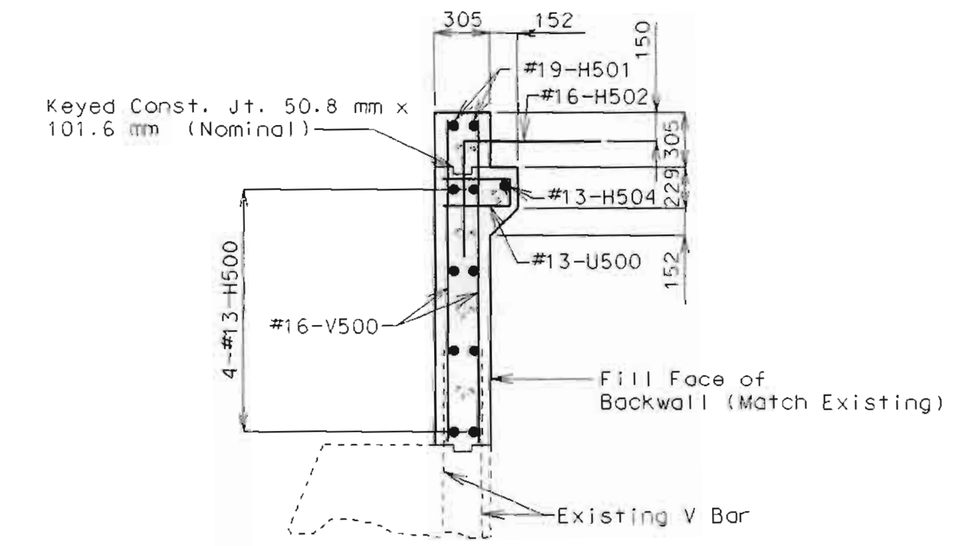
Note: For resin anchor notes see sheet No. 12.



PLAN OF BACKWALL



TYPICAL DETAIL SHOWING RESIN ANCHOR PLACEMENT



SECTION A-A

Remove to this line existing concrete to top of existing backwall.

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

ESTIMATED QUANTITIES		
ITEM		TOTAL
Class B1 Concrete-Metric	Cu. Meter	8.4
Reinforcing Steel (Epoxy Coated)-Metric	Kilogram	670

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

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

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

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

Detailed July 1999
Checked July 1999

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

△2 7/12/99 Added Sheet

Sheet No. 16Aof 17

JACKSON COUNTY A16865

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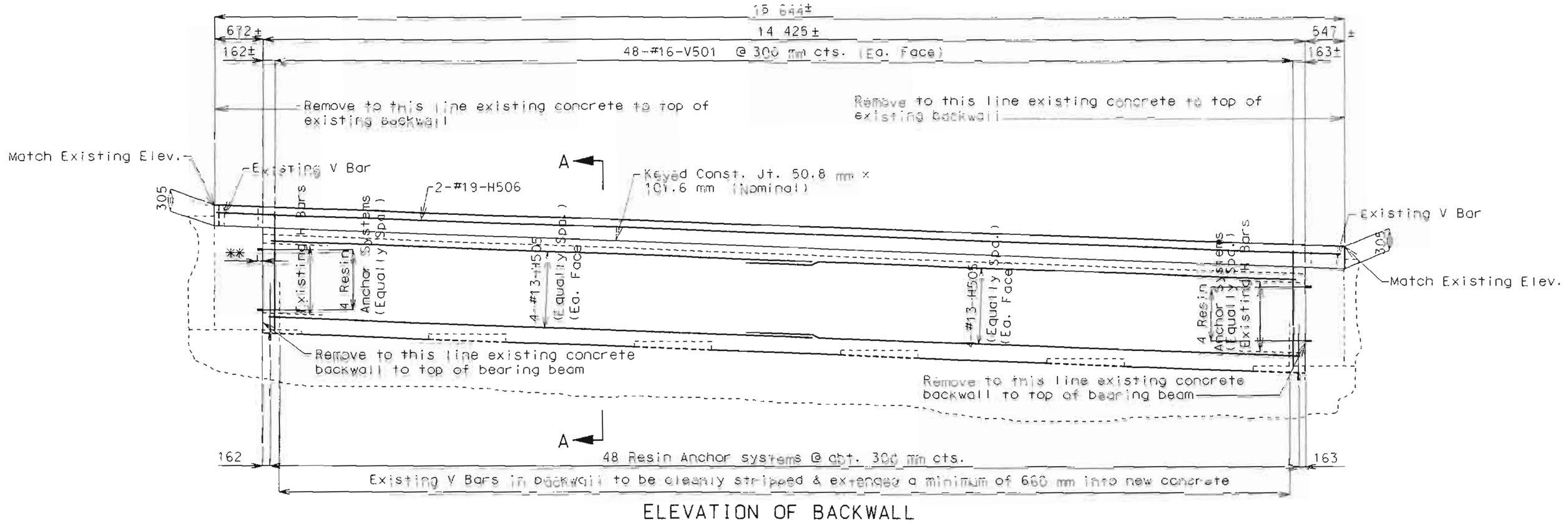
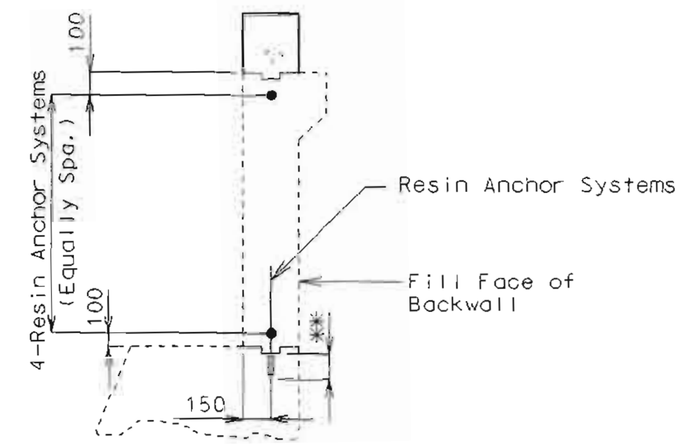


ELEVATION OF BACKWALL

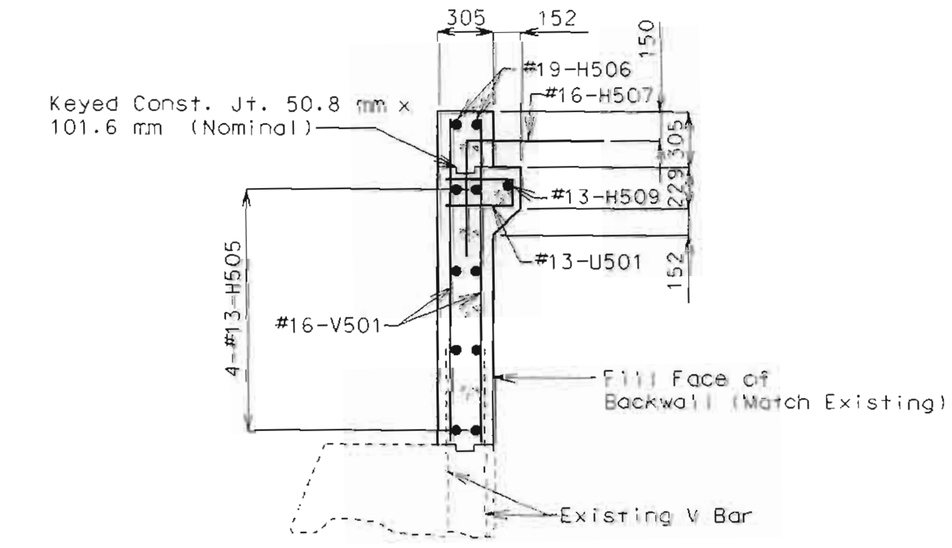
✱✱ Manufactures embedment length

Note: For resin anchor notes see sheet No. 12.

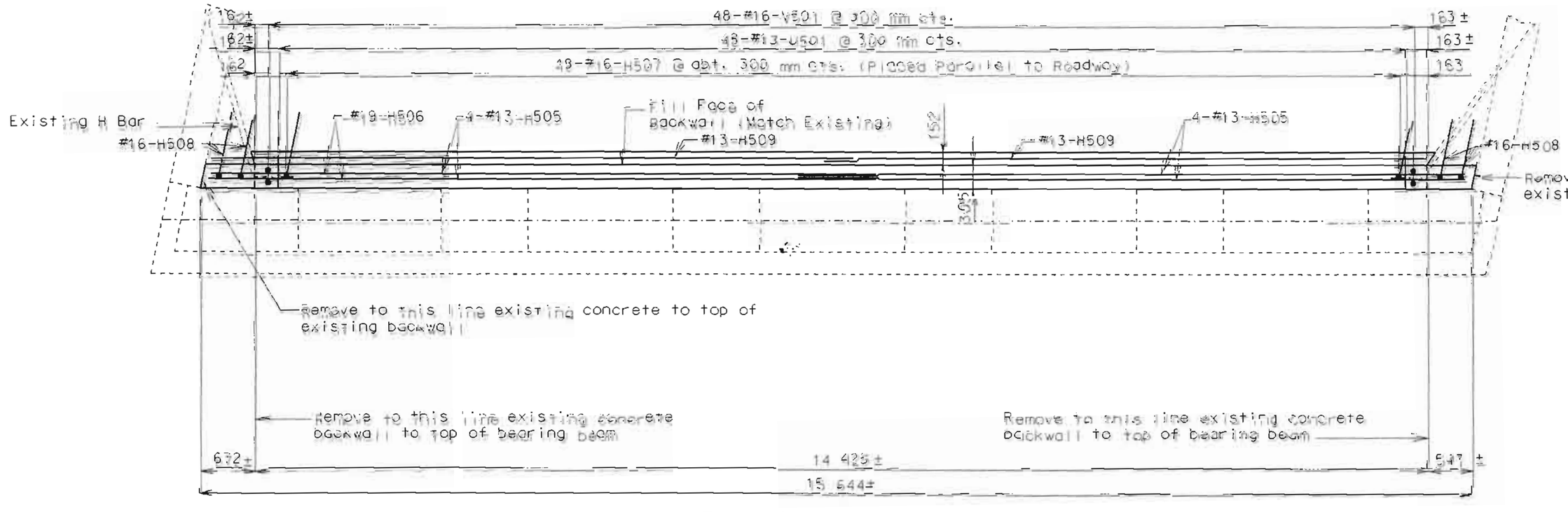
Design Unit Stresses:
Class B1 Concrete f'c = 28 MPa
Reinforcing Steel (Grade 420) fy = 420 MPa
$\phi \geq 34°$ for select granular backfill
$\phi = 23°$ for for random material



TYPICAL DETAIL SHOWING RESIN ANCHOR PLACEMENT



SECTION A-A



PLAN OF BACKWALL

ESTIMATED QUANTITIES		
ITEM		TOTAL
Class B1 Concrete-Metric	Cu. Meter	7.3
Reinforcing Steel (Epoxy Coated)-Metric	Kilogram	590

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

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

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

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

DETAILS OF END BENT NO. 10 ON NORTHBOUND LANE SHOWING BACKWALL REPLACEMENT

Detailed July 1999
Checked July 1999

⚠ 7/12/99 Added Sheet

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

Sheet No. 18 of 17

JACKSON COUNTY A16865

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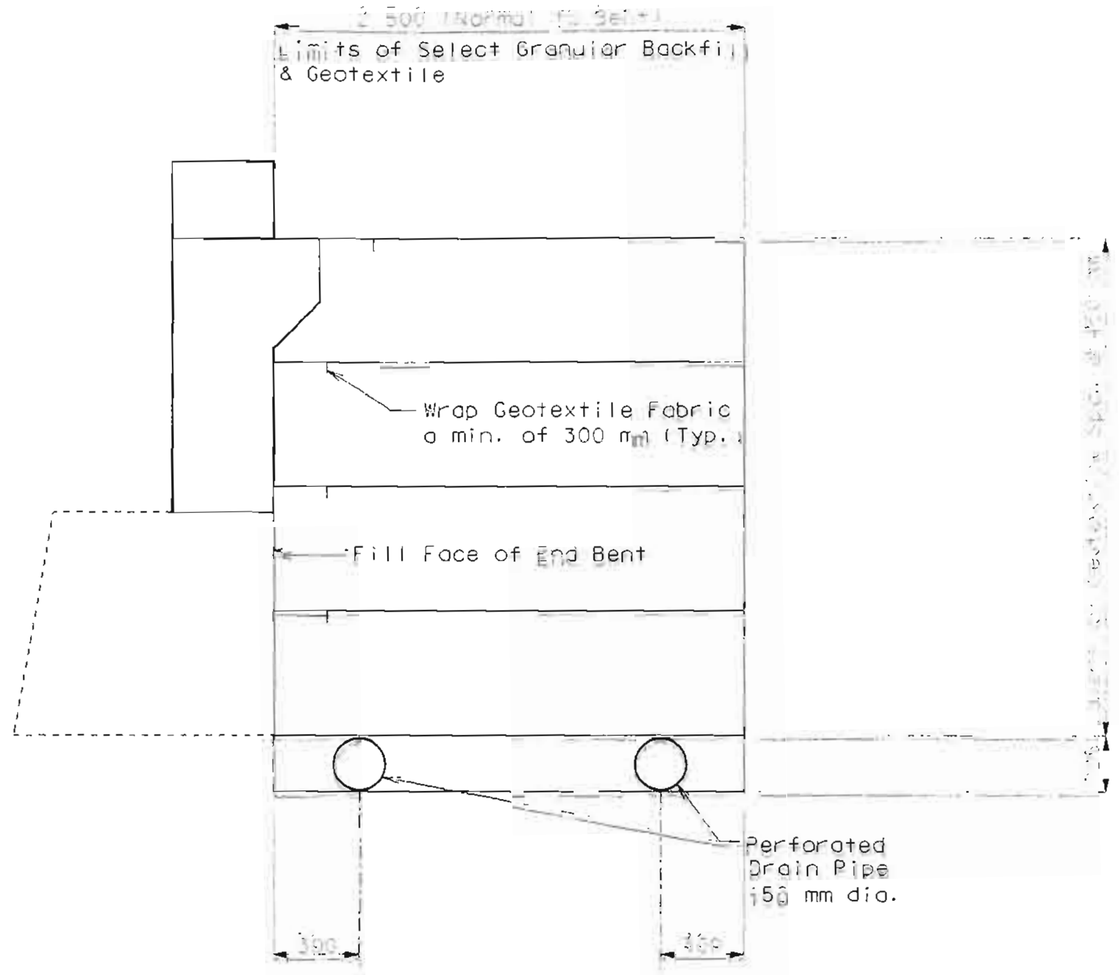


SECTION A-A

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

REINFORCED SOIL MASS

Notes:

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

Slope to lowest grade of ground line.

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

STATE	PROJ. NO.	SHEET NO.
MO.		

Notes:

GEOSYNTHETIC MATERIAL:

All Geotextile Material is to conform to AASHTO M288.

Tallowable(wide width tensile strength) 5840 N/m

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

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

SELECT GRANULAR BACKFILL:

The maximum lift thickness shall be 225 mm

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

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

The backfill material shall be homogenous throughout.

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

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

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

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

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

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

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

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

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

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

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

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

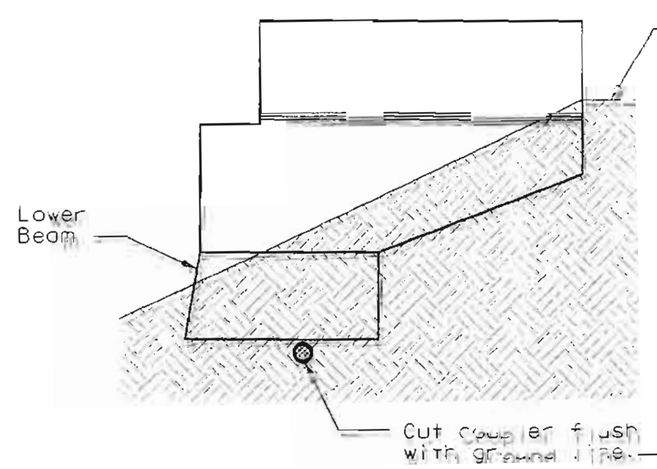
Excepting pH and organic content requirements, the electrochemical requirements are waived for wall systems with a totally non-metallic reinforcement and connecting system to the wall units.

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

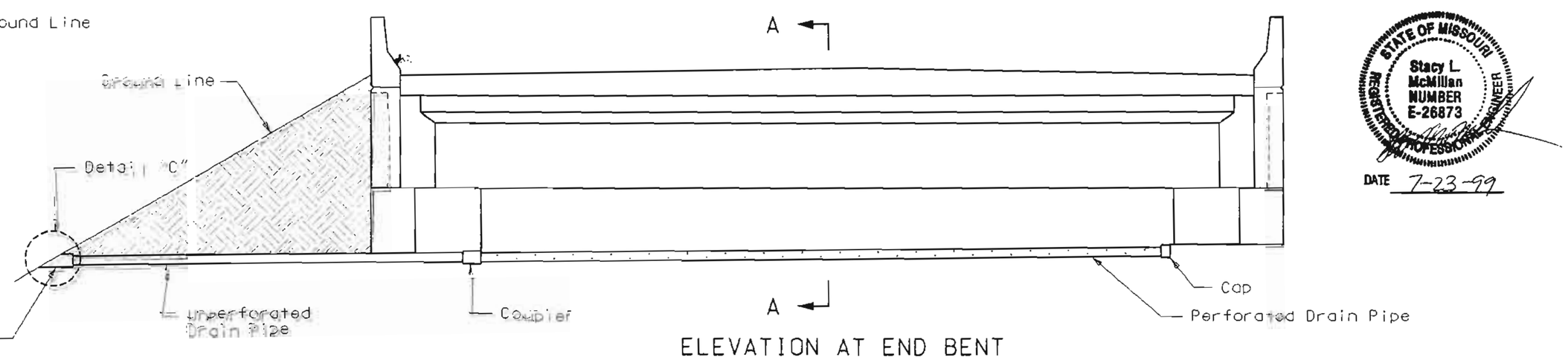
The contractor shall furnish to the engineer a Certificate of Compliance certifying the selected granular backfill material complies with this section of the specifications. A copy of all test results performed by the contractor or his/her supplier necessary to assure contract compliance shall also be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

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

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



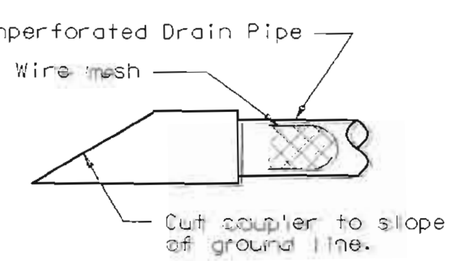
ELEVATION OF WING



ELEVATION AT END BENT

REINFORCED SOIL MASS

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



DETAIL "C"

Detailed July 1999
Checked July 1999

7/12/99 Added Sheet

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FOR INFORMATION ONLY

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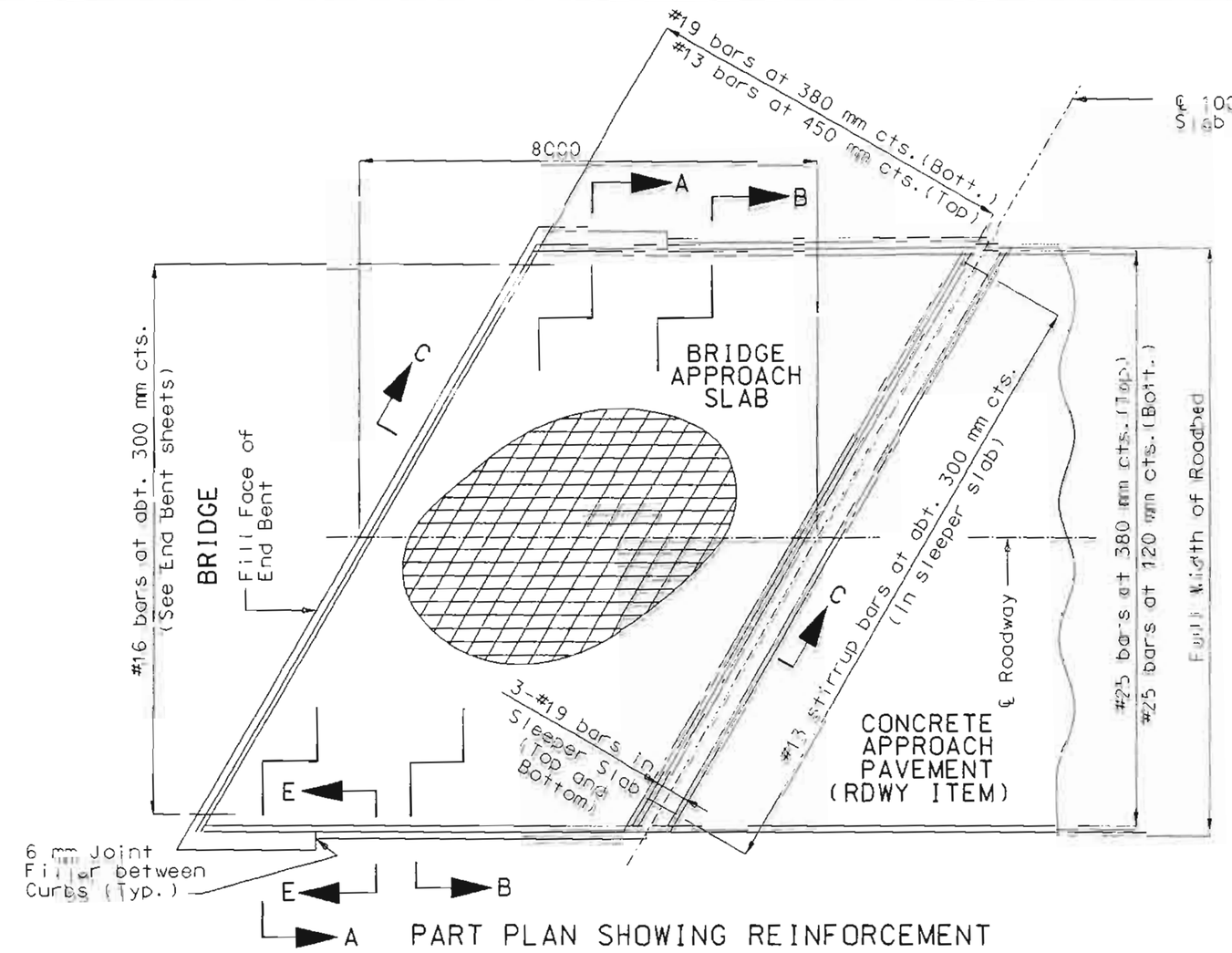
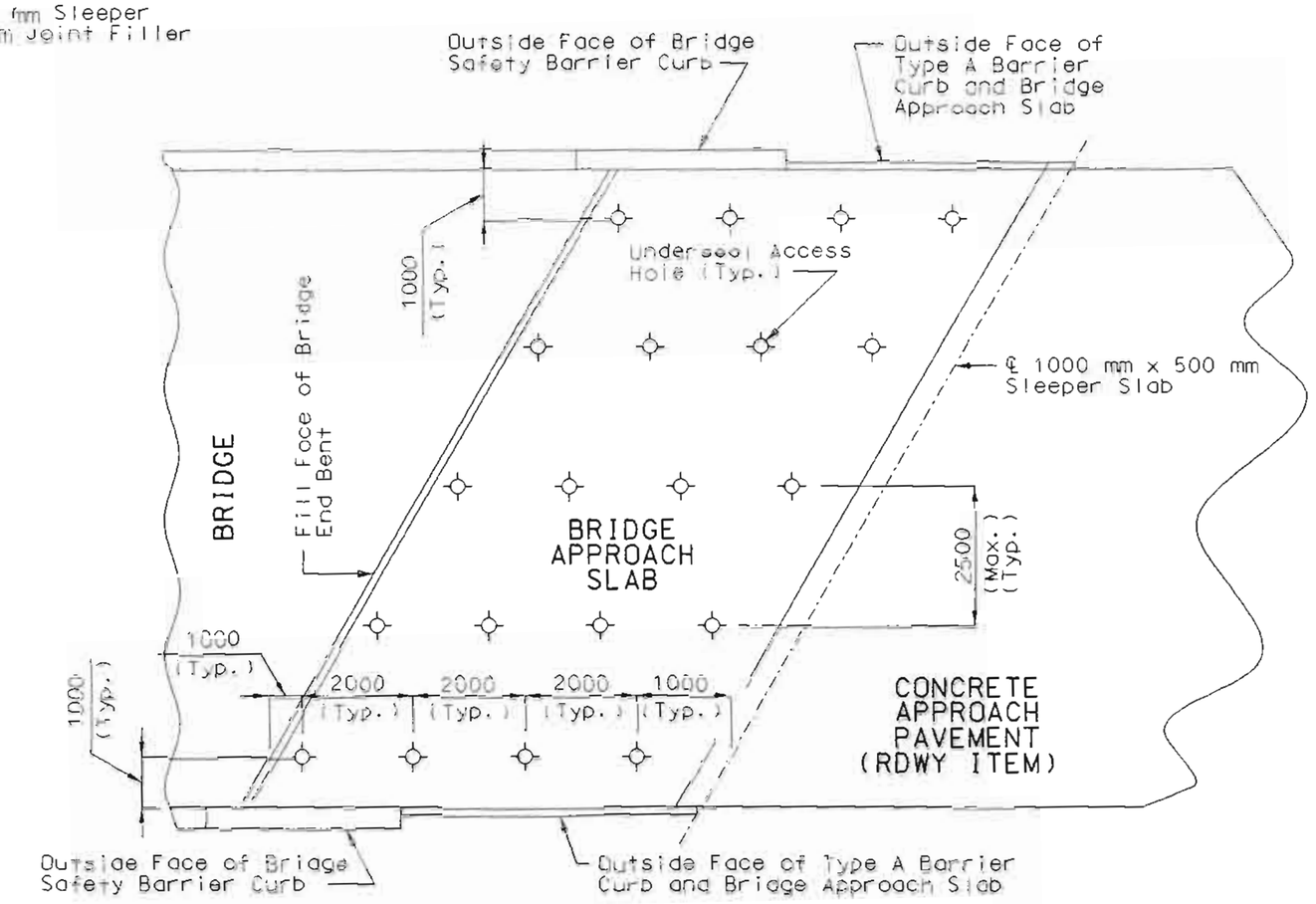
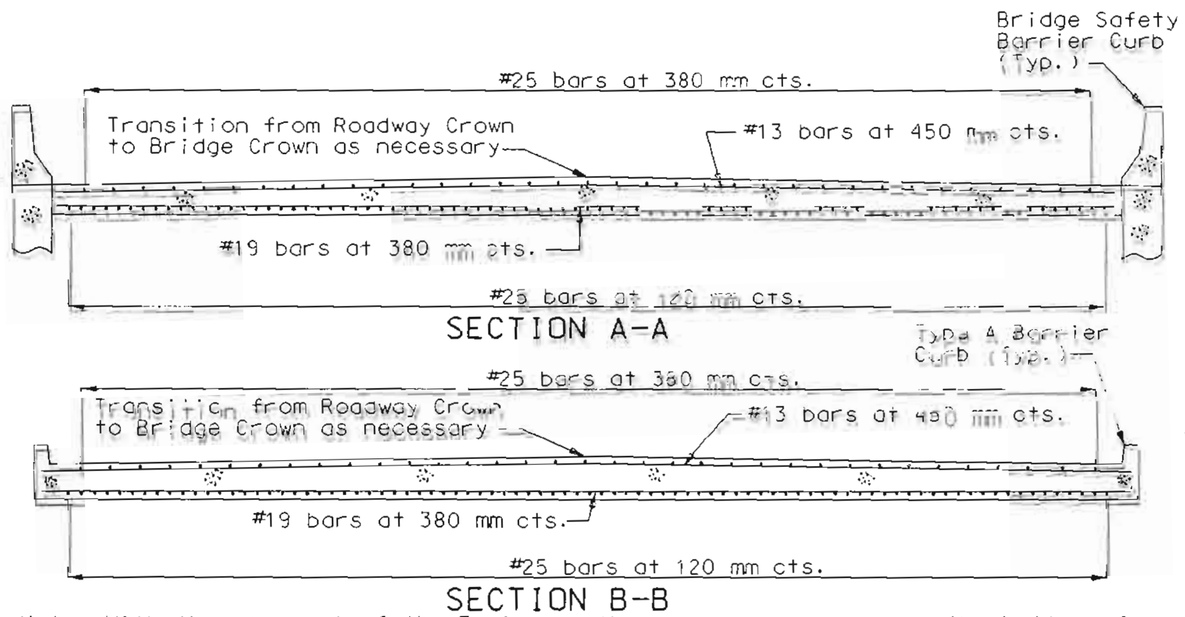


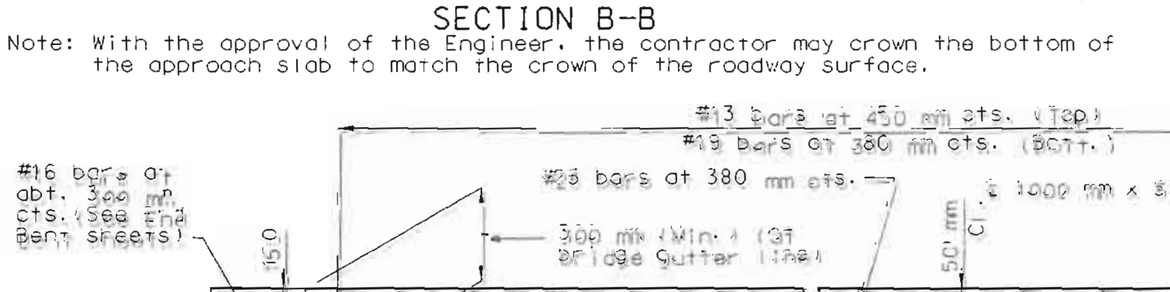
PART PLAN SHOWING REINFORCEMENT



PART PLAN
(SHOWING TYPICAL UNDERSEAL ACCESS HOLE LOCATIONS)

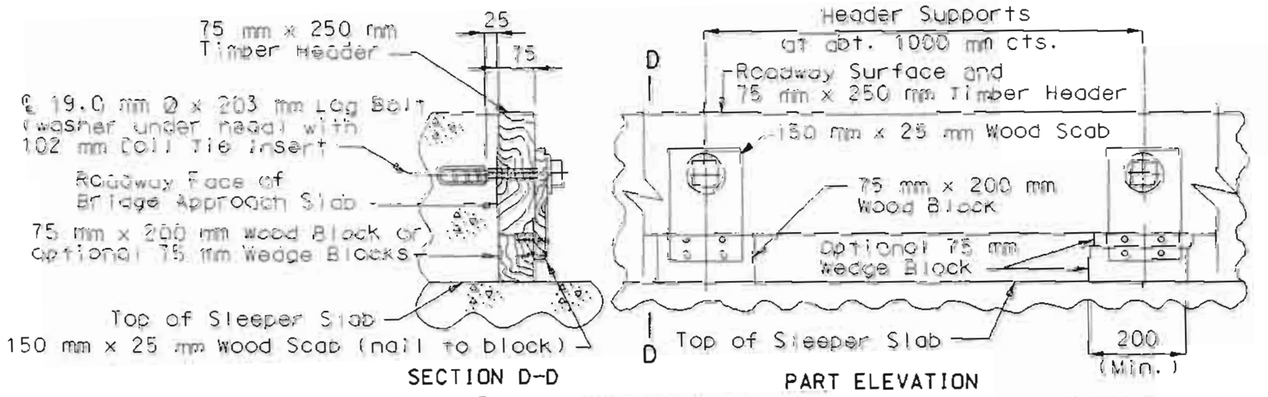


SECTION A-A



SECTION B-B

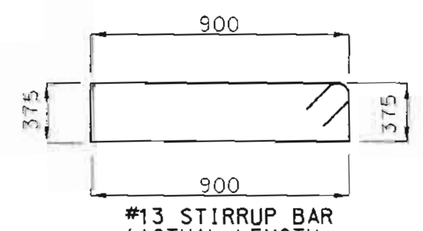
Note: With the approval of the Engineer, the contractor may crown the bottom of the approach slab to match the crown of the roadway surface.



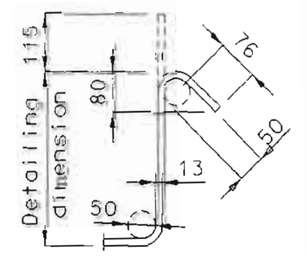
SECTION D-D PART ELEVATION

Note: Remove timber header when concrete pavement is placed.

DETAILS OF TIMBER HEADER



#13 STIRRUP BAR (ACTUAL LENGTH = 2750 mm)



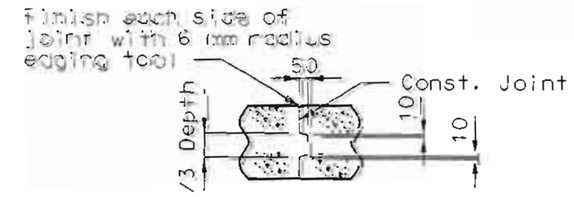
TYPICAL 135° STIRRUP HOOK DIMENSIONS BENDING DIAGRAM

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

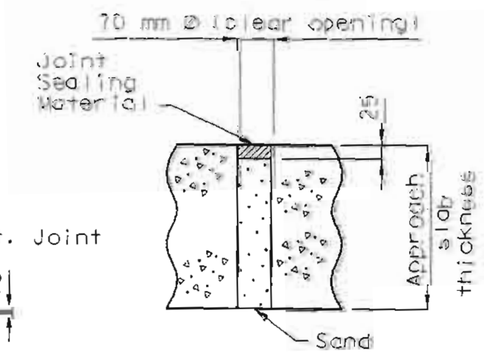
SECTION C-C

SECTION E-E
(BETWEEN CURBS)

BRIDGE APPROACH SLAB



CONST. JOINT DETAIL
(IF REQUIRED)



TYPICAL UNDERSEAL ACCESS HOLE DETAIL

GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

For Concrete Approach Pavement details, see roadway plans.

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

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

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

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

STATE	PROJ. NO.	SHEET NO.
MO.		

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

Detailed July 1999
Checked July 1999

7/12/99 Added Sheet

Sheet No. 160 of 17

JACKSON COUNTY

A16865

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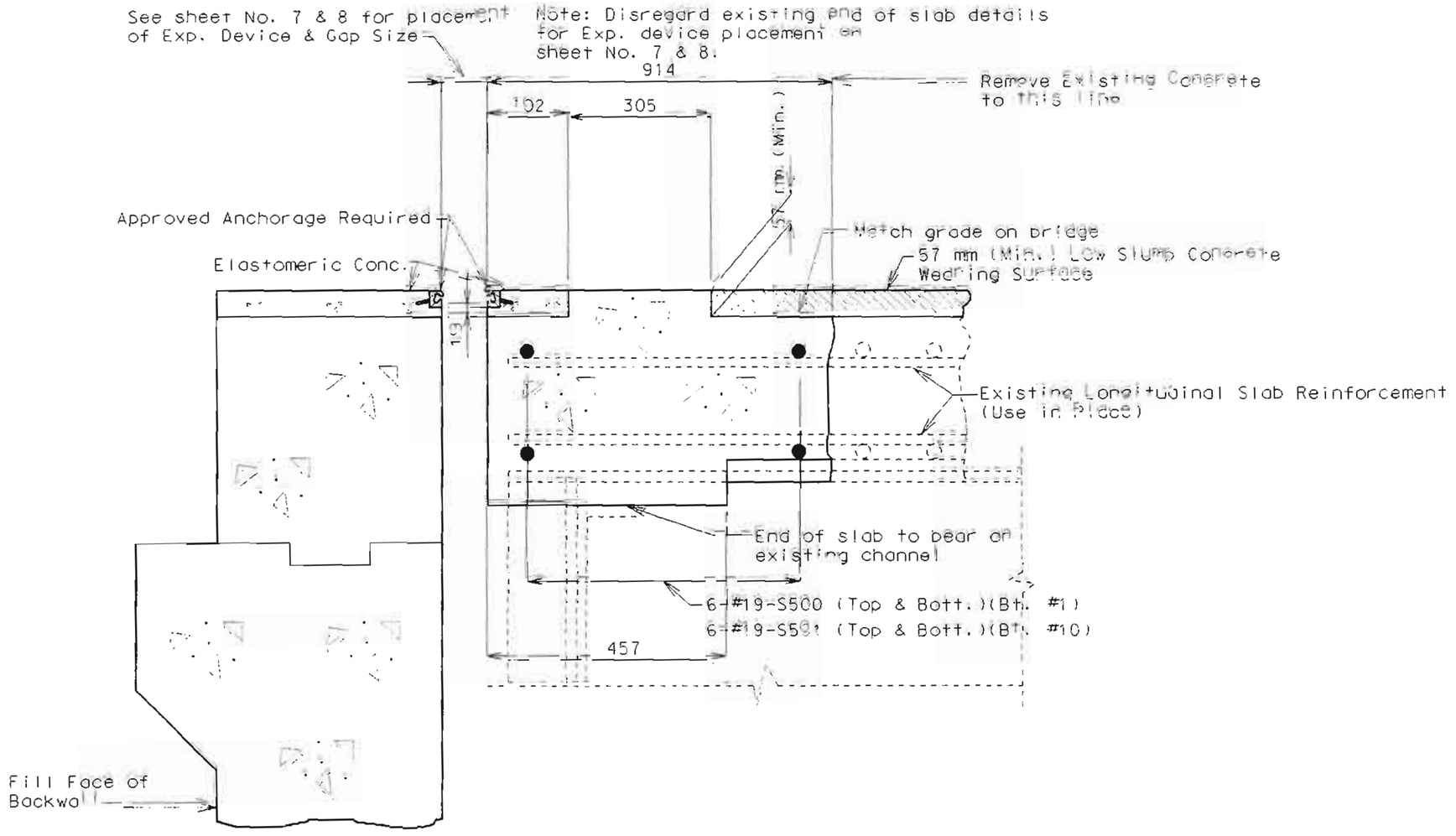
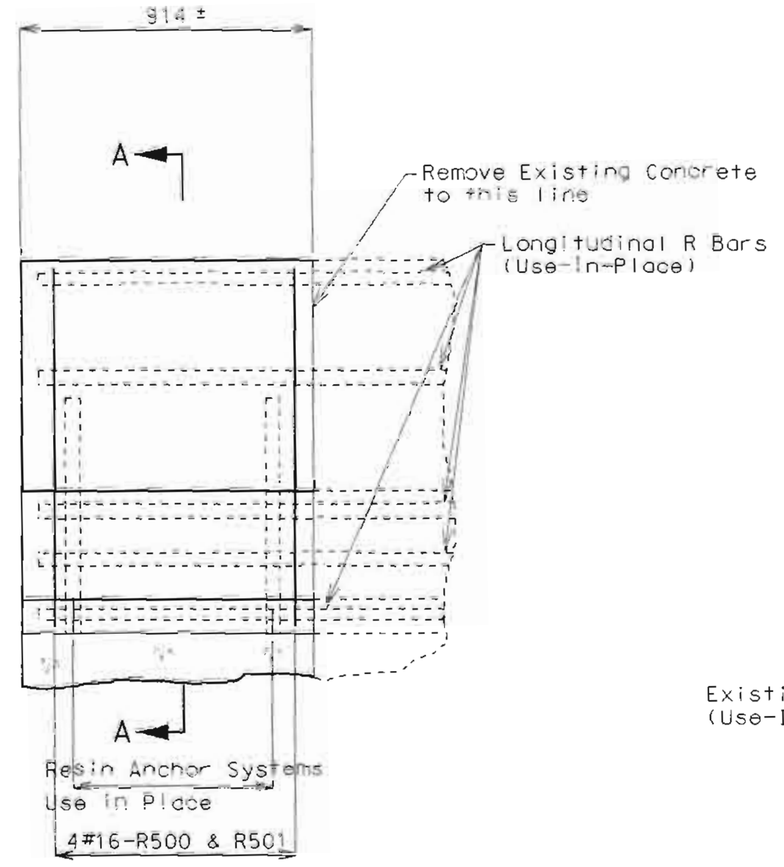
A16866, Sht. 126

State	Proj. No.	Sheet No.
MO		



PART SECTION THRU END OF SLAB AT BENT NO. 1

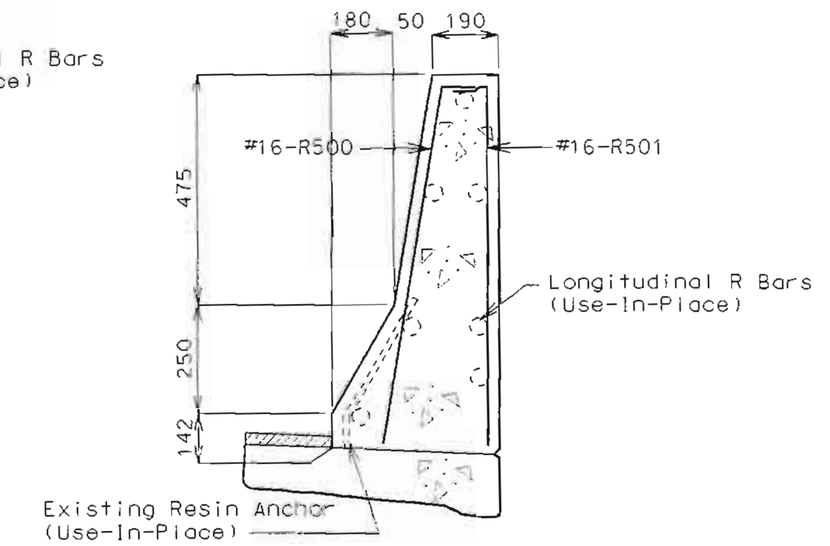
Note: Bent No. 10 similar.



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

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

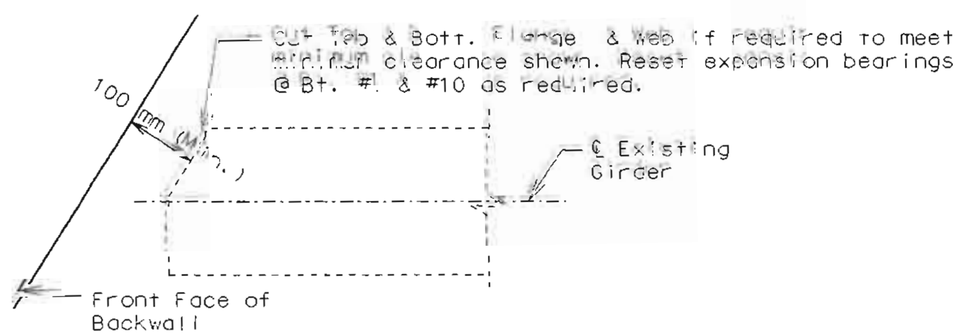
Design Unit Stresses:
Class B1 Concrete f'c = 28 MPa
Reinforcing Steel (Grade 420) fy = 420 MPa



SECTION A-A

MODIFICATION OF EXISTING EXPANSION DEVICE

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



TYPICAL DETAIL OF EXISTING GIRDERS AT END BENTS

Note: End Bent 10 similar.

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

ESTIMATED QUANTITIES		
ITEM		TOTAL
Bridge Approach Slab (Bridge)-Metric	Sq. Meter	245
Modification of Existing Expansion Device-Metric	Meter	35
Reinforced Soil Mass	Lump Sum	1

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

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

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

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

DETAILS OF END OF SLAB REPLACEMENT ON NORTHBOUND LANE

Detailed July 1999
Checked July 1999

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

7/12/99 Added Sheet

Sheet No. 16 of 17

JACKSON COUNTY A16865

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FOR INFORMATION ONLY

A16866, Sht. 127

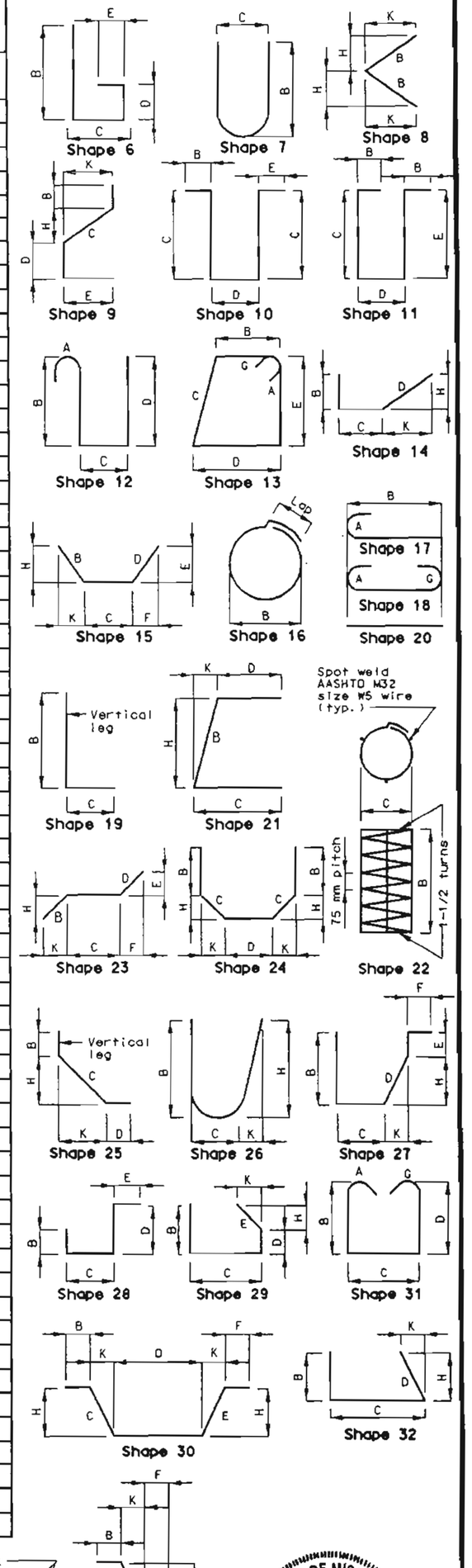
BILL OF REINFORCING STEEL

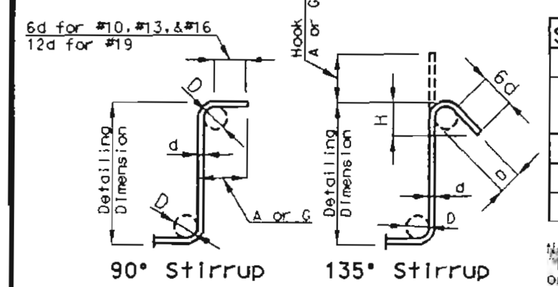
No. Req'd.	Mark No. Size	Mark No. Mark	Location	Epoxy (E)	Shape No.	Stirrup (S)	Substr. (X)	Varies (V)	No. Each	Dimensions B mm	C mm	D mm	E mm	F mm	H mm	K mm	Nominal Length mm	Actual Length mm	Mass kg
			BAR. CURB																
1936	16	R1	BAR. CURB	E	19	S				765	110						875	840	2524
1936	16	R2	BAR. CURB	E	15	S				780	110				775	80	890	860	2584
56	16	R3	BAR. CURB	E	19	S				955	110						1065	1030	90
14	16	R4	BAR. CURB	E	15	S				960	110				955	100	1070	1040	23
20	16	R5	BAR. CURB	E	19	S		V	4	955	250						1205	1170	
			INCREMENT = 30 MM							955	125						1080	1045	34
24	16	R6	BAR. CURB	E	19	S		V	4	955	335						1290	1255	
			INCREMENT = 10 MM							955	280						1235	1200	46
56	16	R7	BAR. CURB	E	19	S				955	240						1195	1160	101
8	16	R8	BAR. CURB	E	19	S				890	240						1130	1095	14
32	16	R9	BAR. CURB	E	10	S					395	340					1130	1065	53
17	16	R10	BAR. CURB	E	20					3110							3110	3110	82
12	16	R11	BAR. CURB	E	20					3880							3880	3880	72
44	16	R12	BAR. CURB	E	20					1525							1525	1525	104
4	16	R13	BAR. CURB	E	20					760							760	760	5
4	16	R14	BAR. CURB	E	20					4490							4490	4490	28
5	16	R15	BAR. CURB	E	20					3690							3690	3690	29
252	16	R20	BAR. CURB	E	20					2920							2920	2920	1142
21	16	R21	BAR. CURB	E	20					10985							10985	10985	358
28	16	R22	BAR. CURB	E	20					9460							9460	9460	411
28	16	R23	BAR. CURB	E	20					9470							9470	9470	412
14	16	R24	BAR. CURB	E	20					11500							11500	11500	250
14	16	R25	BAR. CURB	E	20					6845							6845	6845	149
63	16	R26	BAR. CURB	E	20					8550							8550	8550	836
14	16	R27	BAR. CURB	E	20					8290							8290	8290	180
21	16	R28	BAR. CURB	E	20					11055							11055	11055	360
28	16	R29	BAR. CURB	E	20					9510							9510	9510	413
28	16	R30	BAR. CURB	E	20					9500							9500	9500	413
21	16	R31	BAR. CURB	E	20					9135							9135	9135	298
14	16	R32	BAR. CURB	E	20					8700							8700	8700	189
63	16	R33	BAR. CURB	E	20					8545							8545	8545	835
14	16	R34	BAR. CURB	E	20					8290							8290	8290	180
			SLIP FORM																
144	16	C1	SLIP FORM	E	20					3000							3000	3000	670

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		336





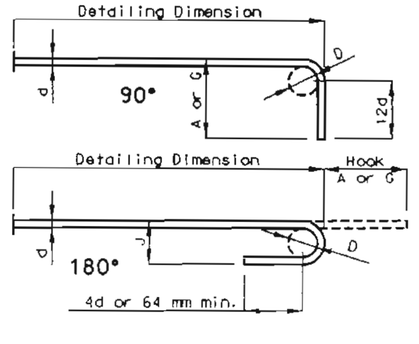
Detailed Apr. 1998
Checked Apr. 1998

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.

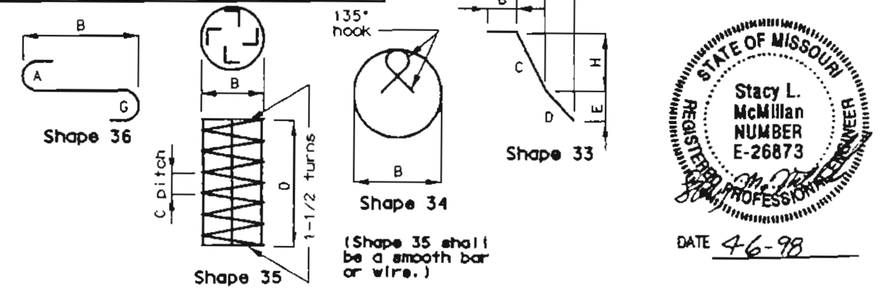


END HOOK DIMENSIONS (mm)

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

Two additional #16-R10 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



BENDING DIAGRAMS

DATE 4-6-98

JACKSON COUNTY

A16865

FOR INFORMATION ONLY

A16866, Sht. 128

bardi1_1_s Feb. 1997

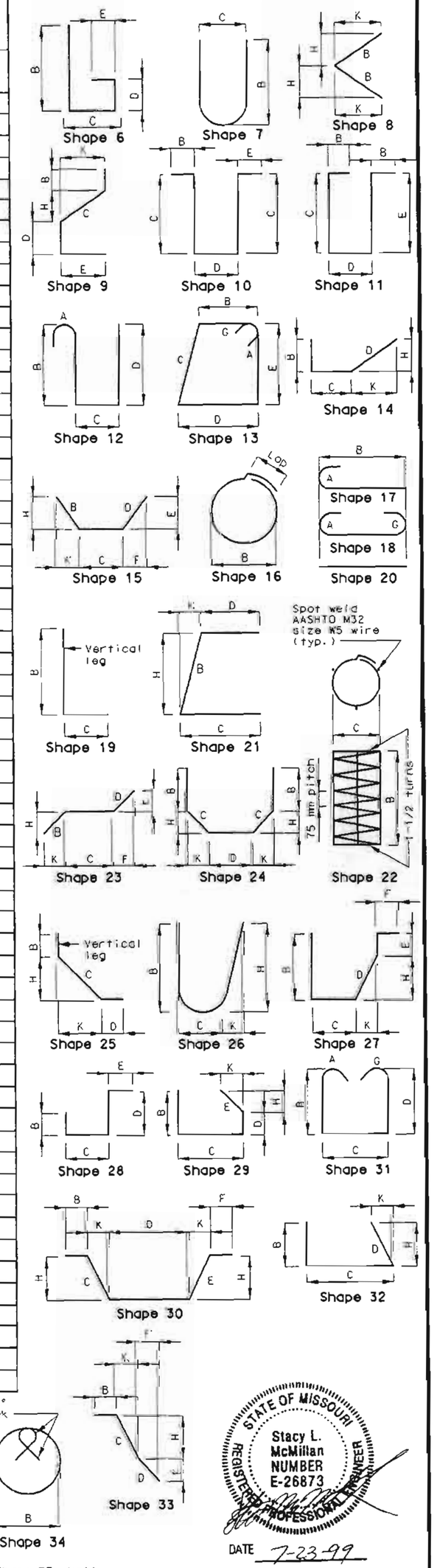
BILL OF REINFORCING STEEL

No. Req'd.	Mark No. Size	Mark No. Mark	Location	Epoxy (E)	Shape No.	Stirrup (S)	Substr. (X)	Varies (V)	No. Each	Dimensions B mm	C mm	D mm	E mm	F mm	H mm	K mm	Nominal Length mm	Actual Length mm	Mass kg
			END BENT 1																
16	13	H500	BACKWALL	E	20					8605							8605	8605	137
2	19	H501	BACKWALL	E	20					17915							17915	17915	80
55	16	H502	BACKWALL	E	19	S				610	610						1220	1185	101
4	16	H503	BACKWALL	E	19	S				110	610						720	685	4
2	13	H504	APR. HAUNCH	E	20					8605							8605	8605	17
55	13	U500	APR. HAUNCH	E	10	S					381	152					915	860	47
110	16	V500	BACKWALL	E	20					1680							1680	1850	287
			END BENT 10																
16	13	H505	BACKWALL	E	20					7565							7565	7565	120
2	19	H506	BACKWALL	E	20					15540							15540	15540	80
48	16	H507	BACKWALL	E	19	S				610	610						1220	1185	88
4	16	H508	BACKWALL	E	19	S				110	610						720	685	4
2	13	H509	APR. HAUNCH	E	20					7565							7565	7565	15
48	13	U501	APR. HAUNCH	E	10	S					381	152					915	860	41
96	16	V501	BACKWALL	E	20					1715							1715	1715	256
			BRIDGE SLAB																
12	19	S500	SLAB	E	20					9940							9940	9940	267
6	19	S501	SLAB	E	20					16320							16320	16320	219
			CURB																
16	16	R500	CURB	E	15	S				780	110				775	80	890	860	21
16	16	R501	CURB	E	19	S				765	110						875	840	21

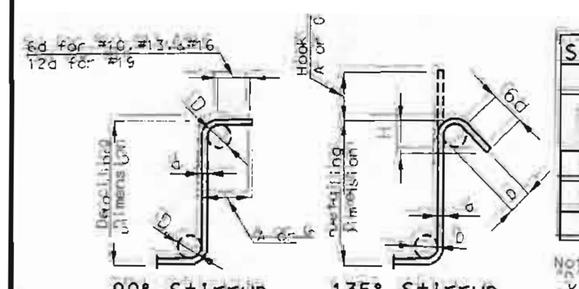
BILL OF REINFORCING STEEL

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

State	Proj. No.	Sheet No.
MO		



BENDING DIAGRAMS



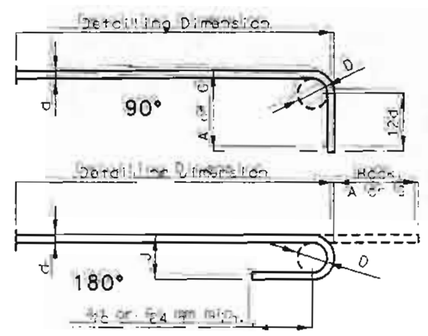
Detailed July 1995
Checked July 1995

STIRRUP HOOK DIMENSIONS (mm)

Grades 300 & 420 MPa

Bar Size	D	90° Hook A or G	90° Hook H	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 of the hook for all bends and hooks at a bar.



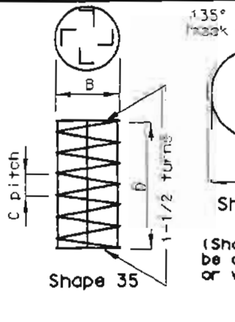
END HOOK DIMENSIONS (mm)

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

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 time and the following time.
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

7/12/99 Added Sheet

Sheet No. 17A of 17



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

JACKSON COUNTY

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