LETTER OF TRANSMITTAL

DATE: June 24, 2019

TO: All Prospective Bidders

FROM: Andy Macias, P.E.

RE: Daviess County Bridge – Daviess County, Missouri
MoDOT Project BRO-B031(34)
Addendum No. 1

CONTENT: The following is Addendum No. 1 for the above reference project. **Please complete the confirmation portion from this addendum and fax it back to our office at (816) 364-6086 or scan and email to akatakis@snyder-associates.com** to ensure that you have received the addendum.

CONFIRMATION OF RECEIPT
ADDENDUM NO. 1

This is to confirm that we did receive Addendum No. 1 for the above referenced project on this _____ day of _____, 2019.

Company:_____

By:_____

802 FRANCIS STREET | ST. JOSEPH, MO 64501-1916
P: 816-364-5222 | F: 816-364-6086 | SNYDER-ASSOCIATES.COM

Addendum No. 1

Daviess County Bridge BRO-B031(34)
Daviess County, Missouri

All Prospective Bidders:

The contract documents are hereby amended in the following particulars only. All other terms and conditions remain unchanged.

A. SPECIFICATIONS

1. All work associated with piling and substructure construction including shoring, sheeting, and dewatering, shall be included in the cost of class B concrete. This includes all work required for footings and walls.
2. Demolition of structure including any approach span is for salvage use only and not re-erection.

B. PLANS

1. Replace sheet 6 of 22 with the enclosed. Elevation table has been corrected.
2. Attached you will find a complete replacement set of plans that are more legible. No other corrections have been made.

The above interpretations and alterations are hereby made a part of the contract documents and supersede all other addenda or interpretations.

Issued this Twenty-fourth (24th) day of June 2019.

SNYDER & ASSOCIATES

Andy Macias, P.E.

802 FRANCIS STREET | ST. JOSEPH, MO 64501-1916
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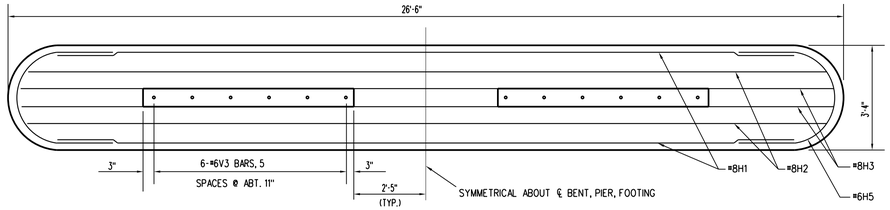
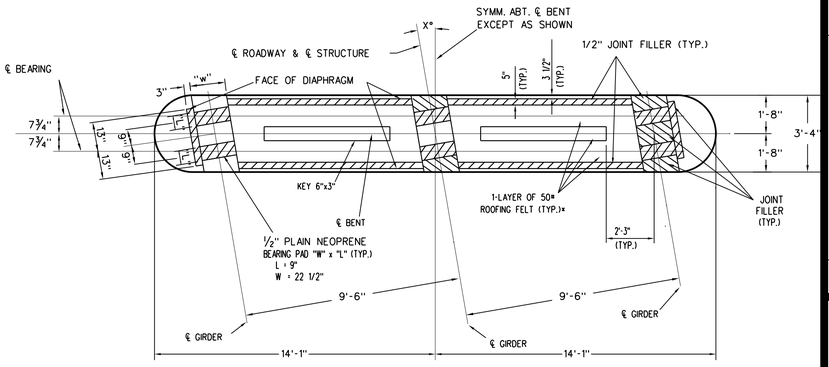


PLAN OF BEAM SHOWING REINFORCEMENT

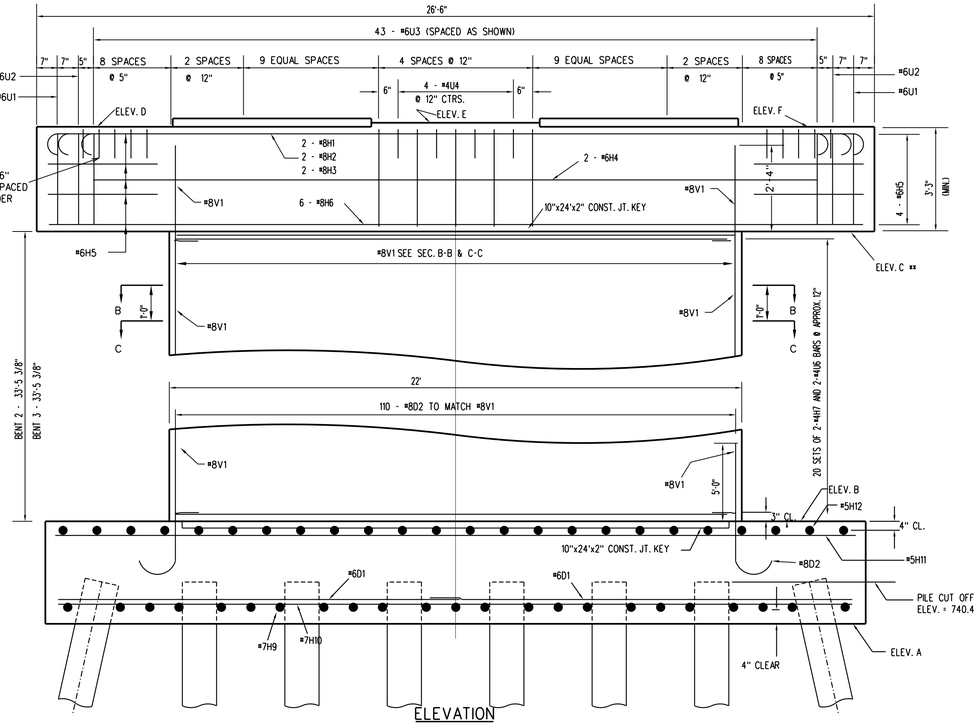
TABLE OF ELEVATIONS		
ELEVATION	BENT 2	BENT 3
A	738.90	738.90
B	741.90	741.90
C	775.35	775.35
D	778.60	778.60
E	778.73	778.73
F	778.60	778.60

** 3'-3" FROM LOWEST TOP OF BEAM ELEV.

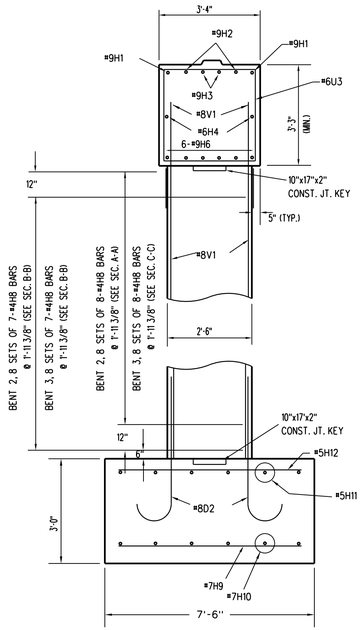


PLAN OF BEAM SHOWING BEARINGS

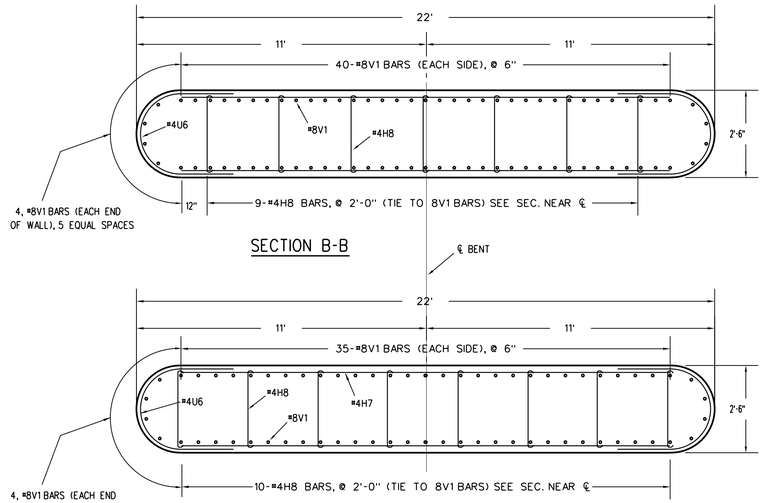
* 2 COATS BITUMINUS PAINT MAY BE USED FOR FELT.



ELEVATION

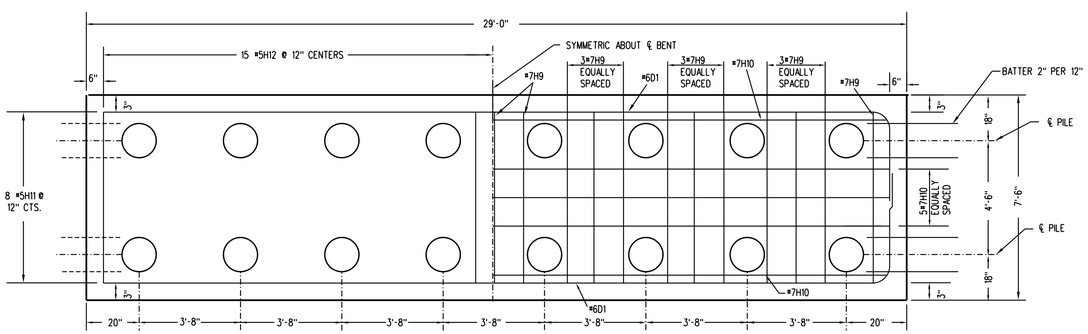


SECTION NEAR ℄ BENT



SECTION B-B

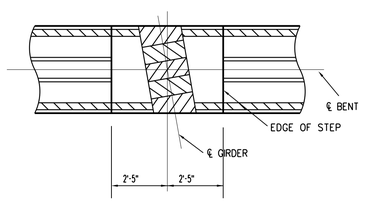
SECTION C-C



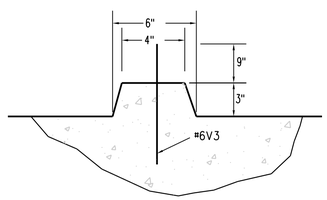
TOP REINFORCEMENT

PLAN OF FOOTING SHOWING REINFORCEMENT

BOTTOM REINFORCEMENT



PART PLAN SHOWING BEAM STEP SKEWED BENT



SECTION THRU KEY (BEAM TOP)

THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS

STATE OF MISSOURI
ALEXANDER E. MACIAS
NUMBER E-24458
6/24/19

REVISION	MARK	DATE	BY
Engineer: RM			
Technician: KG			
Checked By: BB	Scale: 1"=		
Date: 08/29/14	Field Bk:	Pg:	

Project No: 1140351

Sheet 6 of 22

DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

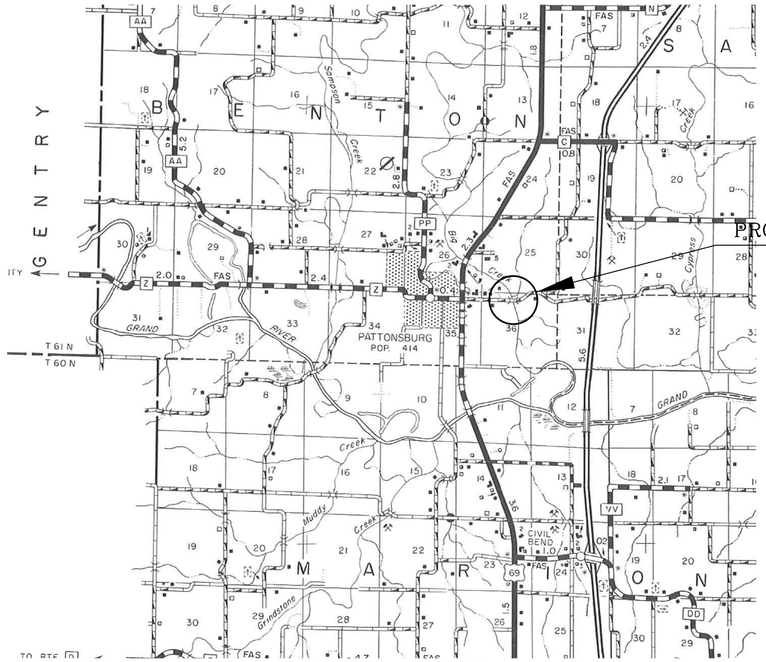
DAVIESS COUNTY, MO

INTERMEDIATE BENT DETAILS

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C.
www.snyder-associates.com
802 FRANCIS STREET
ST. JOSEPH, MO 64501
816-364-5222
212 N. BUCHANAN
MARYVILLE, MO 64468
660-582-8888

Project No: 1140351

Sheet 6 of 22



N

VICINITY MAP

NOT TO SCALE

LEGEND

- CP = CONTROL POINT
- = BENCHMARK
- = SIGN
- = POWER POLE
- = BENT
- = GUY WIRE
- P/L = PROPERTY LINE
- —W— = EXISTING WATERLINE
- —SS— = EXISTING SANITARY SEWER LINE
- — E — = ELECTRIC LINE
- —UE— = UNDERGROUND ELECTRIC LINE
- —T— = TELEPHONE LINE
- —UT— = UNDERGROUND TELEPHONE LINE
- —\\—\\— = EXISTING FENCE
- = EXISTING RIGHT-OF-WAY
- = NEW RIGHT-OF-WAY
- S.L. = SLOPE LINE

INDEX TO SHEETS

Call BEFORE you DIG
TOLL FREE
1–800–DIG–RITE
(344–7483)

MISSOURI ONE–CALL SYSTEM, INC.

UTILITY WARNING:
The existence and locations of any underground utility pipes, lines or structures shown on these drawings are obtained by a search of the available records. The contractor is required to take due precautionary measures to protect the utility lines shown, [and all other lines not of record or not shown on these drawings by] verification of their location in the field prior to the initiation of the actual portion of their work.

DAVIESS COUNTY MISSOURI

COUNTY COMMISSION

PRESIDING COMMISSIONER
JIM RUSE

COMMISSIONER
DAVID COX

COMMISSIONER
WAYNE UTHE

COUNTY CLERK
RONETTA BURTON

PROJECT NO. BRO–B031(34)

CONSTRUCTION OF BRIDGE NO. 35900061
BRIDGE @ BIG CREEK

SECTION 36, T–61N R–29W

LENGTH OF PROJECT	
BEGINNING OF PROJECT	STA. 10+00
END OF PROJECT	STA. 20+00
APPARENT LENGTH	1000 ft.
EQUATIONS AND EXCEPTIONS	NONE
TOTAL CORRECTIONS	NONE
NET LENGTH OF PROJECT	1000 ft.
STATE LENGTH	0.19 Miles
FEDERAL LENGTH	0.19 Miles

PROJECT DATA	
LOCAL ROAD	
A.D.T. (2014)	100
A.D.T. (2034)	115
TRUCK TRAFFIC	10%
DESIGN SPEED	30 m.p.h.
LENGTH OF PROJECT	0.19 miles

COUNTY COMMISSION
APPROVED:
12-26-18
PRESIDING COMMISSIONER DATE

STATE OF MISSOURI
ALEXANDER E. MACIAS
NUMBER E-24639
PROFESSIONAL ENGINEER
12/28/18

MARK	REVISION	DATE	BY
Engineer:	RM	Checked By:	BB
Technician:	KG	Date:	08/29/14

Scale: 1"=
Field Bk:
Pg:
Project No: 1140351
Sheet 1 of 22

DAVIESS COUNTY BRIDGE 35900061 BRO-B031(34)
DAVIESS COUNTY, MO
COVER SHEET – LOCATION MAP

SNYDER & ASSOCIATES
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MARYVILLE, MO 64468
660-582-8888

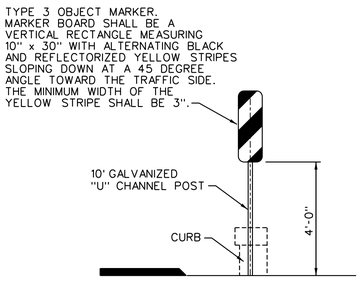
Project No: 1140351
Sheet 1 of 22

NTS

ESTIMATED QUANTITIES FOR ALTERNATE SLABS		
TYPE OF SLAB	REINFORCEMENT (LBS.)	B2 CONCRETE (C.Y.)
CAST-IN-PLACE CONVENTIONAL FORMS	55,593	202
PRE-STRESSED PANEL FORMS	45,804	174

NOTE:

IF CONTRACTOR CHOOSES TO BID PRE-STRESSED PANEL FORM OPTION THE UNIT PRICES FOR CAST-IN-PLACE CONVENTIONAL FORMS CONCRETE AND REINFORCING STEEL SHALL BE THE SAME BID PRICE FOR PRE-STRESSED PANEL FORMS. CONTRACTOR TO ACCOUNT FOR THIS IN THE UNIT PRICE & EXTENDED PRICE.



TYPE-3 OBJECT MARKER

NOTE: FOUR REQUIRED-ONE AT EACH CORNER OF THE BRIDGE.

GENERAL NOTES:

DESIGN SPECIFICATIONS A.A.S.H.T.O.-2007 LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION.

DESIGN LOADING
HL-93 24'-0" ROADWAY
35# PER SQ. FT. FUTURE WEARING SURFACE
EARTH 120# PER CU. FT., EQUIVALENT FLUID PRESSURE 30# PER CU. FT.
SUPERSTRUCTURE: SIMPLY SUPPORTED NON-COMPOSITE FOR DEAD LOAD. CONTINUOUS COMPOSITE FOR LIVE LOAD.

DESIGN UNIT STRESSES:
CLASS B CONCRETE (SUBSTRUCTURE) f'c=3,000 P.S.I.
CLASS B1 CONCRETE (SAFETY BARRIER CURB) f'c=4,000 P.S.I.
CLASS B2 CONCRETE (SUPERSTRUCTURE EXCEPT SAFETY BARRIER CURB AND PRESTRESSED GIRDERS) f'c=4,000 P.S.I.
REINFORCING STEEL (GRADE 60) fy= 60,000 P.S.I.
STEEL PILE fb= 9,000 P.S.I.

NOTE: THE CONTRACTOR SHALL FOLLOW THE SPECIFICATIONS AS STATED IN THE "MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION 2018 & SUPPLEMENTAL SPECIFICATIONS.

NOTE: FOR PRE-STRESSED GIRDER STRESSES SEE SHEETS NO. 8 & 9.

BEARINGS SHALL BE 60 DUROMETER NEOPRENE PADS. COST OF FURNISHING, FABRICATING AND INSTALLING NEOPRENE BEARING PADS COMPLETE IN PLACE, SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR PLAIN NEOPRENE BEARING PADS PER EACH.

ALL JOINT FILLER SHALL MEET THE REQUIREMENT OF STD. SPEC. 1057.7.4.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2 " UNLESS OTHERWISE NOTED.

NOTE: SEISMIC PERFORMANCE CATEGORY - A
ACCELERATION COEFFICIENT - 4%

NOTE: THE COST OF FURNISHING, INSTALLING AND PAINTING A-36 STEEL SWAY BRACING SHALL BE INCLUDED IN COST OF PILING. PROTECTIVE COATING SHALL BE IN ACCORDANCE TO SEC. 702.4.8 OF MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, COLOR ALUMINUM.

NOTE: FOR B.M. SEE SHEET NO. 3

NOTE: SEE SHEET NO. 3 FOR HYDROLOGICAL DATA.

NOTE: ITEMS WHERE ADDITIONAL INFORMATION IS REQUIRED, THE STATEMENT "SEE SPECIAL PROVISIONS" IS LISTED.

NOTE: MODOT AND FHWA MAY MAKE INSPECTIONS OF THE WORK AND THE CONTRACTOR SHALL GRANT THEM ACCESS TO ALL PARTS OF THE WORK.

NOTE: RAILING CRASH TESTED FOR AASHTO SERVICE LEVEL 1 AND WILL PROVIDE AN EQUIVALENT TL-2 RATING IN ACCORDANCE WITH THE CRITERIA OF NCHRP REPORT 350.

ESTIMATED BRIDGE QUANTITIES				
ITEM	UNIT	SUBSTRUCTURE	SUPERSTRUCTURE	TOTAL
TRAFFIC CONTROL	L.S.			1
MOBILIZATION	L.S.			1
TYPE III OBJECT MARKERS	EACH			4
BRIDGE REMOVAL	L.S.			1
CLASS B CONCRETE	CU.YD.	224		224
CLASS B2 CONCRETE	CU.YD.		202	202
14" CIP PIPE PILE	L.F.	2464		2464
REINFORCING STEEL*	LBS.			96,261
PRESTRESSED CONCRETE I-BEAM 55'-0" SPAN	EACH		6	6
PRESTRESSED CONCRETE I-BEAM 90'-0" SPAN	EACH		3	3
LAMINATED NEOPRENE BEARING PADS	EACH		18	18
THRIE BEAM RAIL	L.F.			452
TYPE 3 GEOTEXTILE FABRIC	SQ.YD.			1379
ROCK BLANKET	TON			1520
TEMPORARY SILT FENCE	L.F.			2000
CLASS 2 EXCAVATION	CU.YD.	386		386

ESTIMATED ROADWAY QUANTITIES				
ITEM	UNIT	SUBSTRUCTURE	SUPERSTRUCTURE	TOTAL
CLASS A EXCAVATION	CU.YD.			318
EMBANKMENT IN PLACE (BORROW)	CU.YD.			12,823
SEED, FERTILIZER & MULCH	ACRE			0.8
ROAD STONE	TON			280

NOTE: ALL CONCRETE ABOVE LOWER CONSTRUCTION JOINT IN END BENTS IS INCLUDED WITH SUPERSTRUCTURE QUANTITIES.
ALL REINFORCEMENT IN THE END BENTS IS INCLUDED WITH SUPERSTRUCTURE QUANTITIES.
*TOTAL REINFORCING STEEL QUANTITY REFLECTS CAST-IN-PLACE CONVENTIONAL FORMS QUANTITY.

DRAWING NOT TO SCALE - FOLLOW DIMENSIONS

STATE OF MISSOURI
ALEXANDER E. MACIAS
NUMBER E-24639
PROFESSIONAL ENGINEER
12/28/18

MARK	REVISION	DATE	BY
Engineer:	RM	Checked By:	BB
Technician:	KG	Date:	08/29/14

Scale: 1"=
Field Bk: Pg:
Project No: 1140351
Sheet 2 of 22

DAVIESS COUNTY, MO

DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

GENERAL NOTES AND QUANTITIES

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C. www.snyder-associates.com
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ST. JOSEPH, MO 64501
816-364-5222
212 N. BUCHANAN
MARYVILLE, MO 64468
660-582-8888

Project No: 1140351
Sheet 2 of 22

HYDROLOGIC DATA	
DRAINAGE AREA (SQ. MI.)	378.88
DESIGN FREQUENCY	25 YEAR
DESIGN DISCHARGE (cfs)	21451
MAXIMUM BACKWATER FOR DESIGN FREQUENCY (ft)	0.08
DESIGN HIGH WATER ELEVATION AT THE STRUCTURE (ft)	774.25
LOW ELEVATION OF SUPERSTRUCTURE (ft)	778.6
100-YEAR DISCHARGE (cfs)	29348
100-YEAR HIGH WATER ELEVATION AT THE STRUCTURE (ft)	777.83
APPROACH ROADWAY OVERTOPPING FREQUENCY	4%

UTILITIES:

DAVIESS CO. PWSD #1
660-367-2521

BEGIN PROJECT
10+00.00
N:1313063.41
E:2895832.17

END PROJECT
20+00.00
N:1313455.14
E:2896749.50

STA 10+00 20' LT

STA 10+00 20' RT

STA 20+00 20' LT

STA 20+00 20' RT

60' TRANSITION TO MATCH EXISTING

50' TRANSITION TO MATCH EXISTING

INSTALL 100 LF SILT FENCE EACH SIDE. REMOVE WHEN ROCK BLANKET IS COMPLETED.

INSTALL 410 LF SILT FENCE

INSTALL 340 LF SILT FENCE

INSTALL 465 LF SILT FENCE

INSTALL 540 LF SILT FENCE

CONSTRUCT 200' PRECAST CONCRETE I-GIRDER BRIDGE SKEWED 30° LA

PROPOSED R/W

SLOPE LIMITS

REMOVE EXISTING BRIDGE STEEL MEMBERS SHALL BE CUT INTO SECTIONS 12' LONG (MAX.) AND STOCK PILED AT EDGE OF ADAMS PROPERTY. COORDINATE LOCATION W/ PROPERTY OWNER. ALL OTHER MATERIALS SHALL BE HAULED AWAY.

P.I. Sta. 11+00.00
Δ = 14° 30' 38.46" (LT)
T = 31.83'
L = 63.31'
R = 250.00'

P.I. Sta. 20+55.85
Δ = 25° 49' 38.09" (RT)
T = 57.32'
L = 112.69'
R = 250.00'

CL GRANITE AVE

APPARENT R/W

OWNER: CHERYL L. ADAMS & WILLIAM E. ADAMS, TRUSTEES OF THE CHERYL L. ADAMS TRUST WARRANTY DEED – BOOK-362, PAGE-105

OWNER: (LAND): MAXINE G. DUNHAM FAMILY LIMITED PARTNERSHIP WARRANTY DEED – BOOK-291, PAGE-370

OWNER: (ALL SUBSURFACE COAL, OIL, GAS AND OTHER MINERAL RIGHTS): MAXINE G. DUNHAM, TRUSTEE WARRANTY DEED – BOOK-291, PAGE-370

SCALE (FEET) 0 50

MATCH EXISTING VPC 10+00.00 EL. 773.39

V.P.I. Sta. 10+75.00
V.P.I. Elev. = 774.00
K = 31
150.00' V.C.

VPT 11+50.00 EL. 778.26

VPC 11+75.00 EL. 779.68

V.P.I. Sta. 12+50.00
V.P.I. Elev. = 783.94
SSD = 192'
K = 26
150.00' V.C.

VPT 13+25.00 EL. 783.94

VPC 15+75.00 EL. 783.94

V.P.I. Sta. 16+50.00
V.P.I. Elev. = 783.94
SSD = 235'
K = 36
150.00' V.C.

VPT 17+25.00 EL. 780.82

VPC 18+50.00 EL. 775.62

V.P.I. Sta. 19+25.00
V.P.I. Elev. = 772.50
K = 41
150.00' V.C.

VPT 20+00.00 EL. 772.13

MATCH EXISTING

+0.81% +5.68% +5.68% +0.00% +0.00% -4.16% -4.16% -0.49%

780 770 760 750 740

773.39	773.79	774.20	773.68	775.83	773.93	778.26	774.00	780.98	774.62	782.87	774.36	783.82	770.25	783.94	759.21	783.94	748.41	783.94	755.33	783.94	769.32	783.94	769.81
10+50	11+00	11+50	12+00	12+50	13+00	13+50	14+00	14+50	15+00	15+50	16+00	16+50	17+00	17+50	18+00	18+50	19+00	19+50	20+00	20+50	21+00		

13+52 14+07 14+97 15+52

MARK	REVISION	DATE	BY

Engineer: RM Checked By: BB Scale: 1"=
Technician: KG Date: 08/29/14 Field Bk: Pg:

Project No: 1140351

Sheet 3 of 22

DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

DAVIESS COUNTY, MO

PLAN AND PROFILE

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C.
www.snyder-associates.com

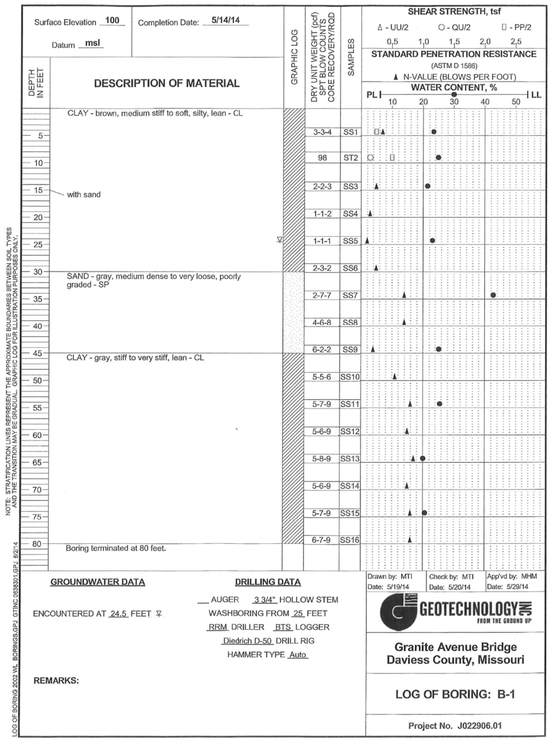
802 FRANCIS STREET
ST. JOSEPH, MO 64501
816-364-5222

212 N. BUCHANAN
MARYVILLE, MO 64468
660-582-8888

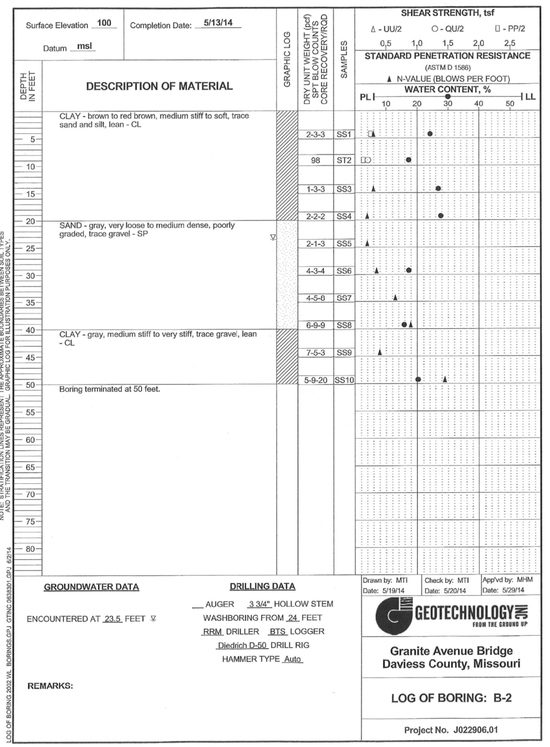
STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24699
PROFESSIONAL ENGINEER
12/28/18

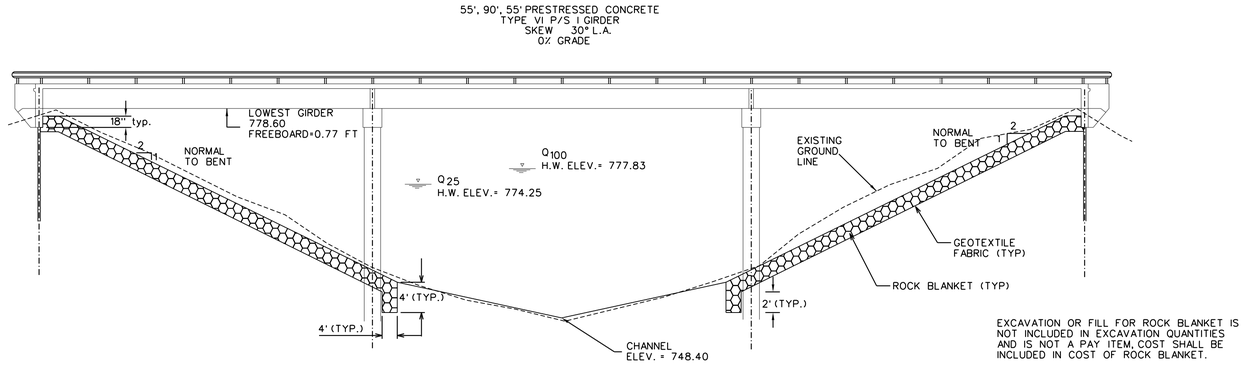
Project No: 1140351

Sheet 3 of 22

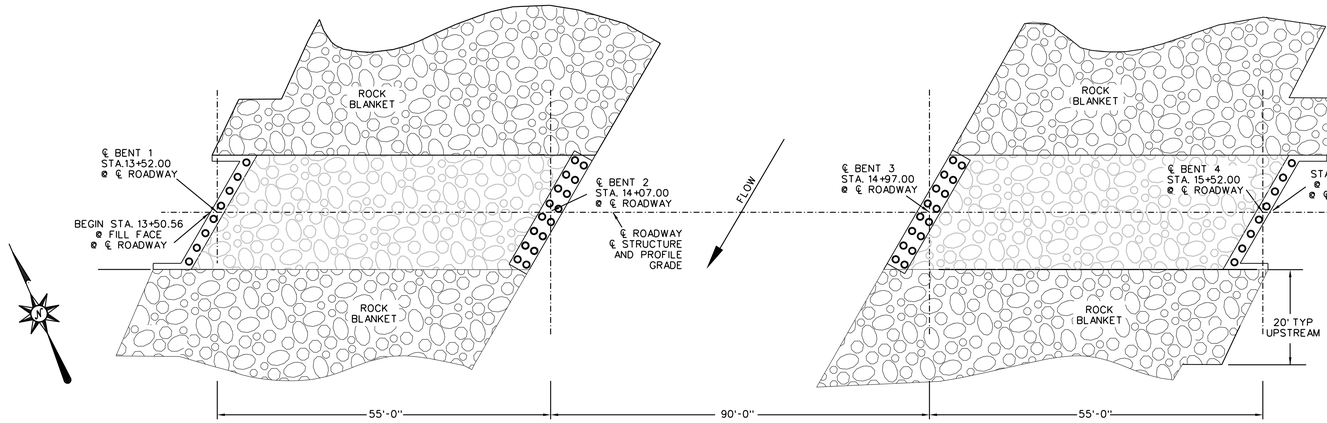


Note: Elevations on boring sheets reference datum 100.00 ft = 777.15 ft.





GENERAL ELEVATION



INDICATES LOCATION OF BORING

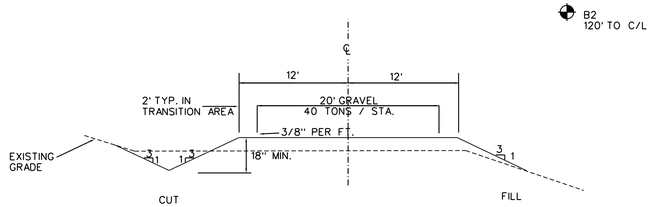
GENERAL PLAN

B1
60' TO C/L

PILE AND FOOTING DATA						
Bent No.		1	2	3	4
BEARING PILE	Pile Type and Size	14" PIPE	14" PIPE	14" PIPE	14" PIPE
	Number	8	16	16	8
	Approximate Length (Per Pile) Ft.	50	52	52	50
	Design Bearing (Per Pile) Tons	26	32	32	26
	Hammer Energy required Ft. Lbs.				

Note: Minimum energy requirement of hammer based on plan length and design bearing value of piles. All pile shall be driven to practical refusal. Drive every other pile, then drive the intermediate pile.

B2
120' TO C/L



TYPICAL ROAD SECTION

DRAWING NOT TO SCALE - FOLLOW DIMENSIONS

STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER PE-2009039
PROFESSIONAL ENGINEER
12/28/18

MARK	REVISION	DATE	BY
Engineer:	RM	Checked By:	BB	Scale:	1"=
Technician:	KG	Date:	08/29/14	Field Bk:	Pg:

Project No: 1140351

Sheet 4 of 22

DAVIESS COUNTY BRIDGE 359006I BRO-B031(34)

DAVIESS COUNTY, MO

SUBSTRUCTURE LAYOUT

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C.
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212 N. BUCHANAN
MARYVILLE, MO 64468
660-562-8888
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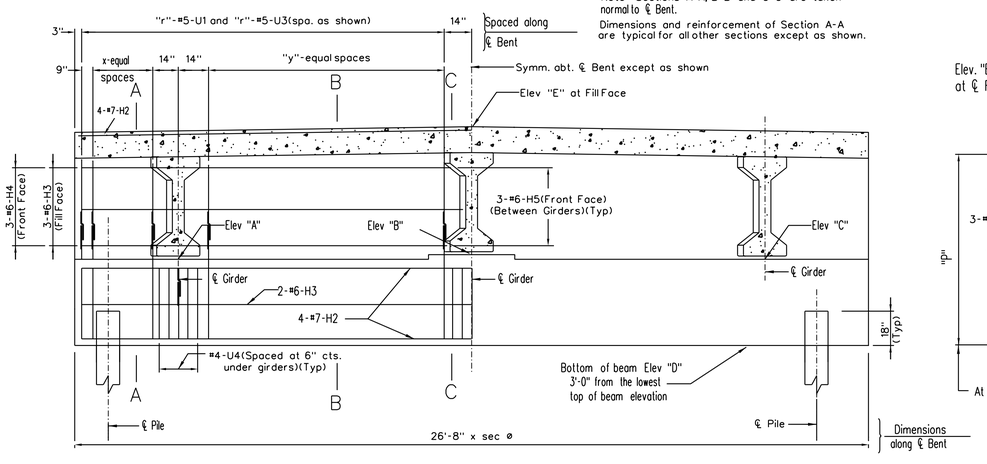
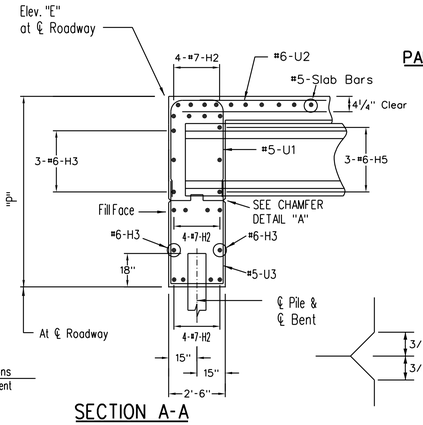
Project No: 1140351

Sheet 4 of 22

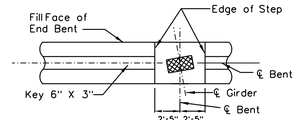


SECTION M-M

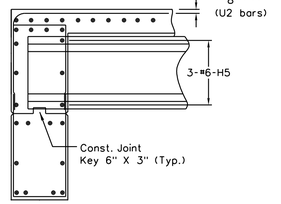
XX 12" minimum at edge of roadway
Note: Sections A-A, B-B and C-C are taken normal to ℄ Bent.
Dimensions and reinforcement of Section A-A are typical for all other sections except as shown.



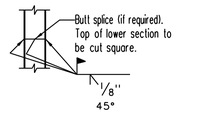
SECTION A-A
(Near Pile)



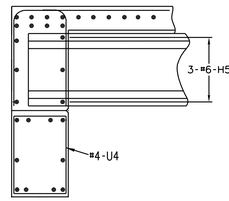
PART PLAN SHOWING BEAM STEP



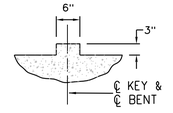
SECTION B-B
(Between Girders)



DETAIL OF STEEL PILE SPLICE



SECTION C-C
(Under Girders)



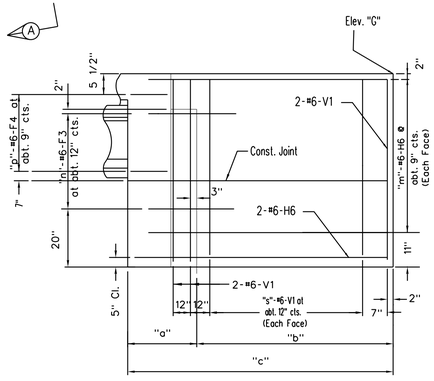
SECTION THRU KEY

Skew Angle ø	Sec. ø
10°	1.0154
20°	1.0642
30°	1.1547
40°	1.3054
50°	1.5557

HALF PLAN OF BEAM (at Const. Joint)

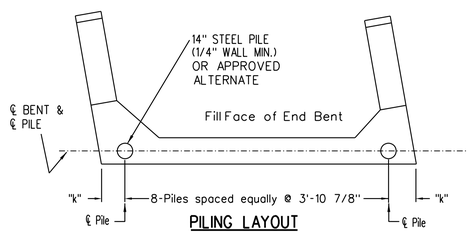
HALF PART PLAN

HALF PLAN SHOWING WING REINFORCEMENT



WING ELEVATION A-A

TABLE OF END BENT DIMENSIONS		
GIRDER TYPE	DIMENSION	
TYPE VI (4'-6")	"a"	5'-1⅞"
	"b"	10'-6"
	"c"	15'-7⅞"
	"d"	18"
	"e"	8⅝"
	"f"	3'-7⅞"
	"g"	10'-6"
	"h"	14'-1⅞"
	"j"	18"
	"k"	20¾"
	"m"	8
	"n"	7
	"p"	8'-4"
	"q"	21
	"r"	15
	"s"	10
	"x"	3
	"y"	9



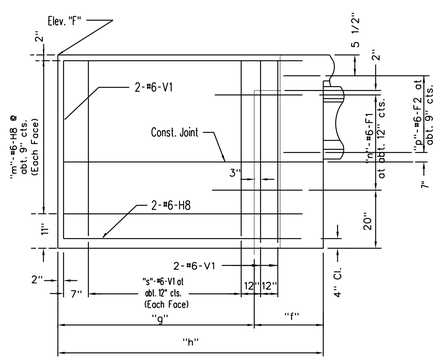
PILING LAYOUT

TABLE OF BEAM ELEVATIONS & DIMENSIONS		
	END BENT NUMBER	
	1	4
"A"	778.60	778.60
"B"	778.73	778.73
"C"	778.60	778.60
"D"	775.60	775.60
"E"	783.94	783.94
"F"	783.81	783.81
"G"	783.81	783.81
"P"	8'-6⅝"	8'-6⅝"

GIRDER TYPE	BEARING PAD SIZE "L"X"W"
II	8" X 15 1/2"
III	9" X 15 1/2"
IV	10" X 15 1/2"
VI	8" X 22 1/2"

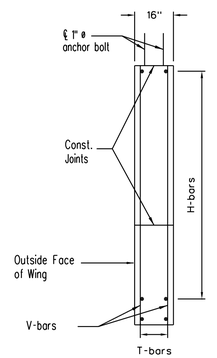
NOTE: All U-bars in end bent to be placed parallel to ℄ Roadway.
The bottom leg of #5-U3 and #4-U4 bars may be cut when necessary to clear piles.
For location of #5-H1 (Strand Tie Bars) see "Prestressed Concrete I-Girder" sheet.

NOTE: All concrete in end bent above top of beam and below top of slab shall be Class B2.
For details of coil ties see "Diaphragm Details" sheet.



WING ELEVATION B-B

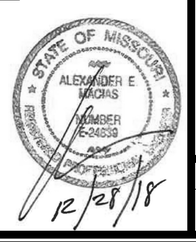
THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS



TYPICAL SECTION THRU WINGS

NOTE: For details of anchor bolts see Thrie Beam Rail sheet.

NOTE: For Timber Header details see Diaphragm Details at Intermediate Bent sheet.



DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)
DAVIESS COUNTY, MO
END BENT DETAILS

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C.
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802 FRANCIS STREET
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816-364-5222
212 N. BUCHANAN
MARYVILLE, MO 64468
660-582-8888

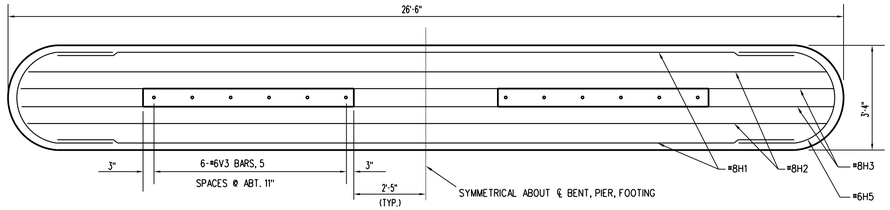
MARK	REVISION	BY	DATE
Engineer:	RM	Scale:	1"=
Technician:	KG	Checked By:	BB
		Date:	08/29/14
		Field Bk:	
		Pg:	

Project No: 1140351

Sheet 5 of 22

Project No: 1140351

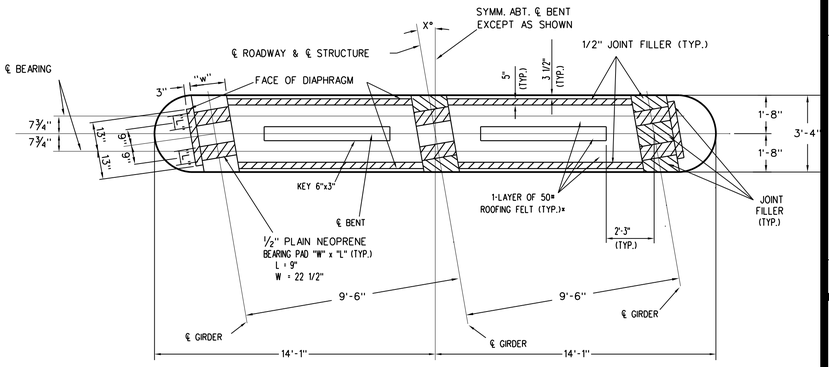
Sheet 5 of 22



PLAN OF BEAM SHOWING REINFORCEMENT

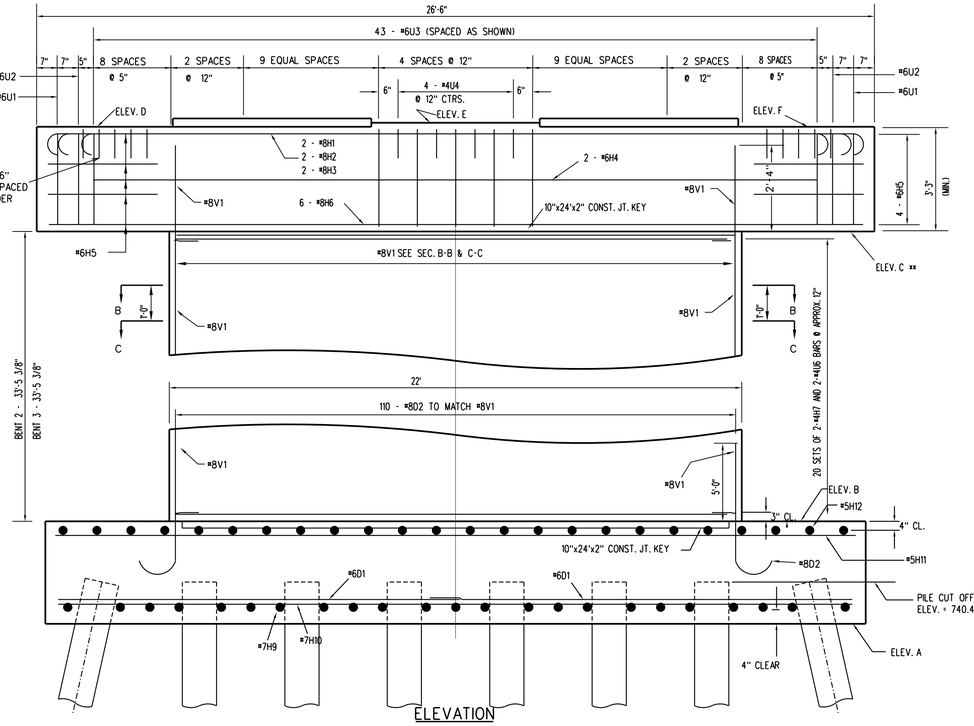
TABLE OF ELEVATIONS		
ELEVATION	BENT 2	BENT 3
A	738.90	738.90
B	741.90	741.90
C	775.35	775.35
D	778.60	778.60
E	778.73	778.73
F	778.60	778.60

** 3'-3" FROM LOWEST TOP OF BEAM ELEV.

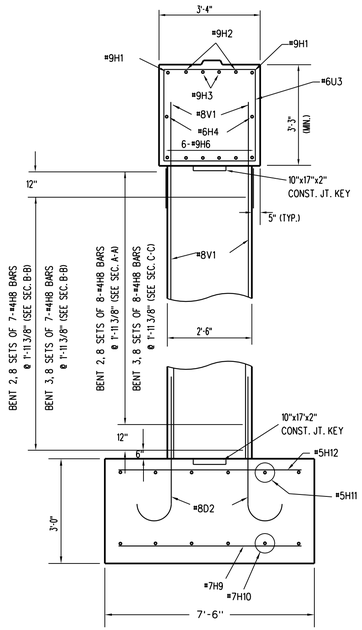


PLAN OF BEAM SHOWING BEARINGS

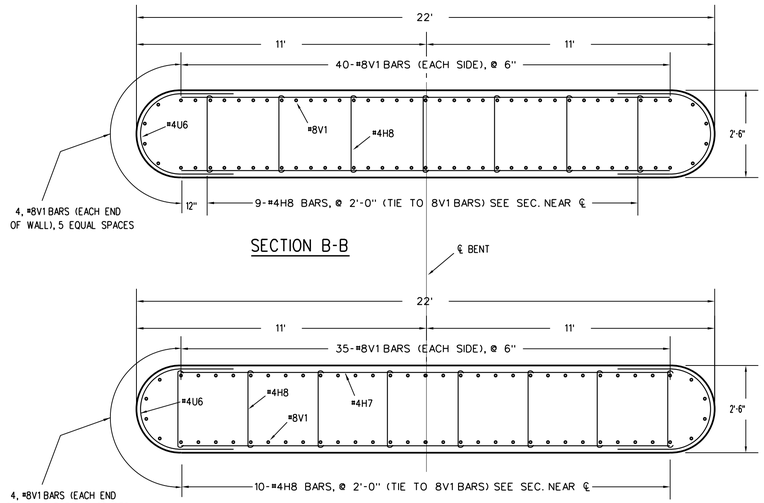
* 2 COATS BITUMINUS PAINT MAY BE USED FOR FELT.



ELEVATION

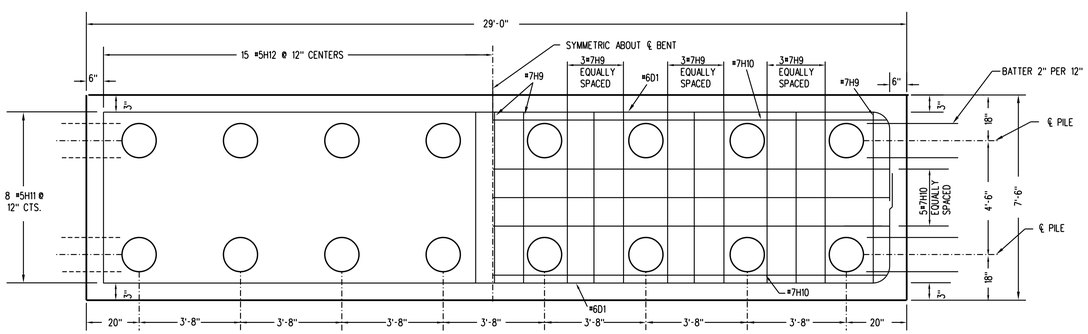


SECTION NEAR ℄ BENT



SECTION B-B

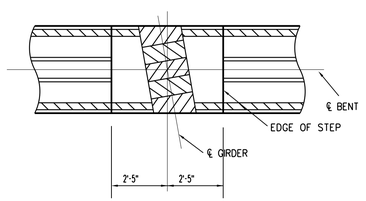
SECTION C-C



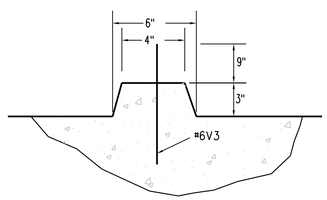
TOP REINFORCEMENT

PLAN OF FOOTING SHOWING REINFORCEMENT

BOTTOM REINFORCEMENT



PART PLAN SHOWING BEAM STEP SKEWED BENT



SECTION THRU KEY (BEAM TOP)

THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS

STATE OF MISSOURI
ALEXANDER E. MACIAS
NUMBER E-24458
6/24/19

REVISION	MARK	DATE	BY
Engineer: RM			
Technician: KG			
Checked By: BB	Scale: 1"=		
Date: 08/29/14	Field Bk:	Pg:	

Project No: 1140351

Sheet 6 of 22

DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

DAVIESS COUNTY, MO

INTERMEDIATE BENT DETAILS

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C.
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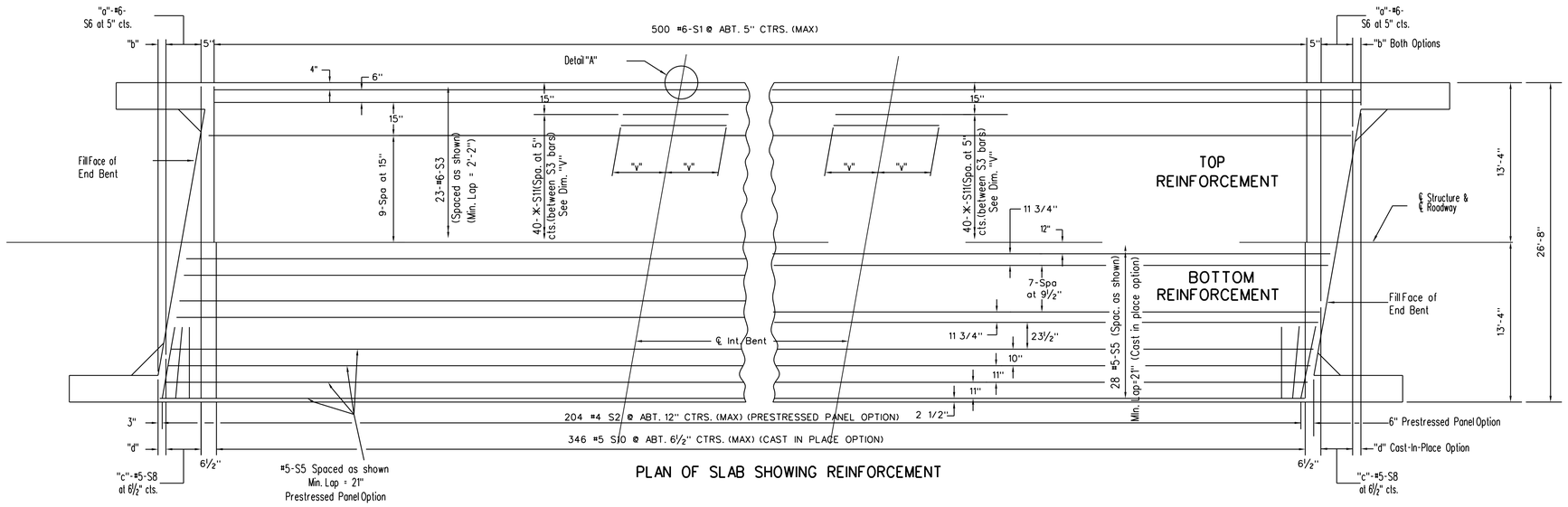
212 N. BUCHANAN
MARYVILLE, MO 64468
660-582-8888

Project No: 1140351

Sheet 6 of 22



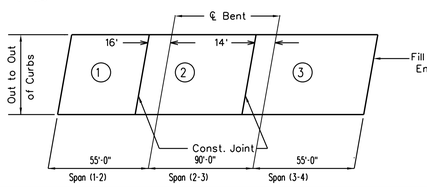
PLAN OF SLAB SHOWING REINFORCEMENT

Note: For details of optional slab forms, see "Details of Prestress Panels" sheet.
For details and reinforcement of safety barrier curb not shown, see "Safety Barrier Curb Details" sheet.
For details and reinforcement of thrie beam rail not shown, see "Thrie Beam Rail Option" sheet.

Note: If girder camber is different from that shown in the Camber Diagram, it shall be necessary to adjust the slab haunches, increase the slab thickness or to raise the grade uniformly throughout the structure. No payment will be made for additional labor or materials required for variation in haunching, slab thickness, or grade adjustment.

TABLE OF SLAB DIMENSIONS	
Dimension	Skew Angle °
	30°
"a"	32
"b"	8¾"
"c"	24
"d"	13½"
"m"	11.5470
"n"	5.7735
"r"	9¼"

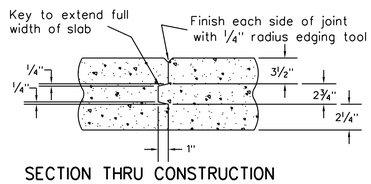
SLAB POURING SEQUENCE



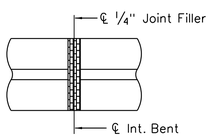
	SEQUENCE OF POURS DIRECTION			Min. Rate of Pour (Cu. Yds./Hour) With Retarder
Basic Sequence	1	2	3	25
	End to 2	1 to 3	2 to end	
Alternate pours to the basic sequence are subject to the approval of the engineer in accordance with section 703.3.12.4 of Missouri Standard Specifications.				
Alternate "A" Pours	1 + 2		3	25
	End to 3		2 to end	
Alternate "B" Pours	1 + 2 + 3			25
	End to End			

3 - SPAN STRUCTURE

Note: The contractor shall furnish an approved retarder to retard the set of the concrete to 2.5 hours and shall pour and satisfactorily finish the slab pours at the rate given.
Machine finishing as specified in Section 703.3.14 will not be required.
The diaphragm at intermediate bents and integral end bents shall be poured a minimum of 30 minutes and a maximum of 2 hours before the slab is poured.



SECTION THRU CONSTRUCTION JOINT IN SLAB (C.I.P. OPTION)



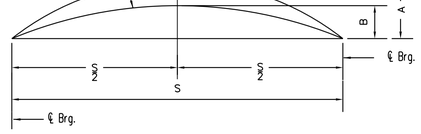
DETAIL "A"
(Safety Barrier Curb Only)

GIRDER CAMBER DIMENSIONS					
Girder Type	Number of Strands	Exterior Girder		℄ Girder	
		A	B	A	B
Type II (2'-8")	12	7/16"	¼"	7/16"	¼"
	14	11/16"	¾"	11/16"	11/16"
Type III (3'-3")	12 ②	5/16"	¼"	5/16"	3/16"
	12 ③	¾"	½"	¾"	7/16"
	16	1¼"	5/16"	1¼"	11/16"
Type IV (3'-9")	10	7/16"	¼"	7/16"	¼"
	12	11/16"	7/16"	11/16"	3/16"
	14	15/16"	½"	15/16"	3/16"
	18	1¼"	¾"	1¼"	5/16"
	20	1 3/16"	5/16"	1 3/16"	5/16"
Type VI (4'-6")	14	½"	3/16"	½"	3/16"
	16	15/16"	9/16"	15/16"	½"
	18	1"	5/16"	1"	½"
	26	1 1/4"	7/8"	1¼"	7/8"
	32	2 3/16"	1 5/16"	2 1/16"	1¼"

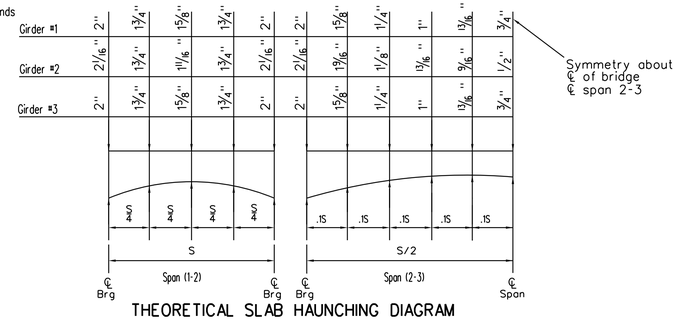
② Straight Strands
③ Draped Strands

GIRDER CAMBER DIAGRAM

Note: Camber at 1/4 point of girder is equal to 0.7125 camber at centerline of girder.

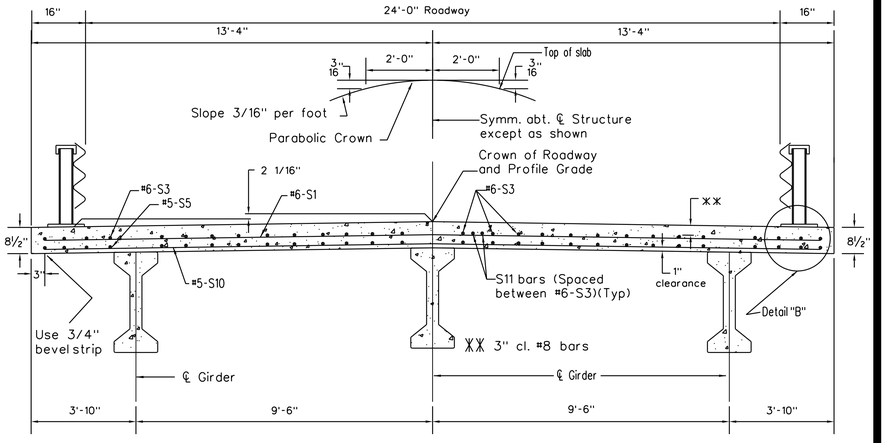


BENT NUMBER	*	Cast in place Dim. "V"	Prestressed panel option Dim. "V"
2	8	24"	34"
3	8	24"	34"

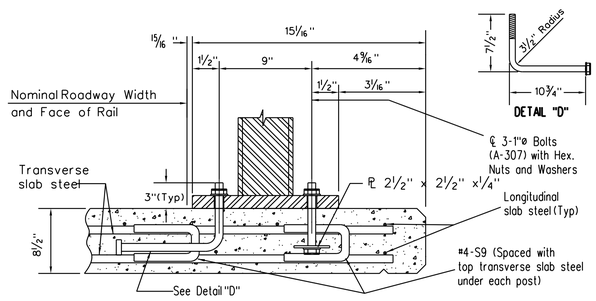


THEORETICAL SLAB HAUNCHING DIAGRAM

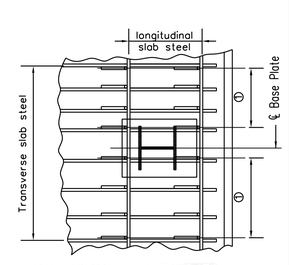
Note: For girder numbering see "Part Plan of Bridge Showing Girder and Intermediate Diaphragm Layout" on "Diaphragm Details" sheet.



SECTION NEAR INTERMEDIATE BENT
(Thrie Beam Rail)



DETAIL "B"



PART PLAN OF DETAIL "B"
① 4-#4-S9(Spaced with top transverse slab steel under each post)

THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS

STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24839
PROFESSIONAL ENGINEER
12/28/18

MARK	REVISION	DATE	BY
Engineer:	RM	Checked By:	BB	Scale:	1"=
Technician:	KG	Date:	08/29/14	Field Bk:	Pg:

Project No: 1140351

Sheet 7 of 22

DAVIESS COUNTY, MO

SLAB DETAILS

DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

SNYDER & ASSOCIATES
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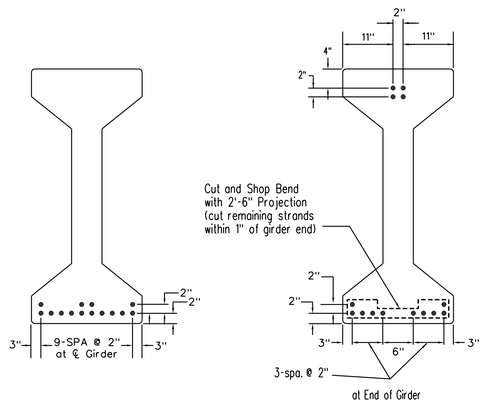
MARYVILLE, MO 64468
660-562-8888

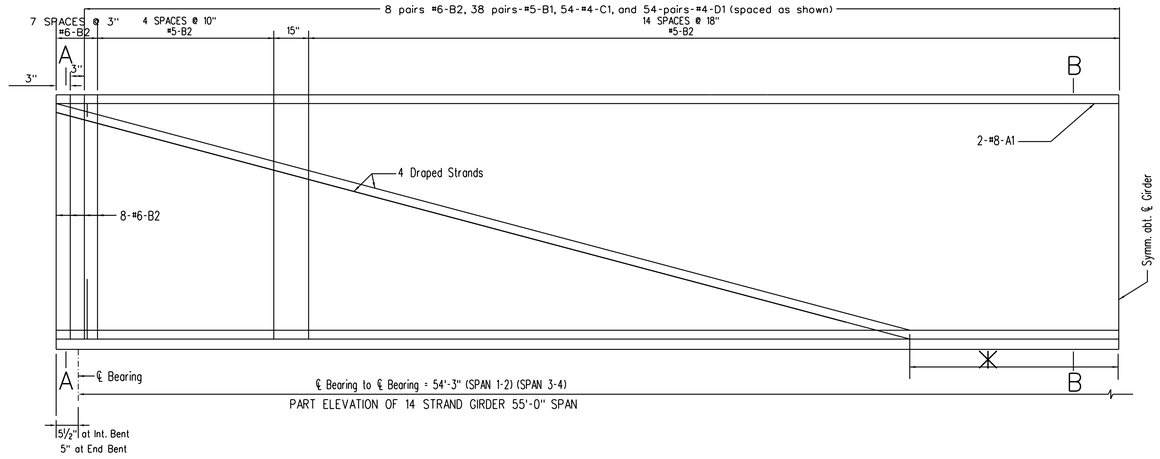
Project No: 1140351

Sheet 7 of 22

Note: Prestressing tendons shall be uncoated seven-wire low relaxation strands, 1/2" in diameter conforming to A.A.S.H.T.O. M203, Grade 270.



14 STRAND ARRANGEMENT
INITIAL PRESTRESS FORCE OF 434 KIPS)

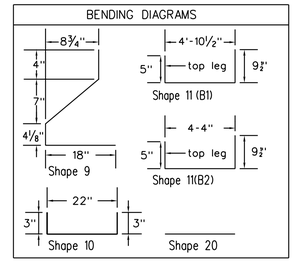


Note: For definition of span length see "Part Plan of Bridge Showing Girder and Intermediate Diaphragm Layout" on Diaphragm Details sheet.

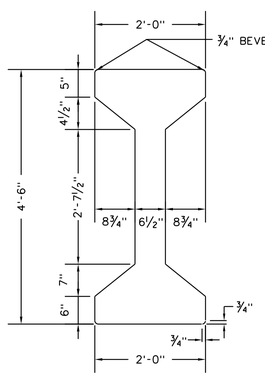
The 1½" ø holes for connection of steel intermediate diaphragms (when required) shall be cast in web. Drilling is not allowed.

REINFORCING STEEL (EACH 14 STRAND GIRDER)			
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE
4	8-A1	42'-4½"	20
38	5-B1	5'-11"	11 (B1)
16	6-B2	5'-4"	11 (B2)
54	4-C1	2'-2"	10
54	4-D1	3'-2"	9

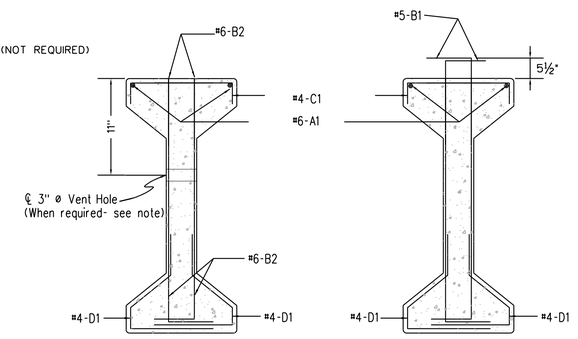
Note: The two D1 bars may be furnished as one bar at the fabricators option.



Note: All dimensions are out to out.
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures stirrup and tie dimensions.
Actual lengths are measured along center-line bar to the nearest inch.
Minimum clearance to reinforcing shall be 1".
All reinforcing steel shall be Grade 60.
Where deflecting strands interfere with placement, some in-place bending may be necessary.



GIRDER DIMENSIONS



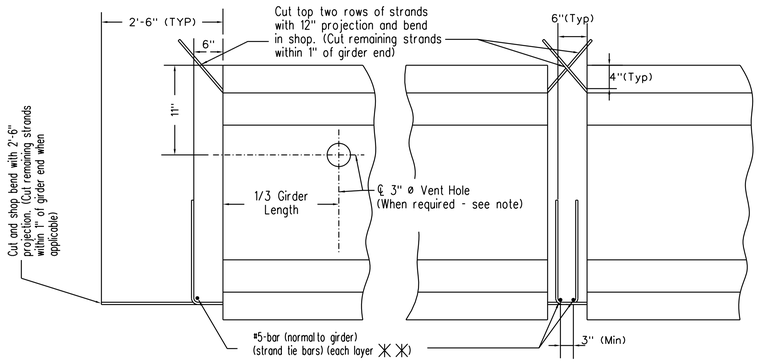
SECTION A-A

SECTION B-B

(Strands not shown for clarity)

Girder Weight = 670.9 lbs. per linear foot.

Note: Concrete for prestressed girders shall be Class A1 with f'c = 6,000 psi. f'ci = 4,500
(•) indicates prestressed strand.
Cost of ¾" ø coil tie rods placed in diaphrams is included in contract unit price for prestressed concrete members.
Coil ties shall be held in place in the forms by slotted wire-setting-studs projecting through forms. Studs are to be left in place or replaced with temporary plugs until girders are erected and then replaced by coil tie rods.

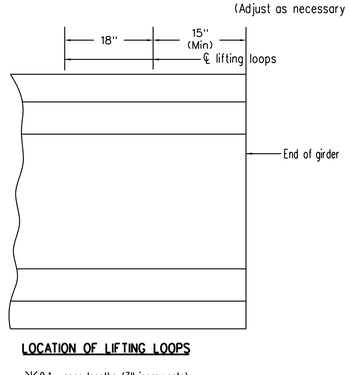


END BEND

INTERMEDIATE BENT

STRAND DETAILS AT GIRDER ENDS

(Adjust as necessary to clear girder reinforcment)



LOCATION OF LIFTING LOOPS

✳ 0.1 x span lengths (3" increments)
✳✳ At intermediate bents only.

Note: For details and location of coil ties see "Diaphragm Details".
Exterior and interior girders are like some except for coil ties.

VENT HOLES:
Prestressed girder vent holes shall be required on upgrade end of girder (stream crossings only). Clear reinforcing steel or strands by 1½" minmum and steel intermediate diaphragm ball connection by 6" minimum. Cost of vent holes in place to be included in contract unit price for prestressed concrete members.

THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS

STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24639
PROFESSIONAL ENGINEER
12/28/18

DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

PRESTRESSED CONCRETE I-GIRDER (55'-0" SPAN) TYPE VI (55'-1 1/2")

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C. www.snyder-associates.com

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212 N. BUCHANAN
MARYVILLE, MO 64468
660-582-8888

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Engineer:	RM		
Checked By:	BB	Scale:	1"=
Date:	08/29/14	Field Bk:	Pg:
Technician:	KG		

Project No: 1140351

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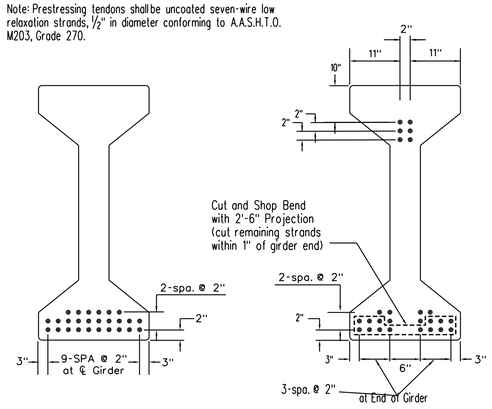
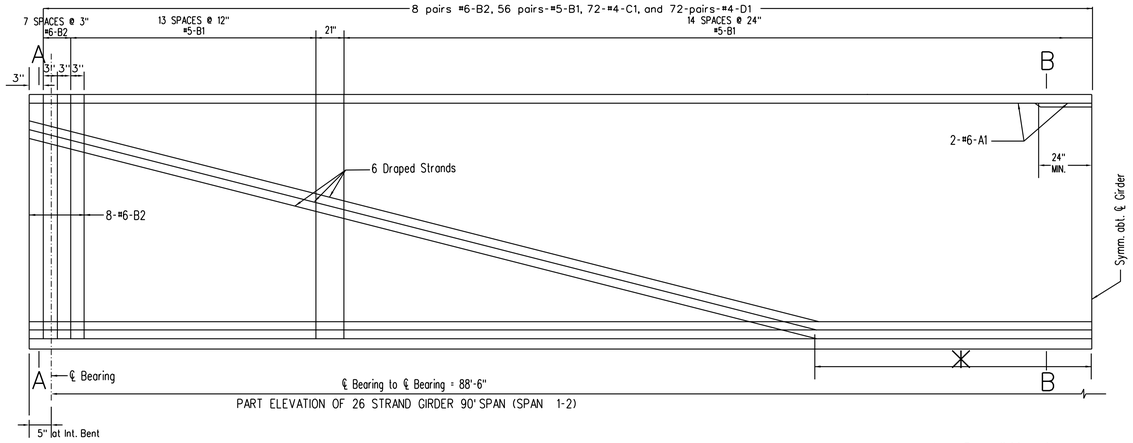
Project No: 1140351
Sheet 8 of 22

Note: Prestressing tendons shall be uncoated seven-wire low relaxation strands, ½" in diameter conforming to A.A.S.H.T.O. M203, Grade 270.



26 STRAND ARRANGEMENT
INITIAL PRESTRESS FORCE OF 806 KIPS)



PART ELEVATION OF 26 STRAND GIRDER 90' SPAN (SPAN 1-2)

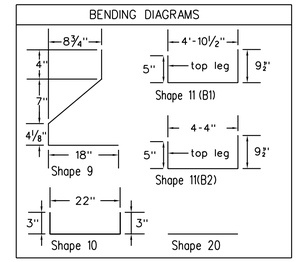
Note: For definition of span length see "Part Plan of Bridge Showing Girder and Intermediate Diaphragm Layout" on Diaphragm Details sheet.

The 1½" ø holes for connection of steel intermediate diaphragms (when required) shall be cast in web. Drilling is not allowed.

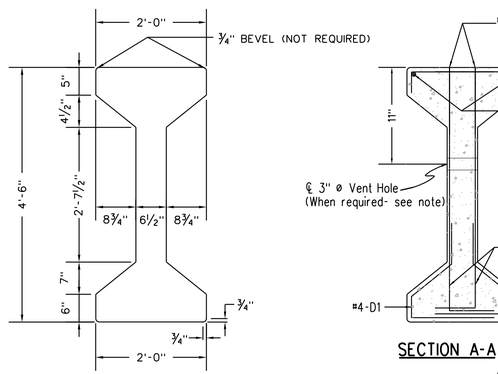
REINFORCING STEEL (EACH 26 STRAND GIRDER)			
NO.	SIZE & MARK	ACTUAL LENGTH	SHAPE
8	6-A1	45'-7"	20
56	5-B1	5'-11"	11 (B1)
16	6-B2	5'-4"	11 (B2)
72	4-C1	2'-2"	10
72	4-D1	3'-2"	9

Note: The two D1 bars may be furnished as one bar at the fabricators option.

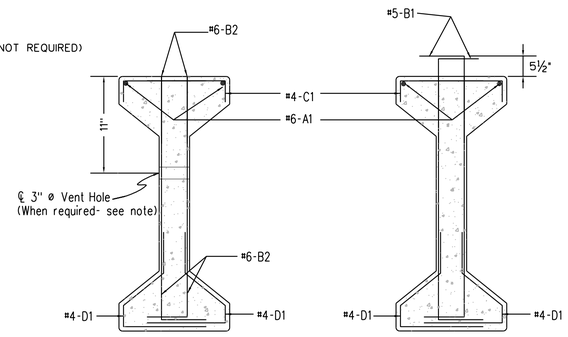
BENDING DIAGRAMS



Note: All dimensions are out to out.
Hooks and bends shall be in accordance with the CRSI Manual of Standard Practice for Detailing Reinforced Concrete Structures stirrup and tie dimensions.
Actual lengths are measured along center-line bar to the nearest inch.
Minimum clearance to reinforcing shall be 1".
All reinforcing steel shall be Grade 60.
Where deflecting strands interfere with placement, some in-place bending may be necessary.



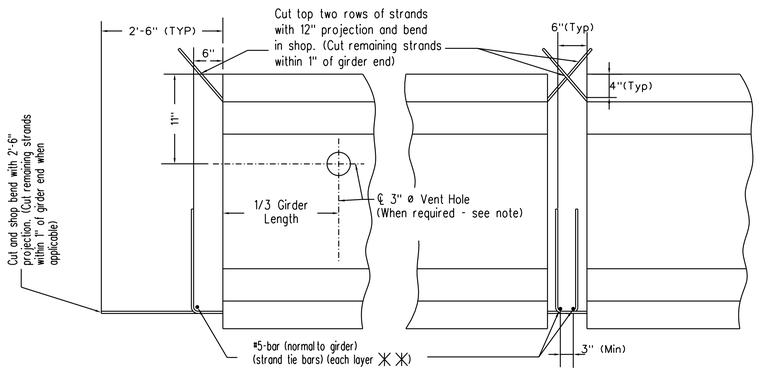
GIRDER DIMENSIONS



SECTION A-A SECTION B-B

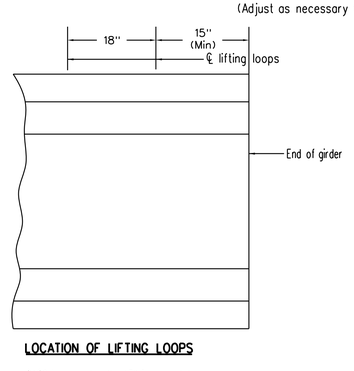
(Strands not shown for clarity)

Girder Weight = 670.9 lbs. per linear foot.



END BENT INTERMEDIATE BENT

STRAND DETAILS AT GIRDER ENDS



LOCATION OF LIFTING LOOPS

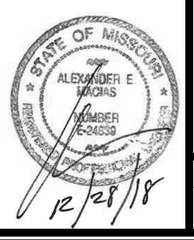
✳✳ 0.1 x span lengths (3" increments) At intermediate bents only.

Note: For details and location of coil ties see "Diaphragm Details".
Exterior and interior girders are like some except for coil ties.

Note: Concrete for prestressed girders shall be Class A1 with f'c = 7,000 psi. f'ci = 5,500
(●) indicates prestressed strand.
Cost of ¾" ø coil tie rods placed in diaphrams is included in contract unit price for prestressed concrete members.
Coil ties shall be held in place in the forms by slotted wire-setting-studs projecting through forms. Studs are to be left in place or replaced with temporary plugs until girders are erected and then replaced by coil tie rods.

VENT HOLES:
Prestressed girder vent holes shall be required on upgrade end of girder (stream crossings only). Clear reinforcing steel or strands by 1½" minmum and steel intermediate diaphragm ball connection by 6" minimum. Cost of vent holes in place to be included in contract unit price for prestressed concrete members.

THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS



MARK	REVISION	BY	DATE
Engineer:	RM	Checked By:	BB
Technician:	KG	Date:	08/29/14

Scale: 1"=
Field Bk:
Pg:

Project No: 1140351

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DAVIESS COUNTY BRIDGE 35900061 BRO-B031(34)

PRESTRESSED CONCRETE I-GIRDER (90' SPAN) TYPE B (36") NO

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MARYVILLE, MO 64468
660-582-8888

Project No: 1140351

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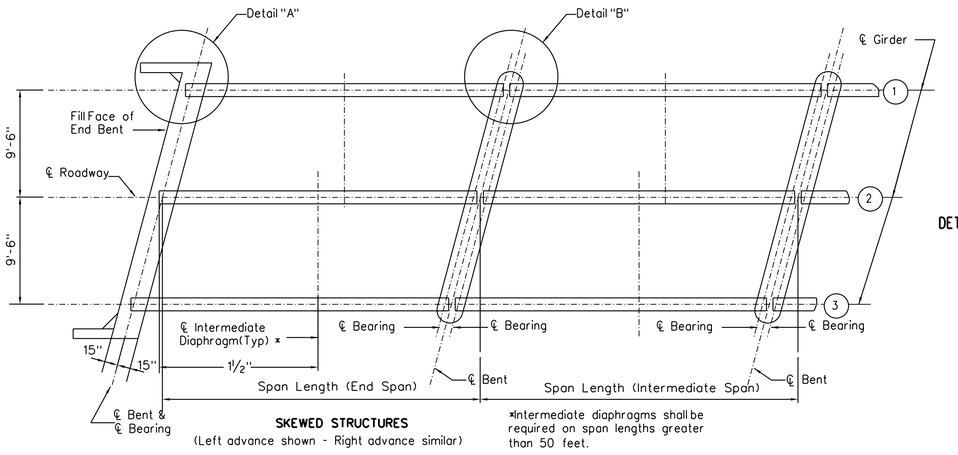
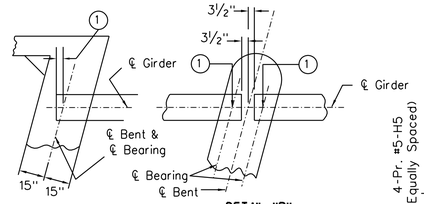


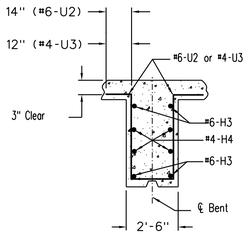
SKEWED STRUCTURES
(Left advance shown - Right advance similar)

*Intermediate diaphragms shall be required on span lengths greater than 50 feet.

PART PLAN OF BRIDGE SHOWING GIRDER AND INTERMEDIATE DIAPHRAGM LAYOUT

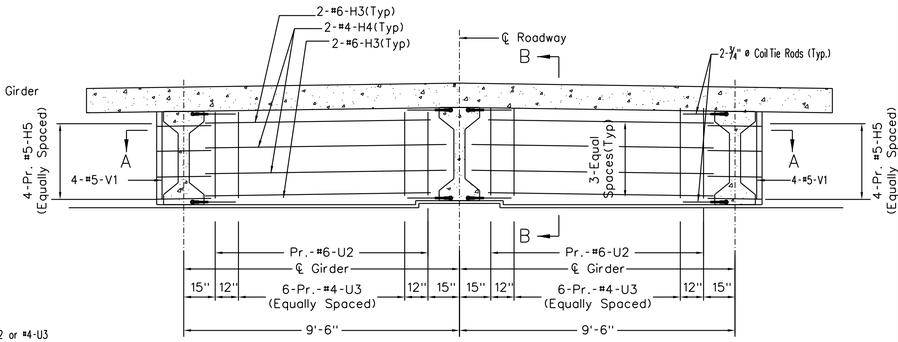


① See Prestressed Concrete I-Girder sheet.



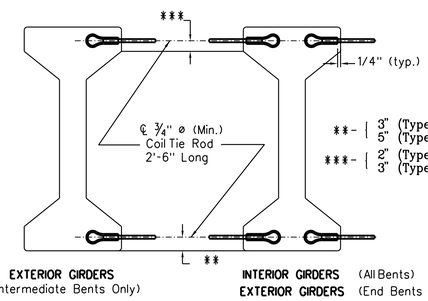
SECTION B-B

Note: Diaphragms at intermediate bents are vertical.



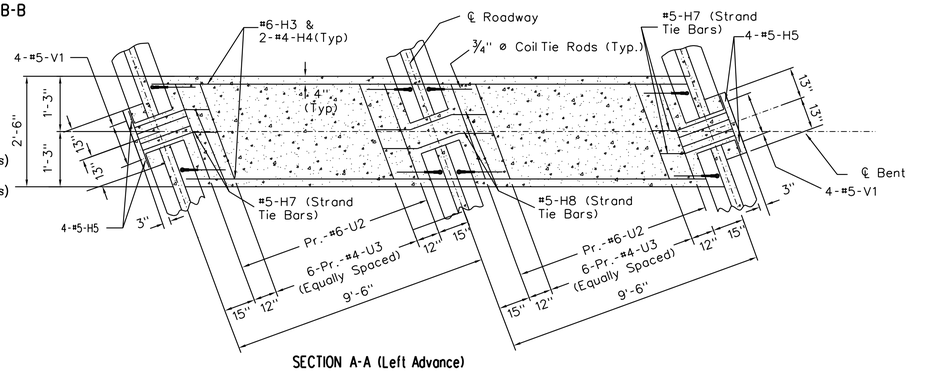
SECTION NEAR INTERMEDIATE BENT (Normal to ℄ Roadway)

NOTE: FOR LOCATION AND NUMBER OF #5-H7 & #5-H8 STRAND TIE BARS, SEE PRESTRESSED CONCRETE I-GIRDER SHEETS.

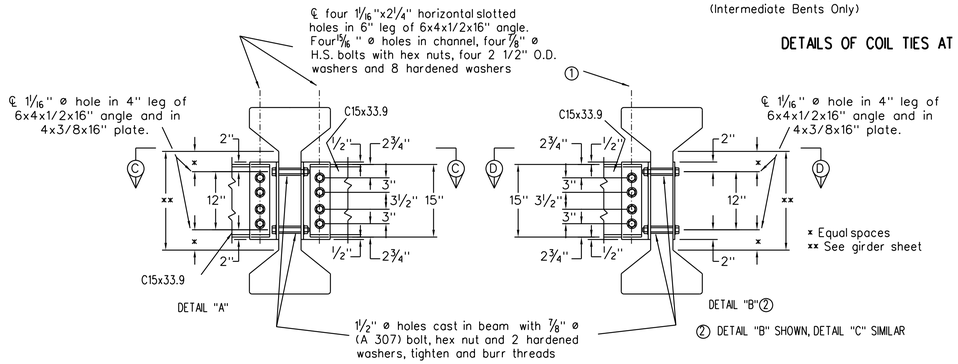


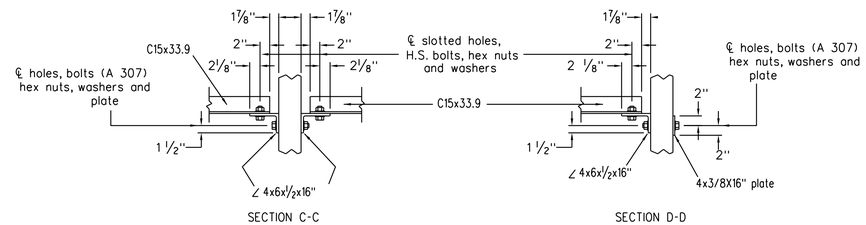
EXTERIOR GIRDERS (Intermediate Bents Only)
INTERIOR GIRDERS (All Bents)
EXTERIOR GIRDERS (End Bents Only)

DETAILS OF COIL TIES AT BENTS



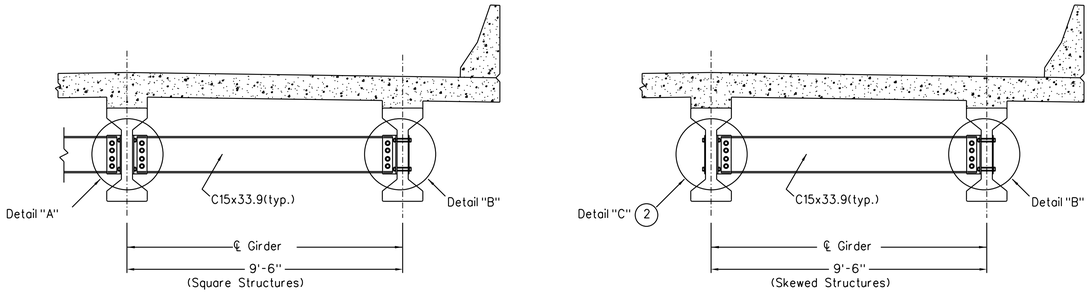
SECTION A-A (Left Advance)





DETAILS OF INTERMEDIATE DIAPHRAGMS WITHIN SPANS

DETAILS OF DIAPHRAGMS AT INTERMEDIATE BENTS



PART SECTION SHOWING INTERMEDIATE DIAPHRAGMS

Notes:
In lieu of 2½" O.D. washers, contractor may substitute a 3/16" (min. thickness) plate with four 15/16" ø holes and 1 hardened washer per bolt.

All H.S. bolts may be tensioned by turn-of-nut method.

All diaphragm materials including bolts, nuts and washers shall be galvanized.

Fabricated structural steel shall be A36 except as noted.

Payment for furnishing and installing steel intermediate diaphragms shall be included in contract price for Prestressed Concrete I- Girders

Shop drawings will not be required for steel intermediate diaphragms and angle connections.

THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS

STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24639
PROFESSIONAL ENGINEER
12/28/18

MARK	REVISION	DATE	BY
Engineer:	RM	Checked By:	BB	Scale:	1"=
Technician:	KG	Date:	08/29/14	Field Bk:	Pg:

Project No: 1140351

Sheet 10 of 22

DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

DIAPHRAGM DETAILS (AT INTERMEDIATE BENTS)

DAVIESS COUNTY, MO

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Project No: 1140351

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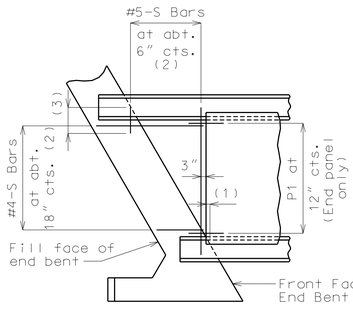
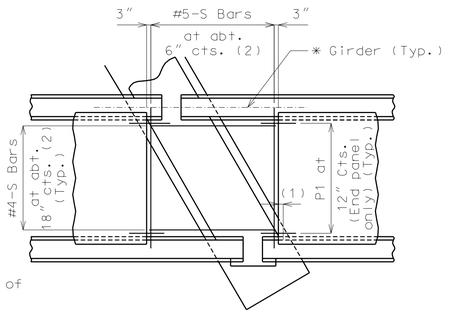
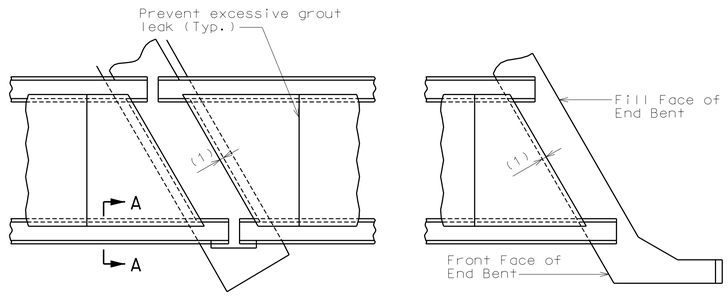


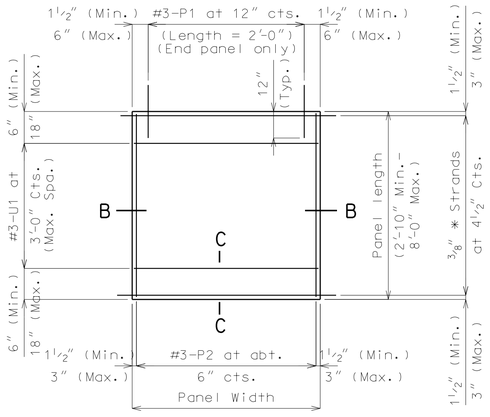


PANELS-SQUARED ENDS

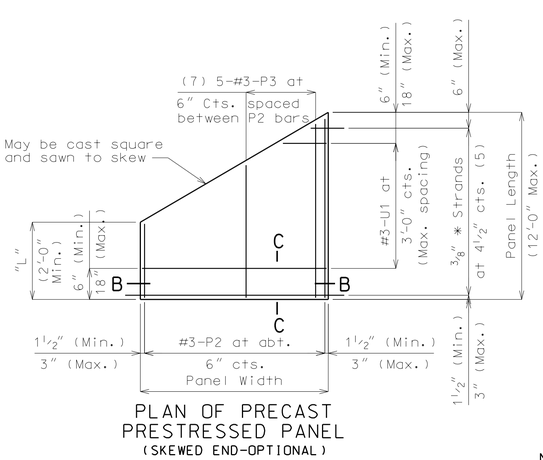


PANELS-SKEWED ENDS

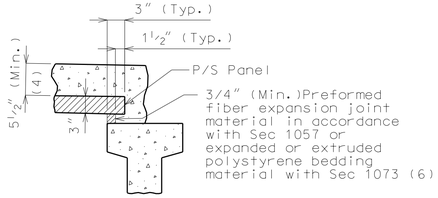
PLAN OF PRECAST PRESTRESSED PANELS PLACEMENT



PLAN OF PRECAST PRESTRESSED PANEL

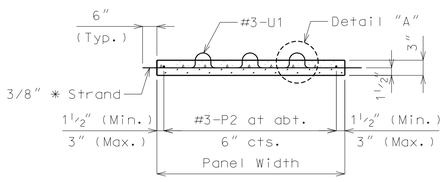


PLAN OF PRECAST PRESTRESSED PANEL
(SKEWED END-OPTIONAL)

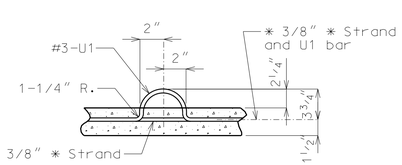


SECTION A-A

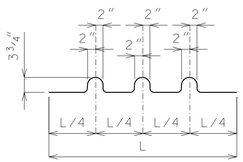
Note: Use slab haunching diagram on Sheet No. XX for determining thickness of preformed fiber expansion joint material or polystyrene bedding material within the limits noted in general notes.



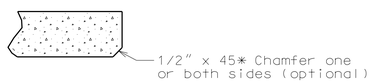
SECTION B-B



DETAIL "A"



BENDING DIAGRAM FOR U1 BAR
(U1 Bars may be oriented at right angles to location and spacing shown. U1 Bars shall be placed between P1 bars).



SECTION C-C

NOTES:

Cost of S-bars will be considered completely covered by the contract unit price for the slab

S-bars are not listed in the bill of reinforcing.

(1) End panels shall be dimensioned 1" min. to 1-1/2" max. from the inside face of diaphragm.

(2) S-bars shown are bottom steel in slab between panels and used with squared end panels only.

(3) Extend S-bars 18 inches beyond the front face of end bents only.

(4) In order to maintain minimum slab thickness, it may be necessary to raise the grade uniformly throughout the structure. No payment will be made for additional labor or materials required for necessary grade adjustment.

(5) Any strand 2'-0" or shorter shall have a #4 reinforcing bar on each side of it, centered between strands. Strands 2'-0" or shorter may then be debonded at the fabricator's option.

(6) All panel support pads shall be glued to the girder. When support thickness exceeds 1-1/2 inches, the pads shall be glued top and bottom. The glue used shall be the type recommended by the panel support pads manufacturer.

(7) Use #3-P3 bars if panel is skewed 45° or greater.

GENERAL NOTES:

PRESTRESSED PANELS:

Concrete for prestressed panels shall be Class A-1 with f'c = 6,000 psi, f'ci = 3,500 psi.

The top surface of all panels shall receive a scored finish with a depth of scoring of 1/8" perpendicular to the prestressing strands in the panels.

Prestressing tendons shall be high-tensile strength uncoated seven-wire, low-relaxation strands for prestressed concrete in accordance with AASHTO M 203 Grade 270, with nominal diameter of strand = 3/8" and nominal area = 0.085 sq.in. and minimum ultimate strength = 22.95 kips (270 ksi). Larger strands may be used with the same spacing and initial tension.

Initial prestressing force = 17.2 kips/strand.

The method and sequence of releasing the strands shall be shown on the shop drawings.

Suitable anchorage devices for lifting panels may be cast in panels, provided the devices are shown on the shop drawings and approved by the engineer. Panel lengths shall be determined by the contractor and shown on the shop drawings.

When square end panels are used at skewed bents, the skewed portion shall be cast full depth. No separate payment will be made for additional concrete and reinforcing required.

Support from diaphragm forms is required under the optional skewed end until cast-in-place concrete has reached 3,000 psi compressive strength.

Minimum preformed fiber expansion joint material or polystyrene bedding material thickness shall be 3/4 inch. Thicker material may be used on one or both sides of the girder to reduce cast-in-place concrete thickness to within tolerances. No more than 2 inches total thickness shall be used.

The same thickness of material shall be used under any one edge of any panel except at locations where top flange thickness may be stepped. The maximum change in thickness between adjacent panels shall be 1/4 inch. The polystyrene bedding material may be cut to match haunch height above top of flange.

Slab thickness over prestressed panels varies due to girder camber.

At the contractor's option, the variation in slab thickness over prestressed panels may be eliminated or reduced by increasing and varying the girder top flange thickness. Dimensions shall be shown on the shop drawings.

REINFORCING STEEL:

All dimensions are out to out.

Minimum clearance to reinforcing steel shall be 1-1/2", unless otherwise shown.

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

Actual lengths are measured along centerline of bar to the nearest inch.

The prestressed panel quantities are not included in the table of estimated quantities for the slab.

If U1 bars interfere with placement of slab steel, U1 loops may be bent over, as necessary, to clear slab steel.

Welded wire fabric or welded deformed bar mats providing a minimum area of reinforcing perpendicular to strands of 0.22 sq. in./ft., with spacing parallel to strands sufficient to insure proper handling, may be used in lieu of the #3-P2 bars shown. Wire or bar diameter shall not be larger then 0.375 inch. The above alternative reinforcement criteria may be used in lieu of the #3-P3 bars, when required, and placed over a width not less than 2 feet.

The reinforcing steel shall be tied securely to the 3/8" * strands with the following maximum spacing in each direction:
#3-P2 bars at 16 inches.
Welded wire fabric or welded deformed bar mats at 2'-0".

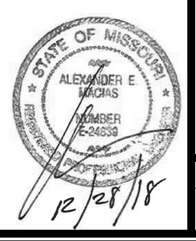
Tie the #3-U1 bars to the #3-P2 bars, to the welded wire fabric or the welded deformed bar mats at about 3'-0" centers.

All reinforcement other than prestressing strands shall be epoxy coated.

Precast panels may be in contact with stirrup reinforcing in diaphragms.

DETAILS OF PRECAST PRESTRESSED PANELS

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



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Engineer:	RM	Checked By:	BB	Scale:	1"=
Technician:	KG	Date:	08/29/14	Field Bk:	Pg:

Project No: 1140351

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DAVIESS COUNTY BRIDGE 359000061 BRO-B031(34)

DAVIESS COUNTY, MO

PRECAST-PRESTRESSED PANEL DETAILS

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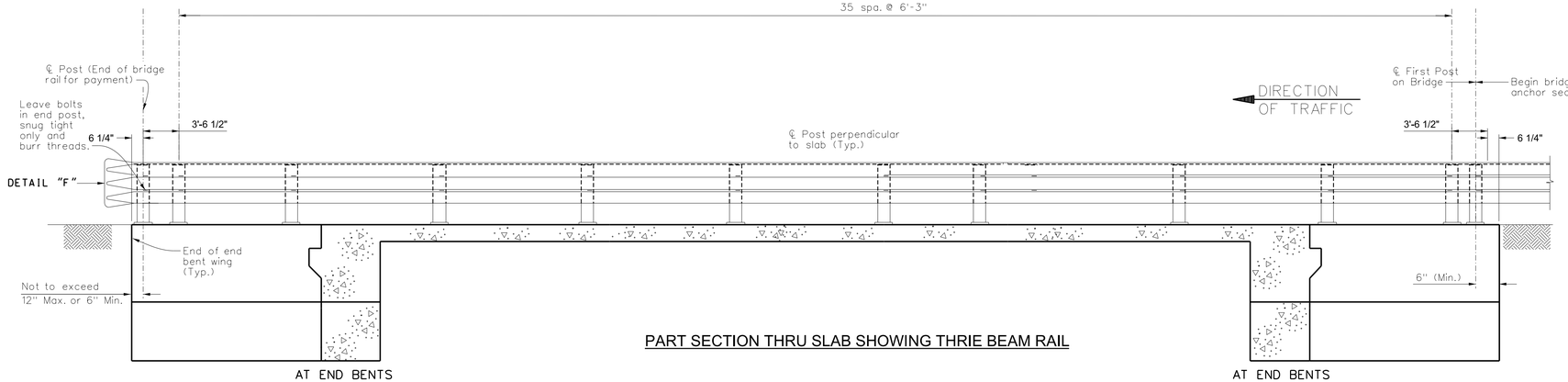
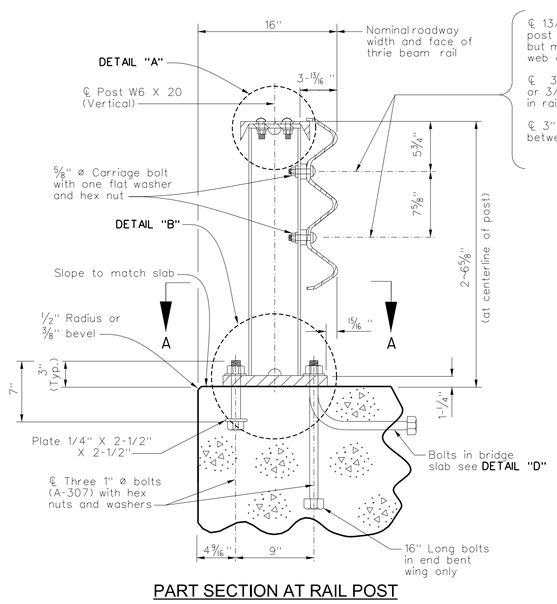
Sheet 11 of 22

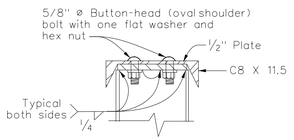


PART SECTION THRU SLAB SHOWING THRIE BEAM RAIL

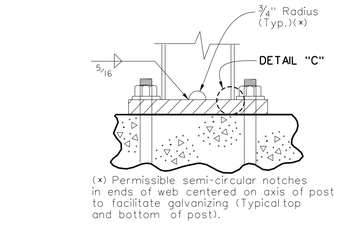
Note: At the bridge ends for two-way pavement, use guard rail at all four corners and for divided pavement, use a guard rail at entrance ends only (Unless required at exit end for high fill).



PART SECTION AT RAIL POST

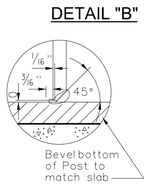


DETAIL "A"



(×) Permissible semi-circular notches in ends of web centered on axis of post to facilitate galvanizing (Typical top and bottom of post).

DETAIL "B"



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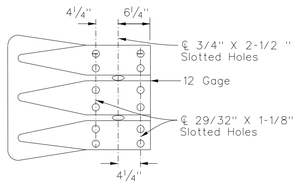
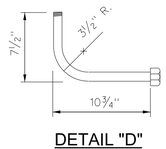


ELEVATION



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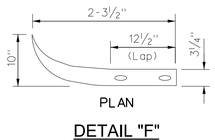
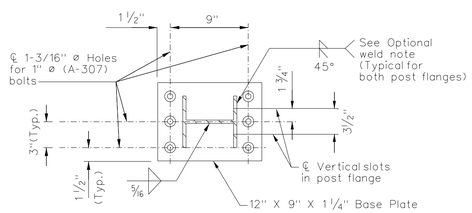


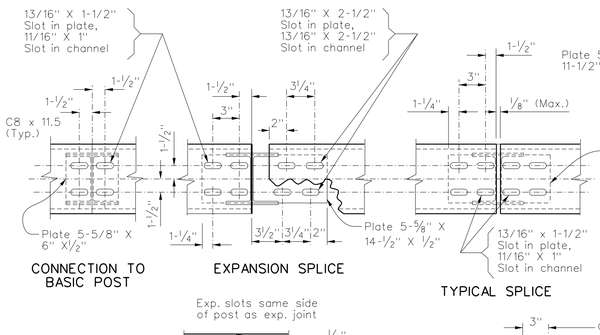
PLAN

DETAIL "F"



SECTION A-A

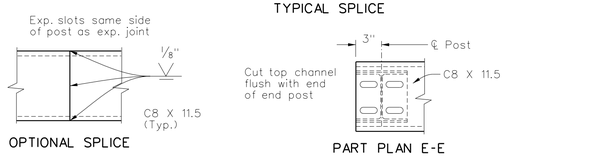
Note: Optional welding of the post to the base plate is a 3/8" fillet weld all around (including the edges of the post flanges) in lieu of the weld shown.



CONNECTION TO BASIC POST

EXPANSION SPLICE

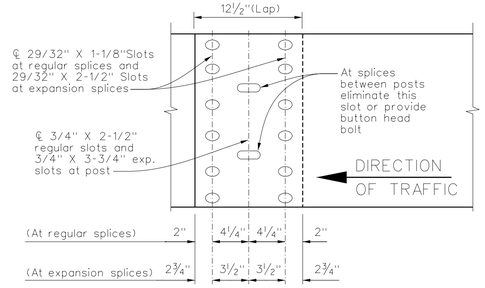
TYPICAL SPLICE



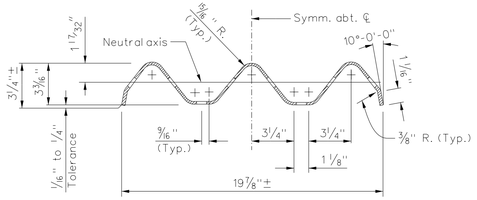
OPTIONAL SPLICE

PART PLAN E-E

CHANNEL MEMBER DETAILS



THRIE BEAM RAIL SPLICE DETAILS



SECTION THRU THRIE BEAM RAIL

GENERAL NOTES:

Design Specifications: AASHTO-1996 and Interims thru 1999

Panel lengths of channel members shall be attached continuously to a minimum of four posts and a maximum of six posts (except at end bents).

All bolts, nuts, washers, plates and elastomeric materials are considered as parts of the thrie beam rail for payment.

All steel connecting bolts and fasteners for posts and railing, and all anchor bolts, nuts, washers and plates shall be galvanized after fabrication. For protective coating and material requirement of steel railing, see Section 1040 of the Missouri Standard Specifications.

Rail posts shall be set perpendicular to roadway profile grade and vertically in cross section, and aligned according to Section 713 of the Missouri Standard Specifications, except that the rail posts shall be aligned by the use of shims so that in the final adjustment no part shall deviate more than one inch from true horizontal alignment. The shims shall be 3" X 1 3/4" and placed between the post and the thrie beam rail. The thickness of the shims shall be determined by the contractor and verified by the engineer before ordering material for this work.

Rail posts shall be seated on elastomeric pads having the same dimensions as the post base plate and 1/16" thickness. Such pads may be any elastomeric material, plain or fibered, having a hardness (Durometer) of 50 or above, as certified by the manufacturer. Additional pads or half pads may be used in shimming for alignment. Post heights shown will increase by the thickness of the pad.

At the expansion slots in the thrie beam rails and channels, tighten bolts, back off one-half turn and burr threads.

At the thrie beam connection to posts on wings, tighten bolts, back off one-half turn and burr threads.

Minimum length of thrie beam sections is equal to one post space.

Use 5/8" ✱ button-head, oval shoulder bolts with hex nuts at all slots. (Thickness of hex nuts = 3/8" Min.).

Thrie beam guard rail on the bridge shall be made of steel and shall be 12 Gage.

Posts, top plates, base plates, channels and channel splice plates shall be fabricated from ASTM A709 Grade 36 steel and galvanized.

Threaded rods Grade A-321 with 2 hex nuts and washers may be substituted for the A-307 anchor bolts.

Each of the three (3) shorter anchor bolts shall be furnished with a 1/4" X 2-1/2" X 2-1/2" plate (ASTM A709 Grade 36) tack welded to the head of the bolt; or, at the contractor's option, one plate 1/4" X 2-1/2" X 12" continuous for all three bolts may be used.

Washers shall be used at all post bolts (between the bolt head and beam). They shall be rectangular in shape (3" X 1-3/4" X 3/16" Min.) and flat with a 1/16" X 1" slot, or when necessary of such design as to fit the contour of the beam. (Use a 3" X 1-3/4" X 5/8" rectangular washer between the post and the thrie beam rail.)

Special drilling of the thrie beam may be required at the splices. (All drilling details are to be shown on the shop drawings.)

Fabrication of structural steel shall be in accordance with Section 712 of the Missouri Standard Specifications.

Expansion splices in the thrie beam rail shall be made at either the first or second post on either side of the joint and on structure at bridge ends. When the splice is made at the second post, an expansion slot shall be provided in the thrie beam rail for connection to the first post to allow for movement.

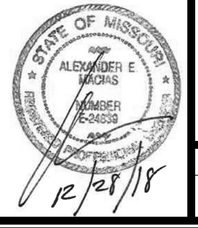
In addition to the expansion provisions at these expansion joints, expansion splices in the thrie beam rail and the channel shall be provided at other locations so that the maximum length without expansion provisions does not exceed 200 ft.

Shim plates 6" X 6" X 1/16" may be used between the top of the post and the channel member as required for vertical alignment.

See Missouri Standard Plans Drawing 606.00 for details not shown.

Note: Railing-Crash Tested for AASHTO Service Level 1 and will provide an equivalent TL-2 raiting in accordance with the criteria of NCHRP Report 350.

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



MARK	REVISION	DATE	BY
Engineer:	RM	Checked By:	BB	Scale:	1"=
Technician:	KG	Date:	08/29/14	Field Bk:	Pg:

Project No: 1140351

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DAVIESS COUNTY, MO

DAVIESS COUNTY BRIDGE 35900061 BRO-B031(34)

THRIE BEAM RAIL DETAILS

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C. www.snyder-associates.com
802 FRANCIS STREET
ST. JOSEPH, MO 64501
816-364-5222
212 N. BUCHANAN
MARYVILLE, MO 64468
660-582-8888

Project No: 1140351

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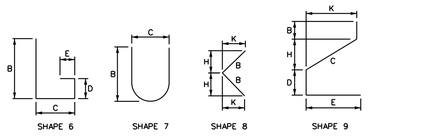
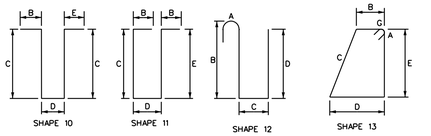
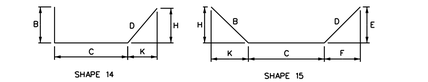
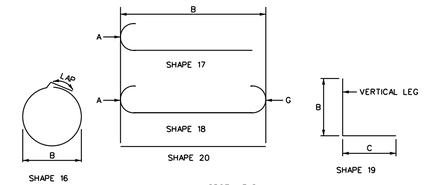
COMPLETE BILL OF REINFORCING STEEL

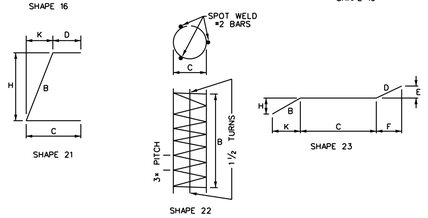
NO. REQD.	MARK NO. / SIZE MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR (X)	VARIES (V)	NO. EACH	DIMENSIONS B	C	D	E	F	H	K	NOMINAL LENGTH	ACTUAL LENGTH	WEIGHT
									FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	FT. IN.	LBS.
		SUPERSTRUCTURE																
		** END BENT (EACH BENT) **																
7	6F1	WING BRACE		15					14.125	5 1.250	14.125	7.000	12.250	7.000	12.250	7 6	7 5	78
7	6F2	DIAPHRAGM		21				2	6.375	6 5.375				2 2.250	15.250	9 0	8 7	90
7	6F3	WING BRACE		15					14.125	3 1.000	14.125	12.250	7.000	12.250	7.000	5 5	5 4	56
7	6F4	DIAPHRAGM		23				2	6.375	5 7.375				2 2.250	15.250	8 2	8 1	85
3	5H1	DIAPHRAGM		23					15.000	2 0.000	15.000	7.500	13.000	7.500	13.000	4 6	4 6	14
12	7H2	BEAM & DIAPH.		20				30	6.000							30 6	30 6	748
5	6H3	BEAM & DIAPH.		20				30	6.000							30 6	30 6	229
6	6H4	DIAPHRAGM		20				2	11.000							2 11	2 11	26
6	6H5	DIAPHRAGM		20				8	4.000							8 4	8 4	75
24	6H6	WING		20				14	1.000							14 1	14 1	508
24	6H8	WING		20				13	4.000							13 4	13 4	481
30	5U1	DIAPHRAGM		10	S					4 10.625	2 7.125					12 4	12 2	381
42	6U2	DIAPHRAGM		19	S			4	3.000	4 0.000						8 3	8 10	510
30	5U3	BEAM		10	S					4 11.000	2 7.125					12 5	12 3	383
15	4U4	BEAM		13	S			2	7.125	2 9.000	2 7.125	2 9.000				11 5	11 2	112
52	6V1	WING		20				8	0.000							8 0	8 0	625
												TOTAL EACH END BENT						4.401
		** DIAPHRAGM AT INTERMEDIATE BENT (EACH BENT) **																
8	6H3	INT. BT. DIAPH.		20				8	4.000							8 4	8 4	100
8	4H4	INT. BT. DIAPH.		20				10	0.000							10 0	10 0	53
16	5H5	INT. BT. DIAPH.		19					10.000	2 8.000						3 6	3 5	57
4	5H7	INT. BT. DIAPH.		23					15.000	2 0.000				7.500	13.000	3 3	3 3	14
2	5H8	INT. BT. DIAPH.		23					15.000	2 0.000	15.000	7.500	13.000	7.500	13.000	4 6	4 6	10
8	6U2	INT. BT. DIAPH.		28	S					2 3.625	4 8.500	14.000				8 2	7 10	94
24	4U3	INT. BT. DIAPH.		28	S					2 1.625	4 8.500	12.000				7 10	7 8	123
8	5V1	INT. BT. DIAPH.		20				4	11.000							4 11	4 11	41
												TOTAL EACH INTERMEDIATE BENT						492
		** CAST-IN-PLACE SLAB **																
500	6S1	SLAB		20				26	5.000							26 5	26 5	19.839
138	6S3	SLAB		20				34	10.000							34 10	34 10	7220
168	5S5	SLAB		20				34	8.000							34 8	34 8	6074
64	6S6	SLAB		20			V	2	2 0.000							2 0	2 0	
		INCR. = 8.750 IN							24 7.000							24 7	24 7	1.278
48	5S8	SLAB		20			V	2	2 10.000							2 10	2 10	
		INCR. = 11.250 IN							24 5.000							24 5	24 5	682
1024	4S9	SLAB		10	S					5.000	3.500					14	12	684
346	5S10	SLAB		20					26 5.000							26 5	26 5	9563
80	8S11	SLAB		20					48 0.000							48 0	48 0	10.253
												TOTAL CAST-IN-PLACE SLAB						55,593
		** PRECAST PRESTRESSED PANEL SLAB **																
500	6S1	SLAB		20					26 5.000							26 5	26 5	19.839
204	4S2	SLAB		20					3 10.000							3 10	3 10	522
138	6S3	SLAB		20					34 10.000							34 10	34 10	7220
48	5S5	SLAB		20					34 8.000							34 8	34 8	1736
64	6S6	SLAB		20			V	2	2 0.000							2 0	2 0	
		INCR. = 8.750 IN							24 7.000							24 7	24 7	1.278
1024	4S9	SLAB		10	S					5.000	3.500					14	12	684
80	8S11	SLAB		20					68 0.000							68 0	68 0	14,525
												TOTAL PRECAST PRESTRESSED PANEL SLAB						45.804
		SUBSTRUCTURE																
		INTERMEDIATE BENT (EACH BENT)																
2	8H1	BEAM		18					23 2.000							25 8	25 8	137
2	8H2	BEAM		18					25 8.000							28 2	28 2	151
2	8H3	BEAM		18					26 2.000							28 8	28 8	153
2	6H4	BEAM		20					23 2.000							23 2	23 2	70
8	6H5	BEAM		7					4 0.500	3 0.000						9 8	9 8	116
6	8H6	BEAM		20					23 2.000							23 2	23 2	371
2	6U1	BEAM		13	S				2 2.250	3 0.000	2 2.250	3 0.000				11 2	10 11	33
2	6U2	BEAM		13	S				2 11.000	3 0.000	2 11.000	3 0.000				12 7	12 4	37
43	6U3	BEAM		13	S				3 1.000	3 0.000	3 1.000	3 0.000				12 11	12 8	818
14	4U4	BEAM		10	S					6.000	3 1.000					4 1	3 11	37
12	6V3	BEAM		20					21.000							21	21	32
88	8D2	COLUMN/FOOTING		17					7 0.000							8 1	8 1	1899
68	4H7	COLUMN		20					19 6.000							19 6	19 6	902
323	4H8	COLUMN		32	S				4.500	2 3.000	4.250			3.000	3.000	3 0	2 5	543
68	4U6	COLUMN		7	S				3 0.000	2 3.000						10 9	10 9	488
88	8V1	COLUMN		20					35 9.000							35 9	35 9	8400
4	6D1	FOOTING		10						15 6.000	5 0.000					19 6	19 4	116
23	7H9	FOOTING		20					5 2.000							7 0	7 0	328
7	7H10	FOOTING		20					23 2.000							28 0	28 0	401
8	5H11	FOOTING		20					23 2.000							28 0	28 0	234
24	5H12	FOOTING		20					5 2.000							7 0	7 0	175
												TOTAL EACH INTERMEDIATE BENT						15.441

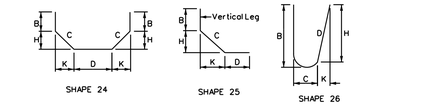


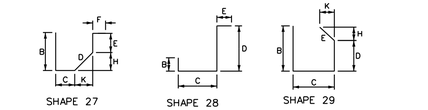


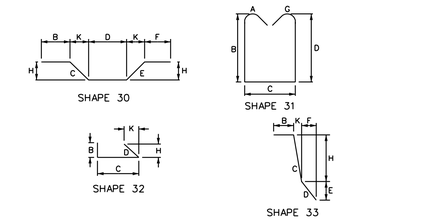






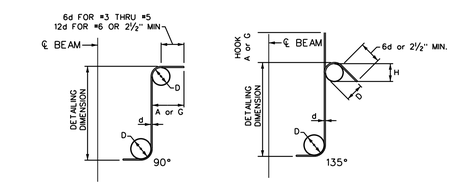






CAST IN PLACE OPTION ONLY

BENDING DIAGRAMS



END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	180° HOOKS ALL GRADES A or G	180° HOOKS ALL GRADES J	90° HOOKS ALL GRADES A or G
#3	2-1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3-1/4"	7"	5"	10"
#6	4-1/2"	8"	6"	12"
#7	5-1/4"	10"	7"	14"
#8	6"	11"	8"	16"
#9	9-1/2"	15"	11-1/4"	19"
#10	10-3/4"	17"	13-1/4"	22"

NOTES:

All standard hooks and bends other than 180 degree to be bent with 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.

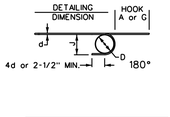
V- Bar dimensions vary in equal increments between dimensions shown on this line and the following line.

NO. EA. - Number of bars of each length.

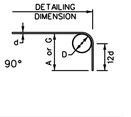
NOMINAL LENGTHS - are based on out to out dimensions shown in bending diagrams and are listed for fabricators use. (Nearest inch).

ACTUAL LENGTHS - are measured along centerline bar to the nearest inch.

Payweights are based on actual lengths.



SIZE OF 180° HOOKS



SIZE OF 90° HOOKS

REINFORCING BAR WEIGHTS
#4 = 0.668 LBS.
#5 = 1.043 LBS.
#6 = 1.502 LBS.
#7 = 2.044 LBS.
#8 = 2.670 LBS.
#9 = 3.400 LBS.
#10 = 4.303 LBS.
#11 = 5.313 LBS.

WEIGHT = ACTUAL LENGTH X WEIGHT PER LINER FOOT X NUMBER REQUIRED.

MAXIMUM REINFORCING LENGTHS:
#4 and #5 bars shall be limited to a maximum length of 40'-0".
#6 through #11 bars shall be limited to a maximum length of 60'-0".

STIRRUP HOOK DIMENSIONS GRADES 40-50-60 KSI				
BAR SIZE	D (IN.)	90° HOOK HOOK A or G	90° HOOK HOOK A or G	135° HOOK APPROX. H
#3	1-1/2"	4"	4"	2-1/2"
#4	2"	4-1/2"	4-1/2"	3"
#5	2-1/2"	6"	5-1/2"	3-3/4"
#6	4-1/2"	12"	7"	4-1/2"

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

THIS DRAWING IS NOT TO SCALE. FOLLOW DIMENSIONS

REVISION	BY	DATE

MARK:
Engineer: RM
Technician: KG
Checked By: BB
Date: 08/29/14
Scale: 1"=
Field Bk:
Pg:

Project No: 1140351

Sheet 13 of 22

DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

BILL OF REINFORCING STEEL

DAVIESS COUNTY, MO

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, L.L.C.
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802 FRANCIS STREET
ST. JOSEPH, MO 64501
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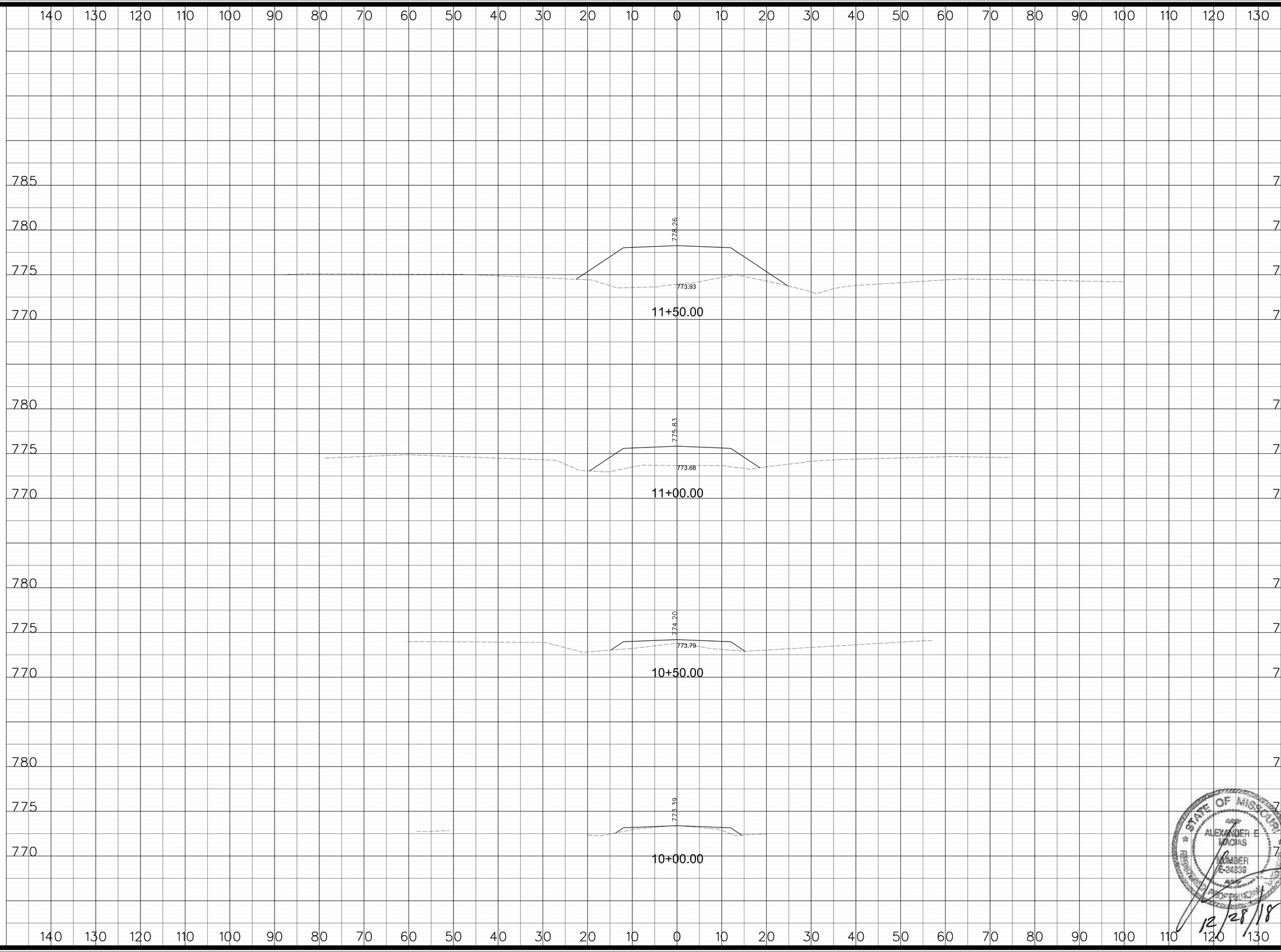
Project No: 1140351

Sheet 13 of 22



MARK	REVISION	BY	DATE
Engineer:	RM	Checked By:	BB
Technician:	KG	Date:	08/29/14

Scale: 1"=
Field Bk: Pg:

Project No: 1140351

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DAVIESS COUNTY BRIDGE 35900061 BRO-B031(34)

DAVIESS COUNTY, MO

CROSS SECTIONS

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STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24539
PROFESSIONAL ENGINEER
12/28/18

Project No: 1140351

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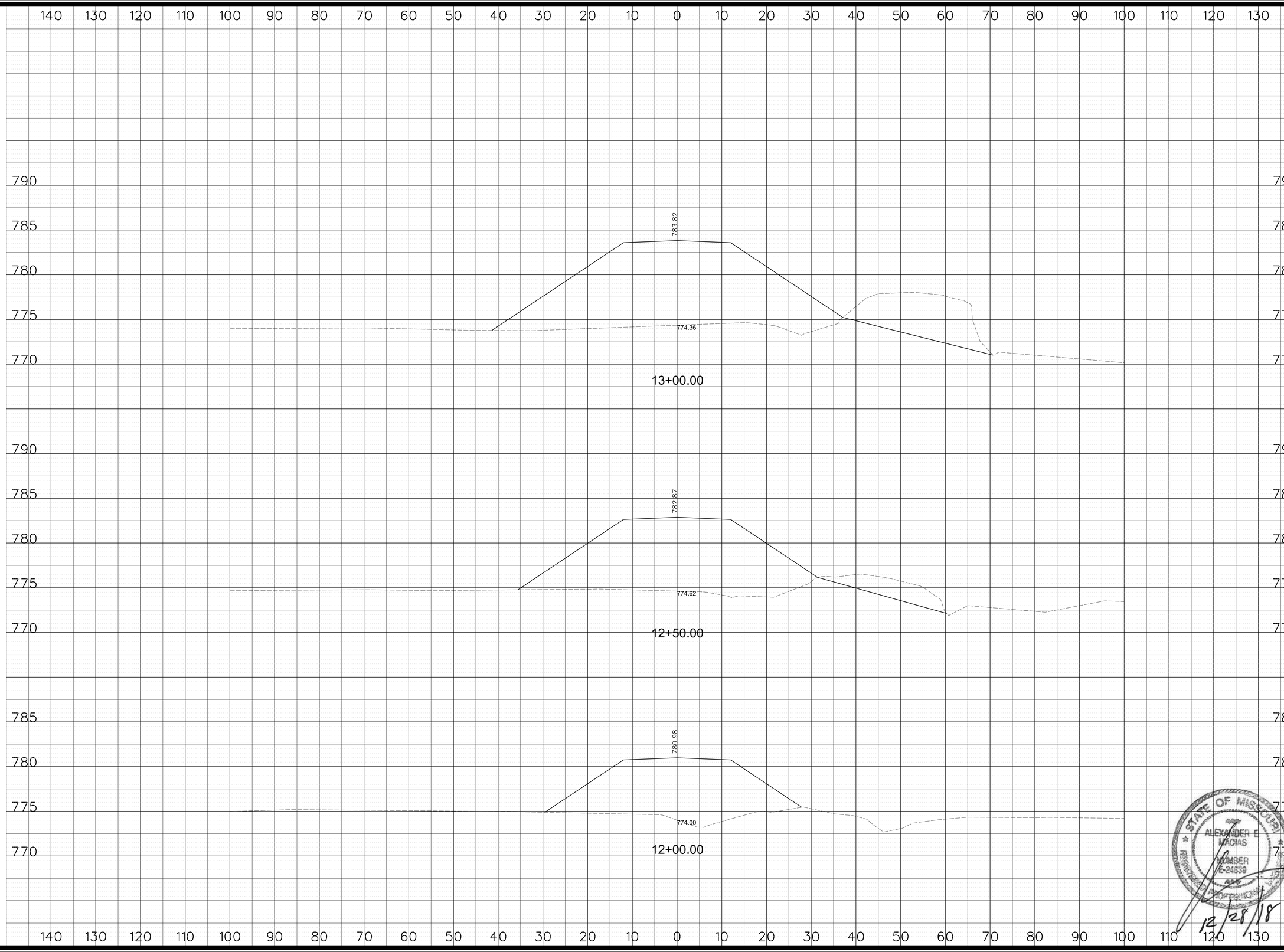

STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24539
PROFESSIONAL ENGINEER
12/28/18

MARK	REVISION	BY	DATE
Engineer:	RM	Checked By:	BB
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DAVIESS COUNTY BRIDGE 359000061 BRO-B031(34)

DAVIESS COUNTY, MO

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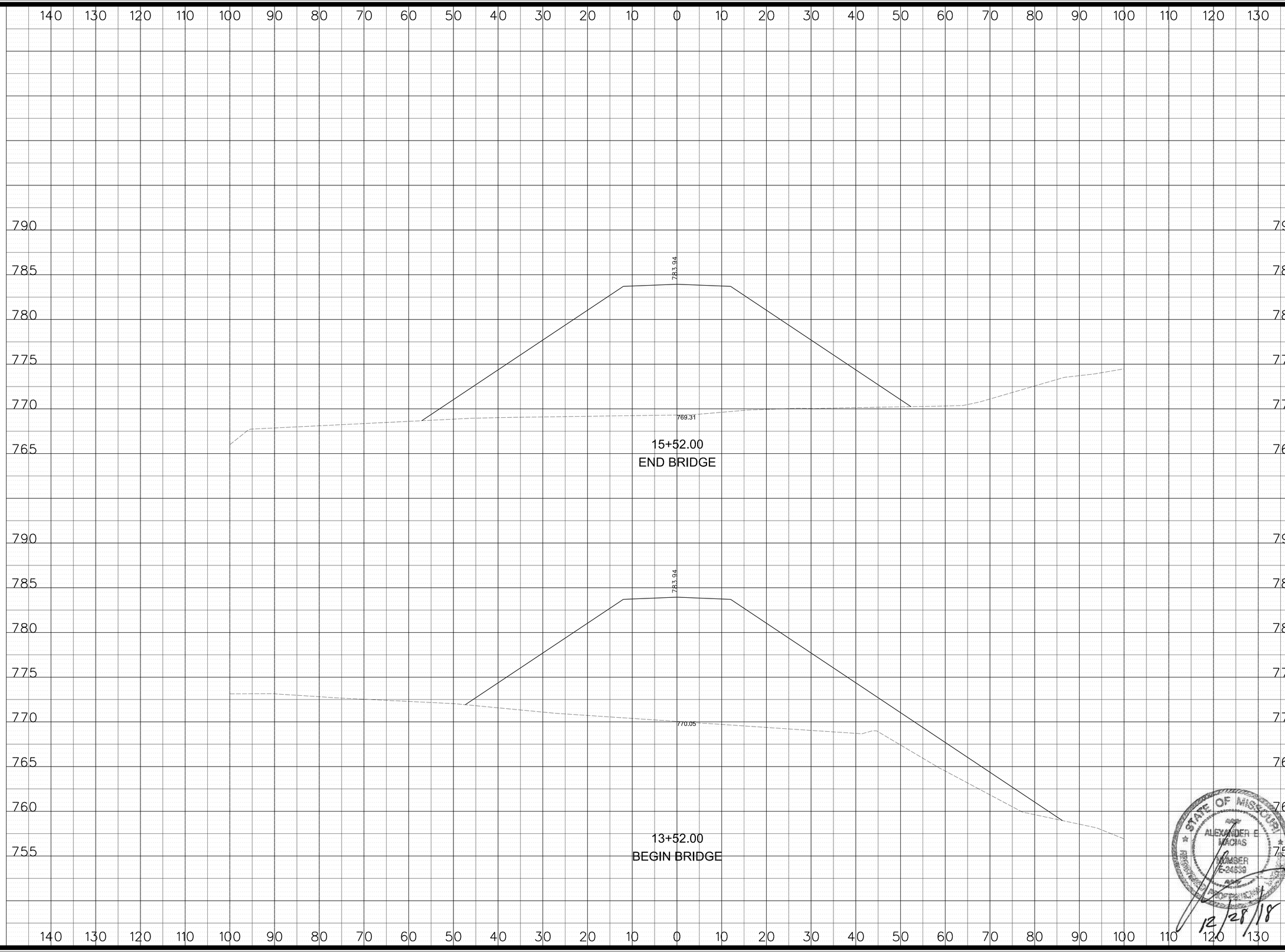
Sheet **15** of **22**



MARK	REVISION	BY	DATE

Engineer: RM
Technician: KG
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Scale: 1"=
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DAVIESS COUNTY BRIDGE 359000061 BRO-B031(34)

DAVIESS COUNTY, MO

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STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24539
REGISTERED PROFESSIONAL ENGINEER
12/28/18

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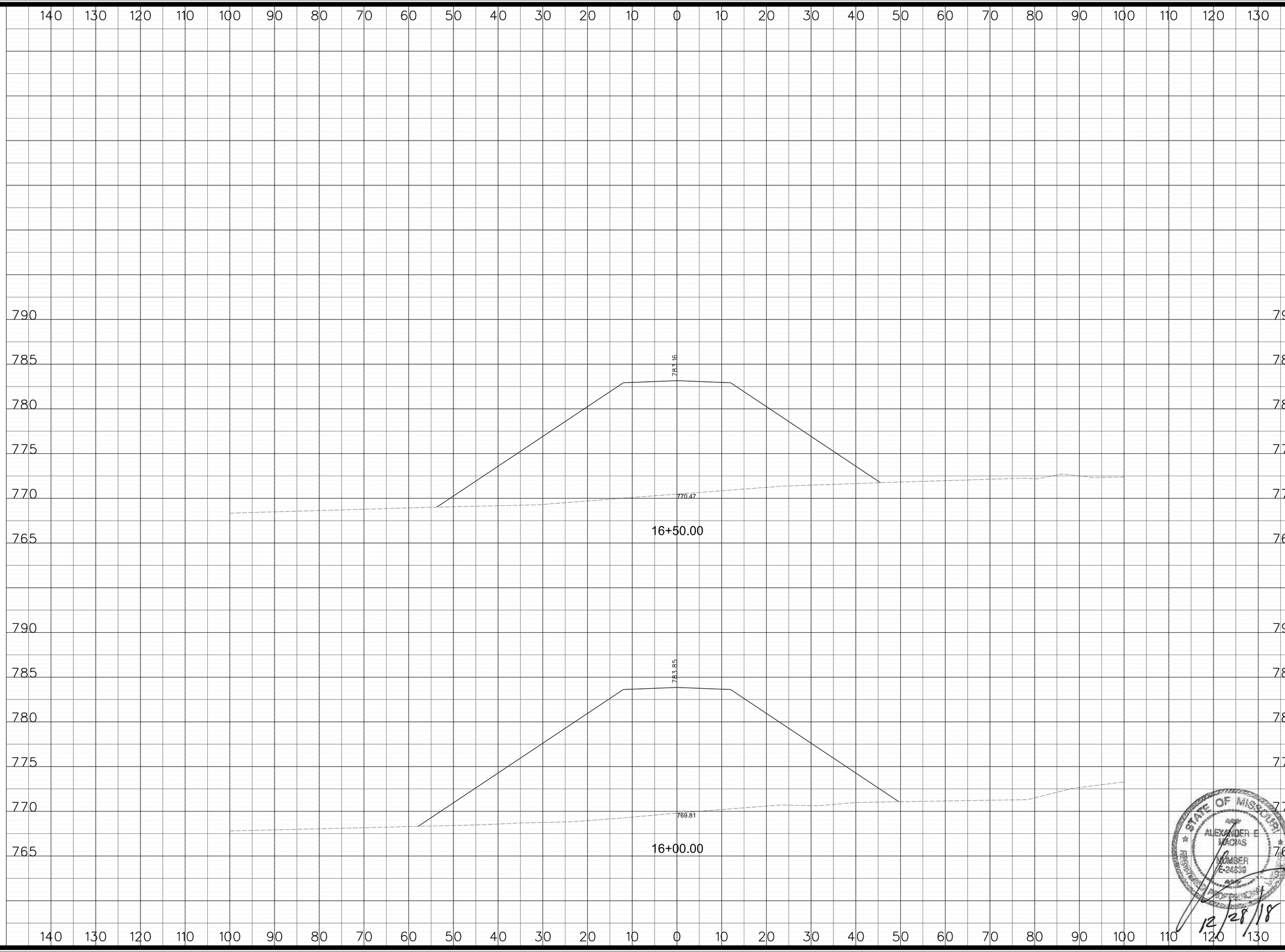

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Technician: KG | Date: 08/29/14 | Field Bk: | Pg:

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DAVIESS COUNTY BRIDGE 3590061 BRO-B031(34)

DAVIESS COUNTY, MO

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STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24839
PROFESSIONAL ENGINEER
12/28/18

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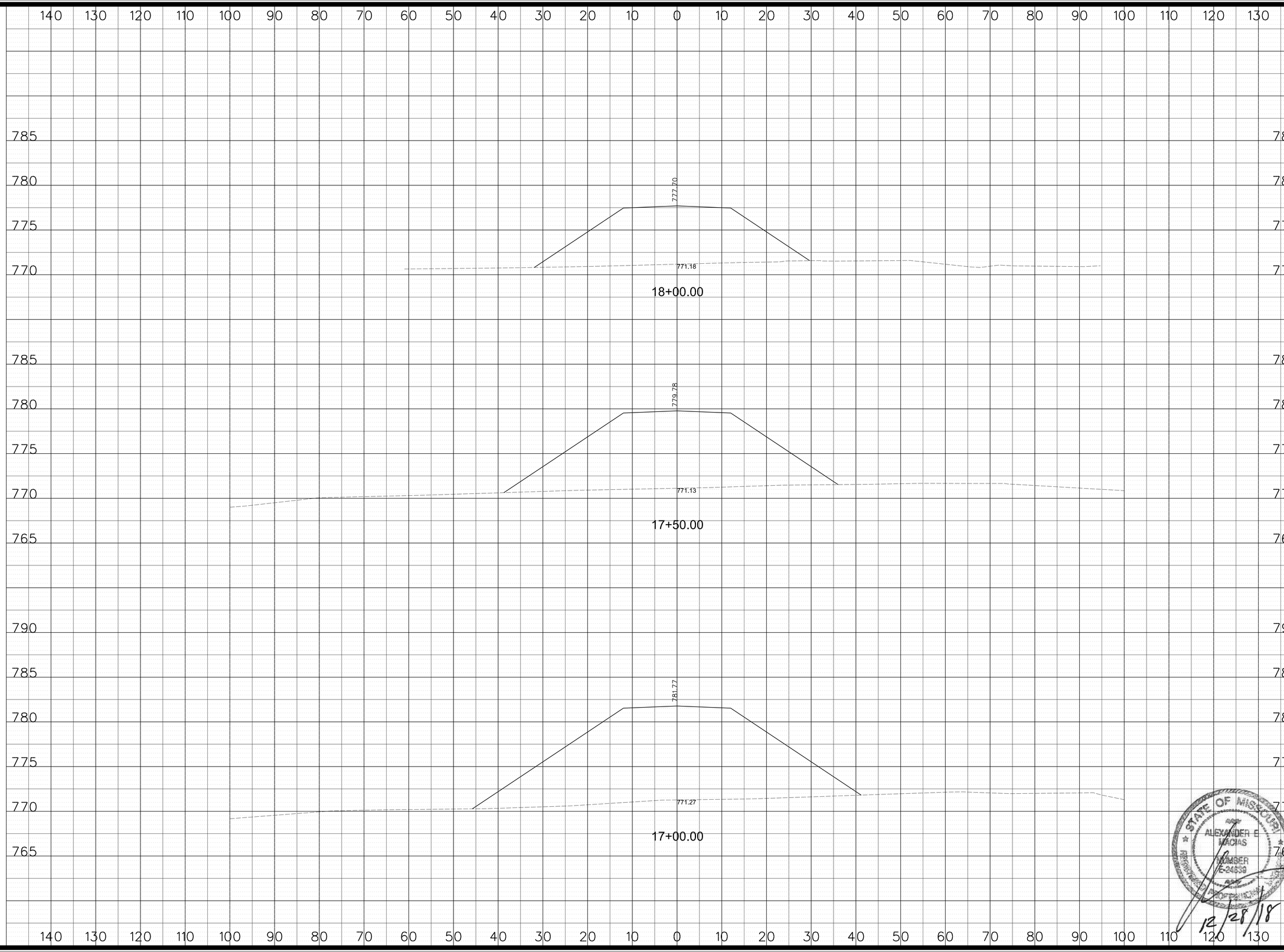

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DAVIESS COUNTY BRIDGE 359000061 BRO-B031(34)

DAVIESS COUNTY, MO

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STATE OF MISSOURI
ALEXANDER E. MACIAS
NUMBER E-24839
PROFESSIONAL ENGINEER
12/28/18

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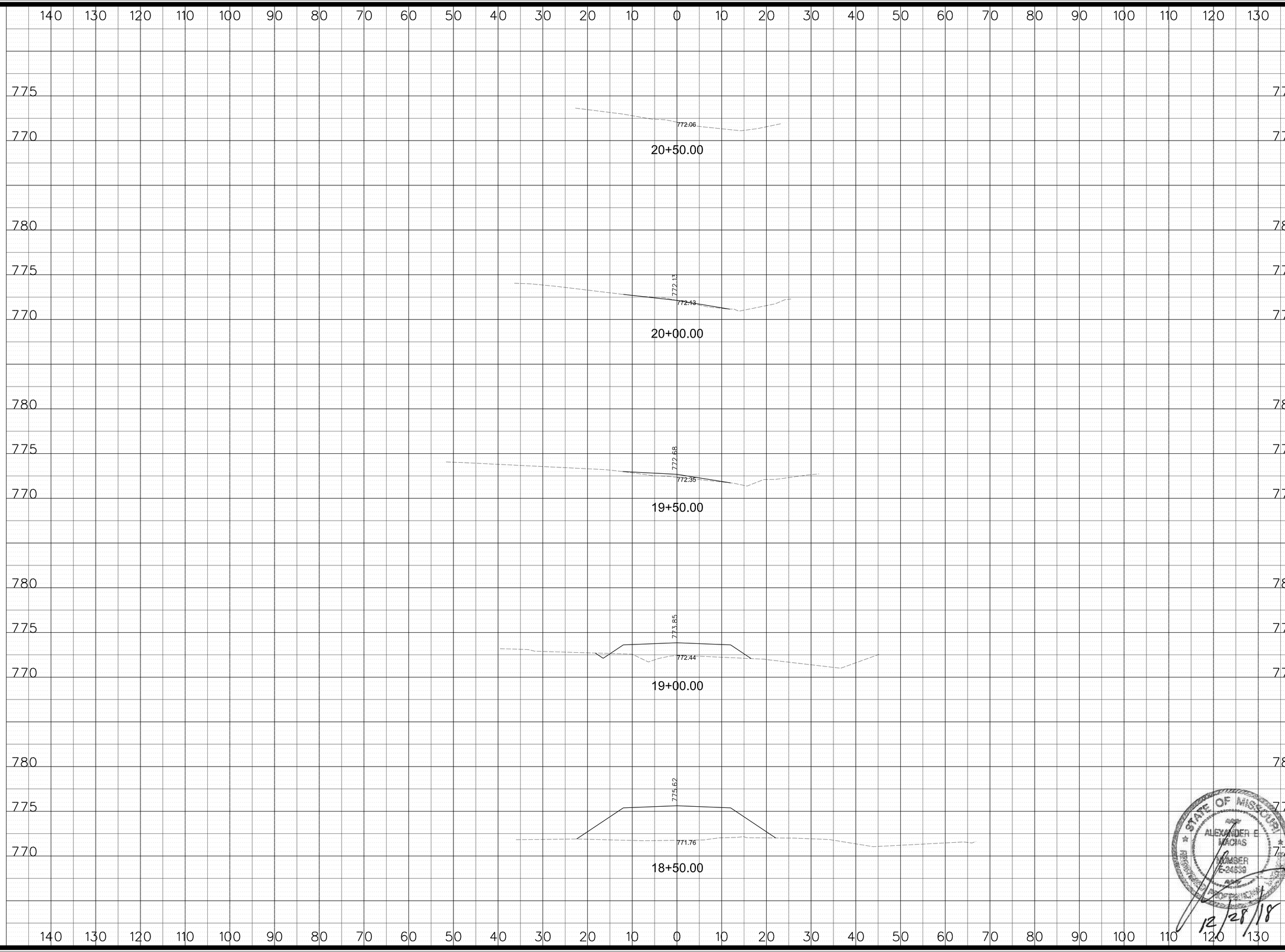

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DAVIESS COUNTY BRIDGE 359000061 BRO-B031(34)

DAVIESS COUNTY, MO

CROSS SECTIONS

I

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STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER 2-24039
PROFESSIONAL ENGINEER
12/28/18

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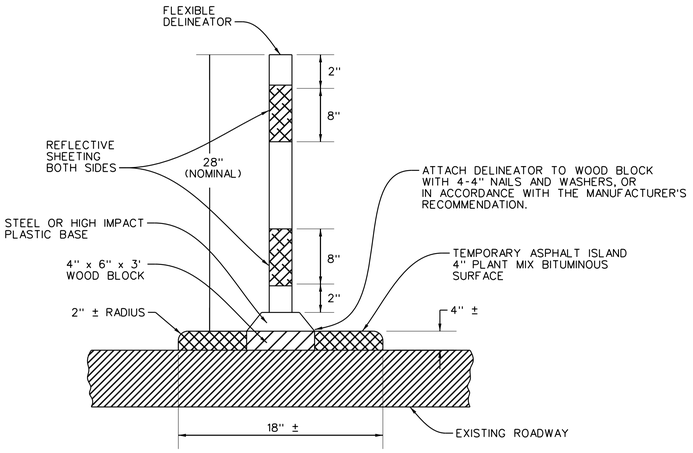
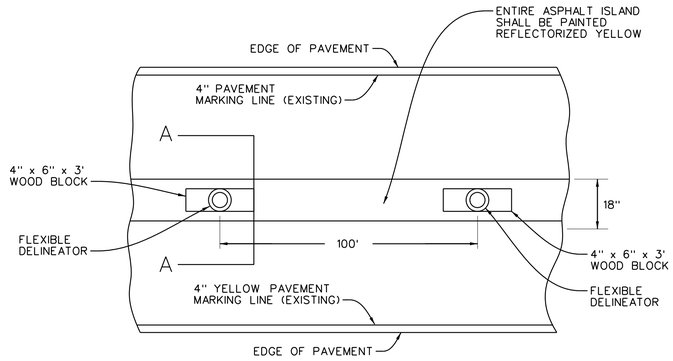


THE DELINEATOR SHALL BE MADE OF A FLEXIBLE MATERIAL OR HAVE A FLEXIBLE JOINT AT THE BASE SUCH THAT IT WILL NOT CAUSE DAMAGE TO VEHICLES UPON IMPACT AND WILL RETURN TO ITS ORIGINAL SHAPE AFTER BEING STRUCK BY A 5000 LB. VEHICLE AT A VELOCITY OF 75 FT/SEC.

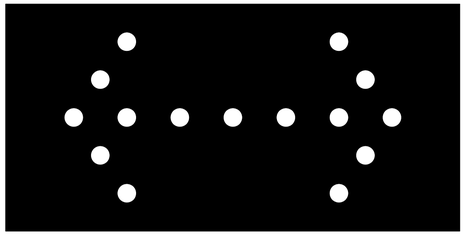
THE TUBULAR DEVICE SHALL BE ORANGE WITH TWO YELLOW REFLECTIVE BANDS.

REFLECTORIZED MATERIALS SHALL HAVE A SMOOTH SEALED OUTER SURFACE WHICH WILL DISPLAY THE SAME APPROXIMATE COLOR DAY AND NIGHT.

SECTION A-A



TEMPORARY ASPHALT ISLAND



REQUIREMENTS:

MINIMUM PANEL SIZE 4 FEET HIGH, 8 FEET WIDE.

MINIMUM 15 SEALED BEAM LAMPS, 12,000 CANDLEPOWER EACH.

NOMINAL 5-INCH, 360 33/64 TUNNEL VISOR ON EACH LAMP.

A LAMP ON THE BACK SIDE OF THE PANEL SHALL BE CONTINUOUSLY ENERGIZED WHEN ARROW PANEL IS OPERATING.

MINIMUM LAMP "ON TIME" SHALL BE FIFTY PERCENT. THE FLASHING RATE OF THE LAMPS SHALL NOT BE LESS THAN 25 NOR GREATER THAN 40 FLASHES PER MINUTE.

MANUAL OR AUTOMATIC CONTROL CIRCUITRY SHALL PROVIDE A MINIMUM 50 PERCENT VOLTAGE REDUCTION TO ALL LAMPS DURING NIGHT OPERATION. THE FRONT SURFACE OF THE PANEL SHALL BE NONREFLECTIVE FLAT BLACK.

THE PANEL MAY BE TRAILER OR TRUCK MOUNTED.

PANEL MOUNTING HEIGHT SHALL BE 7 TO 9 FEET FROM THE ROADWAY SURFACE TO THE LOWEST POINT ON THE PANEL. THE BOTTOM EDGE OF THE PANEL SHALL BE RELATIVELY LEVEL WHEN IN USE.

NO DIRECT PAYMENT WILL BE MADE FOR RELOCATING ARROW PANEL.

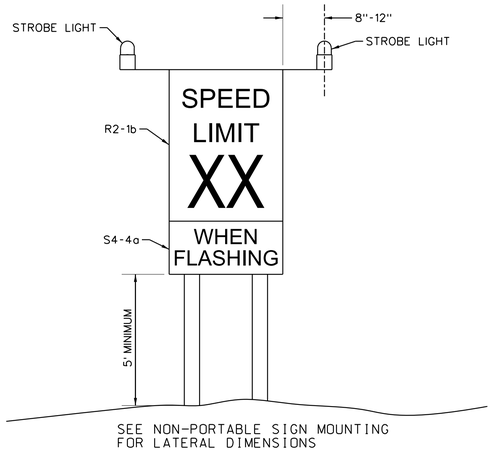
CONTROL PROGRAM:

CAUTION:
FLASH 4 LAMPS SIMULTANEOUSLY CONSISTING OF THE 2 HIGHEST AND THE 2 LOWEST LAMPS ON THE PANEL.

LEFT OR RIGHT ARROW:
FLASH 5 LAMPS IN THE ARROWHEAD AND 5 LAMPS IN THE HORIZONTAL SHANK SIMULTANEOUSLY.

DOUBLE ARROW:
FLASH 5 LAMPS IN LEFT AND RIGHT ARROWHEADS AND 3 LAMPS IN HORIZONTAL SHANK SIMULTANEOUSLY.

FLASHING ARROW PANEL



SEE NON-PORTABLE SIGN MOUNTING FOR LATERAL DIMENSIONS

THE SPEED LIMIT ASSEMBLY MAY BE POST OR SKID MOUNTED.

THE SPEED LIMIT ASSEMBLY SHALL ONLY BE USED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE STROBE LIGHTS SHALL ONLY BE ACTIVATED WHEN THE WORK OR HAZARD IS WITHIN 10' OF THE EDGE OF PAVEMENT.

SPEED LIMIT ASSEMBLY

RADIUS (FT)	SPEED (MPH)	SUPERELEVATION RATE (FT/FT)
100	20	.02
150	25	.04
230	30	.06
310	35	.08
430	40	.08
550	45	.08
690	50	.08
1145	55	.08

THE ABOVE CONTROLS ARE TO BE USED AS A GUIDE AND SHOULD BE ADJUSTED AS NECESSARY TO FIT CONDITIONS. ADVISORY SPEED PLAQUE NUMERICAL DESIGNATION SHALL BE DETERMINED OR VERIFIED BY THE ENGINEER PRIOR TO IMPLEMENTATION.

W013-1a

ADVISORY SPEED PLAQUE

GENERAL NOTES:

SPEED LIMITS SHALL BE POSTED ONLY IN THE ACTIVE WORK AREA OR WHEN A HAZARD IS PRESENT.

SPEED CONTROL SIGNS, WITH THE EXCEPTION OF THE SPEED LIMIT ASSEMBLY, SHALL BE REMOVED OR COVERED WHEN WORK IS INACTIVE OR HAZARD IS NOT PRESENT.

WHEN LOCAL ORDINANCE PROVIDES FOR LOWER SPEEDS, THE LOWER SPEED WILL BE USED.

SPEED LIMIT SIGNS AT THE EXIT END OF CONSTRUCTION AREAS SHALL INDICATE NORMAL SPEED LIMITS.

STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24639
PROFESSIONAL ENGINEER
12/28/18

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DAVIESS COUNTY BRIDGE 35900061 BRO-B031(34)

DAVIESS COUNTY, MO

TRAFFIC CONTROL - SHEET 1

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	TYPE A LOW INTENSITY	TYPE B HIGH INTENSITY	TYPE C STEADY BURN
LENS DIRECTIONAL FACES	1 OR 2	1	1 OR 2
FLASHING RATE PER MINUTE	55 TO 75	55 TO 75	CONSTANT
FLASHING DURATION(1)	10%	8%	CONSTANT
MIN EFFECTIVE INTENSITY(2)	4 CANDELAS	35 CANDELAS	---
MIN BEAM CANDLE POWER(2)	---	---	2 CANDELAS
HOURS OF OPERATION	DUSK TO DAWN	24 HRS/DAY	DUSK TO DAWN

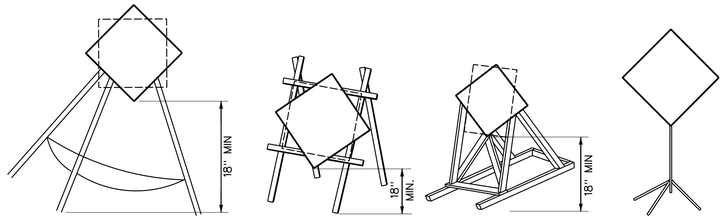
(1) LENGTH OF TIME THAT INSTANTANEOUS INTENSITY IS EQUAL TO OR GREATER THAN EFFECTIVE INTENSITY.

(2) THESE VALUES MUST BE MAINTAINED WITHIN A SOLID ANGLE 9° ON EACH SIDE OF THE VERTICAL AXIS, AND 5° ABOVE AND 5° BELOW THE HORIZONTAL AXIS.

MINIMUM MOUNTING HEIGHT IS 36 INCHES TO BOTTOM OF LENS.

(BATTERY POWERED)

PORTABLE WARNING LIGHTS



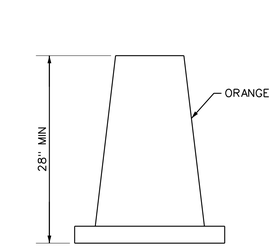
NO DIRECT PAYMENT WILL BE MADE FOR RELOCATION OF PORTABLE MOUNTED SIGNS. LONGITUDINAL SPACINGS OF SIGNS SHOWN IN THE PLANS ARE MINIMUM AND MAY BE ADJUSTED TO MEET EXISTING CONDITIONS.

SIGNS FOR OVERNIGHT OPERATION SHALL BE POST, OR BARRICADE MOUNTED.

SIGNS SHALL NOT BE MOUNTED IN CHANNELIZERS.

REGULATORY SIGNS SHALL HAVE A MINIMUM OF FIVE FEET AND A MAXIMUM OF SEVEN FEET MOUNTING HEIGHT TO BOTTOM OF SIGNS.

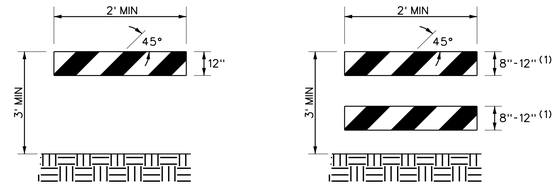
PORTABLE SIGN MOUNTING



NO DIRECT PAYMENT WILL BE MADE FOR CONES OR RELOCATING CONES WHEN SHOWN ON THE PLANS. FOR USE DURING DAYLIGHT HOURS ONLY.

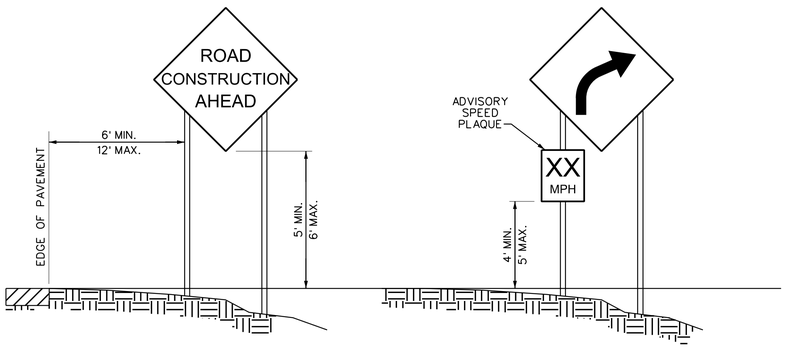
CONE

6 INCH REFLECTIVE ORANGE AND REFLECTIVE WHITE STRIPES ON BOTH SIDES.

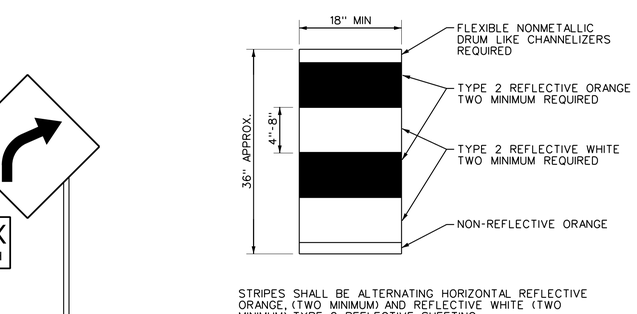


(1) 8 INCH MINIMUM - 12 INCH MAXIMUM. FOR WOODEN BARRICADES NOMINAL LUMBER DIMENSIONS WILL BE SATISFACTORY.

TYPE I TYPE II



RURAL

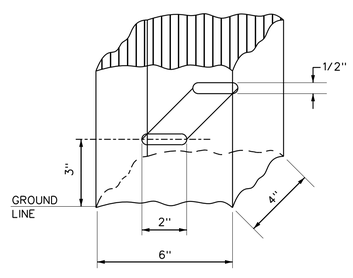


STRIPES SHALL BE ALTERNATING HORIZONTAL REFLECTIVE ORANGE, (TWO MINIMUM) AND REFLECTIVE WHITE (TWO MINIMUM) TYPE 2 REFLECTIVE SHEETING.

THE CONTRACTOR HAS THE OPTION TO USE FLEXIBLE OR REBOUNDABLE REFLECTIVE SHEETING WITH THE SAME MINIMUM REQUIREMENTS AS TYPE 2 REFLECTIVE SHEETING. NON-REFLECTORIZED ORANGE SPACES BETWEEN STRIPES SHALL BE NO GREATER THAN TWO INCHES.

NO DIRECT PAYMENT WILL BE MADE FOR RELOCATION OF CHANNELIZERS.

CHANNELIZER

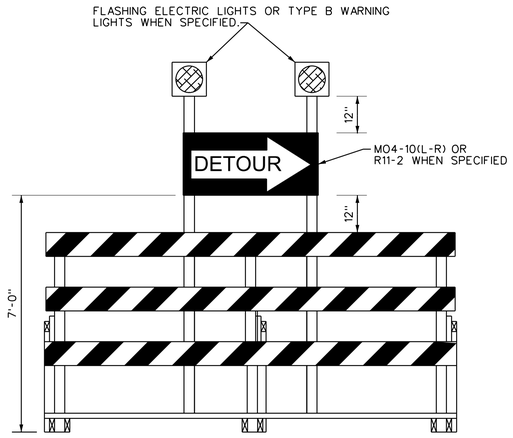


SLOT ACROSS NEUTRAL AXIS FORMED BY SUCCESSIVE DRILLING WITH 1/2 INCH BIT.

MOUNT SIGN ON 4 INCH DIMENSION.

SLOT NOT REQUIRED WITH 4 INCH X 4 INCH POST.

SLOT DETAIL



TYPE III

SEE BARRICADES DRAWING FOR SIZE OF LUMBER AND DIMENSIONS.

SEVEN FOOT SIGN HEIGHT WHEN CHANNELIZERS ARE LOCATED IN FRONT OF BARRICADE.

SIGNS MOUNTED ON RAILS OF BARRICADES WHEN CHANNELIZERS ARE NOT USED.

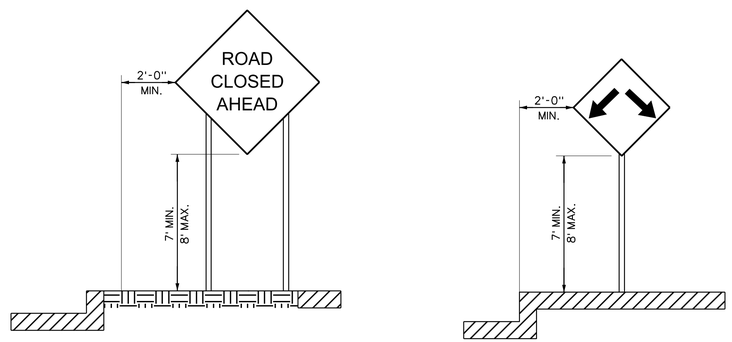
MOVABLE BARRICADES

ALL REFLECTORIZED SURFACES SHALL BE TYPE 1 SHEETING.

NO DIRECT PAYMENT WILL BE MADE FOR RELOCATION OF BARRICADES.

NO PAYMENT WILL BE MADE FOR RELOCATING SIGNS ON MOVABLE BARRICADES WHICH ARE TO BE RELOCATED, UNLESS THE SIGN LEGEND IS TO BE CHANGED. STRIPES SHALL SLOPE DOWNWARD TOWARD THE SIDE WHICH TRAFFIC IS TO PASS.

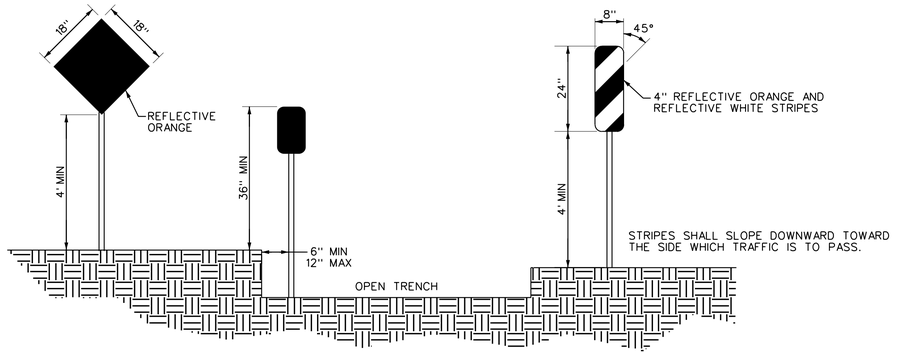
BARRICADES



URBAN

PAYMENT FOR RELOCATION OF NON-PORTABLE MOUNTED SIGNS WILL BE MADE BY THE SQUARE FEET OF SIGN. TWO POSTS SHALL BE USED WHEN THE SIGN IS GREATER THAN TEN SQUARE FEET IN AREA, BOTH RURAL AND URBAN. SUPPORT POSTS SHALL NOT EXTEND ABOVE THE SIGN UNLESS DISTANCE PLAQUE OR WARNING LIGHT IS SPECIFIED. LIGHT WEIGHT STEEL POSTS PERMITTED.

NON-PORTABLE SIGN MOUNTING HEIGHT AND LATERAL LOCATIONS



TYPE I TYPE II TYPE III

NO DIRECT PAYMENT WILL BE MADE FOR RELOCATION OF OBJECT MARKERS. ALL REFLECTORIZED SURFACES SHALL BE TYPE 1 SHEETING.

OBJECT MARKERS

STATE OF MISSOURI
ALEXANDER E MACIAS
NUMBER E-24839
PROFESSIONAL ENGINEER
12/28/18

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DAVIESS COUNTY, MO

DAVIESS COUNTY BRIDGE 35900061 BRO-B031(34)

TRAFFIC CONTROL - SHEET 2

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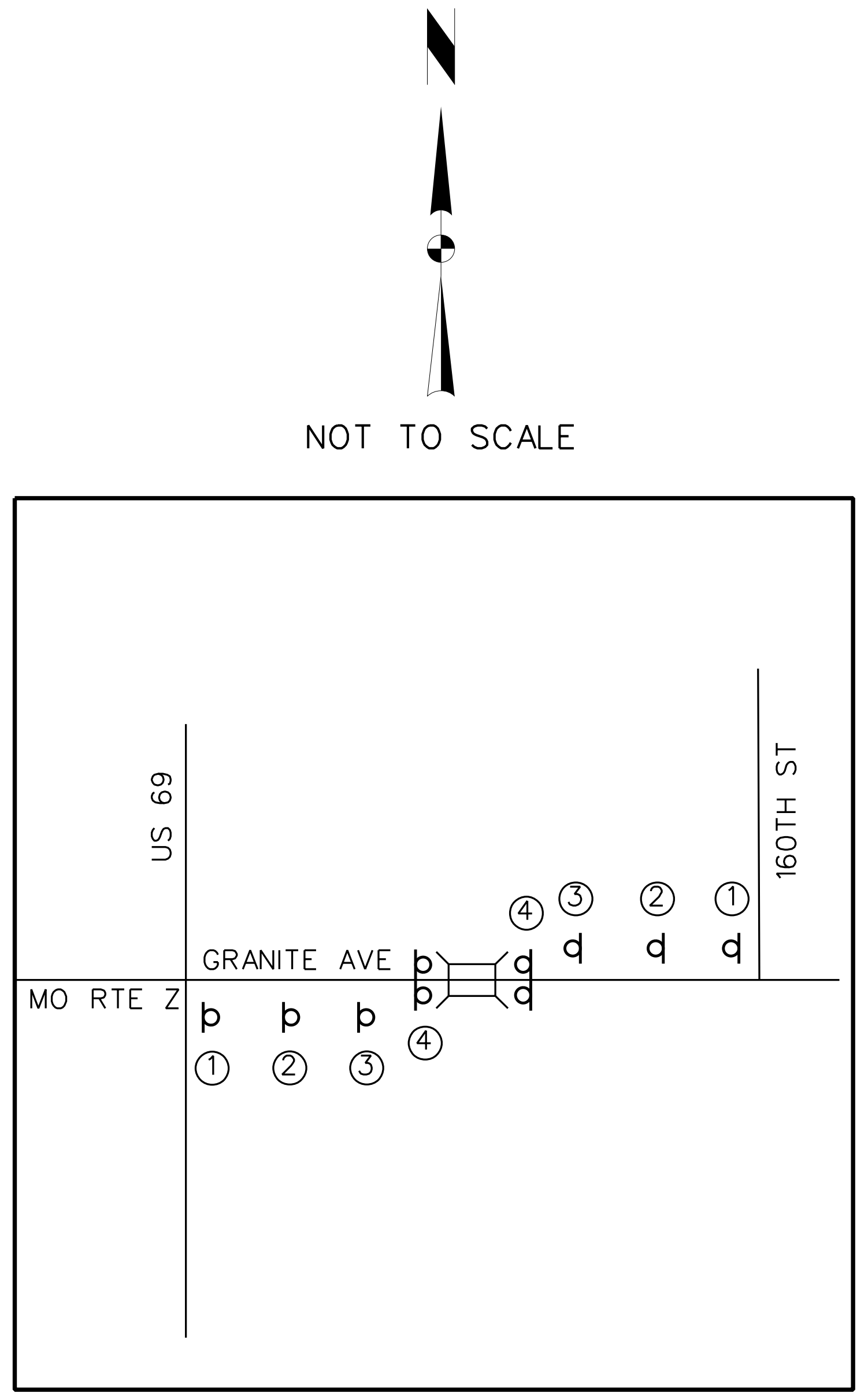
SIGN	SIZE (INS)	AREA SQ FT	LETTER SIZE			COLOR		DESCRIPTION
			LINE 1 (INS)	LINE 2 (INS)	LINE 3 (INS)	SYM LEG BRD	BACK GROUND	
WARNING SIGNS								
W01-1Lb	48X48	16.0	---	---	---	BLACK	ORANGE	TURN (SYMBOL LEFT ARROW)
W01-1Rb	48X48	16.0	---	---	---	BLACK	ORANGE	TURN (SYMBOL RIGHT ARROW)
W01-2Lb	48X48	16.0	---	---	---	BLACK	ORANGE	CURVE (SYMBOL LEFT ARROW)
W01-2Rb	48X48	16.0	---	---	---	BLACK	ORANGE	CURVE (SYMBOL RIGHT ARROW)
W01-3Lb	48X48	16.0	---	---	---	BLACK	ORANGE	REVERSE TURN (SYMBOL LEFT ARROW)
W01-3Rb	48X48	16.0	---	---	---	BLACK	ORANGE	REVERSE TURN (SYMBOL RIGHT ARROW)
W01-4Lb	48X48	16.0	---	---	---	BLACK	ORANGE	REVERSE CURVE (SYMBOL LEFT ARROW)
W01-4Rb	48X48	16.0	---	---	---	BLACK	ORANGE	REVERSE CURVE (SYMBOL RIGHT ARROW)
W01-4Lb2	48X48	16.0	---	---	---	BLACK	ORANGE	DOUBLE ARROW REVERSE CURVE (SYMBOL LEFT ARROWS)
W01-4Rb2	48X48	16.0	---	---	---	BLACK	ORANGE	DOUBLE ARROW REVERSE CURVE (SYMBOL RIGHT ARROWS)
W01-6	48X24	8.0	---	---	---	BLACK	ORANGE	HORIZONTAL ARROW (SYMBOL)
W01-6a	72X36	18.0	---	---	---	BLACK	ORANGE	HORIZONTAL ARROW (SYMBOL)
W01-7	48X24	8.0	---	---	---	BLACK	ORANGE	DOUBLE HEAD HORIZONTAL ARROW (SYMBOL)
W01-7a	72X36	18.0	---	---	---	BLACK	ORANGE	DOUBLE HEAD HORIZONTAL ARROW (SYMBOL)
W01-8	18X24	3.0	---	---	---	BLACK	ORANGE	CHEVRON (SYMBOL)
W03-1b	48X48	16.0	10D	10C	---	BLACK	ORANGE	STOP AHEAD
W03-2b	48X48	16.0	10C	10C	---	BLACK	ORANGE	YIELD AHEAD
W03-3b	48X48	16.0	RED	YELLOW	GREEN	BLACK	ORANGE	SIGNAL AHEAD (SYMBOL)
W03-4b	48X48	16.0	8C	8C	8C	BLACK	ORANGE	BE PREPARED TO STOP
W04-1Lb	48X48	16.0	---	---	---	BLACK	ORANGE	MERGE (SYMBOL FROM LEFT)
W04-1Rb	48X48	16.0	---	---	---	BLACK	ORANGE	MERGE (SYMBOL FROM RIGHT)
W05-1a	48X48	16.0	8D	8D	---	BLACK	ORANGE	ROAD NARROWS
W05-3a	48X48	16.0	8C	8C	---	BLACK	ORANGE	ONE LANE BRIDGE
W06-1b	48X48	16.0	7D	7D	---	BLACK	ORANGE	DIVIDED HIGHWAY
W06-2b	48X48	16.0	7D	7D	7D	BLACK	ORANGE	DIVIDED HIGHWAY ENDS
W06-3b	48X48	16.0	---	---	---	BLACK	ORANGE	TWO WAY TRAFFIC (SYMBOL)
W06-3x	24X18	3.0	4C	4C	---	BLACK	ORANGE	TWO WAY TRAFFIC (PLAQUE)
W08-1b	48X48	16.0	12D	---	---	BLACK	ORANGE	BUMP
W08-2b	48X48	16.0	12E	---	---	BLACK	ORANGE	DIP
W08-3	48X48	16.0	8C	8C	---	BLACK	ORANGE	PAVEMENT ENDS
W08-4b	48X48	16.0	8C	8C	---	BLACK	ORANGE	SOFT SHOULDER
W08-5b	48X48	16.0	---	---	---	BLACK	ORANGE	SLIPPERY WHEN WET (SYMBOL)
W08-6b	48X48	16.0	8C	8C	---	BLACK	ORANGE	TRUCK CROSSING
W08-6c	48X48	16.0	8C	8C	---	BLACK	ORANGE	TRUCK ENTRANCE (Includes 1000FT/1500FT plate W025-1a)
W08-7a	36X36	9.0	6D	6D	---	BLACK	ORANGE	LOOSE GRAVEL
W08-9	48X48	16.0	8C	8C	---	BLACK	ORANGE	LOW SHOULDER
W08-9La	48X48	16.0	---	---	---	BLACK	ORANGE	UNEVEN PAVEMENT (SYMBOL FOR LEFT DROP-OFF)
W08-9Ra	48X48	16.0	---	---	---	BLACK	ORANGE	UNEVEN PAVEMENT (SYMBOL FOR RIGHT DROP-OFF)
W09-1R	48X48	16.0	8D	8D	8D	BLACK	ORANGE	RIGHT LANE ENDS (Includes LEFT/CENTER plate W025-3c)
W09-2Ra	48X48	16.0	6C	8D	8D	BLACK	ORANGE	LANE ENDS MERGE RIGHT (Includes LEFT plate W025-3b)
W10-1a	42 Dia	9.6	9E	---	---	BLACK	ORANGE	RAILROAD CROSSING
W012-1	24X24	4.0	---	---	---	BLACK	ORANGE	DOUBLE DOWN ARROW (SYMBOL)
W012-2a	48X48	16.0	16C,D	---	---	BLACK	ORANGE	LOW CLEARANCE (SYMBOL)
W012-2x	24X18	3.0	5D	3C	---	BLACK	ORANGE	LOW CLEARANCE (PLAQUE)
W012-3a,b	144X24	24.0	16,12D	---	---	BLACK	ORANGE	OVERHEAD LOW CLEARANCE (FEET AND INCHES)
W013-1a	24X24	4.0	12C	4D	---	BLACK	ORANGE	ADVISORY SPEED (PLAQUE)
W020-1	48X48	16.0	7C	7C	7C	BLACK	ORANGE	ROAD CONSTRUCTION AHEAD (Incl RAMP/BRIDGE plate W025-6)
W020-2	48X48	16.0	8D	8D	---	BLACK	ORANGE	DETOUR AHEAD (Includes 500FT/1000FT plate W025-1b)
W020-3	48X48	16.0	7D	7D	7D	BLACK	ORANGE	ROAD CLOSED AHEAD (Includes 500FT/1000FT plate W025-1c)
W020-4a	48X48	16.0	7C	7C	7C	BLACK	ORANGE	ONE LANE ROAD AHEAD (Incl 1000FT/1500FT plate W025-1a)
W020-5	48X48	16.0	7C	7C	7C	BLACK	ORANGE	RIGHT LANE CLOSED AHEAD (Incl LEFT/CENTER plate W025-3d)
W020-6a	48X48	16.0	7D	7D	7D	BLACK	ORANGE	RIGHT LANE CLOSED (Incl LEFT/CENTER plate W025-3c)
W020-7b	48X48	16.0	---	---	---	BLACK	ORANGE	FLAGGER (SYMBOL)
W020-7x	24X18	3.0	6C	6C	---	BLACK	ORANGE	500FT/1000FT (PLAQUE)
W020-9c	48X48	16.0	8D	8D	---	BLACK	ORANGE	OPEN TRENCH
W021-2b	48X48	16.0	8D	8D	---	BLACK	ORANGE	FRESH OIL
W021-5b	48X48	16.0	7C	7C	7C	BLACK	ORANGE	SHOULDER WORK AHEAD
W021-7	36X36	9.0	6D	6D	---	BLACK	ORANGE	SAND BLASTING
W022-1	48X48	16.0	7C	7C	7C	BLACK	ORANGE	BLASTING ZONE 1000FT
W022-2	42X36	10.5	7C	7C	7C	BLACK	ORANGE	TURN OFF 2-WAY RADIO
W022-3	42X36	10.5	7C	7C	7C	BLACK	ORANGE	END BLASTING ZONE
W022-5	30X30	6.3	3-1/2C	3-1/2C	3-1/2C	BLACK	ORANGE	NO PASSING ZONES UNMARKED
W025-1a	26X9	---	6C	---	---	BLACK	ORANGE	1000FT/1500FT Plate
W025-1b	38X9	---	8D	---	---	BLACK	ORANGE	500FT/1000FT Plate
W025-1c	34X9	---	7D	---	---	BLACK	ORANGE	500FT/1000FT Plate
W025-3b	30X9	---	8D	---	---	BLACK	ORANGE	LEFT Plate
W025-3c	33X9	---	8D	---	---	BLACK	ORANGE	LEFT/CENTER Plate
W025-3d	22X9	---	7C	---	---	BLACK	ORANGE	LEFT/CENTER Plate
W025-5	30X12	2.5	6C	---	---	BLACK	ORANGE	½MILE / 1 MILE (PLAQUE)
W025-6	28X9	---	7C	---	---	BLACK	ORANGE	RAMP/BRIDGE Plate

SIGN	SIZE (INS)	AREA SQ FT	LETTER SIZE			COLOR		DESCRIPTION
			LINE 1 (INS)	LINE 2 (INS)	LINE 3 (INS)	SYM LEG BRD	BACK GROUND	
REGULATORY SIGNS								
R1-1b	48X48	13.25	16C	---	---	WHITE	RED	STOP
R1-2a	48X48X48	6.93	4C	---	---	RED	WHITE	YIELD
R1-3	20X9	1.25	4D	---	---	WHITE	RED	4-WAY (PLAQUE)
R1-5	20X9	1.25	4D	---	---	WHITE	RED	3-WAY (PLAQUE)
R2-1b	36X48	12.00	6E	6E	14E	BLACK	WHITE	SPEED LIMIT XX
R2-5b	36X48	12.00	8B	8C	8C	BLACK	WHITE	REDUCED SPEED AHEAD
R3-1b	36X36	9.00	10D	8D	8D	BLACK	WHITE	NO RIGHT TURN (SYMBOL)
R3-2b	36X36	9.00	10D	8D	8D	BLACK	WHITE	NO LEFT TURN (SYMBOL)
R3-3a	36X36	9.00	10D	8D	---	BLACK	WHITE	NO TURNS
R3-4b	36X36	9.00	8D	12F	8D	BLACK	WHITE	NO U-TURNS (SYMBOL)
R3-7L	30X30	6.25	4C	5C	4C	BLACK	WHITE	LEFT LANE MUST TURN LEFT
R3-7R	30X30	6.25	4C	5C	4C	BLACK	WHITE	RIGHT LANE MUST TURN RIGHT
R4-1b	36X48	12.00	8D	8D	8D	BLACK	WHITE	DO NOT PASS
R4-2b	36X48	12.00	8D	8D	8D	BLACK	WHITE	PASS WITH CARE
R4-7Lb	36X48	12.00	8D	ARROW	8D	BLACK	WHITE	KEEP LEFT (HORIZONTAL ARROW)
R4-7Rb	36X48	12.00	8D	ARROW	8D	BLACK	WHITE	KEEP RIGHT (HORIZONTAL ARROW)
R4-17La	36X36	9.00	8D	8D	---	BLACK	WHITE	KEEP LEFT
R4-17Ra	36X36	9.00	8D	8D	---	BLACK	WHITE	KEEP RIGHT
R5-1	30X30	6.25	4D	---	4D	RED	WHITE	DO NOT ENTER
R5-1a	36X24	6.00	6E	6E	---	WHITE	RED	WRONG WAY
R6-1La	48X18	6.00	5-1/2D	---	---	BLACK	WHITE	ONE WAY ARROW (LEFT)
R6-1Ra	48X18	6.00	5-1/2D	---	---	BLACK	WHITE	ONE WAY ARROW (RIGHT)
R6-2La	24X30	5.00	6D	6D	ARROW	BLACK	WHITE	ONE WAY (LEFT)
R6-2Ra	24X30	5.00	6D	6D	ARROW	BLACK	WHITE	ONE WAY (RIGHT)
R11-2	48X30	10.00	8D	8D	---	BLACK	WHITE	ROAD CLOSED
R11-3	60X30	12.50	6D	5D	4D	BLACK	WHITE	ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50	6D	5D	6D	BLACK	WHITE	ROAD CLOSED TO THRU TRAFFIC
R12-3b	36X36	9.00	6D	6B	6C	BLACK	WHITE	TO ONCOMING TRAFFIC (PLAQUE)
SA-4a	36X18	4.50	5D	5D	---	BLACK	WHITE	WHEN FLASHING
REGULATORY SIGNS								
G020-1	60X36	15.00	6C	6C	6C	BLACK	ORANGE	ROAD CONSTRUCTION NEXT XX MILES
G020-2	60X24	10.00	6C	6C	---	BLACK	ORANGE	END CONSTRUCTION
M04-8a	30X15	3.13	8B	---	---	BLACK	ORANGE	DETOUR (PLAQUE)
M04-9L	48X36	12.00	8D	ARROW	---	BLACK	ORANGE	DETOUR (LEFT ARROW)
M04-9R	48X36	12.00	8D	ARROW	---	BLACK	ORANGE	DETOUR (RIGHT ARROW)
M04-10L	48X18	6.00	6D	---	---	BLACK	ORANGE	DETOUR (ARROW LEFT)
M04-10R	48X18	6.00	6D	---	---	BLACK	ORANGE	DETOUR (ARROW RIGHT)
M04-11	24X18	3.00	5C	5C	---	BLACK	ORANGE	DETOUR ENDS
M5-1L	21X15	2.19	---	---	---	BLACK	WHITE	ADVANCE LEFT TURN ARROW
M5-1R	21X15	2.19	---	---	---	BLACK	WHITE	ADVANCE RIGHT TURN ARROW



TRAFFIC CONTROL

GENERAL NOTES:

ALL SIGNING TO BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" CURRENT EDITION AND REVISIONS.

ALL SIGNS, PLATES, AND PLAQUES SHALL BE FACED WITH TYPE 1 REFLECTIVE SHEETING IN ACCORDANCE WITH SEC. 1042, OF THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

SIGN DIMENSIONS SHOWN ARE MINIMUM. NO ADDITIONAL PAYMENT WILL BE MADE IF CONTRACTORS USE LARGER SIGNS.

NO ADDITIONAL AREA OR PAYMENT WILL BE MADE FOR PLATES WHICH ARE TO BE INCLUDED WITH CERTAIN SIGNS.

ALL PLAQUES SHALL HAVE A BLACK BORDER. PLATES DO NOT HAVE A BORDER.

① R11-4
② W020-3 (1000 FT)
③ W020-3 (500 FT)
④ R11-2 & TYPE III BARRICADE

ALEXANDER E. MACIAS
NUMBER E-24839

12/28/18

DAVIESS COUNTY BRIDGE 35900061 BRO-B031(34)

TRAFFIC CONTROL - SHEET 3

DAVIESS COUNTY, MO

MARK	REVISION	DATE	BY
Engineer: RM	Checked By: BB	Scale: 1"=	
Technician: KG	Date: 08/29/14	Field Bk:	Pg:
Project No: 1140351		Sheet 22 of 22	

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Project No: 1140351

Sheet 22 of 22

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