Missouri
Department
of Transportation

Kevin Keith, Director

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P.O. Box 270
Jefferson City, MO 65102
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ADDENDUM 001
REQUEST FOR BID
D611-156-RW Cast in Place Box Culvert

Bidders shall acknowledge receipt of Addendum 001 (ONE) by signing and including it with original quote. The due date for receipt of this bid **does not change** by this Addendum. Accordingly, the following clarifications, questions and answers are believed to be of general interest to all potential bidders. All other terms and conditions remain unchanged and in full force.

Name and Title of Signer (Print or type)	Name and Title of Department Authority Terri Mount Sr. General Services Specialist
Bidder Signature Signature of person authorized to sign	Department of Transportation *Terri Mount* Authorizing Signature
Date Signed:	Date Signed: 4/28/11

REVISED PRICING PAGE: PLEASE DISCARD THE ORIGINAL PRICING PAGE IN THE ABOVE RFB PAGE 14 AND REPLACE WITH THE ATTACHED REVISED PAGE. UPON FURTHER REVIEW IT WAS DETERMINED THE QUANTITIES WERE INCORRECT, AND THE REINFORCING STEEL SHOULD BE EPOXY COATED.

ALSO ATTACHED IS REVISED/ CORRECTED DRAWINGS.

THIS ADDENDUM MUST BE SIGNED AND SUBMITTED WITH RESPONSE.

4. PRICING PAGE D611-156-RW-REVISED

4.1 The bidder shall provide a firm, fixed price in the table below for the original contract period for providing the deliverables/services in accordance with the provisions and requirements of this RFB. All costs associated with providing the required deliverables/services shall be included in the prices stated below.

Box Culvert State Route Y, Jefferson County					
Item #	**Description**	**U/M**	**QTY**	**COST U/M**	**EXTENDED COST**
001	Mobilization	Lump Sum	1		
002	Removals	Lump Sum	1		
003	Class 4 Excavation	CuYd	80		
004	Class B-1 Concrete	CuYd	139.5		
005	Reinforcing Steel (Epoxy Coated)	LB	18,730		
006	Thrie Beam Rail	LF	60.		
007	Linear Grading	Station	0.7		
008	Type 5 Aggregate Base (4" Thick)	SqYd	180		
009	Prime Coat	Gallon	71.7		
010	Tack Coat	Gallon	24.4		
011	Bituminous Base (6" Thick)	Ton	870		
012	BP-1 (1 ¾" Thick)	Ton	1652		
013	Guardrail	LF	510		
014	Bridge Anchor Sections	Each	3		
015	Transition Section	Each	3		
016	Type A End Terminals	Each	3		
017	Type C End Terminal	Each	1		
007				**TOTAL EXTENDED COST**	

COMPANY:_____ DATE;_____

SIGNATURE:_____

PRINTED NAME/
TITLE:_____

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

SEC/SUR 11 TWP 40N RGE 3E

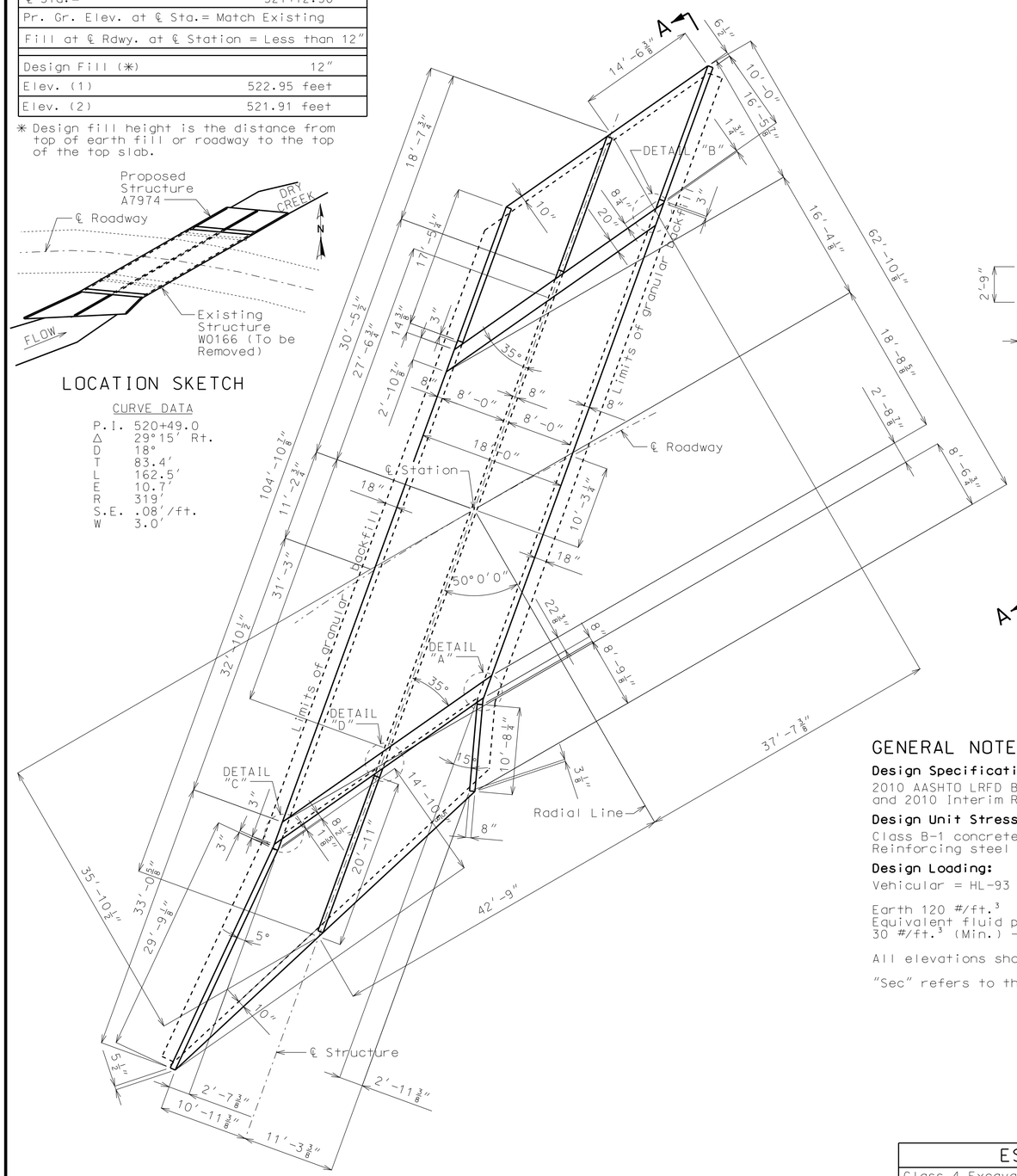
℄ Sta.=	521+12.30
Pr. Gr. Elev. at ℄ Sta.= Match Existing	
Fill at ℄ Rdwy. at ℄ Station = Less than 12"	
Design Fill (✱)	12"
Elev. (1)	522.95 feet
Elev. (2)	521.91 feet

✱ Design fill height is the distance from top of earth fill or roadway to the top of the top slab.

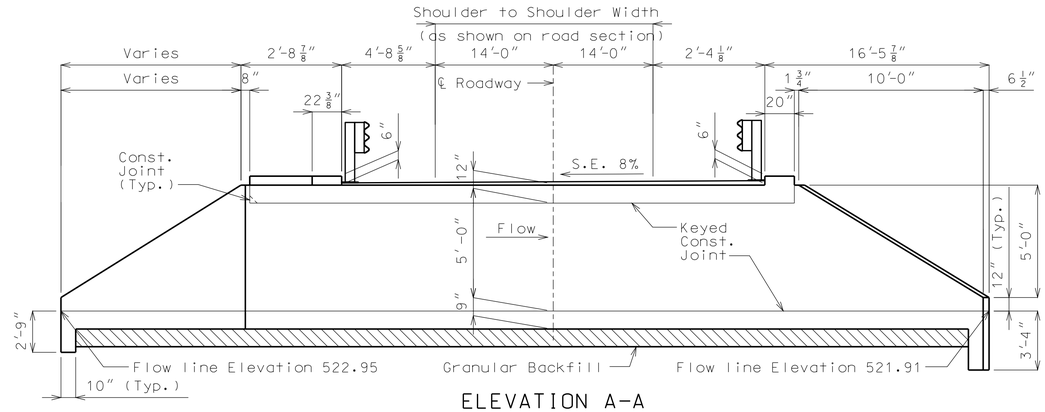
LOCATION SKETCH

CURVE DATA

P.I.	520+49.0
Δ	29°15' Rt.
D	18°
T	83.4'
L	162.5'
E	10.7'
R	319'
S.E.	.08'/ft.
W	3.0'



PLAN SHOWING LAYOUT DIMENSIONS



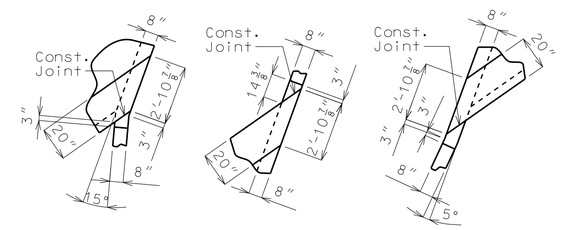
ELEVATION A-A

(Normal to ℄ Roadway)

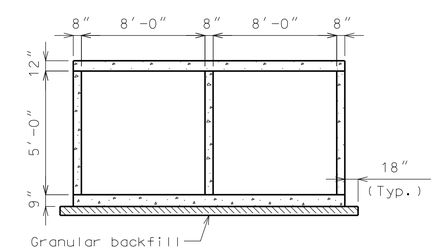
(Looking back station)

Note: Slope of bottom slab shall be placed at natural stream gradient.

If unsuitable material is encountered, excavation of unsuitable material and furnishing and placing of granular backfill shall be in accordance with Sec 206.

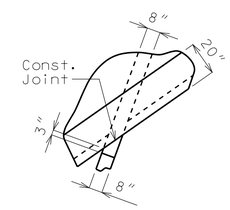


DETAIL "A" DETAIL "B" DETAIL "C"



SECTION THRU BOX

(Normal to ℄ Structure)



DETAIL "D"

GENERAL NOTES:

Design Specifications:

2010 AASHTO LRFD Bridge Design Specifications and 2010 Interim Revisions

Design Unit Stresses:

Class B-1 concrete f'c = 4,000 psi
Reinforcing steel (Grade 60), fy = 60,000 psi

Design Loading:

Vehicular = HL-93 minus Lane Load

Earth 120 #/ft.^{3}
Equivalent fluid pressure
30 #/ft.^{3} (Min.) - 60 #/ft.^{3} (Max.)

All elevations shown are in feet unless otherwise noted.

"Sec" refers to the sections in the standard and supplemental specifications unless specified otherwise.

HYDROLOGIC DATA
Drainage Area = 1.35 (sq. mi.)
Design High Water (DHW) Elev. = 527.95
Design High Water Frequency = 5 (year)
Design High Water Discharge = 550 (cfs)
Backwater/Base Flood Data (100 year)
High Water Elev. = 529.95
Design Discharge = 1,500 (cfs)
Estimated Backwater = 2 (ft)
Outlet Velocity = 15.32 (ft/sec)
Roadway Overtopping
Design Elev. (1' below shoulder) = 529.00
Design Discharge = 666 (cfs)
Design Frequency = 8 (year)

(Epoxy Coated) 1 1 18,730

ESTIMATED QUANTITIES			FINAL QUANTITIES
Class 4 Excavation	cu. yard	70	
Removal of Bridges	lump sum	1	
Class B-1 Concrete (Culverts-Bridge)	cu. yard	137.4	
Reinforcing Steel (Culverts-Bridge)	pound	16,250	
Thrie Beam Rail	linear foot	60	

B.M. #25 ☐ ON WEST END, NORTH HEADWALL, CULV. 10' LT., STA. 521+26 ELEV. 555.51

REPAIRS TO: BRIDGE OVER DRY CREEK

STATE ROAD

ABOUT

STA. 521+12.30 (Match Existing)

STD. 606.00
STD. 706.35

Designed Mar. 2011
Detailed Mar. 2011
Checked Mar. 2011

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

Sheet No. 1 of 6

1 REVISED 4/26/2011

$FILE$

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."

DATE PREPARED	4/27/2011
ROUTE	Y
STATE	MO
DISTRICT	
SHEET NO.	1
COUNTY	JEFFERSON
JOB NO.	TUBRG01P
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A7974

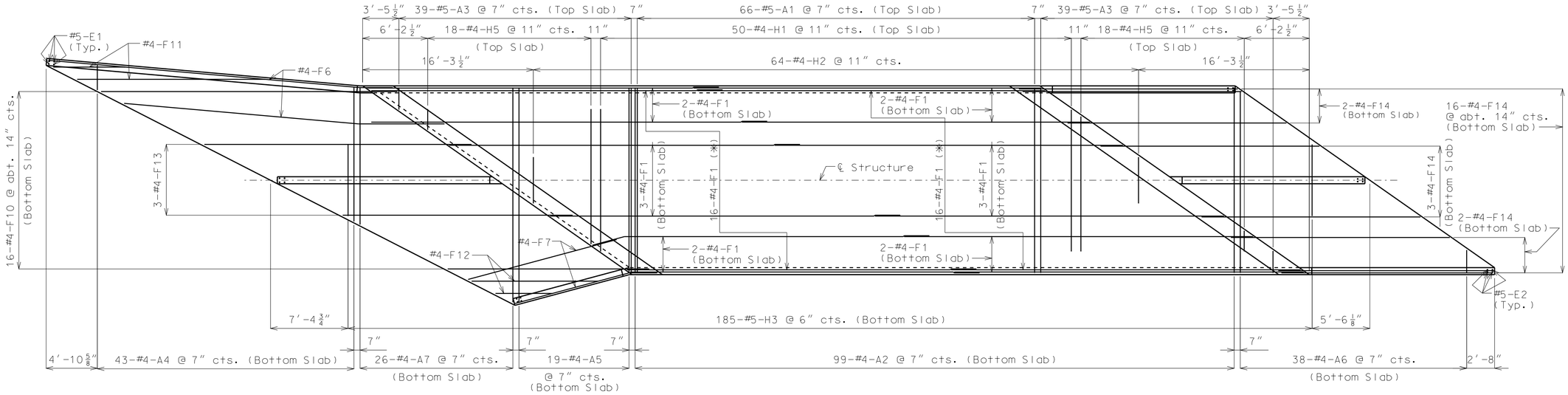
DESCRIPTION

DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

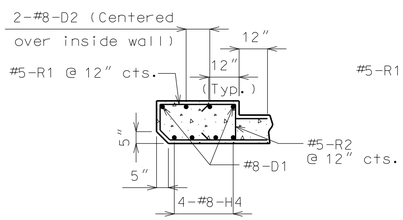
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

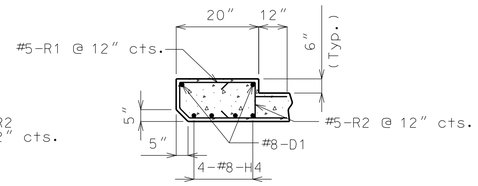


PLAN VIEW OF BOX CULVERT SHOWING REINFORCEMENT

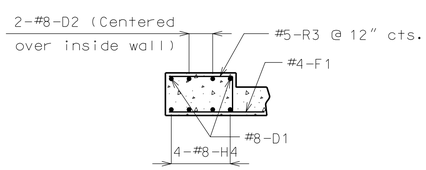
(✳) Top & Bottom of Top Slab and Top of Bottom Slab



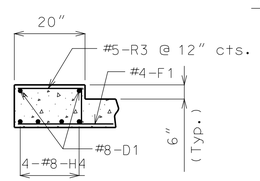
SECTION THRU UPSTREAM HEADWALL NEAR INTERIOR WALL



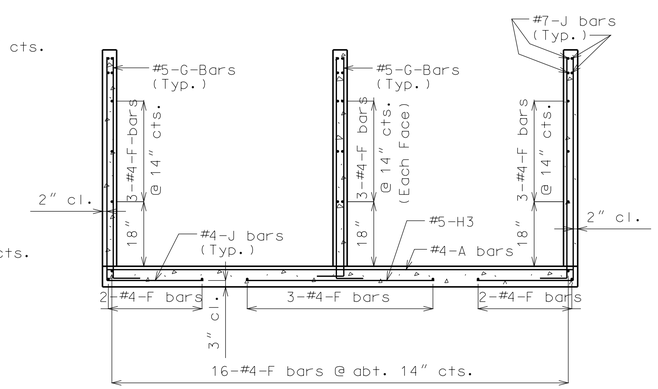
SECTION THRU UPSTREAM HEADWALL BETWEEN WALLS



SECTION THRU DOWNSTREAM HEADWALL NEAR INTERIOR WALL



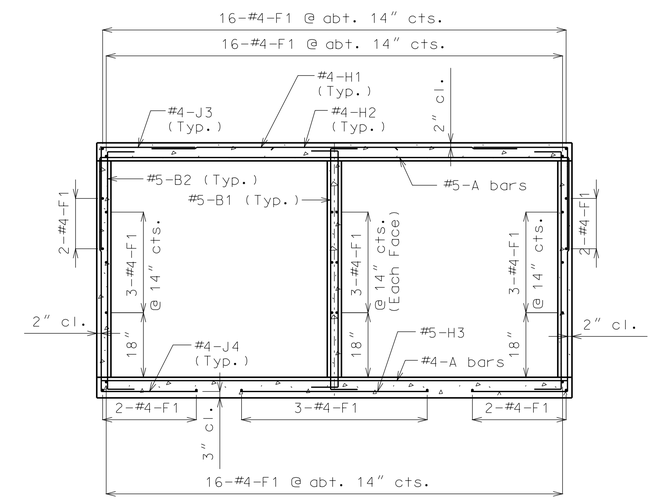
SECTION THRU DOWNSTREAM HEADWALL BETWEEN WALLS



TYPICAL SECTION THRU WINGS

(Normal to ℄ Structure)

Dimensions not shown for clarity.



SECTION THRU BOX

(Normal to ℄ Structure)

Dimensions not shown for clarity.

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DATE PREPARED	4/27/2011
ROUTE	Y
STATE	MO
DISTRICT	BR
SHEET NO.	2A
COUNTY	JEFFERSON
JOB NO.	TUBRG01P
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A7974

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

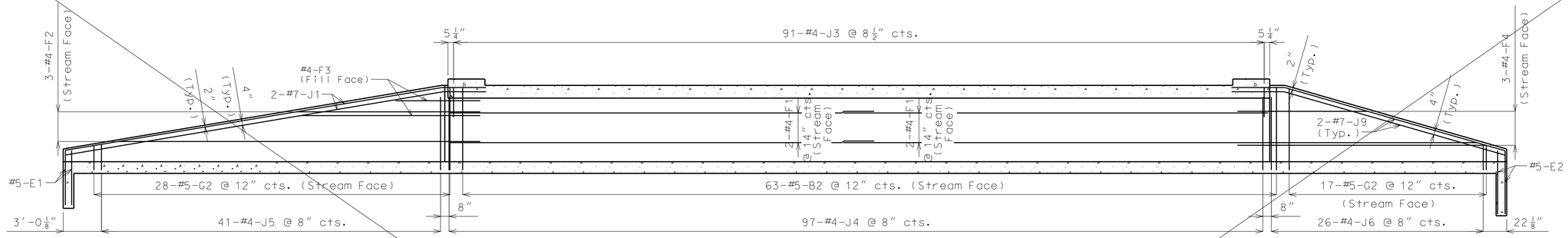
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

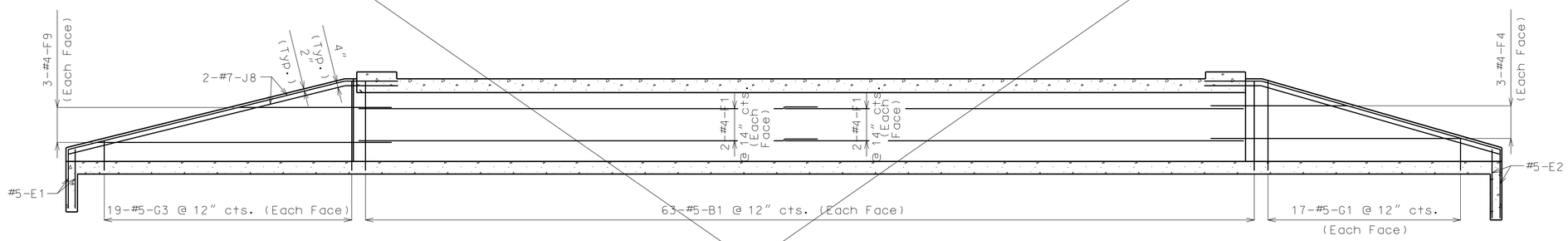
Detailed Apr. 2011
Checked Apr. 2011

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

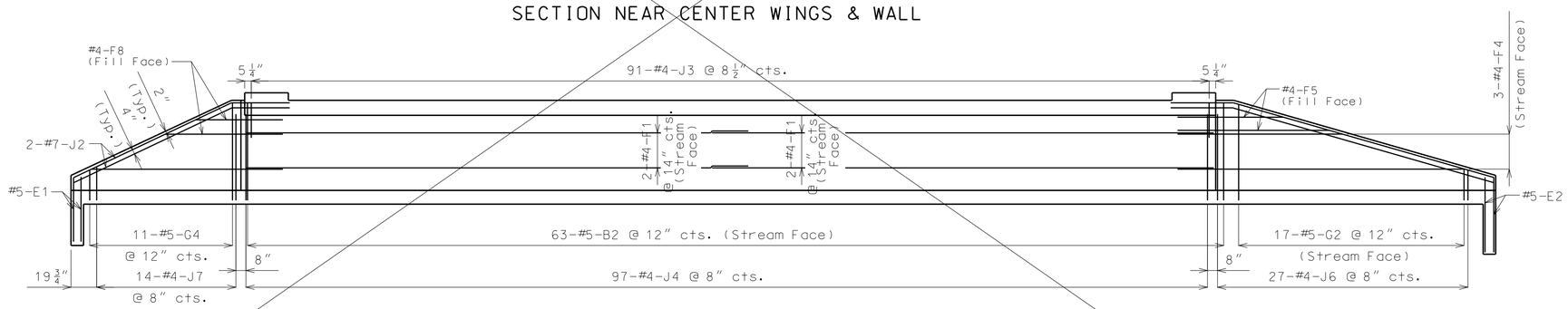
1 4/26/2011 SHEET ADDED.



DEVELOPED SECTION NEAR WEST WINGS & WALL



SECTION NEAR CENTER WINGS & WALL



DEVELOPED ELEVATION OF EAST WINGS & WALL

NOTE:
Box culvert dimensions not shown for clarity.

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DATE PREPARED	4/27/2011
ROUTE	Y
STATE	MO
DISTRICT	BR
SHEET NO.	3
COUNTY	JEFFERSON
JOB NO.	TUBRG01P
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A7974

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
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Detailed Mar. 2011
Checked Mar. 2011

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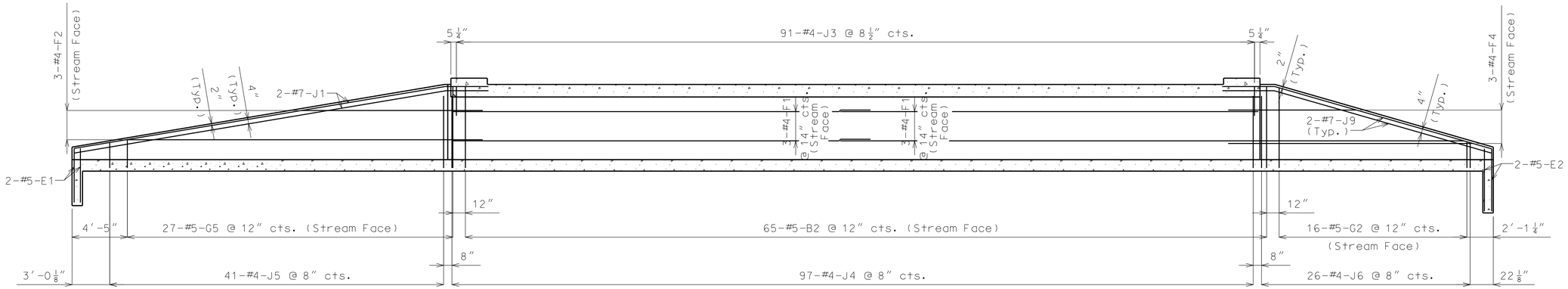
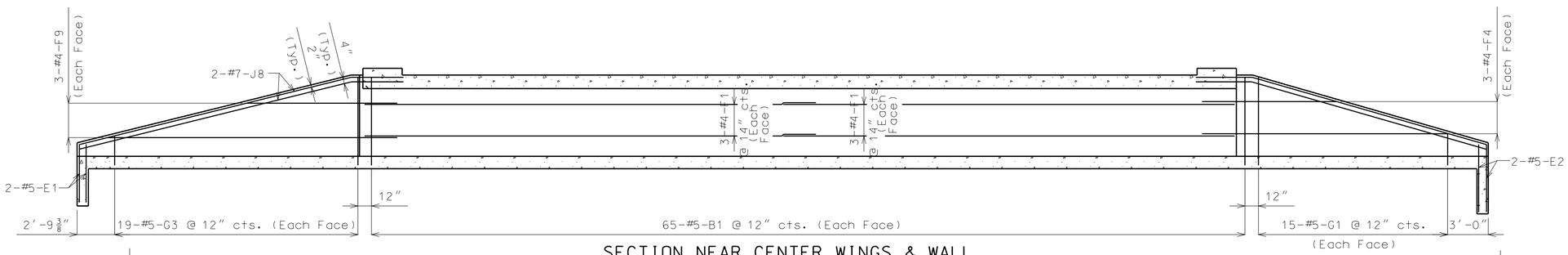
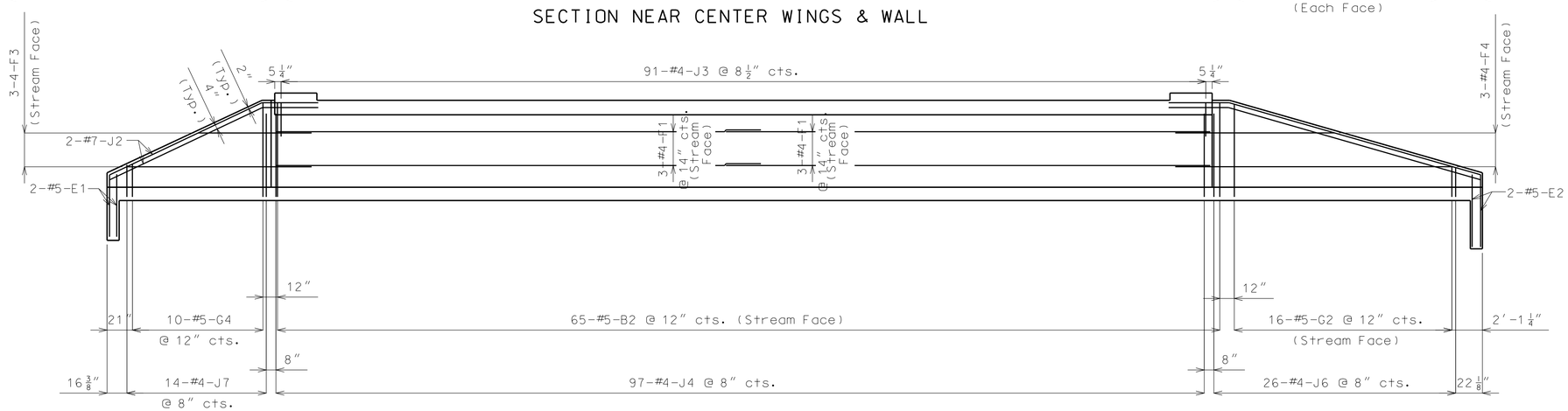
1 4/26/2011 SHEET DELETED. SEE SHEET NO. 3A.



DEVELOPED SECTION NEAR WEST WINGS & WALL



SECTION NEAR CENTER WINGS & WALL



DEVELOPED ELEVATION OF EAST WINGS & WALL

NOTE:
Box culvert dimensions not shown for clarity.

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DATE PREPARED	4/27/2011
ROUTE	Y
STATE	MO
DISTRICT	BR
SHEET NO.	3A
COUNTY	JEFFERSON
JOB NO.	TUBRG01P
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A7974

DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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Detailed Apr. 2011
Checked Apr. 2011

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

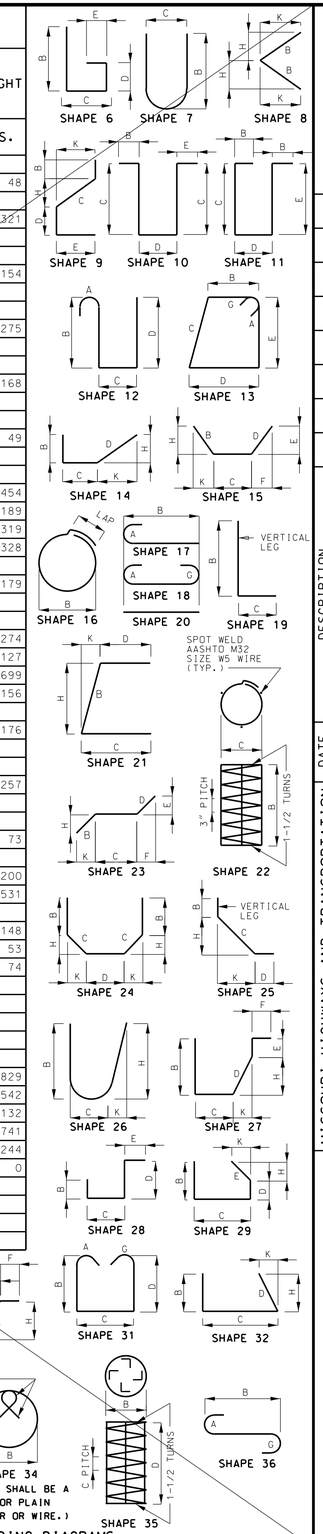
1 4/26/2011 SHEET ADDED.

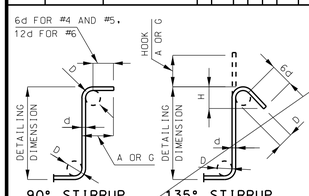
BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
66	5 A1	TOP SLAB		20					17 8.000							17 8	17 8	1216
99	4 A2	BOTTOM SLAB		20					17 8.000							17 8	17 8	1168
78	5 A3	TOP SLAB		20			V	2	17 8.000							17 8	17 8	
		INCREMENT =							2 1.000							2 1	2 1	803
		4.875 INCH																
69	4 A4	BOTTOM SLAB		20			V	1	20 5.000							20 5	20 5	
		INCREMENT =							2 4.000							2 4	2 4	524
		3.250 INCH																
19	4 A5	BOTTOM SLAB		20			V	1	20 5.000							20 5	20 5	
		INCREMENT =							17 8.000							17 8	17 8	242
		1.875 INCH																
38	4 A6	BOTTOM SLAB		20			V	1	17 3.000							17 3	17 3	
		INCREMENT =							2 2.000							2 2	2 2	246
		4.875 INCH																
126	5 B1	INT. WALL		10	S					12.000	6 6.000					8 6	8 4	1095
126	5 B2	EXT. WALL		10	S					12.000	6 6.000					8 6	8 4	1095
4	8 D1	HEADWALL		20					30 9.000							30 9	30 9	328
4	8 D2	HEADWALL		20					8 0.000							8 0	8 0	85
12	5 E1	APRON		20					3 5.000							3 5	3 5	43
12	5 E2	APRON		20					4 0.000							4 0	4 0	50
65	4 F1	TEMP. STEEL		20					33 5.000							33 5	33 5	1451
3	4 F2	UP. EXT. WNG		20			V	1	29 0.000							29 0	29 0	
		INCREMENT =							15 0.000							15 0	15 0	44
		84.000 INCH																
2	4 F3	UP. EXT. WNG		20			V	1	16 4.000							16 4	16 4	
		INCREMENT =							9 3.000							9 3	9 3	17
		85.000 INCH																
12	4 F4	DNSTRM WINGS		20			V	4	18 11.000							18 11	18 11	
		INCREMENT =							10 9.000							10 9	10 9	119
		49.000 INCH																
4	4 F5	DN. EXT. WNG		20			V	2	11 6.000							11 6	11 6	
		INCREMENT =							7 5.000							7 5	7 5	25
		49.000 INCH																
2	4 F6	BOTTOM SLAB		20			V	1	33 0.000							33 0	33 0	
		INCREMENT =							30 9.000							30 9	30 9	43
		27.000 INCH																
2	4 F7	BOTTOM SLAB		20			V	1	14 10.000							14 10	14 10	
		INCREMENT =							13 11.000							13 11	13 11	19
		11.000 INCH																
2	4 F8	UP. EXT. WNG		20			V	1	25 10.000							25 10	25 10	
		INCREMENT =							22 2.000							22 2	22 2	32
		44.000 INCH																
6	4 F9	UP. INT. WNG		20			V	2	20 9.000							20 9	20 9	
		INCREMENT =							11 3.000							11 3	11 3	64
		57.000 INCH																
16	4 F10	BOTTOM SLAB		20			V	1	28 4.000							28 4	28 4	
		INCREMENT =							19 3.000							19 3	19 3	254
		7.250 INCH																
2	4 F11	BOTTOM SLAB		20			V	1	17 11.000							17 11	17 11	
		INCREMENT =							6 10.000							6 10	6 10	17
		133.000 INCH																
2	4 F12	BOTTOM SLAB		20			V	1	12 1.000							12 1	12 1	
		INCREMENT =							5 5.000							5 5	5 5	12
		80.000 INCH																

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
3	4 F13	BOTTOM SLAB		20			V	1	25 10.000							25 10	25 10	
		INCREMENT =							22 2.000							22 2	22 2	48
		22.000 INCH																
23	4 F14	BOTTOM SLAB		20					20 11.000							20 11	20 11	321
34	5 G1	DN. INT. WNG		20			V	2	6 6.000							6 6	6 6	
		INCREMENT =							2 2.000							2 2	2 2	154
		3.250 INCH																
62	5 G2	D&U EXT. WNG		20			V	2	6 6.000							6 6	6 6	
		INCREMENT =							2 0.000							2 0	2 0	275
		1.750 INCH																
38	5 G3	UP. INT. WNG		20			V	2	6 6.000							6 6	6 6	
		INCREMENT =							2 0.000							2 0	2 0	168
		3.000 INCH																
11	5 G4	UP. EXT. WNG		20			V	1	6 6.000							6 6	6 6	
		INCREMENT =							2 0.000							2 0	2 0	49
		5.375 INCH																
50	4 H1	TOP SLAB		20					13 7.000							13 7	13 7	454
64	4 H2	TOP SLAB		20					4 5.000							4 5	4 5	189
185	5 H3	BOTTOM SLAB		20					6 10.000							6 10	6 10	1319
4	8 H4	HEADWALL		20					30 9.000							30 9	30 9	328
36	4 H5	TOP SLAB		20			V	2	12 10.000							12 10	12 10	
		INCREMENT =							2 1.000							2 1	2 1	179
		7.625 INCH																
4	7 J1	UP. EXT. WNG		20					33 6.000							33 6	33 6	274
4	7 J2	UP. EXT. WNG		20					15 6.000							15 6	15 6	127
182	4 J3	TOP CORNER		19	S				2 4.000	3 5.875						5 10	5 9	699
194	4 J4	BOTTOM COR.		19	S				5 5.000	3 7.000						9 0	8 11	1156
41	4 J5	UP EXT. WING		19	S		V	1	5 5.000	3 7.000						9 0	8 11	
		INCREMENT =							2 0.000	2 0.000						4 0	3 11	176
		1.500 INCH																
53	4 J6	DN. EXT. WNG		19	S		V	1	5 5.000	3 7.000						9 0	8 11	
		INCREMENT =							2 1.000	3 7.000						5 8	5 7	257
		0.750 INCH																
15	4 J7	UP EXT. WING		19	S		V	1	5 5.000	3 7.000						9 0	8 11	
		INCREMENT =							2 2.500	3 7.000						5 10	5 9	73
		2.750 INCH																
4	7 J8	UP. EXT. WNG		20					24 5.000							24 5	24 5	200
12	7 J9	DNSTRM. WNGS		20					21 8.000							21 8	21 8	531
27	5 R1	HEADWALL		27	S				17.000	10.000	7.125	2 6.500		5.000	5.000	5 5	5 3	148
18	5 R2	HEADWALL		10	S					10.500	15.000					3 0	2 10	53
18	5 R3	HEADWALL		10	S					17.000	15.000					4 1	3 11	74
		TOTALS																
	4																	7829
	5																	6542
	7																	1132
	8																	741
		TOTAL																16244
		TOTAL	E															0



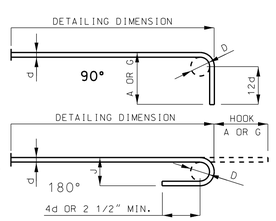


STIRRUP HOOK DIMENSIONS

GRADES 40 - 50 - 60 KSI

BAR SIZE	D (IN.)	90° HOOK: HOOK A OR G	135° HOOK: HOOK A OR G	135° HOOK: APPROX. H
#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"	8"	4 1/2"

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



END HOOK DIMENSIONS

BAR SIZE	D (IN.)	ALL GRADES: 180° HOOKS A OR G	180° HOOKS J	90° HOOKS A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	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 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE 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.
FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.

1 4/26/2011 SHEET DELETED. SEE SHEET NO. 6A.

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."

DATE PREPARED	
4/27/2011	
ROUTE: Y	STATE: MO
DISTRICT: BR	SHEET NO.: 6
COUNTY: JEFFERSON	
JOB NO.: TUBRG01P	
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.: A7974	

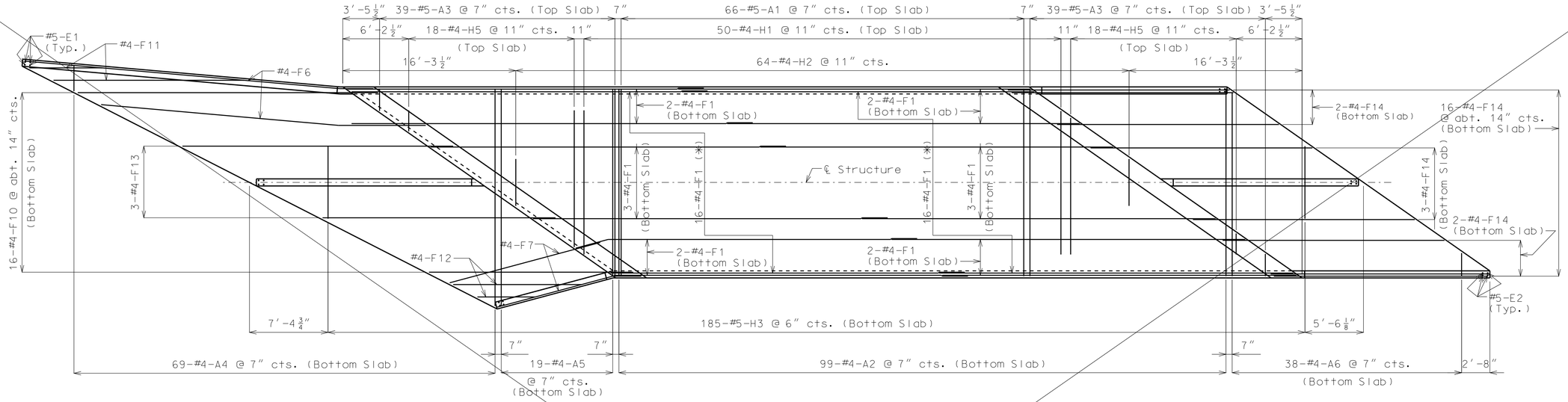
DATE	DESCRIPTION

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

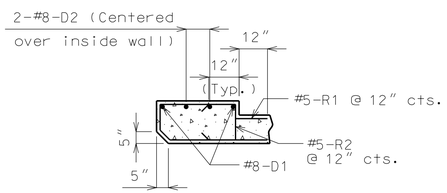
Detailed Mar. 2011
Checked Mar. 2011

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

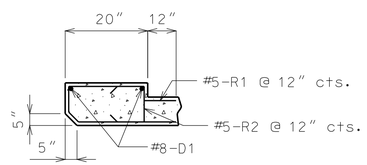


PLAN VIEW OF BOX CULVERT SHOWING REINFORCEMENT

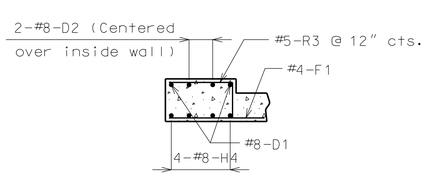
(✳) Top & Bottom of Top Slab and Top of Bottom Slab



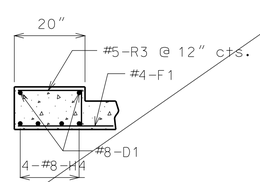
SECTION THRU UPSTREAM HEADWALL NEAR INTERIOR WALL



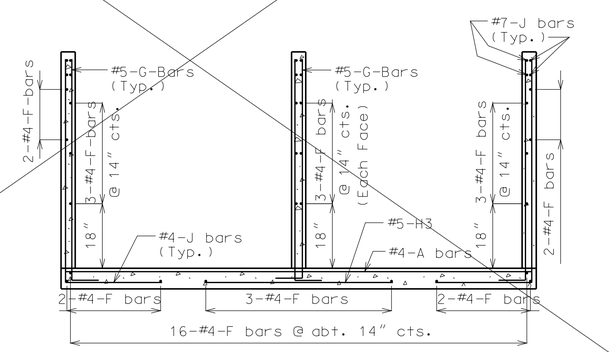
SECTION THRU UPSTREAM HEADWALL BETWEEN WALLS



SECTION THRU DOWNSTREAM HEADWALL NEAR INTERIOR WALL



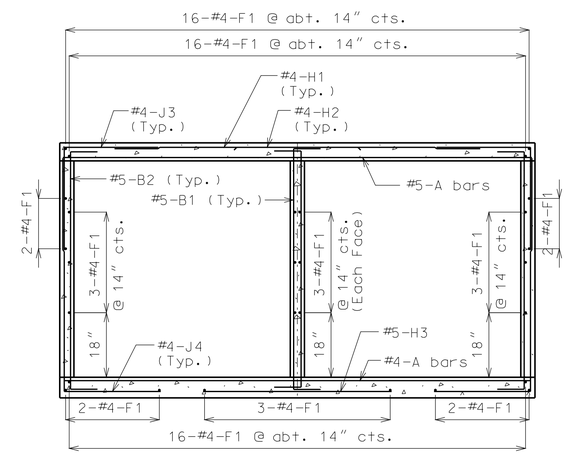
SECTION THRU DOWNSTREAM HEADWALL BETWEEN WALLS



TYPICAL SECTION THRU WINGS

(Normal to ℄ Structure)

Dimensions not shown for clarity.



SECTION THRU BOX

(Normal to ℄ Structure)

Dimensions not shown for clarity.

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."

DATE PREPARED	4/27/2011
ROUTE	Y
STATE	MO
DISTRICT	BR
SHEET NO.	2
COUNTY	JEFFERSON
JOB NO.	TUBRG01P
CONTRACT ID.	
PROJECT NO.	
BRIDGE NO.	A7974

DESCRIPTION | DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

Detailed Mar. 2011
Checked Mar. 2011

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

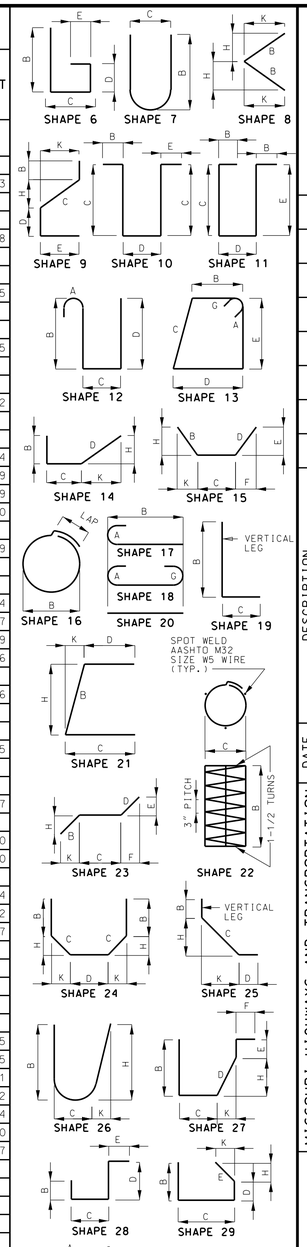
1 4/26/2011 SHEET DELETED. SEE SHEET NO. 2A.

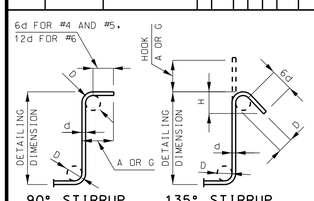
BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
68	5	A1	TOP SLAB	E	20					17 8.000							17 8	17 8	1253
101	4	A2	BOTTOM SLAB	E	20					17 8.000							17 8	17 8	1192
78	5	A3	TOP SLAB	E	20			V	2	17 7.000							17 7	17 7	
			INCREMENT =							2 1.000							2 1	2 1	800
			4.875 INCH																
43	4	A4	BOTTOM SLAB	E	20			V	1	12 9.000							12 9	12 9	
			INCREMENT =							2 4.000							2 4	2 4	217
			3.000 INCH																
19	4	A5	BOTTOM SLAB	E	20			V	1	20 5.000							20 5	20 5	
			INCREMENT =							17 8.000							17 8	17 8	242
			1.875 INCH																
38	4	A6	BOTTOM SLAB	E	20			V	1	17 3.000							17 3	17 3	
			INCREMENT =							2 2.000							2 2	2 2	246
			4.875 INCH																
26	4	A7	BOTTOM SLAB	E	20			V	1	20 6.000							20 6	20 6	
			INCREMENT =							13 0.000							13 0	13 0	291
			3.625 INCH																
130	5	B1	INT. WALL	E	10	S					12.000	6 4.000					8 4	8 2	1107
130	5	B2	EXT. WALL	E	10	S					12.000	6 4.000					8 4	8 2	1107
4	8	D1	HEADWALL	E	20					31 1.000							31 1	31 1	332
6	9	D2	HEADWALL	E	20					9 0.000							9 0	9 0	184
12	5	E1	APRON	E	20					3 5.000							3 5	3 5	43
12	5	E2	APRON	E	20					4 0.000							4 0	4 0	50
142	4	F1	TEMP. STEEL	E	20					33 5.000							33 5	33 5	3170
3	4	F2	UP. EXT. WNG	E	20			V	1	29 0.000							29 0	29 0	
			INCREMENT =							15 0.000							15 0	15 0	44
			84.000 INCH																
3	4	F3	UP. EXT. WNG	E	20			V	1	12 3.000							12 3	12 3	
			INCREMENT =							5 6.000							5 6	5 6	18
			40.500 INCH																
12	4	F4	DNSTRM WINGS	E	20			V	4	19 3.000							19 3	19 3	
			INCREMENT =							10 9.000							10 9	10 9	120
			51.000 INCH																
2	4	F6	BOTTOM SLAB	E	20			V	1	33 0.000							33 0	33 0	
			INCREMENT =							30 9.000							30 9	30 9	43
			27.000 INCH																
2	4	F7	BOTTOM SLAB	E	20			V	1	14 10.000							14 10	14 10	
			INCREMENT =							13 11.000							13 11	13 11	19
			11.000 INCH																
6	4	F9	UP. INT. WNG	E	20			V	2	21 4.000							21 4	21 4	
			INCREMENT =							11 8.000							11 8	11 8	66
			58.000 INCH																
16	4	F10	BOTTOM SLAB	E	20			V	1	28 4.000							28 4	28 4	
			INCREMENT =							19 3.000							19 3	19 3	254
			7.250 INCH																
2	4	F11	BOTTOM SLAB	E	20			V	1	17 11.000							17 11	17 11	
			INCREMENT =							6 10.000							6 10	6 10	17
			133.000 INCH																
2	4	F12	BOTTOM SLAB	E	20			V	1	12 1.000							12 1	12 1	
			INCREMENT =							5 5.000							5 5	5 5	12
			80.000 INCH																
3	4	F13	BOTTOM SLAB	E	20			V	1	25 10.000							25 10	25 10	
			INCREMENT =							22 2.000							22 2	22 2	48
			22.000 INCH																
23	4	F14	BOTTOM SLAB	E	20					20 11.000							20 11	20 11	321

BILL OF REINFORCING STEEL

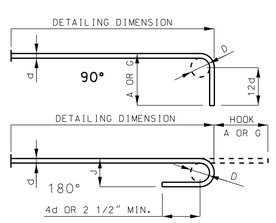
NO. REQ'D.	MARK NO. SIZE	MARK NO. MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
30	5	G1	DN. INT. WNG	E	20			V	2	6 4.000							6 4	6 4	
			INCREMENT =							2 2.000							2 2	2 2	133
			3.625 INCH																
32	5	G2	DN. EXT. WNG	E	20			V	2	6 3.000							6 3	6 3	
			INCREMENT =							2 0.000							2 0	2 0	138
			3.375 INCH																
38	5	G3	UP. INT. WNG	E	20			V	2	6 4.000							6 4	6 4	
			INCREMENT =							2 0.000							2 0	2 0	165
			2.875 INCH																
10	5	G4	UP. EXT. WNG	E	20			V	1	6 6.000							6 6	6 6	
			INCREMENT =							2 2.000							2 2	2 2	45
			5.750 INCH																
27	5	G5	UP. EXT. WNG	E	20			V	1	6 6.000							6 6	6 6	
			INCREMENT =							2 2.000							2 2	2 2	122
			2.000 INCH																
50	4	H1	TOP SLAB	E	20					13 7.000							13 7	13 7	454
64	4	H2	TOP SLAB	E	20					4 5.000							4 5	4 5	189
185	5	H3	BOTTOM SLAB	E	20					6 10.000							6 10	6 10	1319
10	8	H4	HEADWALL	E	20					31 1.000							31 1	31 1	830
36	4	H5	TOP SLAB	E	20			V	2	12 10.000							12 10	12 10	
			INCREMENT =							2 1.000							2 1	2 1	179
			7.625 INCH																
4	7	J1	UP. EXT. WNG	E	20					33 6.000							33 6	33 6	274
4	7	J2	UP. EXT. WNG	E	20					15 6.000							15 6	15 6	127
182	4	J3	TOP CORNER	E	19	S				2 4.000	3 5.875						5 10	5 9	699
194	4	J4	BOTTOM COR.	E	19	S				5 5.000	3 7.000						9 0	8 11	1156
41	4	J5	UP EXT. WING	E	19	S		V	1	5 5.000	3 7.000						9 0	8 11	
			INCREMENT =							22.500	3 7.000						5 6	5 5	196
			1.000 INCH																
52	4	J6	DN. EXT. WNG	E	19	S		V	1	5 5.000	3 7.000						9 0	8 11	
			INCREMENT =							20.000	3 7.000						5 3	5 2	245
			0.875 INCH																
14	4	J7	UP EXT. WING	E	19	S		V	1	5 5.000	3 7.000						9 0	8 11	
			INCREMENT =							2 0.000	3 7.000						5 7	5 6	67
			3.125 INCH																
4	7	J8	UP. EXT. WNG	E	20					24 5.000							24 5	24 5	200
14	7	J9	DNSTRM. WNGS	E	20					21 8.000							21 8	21 8	620
31	5	R1	HEADWALL	E	27	S				17.000	10.875	5.875	2 0.875		4.125	4.125	4 11	4 9	154
31	5	R2	HEADWALL	E	10	S					10.500	15.000					3 0	2 10	92
31	5	R3	HEADWALL	E	10	S					17.000	15.000					4 1	3 11	127
			TOTALS																
	4			E															9505
	5			E															6655
	7			E															1221
	8			E															1162
	9			E															184
			TOTAL																0
			TOTAL	E															18727





STIRRUP HOOK DIMENSIONS				
GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK	135° HOOK	
		HOOK A OR G	HOOK A OR G	APPROX. H
#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"	8"	4 1/2"

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



END HOOK DIMENSIONS				
BAR SIZE	D (IN.)	ALL GRADES		
		180° HOOKS		90° HOOKS
		A OR G	J	A OR G
#3	2 1/4"	5"	3"	6"
#4	3"	6"	4"	8"
#5	3 3/4"	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 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	2'-0"
#14	18 1/4"	2'-3"	21 3/4"	2'-7"

TWO ADDITIONAL #4-A2, #5-A1, #7-J9, #8-H4 & #9-D2 ARE INCLUDED IN THE BAR BILL FOR TESTING.

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE 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.
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ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYWEIGHTS ARE BASED ON ACTUAL LENGTHS.
FOUR ANGLE OR CHANNEL SPACERS ARE REQUIRED FOR EACH COLUMN SPIRAL. SPACERS ARE TO BE PLACED ON INSIDE OF SPIRALS. LENGTH AND WEIGHT OF COLUMN SPIRALS DO NOT INCLUDE SPLICES OR SPACERS.
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.

Detailed Apr. 2011
Checked Apr. 2011

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

Sheet No. 6A of 6

1 4/26/2011 SHEET ADDED.

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."

DATE PREPARED 4/27/2011
ROUTE Y
STATE MO
DISTRICT BR
SHEET NO. 6A
COUNTY JEFFERSON
JOB NO. TUBRG01P
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A7974

DESCRIPTION
DATE

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.