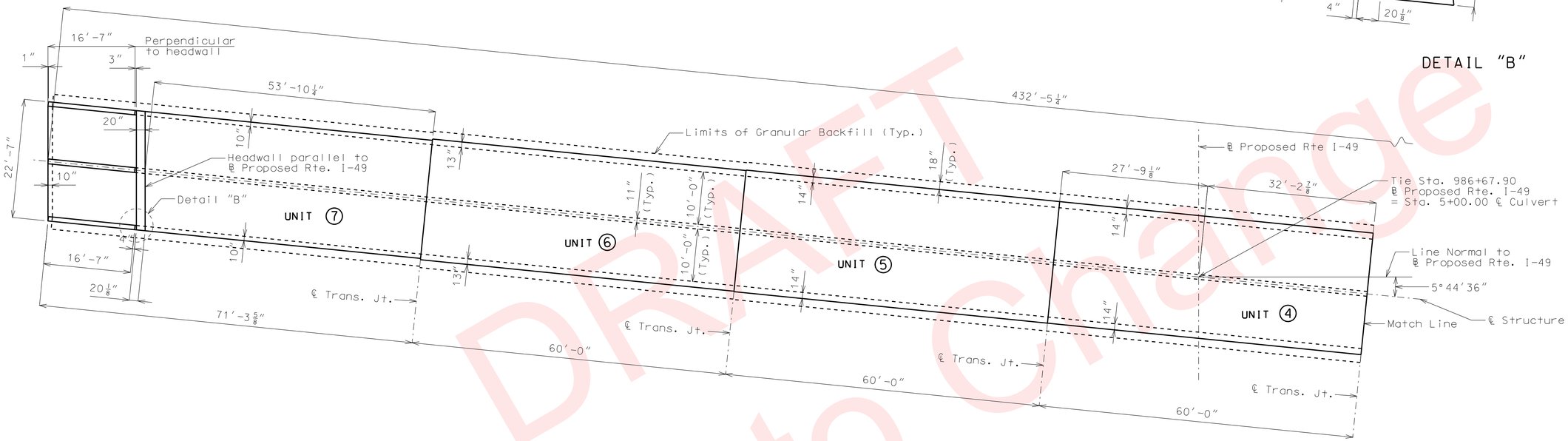
CAUTION: Currently being re-designed as a double 14'x 8' with baffled inlet

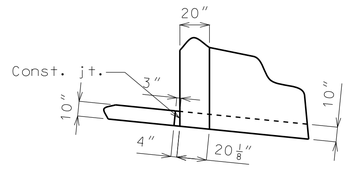
SEC/SUR 34 TWP 21N RGE 32W

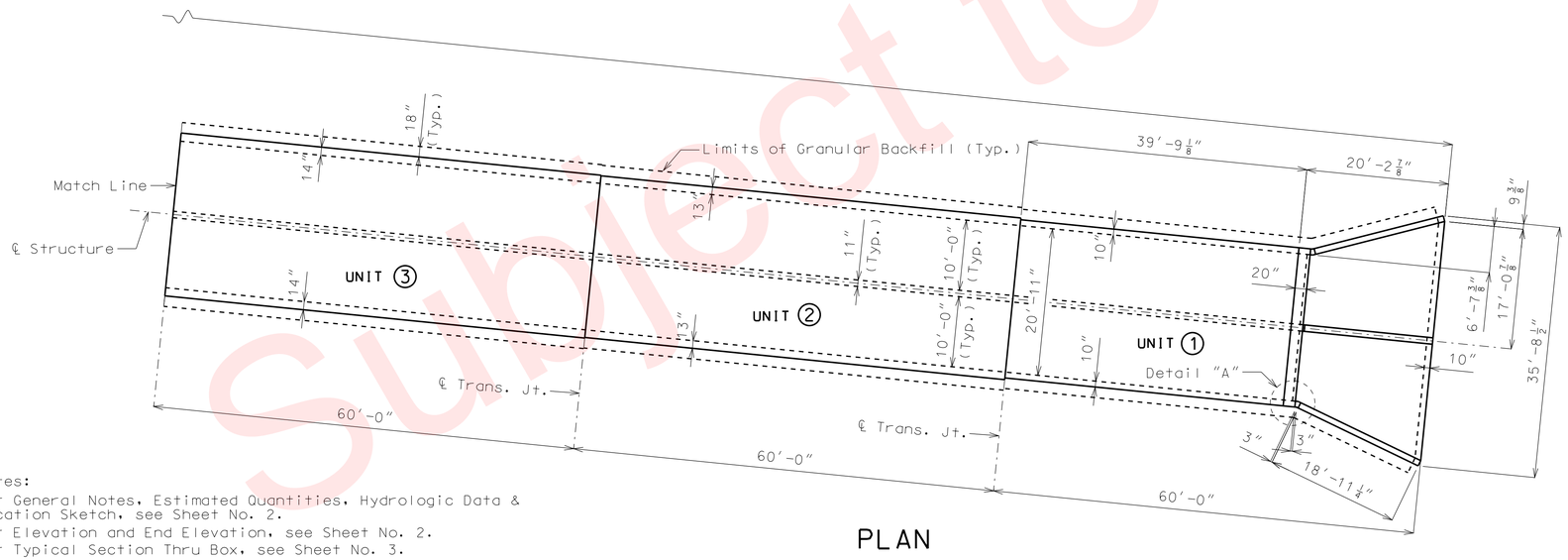
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

2 (10' x 8') CONCRETE BOX CULVERT

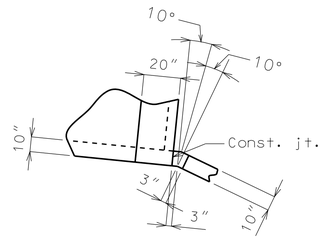


DETAIL "B"





PLAN



DETAIL "A"

Notes:
For General Notes, Estimated Quantities, Hydrologic Data & Location Sketch, see Sheet No. 2.
For Elevation and End Elevation, see Sheet No. 2.
For Typical Section Thru Box, see Sheet No. 3.

B.M.-49-01-17 ELEV. 1038.73
N: 122,910.2783 E: 2,821,845.2573
1.5" ALUM. DISK IN LIMEROCK
OUTCROP ± 150' E/O & 20' S/O TARGET E

BRIDGE OVER RATTLESNAKE HOLLOW CREEK

STATE ROAD FROM RTE. H TO STATE LINE
AT STATE LINE
STA. 986+67.90

STD. 703.37
STD. 703.42
STD. 703.44
STD. 706.35

Designed Sept. 2007
Detailed July 2009
Checked July 2009

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

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

DATE PREPARED 2/25/2010
ROUTE I-49 | STATE MO
DISTRICT BR | SHEET NO. 1
COUNTY McDONALD
JOB NO. J7P0601
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A7054

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.

CAUTION: Currently being re-designed as a double 14'x 8' with baffled inlet

GENERAL NOTES:

Design Specifications:
2002 - AASHTO 17th Edition
Load Factor Design

Design Unit Stresses:
Class B-1 concrete (Box Culvert) f'c = 4,000 psi
Reinforcing steel (Grade 60), fy = 60,000 psi

Design Loading:
HS20 Modified
Military 24,000 # Tandem Axle
Earth 120 #/ft.^{3}
Equivalent fluid pressure
30 #/ft.^{3} (Min.) - 60 #/ft.^{3} (Max.)

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

Miscellaneous:
Provide grading of the channel bottom within the limits of the R/W as needed for culvert flowline elevations and transition of the channel bed to the culvert openings.

Taper channel banks to match end of culvert opening as required. (Roadway Item)

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

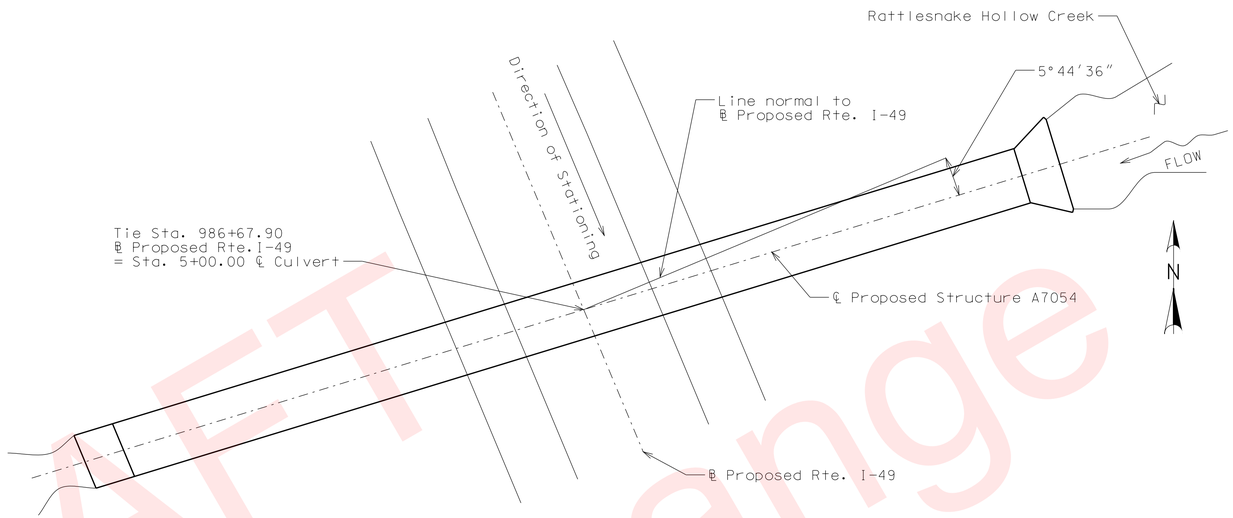
Traffic Handling:
See Roadway Plans for traffic control.

Precast Option:

The box shown below indicating whether a precast or cip box was used should be checked by MoDOT Construction personnel:

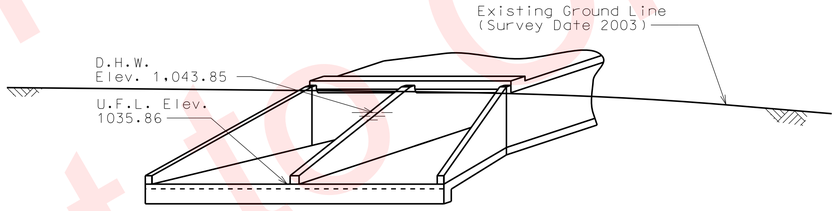
☐ Precast Box used
☐ Cast-in-Place Box used

When alternate precast box sections are used, the minimum barrel length measured along the shortest wall from the first joint to the outside of the headwall, shall be 3'-2". Reinforcement and dimensions for the wings and headwalls shall be in accordance with Missouri Standard Plans drawing.



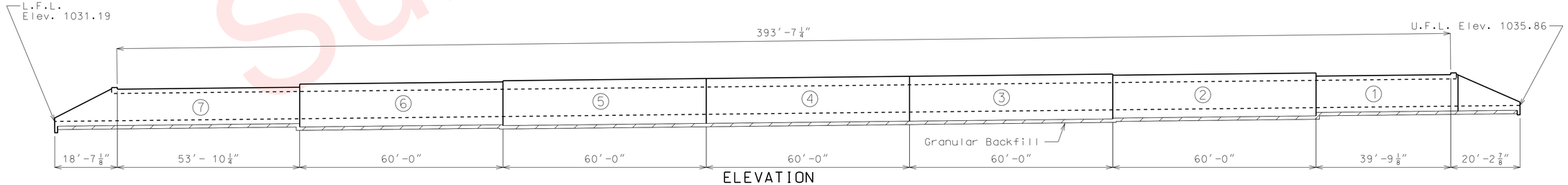
LOCATION SKETCH

HYDROLOGIC DATA
Drainage Area = 2.12 (sq. mi.) (Hilly)
Design High Water (DHW) Elev. = 1,043.85
Design High Water Frequency = 50 (year)
Design High Water Discharge = 1,666.63 (cfs)
Backwater/Base Flood Data (100 year)
High Water Elev. = 1,047.63
Design Discharge = 2,062.42 (cfs)
Estimated Backwater = 1.11 (ft)
Outlet Velocity = 12.89 (ft/sec)
Roadway Overtopping
Design Elev. (1' below shoulder) = 1,109.00
Design Discharge ≥ 3,506.11 (cfs)
Design Frequency > 500 (year)



END ELEVATION (UPSTREAM)

ESTIMATED QUANTITIES			FINAL QUANTITIES
Class 4 Excavation	cu. yard	3,630	
Class B-1 Concrete (Culverts-Bridge)	cu. yard	1,939.4	
Reinforcing Steel (Culverts-Bridge)	pound	163,090	



ELEVATION

Note: Dimensions are along ℄ Structure.

Detailed July 2009
Checked July 2009

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

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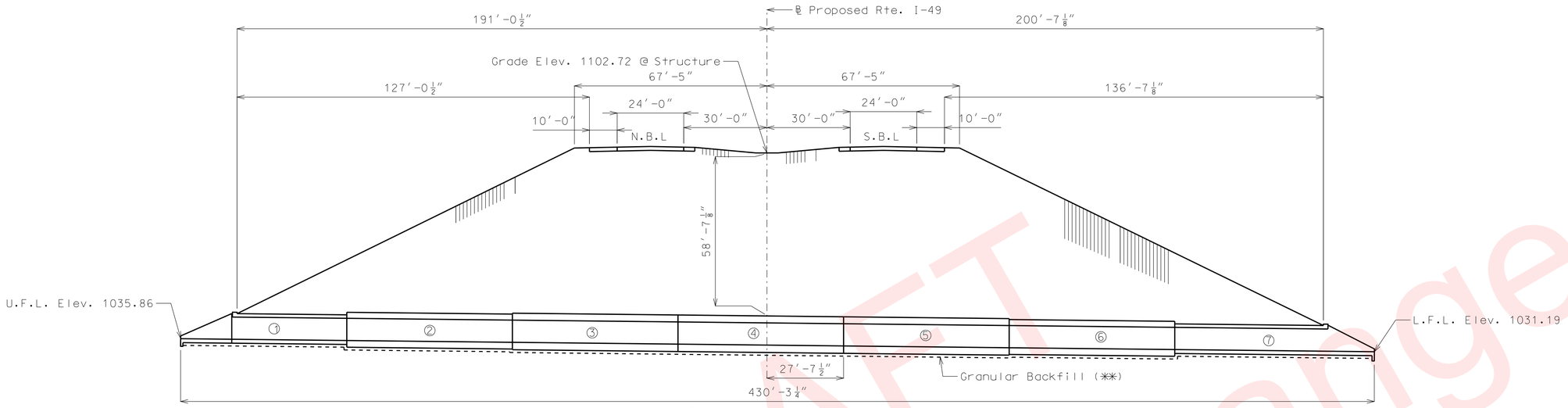
DATE PREPARED: 2/25/2010
ROUTE: I-49 | STATE: MO
DISTRICT: BR | SHEET NO.: 2
COUNTY: McDONALD
JOB NO.: J7P0601
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A7054

DESCRIPTION | DATE

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

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

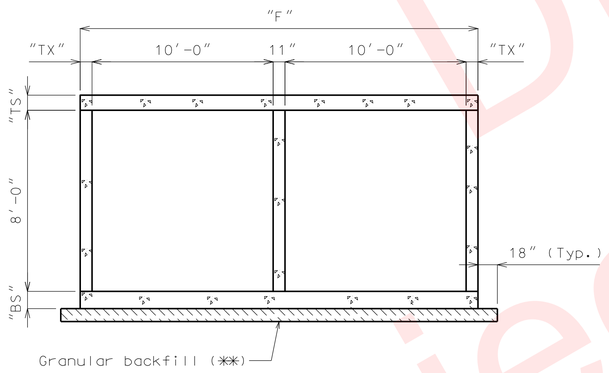
CAUTION: Currently being re-designed as a double 14'x 8' with baffled inlet



ELEVATION

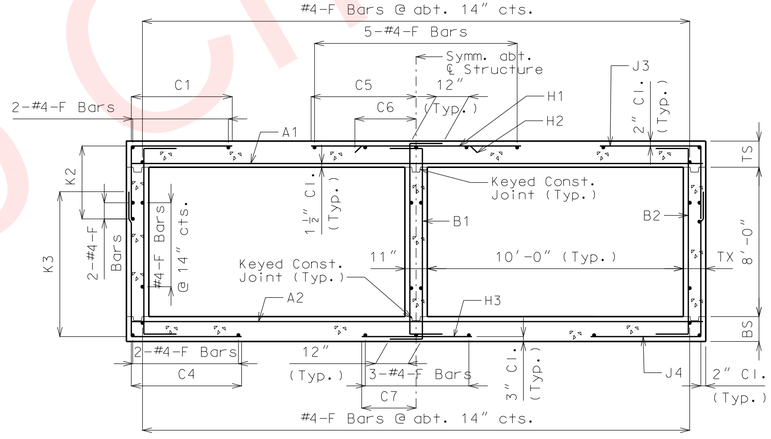
Note: Dimensions are normal to ℄ Proposed Rte. I-49 @ ℄ Structure.

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



SECTION THRU BOX

(Normal to ℄ Structure)



TYPICAL SECTION THRU BOX

UNIT	DESIGN FILL (✻)	MEMBER THICKNESS				REINFORCEMENT TABLE																												"C" Multiplier	"K" Multiplier
						TOP SLAB BARS								BOTTOM SLAB BARS						WALL BARS						COEFFICIENTS (see note)											
		"TS"	"BS"	"TX"	"F"	A1 Bars		J3 Bars		H1 Bars		H2 Bars		A2 Bars		J4 Bars		H3 Bars		B1 Bars		B2 Bars		F Bars		J4		H3		J3		H1		H2			
	(ft-in)	Thick	Thick	Thick		Size	c to c	Size	c to c	Size	c to c	Size	c to c	Size	c to c	Size	c to c	Size	c to c	Size	c to c	Size	c to c	Size	c to c	C4	K3	C7	C1	K2	C5	C6	S = 10 ft	HT = 8 ft
1 & 7	20′-1″	15″	17″	10″	22′-7″	5	8	5	7	6	14.5	6	14.5	5	7.5	5	7.5	6	7.5	5	11.5	5	11.5	4	14.0	0.26	0.90	0.36	0.31	0.34	0.41	0.29	130	123
2 & 6	46′-11″	26″	29″	13″	23′-1″	5	5	6	6.5	6	12	6	12	5	5	5	8.5	7	6	5	11.5	5	7	4	14.0	0.32	0.82	0.45	0.32	0.35	0.39	0.31	132	146
3. 4 & 5	63′-4″	30″	34″	14″	23′-3″	6	6	6	6.5	6	12	6	12	6	6.5	5	8	8	6.5	5	11.5	6	8	4	14.0	0.37	0.80	0.49	0.36	0.36	0.40	0.32	133	155

(✻) Design fill height is the distance from the top of earth fill or roadway to the top of the top slab.

Notes:

Bar dimensions marked with C# or K# are the product of the coefficient and its associated multiplier.

Detailed July 2009
Checked July 2009

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

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DATE PREPARED: 2/25/2010
ROUTE: I-49 | STATE: MO
DISTRICT: BR | SHEET NO.: 3
COUNTY: McDONALD
JOB NO.: J7P0601
CONTRACT ID.:
PROJECT NO.:
BRIDGE NO.: A7054

DESCRIPTION | DATE

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

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CAUTION: Currently being re-designed as a double 14'x 8' with baffled inlet

barbill_i Effective: Aug. 2008 Supercedes: Feb. 2006

BILL OF REINFORCING STEEL

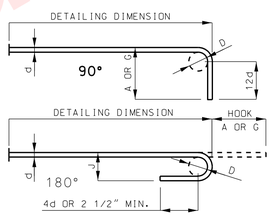
NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT. IN.	C FT. IN.	D FT. IN.	E FT. IN.	F FT. IN.	H FT. IN.	K FT. IN.	NOMINAL LENGTH FT. IN.	ACTUAL LENGTH FT. IN.	WEIGHT LBS.
			BARREL																
			SECTION																
			UNIT 2																
145	5	A1	TOP SLAB		20					22 9.000							22 9	22 9	3441
145	5	A2	BTM SLAB		20					22 9.000							22 9	22 9	3441
224	6	J3	TOP CORNER		19					4 3.125	3 6.250						7 9	7 8	2579
172	5	J4	BTM CORNER		19					9 11.750	3 6.250						13 6	13 5	2407
128	5	B1	INT WALL		10						12.000	12 2.000					14 2	13 11	1858
208	5	B2	EXT WALL		20					12 2.000							12 2	12 2	2639
61	6	H1	TOP SLAB		20					8 7.000							8 7	8 7	786
60	6	H2	TOP SLAB		20					6 10.000							6 10	6 10	616
121	7	H3	BTM SLAB		20					9 11.000							9 11	9 11	2453
82	4	F1	TEMP STEEL		20					59 9.000							59 9	59 9	3273
			UNIT 3																
121	6	A1	TOP SLAB		20					22 11.000							22 11	22 11	4165
121	6	A2	BTM SLAB		20					22 11.000							22 11	22 11	4165
224	6	J3	TOP CORNER		19					4 7.750	4 0.000						8 8	8 6	2860
182	5	J4	BTM CORNER		19					10 4.000	4 1.250						14 5	14 4	2721
128	5	B1	INT WALL		10						12.000	12 11.000					14 11	14 8	1958
182	6	B2	EXT WALL		20					12 11.000							12 11	12 11	3531
61	6	H1	TOP SLAB		20					8 10.000							8 10	8 10	809
60	6	H2	TOP SLAB		20					7 1.000							7 1	7 1	638
112	8	H3	BTM SLAB		20					10 10.000							10 10	10 10	3240
82	4	F1	TEMP STEEL		20					59 9.000							59 9	59 9	3273
			UNIT 4																
121	6	A1	TOP SLAB		20					22 11.000							22 11	22 11	4165
121	6	A2	BTM SLAB		20					22 11.000							22 11	22 11	4165
224	6	J3	TOP CORNER		19					4 7.750	4 0.000						8 8	8 6	2860
182	5	J4	BTM CORNER		19					10 4.000	4 1.250						14 5	14 4	2721
128	5	B1	INT WALL		10						12.000	12 11.000					14 11	14 8	1958
182	6	B2	EXT WALL		20					12 11.000							12 11	12 11	3531
61	6	H1	TOP SLAB		20					8 10.000							8 10	8 10	809
60	6	H2	TOP SLAB		20					7 1.000							7 1	7 1	638
112	8	H3	BTM SLAB		20					10 10.000							10 10	10 10	3240
82	4	F1	TEMP STEEL		20					59 9.000							59 9	59 9	3273
			UNIT 5																
121	6	A1	TOP SLAB		20					22 11.000							22 11	22 11	4165
121	6	A2	BTM SLAB		20					22 11.000							22 11	22 11	4165
224	6	J3	TOP CORNER		19					4 7.750	4 0.000						8 8	8 6	2860
182	5	J4	BTM CORNER		19					10 4.000	4 1.250						14 5	14 4	2721
128	5	B1	INT WALL		10						12.000	12 11.000					14 11	14 8	1958
182	6	B2	EXT WALL		20					12 11.000							12 11	12 11	3531
61	6	H1	TOP SLAB		20					8 10.000							8 10	8 10	809
60	6	H2	TOP SLAB		20					7 1.000							7 1	7 1	638
112	8	H3	BTM SLAB		20					10 10.000							10 10	10 10	3240
82	4	F1	TEMP STEEL		20					59 9.000							59 9	59 9	3273
			UNIT 6																
145	5	A1	TOP SLAB		20					22 9.000							22 9	22 9	3441
145	5	A2	BTM SLAB		20					22 9.000							22 9	22 9	3441
224	6	J3	TOP CORNER		19					4 3.125	3 6.250						7 9	7 8	2579

BILL OF REINFORCING STEEL

NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B 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.
172	5	J4	BTM CORNER		19					9 11.750	3 6.250						13 6	13 5	2407
128	5	B1	INT WALL		10						12.000	12 2.000					14 2	13 11	1858
208	5	B2	EXT WALL		20					12 2.000							12 2	12 2	2639
61	6	H1	TOP SLAB		20					8 7.000							8 7	8 7	786
60	6	H2	TOP SLAB		20					6 10.000							6 10	6 10	616
121	7	H3	BTM SLAB		20					9 11.000							9 11	9 11	2453
82	4	F1	TEMP STEEL		20					59 9.000							59 9	59 9	3273
			UPPER END																
			SECTION																
			(UNIT 1)																
63	5	A1	TOP SLAB		20					22 3.000							22 3	22 3	1462
67	5	A2	BTM SLAB		20					22 3.000							22 3	22 3	1555
142	6	J3	TOP CORNER		19					3 5.500	3 4.500						6 10	6 8	1422
136	5	J4	BTM CORNER		19					9 2.750	2 10.000						12 1	11 11	1690
88	5	B1	INT WALL		10						12.000	10 3.000					12 3	12 0	1101
88	5	B2	EXT WALL		20					10 3.000							10 3	10 3	941
34	6	H1	TOP SLAB		20					8 11.000							8 11	8 11	455
34	6	H2	TOP SLAB		20					6 4.000							6 4	6 4	323
67	6	H3	BTM SLAB		20					7 10.000							7 10	7 10	788
82	4	F10	TEMP STEEL		20					40 9.000							40 9	40 9	2232
			UPPER WINGS																
			AND HEADWALL																
28	5	A10	BTM SLAB		20			V	1	34 9.000							34 9	34 9	
			INCREMENT =							22 3.000							22 3	22 3	832
			5.500 INCH																
2	8	D1	HEADWALL		20					22 4.000							22 4	22 4	119
2	8	D2	HEADWALL		20					8 0.000							8 0	8 0	43
12	5	E1	TOE		20					3 5.000							3 5	3 5	43
12	4	F50	FLARED WINGS		15			V	2	3 1.250	17 4.500				12.750	2 11.000	20 6	20 6	
			INCREMENT =							3 1.250	4 5.125				12.750	2 11.000	7 6	7 6	112
			31.250 INCH																
12	4	F51	BTM SLAB		20			V	2	18 0.000							18 0	18 0	
			INCREMENT =							2 0.000							2 0	2 0	80
			38.375 INCH																
12	4	F52	STRGHT WINGS		20			V	2	19 1.000							19 1	19 1	
			INCREMENT =							7 0.000							7 0	7 0	105
			29.000 INCH																
4	4	F53	BTM SLAB		20					21 3.000							21 3	21 3	57
3	4	F54	BTM SLAB		20					20 3.000							20 3	20 3	41
19	4	F55	BTM SLAB		20					20 3.000							20 3	20 3	257
36	5	G1	INT WALLS		20			V	2	10 3.000							10 3	10 3	
			INCREMENT =							2 5.000							2 5	2 5	238
			5.500 INCH																
38	5	G2	EXT WALLS		20			V	2	10 2.000							10 2	10 2	
			INCREMENT =							2 5.000							2 5	2 5	249
			5.125 INCH																
29	6	H3	BTM SLAB		20					7 10.000							7 10	7 10	341
4	7	J1	STRGHT WINGS		20					22 10.000							22 10	22 10	187
8	7	J6	FLARED WINGS		20					23 10.000							23 10	23 10	390
56	5	J5	EXT WINGS		19			V	2	10 0.625	2 10.000						12 11	12 9	
			INCREMENT =							2 5.500	2 10.000						5 4	5 2	523
			3.375 INCH																
24	5	R1	HEADWALL		27	S				17.000	13.875	5.875	2 2.375		4.125	4.125	5 3	5 1	127
24	5	R2	HEADWALL		10	S					10.500	18.000					3 3	3 1	77

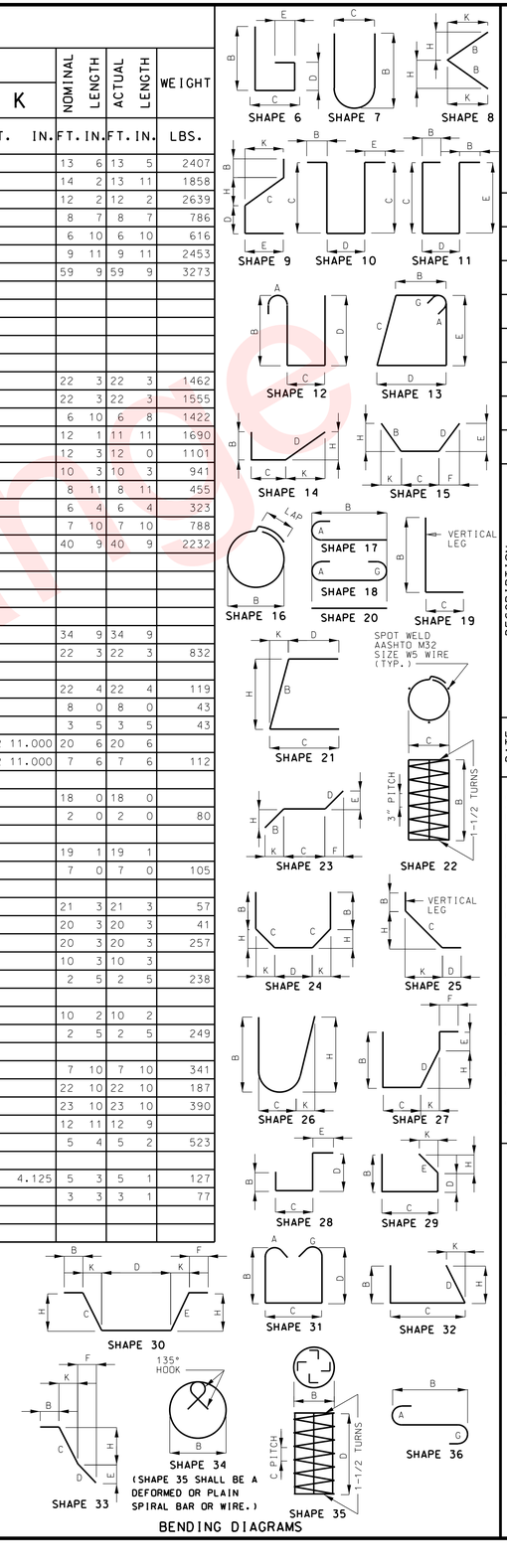
STIRRUP HOOK DIMENSIONS				
GRADES 40 - 50 - 60 KSI				
BAR SIZE	D (IN.)	90° HOOK HOOK A OR G	135° HOOK HOOK A OR G	135° HOOK APPROX. H
#4	2"	4 1/2"	4 1/2"	3"
#5	2 1/2"	6"	5 1/2"	3 3/4"
#6	4 1/2"	12"	8"	4 1/2"

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.



BENDING DIAGRAMS

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

DATE PREPARED 2/25/2010
ROUTE I-49 | STATE MO
DISTRICT BR | SHEET NO. 4
COUNTY McDONALD
JOB NO. J7P0601
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A7054

DESCRIPTION | DATE

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

Detailed Oct. 2009
Checked Oct. 2009

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

CAUTION: Currently being re-designed as a double 14'x 8' with baffled inlet

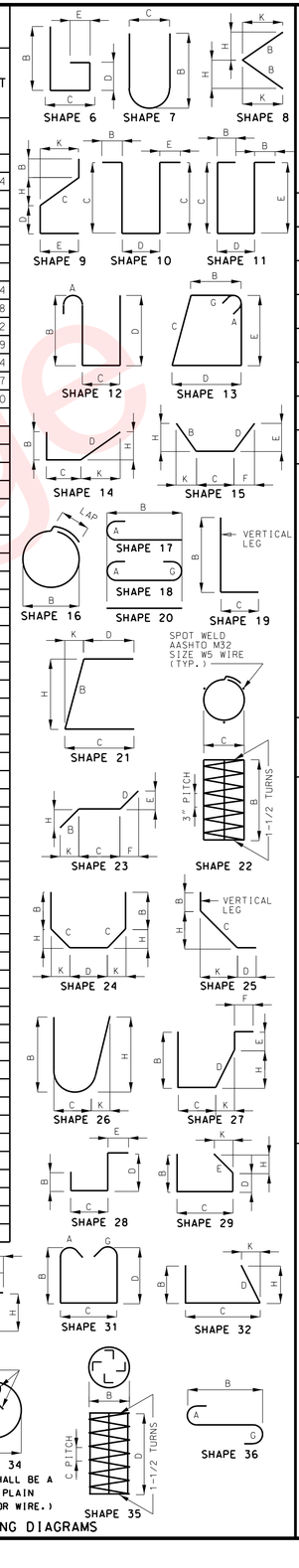
barbill_i Effective: Aug. 2008 Supercedes: Feb. 2006

BILL OF REINFORCING STEEL

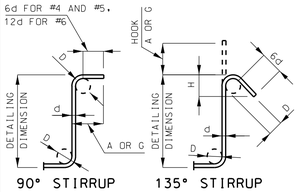
NO. REQ'D.	MARK NO. SIZE	MARK	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR. (X)	VARIES (V)	NO. EACH	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
			LOWER END																									
			SECTION																									
			(UNIT 7)																									
82	5	A1	TOP SLAB		20					22	3.000													22	3	22	3	1903
87	5	A2	BTM SLAB		20					22	3.000													22	3	22	3	2019
3	5	A3	TOP SLAB		20			V	1	15	3.000													15	3	15	3	
			INCREMENT =							2	0.000													2	0	2	0	27
			79.500 INCH																									
192	5	J3	TOP CORNER		19					3	5.875	3	4.500											6	10	6	9	1352
118	5	J4	BTM CORNER		19					9	2.750	2	10.000											12	1	11	11	1467
118	5	B1	INT WALL		10							12	000	10	3.000									12	3	12	0	1477
118	5	B2	INT WALL		20					10	3.000													10	3	10	3	1262
45	6	H1	TOP SLAB		20					8	11.000													8	11	8	11	603
45	6	H2	TOP SLAB		20					6	4.000													6	4	6	4	428
89	6	H3	BTM SLAB		20					7	10.000													7	10	7	10	1047
10	4	F60	TEMP STEEL		20					54	2.000													54	2	54	2	362
1	4	F61	TEMP STEEL		20					54	6.000													54	6	54	6	36
1	4	F62	TEMP STEEL		20					54	10.000													54	10	54	10	37
1	4	F63	TEMP STEEL		20					54	11.000													54	11	54	11	37
14	4	F64	TEMP STEEL		20					55	3.000													55	3	55	3	517
1	4	F70	TEMP STEEL		20					55	7.000													55	7	55	7	37
1	4	F71	TEMP STEEL		20					55	8.000													55	8	55	8	37
1	4	F72	TEMP STEEL		20					56	0.000													56	0	56	0	37
10	4	F73	TEMP STEEL		20					56	4.000													56	4	56	4	376
1	4	F74	TEMP STEEL		20					54	5.000													54	5	54	5	36
1	4	F75	TEMP STEEL		20					54	10.000													54	10	54	10	37
1	4	F78	TEMP STEEL		20					55	8.000													55	8	55	8	37
1	4	F79	TEMP STEEL		20					56	1.000													56	1	56	1	37
40	4	F80	TEMP STEEL		20			V	2	56	4.000													56	4	56	4	
			INCREMENT =							54	2.000													54	2	54	2	1476
			1.375 INCH																									
			LOWER WINGS																									
			AND HEADWALL																									
28	5	A2	BTM SLAB		20					22	3.000													22	3	22	3	650
4	5	A11	BTM SLAB		20			V	1	20	7.000													20	7	20	7	
			INCREMENT =							2	0.000													2	0	2	0	47
			74.375 INCH																									
2	8	D3	HEADWALL		20					22	5.000													22	5	22	5	120
2	8	D4	HEADWALL		20					8	0.000													8	0	8	0	43
12	5	E2	HEEL		20					4	0.000													4	0	4	0	50
24	4	F42	WING		20			V	4	17	9.000													17	9	17	9	
			INCREMENT =							6	0.000													6	0	6	0	190
			28.250 INCH																									
7	4	F44	BTM SLAB		20					18	9.000													18	9	18	9	88
19	4	F45	BTM SLAB		20					18	9.000													18	9	18	9	238
34	5	G1	INT WALLS		20			V	2	10	1.000													10	1	10	1	
			INCREMENT =							2	6.000													2	6	2	6	223
			5.750 INCH																									
34	5	G3	EXT WINGS		20			V	2	10	1.000													10	1	10	1	
			INCREMENT =							2	6.000													2	6	2	6	223
			5.750 INCH																									
28	6	H3	BTM SLAB		20					7	10.000													7	10	7	10	329
4	8	H10	HEADWALL		20					22	5.000													22	5	22	5	239
12	7	J1	WING		20					21	10.000													21	10	21	10	536
50	5	J7	WING		19			V	2	9	11.500	2	10.000											12	10	12	8	
			INCREMENT =							2	6.000	2	10.000											5	4	5	3	467
			3.750 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	DIMENSIONS B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	F FT.	F IN.	H FT.	H IN.	K FT.	K IN.	NOMINAL LENGTH FT.	NOMINAL LENGTH IN.	ACTUAL LENGTH FT.	ACTUAL LENGTH IN.	WEIGHT LBS.
24	5	R3	HEADWALL		10	S						17.000		18.000										4	4	4	2	104
			TOTALS																									
	4																											22864
	5																											61718
	6																											62202
	7																											6019
	8																											10284
			TOTAL																									163087
			TOTAL	E																								0



BENDING DIAGRAMS

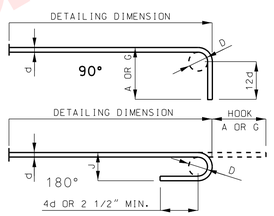


STIRRUP HOOK DIMENSIONS

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.

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

DATE PREPARED 2/25/2010
ROUTE I-49 STATE MO
DISTRICT BR SHEET NO. 5
COUNTY McDONALD
JOB NO. J7P0601
CONTRACT ID.
PROJECT NO.
BRIDGE NO. A7054

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.

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