

MISSOURI HIGHWAYS and TRANSPORTATION COMMISSION

JEFFERSON CITY, MISSOURI

**SUPPLEMENTAL PLANS TO OCTOBER 2009 MISSOURI STANDARD
PLANS FOR HIGHWAY CONSTRUCTION**

EFFECTIVE January 1, 2016

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION
TABLE OF CONTENTS

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

STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE	STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE
203.00E	EXCAVATION AND EMBANKMENT - TYPICAL DETAILS	1	08/01/1998	608.00H	PAVED APPROACHES	2	10/01/2009
203.02F	UNDERGRADING - TYPICAL DETAILS	2	01/01/2004	608.10P	CONCRETE SIDEWALK	*	04/01/2015
203.10D	TABULATED EARTHWORK AND SECTION DATA	1	02/01/2009	608.20E	CONCRETE STAIRS	*	04/01/2015
203.20F	SUPERELEVATION SPIRALS AND WIDENING (UNDIVIDED HIGHWAY)	5	04/01/2002	608.30A	CONCRETE MEDIAN STRIP	*	02/01/2011
203.21J	SUPERELEVATION SPIRALS AND WIDENING (DIVIDED HIGHWAY)	5	04/01/2002	608.40	HANDRAILING	*	04/01/2015
203.35A	MAILBOX TURNOUTS	1	08/01/1981	608.50	CURB RAMPS	*	04/01/2015
203.40G	TYPICAL DETAILS ON AND OFF RAMPS	2	10/01/2007	609.00P	CONCRETE CURB, CURB AND GUTTER AND GUTTER	*	08/01/2008
203.41F	TYPICAL DETAILS ON AND OFF RAMPS (ROADWAY WITH 6:1 FORESLOPE)	2	01/01/1995	609.15C	PAVED DITCHES	1	03/01/1993
203.50M	TYPICAL MEDIAN OPENINGS (DIVIDED HIGHWAYS)	*	07/01/2004	609.40Q	DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS	*	07/01/2015
203.61A	DRIVEWAY - TYPE I	1	07/01/2004	609.60C	ROCK DITCH LINER	1	03/01/1993
203.62C	DRIVEWAY - TYPE II	2	07/01/2004	609.70C	ROCK LINING FOR CULVERT OUTLET	1	10/01/1981
203.63A	DRIVEWAY - TYPE III	2	01/01/1992	611.60R	CONCRETE SLOPE PROTECTION	*	07/01/2015
203.64C	DRIVEWAY - TYPE IV	2	07/01/2004	612.20D	SAND FILLED IMPACT ATTENUATORS	1	08/01/2008
203.65A	DRIVEWAY - TYPE V	1	10/01/1998	613.00P	PAVEMENT REPAIR	*	06/01/2010
204.00D	EMBANKMENT CONTROL - MEASURING DEVICES	1	04/01/1983	614.10T	GRATES AND BEARING PLATES	1	12/01/2005
204.30	PORE PRESSURE MEASUREMENT DEVICES	1	03/01/1996	614.11C	CURVED VANE GRATE AND FRAME	*	06/01/2010
401.00A	TYPE A2 AND A3 SHOULDERS	2	04/01/2009	614.30E	MANHOLE FRAMES AND COVERS	2	03/01/1996
413.20	SCRUB SEAL BROOM CONFIGURATION	1	07/01/2004	616.10AQ	TEMPORARY TRAFFIC CONTROL DEVICES	*	08/01/2012
502.05N	CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15 FT. JOINT SPACING	*	07/01/2015	617.10H	PERMANENT CONCRETE TRAFFIC BARRIER	*	08/01/2012
502.10K	DOWEL SUPPORTING UNITS	*	06/01/2010	617.20D	TEMPORARY CONCRETE TRAFFIC BARRIER	*	10/01/2015
504.00J	CONCRETE APPROACH PAVEMENT	*	07/01/2015	619.10H	PAVEMENT EDGE TREATMENT	*	10/01/2015
602.00D	RIGHT-OF-WAY AND DRAIN MARKERS	2	01/01/2003	620.00J	PAVEMENT MARKING	*	12/01/2009
604.05D	PIPE CULVERT HEADWALLS - TYPE S	2	08/01/2006	620.10C	TEMPORARY PAVEMENT MARKING	*	07/01/2011
604.10E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 18" CONCRETE PIPE	1	07/01/2001	620.20	SNOWPLOWABLE RAISED PAVEMENT MARKERS	4	01/01/2003
604.11E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 24" CONCRETE PIPE	1	07/01/2001	625.00	HOLE PATTERN FOR PAVEMENT SLAB STABILIZATION	1	10/01/1998
604.12E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 30" CONCRETE PIPE	1	07/01/2001	626.00H	RUMBLE STRIPS	2	04/01/2009
604.13E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 36" CONCRETE PIPE	1	07/01/2001	702.02F	CAST-IN-PLACE CONCRETE PILES (APPROVED TYPES)	1	07/01/2004
604.14E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 42" CONCRETE PIPE	1	07/01/2001				
604.15E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 48" CONCRETE PIPE	1	07/01/2001				
604.29C	DROP INLET - TYPE X	2	04/01/1983				
604.30F	CONCRETE MANHOLES	2	04/01/1983				
604.40F	PIPE COLLARS	2	10/01/2000				
604.70	SLOTTED DRAIN	2	03/01/1994				
605.10I	PAVEMENT UNDERDRAINAGE	*	06/01/2013				
606.00AV	GUARDRAIL	*	08/01/2012				
606.01F	MEDIAN PIER PROTECTION	*	08/01/2012				
606.22T	BRIDGE ANCHOR SECTION - SAFETY BARRIER CURB ON BRIDGE	*	08/01/2012				
606.23I	BRIDGE ANCHOR SECTION (THREE BEAM RAIL ON BRIDGE)	*	08/01/2012				
606.30G	GUARDRAIL (TERMINAL ENDS CRASHWORTHY)	*	11/01/2012				
606.40D	ONE-STRAND ACCESS RESTRAINT CABLE	2	07/01/2004				
606.41J	THREE-STRAND GUARD CABLE	*	01/01/2005				
607.10V	CHAIN-LINK FENCE	1	02/01/2007				
607.11H	CHAIN-LINK FENCE FOR RETAINING WALLS	1	06/01/2009				
607.20F	WOVEN WIRE FENCE	2	10/01/1998				

* REVISED OR ADDED SINCE OCTOBER 2009

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MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION TABLE OF CONTENTS

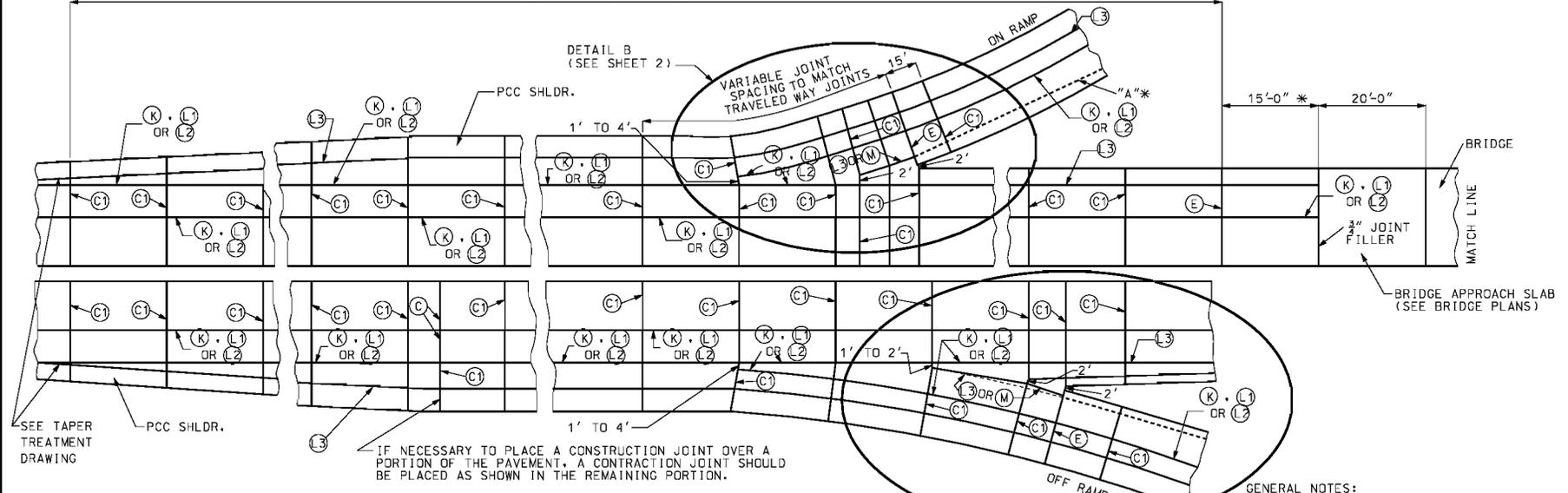
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703.10J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (SQUARED)	*	3	07/01/2015	901.80D	HIGHWAY LIGHTING - POWER SUPPLY ASSEMBLY - SECONDARY SERVICE	2	04/01/2002	
703.11J	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (SQUARED)	*	3	07/01/2015	901.85A	HIGHWAY LIGHTING SYMBOLS	1	01/01/2003	
703.12J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (LEFT ADVANCE)	*	3	07/01/2015	902.00N	TRAFFIC SIGNALS - SIGNAL HEAD MOUNTING	*	2	07/01/2015
703.13J	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (LEFT ADVANCE)	*	3	07/01/2015	902.10Q	TRAFFIC SIGNALS - CONTROLLERS CONDUIT LOCATION	1	04/01/2005	
703.14J	CONCRETE SINGLE BOX CULVERT - STRAIGHT WINGS (RIGHT ADVANCE)	*	3	07/01/2015	902.15K	TRAFFIC SIGNALS - POWER SUPPLY ASSEMBLY	3	07/01/2004	
703.15E	CONCRETE SINGLE BOX CULVERT - FLARED WINGS (RIGHT ADVANCE)	*	3	07/01/2015	902.20G	TRAFFIC SIGNALS - CONCRETE PULL BOXES	*	3	11/01/2010
703.16	CONCRETE SINGLE BOX CULVERT - CUT SECTION	*	1	04/01/2011	902.21C	TRAFFIC SIGNALS - TELEPHONE INTERCONNECT	1	03/01/1996	
703.17	CONCRETE SINGLE BOX CULVERT - MEMBER SIZES AND REINFORCEMENT	*	14	04/01/2011	902.30P	TRAFFIC SIGNALS - POST BASES	*	2	02/01/2008
703.37C	CONCRETE BOX CULVERT - EXTERIOR WING REINFORCEMENT	*	2	04/01/2011	902.40Q	TRAFFIC SIGNALS - TUBULAR STEEL POSTS	*	3	02/01/2008
703.38A	CONCRETE BOX CULVERT - CUTTING DETAILS		2	10/01/2009	902.50L	TRAFFIC SIGNALS - INDUCTION LOOP DETECTORS	2	06/01/2009	
703.40H	CONCRETE DOUBLE BOX CULVERT - STRAIGHT WINGS (SQUARED)	*	3	10/01/2011	902.70P	TRAFFIC SIGNALS - RIGID SPAN WIRE DETAILS	2	02/01/2008	
703.41H	CONCRETE DOUBLE BOX CULVERT - FLARED WINGS (SQUARED)	*	3	10/01/2011	902.80K	TRAFFIC SIGNALS - TRAFFIC SIGNAL SYMBOLS	*	1	07/01/2015
703.42H	CONCRETE DOUBLE BOX CULVERT - STRAIGHT WINGS (LEFT ADVANCE)	*	3	10/01/2011	903.01H	SPECIAL SIGNING CHARACTERS	1	07/01/2004	
703.43H	CONCRETE DOUBLE BOX CULVERT - FLARED WINGS (LEFT ADVANCE)	*	3	10/01/2011	903.02AL	HIGHWAY SIGNING STRUCTURAL SIGNS	*	19	02/01/2012
703.44H	CONCRETE DOUBLE BOX CULVERT - STRAIGHT WINGS (RIGHT ADVANCE)	*	3	10/01/2011	903.03BH	SIGN MOUNTING DETAILS	*	11	02/01/2012
703.45C	CONCRETE DOUBLE BOX CULVERT - FLARED WINGS (RIGHT ADVANCE)	*	3	10/01/2011	903.04F	HIGHWAY SIGNING - WEIGH STATION	*	1	02/01/2012
703.46	CONCRETE BOX CULVERT - CUT SECTION	*	1	10/01/2011	903.05H	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE S, ONE TUBE	2	04/01/2005	
703.47	CONCRETE BOX CULVERT - MEMBER SIZES AND REINFORCEMENT	*	27	10/01/2011	903.06H	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE S, TWO TUBE	2	04/01/2005	
703.60E	CONCRETE BOX STRUCTURE - PIPE INLET		1	07/01/2001	903.07H	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE C	2	04/01/2005	
703.80H	CONCRETE TRIPLE BOX CULVERT - STRAIGHT WINGS (SQUARED)	*	3	12/01/2011	903.08G	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE B	2	04/01/2005	
703.81H	CONCRETE TRIPLE BOX CULVERT - FLARED WINGS (SQUARED)	*	3	12/01/2011	903.10BB	OVERHEAD SIGN TRUSSES - ALUMINUM	*	6	10/01/2011
703.82H	CONCRETE TRIPLE BOX CULVERT - STRAIGHT WINGS (LEFT ADVANCE)	*	3	12/01/2011	903.12Y	OVERHEAD SIGN TRUSSES - BUTTERFLY AND CANTILEVER STRUCTURAL STEEL	*	7	12/01/2008
703.83H	CONCRETE TRIPLE BOX CULVERT - FLARED WINGS (LEFT ADVANCE)	*	3	12/01/2011	903.60AA	OVERHEAD SIGN TRUSSES - STRUCTURAL STEEL	*	5	10/01/2011
703.84H	CONCRETE TRIPLE BOX CULVERT - STRAIGHT WINGS (RIGHT ADVANCE)	*	3	12/01/2011					
703.85C	CONCRETE TRIPLE BOX CULVERT - FLARED WINGS (RIGHT ADVANCE)	*	3	12/01/2011					
703.86	CONCRETE TRIPLE BOX CULVERT - CUT SECTION	*	1	12/01/2011					
703.87	CONCRETE TRIPLE BOX CULVERT - MEMBER SIZES AND REINFORCEMENT	*	27	12/01/2011					
706.35H	BAR SUPPORTS FOR CONCRETE REINFORCEMENT		1	07/01/2004					
712.40J	STEEL DAMS AT EXPANSION DEVICES		1	07/01/2004					
725.00C	CORRUGATED METAL PIPE INSTALLATION METHODS	*	5	04/01/2011					
725.31C	METAL CURTAIN WALL AND METAL INLETS		1	07/01/2004					
726.30J	RIGID CULVERT INSTALLATION METHODS	*	2	04/01/2015					
730.00E	THERMOPLASTIC PIPE INSTALLATION METHODS	*	1	04/01/2015					
731.00T	PRECAST MANHOLES		2	10/01/1998					
731.10R	PRECAST DROP INLET		8	12/01/2005					
732.00R	FLARED END SECTION	*	3	01/01/2016					
732.05C	BEVELED PIPE END TREATMENT		2	07/01/2004					
732.10H	SAFETY SLOPE END SECTION	*	3	06/01/2013					
806.10J	TEMPORARY EROSION CONTROL MEASURES	*	6	04/01/2015					
808.00	TYPICAL PLANTING ILLUSTRATIONS		3	07/01/2004					
901.00AA	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 30' M.H.	*	4	12/01/2013					
901.01AH	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 45' M.H.	*	6	12/01/2013					
901.02B	HIGHWAY LIGHTING - CABLE, CONDUIT AND TRENCHING		1	04/01/2002					
901.30F	HIGHWAY LIGHTING - BASE MOUNTED CONTROL STATION		2	04/01/2005					

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TRANSVERSE JOINT SPACING 15'-0" (MAX.)



INTERCHANGE

DETAIL A (SEE SHEET 2)

GENERAL NOTES:

ALL TRANSVERSE JOINTS ON SHOULDERS SHALL BE (3). THE CONTRACTOR SHALL DETERMINE THE PAVING WIDTH.

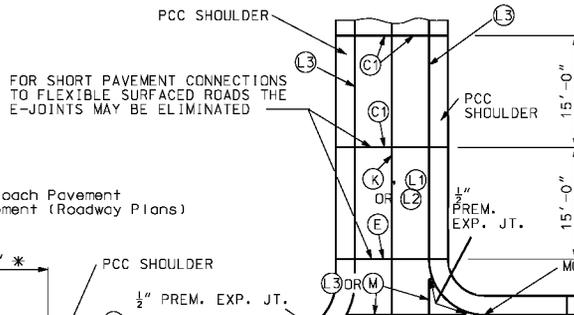
(3) SHALL BE USED BETWEEN PAVEMENT AND SHOULDER GREATER THAN 4'. THE INTERCHANGE WILL EXTEND FROM THE BEGINNING OF THE ACCELERATION/DECELERATION LANE TO THE GORE RETURN TAPER ON THE MAINLINE. THE INTERCHANGE WILL ALSO INCLUDE THE RAMP UP TO THE BEGINNING OF THE RADIUS WITH THE ROAD INTERSECTING THE RAMP.

FOR JOINT DETAILS, SEE SHEETS NO. 3 & 4.

THE JOINT LAYOUT OF RAMP IS TYPICAL FOR OUTER RAMP OF CLOVERLEAF AND DIAMOND INTERCHANGES. SEE OTHER DRAWINGS FOR SPECIAL JOINT LAYOUTS.

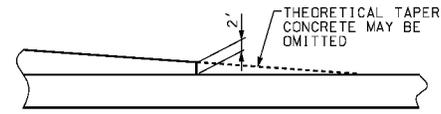
JOINT SPACING SHOWN IS MAXIMUM AND IS TO BE REDUCED TO AVOID CONFLICT WITH ABUTTING STRUCTURES. JOINTS IN MULTI-LANE PAVEMENT ARE TO BE CONTINUOUS.

ALL SHOULDERS 4' OR LESS IN WIDTH CAST MONOLITHICALLY WITH THE ADJACENT LANE AND SHALL NOT HAVE A LONGITUDINAL JOINT OR TIE BARS.

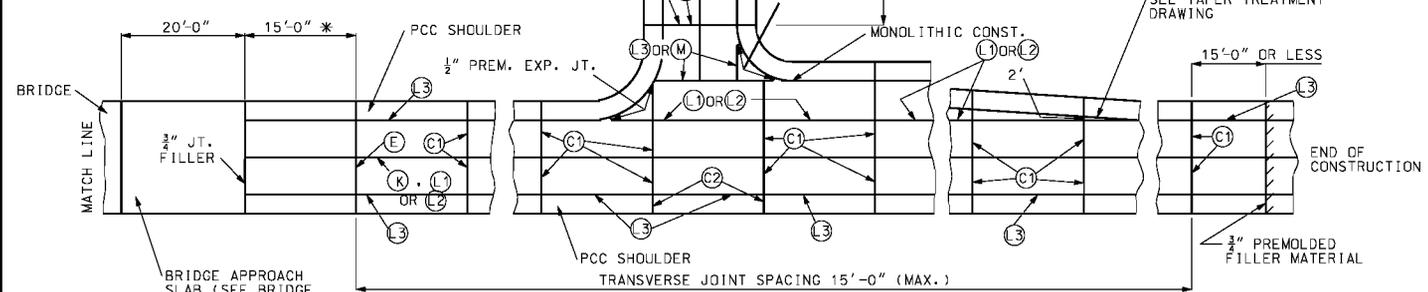


FOR SHORT PAVEMENT CONNECTIONS TO FLEXIBLE SURFACED ROADS THE E-JOINTS MAY BE ELIMINATED

* Concrete Approach Pavement or N/R PCC Pavement (Roadway Plans)



TAPER TREATMENT



NON-INTERCHANGE

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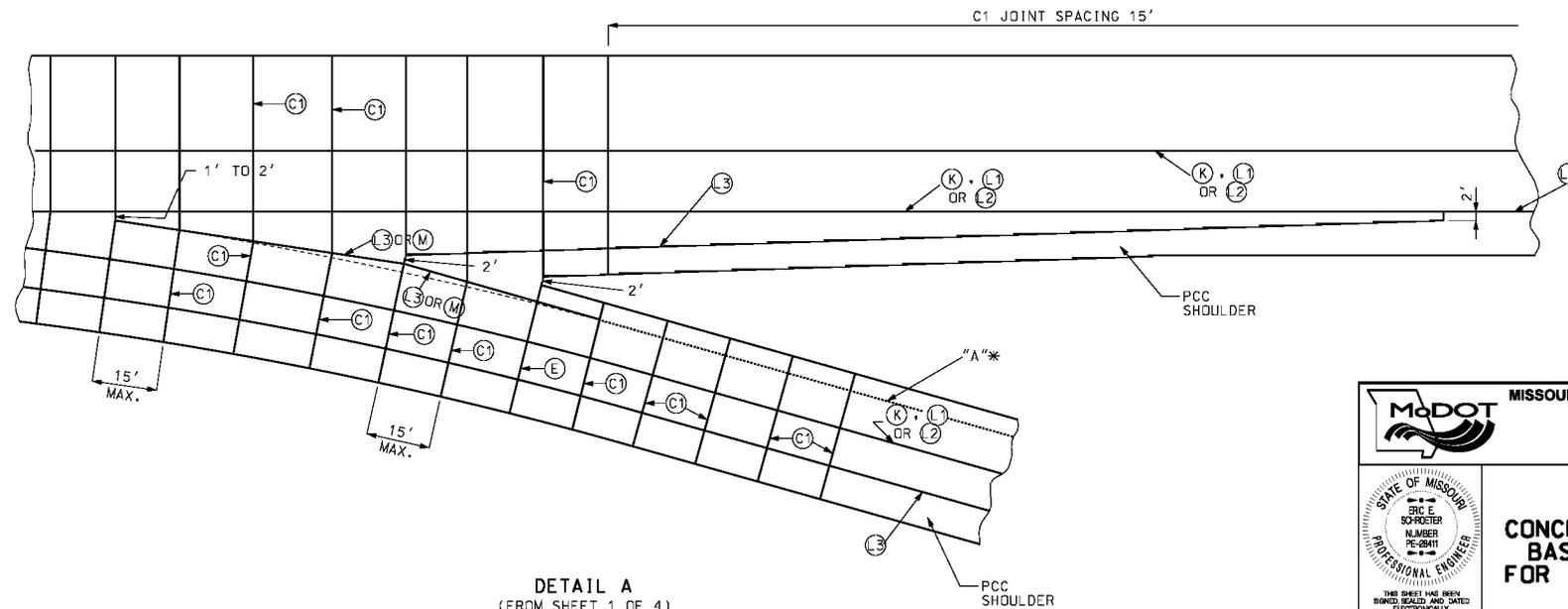
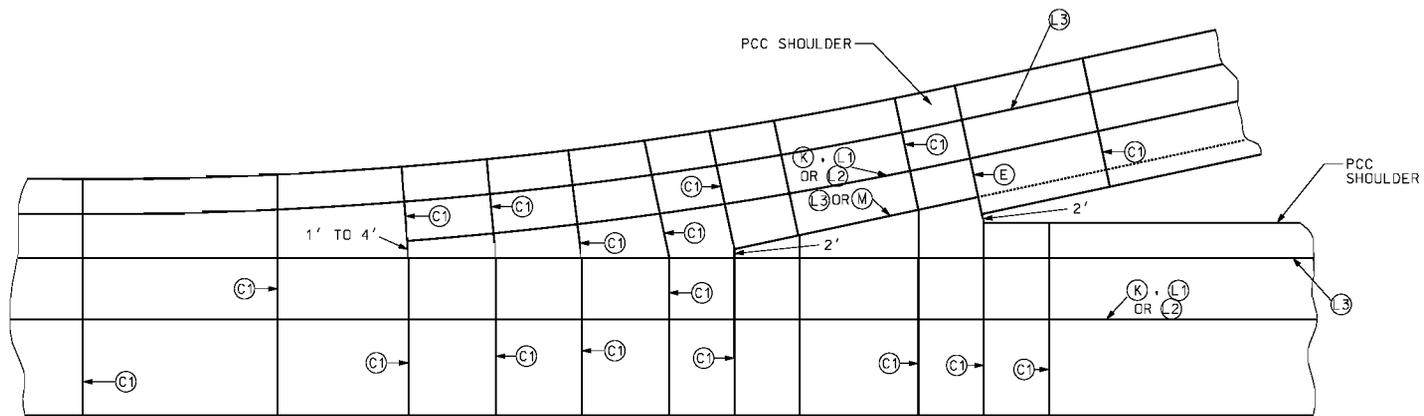
 105 WEST CAPITOL
 JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI
 ERIC E. SCHROETER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING

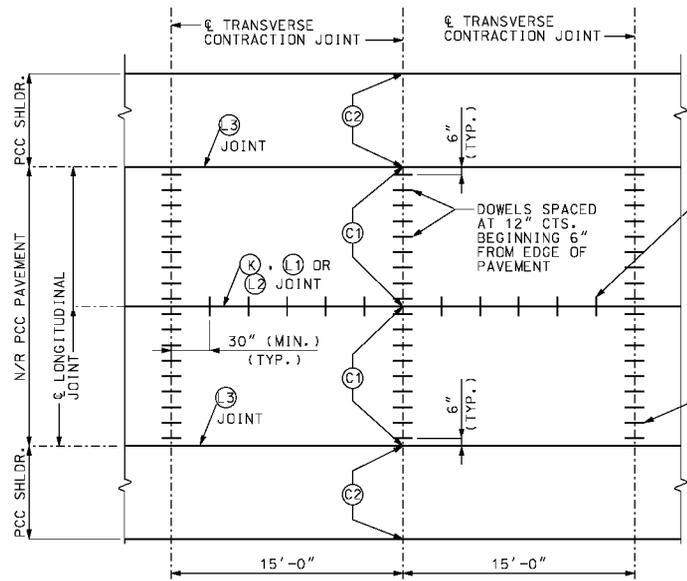
DATE EFFECTIVE:	07/01/2015	502.05N	ROW:	5/29/2015	SHEET NO.
DATE PREPARED:	5/29/2015		1 OF 4		

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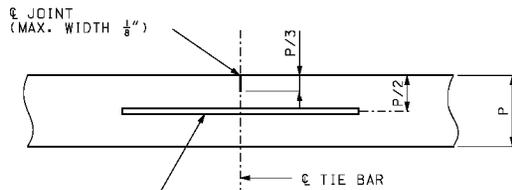
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING	
STATE OF MISSOURI ERIC E. SCHROETER NUMBER PE-28411 PROFESSIONAL ENGINEER <small>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</small>	DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/29/2015	502.05N SHEET NO. 2 OF 4

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



JOINT PLAN AND SPACING FOR CONTRACTION JOINTS (1)

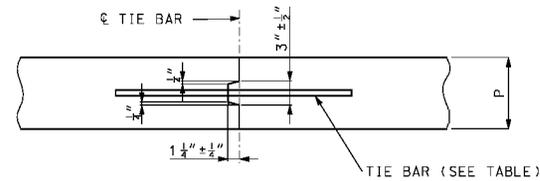
(1) LONGITUDINAL JOINT NOT REQUIRED AT INSIDE SHOULDER ON DIVIDED HIGHWAYS OR AT INSIDE SHOULDER OF RAMPS. FOR 4' OR LESS INSIDE SHOULDERS, DOWELS ARE REQUIRED FOR THE FIRST TWO FEET ADJACENT TO THE TRAVEL LANE.



TIE BARS REQUIRED.

LONGITUDINAL JOINT (L1)

TIE BAR AND DOWEL TABLE				
PCCP THICKNESS (P)	DOWEL SIZE	TIE BAR SIZE	DOWEL SPACING	TIE BAR SPACING
LESS THAN 7"	NONE	#5X30"	NONE	30" CTR.-CTR.
7" TO 10"	1 1/2"X18"	#5X30"	12" CTR.-CTR.	30" CTR.-CTR.
GREATER THAN 10"	1 1/2"X18"	#6X40"	12" CTR.-CTR.	30" CTR.-CTR.



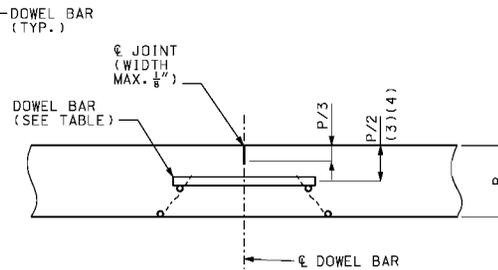
IF METAL IS USED TO FORM KEY DISCONTINUE STRIP FOR DISTANCE OF APPROXIMATELY 3" EACH SIDE OF TRANSVERSE JOINT.

TYPE (K) REQUIRES TIE BAR.

TYPE (M) CONSTRUCTED WITHOUT TIE BARS.

(K) AND (M) JOINTS SHALL NOT BE SAWS.

TONGUE AND GROOVE JOINTS (K) AND (M)



DOWELS REQUIRED. FOR PERMISSIBLE TYPES OF DOWELS SUPPORTING UNITS. SEE OTHER DRAWINGS.

TRANSVERSE CONTRACTION JOINTS FOR CONCRETE PAVEMENT OR BASE WIDENING SHALL MATCH EXISTING JOINTS.

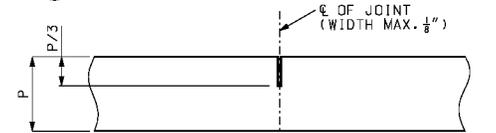
TRANSVERSE CONTRACTION JOINT (C1) (2)

- (2) DOWEL BARS ARE REQUIRED FOR ALL PAVEMENTS HAVING THE SAME THICKNESS AS THE TRAVELED WAY.
- (3) FOR PAVEMENTS HAVING THICKNESS IN 1/2" INCREMENTS, DOWEL BASKETS SHALL BE P/2 - 1/2".
- (4) DOWEL BARS MAY BE PLACED BY MECHANICAL MEANS AT THE OPTION OF THE CONTRACTOR.

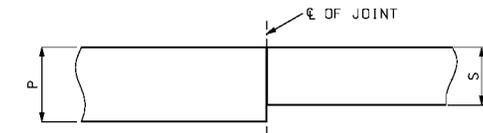


TIE BARS REQUIRED.

LONGITUDINAL CONSTRUCTION JOINT (L2)



TRANSVERSE CONTRACTION JOINT (C2)



LONGITUDINAL CONSTRUCTION JOINT FOR SHOULDER (L3)

S = SHOULDER THICKNESS

GENERAL NOTES:

THE FINAL POSITION OF ALL DOWELS AND TIE BARS SHALL BE PERPENDICULAR TO THE PLANE OF THE JOINT AND PARALLEL TO THE SURFACE OF THE PAVEMENT AND PARALLEL TO EACH OTHER.

(L3) JOINT FOR FULL DEPTH OR PARTIAL DEPTH SHOULDERS.

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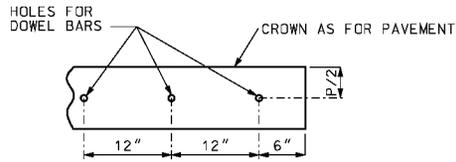
STATE OF MISSOURI
 ERIC E. SCHROETER
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 PROFESSIONAL ENGINEER

CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING

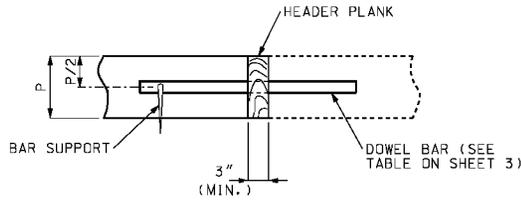
DATE EFFECTIVE: 07/01/2015
 DATE PREPARED: 5/29/2015

502.05N

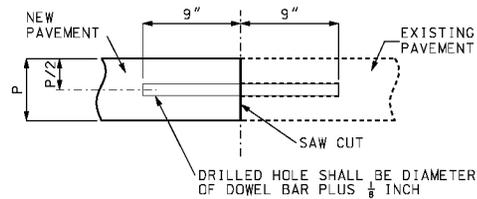
SHEET NO.
 3 OF 4



PART ELEVATION OF HEADER PLANK



HEADER SECTION



SAWED SECTION

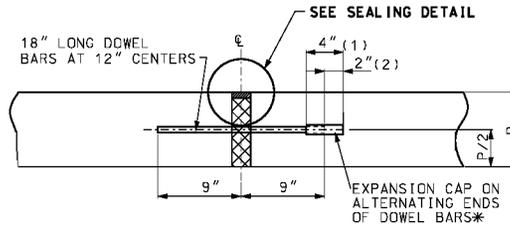
THE HEADER BOARD SHALL BE SUFFICIENTLY RIGID TO PREVENT DISTORTION FROM THE TYPICAL SECTION AND MAINTAIN A STRAIGHT LINE FROM PAVEMENT EDGE TO PAVEMENT EDGE.

THE CONSTRUCTION JOINT MAY BE SAWED FULL DEPTH. HOLES FOR DOWEL BARS SHALL BE DRILLED AFTER THE CONCRETE HAS SUFFICIENT SET TO PREVENT DAMAGE. DOWEL BARS SHALL BE BONDED INTO THE HOLES.

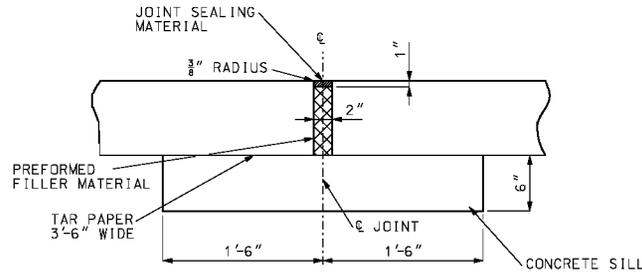
BONDING FOR DOWEL BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

THE PORTION OF THE DOWEL OUTSIDE THE HOLE SHALL BE COATED WITH AN APPROVED LUBRICANT.

CONSTRUCTION JOINT (C)



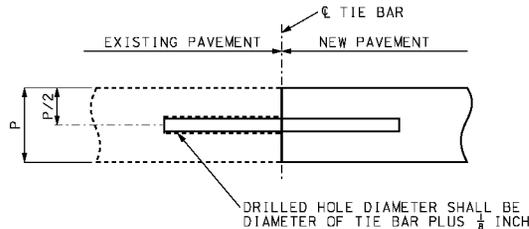
EXPANSION JOINTS (E)



SILL SHALL EXTEND 18" BEYOND EACH EDGE OF THE PAVEMENT AND SHALL BE CONSTRUCTED OF CONCRETE REGARDLESS OF ADJACENT BASE MATERIAL.

ALTERNATE EXPANSION JOINTS (E)

(CONTRACTOR MAY SELECT EITHER EXPANSION JOINT (E))



LONGITUDINAL CONSTRUCTION JOINT (EXISTING PAVEMENT) (L)

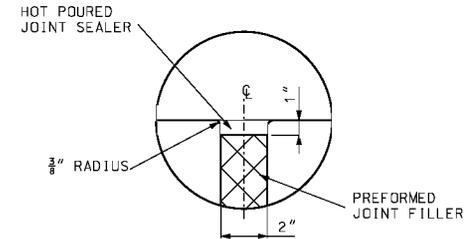
TIE BARS SHALL BE EPOXY COATED, DEFORMED REINFORCING BARS MEETING THE REQUIREMENTS OF SECTIONS 710 AND 1057.

BONDING FOR TIE BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

TIE BAR SIZE AND LENGTH SHALL BE BASED ON THE THICKNESS OF THE THINNER PAVEMENT OR SHOULDER TO BE TIED TOGETHER.

- (1) LENGTH OF CAP
- (2) GAP BETWEEN END OF CAP AND DOWEL.

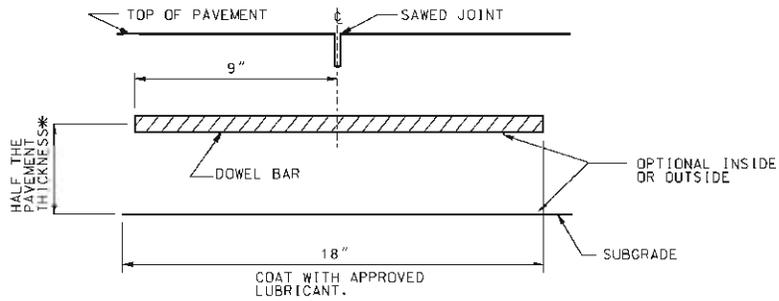
* FOR EXPANSION JOINTS FORMED USING A CONSTRUCTION HEADER, THE EXPANSION CAPS SHALL BE INSTALLED ON THE EXPOSED END OF EACH BAR ONCE THE HEADER HAS BEEN REMOVED AND THE JOINT FILLER MATERIAL HAS BEEN INSTALLED.



SEALING DETAIL

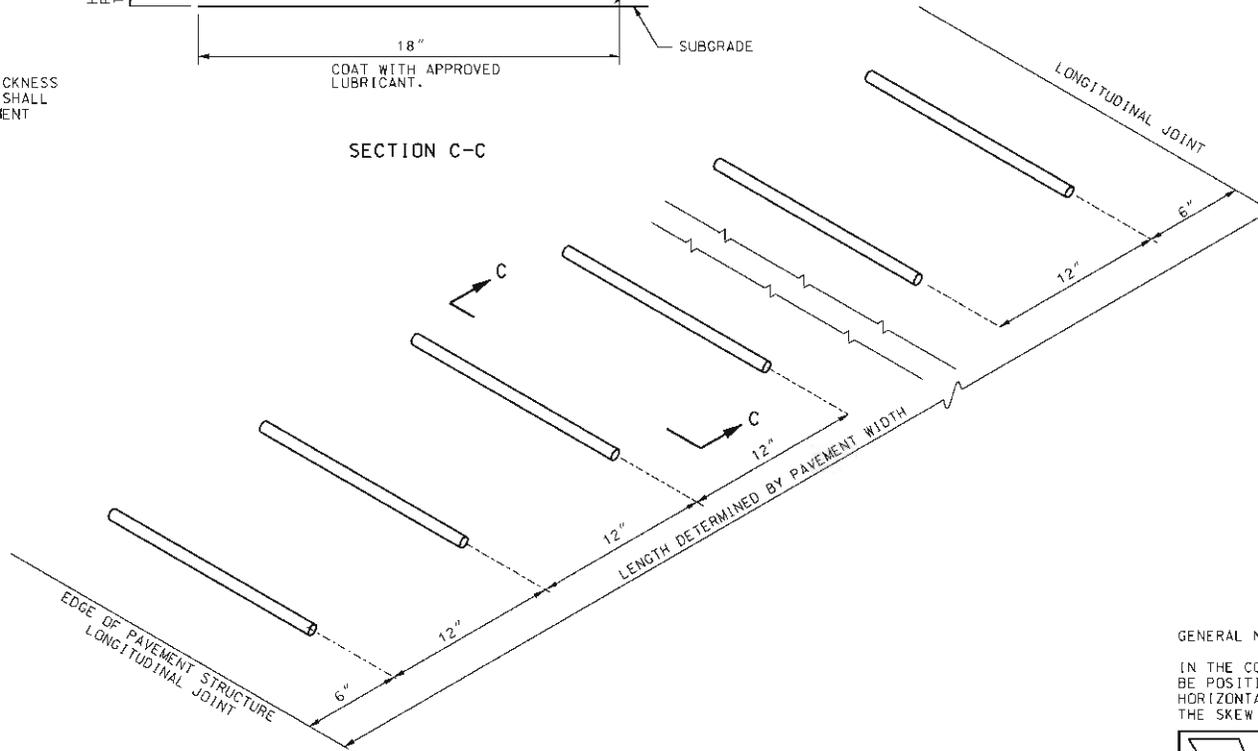
		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING	
DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/29/2015		502.05N	
		SHEET NO. 4 OF 4	

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



* FOR PAVEMENTS HAVING THICKNESS IN 1/2" INCREMENTS, DOWEL SHALL BE PLACED HALF THE PAVEMENT THICKNESS MINUS 1/4".

SECTION C-C

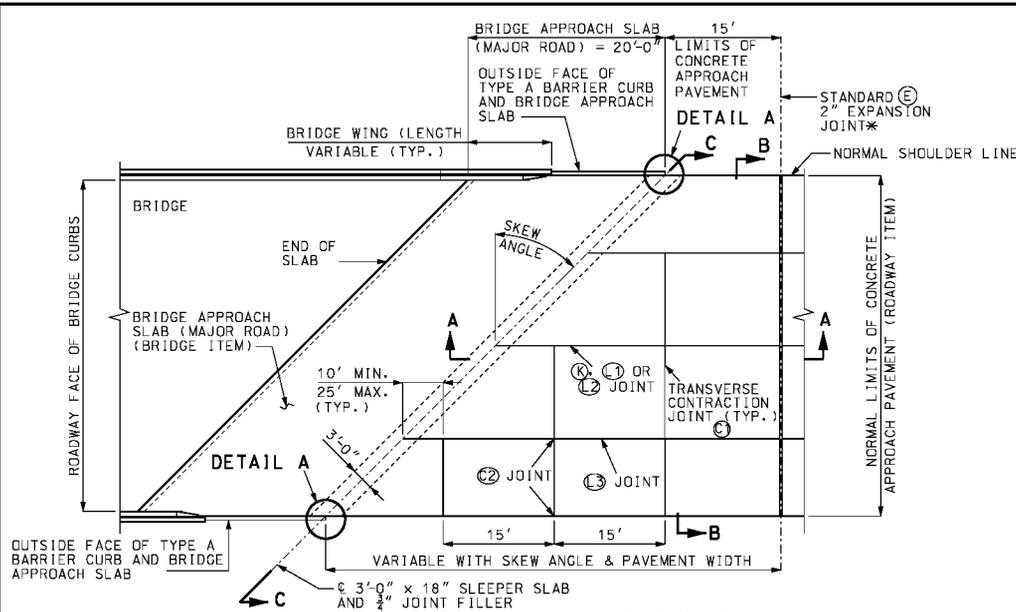


GENERAL NOTES:

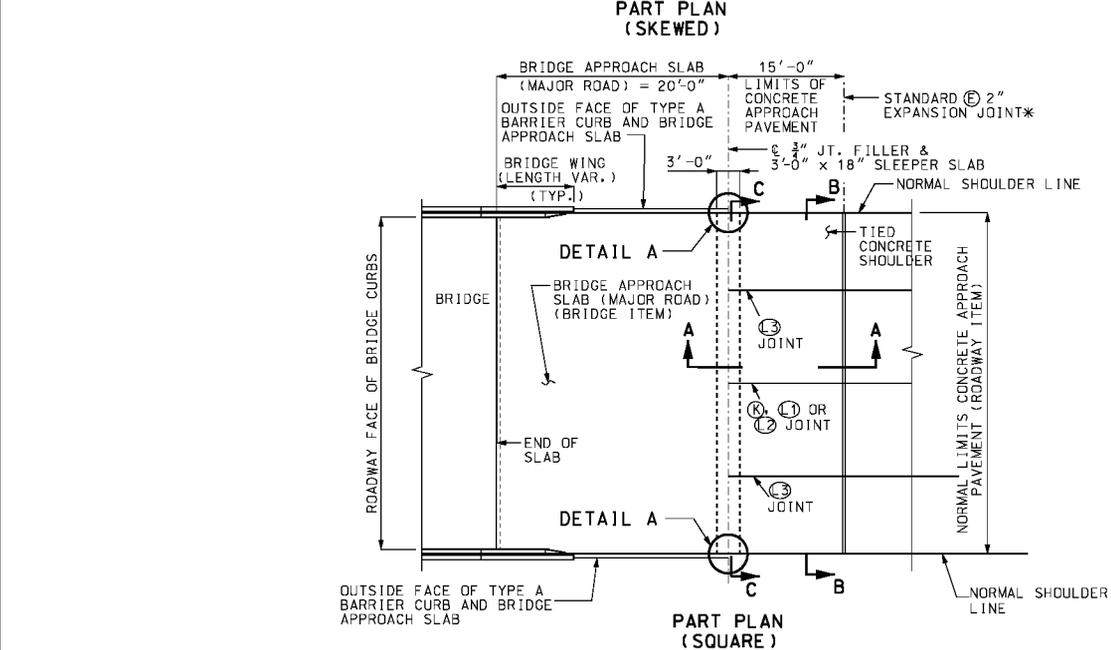
IN THE COMPLETED JOINT INSTALLATION, DOWELS SHALL BE POSITIONED WITHIN 1/2" OF THE VERTICAL AND HORIZONTAL PLANE AND IN THE LONGITUDINAL DIRECTION. THE SKEW TOLERANCE SHALL BE 1/4".

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		DOWEL SUPPORTING UNITS MECHANICAL PLACEMENT
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 5/29/2016	502.10K	SHEET NO. 2 OF 2

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



* NOT REQUIRED WHEN ADJACENT PAVEMENT IS ASPHALT.



GENERAL NOTES:

TYPE A CURB IS TO BE CONSTRUCTED WITH CONCRETE APPROACH PAVEMENT ONLY WHEN DRAIN BASINS ARE REQUIRED. TYPE A CURBS WILL BE CONSIDERED AS INCIDENTAL, AND WILL BE INCLUDED IN THE PAYMENT FOR CONCRETE APPROACH PAVEMENT.

FOR SHOULDER PAVING AND DRAIN BASINS AT BRIDGE ENDS, SEE STANDARD DRAWING NUMBER 609.40.

FOR TYPE A BARRIER CURBS, STANDARD 2" EXPANSION JOINTS, LONGITUDINAL JOINTS AND TONGUE AND GROOVE JOINTS, SEE STANDARD DRAWINGS NO. 502.00 AND 609.00.

FOR BRIDGE APPROACH SLAB, SLEEPER SLAB, AND JOINT FILLER DETAILS, SEE BRIDGE PLANS.

A PRE-FORMED FIBER EXPANSION JOINT MATERIAL SHALL BE PLACED WITH CONCRETE APPROACH PAVEMENT AND MEET THE REQUIREMENTS OF SECTION 1057 OF THE STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION.

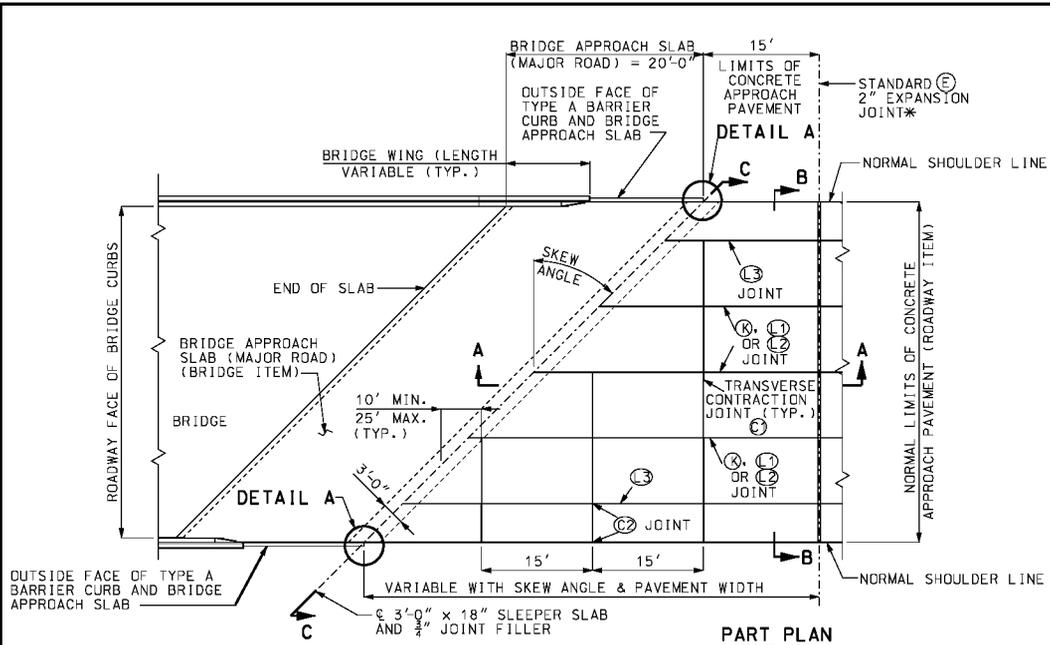
COST OF FURNISHING AND PLACEMENT OF 4" TYPE 5 AGGREGATE BASE AND 3/4" JOINT FILLER IS INCLUDED IN CONTRACT UNIT BID PRICE FOR CONCRETE APPROACH PAVEMENT.

<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
	<p>CONCRETE APPROACH PAVEMENT</p> <p>FOR TWO-LANE PAVEMENTS (MAJOR ROAD)</p>
<p>DATE EFFECTIVE: 07/01/2015</p> <p>DATE PREPARED: 5/29/2015</p>	<p>504.00J</p> <p>SHEET NO. 1 OF 3</p>

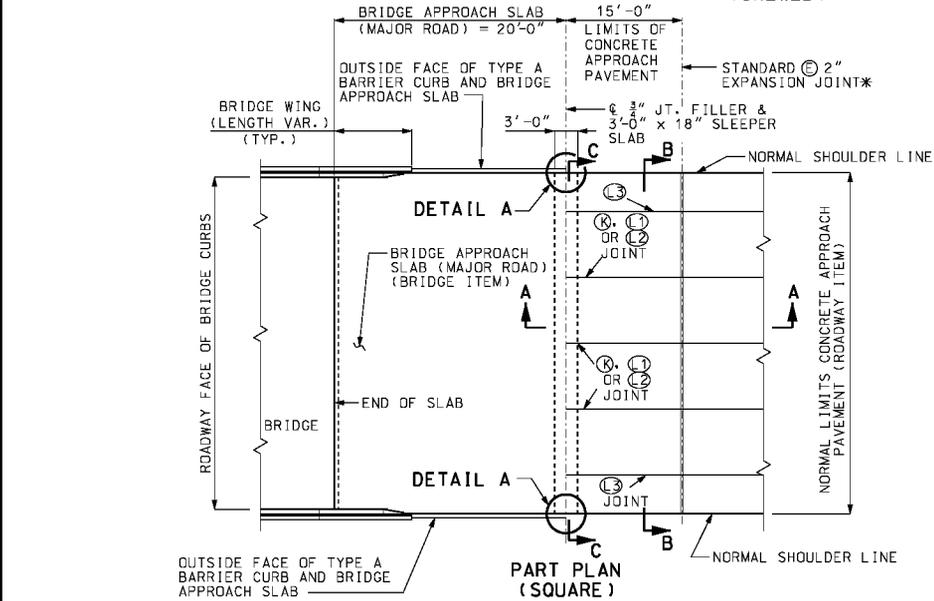
SEE SHEET 2 OF 3 FOR DETAIL A.

FOR SECTIONS A-A, B-B AND C-C, SEE SHEET 3 OF 3.

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

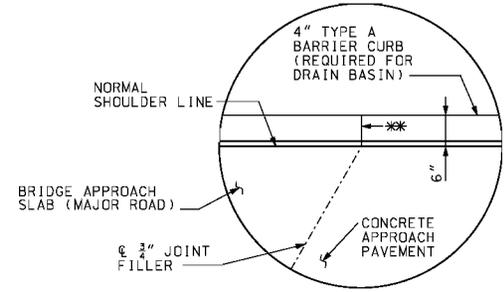


PART PLAN (SKEWED)



PART PLAN (SQUARE)

* NOT REQUIRED WHEN ADJACENT PAVEMENT IS ASPHALT.

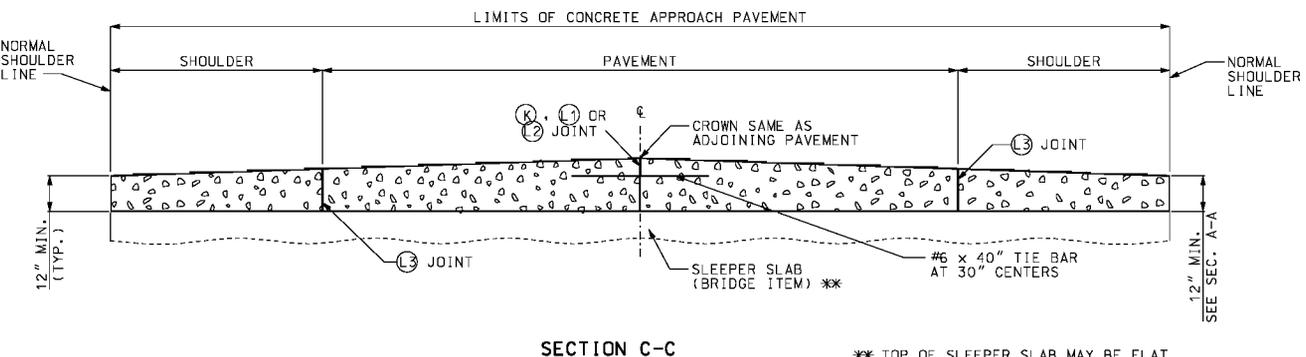
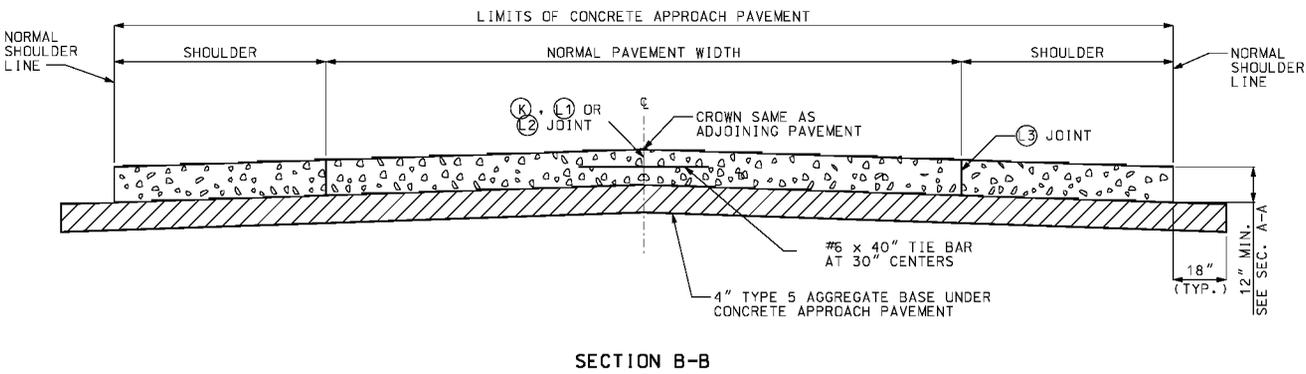
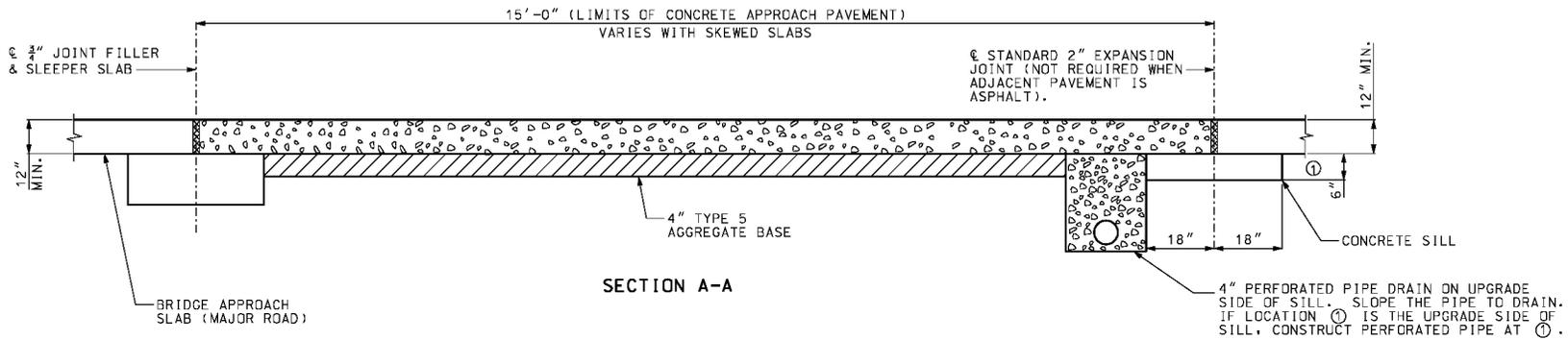


DETAIL A

** USE 3/4" JOINT FILLER BETWEEN TYPE A CURBS

NOTE:
FOR SECTIONS A-A, B-B AND C-C,
SEE SHEET 3 OF 3.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE APPROACH PAVEMENT FOR MULTI-LANE PAVEMENTS (MAJOR ROAD)
DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/29/2015	504.00J
SHEET NO. 2 OF 3	



** TOP OF SLEEPER SLAB MAY BE FLAT OR CROWNED. SEE BRIDGE PLANS.

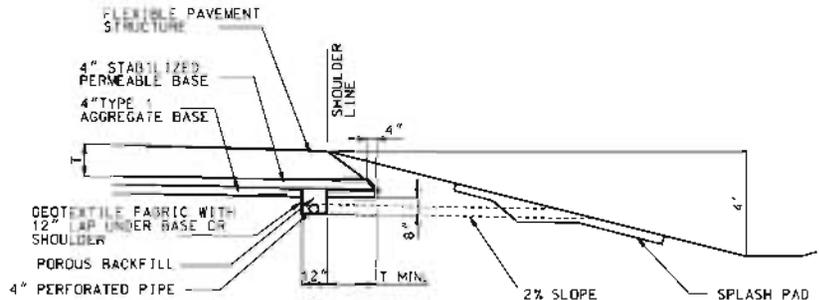
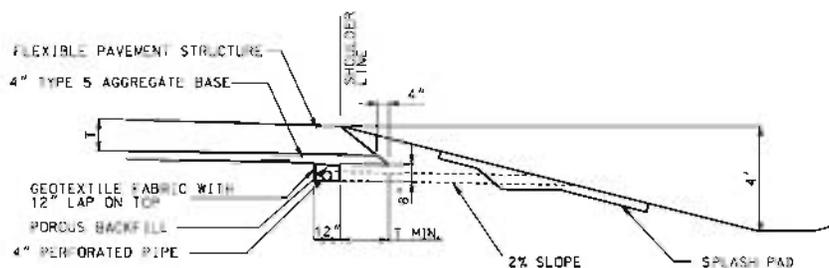
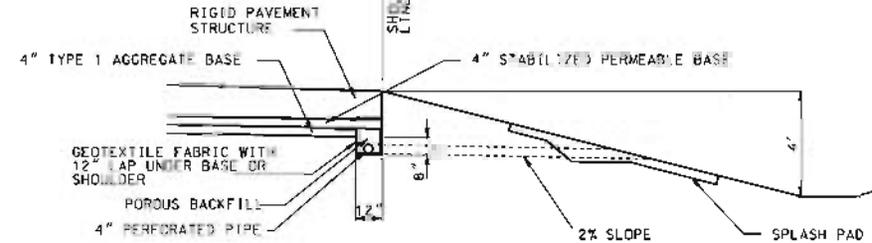
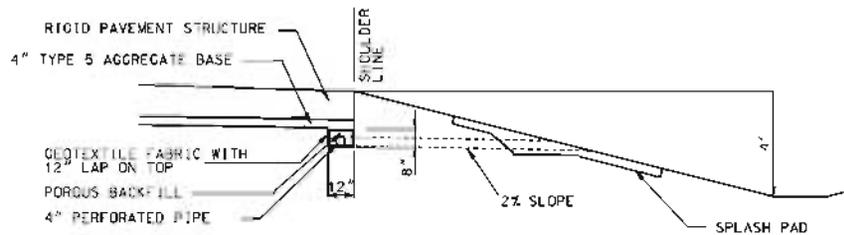
FOR LOCATIONS OF SECTIONS A-A, B-B AND C-C, SEE SHEETS 1 AND 2.

GENERAL NOTES:
SEE STANDARD DRAWING 605.10 FOR PIPE OUTLET DETAIL FROM SHOULDER POINT TO INSLOPE.

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		CONCRETE APPROACH PAVEMENT (MAJOR ROAD)	
DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/29/2015	504.00J	SHEET NO. 3 OF 3	

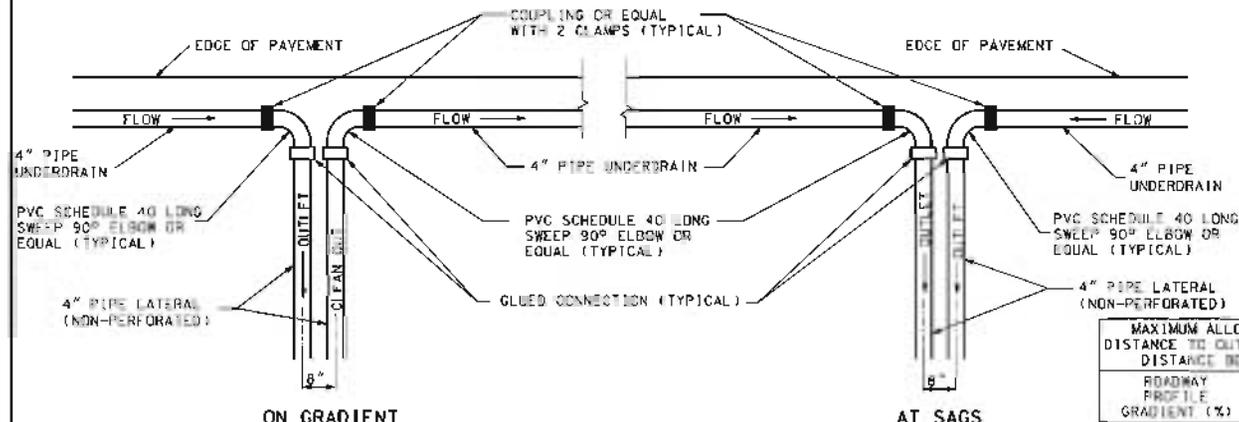
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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



MEDIUM DUTY

HEAVY DUTY



ON GRADIENT

AT SAGS

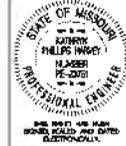
DETAIL OF PIPE AGGREGATE DRAIN OUTLETS

GENERAL NOTES:

ON SUPERELEVATED CURVES PLACE LONGITUDINAL UNDERDRAIN ON LOW SIDE ONLY.

CONSTRUCT OUTLETS AT LOW POINT OF SAG CURVE.


MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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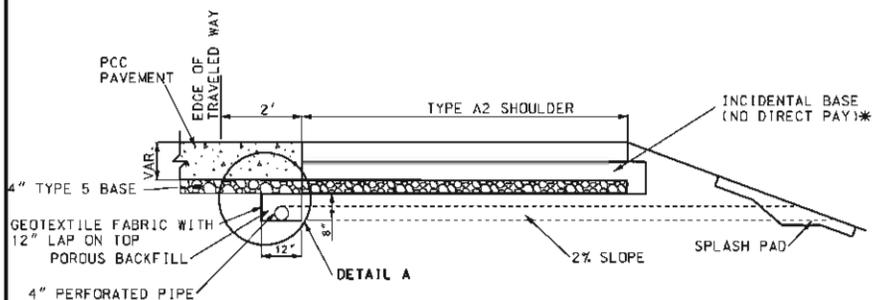
PAVEMENT UNDERDRAINAGE
PIPE AGGREGATE PAVEMENT
EDGE DRAINS FOR
FULL DEPTH SHOULDERS

MAXIMUM ALLOWABLE DRAINAGE DISTANCE TO OUTLET OR SEPARATION DISTANCE BETWEEN OUTLETS	
ROADWAY PROFILE GRADIENT (%)	DISTANCE
≤ 1	250 FT.
> 1 AND ≤ 2	375 FT.
> 2	500 FT.

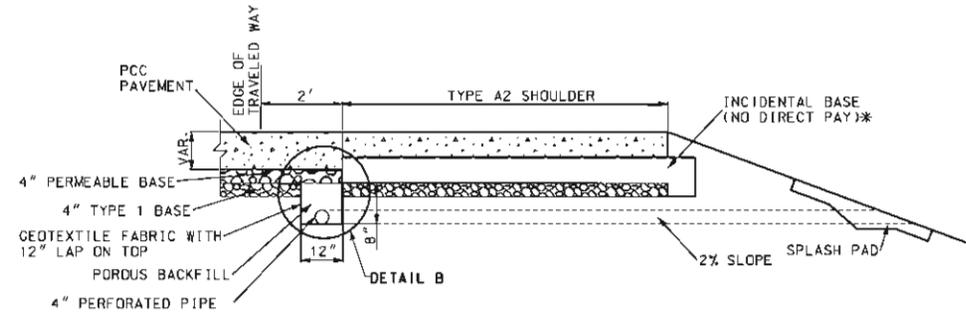
DATE EFFECTIVE: 06/01/2013
 DATE PREPARED: 4/17/2013

SHEET NO.
605.101
 1 OF 4

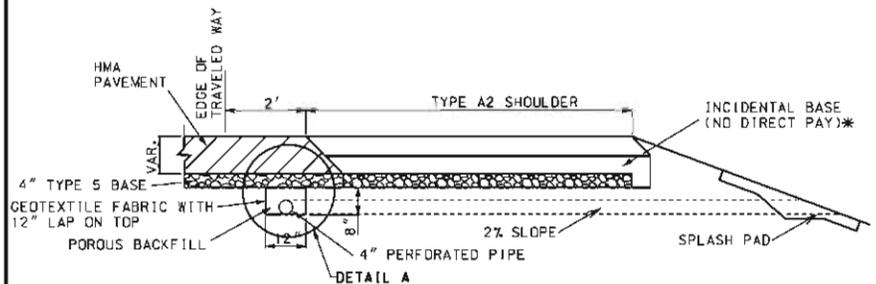
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



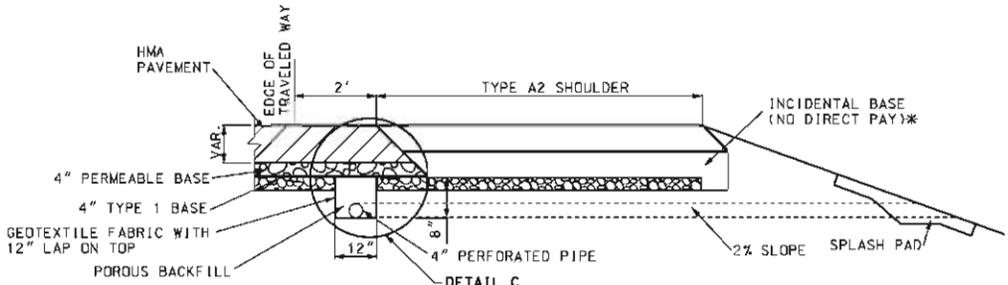
RIGID PAVEMENT WITH TYPE 5 BASE



RIGID PAVEMENT WITH PERMEABLE BASE



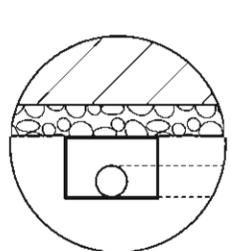
FLEXIBLE PAVEMENT WITH TYPE 5 BASE



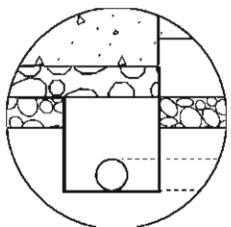
FLEXIBLE PAVEMENT WITH PERMEABLE BASE

-  PCC (PORTLAND CEMENT CONCRETE)
-  HMA (HOT MIX ASPHALT)
-  BASE

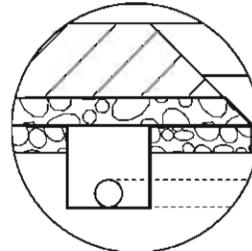
* BASE MATERIAL (ASPHALT MILLINGS, RECYCLED CONCRETE, TYPE 1 BASE, ETC.) APPROVED BY THE ENGINEER.



DETAIL A



DETAIL B

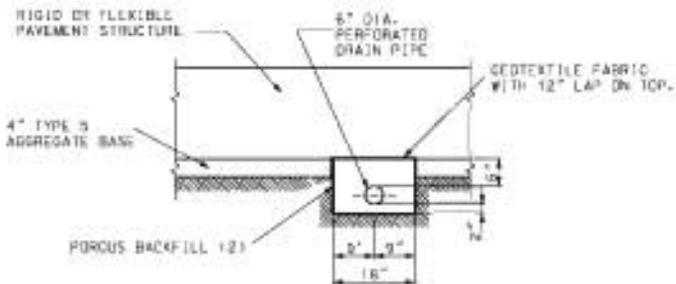


DETAIL C

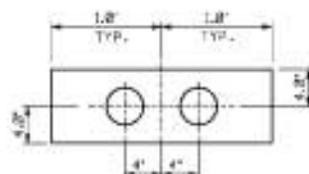
GENERAL NOTES:

SEE DETAIL OF PIPE AGGREGATE DRAIN OUTLETS ON SHEET 1.

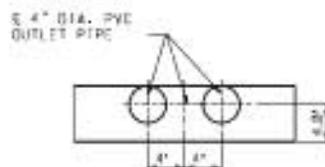
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	PAVEMENT UNDERDRAINAGE PIPE AGGREGATE PAVEMENT EDGE DRAINS FOR TYPE A2 SHOULDERS	
	DATE EFFECTIVE: 06/01/2013 DATE PREPARED: 4/1/2013	SHEET NO. 605.101 2 OF 4



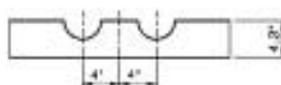
SECTION D-D
WITHOUT PERMEABLE BASE



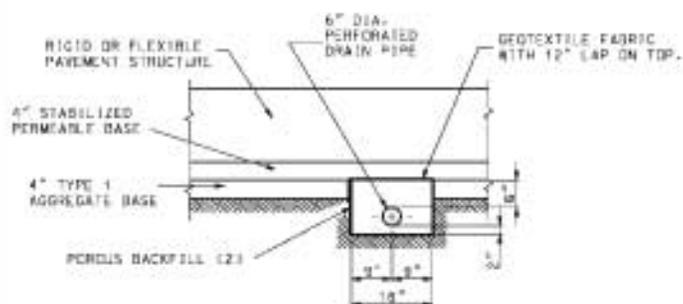
SECTION A-A



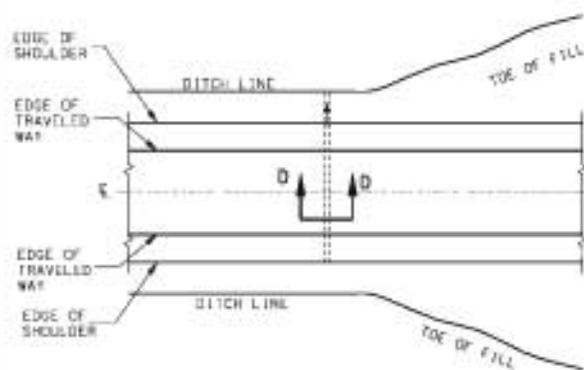
SECTION B-B



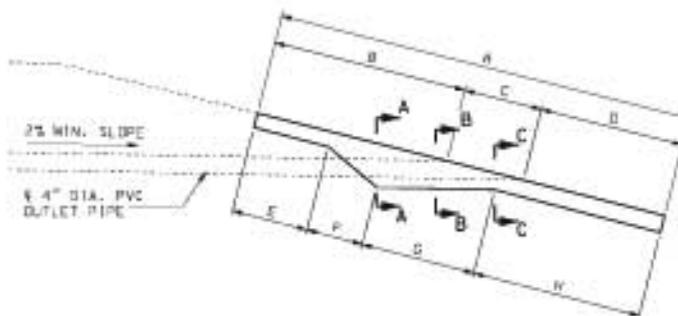
SECTION C-C



SECTION D-D
WITH PERMEABLE BASE



CROSS DRAIN



CONCRETE SPLASH PADS

ITEM	2:1	3:1	4:1	6:1
A	5.48'	5.19'	6.95'	8.58'
B	2.70'	3.01'	3.46'	4.28'
C	0.78'	1.12'	1.49'	2.30'
D	2.00'	2.00'	2.00'	2.00'
E	2.00'	2.00'	2.00'	2.00'
F	0.46'	0.61'	0.78'	1.18'
G	0.71'	1.01'	1.46'	2.27'
H	2.31'	2.51'	2.71'	3.13'
CONC.	0.15 C.Y.	0.17 C.Y.	0.20 C.Y.	0.25 C.Y.

GENERAL NOTES:

PRECAST CONCRETE SPLASH PADS MAY BE INSTALLED AS APPROVED BY THE ENGINEER.

TOP OF SPLASH PAD SHALL MATCH EXISTING CROSS SLOPE. CONSTRUCT BEND IN SPLASH PAD WHERE CROSS SLOPE CHANGES.

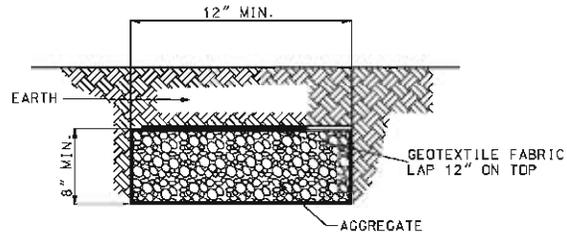
DIMENSIONS ARE APPROXIMATE AND CAN BE ADJUSTED AS DIRECTED BY THE ENGINEER.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-452-MODOT (1-888-875-6636)

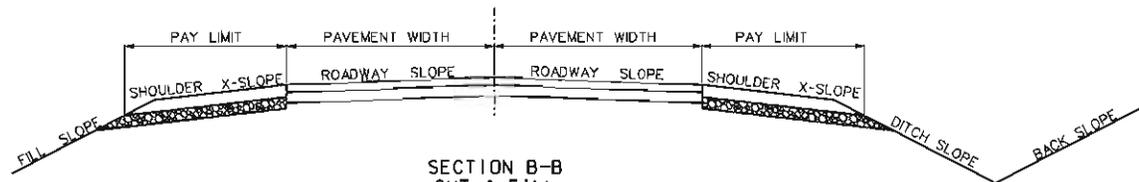


**PAVEMENT UNDERDRAINAGE
CROSS DRAINS**

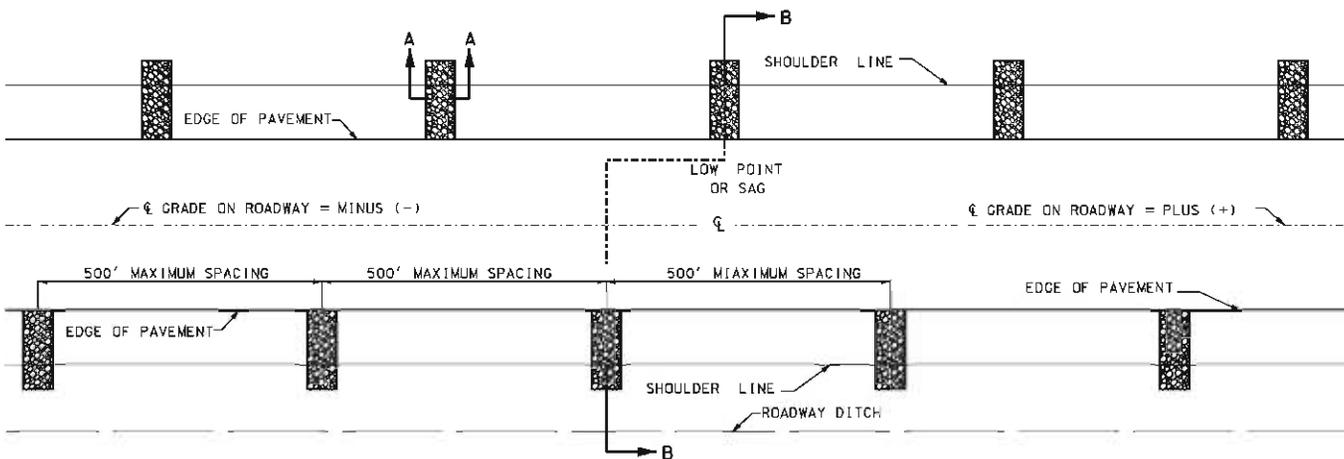
DATE EFFECTIVE: 05/01/2013
 DATE PREPARED: 4/1/2013
605.101 SHEET NO. 3 OF 4



SECTION A-A



SECTION B-B
CUT & FILL
ELEVATION



PLAN

GENERAL NOTES:

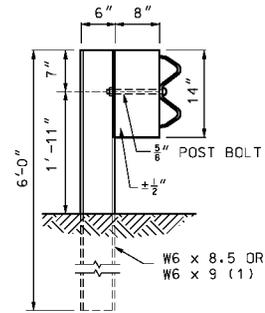
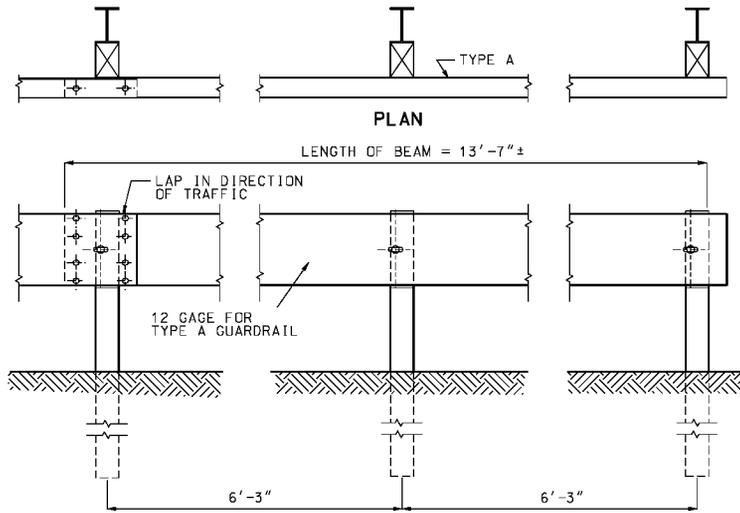
AGGREGATE UNDERDRAIN TO BE USED ONLY WHERE DESIGNATED ON PLANS.

AGGREGATE UNDERDRAIN SHALL BE PLACED AT THE LOW POINT OF THE SAG AND THE SPACING OF AGGREGATE UNDERDRAIN SHALL BE APPROX. 500'. AGGREGATE UNDERDRAINS WILL BE OMITTED ON THE CREST VERTICAL CURVES AND ON THE HIGH SIDE OF SUPERELEVATION. THE LOW SIDE OF SUPERELEVATION SPACING MAY BE DECREASED AS DIRECTED BY ENGINEER.

THE BOTTOM OF THE AGGREGATE DRAINS SHALL BE AT OR BELOW THE BOTTOM OF THE PAVEMENT'S AGGREGATE SUBBASE AT THE POINT OF CONTACT. THE TOP OF THE AGGREGATE DRAINS SHALL BE NO HIGHER THAN THE BOTTOM OF THE SHOULDER'S AGGREGATE BASE.

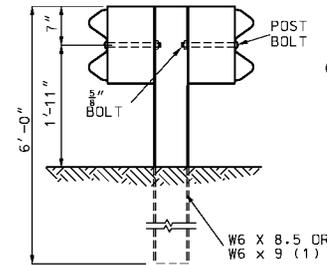
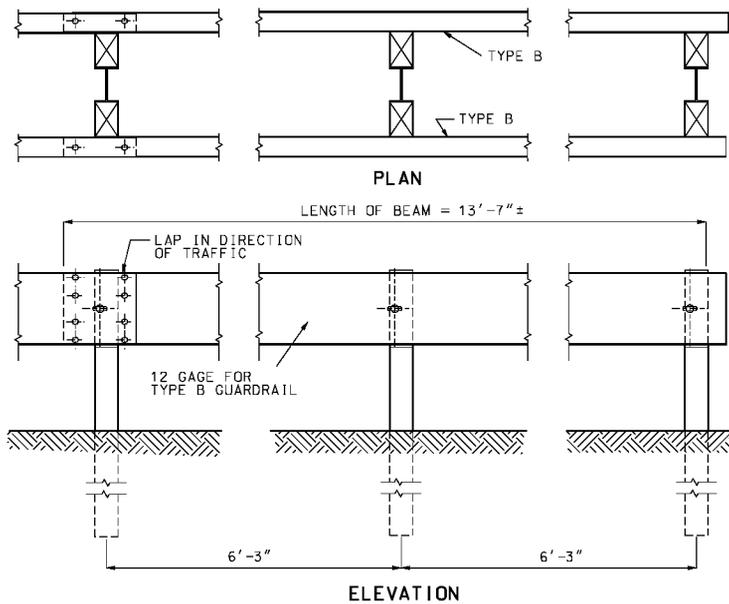
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	PAVEMENT UNDERDRAINAGE AGGREGATE UNDERDRAINS	
	DATE EFFECTIVE: 06/01/2013 DATE PREPARED: 4/1/2013	605.101 SHEET NO. 4 OF 4

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



STEEL POST & WOOD BLOCK

TYPE A GUARDRAIL



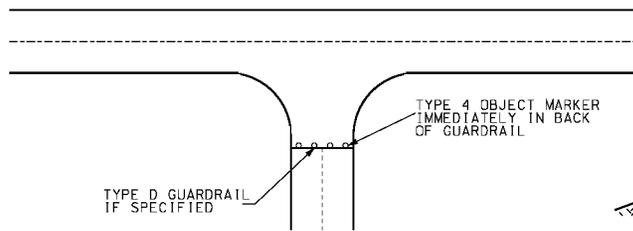
STEEL POST & WOOD BLOCK

TYPE B GUARDRAIL

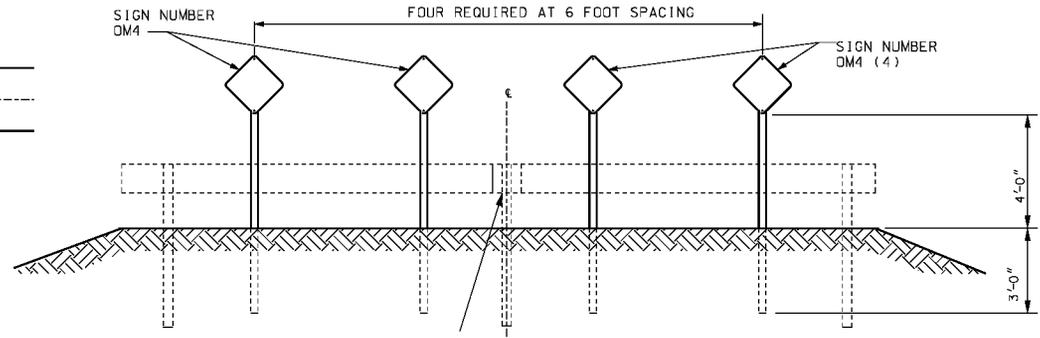
(1) THE CONTRACTOR MAY FURNISH EQUIVALENT SECTIONS FABRICATED FROM MATERIAL MEETING AND IN ACCORDANCE WITH SECTION 1040.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	GUARDRAIL TYPE A AND TYPE B	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 10/22/2013	606.00AV
		SHEET NO. 1 OF 8

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

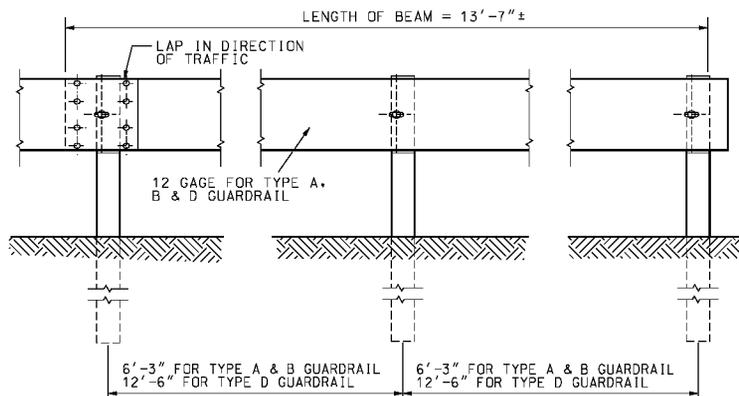
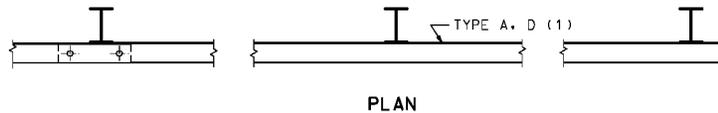


TYPICAL ROAD CLOSURE



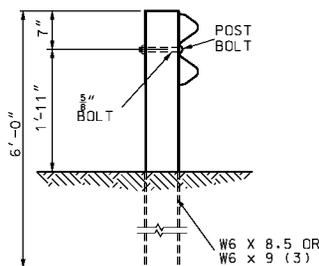
TYPE D GUARDRAIL IF SPECIFIED
**MOUNTING DETAILS
 (END OF ROAD OR STREET)
 TYPE 4 OBJECT MARKER
 SIGN OM4**

(4) RED REFLECTIVE SHEETING IN ACCORDANCE WITH SEC 104.2.7.3 ON 0.080 SHEET ALUMINUM.



ELEVATION

TYPE D GUARDRAIL



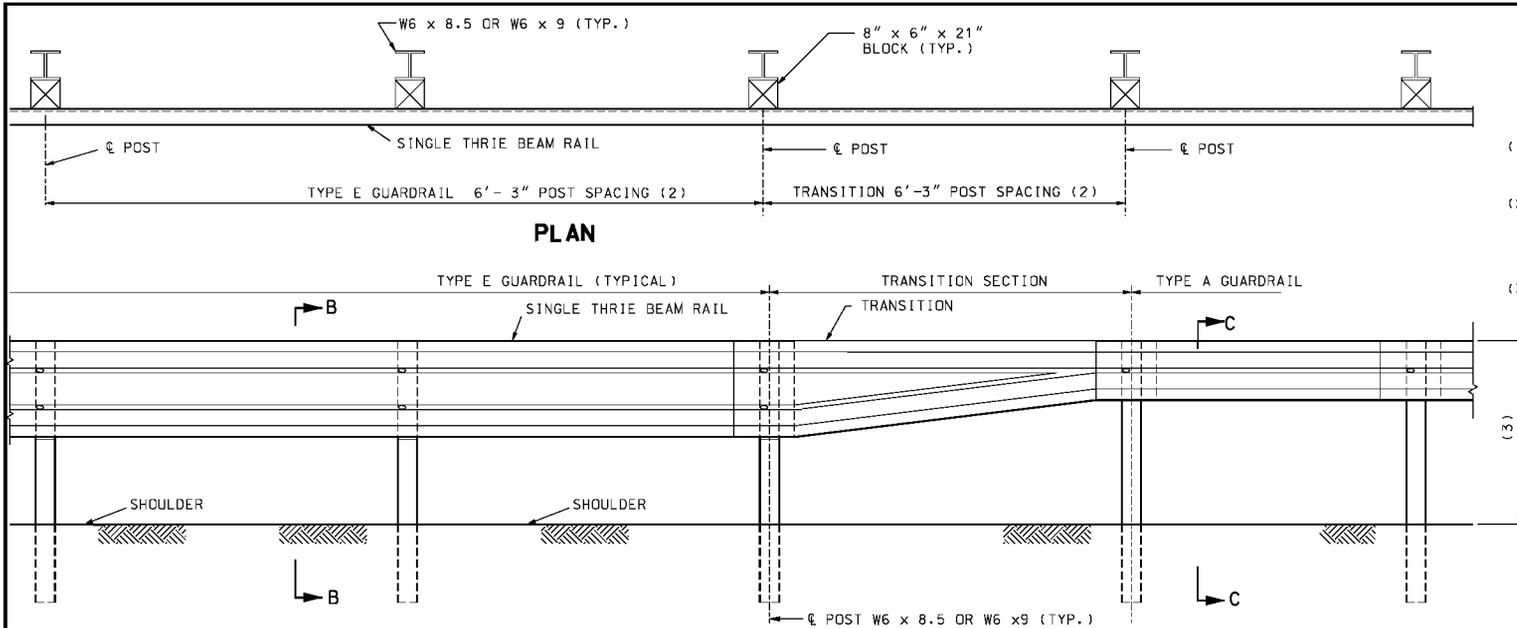
STEEL POST

GENERAL NOTES:

TYPE D GUARDRAIL IS ACCESS RESTRAINT AND VISUAL TARGET VALUE ONLY. IT HAS NO REDIRECTIVE CAPABILITY.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	GUARDRAIL TYPE D	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 10/22/2013	606.00AV
		SHEET NO. 2 OF 8

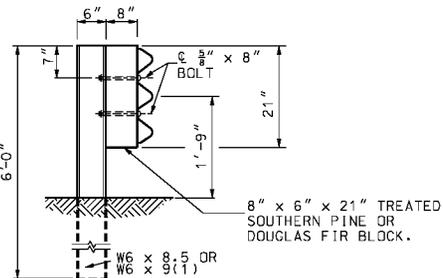
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



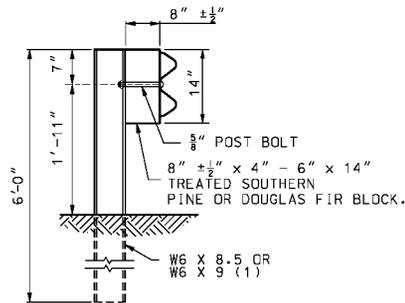
- (1) THE CONTRACTOR MAY FURNISH EQUIVALENT SECTIONS FABRICATED FROM MATERIAL MEETING AND IN ACCORDANCE WITH SECTION 1040.
- (2) IF THE TRANSITION IS CONNECTED TO A BRIDGE ANCHOR SECTION, POST SPACING FOR TYPE E GUARDRAIL AND THE TRANSITION SECTION SHALL BE 3'-1 1/2". FOR ALL OTHER CASES, POST SPACING SHALL BE 6'-3".
- (3) TRANSITION FROM 31" TO 29" HEIGHT OVER NEXT EIGHT UPSTREAM 12.5" W-BEAMS.

PART SECTION SHOWING TYPE E TO TYPE A GUARDRAIL TRANSITION

THE OVERALL NOMINAL DIMENSIONS SHOWN SHALL BE MET, ALTHOUGH THE SHAPE OF THE PLASTIC BLOCKS MAY VARY FROM THE SHAPE SHOWN, EXCEPT THE 1/4" ± 1/4" FLANGE AND THE OVERALL WIDTH DIMENSIONS MAY BE WAIVED IF APPROVED BY PROJECT OPERATIONS.



**SECTION B-B
FOR WOOD BLOCKS**



**SECTION C-C
FOR WOOD BLOCKS**

GENERAL NOTES:

TYPE E GUARDRAIL SHALL USE 6'-3" POST SPACING UNLESS 3'-1 1/2" POST IS SPECIFIED.

THE THRIE BEAM RAIL FOR THE TYPE E GUARDRAIL AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAUGE.

FOR PROTECTIVE COATING AND MATERIAL REQUIREMENTS, SEE SECTION 1040 OF THE STANDARD SPECIFICATIONS.

SEE SHEET 7 OF 8 FOR REQUIREMENTS FOR SPECIAL INSTALLATIONS.

ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES EXCEPT WHERE ALLOWABLE TOLERANCES ARE SHOWN.

FOR DETAILS NOT SHOWN, SEE OTHER SHEETS OF THIS DRAWING.

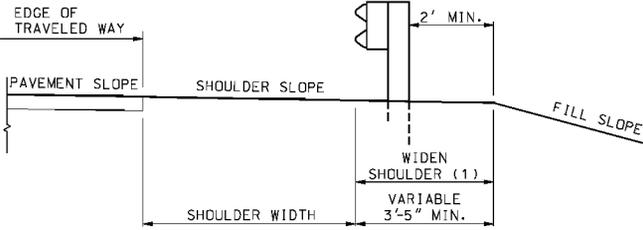
MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI
 ERIC E. SCHROETER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER

**GUARDRAIL
TYPE E**

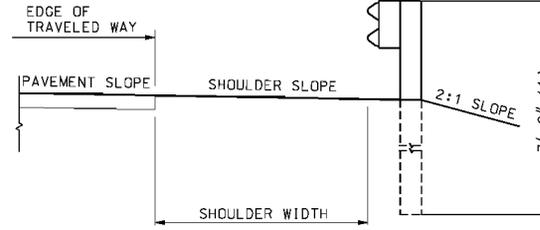
DATE EFFECTIVE: 08/01/2012	606.00AV	SHEET NO. 3 OF 8
DATE PREPARED: 8/14/2014		

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



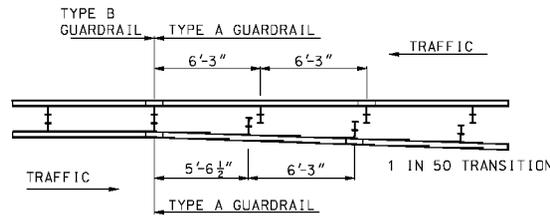
TYPICAL SECTION

(1) SHOULDER WIDENING SHALL CONSIST OF EMBANKMENT MATERIAL COMPACTED IN ACCORDANCE WITH SEC 203.4 OF THE STANDARD SPECIFICATIONS.

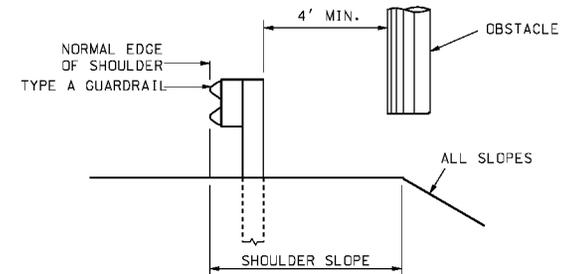


ALTERNATE TYPICAL SECTION AT SLOPE BREAKPOINT

(1) POST SHALL BE SPACED AT 3'-1 1/2" ON CENTER.



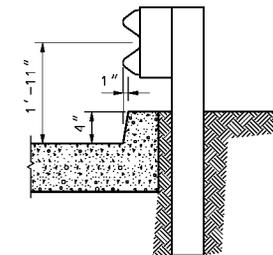
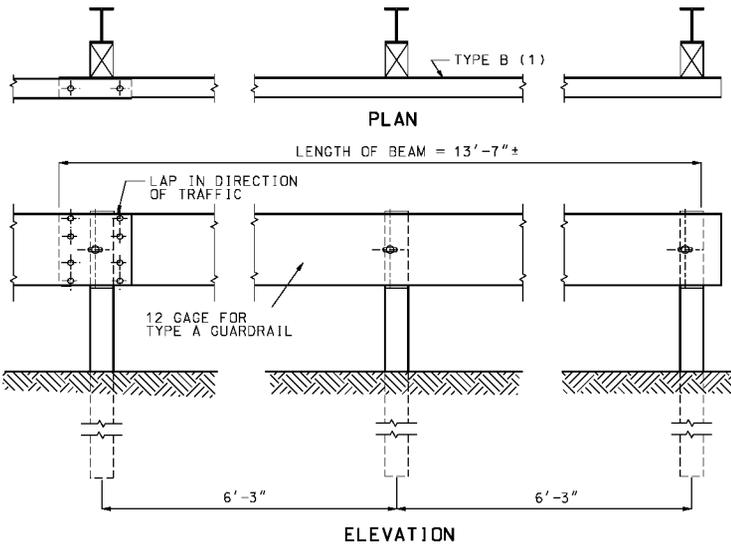
DETAIL FOR TRANSITIONING BETWEEN TYPE A AND TYPE B GUARDRAIL



LOCATION OTHER THAN MEDIAN

LATERAL PLACEMENT OF GUARDRAIL FOR SHOULDER INSTALLATION

(1) SHOULDER WIDENING SHALL CONSIST OF EMBANKMENT MATERIAL COMPACTED IN ACCORDANCE WITH SEC 203.4 OF THE STANDARD SPECIFICATIONS.

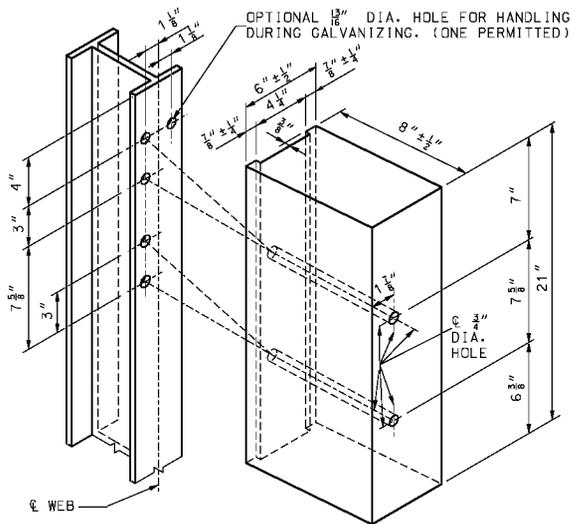


GUARDRAIL AT CURBS (3)

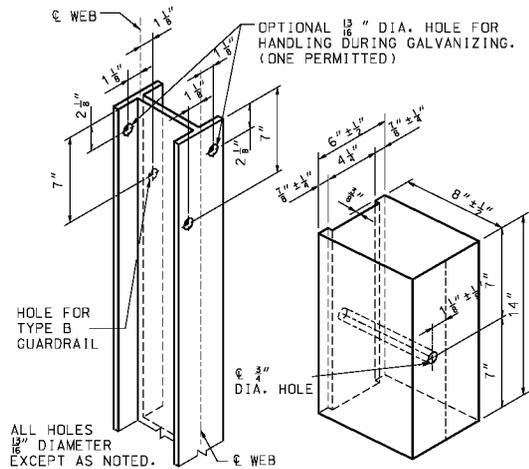
- (1) APPROVED TYPE A CRASHWORTHY END TERMINAL.
- (2) SHOULDER WIDENING SHALL CONSIST OF EMBANKMENT MATERIAL COMPACTED IN ACCORDANCE WITH SECTION 203.4 OF THE STANDARD SPECIFICATIONS.
- (3) WHEN GUARDRAIL IS CONSTRUCTED OVER CURBS, THE CURBS SHALL BE CONSTRUCTED AS SHOWN.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	GUARDRAIL LAYOUT
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 10/22/2013	606.00AV
SHEET NO. 4 OF 8	

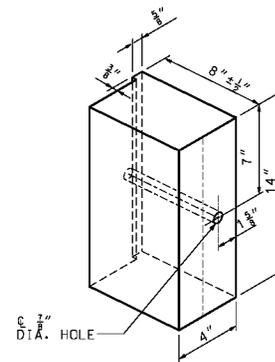
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TYPE E
FOR STEEL POST & WOOD OR PLASTIC BLOCKS (1)

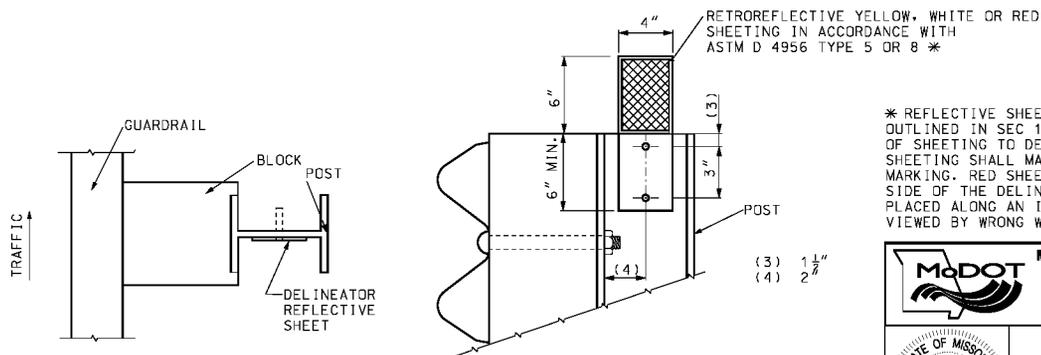


TYPE A AND TYPE B
FOR STEEL POST AND WOOD OR PLASTIC BLOCKS (1)



ALTERNATE DESIGN
FOR WOOD BLOCK

(1) THE OVERALL NOMINAL DIMENSIONS SHOWN SHALL BE MET, ALTHOUGH THE SHAPE OF THE PLASTIC BLOCKS MAY VARY FROM THE SHAPE SHOWN, EXCEPT THE $\frac{7}{8}$ " \pm $\frac{1}{4}$ " FLANGE AND THE OVERALL WIDTH DIMENSIONS MAY BE WAIVED IF APPROVED BY PROJECT OPERATIONS.



DELINEATORS SHALL BE AFFIXED WITH $1\frac{1}{2}$ " LONG X $\frac{1}{4}$ " DIAMETER BOLTS FOR STEEL POSTS OR 2" (MIN.) LONG X $\frac{1}{4}$ " DIAMETER SCREWS FOR WOOD POSTS. THE DIAMETER OF THE BOLT'S OR SCREW'S HEAD SHALL BE TWICE THE DIAMETER OF THE HOLE, WITH A MINIMUM OF $\frac{1}{2}$ ". WASHERS SHALL BE USED WITH THE BOLTS AND SHALL HAVE $\frac{1}{2}$ " DIAMETER HOLES.

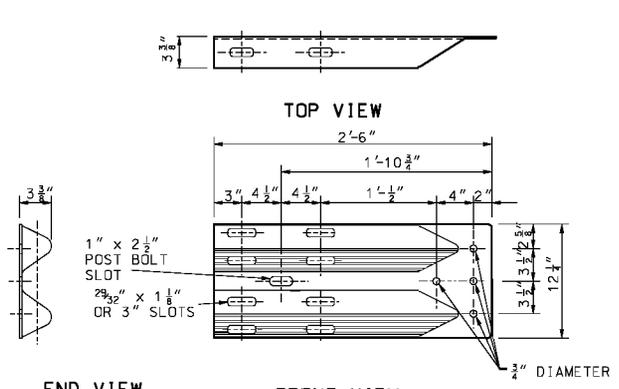
* REFLECTIVE SHEETING SHALL FOLLOW GUIDELINES OUTLINED IN SEC 1042.2.7 FOR CORRECT APPLICATION OF SHEETING TO DELINEATOR BODY. THE COLOR OF THE SHEETING SHALL MATCH THE CLOSEST ADJACENT PAVEMENT MARKING. RED SHEETING SHALL BE APPLIED TO THE BACK SIDE OF THE DELINEATOR WHEN THE DELINEATION IS PLACED ALONG AN INTERCHANGE RAMP WHERE IT COULD BE VIEWED BY WRONG WAY TRAFFIC.

DELINEATORS ON NEW GUARDRAIL

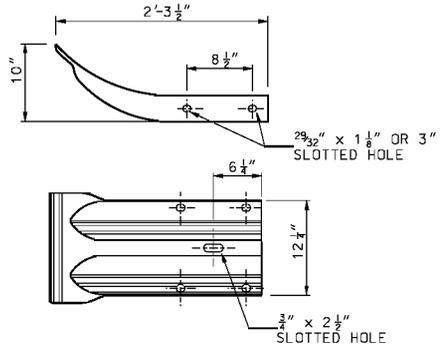
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	GUARDRAIL POST AND BLOCK
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 10/22/2013	606.00AV SHEET NO. 5 OF 8

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

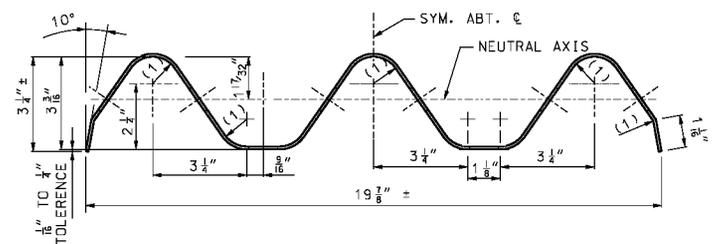
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



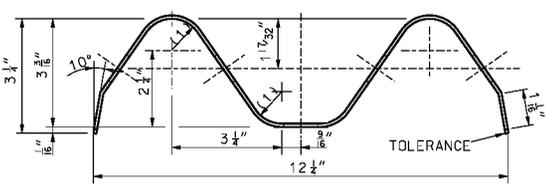
END VIEW FRONT VIEW TERMINAL CONNECTOR



END SECTION 12 GAGE

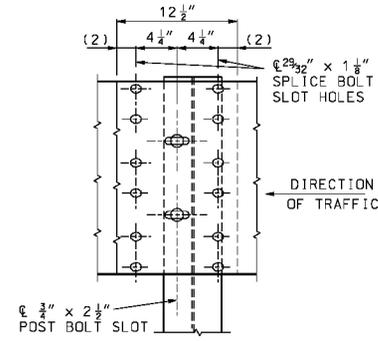


SECTION THRU THRIE BEAM RAIL

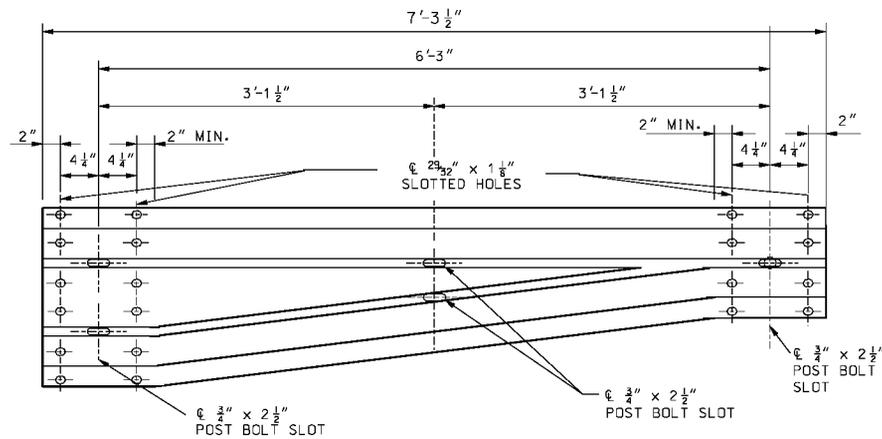


SECTION THROUGH BEAM

- (1) 1/8" RADIUS
- (2) 2" (TOLERANCE +1/4", -1/4")

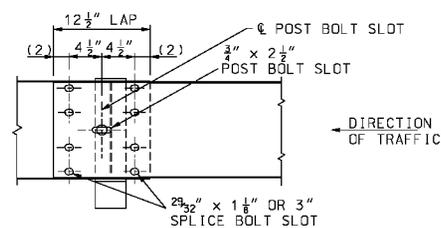


BEAM SPLICE AT POST TYPE E GUARDRAIL

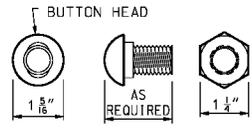


ELEVATION OF ASYMMETRICAL TRANSITION SECTION

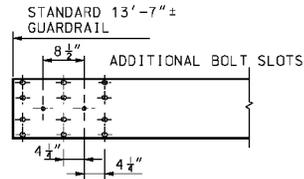
NOTE: PORTIONS OF BEAM WITH UNUSED BOLT SLOTS TO BE LAPPED BEHIND.



BEAM SPLICE AT POST TYPE A, B AND D GUARDRAIL



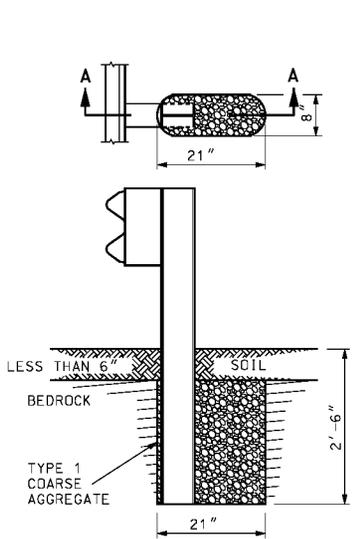
OVAL SHOULDER SHALL BE OF ADEQUATE HEIGHT, LENGTH & SHAPE TO PREVENT TURNING DURING INSTALLATION OR REMOVAL OF BOLT.



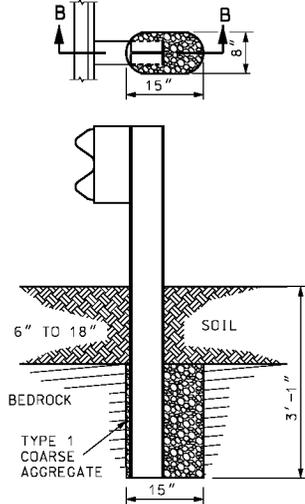
BEAM DETAILS SHOWING LOCATION OF ADDITIONAL BOLT SLOTS NECESSARY TO OBTAIN GUARDRAIL OFFSET.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	GUARDRAIL RAIL ELEMENTS	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 10/22/2013	606.00AV SHEET NO. 6 OF 8

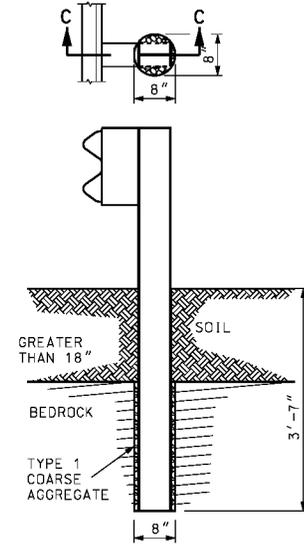
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



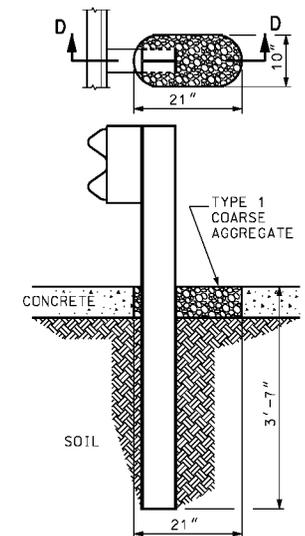
SECTION A-A
ROCK ENCOUNTERED
UP TO 6" BENEATH SURFACE



SECTION B-B
ROCK ENCOUNTERED
6" TO 18" BENEATH SURFACE

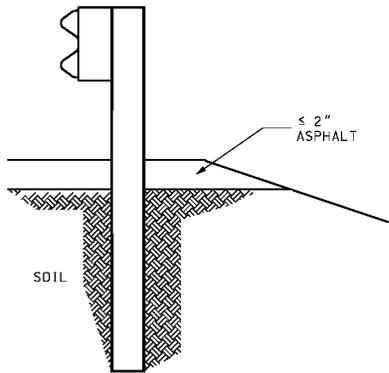


SECTION C-C
ROCK ENCOUNTERED MORE
THAN 18" BENEATH SURFACE



SECTION D-D
SETTING POST THROUGH CONCRETE

SETTING POST IN SOLID ROCK



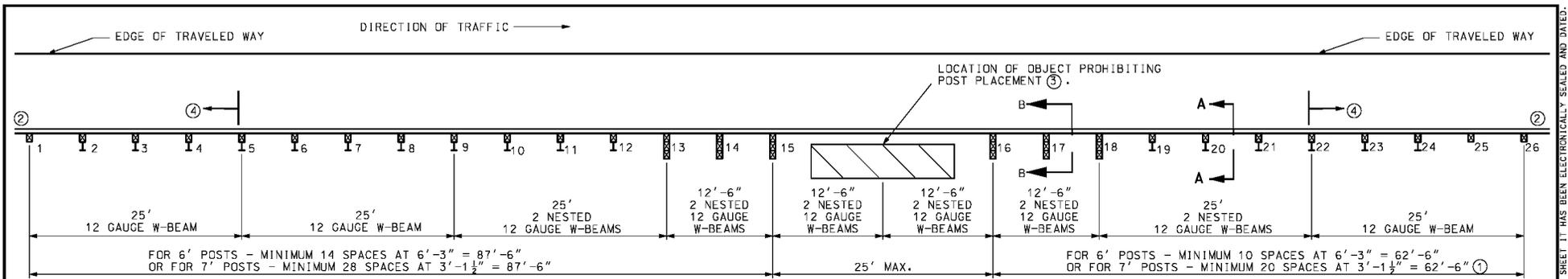
SETTING POST THROUGH ASPHALT

GENERAL NOTES:

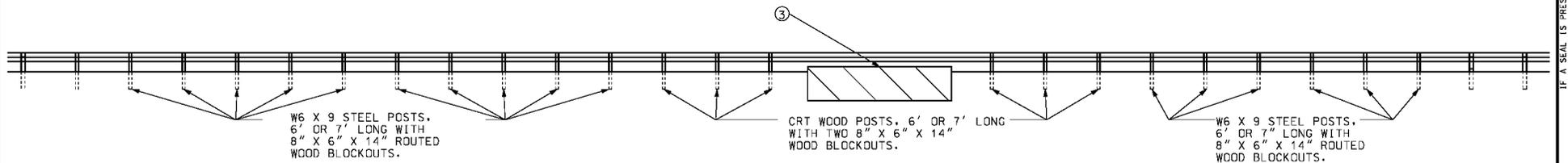
HOLES IN SOLID ROCK SHALL PROVIDE A DIAMETER OF NOT LESS THAN 4 INCHES GREATER THAN THE MAXIMUM TRANSVERSE DIMENSION OF THE POST SECTION.

POST MAY BE SHORTER WHERE PLACED IN 2 FEET OF SOLID ROCK. STEEL POSTS MAY BE FLAME OR SAW CUT. REPAIR OF CUT SHALL BE IN ACCORDANCE WITH SECTION 712 OF THE STANDARD SPECIFICATIONS.

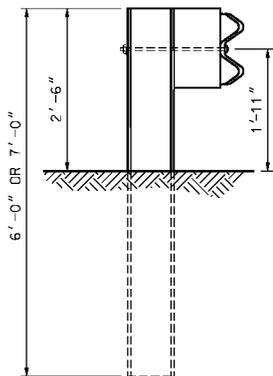
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center">GUARDRAIL SPECIAL INSTALLATIONS</p>
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 10/22/2013	<p align="center">606.00AV</p>
SHEET NO. 7 OF 8	



PLAN

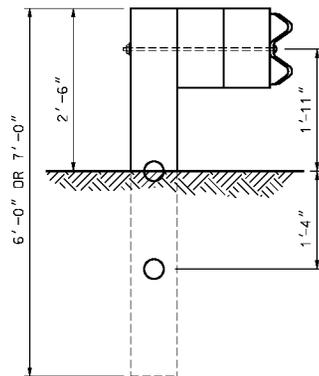


ELEVATION



SECTION A-A

W6 X 9 STEEL POSTS, 6' OR 7' LONG WITH 8" X 6" X 14" ROUTED WOOD BLOCKOUTS POSTS 3 THROUGH 12 AND 19 THROUGH 24.



SECTION B-B

CRT WOOD POSTS, 6' OR 7' LONG WITH TWO 8" X 6" X 14" WOOD BLOCKOUTS POSTS 13 THROUGH 18.

- ① IF LOCATED WITHIN THE CLEAR ZONE OF A TWO-WAY ROADWAY, THE MINIMUM LENGTH IS 87'-6".
- ② ADDITIONAL GUARDRAIL AS REQUIRED, INCLUDING END TREATMENT.
- ③ THE POST MAY BE SKIPPED DUE TO THE PRESENCE OF AN OBSTACLE SUCH AS A CULVERT.
- ④ PLACE END TREATMENT NO CLOSER TO THE SKIPPED POST THAN POSTS 5 AND 22.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**GUARDRAIL
LONG-SPAN NESTED W-BEAM**

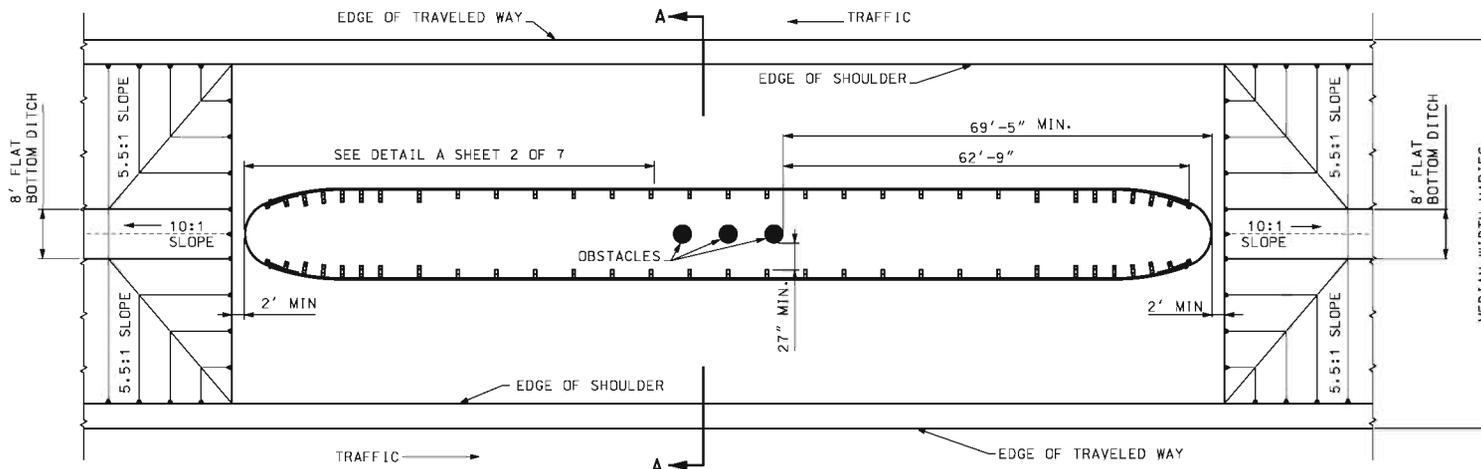
DATE EFFECTIVE: 08/01/2012
DATE PREPARED: 10/22/2013

606.00AV

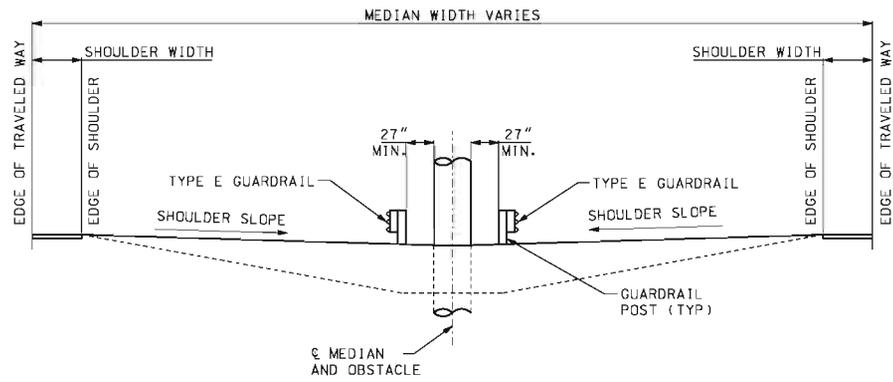
SHEET NO.
8 OF 8

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

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



**PIER AT C OF MEDIAN
PLAN VIEW**

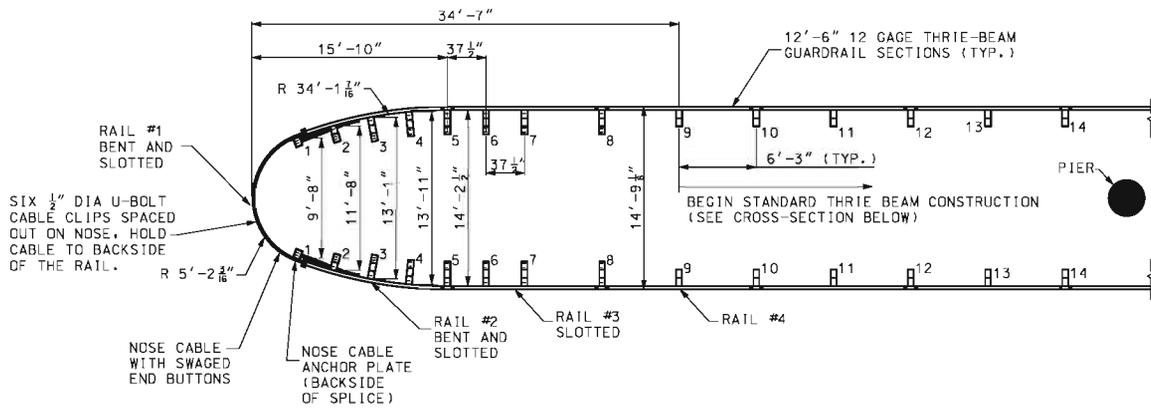


SECTION A-A

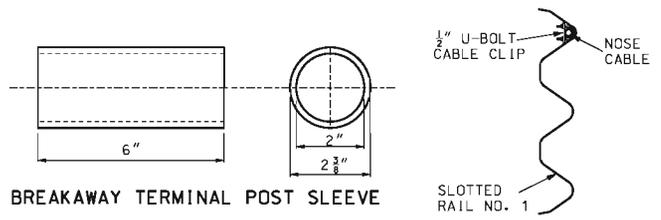
GENERAL NOTES:

- WOOD POSTS AND WOOD BLOCKS MAY BE USED ON TYPE E GUARDRAIL.
- THE BULLNOSE GUARDRAIL PAY ITEM INCLUDES THE STRUCTURE BETWEEN POST 10 AND THE NOSE. THE REMAINING GUARDRAIL WILL BE PAID FOR AS STANDARD GUARDRAIL ITEMS.
- SUITABLE DRAINAGE MUST BE PROVIDED WHEN MEDIAN GRADING IMPEDES NORMAL FLOW.

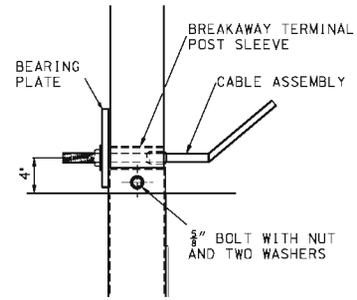
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)
	MEDIAN PIER PROTECTION BULLNOSE GUARDRAIL SYSTEM
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012	606.01F
SHEET NO. 1 OF 9	



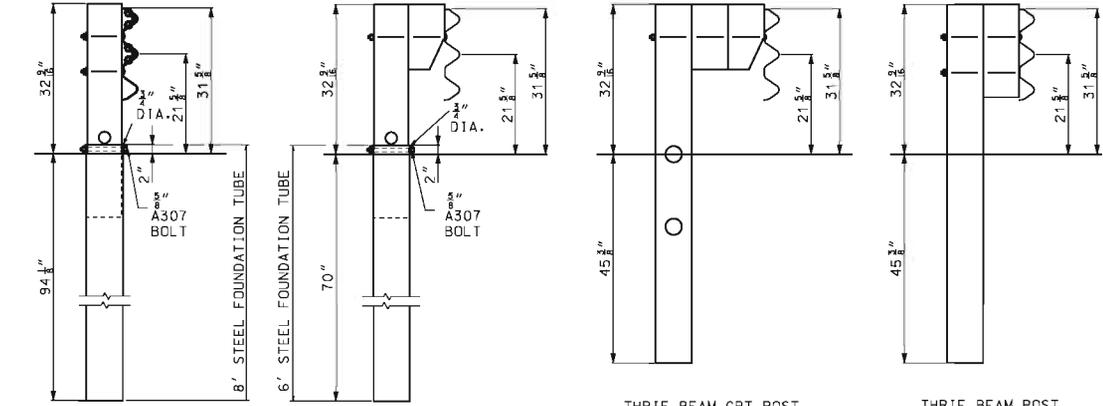
DETAIL A



U-BOLT CABLE CLIP DETAIL



POST 1 DETAIL



THRIE BEAM BCT POST WITH 96 1/8" FOUNDATION TUBE POST 1

THRIE BEAM BCT POST WITH 72" FOUNDATION TUBE AND 14" TAPERED BLOCK POST 2

THRIE BEAM CRT POST 78" LONG WITH 14" BLOCK AND 14" TAPERED BLOCK POSTS 3, 4, 5, 6, 7, 8

THRIE BEAM POST 78" LONG WITH 14" BLOCK POSTS 9 AND 10

POST DETAILS

GENERAL NOTE:

RAILS NUMBERS 1, 2, 3 AND 4 ARE TYPE E GUARDRAIL. RAIL NUMBER 4 IS A STANDARD THRIE BEAM, NOT SLOTTED.

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

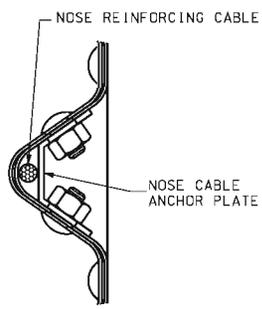
STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-22781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 SIGNED, SEALED AND DATED
 ELECTRONICALLY.

**MEDIAN PIER PROTECTION
 BULLNOSE GUARDRAIL SYSTEM**

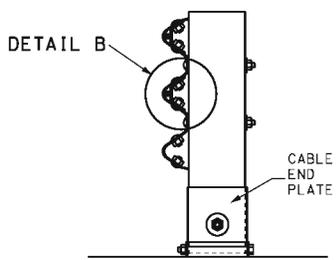
DATE EFFECTIVE: 08/01/2012	606.01F	SHEET NO. 2 OF 9
DATE PREPARED: 7/27/2012		

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

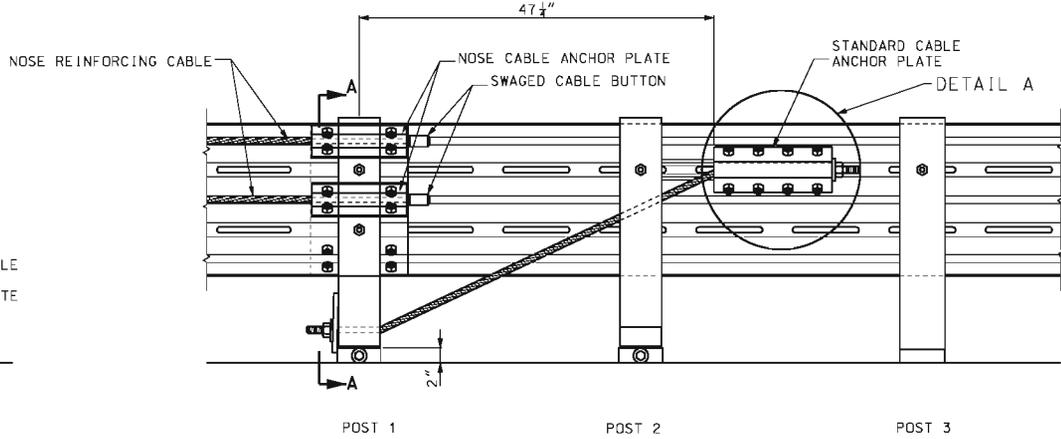
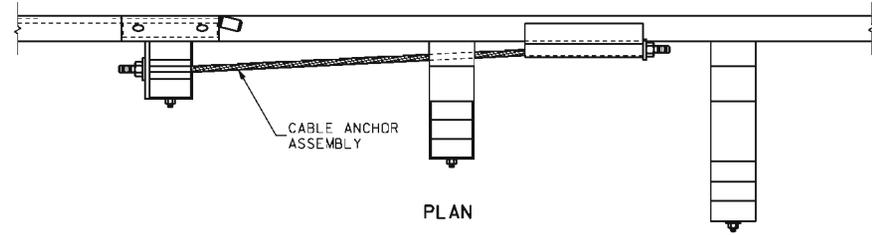
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



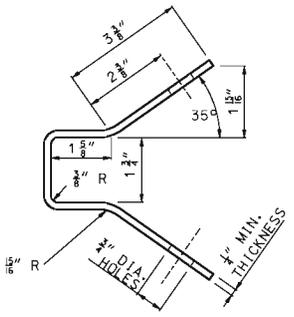
DETAIL B



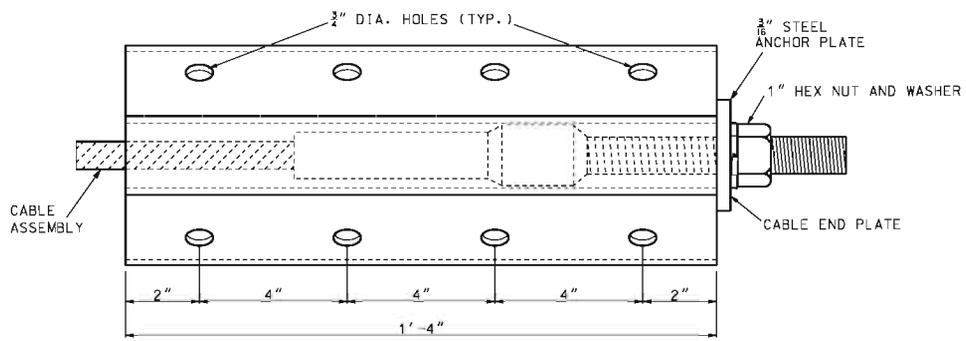
SECTION A-A



ELEVATION
CABLE ANCHOR ASSEMBLY

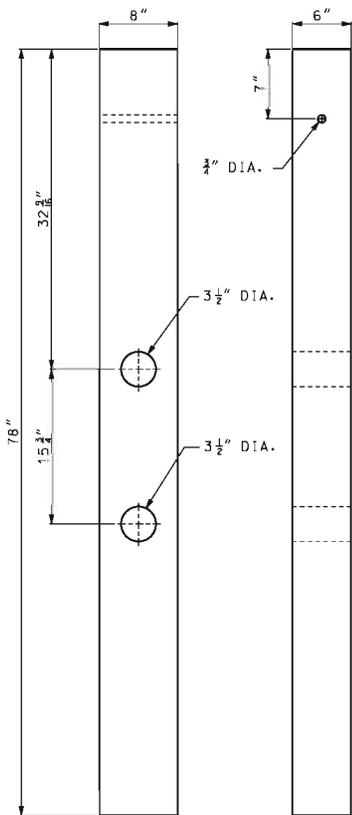


END VIEW

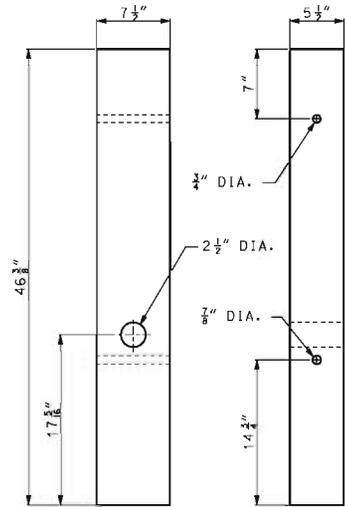


DETAIL A

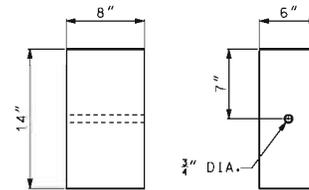
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	MEDIAN PIER PROTECTION BULLNOSE GUARDRAIL SYSTEM CABLE ANCHOR	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012	606.01F SHEET NO. 3 OF 9



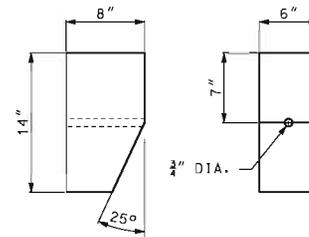
THREE BEAM CRT POSTS



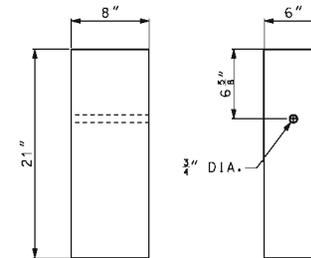
THREE BEAM ANCHOR POSTS



POSTS 2 THROUGH 8
STANDARD BLOCKS



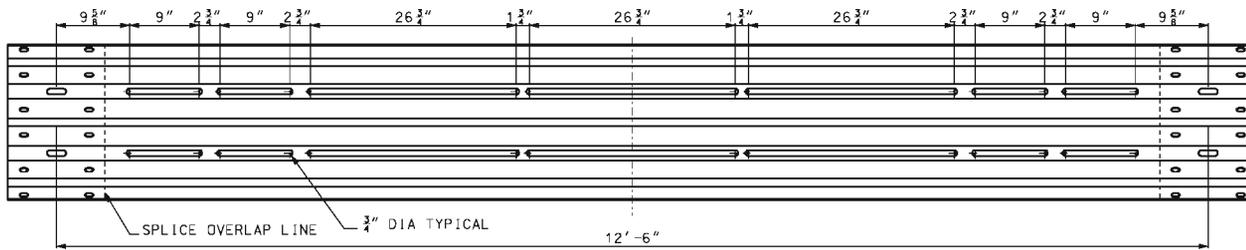
TAPERED BLOCK



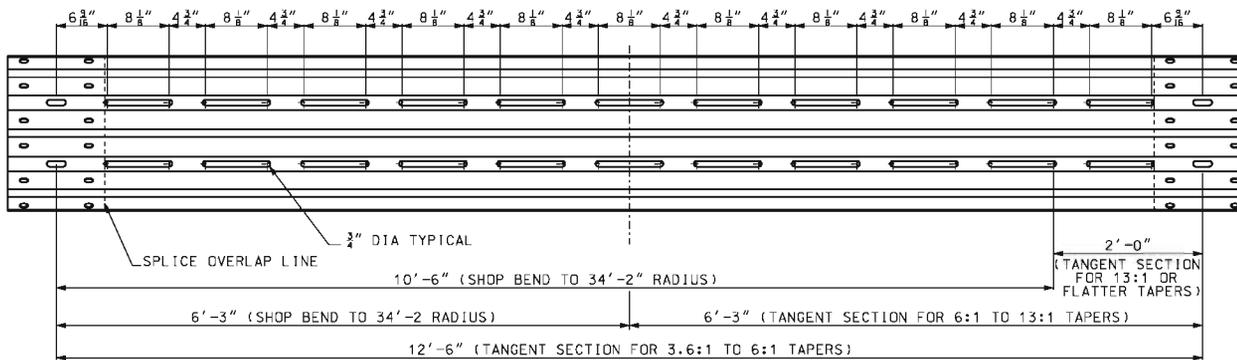
BLOCKS FOR POSTS 9 AND 10
STANDARD BLOCKS

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

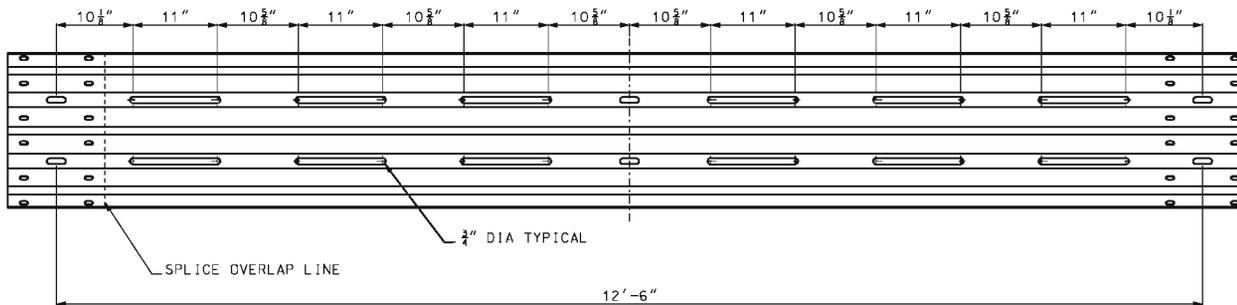
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		MEDIAN PIER PROTECTION BULLNOSE GUARDRAIL SYSTEM POST AND BLOCKS
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012	606.01F	SHEET NO. 4 OF 9



RAIL SECTION 1 (NOSE SECTION)



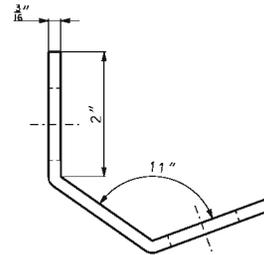
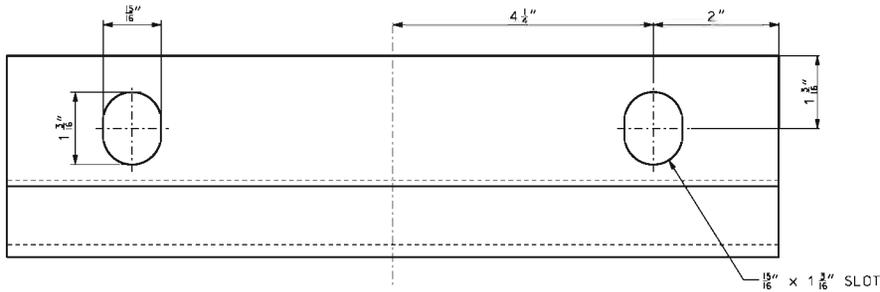
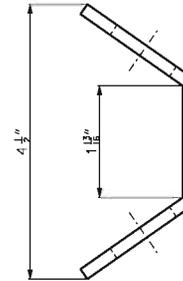
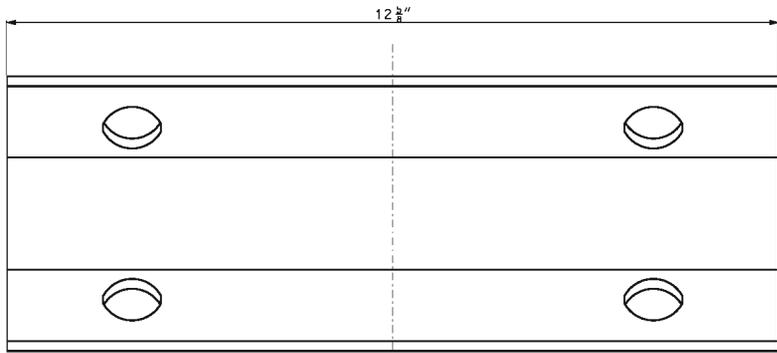
RAIL SECTION 2



RAIL SECTION 3

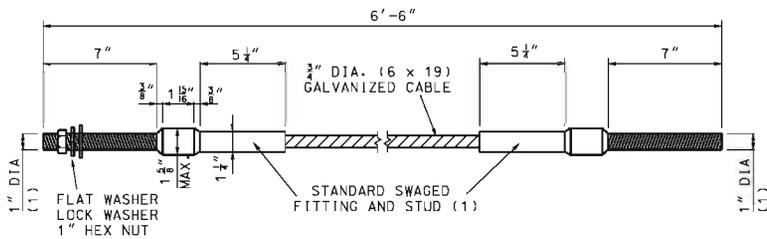
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	MEDIAN PIER PROTECTION BULLNOSE GUARDRAIL SYSTEM RAIL SECTION 1, 2 AND 3	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012	606.01F SHEET NO. 5 OF 9

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

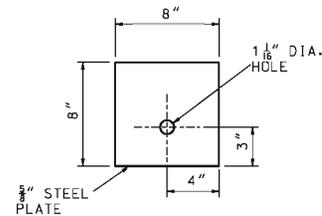


STEEL PLATE, A306
12 3/8" x 5 7/8" x 3/16"

(1) STUD, THREADED ENTIRE LENGTH.



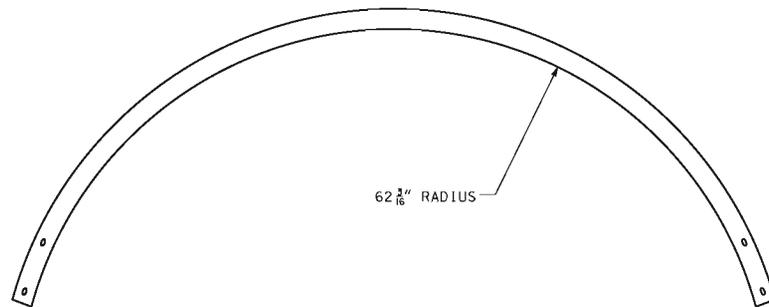
DETAIL OF CABLE ASSEMBLY



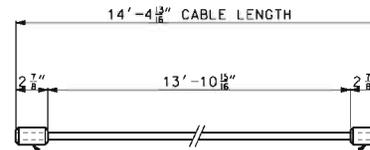
DETAIL OF STEEL BEARING PLATE

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		MEDIAN PIER PROTECTION BULLNOSE GUARDRAILS SYSTEM PLATES AND CABLE ASSEMBLY	
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012		606.01F SHEET NO. 6 OF 9	

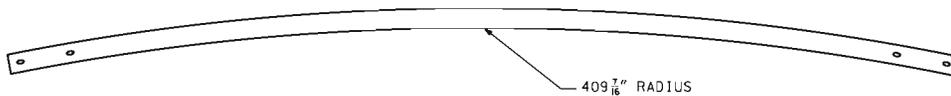
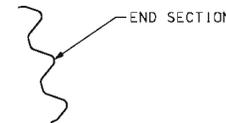
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



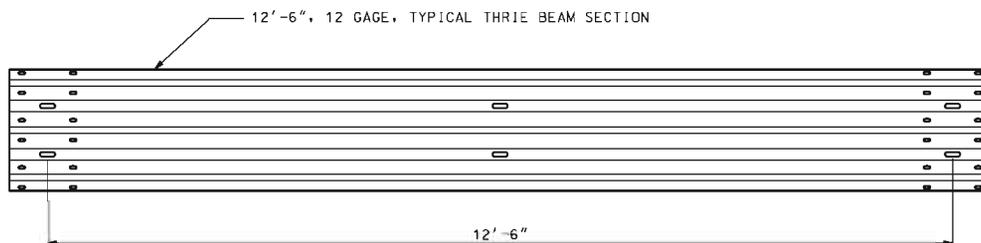
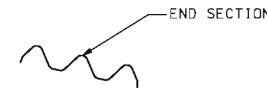
TOP VIEW, RAIL #1



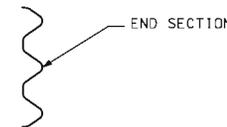
"COLD TUFF" BUTTON, S-409 SIZE NO. 12 SB 2 $\frac{7}{8}$ "
 STOCK NO. 1040395 FOR $\frac{3}{8}$ " DIA (6 x 25) WIRE ROPE
 (OR ANY SIMILARLY SIZED SWAGE-GRIP BUTTON FERRULES)



TOP VIEW, RAIL #2

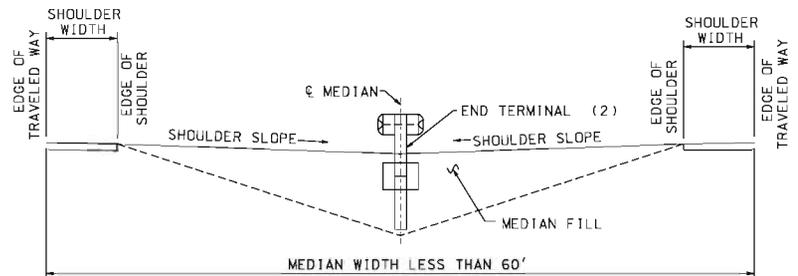


FRONT VIEW (UNBENT)

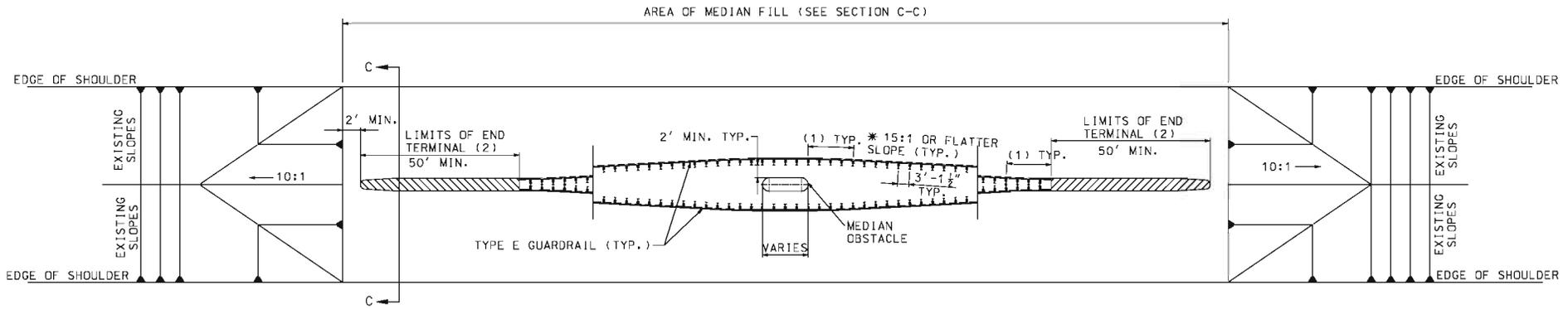


	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		MEDIAN PIER PROTECTION BULLNOSE GUARDRAIL SYSTEM THRIE BEAM AND CABLE LENGTH
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012	606.01F	SHEET NO. 7 OF 9

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



SECTION C-C



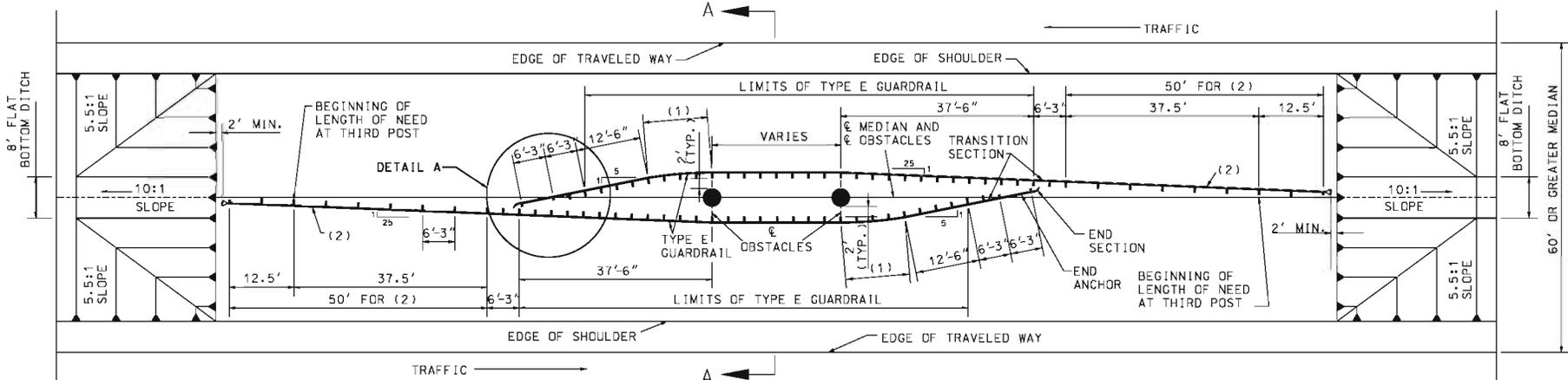
- (1) TYPE E GUARDRAIL 12'-6" IN LENGTH AND FACTORY FORMED TO THE REQUIRED RADIUS.
- (2) PAYMENT FOR THE END TERMINAL WILL BE CONSIDERED FULL COMPENSATION FOR ANY TRANSITION SECTIONS, BACKUP ASSEMBLIES, OR OTHER ITEMS NECESSARY FOR PROPER INSTALLATION AS REQUIRED BY THE MANUFACTURER.
- * VARY SLOPE NO STEEPER THAN 15:1 TO UTILIZE A FULL 12.5' LENGTH OF GUARDRAIL WHEN ATTACHING TO THE CRASHWORTHY END TERMINAL.

GENERAL NOTES:
 TYPE B CRASHWORTHY END TERMINAL SHALL BE LATEST VERSION AND SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TYPE E MEDIAN PIER PROTECTION MEDIAN LESS THAN 60'	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/27/2012	606.01F SHEET NO. 8 OF 9

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

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



PIER AT C OF MEDIAN

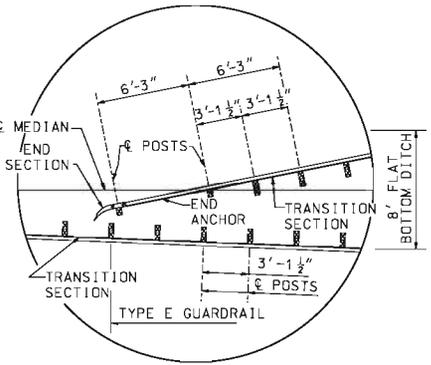
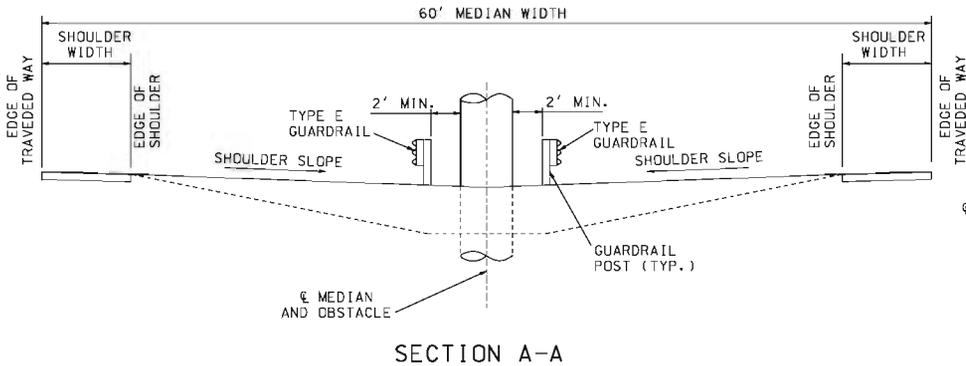
- (1) TYPE E GUARDRAIL IN THIS REGION SHALL BE 12'6" IN LENGTH AND FACTORY FORMED TO A 75' RADIUS.
- (2) TYPE A NON-FLARED CRASHWORTHY END TREATMENT.

GENERAL NOTES:

WOOD POSTS AND WOOD BLOCKS MAY BE USED ON TYPE E GUARDRAIL. END ANCHOR SECTION TO BE USED ON TERMINAL END OF TYPE E GUARDRAIL.

END ANCHOR TO BE LOCATED BEYOND THE LONGITUDINAL LIMITS OF TYPE A NON-FLARED CRASHWORTHY END TERMINAL.

TYPE A NON-FLARED CRASHWORTHY END TERMINAL SHALL BE THE LATEST VERSION AND SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.



DETAIL A

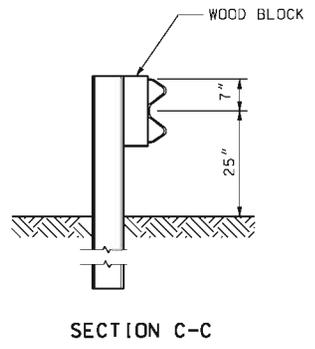
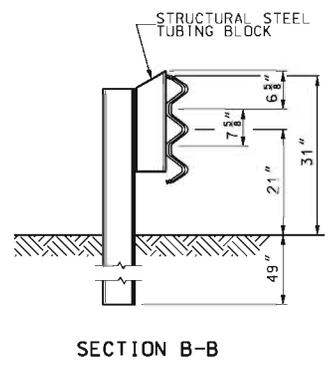
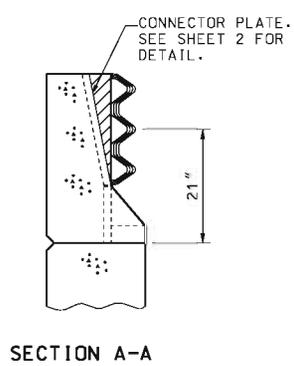
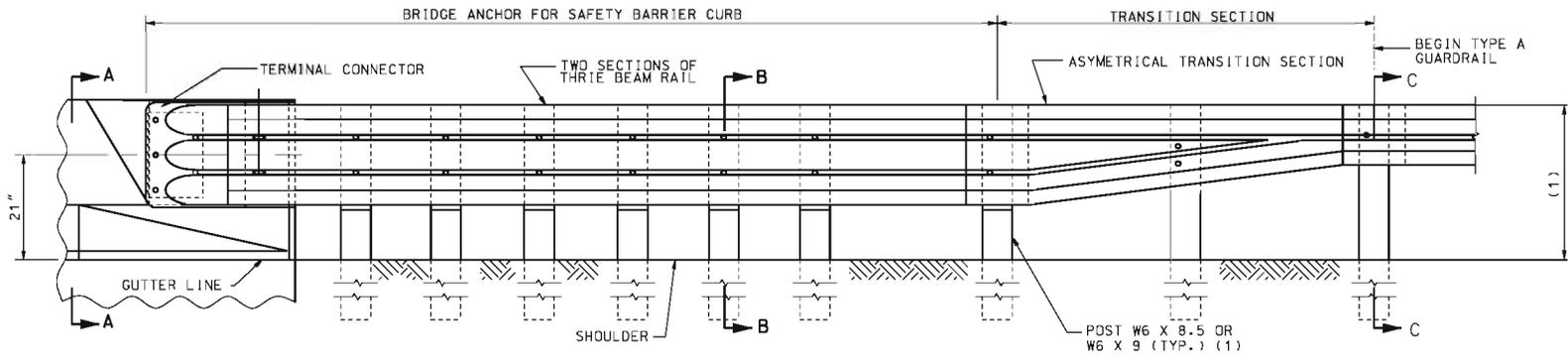
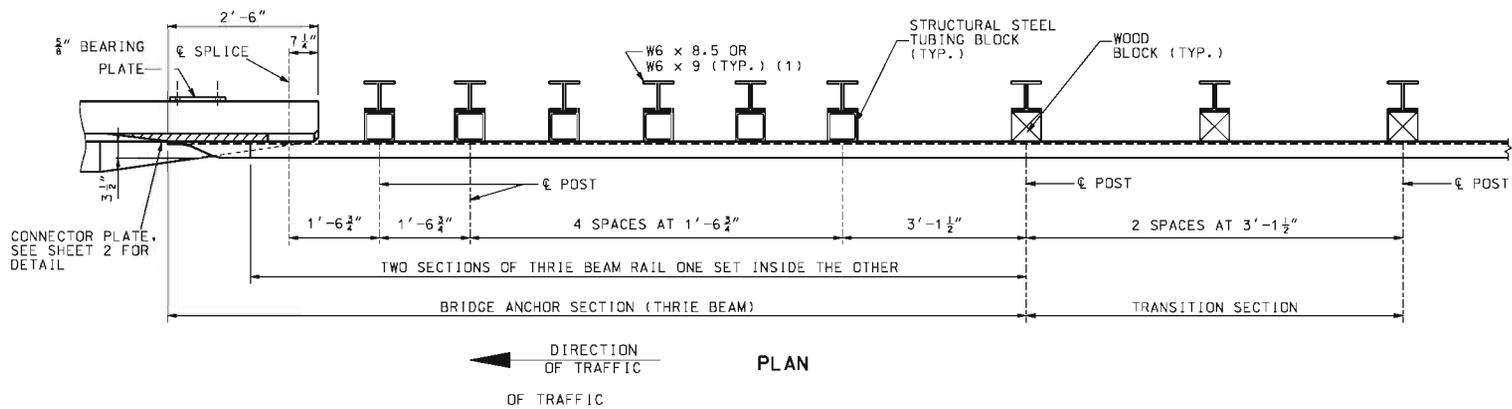
MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-2781
 PROFESSIONAL ENGINEER

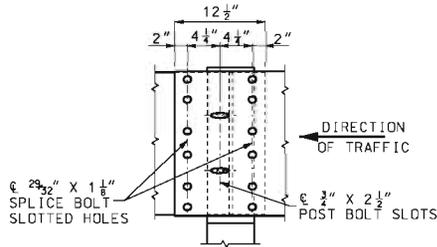
TYPE E MEDIAN PIER PROTECTION
 60' MEDIAN OR GREATER

DATE EFFECTIVE: 08/01/2012	606.01F	SHEET NO. 9 OF 9
DATE PREPARED: 7/27/2012		

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

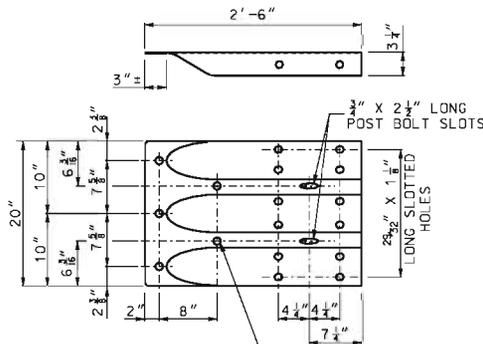


<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p>BRIDGE ANCHOR SECTION</p> <p>SAFETY BARRIER CURB ON BRIDGE</p>	
	<p>STATE OF MISSOURI</p> <p>KATHRYN PHILLIPS HAWRY</p> <p>NUMBER PE-22781</p> <p>PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p>DATE EFFECTIVE: 08/01/2012</p> <p>DATE PREPARED: 11/26/2012</p>



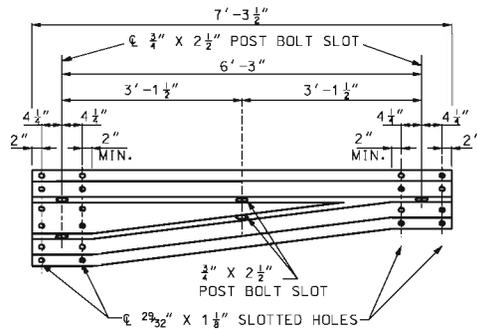
THREE BEAM RAIL SPLICE AT POST

(1) THE CONTRACTOR MAY, AT HIS OPTION, FURNISH EQUIVALENT SECTIONS FABRICATED FROM MATERIAL MEETING AND IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A769 GRADE 36 OR 40. THE SECTIONS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH REQUIREMENTS OF AASHTO M 111.

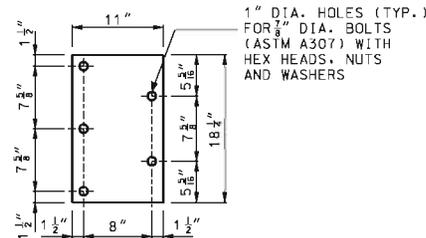


1" DIA. HOLES (TYP.) (FOR 3/4" DIA. BOLTS (ASTM A307) WITH HEX HEADS, NUTS AND WASHERS)

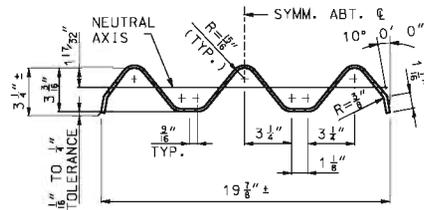
TERMINAL CONNECTOR



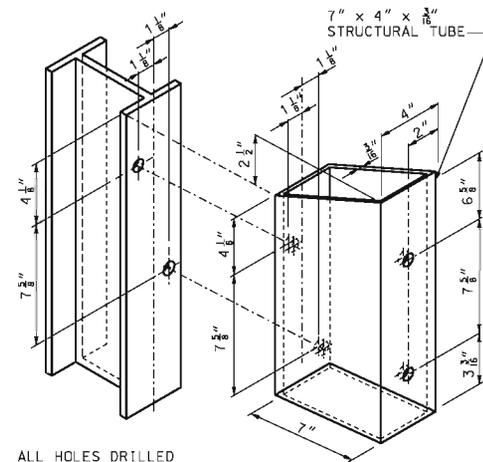
ASYMMETRICAL TRANSITION SECTION



5/8" BEARING PLATE



SECTION THROUGH THREE BEAM RAIL



ALL HOLES DRILLED OR PUNCHED 1/16" DIA.

STRUCTURAL STEEL TUBING BLOCK DETAIL

GENERAL NOTES:

DESIGN BASED ON NCHRP REPORT 350 TEST LEVEL 3.

THE THREE BEAM RAIL, TERMINAL CONNECTOR AND THE TRANSITION SECTION FOR THE BRIDGE ANCHOR SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE.

FOR PROTECTIVE COATING AND MATERIAL REQUIREMENTS, SEE SECTION 1040 OF THE STANDARD SPECIFICATIONS.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

WASHERS SHALL BE USED AT ALL POST BOLTS.

STRUCTURAL TUBING BLOCK SHALL BE FABRICATED FROM ASTM A500 GRADE B STEEL AND GALVANIZED.

USE 3/8" BUTTON-HEAD OVAL SHOULDER BOLTS WITH HEX NUTS AT ALL SLOTS (THICKNESS OF HEX NUTS = 3/8" MIN.).

THE BEARING PLATE SHALL BE FABRICATED FROM GRADE A36 STEEL AND GALVANIZED.

ALL LAP SPLICES, INCLUDING END SHOES, SHALL BE MADE IN THE DIRECTION OF TRAFFIC.

SEE STANDARD PLAN 606.00 FOR DETAILS NOT SHOWN.

THE COST OF FURNISHING, FABRICATING AND INSTALLING TRANSITION SECTION, COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH.

THE COST OF FURNISHING AND INSTALLING BRIDGE ANCHOR SECTION (SAFETY BARRIER CURB), COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH.

LOCK SHALL BE OF THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.

FOR DETAILS OF BLOCKS ON STEEL POSTS, SEE STANDARD PLAN 606.00.

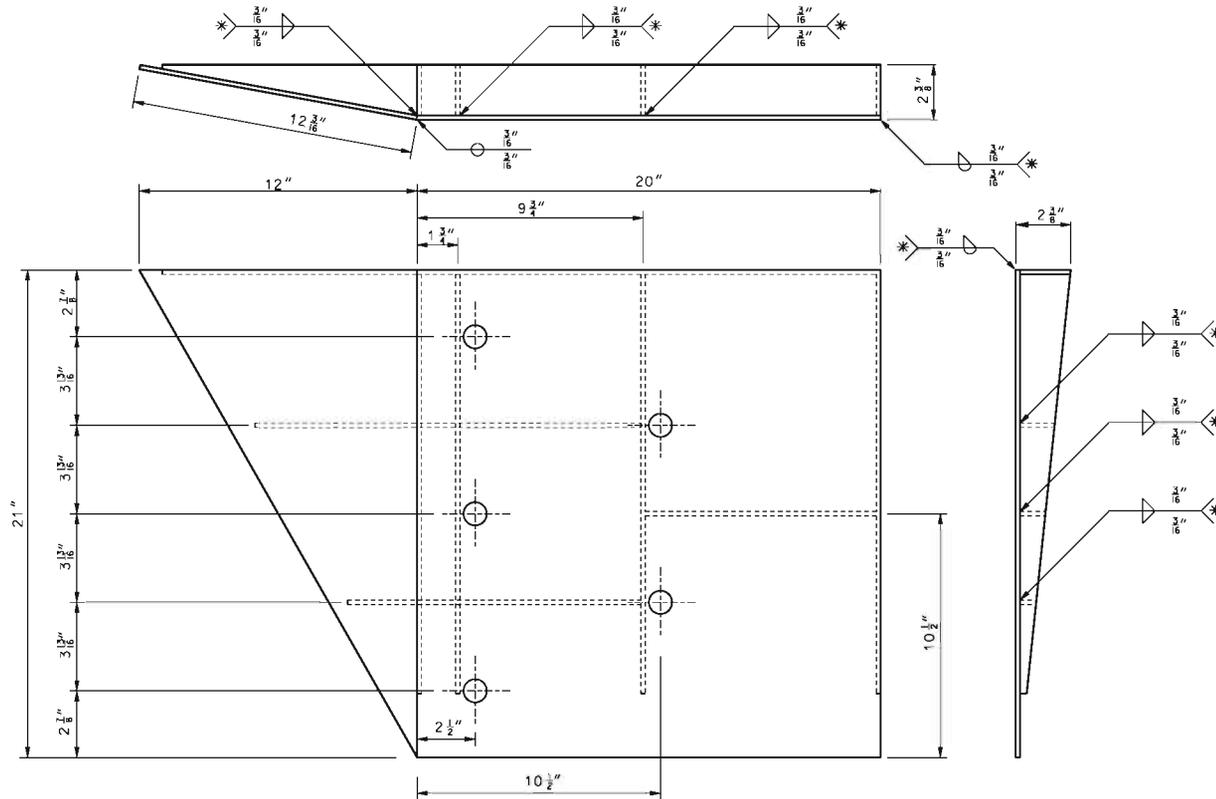
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-23761
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 BOUND, SEALED AND DATED
 ELECTRONICALLY.

**BRIDGE ANCHOR SECTION
 SAFETY BARRIER CURB ON BRIDGE**

DATE EFFECTIVE: 08/01/2007	606.22T	SHEET NO. 2 OF 5
DATE PREPARED: 11/26/2012		

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



WELDING INSTRUCTION

* ALL FILLET WELDS SHALL BE 1" LONG SPACED AT 2".

GENERAL NOTES:

COVER PLATE PANELS ARE 4. ³/₁₆" THICK.

ALL STIFFENERS ARE 1/4" THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

FOR GALVANIZED REQUIREMENTS, SEE SECTION 1040 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".

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

**BRIDGE ANCHOR SECTION
SAFETY BARRIER CURB ON BRIDGE
(CONNECTOR PLATE DETAIL)**

DATE EFFECTIVE:	08/01/2012	606.22T	SHEET NO. 3 OF 5
DATE PREPARED:	7/19/2012		

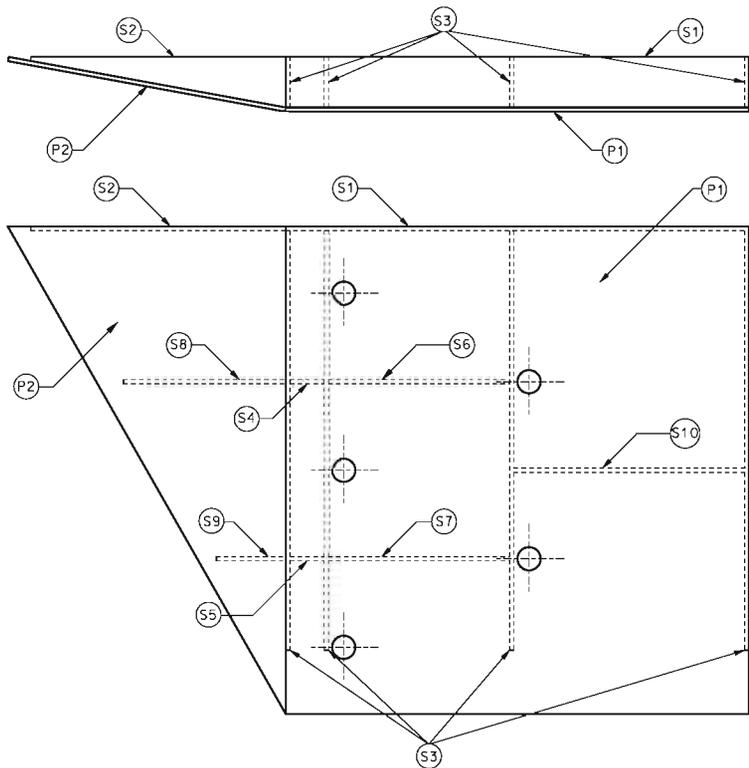
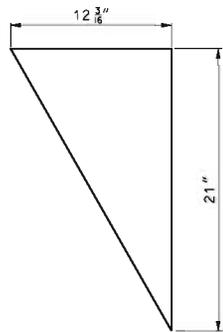
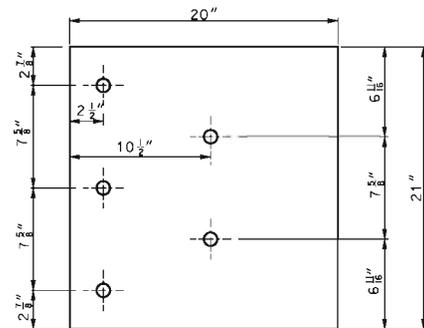


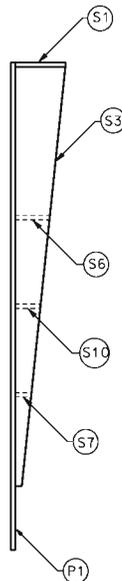
PLATE AND STIFFENER IDENTIFICATION



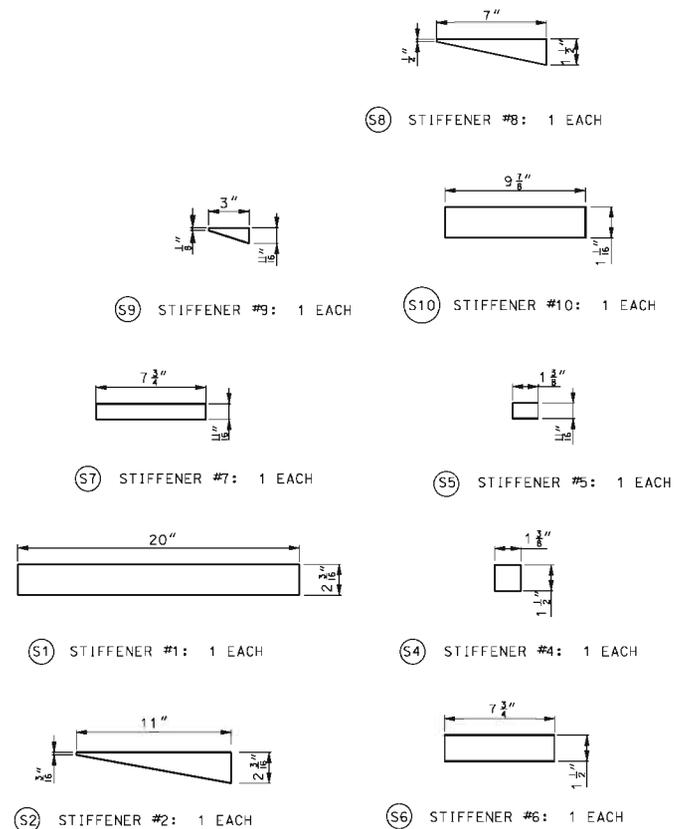
(P2) COVER PLATE #2

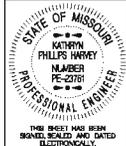


(P1) COVER PLATE #1

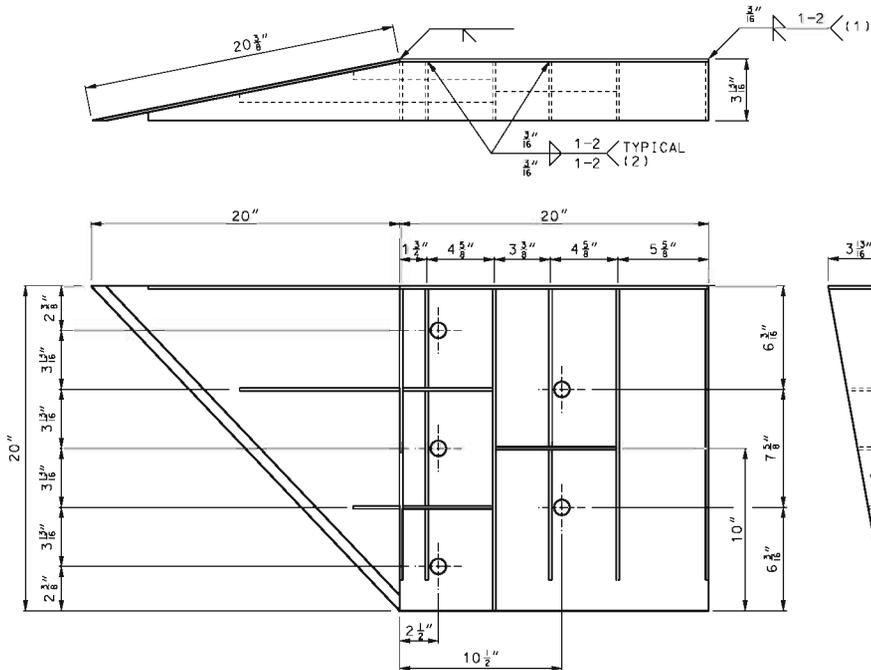


(S3) STIFFENER #3: 4 EACH



 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	BRIDGE ANCHOR SECTION SAFETY BARRIER CURB ON BRIDGE (CONNECTOR PLATE DETAIL)
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	606.22T
SHEET NO. 4 OF 5	

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



WELDING INSTRUCTION

- (1) STIFFENERS LOCATED AT THE OUTSIDE EDGES OF THE COVER PLATES SHALL BE WELDED AS FOLLOWS:
SINGLE BEVEL GROOVE WELD ON EXTERNAL SIDES AND 3/16" FILLET WELD BY 1" LONG SPACED AT 2" ON INTERNAL SIDES.
- (2) STEFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/16" FILLET WELD BY 1" LONG SPACED AT 2".

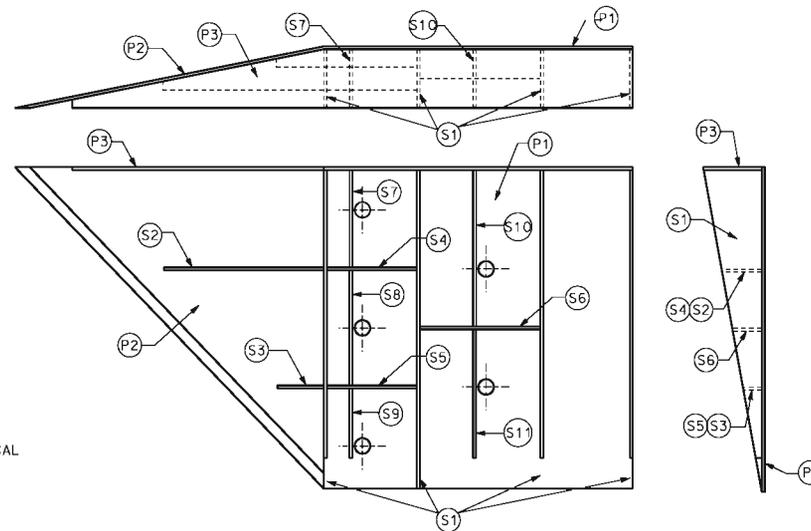


PLATE AND STIFFENER IDENTIFICATION

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)

PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1	B	20" x 20"	3/16"
P2	1	B	20" x 20" x 28 3/8"	3/16"
P3	1	B	39" x 3 3/8" x 20" x 19 3/8"	3/16"
S1	4	B	18 7/8" x 3 3/8" x 18 3/4"	1/4"
S2	1	B	10 1/4" x 2 7/8" x 10 3/8" x 1/2"	1/4"
S3	1	B	3" x 1 1/8" x 3 1/8" x 1/2"	1/4"
S4	1	B	6 1/8" x 2 7/8"	1/4"
S5	1	B	6 1/8" x 1 1/8"	1/4"
S6	1	B	7 1/2" x 1 3/4"	1/4"
S7	1	A	2 9/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1	A	1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1	C	6 1/16" x 6 3/8" x 1 3/32"	1/4"
S10	1	A	1 7/8" x 9 7/8" x 3 3/8" x 9 1/4"	1/4"
S11	1	C	8 1/2" x 8 3/4" x 1 1/8"	1/4"

GENERAL NOTES:

COVER PLATE PANELS ARE 3/16" THICK.

ALL STIFFENERS ARE 1/4" THICK.

CONNECTOR PLATE SHALL BE FABRICATED FROM ASTM GRADE A36 STEEL AND GALVANIZED.

FOR GALVANIZED REQUIREMENTS, SEE SECTION 1040 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-22781
 PROFESSIONAL ENGINEER

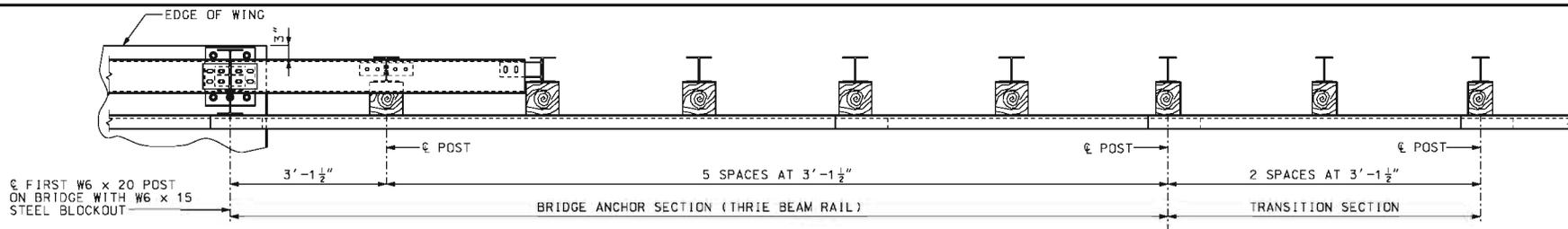
**BRIDGE ANCHOR SECTION
 SAFETY BARRIER CURB ON BRIDGE
 (CONNECTOR PLATE DETAIL)
 SINGLE SLOPE BARRIERS**

DATE EFFECTIVE: 08/01/2012
 DATE PREPARED: 7/19/2012

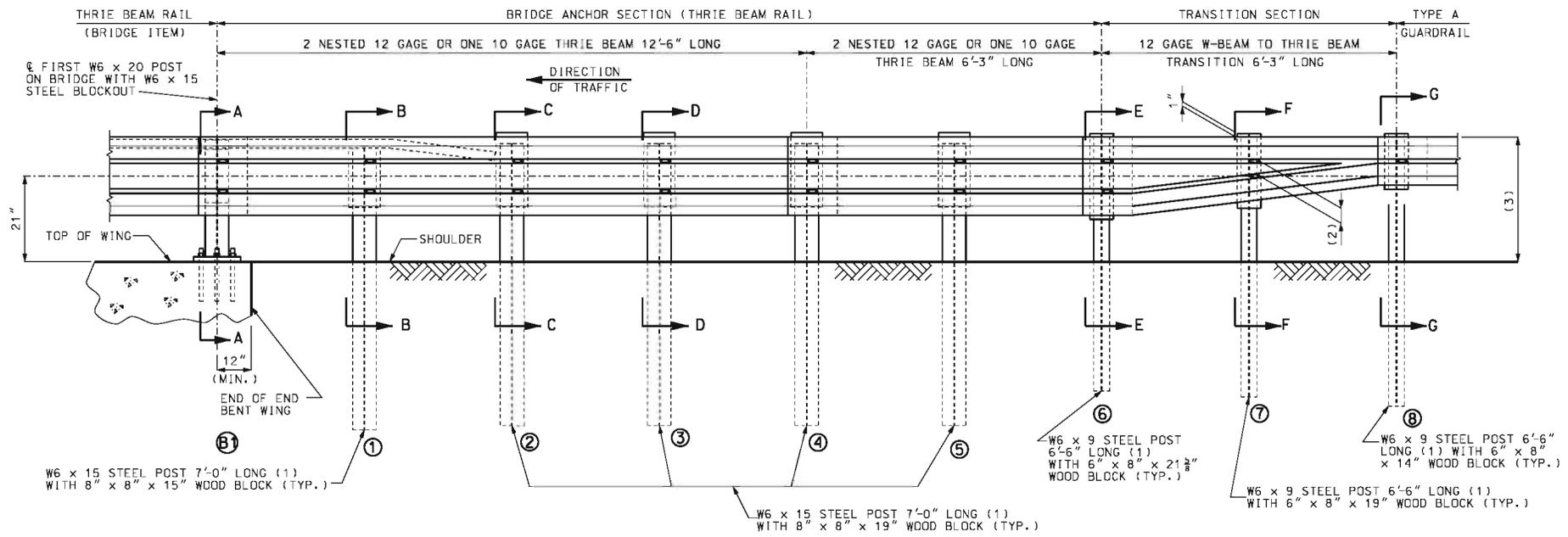
606.22T

SHEET NO.
 5 OF 5

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



PLAN

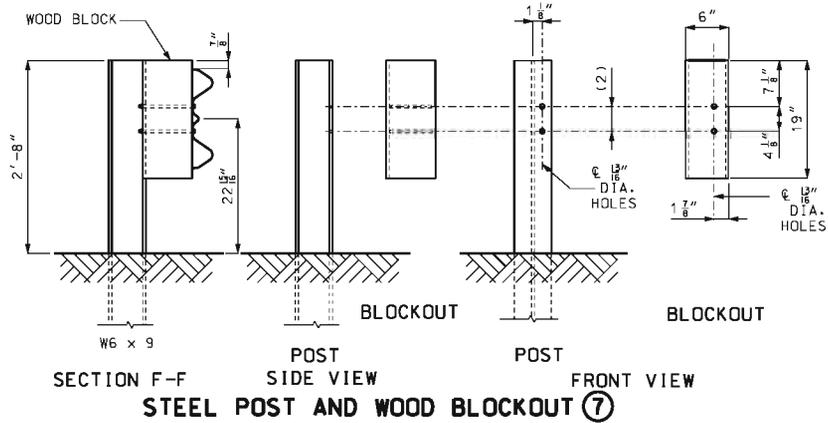


PART SECTION THROUGH SLAB AT END OF WING

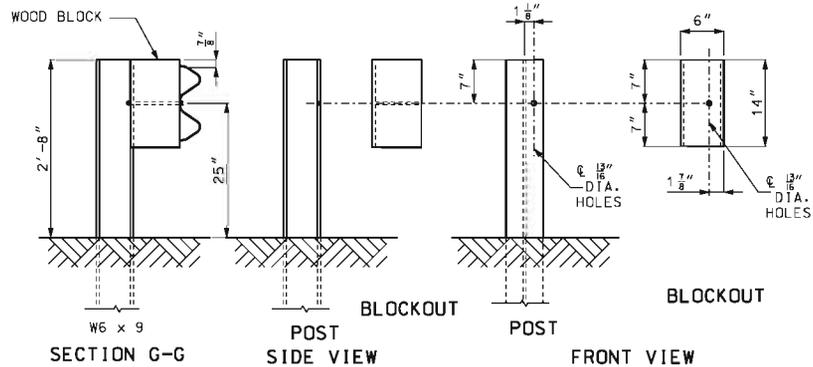
NOTES:
 FOR GENERAL NOTES, SEE SHEET 2 OF 5.
 FOR POST DETAILS AND SECTION VIEWS, SEE SHEET 2 AND 3 OF 5.

- (1) AT CONTRACTOR'S OPTION, EQUIVALENT SECTIONS MAY BE FABRICATED FROM MATERIAL MEETING AND IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A769 GRADE 36 OR 40. THE SECTIONS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO 111.
- (2) VERIFY BY RAIL TRANSITION PRODUCER.
- (3) TRANSITION FROM 31" TO 29" HEIGHT OVER NEXT EIGHT UPSTREAM 12.5' W-BEAMS.

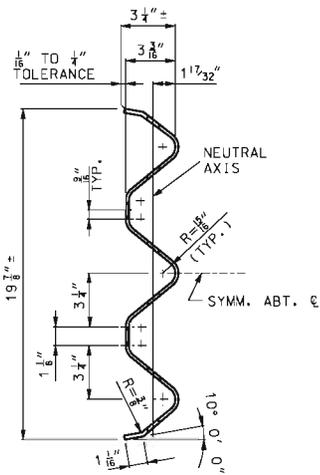
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	BRIDGE ANCHOR SECTION (THRIE BEAM RAIL ON BRIDGE)
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 11/26/2012	606.231
	SHEET NO. 1 OF 5



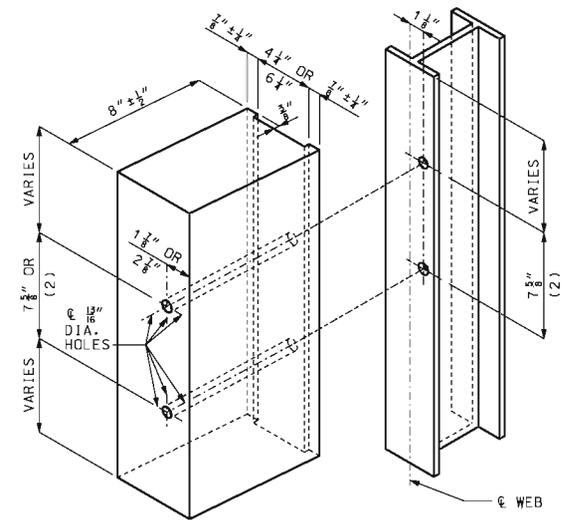
SECTION F-F
STEEL POST AND WOOD BLOCKOUT (7)



SECTION G-G
STEEL POST AND WOOD BLOCKOUT (8)

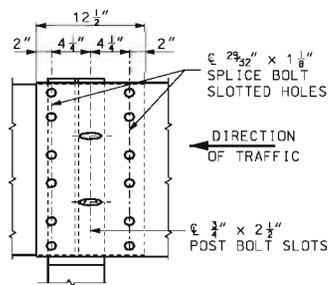


SECTION H-H
THROUGH THRIE BEAM RAIL

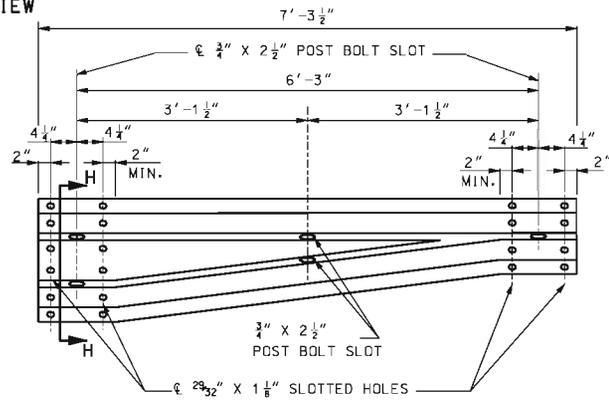


POST (7) - (2) VERIFY BY RAIL TRANSITION PRODUCER (SEE FRONT SHEET)
 POST (8) - ONLY 1 HOLE REQUIRED
 ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL
 FOR STEEL POST & WOOD BLOCKS (6" AND 8")



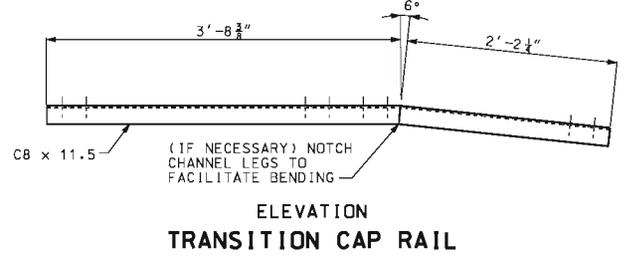
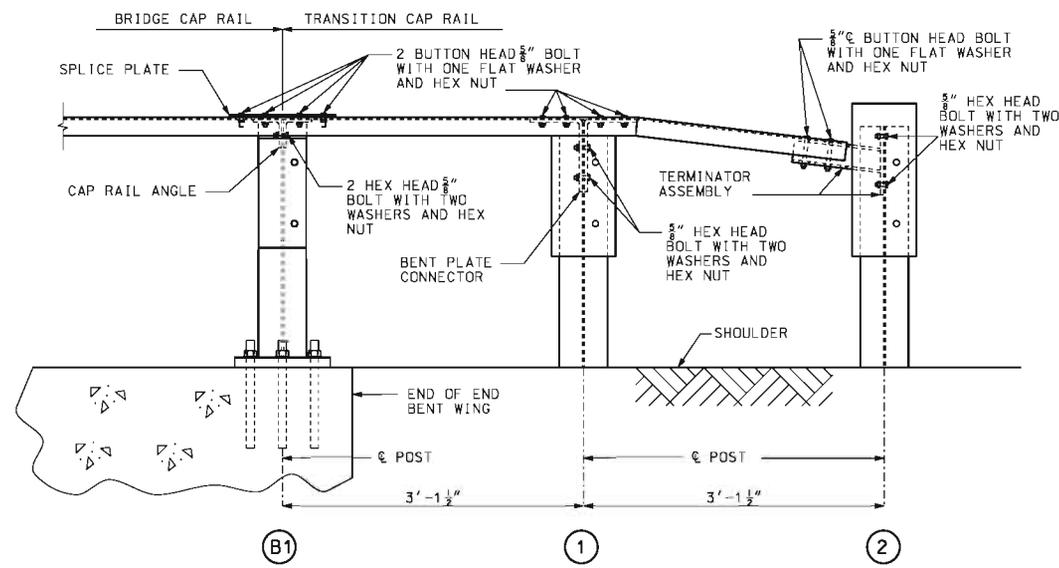
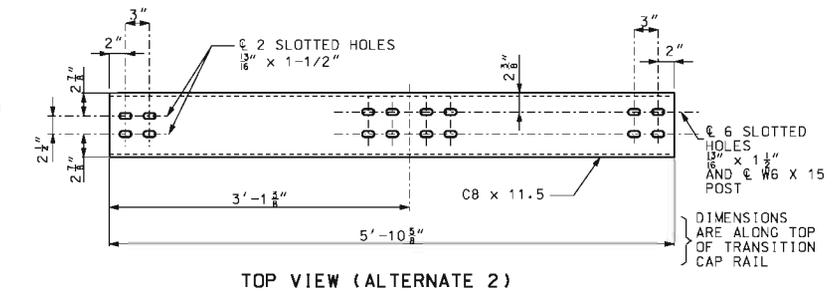
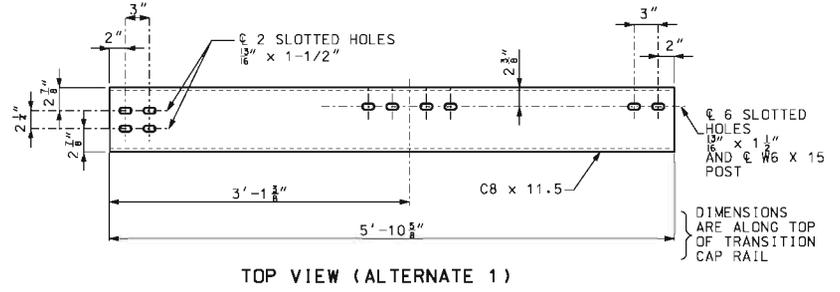
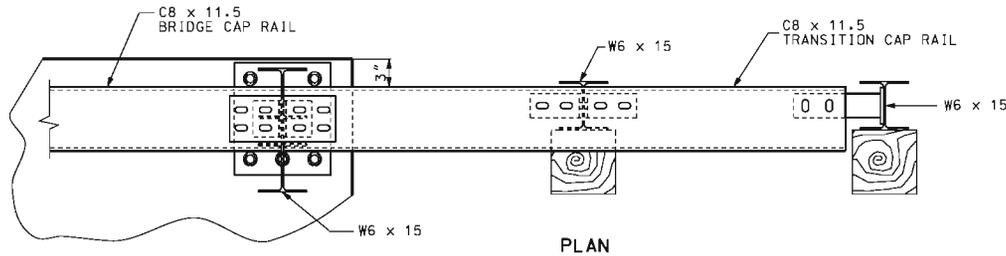
THRIE BEAM RAIL SPLICE AT POST



ASYMMETRICAL TRANSITION SECTION

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	BRIDGE ANCHOR SECTION (THRIE BEAM RAIL ON BRIDGE)	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 11/26/2012	606.231 SHEET NO. 3 OF 5

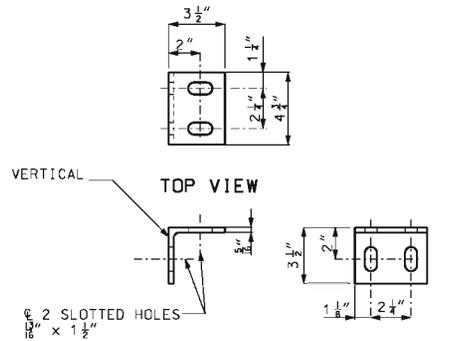
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



GENERAL NOTES:

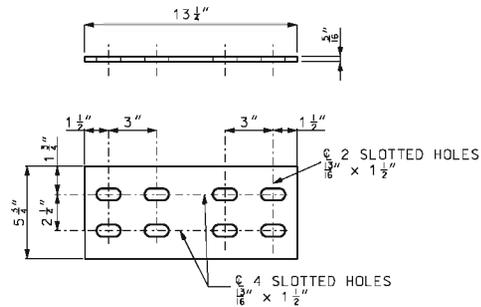
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		BRIDGE ANCHOR SECTION (THRIE BEAM RAIL ON BRIDGE)
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	606.231	SHEET NO. 4 OF 5

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

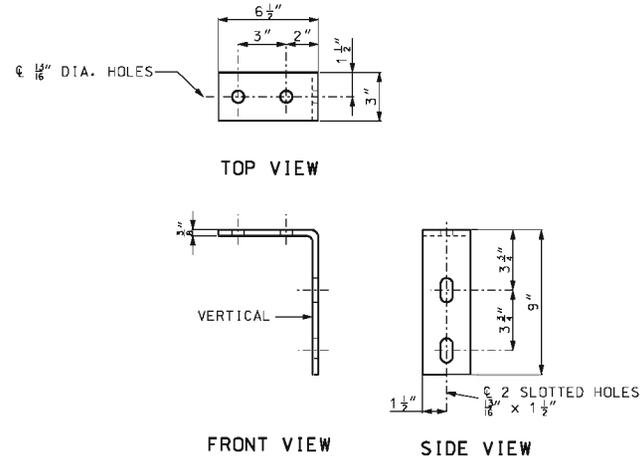


CAP RAIL ANGLE

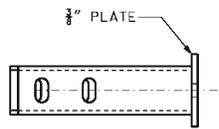
∠ 3 1/2" x 3 1/2" x 3/8"



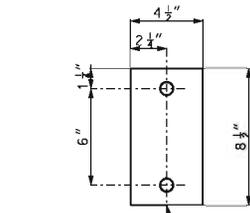
SPLICE PLATE



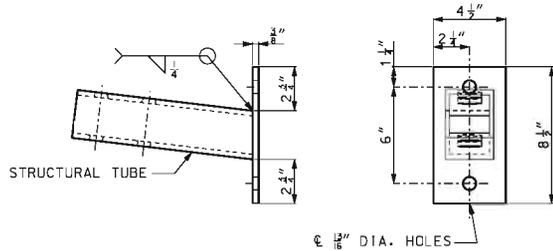
BENT PLATE CONNECTOR



TOP VIEW

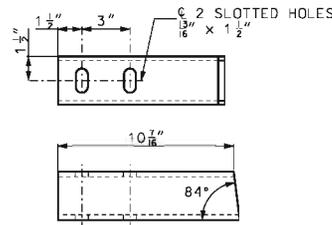


3/8" PLATE



FRONT VIEW

SIDE VIEW



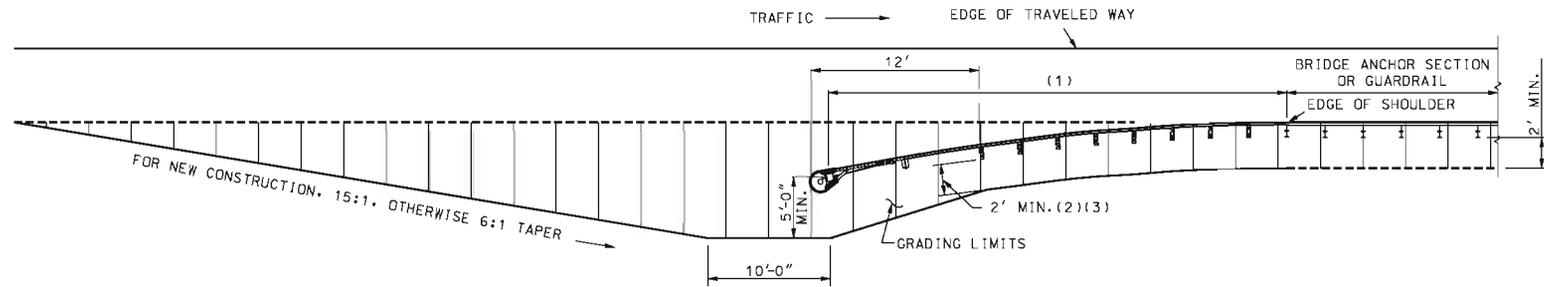
STRUCTURAL TUBE

TS 3" x 3" x 3/8"

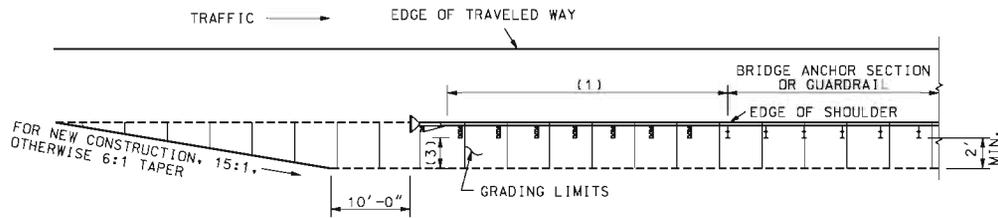
TERMINATOR ASSEMBLY

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	
BRIDGE ANCHOR SECTION (THREE BEAM RAIL ON BRIDGE)	
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	606.231
SHEET NO. 5 OF 5	

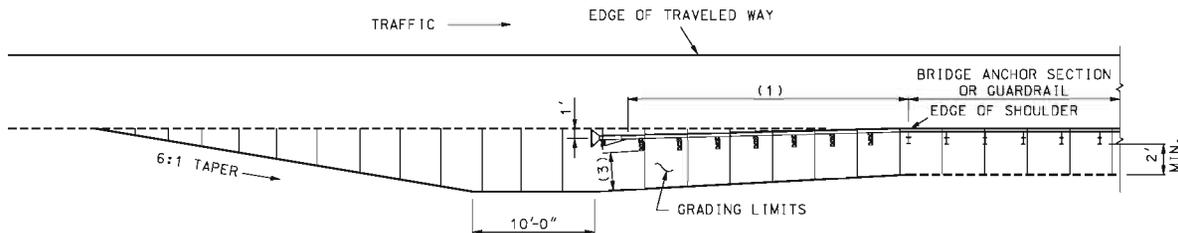
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



GRADING LIMITS FOR TYPE A FLARED CRASHWORTHY END TERMINAL



GRADING LIMITS FOR TYPE A NON-FLARED CRASHWORTHY END TERMINAL



GRADING LIMITS FOR TYPE A NON-FLARED OFFSET CRASHWORTHY END TERMINAL

GENERAL NOTES:

THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH APPROVED SHOP DRAWINGS OF THE APPROVED CRASHWORTHY END TERMINAL.

END ANCHORS SHALL BE INSTALLED ON ENDS OF GUARDRAIL RUNS WHERE CRASHWORTHY END TERMINAL IS NOT REQUIRED.

- (1) APPROVED TYPE A CRASHWORTHY END TERMINAL.
- (2) THE SLOPE SHOULD BREAK BEHIND THIRD POST.
- (3) AS PER MANUFACTURER'S SPECIFICATIONS, 2' MINIMUM. NO DIRECT PAY.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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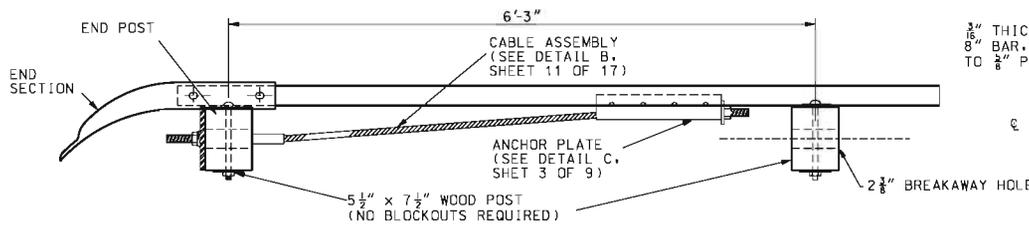
STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-22781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 BOARD SEALED AND DATED
 ELECTRONICALLY

**GUARDRAIL
 TERMINAL ENDS CRASHWORTHY**

DATE EFFECTIVE: 08/01/2012
 DATE PREPARED: 7/19/2012

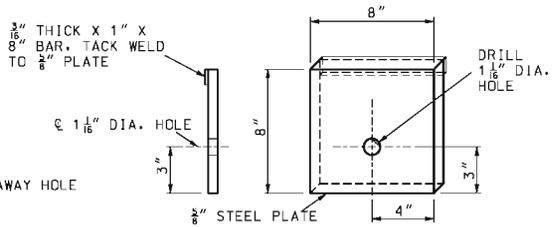
606.30F

SHEET NO.
 1 OF 9

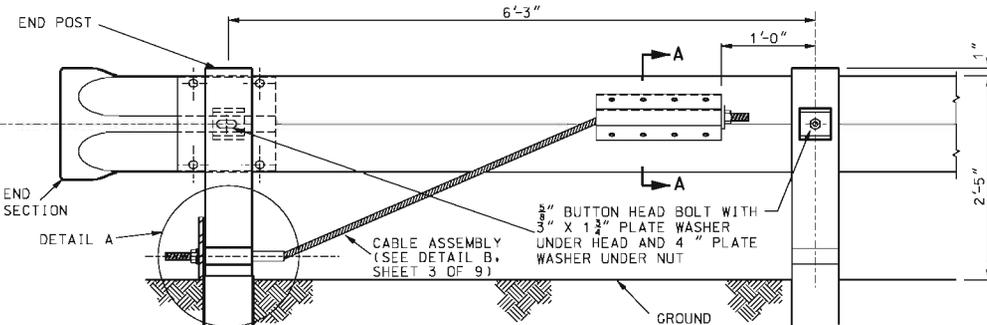


NOTE: SEE SHEET 7 OF 17 FOR DETAILS OF END SECTION.

PLAN



DETAIL OF STEEL BEARING PLATE

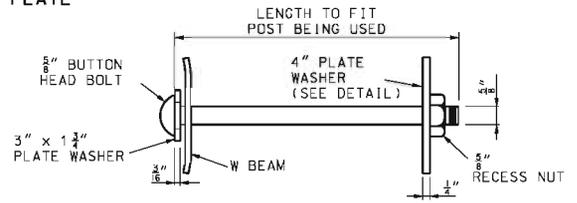


POST 1

ELEVATION (BACK SIDE)

POST 2

END ANCHOR DETAILS



POST BOLT ASSEMBLY

GENERAL NOTES:

END ANCHOR DETAILS SHOWN SHALL BE USED ONLY ON DOWN STREAM ENDS OF GUARDRAIL WHEN AN END ANCHOR IS REQUIRED.

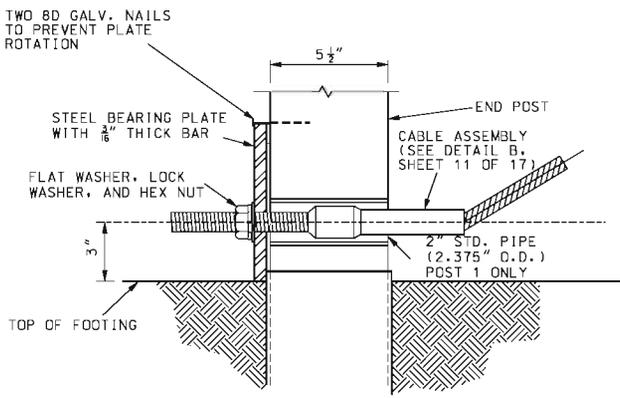
THE DETAILS SHOWN ARE FOR AN END ANCHORAGE SYSTEM FOR GUARDRAIL. GUARDRAIL AND POSTS ARE PAID FOR SEPARATELY.

CABLE ASSEMBLY AND ANCHOR PLATE SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER AND SHALL HAVE A MINIMUM BREAKING STRENGTH OF 20 TONS.

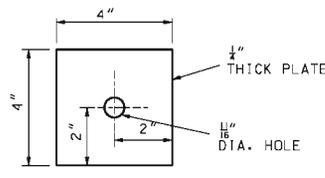
ALL FITTINGS AND HARDWARE REQUIRED SHALL BE GALVANIZED AFTER FABRICATION. SEE SECTION 1040 STANDARD SPECIFICATION.

WOOD POSTS 1 AND 2 SHALL BE 5 1/2" X 7 1/2".

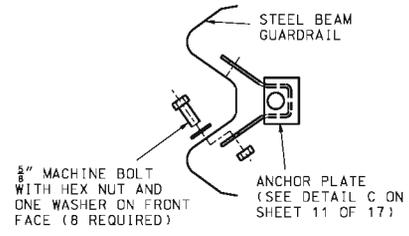
SEE SHEET 4 FOR WOOD POST DETAILS.



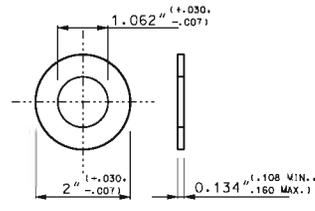
DETAIL A (END POST DETAIL)



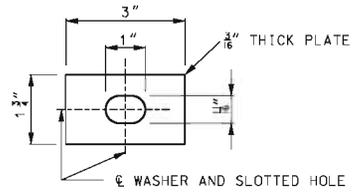
4" PLATE WASHER



SECTION A-A



TYPE A WASHER



3" X 1 3/4" PLATE WASHER

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STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-22781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 ELECTRONICALLY SEALED AND DATED

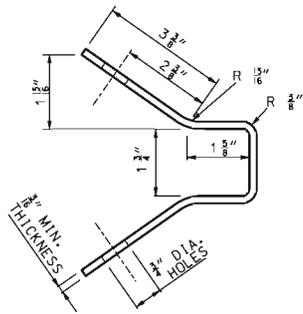
**GUARDRAIL
 TERMINAL ANCHOR ENDS**

DATE EFFECTIVE: 08/01/2012
 DATE PREPARED: 7/19/2012

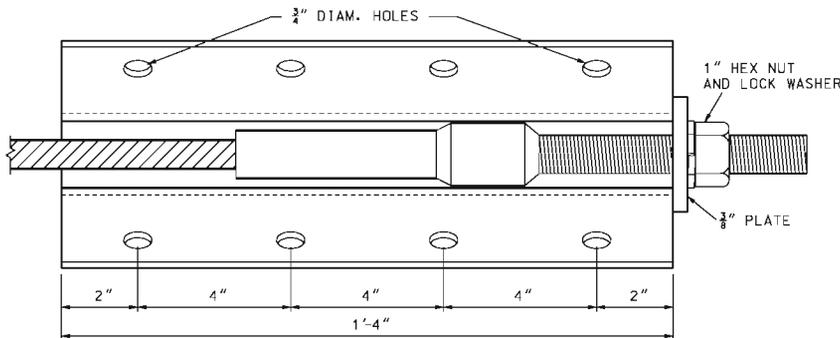
606.30F

SHEET NO.
 2 OF 9

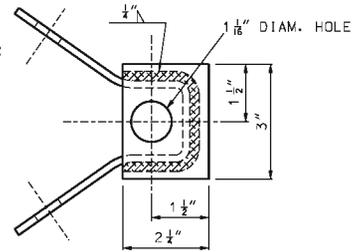
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



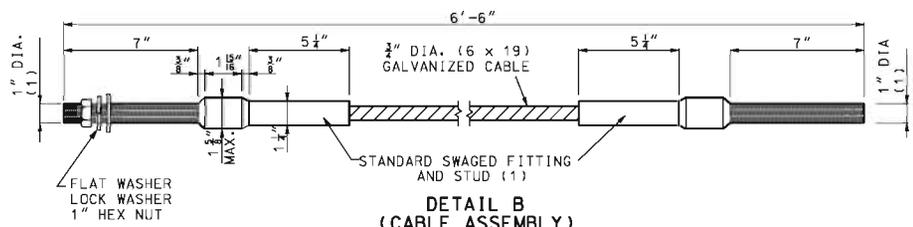
FABRICATION DETAIL



DETAIL C
ASSEMBLED VIEW
(ANCHOR PLATE)

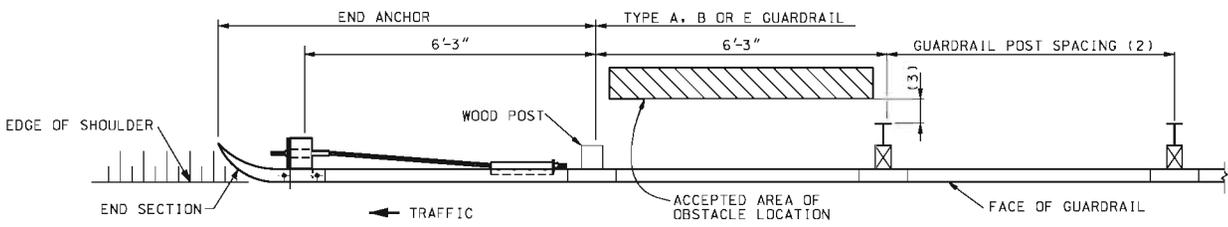


END VIEW

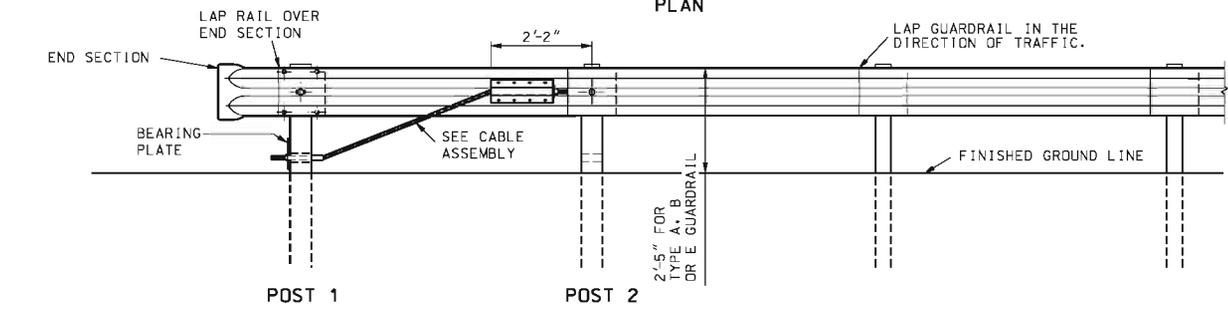


DETAIL B
(CABLE ASSEMBLY)

- (1) STUD, THREADED ENTIRE LENGTH.
- (2) 6'-3" SPACING FOR TYPE A OR B GUARDRAIL; 3'-1 1/2" SPACING FOR TYPE E GUARDRAIL.
- (3) 27" MINIMUM BUT LESS THAN 4' FOR TYPE E GUARDRAIL; 4' MINIMUM FOR TYPE A GUARDRAIL.



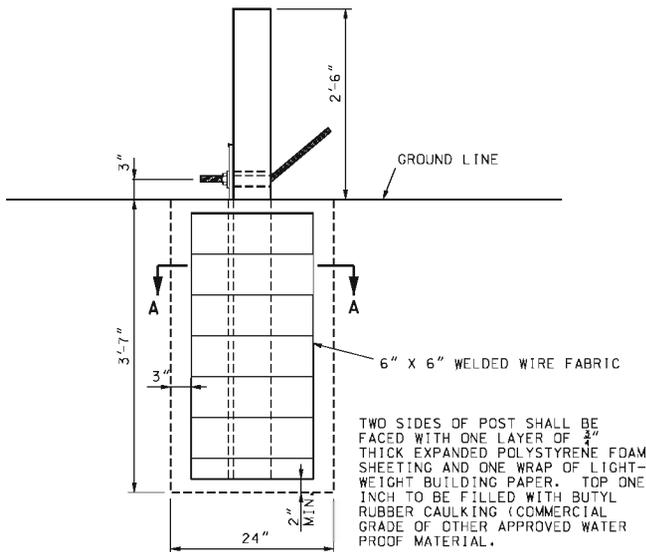
PLAN



ELEVATION
END ANCHOR

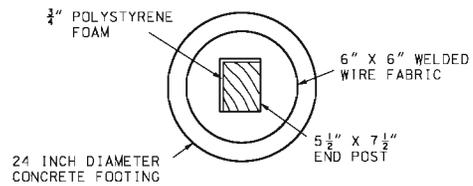
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		GUARDRAIL TERMINAL ANCHOR ENDS
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	606.30F	SHEET NO. 3 OF 9

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

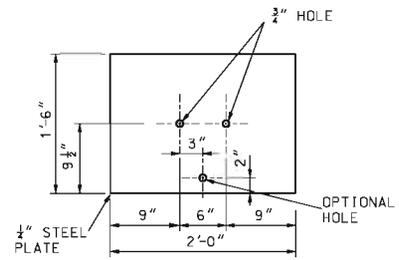


POST 1
CONCRETE FOUNDATION FOR END ANCHORS

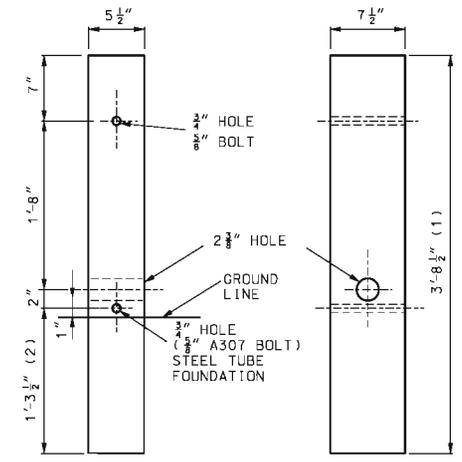
TWO SIDES OF POST SHALL BE FACED WITH ONE LAYER OF $\frac{3}{4}$ " THICK EXPANDED POLYSTYRENE FOAM SHEETING AND ONE WRAP OF LIGHT-WEIGHT BUILDING PAPER. TOP ONE INCH TO BE FILLED WITH BUTYL RUBBER CAULKING (COMMERCIAL GRADE OF OTHER APPROVED WATER PROOF MATERIAL).



SECTION A-A
EXPANDED POLYSTYRENE FOAM INSTALLATION DETAIL



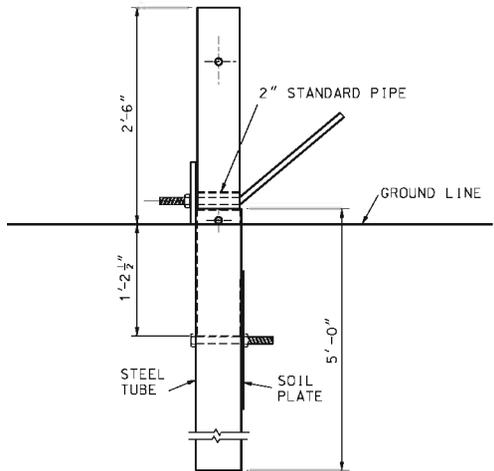
SOIL PLATE



FRONT VIEW SIDE VIEW

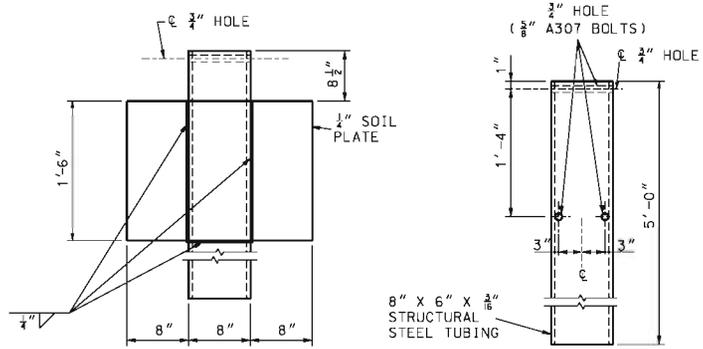
WOOD BREAKAWAY POST
 SEE SECTION 1050

- (1) 5'-11 1/2" FOR CONCRETE FOUNDATION ALTERNATE.
- (2) 3'-8 1/2" FOR CONCRETE FOUNDATION ALTERNATE.



POST 1
STEEL TUBE FOUNDATION FOR END ANCHORS

BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M232, OR THEY MAY BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH AASHTO M232 CLASS C.



SHOP WELDED SOIL PLATE CONNECTION

STEEL TUBE

GENERAL NOTES:

THE CONTRACTOR HAS THE OPTION TO INSTALL WOOD POST 1 AND 2 IN STEEL TUBE OR CONCRETE FOUNDATION.

TRIMMING OF WOOD POST MAY BE NECESSARY FOR STEEL TUBE FOUNDATION.

STEEL TUBE FOUNDATIONS SHALL BE DRILLED AND BACK-FILLED WITH A SUITABLE MATERIAL WHEN THE SOIL PLATE IS BOLTED, AS SHOWN. TO THE STEEL TUBE. STEEL TUBE FOUNDATION MAY BE DRIVEN WHEN THE SOIL PLATE IS WELDED, AS SHOWN. TO THE STEEL TUBE.

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

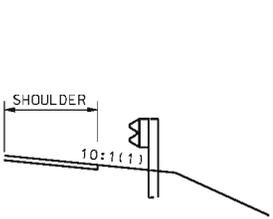
STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-2781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 BOUND, SEALED AND DATED
 ELECTRONICALLY.

**GUARDRAIL
 TERMINAL ANCHOR ENDS**

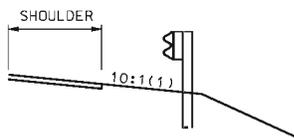
DATE EFFECTIVE:	08/01/2012	606.30F	SHEET NO. 4 OF 9
DATE PREPARED:	7/19/2012		

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

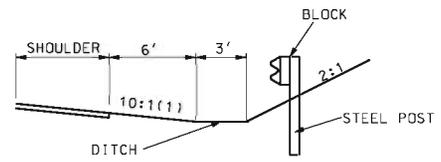
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



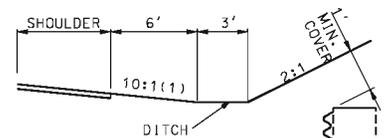
SECTION A-A



SECTION B-B

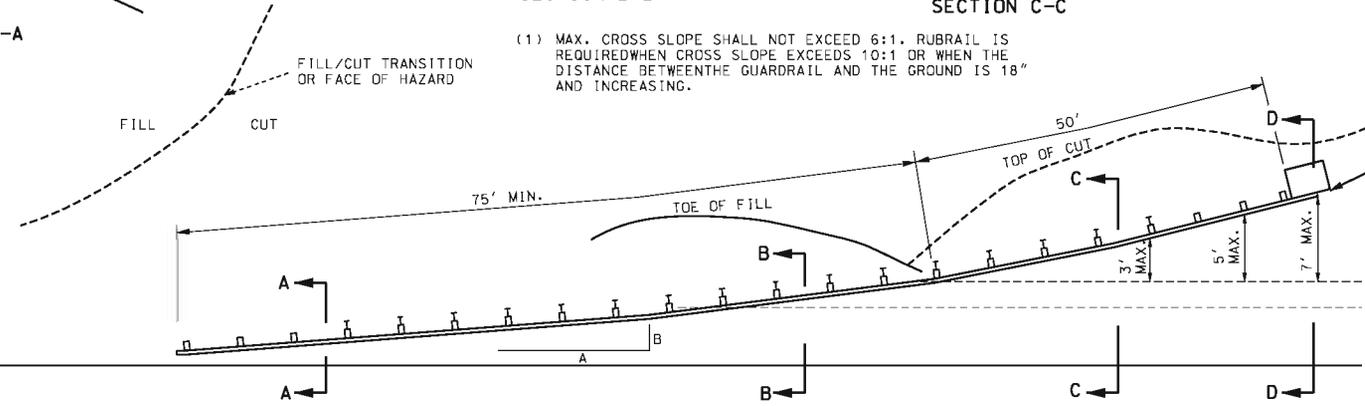


SECTION C-C



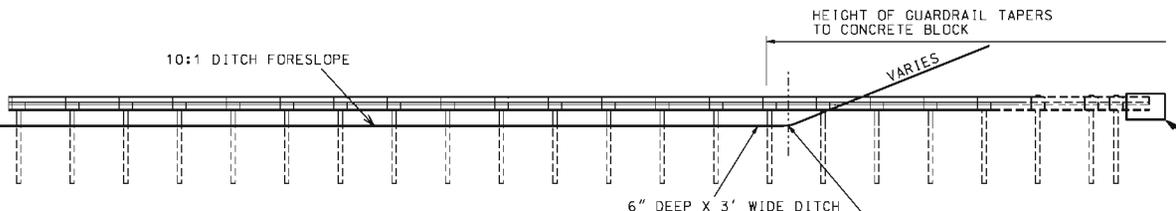
SECTION D-D

(1) MAX. CROSS SLOPE SHALL NOT EXCEED 6:1. RUBRAIL IS REQUIRED WHEN CROSS SLOPE EXCEEDS 10:1 OR WHEN THE DISTANCE BETWEEN THE GUARDRAIL AND THE GROUND IS 18" AND INCREASING.



PLAN VIEW

10:1 CROSS SLOPE		STEEPER THAN 10:1 CROSS SLOPE (1)	
DESIGN SPEED mph	A:B	DESIGN SPEED mph	A:B
70	15:1	45-70	12.5:1
60	13:1	40	9:1
55	12:1	30 OR LESS	7:1
50	11:1		
45	10:1		
40	9:1		
30 OR LESS	7:1		



ELEVATION
ANCHORED IN BACKSLOPE GUARDRAIL

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

STATE OF MISSOURI

KATHRYN PHILLIPS HAWRY

NUMBER PE-23761

PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN
SIGNED, SEALED AND DATED
ELECTRONICALLY.

**GUARDRAIL
EMBEDDED TERMINAL
ENDS (FLAT DITCH)**

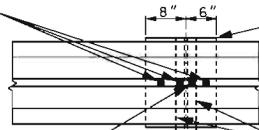
DATE EFFECTIVE: 08/01/2012

DATE PREPARED: 7/19/2012

606.30F

SHEET NO.
6 OF 9

3 - 1" Ø HOLES TO BE FIELD DRILLED IN W-BEAM ELEMENT AND ATTACHED WITH 3/4" Ø HEX HEAD BOLTS 1 1/2" LONG EACH WITH ONE SQUARE WASHER AND HEX NUT.



1/2" X 14" X 14" STEEL PLATE

STEEL POST

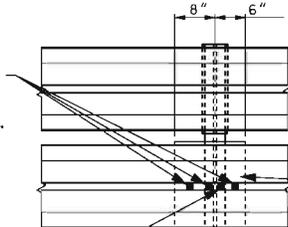
1" Ø HOLE TO BE FIELD DRILLED THROUGH W-BEAM AND THROUGH POST FLANGE. ATTACHED W-BEAM WITH 1/2" Ø HEX HEAD BOLT 2" LONG WITH ONE SQUARE WASHER AND HEX NUT.

1/2" FILLET WELD PLATE TO POST BOTH SIDES OF POST

8' - 0"

EMBEDDED STEEL POST

3 - 1" Ø HOLES TO BE FIELD DRILLED IN W-BEAM ELEMENT AND ATTACHED WITH 3/4" Ø HEX HEAD BOLTS 1 1/2" LONG EACH WITH ONE SQUARE WASHER AND HEX NUT.



1/2" X 14" X 14" STEEL PLATE

STEEL POST

1" Ø HOLE TO BE FIELD DRILLED THROUGH W-BEAM AND THROUGH POST FLANGE. ATTACHED W-BEAM WITH 1/2" Ø HEX HEAD BOLT 2" LONG WITH ONE SQUARE WASHER AND HEX NUT.

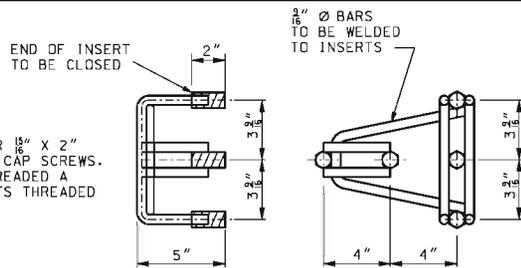
1/2" FILLET WELD PLATE TO POST BOTH SIDES OF POST

8' - 0"

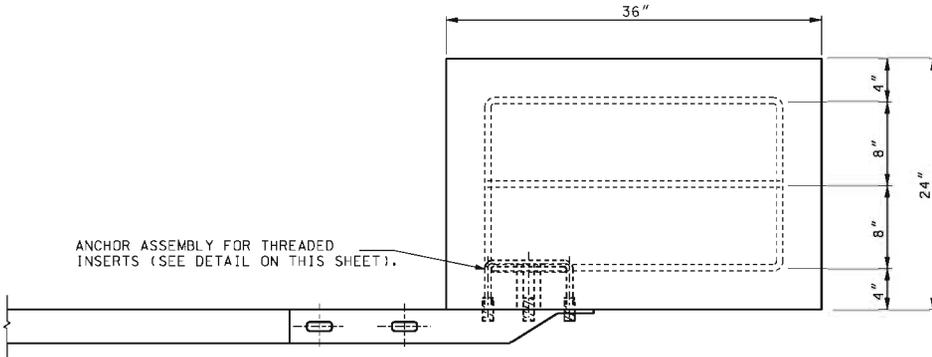
SPECIAL RUBRAIL TO POST CONNECTION AT POST A

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	GUARDRAIL EMBEDDED ANCHOR TERMINAL ENDS (STEEL POST OPTION)
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	606.30F
SHEET NO. 7 OF 9	

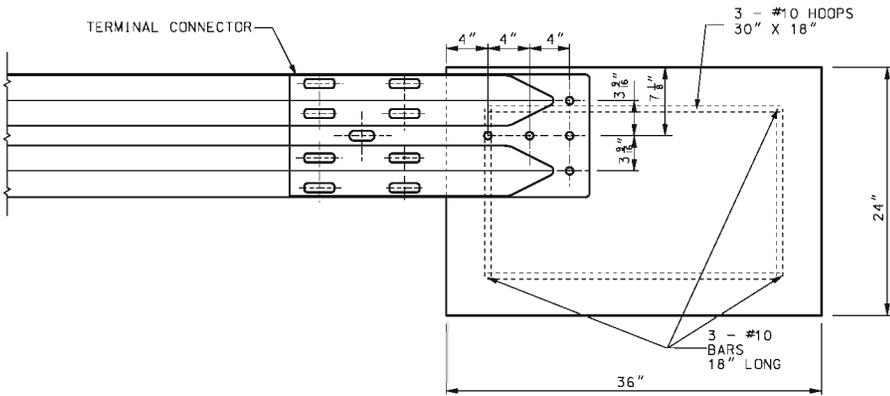
THREADED INSERTS FOR $\frac{1}{8}$ " X 2" GALVANIZED HEX HEAD CAP SCREWS. CAP SCREWS TO BE THREADED A MINIMUM $1\frac{7}{8}$ ". INSERTS THREADED MINIMUM OF $1\frac{3}{4}$ ".



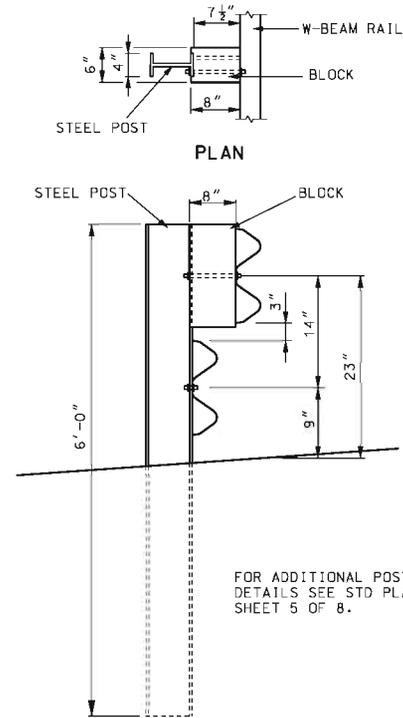
CONCRETE BLOCK ANCHOR ANCHOR ASSEMBLY



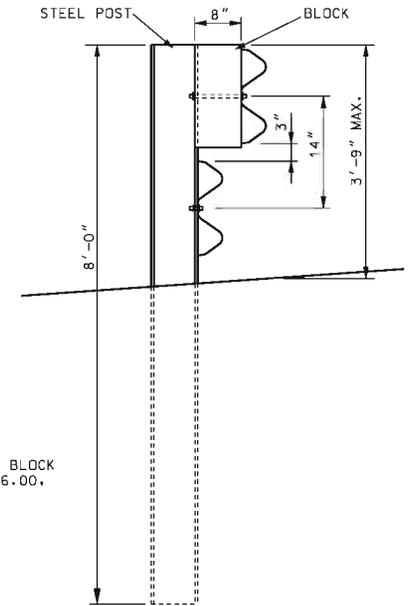
TOP VIEW



ELEVATION CONCRETE BLOCK ANCHOR
(24" X 24" X 36")



ELEVATION OF 6' POST



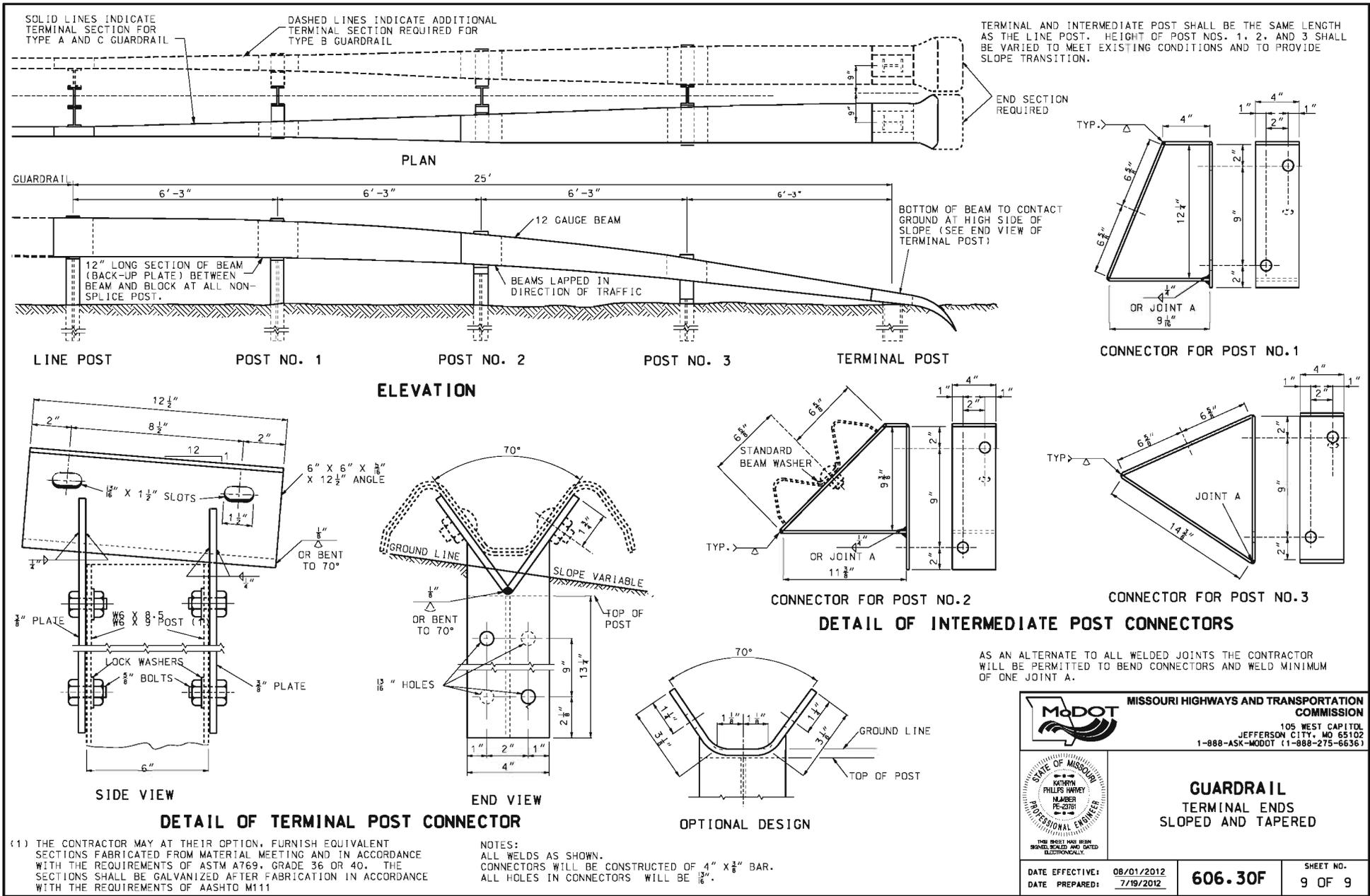
ELEVATION 8' POST

STEEL POST AND BLOCK DETAIL

FOR ADDITIONAL POST AND BLOCK DETAILS SEE STD PLAN 606.00, SHEET 5 OF 8.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	GUARDRAIL EMBEDDED TERMINAL ENDS GENERAL DETAILS	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	606.30F
		SHEET NO. 8 OF 9

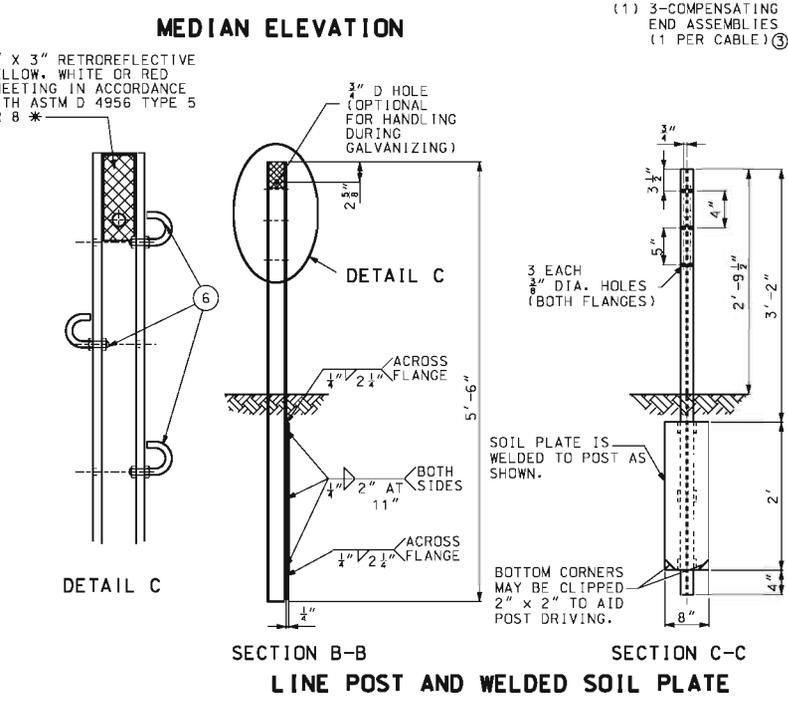
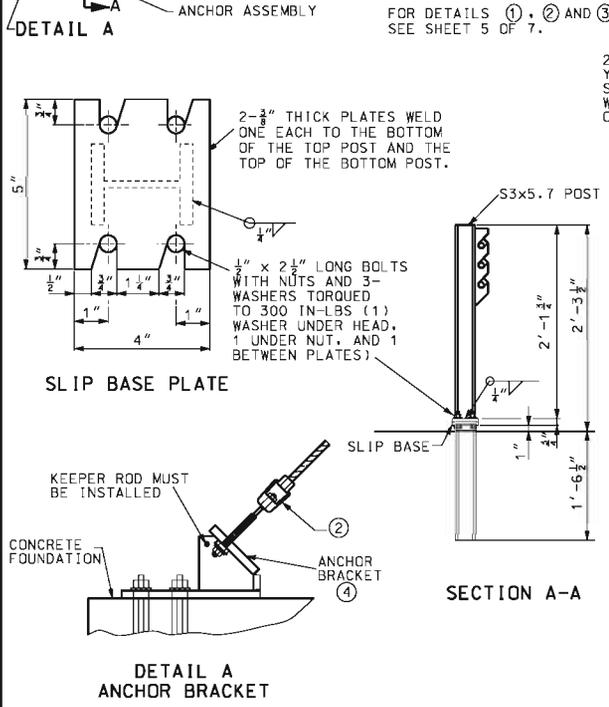
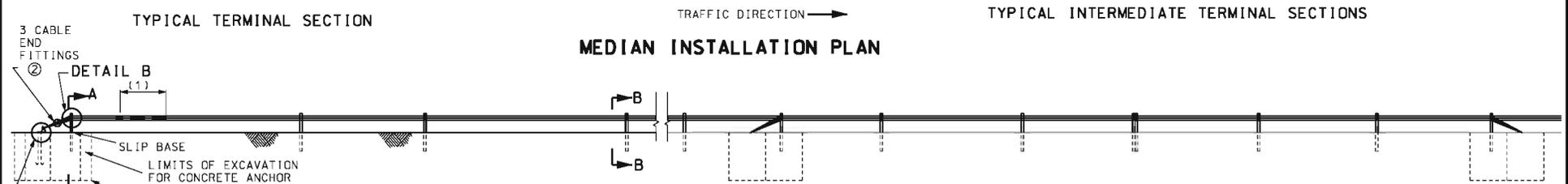
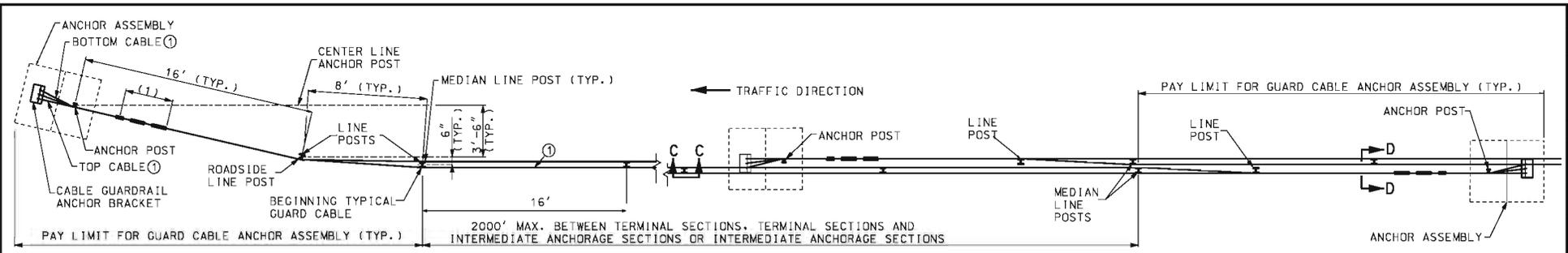
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



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)	
		GUARDRAIL TERMINAL ENDS SLOPED AND TAPERED	
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	606.30F		SHEET NO. 9 OF 9

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



GENERAL NOTES:

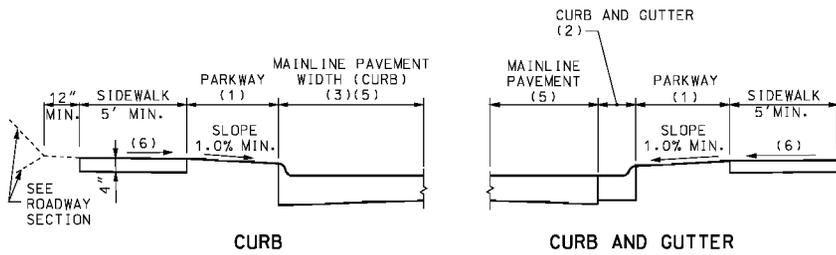
IN THE EVENT THE NORMAL 16' POST SPACING WOULD PLACE A POST ON A DROP INLET, THE SPACING OF THE TWO POSTS IMMEDIATELY PRECEDING THE INLET SHALL BE REDUCED SUCH THAT THE FOLLOWING POST CLEARS THE INLET. EACH SUBSEQUENT POST SHALL BE SPACED AT 16'. IN NO CASE SHALL THE SPACING EXCEED 16'.

IN THE EVENT A LONGITUDINAL MEDIAN PIPE IS ENCOUNTERED THE CABLE SHALL BE PLACED PARALLEL TO THE PIPE AT A MINIMUM OFFSET OF 12". THE OFFSET SHALL BE ACHIEVED BY A MINIMUM 16:1 TAPER ON THE UPSTREAM AND DOWNSTREAM END OF THE PIPE.

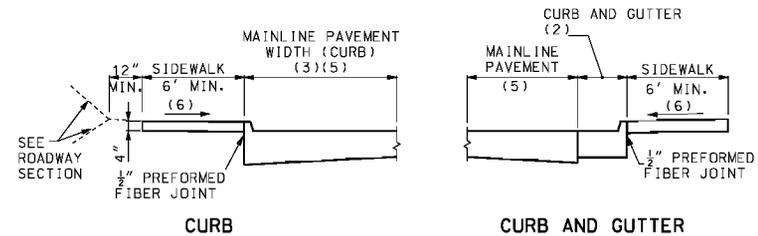
FOR SECTION D-D, SEE SHEET 4.

* REFLECTIVE SHEETING SHALL FOLLOW GUIDELINES OUTLINED IN SEC 1042.2.7 FOR CORRECT APPLICATION OF SHEETING TO GUARD CABLE POST. THE COLOR OF THE SHEETING SHALL MATCH THE CLOSEST ADJACENT PAVEMENT MARKING. RED SHEETING SHALL BE APPLIED TO THE BACK SIDE OF THE POST WHEN THE DELINEATION IS PLACED ALONG AN INTERCHANGE RAMP AND COULD BE VIEWED BY WRONG WAY TRAFFIC.

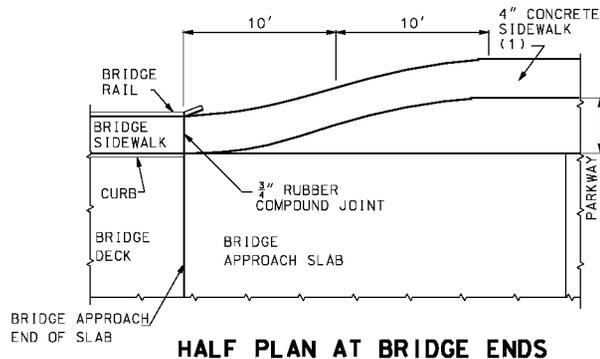
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	THREE-STRAND GUARD CABLE MEDIAN APPLICATION	
	DATE EFFECTIVE: 01/01/2005 DATE PREPARED: 11/26/2012	606.41J SHEET NO. 1 OF 7



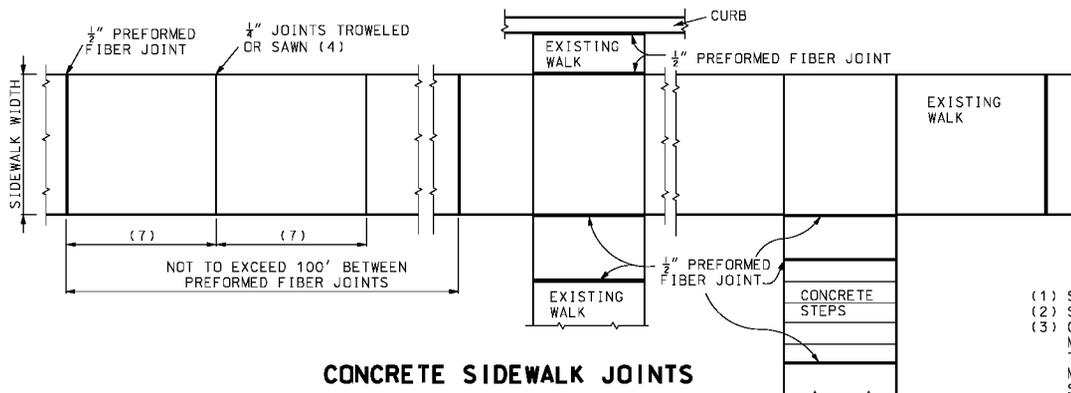
TYPICAL SIDEWALK WITH PARKWAY 2' OR MORE



TYPICAL SIDEWALK WITH NO PARKWAY



HALF PLAN AT BRIDGE ENDS



CONCRETE SIDEWALK JOINTS

- (1) SEE PLANS FOR WIDTH
- (2) SEE STANDARD 608.00
- (3) CURB TO BE MONOLITHIC WITH PCC MAINLINE PAVEMENT. CURB TO BE TYPE S WITH ASPHALT CONCRETE MAINLINE PAVEMENT. SEE STANDARD PLAN 609.00.
- (4) MIN. 1/2" DEPTH JOINT.
- (5) SEE TYPICAL PAVEMENT SECTION
- (6) SLOPE 1.0% (2.0% MAX.)
- (7) SPACING EQUAL TO WIDTH OF WALK

GENERAL NOTES:

ALL AREAS OF THE PEDESTRIAN ACCESS ROUTE MUST BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT - GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS OF WAY. EXCEPTIONS MUST BE APPROVED BY THE ENGINEER. ALL OTHER AREAS OF NON-COMPLIANCE SHALL BE REMOVED AND CORRECTED AT THE CONTRACTOR'S EXPENSE.

THE SURFACES OF PEDESTRIAN ACCESS ROUTES AND ELEMENTS, AND SPACES REQUIRED TO CONNECT TO PEDESTRIAN ACCESS ROUTES, SHALL BE FIRM, STABLE, SLIP RESISTANT, AND SHALL NOT POND WATER.

WHERE SIDEWALKS ARE LESS THAN 5 FT., 5 FT. X 5 FT. PASSING SPACES EVERY 200 FT. SHALL BE PROVIDED AND ARE PERMITTED TO OVERLAP PEDESTRIAN ACCESS ROUTES.

THE CROSS SLOPE OF THE CONTINUOUS PEDESTRIAN ACCESS ROUTE THROUGH ENTRANCES, ALLEYS, AND SIDEROAD CONNECTIONS WITH STOP OR YIELD CONTROL SHALL BE 1.00% TO FACILITATE DRAINAGE (2.00% MAX.).

WHERE PEDESTRIAN ACCESS ROUTES ARE CONTAINED WITHIN PEDESTRIAN STREET CROSSINGS WITHOUT YIELD OR STOP CONTROL, THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE 5.00% MAXIMUM.

WHERE PEDESTRIAN ACCESS ROUTES ARE CONTAINED WITHIN MIDBLOCK PEDESTRIAN STREET CROSSINGS, THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE PERMITTED TO EQUAL THE STREET OR HIGHWAY GRADE.

STORMWATER INLETS, SIGNS, POSTS, MANHOLE COVERS, PULL BOXES AND OTHER ACCESS LIDS SHOULD BE AVOIDED WITHIN THE SIDEWALK. IF SUCH A LOCATION IS NECESSARY, THE FEATURE MUST MEET ADA STANDARDS.

THE RUNNING GRADE OF A SIDEWALK SHALL NOT EXCEED 5.0% UNLESS IT IS MATCHING THE GRADE OF THE ADJACENT ROADWAY.

PEDESTRIAN ACCESS ROUTE SHALL CONTINUE ACROSS RESIDENTIAL AND COMMERCIAL ENTRANCES, ALLEYS, AND SIDEROAD CONNECTIONS.

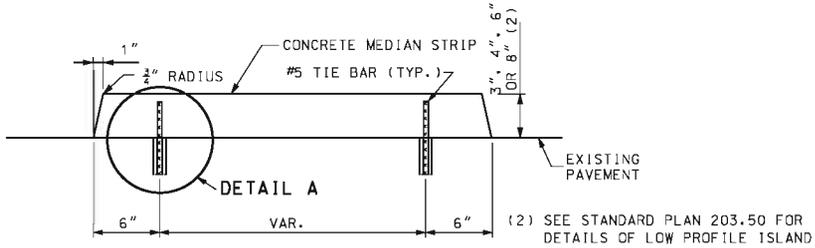
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE SIDEWALK	
	DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015	608.10P SHEET NO. 1 OF 1

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

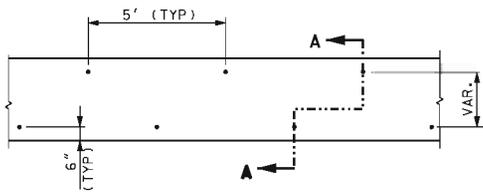
QUANTITIES FOR CONCRETE STEPS														
CONCRETE C.Y. STEEL LB.														
		10 1/2" TREAD				1:1.5 SLOPE				7" RISE				
W	NO. STEPS	2	3	4	5	6	7	8	9	10	11	12	13	14
2'	CONC.	0.20	0.29	0.38	0.47	0.56	0.65	0.74	0.83	0.92	1.01	1.10	1.19	1.28
	STEEL	10	13	16	20	24	28	30	34	38	42	46	48	52
3'	CONC.	0.27	0.39	0.51	0.63	0.75	0.88	1.00	1.12	1.24	1.36	1.48	1.60	1.73
	STEEL	13	18	21	27	32	38	41	46	52	57	63	65	71
4'	CONC.	0.34	0.49	0.64	0.80	0.95	1.10	1.25	1.40	1.56	1.71	1.86	2.01	2.17
	STEEL	17	23	27	34	41	48	52	59	66	73	80	83	90
5'	CONC.	0.41	0.59	0.78	0.96	1.14	1.33	1.51	1.69	1.88	2.06	2.24	2.42	2.61
	STEEL	21	28	33	42	50	59	63	71	80	88	97	101	109
6'	CONC.	0.48	0.70	0.91	1.12	1.34	1.55	1.77	1.98	2.19	2.41	2.62	2.84	3.05
	STEEL	24	33	39	49	59	69	74	84	94	104	114	118	128
		12" TREAD				1:2 SLOPE				6" RISE				
W	NO. STEPS	2	3	4	5	6	7	8	9	10	11	12	13	14
2'	CONC.	0.18	0.26	0.33	0.41	0.49	0.56	0.64	0.72	0.80	0.87	0.95	1.03	1.10
	STEEL	10	12	16	19	23	25	29	33	36	39	42	46	50
3'	CONC.	0.25	0.35	0.45	0.56	0.66	0.76	0.87	0.97	1.07	1.18	1.28	1.38	1.49
	STEEL	13	16	21	26	32	34	39	45	50	53	58	63	68
4'	CONC.	0.31	0.44	0.57	0.70	0.83	0.96	1.09	1.22	1.35	1.48	1.61	1.74	1.87
	STEEL	17	20	27	33	40	44	50	57	63	67	73	81	87
5'	CONC.	0.38	0.53	0.69	0.85	1.00	1.16	1.31	1.47	1.63	1.78	1.94	2.10	2.25
	STEEL	21	25	33	41	49	53	61	69	77	82	89	98	105
6'	CONC.	0.44	0.62	0.81	0.99	1.17	1.36	1.54	1.72	1.90	2.09	2.27	2.45	2.64
	STEEL	24	29	39	48	58	62	71	81	90	96	105	115	124
		14 1/4" TREAD				1:3 SLOPE				4 1/2" RISE				
W	NO. STEPS	2	3	4	5	6	7	8	9	10	11	12	13	14
2'	CONC.	0.19	0.27	0.35	0.43	0.51	0.59	0.68	0.76	0.84	0.92	1.00	1.08	1.16
	STEEL	10	14	18	21	25	29	33	37	41	43	47	51	55
3'	CONC.	0.26	0.37	0.48	0.59	0.70	0.80	0.91	1.02	1.13	1.24	1.35	1.46	1.56
	STEEL	14	19	25	28	34	39	45	50	56	59	65	70	76
4'	CONC.	0.33	0.47	0.61	0.74	0.88	1.02	1.15	1.29	1.42	1.56	1.70	1.83	1.97
	STEEL	18	25	32	36	43	50	57	64	71	75	82	89	96
5'	CONC.	0.40	0.57	0.73	0.90	1.06	1.22	1.39	1.55	1.72	1.88	2.05	2.21	2.38
	STEEL	22	30	39	44	52	61	69	78	86	91	100	108	117
6'	CONC.	0.47	0.66	0.86	1.05	1.24	1.43	1.63	1.82	2.01	2.21	2.40	2.59	2.78
	STEEL	25	35	45	51	61	71	81	91	101	107	117	127	137

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE STAIRS	
	SHEET NO. 2 OF 2	
DATE EFFECTIVE: <u>04/01/2015</u> DATE PREPARED: <u>2/20/2015</u>	608.20E	

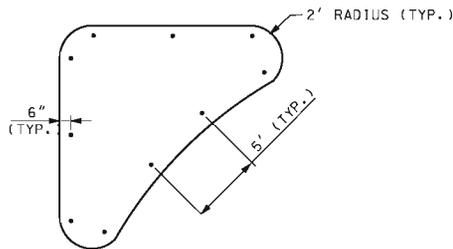
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



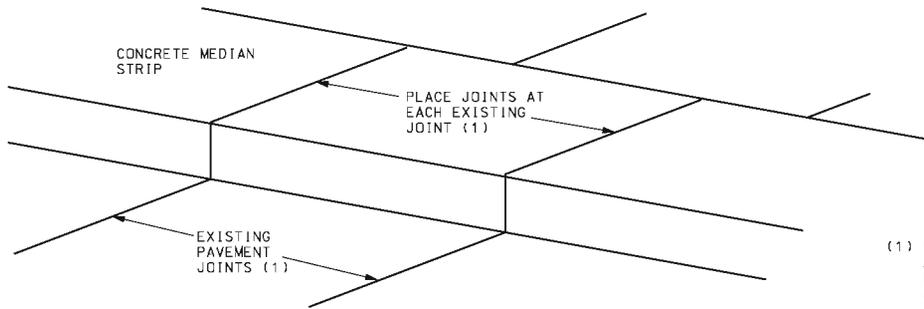
SECTION A-A
CONCRETE MEDIAN STRIP



TIE BAR LOCATIONS FOR
CONCRETE MEDIAN STRIP

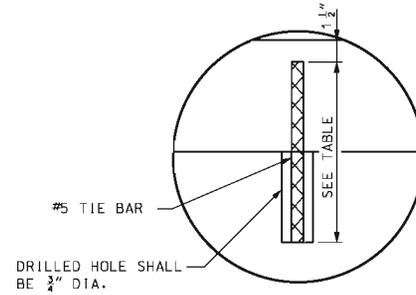


TIE BAR LOCATIONS FOR
CONCRETE MEDIAN STRIP (ISLAND)



CONCRETE MEDIAN STRIP JOINT LOCATION

(1) WHEN THERE ARE NO VISIBLE JOINTS IN THE ADJACENT PAVEMENT, THE JOINT SPACING WILL BE EQUAL TO THE MEDIAN STRIP WIDTH, WITH A MINIMUM SPACING OF 10'.



DETAIL A

MEDIAN HEIGHT	BAR LENGTH
3"	8"
4"	9"
6"	11"
8"	13"

GENERAL NOTES:

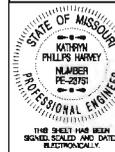
TIE BARS SHALL BE EPOXY COATED, DEFORMED REINFORCING BARS MEETING THE REQUIREMENTS OF SECTION 710 AND 1057.

BONDING FOR TIE BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

THE FACE OF THE MEDIAN MAY BE CONSTRUCTED WITHOUT BATTER WHEN CONSTRUCTED ON A RADIUS OF 6' OR LESS.

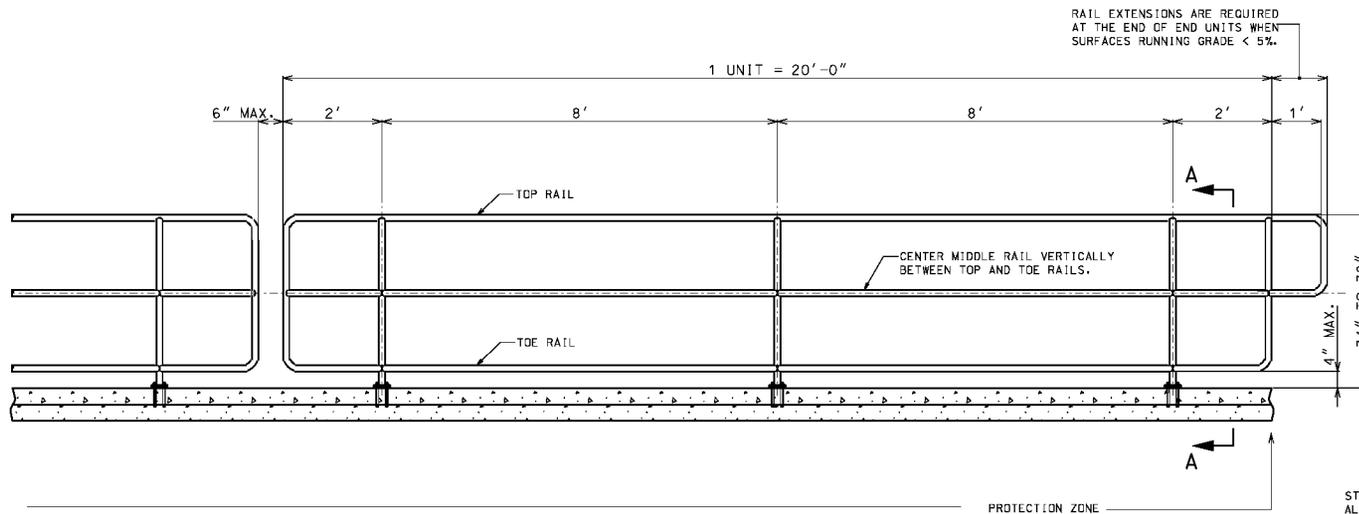
WHEN CONCRETE MEDIANS ARE CONSTRUCTED DIRECTLY BENEATH GUARDRAIL, THE MEDIAN HEIGHT WILL BE 4".

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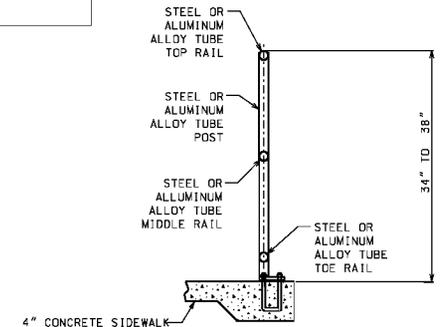
CONCRETE MEDIAN STRIP

DATE EFFECTIVE: 02/01/2011	608.30A	SHEET NO. 1 OF 1
DATE PREPARED: 3/9/2011		

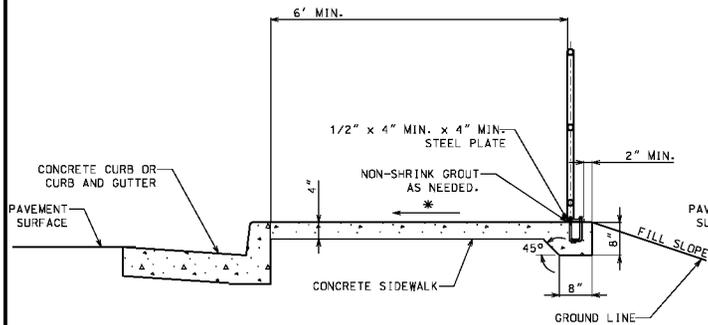


SIDEWALK HANDRAILING WITHOUT BALUSTERS

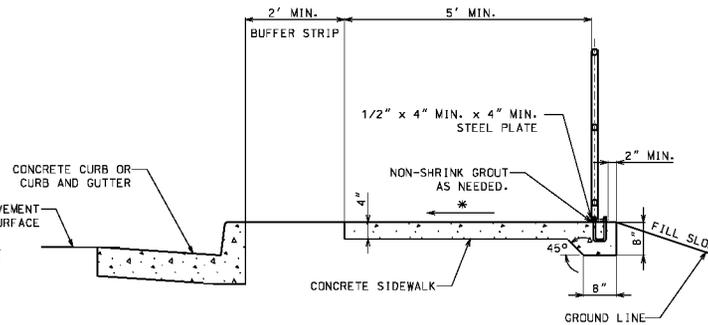
* CROSS SLOPE: 1.0% MIN. - 2.0% MAX.



HANDRAILING



SIDEWALK WITHOUT BUFFER STRIP (SECTION A-A)

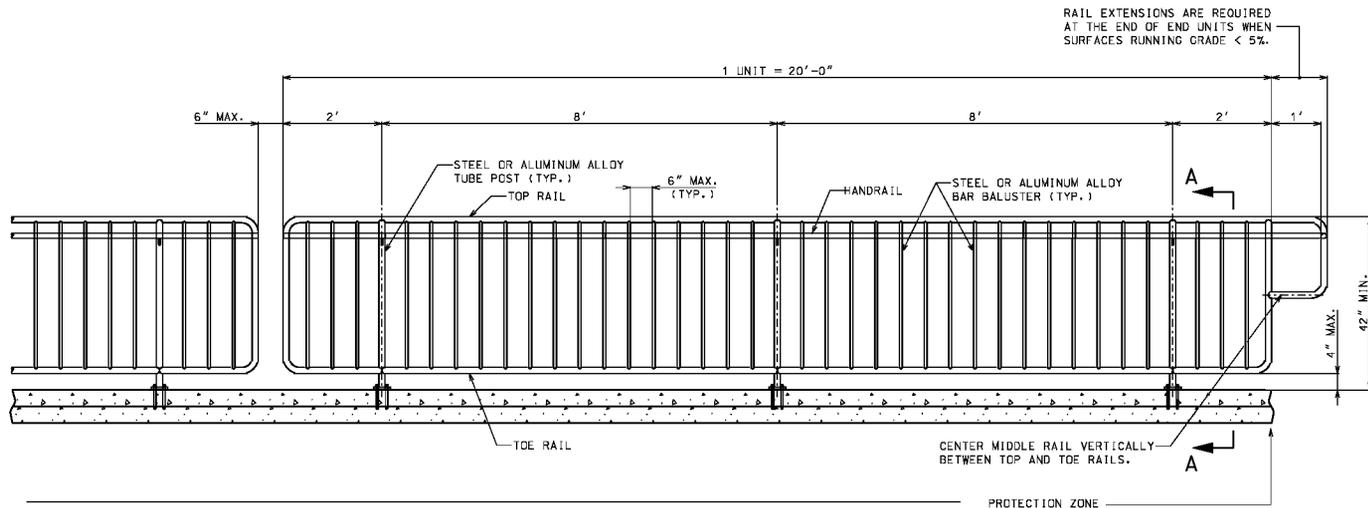


SIDEWALK WITH BUFFER STRIP (SECTION A-A)

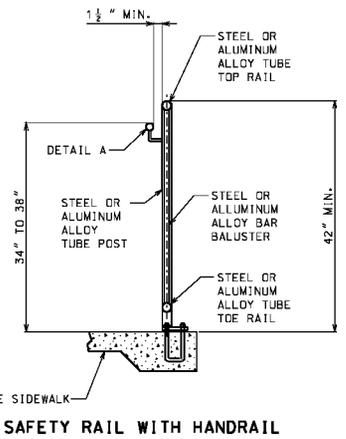
FOR GENERAL NOTES AND HANDRAILING REQUIREMENTS ON FILL SLOPES SEE SHEET 3 OF 4

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	HANDRAILING	
	DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015	608.40
		SHEET NO. 1 OF 4

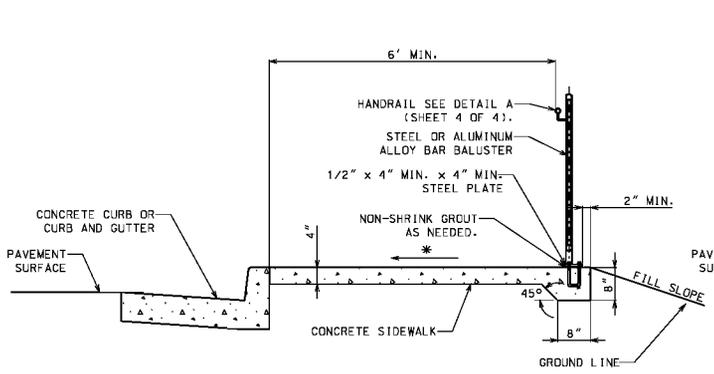
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



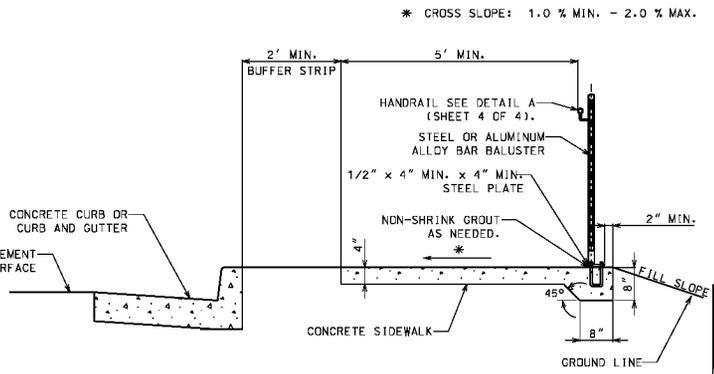
SIDEWALK SAFETY RAIL WITH BALUSTERS AND HANDRAIL



SAFETY RAIL WITH HANDRAIL



SIDEWALK WITHOUT BUFFER STRIP (SECTION A-A)



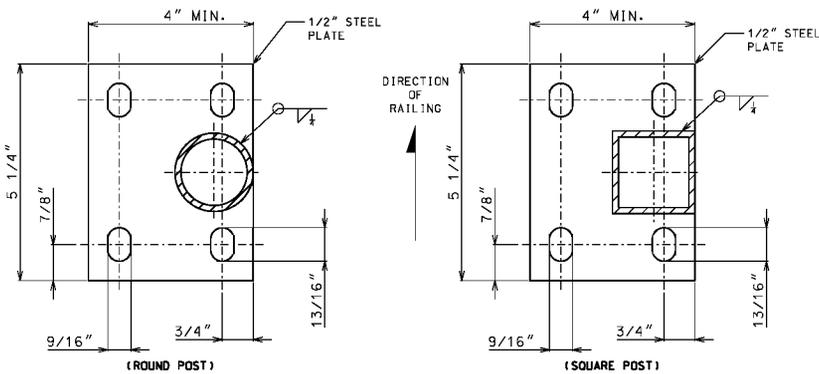
SIDEWALK WITH BUFFER STRIP (SECTION A-A)

* CROSS SLOPE: 1.0 % MIN. - 2.0 % MAX.

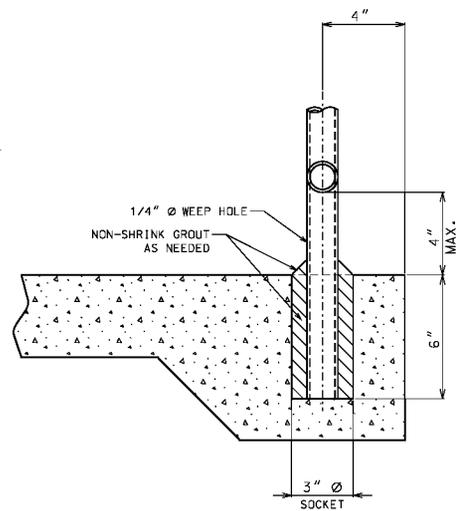
FOR GENERAL NOTES AND HANDRAIL REQUIREMENTS ON FILL SLOPES SEE SHEET 3 OF 4.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	HANDRAILING	
	DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015	608.40
		SHEET NO. 2 OF 4

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



**MOUNTING PLATE DETAIL
(PLAN VIEW)**



SOCKET MOUNTING DETAIL

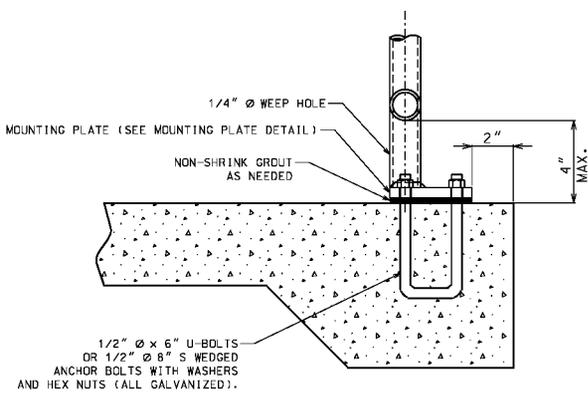


PLATE MOUNTING DETAIL

HANDRAIL REQUIREMENTS		
FILL SLOPE	FILL HEIGHT	HANDRAIL
(1V:3H) OR FLATTER	—	NOT REQUIRED
(1V:3H) OR STEEPER	≥ 6 FT.	REQUIRED
(1V:2H) OR STEEPER	≥ 4 FT.	REQUIRED
(1V:1H) OR STEEPER	≥ 1 FT.	REQUIRED

RAILING AND POST SPECIFICATION				
DESCRIPTION	TYPE	SIZE (DIA.)	WEIGHT (LBS. / FT.)	
			ALUM.	STEEL
RAILING & POST	ROUND	1 1/2"	0.940	2.720
	SQUARE	2" X 2"	1.3094	4.310
BALUSTER	ROUND	1/2"	0.2312	0.668
	RECT.	3/8" X 1/2" STL.	—	0.6375
	SQUARE	1/2" X 1/2" ALUM.	0.2944	—

GENERAL NOTES:

- RAILINGS AND POSTS MAY BE EITHER ROUND OR SQUARE STEEL OF GOOD COMMERCIAL WELDABLE QUALITY OR ALUMINUM ALLOY 6061-T6 OR 6063-T6.
- STEEL RAILINGS AND POSTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111.
- ALL JOINTS SHALL BE CONTINUOUS WELDED AND GROUND SMOOTH.
- METAL SAFETY RAIL MUST BE COMPLIANT WITH THE "AMERICAN'S WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG)". EXCEPTIONS MUST BE APPROVED BY THE ENGINEER. ALL OTHER AREAS OF NON-COMPLIANCE SHALL BE REMOVED AND CORRECTED AT THE CONTRACTOR'S EXPENSE.
- ALL POSTS SHALL HAVE A 1/4" WEEP HOLE IMMEDIATELY ABOVE THE MOUNTING PLATE.
- WHEN INSTALLED THE POSTS SHALL BE PLUMB AND RAILINGS SHALL MATCH THE SLOPE OF THE SIDEWALK.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HANDRAILING

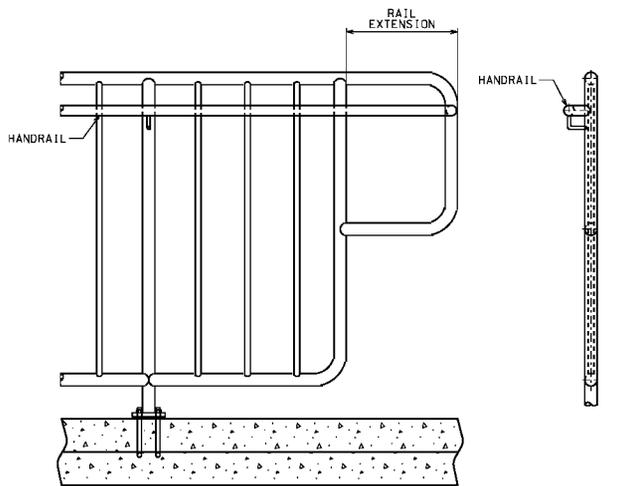
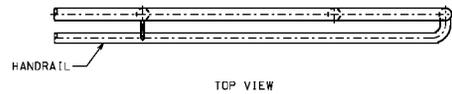
DATE EFFECTIVE: 04/01/2015
DATE PREPARED: 2/20/2015

608.40

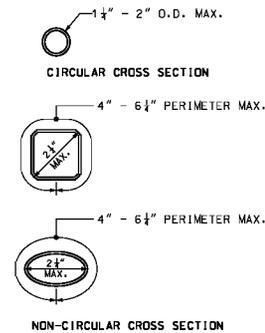
SHEET NO.
3 OF 4

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

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



HANDRAIL AND EXTENSION CONNECTION



HANDRAIL GRIPPING SURFACES

HANDRAIL NOTES:

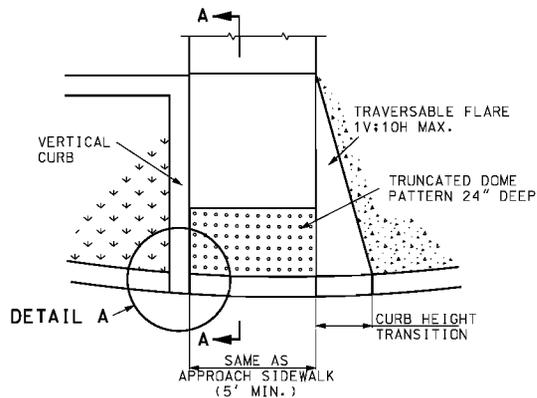
- HANDRAILS SHALL BE STEEL OF GOOD COMMERCIAL WELDABLE QUALITY OR ALUMINUM ALLOY 6061-T6 OR 6063-T6.
- HANDRAILS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111.
- HANDRAILS SHALL BE AT A CONSISTENT HEIGHT ABOVE WALKING SURFACES.
- HANDRAIL GRIPPING SURFACES SHALL BE CONTINUOUS ALONG THEIR LENGTH AND SHALL NOT BE OBSTRUCTED ALONG THEIR TOPS OR SIDES.
- THE BOTTOMS OF HANDRAIL GRIPPING SURFACES SHALL NOT BE OBSTRUCTED FOR MORE THAN 20 PERCENT OF THEIR LENGTH.
- WHERE HANDRAILS ARE PROVIDED ALONG WALKING SURFACES WITH SLOPES NOT STEEPER THAN 1:20, THE BOTTOMS OF HANDRAIL GRIPPING SURFACES SHALL BE PERMITTED TO BE OBSTRUCTED ALONG THEIR ENTIRE LENGTH WHERE THEY ARE INTEGRAL TO CRASH RAILS OR BUMPER GUARDS.
- THE DISTANCE BETWEEN HORIZONTAL PROJECTIONS AND THE BOTTOM OF THE GRIPPING SURFACE SHALL BE PERMITTED TO BE REDUCED BY 1/2" FOR EACH 3/4" OF ADDITIONAL HANDRAIL PERIMETER DIMENSION THAT EXCEEDS 4".
- HANDRAIL SURFACES AND ANY SURFACES ADJACENT TO THEM SHALL BE FREE OF SHARP OR ABRASIVE ELEMENTS AND SHALL HAVE ROUNDED EDGES.
- HANDRAILS SHALL NOT ROTATE WITHIN THEIR FITTINGS.

DETAIL A - HANDRAIL

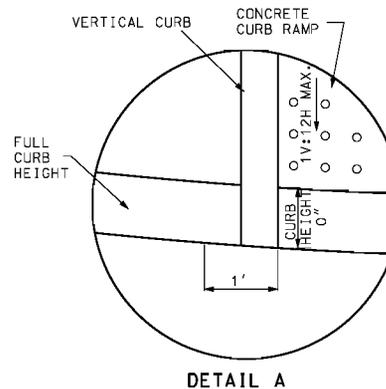
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	HANDRAILING	
	DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015	SHEET NO. 608.40 4 OF 4

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

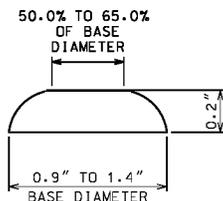
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



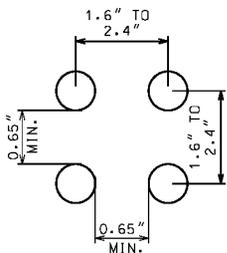
CURB RAMP DETAIL



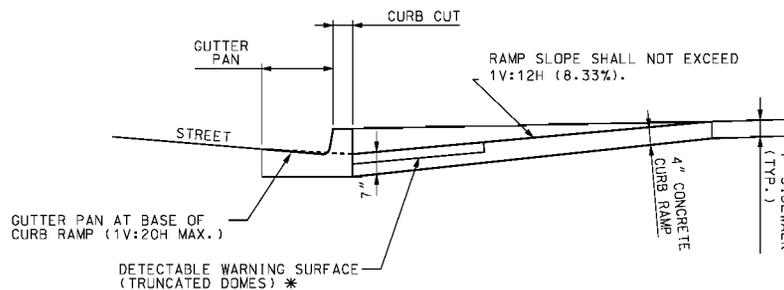
DETAIL A



TRUNCATED DOMES CROSS SECTION



TRUNCATED DOMES SPACING



SECTION A-A

* SOME DETECTABLE WARNING PRODUCTS REQUIRE A CONCRETE BORDER FOR PROPER INSTALLATION. THE CONCRETE BORDER SHALL NOT EXCEED 2 INCH PER SIDE.

GENERAL NOTES:

ALL AREAS OF THE PEDESTRIAN ACCESS ROUTE MUST BE COMPLIANT WITH THE AMERICANS WITH DISABILITIES ACT - GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS OF WAY. EXCEPTIONS MUST BE APPROVED BY THE ENGINEER. ALL OTHER AREAS OF NON-COMPLIANCE SHALL BE REMOVED AND CORRECTED AT THE CONTRACTOR'S EXPENSE.

THE SURFACES OF PEDESTRIAN ACCESS ROUTES AND ELEMENTS, AND SPACES REQUIRED TO CONNECT TO PEDESTRIAN ACCESS ROUTES, SHALL BE FIRM, STABLE, SLIP RESISTANT, AND SHALL NOT POND WATER.

SIDEWALK, RAMP AND LANDING CROSS SLOPES SHALL BE 1.00% TO FACILITATE DRAINAGE (2.00% MAX.).

THE CROSS SLOPE OF THE CONTINUOUS PEDESTRIAN ACCESS ROUTE THROUGH ENTRANCES, ALLEYS, AND SIDEROAD CONNECTIONS WITH STOP OR YIELD CONTROL SHALL BE 1.00% TO FACILITATE DRAINAGE (2.00% MAX.).

WHERE PEDESTRIAN ACCESS ROUTES ARE CONTAINED WITHIN PEDESTRIAN STREET CROSSINGS WITHOUT YIELD OR STOP CONTROL, THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE 5.00% MAXIMUM.

WHERE PEDESTRIAN ACCESS ROUTES ARE CONTAINED WITHIN MIDBLOCK PEDESTRIAN STREET CROSSINGS, THE CROSS SLOPE OF THE PEDESTRIAN ACCESS ROUTE SHALL BE PERMITTED TO EQUAL THE STREET OR HIGHWAY GRADE.

30"x 48" CLEAR SPACE SHALL BE PROVIDED CENTERED ON THE PEDESTRIAN PUSH BUTTON.

BEYOND THE BOTTOM GRADE BREAK OF A CURB RAMP, A CLEAR SPACE 4' MINIMUM BY 4' MINIMUM SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE.

SIDE FLARES OF CURB RAMP, IN THE PATH OF PEDESTRIAN TRAVEL (TRAVERSABLE), SHALL NOT EXCEED A SLOPE OF 1V:10H. SIDE FLARES OUTSIDE THE PEDESTRIAN PATH (NONTRAVERSABLE) MAY BE VERTICAL.

TRANSITION FROM SIDEWALK OR CURB RAMP TO GUTTER TO ROADWAY SHALL BE FLUSH.

DETECTABLE WARNING SURFACES (TRUNCATED DOMES) SHALL BE PERFORMED AND INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS. STAMPED CONCRETE WILL NOT BE ACCEPTED.

THE DETECTABLE WARNING SURFACE SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. TRUNCATED DOMES SHALL SPAN THE FULL WIDTH OF THE RAMP OR LANDING 24" DEEP.

DETECTABLE WARNING SURFACES SHALL BE ALIGNED PERPENDICULAR OR RADIAL TO THE BREAK BETWEEN THE RAMP, LANDING OR BLENDED TRANSITION, AND THE STREET.

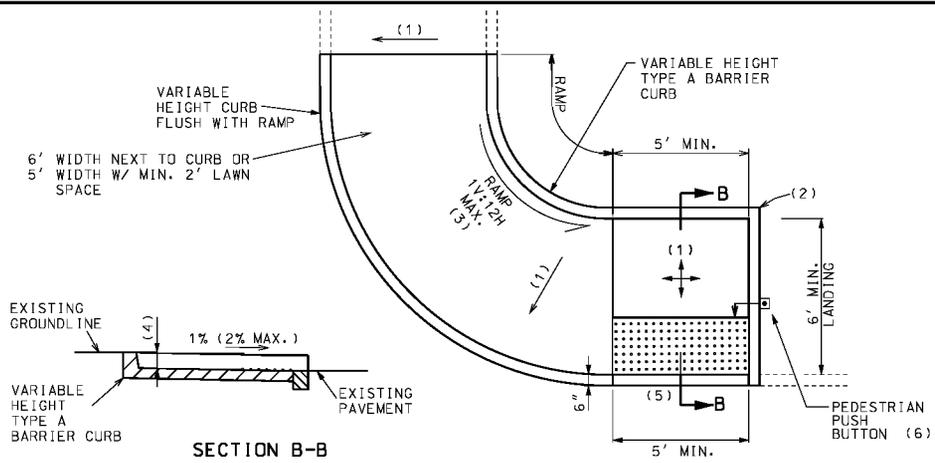
WHERE THE BOTTOM GRADE BREAK OF A CURB RAMP IS LESS THAN 5' FROM THE BACK OF CURB, DETECTABLE WARNINGS SHALL BE LOCATED ON THE RAMP SURFACE AT THE BACK OF THE CURB. WHERE THE GRADE BREAK IS GREATER THAN 5' FROM THE BACK OF CURB, THE DETECTABLE WARNING SHALL BE LOCATED ON THE LOWER LANDING.

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 1-888-ASK-MODOT (1-888-275-6636)

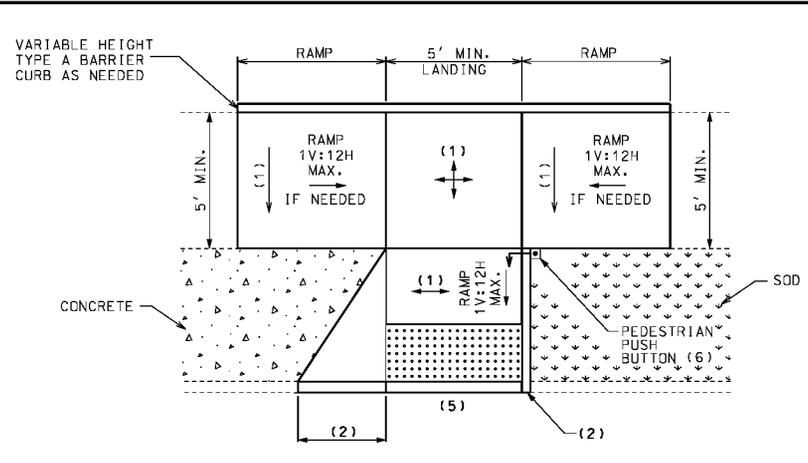
STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

CURB RAMPS

DATE EFFECTIVE: 04/01/2015	608.50	SHEET NO. 1 of 4
DATE PREPARED: 5/29/2015		

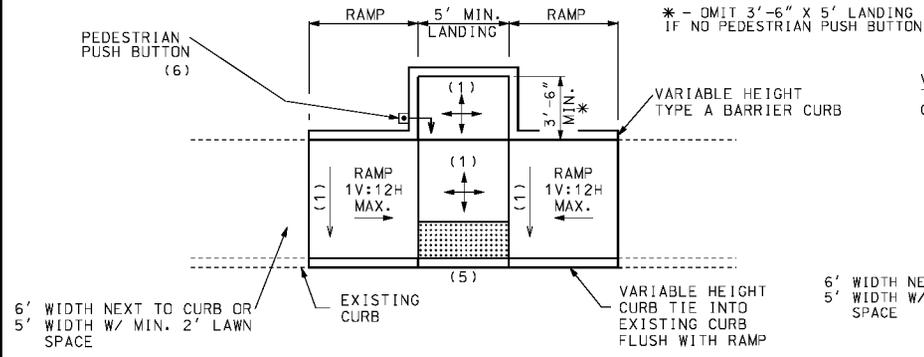


SECTION B-B

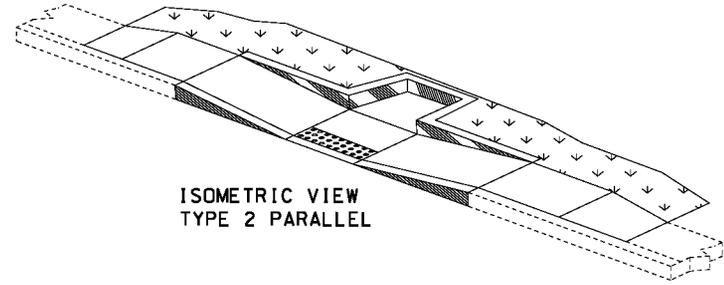


COMPOUND PERPENDICULAR

TYPE 1 PARALLEL

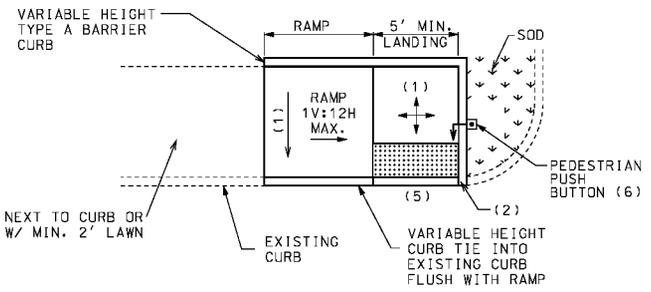


TYPE 2 PARALLEL



ISOMETRIC VIEW
TYPE 2 PARALLEL

TYPE 3 PARALLEL



- GENERAL NOTES:
- (1) 1.0% (2.0% MAX.) OR ROAD GRADE EXCEPTION
 - (2) VARIABLE HEIGHT VERTICAL CURB . IF TRAVERSABLE USE A MAX. 1V:10H FLARE MEASURED PARALLEL TO THE CURB LINE.
 - (3) ENSURE THAT THE INSIDE EDGE OF CURVED RAMPS MAINTAIN AN 8.3% (1V:12H) MAXIMUM SLOPE.
 - (4) HEIGHT VARIES TO MEET EXISTING GROUND.
 - (5) THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE FOOT OF CURB RAMP RUNS, BLENDED TRANSITIONS, AND TURNING SPACES SHALL BE 5% MAXIMUM.
 - (6) THE FACE OF PEDESTRIAN PUSH BUTTONS SHALL BE 0" OFFSET FOR FRONT APPROACH AND 10" MAX. FOR SIDE APPROACH TO THE CURB FACE.

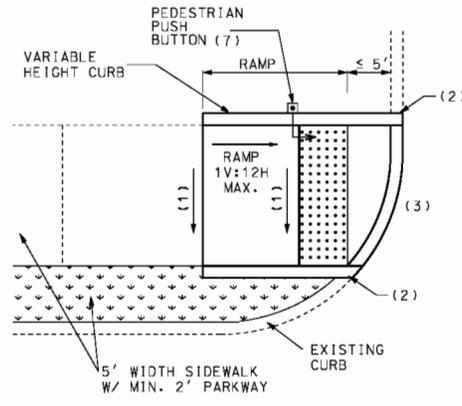
MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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STATE OF MISSOURI
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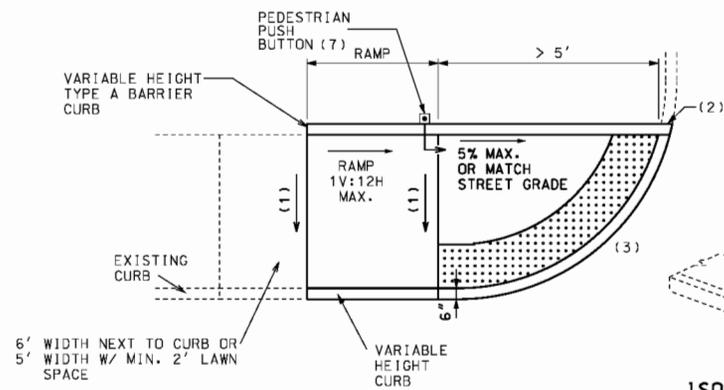
CURB RAMPS

DATE EFFECTIVE: 04/01/2015	SHEET NO. 2 of 4
DATE PREPARED: 2/20/2015	608.50

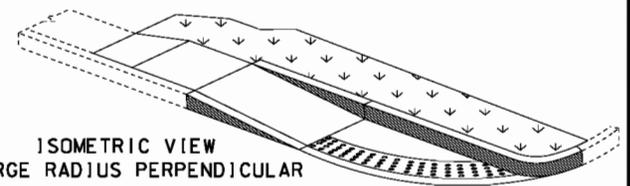
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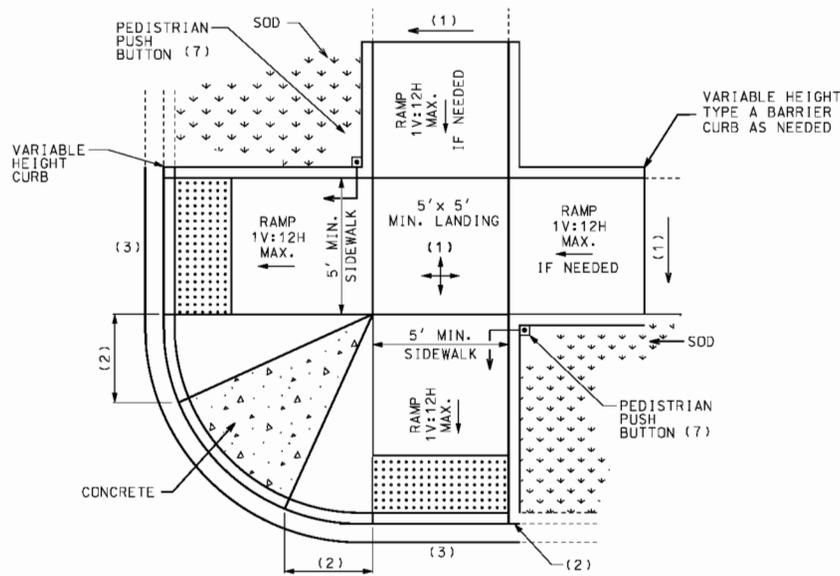
SMALL RADIUS PERPENDICULAR



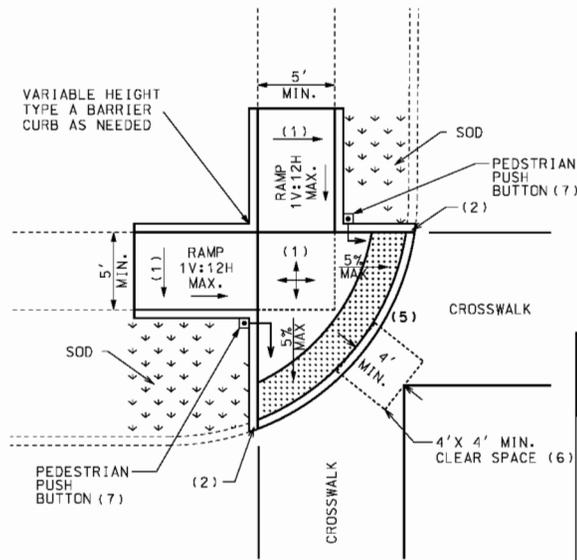
LARGE RADIUS PERPENDICULAR



**ISOMETRIC VIEW
LARGE RADIUS PERPENDICULAR**



DUAL PERPENDICULAR

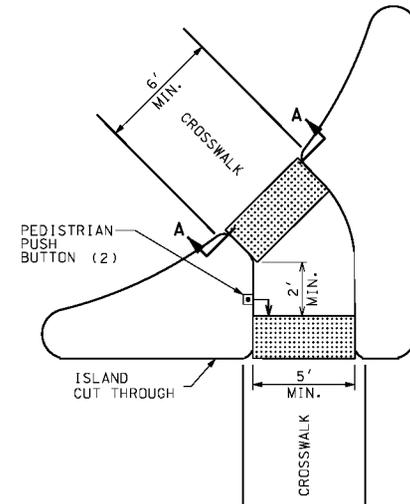
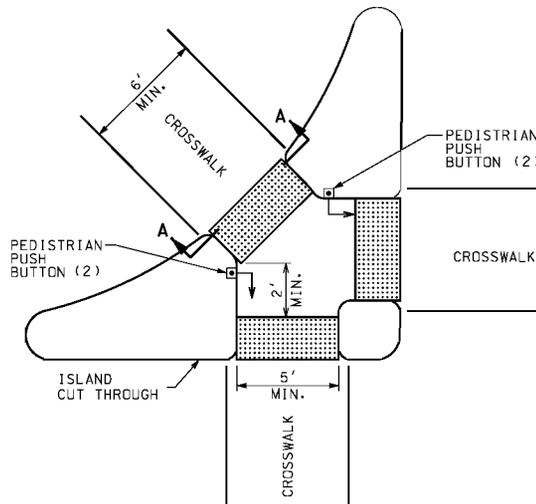
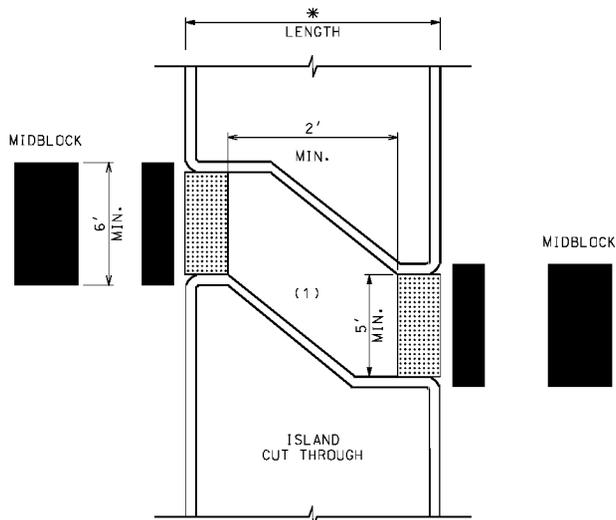


BLENDED TRANSITION

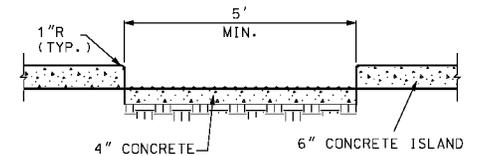
- GENERAL NOTES:**
- (1) 1.0% MINIMUM, 2.0% MAXIMUM.
 - (2) VERTICAL OR 1' FLARE, IF TRAVERSABLE USE A MAX. 1V:10H FLARE MEASURED PARALLEL TO THE CURB LINE.
 - (3) ENSURE THAT THE INSIDE EDGE OF CURVED RAMPS MAINTAIN AN 8.3% (1V:12H) MAXIMUM SLOPE.
 - (4) HEIGHT VARIES TO MEET EXISTING GROUND.
 - (5) THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE FOOT OF CURB RAMP RUNS, BLENDED TRANSITIONS, AND TURNING SPACES SHALL BE 5% MAXIMUM.
 - (6) BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE 4' X 4' MINIMUM SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE.
 - (7) THE FACE OF PEDESTRIAN PUSH BUTTONS SHALL BE 0" OFFSET FOR FRONT APPROACH AND 10" MAX. FOR SIDE APPROACH TO THE CURB FACE.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CURB RAMPS	
	DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015	SHEET NO. 608.50 3 of 4

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



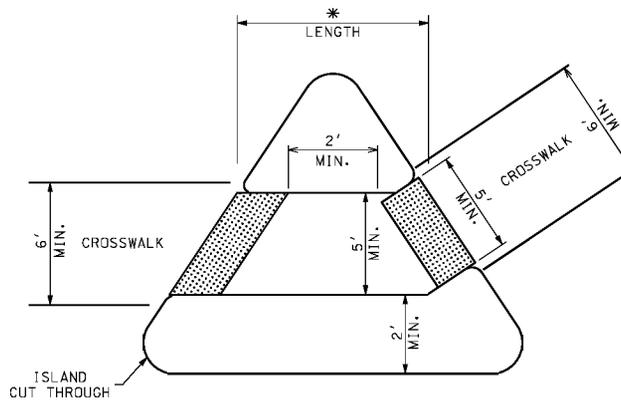
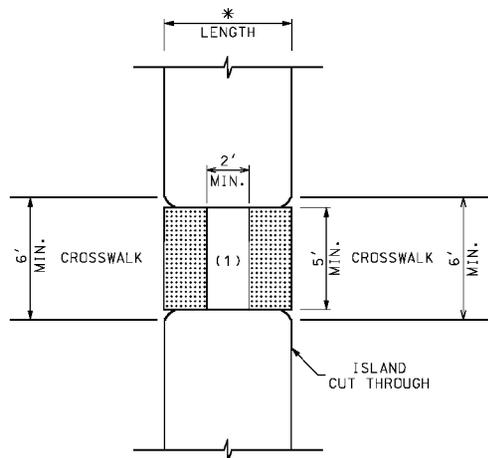
(2) PEDESTRIAN PUSH BUTTONS SHALL BE 0" OFFSET FOR FRONT APPROACH AND 10" MAX. FOR SIDE APPROACH TO THE CURB FACE.



SECTION A-A
ISLAND CUT THROUGH TYPICAL

RAMP OR CUT-THROUGH DEPENDING ON ISLAND WIDTH. IF RAMPED, PROVIDE 4' MINIMUM LANDING AND SLOPE RAMPS AT 1V:12H MAX.

RAMP MUST BE CONSTRUCTED TO DRAIN TO THE OUTSIDE.



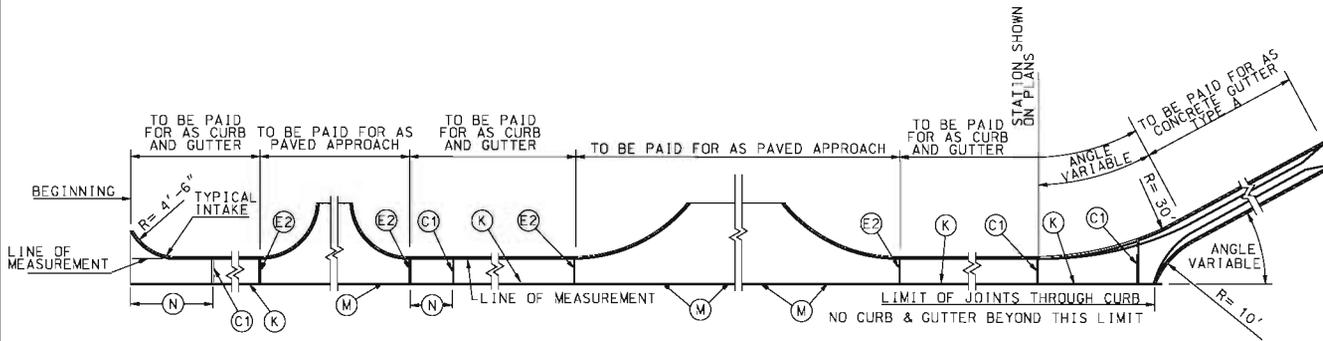
* DETECTABLE WARNING SURFACES SHALL BE OMITTED IF LENGTH IS < 6', BECAUSE REFUGE SPACE IS DEEMED TOO SMALL.

ISLAND CUT THROUGHS

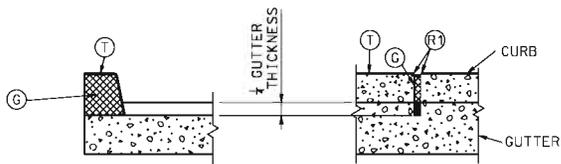
(1) DETECTABLE WARNING SURFACES SHALL BE PLACED AT THE EDGES OF THE PEDESTRIAN ISLAND AND SHALL BE SEPARATED BY 2' MIN. LENGTH OF SURFACE WITHOUT DETECTABLE WARNINGS.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p>CURB RAMPS</p>
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SHEET NO. 4 of 4	

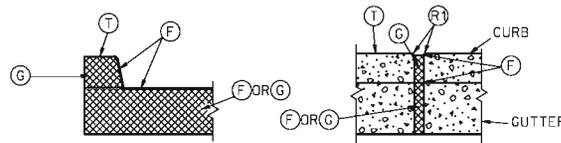
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



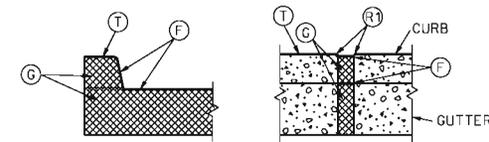
PLAN OF MEASUREMENT OF CURB & GUTTER AND JOINT PLAN



(C1) JOINT



(E2) JOINT



(E1) JOINT

LEGEND

- (C1) 1/8" MAXIMUM WIDTH TRANSVERSE CONTRACTION JOINT (PERFORMED OR SAWED).
- (E1) 2" TRANSVERSE EXPANSION JOINT. (PERFORMED OR SAWED)
- (E2) 1/2" TRANSVERSE EXPANSION JOINT. (PERFORMED OR SAWED)
- (F) FILLER FOR JOINTS - HOT POURED.
- (G) PREFORMED JOINT FILLER MATERIAL.
- (K) TONGUE & GROOVE JOINT WITH TIE BAR - SEE DETAIL.
- (M) TONGUE & GROOVE JOINT WITHOUT TIE BARS - SEE DETAIL.
- (N) NOT LESS THAN 10' OR MORE THAN 30'.
- (T) TOP OF CURB.
- (R) ROUND TO 1/4" RADIUS. (EXCEPT FOR SAWED JOINTS)

GENERAL NOTES:

A MINIMUM 4" TYPE 1 OR 5 AGGREGATE BASE SHALL BE PLACED BENEATH ALL CURB AND GUTTER SECTIONS AND INCLUDED WITHIN THE MAINLINE BASE PAY LIMITS.

WHEN CURBS ARE CONSTRUCTED DIRECTLY BENEATH GUARDRAIL, CURB HEIGHT SHALL BE 4 INCH BARRIER CURB, AS SHOWN ON STANDARD PLAN 606.00.

CURB, GUTTER AND CURB AND CUTTER CONSTRUCTED ALONG AND ATTACHED TO CONCRETE PAVEMENT OR BASE SHALL HAVE:

1. JOINT (C1) ONE-QUARTER DEPTH OF CURB AND GUTTER THICKNESS AS A CONTINUATION OF EACH CONTRACTION JOINT IN THE BASE OR PAVEMENT.
2. JOINT (E1) AS CONTINUATION OF 2" EXPANSION JOINT (E) IN THE CONCRETE BASE OR PAVEMENT SHALL EXTEND AND CONTINUE THROUGH THE CURB, CUTTER AND CURB AND GUTTER.
3. JOINT (E2) THROUGH CURB AND CURB AND GUTTER AT THE BEGINNING AND END OF EACH PAVED APPROACH.

CURB, CURB AND GUTTER CONSTRUCTED APART OR SEPARATED FROM CONCRETE BASE OR PAVEMENT OR AS A FORM FOR ASPHALTIC CONCRETE PAVEMENT SHALL HAVE A JOINT (E) ENTIRELY THROUGH THE CURB, CURB AND GUTTER AND GUTTER, AT THE BEGINNING AND END OF EACH "PAVED APPROACH" AND A JOINT (C1) TO 1/2 DEPTH OF CURB AND GUTTER THICKNESS AT INTERVALS OF 30 FEET BETWEEN APPROACHES.

JOINTS (E) AND (E2) THROUGH CURB SHALL BE FILLED WITH PREFORMED FILLER MATERIAL AND SEALED WITH HOT POURED FILLER FOR JOINTS.

JOINT (C1) IN GUTTER SHALL BE FILLED WITH PREFORMED FILLER AND SEALED WITH HOT FILLER MATERIAL.

JOINT (E2) IN GUTTER SHALL BE FILLED WITH PREFORMED FILLER AND SEALED WITH FILLER OR FILLED WITH HOT POURED FILLER.

PREFORMED FILLER MATERIAL SHALL BE PLACED TO PROVIDE 1" HOT POURED FILLER FOR JOINTS.

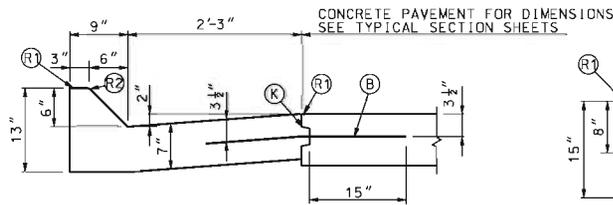
THE BARRIER CLASS CURBS MAY BE CONSTRUCTED WITHOUT BATTER WHEN CONSTRUCTED ON A RADIUS OF 6 FEET OR LESS. THE (E2) WILL BE REQUIRED.

WHERE A SIDEWALK INTERSECTS A CURB, THE SIDEWALK SHALL BE RAMPED NO STEEPER THAN 12:1 SLOPE TO PROVIDED ACCESS FOR WHEELCHAIR ACROSS APPROACHES.

WHEN ALLOWED BY THE ENGINEER, TYPES A AND B GUTTER MAY BE PRECAST TO CONFORM TO THE DIMENSIONS SHOWN. THE PRECASTER SHALL SUBMIT SHOP DRAWINGS INDICATING THE SECTION LENGTH, SECTION CONNECTION, AND PROPOSED JOINT SEALING SYSTEM. WHEN PRECAST SECTIONS CANNOT CONFORM TO ANY VERTICAL OR HORIZONTAL CURVE DESIGNATED ON THE PLANS, THE GUTTER SHALL BE CAST-IN-PLACE. A COMBINATION OF CAST-IN-PLACE AND PRECAST GUTTER MAY BE PERMITTED.

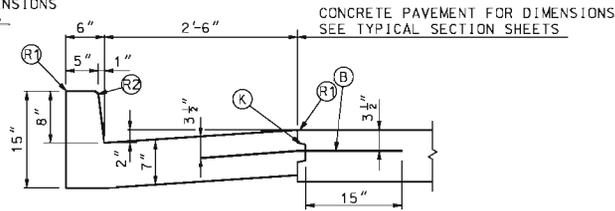
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE CURB, CURB AND GUTTER AND GUTTER
DATE EFFECTIVE: 08/01/2008 DATE PREPARED: 12/29/2011	609.00P
	SHEET NO. 1 OF 2

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

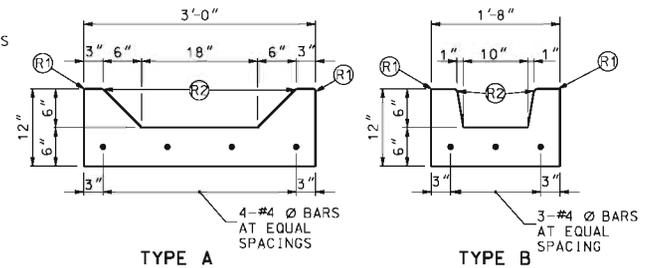


TYPE A
(MOUNTABLE)

CURB & GUTTER



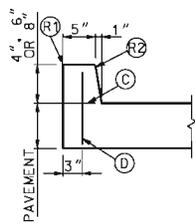
TYPE B
(BARRIER)



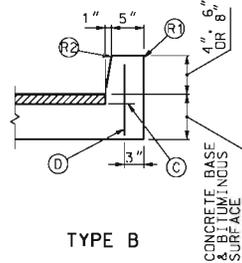
TYPE A

GUTTERS

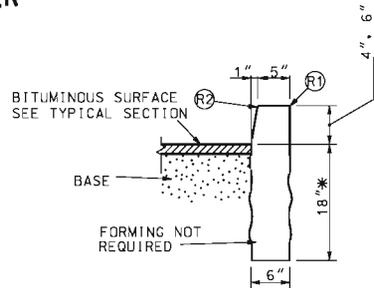
TYPE B



TYPE A
(INTEGRAL)

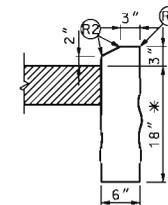


TYPE B

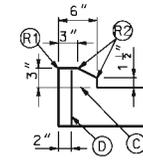


TYPE S
(SEPARATED)

* DEPTH MAY BE REDUCED IF KEYED 6" IN ROCK



TYPE F
(SEPARATED)



TYPE E
(INTEGRAL)

BEGINNING AND ENDINGS OF INTRODUCED LOW PROFILE CURBS SHALL UTILIZE CURB HEIGHT RUNOUT FORM 0 INCH TO 3 INCHES IN 5 FEET PAYMENT. LENGTH SHALL INCLUDE TAPERS.

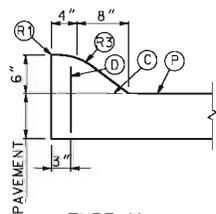
* DEPTH MAY BE REDUCED IF KEYED 6" IN ROCK.

LOW PROFILE CURB

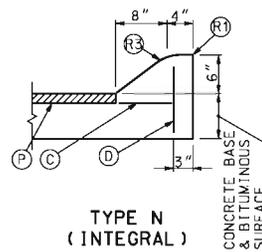
BARRIER CURBS

LEGEND

- (B) TIE BARS - 30" X #5 @ 30" CTRS.
- (C) PERMISSIBLE CONSTRUCTION JOINT. IF CONSTRUCTED IN THIS MANNER TIE BARS MUST BE USED.
- (D) #4 @ TIE BAR AT 24" CENTERS LENGTH OF THE TIE BARS EQUALS THICKNESS OF PAVEMENT PLUS HEIGHT OF CURB, LESS 3 INCHES.
- (K) TONGUE & GROOVE JOINT WITH TIE BAR - SEE DETAIL.
- (P) TOP OF PAVEMENT OR CONCRETE BASE.
- (R1) ROUND TO 1/4" RADIUS. (EXCEPT FOR SAWED JOINTS)
- (R2) ROUND TO 3/8" RADIUS.
- (R3) CONSTRUCT TO 9" RADIUS

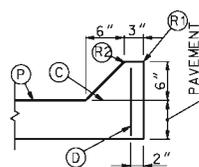


TYPE M
(INTEGRAL)

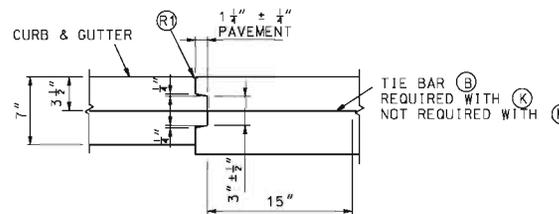


TYPE N
(INTEGRAL)

MOUNTABLE CURBS



TYPE O
(INTEGRAL)

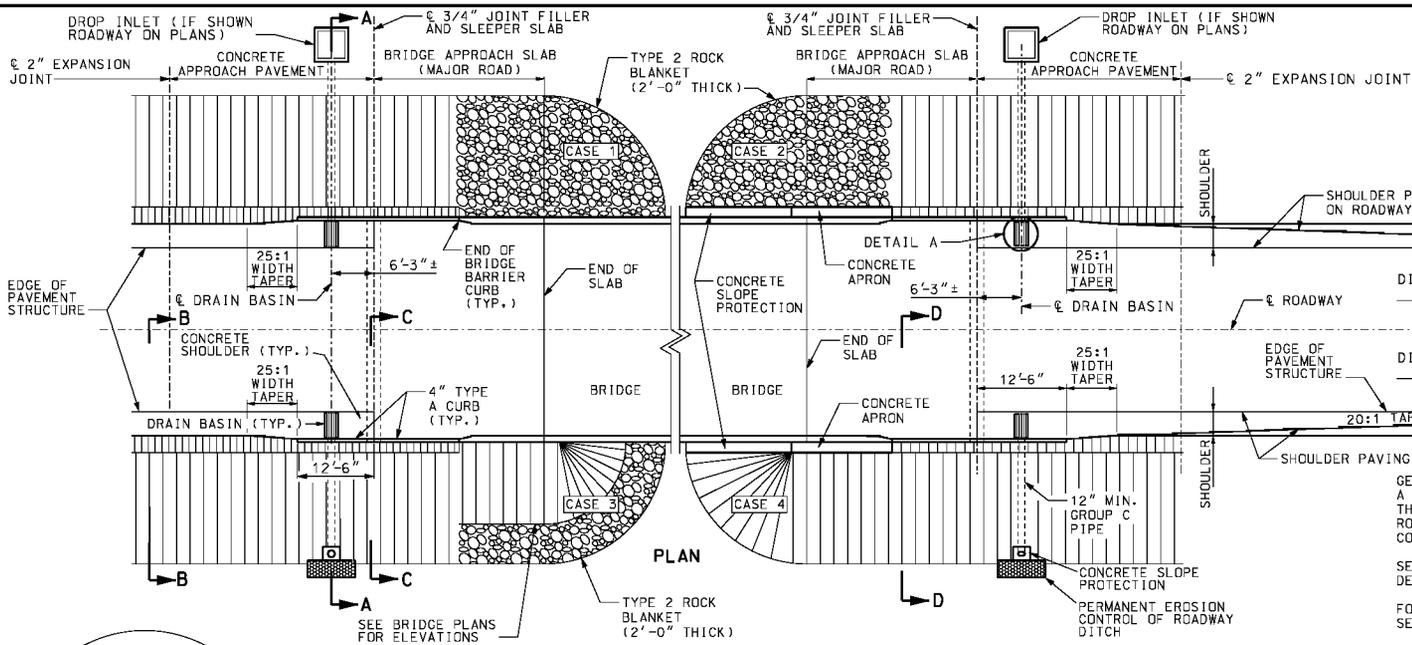


THRU TONGUE & GROOVE JOINT

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
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	CONCRETE CURB, CURB AND GUTTER AND GUTTER
DATE EFFECTIVE: 08/01/2008 DATE PREPARED: 8/26/2009	609.00P
SHEET NO. 2 OF 2	

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

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* SHOULDER PAVING AT EXIT END OF BRIDGE IN DIRECTION OF TRAFFIC (BOTH SIDES AT EXIT END OR ONE WAY BRIDGES). SURFACE AND BASE DESIGN SAME AS TRAVEL WAY.

GENERAL NOTES:
A 25:1 WIDTH TAPER MUST BE PROVIDED IMMEDIATELY BEYOND THE LIMITS OF TYPE A CURB AS SHOWN IN ORDER TO TRANSITION ROADWAY WIDTH TO WIDTH BETWEEN GUARDRAIL FACES ON CONCRETE APPROACH PAVEMENT.

SEE STANDARD PLANS 606.00, 606.22, 606.23 AND 606.30 FOR DETAILS OF GUARDRAILS AND BRIDGE ANCHOR SECTIONS.

FOR DETAILS OF BRIDGE APPROACH SLAB (MAJOR ROAD), SEE BRIDGE PLANS.

CONSTRUCT DRAIN BASINS WHEN SHOWN ON ROADWAY PLANS.

TYPE A CURB IS TO BE CONSTRUCTED ON CONCRETE APPROACH PAVEMENT ONLY WHEN DRAIN BASINS ARE REQUIRED. SEE STANDARD PLANS 609.00 FOR TYPE A CURB.

SEE STANDARD PLANS 504.00 FOR DETAILS OF CONCRETE APPROACH PAVEMENT.

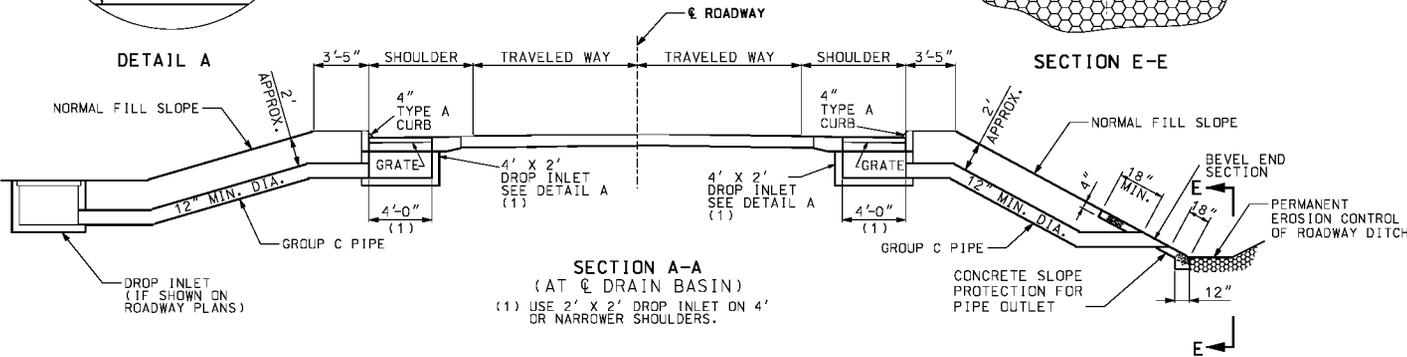
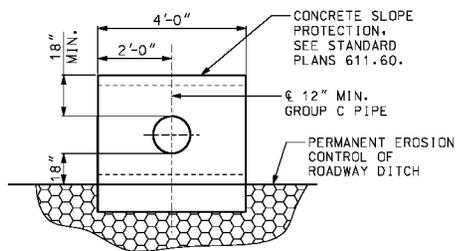
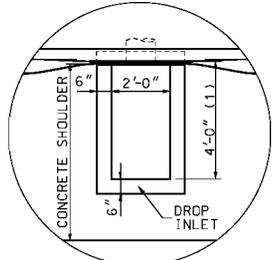
FOR DETAILS OF GRATES AND BEARING PLATES FOR DROP INLET, SEE STANDARD PLANS 614.10 AND 614.11.

FOR DETAILS OF DROP INLET FOR ROADWAY SURFACE, SEE STANDARD PLANS 731.10. USE TYPE A DROP INLET AND USE DEPTH OF DROP INLET AS SHOWN ON ROADWAY PLANS.

PAYMENT FOR DROP INLET, GRATE, GROUP C PIPE, CONCRETE SLOPE PROTECTION AT PIPE OUTLETS, MATERIAL AND INSTALLATION WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR DRAIN BASIN PER EACH.

FOR DETAILS OF SECTION B-B, C-C AND D-D, SEE SHEET 2 OF 3.

CASE	FILL SLOPE PROTECTION
1	ROCK BLANKET FILL SLOPE
2	ROCK BLANKET FILL SLOPE WITH CONCRETE SLOPE PROTECTION
3	FILL SLOPE WITH PARTIAL ROCK BLANKET
4	FILL SLOPE WITH CONCRETE SLOPE PROTECTION



SECTION A-A
(AT € DRAIN BASIN)
(1) USE 2' X 2' DROP INLET ON 4' OR NARROWER SHOULDERS.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

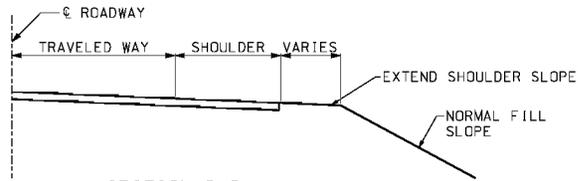
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

ERIC E. SCHREIER
REGISTERED PROFESSIONAL ENGINEER
NUMBER PE-28411

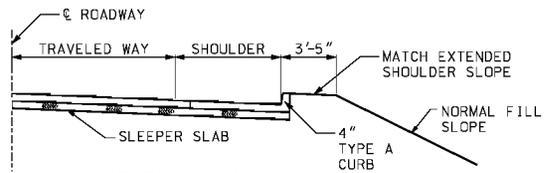
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DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS (MAJOR ROAD)

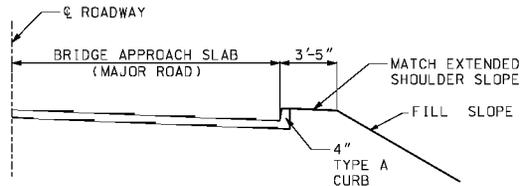
DATE EFFECTIVE:	07/01/2015	609.400	SHEET NO.
DATE PREPARED:	5/29/2015		1 OF 3



SECTION B-B

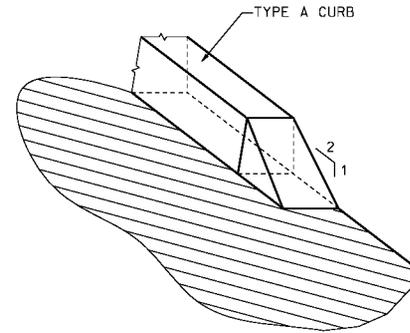


SECTION C-C



SECTION D-D

NOTE: FOR DETAILS NOT SHOWN, SEE OTHER SECTIONS.



TYPE A CURB
TRANSITION DETAIL

GENERAL NOTE:

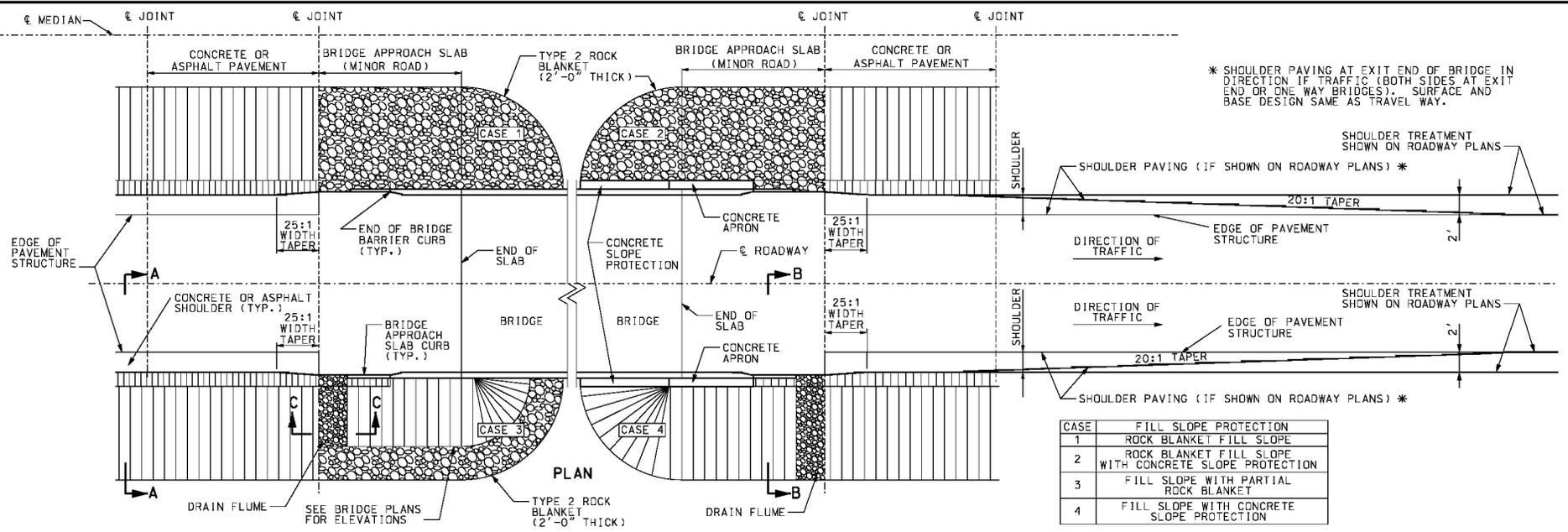
FOR LOCATION OF SEC. B-B, C-C AND D-D, SEE SHEET 1 OF 3.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)
	DRAIN BASIN, SHOULDER PAVING AND FILL SLOPE AT BRIDGE ENDS (MAJOR ROAD)

STATE OF MISSOURI ERIC E. SCHREIER NUMBER PE-28411 PROFESSIONAL ENGINEER THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY
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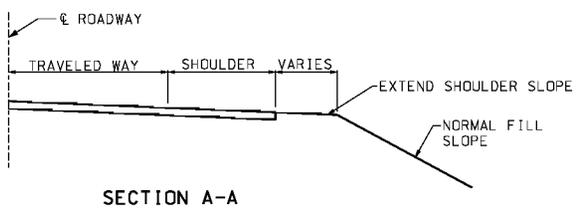
DATE EFFECTIVE: 07/01/2015	609.400	SHEET NO. 2 OF 3
DATE PREPARED: 5/29/2015		

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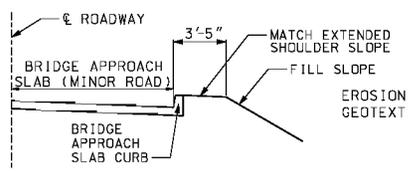


CASE	FILL SLOPE PROTECTION
1	ROCK BLANKET FILL SLOPE
2	ROCK BLANKET FILL SLOPE WITH CONCRETE SLOPE PROTECTION
3	FILL SLOPE WITH PARTIAL ROCK BLANKET
4	FILL SLOPE WITH CONCRETE SLOPE PROTECTION

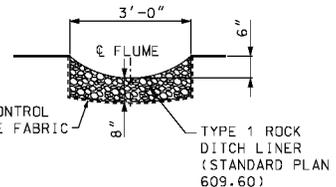
* SHOULDER PAVING AT EXIT END OF BRIDGE IN DIRECTION OF TRAFFIC (BOTH SIDES AT EXIT END ON ONE WAY BRIDGES); SURFACE AND BASE DESIGN SAME AS TRAVEL WAY.



SECTION A-A



SECTION B-B



SECTION C-C

GENERAL NOTES:

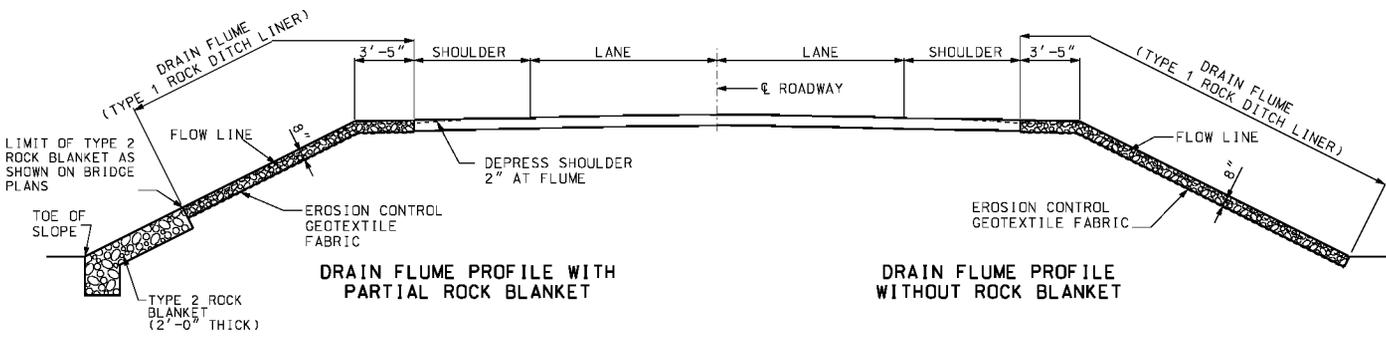
A 25:1 WIDTH TAPER MUST BE PROVIDED IMMEDIATELY BEYOND THE LIMITS OF CURB AS SHOWN IN ORDER TO TRANSITION ROADWAY WIDTH TO WIDTH BETWEEN GUARDRAIL FACES ON PAVEMENT.

SEE STANDARD PLANS 606.00, 606.22, 606.23 AND 606.30 FOR DETAILS OF GUARDRAILS AND BRIDGE ANCHOR SECTIONS.

FOR DETAILS OF BRIDGE APPROACH SLAB (MINOR ROAD), SEE BRIDGE PLANS.

CONSTRUCT DRAIN FLUMES AND OR FILL SLOPE PROTECTION WHEN SHOWN ON ROADWAY PLANS.

PAYMENT FOR FURNISHING ALL MATERIALS, LABOR AND EXCAVATION NECESSARY TO CONSTRUCT THE DRAIN FLUMES, INCLUDING THE PERMANENT EROSION CONTROL GEOTEXTILE, COMPLETE-IN-PLACE, WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR TYPE 1 ROCK DITCH LINER.



DRAIN FLUME PROFILE WITH PARTIAL ROCK BLANKET

DRAIN FLUME PROFILE WITHOUT ROCK BLANKET

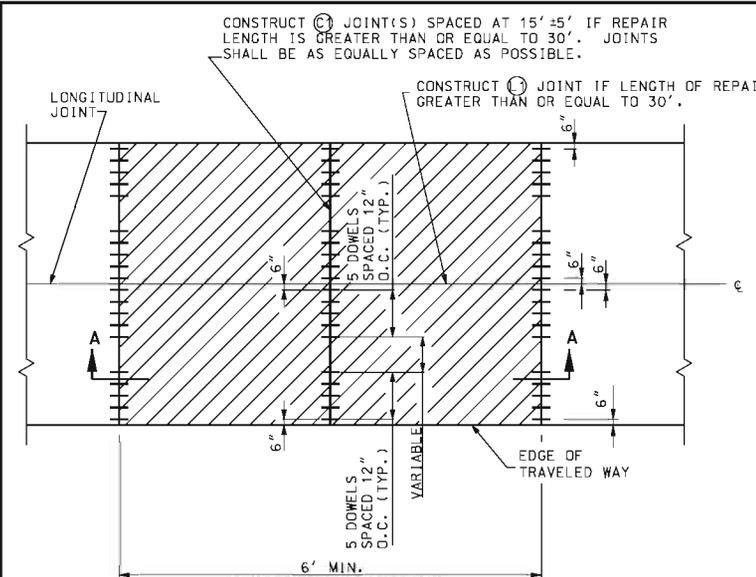
MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

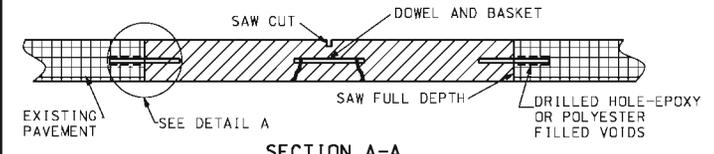
DRAIN FLUME, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS (MINOR ROAD)

DATE EFFECTIVE: 07/01/2015	609.400	SHEET NO. 3 OF 3
DATE PREPARED: 5/29/2015		

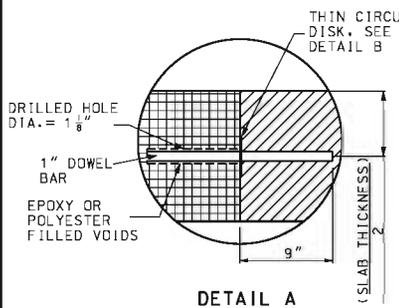
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TWO OR MORE LANES

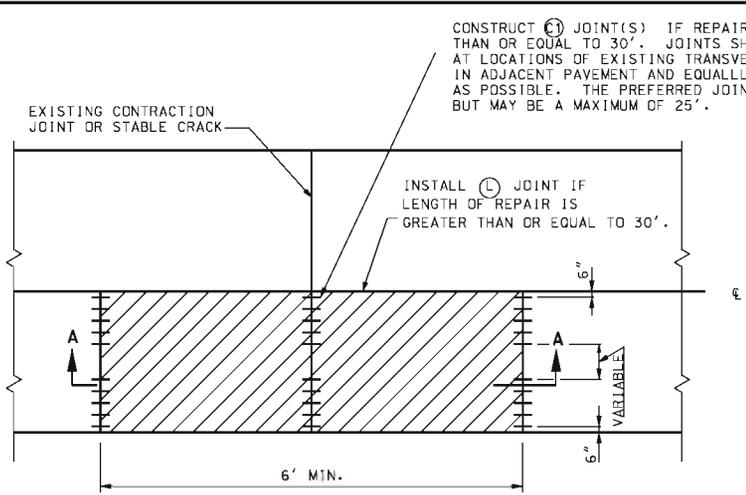


SECTION A-A

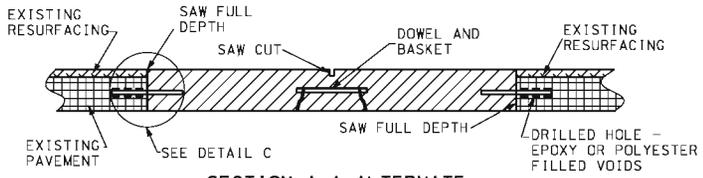


DETAIL A

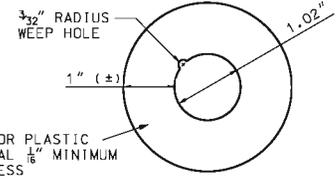
1. SMOOTH EPOXY COATED DOWELS SHALL BE USED IN ALL FULL DEPTH PAVEMENT REPAIR TRANSVERSE JOINTS.
2. THE ANCHORING MATERIAL (EPOXY OR POLYESTER) SHALL BE PLACED TO THE BACK OF THE PREDRILLED HOLE BEFORE INSERTING THE DOWEL BAR.
3. THE DOWEL IS INSERTED INTO THE HOLE WITH A TWISTING MOTION SO THAT THE MATERIAL IN THE BACK OF THE HOLE IS FORCED UP AND AROUND THE BAR.
4. EXPOSED END OF DOWEL SHALL BE COATED WITH A THIN UNIFORM COAT OF GRAPHITE GREASE. DOWEL BASKET ASSEMBLIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD PLAN 502.10. IN LIEU OF GRAPHITE GREASE, THE DOWEL BAR BASKET SUPPLIER MAY PROVIDE COMPLETED BASKET UNITS PRE-DIPPED IN AN APPROVED BONDBREAKER.
5. REPAIR ONLY ONE LANE AT A TIME.



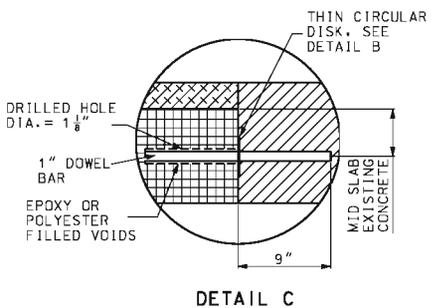
ONE LANE



SECTION A-A ALTERNATE WITH ASPHALT OVERLAY



DETAIL B THIN CIRCULAR DISK



DETAIL C

GENERAL NOTES:
 ALL SAW CUTS SHALL BE MADE WITH A DIAMOND SAW EXCEPT THE CENTER RELIEF CUT.
 FOR DETAILS OF TYPE (C), (L) AND (L1) JOINTS, SEE STANDARD PLAN 502.05.

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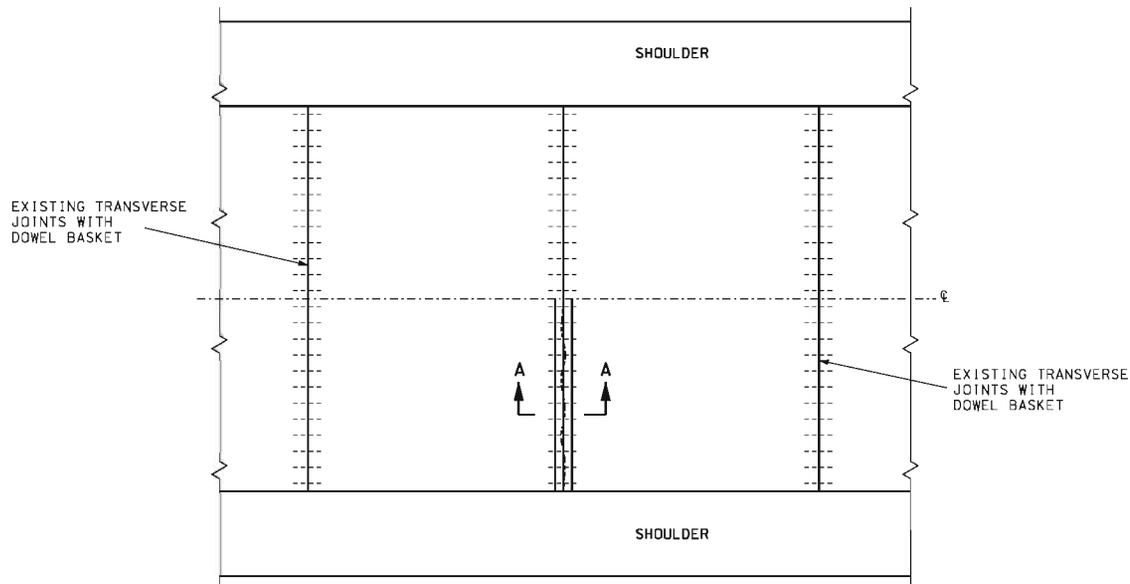
STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-2075
 PROFESSIONAL ENGINEER
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PAVEMENT REPAIR FULL DEPTH

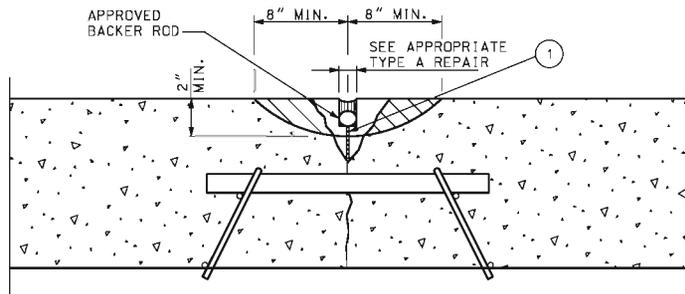
NON-REINFORCED AND REINFORCED PORTLAND CEMENT CONCRETE

DATE EFFECTIVE: 06/01/2010	613.00P	SHEET NO. 1 OF 3
DATE PREPARED: 4/1/2010		

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



PLAN VIEW



SECTION A-A
MILLING OPTIONS

AREA TO BE REMOVED

- 1 THE INITIAL RE-ESTABLISHMENT OF THE JOINT OR CRACK IN THE PLASTIC CONCRETE SHALL BE ACCOMPLISHED WITH AN APPROVED CUTTER BAR OR WITH MINIMUM 1/4" COMPRESSION RELIEF MATERIAL (SAWING NOT ALLOWED).

JOINT COMPRESSION RELIEF TO THE TOP OF THE DOWEL BARS SHALL BE PROVIDED BY A MINIMUM 1/4" SAWCUT AS SOON AS POSSIBLE AFTER INITIAL SET OR MINIMUM 1/4" COMPRESSION RELIEF MATERIAL AS NOTED ABOVE.

GENERAL NOTES:

THE LIMITS OF THE REMOVAL AREA WILL BE DEFINED BY THE ENGINEER.

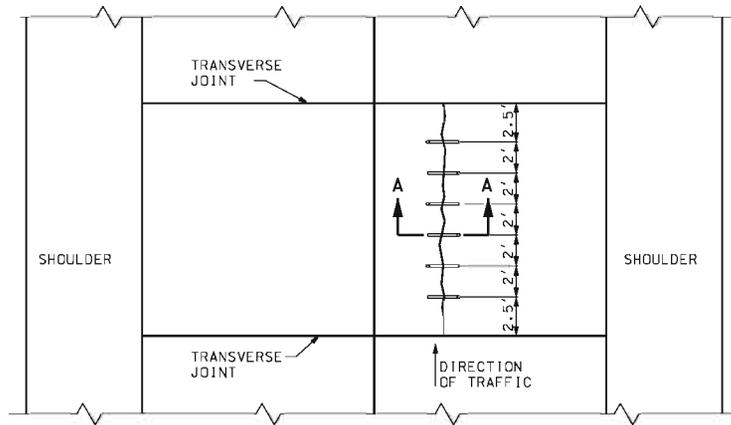
ALL CONCRETE SHALL BE REMOVED TO LIMITS SHOWN IN THE DETAIL, INCLUDING DETERIORATED CONCRETE TO A MAXIMUM OF 1/2 THE PAVEMENT DEPTH OR TOP OF DOWELS BY MILLING.

EXPOSED SURFACE SHALL BE CLEANED BY SANDBLASTING, HIGH-PRESSURE WATER BLASTING OR OTHER METHODS APPROVED BY THE ENGINEER.

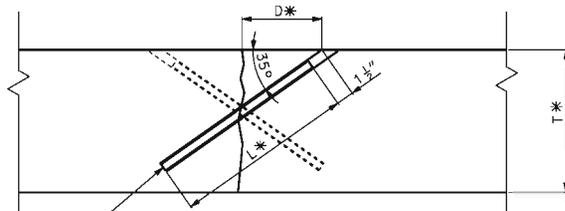
EXPOSED SURFACES OF DOWELS, IF ANY, SHALL BE COATED WITH AN APPROVED BOND BREAKER.

JOINTS AND CRACKS SHALL BE SEALED WITH APPROPRIATE SEALER.

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	<p>PAVEMENT REPAIR PARTIAL DEPTH AT JOINTS AND CRACKS CLASS A</p>
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	613.00P
SHEET NO. 2 OF 3	



CROSS STITCHING PLAN



#6 EPOXY REBAR
CROSS STITCH
BAR

* SEE TABLE

T	SLAB THICKNESS (IN)	8	9	10	11	12
D	DISTANCE TO HOLE (IN)	5 3/4	6 1/2	7 1/4	8 1/2	8 1/2
L	LENGTH OF BAR (IN)	8 1/2	11	12 1/2	14	16

SECTION A-A

GENERAL NOTES:

AT EACH REPAIR LOCATION, HOLES SHALL BE DRILLED AT 35° ANGLES TO THE PAVEMENT SURFACE, PERPENDICULAR TO THE CRACK. THE DRILL BIT DIAMETER SHALL NOT EXCEED 1 1/8".

DRILLING SHALL ALTERNATE BACK AND FORTH ON EITHER SIDE OF THE LONGITUDINAL JOINT FROM HOLE TO HOLE.

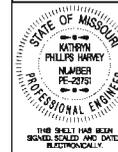
DRILLED HOLES SHALL NOT PENETRATE THROUGH THE SLAB BOTTOM.

DRILLED HOLES SHALL BE CLEANED OF LOOSE DEBRIS AND DUST. EPOXY OR POLYESTER BONDING AGENTS FOR DOWELS, MEETING THE MATERIAL REQUIREMENTS OF SECTION 1039, SHALL BE INJECTED OR POURED INTO EACH HOLE. A CROSS-STITCH BAR SHALL BE INSERTED IN EACH HOLE SUCH THAT THE EPOXY MATERIAL IS EVENLY DISTRIBUTED AROUND THE BAR AND EXTRUDING FROM THE SURFACE OPENING. EACH BAR SHALL BE INSERTED FAR ENOUGH TO ALLOW 1 1/2" OF COVER AS SHOWN IN THE PROFILE DETAIL.

THE SURFACE SHALL HAVE ALL EXCESS EPOXY REMOVED AND HAVE A FLUSH FINISH.

GENERAL NOTES:

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**PAVEMENT REPAIR
CROSS STITCHING**

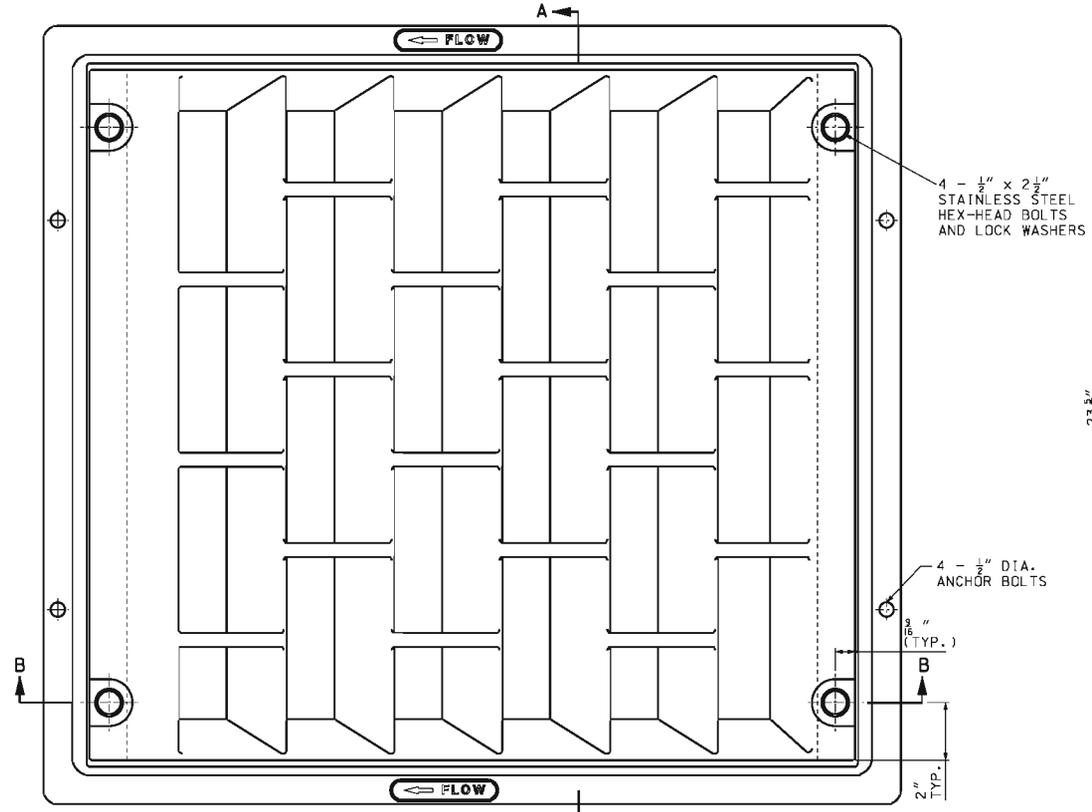
DATE EFFECTIVE: 06/01/2010
 DATE PREPARED: 4/1/2010

613.00P

SHEET NO.
3 OF 3

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

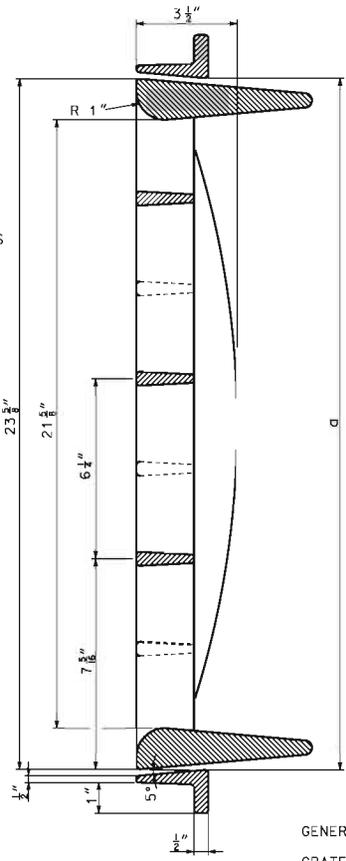
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



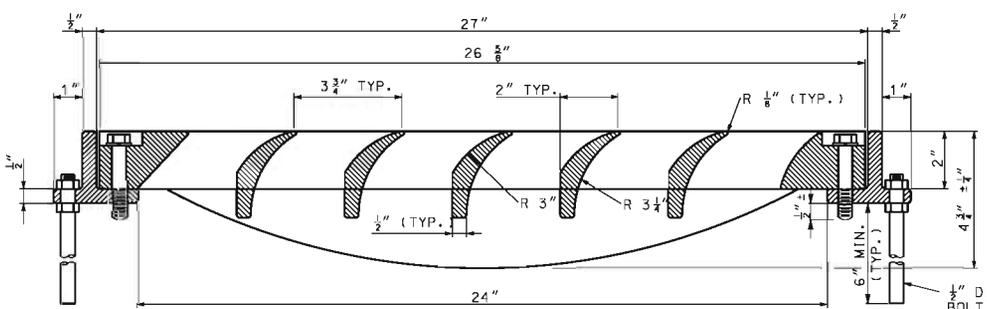
PLAN

4 - 1/2" x 2 1/2"
STAINLESS STEEL
HEX-HEAD BOLTS
AND LOCK WASHERS

4 - 1/2" DIA.
ANCHOR BOLTS



SECTION A-A



SECTION B-B

(*) 1/2" DIA. ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 232 OR SHALL BE MECHANICALLY GALVANIZED. IF MECHANICALLY GALVANIZED, THE COATING THICKNESS, ADHERENCE AND QUALITY REQUIREMENTS SHALL BE IN ACCORDANCE WITH AASHTO M 232, CLASS C. DAMAGED SPECTER COATING SHALL BE REPAIRED IN ACCORDANCE WITH SEC 1081.

1/2" DIA. ANCHOR BOLT (TYP.)(*)

NOMINAL DIMENSIONS AND WEIGHTS					
OPENING		a	WEIGHT (LB.)	NUMBER OF	
WIDTH	LENGTH			ANCHOR BOLTS	STAINLESS STEEL BOLTS
2'-0"	2'-0"	24"	200	4	4
4'-0"	2'-0"	48"	348	8	8

NOTE: TWO 2' X 2' GRATES MAY BE USED IN LIEU OF SINGLE 4' X 2' GRATES.

INSTALLATION INSTRUCTIONS:

DRILL AND TAP FRAME.

INSTALL 1/2" DIA. BOLTS WITHOUT WASHERS BEFORE CONCRETE POUR TO FORM 1/2" ± BOLT EXTENSION INTO CONCRETE BELOW FRAME. LUBRICATE EXPOSED THREADS.

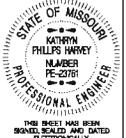
AFTER CONCRETE HARDENS SUFFICIENTLY, FINAL INSTALLATION SHALL REMOVE AND REINSTALL 1/2" DIA. BOLTS AND LOCK WASHERS THROUGH GRATE AND FRAME. TORQUE 1/2" DIA. BOLTS TO 35-40 FT. LB. APPLY THREAD ADHESIVE TO ALL 1/2" DIA. STAINLESS STEEL BOLTS.

GENERAL NOTES:

GRATES TO BE CONSTRUCTED OF CAST GRAY IRON AND MEET REQUIREMENTS OF AASHTO M 306. MINOR VARIATIONS IN VANE SHAPE TO MEET MANUFACTURER'S STANDARD PRACTICE ARE PERMITTED.

MINIMUM CLEAR OPEN AREA: 2.10 SQUARE FEET.

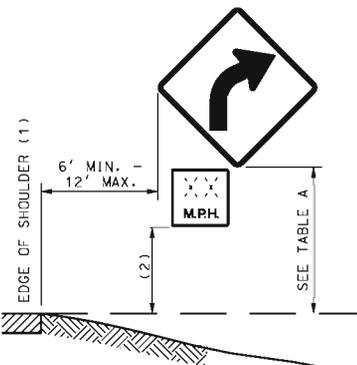
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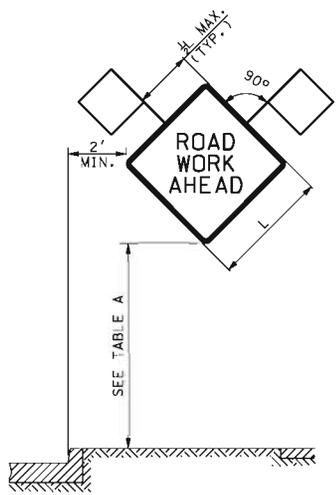
CURVED VANE GRATE AND FRAME

DATE EFFECTIVE: 06/01/2010	614.11C	SHEET NO. 1 OF 1
DATE PREPARED: 7/3/2013		

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(1) EDGE OF TRAVELED WAY WHERE THERE IS NO PAVED OR STABILIZED SHOULDER.
 (2) ONE-FOOT LESS THAN MOUNTING HEIGHT NOTED IN TABLE A.



HEIGHT AND LATERAL LOCATIONS FOR POST AND PORTABLE SIGN MOUNTING

TYPE	SIGN SUPPORT	SIGN SUBSTRATE	MINIMUM MOUNTING HEIGHT(3)	USAGE LIMITATIONS	COMMENTS
POST	PERFORATED SQUARE STEEL TUBE U-CHANNEL WOOD	RIGID	5' RURAL UNDIVIDED HIGHWAYS 7' RURAL DIVIDED HIGHWAYS 7' URBAN HIGHWAYS	NONE	POSTS SHALL BE FREE OF ANY BRACING AND EXTEND NO FURTHER ABOVE THE SIGN EXCEPT AS NEEDED FOR WARNING LIGHT ATTACHMENT. SEE STANDARD PLAN 903.03 FOR POST INSTALLATION DETAILS. GALVANIZATION OF POSTS WILL NOT BE REQUIRED.
TYPE 1 PORTABLE	SKID FOLD-UP STAND	RIGID	5' RURAL UNDIVIDED HIGHWAYS 7' RURAL DIVIDED HIGHWAYS 7' URBAN HIGHWAYS	PERMITTED ONLY WHERE POST MOUNTING IS NOT FEASIBLE.	SYSTEMS SHALL COMPLY WITH CRASH TEST REQUIREMENTS OF NCHRP 350 TEST LEVEL 3 AND MAY BE PLACED ADJACENT TO OR WITHIN THE ROADWAY PROVIDED A MINIMUM LATERAL CLEARANCE OF 3 FEET, MEASURED HORIZONTALLY FROM THE EDGE OF THE SIGN TO THE EDGE OF DESIGNATED TRAVELED WAY, IS MAINTAINED.
TYPE 2 PORTABLE	EASEL FOLD-UP STAND SELF-DRIVING POST TYPE III MOVABLE BARRICADE SKID	FLEXIBLE RIGID	12"(4)	PERMITTED ONLY FOR INSTALLATION UP TO 3 DAYS(5). WHERE SIGNS ARE OBSCURED BY OTHER OBJECTS (I.E., TRAFFIC CONTROL DEVICES, PARKED VEHICLES, BARRIER, VEGETATION, ETC.) OR INSTALLED ON MULTI-LANE UNDIVIDED FACILITIES OR MULTI-LANE DIVIDED FACILITIES WITH 3 OR MORE LANES IN ONE DIRECTION, MOUNTING HEIGHTS SHALL BE AS SPECIFIED FOR POST-MOUNTED SIGNS.	SYSTEMS SHALL COMPLY WITH CRASH TEST REQUIREMENTS OF NCHRP 350 TEST LEVEL 3 AND MAY BE PLACED ADJACENT TO OR WITHIN ROADWAY PROVIDED A MINIMUM LATERAL CLEARANCE OF 3 FEET, MEASURED HORIZONTALLY FROM THE EDGE OF THE SIGN TO THE EDGE OF THE DESIGNATED TRAVELED WAY, IS MAINTAINED.
BARRIER	CONCRETE TRAFFIC BARRIER GUARDRAIL	FLEXIBLE RIGID	5' RURAL UNDIVIDED HIGHWAYS 7' RURAL DIVIDED HIGHWAYS 7' URBAN HIGHWAYS	PERMITTED ONLY WHERE LONGITUDINAL BARRIER IS PRESENT.	SYSTEMS SHALL PROVIDE POSITIVE CONNECTION TO THE BARRIER AND MINIMIZE POTENTIAL FOR VEHICLE SNAGGING.
VEHICLE	PAVEMENT MARKING EQUIPMENT PILOT CAR PROTECTIVE VEHICLE	FLEXIBLE RIGID	48" (6)	PERMITTED ONLY IN PILOT CAR OR MOVING OPERATIONS.	

(3) MEASURED FROM THE BOTTOM OF THE SIGN TO THE NEAR EDGE OF THE PAVEMENT.
 (4) MOUNTING HEIGHTS FOR REGULATORY AND GUIDE SIGNS SHALL BE AS SPECIFIED FOR POST-MOUNTED SIGNS.
 (5) SIGNS MOUNTED ON TYPE III BARRICADES, GORE EXIT SIGN, AND SIGNS FOR CROSSWALK/SIDEWALK CLOSURES MAY BE LEFT IN PLACE FOR MORE THAN 3 DAYS.
 (6) DEVIATIONS AS APPROVED BY THE ENGINEER.

**TABLE A
WORK ZONE SIGN MOUNTING REQUIREMENTS**

SIGN AREA (SQ.FT.)	POST TYPE		
	U-CHANNEL	WOOD	PERF. SQUARE STEEL TUBING
≤ 10	1 - 3.0 LB./FT.*	1 - 4" X 4" *	1 - 2" 12 GA.*
> 10 ≤ 16	2 - 3.0 LB./FT.	2 - 4" X 4" 1 - 4" X 6" *	2 - 2" 12 GA.
> 16 ≤ 24	2 - 3.0 LB./FT.	2 - 4" X 6"	3 - 2" 12 GA.*
> 24 ≤ 30	3 - 3.0 LB./FT.	2 - 4" X 6"	N/A
> 30 ≤ 50	N/A	2 - 6" X 6"	N/A

* SIGNS GREATER THAN 4 FEET IN WIDTH, EXCEPT DIAMOND SHAPE SIGNS, REQUIRE TWO POSTS.
 ** REQUIRES SLIP BASE PER MANUFACTURER'S RECOMMENDATION.

**TABLE B
POST SIZE REQUIREMENTS**

GENERAL NOTES:

LONGITUDINAL SPACING OF SIGNS SHOWN IN THE PLANS ARE PREFERRED MINIMUMS, BUT MAY BE ADJUSTED TO MEET EXISTING FIELD CONDITIONS WITH APPROVAL FROM THE ENGINEER.

SIGNS SHALL NOT BE MOUNTED IN OR ON CHANNELIZERS.

ALL POSTS AND SIGNS SHALL BE INSTALLED AND MAINTAINED IN A PLUMB POSITION.

CONSTRUCTION SIGNS SHALL NOT BE LOCATED ON SIDEWALKS, BICYCLE LANES, OR AREAS DESIGNATED FOR PEDESTRIAN OR BICYCLE TRAFFIC.

ALL BATTERY PACKS SEPARATE FROM WARNING LIGHT SHALL BE MOUNTED ON A SUPPORT POST NO HIGHER THAN 18" ABOVE GROUND LINE. IF USED, WARNING LIGHTS SHALL NOT COVER ANY PORTION OF THE SIGN FACE.

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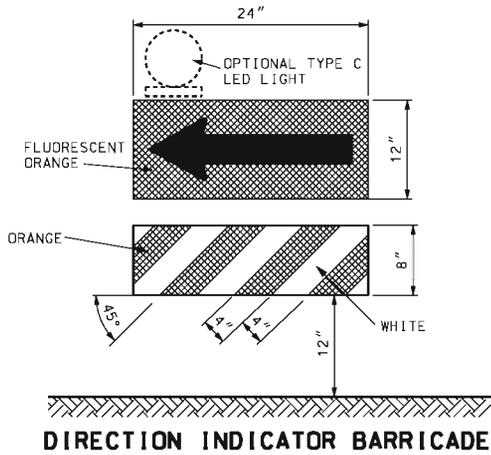
TEMPORARY TRAFFIC CONTROL DEVICES SIGN MOUNTING REQUIREMENTS

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-23781
 PROFESSIONAL ENGINEER

THIS SEAL HAS BEEN ELECTRONICALLY SEALED AND DATED.

616.10A0

DATE EFFECTIVE: 08/01/2012	616.10A0	SHEET NO. 1 OF 8
DATE PREPARED: 8/15/2012		

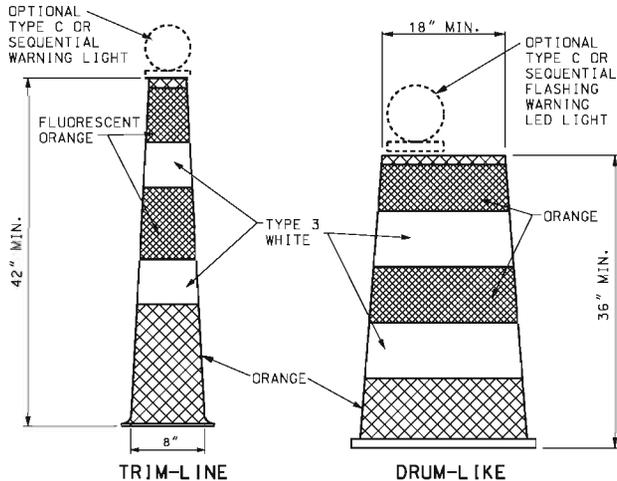


DIRECTION INDICATOR BARRICADE

VERTICAL DIMENSIONS DO NOT INCLUDE PROJECTIONS DESIGNED FOR EASE OF HANDLING.

DIRECTION INDICATOR BARRICADES SHALL NOT BE USED IN SHIFTING TAPERS UNLESS SHOWN ON THE PLANS.

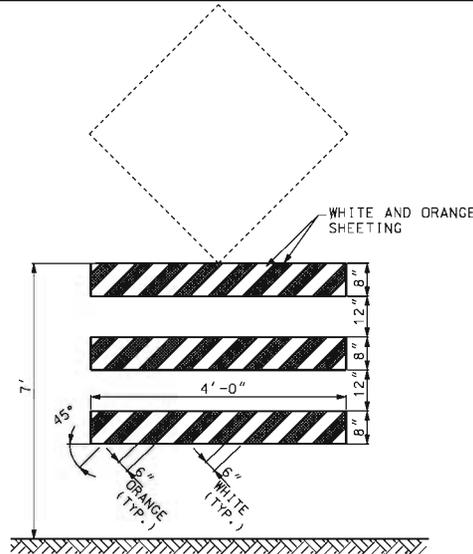
THE PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE, CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.



CHANNELIZERS

REFLECTIVE SHEETING APPLIED TO CHANNELIZERS SHALL BE REBOUNDABLE MEETING ASTM D 4956.

STRIPES ON TRIM-LINE CHANNELIZERS SHALL BE 6" TO 8".
STRIPES ON DRUM-LIKE CHANNELIZERS SHALL BE 4" TO 6".



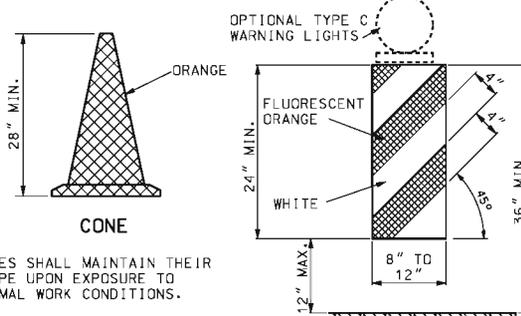
ADVANCE WARNING RAIL SYSTEM

MAXIMUM WEIGHT OF SIGN SHALL NOT EXCEED 25 LBS.

THE SIGN AND RAIL SYSTEM MAY BE MOUNTED AS TWO SEPARATE CRASHWORTHY DEVICES. THE RAIL SYSTEM SHALL BE LOCATED DIRECTLY IN FRONT OF THE SIGN WITH 7 TO 10 FEET SEPARATING THE TWO DEVICES.

WHERE MARKING IS NOT PROVIDED ON THE BACKSIDE, STRIPS OF 3" WIDE MODOT TYPE 7 ORANGE SHEETING MAY BE APPLIED TO THE ENDS OF EACH RAIL TO HELP DELINEATE THE DEVICE.

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.



CONE

CONES SHALL MAINTAIN THEIR SHAPE UPON EXPOSURE TO NORMAL WORK CONDITIONS.

CONES SHALL BE USED DURING DAYLIGHT HOURS ONLY.

VERTICAL PANEL

VERTICAL PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE, CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.

GENERAL NOTES:

FLUORESCENT ORANGE REFLECTIVE SHEETING SHALL IN ACCORDANCE WITH SEC 1042.2.7.3.

BALLAST FOR TRAFFIC CONTROL DEVICES SHALL CONFORM TO MANUFACTURERS' RECOMMENDATION FOR FIELD CONDITIONS WHEN APPLICABLE.

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.2.

IF REQUIRED BY THE ENGINEER OR SPECIFIED ON THE PLANS, EACH DIRECTION INDICATOR BARRICADE, CHANNELIZER, AND VERTICAL PANEL SHALL BE EQUIPPED WITH ONE TYPE C OR SEQUENTIAL FLASHING WARNING PORTABLE LIGHT UNIT. IF USED, THE LIGHT UNIT AND BATTERY COMPARTMENT SHALL BE FURNISHED BY THE DEVICE MANUFACTURER OR OTHERWISE MEET THE MANUFACTURER'S RECOMMENDATIONS FOR DESIGN AND WILL BE REQUIRED ON ALL DEVICES IN THE SERIES.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE DRUM-LIKE CHANNELIZERS IN LIEU OF TRIM-LINE CHANNELIZERS TO PROVIDE LONGITUDINAL CHANNELIZATION WITHIN THE ACTIVITY AREA WHERE NO RAMPS, INTERSECTIONS OR LIMITED LATERAL CLEARANCE EXISTS.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE DIRECTION INDICATOR BARRICADES IN LIEU OF TRIM-LINE CHANNELIZERS IN MERGING TAPERS.

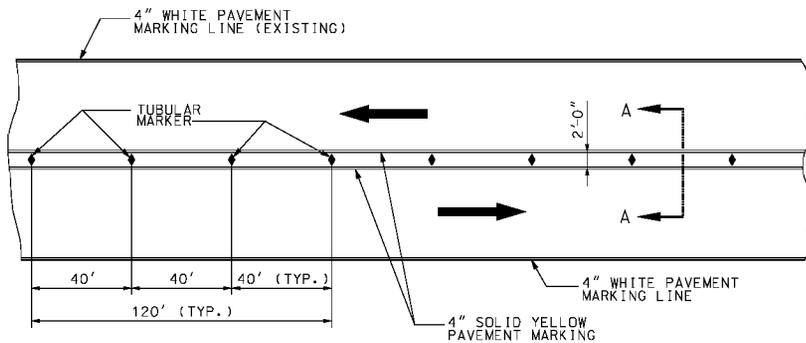
UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE VERTICAL PANELS IN LIEU OF TRIM-LINE CHANNELIZERS TO PROVIDE LONGITUDINAL CHANNELIZATION WITHIN THE ACTIVITY AREA.

UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE CONES IN LIEU OF TRIM-LINE CHANNELIZERS DURING DAYTIME OPERATIONS ON MINOR ROUTES.

PANEL AND RAIL MARKINGS FOR TRAFFIC DELINEATION SHALL SLOPE DOWNWARD TOWARD THE INTENDED DIRECTION OF TRAVEL. ILLUSTRATIONS SHOWN ARE FOR INSTANCES WHERE TRAFFIC MOVES TO THE LEFT. REVERSE CONFIGURATIONS SHALL BE USED FOR TRAFFIC MOVEMENTS TO THE RIGHT. MARKINGS SHALL ONLY BE APPLIED TO THE FRONT OF EACH RAIL OR PANEL, OR MAY BE APPLIED TO BOTH THE FRONT AND BACK PROVIDING THE MARKING ON THE BACK DOES NOT CONFLICT WITH INTENDED OPPOSING TRAFFIC MOVEMENT.

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<p>TEMPORARY TRAFFIC CONTROL DEVICES CHANNELIZERS AND DIRECTION INDICATOR BARRICADE</p>	
<p>STATE OF MISSOURI KATHRYN PHILLIPS HAWRY NUMBER PE-22781 PROFESSIONAL ENGINEER THIS SHEET HAS BEEN BOUND, SEALED AND DATED ELECTRONICALLY.</p>	<p>DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012</p>
<p>616.10A0</p>	<p>SHEET NO. 2 OF 8</p>

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



TWO LANE / TWO WAY TRAFFIC DELINEATION PLAN FOR DIVIDED HIGHWAY

IF RAISED PAVEMENT MARKERS ARE PRESENT, THE LENSES SHALL BE REMOVED OR COVERED TO THE SATISFACTION OF THE ENGINEER.

ONE TYPE III MOVABLE BARRICADE WILL BE REQUIRED TO COMPLETELY CLOSE EACH 8' OF PAVEMENT. PAVED SHOULDERS SHALL BE INCLUDED IN THE AREA TO BE CLOSED.

SIGNS SHALL BE LIGHT WEIGHT (ROLL-UP OR PLASTIC) AND OBSCURE NO MORE THAN 50 PERCENT OF THE TOP 2 RAILS OR 33 PERCENT OF ALL THREE RAILS.

TYPE C WARNING LIGHTS SHALL BE LIGHT WEIGHT (3.3 LBS. OR LESS) OR HAVE BATTERY PACK MOUNTED NO HIGHER THAN 18-INCH AND SHALL NOT COVER ANY PORTION OF THE BARRICADED FACE.

IF SIGNS OR LIGHTS CANNOT MEET THE ABOVE REQUIREMENTS, THEY SHALL BE MOUNTED ON SEPARATE CRASHWORTHY DEVICES, LOCATED 7 TO 10 FEET BEHIND THE BARRICADE AND AT HEIGHTS SPECIFIED FOR POST MOUNTED SIGNS, LOCATED IN TABLE A ON SHEET 1.

WHERE A BARRICADE ARRAY EXTENDS ACROSS A ROADWAY, THE STRIPES SHALL SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN OR PASS.

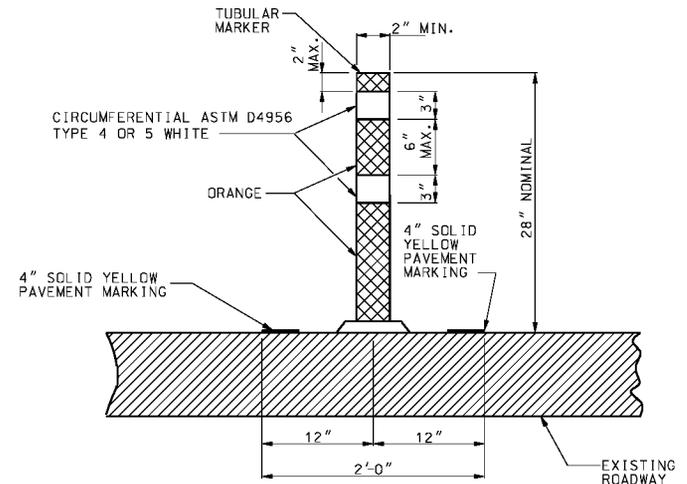
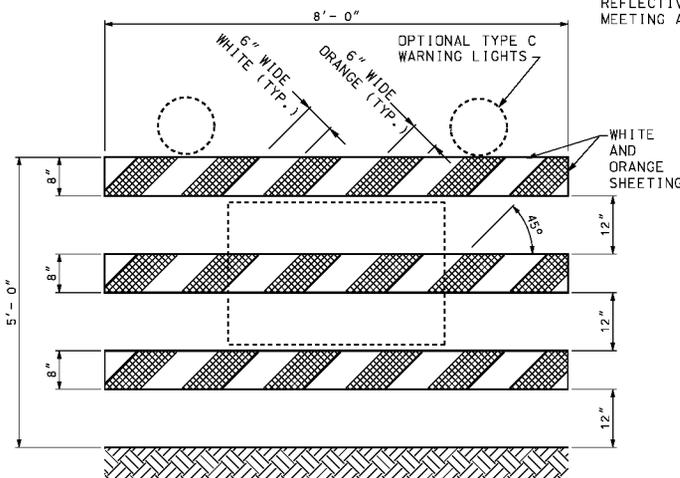
WHERE BOTH RIGHT AND LEFT VEHICULAR MOVEMENTS ARE PROVIDED, THE STRIPES SHALL SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE ARRAY.

WHERE NO VEHICULAR MOVEMENTS ARE PROVIDED, THE STRIPES SHALL SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE ARRAY.

TYPE III MOVABLE BARRICADES SHALL BE ENTIRELY FREE STANDING AND PORTABLE. MARKING SHALL ONLY BE APPLIED TO THE FRONT OF EACH RAIL OR MAY BE APPLIED TO BOTH THE FRONT AND THE BACK OF EACH RAIL PROVIDED THE MARKING ON THE BACK DOES NOT CONFLICT WITH INTENDED OPPOSING TRAFFIC MOVEMENT. WHERE MARKING IS NOT PROVIDED ON THE BACKSIDE, STRIPS OF 3" WIDE ORANGE SHEETING MAY BE APPLIED TO THE ENDS OF EACH RAIL TO HELP DELINEATE THE DEVICE.

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 104.2.7.3.

TYPE III MOVABLE BARRICADE



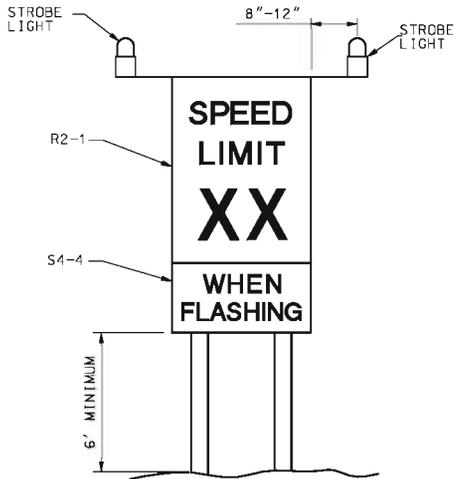
SECTION A-A TUBULAR MARKER DETAIL

AN ADHESIVE, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, SHALL BE USED TO APPLY THE TUBULAR MARKER TO THE ROADWAY SURFACE. THE ADHESIVE SHALL PERMIT EASY REMOVAL OF THE TUBULAR MARKER WITHOUT DAMAGE TO THE ROADWAY SURFACE.

REFLECTIVE SHEETING APPLIED TO TUBULAR MARKERS SHALL BE REBOUNDABLE MEETING ASTM D4956.

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		TEMPORARY TRAFFIC CONTROL DEVICES	
DATE EFFECTIVE:	08/01/2012	616.10A0	SHEET NO.
DATE PREPARED:	5/29/2015		3 OF 8

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



SEE NON-PORTABLE SIGN MOUNTING FOR LATERAL DIMENSIONS

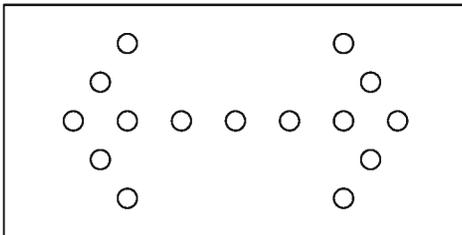
SPEED LIMIT AND STROBE LIGHT ASSEMBLY

THE ASSEMBLY MAY BE EITHER POST- OR PORTABLE-MOUNTED.

THE ASSEMBLY SHALL ONLY BE USED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

THE ASSEMBLY SHALL BE COVERED OR ROTATED SO THE SIGNS ARE NOT VISIBLE TO TRAFFIC WHEN WORK IS SUSPENDED OR THE CONDITION REQUIRING THE SPEED REDUCTION IS NOT PRESENT FOR 48 HOURS OR MORE.

THE STROBE LIGHTS SHALL BE TURNED OFF WHEN THE SPEED LIMIT IS NOT IN EFFECT.



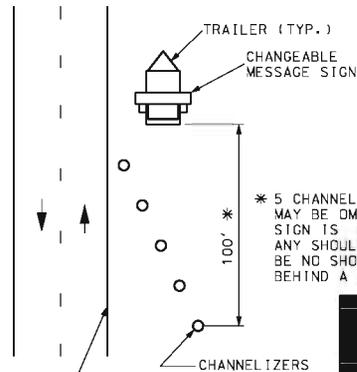
FLASHING ARROW PANEL REQUIREMENTS

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

STROBE LIGHT REQUIREMENTS

STROBE LIGHTS SHALL BE SHIELDED SO THEY WILL NOT BE DIRECTLY VISIBLE FROM THE REAR. NO DIRECT PAYMENT WILL BE MADE FOR THE BATTERIES REQUIRED TO POWER THE STROBE LIGHTS.

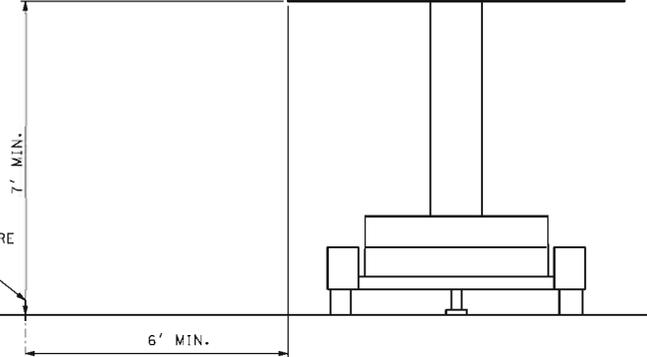
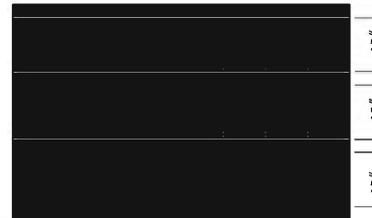
AT THE CONTRACTOR'S OPTION, THE STROBE LIGHTS MAY BE CONTROLLED BY A SWITCH LOCATED ON THE SIGN OR MAY BE A STANDARD TWO-CHANNEL DIGITAL TRANSMITTER AND RECEIVER UNIT. IF THE TRANSMITTER AND RECEIVER METHOD IS USED, ONE TRANSMITTER SHALL BE FURNISHED TO THE ENGINEER AT THE TIME OF INSTALLATION OF THE SPEED LIMIT ASSEMBLY. THE TRANSMITTER WILL BE RETURNED TO THE CONTRACTOR AT THE COMPLETION OF THE PROJECT. THE TRANSMITTER AND RECEIVERS WILL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE PROJECT IS COMPLETED. NO DIRECT PAYMENT WILL BE MADE FOR THE COST OF THE TRANSMITTER AND RECEIVER.



* 5 CHANNELIZERS AT 20' INTERVALS. CHANNELIZERS MAY BE OMITTED WHERE THE CHANGEABLE MESSAGE SIGN IS LOCATED 15' OR MORE FROM THE EDGE OF ANY SHOULDER (EDGE OF ROADWAY WOULD THERE BE NO SHOULDER), BEYOND THE DITCH LINE, OR BEHIND A CURB OR PHYSICAL BARRIER.

EDGE OF PAVEMENT (OR SHOULDER WHERE APPLICABLE)

EDGE OF PAVEMENT (OR SHOULDER WHERE APPLICABLE)



CHANGEABLE MESSAGE SIGN

PORTABLE WARNING LIGHTS

	TYPE A	TYPE B	TYPE C	SEQUENTIAL FLASHING
LOW INTENSITY	1 OR 2	HIGH INTENSITY	STEADY BURN	FLASHING
LENS DIRECTIONAL FACES	1 OR 2	1	1 OR 2	1
FLASHING RATE PER MINUTE	55 TO 75	55 TO 75	CONSTANT	55 TO 75
MINIMUM ON-TIME(1)	10%	8%	CONSTANT	CONSTANT
HOURS OF OPERATION	DUSK TO DAWN	24 HRS/DAY	DUSK TO DAWN	24 HRS/DAY

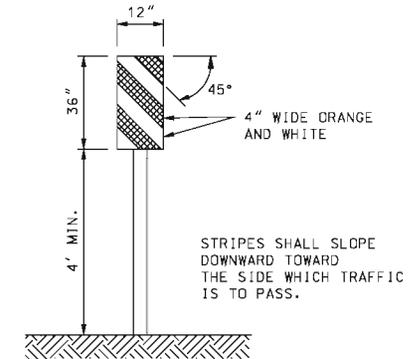
TYPE A, TYPE C AND SEQUENTIAL LIGHTS SHALL BE VISIBLE ON A CLEAR NIGHT FROM A DISTANCE OF 3000 FEET(2).

TYPE B LIGHTS SHALL BE VISIBLE ON A SUNNY DAY WHEN VIEWED WITHOUT THE SUN DIRECTLY ON OR BEHIND THE DEVICE FROM A DISTANCE OF 1000 FEET(2).

SEQUENTIAL FLASHING WARNING LIGHTS SHALL BE PLACED WITHIN THE MERGING TAPER AND STILL COMMUNICATE WITH ANY LIGHT WITH THE SEQUENCE. THE LIGHTS SHOULD BE CAPABLE OF BEING SPACED AT LEAST 60 FEET AND MAY HAVE AN OFFSET CAPABILITY OF AT LEAST 6 FEET.

- (1) LENGTH OF TIME THAT INSTANTANEOUS INTENSITY IS EQUAL TO OR GREATER THAN EFFECTIVE INTENSITY.
- (2) THIS VISIBILITY MUST BE MAINTAINED WITHIN A SOLID ANGLE 9° ON EACH SIDE OF THE VERTICAL AXIS, AND 5° ABOVE AND 5° BELOW THE HORIZONTAL AXIS.

PORTABLE WARNING LIGHTS SHALL BE BATTERY- OR SOLAR-POWERED AND CONSIST OF A SINGLE UNIT (HEAD AND HOUSING).



TYPE 3 OBJECT MARKERS

WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

TEMPORARY TRAFFIC CONTROL DEVICES

STATE OF MISSOURI
KATHRYN PHILLIPS HAWRY
NUMBER PE-22781
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN BOUND, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 08/01/2012
DATE PREPARED: 7/26/2012

616.10A0

SHEET NO.
4 OF 8

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

WARNING SIGNS						
SIGN	SIZE (IN.)	AREA (SQ. FT.)	COLOR		SHEETING	DESCRIPTION
			SYM. LEG. BRD.	BACK GROUND		
SPECIAL	36X36	9.00	BK	FL. OR	R4	FRESH OIL/LOOSE GRAVEL (3)
E05-2	48X36	12.00	BK	FL. OR	R4	EXIT OPEN
E05-2c	48X36	12.00	BK	FL. OR	R4	EXIT CLOSED
W01-1L	48X48	16.00	BK	FL. OR	R4	TURN (SYMBOL LEFT ARROW)
W01-1R	48X48	16.00	BK	FL. OR	R4	TURN (SYMBOL RIGHT ARROW)
W01-2L	48X48	16.00	BK	FL. OR	R4	CURVE (SYMBOL LEFT ARROW)
W01-2R	48X48	16.00	BK	FL. OR	R4	CURVE (SYMBOL RIGHT ARROW)
W01-3L	48X48	16.00	BK	FL. OR	R4	REVERSE TURN (SYMBOL LEFT ARROW)
W01-3R	48X48	16.00	BK	FL. OR	R4	REVERSE TURN (SYMBOL RIGHT ARROW)
W01-4L	48X48	16.00	BK	FL. OR	R4	REVERSE CURVE (SYMBOL LEFT ARROW)
W01-4R	48X48	16.00	BK	FL. OR	R4	REVERSE CURVE (SYMBOL RIGHT ARROW)
W01-4bL	48X48	16.00	BK	FL. OR	R4	DOUBLE ARROW REVERSE CURVE (SYMBOL LEFT ARROWS) (2)
W01-4bR	48X48	16.00	BK	FL. OR	R4	DOUBLE ARROW REVERSE CURVE (SYMBOL RIGHT ARROWS) (2)
W01-4cL	48X48	16.00	BK	FL. OR	R4	TRIPLE ARROW REVERSE CURVE (SYMBOL LEFT ARROWS) (2)
W01-4cR	48X48	16.00	BK	FL. OR	R4	TRIPLE ARROW REVERSE CURVE (SYMBOL RIGHT ARROWS) (2)
W01-6	60X30	12.50	BK	FL. OR	R4	HORIZONTAL ARROW (SYMBOL)
W01-6c	72X36	18.00	BK	FL. OR	R4	HORIZONTAL ARROW (SYMBOL ON PERMANENT BARRICADE) (1)
W01-7	60X30	12.50	BK	FL. OR	R4	DOUBLE HEAD HORIZONTAL ARROW (SYMBOL)
W01-7c	72X36	18.00	BK	FL. OR	R4	DOUBLE HEAD HORIZONTAL ARROW (SYMBOL ON PERMANENT BARRICADE) (1)
W01-8	18X24	3.00	BK	FL. OR	R4	CHEVRON (SYMBOL)
W01-8c	30X36	7.50	BK	FL. OR	R4	CHEVRON (SYMBOL FOR DIVIDED HIGHWAYS)
W03-1	48X48	16.00	BK	FL. OR	R4	STOP AHEAD (SYMBOL)
W03-2	48X48	16.00	BK	FL. OR	R4	YIELD AHEAD (SYMBOL)
W03-3	48X48	16.00	BK	FL. OR	R4	SIGNAL AHEAD (SYMBOL)
W03-4	48X48	16.00	BK	FL. OR	R4	BE PREPARED TO STOP
W03-5	48X48	16.00	BK	FL. OR	R4	SPEED LIMIT AHEAD
W04-1L	48X48	16.00	BK	FL. OR	R4	MERGE (SYMBOL FROM LEFT)
W04-1R	48X48	16.00	BK	FL. OR	R4	MERGE (SYMBOL FROM RIGHT)
W05-1	48X48	16.00	BK	FL. OR	R4	ROAD/BRIDGE/RAMP NARROWS (4)
W05-3	48X48	16.00	BK	FL. OR	R4	ONE LANE BRIDGE
W05-5	48X48	16.00	BK	FL. OR	R4	NARROW LANES (3)
W06-1	48X48	16.00	BK	FL. OR	R4	DIVIDED HIGHWAY (SYMBOL)
W06-2	48X48	16.00	BK	FL. OR	R4	DIVIDED HIGHWAY END (SYMBOL)
W06-3	48X48	16.00	BK	FL. OR	R4	TWO WAY TRAFFIC (SYMBOL)
W07-3a	30X24	5.00	BK	FL. OR	R4	NEXT XX MILES (PLAQUE)
W08-1	48X48	16.00	BK	FL. OR	R4	BUMP
W08-2	48X48	16.00	BK	FL. OR	R4	DIP
W08-3	48X48	16.00	BK	FL. OR	R4	PAVEMENT ENDS
W08-4	48X48	16.00	BK	FL. OR	R4	SOFT SHOULDER
W08-5	48X48	16.00	BK	FL. OR	R4	SLIPPERY WHEN WET (SYMBOL)
W08-6	48X48	16.00	BK	FL. OR	R4	TRUCK CROSSING WITH FLAGS
W08-6c	48X48	16.00	BK	FL. OR	R4	TRUCK ENTRANCE (3)
W08-7	36X36	9.00	BK	FL. OR	R4	LOOSE GRAVEL
W08-9	48X48	16.00	BK	FL. OR	R4	LOW SHOULDER
W08-11	48X48	16.00	BK	FL. OR	R4	UNEVEN LANES
W08-12	48X48	16.00	BK	FL. OR	R4	NO CENTER LINE
W08-15	48X48	16.00	BK	FL. OR	R4	GROOVED PAVEMENT
W08-15p	30X24	5.00	BK	FL. OR	R4	MOTORCYCLE (PLAQUE)
W08-17	48X48	16.00	BK	FL. OR	R4	SHOULDER DROP-OFF (SYMBOL)
W08-17p	30X24	5.00	BK	FL. OR	R4	SHOULDER DROP-OFF (PLAQUE)
W10-1	42 RND.	9.62	BK	FL. YL	R4	RAILROAD CROSSING
W012-1	24X24	4.00	BK	FL. OR	R4	DOUBLE DOWN ARROW (SYMBOL)
W012-2	48X48	16.00	BK	FL. OR	R4	LOW CLEARANCE (SYMBOL)
W012-2x	24X18	3.00	BK	FL. OR	R4	LOW CLEARANCE (PLAQUE) (3)
W012-2a	84X24	14.00	BK	FL. OR	R4	OVERHEAD LOW CLEARANCE (FEET AND INCHES) (3)
SPECIAL	120X60	50.00	BK	FL. OR	R4	LOW CLEARANCE XX FT XX IN XX MILES AHEAD (3)
SPECIAL	120X60	50.00	BK	FL. OR	R4	WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD (3)
W013-1	30X30	6.25	BK	FL. OR	R4	ADVISORY SPEED (PLAQUE)
W016-2	30X24	5.00	BK	FL. OR	R4	XXX FEET (PLAQUE)
W016-3	30X24	5.00	BK	FL. OR	R4	X MILE (PLAQUE)
W020-1	48X48	16.00	BK	FL. OR	R4	ROAD/BRIDGE/RAMP WORK AHEAD (4)
W020-2	48X48	16.00	BK	FL. OR	R4	DETOUR AHEAD
W020-3	48X48	16.00	BK	FL. OR	R4	ROAD CLOSED AHEAD
W020-4	48X48	16.00	BK	FL. OR	R4	ONE LANE ROAD AHEAD
W020-5	48X48	16.00	BK	FL. OR	R4	RIGHT/CENTER/LEFT LANE CLOSED AHEAD (4)

- (1) SIGN DEPICTION, ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (2) REFER TO THE LATEST EDITION OF MUTCD PART VI BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA FOR SIGN DEPICTION, ARROW, BORDERS AND SPACING SHALL CONFORM TO THE GUIDELINES SET FORTH IN THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (3) ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (4) USE OF A SUPPLEMENTAL PLATE FOR LINE 1 IS ACCEPTABLE.
- (5) PLAQUE AND APPLICABLE REGULATORY SIGN MAY BE MANUFACTURED AS ONE SIGN.
- (6) R4 REFER TO SEC 1042.2.7.3.

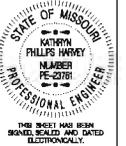
GENERAL NOTES:

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA, UNLESS SPECIFIED OTHERWISE.

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

NO ADDITIONAL PAYMENT WILL BE MADE FOR PLATES.

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

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TEMPORARY TRAFFIC CONTROL DEVICES WARNING SIGNS
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 8/15/2012	616.10A0
	SHEET NO. 5 OF 8

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

WARNING SIGNS						
SIGN	SIZE (IN.)	AREA (SQ. FT.)	COLOR		SHEETING	DESCRIPTION
			SYM. LEG. BKG.	BACK GROUND		
W020-5a	48X48	16.00	BK	FL. OR	R4	2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD (4)
SPECIAL W020-6a	48X48	16.00	BK	FL. OR	R4	RIGHT/CENTER/LEFT LANE CLOSED (3)(4)
W020-7	48X48	16.00	BK	FL. OR	R4	FLAGGER (SYMBOL) WITH FLAGS
W021-2	36X36	9.00	BK	FL. OR	R4	FRESH DIL
SPECIAL W021-5b	48X48	16.00	BK	FL. OR	R4	SHOULDER WORK AHEAD (3)
W022-1	48X48	16.00	BK	FL. OR	R4	BLASTING ZONE AHEAD
W022-2	42X36	10.50	BK	FL. OR	R4	TURN OFF 2-WAY RADIO AND PHONE
W022-3	42X36	10.50	BK	FL. OR	R4	END BLASTING ZONE
SPECIAL W022-6a	21X15	2.19	BK	FL. OR	R4	WET PAINT (ARROW PIVOTS) (3)
GUIDE SIGNS						
E05-1	36X48	12.00	BK	FL. OR	R4	GORE EXIT (3)
G020-1	60X24	10.00	BK	FL. OR	R4	ROAD WORK NEXT XX MILES
G020-2	48X24	8.00	BK	FL. OR	R4	END ROAD WORK
G020-4	36X18	4.50	BK	FL. OR	R4	PILOT CAR FOLLOW ME
SPECIAL	42X30	8.75	BK	FL. OR	R4	PLEASE WAIT FOR PILOT CAR (3)
G020-5aP	36X24	6.00	BK	FL. OR	R4	WORK ZONE (PLAQUE) (3) (5)
M04-8a	24X18	3.00	BK	FL. OR	R4	END DETOUR
M04-9L	48X36	12.00	BK	FL. OR	R4	DETOUR (LEFT ARROW)
M04-9R	48X36	12.00	BK	FL. OR	R4	DETOUR (RIGHT ARROW)
M04-10L	48X18	6.00	BK	FL. OR	R4	DETOUR (ARROW LEFT)
M04-10R	48X18	6.00	BK	FL. OR	R4	DETOUR (ARROW RIGHT)
REGULATORY SIGNS						
R1-1	48X48	13.25	WH	RD	R2	STOP
R1-2	48 TRI.	6.93	RD	WH	R2	YIELD
R1-2a	36X36	9.00	BK	WH	R2	TO ONCOMING TRAFFIC (PLAQUE)
R1-3	20X9	1.25	WH	RD	R2	X-WAY (PLAQUE)
R2-1	36X48	12.00	BK	WH	R2	SPEED LIMIT XX
R3-1	48X48	16.00	BK/RD	WH	R2	NO RIGHT TURN (SYMBOL)
R3-2	48X48	16.00	BK/RD	WH	R2	NO LEFT TURN (SYMBOL)
R3-3	36X36	9.00	BK	WH	R2	NO TURNS
R3-4	48X48	16.00	BK/RD	WH	R2	NO U-TURN (SYMBOL)
R3-7L	30X30	6.25	BK	WH	R2	LEFT LANE MUST TURN LEFT
R3-7R	30X30	6.25	BK	WH	R2	RIGHT LANE MUST TURN RIGHT
R4-1	36X48	12.00	BK	WH	R2	DO NOT PASS
R4-2	36X48	12.00	BK	WH	R2	PASS WITH CARE
R4-7a	36X48	12.00	BK	WH	R2	KEEP RIGHT (HORIZONTAL ARROW)
R4-8a	36X48	12.00	BK	WH	R2	KEEP LEFT (HORIZONTAL ARROW)
R5-1	30X30	6.25	RD	WH	R2	DO NOT ENTER
R5-1a	36X24	6.00	WH	RD	R2	WRONG WAY
R6-1L	48X18	6.00	BK	WH	R2	ONE WAY ARROW (LEFT)
R6-1R	48X18	6.00	BK	WH	R2	ONE WAY ARROW (RIGHT)
R6-2L	24X30	5.00	BK	WH	R2	ONE WAY (LEFT)
R6-2R	24X30	5.00	BK	WH	R2	ONE WAY (RIGHT)
R10-6	24X36	6.00	BK	WH	R2	STOP HERE ON RED (45° ARROW)
R11-2	48X30	10.00	BK	WH	R2	ROAD CLOSED
R11-3a	60X30	12.50	BK	WH	R2	ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60X30	12.50	BK	WH	R2	ROAD CLOSED TO THRU TRAFFIC
CONST-3A	60X48	20.00	BK	FL. OR	R2	FINE SIGN (3)
CONST-3X	56X12	4.67	BK	WH	R2	SPEEDING/PASSING (PLATE) (3)
SPECIAL SIGNS						
CONST-7-72	72X36	18.00	WH/BL	BK/FL. OR	R2	RATE OUR WORK ZONE
CONST-7-48	48X24	8.00	WH/BL	BK/FL. OR	R2	RATE OUR WORK ZONE

- (1) SIGN DEPICTION, ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (2) REFER TO THE LATEST EDITION OF MUTCD PART VI BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA FOR SIGN DEPICTION, ARROW, BORDERS AND SPACING SHALL CONFORM TO THE GUIDELINES SET FORTH IN THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (3) ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (4) USE OF A SUPPLEMENTAL PLATE FOR LINE 1 IS ACCEPTABLE.
- (5) PLAQUE AND APPLICABLE REGULATORY SIGN MAY BE MANUFACTURED AS ONE SIGN.
- (6) R2 REFER TO SEC 1042.2.7.2.
- (7) R4 REFER TO SEC 1042.2.7.3.

GENERAL NOTES:

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA, UNLESS SPECIFIED OTHERWISE.

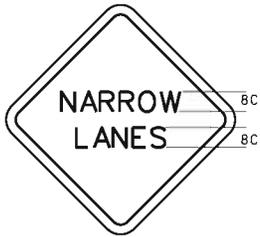
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NO ADDITIONAL PAYMENT WILL BE MADE FOR PLATES.

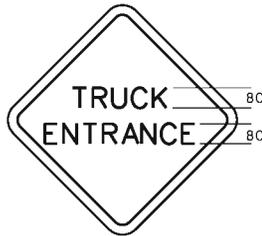
ALL PLAQUES SHALL HAVE A BORDER. PLATES SHALL NOT HAVE A BORDER.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TEMPORARY TRAFFIC CONTROL DEVICES WARNING, GUIDE AND REGULATORY SIGNS
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 8/15/2012	616.10A0 SHEET NO. 6 OF 8

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



W05-5 (3)



W08-6c (3)



W012-2x (3)



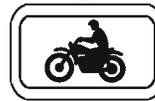
SPECIAL (3)



W020-6a (3)(4)



W021-5b (3)

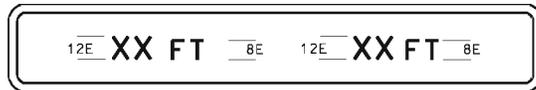


W08-15(3)
W08-15p

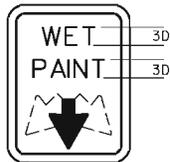
FL. OR



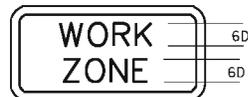
SPECIAL (3)



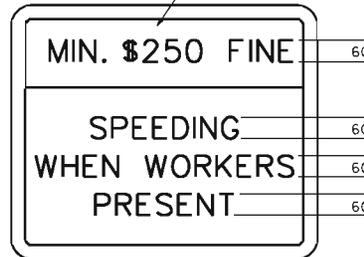
W012-2a (3)



W022-6e (3)



G020-5aP (3)



CONST-3A (3)



SPECIAL (3)

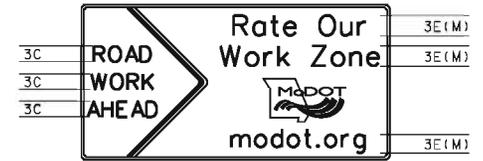


SPECIAL (3)

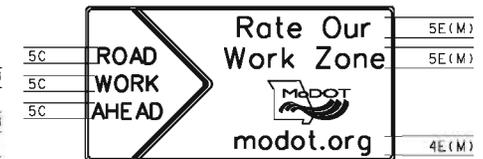


CONST-3X (3)

- (1) SIGN DEPICTION, ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (2) REFER TO THE LATEST EDITION OF MUTCD PART VI BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA FOR SIGN DEPICTION, ARROW, BORDERS AND SPACING SHALL CONFORM TO THE GUIDELINES SET FORTH IN THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (3) ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.
- (4) USE OF A SUPPLEMENTAL PLATE FOR LINE 1 IS ACCEPTABLE.
- (5) PLAQUE AND APPLICABLE REGULATORY SIGN MAY BE MANUFACTURED AS ONE SIGN.



CONST-7-48



CONST-7-72

GENERAL NOTES:

SIGN LAYOUTS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA UNLESS SPECIFIED OTHERWISE.

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

NO ADDITIONAL PAYMENT WILL BE MADE FOR PLATES.

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

LETTER DIMENSIONS SHALL BE AS SHOWN.

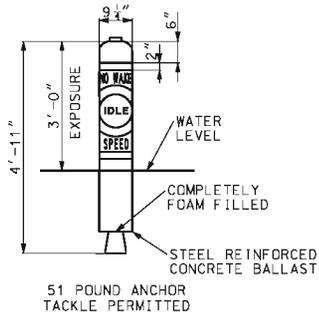
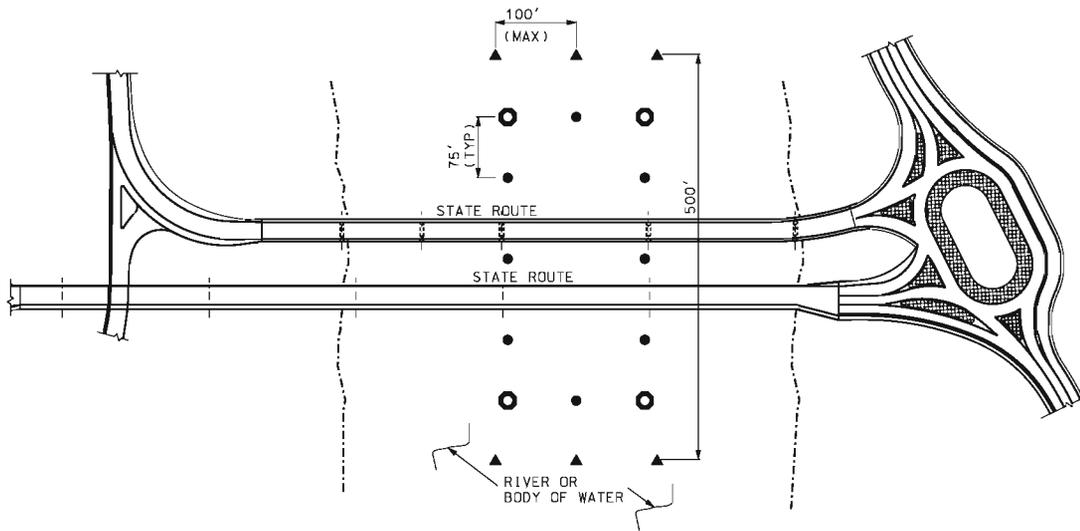
<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>STATE OF MISSOURI KATHRYN PHILLIPS HAWRY NUMBER PE-2781 PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN BONDED, SEALED AND DATED ELECTRONICALLY.</p>	<p>TEMPORARY TRAFFIC CONTROL DEVICES</p>
<p>DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 8/28/2012</p>	<p>616.10A0</p>
<p>SHEET NO. 7 OF 8</p>	

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

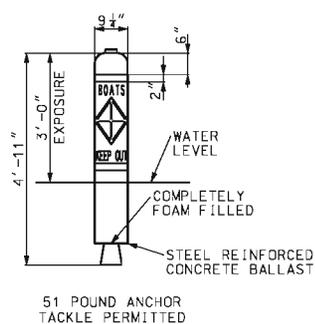
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

LEGEND

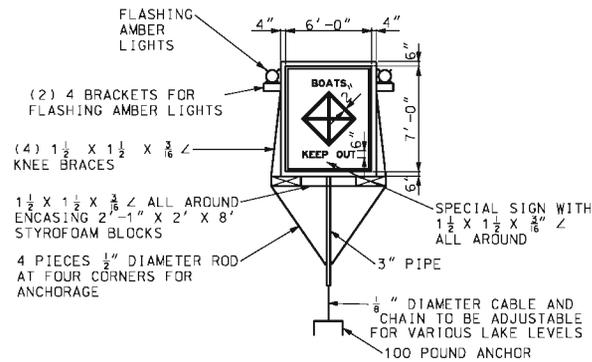
- - BOATS KEEP OUT (SIGN)
- - BOATS KEEP OUT (BUOY)
- ▲ - NO WAKE (BUOY)



RESTRICTED AREA BUOY
("NO WAKE")
(6 REQUIRED - ROADWAY ITEM)



CONTROLLED AREA BUOY
("BOATS KEEP OUT")
(8 REQUIRED - ROADWAY ITEM)



SPECIAL SIGN ASSEMBLY
("BOATS KEEP OUT")
(4 REQUIRED - ROADWAY ITEM)

GENERAL NOTES:

INFORMATION SHOWN IS SCHEMATIC ONLY. FINAL LOCATION AND NUMBER OF SIGNS AND BUOYS IS SUBJECT TO APPROVAL OF MISSOURI STATE WATER PATROL

THE DETAILS SHOWN ARE FOR BIDDING PURPOSES ONLY. ALL MATERIALS AND LABOR NECESSARY TO INSTALL AND REMOVE SIGNS SHALL BE INCIDENTAL TO OTHER ITEMS

THE CONTRACTOR IS RESPONSIBLE FOR BUOY MAINTENANCE THROUGHOUT CONSTRUCTION AND FOR DETERMINING ANTICIPATED WATER LEVELS DURING CONSTRUCTION. EACH SIGN AND BUOY SHALL BE ANCHORED TO BOTTOM OF LAKE.

SIGNS SHALL BE DOUBLE FACED

EACH SIGN SHALL BE EQUIPPED WITH TWO (2) FLASHING LIGHT UNITS WITH AMBER LENS. FLASHING LIGHT UNITS SHALL BE FURNISHED AND MAINTAINED BY THE CONTRACTOR

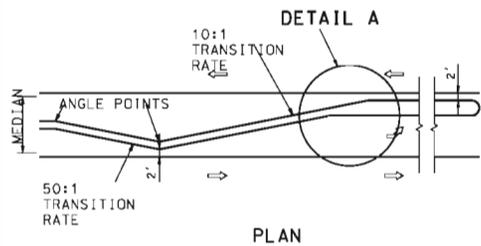
ALL LETTERING TO BE BLACK IN COLOR IN BLOCK FORM.

FOR OTHER INFORMATION AND LOCATION OF SIGNS AND BUOYS SEE SPECIAL PROVISIONS.

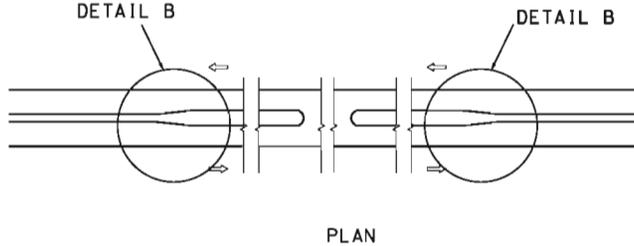
SCHEMATIC SHOWN IS FOR ONE NAVIGATIONAL SPAN. FOR WORK ON OTHER SPANS MOVE APPROPRIATE SIGNS WITH NO DIRECT PAY

COLOR:
BACKGROUND - WHITE
LEGEND - BLACK
2" REFLECTIVE BAND AND SYMBOL - INTERNATIONAL ORANGE

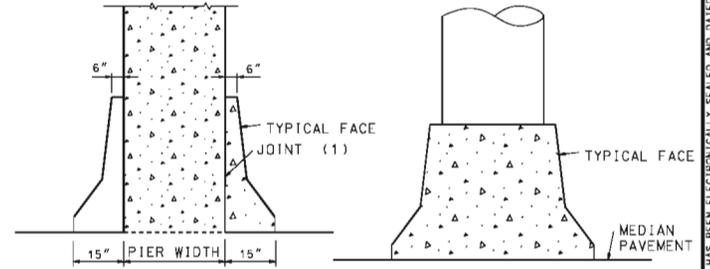
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TEMPORARY TRAFFIC CONTROL DEVICES TRAFFIC CONTROL FOR WATERWAYS
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 8/15/2012	616.10A0
SHEET NO. 8 OF 8	



PLAN

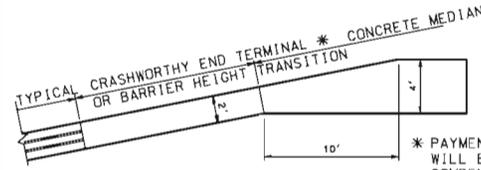


PLAN

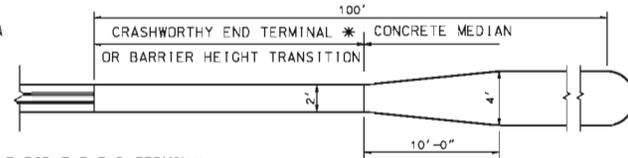


SECTION C-C

SECTION B-B

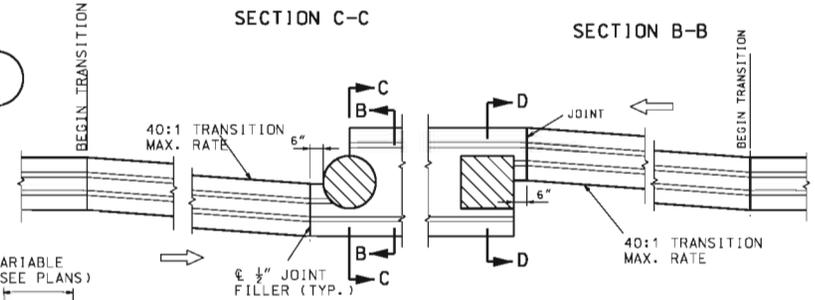


DETAIL A
LEFT TURN LANE TRANSITION

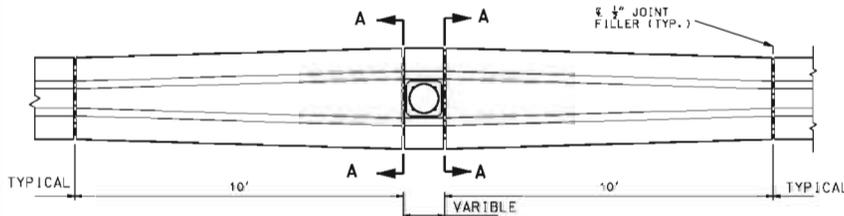


DETAIL B
MEDIAN OPENING TRANSITION

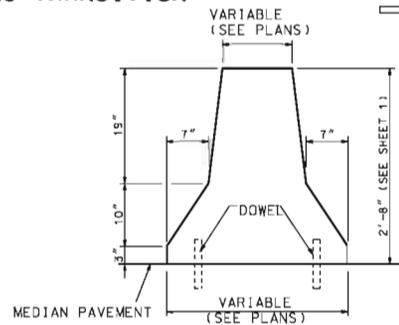
* PAYMENT FOR THE END TERMINAL WILL BE CONSIDERED FULL COMPENSATION FOR END TERMINAL, BACKUP ASSEMBLIES, AND OTHER ITEMS NECESSARY FOR PROPER INSTALLATION AS REQUIRED BY THE MANUFACTURER.



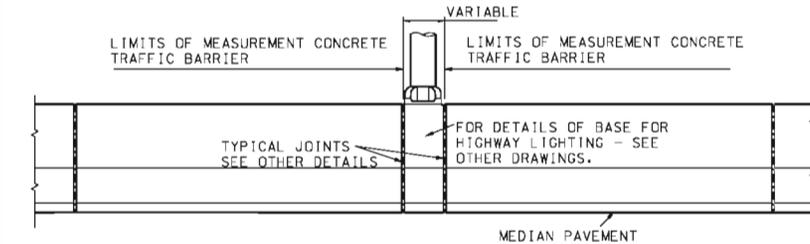
TRANSITION DETAILS FOR PIER PROTECTION



PLAN

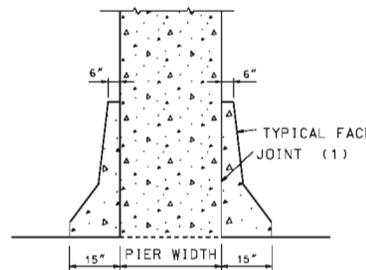


SECTION A-A



ELEVATION

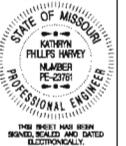
TRANSITION DETAILS FOR MEDIAN LIGHTING



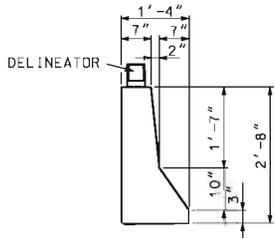
SECTION D-D

GENERAL NOTES:

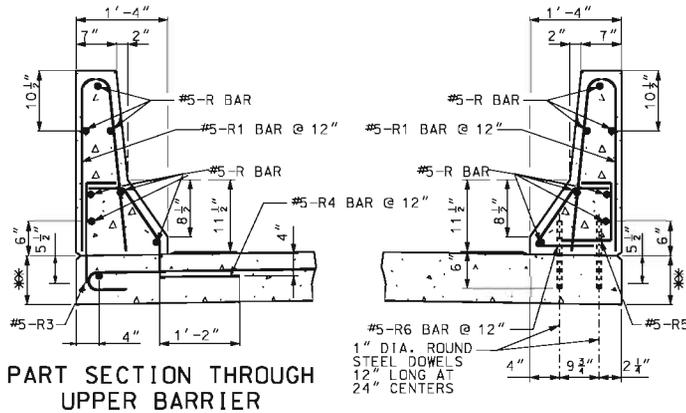
FOR DETAILS AND LOCATION OF DOWELS, SEE SHEET 1.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	PERMANENT CONCRETE TRAFFIC BARRIER TYPE A AND B
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	617.10H SHEET NO. 2 OF 12

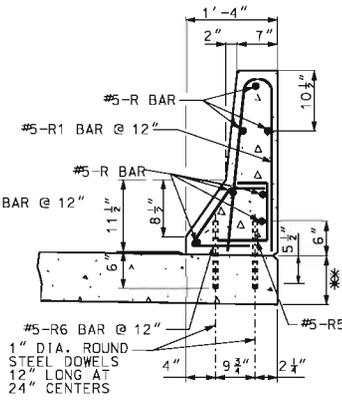
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



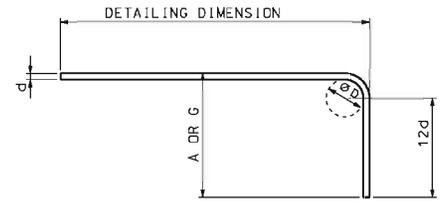
TYPE B (MODIFIED)
TYPICAL SECTION



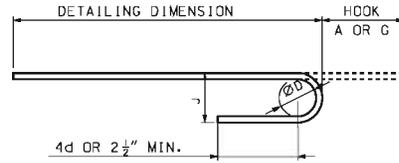
PART SECTION THROUGH
UPPER BARRIER



PART SECTION THROUGH
LOWER BARRIER



90° HOOKS



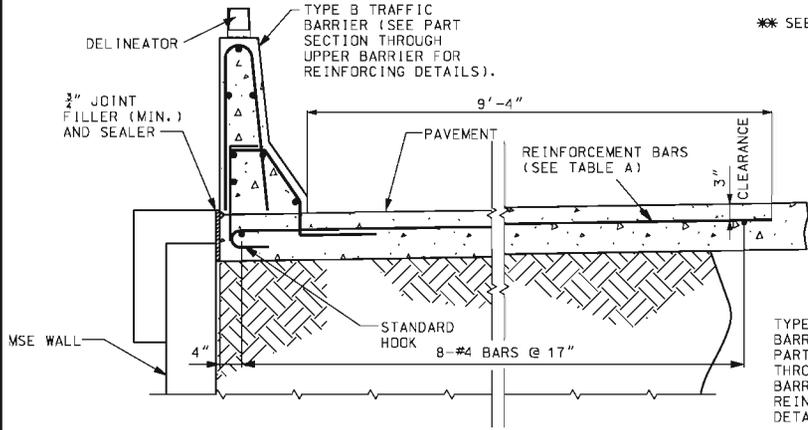
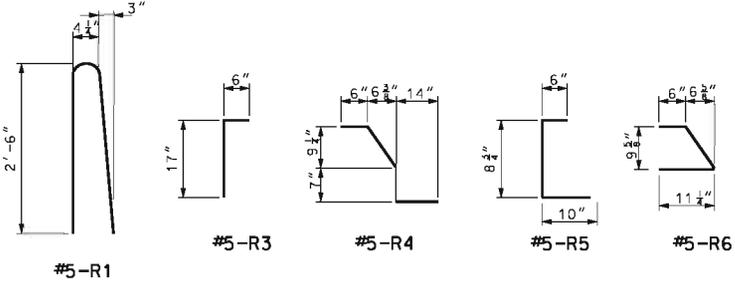
180° HOOKS

BAR SIZE	END HOOK DIMENSIONS			
	D (IN.)	ALL GRADES		
		180° HOOKS A OR G	J	90° HOOKS A OR G
#5	3 3/4"	7"	5"	10"
#6	4 1/2"	8"	6"	12"

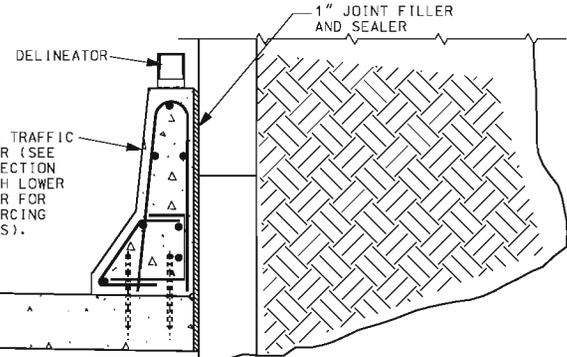
ALL STANDARD HOOKS AND BENDS OTHER THAN 180° TO BE BENT WITH THE SAME PROCEDURE AS FOR 90° STANDARD HOOKS.

PAVEMENT THICKNESS	BAR SIZE & SPACING
8"	#5 @ 5"
9"	#5 @ 6"
10"	#5 @ 8"
11"	#5 @ 9"
> 12"	#6 @ 12"

NOTES:
ALL REINFORCING STEEL SHALL BE EPOXY COATED.
NO DIRECT PAYMENT WILL BE MADE FOR REINFORCING STEEL.
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2", UNLESS OTHERWISE SHOWN.
* SEE ROADWAY PAVEMENT DESIGN.



TYPE B TRAFFIC BARRIER ON TOP OF MSE WALL



TYPE B TRAFFIC BARRIER AT THE SIDE OF MSE WALL

NOTES:
TYPE B (MODIFIED) SHALL BE USED ONLY AT LOCATIONS SHOWN IN PLANS.
FOR DELINEATOR DETAILS, SEE SHEET 1.

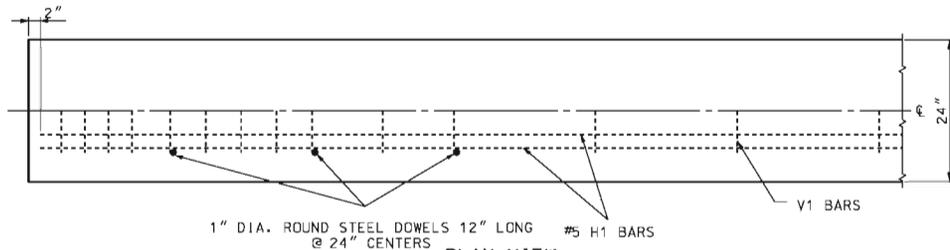
MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI
KATHRYN PHILLIPS HAWRY
NUMBER PE-22781
PROFESSIONAL ENGINEER

PERMANENT CONCRETE TRAFFIC BARRIER AT MSE WALL TYPE B MODIFIED

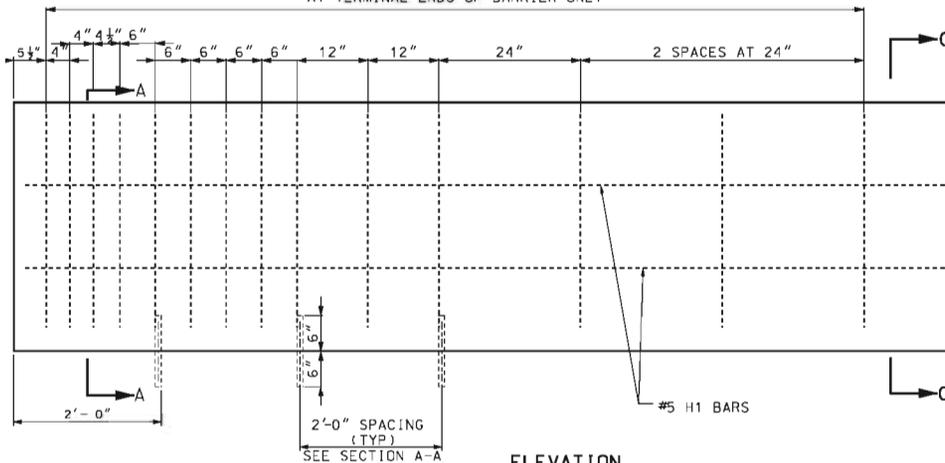
DATE EFFECTIVE:	08/01/2012	617.10H	SHEET NO. 3 OF 12
DATE PREPARED:	7/19/2012		

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

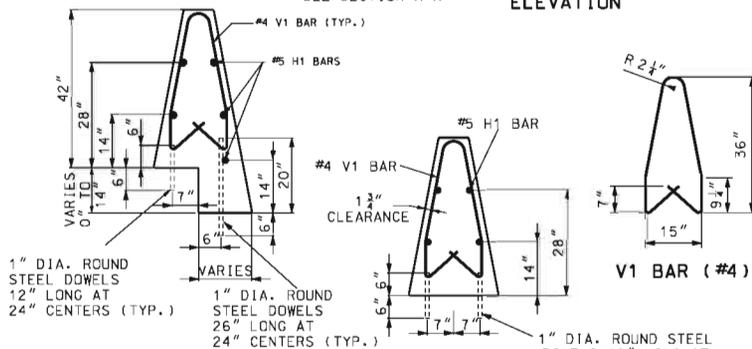


PLAN VIEW
(SYMMETRICAL ABOUT CENTERLINE)

LIMITS OF #4 - V1 SPACED AS SHOWN BELOW AT TERMINAL ENDS OF BARRIER ONLY

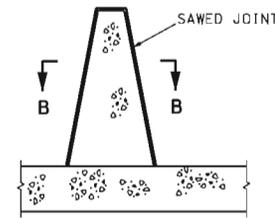


ELEVATION

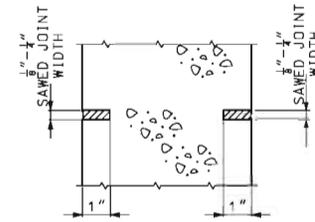


SECTION A-A (STEPPED PAVEMENT) SECTION A-A (NORMAL PAVEMENT)

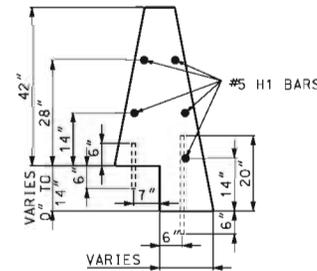
REINFORCING DETAILS



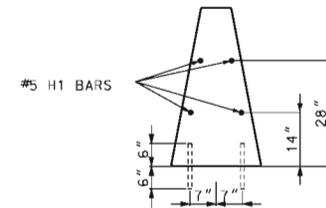
SECTION THROUGH SAWED JOINT



SECTION B-B



SECTION C-C (STEPPED PAVEMENT)



SECTION C-C (NORMAL PAVEMENT)

NOTES:

BAR SPLICES SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.

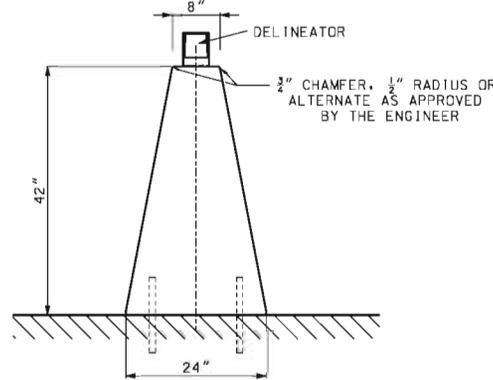
ANY REINFORCING BAR INSTALLATION METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL REINFORCING STEEL WILL BE POSITIONED ± 1/2 INCH AS DIMENSIONED WILL BE SATISFACTORY.

THE CONTRACTOR HAS THE OPTION TO SLIP-FORM THE BARRIER. IN WHICH CASE, ADDITIONAL REINFORCEMENT MAY BE TIED TO THE UPPER TWO-THIRDS OF THE REINFORCING CAGE TO PROVIDE BRACING.

ANCHORING DOWELS MAY BE OMITTED WHEN THE PLANS SPECIFY A MINIMUM 1 1/4" PAVEMENT SURFACE TO BE PLACED ABUTTING BOTH BARRIER FACES.

SAWED JOINTS SHALL BE LOCATED AT PAVEMENT TRANSVERSE JOINTS.

FOR DELINEATOR DETAILS, SEE SHEET 1.

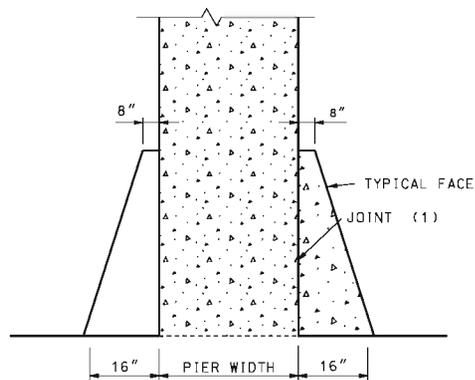


TYPE C TYPICAL SECTION

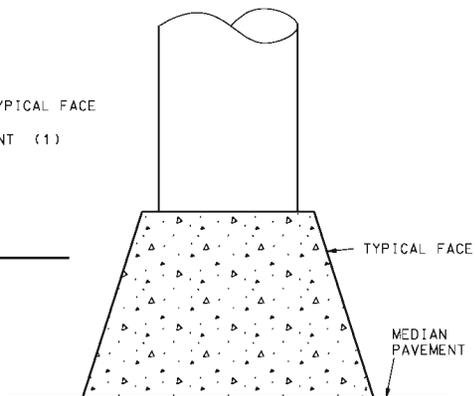
		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		PERMANENT CONCRETE TRAFFIC BARRIER TYPE C	
DATE EFFECTIVE:	08/01/2012	617.10H	SHEET NO. 4 OF 12
DATE PREPARED:	8/7/2012		

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

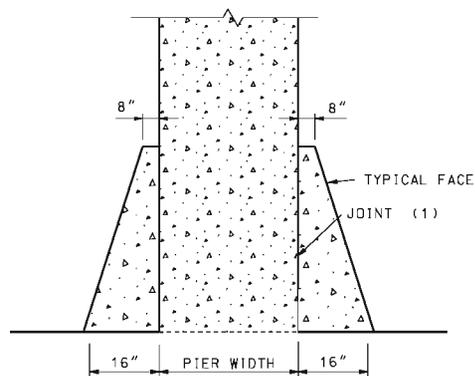
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



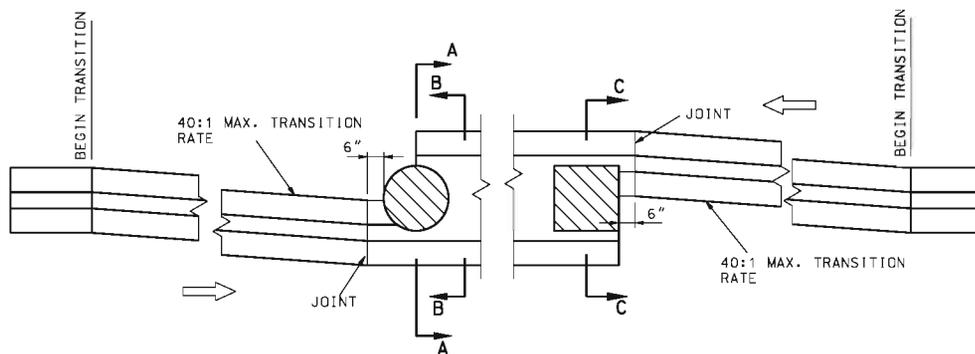
SECTION A-A



SECTION B-B



SECTION C-C

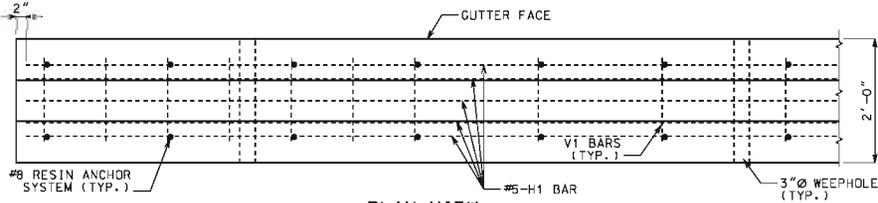


PLAN

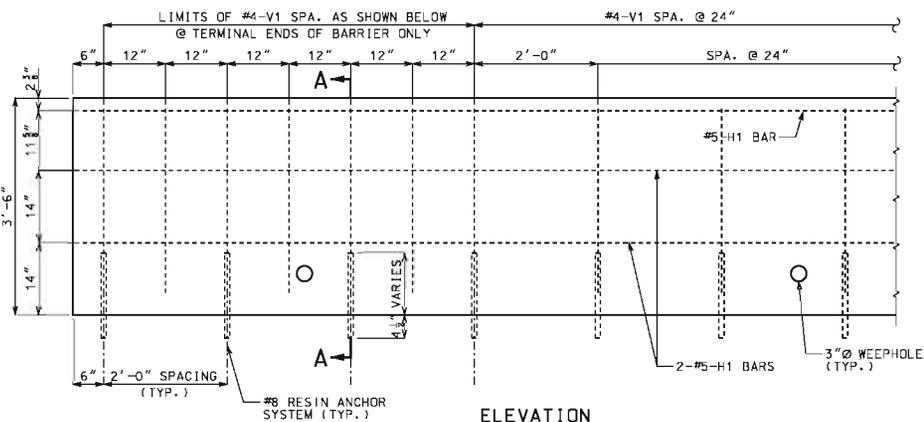
TRANSITION DETAILS FOR PIER PROTECTION

(1) 1 IN. JOINT WITH JOINT FILLER AND SEALER

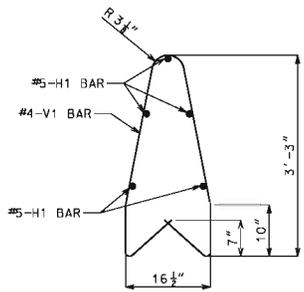
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		PERMANENT CONCRETE TRAFFIC BARRIER TYPE C
DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	617.10H	SHEET NO. 5 OF 12



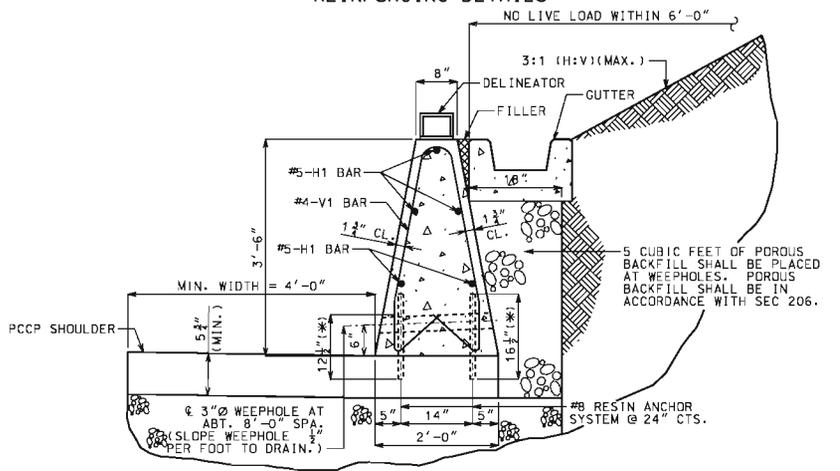
PLAN VIEW
NOTE: GUTTER NOT SHOWN FOR CLARITY.



ELEVATION REINFORCING DETAILS



PART SECTION OF #4-V1 BAR



SECTION A-A
(FOR SLOPING AND NONSLOPING BACKSLOPE)

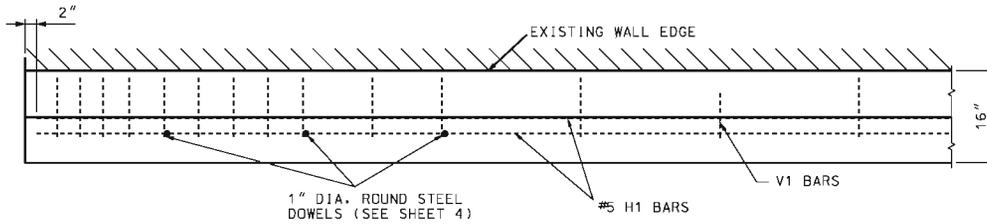
(*) EMBED ANCHOR 4 1/2" BELOW PCCP SHOULDER.

GENERAL NOTES:

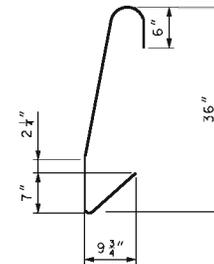
- CONCRETE SHALL BE CLASS B F'C = 4,000 PSI.
- ALL REINFORCEMENT SHALL BE GRADE 60 EPOXY COATED.
- ANGLE OF INTERNAL FRICTION, $\phi_f \geq 27^\circ$ FOR BACKFILL MATERIAL.
- MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2", UNLESS OTHERWISE SHOWN.
- BAR SPLICES SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OR THE BAR.
- ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL REINFORCING STEEL WILL BE POSITIONED +/- 1/2 INCH AS DIMENSIONED WILL BE SATISFACTORY.
- THE CONTRACTOR HAS THE OPTION TO SLIP-FORM THE BARRIER. IN WHICH CASE, ADDITIONAL REINFORCEMENT MAY BE TIED TO THE UPPER TWO-THIRDS FOR THE REINFORCING CAGE TO PROVIDE BRACING.
- THIS BARRIER SHALL NOT BE USED TO SUPPORT HIGHWAY LIGHTING POLES.
- THIS BARRIER SHALL NOT BE USED FOR BRIDGE ROADWAY APPLICATIONS.
- SAWED JOINTS SHALL BE SPACED AT 15'-0". SEE MISSOURI STANDARD PLANS FOR SAWED JOINT DETAIL.
- TYPE C BARRIER MODIFIED RETAINING WALL WITH NONMOMENT SLAB SHALL BE USED ONLY AT LOCATIONS SHOWN ON PLANS.
- FOR DELINEATOR DETAILS, SEE SHEET NO. 1 OF THE MISSOURI STANDARD PLAN 617.10.
- RESIN ANCHOR SYSTEM SHALL BE DRILLED IN THE PAVEMENT.
- WHEN CURB HEIGHT EXCEEDS 42" OR SLOPE EXCEEDS 3:1 (H:V) OR LIVE LOAD IS WITHIN 6'-0", CONTACT BRIDGE DIVISION FOR SPECIAL DESIGN.

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		PERMANENT CONCRETE TRAFFIC BARRIER TYPE C AS RETAINING WALL	
DATE EFFECTIVE:	08/01/2012	617.10H	SHEET NO. 6 OF 12
DATE PREPARED:	7/19/2012		

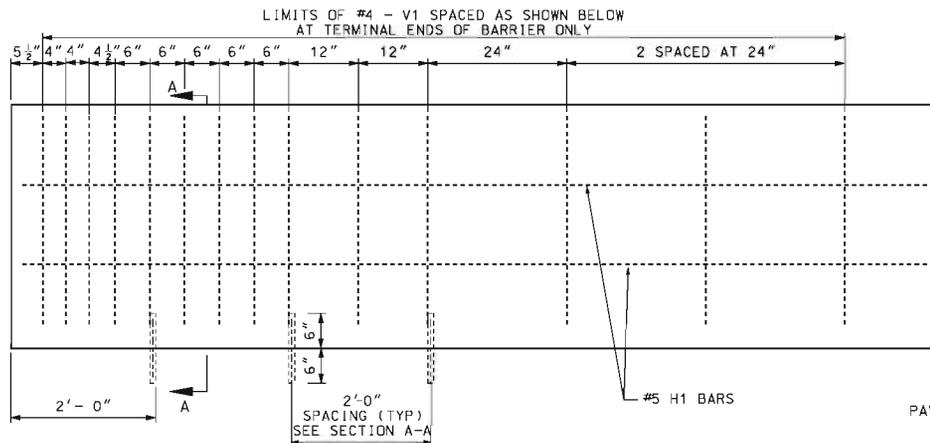
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



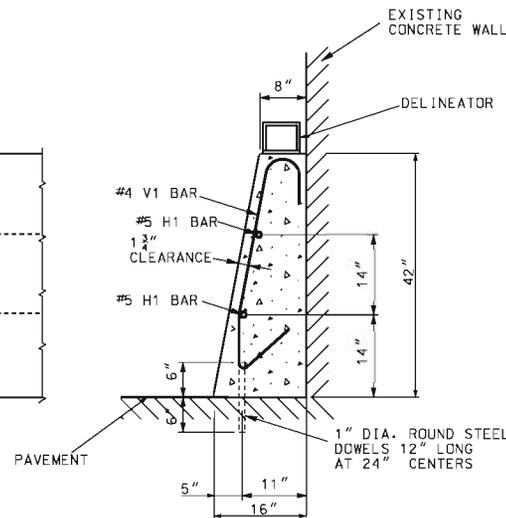
PLAN VIEW



V1 BAR (#4)



ELEVATION
REINFORCING DETAILS



SECTION A-A

NOTES:

BAR SPLICES SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.

ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL REINFORCING STEEL WILL BE POSITIONED $\pm \frac{1}{2}$ INCH AS DIMENSIONED WILL BE SATISFACTORY.

THE CONTRACTOR HAS THE OPTION TO SLIP-FORM THE BARRIER. IN WHICH CASE, ADDITIONAL REINFORCEMENT MAY BE TIED TO THE UPPER TWO-THIRDS OF THE REINFORCING CAGE TO PROVIDE BRACING.

THIS BARRIER SHALL NOT BE USED TO SUPPORT HIGHWAY LIGHTING POLES.

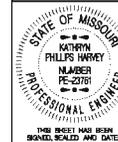
THIS BARRIER SHALL NOT BE USED FOR BRIDGE ROADWAY APPLICATIONS.

SAWED JOINTS SHALL BE LOCATED AT PAVEMENT TRANSVERSE JOINTS.

TYPE D SHALL BE USED ONLY AT LOCATIONS SHOWN ON PLANS.

FOR DELINEATOR DETAILS, SEE SHEET 1.

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



PERMANENT CONCRETE TRAFFIC BARRIER
TYPE D

DATE EFFECTIVE: 08/01/2012
 DATE PREPARED: 7/19/2012

617.10H

SHEET NO.
7 OF 12

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

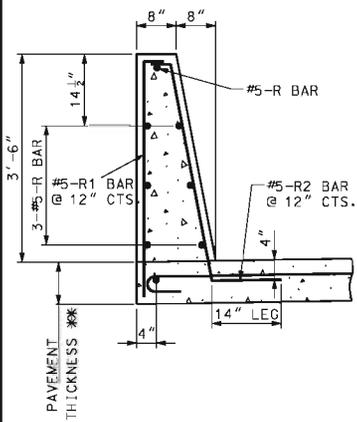
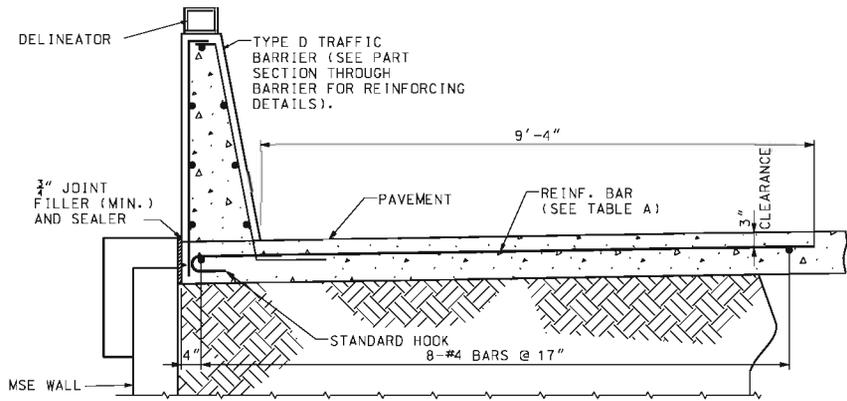


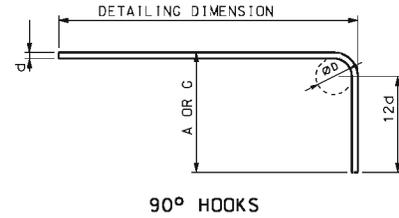
TABLE A
TRANSVERSE PAVEMENT
REINFORCEMENT

PAVEMENT THICKNESS **	BAR SIZE & SPACING
8"	#5 @ 4"
9"	#5 @ 5"
10"	#5 @ 6"
11"	#5 @ 7"
12"	#6 @ 12"
≥ 13"	#6 @ 12"

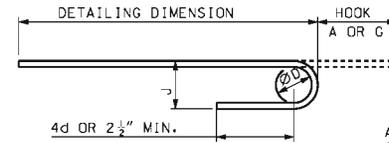
PART SECTION THROUGH BARRIER



TYPE D (MSE WALL) TRAFFIC BARRIER ON TOP OF MSE WALL



90° HOOKS

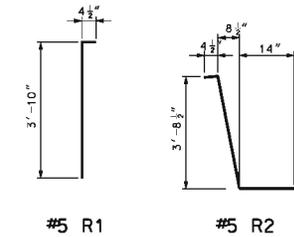


180° HOOKS

END HOOK DIMENSIONS

BAR SIZE	D (IN.)	ALL GRADES		
		180° HOOKS A OR C	J	90° HOOKS A OR C
#5	3 1/2"	7"	5"	10"
#6	4 1/2"	8"	6"	12"

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



#5 R1

#5 R2

NOTES:

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

** SEE ROADWAY PAVEMENT DESIGN.

TYPE D SHALL BE USED ONLY AT LOCATIONS SHOWN ON PLANS.

FOR DELINEATOR DETAILS, SEE SHEET 1.

TABLE B
TRANSVERSE PAVEMENT
REINFORCEMENT

PAVEMENT THICKNESS **	BAR SIZE & SPACING
8"	#6 @ 5"
9"	#6 @ 6"
10"	#5 @ 6"
11"	#6 @ 8"
12"	#6 @ 9"
≥ 13"	#6 @ 9"

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

PERMANENT CONCRETE TRAFFIC BARRIER
TYPE D ATOP MSE WALL

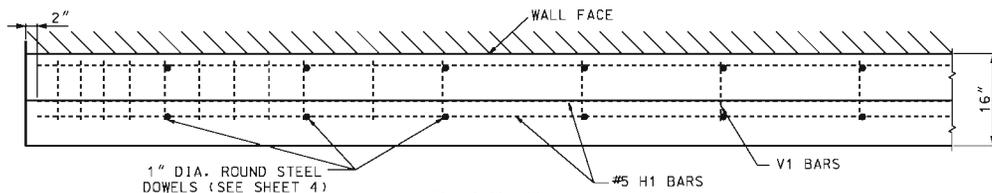
STATE OF MISSOURI
KATHRYN PHILLIPS HAWRY
NUMBER PE-23781
PROFESSIONAL ENGINEER

DATE EFFECTIVE: 08/01/2012
DATE PREPARED: 8/7/2012

617.10H

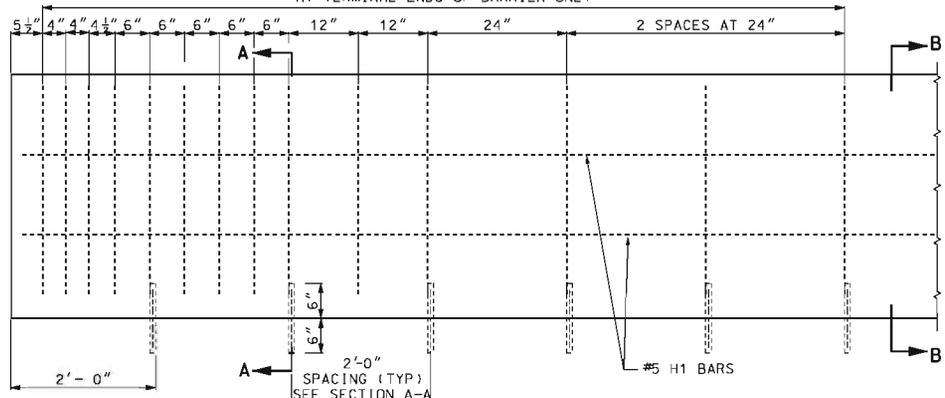
SHEET NO. 8 OF 12

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

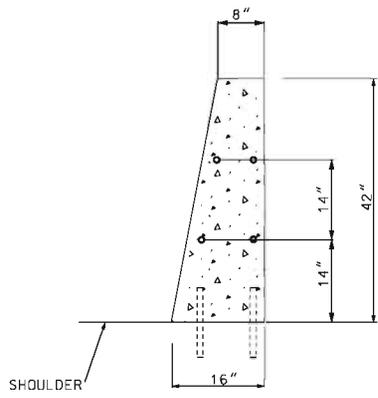


PLAN VIEW

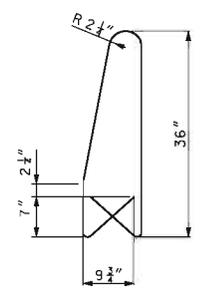
LIMITS OF #4 - V1 SPACED AS SHOWN BELOW AT TERMINAL ENDS OF BARRIER ONLY



ELEVATION REINFORCING DETAILS



TYPE D TYPICAL SECTION



V1 BAR (#4)

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

NOTES:

BAR SPLICES SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.

ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL REINFORCING STEEL WILL BE POSITIONED ± 1/2 INCH AS DIMENSIONED WILL BE SATISFACTORY.

THE CONTRACTOR HAS THE OPTION TO SLIP-FORM THE BARRIER. IN WHICH CASE, ADDITIONAL REINFORCEMENT MAY BE TIED TO THE UPPER TWO-THIRDS OF THE REINFORCING CAGE TO PROVIDE BRACING.

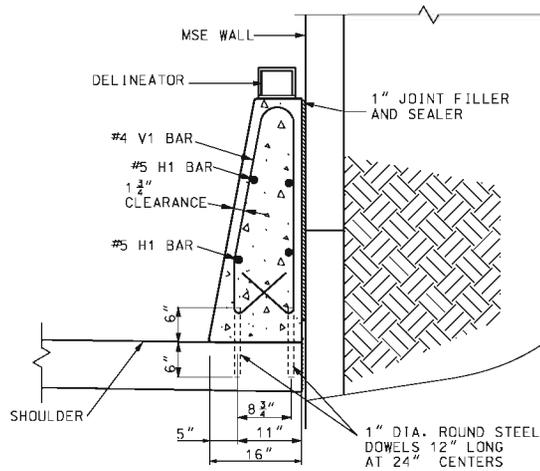
THIS BARRIER SHALL NOT BE USED TO SUPPORT HIGHWAY LIGHTING POLES.

THIS BARRIER SHALL NOT BE USED FOR BRIDGE ROADWAY APPLICATIONS.

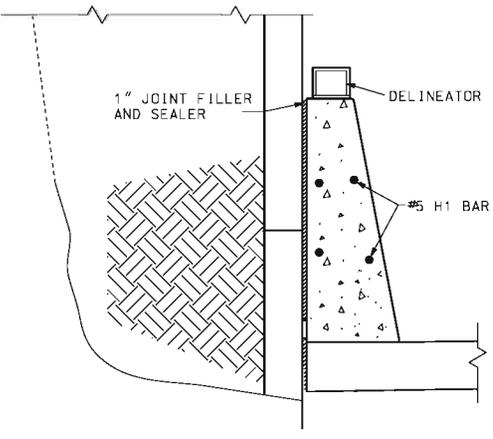
SAWED JOINTS SHALL BE SPACED AT 15'-0". SEE STANDARD PLANS FOR SAWED JOINT DETAIL

TYPE D BARRIER SHALL BE USED ONLY AT LOCATIONS SHOWN ON PLANS.

FOR DELINEATOR DETAILS, SEE STANDARD PLANS.



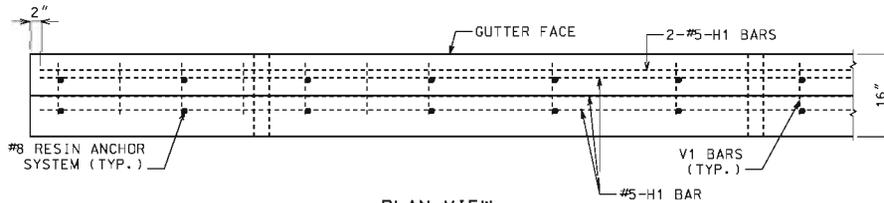
SECTION A-A



SECTION B-B

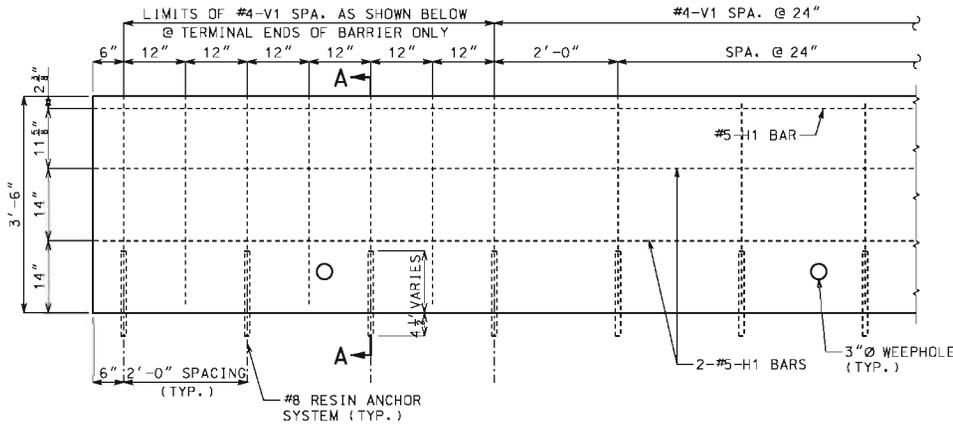
		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		PERMANENT CONCRETE TRAFFIC BARRIER TYPE D BESIDE MSE WALL	
DATE EFFECTIVE:	08/01/2012	617.10H	SHEET NO. 9 OF 12
DATE PREPARED:	7/19/2012		

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

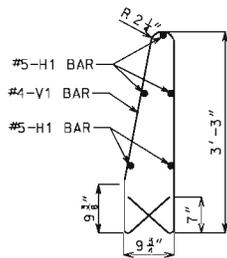


PLAN VIEW

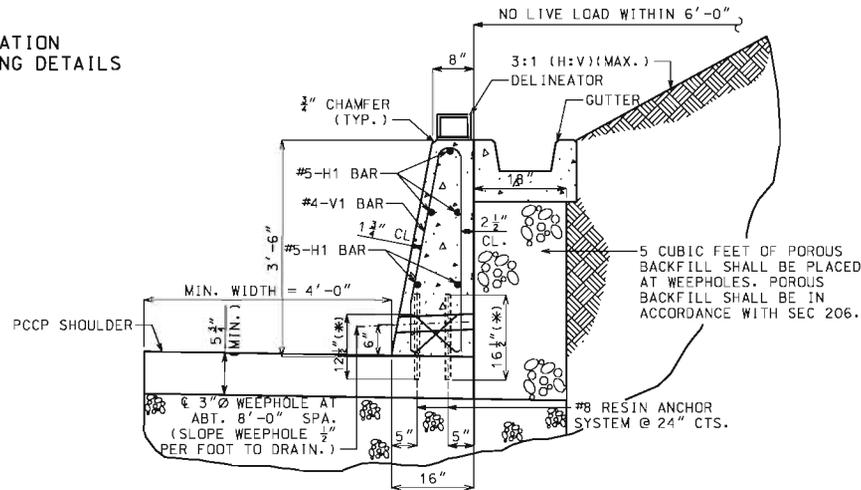
NOTE: GUTTER NOT SHOWN FOR CLARITY.



ELEVATION REINFORCING DETAILS



PART SECTION OF #4-V1 BAR



SECTION A-A
(FOR SLOPING AND NONSLOPING BACKSLOPE)

GENERAL NOTES:

CONCRETE SHALL BE CLASS B $f'c = 4,000$ PSI.

ALL REINFORCEMENT SHALL BE GRADE 60 EPOXY COATED.

ANGLE OF INTERNAL FRICTION, $\phi_f \geq 30^\circ$ FOR BACKFILL MATERIAL.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1-1/2", UNLESS OTHERWISE SHOWN.

BAR SPLICES SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.

ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL REFORCING STEEL WILL BE POSITIONED $\pm 1/2$ INCH AS DIMENSIONED WILL BE SATISFACTORY.

THE CONTRACTOR HAS THE OPTION TO SLIP-FORM THE BARRIER. IN WHICH CASE, ADDITIONAL REINFORCEMENT MAY BE TIED TO THE UPPER TWO-THIRDS OF THE REINFORCING CAGE TO PROVIDE BRACING.

THIS BARRIER SHALL NOT BE USED TO SUPPORT HIGHWAY LIGHTING POLES.

THIS BARRIER SHALL NOT BE USED FOR BRIDGE ROADWAY APPLICATION.

SAWED JOINTS SHALL BE SPACED AT 15'-0". SEE MISSOURI STANDARD PLANS FOR SAWED JOINT DETAIL.

TYPE D A BARRIER MODIFIED RETAINING WALL WITH NONMOMENT SLAB SHALL BE USED ONLY AT LOCATIONS SHOWN ON PLANS.

FOR DELINEATOR DETAILS, SEE SHEET NO. 1 OF THE MISSOURI STANDARD PLAN 617.10.

RESIN ANCHOR SYSTEM SHALL BE DRILLED IN THE PAVEMENT.

WHEN CURB HEIGHT EXCEEDS 42" OR SLOPE EXCEEDS 3:1 (H:V) OR LIVE LOAD IS WITHIN 6'-0", CONTACT BRIDGE DIVISION FOR SPECIAL DESIGN.

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-22781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 BOARD SEALED AND DATED
 ELECTRONICALLY.

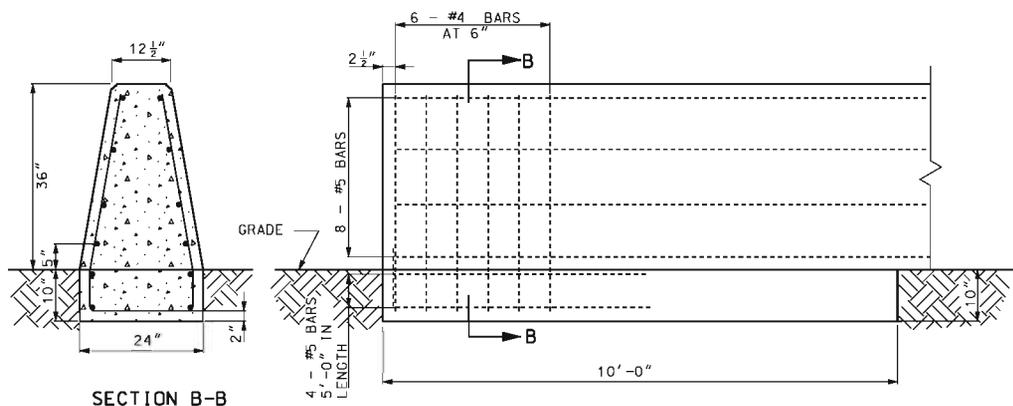
PERMANENT CONCRETE TRAFFIC BARRIER
 TYPE D AS RETAINING WALL

DATE EFFECTIVE: 08/01/2012
 DATE PREPARED: 7/19/2012

617.10H

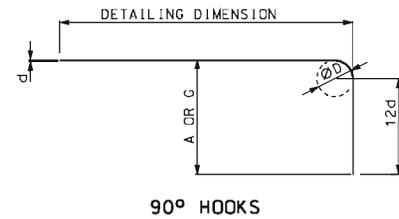
SHEET NO. 10 OF 12

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

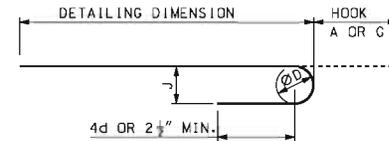


SECTION B-B

CONCRETE BARRIER END ANCHORAGE ON GRADE



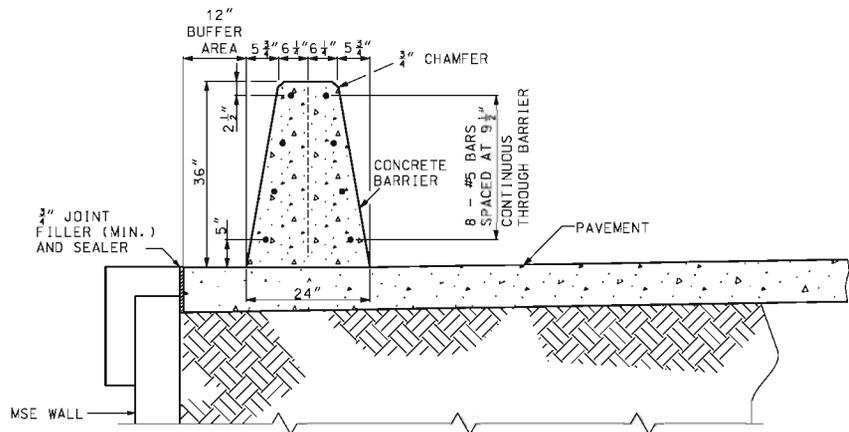
90° HOOKS



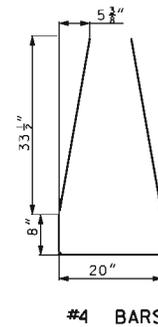
180° HOOKS

BAR SIZE	D (IN.)	END HOOK DIMENSIONS			
		ALL GRADES			
		180° HOOKS		90° HOOKS	
		A OR G	J	A OR G	A OR G
#5	3 3/8"	7"	5"	10"	
#6	4 1/2"	8"	6"	12"	

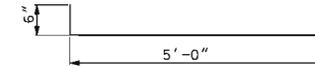
ALL STANDARD HOOKS AND BENDS OTHER THAN 180° TO BE BENT WITH THE SAME PROCEDURE AS FOR 90° STANDARD HOOKS.



TRAFFIC BARRIER ON TOP OF MSE WALL



#4 BARS



#5 BARS

GENERAL NOTES:

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

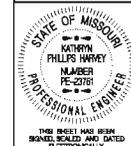
A 12" BUFFER REQUIRED WITHIN THE LIMITS OF THE TRAFFIC BARRIER EXCLUDING THE END ANCHORAGE SECTIONS.

FOR DELINEATOR DETAILS, SEE STANDARD PLAN 617.10.

PAVEMENT SURFACE DIFFERENTIAL SHALL NOT EXCEED 1 1/2".

BAR SPLICES SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.

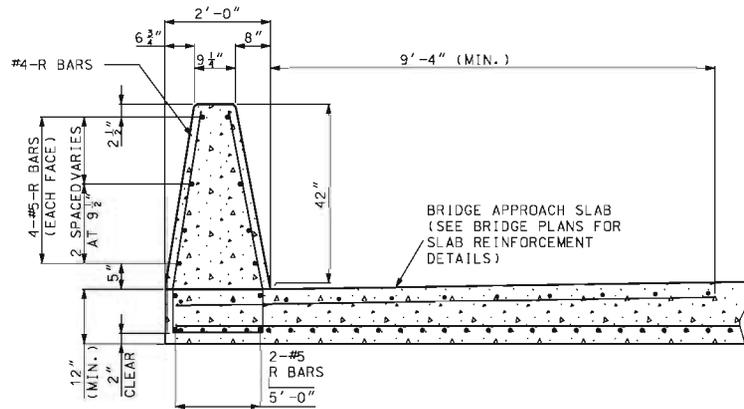
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)



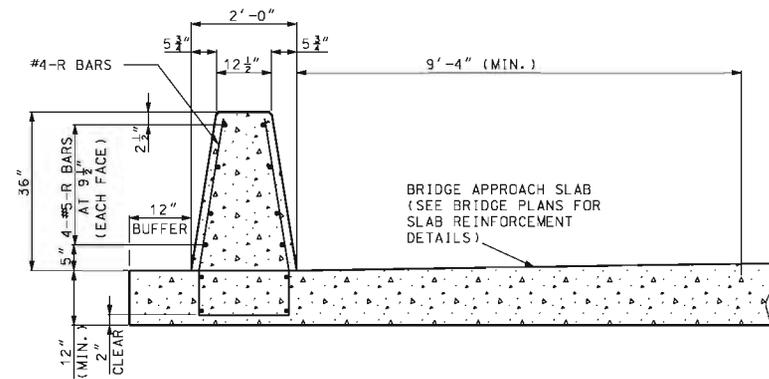
PERMANENT CONCRETE TRAFFIC BARRIER
 TYPE E ATOP MSE WALL

DATE EFFECTIVE:	08/01/2012	617.10H	SHEET NO. 11 OF 12
DATE PREPARED:	7/19/2012		

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

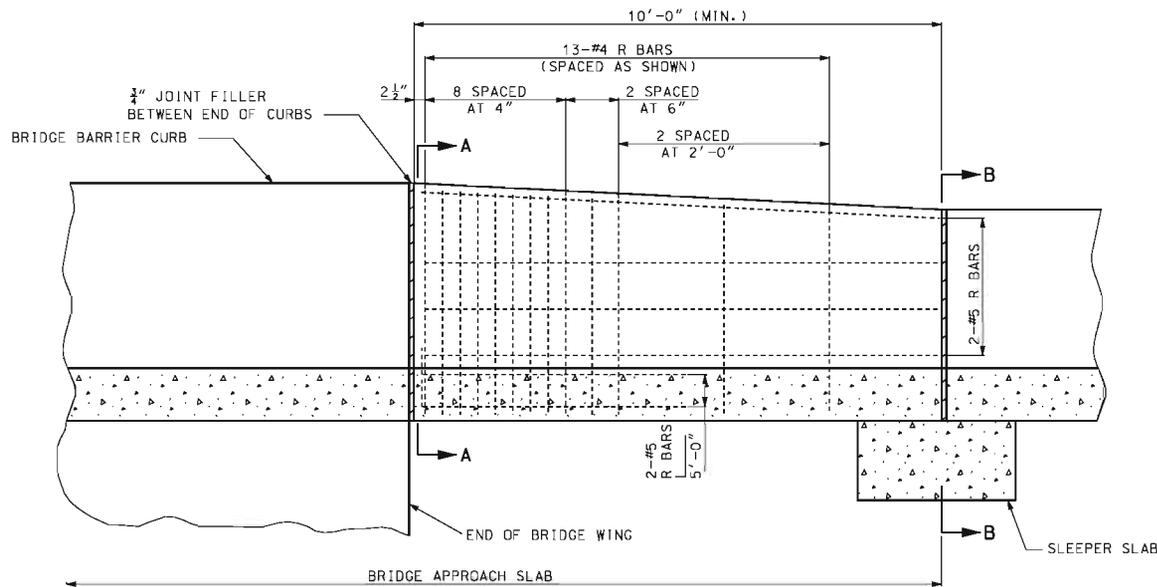


SECTION A-A



SECTION B-B

NOTE: SEE 'CONCRETE BARRIER END ANCHORAGE ON GRADE', SHEET 11 OF 12, FOR REINFORCEMENT DETAILS.



CONCRETE BARRIER END ANCHORAGE AT BRIDGE

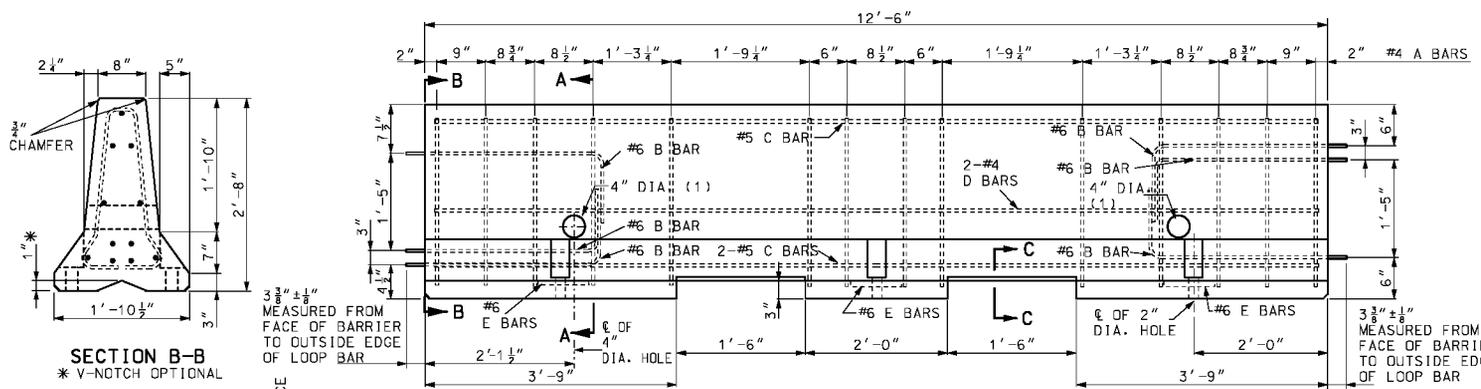
GENERAL NOTES:

ANCHORAGE SHALL BE 10' LONG. IF 10' OF BRIDGE APPROACH SLAB IS NOT AVAILABLE BEYOND THE WINGS, THE SLAB LENGTH SHALL BE ADJUSTED ACCORDINGLY. SEE BRIDGE PLANS.

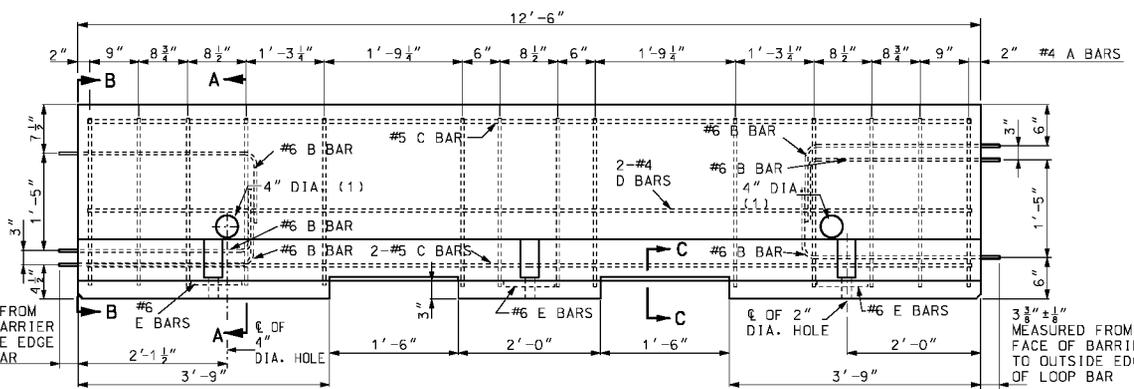
A 12" BUFFER REQUIRED WITHIN THE LIMITS OF THE TRAFFIC BARRIER EXCLUDING THE END ANCHORAGE SECTIONS.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	PERMANENT CONCRETE TRAFFIC BARRIER TYPE E ATOP MSE WALL	
	DATE EFFECTIVE: 08/01/2012 DATE PREPARED: 7/19/2012	617.10H SHEET NO. 12 OF 12

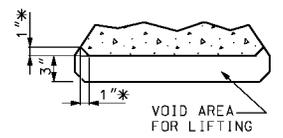
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



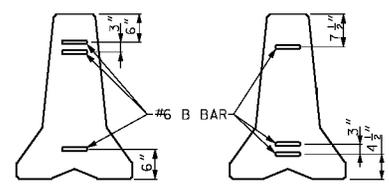
SECTION B-B
* V-NOTCH OPTIONAL



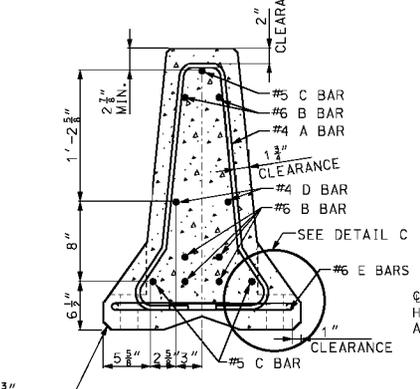
ELEVATION VIEW



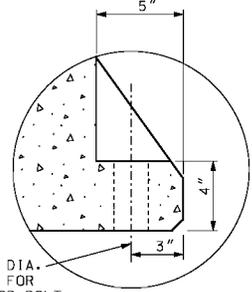
PART SECTION C-C LIFTING SLOT DETAIL
* RADIUS EDGER TO PREVENT SPALLING



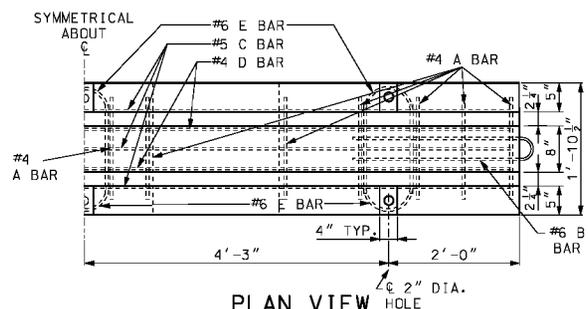
ALTERNATING END VIEWS FOR BARRIER LOOP CONNECTION



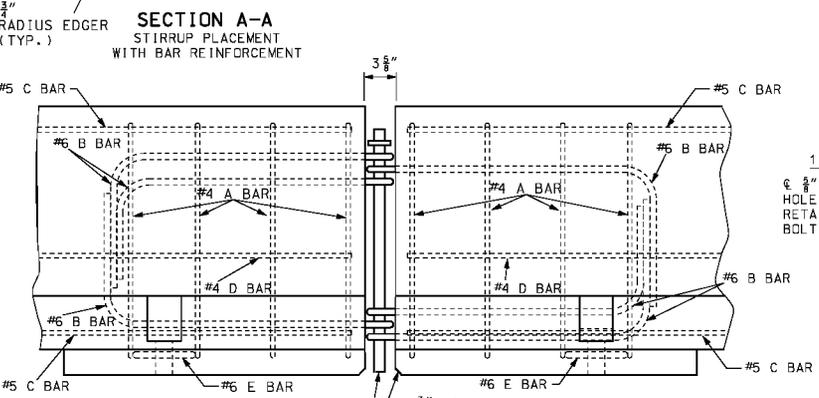
SECTION A-A
STIRRUP PLACEMENT WITH BAR REINFORCEMENT



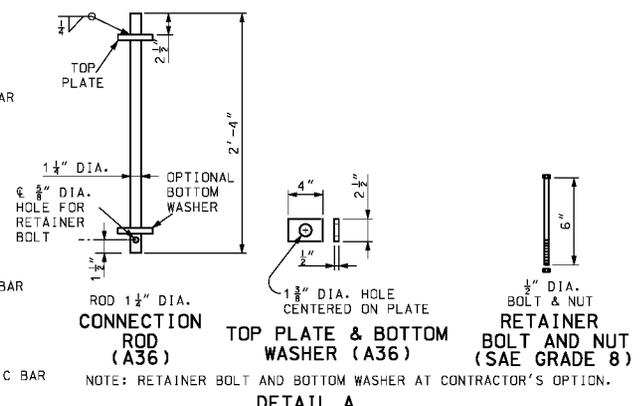
DETAIL C



PLAN VIEW



DETAILS OF BARRIER CONNECTION



CONNECTION ROD ASSEMBLY

GENERAL NOTES:

ALL REINFORCING SHALL MEET REQUIREMENTS OF CRS1 EXCEPT WHERE SHOWN ON PLANS.

REINFORCING STEEL CLEARANCE TO EDGE OF CONCRETE SHALL BE 1 3/4" UNLESS OTHERWISE SHOWN.

AT NO TIME SHALL THE BARRIERS BE LIFTED OR MOVED BY USE OF THE LOOP BARS.

THE SECTION FURNISHED SHALL COMPLY WITH DIMENSIONS SHOWN, AS APPROVED BY THE ENGINEER.

SEE SHEET 3 FOR DELINEATOR DETAILS.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

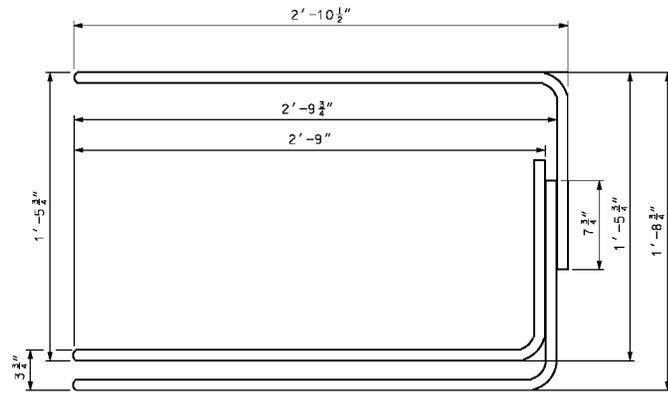
TEMPORARY CONCRETE TRAFFIC BARRIER TYPE F

STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER

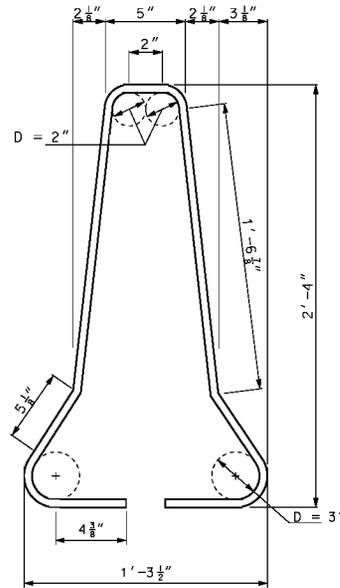
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE:	10/01/2015	617.20D	SHEET NO.
DATE PREPARED:	8/24/2015		1 OF 8

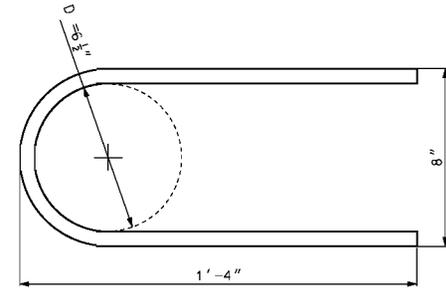
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



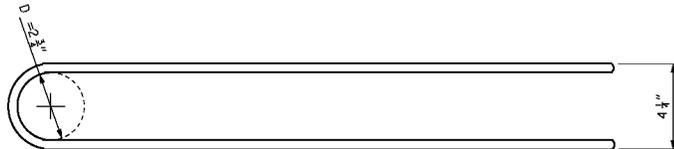
#6 B BAR ELEVATION



#4 A BARS



#6 E BAR



#6 B BAR PLAN

REINFORCING BARS					
PER 12' - 6" BARRIER SECTION					
MARK	BAR SIZE	NO. OF BARS	SHAPE OF EACH	LENGTH EACH (NDM.)	WEIGHT
A	4	14		6'-5"	60.8 lbs
C	5	3		12'-2"	38.1 lbs
D	4	2		12'-2"	16.3 lbs
E	6	6		2'-11"	26.3 lbs
LOOP ASSEMBLY					
B	6	6		7'-10"	70.5 lbs

CONCRETE VOLUME 1.3 CU YDS APPROXIMATE WEIGHT 5601 LBS.

GENERAL NOTE:

DIMENSIONS ARE OUT TO OUT OF BARS UNLESS OTHERWISE NOTED.

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

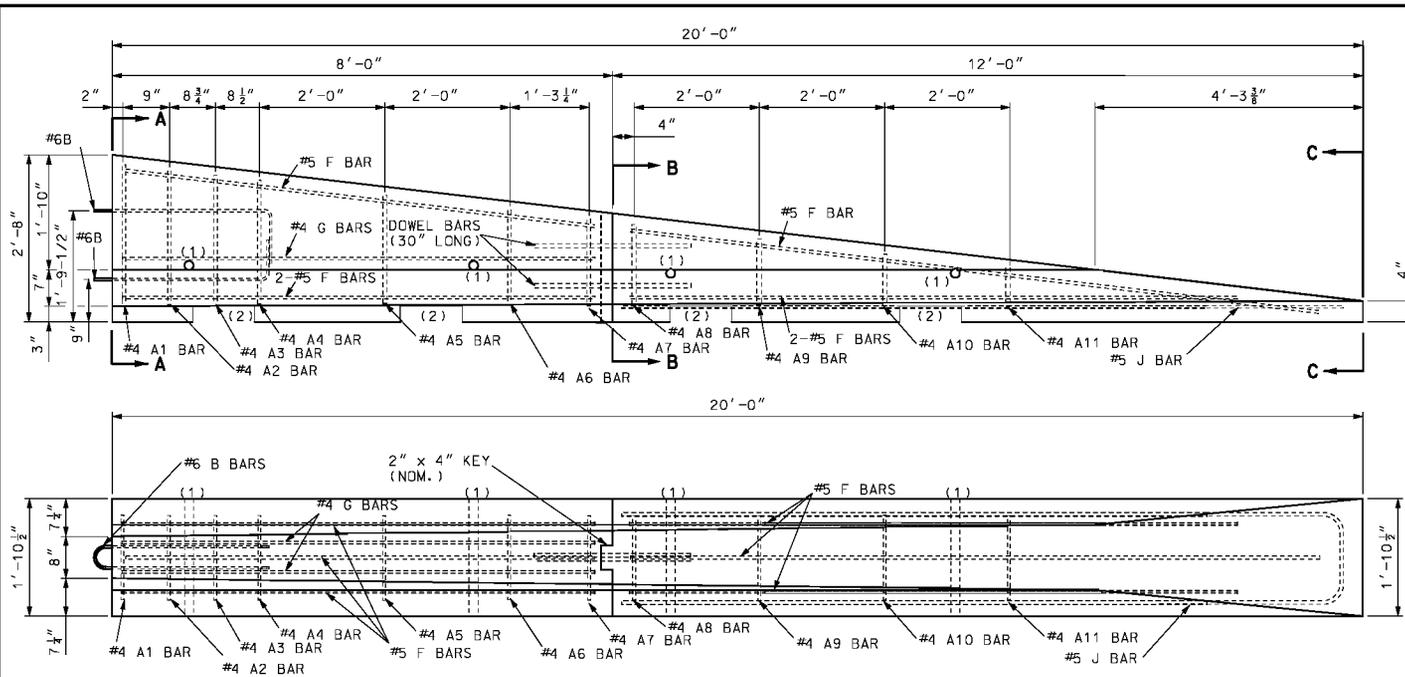
STATE OF MISSOURI
 ERIC E. SCHROETER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

TEMPORARY CONCRETE TRAFFIC BARRIER
 TYPE F

DATE EFFECTIVE: 10/01/2015
 DATE PREPARED: 8/24/2015

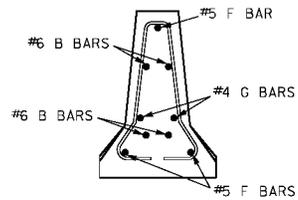
617.20D

SHEET NO.
 2 OF 8

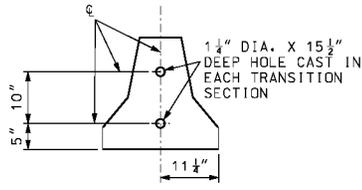


**PRECAST BARRIER HEIGHT TRANSITION
(TEMPORARY INSTALLATIONS ONLY)**

- (1) OPTIONAL 4 INCH DIAMETER, 11 GAUGE STEEL ROUND MECHANICAL TUBING SLEEVE FOR LIFT HOLE ALLOWED. THE LOCATION OF THE HOLE MAY VARY TO ACCOMMODATE THE DIFFERING WEIGHT DISTRIBUTIONS OF TRANSITION SECTIONS.
- (2) 3" X 1'-0" SLOTS FOR LIFTING - TWO PER SECTION. LOCATION TO BE DETERMINED BY CONTRACTOR.

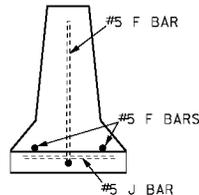


SECTION A-A

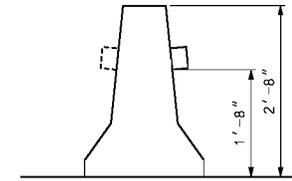


SECTION B-B

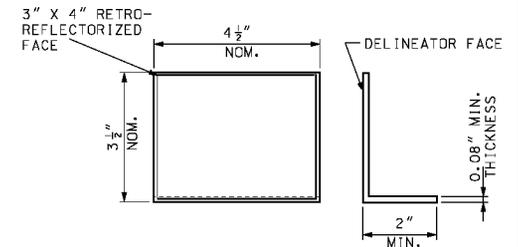
NOTE: SECTIONS TO BE CONNECTED WITH TWO- 1" DIA. BARS OR #8 REINFORCING BARS 30" LONG IN 1 1/4" DIA. HOLES AS SHOWN.



SECTION C-C



TRAFFIC BARRIER DELINEATORS



DELINEATOR

GENERAL NOTES:

REINFORCING STEEL CLEARANCE TO EDGE OF CONCRETE SHALL BE 1 3/4" UNLESS OTHERWISE SHOWN.

HEIGHT TRANSITIONS SHALL NOT BE USED ON INTERSTATE ROUTES OR IN LOCATIONS WHERE THE POSTED SPEED PRIOR TO CONSTRUCTION IS GREATER THAN 35 MPH.

AT NO TIME SHALL THE BARRIERS BE LIFTED OR MOVED BY USE OF THE LOOP BARS.

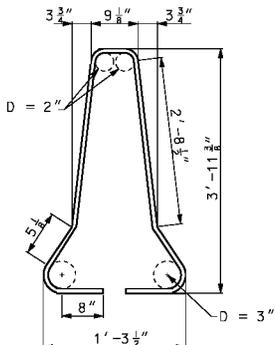
RETAINER BOLT AND NUT MUST BE USED WITH TRANSITION BARRIER.

AT THE OPTION OF THE CONTRACTOR, HEIGHT TRANSITIONS MAY BE MANUFACTURED IN ONE SECTION. THE PLANS FOR REINFORCEMENT ACROSS JOINT SHALL BE APPROVED BY THE ENGINEER PRIOR TO MANUFACTURE.

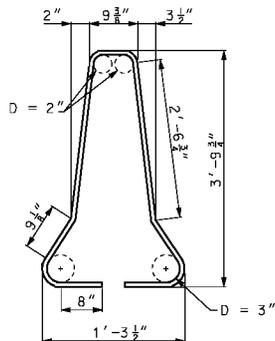
<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p>TEMPORARY CONCRETE TRAFFIC BARRIER TYPE F HEIGHT TRANSITIONS</p>	<p>DATE EFFECTIVE: 10/01/2015 DATE PREPARED: 8/24/2015</p>	<p>617.20D</p>	<p>SHEET NO. 3 OF 8</p>
		<p>STATE OF MISSOURI ERIC E. SCHROETER REGISTERED PROFESSIONAL ENGINEER NUMBER PE-28411</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>		

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

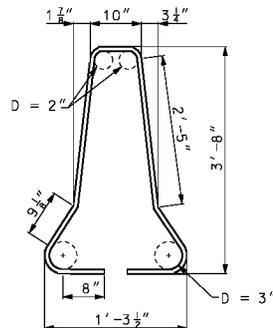
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



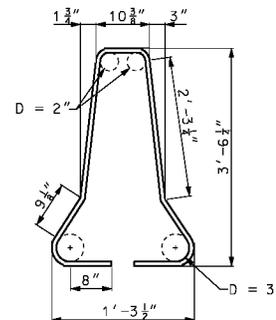
#4 A1 BAR



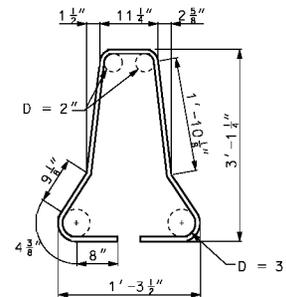
#4 A2 BAR



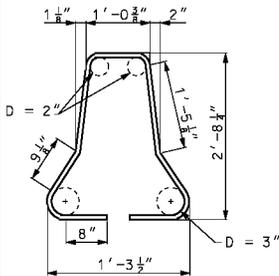
#4 A3 BAR



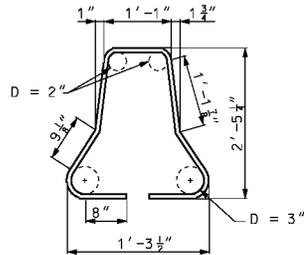
#4 A4 BAR



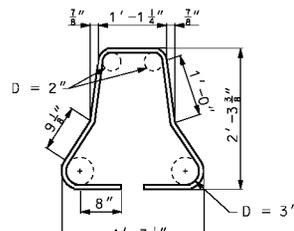
#4 A5 BAR



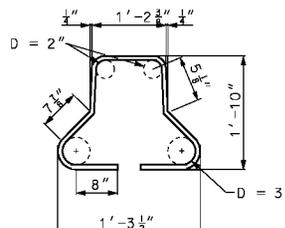
#4 A6 BAR



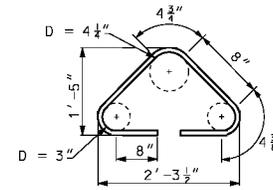
#4 A7 BAR



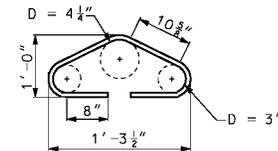
#4 A8 BAR



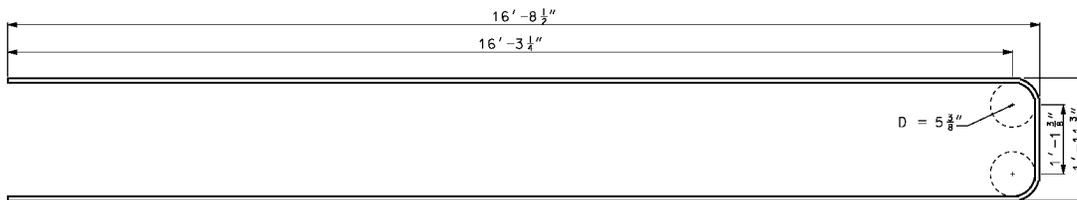
#4 A9 BAR



#4 A10 BAR



#4 A11 BAR



#5 J BAR

NOTE: FOR DETAILS OF B BARS, SEE SHEET 2 OF 6.

GENERAL NOTES:

DIMENSIONS ARE OUT TO OUT OF BARS UNLESS OTHERWISE NOTED.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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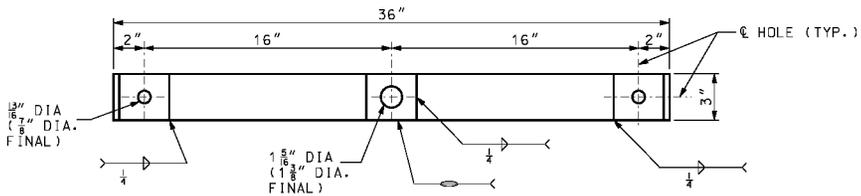
STATE OF MISSOURI
 ERIC E. SCHROETER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER

TEMPORARY CONCRETE TRAFFIC BARRIER TYPE F HEIGHT TRANSITIONS

DATE EFFECTIVE: 10/01/2015
 DATE PREPARED: 8/24/2015

617.20D

SHEET NO.
 4 OF 8



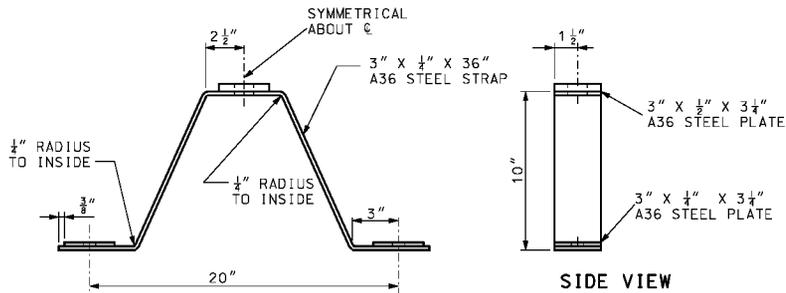
PLAN OF TIE-DOWN STRAP

(1) TIE-DOWN STRAP ANCHOR SHALL BE ONE OF THE FOLLOWING:

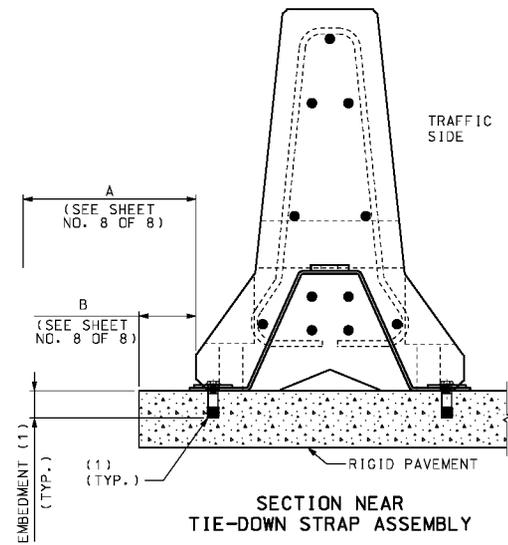
3/4" DROP IN ANCHOR WITH A 3 1/4" EMBEDMENT AND 3/8" DIA. X 1 1/2" LONG GRADE 5 BOLT.

RED HEAD LARGE DIAMETER TAPCON (LDT) 3/4" X 4 1/2" LONG WITH A 4" EMBEDMENT.

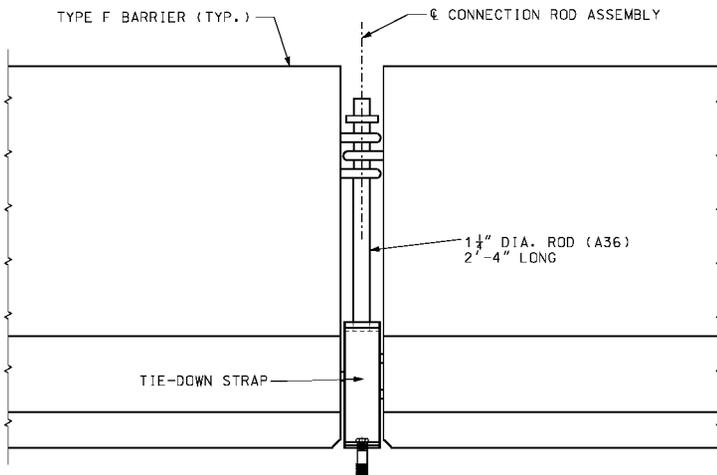
SIMPSON TITEN HD 3/4" DIA. X 5" LONG WITH A 4 1/2" EMBEDMENT.



DETAILS OF TYPE F TEMPORARY BARRIER TIE-DOWN STRAP

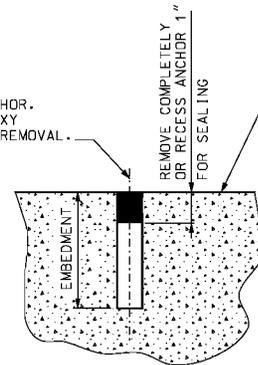


SECTION NEAR TIE-DOWN STRAP ASSEMBLY



PART ELEVATION OF BARRIER

3/4" DIA. ANCHOR. FILL WITH EPOXY MORTAR AFTER REMOVAL.



DETAIL SHOWING SEALING OF HOLES AFTER REMOVAL OF TIE-DOWN BOLTS

GENERAL NOTES:

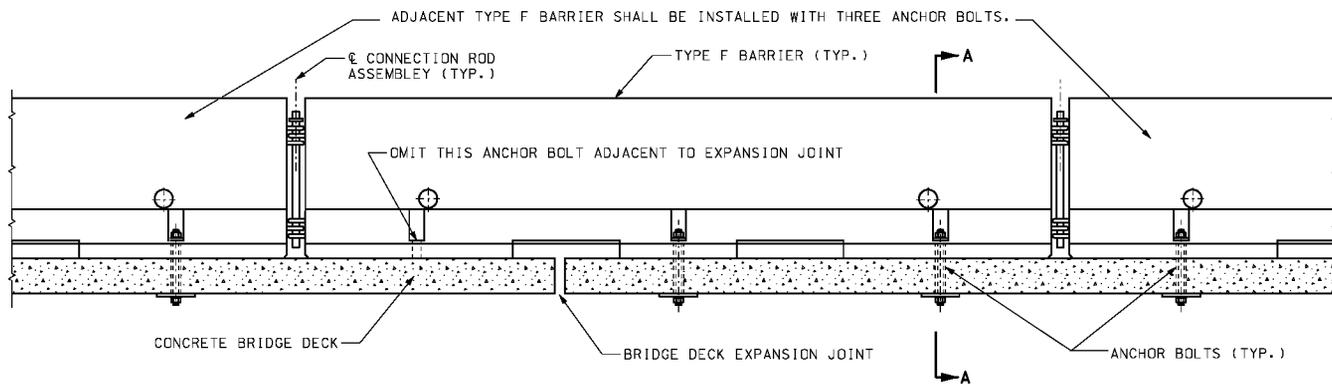
TIE-DOWN STRAP SYSTEMS ARE ONLY APPLICABLE ON RIGID PAVEMENTS.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD BEFORE ORDERING NEW MATERIAL.

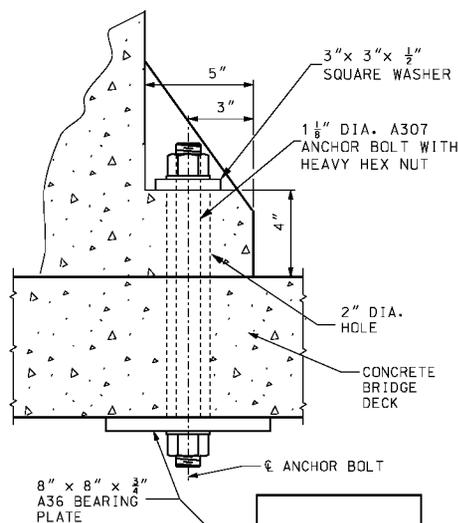
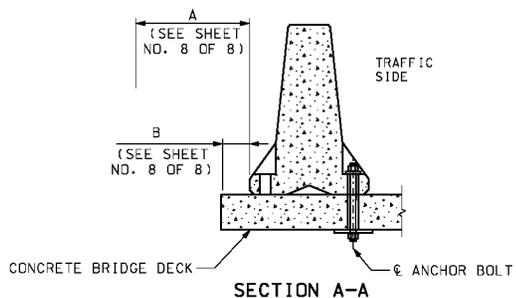
SEE OTHER SHEETS FOR DETAILS NOT SHOWN.

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		TEMPORARY CONCRETE TRAFFIC BARRIER TIE-DOWN STRAP SYSTEM	
DATE EFFECTIVE:	10/01/2015	617.20D	SHEET NO. 5 OF 8
DATE PREPARED:	8/24/2015		

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



BOLT THROUGH DECK AT THERMAL EXPANSION JOINTS



BOLT THROUGH DECK DETAIL

GENERAL NOTES:

ANCHOR BOLT SYSTEMS ARE ONLY APPLICABLE ON BRIDGE DECKS AND RIGID PAVEMENTS.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD BEFORE ORDERING NEW MATERIAL.

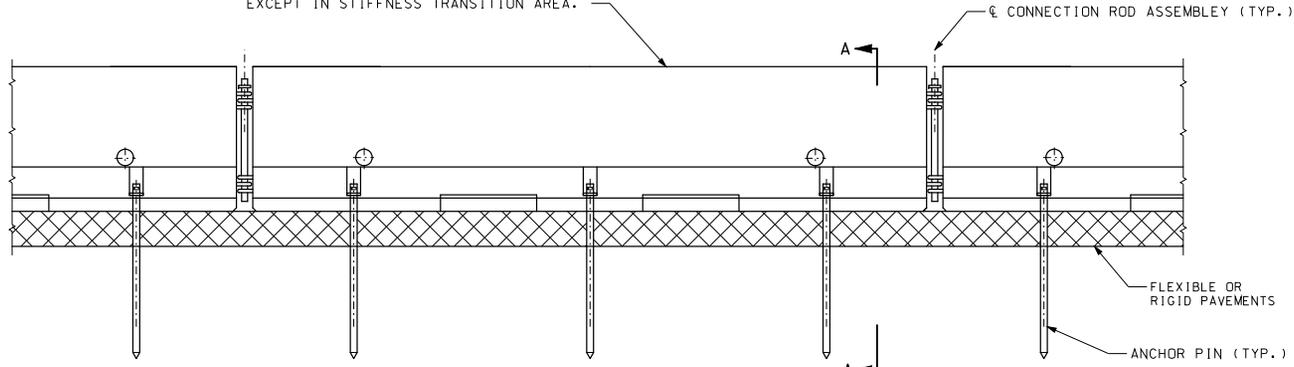
SEE OTHER SHEETS FOR DETAILS NOT SHOWN.

AFTER REMOVAL OF ANCHOR BOLTS HOLES SHALL BE FILLED WITH QUALIFIED SPECIAL MORTAR IN ACCORDANCE WITH SEC 704.

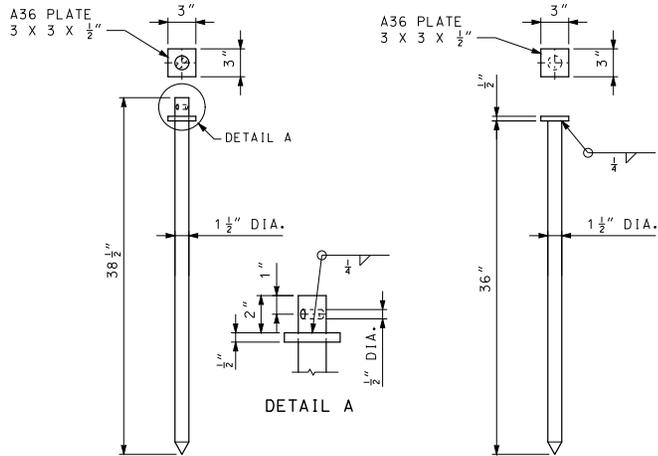
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TEMPORARY CONCRETE TRAFFIC BARRIER ANCHOR BOLT SYSTEM
DATE EFFECTIVE: 10/01/2015 DATE PREPARED: 8/24/2015	617.20D
SHEET NO. 6 OF 8	

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

TYPE F BARRIER SHALL BE INSTALLED WITH THREE DRIVEN ANCHOR PINS (TYP.), EXCEPT IN STIFFNESS TRANSITION AREA.

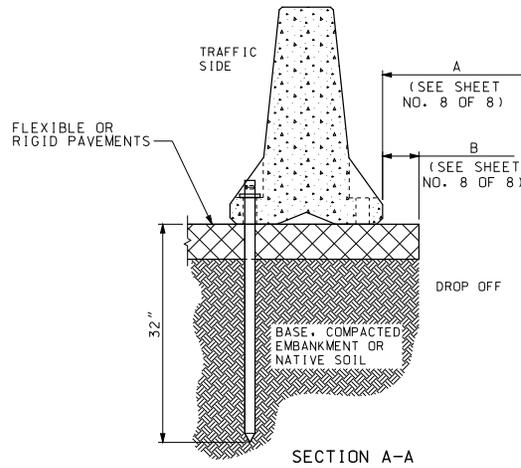


ELEVATION OF BARRIER WITH ANCHOR PINS



DRIVEN ANCHOR PIN (A36)

(OPTIONAL)



SECTION A-A

GENERAL NOTES:

CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD BEFORE ORDERING NEW MATERIAL.

WHERE EXISTING FLEXIBLE PAVEMENT OR RIGID PAVEMENT IS NOT PRESENT A 2" THICK X 30" WIDE MINIMUM ASPHALT PAD SHALL BE CONSTRUCTED.

COST OF FURNISHING AND INSTALLING THE ASPHALT PAD COMPLETE-IN-PLACE WILL BE CONSIDERED INCIDENTAL TO OTHER PAY ITEMS.

SEE OTHER SHEETS FOR DETAILS NOT SHOWN.

AFTER REMOVAL OF ANCHOR PINS HOLES SHALL BE FILLED WITH QUALIFIED SPECIAL MORTAR IN ACCORDANCE WITH SEC 704.

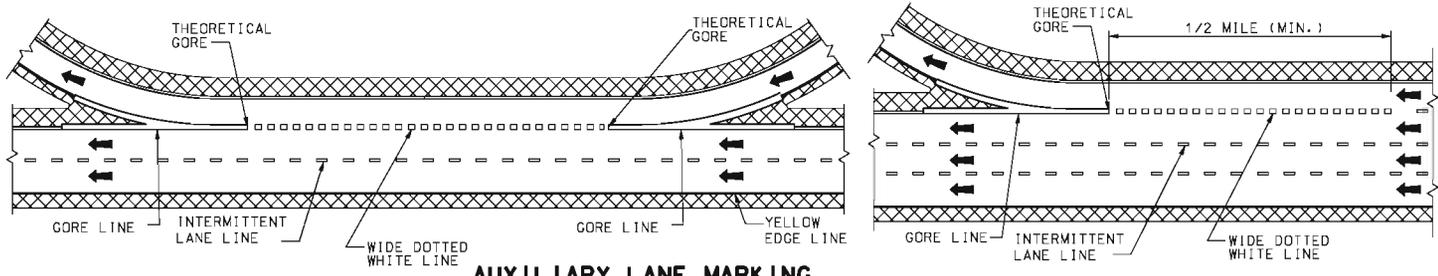
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TEMPORARY CONCRETE TRAFFIC BARRIER ANCHORED (PIN SYSTEM)
DATE EFFECTIVE: 10/01/2015 DATE PREPARED: 9/3/2015	617.20D SHEET NO. 7 OF 8

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

	CROSS SECTION	CONDITION		TREATMENT	SIGN		
		DIFFERENTIAL	TIME		MAINLINE (1)	SIDE ROAD (2)	
EDGE DROP-OFF		PAVEMENT EDGE DIFFERENTIAL > 2" TO ≤ 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:1H OR FLATTER		NO SIGNS REQUIRED	<p>(1) SIGNS SHALL BE SPACED AT APPROXIMATELY ONE MILE INTERVALS AND LOCATED WITHIN 150 FT. BEYOND ANY STATE ROADS. WHEN A SIGN PLACED AT THE ONE MILE INTERVAL FALLS WITHIN 1/2 MILE OF A SIGN PLACED AFTER AN INTERSECTION, THE SIGN PLACED AT THE 1/2 MILE INTERVAL MAY BE OMITTED. WHEN LOW SHOULDER/SHOULDER DROP-OFF SIGNS WITH UNEVEN LANES ARE BOTH SPECIFIED, ALTERNATING SIGN MESSAGES SHALL BE USED AT 1 MILE SPACINGS.</p> <p>(2) ON SIDE ROADS WITH POSTED SPEED OF 45 MPH OR GREATER, SIGNS SHALL BE PLACED 150 FT. IN ADVANCE OF INTERSECTION WITH MAINLINE.</p> <p>(3) SIGNS SHALL BE LOCATED ON THE SIDE OF THE ROADWAY WHERE THE PAVEMENT EDGE DIFFERENTIAL EXISTS, ON TWO-LANE UNDIVIDED HIGHWAYS, BACK-TO-BACK SIGNS SHALL BE PROVIDED ON THE SIDE OF THE ROADWAY, WHERE THE PAVEMENT EDGE DIFFERENTIAL EXISTS. "BACK TO BACK" SIGNS SHALL BE SEPARATED BY 7-10 FEET.</p> <p>(4) SIGNS TO REMAIN VISIBLE UNTIL SHOULDER SHAPING IS COMPLETE.</p> <p>(5) SIGNS SHALL BE LOCATED ON RIGHT SIDE OF NON-DIVIDED HIGHWAYS AND ON BOTH SIDES OF DIVIDED HIGHWAYS WHERE A LANE LINE DIFFERENTIAL EXISTS.</p> <p>(6) WHEN THE SHOULDER DROP-OFF SIGNS ARE IN PLACE FOR GREATER THAN THREE DAYS, THE SHOULDER DROP-OFF PLAQUE SHOULD BE USED IN ADDITION WITH THE SHOULDER DROP-OFF SIGN.</p>
	WORKING HOURS		NO EDGE TREATMENT REQUIRED	W08-17 (3)(4) W08-17p (6)			
		PAVEMENT EDGE DIFFERENTIAL > 2" TO ≤ 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:1H OR FLATTER		NO SIGNS REQUIRED	
	WORKING HOURS		NO EDGE TREATMENT REQUIRED	W08-17 (3)(4) W08-17p (6)			
	PAVEMENT EDGE DIFFERENTIAL > 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:3H OR FLATTER				
WORKING HOURS		DELINEATE DIFFERENTIAL WITH CHANNELIZERS	W08-17 (3)(4) W08-17p (6)			W08-1 (3)	
	ANY PAVEMENT EDGE OR LANE LINE DIFFERENTIAL	NON-WORKING AND WORKING HOURS WHERE PLANS REQUIRE ADJACENT LANE CLOSURE WITH CHANNELIZATION OR PARTIAL LANE CLOSURE WITH BARRIER.	NO EDGE TREATMENT REQUIRED	NO SIGNS REQUIRED	NO SIGNS REQUIRED	<p>LEGEND</p> <p> - RIGID PAVEMENT</p> <p> - FLEXIBLE PAVEMENT</p> <p> - ALL PAVEMENT TYPES</p> <p>GENERAL NOTES:</p> <p>SIGNS SHALL BE VISIBLE TO TRAFFIC ONLY WHEN AND WHERE CONDITIONS EXIST.</p> <p>FOR ADDITIONAL SIGN SPACING AND DETAILS SEE STANDARD PLAN 620.10.</p>	
LANE DIFFERENTIAL		LANE LINE DIFFERENTIAL ≤ 2"	NON-WORKING AND WORKING HOURS	NO EDGE TREATMENT REQUIRED		NO SIGNS REQUIRED	<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p> <p>PAVEMENT EDGE TREATMENT</p> <p>STATE OF MISSOURI ERIC E. SCHROETER NUMBER PE-28411 PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p> <p>DATE EFFECTIVE: 10/01/2015 DATE PREPARED: 8/24/2015</p> <p>619.10H</p> <p>SHEET NO. 1 OF 1</p>
		LANE LINE DIFFERENTIAL > 2"	NON-WORKING AND WORKING HOURS WHERE LANES OPEN TO TRAFFIC	WEDGE SLOPE TO 1V:3H OR FLATTER			
			NON-WORKING AND WORKING HOURS WHERE LANE CLOSED TO TRAFFIC	DELINEATE DIFFERENTIAL WITH CHANNELIZERS	W08-11 (5)	W08-1	

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

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FIRST ARROW 25' FROM CROSSROAD OR STOP LINE.
 MAXIMUM 3 ARROWS AT 100' INTERVALS.
 ON MULTI-LANE RAMP USE ARROW IN EACH LANE.
 WRONG WAY ARROWS ARE NOT USED WHEN RAMP HAS LANE USE CONTROL ARROWS.

OFF RAMP WRONG WAY ARROW

GENERAL NOTES:
 DOTTED LINES SHALL BE 3 FEET IN LENGTH SEPARATED BY 9 FOOT GAPS.
 REFER TO THE STANDARD PLAN 626.00 WHEN INSTALLING PAVEMENT MARKINGS OVER RUMBLE STRIPS.
 WIDE LINES ARE TWICE THE WIDTH OF NORMAL LINES.
 LANE LINES SHALL BE AN INTERMITTENT OR SOLID WHITE.
 INTERMITTENT LINES SHALL BE 10 FEET IN LENGTH SEPARATED BY 30 FOOT GAPS.

EDGELINES SHALL BE CONTINUOUS SOLID WHITE OR YELLOW LINES. RIGHT SIDE EDGELINES SHALL BE SOLID WHITE. MEDIAN OR LEFT SIDE EDGELINES ON DIVIDED HIGHWAYS AND ON THE LEFT SIDE OF RAMP SHALL BE SOLID YELLOW. EDGELINES SHALL BE CONTINUOUS ACROSS DRIVEWAYS AND MINOR INTERSECTING ROADS.

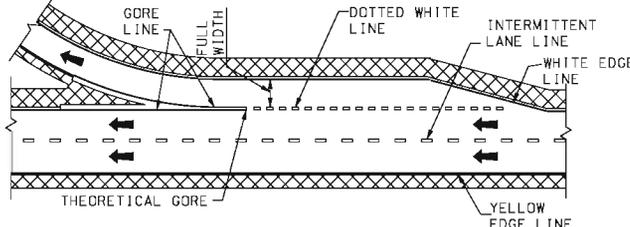
"NO PASSING" LINES SHALL BE CONTINUOUS SOLID YELLOW.
 "NO PASSING" LINES SHALL BE PLACED AS SHOWN IN "LINE DETAIL". "NO PASSING" LINES ON A TWO-LANE, TWO-WAY HIGHWAY WHEN PASSING IS PROHIBITED IN EACH DIRECTION SHALL BE PLACED 4 INCHES APART AND THE INTERMITTENT CENTERLINE SHALL BE OMITTED.

STOP LINES SHALL BE A SOLID WHITE TRANSVERSE LINE 24 INCHES WIDE, LOCATED AT LEAST 4 FEET FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY.

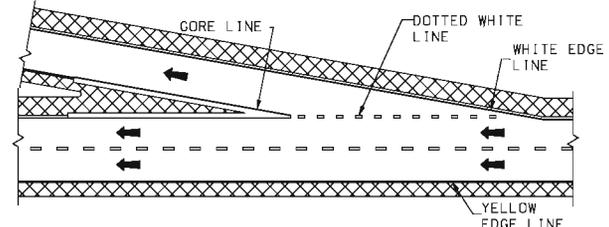
CROSSWALK LINES SHALL BE SOLID WHITE TRANSVERSE LINES 6 INCHES WIDE AT LEAST 6 FEET APART. CROSSWALK LINES ON THE INTERSECTION SIDE OF THE CROSSWALK SHALL MEET AT THE CURB.

GORE LINES SHALL BE A SOLID WHITE LINE WITH A WIDTH TWICE THAT OF THE EDGELINE.
 ARROWS AND WORD SYMBOLS SHALL BE SOLID WHITE.

AUXILIARY LANE MARKING



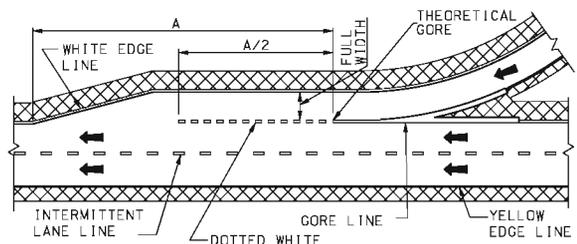
PARALLEL LANE



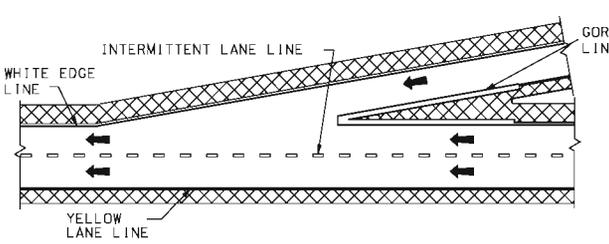
TAPERED LANE

EXIT RAMP MARKING

A = LENGTH OF ACCELERATION LANE PLUS TAPER.



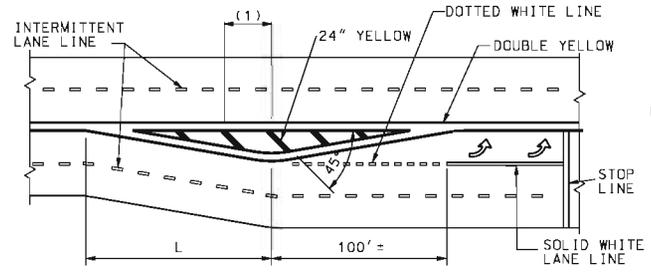
PARALLEL LANE



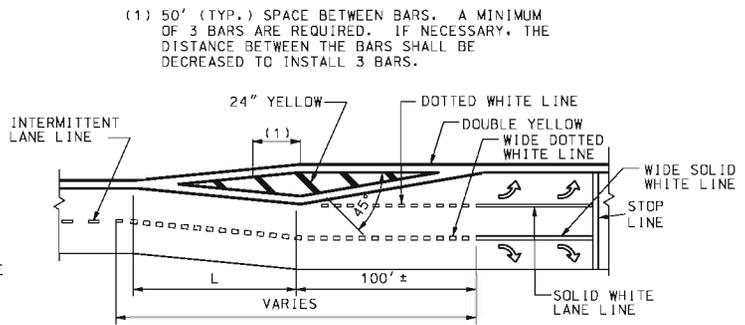
TAPERED LANE

ENTRANCE RAMP MARKING

L = LENGTH OF TAPER IN FEET.



MEDIAN ISLAND MARKING



LANE DROP MARKING

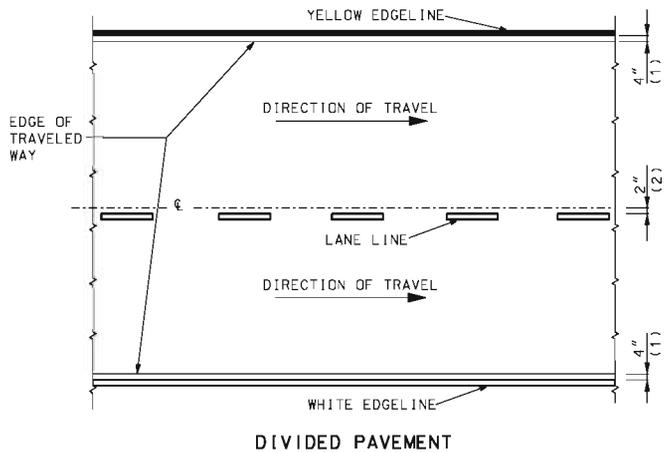
(1) 50' (TYP.) SPACE BETWEEN BARS. A MINIMUM OF 3 BARS ARE REQUIRED. IF NECESSARY, THE DISTANCE BETWEEN THE BARS SHALL BE DECREASED TO INSTALL 3 BARS.

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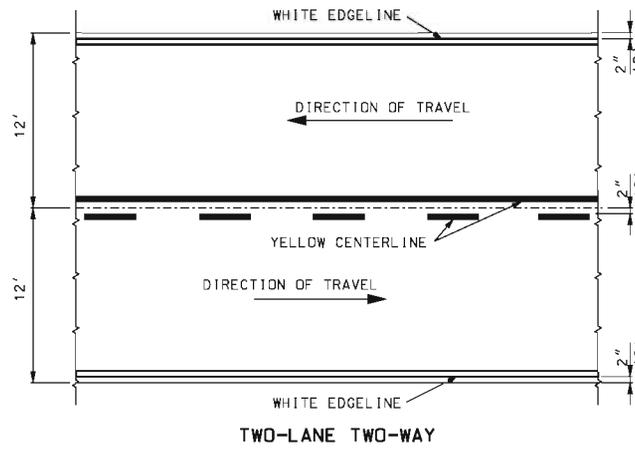


PAVEMENT MARKING

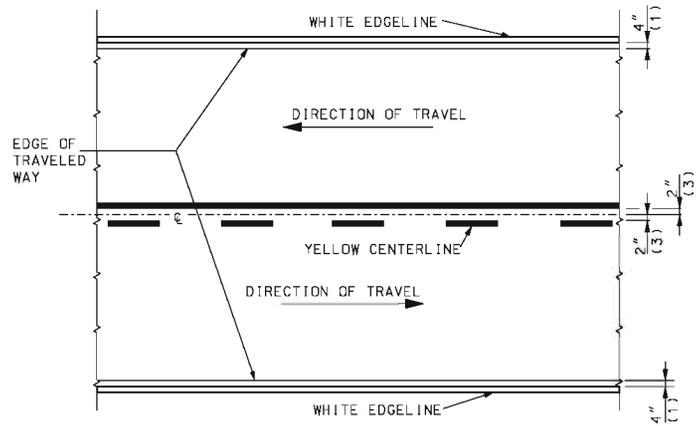
DATE EFFECTIVE:	12/01/2009	620.00J	SHEET NO.
DATE PREPARED:	11/26/2012		1 OF 5



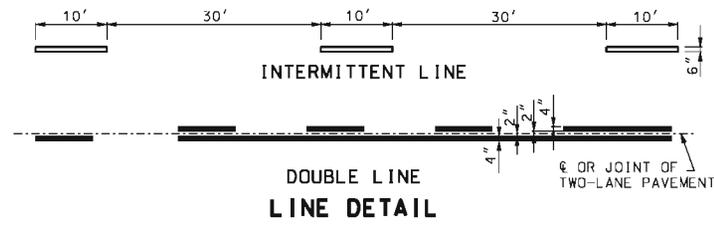
DIVIDED PAVEMENT



TWO-LANE TWO-WAY
TYPICAL STRIPING OFFSETS
WITHOUT RUMBLE STRIPES



TWO-LANE TWO-WAY
TYPICAL STRIPING OFFSETS
FOR RUMBLE STRIPES



DOUBLE LINE
LINE DETAIL

LEGEND
 WHITE LINE
 YELLOW LINE

- (1) OFFSET FROM EDGE OF TRAVELED WAY (TYP.)
- (2) OFFSET FROM JOINT (TYP.)
- (3) OFFSET FROM CENTERLINE (TYP.)

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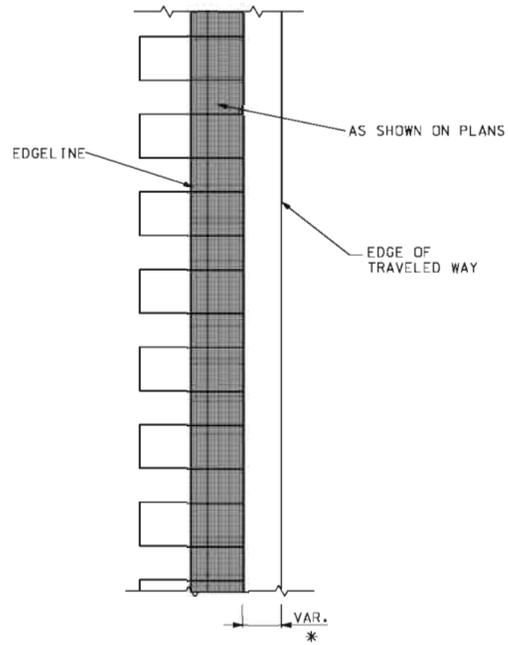
PAVEMENT MARKING

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-23781
 PROFESSIONAL ENGINEER

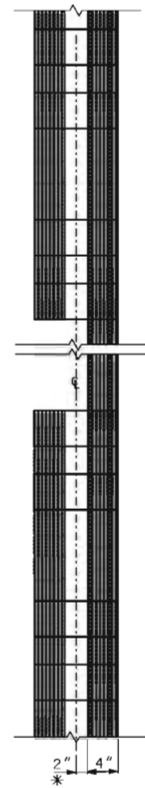
THIS SHEET HAS BEEN
 SIGNED, SEALED AND DATED
 ELECTRONICALLY.

DATE EFFECTIVE: 12/01/2009	620.00J	SHEET NO. 2 OF 5
DATE PREPARED: 11/26/2012		

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



FOR SHOULDERS

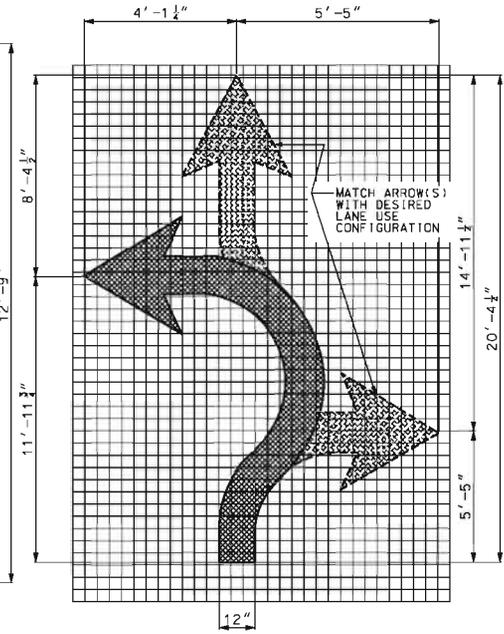
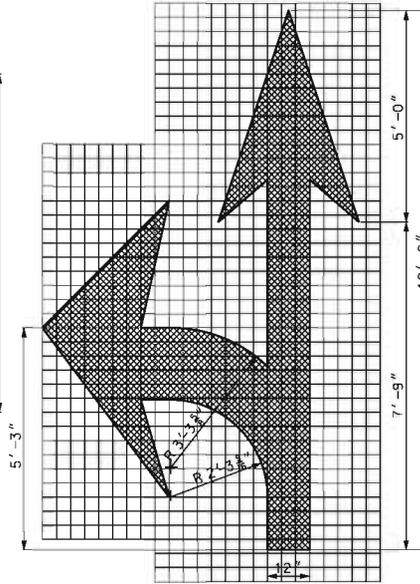
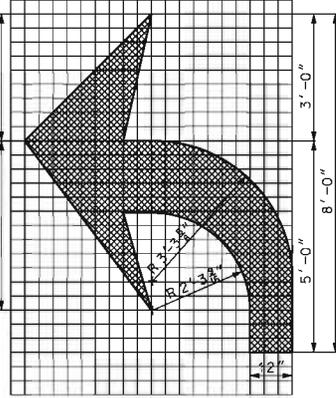
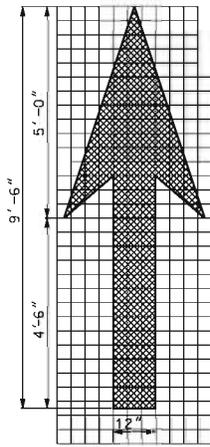
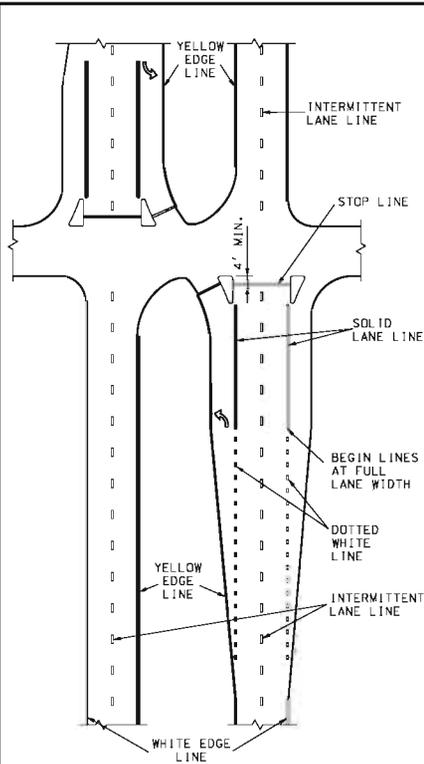


2 WAY 2 LANE
(SEE TYPICAL STRIPING
FOR RUMBLESTRIPS)

* = LATERAL DEVIATION SHALL NOT EXCEED ONE INCH IN 100 FEET.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center">PAVEMENT MARKING STRIPING THROUGH RUMBLE STRIPS</p>
DATE EFFECTIVE: 12/01/2009 DATE PREPARED: 11/26/2012	<p align="center">620.00J</p>
SHEET NO. 3 OF 5	

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

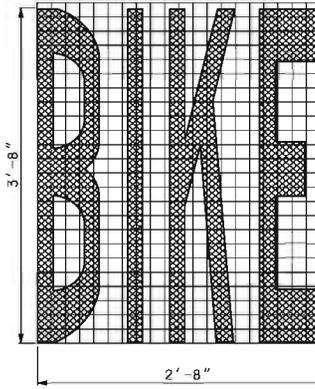
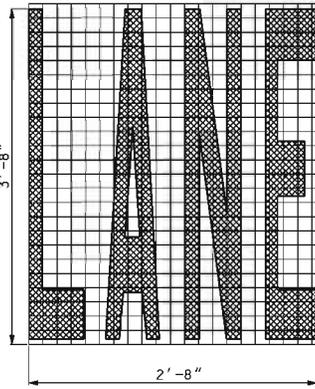
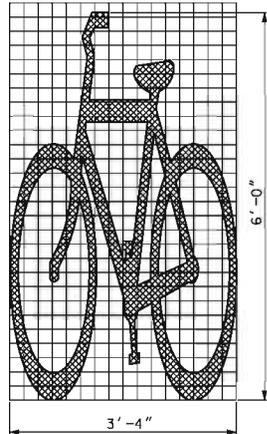
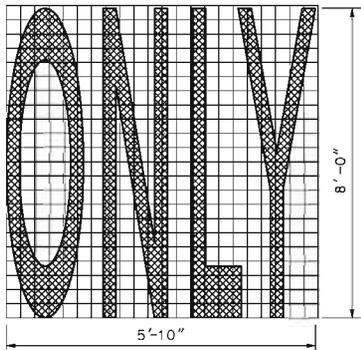


ARROW MARKINGS

TWO LANE USE CONTROL ARROWS FOR FIRST 200 FEET WITH ONE ADDITIONAL ARROW EVERY 400 FEET OF MANDATORY MOVEMENT LANE. FIRST ARROW 75 FEET FROM STOP LINE.

FISH-HOOK ARROW ROUNDABOUT APPROACH MARKINGS

SIGNALIZED GRADE INTERSECTION MARKING



WORD MARKING ELONGATED WORD & SYMBOL

BICYCLE SYMBOL

WORD MARKING ELONGATED WORD & SYMBOL

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-23781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 BOUND, SEALED AND DATED
 ELECTRONICALLY.

PAVEMENT MARKING

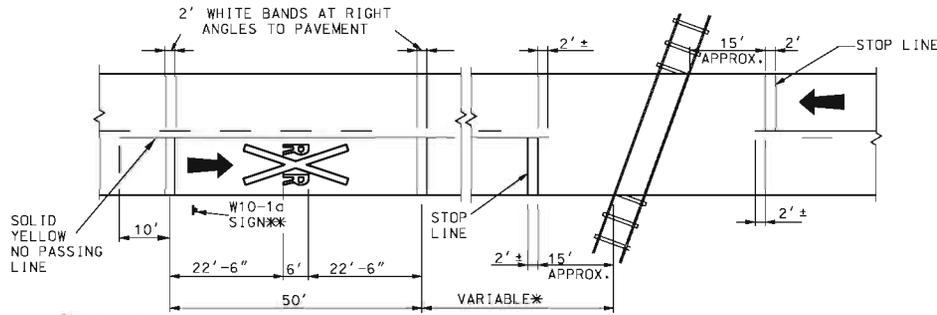
DATE EFFECTIVE: 12/01/2009
 DATE PREPARED: 11/26/2012

620.00J

SHEET NO.
 4 OF 5

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

1. STOP LINES SHALL BE PLACED 90° TO THE ROADWAY.
2. IF RAILROAD GATE IS PRESENT THE STOP LINE SHALL BE 8' FROM GATE.

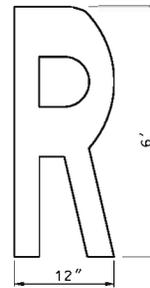


PAVEMENT DETAIL

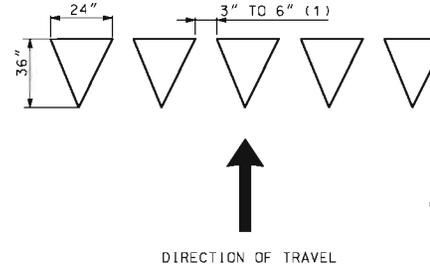
* THE DISTANCE FROM THE RAILROAD CROSSING MARKING TO THE NEAREST TRACK WILL VARY ACCORDING TO THE APPROACH SPEED AND THE SIGHT DISTANCE OF THE VEHICULAR TRAFFIC APPROACHING, BUT SHALL BE NO LESS THAN 50 FEET.
 A THREE-LANE ROADWAY SHALL BE MARKED WITH A CENTERLINE FOR TWO-LANE APPROACH OPERATION ON THE APPROACH TO A CROSSING. ON MULTI-LANE ROADWAYS THE TRANSVERSE BANDS SHALL EXTEND ACROSS ALL APPROACH LANES, AND INDIVIDUAL "R X R" SYMBOLS SHALL BE USED IN EACH APPROACH LANE.

** PLACEMENT OF W10-1c SIGN BY OTHERS.

RAILROAD GRADE CROSSING

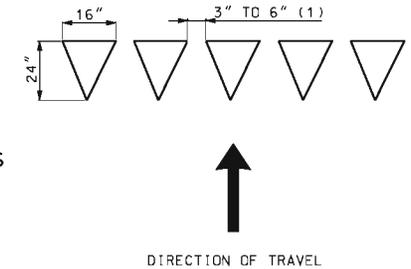


LETTER DETAIL



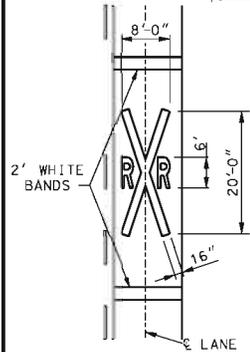
24 INCH YIELD LINE TRIANGLES

(1) TRIANGLES SHALL BE UNIFORMLY SPACED AND COVER THE COMPLETE WIDTH OF THE TRAVEL LANE. SPACING SHALL BE ADJUSTED SO THERE ARE NO PARTIAL TRIANGLES WITHIN THE YIELD MARKING.

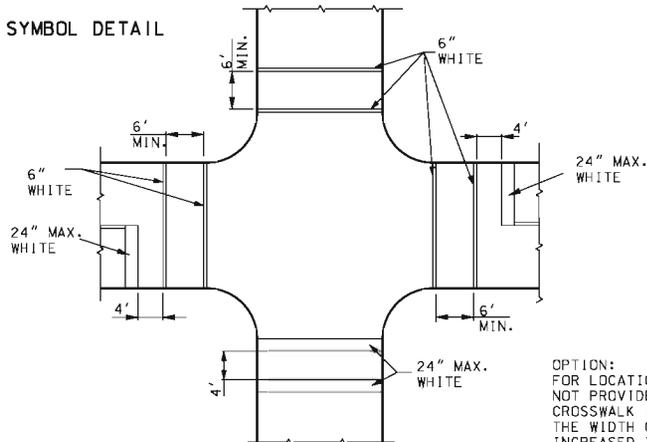


16 INCH YIELD LINE TRIANGLES

YIELD LINE TRIANGLES

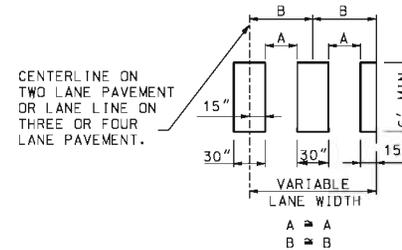


SYMBOL DETAIL



SOLID WHITE PEDESTRIAN CROSSWALK

OPTION:
 FOR LOCATIONS WHERE STOP BARS ARE NOT PROVIDED, SPEEDS EXCEED 35 MPH, OR CROSSWALK IN AN UNEXPECTED LOCATION, THE WIDTH OF THE CROSSWALK MARKINGS MAY BE INCREASED TO 24 INCHES.



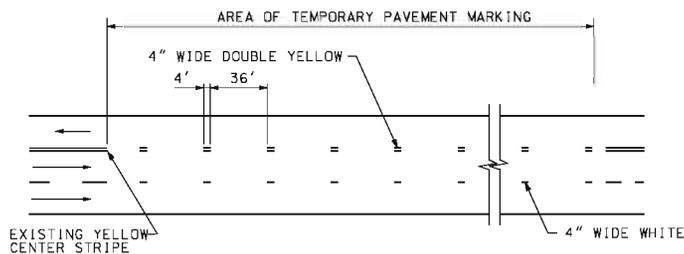
WHITE MIDBLOCK (ZEBRA)

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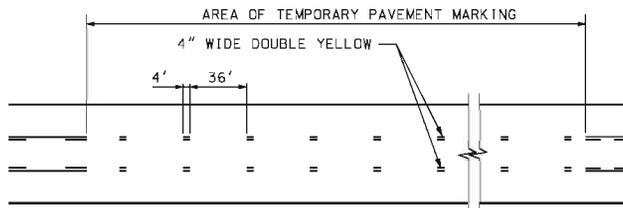
STATE OF MISSOURI
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PAVEMENT MARKING

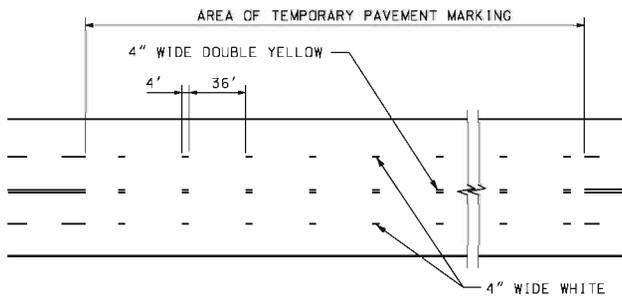
DATE EFFECTIVE: 12/01/2009	620.00J	SHEET NO. 5 OF 5
DATE PREPARED: 11/26/2012		



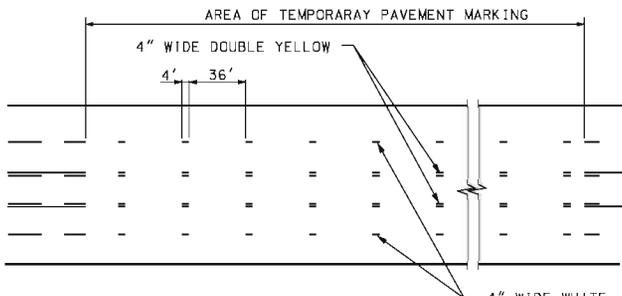
2-LANE SECTION WITH AUXILIARY LANE



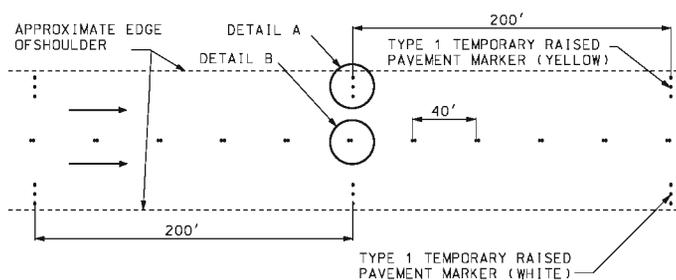
3-LANE SECTION



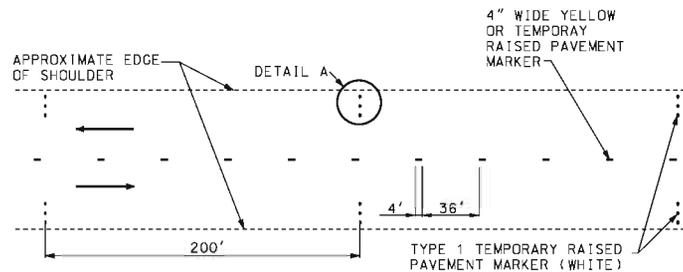
4-LANE SECTION



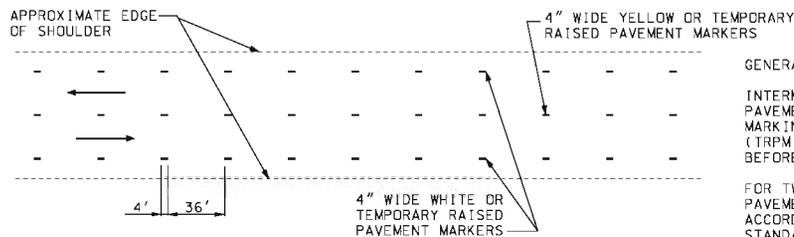
5-LANE SECTION



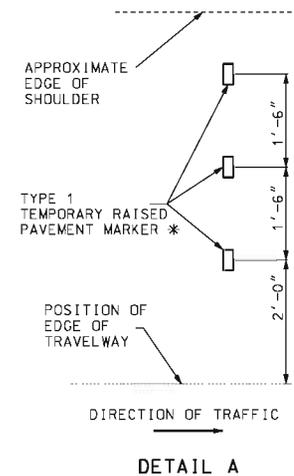
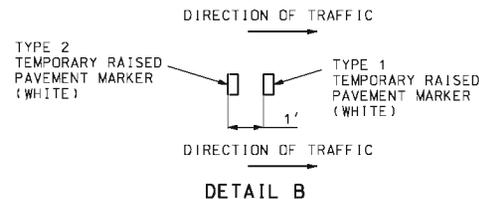
EDGE LINES ON MULTILANE DIVIDED SECTIONS



EDGE LINES ON TWO-WAY SECTIONS WITH PAVED SHOULDERS GREATER THAN 4 FEET WIDE



EDGE LINES ON TWO-WAY SECTIONS WITH AGGREGATE OR PAVED SHOULDERS 4 FEET OR LESS



* THREE TYPE 1 TEMPORARY RAISED PAVEMENT MARKERS SHALL BE USED IF SHOULDER IS 6' OR WIDER. OTHERWISE, USE TWO TYPE 1 TEMPORARY RAISED PAVEMENT MARKERS.

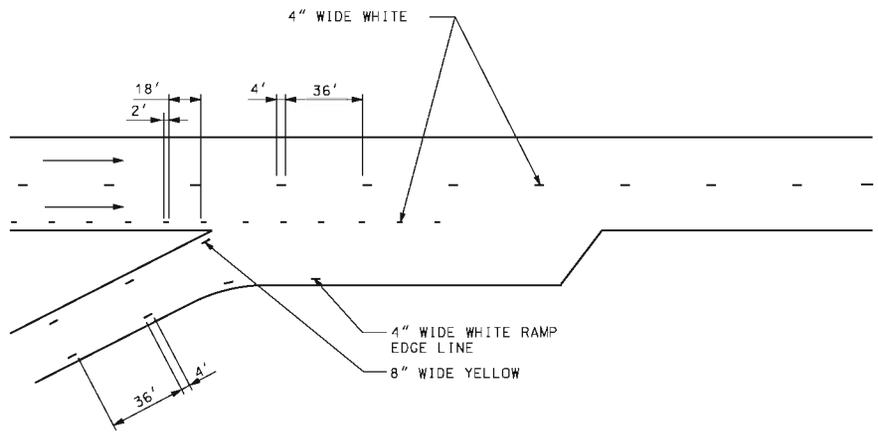
GENERAL NOTES:

INTERMEDIATE LIFTS FOR ALL PROJECTS, TEMPORARY PAVEMENT MARKINGS SHOULD EITHER BE SHORT TERM MARKING TAPE, TEMPORARY RAISED PAVEMENT MARKERS (TRPM) OR PAINT. IF USED, TRPM SHALL BE REMOVED BEFORE THE NEXT LIFT IS INSTALLED.

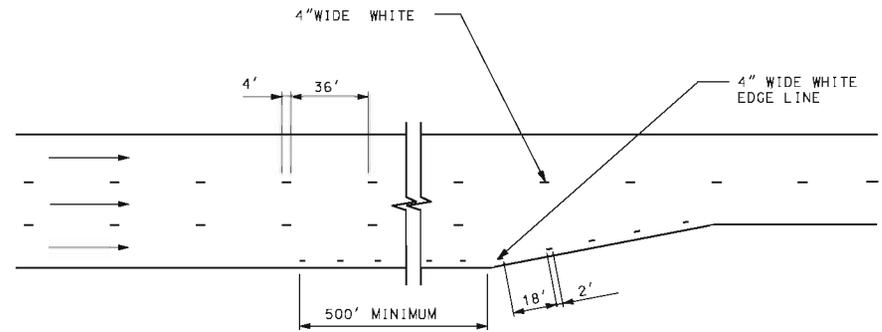
FOR TWO-LANE TWO-WAY ROADWAYS, TEMPORARY RAISED PAVEMENT MARKERS, IF USED, SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 620 OF THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TEMPORARY PAVEMENT MARKING TEMPORARY PAVEMENT MARKING
DATE EFFECTIVE: 07/01/2011 DATE PREPARED: 10/18/2011	620.10C
SHEET NO. 1 OF 4	

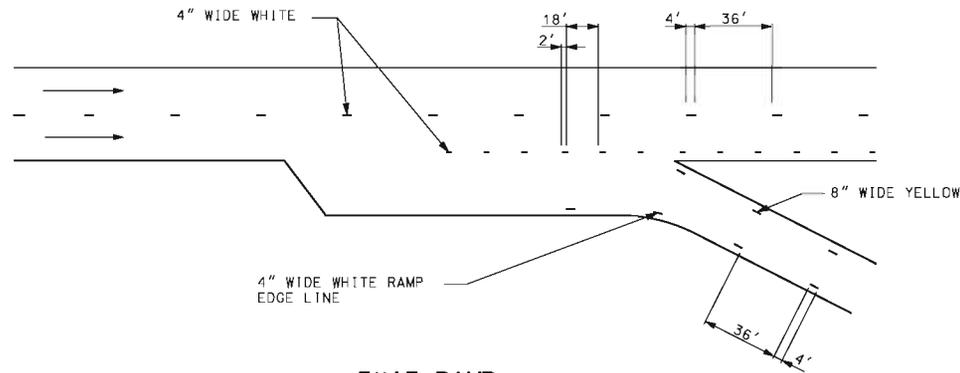
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



ENTRANCE RAMP



LANE TRANSITION



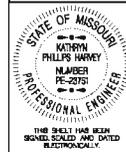
EXIT RAMP

GENERAL NOTES:

TEMPORARY PAVEMENT MARKING IN INTERSECTIONS, RAMPS, GORES AND OTHER TRANSITION AREAS USE AN INTERMITTENT MARKING OF 2 FEET LONG AT A CYCLE OF 20 FEET.

LIMITS OF TEMPORARY GORE MARKING ARE THE SAME AS THE EXISTING GORE LINES.

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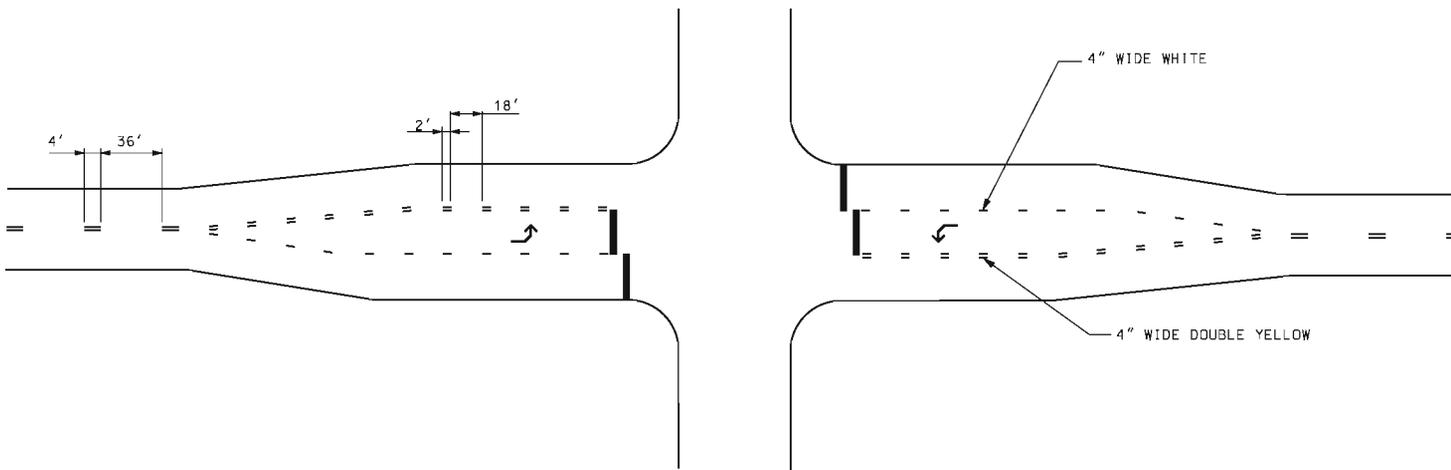
TEMPORARY PAVEMENT MARKING
LANE TRANSITION AND RAMP AREAS

DATE EFFECTIVE: 07/01/2011
 DATE PREPARED: 6/20/2011

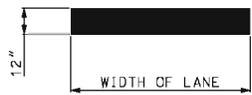
620.10C

SHEET NO.
 2 OF 4

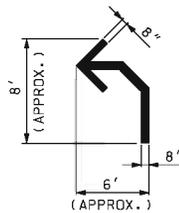
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



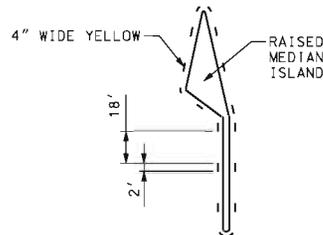
PLAN VIEW



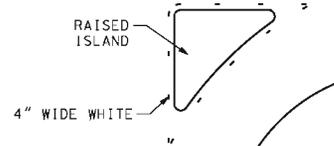
TEMPORARY STOP BAR DETAIL (WHITE)



TEMPORARY ARROW DETAIL (WHITE)



RAISED DIVISIONAL ISLAND



RAISED CHANNELIZING ISLAND

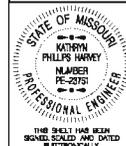
GENERAL NOTES:

TEMPORARY ARROWS AND STOP BARS ARE REQUIRED WHEN GEOMETRIC MODIFICATIONS DURING CONSTRUCTION CREATE LANE CONFIGURATIONS DIFFERENT THAN EXISTING, OR THE EXISTING PAVEMENT MARKING INCLUDES THEM.

YELLOW AND WHITE TEMPORARY MARKING AROUND ISLANDS ONLY REQUIRED WHEN THE ISLAND CURB IS NOT PAINTED.

TEMPORARY PAVEMENT MARKING IN INTERSECTIONS, RAMP GORES AND OTHER TRANSITION AREAS USE AN INTERMITTENT MARKING 2' LONG AT A CYCLE OF 20'.

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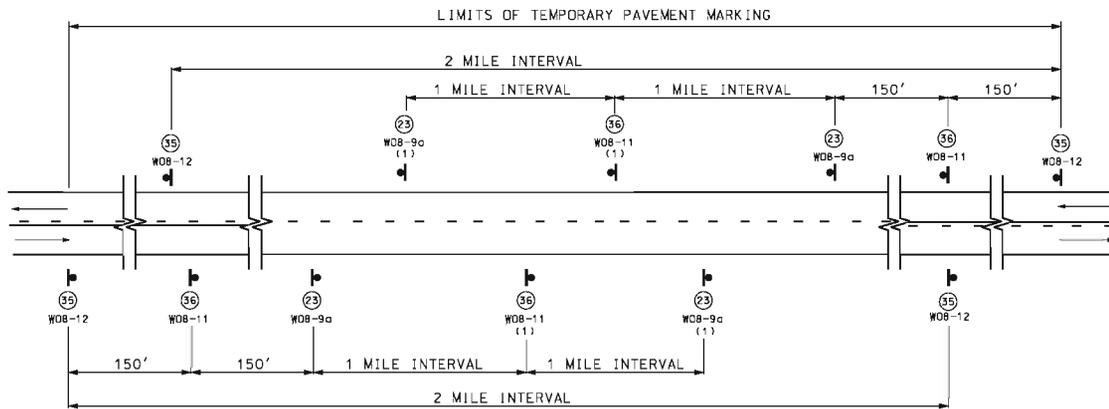
THIS SHEET HAS BEEN SCANNED, SIGNED AND DATED ELECTRONICALLY.

TEMPORARY PAVEMENT MARKING INTERSECTIONS

DATE EFFECTIVE: 07/01/2011
 DATE PREPARED: 6/20/2011

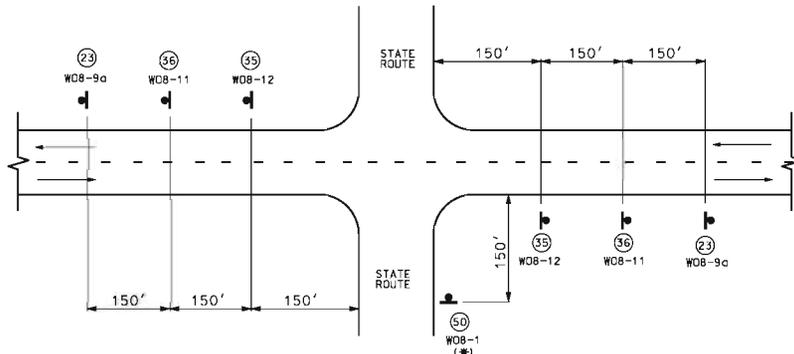
620.10C

SHEET NO. 3 OF 4



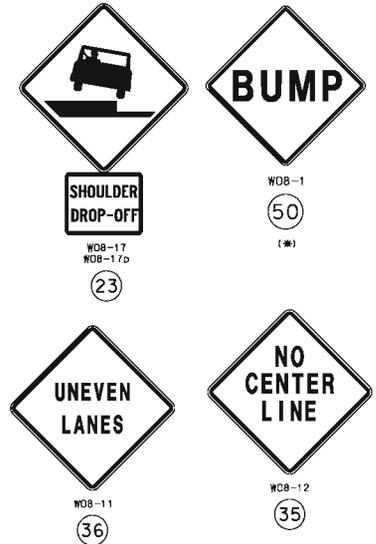
SIGN SPACING FOR MAINLINE

(DETAIL SHOWN IS BASED ON A PROJECT MEETING ALL CONDITIONS: NO CENTER STRIPE, UNEVEN LANES, SHOULDER DROP OFF AND BUMP.)
 (1) IF ONLY ONE CONDITION EXISTS (UNEVEN LANES OR SHOULDER DROP OFF), THE SIGN SPACING SHALL BE AT 1 MILE INTERVALS.



SIGN SPACING AT STATE ROUTE INTERSECTIONS

(*) BUMP SIGN SHOULD BE IN ACCORDANCE WITH STANDARD PLAN 619.10.



GENERAL NOTES:

FOR DETAILS OF TEMPORARY PAVEMENT MARKING SEE STANDARD PLAN 620.10.

SIGN (35) AND TEMPORARY PAVEMENT MARKING INSTALLED WHERE CENTERLINE STRIPING HAS BEEN COVERED OR REMOVED. SIGNS ARE TO REMAIN IN PLACE UNTIL THE PERMANENT CENTERLINE PAVEMENT MARKINGS ARE IN PLACE. SIGNS SHALL BE COVERED OR REMOVED WHEN PAVEMENT CENTERLINE MARKING HAS BEEN INSTALLED.

SIGN (35) IS PLACED AT APPROXIMATELY TWO-MILE INTERVALS AND AT STATE ROUTE JUNCTIONS. WHEN THE INSTALLATION AT A JUNCTION IS WITHIN ONE-EIGHTH MILE OF THE NORMAL MAINLINE SIGN (35), THE LATTER MAY BE ELIMINATED.

ALL SIGNS SHALL BE POST MOUNTED AND IN ACCORDANCE WITH STANDARD PLAN 616.10 AND 903.03.

WHEN SHOULDER DROP-OFF SIGNS ARE IN PLACE FOR GREATER THAN THREE DAYS, THE SHOULDER DROP-OFF PLAQUE SHOULD BE USED IN ADDITION WITH THE SHOULDER DROP-OFF SIGN.

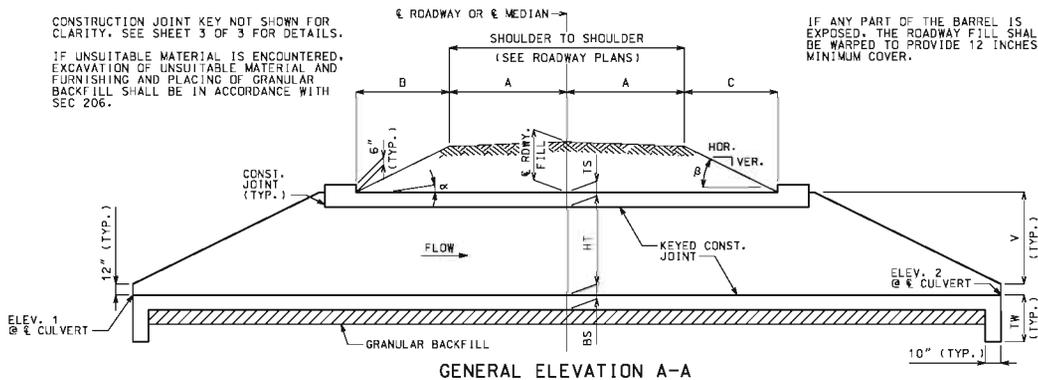
		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		TEMPORARY PAVEMENT MARKING TWO-LANE TWO-WAY HIGHWAY	
DATE EFFECTIVE: 07/01/2011 DATE PREPARED: 7/3/2013		620.10C	
		SHEET NO. 4 OF 4	

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

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY. SEE SHEET 3 OF 3 FOR DETAILS.

IF UNSUITABLE MATERIAL IS ENCOUNTERED, EXCAVATION OF UNSUITABLE MATERIAL AND FURNISHING AND PLACING OF GRANULAR BACKFILL SHALL BE IN ACCORDANCE WITH SEC 206.

IF ANY PART OF THE BARREL IS EXPOSED, THE ROADWAY FILL SHALL BE WARPED TO PROVIDE 12" MINIMUM COVER.



GENERAL ELEVATION A-A

CHANNEL BOTTOM SHALL BE GRADED WITHIN RIGHT OF WAY FOR TRANSITION OF CHANNEL BED TO CULVERT OPENINGS. CHANNEL BANKS SHALL BE TAPERED TO MATCH CULVERT OPENINGS.

EQUATIONS FOR COMPUTING α , β , B AND C

α = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO ϵ ROADWAY OR ϵ MEDIAN = $\text{ARCTAN} \left(\frac{\text{ELEV. 1} - \text{ELEV. 2}}{W} \right)$

β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO ϵ ROADWAY OR ϵ MEDIAN = $\text{ARCTAN} \left(\frac{\text{VER.}}{\text{HOR.}} \right)$

B = HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO ϵ ROADWAY OR ϵ MEDIAN = $\frac{\text{RDWY. FILL} + A(CS) - A(\text{TAN} \alpha)}{\text{TAN} \beta + \text{TAN} \alpha}$

C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO ϵ ROADWAY OR ϵ MEDIAN = $\frac{\text{RDWY. FILL} + A(CS) + A(\text{TAN} \alpha)}{\text{TAN} \beta - \text{TAN} \alpha}$

CS = CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN, LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM ϵ ROADWAY OR ϵ MEDIAN.

THE TERM "A(CS)" IS THE DIFFERENCE IN ELEVATION BETWEEN ϵ ROADWAY OR ϵ MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO ϵ ROADWAY OR ϵ MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS.

TO ACCOUNT FOR A VARYING PROFILE GRADE THE ϵ ROADWAY FILL SHALL BE BASED ON STATIONS THAT CORRESPOND TO THE CORNERS OF THE INSIDE FACE OF THE HEADWALLS THAT PRODUCE MAXIMUM VALUES FOR B AND C.

SEE ROADWAY PLANS FOR SLOPES, ϵ ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

LAYOUT DIMENSIONS	
VARIABLE	DIMENSION
α	SEE EQUATIONS
β	SEE EQUATIONS
B	SEE EQUATIONS
C	SEE EQUATIONS
E	G + 23"
F	S + 2TX
G	2V
V	HT + TS - 12"
W	2A + B + C + 2E
TW	MAX{3'-4" OR (BS + 12")}

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

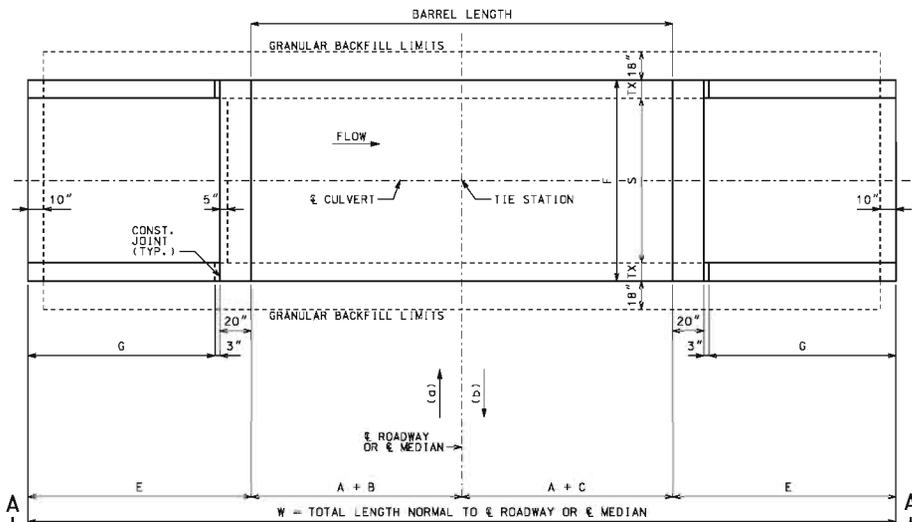
DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) $f'c$ = 4,000 PSI
REINFORCING STEEL (GRADE 60) f_y = 60,000 PSI

MISCELLANEOUS:
FOR REINFORCEMENT DETAILS, SEE SHEET 2 OF 3. FOR SECTION DETAILS, SEE SHEET 3 OF 3. FOR MEMBER THICKNESS, SEE 703.17.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULVERT SECTIONS ARE USED, THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINGS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.

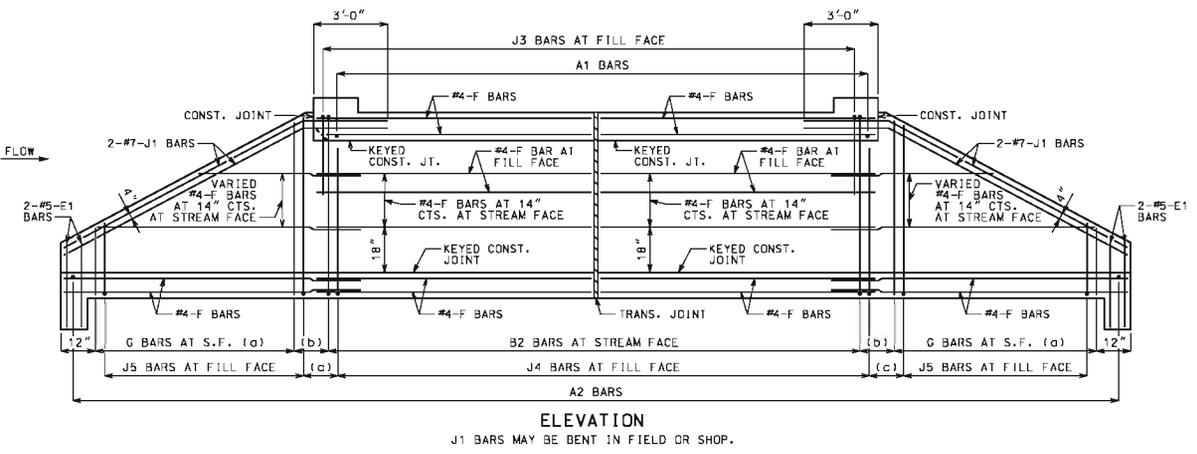
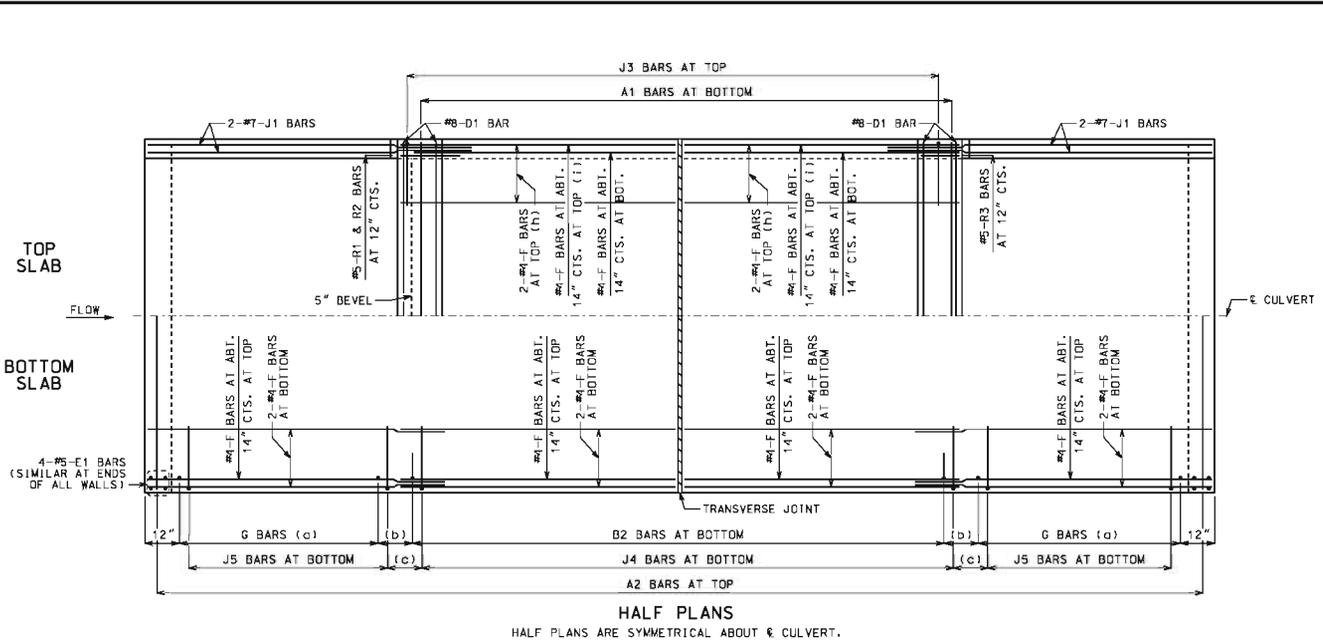


PLAN OF LAYOUT DIMENSIONS

(a) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE SINGLE BOX CULVERT SKEW: SQUARED WINGS: STRAIGHT LAYOUT	
	DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/13/2015	703.10J SHEET NO. 1 OF 3

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



LAYING OUT TRANSVERSE JOINTS
UNLESS SHOWN ON ROADWAY OR BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT
CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.
FOR CUT SECTION DETAILS, SEE 703.16.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN HALF PLANS AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS B2 BARS
(b) VARIES, 12" MAXIMUM
(c) J4 BAR SPACING
(d) NOT SPECIFIED ON THIS SHEET
(e) NOT SPECIFIED ON THIS SHEET
(f) NOT SPECIFIED ON THIS SHEET
(g) NOT SPECIFIED ON THIS SHEET
(h) FOR DESIGN FILLS OVER 2'-0"
(i) FOR DESIGN FILLS 2'-0" OR LESS

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
DENNIS W. REDMON
NUMBER PE-27141
PROFESSIONAL ENGINEER

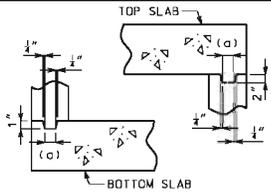
CONCRETE SINGLE BOX CULVERT

SKEW: SQUARED
WINGS: STRAIGHT

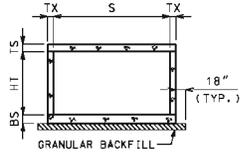
REINFORCEMENT

DATE EFFECTIVE:	07/01/2015	703.10J	SHEET NO.
DATE PREPARED:	5/13/2015		2 OF 3

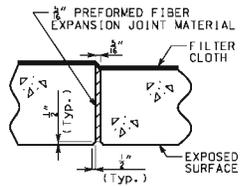
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KEYED CONSTRUCTION JOINT
 (c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



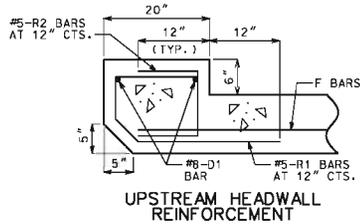
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



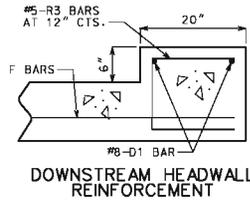
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

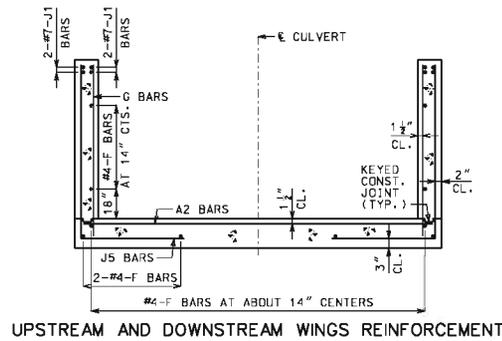
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



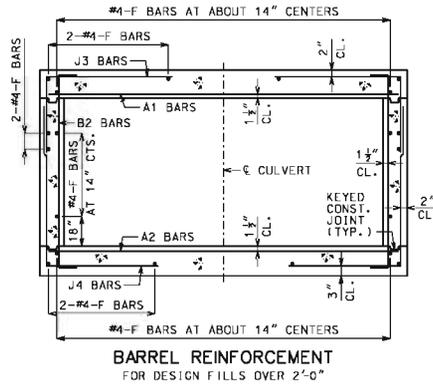
UPSTREAM HEADWALL REINFORCEMENT



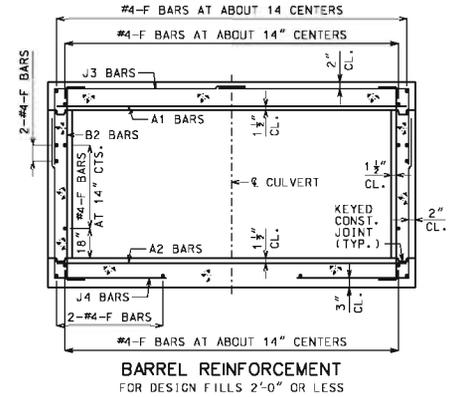
DOWNSTREAM HEADWALL REINFORCEMENT



UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO ϵ CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

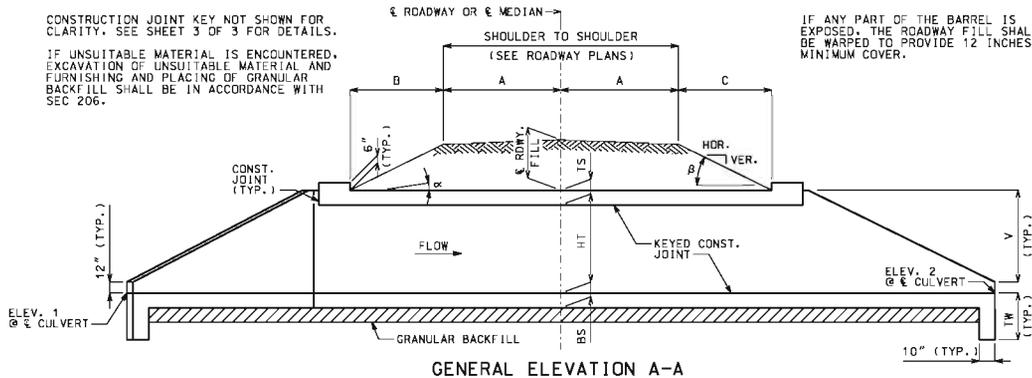
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE SINGLE BOX CULVERT SKEW: SQUARED WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/13/2015	703.10J SHEET NO. 3 OF 3

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

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY. SEE SHEET 3 OF 3 FOR DETAILS.

IF UNSUITABLE MATERIAL IS ENCOUNTERED, EXCAVATION OF UNSUITABLE MATERIAL AND FURNISHING AND PLACING OF GRANULAR BACKFILL SHALL BE IN ACCORDANCE WITH SEC 206.

IF ANY PART OF THE BARREL IS EXPOSED, THE ROADWAY FILL SHALL BE WARPED TO PROVIDE 12" MINIMUM COVER.



GENERAL ELEVATION A-A

CHANNEL BOTTOM SHALL BE GRADED WITHIN RIGHT OF WAY FOR TRANSITION OF CHANNEL BED TO CULVERT OPENINGS. CHANNEL BANKS SHALL BE TAPERED TO MATCH CULVERT OPENINGS.

EQUATIONS FOR COMPUTING α , β , B AND C

α = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO ϵ ROADWAY OR ϵ MEDIAN = $\text{ARCTAN} \left(\frac{\text{ELEV. 1} - \text{ELEV. 2}}{W} \right)$

β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO ϵ ROADWAY OR ϵ MEDIAN = $\text{ARCTAN} \left(\frac{\text{VER.}}{\text{HOR.}} \right)$

B = HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO ϵ ROADWAY OR ϵ MEDIAN = $\frac{\text{RDWY. FILL} + A(\text{CS}) - A(\text{TAN } \alpha)}{\text{TAN } \beta + \text{TAN } \alpha}$

C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO ϵ ROADWAY OR ϵ MEDIAN = $\frac{\text{RDWY. FILL} + A(\text{CS}) + A(\text{TAN } \alpha)}{\text{TAN } \beta - \text{TAN } \alpha}$

CS = CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN, LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM ϵ ROADWAY OR ϵ MEDIAN.

THE TERM "A(CS)" IS THE DIFFERENCE IN ELEVATION BETWEEN ϵ ROADWAY OR ϵ MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO ϵ ROADWAY OR ϵ MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS.

TO ACCOUNT FOR A VARYING PROFILE GRADE THE ϵ ROADWAY FILL SHALL BE BASED ON STATIONS THAT CORRESPOND TO THE CORNERS OF THE INSIDE FACE OF THE HEADWALLS THAT PRODUCE MAXIMUM VALUES FOR B AND C.

SEE ROADWAY PLANS FOR SLOPES, ϵ ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

LAYOUT DIMENSIONS			
VARIABLE	DIMENSION	VARIABLE	DIMENSION
α	SEE EQUATIONS	P	$2V(\text{SEC } 20^\circ)$
B	SEE EQUATIONS	Q	$TX(\text{COS } 20^\circ)$
B	SEE EQUATIONS	R	$P(\text{COS } 20^\circ)$
C	SEE EQUATIONS	U	$(R + M)(\text{TAN } 20^\circ)$
D	$R + M + N + 20"$	V	$HT + TS - 12"$
E	$G + 23"$	W	$2A + B + C + D + E$
F	$S + 2TX$	Y	$TX(\text{SIN } 20^\circ)$
G	2V	KK	$S/2 + U$
M	$N(\text{COS } 20^\circ)$	TW	$\text{MAX}(3'-4" \text{ OR } (BS + 12"))$
N	$3" + TX(\text{TAN } 10^\circ)$		

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

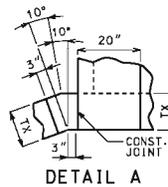
DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) $f'c = 4,000$ PSI
REINFORCING STEEL (GRADE 60) $f_y = 60,000$ PSI

MISCELLANEOUS:
FOR REINFORCEMENT DETAILS, SEE SHEET 2 OF 3. FOR SECTION DETAILS, SEE SHEET 3 OF 3. FOR MEMBER THICKNESS, SEE 703.17.

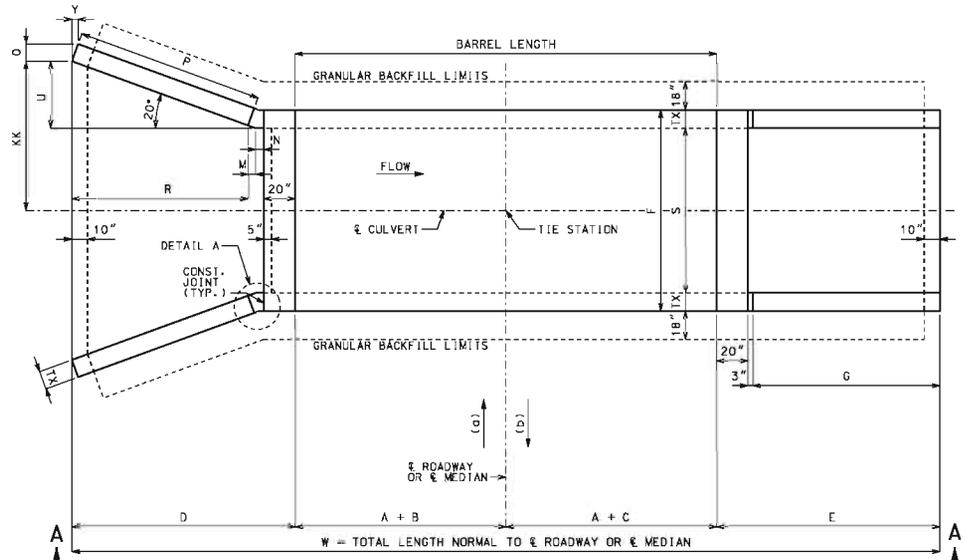
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULVERT SECTIONS ARE USED, THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINGS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.



DETAIL A



PLAN OF LAYOUT DIMENSIONS

(a) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.

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

CONCRETE SINGLE BOX CULVERT
SKEW: SQUARED
WINGS: FLARED
LAYOUT

DATE EFFECTIVE: 07/01/2015
DATE PREPARED: 5/13/2015

703.11J

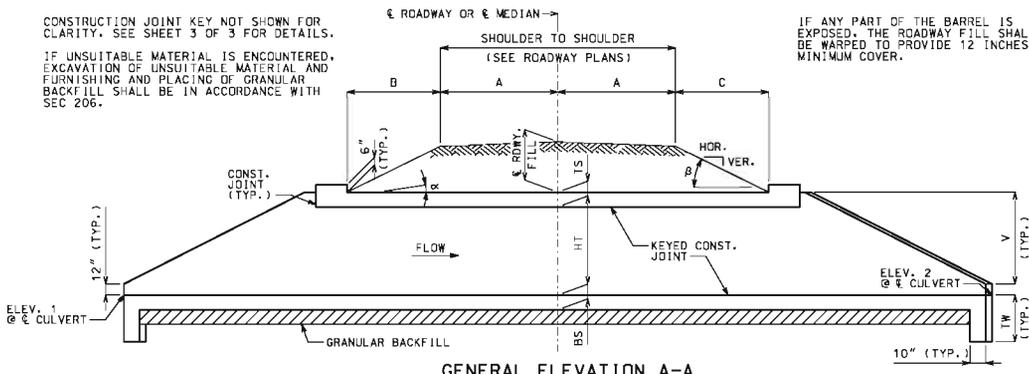
SHEET NO. 1 OF 3

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

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY. SEE SHEET 3 OF 3 FOR DETAILS.

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β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO ϵ ROADWAY OR ϵ MEDIAN = $\text{ARCTAN} \left(\frac{\text{VER.}}{\text{HOR.}} \right)$

B = HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO ϵ ROADWAY OR ϵ MEDIAN = $\frac{\text{ELEV. 1} - \text{ELEV. 2}}{\text{TAN} \beta + \text{TAN} \alpha}$

C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO ϵ ROADWAY OR ϵ MEDIAN = $\frac{\text{ELEV. 1} - \text{ELEV. 2}}{\text{TAN} \beta - \text{TAN} \alpha}$

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LAYOUT DIMENSIONS			
VARIABLE	DIMENSION	VARIABLE	DIMENSION
α	SEE EQUATIONS	T	G(SEC Z)
B	SEE EQUATIONS	V	HT + TS - 12"
B	SEE EQUATIONS	W	2A + B + C + 2E
C	SEE EQUATIONS	X	3" + TX(TAN Z)
E	G + D + 20"	Z	SKEW ANGLE
F	S + 2TX	BB	(A + B)(SEC Z)
G	2V	CC	(A + C)(SEC Z)
H	(A + C + E)(TAN Z)	EE	E(SEC Z)
I	3"(CDS Z)	HH	20"(SEC Z)
J	(A + B + E)(TAN Z)	QQ	TX(COS Z)
K	S(SEC Z)/2	YY	TX(SIN Z)
L	2EE + BB + CC	TW	MAX{3'-4" OR (BS + 12")}
Q	I + YY		

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD. EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

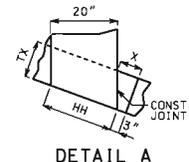
DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) $f'c = 4,000$ PSI
REINFORCING STEEL (GRADE 60) $f_y = 60,000$ PSI

MISCELLANEOUS:
FOR REINFORCEMENT DETAILS, SEE SHEET 2 OF 3. FOR SECTION DETAILS, SEE SHEET 3 OF 3. FOR MEMBER THICKNESS, SEE 703.17.

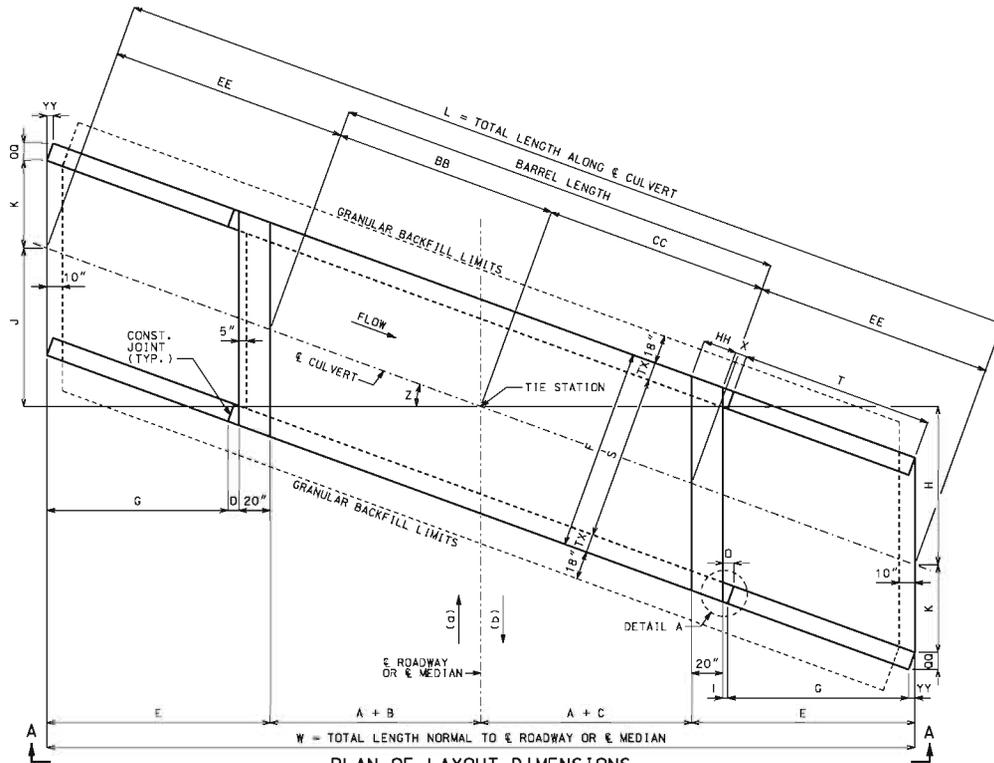
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

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DETAIL A



PLAN OF LAYOUT DIMENSIONS

(a) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

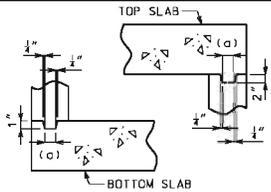
CONCRETE SINGLE BOX CULVERT

SKEW: LEFT AVANCE
WINGS: STRAIGHT

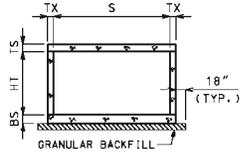
LAYOUT

DATE EFFECTIVE:	07/01/2015	703.12J	SHEET NO.
DATE PREPARED:	5/13/2015		1 OF 3

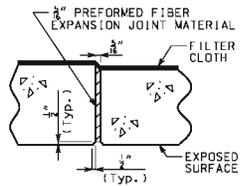
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



KEYED CONSTRUCTION JOINT
 (c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



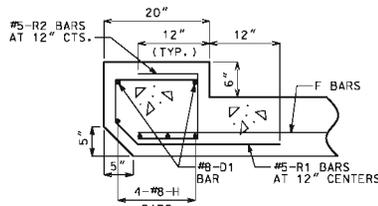
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



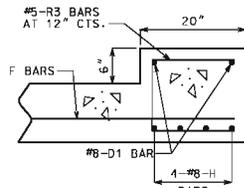
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

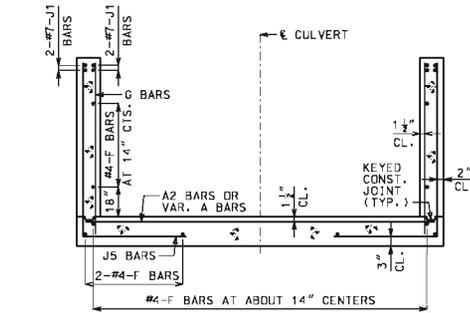
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



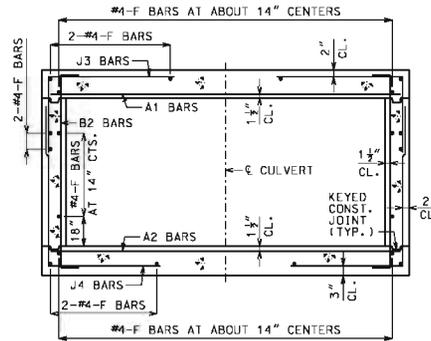
UPSTREAM HEADWALL REINFORCEMENT



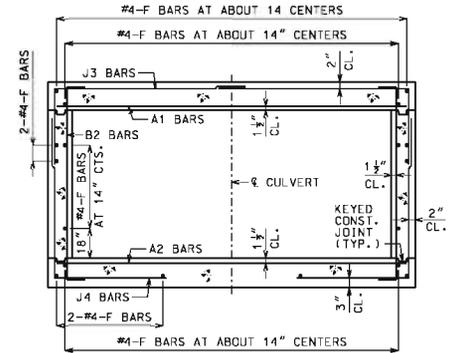
DOWNSTREAM HEADWALL REINFORCEMENT



UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.

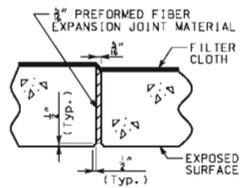
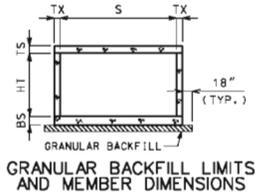
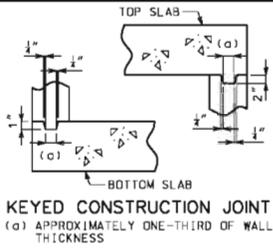
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO & CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2\"/>

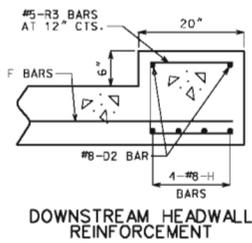
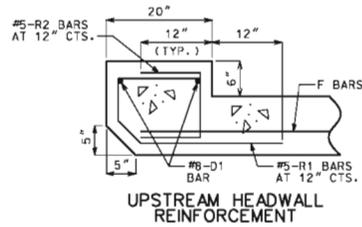
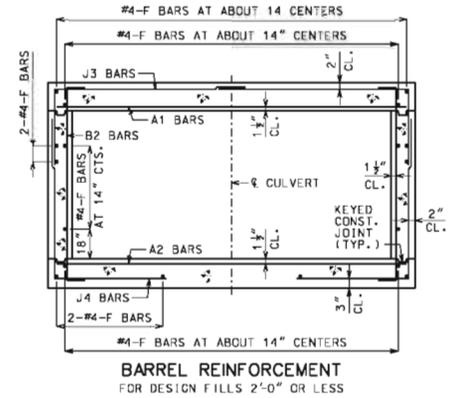
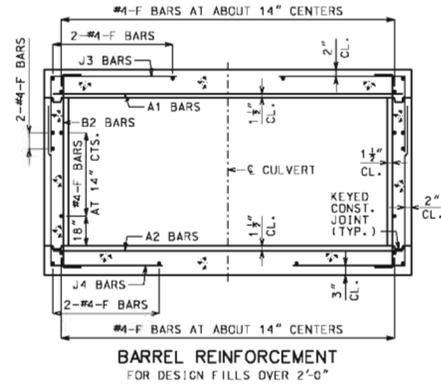
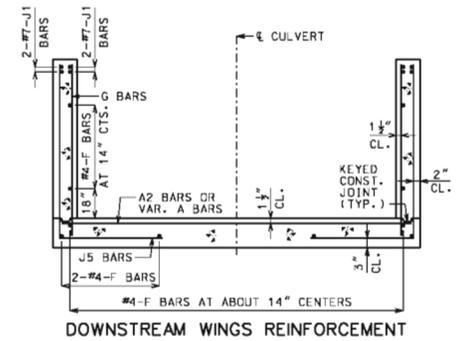
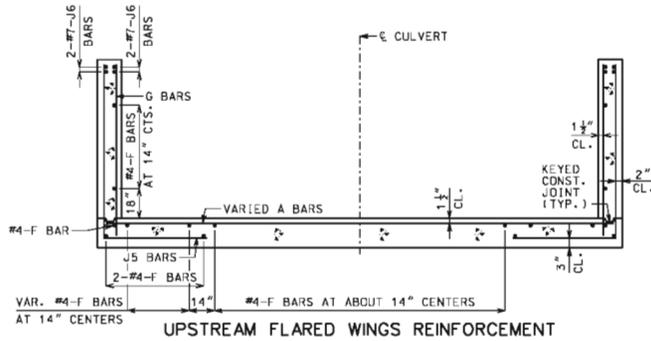
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE SINGLE BOX CULVERT SKEW: LEFT AVANCE WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/13/2015	703.12J SHEET NO. 3 OF 3

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



PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

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GENERAL NOTES:
 FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.

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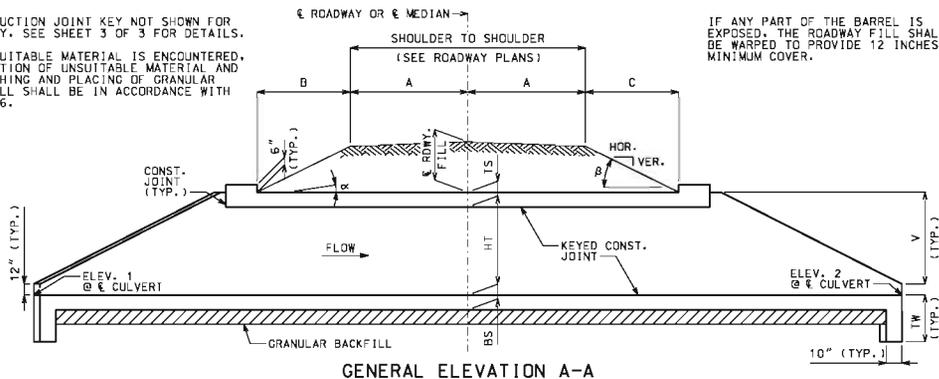
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE SINGLE BOX CULVERT SKEW: LEFT ADVANCE WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/13/2015	703.13J SHEET NO. 3 OF 3

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

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY. SEE SHEET 3 OF 3 FOR DETAILS.

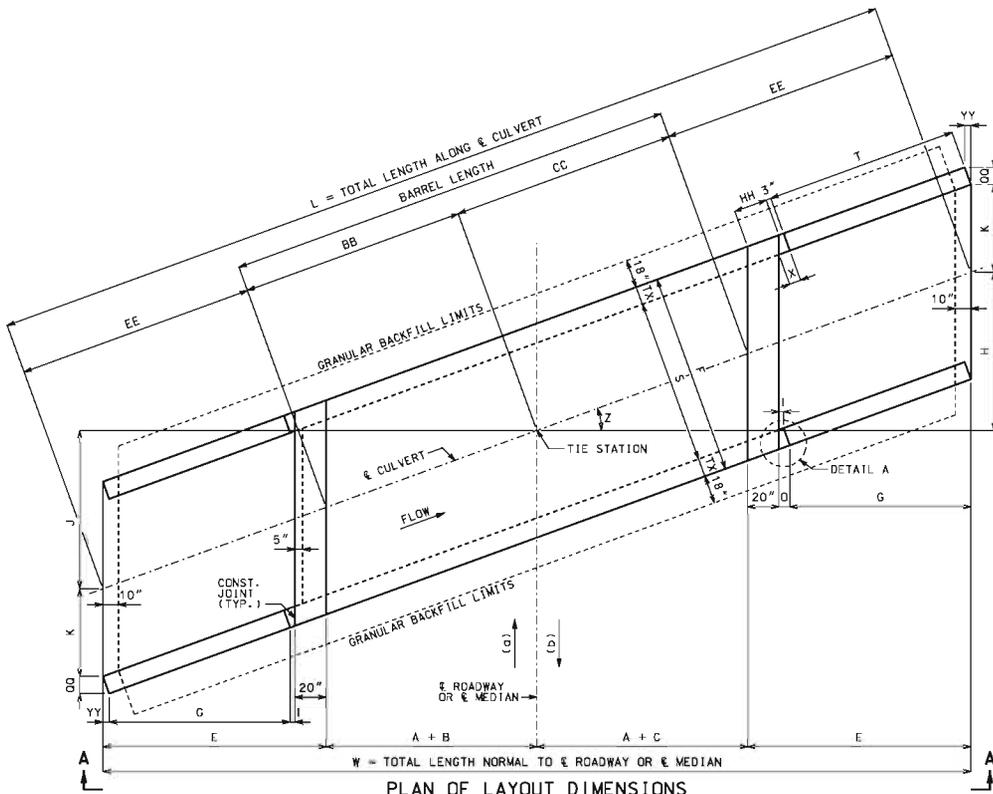
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GENERAL ELEVATION A-A

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PLAN OF LAYOUT DIMENSIONS

(a) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.

EQUATIONS FOR COMPUTING α , β , B AND C

α = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO ROADWAY OR MEDIAN = $\arctan\left(\frac{\text{ELEV. 1} - \text{ELEV. 2}}{W}\right)$

β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO ROADWAY OR MEDIAN = $\arctan\left(\frac{\text{HOR.}}{\text{VER.}}\right)$

B = HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO ROADWAY OR MEDIAN = $\frac{\text{ROADWAY FILL} + A(CS) - A(\tan\alpha)}{\tan\beta + \tan\alpha}$

C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO ROADWAY OR MEDIAN = $\frac{\text{ROADWAY FILL} + A(CS) + A(\tan\alpha)}{\tan\beta - \tan\alpha}$

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LAYOUT DIMENSIONS

VARIABLE	DIMENSION	VARIABLE	DIMENSION
α	SEE EQUATIONS	T	G(SEC Z)
B	SEE EQUATIONS	V	HT + TS - 12"
B	SEE EQUATIONS	W	2A + B + C + 2E
C	SEE EQUATIONS	X	3" + TX(TAN Z)
E	G + D + 20"	Z	SKEW ANGLE
F	S + 2TX	BB	(A + B)(SEC Z)
G	2V	CC	(A + C)(SEC Z)
H	(A + C + E)(TAN Z)	EE	E(SEC Z)
I	3"(COS Z)	HH	20"(SEC Z)
J	(A + B + E)(TAN Z)	QQ	TX(COS Z)
K	S(SEC Z)/2	YY	TX(SIN Z)
L	2EE + BB + CC	TW	MAX{3'-4" OR (BS + 12")}
D	I + YY		

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

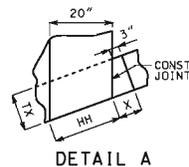
DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) f'c = 4,000 PSI
REINFORCING STEEL (GRADE 60) fy = 60,000 PSI

MISCELLANEOUS:
FOR REINFORCEMENT DETAILS, SEE SHEET 2 OF 3. FOR SECTION DETAILS, SEE SHEET 3 OF 3. FOR MEMBER THICKNESS, SEE 703.17.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

WHEN ALTERNATE PRECAST CONCRETE BOX CULVERT SECTIONS ARE USED, THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINGS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.



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

STATE OF MISSOURI
DENNIS W. HEDGEMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER

CONCRETE SINGLE BOX CULVERT
SKEW: RIGHT ADVANCE
WINGS: STRAIGHT

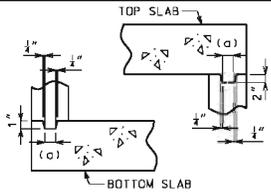
LAYOUT

DATE EFFECTIVE: 07/01/2015
DATE PREPARED: 5/13/2015

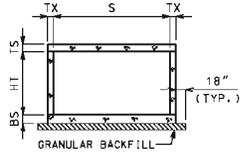
703.14J

SHEET NO. 1 OF 3

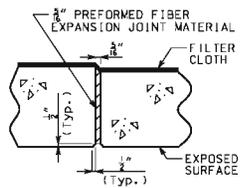
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



KEYED CONSTRUCTION JOINT
 (c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



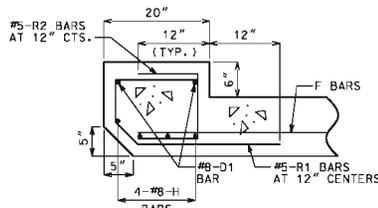
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



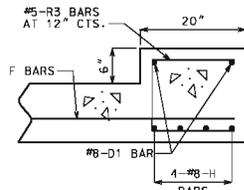
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

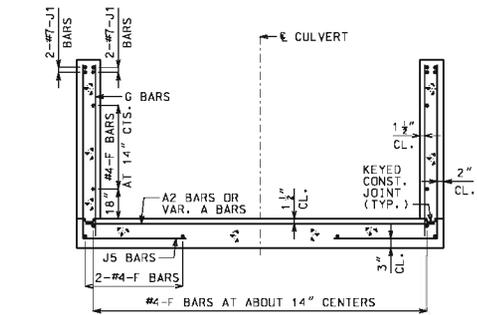
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



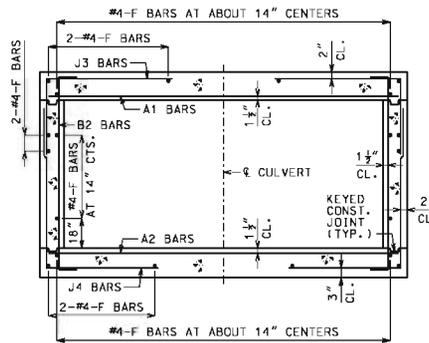
UPSTREAM HEADWALL REINFORCEMENT



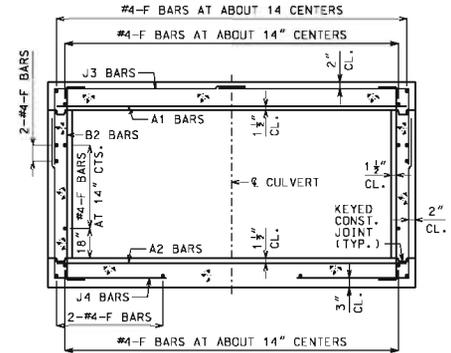
DOWNSTREAM HEADWALL REINFORCEMENT



UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT
 FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT
 FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO & CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

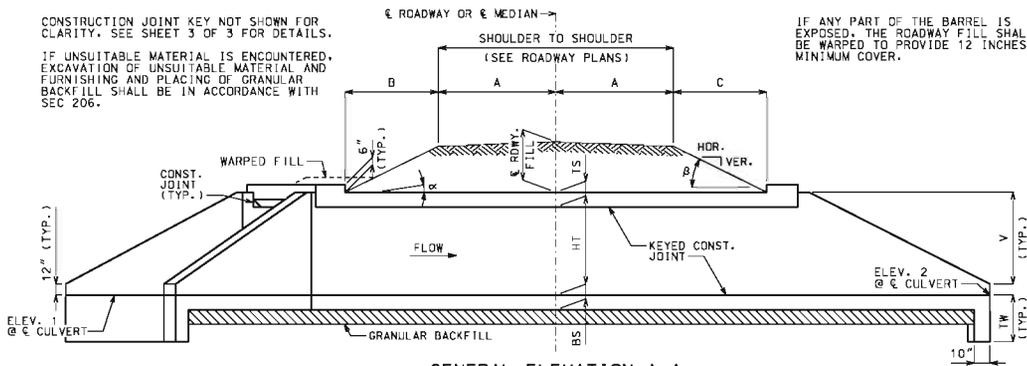
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE SINGLE BOX CULVERT SKEW: RIGHT ADVANCE WINGS: STRAIGHT SECTIONS	
DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/13/2015	703.14J	SHEET NO. 3 OF 3

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

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY. SEE SHEET 3 OF 3 FOR DETAILS.

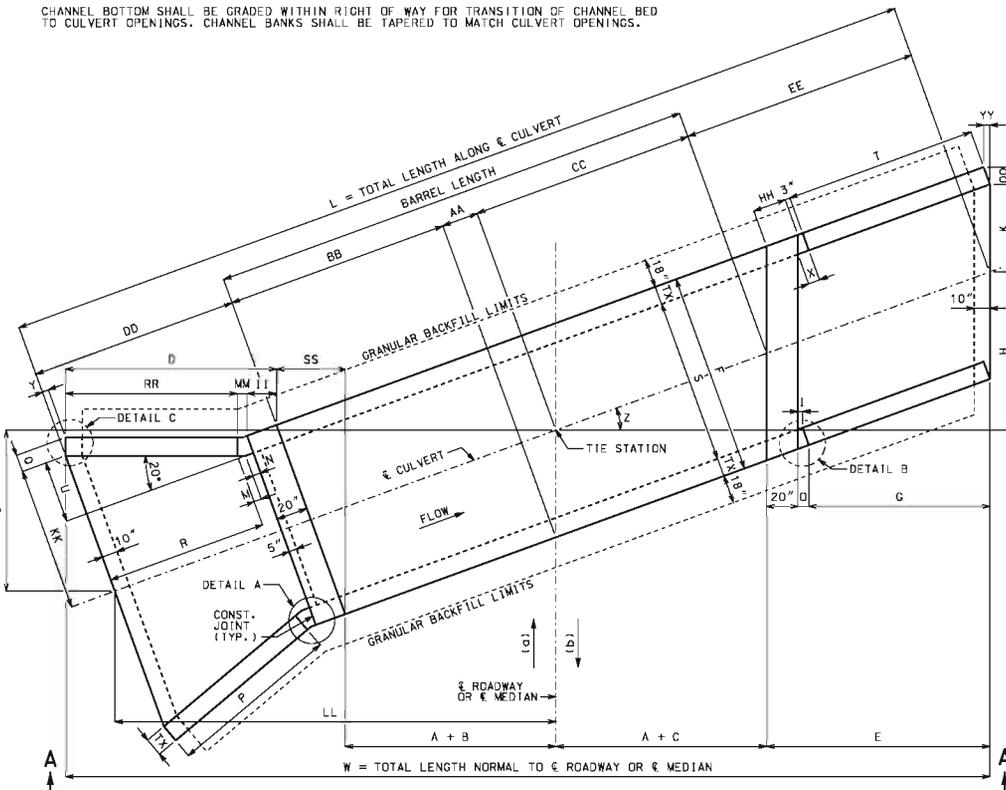
IF UNSUITABLE MATERIAL IS ENCOUNTERED, EXCAVATION OF UNSUITABLE MATERIAL AND FURNISHING AND PLACING OF GRANULAR BACKFILL SHALL BE IN ACCORDANCE WITH SEC 206.

IF ANY PART OF THE BARREL IS EXPOSED, THE ROADWAY FILL SHALL BE WARPED TO PROVIDE 12 INCHES MINIMUM COVER.



GENERAL ELEVATION A-A

CHANNEL BOTTOM SHALL BE GRADED WITHIN RIGHT OF WAY FOR TRANSITION OF CHANNEL BED TO CULVERT OPENINGS. CHANNEL BANKS SHALL BE TAPERED TO MATCH CULVERT OPENINGS.



PLAN OF LAYOUT DIMENSIONS

(a) AHEAD STATION WHERE STREAM FLOWS LEFT TO RIGHT. (b) AHEAD STATION WHERE STREAM FLOWS RIGHT TO LEFT.

EQUATIONS FOR COMPUTING α , β , B AND C

α = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO & ROADWAY OR & MEDIAN = $\arctan\left(\frac{ELEV. 1 - ELEV. 2}{A + C + E + LL}\right)$

β = ANGLE OF FILL SLOPE WITH HORIZONTAL NORMAL TO & ROADWAY OR & MEDIAN = $\arctan\left(\frac{VER.}{HOR.}\right)$

B = HORIZONTAL DISTANCE FROM UPSTREAM EDGE OF SHOULDER TO = & ROADWAY, FILL + A(CS) - A(TAN α)
UPSTREAM HEADWALL NORMAL TO & ROADWAY OR & MEDIAN
 $\frac{A}{TAN\beta} + TAN\alpha$

C = HORIZONTAL DISTANCE FROM DOWNSTREAM EDGE OF SHOULDER TO = & ROADWAY, FILL + A(CS) + A(TAN α)
DOWNSTREAM HEADWALL NORMAL TO & ROADWAY OR & MEDIAN
 $\frac{A}{TAN\beta} - TAN\alpha$

CS = CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN, LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM & ROADWAY OR & MEDIAN.

THE TERM "A(CS)" IS THE DIFFERENCE IN ELEVATION BETWEEN & ROADWAY OR & MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO & ROADWAY OR & MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS. TO ACCOUNT FOR A VARYING PROFILE GRADE THE & ROADWAY FILL SHALL BE BASED ON STATIONS THAT CORRESPOND TO THE CORNERS OF THE INSIDE FACE OF THE HEADWALLS THAT PRODUCE MAXIMUM VALUES FOR B AND C.

SEE ROADWAY PLANS FOR SLOPES, & ROADWAY FILL AND ELEVATIONS 1 AND 2. ELEVATIONS 1 AND 2 CORRESPOND TO UPPER AND LOWER FLOW LINE ELEVATIONS AND MAY BE BELOW THE NATURAL STREAM BOTTOM DUE TO ENVIRONMENTAL REQUIREMENTS.

LAYOUT DIMENSIONS

VARIABLE	DIMENSION	VARIABLE	DIMENSION	VARIABLE	DIMENSION
α	SEE EQUATIONS	N	$3" + TX(TAN 10^\circ)$	CC	$(A + C)(SEC Z)$
B	SEE EQUATIONS	O	$I + YY$	DD	$R + M + N + 20"$
B	SEE EQUATIONS	P	$2Y[SEC(Z + 20^\circ)]$	EE	$E(SEC Z)$
C	SEE EQUATIONS	O	$TX(COS 20^\circ)$	HH	$20"(SEC Z)$
D	$Z \geq 20^\circ: II + MM + RR$	R	$P(COS 20^\circ)$	II	$20"(COS Z)$
		T	$G(SEC Z)$	KK	$S/2 + U$
E	$G + O + 20"$	U	$(R + M)(TAN 20^\circ)$	LL	$(AA + BB + DD)(COS Z)$
F	$S + 2TX$	V	$HT + TS - 12"$	MM	$3"[COS Z + COS(Z - 20^\circ)]$
G	2V	W	$2A + B + C + D + E + SS$	OO	$TX(COS Z)$
H	$(A + C + E)(TAN Z)$	X	$3" + TX(TAN Z)$	RR	$P[COS(Z - 20^\circ)]$
I	$3"(COS Z)$	Y	$TX(SIN 20^\circ)$	SS	$F(SIN Z)$
J	$(AA + BB + DD)(SIN Z)$	Z	SKEW ANGLE	TT	$TX[SIN(20^\circ - Z)]$
K	$S(SEC Z)/2$	AA	$F(TAN Z)/2$	YY	$TX(SIN Z)$
L	$AA + BB + CC + DD + EE$	BB	$(A + B)(SEC Z)$	TW	$MAX\{3'-4" \text{ OR } (BS + 12")\}$
M	$N(COS 20^\circ)$				

GENERAL NOTES:

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

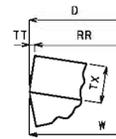
DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) f'_c = 4,000 PSI
REINFORCING STEEL (GRADE 60) f_y = 60,000 PSI

MISCELLANEOUS:
FOR REINFORCEMENT DETAILS, SEE SHEET 2 OF 3. FOR SECTION DETAILS, SEE SHEET 3 OF 3. FOR MEMBER THICKNESS, SEE 703.17.

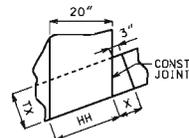
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

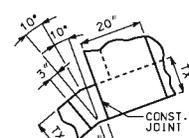
WHEN ALTERNATE PRECAST CONCRETE BOX CULVERT SECTIONS ARE USED, THE MINIMUM DISTANCE FROM INSIDE FACE OF HEADWALLS TO PRECAST SECTIONS MEASURED ALONG THE SHORTEST WALL SHALL BE 3 FEET. REINFORCEMENT AND DIMENSIONS FOR WINGS AND HEADWALLS SHALL BE IN ACCORDANCE WITH MISSOURI STANDARD PLANS.



DETAIL C
For Z < 20°



DETAIL B



DETAIL A

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

CONCRETE SINGLE BOX CULVERT
 SKEW: RIGHT ADVANCE
 WINGS: FLARED
 LAYOUT

DATE EFFECTIVE: 07/01/2015
 DATE PREPARED: 6/4/2015
703.15E
 SHEET NO. 1 OF 3

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

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

LAYING OUT TRANSVERSE JOINTS

UNLESS SHOWN ON ROADWAY OR BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

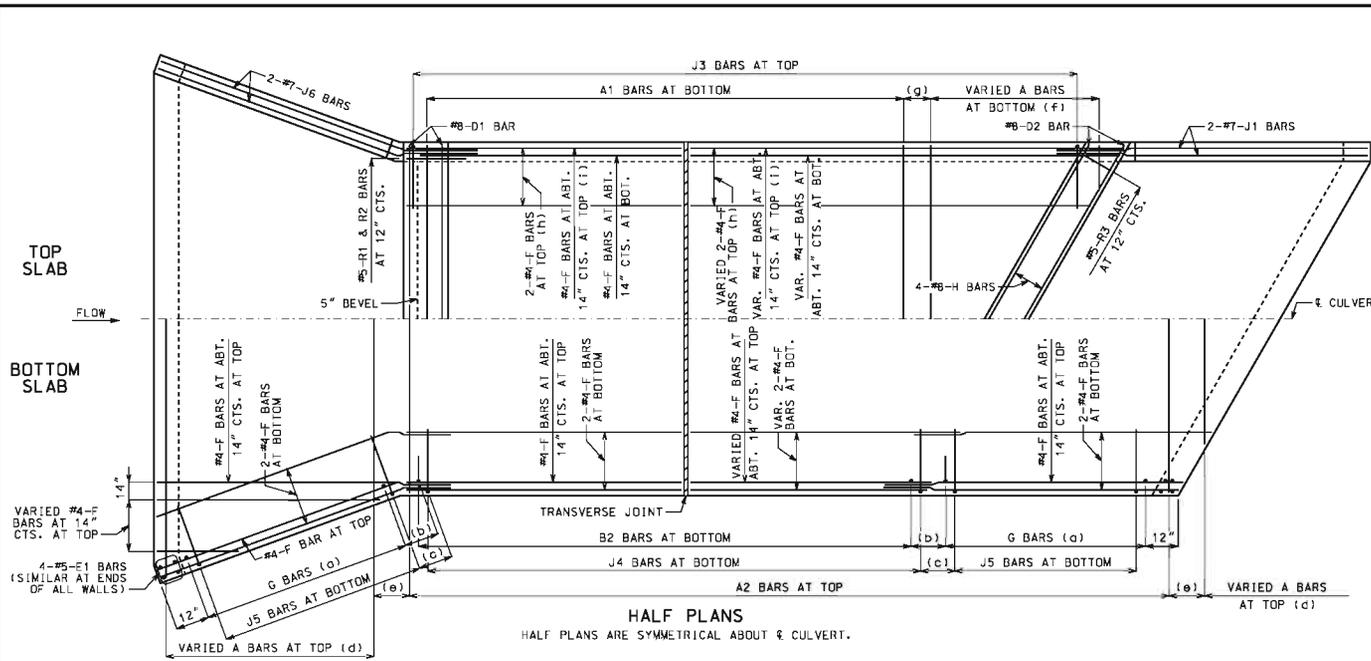
TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT
CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.16.



HALF PLANS
HALF PLANS ARE SYMMETRICAL ABOUT ϕ CULVERT.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.17. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN HALF PLANS AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS B2 BARS

(b) VARIES, 12" MAXIMUM

(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

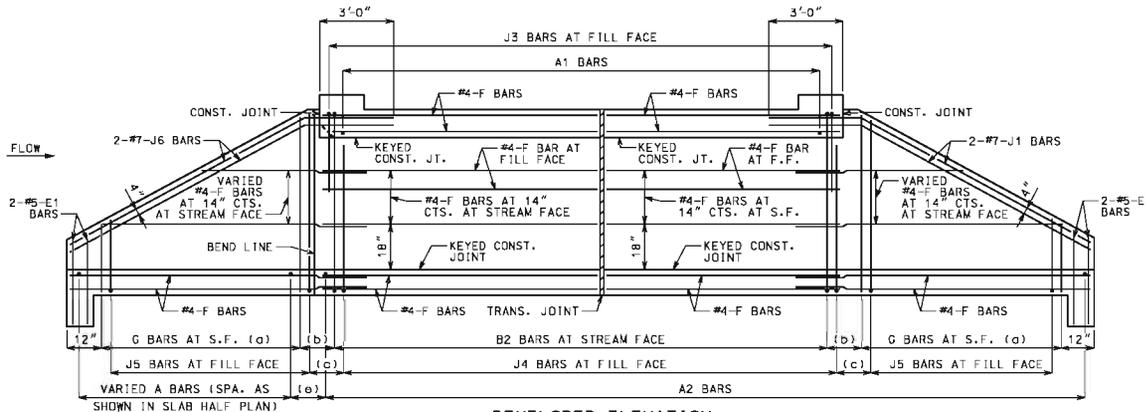
(e) A2 BAR SPACING

(f) SAME SIZE AND SPACING AS A1 BARS

(g) A1 BAR SPACING

(h) FOR DESIGN FILLS OVER 2'-0"

(i) FOR DESIGN FILLS 2'-0" OR LESS



DEVELOPED ELEVATION
J1 AND J6 BARS MAY BE BENT IN FIELD OR SHOP.

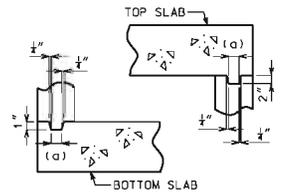
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



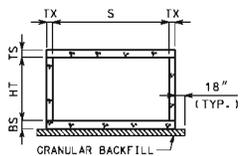
CONCRETE SINGLE BOX CULVERT
SKEW: RIGHT ADVANCE
WINGS: FLARED

REINFORCEMENT

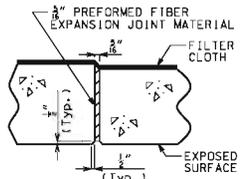
DATE EFFECTIVE:	07/01/2015	703.15E	SHEET NO. 2 OF 3
DATE PREPARED:	5/13/2015		



KEYED CONSTRUCTION JOINT
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



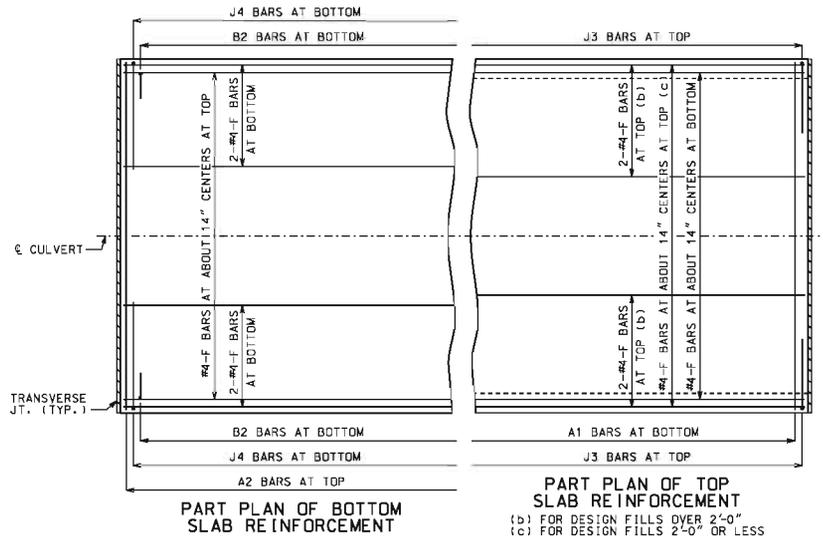
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

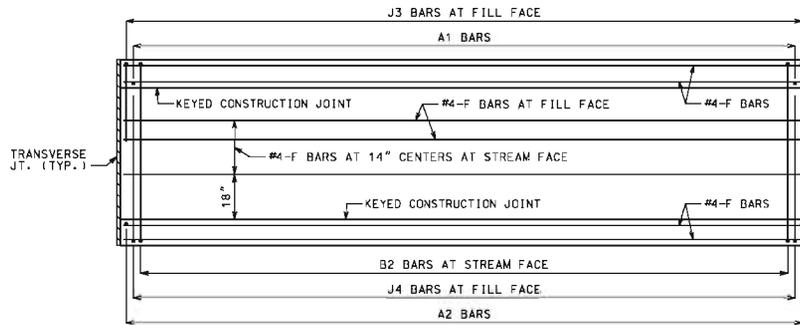
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



PART PLAN OF BOTTOM SLAB REINFORCEMENT

PART PLAN OF TOP SLAB REINFORCEMENT

(b) FOR DESIGN FILLS OVER 2'-0"
(c) FOR DESIGN FILLS 2'-0" OR LESS



ELEVATION OF WALL REINFORCEMENT

GENERAL NOTES

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 50 LB/CF (MIN.), 60 LB/CF (MAX.)

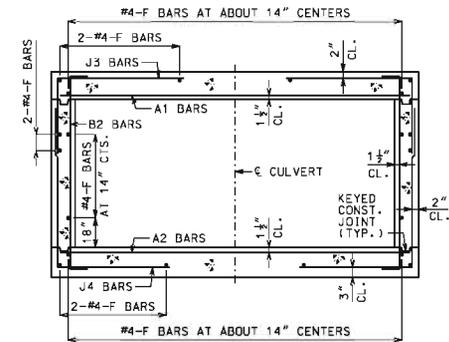
DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) $f'_c = 4,000$ PSI
REINFORCING STEEL (GRADE 60) $f_y = 60,000$ PSI

MISCELLANEOUS:
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS. SEE 703.17.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PART PLANS AND ELEVATION.

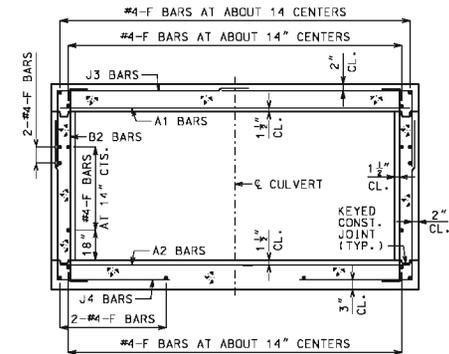
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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



BARREL REINFORCEMENT

FOR DESIGN FILLS OVER 2'-0"
SYMMETRICAL ABOUT AND NORMAL TO & CULVERT.



BARREL REINFORCEMENT

FOR DESIGN FILLS 2'-0" OR LESS
SYMMETRICAL ABOUT AND NORMAL TO & CULVERT.

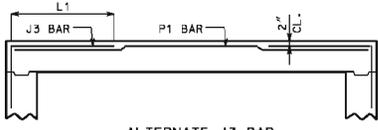
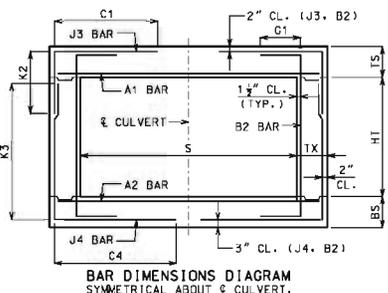
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE SINGLE BOX CULVERT CUT SECTION	
	DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 5/13/2015	703.16 SHEET NO. 1 OF 1

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

		SPAN (S) = 3 FT										HEIGHT (HT) = 2 FT OR 3 FT									
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS									
		A1 BARS		J3 BARS			A2 BARS		J4 BARS			B2 BARS									
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=2'	HT=3'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=2'	HT=3'	SIZE	SPA.	C1
1 FT	9	8	8	4	7	4	12	32.5	25.3	33.6	4	11.5	4	12	32.5	28	40	5	12	12	
2 FT	9	8	8	4	7	4	12	32.5	25.3	33.6	4	11.5	4	12	30.8	28	40	5	12	12	
4 FT	8	8	8	4	12	4	12	26.4	24.1	32.4	4	12	4	12	26.0	28	40	5	12	0	
6 FT	8	8	8	4	12	4	12	24.6	24.1	32.4	4	12	4	12	24.6	28	40	5	12	0	
8 FT	8	8	8	4	12	4	12	23.8	24.1	32.4	4	12	4	12	23.8	28	40	5	12	0	
10 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0	
12 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0	
14 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0	
16 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0	
18 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	12	4	12	22.0	28	40	5	12	0	
20 FT	8	8	8	4	12	4	12	22.0	24.1	32.4	4	11	4	12	22.0	28	40	5	12	0	
22 FT	8	8	8	4	11.5	4	12	22.0	24.1	32.4	4	10	4	12	22.0	28	40	5	12	0	
24 FT	8	8	8	4	10.5	4	12	22.0	24.1	32.4	4	9	4	12	22.0	28	40	5	12	0	
26 FT	8	8	8	4	9.5	4	12	22.0	24.1	32.4	4	8.5	4	11.5	22.0	28	40	5	12	0	
28 FT	8	8	8	4	9	4	11.5	22.0	24.1	32.4	4	8	4	10.5	22.0	28	40	5	12	0	
30 FT	8	8	8	4	8.5	4	11	22.0	24.1	32.4	4	7.5	4	10	22.0	28	40	5	12	0	
32 FT	8	8	8	4	8	4	10	22.0	24.1	32.4	4	7	4	9.5	22.0	28	40	5	12	0	
34 FT	8	8	8	4	7.5	4	9.5	22.0	24.1	32.4	4	6.5	4	8.5	22.0	28	40	5	12	0	
36 FT	8	8	8	4	7	4	9	22.0	24.1	32.4	4	6	4	8	22.0	28	40	5	12	0	
38 FT	8	8	8	4	6.5	4	8.5	22.0	24.1	32.4	5	9	4	8	22.0	28	40	5	12	0	
40 FT	8	8	8	4	6.5	4	8	22.0	24.1	32.1	4	6	4	11	21.5	29	41	5	12	0	
42 FT	8	8	8	4	6	4	8	22.0	24.1	32.1	5	9	4	10	21.5	29	41	5	12	0	
44 FT	8	8	8	4	6	4	7.5	22.0	24.1	32.1	5	8.5	4	10	21.5	29	41	5	12	0	
46 FT	8	8	8	4	6	4	7	22.0	24.1	32.1	5	8	4	9.5	21.5	29	41	5	12	0	
48 FT	8	10	8	4	6	4	7	22.0	24.0	31.9	5	8.5	4	12	21.5	30	42	5	12	0	
50 FT	8	10	8	4	6	4	6.5	22.0	24.0	31.9	5	8	4	12	21.5	30	42	5	12	0	

		SPAN (S) = 3 FT										HEIGHT (HT) = 4 FT OR 5 FT									
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS									
		A1 BARS		J3 BARS			A2 BARS		J4 BARS			B2 BARS									
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=4'	HT=5'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=4'	HT=5'	SIZE	SPA.	C1
1 FT	9	8	8	4	6.5	4	12	32.5	25.3	30.3	4	10.5	4	12	32.5	52	64	5	12	12	
2 FT	9	8	8	4	6.5	4	12	32.5	25.3	30.3	4	10	4	12	32.5	52	64	5	12	12	
4 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	12	4	12	32.5	52	64	5	12	0	
6 FT	8	8	8	4	12	4	12	36.1	24.3	29.1	4	12	4	12	35.5	52	64	5	12	0	
8 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	12	4	12	32.5	52	64	5	12	0	
10 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	12	4	12	32.5	52	64	5	12	0	
12 FT	8	8	8	4	12	4	12	35.6	24.3	29.1	4	12	4	12	32.5	52	64	5	12	0	
14 FT	8	8	8	4	12	4	12	34.4	24.3	29.1	4	12	4	11.5	36.1	52	64	5	12	0	
16 FT	8	8	8	4	12	4	12	33.5	24.3	29.1	4	12	4	11	35.3	52	64	5	12	0	
18 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	12	4	10.5	34.8	52	64	5	12	0	
20 FT	8	8	8	4	12	4	12	31.6	24.3	29.1	4	10.5	4	10	34.4	52	64	5	12	0	
22 FT	8	8	8	4	11.5	4	11	31.6	24.3	29.1	4	9.5	4	9.5	33.9	52	64	5	12	0	
24 FT	8	8	8	4	10.5	4	10	31.6	24.3	29.1	4	9	4	9	33.9	52	64	5	12	0	
26 FT	8	8	8	4	9.5	4	9.5	31.3	24.3	29.1	4	8.5	4	8	33.5	52	64	5	12	0	
28 FT	8	8	8	4	9	4	8.5	31.3	24.3	29.1	4	7.5	4	7.5	33.0	52	64	5	12	0	
30 FT	8	8	8	4	8.5	4	8	31.3	24.3	29.1	4	7	4	7	33.0	52	64	5	12	0	
32 FT	8	8	8	4	8	4	7.5	30.8	24.3	29.1	4	7	4	6.5	33.0	52	64	5	12	0	
34 FT	8	8	8	4	7.5	4	7	30.8	24.3	29.1	4	6.5	4	6.5	32.5	52	64	5	12	0	
36 FT	8	8	8	4	7	4	7	30.8	24.3	29.1	4	6	4	6	32.5	52	64	5	12	0	
38 FT	8	8	8	4	6.5	4	6.5	30.8	24.3	29.1	5	9	5	7	32.5	52	64	5	12	0	
40 FT	8	8	8	4	6.5	4	6	30.8	24.0	28.8	4	6	4	6.5	32.5	53	65	5	12	0	
42 FT	8	8	8	4	6	4	6	30.8	24.0	28.8	5	9	4	6	32.5	53	65	5	11.5	0	
44 FT	8	8	8	4	6	5	6.5	30.8	24.0	28.8	5	8.5	4	6	32.5	53	65	5	11	0	
46 FT	8	8	8	4	6	5	6.5	30.4	24.0	28.8	5	8	5	6.5	34.8	53	65	5	10.5	0	
48 FT	8	8	8	4	6	5	6	30.4	24.0	28.8	5	8	5	6.5	34.8	53	65	5	10	0	
50 FT	8	8	8	4	6	5	6	30.4	24.0	28.8	5	7.5	5	6	34.8	53	65	5	9.5	0	

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



ALTERNATE J3 BAR

AT CONTRACTOR'S OPTION, ALTERNATE J3 BARS MAY BE USED WHEN THE DISTANCE BETWEEN THE ENDS OF J3 BARS IN THE TOP SLAB IS LESS THAN 2'-0". DIMENSION L1 (NOT C1) SHALL BE USED WITH ALTERNATE J3 BARS, WHERE L1 IS EQUAL TO 18", 22" AND 28" FOR #4, #5 AND #6 BARS, RESPECTIVELY. ADDITIONAL P1 BARS ARE REQUIRED WITH ALTERNATE J3 BARS WITH A LENGTH EQUAL TO A1 BARS, AND SIZE AND SPACING EQUAL TO J3 BARS. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS SUBSTITUTION.

GENERAL NOTES:
IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE SINGLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 3 FEET HEIGHT (HT): 2 THRU 5 FEET	SHEET NO. 1 OF 14
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	703.17	THIS SHEET HAS BEEN E-SEALED AND DATED ELECTRONICALLY.

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

		SPAN (S) = 4 FT										HEIGHT (HT) = 2 FT OR 3 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS		J3 BARS		A2 BARS		J4 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	C1					
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE				SPA.				
1 FT	10	8	8	4	6	4	10.5	38.6	26.3	34.8	4	7	4	7	30.3	28	40	5	12	12			
2 FT	10	8	8	4	6	4	10.5	38.6	26.3	34.8	4	7	4	7	28.0	28	40	5	12	12			
4 FT	8	8	8	4	12	4	12	25.3	24.1	32.4	4	11	4	12	25.3	28	40	5	12	0			
6 FT	8	8	8	4	12	4	12	24.6	24.1	32.4	4	12	4	12	24.6	28	40	5	12	0			
8 FT	8	8	8	4	12	4	12	24.1	24.1	32.4	4	12	4	12	24.1	28	40	5	12	0			
10 FT	8	8	8	4	12	4	12	23.0	24.1	32.4	4	12	4	12	23.0	28	40	5	12	0			
12 FT	8	8	8	4	12	4	12	23.0	24.1	32.4	4	11	4	12	23.0	28	40	5	12	0			
14 FT	8	8	8	4	11	4	12	23.0	24.1	32.4	4	9.5	4	11.5	23.0	28	40	5	12	0			
16 FT	8	8	8	4	10	4	11	23.0	24.1	32.4	4	8.5	4	10	23.0	28	40	5	12	0			
18 FT	8	8	8	4	8.5	4	10	23.0	24.1	32.4	4	7.5	4	9	22.4	28	40	5	12	0			
20 FT	8	8	8	4	8	4	9	23.0	24.1	32.4	4	6.5	4	8	22.4	28	40	5	12	0			
22 FT	8	8	8	4	7	4	8	23.0	24.1	32.4	4	6	4	7.5	22.4	28	40	5	12	0			
24 FT	8	8	8	4	6.5	4	7.5	23.0	24.1	32.4	5	8.5	4	6.5	22.4	28	40	5	12	0			
26 FT	8	8	8	4	6	4	7	23.0	24.1	32.4	5	8	4	6	22.4	28	40	5	12	0			
28 FT	8	9	8	4	6	4	6.5	23.0	24.1	32.1	5	8	4	8	21.9	29	41	5	12	0			
30 FT	8	9	8	4	6	4	6	23.0	24.1	32.1	5	7.5	4	7.5	21.9	29	41	5	12	0			
32 FT	8	10	8	4	6	5	6.5	23.0	24.0	31.9	5	7.5	4	10	21.3	30	42	5	12	0			
34 FT	9	10	8	5	8.5	4	7	22.4	25.1	33.0	5	7.5	4	9.5	21.3	30	42	5	12	0			
36 FT	9	10	8	5	8.5	4	7	22.4	25.1	33.0	5	7	4	9	21.3	30	42	5	12	0			
38 FT	9	11	8	5	8.5	4	6.5	22.4	25.4	33.1	5	7	4	10	20.8	31	43	5	12	0			
40 FT	9	11	8	5	8.5	4	6	22.4	25.4	33.1	5	6.5	4	9.5	20.8	31	43	5	12	0			
42 FT	10	11	8	5	8	4	7	21.9	26.0	33.8	5	6.5	4	9	21.3	31	43	5	12	0			
44 FT	10	11	8	5	8	4	6.5	21.9	26.0	33.8	5	6.5	4	8.5	21.3	31	43	5	12	0			
46 FT	10	12	8	5	8	4	6.5	21.9	26.3	33.9	5	6	4	9.5	20.8	32	44	5	12	0			
48 FT	10	12	8	5	8	4	6	21.9	26.3	33.9	5	6	4	9.5	20.8	32	44	5	12	0			
50 FT	11	12	8	5	7.5	4	7	21.3	27.3	35.1	5	6	4	9.5	21.3	32	44	5	12	0			

		SPAN (S) = 4 FT										HEIGHT (HT) = 4 FT OR 5 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS		J3 BARS		A2 BARS		J4 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	C1					
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE				SPA.				
1 FT	10	8	8	5	9	4	10.5	38.6	26.3	31.4	4	6	4	8	38.6	52	64	5	12	12			
2 FT	10	8	8	5	9	4	10.5	38.6	26.3	31.4	4	6	4	7.5	38.6	52	64	5	12	12			
4 FT	8	8	8	4	11.5	4	12	38.6	24.3	29.1	4	9.5	4	11.5	38.6	52	64	5	12	0			
6 FT	8	8	8	4	12	4	12	35.9	24.3	29.1	4	11	4	11.5	35.9	52	64	5	12	0			
8 FT	8	8	8	4	12	4	12	32.5	24.3	29.1	4	11	4	11	32.5	52	64	5	12	0			
10 FT	8	8	8	4	12	4	12	28.0	24.3	29.1	4	11.5	4	11.5	28.0	52	64	5	12	0			
12 FT	8	8	8	4	12	4	12	27.5	24.3	29.1	4	10	4	10.5	28.0	52	64	5	12	0			
14 FT	8	8	8	4	10.5	4	12	27.5	24.3	29.1	4	9	4	10	27.5	52	64	5	12	0			
16 FT	8	8	8	4	9.5	4	11	26.9	24.3	29.1	4	8	4	9.5	27.5	52	64	5	12	0			
18 FT	8	8	8	4	8.5	4	9.5	26.9	24.3	29.1	4	7	4	8.5	27.5	52	64	5	12	0			
20 FT	8	8	8	4	7.5	4	9	26.9	24.3	29.1	4	6.5	4	7.5	27.5	52	64	5	12	0			
22 FT	8	8	8	4	7	4	8	26.9	24.3	29.1	4	6	4	7	27.5	52	64	5	12	0			
24 FT	8	8	8	4	6	4	7.5	26.9	24.3	29.1	5	8.5	4	6.5	26.9	52	64	5	12	0			
26 FT	8	8	8	4	6	4	6.5	26.9	24.3	29.1	5	8	4	6	26.9	52	64	5	12	0			
28 FT	8	9	8	4	6	4	6	26.9	24.0	28.8	5	8	4	7.5	27.5	53	65	5	12	0			
30 FT	8	9	8	4	6	4	6	26.9	24.0	28.8	5	7.5	4	7	27.5	53	65	5	12	0			
32 FT	8	9	8	4	6	5	6.5	26.9	24.0	28.8	5	7.5	4	6.5	27.5	53	65	5	12	0			
34 FT	9	10	8	5	8.5	4	6.5	26.9	25.4	30.4	5	7	4	7.5	28.0	54	66	5	12	0			
36 FT	9	10	8	5	8.5	4	6	26.9	25.4	30.4	5	7	4	7	28.0	54	66	5	12	0			
38 FT	9	10	8	5	8.5	4	6.5	26.9	25.4	30.4	5	7	4	7	28.0	54	66	5	12	0			
40 FT	9	11	8	5	8.5	4	6.5	26.9	25.3	30.0	5	6.5	4	7	28.5	55	67	5	12	0			
42 FT	10	11	8	5	8	4	7.5	27.5	26.3	31.1	5	6.5	4	6.5	28.5	55	67	5	12	0			
44 FT	10	11	8	5	8	4	6.5	27.5	26.3	31.1	5	6.5	4	6	28.5	55	67	5	12	0			
46 FT	10	11	8	5	8	4	6.5	27.5	26.3	31.1	5	6.5	4	6	28.5	55	67	5	12	0			
48 FT	10	12	8	5	8	4	6	27.5	26.0	30.8	5	6	4	6	29.1	56	68	5	11.5	0			
50 FT	11	12	8	5	7.5	4	8	28.0	27.0	32.0	5	6	4	6	29.1	56	68	5	11	0			

		SPAN (S) = 4 FT										HEIGHT (HT) = 6 FT OR 7 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS		J3 BARS		A2 BARS		J4 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	C1					
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE				SPA.				
1 FT	10	8	8	5	8.5	4	10.5	38.6	26.4	30.1	5	9	4	7	38.6	76	88	5	12	12			
2 FT	10	8	8	5	8.5	4	10.5	38.6	26.4	30.1	5	8.5	4	6.5	38.6	76	88	5	12	12			
4 FT	8	8	8	4	11	4	11	38.6	24.1	27.5	4	9	4	8	38.6	76	88	5	12	0			
6 FT	8	8	8	4	12	4	11	38.6	24.1	27.5	4	10.5	4	7	38.6	76	88	5	12	0			
8 FT	8	8	8	4	12	4	11	38.6	24.1	27.5	4	10.5	4	7	38.6	76	88	5	12	0			
10 FT	8	8	8	4	12	4	11	38.6	24.1	27.5	4	11	4	7	38.6	76	88	5	12	0			
12 FT	8	8	8	4	12	4	9.5	38.6	24.1	27.5	4	10	4	6.5	38.6	76	88	5	12	0			
14 FT	8	8	8	4	10.5	4	8	38.6	24.1	27.5	4	8.5	4	6	38.6	76	88	5	12	0			
16 FT	8	9	8	4	9.5	4	7	38.6	24.4	27.9	4	8.5	4	6.5	38.6	77	89	5	12	0			
18 FT	8	9	8	4	8.5	4	6.5	38.6	24.4	27.9	4	7.5	4	6	38.6	77	89	5	12	0			
20 FT	8	10	8	4	8	4	6	38.6	24.6	28.1	4	7.5	4	6	40.9								

		SPAN (S) = 5 FT						HEIGHT (HT) = 3 FT OR 4 FT												
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										WALL BARS								
		A1 BARS		J3 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	C1						
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE				SPA.					
1 FT	10	8	8	5	8	4	10.5	44.9	26.5	33.0	5	8.5	4	6	35.4	40	52	5	12	12
2 FT	10	8	8	5	8	4	10.5	44.9	26.5	33.0	5	8	4	6	32.0	40	52	5	12	12
4 FT	8	8	8	4	8.5	4	10.5	26.5	24.5	30.6	4	7.5	4	10	28.5	40	52	5	12	0
6 FT	8	8	8	4	10	4	12	21.3	24.5	30.6	4	8	4	10	27.3	40	52	5	12	0
8 FT	8	8	8	4	9.5	4	11	26.5	24.5	30.6	4	8	4	9.5	26.5	40	52	5	12	0
10 FT	8	8	8	4	10	4	12	25.1	24.5	30.6	4	8.5	4	10.5	25.1	40	52	5	12	0
12 FT	8	8	8	4	8.5	4	10	25.1	24.5	30.6	4	7	4	9	25.1	40	52	5	12	0
14 FT	8	8	8	4	7.5	4	8.5	25.1	24.5	30.6	4	6	4	7.5	25.1	40	52	5	12	0
16 FT	8	8	8	4	6.5	4	7.5	25.1	24.5	30.6	5	8.5	4	7	25.1	40	52	5	12	0
18 FT	8	8	8	4	6	4	6.5	25.1	24.5	30.6	5	8	4	6	25.1	40	52	5	12	0
20 FT	8	8	8	4	6	4	6	25.1	24.5	30.6	5	8	5	6.5	25.1	40	52	5	12	0
22 FT	8	9	8	4	6	5	6.5	25.1	24.0	30.0	5	7.5	4	7	23.8	41	53	5	12	0
24 FT	8	9	8	4	6	5	6	25.1	24.0	30.0	5	7.5	4	6.5	23.8	41	53	5	12	0
26 FT	9	10	8	5	8.5	4	6.5	24.5	25.0	31.0	5	7	4	8.5	23.8	42	54	5	12	0
28 FT	9	10	8	5	8.5	4	6	24.5	25.0	31.0	5	7	4	8	23.8	42	54	5	12	0
30 FT	9	11	8	5	8	5	6.5	24.5	25.5	31.5	5	6.5	4	9	23.1	43	55	5	12	0
32 FT	10	11	8	5	8	4	6	23.8	26.0	32.0	5	6.5	4	8	23.1	43	55	5	12	0
34 FT	10	12	8	5	7.5	5	7.5	23.8	26.5	32.5	5	6	4	8	22.5	44	56	5	12	0
36 FT	10	12	8	5	7	4	7.5	23.8	26.5	32.5	5	6	4	8.5	22.5	44	56	5	12	0
38 FT	11	12	8	5	7	4	6	23.8	27.0	33.0	5	6	4	8	23.1	44	56	5	12	0
40 FT	11	13	8	5	6.5	5	8.5	23.8	27.5	33.5	5	6	4	8.5	22.5	45	57	5	12	0
42 FT	12	13	8	5	6.5	4	6	23.1	28.0	34.0	5	6	4	8	23.1	45	57	5	12	0
44 FT	12	13	8	5	6.5	5	9	23.1	28.0	34.0	5	6	4	7.5	23.1	45	57	5	12	0
46 FT	12	14	8	5	6	5	8.5	23.8	28.5	34.5	6	8	4	7.5	22.5	46	58	5	12	0
48 FT	13	14	8	5	6	4	6	23.1	29.0	35.0	6	8	4	7.5	23.1	46	58	5	12	0
50 FT	13	14	8	5	6	5	8.5	23.1	29.0	35.0	6	8	4	7.5	23.1	46	58	5	12	0

		SPAN (S) = 5 FT						HEIGHT (HT) = 5 FT OR 6 FT														
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										WALL BARS										
		A1 BARS		J3 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	C1								
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE				SPA.							
1 FT	10	8	8	5	8	4	10.5	44.9	26.3	30.6	5	8	4	6	44.9	64	76	5	12	12		
2 FT	10	8	8	5	8	4	10.5	44.9	26.3	30.6	5	8	4	6	44.9	64	76	5	12	12		
4 FT	8	8	8	4	9	4	11	44.9	24.1	28.3	4	7	4	8.5	44.9	64	76	5	12	0		
6 FT	8	8	8	4	9	4	10.5	39.5	24.1	28.3	4	7.5	4	8	38.1	64	76	5	12	0		
8 FT	8	8	8	4	9	4	10	34.6	24.1	28.3	4	7	4	7.5	34.6	64	76	5	12	0		
10 FT	8	8	8	4	9.5	4	11	30.6	24.1	28.3	4	8	4	8	30.6	64	76	5	12	0		
12 FT	8	8	8	4	8	4	9	29.9	24.1	28.3	4	6.5	4	7.5	30.6	64	76	5	12	0		
14 FT	8	8	8	4	7	4	8	29.9	24.1	28.3	4	6	4	6.5	29.9	64	76	5	12	0		
16 FT	8	8	8	4	6	4	7	29.3	24.1	28.3	5	8	4	6	29.9	64	76	5	12	0		
18 FT	8	8	8	4	6	4	6	29.3	24.1	28.3	5	8	5	6.5	29.9	64	76	5	12	0		
20 FT	8	8	8	4	6	5	6.5	29.3	24.1	28.3	5	8	5	6	29.9	64	76	5	12	0		
22 FT	8	9	8	4	6	5	6	29.3	24.5	28.5	5	7.5	4	6	29.9	65	77	5	12	0		
24 FT	8	9	8	4	6	5	6	7.5	32.0	28.1	32.0	5	7.5	5	6.5	29.9	65	77	5	12	0	
26 FT	9	10	8	5	8.5	5	6.5	29.3	25.1	29.3	5	7	4	6	30.6	66	78	5	12	0		
28 FT	9	10	8	5	8	5	6.5	29.3	25.1	29.3	5	7	5	7	29.9	66	78	5	12	0		
30 FT	9	10	8	5	7.5	5	6.5	29.3	29.6	34.4	5	6.5	5	6.5	29.9	66	78	5	12	0		
32 FT	10	11	8	5	7.5	5	7	29.3	26.6	30.8	5	6.5	5	7.5	30.6	67	79	5	12	0		
34 FT	10	11	8	5	7.5	5	6.5	29.3	26.6	30.8	5	6.5	5	7	30.6	67	79	5	11.5	0		
36 FT	10	11	8	5	7	5	7	5	6.5	29.3	30.4	35.3	5	6	5	6	30.6	67	79	5	11	0
38 FT	11	12	8	5	7	5	7	29.9	27.3	31.5	5	6	5	7	31.3	68	80	5	10	0		
40 FT	11	12	8	5	6.5	5	6.5	29.9	31.3	36.0	5	6	5	6.5	31.3	68	80	5	10	0		
42 FT	11	13	8	5	6.5	5	6	29.9	27.6	31.9	5	6	5	7	31.3	69	81	5	9.5	0		
44 FT	12	13	8	5	6.5	5	6.5	29.9	28.0	32.3	5	6	5	6.5	32.0	69	81	5	9.5	0		
46 FT	12	13	8	5	6	5	6	29.9	32.0	36.8	5	6	5	6	31.3	69	81	5	9.5	0		
48 FT	12	14	9	5	6	5	7	30.4	28.4	32.5	6	8	5	8	31.8	70	82	5	9.5	0		
50 FT	13	14	9	5	6	5	7.5	30.4	29.5	33.9	6	8	5	7.5	32.4	70	82	5	9	0		

		SPAN (S) = 5 FT						HEIGHT (HT) = 7 FT OR 8 FT												
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										WALL BARS								
		A1 BARS		J3 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	C1						
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE				SPA.					
1 FT	10	9	8	5	8	4	9.5	44.9	26.5	29.8	5	7.5	4	7	44.9	89	101	5	12	12
2 FT	10	9	8	5	8	4	8.5	44.9	26.5	29.8	5	7.5	4	6.5	44.9	89	101	5	12	12
4 FT	8	8	8	4	7.5	4	7.5	44.9	24.8	27.9	4	6.5	4	6	44.9	88	100	5	12	0
6 FT	8	9	8	4	9	4	7.5	44.9	24.0	27.0	4	7.5	4	6.5	44.9	89	101	5	12	0
8 FT	8	9	8	4	9	4	7	44.9	24.0	27.0	4	7.5	4	6	44.9	89	101	5	12	0
10 FT	8	9	8	4	10	4	7.5	44.9	24.0	27.0	4	8	4	6.5	44.9	89	101	5	12	0
12 FT	8	10	8	4	8.5	4	6.5	44.9	24.3	27.3	4	8	4	6.5	44.9	90	102	5	12	0
14 FT	8	10	9	4	7.5	4	6.5	41.4	24.3	27.3	4	7	4	7	45.5	90	102	5	12	0
16 FT	8	10	9	4	6.5	4	6	40.8	24.3	27.3	4	6	4	6.5	45.5	90	102	5	11.5	0
18 FT	8	10	9	4	6	5	6.5	40.0	24.3	27.3	5	9	4	6	45.5	90	102	5	10.5	0
20 FT	8	10	9	4	6	5	6	39.4	25.3	28.4	5	8	5	6.5	47.6	90	102	5	10	0
22 FT	8	10	9	4	6	6	7	42.1	25.3	28.4	5	7.5	5	6	47.6	90	102	5	9	0
24 FT	9	11	9																	

DESIGN FILL	SPAN (S) = 6 FT												HEIGHT (HT) = 3 FT OR 4 FT OR 5 FT											
	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS								
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS								
				SIZE	SPA.	SIZE	SPA.	C1	K2	HT=3'	HT=4'	HT=5'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=3'	HT=4'	HT=5'	SIZE	SPA.	C1
1 FT	10	8	8	5	8	4	9	51.3	26.5	33.0	39.4	5	8	5	6	41.6	40	52	64	5	12	12		
2 FT	11	8	8	5	7.5	4	9.5	51.3	27.0	33.5	40.0	5	8	6	7.5	36.0	40	52	64	5	12	12		
4 FT	8	8	8	4	6.5	4	7.5	32.8	24.5	30.6	36.9	5	8	4	6.5	32.0	40	52	64	5	12	0		
6 FT	8	8	8	4	7	4	8	30.4	24.5	30.6	36.9	5	9	4	7	30.4	40	52	64	5	12	0		
8 FT	8	8	8	4	6.5	4	7.5	29.6	24.5	30.6	36.9	5	8.5	4	6.5	29.6	40	52	64	5	12	0		
10 FT	8	8	8	4	7	4	8	27.3	24.5	30.6	36.9	4	6	4	7	27.3	40	52	64	5	12	0		
12 FT	8	8	8	4	6	4	7	27.3	24.5	30.6	36.9	5	8	4	6	27.3	40	52	64	5	12	0		
14 FT	8	8	8	4	6	4	6	27.3	24.5	30.6	36.9	5	8	5	6	27.3	40	52	64	5	12	0		
16 FT	8	8	8	4	6	5	6	27.3	28.3	35.4	42.6	5	8	6	7	30.4	40	52	64	5	12	0		
18 FT	8	9	8	5	8.5	6	7.5	30.4	24.0	30.0	36.0	5	7.5	4	6	26.4	41	53	65	5	12	0		
20 FT	8	9	8	5	7.5	6	7.5	30.4	28.4	35.4	42.5	5	7	5	6.5	26.4	41	53	65	5	12	0		
22 FT	9	10	8	5	7.5	5	6.5	26.4	25.0	31.0	37.0	5	7	4	6.5	25.6	42	54	66	5	12	0		
24 FT	9	11	8	5	7	5	6.5	26.4	25.5	31.5	37.5	5	6.5	4	7	24.8	43	55	67	5	12	0		
26 FT	10	11	8	5	7	5	7.5	26.4	26.0	32.0	38.0	5	6.5	4	6.5	25.6	43	55	67	5	12	0		
28 FT	10	12	8	5	6.5	5	7.5	26.4	26.5	32.5	38.5	5	6	4	7	24.8	44	56	68	5	12	0		
30 FT	11	12	8	5	6.5	5	8.5	25.6	27.0	33.0	39.0	5	6	4	6	24.8	44	56	68	5	12	0		
32 FT	11	13	8	5	6	5	8	25.6	27.5	33.5	39.5	5	6	4	7	24.8	45	57	69	5	12	0		
34 FT	12	13	8	5	6	5	8.5	25.6	28.0	34.0	40.0	5	6	4	6	24.8	45	57	69	5	12	0		
36 FT	12	14	8	6	8	5	8.5	25.6	28.5	34.5	40.5	5	6	4	6.5	24.8	46	58	70	5	12	0		
38 FT	13	14	8	6	8	5	8.5	24.8	29.0	35.0	41.0	6	8	4	6	24.8	46	58	70	5	12	0		
40 FT	13	14	8	6	7.5	5	8.5	24.8	29.0	35.0	41.0	6	7.5	5	6	24.8	46	58	70	5	12	0		
42 FT	14	15	8	6	8	5	8.5	24.8	30.0	36.0	42.0	6	7.5	4	6	24.8	47	59	71	5	12	0		
44 FT	14	15	8	6	7.5	5	8.5	24.8	30.0	36.0	42.0	6	7.5	5	8.5	24.8	47	59	71	5	12	0		
46 FT	14	16	8	6	7	5	8.5	24.8	30.5	36.5	42.5	6	7	4	6	24.8	48	60	72	5	12	0		
48 FT	15	16	8	6	7	5	8	29.6	31.0	37.0	43.0	6	7	5	8	25.6	48	60	72	5	12	0		
50 FT	15	16	8	6	7	5	8	29.6	31.0	37.0	43.0	6	7	5	8	24.8	48	60	72	5	12	0		

DESIGN FILL	SPAN (S) = 6 FT												HEIGHT (HT) = 6 FT OR 7 FT											
	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS								
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS								
				SIZE	SPA.	SIZE	SPA.	C1	K2	HT=6'	HT=7'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=6'	HT=7'	SIZE	SPA.	C1		
1 FT	10	8	8	5	8	4	9	51.3	26.4	30.1	36.7	5	8	5	6	52.8	76	88	5	12	12			
2 FT	11	8	8	5	7.5	4	9.5	51.3	27.9	31.6	38.2	5	7.5	4	6.5	51.3	77	89	5	12	12			
4 FT	8	8	8	4	6	4	7	51.3	24.1	27.5	34.1	5	8	4	6	51.3	76	88	5	12	0			
6 FT	8	8	8	4	6.5	4	7.5	42.4	24.1	27.5	34.1	5	8	4	6	41.6	76	88	5	12	0			
8 FT	8	8	8	4	6.5	4	7.5	38.4	24.1	27.5	34.1	5	8	5	6.5	38.4	76	88	5	12	0			
10 FT	8	8	8	4	7	4	7.5	32.8	24.1	27.5	34.1	5	8.5	4	6	33.6	76	88	5	12	0			
12 FT	8	8	8	4	6	4	6	32.8	24.4	27.9	34.4	5	8	4	7	33.6	77	89	5	12	0			
14 FT	8	9	8	4	6	5	6.5	32.0	24.4	27.9	34.4	5	7.5	4	6	32.8	77	89	5	12	0			
16 FT	8	9	8	4	6	6	7.5	35.3	28.5	32.6	39.1	5	7.5	5	6.5	32.8	77	89	5	12	0			
18 FT	8	9	8	5	8.5	6	7.5	34.4	28.5	32.6	39.1	5	7.5	6	7.5	35.3	77	89	5	12	0			
20 FT	8	9	8	5	7.5	6	7.5	34.4	28.5	32.6	39.1	5	6.5	6	7	35.3	77	89	5	12	0			
22 FT	9	10	8	5	7.5	5	6	32.0	25.8	29.4	35.9	5	7	5	6	32.8	78	90	5	12	0			
24 FT	9	11	8	5	7	6	7	34.4	29.6	33.6	40.1	5	6.5	5	6.5	32.8	79	91	5	12	0			
26 FT	10	11	8	5	6.5	5	6	32.0	30.8	35.0	41.5	5	6.5	5	6	32.8	79	91	5	12	0			
28 FT	10	12	8	5	6.5	6	7	34.4	30.3	34.4	41.5	5	6	5	6.5	33.6	80	92	5	10	0			
30 FT	11	12	8	5	6.5	5	6	32.0	31.5	35.8	42.5	5	6	5	6	33.6	80	92	5	9	0			
32 FT	11	13	8	5	6	6	7	35.3	31.9	36.0	43.5	5	6	5	6	33.6	81	93	5	9	0			
34 FT	11	13	8	6	7.5	6	7.5	35.3	31.9	36.0	43.5	5	6	5	6	32.6	81	93	5	9	0			
36 FT	12	13	8	6	8	6	7	35.3	32.3	36.4	44.5	6	8	6	7	36.8	81	93	5	9	0			
38 FT	12	14	8	6	8	6	6.5	35.3	32.5	36.6	44.5	6	8	5	6	34.4	82	94	5	9	0			
40 FT	13	14	8	6	8	5	6	32.4	33.9	38.1	45.5	6	8	5	6.5	34.0	82	94	5	8	0			
42 FT	13	15	10	6	8	5	7	32.8	33.3	37.5	45.5	6	7.5	5	7.5	34.5	83	95	5	9	0			
44 FT	14	15	10	6	8	5	7.5	32.8	34.5	38.9	46.5	6	7.5	5	7.5	34.5	83	95	5	8	0			
46 FT	14	16	11	6	7.5	5	7	33.3	34.9	39.3	47.5	6	7	5	7	34.9	84	96	5	9	0			
48 FT	14	16	11	6	7.5	5	6.5	33.3	34.9	39.3	47.5	6	7	5	7	34.9	84	96	5	9	0			
50 FT	15	16	11	6	7.5	5	7	38.1	35.3	39.6	48.5	6	7	5	7	34.9	84	96	5	8	0			

DESIGN FILL	SPAN (S) = 6 FT												HEIGHT (HT) = 8 FT OR 9 FT											
	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS								
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS								
				SIZE	SPA.	SIZE	SPA.	C1	K2	HT=8'	HT=9'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=8'	HT=9'	SIZE	SPA.	C1		
1 FT	10	10	8	5	8	4	7	51.3	26.6	29.5	36.1	5	7	4	6.5	51.3	102	114	5	12	12			
2 FT	11	10	8	5	7.5	4	7	51.3	28.0	31.0	37.6	5	7	4	6	51.3	102	114	5	12	12			
4 FT	8	9	9	4	6	4	6.5	51.9	24.9	27.6	34.2	5	8	4	6.5	51.9	101	113	5	12	0			
6 FT	8	9	9	4	6.5	4	6.5	51.9	24.9	27.6	34.2	5	8.5	4	6	51.9	101	113	5	12	0			
8 FT	8	10	9	4	6.5	4	6	51.9	25.1	27.9	34.5	5	8	4	6	51.9	102	114	5	11.5	0			
10 FT	8	10	9	4	7.5	4	6.5	45.4	25.1	27.9	34.5	4	6.5	4	6.5	51.9	102	114	5	12	0			
12 FT	8	10	9	4	6	5	6.5	43.8	25.1	27.9	34.5	5	8.5	4	6	51.9	102	114	5	11.5	0			
14 FT	8	10	9	4	6	5	6	42.1	25.1	29.0	35.5	5	7.5	5	6.5	54.3	102	114	5	10	0			
16 FT	8	10	9	4	6	6	7	44.5	28.4	31.5	38.1	5	7	5	6	54.3	102	114	5	9.5	0			
18 FT	8	10	9	5	9	6	7	43.8	29.4	32.6	39.2	5	7	6	7	55.9	102	114	5	8.5	0			
20 FT	9	10	9	5	8.5	5	6	43.8	29.8	33.0	39.5	5	7	6	6.5	56.8	102	114	5	8.5	0			
22 FT	9	11	9	5	8	5	6	42.9	30.0	33.3	39.8	5	6.5	6	6.5	55.9	103	115	5	8.5	0			
24 FT	10	11	9	5	7.5	5	6	45.4	30.3	33.5	40.1	5	6.5	6	6	55.9	103	115	5	8.5	0			
26 FT	10	11	9	5	7	5	6	44.5	30.3	33.5	40.1	5	6	6	6	55.9	103	115	5	8.5	0			
28 FT	10	12	9	5	6.5	6	7	47.0	31.6	35.0	41.4	5	6	6	6	55.9	104	116	5	8	0			
30 FT	11	12	9	5	6.5	6	6.5	49.4	3															

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

		SPAN (S) = 7 FT										HEIGHT (HT) = 4 FT OR 5 FT OR 6 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=4'	HT=5'	HT=6'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=4'	HT=5'	HT=6'	SIZE	SPA.	C1
1 FT	11	9	8	5	7.5	4	9	57.0	27.1	32.3	37.4	5	7.5	4	6	54.3	53	65	77	5	12	12	
2 FT	11	9	8	5	7.5	4	9	57.0	27.1	32.3	37.4	5	7.5	5	7	43.3	53	65	77	5	12	12	
4 FT	8	8	8	4	6	4	6	35.8	24.3	29.1	34.0	5	8	5	6	35.9	52	64	76	5	12	0	
6 FT	8	8	8	4	6	4	6	33.1	24.3	29.1	34.0	5	8	5	6	33.1	52	64	76	5	12	0	
8 FT	8	8	8	4	6	5	6.5	32.3	24.0	28.8	33.6	5	7.5	4	6	32.3	53	65	77	5	12	0	
10 FT	8	8	8	4	6	4	6	30.4	24.0	28.8	33.6	5	7.5	4	6	29.5	53	65	77	5	12	0	
12 FT	8	8	8	4	6	5	6	30.4	24.0	28.8	33.6	5	7.5	4	6	28.5	53	65	77	5	12	0	
14 FT	8	8	8	4	6	5	6	33.1	28.3	33.9	39.5	5	7	5	6.5	28.5	53	65	77	5	12	0	
16 FT	8	9	8	5	7	6	7	33.1	28.3	33.9	39.5	5	6.5	6	7.5	31.3	53	65	77	5	12	0	
18 FT	9	10	8	5	7	5	6.5	28.5	25.4	30.4	35.3	5	6	5	7	28.5	54	66	78	5	12	0	
20 FT	9	10	8	5	6	5	6	28.5	29.1	34.8	40.4	6	8	5	6	27.6	54	66	78	5	12	0	
22 FT	10	11	8	5	6	5	7	28.5	26.3	31.1	36.1	6	8	5	7.5	27.6	55	67	79	5	12	0	
24 FT	10	12	8	6	8	5	6	28.5	26.0	30.8	35.6	6	8	5	8.5	26.6	56	68	80	5	12	0	
26 FT	11	13	8	6	8	5	7	27.6	27.5	32.4	37.3	6	8	5	8.5	26.6	57	69	81	5	12	0	
28 FT	12	13	8	6	7.5	5	8	27.6	28.5	33.6	38.6	6	7.5	5	8.5	27.6	57	69	81	5	12	0	
30 FT	12	14	8	6	7.5	5	7	27.6	28.3	33.3	38.1	6	7.5	5	8.5	26.6	58	70	82	5	12	0	
32 FT	13	14	8	6	7	5	8	26.6	29.4	34.5	39.5	6	7	5	8.5	27.6	58	70	82	5	12	0	
34 FT	13	15	8	6	7	5	7	27.6	28.1	34.0	39.0	6	7	5	8.5	26.6	59	71	83	5	12	0	
36 FT	14	15	8	6	6.5	5	7.5	26.6	30.3	35.3	40.4	6	7	5	8.5	27.6	59	71	83	5	12	0	
38 FT	14	16	8	6	6.5	5	7	26.6	30.6	35.8	40.8	6	7	5	8	26.6	60	72	84	5	11.5	0	
40 FT	15	16	8	6	6.5	5	7.5	32.3	31.1	36.1	41.1	6	6.5	5	8	27.6	60	72	84	5	10.5	0	
42 FT	15	17	8	6	6	5	7	32.3	35.3	40.9	46.5	6	6.5	5	7	27.6	61	73	85	5	10	0	
44 FT	16	17	8	6	6	5	7	32.3	36.5	42.3	48.0	6	6.5	5	7	27.6	61	73	85	5	9.5	0	
46 FT	16	18	8	6	6	5	6	32.3	36.3	41.9	47.5	6	6.5	5	6.5	27.6	62	74	86	5	9.5	0	
48 FT	17	18	9	6	6	5	7.5	32.5	33.5	38.8	43.9	6	6.5	5	8	27.9	62	74	86	5	10	0	
50 FT	17	19	9	6	6	5	7	32.5	37.1	42.8	48.4	6	6	5	7.5	27.9	63	75	87	5	9	0	

		SPAN (S) = 7 FT										HEIGHT (HT) = 7 FT OR 8 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=7'	HT=8'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=7'	HT=8'	SIZE	SPA.	C1		
1 FT	11	9	8	5	7.5	4	8	57.0	27.8	31.1	36.1	5	7.5	5	6.5	58.9	89	101	5	12	12		
2 FT	11	9	8	5	7.5	4	7.5	57.0	27.8	31.1	36.1	5	7.5	5	6	58.9	89	101	5	12	12		
4 FT	8	9	8	4	6	5	6.5	58.9	24.0	27.0	32.0	5	7.5	4	6	57.0	89	101	5	12	0		
6 FT	8	9	8	4	6	5	6.5	46.0	25.0	28.1	33.0	5	7.5	5	6.5	44.1	89	101	5	12	0		
8 FT	8	9	8	4	6	5	6	41.4	25.0	28.1	33.0	5	7.5	5	6.5	44.1	89	101	5	12	0		
10 FT	8	9	8	4	6	5	6.5	35.9	25.0	28.1	33.0	5	7.5	5	6.5	36.8	89	101	5	12	0		
12 FT	8	9	8	4	6	6	7.5	38.6	28.8	32.4	37.4	5	7.5	5	6	36.8	89	101	5	12	0		
14 FT	8	9	8	4	6	5	6	37.8	28.8	32.4	37.4	5	7	6	6.5	38.6	89	101	5	12	0		
16 FT	8	9	8	4	6	7	6	37.8	32.6	36.8	41.8	5	6	6	6	38.6	89	101	5	12	0		
18 FT	9	10	8	5	6.5	6	7	37.8	29.4	33.0	38.0	5	6	6.5	38.6	90	102	5	12	0			
20 FT	9	10	8	5	6	6	7	36.8	33.4	37.4	42.4	6	7.5	6	6	38.6	90	102	5	11	0		
22 FT	10	11	9	5	6	5	6	34.4	30.0	33.6	38.6	6	8	5	6	35.4	91	103	5	12	0		
24 FT	10	12	9	6	8.5	5	6	34.4	30.3	33.9	39.0	6	8	5	6.5	36.3	92	104	5	11	0		
26 FT	11	13	9	6	8	5	6	7.5	38.1	31.9	35.6	40.6	6	8	5	6.5	36.3	93	105	5	10	0	
28 FT	11	13	9	6	7	6	7	37.3	31.9	35.6	40.6	6	7.5	5	6	36.3	93	105	5	9.5	0		
30 FT	12	13	9	6	7.5	6	7.5	37.3	33.3	37.1	42.1	6	7	6	7.5	39.0	93	105	5	8.5	0		
32 FT	12	14	9	6	6.5	6	6.5	37.3	32.5	36.3	41.3	6	7	5	6	36.3	94	106	5	8.5	0		
34 FT	13	14	9	6	7	6	7	38.1	33.9	37.8	42.8	6	7	6	7	39.0	94	106	5	8.5	0		
36 FT	14	15	10	6	7	5	6.5	34.8	34.5	38.4	43.3	6	7	5	7	36.6	95	107	5	8	0		
38 FT	14	16	11	6	7	5	6.5	36.1	34.9	38.8	43.7	6	7	5	7	37.0	96	108	5	8.5	0		
40 FT	15	16	11	6	7	5	6.5	40.9	35.3	39.0	44.3	6	7	5	7	37.0	96	108	5	8	0		
42 FT	15	17	11	6	6.5	6	6	40.9	35.5	39.4	44.7	6	7	5	7	37.0	97	109	5	7.5	0		
44 FT	16	17	12	6	6.5	6	6.5	41.3	37.0	40.9	45.8	6	6.5	5	6.5	37.5	97	109	5	8	0		
46 FT	16	18	12	6	6.5	6	6.5	41.3	36.1	40.0	45.0	6	6.5	5	6.5	37.5	98	110	5	8	0		
48 FT	17	18	12	6	6.5	6	6.5	41.3	37.6	41.6	46.6	6	6.5	5	6.5	38.4	98	110	5	7.5	0		
50 FT	17	18	12	6	6	5	6	41.3	37.6	41.6	46.6	6	6	5	6.5	38.4	98	110	5	7	0		

		SPAN (S) = 7 FT										HEIGHT (HT) = 9 FT OR 10 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=9'	HT=10'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=9'	HT=10'	SIZE	SPA.	C1		
1 FT	11	10	8	5	7.5	4	6	57.0	27.3	29.9	34.9	5	7	5	6.5	58.9	114	126	5	12	12		
2 FT	11	10	8	5	7.5	5	8.5	58.9	28.5	31.3	36.3	5	7	5	6	58.9	114	126	5	11	12		
4 FT	8	9	9	4	6	5	6	59.5	28.8	31.6	36.6	5	7.5	5	6	59.5	113	125	5	10.5	0		
6 FT	8	10	9	4	6	5	6	59.5	29.0	31.9	36.9	5	7	5	6.5	59.5	114	126	5	10	0		
8 FT	8	10	9	4	6	6	7	62.3	29.0	31.9	36.9	5	7	5	6	59.5	114	126	5	9	0		
10 FT	8	10	9	4	6	5	6	46.5	26.6	29.5	34.5	5	7.5	5	6	59.5	114	126	5	10	0		
12 FT	8	11	9	4	6	6	7	47.4	25.6	28.5	33.5	5	7	5	6	59.5	115	127	5	9	0		
14 FT	8	11	9	5	8.5	6	7	46.5	29.3	32.1	37.1	5	6.5	6	7	62.3	115	127	5	8.5	0		
16 FT	9	11	9	5	8	5	6	46.5	29.5	32.4	37.4	5	6.5	6	6.5	62.3	115	127	5	8.5	0		
18 FT	9	11	9	5	7	6	7	48.4	30.8	33.8	38.8	5	6.5	6	6	64.1	115	127	5	8.5	0		
20 FT	10	11	9	5	7	6	7.5	50.3	31.0	34.0	39.0	5	6	6	6	60.5	115	127	5	8.5	0		
22 FT	10	12	9	5	6.5	6	6.5	49.3	31.3	34.3	39.3	5	6	6	6	62.3	116	128	5	8	0		
24 FT	11	12	9	5	6	6	7	51.1	35.3	38.6	43.6	6	8.5	6	6	64.1	116	128	5	7.5	0		
26 FT	11	13	10	5	6	6	7.5	48.9	33.0	36.1	41.1	5	6	6	6.5	60.1	117	129	5	8	0		
28 FT	12	13	11	5	6	5	6.5	45.6	32.0	35.0	40.0	6	8	6	7	54.1	117	129	5	7.5	0		
30 FT	12	14																					

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

		SPAN (S) = 8 FT										HEIGHT (HT) = 4 FT OR 5 FT OR 6 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=4'	HT=5'	HT=6'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=4'	HT=5'	HT=6'	SIZE
1 FT	12	9	8	5	7	4	8.5	63.5	28.1	33.5	38.8	5	7.5	5	6	44.8	53	65	77	5	12	12	
2 FT	12	9	8	5	7	4	8	63.5	28.1	33.5	38.8	5	7	6	7.5	43.6	53	65	77	5	12	12	
4 FT	8	8	8	5	8	6	7.5	39.5	32.5	39.0	45.6	5	6.5	6	6	38.5	52	64	76	5	12	0	
6 FT	8	8	8	5	8.5	6	7.5	31.5	32.5	39.0	45.6	5	7	6	6	36.4	52	64	76	5	12	0	
8 FT	8	8	8	5	8	6	7.5	36.4	37.5	39.0	45.6	5	6.5	6	6	35.4	52	64	76	5	12	0	
10 FT	8	8	8	5	8.5	6	7.5	34.4	32.5	39.0	45.6	5	7	6	6	34.4	52	64	76	5	12	0	
12 FT	8	9	8	5	7.5	6	7.5	34.4	32.4	38.9	45.4	5	6.5	6	7.5	32.3	53	65	77	5	12	0	
14 FT	8	9	8	5	6.5	6	6.5	34.4	32.4	38.9	45.4	6	8	6	7	32.3	53	65	77	5	12	0	
16 FT	9	10	8	5	6	5	6	30.1	29.1	34.8	40.4	6	8	5	6.5	28.1	54	66	78	5	12	0	
18 FT	9	11	8	6	7.5	6	7	33.3	29.6	35.3	40.9	6	7.5	5	7.5	27.0	55	67	79	5	12	0	
20 FT	10	12	8	6	7.5	5	6	29.1	26.0	30.8	35.6	6	7.5	5	8.5	26.0	56	68	80	5	12	0	
22 FT	11	13	8	6	7	5	6.5	28.1	27.5	32.4	37.3	6	7	5	8.5	26.0	57	69	81	5	12	0	
24 FT	12	13	8	6	7	5	7.5	27.0	32.6	38.4	44.1	6	7	5	8	26.0	57	69	81	5	12	0	
26 FT	13	14	8	6	7	5	8	27.0	29.4	34.5	39.5	6	7	5	8.5	26.0	58	70	82	5	12	0	
28 FT	13	15	8	6	6.5	5	7	27.0	29.1	34.0	39.0	6	6.5	5	8.5	26.0	59	71	83	5	12	0	
30 FT	14	15	8	6	6	5	7.5	26.0	30.3	35.3	40.4	6	6.5	5	8.5	26.0	59	71	83	5	12	0	
32 FT	15	16	8	6	6	5	7.5	31.3	35.5	41.3	47.0	6	6.5	5	8	26.0	60	72	84	5	12	0	
34 FT	15	17	8	6	6	5	7	31.3	31.5	36.5	41.6	6	6.5	5	7	26.0	59	73	85	5	12	0	
36 FT	15	17	8	6	6	5	7	31.3	32.6	37.9	43.0	6	6	5	7	26.0	61	73	85	5	12	0	
38 FT	16	18	8	7	7.5	5	7	31.3	36.3	41.9	47.5	6	6	5	6.5	26.0	62	74	86	5	11.5	0	
40 FT	17	18	8	7	7.5	5	6.5	31.3	37.5	43.3	49.0	6	6	5	6.5	26.0	62	74	86	5	10.5	0	
42 FT	17	19	8	7	7	5	6.5	31.3	37.1	42.8	48.4	6	6	5	6.5	26.0	63	75	87	5	10	0	
44 FT	18	19	8	7	7	5	6.5	30.1	38.4	44.1	49.9	7	7.5	5	6.5	26.0	63	75	87	5	9.5	0	
46 FT	18	20	8	7	7	5	6	31.3	38.1	43.8	49.4	7	7.5	5	6	26.0	64	76	88	5	9.5	0	
48 FT	19	20	8	7	7	5	6	31.3	39.4	45.1	50.9	7	7.5	5	6	26.0	64	76	88	5	9.5	0	
50 FT	19	20	8	7	6.5	5	6	31.3	39.4	45.1	50.9	7	7	6	7.5	29.1	64	76	88	5	9.5	0	

		SPAN (S) = 8 FT										HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=7'	HT=8'	HT=9'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=7'	HT=8'	HT=9'	SIZE
1 FT	12	10	8	5	7	4	6.5	63.5	28.3	31.6	35.0	5	7	5	6.5	65.5	90	102	114	5	12	12	
2 FT	12	10	8	5	7	4	6	63.5	28.3	31.6	35.0	5	7	5	6.5	65.5	90	102	114	5	12	12	
4 FT	8	9	8	5	7.5	6	7.5	66.5	28.0	32.4	36.0	5	6.5	6	6.5	66.5	89	101	113	5	12	0	
6 FT	8	9	8	5	8	6	7.5	55.0	28.0	32.4	36.0	5	7	6	6.5	58.3	89	101	113	5	12	0	
8 FT	8	9	8	5	7.5	6	7.5	47.9	28.8	32.4	36.0	5	6.5	6	6	51.0	89	101	113	5	11.5	0	
10 FT	8	9	8	5	8	6	7.5	41.6	28.8	32.4	36.0	5	7	6	6	43.6	89	101	113	5	12	0	
12 FT	8	9	9	5	7.5	6	7	41.0	32.6	36.8	40.8	5	6.5	6	6.5	42.0	89	101	113	5	12	0	
14 FT	8	10	9	5	6.5	6	6.5	41.0	28.1	31.6	35.1	5	6	6	7	42.0	90	102	114	5	12	0	
16 FT	9	10	9	5	6	6	7.5	41.0	29.4	33.0	36.6	6	7.5	6	6.5	42.0	90	102	114	5	12	0	
18 FT	9	11	9	6	8	6	6.5	39.9	29.8	33.3	36.9	6	7.5	6	7	42.0	91	103	115	5	11	0	
20 FT	10	11	9	6	7.5	6	7	39.9	30.0	33.6	37.3	6	6.5	6	6	42.0	91	103	115	5	10	0	
22 FT	11	12	9	6	7.5	6	7	39.9	31.6	35.4	39.0	6	7	6	6.5	42.0	92	104	116	5	9	0	
24 FT	11	13	9	6	6.5	6	6.5	39.9	31.9	35.6	39.4	6	6.5	6	7	42.0	93	105	117	5	8.5	0	
26 FT	12	14	10	6	7	5	6	38.1	32.5	36.3	40.0	6	7	5	6.5	39.3	94	106	118	5	9	0	
28 FT	13	15	10	6	7	6	7.5	40.3	33.1	36.9	40.6	6	7	5	6.5	39.3	95	107	119	5	8	0	
30 FT	13	15	10	6	6.5	6	6.5	40.3	33.1	36.9	40.6	6	6.5	5	6	39.3	95	107	119	5	8	0	
32 FT	14	16	11	6	6.5	6	8.5	40.6	34.9	38.8	42.5	6	6.5	5	7	39.6	96	108	120	5	8	0	
34 FT	15	17	11	6	6.5	6	8	47.1	35.5	39.4	43.3	6	6.5	5	7	39.6	97	109	121	5	7.5	0	
36 FT	15	17	11	6	6	6	7	47.1	35.5	39.4	43.3	6	6	5	6.5	39.6	97	109	121	5	7.5	0	
38 FT	16	18	12	6	6	6	8	47.5	36.1	40.0	43.9	6	6	5	6.5	40.0	98	110	122	5	7.5	0	
40 FT	17	18	12	6	6	6	8	47.5	36.1	40.0	43.9	6	6	5	6.5	40.0	98	110	122	5	7	0	
42 FT	17	19	12	7	8	6	7.5	47.5	38.0	41.9	45.9	6	6	5	6.5	41.0	99	111	123	5	7	0	
44 FT	18	19	13	7	8	5	6	44.8	38.3	42.3	46.3	6	6	5	6	40.4	99	111	123	5	7	0	
46 FT	18	20	13	7	7.5	6	8	48.0	38.6	42.6	46.5	7	8	5	6	41.4	100	112	124	5	6.5	0	
48 FT	19	20	13	7	7.5	6	8	48.0	40.1	44.3	48.3	7	7.5	5	6	41.4	100	112	124	5	6.5	0	
50 FT	19	21	13	7	7	6	7	48.0	39.3	43.3	47.3	7	7.5	5	6	41.4	101	113	125	5	6.5	0	

		SPAN (S) = 8 FT										HEIGHT (HT) = 10 FT OR 11 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=10'	HT=11'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=10'	HT=11'	SIZE	SPA.	C1
1 FT	11	10	8	5	6.5	5	7.5	65.5	31.3	34.0	5	6.5	6	6.5	66.5	126	138	5	9.5	12			
2 FT	11	10	8	5	6.5	5	7	65.5	31.3	34.0	5	6	6	6	66.5	126	138	5	9.5	12			
4 FT	8	9	9	5	7.5	6	7	68.3	33.0	36.0	5	6	6	6	68.3	125	137	5	8.5	0			
6 FT	8	10	9	5	8.5	6	7	68.3	30.6	33.4	5	7	6	6.5	68.3	126	138	5	8.5	0			
8 FT	8	10	9	5	8	6	7	68.3	33.3	36.3	5	7	6	6	68.3	126	138	5	8.5	0			
10 FT	8	10	9	5	8.5	6	7	52.3	30.6	33.4	5	7	6	6	68.3	126	138	5	8.5	0			
12 FT	8	10	9	5	7.5	6	6.5	50.4	33.3	36.3	5	6.5	6	6	65.1	126	138	5	8.5	0			
14 FT	9	11	9	5	7	6	7	52.5	31.0	33.8	5	6.5	6	6	69.3	127	139	5	8.5	0			
16 FT	9	11	9	5	6	6	6	50.4	33.8	36.8	6	8	6	6	64.0	127	139	5	8.5	0			
18 FT	10	12	9	5	6	6	6	52.5	34.3	37.3	6	8	6	6	68.3	128	140	5	8	0			
20 FT	11	12	10	5	6	5	6	48.8	31.8	34.5	6	7.5	6	6.5	58.3	128	140	5	8	0			
22 FT	11	13	10	6	8	6	7	50.9	33.4	36.3	6	7.5	6	6.5	60.4	129	141	5	7.5	0			
24 FT	12	13	11	6	7.5	6	8	51.4	33.6	36.5	6	7	6	7	56.8	129	141	5	7.5	0			
26 FT	12	14	11	6	7	6	7.5	50.3	33.9	36.8	6	7	6	7	57.8	130	142	5	7.5	0			

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

		SPAN (S) = 9 FT						HEIGHT (HT) = 5 FT OR 6 FT OR 7 FT														
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS								
		A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS								
		TS	BS	TX	SIZE	SPA.	SIZE SPA.	C1	HT=5'	HT=6'	HT=7'	SIZE	SPA.	SIZE SPA.	C4	HT=5'	HT=6'	HT=7'	SIZE	SPA.	C1	
1 FT	12	9	8	5	6.5	4	7	69.6	28.1	32.5	37.0	5	6.5	6	7.5	54.5	65	77	89	5	12	12
2 FT	12	9	8	5	6.5	4	7	69.6	28.1	32.5	37.0	5	6	6	7	48.8	65	77	89	5	12	12
4 FT	9	9	8	5	6.5	6	7	42.9	32.4	37.8	43.3	5	6	6	7.5	42.9	65	77	89	5	12	0
6 FT	9	9	8	5	7	6	7.5	40.6	32.4	37.8	43.3	5	6	6	7	39.5	65	77	89	5	12	0
8 FT	8	10	8	5	6.5	6	7	39.5	24.1	28.0	32.0	5	6	5	6.5	33.6	66	78	90	5	12	0
10 FT	8	10	8	5	7	6	7.5	37.1	24.1	28.0	32.0	5	6.5	4	6	31.4	66	78	90	5	12	0
12 FT	8	10	8	5	6	6	6	37.1	28.5	33.1	37.9	6	8	5	6.5	30.1	66	78	90	5	12	0
14 FT	9	10	8	6	7.5	6	7	34.8	29.6	34.4	39.3	6	7	5	6	30.1	66	78	90	5	12	0
16 FT	9	11	8	6	7	6	6	34.8	29.3	33.9	38.6	6	6.5	5	7	29.0	67	79	91	5	12	0
18 FT	10	12	8	6	6.5	6	6.5	33.6	30.0	34.8	39.4	6	6.5	5	7.5	29.0	68	80	92	5	12	0
20 FT	11	13	8	6	6	6	6	33.6	31.6	36.4	41.3	6	6	5	8	29.0	69	81	93	5	12	0
22 FT	12	14	8	6	6	5	6	29.0	32.4	37.3	42.0	6	6	5	8.5	27.9	70	82	94	5	12	0
24 FT	13	15	8	6	6	5	6	29.0	33.3	37.5	42.0	6	6	5	8.5	27.9	71	83	95	5	12	0
26 FT	14	16	8	6	6	5	6	29.0	34.9	39.3	43.6	6	6	5	8	27.9	72	84	96	5	12	0
28 FT	15	16	8	7	7.5	5	6.5	33.6	35.3	40.1	45.1	7	8	5	8	27.9	72	84	96	5	12	0
30 FT	15	17	8	7	7	6	8	37.1	35.6	40.6	45.5	7	7.5	5	7	27.9	73	85	97	5	11.5	0
32 FT	16	17	8	7	7	5	6	32.5	36.1	41.0	45.9	7	7.5	5	6.5	27.9	73	85	97	5	10	0
34 FT	17	18	8	7	7	5	6	32.5	37.8	42.9	47.9	7	7.5	5	6.5	29.0	74	86	98	5	9.5	0
36 FT	17	19	9	7	7	5	6	33.9	37.3	42.3	47.1	7	7.5	5	7.5	29.3	75	87	99	5	10.5	0
38 FT	18	20	9	7	7	5	6	33.9	38.1	43.0	48.0	7	7.5	5	7	29.3	76	88	100	5	9.5	0
40 FT	19	20	9	7	6.5	5	6.5	33.9	39.5	44.5	49.5	7	7	5	7	29.3	76	88	100	5	8.5	0
42 FT	19	21	10	7	6.5	5	6.5	34.3	39.9	45.0	50.0	7	7	5	7.5	29.5	77	89	101	5	10	0
44 FT	20	21	10	7	6.5	5	6.5	34.3	40.4	45.4	50.4	7	6.5	5	7.5	29.5	77	89	101	5	9.5	0
46 FT	21	22	10	7	6.5	5	6.5	34.3	41.1	46.3	51.3	7	7	5	7	29.5	78	90	102	5	8.5	0
48 FT	21	22	10	7	6	5	6.5	34.3	41.1	46.3	51.3	7	6.5	5	7	29.5	78	90	102	5	8	0
50 FT	22	23	10	7	6	5	6.5	34.3	42.0	47.0	52.1	7	6.5	5	6.5	30.6	79	91	103	5	8	0

		SPAN (S) = 9 FT						HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT															
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS									
		A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS									
		TS	BS	TX	SIZE	SPA.	SIZE SPA.	C1	HT=8'	HT=9'	HT=10'	SIZE	SPA.	SIZE SPA.	C4	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C1		
1 FT	12	11	8	5	6.5	5	8.5	70.8	29.6	32.8	35.9	5	6.5	5	6.5	70.8	103	115	127	5	12	12	
2 FT	12	11	8	5	6.5	5	8.5	70.8	29.6	32.8	35.9	5	6	5	6	70.8	103	115	127	5	11.5	12	
4 FT	8	10	9	5	6.5	6	7	67.9	26.1	29.0	31.9	5	6	5	6	6	72.5	102	114	126	5	11.5	0
6 FT	8	10	9	5	7	6	7	53.9	28.4	31.5	34.6	5	6	6	7	64.4	102	114	126	5	11	0	
8 FT	8	10	9	5	6.5	6	6.5	49.1	28.4	31.5	34.6	5	6	6	6.5	55.0	102	114	126	5	10.5	0	
10 FT	8	10	9	5	7	6	7	44.5	28.4	31.5	34.6	5	6.5	6	7	46.8	102	114	126	5	12	0	
12 FT	9	10	9	5	6.5	5	6	41.0	29.8	33.0	36.1	6	8	6	6	45.6	102	114	126	5	11.5	0	
14 FT	9	10	9	6	8	6	6.5	43.3	33.0	36.6	40.3	6	6.5	6	6	45.6	102	114	126	5	10.5	0	
16 FT	10	11	9	6	7.5	6	7	43.3	30.3	33.5	36.8	6	6.5	6	6	45.6	103	115	127	5	9.5	0	
18 FT	10	12	9	6	6.5	6	6	43.3	31.6	35.0	38.4	6	6.5	6	6	45.6	104	116	128	5	8.5	0	
20 FT	11	13	9	6	6.5	6	6.5	43.3	31.0	34.3	37.5	6	6.5	6	6	45.6	105	117	129	5	8.5	0	
22 FT	12	13	9	6	6	6	6	43.3	33.6	37.1	40.6	6	6	6	6.5	48.0	105	117	129	5	8.5	0	
24 FT	13	14	10	6	6	6	6	43.6	33.0	36.4	39.8	6	6	6	6.5	44.9	106	118	130	5	8	0	
26 FT	14	15	10	6	6	6	7	43.6	34.8	38.3	41.8	6	6	6	7	44.9	107	119	131	5	8	0	
28 FT	14	16	11	7	8	6	7	44.0	35.1	38.6	42.0	7	8	5	6	42.9	108	120	132	5	7.5	0	
30 FT	15	17	11	7	8	6	6.5	50.0	35.6	39.1	42.6	6	6	5	6	42.9	109	121	133	5	7.5	0	
32 FT	16	18	12	6	6	7.5	50.4	36.3	39.8	43.3	6	6	5	6	43.3	110	122	134	5	7	0		
34 FT	16	18	12	7	7.5	6	7	50.4	36.3	39.8	43.3	7	7.5	6	6	43.3	110	122	134	5	7	0	
36 FT	17	19	13	7	7.5	6	7.5	50.9	38.1	41.8	45.3	7	7.5	6	6	43.5	111	123	135	5	7	0	
38 FT	18	20	13	7	7.5	6	7.5	50.9	38.8	42.3	45.9	7	7.5	5	6	43.5	112	124	136	5	6.5	0	
40 FT	18	20	13	7	6	7	50.9	38.8	42.3	45.9	7	7	6	8.5	46.0	112	124	136	5	6.5	0		
42 FT	19	21	13	7	6	6.5	50.9	39.3	42.9	46.5	7	7	6	8	47.3	113	125	137	5	6.5	0		
44 FT	19	21	14	7	6.5	6	6.5	51.3	39.3	42.9	46.5	7	7	5	6	43.9	113	125	137	5	6	0	
46 FT	20	22	14	7	6.5	6	7	51.3	41.3	45.0	48.6	7	7	6	8.5	47.6	114	126	138	5	6	0	
48 FT	20	22	14	7	6.5	6	6	51.3	41.3	45.0	48.6	7	6.5	6	7.5	47.6	114	126	138	5	6	0	
50 FT	21	23	14	7	6.5	6	6	51.3	41.9	45.6	49.3	7	6.5	6	8	47.6	115	127	139	5	6	0	

		SPAN (S) = 9 FT						HEIGHT (HT) = 11 FT OR 12 FT												
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS						
		A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS						
		TS	BS	TX	SIZE	SPA.	SIZE SPA.	C1	HT=11'	HT=12'	SIZE	SPA.	SIZE SPA.	C4	HT=11'	HT=12'	SIZE	SPA.	C1	
1 FT	11	11	8	5	6	5	6	70.8	31.3	33.8	5	6	6	6	73.1	139	151	5	9.5	12
2 FT	11	12	8	6	8.5	6	7	73.1	33.0	35.6	5	6	6	6	73.1	140	152	5	9.5	12
4 FT	8	10	9	5	6	6.5	73.8	33.4	36.1	6	8	6	6	73.8	138	150	5	8.5	0	
6 FT	8	11	9	5	7	6	6.5	73.8	32.1	34.8	5	6	6	6	73.8	139	151	5	8.5	0
8 FT	9	11	8	5	7	6	7	73.8	30.9	33.4	5	6	6	6	73.8	139	151	5	8.5	0
10 FT	9	11	8	5	7.5	6	7	58.5	30.9	33.4	5	6.5	6	6	73.8	139	151	5	8.5	0
12 FT	9	12	9	5	6.5	6	6	56.1	34.0	36.8	5	6	6	6	73.8	140	152	5	8.5	0
14 FT	10	12	9	5	6	6	6	57.4	34.3	37.0	6	8	6	6	73.8	140	152	5	7.5	0
16 FT	10	12	10	6	6	6.5	53.1	34.3	37.0	6	7	6	6	63.8	140	152	5	8	0	
18 FT	11	13	10	6	7.5	6	6.5	54.3	36.3	39.1	6	7	6	6	64.9	141	153	5	7.5	0
20 FT	11	13	11	6	6.5	6	6.5	52.4	36.3	39.1	6	6.5	6	7	59.5	141	153	5	7.5	0
22 FT	12	14	12	6	7	6	8	52.8	33.6	36.3	6	6.5	6	7.5	58.8	142	154	5	7	0
24 FT	13	15	12	6	6.5	6	7.5	54.0	37.3	40.1	6	6.5	6	7	60.0	143	155	5	7	0
26 FT	14	15	13	6	6.5	6	7.5	54.5	35.9	38.6	6	6	6	6.5	56.9	143	155	5	6.5	0
28 FT	14	1																		

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

SPAN (S) = 10 FT													HEIGHT (HT) = 5 FT OR 6 FT OR 7 FT												
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS									
				A1 BARS			J3 BARS			A2 BARS			J4 BARS												
	TS	BS	TX	SIZE	SPA.	SIZE SPA.	C1	K2	HT=5'	HT=6'	HT=7'	SIZE	SPA.	SIZE SPA.	C4	K3	HT=5'	HT=6'	HT=7'	SIZE	SPA.	C1			
1 FT	12	9	8	5	6	4	6	75.5	28.1	32.5	37.0	5	6	6	6.5	52.5	65	77	89	5	12	12			
2 FT	12	10	8	5	6	5	7.5	76.8	32.4	37.4	42.4	5	6	5	6.5	44.8	66	78	90	5	12	12			
4 FT	9	9	8	6	8	7	6.5	44.8	32.4	37.8	43.3	6	7.5	6	7	42.3	65	77	89	5	12	0			
6 FT	8	10	8	6	8.5	6	6	42.3	28.5	33.1	37.9	6	7.5	5	6.5	35.9	66	78	90	5	12	0			
8 FT	8	10	8	6	7.5	7	6	43.5	28.5	33.1	37.9	6	7.5	5	6.5	33.3	66	78	90	5	12	0			
10 FT	9	10	8	6	7	6	6.5	38.4	29.6	34.4	39.3	6	6.5	6	7	35.9	66	78	90	5	12	0			
12 FT	9	10	8	6	7.5	6	6.5	35.9	29.6	34.4	39.3	6	6.5	6	7	34.5	66	78	90	5	12	0			
14 FT	9	11	8	6	6.5	7	6	39.6	29.3	33.9	38.6	6	6	5	7	29.5	67	79	91	5	12	0			
16 FT	10	12	8	6	6	6	6	34.5	30.0	34.8	39.4	6	6	5	7.5	28.1	68	80	92	5	12	0			
18 FT	11	13	8	7	7.5	6	6.5	33.3	31.6	36.4	41.3	7	7.5	5	8	28.1	69	81	93	5	12	0			
20 FT	12	14	8	7	7.5	6	7	33.3	32.4	37.3	42.0	7	7.5	5	8.5	26.9	70	82	94	5	12	0			
22 FT	13	15	8	7	7	6	7.5	32.0	33.3	38.0	42.8	7	7.5	5	8.5	26.9	71	83	95	5	12	0			
24 FT	14	16	8	7	7	6	8	30.8	34.0	38.8	43.6	7	7.5	5	8	26.9	72	84	96	5	12	0			
26 FT	15	17	8	7	6.5	6	8	37.1	35.6	40.6	45.5	7	7	5	7	26.9	73	85	97	5	12	0			
28 FT	16	18	8	7	6.5	6	8.5	35.9	36.5	41.4	46.4	7	7	5	6.5	26.9	74	86	98	5	12	0			
30 FT	17	18	8	7	6.5	5	6	32.0	37.8	42.9	47.9	7	6.5	5	6.5	26.9	74	86	98	5	11.5	0			
32 FT	18	19	8	7	6.5	5	6	32.0	38.6	43.6	48.8	7	6.5	5	6.5	26.9	75	87	99	5	10	0			
34 FT	19	20	8	7	6	6	7.5	38.1	43.0	48.0	53.0	7	6.5	5	6	26.9	76	88	100	5	9.5	0			
36 FT	19	21	8	7	6	6	7.5	35.9	38.9	45.0	50.0	7	6.5	6	7.5	30.8	77	89	101	5	9	0			
38 FT	20	21	8	7	6	6	7.5	35.9	44.1	49.6	55.3	7	6.5	6	7.5	30.8	77	89	101	5	9.5	0			
40 FT	21	22	8	7	6	6	7	35.9	45.1	50.6	56.1	7	6.5	6	7	30.8	78	90	102	5	9	0			
42 FT	21	23	9	8	7.5	5	6	33.5	41.6	46.6	51.6	7	6	5	6	28.4	79	91	103	5	8.5	0			
44 FT	22	23	9	8	7.5	6	7.5	37.4	42.0	47.0	52.1	7	6	5	6	28.4	79	91	103	5	8.5	0			
46 FT	23	24	10	8	7.5	5	6.5	33.8	43.9	49.0	54.1	7	6	5	6.5	28.6	80	92	104	5	8.5	0			
48 FT	23	25	10	8	7	5	6	33.8	43.3	48.3	53.4	7	6	5	6	28.6	81	93	105	5	8	0			
50 FT	24	25	10	8	7	5	6	33.8	44.8	49.9	55.0	7	6	5	6	28.6	81	93	105	5	8	0			

SPAN (S) = 10 FT													HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT												
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS									
				A1 BARS			J3 BARS			A2 BARS			J4 BARS												
	TS	BS	TX	SIZE	SPA.	SIZE SPA.	C1	K2	HT=8'	HT=9'	HT=10'	SIZE	SPA.	SIZE SPA.	C4	K3	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C1			
1 FT	12	11	8	5	6	5	8	76.8	33.0	36.5	40.0	5	6	5	6	76.8	103	115	127	5	12	12			
2 FT	12	11	8	6	8	5	7	76.8	33.0	36.5	40.0	6	8	6	7.5	79.4	103	115	127	5	11.5	12			
4 FT	8	10	9	6	8	6	6	59.4	28.4	31.5	34.6	6	7.5	6	7	66.4	102	114	126	5	12	0			
6 FT	8	10	9	6	8	6	6	51.6	32.8	36.3	39.9	6	7.5	6	6.5	56.8	102	114	126	5	11.5	0			
8 FT	9	10	9	6	8	6	6	49.0	33.0	36.6	40.3	6	7	6	6	51.6	102	114	126	5	11.5	0			
10 FT	9	11	9	6	7.5	6	6	47.8	30.0	33.3	36.5	6	7	6	6.5	49.0	103	115	127	5	11	0			
12 FT	9	11	9	6	7.5	6	6.5	43.9	30.0	33.3	36.5	6	7	6	6.5	43.9	103	115	127	5	12	0			
14 FT	10	11	9	6	7	6	6.5	42.6	31.4	34.8	38.1	6	6	6	6	43.9	103	115	127	5	12	0			
16 FT	10	12	9	6	6	6	6	42.6	30.5	33.8	37.0	7	8	6	6.5	42.6	104	116	128	5	10.5	0			
18 FT	11	13	9	6	6	6	6	42.6	31.0	34.3	37.5	7	7.5	6	6.5	42.6	105	117	129	5	9.5	0			
20 FT	12	14	9	7	7.5	6	6.5	41.3	32.8	36.1	39.5	7	7.5	6	6.5	42.6	106	118	130	5	8.5	0			
22 FT	13	15	9	7	7.5	6	6	41.3	33.4	36.6	40.0	7	7.5	6	6.5	42.6	107	119	131	5	8.5	0			
24 FT	14	16	10	7	7.5	6	7	41.6	35.1	38.6	42.0	7	7.5	6	8	42.9	108	120	132	5	8	0			
26 FT	15	17	11	7	7.5	6	7	48.5	35.6	39.1	42.6	7	7.5	5	6	40.6	109	121	133	5	8.5	0			
28 FT	16	18	11	7	7	6	7	48.5	36.3	39.8	43.3	7	7.5	5	6	40.6	110	122	134	5	7.5	0			
30 FT	17	19	12	7	7	6	7.5	48.9	38.1	41.8	45.3	7	7	5	6	40.9	111	123	135	5	8	0			
32 FT	17	19	12	7	6.5	6	7	48.9	38.1	41.8	45.3	7	7	5	6	40.9	111	123	135	5	7.5	0			
34 FT	18	20	12	7	6.5	6	7	48.9	38.8	42.3	45.9	7	6.5	6	8.5	43.5	112	124	136	5	7	0			
36 FT	19	21	12	7	6.5	6	6	48.9	39.3	42.9	46.5	7	6.5	6	8	43.5	113	125	137	5	7	0			
38 FT	19	21	13	7	6	6	6	49.3	39.3	42.9	46.5	7	6.5	6	8	43.9	113	125	137	5	7	0			
40 FT	20	22	13	7	6	6	6.5	49.3	41.3	45.0	48.6	7	6.5	6	8	43.9	114	126	138	5	6.5	0			
42 FT	21	23	13	7	6	6	6	49.3	41.9	45.6	49.3	7	6.5	6	8	43.9	115	127	139	5	6.5	0			
44 FT	21	23	14	7	6	6	6	49.6	41.9	45.6	49.3	7	6	7.5	44.3	115	127	139	5	6.5	0				
46 FT	22	24	14	7	6	6	6.5	49.6	42.5	46.3	49.9	7	6	6	8	45.5	116	128	140	5	6	0			
48 FT	23	25	14	8	7.5	6	6.5	49.6	43.1	46.8	50.5	7	6	6	8	45.5	117	129	141	5	6	0			
50 FT	23	25	14	8	7	6	6	49.6	43.1	46.8	50.5	7	6	6	7.5	45.5	117	129	141	5	6	0			

SPAN (S) = 10 FT													HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT												
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS									
				A1 BARS			J3 BARS			A2 BARS			J4 BARS												
	TS	BS	TX	SIZE	SPA.	SIZE SPA.	C1	K2	HT=11'	HT=12'	HT=13'	SIZE	SPA.	SIZE SPA.	C4	K3	HT=11'	HT=12'	HT=13'	SIZE	SPA.	C1			
1 FT	11	11	9	6	8	6	7.5	80.0	31.3	33.8	36.4	6	7.5	6	6	80.0	139	151	163	5	8.5	12			
2 FT	11	11	9	6	7.5	6	7	80.0	35.8	38.6	41.5	6	7.5	6	6	80.0	139	151	163	5	8.5	12			
4 FT	9	11	9	6	8	6	6.5	80.0	33.8	36.6	39.4	6	7.5	6	6	80.0	139	151	163	5	8	0			
6 FT	9	12	9	5	6	6	6	80.0	31.1	33.6	36.1	6	7.5	6	6	80.0	140	152	164	5	7.5	0			
8 FT	9	12	10	5	6	6	6.5	75.4	31.1	33.6	36.1	6	7.5	6	6.5	80.6	140	152	164	5	7.5	0			
10 FT	10	12	10	6	8	6	6.5	74.4	32.8	35.4	38.0	6	7.5	6	6	80.6	140	152	164	5	7	0			
12 FT	10	12	10	6	8.5	6	6.5	58.5	32.8	35.4	38.0	6	7.5	6	6	71.5	140	152	164	5	8	0			
14 FT	10	13	10	6	7.5	6	6	57.3	31.5	34.0	36.5	6	7	6	6	74.1	141	153	165	5	7	0			
16 FT	11	13	11	6	7	6	6.5	56.4	33.3	35.9	38.5	6	6.5	6	6.5	65.5	141	153	165	5	7.5	0			
18 FT	12	14	12	6	7	6	7.5	56.8	33.6	36.3	39.0	6	6.5	6	7.5	63.4	142	154	166	5	7	0			
20 FT	13	15	12	6	6.5	6	7	56.8	35.6	38.4	41.1	6	6	6	7	64.6	143	155	167	5	7	0			
22 FT	13	15	13	6	6	6	6	55.9	35.6	38.4	41.1	7	8	6	7	61.1	143	155	167	5	6.5	0			
24 FT	14	16	13	6	6	6	6.5	57.3	36.1	38.9	41.6														

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

		SPAN (S) = 11 FT										HEIGHT (HT) = 6 FT OR 7 FT OR 8 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=6'	HT=7'	HT=8'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=6'	HT=7'	HT=8'	SIZE
1 FT	12	10	8	6	7.5	5	7	82.6	32.0	36.4	40.6	6	8	6	7.5	61.6	78	90	102	5	12	12	
2 FT	12	10	8	6	7.5	5	6.5	82.6	32.0	36.4	40.6	6	7.5	6	7	53.3	78	90	102	5	12	12	
4 FT	9	10	8	6	7	6	6.5	46.3	29.3	33.4	37.4	6	7	6	7.5	46.3	78	90	102	5	12	0	
6 FT	9	10	8	6	7	6	6.5	43.4	29.3	33.4	37.4	6	6.5	6	6.5	42.0	78	90	102	5	12	0	
8 FT	9	10	8	6	6.5	6	6	42.0	33.5	38.3	42.9	6	6	6	6	40.6	78	90	102	5	12	0	
10 FT	10	11	8	6	6.5	6	6.5	39.3	30.8	35.0	39.3	7	8	6	7	37.8	79	91	103	5	12	0	
12 FT	10	11	8	6	6.5	6	6.5	37.8	30.8	35.0	39.3	6	6	6	7	35.0	79	91	103	5	12	0	
14 FT	10	11	8	7	7.5	6	6	36.4	34.4	39.0	43.6	7	7	6	6	35.0	79	91	103	5	12	0	
16 FT	11	13	8	7	7	6	6	36.4	31.9	36.0	40.3	7	7	5	6.5	30.8	81	93	105	5	12	0	
18 FT	11	14	8	7	6	7	6	39.3	31.3	35.4	39.5	7	6.5	5	7	29.4	82	94	106	5	12	0	
20 FT	13	15	8	7	6.5	6	6.5	33.6	33.3	37.5	41.6	7	6.5	5	7	29.4	83	95	107	5	12	0	
22 FT	14	16	8	7	6	6.5	6	33.6	34.9	39.3	43.5	7	6.5	5	7	29.4	84	96	108	5	12	0	
24 FT	15	17	8	7	6	6.5	6	39.3	35.6	40.0	44.3	7	6.5	5	6.5	29.4	85	97	109	5	12	0	
26 FT	16	18	8	7	6	6.5	6	37.8	36.4	40.6	45.0	7	6.5	5	6.5	29.4	86	98	110	5	10	0	
28 FT	17	19	8	7.5	6	6.5	6.5	37.8	37.1	41.4	45.8	7	6	5	6.5	29.4	87	99	111	5	9.5	0	
30 FT	18	20	8	7.5	6	6	6	37.8	38.9	43.3	47.8	7	6	5	6	29.4	88	100	112	5	9.5	0	
32 FT	19	21	9	8	7.5	6	7	39.5	39.6	44.0	48.5	7	6	5	6.5	29.6	89	101	113	5	9	0	
34 FT	20	22	10	8	7.5	6	8	39.8	40.4	44.8	49.3	7	6	5	7	31.3	90	102	114	5	10	0	
36 FT	21	23	10	8	7.5	6	8	39.8	41.1	45.5	50.0	7	6	5	6.5	31.3	91	103	115	5	9	0	
38 FT	22	23	10	8	7	6	8	39.8	42.5	47.1	51.6	8	7.5	5	6.5	31.3	91	103	115	5	8	0	
40 FT	22	24	11	8	7	6	7	40.0	43.0	47.5	52.0	8	7.5	5	7	31.5	92	104	116	5	9	0	
42 FT	23	25	11	8	7	6	8	40.0	43.8	48.3	52.9	8	7.5	5	7	31.5	93	105	117	5	8.5	0	
44 FT	24	26	11	8	7	6	8	40.0	44.5	49.0	53.6	8	7.5	5	6.5	31.5	94	106	118	5	7.5	0	
46 FT	25	26	11	8	6.5	6	8	40.0	46.0	50.8	55.4	8	7	5	6.5	31.5	94	106	118	5	7.5	0	
48 FT	25	27	11	8	6.5	6	7.5	40.0	45.3	49.8	54.4	8	7	5	6	31.5	95	107	119	5	7.5	0	
50 FT	26	27	11	8	6.5	6	8	40.0	46.8	51.5	56.1	8	7	5	6	31.5	95	107	119	5	7.5	0	

		SPAN (S) = 11 FT										HEIGHT (HT) = 9 FT OR 10 FT OR 11 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=9'	HT=10'	HT=11'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=9'	HT=10'	HT=11'	SIZE
1 FT	12	11	8	6	7.5	5	7	82.6	32.8	35.9	39.0	6	7.5	6	6.5	85.4	115	127	139	5	9.5	12	
2 FT	12	11	8	6	7	5	6.5	82.6	32.8	35.9	39.0	6	7	6	6	85.4	115	127	139	5	9.5	12	
4 FT	9	10	9	6	7	6	6.5	70.5	34.1	37.5	40.9	6	6.5	6	6	73.4	114	126	138	5	9.5	0	
6 FT	9	11	9	6	7.5	6	6	57.8	30.8	35.8	36.8	6	6.5	6	6	64.9	115	127	139	5	9.5	0	
8 FT	9	11	9	6	7	7	6.5	56.4	30.8	35.8	36.8	6	6	6	6	56.4	115	127	139	5	9	0	
10 FT	10	12	9	6	6.5	6	6	50.8	31.3	34.3	37.3	6	6	6	6	55.0	116	128	140	5	8.5	0	
12 FT	10	12	9	6	6.5	6	6	46.5	31.3	34.3	37.3	6	6	6	6	48.0	116	128	140	5	10	0	
14 FT	11	12	9	6	6	6	6.5	45.1	35.3	38.6	42.0	7	7.5	6	6	46.5	116	128	140	5	9	0	
16 FT	11	13	10	7	7.5	6	6	45.5	33.0	36.1	39.3	7	7	6	6.5	46.9	117	129	141	5	9.5	0	
18 FT	12	14	10	7	6	6	6.5	45.5	32.3	35.3	38.3	7	7	6	6.5	45.5	118	130	142	5	8.5	0	
20 FT	13	15	10	7	7	6	6	45.5	34.0	37.1	40.3	7	6.5	6	6.5	45.5	119	131	143	5	8	0	
22 FT	14	16	11	7	7	6	6.5	45.8	35.9	39.1	42.4	7	6.5	6	7.5	45.8	120	132	144	5	8	0	
24 FT	15	17	11	7	6.5	6	6	51.5	36.5	39.8	42.9	7	6.5	6	7.5	45.8	121	133	145	5	7.5	0	
26 FT	16	18	12	7	6.5	6	6.5	51.9	37.0	40.3	43.5	7	6.5	6	6	46.1	122	134	146	5	7.5	0	
28 FT	17	19	12	7	6.5	6	6.5	51.9	37.5	40.8	44.0	7	6.5	6	7.5	46.1	123	135	147	5	7	0	
30 FT	18	20	13	7	6.5	6	6.5	52.3	38.1	41.3	44.5	7	6.5	6	6	46.4	124	136	148	5	7.5	0	
32 FT	19	21	13	7	6	6	6.5	52.3	40.0	43.4	46.8	7	6	6	7.5	46.4	125	137	149	5	6.5	0	
34 FT	20	22	13	7	6	6	6	52.3	40.6	44.0	47.4	7	6	6	7.5	46.4	126	138	150	5	6.5	0	
36 FT	21	22	13	7	6	6	6	52.3	45.3	49.0	52.8	7	6	6	6.5	46.4	126	138	150	5	6.5	0	
38 FT	21	23	14	8	7.5	6	6	52.5	41.1	44.5	47.9	7	6	7.5	46.8	127	139	151	5	6	0		
40 FT	22	24	14	8	7.5	6	6	52.5	43.3	46.8	50.1	8	7.5	6	7	48.1	128	140	152	5	6	0	
42 FT	23	25	15	8	7.5	6	6.5	52.9	48.4	52.1	56.0	8	7.5	6	7.5	48.5	129	141	153	5	6	0	
44 FT	24	25	15	8	7	6	6.5	52.9	48.6	52.5	56.4	8	7	6	6.5	48.5	129	141	153	6	8	0	
46 FT	24	26	15	8	7	6	6	52.9	49.0	52.8	56.6	8	7	6	7	48.5	130	142	154	6	8	0	
48 FT	25	27	16	8	7	6	6	53.3	49.6	53.5	57.3	8	7	6	7.5	48.9	131	143	155	6	8	0	
50 FT	26	27	16	8	6.5	6	6	53.3	51.5	55.5	59.4	8	7	6	6.5	48.9	131	143	155	6	8	0	

		SPAN (S) = 11 FT										HEIGHT (HT) = 12 FT OR 13 FT OR 14 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=12'	HT=13'	HT=14'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=12'	HT=13'	HT=14'	SIZE
1 FT	12	12	9	6	7.5	6	7	86.0	32.6	35.0	37.4	6	7.5	6	6	86.0	152	164	176	5	8.5	12	
2 FT	12	12	9	6	7	6	6.5	86.0	34.3	36.8	39.3	6	7	6	6	86.0	152	164	176	5	8	12	
4 FT	9	11	10	6	7	6	6	86.6	33.4	35.9	38.4	6	6.5	6	6	86.6	151	163	175	5	7.5	0	
6 FT	9	12	10	6	7.5	6	6	86.6	33.6	36.1	38.6	6	6.5	6	6	88.0	152	164	176	5	7	0	
8 FT	10	13	10	6	7.5	6	6	86.6	34.0	36.5	39.0	6	7	6	6	86.6	153	165	177	5	6.5	0	
10 FT	10	13	11	6	7.5	6	6	70.1	34.0	36.5	39.0	6	6.5	6	6	88.6	153	165	177	5	6.5	0	
12 FT	10	13	11	6	7.5	6	6	60.0	32.4	34.8	37.3	6	6.5	6	6.5	74.4	153	165	177	5	7.5	0	
14 FT	11	13	11	6	6.5	6	6	60.0	35.9	38.5	41.1	6	6	6	6	70.1	153	165	177	5	7	0	
16 FT	12	14	12	6	6.5	6	7	60.5	36.3	39.0	41.6	7	8	6	6.5	67.6	154	166	178	5	7	0	
18 FT	13	15	13	6	6	6	7	59.5	38.4	41.1	43.9	7	7.5	6	7	65.3	155	167	179	5	6.5	0	
20 FT	14	16	13	6	6	6	6.5	60.9	38.9	41.6	44.4	7	7.5	6	6.5	66.8	156	168	180	5	6.5	0	
22 FT	14	17	14	7	7.5	6	6.5	59.9	39.1	41.9	44.6	7	7	6	6.5	64.3	157	1					

		SPAN (S) = 12 FT										HEIGHT (HT) = 6 FT OR 7 FT OR 8 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=6'	HT=7'	HT=8'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=6'	HT=7'	HT=8'	SIZE
1 FT	13	10	8	6	7.5	5	8.5	89.6	33.3	37.8	42.1	6	7.5	6	6.5	57.8	78	90	102	5	12	12	
2 FT	14	10	8	6	7	5	8.5	89.6	34.6	39.1	43.8	6	7	6	6	51.6	78	90	102	5	12	12	
4 FT	10	11	8	6	6.5	6	6.5	47.1	30.8	35.0	39.3	6	6.5	5	6.5	42.5	79	91	103	5	12	0	
6 FT	10	11	8	6	6.5	6	6.5	44.1	30.8	35.0	39.3	6	6.5	5	6.5	39.5	79	91	103	5	12	0	
8 FT	10	11	8	6	6	6	6.5	41.0	30.8	35.0	39.3	7	7.5	6	6.5	39.5	79	91	103	5	12	0	
10 FT	10	11	8	7	7	7	7	42.5	34.4	39.0	43.6	7	6.5	6	6	38.0	79	91	103	5	12	0	
12 FT	11	12	8	7	7	6	6	38.0	35.1	39.8	44.5	7	6.5	6	6.5	36.5	80	92	104	5	12	0	
14 FT	11	13	8	7	7	6	6	36.5	31.9	36.0	40.3	7	6.5	5	7	30.4	81	93	105	5	12	0	
16 FT	12	14	8	7	6.5	6	6	35.0	32.5	36.8	41.0	7	6.5	5	7	30.4	82	94	106	5	12	0	
18 FT	13	15	8	7	6	6	6.5	33.5	33.3	37.5	41.6	7	6	5	6.5	30.4	83	95	107	5	12	0	
20 FT	15	17	8	7	6	6	7	39.5	35.6	40.0	44.3	7	6.5	5	7	30.4	85	97	109	5	12	0	
22 FT	16	18	8	7	6	6	7	39.5	36.4	40.6	45.0	7	6	5	6.5	30.4	86	98	110	5	12	0	
24 FT	17	19	8	7.5	6	7	39.5	37.1	41.4	45.8	7	6	5	6.5	30.4	87	99	111	5	11	0		
26 FT	18	20	8	7	6	7	39.5	38.9	43.3	47.8	7	6	5	6	30.4	88	100	112	5	9	0		
28 FT	19	21	8	7	6	7	39.5	39.6	44.0	48.5	7	6	6	7.5	33.5	89	101	113	5	9	0		
30 FT	20	21	8	7	6	6.5	39.5	44.3	49.3	54.1	8	7	6	7.5	33.5	89	101	113	5	9	0		
32 FT	21	23	9	8	7	6	7.5	39.8	41.1	45.5	50.0	8	7.5	5	6	30.6	91	103	115	5	8	0	
34 FT	22	23	9	8	6.5	6	7.5	39.8	42.5	47.1	51.6	8	7	5	6	30.6	91	103	115	5	8	0	
36 FT	23	24	9	8	6.5	6	7	39.8	47.9	52.9	58.0	8	7	6	7	33.6	92	104	116	5	8	0	
38 FT	24	25	9	8	6.5	6	6.5	39.8	48.8	53.8	58.8	8	7	6	7	33.6	93	105	117	5	8	0	
40 FT	24	26	10	8	6	6	7	40.0	44.5	49.0	53.6	8	7	5	6	30.8	94	106	118	5	8	0	
42 FT	25	27	10	8	6	6	7	40.0	45.3	49.8	54.4	8	7	6	7	33.9	95	107	119	5	8	0	
44 FT	26	27	10	8	6	6	7	40.0	50.4	55.5	60.5	8	6.5	6	7	33.9	95	107	119	5	8	0	
46 FT	27	28	10	8	6	6	7	40.0	51.3	56.3	61.4	8	6.5	6	7	33.9	96	108	120	5	7	0	
48 FT	28	29	11	8	6	6	7.5	40.3	52.1	57.1	62.1	8	6.5	6	7.5	34.1	97	109	121	5	7	0	
50 FT	28	30	11	8	6	6	7.5	40.3	52.5	57.5	62.6	8	6.5	6	7	34.1	98	110	122	5	7	0	

		SPAN (S) = 12 FT										HEIGHT (HT) = 9 FT OR 10 FT OR 11 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=9'	HT=10'	HT=11'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=9'	HT=10'	HT=11'	SIZE
1 FT	11	12	8	6	6.5	6	7	91.3	31.5	34.5	37.5	6	7.5	6	7	91.3	116	128	140	5	10	12	
2 FT	11	12	8	6	6	6	6.5	91.3	31.5	34.5	37.5	6	7	6	6.5	91.3	116	128	140	5	9.5	12	
4 FT	10	12	8	6	6	6	6	69.9	30.0	32.9	35.8	6	6.5	6	6.5	69.9	116	128	140	5	9.5	0	
6 FT	10	12	8	6	6.5	6	6.5	67.8	31.3	34.3	37.3	6	6	6	6	62.4	116	128	140	5	9.5	0	
8 FT	10	12	9	6	6	6	6	62.0	31.3	34.3	37.3	7	8	6	6	55.1	116	128	140	5	10	0	
10 FT	10	12	9	7	7.5	7	7.5	62.0	35.0	38.4	41.8	7	7	6	6	50.5	116	128	140	5	9.5	0	
12 FT	11	13	10	7	7.5	6	6	49.3	33.0	36.1	39.3	7	7	6	6.5	49.3	117	129	141	5	10	0	
14 FT	11	13	10	7	7.5	6	6	46.3	31.8	34.8	37.8	7	7	6	6.5	46.3	117	129	141	5	12	0	
16 FT	12	14	10	7	7	6	6.5	46.3	32.3	35.3	38.3	7	6.5	6	7	44.6	118	130	142	5	11	0	
18 FT	13	15	10	7	6.5	6	6	44.6	38.0	41.5	45.0	7	6	6	7	44.6	119	131	143	5	9.5	0	
20 FT	14	16	10	7	6	7	7.5	47.8	38.6	42.0	45.5	7	6	6.5	44.6	120	132	144	5	8.5	0		
22 FT	16	18	11	7	6.5	6	6.5	51.1	37.0	40.3	43.5	7	6.5	6	7.5	45.0	120	134	146	5	8.5	0	
24 FT	17	19	11	7	6	6	6	49.6	37.5	40.8	44.0	7	6	7.5	45.0	123	135	147	5	7.5	0		
26 FT	18	20	12	7	6	6.5	49.9	39.1	41.3	44.5	7	6	6	7.5	45.3	124	136	148	5	8	0		
28 FT	19	21	12	7	6	6	6	49.9	40.0	43.4	46.8	7	6	7.5	45.3	125	137	149	5	7	0		
30 FT	20	22	13	8	7.5	6	6.5	51.8	40.6	44.0	47.4	7	6	6	8	45.8	126	138	150	5	7.5	0	
32 FT	21	23	13	8	7.5	6	6	50.3	41.1	44.5	47.9	8	7.5	6	7.5	45.5	127	139	151	5	7	0	
34 FT	22	23	13	8	7	6	6	50.3	45.6	49.3	53.0	8	7	6	7	45.5	127	139	151	5	6.5	0	
36 FT	22	24	14	8	7	6	6	52.1	43.3	46.8	50.1	8	7	6	7.5	45.9	128	140	152	5	7	0	
38 FT	23	25	14	8	6.5	6	6	50.5	43.8	47.3	50.8	8	7	6	7.5	45.9	129	141	153	5	6	0	
40 FT	24	26	14	8	6.5	6	6	50.5	44.4	47.9	51.4	8	7	6	7	45.9	129	141	153	5	6	0	
42 FT	25	27	15	8	6.5	6	6	52.5	49.6	53.5	57.3	8	7	6	7.5	46.1	131	143	155	5	6	0	
44 FT	26	28	15	8	6.5	6	6	52.5	54.1	57.9	61.6	8	6.5	6	7.5	47.8	132	144	156	6	8	0	
46 FT	27	28	15	8	6.5	6	6	50.9	52.1	56.1	60.0	8	6.5	6	7	47.8	132	144	156	6	8	0	
48 FT	27	29	15	8	6	6	6	52.5	56.4	60.4	64.4	8	6.5	6	7	47.8	133	145	157	6	8	0	
50 FT	28	30	16	8	6	6	6	52.8	53.1	57.1	61.0	8	6.5	6	7.5	48.0	134	146	158	6	8	0	

		SPAN (S) = 12 FT										HEIGHT (HT) = 12 FT OR 13 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=12'	HT=13'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=12'	HT=13'	SIZE	SPA.	C1
1 FT	12	11	9	6	6.5	5	6	90.3	32.4	34.8	36	6	6.5	6	6	91.8	151	163	5	8.5	12		
2 FT	12	11	9	6	6.5	6	7	91.8	34.0	36.5	38	6	6.5	6	6	91.8	151	163	5	8.5	12		
4 FT	10	12	9	6	6.5	6	6	91.8	38.0	41.5	45	6	6	6	6	91.8	152	164	5	8.5	0		
6 FT	10	12	9	6	6.5	6	6.5	81.1	35.4	38.0	40	6	6	6	6	91.8	152	164	5	8	0		
8 FT	10	12	10	6	6.5	6	6	64.6	35.4	38.0	40	7	7.5	6	6	73.9	152	164	5	8	0		
10 FT	11	13	10	6	6.5	6	6	61.6	35.9	38.9	41	7	7.5	6	6	69.3	153	165	5	8	0		
12 FT	12	13	11	6	6	6	7	58.9	36.1	38.8	41	7	7	6	6	62.0	153	165	5	7.5	0		
14 FT	12	13	11	6	6	6	7	54.3	36.1	38.8	41	7	7	6	6	65.8	153	165	5	7.5	0		
16 FT	12	14	11	7	7	6	6	52.8	36.3	39.0	41	7	6.5	6	6.5	55.8	154	166	5	7.5	0		
18 FT	13	16	12	7	7	6	6	53.0	38.6	41.4	47	7	6.5	6	7	56.1	156	168	5	7	0		
20 FT	14	16	12	7	6.5	6	6	53.0	38.9	41.6	47	7	6	6	6	54.6	156	168	5	7	0		
22 FT	16	18	13	7	6.5	6	6	59.6	41.5	44.4	47	6.5	6	7	55.0	158	170	5	6.5	0			
24 FT	16	19	13	7	6	7	7	64.4	40.0	42.8	47	6	6	6.5	55.0	159	171	5	6.5	0			
26 FT	18	20	14	7	6.5	6	6	58.5	42.5	45.4	47	6	6	6.5	55.3								

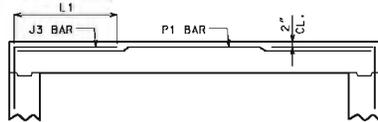
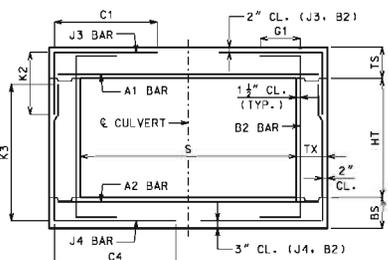
DESIGN FILL	SPAN (S) = 13 FT											HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT										
	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS						
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS						
				SIZE	SPA.	SIZE SPA.	C1	K2 HT=7' HT=8' HT=9'	SIZE SPA.	SIZE SPA.	C4	K3 HT=7' HT=8' HT=9'	SIZE SPA.	C1								
1 FT	13	11	8	6	6.5	5	8.5	95.1	34.0	38.0	41.9	6	7	6	7	67.3	91	103	115	5	12	12
2 FT	13	11	8	6	6.5	5	8.5	95.1	34.0	38.0	41.9	6	6.5	6	6.5	59.0	91	103	115	5	12	12
4 FT	10	11	8	7	7.5	6	6	49.3	31.0	34.8	38.5	6	6	6	6	49.3	91	103	115	5	12	0
6 FT	10	11	8	7	7.5	6	6	49.3	34.0	38.1	42.1	7	6	6	6	49.3	91	103	115	5	12	0
8 FT	10	12	8	7	7	6	6	47.5	30.3	33.9	37.5	7	6	7	6	42.6	92	104	116	5	12	0
10 FT	11	12	8	7	6.5	7	6.5	44.3	35.8	39.9	44.1	7	6	6	6	41.0	92	104	116	5	12	0
12 FT	12	13	8	7	6.5	7	6.5	42.6	36.4	40.6	44.8	7	6	6	6.5	39.4	93	105	117	5	12	0
14 FT	12	14	8	7	6	7	6.5	41.0	32.5	36.3	40.0	7	6	5	6	32.8	94	106	118	5	12	0
16 FT	13	15	8	8	7.5	7	6.5	39.4	33.1	36.9	40.6	7	6	5	6	31.1	95	107	119	5	12	0
18 FT	14	16	8	8	7	7	7	37.8	34.9	38.8	42.5	8	7.5	6	8	34.5	96	108	120	5	12	0
20 FT	15	18	8	8	6.5	7	7	45.9	35.9	39.6	43.5	8	7.5	5	6	31.1	98	110	122	5	11.5	0
22 FT	17	19	8	8	7	6	6	41.0	38.0	41.9	45.9	8	7.5	6	8	34.5	99	111	123	5	9.5	0
24 FT	18	20	8	8	6.5	7	7.5	45.9	38.6	42.6	46.5	8	7	6	7.5	34.5	100	112	124	5	9.5	0
26 FT	19	21	9	8	6.5	6	6	41.3	39.3	43.3	47.3	8	7	5	6	31.4	101	113	125	5	9	0
28 FT	20	22	10	8	6.5	6	6.5	41.5	41.1	45.3	49.3	8	7	5	6	33.3	102	114	126	5	10	0
30 FT	21	23	10	8	6.5	6	6.5	41.5	41.9	45.9	50.0	8	6.5	5	6	33.3	103	115	127	5	9	0
32 FT	22	24	10	8	6	6	6	41.5	42.5	46.6	50.6	8	6.5	5	6	33.3	104	116	128	5	8	0
34 FT	23	25	11	8	6	6	6.5	41.8	43.1	47.3	51.1	8	6.5	5	6	33.4	105	117	129	5	8.5	0
36 FT	24	26	11	8	6	6	6.5	41.8	43.1	47.3	51.1	8	6.5	5	6	33.4	106	118	130	5	8	0
38 FT	25	27	12	8	6	6	6.5	42.0	45.9	50.0	54.3	8	6.5	5	6	33.6	107	119	131	5	8.5	0
40 FT	26	28	12	8	6	6	6	42.0	46.5	50.8	55.0	8	6.5	5	6	33.6	108	120	132	5	7.5	0
42 FT	27	29	12	9	7.5	6	7	42.0	51.3	55.9	60.4	8	6	6	8.5	37.0	109	121	133	5	7	0
44 FT	28	30	12	9	7	6	7	42.0	52.0	56.6	61.1	8	6	6	8	37.0	110	122	134	5	7	0
46 FT	29	30	12	9	7	6	7	42.0	53.9	58.5	63.1	8	6	6	7.5	37.0	110	122	134	5	7	0
48 FT	30	31	12	9	7	6	7	42.0	54.6	59.3	64.0	8	6	6	7.5	37.0	111	123	135	5	7	0
50 FT	30	32	12	9	7	6	6.5	42.0	55.0	59.6	64.4	8	6	6	7.5	37.0	112	124	136	5	7	0

DESIGN FILL	SPAN (S) = 13 FT											HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT											
	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS							
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS							
				SIZE	SPA.	SIZE SPA.	C1	K2 HT=10' HT=11' HT=12'	SIZE SPA.	SIZE SPA.	C4	K3 HT=10' HT=11' HT=12'	SIZE SPA.	C1									
1 FT	12	12	9	6	6.5	5	6	95.8	33.4	36.3	39.1	6	7	6	6.5	99.0	128	140	152	5	9	12	
2 FT	12	13	9	6	6.5	5	6	99.0	32.3	35.0	37.8	6	6.5	6	7	99.0	129	141	153	5	9	12	
4 FT	10	11	9	7	7.5	6	6	72.6	34.0	37.0	40.0	7	7.5	6	6	77.5	127	139	151	5	8.5	0	
6 FT	10	11	10	6	6	6	6	61.4	34.0	37.0	40.0	7	7.5	6	6	65.1	127	139	151	5	9	0	
8 FT	10	12	10	7	7.5	7	6	6	59.8	34.3	37.3	40.3	7	7	6	6.5	59.8	128	140	152	5	9	0
10 FT	11	13	10	7	7	6	6	54.8	36.1	39.3	42.4	7	6.5	6	6.5	56.5	129	141	153	5	8.5	0	
12 FT	12	14	10	7	6.5	6	6	51.5	33.9	36.8	39.6	7	6.5	6	6	53.1	130	142	154	5	8	0	
14 FT	12	14	10	7	6.5	6	6	51.5	33.9	36.8	39.6	7	6	6	6	48.1	130	142	154	5	9.5	0	
16 FT	13	15	10	7	6	7	7	51.5	34.4	37.3	40.1	7	6	6	6	48.1	131	143	155	5	8	0	
18 FT	14	16	11	7	6	7	7.5	51.8	39.1	42.4	45.6	8	7.5	6	6.5	48.4	132	144	156	5	8.5	0	
20 FT	15	18	11	8	7.5	7	7	58.5	37.0	40.0	43.0	8	7.5	6	7	46.8	134	146	158	5	7.5	0	
22 FT	17	19	12	8	7.5	6	6	53.8	39.3	42.4	45.5	8	7.5	6	7	48.8	135	147	159	5	7.5	0	
24 FT	18	20	12	8	7	7	7.5	58.8	39.8	42.9	46.0	8	7	6	6.5	48.8	136	148	160	5	7	0	
26 FT	19	21	13	8	7	7	7	59.1	40.3	43.4	46.5	8	7	6	7	49.0	137	149	161	5	7	0	
28 FT	20	22	13	8	7	7	7.5	59.1	42.4	45.6	48.9	8	7	6	6.5	49.0	138	150	162	5	6.5	0	
30 FT	21	23	14	8	7	7	7	59.5	46.1	49.6	53.1	8	7	6	7	49.3	139	151	163	5	7	0	
32 FT	22	24	14	8	6.5	7	7.5	59.5	46.8	50.1	53.6	8	6.5	6	6.5	49.3	140	152	164	5	6	0	
34 FT	23	25	14	8	6.5	7	7.5	59.5	46.0	47.3	50.5	8	6.5	6	6.5	49.3	141	153	165	6	6	0	
36 FT	24	26	15	8	6.5	7	7.5	59.9	49.5	53.1	56.8	8	6.5	6	6.5	49.6	142	154	166	5	6	0	
38 FT	25	27	15	8	6	7	7.5	59.9	50.1	53.8	57.3	8	6.5	6	6.5	49.6	143	155	167	6	8	0	
40 FT	26	28	15	8	6	7	7	59.9	50.8	54.3	57.9	8	6.5	6	6.5	49.6	144	156	168	6	8	0	
42 FT	27	29	16	8	6	7	7.5	60.3	51.3	54.9	58.5	8	6	6	6.5	49.9	145	157	169	6	8	0	
44 FT	28	30	16	8	6	7	7.5	60.3	53.6	57.4	61.1	8	6	6	6.5	49.9	146	158	170	6	8	0	
46 FT	28	30	16	9	7	7	6.5	60.3	53.6	57.4	61.1	8	6	6	6	49.9	146	158	170	6	8	0	
48 FT	29	31	17	9	7	7	7.5	60.5	54.3	58.0	61.8	8	6	6	6.5	50.1	147	159	171	6	7.5	0	
50 FT	30	32	17	9	7	7	7.5	60.5	54.9	58.6	62.3	8	6	6	6.5	50.1	148	160	172	6	7.5	0	

DESIGN FILL	SPAN (S) = 13 FT											HEIGHT (HT) = 13 FT OR 14 FT										
	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS						
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS						
				SIZE	SPA.	SIZE SPA.	C1	K2 HT=13' HT=14'	SIZE SPA.	SIZE SPA.	C4	K3 HT=13' HT=14'	SIZE SPA.	C1								
1 FT	12	12	9	6	6	6	6.5	99.0	36.8	39.3	6	6.5	6	6	99.0	164	176	5	8.5	12		
2 FT	12	12	9	7	8	6	6.5	99.0	36.8	39.3	6	6	6	6	99.0	164	176	5	8	12		
4 FT	10	12	10	6	6	6	6	99.6	34.6	37.0	7	8	6	6	99.6	164	176	5	8	0		
6 FT	11	13	10	6	6	6	6.5	84.6	35.0	37.4	6	6	6	6.5	99.6	165	177	5	7.5	0		
8 FT	11	13	10	6	6	7	6.5	74.8	35.0	37.4	7	7	6	6	84.6	165	177	5	7	0		
10 FT	11	13	11	7	7.5	6	6.5	68.5	35.0	37.4	7	6.5	6	6	70.1	165	177	5	7.5	0		
12 FT	12	14	12	7	7	6	6.5	62.1	37.1	39.8	7	6.5	6	6.5	67.3	166	178	5	7	0		
14 FT	13	15	12	7	6	6	6	62.1	37.6	40.1	7	6	6	6	65.3	167	179	5	7	0		
16 FT	13	15	12	7	6.5	7	6.5	60.5	37.6	40.1	7	6	6	6.5	58.8	167	179	5	7	0		
18 FT	14	17	13	7	6.5	7	8	59.1	38.3	40.8	7	6	6	6.5	59.1	169	181	5	6.5	0		
20 FT	15	18	13	7	6	7	7	67.6	40.5	43.1	7	6	6	6	59.1	170	182	5	6.5	0		
22 FT	17	19	14	7	6	7	7.5	68.0	41.1	43.8	7	6	6	6	59.5	171	183	5	6	0		
24 FT	18	20	14	7	6	7	7.5	66.3	43.5	46.3	8	7.5	6	6	59.5	172	184	5	6	0		
26 FT	19	21	15	8	7.5	7	7.5	66.8	43.9	46.8	8	7	6	6	58.1	173	185	6	8	0		
28 FT	20	22	15	8	7																	

		SPAN (S) = 14 FT										HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=7'	HT=8'	HT=9'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=7'	HT=8'	HT=9'	SIZE	SPA.	C1
1 FT	13	12	8	6	6	5	7	102.1	33.3	37.1	41.0	6	6.5	6	6.5	66.9	92	104	116	5	12	12	
2 FT	13	12	8	7	8	5	6	102.1	33.3	37.1	41.0	6	6	6	6	58.1	92	104	116	5	12	12	
4 FT	10	11	8	7	6.5	7	6	52.8	34.0	38.1	42.1	7	7	6	6	49.3	91	103	115	5	12	0	
6 FT	11	12	8	7	6	6	6	45.8	31.6	35.4	39.0	7	6	7	44.0	92	104	116	5	12	0		
8 FT	11	12	8	7	6.5	7	6.5	45.8	35.8	39.9	44.1	7	6	6	6	42.3	92	104	116	5	12	0	
10 FT	12	13	8	7	6	7	6.5	44.0	33.3	37.1	41.0	8	7.5	6	6.5	38.8	93	105	117	5	12	0	
12 FT	12	14	8	8	7	7	6	42.3	36.8	41.0	45.1	8	7	6	7	37.0	94	106	118	5	12	0	
14 FT	13	16	8	8	6.5	7	6	42.3	33.5	37.3	40.9	8	7	5	6	31.6	96	108	120	5	12	0	
16 FT	13	16	8	8	6.5	7	6	40.5	33.5	37.3	40.9	8	7	5	6	31.6	96	108	120	5	12	0	
18 FT	15	17	8	8	6.5	7	6	45.8	35.5	39.4	43.3	8	6.5	6	7.5	35.3	97	109	121	5	12	0	
20 FT	16	19	8	8	6	7	6.5	45.8	36.5	40.4	44.1	8	7	5	6	31.6	99	111	123	5	11.5	0	
22 FT	18	20	8	8	6	7	7.5	45.8	38.6	42.6	46.5	8	6.5	6	7.5	35.3	100	112	124	5	9.5	0	
24 FT	19	21	8	8	6	7	7	45.8	44.0	48.5	52.9	8	6.5	6	7.5	35.3	101	113	125	5	9.5	0	
26 FT	21	23	9	8	6	6.5	6	42.5	41.9	45.9	50.0	8	6.5	5	6	55.6	103	115	127	5	8.5	0	
28 FT	22	24	9	8	6	6	6	42.5	46.3	50.8	55.1	8	6.5	6	7	35.4	104	116	128	5	8.5	0	
30 FT	23	25	10	8	6	6	6.5	42.8	43.1	47.3	51.4	8	6.5	6	7	35.9	105	117	129	5	8.5	0	
32 FT	24	26	10	9	7.5	6	6	42.8	45.1	49.4	53.5	8	6	5	6	33.9	106	118	130	5	8	0	
34 FT	25	27	11	9	7	6	7	45.0	45.9	50.0	54.3	8	6	5	6	34.0	107	119	131	5	8.5	0	
36 FT	26	28	11	9	7	6	7	43.0	46.5	50.9	55.0	8	6	5	6	34.0	108	120	132	5	7.5	0	
38 FT	27	29	11	9	7	6	7	43.0	51.3	55.9	60.4	8	6	6	7.5	37.6	109	121	133	5	7.5	0	
40 FT	28	30	11	9	7	6	6.5	43.0	52.0	56.6	61.1	8	6	6	7	37.6	110	122	134	5	7.5	0	
42 FT	29	31	12	9	6.5	6	7	43.3	54.3	58.9	63.6	9	7.5	6	7.5	37.8	111	123	135	5	7	0	
44 FT	30	32	12	9	6.5	6	7	43.3	55.0	59.6	64.4	9	7	6	7.5	37.8	112	124	136	5	7	0	
46 FT	31	33	12	9	6.5	6	7	43.3	55.8	60.5	65.1	9	7	6	7	37.8	113	125	137	5	7	0	
48 FT	31	33	12	9	6.5	6	7	43.3	56.1	60.9	65.9	9	7	6	7	37.8	113	125	137	5	7	0	
50 FT	33	34	12	9	6.5	6	7	43.3	58.4	63.3	68.0	9	7	6	7	37.8	114	126	138	5	6.5	0	

		SPAN (S) = 14 FT										HEIGHT (HT) = 13 FT OR 14 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=13'	HT=14'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=13'	HT=14'	SIZE	SPA.	C1		
1 FT	12	12	10	6	6	6	7	105.0	36.8	39.3	43.0	6	6	6	6	105.0	164	176	188	5	8	12	
2 FT	13	13	10	7	8	6	7	105.0	35.4	37.8	41.0	7	8	6	6.5	105.0	165	177	189	5	8	12	
4 FT	11	12	10	7	7.5	6	6.5	105.0	36.5	39.0	42.0	7	7	6	6	105.0	164	176	188	5	8	0	
6 FT	11	13	10	7	7.5	6	6	78.5	35.0	37.4	40.0	7	6	6	6	87.3	165	177	189	5	8	0	
8 FT	11	13	11	7	7.5	6	6	66.3	35.0	37.4	40.0	7	6.5	6	6	6	71.6	163	175	187	5	7.5	0
10 FT	12	14	11	7	7	6	6	64.5	37.1	39.8	42.0	7	6	6	6	68.0	166	178	190	5	7.5	0	
12 FT	13	15	12	7	6.5	6	6	61.3	37.6	40.1	42.0	7	6	6	6.5	64.8	167	179	191	5	7	0	
14 FT	14	16	13	7	6.5	6	6	59.8	38.0	40.5	42.0	7	6	6	6.5	63.4	168	180	192	5	6	0	
16 FT	14	16	13	7	6	7	6	59.8	38.0	40.5	42.0	8	7.5	6	6	56.1	168	180	192	5	7.5	0	
18 FT	15	18	13	7	6	7	7	67.0	40.5	43.1	45.0	8	7.5	6	6.5	56.1	170	182	194	5	6.5	0	
20 FT	16	19	13	8	7	7	6.5	65.1	40.9	43.5	45.0	8	7	6	6	56.1	171	183	195	5	6.5	0	
22 FT	18	20	14	8	7	7	7	65.5	43.5	46.3	48.0	8	7	6	6	56.4	172	184	196	5	6	0	
24 FT	19	22	14	8	7	7	7	65.5	44.1	46.9	48.0	8	7	6	6	56.4	174	186	198	5	6	0	
26 FT	20	23	15	8	6.5	7	7	65.9	44.6	47.4	48.0	8	6.5	6	6	56.8	175	187	199	5	6	0	
28 FT	21	24	15	8	6.5	7	6.5	65.9	45.1	47.9	48.0	8	6.5	6	6	56.8	176	188	200	5	6	0	
30 FT	22	25	16	8	6.5	7	6.5	66.3	47.5	50.4	52.0	8	6.5	6	6	57.0	177	189	202	5	6	0	
32 FT	23	26	16	8	6	7	6	66.3	50.0	53.0	55.0	8	6	7	8	58.9	178	190	204	5	6	0	
34 FT	24	27	17	8	6	7	6	66.6	48.5	51.4	53.0	8	6	6	6	57.4	179	191	206	5	7.5	0	
36 FT	25	28	17	8	6	7	6	66.6	53.0	56.1	58.0	8	6	7	8	59.3	180	192	208	5	7.5	0	
38 FT	26	29	18	9	7.5	7	6	67.0	51.5	54.5	56.0	8	6	6	6	57.6	181	193	210	5	7	0	
40 FT	27	30	18	9	7	7	6	67.0	54.1	57.3	59.0	8	6	7	9	61.4	182	194	212	5	7	0	
42 FT	28	31	19	9	7	7	6	67.4	52.5	55.9	57.5	9	7.5	6	6	58.0	183	195	214	5	6.5	0	
44 FT	29	32	19	9	7	7	6	67.4	57.3	60.5	62.0	9	7	7	8	61.8	184	196	216	5	6.5	0	
46 FT	30	33	20	9	7	7	6.5	67.6	55.6	58.8	60.0	9	7	6	6	58.3	185	197	218	5	6.5	0	
48 FT	31	34	20	9	6.5	7	6	67.6	58.4	61.5	63.0	9	7	7	8	62.0	186	198	220	5	6.5	0	
50 FT	32	35	21	9	6.5	7	6.5	69.9	56.6	59.8	61.0	9	7	6	6	58.6	187	199	222	5	6	0	



AT CONTRACTOR'S OPTION, ALTERNATE J3 BARS MAY BE USED WHEN THE DISTANCE BETWEEN THE ENDS OF BARS IN THE TOP SLAB IS LESS THAN 2'-0\"/>

		SPAN (S) = 14 FT										HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=10'	HT=11'	HT=12'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=10'	HT=11'	HT=12'	SIZE	SPA.	C1
1 FT	13	12	9	6	6	5	6.5	102.6	33.6	36.5	39.4	6	6	6	6	106.3	128	140	152	5	9	12	
2 FT	13	12	9	7	7.5	5	6	102.6	33.6	36.5	39.4	7	7.5	6	6	106.3	128	140	152	5	8.5	12	
4 FT	11	12	9	7	6	6	6	69.0	35.9	39.0	42.1	7	7.5	6	6	72.6	128	140	152	5	9	0	
6 FT	11	12	9	7	6	6	6	60.1	35.9	39.0	42.1	7	6.5	6	6	62.0	128	140	152	5	9	0	
8 FT	11	12	10	7	6	6	6	55.1	35.9	39.0	42.1	7	6.5	6	6	57.0	128	140	152	5	10	0	
10 FT	12	13	10	7	6.5	6	6	53.4	36.4	39.5	42.6	7	6	6	6	53.4	129	141	153	5	9.5	0	
12 FT	12	14	10	8	7.5	7	6	55.1	36.6	39.8	42.9	8	7	6	6	51.6	130	142	154	5	9	0	
14 FT	14	16	10	8	7.5	7	7	53.4	39.1	42.4	45.6	8	7.5	6	6	49.9	132	144	156	5	8	0	
16 FT	14	16	10	8	7	7	7	49.9	39.1	42.4	45.6	8	7	6	6.5	46.3	132	144	156	5	9	0	
18 FT	15	17	11	8	7	7	7.5	59.1	39.8	42.9	46.1	8	7	6	6	46.5	133	145	157	5	9.5	0	
20 FT	16	19	11	8	6.5	7	6.5	57.3	37.5	40.5	43.5	8	7	6	7	46.5	135	147	159	5	8	0	
22 FT	18	20	12	8	7	7																	

		SPAN (S) = 15 FT										HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=8" HT=9" HT=10"	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=8" HT=9" HT=10"	SIZE	SPA.	C1				
1 FT	12	13	8	7	7	6	7	109.0	32.5	35.9	39.3	6	6	6	7	82.8	105	117	129	5	12	12	
2 FT	12	13	8	7	6.5	6	6.5	109.0	33.6	37.1	40.6	7	7.5	6	6.5	85.8	105	117	129	5	12	12	
4 FT	11	12	8	7	6	6	6	52.6	35.4	39.0	42.8	7	7	6	6	52.6	104	116	128	5	12	0	
6 FT	11	12	9	7	6.5	6	6	51.0	35.4	39.0	42.8	7	6.5	6	6	49.1	104	116	128	5	12	0	
8 FT	11	12	9	7	6	7	6	51.0	35.4	39.0	42.8	8	7.5	6	6	47.3	104	116	128	5	12	0	
10 FT	12	14	9	8	7.5	7	6	49.1	32.8	36.1	39.5	8	7	6	7	43.5	106	118	130	5	12	0	
12 FT	13	15	9	8	6.5	7	6.5	47.3	34.5	38.0	41.5	8	6.5	6	7	41.6	107	119	131	5	12	0	
14 FT	14	17	9	8	6.5	7	6.5	45.4	34.1	37.5	40.9	8	6.5	6	8	39.8	109	121	133	5	12	0	
16 FT	14	17	9	8	6	7	6	43.5	34.1	37.5	40.9	8	6.5	6	8	37.8	109	121	133	5	12	0	
18 FT	16	19	9	8	6	7	7	49.1	36.5	40.0	43.5	8	6.5	6	8	37.8	111	123	135	5	12	0	
20 FT	17	20	9	9	7.5	7	6	49.1	37.1	40.6	44.1	8	6.5	6	7.5	37.8	112	124	136	5	11	0	
22 FT	19	21	9	9	7.5	7	7	49.1	43.3	47.3	51.1	8	6	6	7	37.8	113	125	137	5	9	0	
24 FT	21	23	10	9	6	6	6	43.8	41.9	45.6	49.3	8	6	6	8	38.0	115	127	139	5	9	0	
26 FT	22	24	11	9	7.5	6	6	43.9	42.5	46.3	49.9	8	6	6	8	38.3	116	128	140	5	10.9	0	
28 FT	23	25	11	9	7	6	6	43.9	43.1	46.8	50.5	8	6	6	8	38.3	117	129	141	5	9	0	
30 FT	24	26	11	9	7	7	7.5	49.6	49.4	53.5	57.8	9	7.5	6	7	38.3	118	130	142	5	8	0	
32 FT	26	28	12	9	7	6	6.5	46.1	46.4	50.3	54.1	8	6	6	8.5	38.4	120	132	144	5	8	0	
34 FT	27	29	12	9	7	6	6.5	46.1	51.5	55.6	59.9	9	7.5	6	8	38.4	121	133	145	5	7.5	0	
36 FT	28	30	12	9	6.5	6	6.5	46.1	52.1	56.4	60.5	9	7	6	8	38.4	122	134	146	5	7	0	
38 FT	29	31	12	9	6.5	6	6	46.1	54.4	58.6	63.0	9	7	6	7.5	38.4	123	135	147	5	7	0	
40 FT	30	32	13	9	6.5	6	6.5	46.4	55.1	59.4	63.8	9	7	6	7.5	40.5	124	136	148	5	6.5	0	
42 FT	31	33	13	9	6.5	6	6.5	46.4	55.8	60.1	64.5	9	7	6	7	40.5	125	137	149	5	6.5	0	
44 FT	32	34	13	9	6	6	6.5	46.4	56.5	60.9	65.1	9	6.5	6	7	40.5	126	138	150	5	6.5	0	
46 FT	33	35	13	9	6	6	6.5	46.4	57.3	61.5	65.9	9	6.5	6	6.5	40.5	127	139	151	5	6.5	0	
48 FT	34	36	13	9	6	6	6.5	46.4	59.6	64.0	68.5	9	6.5	6	6.5	40.5	128	140	152	5	6.5	0	
50 FT	35	36	13	9	6	6	6.5	46.4	60.0	64.4	68.9	9	6.5	6	6	40.5	128	140	152	5	6	0	

		SPAN (S) = 15 FT										HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=11" HT=12" HT=13"	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=11" HT=12" HT=13"	SIZE	SPA.	C1				
1 FT	12	12	9	7	7	6	6.5	109.6	36.3	39.1	42.0	7	7	6	6	109.6	140	152	164	5	8.5	12	
2 FT	13	14	9	7	7	6	6.5	109.6	38.5	41.5	44.5	7	7.5	6	6	109.6	142	154	166	5	8.5	12	
4 FT	11	12	10	7	6.5	6	6	74.1	36.0	38.9	41.8	7	7	6	6	76.0	140	152	164	5	8	0	
6 FT	12	13	10	7	7	6	6.5	64.6	36.5	39.4	42.3	7	6.5	6	6.5	66.4	141	153	165	5	8	0	
8 FT	12	13	10	7	6.5	6	6	58.9	36.5	39.4	42.3	7	6	6	6	62.8	141	153	165	5	8	0	
10 FT	13	14	10	7	6	7	6	58.9	38.5	41.5	44.5	8	7	6	6	58.9	142	154	166	5	8	0	
12 FT	13	15	10	8	7	7	6	57.0	38.8	41.8	44.8	8	6.5	7	6.5	58.9	143	155	167	5	8	0	
14 FT	14	17	11	8	7	7	6.5	57.3	39.5	42.5	45.5	8	6.5	6	6	53.5	145	157	169	5	7.5	0	
16 FT	14	17	11	8	6.5	7	6	53.5	39.5	42.5	45.5	8	6.5	6	6	49.6	145	157	169	5	8.5	0	
18 FT	16	19	12	8	6.5	7	7	61.5	40.5	43.5	46.5	8	6.5	6	6.5	49.9	147	159	171	5	8.5	0	
20 FT	17	20	12	8	6	7	6	61.5	41.0	44.0	47.0	8	6.5	6	6	49.9	148	160	172	5	7.5	0	
22 FT	19	22	13	8	6.5	7	7	61.8	43.6	46.8	49.9	8	6.5	6	6.5	50.1	150	162	174	5	7.5	0	
24 FT	20	23	13	8	6	7	6.5	59.9	44.3	47.4	50.5	8	6	6	6	50.1	151	163	175	5	6.5	0	
26 FT	21	24	14	8	6	7	6	62.1	46.5	49.6	52.9	8	6	6	6.5	50.5	152	164	176	5	7	0	
28 FT	23	25	14	8	6	7	6	60.1	47.3	50.5	53.8	8	6	6	6	50.9	153	165	177	5	6	0	
30 FT	24	27	15	9	7.5	7	7	60.5	48.0	51.3	54.5	8	6	6	6.5	50.8	155	167	179	5	6	0	
32 FT	25	28	15	9	7	7	6.5	60.5	50.4	53.8	57.1	8	6	6	6	50.8	156	168	180	6	8	0	
34 FT	26	29	15	9	7	7	6	60.5	51.0	54.4	57.6	9	7.5	6	6	50.8	157	168	181	6	8	0	
36 FT	27	30	16	9	7	7	6	60.8	51.5	54.9	58.3	9	7	6	6	51.0	158	170	182	6	8	0	
38 FT	28	31	16	9	6.5	7	6	60.8	52.1	55.5	58.9	9	7	6	6	51.0	159	171	183	6	8	0	
40 FT	29	32	17	9	6.5	7	6	61.1	54.5	58.0	61.5	9	7	6	6	51.3	160	172	184	6	7.5	0	
42 FT	31	33	17	9	6.5	7	7	61.1	55.4	58.9	62.4	9	7	6	6	51.3	161	173	185	6	7.5	0	
44 FT	32	34	17	9	6.5	7	6.5	61.1	57.9	61.5	65.1	9	6.5	6	6	51.3	162	174	186	6	7.5	0	
46 FT	33	35	17	9	6	7	6	61.1	58.5	62.1	65.8	9	6.5	6	6	53.3	163	175	187	6	7.5	0	
48 FT	34	36	18	9	6	7	7	61.4	59.1	62.8	66.3	9	6.5	6	6	53.5	164	176	188	6	7	0	
50 FT	34	37	18	9	6	7	6	61.4	59.4	63.0	66.6	9	6.5	6	6	53.5	165	177	189	6	7	0	

		SPAN (S) = 15 FT										HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT											
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS	
		A1 BARS					J3 BARS					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=14" HT=15" HT=16"	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=14" HT=15" HT=16"	SIZE	SPA.	C1				
1 FT	13	14	11	7	8	6	7.5	112.8	36.1	38.4	40.6	7	8	6	7	112.8	178	190	202	5	7.5	12	
2 FT	13	14	11	7	7.5	6	6.5	112.8	38.0	40.4	42.8	7	7.5	6	6.5	112.8	178	190	202	5	7	12	
4 FT	12	13	11	7	7	6	6.5	112.8	37.6	40.0	42.4	7	7	6	6	112.8	177	189	201	5	6.5	0	
6 FT	12	13	12	7	7.5	6	6.5	92.1	37.6	40.0	42.4	7	6.5	6	6	97.9	177	189	201	5	6.5	0	
8 FT	12	14	13	7	7.5	6	6	77.3	37.8	40.3	42.6	7	6.5	6	6	84.9	178	190	202	5	6.5	0	
10 FT	13	15	13	7	6.5	6	6	73.0	38.3	40.6	43.0	7	6	6	6	81.0	179	191	203	5	6.5	0	
12 FT	14	16	14	7	6.5	7	8	73.8	38.6	41.0	43.4	8	7.5	6	6	75.6	180	192	204	5	6	0	
14 FT	15	17	14	7	6	7	7	81.5	41.0	43.5	46.0	8	7	7	7.5	75.6	181	193	205	5	6	0	
16 FT	16	18	15	8	7.5	7	7	80.0	45.3	48.1	50.9	8	7	7	7	74.1	182	194	206	6	8	0	
18 FT	16	19	15	8	7	7	7	74.1	41.6	44.1	46.6	8	7	7	7.5	70.3	183	195	207	6	8	0	
20 FT	17	20	15	8	7	7	6	74.1	46.0	48.8	51.5	8	6.5	7	7	68.3	184	196	208	6	8	0	
22 FT	19	21	15	8	6.5	7	6	74.1	50.8	53.8	56.8	8	6	7	6	68.3	185	197	209	6	8	0	
24 FT	20	23	16	8	6.5	7	6	74.5	47.4	50.1	52.9	8											

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

SPAN (S) = 16 FT													HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT												
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS									BOTTOM SLAB BARS									WALL BARS			
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS									
				SIZE	SPA.	SIZE	HT=8'	HT=9'	HT=10'	SIZE	SPA.	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C1								
1 FT	12	13	8	7	6.5	6	6.5	116.0	37.1	41.0	44.8	7	7.5	6	6.5	76.0	105	117	129	5	12	12			
2 FT	12	13	8	7	6.5	6	6.5	116.0	37.1	41.0	44.8	7	7	6	6	64.0	105	117	129	5	12	12			
4 FT	12	12	9	7	6.5	6	6.5	54.3	36.8	40.6	44.5	7	6.5	6	6	54.3	104	116	128	5	12	0			
6 FT	12	12	9	7	6	6	6.5	50.3	36.8	40.6	44.5	7	6	6	6	50.3	104	116	128	5	12	0			
8 FT	12	13	9	8	7.5	7	6.5	50.3	37.1	41.0	44.8	8	7	6	6	46.3	105	117	129	5	12	0			
10 FT	13	14	9	8	6.5	7	6.5	48.3	37.8	41.6	45.5	8	6.5	6	6	44.3	106	118	130	5	12	0			
12 FT	14	16	9	8	6.5	7	6.5	46.3	35.1	38.6	42.0	8	6.5	6	7.5	40.3	108	120	132	5	12	0			
14 FT	15	18	9	8	6	7	6	52.3	36.0	39.5	42.9	8	6	6	8	38.3	110	122	134	5	12	0			
16 FT	16	19	9	9	7	7	6	50.3	36.5	40.0	43.5	8	6	6	7.5	38.3	111	123	135	5	12	0			
18 FT	17	20	9	9	7	7	6.5	50.3	37.1	40.6	44.1	8	6	6	8	38.3	112	124	136	5	12	0			
20 FT	19	21	9	9	7	7	7	50.3	39.3	42.9	46.5	8	6	6	7.5	38.3	113	125	137	5	10.5	0			
22 FT	20	23	9	9	6.5	7	6.5	50.3	40.3	43.8	47.4	8	6	6	7.5	38.3	115	127	139	5	9	0			
24 FT	22	24	10	9	7	7	7.5	50.5	42.5	46.3	49.9	9	7.5	6	7.5	38.4	116	128	140	5	9.5	0			
26 FT	23	25	10	9	6.5	7	7	50.5	47.3	51.4	55.4	9	7	6	7	38.4	117	129	141	5	8.5	0			
28 FT	25	27	11	9	6.5	6	6	46.8	45.8	49.6	53.5	9	7	6	8	40.6	119	131	143	5	8.5	0			
30 FT	26	28	11	9	6.5	6	6	46.8	46.4	50.3	54.1	9	7	6	8	40.6	120	132	144	5	7.5	0			
32 FT	28	29	11	9	6.5	6	6.5	46.8	53.3	57.6	61.9	9	7	6	7	40.6	121	133	145	5	7.5	0			
34 FT	29	31	12	9	6.5	6	6.5	46.9	54.4	58.6	63.0	9	7	6	7.5	40.8	123	135	147	5	7	0			
36 FT	30	32	12	9	6	6	6.5	46.9	55.1	59.4	63.8	9	6.5	6	7.5	40.8	124	136	148	5	7	0			
38 FT	31	33	12	9	6	6	6.5	46.9	55.8	60.1	64.5	9	6.5	6	7	40.8	125	137	149	5	7	0			
40 FT	32	34	12	9	6	6	6.5	46.9	56.5	60.9	65.1	9	6.5	6	7	40.8	126	138	150	5	7	0			
42 FT	33	35	12	9	6	6	6	46.9	57.3	61.5	65.9	9	6.5	6	6.5	40.8	127	139	151	5	6.5	0			
44 FT	34	36	13	10	7	6	6.5	47.1	59.6	64.0	68.5	9	6	6	6.5	41.0	128	140	152	5	6.5	0			
46 FT	35	37	13	10	7	6	6	47.1	60.3	64.8	69.3	9	6	6	6.5	41.0	129	141	153	5	6.5	0			
48 FT	36	38	13	10	7	6	6.5	47.1	61.0	65.5	69.9	9	6	6	6	41.0	130	142	154	5	6	0			
50 FT	37	39	13	10	7	6	6	47.1	61.8	66.3	70.6	9	6	6	6	41.0	131	143	155	6	8.5	0			

SPAN (S) = 16 FT													HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT												
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS									BOTTOM SLAB BARS									WALL BARS			
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS									
				SIZE	SPA.	SIZE	HT=11'	HT=12'	HT=13'	SIZE	SPA.	HT=11'	HT=12'	HT=13'	SIZE	SPA.	C1								
1 FT	12	14	9	7	6.5	6	6	116.6	36.8	39.6	42.5	7	7.5	6	6	116.6	142	154	166	5	8.5	12			
2 FT	13	14	10	7	6	6	7	117.1	38.5	41.5	44.5	7	7.5	6	6	101.0	142	154	166	5	8.5	12			
4 FT	12	13	10	7	6.5	6	6.5	72.8	36.5	39.4	42.3	7	6.5	6	6.5	74.8	141	153	165	5	8.5	0			
6 FT	12	13	10	7	6	6	6	62.6	36.5	39.4	42.3	7	6	6	6	64.6	141	153	165	5	8.5	0			
8 FT	12	14	10	7	6	7	6	62.6	36.8	39.6	42.5	8	7.5	6	6	60.6	142	154	166	5	8.5	0			
10 FT	13	15	11	8	7.5	7	6.5	60.9	37.3	40.1	43.0	8	7	6	6.5	56.9	143	155	167	5	9	0			
12 FT	14	16	11	8	6.5	7	6.5	58.9	39.3	42.3	45.3	8	6.5	6	6	54.8	144	156	168	5	8.5	0			
14 FT	15	17	11	8	6	7	6	65.0	46.1	49.6	53.1	8	6	7	7	56.9	145	157	169	5	8	0			
16 FT	16	19	12	8	6	7	6	65.3	40.5	43.5	46.5	8	6	6	6	53.0	147	159	171	5	8	0			
18 FT	17	20	12	8	6	7	6.5	61.3	41.0	44.0	47.0	8	6	6.5	6	49.0	148	160	172	5	9	0			
20 FT	19	21	12	8	6	7	6.5	59.1	43.4	46.5	49.6	8	6	6	6	49.0	149	161	173	5	7.5	0			
22 FT	20	23	13	9	7.5	7	6.5	61.5	44.3	47.4	50.5	8	6	6.5	6	49.3	151	163	175	5	8	0			
24 FT	22	24	13	9	7	7	6.5	59.5	46.8	50.0	53.3	9	7.5	6	6	49.3	152	164	176	5	6.5	0			
26 FT	23	26	14	9	7	7	6.5	59.8	47.5	50.8	54.0	9	7.5	6	6.5	49.5	154	166	178	5	7	0			
28 FT	24	27	14	9	7	7	6.5	59.8	48.0	51.3	54.5	9	7	6	6	49.5	155	167	179	5	6	0			
30 FT	26	28	14	9	6.5	7	6	59.8	50.6	54.0	57.4	9	7	6	6	49.5	156	168	180	5	6	0			
32 FT	27	29	15	9	6.5	7	6.5	60.0	51.3	54.6	58.0	9	7	6	6	49.6	157	169	181	5	6	0			
34 FT	28	31	15	9	6.5	7	6	60.0	52.1	55.5	58.8	9	7	6	6	49.6	159	171	183	5	8	0			
36 FT	29	32	16	9	6.5	7	6.5	60.4	54.5	58.0	61.5	9	6.5	6	6	49.9	160	172	184	5	8	0			
38 FT	30	33	16	9	6	7	6	60.4	55.1	58.6	62.0	9	6.5	6	6	49.9	161	173	185	5	8	0			
40 FT	32	34	16	9	6	7	6.5	60.4	57.9	61.5	65.1	9	6.5	6	6	49.9	162	174	186	5	8	0			
42 FT	33	35	17	9	6	7	6	60.6	58.5	62.1	65.8	9	6.5	6	6	50.1	163	175	187	5	7.5	0			
44 FT	34	36	17	9	6	7	7	60.6	59.1	62.8	66.3	9	6	6	6	50.1	164	176	188	6	7.5	0			
46 FT	35	37	17	10	7.5	7	6.5	60.6	59.8	63.3	66.9	9	6	6	6	50.1	165	177	189	6	7.5	0			
48 FT	36	38	18	10	7	7	7	60.9	63.9	67.5	71.5	9	6	6	6	52.5	166	178	190	6	7	0			
50 FT	37	39	18	10	7	7	7	60.9	62.9	66.6	70.4	9	6	6	6	52.5	167	179	191	6	7	0			

SPAN (S) = 16 FT													HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT												
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS									BOTTOM SLAB BARS									WALL BARS			
	TS	BS	TX	A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS									
				SIZE	SPA.	SIZE	HT=14'	HT=15'	HT=16'	SIZE	SPA.	HT=14'	HT=15'	HT=16'	SIZE	SPA.	C1								
1 FT	13	14	11	7	7.5	6	7	117.8	38.0	40.4	42.8	7	7.5	6	6.5	117.8	178	190	202	5	7.5	12			
2 FT	13	14	11	7	7	7	7.5	121.8	38.0	40.4	42.8	7	7	6	6.5	117.8	178	190	202	5	7	12			
4 FT	12	14	11	7	6.5	6	6	117.8	37.8	40.3	42.6	7	6.5	6	6	117.8	178	190	202	5	6.5	0			
6 FT	12	14	12	7	6.5	6	6	83.6	37.8	40.3	42.6	7	6.5	6	6	95.9	178	190	202	5	7	0			
8 FT	12	14	13	7	6.5	7	6.5	77.9	37.8	40.3	42.6	7	6	6	6	90.0	178	190	202	5	6.5	0			
10 FT	13	16	13	7	6	6.5	7	75.8	36.4	40.8	43.6	8	7.5	6	6	77.9	180	192	204	5	6.5	0			
12 FT	14	17	14	7	6	6.5	7	72.1	40.8	43.3	45.8	8	7	8	76.3	181	193	205	5	6	0				
14 FT	16	18	14	8	7	7	6.5	76.3	45.3	48.1	50.9	8	6.5	7	7	74.1	182	194	206	5	6	0			
16 FT	17	19	15	8	7	7	6.5	76.6	47.8	50.6	53.5	8	6.5	7	6.5	72.5	183	195	207	6	8	0			
18 FT	17	20	15	8	6.5	7	6.5	72.5	42.0	44.5	47.0	8	6	7	7.5	66.3	184	196	208	6	8	0			
20 FT	19	21	15	8	6.5	7	6	72.5	50.8	53.8	56.8	8	6	7	6.5	66.3	185	197	209	6	8	0			
22 FT	20	23	16	8	6	7	6	72.8	45.4	48.0	50.6	8	6	7	7	66.5	187	199	211	6	8	0			

**AREA OF STEEL REQUIRED FOR J5 BARS IN WINGS (SO. IN./FT.)
WALL HEIGHT VS. WALL THICKNESS**

Ⓞ Backfill Slope = 2:1

Wall Thickness Tx (In.)	Wall Height (ft.)																			
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
8	0.168	0.168	0.197	0.291	0.414	0.429	0.578	0.766	1.003											
9	0.168	0.168	0.168	0.244	0.346	0.456	0.477	0.626	0.809	1.034	1.312									
10	0.168	0.168	0.168	0.211	0.298	0.407	0.487	0.532	0.683	0.864	1.084	1.349								
11	0.168	0.168	0.168	0.185	0.261	0.357	0.475	0.520	0.592	0.746	0.929	1.147	1.405							
12		0.168	0.168	0.168	0.233	0.318	0.422	0.548	0.554	0.658	0.816	1.002	1.220	1.475						
13		0.168	0.168	0.168	0.210	0.287	0.380	0.493	0.588	0.589	0.729	0.892	1.081	1.301						
14			0.168	0.168	0.192	0.261	0.346	0.448	0.569	0.623	0.659	0.805	0.973	1.167	1.390					
15				0.168	0.176	0.240	0.317	0.411	0.521	0.652	0.658	0.734	0.886	1.059	1.258					
16					0.168	0.222	0.293	0.379	0.481	0.601	0.693	0.693	0.813	0.971	1.151					
17						0.168	0.206	0.273	0.352	0.447	0.557	0.686	0.729	0.752	0.897	1.061	1.247			
18							0.255	0.329	0.417	0.520	0.639	0.764	0.764	0.834	0.985	1.156				
19								0.309	0.391	0.487	0.599	0.727	0.800	0.800	0.920	1.078				
20									0.291	0.368	0.459	0.563	0.684	0.821	0.836	0.863	1.011			
21										0.348	0.433	0.532	0.645	0.774	0.871	0.871	0.952			
22											0.411	0.504	0.611	0.733	0.870	0.907	0.970			
23												0.479	0.580	0.696	0.826	0.943	0.943			
24													0.456	0.552	0.662	0.786	0.925	0.979		
25														0.527	0.632	0.750	0.882	1.015		
26															0.604	0.717	0.843	0.984		
27																0.686	0.807	0.942		

**AREA OF STEEL REQUIRED FOR J5 BARS IN WINGS (SO. IN./FT.)
WALL HEIGHT VS. WALL THICKNESS**

Ⓞ Backfill Slope = 3:1

Wall Thickness Tx (In.)	Wall Height (ft.)																			
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
8	0.168	0.168	0.168	0.187	0.264	0.362	0.425	0.475	0.612											
9	0.168	0.168	0.168	0.168	0.222	0.303	0.403	0.456	0.504	0.637	0.795									
10	0.168	0.168	0.168	0.168	0.191	0.261	0.346	0.450	0.487	0.541	0.671	0.824	1.005	1.217						
11	0.168	0.168	0.168	0.168	0.168	0.229	0.304	0.394	0.501	0.520	0.583	0.713	0.864	1.039						
12		0.168	0.168	0.168	0.168	0.204	0.271	0.351	0.445	0.554	0.554	0.629	0.760	0.910						
13			0.168	0.168	0.168	0.168	0.185	0.244	0.316	0.401	0.501	0.588	0.588	0.679	0.812	0.963				
14				0.168	0.168	0.168	0.168	0.223	0.288	0.365	0.455	0.560	0.623	0.623	0.733	0.868				
15					0.168	0.168	0.168	0.204	0.264	0.335	0.417	0.513	0.623	0.658	0.669	0.791				
16						0.168	0.168	0.189	0.244	0.309	0.385	0.474	0.575	0.690	0.693	0.727				
17							0.168	0.168	0.176	0.227	0.287	0.358	0.440	0.533	0.640	0.729	0.729	0.788		
18								0.168	0.212	0.269	0.334	0.411	0.498	0.597	0.709	0.764	0.764			
19									0.199	0.252	0.314	0.385	0.467	0.559	0.664	0.782	0.800			
20										0.188	0.237	0.295	0.362	0.439	0.526	0.625	0.735	0.836		
21											0.224	0.279	0.342	0.415	0.497	0.590	0.694	0.810		
22												0.265	0.325	0.393	0.471	0.558	0.657	0.766		
23													0.308	0.373	0.447	0.530	0.624	0.727		
24														0.294	0.356	0.426	0.505	0.594	0.692	
25															0.340	0.407	0.482	0.566	0.661	
26																0.389	0.461	0.542	0.632	
27																	0.442	0.519	0.605	

NOTE:

THE WALL HEIGHT IS EQUAL TO THE BARREL HEIGHT (HT) PLUS THE TOP SLAB THICKNESS (TS). WHEN WALL HEIGHT IS IN BETWEEN OR OUTSIDE TABULATED WALL HEIGHTS, THE AREA OF STEEL REQUIRED SHOULD BE INTERPOLATED BETWEEN OR EXTRAPOLATED FROM ADJACENT AREAS OF STEEL USING THE ACTUAL WALL HEIGHT.

IF AREA OF STEEL IN THE WALL OF THE CULVERT (J4 BARS) IS GREATER THAN THAT INDICATED IN THE TABLE, USE THE SAME SIZE AND SPACING FOR THE J5 BARS IN THE WINGS. HOWEVER, IF THE AREA OF STEEL PROVIDED BY MATCHING SIZE AND SPACING OF THE J4 BARS IS INSUFFICIENT, INCREASE THE SIZE OF THE J5 BARS (#8 MAX.) AND/OR DECREASE THE SPACING OF THE J5 BARS (6" MIN.). USE SMALLEST BAR SIZE POSSIBLE BASED ON MINIMUM SPACING.

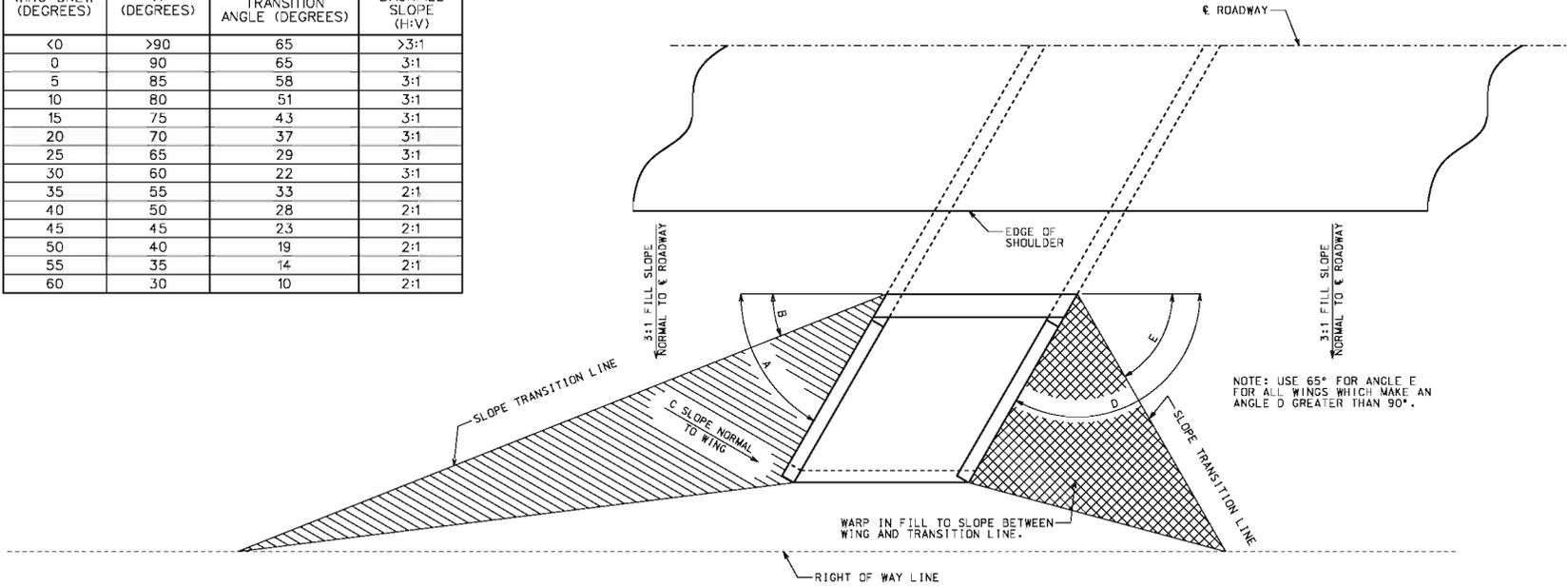
MINIMUM STEEL TO BE USED IN THE WINGS FOR J5 BARS IS #4 BARS AT 14" CENTERS (AREA OF STEEL = 0.1683 SQ. IN./FT.)

Ⓞ SEE STANDARD PLAN 703.37C, SHEET 2 OF 2 FOR BACKFILL SLOPE TO BE USED BASED ON SKEW.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE BOX CULVERT EXTERIOR WING REINFORCEMENT
 <small>THIS SHEET HAS BEEN CHECKED, SEALED AND DATED ELECTRONICALLY.</small>	
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	703.37C
	SHEET NO. 1 OF 2

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

WING BACKFILL TABLE			
WING SKEW (DEGREES)	A (DEGREES)	B TRANSITION ANGLE (DEGREES)	C BACKFILL SLOPE (H:V)
<0	>90	65	>3:1
0	90	65	3:1
5	85	58	3:1
10	80	51	3:1
15	75	43	3:1
20	70	37	3:1
25	65	29	3:1
30	60	22	3:1
35	55	33	2:1
40	50	28	2:1
45	45	23	2:1
50	40	19	2:1
55	35	14	2:1
60	30	10	2:1



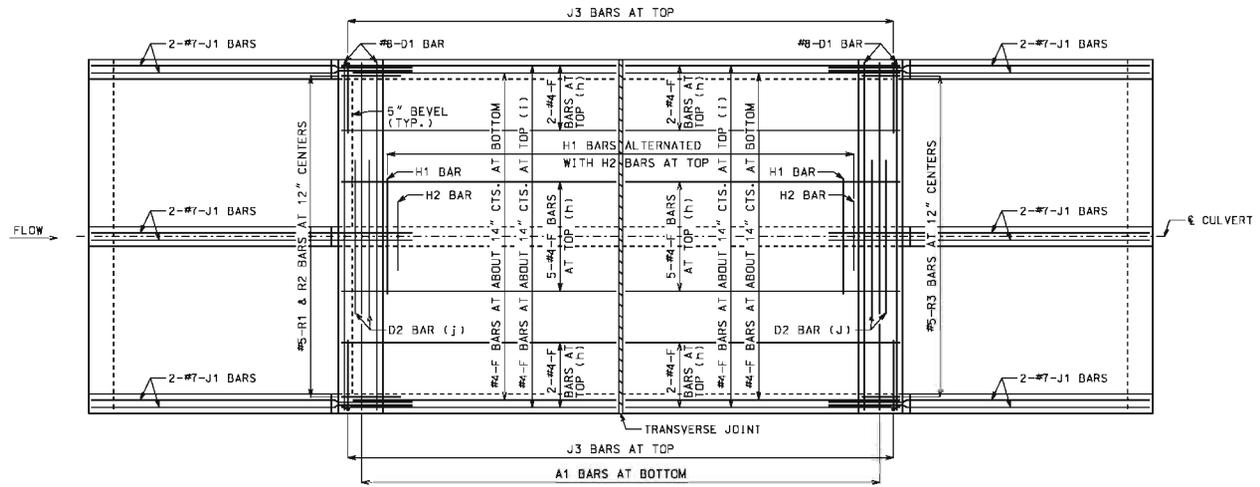
PLAN OF WINGS AND SLOPE TRANSITION LINES

NOTE: BACKFILL TRANSITION ANGLE AND BACKFILL SLOPE SHALL APPLY TO ALL BOX CULVERTS REGARDLESS OF TYPE - SINGLE, DOUBLE, OR TRIPLE.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE BOX CULVERT EXTERIOR WING BACKFILL SLOPE TRANSITION	
	DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	SHEET NO. 703.37C 2 OF 2

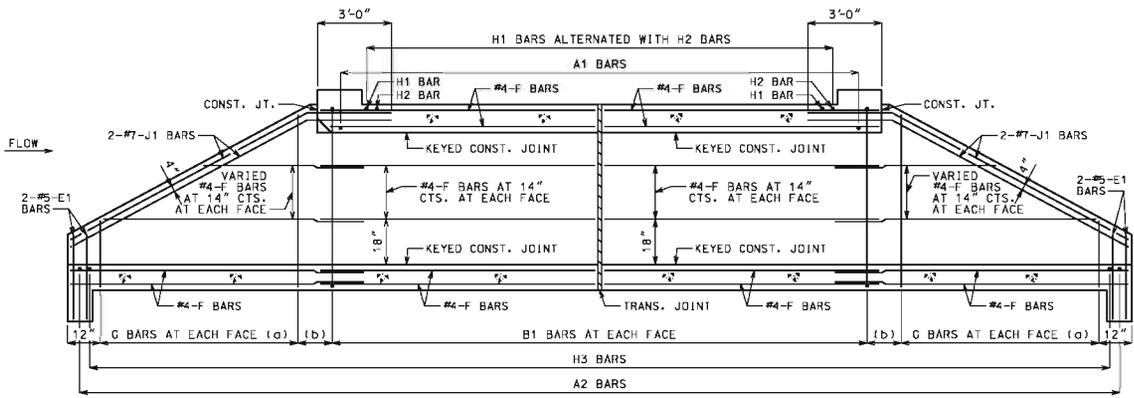
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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



PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.

- GENERAL NOTES:**
- FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.
 - CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION. SEE SHEET 3 OF 3 FOR DETAILS.
 - DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
 - MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".
 - LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
 - BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.
 - (g) SAME SIZE AND SPACING AS ADJACENT B BARS
 - (b) VARIES, 12" MAXIMUM
 - (c) NOT SPECIFIED ON THIS SHEET
 - (d) NOT SPECIFIED ON THIS SHEET
 - (e) NOT SPECIFIED ON THIS SHEET
 - (f) NOT SPECIFIED ON THIS SHEET
 - (g) NOT SPECIFIED ON THIS SHEET
 - (h) FOR DESIGN FILLS OVER 2'-0"
 - (i) FOR DESIGN FILLS 2'-0" OR LESS
 - (j) NOT REQUIRED FOR CLEAR SPAN ≤ 10'-0"
 #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"

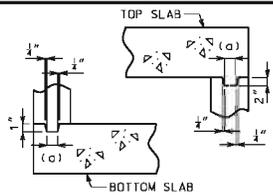


SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

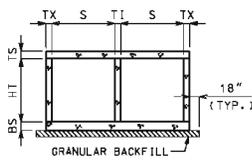
IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF $\#$ WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/3 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT SKEW: SQUARED WINGS: STRAIGHT REINFORCEMENT	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.40H SHEET NO. 2 OF 3

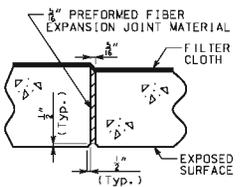
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



KEYED CONSTRUCTION JOINT
 (c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



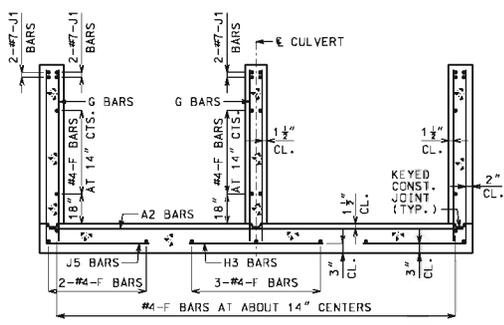
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



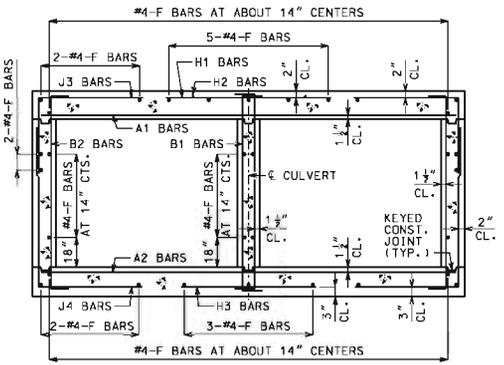
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

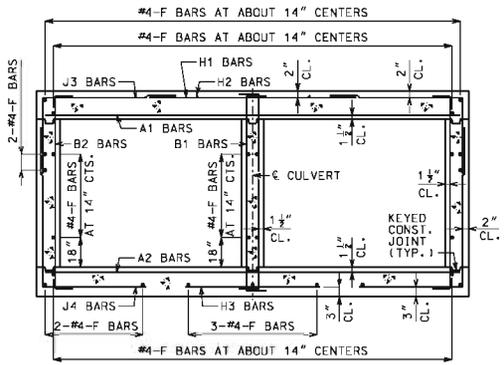
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



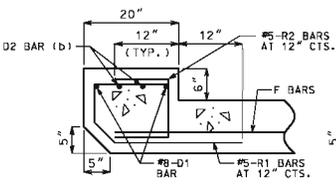
UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



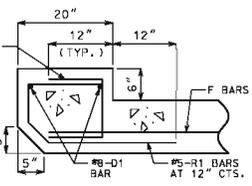
BARREL REINFORCEMENT
 FOR DESIGN FILLS OVER 2'-0"



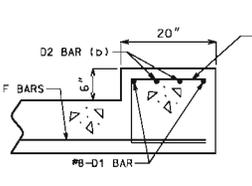
BARREL REINFORCEMENT
 FOR DESIGN FILLS 2'-0" OR LESS



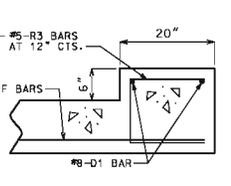
UPSTREAM HEADWALL REINFORCEMENT
 NEAR INTERIOR WALL



UPSTREAM HEADWALL REINFORCEMENT
 NEAR MIDSPAN



DOWNSTREAM HEADWALL REINFORCEMENT
 NEAR INTERIOR WALL



DOWNSTREAM HEADWALL REINFORCEMENT
 NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"
 NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF E WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

GENERAL NOTES:
 FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703-37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO E CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT SKEW: SQUARED WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.40H SHEET NO. 3 OF 3

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

LAYING OUT TRANSVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

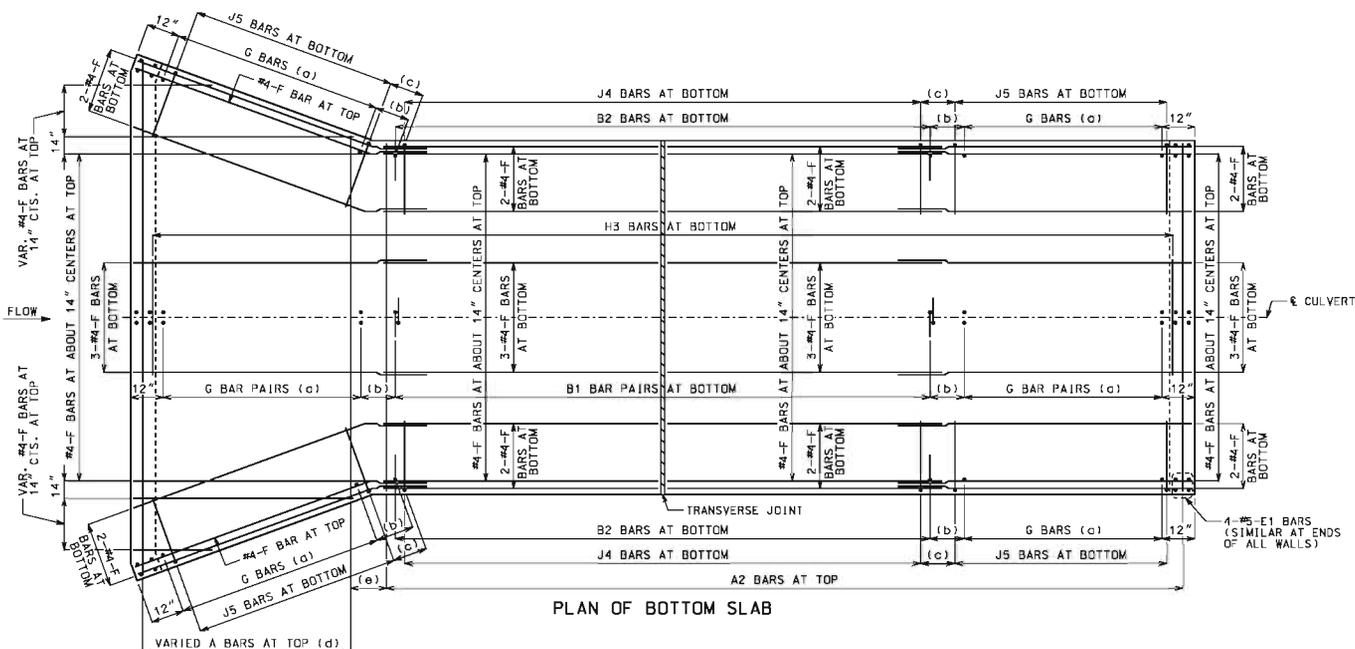
BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

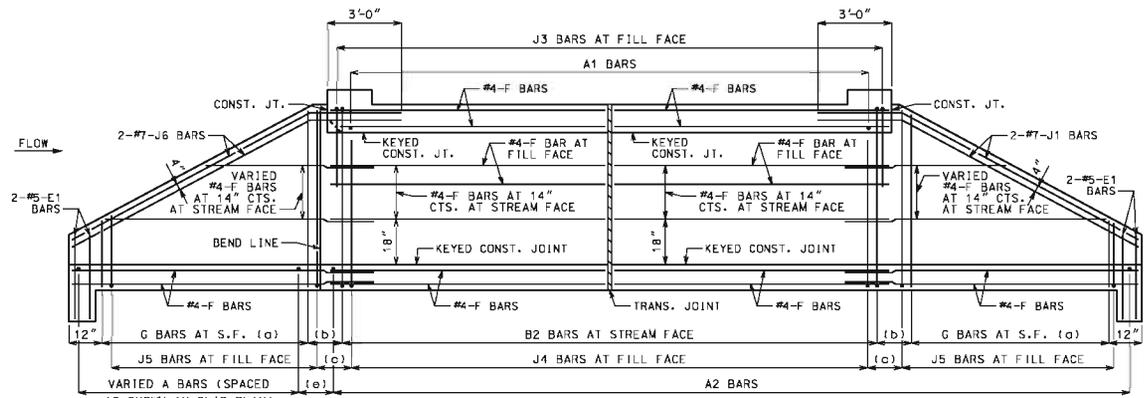
WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.46.



PLAN OF BOTTOM SLAB



DEVELOPED ELEVATION OF EXTERIOR WALL

J1 AND J6 BARS MAY BE BENT IN FIELD OR SHOP.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

(e) A2 BAR SPACING

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



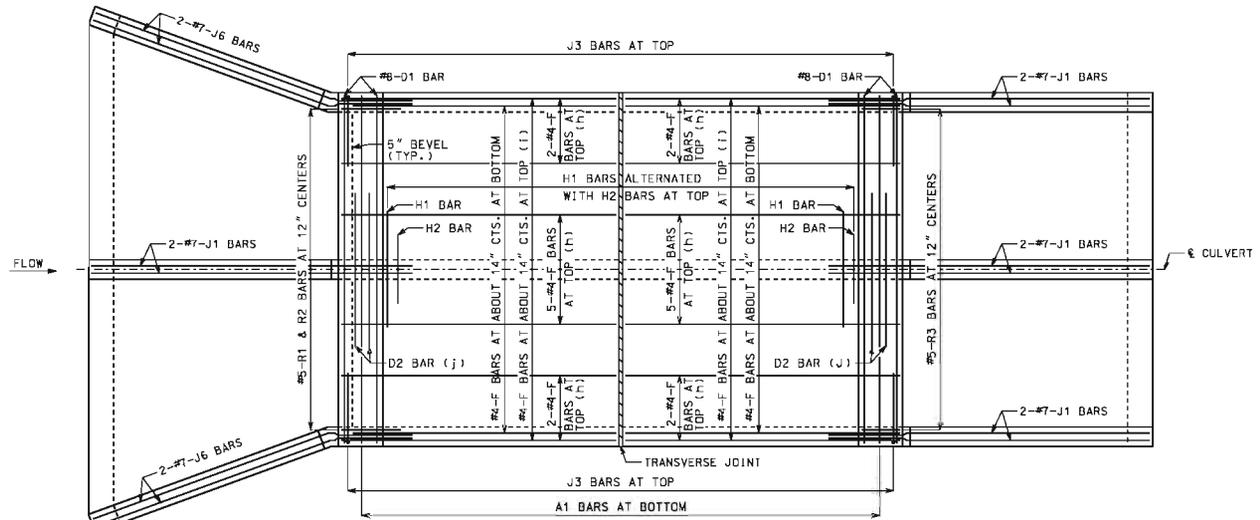
CONCRETE DOUBLE BOX CULVERT

SKEW: SQUARED
 WINGS: FLARED

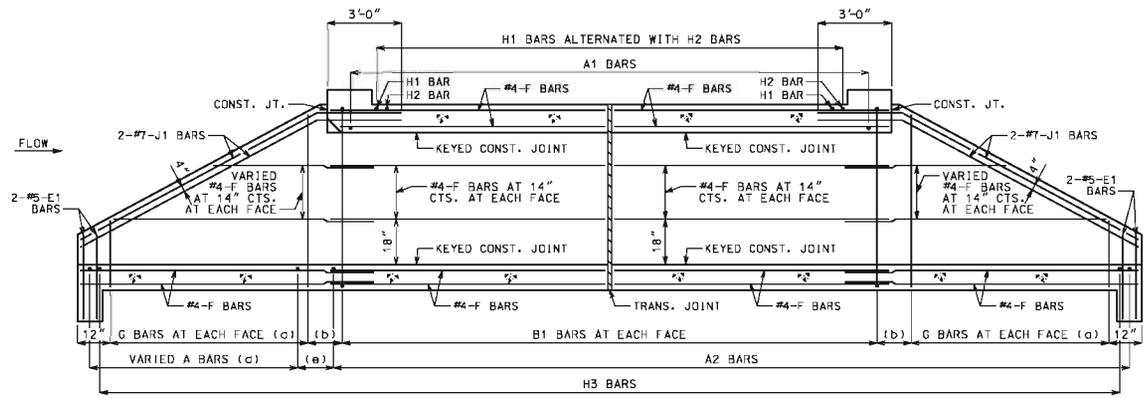
REINFORCEMENT

DATE EFFECTIVE:	10/01/2011	703.41H	SKETCH NO.
DATE PREPARED:	5/13/2015		1 OF 3

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



PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.



SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

- GENERAL NOTES:**
- FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.
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 - BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.
 - (a) SAME SIZE AND SPACING AS ADJACENT B BARS
 - (b) VARIES, 12" MAXIMUM
 - (c) NOT SPECIFIED ON THIS SHEET
 - (d) SAME SIZE AND SPACING AS A2 BARS
 - (e) A2 BAR SPACING
 - (f) NOT SPECIFIED ON THIS SHEET
 - (g) NOT SPECIFIED ON THIS SHEET
 - (h) FOR DESIGN FILLS OVER 2'-0"
 - (i) FOR DESIGN FILLS 2'-0" OR LESS
 - (j) NOT REQUIRED FOR CLEAR SPAN ≤ 10'-0"
 #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF ϕ WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/3 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

STATE OF MISSOURI

DENNIS W. REDMAN

REGISTERED PROFESSIONAL ENGINEER

NUMBER PE-27141

EXPIRES 12/31/2015

THIS SHEET HAS BEEN ELECTRONICALLY SEALED AND DATED.

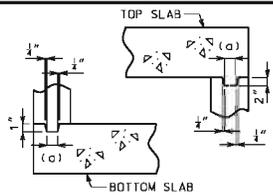
CONCRETE DOUBLE BOX CULVERT

SKEW: SQUARED
WINGS: FLARED

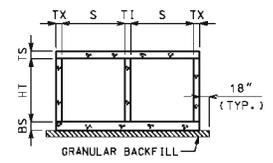
REINFORCEMENT

DATE EFFECTIVE:	10/01/2011	703.41H	SHEET NO.
DATE PREPARED:	5/13/2015		2 OF 3

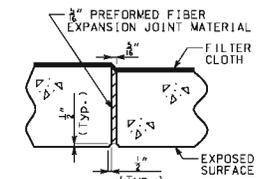
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



KEYED CONSTRUCTION JOINT
(c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



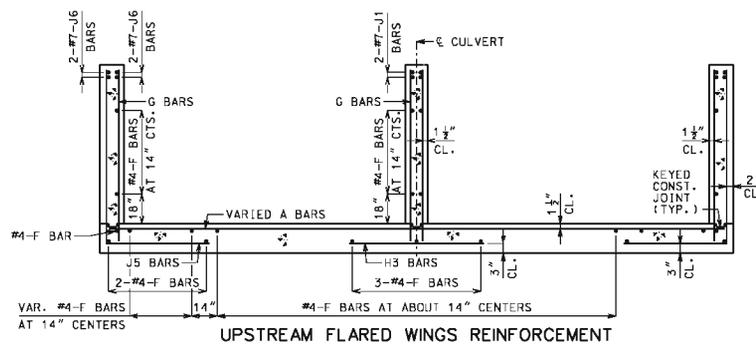
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



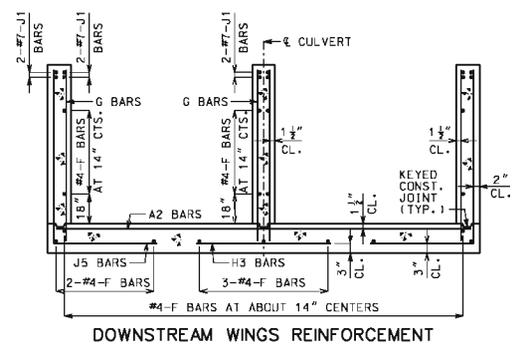
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

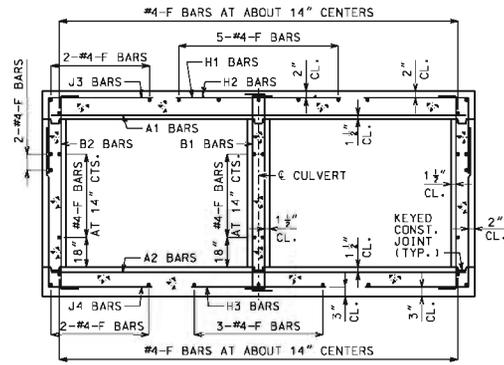
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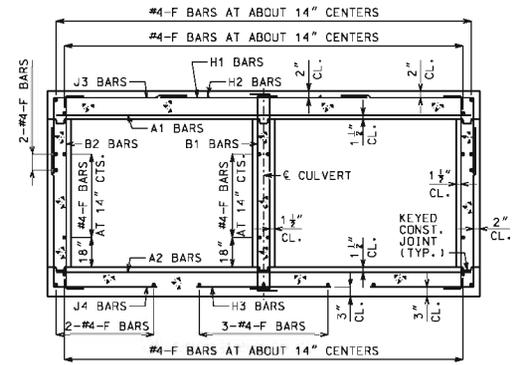
UPSTREAM FLARED WINGS REINFORCEMENT



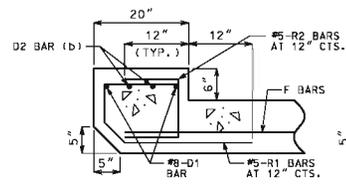
DOWNSTREAM WINGS REINFORCEMENT



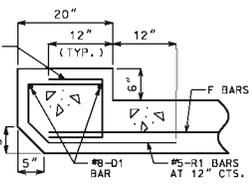
BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



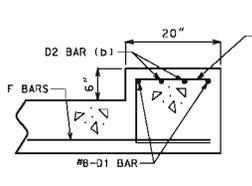
BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



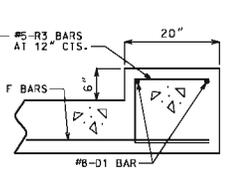
UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL



UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN



DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL



DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0"
#9 FOR CLEAR SPAN > 13'-0"
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF ϵ WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR $\frac{1}{4}$ CLEAR SPAN, THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

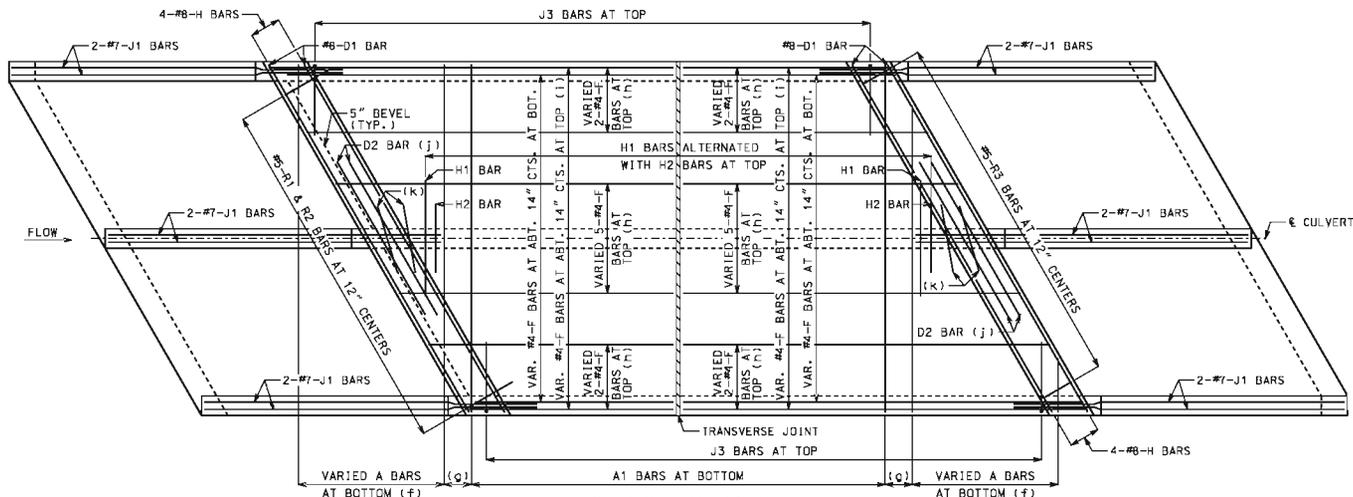
GENERAL NOTES:
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO ϵ CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

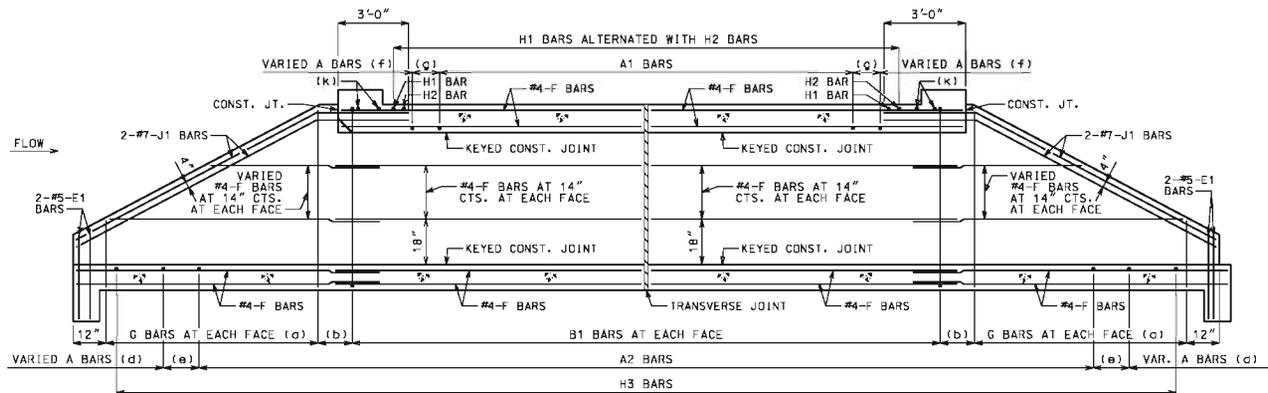
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}$ ".

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT SKEW: SQUARED WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.41H SHEET NO. 3 OF 3



PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.



SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

GENERAL NOTES:
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MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2\"/>

LAP LONGITUDINAL BARS A MINIMUM OF 23\"/>

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(o) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12\"/>

(c) NOT SPECIFIED ON THIS SHEET

(d) SAME SIZE AND SPACING AS A2 BARS

(e) A2 BAR SPACING

(f) SAME SIZE AND SPACING AS A1 BARS

(g) A1 BAR SPACING

(h) FOR DESIGN FILLS OVER 2'-0\"/>

(i) FOR DESIGN FILLS 2'-0\"/>

(j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0\"/>

#8 FOR CLEAR SPAN > 10'-0\"/>

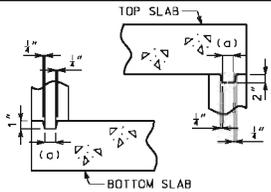
#9 FOR CLEAR SPAN > 13'-0\"/>

IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF CULVERT WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

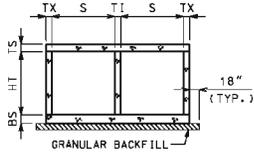
(k) H2 BARS AS REQUIRED, QUANTITY OF BARS VARIES WITH SKEW.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT SKEW: LEFT ADVANCE WINGS: STRAIGHT REINFORCEMENT	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.42H SHEET NO. 2 OF 3

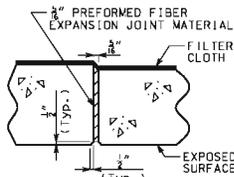
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KEYED CONSTRUCTION JOINT
(c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



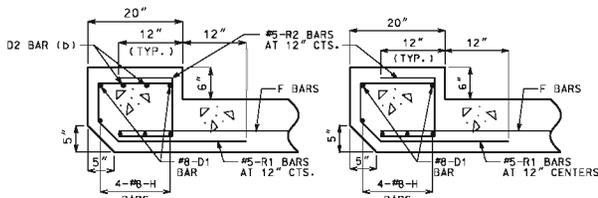
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



TRANSVERSE JOINT THRU BARREL

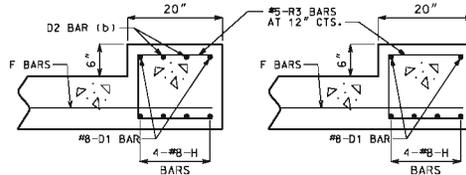
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UPSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL

UPSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

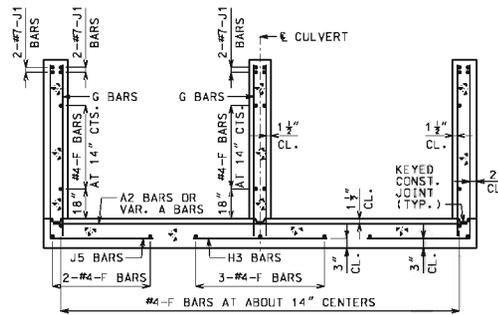


DOWNSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL

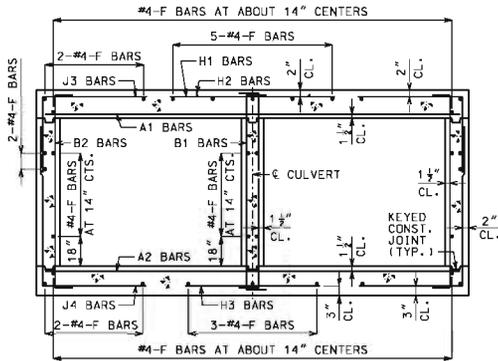
DOWNSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0"
#9 FOR CLEAR SPAN > 13'-0"
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

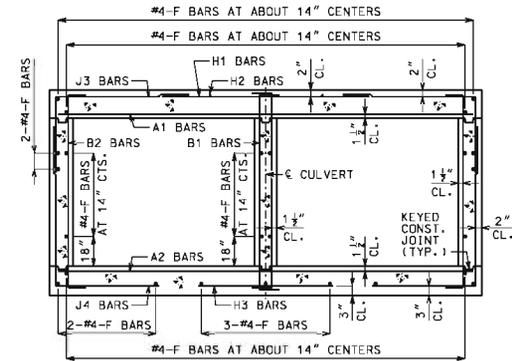
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UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT
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BARREL REINFORCEMENT
FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO E CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

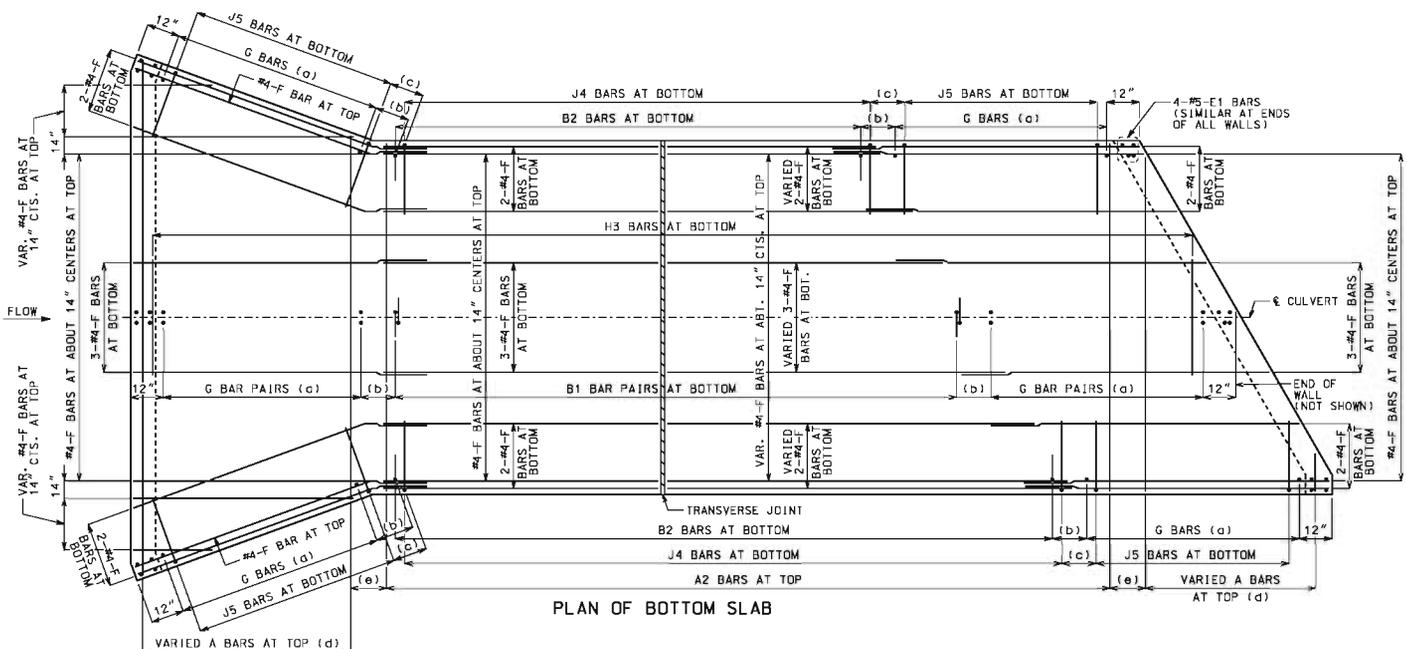
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>CONCRETE DOUBLE BOX CULVERT</p> <p>SKEW: LEFT AVANCE WINGS: STRAIGHT</p> <p>SECTIONS</p>	
<p>DATE EFFECTIVE: 10/01/2011</p> <p>DATE PREPARED: 5/13/2015</p>	<p>703.42H</p>
<p>SHEET NO. 3 OF 3</p>	

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

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



PLAN OF BOTTOM SLAB

LAYING OUT TRANSVERSE JOINTS
UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT
CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.
FOR CUT SECTION DETAILS, SEE 703.46.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE SHEET 3 OF 3 FOR DETAILS.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

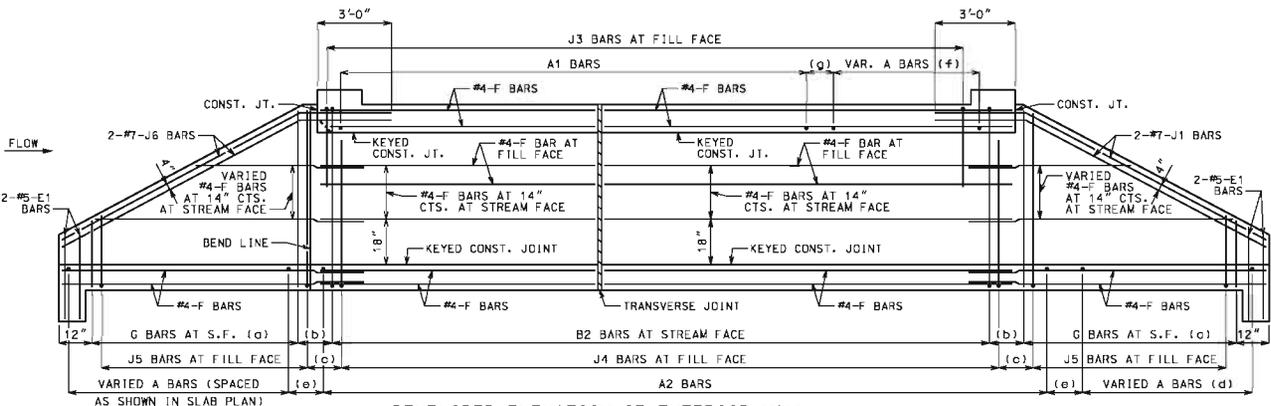
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

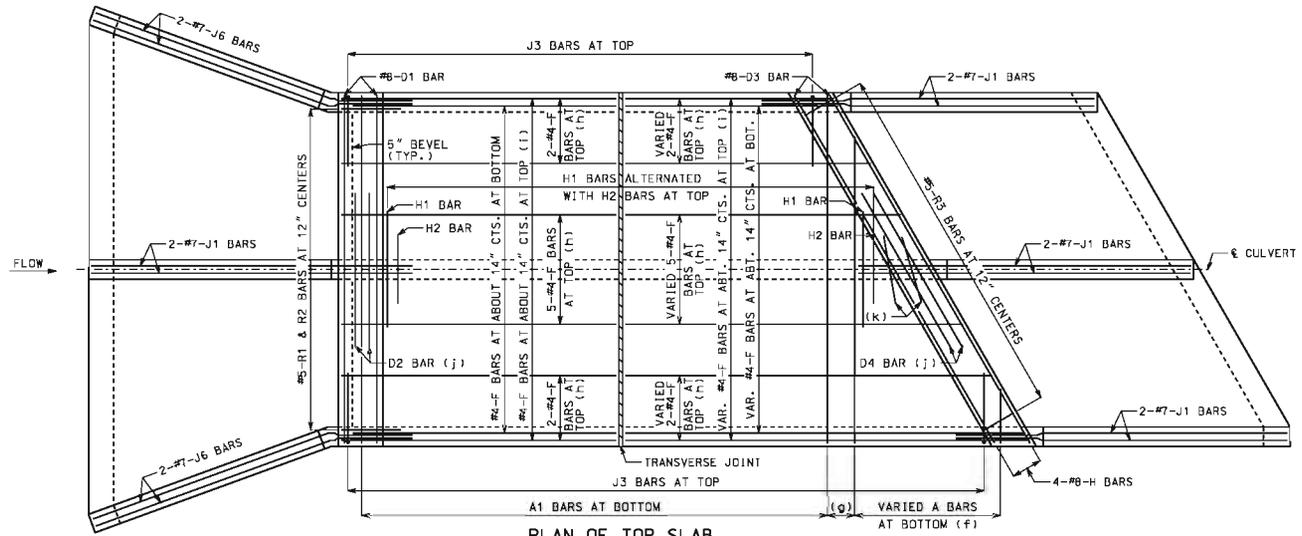
(a) SAME SIZE AND SPACING AS ADJACENT B BARS
(b) VARIES, 12" MAXIMUM
(c) J4 BAR SPACING
(d) SAME SIZE AND SPACING AS A2 BARS
(e) A2 BAR SPACING
(f) SAME SIZE AND SPACING AS A1 BARS
(g) A1 BAR SPACING



DEVELOPED ELEVATION OF EXTERIOR WALL
J1 AND J6 BARS MAY BE BENT IN FIELD OR SHOP.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE DOUBLE BOX CULVERT SKEW: LEFT ADVANCE WINGS: FLARED	
	REINFORCEMENT	
STATE OF MISSOURI DENNIS W. HEDGEMAN NUMBER PE-27141 PROFESSIONAL ENGINEER	THIS SHEET HAS BEEN E-SEALED AND DATED ELECTRONICALLY	SHEET NO. 703.43H 1 OF 3
DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015		

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



PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.

GENERAL NOTES:
 FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3.
 FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(o) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

(c) NOT SPECIFIED ON THIS SHEET

(d) SAME SIZE AND SPACING AS A2 BARS

(e) A2 BAR SPACING

(f) SAME SIZE AND SPACING AS A1 BARS

(g) A1 BAR SPACING

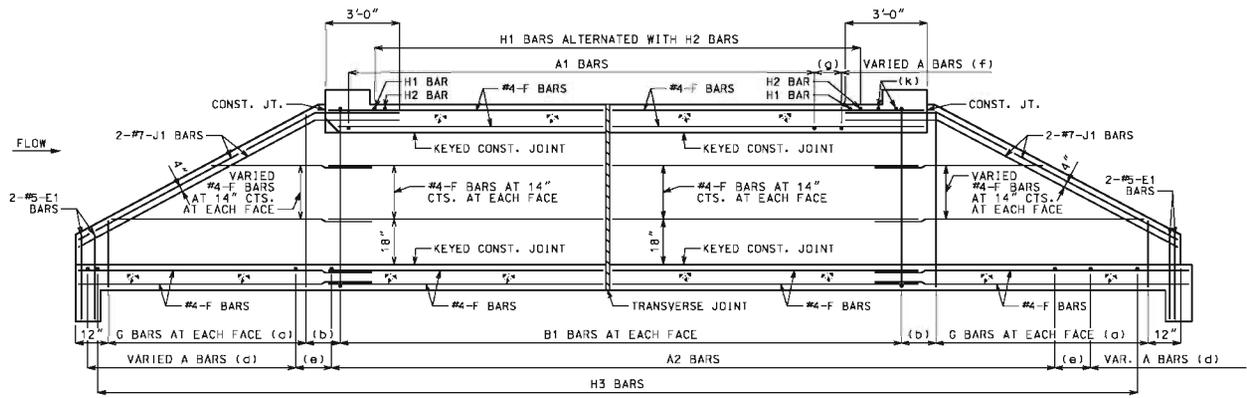
(h) FOR DESIGN FILLS OVER 2'-0"

(i) FOR DESIGN FILLS 2'-0" OR LESS

(j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
 #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF C OF WALL SHALL BE THE GREATER OF 4B BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

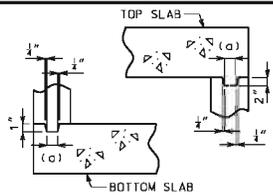
(k) H2 BARS AS REQUIRED, QUANTITY OF BARS VARIES WITH SKEW.



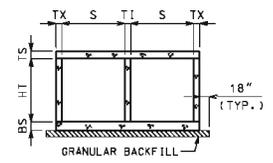
SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT SKEW: LEFT ADVANCE WINGS: FLARED REINFORCEMENT	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.43H SHEET NO. 2 OF 3

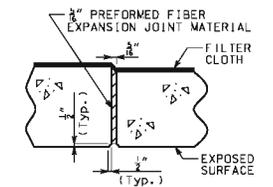
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



KEYED CONSTRUCTION JOINT
(c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



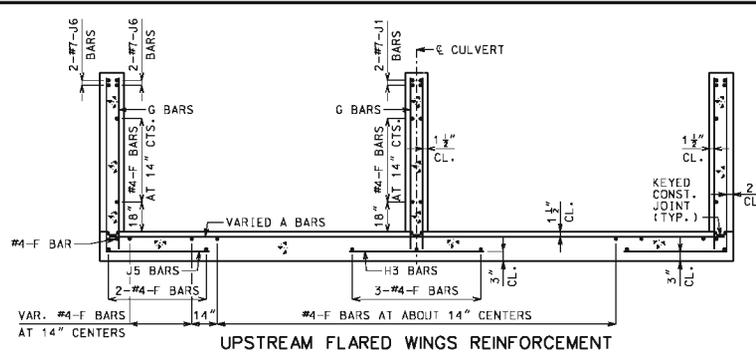
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



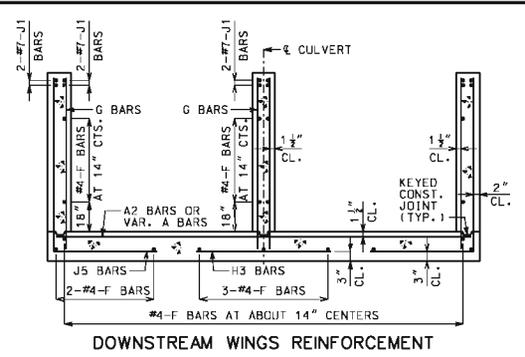
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

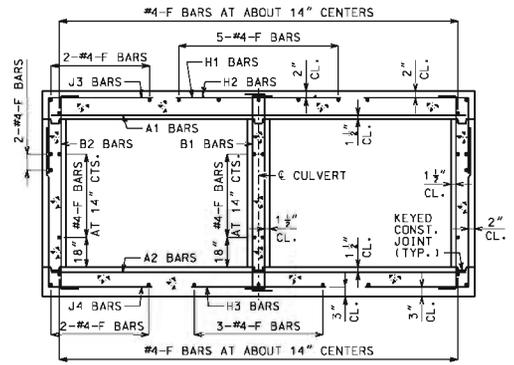
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



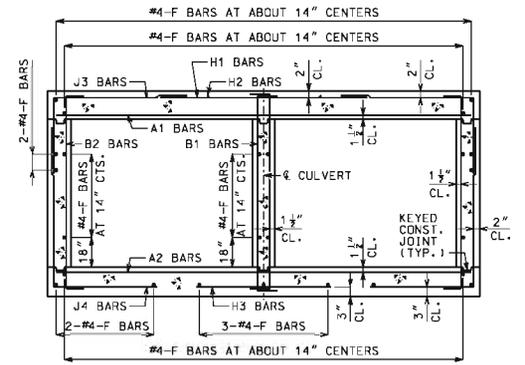
UPSTREAM FLARED WINGS REINFORCEMENT



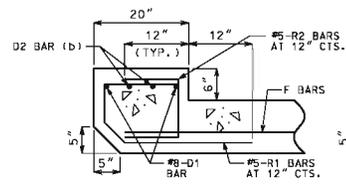
DOWNSTREAM WINGS REINFORCEMENT



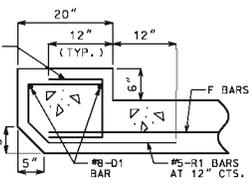
BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



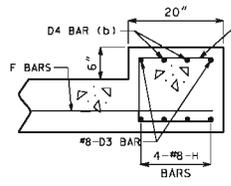
BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



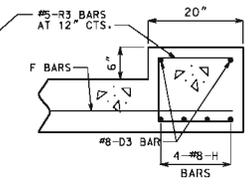
UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL



UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN



DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL



DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0"
#9 FOR CLEAR SPAN > 13'-0"
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 AND D4 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF # WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

GENERAL NOTES:
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703-37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO # CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT SKEW: LEFT ADVANCE WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.43H SHEET NO. 3 OF 3

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

LAYING OUT TRANSVERSE JOINTS UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

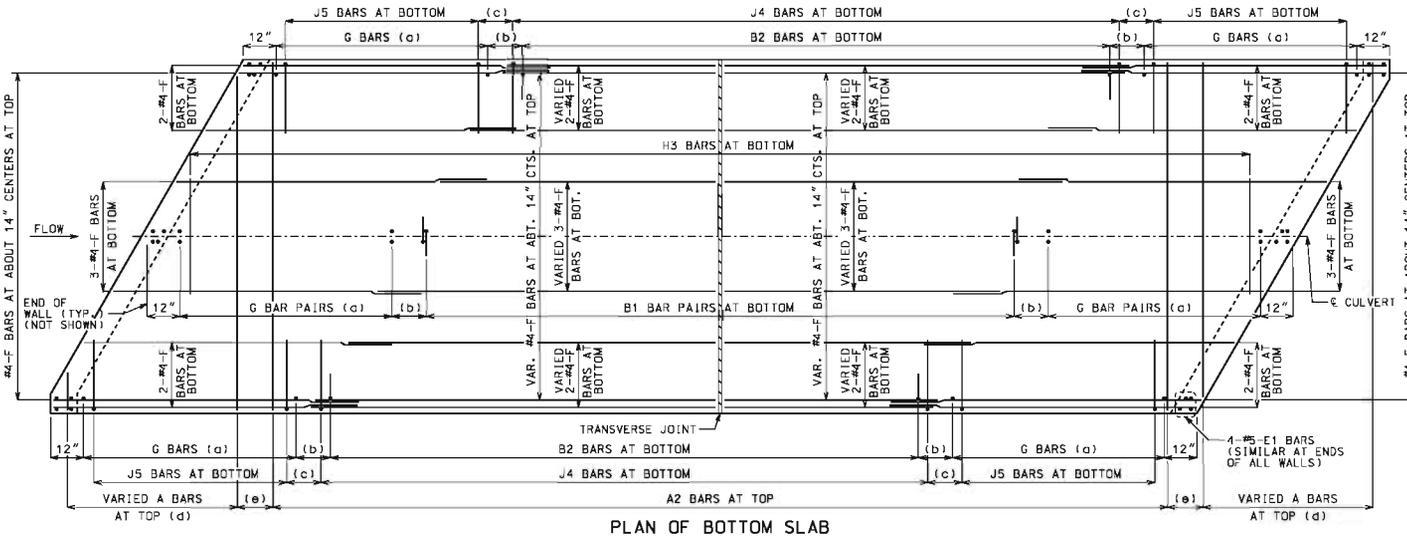
TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

- BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT
- CUT SECTION LENGTHS UP TO 60 FEET

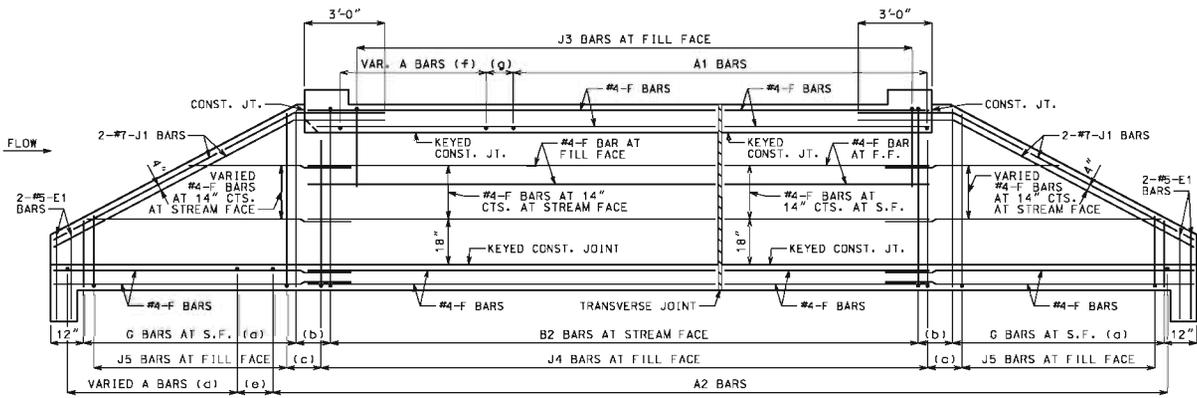
WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.46.



PLAN OF BOTTOM SLAB

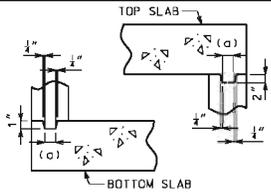


ELEVATION OF EXTERIOR WALL
J1 BARS MAY BE BENT IN FIELD OR SHOP.

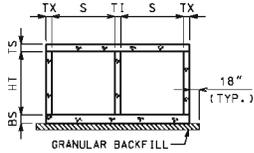
GENERAL NOTES:

- FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3 FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.
- CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.
- DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
- MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".
- LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
- BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.
- (a) SAME SIZE AND SPACING AS ADJACENT B BARS
- (b) VARIES, 12" MAXIMUM
- (c) J4 BAR SPACING
- (d) SAME SIZE AND SPACING AS A2 BARS
- (e) A2 BAR SPACING
- (f) SAME SIZE AND SPACING AS A1 BARS
- (g) A1 BAR SPACING

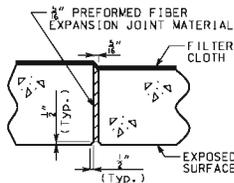
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT	
	SKEW: RIGHT ADVANCE WINGS: STRAIGHT	
REINFORCEMENT		SHEET NO. 703.44H
DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015		1 OF 3



KEYED CONSTRUCTION JOINT
 (c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



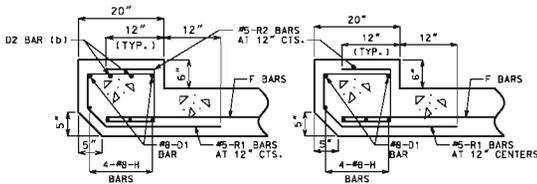
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



TRANSVERSE JOINT THRU BARREL

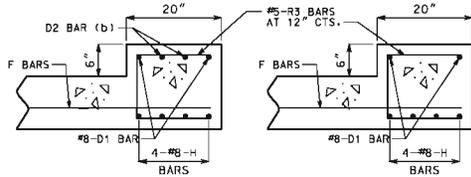
PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



UPSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL

UPSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

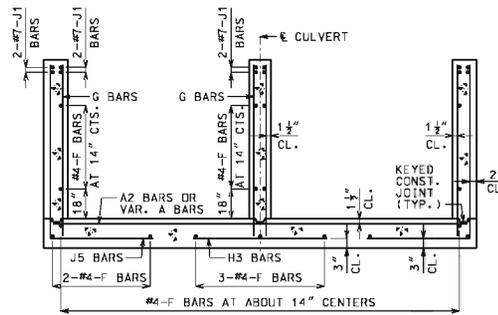


DOWNSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL

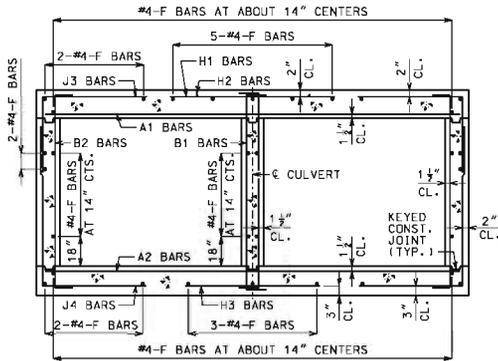
DOWNSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"
 NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

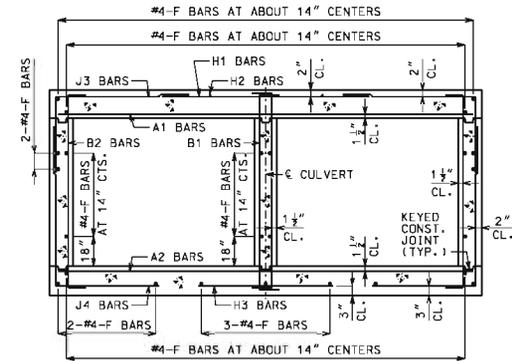
IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF E WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT
FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT
FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703-37.

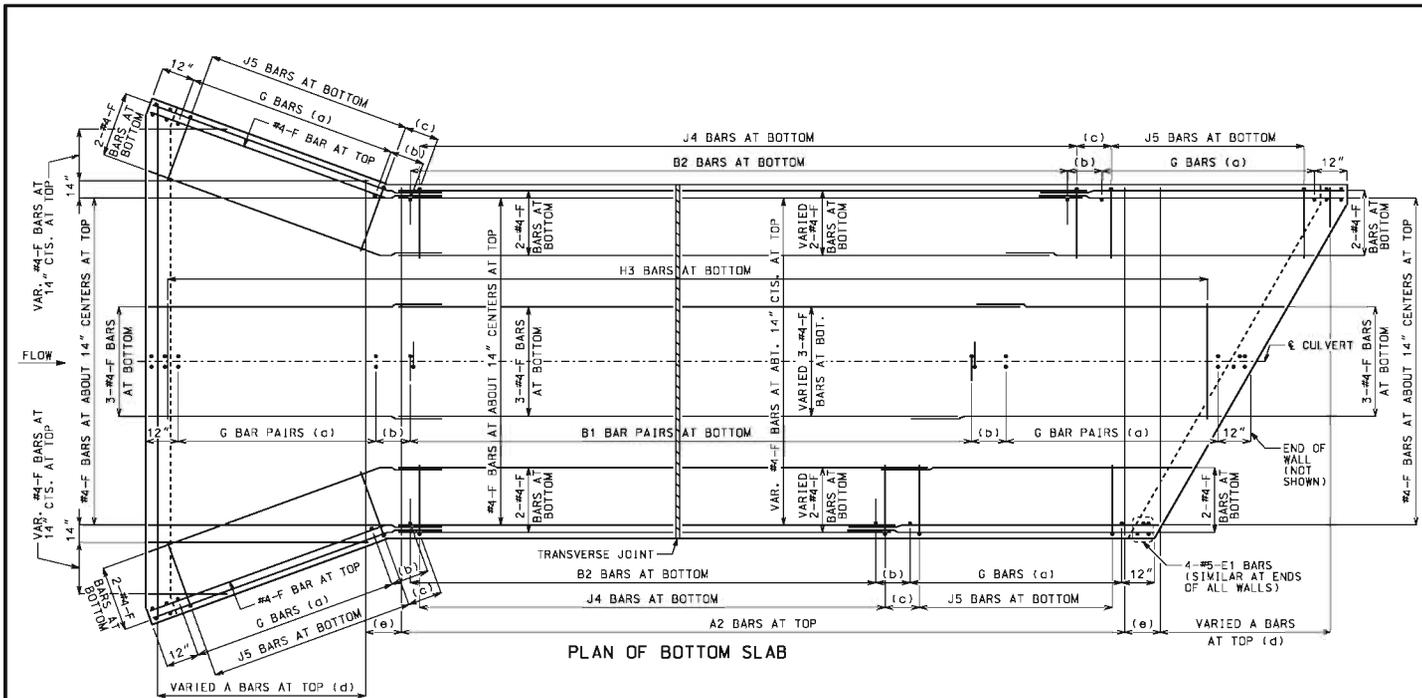
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO E CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT SKEW: RIGHT ADVANCE WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.44H SHEET NO. 3 OF 3

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



PLAN OF BOTTOM SLAB

LAYING OUT TRANSVERSE JOINTS
UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT
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WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.46.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/4".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

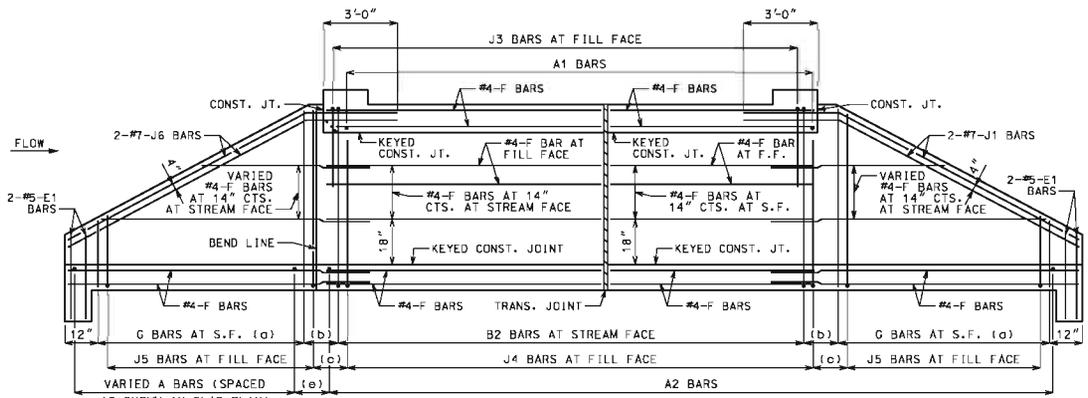
(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

(e) A2 BAR SPACING



DEVELOPED ELEVATION OF EXTERIOR WALL

J1 AND J6 BARS MAY BE BENT IN FIELD OR SHOP.

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

CONCRETE DOUBLE BOX CULVERT
SKEW: RIGHT ADVANCE
WINGS: FLARED

REINFORCEMENT

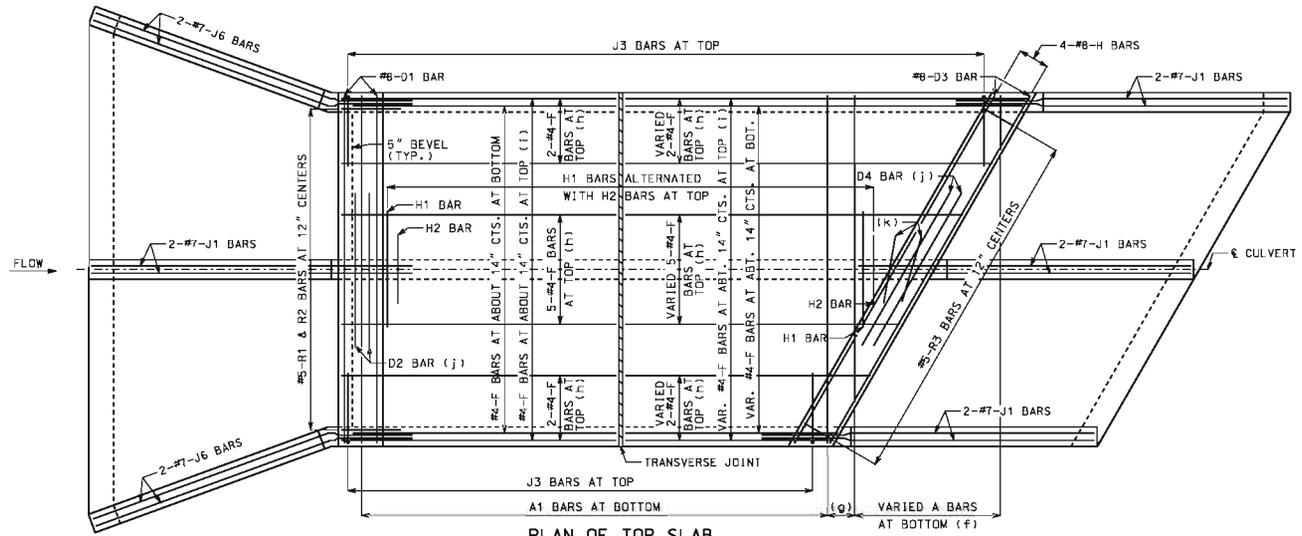
DATE EFFECTIVE: 10/01/2011
DATE PREPARED: 5/13/2015

703.45C

SHEET NO. 1 OF 3

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

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

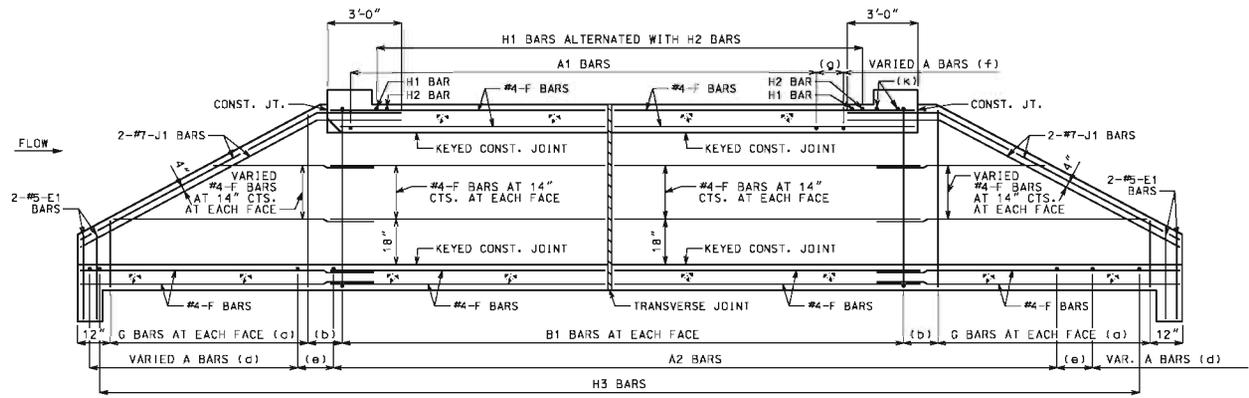


PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.

- GENERAL NOTES:**
- FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.
 - CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION, SEE SHEET 3 OF 3 FOR DETAILS.
 - DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
 - MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".
 - LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
 - BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.
 - (o) SAME SIZE AND SPACING AS ADJACENT B BARS
 - (b) VARIES, 12" MAXIMUM
 - (c) NOT SPECIFIED ON THIS SHEET
 - (d) SAME SIZE AND SPACING AS A2 BARS
 - (e) A2 BAR SPACING
 - (f) SAME SIZE AND SPACING AS A1 BARS
 - (g) A1 BAR SPACING
 - (h) FOR DESIGN FILLS OVER 2'-0"
 - (i) FOR DESIGN FILLS 2'-0" OR LESS
 - (j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
 #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF CULVERT SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

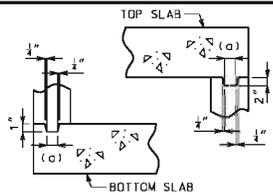
(k) H2 BARS AS REQUIRED, QUANTITY OF BARS VARIES WITH SKEW.



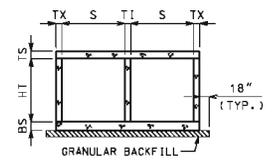
SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT	
	SKEW: RIGHT ADVANCE WINGS: FLARED	
REINFORCEMENT		
DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.45C	SHEET NO. 2 OF 3

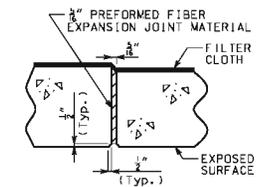
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



KEYED CONSTRUCTION JOINT
(c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



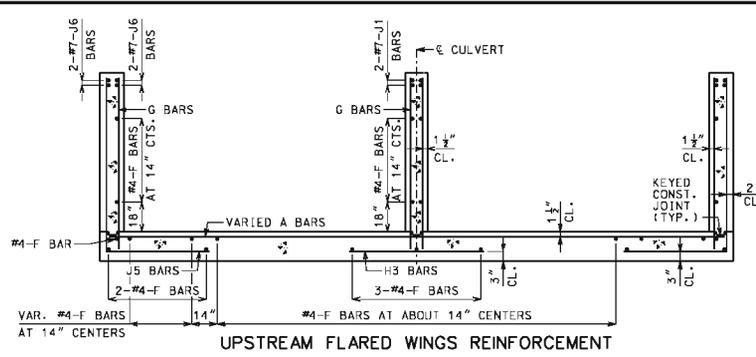
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



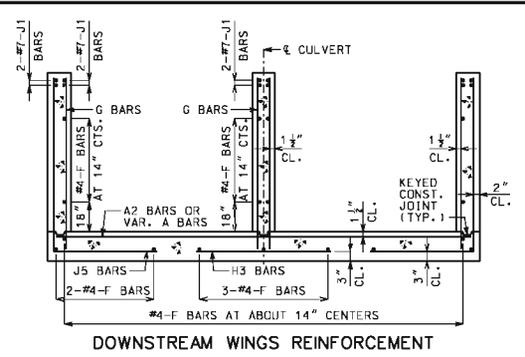
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

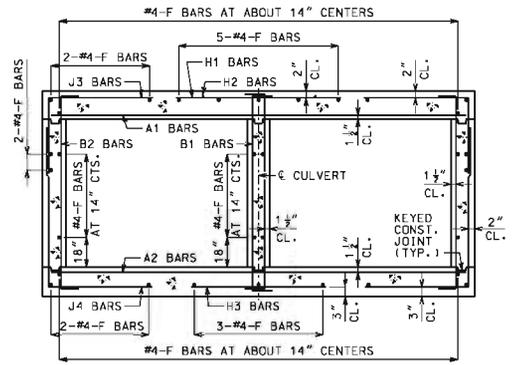
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



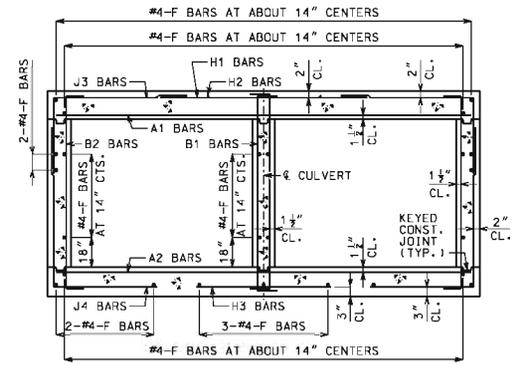
UPSTREAM FLARED WINGS REINFORCEMENT



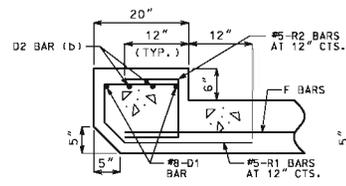
DOWNSTREAM WINGS REINFORCEMENT



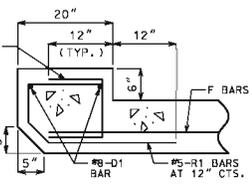
BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



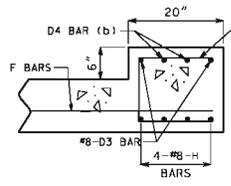
BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS



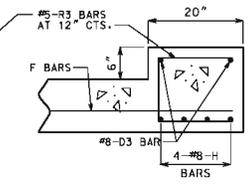
UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL



UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN



DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL



DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN

(b) #8 FOR CLEAR SPAN > 10'-0"
#9 FOR CLEAR SPAN > 13'-0"
NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"

IF D2 AND D4 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF # WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

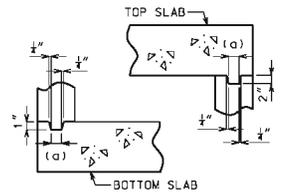
GENERAL NOTES:
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.47. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO # CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

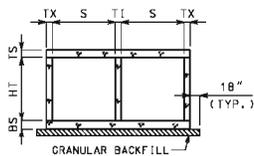
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

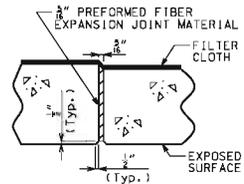
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT SKEW: RIGHT ADVANCE WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015	703.45C SHEET NO. 3 OF 3



KEYED CONSTRUCTION JOINT
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



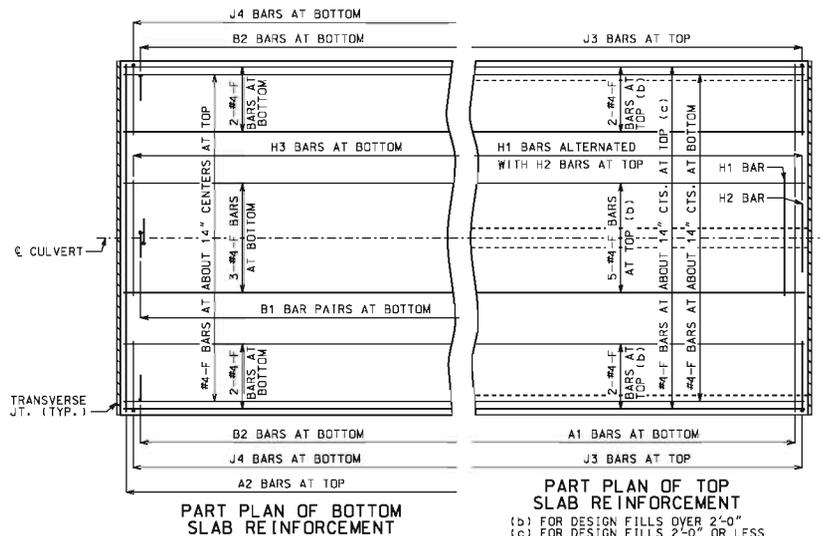
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

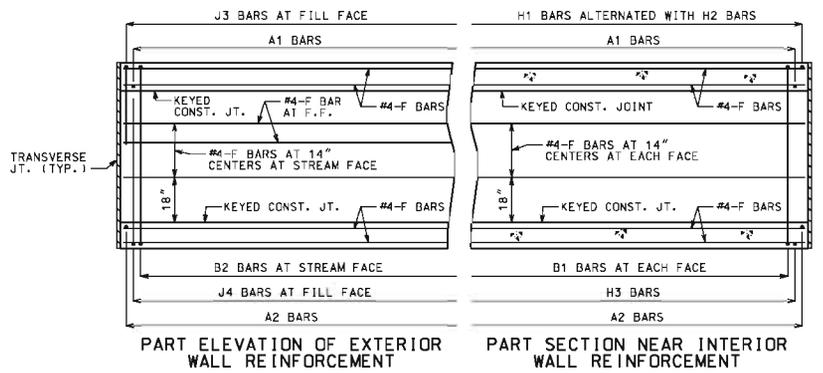
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



PART PLAN OF BOTTOM SLAB REINFORCEMENT

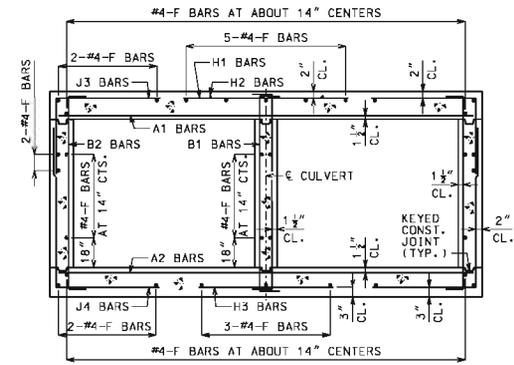
PART PLAN OF TOP SLAB REINFORCEMENT

(b) FOR DESIGN FILLS OVER 2'-0"
(c) FOR DESIGN FILLS 2'-0" OR LESS



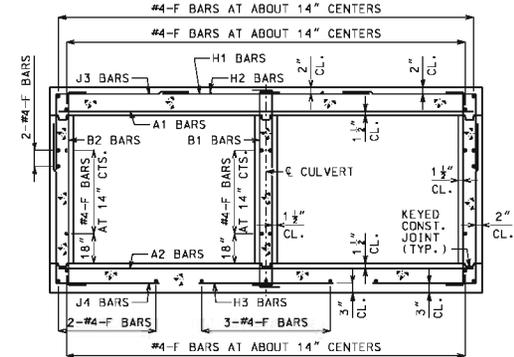
PART ELEVATION OF EXTERIOR WALL REINFORCEMENT

PART SECTION NEAR INTERIOR WALL REINFORCEMENT



BARREL REINFORCEMENT

FOR DESIGN FILLS OVER 2'-0"
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.



BARREL REINFORCEMENT

FOR DESIGN FILLS 2'-0" OR LESS
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.

GENERAL NOTES

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 50 LB/CF (MIN.), 60 LB/CF (MAX.)

DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) $f'_c = 4,000$ PSI
REINFORCING STEEL (GRADE 60) $f_y = 60,000$ PSI

MISCELLANEOUS:
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS. SEE 703.47.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PART PLANS, PART ELEVATION AND PART SECTION.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		CONCRETE DOUBLE BOX CULVERT CUT SECTION	
DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 5/13/2015		703.46 SHEET NO. 1 OF 1	

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

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

		SPAN (S) = 3 FT												HEIGHT (HT) = 2 FT OR 3 FT OR 4 FT																				
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																	
	TS	BS	TX	TI	J3 BARS			H2 BARS			A2 BARS			J4 BARS			B1 BARS	B2 BARS																
					SIZE	SPA.	SIZE	SPA.	C1	HT=2'	HT=3'	HT=4'	SIZE	SPA.	C5	SIZE			SPA.	C6	SIZE	SPA.	C4	HT=2'	HT=3'	HT=4'	SIZE	SPA.	C7					
1 FT	10	8	8	8	4	8.5	4	10.5	23.8	26.0	26.0	26.0	4	24	39.5	4	24	16.0	4	12	4	12	35.3	28	40	52	4	12	24.5	5	12	5	12	12
2 FT	10	8	8	8	4	9	4	10.5	23.8	26.0	26.0	26.0	4	24	39.5	4	24	16.0	4	12	4	12	33.0	28	40	52	4	12	24.5	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	23.8	24.0	24.0	24.0	4	24	39.5	4	24	15.5	4	12	4	12	30.1	28	40	52	4	12	23.5	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	30.0	24.0	24.0	24.0	4	24	24.5	4	24	15.0	4	12	4	12	28.0	28	40	52	4	12	23.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	28.0	24.0	24.0	24.0	4	24	23.5	4	24	15.0	4	12	4	12	27.0	28	40	52	4	12	23.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	12	25.0	24.0	24.0	24.0	4	24	22.0	4	24	14.5	4	12	4	12	24.6	28	40	52	4	12	22.5	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	24.9	24.0	24.0	24.0	4	24	22.0	4	24	15.5	4	12	4	12	24.5	28	40	52	4	12	22.5	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	12	24.8	24.0	24.0	24.0	4	24	22.0	4	24	16.0	4	12	4	12	24.5	28	40	52	4	11.5	22.5	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	12	24.6	24.0	24.0	24.0	4	24	22.0	4	24	17.0	4	12	4	12	24.4	28	40	52	4	10.5	22.5	5	12	5	12	0
18 FT	8	8	8	8	4	12	4	12	24.6	24.0	24.0	24.0	4	24	22.0	4	24	17.5	4	12	4	12	24.4	28	40	52	4	10	22.5	5	12	5	12	0
20 FT	8	8	8	8	4	12	4	12	24.5	24.0	24.0	24.0	4	24	22.0	4	24	17.5	4	12	4	12	24.3	28	40	52	4	9.5	22.5	5	12	5	12	0
22 FT	8	8	8	8	4	12	4	12	24.5	24.0	24.0	24.0	4	24	22.0	4	24	18.0	4	12	4	12	24.3	28	40	52	4	9	22.5	5	12	5	12	0
24 FT	8	8	8	8	4	12	4	12	24.5	24.0	24.0	24.0	4	24	22.0	4	24	18.0	4	12	4	12	24.3	28	40	52	4	8.5	22.5	5	12	5	12	0
26 FT	8	8	8	8	4	12	4	12	24.5	24.0	24.0	24.0	4	24	22.0	4	24	18.0	4	11	4	11	24.3	28	40	52	4	8	22.5	5	12	5	12	0
28 FT	8	8	8	8	4	12	4	11	24.4	24.0	24.0	24.0	4	23	22.0	4	23	18.0	4	10.5	4	10.5	24.1	28	40	52	4	7.5	22.5	5	12	5	12	0
30 FT	8	8	8	8	4	11.5	4	10.5	24.4	24.0	24.0	24.0	4	22	22.0	4	22	18.0	4	9	4	9.5	24.1	28	40	52	4	7.5	22.5	5	12	5	12	0
32 FT	8	9	8	8	4	11	4	9.5	24.5	24.0	24.0	24.0	4	21	22.0	4	21	18.0	4	10.5	4	12	24.5	29	41	53	4	8	22.5	5	12	5	12	0
34 FT	8	9	8	8	4	10.5	4	9	24.5	24.0	24.0	24.0	4	20	22.0	4	20	18.0	4	9.5	4	11.5	24.4	29	41	53	4	8	22.5	5	12	5	12	0
36 FT	8	9	8	8	4	10	4	8.5	24.4	24.0	24.0	24.0	4	19	22.0	4	19	18.0	4	9	4	11	24.4	29	41	53	4	7.5	22.5	5	12	5	12	0
38 FT	8	10	8	8	4	9.5	4	8	24.5	24.0	24.0	24.0	4	18	22.0	4	18	17.5	4	10	4	12	24.8	30	42	54	4	8.5	22.5	5	12	5	12	0
40 FT	8	10	8	8	4	9	4	7.5	24.5	24.0	24.0	24.0	4	17	22.0	4	17	17.5	4	9.5	4	12	24.8	30	42	54	4	8	22.5	5	12	5	12	0
42 FT	9	10	8	8	4	9	4	9	24.6	25.0	25.0	25.0	4	19	22.0	4	19	17.5	4	9	4	11.5	24.8	30	42	54	4	8	22.5	5	12	5	12	0
44 FT	9	10	8	8	4	9	4	8.5	24.6	25.0	25.0	25.0	4	18	22.0	4	18	17.5	4	8.5	4	11	24.8	30	42	54	4	8	22.5	5	12	5	12	0
46 FT	9	11	8	8	4	8.5	4	8	24.8	25.0	25.0	25.0	4	18	22.0	4	18	17.5	4	9	4	10.5	25.0	31	43	55	4	8.5	22.5	5	12	5	12	0
48 FT	9	11	8	8	4	8	4	7.5	24.8	25.0	25.0	25.0	4	17	22.0	4	17	17.5	4	8.5	4	10.5	25.0	31	43	55	4	8	22.5	5	12	5	12	0
50 FT	10	11	8	8	4	8.5	4	8	24.9	26.0	26.0	26.0	4	19	21.5	4	19	17.5	4	8.5	4	10.5	25.1	31	43	55	4	8	22.5	5	12	5	12	0

		SPAN (S) = 3 FT												HEIGHT (HT) = 5 FT OR 6 FT																		
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS															
	TS	BS	TX	TI	J3 BARS			H2 BARS			A2 BARS			J4 BARS			B1 BARS	B2 BARS														
					SIZE	SPA.	SIZE	SPA.	C1	HT=5'	HT=6'	SIZE	SPA.	C5	SIZE	SPA.			C6	SIZE	SPA.	C4	HT=5'	HT=6'	SIZE	SPA.	C7					
1 FT	10	8	8	8	4	8.5	4	10.5	23.8	26.0	26.0	4	24	39.5	4	24	16.0	4	12	4	11.5	39.0	64	76	4	12	24.5	5	12	5	12	12
2 FT	10	8	8	8	4	8.5	4	10.5	23.8	26.0	26.0	4	24	39.5	4	24	16.0	4	12	4	11	39.9	64	76	4	11.5	24.5	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	23.8	24.0	24.0	4	24	39.5	4	24	15.0	4	12	4	10	38.6	64	76	4	12	23.5	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	36.9	24.0	24.0	4	24	25.0	4	24	14.5	4	12	4	9.5	36.9	64	76	4	12	23.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	38.6	24.0	24.0	4	24	23.5	4	24	15.0	4	12	4	9	35.8	64	76	4	12	23.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	12	33.1	24.0	24.0	4	24	21.5	4	24	14.0	4	12	4	9.5	32.8	64	76	4	12	22.5	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	32.8	24.0	24.0	4	24	21.5	4	24	15.0	4	12	4	9	32.5	64	76	4	12	22.5	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	11	32.4	24.0	24.0	4	24	21.5	4	24	16.0	4	12	4	8.5	32.3	64	76	4	12	22.5	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	10	32.1	24.0	24.0	4	24	21.5	4	24	16.5	4	12	4	8	32.1	64	76	4	11.5	22.5	5	12	5	12	0
18 FT	8	8	8	8	4	12	4	9	32.0	24.0	24.0	4	24	21.5	4	24	17.0	4	12	4	7.5	32.0	64	76	4	11	22.5	5	12	5	12	0
20 FT	8	8	8	8	4	12	4	8	31.8	24.0	24.0	4	24	21.5	4	24	17.0	4	12	4	7	31.9	64	76	4	10	22.5	5	12	5	12	0
22 FT	8	8	8	8	4	12	4	7.5	31.6	24.0	24.0	4	24	21.5	4	24	17.5	4	12	4	6.5	31.8	64	76	4	9.5	22.5	5	12	5	12	0
24 FT	8	8	8	8	4	12	4	7	31.6	24.0	24.0	4	24	21.5	4	24	17.5	4	12	4	6	31.6	64	76	4	9.5	22.5	5	12	5	12	0
26 FT	8	8	8	8	4	12	4	6.5	31.5	24.0	24.0	4	24	21.5	4	24	17.5	4	11.5	5	6.5	31.6	64	76	4	9	22.5	5	12	5	12	0
28 FT	8	8	8	8	4	12	4	6	31.5	24.0	24.0	4	24	21.5	4	24	17.5	4	10.5	5	6	31.5	64	76	4	8.5	22.5	5	12	5	12	0
30 FT	8	9	8	8	4	12	5	6.5	31.3	24.0	28.0	4	24	21.5	4	24	17.5	4	11.5	5	6.5	32.8	65	77	4	10	22.5	5	12	5	11.5	0
32 FT	8	9	8	8	4	11	5	6	31.3	24.0	28.0	4	24	21.5	4	24	17.5	4	11	5	6	32.6	65	77	4	9.5	22.5	5	12	5	11	0
34 FT	8	9	8	8	4	10.5	5	6	31.3	24.0	28.0	4	23	21.5	4	23	17.5	4	10	5	6	32.6	65	77	4	9	22.5	5	12	5	10.5	0
36 FT	8	10	8	8	4	10	6	7.5	34.1	24.0	28.0	4	22	21.5	4	22	17.5	4	11	5	6	33.5	66	78	4	10.5	22.5	5	12	5	10	0
38 FT	8	10	8	8	4	9.5	6	7.5	34.1	24.0	28.0	4	21	21.5	4	21	17.5	4	10.5	5	6	33.5	66	78	4	10	22.5					

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

		SPAN (S) = 4 FT												HEIGHT (HT) = 2 FT OR 3 FT																		
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS															
	TS	BS	TX	TI	J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			B1 BARS	B2 BARS											
					SIZE	SPA.	SIZE	SPA.	C1	HT=2'	HT=3'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.			SIZE	SPA.	C4	HT=2'	HT=3'						
1 FT	10	8	8	8	4	7	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.5	4	12	4	12	29.3	28	40	4	9.5	28.0	5	12	5	12	12
2 FT	10	8	8	8	4	7	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.0	4	12	4	12	27.3	28	40	4	9	27.5	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	26.3	24.0	24.0	4	24	34.0	4	24	19.0	4	12	4	12	25.0	28	40	4	9.5	27.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	24.8	24.0	24.0	4	24	28.5	4	24	19.0	4	12	4	12	24.0	28	40	4	9.5	26.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	24.1	24.0	24.0	4	24	27.0	4	24	19.0	4	12	4	12	23.4	28	40	4	9	26.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	12	22.6	24.0	24.0	4	24	25.5	4	24	18.5	4	12	4	12	22.1	28	40	4	9	25.5	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	24	25.5	4	24	18.5	4	12	4	12	22.1	28	40	4	8	25.5	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	22	25.5	4	22	18.5	4	12	4	12	22.1	28	40	4	7.5	25.5	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	20	25.5	4	20	18.5	4	11	4	12	22.1	28	40	4	7	25.5	5	12	5	12	0
18 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	18	25.5	4	18	18.5	4	10	4	11.5	22.0	28	40	4	6.5	25.5	5	12	5	12	0
20 FT	8	8	8	8	4	10.5	4	11.5	22.5	24.0	24.0	4	17	25.5	4	17	18.5	4	9	4	10.5	22.0	28	40	4	6	25.5	5	12	5	12	0
22 FT	8	9	8	8	4	10	4	10.5	22.6	24.0	24.0	4	15	25.5	4	15	18.5	4	9	4	12	21.4	29	41	4	6.5	26.0	5	12	5	12	0
24 FT	8	9	8	8	4	9	4	9.5	22.6	24.0	24.0	4	14	25.5	4	14	18.5	4	8.5	4	12	21.4	29	41	4	6	26.0	5	12	5	12	0
26 FT	8	10	8	8	4	8.5	4	8.5	22.8	24.0	24.0	4	13	25.5	4	13	18.5	4	8.5	4	12	20.9	30	42	4	6.5	26.0	5	12	5	12	0
28 FT	8	10	8	8	4	7.5	4	8	22.8	24.0	24.0	4	12	25.5	4	12	18.5	4	8	4	12	20.9	30	42	4	6.5	26.0	5	12	5	12	0
30 FT	9	10	8	8	4	8	4	10.5	22.3	25.0	25.0	4	13	25.5	4	13	18.5	4	7.5	4	12	21.0	30	42	4	6	26.0	5	12	5	12	0
32 FT	9	11	8	8	4	7.5	4	10	22.4	25.0	25.0	4	12	25.5	4	12	18.5	4	8	4	10.5	20.6	31	43	4	6.5	26.0	5	12	5	12	0
34 FT	10	11	8	8	4	7.5	4	10.5	22.0	26.0	26.0	4	13	25.0	4	13	18.5	4	7.5	4	10.5	20.9	31	43	4	6	26.0	5	12	5	12	0
36 FT	10	12	8	8	4	7.5	4	10	22.1	26.0	26.0	4	12	25.0	4	12	18.5	4	7.5	4	9.5	20.6	32	44	4	6.5	26.0	5	12	5	12	0
38 FT	10	12	8	8	4	7	4	9.5	22.1	26.0	26.0	4	12	25.0	4	12	18.5	4	7.5	4	9.5	20.6	32	44	4	6	26.0	5	12	5	12	0
40 FT	11	12	8	8	4	7	4	9.5	21.8	27.0	27.0	4	13	25.0	4	13	18.5	4	7	4	9.5	20.9	32	44	4	6	26.0	5	12	5	12	0
42 FT	11	13	8	8	4	6.5	4	9.5	21.9	27.0	27.0	4	12	25.0	4	12	18.5	4	7	4	8.5	20.6	33	45	4	6	26.0	5	12	5	12	0
44 FT	11	13	8	8	4	6.5	4	9	21.9	27.0	27.0	4	12	25.0	4	12	18.5	4	7	4	8.5	20.6	33	45	4	6	26.0	5	12	5	12	0
46 FT	12	13	8	8	4	6.5	4	8.5	21.6	28.0	28.0	4	12	24.5	4	12	18.5	4	6.5	4	8.5	20.9	33	45	5	8.5	26.0	5	12	5	12	0
48 FT	12	13	8	8	4	6.5	4	8.5	21.6	28.0	28.0	4	12	24.5	4	12	18.5	4	6	4	8.5	20.9	33	45	5	8.5	26.0	5	12	5	12	0
50 FT	12	14	8	8	4	6	4	8.5	21.8	28.0	28.0	4	12	24.5	4	12	18.5	4	6.5	4	7.5	20.8	34	46	5	9	26.0	5	12	5	12	0

		SPAN (S) = 4 FT												HEIGHT (HT) = 4 FT OR 5 FT																		
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS															
	TS	BS	TX	TI	J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			B1 BARS	B2 BARS											
					SIZE	SPA.	SIZE	SPA.	C1	HT=4'	HT=5'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.			SIZE	SPA.	C4	HT=4'	HT=5'						
1 FT	10	8	8	8	4	7	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.5	4	12	4	12	39.9	52	64	4	9	28.0	5	12	5	12	12
2 FT	10	8	8	8	4	7	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.5	4	12	4	12	36.8	52	64	4	9	27.5	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	27.3	24.0	24.0	4	24	48.0	4	24	19.5	4	12	4	12	33.8	52	64	4	9	27.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	33.5	24.0	24.0	4	24	28.5	4	24	19.0	4	12	4	11.5	31.3	52	64	4	9	26.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	30.6	24.0	24.0	4	24	27.0	4	24	19.0	4	12	4	11	29.9	52	64	4	8.5	26.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	12	27.4	24.0	24.0	4	24	25.5	4	24	18.5	4	12	4	12	27.1	52	64	4	9	25.5	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	12	27.1	24.0	24.0	4	24	25.5	4	24	18.5	4	12	4	11	26.9	52	64	4	8	25.5	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	12	27.0	24.0	24.0	4	22	25.5	4	22	18.5	4	12	4	10.5	26.8	52	64	4	7.5	25.5	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	11	26.9	24.0	24.0	4	21	25.0	4	21	18.5	4	10.5	4	10	26.6	52	64	4	7	25.5	5	12	5	12	0
18 FT	8	8	8	8	4	11.5	4	10	26.8	24.0	24.0	4	19	25.0	4	19	18.5	4	9.5	4	9	26.6	52	64	4	6.5	25.5	5	12	5	12	0
20 FT	8	8	8	8	4	10.5	4	9	26.6	24.0	24.0	4	17	25.0	4	17	18.5	4	8.5	4	8	26.5	52	64	4	6	25.5	5	12	5	12	0
22 FT	8	9	8	8	4	9.5	4	8	26.8	24.0	24.0	4	15	25.0	4	15	18.5	4	9	4	9.5	26.8	53	65	4	6.5	26.0	5	12	5	12	0
24 FT	8	9	8	8	4	9	4	7.5	26.6	24.0	24.0	4	14	25.0	4	14	18.5	4	8.5	4	9	26.6	53	65	4	6.5	26.0	5	12	5	12	0
26 FT	8	10	8	8	4	8.5	4	6.5	26.6	24.0	24.0	4	13	25.0	4	13	18.5	4	8.5	4	10.5	26.9	54	66	4	7	26.0	5	12	5	12	0
28 FT	8	10	8	8	4	7.5	4	6	26.6	24.0	24.0	4	12	25.0	4	12	18.5	4	8	4	10	26.9	54	66	4	6.5	26.0	5	12	5	12	0
30 FT	9	10	8	8	4	8	4	7.5	26.8	25.0	25.0	4	13	25.0	4	13	18.5	4	7	4	9	26.9	54	66	4	6	26.0	5	12	5	12	0
32 FT	9	11	8	8	4	7.5	4	6.5	26.9	25.0	25.0	4	12	25.0	4	12	18.5	4	8	4	9	27.1	55	67	4	6.5	26.0	5	12	5	12	0
34 FT	10	11	8	8	4	7.5	4	6.5	27.0	26.0	26.0	4	14	24.5	4	14	18.5	4	7.5	4	8.5	27.1	55	67	4	6	26.0	5	12	5	12	0
36 FT	10	12	8	8	4	7.5	4	6.5	27.1	26.0	26.0	4	13	24.5	4	13	18.5	4	8	4	8.5	27.4	56	68	4	6.5	26.0	5	12	5	12	0
38 FT	10	12	8	8	4	7	4	6	27.1	26.0	26.0	4	12	24.5	4	12	18.5	4	7.5	4	8	27.4	56	68	4	6	26.0	5	12	5	12	0
40 FT	11	12	8	8	4	7	4	6	27.3	27.0	27.0	4	14	24.5	4	14	18.5	4	7	4	7.5	27.5	56	68	4	6	26.0	5	12	5	12	0
42 FT	11	13	8	8	4	7	5	9	27.3	27.0	27.0	4	13	24.5	4	13	18.5	4	7													

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 4 FT												HEIGHT (HT) = 6 FT OR 7 FT															
					TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS															
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS											
					SIZE	SPA.	SIZE	SPA.	C1	K2	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1						
1 FT	10	8	8	8	4	6.5	4	10.5	27.3	26.0	26.0	4	24	48.0	4	24	20.5	4	12	4	8.5	46.6	76	88	4	8.5	28.0	5	12	5	12	12
2 FT	10	8	8	8	4	6.5	4	10.5	27.3	26.0	26.0	4	23	48.0	4	23	20.5	4	12	4	8.5	45.3	76	88	4	8.5	27.5	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	10.5	27.3	24.0	24.0	4	24	48.0	4	24	19.5	4	12	4	7.5	43.0	76	88	4	9	27.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	10	47.3	24.0	24.0	4	24	28.5	4	24	19.0	4	12	4	7	40.8	76	88	4	9	26.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	9	41.4	24.0	24.0	4	24	27.0	4	24	19.0	4	12	4	6.5	39.0	76	88	4	8.5	26.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	10	35.4	24.0	24.0	4	24	25.0	4	24	18.5	4	12	4	7	35.1	76	88	4	8.5	25.5	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	8.5	34.9	24.0	24.0	4	24	25.0	4	24	18.5	4	12	4	6.5	34.9	76	88	4	8	25.5	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	7.5	34.6	24.0	24.0	4	23	25.0	4	23	18.5	4	12	4	6	34.6	76	88	4	7.5	25.5	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	6.5	34.4	24.0	24.0	4	22	25.0	4	22	18.5	4	10.5	5	6.5	34.4	76	88	4	7	25.5	5	12	5	12	0
18 FT	8	8	8	8	4	12	4	6	34.1	24.0	24.0	4	19	25.0	4	19	18.5	4	9.5	5	6	34.3	76	88	4	6.5	25.5	5	12	5	12	0
20 FT	8	9	9	8	4	11	4	6.5	33.6	24.0	24.0	4	18	24.5	4	18	18.5	4	10	4	6.5	34.9	77	89	4	7.5	25.5	5	12	5	12	0
22 FT	8	9	9	8	4	10	4	6	33.5	24.0	24.0	4	16	25.0	4	16	18.5	4	9	4	6	34.8	77	89	4	7	25.5	5	12	5	12	0
24 FT	8	9	9	8	4	9	5	6.5	33.4	24.0	28.0	4	15	25.0	4	15	18.5	4	8.5	5	7	34.6	77	89	4	6.5	25.5	5	12	5	12	0
26 FT	8	10	9	8	4	8.5	5	6	33.1	24.0	24.0	4	14	24.5	4	14	18.5	4	9	4	6	35.5	78	90	4	7	26.0	5	12	5	11.5	0
28 FT	8	10	9	8	4	8	6	7.5	36.1	24.0	28.0	4	13	24.5	4	13	18.5	4	8.5	5	7	35.5	78	90	4	6.5	26.0	5	12	5	10.5	0
30 FT	9	10	9	8	4	8	5	6	34.0	25.0	29.0	4	14	24.5	4	14	18.5	4	7.5	5	6.5	35.3	78	90	4	6	25.5	5	12	5	10	0
32 FT	9	11	9	8	4	8	5	6	33.9	25.0	29.0	4	13	24.5	4	13	18.5	4	8	5	6.5	35.9	79	91	4	6.5	26.0	5	12	5	9.5	0
34 FT	9	11	9	8	4	7.5	5	6	33.9	25.0	29.0	4	13	24.5	4	13	18.5	4	7.5	5	6.5	35.9	79	91	4	6	26.0	5	12	5	9	0
36 FT	10	11	9	8	4	7.5	5	6.5	34.6	26.0	30.0	4	14	24.0	4	14	18.0	4	7	5	6	35.8	79	91	4	6	25.5	5	12	5	8.5	0
38 FT	10	12	9	8	4	7	5	6	34.5	26.0	30.0	4	14	24.0	4	14	18.0	4	7.5	5	6	36.3	80	92	4	6	25.5	5	12	5	8.5	0
40 FT	10	12	9	8	4	7	5	6	34.5	26.0	30.0	4	13	24.0	4	13	18.0	4	7.5	5	6	36.3	80	92	4	6	25.5	5	12	5	8.5	0
42 FT	11	12	9	8	4	7	5	6	35.1	31.0	31.0	4	14	23.5	4	14	18.0	4	6.5	6	7.5	39.1	80	92	5	9	25.5	5	12	5	8.5	0
44 FT	11	13	10	8	4	6.5	5	7	35.1	27.0	31.0	4	14	23.0	4	14	18.0	4	7.5	5	7.5	36.8	81	93	4	6	25.5	5	12	5	8	0
46 FT	11	13	10	8	4	6.5	5	6.5	35.0	27.0	31.0	4	13	23.0	4	13	18.0	4	7	5	7	36.8	81	93	5	9	26.0	5	12	5	8	0
48 FT	11	13	10	8	4	6	5	6	35.0	27.0	31.0	4	13	23.0	4	13	18.0	4	6.5	5	6.5	36.8	81	93	5	8.5	25.5	5	12	5	8	0
50 FT	12	14	11	8	4	6.5	5	7	35.6	28.0	32.0	4	15	23.0	4	15	18.0	4	7	5	7.5	37.3	82	94	5	9	26.0	5	12	5	8	0

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

GENERAL NOTES:

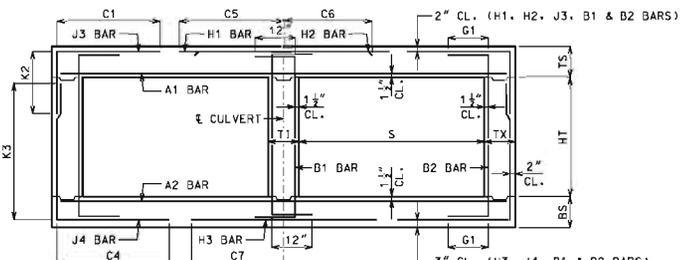
IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



BAR DIMENSIONS DIAGRAM
SYMMETRICAL ABOUT ϵ CULVERT.

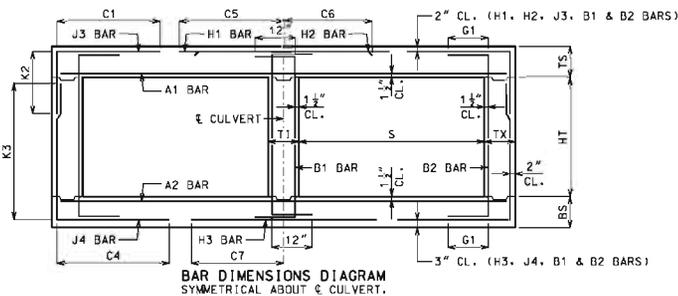
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT	
	MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS	
SPAN (S): 4 FEET HEIGHT (HT): 6 THRU 7 FEET		
DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011	703.47	SHEET NO. 3 OF 27

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

		SPAN (S) = 5 FT										HEIGHT (HT) = 3 FT OR 4 FT																				
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																	
	TS	BS	TX	TI	A1 BARS		J3 BARS			H1 BARS		H2 BARS		A2 BARS		J4 BARS			B1 BARS	B2 BARS												
					SIZE	SPA.	SIZE	SPA.	C1	H1	H2	A2	SIZE	SPA.	SIZE	SPA.	C4	SIZE			SPA.	C7										
1 FT	11	8	8	8	4	6.5	4	9.5	30.9	27.0	27.0	4	20	56.0	4	20	21.5	4	12	4	12	33.5	40	52	4	7.5	31.0	5	12	5	12	12
2 FT	11	8	8	8	4	6.5	4	9.5	30.9	27.0	27.0	4	19	56.0	4	19	21.5	4	11.5	4	11.5	31.0	40	52	4	7	31.0	5	12	5	12	12
4 FT	8	8	8	8	4	11	4	12	30.0	24.0	24.0	4	18	39.0	4	18	20.0	4	12	4	12	28.4	40	52	4	7	29.5	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	27.4	24.0	24.0	4	18	32.0	4	18	20.0	4	11.5	4	11.5	28.9	40	52	4	7	29.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	26.6	24.0	24.0	4	18	30.5	4	18	19.5	4	10.5	4	10.5	28.0	40	52	4	6.5	29.0	5	12	5	12	10
10 FT	8	8	8	8	4	11	4	12	26.1	24.0	24.0	4	16	29.5	4	16	19.5	4	9.5	4	9.5	25.5	40	52	4	6	29.0	5	12	5	12	10
12 FT	8	8	8	8	4	12	4	12	24.6	24.0	24.0	4	16	28.5	4	16	19.0	4	9.5	4	11	24.4	40	52	5	7.5	28.5	5	12	5	12	10
14 FT	8	8	8	8	4	10	4	11	24.6	24.0	24.0	4	14	28.5	4	14	19.0	4	8.5	4	10	24.3	40	52	5	7	28.5	5	12	5	12	10
16 FT	8	9	8	8	4	9	4	9.5	24.8	24.0	24.0	4	12	28.5	4	12	19.0	4	8.5	4	12	23.5	41	53	5	7.5	29.0	5	12	5	12	10
18 FT	8	9	8	8	4	8	4	8.5	24.8	24.0	24.0	5	17	28.5	5	17	19.5	4	7.5	4	11.5	23.5	41	53	5	7	29.0	5	12	5	12	10
20 FT	8	10	8	8	4	7.5	4	7.5	24.9	24.0	24.0	5	17	28.0	5	17	20.0	4	7.5	4	12	22.9	42	54	5	7.5	29.0	5	12	5	12	10
22 FT	9	10	8	8	4	7	4	7	24.3	25.0	25.0	5	16	28.5	5	16	19.0	4	7	4	12	23.1	42	54	5	7	29.0	5	12	5	12	10
24 FT	9	11	8	8	4	6.5	4	8	24.5	25.0	25.0	5	16	28.5	5	16	20.0	4	7	4	10.5	22.8	43	55	5	7.5	29.0	5	12	5	12	10
26 FT	10	11	8	8	4	6.5	4	8.5	24.0	26.0	26.0	5	16	28.5	5	16	19.0	4	6.5	4	10.5	23.0	43	55	5	7	29.0	5	12	5	12	10
28 FT	10	12	8	8	4	6.5	4	8	24.1	26.0	26.0	5	15	28.0	5	15	19.5	4	6.5	4	9.5	22.6	44	56	5	7.5	29.0	5	12	5	12	10
30 FT	11	12	8	8	4	6.5	4	8.5	23.8	27.0	27.0	5	15	28.0	5	15	19.0	4	6	4	9.5	22.9	44	56	5	7	29.0	5	12	5	12	10
32 FT	11	13	8	8	4	6	4	7.5	23.9	27.0	27.0	5	15	28.0	5	15	19.0	4	6.5	4	8.5	22.8	45	57	5	7.5	29.0	5	12	5	12	10
34 FT	12	13	8	8	4	6	4	8.5	23.6	28.0	28.0	5	15	28.0	5	15	19.0	4	6	4	8.5	22.9	45	57	5	7	29.0	5	12	5	12	10
36 FT	12	14	8	8	5	9	4	7.5	23.8	28.0	28.0	5	15	28.0	5	15	19.0	4	6	4	7.5	22.8	46	58	5	7.5	29.0	5	12	5	12	10
38 FT	13	14	8	8	5	9	4	7.5	23.5	29.0	29.0	5	15	27.5	5	15	19.0	4	6	4	7.5	23.0	46	58	5	7	29.0	5	12	5	12	10
40 FT	13	15	8	8	5	8.5	4	7.5	23.8	29.0	29.0	5	15	27.5	5	15	19.0	4	6	4	7	22.9	47	59	5	7.5	29.0	5	12	5	12	10
42 FT	13	15	8	8	5	8	4	7	23.8	29.0	29.0	5	14	27.5	5	14	19.0	5	8.5	4	7	22.9	47	59	5	7	29.0	5	12	5	12	10
44 FT	14	15	8	8	5	8.5	4	7	23.5	30.0	30.0	5	15	27.0	5	15	19.0	5	9.5	4	7	23.1	47	59	5	6.5	29.0	5	12	5	12	10
46 FT	14	16	8	8	5	8	4	7	23.6	30.0	30.0	5	14	27.0	5	14	19.0	5	9	4	6.5	23.1	48	60	5	7	29.0	5	12	5	12	10
48 FT	14	16	8	8	5	7.5	4	6.5	23.6	30.0	30.0	5	14	27.0	5	14	19.0	5	8.5	4	6.5	23.1	48	60	5	6.5	29.0	5	12	5	12	10
50 FT	15	16	8	8	5	7.5	4	6.5	25.6	31.0	31.0	5	15	31.5	5	15	24.0	5	8	4	6.5	23.3	48	60	5	6.5	29.0	5	12	5	12	10

		SPAN (S) = 5 FT										HEIGHT (HT) = 5 FT OR 6 FT																				
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																	
	TS	BS	TX	TI	A1 BARS		J3 BARS			H1 BARS		H2 BARS		A2 BARS		J4 BARS			B1 BARS	B2 BARS												
					SIZE	SPA.	SIZE	SPA.	C1	H1	H2	A2	SIZE	SPA.	SIZE	SPA.	C4	SIZE			SPA.	C7										
1 FT	11	8	8	8	4	6	4	9.5	30.9	27.0	27.0	4	20	56.0	4	20	22.0	4	11.5	4	9.5	44.1	64	76	4	7	31.0	5	12	5	12	12
2 FT	11	8	8	8	4	6	4	9.5	30.9	27.0	27.0	4	19	56.0	4	19	21.5	4	10.5	4	9	40.6	64	76	4	7	31.0	5	12	5	12	12
4 FT	8	8	8	8	4	10.5	4	10.5	30.9	24.0	24.0	4	18	56.0	4	18	20.0	4	11.5	4	9	37.6	64	76	4	7	30.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	10.5	37.1	24.0	24.0	4	19	32.0	4	19	20.0	4	11	4	8.5	34.6	64	76	4	6.5	29.5	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	10	33.8	24.0	24.0	4	18	30.5	4	18	19.5	4	10	4	8	33.0	64	76	4	6	29.0	5	12	5	12	10
10 FT	8	8	8	8	4	11	4	9	32.3	24.0	24.0	4	16	29.5	4	16	19.5	4	9	4	7.5	31.9	64	76	5	7.5	29.0	5	12	5	12	10
12 FT	8	8	8	8	4	11.5	4	9.5	29.5	24.0	24.0	4	16	28.5	4	16	19.0	4	9	4	7.5	29.4	64	76	5	7.5	28.5	5	12	5	12	10
14 FT	8	8	8	8	4	10	4	8	29.3	24.0	24.0	4	14	28.5	4	14	19.0	4	8	4	7	29.1	64	76	5	7	28.5	5	12	5	12	10
16 FT	8	9	8	8	4	9	4	7	29.3	24.0	24.0	4	12	28.0	4	12	19.0	4	8	4	8	29.3	65	77	5	7.5	29.0	5	12	5	12	10
18 FT	8	9	8	8	4	8	4	6.5	29.1	24.0	24.0	5	17	28.0	5	17	19.5	4	7	4	7.5	29.1	65	77	5	7	29.0	5	12	5	12	10
20 FT	8	10	8	8	4	7	5	7	29.0	24.0	24.0	5	17	28.0	5	17	20.0	4	7.5	4	8.5	29.3	66	78	5	7.5	29.0	5	12	5	12	10
22 FT	9	10	8	8	4	7	4	6.5	29.1	25.0	25.0	5	16	28.0	5	16	19.0	4	7	4	7.5	29.3	66	78	5	7	29.0	5	12	5	12	10
24 FT	9	11	8	8	4	6.5	4	8	29.1	25.0	25.0	5	16	28.0	5	16	19.5	4	7	4	7.5	29.5	67	79	5	7.5	29.0	5	12	5	12	10
26 FT	10	11	8	8	4	6.5	5	8	29.3	26.0	26.0	5	16	28.0	5	16	19.0	4	6.5	4	6.5	29.5	67	79	5	7.5	29.0	5	12	5	12	10
28 FT	10	12	8	8	4	6.5	5	7.5	29.3	26.0	26.0	5	15	28.0	5	15	19.0	4	6.5	4	6.5	29.6	68	80	5	7.5	29.0	5	12	5	12	10
30 FT	11	12	8	8	4	6.5	5	8.5	29.4	27.0	27.0	5	16	27.5	5</																	

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 5 FT										HEIGHT (HT) = 7 FT OR 8 FT																	
					TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																	
	TS	BS	TX	TI	A1 BARS		J3 BARS		K2		H1 BARS		H2 BARS		A2 BARS		J4 BARS		K3		H3 BARS		B1 BARS		B2 BARS							
					SIZE	SPA.	SIZE	SPA.	C1	H1=B1	H1=B1	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	H1=B1	H1=B1	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1
1 FT	11	8	8	8	4	6	4	9.5	30.9	27.0	27.0	4	20	56.0	4	20	22.0	4	10.5	4	7	52.1	88	100	4	7	31.0	5	12	5	12	12
2 FT	11	8	8	8	4	6	4	9	30.9	27.0	27.0	4	20	56.0	4	20	22.0	4	10.5	4	6.5	50.0	88	100	4	6.5	31.0	5	12	5	12	12
4 FT	8	8	8	8	4	10	4	7	30.9	24.0	24.0	4	18	56.0	4	18	20.5	4	10.5	4	6	47.4	88	100	4	6.5	30.0	5	12	5	12	12
6 FT	8	9	8	8	4	12	4	7	51.6	24.0	24.0	4	19	32.5	4	19	20.0	4	12	4	6.5	46.3	89	101	4	7.5	29.5	5	12	5	12	12
8 FT	8	9	8	8	4	12	4	6.5	44.5	24.0	24.0	4	18	30.5	4	18	19.5	4	11	4	6.5	44.0	89	101	4	7	29.5	5	12	5	12	0
10 FT	8	9	9	8	4	11.5	4	7	40.8	24.0	24.0	4	16	29.5	4	16	19.5	4	10	4	6.5	41.4	89	101	4	6.5	29.0	5	12	5	12	0
12 FT	8	9	9	8	4	12	4	7	36.9	24.0	24.0	4	17	28.0	4	17	19.0	4	10.5	4	7	38.3	89	101	4	6.5	29.0	5	12	5	12	0
14 FT	8	9	9	8	4	10.5	4	6.5	36.4	24.0	24.0	4	15	28.0	4	15	19.0	4	9	4	6.5	37.9	89	101	4	6	29.0	5	12	5	12	0
16 FT	8	9	9	8	4	9	5	7	36.0	24.0	28.0	4	13	28.0	4	13	19.0	4	8	5	7	37.5	89	101	5	7.5	28.5	5	12	5	12	0
18 FT	8	9	9	8	4	8	5	6	35.8	24.0	28.0	5	18	28.0	5	18	19.0	4	7.5	5	6	37.3	89	101	5	7	28.5	5	12	5	12	0
20 FT	8	10	9	8	4	7.5	6	7	38.4	24.0	28.0	5	17	28.0	5	17	19.5	4	7.5	5	6.5	38.1	90	102	5	7.5	29.0	5	12	5	11	0
22 FT	9	10	9	8	4	7.5	5	6	36.4	25.0	29.0	5	17	27.5	5	17	19.0	4	7	5	6	37.8	90	102	5	7.5	29.0	5	12	5	10	0
24 FT	9	11	9	8	4	7	5	6	36.1	25.0	29.0	5	16	27.5	5	16	19.0	4	7	5	6	38.5	91	103	5	8	29.0	5	12	5	9.5	0
26 FT	10	11	9	8	4	7	5	6	36.9	26.0	30.0	5	17	27.5	5	17	19.0	4	6.5	5	6	38.3	91	103	5	7.5	29.0	5	12	5	9	0
28 FT	10	12	9	8	4	6.5	5	6	36.8	30.0	30.0	5	16	27.5	5	16	19.0	4	7	5	6	38.9	92	104	5	8	29.0	5	12	5	8.5	0
30 FT	11	12	9	8	4	6.5	5	6	37.4	31.0	31.0	5	17	27.0	5	17	19.0	4	6.5	6	7.5	41.6	92	104	5	7.5	29.0	5	12	5	8.5	0
32 FT	11	13	9	8	4	6.5	6	7	40.3	31.0	31.0	5	16	27.0	5	16	19.0	4	6.5	5	6	39.1	93	105	5	7.5	29.0	5	12	5	8.5	0
34 FT	11	13	9	8	4	6	6	7	40.1	31.0	35.0	5	15	27.0	5	15	19.0	4	6.5	6	7	42.1	93	105	5	7.5	29.0	5	12	5	8.5	0
36 FT	12	14	10	8	4	6	5	6.5	37.8	32.0	32.0	5	17	26.0	5	17	19.0	4	6.5	5	7	39.5	94	106	5	7.5	29.0	5	12	5	8	0
38 FT	12	14	10	8	5	9	5	6	37.6	32.0	32.0	5	16	26.0	5	16	19.0	4	6	5	6.5	39.5	94	106	5	7	29.0	5	12	5	8	0
40 FT	12	15	11	8	5	8.5	5	7	37.8	28.0	32.0	5	15	26.0	5	15	19.0	4	6	5	7	40.0	95	107	5	7.5	29.0	5	12	5	7.5	0
42 FT	13	15	11	8	5	8.5	5	7	38.3	33.0	33.0	5	17	25.5	5	17	18.5	4	6	5	7	39.9	95	107	5	7	29.0	5	12	5	7.5	0
44 FT	13	15	11	8	5	8.5	5	6.5	38.1	33.0	33.0	5	16	25.5	5	16	18.5	5	9	5	7	39.9	95	107	5	6.5	29.0	5	12	5	7.5	0
46 FT	13	16	12	8	5	8	5	6.5	38.3	29.0	33.0	5	16	25.5	5	16	18.5	4	6	5	7	40.4	96	108	5	7	29.0	5	12	5	7.5	0
48 FT	14	16	12	8	5	8	5	6.5	38.8	34.0	34.0	5	17	25.0	5	17	18.5	5	9	5	6.5	40.4	96	108	5	6.5	29.0	5	12	5	7	0
50 FT	14	16	12	8	5	7.5	5	6.5	38.8	34.0	34.0	5	17	25.0	5	17	18.5	5	8.5	5	6.5	40.3	96	108	5	6.5	29.0	5	12	5	7	0



GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE DOUBLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 5 FEET HEIGHT (HT): 7 THRU 8 FEET
	SHEET NO. 703.47 5 OF 27
DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011	SHEET NO. 703.47 5 OF 27

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

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

		SPAN (S) = 6 FT										HEIGHT (HT) = 3 FT OR 4 FT OR 5 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS													
		A1 BARS					J3 BARS					H2 BARS					A2 BARS					J4 BARS					H3 BARS			B1 BARS		B2 BARS			
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=3'	HT=4'	HT=5'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=3'	HT=4'	HT=5'	SIZE	SPA.	C7	SIZE	SPA.	SIZE
1 FT	11	8	8	8	5	8.5	4	9.5	34.5	27.0	27.0	27.0	4	16	64.5	4	16	23.0	4	9.5	4	9.5	37.6	40	52	64	4	6	34.5	5	12	5	12	12	
2 FT	11	8	8	8	5	8.5	4	9.5	34.5	27.0	27.0	27.0	4	15	64.5	4	15	22.5	4	9	4	9	35.0	40	52	64	5	7.5	34.0	5	12	5	12	12	
4 FT	8	8	8	8	4	9	4	9	34.0	24.0	24.0	24.0	4	13	43.5	4	13	21.0	4	9	4	9.5	32.0	40	52	64	5	7.5	33.5	5	12	5	12	12	
6 FT	8	8	8	8	4	9.5	4	9.5	30.4	24.0	24.0	24.0	4	13	35.5	4	13	20.5	4	8.5	4	9	29.9	40	52	64	5	7	32.5	5	12	5	12	12	
8 FT	8	8	8	8	4	9	4	9	29.3	24.0	24.0	24.0	4	12	34.0	4	12	20.5	4	7.5	4	8	28.9	40	52	64	5	6.5	32.0	5	12	5	12	12	
10 FT	8	9	8	8	4	8	4	8	28.8	24.0	24.0	24.0	5	17	33.0	5	17	20.5	4	7.5	4	10	27.8	41	53	65	5	7	32.0	5	12	5	12	12	
12 FT	8	9	8	8	4	7	4	7	28.4	24.0	24.0	24.0	5	16	32.5	5	16	21.5	4	6.5	4	9	27.3	41	53	65	5	6.5	32.0	5	12	5	12	12	
14 FT	8	9	8	8	4	7.5	4	7	27.0	24.0	24.0	24.0	5	16	31.5	5	16	21.5	4	6.6	4	9.5	25.9	41	53	65	5	6	32.0	5	12	5	12	12	
16 FT	8	10	8	8	4	6.5	4	6	27.1	24.0	24.0	24.0	5	15	31.5	5	15	22.5	4	6.5	4	11.8	25.3	42	54	66	5	6.5	32.0	5	12	5	12	12	
18 FT	9	11	8	8	4	6.5	4	7.5	26.6	25.0	25.0	25.0	5	16	31.5	5	16	21.5	4	6.5	4	10.8	25.0	43	55	67	5	7	32.0	5	12	5	12	12	
20 FT	10	11	8	8	4	6	4	7.5	26.1	26.0	26.0	26.0	5	15	31.5	5	15	21.0	4	6	4	10	25.3	43	55	67	5	6.5	32.0	5	12	5	12	12	
22 FT	10	12	8	8	5	9	4	6.5	26.3	26.0	26.0	26.0	5	15	31.5	5	15	21.5	4	6	4	9.5	24.9	44	56	68	5	6.5	32.0	5	12	5	12	12	
24 FT	11	12	8	8	5	9	4	7	25.9	27.0	27.0	27.0	5	14	31.5	5	14	21.0	5	8.5	4	9	25.1	44	56	68	5	6	32.0	5	12	5	12	12	
26 FT	11	13	8	8	5	8.5	4	6	26.0	27.0	27.0	27.0	5	14	31.5	5	14	21.5	5	8.5	4	8.5	24.9	45	57	69	5	6	32.0	5	12	5	12	12	
28 FT	12	14	8	8	5	8.5	4	6.5	25.9	28.0	28.0	28.0	5	13	31.5	5	13	20.5	5	9	4	7.5	25.0	46	58	70	5	6.5	32.0	5	12	5	12	12	
30 FT	13	14	8	8	5	8.5	4	6.5	25.6	29.0	29.0	29.0	5	12	31.0	5	12	20.0	5	8.5	4	7.5	25.1	46	58	70	5	6	32.0	5	12	5	12	12	
32 FT	13	15	8	8	5	8	4	6	25.8	29.0	29.0	29.0	5	12	31.0	5	12	20.5	5	8.5	4	7	25.1	47	59	71	5	6	32.0	5	12	5	12	12	
34 FT	14	15	8	8	5	8	4	6	25.5	30.0	30.0	30.0	5	12	31.0	5	12	20.0	5	8	4	7	25.3	47	59	71	6	8.5	35.0	5	12	5	12	12	
36 FT	14	16	8	8	5	7.5	5	8.5	25.8	30.0	30.0	30.0	5	12	31.0	5	12	20.0	5	8	4	6.5	25.3	48	60	72	5	6	32.0	5	12	5	12	12	
38 FT	15	16	8	8	5	7.5	4	6	27.5	31.0	31.0	31.0	5	12	35.5	5	12	25.0	5	7.5	4	6.5	25.4	48	60	72	6	8	35.0	5	12	5	12	12	
40 FT	15	17	8	8	5	7	5	8	30.8	31.0	31.0	31.0	6	17	39.5	6	17	29.0	5	7.5	4	6	25.4	49	61	73	6	8.5	35.0	5	12	5	12	12	
42 FT	16	17	8	8	5	7	5	7	30.6	32.0	32.0	32.0	5	12	35.0	5	12	25.0	5	7.5	4	6	25.6	49	61	73	6	8	35.0	5	12	5	12	12	
44 FT	16	18	8	8	5	6.5	5	7	30.8	32.0	32.0	36.0	6	17	39.0	6	17	29.0	5	7.5	5	6.5	25.6	50	62	74	6	8	35.0	5	12	5	12	12	
46 FT	16	18	8	8	5	6	5	7	30.8	32.0	32.0	36.0	6	16	39.0	6	16	29.0	5	7	5	6.5	25.6	50	62	74	6	8	35.0	5	12	5	11.5	10	
48 FT	17	19	8	8	5	6.5	5	6.5	30.8	37.0	37.0	37.0	5	12	34.5	5	12	24.5	5	7.5	5	6.5	25.9	51	63	75	6	8	35.0	5	12	5	10.5	10	
50 FT	17	19	8	8	5	6	5	6.5	30.8	37.0	37.0	37.0	6	16	38.5	6	16	28.5	5	7	5	6.5	25.9	51	63	75	6	7.5	35.0	5	12	5	10	10	

		SPAN (S) = 6 FT										HEIGHT (HT) = 6 FT OR 7 FT																					
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS											
		A1 BARS					J3 BARS					H2 BARS					A2 BARS					J4 BARS					H3 BARS			B1 BARS		B2 BARS	
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=6'	HT=7'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=6'	HT=7'	SIZE	SPA.	C7	SIZE	SPA.	SIZE
1 FT	11	8	8	8	5	8	4	9.5	34.5	27.0	27.0	27.0	4	16	64.5	4	16	23.5	4	9	4	7.5	48.9	76	88	5	7.5	34.5	5	12	5	12	12
2 FT	11	8	8	8	5	8	4	9.5	34.5	27.0	27.0	27.0	4	15	64.5	4	15	25.0	4	8.5	4	7	45.0	76	88	5	7.5	34.0	5	12	5	12	12
4 FT	8	8	8	8	4	7.5	4	7.5	34.5	24.0	24.0	24.0	4	13	64.5	4	13	21.0	4	8.5	4	7	41.6	76	88	5	7	33.5	5	12	5	12	12
6 FT	8	8	8	8	4	9	4	7.5	40.9	24.0	24.0	24.0	4	13	64.5	4	13	20.5	4	8	4	6.5	38.1	76	88	5	7	32.5	5	12	5	12	12
8 FT	8	8	8	8	4	9	4	7	37.0	24.0	24.0	24.0	4	12	34.0	4	12	20.5	4	7.5	4	6	36.3	76	88	5	6.5	32.0	5	12	5	12	12
10 FT	8	9	8	8	4	8	4	6	35.1	24.0	24.0	24.0	5	17	33.0	5	17	21.0	4	7.5	4	6.5	35.5	77	89	5	7	32.0	5	12	5	12	12
12 FT	8	9	8	8	4	7	5	6.5	34.1	24.0	24.0	24.0	5	16	32.5	5	16	21.5	4	6.5	4	6	34.5	77	89	5	6.5	32.0	5	12	5	12	12
14 FT	8	9	8	8	4	7	5	6.5	31.8	24.0	24.0	24.0	5	16	31.5	5	16	21.5	4	6.5	4	6	32.0	77	89	5	6	32.0	5	12	5	12	12
16 FT	8	10	8	8	4	6.5	5	6	31.6	24.0	24.0	24.0	5	15	31.0	5	15	22.5	4	6.5	4	7	32.0	78	90	5	6.5	32.0	5	12	5	12	12
18 FT	9	11	8	8	4	6.5	5	6.5	31.8	25.0	25.0	25.0	5	16	31.0	5	16	21.5	4	6.5	4	6.5	32.3	79	91	5	7	32.0	5	12	5	12	12
20 FT	10	11	8	8	4	6	5	7.5	31.8	26.0	30.0	30.0	5	15	31.0	5	15	21.0	4	6	5	7.5	32.1	79	91	5	6.5	32.0	5	12	5	12	12
22 FT	10	12	8	8	5	9	5	7	31.6	26.0	30.0	30.0	5	15	31.0	5	15	21.5	4	6	5	8	32.3	80	92	5	6.5	32.0	5	12	5	12	12
24 FT	11	12	8	8	5	9	5	7.5	31.8	27.0	31.0	31.0	5	14	31.0	5	14	20.5	5	8.5	5	7.5	32.1	80	92	5	6	32.0	5	12	5	12	12
26 FT	11	13	8	8	5	8.5	5	6.5	31.8	27.0	31.0	31.0	5	14	31.0	5	14	21.0	5	9	5	7.5	32.3	81	93	5	6	32.0	5	12	5	11	10
28 FT	12	14	8	8	5	8.5	5	7	31.9	28.0	32.0	32.0	5	13	30.5	5	13	20.0	5	9	5	8	32.6	82	94	5	6.5	32.0	5	12	5	10	10
30 FT	12	14	8	8	5	7.5	5	6.5	31.8	28.0	32.0	32.0	5	13	30.5	5	13	20.5	5	8.5	5	7.5	32.5	82	94	5	6	32.0	5	12	5	9.5	10
32 FT	13	15	8	8	5	8	5	6.5	32.0	29.0	33.0	33.0	5	12	30.0	5	12	20.0	5	8.5	5	7.5	32.8	83	95	5	6	32.0	5	12	5	9.5	10
34 FT	13	15	8	8	5	7	5	6	31.9	29.0	33.0	33.0	5	12	30.0	5	12	20.0	5	8	5	7	32.8	83	95	5	6	32.0	5	12	5	9.5	10
36 FT	14	16	9	8	5	7.5	5	7.5	32.6	30.0	34.0	34.0	5	12	29.5	5	12	1															

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 6 FT												HEIGHT (HT) = 8 FT OR 9 FT															
					TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS															
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS											
					SIZE	SPA.	SIZE	SPA.	C1	H1=8"	H1=9"	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	K3	H1=8"	H1=9"	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	11	9	8	8	5	8	4	7	34.5	27.0	27.0	4	16	64.5	4	16	23.5	4	9.5	4	6.5	59.4	101	113	4	6.5	34.5	5	12	5	12	12
2 FT	11	9	8	8	5	8	4	6.5	34.5	27.0	27.0	4	16	64.5	4	16	23.0	4	9	4	6	57.0	101	113	4	6	34.0	5	12	5	12	12
4 FT	8	9	8	8	4	7.5	4	6.5	35.1	24.0	24.0	4	13	65.0	4	13	21.0	4	9.5	4	6.5	53.0	101	113	4	6	33.5	5	12	5	12	12
6 FT	8	9	8	8	4	9	4	6	33.1	24.0	24.0	4	13	36.0	4	13	20.5	4	9	4	6	49.5	101	113	4	6	33.0	5	12	5	12	12
8 FT	8	9	8	8	4	9	5	7	46.5	24.0	28.0	4	12	33.5	4	12	20.5	4	8	5	6.5	46.5	101	113	5	7.5	32.5	5	12	5	12	0
10 FT	8	9	8	8	4	8	5	6	43.8	24.0	28.0	5	17	32.5	5	17	20.5	4	7.5	5	6	44.6	101	113	5	6.5	32.0	5	12	5	11.5	0
12 FT	8	9	10	8	4	7.5	5	6.5	41.8	24.0	28.0	5	17	32.0	5	17	21.5	4	6.5	5	6.5	42.9	101	113	5	6.5	32.0	5	12	5	11.5	0
14 FT	8	9	10	8	4	7.5	5	6.5	38.5	24.0	28.0	5	17	31.0	5	17	21.0	4	6.5	5	6.5	39.6	101	113	5	6	31.5	5	12	5	12	0
16 FT	8	10	10	8	4	6.5	5	6	38.1	24.0	28.0	5	16	31.0	5	16	22.0	4	6.5	5	7	40.6	102	114	5	6.5	32.0	5	12	5	11.5	0
18 FT	9	11	10	8	4	6.5	5	6	38.8	25.0	29.0	5	16	31.0	5	16	21.0	4	6.5	5	7	41.1	103	115	5	7	32.0	5	12	5	10.5	0
20 FT	9	11	10	8	4	6	5	6	38.5	25.0	29.0	5	16	31.0	5	16	22.0	4	6	5	6.5	40.9	103	115	5	6	32.0	5	12	5	10	0
22 FT	10	12	10	8	4	6	5	6.5	39.1	30.0	30.0	5	15	30.5	5	15	21.0	4	6	5	6.5	41.4	104	116	5	6.5	32.0	5	12	5	9	0
24 FT	11	13	10	8	4	6	5	6.5	39.6	31.0	31.0	5	14	30.5	5	14	20.0	4	6	5	6.5	41.8	105	117	5	6.5	32.0	5	12	5	8.5	0
26 FT	11	13	10	8	5	9	5	6	39.4	31.0	31.0	5	14	30.5	5	14	20.5	5	9	5	6.5	41.6	105	117	5	6	32.0	5	12	5	8	0
28 FT	12	14	10	8	5	9	5	6	40.0	32.0	32.0	5	13	30.0	5	13	19.5	4	6	5	6.5	42.0	106	118	5	6.5	32.0	5	12	5	8	0
30 FT	12	14	10	8	5	8	5	6	39.9	32.0	32.0	5	13	30.0	5	13	20.0	5	8.5	5	6	41.9	106	118	5	6	32.0	5	12	5	8	0
32 FT	13	15	11	8	5	8.5	5	7	40.4	33.0	33.0	5	13	29.0	5	13	19.5	5	8.5	5	7	42.3	107	119	5	6	32.0	5	12	5	7.5	0
34 FT	13	15	11	8	5	8	5	6.5	40.3	33.0	33.0	5	13	29.0	5	13	19.5	5	8	5	7	42.1	107	119	6	8	35.0	5	12	5	7.5	0
36 FT	14	16	11	8	5	8	5	6	40.8	34.0	34.0	5	14	28.5	5	14	19.5	5	8.5	5	7	42.6	108	120	5	6	32.0	5	12	5	7.5	0
38 FT	14	16	12	8	5	7.5	5	6.5	40.8	34.0	34.0	5	13	28.5	5	13	19.5	5	7.5	5	6.5	42.5	108	120	6	8	35.0	5	12	5	7	0
40 FT	14	17	12	8	5	7	5	6	40.8	34.0	34.0	5	12	28.5	5	12	19.5	5	8	5	6.5	43.0	109	121	6	8	35.0	5	12	5	7	0
42 FT	15	17	13	8	5	7	5	6	46.4	35.0	35.0	5	13	33.0	5	13	24.5	5	7	5	6	42.8	109	121	6	7.5	35.0	5	12	5	7	0
44 FT	15	18	13	8	5	7	5	6	46.4	35.0	35.0	5	13	33.0	5	13	24.5	5	7.5	5	6	43.3	110	122	6	8	35.0	5	12	5	6.5	0
46 FT	15	18	13	8	5	6	5	6	46.3	35.0	35.0	5	12	33.0	5	12	24.5	5	7.5	5	6	43.3	110	122	6	7.5	35.0	5	12	5	6.5	0
48 FT	16	19	14	8	5	6.5	5	6	47.0	36.0	36.0	5	14	32.5	5	14	24.0	5	7.5	5	6	43.8	111	123	6	7.5	35.0	5	12	5	6.5	0
50 FT	16	19	14	8	5	6	5	6	46.9	36.0	36.0	5	13	32.5	5	13	24.0	5	7	5	6	43.6	111	123	6	7.5	35.0	5	12	5	6.5	0

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

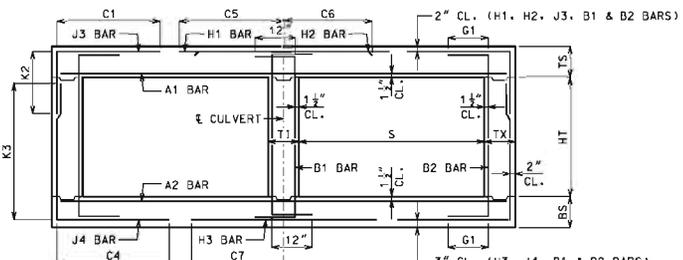
GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



BAR DIMENSIONS DIAGRAM
 SYMMETRICAL ABOUT ϵ CULVERT.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 6 FEET HEIGHT (HT): 8 THRU 9 FEET	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011	703.47 SHEET NO. 7 OF 27

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

		SPAN (S) = 7 FT												HEIGHT (HT) = 4 FT OR 5 FT OR 6 FT																				
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS								
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS		B2 BARS									
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	H1=4'	H1=5'	H1=6'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	H1=4'	H1=5'	H1=6'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	C1	
1 FT	12	8	8	8	5	8	4	8.5	38.1	28.0	28.0	28.0	4	15	73.0	4	15	25.5	4	7	4	6.5	41.8	52	64	76	5	6.5	37.5	5	12	5	12	12
2 FT	12	9	8	8	5	7.5	4	8.5	38.1	28.0	28.0	28.0	4	14	73.0	4	14	24.5	4	7.5	4	8.5	39.9	53	65	77	5	7	37.5	5	12	5	12	12
4 FT	8	8	8	8	4	6	4	6.5	38.4	24.0	24.0	24.0	5	17	48.0	5	17	23.5	4	7	4	7	35.8	52	64	76	5	6	36.5	5	12	5	12	12
6 FT	8	8	8	8	4	7	4	7	33.9	24.0	24.0	24.0	5	17	39.0	5	17	23.5	4	6.5	4	6.5	33.3	52	64	76	5	7	38.5	5	12	5	12	12
8 FT	8	9	8	8	4	7	4	6.5	32.1	24.0	24.0	24.0	5	16	37.0	5	16	24.0	4	6.5	4	6.5	31.8	53	65	77	5	6	35.5	5	12	5	12	12
10 FT	8	10	8	8	4	6	5	7	31.5	24.0	24.0	24.0	5	15	36.0	5	15	24.0	4	6.5	4	9.5	30.5	54	66	78	5	6.5	35.5	5	12	5	12	12
12 FT	9	10	8	8	4	6	4	6.5	30.5	25.0	25.0	25.0	5	15	35.5	5	15	24.0	5	9	4	8.5	29.8	54	66	78	5	6	35.5	5	12	5	12	12
14 FT	9	11	8	8	5	8.5	5	7	30.4	25.0	25.0	25.0	5	14	35.5	5	14	24.0	5	9	4	8.5	29.1	55	67	79	5	6	35.5	5	12	5	12	12
16 FT	10	11	8	8	4	6	4	6.5	28.5	26.0	26.0	26.0	5	15	34.5	5	15	23.0	5	8.5	4	8	27.8	55	67	79	5	6	35.0	5	12	5	12	12
18 FT	10	12	8	8	5	8	5	8	28.6	26.0	26.0	26.0	5	14	34.5	5	14	23.5	5	8.5	4	8.5	27.4	56	68	80	5	6	35.0	5	12	5	12	12
20 FT	11	12	8	8	5	8	5	9	28.1	27.0	27.0	27.0	5	14	34.5	5	14	23.5	5	7	4	7	27.5	56	68	80	6	7	38.0	5	12	5	12	12
22 FT	12	13	8	8	5	8	5	8.5	27.9	28.0	28.0	28.0	5	13	34.5	5	13	23.0	5	7.5	4	7	27.5	57	69	81	6	7.5	38.0	5	12	5	12	12
24 FT	12	14	8	8	5	7.5	5	8.5	28.0	28.0	28.0	28.0	5	13	34.5	5	13	23.5	5	7.5	4	7	27.3	58	70	82	6	7.5	38.0	5	12	5	12	12
26 FT	13	15	8	8	5	7	5	8.5	27.9	29.0	29.0	29.0	5	12	34.5	5	12	22.5	5	7.5	4	7	27.4	59	71	83	6	7.5	38.0	5	12	5	12	12
28 FT	14	15	8	8	5	7	5	8.5	27.6	30.0	30.0	30.0	5	12	34.0	5	12	22.0	5	7	4	6.5	27.6	59	71	83	6	7	38.0	5	12	5	12	12
30 FT	14	16	8	8	5	6.5	5	8.5	27.8	30.0	30.0	30.0	5	12	34.0	5	12	22.5	5	7	4	6.5	27.5	60	72	84	6	7	38.0	5	12	5	12	12
32 FT	15	17	8	8	5	6.5	5	8	32.8	31.0	31.0	31.0	6	16	43.0	6	16	30.5	5	7.5	4	6	27.8	61	73	85	6	7.5	38.0	5	12	5	12	12
34 FT	16	17	8	8	5	6.5	5	7	32.6	32.0	32.0	32.0	6	15	42.5	6	15	29.5	5	7	4	6	27.9	61	73	85	6	7	38.0	5	12	5	11.5	12
36 FT	16	18	8	8	5	6	5	7	32.8	32.0	36.0	36.0	6	15	42.5	6	15	30.0	5	7	5	6.5	27.9	62	74	86	6	7	38.0	5	12	5	10.5	12
38 FT	17	18	8	8	5	6	5	6.5	32.8	37.0	37.0	37.0	6	14	42.0	6	14	29.5	5	6	5	6.5	28.0	62	74	86	6	6.5	38.0	5	12	5	10	12
40 FT	17	19	8	8	5	6	5	6.5	32.8	37.0	37.0	37.0	6	14	42.0	6	14	30.0	5	6.5	5	6.5	28.0	63	75	87	6	6.5	38.0	5	12	5	9.5	12
42 FT	18	20	8	8	5	6	5	6.5	32.9	38.0	38.0	38.0	6	14	41.5	6	14	29.5	5	6.5	5	6	28.3	64	76	88	6	7	38.0	5	12	5	9.5	12
44 FT	18	20	8	8	6	8	5	6.5	32.9	38.0	38.0	38.0	6	14	41.5	6	14	29.5	5	6.5	5	6	28.3	64	76	88	6	6.5	38.0	5	12	5	9.5	12
46 FT	19	21	8	8	6	8	5	6	33.0	39.0	39.0	39.0	6	14	41.0	6	14	29.5	5	6.5	6	7.5	31.5	65	77	89	6	6.5	38.0	5	12	5	9.5	12
48 FT	19	21	8	8	6	8	5	6	32.9	39.0	39.0	39.0	6	14	41.0	6	14	29.5	5	6	6	7.5	31.4	65	77	89	6	6.5	38.0	5	12	5	9.5	12
50 FT	20	22	9	8	6	8	5	6.5	33.8	40.0	40.0	40.0	6	15	40.0	6	15	29.0	5	6	6	6	29.0	66	78	90	6	6.5	38.0	5	12	5	8.5	12

		SPAN (S) = 7 FT												HEIGHT (HT) = 7 FT OR 8 FT																		
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS						
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS		B2 BARS							
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	H1=7'	H1=8'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	H1=7'	H1=8'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	C1	
1 FT	12	9	8	8	5	7.5	4	8.5	38.1	28.0	28.0	4	15	73.0	4	15	25.5	4	7.5	4	7	56.0	89	101	5	7	37.5	5	12	5	12	12
2 FT	12	9	8	8	5	7.5	4	8	38.1	28.0	28.0	4	15	73.0	4	15	25.0	4	7	4	6.5	51.4	89	101	5	7	37.5	5	12	5	12	12
4 FT	8	9	8	8	4	6	5	6.5	40.1	24.0	24.0	5	17	75.0	5	17	23.5	4	7.5	4	6.5	47.8	89	101	5	7	37.0	5	12	5	12	12
6 FT	8	9	8	8	4	7	5	6.5	44.6	24.0	24.0	5	17	39.5	5	17	23.5	4	7	4	6	43.5	89	101	5	6.5	36.0	5	12	5	12	12
8 FT	8	9	9	8	4	7	4	6	40.1	24.0	24.0	5	16	37.0	5	16	23.5	4	6.5	4	6.5	40.4	89	101	5	6	35.5	5	12	5	12	12
10 FT	8	10	9	8	4	6.5	5	6	38.4	24.0	24.0	5	15	36.0	5	15	24.0	4	6.5	4	7	39.5	90	102	5	6.5	35.5	5	12	5	12	12
12 FT	9	10	9	8	4	6	5	6.5	37.8	25.0	25.0	5	15	35.5	5	15	24.0	5	9	4	6	38.1	90	102	5	6	35.0	5	12	5	12	12
14 FT	9	11	9	8	5	8.5	5	6	37.1	25.0	25.0	5	14	35.5	5	14	23.5	5	9	4	6	37.9	91	103	5	6	35.5	5	12	5	12	12
16 FT	9	11	9	8	5	8.5	5	6	34.8	25.0	25.0	5	14	34.0	5	14	23.5	5	8.5	4	6	35.3	91	103	5	6	35.0	5	12	5	12	12
18 FT	10	12	9	8	5	8.5	5	7	34.9	26.0	30.0	5	14	34.0	5	14	23.5	5	8.5	5	8.5	35.3	92	104	5	6	35.0	5	12	5	12	12
20 FT	11	13	9	8	5	8	5	7.5	34.9	27.0	31.0	5	14	34.0	5	14	23.0	5	8.5	5	8	35.4	93	105	6	8	38.0	5	12	5	12	12
22 FT	11	13	9	8	5	7	5	6.5	34.8	27.0	31.0	5	13	34.0	5	13	23.5	5	7.5	5	8	35.1	93	105	6	7.5	38.0	5	12	5	11.5	12
24 FT	12	14	9	8	5	7.5	5	7	34.8	28.0	32.0	5	13	34.0	5	13	23.0	5	8	5	8	35.4	94	106	6	7.5	38.0	5	12	5	10.5	12
26 FT	13	15	9	8	5	7.5	5	7	34.9	29.0	33.0	5	12	33.5	5	12	22.0	5	8	5	8	35.6	95	107	6	7.5	38.0	5	12	5	9.5	12
28 FT	13	15	9	8	5	6.5	5	6.5	34.8	33.0	33.0	5	12	33.5	5	12	22.5	5	7	5	7.5	35.4	95	107	6	7	38.0	5	12	5	9	12
30 FT	14	16	9	8	5	7	5	6.5	34.9	34.0	34.0	5	12	33.0	5	12	21.5	5	7.5	5	7.5	35.6	96	108	6	7	38.0	5	12	5	8.5	12
32 FT	15	17	9	8	5	7	5	6	40.0	35.0	35.0	6	16	41.5	6	16	29.5	5	7.5	5	7.5	36.0	97	109	6	7.5	38.0	5	12	5	8.5	12
34 FT	15	17	10	8	5	6.5	5	7	40.5	35.0	35.0	6	16	41.5	6	16	30.0	5	6.5	5	7.5	36.0	97	109	6	7	38.0	5	12	5	8.5	12
36 FT	16	18	10	8	5	6.5	5	6.5	40.6	36.0	36.0	6	15	41.0	6	15	29.5	5	7	5	7.5	36.4	98	110	6	7	38.0	5	12	5	8	12
38 FT	16	19	11	8	5	6	5																									

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 7 FT												HEIGHT (HT) = 9 FT OR 10 FT															
					TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS															
	TS	BS	TX	TI	J3 BARS			K2			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS	B1 BARS		B2 BARS						
					SIZE	SPA.	C1	HT=8'	HT=10'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	HT=8'	HT=10'	HT=8'	HT=10'		HT=8'	HT=10'	HT=8'	HT=10'	HT=8'	HT=10'	HT=8'	HT=10'	
1 FT	12	9	8	8	5	7.5	4	6	38.1	28.0	28.0	4	16	73.0	4	16	26.0	4	7	6	7	68.1	113	125	5	7	38.0	5	12	5	12	12
2 FT	12	9	8	8	5	7.5	5	6.5	38.1	28.0	32.0	4	15	73.0	4	15	25.0	4	6.5	6	6.5	64.9	113	125	5	6.5	37.5	5	12	5	12	12
4 FT	8	9	8	8	4	6	5	6	40.8	24.0	28.0	5	17	75.5	5	17	23.5	4	7.5	5	6	57.8	113	125	5	7	37.0	5	12	5	11.5	12
6 FT	8	9	10	8	4	7	5	6.5	55.0	24.0	28.0	5	17	39.5	5	17	23.0	4	7	5	6.5	51.9	113	125	5	6.5	36.0	5	12	5	11.5	12
8 FT	8	9	10	8	4	7	5	6	49.0	28.0	28.0	5	16	37.0	5	16	23.5	4	6.5	5	6	49.3	113	125	5	6	35.5	5	12	5	10.5	0
10 FT	8	10	10	8	4	6.5	6	7	49.0	28.0	28.0	5	15	36.0	5	15	24.0	4	6.5	5	6	49.1	114	126	5	6	35.5	5	12	5	10	0
12 FT	9	10	10	8	4	6	5	6	46.1	29.0	29.0	5	16	35.5	5	16	23.5	5	9	6	7	50.3	114	126	5	6	35.0	5	12	5	9.5	0
14 FT	9	11	10	8	5	9	5	6	44.6	29.0	29.0	5	15	35.0	5	15	23.5	5	9	6	7.5	50.6	115	127	5	6	35.0	5	12	5	8.5	0
16 FT	9	11	10	8	5	9	5	6	41.5	29.0	29.0	5	14	34.0	5	14	23.5	5	8.5	5	6	44.0	115	127	5	6	35.0	5	12	5	9.5	0
18 FT	10	12	10	8	5	8.5	5	6.5	42.0	30.0	30.0	5	15	34.0	5	15	23.5	5	8.5	5	6	44.3	116	128	5	6	35.0	5	12	5	8.5	0
20 FT	11	13	10	8	5	8.5	5	6	42.4	31.0	31.0	5	14	33.5	5	14	22.5	5	8.5	5	6	44.6	117	129	6	8	38.0	5	12	5	8	0
22 FT	11	13	10	8	5	7.5	5	6	42.1	31.0	31.0	5	14	33.5	5	14	23.5	5	7.5	6	7	47.3	117	129	6	7.5	38.0	5	12	5	8	0
24 FT	12	14	10	8	5	7.5	5	6	42.5	32.0	32.0	5	13	33.5	5	13	22.5	5	8	6	7.5	47.6	118	130	6	7.5	38.0	5	12	5	8	0
26 FT	13	15	10	8	5	7.5	6	7	45.8	33.0	37.0	5	12	33.0	5	12	21.5	5	8	6	7.5	47.9	119	131	6	7.5	38.0	5	12	5	8	0
28 FT	13	16	11	8	5	7	5	6	42.9	33.0	33.0	5	12	32.5	5	12	22.0	5	8	5	6.5	45.3	120	132	6	7.5	38.0	5	12	5	7.5	0
30 FT	14	16	11	8	5	7	6	7.5	46.1	34.0	34.0	5	12	32.0	5	12	21.0	5	7.5	5	6	45.0	120	132	6	7	38.0	5	12	5	7.5	0
32 FT	14	17	12	8	5	7	5	6	43.4	34.0	34.0	5	12	32.0	5	12	21.5	5	7.5	5	6.5	45.4	121	133	6	7	38.0	5	12	5	7	0
34 FT	15	17	12	8	5	6.5	6	8.5	52.6	35.0	35.0	6	16	40.5	6	16	29.5	5	6.5	5	6.5	45.1	121	133	6	7	38.0	5	12	5	7	0
36 FT	15	18	13	8	5	6	6	8.5	52.9	35.0	35.0	6	16	40.0	6	16	29.5	5	7	5	6	45.5	122	134	6	7	38.0	5	12	5	6.5	0
38 FT	16	19	13	8	5	6.5	6	8	53.1	36.0	36.0	6	16	39.5	6	16	29.0	5	7	5	6	45.9	123	135	6	7	38.0	5	12	5	6.5	0
40 FT	17	19	13	8	5	6	6	7.5	53.4	37.0	37.0	5	12	35.0	5	12	25.0	5	6.5	5	6	45.8	123	135	6	6.5	38.0	5	12	5	6.5	0
42 FT	17	20	14	8	5	6	6	8	53.8	37.0	37.0	6	16	39.0	6	16	29.0	5	6.5	5	6	46.1	124	136	6	6.5	38.5	5	12	5	6	0
44 FT	17	20	14	8	6	8.5	6	7.5	53.6	37.0	37.0	6	15	39.0	6	15	29.0	5	6	5	6	46.1	124	136	6	6.5	38.5	5	12	5	6	0
46 FT	18	21	14	8	6	8	6	7	53.9	38.0	38.0	6	17	38.5	6	17	29.0	5	6.5	5	6	46.5	125	137	6	6.5	38.0	5	12	5	6	0
48 FT	18	22	15	8	6	8	6	7.5	54.3	38.0	42.0	6	16	38.5	6	16	29.0	5	6.5	6	8	49.9	126	138	6	6.5	38.5	5	12	5	6	0
50 FT	18	22	15	8	6	7.5	6	7.5	54.3	38.0	42.0	6	15	38.5	6	15	29.0	5	6	6	8	49.9	126	138	6	6	38.5	5	12	6	8	0

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

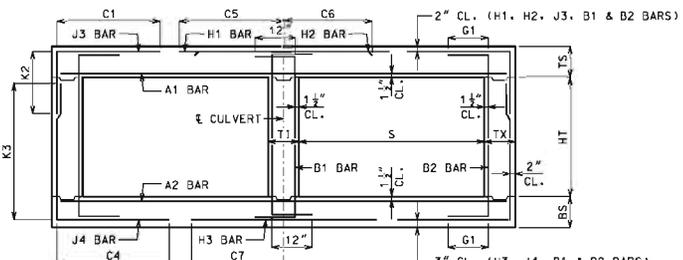
GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.



BAR DIMENSIONS DIAGRAM
 SYMMETRICAL ABOUT ϵ CULVERT.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 7 FEET HEIGHT (HT): 9 THRU 10 FEET	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011	703.47 SHEET NO. 9 OF 27

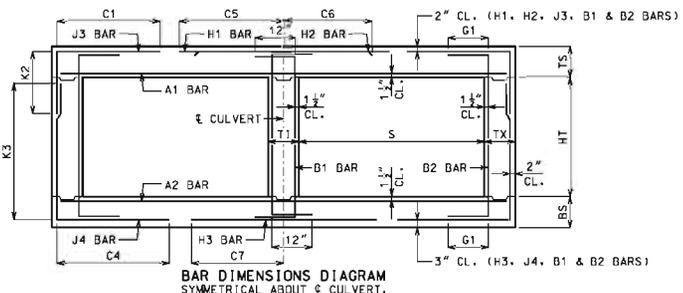
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 8 FT										HEIGHT (HT) = 4 FT OR 5 FT OR 6 FT																							
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																				
	TS	BS	TX	T1	A1 BARS		J3 BARS			H1 BARS		H2 BARS		A2 BARS		J4 BARS			H3 BARS		B1 BARS		B2 BARS												
					SIZE	SPA.	SIZE	SPA.	C1	K2		SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	K3		SIZE	SPA.	C7	SIZE	SPA.	C1							
1 FT	12	9	8	8	5	7	4	8.5	41.8	28.0	28.0	28.0	4	12	81.5	4	12	26.5	4	7	4	8	43.0	53	65	77	5	6	5	41.0	5	12	5	12	12
2 FT	13	9	8	8	5	7.5	4	7.5	41.8	29.0	29.0	29.0	4	13	81.5	4	13	26.5	4	6.5	4	7	39.1	53	65	77	5	6	40.5	5	12	5	12	12	
4 FT	8	8	8	8	4	6	5	6.5	36.4	24.0	24.0	24.0	5	15	51.0	5	15	26.0	4	6	4	6	35.3	52	64	76	6	6.5	42.5	5	9.5	5	12	12	
6 FT	8	8	8	8	4	6	5	6.5	34.3	24.0	24.0	24.0	5	15	42.5	5	15	26.0	4	6	4	7.5	35.1	53	65	77	6	7	42.0	5	12	5	12	12	
8 FT	8	8	8	8	4	6	5	6	33.1	24.0	24.0	24.0	5	13	40.5	5	13	25.5	5	8.5	4	7	31.6	53	65	77	6	6.5	41.5	5	12	5	12	0	
10 FT	9	10	8	8	5	8.5	4	6	31.9	25.0	25.0	25.0	5	14	39.5	5	14	25.0	5	8	4	8	30.4	54	66	78	6	7	41.5	5	12	5	12	0	
12 FT	10	11	8	8	5	8	4	6	30.6	26.0	26.0	26.0	5	14	39.0	5	14	25.0	5	8	4	8	29.3	55	67	79	6	7	41.5	5	12	5	12	0	
14 FT	11	12	8	8	5	8	4	6	29.8	27.0	27.0	27.0	5	14	38.5	5	14	25.0	5	7.5	4	7.5	28.6	56	68	80	6	7	41.5	5	12	5	12	0	
16 FT	11	13	8	8	5	7.5	5	8.5	29.6	27.0	27.0	27.0	5	12	38.5	5	12	25.0	5	7.5	4	8	28.0	57	69	81	6	7	41.5	5	12	5	12	0	
18 FT	12	13	8	8	5	7.5	4	6	27.5	28.0	28.0	28.0	5	13	37.5	5	13	25.0	5	7	4	7.5	26.8	57	69	81	6	7	41.0	5	12	5	12	0	
20 FT	12	14	8	8	5	7	5	8.5	27.8	28.0	28.0	28.0	5	12	37.5	5	12	25.0	5	7	4	7.5	26.4	58	70	82	6	7	41.5	5	12	5	12	0	
22 FT	13	15	8	8	5	6.5	6	8.5	27.4	29.0	29.0	29.0	5	12	37.5	5	12	25.0	5	7	4	7	26.4	59	71	83	6	7	41.5	5	12	5	12	0	
24 FT	14	16	8	8	5	6.5	5	8.5	27.3	30.0	30.0	30.0	5	12	37.5	5	12	24.5	5	7	4	6.5	26.5	60	72	84	6	7	41.5	5	12	5	12	0	
26 FT	15	16	8	8	5	6.5	5	8	31.9	31.0	31.0	31.0	6	16	46.5	6	16	33.0	5	6.5	4	6.5	26.6	60	72	84	6	7	41.0	5	12	5	12	0	
28 FT	16	17	8	8	5	6	5	7	31.8	32.0	32.0	32.0	6	15	46.0	6	15	32.0	5	6.5	4	6	26.8	61	73	85	6	6.5	41.0	5	12	5	12	0	
30 FT	16	18	8	8	5	6	5	7	32.0	32.0	32.0	32.0	6	15	46.0	6	15	33.0	5	6.5	5	6.5	26.6	62	74	86	6	6.5	41.0	5	12	5	12	0	
32 FT	17	19	8	8	5	6	5	6.5	31.9	37.0	37.0	37.0	6	14	45.5	6	14	32.0	5	6.5	5	6.5	26.8	63	75	87	6	6.5	41.0	5	12	5	12	0	
34 FT	18	19	8	8	6	8.5	5	6.5	31.8	38.0	38.0	38.0	6	13	45.5	6	13	31.0	5	6	5	6.5	26.9	63	75	87	6	6	41.0	5	12	5	11	0	
36 FT	18	20	8	8	6	8	5	6.5	31.9	38.0	38.0	38.0	6	13	45.5	6	13	32.0	5	6	5	6	26.9	64	76	88	6	6	41.0	5	12	5	10	0	
38 FT	19	21	8	8	6	8	5	6	32.0	39.0	39.0	39.0	6	13	45.0	6	13	31.0	5	6	6	7.5	30.1	65	77	89	6	6	41.0	5	12	5	9.5	0	
40 FT	20	22	8	8	6	7.5	6	7.5	36.0	44.0	44.0	44.0	6	13	44.5	6	13	30.5	5	6	6	7	30.4	66	78	90	6	6	41.0	5	12	5	9.5	0	
42 FT	20	22	8	8	6	7.5	6	7.5	36.0	44.0	44.0	44.0	6	12	44.5	6	12	30.5	6	8.5	6	7	30.3	66	78	90	6	6	41.0	5	12	5	9.5	0	
44 FT	21	23	8	8	6	7.5	6	7	36.0	45.0	45.0	45.0	6	12	43.5	6	12	30.0	6	8.5	6	6.5	30.5	67	79	91	6	6	41.0	5	12	5	9.5	0	
46 FT	21	23	8	8	6	7	6	7	36.0	45.0	45.0	45.0	6	12	43.5	6	12	30.0	6	8	6	6.5	30.5	67	79	91	7	7.5	44.0	5	12	5	9.5	0	
48 FT	22	24	8	8	6	7	6	6.5	36.1	46.0	46.0	46.0	6	12	43.0	6	12	30.0	6	8	6	6	30.8	68	80	92	7	7.5	44.0	5	12	5	9	0	
50 FT	22	24	8	8	6	6.5	6	6.5	36.1	46.0	46.0	46.0	6	12	43.0	6	12	30.0	6	7.5	6	6	30.8	68	80	92	7	7.5	44.0	5	12	5	8.5	0	

		SPAN (S) = 8 FT										HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT																						
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																			
	TS	BS	TX	T1	A1 BARS		J3 BARS			H1 BARS		H2 BARS		A2 BARS		J4 BARS			H3 BARS		B1 BARS		B2 BARS											
					SIZE	SPA.	SIZE	SPA.	C1	K2		SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	K3		SIZE	SPA.	C7	SIZE	SPA.	C1						
1 FT	12	9	8	8	5	7	4	8.5	41.8	28.0	28.0	28.0	4	12	81.5	4	12	27.5	4	6	5	6.5	61.6	89	101	113	5	6	41.0	5	12	5	12	12
2 FT	13	10	8	8	5	7	4	8.5	41.8	29.0	29.0	29.0	4	13	81.5	4	13	27.0	4	6.5	4	6	58.3	90	102	114	5	6.5	40.5	5	12	5	12	12
4 FT	8	9	8	8	4	6	6	7.5	43.8	24.0	24.0	24.0	5	15	83.5	5	15	27.0	4	6	5	6	52.3	89	101	113	5	6	40.0	5	11	5	12	12
6 FT	8	10	8	8	4	6	6	7.5	51.4	24.0	24.0	24.0	5	15	43.0	5	15	26.0	4	6.5	5	6	49.0	90	102	114	5	6.5	39.5	5	12	5	12	12
8 FT	8	11	8	8	4	6	6	7.5	46.6	24.0	24.0	24.0	5	13	40.5	5	13	25.5	4	6.5	5	6.5	46.3	91	103	115	5	6	39.0	5	12	5	12	0
10 FT	9	11	8	8	5	8.5	6	7	45.3	25.0	25.0	25.0	5	14	39.5	5	14	25.5	5	8.5	5	6	43.6	91	103	115	5	6	38.5	5	12	5	11	0
12 FT	10	12	8	8	5	8	6	7	44.4	26.0	30.0	30.0	5	14	39.0	5	14	25.0	5	8.5	5	6	42.5	92	104	116	5	6	38.5	5	12	5	10	0
14 FT	11	12	8	8	5	8	6	7	43.5	27.0	31.0	35.0	5	14	38.5	5	14	25.0	5	7.5	6	7	44.4	92	104	116	6	7	41.5	5	12	5	9.5	0
16 FT	11	13	8	8	5	7.5	6	6.5	42.9	27.0	31.0	35.0	5	12	38.0	5	12	25.0	5	7.5	6	7	44.0	93	105	117	6	7.5	41.5	5	12	5	9.5	0
18 FT	12	13	8	8	5	7.5	5	6	37.1	28.0	32.0	32.0	5	13	37.5	5	13	25.0	5	7	6	7.5	41.1	93	105	117	6	7	41.0	5	12	5	9.5	0
20 FT	12	14	8	8	5	7	6	7	39.9	32.0	32.0	36.0	5	12	37.5	5	12	25.0	5	7	6	7.5	41.1	94	106	118	6	7	41.0	5	12	5	9.5	0
22 FT	13	15	8	8	5	6.5	6	7	39.9	33.0	33.0	37.0	5	12	37.0	5	12	25.0	5	7	6	7.5	41.3	95	107	119	6	7	41.0	5	12	5	9.5	0
24 FT	14	16	8	8	5	6.5	6	7	40.0	34.0	34.0	38.0	5	12	37.0	5	12	24.0	5	7														

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

DESIGN FILL	MEMBER THICKNESS		SPAN (S) = 8 FT												HEIGHT (HT) = 10 FT OR 11 FT																		
			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																		
	TS	BS	TX	TI	J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS		B2 BARS								
					SIZE	SPA.	C1	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	G1					
1 FT	12	9	8	9	5	7	5	7.5	41.9	32.0	32.0	4	12	81.5	4	12	27.5	5	9	6	6	6	73.9	125	137	5	6	41.5	5	12	5	10.5	12
2 FT	13	10	9	9	5	7	5	8	42.5	29.0	33.0	4	13	82.0	4	13	27.0	4	6	5	6	66.8	126	138	5	6.5	41.0	5	12	5	11	12	
4 FT	8	11	9	9	4	6	6	7	44.5	24.0	28.0	5	16	84.0	5	16	27.0	4	7	5	6	66.0	127	139	5	7	40.0	5	10.5	5	9.5	12	
6 FT	8	11	9	9	4	6	6	7	61.5	28.0	32.0	5	15	43.0	5	15	26.0	4	6.5	6	7	64.5	127	139	5	7	40.0	5	11.5	5	9	12	
8 FT	8	11	9	9	4	6	6	7	55.6	28.0	32.0	5	14	40.5	5	14	25.5	4	6	6	6.5	60.4	127	139	5	6	39.5	5	11.5	5	8.5	0	
10 FT	9	11	9	9	5	8.5	6	7.5	54.9	29.0	33.0	5	14	39.5	5	14	25.5	5	8.5	6	6	57.5	127	139	5	6	39.0	5	12	5	8.5	0	
12 FT	10	11	9	9	5	8	5	6	51.1	30.0	30.0	5	14	39.0	5	14	25.5	5	7.5	6	6	55.3	127	139	6	7	41.5	5	12	5	8.5	0	
14 FT	10	12	9	9	5	8	6	6.5	52.0	30.0	34.0	5	13	38.5	5	13	25.5	5	7.5	6	6	54.8	128	140	6	7	41.5	5	12	5	8.5	0	
16 FT	11	13	10	9	5	7.5	5	6	48.6	31.0	31.0	5	13	38.0	5	13	25.5	5	7.5	6	6.5	54.1	129	141	6	7.5	41.5	5	12	5	8	0	
18 FT	11	13	10	9	5	7.5	5	6	45.1	31.0	31.0	5	12	37.0	5	12	25.0	5	7	6	6.5	50.4	129	141	6	7	41.5	5	12	5	8	0	
20 FT	12	14	10	9	5	7	6	7.5	48.4	32.0	36.0	5	13	37.0	5	13	25.0	5	7	6	6.5	50.5	130	142	6	7.5	41.5	5	12	5	8	0	
22 FT	13	15	10	9	5	7	6	7	48.5	33.0	37.0	5	12	37.0	5	12	24.5	5	7	6	6.5	50.6	131	143	6	7	41.5	5	12	5	8	0	
24 FT	13	16	11	9	5	6.5	6	8	48.5	33.0	33.0	5	12	36.5	5	12	25.0	5	7	5	6	47.8	132	144	6	7	41.5	5	12	5	7.5	0	
26 FT	14	16	12	9	5	6.5	5	6	46.0	34.0	34.0	5	12	36.0	5	12	24.5	5	6	5	6	47.5	132	144	6	7	41.5	5	12	5	7	0	
28 FT	15	17	12	9	5	6.5	6	8	55.3	35.0	35.0	6	16	44.5	6	16	32.5	5	6.5	5	6	47.8	133	145	6	6.5	41.5	5	12	5	7	0	
30 FT	16	18	13	9	5	6.5	6	8	55.8	36.0	36.0	6	15	44.0	6	15	31.5	5	6.5	5	6	48.0	134	146	6	6.5	41.5	5	12	5	6.5	0	
32 FT	16	19	13	9	5	6	6	7.5	55.8	36.0	36.0	6	15	44.0	6	15	32.0	5	6.5	5	6	48.3	135	147	6	6	41.5	5	12	5	6.5	0	
34 FT	17	20	13	9	5	6	6	7	56.0	37.0	37.0	6	14	43.5	6	14	31.0	5	6.5	5	6	48.5	136	148	6	6.5	41.5	5	12	5	6.5	0	
36 FT	17	20	14	9	6	8	6	7.5	56.1	37.0	37.0	6	14	43.0	6	14	31.5	5	6	5	6	48.6	136	148	6	6	41.5	5	12	5	6	0	
38 FT	18	21	14	9	6	8	6	7	56.4	38.0	38.0	6	13	42.5	6	13	30.5	5	6	5	6	48.9	137	149	6	6	41.5	5	12	5	6	0	
40 FT	18	22	15	9	6	7	6	7.5	56.8	38.0	42.0	6	13	42.5	6	13	30.5	5	6	6	8	52.3	138	150	6	6	41.5	5	12	6	8	0	
42 FT	19	22	15	9	6	7.5	6	7	57.0	39.0	43.0	6	14	42.0	6	14	30.0	6	8.5	6	8	52.3	138	150	7	7.5	44.5	5	12	6	8	0	
44 FT	19	23	15	9	6	6.5	6	6.5	56.9	39.0	43.0	6	13	42.0	6	13	30.0	6	8.5	6	8	52.5	139	151	7	8	44.5	5	12	6	8	0	
46 FT	20	24	16	9	6	7	6	7	57.6	40.0	44.0	6	14	41.5	6	14	30.0	6	8	6	7.5	52.9	140	152	7	8	44.5	5	12	6	8	0	
48 FT	20	24	16	9	6	6.5	6	6.5	57.5	40.0	44.0	6	13	41.5	6	13	30.0	6	8	6	7.5	52.9	140	152	7	7.5	44.5	5	12	6	8	0	
50 FT	21	25	16	9	6	6.5	6	6	57.8	41.0	45.0	6	14	41.0	6	14	30.0	6	8	6	7.5	53.1	141	153	7	7.5	44.5	5	12	6	8	0	



GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE DOUBLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 8 FEET HEIGHT (HT): 10 THRU 11 FEET	SHEET NO. 11 OF 27
	703.47	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011

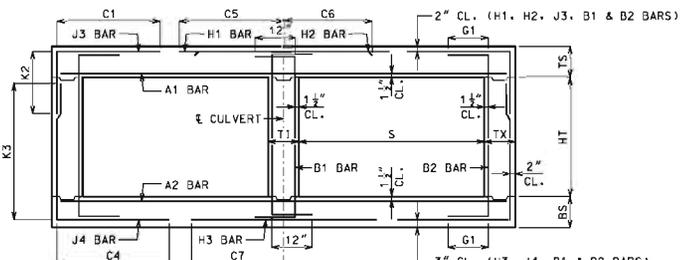
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 9 FT										HEIGHT (HT) = 5 FT OR 6 FT OR 7 FT																									
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS															
		A1 BARS					J3 BARS					H1 BARS					H2 BARS					A2 BARS					J4 BARS					H3 BARS		B1 BARS		B2 BARS	
		TS	BS	TX	T1	SIZE	SPA.	SIZE	SPA.	C1	H1=5'	H1=6'	H1=7'	SIZE	SPA.	C5	SIZE	SPA.	C6	A2 BARS	SIZE	SPA.	C4	K3	H1=5'	H1=6'	H1=7'	SIZE	SPA.	C7	SIZE	SPA.	C1	SIZE	SPA.	C1	
1 FT	13	9	8	8	5	6.5	4	7.5	45.3	29.0	29.0	29.0	5	17	89.5	5	17	28.5	4	6	4	6	47.3	65	77	89	5	6	44.0	5	12	5	12	12			
2 FT	13	10	8	8	5	6.5	4	7.5	45.3	29.0	29.0	29.0	5	16	89.5	5	16	27.5	4	6	4	7.5	44.5	66	78	90	5	6.5	44.0	5	12	5	12	12			
4 FT	9	9	8	8	5	8.5	5	6.5	42.1	25.0	25.0	25.0	5	15	59.0	5	15	28.5	5	8	4	6	39.5	65	77	89	6	6.5	46.0	5	11	5	12	12			
6 FT	9	9	8	8	5	8.5	5	6.5	36.9	25.0	25.0	25.0	5	14	47.0	5	14	27.5	5	7.5	5	7	36.5	65	77	89	6	6	45.0	5	12	5	12	12			
8 FT	9	10	8	8	5	8.5	5	6.5	35.6	25.0	25.0	25.0	5	12	44.0	5	12	27.0	5	7.5	4	6.5	34.6	66	78	90	6	6.5	45.0	5	12	5	12	0			
10 FT	10	11	8	8	5	8	5	7.5	34.3	26.0	26.0	26.0	5	12	43.0	5	12	26.5	5	7.5	4	6.5	33.3	67	79	91	6	6.5	44.5	5	12	5	12	0			
12 FT	11	12	8	8	5	7.5	5	8.5	33.0	27.0	27.0	27.0	5	12	42.5	5	12	26.5	5	7	4	6	32.1	68	80	92	6	6.5	44.5	5	12	5	12	0			
14 FT	12	13	8	8	5	7	5	8.5	32.1	28.0	28.0	28.0	5	12	42.0	5	12	26.5	5	6.5	4	6	31.5	69	81	93	6	6.5	44.5	5	12	5	12	0			
16 FT	13	14	8	8	5	6.5	5	8.5	31.5	29.0	29.0	33.0	6	16	44.5	6	16	29.5	5	6.5	5	8.5	31.0	70	82	94	6	6.5	44.5	5	12	5	12	0			
18 FT	13	15	8	8	5	6.5	5	8	31.3	29.0	29.0	33.0	6	15	44.5	6	15	29.5	5	6.5	5	8.5	30.5	71	83	95	6	6.5	44.5	5	12	5	12	0			
20 FT	14	15	8	8	5	6	5	8.5	29.3	30.0	30.0	34.0	6	16	43.5	6	16	29.0	5	6	5	8.5	29.1	71	83	95	6	6.5	44.5	5	12	5	12	0			
22 FT	15	16	8	8	5	6	5	8	34.1	31.0	31.0	35.0	6	15	49.5	6	15	35.0	5	6	5	8	29.1	72	84	96	6	6.5	44.5	5	12	5	12	0			
24 FT	15	17	8	8	6	7.5	5	8	34.3	31.0	31.0	35.0	6	14	49.5	6	14	35.0	5	6	5	7	28.9	73	85	97	6	6.5	44.5	5	12	5	12	0			
26 FT	16	18	8	8	6	8	5	7	34.1	32.0	36.0	36.0	6	14	49.0	6	14	35.0	5	6	5	6.5	29.0	74	86	98	6	6.5	44.5	5	12	5	11	0			
28 FT	17	19	8	8	6	7.5	5	6.5	34.0	37.0	37.0	37.0	6	14	49.0	6	14	35.0	5	6	5	6.5	29.1	75	87	99	6	6	44.5	5	12	5	10	0			
30 FT	18	20	8	8	6	7.5	5	6.5	34.0	38.0	38.0	38.0	6	13	48.5	6	13	34.0	5	6	5	6	29.3	76	88	100	6	6	44.5	5	12	5	9.5	0			
32 FT	19	21	8	8	6	7.5	5	6	34.1	39.0	39.0	39.0	6	13	48.0	6	13	33.0	6	8.5	6	7.5	32.5	77	89	101	7	7.5	47.0	5	12	5	9.5	0			
34 FT	20	21	8	8	6	7.5	6	7.5	38.0	44.0	44.0	44.0	6	12	47.5	6	12	32.5	6	7.5	6	7.5	32.6	77	89	101	7	7.5	47.0	5	12	5	9.5	0			
36 FT	20	22	8	8	6	7	6	7.5	38.0	44.0	44.0	44.0	6	12	47.5	6	12	33.0	6	8	6	7	32.6	78	90	102	7	7.5	47.0	5	12	5	9.5	0			
38 FT	21	23	8	8	6	7	6	7	38.1	45.0	45.0	45.0	6	12	47.0	6	12	32.0	6	7.5	6	6.5	32.8	79	91	103	7	7	47.0	5	12	5	9	0			
40 FT	22	24	8	8	6	6.5	6	6.5	38.3	46.0	46.0	46.0	7	15	51.5	7	15	36.0	6	7.5	6	6	33.0	80	92	104	7	7	47.0	5	12	5	8	0			
42 FT	22	24	8	8	6	6.5	6	6	38.1	46.0	46.0	46.0	7	15	51.5	7	15	36.5	6	7.5	6	6	33.0	80	92	104	7	7	47.0	5	12	5	7.5	0			
44 FT	23	25	9	8	6	6.5	6	7	39.0	47.0	47.0	47.0	7	15	50.5	7	15	36.0	6	7.5	6	7	33.5	81	93	105	7	7	47.0	5	12	5	8.5	0			
46 FT	24	26	9	8	6	6	6	7	39.0	48.0	48.0	48.0	7	15	49.5	7	15	35.5	6	7.5	6	6.5	33.8	82	94	106	7	7	47.0	5	12	5	8	0			
48 FT	24	26	9	8	6	6	6	7	39.0	48.0	48.0	48.0	7	15	49.5	7	15	35.5	6	6.5	6	6.5	33.8	82	94	106	7	6.5	47.0	5	12	5	8	0			
50 FT	25	27	9	8	6	6	6	6.5	39.0	49.0	49.0	49.0	7	15	49.0	7	15	35.5	6	7	6	6.5	34.0	83	95	107	7	6.5	47.0	5	12	5	7.5	0			

		SPAN (S) = 9 FT										HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT																									
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS															
		A1 BARS					J3 BARS					H1 BARS					H2 BARS					A2 BARS					J4 BARS					H3 BARS		B1 BARS		B2 BARS	
		TS	BS	TX	T1	SIZE	SPA.	SIZE	SPA.	C1	H1=8'	H1=9'	H1=10'	SIZE	SPA.	C5	SIZE	SPA.	C6	A2 BARS	SIZE	SPA.	C4	K3	H1=8'	H1=9'	H1=10'	SIZE	SPA.	C7	SIZE	SPA.	C1	SIZE	SPA.	C1	
1 FT	13	10	8	8	5	6.5	5	8.5	47.3	29.0	29.0	33.0	5	18	91.5	5	18	29.0	4	6	5	6	69.0	102	114	126	5	6.5	44.5	5	12	5	12	12			
2 FT	13	10	8	8	5	6.5	5	8.5	47.3	29.0	29.0	33.0	5	17	91.5	5	17	28.0	5	9	6	7	66.6	102	114	126	5	6	44.0	5	12	5	12	12			
4 FT	9	9	8	8	5	8.5	6	7	47.3	29.0	33.0	33.0	5	15	91.5	5	15	29.0	5	7.5	6	6	59.4	101	113	125	6	6	46.0	5	12	5	10.5	12			
6 FT	9	10	9	8	5	8.5	5	6	54.1	25.0	25.0	29.0	5	14	48.0	5	14	27.5	5	8	5	6	51.8	102	114	126	6	6.5	45.5	5	12	5	11.5	12			
8 FT	9	11	9	8	5	8.5	5	6	48.0	25.0	29.0	29.0	5	13	44.0	5	13	27.0	5	8	5	6	49.3	103	115	127	6	7	45.0	5	12	5	11	0			
10 FT	10	11	9	8	5	8	5	6	46.6	26.0	30.0	30.0	5	12	43.0	5	12	26.5	5	7	6	7	50.0	103	115	127	6	6.5	44.5	5	12	5	10	0			
12 FT	11	12	9	8	5	7.5	6	7	48.4	31.0	31.0	35.0	5	12	42.0	5	12	26.5	5	7	6	7	49.0	104	116	128	6	6.5	44.5	5	12	5	9.5	0			
14 FT	12	13	9	8	5	7	6	7.5	47.4	32.0	32.0	36.0	5	12	41.5	5	12	26.5	5	6.5	6	7	48.1	105	117	129	6	6.5	44.5	5	12	5	8.5	0			
16 FT	12	14	9	8	5	7	6	6.5	46.4	32.0	32.0	36.0	6	15	44.5	6	15	29.5	5	6.5	6	7	47.5	106	118	130	6	6.5	44.5	5	12	5	8.5	0			
18 FT	13	15	9	8	5	6.5	6	6.5	46.0	33.0	33.0	37.0	6	15	44.0	6	15	29.0	5	6.5	6	7.5	47.3	107	119	131	6	7	44.5	5	12	5	8.5	0			
20 FT	14	15	9	8	5	6.5	5	6	40.1	34.0	34.0	34.0	6	16	43.0	6	16	29.0	5	6	6	7.5	44.4	107	119	131	6	6.5	44.5	5	12	5	8.5	0			
22 FT	14	16	10	8	5	6	5	6	40.5	34.0	34.0	34.0	6	15	43.0	6	15	29.0	5	6	5	7	41.5	108	120	132	6	6.5	44.5	5	12	5	8	0			
24 FT	15	17	10	8	6	8	6	8	49.5	35.0	35.0	35.0	6	15	48.5	6	15	35.0	5	6	5	6.5	41.6	109	121	133	6	6.5	44.5	5	12	5	8	0			
26 FT	16	18	11	8	6	8	6	6	46.1	36.0	36.0	36.0	6	15	48.0	6	15	34.5	5	6	5	7	41.9	110	122	134	6	6.5	44.5	5	12	5	7.5	0			
28 FT	17	19	11	8	6	8	6	8	50.1	37.0	37.0	37.0	6	14	47.5	6	14	33.5	5	6	5	7	42.0	111	123	135	6	6	44.5	5	12	5	7.5	0			
30 FT	18	20	12	8	6	8	5	6	46.8	38.0	38.0	38.0	6	13	47.0	6	13	32.5	6	8.5	5	6.5	42.4	112	124	136	6	6	44.5	5	12	5	7.5	0			
32 FT	18	21	12	8	6	7.5	6	8	50.8	38.0	38.0	38.0	6	13	47.0	6	13	33.5	6	8	5	6.5	42.5	113	125	137	7	7.5	47.5	5	12	5	7	0			
34 FT	19	22	12	8	6	7	6	7.5	50.9	39.0	39.0	39.0	6	13	46.0	6	13	32.5	6	8	5	6.5	42.8														

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

DESIGN FILL	SPAN (S) = 9 FT										HEIGHT (HT) = 11 FT OR 12 FT																					
	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																	
	TS	BS	TX	TI	A1 BARS		J3 BARS			H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS										
					SIZE	SPA.	SIZE	SPA.	C1	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	G1				
1 FT	13	10	9	10	5	6.5	5	8	48.3	33.0	33.0	5	17	93.0	5	17	29.0	5	9	6	6.5	79.4	138	150	5	6	44.5	5	12	5	9.5	12
2 FT	13	11	9	10	5	6.5	5	7.5	48.3	33.0	33.0	5	16	93.0	5	16	28.0	4	6	6	7	77.0	139	151	5	6	44.5	5	12	5	9	12
4 FT	9	10	9	10	5	8.5	5	6	48.3	29.0	29.0	5	15	93.0	5	15	29.0	5	8	6	6	71.4	138	150	6	7	46.5	5	12	5	8.5	12
6 FT	9	11	9	10	5	8.5	6	7	69.3	29.0	33.0	5	15	47.0	5	15	28.0	5	8.5	6	6	66.0	139	151	5	6	43.0	5	12	5	8.5	12
8 FT	9	11	9	10	5	8.5	6	6.5	61.6	29.0	33.0	5	13	44.0	5	13	27.5	5	7.5	6	6	63.8	139	151	6	7	45.5	5	12	6	8.5	0
10 FT	10	11	10	10	5	8	5	6	56.4	30.0	30.0	5	13	43.0	5	13	27.5	5	7	6	6	60.1	139	151	6	6.5	45.0	5	12	5	8	0
12 FT	11	12	10	10	5	7.5	5	6	55.0	31.0	31.0	5	13	42.5	5	13	27.0	5	6.5	6	6.5	59.1	140	152	6	6.5	45.0	5	12	5	8	0
14 FT	11	13	10	10	5	7.5	6	7	55.6	31.0	35.0	6	16	45.0	6	16	30.0	5	6.5	6	6.5	58.5	141	153	6	6.5	45.0	5	12	5	8	0
16 FT	12	14	11	10	5	7	6	8.5	54.6	32.0	36.0	6	16	44.5	6	16	30.0	5	6.5	6	7	57.4	142	154	6	6.5	45.0	5	12	5	7.5	0
18 FT	13	15	11	10	5	6.5	6	7.5	54.6	33.0	37.0	6	16	44.0	6	16	30.0	5	6.5	6	6.5	57.1	143	155	6	7	44.5	5	12	5	7.5	0
20 FT	13	15	11	10	5	6.5	6	7.5	51.5	33.0	37.0	6	15	43.5	6	15	29.5	5	6	6	6.5	53.4	143	155	6	6.5	44.5	5	12	5	7.5	0
22 FT	14	16	12	10	5	6	6	8	51.9	34.0	38.0	6	16	43.0	6	16	29.5	5	6	6	7.5	53.6	144	156	6	6.5	44.5	5	12	5	7	0
24 FT	15	17	12	10	5	6	6	7.5	58.0	35.0	39.0	6	16	48.5	6	16	35.5	5	6	6	7.5	53.8	145	157	6	6.5	44.5	5	12	5	7	0
26 FT	16	18	13	10	6	8.5	6	7.5	58.5	36.0	40.0	6	15	48.0	6	15	34.5	5	6	6	8	54.0	146	158	6	6.5	44.5	5	12	5	6.5	0
28 FT	17	19	13	10	6	8	6	7	58.6	37.0	41.0	6	14	47.5	6	14	33.5	6	8.5	6	8	54.1	147	159	6	6	44.5	5	12	5	6.5	0
30 FT	17	20	13	10	6	7.5	6	8.5	58.5	37.0	41.0	6	14	47.5	6	14	34.5	6	8	6	7	54.4	148	160	6	6	44.5	5	12	5	6.5	0
32 FT	18	21	14	10	6	7.5	6	7	59.1	38.0	42.0	6	13	47.0	6	13	33.5	6	8	6	8	54.6	149	161	7	7.5	47.5	5	12	5	6	0
34 FT	19	22	14	10	6	7.5	6	6.5	59.3	39.0	43.0	6	13	46.5	6	13	32.5	6	8	6	8	54.9	150	162	7	7.5	47.5	5	12	5	6	0
36 FT	19	22	15	10	6	7	6	6.5	59.5	43.0	43.0	6	13	46.0	6	13	33.0	6	7	6	8	54.9	150	162	7	7.5	48.0	5	12	6	8	0
38 FT	20	23	15	10	6	7	6	6.5	59.6	44.0	44.0	6	12	45.5	6	12	32.0	6	7.5	6	8	55.1	151	163	7	7	47.5	5	12	6	8	0
40 FT	20	24	16	10	6	6	6	6.5	60.0	44.0	44.0	6	12	45.0	6	12	32.5	6	7.5	6	7.5	55.5	152	164	7	7	48.0	5	12	6	8	0
42 FT	21	25	16	10	6	6.5	6	6	60.3	45.0	45.0	6	12	44.5	6	12	31.5	6	7.5	6	7.5	55.8	153	165	7	7	48.0	5	12	6	8	0
44 FT	22	25	17	10	6	6.5	6	6.5	60.8	46.0	46.0	6	12	44.0	6	12	31.0	6	6.5	6	7	55.9	153	165	7	6.5	48.0	5	12	6	7.5	0
46 FT	22	26	17	10	6	6	6	6	60.8	46.0	46.0	6	12	44.0	6	12	31.0	6	7	6	7	56.1	154	166	7	6.5	48.0	5	12	6	7.5	0
48 FT	23	27	18	10	6	6	6	6.5	61.5	47.0	47.0	6	12	43.5	6	12	31.0	6	7	6	6.5	56.6	155	167	7	6.5	48.0	5	12	6	7	0
50 FT	23	28	19	10	6	6	6	6.5	62.0	43.0	47.0	6	12	43.5	6	12	31.0	6	7	6	7	57.0	156	168	7	6.5	48.0	5	12	6	7	0



GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE DOUBLE BOX CULVERT	
	MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 9 FEET HEIGHT (HT): 11 THRU 12 FEET	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011	703.47 SHEET NO. 13 OF 27

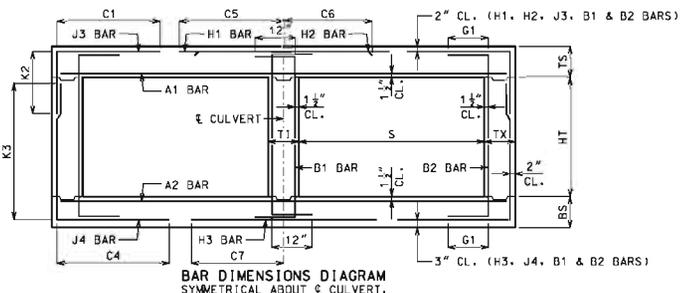
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 10 FT										HEIGHT (HT) = 5 FT OR 6 FT OR 7 FT																						
		TOP SLAB BARS										BOTTOM SLAB BARS																						
DESIGN FILL	MEMBER THICKNESS				A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			WALL BARS								
	TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	H1=5'	H1=6'	H1=7'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	H1=5'	H1=6'	H1=7'	SIZE	SPA.	C7	B1 BARS	B2 BARS	C1		
1 FT	13	10	8	8	5	6.5	4	7	48.9	29.0	29.0	29.0	5	15	98.0	5	15	29.0	4	6	4	7	48.1	66	78	90	5	6	47.5	5	12	5	12	12
2 FT	13	10	8	8	5	6.5	4	7	48.9	29.0	29.0	29.0	5	13	98.0	5	13	28.5	5	8.5	4	6.5	43.8	66	78	90	6	7	50.0	5	12	5	12	12
4 FT	9	10	8	8	5	7.5	5	7	43.1	25.0	25.0	25.0	5	12	62.0	5	12	30.0	5	8	4	7	38.9	66	78	90	6	6.5	49.5	5	8.5	5	12	12
6 FT	9	10	8	8	5	8.5	5	6	38.0	25.0	25.0	25.0	6	15	53.5	6	15	32.0	5	7	4	6.5	36.1	66	78	90	6	6	48.5	5	12	5	12	12
8 FT	10	11	8	8	5	8	5	7.5	36.0	26.0	26.0	26.0	6	16	51.0	6	16	31.5	5	7	4	6.5	34.1	67	79	91	6	6	48.0	5	12	5	12	0
10 FT	11	12	8	8	5	7.5	5	8	34.1	27.0	27.0	27.0	6	15	49.5	6	15	31.0	5	6.5	4	6	32.6	68	80	92	6	6.5	48.0	5	12	5	12	0
12 FT	12	13	8	8	5	7	5	8.5	32.8	28.0	28.0	28.0	6	15	48.5	6	15	31.0	5	6.5	4	6	31.5	69	81	93	6	6.5	48.0	5	12	5	12	0
14 FT	13	14	8	8	5	6.5	5	8.5	31.6	29.0	29.0	33.0	6	15	48.5	6	15	31.0	5	6	5	9	30.8	70	82	94	6	6	47.5	5	12	5	12	0
16 FT	14	15	8	8	5	6	5	8.5	30.8	30.0	30.0	34.0	6	14	48.0	6	14	31.0	5	6	5	8.5	30.1	71	83	95	6	6	47.5	5	12	5	12	0
18 FT	15	16	8	8	6	8	5	8	35.1	31.0	31.0	35.0	6	14	53.5	6	14	36.5	6	8	5	8	29.9	72	84	96	6	6	47.5	5	12	5	12	0
20 FT	15	17	8	8	6	7.5	5	8	35.1	31.0	31.0	35.0	6	13	53.5	6	13	36.5	6	8	5	7	29.4	73	85	97	6	6	47.5	5	12	5	12	0
22 FT	16	18	8	8	6	8	5	7	33.4	32.0	32.0	36.0	6	13	52.5	6	13	36.5	6	8	5	6.5	28.0	74	86	98	6	6.5	47.5	5	12	5	12	0
24 FT	17	19	8	8	6	7.5	5	6.5	33.3	37.0	37.0	37.0	6	13	52.5	6	13	36.5	6	8	5	6.5	28.0	75	87	99	6	6	47.5	5	12	5	12	0
26 FT	18	20	8	8	6	7	5	6.5	33.1	38.0	38.0	38.0	6	13	52.0	6	13	36.5	6	8	5	6	28.1	76	88	100	6	6	47.5	5	12	5	10.5	0
28 FT	19	21	8	8	6	7	5	6	33.1	39.0	39.0	39.0	6	13	52.0	6	13	36.0	6	7.5	6	7.5	31.3	77	89	101	7	7.5	50.5	5	12	5	9.5	0
30 FT	20	22	8	8	6	7	5	6	37.1	44.0	44.0	44.0	6	12	51.5	6	12	35.5	6	7.5	6	7	31.4	78	90	102	7	7.5	50.5	5	12	5	9.5	0
32 FT	21	23	8	8	6	6.5	6	7	37.1	45.0	45.0	45.0	6	12	51.0	6	12	34.5	6	7.5	6	6.5	31.5	79	91	103	7	7	50.5	5	12	5	9.5	0
34 FT	22	23	8	8	6	6.5	6	6.5	37.0	46.0	46.0	46.0	7	15	55.5	7	15	38.5	6	6.5	6	6.5	31.6	79	91	103	7	7	50.5	5	12	5	9.5	0
36 FT	22	24	8	8	6	6.5	6	6.5	37.1	46.0	46.0	46.0	7	15	55.5	7	15	39.5	6	7	6	6	31.6	80	92	104	7	7	50.0	5	12	5	9	0
38 FT	23	25	8	8	6	6	6	6	37.1	47.0	47.0	47.0	7	15	55.0	7	15	38.5	6	7	6	6	31.9	81	93	105	7	6.5	50.0	5	12	5	8.5	0
40 FT	24	26	9	8	6	6	6	6	38.0	48.0	48.0	48.0	7	14	54.0	7	14	37.5	6	7	6	6.5	32.5	82	94	106	7	6.5	50.0	5	12	5	8.5	0
42 FT	25	27	9	8	6	6	6	6.5	38.0	49.0	49.0	49.0	7	14	53.5	7	14	37.0	6	7	6	6.5	32.6	83	95	107	7	6	50.0	5	12	5	8.5	0
44 FT	25	28	9	8	7	7.5	6	6.5	38.1	49.0	49.0	49.0	7	14	53.0	7	14	37.5	6	6.5	6	6	32.8	84	96	108	7	6	50.0	5	12	5	8.5	0
46 FT	26	28	9	8	7	7.5	6	6.5	38.1	50.0	50.0	50.0	7	13	52.5	7	13	36.5	6	6.5	6	6	32.9	84	96	108	7	6	50.0	5	12	5	8	0
48 FT	27	29	9	8	7	7.5	6	6	38.1	51.0	51.0	51.0	7	14	51.5	7	14	36.5	6	6.5	6	6	33.0	85	97	109	7	6	50.0	5	12	5	7.5	0
50 FT	27	30	10	8	7	7	6	7	39.0	51.0	51.0	51.0	7	13	51.5	7	13	36.0	6	6.5	6	6.5	33.5	86	98	110	7	6	50.0	5	12	5	8	0

		SPAN (S) = 10 FT										HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT																						
		TOP SLAB BARS										BOTTOM SLAB BARS																						
DESIGN FILL	MEMBER THICKNESS				A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			WALL BARS								
	TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	H1=8'	H1=9'	H1=10'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	H1=8'	H1=9'	H1=10'	SIZE	SPA.	C7	B1 BARS	B2 BARS	C1		
1 FT	13	10	8	8	5	6.5	5	8.5	50.9	29.0	33.0	33.0	5	14	100.0	5	14	29.5	5	8.5	6	7.5	71.6	102	114	126	5	6	47.5	5	12	5	12	12
2 FT	13	11	8	8	5	6.5	5	8.5	50.9	29.0	33.0	33.0	5	13	100.0	5	13	28.5	5	8.5	5	6	64.1	103	115	127	5	6	47.0	5	12	5	12	12
4 FT	9	10	9	8	5	7.5	5	6	69.0	25.0	25.0	29.0	5	12	73.0	5	12	30.0	5	7.5	5	6	55.4	102	114	126	6	6.5	49.5	5	10	5	12	12
6 FT	9	10	9	8	5	8.5	5	6	51.4	25.0	29.0	29.0	6	15	54.0	6	15	32.0	5	7	6	7	53.4	102	114	126	6	6	48.5	5	12	5	12	12
8 FT	10	11	9	8	5	8	5	6	48.0	26.0	30.0	30.0	5	12	48.0	5	12	28.5	5	7	6	7.5	50.9	103	115	127	6	6	48.0	5	12	5	11.5	0
10 FT	11	12	9	8	5	7.5	5	6	46.0	31.0	31.0	31.0	6	16	49.5	6	16	31.0	5	6.5	5	6	46.3	104	116	128	6	6	48.0	5	12	5	10.5	0
12 FT	12	13	9	8	5	7	5	6	44.5	32.0	32.0	32.0	6	15	48.5	6	15	31.0	5	6.5	5	6	45.0	105	117	129	6	6	47.5	5	12	5	9.5	0
14 FT	13	14	9	8	5	6.5	5	6	43.3	33.0	33.0	33.0	6	15	48.0	6	15	30.5	5	6	5	6	43.9	106	118	130	6	6	47.5	5	12	5	8.5	0
16 FT	14	15	9	8	5	6	5	6	42.1	34.0	34.0	34.0	6	15	47.5	6	15	30.5	5	6	5	6	43.0	107	119	131	6	6	47.5	5	12	5	8.5	0
18 FT	15	16	10	8	6	8.5	5	6.5	47.1	35.0	35.0	35.0	6	15	53.0	6	15	36.5	6	8	5	7	42.8	108	120	132	6	6	47.5	5	12	5	8.5	0
20 FT	15	17	10	8	6	8	6	8	50.6	35.0	35.0	35.0	6	13	52.5	6	13	36.5	6	8	5	6.5	42.3	109	121	133	6	6	47.5	5	12	5	8	0
22 FT	16	18	10	8	6	8	5	6	44.5	36.0	36.0	36.0	6	14	52.0	6	14	36.0	6	8	5	7	40.0	110	122	134	6	6.5	47.5	5	12	5	8	0
24 FT	17	19	10	8	6	7.5	6	8	48.4	37.0	37.0	37.0	6	14	51.5	6	14	36.0	6	8	5	6.5	40.1	111	123	135	6	6	47.5	5	12	5	8	0
26 FT	18	20	11	8	6	7.5	5	6	45.0	38.0	38.0	38.0	6	13	51.0	6	13	35.5	6	7.5	5	7	40.5	112	124	136	6	6	47.5	5	12	5	7.5	0
28 FT	19	21	11	8	6	7	6	8	49.0	39.0	39.0	39.0	6	13	50.5	6	13	35.0	6	7.5	5	7	40.5	113	125	137	7	7.5	50.5	5	12	5	7.5	0
30 FT	19	22	12	8	6	6.5	6	8	49.8	39.0	39.0	39.0	6	13	50.0	6	13	35.5	6	7.5	5	6.5	40.9	114	126	138	7	7.5	50.5	5	12	5	7.5	0
32 FT	20	23	12	8	6	6.5	6	8	49.6	40.0	40.0	40.0	6	12	49.5	6	12	34.5	6	7.5	5	6.5	41.0	115	127	139	7	7	50.5	5	12	5	7	0
34 FT	21	24	12	8	6	6.5	6	7.5	49.6	41.0	41.0	41.0	6	12	49.0	6	12	33.5	6	7.5	5	6.5	41.1	116	128	140	7							

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

DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS					
					A1 BARS				J3 BARS				H1 BARS				H2 BARS				A2 BARS				J4 BARS				H3 BARS				B1 BARS	
	TS	BS	TX	T1	SIZE	SPA.	SIZE	SPA.	C1	K2			SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3			SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	C1
									HT=11 HT=12 HT=13									HT=11 HT=12 HT=13																
1 FT	13	10	9	10	5	6.5	5	6.5	51.9	33.0	33.0	33.0	5	14	101.0	5	14	30.0	5	7.5	6	6	85.4	138	150	162	6	7	51.0	5	12	5	8.5	12
2 FT	13	11	9	10	5	6.5	5	6	51.9	33.0	33.0	33.0	5	13	101.0	5	13	29.0	5	8	6	6	82.6	139	151	163	5	6	47.5	5	12	5	8.5	12
4 FT	9	10	10	10	5	7.5	6	7	52.5	29.0	29.0	33.0	5	12	101.5	5	12	30.5	5	7	6	6	74.5	138	150	162	6	6	50.0	5	10	5	8	12
6 FT	9	11	10	10	5	8.5	6	7	70.4	29.0	29.0	33.0	5	12	50.5	5	12	29.5	5	7	6	6	71.0	139	151	163	6	6.5	49.5	5	12	5	8	12
8 FT	10	12	11	10	5	8	5	6	62.6	30.0	30.0	30.0	5	12	47.5	5	12	29.0	5	7	5	6	64.6	140	152	164	6	6.5	48.5	5	12	5	7.5	0
10 FT	11	12	11	10	5	7.5	5	6.5	60.9	31.0	31.0	31.0	5	12	46.5	5	12	28.5	5	6.5	6	6.5	64.4	140	152	164	6	6	48.0	5	12	5	7.5	0
12 FT	11	13	11	10	5	7.5	6	7.5	60.6	31.0	31.0	35.0	6	15	48.5	6	15	31.5	5	6	6	6.5	63.6	141	153	165	6	6	48.0	5	12	5	7.5	0
14 FT	12	14	11	10	5	7	6	7.5	59.6	32.0	32.0	36.0	6	14	48.0	6	14	31.5	5	6	6	6.5	62.5	142	154	166	6	6	48.0	5	12	5	7.5	0
16 FT	13	15	12	10	5	6.5	6	7.5	58.4	33.0	33.0	37.0	6	14	47.5	6	14	31.0	6	8	6	7	61.1	143	155	167	6	6	48.0	5	12	5	7	0
18 FT	14	16	12	10	5	6	6	7	58.0	34.0	38.0	38.0	6	14	47.0	6	14	31.0	6	8	6	6.5	60.5	144	156	168	6	6.5	48.0	5	12	5	7	0
20 FT	15	17	13	10	6	8	6	7	64.0	35.0	39.0	39.0	6	14	52.5	6	14	37.0	6	8	6	6.5	59.9	145	157	169	6	6.5	48.0	5	12	5	6.5	0
22 FT	15	18	13	10	6	7.5	6	7	61.1	35.0	35.0	39.0	6	13	52.0	6	13	37.0	6	8	6	7.5	57.4	146	158	170	6	6.5	48.0	5	12	5	6.5	0
24 FT	16	19	13	10	6	7.5	6	6.5	61.3	36.0	36.0	40.0	6	13	51.5	6	13	36.5	6	7.5	6	7.5	57.4	147	159	171	6	6	48.0	5	12	5	6.5	0
26 FT	17	20	14	10	6	7.5	6	7	61.8	37.0	37.0	41.0	6	13	51.5	6	13	36.5	6	7.5	6	7.5	57.6	148	160	172	6	6	48.0	5	12	5	6	0
28 FT	18	21	14	10	6	7	6	6.5	61.9	38.0	38.0	42.0	6	13	51.0	6	13	36.5	6	7.5	6	7.5	57.8	149	161	173	7	7.5	51.0	5	12	5	6	0
30 FT	19	22	15	10	6	7	6	6.5	62.4	39.0	43.0	43.0	6	13	50.0	6	13	35.5	6	7.5	6	7.5	58.0	150	162	174	7	7.5	51.0	5	12	6	8	0
32 FT	20	23	15	10	6	7	6	6	62.5	44.0	44.0	44.0	6	12	49.5	6	12	34.5	6	7	6	7.5	58.1	151	163	175	7	7	51.0	5	12	6	8	0
34 FT	21	24	16	10	6	6.5	6	6.5	63.0	41.0	45.0	45.0	6	12	48.5	6	12	33.5	6	7	6	7.5	58.5	152	164	176	7	7	51.0	5	12	6	8	0
36 FT	21	25	16	10	6	6	6	6	62.9	45.0	45.0	45.0	6	12	48.5	6	12	34.0	6	7	6	7.5	58.6	153	165	177	7	6.5	51.0	5	12	6	8	0
38 FT	22	26	17	10	6	6.5	6	6	63.5	42.0	46.0	46.0	7	15	52.5	7	15	38.5	6	7	6	7	59.0	154	166	178	7	6.5	51.0	5	12	6	7.5	0
40 FT	23	26	17	10	6	6	6	6	63.5	47.0	47.0	47.0	7	15	52.0	7	15	37.5	6	6	6	7	58.9	154	166	178	7	6.5	51.0	5	12	6	7.5	0
42 FT	24	27	18	10	6	6	6	6	64.1	44.0	48.0	48.0	7	15	51.5	7	15	37.0	6	6.5	6	6.5	59.3	155	167	179	7	6	51.0	5	12	6	7	0
44 FT	24	28	19	10	7	8	6	6	64.6	44.0	48.0	48.0	7	14	51.5	7	14	37.0	6	6.5	6	6.5	59.6	156	168	180	7	6	51.0	5	12	6	7	0
46 FT	25	29	19	10	7	7.5	6	6	64.8	49.0	49.0	49.0	7	15	51.0	7	15	36.5	6	6.5	6	6.5	59.9	157	169	181	7	6	51.0	5	12	6	6.5	0
48 FT	25	30	20	10	7	7.5	7	8	70.3	49.0	49.0	49.0	7	15	51.0	7	15	36.5	6	6.5	6	6.5	60.3	158	170	182	7	6	51.0	5	12	6	6.5	0
50 FT	26	31	20	10	7	7	7	7	70.4	50.0	50.0	50.0	7	15	50.5	7	15	36.5	6	6	6	6	60.5	159	171	183	7	6	51.0	5	12	6	6.5	0



GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE DOUBLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 10 FEET HEIGHT (HT): 11 THRU 13 FEET		SHEET NO. 15 OF 27
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011	703.47	

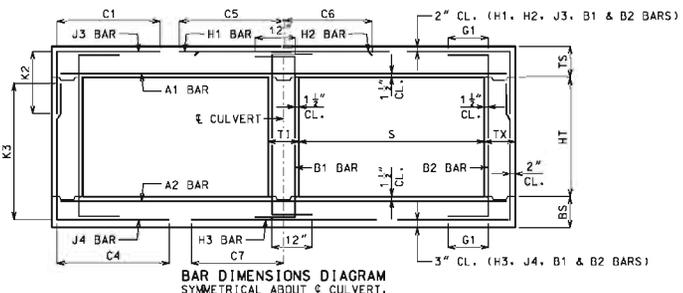
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 11 FT										HEIGHT (HT) = 6 FT OR 7 FT OR 8 FT																									
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS															
		A1 BARS					J3 BARS					H1 BARS					H2 BARS					A2 BARS					J4 BARS					H3 BARS		B1 BARS		B2 BARS	
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	HT=7'	HT=8'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=6'	HT=7'	HT=8'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	C1	
1 FT	14	10	8	8	5	6	4	6.5	52.5	30.0	30.0	30.0	5	13	106.5	5	13	30.0	5	8	5	7	52.9	78	90	102	6	7	53.5	5	12	5	12	12			
2 FT	14	11	8	8	5	6	4	6	52.5	30.0	30.0	30.0	5	12	106.5	5	12	29.0	5	8	5	8	49.1	79	91	103	6	7	53.0	5	12	5	12	12			
4 FT	10	10	8	8	5	7	5	6	45.6	26.0	26.0	30.0	6	16	72.5	6	16	35.0	5	7	5	6.5	43.0	79	90	102	6	6	52.5	5	10.5	5	12	12			
6 FT	10	11	9	9	5	7.5	5	6	40.8	26.0	26.0	30.0	6	15	58.5	6	15	33.5	5	6.5	5	7.5	39.5	79	91	103	6	6	52.0	5	12	5	12	12			
8 FT	11	12	8	8	5	7.5	5	7	38.6	27.0	27.0	31.0	6	15	54.5	6	15	33.0	5	6.5	5	8	37.3	80	92	104	6	6	51.5	5	12	5	12	0			
10 FT	12	13	8	8	5	7	5	7.5	36.6	28.0	28.0	32.0	6	14	53.0	6	14	32.5	5	6	5	8	35.6	81	93	105	6	6	51.0	5	12	5	12	0			
12 FT	13	14	8	8	5	6.5	5	7.5	35.3	29.0	33.0	33.0	6	14	52.0	6	14	32.5	6	8.5	5	8.5	34.6	82	94	106	6	6	51.0	5	12	5	12	0			
14 FT	14	15	8	8	5	6	5	8	34.1	30.0	34.0	34.0	6	13	51.5	6	13	32.0	6	8	5	8.5	33.8	83	95	107	6	6	51.0	5	12	5	12	0			
16 FT	15	16	8	8	6	8	5	7.5	33.3	31.0	35.0	35.0	6	13	57.0	6	13	38.0	6	7.5	5	8	33.1	84	96	108	6	6	51.0	5	12	5	12	0			
18 FT	16	17	8	8	6	8	5	7	37.5	32.0	36.0	36.0	6	12	56.5	6	12	38.0	6	7	5	7	32.6	85	97	109	7	7	53.5	5	12	5	10.5	0			
20 FT	17	18	8	8	6	7.5	5	6.5	37.1	37.0	37.0	37.0	6	12	56.5	6	12	38.0	6	7	5	6.5	32.4	86	98	110	7	7	53.5	5	12	5	9.5	0			
22 FT	18	20	8	8	6	7	5	6.5	37.1	38.0	38.0	38.0	6	12	56.0	6	12	37.5	6	7.5	5	6	32.4	88	100	112	6	6	50.5	5	12	5	9.5	0			
24 FT	19	20	8	8	6	6.5	5	6	35.1	39.0	39.0	39.0	6	12	55.0	6	12	37.5	6	7	5	6	30.9	88	100	112	6	6	50.5	5	12	5	9.5	0			
26 FT	20	21	8	8	6	6.5	6	7.5	39.1	44.0	44.0	44.0	6	12	54.5	6	12	37.5	6	6.5	6	7.5	33.9	89	101	113	7	7	53.5	5	12	5	9.5	0			
28 FT	21	22	8	8	6	6.5	6	7	39.1	45.0	45.0	45.0	6	12	54.5	6	12	37.0	6	6	6	7	34.0	90	102	114	7	7	53.5	5	12	5	9.5	0			
30 FT	22	23	8	8	6	6	6	6.5	39.1	46.0	46.0	46.0	7	15	59.0	7	15	41.0	6	6	6	6.5	34.1	91	103	115	7	7	53.5	5	12	5	8.5	0			
32 FT	23	24	8	8	6	6	6	6	39.1	47.0	47.0	47.0	7	15	58.5	7	15	40.5	6	6	6	6	34.3	92	104	116	7	7	53.5	5	12	5	8	0			
34 FT	23	26	8	8	7	7.5	6	7	40.3	47.0	47.0	47.0	7	15	58.0	7	15	41.0	6	6.5	6	6.5	34.8	94	106	118	7	6.5	53.5	5	12	5	8.5	0			
36 FT	24	27	9	8	7	7.5	6	7	40.3	48.0	48.0	48.0	7	14	57.5	7	14	40.5	6	6.5	6	6.5	34.9	95	107	119	7	6	53.5	5	12	5	8	0			
38 FT	25	27	9	8	7	7.5	6	6.5	40.1	49.0	49.0	49.0	7	14	57.0	7	14	39.5	6	6	6	6.5	35.0	95	107	119	7	6	53.5	5	12	5	7.5	0			
40 FT	26	28	10	8	7	7.5	6	7	40.9	50.0	50.0	50.0	7	13	56.0	7	13	38.5	6	6	6	6	35.5	96	108	120	7	6	53.5	5	12	5	8	0			
42 FT	27	29	10	8	7	7	6	7	41.0	51.0	51.0	51.0	7	13	55.0	7	13	37.5	6	6	6	6.5	35.8	97	109	121	8	7.5	53.5	5	12	5	8	0			
44 FT	27	30	11	8	7	6.5	5	6	37.9	47.0	47.0	47.0	7	13	54.5	7	13	38.0	6	6	6	7	36.1	98	110	122	8	7.5	53.5	5	12	5	7.5	0			
46 FT	28	31	11	8	7	6.5	6	7.5	41.9	52.0	52.0	52.0	7	12	54.0	7	12	37.5	6	6	6	7	36.4	99	111	123	8	7	53.5	5	12	5	7.5	0			
48 FT	29	32	11	8	7	6.5	6	7	41.9	53.0	53.0	53.0	7	12	53.5	7	12	37.0	6	6	6	6.5	36.5	100	112	124	8	7	53.0	5	12	5	7.5	0			
50 FT	29	33	11	8	7	6.5	6	7	42.0	53.0	53.0	53.0	7	12	53.5	7	12	37.0	6	6	6	6.5	36.6	101	113	125	8	7	53.0	5	12	5	7	0			

		SPAN (S) = 11 FT										HEIGHT (HT) = 9 FT OR 10 FT OR 11 FT																									
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS															
		A1 BARS					J3 BARS					H1 BARS					H2 BARS					A2 BARS					J4 BARS					H3 BARS		B1 BARS		B2 BARS	
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=9'	HT=10'	HT=11'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=9'	HT=10'	HT=11'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	C1	
1 FT	14	10	8	9	5	6	5	8	54.6	34.0	34.0	34.0	5	13	109.0	5	13	30.5	5	7.5	6	6	76.4	114	126	138	6	6.5	54.0	5	12	5	10	12			
2 FT	14	11	8	9	5	6	5	8	54.6	34.0	34.0	34.0	5	12	109.0	5	12	29.5	5	7.5	6	6.5	71.8	115	127	139	6	7	53.5	5	12	5	10	12			
4 FT	10	10	9	9	5	7	5	6	82.4	30.0	30.0	30.0	6	16	84.0	6	16	35.0	5	7	6	6.5	62.1	114	126	138	7	7	55.5	5	10.5	5	10	12			
6 FT	10	11	9	9	5	7.5	5	6	56.3	30.0	30.0	30.0	6	15	58.5	6	15	33.5	5	6.5	6	6.5	58.1	115	127	139	6	6	52.0	5	12	5	9.5	12			
8 FT	11	12	10	9	5	7.5	5	6	52.4	31.0	31.0	31.0	6	15	54.5	6	15	33.0	5	6	5	6	52.1	116	128	140	6	6	51.5	5	12	5	10.5	0			
10 FT	11	13	10	9	5	7.5	5	6	49.6	31.0	31.0	31.0	6	14	52.5	6	14	32.5	5	6	5	6	50.5	117	129	141	6	6	51.5	5	12	5	9.5	0			
12 FT	12	14	10	9	5	6.5	5	6	48.1	32.0	32.0	32.0	6	13	52.0	6	13	32.5	6	8	5	6	49.0	118	130	142	6	6	51.0	5	12	5	9	0			
14 FT	14	15	10	9	5	6	5	6	47.1	34.0	34.0	34.0	6	14	51.5	6	14	32.5	6	8	5	6	47.9	119	131	143	6	6	51.0	5	12	5	8	0			
16 FT	15	16	10	9	6	8	6	8	55.0	35.0	35.0	35.0	6	13	57.0	6	13	38.5	6	7.5	5	6	46.9	120	132	144	6	6	51.0	5	12	5	8	0			
18 FT	16	17	10	9	6	8	6	7.5	53.9	36.0	36.0	40.0	6	13	56.5	6	13	38.0	6	7	6	7	49.0	121	133	145	6	6	51.0	5	12	5	8	0			
20 FT	17	18	11	9	6	7.5	6	8	54.0	37.0	37.0	37.0	6	13	56.0	6	13	38.0	6	6.5	5	6	45.9	122	134	146	6	6	51.0	5	12	5	7.5	0			
22 FT	18	20	12	9	6	7	6	8	54.4	38.0	38.0	38.0	6	13	55.5	6	13	38.0	6	7.5	5	6.5	46.0	124	136	148	6	6	51.0	5	12	5	7	0			
24 FT	18	20	12	9	6	7	6	8	52.1	38.0	38.0	38.0	6	12	54.5	6	12	37.5	6	6.5	5	6.5	43.5	124	136	148	6	6	51.0	5	12	5	7.5	0			
26 FT	19	22	12	9	6	6.5	6	7.5	52.1	39.0	39.0	39.0	6	12	54.5	6	12	37.5	6	7	5	6.5	43.6	126	138	150	7	7.5	54.0	5	12	5	7	0			
28 FT	20	23	12	9	6	6.5	6	7	52.1	40.0	40.0	40.0	6	12	54.0	6	12	37.5	6	7	5	6	43.8	127	139	151	7	7	54.0	5	12	5	7	0			
30 FT	21	24	13	9	6	6	6	7.5	52.8	41.0	41.0	41.0	6	12	53.0	6	12	37.0	6	6.5	5	6	44.1	128	140	152	7	7	54.0	5	12	5	6.5	0			
32 FT	22	25	13	9	6	6	6	7	52.8	42.0	42.0	42.0	7	15	56.5	7	15	41.0	6	6.5	5	6	44.3	129	141	153	7	6.5	54.0	5	12	5	6.5	0			
34 FT	23	26	13	9	6	6	6	6.5	52.8	43.0	43.0	43.0	7	15	57.0	7	15	40.0	6	6.5	5	6	44.4	130													

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

DESIGN FILL	SPAN (S) = 11 FT											HEIGHT (HT) = 12 FT OR 13 FT OR 14 FT																							
	TOP SLAB BARS											BOTTOM SLAB BARS																							
	MEMBER THICKNESS			A1 BARS				J3 BARS				H1 BARS			H2 BARS			A2 BARS			J4 BARS				WALL BARS										
	TS	BS	TX	T1	SIZE	SPA.	SIZE	SPA.	C1	K2			SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3			SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	C1	
1 FT	14	12	9	11	5	6	5	6	55.6	34.0	34.0	34.0	5	13	110.0	5	13	30.5	5	8	6	6	94.6	152	164	176	5	6	51.5	5	12	5	8.5	12	
2 FT	14	12	9	11	5	6	6	7.5	55.6	34.0	34.0	38.0	5	12	110.0	5	12	30.0	5	7.5	6	6	89.4	152	164	176	5	6	51.0	5	12	5	8.5	12	
4 FT	10	12	10	11	5	7	6	7	58.3	30.0	30.0	34.0	6	16	112.5	6	16	35.5	5	7	6	6.5	83.4	152	164	176	6	7	53.5	5	11.5	5	8	12	
6 FT	10	12	10	11	5	7.5	6	6.5	78.8	30.0	34.0	34.0	6	15	57.5	6	15	34.0	5	6.5	6	6	77.1	152	164	176	6	6.5	52.5	5	12	5	7.5	12	
8 FT	10	13	10	11	5	7.5	6	6	70.1	34.0	34.0	34.0	6	14	54.0	6	14	33.5	5	6	6	6	74.1	153	165	177	6	6.5	52.0	5	12	5	7	0	
10 FT	11	13	11	11	5	7.5	6	7	67.0	31.0	31.0	35.0	6	14	52.5	6	14	33.0	5	6	6	6	69.9	153	165	177	6	6	51.5	5	12	5	7.5	0	
12 FT	12	14	12	11	5	7	6	8	64.6	32.0	32.0	36.0	6	14	51.5	6	14	33.0	6	8	6	7	67.6	154	166	178	6	6	51.5	5	12	5	7	0	
14 FT	13	15	12	11	5	6.5	6	7	63.4	33.0	37.0	37.0	6	13	51.0	6	13	33.0	6	7.5	6	6.5	66.4	155	167	179	6	6	51.0	5	12	5	7	0	
16 FT	14	16	13	11	5	6	6	7	62.3	34.0	38.0	38.0	6	13	51.0	6	13	33.0	6	7	6	7	64.8	156	168	180	6	6	51.0	5	12	5	6.5	0	
18 FT	15	17	13	11	5	8	6	6.5	67.6	35.0	39.0	39.0	6	12	56.5	6	12	38.5	6	6.5	6	6	63.8	157	169	181	6	6	51.0	5	12	5	6.5	0	
20 FT	16	19	14	11	6	8	6	6.5	67.4	36.0	40.0	40.0	6	12	56.0	6	12	38.5	6	7.5	6	6.5	63.8	159	171	183	6	6	51.5	5	12	5	6	0	
22 FT	17	20	14	11	6	7.5	6	6	67.3	37.0	41.0	41.0	6	12	55.5	6	12	38.5	6	7	6	6	63.5	160	172	184	6	6	51.0	5	12	5	6	0	
24 FT	18	21	15	11	6	7	6	6.5	67.4	42.0	42.0	42.0	6	12	55.0	6	12	38.5	6	7	6	6.5	63.4	161	173	185	7	7.5	54.5	5	12	6	8	0	
26 FT	19	22	15	11	6	6.5	6	6.5	65.3	43.0	43.0	43.0	6	13	54.5	6	13	38.0	6	7	6	7	61.1	162	174	186	7	7.5	54.0	5	12	6	8	0	
28 FT	20	23	15	11	6	6.5	6	6	65.3	44.0	44.0	44.0	6	12	54.0	6	12	38.0	6	7	6	6.5	61.3	163	175	187	7	7	54.0	5	12	6	8	0	
30 FT	21	24	16	11	6	6.5	6	6	65.8	45.0	45.0	45.0	6	12	53.0	6	12	37.0	6	6.5	6	7	61.4	164	176	188	7	7	54.0	5	12	6	8	0	
32 FT	22	25	16	11	6	6	7	7.5	70.8	46.0	46.0	46.0	7	15	57.5	7	15	41.0	6	6.5	6	6.5	61.6	165	177	189	7	6.5	54.0	5	12	6	8	0	
34 FT	23	26	17	11	6	6	6	66.4	47.0	47.0	47.0	7	15	56.5	7	15	40.0	6	6.5	6	7	61.9	166	178	190	7	6.5	54.5	5	12	6	7.5	0		
36 FT	23	27	17	11	7	7.5	7	7	71.3	47.0	47.0	47.0	7	15	56.5	7	15	41.0	6	6.5	6	6.5	62.0	167	179	191	7	6	54.5	5	12	6	7.5	0	
38 FT	24	28	18	11	7	7.5	7	7.5	71.8	48.0	48.0	48.0	7	14	55.5	7	14	40.0	6	6	6	6.5	62.4	168	180	192	7	6	54.5	5	12	6	7	0	
40 FT	25	29	19	11	7	7.5	7	7.5	72.4	49.0	49.0	49.0	7	14	55.0	7	14	39.0	6	6	6	6.5	62.6	169	181	193	8	7.5	60.5	5	12	6	6.5	0	
42 FT	26	30	19	11	7	7.5	7	7	72.5	50.0	50.0	50.0	7	13	54.5	7	13	38.0	6	6	6	6.5	62.9	170	182	194	8	7.5	60.5	5	12	6	6.5	0	
44 FT	27	31	20	11	7	7	7	7.5	73.0	51.0	51.0	51.0	7	14	54.0	7	14	38.0	6	6	6	6	63.3	171	183	195	8	7	60.5	5	12	6	6.5	0	
46 FT	28	32	20	11	7	7	7	6.5	73.1	52.0	52.0	52.0	7	14	53.5	7	14	38.0	6	6	6	6	63.5	172	184	196	8	7	60.5	5	12	6	6.5	0	
48 FT	28	32	21	11	7	6.5	7	6.5	73.6	52.0	52.0	52.0	7	14	53.5	7	14	37.5	7	7	6	6	6	63.5	172	184	196	8	7	60.5	5	12	6	6	0
50 FT	28	33	22	11	7	6.5	7	6.5	74.1	52.0	52.0	52.0	7	13	53.5	7	13	37.5	7	7.5	6	6	6	63.9	173	185	197	8	7	60.5	5	12	6	6	0



GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE DOUBLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 11 FEET HEIGHT (HT): 12 THRU 14 FEET	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011	703.47 SHEET NO. 17 OF 27

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

		SPAN (S) = 12 FT												HEIGHT (HT) = 6 FT OR 7 FT OR 8 FT																				
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																	
	TS	BS	TX	TI	A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS		B1 BARS		B2 BARS							
					SIZE	SPA.	SIZE	SPA.	C1	HT=6'	HT=7'	HT=8'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=6'	HT=7'	HT=8'	SIZE	SPA.	C7	SIZE	SPA.	C1	
1 FT	14	10	8	8	5	6	4	6	56.1	30.0	30.0	30.0	5	12	115.0	5	12	31.5	5	7.5	5	6.5	52.4	78	90	102	6	6.5	56.5	5	12	5	12	12
2 FT	15	11	8	8	6	8	4	6.5	59.1	31.0	31.0	31.0	6	16	118.0	6	16	39.0	5	7.5	5	7.5	47.9	79	91	103	6	6.5	56.0	5	12	5	12	12
4 FT	11	11	8	8	5	6.5	5	7	43.6	31.0	31.0	31.0	6	15	77.5	6	15	36.5	5	6.5	5	7	42.6	79	90	102	7	6.5	58.5	5	12	5	12	12
6 FT	11	11	8	8	5	7	5	6.5	40.9	27.0	27.0	27.0	6	14	63.0	6	14	35.0	5	6.5	5	7	39.3	79	91	103	7	6.5	57.5	5	12	5	12	12
8 FT	11	13	8	8	5	7	5	6	39.1	27.0	27.0	31.0	6	12	58.0	6	12	34.0	5	6	5	8.5	36.3	81	93	105	6	6	54.5	5	12	5	12	0
10 FT	12	14	8	8	5	6.5	5	6.5	37.0	28.0	28.0	32.0	6	12	56.5	6	12	33.5	6	8	5	8.5	34.5	82	94	106	6	6	54.5	5	12	5	12	0
12 FT	14	15	8	8	5	6	5	8	34.6	30.0	34.0	34.0	6	13	55.5	6	13	33.5	6	7.5	5	8.5	33.8	83	95	107	7	7	57.0	5	12	5	12	0
14 FT	15	16	8	8	6	8	5	7.5	38.4	31.0	35.0	35.0	6	12	61.0	6	12	39.5	6	7.5	5	8	32.9	84	96	108	7	7	57.0	5	12	5	12	0
16 FT	16	17	8	8	6	8	5	7	37.5	32.0	36.0	36.0	7	16	65.5	7	16	44.5	6	7	5	7	32.3	85	97	109	7	6.5	57.0	5	12	5	12	0
18 FT	17	19	8	8	6	7.5	5	6.5	37.0	37.0	37.0	37.0	7	15	65.0	7	15	44.0	6	7	5	6.5	31.6	87	99	111	7	7	57.0	5	12	5	10.5	0
20 FT	18	20	8	8	6	7	5	6.5	36.4	38.0	38.0	38.0	7	15	64.5	7	15	44.0	6	6.5	5	6	31.3	88	100	112	7	7	57.0	5	12	5	9.5	0
22 FT	19	21	8	8	6	6	5	6	36.0	39.0	39.0	39.0	7	14	64.0	7	14	44.0	6	6.5	6	7.5	34.1	89	101	113	7	7	57.0	5	12	5	9.5	0
24 FT	21	22	8	8	6	6	6	7	39.6	45.0	45.0	45.0	7	15	63.5	7	15	44.0	6	6.5	6	7	34.4	90	102	114	7	7	56.5	5	12	5	9.5	0
26 FT	21	23	8	8	6	6	6	7	38.3	45.0	45.0	45.0	7	14	63.0	7	14	43.5	6	6.5	6	6.5	32.8	91	103	115	7	7	56.5	5	12	5	9.5	0
28 FT	23	24	8	8	6	6	6	6	38.3	47.0	47.0	47.0	7	15	62.0	7	15	43.0	6	6	6	6	33.0	92	104	116	7	7	56.5	5	12	5	9	0
30 FT	23	25	8	8	7	7	6	6	38.3	47.0	47.0	47.0	7	14	62.0	7	14	43.5	6	6	6	6	33.0	93	105	117	7	6.5	56.5	5	12	5	8.5	0
32 FT	25	27	9	8	7	7.5	6	6.5	39.1	49.0	49.0	49.0	7	14	61.0	7	14	41.5	6	6	6	6.5	33.8	95	107	119	7	6	56.5	5	12	5	8.5	0
34 FT	25	28	8	8	7	6.5	6	6.5	39.3	49.0	49.0	49.0	7	13	61.0	7	13	42.5	6	6	6	6	33.8	95	108	120	7	6	56.5	5	12	5	8.5	0
36 FT	26	29	8	8	7	6.5	6	6.5	39.3	50.0	50.0	50.0	7	13	61.0	7	13	41.5	6	6	6	6	33.9	97	109	121	8	7.5	52.5	5	12	5	8	0
38 FT	27	30	10	8	7	6.5	6	7	40.1	51.0	51.0	51.0	7	13	59.0	7	13	41.0	6	6	6	6.5	34.5	98	110	122	8	7.5	52.5	5	12	5	8	0
40 FT	28	31	10	8	7	6.5	6	6.5	40.1	52.0	52.0	52.0	7	12	58.5	7	12	40.0	7	8	6	6	34.6	99	111	123	8	7	52.5	5	12	5	8	0
42 FT	29	32	10	8	7	6.5	6	6.5	40.1	53.0	53.0	53.0	7	12	57.5	7	12	39.0	7	8	6	6	34.9	100	112	124	8	7	52.5	5	12	5	7.5	0
44 FT	30	33	10	8	7	6.5	6	6	40.3	54.0	54.0	54.0	7	12	56.5	7	12	38.5	7	7.5	7	6.5	38.1	101	113	125	8	6.5	52.0	5	12	5	7	0
46 FT	31	34	10	8	7	6	6	6	40.3	55.0	55.0	55.0	8	15	64.0	8	15	45.5	7	7.5	7	6.5	38.3	102	114	126	8	6.5	52.0	5	12	5	6.5	0
48 FT	31	34	11	8	7	6	6	6.5	41.0	55.0	55.0	55.0	8	15	64.0	8	15	45.0	7	6.5	6	6	35.6	102	114	126	8	6.5	52.5	5	12	5	7.5	0
50 FT	32	35	11	8	8	7.5	6	6.5	41.0	56.0	56.0	56.0	8	15	63.5	8	15	45.5	7	7	6	6	35.8	103	115	127	8	6.5	52.0	5	12	5	7	0

		SPAN (S) = 12 FT												HEIGHT (HT) = 9 FT OR 10 FT OR 11 FT																				
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																	
	TS	BS	TX	TI	A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS		B1 BARS		B2 BARS							
					SIZE	SPA.	SIZE	SPA.	C1	HT=9'	HT=10'	HT=11'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=9'	HT=10'	HT=11'	SIZE	SPA.	C7	SIZE	SPA.	C1	
1 FT	14	11	8	9	5	6	5	8	58.3	34.0	34.0	34.0	5	12	117.5	5	12	32.0	5	7.5	6	6.5	77.5	115	127	139	6	7	57.0	5	12	5	10	12
2 FT	15	12	8	9	6	8	5	8	62.3	35.0	35.0	35.0	6	16	121.5	6	16	39.5	5	7.5	6	7	71.9	116	128	140	6	7	56.5	5	12	5	10	12
4 FT	11	11	9	9	5	6.5	6	7	76.1	31.0	31.0	35.0	6	15	86.0	6	15	37.0	5	6.5	6	7	61.8	115	127	139	6	6	56.0	5	11.5	5	10.5	12
6 FT	11	12	9	9	5	7	6	7	59.0	31.0	31.0	35.0	6	14	63.0	6	14	35.5	5	6	6	7	57.6	116	128	140	6	6	55.0	5	12	5	10	12
8 FT	11	13	9	9	5	7	6	7	54.0	31.0	31.0	35.0	6	13	58.0	6	13	34.5	5	6	6	7	54.5	117	129	141	6	6	55.0	5	12	5	9.5	0
10 FT	12	14	10	9	5	7	5	6	49.0	32.0	32.0	32.0	6	12	56.0	6	12	34.0	6	8	5	6.5	49.3	118	130	142	7	7	57.5	5	12	5	10	0
12 FT	13	15	10	9	5	6.5	6	7.5	50.1	33.0	33.0	33.0	6	12	55.0	6	12	33.5	6	7.5	5	6.5	47.6	119	131	143	7	7	57.5	5	12	5	9	0
14 FT	15	16	10	9	6	8	5	6	50.6	35.0	35.0	35.0	6	12	60.5	6	12	39.5	6	7	5	6	46.4	120	132	144	7	7	57.0	5	12	5	8	0
16 FT	16	17	10	9	6	8	6	7.5	53.8	36.0	36.0	36.0	6	12	60.0	6	12	39.5	6	6.5	5	6	45.4	121	133	145	7	6.5	57.0	5	12	5	8	0
18 FT	17	19	10	9	6	7.5	6	7	53.1	37.0	37.0	41.0	7	16	64.5	7	16	44.5	6	7	6	7.5	47.8	123	135	147	7	7	57.0	5	12	5	8	0
20 FT	18	20	11	9	6	7	6	7.5	53.1	38.0	38.0	38.0	7	15	64.0	7	15	44.0	6	6.5	5	6	44.6	124	136	148	7	7	57.0	5	12	5	7.5	0
22 FT	19	21	12	9	6	6.5	6	7.5	53.5	39.0	39.0	39.0	7	15	63.0	7	15	44.0	6	6.5	5	6.5	44.8	125	137	149	7	7	57.0	5	12	5	7.5	0
24 FT	20	23	12	9	6	6.5	6	7	53.4	40.0	40.0	40.0	7	15	63.0	7	15	44.0	6	6.5	5	6.5	44.6	127	139	151	7	7	57.0	5	12	5	7	0
26 FT	21	23	12	9	6	6	6	7.5	51.4	41.0	41.0	41.0	7	15	62.0	7	15	43.5	6	6	5	6.5	42.8	127	139	151	7	7	57.0	5	12	5	7	0
28 FT	22	25	12	9	6	6	6	7	51.4	42.0	42.0	42.0	7	15	61.5	7	15	43.5	6	6.5	5	6.5	42.9	129	141	153	7	6.5	57.0	5	12	5	7	0
30 FT	23	26	12	9	7	7.5	6	6.5	51.3	43.0	43.0	43.0	7	15	61.0	7	15	43.5	6	6	5	6	43.0	130	142	154	7	6.5	57.0	5	12	5	7	0
32 FT	24	27	13	9	7	7.5	6	7	52.0	44.0	44.0	44.0	7	14	60.5	7	14	42.5	6	6	5	6	43.4	131	143	155	7	6	57.0	5	12	5	6.5	0
34 FT	25	28	13	9	7	7	6	7	52.0	45.0	45.0	45.0																						

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

		SPAN (S) = 12 FT												HEIGHT (HT) = 12 FT OR 13 FT																		
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS															
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS	B1 BARS	B2 BARS													
					SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.		SIZE	SPA.	SIZE	SPA.											
1 FT	14	11	9	10	5	6	5	6.5	59.0	34.0	34.0	5	12	118.0	5	12	32.5	5	7	6	6	88.9	151	163	6	6.5	57.5	5	12	5	8.5	12
2 FT	15	12	9	10	6	8	5	7	63.0	35.0	35.0	6	16	122.0	6	16	39.5	5	7	6	6	83.6	152	164	6	7	57.0	5	12	5	8.5	12
4 FT	11	12	9	10	5	6.5	6	7	61.0	35.0	35.0	6	15	120.0	6	15	37.0	5	6.5	6	6	76.5	152	164	6	6.5	56.5	5	12	5	8.5	12
6 FT	11	12	9	10	5	7	6	6.5	73.5	35.0	35.0	6	14	63.5	6	14	35.5	5	6	6	6	70.0	152	164	6	6	55.5	5	12	5	8.5	12
8 FT	11	13	10	10	5	7	6	7	63.9	31.0	35.0	6	13	58.0	6	13	34.5	5	6	6	6.5	65.8	153	165	6	6	55.0	5	12	5	8	0
10 FT	12	14	10	10	5	7	6	7	61.6	36.0	36.0	6	12	56.5	6	12	34.5	6	6	6	6	63.1	154	166	7	7	57.5	5	12	5	8	0
12 FT	13	15	11	10	5	6.5	6	7.5	59.9	33.0	37.0	6	12	55.0	6	12	34.0	6	7.5	6	6.5	61.4	155	167	7	7	57.5	5	12	5	7.5	0
14 FT	14	16	12	10	5	6	6	7.5	58.8	34.0	38.0	6	12	54.5	6	12	34.0	6	7	6	7.5	60.0	156	168	7	7	57.5	5	12	5	7	0
16 FT	16	18	12	10	6	8	6	7	64.1	36.0	40.0	6	12	60.0	6	12	40.0	6	7	6	7.5	59.5	158	170	6	6	54.0	5	12	5	7	0
18 FT	17	19	12	10	6	7.5	6	6.5	63.1	37.0	41.0	6	12	59.5	6	12	39.5	6	7	6	6.5	58.5	159	171	7	7	57.0	5	12	5	7	0
20 FT	18	20	13	10	6	7	6	6.5	62.6	38.0	42.0	6	12	58.5	6	12	39.5	6	6.5	6	7.5	57.9	160	172	7	7	57.0	5	12	5	6.5	0
22 FT	19	21	13	10	6	6.5	6	6.5	62.3	39.0	43.0	7	16	63.0	7	16	44.5	6	6	6	6.5	57.5	161	173	7	7	57.0	5	12	5	6.5	0
24 FT	20	23	14	10	6	6.5	6	6.5	62.5	40.0	44.0	7	16	62.5	7	16	44.0	6	6.5	6	7.5	57.8	163	175	7	7	57.0	5	12	5	6	0
26 FT	21	24	14	10	6	6	6	6	62.3	41.0	45.0	7	15	62.0	7	15	44.0	6	6.5	6	7	57.6	164	176	7	7	57.0	5	12	5	6	0
28 FT	22	25	14	10	6	6	6	6	59.8	42.0	46.0	7	15	61.0	7	15	43.5	6	6.5	6	7.5	55.1	165	177	7	6.5	57.0	5	12	5	6	0
30 FT	23	26	15	10	7	8	6	6	60.3	47.0	47.0	7	15	60.0	7	15	42.5	6	6	6	7.5	55.4	166	178	7	6.5	57.0	5	12	6	8	0
32 FT	24	27	15	10	7	7.5	6	6	60.3	48.0	48.0	7	14	59.5	7	14	42.0	6	6	6	7.5	55.5	167	179	7	6	57.0	5	12	6	8	0
34 FT	25	28	16	10	7	7.5	6	6	60.9	49.0	49.0	7	14	58.5	7	14	41.0	6	6	6	7.5	55.8	168	180	7	6	57.0	5	12	6	8	0
36 FT	25	29	16	10	7	6.5	7	7.5	65.8	49.0	49.0	7	13	58.5	7	13	41.5	6	6	6	7.5	55.8	169	181	8	7.5	63.0	5	12	6	8	0
38 FT	26	30	17	10	7	7	6	6	61.5	50.0	50.0	7	13	57.5	7	13	40.5	7	7.5	6	7	56.1	170	182	8	7.5	63.0	5	12	6	7.5	0
40 FT	27	31	17	10	7	6.5	7	7.5	66.5	51.0	51.0	7	13	57.0	7	13	40.0	7	7.5	6	7.5	56.3	171	183	8	7	63.0	5	12	6	7.5	0
42 FT	28	32	18	10	7	6.5	7	7.5	67.1	52.0	52.0	7	12	56.5	7	12	39.0	7	7.5	6	6.5	56.6	172	184	8	7	63.0	5	12	6	7	0
44 FT	29	33	18	10	7	6.5	7	7	67.1	53.0	53.0	7	12	56.0	7	12	38.0	7	7.5	6	6.5	56.9	173	185	8	6.5	63.0	5	12	6	7	0
46 FT	29	34	19	10	7	6	7	7.5	67.9	53.0	53.0	7	12	56.0	7	12	38.5	7	7.5	6	6.5	57.0	174	186	8	6.5	63.0	5	12	6	6.5	0
48 FT	30	35	19	10	7	6	7	6.5	67.9	54.0	54.0	7	12	55.0	7	12	38.0	7	7	6	6.5	57.3	175	187	8	6.5	63.0	5	12	6	6.5	0
50 FT	31	36	20	10	7	6	7	7	68.6	55.0	55.0	7	13	54.5	7	13	37.5	7	7	6	6.5	57.6	176	188	8	6	63.0	5	12	6	6.5	0

		SPAN (S) = 12 FT												HEIGHT (HT) = 14 FT OR 15 FT																		
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS															
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS	B1 BARS	B2 BARS													
					SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.		SIZE	SPA.	SIZE	SPA.											
1 FT	14	12	10	12	5	6	5	6	60.0	34.0	34.0	5	12	119.0	5	12	32.5	5	7	6	6	98.8	176	188	6	7	58.0	5	12	5	8	12
2 FT	15	12	10	12	6	8	6	8	67.0	35.0	39.0	6	16	126.0	6	16	40.0	5	6.5	6	6	92.5	176	188	6	6.5	57.0	5	12	5	8	12
4 FT	11	13	10	12	5	6.5	6	6.5	62.0	35.0	35.0	6	16	121.0	6	16	37.5	5	6.5	6	6	89.8	177	189	6	7	57.0	5	12	5	7	12
6 FT	11	13	11	12	5	7	6	7	63.8	31.0	35.0	6	15	61.0	6	15	36.0	5	6	6	6.5	81.4	177	189	6	6.5	56.0	5	12	5	7	12
8 FT	11	13	12	12	5	7	6	7.5	73.9	35.0	35.0	6	13	57.5	6	13	35.0	5	6	6	6.5	76.1	177	189	7	7	58.0	5	12	5	7	0
10 FT	12	14	12	12	5	7	6	7	71.4	36.0	36.0	6	13	56.0	6	13	35.0	6	6	6	6.5	74.1	178	190	7	7	58.0	5	12	5	7	0
12 FT	13	15	13	12	5	6.5	6	7.5	68.8	37.0	37.0	6	13	55.0	6	13	34.5	6	7.5	6	6.5	71.6	179	191	7	7	57.5	5	12	5	6.5	0
14 FT	14	16	13	12	5	6	6	6.5	67.3	38.0	38.0	6	12	54.5	6	12	34.5	6	6.5	6	6	70.1	180	192	7	7	57.5	5	12	5	6.5	0
16 FT	15	18	14	12	6	8	6	6.5	72.1	39.0	39.0	6	12	60.0	6	12	40.5	6	7	6	6.5	69.5	182	194	6	6	54.5	5	12	5	6	0
18 FT	17	19	14	12	6	7.5	6	6	72.1	41.0	41.0	6	12	59.5	6	12	40.5	6	6.5	6	6	68.1	183	195	6	6	54.5	5	12	5	6	0
20 FT	18	20	15	12	6	7	6	6	71.5	42.0	42.0	6	12	59.0	6	12	40.0	6	6.5	6	6	67.1	184	196	7	7	57.5	5	12	6	8	0
22 FT	19	22	16	12	6	6.5	6	6	71.4	43.0	43.0	6	12	58.5	6	12	40.0	6	6.5	6	6	67.4	186	198	7	7	57.5	5	12	6	8	0
24 FT	20	23	16	12	6	6.5	6	6	71.3	44.0	44.0	6	12	58.0	6	12	40.0	6	6.5	6	6	67.1	187	199	7	7	57.5	5	12	6	8	0
26 FT	21	24	17	12	6	6	6	6	71.4	45.0	45.0	6	12	57.0	6	12	39.5	6	6	6	6	67.1	188	200	7	7	57.5	5	12	6	7.5	0
28 FT	22	25	17	12	6	6	6	6	69.1	46.0	46.0	7	15	61.5	7	15	44.0	6	6	6	6.5	64.9	189	201	7	6.5	57.5	5	12	6	7.5	0
30 FT	23	26																														

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

		SPAN (S) = 13 FT										HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT																							
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS										
	TS	BS	TX	T1	J3 BARS					H1 BARS					H2 BARS					A2 BARS					J4 BARS					H3 BARS		B1 BARS		B2 BARS	
					SIZE	SPA.	SIZE	SPA.	C1	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	C1
1 FT	14	10	8	8	5	6	5	8.5	61.8	30.0	34.0	34.0	5	12	125.5	5	12	36.5	5	7	6	7	61.0	90	102	114	6	6	60.0	5	12	5	12	12	
2 FT	15	12	8	8	6	8	5	8	65.8	31.0	35.0	35.0	6	16	129.5	6	16	43.5	5	7	5	7	53.8	92	104	116	6	6.5	59.5	5	12	5	12	12	
4 FT	11	11	8	8	6	8	6	7	52.1	31.0	31.0	31.0	6	13	82.0	6	13	39.0	5	6.5	5	6	46.5	91	103	115	7	6.5	62.0	5	11	5	12	12	
6 FT	12	12	8	8	5	6.5	5	6.5	44.1	32.0	32.0	32.0	6	13	68.0	6	13	36.5	5	6	5	6	42.8	92	104	116	7	6.5	61.0	5	12	5	12	12	
8 FT	12	13	8	8	5	6	5	6	41.5	32.0	32.0	32.0	7	16	65.0	7	16	38.5	5	6	5	6.5	40.0	93	105	117	7	6.5	60.5	5	12	5	12	0	
10 FT	13	15	8	8	5	6	5	6	39.5	29.0	33.0	33.0	7	15	63.0	7	15	38.0	6	7.5	5	8	38.0	95	107	119	7	7	60.5	5	12	5	12	0	
12 FT	15	16	8	8	6	8	5	6.5	42.4	35.0	35.0	35.0	7	16	70.0	7	16	46.0	6	7	5	7.5	37.1	96	108	120	7	6.5	60.0	5	12	5	11	0	
14 FT	16	17	8	8	6	8	5	6	41.1	36.0	36.0	36.0	7	15	69.0	7	15	46.0	6	7	5	7	36.1	97	109	121	7	6.5	60.0	5	12	5	10	0	
16 FT	17	18	8	8	6	7.5	5	6	40.1	37.0	37.0	37.0	7	14	68.5	7	14	45.5	6	6	5	6.5	35.4	98	110	122	7	6.5	60.0	5	12	5	9.5	0	
18 FT	18	20	8	8	6	6.5	6	6	43.5	38.0	38.0	38.0	7	14	68.0	7	14	45.0	6	6.5	5	6	34.8	100	112	124	7	6.5	60.0	5	12	5	9.5	0	
20 FT	20	21	8	8	6	6.5	6	7.5	42.6	44.0	44.0	44.0	7	14	67.0	7	14	45.0	6	6	6	7.5	37.5	101	113	125	7	6.5	60.0	5	12	5	9	0	
22 FT	21	23	8	8	6	6	6	6.5	42.5	45.0	45.0	45.0	7	14	66.5	7	14	45.0	6	6	6	6.5	37.3	103	115	127	7	6.5	60.0	5	12	5	8	0	
24 FT	22	24	9	8	6	6	6	7.5	43.1	42.0	42.0	46.0	7	13	66.0	7	13	45.0	6	6	6	7	37.6	104	116	128	7	6.5	60.0	5	12	5	8.5	0	
26 FT	23	25	9	8	7	7.5	6	6.5	42.9	47.0	47.0	47.0	7	13	65.5	7	13	45.0	6	6	6	7	37.6	105	117	129	7	6.5	60.0	5	12	5	8.5	0	
28 FT	24	26	9	8	7	7.5	6	7	41.3	48.0	48.0	48.0	7	13	64.5	7	13	44.5	7	8	6	6.5	36.1	106	118	130	7	6.5	59.5	5	12	5	8.5	0	
30 FT	25	27	9	8	7	7	6	6	41.3	49.0	49.0	49.0	7	13	64.0	7	13	44.0	7	7.5	6	6.5	36.3	107	119	131	7	6	59.5	5	12	5	7.5	0	
32 FT	26	29	10	8	7	7	6	7	42.3	50.0	50.0	50.0	7	13	63.5	7	13	44.0	7	8	6	6.5	36.9	109	121	133	8	7.5	65.5	5	12	5	8	0	
34 FT	27	30	10	8	7	6.5	6	6.5	42.3	51.0	51.0	51.0	7	13	62.5	7	13	43.5	7	7.5	6	6.5	37.0	110	122	134	8	7.5	65.5	5	12	5	7.5	0	
36 FT	28	31	11	8	7	6.5	6	7.5	43.1	52.0	52.0	52.0	7	12	62.0	7	12	42.5	7	7.5	6	7	37.5	111	123	135	8	7	65.5	5	12	5	7.5	0	
38 FT	29	32	11	8	7	6	6	7	43.1	53.0	53.0	53.0	7	12	61.0	7	12	41.5	7	7.5	6	6.5	37.6	112	124	136	8	7	65.5	5	12	5	7.5	0	
40 FT	30	33	11	8	7	6	6	7	43.1	54.0	54.0	54.0	7	12	60.0	7	12	41.0	7	7	6	6.5	37.9	113	125	137	8	6.5	65.5	5	12	5	7	0	
42 FT	31	34	12	8	7	6	6	7.5	44.0	55.0	55.0	55.0	8	15	67.0	8	15	48.0	7	7	6	7	38.4	114	126	138	8	6.5	65.5	5	12	5	7	0	
44 FT	32	35	12	8	7	7.5	6	7	44.0	56.0	56.0	56.0	8	14	66.5	8	14	47.0	7	7	6	6.5	38.5	115	127	139	8	6.5	65.5	5	12	5	7	0	
46 FT	33	36	12	8	7	7	6	7	44.0	57.0	57.0	57.0	8	14	66.0	8	14	46.0	7	7	6	6.5	38.8	116	128	140	8	6	65.5	5	12	5	6.5	0	
48 FT	33	37	12	8	7	6.5	6	7	44.0	57.0	57.0	57.0	8	13	66.0	8	13	46.5	7	6.5	6	6.5	38.8	117	129	141	8	6	65.5	5	12	5	6.5	0	
50 FT	34	38	12	8	7	6	6	7	44.0	58.0	58.0	58.0	8	14	65.0	8	14	46.0	7	6.5	6	6	39.0	118	130	142	8	6	65.5	5	12	5	6	0	

		SPAN (S) = 13 FT										HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT																							
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS										
	TS	BS	TX	T1	J3 BARS					H1 BARS					H2 BARS					A2 BARS					J4 BARS					H3 BARS		B1 BARS		B2 BARS	
					SIZE	SPA.	SIZE	SPA.	C1	HT=10'	HT=11'	HT=12'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=10'	HT=11'	HT=12'	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	C1
1 FT	14	11	9	10	5	6	5	7.5	62.6	34.0	34.0	34.0	5	12	126.5	5	12	36.5	5	6.5	6	6.5	81.1	127	139	151	6	6.5	60.5	5	11.5	5	9.5	12	
2 FT	15	12	9	10	6	8	5	7.5	66.6	35.0	35.0	35.0	6	16	130.5	6	16	43.5	5	6.5	6	6.5	75.6	128	140	152	6	6.5	60.0	5	12	5	9	12	
4 FT	11	11	9	10	6	8	6	7	78.5	35.0	35.0	35.0	6	13	84.0	6	13	38.0	5	6.5	6	6	66.3	127	139	151	7	6.5	62.0	5	9	5	8.5	12	
6 FT	12	12	9	10	5	6.5	6	6.5	63.6	32.0	36.0	36.0	6	13	67.0	6	13	37.0	5	6	6	6	61.5	128	140	152	7	6.5	61.5	5	12	5	8.5	12	
8 FT	12	14	9	10	5	6	6	6.5	58.3	32.0	32.0	36.0	6	12	61.5	6	12	36.0	6	8	6	6.5	59.1	130	142	154	7	7	61.0	5	12	5	8.5	0	
10 FT	13	15	9	10	5	6	6	6	55.4	33.0	33.0	37.0	7	15	63.0	7	15	38.0	6	7.5	6	6.5	56.6	131	143	155	7	7	61.0	5	12	5	8.5	0	
12 FT	14	16	10	10	5	6	6	6.5	53.6	34.0	34.0	38.0	7	15	61.5	7	15	38.5	6	7	6	7	54.6	132	144	156	7	6.5	60.5	5	12	5	8	0	
14 FT	16	17	10	10	6	6	6	7	58.0	36.0	36.0	40.0	7	15	69.0	7	15	46.0	6	7	6	6.5	53.3	133	145	157	7	6.5	60.5	5	12	5	8	0	
16 FT	17	19	11	10	6	7.5	6	7	57.5	37.0	37.0	41.0	7	15	68.5	7	15	46.0	6	6.5	6	8	52.4	135	147	159	7	7	60.5	5	12	5	7.5	0	
18 FT	18	20	12	10	6	7	6	7.5	57.4	38.0	38.0	38.0	7	14	68.0	7	14	46.0	6	6.5	5	6	48.8	136	148	160	7	6.5	60.5	5	12	5	7	0	
20 FT	19	21	12	10	6	6.5	6	7	56.6	39.0	39.0	43.0	7	14	67.5	7	14	46.0	6	6	6	8	51.1	137	149	161	7	6.5	60.5	5	12	5	7	0	
22 FT	21	23	12	10	6	6	6	6.5	56.1	41.0	41.0	45.0	7	14	66.5	7	14	45.5	6	6	7.5	51.0	139	151	163	7	6.5	60.5	5	12	5	7	0		
24 FT	22	24	13	10	6	6	6	7	56.5	42.0	42.0	46.0	7	14	66.0	7	14	45.5	6	6	8	51.1	140	152	164	7	6.5	60.5	5	12	5	6.5	0		
26 FT	23	25	13	10	7	7.5	6	6.5	56.3	43.0	43.0	47.0	7	14	65.5	7	14	45.5	7	7.5	6	7.5	51.0	141	153	165	7	6.5	60.5	5	12	5	6.5	0	
28 FT	24	26	13	10	7	7.5	6	6.5	54.4	44.0	44.0	48.0	7	14	64.5	7	14	45.0	7	7.5	6	8	49.1	142	154	166	7	6.5	60.0	5	12	5	6.5	0	
30 FT	25	28	13	10	7	7	6	6	54.4	45.0	45.0	49.0	7	14	64.0	7	14	45.0	7	8	6	8	49.3	144	156	168	7	6	60.0	5	12	5	6.5	0	
32 FT	26	29	14	10	7	7	6	6.5	55.1	46.0	50.0	50.0	7	13	63.5	7	13	44.0	7	7.5	6	8.5	49.8	145	157	169	8	7.5	66.0	5	12	5	6	0	
34 FT	27	30	14																																

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

DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS								BOTTOM SLAB BARS								WALL BARS											
	TS	BS	TX	TI	A1 BARS				J3 BARS				H1 BARS				H2 BARS				A2 BARS				J4 BARS				B1 BARS		B2 BARS	
					SIZE	SPA.	SIZE	SPA.	C1	K2 HT=13" HT=14"	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	K3 HT=13" HT=14"	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.			
1 FT	14	11	11	11	5	6	5	7	64.1	34.0	34.0	5	12	127.5	5	12	36.5	5	6.5	5	6	85.3	163	175	6	6	60.5	5	12	5	8	12
2 FT	15	12	11	11	6	8	5	7	68.1	35.0	35.0	6	16	131.5	6	16	43.5	5	6.5	5	6	80.9	164	176	6	6.5	60.0	5	12	5	7.5	12
4 FT	11	12	11	11	5	6	5	6	92.9	31.0	31.0	6	13	82.5	6	13	38.0	5	6	5	6	75.5	164	176	7	7	62.5	5	11.5	5	7.5	12
6 FT	11	12	11	11	5	6	7.5	6	74.6	31.0	35.0	6	12	64.5	6	12	37.0	5	6	6	6	72.1	164	176	7	6.5	61.5	5	12	5	7.5	12
8 FT	12	14	11	11	5	6.5	6	7.5	68.5	32.0	36.0	6	12	61.5	6	12	36.5	6	8	6	7	70.1	166	178	7	7	61.5	5	12	5	7.5	0
10 FT	13	15	11	11	5	6.5	6	7	65.9	37.0	37.0	6	12	59.5	6	12	36.0	6	7.5	6	6.5	67.4	167	179	7	6.5	61.0	5	12	5	7.5	0
12 FT	14	16	12	11	5	6	6	7	64.0	38.0	38.0	7	15	61.5	7	15	38.5	6	7	6	7	65.5	168	180	7	6.5	60.5	5	12	5	7	0
14 FT	15	17	12	11	6	7.5	6	6.5	68.5	39.0	39.0	7	15	69.0	7	15	46.5	6	6.5	6	6	64.1	169	181	7	6.5	60.5	5	12	5	7	0
16 FT	17	19	13	11	6	7.5	6	6.5	68.0	41.0	41.0	7	15	68.0	7	15	46.5	6	6.5	6	7	63.4	171	183	7	6.5	60.5	5	12	5	6.5	0
18 FT	18	20	13	11	6	7	6	6	66.9	42.0	42.0	7	15	67.5	7	15	46.5	6	6	6	6	62.4	172	184	7	6.5	60.5	5	12	5	6.5	0
20 FT	19	22	14	11	6	6.5	6	6	66.5	43.0	43.0	7	14	67.0	7	14	46.0	6	6	6	6	62.0	174	186	7	7	60.5	5	12	5	6	0
22 FT	20	23	14	11	6	6	7	8	70.6	44.0	44.0	7	14	66.5	7	14	46.0	6	6	6	6	61.3	175	187	7	6.5	60.5	5	12	5	6	0
24 FT	22	25	15	11	6	6	6	6	66.1	46.0	46.0	7	15	65.5	7	15	45.5	6	6	6	6	61.5	177	189	7	6.5	60.5	5	12	6	8	0
26 FT	23	25	15	11	7	7.5	7	7.5	70.6	47.0	47.0	7	14	65.0	7	14	45.5	7	7	6	6	60.9	177	189	7	6.5	60.5	5	12	6	8	0
28 FT	24	27	16	11	7	7.5	7	8	71.0	48.0	48.0	7	14	65.5	7	14	45.0	7	8	6	7	61.3	179	191	7	6	60.5	5	12	6	8	0
30 FT	25	28	16	11	7	7	7	8	68.5	49.0	49.0	7	14	63.5	7	14	44.0	7	7.5	6	7	58.9	180	192	7	6	60.5	5	12	6	8	0
32 FT	26	29	16	11	7	7	7	7.5	68.4	50.0	50.0	7	13	62.5	7	13	43.5	7	7.5	6	6.5	58.9	181	193	8	7.5	66.5	5	12	6	8	0
34 FT	27	30	17	11	7	6.5	7	7.5	69.0	51.0	51.0	7	13	61.5	7	13	42.5	7	7.5	6	7	59.1	182	194	8	7.5	66.5	5	12	6	7.5	0
36 FT	27	31	17	11	7	6	7	6.5	68.9	51.0	51.0	7	12	61.5	7	12	43.5	7	7	6	7	59.1	183	195	8	7	66.5	5	12	6	7.5	0
38 FT	28	33	18	11	7	6	7	7	69.8	52.0	52.0	7	12	60.0	7	12	42.5	7	7	6	6.5	59.6	185	197	8	6.5	66.5	5	12	6	7	0
40 FT	29	34	19	11	7	6	7	7	70.4	53.0	53.0	7	12	59.5	7	12	41.5	7	7	6	6.5	60.0	186	198	8	6.5	66.5	5	12	6	6.5	0
42 FT	30	35	19	11	7	6	7	6.5	70.4	54.0	54.0	7	12	59.0	7	12	40.5	7	7	6	6.5	60.1	187	199	8	6.5	66.5	5	12	6	6.5	0
44 FT	31	36	20	11	7	6	7	7	71.0	55.0	55.0	8	15	66.5	8	15	47.5	7	7	6	6	60.5	188	200	8	6	66.5	5	12	6	6.5	0
46 FT	32	37	21	11	8	7.5	7	7	71.8	56.0	56.0	8	15	66.0	8	15	47.0	7	6.5	6	6	60.8	189	201	8	6	66.5	5	12	6	6	0
48 FT	32	38	21	11	8	7	7	6	71.8	56.0	56.0	8	14	66.0	8	14	47.0	7	6.5	6	6	60.9	190	202	8	6	66.5	5	12	6	6	0
50 FT	33	39	22	11	8	7	7	6.5	72.5	57.0	57.0	8	15	65.5	8	15	47.0	7	6.5	6	6	61.3	191	203	8	6	66.5	5	12	6	6	0

DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS								BOTTOM SLAB BARS								WALL BARS											
	TS	BS	TX	TI	A1 BARS				J3 BARS				H1 BARS				H2 BARS				A2 BARS				J4 BARS				B1 BARS		B2 BARS	
					SIZE	SPA.	SIZE	SPA.	C1	K2 HT=15" HT=16"	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	K3 HT=15" HT=16"	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.			
1 FT	14	12	12	13	5	6	5	6	65.0	34.0	34.0	5	12	128.5	5	12	36.0	5	6.5	6	7	99.8	188	200	6	6.5	61.0	5	12	5	7	12
2 FT	15	13	12	13	6	8	6	8.5	72.0	35.0	39.0	6	16	135.5	6	16	43.5	5	6.5	6	7	96.4	189	201	6	6.5	60.5	5	12	5	7	12
4 FT	11	13	12	13	5	6	6	7	115.0	35.0	35.0	6	14	81.0	6	14	38.5	5	6	6	6.5	91.6	189	201	6	6	60.5	5	12	5	7	12
6 FT	11	13	12	13	5	6.5	6	6.5	84.8	35.0	35.0	6	13	63.5	6	13	37.5	5	6	6	6	84.8	189	201	7	7	62.0	5	12	5	6.5	12
8 FT	12	14	13	13	5	6.5	6	7	78.8	36.0	36.0	6	13	61.0	6	13	37.0	6	8	6	6.5	80.6	190	202	7	7	61.5	5	12	5	6.5	0
10 FT	13	15	13	13	5	6.5	6	7	75.9	37.0	37.0	6	12	59.5	6	12	36.5	6	7.5	6	6.5	78.4	191	203	7	6.5	61.0	5	12	5	6.5	0
12 FT	14	16	14	13	5	6	6	7	72.9	38.0	38.0	6	12	58.5	6	12	36.5	6	6.5	6	6.5	75.6	192	204	7	6.5	61.0	5	12	5	6	0
14 FT	15	18	14	13	6	6	6	6	77.1	39.0	39.0	7	16	69.0	7	16	47.0	6	6.5	6	6	75.3	194	206	7	7	61.0	5	12	5	6	0
16 FT	16	19	15	13	6	7.5	6	6	76.0	40.0	40.0	7	15	68.0	7	15	47.0	6	6.5	6	6	73.3	195	207	7	6.5	61.0	5	12	6	8	0
18 FT	18	20	16	13	6	7	6	6	76.0	42.0	42.0	7	15	67.5	7	15	47.0	6	6	6	6	71.6	196	208	7	6.5	61.0	5	12	6	8	0
20 FT	19	22	16	13	6	6.5	7	8	80.4	43.0	49.0	7	15	67.5	7	15	47.0	6	6	7	7.5	74.5	198	210	7	7	61.0	5	12	6	8	0
22 FT	20	23	17	13	6	6.5	7	8	79.9	44.0	50.0	7	14	67.0	7	14	46.5	6	6	7	7.5	73.9	199	211	7	6.5	61.0	5	12	6	7.5	0
24 FT	21	24	17	13	6	6	7	7.5	79.6	45.0	51.0	7	14	66.5	7	14	46.5	7	7	7	7	73.6	200	212	7	6.5	61.0	5	12	6	7.5	0
26 FT	23	26	18	13	7	7.5	7	7.5	80.1	47.0	53.0	7	15	65.5	7	15	46.0	7	8	7	8	73.9	202	214	7	6.5	61.0	5	12	6	7	0
28 FT	23	27	19	13	7	7.5	7	7.5	80.0	47.0	47.0	7	14	65.0	7	14	46.0	7	7.5	6	6	70.9	203	215	7	6	61.0	5	12	6	6.5	0
30 FT	24	28	19	13	7	7.5	7	7.5	77.8	48.0	48.0	7	14	64.5	7	14	46.0	7	7.5	6	6	68.5	204	216	7	6	61.0	5	12	6	6.5	0
32 FT	25	29	19	13	7	7	7	7	77.8	49.0	49.0	7	14	63.5	7	14	45.5	7	7.5	6	6	68.6	205	217	8	7.5	67.0	5	12	6	6.5	0
34 FT	26	30	20	13	7	7	7	7	78.3	50.0	50.0	7	13	63.0	7	13	44.5	7	6.5	6	6	68.9	206	218	8	7.5	67.0	5	12	6	6.5	0
36 FT	27	32	21	13	7	6.5	7	7	78.9	51.0	51.0	7	13	62.0	7	13	43.5	7	7	6	6	69.4	208	220	8	7	67.0	5	12	6	6	0
38 FT	28	33	22	13	7	6.5	7	7	79.4	52.0	58.0	7	12	61.0	7	12	43.0	7	7	7	7.5	72.6	209	221	8	6.5	67.0	5	12	6	6	0
40 FT	29	34	22	13	7	6.5	7	6.5	79.5	59.0	59.0	7	12	60.0	7	12	42.0	7	7	7	7.5	72.9	210	222	8	6.5	67					

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

		SPAN (S) = 14 FT										HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT																						
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																			
	TS	BS	TX	T1	J3 BARS			H1 BARS		H2 BARS		J4 BARS			H3 BARS		B1 BARS		B2 BARS															
					SIZE	SPA.	SIZE SPA.	C1	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C7	SIZE	SPA.	C1					
1 FT	15	11	8	8	6	8	5	8	69.3	31.0	35.0	35.0	6	16	137.5	6	16	46.5	5	6.5	5	6	57.8	91	103	115	6	6	63.0	5	12	5	12	12
2 FT	15	12	8	8	6	8	5	8	69.3	35.0	35.0	35.0	6	16	137.5	6	16	48.0	5	6	5	6.5	52.5	92	104	116	6	6	62.5	5	12	5	12	12
4 FT	12	11	8	8	6	7.5	5	6	48.0	32.0	32.0	32.0	6	12	86.0	6	12	39.5	5	6.5	6	7	49.3	91	103	115	7	6	64.5	5	12	5	12	12
6 FT	12	13	8	8	6	8	6	7.5	47.6	32.0	32.0	32.0	7	15	74.0	7	15	41.0	5	6	6	7	49.9	93	105	117	7	6.5	64.5	5	12	5	12	12
8 FT	13	14	8	8	5	6	5	6.5	41.1	33.0	33.0	33.0	7	15	68.5	7	15	40.0	6	6	5	7.5	39.1	94	106	118	7	6.5	64.0	5	12	5	12	0
10 FT	14	15	8	8	6	8	5	6.5	38.6	34.0	34.0	34.0	7	14	66.5	7	14	39.5	6	7.5	5	7.5	37.4	95	107	119	7	6	63.5	5	12	5	12	0
12 FT	16	17	8	8	6	8	5	6.5	41.5	36.0	36.0	36.0	7	14	73.0	7	14	47.5	6	7	5	7	36.1	97	109	121	7	6.5	63.5	5	12	5	11	0
14 FT	17	18	8	8	6	7.5	5	6	40.3	37.0	37.0	37.0	7	14	72.5	7	14	47.0	6	6.5	5	6.5	35.1	98	110	122	7	6.5	63.0	5	12	5	10	0
16 FT	18	20	8	8	6	7	6	8	43.4	38.0	38.0	38.0	7	13	71.5	7	13	47.0	6	6	5	6	34.4	100	112	124	7	6.5	63.0	5	12	5	9.5	0
18 FT	20	21	8	8	6	6.5	6	7.5	42.4	44.0	44.0	44.0	7	13	71.0	7	13	46.5	6	6	7.5	37.0	101	113	125	7	6.5	63.0	5	12	5	9.5	0	
20 FT	21	22	8	8	6	6	6	7	41.8	45.0	45.0	45.0	7	13	70.5	7	13	46.5	7	7.5	6	7	36.5	102	114	126	7	6	63.0	5	12	5	9	0
22 FT	23	24	8	8	7	7.5	6	6	41.3	47.0	47.0	47.0	7	13	69.5	7	13	46.5	7	7.5	6	6	36.4	104	116	128	7	6	63.0	5	12	5	8	0
24 FT	24	26	9	8	7	7.5	6	7	42.1	48.0	48.0	48.0	7	13	69.0	7	13	46.0	7	7.5	6	6.5	36.8	106	118	130	7	6.5	63.0	5	12	5	8.5	0
26 FT	25	27	9	8	7	7	6	6.5	41.9	49.0	49.0	49.0	7	12	68.5	7	12	46.0	7	7.5	6	6.5	36.6	107	119	131	7	6	63.0	5	12	5	8	0
28 FT	26	28	9	8	7	7	6	6	41.8	50.0	50.0	50.0	7	12	68.0	7	12	46.0	7	7.5	6	6	36.6	108	120	132	7	6	63.0	5	12	5	7.5	0
30 FT	27	29	9	8	7	6.5	6	6	41.1	51.0	51.0	51.0	7	12	67.0	7	12	45.5	7	7	6	6	35.4	109	121	133	8	7.5	68.5	5	12	5	7.5	0
32 FT	28	31	10	8	7	6.5	6	6.5	41.8	52.0	52.0	52.0	7	12	66.0	7	12	45.0	7	7	6	6	35.9	111	123	135	8	7	68.5	5	12	5	8	0
34 FT	29	32	10	8	7	6	6	6.5	41.8	53.0	53.0	53.0	7	12	65.5	7	12	44.5	7	7	6	6	36.0	112	124	136	8	7	68.5	5	12	5	7.5	0
36 FT	31	33	10	8	7	6	6	6	41.8	55.0	55.0	55.0	8	15	71.5	8	15	50.5	7	7	7	6.5	39.4	113	125	137	8	6.5	68.5	5	12	5	6.5	0
38 FT	31	34	11	8	8	7	6	6.5	42.3	55.0	55.0	55.0	8	14	71.5	8	14	51.0	7	6.5	6	6	36.8	114	126	138	8	6.5	68.5	5	12	5	7.5	0
40 FT	33	35	11	8	8	7.5	6	6	42.3	57.0	57.0	57.0	8	14	69.5	8	14	49.0	7	6	6	6	37.0	115	127	139	8	6.5	68.5	5	12	5	7	0
42 FT	33	37	11	8	8	7	6	6	42.3	57.0	57.0	57.0	8	14	69.5	8	14	49.5	7	6.5	7	6.5	40.1	117	129	141	8	6	68.5	5	12	5	6.5	0
44 FT	34	38	12	8	8	7	6	6.5	43.3	58.0	58.0	58.0	8	14	69.0	8	14	48.5	7	6.5	6	6	37.6	118	130	142	8	6	68.5	5	12	5	7	0
46 FT	35	39	12	8	8	6.5	6	6.5	43.1	59.0	59.0	59.0	8	13	68.5	8	13	47.5	7	6.5	6	6	37.9	119	131	143	8	6	68.5	5	12	5	6.5	0
48 FT	36	40	12	8	8	6.5	6	6.5	43.1	60.0	60.0	60.0	8	13	67.5	8	13	46.5	7	6.5	6	6	38.1	120	132	144	9	7	74.5	5	11.5	5	6	0
50 FT	37	41	12	8	8	6.5	6	6	43.3	61.0	61.0	61.0	8	13	67.0	8	13	46.5	7	6	7	6.5	41.3	121	133	145	9	7	74.5	5	8.5	6	8	0

		SPAN (S) = 14 FT										HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT																							
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																				
	TS	BS	TX	T1	J3 BARS			H1 BARS		H2 BARS		J4 BARS			H3 BARS		B1 BARS		B2 BARS																
					SIZE	SPA.	SIZE SPA.	C1	HT=10'	HT=11'	HT=12'	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	C4	HT=10'	HT=11'	HT=12'	SIZE	SPA.	C7	SIZE	SPA.	C1						
1 FT	15	12	8	10	6	8	5	7	69.6	35.0	35.0	35.0	6	16	138.5	6	16	47.0	5	6.5	6	6	83.9	128	140	152	6	6.5	63.5	5	12	5	9.5	12	
2 FT	15	13	8	10	6	8	5	6.5	69.6	35.0	35.0	35.0	6	16	138.5	6	16	48.0	5	6	6	6	77.4	129	141	153	6	6.5	63.0	5	12	5	9.5	12	
4 FT	12	12	10	10	6	8	5	6	70.1	32.0	32.0	32.0	6	13	85.5	6	13	40.0	5	6	6	7	65.5	128	140	152	7	6.5	65.5	5	10	5	9.5	12	
6 FT	12	13	10	10	6	8.5	5	6	58.6	32.0	32.0	32.0	6	12	69.0	6	12	38.0	5	6	6	7	60.8	129	141	153	7	6.5	64.5	5	12	5	9.5	12	
8 FT	13	14	10	10	5	6	6	7	57.1	33.0	33.0	37.0	7	15	68.0	7	15	40.5	6	8	6	7	57.4	130	142	154	7	6.5	64.0	5	12	5	9	0	
10 FT	14	16	10	10	5	6	6	7	54.4	34.0	34.0	34.0	7	15	66.5	7	15	40.0	6	7	5	6	52.0	132	144	156	7	6.5	64.0	5	12	5	8	0	
12 FT	15	17	10	10	6	8	6	7	58.6	35.0	35.0	39.0	7	14	73.0	7	14	48.0	6	7	6	7.5	53.1	133	145	157	7	6.5	63.5	5	12	5	8	0	
14 FT	17	18	10	10	6	7.5	6	7	57.1	37.0	37.0	41.0	7	14	72.5	7	14	47.5	6	6.5	6	6.5	52.0	134	146	158	7	6.5	63.5	5	12	5	8	0	
16 FT	18	20	11	10	6	7	6	7	57.0	38.0	38.0	42.0	7	14	71.5	7	14	47.5	6	6	8	5	51.5	136	148	160	7	6.5	63.5	5	12	5	7.5	0	
18 FT	19	21	12	10	6	6.5	6	7	56.9	39.0	39.0	43.0	7	13	71.0	7	13	47.5	6	6	8	5	51.1	137	149	161	7	6.5	63.5	5	12	5	7	0	
20 FT	21	23	12	10	6	6	6	7	56.1	41.0	41.0	45.0	7	13	70.5	7	13	47.0	7	6	8	5	50.8	139	151	163	7	6.5	63.5	5	12	5	7	0	
22 FT	22	24	12	10	6	6	6.5	6.5	55.5	42.0	42.0	46.0	7	13	70.0	7	13	47.0	7	7.5	6	7.5	50.1	140	152	164	7	6.5	63.5	5	12	5	7	0	
24 FT	23	26	13	10	7	7	6	6.5	55.9	43.0	43.0	47.0	7	12	69.5	7	12	47.0	7	7.5	6	8	5	50.3	142	154	166	7	6.5	63.5	5	12	5	6.5	0
26 FT	25	27	13	10	7	7	6	6.5	55.5	45.0	45.0	49.0	7	13	68.5	7	13	46.5	7	7.5	6	8	5	50.3	143	155	167	7	6	63.5	5	12	5	6.5	0
28 FT	26	29	14	10	7	7	6	6.5	56.3	46.0	50.0	50.0	7	13	67.5	7	13	46.5	7	7.5	6	8.5	50.5	145	157	169	8	7.5	69.5	5	12	5	6	0	
30 FT	27	30	14	10	7	6.5	6	6.5	56.0	47.0	51.0	51.0	7	13	67.0	7	13	46.0	7	7	6	8	50.5	146	158	170	8	7.5	69.5	5	12	5	6	0	
32 FT	28	31	14	10	7	6.5	6	6.5	54.3	52.0	52.0	52.0	7	12	66.0	7	12	45.5	7	7	6	7.5	48.9	147	159	171	8	7	69.5	5	12	5	6	0	
34 FT	29	32	14	10	7	6	6	6	54.1	53.0	53.0	53.0	7	12	65.0	7	12	44.5																	

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

		SPAN (S) = 14 FT										HEIGHT (HT) = 13 FT OR 14 FT																					
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																		
	TS	BS	TX	TI	A1 BARS		J3 BARS			H1 BARS		H2 BARS			A2 BARS		J4 BARS			B1 BARS	B2 BARS												
					SIZE	SPA.	SIZE	SPA.	C1	H1	SPA.	C5	SIZE	H2	SPA.	C6	SIZE	SPA.	C4			SIZE	SPA.	C7									
1 FT	15	12	9	11	6	8	5	6	70.4	35.0	35.0	6	16	139.0	6	16	47.0	5	6	6	6	96.1	164	176	6	6	64.0	5	12	5	8.5	12	
2 FT	15	13	10	11	6	8	5	6	71.0	35.0	35.0	6	16	139.5	6	16	47.5	5	6	6	6	96.5	164	176	6	6.5	63.5	5	12	5	8	12	
4 FT	12	12	10	11	6	7.5	6	7.5	100.0	36.0	36.0	6	13	84.5	6	13	40.0	5	6	6	6	77.9	164	176	7	6.5	65.0	5	12	5	8	12	
6 FT	12	13	10	11	6	8	6	7	14.8	36.0	36.0	6	12	69.0	6	12	39.0	5	6	6	6	72.4	165	177	7	6.5	65.0	5	12	5	8	12	
8 FT	13	14	11	11	5	6	6	6	68.4	37.0	37.0	7	16	68.0	7	16	41.0	6	8	6	6	7	68.4	166	178	7	6	64.0	5	12	5	7.5	0
10 FT	14	16	11	11	5	6	6	6	65.4	38.0	38.0	7	15	66.0	7	15	40.5	6	7	6	6	6	66.8	168	180	7	6.5	64.0	5	12	5	7.5	0
12 FT	15	17	12	11	6	8	6	6	69.4	39.0	39.0	7	14	73.0	7	14	48.0	6	7	6	6	7	64.6	169	181	7	6.5	64.0	5	12	5	7	0
14 FT	17	18	12	11	6	7.5	6	6.5	67.9	41.0	41.0	7	15	72.0	7	15	48.0	6	6	6	6	6	63.0	170	182	7	6	63.5	5	12	5	7	0
16 FT	18	20	13	11	6	7	6	6.5	66.9	42.0	42.0	7	14	71.5	7	14	47.5	6	6	6	6	7	62.1	172	184	7	6.5	63.5	5	12	5	6.5	0
18 FT	19	21	13	11	6	6.5	6	6	65.6	43.0	43.0	7	13	71.0	7	13	47.5	7	8	6	6	6	61.0	173	185	7	6.5	63.5	5	12	5	6.5	0
20 FT	21	23	14	11	6	6	6	6	65.4	45.0	45.0	7	14	70.0	7	14	47.5	7	8	6	6	7	60.6	175	187	7	6.5	63.5	5	12	5	6	0
22 FT	22	24	14	11	6	6	7	8	69.4	46.0	46.0	7	13	69.0	7	13	47.0	7	7	6	6	6	59.8	176	188	7	6.5	63.5	5	12	5	6	0
24 FT	23	26	15	11	7	7.5	7	8	69.5	47.0	47.0	7	13	69.0	7	13	47.0	7	7.5	6	6	7	59.5	178	190	7	6.5	63.5	5	12	6	8	0
26 FT	24	27	15	11	7	7	7	7.5	69.0	48.0	48.0	7	13	68.5	7	13	47.0	7	7	6	6	6.5	59.3	179	191	7	6	63.5	5	12	6	8	0
28 FT	25	29	16	11	7	6.5	7	7.5	69.5	49.0	49.0	7	13	67.5	7	13	46.5	7	7	6	7	6	59.5	181	193	8	7.5	69.5	5	12	6	8	0
30 FT	27	30	16	11	7	6.5	7	7	69.3	51.0	51.0	7	13	66.0	7	13	45.5	7	7	6	6	6.5	59.5	182	194	8	7.5	69.5	5	12	6	8	0
32 FT	28	31	16	11	7	6.5	7	7.5	67.1	52.0	52.0	7	12	65.0	7	12	44.5	7	7	6	7	6	57.1	183	195	8	7	69.5	5	12	6	8	0
34 FT	29	32	17	11	7	6	7	7.5	67.8	53.0	53.0	7	12	64.0	7	12	44.0	7	6.5	6	7	6	57.5	184	196	8	7	69.5	5	12	6	7.5	0
36 FT	30	34	17	11	7	6	7	6.5	67.8	54.0	54.0	7	12	63.0	7	12	43.0	7	7	6	7	6	57.6	186	198	8	6.5	69.5	5	12	6	7.5	0
38 FT	31	35	18	11	7	6	7	7	68.5	55.0	55.0	8	15	70.0	8	15	50.5	7	6.5	6	6.5	58.0	187	199	8	6.5	69.5	5	12	6	7	0	
40 FT	32	36	18	11	8	7.5	7	6.5	68.4	56.0	56.0	8	14	69.0	8	14	49.5	7	6.5	6	6.5	58.1	188	200	8	6	69.5	5	12	6	7	0	
42 FT	33	37	19	11	8	7	7	7	69.1	57.0	57.0	8	14	69.0	8	14	48.5	7	6.5	6	6.5	58.5	189	201	8	6	69.5	5	12	6	6.5	0	
44 FT	33	38	20	11	8	7	7	7	69.9	57.0	57.0	8	14	69.0	8	14	49.0	7	6	6	6	6	58.9	190	202	8	6	69.5	5	12	6	6.5	0
46 FT	34	39	20	11	8	7	7	6	69.8	58.0	58.0	8	14	68.5	8	14	48.5	7	6	6	6	6	59.0	191	203	8	6	69.5	5	12	6	6.5	0
48 FT	35	41	21	11	8	6.5	7	6.5	70.6	65.0	65.0	8	13	68.0	8	13	47.5	7	6	7	8	6	62.5	193	205	9	7	75.5	5	12	6	6	0
50 FT	36	42	22	11	8	6.5	7	6.5	71.4	66.0	66.0	8	14	67.0	8	14	47.5	7	6	7	7.5	6	63.0	194	206	9	7	75.5	5	12	6	6	0

		SPAN (S) = 14 FT										HEIGHT (HT) = 15 FT OR 16 FT																					
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																		
	TS	BS	TX	TI	A1 BARS		J3 BARS			H1 BARS		H2 BARS			A2 BARS		J4 BARS			B1 BARS	B2 BARS												
					SIZE	SPA.	SIZE	SPA.	C1	H1	SPA.	C5	SIZE	H2	SPA.	C6	SIZE	SPA.	C4			SIZE	SPA.	C7									
1 FT	15	13	12	13	6	8	5	6	72.6	35.0	35.0	6	16	141.0	6	16	46.0	5	6.5	6	7.5	102.3	189	201	6	6.5	64.5	5	12	5	7	12	
2 FT	15	13	12	13	6	8	6	8	75.6	35.0	35.0	6	16	144.0	6	16	47.5	5	6	6	7	95.8	189	201	6	6	63.5	5	12	5	7	12	
4 FT	12	12	12	13	6	8	6	7.5	118.3	36.0	36.0	6	13	86.5	6	13	40.0	5	6	6	6	86.6	188	200	7	6.5	65.5	5	12	5	7	12	
6 FT	12	13	12	13	5	6	6	7	86.4	36.0	36.0	6	12	68.0	6	12	39.0	5	6	6	6	83.0	189	201	7	6	65.0	5	12	5	7	12	
8 FT	13	13	13	13	5	6	6	7	78.9	37.0	37.0	6	12	64.5	6	12	38.0	6	7.5	6	6.5	80.3	191	203	7	6.5	64.5	5	12	5	6.5	0	
10 FT	14	16	13	13	5	6	6	6.5	75.0	38.0	38.0	7	15	66.0	7	15	41.0	6	7	6	6.5	77.3	192	204	7	6.5	64.5	5	12	5	6.5	0	
12 FT	15	17	14	13	6	8	6	6.5	78.5	39.0	39.0	7	15	73.0	7	15	48.5	6	6.5	6	6.5	74.1	193	205	7	6.5	64.0	5	12	5	6	0	
14 FT	16	19	14	13	6	8	6	6	77.0	40.0	40.0	7	14	72.0	7	14	48.5	6	6	6	6	73.6	195	207	7	6.5	64.0	5	12	5	6	0	
16 FT	18	20	15	13	6	7	6	6	76.5	42.0	42.0	7	14	71.5	7	14	48.5	6	6	6	6	72.1	196	208	7	6.5	64.0	5	12	6	8	0	
18 FT	19	21	15	13	6	6.5	7	7.5	80.5	43.0	43.0	7	14	71.0	7	14	48.5	7	8	7	7	74.1	197	209	7	6.5	64.0	5	12	6	8	0	
20 FT	20	23	16	13	6	6.5	7	7.5	79.9	44.0	44.0	7	13	70.5	7	13	48.0	7	7.5	7	8	73.8	199	211	7	6.5	64.0	5	12	6	8	0	
22 FT	22	25	17	13	6	7	7.5	79.8	46.0	46.0	7	14	69.5	7	14	48.0	7	7.5	6	6	6	70.5	201	213	7	6.5	64.0	5	12	6	7.5	0	
24 FT	23	26	18	13	7	7.5	7	7.5	79.5	47.0	47.0	7	13	69.0	7	13	47.5	7	7.5	6	6	6	69.9	202	214	7	6.5	64.0	5	12	6	7	0
26 FT	24	27	18	13	7	7.5	7	7	79.1	48.0	48.0	7	13	68.5	7	13	47.5	7	6.5	6	6	6	69.6	203	215	7	6	64.0	5	12	6	7	0
28 FT	25	29	19	13	7	7	7	7	79.5	49.0	49.0	7	13	68.0	7	13	47.5	7															

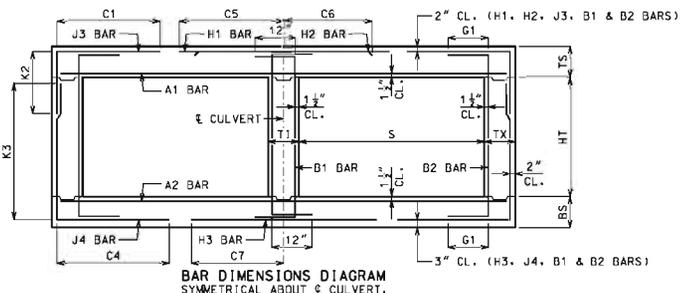
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 15 FT										HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT																						
		TOP SLAB BARS										BOTTOM SLAB BARS																						
DESIGN FILL	MEMBER THICKNESS			A1 BARS			J3 BARS				H1 BARS			H2 BARS			A2 BARS				H3 BARS			WALL BARS										
	TS	BS	TX	T1	SIZE	SPA.	SIZE	SPA.	C1	K2			SIZE	SPA.	C5	SIZE	SPA.	C6	K3		SIZE	SPA.	C7	B1 BARS	B2 BARS									
										HT=8'	HT=9'	HT=10'								HT=8'	HT=9'	HT=10'		SIZE	SPA.	SIZE	SPA.	C1						
1 FT	15	12	8	8	6	8	5	8	72.9	35.0	35.0	35.0	6	16	146.0	6	16	51.0	5	6	5	6	64.9	104	116	128	6	6	66.5	5	12	5	12	12
2 FT	17	13	8	8	6	7.5	5	6.5	72.9	37.0	37.0	37.0	6	14	146.0	6	14	45.5	5	6	5	6	57.8	105	117	129	6	6	65.5	5	12	5	12	12
4 FT	13	12	8	8	6	7	5	6	53.1	33.0	33.0	33.0	6	12	92.5	6	12	41.5	5	6	6	6.5	53.3	104	116	128	7	6	68.0	5	12	5	12	12
6 FT	13	13	8	8	6	7.5	6	7.5	50.4	33.0	33.0	33.0	7	15	78.5	7	15	42.5	5	6	6	7	48.9	105	117	129	7	6	67.0	5	12	5	12	12
8 FT	14	15	8	8	6	8	5	6	44.0	34.0	34.0	34.0	7	14	72.5	7	14	41.5	6	7.5	5	6.5	42.8	107	119	131	7	6	67.0	5	12	5	11	0
10 FT	15	16	8	8	6	7.5	6	8	50.5	35.0	35.0	35.0	7	13	78.0	7	13	49.0	6	7	5	6.5	40.9	108	120	132	7	6	66.5	5	12	5	10	0
12 FT	17	18	8	8	6	7.5	6	8	48.4	37.0	37.0	37.0	7	13	76.5	7	13	48.5	6	6.5	5	6	39.6	110	122	134	7	6	66.5	5	12	5	9.5	0
14 FT	18	19	8	8	6	7	6	7.5	47.0	38.0	38.0	42.0	7	13	75.5	7	13	48.5	6	6	6	8	41.5	111	123	135	7	6	66.5	5	12	5	9.5	0
16 FT	19	21	8	8	6	6	6	6.5	46.1	39.0	43.0	43.0	7	12	75.0	7	12	48.0	6	6	6	7	40.8	113	125	137	7	6	66.5	5	12	5	9	0
18 FT	21	22	9	8	6	6	6	7.5	46.0	41.0	41.0	41.0	7	12	74.0	7	12	48.0	7	7.5	5	6	37.8	114	126	138	7	6	66.0	5	12	5	8.5	0
20 FT	22	24	9	8	6	6	6	6.5	45.5	42.0	42.0	46.0	7	12	73.5	7	12	47.5	7	7.5	6	7	40.3	116	128	140	7	6	66.0	5	12	5	8.5	0
22 FT	24	26	10	8	7	7.5	6	7.5	46.0	44.0	44.0	44.0	7	12	72.5	7	12	47.5	7	7.5	5	6	37.5	118	130	142	7	6	66.0	5	12	5	8	0
24 FT	25	27	11	8	7	7	6	8	46.5	45.0	45.0	45.0	7	12	71.5	7	12	47.0	7	6.5	5	6	37.5	119	131	143	8	7	72.0	5	12	5	7.5	0
26 FT	27	29	11	8	7	6.5	6	8	46.1	47.0	47.0	51.0	7	12	70.5	7	12	47.0	7	7	6	7.5	40.6	121	133	145	8	7	72.0	5	12	5	7.5	0
28 FT	28	30	11	8	7	6.5	6	7	45.9	52.0	52.0	52.0	7	12	69.5	7	12	46.5	7	6.5	6	7	40.5	122	134	146	8	7	72.0	5	12	5	7.5	0
30 FT	29	32	12	8	7	6	6	7.5	46.9	53.0	53.0	53.0	7	12	69.0	7	12	46.5	7	7	6	7.5	41.0	124	136	148	8	7	72.0	5	12	5	7	0
32 FT	30	33	12	8	7	6	6	7.5	45.4	54.0	54.0	54.0	7	12	67.5	7	12	46.0	7	6.5	6	7	39.5	125	137	149	8	6.5	72.0	5	12	5	7	0
34 FT	31	34	12	8	8	7.5	6	7.5	45.3	55.0	55.0	55.0	8	15	75.0	8	15	53.0	7	6.5	6	7	39.6	126	138	150	8	6.5	72.0	5	12	5	7	0
36 FT	32	36	12	8	8	7	6	7	45.4	56.0	56.0	56.0	8	14	73.5	8	14	52.5	7	6.5	6	6.5	39.9	128	140	152	8	6	72.0	5	12	5	7	0
38 FT	33	37	12	8	8	6.5	6	6.5	45.4	57.0	57.0	57.0	8	13	72.5	8	13	51.5	7	6.5	6	6.5	40.0	129	141	153	8	6	72.0	5	12	5	6.5	0
40 FT	35	38	12	8	8	6.5	6	6.5	45.1	59.0	59.0	59.0	8	13	71.0	8	13	49.5	7	6	6	6	40.3	130	142	154	8	6	71.5	5	12	5	6	0
42 FT	35	39	13	8	8	6	6	6.5	46.1	59.0	59.0	59.0	8	12	71.0	8	12	50.0	7	6	6	6	40.6	131	143	155	8	6	72.0	5	12	5	6.5	0
44 FT	36	41	13	8	8	6	6	6.5	46.3	60.0	60.0	60.0	8	12	70.5	8	12	49.0	7	6	7	7	43.9	133	145	157	9	7	77.5	5	12	5	6	0
46 FT	37	42	13	8	8	6	6	6	46.3	61.0	61.0	61.0	8	12	70.0	8	12	48.0	7	6	7	7	44.1	134	146	158	9	7	77.5	5	6.5	6	8.5	0
48 FT	38	43	13	9	8	6	6	6	46.3	62.0	62.0	62.0	8	12	70.5	8	12	48.5	7	6	7	6.5	44.3	135	147	159	9	7	77.5	5	12	6	8	0
50 FT	39	44	14	9	8	6	6	6	47.1	63.0	63.0	63.0	8	12	70.0	8	12	47.5	8	7.5	7	7	44.8	136	148	160	9	6.5	77.5	5	12	6	8	0

		SPAN (S) = 15 FT										HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT																						
		TOP SLAB BARS										BOTTOM SLAB BARS																						
DESIGN FILL	MEMBER THICKNESS			A1 BARS			J3 BARS				H1 BARS			H2 BARS			A2 BARS				H3 BARS			WALL BARS										
	TS	BS	TX	T1	SIZE	SPA.	SIZE	SPA.	C1	K2			SIZE	SPA.	C5	SIZE	SPA.	C6	K3		SIZE	SPA.	C7	B1 BARS	B2 BARS									
										HT=11'	HT=12'	HT=13'								HT=11'	HT=12'	HT=13'		SIZE	SPA.	SIZE	SPA.	C1						
1 FT	15	12	9	10	6	8	5	6.5	73.9	35.0	35.0	35.0	6	16	147.0	6	16	51.0	5	6	6	6	88.3	140	152	164	6	6	67.0	5	12	5	8.5	12
2 FT	17	13	9	10	6	7.5	5	6.5	73.9	37.0	37.0	37.0	6	14	147.0	6	14	46.0	5	6	6	6	80.4	141	153	165	6	6	66.0	5	12	5	8.5	12
4 FT	13	12	9	10	6	7	6	6	85.5	33.0	37.0	37.0	6	12	96.0	6	12	42.0	5	6	6	6	70.6	140	152	164	7	6	68.5	5	12	5	8.5	12
6 FT	13	14	10	10	6	8	6	7	67.4	33.0	33.0	37.0	7	15	76.5	7	15	43.0	6	8	6	6.5	66.0	142	154	166	7	6.5	68.0	5	12	5	8	12
8 FT	14	15	10	10	6	8	6	6.5	62.0	34.0	34.0	38.0	7	14	72.0	7	14	42.0	6	7.5	6	6.5	62.1	143	155	167	7	6	67.0	5	12	5	8	0
10 FT	15	17	10	10	6	8	6	6.5	64.6	35.0	35.0	39.0	7	14	78.0	7	14	49.5	6	7	6	6.5	59.6	145	157	169	7	6.5	67.0	5	12	5	8	0
12 FT	16	18	11	10	6	7.5	6	6.5	62.6	36.0	36.0	40.0	7	13	76.5	7	13	49.0	6	6.5	6	7.5	57.4	146	158	170	7	6	67.0	5	12	5	7.5	0
14 FT	18	20	12	10	6	7	6	7	62.0	38.0	38.0	42.0	7	13	75.5	7	13	49.0	6	6	8	8	56.4	148	160	172	7	6.5	67.0	5	12	5	7	0
16 FT	19	21	12	10	6	6.5	6	6.5	60.9	39.0	39.0	43.0	7	13	74.5	7	13	48.5	7	8	6	7.5	55.4	149	161	173	7	6	66.5	5	12	5	7	0
18 FT	21	22	12	10	6	6	6	6.5	59.8	41.0	45.0	45.0	7	13	74.0	7	13	48.5	7	7	6	6	54.6	150	162	174	7	6	66.5	5	12	5	7	0
20 FT	22	24	13	10	6	6	6	6.5	59.9	42.0	42.0	46.0	7	12	73.5	7	12	48.5	7	7	6	7.5	54.4	152	164	176	7	6	66.5	5	12	5	6.5	0
22 FT	23	26	13	10	7	7	6	6	59.3	43.0	43.0	47.0	7	12	72.5	7	12	48.0	7	7	6	7	53.9	154	166	178	7	6	66.5	5	12	5	6.5	0
24 FT	25	28	14	10	7	6	6	6	59.5	45.0	45.0	49.0	7	12	71.5	7	12	48.0	7	6	7.5	54.0	156	168	180	7	6	66.5	5	12	5	6	0	
26 FT	26	29	14	10	7	6.5	6	6	59.0	50.0	50.0	50.0	7	12	71.0	7	12	47.5	7	6	7.5	53.6	157	169	181	8	7	72.5	5	12	5	6	0	
28 FT	27	31	15	10	7	6	6	6	59.6	51.0	51.0	51.0	7	12	70.5	7	12	47.5	7	6	7.5	53.9	159	171	183	8	7	72.5	5	12	6	8	0	
30 FT	29	32	15	10	7	6	7	8	64.3	53.0	53.0	53.0	7	12	69.0	7	12	47.0	7	6.5	6	7.5	54.0	160	172	184	8	7	72.5	5	12	6	8	0
32 FT	30	33	16	10	7	6	6	6	59.9	54.0	54.0	54.0	7	12	68.0	7	12	46.5	7	6	6	7	54.3	161	173	185	8	6.5	72.					

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

DESIGN FILL	SPAN (S) = 15 FT												HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT																					
	TOP SLAB BARS												BOTTOM SLAB BARS																					
	MEMBER THICKNESS			J3 BARS						H1 BARS			H2 BARS			J4 BARS						WALL BARS												
	TS	BS	TX	T1	SIZE	SPA.	SIZE	SPA.	C1	HT=14	HT=15	HT=16	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=14	HT=15	HT=16	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.
1 FT	15	13	12	13	6	8	6	8.5	79.3	35.0	35.0	39.0	6	16	152.5	6	16	50.0	5	6	6	7	102.4	177	189	201	6	6	67.5	5	11	5	7	12
2 FT	16	14	12	13	6	7.5	5	6	76.3	36.0	36.0	36.0	6	15	149.5	6	15	48.5	6	8	6	7.5	96.3	178	190	202	6	6	67.0	5	12	5	7	12
4 FT	12	13	12	13	6	7	6	7	101.4	36.0	36.0	36.0	6	12	86.5	6	12	41.5	5	6	6	6.5	88.5	177	189	201	7	6.5	69.0	5	10.5	5	7	12
6 FT	13	14	12	13	6	8	6	6.5	86.3	37.0	37.0	37.0	7	16	74.5	7	16	43.5	6	8	6	6.5	82.9	178	190	202	7	6	68.0	5	12	5	7	12
8 FT	13	15	13	13	6	8	6	6.5	76.4	37.0	37.0	37.0	7	14	70.5	7	14	42.5	6	7.5	6	6.5	77.9	179	191	203	7	6	68.0	5	12	5	6.5	0
10 FT	15	17	13	13	6	8	6	6	80.6	39.0	39.0	39.0	7	14	77.5	7	14	50.5	6	7	6	6.5	76.0	181	193	205	7	6.5	67.5	5	12	5	6.5	0
12 FT	16	18	14	13	6	8	6	6	78.4	40.0	40.0	40.0	7	14	76.5	7	14	50.0	6	6.5	6	6.5	73.8	182	194	206	7	6	67.5	5	12	5	6	0
14 FT	17	20	14	13	6	7.5	7	7.5	81.6	41.0	41.0	41.0	7	13	75.5	7	13	50.0	6	6	6	6	72.9	184	196	208	7	6	67.5	5	12	5	6	0
16 FT	19	21	15	13	6	6.5	7	8	80.9	43.0	43.0	49.0	7	13	75.0	7	13	49.5	7	8	7	8	74.4	185	197	209	7	6	67.0	5	12	6	8	0
18 FT	20	23	16	13	6	6.5	7	8	80.1	44.0	44.0	44.0	7	13	74.0	7	13	49.5	7	7.5	6	6	70.8	187	199	211	7	6	67.0	5	12	6	8	0
20 FT	21	24	17	13	6	6	7	7.5	79.5	45.0	45.0	45.0	7	12	73.5	7	12	49.5	7	7	6	6	69.8	188	200	212	7	6	67.0	5	12	6	7.5	0
22 FT	23	26	17	13	7	7.5	7	7.5	78.9	47.0	47.0	47.0	7	12	73.0	7	12	49.0	7	7	6	6	69.4	190	202	214	7	6	67.0	5	12	6	7.5	0
24 FT	24	28	18	13	7	7	7	7.5	78.6	48.0	48.0	48.0	7	12	72.5	7	12	49.0	7	7	6	6.5	69.0	192	204	216	7	6	67.0	5	12	6	7	0
26 FT	26	29	18	13	7	7	7	7	78.1	50.0	50.0	50.0	7	12	71.5	7	12	49.0	7	6	6	6	68.5	193	205	217	8	7	73.0	5	12	6	7	0
28 FT	27	31	19	13	7	6.5	7	7	78.5	51.0	51.0	51.0	7	12	71.0	7	12	48.5	7	6.5	6	6	68.6	195	207	219	8	7	73.0	5	12	6	6.5	0
30 FT	28	32	19	13	7	6	7	6	78.1	52.0	52.0	52.0	7	12	70.5	7	12	48.5	7	6.5	6	6	68.5	196	208	220	8	7	73.0	5	12	6	6.5	0
32 FT	30	34	20	13	7	6	7	6.5	78.8	54.0	54.0	54.0	7	12	69.0	7	12	47.0	7	6.5	6	6	68.9	198	210	222	8	6.5	73.0	5	12	6	6.5	0
34 FT	31	35	20	13	7	6	7	6.5	76.3	55.0	55.0	55.0	8	15	76.0	8	15	54.0	7	6.5	6	6	66.4	199	211	223	8	6.5	73.0	5	12	6	6.5	0
36 FT	32	36	21	13	8	7.5	7	6.5	76.8	56.0	56.0	56.0	8	14	75.0	8	14	53.5	7	6	6	6	66.6	200	212	224	8	6	73.0	5	12	6	6	0
38 FT	33	37	21	13	8	7	7	6	76.8	57.0	57.0	57.0	8	14	74.0	8	14	53.0	7	6	6	6	66.6	201	213	225	8	6	73.0	5	12	6	6	0
40 FT	34	39	22	13	8	7	7	6	77.5	58.0	58.0	64.0	8	14	73.0	8	14	52.0	7	6	7	7.5	70.1	203	215	227	8	6	73.0	5	12	6	6	0
42 FT	35	40	23	13	8	7	7	6.5	78.1	59.0	59.0	65.0	8	13	72.5	8	13	51.0	7	6	7	7.5	70.4	204	216	228	9	7	79.0	5	12	7	7.5	0
44 FT	35	41	24	13	8	6	7	6	78.9	65.0	65.0	65.0	8	12	72.5	8	12	52.0	8	7.5	7	7	70.6	205	217	229	9	7	79.5	5	12	7	8	0
46 FT	36	42	25	13	8	6	7	6	79.5	66.0	66.0	66.0	8	12	72.0	8	12	51.0	8	7	7	7.5	70.9	206	218	230	9	7	79.5	5	12	7	8	0
48 FT	37	43	26	13	8	6.5	7	6	80.3	67.0	67.0	67.0	8	12	71.5	8	12	50.0	8	6.5	7	7.5	71.3	207	219	231	9	7	79.5	5	12	7	8	0
50 FT	38	45	27	13	8	6	7	6	81.1	68.0	68.0	68.0	8	12	71.0	8	12	49.0	8	7	7	7	71.8	209	221	233	9	6.5	79.5	5	12	7	8	0



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

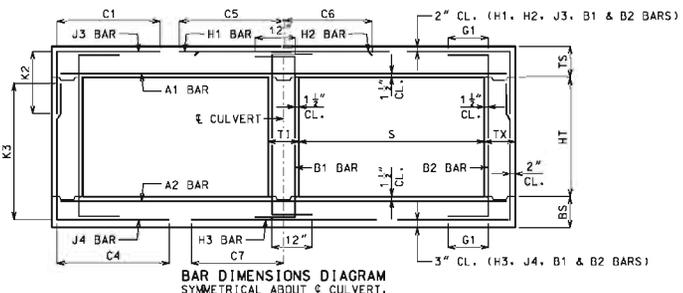
DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE DOUBLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 15 FEET HEIGHT (HT): 14 THRU 16 FEET		SHEET NO. 25 OF 27
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011	703.47	

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

DESIGN FILL	SPAN (S) = 16 FT												HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT																					
	TOP SLAB BARS												BOTTOM SLAB BARS																					
	MEMBER THICKNESS				J3 BARS				H1 BARS				H2 BARS				A2 BARS				J4 BARS				H3 BARS				WALL BARS					
	TS	BS	TX	T1	SIZE	SPA.	SIZE	SPA.	C1	HT=14	HT=15	HT=16	SIZE	SPA.	C5	SIZE	SPA.	C6	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=14	HT=15	HT=16	SIZE	SPA.	C7	SIZE	SPA.	SIZE	SPA.
1 FT	15	13	12	13	6	7.5	6	8	82.9	35.0	35.0	39.0	6	15	160.5	6	15	53.0	5	6	6	7	101.1	177	189	201	6	6	70.5	5	10	5	7	12
2 FT	17	14	12	13	6	7.5	6	8.5	82.9	37.0	37.0	41.0	6	14	160.5	6	14	50.0	6	8	6	7	95.1	178	190	202	7	7	73.0	5	12	5	7	12
4 FT	13	13	12	13	6	7	6	7	99.8	37.0	37.0	37.0	7	15	94.0	7	15	46.0	6	8.5	6	6	86.1	177	189	201	7	6	72.0	5	11	5	7	12
6 FT	13	15	12	13	6	7	6	6.5	82.6	37.0	37.0	37.0	7	14	77.5	7	14	44.5	6	7.5	6	6.5	82.5	179	191	203	7	6	71.5	5	12	5	7	12
8 FT	14	16	13	13	6	7.5	6	6.5	76.6	38.0	38.0	38.0	7	13	74.5	7	13	44.0	6	7	6	6.5	77.6	180	192	204	7	6	71.0	5	12	5	6.5	0
10 FT	15	18	13	13	6	6.5	6	6	79.5	39.0	39.0	39.0	7	13	80.5	7	13	51.5	6	6.5	6	6	75.6	182	194	206	7	6	71.0	5	12	5	6.5	0
12 FT	17	19	14	13	6	7	6	6	77.8	41.0	41.0	41.0	7	13	79.5	7	13	51.5	6	6	6	6	73.1	183	195	207	7	6	70.5	5	12	5	6	0
14 FT	18	21	15	13	6	7	6	6	76.3	42.0	42.0	42.0	7	12	78.5	7	12	51.0	7	8	6	6	71.8	185	197	209	7	6	70.5	5	12	6	8	0
16 FT	20	22	15	13	6	6.5	7	7.5	79.9	44.0	44.0	44.0	7	12	78.0	7	12	51.0	7	7.5	6	6	70.3	186	198	210	7	6	70.0	5	12	6	8	0
18 FT	22	24	15	13	6	6	7	7	78.8	46.0	46.0	52.0	7	12	77.5	7	12	51.0	7	7	7	7	72.4	188	200	212	7	6	70.0	5	12	6	8	0
20 FT	23	25	16	13	7	7.5	7	7	78.0	47.0	47.0	53.0	8	15	85.0	8	15	58.5	7	6	7	7.5	71.4	189	201	213	8	7	76.0	5	12	6	8	0
22 FT	25	27	17	13	7	7	7	7.5	77.8	49.0	49.0	49.0	7	12	76.0	7	12	50.5	7	6	6	6	68.0	191	203	215	8	7	76.0	5	12	6	7.5	0
24 FT	26	29	17	13	7	7	7	7	76.9	50.0	50.0	56.0	8	15	83.5	8	15	58.5	7	6.5	7	7.5	70.4	193	205	217	8	7	76.0	5	12	6	7.5	0
26 FT	28	31	18	13	7	6.5	7	7	76.9	52.0	52.0	52.0	8	15	82.5	8	15	58.0	7	6.5	6	6	67.1	195	207	219	8	7	76.5	5	12	6	7	0
28 FT	29	33	19	13	7	6	7	7	77.1	53.0	53.0	53.0	8	15	82.0	8	15	58.0	7	6	6	6	67.1	197	209	221	8	6.5	76.5	5	12	6	6.5	0
30 FT	31	34	19	13	8	7.5	7	6.5	76.8	55.0	55.0	55.0	8	15	80.5	8	15	57.0	7	6	6	6	67.0	198	210	222	8	6.5	76.0	5	12	6	6.5	0
32 FT	32	36	20	13	8	7.5	7	6.5	77.3	56.0	56.0	56.0	8	14	79.5	8	14	56.5	7	6	6	6	67.3	200	212	224	8	6	76.5	5	12	6	6.5	0
34 FT	33	37	21	13	8	7	7	6.5	77.6	57.0	57.0	57.0	8	14	78.5	8	14	55.5	7	6	6	6	67.3	201	213	225	8	6	76.5	5	12	6	6	0
36 FT	34	38	21	13	8	7	7	6.5	75.5	58.0	58.0	58.0	8	14	77.5	8	14	55.0	8	7	6	6	64.9	202	214	226	8	6	76.5	5	12	6	6	0
38 FT	35	40	21	13	8	6.5	7	6	75.5	59.0	59.0	59.0	8	13	76.5	8	13	54.0	8	7.5	6	6	65.1	204	216	228	9	7	82.0	5	12	6	6	0
40 FT	36	41	22	13	8	6.5	7	6	76.1	66.0	66.0	66.0	8	13	75.5	8	13	53.5	8	7.5	7	7.5	68.5	205	217	229	9	7	82.0	5	12	6	6	0
42 FT	37	42	23	13	8	6.5	7	6.5	76.9	67.0	67.0	67.0	8	12	75.0	8	12	52.5	8	6.5	7	7.5	68.8	206	218	230	9	7	82.5	5	12	7	7.5	0
44 FT	38	44	24	13	8	6	7	6	77.6	68.0	68.0	68.0	8	12	74.5	8	12	52.0	8	7	7	7	69.4	208	220	232	9	6.5	82.5	5	12	7	7.5	0
46 FT	39	45	25	13	8	6	7	6	78.4	69.0	69.0	69.0	8	12	74.0	8	12	51.0	8	7	7	7	69.8	209	221	233	9	6.5	82.5	5	12	7	7.5	0
48 FT	40	46	26	13	8	6	7	6	79.1	70.0	70.0	70.0	8	12	73.5	8	12	50.0	8	6.5	7	7	70.1	210	222	234	9	6.5	82.5	5	12	7	8	0
50 FT	41	47	27	13	9	7.5	7	6	79.9	71.0	71.0	71.0	8	12	73.0	8	12	49.5	8	6	7	6.5	70.5	211	223	235	9	6	82.5	5	12	7	8	0



GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE DOUBLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 16 FEET HEIGHT (HT): 14 THRU 16 FEET	SHEET NO. 27 OF 27
	703.47	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/8/2011

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

LAYING OUT TRANSVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

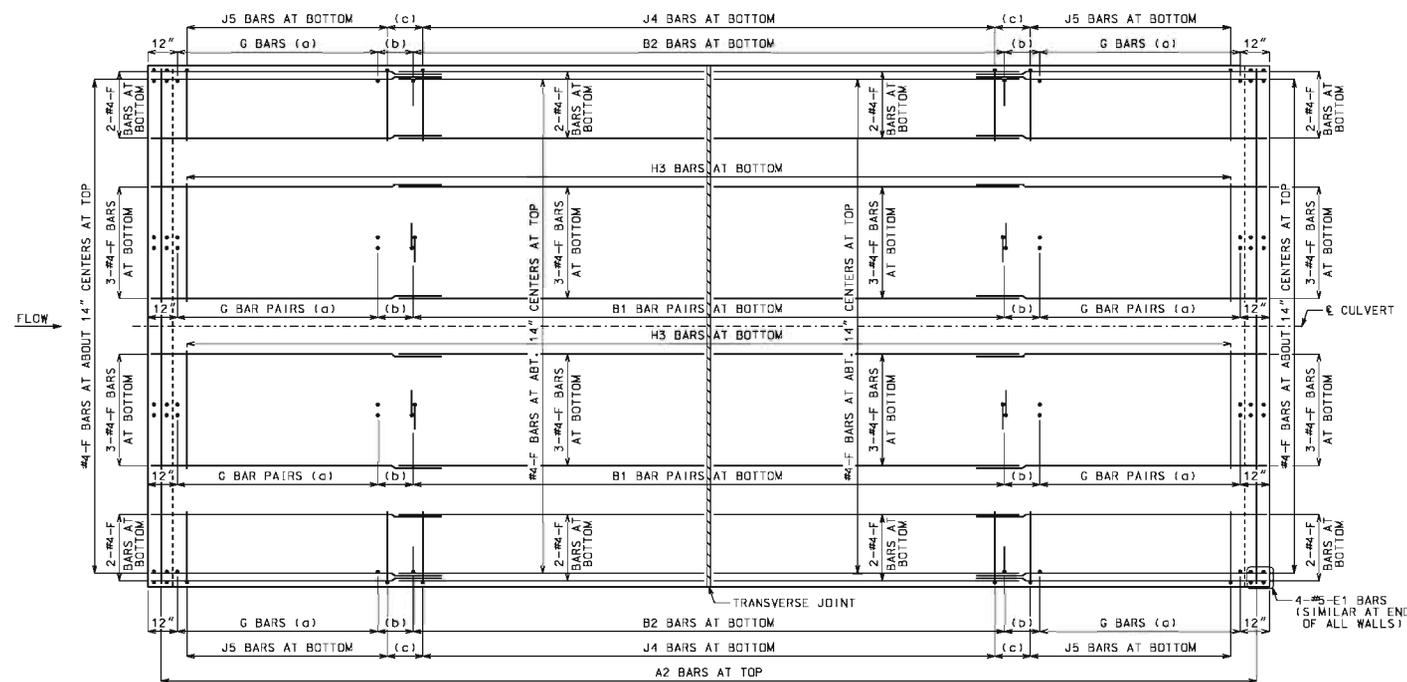
BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

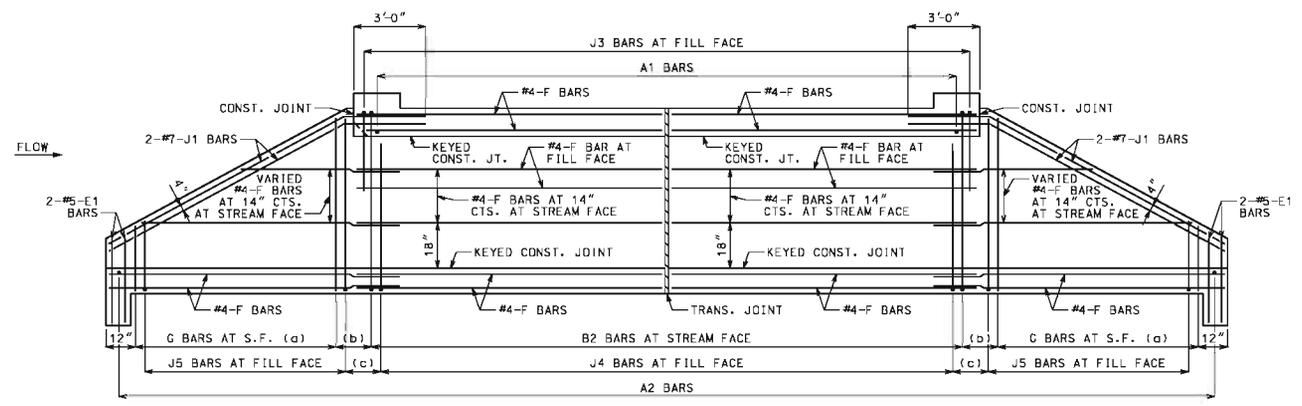
WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.86.



PLAN OF BOTTOM SLAB



ELEVATION OF EXTERIOR WALL

J1 BARS MAY BE BENT IN FIELD OR SHOP.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

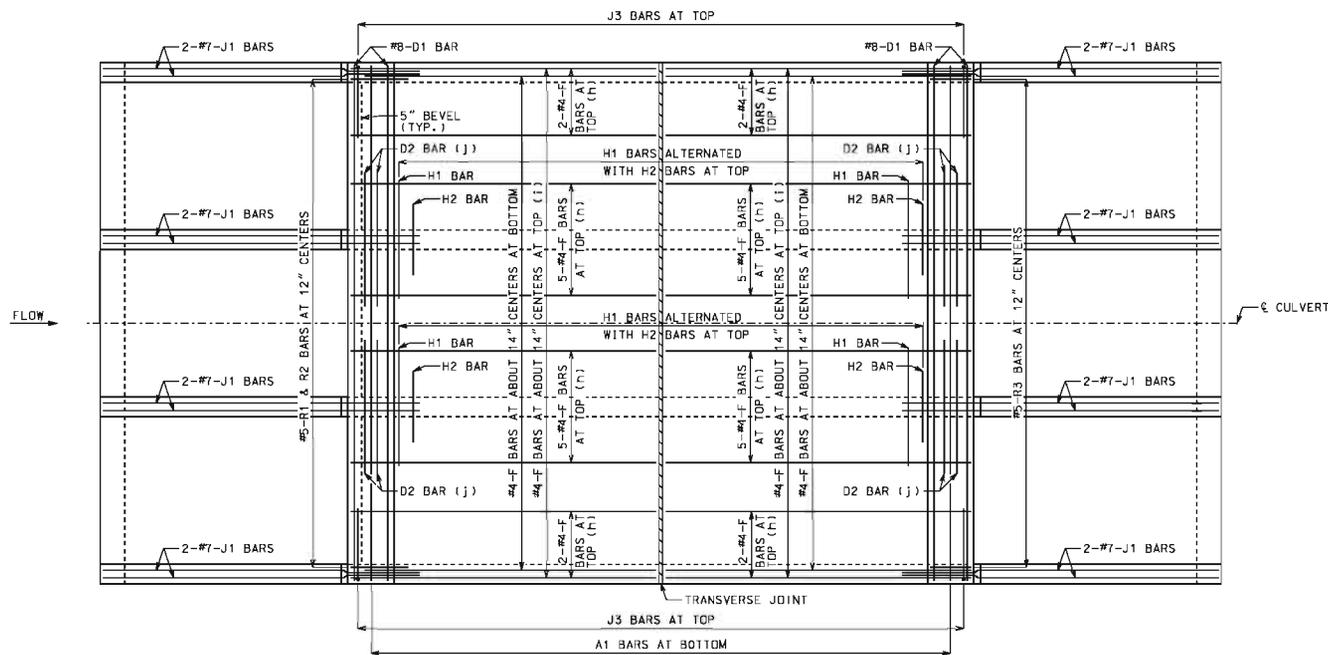
(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

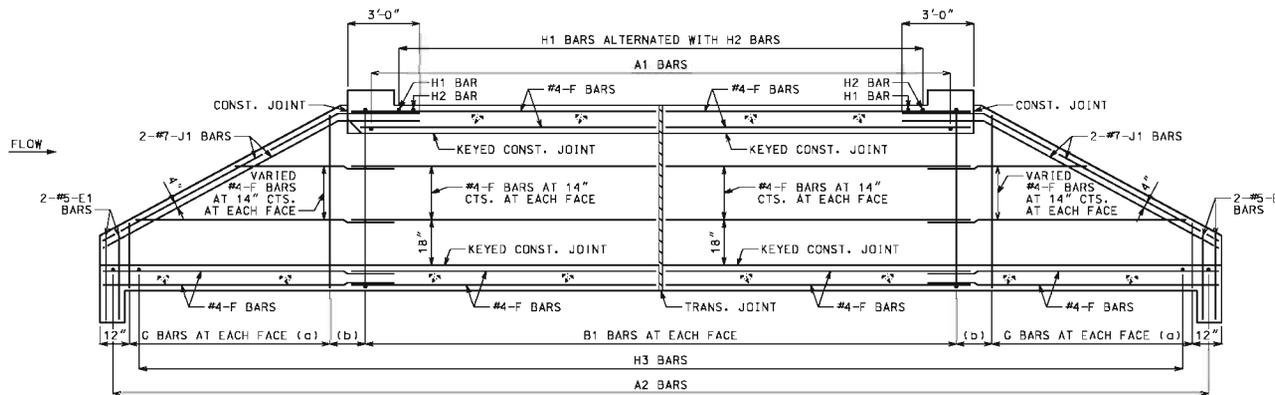
(c) J4 BAR SPACING

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT SKEW: SQUARED WINGS: STRAIGHT REINFORCEMENT	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 5/13/2015	703.80H SHEET NO. 1 OF 3

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



PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.

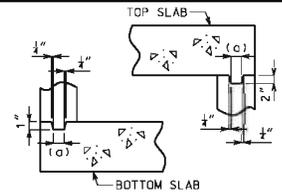


SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

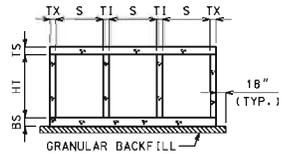
- GENERAL NOTES:**
- FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.
 - CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION. SEE SHEET 3 OF 3 FOR DETAILS.
 - DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
 - MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".
 - LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
 - BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.
 - (a) SAME SIZE AND SPACING AS ADJACENT B BARS
 - (b) VARIES, 12" MAXIMUM
 - (c) NOT SPECIFIED ON THIS SHEET
 - (d) NOT SPECIFIED ON THIS SHEET
 - (e) NOT SPECIFIED ON THIS SHEET
 - (f) NOT SPECIFIED ON THIS SHEET
 - (g) NOT SPECIFIED ON THIS SHEET
 - (h) FOR DESIGN FILLS OVER 2'-0"
 - (i) FOR DESIGN FILLS 2'-0" OR LESS
 - (j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
 #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF ϕ WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR $\frac{1}{4}$ CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

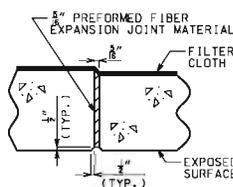
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT SKEW: SQUARED WINGS: STRAIGHT REINFORCEMENT	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 5/13/2015	703.80H SHEET NO. 2 OF 3



KEYED CONSTRUCTION JOINT
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



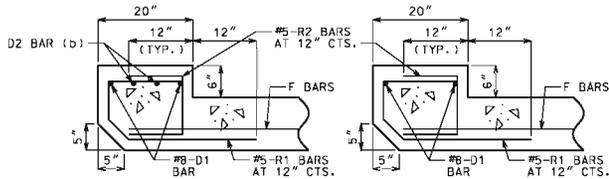
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



TRANSVERSE JOINT THRU BARREL

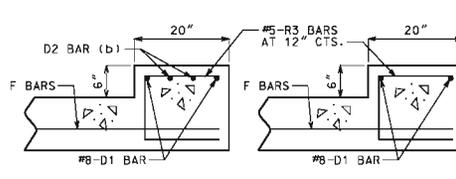
PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



UPSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL

UPSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

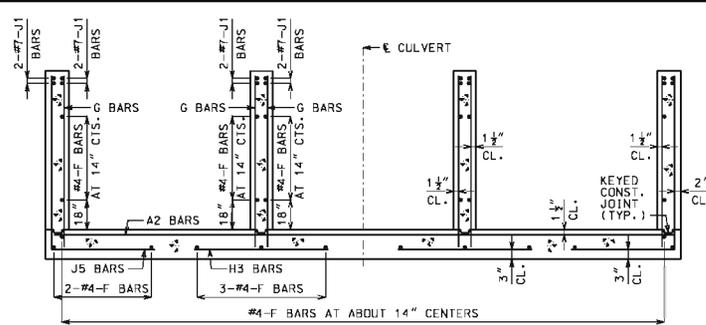


DOWNSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL

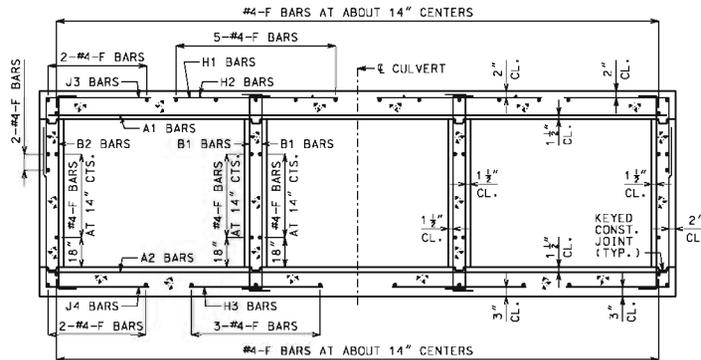
DOWNSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

(b) NOT REQUIRED FOR CLEAR SPANS $\leq 10'-0"$
 $\#8$ FOR CLEAR SPAN $> 10'-0"$
 $\#9$ FOR CLEAR SPAN $> 13'-0"$

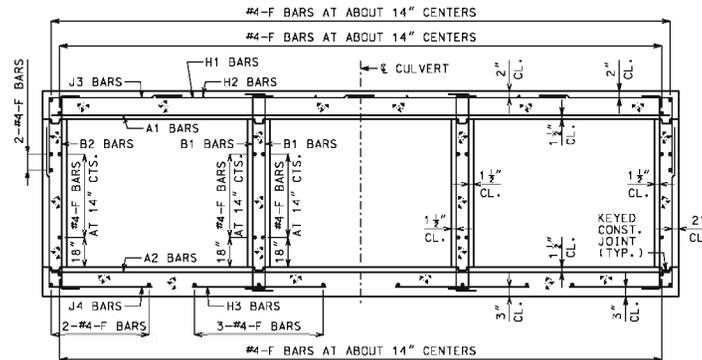
IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF ϵ WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR $\frac{1}{4}$ CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT
FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT
FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO ϵ CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE $1\frac{1}{2}"$.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT SKEW: SQUARED WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 5/13/2015	703.80H SHEET NO. 3 OF 3

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

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

LAYING OUT TRANSVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.86.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

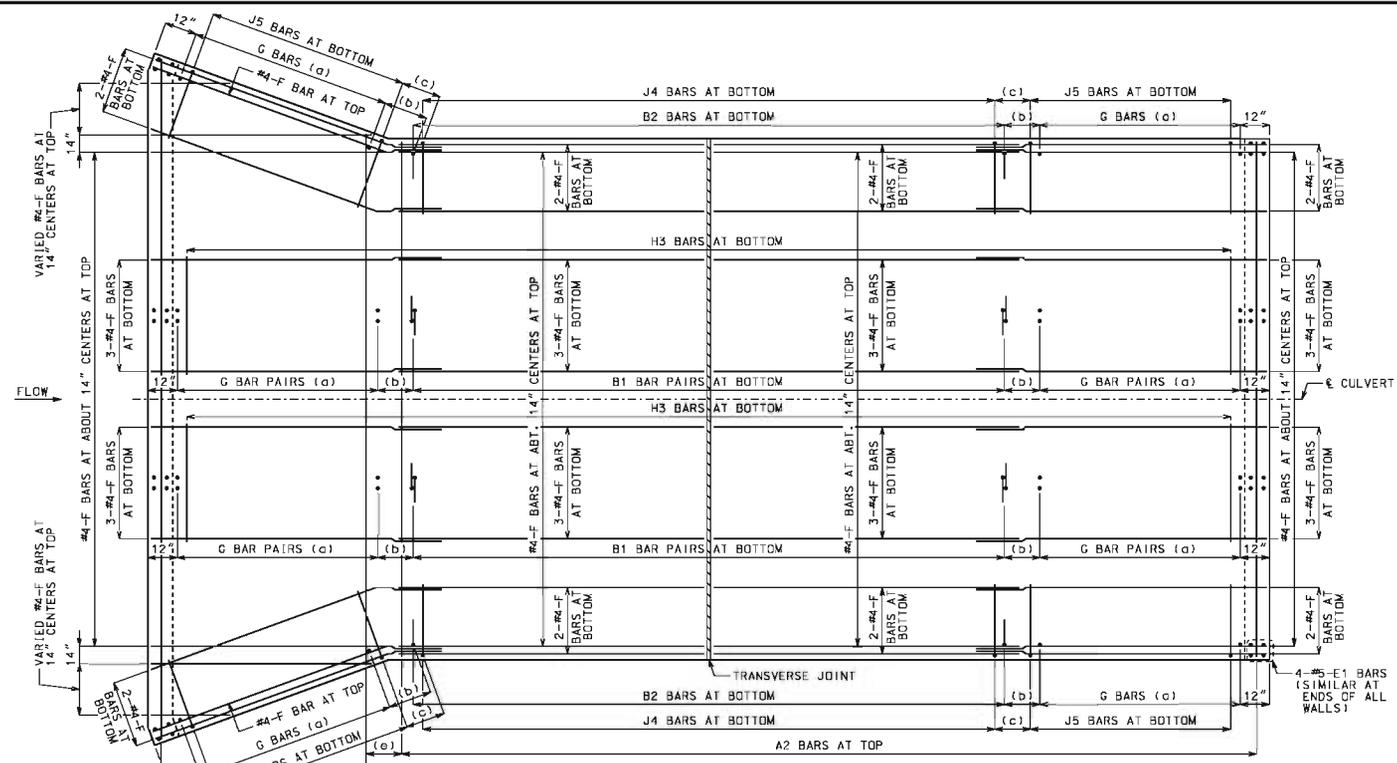
(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

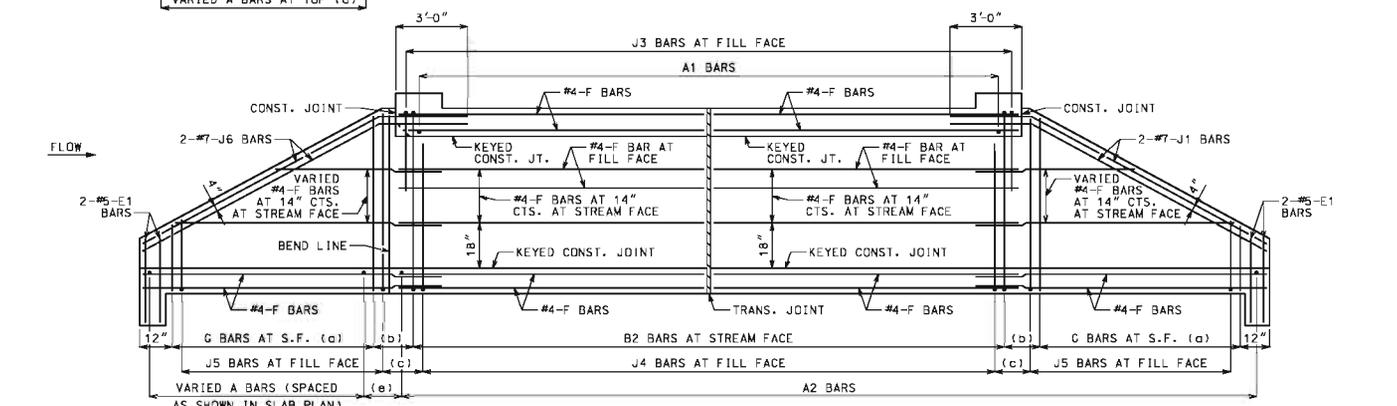
(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

(e) A2 BAR SPACING



PLAN OF BOTTOM SLAB

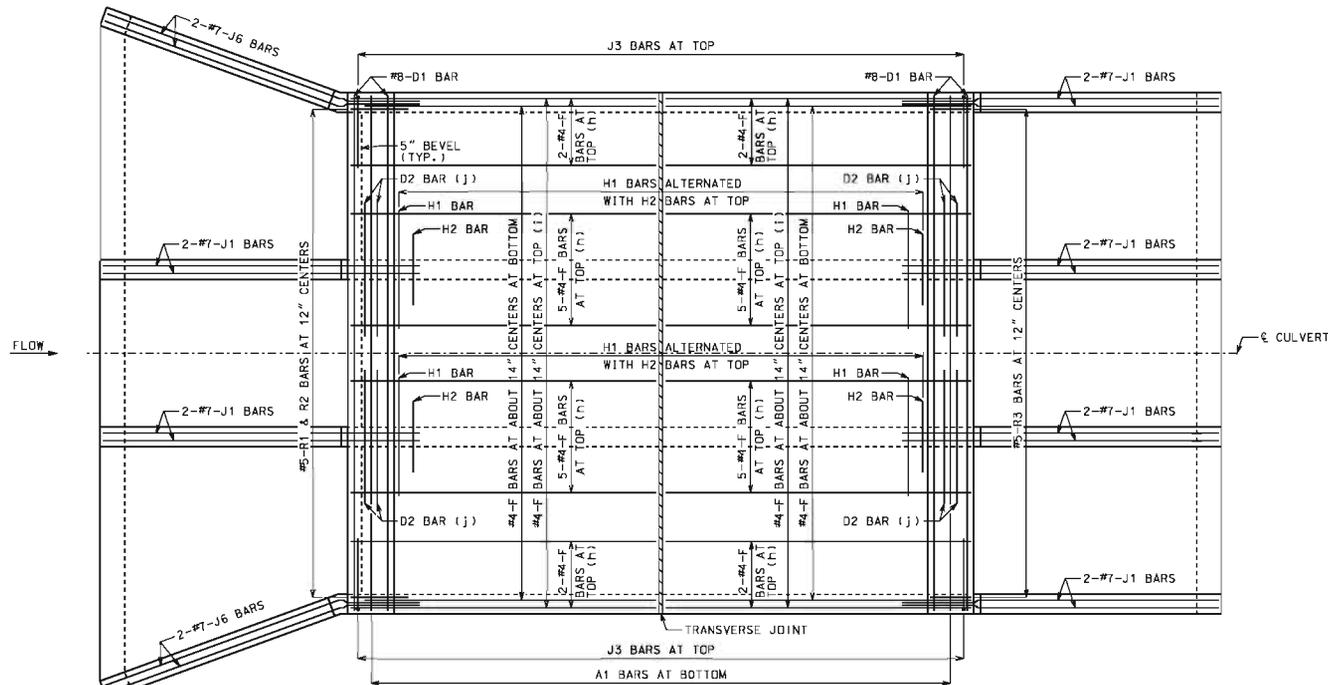


DEVELOPED ELEVATION OF EXTERIOR WALL
J1 AND J6 BARS MAY BE BENT IN FIELD OR SHOP.

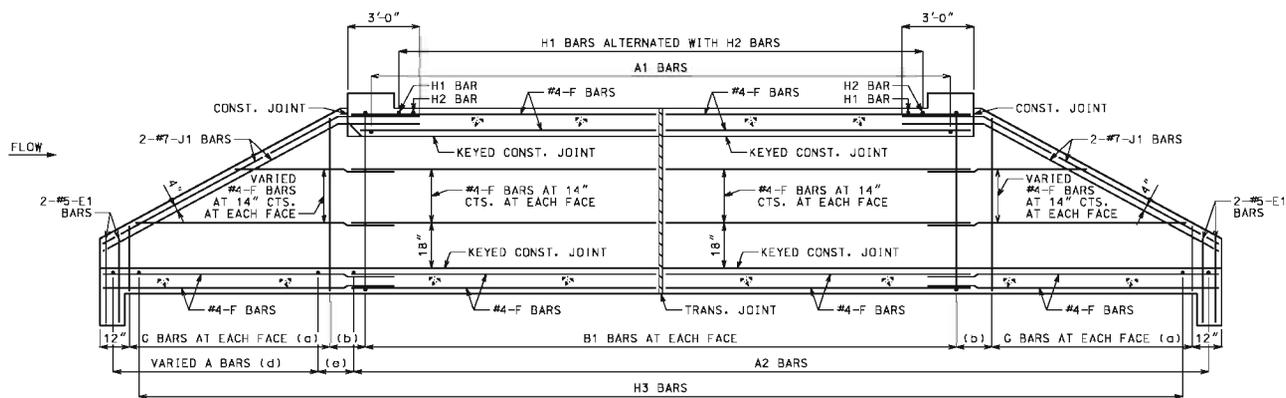
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT	
	SKEW: SQUARED FLANGES: FLARED	
REINFORCEMENT		

DATE EFFECTIVE:	12/01/2011	703.81H	SHEET NO. 1 OF 3
DATE PREPARED:	5/13/2015		

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



PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.



SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

- GENERAL NOTES:**
- FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.
 - CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION. SEE SHEET 3 OF 3 FOR DETAILS.
 - DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
 - MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".
 - LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
 - BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.
 - (a) SAME SIZE AND SPACING AS ADJACENT B BARS
 - (b) VARIES, 12" MAXIMUM
 - (c) NOT SPECIFIED ON THIS SHEET
 - (d) SAME SIZE AND SPACING AS A2 BARS
 - (e) A2 BAR SPACING
 - (f) NOT SPECIFIED ON THIS SHEET
 - (g) NOT SPECIFIED ON THIS SHEET
 - (h) FOR DESIGN FILLS OVER 2'-0"
 - (i) FOR DESIGN FILLS 2'-0" OR LESS
 - (j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
 #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF $\frac{1}{4}$ WALL SHALL BE THE GREATER OF 4B BAR DIAMETERS OR $\frac{1}{4}$ CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

CONCRETE TRIPLE BOX CULVERT

SKEW: SQUARED
 WINGS: FLARED

REINFORCEMENT

DATE EFFECTIVE:	12/01/2011	703.81H	SHEET NO. 2 OF 3
DATE PREPARED:	5/13/2015		

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

LAYING OUT TRANSVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

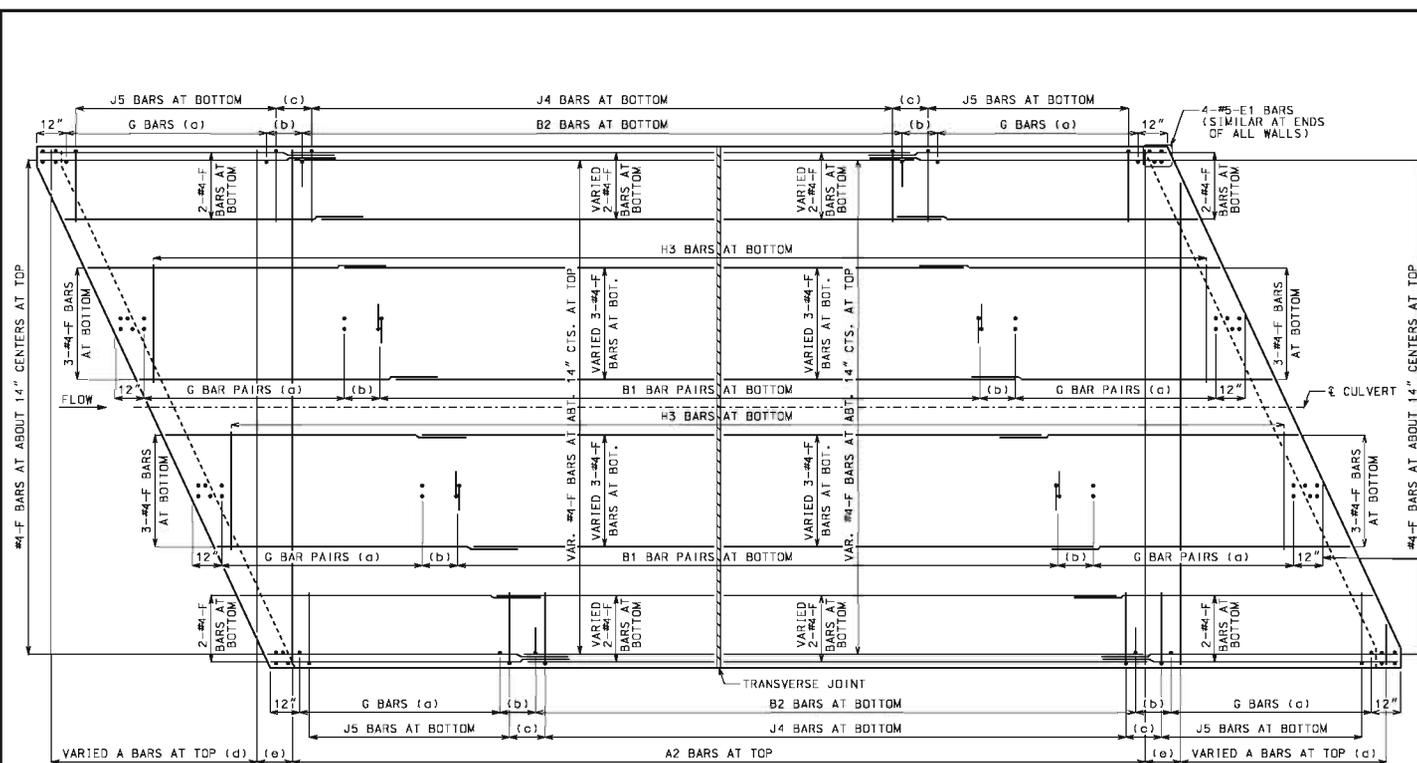
BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

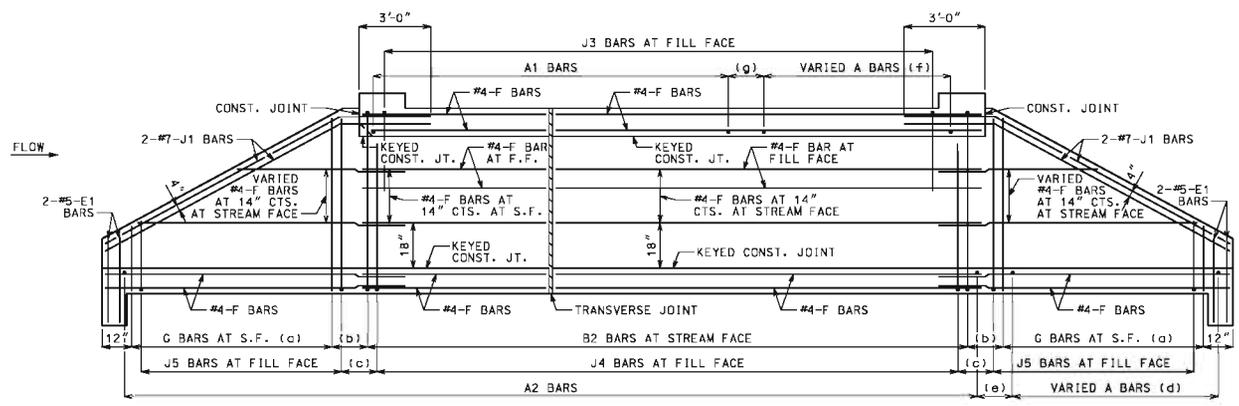
WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.86.



PLAN OF BOTTOM SLAB



ELEVATION OF EXTERIOR WALL

J1 BARS MAY BE BENT IN FIELD OR SHOP.

END OF WALL (TYP.) (NOT SHOWN)

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

(e) A2 BAR SPACING

(f) SAME SIZE AND SPACING AS A1 BARS

(g) A1 BAR SPACING

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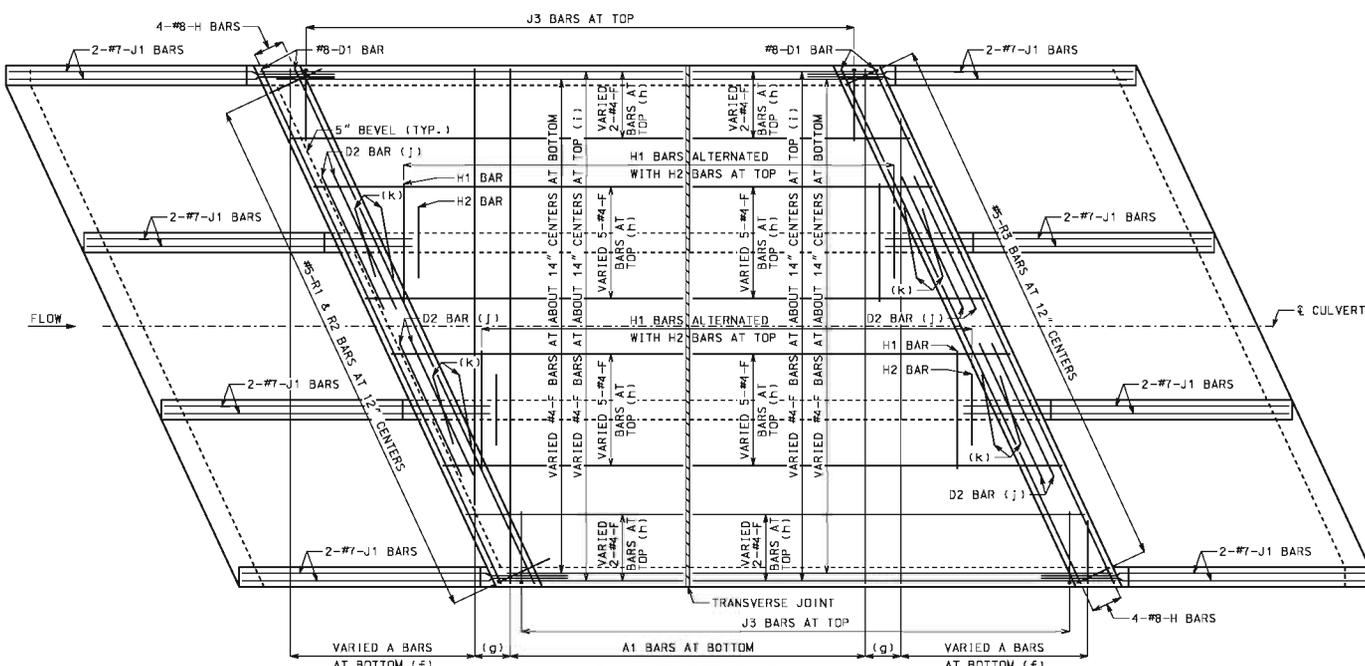
CONCRETE TRIPLE BOX CULVERT

SKEW: LEFT AVANCE
 WINGS: STRAIGHT

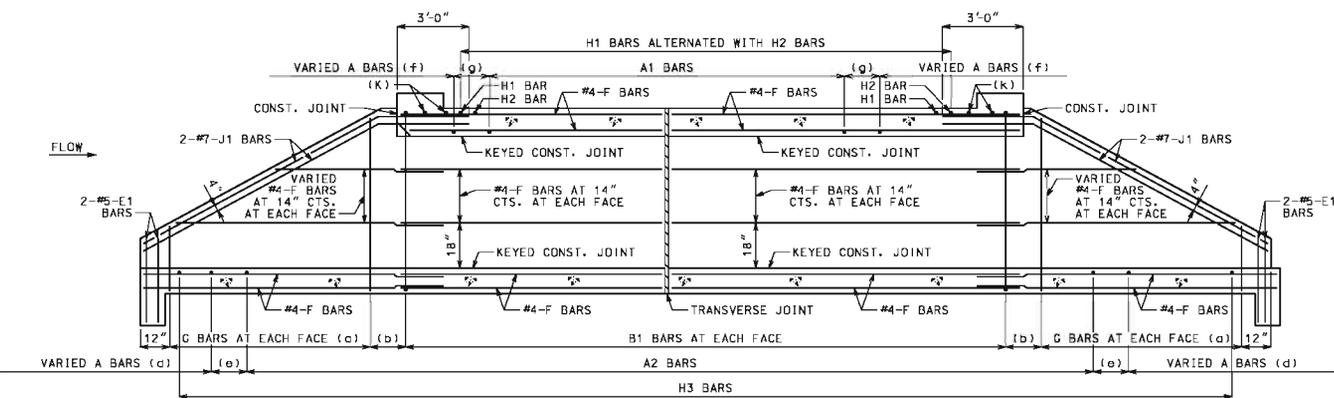
REINFORCEMENT

DATE EFFECTIVE:	12/01/2011	703.82H	SHEET NO. 1 OF 3
DATE PREPARED:	5/13/2015		

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



PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.



SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

- GENERAL NOTES:**
- FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.
 - CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION, SEE SHEET 3 OF 3 FOR DETAILS.
 - DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
 - MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".
 - LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
 - BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.
 - (c) SAME SIZE AND SPACING AS ADJACENT B BARS
 - (d) VARIES, 12" MAXIMUM
 - (e) NOT SPECIFIED ON THIS SHEET
 - (f) SAME SIZE AND SPACING AS A2 BARS
 - (g) A1 BAR SPACING
 - (h) FOR DESIGN FILLS OVER 2'-0"
 - (i) FOR DESIGN FILLS 2'-0" OR LESS
 - (j) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
 #8 FOR CLEAR SPAN > 10'-0"
 #9 FOR CLEAR SPAN > 13'-0"
 - IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.
 - (k) H2 BARS AS REQUIRED. QUANTITY OF BARS VARIES WITH SKEW.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
 JEFFERSON CITY, MO 65102
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CONCRETE TRIPLE BOX CULVERT

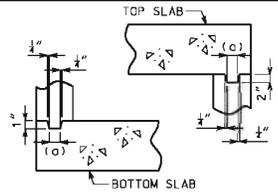
SKEW: LEFT AVANCE
 WINGS: STRAIGHT

REINFORCEMENT

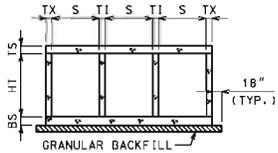
DATE EFFECTIVE:	12/01/2011	703.82H	SHEET NO. 2 OF 3
DATE PREPARED:	5/13/2015		



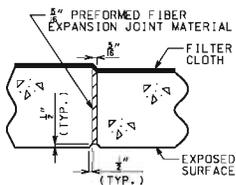
THIS SHEET HAS BEEN E-SIGNED, SEALED AND DATED ELECTRONICALLY.



KEYED CONSTRUCTION JOINT
(c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



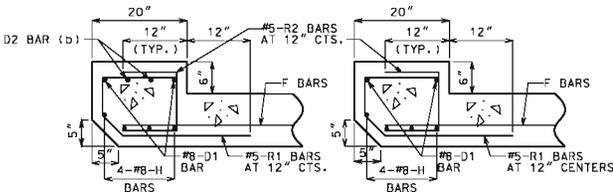
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



TRANSVERSE JOINT THRU BARREL

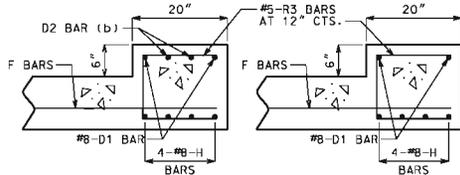
PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



UPSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL

UPSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

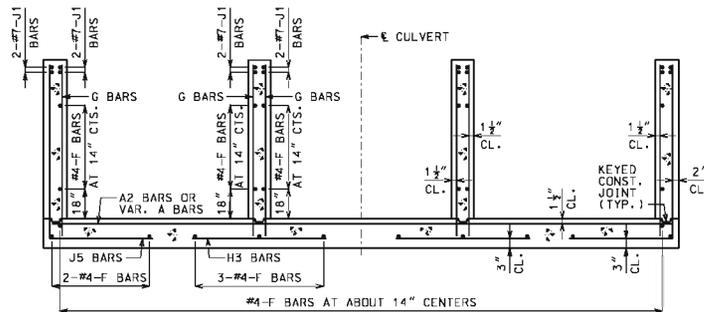


DOWNSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL

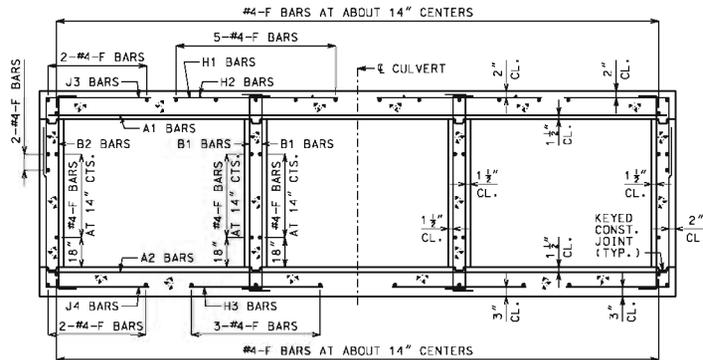
DOWNSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
#8 FOR CLEAR SPAN > 10'-0"
#9 FOR CLEAR SPAN > 13'-0"

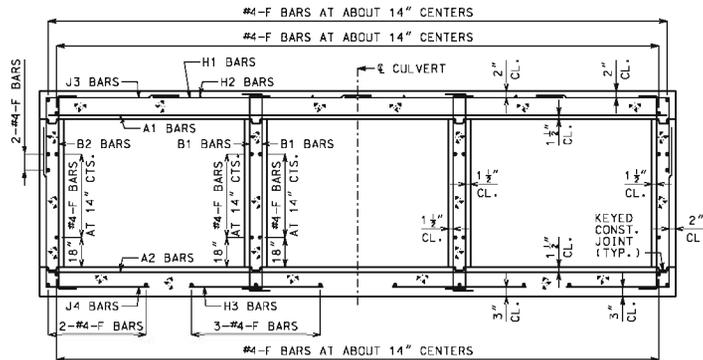
IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF E WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.



UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT
FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT
FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO E & CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT SKEW: LEFT AVANCE WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 5/13/2015	703.82H SHEET NO. 3 OF 3

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

LAYING OUT TRANSVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.86.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE SHEET 3 OF 3 FOR DETAILS.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION. SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

(e) A2 BAR SPACING

(f) SAME SIZE AND SPACING AS A1 BARS

(g) A1 BAR SPACING

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL
 JEFFERSON CITY, MO 65102
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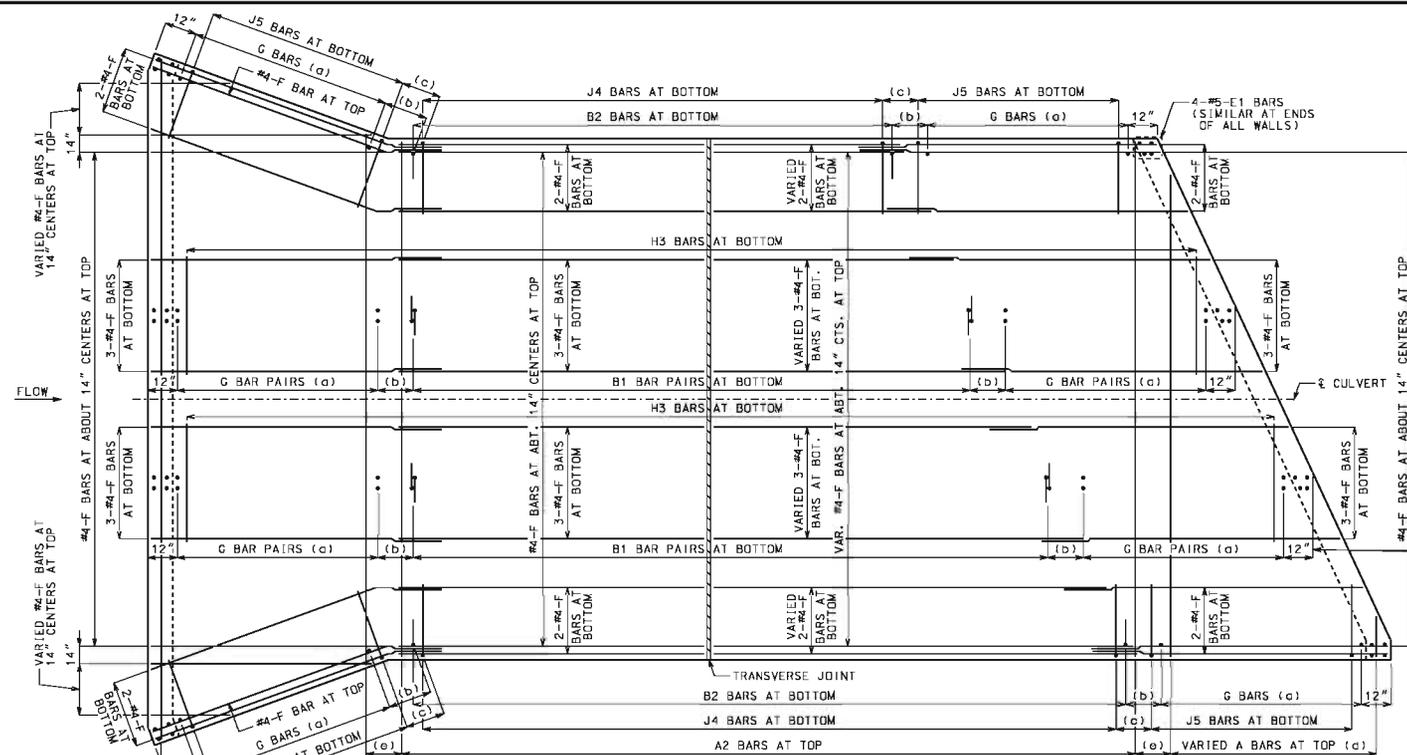


CONCRETE TRIPLE BOX CULVERT

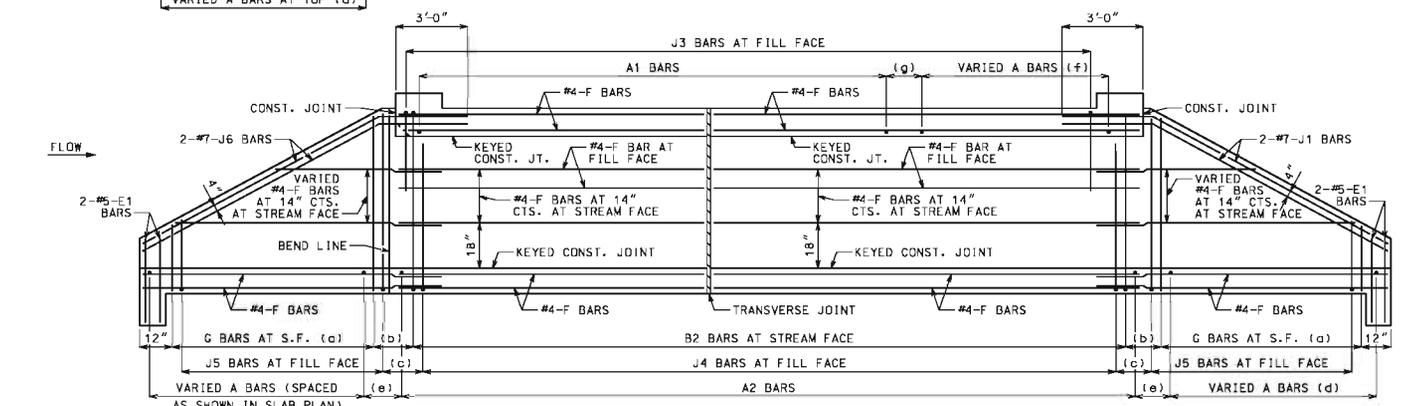
SKEW: LEFT ADVANCE
 WINGS: FLARED

REINFORCEMENT

DATE EFFECTIVE:	12/01/2011	703.83H	SHEET NO. 1 OF 3
DATE PREPARED:	5/13/2015		

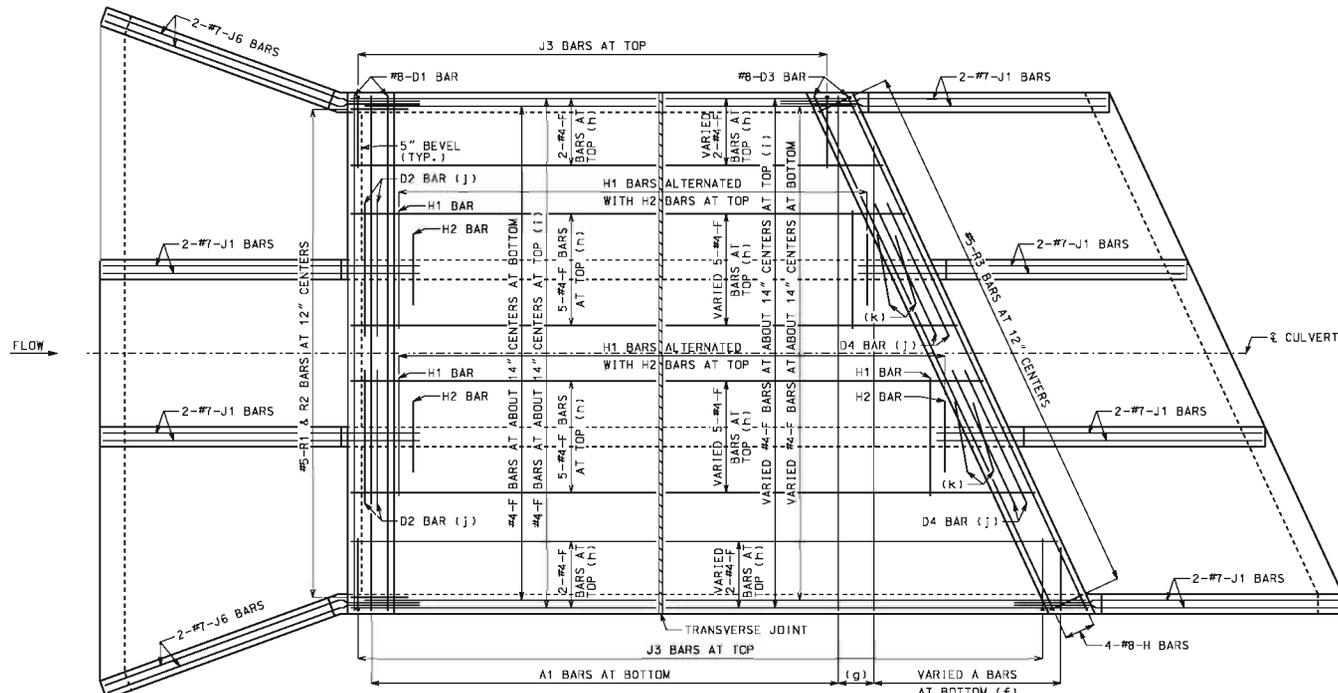


PLAN OF BOTTOM SLAB

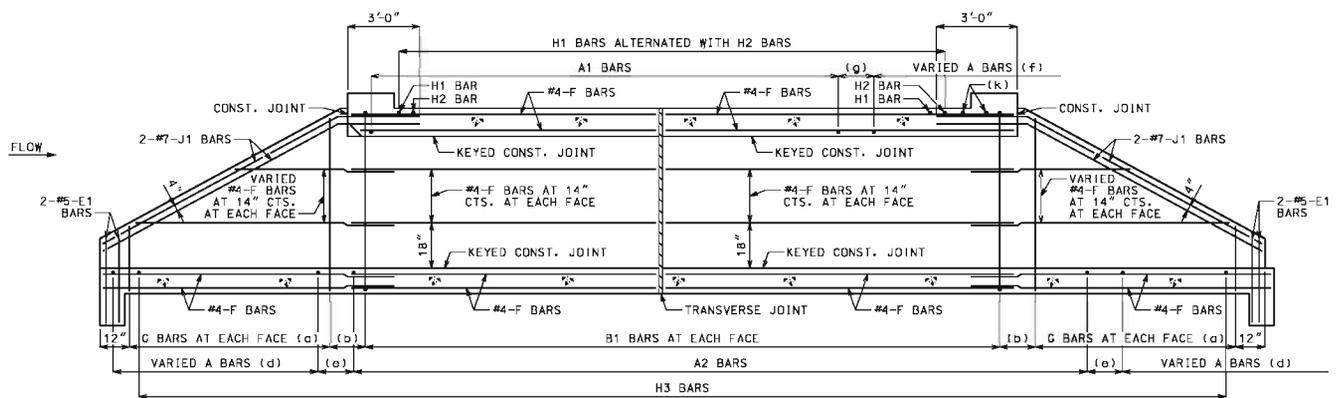


DEVELOPED ELEVATION OF EXTERIOR WALL
 J1 AND J6 BARS MAY BE BENT IN FIELD OR SHOP.

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



PLAN OF TOP SLAB
 B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
 FOR PLACEMENT, SEE SHEET 1 OF 3.



SECTION NEAR INTERIOR WALL
 J1 BARS MAY BE BENT IN FIELD OR SHOP.

- GENERAL NOTES:**
- FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.
- CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION, SEE SHEET 3 OF 3 FOR DETAILS.
- DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
- MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".
- LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
- BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.
- (c) SAME SIZE AND SPACING AS ADJACENT B BARS
 - (d) VARIES, 12" MAXIMUM
 - (e) NOT SPECIFIED ON THIS SHEET
 - (f) SAME SIZE AND SPACING AS A2 BARS
 - (g) A2 BAR SPACING
 - (h) SAME SIZE AND SPACING AS A1 BARS
 - (i) A1 BAR SPACING
 - (j) FOR DESIGN FILLS OVER 2'-0"
 - (k) FOR DESIGN FILLS 2'-0" OR LESS
 - (l) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
 - (m) #8 FOR CLEAR SPAN > 10'-0"
 - (n) #9 FOR CLEAR SPAN > 13'-0"

IF REQUIRED, THE MINIMUM LENGTH EACH SIDE OF WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

(K) H2 BARS AS REQUIRED. QUANTITY OF BARS VARIES WITH SKEW.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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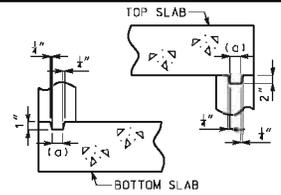
CONCRETE TRIPLE BOX CULVERT

SKEW: LEFT ADVANCE
 WINGS: FLARED

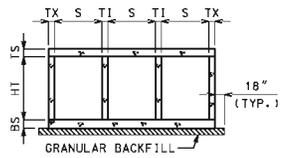
REINFORCEMENT

DATE EFFECTIVE:	12/01/2011	703.83H	SHEET NO.
DATE PREPARED:	5/13/2015		2 OF 3

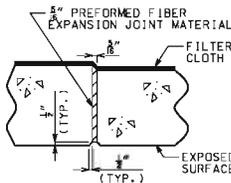




KEYED CONSTRUCTION JOINT
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



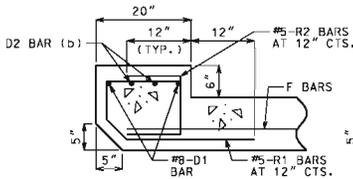
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



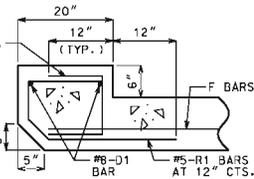
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

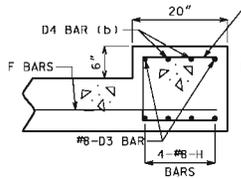
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



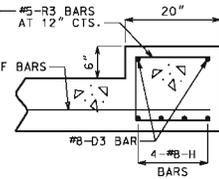
UPSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL



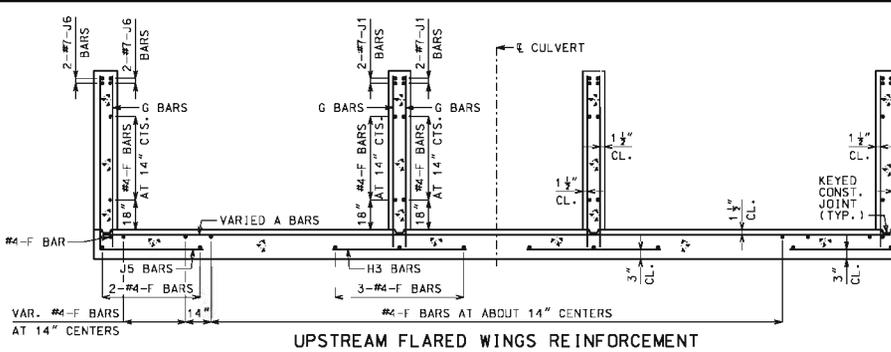
UPSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN



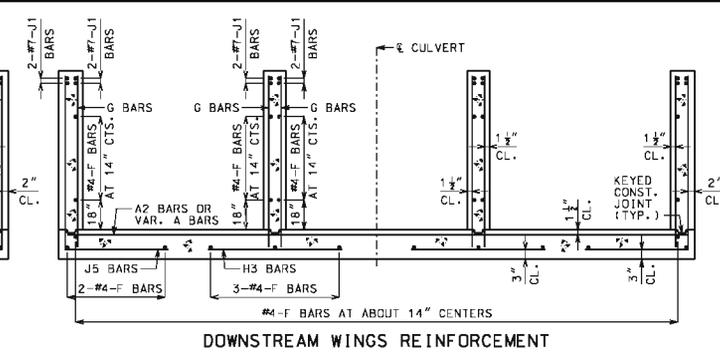
DOWNSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL



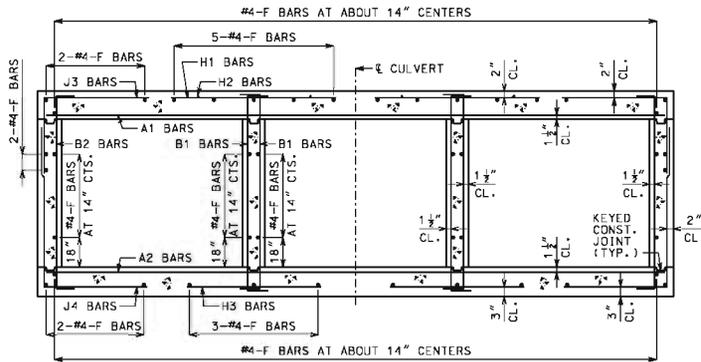
DOWNSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN



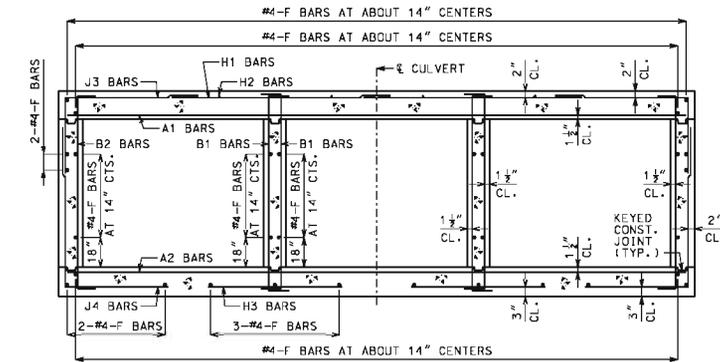
UPSTREAM FLARED WINGS REINFORCEMENT



DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT
FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT
FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703-37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
#8 FOR CLEAR SPAN > 10'-0"
#9 FOR CLEAR SPAN > 13'-0"

IF D2 AND D4 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF CULVERT SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT SKEW: LEFT ADVANCE WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 5/13/2015	703.83H SHEET NO. 3 OF 3

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

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LAYING OUT TRANSVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

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GENERAL NOTES:

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(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

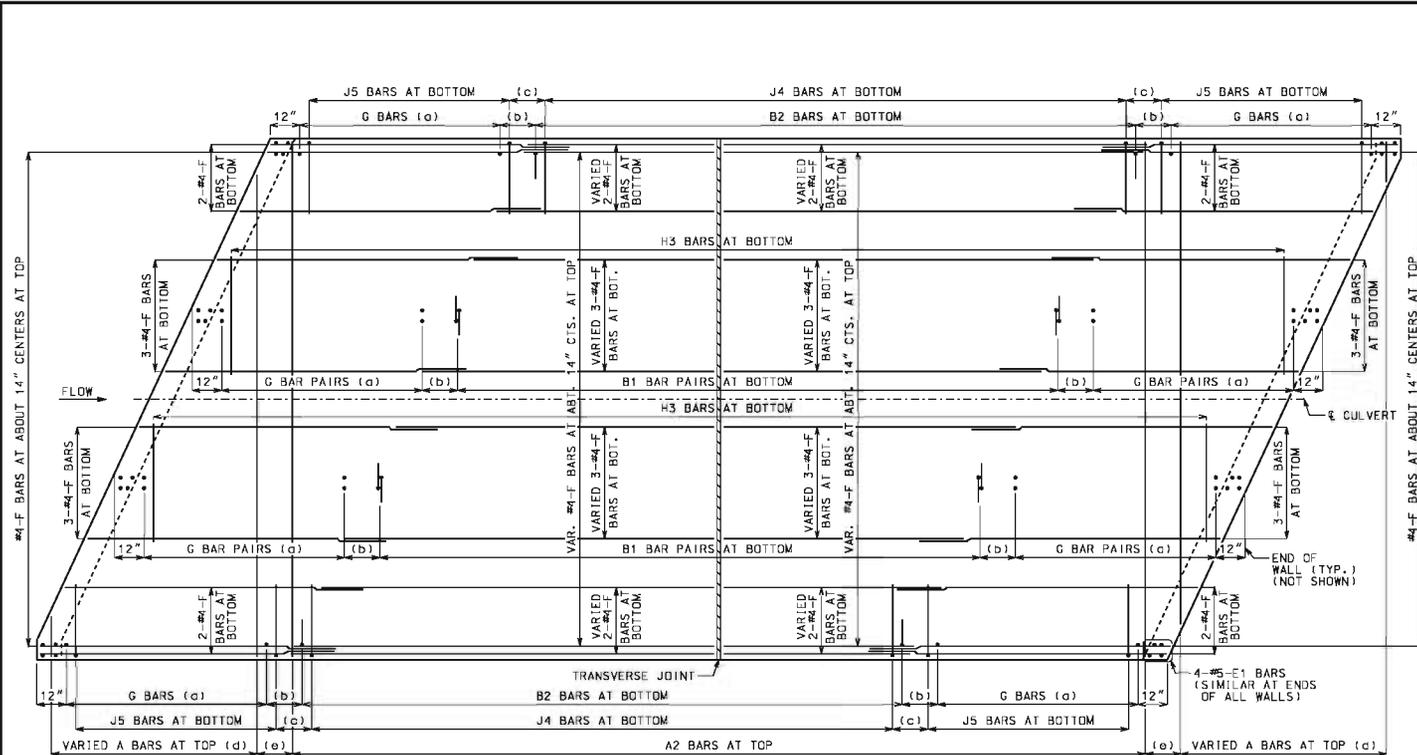
(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

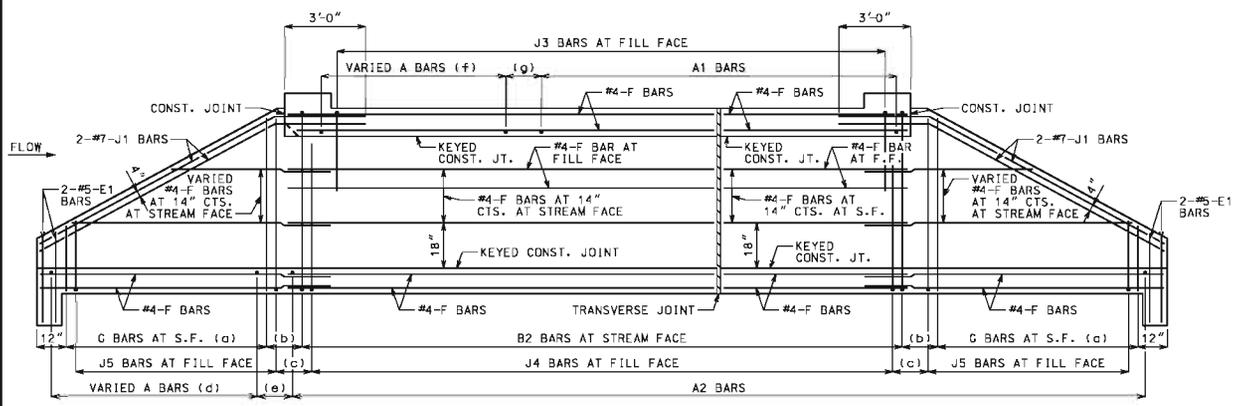
(e) A2 BAR SPACING

(f) SAME SIZE AND SPACING AS A1 BARS

(g) A1 BAR SPACING



PLAN OF BOTTOM SLAB

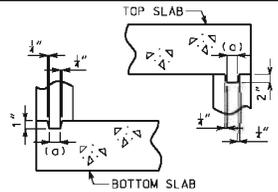


ELEVATION OF EXTERIOR WALL

J1 BARS MAY BE BENT IN FIELD OR SHOP.

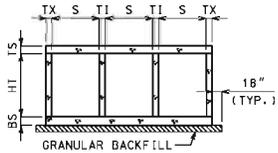
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT	
	SKEW: RIGHT ADVANCE WINGS: STRAIGHT	
REINFORCEMENT		

DATE EFFECTIVE:	12/01/2011	703.84H	SHEET NO. 1 OF 3
DATE PREPARED:	5/13/2015		

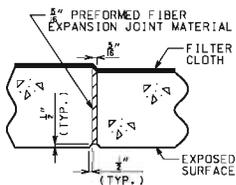


KEYED CONSTRUCTION JOINT

(c) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



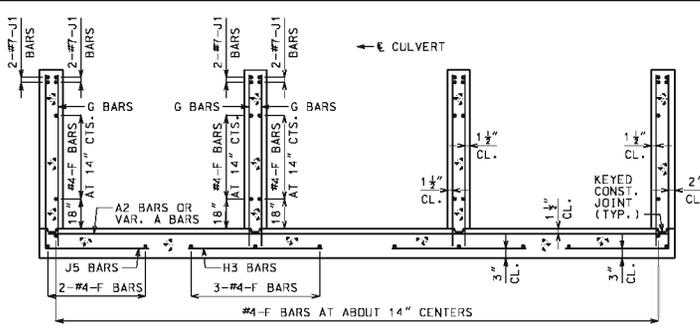
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



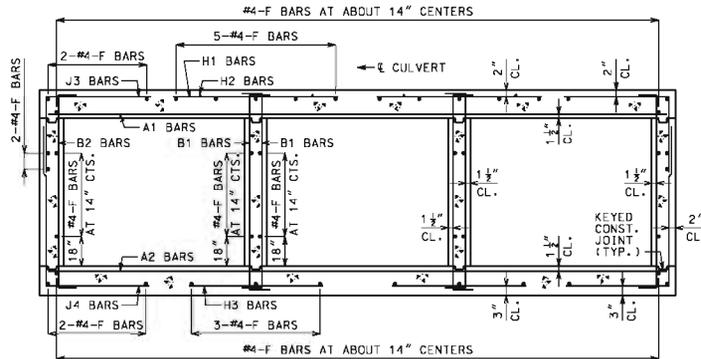
TRANSVERSE JOINT THRU BARREL

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FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

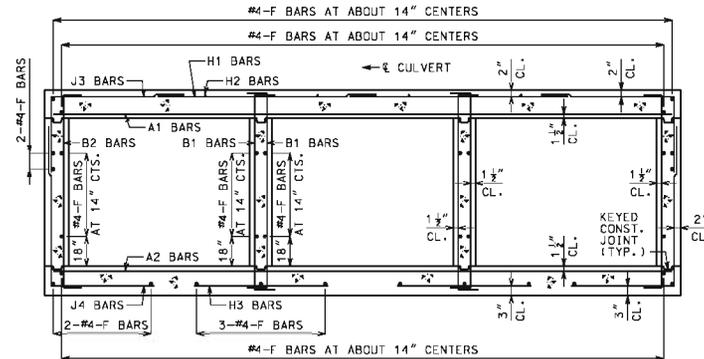


UPSTREAM AND DOWNSTREAM WINGS REINFORCEMENT



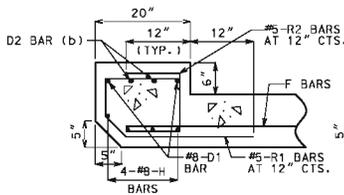
BARREL REINFORCEMENT

FOR DESIGN FILLS OVER 2'-0"

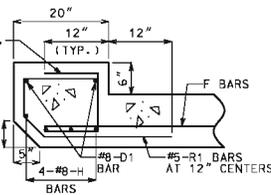


BARREL REINFORCEMENT

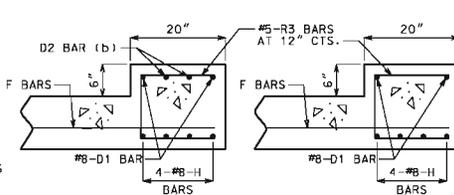
FOR DESIGN FILLS 2'-0" OR LESS



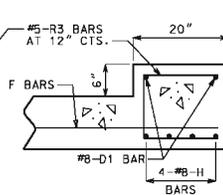
UPSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL



UPSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN



DOWNSTREAM HEADWALL REINFORCEMENT
NEAR INTERIOR WALL



DOWNSTREAM HEADWALL REINFORCEMENT
NEAR MIDSPAN

(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
#8 FOR CLEAR SPAN > 10'-0"
#9 FOR CLEAR SPAN > 13'-0"

IF D2 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF E WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

GENERAL NOTES:

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BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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	CONCRETE TRIPLE BOX CULVERT SKEW: RIGHT ADVANCE WINGS: STRAIGHT SECTIONS	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 5/13/2015	703.84H SHEET NO. 3 OF 3

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

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LAYING OUT TRANSVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET. USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

TO AVOID LOCATING TRANSVERSE JOINTS UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS THE FOLLOWING SHALL APPLY:

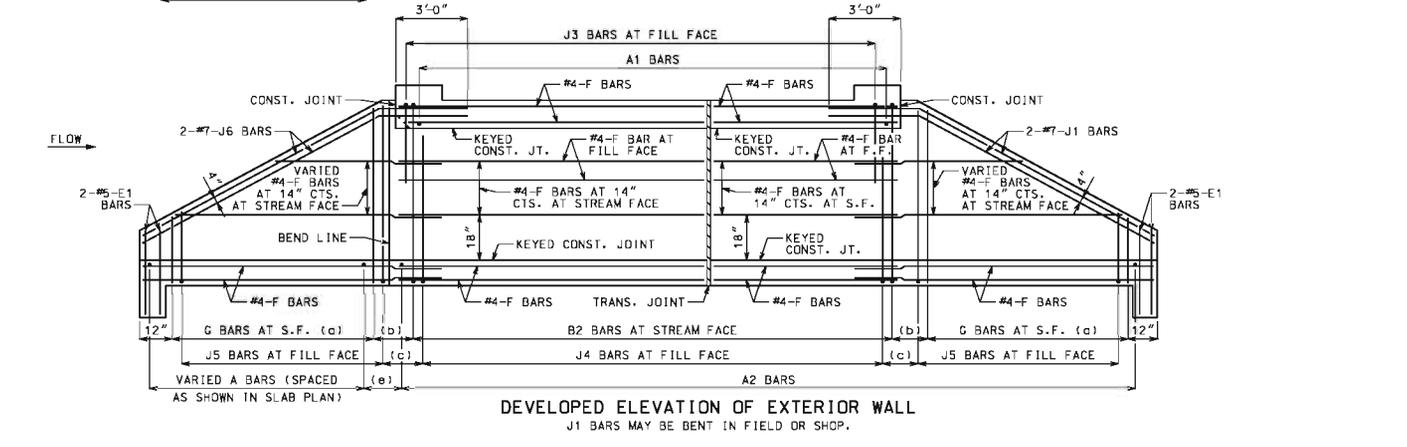
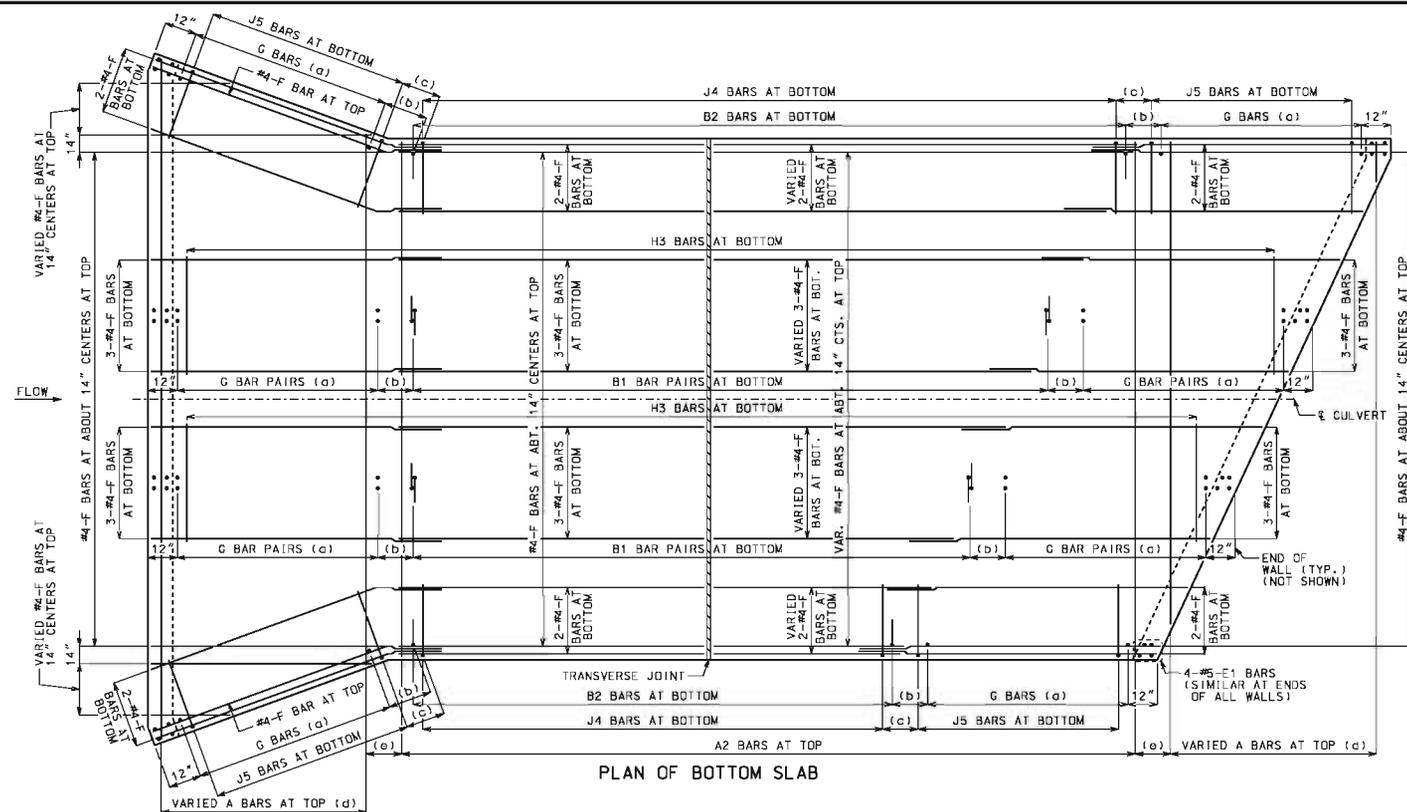
BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

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TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE 703.86.



GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE SHEET 3 OF 3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE SHEET 3 OF 3 FOR DETAILS.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(a) SAME SIZE AND SPACING AS ADJACENT B BARS

(b) VARIES, 12" MAXIMUM

(c) J4 BAR SPACING

(d) SAME SIZE AND SPACING AS A2 BARS

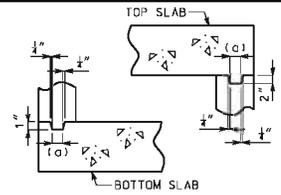
(e) A2 BAR SPACING

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

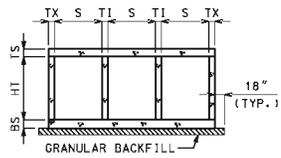


CONCRETE TRIPLE BOX CULVERT
 SKEW: RIGHT ADVANCE
 WINGS: FLARED
 REINFORCEMENT

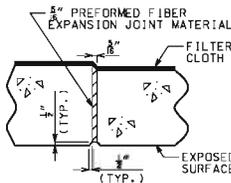
DATE EFFECTIVE: 12/01/2011	703.85C	SHEET NO. 1 OF 3
DATE PREPARED: 5/13/2015		



KEYED CONSTRUCTION JOINT
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



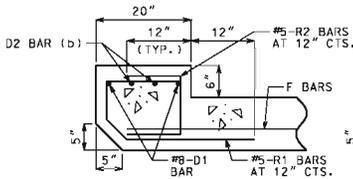
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



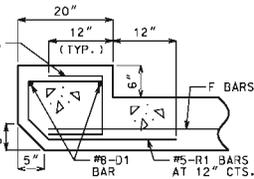
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

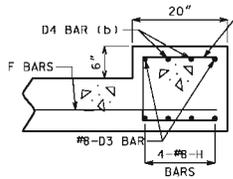
FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.



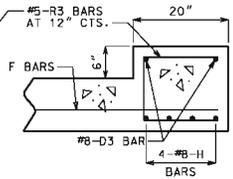
UPSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL



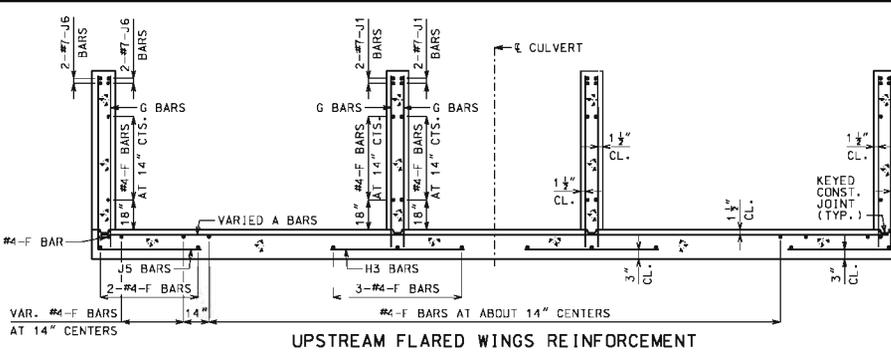
UPSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN



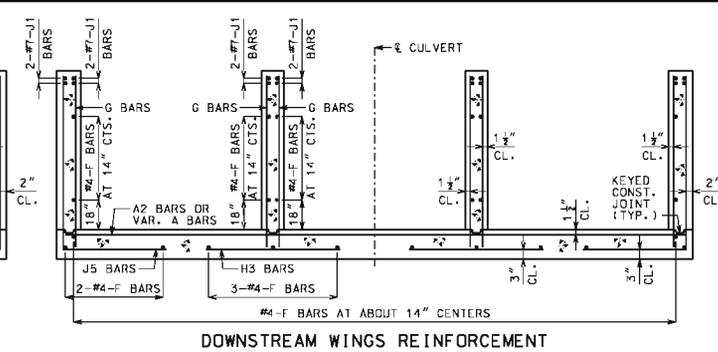
DOWNSTREAM HEADWALL REINFORCEMENT NEAR INTERIOR WALL



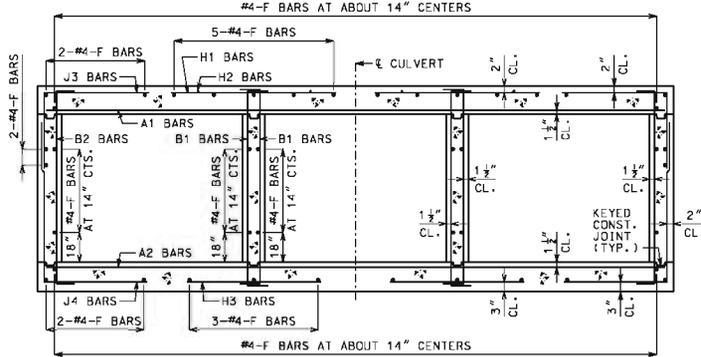
DOWNSTREAM HEADWALL REINFORCEMENT NEAR MIDSPAN



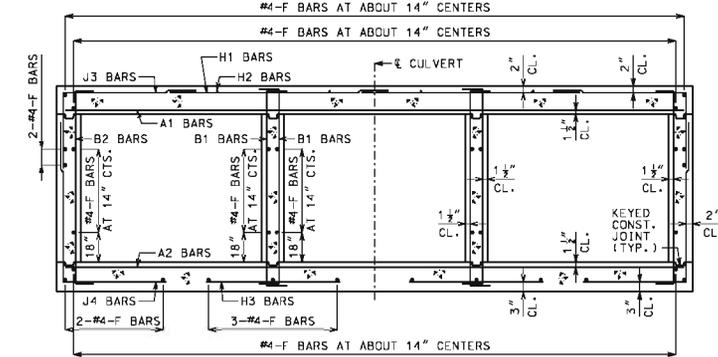
UPSTREAM FLARED WINGS REINFORCEMENT



DOWNSTREAM WINGS REINFORCEMENT



BARREL REINFORCEMENT FOR DESIGN FILLS OVER 2'-0"



BARREL REINFORCEMENT FOR DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT EXCEPT J5 BARS, SEE 703.87. FOR J5 BARS, SEE 703.37.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

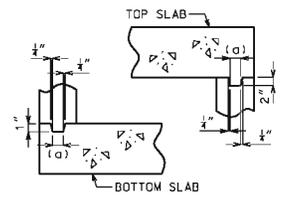
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".

(b) NOT REQUIRED FOR CLEAR SPANS ≤ 10'-0"
#8 FOR CLEAR SPAN > 10'-0"
#9 FOR CLEAR SPAN > 13'-0"

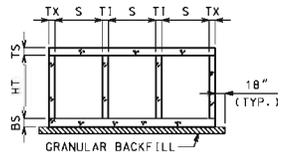
IF D2 AND D4 BARS ARE REQUIRED, THE MINIMUM LENGTH EACH SIDE OF CULVERT WALL SHALL BE THE GREATER OF 48 BAR DIAMETERS OR 1/4 CLEAR SPAN. THE CLEAR SPAN IS PARALLEL TO LONG DIRECTION OF HEADWALL.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT SKEW: RIGHT ADVANCE WINGS: FLARED SECTIONS	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 5/13/2015	703.85C SHEET NO. 3 OF 3

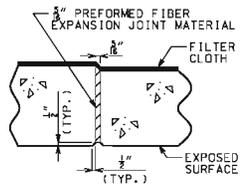
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



KEYED CONSTRUCTION JOINT
(a) APPROXIMATELY ONE-THIRD OF WALL THICKNESS



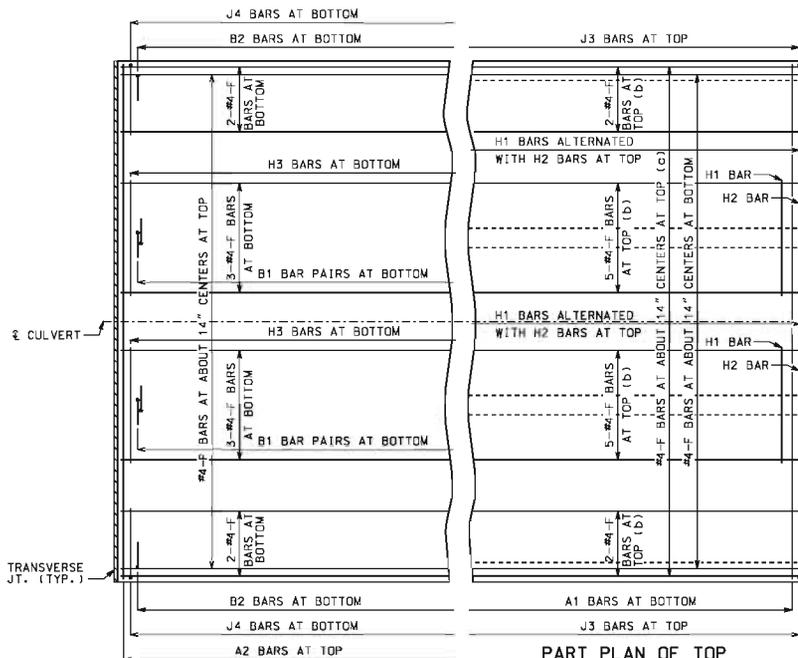
GRANULAR BACKFILL LIMITS AND MEMBER DIMENSIONS



TRANSVERSE JOINT THRU BARREL

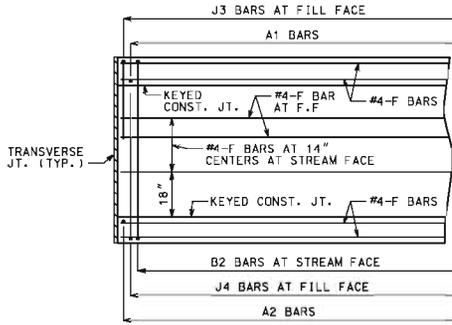
PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH SEC 1057 SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH 10 GAGE COPPER WIRE OR 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SUBSURFACE DRAINAGE GEOTEXTILE IN ACCORDANCE WITH SEC 1011. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

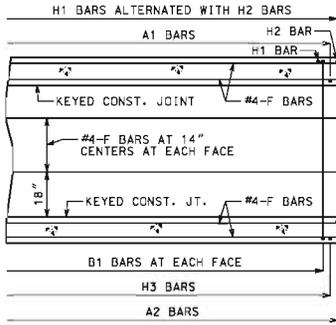


PART PLAN OF BOTTOM SLAB REINFORCEMENT

PART PLAN OF TOP SLAB REINFORCEMENT
(b) FOR DESIGN FILLS OVER 2'-0"
(c) FOR DESIGN FILLS 2'-0" OR LESS



PART ELEVATION OF EXTERIOR WALL REINFORCEMENT



PART SECTION NEAR INTERIOR WALL REINFORCEMENT

GENERAL NOTES

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

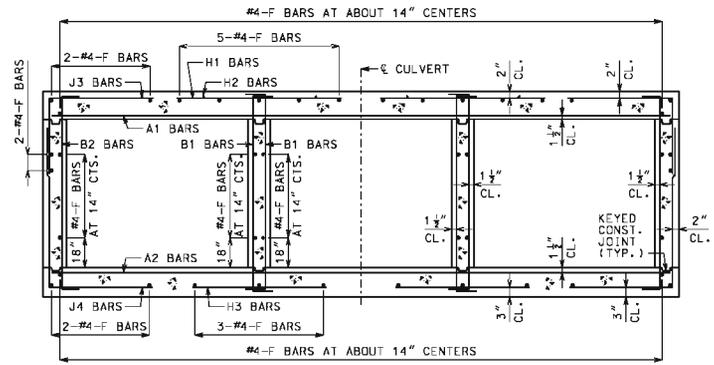
DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) $f'c = 4,000$ PSI
REINFORCING STEEL (GRADE 60) $f_y = 60,000$ PSI

MISCELLANEOUS:
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS. SEE 703.87.

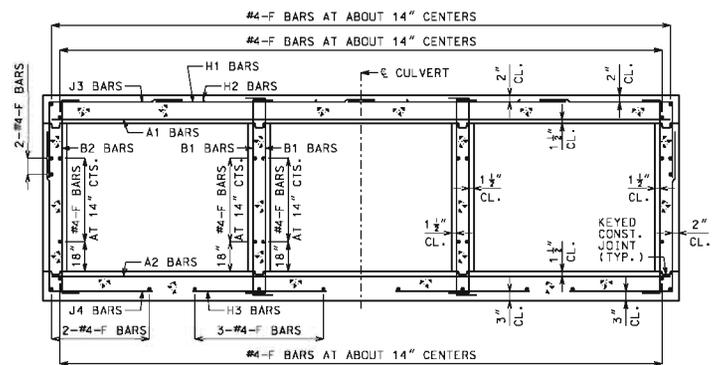
CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PART PLANS, PART ELEVATION AND PART SECTION.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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



BARREL REINFORCEMENT
FOR DESIGN FILLS OVER 2'-0"
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.



BARREL REINFORCEMENT
FOR DESIGN FILLS 2'-0" OR LESS
SYMMETRICAL ABOUT AND NORMAL TO CULVERT.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT CUT SECTION	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 5/13/2015	703.86 SHEET NO. 1 OF 1

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

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

		SPAN (S) = 3 FT												HEIGHT (HT) = 2 FT OR 3 FT OR 4 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS				J3 BARS				H1 BARS				H2 BARS				A2 BARS				J4 BARS				H3 BARS				B1 BARS	B2 BARS						
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=2'	HT=3'	HT=4'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	HT=2'	HT=3'	HT=4'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.
1 FT	10	8	8	8	4	8.5	4	10.5	26.8	26.0	26.0	26.0	4	24	39.5	30.5	4	24	20.0	20.0	4	12	4	12	36.0	28	40	52	4	12	25.0	25.0	5	12	5	12	12
2 FT	10	8	8	8	4	8.5	4	10.5	26.8	26.0	26.0	26.0	4	24	39.5	30.5	4	24	20.0	20.0	4	12	4	12	35.0	28	40	52	4	12	24.0	24.0	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	24.0	4	24	39.5	34.0	4	24	19.0	19.0	4	12	4	12	31.1	28	40	52	4	12	23.0	24.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	24.0	4	24	26.0	26.0	4	24	18.0	18.0	4	12	4	12	28.9	28	40	52	4	12	22.0	23.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	24.0	4	24	24.0	24.0	4	24	18.0	18.0	4	12	4	12	27.3	28	40	52	4	12	22.0	23.0	5	12	5	12	12
10 FT	8	8	8	8	4	12	4	12	27.1	24.0	24.0	24.0	4	24	23.0	24.0	4	24	18.0	18.0	4	12	4	12	26.5	28	40	52	4	12	22.0	23.0	5	12	5	12	12
12 FT	8	8	8	8	4	12	4	12	25.0	24.0	24.0	24.0	4	24	21.0	23.0	4	24	18.0	18.0	4	12	4	12	24.5	28	40	52	4	12	22.0	23.0	5	12	5	12	12
14 FT	8	8	8	8	4	12	4	12	24.9	24.0	24.0	24.0	4	24	21.0	23.0	4	24	18.0	18.0	4	12	4	12	24.5	28	40	52	4	12	22.0	23.0	5	12	5	12	12
16 FT	8	8	8	8	4	12	4	12	24.8	24.0	24.0	24.0	4	24	21.0	22.0	4	24	18.0	18.0	4	12	4	12	24.4	28	40	52	4	11.5	22.0	23.0	5	12	5	12	12
18 FT	8	8	8	8	4	12	4	12	24.8	24.0	24.0	24.0	4	24	21.0	22.0	4	24	18.0	18.0	4	12	4	12	24.4	28	40	52	4	11	22.0	23.0	5	12	5	12	12
20 FT	8	8	8	8	4	12	4	12	24.6	24.0	24.0	24.0	4	24	21.0	22.0	4	24	18.0	18.0	4	12	4	12	24.3	28	40	52	4	10.5	22.0	23.0	5	12	5	12	12
22 FT	8	8	8	8	4	12	4	12	24.6	24.0	24.0	24.0	4	24	21.0	22.0	4	24	18.0	18.0	4	12	4	12	24.3	28	40	52	4	9.5	22.0	23.0	5	12	5	12	12
24 FT	8	8	8	8	4	12	4	12	24.5	24.0	24.0	24.0	4	24	21.0	22.0	4	24	18.0	18.0	4	11.5	4	12	24.3	28	40	52	4	9	22.0	23.0	5	12	5	12	12
26 FT	8	8	8	8	4	12	4	12	24.5	24.0	24.0	24.0	4	24	21.0	22.0	4	24	18.0	18.0	4	10.5	4	11	24.1	28	40	52	4	9	22.0	23.0	5	12	5	12	12
28 FT	8	8	8	8	4	12	4	11	24.5	24.0	24.0	24.0	4	24	21.0	22.0	4	24	18.0	18.0	4	10	4	10	24.1	28	40	52	4	8.5	22.0	23.0	5	12	5	12	12
30 FT	8	8	8	8	4	11	4	10.5	24.5	24.0	24.0	24.0	4	24	21.0	22.0	4	24	18.0	18.0	4	9	4	9.5	24.1	28	40	52	4	8	22.0	23.0	5	12	5	12	12
32 FT	8	9	8	8	4	10.5	4	9.5	24.5	24.0	24.0	24.0	4	23	21.0	22.0	4	23	18.0	18.0	4	9.5	4	12	24.5	29	41	53	4	9.5	21.0	23.0	5	12	5	12	12
34 FT	8	9	8	8	4	10	4	9	24.5	24.0	24.0	24.0	4	23	21.0	22.0	4	23	18.0	18.0	4	9	4	11	24.4	29	41	53	4	9	21.0	23.0	5	12	5	12	12
36 FT	8	9	8	8	4	9.5	4	8.5	24.5	24.0	24.0	24.0	4	21	21.0	22.0	4	21	18.0	18.0	4	8.5	4	10.5	24.4	29	41	53	4	8.5	21.0	23.0	5	12	5	12	12
38 FT	8	9	8	8	4	9	4	8	24.5	24.0	24.0	24.0	4	20	21.0	22.0	4	20	18.0	18.0	4	8	4	10	24.4	29	41	53	4	8.5	21.0	23.0	5	12	5	12	12
40 FT	8	10	8	8	4	8.5	4	7.5	24.5	24.0	24.0	24.0	4	19	21.0	22.0	4	19	18.0	18.0	4	8.5	4	12	24.8	30	42	54	4	9	21.0	23.0	5	12	5	12	12
42 FT	8	10	8	8	4	9	4	9	24.8	25.0	25.0	25.0	4	21	21.0	23.0	4	21	17.0	18.0	4	8	4	11.5	24.8	30	42	54	4	9	21.0	23.0	5	12	5	12	12
44 FT	8	10	8	8	4	8.5	4	8.5	24.8	25.0	25.0	25.0	4	20	21.0	23.0	4	20	17.0	18.0	4	8	4	11	24.8	30	42	54	4	9	21.0	23.0	5	12	5	12	12
46 FT	8	10	8	8	4	8	4	8	24.8	25.0	25.0	25.0	4	19	21.0	23.0	4	19	17.0	18.0	4	7.5	4	10.5	24.8	30	42	54	4	8.5	21.0	23.0	5	12	5	12	12
48 FT	9	11	8	8	4	8	4	7.5	24.9	25.0	25.0	25.0	4	19	21.0	22.0	4	19	18.0	18.0	4	8	4	10.5	25.0	31	43	55	4	9.5	21.0	23.0	5	12	5	12	12
50 FT	10	11	8	8	4	8	4	8	25.1	26.0	26.0	26.0	4	20	21.0	23.0	4	20	17.0	18.0	4	7.5	4	10.5	25.1	31	43	55	4	9	21.0	23.0	5	12	5	12	12

		SPAN (S) = 3 FT												HEIGHT (HT) = 5 FT OR 6 FT																					
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS									
		A1 BARS				J3 BARS				H1 BARS				H2 BARS				A2 BARS				J4 BARS				H3 BARS				B1 BARS	B2 BARS				
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=5'	HT=6'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	HT=5'	HT=6'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.
1 FT	10	8	8	8	4	8.5	4	10.5	26.8	26.0	26.0	4	24	39.5	30.5	4	24	21.0	20.0	4	12	4	11.5	36.0	64	76	4	12	34.0	25.0	5	12	5	12	12
2 FT	10	8	8	8	4	8.5	4	10.5	26.8	26.0	26.0	4	24	39.5	30.5	4	24	20.0	20.0	4	12	4	11	36.0	64	76	4	12	34.0	24.0	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	39.5	34.0	4	24	19.0	19.0	4	12	4	10	36.0	64	76	4	12	34.0	24.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	39.5	26.0	4	24	18.0	19.0	4	12	4	9.5	36.0	64	76	4	12	34.0	23.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	39.5	24.0	4	24	18.0	18.0	4	12	4	9	36.0	64	76	4	12	24.0	23.0	5	12	5	12	12
10 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	39.5	23.0	4	24	18.0	18.0	4	12	4	8.5	36.0	64	76	4	12	23.0	23.0	5	12	5	12	12
12 FT	8	8	8	8	4	12	4	12	26.8	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	8	34.4	64	76	4	12	22.0	23.0	5	12	5	12	12
14 FT	8	8	8	8	4	12	4	11	34.5	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	8.5	34.1	64	76	4	12	22.0	23.0	5	12	5	12	12
16 FT	8	8	8	8	4	12	4	10	34.3	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	8	33.9	64	76	4	12	22.0	23.0	5	12	5	12	12
18 FT	8	8	8	8	4	12	4	9	34.0	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	7.5	33.8	64	76	4	12	22.0	23.0	5	12	5	12	12
20 FT	8	8	8	8	4	12	4	8	33.8	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	7	33.6	64	76	4	11.5	22.0	23.0	5	12	5	12	12
22 FT	8	8	8	8	4	12	4	7.5	33.6	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	12	4	6.5	33.5	64	76	4	10.5	22.0	23.0	5	12	5	12	12
24 FT	8	8	8	8	4	12	4	7	33.5	24.0	24.0	4	24	22.0	22.0	4	24	17.0	18.0	4	11.5	4	6	33.4	64	76	4	10.5	22.0	23.0	5	12	5	12	12
26 FT	8	8	8	8	4	12	4	6.5	33.4	24.0	24.0	4	24	21.0	22.0	4	24	17.0	18.0	4	10.5	5	6.5	33.3	64	76	4	10	22.0	22.0	5	12	5	12	12
28 FT	8	8	8	8	4	12	4	6	33.3	24.0	24.0	4	24	21.0	22.0	4	24	17.0	18.0	4															

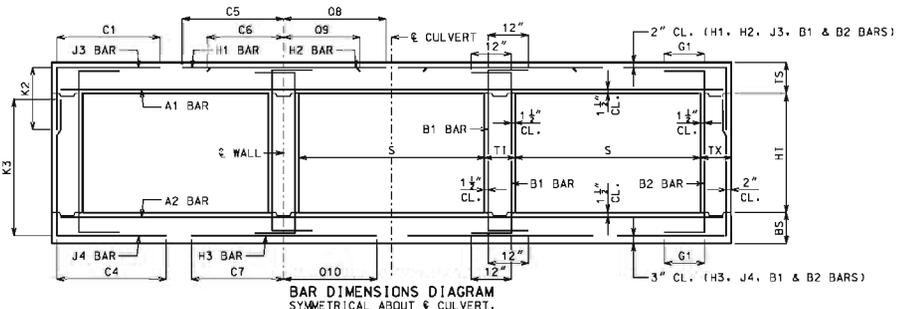
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 4 FT																HEIGHT (HT) = 2 FT OR 3 FT															
					TOP SLAB BARS				H1 BARS				H2 BARS				A2 BARS				BOTTOM SLAB BARS				WALL BARS											
					A1 BARS		J3 BARS		K2		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS													
					TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=2'	HT=3'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	HT=2'	HT=3'	SIZE	SPA.	C7	Q10	SIZE	SPA.
1 FT	10	8	8	8	4	7	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	21.0	20.0	4	12	4	12	29.4	28	40	4	12	27.0	28.0	5	12	5	12	12	
2 FT	10	8	8	8	4	7	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	21.0	20.0	4	12	4	12	27.3	28	40	4	11.5	27.0	27.0	5	12	5	12	12	
4 FT	8	8	8	8	4	12	4	12	28.6	24.0	24.0	4	24	33.0	36.0	4	24	20.0	20.0	4	12	4	12	25.0	28	40	4	11.5	26.0	27.0	5	12	5	12	12	
6 FT	8	8	8	8	4	12	4	12	26.0	24.0	24.0	4	24	28.0	29.0	4	24	19.0	19.0	4	12	4	12	24.1	28	40	4	10.5	25.0	26.0	5	12	5	12	12	
8 FT	8	8	8	8	4	12	4	12	24.8	24.0	24.0	4	24	26.0	28.0	4	24	19.0	19.0	4	12	4	12	23.5	28	40	4	10	25.0	26.0	5	12	5	12	0	
10 FT	8	8	8	8	4	12	4	12	24.1	24.0	24.0	4	24	26.0	27.0	4	24	19.0	19.0	4	12	4	12	23.1	28	40	4	9	25.0	26.0	5	12	5	12	0	
12 FT	8	8	8	8	4	12	4	12	23.6	24.0	24.0	4	23	25.0	26.0	4	23	18.0	19.0	4	12	4	12	22.9	28	40	4	8	25.0	26.0	5	12	5	12	0	
14 FT	8	8	8	8	4	12	4	12	23.4	24.0	24.0	4	22	25.0	26.0	4	22	18.0	18.0	4	11	4	12	22.6	28	40	4	7.5	24.0	26.0	5	12	5	12	0	
16 FT	8	8	8	8	4	12	4	12	22.5	24.0	24.0	4	21	24.0	25.0	4	21	18.0	18.0	4	10.5	4	12	22.1	28	40	4	7.5	24.0	25.0	5	12	5	12	0	
18 FT	8	8	8	8	4	11.5	4	12	22.5	24.0	24.0	4	20	24.0	25.0	4	20	18.0	18.0	4	9.5	4	10.5	22.1	28	40	4	7	24.0	25.0	5	12	5	12	0	
20 FT	8	8	8	8	4	10.5	4	11	22.4	24.0	24.0	4	18	24.0	25.0	4	18	18.0	18.0	4	8.5	4	9.5	22.1	28	40	4	6.5	24.0	25.0	5	12	5	12	0	
22 FT	8	8	8	8	4	9.5	4	10	22.4	24.0	24.0	4	17	24.0	25.0	4	17	18.0	18.0	4	7.5	4	9	22.0	28	40	4	6	24.0	25.0	5	12	5	12	0	
24 FT	8	9	8	8	4	8.5	4	9	22.6	24.0	24.0	4	15	24.0	25.0	4	15	18.0	18.0	4	8	4	11.5	21.4	29	41	4	7	24.0	26.0	5	12	5	12	0	
26 FT	8	9	8	8	4	8	4	8.5	22.5	24.0	24.0	4	14	24.0	25.0	4	14	18.0	18.0	4	7	4	11	21.4	29	41	4	6.5	24.0	26.0	5	12	5	12	0	
28 FT	8	10	8	8	4	7.5	4	8	22.8	24.0	24.0	4	13	24.0	25.0	4	13	18.0	18.0	4	7.5	4	12	20.9	30	42	4	7	24.0	26.0	5	12	5	12	0	
30 FT	9	10	8	8	4	7.5	4	10	22.1	25.0	25.0	4	15	24.0	26.0	4	15	18.0	18.0	4	7	4	12	21.0	30	42	4	7	24.0	26.0	5	12	5	12	0	
32 FT	9	10	8	8	4	7	4	9.5	22.1	25.0	25.0	4	14	24.0	26.0	4	14	18.0	18.0	4	6	4	12	21.0	30	42	4	6	24.0	26.0	5	12	5	12	0	
34 FT	9	11	8	8	4	6.5	4	9	22.3	25.0	25.0	4	13	24.0	26.0	4	13	18.0	18.0	4	6.5	4	10.5	20.6	31	43	4	7	24.0	26.0	5	12	5	12	0	
36 FT	10	11	8	8	4	7	4	10	21.9	26.0	26.0	4	14	24.0	26.0	4	14	18.0	19.0	4	6.5	4	10.5	20.9	31	43	4	7	24.0	26.0	5	12	5	12	0	
38 FT	10	12	8	8	4	6.5	4	9.5	22.0	26.0	26.0	4	13	24.0	26.0	4	13	18.0	19.0	4	6.5	4	9.5	20.5	32	44	4	7.5	24.0	27.0	5	12	5	12	0	
40 FT	10	12	8	8	4	6	4	9	22.0	26.0	26.0	4	13	24.0	26.0	4	13	18.0	19.0	4	6.5	4	9.5	20.5	32	44	4	7	24.0	27.0	5	12	5	12	0	
42 FT	11	12	8	8	4	6.5	4	9.5	21.6	27.0	27.0	4	14	23.0	26.0	4	14	18.0	19.0	4	6	4	9.5	20.8	32	44	4	6.5	24.0	26.0	5	12	5	12	0	
44 FT	11	12	8	8	4	6	4	9.5	21.6	27.0	27.0	4	13	23.0	26.0	4	13	18.0	19.0	4	6	4	9.5	20.8	32	44	4	6	24.0	26.0	5	12	5	12	0	
46 FT	11	13	8	8	4	6	4	8.5	21.8	27.0	27.0	4	12	23.0	26.0	4	12	18.0	19.0	4	6	4	8.5	20.5	33	45	4	6.5	23.0	27.0	5	12	5	12	0	
48 FT	12	13	8	8	4	6	4	8.5	21.5	28.0	28.0	4	13	23.0	26.0	4	13	18.0	19.0	4	6	4	8.5	20.8	33	45	4	6.5	24.0	27.0	5	12	5	12	0	
50 FT	12	13	8	8	5	9	4	8.5	21.5	28.0	28.0	4	13	23.0	26.0	4	13	18.0	19.0	5	8.5	4	8.5	20.8	33	45	4	6	24.0	27.0	5	12	5	12	0	

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 4 FT																HEIGHT (HT) = 4 FT OR 5 FT															
					TOP SLAB BARS				H1 BARS				H2 BARS				A2 BARS				BOTTOM SLAB BARS				WALL BARS											
					A1 BARS		J3 BARS		K2		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS													
					TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	HT=5'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	HT=4'	HT=5'	SIZE	SPA.	C7	Q10	SIZE	SPA.
1 FT	10	8	8	8	4	7	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	21.0	21.0	4	12	4	12	42.0	52	64	4	12	28.0	28.0	5	12	5	12	12	
2 FT	10	8	8	8	4	7	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	21.0	21.0	4	12	4	12	39.1	52	64	4	11	27.0	28.0	5	12	5	12	12	
4 FT	8	8	8	8	4	12	4	12	30.3	24.0	24.0	4	24	47.5	37.0	4	24	20.0	20.0	4	12	4	12	34.8	52	64	4	11	26.0	27.0	5	12	5	12	12	
6 FT	8	8	8	8	4	12	4	12	34.6	24.0	24.0	4	24	29.0	30.0	4	24	19.0	19.0	4	12	4	11.5	32.1	52	64	4	10.5	25.0	26.0	5	12	5	12	12	
8 FT	8	8	8	8	4	12	4	12	31.4	24.0	24.0	4	24	27.0	28.0	4	24	19.0	19.0	4	12	4	11	30.3	52	64	4	9.5	25.0	26.0	5	12	5	12	12	
10 FT	8	8	8	8	4	12	4	12	28.9	24.0	24.0	4	24	26.0	27.0	4	24	19.0	19.0	4	12	4	10.5	29.3	52	64	4	9	25.0	26.0	5	12	5	12	12	
12 FT	8	8	8	8	4	12	4	12	29.1	24.0	24.0	4	24	25.0	27.0	4	24	18.0	19.0	4	11.5	4	10	28.5	52	64	4	8.5	24.0	26.0	5	12	5	12	12	
14 FT	8	8	8	8	4	12	4	11	28.5	24.0	24.0	4	23	25.0	26.0	4	23	18.0	19.0	4	10.5	4	9.5	28.1	52	64	4	7.5	24.0	26.0	5	12	5	12	12	
16 FT	8	8	8	8	4	12	4	11	26.9	24.0	24.0	4	22	24.0	26.0	4	22	18.0	19.0	4	10	4	9.5	26.6	52	64	4	7.5	24.0	26.0	5	12	5	12	12	
18 FT	8	8	8	8	4	11	4	10	26.8	24.0	24.0	4	21	24.0	26.0	4	21	18.0	19.0	4	9	4	8.5	26.5	52	64	4	7	24.0	26.0	5	12	5	12	12	
20 FT	8	8	8	8	4	10	4	9	26.8	24.0	24.0	4	19	24.0	26.0	4	19	18.0	19.0	4	8	4	8	26.4	52	64	4	6.5	24.0	26.0	5	12	5	12	12	
22 FT	8	8	8	8	4	9	4	8	26.6	24.0	24.0	4	17	24.0	26.0	4	17	18.0	18.0	4	7	4	7	26.4	52	64	4	6	24.0	26.0	5	12	5	12	12	
24 FT	8	9	8	8	4	8.5	4	7.5	26.6	24.0	24.0	4	16	24.0	25.0	4	16	18.0	18.0	4	7.5	4	8.5	26.6	53	65	4	7	24.0	26.0	5	12	5	12	12	
26 FT	8	9	8	8	4	8	4	7.5	26.6	24.0	24.0	4	14	24.0	25.0	4	14	18.0	18.0	4	7	4	8	26.5	53	65	4	6.5	24.0	26.0	5	12	5	12	12	
28 FT	8	10	8	8	4	7.5	4	6	26.6	24.0	24.0	4	13	24.0	25.0	4	13	18.0	18.0	4	7.5	4	9.5	26.8	54	66	4	7.5	24.0	26.0	5	12	5	12	12	
30 FT	9	10	8	8	4	7.5	4	7.5	26.9	25.0	25.0	4	15	24.0	26.0	4	15	18.0	19.0	4	7	4	9	26.9	54	66	4	7	24.0							

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

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 4 FT												HEIGHT (HT) = 6 FT OR 7 FT																		
					TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																		
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS														
					SIZE	SPA.	SIZE	SPA.	C1	HT=6'	HT=7'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	HT=6'	HT=7'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1
1 FT	10	8	8	8	4	6.5	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	22.0	21.0	4	12	4	9	42.0	76	88	4	11.5	40.0	28.0	5	12	5	12	12
2 FT	10	8	8	8	4	6.5	4	10.5	30.3	26.0	26.0	4	24	47.5	36.5	4	24	21.0	21.0	4	12	4	8.5	42.0	76	88	4	11	40.0	28.0	5	12	5	12	12
4 FT	8	8	8	8	4	12	4	10	30.3	24.0	24.0	4	24	47.5	37.0	4	24	20.0	20.0	4	12	4	7.5	42.0	76	88	4	11	29.0	27.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	10	30.3	24.0	24.0	4	24	47.5	29.0	4	24	19.0	19.0	4	12	4	7	42.0	76	88	4	10	27.0	26.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	9	30.3	24.0	24.0	4	24	47.5	28.0	4	24	19.0	19.0	4	12	4	6.5	42.0	76	88	4	9.5	26.0	26.0	5	12	5	12	0
10 FT	8	8	8	8	4	12	4	8	43.1	24.0	24.0	4	24	28.0	27.0	4	24	18.0	19.0	4	12	4	6.5	40.6	76	88	4	9	25.0	26.0	5	12	5	12	0
12 FT	8	8	8	8	4	12	4	7.5	40.5	24.0	24.0	4	24	27.0	26.0	4	24	18.0	19.0	4	11.5	4	6	39.1	76	88	4	8.5	25.0	26.0	5	12	5	12	0
14 FT	8	8	8	8	4	12	4	6.5	39.3	24.0	24.0	4	23	26.0	26.0	4	23	18.0	19.0	4	10.5	5	6.5	38.4	76	88	4	8	25.0	26.0	5	12	5	12	0
16 FT	8	8	8	8	4	12	4	6.5	35.5	24.0	24.0	4	23	24.0	25.0	4	23	18.0	19.0	4	10	5	6.5	35.4	76	88	4	7.5	24.0	26.0	5	12	5	12	0
18 FT	8	8	8	8	4	11.5	4	6	35.3	24.0	24.0	4	21	24.0	25.0	4	21	18.0	18.0	4	9	5	6	35.1	76	88	4	7	24.0	26.0	5	12	5	12	0
20 FT	8	8	8	8	4	10	5	6.5	35.0	24.0	28.0	4	19	24.0	25.0	4	19	18.0	18.0	4	8	6	6.5	38.0	76	88	4	6.5	24.0	26.0	5	12	5	12	0
22 FT	8	9	8	8	4	9.5	5	6	34.6	24.0	28.0	4	18	24.0	25.0	4	18	18.0	18.0	4	8.5	5	6	36.1	77	89	4	8	25.0	26.0	5	12	5	11.5	0
24 FT	8	9	9	8	4	8.5	5	6.5	34.1	24.0	28.0	4	16	24.0	25.0	4	16	18.0	18.0	4	8	5	7	35.6	77	89	4	7.5	25.0	26.0	5	12	5	11.5	0
26 FT	8	9	9	8	4	8	5	6	34.0	24.0	28.0	4	15	24.0	25.0	4	15	18.0	18.0	4	7.5	5	6.5	35.5	77	89	4	7	25.0	26.0	5	12	5	11	0
28 FT	8	10	9	8	4	7.5	6	7.5	36.8	24.0	28.0	4	14	24.0	25.0	4	14	18.0	18.0	4	7.5	5	7	36.6	78	90	4	7.5	25.0	26.0	5	12	5	10.5	0
30 FT	9	10	9	8	4	8	5	6	35.0	25.0	29.0	4	15	24.0	25.0	4	15	18.0	18.0	4	7	5	6.5	36.4	78	90	4	7	25.0	26.0	5	12	5	10	0
32 FT	9	10	9	8	4	7.5	5	6	35.0	25.0	29.0	4	14	24.0	25.0	4	14	18.0	18.0	4	6.5	5	6	36.3	78	90	4	6.5	25.0	26.0	5	12	5	9.5	0
34 FT	9	11	9	8	4	7	5	6	34.9	25.0	29.0	4	13	24.0	25.0	4	13	18.0	18.0	4	7	5	6.5	37.4	79	91	4	7	25.0	26.0	5	12	5	9	0
36 FT	10	11	9	8	4	7	5	6.5	35.9	26.0	30.0	4	15	24.0	25.0	4	15	18.0	18.0	4	7	5	6	37.0	79	91	4	7	25.0	26.0	5	12	5	8.5	0
38 FT	10	11	9	8	4	7	5	6	35.8	26.0	30.0	4	14	24.0	25.0	4	14	18.0	18.0	4	6.5	6	7.5	40.0	79	91	4	6.5	25.0	26.0	5	12	5	8.5	0
40 FT	10	12	9	8	4	6.5	5	6	35.6	26.0	30.0	4	13	24.0	25.0	4	13	18.0	18.0	4	6.5	5	6	38.3	80	92	4	7	25.0	26.0	5	12	5	8.5	0
42 FT	10	12	9	8	4	6.5	5	6	35.6	30.0	30.0	4	12	24.0	25.0	4	12	18.0	18.0	4	6.5	6	7.5	41.1	80	92	4	6.5	25.0	26.0	5	12	5	8.5	0
44 FT	11	12	9	8	4	6.5	6	7.5	39.5	31.0	35.0	4	14	24.0	25.0	4	14	18.0	18.0	4	6	6	7	40.9	80	92	4	6.5	25.0	26.0	5	12	5	8.5	0
46 FT	11	13	9	8	4	6	6	6.5	39.4	31.0	35.0	4	13	24.0	25.0	4	13	18.0	18.0	4	6.5	6	7.5	42.0	81	93	4	6.5	26.0	26.0	5	12	5	8.5	0
48 FT	11	13	10	8	4	6	5	6	36.3	27.0	31.0	4	13	23.0	25.0	4	13	18.0	18.0	4	6	5	6.5	38.4	81	93	4	6.5	26.0	26.0	5	12	5	8	0
50 FT	12	13	11	8	4	6	5	7	37.0	28.0	32.0	4	14	23.0	25.0	4	14	18.0	18.0	4	6	5	7.5	37.9	81	93	4	6	25.0	26.0	5	12	5	7.5	0



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 4 FEET HEIGHT (HT): 6 THRU 7 FEET		SHEET NO. 3 OF 27
		703.87	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011

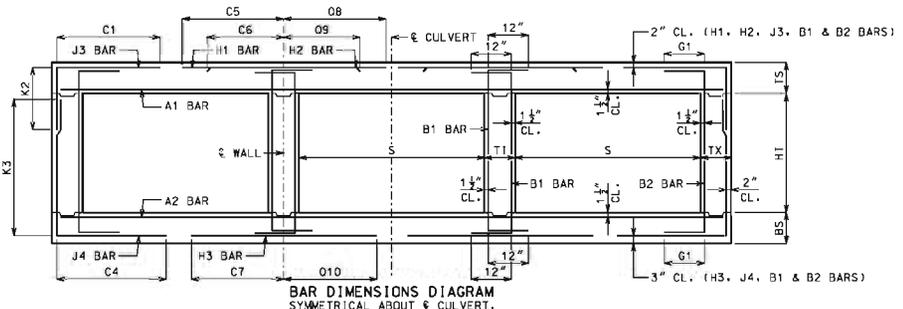
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

DESIGN FILL	SPAN (S) = 5 FT										HEIGHT (HT) = 3 FT OR 4 FT																								
	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																		
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS														
					SIZE	SPA.	SIZE	SPA.	C1	K2 HT=3' HT=4'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=3' HT=4'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	10	8	8	8	5	9	4	10.5	33.9	27.0	27.0	4	19	56.5	42.5	4	19	22.0	21.0	4	12	4	12	33.9	40	52	4	8.5	30.0	31.0	5	12	5	12	12
2 FT	11	8	8	8	4	6	4	9.5	33.9	27.0	27.0	4	21	56.5	42.5	4	21	22.0	21.0	4	12	4	12	31.1	40	52	4	8.5	30.0	31.0	5	12	5	12	12
4 FT	8	8	8	8	4	10.5	4	12	32.1	24.0	24.0	4	20	38.0	46.0	4	20	20.0	20.0	4	12	4	12	28.4	40	52	4	8.5	28.0	29.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	12	29.3	24.0	24.0	4	21	51.0	34.0	4	21	20.0	20.0	4	12	4	12	27.0	40	52	4	8	28.0	29.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	12	27.5	24.0	24.0	4	20	30.0	31.0	4	20	19.0	19.0	4	11	4	11	26.3	40	52	4	7	28.0	29.0	5	12	5	12	0
10 FT	8	8	8	8	4	11	4	12	26.6	24.0	24.0	4	18	29.0	30.0	4	18	19.0	19.0	4	9.5	4	10.5	25.6	40	52	4	6.5	27.0	29.0	5	12	5	12	0
12 FT	8	8	8	8	4	10	4	10.5	26.1	24.0	24.0	4	16	28.0	30.0	4	16	19.0	19.0	4	8	4	9.5	25.3	40	52	4	6	27.0	29.0	5	12	5	12	0
14 FT	8	8	8	8	4	8.5	4	9.5	25.6	24.0	24.0	4	14	28.0	29.0	4	14	19.0	19.0	4	7	4	8.5	25.0	40	52	5	7	27.0	29.0	5	12	5	12	0
16 FT	8	9	8	8	4	8	4	8.5	25.6	24.0	24.0	4	13	28.0	29.0	4	13	19.0	19.0	4	7	4	11	24.3	41	53	4	6	27.0	29.0	5	12	5	12	0
18 FT	8	9	8	8	4	7.5	4	8	24.8	24.0	24.0	4	12	27.0	28.0	4	12	19.0	19.0	4	7	4	10.5	23.5	41	53	4	6	27.0	29.0	5	12	5	12	0
20 FT	8	9	8	8	4	7	4	7.5	24.6	24.0	24.0	5	17	27.0	28.0	5	17	19.0	19.0	4	6	4	9.5	23.5	41	53	5	7	27.0	29.0	5	12	5	12	0
22 FT	9	10	8	8	4	7	4	9	24.3	25.0	25.0	4	12	27.0	29.0	4	12	19.0	19.0	4	6.5	4	12	23.1	42	54	4	6	27.0	29.0	5	12	5	12	0
24 FT	9	11	8	8	4	6.5	4	8	24.4	25.0	25.0	5	17	27.0	29.0	5	17	19.0	19.0	4	6.5	4	10.5	22.6	43	55	4	6	26.0	30.0	5	12	5	12	0
26 FT	10	11	8	8	4	6.5	4	8.5	23.9	26.0	26.0	5	18	26.0	29.0	5	18	19.0	19.0	4	6	4	10.5	22.9	43	55	5	8	26.0	29.0	5	12	5	12	0
28 FT	10	11	8	8	4	6	4	8	23.9	26.0	26.0	5	17	26.0	29.0	5	17	19.0	19.0	5	8.5	4	10.5	22.9	43	55	5	8	26.0	29.0	5	12	5	12	0
30 FT	10	12	8	8	5	8	4	7	24.0	26.0	26.0	5	16	26.0	29.0	5	16	19.0	19.0	5	9	4	9.5	22.5	44	56	5	8.5	26.0	30.0	5	12	5	12	0
32 FT	11	12	8	8	5	9	4	8	23.6	27.0	27.0	5	17	26.0	29.0	5	17	19.0	19.0	5	8.5	4	9.5	22.8	44	56	5	8	26.0	30.0	5	12	5	12	0
34 FT	11	13	8	8	5	8.5	4	7	23.8	27.0	27.0	5	16	26.0	29.0	5	16	19.0	19.0	5	8.5	4	8.5	22.5	45	57	5	8.5	26.0	30.0	5	12	5	12	0
36 FT	12	13	8	8	5	8.5	4	8	23.5	28.0	28.0	5	17	26.0	29.0	5	17	19.0	19.0	5	8	4	8.5	22.8	45	57	5	8	26.0	29.0	5	12	5	12	0
38 FT	12	14	8	8	5	8	4	7	23.6	28.0	28.0	5	16	26.0	29.0	5	16	19.0	19.0	5	8	4	7.5	22.6	46	58	5	8.5	26.0	30.0	5	12	5	12	0
40 FT	13	14	8	8	5	8	4	7.5	23.4	29.0	29.0	5	16	26.0	29.0	5	16	19.0	19.0	5	8	4	7.5	22.8	46	58	5	8	26.0	30.0	5	12	5	12	0
42 FT	13	14	8	8	5	7.5	4	7.5	23.4	29.0	29.0	5	16	26.0	29.0	5	16	19.0	19.0	5	7.5	4	7.5	22.8	46	58	5	7.5	26.0	30.0	5	12	5	12	0
44 FT	13	15	8	8	5	7.5	4	7	23.6	29.0	29.0	5	15	26.0	29.0	5	15	19.0	19.0	5	7.5	4	7	22.8	47	59	5	8	26.0	30.0	5	12	5	12	0
46 FT	14	15	8	8	5	7.5	4	7	23.4	30.0	30.0	5	16	25.0	29.0	5	16	18.0	19.0	5	7.5	4	7	22.9	47	59	5	7.5	26.0	30.0	5	12	5	12	0
48 FT	14	15	8	8	5	7	4	7	23.4	30.0	30.0	5	15	25.0	29.0	5	15	18.0	19.0	5	7	4	7	22.9	47	59	5	7	26.0	30.0	5	12	5	12	0
50 FT	14	16	8	8	5	7	4	6.5	23.6	30.0	30.0	5	15	25.0	29.0	5	15	18.0	19.0	5	7	4	6.5	22.9	48	60	5	7.5	26.0	30.0	5	12	5	12	0

DESIGN FILL	SPAN (S) = 5 FT										HEIGHT (HT) = 5 FT OR 6 FT																								
	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																		
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS														
					SIZE	SPA.	SIZE	SPA.	C1	K2 HT=5' HT=6'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=5' HT=6'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	11	8	8	8	4	6	4	9.5	33.9	27.0	27.0	4	22	56.5	42.5	4	22	23.0	23.0	4	12	4	10	47.5	64	76	4	8	31.0	31.0	5	12	5	12	12
2 FT	11	8	8	8	4	6	4	9.5	33.9	27.0	27.0	4	21	56.5	42.5	4	21	22.0	22.0	4	11	4	9.5	42.8	64	76	4	8	30.0	31.0	5	12	5	12	12
4 FT	8	8	8	8	4	10	4	10	33.9	24.0	24.0	4	20	56.5	46.0	4	20	21.0	21.0	4	12	4	9	38.9	64	76	4	8.5	29.0	30.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	10.5	38.3	24.0	24.0	4	21	33.0	35.0	4	21	20.0	20.0	4	12	4	8.5	35.5	64	76	4	7.5	28.0	30.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	10	34.4	24.0	24.0	4	20	30.0	31.0	4	20	19.0	20.0	4	10.5	4	8	33.5	64	76	4	7	28.0	29.0	5	12	5	12	12
10 FT	8	8	8	8	4	12.5	4	9	32.9	24.0	24.0	4	18	29.0	30.0	4	18	19.0	19.0	4	9.5	4	8.5	32.3	64	76	4	6.5	27.0	29.0	5	12	5	12	12
12 FT	8	8	8	8	4	9.5	4	8	31.9	24.0	24.0	4	16	28.0	30.0	4	16	19.0	19.0	4	7.5	4	7	31.3	64	76	4	6	27.0	29.0	5	12	5	12	12
14 FT	8	8	8	8	4	8.5	4	7	31.1	24.0	24.0	4	14	28.0	29.0	4	14	19.0	19.0	4	7	4	6	30.8	64	76	5	7	27.0	29.0	5	12	5	12	0
16 FT	8	9	8	8	4	8	4	6.5	30.8	24.0	24.0	4	13	28.0	29.0	4	13	19.0	19.0	4	7	4	7	30.9	65	77	4	6	27.0	29.0	5	12	5	12	0
18 FT	8	9	8	8	4	7.5	4	6.5	29.1	24.0	24.0	4	12	27.0	28.0	4	12	19.0	19.0	4	6.5	4	7	29.1	65	77	4	6	27.0	29.0	5	12	5	12	0
20 FT	8	9	8	8	4	7	4	7	29.0	24.0	24.0	5	17	27.0	28.0	5	17	19.0	19.0	4	6	4	6.5	29.0	65	77	5	7.5	27.0	29.0	5	12	5	12	0
22 FT	9	10	8	8	4	7	4	6.5	29.1	25.0	25.0	4	12	26.0	29.0	4	12	19.0	19.0	4	6	4	7.5	29.3	66	78	4	6	27.0	29.0	5	12	5	12	0
24 FT	9	10	8	8	4	6.5	4	6	29.1	25.0	25.0	5	17	26.0	29.0	5	17	19.0	19.0	5	8.5	4	7	29.1	66	78	5	7.5	27.0	29.0	5	12	5	12	0
26 FT	10	11	8	8	4	6.5	4	6.5	29.1	26.0	26.0	4	12	26.0	29.0	4	12	19.0	19.0	4	6	4	6.5	29.4	67	79	5	8.5	26.0	29.0	5	12	5	12	0
28 FT	10	11	8	8	4	6	4	6.5	29.3	26.0	26.0	5	17	26.0	29.0	5	17	19.0	19.0	5	8.5	4	6	29.4	67	79	5	8	26.0	29.0	5	12	5	12	0
30 FT	10	12	8	8	5	8.5	5	7.5	29.3	26.0	26.0	5	16	26.0	29.0	5	16	19.0	19.0	5	9	4	6	29.5	68	80	5	8.5	26.0	30.0	5	12	5	12	0
32 FT	11	12																																	

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

DESIGN FILL	SPAN (S) = 5 FT											HEIGHT (HT) = 7 FT OR 8 FT																							
	MEMBER THICKNESS		TOP SLAB BARS											BOTTOM SLAB BARS																					
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS			H2 BARS			A2 BARS		J4 BARS		H3 BARS			WALL BARS													
					SIZE	SPA.	SIZE	SPA.	C1	K2	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	SIZE	SPA.	C4	K3	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1		
						HT=7'	HT=8'																												
1 FT	11	8	8	8	4	6	4	9	33.9	27.0	27.0	4	22	56.5	42.5	4	22	23.0	23.0	4	11	4	7	48.0	88	100	4	8	46.0	31.0	5	12	5	12	12
2 FT	11	8	8	8	4	6	4	8.5	33.9	27.0	27.0	4	21	56.5	42.5	4	21	23.0	23.0	4	10.5	4	6.5	48.0	88	100	4	8	32.0	31.0	5	12	5	12	12
4 FT	8	8	8	8	4	9.5	4	7	33.9	24.0	24.0	4	20	56.5	46.0	4	20	21.0	21.0	4	11.5	4	6	48.0	88	100	4	8	31.0	30.0	5	12	5	12	12
6 FT	8	8	8	8	4	12	4	7	33.9	24.0	24.0	4	21	56.5	35.0	4	21	20.0	20.0	4	11	5	6	48.0	88	100	4	7.5	29.0	30.0	5	12	5	12	12
8 FT	8	8	8	8	4	12	4	6.5	51.8	24.0	24.0	4	20	34.0	31.0	4	20	19.0	20.0	4	10	5	6	46.0	88	100	4	7	28.0	29.0	5	12	5	12	0
10 FT	8	8	9	8	4	11	4	7	43.8	24.0	24.0	4	18	30.0	30.0	4	18	19.0	20.0	4	9	4	6	41.6	88	100	4	6.5	28.0	29.0	5	12	5	12	0
12 FT	8	8	9	8	4	9.5	4	6	41.3	24.0	24.0	4	16	29.0	30.0	4	16	19.0	19.0	4	8	5	6	40.4	88	100	4	6	27.0	29.0	5	12	5	12	0
14 FT	8	9	9	8	4	9	5	7	39.9	24.0	28.0	4	15	28.0	29.0	4	15	19.0	19.0	4	8	5	6.5	41.4	89	101	4	6.5	27.0	29.0	5	12	5	11.5	0
16 FT	8	9	9	8	4	8	5	6	39.1	24.0	28.0	4	13	28.0	29.0	4	13	19.0	19.0	4	7	5	6	40.8	89	101	4	6	27.0	29.0	5	12	5	11	0
18 FT	8	9	9	8	4	7.5	5	6	36.5	24.0	28.0	4	13	26.0	28.0	4	13	19.0	19.0	4	7	5	6	38.1	89	101	4	6	27.0	29.0	5	12	5	11.5	0
20 FT	8	9	9	8	4	7	6	7	39.1	24.0	32.0	5	18	26.0	28.0	5	18	19.0	19.0	4	6	6	7	40.9	89	101	5	7.5	27.0	29.0	5	12	5	10.5	0
22 FT	8	10	9	8	4	6.5	6	7	38.8	24.0	28.0	5	17	27.0	28.0	5	17	19.0	20.0	4	6.5	5	6	39.0	90	102	5	8	27.0	29.0	5	12	5	10	0
24 FT	9	11	9	8	4	6.5	5	6	37.0	25.0	29.0	5	18	26.0	28.0	5	18	19.0	19.0	4	6.5	5	6	39.8	91	103	4	6	27.0	29.0	5	12	5	9.5	0
26 FT	9	11	9	8	4	6	5	6	36.9	25.0	29.0	5	16	26.0	28.0	5	16	19.0	19.0	4	6	5	6	39.6	91	103	5	8.5	27.0	29.0	5	12	5	8.5	0
28 FT	10	12	9	8	4	6	5	6	37.9	30.0	30.0	5	17	26.0	28.0	5	17	19.0	19.0	4	6	5	6	40.3	92	104	4	6	27.0	29.0	5	12	5	8.5	0
30 FT	10	12	9	8	4	6	5	6	37.8	30.0	30.0	5	16	26.0	28.0	5	16	19.0	19.0	4	6	6	7.5	43.1	92	104	5	8.5	27.0	29.0	5	12	5	8.5	0
32 FT	11	12	10	8	4	6	5	6.5	38.4	31.0	31.0	5	17	26.0	28.0	5	17	18.0	19.0	5	9	5	6.5	39.6	92	104	5	8	27.0	29.0	5	12	5	8	0
34 FT	11	13	10	8	5	9	5	6.5	38.3	31.0	31.0	5	16	26.0	28.0	5	16	19.0	19.0	5	9	5	6.5	40.4	93	105	5	8.5	28.0	30.0	5	12	5	8	0
36 FT	12	13	10	8	5	9	5	6.5	39.1	32.0	32.0	5	17	26.0	28.0	5	17	18.0	19.0	5	8.5	5	6.5	40.3	93	105	5	8	27.0	30.0	5	12	5	8	0
38 FT	12	14	10	8	5	8.5	5	6	39.0	32.0	32.0	5	17	26.0	28.0	5	17	18.0	19.0	5	9	5	6.5	40.9	94	106	5	8.5	28.0	30.0	5	12	5	8	0
40 FT	12	14	11	8	5	8	5	7	38.9	32.0	32.0	5	16	26.0	28.0	5	16	18.0	19.0	5	8.5	5	7	40.8	94	106	5	8	28.0	30.0	5	12	5	7.5	0
42 FT	13	14	11	8	5	8.5	5	7	39.6	33.0	33.0	5	17	26.0	28.0	5	17	18.0	19.0	5	8	5	7	40.5	94	106	5	7.5	28.0	30.0	5	12	5	7.5	0
44 FT	13	15	11	8	5	8	5	6.5	39.5	33.0	33.0	5	16	26.0	28.0	5	16	18.0	19.0	5	8	5	7	41.3	95	107	5	8	28.0	30.0	5	12	5	7.5	0
46 FT	13	15	12	8	5	7.5	5	6.5	39.5	33.0	33.0	5	15	26.0	28.0	5	15	18.0	19.0	5	8	5	6.5	41.0	95	107	5	7.5	28.0	30.0	5	12	5	7	0
48 FT	14	15	12	8	5	8	5	6.5	40.3	34.0	34.0	5	17	26.0	27.0	5	17	18.0	19.0	5	7.5	5	6.5	40.9	95	107	5	7	28.0	30.0	5	12	5	7	0
50 FT	14	16	12	8	5	7.5	5	6.5	40.1	34.0	34.0	5	16	26.0	27.0	5	16	18.0	19.0	5	8	5	6.5	41.6	96	108	5	7.5	28.0	30.0	5	12	5	7	0



GENERAL NOTES:

IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 5 FEET HEIGHT (HT): 7 THRU 8 FEET		SHEET NO. 703.87 5 OF 27
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011		

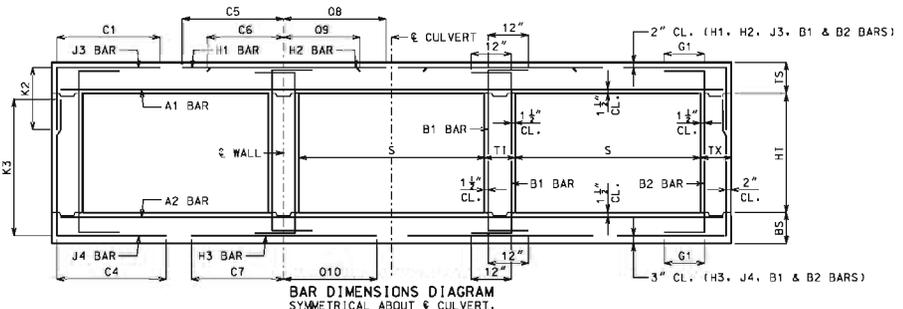
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 6 FT												HEIGHT (HT) = 3 FT OR 4 FT OR 5 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS													
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=3'	HT=4'	HT=5'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	C4	HT=3'	HT=4'	HT=5'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	11	8	8	8	5	8	4	9.5	37.5	27.0	27.0	27.0	4	17	64.5	48.5	4	17	24.0	23.0	4	10	4	10	38.1	40	52	64	4	7.5	33.0	34.0	5	12	5	12	12
2 FT	11	8	8	8	5	8	4	9.5	37.5	27.0	27.0	27.0	4	17	64.5	48.5	4	17	23.0	22.0	4	9.5	4	9	35.1	40	52	64	4	7	33.0	34.0	5	12	5	12	12
4 FT	8	8	8	8	4	7.5	4	8.5	35.8	24.0	24.0	24.0	4	14	43.0	32.0	4	14	21.0	21.0	4	9	4	9	32.1	40	52	64	4	6.5	32.0	33.0	5	12	5	12	12
6 FT	8	8	8	8	4	7	4	8.5	32.6	24.0	24.0	24.0	4	14	35.0	38.0	4	14	21.0	21.0	4	8.5	4	8	30.0	40	52	64	4	6	31.0	32.0	5	12	5	12	12
8 FT	8	8	8	8	4	7	4	8	30.4	24.0	24.0	24.0	4	13	33.0	35.0	4	13	20.0	20.0	4	8	4	8	29.0	40	52	64	5	7.5	30.0	32.0	5	12	5	12	0
10 FT	8	8	8	8	4	6	4	8	29.4	24.0	24.0	24.0	4	12	32.0	34.0	4	12	20.0	20.0	4	7	4	7	28.4	40	52	64	5	6.5	30.0	32.0	5	12	5	12	0
12 FT	8	8	8	8	4	7	4	7	28.8	24.0	24.0	24.0	5	17	31.0	33.0	5	17	20.0	20.0	4	6.5	4	6	27.4	41	53	65	5	7	30.0	32.0	5	12	5	12	0
14 FT	8	8	8	8	4	6.5	4	6.5	28.3	24.0	24.0	24.0	5	16	31.0	32.0	5	16	21.0	21.0	5	9	4	8	26.9	41	53	65	5	6.5	30.0	32.0	5	12	5	12	0
16 FT	9	10	8	8	4	6	4	7.5	27.6	25.0	25.0	25.0	5	16	30.0	33.0	5	16	20.0	20.0	5	9	4	9.5	26.5	42	54	66	5	7	29.0	32.0	5	12	5	12	0
18 FT	9	10	8	8	5	9	4	6.5	27.4	25.0	25.0	25.0	5	16	30.0	32.0	5	16	21.0	21.0	5	8	4	8.5	26.3	42	54	66	5	6.5	29.0	32.0	5	12	5	12	0
20 FT	10	11	8	8	5	9	4	7	27.0	26.0	26.0	26.0	5	15	30.0	33.0	5	15	20.0	20.0	5	8	4	8.5	26.0	43	55	67	5	7	29.0	33.0	5	12	5	12	0
22 FT	10	11	8	8	5	8.5	4	6.5	26.0	26.0	26.0	26.0	5	15	29.0	32.0	5	15	20.0	20.0	5	7.5	4	8.5	25.0	43	55	67	5	7	29.0	33.0	5	12	5	12	0
24 FT	11	12	8	8	5	8.5	4	6.5	25.8	27.0	27.0	27.0	5	15	29.0	32.0	5	15	20.0	20.0	5	8	4	8.5	24.9	44	56	68	5	7	29.0	33.0	5	12	5	12	0
26 FT	11	12	8	8	5	7.5	4	6	25.6	27.0	27.0	27.0	5	14	29.0	32.0	5	14	20.0	20.0	5	6.5	4	8	24.9	44	56	68	5	6.5	29.0	33.0	5	12	5	12	0
28 FT	12	13	8	8	5	7.5	4	6.5	25.5	28.0	28.0	28.0	5	14	29.0	32.0	5	14	19.0	20.0	5	7.5	4	8	24.9	45	57	69	5	7	29.0	33.0	5	12	5	12	0
30 FT	12	14	8	8	5	7	4	6	25.6	28.0	28.0	28.0	5	13	29.0	32.0	5	13	19.0	20.0	5	7.5	4	7.5	24.8	46	58	70	5	7	28.0	33.0	5	12	5	12	0
32 FT	13	14	8	8	5	7	4	6	25.4	29.0	29.0	29.0	5	14	28.0	33.0	5	14	19.0	20.0	5	7	4	7.5	24.9	46	58	70	5	6.5	28.0	33.0	5	12	5	12	0
34 FT	13	15	8	8	5	7	5	8.5	25.6	29.0	29.0	29.0	5	13	28.0	32.0	5	13	19.0	20.0	5	7	4	7	24.7	47	59	71	5	7	28.0	33.0	5	12	5	12	0
36 FT	14	15	8	8	5	7	4	6	25.4	30.0	30.0	30.0	5	13	28.0	33.0	5	13	19.0	20.0	5	6.5	4	7	25.0	47	59	71	5	6.5	28.0	33.0	5	12	5	12	0
38 FT	14	16	8	8	5	6.5	5	8.5	25.5	30.0	30.0	30.0	5	13	28.0	32.0	5	13	19.0	20.0	5	7	4	6.5	24.9	48	60	72	5	6.5	28.0	33.0	5	12	5	12	0
40 FT	15	16	8	8	5	6.5	5	8	30.4	31.0	31.0	31.0	5	13	33.0	38.0	5	13	24.0	25.0	5	6.5	4	6.5	25.1	48	60	72	5	6.5	28.0	33.0	5	12	5	12	0
42 FT	15	17	8	8	5	6.5	5	8	30.6	31.0	31.0	31.0	5	12	33.0	37.0	5	12	24.0	25.0	5	6.5	4	6	25.1	49	61	73	5	6.5	28.0	33.0	5	12	5	12	0
44 FT	16	17	8	8	5	6.5	5	7	30.5	32.0	32.0	32.0	5	13	33.0	37.0	5	13	24.0	25.0	5	6.5	4	6	25.3	49	61	73	5	6	28.0	33.0	5	12	5	12	0
46 FT	16	17	8	8	5	6	5	7	30.5	32.0	32.0	32.0	5	12	33.0	37.0	5	12	24.0	25.0	5	6	4	6	25.3	49	61	73	5	6	28.0	33.0	5	12	5	12	0
48 FT	17	18	8	8	5	6	5	6.5	30.6	37.0	37.0	37.0	5	13	33.0	37.0	5	13	24.0	25.0	5	6	5	6.5	25.5	50	62	74	5	6	28.0	33.0	5	12	5	11	0
50 FT	17	18	8	8	5	6	5	6.5	30.6	37.0	37.0	37.0	5	12	33.0	37.0	5	12	24.0	25.0	5	6	5	6.5	25.4	50	62	74	5	6	28.0	33.0	5	12	5	10.5	0

		SPAN (S) = 6 FT												HEIGHT (HT) = 6 FT OR 7 FT																						
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS										
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS												
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	HT=7'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	C4	HT=6'	HT=7'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	11	8	8	8	5	8	4	9.5	37.5	27.0	27.0	27.0	4	17	64.5	48.5	4	17	24.0	24.0	4	9.5	4	7.5	52.8	76	88	4	7	34.0	34.0	5	12	5	12	12
2 FT	11	8	8	8	5	8	4	9.5	37.5	27.0	27.0	27.0	4	17	64.5	48.5	4	17	23.0	23.0	4	8.5	4	7	47.3	76	88	4	6.5	33.0	34.0	5	12	5	12	12
4 FT	8	8	8	8	4	7	4	7	37.5	24.0	24.0	24.0	4	14	64.5	52.0	4	14	21.0	22.0	4	8.5	4	7	43.0	76	88	4	6.5	32.0	34.0	5	12	5	12	12
6 FT	8	8	8	8	4	8.5	4	7.5	41.9	24.0	24.0	24.0	4	14	37.0	39.0	4	14	21.0	21.0	4	8	4	6.5	39.1	76	88	4	6	31.0	33.0	5	12	5	12	12
8 FT	8	8	8	8	4	8.5	4	7	37.6	24.0	24.0	24.0	4	13	34.0	35.0	4	13	20.0	20.0	4	7.5	4	6	36.9	76	88	5	7	30.0	32.0	5	12	5	12	0
10 FT	8	8	8	8	4	8	4	6	36.0	24.0	24.0	24.0	4	12	32.0	34.0	4	12	20.0	20.0	4	6.5	5	6	35.4	76	88	5	6.5	29.0	33.0	5	12	5	12	0
12 FT	8	8	8	8	4	7	5	6.5	34.8	24.0	24.0	24.0	5	17	31.0	33.0	5	17	20.0	20.0	4	6.5	4	6	35.0	77	89	5	7	30.0	32.0	5	12	5	12	0
14 FT	8	8	8	8	4	6	5	6	33.9	24.0	24.0	24.0	5	16	31.0	33.0	5	16	21.0	21.0	5	8.5	5	6.5	34.1	77	89	5	6.5	30.0	32.0	5	12	5	12	0
16 FT	9	10	8	8	4	6	5	6.5	33.8	25.0	25.0	25.0	5	16	30.0	33.0	5	16	20.0	20.0	5	9	4	6	34.0	78	90	5	7	29.0	33.0	5	12	5	12	0
18 FT	9	10	8	8	5	9	5	6.5	33.4	25.0	25.0	25.0	5	16	30.0	32.0	5	16	21.0	21.0	5	8	5	6.5	33.6	78	90	5	6.5	29.0	32.0	5	12	5	12	0
20 FT	9	11	8	8	5	8	5	6	33.1	25.0	25.0	25.0	5	16	30.0	32.0	5	16	21.0	22.0	5	8	5	7	33.8	79	91	5	7.5	29.0	33.0	5	12	5	12	0
22 FT	10	11	8	8	5	8.5	5	7	31.6	26.0	30.0	30.0	5	15	29.0	32.0	5	15	20.0	20.0	5	7.5	5	7	31.9	79	91	5	7	29.0	33.0	5	12	5	12	0
24 FT	10	12	8	8	5	7.5	5	6.5	31.6	26.0	30.0	30.0	5	15	29.0	32.0	5	15	20.0	21.0	5	8	5	7.5	32.0	80	92	5	7	29.0	33.0	5	12	5	12	0
26 FT	11	13	8	8	5	8	5	6.5	31.9	27.0	31.0	31.0	5	14	29.0	32.0	5	14	20.0	20.0	5	8	5	7.5	32.3	81	93	5	7.5	29.0	33.0	5	12	5	12	0
28 FT	12	13	8	8	5	8	5	7	31.9	28.0	32.0	32.0	5	14																						

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

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 6 FT												HEIGHT (HT) = 8 FT OR 9 FT																		
					TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																		
	TS	BS	TX	TI	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS														
					SIZE	SPA.	SIZE	SPA.	C1	K2	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	C4	K3	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1				
1 FT	11	8	8	8	5	7.5	4	7	37.5	27.0	27.0	4	17	64.5	48.5	4	17	24.0	25.0	4	8.5	5	6.5	54.0	100	112	4	7	52.0	35.0	5	12	5	12	12
2 FT	11	8	8	8	5	7.5	4	6.5	37.5	27.0	27.0	4	17	64.5	48.5	4	17	23.0	24.0	4	8	5	6	54.0	100	112	4	6.5	35.0	34.0	5	12	5	12	12
4 FT	8	8	9	8	4	7	4	6	38.1	24.0	24.0	4	14	64.5	52.0	4	14	22.0	22.0	4	8	5	6.5	54.8	100	112	4	6	33.0	34.0	5	12	5	12	12
6 FT	8	8	9	8	4	8.5	4	6	38.1	24.0	24.0	4	14	64.5	40.0	4	14	21.0	21.0	4	8	5	6	50.8	100	112	4	6	32.0	33.0	5	12	5	12	12
8 FT	8	9	9	8	4	8.5	4	6	50.1	24.0	24.0	4	14	35.0	35.0	4	14	20.0	20.0	4	8.5	5	6.5	50.8	101	113	4	6.5	31.0	33.0	5	12	5	12	0
10 FT	8	9	9	8	4	8	5	6.5	45.8	24.0	28.0	4	12	33.0	33.0	4	12	20.0	20.0	4	7.5	5	6	47.5	101	113	4	6	31.0	33.0	5	12	5	11	0
12 FT	8	9	10	8	4	7	5	6.5	43.0	24.0	28.0	5	17	32.0	33.0	5	17	20.0	20.0	4	6.5	5	6.5	44.8	101	113	5	7	30.0	32.0	5	12	5	11	0
14 FT	8	9	10	8	4	6.5	5	6	41.6	28.0	28.0	5	17	31.0	32.0	5	17	21.0	21.0	4	6	5	6	43.5	101	113	5	6.5	30.0	32.0	5	12	5	10	0
16 FT	8	10	10	8	4	6	6	7	43.3	28.0	28.0	5	16	30.0	32.0	5	16	22.0	22.0	5	9	5	6	44.4	102	114	5	7	30.0	33.0	5	12	5	9.5	0
18 FT	9	10	10	8	4	6	5	6	41.8	29.0	29.0	5	16	30.0	32.0	5	16	20.0	21.0	5	8.5	6	7.5	46.4	102	114	5	7	30.0	32.0	5	12	5	9	0
20 FT	9	11	10	8	5	8.5	5	6	41.0	29.0	29.0	5	16	30.0	32.0	5	16	21.0	22.0	5	8.5	5	6	44.4	103	115	5	7	30.0	33.0	5	12	5	8.5	0
22 FT	10	11	10	8	5	9	5	6.5	39.9	30.0	30.0	5	15	29.0	32.0	5	15	20.0	20.0	5	8	5	6	41.4	103	115	5	7	30.0	33.0	5	12	5	9	0
24 FT	10	12	10	8	5	8	5	6.5	39.5	30.0	30.0	5	15	29.0	32.0	5	15	20.0	21.0	5	8	5	6	42.3	104	116	5	7	30.0	33.0	5	12	5	8.5	0
26 FT	11	12	10	8	5	8	5	6	40.5	31.0	31.0	5	14	29.0	32.0	5	14	19.0	20.0	5	7	5	6	41.9	104	116	5	6.5	30.0	33.0	5	12	5	8	0
28 FT	11	13	10	8	5	7.5	5	6	40.3	31.0	31.0	5	14	29.0	32.0	5	14	20.0	20.0	5	7.5	5	6	42.8	105	117	5	7	30.0	33.0	5	12	5	8	0
30 FT	12	14	10	8	5	8	5	6	41.0	32.0	32.0	5	14	29.0	31.0	5	14	19.0	20.0	5	8	5	6	43.3	106	118	5	7	30.0	33.0	5	12	5	8	0
32 FT	12	14	11	8	5	7.5	5	6.5	40.8	32.0	32.0	5	13	29.0	31.0	5	13	19.0	20.0	5	7.5	5	7	42.9	106	118	5	6.5	30.0	33.0	5	12	5	7.5	0
34 FT	13	15	11	8	5	7.5	5	6.5	41.5	33.0	33.0	5	13	28.0	31.0	5	13	19.0	20.0	5	7.5	5	7	43.5	107	119	5	7	30.0	33.0	5	12	5	7.5	0
36 FT	13	15	11	8	5	7	5	6	41.4	33.0	33.0	5	13	28.0	31.0	5	13	19.0	20.0	5	7	5	6.5	43.4	107	119	5	6.5	30.0	33.0	5	12	5	7.5	0
38 FT	14	16	12	8	5	7	5	6.5	42.1	34.0	34.0	5	13	28.0	31.0	5	13	19.0	20.0	5	7	5	6.5	43.8	108	120	5	6.5	30.0	33.0	5	12	5	7	0
40 FT	14	16	12	8	5	7	5	6	42.0	34.0	34.0	5	13	28.0	31.0	5	13	19.0	20.0	5	7	5	6.5	43.6	108	120	5	6.5	30.0	33.0	5	12	5	7	0
42 FT	15	17	12	8	5	7	5	6	47.6	35.0	35.0	5	13	33.0	36.0	5	13	24.0	25.0	5	7	5	6.5	44.3	109	121	5	6.5	30.0	33.0	5	12	5	7	0
44 FT	15	17	13	8	5	6.5	5	6	47.6	35.0	35.0	5	13	33.0	36.0	5	13	24.0	25.0	5	6.5	5	6	44.0	109	121	5	6	30.0	33.0	5	12	5	6.5	0
46 FT	15	17	13	8	5	6	5	6	47.6	35.0	35.0	5	12	33.0	36.0	5	12	24.0	25.0	5	6	5	6	43.9	109	121	5	6	30.0	33.0	5	12	5	6.5	0
48 FT	16	18	13	8	5	6.5	5	6	48.3	36.0	36.0	5	13	33.0	36.0	5	13	24.0	25.0	5	6.5	5	6	44.5	110	122	5	6	30.0	33.0	5	12	5	6.5	0
50 FT	16	18	14	8	5	6	5	6	48.3	36.0	36.0	5	12	33.0	35.0	5	12	24.0	25.0	5	6	5	6	44.3	110	122	6	8.5	32.0	37.0	5	12	5	6.5	0



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 6 FEET HEIGHT (HT): 8 THRU 9 FEET	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011	SHEET NO. 703.87 7 OF 27

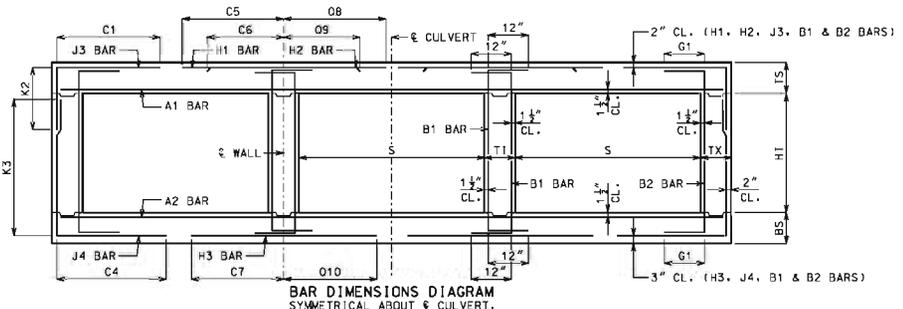
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 7 FT												HEIGHT (HT) = 4 FT OR 5 FT OR 6 FT																								
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS												
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS														
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	K2	HT=5'	HT=6'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	HT=4'	K3	HT=5'	HT=6'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE
1 FT	12	8	8	8	5	7.5	4	8.5	41.1	28.0	28.0	28.0	4	16	72.5	54.5	4	16	25.0	25.0	4	8.5	4	7.5	42.5	52	64	76	4	6	36.0	37.0	5	12	5	12	12	
2 FT	12	8	8	8	5	7.5	4	8.5	41.1	28.0	28.0	28.0	4	15	72.5	54.5	4	15	24.0	24.0	4	7.5	4	7	39.0	52	64	76	5	7.5	35.0	37.0	5	12	5	12	12	
4 FT	8	8	8	8	4	6	4	6.5	39.5	24.0	24.0	24.0	5	17	47.0	58.0	5	17	23.0	23.0	4	7	4	7	36.0	52	64	76	5	7	35.0	37.0	5	12	5	12	12	
6 FT	8	8	8	8	4	6.5	4	7	36.0	24.0	24.0	24.0	5	17	58.0	42.0	5	17	23.0	23.0	4	6.5	4	6.5	33.4	52	64	76	5	6.5	34.0	35.0	5	12	5	12	12	
8 FT	8	8	8	8	4	6.5	4	6.5	33.5	24.0	24.0	24.0	5	17	36.0	38.0	5	17	23.0	23.0	5	9	4	6	32.0	52	64	76	5	6	33.0	35.0	5	12	5	12	12	
10 FT	8	9	8	8	4	6	5	7	32.3	24.0	24.0	24.0	5	16	35.0	37.0	5	16	23.0	23.0	5	9	4	7	30.9	53	65	77	5	6.5	33.0	35.0	5	12	5	12	12	
12 FT	8	9	8	8	4	6	5	6	31.4	24.0	24.0	24.0	5	14	34.0	36.0	5	14	23.0	23.0	5	7.5	4	6	30.1	53	65	77	5	6	32.0	35.0	5	12	5	12	12	
14 FT	9	10	8	8	5	8.5	4	6	30.5	25.0	25.0	25.0	5	15	33.0	36.0	5	15	23.0	23.0	5	7.5	4	7	29.5	54	66	78	5	6	32.0	36.0	5	12	5	12	12	
16 FT	10	11	8	8	5	8	5	8	29.9	26.0	26.0	26.0	5	15	33.0	36.0	5	15	22.0	22.0	5	7.5	4	7	29.0	55	67	79	5	6.5	32.0	36.0	5	12	5	12	12	
18 FT	10	11	8	8	5	8	5	7.5	29.5	26.0	26.0	26.0	5	15	33.0	36.0	5	15	23.0	24.0	5	6	4	6.5	28.6	55	67	79	5	6	32.0	36.0	5	12	5	12	12	
20 FT	11	12	8	8	5	7.5	5	8.5	29.1	27.0	27.0	27.0	5	14	32.0	36.0	5	14	22.0	23.0	5	6.5	4	6.5	28.4	56	68	80	5	6	31.0	36.0	5	12	5	12	12	
22 FT	12	13	8	8	5	7	5	8.5	28.9	28.0	28.0	28.0	5	13	32.0	36.0	5	13	21.0	22.0	5	6.5	4	6	28.3	57	69	81	5	6	31.0	36.0	5	12	5	12	12	
24 FT	12	13	8	8	5	7	5	8.5	27.6	28.0	28.0	28.0	5	13	31.0	36.0	5	13	21.0	22.0	5	6	4	6	27.1	57	69	81	6	8	34.0	39.0	5	12	5	12	12	
26 FT	13	14	8	8	5	6.5	5	8.5	27.5	29.0	29.0	29.0	5	12	31.0	36.0	5	12	20.0	21.0	5	6.5	4	6	27.1	58	70	82	5	6	31.0	36.0	5	12	5	12	12	
28 FT	13	15	8	8	5	6.5	5	8.5	27.6	29.0	29.0	29.0	5	12	31.0	36.0	5	12	21.0	22.0	5	6.5	4	6.5	27.0	59	71	83	5	6	31.0	37.0	5	12	5	12	12	
30 FT	14	15	8	8	5	6	5	8.5	27.5	30.0	30.0	34.0	5	12	31.0	36.0	5	12	20.0	21.0	5	6	5	8.5	27.1	59	71	83	6	8	34.0	39.0	5	12	5	12	12	
32 FT	15	16	8	8	5	6	5	8	32.5	31.0	31.0	35.0	6	17	39.0	45.0	6	17	29.0	30.0	5	6	5	8	27.3	60	72	84	6	8	34.0	40.0	5	12	5	12	12	
34 FT	15	17	8	8	5	6	5	8	32.6	31.0	31.0	31.0	6	16	39.0	45.0	6	16	29.0	30.0	5	6	4	6	27.3	61	73	85	6	8.5	34.0	40.0	5	12	5	11.5	12	
36 FT	15	17	8	8	5	6	5	7	32.5	32.0	32.0	36.0	6	16	39.0	45.0	6	16	29.0	30.0	6	8.5	5	7	27.4	61	73	85	6	8	34.0	40.0	5	12	5	11	12	
38 FT	16	18	8	8	6	8	5	7	32.6	32.0	36.0	36.0	6	15	39.0	45.0	6	15	29.0	30.0	5	6	5	6.5	27.4	62	74	86	6	8	34.0	40.0	5	12	5	10	12	
40 FT	17	18	8	8	6	8	5	6.5	32.6	37.0	37.0	37.0	6	16	39.0	45.0	6	16	29.0	30.0	6	8	5	6.5	27.6	62	74	86	6	7.5	34.0	40.0	5	12	5	9.5	12	
42 FT	17	19	8	8	6	7.5	5	6.5	32.8	37.0	37.0	37.0	6	15	39.0	45.0	6	15	29.0	30.0	6	8	5	6.5	27.6	63	75	87	6	8	34.0	40.0	5	12	5	9.5	12	
44 FT	18	19	8	8	6	7.5	5	6.5	32.6	38.0	38.0	38.0	6	15	39.0	45.0	6	15	29.0	30.0	6	7.5	5	6.5	27.8	63	75	87	6	7.5	34.0	40.0	5	12	5	9.5	12	
46 FT	18	20	8	8	6	7.5	5	6.5	32.8	38.0	38.0	38.0	6	15	39.0	44.0	6	15	29.0	30.0	6	8	5	6	27.8	64	76	88	6	7.5	34.0	40.0	5	12	5	9.5	12	
48 FT	19	20	8	8	6	7.5	5	6	32.8	39.0	39.0	39.0	6	15	39.0	44.0	6	15	29.0	30.0	6	7.5	5	6	27.9	64	76	88	6	7	34.0	40.0	5	12	5	9.5	12	
50 FT	19	21	8	8	6	7	5	6	32.9	39.0	39.0	39.0	6	14	39.0	44.0	6	14	29.0	30.0	6	7.5	6	7.5	31.0	65	77	89	6	7.5	34.0	40.0	5	12	5	9	12	

		SPAN (S) = 7 FT												HEIGHT (HT) = 7 FT OR 8 FT																						
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS										
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS												
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	K2	HT=8'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	HT=7'	K3	HT=8'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE
1 FT	12	8	8	8	5	7.5	4	8	41.1	28.0	28.0	4	16	72.5	54.5	4	16	25.0	26.0	4	8	4	6	57.4	88	100	4	6	37.0	37.0	5	12	5	12	12	
2 FT	12	8	8	8	5	7.5	4	7.5	41.1	28.0	28.0	4	15	72.5	54.5	4	15	25.0	25.0	4	7	5	6.5	51.3	88	100	5	7	36.0	37.0	5	12	5	12	12	
4 FT	8	8	9	8	4	6	4	6	41.8	24.0	24.0	5	17	73.5	58.0	5	17	23.0	23.0	4	7	4	6.5	45.9	88	100	5	7	35.0	37.0	5	12	5	12	12	
6 FT	8	8	9	8	4	6.5	4	6	44.3	24.0	24.0	5	17	40.0	43.0	5	17	22.0	22.0	4	6.5	5	6.5	41.8	88	100	5	6.5	34.0	36.0	5	12	5	12	12	
8 FT	8	8	9	8	4	6.5	4	6	40.9	24.0	24.0	5	17	37.0	38.0	5	17	22.0	23.0	5	9	5	6	39.9	88	100	5	6	33.0	35.0	5	12	5	12	12	
10 FT	8	9	8	8	4	6	5	6.5	39.1	24.0	28.0	5	16	35.0	37.0	5	16	23.0	23.0	5	9	5	7	39.4	89	101	5	6.5	33.0	36.0	5	12	5	12	12	
12 FT	8	9	8	8	4	6	5	7	41.0	24.0	28.0	5	15	34.0	36.0	5	15	23.0	24.0	5	7	5	6	38.3	89	101	5	6	32.0	35.0	5	12	5	12	12	
14 FT	9	10	9	8	5	8.5	5	6	37.8	25.0	29.0	5	15	34.0	36.0	5	15	23.0	23.0	5	7.5	5	6.5	37.9	90	102	5	6	32.0	36.0	5	12	5	12	12	
16 FT	10	11	9	8	5	8	5	7	37.4	26.0	30.0	5	15	33.0	36.0	5	15	22.0	22.0	5	7.5	5	7	37.6	91	103	5	6.5	32.0	36.0	5	12	5	12	12	
18 FT	10	11	9	8	5	8	5	6.5	36.8	30.0	30.0	5	15	33.0	36.0	5	15	23.0	23.0	5	6	5	6.5	36.9	91	103	5	6	32.0	36.0	5	12	5	12	12	
20 FT	11	12	9	8	5	7.5	5	6.5	36.8	31.0	31.0	5	14	32.0	36.0	5	14	21.0	22.0	5	7	5	6.5	37.0	92	104	5	6	32.0	36.0	5	12	5	11	12	
22 FT	11	13	9	8	5	7	5	6	36.5	31.0	31.0	5	14	32.0	35.0	5	14	22.0	23.0	5	7	5	7	37.0	93	105	5	6	32.0	36.0	5	12	5	10	12	
24 FT	12	13	9	8	5	7	5	7	34.8	32.0	32.0	5	13	31.0	35.0	5	13	21.0	22.0	5	6	5	7	35.0	93	105	6	8	34.0	39.0	5	12	5	10.5	12	
26 FT	13	14	9	8	5	7	5	7	34.9	33.0	33.0	5	12	31.0	35.0	5	12	21.0	22.0	5	6.5	5	7.5	35.4	95	107	5	6	31.0	36.0	5	12	5	9	12	
30 FT	14	15	9	8	5	6.5	5	7	35.0	34.0	34.0	5	12	31.0	35.0	5	12	20.0</																		

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

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 7 FT										HEIGHT (HT) = 9 FT OR 10 FT																				
	TS	BS	TX	TI	TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																				
					A1 BARS		J3 BARS			H1 BARS			H2 BARS			A2 BARS		J4 BARS			H3 BARS		B1 BARS		B2 BARS										
					SIZE	SPA.	SIZE	SPA.	C1	K2 HT=9' HT=10'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=9' HT=10'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	12	9	8	8	5	7.5	5	9	41.1	28.0	32.0	4	16	72.5	54.5	4	16	26.0	27.0	4	8	5	6	60.0	113	125	4	7	58.0	38.0	5	12	5	12	12



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.
 SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.
 DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
 DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.
 CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 7 FEET HEIGHT (HT): 9 THRU 10 FEET		SHEET NO. 9 OF 27
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011	703.87	

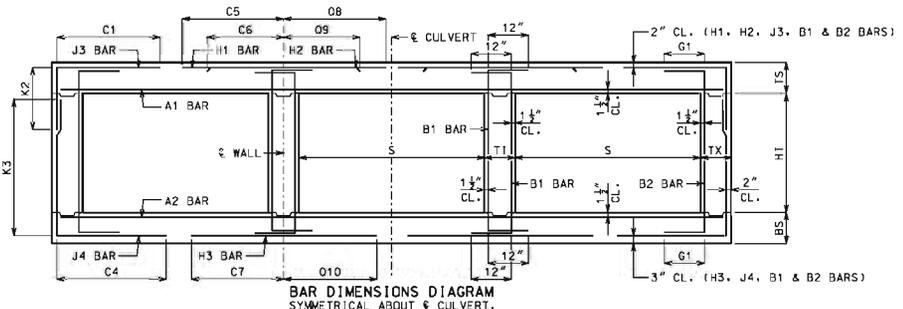
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 8 FT												HEIGHT (HT) = 4 FT OR 5 FT OR 6 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS													
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=4'	HT=5'	HT=6'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	HT=4'	HT=5'	HT=6'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.			
1 FT	12	8	8	8	5	7	4	8.5	44.8	28.0	28.0	28.0	4	13	81.5	60.5	4	13	27.0	23.0	4	7.5	4	6.5	42.0	52	64	76	5	7	39.0	40.0	5	12	5	12	12
2 FT	12	8	8	8	5	7	4	8.5	44.8	28.0	28.0	28.0	4	12	81.5	60.5	4	12	26.0	25.0	4	6.5	4	6	38.8	52	64	76	5	6.5	38.0	40.0	5	12	5	12	12
4 FT	8	8	8	8	4	6	5	6	40.6	24.0	24.0	24.0	5	16	50.0	64.0	5	16	27.0	27.0	4	6	4	6	35.4	52	64	76	5	6	38.0	40.0	5	11	5	12	12
6 FT	8	8	8	8	4	6	5	6.5	36.5	24.0	24.0	24.0	5	15	42.0	45.0	5	15	26.0	26.0	5	8.5	5	6.5	33.5	52	64	76	5	6	36.0	39.0	5	12	5	12	0
8 FT	8	8	8	8	4	6	5	6	34.4	24.0	24.0	24.0	5	14	39.0	41.0	5	14	25.0	25.0	5	8	4	6.5	31.9	53	65	77	5	6	36.0	39.0	5	12	5	12	0
10 FT	9	10	8	8	5	8.5	4	6	32.6	25.0	25.0	25.0	5	15	38.0	41.0	5	15	25.0	25.0	5	8	4	7.5	30.5	54	66	78	5	6	35.0	39.0	5	12	5	12	0
12 FT	9	10	8	8	5	8.5	5	6.5	31.6	25.0	25.0	25.0	5	14	37.0	40.0	5	14	24.0	25.0	5	7	4	6.5	29.8	54	66	78	5	7	38.0	42.0	5	12	5	12	0
14 FT	10	11	8	8	5	8	5	7.5	30.5	26.0	26.0	26.0	5	14	36.0	40.0	5	14	24.0	25.0	5	6.5	4	6.5	29.0	55	67	79	5	6	34.0	39.0	5	12	5	12	0
16 FT	11	12	8	8	5	7.5	5	8.5	29.6	27.0	27.0	27.0	5	14	35.0	40.0	5	14	24.0	25.0	5	6.5	4	6.5	28.4	56	68	80	5	6	34.0	39.0	5	12	5	12	0
18 FT	11	13	8	8	5	7.5	5	8	29.5	27.0	27.0	27.0	5	13	35.0	39.0	5	13	24.0	25.0	5	6	4	6.5	27.6	57	69	81	5	8	37.0	43.0	5	12	5	12	0
20 FT	12	14	8	8	5	7	5	8.5	28.8	28.0	28.0	28.0	5	13	35.0	39.0	5	13	24.0	25.0	5	6	4	6.5	27.3	58	70	82	5	8	36.0	43.0	5	12	5	12	0
22 FT	13	14	8	8	5	6.5	5	8.5	28.1	29.0	29.0	29.0	5	12	34.0	40.0	5	12	23.0	24.0	6	8	4	6	27.4	58	70	82	5	7.5	37.0	43.0	5	12	5	12	0
24 FT	14	15	8	8	5	6	5	8.5	27.9	30.0	30.0	30.0	5	12	34.0	40.0	5	12	22.0	23.0	6	8	4	6	27.3	59	71	83	5	7.5	36.0	43.0	5	12	5	12	0
26 FT	15	16	8	8	5	6.5	5	8	32.6	31.0	31.0	31.0	6	16	42.0	49.0	6	16	30.0	32.0	6	8	4	6	27.3	60	72	84	5	7.5	36.0	43.0	5	12	5	12	0
28 FT	15	16	8	8	5	6	5	8	31.6	31.0	31.0	31.0	6	16	42.0	48.0	6	16	31.0	32.0	6	7.5	4	6	26.1	60	72	84	5	7	36.0	43.0	5	12	5	12	0
30 FT	16	17	8	8	5	6	5	7	31.5	32.0	32.0	32.0	6	15	42.0	48.0	6	15	30.0	31.0	6	7.5	4	6	26.3	61	73	85	5	7	36.0	43.0	5	12	5	12	0
32 FT	16	18	8	8	5	6.5	5	7	31.6	32.0	32.0	32.0	6	15	42.0	48.0	6	15	31.0	32.0	6	7.5	5	6.5	26.1	62	74	86	5	7	36.0	43.0	5	12	5	12	0
34 FT	17	19	8	8	5	6.5	5	6.5	31.6	37.0	37.0	37.0	6	14	42.0	48.0	6	14	30.0	31.0	6	7.5	5	6.5	26.3	63	75	87	5	7	36.0	43.0	5	12	5	11.5	0
36 FT	17	19	8	8	5	6.5	5	6.5	31.5	38.0	38.0	38.0	5	14	42.0	48.0	5	14	29.0	31.0	6	7.5	5	6.5	26.4	63	75	87	5	7	36.0	43.0	5	12	5	10.5	0
38 FT	18	20	8	8	5	6.5	5	6.5	31.6	38.0	38.0	38.0	6	13	42.0	48.0	6	13	30.0	31.0	6	7.5	5	6	26.4	64	76	88	5	7	36.0	43.0	5	12	5	10	0
40 FT	19	20	8	8	5	6	5	6	31.6	39.0	39.0	39.0	6	13	42.0	48.0	6	13	29.0	31.0	6	6.5	5	6	26.5	64	76	88	5	6.5	36.0	43.0	5	12	5	9.5	0
42 FT	19	21	8	8	5	6	5	6	31.8	39.0	39.0	39.0	6	12	42.0	48.0	6	12	30.0	31.0	6	7	6	7.5	29.6	65	77	89	5	6.5	36.0	43.0	5	12	5	9.5	0
44 FT	20	22	8	8	5	6.5	6	7.5	35.9	44.0	44.0	44.0	6	13	41.0	48.0	6	13	29.0	30.0	6	7	6	7	29.8	66	78	90	5	6.5	36.0	43.0	5	12	5	9.5	0
46 FT	21	22	8	8	5	6.5	6	7	35.8	45.0	45.0	45.0	6	13	41.0	48.0	6	13	29.0	30.0	6	6.5	6	7	29.9	66	78	90	5	6.5	36.0	43.0	5	12	5	9.5	0
48 FT	21	23	8	8	5	6.5	6	7	36.0	45.0	45.0	45.0	6	13	41.0	48.0	6	13	29.0	30.0	6	7	6	6.5	30.0	67	79	91	5	6.5	36.0	43.0	5	12	5	9.5	0
50 FT	22	23	8	8	5	6.5	6	6.5	35.9	46.0	46.0	46.0	6	13	41.0	47.0	6	13	29.0	30.0	6	6.5	6	6.5	30.1	67	79	91	5	6	36.0	43.0	5	12	5	9	0

		SPAN (S) = 8 FT												HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS													
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.			
1 FT	12	9	8	8	5	7	4	6	44.8	28.0	28.0	28.0	4	13	81.5	60.5	4	13	27.0	25.0	4	7.5	4	6	66.0	89	101	113	5	8	41.0	41.0	5	12	5	12	12
2 FT	12	9	8	8	5	7	4	6	44.8	28.0	28.0	28.0	4	12	81.5	60.5	4	12	26.0	24.0	4	6.5	5	6.5	61.3	89	101	113	5	7.5	39.0	41.0	5	12	5	12	12
4 FT	8	8	8	8	4	6	4	7.5	47.8	28.0	32.0	32.0	5	16	83.5	64.0	5	16	27.0	28.0	5	8.5	6	6	55.0	88	100	112	5	6	38.0	40.0	5	12	5	12	12
6 FT	8	9	8	8	4	6	6	7.5	52.5	24.0	28.0	32.0	5	15	44.0	47.0	5	15	26.0	26.0	5	8.5	6	6.5	52.3	89	101	113	5	6.5	37.0	40.0	5	12	5	12	12
8 FT	8	9	8	8	4	6	6	7.5	47.4	24.0	28.0	32.0	5	14	40.0	42.0	5	14	25.0	25.0	5	7.5	6	6	48.1	89	101	113	5	6	36.0	39.0	5	12	5	11.5	0
10 FT	9	10	8	8	5	8.5	6	7	46.3	25.0	29.0	33.0	5	15	39.0	41.0	5	15	25.0	25.0	5	7.5	6	6.5	46.9	90	102	114	5	6	35.0	39.0	5	12	5	11	0
12 FT	9	10	8	8	5	8.5	6	7	44.8	29.0	33.0	33.0	5	14	37.0	40.0	5	14	24.0	25.0	5	6.5	6	6	45.4	90	102	114	5	7	38.0	42.0	5	12	5	10	0
14 FT	10	11	8	8	5	8	6	6.5	44.1	30.0	30.0	34.0	5	14	37.0	40.0	5	14	24.0	25.0	5	6.5	6	6	44.9	91	103	115	5	6	35.0	39.0	5	12	5	9.5	0
16 FT	11	12	8	8	5	7.5	6	6.5	43.6	31.0	31.0	35.0	5	14	36.0	40.0	5	14	24.0	25.0	5	6.5	6	6.5	44.4	92	104	116	5	6	34.0	39.0	5	12	5	9.5	0
18 FT	11	13	8	8	5	7.5	6	6	42.8	31.0	31.0	35.0	5	13	35.0	39.0	5	13	24.0	25.0	5	6	6	6.5	43.9	93	105	117	5	6	37.0	43.0	5	12	5	9.5	0
20 FT	12	14	8	8	5	7	6	6	42.4	32.0	32.0	36.0	5	13	35.0	39.0	5	13	24.0	25.0	5	6	6	6.5	43.4	94	106	118	5	6	37.0	43.0	5	12	5	9.5	0
22 FT	13	14	8	8	5	6.5	6	6	42.1	33.0	33.0	37.0	5	12	35.0	39.0	5	12	23.0	24.0	6	8	6	6	43.0	94	106	118	5	7.5	37.0	43.0	5	12	5	9	0
24 FT	14	15	10	8	5	6	5	6.5	40.0	34.0	34.0	34.0	5	12	34.0	39.0	5	12	22.0	23.0	6	8.5	5	7	40.4	95	107	119	5	6	37.0	43.0	5	12	5	8	0
26 FT	14	16	10	8	5	6	5	6	39.8	34.0	34.0	34.0	5	12	34.0	39.0	5	12	22.0	24.0	6	8	5	7	40.4	96	108	120	5	7.5	37.0</						

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

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 8 FT												HEIGHT (HT) = 10 FT OR 11 FT																			
	TS	BS	TX	TI	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS							
					A1 BARS				J3 BARS				H1 BARS				H2 BARS				A2 BARS				J4 BARS				H3 BARS				B1 BARS		B2 BARS	
					SIZE	SPA.	SIZE	SPA.	C1	K2 HT=10' HT=11'		SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=10' HT=11'		SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	12	9	8	9	5	7	5	7	44.9	32.0	32.0	4	13	81.5	61.5	4	13	28.0	26.0	4	6.5	6	6	69.3	125	137	5	7.5	43.0	42.0	5	11.5	5	10	12	
2 FT	12	9	9	9	5	7	5	8	45.5	32.0	32.0	4	12	82.5	61.5	4	12	27.0	24.0	4	6.5	6	6.5	70.0	125	137	5	7	41.0	41.0	5	11.5	5	10.5	12	
4 FT	8	9	10	9	4	6	6	7	49.1	28.0	28.0	5	16	64.5	65.0	5	16	27.0	27.0	4	6	5	6	65.8	125	137	5	7	39.0	41.0	5	11.5	5	9.5	12	
6 FT	8	9	11	9	4	6	5	6	57.1	28.0	28.0	5	16	44.0	44.0	5	16	26.0	26.0	5	9	5	6	56.6	125	137	5	6.5	37.0	39.0	5	11.5	5	9.5	12	
8 FT	8	10	11	9	4	6	6	7	54.8	28.0	28.0	5	15	41.0	41.0	5	15	25.0	26.0	5	9	5	6.5	56.4	126	138	5	6.5	37.0	39.0	5	12	5	9	0	
10 FT	8	10	11	9	4	6	6	6.5	51.9	28.0	28.0	5	14	39.0	40.0	5	14	25.0	25.0	5	7.5	5	6	54.0	126	138	5	6	36.0	39.0	5	12	5	8.5	0	
12 FT	9	11	11	9	5	8.5	6	7	52.5	29.0	29.0	5	14	38.0	39.0	5	14	25.0	25.0	5	7.5	5	6	53.9	127	139	5	6	36.0	39.0	5	12	5	8	0	
14 FT	10	11	11	9	5	8	5	6	50.1	30.0	30.0	5	15	37.0	39.0	5	15	25.0	25.0	5	7	5	6	51.9	127	139	5	6	35.0	39.0	5	12	5	7.5	0	
16 FT	10	12	11	9	5	7.5	5	6	48.3	30.0	30.0	5	13	36.0	39.0	5	13	24.0	25.0	5	6.5	5	6	52.3	128	140	5	6	35.0	39.0	5	12	5	7.5	0	
18 FT	11	13	11	9	5	7.5	5	6.5	48.6	31.0	31.0	5	14	36.0	39.0	5	14	24.0	25.0	5	6.5	6	7	55.0	129	141	6	8	38.0	42.0	5	12	5	7.5	0	
20 FT	12	14	11	9	5	7	5	6	48.8	32.0	32.0	5	13	35.0	39.0	5	13	24.0	25.0	5	6.5	6	7	54.9	130	142	6	8	38.0	43.0	5	12	5	7.5	0	
22 FT	13	15	11	9	5	6.5	6	8	52.1	33.0	37.0	5	12	35.0	39.0	5	12	23.0	24.0	5	6	6	7	54.9	131	143	6	8	38.0	43.0	5	12	5	7.5	0	
24 FT	13	15	12	9	5	6.5	5	6	48.3	33.0	33.0	5	12	35.0	38.0	5	12	23.0	25.0	5	6	6	7.5	53.9	131	143	6	7	38.0	43.0	5	12	5	7	0	
26 FT	14	16	12	9	5	6	6	8	51.8	34.0	38.0	5	12	35.0	38.0	5	12	22.0	24.0	5	6	6	7.5	54.1	132	144	6	7.5	38.0	43.0	5	12	5	7	0	
28 FT	15	16	12	9	5	6	6	8	56.1	35.0	39.0	6	16	43.0	47.0	6	16	31.0	32.0	6	7.5	6	8	51.0	132	144	6	7	38.0	43.0	5	12	5	7	0	
30 FT	15	17	12	9	6	8	6	7	55.9	35.0	39.0	6	16	43.0	47.0	6	16	31.0	32.0	6	8	6	7.5	51.5	133	145	6	7	38.0	43.0	5	12	5	7	0	
32 FT	16	18	13	9	6	8	6	8	56.5	36.0	40.0	6	15	42.0	47.0	6	15	30.0	31.0	6	8	6	8.5	51.8	134	146	6	7	38.0	43.0	5	12	5	6.5	0	
34 FT	17	19	13	9	6	8	6	7.5	56.9	37.0	41.0	6	14	42.0	47.0	6	14	30.0	31.0	6	8	6	8.5	52.3	135	147	6	7	38.0	43.0	5	12	5	6.5	0	
36 FT	17	19	14	9	6	7.5	6	7.5	57.0	37.0	41.0	6	14	42.0	46.0	6	14	30.0	31.0	6	7.5	6	8	51.9	135	147	6	6.5	38.0	43.0	5	12	5	6	0	
38 FT	18	20	14	9	6	7.5	6	7.5	57.4	38.0	42.0	6	14	42.0	46.0	6	14	30.0	31.0	6	7.5	6	8	52.3	136	148	6	7	38.0	43.0	5	12	5	6	0	
40 FT	18	20	14	9	6	7	6	6.5	57.3	38.0	42.0	6	13	42.0	46.0	6	13	30.0	31.0	6	6.5	6	8	52.1	136	148	6	6.5	38.0	43.0	5	12	5	6	0	
42 FT	19	21	15	9	6	7	6	7	57.9	43.0	43.0	6	14	42.0	46.0	6	14	30.0	30.0	6	7	6	8	52.6	137	149	6	6.5	38.0	43.0	5	12	6	8	0	
44 FT	19	22	15	9	6	7	6	7	57.9	43.0	43.0	6	13	42.0	46.0	6	13	30.0	30.0	6	7	6	8	53.0	138	150	6	6.5	38.0	43.0	5	12	6	8	0	
46 FT	20	22	15	9	6	7	6	6	58.1	44.0	44.0	6	14	42.0	45.0	6	14	30.0	30.0	6	7	6	7.5	52.9	138	150	6	6.5	38.0	43.0	5	12	6	8	0	
48 FT	20	23	16	9	6	6.5	6	7	58.5	44.0	44.0	6	13	42.0	45.0	6	13	30.0	30.0	6	7	6	7.5	53.3	139	151	6	6.5	38.0	44.0	5	12	6	8	0	
50 FT	21	23	16	9	6	6.5	6	6.5	58.9	45.0	45.0	6	13	42.0	45.0	6	13	29.0	30.0	6	6.5	6	7.5	53.3	139	151	6	6	38.0	44.0	5	12	6	8	0	



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 8 FEET HEIGHT (HT): 10 THRU 11 FEET		SHEET NO. 11 OF 27
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011	703.87	SHEET NO. 11 OF 27

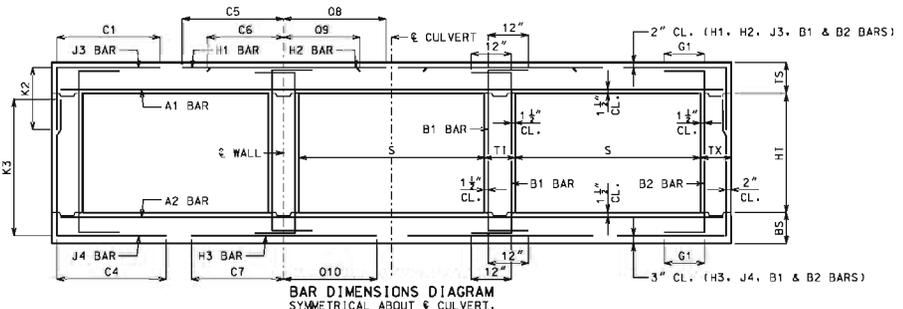
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 9 FT												HEIGHT (HT) = 5 FT OR 6 FT OR 7 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS													
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=6'	K2	HT=7'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	HT=5'	HT=6'	HT=7'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	13	8	8	8	5	6.5	4	7.5	48.3	29.0	29.0	29.0	4	12	89.5	66.5	4	12	28.0	26.0	4	6.5	5	6	46.1	64	76	88	5	6	42.0	43.0	5	12	5	12	12
2 FT	13	9	8	8	5	6.5	4	7.5	48.3	29.0	29.0	29.0	5	17	89.5	68.5	5	17	27.0	27.0	4	6.5	4	6	43.9	65	77	89	5	6.5	41.0	43.0	5	12	5	12	12
4 FT	9	9	8	8	5	8.5	5	6.5	44.8	25.0	25.0	25.0	5	16	57.0	70.0	5	16	29.0	29.0	5	8.5	4	6	39.6	65	77	89	5	6	40.0	43.0	5	12	5	12	12
6 FT	9	9	8	8	5	8.5	5	6.5	39.6	25.0	25.0	25.0	5	15	46.0	52.0	5	15	26.0	27.0	5	7.5	5	6.5	36.9	65	77	89	5	7	42.0	45.0	5	12	5	12	12
8 FT	9	10	8	8	5	8.5	5	6.5	36.8	25.0	25.0	25.0	5	14	42.0	45.0	5	14	26.0	27.0	5	7.5	4	6.5	34.8	66	78	90	5	6	38.0	42.0	5	12	5	12	0
10 FT	9	10	8	8	5	8.5	5	6.5	35.4	25.0	25.0	29.0	5	12	41.0	44.0	5	12	26.0	26.0	5	7	5	7	33.5	66	78	90	6	6.5	41.0	45.0	5	12	5	12	0
12 FT	10	11	8	8	5	8	5	7	33.9	26.0	26.0	30.0	5	12	40.0	44.0	5	12	26.0	26.0	5	6.5	5	7.5	32.4	67	79	91	6	7	40.0	45.0	5	12	5	12	0
14 FT	11	12	8	8	5	7.5	5	7.5	32.8	27.0	27.0	31.0	5	13	39.0	43.0	5	13	25.0	26.0	5	6	5	8.5	31.6	68	80	92	6	7	40.0	46.0	5	12	5	12	0
16 FT	12	13	8	8	5	7	5	8	31.9	28.0	28.0	32.0	5	13	38.0	43.0	5	13	25.0	27.0	5	6	5	8.5	31.0	69	81	93	6	7	39.0	46.0	5	12	5	12	0
18 FT	13	14	8	8	5	6.5	5	8	31.3	29.0	29.0	33.0	5	12	37.0	43.0	5	12	25.0	26.0	6	8	5	8.5	30.6	70	82	94	6	7.5	39.0	46.0	5	12	5	12	0
20 FT	14	15	8	8	5	6	5	8.5	30.6	30.0	30.0	34.0	5	12	37.0	43.0	5	12	24.0	26.0	6	8	5	8.5	30.3	71	83	95	6	7	39.0	46.0	5	12	5	12	0
22 FT	15	16	8	8	6	8	5	8	35.3	31.0	31.0	35.0	6	16	45.0	52.0	6	16	32.0	34.0	6	7.5	5	8	30.0	72	84	96	6	7	39.0	46.0	5	12	5	12	0
24 FT	15	16	8	8	6	8	5	7.5	35.0	31.0	35.0	35.0	6	16	45.0	52.0	6	16	33.0	35.0	6	6.5	5	8	29.8	72	84	96	6	6.5	39.0	46.0	5	12	5	11.5	0
26 FT	16	17	8	8	6	8	5	7	34.9	32.0	36.0	36.0	6	15	45.0	52.0	6	15	32.0	34.0	6	7	5	7	29.8	73	85	97	6	6.5	39.0	46.0	5	12	5	10.5	0
28 FT	17	18	8	8	6	7.5	5	6.5	34.8	37.0	37.0	37.0	6	14	45.0	52.0	6	14	32.0	34.0	6	7	5	6.5	29.8	74	86	98	6	6.5	39.0	46.0	5	12	5	9.5	0
30 FT	18	19	8	8	6	7	5	6.5	33.6	38.0	38.0	38.0	6	13	44.0	52.0	6	13	31.0	32.0	6	7	5	6.5	28.8	75	87	99	6	6	39.0	46.0	5	12	5	9.5	0
32 FT	18	20	8	8	6	7	5	6.5	33.8	38.0	38.0	38.0	6	13	44.0	51.0	6	13	32.0	33.0	6	7	5	6	28.8	76	88	100	6	6.5	39.0	46.0	5	12	5	9.5	0
34 FT	19	20	8	8	6	6.5	5	6	33.6	39.0	39.0	39.0	6	13	44.0	51.0	6	13	31.0	33.0	6	6	5	6	28.9	76	88	100	6	6	39.0	46.0	5	12	5	9.5	0
36 FT	20	21	8	8	6	6.5	6	7.5	37.8	44.0	44.0	44.0	6	12	44.0	51.0	6	12	30.0	32.0	6	6.5	6	7.5	33.0	77	89	101	6	6	39.0	46.0	5	12	5	9.5	0
38 FT	20	22	8	8	6	6	6	7.5	37.9	44.0	44.0	44.0	6	12	44.0	51.0	6	12	31.0	32.0	6	6.5	6	7	32.0	78	90	102	6	6	39.0	46.0	5	12	5	9	0
40 FT	21	23	8	8	6	6	6	7	38.0	45.0	45.0	45.0	6	12	44.0	51.0	6	12	30.0	32.0	6	6.5	6	6.5	32.3	79	91	103	6	6	39.0	46.0	5	12	5	8.5	0
42 FT	22	23	8	8	6	6	6	6.5	37.9	46.0	46.0	46.0	6	12	44.0	51.0	6	12	30.0	31.0	6	6	6	6.5	32.3	79	91	103	7	8	42.0	49.0	5	12	5	8	0
44 FT	23	24	9	8	6	6	6	7	38.8	47.0	47.0	47.0	6	12	44.0	50.0	6	12	30.0	31.0	6	6	6	7	33.0	80	92	104	7	8	42.0	50.0	5	12	5	8.5	0
46 FT	23	25	9	8	7	8	6	7	38.9	47.0	47.0	47.0	7	16	49.0	55.0	7	16	35.0	36.0	6	6	6	7	33.0	81	93	105	7	8	42.0	50.0	5	12	5	8.5	0
48 FT	24	25	9	8	7	8	6	7	38.9	48.0	48.0	48.0	6	12	43.0	50.0	6	12	30.0	31.0	6	6	6	7	33.1	81	93	105	7	7.5	42.0	50.0	5	12	5	8	0
50 FT	24	26	9	8	7	7.5	6	6.5	39.0	48.0	48.0	48.0	7	15	48.0	55.0	7	15	35.0	36.0	6	6	6	6.5	33.3	82	94	106	7	7.5	42.0	50.0	5	12	5	7.5	0

		SPAN (S) = 9 FT												HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS													
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	K2	HT=10'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	13	9	8	8	5	6.5	5	8.5	48.3	29.0	29.0	33.0	4	12	89.5	66.5	4	12	29.0	27.0	4	6.5	6	6.5	75.0	101	113	125	5	7	43.0	44.0	5	12	5	12	12
2 FT	13	9	8	8	5	6.5	5	8.5	51.3	29.0	33.0	33.0	5	18	91.5	68.5	5	18	28.0	25.0	5	9	6	6.5	69.0	101	113	125	5	6.5	42.0	44.0	5	12	5	11.5	12
4 FT	9	9	8	8	5	8.5	6	7	51.3	29.0	33.0	33.0	5	16	91.5	70.0	5	16	29.0	30.0	5	8	6	6	62.0	101	113	125	5	6	41.0	44.0	5	12	5	10	12
6 FT	9	10	9	8	5	8.5	5	6	34.9	25.0	25.0	29.0	5	15	49.0	53.0	5	15	27.0	28.0	5	8	5	6	53.9	102	114	126	5	6.5	39.0	43.0	5	12	5	11	12
8 FT	9	10	9	8	5	8.5	5	6	48.8	25.0	29.0	29.0	5	14	44.0	46.0	5	14	26.0	27.0	5	7	6	6.5	52.4	102	114	126	6	7	41.0	46.0	5	12	5	10.5	0
10 FT	9	11	9	8	5	8.5	5	6	46.5	25.0	29.0	29.0	5	14	44.0	46.0	5	14	26.0	27.0	5	6.5	6	7	51.4	103	115	127	5	6	38.0	43.0	5	12	5	9.5	0
12 FT	10	11	9	8	5	8	5	6	45.8	30.0	30.0	30.0	5	13	40.0	43.0	5	13	26.0	27.0	5	6.5	6	6	49.5	103	115	127	6	7	40.0	45.0	5	12	5	9	0
14 FT	11	12	9	8	5	7.5	6	7	48.1	31.0	31.0	35.0	5	13	39.0	43.0	5	13	25.0	27.0	5	6	6	6.5	48.8	104	116	128	6	7	40.0	46.0	5	12	5	8.5	0
16 FT	12	13	9	8	5	7	6	6.5	47.4	32.0	32.0	36.0	5	13	39.0	43.0	5	13	25.0	27.0	5	6	6	6.5	48.3	105	117	129	6	7	40.0	46.0	5	12	5	8.5	0
18 FT	13	14	9	8	5	6.5	6	7	46.9	33.0	33.0	37.0	5	12	38.0	43.0	5	12	24.0	26.0	6	8	6	6.5	47.6	106	118	130	6	7.5	40.0	46.0	5	12	5	8.5	0
20 FT	13	15	9	8	5	6.5	6	6	46.0	33.0	33.0	37.0	5	12	38.0	43.0	5	12	25.0	27.0	6	8	6	6.5	47.1	107	119	131	6	7	40.0	46.0	5	12	5	8.5	0
22 FT	14	16	11	8	5	6	5	6	43.5	34.0	34.0	34.0	5	12	37.0	42.0	5	12	25.0	26.0	6	7.5	5	7	44.0	108	120	132	6	7	40.0	46.0	5	12	5	8	0
24 FT	15	17	11	8	6	6	5	6	48.4	35.0	35.0	35.0	6	16	46.0	51.0	6	16	33.0	35.0	6	7.5	5	7	44.0	109	121	133	6	6.5	40.0	46.0	5	12	5	7.5	0
26 FT	16	17	11	8	6	8	6	8	52.1	36.0	36.0	36.0	6	15	45.0	51.0	6	15	32.0	34.0	6	6.5	5	6	43.6												

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

DESIGN FILL	SPAN (S) = 9 FT										HEIGHT (HT) = 11 FT OR 12 FT																								
	MEMBER THICKNESS		TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																						
	TS	BS	TX	TI	A1 BARS		J3 BARS			H1 BARS		H2 BARS			A2 BARS		J4 BARS			H3 BARS		B1 BARS		B2 BARS											
					SIZE	SPA.	SIZE	SPA.	C1	K2 HT=11 HT=12	SIZE	SPA.	C5	OB	SIZE	SPA.	C6	O9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=11 HT=12	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	13	9	9	10	5	6.5	5	7.5	49.3	33.0	33.0	4	12	90.5	67.5	4	12	29.0	27.0	4	6	6	6	76.3	137	149	5	6.5	44.0	44.0	5	10	5	9	12
2 FT	13	10	9	10	5	6.5	5	7	52.3	33.0	33.0	5	18	92.5	69.5	5	18	28.0	25.0	4	6	6	6.5	76.3	138	150	5	7	44.0	45.0	5	11.5	5	9	12
4 FT	9	10	9	10	5	8.5	5	6	52.3	29.0	29.0	5	16	92.5	71.0	5	16	29.0	30.0	5	8.5	6	6	76.3	138	150	5	7	43.0	45.0	5	11.5	5	8.5	12
6 FT	9	10	10	10	5	8.5	5	6	69.4	29.0	29.0	5	16	51.0	49.0	5	16	28.0	28.0	5	7.5	6	6.5	68.8	138	150	5	6	41.0	43.0	5	12	5	8	12
8 FT	9	10	10	10	5	8.5	5	6	60.0	29.0	29.0	5	14	45.0	45.0	5	14	27.0	27.0	5	7	6	6	63.9	138	150	6	7	43.0	45.0	5	12	5	8	0
10 FT	9	11	10	10	5	8.5	6	7	59.0	29.0	33.0	5	13	42.0	43.0	5	13	27.0	27.0	5	6.5	6	6	63.6	139	151	5	6	39.0	43.0	5	12	5	8	0
12 FT	10	12	10	10	5	8	6	7	58.6	30.0	34.0	5	13	41.0	43.0	5	13	26.0	27.0	5	6.5	6	6.5	62.8	140	152	5	6	39.0	43.0	5	12	5	8	0
14 FT	11	12	10	10	5	7.5	6	7.5	58.5	31.0	35.0	5	13	41.0	43.0	5	13	26.0	27.0	5	6	6	6	60.4	140	152	6	7	41.0	45.0	5	12	5	8	0
16 FT	12	13	11	10	5	7	5	6	54.4	32.0	32.0	5	13	40.0	42.0	5	13	26.0	27.0	5	6	6	7	59.1	141	153	6	7	41.0	45.0	5	12	5	7.5	0
18 FT	12	14	11	10	5	7	6	7.5	55.6	32.0	36.0	5	12	39.0	42.0	5	12	26.0	27.0	6	8	6	6.5	59.0	142	154	6	7.5	41.0	46.0	5	12	5	7.5	0
20 FT	13	15	12	10	5	6.5	6	8	55.0	33.0	37.0	5	12	38.0	42.0	5	12	26.0	27.0	6	8	6	7	58.1	143	155	6	7	41.0	46.0	5	12	5	7	0
22 FT	14	16	12	10	5	6	6	7.5	55.0	34.0	38.0	5	12	38.0	42.0	5	12	25.0	27.0	6	7.5	6	7	57.9	144	156	6	7	41.0	46.0	5	12	5	7	0
24 FT	15	17	13	10	6	8	6	7.5	61.0	35.0	39.0	6	16	47.0	51.0	6	16	33.0	35.0	6	7.5	6	7.5	57.4	145	157	6	6.5	41.0	46.0	5	12	5	6.5	0
26 FT	16	17	13	10	6	8	6	7	61.3	40.0	40.0	6	15	46.0	51.0	6	15	33.0	34.0	6	6.5	6	7	56.6	145	157	6	6.5	41.0	46.0	5	12	5	6.5	0
28 FT	16	18	14	10	6	8	6	7.5	61.0	36.0	40.0	6	15	46.0	51.0	6	15	33.0	35.0	6	7	6	7	56.6	146	158	6	6.5	41.0	46.0	5	12	5	6	0
30 FT	17	19	14	10	6	7.5	6	7.5	59.6	37.0	41.0	6	14	45.0	50.0	6	14	32.0	34.0	6	7	6	7.5	54.8	147	159	6	6	41.0	46.0	5	12	5	6	0
32 FT	18	20	14	10	6	7	6	7	59.9	38.0	42.0	6	13	45.0	50.0	6	13	32.0	33.0	6	7	6	7.5	55.0	148	160	6	6	41.0	46.0	5	12	5	6	0
34 FT	18	20	14	10	6	6.5	6	6.5	59.8	38.0	42.0	6	13	45.0	50.0	6	13	32.0	34.0	6	6	6	7.5	54.9	148	160	6	6	41.0	46.0	5	12	5	6	0
36 FT	19	21	15	10	6	6.5	6	7	60.3	43.0	43.0	6	13	45.0	50.0	6	13	31.0	33.0	6	6.5	6	7.5	55.3	149	161	6	6	41.0	47.0	5	12	6	8	0
38 FT	20	22	15	10	6	6.5	6	6.5	60.6	44.0	44.0	6	12	45.0	50.0	6	12	31.0	32.0	6	6.5	6	7.5	55.5	150	162	6	6	41.0	47.0	5	12	6	8	0
40 FT	20	23	16	10	6	6.5	6	6.5	60.9	44.0	44.0	6	12	45.0	49.0	6	12	31.0	32.0	6	6.5	6	7.5	55.9	151	163	6	6	41.0	47.0	5	12	6	8	0
42 FT	21	23	16	10	6	6.5	6	6.5	61.1	45.0	45.0	6	12	45.0	49.0	6	12	31.0	32.0	6	6	6	7.5	55.8	151	163	7	7.5	44.0	50.0	5	12	6	8	0
44 FT	22	24	17	10	6	6	6	6.5	61.9	46.0	46.0	6	12	45.0	49.0	6	12	31.0	32.0	6	6	6	7	56.3	152	164	7	7.5	44.0	50.0	5	12	6	7.5	0
46 FT	22	25	17	10	6	6	6	6	61.9	46.0	46.0	6	12	45.0	48.0	6	12	31.0	32.0	6	6	6	7	56.5	153	165	7	8	44.0	50.0	5	12	6	7.5	0
48 FT	23	26	18	10	6	6	6	6.5	62.5	47.0	47.0	6	12	44.0	48.0	6	12	31.0	31.0	6	6	6	6.5	57.0	154	166	7	8	44.0	50.0	5	12	6	7	0
50 FT	23	26	18	10	7	8	6	6	62.5	47.0	47.0	6	12	44.0	48.0	6	12	31.0	31.0	6	6	6	6.5	56.9	154	166	7	7.5	44.0	50.0	5	12	6	7	0



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 9 FEET HEIGHT (HT): 11 THRU 12 FEET		SHEET NO. 13 OF 27
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011	703.87	

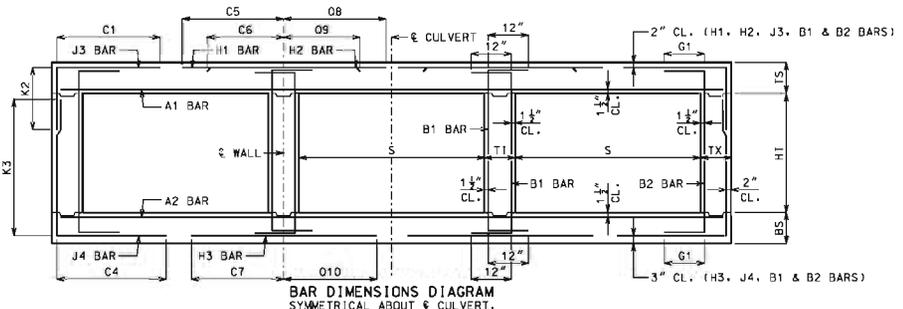
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 10 FT										HEIGHT (HT) = 5 FT OR 6 FT OR 7 FT																									
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																						
	TS	BS	TX	TI	A1 BARS		J3 BARS			H1 BARS			H2 BARS			J4 BARS			B1 BARS	B2 BARS																	
					SIZE	SPA.	SIZE	SPA.	C1	HT=6'	HT=6'	HT=7'	SIZE	SPA.	C5	C8	SIZE	SPA.			C6	C9	SIZE	SPA.	C4	HT=5'	HT=6'	HT=7'	SIZE	SPA.	C7	C10					
1 FT	13	9	8	8	5	6.5	4	7	51.9	29.0	29.0	29.0	5	16	98.5	74.5	5	16	29.0	27.0	4	6	4	6	47.4	65	77	89	5	6.5	45.0	47.0	5	12	5	12	12
2 FT	13	9	8	8	5	6.5	4	6.5	51.9	29.0	29.0	29.0	5	14	98.5	74.5	5	14	28.0	29.0	5	8.5	5	6.5	45.3	65	77	89	5	6	44.0	46.0	5	12	5	12	12
4 FT	9	8	8	8	5	7.5	6	7.5	48.4	25.0	29.0	29.0	5	13	59.0	76.0	5	13	30.0	30.0	5	7.5	5	6.5	39.0	65	77	89	6	6.5	44.0	49.0	5	12	5	12	12
6 FT	9	8	8	8	5	8	5	6	39.8	29.0	29.0	29.0	5	13	49.0	55.0	5	13	28.0	29.0	5	7.5	6	7	39.8	65	77	89	6	6	49.0	48.0	5	12	5	12	12
8 FT	10	10	8	8	5	8	5	7.5	36.8	26.0	26.0	30.0	5	13	45.0	50.0	5	13	28.0	29.0	5	7	5	6.5	34.8	66	78	90	6	6.5	44.0	48.0	5	12	5	12	0
10 FT	10	11	8	8	5	8	5	6.5	35.4	26.0	26.0	30.0	6	15	47.0	51.0	6	15	30.0	31.0	5	6.5	5	7.5	32.9	67	79	91	6	6.5	43.0	49.0	5	12	5	12	0
12 FT	11	12	8	8	5	7.5	5	6	33.6	27.0	27.0	31.0	6	16	45.0	50.0	6	16	30.0	31.0	5	6	5	8.5	31.6	68	80	92	6	6.5	42.0	49.0	5	12	5	12	0
14 FT	12	13	8	8	5	7	5	8	32.4	28.0	28.0	32.0	6	16	44.0	50.0	6	16	29.0	31.0	5	6	5	8.5	30.9	69	81	93	6	6.5	42.0	49.0	5	12	5	12	0
16 FT	13	14	8	8	5	6.5	5	8	31.3	29.0	29.0	33.0	6	16	44.0	50.0	6	16	29.0	31.0	6	8	5	8.5	30.3	70	82	94	6	7	42.0	49.0	5	12	5	12	0
18 FT	14	15	8	8	5	6	5	8.5	30.5	30.0	30.0	34.0	6	16	43.0	50.0	6	16	29.0	31.0	6	7.5	5	8.5	29.8	71	83	95	6	7	41.0	49.0	5	12	5	12	0
20 FT	15	16	8	8	6	8	5	8	34.9	31.0	31.0	35.0	6	16	48.0	56.0	6	16	35.0	37.0	6	7	5	8	29.4	72	84	96	6	7	41.0	49.0	5	12	5	12	0
22 FT	16	17	8	8	6	8	5	7	34.4	32.0	32.0	36.0	6	15	48.0	56.0	6	15	34.0	37.0	6	7	5	7	29.0	73	85	97	6	6.5	41.0	50.0	5	12	5	12	0
24 FT	17	18	8	8	6	7.5	5	6.5	34.0	37.0	37.0	37.0	6	14	48.0	56.0	6	14	34.0	36.0	6	6.5	5	6.5	28.9	74	86	98	6	6.5	41.0	50.0	5	12	5	11	0
26 FT	18	19	8	8	6	7	5	6.5	33.9	38.0	38.0	38.0	6	13	47.0	55.0	6	13	33.0	35.0	6	6.5	5	6.5	28.8	75	87	99	6	6	41.0	50.0	5	12	5	10	0
28 FT	19	20	8	8	6	6.5	5	6	33.8	39.0	39.0	39.0	6	13	47.0	55.0	6	13	33.0	35.0	6	6.5	5	6	28.8	76	88	100	6	6	41.0	50.0	5	12	5	9.5	0
30 FT	19	21	8	8	6	6	5	6	33.8	39.0	39.0	39.0	6	12	47.0	55.0	6	12	33.0	36.0	6	6	6	7.5	31.6	77	89	101	7	7.5	44.0	53.0	5	12	5	9.5	0
32 FT	20	22	8	8	6	6.5	6	7.5	37.8	44.0	44.0	44.0	6	12	47.0	55.0	6	12	33.0	35.0	6	6	6	7	31.8	78	90	102	7	7.5	44.0	53.0	5	12	5	9.5	0
34 FT	21	23	8	8	6	6	6	7	36.8	49.0	45.0	45.0	6	12	46.0	55.0	6	12	32.0	34.0	6	6	6	6.5	30.9	79	91	103	7	7.5	44.0	53.0	5	12	5	9.5	0
36 FT	22	23	8	8	6	6	6	6.5	36.8	46.0	46.0	46.0	7	15	51.0	60.0	7	15	36.0	36.0	6	6	6	6.5	31.0	79	91	103	7	7	44.0	53.0	5	12	5	9.5	0
38 FT	23	24	8	8	7	7.5	6	6	36.8	47.0	47.0	47.0	7	15	51.0	59.0	7	15	36.0	37.0	6	6	6	6	31.1	80	92	104	7	7	44.0	53.0	5	12	5	8.5	0
40 FT	23	25	8	8	7	7.5	6	6	36.9	47.0	47.0	47.0	7	15	51.0	59.0	7	15	36.0	38.0	6	6	6	6	31.1	81	93	105	7	7	44.0	53.0	5	12	5	8	0
42 FT	24	26	8	8	7	7.5	6	6	37.0	48.0	48.0	48.0	7	14	51.0	59.0	7	14	36.0	37.0	7	8	7	6.5	34.4	82	94	106	7	7	44.0	53.0	5	12	5	7.5	0
44 FT	25	26	9	8	7	7	6	6.5	37.8	49.0	49.0	49.0	7	14	51.0	59.0	7	14	36.0	37.0	7	7.5	6	6.5	32.0	82	94	106	7	7	44.0	53.0	5	12	5	8.5	0
46 FT	25	27	9	8	7	7	6	6.5	37.9	49.0	49.0	49.0	7	14	51.0	59.0	7	14	36.0	37.0	7	7.5	6	6.5	32.0	83	95	107	7	7	44.0	53.0	5	12	5	8	0
48 FT	26	28	9	8	7	7	6	6.5	38.0	50.0	50.0	50.0	7	14	51.0	58.0	7	14	35.0	37.0	7	7.5	6	6	32.3	84	96	108	7	7	44.0	53.0	5	12	5	7	0
50 FT	27	28	9	8	7	7	6	6	38.0	51.0	51.0	51.0	7	14	51.0	58.0	7	14	35.0	37.0	7	7	6	6	32.4	84	96	108	7	6.5	44.0	53.0	5	12	5	7	0

		SPAN (S) = 10 FT										HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT																									
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																						
	TS	BS	TX	TI	A1 BARS		J3 BARS			H1 BARS			H2 BARS			J4 BARS			B1 BARS	B2 BARS																	
					SIZE	SPA.	SIZE	SPA.	C1	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C5	C8	SIZE	SPA.			C6	C9	SIZE	SPA.	C4	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C7	C10					
1 FT	13	9	8	8	5	6.5	5	8.5	54.9	29.0	33.0	33.0	5	16	100.5	74.5	5	16	30.0	30.0	5	8.5	6	6.5	74.1	101	113	125	5	6	46.0	47.0	5	12	5	12	12
2 FT	13	9	8	8	5	6.5	5	8	54.9	29.0	33.0	33.0	5	14	100.5	74.5	5	14	28.0	28.0	5	7.5	6	6	65.8	101	113	125	6	7	47.0	50.0	5	12	5	11.5	12
4 FT	9	9	8	8	5	7	5	6	65.9	29.0	29.0	29.0	5	13	74.0	76.0	5	13	30.0	31.0	5	7.5	6	6.5	57.6	101	113	125	6	6.5	46.0	50.0	5	12	5	11.5	12
6 FT	9	9	8	8	5	8	5	6	51.8	29.0	29.0	29.0	5	13	51.0	57.0	5	13	29.0	29.0	5	7	6	6	52.9	101	113	125	6	6	45.0	48.0	5	12	5	11.5	12
8 FT	9	10	8	8	5	8	5	6	48.1	29.0	29.0	29.0	6	15	49.0	52.0	6	15	30.0	31.0	5	7	6	6.5	51.0	102	114	126	6	6	44.0	49.0	5	12	5	11	0
10 FT	10	11	8	8	5	6	5	6	46.5	30.0	30.0	30.0	6	12	44.0	48.0	6	12	22.0	22.0	5	6.5	6	6.5	49.5	103	117	127	6	6.5	43.0	49.0	5	12	5	10.5	0
12 FT	11	12	9	8	5	7.5	6	7	49.1	31.0	31.0	35.0	6	16	45.0	50.0	6	16	30.0	31.0	5	6	6	6.5	48.4	104	116	128	6	6.5	43.0	49.0	5	12	5	9.5	0
14 FT	12	13	9	8	5	7	6	7	47.0	32.0	32.0	36.0	6	16	45.0	50.0	6	16	29.0	31.0	5	6	7	7	47.4	105	117	129	6	6.5	42.0	49.0	5	12	5	8.5	0
16 FT	13	14	9	8	5	6.5	6	7	46.0	33.0	33.0	37.0	6	16	44.0	50.0	6	16	29.0	31.0	6	8	6	7	46.5	106	118	130	6	7	42.0	49.0	5	12	5	8.5	0
18 FT	14	15	9	8	5	6	6	7	45.3	34.0	34.0	38.0	6	16	43.0	49.0	6	16	29.0	31.0	6	7.5	6	7	45.9	107	119	131	6	7	42.0	49.0	5	12	5	8.5	0
20 FT	15	16	9	8	6	6	6	7	50.5	35.0	35.0	39.0	6	16	49.0	55.0	6	16	35.0	37.0	6	7	6	6.5	45.3	108	120	132	6	7	42.0	49.0	5	12	5	8.5	0
22 FT	15	17	11	8	6	7.5	5	6	47.1	35.0	35.0	35.0	6	15	48.0	55.0	6	15	35.0	37.0	6	7	5	7	42.1	109	121	133	6	6.5	42.0	50.0	5	12	5	8	0
24 FT	17	18	11	8	6	7.5	6	8.5	50.8	37.0	37.0	37.0	6	14	48.0	55.0	6	14	33.0	36.0	6	6.5	5	6.5	42.0	110	122	134	6	6.5	42.0	50.0	5	12	5	7.5	0
26 FT	18	19	11	8	6	7	6	8	50.4	38.0	38.0	38.0	6	13	47.0	55.0	6	13	33.0	35.0	6	6.5	5	6	41.8	111	123	135</									

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

DESIGN FILL	SPAN (S) = 10 FT										HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT																										
	TOP SLAB BARS										BOTTOM SLAB BARS																										
	MEMBER THICKNESS		A1 BARS			J3 BARS				H1 BARS			H2 BARS			A2 BARS		J4 BARS			H3 BARS		WALL BARS														
	TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=11	HT=12	HT=13	HT=11	HT=12	HT=13	SIZE	SPA.	SIZE	SPA.	C4	HT=11	HT=12	HT=13	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1					
1 FT	13	10	9	10	5	6.5	5	6.5	55.9	33.0	33.0	33.0	5	16	101.5	75.5	5	16	30.0	29.0	5	8.5	6	6	82.3	138	150	162	5	6.5	49.0	49.0	5	10	5	8.5	12
2 FT	13	10	10	10	5	6.5	5	6.5	56.5	33.0	33.0	33.0	5	14	101.5	75.5	5	14	29.0	29.0	5	8	6	6.5	83.0	138	150	162	5	6.5	47.0	48.0	5	12	5	8	12
4 FT	9	10	10	10	5	7	6	7	56.5	29.0	29.0	33.0	5	13	101.5	77.0	5	13	31.0	31.0	5	7	6	6	81.3	138	150	162	5	6	46.0	48.0	5	11	5	8	12
6 FT	9	11	10	10	5	8	6	7	75.6	29.0	29.0	33.0	5	13	54.0	55.0	5	13	29.0	29.0	5	7	6	6	77.8	139	151	163	5	6	44.0	47.0	5	12	5	8	12
8 FT	9	11	11	10	5	8	6	7	64.6	29.0	29.0	33.0	5	12	47.0	48.0	5	12	28.0	28.0	5	6.5	6	6.5	89.5	139	151	163	6	7	45.0	49.0	5	12	5	7.5	0
10 FT	10	11	11	10	5	8	5	6	61.1	30.0	30.0	30.0	5	12	46.0	47.0	5	12	28.0	28.0	5	6	6	6	85.8	139	151	163	6	6.5	45.0	48.0	5	12	5	7.5	0
12 FT	11	12	11	10	5	7.5	5	6	60.3	31.0	31.0	31.0	5	12	44.0	47.0	5	12	27.0	28.0	5	6	6	6	85.1	140	152	164	6	6.5	44.0	49.0	5	12	5	7.5	0
14 FT	12	13	11	10	5	7	6	7.5	62.6	32.0	32.0	36.0	5	12	43.0	46.0	5	12	27.0	28.0	5	6	6	6.5	84.4	141	153	165	6	6.5	44.0	49.0	5	12	5	7	0
16 FT	13	14	12	10	5	6.5	6	8	61.3	33.0	33.0	37.0	5	12	42.0	46.0	5	12	27.0	28.0	6	8	6	7	83.0	142	154	166	6	7	44.0	49.0	5	12	5	7	0
18 FT	13	15	12	10	5	6.5	6	7	59.3	33.0	37.0	37.0	6	15	45.0	48.0	6	15	30.0	31.0	6	7.5	6	6.5	82.8	143	155	167	6	7	44.0	49.0	5	12	5	7	0
20 FT	14	16	13	10	5	6	6	7.5	58.8	34.0	38.0	38.0	6	15	44.0	48.0	6	15	30.0	31.0	6	7	6	7	81.8	144	156	168	6	7	44.0	49.0	5	12	5	6.5	0
22 FT	15	17	13	10	6	8	6	6.5	64.6	35.0	39.0	39.0	6	15	50.0	54.0	6	15	36.0	37.0	6	7	6	6.5	81.4	145	157	169	6	6.5	44.0	50.0	5	12	5	6.5	0
24 FT	16	18	14	10	6	8	6	7	64.6	36.0	40.0	40.0	6	15	49.0	54.0	6	15	35.0	37.0	6	6.5	6	6.5	80.5	146	158	170	6	6.5	44.0	50.0	5	12	5	6	0
26 FT	17	19	14	10	6	7.5	6	6.5	64.5	37.0	41.0	41.0	6	14	49.0	54.0	6	14	35.0	37.0	6	6.5	6	6.5	80.4	147	159	171	6	6	44.0	50.0	5	12	5	6	0
28 FT	18	20	15	10	6	7	6	6.5	64.9	42.0	42.0	42.0	6	13	48.0	54.0	6	13	34.0	36.0	6	6.5	6	6.5	80.3	148	160	172	6	6	44.0	50.0	5	12	6	8	0
30 FT	19	21	15	10	6	6.5	6	6.5	65.1	43.0	43.0	43.0	6	13	48.0	54.0	6	13	33.0	35.0	6	6.5	6	6.5	80.4	149	161	173	7	7.5	47.0	53.0	5	12	6	8	0
32 FT	20	22	16	10	6	6.5	6	6.5	65.5	44.0	44.0	44.0	6	12	48.0	53.0	6	12	33.0	34.0	6	6	6	7	80.5	150	162	174	7	7.5	47.0	53.0	5	12	6	8	0
34 FT	20	23	16	10	6	6.5	6	6.5	63.5	44.0	44.0	44.0	6	12	47.0	53.0	6	12	33.0	35.0	6	6	6	7.5	80.9	151	163	175	7	7.5	46.0	53.0	5	12	6	8	0
36 FT	21	24	16	10	6	6	6	6	63.9	45.0	45.0	45.0	6	12	47.0	53.0	6	12	32.0	34.0	6	6	6	7	80.1	152	164	176	7	7.5	46.0	53.0	5	12	6	8	0
38 FT	22	24	17	10	6	6	6	6	64.4	46.0	46.0	46.0	6	15	52.0	58.0	6	15	37.0	38.0	6	6	6	7	80.0	152	164	176	7	7	46.0	53.0	5	12	6	7.5	0
40 FT	23	25	17	10	6	6	6	6	64.6	47.0	47.0	47.0	7	15	52.0	57.0	7	15	36.0	37.0	6	6	6	7	80.3	153	165	177	7	7	46.0	53.0	5	12	6	7.5	0
42 FT	23	26	18	10	7	7.5	6	6	65.0	47.0	47.0	47.0	7	15	52.0	57.0	7	15	37.0	38.0	7	8	6	6.5	80.6	154	166	178	7	7	46.0	54.0	5	12	6	7	0
44 FT	24	27	19	10	7	7.5	6	6	65.8	44.0	48.0	48.0	7	15	52.0	57.0	7	15	36.0	37.0	7	8	6	6.5	80.0	155	167	179	7	7	46.0	54.0	5	12	6	7	0
46 FT	24	27	19	10	7	7	6	6	65.6	48.0	48.0	48.0	7	14	52.0	57.0	7	14	36.0	38.0	7	7.5	6	6.5	80.9	155	167	179	7	6.5	46.0	54.0	5	12	6	6.5	0
48 FT	25	28	20	10	7	7	6	6	66.4	45.0	49.0	49.0	7	14	52.0	56.0	7	14	36.0	37.0	7	7.5	6	6	80.4	156	168	180	7	6.5	46.0	54.0	5	12	6	6.5	0
50 FT	26	29	20	10	7	7	7	7.5	71.6	50.0	50.0	50.0	7	15	51.0	55.0	7	15	36.0	37.0	7	7.5	6	6	80.6	157	169	181	7	6.5	47.0	54.0	5	12	6	6.5	0



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.
 SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.
 DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
 DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.
 CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 10 FEET HEIGHT (HT): 11 THRU 13 FEET	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011	703.87

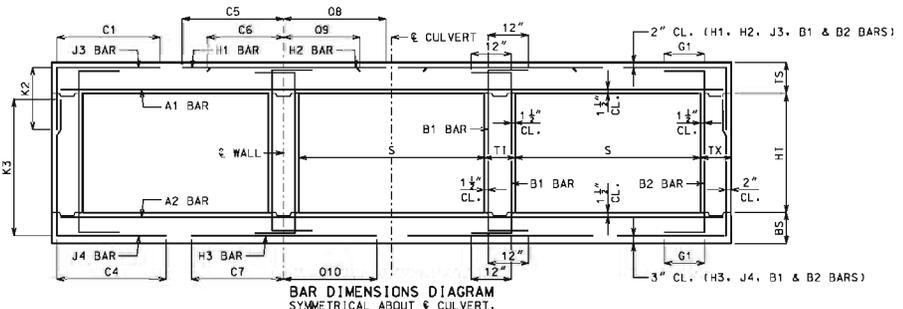
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 11 FT												HEIGHT (HT) = 6 FT OR 7 FT OR 8 FT																							
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS								
	TS	BS	TX	TI	A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS										
					SIZE	SPA.	SIZE	SPA.	C1	HT=6'	HT=7'	HT=8'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	HT=6'	HT=7'			HT=8'	SIZE	SPA.	C7	O10					
1 FT	13	9	8	8	5	6.5	5	9	58.5	29.0	29.0	33.0	5	13	108.5	80.5	5	13	30.0	33.0	5	8.5	5	6	52.6	77	89	101	6	7	50.0	53.0	5	12	5	12	12
2 FT	14	9	8	8	5	6	4	6	55.5	30.0	30.0	30.0	5	14	106.5	80.5	5	14	29.0	28.0	5	7.5	6	6.5	50.8	77	89	101	6	6.5	49.0	52.0	5	12	5	12	12
4 FT	10	9	8	8	5	6.5	5	6	49.1	30.0	30.0	30.0	5	12	66.0	82.0	5	12	32.0	33.0	5	7.5	6	6.5	45.9	77	89	101	6	6	49.0	52.0	5	11.5	5	12	12
6 FT	10	10	8	8	5	7	5	6	42.8	30.0	30.0	30.0	5	12	53.0	65.0	5	12	30.0	31.0	5	7	5	6	39.8	78	90	102	6	6	47.0	52.0	5	12	5	12	12
8 FT	10	11	8	8	5	7	6	7	43.0	26.0	30.0	30.0	6	15	52.0	56.0	6	15	32.0	32.0	5	6.5	5	6.5	37.4	79	91	103	6	6.5	46.0	52.0	5	12	5	12	0
10 FT	11	12	8	8	5	7	5	6	37.6	27.0	31.0	31.0	6	15	50.0	55.0	6	15	31.0	32.0	5	6	5	7	35.6	80	92	104	6	6.5	45.0	52.0	5	12	5	12	0
12 FT	12	13	8	8	5	7	5	6.5	36.0	28.0	32.0	32.0	6	15	48.0	54.0	6	15	31.0	32.0	5	6	5	7.5	34.6	81	93	105	6	6.5	45.0	52.0	5	12	5	12	0
14 FT	13	14	8	8	5	6.5	5	7	34.6	33.0	33.0	33.0	6	15	47.0	54.0	6	15	31.0	32.0	6	8	5	7.5	33.8	82	94	106	6	6.5	44.0	53.0	5	12	5	12	0
16 FT	14	15	8	8	5	6	5	7	33.6	34.0	34.0	34.0	6	14	46.0	53.0	6	14	30.0	32.0	6	7.5	5	7.5	33.1	83	95	107	6	6.5	44.0	53.0	5	12	5	12	0
18 FT	15	16	8	8	6	8	5	6.5	37.9	35.0	35.0	35.0	6	14	51.0	59.0	6	14	36.0	38.0	6	7	5	7.5	32.6	84	96	108	6	6.5	44.0	53.0	5	12	5	11	0
20 FT	16	17	8	8	6	8	5	6.5	37.3	36.0	36.0	36.0	6	14	51.0	59.0	6	14	36.0	38.0	6	7	5	7	32.1	85	97	109	6	6.5	44.0	53.0	5	12	5	10	0
22 FT	17	18	8	8	6	7.5	5	6	36.9	37.0	37.0	37.0	6	14	50.0	59.0	6	14	36.0	38.0	6	6.5	5	6.5	31.9	86	98	110	6	6.5	44.0	53.0	5	12	5	9.5	0
24 FT	18	19	8	8	6	7	5	6	36.5	38.0	38.0	38.0	6	13	50.0	59.0	6	13	36.0	38.0	6	6	6	6.5	31.6	87	99	111	6	6	44.0	53.0	5	12	5	9.5	0
26 FT	19	21	8	8	6	6.5	6	7.5	40.4	39.0	39.0	43.0	6	13	50.0	59.0	6	13	35.0	38.0	6	6	6	7.5	34.4	89	101	113	7	7.5	47.0	56.0	5	12	5	9.5	0
28 FT	20	22	9	8	6	6.5	5	6	37.1	40.0	40.0	40.0	6	12	49.0	58.0	6	12	35.0	37.0	6	6	5	6	31.9	90	102	114	7	7.5	47.0	56.0	5	12	5	8.5	0
30 FT	21	23	10	8	6	6	5	6.5	37.9	41.0	41.0	41.0	6	12	49.0	58.0	6	12	34.0	37.0	7	8	5	6.5	32.4	91	103	115	7	7	47.0	56.0	5	12	5	8.5	0
32 FT	22	24	10	8	6	6	5	6.5	37.8	42.0	42.0	42.0	7	15	54.0	63.0	7	15	39.0	41.0	7	7.5	5	6.5	32.5	92	104	116	7	7	47.0	57.0	5	12	5	8	0
34 FT	23	25	10	8	7	7.5	5	6.5	37.8	43.0	43.0	43.0	7	15	54.0	63.0	7	15	38.0	40.0	7	7.5	5	6	32.5	93	105	117	7	6.5	47.0	57.0	5	12	5	8	0
36 FT	24	26	10	8	7	7.5	5	6	36.5	44.0	44.0	44.0	7	14	54.0	62.0	7	14	37.0	39.0	7	7	5	6	31.6	93	105	117	7	6.5	47.0	56.0	5	12	5	8	0
38 FT	25	26	10	8	7	7	5	6	36.6	45.0	45.0	45.0	7	14	53.0	62.0	7	14	37.0	38.0	7	7	5	6	31.8	94	106	118	7	6.5	47.0	56.0	5	12	5	8	0
40 FT	25	27	10	8	7	6.5	5	6	36.8	45.0	45.0	45.0	7	13	53.0	62.0	7	13	37.0	39.0	7	7	6	7	34.6	95	107	119	7	6.5	46.0	56.0	5	12	5	8	0
42 FT	26	28	10	8	7	7	6	7	40.8	50.0	50.0	50.0	7	13	53.0	62.0	7	13	37.0	38.0	7	7	6	7	34.9	96	108	120	7	6.5	46.0	56.0	5	12	5	8	0
44 FT	27	29	10	8	7	6.5	6	7	40.9	51.0	51.0	51.0	7	13	53.0	61.0	7	13	36.0	37.0	7	7	6	6.5	35.0	97	109	121	7	6.5	46.0	56.0	5	12	5	7.5	0
46 FT	28	29	11	8	7	6.5	6	7.5	41.6	52.0	52.0	52.0	7	13	53.0	61.0	7	13	36.0	37.0	7	6	6	7.5	35.6	97	109	121	7	6	47.0	57.0	5	12	5	7.5	0
48 FT	28	30	11	8	7	6	6	7.5	41.8	52.0	52.0	52.0	7	12	53.0	61.0	7	12	36.0	37.0	7	6.5	6	7.5	35.6	98	110	122	7	6	47.0	57.0	5	12	5	7.5	0
50 FT	29	31	11	8	7	6	6	7	41.9	53.0	53.0	53.0	7	12	53.0	60.0	7	12	36.0	37.0	7	6.5	6	7	35.9	99	111	123	7	6	47.0	57.0	5	12	5	7.5	0

		SPAN (S) = 11 FT												HEIGHT (HT) = 9 FT OR 10 FT OR 11 FT																							
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS								
	TS	BS	TX	TI	A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS										
					SIZE	SPA.	SIZE	SPA.	C1	HT=9'	HT=10'	HT=11'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	HT=9'	HT=10'			HT=11'	SIZE	SPA.	C7	O10					
1 FT	13	9	9	9	5	6.5	5	8	59.3	33.0	33.0	33.0	5	13	109.5	81.5	5	13	31.0	33.0	5	7.5	6	6	74.5	113	125	137	6	7	51.0	53.0	5	11.5	5	10.5	12
2 FT	14	10	9	9	5	6	5	8	59.3	34.0	34.0	34.0	5	14	109.5	81.5	5	14	29.0	28.0	5	7.5	6	7	70.6	114	126	138	5	6	47.0	50.0	5	12	5	10.5	12
4 FT	10	10	9	9	5	6.5	5	6	59.3	30.0	30.0	30.0	5	13	109.5	83.0	5	13	32.0	33.0	5	7	6	6.5	64.1	114	126	138	6	6.5	50.0	53.0	5	11.5	5	9.5	12
6 FT	10	10	9	9	5	7	5	6	56.6	30.0	30.0	30.0	5	12	55.0	61.0	5	12	30.0	31.0	5	7	6	6	57.8	114	126	138	6	6	48.0	52.0	5	12	5	9.5	12
8 FT	10	11	9	9	5	7	6	7.5	58.5	30.0	30.0	34.0	6	15	53.0	56.0	6	15	32.0	33.0	5	6.5	6	6	55.6	115	127	139	6	6	47.0	52.0	5	12	5	9	0
10 FT	11	12	9	9	5	7	6	7	58.5	31.0	35.0	35.0	6	15	51.0	56.0	6	15	31.0	32.0	6	6	6	6	53.8	116	128	140	6	6.5	46.0	52.0	5	12	5	8.5	0
12 FT	12	13	9	9	5	7	6	6.5	51.9	32.0	36.0	36.0	6	15	49.0	54.0	6	15	31.0	33.0	5	6	6	6	52.4	117	129	141	6	6.5	46.0	52.0	5	12	5	8.5	0
14 FT	13	14	9	9	5	6.5	6	6	50.5	33.0	37.0	37.0	6	15	48.0	53.0	6	15	31.0	33.0	6	8	6	6	51.3	118	130	142	6	6.5	45.0	52.0	5	12	5	8.5	0
16 FT	14	15	10	9	5	6	6	7	49.9	34.0	34.0	38.0	6	15	47.0	53.0	6	15	31.0	33.0	6	7.5	6	7	50.4	119	131	143	6	6.5	45.0	52.0	5	12	5	8	0
18 FT	15	16	10	9	6	6	6	7	54.9	35.0	35.0	39.0	6	15	52.0	59.0	6	15	37.0	39.0	6	7	6	7	49.6	120	132	144	6	6.5	45.0	53.0	5	12	5	8	0
20 FT	16	17	11	9	6	8	6	7.5	54.8	36.0	36.0	40.0	6	14	52.0	58.0	6	14	36.0	39.0	6	7	6	8	49.3	121	133	145	6	6.5	45.0	53.0	5	12	5	7.5	0
22 FT	17	18	12	9	6	7.5	6	6	54.8	37.0	37.0	37.0	6	14	51.0	58.0	6	14	36.0	39.0	6	6.5	5	6	45.9	122	134	146	6	6.5	45.0	53.0	5	12	5	7.5	0
24 FT	18	20	12	9	6	7	6	7.5	54.4	38.0	38.0	38.0	6	13	51.0	58.0	6	13	36.0	38.0	6	6	5	6	45.8	124	136	148	6	6	45.0	53.0	5	12	5	7	0
26 FT	19	21	12	9	6	6.5	6	7	53.9	39.0	39.0	43.0	6	13	5																						

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

DESIGN FILL	MEMBER THICKNESS				SPAN (S) = 11 FT												HEIGHT (HT) = 12 FT OR 13 FT OR 14 FT																				
	TS	BS	TX	TI	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS								
					A1 BARS				J3 BARS				H1 BARS				H2 BARS				A2 BARS				J4 BARS				H3 BARS				B1 BARS		B2 BARS		
					SIZE	SPA.	SIZE	SPA.	C1	K2			SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	K3			SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	13	10	10	11	5	6.5	5	6	60.3	33.0	33.0	33.0	5	13	110.5	82.5	5	13	31.0	33.0	5	7.5	6	6	89.3	150	162	174	5	6	51.0	51.0	5	10	5	8	12



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.
 SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.
 DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
 DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.
 CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 11 FEET HEIGHT (HT): 12 THRU 14 FEET	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011	703.87

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

		SPAN (S) = 12 FT												HEIGHT (HT) = 6 FT OR 7 FT OR 8 FT																							
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																				
	TS	BS	TX	TI	A1 BARS		J3 BARS				H1 BARS				H2 BARS				A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS										
					SIZE	SPA.	SIZE	SPA.	C1	HT=6'	HT=7'	HT=8'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	HT=6'	HT=7'	HT=8'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.			
1 FT	14	9	8	8	5	6	4	6	59.1	30.0	30.0	30.0	5	12	114.5	86.5	5	12	31.0	34.0	5	7.5	6	7	54.6	77	89	101	6	6.5	53.0	56.0	5	12	5	12	12
2 FT	14	9	8	8	5	6	5	8.5	62.1	30.0	30.0	34.0	5	12	116.5	86.5	5	12	30.0	33.0	5	7.5	6	6.5	50.3	77	89	101	6	6	52.0	55.0	5	12	5	12	12
4 FT	11	10	8	8	5	6	5	6.5	48.9	31.0	31.0	31.0	5	12	69.0	88.0	5	12	33.0	35.0	5	7	5	6	42.6	78	90	102	6	6	51.0	56.0	5	12	5	12	12
6 FT	11	11	8	8	5	6.5	5	6.5	42.8	31.0	31.0	31.0	6	16	59.0	71.0	6	16	34.0	36.0	5	6.5	5	6.5	39.3	79	91	103	6	6.5	49.0	56.0	5	12	5	12	12
8 FT	11	12	8	8	5	6.5	5	6	39.9	31.0	31.0	31.0	6	14	55.0	61.0	6	14	33.0	34.0	5	6	5	7.5	36.6	80	92	104	6	6.5	48.0	56.0	5	12	5	12	12
10 FT	12	13	8	8	5	6.5	5	6.5	37.3	32.0	32.0	32.0	6	14	52.0	59.0	6	14	32.0	34.0	5	6	5	7.5	34.9	81	93	105	6	6	47.0	56.0	5	12	5	12	12
12 FT	13	14	8	8	5	6	5	7	35.4	33.0	33.0	33.0	6	14	51.0	58.0	6	14	32.0	34.0	6	8	5	8	33.8	82	94	106	6	6	47.0	56.0	5	12	5	12	12
14 FT	14	15	8	8	5	6	5	7	33.9	34.0	34.0	34.0	6	13	49.0	57.0	6	13	32.0	34.0	6	7.5	5	8	32.8	83	95	107	6	6	47.0	56.0	5	12	5	12	12
16 FT	15	16	8	8	6	8	5	6.5	37.9	35.0	35.0	35.0	6	13	55.0	63.0	6	13	37.0	40.0	6	7	5	8	32.1	84	96	108	6	6	46.0	56.0	5	12	5	12	12
18 FT	16	17	8	8	6	8	5	6.5	37.0	36.0	36.0	36.0	6	13	54.0	63.0	6	13	37.0	40.0	6	7	5	7	31.6	85	97	109	6	6	46.0	56.0	5	12	5	11.5	0
20 FT	17	18	8	8	6	7.5	5	6.5	36.4	37.0	37.0	37.0	6	12	53.0	63.0	6	12	37.0	40.0	6	6.5	5	6.5	31.1	86	98	110	6	6	46.0	56.0	5	12	5	10	0
22 FT	18	20	8	8	6	6.5	5	6	36.1	38.0	38.0	38.0	6	12	53.0	62.0	6	12	37.0	40.0	6	6	5	6	30.8	88	100	112	6	6	46.0	56.0	5	12	5	9.5	0
24 FT	20	21	8	8	6	6.5	6	7.5	39.5	44.0	44.0	44.0	6	12	52.0	62.0	6	12	36.0	39.0	7	8	6	7.5	33.8	89	101	113	7	7.5	49.0	59.0	5	12	5	9.5	0
26 FT	21	22	8	8	6	6	6	7	39.3	45.0	45.0	45.0	6	12	52.0	62.0	6	12	36.0	39.0	7	7.5	6	7	33.6	90	102	114	7	7.5	49.0	60.0	5	12	5	9.5	0
28 FT	22	23	8	8	6	6	6	6.5	39.0	46.0	46.0	46.0	7	15	57.0	67.0	7	15	41.0	44.0	7	7	6	6.5	33.4	91	103	115	7	7	49.0	60.0	5	12	5	8.5	0
30 FT	23	24	8	8	7	7.5	6	6	38.9	47.0	47.0	47.0	7	15	56.0	67.0	7	15	40.0	43.0	7	6.5	6	6	33.4	92	104	116	7	6.5	49.0	60.0	5	12	5	8	0
32 FT	24	25	9	8	7	7.5	6	7	39.8	48.0	48.0	48.0	7	14	56.0	66.0	7	14	40.0	42.0	7	6.5	6	7	34.0	93	105	117	7	6.5	49.0	60.0	5	12	5	8.5	0
34 FT	25	26	9	8	7	7	6	6.5	39.8	49.0	49.0	49.0	7	14	56.0	66.0	7	14	39.0	42.0	7	6	6	6.5	34.0	94	106	118	7	6	49.0	60.0	5	12	5	8	0
36 FT	26	27	9	8	7	6	6	6.5	39.8	50.0	50.0	50.0	7	13	56.0	66.0	7	13	39.0	41.0	7	6	6	6.5	34.1	95	107	119	7	6	49.0	60.0	5	12	5	7.5	0
38 FT	27	28	9	8	7	6.5	6	6	39.8	51.0	51.0	51.0	7	13	56.0	66.0	7	13	38.0	40.0	7	6	6	6	34.3	96	108	120	7	6	49.0	60.0	5	12	5	7	0
40 FT	28	29	9	8	7	6.5	6	6	38.9	52.0	52.0	52.0	7	12	56.0	65.0	7	12	37.0	39.0	7	6.5	6	6	33.4	97	109	121	8	7.5	55.0	66.0	5	12	5	7	0
42 FT	28	30	10	8	7	6	6	6.5	39.8	52.0	52.0	52.0	7	12	56.0	65.0	7	12	38.0	40.0	7	6.5	6	6.5	33.9	98	110	122	8	7.5	55.0	66.0	5	12	5	8	0
44 FT	29	31	10	8	7	6	6	6.5	39.9	53.0	53.0	53.0	7	12	55.0	64.0	7	12	38.0	39.0	7	6.5	6	6	34.0	99	111	123	8	7.5	55.0	66.0	5	12	5	7	0
46 FT	30	32	10	8	7	6	6	6	40.0	54.0	54.0	54.0	7	12	55.0	64.0	7	12	37.0	38.0	7	6	6	6	34.3	100	112	124	8	7.5	55.0	66.0	5	12	5	6.5	0
48 FT	31	33	10	8	7	6.5	6	6	40.1	55.0	55.0	55.0	8	15	63.0	71.0	8	15	45.0	46.0	7	6	7	6.5	37.5	101	113	125	8	7.5	55.0	66.0	5	12	5	6.5	0
50 FT	32	34	11	8	8	7.5	6	6.5	41.0	56.0	56.0	56.0	7	12	55.0	63.0	7	12	37.0	38.0	7	6	6	6	35.1	102	114	126	8	7	55.0	66.0	5	12	5	7	0

		SPAN (S) = 12 FT												HEIGHT (HT) = 9 FT OR 10 FT OR 11 FT																								
DESIGN FILL	MEMBER THICKNESS				TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS																					
	TS	BS	TX	TI	A1 BARS		J3 BARS				H1 BARS				H2 BARS				A2 BARS		J4 BARS		H3 BARS		B1 BARS		B2 BARS											
					SIZE	SPA.	SIZE	SPA.	C1	HT=9'	HT=10'	HT=11'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	HT=9'	HT=10'	HT=11'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.				
1 FT	14	10	8	9	5	6	5	7.5	62.3	34.0	34.0	34.0	5	12	117.5	87.5	5	12	31.0	35.0	5	7.5	6	6	79.4	114	126	138	5	6	51.0	54.0	5	12	5	10	12	
2 FT	14	10	9	9	5	6	5	8	62.3	34.0	34.0	34.0	5	12	117.5	87.5	5	12	30.0	33.0	5	7	6	6.5	68.6	114	126	138	6	6.5	53.0	56.0	5	12	5	10.5	12	
4 FT	11	10	9	9	5	6	6	7	75.1	31.0	31.0	35.0	5	12	82.0	89.0	5	12	34.0	36.0	5	7	6	6	61.3	114	126	138	6	6	52.0	56.0	5	12	5	10	12	
6 FT	11	11	9	9	5	6.5	6	7	39.8	31.0	35.0	35.0	6	16	61.0	70.0	6	16	35.0	36.0	5	6.5	6	6	57.5	115	127	139	6	6	50.0	56.0	5	12	5	9.5	12	
8 FT	11	12	9	9	5	6.5	6	7	36.3	31.0	31.0	35.0	6	15	66.0	60.0	6	15	33.0	34.0	5	6	6	6.5	54.5	116	128	140	6	6	49.0	56.0	5	12	5	9	0	
10 FT	12	13	9	9	5	6.5	6	6.5	52.5	32.0	32.0	36.0	6	14	54.0	59.0	6	14	33.0	34.0	5	6	6	6.5	52.4	117	129	141	6	6	48.0	56.0	5	12	5	8.5	0	
12 FT	13	14	9	9	5	6	6	6.5	50.4	33.0	33.0	37.0	6	14	52.0	58.0	6	14	32.0	34.0	6	8	6	6.5	50.6	118	130	142	6	6	48.0	56.0	5	12	5	8.5	0	
14 FT	14	15	9	9	5	6	6	6.5	48.8	34.0	34.0	38.0	6	14	51.0	57.0	6	14	32.0	34.0	6	7.5	6	6.5	49.4	119	131	143	6	6	48.0	56.0	5	12	5	8.5	0	
16 FT	15	16	10	9	6	8	6	7.5	54.3	35.0	35.0	39.0	6	13	55.0	63.0	6	13	38.0	40.0	6	7	6	7.5	48.5	120	132	144	6	6	47.0	56.0	5	12	5	8	0	
18 FT	16	17	11	9	6	8	6	8	54.3	36.0	36.0	36.0	6	13	55.0	62.0	6	13	38.0	40.0	6	7	5	6	45.4	121	133	145	6	6	47.0	56.0	5	12	5	8	0	
20 FT	17	18	11	9	6	7.5	6	7.5	53.6	37.0	37.0	41.0	6	13	54.0	62.0	6	13	37.0	40.0	6	6	6	8	47.8	122	134	146	6	6	47.0	56.0	5	12	5	7.5	0	
22 FT	18	20	11	9	6	7	6	6.5	53.3	38.0	38.0	42.0	6	12	54.0	62.0	6	12	37.0	40.0	6	6	6	6	7.5	47.5	124	136	148	6	6	47.0	57.0	5	12	5	7.5	0
24 FT	19	21	12	9	6	6.5	6	7	53.9	39.0	39.0	39.0	6	12	53.0	62.0	6	12	37.0	40.0	7	8	5	6	44.5	125	137	149	7	7.5	50.0	60.0	5	12	5	7	0	
26 FT	20	22	13	9	6	6	6	7.5</																														

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

DESIGN FILL	SPAN (S) = 12 FT										HEIGHT (HT) = 12 FT OR 13 FT																								
	MEMBER THICKNESS			TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																					
	TS	BS	TX	A1 BARS		J3 BARS			H1 BARS		H2 BARS			A2 BARS		J4 BARS			H3 BARS		B1 BARS		B2 BARS												
				SIZE	SPA.	SIZE	SPA.	C1	K2 HT=12 HT=13	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=12 HT=13	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1			
1 FT	14	10	10	5	6	5	7	63.8	34.0	34.0	5	12	118.5	87.5	5	12	32.0	35.0	5	7	6	6.5	89.1	150	162	6	7	6	55.0	57.0	5	12	5	8.5	12
2 FT	14	10	10	5	6	5	7	63.8	34.0	34.0	5	12	118.5	87.5	5	12	31.0	33.0	5	7	6	6	79.6	150	162	6	6.5	6	54.0	56.0	5	12	5	8	12
4 FT	11	10	10	5	6.5	5	6	63.8	31.0	31.0	5	12	118.5	89.0	5	12	34.0	35.0	5	6.5	6	6.5	76.3	151	163	6	6.5	6	53.0	57.0	5	12	5	8	12
6 FT	11	10	10	5	6.5	5	6	61.3	31.0	31.0	5	12	118.5	89.0	5	12	35.0	36.0	5	6.5	6	6	69.1	151	163	6	6	6	51.0	56.0	5	12	5	8	12
8 FT	11	10	10	5	6.5	6	7	65.4	31.0	35.0	6	15	57.0	60.0	6	15	34.0	35.0	5	6	6	6	66.4	152	164	6	6	6	50.0	56.0	5	12	5	8	0
10 FT	12	13	10	5	6.5	6	7	62.9	36.0	36.0	6	15	55.0	58.0	6	15	33.0	34.0	5	6	6	6	63.8	153	165	6	6	6	49.0	56.0	5	12	5	8	0
12 FT	13	14	11	5	6.5	6	7.5	61.1	33.0	37.0	6	14	53.0	57.0	6	14	33.0	34.0	6	8	6	7	62.0	154	166	6	6	6	49.0	56.0	5	12	5	7.5	0
14 FT	14	15	11	5	6	6	7	59.9	38.0	38.0	6	14	51.0	57.0	6	14	32.0	34.0	6	7.5	6	6	60.9	155	167	6	6	6	48.0	56.0	5	12	5	7.5	0
16 FT	15	16	12	6	8	6	7	65.0	39.0	39.0	6	14	56.0	62.0	6	14	38.0	40.0	6	7	6	7	59.9	156	168	6	6	6	48.0	56.0	5	12	5	7	0
18 FT	16	17	12	6	8	6	6	65.4	40.0	40.0	6	13	55.0	62.0	6	13	38.0	40.0	6	7	6	6	59.1	157	169	6	6	6	48.0	56.0	5	12	5	7	0
20 FT	17	18	13	6	7.5	6	6.5	63.8	41.0	41.0	6	13	55.0	61.0	6	13	38.0	40.0	6	6	6	7	58.5	158	170	6	6	6	48.0	56.0	5	12	5	6.5	0
22 FT	18	20	13	6	7	6	6	63.3	42.0	42.0	6	13	54.0	61.0	6	13	38.0	40.0	6	6	6	6.5	58.4	160	172	6	6	6	48.0	56.0	5	12	5	6.5	0
24 FT	19	21	14	6	6.5	6	6.5	63.1	39.0	43.0	6	12	54.0	61.0	6	12	37.0	40.0	7	8	6	7	58.0	161	173	7	7.5	6	51.0	60.0	5	12	5	6	0
26 FT	20	22	14	6	6.5	6	6	62.8	44.0	44.0	6	12	53.0	61.0	6	12	37.0	40.0	7	7.5	6	6.5	57.6	162	174	7	7.5	6	51.0	60.0	5	12	5	6	0
28 FT	21	23	15	6	6	6	6	62.9	45.0	45.0	6	12	53.0	61.0	6	12	37.0	40.0	7	7	6	7	57.4	163	175	7	7	6	51.0	60.0	5	12	6	8	0
30 FT	23	25	15	7	7.5	6	6	62.8	47.0	47.0	7	15	57.0	65.0	7	15	40.0	42.0	7	7	6	7	57.5	165	177	7	6.5	6	51.0	60.0	5	12	6	8	0
32 FT	23	26	16	7	7	6	6	63.1	47.0	47.0	7	14	57.0	65.0	7	14	41.0	43.0	7	7	6	7.5	57.5	166	178	7	6.5	6	51.0	60.0	5	12	6	8	0
34 FT	24	27	16	7	7	7	7.5	66.1	48.0	48.0	7	14	57.0	65.0	7	14	40.0	42.0	7	7	6	7	57.5	167	179	7	6	6	51.0	60.0	5	12	6	8	0
36 FT	25	28	17	7	7	6	6	63.4	49.0	49.0	7	14	57.0	64.0	7	14	40.0	42.0	7	7	6	7	57.8	168	180	7	6	6	51.0	60.0	5	12	6	7.5	0
38 FT	26	29	17	7	7	7	7.5	68.6	50.0	50.0	7	13	57.0	64.0	7	13	39.0	41.0	7	6.5	6	7	57.9	169	181	7	6	6	51.0	60.0	5	12	6	7.5	0
40 FT	27	29	17	7	6.5	7	8	66.8	51.0	51.0	7	13	56.0	63.0	7	13	38.0	40.0	7	6	6	7	55.9	169	181	8	7.5	6	51.0	60.0	5	12	6	7.5	0
42 FT	28	30	17	7	6.5	7	7	66.9	52.0	52.0	7	12	56.0	63.0	7	12	38.0	39.0	7	6	6	7	56.0	170	182	8	7.5	6	51.0	60.0	5	12	6	7.5	0
44 FT	29	31	18	7	6	7	7.5	67.8	53.0	53.0	7	12	56.0	62.0	7	12	37.0	38.0	7	6	6	6.5	56.4	171	183	8	7.5	6	51.0	60.0	5	12	6	7	0
46 FT	29	32	19	7	6	7	7.5	68.5	53.0	53.0	7	12	56.0	62.0	7	12	38.0	39.0	7	6	6	6.5	56.8	172	184	8	7	6	51.0	67.0	5	12	6	6.5	0
48 FT	30	33	19	7	6	7	7	68.5	54.0	54.0	7	12	56.0	61.0	7	12	37.0	38.0	7	6	6	6.5	56.9	173	185	8	7	6	51.0	67.0	5	12	6	6.5	0
50 FT	31	34	19	7	6	7	6.5	68.6	55.0	55.0	7	12	56.0	61.0	7	12	37.0	38.0	7	6	6	6.5	57.3	174	186	8	7	6	51.0	67.0	5	12	6	6.5	0

DESIGN FILL	SPAN (S) = 12 FT										HEIGHT (HT) = 14 FT OR 15 FT																								
	MEMBER THICKNESS			TOP SLAB BARS					BOTTOM SLAB BARS					WALL BARS																					
	TS	BS	TX	A1 BARS		J3 BARS			H1 BARS		H2 BARS			A2 BARS		J4 BARS			H3 BARS		B1 BARS		B2 BARS												
				SIZE	SPA.	SIZE	SPA.	C1	K2 HT=14 HT=15	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=14 HT=15	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1			
1 FT	14	11	10	5	6	6	7.5	64.0	34.0	38.0	5	12	119.5	88.5	5	12	32.0	35.0	5	7	6	6	95.5	175	187	5	6	6	55.0	55.0	5	12	5	8	12
2 FT	14	12	10	5	6	6	7	64.0	34.0	38.0	5	12	119.5	88.5	5	12	31.0	34.0	5	7	6	6	95.5	176	188	5	6	6	54.0	55.0	5	12	5	8	12
4 FT	10	11	12	5	6	6	7.5	68.3	34.0	34.0	6	15	121.5	77.0	6	15	37.0	37.0	5	6.5	6	6	86.8	175	187	6	6.5	6	55.0	57.0	5	11	5	7	12
6 FT	10	12	12	5	6.5	6	7	80.0	34.0	34.0	6	15	61.0	61.0	6	15	35.0	35.0	5	6	6	6.5	83.1	176	188	6	6.5	6	53.0	57.0	5	12	5	7	12
8 FT	11	12	12	5	7	6	7.5	76.8	35.0	35.0	6	15	58.0	59.0	6	15	35.0	35.0	5	6	6	6	77.1	176	188	6	6	6	52.0	55.0	5	12	5	7	0
10 FT	12	13	12	5	6.5	6	7.5	74.4	36.0	36.0	6	15	56.0	58.0	6	15	34.0	35.0	5	6	6	6	75.5	177	189	6	6	6	51.0	55.0	5	12	5	6.5	0
12 FT	13	14	13	5	6.5	6	7.5	71.5	37.0	37.0	6	15	54.0	57.0	6	15	34.0	35.0	6	6	6	6	73.0	178	190	6	6	6	50.0	55.0	5	12	5	6.5	0
14 FT	14	15	13	5	6	6	6.5	70.3	38.0	38.0	6	14	52.0	56.0	6	14	33.0	35.0	6	7.5	6	6	72.0	179	191	6	6	6	50.0	55.0	5	12	5	6.5	0
16 FT	15	16	14	6	8	6	6.5	74.5	39.0	39.0	6	14	57.0	62.0	6	14	39.0	41.0	6	7	6	6.5	70.3	180	192	6	6	6	49.0	55.0	5	12	5	6	0
18 FT	15	17	15	6	7.5	6	6.5	72.4	39.0	39.0	6	13	56.0	61.0	6	13	39.0	40.0	6	6.5	6	6.5	69.0	181	193	6	6	6	49.0	56.0	5	12	6	8	0
20 FT	17	19	15	6	7.5	6	6	73.0	41.0	41.0	6	13	56.0	61.0	6	13	39.0	41.0	6	6	6	6	69.6	183	195	6	6	6	49.0	56.0	5	12	6	8	0
22 FT	18	20	16	6	7	6	6.5	72.8	42.0	42.0	6	13	55.0	61.0	6	13	39.0	41.0	6	6	6	6	68.4	184	196	6	6	6	49.0	56.0	5	12	6	8	0
24 FT	19	21	16	6	6.5	6	6	72.4	43.0	43.0	6	13	55.0	61.0	6	13	38.0	41.0	7	8	7	7.5	71.1	185	197	7	7.5	6	52.0	59.0	5	12	6	8	0
26 FT	20	22	16	6	6.5	7	7.5	77.1	44.0	50.0	6	12	55.0	61.0	6	12	38.0	40.0	7	7.5	7	7	70.8	186	198	7	7.5	6	52.0	60.0	5	12	6	8	0
28 FT	21	23	17	6	6	7	7.5	77.1	45.0	51.0	6	12	54.0	60.0	6	12	37.0	40.0	7	6.5	7	7.5	70.5	187	199	7	6.5	6	52.0	60.0	5	12	6	7.5	0
30 FT	22	25	18	6	6	7	7.5	77.3	46.0	46.0	7	15	59.0	65.0	7	15	42.0	44.0	7	7	6	6	67.8	189	201	7	6.5								

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

		SPAN (S) = 13 FT												HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT																							
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS									
	TS	BS	TX	A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS											
				SIZE	SPA.	SIZE	SPA.	C1	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	C4	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1			
1 FT	14	9	8	8	5	6	5	8.5	65.8	34.0	34.0	34.0	5	12	125.5	92.5	5	12	34.0	38.0	5	7.5	6	6	60.0	89	101	113	6	6	56.0	59.0	5	12	5	12	12
2 FT	15	10	8	8	6	8	5	8	65.8	31.0	35.0	35.0	6	16	129.5	99.5	6	16	40.0	44.0	5	7	6	6.5	55.5	90	102	114	6	6	54.0	59.0	5	12	5	12	12
4 FT	11	10	8	8	6	8	6	7	56.4	31.0	35.0	35.0	6	14	77.0	97.0	6	14	38.0	40.0	5	7	6	6	49.5	90	102	114	7	6.5	57.0	62.0	5	12	5	12	12
6 FT	11	11	8	8	6	8.5	6	7	49.0	31.0	31.0	31.0	6	13	63.0	75.0	6	13	35.0	37.0	5	6.5	6	6	45.9	91	103	115	7	7	55.0	62.0	5	12	5	12	12
8 FT	12	12	8	8	5	6	5	6	42.0	32.0	32.0	32.0	6	14	58.0	67.0	6	14	34.0	36.0	5	6	6	7	43.3	92	104	116	7	7	54.0	62.0	5	12	5	12	0
10 FT	13	14	8	8	5	6	5	6	39.8	33.0	33.0	33.0	6	13	55.0	63.0	6	13	33.0	36.0	6	8	5	6.5	38.1	94	106	118	6	6	50.0	59.0	5	12	5	12	0
12 FT	14	15	8	8	6	8	5	6	37.9	34.0	34.0	34.0	6	13	53.0	62.0	6	13	33.0	35.0	6	7.5	5	6.5	36.9	95	107	119	6	6	49.0	59.0	5	12	5	12	0
14 FT	15	16	8	8	6	7.5	5	6	41.4	35.0	35.0	35.0	6	12	58.0	67.0	6	12	39.0	41.0	6	7	5	6.5	35.9	96	108	120	6	6	49.0	59.0	5	12	5	10.5	0
16 FT	16	17	8	8	6	7.5	6	8	44.4	36.0	36.0	36.0	6	12	57.0	67.0	6	12	38.0	41.0	6	7	5	6.5	35.1	97	109	121	6	6	49.0	60.0	5	12	5	9.5	0
18 FT	17	18	8	8	6	7	6	7.5	43.5	37.0	37.0	37.0	6	12	56.0	66.0	6	12	38.0	41.0	6	6.5	5	6	34.5	98	110	122	7	7	52.0	63.0	5	12	5	9.5	0
20 FT	18	20	9	8	6	6.5	6	8	44.3	38.0	38.0	38.0	7	15	61.0	71.0	7	15	43.0	46.0	6	6	5	7	34.6	100	112	124	6	6	49.0	60.0	5	12	5	9	0
22 FT	20	21	9	8	6	6.5	6	8	43.4	40.0	40.0	40.0	6	12	55.0	66.0	6	12	38.0	41.0	7	8	5	6.5	34.5	101	113	125	7	7	52.0	63.0	5	12	5	8.5	0
24 FT	21	22	9	8	6	6	6	7.5	43.0	41.0	41.0	41.0	7	15	60.0	71.0	7	15	43.0	46.0	7	7.5	5	6	34.3	102	114	126	7	7	51.0	63.0	5	12	5	8.5	0
26 FT	22	24	10	8	6	6	6	8	43.8	42.0	42.0	42.0	7	15	59.0	70.0	7	15	42.0	46.0	7	7	5	6.5	34.5	104	116	128	7	7	51.0	63.0	5	12	5	8	0
28 FT	23	25	11	8	7	7	5	6	40.5	43.0	43.0	43.0	7	14	59.0	70.0	7	14	42.0	46.0	7	6.5	5	7	34.9	105	117	129	7	6.5	51.0	63.0	5	12	5	8.5	0
30 FT	25	26	11	8	7	7	5	6	40.0	45.0	45.0	45.0	7	14	59.0	70.0	7	14	41.0	44.0	7	6.5	5	6.5	34.9	106	118	130	7	6.5	51.0	63.0	5	12	5	7.5	0
32 FT	26	27	11	8	7	7	5	6	39.8	46.0	46.0	46.0	7	13	59.0	69.0	7	13	40.0	43.0	7	6	5	6	34.8	107	119	131	7	6	51.0	63.0	5	12	5	7.5	0
34 FT	27	29	11	8	7	6.5	6	8	43.9	47.0	47.0	47.0	7	13	58.0	69.0	7	13	40.0	42.0	7	6.5	6	7.5	37.9	109	121	133	8	7.5	57.0	69.0	5	12	5	7.5	0
36 FT	28	30	11	8	7	6.5	6	7.5	43.9	52.0	52.0	52.0	7	12	58.0	68.0	7	12	40.0	42.0	7	6	6	7	37.8	110	122	134	8	7.5	57.0	69.0	5	12	5	7.5	0
38 FT	29	31	11	8	7	6	6	6.5	43.9	53.0	53.0	53.0	7	12	58.0	68.0	7	12	39.0	41.0	7	6	6	7	38.0	111	123	135	8	7	57.0	69.0	5	12	5	7	0
40 FT	30	32	12	8	7	6	6	7.5	44.8	54.0	54.0	54.0	7	12	58.0	68.0	7	12	38.0	40.0	7	6	6	7.5	38.5	112	124	136	8	7	57.0	70.0	5	12	5	7	0
42 FT	31	33	12	8	8	7.5	6	7.5	43.8	55.0	55.0	55.0	8	15	66.0	75.0	8	15	46.0	47.0	7	6	6	7	37.6	113	125	137	8	7	57.0	69.0	5	12	5	7	0
44 FT	32	34	12	8	8	7.5	6	7	43.9	56.0	56.0	56.0	8	14	65.0	74.0	8	14	45.0	47.0	7	6	6	7	37.8	114	126	138	8	7	57.0	69.0	5	12	5	7	0
46 FT	32	35	12	8	8	7	6	7	43.9	56.0	56.0	56.0	8	14	65.0	74.0	8	14	46.0	47.0	7	6	6	6.5	37.8	115	127	139	8	7	57.0	69.0	5	12	5	7	0
48 FT	33	35	12	8	8	7	6	7	43.9	57.0	57.0	57.0	8	14	65.0	74.0	8	14	45.0	47.0	8	7	6	6.5	37.9	115	127	139	8	6.5	57.0	69.0	5	12	5	6.5	0
50 FT	34	36	12	8	8	7	6	6.5	43.9	58.0	58.0	58.0	8	14	65.0	73.0	8	14	45.0	46.0	8	7	6	6.5	38.1	116	128	140	8	6.5	57.0	69.0	5	12	5	6	0

		SPAN (S) = 13 FT												HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT																							
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS									
	TS	BS	TX	A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS											
				SIZE	SPA.	SIZE	SPA.	C1	HT=10'	HT=11'	HT=12'	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	C4	HT=10'	HT=11'	HT=12'	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1			
1 FT	14	10	9	10	5	6	5	7	66.6	34.0	34.0	34.0	5	12	126.5	93.5	5	12	35.0	38.0	5	7	6	6	81.5	126	138	150	6	6.5	57.0	60.0	5	12	5	9	12
2 FT	15	10	10	10	6	8	5	7.5	67.3	35.0	35.0	35.0	6	16	130.5	100.5	6	16	41.0	44.0	5	7	6	6	70.1	126	138	150	6	6	56.0	58.0	5	12	5	9.5	12
4 FT	11	10	10	10	6	8	5	6	72.3	31.0	31.0	31.0	6	15	82.0	97.0	6	15	38.0	39.0	5	7	6	6	64.6	126	138	150	7	6.5	58.0	61.0	5	9.5	5	9	12
6 FT	11	11	10	10	5	6	5	6	80.5	31.0	31.0	31.0	6	14	64.0	71.0	6	14	36.0	37.0	5	6.5	6	6	61.0	127	139	151	7	6.5	57.0	61.0	5	12	5	9	12
8 FT	12	13	10	10	5	6	5	6	56.8	32.0	32.0	32.0	6	14	60.0	64.0	6	14	35.0	36.0	5	6	6	6.5	59.1	129	141	153	6	6	52.0	59.0	5	12	5	8.5	0
10 FT	13	14	10	10	6	6	6	7	56.9	33.0	33.0	33.0	6	13	57.0	62.0	6	13	35.0	37.0	6	8	6	6.5	56.8	130	142	154	6	6	51.0	59.0	5	12	5	8	0
12 FT	14	15	10	10	5	6	6	6.5	54.6	34.0	34.0	38.0	6	13	55.0	61.0	6	13	34.0	36.0	6	7.5	6	6.5	54.9	131	143	155	6	6	51.0	59.0	5	12	5	8	0
14 FT	15	16	10	10	6	8	6	6.5	58.9	35.0	35.0	39.0	6	13	60.0	66.0	6	13	39.0	42.0	6	7	6	6	53.5	132	144	156	6	6	50.0	59.0	5	12	5	8	0
16 FT	16	17	11	10	6	7.5	6	7	58.0	36.0	36.0	40.0	6	12	58.0	66.0	6	12	39.0	42.0	6	7	6	7.5	52.5	133	145	157	6	6	50.0	59.0	5	12	5	7.5	0
18 FT	17	18	12	10	6	7.5	6	7	57.9	37.0	37.0	41.0	6	12	58.0	66.0	6	12	39.0	42.0	6	6	6	7.5	52.0	134	146	158	7	7	53.0	62.0	5	12	5	7	0
20 FT	18	20	12	10	6	7	6	6.5	57.3	38.0	38.0	42.0	6	12	57.0	65.0	6	12	39.0	42.0	6	6	6	7.5	51.5	136	148	160	6	6	50.0	60.0	5	12	5	7	0
22 FT	19	21	12	10	6	6	6	6.5	56.8	39.0	39.0	43.0	7	15	62.0	70.0	7	15	44.0	47.0	7	8	6	7	51.0	137	149	161	7	7	53.0	63.0	5	12	5	7	0
24 FT	21	22	13	10	6	6	6	6.5	56.9	41.0	41.0	45.0	6	12	56.0	65.0	6	12	38.0	42.0	7	7	6	7.5	51.1	138	150	162	7	7	53.0	63.0	5	12	5	6.5	0
26 FT	22	24	13	10	6	6	6	6.5	56.6																												

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

		SPAN (S) = 13 FT												HEIGHT (HT) = 13 FT OR 14 FT																					
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS									
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS											
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=13 HT=14	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=13 HT=14	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	14	11	10	11	5	6	5	6	67.5	34.0	34.0	5	12	127.5	94.5	5	12	35.0	38.0	5	7	6	6.5	100.1	163	175	5	6	56.0	58.0	5	12	5	8	12
2 FT	15	11	10	11	6	8	5	6	67.5	35.0	35.0	6	16	131.5	101.5	6	16	41.0	44.0	5	6.5	6	6	88.9	163	175	6	6.5	57.0	60.0	5	12	5	8	12
4 FT	11	11	11	11	6	8	5	6	68.1	31.0	31.0	6	15	127.5	92.0	6	15	38.0	39.0	5	6.5	6	6	78.6	163	175	6	6	56.0	60.0	5	12	5	7.5	12
6 FT	11	12	11	11	5	6	6	7.5	75.9	31.0	31.0	6	14	65.0	69.0	6	14	36.0	37.0	5	6	6	6.5	74.6	164	176	6	6	54.0	59.0	5	12	5	7.5	12
8 FT	12	13	11	11	5	6	6	7.5	70.1	32.0	36.0	6	14	61.0	64.0	6	14	35.0	36.0	5	6	6	6.5	70.9	165	177	6	6	53.0	59.0	5	12	5	7.5	0
10 FT	12	14	12	11	5	6	6	7.5	65.9	36.0	36.0	6	12	58.0	61.0	6	12	35.0	35.0	6	8	6	7	67.9	166	178	6	6	52.0	59.0	5	12	5	7	0
12 FT	13	15	12	11	6	8	6	7	64.4	37.0	37.0	6	12	56.0	60.0	6	12	34.0	35.0	6	7.5	6	7	66.3	167	179	6	6	52.0	59.0	5	12	5	7	0
14 FT	15	16	12	11	6	8	6	6.5	69.9	39.0	39.0	6	13	60.0	66.0	6	13	40.0	42.0	6	7	6	6	64.9	168	180	6	6	51.0	59.0	5	12	5	7	0
16 FT	16	17	13	11	6	8	6	6.5	68.9	40.0	40.0	6	13	59.0	65.0	6	13	40.0	42.0	6	7	6	6.5	63.8	169	181	6	6	51.0	59.0	5	12	5	6.5	0
18 FT	17	19	14	11	6	7.5	6	6.5	68.3	41.0	41.0	6	12	58.0	65.0	6	12	40.0	42.0	6	6	6	6.5	63.5	171	183	6	6	51.0	60.0	5	12	5	6	0
20 FT	18	20	14	11	6	7	6	6	67.5	42.0	42.0	6	12	58.0	65.0	6	12	39.0	42.0	6	6	6	6.5	62.8	172	184	6	6	51.0	60.0	5	12	5	6	0
22 FT	19	21	14	11	6	6.5	6	6	66.9	43.0	43.0	6	12	57.0	65.0	6	12	39.0	42.0	7	8	6	6	62.1	173	185	7	7	54.0	63.0	5	12	5	6	0
24 FT	20	22	16	11	6	6	6	6	67.3	44.0	44.0	7	15	62.0	69.0	7	15	44.0	47.0	7	7	6	6.5	61.8	174	186	7	7	54.0	63.0	5	12	6	8	0
26 FT	22	24	16	11	6	6	6	6	67.1	46.0	46.0	7	15	61.0	69.0	7	15	43.0	46.0	7	7	6	7	61.8	176	188	7	7	54.0	63.0	5	12	6	8	0
28 FT	23	25	16	11	7	7.5	7	8	71.6	47.0	47.0	7	15	61.0	69.0	7	15	43.0	46.0	7	6.5	6	6.5	61.4	177	189	7	6.5	54.0	63.0	5	12	6	8	0
30 FT	24	26	16	11	7	7.5	7	7	71.3	48.0	48.0	7	14	60.0	69.0	7	14	42.0	45.0	7	6.5	6	6	61.0	178	190	7	6.5	54.0	63.0	5	12	6	8	0
32 FT	25	28	17	11	7	7	7	7.5	71.6	49.0	49.0	7	14	60.0	68.0	7	14	42.0	45.0	7	6.5	6	6.5	61.1	180	192	7	6	54.0	64.0	5	12	6	7.5	0
34 FT	26	29	17	11	7	6.5	7	6.5	71.4	50.0	50.0	7	13	60.0	68.0	7	13	42.0	44.0	7	6.5	6	6.5	61.0	181	193	8	7.5	60.0	70.0	5	12	6	7.5	0
36 FT	27	30	18	11	7	6.5	7	7	72.0	51.0	51.0	7	13	60.0	68.0	7	13	41.0	43.0	7	6	6	6.5	61.3	182	194	8	7.5	60.0	70.0	5	12	6	7	0
38 FT	28	31	19	11	7	6.5	7	7.5	72.5	52.0	52.0	7	12	59.0	67.0	7	12	41.0	43.0	7	6	6	6.5	61.5	183	195	8	7	60.0	70.0	5	12	6	6.5	0
40 FT	29	32	19	11	7	6	6	6.5	72.6	53.0	53.0	7	12	59.0	67.0	7	12	40.0	42.0	7	6	6	6	61.5	184	196	8	7	60.0	70.0	5	12	6	6.5	0
42 FT	30	33	20	11	7	6	7	7	73.3	54.0	54.0	7	12	59.0	66.0	7	12	39.0	41.0	7	6	6	6	61.9	185	197	8	7	60.0	70.0	5	12	6	6.5	0
44 FT	31	34	20	11	8	7.5	7	7	71.6	55.0	55.0	8	15	67.0	73.0	8	15	47.0	48.0	7	6	6	6	60.1	186	198	8	7	60.0	70.0	5	12	6	6.5	0
46 FT	32	35	20	11	8	7.5	7	6.5	71.6	56.0	56.0	8	15	67.0	73.0	8	15	46.0	48.0	8	7.5	6	6	60.3	187	199	8	7	60.0	70.0	5	12	6	6.5	0
48 FT	32	36	21	11	8	7	7	7	72.4	56.0	56.0	8	14	67.0	73.0	8	14	47.0	48.0	8	7.5	6	6	60.5	188	200	8	6.5	60.0	70.0	5	12	6	6	0
50 FT	33	36	22	11	8	7	7	7	73.1	57.0	63.0	8	14	66.0	72.0	8	14	46.0	47.0	8	6.5	7	7.5	63.8	188	200	8	6.5	60.0	70.0	5	12	6	6	0

		SPAN (S) = 13 FT												HEIGHT (HT) = 15 FT OR 16 FT																					
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS									
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS											
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=15 HT=16	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=15 HT=16	SIZE	SPA.	C7	Q10	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	14	11	12	13	5	6	5	6	69.0	34.0	34.0	5	12	128.5	95.5	5	12	35.0	37.0	5	6.5	6	6.5	103.3	187	199	6	7	60.0	61.0	5	10.5	5	7	12
2 FT	15	11	12	13	6	8	6	8	72.0	35.0	39.0	6	16	135.5	102.5	6	16	41.0	44.0	5	6.5	6	6	95.4	187	199	6	6.5	58.0	59.0	5	12	5	7	12
4 FT	11	11	12	13	6	8	6	7	72.0	35.0	35.0	6	15	130.5	82.0	6	15	39.0	39.0	5	6.5	7	6	92.5	187	199	6	6	57.0	59.0	5	12	5	6.5	12
6 FT	11	12	12	13	5	6	6	6.5	80.4	35.0	35.0	6	14	65.0	66.0	6	14	37.0	37.0	5	6	7	6	88.9	188	200	6	6	56.0	59.0	5	12	5	6.5	12
8 FT	11	13	13	13	5	6	6	6.5	78.1	35.0	35.0	6	13	60.0	62.0	6	13	36.0	36.0	5	6	6	6	82.4	189	201	6	6	55.0	59.0	5	12	5	6.5	0
10 FT	12	14	13	13	5	6	6	6.5	76.0	36.0	36.0	6	13	58.0	60.0	6	13	35.0	35.0	5	6	6	6	80.4	190	202	6	6	54.0	59.0	5	12	5	6	0
12 FT	13	15	14	13	5	6	6	6.5	73.3	37.0	37.0	6	12	57.0	59.0	6	12	35.0	36.0	6	7.5	6	6	77.5	191	205	6	6	53.0	59.0	5	12	5	6	0
14 FT	14	16	14	13	6	8	6	6	72.3	38.0	38.0	6	12	55.0	59.0	6	12	35.0	36.0	6	7	6	6	76.3	192	204	7	7	53.0	62.0	5	12	5	6	0
16 FT	15	17	16	13	6	7.5	6	6.5	76.6	39.0	39.0	6	12	60.0	64.0	6	12	41.0	42.0	6	6.5	6	6.5	73.3	193	205	7	7	55.0	62.0	5	12	6	8	0
18 FT	16	19	16	13	6	7	6	6	76.3	40.0	40.0	6	12	59.0	64.0	6	12	40.0	42.0	6	6	6	6	74.1	195	207	6	6	52.0	60.0	5	12	6	8	0
20 FT	18	20	16	13	6	7	6	6	76.8	42.0	42.0	6	12	59.0	64.0	6	12	40.0	42.0	6	6	6	6	73.0	196	208	6	6	52.0	60.0	5	12	6	8	0
22 FT	19	21	17	13	6	6.5	6	6	76.4	43.0	43.0	6	12	58.0	64.0	6	12	40.0	42.0	7	7.5	7	7.5	75.1	197	209	7	7	55.0	63.0	5	12	6	7.5	0
24 FT	20	23	17	13	6	6.5	7	7.5	81.1	44.0	50.0	6	12	58.0	64.0	6	12	40.0	42.0	7	7	7	7	75.4	199	211	7	7	55.0	63.0	5	12	6	7.5	0
26 FT	22	24	18	13	6	6	7	7.5	81.5	46.0	52.0	7	15	62.0	69.0	7	15	44.0	46.0	7	7	7	7.5	74.9	200	212	7	7	55.0	63.0	5	12	6	7	0
28 FT	23	25	18	13	7	7.5	7	6.5	81.3	47.0	53.0	7	15	62.0	69.0	7	15	43.0	46.0	7	6.5	7	6.5	74.6	201	213	7	6.5	55.0	63.0	5	12	6	7	0
30 FT	24	26	19	13	7	7.5	7	7	81.3	48.0	54.0	7	14	61.0	69.0	7	14	43.0	46.0	7	6.5	7	7	74.4	202	214	7								

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

		SPAN (S) = 14 FT										HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT																									
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS															
		A1 BARS		J3 BARS				H1 BARS				H2 BARS				A2 BARS		J4 BARS				H3 BARS		B1 BARS	B2 BARS												
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	HT=7'	HT=8'	HT=9'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	14	10	8	8	6	8.5	5	8.5	69.3	34.0	34.0	34.0	5	12	133.5	98.5	5	12	39.0	43.0	5	7	6	7	60.9	90	102	114	6	6.5	58.0	63.0	5	12	5	12	12
2 FT	15	10	8	8	6	8	5	8	69.3	35.0	35.0	35.0	6	16	137.5	105.5	6	16	45.0	49.0	5	7	6	6	54.8	90	102	114	7	7	60.0	64.0	5	12	5	12	12
4 FT	12	11	8	8	6	7.5	5	6	52.4	32.0	32.0	32.0	6	14	80.0	103.0	6	14	39.0	42.0	5	6.5	6	6	49.1	91	103	115	6	6	56.0	62.0	5	12	5	12	12
6 FT	12	12	8	8	6	8	6	7.5	48.9	32.0	32.0	32.0	6	13	66.0	81.0	6	13	37.0	39.0	5	6	5	6	42.1	92	104	116	7	7	57.0	65.0	5	12	5	12	12
8 FT	12	13	8	8	6	7.5	6	7	45.5	32.0	32.0	32.0	6	12	61.0	69.0	6	12	35.0	37.0	6	8.5	5	6	39.1	93	105	117	7	7	56.0	66.0	5	12	5	12	0
10 FT	13	14	9	8	6	7	5	6	41.3	33.0	33.0	33.0	7	15	61.0	69.0	7	15	38.0	40.0	6	8	5	7	38.4	94	106	118	7	6.5	55.0	65.0	5	12	5	12	0
12 FT	15	16	9	8	6	7.5	5	6.5	43.5	35.0	35.0	35.0	6	12	62.0	71.0	6	12	40.0	43.0	6	7	5	8	36.8	96	108	120	6	6	52.0	63.0	5	12	5	12	0
14 FT	16	17	9	8	6	7	5	6	41.9	36.0	36.0	36.0	6	12	61.0	70.0	6	12	40.0	43.0	6	7	5	7.5	35.8	97	109	121	7	7	54.0	66.0	5	12	5	12	0
16 FT	17	18	9	8	6	7	5	6	40.8	37.0	37.0	37.0	7	15	65.0	75.0	7	15	44.0	48.0	6	6.5	5	7	34.9	98	110	122	7	7	54.0	66.0	5	12	5	12	0
18 FT	18	20	9	8	6	6.5	6	8	44.0	38.0	38.0	38.0	7	15	64.0	75.0	7	15	44.0	47.0	6	6	5	7	34.0	100	112	124	7	7	54.0	66.0	5	12	5	10	0
20 FT	20	21	9	8	6	6.5	5	6	38.9	40.0	40.0	40.0	7	15	63.0	75.0	7	15	44.0	48.0	7	8	5	6.5	33.9	101	113	125	7	7	54.0	66.0	5	12	5	9	0
22 FT	21	22	9	8	6	6	6	8	42.4	41.0	41.0	41.0	7	14	63.0	74.0	7	14	44.0	47.0	7	7	5	6	33.5	102	114	126	7	6.5	54.0	66.0	5	12	5	8.5	0
24 FT	23	24	9	8	7	7.5	6	7	42.0	47.0	47.0	47.0	7	15	62.0	74.0	7	15	44.0	47.0	7	7	6	7	36.4	104	116	128	7	7	54.0	66.0	5	12	5	8.5	0
26 FT	24	25	9	8	7	7.5	6	7	41.6	48.0	48.0	48.0	7	14	62.0	74.0	7	14	43.0	47.0	7	6.5	6	7	36.1	105	117	129	7	6.5	54.0	66.0	5	12	5	8.5	0
28 FT	25	26	9	8	7	7	6	6	41.4	49.0	49.0	49.0	7	14	61.0	73.0	7	14	43.0	47.0	7	6	6	6.5	35.9	106	118	130	7	6	54.0	66.0	5	12	5	7.5	0
30 FT	27	28	10	8	7	6.5	6	7	42.3	51.0	51.0	51.0	7	13	61.0	73.0	7	13	42.0	45.0	7	6	6	7	36.5	108	120	132	7	6	54.0	67.0	5	12	5	8	0
32 FT	28	29	10	8	7	6.5	6	6.5	42.0	52.0	52.0	52.0	7	12	61.0	73.0	7	12	41.0	44.0	7	6	6	6.5	36.4	109	121	133	8	7.5	60.0	73.0	5	12	5	7.5	0
34 FT	29	30	10	8	7	6	6	7	41.9	53.0	53.0	53.0	7	12	61.0	72.0	7	12	41.0	44.0	8	7	6	6.5	36.4	110	122	134	8	7	60.0	73.0	5	12	5	7	0
36 FT	30	32	11	8	7	6	6	7	42.9	54.0	54.0	54.0	7	12	61.0	72.0	7	12	41.0	43.0	7	6	5	6.5	36.3	112	124	136	8	7	60.0	73.0	5	12	5	7.5	0
38 FT	31	33	11	8	8	7.5	6	6.5	42.9	55.0	55.0	55.0	8	15	68.0	79.0	8	15	48.0	51.0	8	7.5	6	6.5	37.0	113	125	137	8	6.5	60.0	73.0	5	12	5	7	0
40 FT	32	34	11	8	8	7.5	6	6.5	42.9	56.0	56.0	56.0	8	14	68.0	79.0	8	14	48.0	50.0	8	7.5	6	6	37.1	114	126	138	8	6.5	60.0	73.0	5	12	5	6	0
42 FT	33	35	12	8	8	7	6	7	43.8	57.0	57.0	57.0	8	14	68.0	78.0	8	14	47.0	49.0	8	7	6	6.5	37.6	115	127	139	8	6.5	60.0	73.0	5	12	5	7	0
44 FT	34	36	12	8	8	7	6	6.5	43.8	58.0	58.0	58.0	8	14	68.0	78.0	8	14	47.0	48.0	8	7	6	6.5	37.8	116	128	140	8	6	60.0	73.0	5	12	5	6.5	0
46 FT	35	37	12	8	8	6.5	6	6.5	42.9	59.0	59.0	59.0	8	13	67.0	77.0	8	13	46.0	47.0	8	7	6	6.5	37.0	117	129	141	8	6	60.0	73.0	5	12	5	6.5	0
48 FT	36	38	12	8	8	6.5	6	6.5	43.0	60.0	60.0	60.0	8	13	67.0	76.0	8	13	46.0	47.0	8	7	6	6	37.1	118	130	142	8	6	60.0	73.0	5	12	5	6	0
50 FT	37	39	12	8	8	6.5	6	6	43.1	61.0	61.0	61.0	8	13	67.0	75.0	8	13	46.0	47.0	8	7	6	6	37.4	119	131	143	8	6	60.0	73.0	5	12	5	6	0

		SPAN (S) = 14 FT										HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT																									
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS										BOTTOM SLAB BARS										WALL BARS															
		A1 BARS		J3 BARS				H1 BARS				H2 BARS				A2 BARS		J4 BARS				H3 BARS		B1 BARS	B2 BARS												
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=10'	HT=11'	HT=12'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	HT=10'	HT=11'	HT=12'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	14	10	9	10	6	8.5	5	7	70.3	34.0	34.0	34.0	5	12	134.5	99.5	5	12	39.0	43.0	5	7	6	6	80.1	126	138	150	6	6	60.0	63.0	5	10.5	5	9	12
2 FT	15	11	9	10	6	8	5	7	70.3	35.0	35.0	35.0	6	16	138.5	106.5	6	16	45.0	48.0	5	6.5	6	6	73.6	127	139	151	6	6.5	59.0	62.0	5	12	5	9	12
4 FT	11	11	11	10	6	7	5	6	66.6	31.0	31.0	31.0	6	13	81.0	94.0	6	13	39.0	40.0	5	6.5	5	6	61.8	127	139	151	7	7	61.0	65.0	5	9.5	5	10	12
6 FT	12	12	11	10	6	8	5	6.5	60.6	32.0	32.0	32.0	6	13	67.0	75.0	6	13	37.0	39.0	5	6	5	6	57.3	128	140	152	7	7	59.0	65.0	5	12	5	10.5	12
8 FT	12	13	11	10	6	8	5	6	56.3	32.0	32.0	32.0	6	12	62.0	67.0	6	12	36.0	37.0	5	6	6	7	57.4	129	141	153	7	6.5	57.0	65.0	5	12	5	10	0
10 FT	13	14	11	10	6	7.5	6	8	56.3	33.0	33.0	33.0	6	12	59.0	65.0	6	12	35.0	37.0	6	7.5	6	7	55.0	130	142	154	7	6.5	57.0	65.0	5	12	5	9.5	0
12 FT	14	16	12	10	6	7.5	6	8	54.9	34.0	34.0	34.0	7	15	61.0	67.0	7	15	38.0	39.0	6	7	5	6	50.9	132	144	156	7	7	56.0	66.0	5	12	5	9.5	0
14 FT	16	17	12	10	6	7.5	6	8	53.3	36.0	36.0	36.0	6	12	62.0	70.0	6	12	41.0	43.0	6	7	5	6	49.9	133	145	157	7	7	56.0	66.0	5	12	5	9	0
16 FT	17	18	12	10	6	7	6	7.5	58.1	37.0	37.0	41.0	7	16	66.0	74.0	7	16	45.0	48.0	6	6.5	6	8	52.0	134	146	158	7	7	56.0	66.0	5	12	5	8	0
18 FT	18	20	12	10	6	7	6	7	57.5	38.0	38.0	42.0	7	15	65.0	74.0	7	15	45.0	48.0	6	6	6	8	51.3	136	148	160	7	7	55.0	66.0	5	12	5	7.5	0
20 FT	19	21	12	10	6	6	6	6.5	56.6	39.0	39.0	43.0	7	14	64.0	74.0	7	14	45.0	48.0	7	8	6	7.5	50.6	137	149	161	7	7	55.0	66.0	5	12	5	7	0
22 FT	21	22	12	10	6	6	6	6.5	55.9	41.0	41.0	45.0	7	15	64.0	74.0	7	15	45.0	48.0	7	7	6	6.5	50.3	138	150	162	7	7	55.0	66.0	5	12	5	7	0
24 FT	22	24	13	10	6	6	6	6.5	56.4	42.0	42.0	46.0	7	14	63.0	73.0	7	14	44.0	48.0	7	7	6	7.5	50.4	140	152	164	7	7	55.0	67.0	5	12	5	6.5	0
26 FT	23	25	14	10	7	7	6	6.5	56.6	43.0	43.0																										

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

DESIGN FILL	SPAN (S) = 14 FT											HEIGHT (HT) = 13 FT OR 14 FT																							
	MEMBER THICKNESS			TOP SLAB BARS				BOTTOM SLAB BARS				WALL BARS																							
	TS	BS	TX	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS	B2 BARS																
				SIZE	SPA.	SIZE	SPA.	C1	K2 HT=13 HT=14	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	Q10	SIZE	SPA.	SIZE	SPA.	G1						
1 FT	14	10	11	11	5	6	5	6.5	71.8	34.0	34.0	5	12	135.5	100.5	5	12	39.0	42.0	5	7	6	6	87.3	162	174	6	6	60.0	62.0	5	12	5	7.5	12
2 FT	15	11	11	11	6	8	5	6.5	71.8	35.0	35.0	6	16	139.5	107.5	6	16	45.0	48.0	5	6.5	6	6.5	93.4	163	175	6	6	59.0	62.0	5	12	5	7.5	12
4 FT	11	11	11	11	6	6.5	6	7	88.0	31.0	35.0	6	13	86.0	92.0	6	13	40.0	40.0	5	6.5	6	6	76.4	163	175	7	6.5	62.0	65.0	5	10.5	5	7.5	12
6 FT	12	12	11	11	6	8	6	7.5	74.5	32.0	36.0	6	13	89.0	75.0	6	13	39.0	39.0	5	6	6	6	71.3	164	176	7	6.5	60.0	65.0	5	12	5	7.5	12
8 FT	12	13	11	11	6	8	6	7	68.5	36.0	36.0	6	12	83.0	67.0	6	12	36.0	37.0	6	6	6	6.5	68.8	165	177	7	6.5	58.0	65.0	5	12	5	7.5	0
10 FT	13	15	11	11	6	7.5	6	6.5	66.0	37.0	37.0	6	12	60.0	65.0	6	12	36.0	37.0	6	7.5	6	6	67.4	167	179	6	6	55.0	63.0	5	12	5	7.5	0
12 FT	14	16	12	11	6	7.5	6	6.5	64.0	38.0	38.0	7	16	61.0	67.0	7	16	38.0	40.0	6	7	6	7	65.3	168	180	7	7	57.0	66.0	5	12	5	7	0
14 FT	16	17	13	11	6	7.5	6	7	69.1	40.0	40.0	6	12	63.0	69.0	6	12	41.0	43.0	6	7	6	6.5	63.6	169	181	7	7	57.0	65.0	5	12	5	6.5	0
16 FT	17	18	13	11	6	7	6	6.5	67.8	41.0	41.0	6	12	62.0	69.0	6	12	41.0	43.0	6	6	6	6.5	62.4	170	182	7	6.5	56.0	66.0	5	12	5	6.5	0
18 FT	18	20	13	11	6	7	6	6	66.6	42.0	42.0	7	15	66.6	74.0	7	15	46.0	48.0	6	6	6	6	61.9	172	184	7	7	56.0	66.0	5	12	5	6.5	0
20 FT	19	21	14	11	6	6.5	6	6	66.3	43.0	43.0	7	15	65.0	73.0	7	15	45.0	48.0	7	8	6	6.5	61.0	173	185	7	7	56.0	66.0	5	12	5	6	0
22 FT	21	23	14	11	6	6	7	8	70.6	45.0	45.0	7	15	64.0	73.0	7	15	45.0	48.0	7	7	6	6	60.8	175	187	7	7	56.0	66.0	5	12	5	6	0
24 FT	22	24	15	11	6	6	7	8	70.5	46.0	46.0	7	15	64.0	73.0	7	15	45.0	48.0	7	7	6	6.5	60.3	176	188	7	7	56.0	66.0	5	12	6	8	0
26 FT	23	25	15	11	7	7.5	7	7.5	69.9	47.0	47.0	7	14	64.0	73.0	7	14	45.0	48.0	7	6.5	6	6	59.6	177	189	7	6.5	56.0	67.0	5	12	6	8	0
28 FT	25	27	16	11	7	7	7	7.5	70.3	48.0	49.0	7	14	63.0	72.0	7	14	44.0	47.0	7	6.5	6	6.5	59.9	179	191	7	6	56.0	67.0	5	12	6	8	0
30 FT	26	28	16	11	7	7	7	7	69.8	50.0	50.0	7	13	62.0	72.0	7	13	43.0	46.0	7	6	6	6	59.4	180	192	7	6	56.0	67.0	5	12	6	8	0
32 FT	27	30	17	11	7	6.5	7	7.5	70.1	51.0	51.0	7	13	62.0	72.0	7	13	43.0	46.0	7	6	6	6.5	59.5	182	194	8	7.5	62.0	73.0	5	12	6	7.5	0
34 FT	28	31	17	11	7	6	7	6.5	69.8	52.0	52.0	7	12	62.0	71.0	7	12	43.0	45.0	7	6	6	6.5	59.1	183	195	8	7	62.0	73.0	5	12	6	7.5	0
36 FT	29	32	18	11	7	6	7	7	70.3	53.0	53.0	7	12	62.0	71.0	7	12	42.0	45.0	8	7.5	6	6.5	59.3	184	196	8	7	62.0	73.0	5	12	6	7	0
38 FT	31	33	19	11	8	7.5	7	7.5	71.0	55.0	55.0	8	15	70.0	78.0	8	15	48.0	50.0	8	7.5	6	6.5	59.6	185	197	8	6.5	62.0	73.0	5	12	6	6.5	0
40 FT	31	34	19	11	8	7	7	6.5	70.9	55.0	55.0	8	14	70.0	78.0	8	14	49.0	51.0	8	7	6	6.5	59.5	186	198	8	6.5	62.0	73.0	5	12	6	6.5	0
42 FT	32	35	20	11	8	7	7	7	71.5	56.0	56.0	8	14	69.0	77.0	8	14	49.0	51.0	8	7	6	6	59.8	187	199	8	6.5	62.0	74.0	5	12	6	6.5	0
44 FT	33	36	20	11	8	7	7	6.5	71.5	57.0	57.0	8	14	69.0	77.0	8	14	48.0	50.0	8	7	6	6	59.9	188	200	8	6	62.0	74.0	5	12	6	6.5	0
46 FT	34	37	20	11	8	7	7	7	70.1	58.0	58.0	8	14	69.0	76.0	8	14	47.0	49.0	8	7	6	6	58.5	189	201	8	6	62.0	74.0	5	12	6	6.5	0
48 FT	35	38	21	11	8	6.5	7	7	70.9	59.0	59.0	8	13	68.0	75.0	8	13	47.0	48.0	8	7	6	6	59.0	190	202	8	6	62.0	74.0	5	12	6	6	0
50 FT	36	39	21	11	8	6.5	7	6.5	70.9	60.0	60.0	8	13	68.0	75.0	8	13	47.0	48.0	8	6.5	6	6	59.1	191	203	8	6	62.0	74.0	5	12	6	6	0

DESIGN FILL	SPAN (S) = 14 FT											HEIGHT (HT) = 15 FT OR 16 FT																							
	MEMBER THICKNESS			TOP SLAB BARS				BOTTOM SLAB BARS				WALL BARS																							
	TS	BS	TX	A1 BARS		J3 BARS		H1 BARS		H2 BARS		A2 BARS		J4 BARS		H3 BARS		B1 BARS	B2 BARS																
				SIZE	SPA.	SIZE	SPA.	C1	K2 HT=15 HT=16	SIZE	SPA.	C5	Q8	SIZE	SPA.	C6	Q9	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	Q10	SIZE	SPA.	SIZE	SPA.	G1						
1 FT	14	11	12	13	5	6	5	6	72.6	34.0	34.0	5	12	136.5	101.5	5	12	38.0	41.0	5	6.5	6	6	103.4	187	199	6	6.5	62.0	63.0	5	11.5	5	7	12
2 FT	15	12	12	13	6	8	6	8	75.6	35.0	39.0	6	16	143.5	108.5	6	16	45.0	48.0	5	6	6	6.5	99.0	188	200	6	6.5	61.0	63.0	5	12	5	7	12
4 FT	12	12	12	13	6	8	6	7.5	75.6	36.0	36.0	6	15	138.5	89.0	6	15	40.0	41.0	5	6	6	6	90.1	188	200	6	6	60.0	63.0	5	12	5	7	12
6 FT	12	13	12	13	6	8	6	7	89.3	36.0	36.0	6	14	69.0	71.0	6	14	39.0	39.0	5	6	6	6	86.4	189	201	6	6	58.0	65.0	5	12	5	6.5	12
8 FT	12	14	13	13	6	8	6	6.5	78.1	36.0	36.0	6	12	64.0	66.0	6	12	37.0	37.0	6	8	6	6	81.9	190	202	6	6	57.0	62.0	5	12	5	6.5	12
10 FT	13	15	13	13	6	6	6.5	75.1	37.0	37.0	6	12	61.0	64.0	6	12	37.0	37.0	6	7.5	6	6.5	79.1	191	205	7	7	57.0	65.0	5	12	5	6.5	0	
12 FT	14	16	14	13	6	7.5	6	6.5	72.9	38.0	38.0	6	12	59.0	63.0	6	12	36.0	37.0	6	7	6	6.5	75.6	192	204	7	7	58.0	65.0	5	12	5	6.5	0
14 FT	15	17	15	13	6	7.5	6	6.5	77.6	39.0	39.0	7	16	69.0	73.0	7	16	47.0	48.0	6	7	6	6.5	73.6	193	205	7	7	58.0	65.0	5	12	6	8	0
16 FT	17	19	15	13	6	7.5	6	6	77.6	41.0	41.0	6	12	63.0	68.0	6	12	42.0	44.0	6	6	6	6	73.5	195	207	6	6	55.0	63.0	5	12	6	8	0
18 FT	18	20	15	13	6	7	7	7.5	81.8	42.0	48.0	7	16	67.0	73.0	7	16	46.0	49.0	6	6	7	7	75.6	196	208	7	7	57.0	66.0	5	12	6	8	0
20 FT	19	21	16	13	6	6.5	7	7.5	81.1	43.0	49.0	7	15	66.0	73.0	7	15	46.0	49.0	7	7.5	7	7.5	74.8	197	209	7	7	57.0	66.0	5	12	6	8	0
22 FT	20	23	17	13	6	6	7	7.5	80.8	44.0	50.0	7	15	65.0	73.0	7	15	46.0	49.0	7	7	7	7.5	74.6	199	211	7	7	57.0	66.0	5	12	6	7.5	0
24 FT	22	24	17	13	6	6	7	7	80.8	46.0	52.0	7	15	65.0	73.0	7	15	46.0	49.0	7	7	7	7	74.1	200	212	7	7	57.0	66.0	5	12	6	7.5	0
26 FT	23	25	18	13	7	7.5	7	7	80.5	47.0	53.0	7	15	65.0	72.0	7	15	46.0	49.0	7	6	7	7.5	73.6	201	213	7	6	57.0	67.0	5	12	6	7	0
28 FT	24	27	19	13	7	7.5	7	7	80.5	48.0	54.0	7	14	64.0	72.0	7	14	45.0	48.0	7	6.5	7	8	73.8	203	215	7	6	57.0	67.0	5	12	6	6.5	0
30 FT	25	28	20	13	7	6.5	7	7	80.6	49.0	55.0	7	13	64.0	72.0	7	13	45.0	48.0	7	6	7	8	73.5	204	216	7	6	57.0						

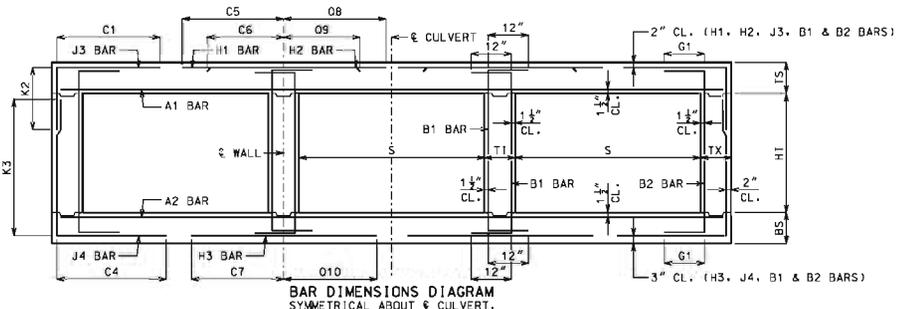
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 15 FT												HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT																								
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS												
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS														
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	SIZE	SPA.	C4	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	
1 FT	15	10	8	8	6	8	5	8	72.9	35.0	35.0	35.0	6	16	146.5	111.5	6	16	48.0	53.0	5	7	7	6.5	69.0	102	114	126	6	6	61.0	65.0	5	12	5	12	12	
2 FT	15	11	9	8	6	7.5	5	8	73.5	35.0	35.0	35.0	6	16	146.5	111.5	6	16	49.0	53.0	5	6.5	6	6	7	60.4	103	115	127	6	6	59.0	65.0	5	12	5	12	12
4 FT	12	11	9	8	6	6.5	6	7	60.8	32.0	36.0	36.0	6	12	84.0	109.0	6	12	40.0	43.0	5	6	6	6.5	53.9	103	115	127	7	6.5	61.0	68.0	5	11.5	5	12	12	
6 FT	12	12	9	8	6	7	6	6.5	59.4	32.0	36.0	36.0	7	16	72.0	86.0	7	16	41.0	43.0	6	8	6	7	49.9	104	116	128	7	6.5	60.0	68.0	5	12	5	12	12	
8 FT	13	14	9	8	6	7	6	7	49.5	33.0	33.0	33.0	7	15	67.0	77.0	7	15	39.0	42.0	6	8	5	6.5	43.4	106	118	130	7	7	58.0	69.0	5	12	5	12	0	
10 FT	14	15	9	8	6	7	6	7.5	46.6	34.0	34.0	34.0	7	15	64.0	73.0	7	15	39.0	41.0	6	7.5	5	6.5	41.5	107	119	131	7	6.5	58.0	69.0	5	12	5	12	0	
12 FT	15	16	9	8	6	6	6	7.5	50.4	35.0	35.0	35.0	7	14	70.0	80.0	7	14	46.0	49.0	6	6	5	6	40.0	108	120	132	7	6.5	57.0	69.0	5	12	5	11.5	0	
14 FT	17	18	9	8	6	6.5	6	7.5	48.4	37.0	37.0	37.0	7	15	68.0	79.0	7	15	46.0	49.0	6	6.5	5	6	38.9	110	122	134	7	6.5	57.0	69.0	5	12	5	9.5	0	
16 FT	18	19	9	8	6	6.5	6	7.5	47.1	38.0	38.0	42.0	7	14	67.0	79.0	7	14	45.0	49.0	6	6	6	8.5	41.0	111	123	135	7	6.5	57.0	69.0	5	12	5	8.5	0	
18 FT	19	21	10	8	6	6	6	7.5	47.8	39.0	39.0	39.0	7	14	66.0	78.0	7	14	45.0	49.0	7	8	5	6.5	37.9	113	125	137	7	6.5	57.0	70.0	5	12	5	9.5	0	
20 FT	21	22	10	8	6	6	6	7.5	46.6	41.0	41.0	41.0	7	14	66.0	78.0	7	14	45.0	49.0	7	7.5	5	6	37.5	114	126	138	7	6.5	56.0	70.0	5	12	5	8	0	
22 FT	23	24	10	8	6	7.5	6	7.5	46.0	43.0	43.0	43.0	7	14	65.0	77.0	7	14	45.0	49.0	7	7	5	6	37.3	116	128	140	7	6.5	56.0	70.0	5	12	5	8	0	
24 FT	24	25	11	8	6	7.5	6	8	46.5	44.0	44.0	44.0	7	13	64.0	77.0	7	13	45.0	49.0	7	6.5	5	6.5	37.5	117	129	141	7	6.5	56.0	70.0	5	12	5	7.5	0	
26 FT	25	27	11	8	7	7	6	7.5	46.4	45.0	45.0	45.0	7	13	64.0	77.0	7	13	44.0	48.0	7	6.5	5	6	37.1	119	131	143	7	6	56.0	70.0	5	12	5	7.5	0	
28 FT	27	28	11	8	7	6.5	6	7.5	45.8	47.0	47.0	47.0	7	13	64.0	76.0	7	13	44.0	48.0	7	6	5	6	37.1	120	132	144	7	6	56.0	70.0	5	12	5	7.5	0	
30 FT	28	30	12	8	7	6.5	6	7.5	46.8	52.0	52.0	52.0	7	12	63.0	76.0	7	12	43.0	47.0	8	7.5	6	8	40.4	122	134	146	8	7.5	62.0	76.0	5	12	5	7	0	
32 FT	30	31	12	8	7	6	6	7.5	46.3	54.0	54.0	54.0	7	12	63.0	75.0	7	12	42.0	45.0	8	7.5	6	7.5	40.5	123	135	147	8	7	62.0	76.0	5	12	5	7	0	
34 FT	31	32	12	8	8	7.5	6	7.5	46.1	55.0	55.0	55.0	8	15	71.0	83.0	8	15	50.0	53.0	8	6.5	6	7.5	40.3	124	136	148	8	6.5	62.0	76.0	5	12	5	7	0	
36 FT	32	34	12	8	8	7.5	6	7	46.1	56.0	56.0	56.0	8	14	71.0	82.0	8	14	49.0	52.0	8	7	6	7	40.3	126	138	150	8	6.5	62.0	76.0	5	12	5	7	0	
38 FT	33	35	13	8	8	7	6	7	47.0	57.0	57.0	57.0	8	14	71.0	82.0	8	14	49.0	51.0	8	7	6	6.5	40.8	127	139	151	8	6.5	62.0	76.0	5	12	5	6.5	0	
40 FT	34	36	13	8	8	7	6	6.5	46.9	58.0	58.0	58.0	8	14	70.0	81.0	8	14	49.0	51.0	8	6.5	6	6.5	40.8	128	140	152	8	6	62.0	76.0	5	12	5	6.5	0	
42 FT	35	37	13	8	8	6.5	6	6.5	46.9	59.0	59.0	59.0	8	13	70.0	81.0	8	13	48.0	50.0	8	6	6	6.5	40.9	129	141	153	8	6	62.0	76.0	5	12	5	6.5	0	
44 FT	36	38	13	8	8	6.5	6	6.5	46.9	60.0	60.0	60.0	8	13	70.0	80.0	8	13	48.0	49.0	8	6	6	6	41.0	130	142	154	8	6	62.0	76.0	5	12	5	6	0	
46 FT	37	39	13	8	8	6.5	6	6	46.9	61.0	61.0	61.0	8	12	70.0	79.0	8	12	47.0	49.0	8	6	6	6	41.1	131	143	155	8	6	62.0	76.0	5	12	6	8	0	
48 FT	38	41	13	8	8	6	6	6	46.1	62.0	62.0	62.0	8	12	69.0	78.0	8	12	46.0	48.0	8	6.5	7	7	43.3	133	145	157	9	7.5	68.0	82.0	5	12	6	8	0	
50 FT	39	42	14	8	8	6	6	6	47.1	63.0	63.0	63.0	8	12	69.0	77.0	8	12	46.0	47.0	8	6.5	7	7.5	43.9	134	146	158	9	7	68.0	82.0	5	12	5	6	0	

		SPAN (S) = 15 FT												HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS													
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=11'	HT=12'	HT=13'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	SIZE	SPA.	C4	HT=11'	HT=12'	HT=13'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.
1 FT	15	11	9	10	6	8	5	6.5	73.9	35.0	35.0	35.0	6	16	147.5	112.5	6	16	48.0	52.0	5	6.5	6	6	89.3	139	151	163	6	6.5	63.0	67.0	5	12	5	8.5	12
2 FT	15	11	10	10	6	7.5	5	6.5	74.5	35.0	35.0	35.0	6	16	147.5	112.5	6	16	49.0	53.0	5	6.5	6	6	77.1	139	151	163	6	6	61.0	65.0	5	12	5	8	12
4 FT	12	12	10	10	6	7	6	7.5	77.5	32.0	36.0	36.0	6	13	89.0	107.0	6	13	41.0	43.0	5	6	6	6.5	71.3	140	152	164	6	6	60.0	67.0	5	10	5	8	12
6 FT	12	12	10	10	6	7	6	7	67.9	32.0	36.0	36.0	7	16	74.0	83.0	7	16	41.0	43.0	6	8	6	6	65.1	140	152	164	7	6	61.0	68.0	5	12	5	8	12
8 FT	13	14	10	10	6	7.5	6	6.5	63.0	33.0	37.0	37.0	7	16	69.0	75.0	7	16	40.0	42.0	6	7.5	6	6	62.3	142	154	166	7	6.5	60.0	69.0	5	12	5	8	0
10 FT	14	15	10	10	6	7	6	6.5	59.4	34.0	38.0	38.0	7	15	66.0	72.0	7	15	40.0	42.0	6	7	6	7	62.4	143	155	167	7	6.5	59.0	69.0	5	12	5	8	0
12 FT	15	17	11	10	6	7	6	6.5	63.5	35.0	35.0	39.0	7	14	71.0	79.0	7	14	47.0	49.0	6	7	6	7	57.5	145	157	169	7	7	59.0	69.0	5	12	5	7.5	0
14 FT	17	18	12	10	6	7	6	6.5	62.4	37.0	41.0	41.0	7	15	70.0	78.0	7	15	47.0	49.0	6	6.5	6	7	56.4	146	158	170	7	6.5	58.0	69.0	5	12	5	7	0
16 FT	18	19	12	10	6	6.5	6	6.5	61.1	38.0	42.0	42.0	7	14	68.0	78.0	7	14	46.0	49.0	6	6	6	7	55.4	147	159	171	7	6.5	58.0	69.0	5	12	5	7	0
18 FT	19	21	12	10	6	6	6	6	60.4	39.0	43.0	43.0	7	14	68.0	77.0	7	14	46.0	49.0	7	8	6	6	54.6	149	161	173	7	6.5	58.0	70.0	5	12	5	7	0
20 FT	21	22	13	10	6	6	6	6	60.3	41.0	45.0	45.0	7	14	67.0	77.0	7	14	46.0	49.0	7	7	6	6.5	54.5	150	162	174	7	6.5	58.0	70.0	5	12	5	6.5	0
22 FT	22	24	13	10	6	6	6	6	59.6	42.0	46.0	46.0	7	14	66.0	77.0	7	14	46.0	49.0	7	7	6	6.5	54.0	152	164	176	7	6.5	58.0	70.0	5	12	5	6.5	0
24 FT	24	25	14	10	7	7.5	6	6	59.8	44.0	48.0	48.0	7	14	66.0	77.0	7	14	45.0	49.0	7	6.5	6	7	54.1	153	165	177	7	6.5	58.0	70.0	5	12	5	6	0
26 FT	25	27	14</																																		

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

DESIGN FILL	SPAN (S) = 15 FT											HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT																									
	TOP SLAB BARS											BOTTOM SLAB BARS																									
	MEMBER THICKNESS				A1 BARS				J3 BARS			H1 BARS				H2 BARS			A2 BARS				J4 BARS			H3 BARS				WALL BARS							
	TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=14 HT=15 HT=16			SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	K3 HT=14 HT=15 HT=16			SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1		
1 FT	15	11	12	13	6	8	6	8	79.3	35.0	35.0	39.0	6	16	152.5	114.5	6	16	48.0	51.0	5	6.5	6	6	99.0	175	187	199	6	6	64.0	65.0	5	11.5	5	7	12
2 FT	15	12	12	13	6	8	6	8	79.3	35.0	35.0	39.0	6	16	152.5	114.5	6	16	49.0	52.0	5	6	6	6.5	95.5	176	188	200	6	6	63.0	66.0	5	11.5	5	7	12
4 FT	12	12	12	13	6	7	6	7	111.5	36.0	36.0	36.0	6	13	99.0	91.0	6	13	41.0	42.0	5	6	6	6	88.6	176	188	200	7	6.5	65.0	69.0	5	9.5	5	7	12
6 FT	12	13	12	13	6	7.5	6	6.5	85.6	36.0	36.0	36.0	6	12	71.0	75.0	6	12	40.0	40.0	6	8	6	6	84.0	177	189	201	7	6.5	64.0	69.0	5	12	5	6.5	12
8 FT	13	14	13	13	6	7.5	6	7	77.4	37.0	37.0	37.0	6	12	67.0	70.0	6	12	38.0	39.0	6	7.5	6	6	78.1	178	190	202	7	6.5	62.0	68.0	5	12	5	6.5	12
10 FT	14	16	13	13	6	7.5	6	6	75.0	38.0	38.0	38.0	7	15	67.0	71.0	7	15	41.0	42.0	6	7	6	6	77.0	180	192	204	7	7	61.0	69.0	5	12	5	6.5	12
12 FT	15	17	14	13	6	7	6	6	78.9	39.0	39.0	39.0	7	15	73.0	78.0	7	15	48.0	50.0	6	7	6	6.5	74.8	181	193	205	7	6.5	60.0	69.0	5	12	5	6	12
14 FT	16	18	15	13	6	7	6	6	77.5	40.0	40.0	40.0	7	14	71.0	77.0	7	14	48.0	49.0	6	6.5	6	6.5	73.0	182	194	206	7	6.5	60.0	69.0	5	12	6	8	12
16 FT	18	20	15	13	6	7	7	8	81.9	42.0	42.0	42.0	7	15	70.0	77.0	7	15	48.0	50.0	6	6	6	6	72.4	184	196	208	7	7	60.0	69.0	5	12	6	8	12
18 FT	19	21	15	13	6	6.5	7	7	80.8	43.0	43.0	49.0	7	14	69.0	77.0	7	14	48.0	50.0	7	8	7	7	74.4	185	197	209	7	6.5	60.0	69.0	5	12	6	8	12
20 FT	20	23	16	13	6	6	7	7	80.3	44.0	44.0	50.0	7	14	69.0	76.0	7	14	47.0	50.0	7	7	7	7	74.0	187	199	211	7	7	59.0	70.0	5	12	6	8	12
22 FT	22	24	17	13	6	6	7	7.5	80.1	46.0	46.0	52.0	7	14	68.0	76.0	7	14	47.0	50.0	7	7	7	7	75.0	188	200	212	7	6.5	59.0	70.0	5	12	6	7.5	12
24 FT	23	25	17	13	7	7.5	7	7	79.4	47.0	47.0	53.0	7	14	67.0	76.0	7	14	47.0	50.0	7	6	7	7	72.5	189	201	213	7	6	59.0	70.0	5	12	6	7.5	12
26 FT	25	27	18	13	7	7	7	7	79.6	49.0	49.0	55.0	7	14	67.0	76.0	7	14	47.0	50.0	7	6.5	7	7	72.5	191	203	215	7	6	59.0	70.0	5	12	6	7	12
28 FT	26	29	19	13	7	7	7	7	79.6	50.0	50.0	50.0	7	13	66.0	76.0	7	13	46.0	50.0	7	6	6	6	69.5	193	205	217	8	7.5	65.0	76.0	5	12	6	6.5	12
30 FT	27	30	19	13	7	6.5	7	6.5	79.3	51.0	51.0	57.0	7	13	66.0	76.0	7	13	46.0	49.0	8	7.5	7	7	75.0	194	206	218	8	7.5	65.0	77.0	5	12	6	6.5	12
32 FT	29	31	20	13	7	6	7	7	79.5	53.0	53.0	59.0	7	12	65.0	75.0	7	12	44.0	47.0	8	7	7	7	71.9	195	207	219	8	7	65.0	77.0	5	12	6	6.5	12
34 FT	30	33	21	13	7	6	7	7	79.9	54.0	54.0	54.0	7	12	65.0	75.0	7	12	44.0	47.0	8	7	6	6	69.0	197	209	221	8	6.5	65.0	77.0	5	12	6	6	12
36 FT	31	34	22	13	8	7.5	7	6.5	80.1	55.0	61.0	61.0	8	15	73.0	82.0	8	15	52.0	55.0	8	7	7	7	71.9	198	210	222	8	6.5	65.0	77.0	5	12	6	6	12
38 FT	32	35	22	13	8	7	7	7	79.8	56.0	62.0	62.0	8	14	73.0	82.0	8	14	52.0	54.0	8	6.5	7	7	71.6	199	211	223	8	6.5	65.0	77.0	5	12	6	6	12
40 FT	33	36	23	13	8	6.5	7	6.5	80.4	57.0	63.0	63.0	8	13	73.0	82.0	8	13	51.0	54.0	8	6	7	7	71.8	200	212	224	8	6	65.0	77.0	5	12	7	7.5	12
42 FT	34	38	24	13	8	6.5	7	6.5	81.1	58.0	64.0	64.0	8	13	72.0	81.0	8	13	51.0	53.0	8	6.5	7	7	72.4	202	214	226	8	6	65.0	78.0	5	12	7	7.5	12
44 FT	35	39	25	13	8	6.5	7	6.5	81.9	59.0	65.0	65.0	8	13	72.0	81.0	8	13	50.0	52.0	8	6.5	7	7	72.5	203	215	227	8	6	65.0	78.0	5	12	7	7.5	12
46 FT	36	40	26	13	8	6.5	7	6.5	82.5	60.0	66.0	66.0	8	13	72.0	80.0	8	13	50.0	52.0	8	6.5	7	7	72.9	204	216	228	9	7.5	71.0	84.0	5	12	7	8	12
48 FT	37	41	27	13	8	6.5	7	6	83.3	67.0	67.0	67.0	8	12	72.0	79.0	8	12	49.0	51.0	8	6.5	7	7	73.1	205	217	229	9	7	71.0	84.0	5	12	7	8	12
50 FT	38	42	27	13	8	6	7	6.5	81.8	68.0	68.0	68.0	8	12	71.0	79.0	8	12	49.0	50.0	8	6	7	7	71.4	206	218	230	9	7	71.0	84.0	5	12	6	6	12



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 15 FEET HEIGHT (HT): 14 THRU 16 FEET	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011	703.87 SHEET NO. 25 OF 27

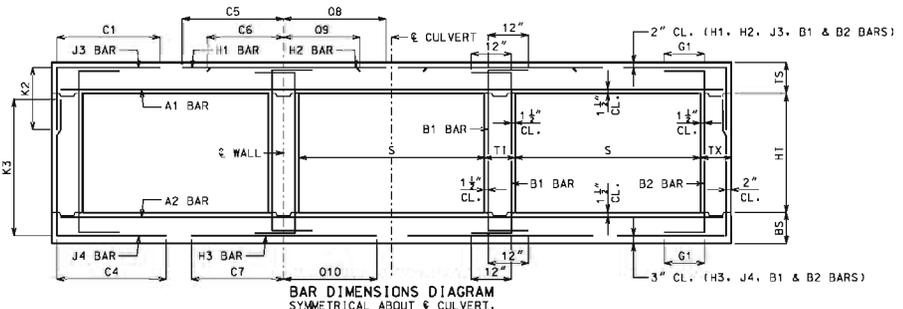
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

		SPAN (S) = 16 FT												HEIGHT (HT) = 8 FT OR 9 FT OR 10 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS													
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	HT=8'	HT=9'	HT=10'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	15	10	9	8	6	7.5	5	8	77.1	35.0	35.0	35.0	6	16	154.5	117.5	6	16	52.0	57.0	5	7	6	6	64.6	102	114	126	7	6.5	66.0	71.0	5	12	5	12	12
2 FT	16	11	9	8	6	7	5	8	77.1	36.0	36.0	36.0	6	14	154.5	117.5	6	14	48.0	53.0	5	6.5	6	6.5	59.3	103	115	127	7	7	65.0	71.0	5	12	5	12	12
4 FT	13	11	9	8	6	6.5	5	6	55.9	33.0	33.0	33.0	6	12	87.0	115.0	6	12	42.0	45.0	6	6	6	6	54.0	103	115	127	7	6	64.0	71.0	5	12	5	12	12
6 FT	12	12	10	8	6	7	5	6	51.4	33.0	33.0	33.0	7	15	75.0	91.0	7	15	45.0	45.0	6	7	6	6.5	51.4	104	116	128	7	6	62.0	70.0	5	12	5	12	12
8 FT	14	14	10	8	6	7	5	6	47.3	34.0	34.0	34.0	7	15	70.0	81.0	7	15	41.0	43.0	6	7.5	5	6.5	44.5	106	118	130	7	6	61.0	71.0	5	12	5	12	0
10 FT	15	16	10	8	6	6.5	6	8	53.6	35.0	35.0	35.0	7	14	75.0	85.0	7	14	48.0	51.0	6	7	5	7	41.6	108	120	132	7	6.5	60.0	72.0	5	12	5	12	0
12 FT	16	17	10	8	6	6.5	6	8	51.3	36.0	36.0	36.0	7	13	73.0	83.0	7	13	47.0	50.0	6	6.5	5	6.5	40.1	109	121	133	7	6	60.0	72.0	5	12	5	12	0
14 FT	18	19	10	8	6	6	6	8	49.0	38.0	38.0	38.0	7	14	71.0	83.0	7	14	47.0	50.0	6	6	5	6.5	38.8	111	123	135	7	6.5	59.0	73.0	5	12	5	12	0
16 FT	19	20	10	8	6	6	6	7.5	47.6	39.0	39.0	39.0	7	13	69.0	82.0	7	13	46.0	50.0	6	6	5	6.5	37.8	112	124	136	7	6	59.0	73.0	5	12	5	11	0
18 FT	20	22	10	8	7	7	6	7.5	46.9	40.0	40.0	40.0	7	13	69.0	81.0	7	13	46.0	50.0	7	7.5	5	6.5	36.8	114	126	138	7	6.5	59.0	73.0	5	12	5	9.5	0
20 FT	22	23	10	8	7	7.5	6	7.5	45.6	42.0	42.0	42.0	7	13	68.0	81.0	7	13	46.0	50.0	7	6.5	5	6	36.5	115	127	139	7	6	59.0	73.0	5	12	5	8	0
22 FT	24	25	10	8	7	7.5	6	7.5	45.0	44.0	44.0	44.0	7	13	67.0	81.0	7	13	46.0	50.0	7	6.5	5	6	36.3	117	129	141	7	6.5	59.0	73.0	5	12	5	8	0
24 FT	25	27	11	8	7	7	6	7.5	45.9	45.0	45.0	45.0	7	12	67.0	80.0	7	12	46.0	50.0	7	6.5	5	6	36.4	119	131	143	7	6	59.0	73.0	5	12	5	7.5	0
26 FT	27	28	11	8	7	6.5	6	7.5	45.1	47.0	47.0	47.0	7	12	66.0	80.0	7	12	45.0	50.0	7	6	5	6	36.4	120	132	144	7	6	59.0	73.0	5	12	5	7.5	0
28 FT	28	30	11	8	7	6	6	7	45.0	52.0	52.0	52.0	7	12	66.0	80.0	7	12	45.0	50.0	8	7.5	6	7	39.0	122	134	146	8	7.5	65.0	79.0	5	12	5	7.5	0
30 FT	30	31	11	8	7	6	6	6.5	44.6	54.0	54.0	54.0	7	12	66.0	79.0	7	12	44.0	48.0	8	7	6	7	39.0	123	135	147	8	7	65.0	79.0	5	12	5	7.5	0
32 FT	31	33	12	8	8	7.5	6	7.5	45.5	55.0	55.0	55.0	8	15	74.0	87.0	8	15	52.0	56.0	8	7	6	7	39.4	125	137	149	8	6.5	65.0	80.0	5	12	5	7	0
34 FT	33	34	12	8	8	7	6	7	45.3	57.0	57.0	57.0	8	14	73.0	86.0	8	14	51.0	54.0	8	6.5	6	7	39.5	126	138	150	8	6.5	65.0	80.0	5	12	5	7	0
36 FT	34	36	12	8	8	7	6	6.5	45.3	58.0	58.0	58.0	8	14	73.0	85.0	8	14	50.0	53.0	8	6.5	6	6.5	39.4	128	140	152	8	6	65.0	80.0	5	12	5	6.5	0
38 FT	35	37	12	8	8	6.5	6	6.5	45.3	59.0	59.0	59.0	8	13	73.0	85.0	8	13	50.0	53.0	8	6.5	6	6.5	39.4	129	141	153	8	6	65.0	80.0	5	12	5	6	0
40 FT	36	39	13	8	8	6	6	6.5	46.1	60.0	60.0	60.0	8	12	73.0	84.0	8	12	50.0	52.0	8	6.5	6	6	39.9	131	143	155	8	6	65.0	80.0	5	12	5	6.5	0
42 FT	38	40	13	8	8	6	6	6	46.0	62.0	62.0	62.0	8	12	72.0	83.0	8	12	48.0	50.0	8	6.5	6	6	40.1	132	144	156	9	7	71.0	86.0	5	12	5	6	0
44 FT	39	41	13	8	8	6	6	6	46.0	63.0	63.0	63.0	8	12	72.0	82.0	8	12	48.0	49.0	8	6	7	7	43.3	133	145	157	9	7	71.0	86.0	5	12	6	8	0
46 FT	40	42	13	8	8	6	7	7	51.1	70.0	70.0	70.0	8	12	72.0	82.0	8	12	47.0	48.0	8	6	7	7	43.4	134	146	158	9	7	71.0	86.0	5	12	6	7.5	0
48 FT	41	43	13	8	9	7.5	7	7	51.1	71.0	71.0	71.0	9	15	79.0	89.0	9	15	55.0	56.0	8	6	7	6.5	43.5	135	147	159	9	7	70.0	86.0	5	12	6	7.5	0
50 FT	42	45	13	8	9	7	7	6	51.4	72.0	72.0	72.0	9	15	79.0	88.0	9	15	55.0	56.0	8	6	7	6.5	43.8	137	149	161	9	7	70.0	86.0	5	10.5	6	7	0

		SPAN (S) = 16 FT												HEIGHT (HT) = 11 FT OR 12 FT OR 13 FT																							
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS												BOTTOM SLAB BARS												WALL BARS											
		A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			B1 BARS	B2 BARS													
		TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=11'	HT=12'	HT=13'	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	C4	HT=11'	HT=12'	HT=13'	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	G1	
1 FT	15	11	9	10	6	7.5	5	6	77.5	35.0	35.0	35.0	6	16	155.5	118.5	6	16	52.0	57.0	5	6.5	6	6	87.6	139	151	163	6	6	65.0	69.0	5	12	5	8.5	12
2 FT	16	12	9	10	6	7	5	6	77.5	36.0	36.0	36.0	6	14	155.5	118.5	6	14	49.0	54.0	5	6	6	6	79.0	140	152	164	6	6	64.0	69.0	5	12	5	8.5	12
4 FT	13	12	10	10	6	6.5	6	7	76.3	37.0	37.0	37.0	6	12	91.0	115.0	6	12	42.0	45.0	5	6	6	6	69.6	140	152	164	7	6.5	65.0	72.0	5	10.5	5	8	12
6 FT	15	13	10	10	6	6.5	6	7	87.3	37.0	37.0	37.0	7	15	77.0	88.0	7	15	43.0	45.0	6	7.5	6	6.5	64.3	141	153	165	7	6	64.0	72.0	5	12	5	8	12
8 FT	14	14	10	10	6	7	6	6.5	81.5	38.0	38.0	38.0	7	15	71.0	79.0	7	15	41.0	44.0	6	7	6	6	60.3	142	154	166	7	6	62.0	72.0	5	12	5	8	0
10 FT	15	16	10	10	6	6.5	6	6	65.9	39.0	39.0	39.0	7	14	76.0	84.0	7	14	49.0	53.0	6	6.5	6	6	57.6	144	156	168	7	6.5	61.0	72.0	5	12	5	8	0
12 FT	16	18	11	10	6	6.5	6	6	62.9	36.0	40.0	40.0	7	14	74.0	83.0	7	14	48.0	51.0	6	6.5	6	6	56.4	146	158	170	7	6.5	61.0	73.0	5	12	5	7.5	0
14 FT	18	19	12	10	6	6.5	6	6.5	61.8	38.0	42.0	42.0	7	14	72.0	82.0	7	14	48.0	51.0	6	6	7	6	55.8	147	159	171	7	6.5	61.0	73.0	5	12	5	7	0
16 FT	19	21	12	10	6	6	6	6	60.8	39.0	43.0	43.0	7	13	71.0	81.0	7	13	47.0	51.0	7	8	6	7	54.6	149	161	173	7	6.5	60.0	73.0	5	12	5	7	0
18 FT	20	22	12	10	7	8	7	8	64.6	40.0	44.0	44.0	7	13	70.0	81.0	7	13	47.0	51.0	7	7.5	6	6	53.8	150	162	174	7	6.5	60.0	73.0	5	12	5	7	0
20 FT	22	24	13	10	7	8	6	6	59.6	42.0	46.0	46.0	7	13	69.0	81.0	7	13	47.0	51.0	7	7	6	7	53.6	152	164	176	7	6.5	60.0	73.0	5	12	5	6.5	0
22 FT	23	25	14	10	7	7	6	6	59.8	43.0	47.0	47.0	7	12	69.0	80.0	7	12	47.0	50.0	7	6.5	6	7	53.5	153	165	177	7	6.5	60.0	73.0	5	12	5	6.5	0
24 FT	25	27	14	10	7	7	6	6	59.1	45.0	49.0	49.0	7	13	68.0	80.0	7	13	46.0	50.0	7	6.5	6	7	53.3	155	167	179	7	6	60.0	74.0	5	12	5	6	0
26 FT	27	29	14	10	7	6.5	6	6	58.6	51.0</																											

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

DESIGN FILL	SPAN (S) = 16 FT												HEIGHT (HT) = 14 FT OR 15 FT OR 16 FT																								
	TOP SLAB BARS												BOTTOM SLAB BARS																								
	MEMBER THICKNESS			A1 BARS			J3 BARS			H1 BARS			H2 BARS			A2 BARS			J4 BARS			H3 BARS			WALL BARS												
	TS	BS	TX	TI	SIZE	SPA.	SIZE	SPA.	C1	HT=14	HT=15	HT=16	SIZE	SPA.	C5	O8	SIZE	SPA.	C6	O9	SIZE	SPA.	SIZE	SPA.	C4	HT=14	HT=15	HT=16	SIZE	SPA.	C7	O10	SIZE	SPA.	SIZE	SPA.	B1 BARS
1 FT	15	11	12	13	6	7.5	6	8	82.9	35.0	35.0	39.0	6	16	160.5	120.5	6	16	51.0	55.0	5	6.5	6	6	97.5	175	187	199	7	7	70.0	71.0	5	10.5	5	7	12
2 FT	16	12	12	13	6	7.5	6	8	82.9	36.0	36.0	40.0	6	15	160.5	120.5	6	15	49.0	52.0	5	6	6	6	93.3	176	188	200	7	7	69.0	71.0	5	12	5	7	12
4 FT	12	13	13	13	6	6.5	6	6.5	94.8	36.0	36.0	36.0	7	16	92.0	94.0	7	16	46.0	46.0	5	6	6	6.5	87.8	177	189	201	7	7	68.0	73.0	5	8.5	5	6.5	12
6 FT	15	13	13	13	6	7	6	7	82.5	37.0	37.0	37.0	7	16	77.0	81.0	7	16	44.0	45.0	6	7.5	6	6	79.3	177	189	201	7	6	66.0	71.0	5	12	5	6.5	12
8 FT	14	15	13	13	6	7	6	6.5	77.9	38.0	38.0	38.0	7	15	73.0	77.0	7	15	43.0	44.0	6	7.5	6	6.5	77.8	179	191	203	7	6.5	64.0	72.0	5	12	5	6.5	12
10 FT	15	16	13	13	6	7	6	6	80.9	39.0	39.0	39.0	7	15	78.0	83.0	7	15	50.0	51.0	6	6.5	6	6	75.3	180	192	204	7	6	63.0	72.0	5	12	5	6.5	12
12 FT	16	18	14	13	6	6.5	6	6	78.5	40.0	40.0	40.0	7	14	76.0	82.0	7	14	49.0	51.0	6	6.5	6	6	73.8	182	194	206	7	6.5	63.0	72.0	5	12	5	6	12
14 FT	17	19	14	13	6	6	7	7.5	81.6	41.0	41.0	47.0	7	13	74.0	81.0	7	13	49.0	51.0	6	6	7	7.5	75.0	183	195	207	7	6.5	62.0	72.0	5	12	5	6	12
16 FT	19	21	15	13	6	6.5	7	7.5	80.9	43.0	43.0	49.0	7	14	73.0	81.0	7	14	49.0	51.0	7	8	7	7.5	74.0	185	197	209	7	6.5	62.0	73.0	5	12	6	8	12
18 FT	20	22	16	13	6	6	7	7.5	80.0	44.0	44.0	50.0	7	13	72.0	80.0	7	13	49.0	51.0	7	7.5	7	7.5	72.9	186	198	210	7	6.5	62.0	73.0	5	12	6	8	12
20 FT	22	24	16	13	6	6	7	7	79.1	46.0	46.0	52.0	7	13	71.0	80.0	7	13	48.0	51.0	7	7	7	7.5	72.3	188	200	212	7	6.5	62.0	73.0	5	12	6	8	12
22 FT	23	25	17	13	7	7.5	7	7	78.8	47.0	47.0	53.0	7	13	70.0	80.0	7	13	48.0	51.0	7	6	7	8	71.5	189	201	213	7	6	62.0	73.0	5	12	6	7.5	12
24 FT	25	27	17	13	7	7	7	7	78.1	49.0	49.0	55.0	7	13	70.0	80.0	7	13	48.0	51.0	7	6.5	7	7	71.3	191	203	215	7	6	61.0	73.0	5	12	6	7.5	12
26 FT	26	29	18	13	7	7	7	7	78.1	50.0	50.0	56.0	7	12	69.0	79.0	7	12	48.0	51.0	7	6	7	8	71.0	193	205	217	8	7.5	67.0	80.0	5	12	6	7	12
28 FT	28	30	19	13	7	6.5	7	7	78.3	52.0	52.0	52.0	7	12	68.0	79.0	7	12	47.0	51.0	8	7.5	6	6	67.8	194	206	218	8	7.5	67.0	80.0	5	12	6	6.5	12
30 FT	29	32	19	13	7	6	7	6.5	77.9	53.0	53.0	59.0	7	12	68.0	79.0	7	12	47.0	51.0	8	7	7	7.5	70.5	196	208	220	8	7	67.0	80.0	5	12	6	6.5	12
32 FT	31	33	20	13	8	7.5	7	6.5	78.1	55.0	55.0	61.0	8	15	76.0	87.0	8	15	53.0	57.0	8	7	7	8	70.4	197	209	221	8	6.5	67.0	80.0	5	12	6	6.5	12
34 FT	32	34	20	13	8	7.5	7	6	77.6	56.0	56.0	62.0	8	14	75.0	86.0	8	14	53.0	56.0	8	6	7	7	70.0	198	210	222	8	6	67.0	80.0	5	12	6	6.5	12
36 FT	33	36	22	13	8	7	7	6.5	78.8	57.0	57.0	63.0	8	14	75.0	86.0	8	14	53.0	56.0	8	6.5	7	7.5	70.3	200	212	224	8	6	67.0	81.0	5	12	6	6	12
38 FT	34	37	23	13	8	6.5	7	6.5	79.1	58.0	58.0	64.0	8	13	75.0	85.0	8	13	53.0	56.0	8	6	7	7.5	70.3	201	213	225	8	6	67.0	81.0	5	12	6	6	12
40 FT	36	39	23	13	8	6.5	7	6.5	79.0	60.0	60.0	66.0	8	13	75.0	85.0	8	13	51.0	54.0	8	6.5	7	7.5	70.3	203	215	227	8	6	67.0	81.0	5	12	7	7.5	12
42 FT	37	40	23	13	8	6.5	7	6	78.9	61.0	61.0	67.0	8	12	74.0	84.0	8	12	51.0	53.0	8	6	7	7	70.3	204	216	228	9	7	73.0	87.0	5	12	7	7.5	12
44 FT	38	42	24	13	8	6	7	6	79.8	68.0	68.0	68.0	8	12	74.0	83.0	8	12	50.0	52.0	8	6	7	7	70.8	206	218	230	9	7	73.0	87.0	5	12	7	7.5	12
46 FT	39	43	26	13	8	6	7	6.5	81.4	69.0	69.0	69.0	8	12	74.0	83.0	8	12	50.0	52.0	8	6	7	7	71.3	207	219	231	9	7	73.0	87.0	5	12	7	7.5	12
48 FT	40	44	27	13	8	6	7	6	82.1	70.0	70.0	70.0	8	12	74.0	82.0	8	12	49.0	51.0	8	6	7	7	71.6	208	220	232	9	7	73.0	88.0	5	12	7	8	12
50 FT	41	45	28	13	9	7.5	7	6	83.0	71.0	71.0	71.0	9	15	82.0	89.0	9	15	57.0	58.0	8	6	7	7	72.0	209	221	233	9	6.5	73.0	88.0	5	12	7	8	12



GENERAL NOTES:
 IF DESIGN FILL IS BETWEEN TABULATED DESIGN FILLS, USE THE NEXT GREATER TABULATED DESIGN FILL, EXCEPT FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET. FOR DESIGN FILLS BETWEEN 2 FEET AND 4 FEET USE THE GREATER MEMBER THICKNESS, AREA OF REINFORCEMENT AND BAR DIMENSIONS FROM THE 2 FEET AND 4 FEET TABULATED DESIGN FILLS. AREA OF REINFORCEMENT EQUALS BAR AREA PER FOOT SPACING.

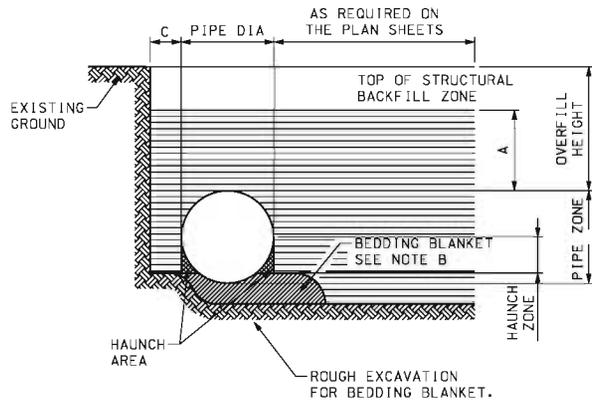
SPECIAL DESIGNS ARE REQUIRED WHEN THE DESIGN FILL IS LESS THAN 1 FOOT OR GREATER THAN 50 FEET.

DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

DESIGN FILLS ARE MEASURED FROM THE TOP OF TOP SLAB TO THE TOP OF EARTH FILL OR ROADWAY.

CULVERTS MEET STRENGTH AND SERVICEABILITY REQUIREMENTS FOR THE DESIGN VEHICULAR LIVE LOAD HL-93 MINUS THE LANE LOAD.

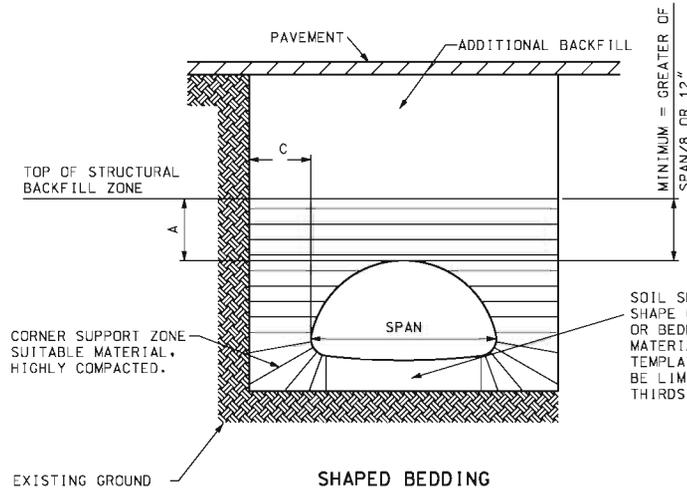
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	CONCRETE TRIPLE BOX CULVERT MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 16 FEET HEIGHT (HT): 14 THRU 16 FEET	
	DATE EFFECTIVE: 12/01/2011 DATE PREPARED: 9/29/2011	703.87 SHEET NO. 27 OF 27



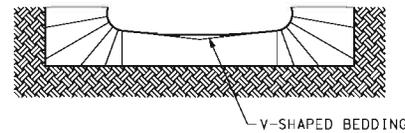
**TYPICAL TRENCH DETAIL
PIPE INSTALLATION AND BEDDING**

NOTE:

- A) MINIMUM STRUCTURAL BACKFILL OVER TOP OF PIPE SHALL BE ONE-EIGHTH DIAMETER OR SPAN OF PIPE OR ONE FOOT WHICHEVER IS GREATER.
 - B) BEDDING BLANKET OF LOOSE FILL SHALL BE ROUGHLY SHAPED TO FIT BOTTOM OF PIPE. MINIMUM THICKNESS BEFORE PLACING PIPE SHALL BE AS FOLLOWS:
- | DEPTH OF CORRUGATION | MIN. BEDDING THICKNESS |
|----------------------|------------------------|
| 1/2" | 1" |
| 1" | 2" |
| 2" | 3" |
- C) TRENCH INSTALLATIONS - 2 FEET MINIMUM EACH SIDE OF CULVERT. THIS RECOMMENDED LIMIT SHOULD BE MODIFIED AS NECESSARY TO ACCOUNT FOR VARIABLES SUCH AS POOR IN-SITU SOILS. EMBANKMENT INSTALLATIONS - ONE DIAMETER OR SPAN EACH SIDE OF CULVERT.



SOIL SHALL BE FINE GRADED TO SHAPE OF BOTTOM OF PIPE-ARCH. OR BEDDING BLANKET OF GRANULAR MATERIAL SHALL BE SHAPED WITH TEMPLATE. BEDDING WIDTH SHALL BE LIMITED TO A MAXIMUM OF TWO-THIRDS THE SPAN.



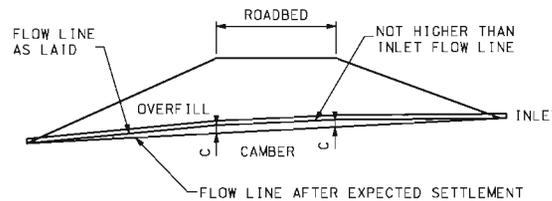
**ALTERNATIVE-SHAPED BEDDING
PIPE-ARCH TRENCH DETAIL
BEDDING AND CORNER ZONE TREATMENT
FOR PIPE ARCH STRUCTURES**



PIPE	
DIAMETER	SPACE S
UP TO 24"	12"
24" TO 72"	1/2 PIPE DIA
72" AND OVER	36"

PIPE-ARCHES	
SPAN	SPACE X
UP TO 36"	12"
36" TO 108"	1/3 ARCH SPAN
108" TO 189"	36"

MULTIPLE STRUCTURE SPACING



TYPICAL CAMBERED FLOW LINE

NOTE:

ON YIELDING SOIL, PIPE CULVERTS SHALL BE PLACED ON A CAMBERED FLOW LINE. THE AMOUNT OF CAMBER WILL VARY WITH SOIL CONDITIONS AND WILL BE SPECIFIED ON THE DESIGN PLANS.

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HARVEY
 NUMBER PE-2975
 PROFESSIONAL ENGINEER
 THIS SEAL HAS BEEN
 SCANNED, SIGNED AND DATED
 ELECTRONICALLY.

**CORRUGATED METAL PIPE
INSTALLATION METHODS**

DATE EFFECTIVE: 04/01/2011
 DATE PREPARED: 3/10/2011

725.00C

SHEET NO.
1 OF 5

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

CORRUGATED METALIC-COATED STEEL CIRCULAR PIPE LOCK SEAM

MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)

SPECIFIED DIAMETER OF PIPE	MINIMUM COVER		SPECIFIED THICKNESS OF COATED SHEET (IN.)																				
	CORRUGATED	SPIRAL RIB	0.064				0.079				0.109				0.138				0.168				
			A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
12	1	1	219	251	224	144	273	314	280	201	382	440	392	334	492	566	504	484	602	693	617		
15	1	1	175	201	179	115	218	251	224	161	306	352	314	267	394	453	403	387	481	555	493		
18	1	1	146	167	149	96	182	209	187	134	255	293	261	223	328	378	336	323	401	462	411		
21	1	1	125	143	128	82	156	179	160	115	219	251	224	191	281	324	288	277	344	396	352		
24	1	1	109	126	112	72	137	157	140	100	191	220	196	167	246	283	252	242	301	347	308		
30	1	1	87	100	90	57	109	126	112	80	153	176	157	134	197	227	202	194	241	277	247		
36	1	1	73	84	75	48	91	105	93	67	127	147	131	111	164	189	168	161	201	231	206		
42	1	1	62	72	64	41	78	90	80	57	109	126	112	95	141	162	144	138	172	198	176		
48	1	1	55	63	56	36	68	78	70	50	96	110	98	83	123	142	126	121	150	173	154		
54	1	2		56	50	32*	61	70	62	45	85	98	87	74	109	126	112	108	134	154	137		
60	1	2		50	45			63	56	40	76	88	78	67	98	113	101	97	120	139	123		
66	1	2		46	41			57	51	37*		80	71	61	89	103	92	88	109	126	112		
72	1	2		42	37			52	47			73	65	56	82	94	84	81	100	116	103		
78	1	2		39	34			48	43			68	60	51		87	78	75	89	107	95		
84	1	2		36	32			45	40			63	56	48*		81	72	69	77	99	88		
90	1	2		33	30			42	37			59	52			76	67	65		92	82		
96	1	2						39	35			55	49			71	63	60*		87	77		
102	2	3						37	33			52	46			67	59	53*		82	73		
108	2	3										49	44			63	56			77	69		
114	2	3										46	41			60	53			73	65		
120	2	3										44	39			57	50			69	62		
126	2	3														54	48			66	59		

* FOR TRENCH INSTALLATION ONLY

CORRUGATED METALIC-COATED STEEL CIRCULAR PIPE RIVETED SEAM

MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)

SPECIFIED DIAMETER OF PIPE	MINIMUM COVER		SPECIFIED THICKNESS OF COATED SHEET (IN.)																				
	CORRUGATED	SPIRAL RIB	0.064				0.079				0.109				0.138				0.168				
			SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
12	1	1	143		185	245	156		255	305	200		382	440	209		419	544	219		438	604	
15	1	1	114		148	196	124		204	244	160		306	352	168		335	436	175		351	483	
18	1	1	95		123	164	104		170	203	133		255	293	140		279	363	146		292	403	
21	1	1	82		105	140	89		146	174	114		219	251	120		239	311	125		251	345	
24	1	1	71		92	123	78		127	153	100		191	220	105		209	272	109		219	302	
30	1	1	57		74	98	62		102	122	80		153	176	84		168	218	88		175	242	
36	1	1	48		62	82	52		85	102	67		127	147	70		140	181	73		146	201	
42	1	1	41		53	70	44		73	87	57		109	126	60		120	156	63		125	173	
48	1	1	36		46	61	39		64	76	50		96	110	52		105	136	55		110	151	
54	1	2				55	35		57	68	44		85	98	47		93	121	49		97	134	
60	1	2				49			61	40			76	88	42		84	109	44		88	121	
66	1	2				45			55				80	38			76	99	40		80	110	
72	1	2				41			51				73	35			70	91	36		73	101	
78	1	2				38			47				68				84	34			67	93	
84	1	2				35			44				63				78	31			63	86	
90	1	2				33			41				59				73				81	81	
96	1	2							38				55				68				76	76	
102	2	3							36				52				64				71	71	
108	2	3											49				60				67	67	
114	2	3											46				57				64	64	
120	2	3											44				54				60	60	
126	2	3															52				58	58	

- A = 2-2/3" X 1/2" CORRUGATIONS.
- B = 3" X 1" CORRUGATIONS.
- C = 5" X 1" CORRUGATIONS
- D = 3/4" X 3/4" X 7-1/2" SPIRAL RIB

(1) MAXIMUM OVERFILL MEASURED FROM THE TOP OF PIPE TO SURFACE.

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



CORRUGATED METAL PIPE INSTALLATION METHODS

DATE EFFECTIVE:	04/01/2011	725.00C	SHEET NO. 2 OF 5
DATE PREPARED:	3/9/2011		

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

CORRUGATED H32 ALUMINUM CIRCULAR PIPE LOCK SEAM

MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)

SPECIFIED DIAMETER OF PIPE	MINIMUM COVER		SPECIFIED THICKNESS OF COATED SHEET (IN.)																							
	CORRUGATED	SPIRAL RIB	0.06				0.075				0.105				0.135				0.164							
			A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D				
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
12	1	1	132	152		71	165	191		97	232	267		156	298	357		221	364	420						
15	1	1	106	122		57	132	153		78	185	213		125	239	286		176	291	336						
18	1	1	88	101		47	110	127		65	155	178		104	199	238		147	243	280						
21	1	1	76	87		41	95	109		56	132	152		89	170	204		126	208	240						
24	1	1	66	76		35	83	96		49	116	133		78	149	178		110	182	210						
30	1	2		61		28	66	76		39	93	107		62	119	143		88	146	168						
36	1	2		51		24*	55	64		32	77	89		52	99	119		74	121	140						
42	1	2		43				55		28*	66	76		45	85	102		63	104	120						
48	1	2		38				48			58	67		39	75	89		55	91	105						
54	1	2		34				42			51	59		35	66	79		49	81	93						
60	1	2		30				38				53		31*	55	71		44	68	84						
66	1	2		28				35				48			65			40	56	76						
72	1	3		25				32				44			59			37*	46	70						
78	1	3						29				41			55				65							
84	1	3										38			51				60							
90	1	3										36			48				56							
96	1	3										33			45				53							
102	2	4													42				49							
108	2	4													39				47							
114	2	4																	42							
120	2	4																	39							
126	2	4																								

* FOR TRENCH INSTALLATION ONLY

CORRUGATED H32 ALUMINUM CIRCULAR PIPE RIVETED SEAM

MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)

SPECIFIED DIAMETER OF PIPE	MINIMUM COVER		SPECIFIED THICKNESS OF COATED SHEET (IN.)																							
	CORRUGATED	SPIRAL RIB	0.06				0.075				0.105				0.135				0.164							
			SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET					
IN.	FT.	FT.	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B				
12	1	1	77		120	141	77		154	175	133		269	239	138		282	359	144		291	466				
15	1	1	62		96	113	62		123	140	107		215	191	111		226	287	115		232	373				
18	1	1	51		80	94	51		103	117	89		179	160	92		188	239	96		194	311				
21	1	1	44		68	81	44		88	100	76		154	137	79		161	205	82		166	266				
24	1	1	38		60	71	38		77	88	67		135	120	69		141	179	72		145	233				
30	1	2				56	31		62	70	53		108	96	55		113	144	57		116	186				
36	1	2				47	26		51	58	44		90	80	46		94	120	48		97	155				
42	1	2				40				50	38		77	68	40		81	103	41		83	133				
48	1	2				35				44	33		67	60	35		71	90	36		73	116				
54	1	2				31				39	30		56	53	31		63	80	32		65	104				
60	1	2				28				35			48	28			56	72	29		58	93				
66	1	2				26				32			44				65	26			53	85				
72	1	3				24				29			40				60	24			47	78				
78	1	3								27							37				55					
84	1	3															34				51					
90	1	3															32				48					
96	1	3															30				45					
102	2	4																			42					
108	2	4																			40					
114	2	4																								
120	2	4																								
126	2	4																								

- A = 2-2/3" X 1/2" CORRUGATIONS.
- B = 3" X 1" CORRUGATIONS.
- C = 5" X 1" CORRUGATIONS
- D = 3/4" X 3/4" X 7-1/2" SPIRAL RIB

(1) MAXIMUM OVERFILL MEASURED FROM THE TOP OF PIPE TO SURFACE.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

THIS SHEET HAS BEEN
SEALD, SIGNED AND DATED
ELECTRONICALLY.

**CORRUGATED METAL PIPE
INSTALLATION METHODS**

DATE EFFECTIVE: 04/01/2011	725.00C	SHEET NO.
DATE PREPARED: 3/9/2011		3 OF 5

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

CORRUGATED H34 ALUMINUM CIRCULAR PIPE LOCK SEAM

MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)

SPECIFIED DIAMETER OF PIPE	MINIMUM COVER		SPECIFIED THICKNESS OF COATED SHEET (IN.)																							
	CORRUGATED	SPIRAL RIB	0.06				0.075				0.105				0.135				0.164							
			A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D				
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
12	1	1	159	183		85	199	229		117	278	320		187	358	428		265	437	504						
15	1	1	127	146		68	159	183		93	223	256		150	286	343		212	350	403						
18	1	1	106	122		57	132	153		78	185	213		125	239	286		176	291	336						
21	1	1	91	104		49	113	131		67	159	183		107	205	245		151	250	288						
24	1	1	79	91		43	99	115		58	139	160		94	179	214		132	218	252						
30	1	2		73		34	79	92		47	111	128		75	143	171		106	175	202						
36	1	2		61		28*	66	76		39	93	107		62	119	143		88	146	168						
42	1	2		52				66		33*	79	91		54	102	122		76	125	144						
48	1	2		46				57			68	80		47	89	107		66	109	126						
54	1	2		41				51			56	71		42	73	95		59	90	112						
60	1	2		37				46				64		37*	59	86		53	73	101						
66	1	2		33				42				58			78			48	59	92						
72	1	3		30				38				53			71		42*	47	84							
78	1	3						35				49				66			78							
84	1	3										46				61			72							
90	1	3										43				57			67							
96	1	3										39				53			62							
102	2	4														48			56							
108	2	4														43			51							
114	2	4																	46							
120	2	4																	41							
126	2	4																								

* FOR TRENCH INSTALLATION ONLY

CORRUGATED H34 ALUMINUM CIRCULAR PIPE RIVETED SEAM

MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)

SPECIFIED DIAMETER OF PIPE	MINIMUM COVER		SPECIFIED THICKNESS OF COATED SHEET (IN.)																						
	CORRUGATED	SPIRAL RIB	0.06				0.075				0.105				0.135				0.164						
			SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET				
IN.	FT.	FT.	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B			
12	1	1	77		120	141	77		154	175	133		269	239	138		282	359	144		291	466			
15	1	1	62		96	113	62		123	140	107		215	191	111		226	287	115		232	373			
18	1	1	51		80	94	51		103	117	89		179	160	92		188	239	96		194	311			
21	1	1	44		68	81	44		88	100	76		154	137	79		161	205	82		166	266			
24	1	1	38		60	71	38		77	88	67		135	120	69		141	179	72		145	233			
30	1	2				56	31		62	70	53		108	96	55		113	144	57		116	186			
36	1	2				47	26		51	58	44		90	80	46		94	120	48		97	155			
42	1	2				40				50	38		77	68	40		81	103	41		83	133			
48	1	2				35				44	33		67	60	35		71	90	36		73	116			
54	1	2				31				39	30		56	53	31		63	80	32		65	104			
60	1	2				28				35			48	28			56	72	29		58	93			
66	1	2				26				32			44				65	26			53	85			
72	1	3				24				29			40				60	24			47	78			
78	1	3									27														
84	1	3																							
90	1	3																							
96	1	3																							
102	2	4																							
108	2	4																							
114	2	4																							
120	2	4																							
126	2	4																							

- A = 2-2/3" X 1/2" CORRUGATIONS.
- B = 3" X 1" CORRUGATIONS.
- C = 5" X 1" CORRUGATIONS
- D = 3/4" X 3/4" X 7-1/2" SPIRAL RIB

(1) MAXIMUM OVERFILL MEASURED FROM THE TOP OF PIPE TO SURFACE.


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


 KATHRYN PHILLIPS HAWRY
 NUMBER PE-2781
 PROFESSIONAL ENGINEER

CORRUGATED METAL PIPE INSTALLATION METHODS

DATE EFFECTIVE:	04/01/2011	725.00C	SHEET NO. 4 OF 5
DATE PREPARED:	4/11/2013		

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

**MINIMUM COVER FOR CONSTRUCTION LOADS
(ROUND AND PIPE-ARCH)**

DIAMETER OR PIPE SPAN	MINIMUM COVER (FT.) FOR INDICATED AXLE LOADS (2)			
	18K LBS.- 50K LBS.	50K LBS.- 75K LBS.	75K LBS.- 110K LBS.	110K LBS.- 150K LBS.
IN.	FT.	FT.	FT.	FT.
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

THE CONTRACTOR SHALL PROVIDE MINIMUM COVER PLUS ANY ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. IN UNPAVED SITUATIONS, THE SURFACE MUST BE MAINTAINED TO A LEVEL AND NON-RUTTED CONDITION.

- (2) MINIMUM COVER MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.
- (3) A TOLERANCE OF PLUS OR MINUS ONE INCH OR 2 PERCENT OF EQUIVALENT CIRCULAR DIAMETER, WHICHEVER IS GREATER, WILL BE PERMISSIBLE IN SPAN AND RISE.
- (4) TOLERANCES IN PARENTHESES. NO TOLERANCE IN OPPOSITE DIRECTION.

**PIPE-ARCH REQUIREMENTS
2-2/3" X 1/2" CORRUGATIONS**

TYPE	SPAN (3) (IN.)	RISE (3) (IN.)	GALVANIZED SHEET	
			THICKNESS (IN.)	GAUGE
B1	17	13	0.064	16
B2	21	15	0.064	16
B3	24	18	0.064	16
B4	28	20	0.064	16
B5	35	24	0.064	16
B6	42	29	0.079	14
B7	49	33	0.109	12
B8	57	38	0.109	12
B9	64	43	0.109	12
B10	71	47	0.138	10
B11	77	52	0.168	8
B12	83	57	0.168	8

PIPE-ARCH REQUIREMENTS

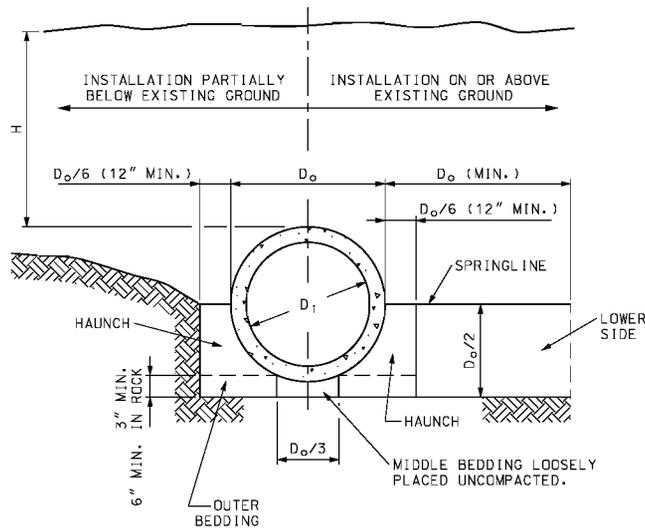
TYPE	SPAN (4) (IN.)	RISE (4) (IN.)	GALVANIZED SHEET 3" X 1/2" CORRUGATIONS		GALVANIZED SHEET 5" X 1/2" CORRUGATIONS		MINIMUM COVER (2) (IN.)
			THICKNESS (IN.)	GAUGE	THICKNESS (IN.)	GAUGE	
B8A	53 (-2.4)	41 (+2.4)	0.079	14	0.109	12	12
B9A	60 (-2.7)	46 (+2.7)	0.079	14	0.109	12	15
B10A	66 (-3.0)	51 (+3.0)	0.079	14	0.109	12	15
B11A	73 (-3.3)	55 (+3.3)	0.079	14	0.109	12	18
B12A	81 (-3.6)	59 (+3.6)	0.079	14	0.109	12	18
B13A	87 (-4.4)	63 (+4.4)	0.079	14	0.109	12	18
B14A	95 (-4.8)	67 (+4.8)	0.079	14	0.109	12	18
B15A	103 (-5.2)	71 (+5.2)	0.079	14	0.109	12	18
B16A	112 (-5.6)	75 (+5.6)	0.109	12	0.109	12	21
B17A	117 (-5.9)	79 (+5.9)	0.109	12	0.109	12	21
B18A	128 (-6.4)	83 (+6.4)	0.109	12	0.109	12	24
B19A	137 (-6.9)	87 (+6.9)	0.109	12	0.109	12	24
B20A	142 (-7.1)	91 (+7.1)	0.138	10	0.138	10	24

 <p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p>CORRUGATED METAL PIPE INSTALLATION METHODS</p>	<p>DATE EFFECTIVE: 04/01/2011</p>	<p>725.00C</p>	<p>SHEET NO. 5 OF 5</p>
		<p>DATE PREPARED: 8/24/2015</p>		



THIS SHEET HAS BEEN
SIGNED, SEALED AND DATED
ELECTRONICALLY

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

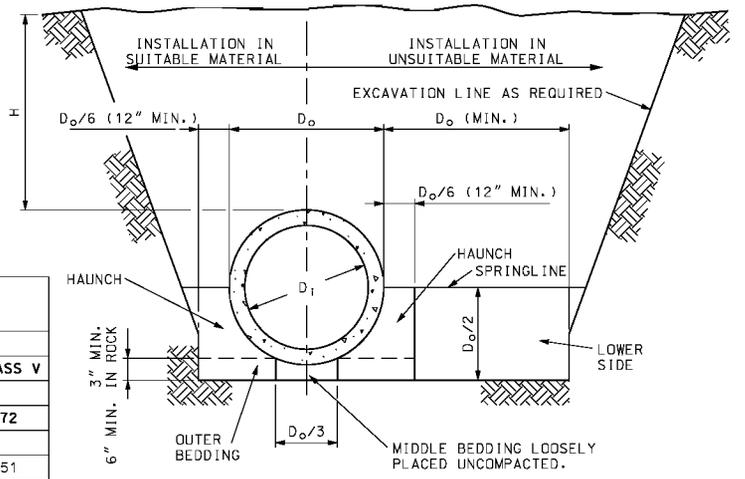


EMBANKMENT INSTALLATIONS

- CONSTRUCTION SEQUENCE**
1. PLACE BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
 2. INSTALL PIPE TO GRADE.
 3. COMPACT BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
 4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE SPRINGLINE.
 5. COMPLETE BACKFILL ACCORDING TO SPECIFICATIONS.

INSTALLATION TYPE	CLASS OF PIPE				
	CLASS I	CLASS II	CLASS III	CLASS IV	CLASS V
	MAXIMUM DIAMETER (INCHES)				
	108	108	108	84	72
	MAXIMUM FILL HEIGHT IN (FEET)				
TYPE 1	12	15	21	33	51
TYPE 2	9	12	17	26	39
TYPE 3	7	9	13	20	30
TYPE 4	4	6	9	13	20

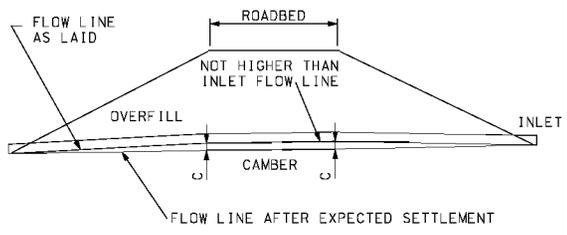
IF FILL HEIGHT EXCEEDS 51 FEET AND PIPE DIAMETER IS 36 INCHES OR LESS A SPECIAL PIPE DESIGN AND INSTALLATION PROCEDURE SHALL BE REQUIRED. IF FILL HEIGHT EXCEEDS 51 FEET AND PIPE DIAMETER IS GREATER THAN 36 INCHES A SPECIAL DESIGN PIPE IS NOT ALLOWED.



TRENCH INSTALLATION

- LEGEND -

- D₁ = NORMAL INSIDE DIAMETER OF PIPE.
- D_o = OUTSIDE DIAMETER OF PIPE.
- H = FILL COVER HEIGHT OVER PIPE (FEET)
- MIN. = MINIMUM
- [Symbol] = UNDISTURBED SOIL



TYPICAL CAMBERED FLOW LINE

NOTE: ON YIELDING SOIL, PIPE CULVERTS SHALL BE PLACED ON A CAMBERED FLOW LINE. THE AMOUNT OF CAMBER WILL VARY WITH SOIL CONDITION AND SHALL BE SPECIFIED ON THE DESIGN PLANS.

INSTALLATION TYPE	BEDDING THICKNESS	COMPACTION REQUIREMENTS (MIN. STANDARD PROCTOR %)					
		HAUNCH AND OUTER BEDDING			LOWER SIDE BEDDING		
		CATEGORY 1 SOIL (A)	CATEGORY 2 SOIL (B)	CATEGORY 3 SOIL (C)	CATEGORY 1 SOIL (A)	CATEGORY 2 SOIL (B)	CATEGORY 3 SOIL (C)
1	D _o /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D _o /12 MINIMUM, NOT LESS THAN 6".	95	N/A	N/A	90	95	100
2	D _o /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D _o /12 MINIMUM, NOT LESS THAN 6".	90	95	N/A	85	90	95
3	D _o /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D _o /12 MINIMUM, NOT LESS THAN 6".	85	90	95	85	90	95
4	D _o /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D _o /12 MINIMUM, NOT LESS THAN 6".	NO COMPACTION REQUIRED	NO COMPACTION REQUIRED	85	NO COMPACTION REQUIRED	NO COMPACTION REQUIRED	85

- (A) GRAVELLY SAND
- (B) SANDY-SILT
- (C) SILTY CLAY

GENERAL NOTES:

MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE BETWEEN PIPES OF 1/2 D_o OR 12", WHICHEVER IS GREATER, BUT NOT TO EXCEED 36".

CLASS I AND CLASS II REINFORCED CONCRETE PIPE SHALL ONLY BE USED FOR SEWERS IN TRENCHES OUTSIDE ROADBED AND STREET LIMITS.

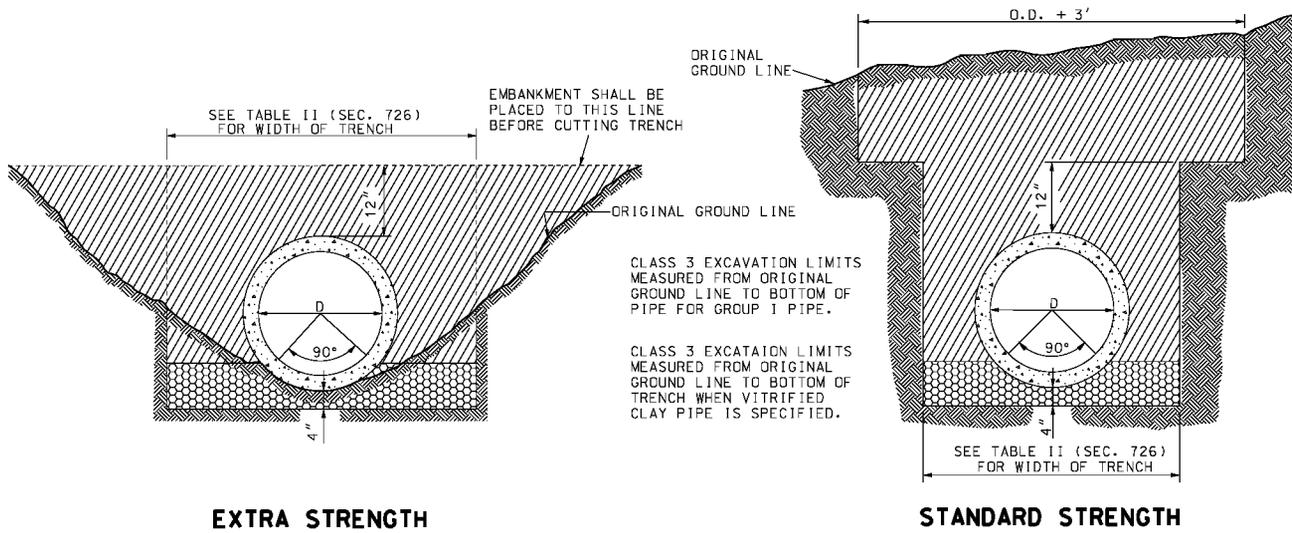
MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER

RIGID CULVERT INSTALLATION METHODS REINFORCED CONCRETE PIPE CULVERTS

DATE EFFECTIVE: 04/01/2015	726.30J	SHEET NO. 1 OF 2
DATE PREPARED: 2/20/2015		

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



- LEGEND**
- COMPACTED ROADWAY EMBANKMENT
 - SUITABLE BACKFILL
 - LOOSE DRY MATERIAL
 - COMPACTED SAND

HEIGHT OF FILL OVER V.C. PIPE CULVERTS						
NOMINAL PIPE DIAMETER (INCH)	STANDARD STRENGTH			EXTRA STRENGTH		
	TRENCH WIDTH AT ONE FOOT ABOVE TOP OF PIPE (FEET)	MINIMUM FILL HEIGHT (FEET)	MAXIMUM FILL HEIGHT (FEET)	TRENCH WIDTH AT ONE FOOT ABOVE TOP OF PIPE (FEET)	MINIMUM FILL HEIGHT (FEET)	MAXIMUM FILL HEIGHT (FEET)
6	2.0	1.0	9.0			
8	2.0	1.0	7.0	2.5	4.0	12.0
10	2.5	1.0	7.0	2.5	4.0	12.0
12	2.7	1.0	6.0	3.0	4.0	13.0
15	3.5	1.0	6.0	3.0	4.0	17.0
18	3.5	1.0	6.0	3.5	4.0	17.0
21	4.0	1.0	6.0	4.0	4.0	17.0
24	4.0	1.0	8.0	4.0	3.0	19.0
30	4.5	1.0	10.0	4.5	3.0	19.0
36	5.0	1.0	11.0	5.0	3.0	19.0

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STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

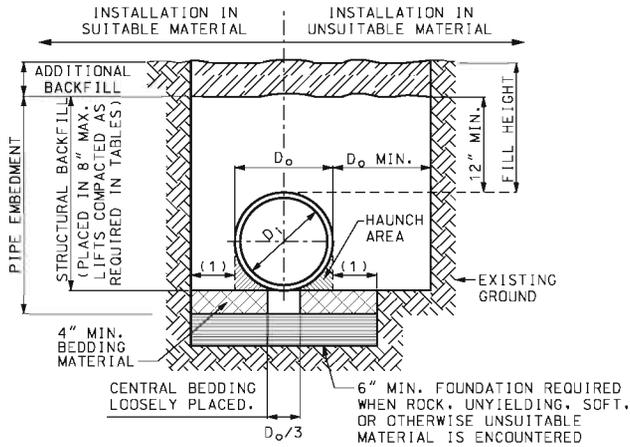
RIGID CULVERT INSTALLATION METHODS
 VITRIFIED CLAY PIPE CULVERTS

DATE EFFECTIVE: 04/01/2015
 DATE PREPARED: 2/20/2015

726.30J

SHEET NO. 2 OF 2

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

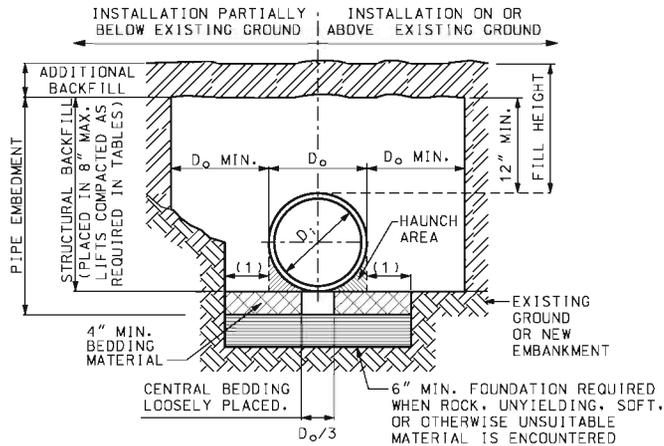


TRENCH INSTALLATION

LEGEND

D₁ = INSIDE DIAMETER OF PIPE.
 D_o = OUTSIDE DIAMETER OF PIPE.
 (1) = (D_o/4)+6" (MIN.)

NOTE:
 MULTIPLE PIPE SHALL BE INSTALLED WITH A MINIMUM CLEARANCE BETWEEN PIPES OF 1/2 D_o OR 12", WHICHEVER IS GREATER, BUT NOT TO EXCEED 36".



EMBANKMENT INSTALLATION

CONSTRUCTION SEQUENCE

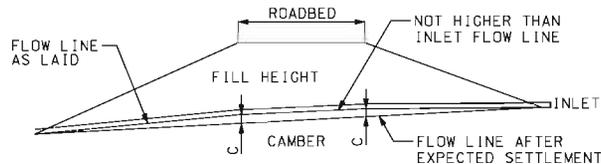
1. PLACE BEDDING MATERIAL TO GRADE.
2. COMPACT BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
3. INSTALL PIPE TO GRADE.
4. COMPLETE STRUCTURAL BACKFILL ACCORDING TO SPECIFICATIONS.

		FILL HEIGHT LIMITS															
STRUCTURAL BACKFILL	SPECIFIED NOMINAL DIA OF PIPE (IN.)	POLYETHYLENE				STEEL REINFORCED POLYETHYLENE		POLYVINYL				DOUBLE WALL POLYPROPYLENE				TRIPLE WALL POLYPROPYLENE	
		COMPACTION 90% SPD		COMPACTION 95% SPD		COMPACTION 90% SPD		COMPACTION 90% SPD		COMPACTION 95% SPD		COMPACTION 90% SPD		COMPACTION 95% SPD		COMPACTION 90% SPD	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
GRAVEL (AASHTO M45 SOIL TYPE A1 & A3)	12	2'	19'	2'	26'	--	--	2'	32'	2'	61'	2'	21'	2'	29'	--	--
	15	2'	19'	2'	27'	--	--	2'	32'	2'	55'	2'	22'	2'	31'	--	--
	18	2'	17'	2'	25'	--	--	2'	31'	2'	60'	2'	19'	2'	27'	--	--
	24	2'	15'	2'	21'	2'	50'	2'	30'	2'	54'	2'	16'	2'	22'	--	--
	30	2'	17'	2'	24'	2'	50'	2'	31'	2'	52'	2'	11'	2'	15'	2'	17'
	36	2'	13'	2'	19'	2'	50'	2'	30'	2'	53'	--	--	--	--	2'	15'
	42	2'	13'	2'	19'	2'	50'	--	--	--	--	--	--	--	--	2'	19'
48	2'	12'	2'	18'	2'	30'	--	--	--	--	--	--	--	--	2'	12'	
60	2'	13'	2'	20'	2'	30'	--	--	--	--	--	--	--	--	2'	16'	
COURSE SAND (AASHTO M45 SOIL TYPE A-1-B)	12	2'	17'	2'	23'	--	--	2'	32'	2'	55'	2'	18'	2'	24'	--	--
	15	2'	16'	2'	22'	--	--	2'	32'	2'	49'	2'	22'	2'	31'	--	--
	18	2'	15'	2'	21'	--	--	2'	31'	2'	53'	2'	16'	2'	21'	--	--
	24	2'	14'	2'	20'	2'	50'	2'	30'	2'	48'	2'	13'	2'	17'	--	--
	30	2'	13'	2'	19'	2'	50'	2'	31'	2'	46'	2'	7'	2'	10'	2'	17'
	36	2'	12'	2'	17'	2'	50'	2'	30'	2'	46'	--	--	--	--	2'	19'
	42	2'	13'	2'	18'	2'	50'	--	--	--	--	--	--	--	--	2'	19'
48	2'	12'	2'	17'	2'	30'	--	--	--	--	--	--	--	--	2'	12'	
60	2'	13'	2'	20'	2'	30'	--	--	--	--	--	--	--	--	2'	16'	
SILTY SAND OR SILTY GRAVEL (AASHTO M45 SOIL TYPES A-2-4 & A-2-5)	12	3.3'	10'	2'	17'	--	--	2.7'	16'	2'	33'	2.8'	11'	2'	19'	--	--
	15	3.4'	10'	2'	16'	--	--	2.7'	16'	2'	33'	2.8'	11'	2'	23'	--	--
	18	3.6'	10'	2'	15'	--	--	2.7'	15'	2'	32'	3'	11'	2'	16'	--	--
	24	3.8'	9'	2'	14'	2'	50'	2.7'	15'	2'	31'	3.3'	10'	2'	13'	--	--
	30	3.7'	10'	2'	14'	2'	50'	2.8'	15'	2'	31'	3.4'	6'	2'	7'	3'	10'
	36	4.2'	7'	2'	12'	2'	50'	2.8'	14'	2'	31'	--	--	--	--	3.3'	10'
	42	4.2'	7'	2'	13'	2'	50'	--	--	--	--	--	--	--	--	3.2'	11'
48	4.5'	6'	2'	12'	2'	30'	--	--	--	--	--	--	--	--	3.1'	9'	
60	3.3'	7'	2'	14'	2'	30'	--	--	--	--	--	--	--	--	2'	10'	

MINIMUM COVER FOR CONSTRUCTION LOADS

NOMINAL PIPE DIA. (IN.)	MINIMUM COVER (FT) FOR INDICATED AXLE LOADS (THOUSANDS OF POUNDS)			
	18-50	50-75	75-110	110-150
12-36	2.0	2.5	3.0	3.0
42-60	3.0	3.0	3.5	4.0

MINIMUM COVER LIMITS ARE NOT SUFFICIENT FOR SILTY SAND OR SILTY GRAVEL STRUCTURAL BACKFILL COMPACTED TO 90% STANDARD PROCTOR DENSITY. THE CONTRACTOR SHALL PROVIDE MINIMUM COVER PLUS ANY ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. IN UNPAVED SITUATIONS, THE SURFACE MUST BE MAINTAINED TO A LEVEL AND NON-RUTTED CONDITION.



NOTE:
 ON YIELDING SOIL, PIPE CULVERTS SHALL BE PLACED ON A CAMBERED FLOW LINE. THE AMOUNT OF CAMBER WILL VARY WITH SOIL CONDITION AND WILL BE SPECIFIED ON THE DESIGN PLANS.

TYPICAL CAMBERED FLOW LINE

NOTE:

SPD = STANDARD PROCTOR DENSITY.

FILL HEIGHT MEASURED FROM THE TOP OF PIPE TO SURFACE.

LIMITS ACCOUNT FOR SHORT-TERM TEMPORARY WATER TABLE DEPTHS OF FIVE FEET ABOVE SPRINGLINE. TABLES ARE NOT APPLICABLE FOR LONG-TERM PERMANENT WATER TABLE DEPTHS ABOVE SPRINGLINE.

WHEN PIPES ARE USED AS GROUP A, FILL HEIGHTS ARE LIMITED TO SHADED VALUES.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

THERMOPLASTIC PIPE INSTALLATION METHODS

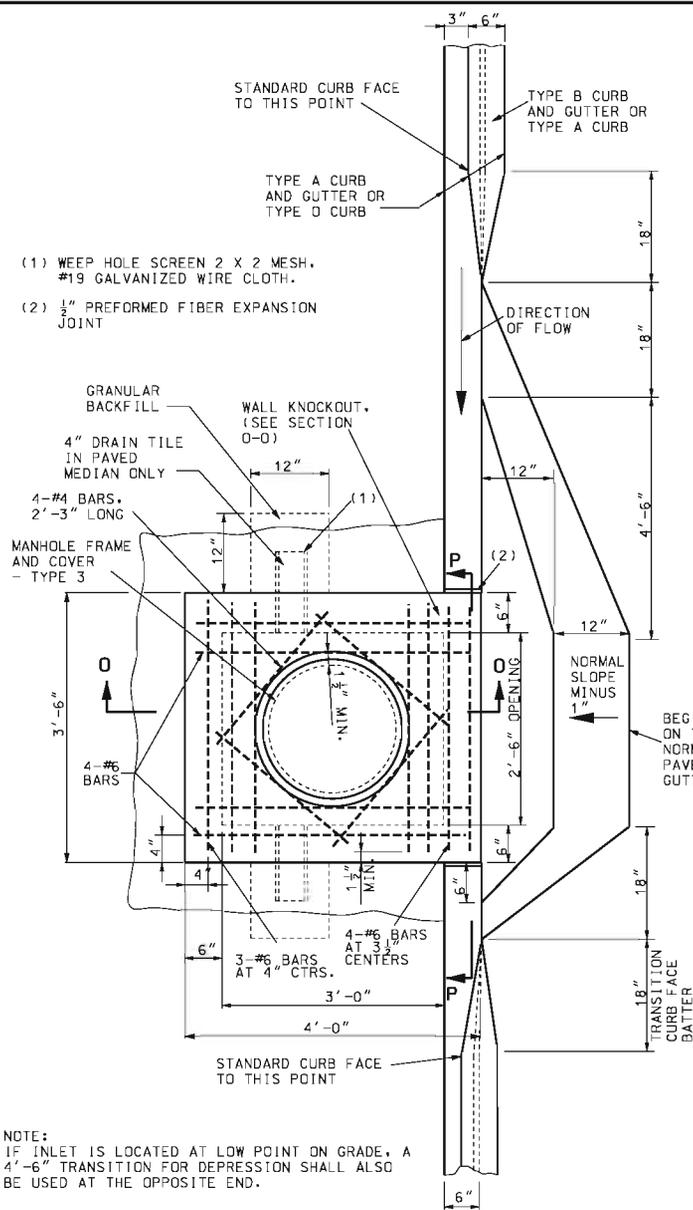
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 04/01/2015
 DATE PREPARED: 2/27/2015

730.00E

SHEET NO.
1 OF 1

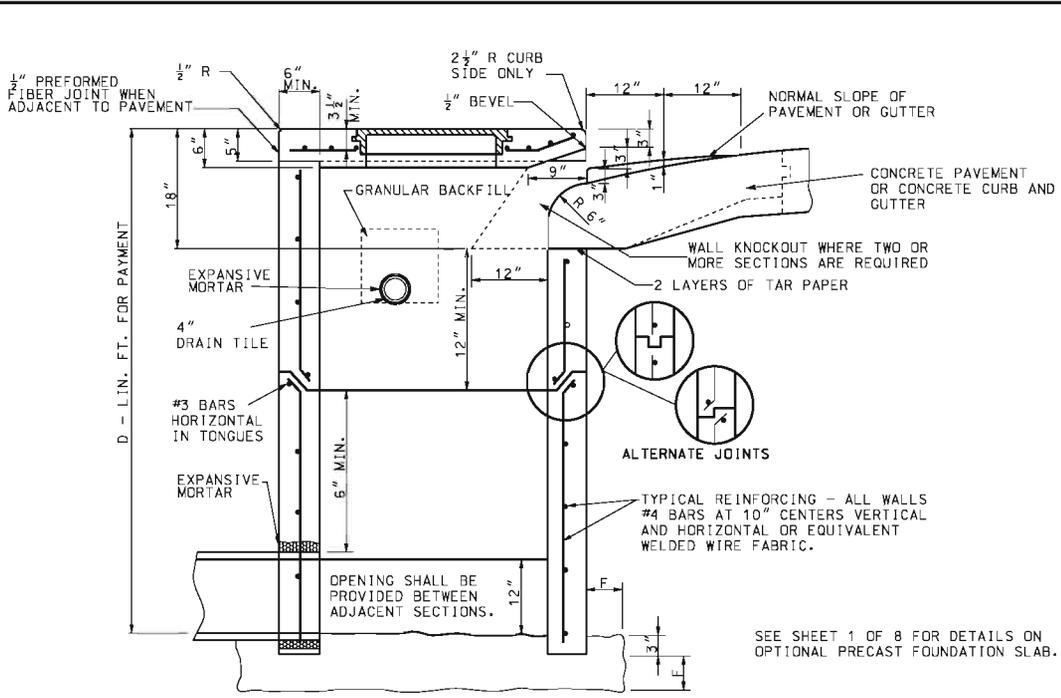
IF A SEAL IS PRESENT ON THIS SHEET, IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PLAN

- (1) WEEP HOLE SCREEN 2 X 2 MESH, #19 GALVANIZED WIRE CLOTH.
- (2) 1/2" PREFORMED FIBER EXPANSION JOINT

NOTE:
IF INLET IS LOCATED AT LOW POINT ON GRADE, A 4'-6" TRANSITION CURB FACE BATTER SHALL ALSO BE USED AT THE OPPOSITE END.

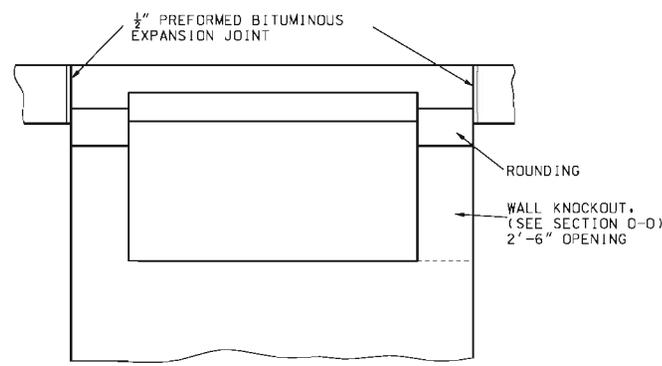


SECTION O-O

$F = 6" \text{ FOR } D'S \leq 6'$
 $F = 12" \text{ FOR } D'S > 6'$

Precast base section set on concrete blocks foundation slab and invert poured monolithic.

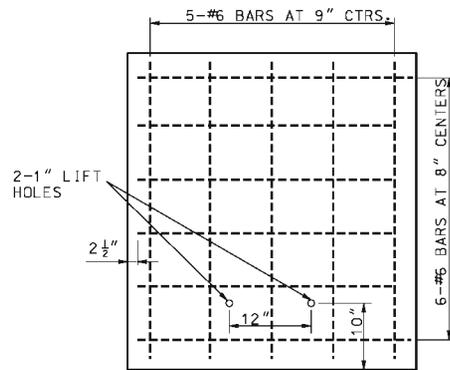
SEE SHEET 1 OF 8 FOR DETAILS ON OPTIONAL PRECAST FOUNDATION SLAB.



**SECTION P-P
DETAILS OF OPENING**

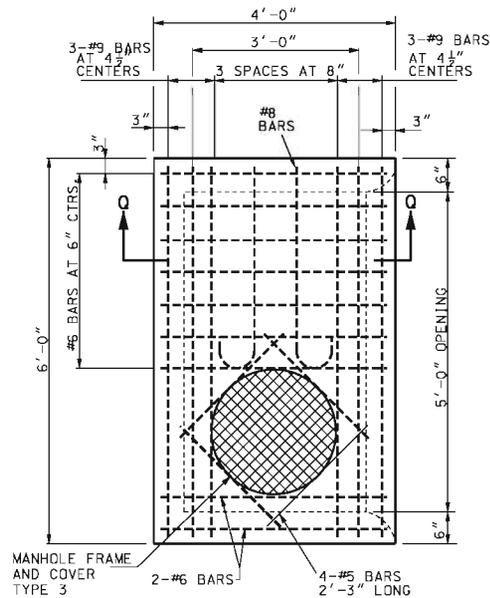
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	PRECAST DROP INLET CURB INLET - TYPE T	
	DATE EFFECTIVE: 12/01/2005 DATE PREPARED: 9/3/2010	731.10R SHEET NO. 5 OF 8

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

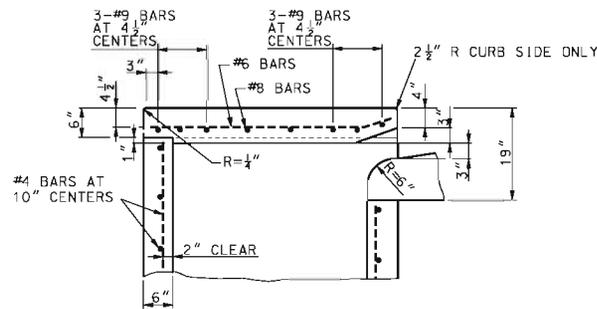


NOTE: REINFORCING FOR LIDS ON UPSTREAM SECTIONS.

LID FOR ADJACENT SECTIONS



PLAN



SECTION Q-Q

**OPTIONAL PRECAST CURB INLET
5'-0" OPENING**

OTHER DETAILS ARE SAME AS FOR THE 2'-6" OPENING DROP INLET THIS SHEET.

GENERAL NOTES:

NOTES PERTAINING TO TYPE T:

THE LENGTH AND DEPTH OF THE INLET SHALL BE AS SHOWN ON THE PLANS.

WALLS BETWEEN THE ADJACENT SECTIONS SHALL BE SEALED IN ACCORDANCE WITH SECTION 726.3.1 OF THE STANDARD SPECIFICATIONS.

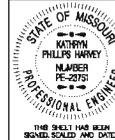
IF DEPTH OF INLET EXCEEDS 6 FEET THE PRECAST UNITS MAY BE FURNISHED IN TWO OR MORE SECTIONS.

IF TWO OR MORE SECTIONS ARE USED, THE TYPE 3 MANHOLE FRAME AND COVER SHALL BE IN THE DOWNSTREAM SECTION ONLY.

IF A 5 FOOT OPENING IS REQUIRED, TWO 2'-6" OPENING SECTIONS OR ONE 5 FOOT OPENING SECTION MAY BE PROVIDED AT THE CONTRACTOR'S OPTION.

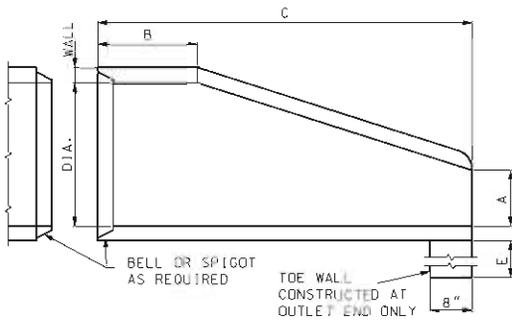
SEE SHEET 1 FOR STEP DETAILS AND SHEET 4 FOR GENERAL NOTES.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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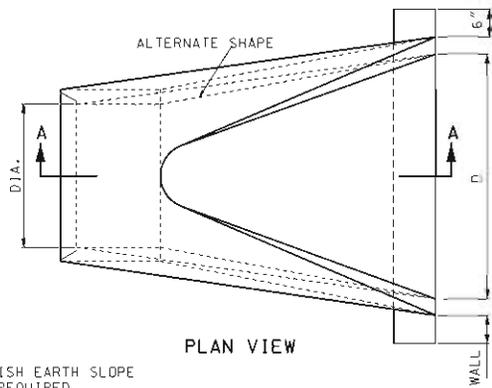


**PRECAST DROP INLET
CURB INLET - TYPE T**

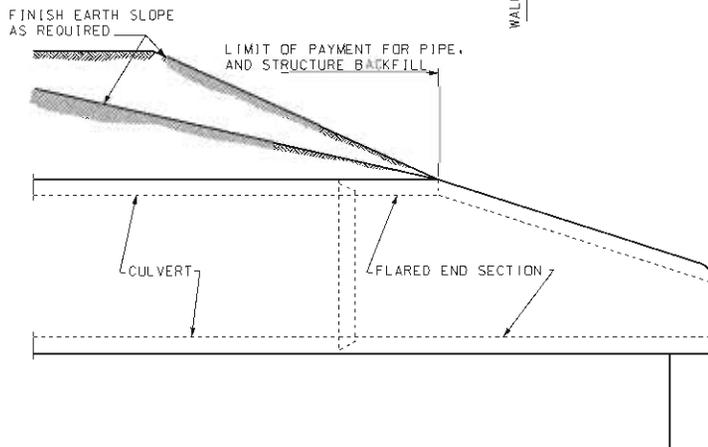
DATE EFFECTIVE:	12/01/2005	731.10R	SHEET NO. 6 OF 8
DATE PREPARED:	9/3/2010		



SECTION A-A

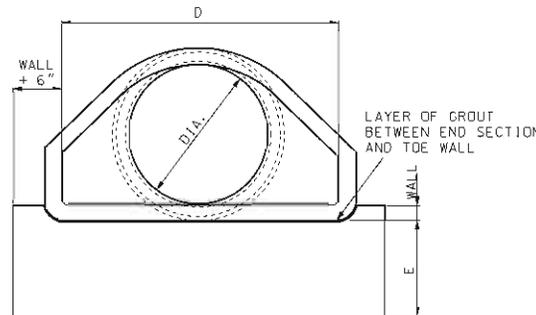


PLAN VIEW



INSTALLATION DETAILS

DIMENSIONS						
DIA.	WALL	A	B MIN.	C MIN.	D	E
12"	2"	4"	4'-0"	6'	2'-0"	18"
15"	2 1/4"	6"	3'-10"	6'	2'-6"	18"
18"	2 1/2"	9"	3'-10"	6'	3'-0"	18"
21"	2 3/4"	9"	3'-2"	6'	3'-6"	18"
24"	3"	9 1/2"	2'-6"	6'	4'-0"	24"
27"	3 1/4"	10 1/2"	2'-1"	6'	4'-6"	24"
30"	3 1/2"	1'-0"	1'-7"	6'	5'-0"	24"
33"	3 3/4"	1'-2"	1'-7"	6'	5'-6"	24"
36"	4"	1'-3"	2'-10"	8'	6'-0"	24"
42"	4 1/2"	1'-9"	2'-11"	8'	6'-6"	24"
48"	5"	2'-0"	2'-2"	8'	7'-0"	24"
54"	5 1/2"	2'-3"	2'-11"	8'	7'-6"	36"
60"	6"	2'-6"	3'-3"	8'	8'-0"	36"
66"	6 1/2"	2'-0"	1'-9"	8'	8'-6"	36"
72"	7"	2'-0"	2'-9"	10'	9'-0"	36"
78"	7 1/2"	2'-3"	2'-3"	10'	9'-6"	36"
84"	8"	2'-6"	2'-0"	10'	10'-0"	36"



END VIEW

ADJOINING PIPE DIA.	REINFORCEMENT				
	BARREL SECTION REINFORCEMENT		FLARE SECTION REINFORCEMENT (ONE LAYER ONLY IN CENTER OF WALL)		
	CIRCULAR		ELLIPTICAL	AREA OF LONGITUDINAL	AREA OF TRANSVERSE
	INNER CAGE SQ. IN./LIN. FT.	OUTER CAGE SQ. IN./LIN. FT.	SO. IN./LIN. FT.	SO. IN./LIN. FT.	SO. IN./LIN. FT.
12"	0.07			0.048	0.048
15"	0.07			0.054	0.054
18"	0.07		0.07	0.060	0.060
21"	0.07		0.07	0.066	0.066
24"	0.07		0.07	0.072	0.072
27"	0.13		0.11	0.078	0.078
30"	0.14		0.12	0.084	0.084
33"	0.15		0.13	0.090	0.090
36"	0.12	0.09	0.13	0.096	0.096
42"	0.15	0.12	0.17	0.108	0.108
48"	0.18	0.14	0.20	0.120	0.120
54"	0.22	0.16	0.24	0.132	0.132
60"	0.25	0.19	0.28	0.144	0.144
66"	0.31	0.23	0.34	0.156	0.156
72"	0.35	0.21	0.39	0.170	0.170
78"	0.40	0.24	0.44	0.185	0.185
84"	0.46	0.28	0.51	0.205	0.205

GENERAL NOTES:

SLIGHT VARIATIONS IN BOTH SHAPE AND DIMENSIONS FROM THOSE SHOWN MAY BE ACCEPTED IF APPROVED BY THE ENGINEER.

NOT MORE THAN THREE LIFT HOLES MAY BE DRILLED OR CAST IN THE END SECTION FOR HANDLING AND LAYING.

LIFT LUGS OR BARS WILL BE PERMITTED IN PRECAST TOE WALLS.

TOE WALLS MAY BE CAST-IN-PLACE OR PRECAST.

STEEL FIBERS MAY BE USED IN LIEU OF REBAR OR COLD DRAWN STEEL WIRE A5 PER SECTION 1032.3.4.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

FLARED END SECTION

PRECAST CONCRETE

THIS SHEET HAS BEEN
SEAL, SIGNED AND DATED
ELECTRONICALLY

DATE EFFECTIVE: 01/01/2016

DATE PREPARED: 10/30/2015

732.00R

SHEET NO.
1 OF 3

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

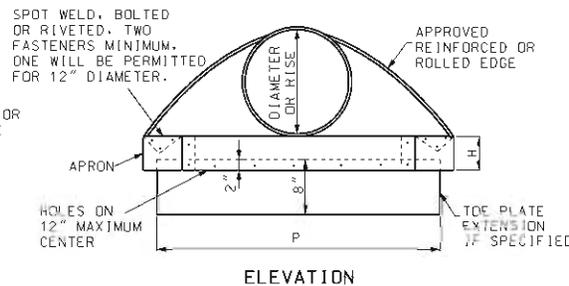
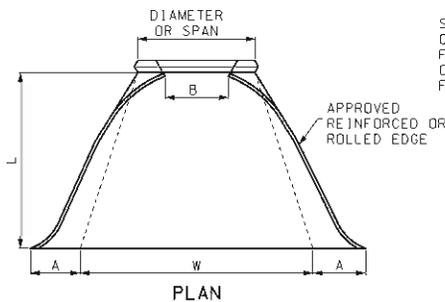
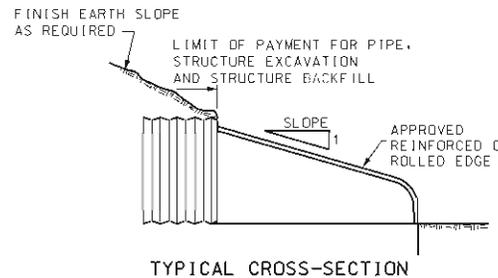
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

END SECTIONS FOR ARCH PIPE

TYPE	ARCH DIMENSIONS SPAN x RISE	DIAMETER EQUIVALENT ROUND PIPE (IN.)	GALVANIZED SHEET THICK (IN.)	DIMENSIONS (IN.)				APPROXIMATE SLOPE (V:H) (1:SLOPE)	TOE PLATE IF SPECIFIED P. (IN.)	
				A 1" TOL.	B MAX.	H 1" TOL.	L 1/2" TOL.			W 2" TOL.
B1	SEE STANDARD PLAN 725.00	15	.064	6	9	6	19	30	2 1/8	40
B2		18	.064	7	11	6	23	36	2	46
B3		21	.064	8	12	6	28	42	2 1/8	52
B4		24	.064	9	16	6	32	48	2	58
B5		30	.079	10	16	6	39	60	1 7/8	70
B6 OR B6A		36	.079	12	18	8	46	75	1 3/4	85
B7 OR B7A		42	.109	13	21	9	53	85	1 7/8	107
B8 OR B8A		48	.109	18	26	12	63	90	1 7/8	112
B9 OR B9A		54	.109	18	30	12	70	102	1 7/8	124
B10 OR B10A		60	.109	18	33	12	77	114	1 7/8	136
B11 OR B11A		66	.109	18	36	12	77	126	1 7/8	148
B12 OR B12A		72	.109	18	39	12	77	138	1 1/2	160

END SECTIONS FOR ROUND PIPE

PIPE DIAMETER (IN.)	GALVANIZED SHEET THICK (IN.)	DIMENSIONS (IN.)				APPROXIMATE SLOPE (V:H) (1:SLOPE)	TOE PLATE IF SPECIFIED P. (IN.)	
		A 1" TOL.	B MAX.	H 1" TOL.	L 1/2" TOL.			W 2" TOL.
12	.064	6	6	6	21	24	2 1/2	34
15	.064	7	8	6	26	30	2 1/2	40
18	.064	9	10	6	31	36	2 1/2	46
21	.064	9	12	6	36	42	2 1/2	52
24	.064	10	13	6	41	48	2 1/2	58
30	.079	12	16	8	51	60	2 1/2	70
36	.079	14	19	9	60	72	2 1/2	94
42	.109	16	22	11	69	84	2 1/2	106
48	.109	18	27	12	78	90	2 1/2	112
54	.109	18	30	12	84	102	2 OR 2 1/2	124
60	.109	18	33	12	87	114	1 1/2 OR 2	136
66	.109	18	36	12	87	120	1 1/2 OR 2	144
72	.109	18	39	12	87	126	1 1/2 OR 2	148
78	.109	18	42	12	87	132	1 1/2 OR 1 1/2	154
84	.109	18	45	12	87	138	1 1/2 OR 1 1/2	160



END SECTION FOR PIPE AND PIPE ARCH

GENERAL NOTES:

MINOR VARIATIONS OF DETAIL AND DIMENSIONS WILL BE ACCEPTED TO PERMIT THE USE OF A MANUFACTURER'S STANDARD METHODS OF FABRICATION.

END SECTIONS FABRICATED FROM THICKER METAL THAN INDICATED WILL BE ACCEPTED.

ALL BOLTS SHALL BE 3/8" DIAMETER AND GALVANIZED, UNLESS OTHERWISE SHOWN.

TOE PLATE EXTENSIONS, IF SPECIFIED, SHALL HAVE HOLES TO MATCH HOLES IN TOE PLATE.

SKIRT SECTION IS DEFINED AS THE FLARED PORTION OF THE END SECTION INCLUDING SIDE AND BOTTOM (CENTER) PANELS AND APRON.

SKIRT SECTION FOR 12" THROUGH 24" PIPES SHALL BE MADE IN ONE PIECE.

SKIRT SECTIONS FOR 30" AND LARGER PIPES AND B5 AND LARGER PIPE ARCHES MAY BE MADE FROM UP TO 2 SHEETS JOINED BY RIVETING OR BOLTING ON CENTERLINE.

SKIRT SECTIONS FROM 48" AND LARGER PIPES AND B8 OR LARGER PIPE ARCHES MAY BE MADE FROM UP TO 3 SHEETS JOINED BY RIVETING OR BOLTING EQUAL DISTANCE FROM CENTERLINE.

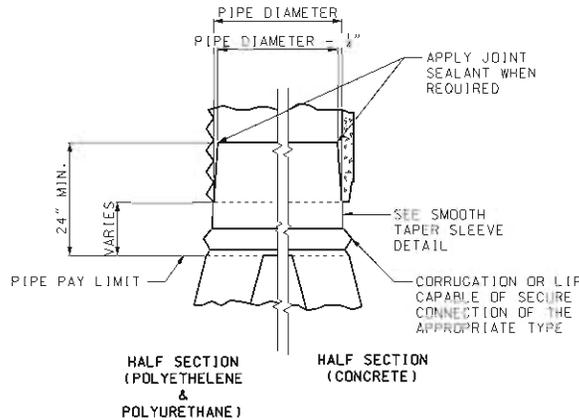
SKIRT SECTIONS FOR 72" AND LARGER PIPES MAY BE MADE FROM UP TO 4 SHEETS JOINED BY RIVETING AND BOLTING. THE BOTTOM PANEL SHALL BE 2 EQUAL WIDTH SHEETS JOINED ON CENTERLINE.

ALL 3 PIECE AND 4 PIECE SKIRTS FOR 60" OR LARGER PIPES AND B10 AND LARGER PIPE ARCHES SHALL HAVE 0.109" THICK SIDES AND 0.138" THICK BOTTOM (CENTER) PANELS. WIDTH OF BOTTOM PANELS SHALL BE GREATER THAN 20% OF THE PIPE PERIPHERY CONNECTOR SECTIONS. CORNER PLATES AND TOE PLATES SHALL BE GALVANIZED AND OF THE SAME OR GREATER THICKNESS AS THE SKIRT.

SEE SHEET 3 OF 3 FOR CONNECTION DETAILS

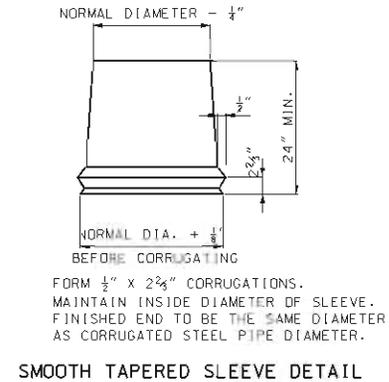
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	FLARED END SECTION METAL	
	DATE EFFECTIVE: 01/01/2016 DATE PREPARED: 10/30/2015	732.00R SHEET NO. 2 OF 3

CONNECTION REQUIREMENTS					
TYPE	CONNECTION TYPE	ALLOWABLE SIZE RANGE (IN.)	TAPERED SLEEVE REQUIREMENT		
			CMP	RCP/PVC	PP/PE
SAFETY END SECTION	2	ALL	N	Y	Y
	6	12-24	N	Y	Y
METAL FLARED END SECTION	1	12-24	N	Y	N
	2	ALL	N	Y	N
	3	ALL	N	Y	N
	4	12-24	N	Y	N
	5	12-24	N	Y	N
	6	12-24	N	Y	N



HALF SECTION (POLYETHYLENE & POLYURETHANE) & HALF SECTION (CONCRETE)
TAPERED SLEEVE CONNECTION FOR CONCRETE AND THERMOPLASTIC PIPE

TAPERED SLEEVE SHALL BE FIRMLY WEDGED INTO PIPE END BEFORE BACKFILLING PIPE PAY LENGTH.



SMOOTH TAPERED SLEEVE DETAIL

FORM 1/2" X 2 3/4" CORRUGATIONS. MAINTAIN INSIDE DIAMETER OF SLEEVE. FINISHED END TO BE THE SAME DIAMETER AS CORRUGATED STEEL PIPE DIAMETER.

GENERAL NOTES:

MINOR VARIATIONS OF DETAIL AND DIMENSIONS WILL BE ACCEPTED TO PERMIT THE USE OF A MANUFACTURER'S STANDARD METHODS OF FABRICATION.

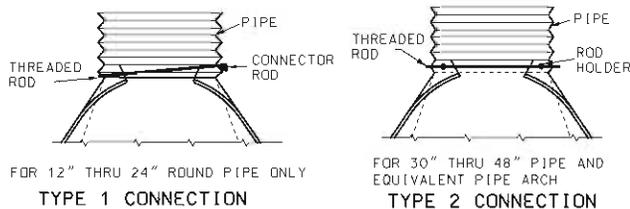
TAPERED SLEEVES SHALL BE FABRICATED FROM SMOOTH 12 GAUGE STEEL COATED IN ACCORDANCE WITH AASHTO M-218.

TAPERED SLEEVES SHALL BE FIRMLY WEDGED INTO THE PIPE END BEFORE BACKFILLING PIPE PAY LENGTH.

THE LENGTH OF TAPERED SLEEVE SHALL BE SIZED TO PROTECT UV SENSITIVE PIPE MATERIALS FROM SUNLIGHT. THE ENTIRE COST OF THE TAPERED SLEEVE, HARDWARE, AND INSTALLATION SHALL BE INCLUDED IN THE COST OF THE PIPE.

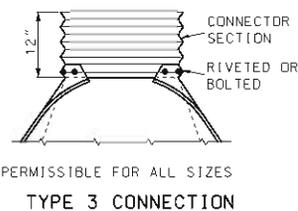
TAPERED SLEEVES SHALL HAVE AT A MINIMUM A HALF CORRUGATION OR LIP DESIGNED TO PROVIDE A SECURE CONNECTION WITH THE END SECTION.

ANY ROD OR STRAP USED FOR MAKING A CONNECTION SHALL BE SECURELY SEATED INTO A VALLEY OF THE PIPE CORRUGATION. THE VALLEY CHOSEN TO HOLD THE ROD OR STRAP SHALL LEAVE AT LEAST ONE FULL INTACT CORRUGATION BEFORE THE END OF THE PIPE. THE FEMALE PORTION OF A BELL END SHALL NOT COUNT AS A FULL INTACT CORRUGATION.

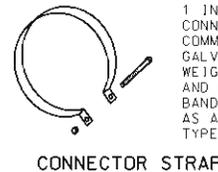


FOR 12" THRU 24" ROUND PIPE ONLY
TYPE 1 CONNECTION

FOR 30" THRU 48" PIPE AND EQUIVALENT PIPE ARCH
TYPE 2 CONNECTION

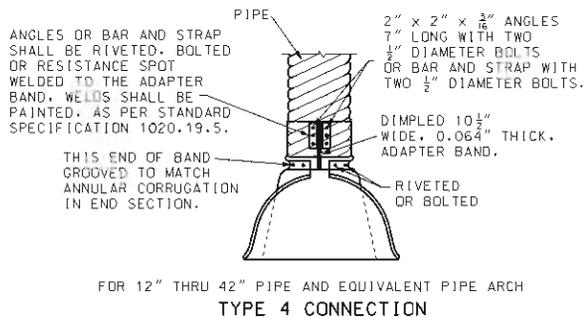


PERMISSIBLE FOR ALL SIZES
TYPE 3 CONNECTION

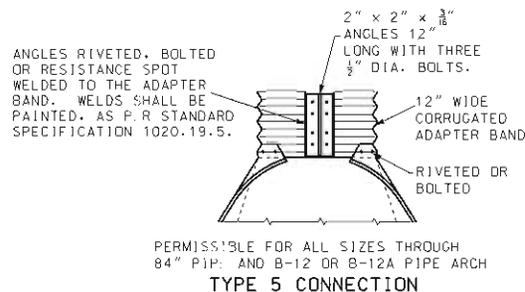


1 INCH WIDE, 0.109" THICK CONNECTOR STRAP OF COMMERCIAL QUALITY STEEL GALVANIZED WITH SAME WEIGHT COATING AS PIPE. AND 6" X 1/2" GALVANIZED BAND BOLT AND NUT. USE AS ALTERNATE ON TYPE 1 CONNECTION ONLY.

CONNECTOR STRAP



FOR 12" THRU 42" PIPE AND EQUIVALENT PIPE ARCH
TYPE 4 CONNECTION

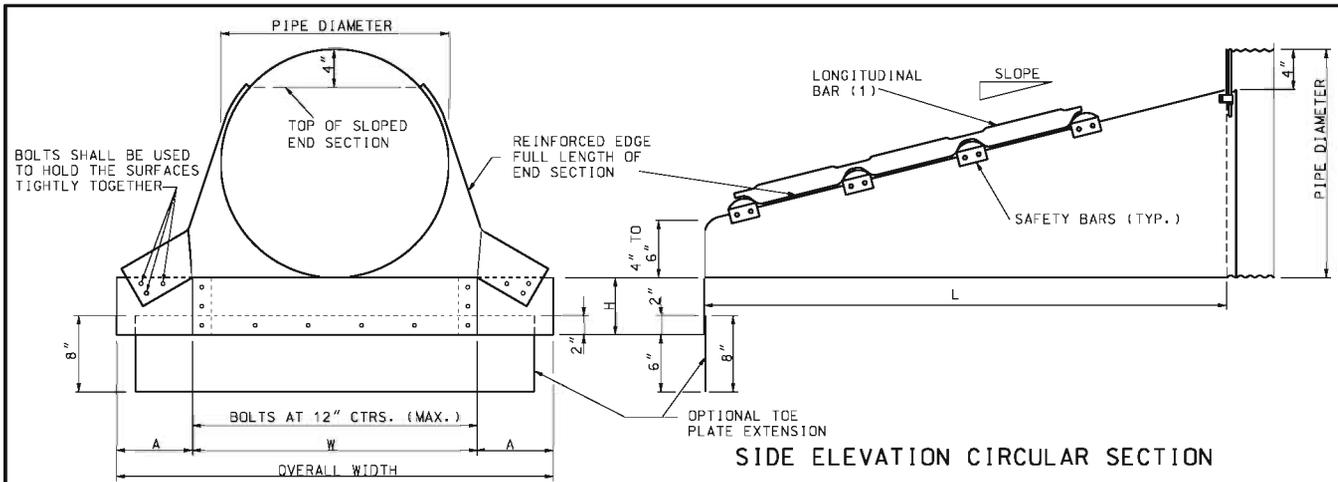


PERMISSIBLE FOR ALL SIZES THROUGH 84" PIPE AND 8-12 OR 8-12A PIPE ARCH
TYPE 5 CONNECTION

END SECTION FOR PIPE AND PIPE ARCH

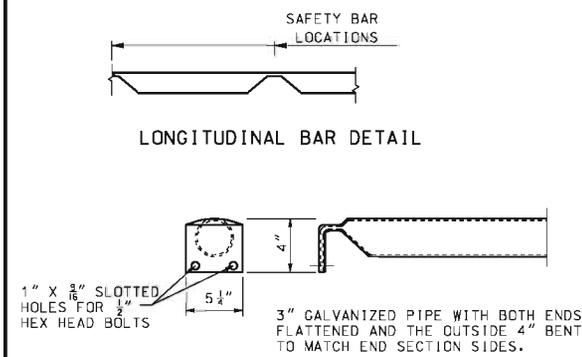
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	FLARED END SECTION METAL	
	DATE EFFECTIVE: 01/01/2016 DATE PREPARED: 10/30/2015	732.00R SHEET NO. 3 OF 3

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



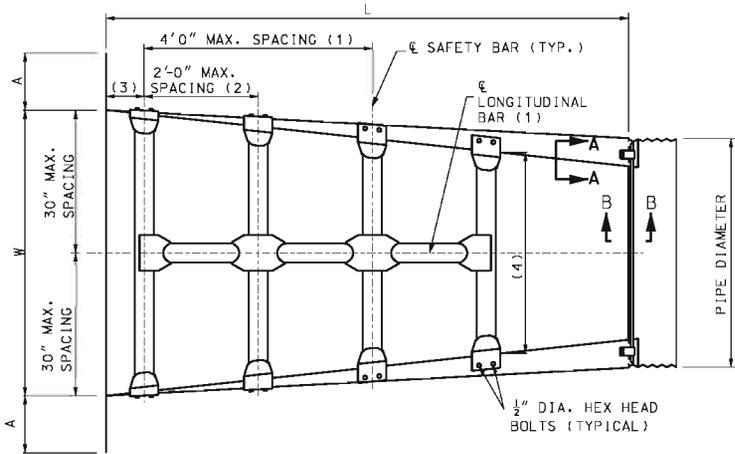
FRONT VIEW CIRCULAR PIPE

SIDE ELEVATION CIRCULAR SECTION



LONGITUDINAL BAR DETAIL

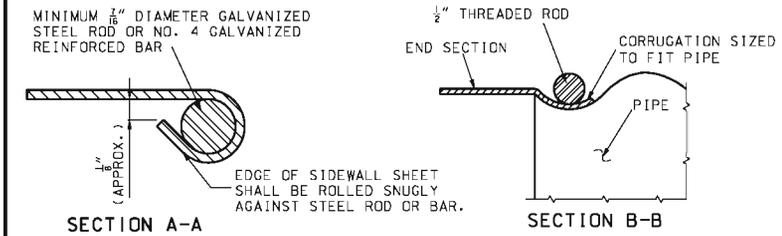
DETAIL OF SAFETY BAR



TOP VIEW CIRCULAR SECTION

LONGITUDINAL BAR, WHEN REQUIRED, SHALL BE WELDED TO SAFETY BARS TO FORM SINGLE GRATE STRUCTURE. LONGITUDINAL BAR IS NOT TO BE USED FOR PARALLEL DRAINAGE STRUCTURES.

- NOTES:
- (1) FOR CROSSROAD DRAINAGE STRUCTURES ONLY.
 - (2) FOR PARALLEL DRAINAGE STRUCTURES ONLY.
 - (3) 4" TO 6" MINIMUM
 - (4) SAFETY BARS SHALL BE PROVIDED UNTIL THE LATERAL SPAN OF THE OPENING IS LESS THAN OR EQUAL TO 30".



SECTION A-A

SECTION B-B

GENERAL NOTES:

END SECTIONS, INCLUDING ALL BOLTS, NUTS, RODS AND STRAPS, SHALL BE FABRICATED FROM GALVANIZED STEEL MEETING THE REQUIREMENTS OF SECTION 1020.

ALL BOLTS UNLESS OTHERWISE SHOWN SHALL BE A307 BOLTS.

WHEN REQUIRED, OPTIONAL TOE PLATE EXTENSION SHALL BE PUNCHED OR DRILLED AND BOLTED TO END SECTION TOE PLATE. STEEL FOR TOE PLATE EXTENSION SHALL BE SAME GAUGE AS END SECTION. DIMENSIONS SHALL BE OVERALL WIDTH LESS 6" BY 8" HIGH.

ATTACHMENT TO CIRCULAR PIPES 15" THROUGH 24" DIAMETER SHALL BE MADE WITH TYPE #1 STRAPS. ALL OTHER SIZES SHALL BE ATTACHED WITH TYPE #2 CONNECTORS.

SAFETY BARS AND LONGITUDINAL BARS SHALL BE FABRICATED FROM STEEL PIPE MEETING THE REQUIREMENTS OF ASTM A-53 SCHEDULE 40 SPECIFICATIONS. SAFETY BARS AND LONGITUDINAL BARS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH SECTION 1020 OF STANDARD SPECIFICATIONS.

INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 725 AND 732 OF THE STANDARD SPECIFICATIONS.

SLOTTED HOLES FOR SAFETY BAR ATTACHMENT SHALL BE PROVIDED FOR ALL END SECTIONS.

MINOR VARIATIONS OF DETAIL WILL BE ACCEPTED TO PERMIT THE USE OF A MANUFACTURER'S STANDARD METHODS OF FABRICATION.

END SECTIONS FABRICATED FROM THICKER METAL THAN INDICATED WILL BE ACCEPTED.

ALL BOLTS SHALL BE 3/8" DIAMETER AND GALVANIZED, UNLESS OTHERWISE SHOWN.

SKIRT SECTION IS DEFINED AS THE FLARED PORTION OF THE END SECTION INCLUDING SIDE AND BOTTOM (CENTER) PANELS AND APRON.

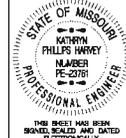
SKIRT SECTION FOR 12" THROUGH 24" PIPES SHALL BE MADE IN ONE PIECE.

SKIRT SECTIONS FOR 30" AND LARGER PIPES MAY BE MADE FROM UP TO 2 SHEETS JOINED BY RIVETING OR BOLTING ON CENTERLINE.

SKIRT SECTIONS FROM 48" AND LARGER PIPES MAY BE MADE FROM UP TO 3 SHEETS JOINED BY RIVETING OR BOLTING EQUAL DISTANCE FROM CENTERLINE.

ALL 3 PIECE SKIRTS FOR 60" PIPES SHALL HAVE 0.109" THICK SIDES AND 0.138" THICK BOTTOM (CENTER) PANELS. WIDTH OF BOTTOM PANELS SHALL BE GREATER THAN 20% OF THE PIPE PERIPHERY CONNECTOR SECTION. CORNER PLATES AND TOE PLATES SHALL BE GALVANIZED AND OF THE SAME OR GREATER THICKNESS AS THE SKIRT.

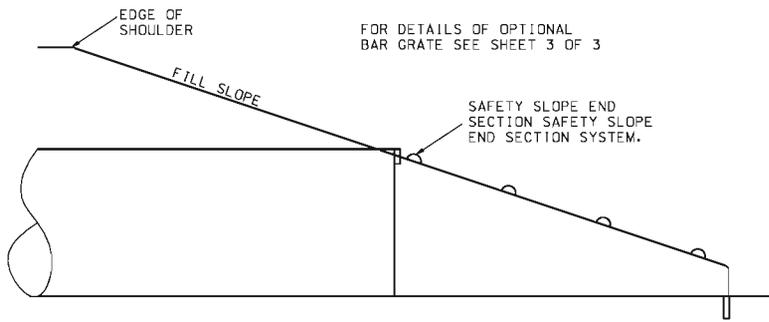
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 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)



SAFETY SLOPE END SECTION

DATE EFFECTIVE:	06/01/2013	732.10H	SHEET NO. 1 OF 3
DATE PREPARED:	4/11/2013		

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



FOR DETAILS OF OPTIONAL
BAR GRATE SEE SHEET 3 OF 3

PIPE END DETAILS FOR DRAINAGE STRUCTURES

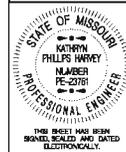
(SINGLE PIPE INSTALLATION)

NOTE:
SEE DRIVEWAY STANDARD PLANS FOR
BEVELED END SECTION REQUIREMENT.

FOR CONNECTION DETAILS, SEE 732.00
SHEET 3 OF 3.

METAL END SECTIONS FOR CIRCULAR PIPES												
PIPE DIA. (IN.)	MIN. GAUGE ENDS (IN.) 4:1 & 6:1	MIN. GAUGE ENDS (IN.) 10:1	DIMENSIONS IN INCHES			OVERALL WIDTH	L DIMENSIONS					
			A 1" TOL.	H 1" TOL.	W 2" TOL.		SLOPE	LENGTH (IN.)	SLOPE	LENGTH (IN.)	SLOPE	LENGTH (IN.)
15	16	12	8	6	21	37	4:1	20	6:1	30	10:1	70
18	16	12	8	6	24	40	4:1	32	6:1	48	10:1	100
21	16	12	8	6	27	43	4:1	44	6:1	66	10:1	130
24	16	12	8	6	30	46	4:1	56	6:1	84	10:1	160
30	12		12	9	36	60	4:1	80	6:1	120	10:1	220
36	12		12	9	42	66	4:1	104	6:1	156	10:1	280
42	12		16	12	48	80	4:1	128	6:1	192		
48	12		16	12	54	86	4:1	152	6:1	228		
54	12		16	12	60	92	4:1	176	6:1	264		
60	12		16	12	66	98	4:1	200	6:1	300		

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**SAFETY SLOPE
END SECTION**

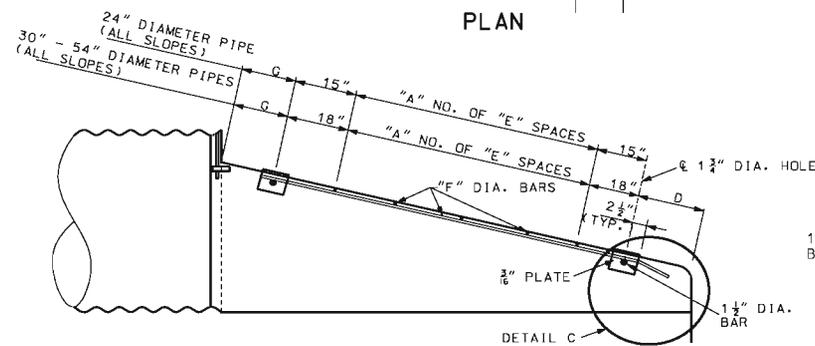
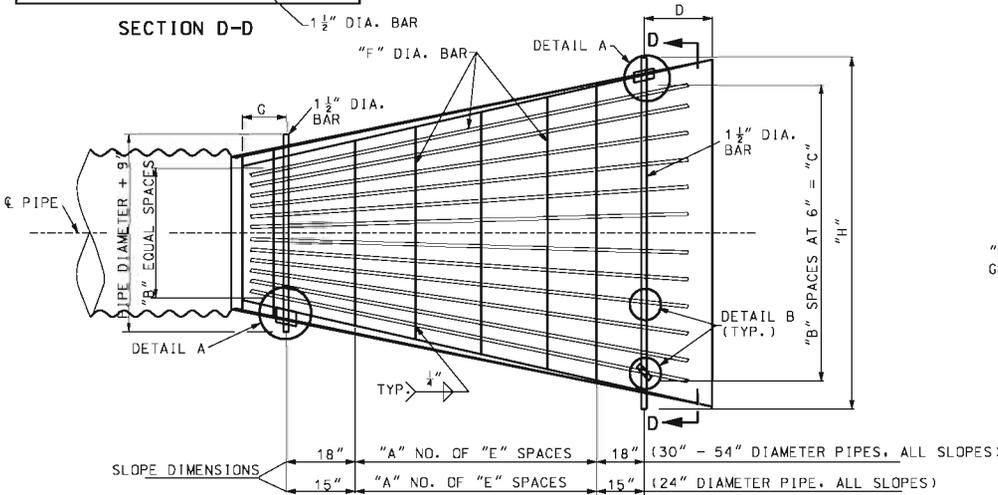
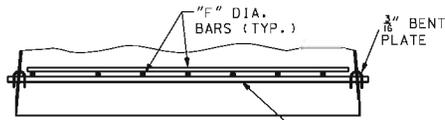
DATE EFFECTIVE: 06/01/2013	732.10H	SHEET NO. 2 OF 3
DATE PREPARED: 4/11/2013		

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

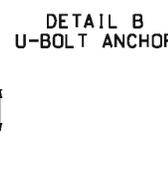
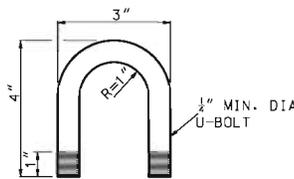
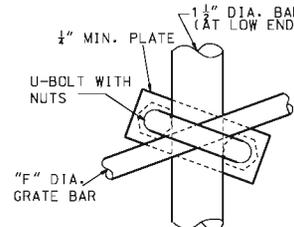
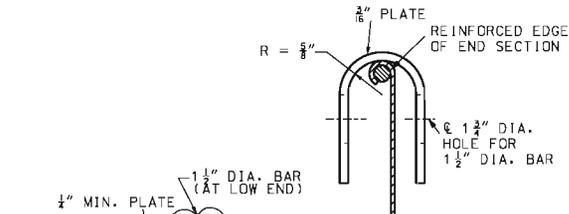
BAR GRATE SYSTEM DATA

DRAIN PIPE SIZE	3:1 SLOPE												4:1 SLOPE												6:1 SLOPE											
	A	B	C	D	E	"F" BARS	G	H	J	A	B	C	D	E	"F" BARS	G	H	J	A	B	C	D	E	"F" BARS	G	H	J									
15"*																																				
18"*																																				
21"*																																				
24"	0	4	2'-0"	6"	15"	5"	8 1/4"	3'-3"	18.4°	0	4	2'-0"	15 3/8"	15"	5"	12"	3'-3"	14°	2	4	2'-0"	13 1/8"	15"	5"	12"	3'-3"	9.5°									
30"	0	5	2'-6"	15 1/4"	18"	5 5/8"	12"	3'-9"	18.4°	1	5	2'-6"	16 1/2"	18"	5 5/8"	12"	3'-9"	14°	3	5	2'-6"	19 3/8"	18"	5 5/8"	12"	3'-9"	9.5°									
36"	1	6	3'-0"	16 1/4"	18"	3 1/2"	12"	4'-3"	18.4°	2	6	3'-0"	18"	18"	3 1/2"	17 1/4"	4'-3"	14°	5	6	3'-0"	20 1/8"	18"	3 1/2"	12"	4'-3"	9.5°									
42"	2	7	3'-6"	17 1/4"	18"	1"	12"	4'-9"	18.4°	4	7	3'-6"	12"	18"	1"	12"	4'-9"	14°	7	7	3'-6"	11 1/8"	18"	1"	9"	4'-9"	10.1°									
48"	3	8	4'-0"	18"	18"	1"	12 1/8"	5'-3"	18.4°	5	8	4'-0"	18"	18"	1"	12 3/8"	5'-3"	14°	7	8	4'-0"	13"	18"	1"	9"	5'-3"	11.9°									
54"	4	9	4'-6"	18"	18"	1 1/8"	13 3/8"	5'-9"	18.4°	6	9	4'-6"	18"	18"	1 1/8"	19 3/8"	5'-9"	14°	7	9	4'-6"	14 1/4"	18"	1 1/8"	9"	5'-9"	13.7°									

* BAR GRATE SYSTEM IS NOT REQUIRED FOR DRAIN PIPE DIAMETER OF 21" OR LESS, FOR SINGLE PIPE INSTALLATIONS.



ELEVATION



DETAIL C

GENERAL NOTES:

ALL STEEL MATERIAL FOR BAR GRATE SYSTEM SHALL BE IN ACCORDANCE WITH ASTM A575 GRADE 1020 STEEL.

ALL MATERIAL IN GRATE SYSTEM SHALL BE GALVANIZED.

GALVANIZING SHALL BE DONE IN ACCORDANCE WITH ASTM A123.

ALL MATERIALS, FABRICATION AND INSTALLATION OF OPTIONAL BAR GRATE SYSTEM USED IN LIEU OF SAFETY BAR SYSTEM SHALL BE INCLUDED IN CONTRACT UNIT PRICE BID FOR END SECTION (SAFETY SLOPE).

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

OPTIONAL BAR GRATE SYSTEM FOR SAFETY SLOPE END SECTION

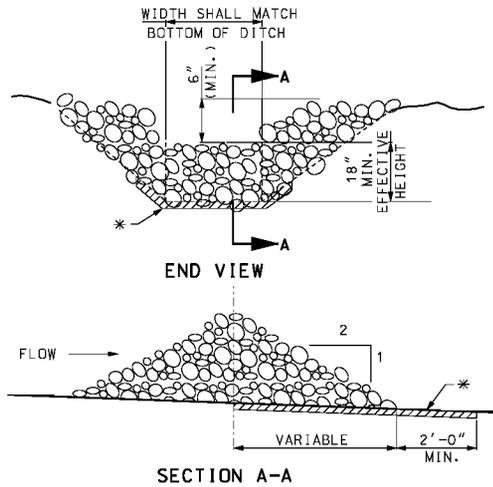
DATE EFFECTIVE: 06/01/2013
DATE PREPARED: 4/11/2013

732.10H

SHEET NO. 3 OF 3

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

ROCK DITCH CHECK



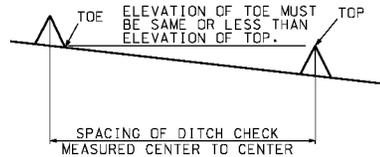
* GEOTEXTILE LINING MAY BE INSTALLED AS REQUIRED BY THE ENGINEER.

NOTE:

ROCK DITCH CHECK IN THE CLEAR ZONE SHALL BE REMOVED OR LEVELED (IF ALLOWABLE) AFTER THE VEGETATION HAS SUFFICIENTLY MATURED TO PROTECT THE DITCH OR SWALE.

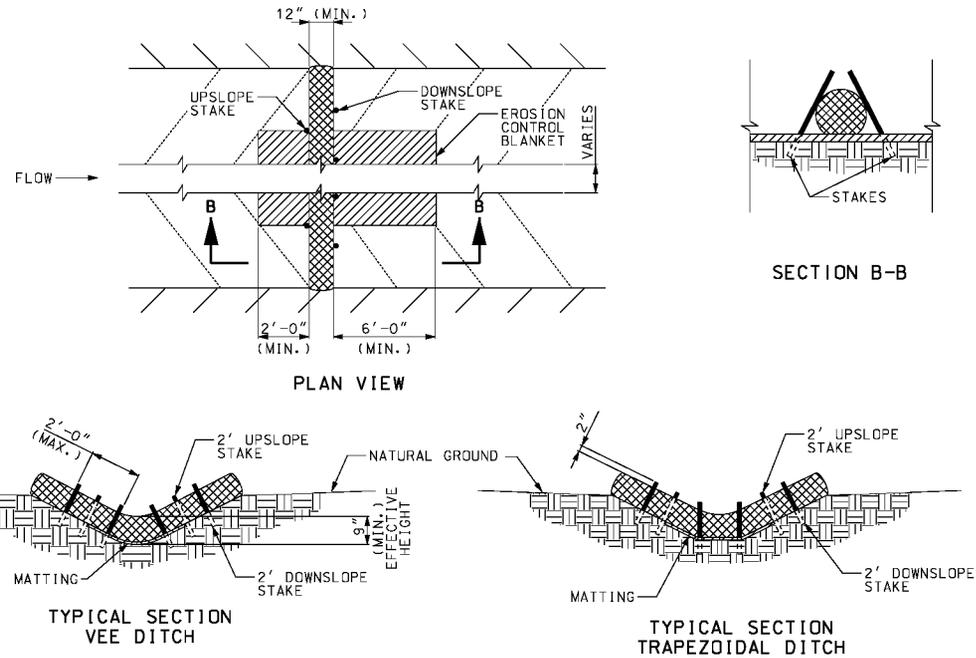
EXAMPLE DITCH CHECK SPACING FOR STANDARD HEIGHTS (FT.)

DITCH & SLOPE %	SPACING FOR 9" EFF. HEIGHT	SPACING FOR 18" EFF. HEIGHT
0.5	150	300
1.0	75	150
1.5	50	100
2.0	37	75
2.5	30	60
3.0	25	50
3.5	21	43
4.0	19	38
4.5	16	33
5.0	15	30
5.5	13	27
6.0	12	25
6.5	11	23
7.0	10	21
7.5	10	20
8.0	9	19
8.5	9	18
9.0	8	17
9.5	8	16
10.0	7	15



MINIMUM DITCH CHECK SPACING

ALTERNATE DITCH CHECK



NOTES:

- USE MINIMUM 12 IN. DIAMETER LOG/SOCK.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- INSTALL LOG/SOCK TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND LOG/SOCK AND SCOUR DITCH SLOPES OR AS DIRECTED BY ENGINEER.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE LOG/SOCK TO BOTTOM OF DITCH.
- EROSION CONTROL BLANKET SHALL BE ANCHORED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

GENERAL NOTES:

- OTHER PROPRIETARY DITCH CHECKS MAY BE SUBSTITUTED IN ACCORDANCE WITH SEC 806 OR AS DIRECTED BY THE ENGINEER.
- INSTALLATION OF PROPRIETARY DITCH CHECKS SHALL BE ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

TEMPORARY EROSION CONTROL MEASURES

TEMPORARY DITCH CHECKS

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

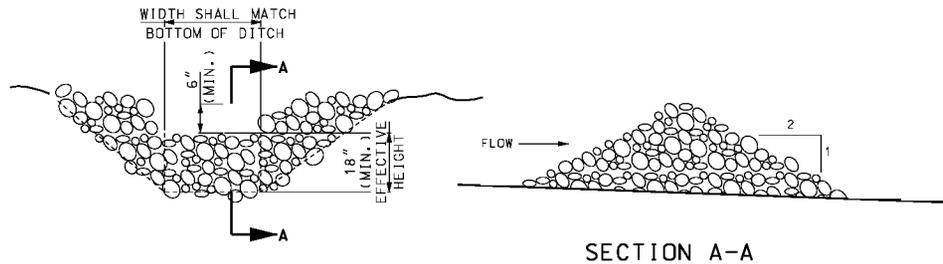
DATE EFFECTIVE: 04/01/2015

DATE PREPARED: 2/20/2015

806.10J

SHEET NO. 1 OF 6

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



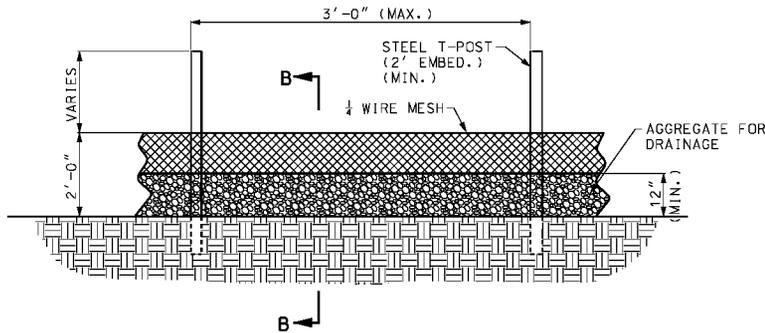
END VIEW

SECTION A-A

NOTE:

SEDIMENT TRAP

SEDIMENT TRAP IN THE CLEAR ZONE SHALL BE REMOVED OR LEVELED (IF ALLOWABLE) AFTER THE VEGETATION HAS SUFFICIENTLY MATURED TO PROTECT THE DITCH OR SWALE.



ELEVATION DETAIL

NOTES:

AGGREGATE FOR DRAINAGE SHALL BE IN ACCORDANCE WITH SEC 1009, GRADE 4 OR GRADE 5.

USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH 1/4 INCH MESH OPENINGS.

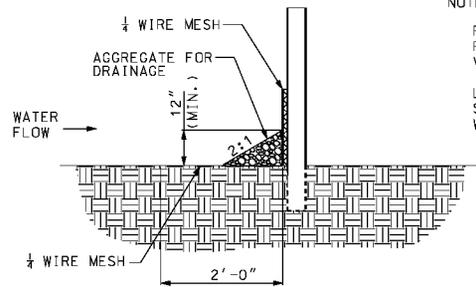
INSTALL 5 FT. T-POST WITH A 2 FOOT EMBEDMENT DEPTH (MIN.).

ATTACH HARDWARE CLOTH TO POST WITH WIRE STAPLE OR OTHER ACCEPTABLE METHODS

SPACE POST A MAXIMUM OF 3 FT.

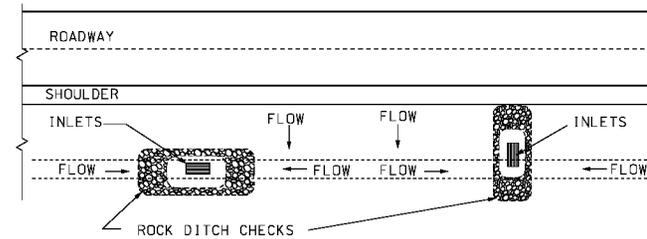
FOR INSTALLATION BETWEEN SECTIONS OF SILT FENCE, EXTEND AGGREGATE FOR DRAINAGE A MINIMUM OF 12 INCHES ON EACH SIDE OF SPECIAL SEDIMENT CONTROL FENCE SECTION.

INSTALLATION SHALL BE FOR AREA INLETS AND PERIMETER PROTECTION BMP'S.



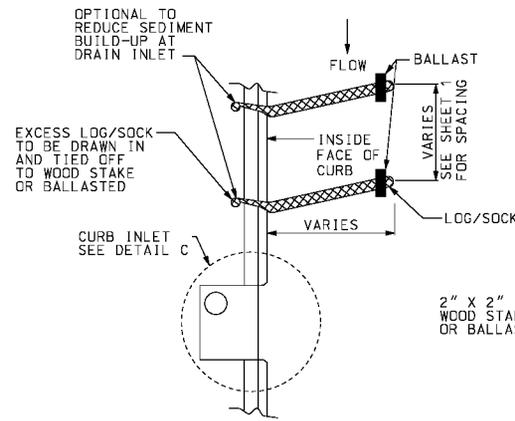
SECTION B-B

ROCK/MESH SEDIMENT CONTROL FENCE



DROP INLET CHECK

SEE SHEET 1 OF 6 FOR DETAILS OF ROCK DITCH CHECK.

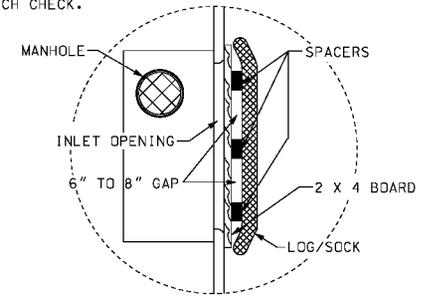


PLAN

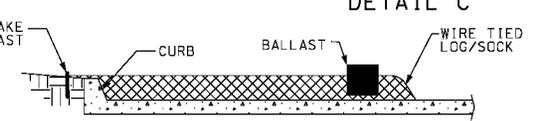
NOTES:

PRIOR TO PLACEMENT ALL DEBRIS, ROCK, LARGE CLODS AND WOOD VEGETATION SHALL BE CLEARED.

LOG/SOCK PLACED ON PAVEMENT SHALL BE WEIGHTED DOWN WITH GRAVEL/SAND BALLAST.



DETAIL C



SECTION
INLET PROTECTION DROP CONTAINMENT

GENERAL NOTES:

OTHER PROPRIETARY INLET PROTECTION MAY BE SUBSTITUTED IN ACCORDANCE WITH SEC 806 OR AS DIRECTED BY THE ENGINEER.

FOR SEDIMENT CONTROL SPACING SEE SHEET 1 OF 6.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-08411
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

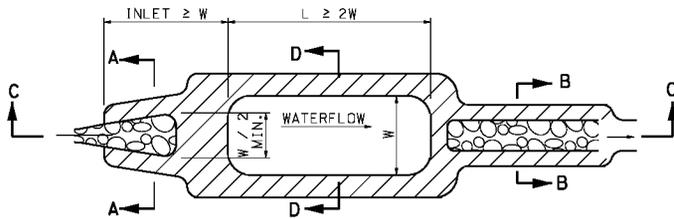
TEMPORARY EROSION CONTROL MEASURES

DATE EFFECTIVE: 04/01/2015
 DATE PREPARED: 2/20/2015

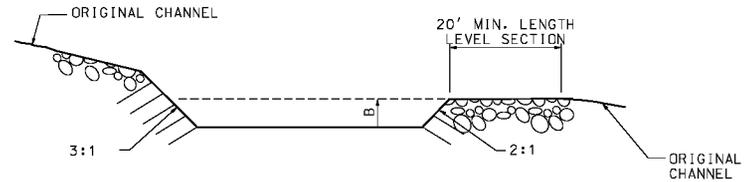
806.10J

SHEET NO.
 2 OF 6

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

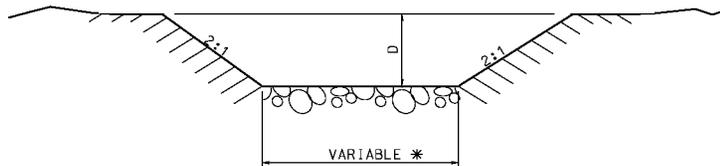


PLAN VIEW



SECTION C-C

EFFECTIVE DEPTH "B" = MIN. 2', MAX. 6' DEPENDENT UPON CONFIGURATION REQUIRED BY LOCATION AND ESTIMATED VOLUME.

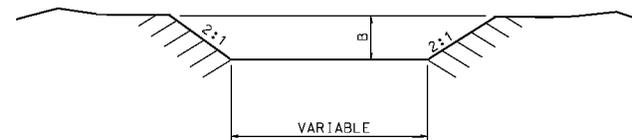


SECTION A-A

INLET

D = 1.0' + DESIGN FLOW DEPTH-MIN.

* VARIES FROM WIDTH OF STREAM AT INLET TO ONE-HALF WIDTH OF POND AT OUTLET.



SECTION D-D

GENERAL NOTES:

SEDIMENT BASINS ARE TO BE INCLUDED IN THE BMP SYSTEM WHEN THE GEOMETRY OF RIGHT-OF-WAY ALLOWS. WHERE INCLUDED, SEDIMENT BASINS ARE TO BE DESIGNED AND CONSTRUCTED TO PROVIDE STORAGE VOLUME FOR THE LOCAL 2-YR. 24-HOUR STORM FOR DISTURBED ACREAGE DRAINING TO THEM. IF THE DESIGN STORM VOLUME HAS NOT BEEN CALCULATED, BASINS ARE TO BE DESIGNED AND CONSTRUCTED TO PROVIDE A STORAGE VOLUME OF AT LEAST 3,600 CUBIC FEET PER DISTURBED ACRE DRAINING TO THE BASIN(S).

IF SEDIMENT BASIN IS TO BE PERMANENT ITS SLOPES SHALL BE STABILIZED WITH ROCK RIPRAP OR EQUIVALENT.

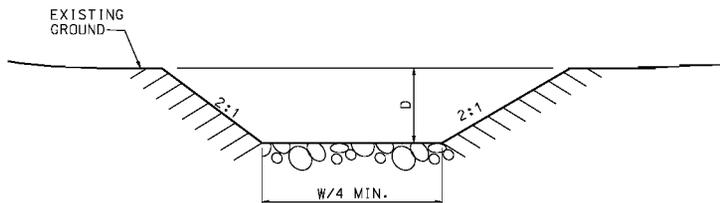
THE MATERIALS FOR ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF SEC 611.30 FOR TYPE 2 ROCK BLANKET.

SEE PLANS FOR LENGTH, DEPTH AND WIDTH OF BASIN.

SEE PLANS FOR ESTIMATED QUANTITIES OF ROCK RIPRAP - CUBIC YARDS.



LAYER OF APPROVED STABILIZING MATERIAL FOR SCOUR PREVENTION



SECTION B-B

OUTLET

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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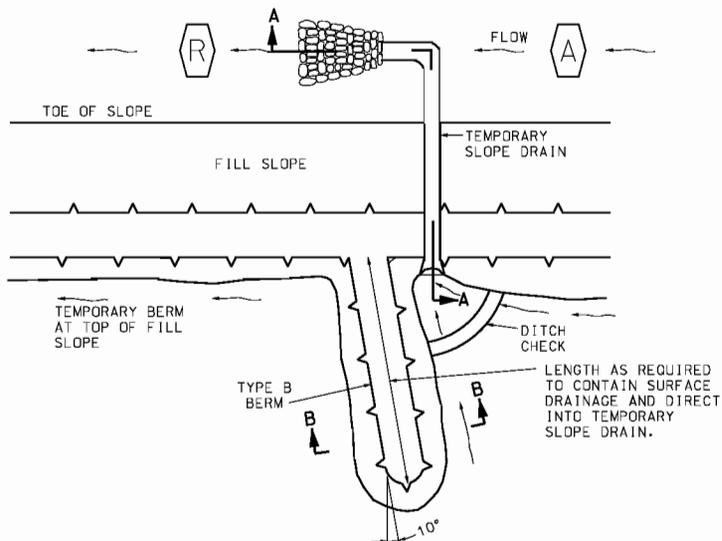
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**TEMPORARY EROSION CONTROL MEASURES
 SEDIMENT BASIN**

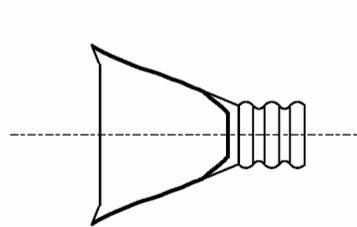
DATE EFFECTIVE: 04/01/2015
 DATE PREPARED: 2/20/2015

806.10J

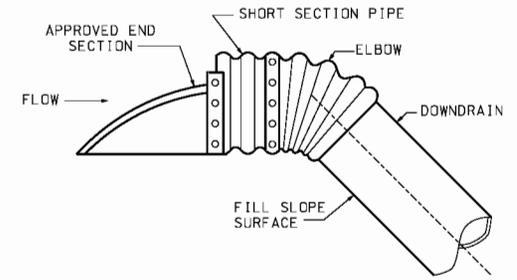
SHEET NO.
 3 OF 6



PLAN VIEW

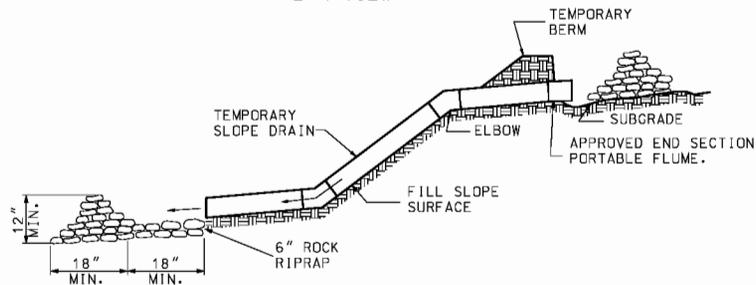


PLAN VIEW



SECTION VIEW

TEMPORARY SLOPE DRAIN INLET TREATMENT



NOTE:

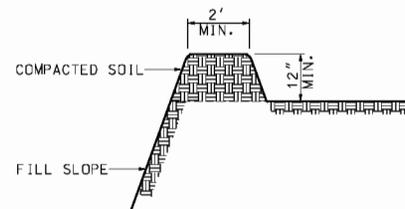
IN SOME CASES IT MAY BE NECESSARY TO EMBED METAL OR PLASTIC PIPE INTO THE FILL SLOPE TO SECURE PROPER ANCHORAGE.

SECTION A-A

TEMPORARY BERM

(METAL, FLEXIBLE RUBBER OR PLASTIC PIPE)

NOTE:
MAXIMUM LENGTH BETWEEN SLOPE DRAINS SHALL BE APPROXIMATELY 500 FEET.



SECTION B-B
TYPE B BERM

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

STATE OF MISSOURI
 ERIC E. SCHROETER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

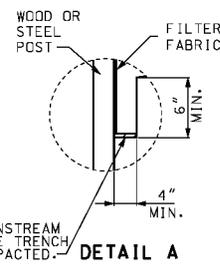
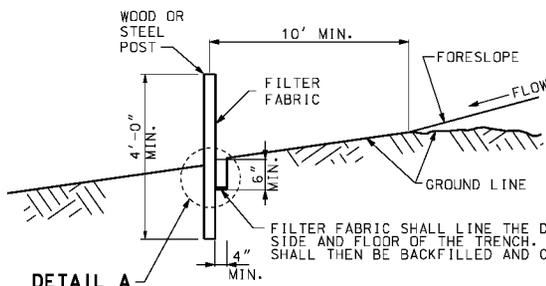
TEMPORARY EROSION CONTROL MEASURES
 SLOPE DRAINS

DATE EFFECTIVE: 04/01/2015
 DATE PREPARED: 2/20/2015

806.10J

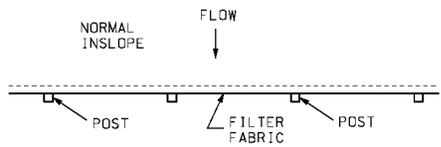
SHEET NO.
 4 OF 6

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

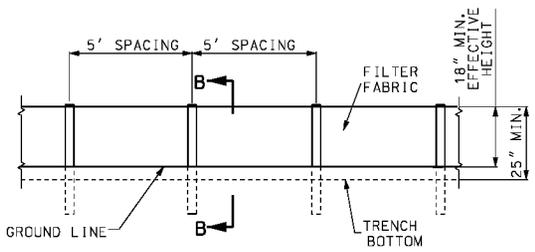


TYPICAL B-B

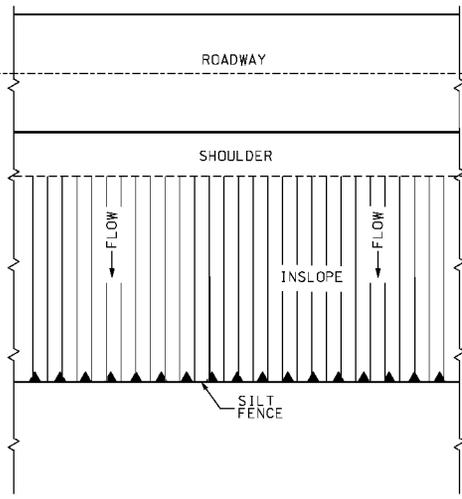
FILTER FABRIC SHALL LINE THE DOWNSTREAM SIDE AND FLOOR OF THE TRENCH. THE TRENCH SHALL THEN BE BACKFILLED AND COMPACTED.



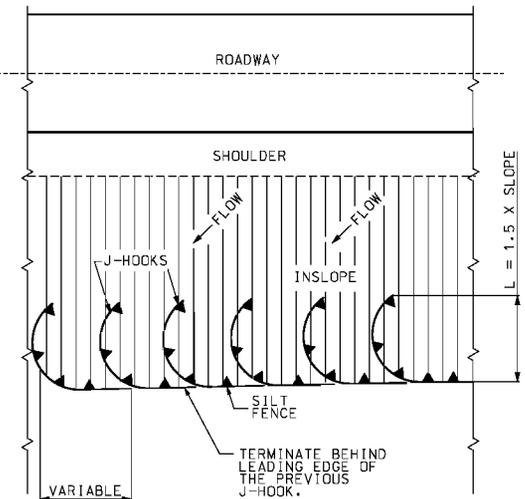
PLAN VIEW



ELEVATION DETAIL FABRIC SILT FENCE

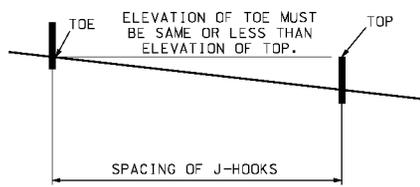


PERIMETER SILT FENCE FOR TRANSVERSE FLOW



FOR SPACING SEE SHEET 1 OF 6

PERIMETER SILT FENCE FOR ANGULAR FLOW



MINIMUM J-HOOK SPACING

GENERAL NOTES:

USE SILT FENCE FOR FILL HEIGHTS GREATER OR EQUAL TO 10 FEET. ON ALL FILLS GREATER THAN 10 FEET HIGH, MID-SLOPE RUNS OF SILT FENCE SHOULD BE CONSIDERED.

FOR FABRIC SILT FENCE:

MINIMUM LONGITUDINAL SPLICE OVERLAP SHALL BE 2' WITH A POST AT EACH END.

SECURE FABRIC TO POSTS.

INSTEAD OF SILT FENCE ACROSS DRAINAGE DITCHES AND DRAINS, DITCH CHECKS SHALL BE USED AS SHOWN ON PLANS OR AS DIRECTED BY ENGINEER.

AT CULVERTS, PLACE SEDIMENT BARRIERS OVER THE TOP OF THE CULVERTS (NOT IN THE STREAM CHANNEL).

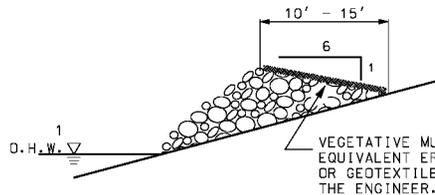
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TEMPORARY EROSION CONTROL MEASURES SILT FENCE	

DATE EFFECTIVE: 04/01/2015	806.10J	SHEET NO. 5 OF 6
DATE PREPARED: 2/20/2015		

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

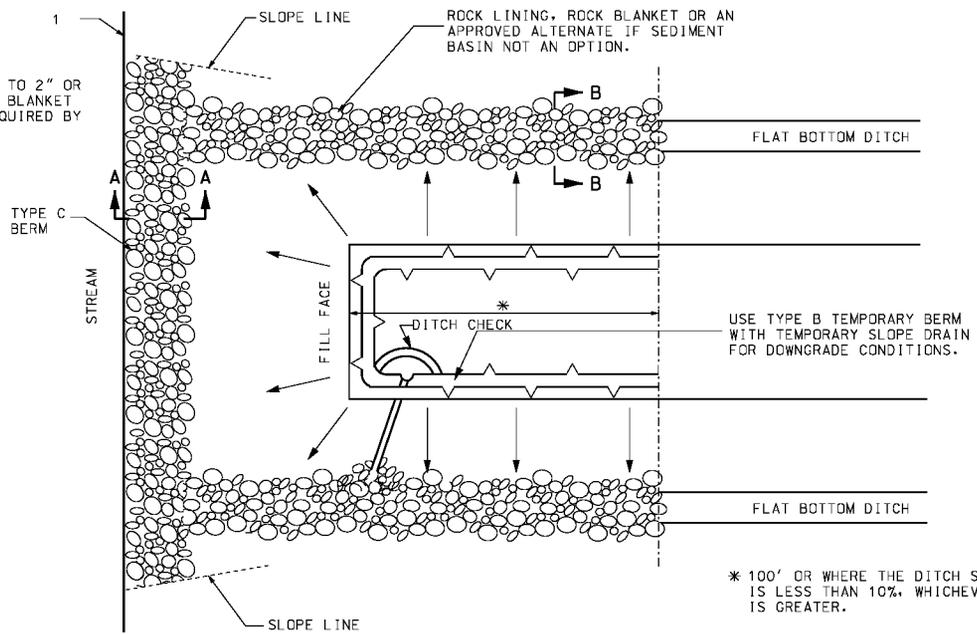


THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.



**SECTION A-A
TYPE C BERM (3)**

(1) TYPE C BERM SHALL BE PLACED ABOVE THE ORDINARY HIGH WATER (O.H.W.) OR AT AN ELEVATION AS DIRECTED BY THE ENGINEER.



PLAN VIEW



SECTION B-B (4)

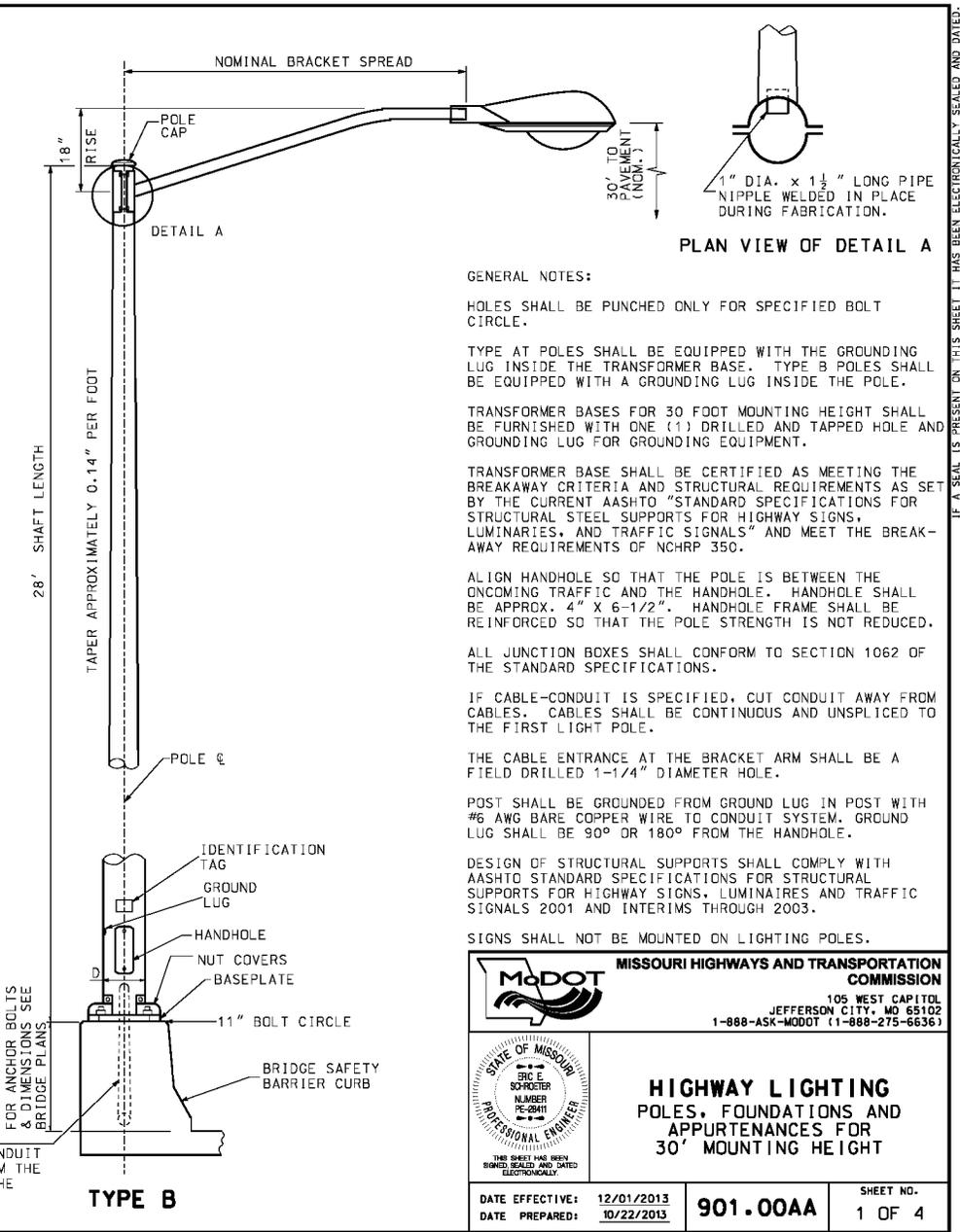
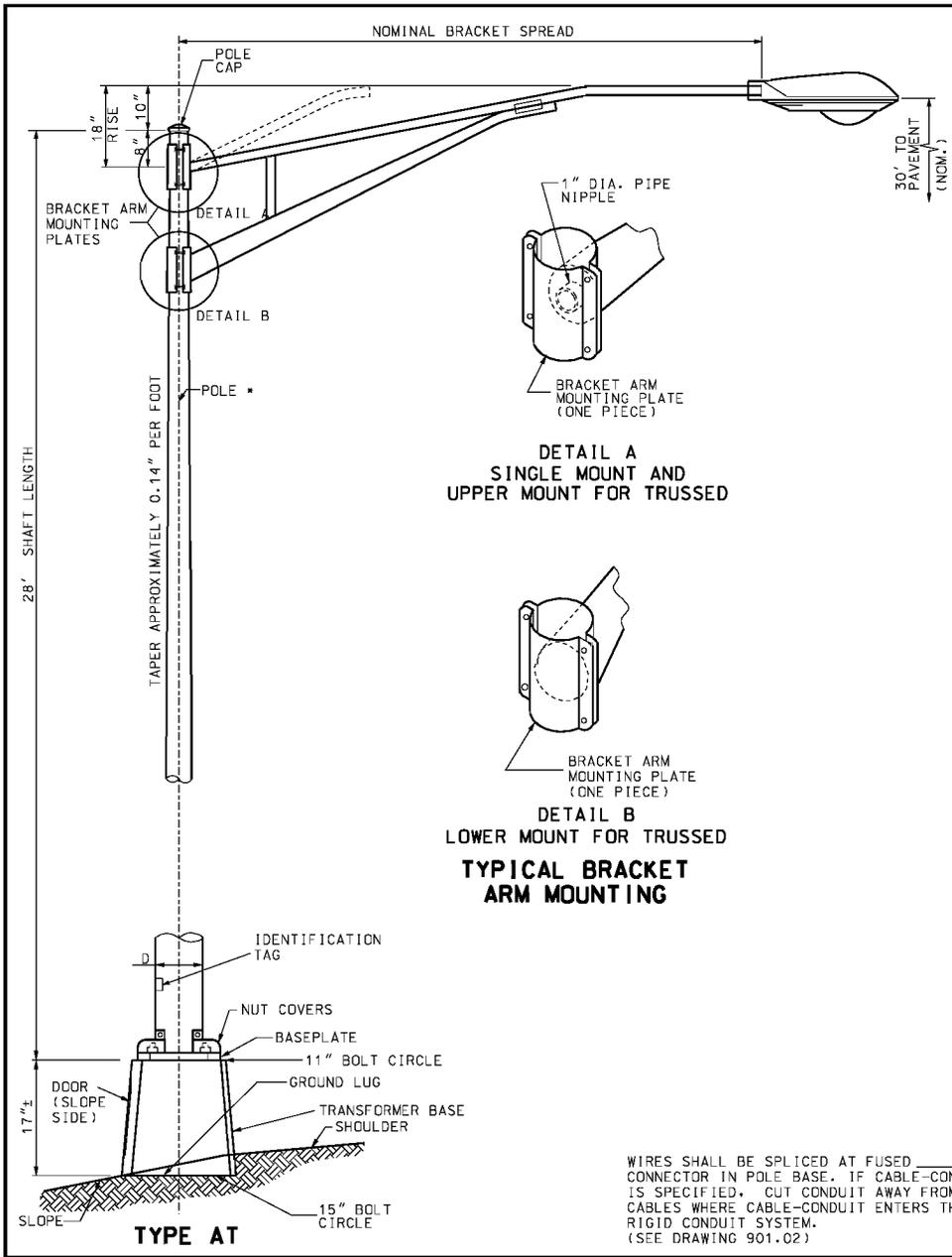
* 100' OR WHERE THE DITCH SLOPE IS LESS THAN 10%, WHICHEVER IS GREATER.

GENERAL NOTES:

TYPE C BERM SHALL BE BUILT TO HANDLE SIGNIFICANT RUN-OFF EVENTS AND SHALL BE INSTALLED PRIOR TO SOIL DISTURBANCE OR PLACEMENT OF FILL IN THE DRAINAGE AREA OF THE BERM.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TEMPORARY EROSION CONTROL MEASURES BRIDGES AND BOX CULVERTS AT STREAM CROSSINGS	
	DATE EFFECTIVE: 04/01/2015 DATE PREPARED: 2/20/2015	SHEET NO. 806.10J 6 OF 6

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



GENERAL NOTES:

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TYPE AT POLES SHALL BE EQUIPPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B POLES SHALL BE EQUIPPED WITH A GROUNDING LUG INSIDE THE POLE.

TRANSFORMER BASES FOR 30 FOOT MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE (1) DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL STEEL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" AND MEET THE BREAKAWAY REQUIREMENTS OF NCHRP 350.

ALIGN HANDHOLE SO THAT THE POLE IS BETWEEN THE ONCOMING TRAFFIC AND THE HANDHOLE. HANDHOLE SHALL BE APPROX. 4" X 6-1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

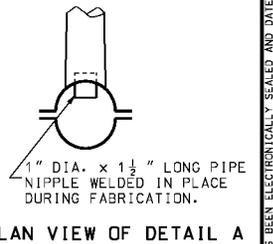
IF CABLE-CONDUIT IS SPECIFIED, CUT CONDUIT AWAY FROM CABLES. CABLES SHALL BE CONTINUOUS AND UNSPLICED TO THE FIRST LIGHT POLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1-1/4" DIAMETER HOLE.

POST SHALL BE GROUNDING FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM THE HANDHOLE.

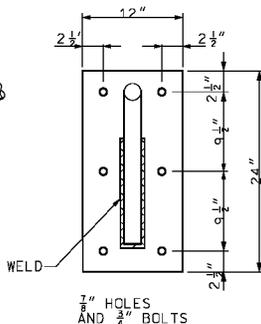
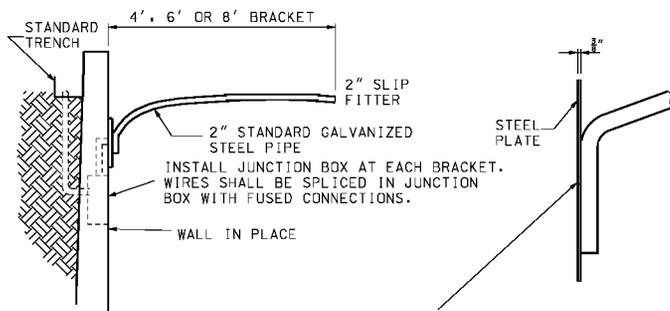
DESIGN OF STRUCTURAL SUPPORTS SHALL COMPLY WITH AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS 2001 AND INTERIMS THROUGH 2003.

SIGNS SHALL NOT BE MOUNTED ON LIGHTING POLES.

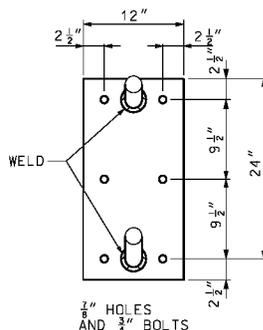
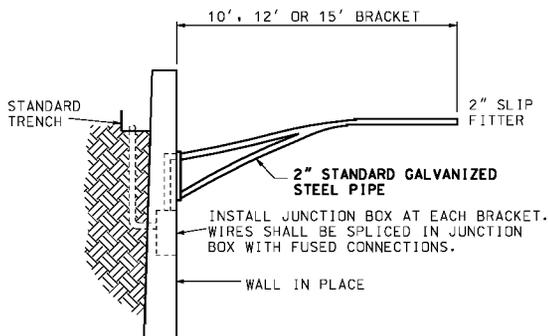


<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
	<p>HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT</p>
<p>DATE EFFECTIVE: 12/01/2013 DATE PREPARED: 10/22/2013</p>	<p>901.00AA</p>
<p>SHEET NO. 1 OF 4</p>	

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



WIRE ENTRANCE HOLE.
CLEAN AND BEVEL EDGES
TO PREVENT WIRE DAMAGE.



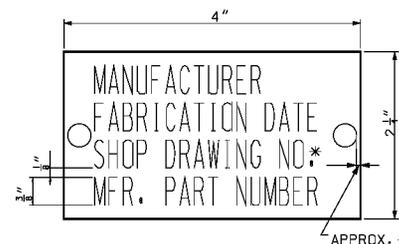
WALL BRACKETS

FACE PLATE DETAILS

ANSI LAMPS			
FUSE RATING	DESIGNATION	WATTS	INITIAL LUMENS
3 A	HPS	150	16,000
	S55		
TYPE III MEDIUM DISTRIBUTION SEMI-CUTOFF UNLESS OTHERWISE SPECIFIED ON PLANS			

TYPE AT POLE				
BRACKET SPREAD	4' - 10' 12' 15'			
MAX. LUMINAIRE WEIGHT	75 LB 71 LB 66 LB			
MAX. PROJECTED AREA	3.3 SQ. FT.			
SINGLE AND TRUSSED BRACKET ARMS				
LOCATION	LENGTH POLE	BRACKET SPREAD	TRANS. BASE BOLT CIRC.	D
SHOULDER	28'	4', 6', 8', 10', 12', 15'	15"	8"

TYPE B POLE				
BRACKET SPREAD	4' 6' 8'			
MAX. LUMINAIRE WEIGHT	75 LB 75 LB 54 LB			
MAX. PROJECTED AREA	3.3 SQ. FT.			
SINGLE BRACKET ARM				
LOCATION	LENGTH POLE	BRACKET SPREAD	D	ANCHOR BOLT DIA.
BRIDGE SAFETY BARRIER CURB	28'	4', 6', 8'	8"	1"



ID TAG NOTE:
TAG SHALL BE ALUMINUM OR STAINLESS STEEL AND ATTACHED TO POLE USING TWO RIVETS OR STAINLESS STEEL DRIVE SCREWS.
* INCLUDING REVISION

IDENTIFICATION TAG

GENERAL NOTES:

- HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.
- TYPE AT POLES SHALL BE EQUIPPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B POLES SHALL BE EQUIPPED WITH A GROUNDING LUG INSIDE THE POLE.
- TRANSFORMER BASES FOR 30 FOOT MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE (1) DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.
- TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL STEEL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" AND MEET THE BREAK-AWAY REQUIREMENTS OF NCHRP 350.
- ALIGN HANDHOLE SO THAT THE POLE IS BETWEEN THE ONCOMING TRAFFIC AND THE HANDHOLE. HANDHOLE SHALL BE APPROX. 4" X 6-1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.
- ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.
- IF CABLE-CONDUIT IS SPECIFIED, CUT CONDUIT AWAY FROM CABLES. CABLES SHALL BE CONTINUOUS AND UNSPLICED TO THE FIRST LIGHT POLE.
- THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1-1/4" DIA. HOLE.
- POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM THE HANDHOLE.
- ID TAG HOLES SHALL BE DRILLED INTO POLE PRIOR TO GALVANIZING.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

**HIGHWAY LIGHTING
POLES, FOUNDATIONS AND
APPURTENANCES FOR
30' MOUNTING HEIGHT**

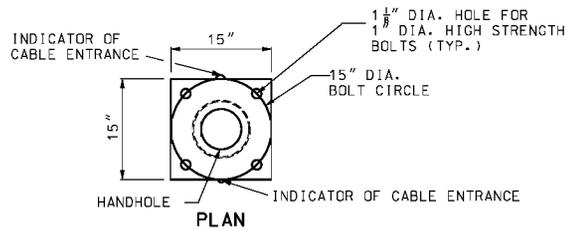
THIS SHEET HAS BEEN
SIGNED, SEALED AND DATED
ELECTRONICALLY

DATE EFFECTIVE: 12/01/2013
DATE PREPARED: 10/22/2013

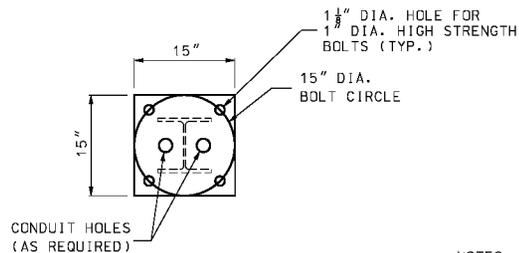
901.00AA

SHEET NO.
2 OF 4

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



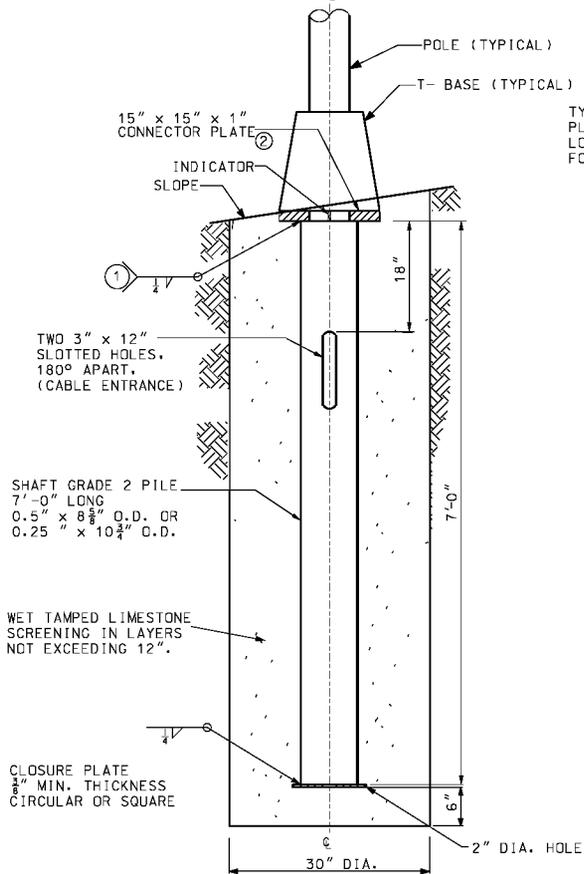
PLAN



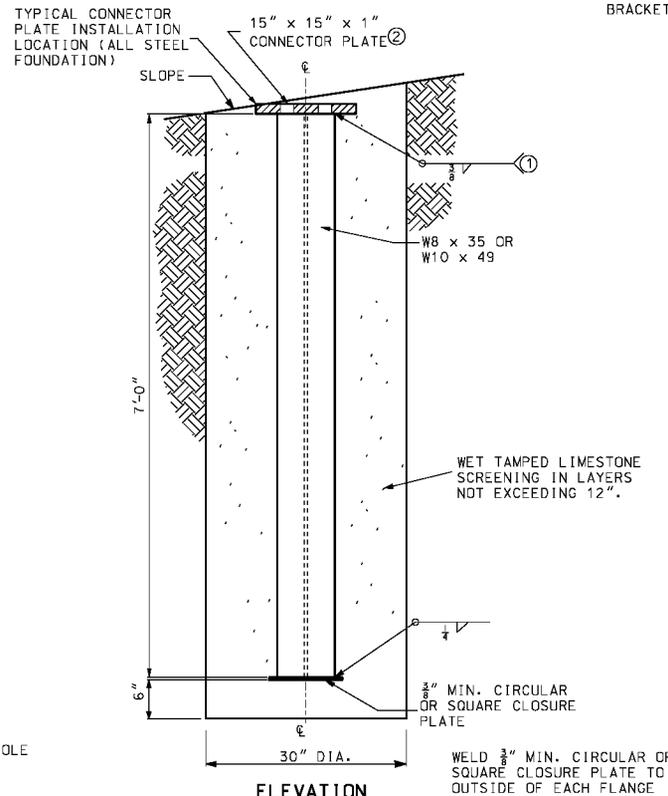
PLAN

NOTES:

- ① GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- ② FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.



ELEVATION
DETAILS OF CIRCULAR
STEEL PILE FOUNDATION



ELEVATION
DETAILS OF STEEL
"H" PILE FOUNDATION

GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

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

STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER

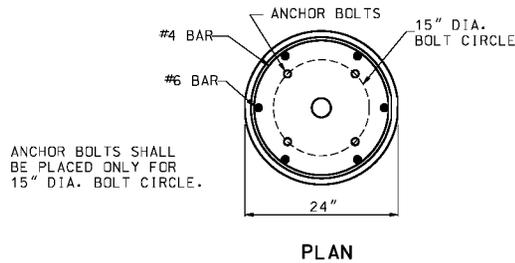
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**HIGHWAY LIGHTING
 POLES, FOUNDATIONS AND
 APPURTENANCES FOR
 30' MOUNTING HEIGHT**

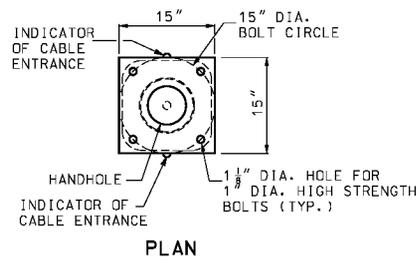
DATE EFFECTIVE: 12/01/2013
 DATE PREPARED: 10/22/2013

901.00AA

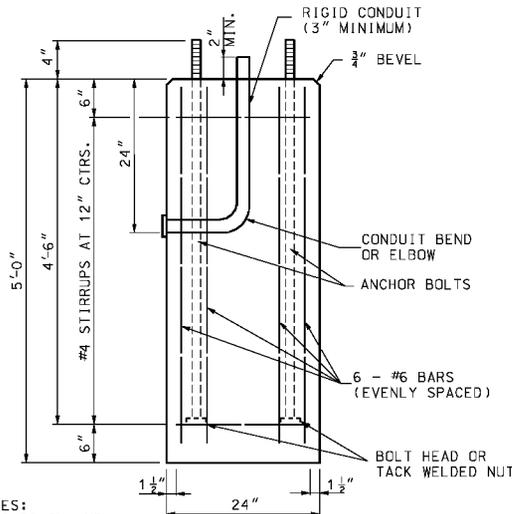
SHEET NO.
 3 OF 4



PLAN

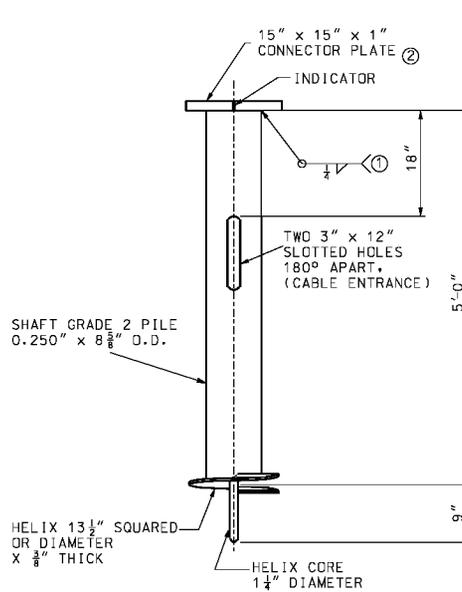


PLAN

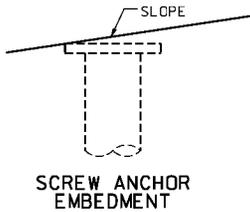
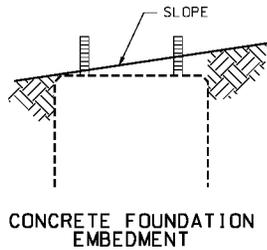


QUANTITIES:
 CONC. = 0.58 CU. YD.
 REIN. = 64 LBS.

ELEVATION
 DETAILS OF CONCRETE FOUNDATION ③



ELEVATION
 DETAILS OF SCREW ANCHOR FOUNDATION



DRIVE HOLES WILL BE PERMITTED PROVIDED THAT THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE, THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.

NOTES:

- ① GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- ② FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.
- ③ AT THE OPTION OF THE CONTRACTOR THE CONCRETE FOUNDATION MAY BE PRECAST. IF PRECAST, THEY SHALL BE SET IN DRILLED HOLES 3 FEET IN DIAMETER AND 6 INCHES DEEPER THAN THE BOTTOM OF THE CONCRETE FOUNDATION. THE BOTTOM 6 INCHES OF THE HOLE AND THE REMAINING SPACE AROUND THE FOUNDATION SHALL BE BACKFILLED WITH WET TAMPED LIMESTONE SCREENINGS IN LAYERS NOT EXCEEDING 12 INCHES.

GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

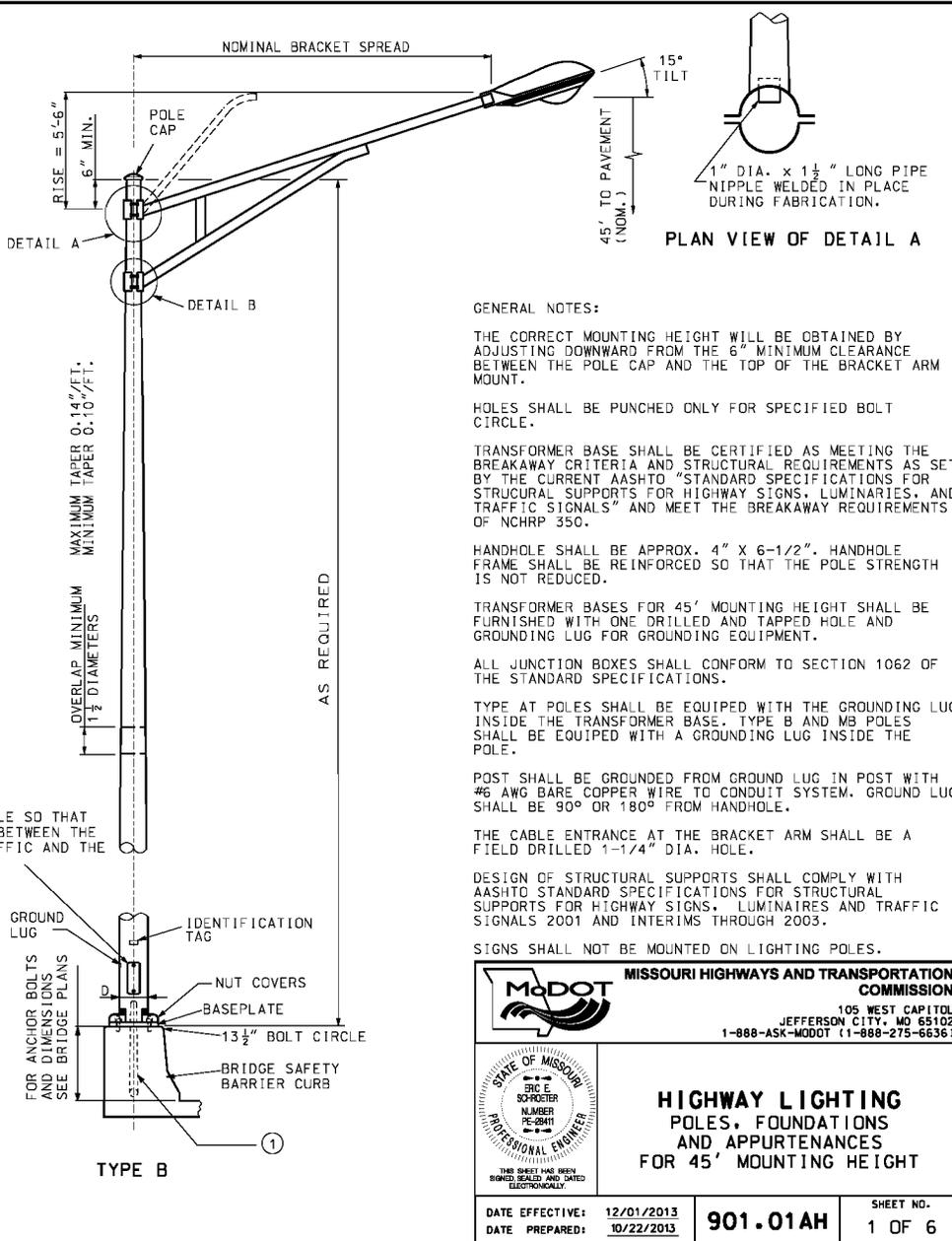
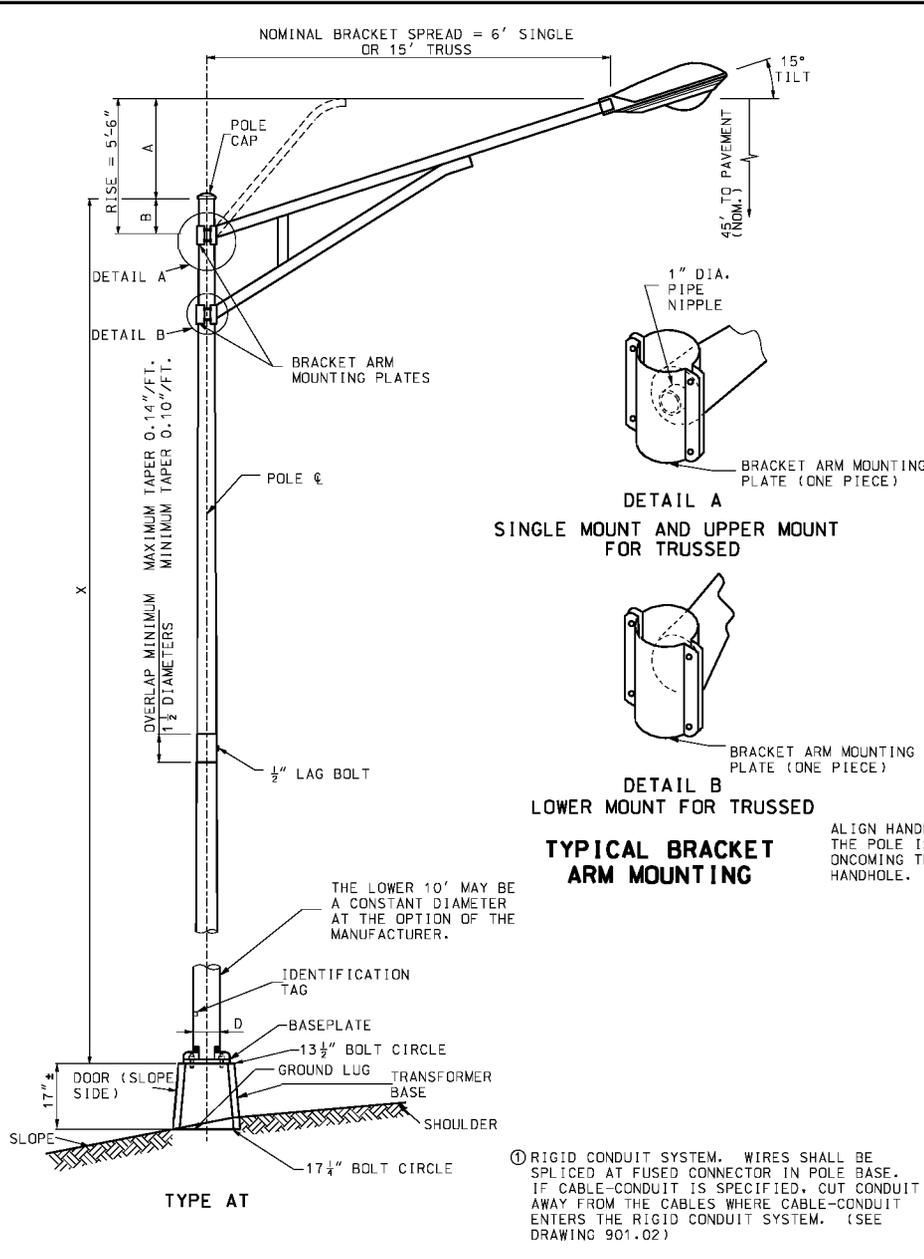
ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

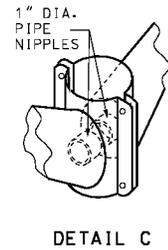
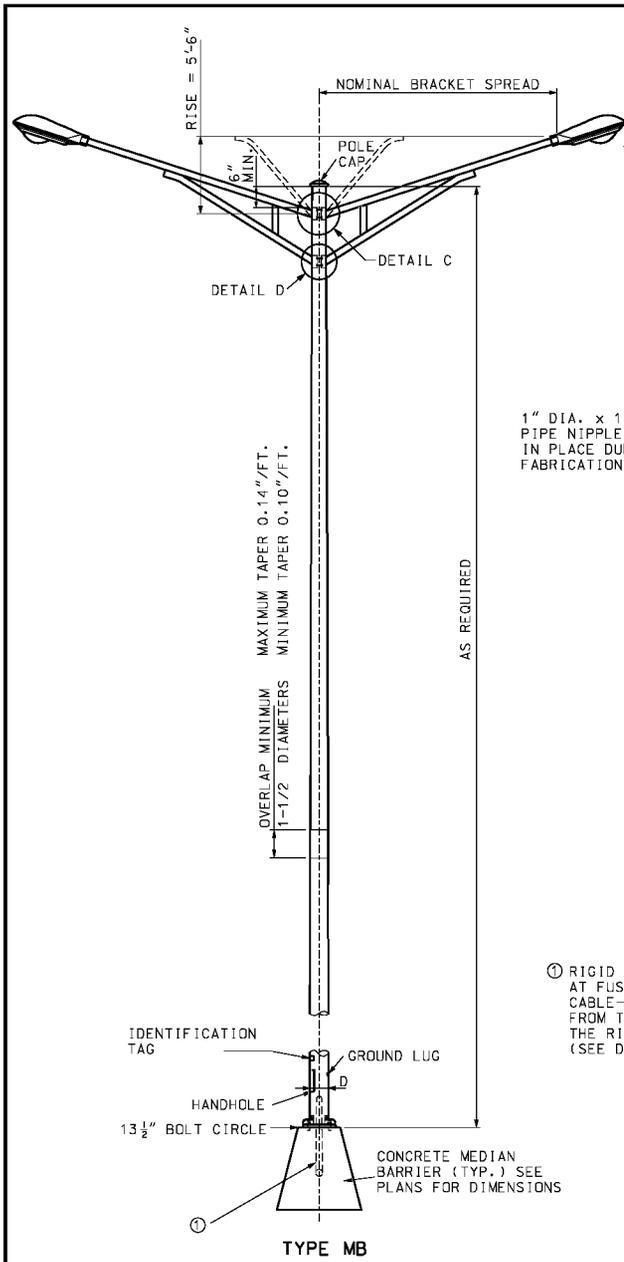
ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT	
DATE EFFECTIVE:	12/01/2013	901.00AA	SHEET NO.
DATE PREPARED:	10/22/2013		4 OF 4

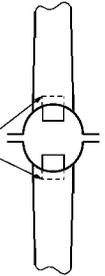
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



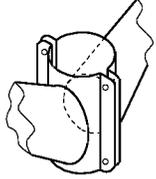
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



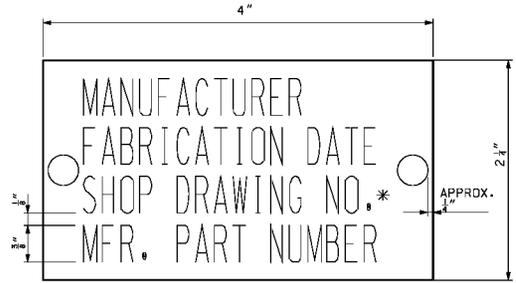
DETAIL C



PLAN VIEW OF DETAIL C



DETAIL D
LOWER MOUNT FOR TRUSSED



IDENTIFICATION TAG

ID TAG NOTE:

TAG SHALL BE ALUMINUM OR STAINLESS STEEL AND ATTACHED TO POLE USING TWO RIVETS OR STAINLESS STEEL DRIVE SCREWS. ID TAG HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

* INCLUDING REVISION

GENERAL NOTES:

THE CORRECT MOUNTING HEIGHT WILL BE OBTAINED BY ADJUSTING DOWNWARD FROM THE 6" MINIMUM CLEARANCE BETWEEN THE POLE CAP AND THE TOP OF THE BRACKET ARM MOUNT.

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS" AND MEET THE BREAKAWAY REQUIREMENTS OF NCHRP 350.

HANDHOLE SHALL BE APPROX. 4" X 6-1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.

TRANSFORMER BASES FOR 45' MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

TYPE AT POLES SHALL BE EQUIPPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B AND MB POLES SHALL BE EQUIPPED WITH A GROUNDING LUG INSIDE THE POLE.

POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM HANDHOLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1-1/4" DIA. HOLE.

SIGNS SHALL NOT BE MOUNTED ON LIGHTING POLES.

① RIGID CONDUIT SYSTEM. WIRES SHALL BE SPLICED AT FUSED CONNECTOR IN POLE BASE. IF CABLE-CONDUIT IS SPECIFIED, CUT CONDUIT AWAY FROM THE CABLES WHERE CABLE-CONDUIT ENTERS THE RIGID CONDUIT SYSTEM. (SEE DRAWING 901.02)

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

STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT

DATE EFFECTIVE: 12/01/2013	801.01AH	SHEET NO. 2 OF 6
DATE PREPARED: 10/22/2013		

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

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

TYPE AT POLE				
BRACKET SPREAD		6' OR 15'		
MAX. LUMINAIRE WEIGHT		60 LB		
MAX. PROJECTED AREA		3.3 SQ. FT.		
AT-45 DESIGN NO.	X	A	B	D* (NOMINAL)
1	50'	VAR.	6" MIN.	10"
2	45'	VAR.	6" MIN.	10"
3	40'	VAR.	6" MIN.	10"
4	35'	VAR.	6" MIN.	10"
5	30'	VAR.	6" MIN.	10"

* THE MINIMUM ALTERNATE DIAMETER SHALL BE 10" FOR A 50' POLE, 9-1/2" FOR A 45' POLE, 9" FOR A 40' POLE, 8-1/2" FOR A 35' POLE AND 8" FOR A 30' POLE.

ANSI LAMPS			
FUSE RATING	DESIGNATION HPS	WATTS	INITIAL LUMENS
3A	S55	150	16,000
5A	S50	250	27,500
7A	S51	400	50,000
TYPE III MEDIUM DISTRIBUTION SEMI-CUTOFF UNLESS OTHERWISE SPECIFIED ON PLANS			

TYPE B POLE			
BRACKET SPREAD		6' OR 15'	
MAX. LUMINAIRE WEIGHT		60 LB	
MAX. PROJECTED AREA		3.3 SQ. FT.	
SINGLE BRACKET ARM			
LOCATION	BRACKET SPREAD	D NOM.	ANCHOR BOLT DIA.
BRIDGE SAFETY BARRIER CURB	6'	10"	1-1/4"
TRUSSED BRACKET ARM			
LOCATION	BRACKET SPREAD	D NOM.	ANCHOR BOLT DIA.
BRIDGE SAFETY BARRIER CURB	15'	10"	1-1/4"

TYPE MB POLE		
BRACKET SPREAD		6' OR 15'
MAX. LUMINAIRE WEIGHT		60 LB
MAX. PROJECTED AREA		3.3 SQ. FT.
DOUBLE BRACKET ARM		
LOCATION	BRACKET SPREAD	D NOM.
MEDIAN BARRIER CURB	6'	10"
DOUBLE TRUSSED BRACKET ARM		
LOCATION	BRACKET SPREAD	D NOM.
MEDIAN BARRIER CURB	15'	10"

GENERAL NOTES:

THE CORRECT MOUNTING HEIGHT WILL BE OBTAINED BY ADJUSTING DOWNWARD FROM THE 6" MINIMUM CLEARANCE BETWEEN THE POLE CAP AND THE TOP OF THE BRACKET ARM MOUNT.

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS" AND MEET THE BREAKAWAY REQUIREMENTS OF NCHRP 350.

HANDHOLE SHALL BE APPROX. 4" X 6 1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.

TRANSFORMER BASES FOR 45' MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

TYPE AT POLES SHALL BE EQUIPPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B AND MB POLES SHALL BE EQUIPPED WITH A GROUNDING LUG INSIDE THE POLE.

POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM HANDHOLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1 1/4" DIA. HOLE.



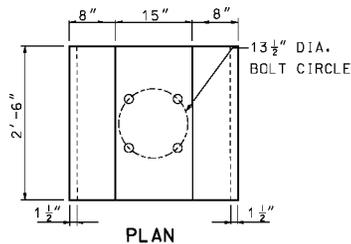
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



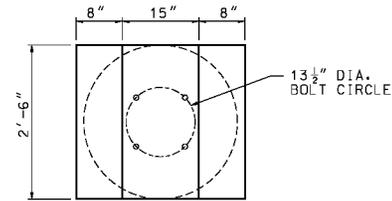
ERIC E. SCHRIETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**HIGHWAY LIGHTING
POLES, FOUNDATIONS
AND APPURTENANCES
FOR 45' MOUNTING HEIGHT**

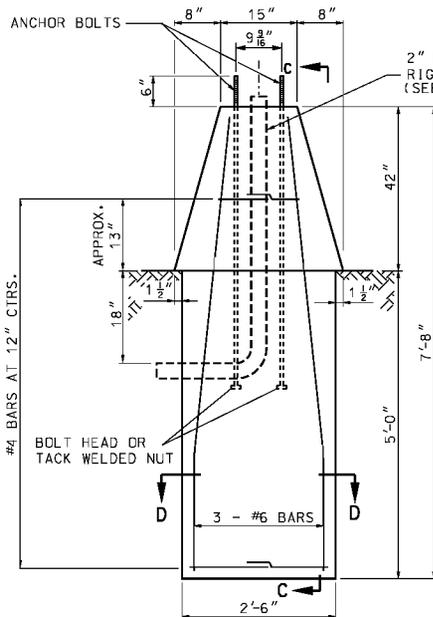
DATE EFFECTIVE:	12/01/2013	901.01AH	SHEET NO. 3 OF 6
DATE PREPARED:	10/22/2013		



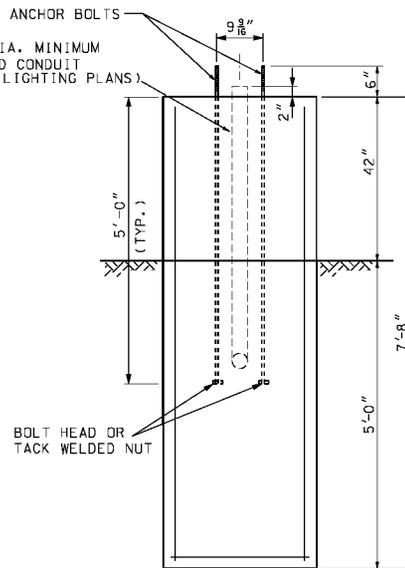
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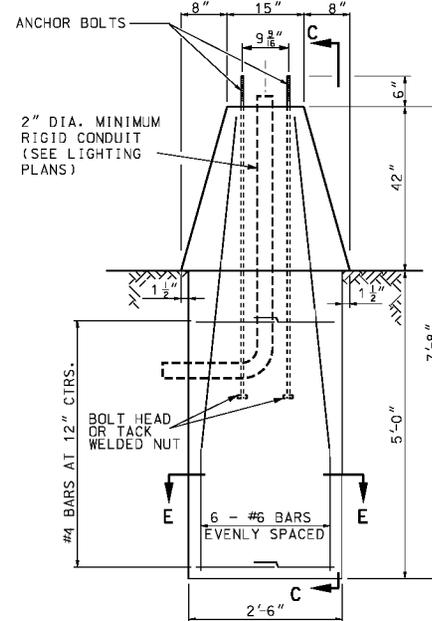
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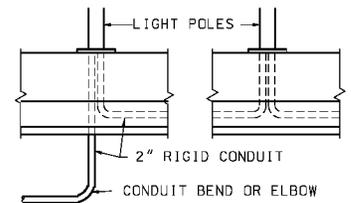
ELEVATION ALTERNATE 1



SECTION C-C



ELEVATION ALTERNATE 2



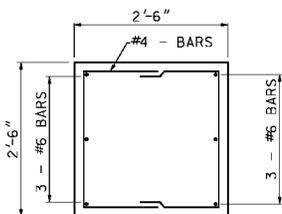
CONDUIT DETAIL FOR ALTERNATE 1 & 2

GENERAL NOTES:

ALL FOUNDATIONS SHALL INCLUDE 4 ANCHOR BOLTS AND NUTS PLACED AS SHOWN.

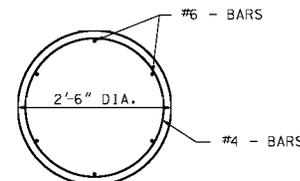
ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1/2" DIAMETER HIGH STRENGTH ANCHOR BOLTS.

TOUNGE AND GROOVE REQUIRED ON MEDIAN BARRIER SECTION FOR TYPE MB POLES WHEN ADJACENT MEDIAN BARRIER IS PRECAST. FOR DETAILS, SEE STANDARD PLANS.



SECTION D-D

CONCRETE MEDIAN BARRIER AND FOUNDATION DESIGN FOR TYPE MB LIGHT POLE



SECTION E-E

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

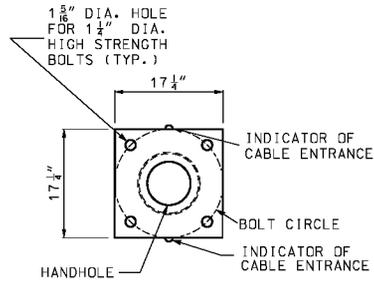
STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER
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HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT

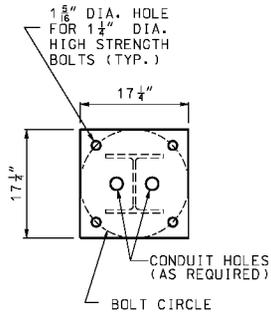
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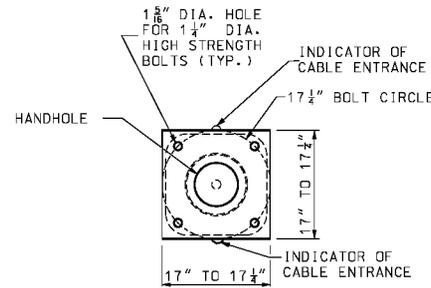
SHEET NO. 4 OF 6



PLAN

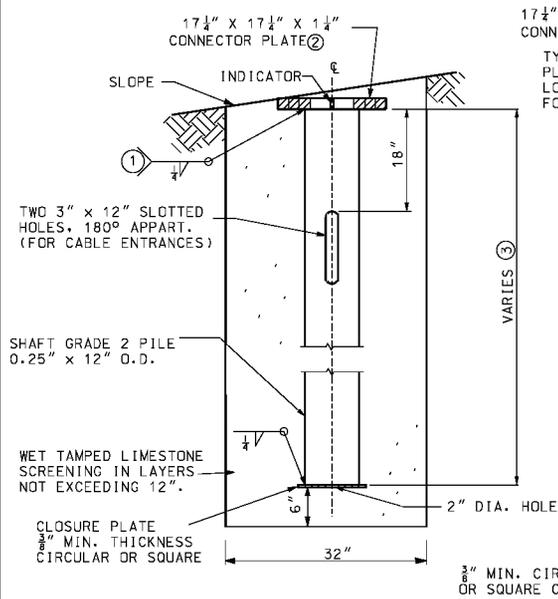


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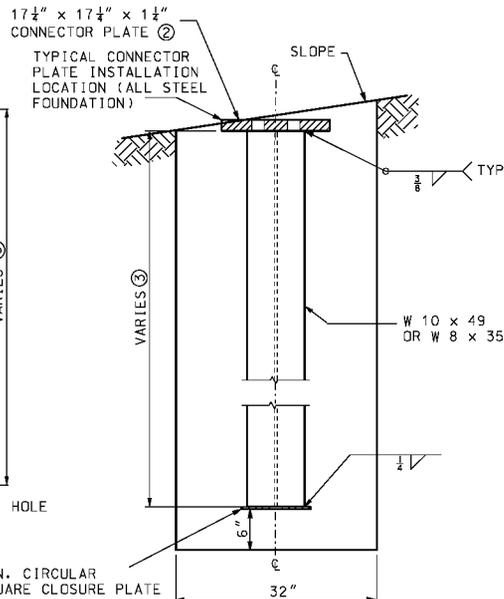


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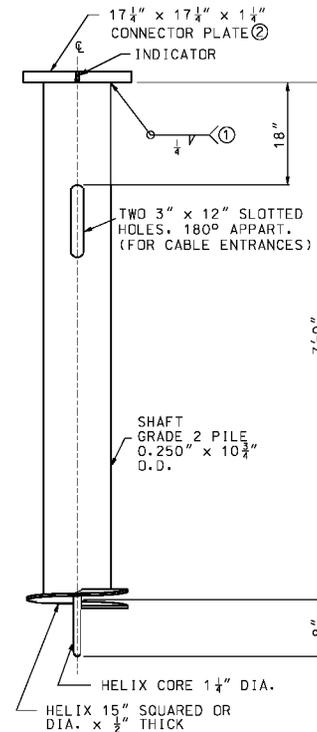
NOTE:
DRIVE HOLES WILL BE PERMITTED PROVIDED THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE, THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.



ELEVATION
DETAILS OF CIRCULAR
STEEL PILE FOUNDATION



ELEVATION
DETAILS OF STEEL "H"
PILE FOUNDATION



ELEVATION
DETAILS OF
SCREW ANCHOR FOUNDATION

- ① GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- ② FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.
- ③ PILE LENGTHS FOR STEEL PILE FOUNDATIONS:

AT-45 DESIGN NO.	PILE LENGTH
4 & 5	8'-0"
2 & 3	9'-0"
1	10'-0"

GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

ALL BOLT CIRCLES FOR 45' MOUNTING HEIGHT SHALL BE 17 1/4".

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1 1/4" DIAMETER HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

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

STATE OF MISSOURI
ERIC E. SCHREIER
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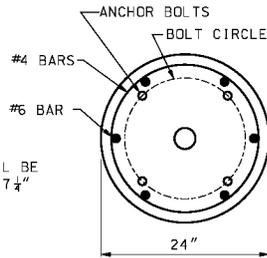
**HIGHWAY LIGHTING
POLES, FOUNDATIONS
AND APPURTENANCES
FOR 45' MOUNTING HEIGHT**

DATE EFFECTIVE: 12/01/2013
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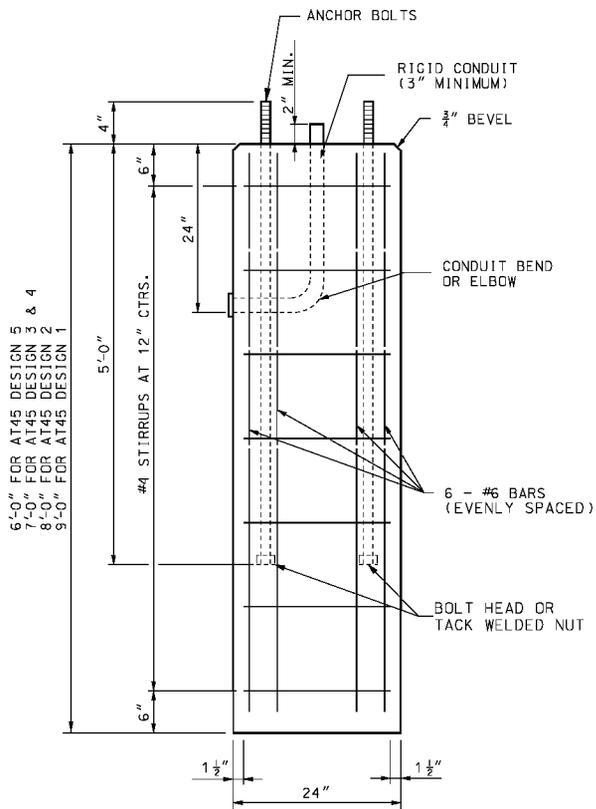
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SHEET NO.
5 OF 6

NOTE:
ANCHOR BOLTS SHALL BE
PLACED ONLY FOR 17 1/4"
BOLT CIRCLE



PLAN

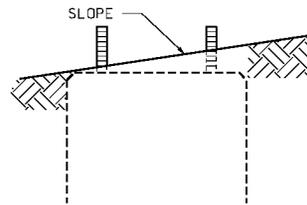


ELEVATION

DETAILS OF CONCRETE
FOUNDATION ④

④ AT THE OPTION OF THE CONTRACTOR THE CONCRETE FOUNDATIONS MAY BE PRECAST. IF PRECAST, THEY SHALL BE SET IN DRILLED HOLES 3 FEET IN DIAMETER AND 6 INCHES DEEPER THAN THE BOTTOM OF THE CONCRETE FOUNDATION. THE BOTTOM 6 INCHES OF THE HOLE AND THE REMAINING SPACE AROUND THE FOUNDATION SHALL BE BACKFILLED WITH WET TAMPED LIMESTONE SCREENINGS IN LAYERS NOT EXCEEDING 12 INCHES.

QUANTITIES		
HEIGHT	CONC. CU. YD.	REINF. LBS.
6'-0"	.70	80
7'-0"	.81	90
8'-0"	.93	104
9'-0"	1.05	120



CONCRETE FOUNDATION
EMBEDMENT

GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

ALL BOLT CIRCLES FOR 45' MOUNTING HEIGHT SHALL BE 17 1/4".

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1 1/2" DIAMETER HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

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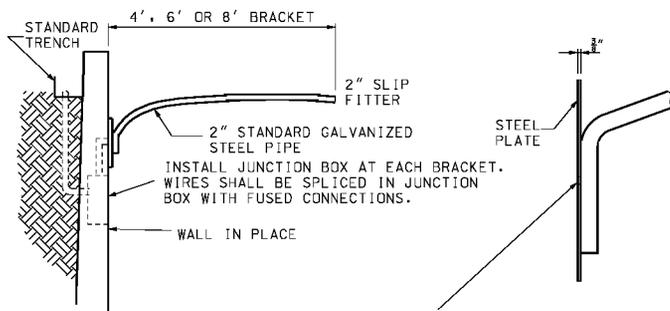
STATE OF MISSOURI
ERIC E. SCHREIER
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**HIGHWAY LIGHTING
POLES, FOUNDATIONS
AND APPURTENANCES
FOR 45' MOUNTING HEIGHT**

DATE EFFECTIVE: 12/01/2013
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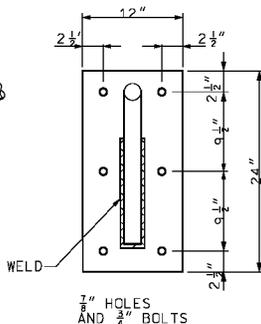
901.01AH

SHEET NO.
6 OF 6

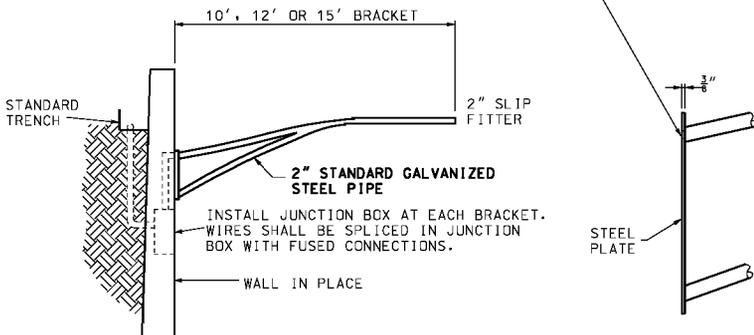


INSTALL JUNCTION BOX AT EACH BRACKET. WIRES SHALL BE SPLICED IN JUNCTION BOX WITH FUSED CONNECTIONS.

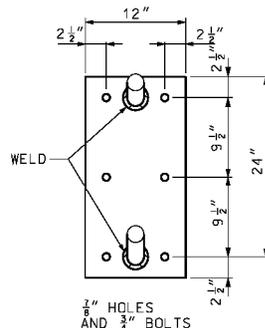
WALL IN PLACE



WIRE ENTRANCE HOLE. CLEAN AND BEVEL EDGES TO PREVENT WIRE DAMAGE.



WALL BRACKETS



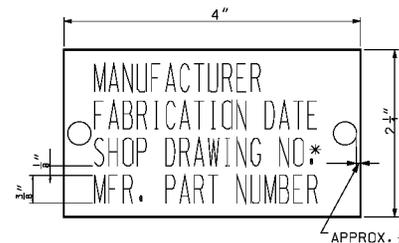
FACE PLATE DETAILS

ANSI LAMPS			
FUSE RATING	DESIGNATION	WATTS	INITIAL LUMENS
3 A	HPS	150	16,000
	S55		

TYPE III MEDIUM DISTRIBUTION SEMI-CUTOFF UNLESS OTHERWISE SPECIFIED ON PLANS

TYPE AT POLE				
BRACKET SPREAD	4' - 10' 12' 15'			
MAX. LUMINAIRE WEIGHT	75 LB 71 LB 66 LB			
MAX. PROJECTED AREA	3.3 SQ. FT.			
SINGLE AND TRUSSED BRACKET ARMS				
LOCATION	LENGTH POLE	BRACKET SPREAD	TRANS. BASE BOLT CIRC.	D
SHOULDER	28'	4', 6', 8', 10', 12', 15'	15"	8"

TYPE B POLE				
BRACKET SPREAD	4' 6' 8'			
MAX. LUMINAIRE WEIGHT	75 LB 75 LB 54 LB			
MAX. PROJECTED AREA	3.3 SQ. FT.			
SINGLE BRACKET ARM				
LOCATION	LENGTH POLE	BRACKET SPREAD	D	ANCHOR BOLT DIA.
BRIDGE SAFETY BARRIER CURB	28'	4', 6', 8'	8"	1"



ID TAG NOTE:
TAG SHALL BE ALUMINUM OR STAINLESS STEEL AND ATTACHED TO POLE USING TWO RIVETS OR STAINLESS STEEL DRIVE SCREWS.

* INCLUDING REVISION

IDENTIFICATION TAG

GENERAL NOTES:

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TYPE AT POLES SHALL BE EQUIPPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B POLES SHALL BE EQUIPPED WITH A GROUNDING LUG INSIDE THE POLE.

TRANSFORMER BASES FOR 30 FOOT MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE (1) DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL STEEL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" AND MEET THE BREAK-AWAY REQUIREMENTS OF NCHRP 350.

ALIGN HANDHOLE SO THAT THE POLE IS BETWEEN THE ONCOMING TRAFFIC AND THE HANDHOLE. HANDHOLE SHALL BE APPROX. 4" X 6-1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

IF CABLE-CONDUIT IS SPECIFIED, CUT CONDUIT AWAY FROM CABLES. CABLES SHALL BE CONTINUOUS AND UNSPLICED TO THE FIRST LIGHT POLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1-1/4" DIA. HOLE.

POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM THE HANDHOLE.

ID TAG HOLES SHALL BE DRILLED INTO POLE PRIOR TO GALVANIZING.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

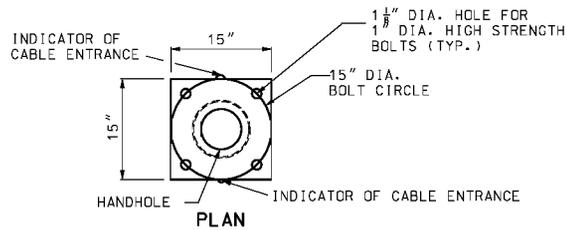
**HIGHWAY LIGHTING
POLES, FOUNDATIONS AND
APPURTENANCES FOR
30' MOUNTING HEIGHT**

DATE EFFECTIVE: 12/01/2013
DATE PREPARED: 10/22/2013

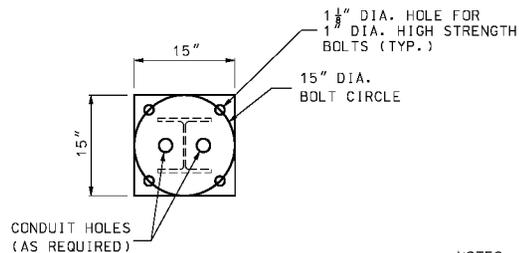
901.00AA

SHEET NO.
2 OF 4

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



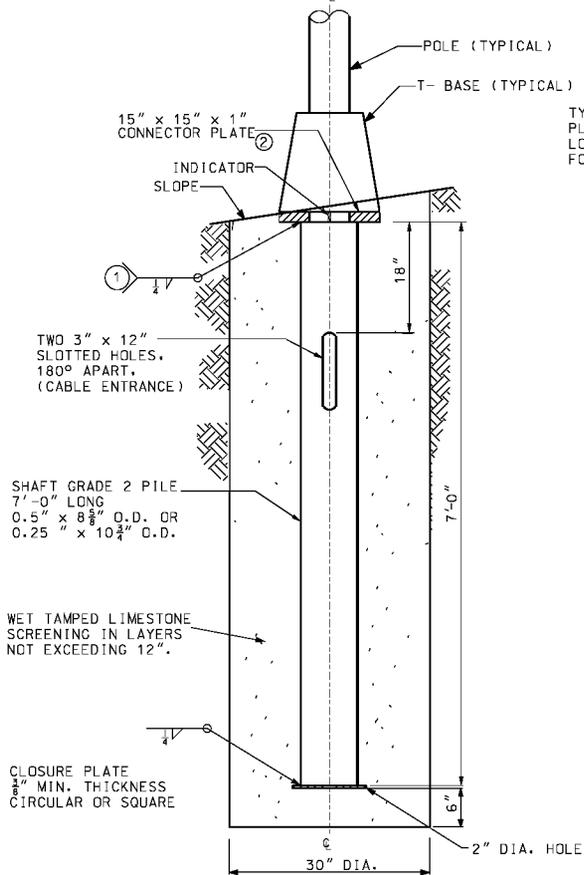
PLAN



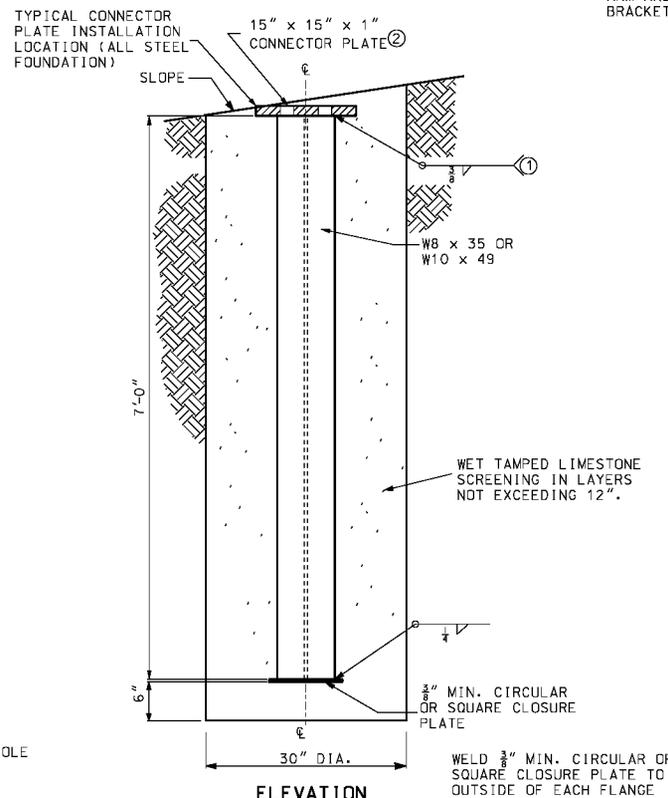
PLAN

NOTES:

- ① GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- ② FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.



ELEVATION
DETAILS OF CIRCULAR
STEEL PILE FOUNDATION



ELEVATION
DETAILS OF STEEL
"H" PILE FOUNDATION

GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

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

STATE OF MISSOURI
 ERIC E. SCHREIER
 NUMBER PE-28411
 PROFESSIONAL ENGINEER

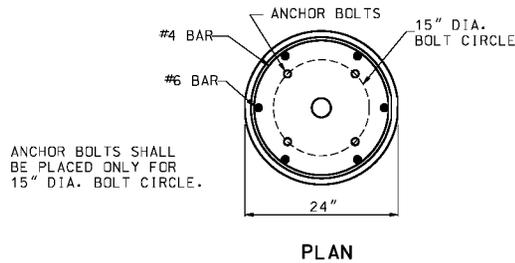
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**HIGHWAY LIGHTING
 POLES, FOUNDATIONS AND
 APPURTENANCES FOR
 30' MOUNTING HEIGHT**

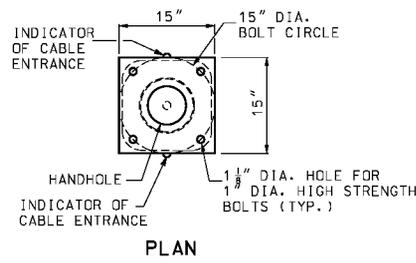
DATE EFFECTIVE: 12/01/2013
 DATE PREPARED: 10/22/2013

901.00AA

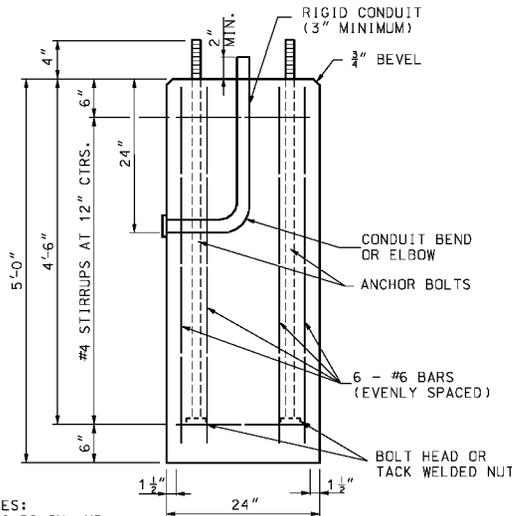
SHEET NO.
 3 OF 4



PLAN

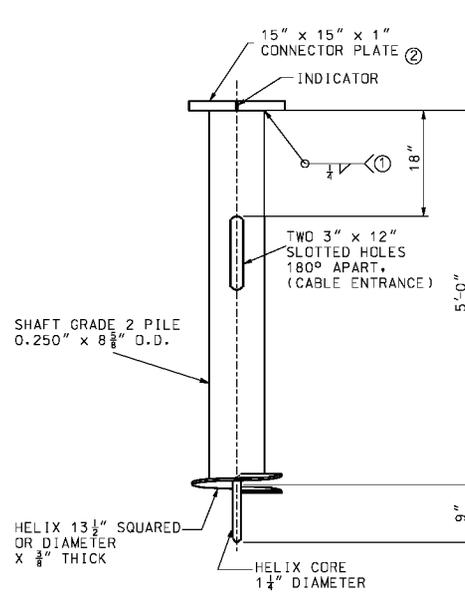


PLAN

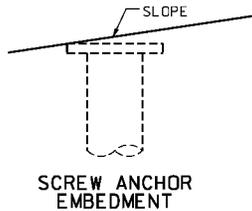
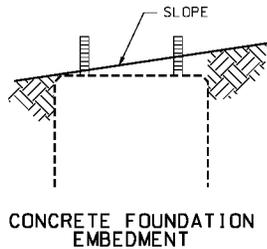


QUANTITIES:
 CONC. = 0.58 CU. YD.
 REIN. = 64 LBS.

ELEVATION
 DETAILS OF CONCRETE FOUNDATION ③



ELEVATION
 DETAILS OF SCREW ANCHOR FOUNDATION



DRIVE HOLES WILL BE PERMITTED PROVIDED THAT THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE, THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.

NOTES:

- ① GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.
- ② FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.
- ③ AT THE OPTION OF THE CONTRACTOR THE CONCRETE FOUNDATION MAY BE PRECAST. IF PRECAST, THEY SHALL BE SET IN DRILLED HOLES 3 FEET IN DIAMETER AND 6 INCHES DEEPER THAN THE BOTTOM OF THE CONCRETE FOUNDATION. THE BOTTOM 6 INCHES OF THE HOLE AND THE REMAINING SPACE AROUND THE FOUNDATION SHALL BE BACKFILLED WITH WET TAMPED LIMESTONE SCREENINGS IN LAYERS NOT EXCEEDING 12 INCHES.

GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

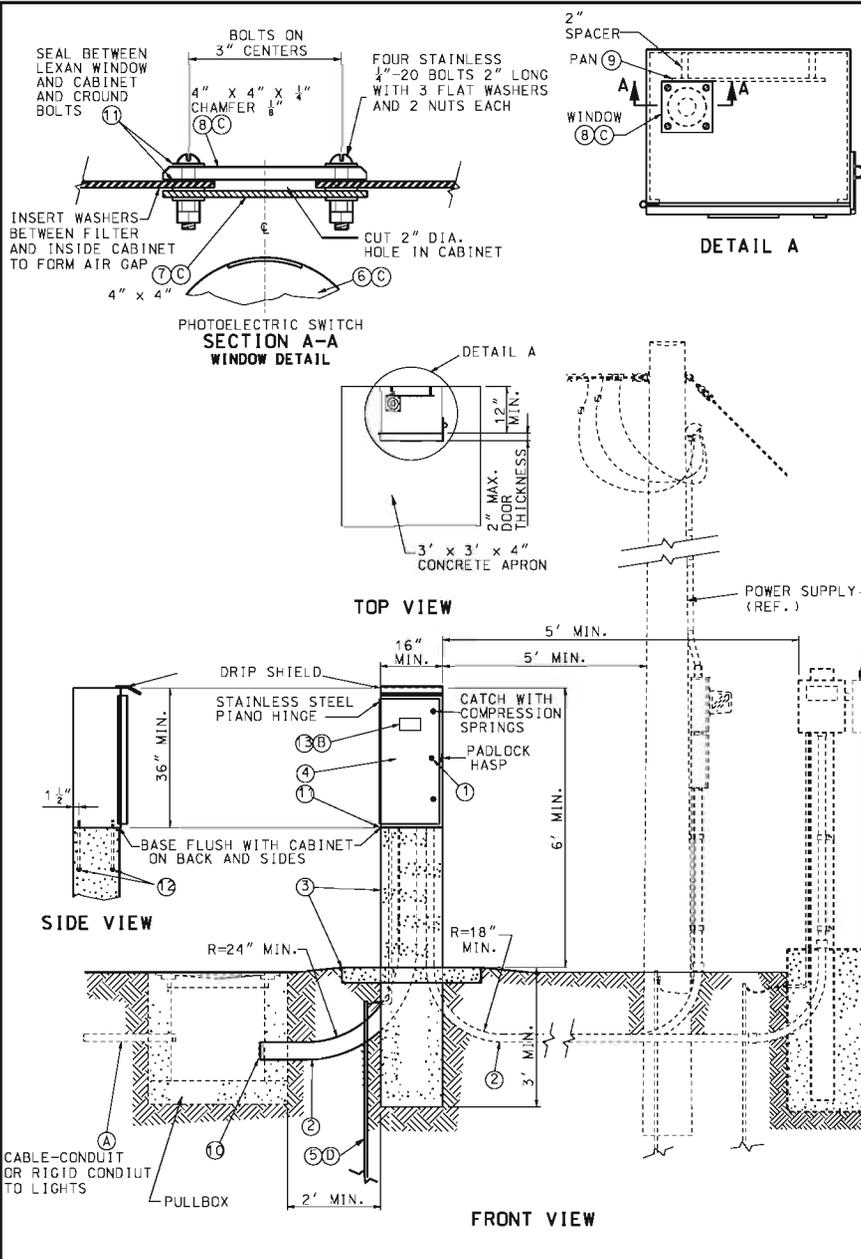
ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT	
DATE EFFECTIVE:	12/01/2013	901.00AA	SHEET NO.
DATE PREPARED:	10/22/2013		4 OF 4

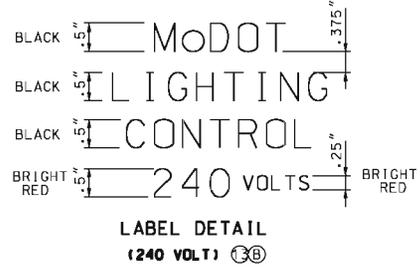
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

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



LIST OF MATERIALS	
ITEM	DESCRIPTION
1	#2 CORBIN LOCK
2	RIGID CONDUIT *
3	CLASS B CONCRETE, 0.4 C.Y.*
4	NEMA 4, DUST-TIGHT, WATERTIGHT, CABINET
5	GROUND ROD, 3/4" DIA. X 8' MIN.
6	PHOTOELECTRIC SWITCH AND SOCKET, 105/285 V., 1000-WATT
7	TRANSLUCENT, PLEXIGLASS FILTER #W2067, 1/4" THICK
8	CLEAR, LEXAN #9034 WINDOW, 1/4" THICK MIN.
9	MOUNTING PAN, 31 1/2" x 12" x 1/4" ALUMINUM OR STAINLESS STEEL
10	PLIABLE DUCT SEALANT
11	LIFETIME SILICONE CAULK
12	ANCHOR BOLTS, 5/8-11 x 14" LONG BOLTS, HOT DIP GALVANIZED, 4 REQUIRED, USE BOLT HEAD OR TACK WELDED NUT ON EMBEDDED END
13	WEATHERPROOF ADHESIVE LABEL, VINYL RAISED LETTERING (OR EQUIVALENT, SEE DETAIL)
* - SEE PLANS	

- NOTES
- (A) IF CABLE-CONDUIT IS SPECIFIED, THE CONDUIT SHALL BE CUT AWAY FROM CABINET BETWEEN PULL BOX AND CONTROL STATION.
 - (B) LIGHTING SYSTEM VOLTAGE AS SPECIFIED ON PLANS.
 - (C) PHOTOELECTRIC SWITCH BRACKETS MAY VARY. LOCATE CENTER OF WINDOW OVER CENTER OF PHOTOELECTRIC SWITCH.
 - (D) IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION, THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN. DEEP. CONNECTION TO GROUND ROD SHALL BE CADWELDED.



GENERAL NOTES:

ALTERNATE CABINET DIMENSIONS WILL BE ALLOWED AS APPROVED BY THE ENGINEER. INTERIOR CABINET VOLUME SHALL BE EQUAL TO OR GREATER THAN THAT SHOWN ON PLANS AND PROPER CLEARANCES SHALL BE PROVIDED FOR ALL EQUIPMENT. CONCRETE BASE DIMENSIONS SHALL BE MODIFIED TO FIT THE CABINET SUPPLIER.

PLACEMENT OF ALL ITEMS SHALL BE APPROVED BY THE ENGINEER.

CABINET SHALL BE LOCATED AWAY FROM TRAFFIC. TOP MOUNT PHOTO CONTROL SHALL FACE AN OPEN SKY. SIDE MOUNT PHOTO CONTROL SHALL FACE NORTH.

SEE PLANS FOR CIRCUIT WIRING: MAXIMUM LOADING PER CIRCUIT IS 7,400 WATTS FOR 240 VOLT AND 11,000 WATTS FOR 480 VOLT.

SCHEMATIC DIAGRAM SHALL BE MOUNTED ON INSIDE OF CABINET DOOR.

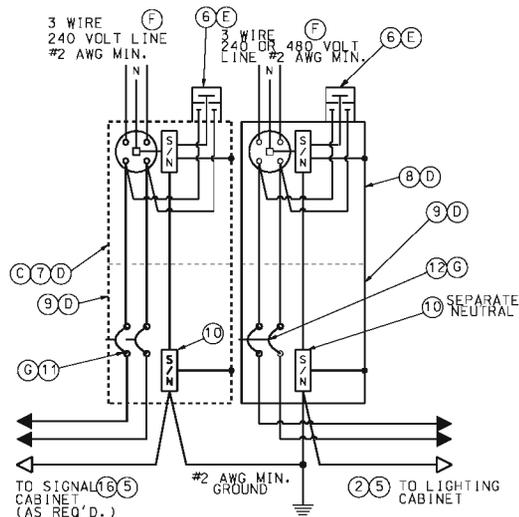
THE UTILITY SHALL BE NOTIFIED IN WRITING 30 DAYS PRIOR TO DATE SERVICE WILL BE REQUIRED.

ALL OPENINGS IN CABINET SHALL BE COVERED AND SEALED WITH LIFETIME SILICONE CAULK.

ALL MATERIALS REQUIRED EXCLUDING REFERENCE ITEMS AS SHOWN ON DRAWING SHALL BE INCLUDED IN PRICE BID FOR CONTROL STATION.

<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p>HIGHWAY LIGHTING BASE MOUNTED CONTROL STATION 240 V OR 480 V - 4 CIRCUIT</p>
<p>901.30F</p>	
<p>SHEET NO. 1 OF 2</p>	

LIST OF MATERIALS	
ITEM	DESCRIPTION
1	SERVICE POLE 30' MIN., CLASS 4 WOOD, CONTRACTOR PROVIDED, MODOT OWNED*
2	#2 AWG MIN. CABLE, 600 VOLT *
3	SERVICE ENTRANCE HEAD
4	GUY CABLE, AS REQUIRED
5	RIGID CONDUIT, 2" MIN., WITH PREFORMED ELBOWS
6	LIGHTNING ARRESTER, VALVE TYPE, 2 POLE, 650 VOLT
7	METER SOCKET, 200 AMP, FOR SIGNALS
8	METER SOCKET, 200 AMP, FOR LIGHTING
9	LOCKING, RAINTIGHT, NEMA 4 SERVICE DISCONNECT BOX
10	INSULATED, GROUNDABLE NEUTRAL WIRE, 200 AMP MINIMUM
11	SIGNAL BREAKERS, SINGLE POLE, 40A MIN, TYPE A OR B *
12	LIGHTING BREAKER, 2 POLE, 240 VOLT, 100A, TYPE A OR B
13	1/2" METAL CONDUIT
14	#2 AWG MIN. GROUND WIRE
15	GROUND ROD, 3/4" x 8' MIN.
16	#8 AWG MIN. CABLE, 600 VOLT *
17	CLASS B CONCRETE, 0.92 C.Y. ±
18	THREADED CONDUIT HUB WITH SEALING WASHERS
19	WEATHERPROOF ADHESIVE LABEL (LIGHTING), VINYL RAISED LETTERING (OR EQUIVALENT, SEE DETAIL)
20	WEATHERPROOF ADHESIVE LABEL (SIGNALS), VINYL RAISED LETTERING (OR EQUIVALENT, SEE DETAIL)
21	W6 x 9 OR W6 x 15 GALVANIZED POST
22	#2 AWG MIN. CABLE, 600 VOLT
23	RIGID CONDUIT, 2" MINIMUM
*	SEE PLANS



**WIRING DIAGRAM
LIGHTING AND/OR SIGNALS**

NOTES:

- (A) SERVICE POLE SHALL BE GUYED WHEN SPAN OF OVERHEAD SERVICE WIRE EXCEEDS 50 FEET.
- (B) INCREASE 1 FOOT FOR EACH 5 FEET ABOVE 30 FEET.
- (C) SERVICE DISCONNECT BOXES AND METER BOXES SHALL BE ALUMINUM OR STAINLESS STEEL. ALL HARDWARE, HINGES, CATCHES, ETC. SHALL BE STAINLESS STEEL. METER SOCKET FOR SIGNALS OR LIGHTING AND OTHER EQUIPMENT AND MATERIALS SHALL BE U.L. APPROVED, AND CONFORM TO THE REQUIREMENTS OF THE UTILITY COMPANY OR MUNICIPALITY PROVIDING POWER.
- (D) SCHEMATIC DIAGRAM SHALL BE MOUNTED ON INSIDE OF CABINET DOOR.
- (E) UTILITY COMPANY SHALL DECIDE IF LIGHTNING ARRESTERS ARE TO BE CONNECTED ON THE LOAD OR LINE SIDE OF THE METER. THE UTILITY COMPANY SHALL ALSO DECIDE IF THE LIGHTNING ARRESTER IS TERMINATED IN THE METER OR DISCONNECT CABINET. IF TERMINATED IN THE DISCONNECT CABINET, IT SHALL BE INSTALLED ON THE DISCONNECT CABINET.
- (F) LIGHTING SYSTEM VOLTAGE OF 240 VOLTS OR 480 VOLTS AS SHOWN ON THE PLANS.
- (G) BREAKERS SHALL CONFORM TO SEC. 901.4 OF THE STANDARD SPECIFICATIONS.
- (H) IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION, THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN. DEEP. CONNECTION TO GROUND ROD SHALL BE CADWELDED.

GENERAL NOTES:

FOR CABLE TYPES AND INSTALLATION, SEE STANDARD SPECIFICATIONS.

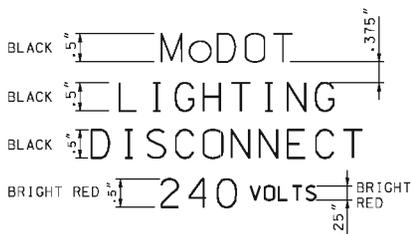
THE POWER SUPPLY ASSEMBLY TYPE IS SHOWN ON THE PLANS OR IS DESIGNATED IN THE CONTRACT.

THE UTILITY COMPANY SHALL BE NOTIFIED IN WRITING 30 DAYS PRIOR TO DATE SERVICE WILL BE REQUIRED.

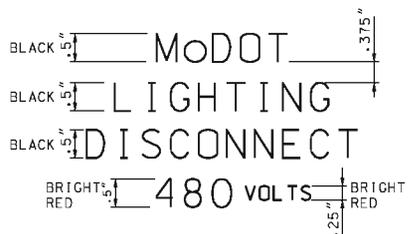
WHERE SIGNAL OR LIGHTING POWER ONLY IS DESIGNATED, OMIT ITEMS NOT REQUIRED.

ALL OPENINGS IN ANY SERVICE BOX OR METER BOX SHALL BE COVERED AND SEALED WITH LIFETIME SILICONE CAULK.

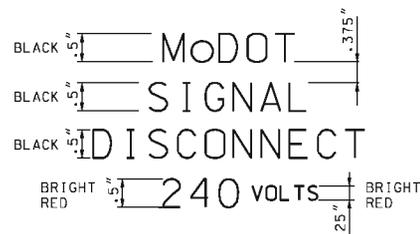
ALL MATERIALS REQUIRED AS SHOWN ON DRAWING, INCLUDING CABLE AND CONDUIT FROM POWER SUPPLY ASSEMBLY TO UTILITY COMPANY FACILITIES, SHALL BE INCLUDED IN UNIT BID PRICE FOR POWER SUPPLY ASSEMBLY.



LABEL DETAIL (19) (240 VOLT) (F)



LABEL DETAIL (19) (480 VOLT) (F)

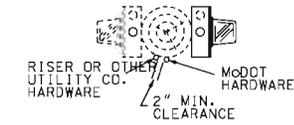
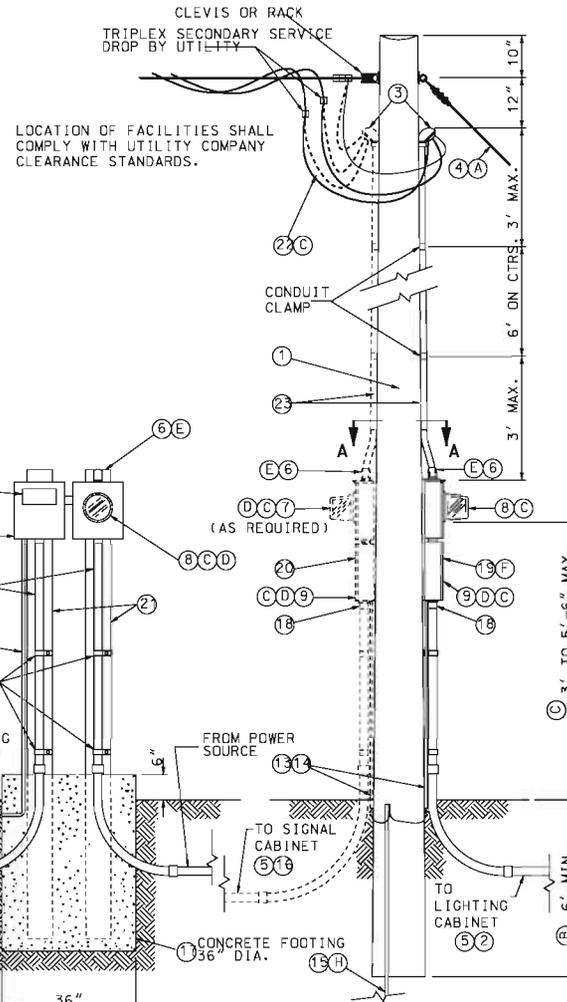
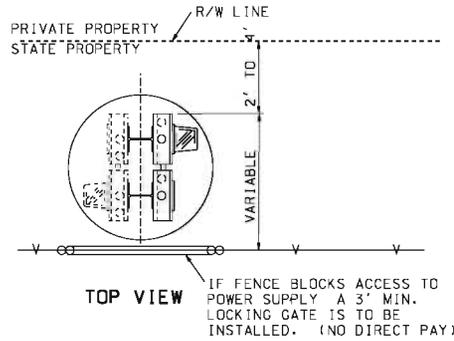


LABEL DETAIL (20)

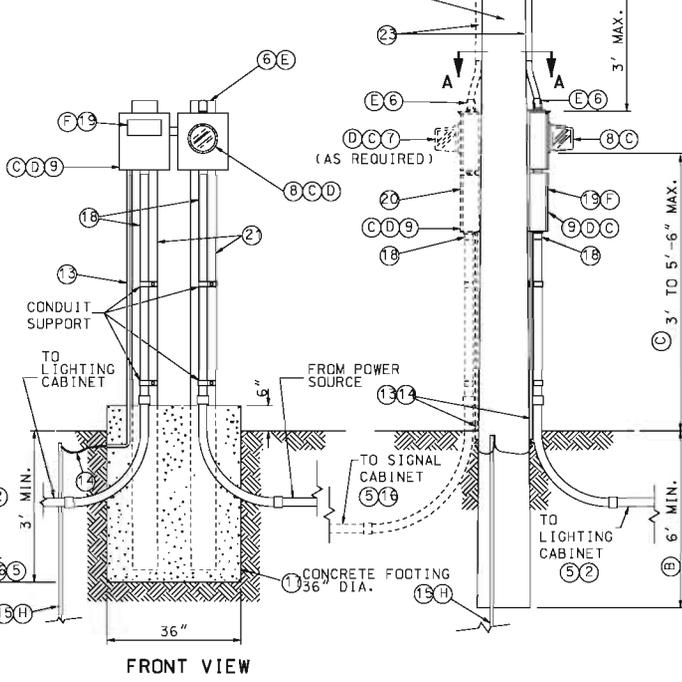
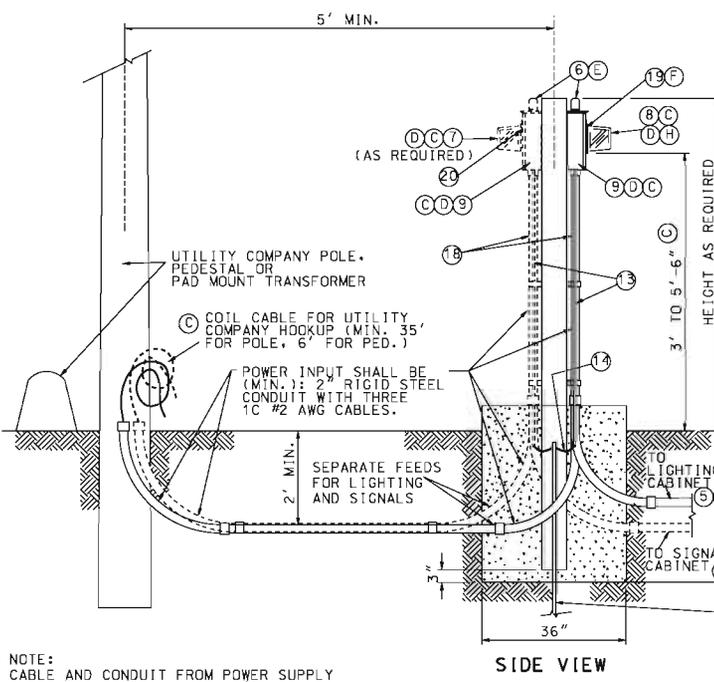
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	HIGHWAY LIGHTING POWER SUPPLY ASSEMBLY SECONDARY SERVICE
DATE EFFECTIVE: 04/01/2002 DATE PREPARED: 4/1/2010	901.80D SHEET NO. 1 OF 2

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

PEDESTAL OR NEW STATE-OWNED POLE TO BE SET WITHIN 2' TO 4' OF RIGHT-OF-WAY LINE.
 ALL SERVICE POWER SUPPLY ASSEMBLIES ARE TO BE LOCATED ON STATE PROPERTY.



SECTION A-A



SIDE VIEW

FRONT VIEW

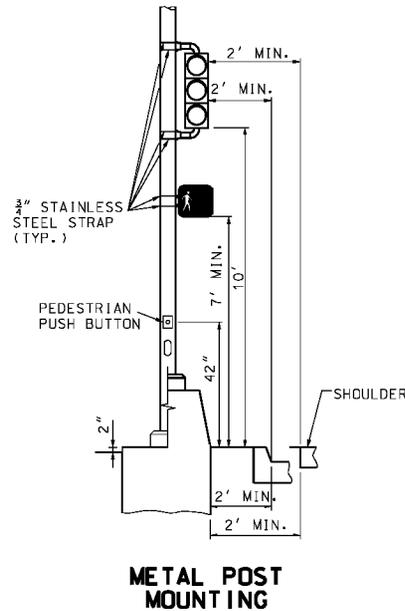
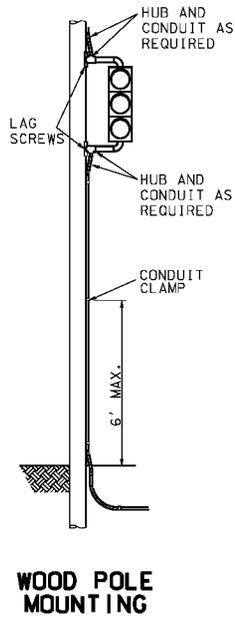
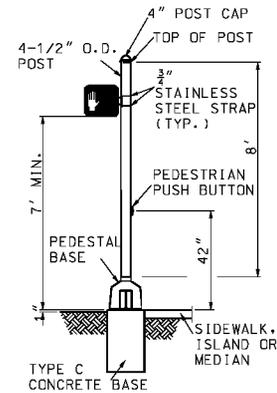
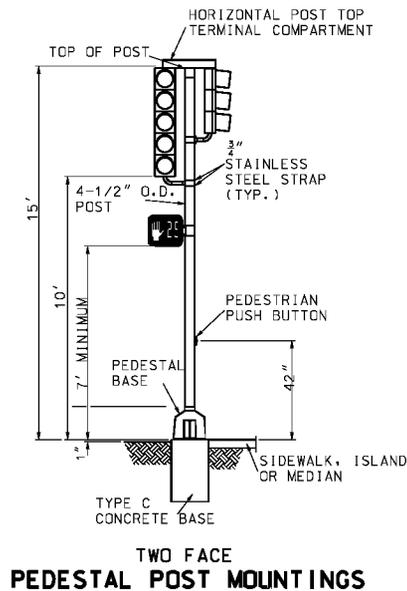
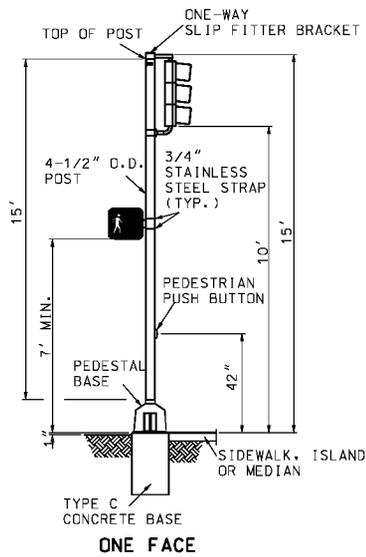
TYPE 2 (PEDESTAL) UNDERGROUND SERVICE

TYPE 1 (POLE) OVERHEAD SERVICE

NOTE:
 CABLE AND CONDUIT FROM POWER SUPPLY ASSEMBLY TO UTILITY COMPANY FACILITIES SHALL BE INCLUDED IN PRICE BID FOR POWER SUPPLY ASSEMBLY.

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		HIGHWAY LIGHTING POWER SUPPLY ASSEMBLY SECONDARY SERVICE	
DATE EFFECTIVE: 04/01/2002 DATE PREPARED: 5/19/2010	901.80D	SHEET NO. 2 OF 2	

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



GENERAL NOTES:

ALL POST WIRE OUTLETS SHALL BE DEBURRED AND EQUIPPED WITH BUSHINGS.

BACKPLATES NOT SHOWN IN MOUNTING DIAGRAMS FOR CLARITY.

POSTS SHALL BE GROUNDED WITH #6 AWG BARE COPPER WIRE FROM GROUNDING BUSHING ON CONDUIT TO GROUNDING LUG IN POST BASE IF STEEL CONDUIT IS USED. IF PVC CONDUIT IS USED, PROVIDE #6 AWG BARE COPPER WIRE FROM GROUNDING LUG IN POST TO POWER SUPPLY GROUND BUSS IN CONTROLLER CABINET.

LEADS FROM PEDESTRIAN SIGNAL LAMPS ARE CONNECTED TO THE SIGNAL HEAD TERMINAL COMPARTMENT.

TYPE C MOUNTED SIGNALS SHALL HAVE A DISCONNECT HANGER.

TYPE B MOUNTED SIGNALS SHALL HAVE A TERMINAL COMPARTMENT.

ONE FACE, TOP-MOUNTED (TYPE T) OR SIDE-MOUNTED (TYPE S) SIGNALS HAVE NO TERMINAL COMPARTMENT. TWO FACE, TOP-MOUNTED (TYPE T) OR SIDE-MOUNTED (TYPE S) SIGNALS SHALL HAVE A HORIZONTAL TERMINAL COMPARTMENT.

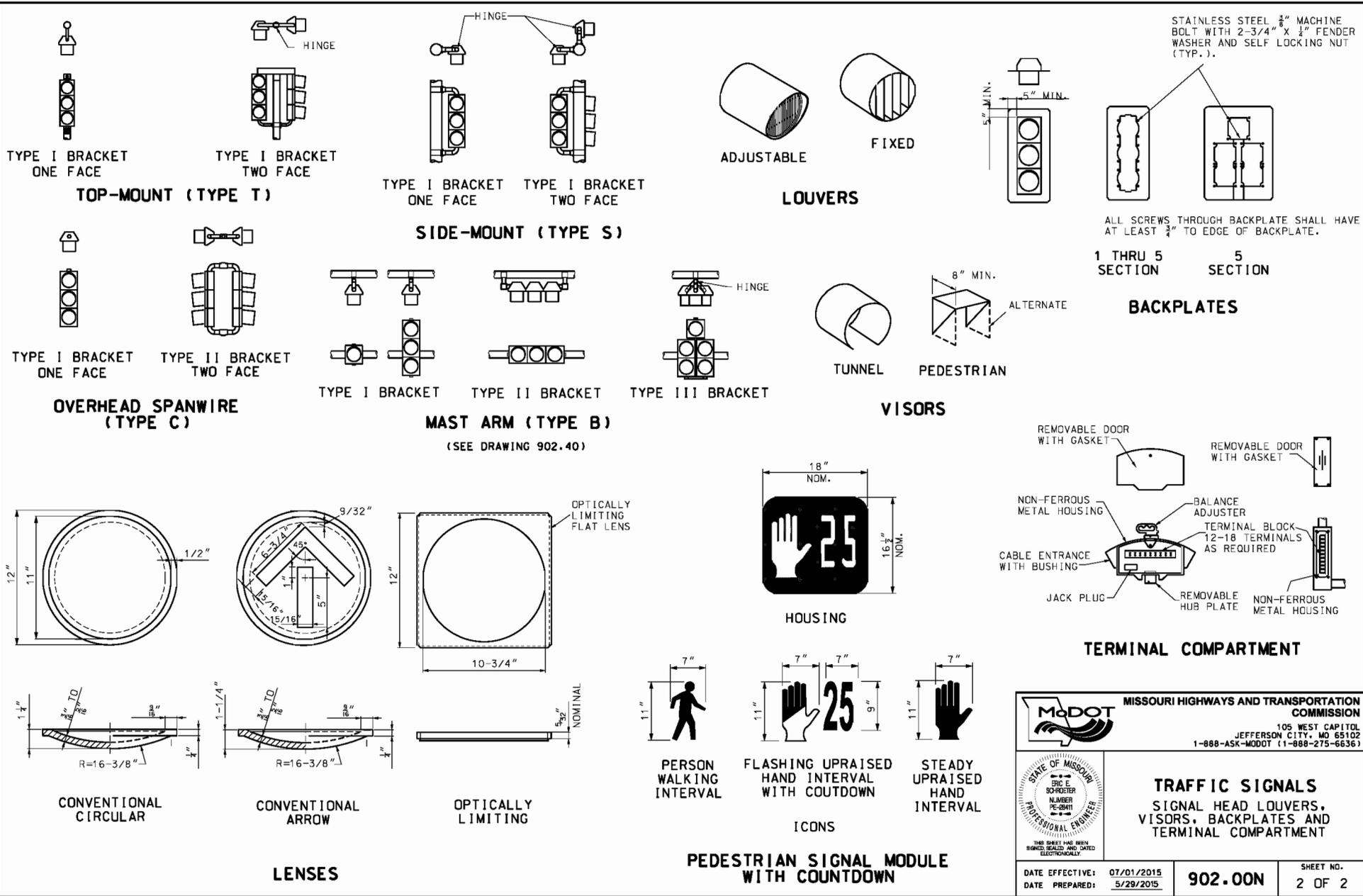
SIDE-MOUNTED OPTICALLY LIMITING HEADS SHALL HAVE A MINIMUM POST CLEARANCE OF 5-1/2".

SIGNAL APPURTENANCES SHALL HAVE A HORIZONTAL CLEARANCE NO LESS THAN 2' FROM THE FACE OF A VERTICAL CURB OR FROM THE OUTSIDE EDGE OF A SHOULDER, EXCEPT SIGNALS LOCATED IN A MEDIAN ISLAND.

SEE STANDARD PLAN 902.30 FOR BASE DETAILS AND CONDUIT LOCATIONS.

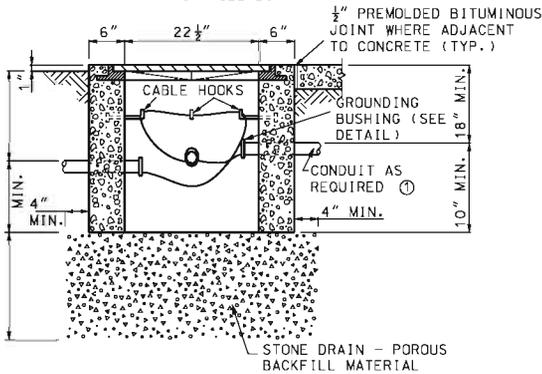
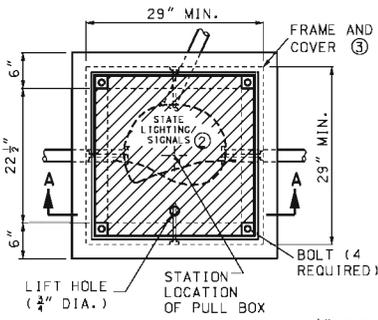
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
TRAFFIC SIGNALS SIGNAL HEAD MOUNTING	
<small>STATE OF MISSOURI ERIC E. SCHREIER NUMBER PE-08411 PROFESSIONAL ENGINEER</small>	
<small>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY</small>	
DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/29/2015	902.00N
SHEET NO. 1 OF 2	

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

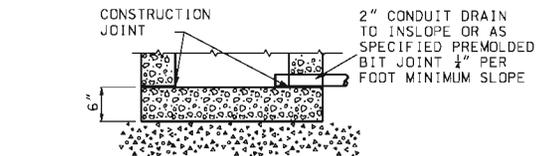


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<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>ERIC E. SCHROETER NUMBER PE-28411 PROFESSIONAL ENGINEER</p> <p><small>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</small></p>	<p>TRAFFIC SIGNALS SIGNAL HEAD LOUVERS, VISORS, BACKPLATES AND TERMINAL COMPARTMENT</p>
<p>DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 5/29/2015</p>	<p>902.00N SHEET NO. 2 OF 2</p>

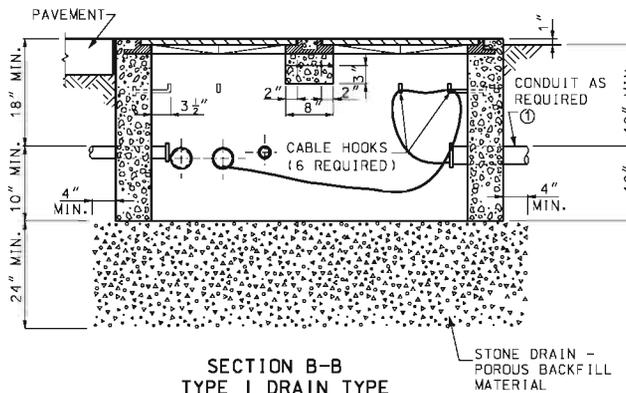
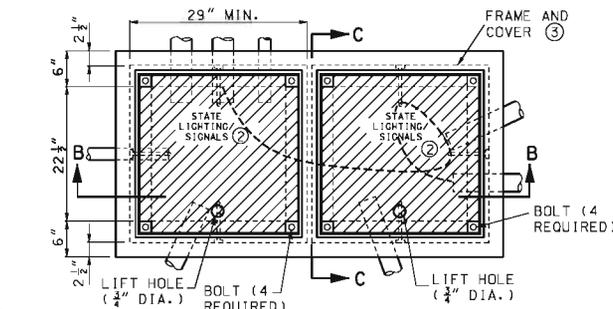


SECTION A-A
TYPE I DRAIN TYPE

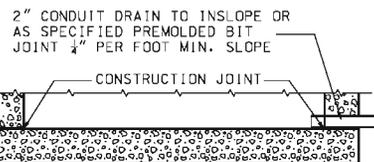


SECTION A-A
TYPE II DRAIN TYPE
(SEE DRAIN OUTLET DETAILS)
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN)

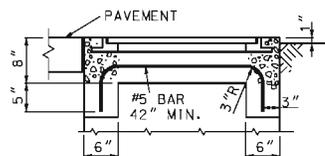
STANDARD CONCRETE PULL BOX



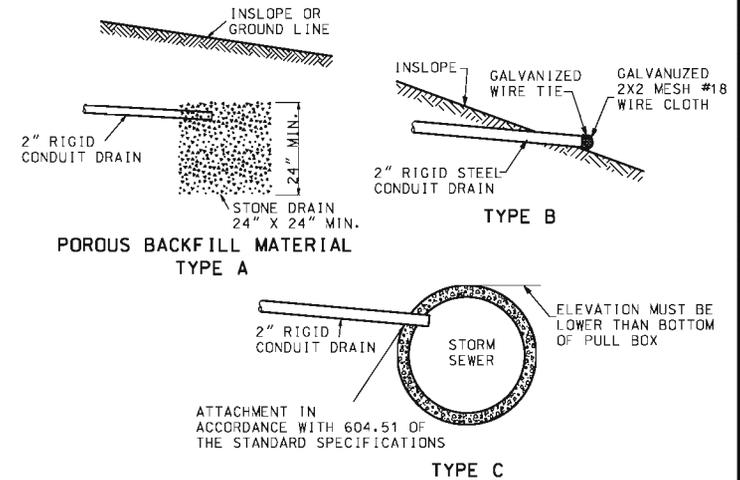
SECTION B-B
TYPE I DRAIN TYPE



SECTION B-B
TYPE II DRAIN TYPE
(SEE DRAIN OUTLET DETAILS)
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN)



SECTION C-C
DOUBLE CONCRETE PULL BOX, TYPE A



TYPE II DRAIN OUTLET DETAILS

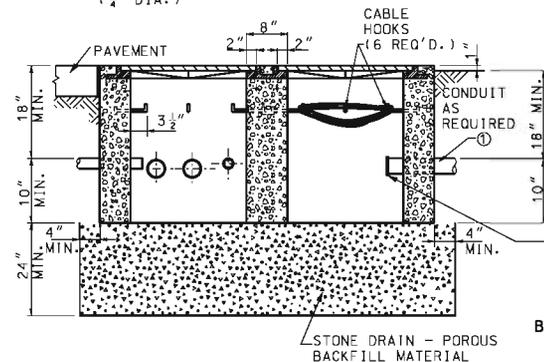
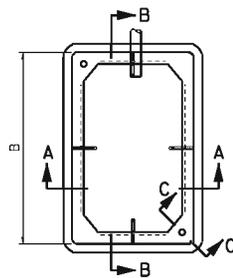
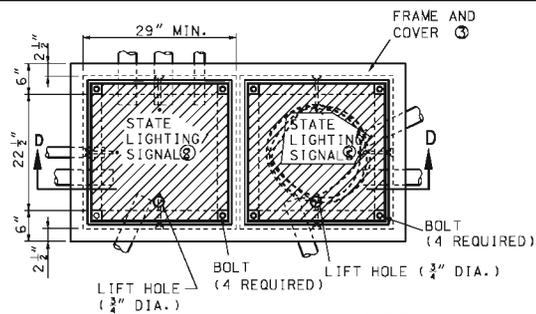
- ① ALL METAL CONDUITS SHALL BE ELECTRICALLY BONDED BY A GROUND BUSHING AND #6 AWG BARE COPPER WIRE. FOR PVC CONDUIT, ALL GROUND WIRES SHALL BE CONNECTED.
- ② SIGNAL PULL BOXES SHALL BE EMBOSSED "STATE SIGNALS" AND LIGHTING PULL BOXES "STATE LIGHTING."
- ③ PULL BOX FRAMES AND COVERS SHALL BE CAST IRON AND THE FOLLOWING MINIMUM DIMENSIONS:
 FRAME SIZE: 29" x 29"
 FRAME HEIGHT: 4 1/4"
 OPENING SIZE: 22 1/2" x 22 1/2"
 FRAME WEIGHT: 120 LBS.
 COVER SIZE: 22 3/8" x 22 3/8"
 COVER THICKNESS: 3/4"
 COVER WEIGHT: 140 LBS.

GENERAL NOTES:

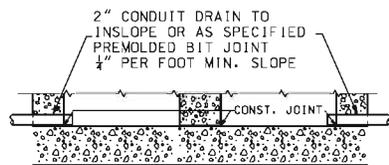
- ALL DIMENSIONS SHOWN ARE NOMINAL.
- BOLT CLEANOUT DETAIL SHALL BE APPROVED BY ENGINEER.
- PAVEMENT AND SUBGRADE SHALL BE AS SHOWN ON PLANS.
- STONE DRAIN MATERIAL SHALL CONFORM TO SECTION 1009 OF THE STANDARD SPECIFICATIONS.

<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>TRAFFIC SIGNALS CONCRETE PULL BOXES</p>	
	<p>DATE EFFECTIVE: 11/01/2010 DATE PREPARED: 9/3/2010</p>
<p>902.20C</p>	<p>SHEET NO. 1 OF 3</p>

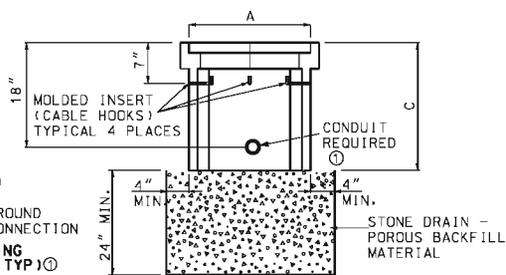
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



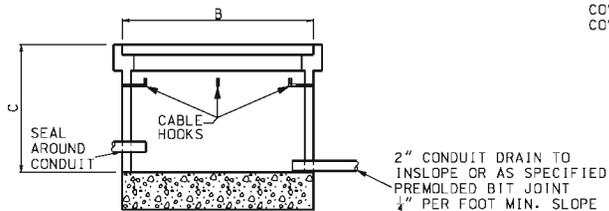
SECTION D-D
TYPE I DRAIN TYPE



TYPE II DRAIN TYPE
(SEE DRAIN OUTLET DETAILS)
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN.)
DOUBLE CONCRETE PULL BOX, TYPE B

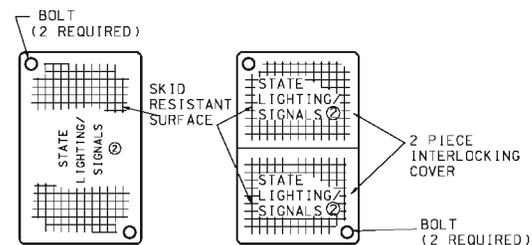


SECTION A-A
TYPE I DRAIN TYPE



SECTION B-B
TYPE II DRAIN TYPE

PREFORMED PULL BOX



CLASS 1 OR 2 CLASS 3
PREFORMED PULL BOX COVER

NUMBER OF ENTERING CONDUCTORS	CLASS	PREFORMED PULL BOX MINIMUM DIMENSIONS		
		A	B	C
< 23	1	17"	30"	22"
23 - 68	2	24"	36"	24"
> 68	3	30"	48"	36"

- ALL METAL CONDUITS SHALL BE ELECTRICALLY BONDED BY A GROUND BUSHING AND #6 AWG BARE COPPER WIRE. FOR PVC CONDUIT, ALL GROUND WIRES SHALL BE CONNECTED.
- SIGNAL PULL BOXES SHALL BE EMBOSSED "STATE SIGNALS" AND LIGHTING PULL BOXES "STATE LIGHTING."
- PULL BOX FRAMES AND COVERS SHALL BE CAST IRON AND THE FOLLOWING MINIMUM DIMENSIONS:

FRAME SIZE: 29" X 29"
 FRAME HEIGHT: 4 1/4"
 OPENING SIZE: 22 1/2" X 22 1/2"
 FRAME WEIGHT: 120 LBS.
 COVER SIZE: 22 3/8" X 22 3/8"
 COVER THICKNESS: 3/8"
 COVER WEIGHT: 140 LBS.

GENERAL NOTES:

IF AN EXTENSION IS USED WITH A PREFORMED BOX, THE LIP OF THE EXTENSION MAY BE INTERIOR OR EXTERIOR. THE EXTENSION SHALL BE COMPATIBLE AND FROM THE SAME MANUFACTURER.

IF PREFORMED PULL BOXES ARE SPECIFIED, THE CONTRACTOR MAY USE THE STANDARD CONCRETE PULL BOX IN LIEU OF THE CLASS 1 OR 2 PREFORMED PULL BOX OR THE DOUBLE CONCRETE PULL BOX, TYPE A, IN LIEU OF THE CLASS 3 PREFORMED PULL BOXES.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-2075
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 SEALED, SIGNED AND DATED
 ELECTRONICALLY.

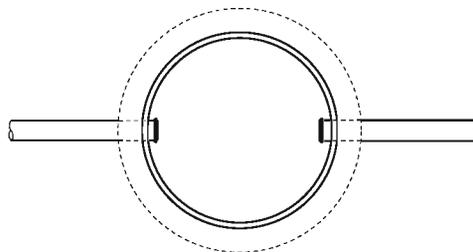
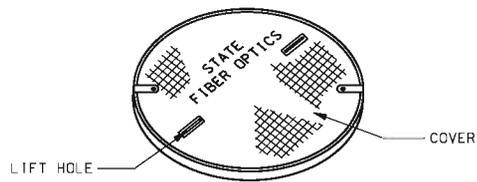
**TRAFFIC SIGNALS
 CONCRETE AND PREFORMED
 PULL BOXES**

DATE EFFECTIVE: 11/01/2010
 DATE PREPARED: 9/3/2010

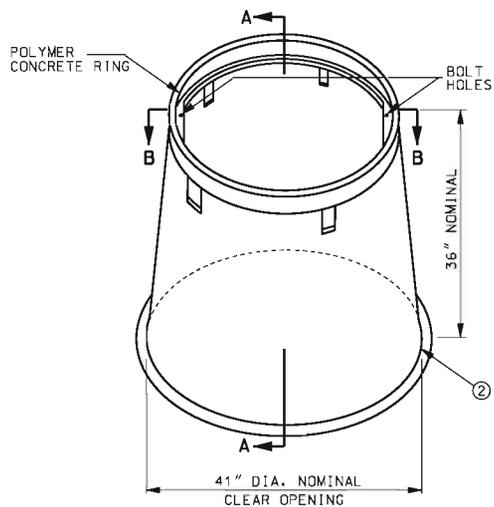
902.20C

SHEET NO.
 2 OF 3

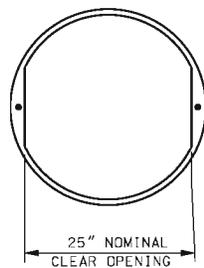
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



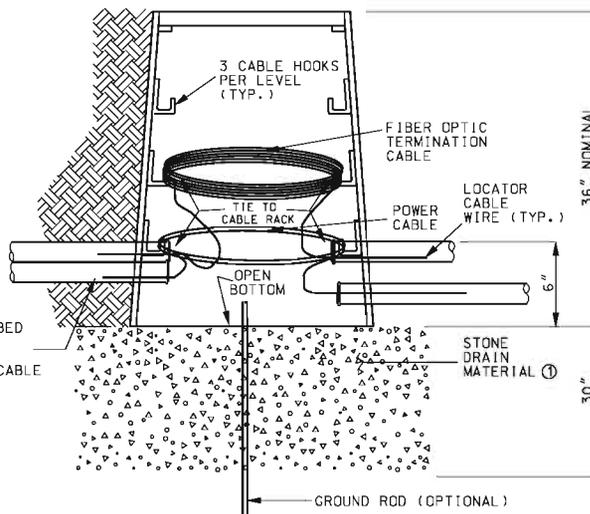
PLAN



CIRCULAR PULL BOX CLASS 5



SECTION B-B



SECTION A-A
TYPE I DRAIN TYPE

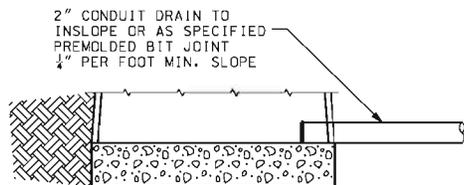
- ① AGGREGATE SHALL BE TYPE 1 CONFORMING TO SEC 1007.
- ② BOX SHALL BE OF A FLARE DESIGN AND HAVE A LIP FOR STABILIZATION.

GENERAL NOTES:

A MINIMUM OF NINE HOOKS, INSTALLED IN THREE LEVELS, SHALL BE INCLUDED WITH EACH PULL BOX.

IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION, THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN. DEEP. CONNECTION TO GROUND ROD SHALL BE CADWELDED.

THE CIRCULAR PULL BOX COVER SHOULD BE SIZED TO FIT A BOX WITH A CLEAR OPENING OF 25".

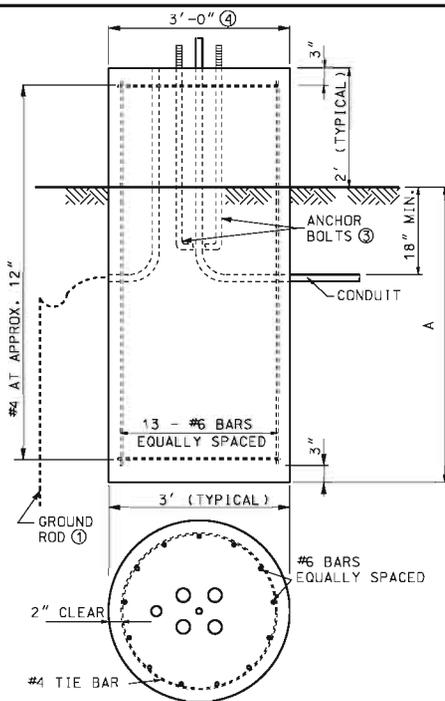


TYPE II DRAIN TYPE

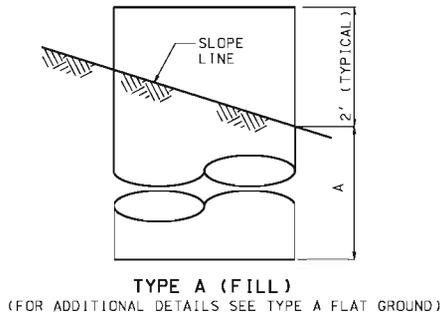
(SEE DRAIN OUTLET DETAILS)
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN.)

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	TRAFFIC SIGNALS CONCRETE AND PREFORMED PULL BOXES
DATE EFFECTIVE: 11/01/2010 DATE PREPARED: 9/3/2010	902.20C
SHEET NO. 3 OF 3	

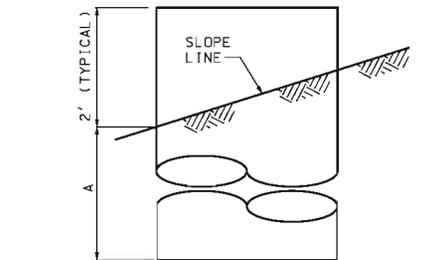
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TYPE A (FLAT GROUND)



TYPE A (FILL)
(FOR ADDITIONAL DETAILS SEE TYPE A FLAT GROUND)



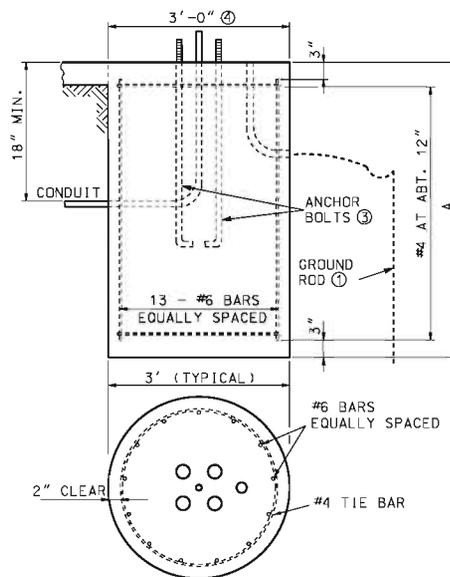
TYPE A (CUT)
(FOR ADDITIONAL DETAILS SEE TYPE A FLAT GROUND)

POST BASES

POST BASES		
POST TYPE	ARM LENGTH (FEET) ⑤	BASE TYPE ⑥
C OR CL	15 - 25	A-9 OR F-9
C OR CL	30 - 35	A-9.5 OR F-9.5
C OR CL	40 - 55	A-10.5 OR F-10.5
B OR BL	15 - 25	A-10 OR F-10
B OR BL	30 - 35	A-11 OR F-11
B OR BL	40 - 55	A-12 OR F-12

STEEL AND CONCRETE REQUIREMENTS FOR POST BASES ③				
TYPE	BASES	#6 STEEL BAR LENGTH	CONC.	
			WEIGHT LBS.	C.Y.
A-9	9'-0"	10'-6"	270	2.88
A-9.5	9'-6"	11'-0"	280	3.01
A-10	10'-0"	11'-6"	300	3.14
A-10.5	10'-6"	12'-0"	310	3.27
A-11	11'-0"	12'-6"	320	3.40
A-12	12'-0"	13'-6"	350	3.67
F-9	9'-0"	8'-6"	230	2.36
F-9.5	9'-6"	9'-0"	240	2.49
F-10	10'-0"	9'-0"	240	2.62
F-10.5	10'-6"	10'-0"	260	2.75
F-11	11'-0"	10'-6"	270	2.88
F-12	12'-0"	11'-6"	300	3.14
C*				0.44

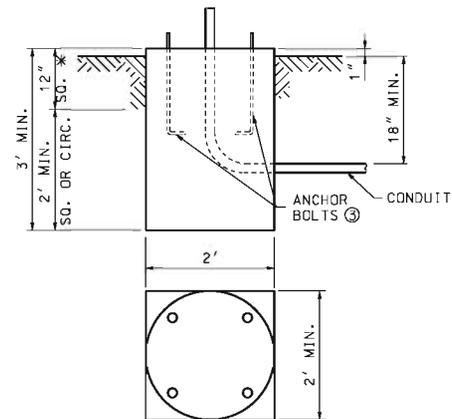
* SURFACE OF BASE TO BE CONSTRUCTED SQUARE FOR A DEPTH OF 12".



TYPE F

BASE EMBEDMENT IN SOLID ROCK	
SOLID ROCK ENCOUNTER POINT	REQUIRED EMBEDMENT FOR BASE TYPE
	AT SURFACE
AT ONE-FOURTH NORMAL DEPTH	4'-0"
AT ONE-HALF NORMAL DEPTH	3'-3"
AT THREE-FOURTHS NORMAL DEPTH	1'-3"

- REQUIRED EMBEDMENT DEPTHS CAN BE INTERPOLATED BETWEEN ENCOUNTER POINTS FOR OTHER SOLID ROCK ENCOUNTER DEPTHS.
- NORMAL LENGTHS FOR ANCHOR BOLTS AND REINFORCING STEEL WILL BE REQUIRED.
- CORE DRILL HOLES FOR ANCHOR BOLTS AND REINFORCING STEEL IN SOLID ROCK SHALL BE PROVIDED. CORE DRILL HOLES SHALL BE TWICE THE DIAMETER OF THE ANCHOR BOLT AND REINFORCING STEEL DIAMETER AND TO WITHIN 3 INCHES OF THE NORMAL BASE DEPTH.
- IF SOIL, SHALE, GRAVEL, FRACTURED ROCK, OR VOIDS ARE ENCOUNTERED DURING CORE DRILLING, THE ROCK SHALL BE REMOVED TO THE POINT OF ENCOUNTER.
- ANCHOR BOLTS AND REINFORCING STEEL SHALL BE GROUTED IN THE CORE DRILL HOLES WITH NON-SHRINK GROUT HAVING A MINIMUM STRENGTH OF 9,000 POUNDS IN 24 HOURS.
- STRAIGHT ANCHOR BOLTS OF THE LENGTH SHOWN IN THE ANCHOR BOLT TABLE UNDER THE COLUMN "BOLT LENGTH" ARE ADEQUATE FOR USE IN GROUTED CORE DRILLED HOLES.



TYPE C

* SURFACE OF BASE TO BE CONSTRUCTED SQUARE FOR A DEPTH OF 12".

- APPLICABLE ONLY WHERE CONTROLLER IS MOUNTED TO A SIGNAL POLE.
- BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.
- ANCHOR BOLT DIMENSIONS ARE SHOWN ON THE MANUFACTURER'S APPROVED DRAWINGS.
- MAXIMUM BOLT CIRCLE DIAMETER IS 26". BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.
- ARM LENGTH DETERMINED BY LENGTH OF LONGEST ARM FOR TYPE B & BL SIGNAL POSTS.
- BASE TYPE A OR F DETERMINED BY LOCATION OF POST BASE.
- SOIL DEPTH, NO ROCK.
- INCLUDE #4 TIE BAR.
- WHEN CONCRETE BASE IS LOCATED WITHIN 8" CONCRETE DIVISIONAL ISLAND, EMBEDMENT LENGTH MAY BE REDUCED BY 1/2 DIAMETER OF THE DRILLED SHAFT.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

**TRAFFIC SIGNALS
POST BASES**

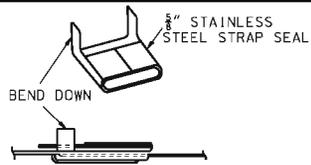
THIS SEAL HAS BEEN
REPRODUCED AND DATED
ELECTRONICALLY.

DATE EFFECTIVE: 02/01/2008
DATE PREPARED: 7/19/2012

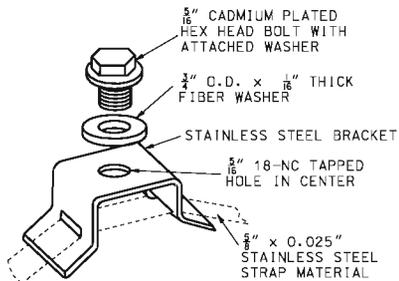
902.30P

SHEET NO.
1 OF 2

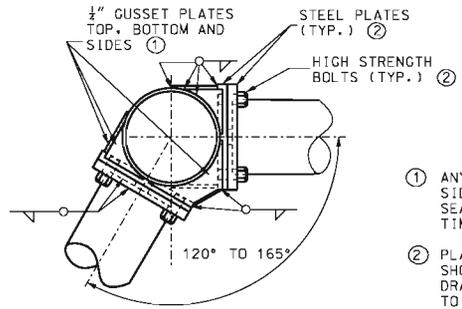
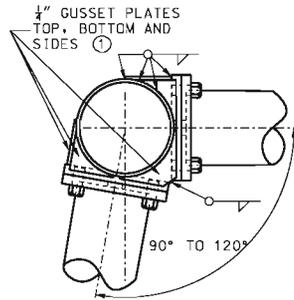
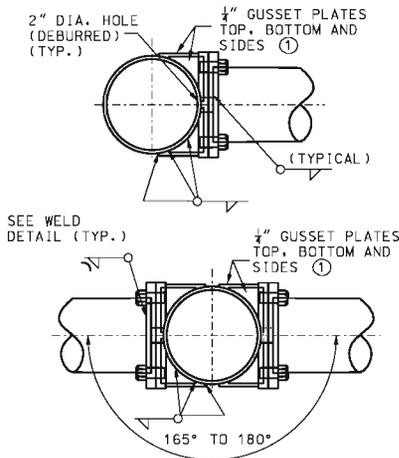
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



VIEW SHOWING
ENDS OF STRAP
CLAMPED IN SEAL

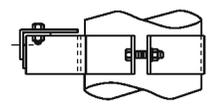


STRAP TYPE
SIGN SUPPORT

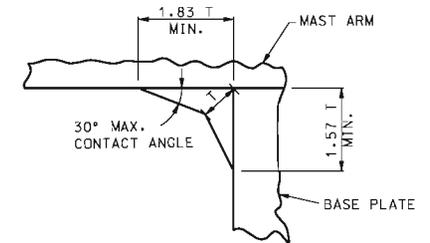


- ① ANY OPENINGS BETWEEN TOP AND SIDE GUSSET PLATES SHALL BE SEALED WITH LIFETIME CAULK AT TIME OF INSTALLATION.
- ② PLATE AND BOLT SIZES SHALL BE SHOWN ON FABRICATORS SHOP DRAWINGS AND SHALL BE SUBJECT TO APPROVAL.

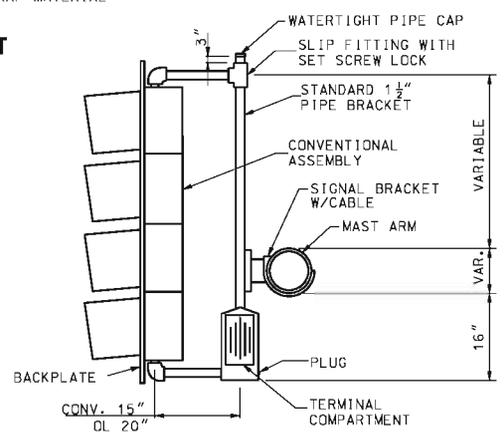
ARM ATTACHMENTS



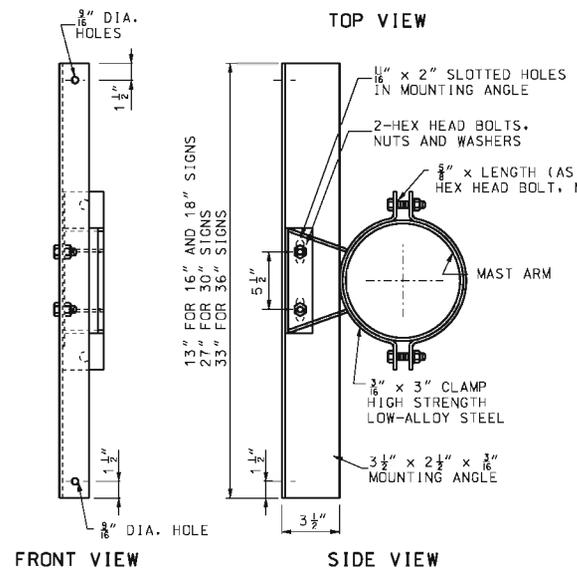
TOP VIEW



WELD DETAIL



MAST ARM MOUNTED
SIGNAL HEAD
(SEE STANDARD 902.00)



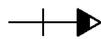
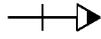
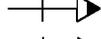
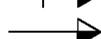
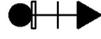
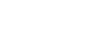
FRONT VIEW

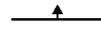
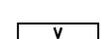
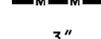
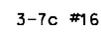
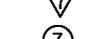
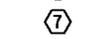
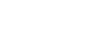
SIDE VIEW

SIGN BRACKET ASSEMBLY
ALTERNATE DESIGN MAY BE PROVIDED
AS APPROVED BY ENGINEER

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		TRAFFIC SIGNALS TUBULAR STEEL POSTS	
DATE EFFECTIVE: 02/01/2008 DATE PREPARED: 1/17/2013	902.400		SHEET NO. 2 OF 3

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

-  OPTICALLY LIMITING SIGNAL HEAD WITH BACKPLATE
-  OPTICALLY LIMITING & CONVENTIONAL SIGNAL HEAD WITH BACKPLATE
-  OPTICALLY LIMITING & CONVENTIONAL SIGNAL HEAD WITH BACKPLATE
-  CONVENTIONAL SIGNAL HEAD WITH BACKPLATE
-  SIGNAL HEAD - PEDESTRIAN
-  POST MOUNTED SIGNAL HEAD WITH SIGN AND BACKPLATE
-  STOP LINE
-  LANE USE
-  TYPE A BASE
-  TYPE F BASE
-  TYPE C BASE
-  EXISTING POST BASE
-  WOOD POLE WITH DOWN GUY
-  STEEL POLE
-  STEEL POLE WITH DOWN GUY
-  CONTROLLER WITH PAD
-  EXISTING CONTROLLER
-  PULL BOX, TYPE I DRAIN, CONCRETE
-  PULL BOX, TYPE II DRAIN, CONCRETE
-  PULL BOX, TYPE I DRAIN, PREFORMED
-  PULL BOX, TYPE II DRAIN, PREFORMED
-  DOUBLE PULL BOX, TYPE A, TYPE I DRAIN, CONCRETE
-  DOUBLE PULL BOX, TYPE A, TYPE II DRAIN, CONCRETE
-  DOUBLE PULL BOX, TYPE B, TYPE I DRAIN
-  DOUBLE PULL BOX, TYPE B, TYPE II DRAIN
-  PULL BOX, CLASS 5, TYPE I DRAIN, PREFORMED
- PULL BOX, CLASS 5, TYPE II DRAIN, PREFORMED
- EXISTING PULL BOX
- SERVICE POLE OR PEDESTAL AND POWER SUPPLY
- EXISTING SERVICE POLE
- 150-WATT HPS LUMINAIRE

-  SPAN WIRE WITH SIGNAL HEAD
-  MAST ARM WITH SIGNAL HEADS AND 150 WATT LUMINAIRE
-  MAST ARM WITH OVERHEAD SIGN
-  INDUCTION LOOP DETECTOR
-  VIDEO DETECTION ZONE
-  PUSH BUTTON DETECTOR
-  CAPPED RIGID CONDUIT
-  RIGID CONDUIT IN TRENCH
-  RIGID CONDUIT PUSHED
-  EXISTING RIGID CONDUIT
-  RIGID CONDUIT ON BRIDGE
-  RIGID CONDUIT IN MEDIAN
- 3"** SIZE OF CONDUIT
- 3-7c #16** NUMBER & AWG SIZE OF CABLE
-  SIGNAL FACE NUMBER
-  POST NUMBER
-  DETECTOR NUMBER
-  PULL BOX NUMBER
-  PERSON WALKING INTERVAL
-  FLASHING UPRAISED HAND INTERVAL WITH COUNTDOWN
-  STEADY UPRAISED HAND INTERVAL

- R** RED LENS (CIRCULAR)
- FR** FLASHING RED (CIRCULAR)
- Y** YELLOW LENS (CIRCULAR)
- FY** FLASHING YELLOW (CIRCULAR)
- FYL** FLASHING YELLOW LEFT ARROW LENS
- FYR** FLASHING YELLOW RIGHT ARROW LENS
- YL** YELLOW LEFT ARROW LENS
- YR+** YELLOW RIGHT ARROW LENS
- G** GREEN LENS (CIRCULAR)
- S** GREEN STRAIGHT ARROW LENS
- L** GREEN LEFT ARROW LENS
- R+** GREEN RIGHT ARROW LENS
- RE** TUNNEL VISOR WITH LOUVER

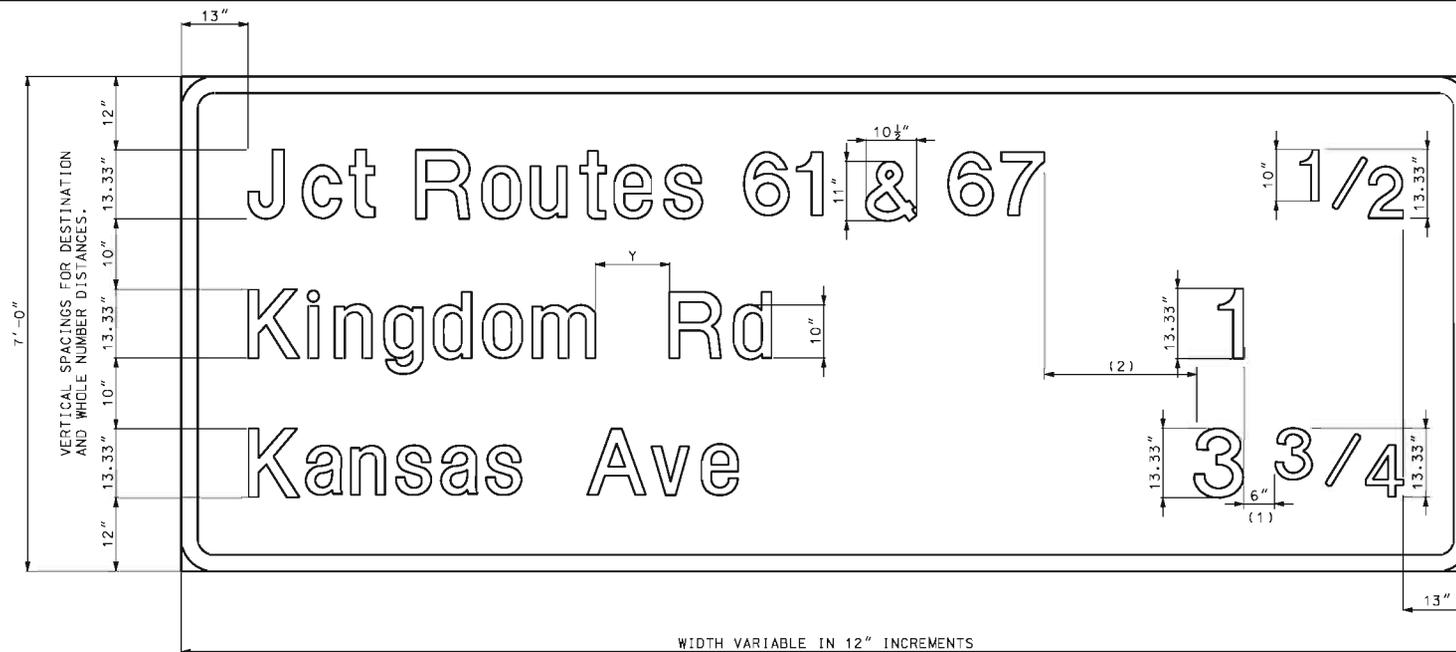
ALL 12 INCH WITH TUNNEL VISOR

SIGN LEGEND

- R10 - 10L LEFT TURN SIGNAL
- R10 - 10R RIGHT TURN SIGNAL
- R3 - 5L LEFT ARROW (SYMBOL) ONLY
- R3 - 5R RIGHT ARROW (SYMBOL) ONLY
- R3 - 5A STRAIGHT ARROW (SYMBOL) ONLY
- R3 - 6L LEFT ARROW - STRAIGHT ARROW (SYMBOL)
- R3 - 6R RIGHT ARROW - STRAIGHT ARROW (SYMBOL)
- R3 - 2 NO LEFT TURN (SYMBOL)
- R3 - 1 NO RIGHT TURN (SYMBOL)
- R3 - 3 NO TURNS
- R10 - 5 LEFT ONLY ON LEFT ARROW
- R10 - 12 LEFT TURN YIELD TO GREEN (SYMBOLIC CIRCULAR GREEN)
- D3 - 16 STREET NAME (ONE LINE)
- D3 - 18 STREET NAME (TWO LINE)
- R10 - 3B CROSSWALK (PEDESTRIAN SYMBOL)
- R10 - 11A NO TURN ON RED
- R10 - 13 EMERGENCY SIGNAL

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
 <p>ERIC E. SCHREIER NUMBER PE-28411 PROFESSIONAL ENGINEER</p> <p><small>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</small></p>	<p>TRAFFIC SIGNALS TRAFFIC SIGNAL SYMBOLS</p>
DATE EFFECTIVE: 07/01/2015 DATE PREPARED: 6/1/2015	<p>902.80K</p>
SHEET NO. 1 OF 1	

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



LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

NOTES:

"ROUTE" SHALL NOT BE ABBREVIATED.

INTERSTATES SHALL BE REFERENCED WITH A CAPITAL "I". (EX. ROUTE I-29).

Y = UPPER CASE LETTER HEIGHT.

USE HYPHEN TO JOIN 2 ROUTES SHARING THE SAME ROADWAY.

USE AN AMPERSAND TO SEPERATE 2 ROUTES ON INDIVIDUAL ROADWAYS.

USE COMMAS AND AN AMPERSAND TO SEPERATE 3 OR MORE ROUTES ON INDIVIDUAL ROADWAYS.

(1) 6" STANDARD. HORIZONTALLY ALIGN RIGHT EXTREME EDGE OF WHOLE NUMERALS, REGARDLESS OF LINE OF COPY.

HORIZONTALLY ALIGN RIGHT EXTREME EDGE OF FRACTIONS REGARDLESS OF LINE COPY.

WHEN NO FRACTIONS EXIST, RIGHT EXTREME EDGE OF WHOLE NUMERALS SHALL BE 13" FROM EDGE OF SIGN.

(2) UPPER CASE LETTER HEIGHT FROM LONGEST DESTINATION TO LONGEST DISTANCE.

INCREASE THIS SPACE TO PROVIDE EVEN 12" WIDTH FOR ENTIRE SIGN.

GENERAL NOTES (ALL SIGNS):

GROUND MOUNTED SIGNS GREATER THAN 6 FEET WIDE OR SIGNS GREATER THAN 30 SQUARE FEET SHALL BE STRUCTURAL.

GUIDE SIGN WIDTH VARIABLE IN 12" INCREMENTS.

GUIDE SIGN HEIGHT VARIABLE IN 12" INCREMENTS.

STATE ABBREVIATIONS SHALL BE THE STANDARD 2-LETTER POSTAL ABBREVIATION, AND SHALL BE DETAILED IN ALL-CAPS.

SEE OTHER STANDARD DRAWINGS FOR ARROW DETAILS.

BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND	L-3	R2	GREEN	
LEGEND	L-3	R4	WHITE	E(M)
SYMBOLS	L-3	R4	VAR.	
BORDER	L-3	R4	WHITE	
SUBSTRATE	STRUCTURAL			

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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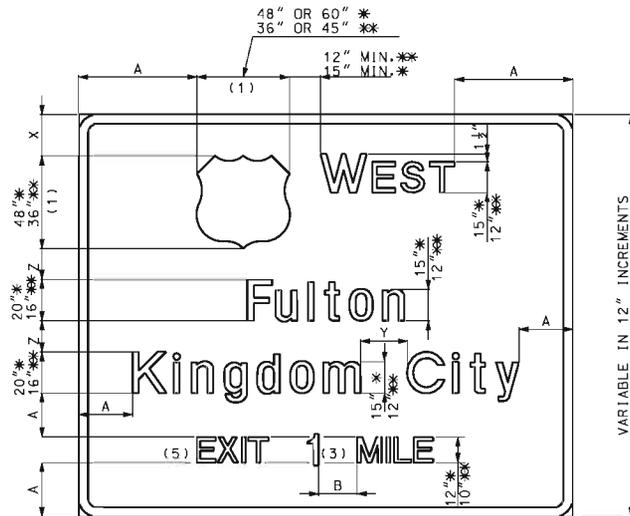
HIGHWAY SIGNING STRUCTURAL SIGNS INTERCHANGE SEQUENCE

DATE EFFECTIVE: 02/01/2011
 DATE PREPARED: 12/22/2011

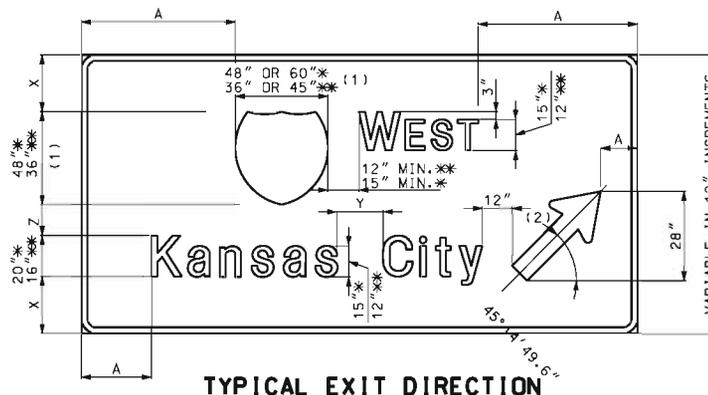
903.02AL

SHEET NO.
1 OF 19

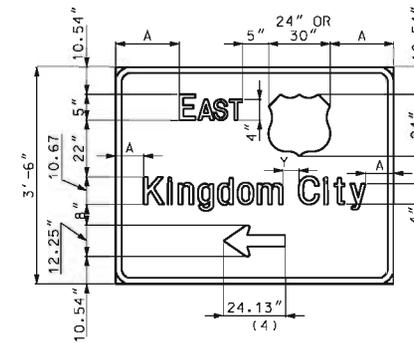
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TYPICAL ADVANCE GUIDE



TYPICAL EXIT DIRECTION



CROSSROAD GUIDE

GUIDE SIGN LEGEND

- A = VARIABLE SO THAT THE OVERALL SIGN WIDTH IS IN 12" INCREMENTS MINIMUM LOWER CASE HEIGHT.
- B = 1.5 TIMES WORDING LETTER HEIGHT.
- X = APPROXIMATELY THE UPPER CASE LETTER HEIGHT. VARY THIS DIMENSION FOR HEIGHT AND WIDTH INCREMENTAL ROUNDING.
- Y = UPPER CASE LETTER HEIGHT
- Z = LOWER CASE LETTER HEIGHT
- * = GROUND MOUNT
- ** = OVERHEAD

NOTES:

- CARDINAL DIRECTION PLACED ON EXIT SIDE OF SHIELD.
- (1) ALTERNATE ROUTE SHIELDS MAY BE USED AS REQUIRED.
- (2) TYPE A ARROW AT 45° STANDARD REGARDLESS OF ROADWAY GEOMETRICS.
- (3) WHOLE NUMERALS, 18" GROUND MOUNT, 15" OVERHEAD.
- (4) LENGTH OF ARROW IS EQUAL TO 50% OF LEGEND LENGTH WITH MAXIMUM OF 48" IN 12" INCREMENTS.
- (5) IF EXIT NUMBER PANELS ARE USED WITH THE ADVANCE GUIDE SIGN, "EXIT" WILL NOT BE REQUIRED.

NOTES:

- NUMERAL TO FRACTION SPACE, 8" GROUND MOUNT, 6" OVERHEAD.
- HORIZONTALLY CENTER ALL LINES OF TEXT AND SYMBOLS.
- BOX DIMENSION FRACTIONS: OVERHEAD IS 15" H x 20"W FOR 1/2, 1/4, 15"H x 25"W FOR 3/4, GROUND MOUNT 18"H x 24"W FOR 1/2, 1/4, 18"H x 30"W FOR 3/4.

LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

BACKGROUND REFLECTIVE SHEETING

- R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
- R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

GENERAL SIGN DATA					
STR2L-3	TYPE	REF. SHEETING TYPE		COLOR	LETTER SERIES
		GROUND	OVERHEAD		
BACKGROUND	L-3	R2	R2	GREEN	
LEGEND	L-3	R4	R4	WHITE	E(M)
SYMBOLS	L-3	R4	R4	VAR.	
BORDER	L-3	R4	R4	WHITE	
SUBSTRATE	STRUCTURAL (SEE GEN. NOTES ON SH. 1)				

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
EILEEN H. PADERS
REGISTERED PROFESSIONAL ENGINEER
NUMBER PE-28238

HIGHWAY SIGNING STRUCTURAL SIGNS

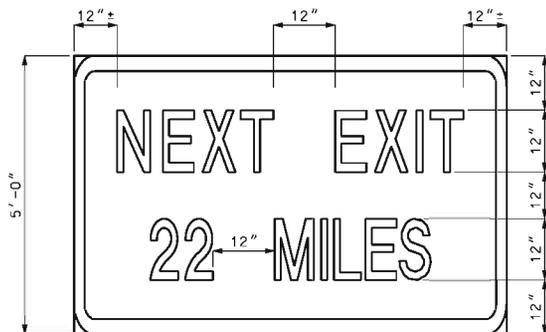
INTERCHANGE SEQUENCE

DATE EFFECTIVE: 02/01/2012

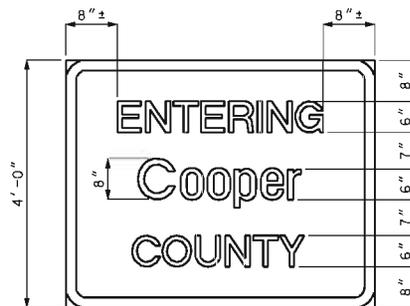
DATE PREPARED: 12/22/2011

903.02AL

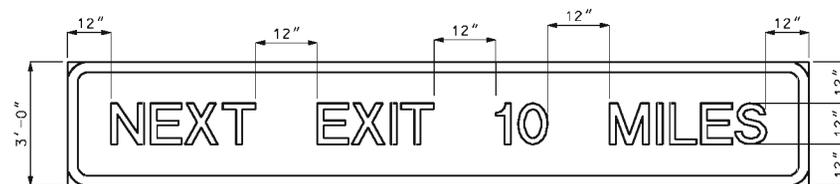
SHEET NO.
2 OF 19



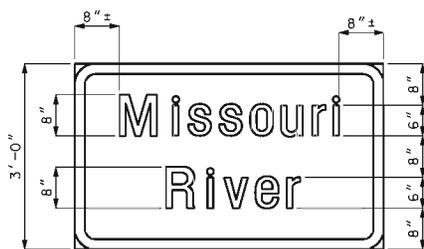
E2-1A



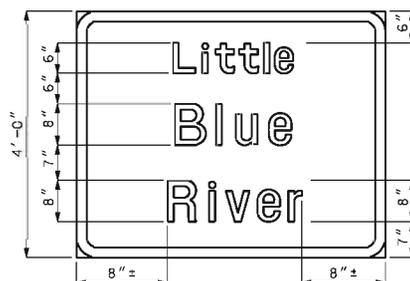
COUNTY LINE



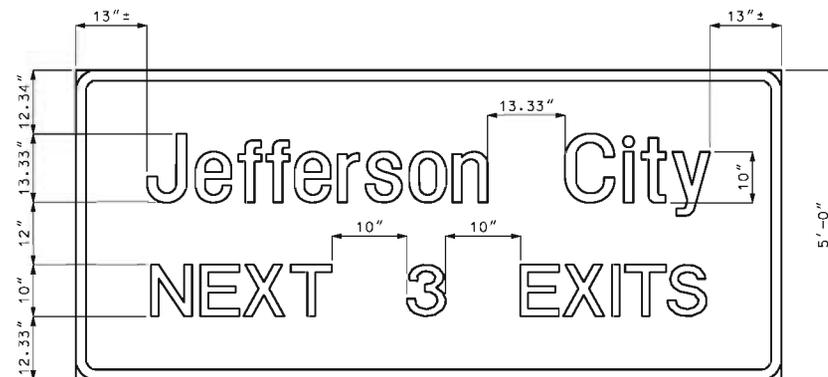
E2-1
NEXT EXIT SUPPLEMENTAL
ADVANCE GUIDE



RIVER/CREEK
(TWO LINES)



RIVER/CREEK
(THREE LINES)



NEXT (X) EXITS

BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R2	GREEN	
LEGEND	L-3	R4	WHITE	E(M)
SYMBOLS	L-3	R4	VAR.	
BORDER	L-3	R4	WHITE	
SUBSTRATE	STRUCTURAL (SEE GEN. NOTES ON SH. 1)			

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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**HIGHWAY SIGNING
STRUCTURAL SIGNS
MISC. FREEWAY AND EXPRESSWAY
GUIDE SIGNS**

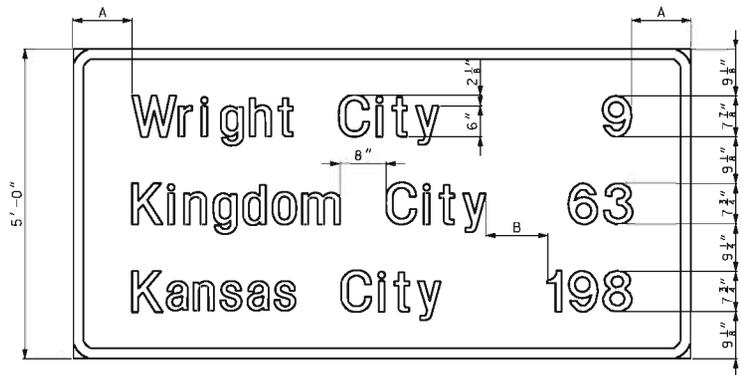
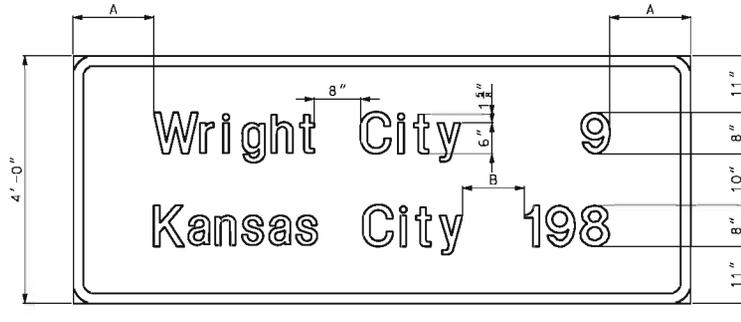
THIS SHEET HAS BEEN
DESIGNED, DRAWN, CHECKED,
AND DATED
ELECTRONICALLY.

DATE EFFECTIVE: 02/01/2012
DATE PREPARED: 12/22/2011

903.02AL

SHEET NO.
3 OF 19

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



NOTE: FOR INTERSTATE, LAST LINE OF COPY SHALL INDICATE APPROVED AASHTO CONTROL CITY.

POST INTERCHANGE/INTERSECTION DISTANCE

- A = VARIABLE SO THAT THE OVERALL SIGN WIDTH IS IN 12" INCREMENTS, MINIMUM LOWER CASE HEIGHT.
- B = UPPER CASE LETTER HEIGHT, FROM LONGEST DESTINATION TO LONGEST DISTANCE, REGARDLESS OF LINE COPY.

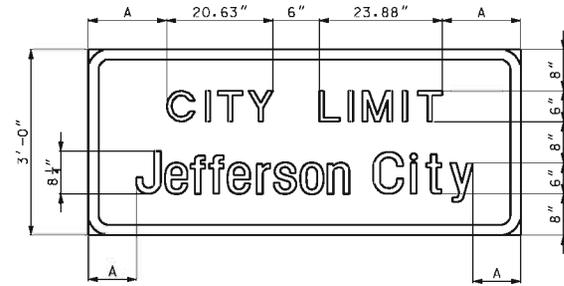
BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

BACKGROUND REFLECTIVE SHEETING

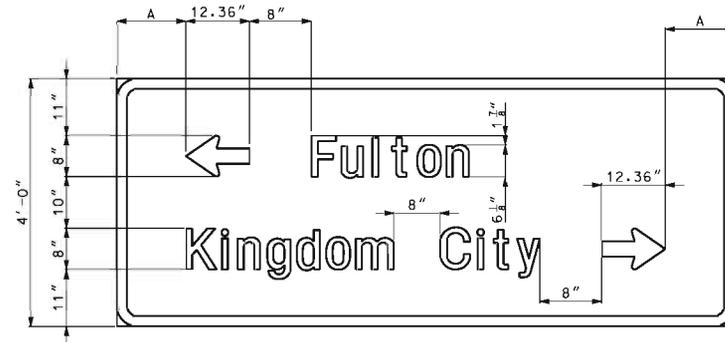
- R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
- R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

LEGEND, SYMBOLS & BORDER

- L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)



CITY LIMITS



NOTE: DESTINATIONS ARE PLACED IN THE FOLLOWING ORDER: AHEAD, LEFT, RIGHT. TYPE D ARROWS SHALL BE USED.

ADVANCE INTERSECTION DESTINATION

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R2	GREEN	
LEGEND	L-3	R4	WHITE	E(M)
SYMBOLS	L-3	R4	VAR.	
BORDER	L-3	R4	WHITE	
SUBSTRATE	STRUCTURAL (SEE GEN. NOTES ON SH. 1)			

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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



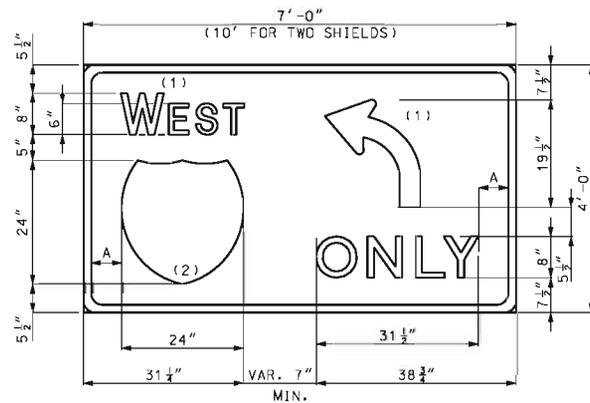
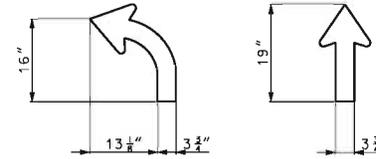
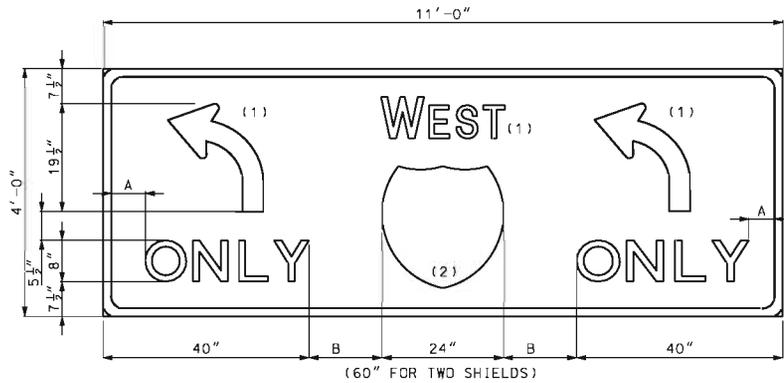
STATE OF MISSOURI
EILEEN H. HADERS
REGISTERED PROFESSIONAL ENGINEER
NUMBER PE-28238
EXPIRES 12/31/2011

THIS SHEET HAS BEEN
DESIGNED, DRAWN AND DATED
ELECTRONICALLY.

**HIGHWAY SIGNING
STRUCTURAL SIGNS
MISC. GROUND MOUNTED FREEWAY
AND EXPRESSWAY GUIDE SIGNS**

DATE EFFECTIVE: 02/01/2012	903.02AL	SHEET NO. 4 OF 19
DATE PREPARED: 12/22/2011		

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



A = VARIABLE SO THAT THE OVERALL SIGN WIDTH IS IN 12" INCREMENTS, MINIMUM 6".
 B = VARIABLE, MINIMUM 7".

NOTES:

SIELD SHALL APPEAR ON THE EXIT SIDE OF SIGN.

SIGN ALWAYS PLACED OVERHEAD. MOUNT ON BRIDGE WHEREVER POSSIBLE.

- (1) ALL CARDINAL DIRECTIONS AND ARROWS HORIZONTALLY CENTERED IN SPACE PROVIDED.
- (2) ALTERNATE ROUTE SHIELDS MAY BE PROVIDED. USE STANDARD 24" OR 30" SHIELD IN SPACE PROVIDED.

BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R2	GREEN	
LEGEND	L-3	R4	WHITE	E(M)
SYMBOLS	L-3	R4	VAR.	
BORDER	L-3	R4	WHITE	
SUBSTRATE	STRUCTURAL			

LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

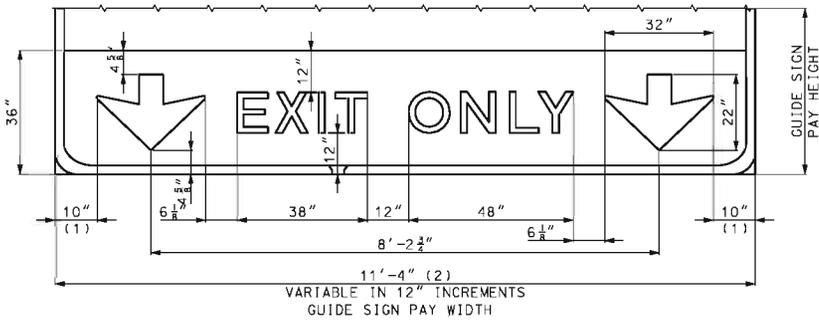
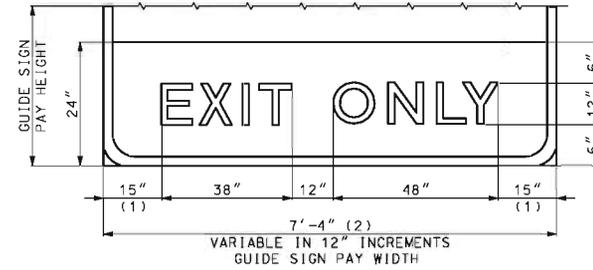
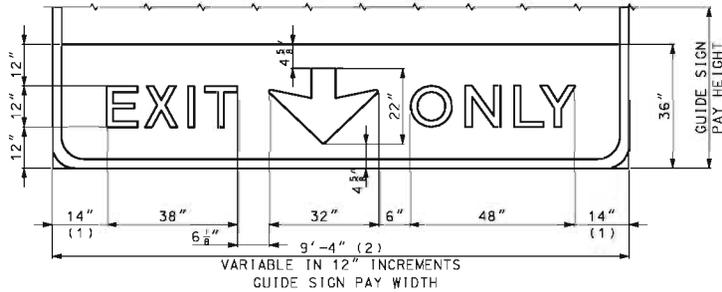
**HIGHWAY SIGNING
 STRUCTURAL SIGNS
 LANE CONTROL
 WITH ROUTE SHIELD**

THIS SHEET HAS BEEN
 DRAWN, CHECKED AND DATED
 ELECTRONICALLY.

DATE EFFECTIVE: 02/01/2012
 DATE PREPARED: 12/22/2011

903.02AL

SHEET NO.
 5 OF 19



- (1) TYPICALLY VARY THIS DISTANCE TO MATCH WIDTH OF GUIDE SIGN.
- (2) MINIMUM GUIDE SIGN WIDTH WHEN EXIT ONLY PANEL IS CONTROL LINE FOR SIGN WIDTH.

BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

BACKGROUND REFLECTIVE SHEETING
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL SIGN DATA				
STR4L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R4	FL. YL.	
LEGEND	L-1		BLACK	E (MOD)
SYMBOLS	L-1		BLACK	
BORDER	L-1		BLACK	
SUBSTRATE	STRUCTURAL			

LEGEND, SYMBOLS AND BORDER
 L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

GENERAL NOTES:

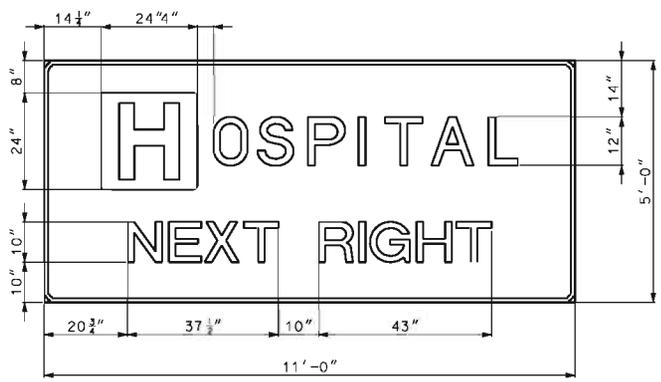
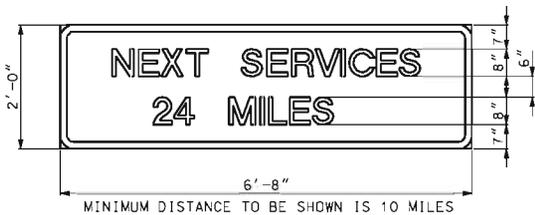
NO DIRECT PAY MADE FOR THIS PANEL. COST FOR PANEL IS INCLUDED IN THE COST FOR THE GUIDE SIGN TO WHICH THIS PANEL IS ATTACHED.

FOR OVERHEAD USE ONLY.

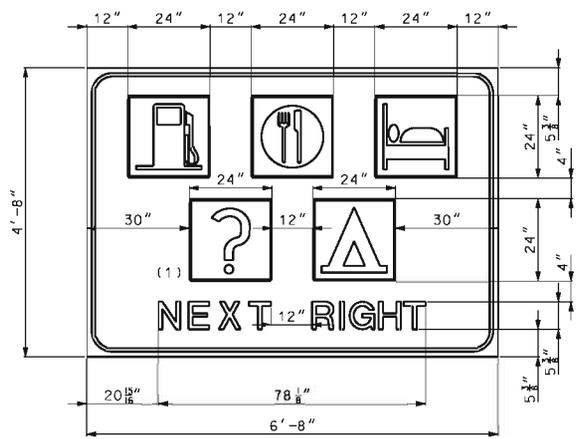
PLACE SIGN ON TRUSS TO ALIGN CENTER OF LANE WITH TYPE C ARROW.

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	HIGHWAY SIGNING STRUCTURAL SIGNS EXIT ONLY PANELS
	DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011
903.02AL	SHEET NO. 6 OF 19

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



NOTE:
FOR THE LETTER "H" USE THE D9-2 SIGNFACE AS A DEMOUNTABLE SHIELD.



INTERSTATE - USE "EXIT XX"
 FREEWAY - USE "NEXT RIGHT" "SECOND RIGHT"
 (1) TO BE USED IN CONFORMANCE WITH
 MANUAL ON UNIFORM TRAFFIC CONTROL.

NOTE:
HORIZONTALLY CENTER ALL LINES OF TEXT AND SYMBOLS.

BORDER (ALL SIGNS)			
CORNER RADII		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

BACKGROUND REFLECTIVE SHEETING
 R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND	L-3	R2	BLUE	
LEGEND	L-3	R4	WHITE	E(M)
SYMBOLS	L-3	R4	WHITE	
BORDER	L-3	R4	WHITE	
SUBSTRATE	STRUCTURAL			

LEGEND, SYMBOLS & BORDER
 L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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 JEFFERSON CITY, MO 65102
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**HIGHWAY SIGNING
 STRUCTURAL SIGNS
 SERVICE SIGNS**

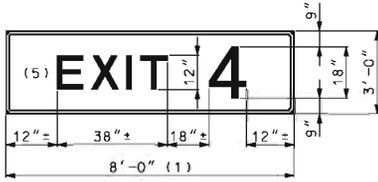
THIS SHEET HAS BEEN
 DRAWN, CHECKED AND DATED
 ELECTRONICALLY.

DATE EFFECTIVE: 02/01/2012
 DATE PREPARED: 12/22/2011

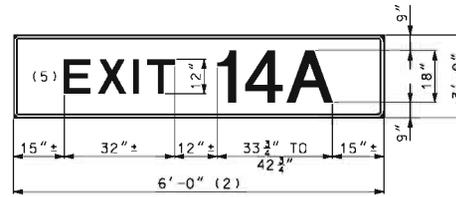
903.02AL

SHEET NO.
7 OF 19

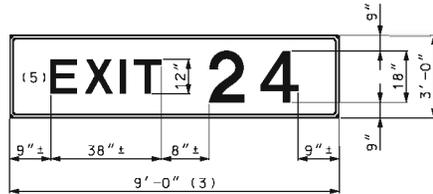
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



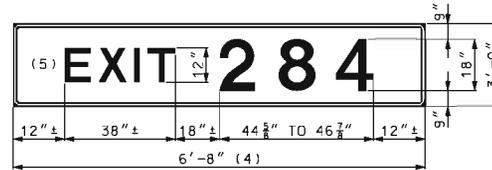
(1) 9'-0" 2 THROUGH 9 WITH A LETTER
 11'-0" FOR "EXITS" 2 THROUGH 9 WITH A-B LETTERS
1 THROUGH 9



(2) 12'-0" FOR "EXITS" 10 THROUGH 19
 NUMERAL WITH A-B LETTERS
**10 THROUGH 19 NUMERAL
 WITH LETTER**



(3) 9'-0" WITH NUMBER 1 NUMERAL
 11'-0" WITH A LETTER
 10'-0" WITH A NUMBER 1 NUMERAL AND A LETTER
 12'-0" FOR "EXITS" WITH A NUMBER 1 NUMERAL AND
 A-B LETTERS
 13'-0" FOR "EXITS" WITH DOUBLE NUMERAL AND
 A-B LETTERS
20 THROUGH 99



(4) 10'-0" WITH NUMBER 1 NUMERAL
 12'-0" WITH A LETTER
 12'-0" WITH A NUMBER 1 NUMERAL AND A LETTER
 13'-0" FOR "EXITS" WITH A TRIPLE NUMERAL
 WITH A NUMBER 1 NUMERAL AND A-B LETTERS
 14'-0" FOR "EXITS" WITH A TRIPLE
 NUMERAL AND A-B LETTERS
100 AND OVER

LEGEND, SYMBOLS & BORDER
 L-3 DIRECT APPLIED (CUT FROM
 MATERIAL SHOWN ON PLANS.)

BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

GENERAL SIGN DATA				
STR2L-3	TYPE	REFL. SHEETING TYPE		LETTER SERIES
		GROUND	OVERHEAD	
BACKGROUND		R2	R2	GREEN
LEGEND	L-3	R4	R4	WHITE E(M)
SYMBOLS	L-3	R4	R4	VAR.
BORDER	L-3	R4	R4	WHITE
SUBSTRATE	STRUCTURAL			

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL NOTES:

FOR MOUNTING DETAILS SEE OTHER DRAWINGS.

PANEL SHALL BE MOUNTED DIRECTLY TO THE TOP OF THE
 GUIDE SIGN AND ALIGNED WITH THE EXIT SIDE.

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

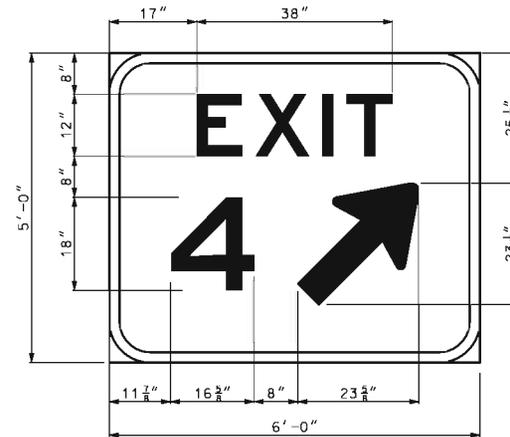
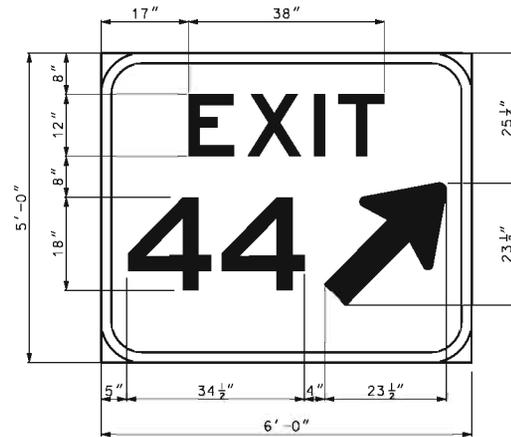
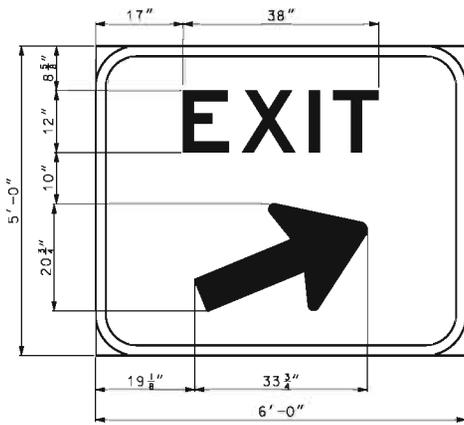
STATE OF MISSOURI
 EILEEN H. FADERS
 NUMBER
 PE-28238
 PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN
 SIGNED, SEALED AND DATED
 ELECTRONICALLY.

HIGHWAY SIGNING

EXIT NUMBER PANELS

DATE EFFECTIVE:	02/01/2012	903.02AL	SHEET NO.
DATE PREPARED:	12/22/2011		8 OF 19



BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

GENERAL SIGN DATA					
STR2L-3	TYPE	REFL. SHEETING TYPE		COLOR	LETTER SERIES
		GROUND	OVERHEAD		
BACKGROUND		R2	R2	GREEN	
LEGEND	L-3	R4	R4	WHITE	E(M)
SYMBOLS	L-3	R4	R4	VAR.	
BORDER	L-3	R4	R4	WHITE	
SUBSTRATE	STRUCTURAL				

SUBSTRATE

ST STRUCTURAL
SH SHEET

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL NOTE:

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

LEGEND, SYMBOLS & BORDER

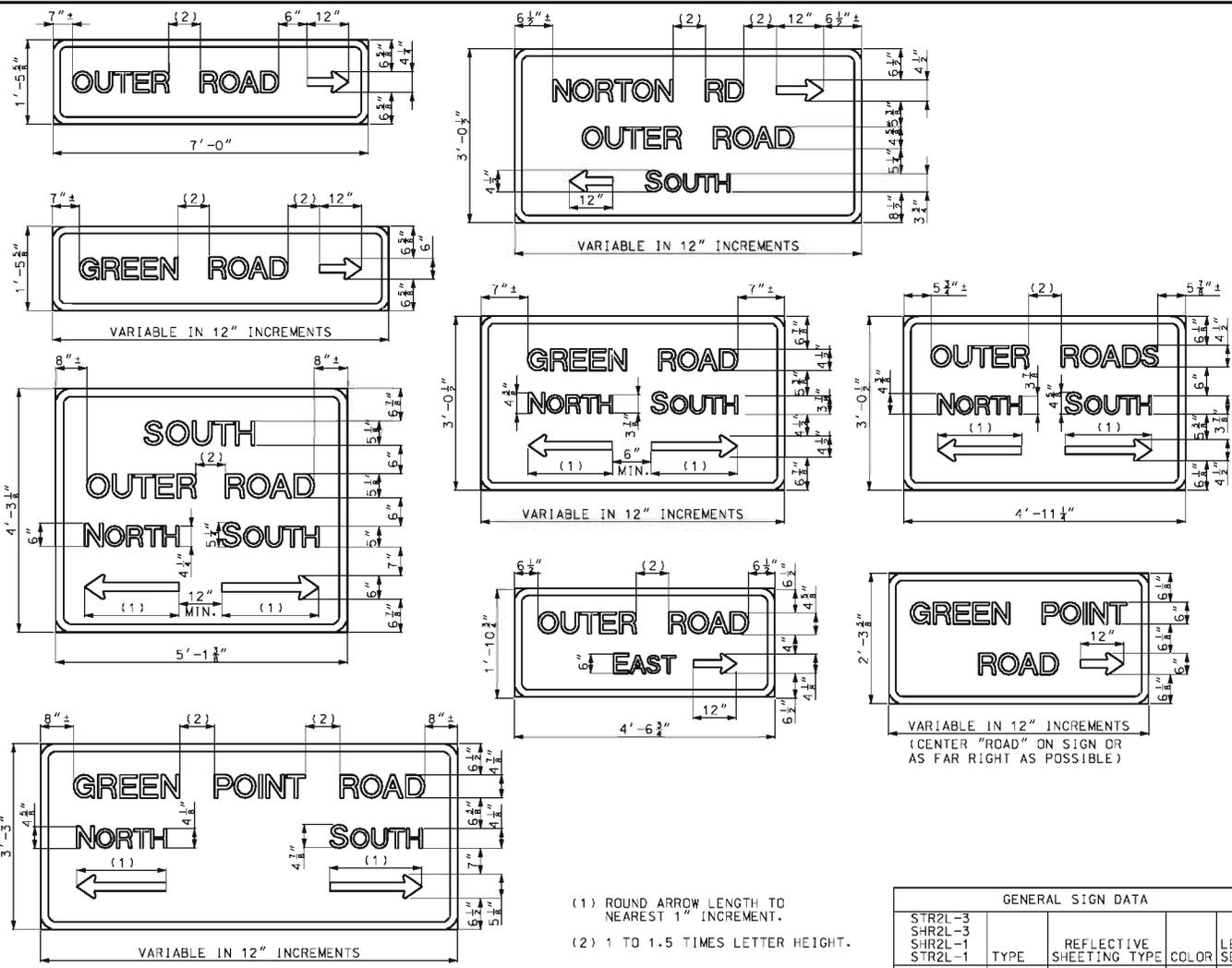
L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED SIGN COLOR COMBINATION.

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p>HIGHWAY SIGNING</p> <p>GORE EXIT SIGN</p>	
	<p>DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011</p>	<p>903.02AL</p>

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

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



MAST ARM STREETNAME SIGNS

BORDER (ALL SIGNS)			
CORNER RADII		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

GENERAL NOTES:

SIGNS GREATER THAN 6' WIDE OR 30 SQ. FT. IN AREA SHALL BE STRUCTURAL.

MAST ARM STREETNAME SIGNS SHALL BE FLAT SHEET.

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS:

9 SQUARE FEET OR LESS - .080 IN..

OVER 9 SQUARE FEET BUT LESS THAN 16 SQUARE FEET - .100 IN..

16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

- (1) ROUND ARROW LENGTH TO NEAREST 1" INCREMENT.
- (2) 1 TO 1.5 TIMES LETTER HEIGHT.

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
SHR2L-3		R2	GR/WHT	
SHR2L-1		R4	WHITE	D
STR2L-1		R4	WHITE	
BORDER	L-1(3)	R4	WHITE	
SUBSTRATE	SHEET (SEE GENERAL NOTES)			

LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED SIGN COLOR COMBINATION.

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

SUBSTRATE
ST STRUCTURAL
SH SHEET

BACKGROUND REFLECTIVE SHEETING
R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

CROSS ROAD AND OUTER ROAD SIGNS

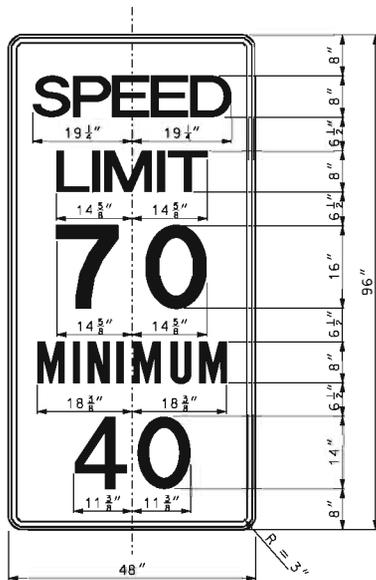
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

HIGHWAY SIGNING
CROSS ROAD AND OUTER ROAD SIGNS

STATE OF MISSOURI
EILEEN H. PADERS
REGISTERED PROFESSIONAL ENGINEER
NUMBER PE-28238
THIS SHEET HAS BEEN BOARD SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE:	02/01/2012	903.02AL	SHEET NO. 10 OF 19
DATE PREPARED:	12/22/2011		



R2-4g
FOR USE ON INTERSTATE ONLY

GENERAL SIGN DATA: R2-4g				
SHR2L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R2	WHITE	
LEGEND	L-1		BLACK	C
SYMBOLS	L-1		BLACK	
BORDER	L-1		BLACK	
SUBSTRATE	SHEET			

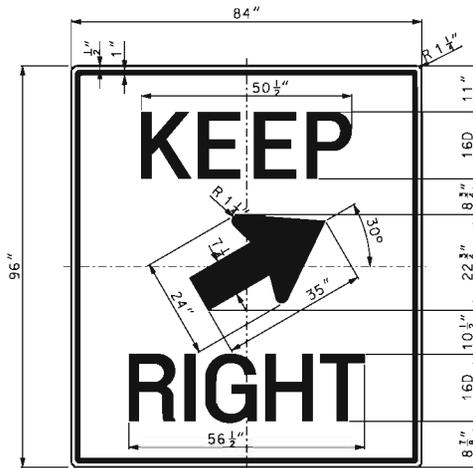
LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2



(3) SIGN R4-7d SHALL BE STRUCTURAL

R4-7d
KEEP RIGHT
(WITH 30° ARROW)
FREEWAY/EXPRESSWAY

GENERAL SIGN DATA: R4-7d				
STR2L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R2	WHITE	
LEGEND	L-1		BLACK	D
SYMBOLS	L-1		BLACK	
BORDER	L-1		BLACK	
SUBSTRATE	STRUCTURE			

GENERAL NOTES:

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS (EXCEPT FOR 36" STOP SIGN THAT USES AN .100 ALUMINUM PLATE):

9 SQUARE FEET OR LESS - .080 IN. .

OVER 9 SQUARE FEET TO 16 SQUARE FEET - .100 IN. .

16 SQUARE FEET OR LARGER - .125 IN. .

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	HIGHWAY SIGNING REGULATORY SIGNS	
	DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011	903.02AL SHEET NO. 11 OF 19

GENERAL SIGN DATA: FLAT SHEET			
SHR4L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR
BACKGROUND		R4	FL. YL
LEGEND	L-1		BLACK
SYMBOLS	L-1		BLACK
BORDER	L-1		BLACK

GENERAL SIGN DATA: STRUCTURE			
STR4L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR
BACKGROUND		R4	FL. YL
LEGEND	L-1		BLACK
SYMBOLS	L-1		BLACK
BORDER	L-1		BLACK

LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

BACKGROUND REFLECTIVE SHEETING

R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7

SUBSTRATE

SH FLAT SHEET

ST EXTRUDED PANEL

GENERAL NOTES:

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS

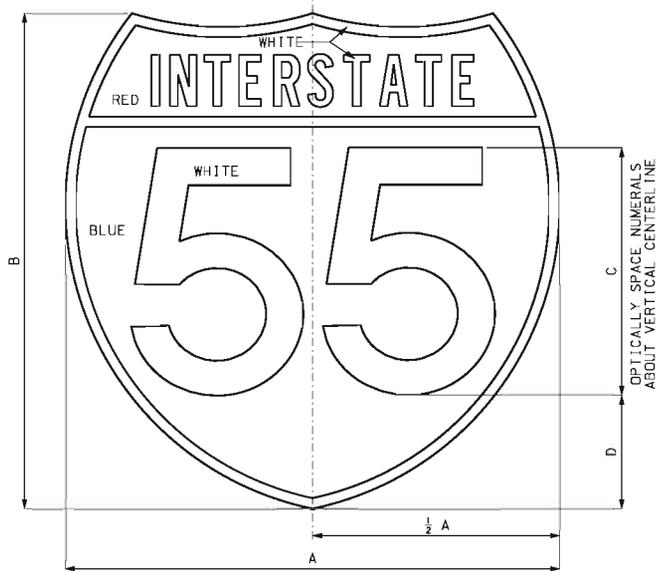
9 SQUARE FEET OR LESS - .080 IN.

OVER 9 SQUARE FEET TO 16 SQUARE FEET - .100 IN.

16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<p align="center">HIGHWAY SIGNING WARNING SIGNS</p>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/22/2011	903.02AL	
		SHEET NO. 12 OF 19



FOR GUIDE SIGN USE



FOR INDEPENDENT USE

INTERSTATE SHIELD

LOCATION	SIGN	DIMENSIONS (INCHES)			
		A	B	C	D
CROSSROAD	1,2-DIGITS	24	24	12D	5 1/2
OVERHEAD	1,2-DIGITS	36	36	18D	8 1/4
GROUND MOUNT	1,2-DIGITS	48	48	24D	11
CROSSROAD	3-DIGITS	30	24	12D	5 1/2
OVERHEAD	3-DIGITS	45	36	18D	8 1/4
GROUND MOUNT	3-DIGITS	60	48	24D	11

DIMENSIONS FOR GUIDE SIGN, BUSINESS LOOP OR SPUR SHIELDS

GUIDE SIGN				
GENERAL SIGN DATA				
	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND	L-1	R4	VAR.	
LEGEND	L-1 *		WHITE	VAR **
SYMBOLS				
BORDER	L-1 *		WHITE	
SUBSTRATE				

* REVERSE SCREEN PROCESS.
** SEE DIMENSION TABLES THIS DRAWING.

SIGN	DIMENSIONS (INCHES)				
	A	B	C	D	E
1 & 2 DIGITS	24	24	1 1/2 D	1 3/8	10D
3 DIGITS	30	24	1 1/2 D	2 1/4	10D

DIMENSIONS FOR INDEPENDENT USE SHIELD

INDEPENDENT GENERAL SIGN DATA				
SHR2L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND	L-1	R2	VAR.	
LEGEND	L-1 *		WHITE	VAR **
SYMBOLS				
BORDER	L-1 *		WHITE	
SUBSTRATE	SHEET			

LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

* REVERSE SCREEN PROCESS.
** SEE DIMENSION TABLES THIS DRAWING.

SUBSTRATE

ST STRUCTURAL
SH SHEET

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL NOTES:

ALL SHIELDS FOR GUIDE SIGN USE SHALL BE SCREEN PROCESS OR ELECTRONIC CUTABLE FILM ON REFLECTIVE SHEETING IN ACCORDANCE WITH SEC 1042.2.7.3.

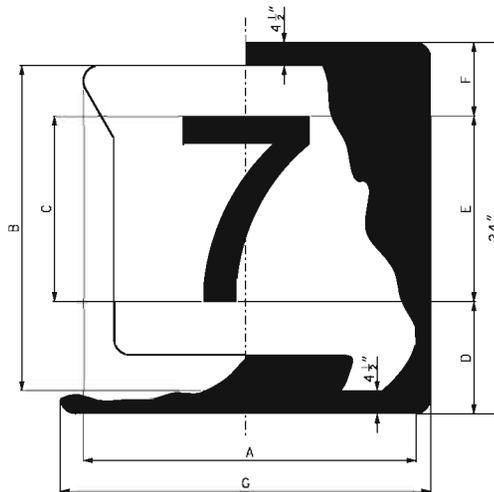
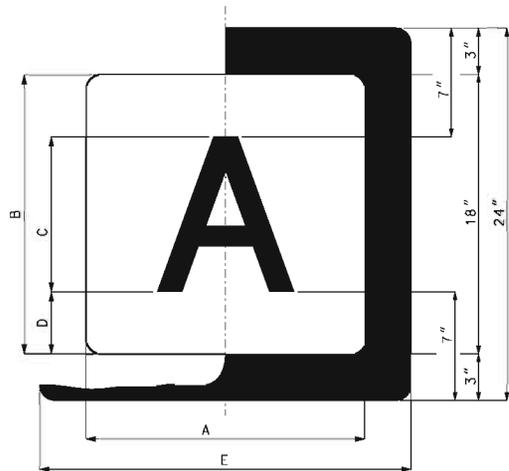
FOR HOLE PUNCHING AND MOUNTING DETAILS SEE OTHER DRAWINGS.

OCCASIONALLY THE NUMERALS CANNOT BE ACCOMMODATED WITHIN THE SPACE AVAILABLE ON THE STANDARD SHIELD. FOR THESE SITUATIONS, THE STANDARD SERIES D NUMERAL MAY BE REDUCED TO SERIES C, OR HORIZONTALLY COMPRESSED BY MEANS OF SIGNING SOFTWARE AS DIRECTED BY THE ENGINEER.

ALL SIGNS ON THIS SHEET ARE TO BE FABRICATED FROM .080 IN. SHEET ALUMINUM, UNLESS OTHERWISE SHOWN.

		MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		HIGHWAY SIGNING SHIELD FOR INDEPENDENT AND GUIDE SIGN USE	
DATE EFFECTIVE:	02/01/2012	903.02AL	SHEET NO. 13 OF 19
DATE PREPARED:	12/22/2011		

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



LOCATION	NO. OF LETTERS	DIMENSIONS (INCHES) FOR GUIDE SIGN USE			
		A	B	C	D
CROSSROAD	1	24	24	12D	6
CROSSROAD	2	30	24	12D	6
OVERHEAD	1	30	30	18D	6
OVERHEAD	2	36	30	18D	6
GROUND MOUNT	1	42	42	24D	9
GROUND MOUNT	2	48	42	24D	9

NUMBER OF LETTERS	DIMENSIONS (INCHES) FOR INDEPENDENT USE	
	C	E
1	12D	24
2	12C	30

SUPPLEMENTARY SHIELD

LOCATION	ROUTE NUMBER	DIMENSIONS (INCHES) FOR GUIDE SIGN USE		
		A	B	C
CROSSROAD	1 & 2 DIGITS	24	24	12D
OVERHEAD	1 & 2 DIGITS	36	36	18C
GROUND MOUNT	1 & 2 DIGITS	48	48	24D
CROSSROAD	3 DIGITS	30	24	12C
OVERHEAD	3 DIGITS	45	36	18D
GROUND MOUNT	3 DIGITS	60	48	24D

ROUTE NUMBER	DIMENSIONS (INCHES) FOR INDEPENDENT USE			
	D	E	F	G
1 & 2 DIGIT	7 1/2	12D	4 3/4	24
3 DIGIT	8 1/2	12 B OR C	5 3/4	30

STATE ROUTE SHIELD

GUIDE SIGN			
GENERAL SIGN DATA			
BACKGROUND	COLOR	REFLECTIVE SHEETING TYPE	LETTER SERIES
	WHITE	R4	
LEGEND	BLACK		VAR *
SYMBOLS	WHITE		

INDEPENDENT			
GENERAL SIGN DATA			
SHR2L-1	COLOR	REFLECTIVE SHEETING TYPE	LETTER SERIES
BACKGROUND	WHITE	R2	
LEGEND	BLACK		VAR *
SYMBOLS	WHITE		
BORDER	BLACK		
SUBSTRATE	SHEET		

* SEE DIMENSION TABLES THIS DRAWING.

LEGEND, SYMBOLS & BORDER
 L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTTABLE FILMS AS APPROVED BY ENGINEER BASED ON SIGN COLOR COMBINATION.

SUBSTRATE
 ST STRUCTURAL
 SH SHEET

BACKGROUND REFLECTIVE SHEETING
 R2 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.2
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042.2.7.3

GENERAL NOTES:

ALL SHIELDS FOR GUIDE SIGN USE SHALL BE SCREEN PROCESS OR CUTTABLE FILM ON REFLECTIVE SHEETING IN ACCORDANCE WITH SEC 1042.2.7.3.

ALL SHIELDS FOR INDEPENDENT SIGN USE SHALL BE SCREEN PROCESS OR CUTTABLE FILM ON REFLECTIVE SHEETING IN ACCORDANCE WITH SEC 1042.2.7.2.

FOR HOLE PUNCHING AND MOUNTING DETAILS SEE OTHER DRAWINGS.

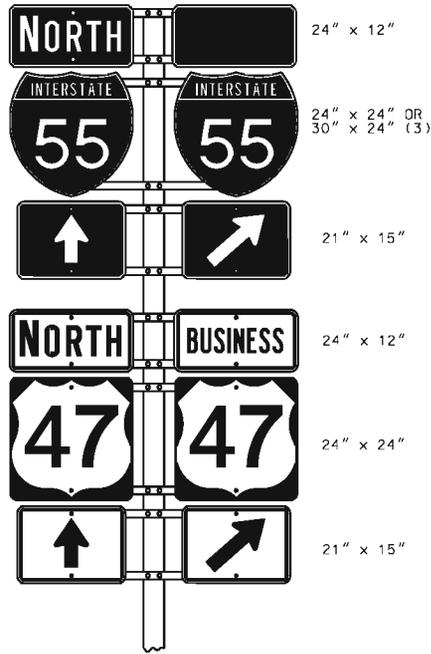
LAYOUT OF MISSOURI SHIELDS ARE AVAILABLE UPON REQUEST.

OCCASIONALLY THE NUMERALS CANNOT BE ACCOMMODATED WITHIN THE SPACE AVAILABLE ON THE STANDARD SHIELD. FOR THESE SITUATIONS, THE STANDARD SERIES D NUMERAL MAY BE REDUCED TO SERIES C, OR HORIZONTALLY COMPRESSED BY MEANS OF SIGNING SOFTWARE AS DIRECTED BY THE ENGINEER.

ALL SIGNS ON THIS SHEET ARE TO BE FABRICATED FROM .080 IN. SHEET ALUMINUM, UNLESS OTHERWISE SHOWN.

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	
HIGHWAY SIGNING STANDARD SHIELDS FOR INDEPENDENT AND GUIDE SIGN USE	
DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011	903.02AL SHEET NO. 14 OF 19

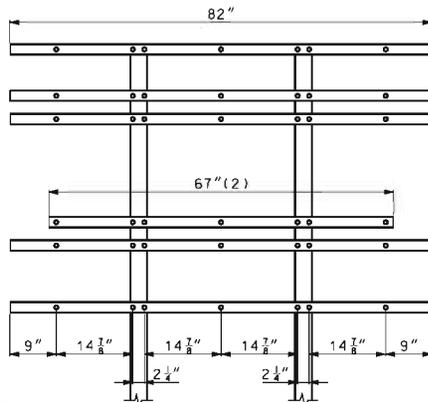
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TWO-ROUTE ASSEMBLY

NOTE: 1ST DIMENSION - WIDTH OF PLATE
2ND DIMENSION - HEIGHT OF PLATE

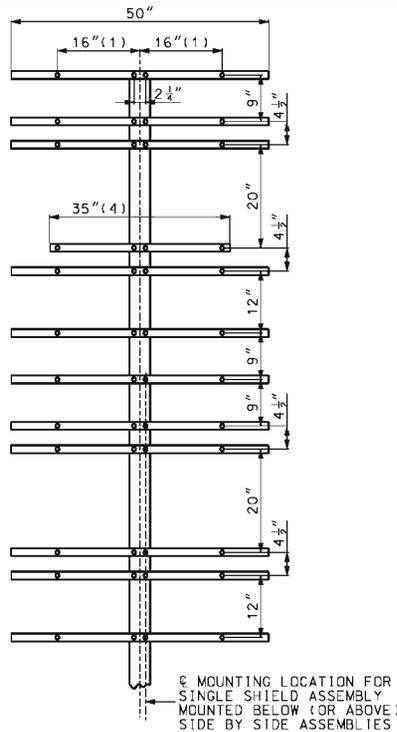
ONE POST
(WITH BARS)



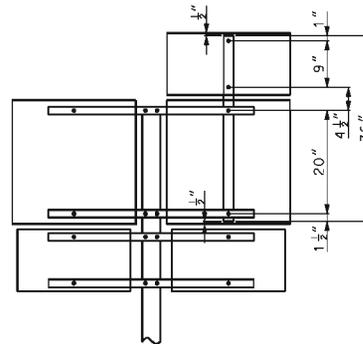
NOTE:
ASSEMBLIES WITH TWO-ROUTE SHIELDS MOUNTED BELOW
THREE-ROUTE SHIELDS SHALL BE MOUNTED TO THE POST
AS SHOWN IN ONE-POST WITH BARS, DRAWING ABOVE.

TWO POSTS

WIDE FLANGE POST MOUNTING



Ø MOUNTING LOCATION FOR
SINGLE SHIELD ASSEMBLY
MOUNTED BELOW (OR ABOVE)
SIDE BY SIDE ASSEMBLIES



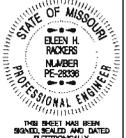
AUXILIARY PLATE MOUNTING

- (1) FOR 30" x 24" SHIELD, DIMENSION WILL BE 22".
- (2) FULL SIZE BARS SHALL BE USED WHEN INTERSTATE SHIELD IS NOT USED. VERTICAL SPACING OF BARS SHALL BE THE SAME AS FOR A SINGLE POST ASSEMBLY.
- (3) 24" x 24" SHALL BE USED FOR 1 OR 2 DIGIT ROUTE SHIELDS.
- (4) FOR SIDE BY SIDE 30" x 24" SHIELDS, DIMENSION WILL BE 41".

GENERAL NOTES:

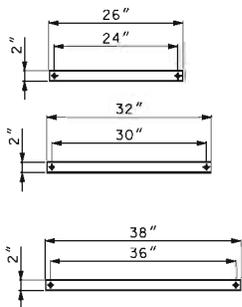
ALL BARS SHALL BE 2" x 3/8" STEEL, GALVANIZED AFTER PUNCHING.
WEIGHT = 2.55 LBS. PER FOOT. HOLES IN BARS SHALL BE 1/4" AND SHALL BE PUNCHED AS SHOWN ON THIS DRAWING.
BACKING BARS PAID FOR AS STRUCTURAL STEEL, PER POUND.

FOR POST AND FOOTING DATA AND DETAILS OF SHIELDS AND PLAQUES, SEE OTHER DRAWINGS.

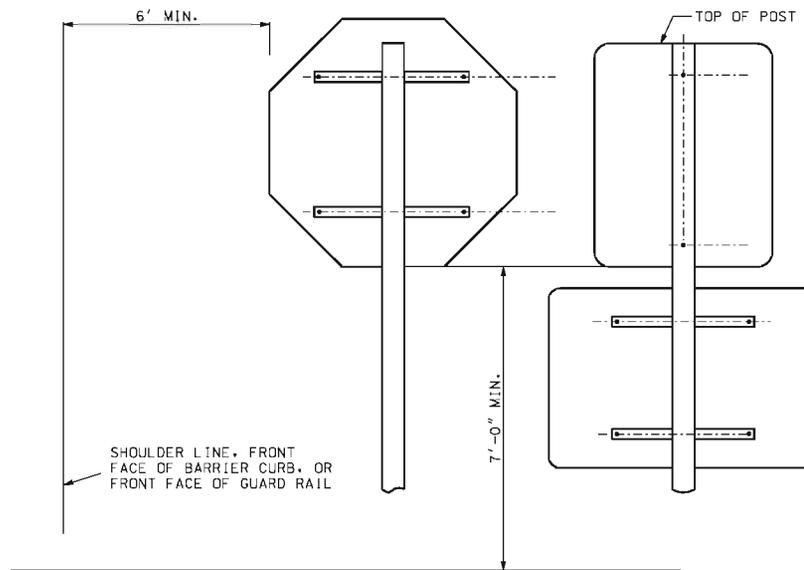
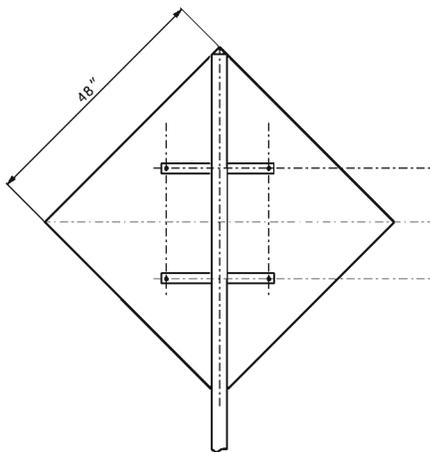
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	HIGHWAY SIGNING BACKING BARS SHEET SIGN MOUNTING ROUTE SHIELD AND MARKER ASSEMBLIES

DATE EFFECTIVE:	02/01/2012	903.02AL	SHEET NO.
DATE PREPARED:	12/22/2011		15 OF 19

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



THE THREE BACKING BAR LAYOUTS FOR SINGLE POST SIGNS

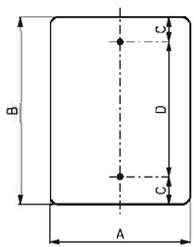


ELEV. OUTSIDE EDGE OF PAVEMENT FOR CLAMP DETAILS. SEE OTHER DRAWINGS.

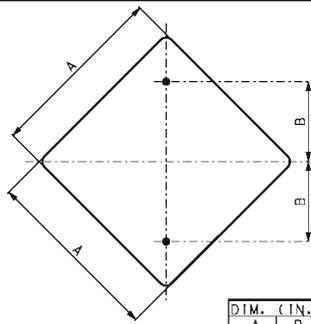
HOLES IN BACKING BARS SHALL BE $\frac{3}{8}$ " AND PUNCHED AS SHOWN ON THIS DRAWING.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	HIGHWAY SIGNING BACKING BARS DETAILS	
	DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/22/2011	903.02AL SHEET NO. 16 OF 19

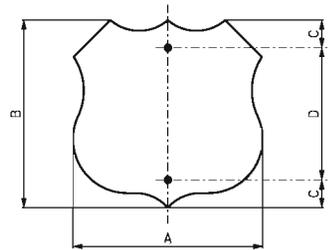
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



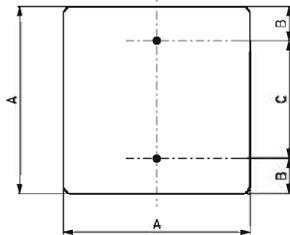
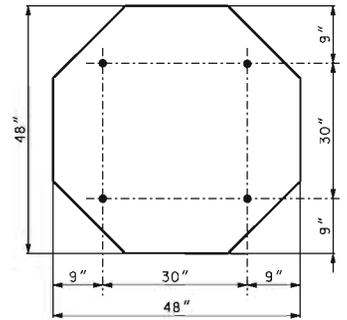
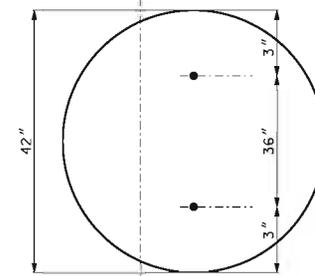
DIMENSIONS (IN.)			
A	B	C	D
6	15	1.5	12
8	24	3	18
9	12	1.5	9
9	48	3	42
10	30	3	24
12	18	3	12
12	24	3	18
12	36	3	30
12	48	3	42
18	24	3	18
24	30	3	24
24	36	3	30
30	36	3	30
30	42	3	36
30	48	3	42



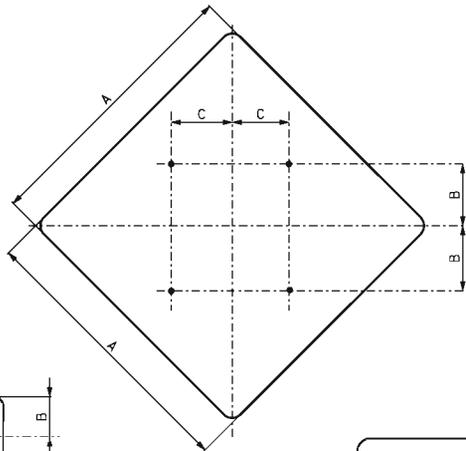
DIM. (IN.)	
A	B
18	9
24	12
30	15
36	18



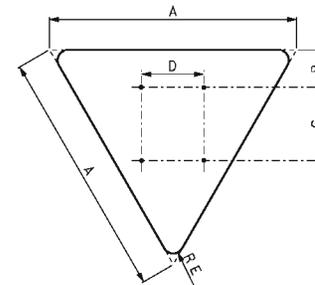
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



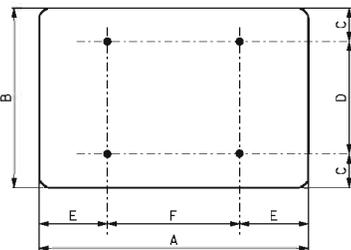
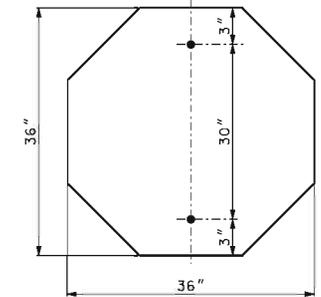
DIMENSIONS (IN.)		
A	B	C
14	3	8
18	3	12
24	3	18
30	3	24



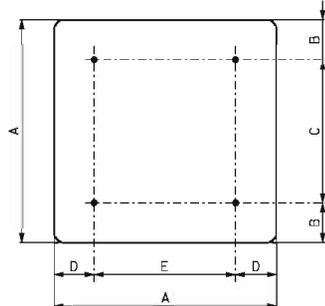
DIMENSIONS (IN.)		
A	B	C
48	15	15
60	18	18



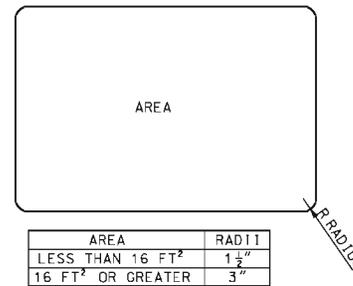
DIMENSIONS (IN.)				
A	B	C	D	E
48	3	12	12	3
60	4	18	15	3



DIMENSIONS (IN.)					
A	B	C	D	E	F
36	24	3	18	6	24
36	30	3	24	6	24
42	30	3	24	6	30
42	36	3	30	6	30
48	12	1.5	9	9	30
48	18	1.5	15	9	30
48	24	3	18	9	30
48	30	3	24	9	30
48	36	3	30	9	30
60	12	1.5	9	12	36
60	24	3	18	12	36
60	36	6	24	12	36



DIMENSIONS (IN.)				
A	B	C	D	E
36	6	24	6	24
48	6	36	9	30



AREA	RADIUS
LESS THAN 16 FT ²	1 1/2"
16 FT ² OR GREATER	3"

RADII FOR SHEET SIGNS

GENERAL NOTES:

SIGNS WITH FOUR OR MORE HOLES REQUIRE BACKING BARS OR MULTIPLE POSTS.

HOLES IN SIGNS SHALL BE 3/8" AND PUNCHED AS SHOWN ON THIS DRAWING.

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS:

9 SQUARE FEET OR LESS - .080 IN..

OVER 9 SQUARE FEET BUT LESS THAN 16 SQUARE FEET - .100 IN..

16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

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

STATE OF MISSOURI
 EILEEN H. PADERS
 NUMBER PE-28238
 PROFESSIONAL ENGINEER

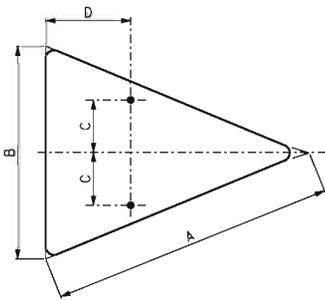
THIS SHEET HAS BEEN
 BOUND, SEALED AND DATED
 ELECTRONICALLY.

**HIGHWAY SIGNING
 HOLE PUNCHING**

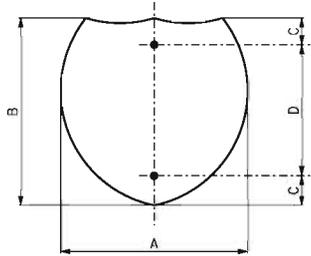
DATE EFFECTIVE: 02/01/2012
 DATE PREPARED: 12/22/2011

903.02AL

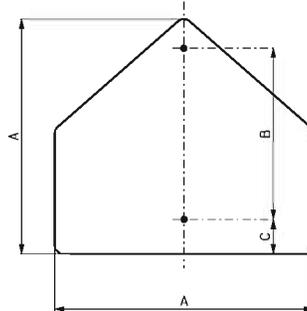
SHEET NO.
 17 OF 19



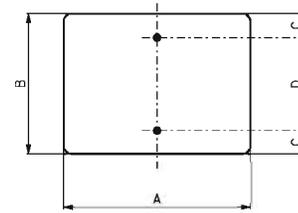
DIMENSIONS (IN.)			
A	B	C	D
40	30	7.5	12
48	36	9	15



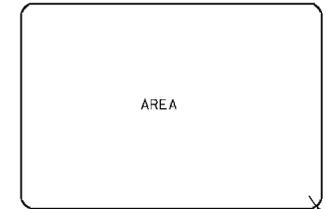
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



DIMENSIONS (IN.)		
A	B	C
36	24	3



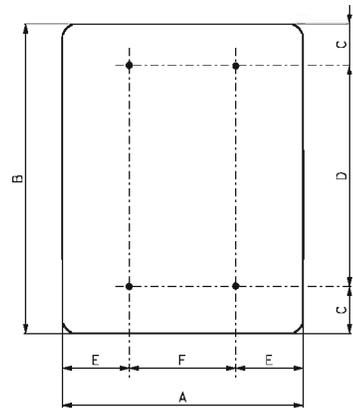
DIMENSIONS (IN.)			
A	B	C	D
5	9	1.5	6
12	9	1.5	6
14	12	1.5	9
18	12	1.5	9
20	9	1.5	6
21	15	1.5	12
24	6	1.5	3
24	8	1.5	5
24	10	1.5	7
24	12	1.5	9
24	18	3	12
30	6	1.5	3
30	12	1.5	9
30	15	1.5	12
30	18	3	12
30	24	3	18
36	12	1.5	9
36	18	3	12



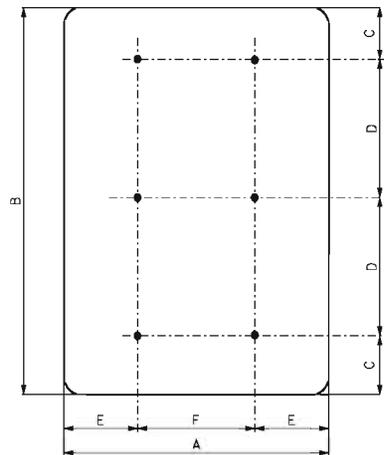
AREA	RADII
LESS THAN 16 FT ²	1 1/2"
16 FT ² OR GREATER	3"

RADII FOR SHEET SIGNS

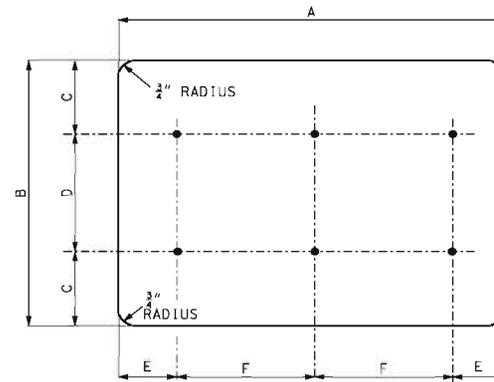
RADIUS



DIMENSIONS (IN.)					
A	B	C	D	E	F
36	48	6	36	6	24
36	54	6	42	6	24
48	60	6	48	9	30



DIMENSIONS (IN.)					
A	B	C	D	E	F
48	96	6	42	9	30



DIMENSIONS (IN.)					
A	B	C	D	E	F
96	48	6	36	16	32

GENERAL NOTES:

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS:

9 SQUARE FEET OR LESS - .080 IN.

OVER 9 SQUARE FEET BUT LESS THAN 16 SQUARE FEET - .100 IN.

16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

HOLES IN SIGNS SHALL BE 3/8" AND PUNCHED AS SHOWN ON THIS DRAWING.

SIGNS WITH FOUR OR MORE HOLES REQUIRE BACKING BARS OR MULTIPLE POSTS.

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

STATE OF MISSOURI
 EILEEN H. FADERS
 NUMBER PE-28238
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 BOUND, SEALED AND DATED
 ELECTRONICALLY.

HIGHWAY SIGNING HOLE PUNCHING

DATE EFFECTIVE: 02/01/2012
 DATE PREPARED: 12/22/2011

903.02AL

SHEET NO.
18 OF 19

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

STRUCTURAL STEEL POST FOR GROUND MOUNTED SIGNS											
POST DES. NO.*	NOM SIZE (IN./LBS/FT.)	TORQUE AND HIGH STRENGTH BOLTS	BASE CONNECTION DATA TABLE (IN.)								
			A	B	C	D	E	F	G	W	R
1	W6x9	3/4" ROUND x 2 1/2" x 3 1/2" IN./LBS.	5	2	1 1/4	2 1/4	1 1/4	3/4	1/2	1/4	1 1/2
2	W6x15										
3	W8x18										
4	W10x22	555 IN./LBS.	6	2 1/2	1 3/8	3 1/2	1 1/4	1	3/4	5/8	1 3/4
5	W10x26										
6	W12x35										

POST AND FOOTING DATA TABLE													
POST DES. NO.*	NOM. SIZE	WEIGHT		STUB LENGTH	DIA.	FOOTING							
		LBS/FT	LBS/IN			LEVEL GROUND		6:1 GRADE		3:1 OR 2:1 GRADE			
		DEPTH	C.Y.			DEPTH	C.Y.	DEPTH	C.Y.	DEPTH	C.Y.		
1	W6	9.0	0.75	3'-0"	15"	3'-0"	0.14	3'-2"	0.15	3'-3"	0.16	3'-6"	0.17
2	W6	15.0	1.25	4'-0"	24"	4'-0"	0.47	4'-2"	0.50	4'-3"	0.51	4'-6"	0.54
3	W8	18.0	1.50	4'-6"	28"	4'-6"	0.71	4'-8"	0.73	4'-9"	0.74	5'-0"	0.78
4	W10	22.0	1.83	5'-0"	36"	5'-0"	1.31	5'-2"	1.36	5'-3"	1.39	5'-6"	1.45
5	W10	26.0	2.17	5'-0"	36"	5'-0"	1.31	5'-3"	1.37	5'-5"	1.43	5'-9"	1.52
6	W12	35.0	2.92	5'-6"	36"	5'-6"	1.44	5'-9"	1.52	5'-11"	1.56	6'-3"	1.65

GENERAL NOTES:
 DESIGN SPECS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS - 1985 (EXCEPT 2001 AND LATEST INTERIMS FOR STRUCTURAL STEEL POSTS).

POSTS, PERFORATED FUSE PLATE AND SPLICE PLATE TO BE GALVANIZED AFTER FABRICATION.

METAL PROJECTING BEYOND THE PLANE OF THE PLATE FACE WILL NOT BE ALLOWED.

REMOVE ALL GALVANIZING RUNS OR BEADS IN THE WASHER AREA.

ALL STRUCTURAL STEEL STIFFENER PLATES AND BASE PLATES, FOR GROUND MOUNTED SIGNS SHALL MEET THE REQUIREMENTS OF ASTM A 36 OR AASHTO M 270 GRADE 50, MINIMUM YIELD 50,000 PSI.

IN THE EVENT THE DISTANCE BETWEEN THE TOP OF THE FOOTING AND THE BOTTOM OF THE SIGN IS LESS THAN 7'-9", THE SIGN HEIGHT AND POST LENGTH IS TO BE INCREASED SUFFICIENTLY TO ACCOMMODATE THIS MINIMUM SPACING.

HINGE PLATES NOT REQUIRED ON SINGLE POST SIGNS OR ANY SIGNS USING PIPE POSTS.

NUTS ON HINGE PLATE BOLTS SHALL BE TIGHTENED TO THE REQUIRED MINIMUM BOLT TENSION VALUES SHOWN IN TABLE 1 SEC. 1080 OF THE STANDARD SPECIFICATIONS.

THE NUT SHALL BE FREE RUNNING. IF THE NUT WILL NOT SPIN ON THE BOLT BECAUSE OF GALVANIZING IRREGULARITIES, A LUBRICANT SHALL BE APPLIED.

ALL BREAKAWAY ASSEMBLY BOLTS SHALL BE TIGHTENED IN A SYSTEMATIC MANNER TO THE PRESCRIBED TORQUE SHOWN ON THIS DRAWING.

EACH BREAKAWAY ASSEMBLY BOLT SHALL BE LOOSENED AND RE-TIGHTENED TO THE REQUIRED TORQUE IN THE SAME ORDER AS THE INITIAL TIGHTENING.

THE THREADS SHALL BE BURRED AT THE NUT USING A CENTER PUNCH TO PREVENT NUT FROM LOOSENING.

POST LENGTH QUANTITY SHOWN ON PLANS INCLUDES STUB.

1" X 2 1/2" HIGH STRENGTH BOLTS FOR PIPE POSTS SHALL BE OF THE DESIGNATION AASHTO M 164 OR ASTM A 449. ALL OTHER H.S. BOLTS SHALL BE OF THE DESIGNATION AASHTO M 164.

FURNISH TWO .012" ± AND TWO .0032" ± THICK SHIMS PER POST FROM BRASS SHIM STOCK OR STRIP, DESIGNATION ASTM B 36. SHIM AS REQUIRED TO PLUMB POST.

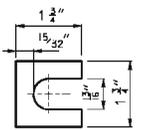
HIGH STRENGTH BOLTS WITH HEX NUT AND THREE WASHERS WITH EACH BOLT ARE TO BE GALVANIZED.

OPTIONAL HOLES (3/16" ROUND FOR "1" SHAPE POSTS AND 3/8" ROUND FOR PIPE POST BASE PLATES) AS SHOWN IN "ELEVATIONS" ARE TO BE USED AS AID FOR GALVANIZING ONLY.

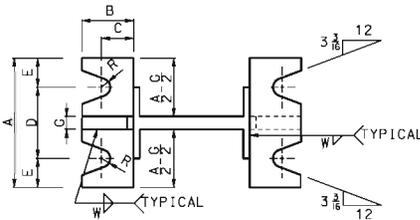
SHEET METAL BOLT RETAINER CUT FROM 30 GAGE GALVANIZED SHEET METAL. PLACE BETWEEN BASE PLATES. SIZE VARIES TO FIT PLATE. BOLT HOLES TO BE 1/16" LARGER THAN REQUIRED BOLT SIZE.



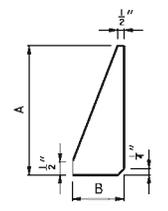
BOLT RETAINER



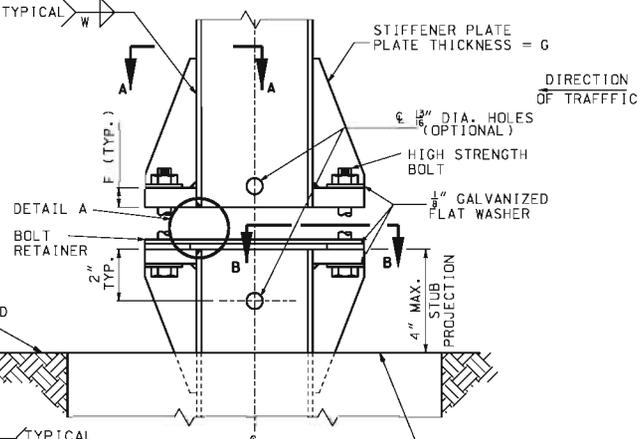
SHIM



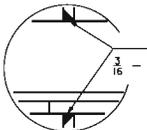
SECTION A-A SECTION B-B POST AND FOOTING



STIFFENER PLATE

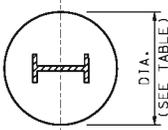


ELEVATION

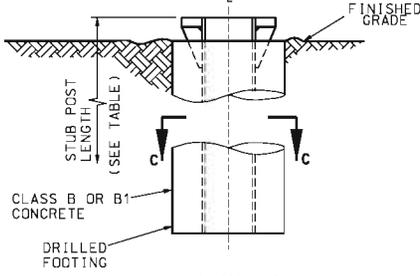


DETAIL A

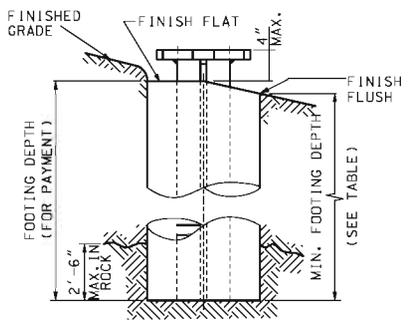
* FOR POST DESIGNS NUMBERS 3, 4, 5 AND 6 HAVING WEIGHTS GREATER THAN 18LBS./FT., POSTS SHALL BE SPACED AT LEAST 7' APART. FOR POST DESIGNS NUMBERS 1 AND 2, POSTS MAY BE SPACED LESS THAN 7' APART. DO NOT USE THREE NUMBER 1 OR 2 POSTS WITH A SIGN WIDTH OF LESS THAN 10'-6\"/>



SECTION C-C



STUB DETAIL



FOOTING DETAIL

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-2781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN BOUND, SEALED AND DATED ELECTRONICALLY.

**SIGN MOUNTING DETAILS
 BREAKAWAY ASSEMBLIES FOR
 GROUND MOUNTED SIGNS**

DATE EFFECTIVE:	02/01/2012	903.03BH	SHEET NO. 1 OF 11
DATE PREPARED:	12/19/2011		

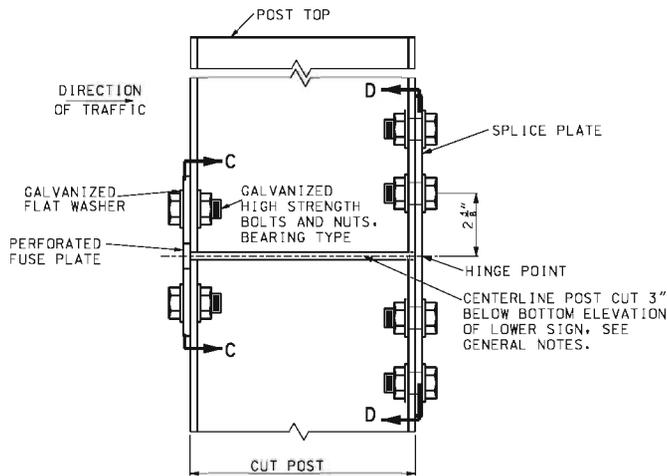
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

POST DES. NO.	NOM. SIZE (IN.)	WEIGHT		DEPTH (IN.)	FLANGE		WEB THICK (IN.)
		LB/FT	LB/IN		WIDTH (IN.)	THICK (IN.)	
1	W6	9	0.75	5 ⁷ / ₈	4	3 ³ / ₁₆	7 ¹ / ₁₆
2	W6	15	1.25	6	6	7 ¹ / ₄	7 ¹ / ₄
3	W8	18	1.50	8 ¹ / ₈	5 ¹ / ₄	7 ¹ / ₈	7 ¹ / ₄
4	W10	22	1.83	10 ³ / ₈	5 ³ / ₄	7 ³ / ₈	7 ¹ / ₄
5	W10	26	2.17	10 ³ / ₈	5 ³ / ₄	7 ¹ / ₈	7 ¹ / ₄
6	W12	35	2.92	12 ¹ / ₂	6 ¹ / ₂	7 ¹ / ₂	7 ⁵ / ₁₆

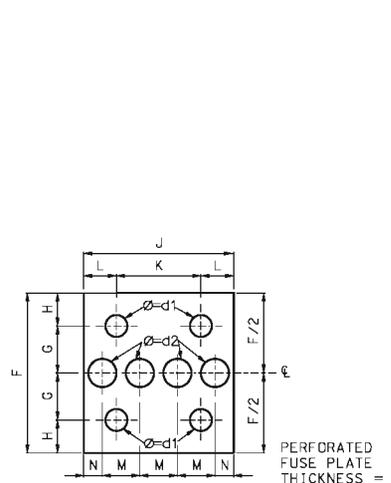
POST DESIGN NO.	PERFORATED FUSE PLATE DATA TABLE										BOLT DIA. (IN.)	WT. (E.A.) (LBS.)	
	F (IN.)	G (IN.)	H (IN.)	J (IN.)	K (IN.)	L (IN.)	M (IN.)	N (IN.)	d1 (IN.)	d2 (IN.)			P (IN.)
1	4 ¹ / ₄	1	1 ¹ / ₈	4	2 ¹ / ₄	7 ¹ / ₈	1	1 ¹ / ₂	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	1/2	0.76
2	5	1 ¹ / ₂	1 ¹ / ₄	6	3 ¹ / ₂	1 ¹ / ₄	1 ¹ / ₂	2 ¹ / ₄	11 ¹ / ₁₆	1 ¹ / ₄	7 ¹ / ₁₆	5 ¹ / ₈	1.67
3	5	1 ¹ / ₂	1 ¹ / ₄	5 ¹ / ₂	2 ³ / ₄	1 ¹ / ₄	1 ¹ / ₄	2 ¹ / ₄	11 ¹ / ₁₆	1 ¹ / ₁₆	7 ¹ / ₁₆	5 ¹ / ₈	1.51
4	6	1 ¹ / ₂	1 ¹ / ₂	5 ³ / ₄	2 ³ / ₄	1 ¹ / ₂	1 ¹ / ₈	1 ¹ / ₈	13 ¹ / ₁₆	1 ¹ / ₈	5 ¹ / ₁₆	3 ¹ / ₄	2.52
5	6	1 ¹ / ₂	1 ¹ / ₂	5 ³ / ₄	2 ³ / ₄	1 ¹ / ₂	1 ¹ / ₈	1 ¹ / ₈	13 ¹ / ₁₆	1 ¹ / ₈	5 ¹ / ₁₆	3 ¹ / ₄	2.52
6	6	1 ¹ / ₂	1 ¹ / ₂	6 ¹ / ₂	3 ¹ / ₂	1 ¹ / ₂	1 ¹ / ₈	1 ¹ / ₈	13 ¹ / ₁₆	1 ¹ / ₈	5 ¹ / ₁₆	3 ¹ / ₄	3.35

POST DESIGN NO.	SPLICE PLATE DATA TABLE							BOLT DIA. (IN.)	WT. (E.A.) (LBS.)
	J (IN.)	K (IN.)	L (IN.)	U (IN.)	d1 (IN.)	P (IN.)			
1	4	2 ¹ / ₄	7 ¹ / ₈	7 ¹ / ₁₆	7 ¹ / ₁₆	7 ¹ / ₁₆	1/2	2.45	
2	6	3 ¹ / ₂	1 ¹ / ₄	1 ¹ / ₄	11 ¹ / ₁₆	7 ¹ / ₁₆	5 ¹ / ₈	4.89	
3	5 ¹ / ₄	2 ³ / ₄	1 ¹ / ₄	5 ¹ / ₁₆	11 ¹ / ₁₆	7 ¹ / ₁₆	5 ¹ / ₈	5.32	
4	5 ³ / ₄	2 ³ / ₄	1 ¹ / ₂	5 ¹ / ₁₆	13 ¹ / ₁₆	5 ¹ / ₁₆	3 ¹ / ₄	5.75	
5	5 ³ / ₄	2 ³ / ₄	1 ¹ / ₂	7 ¹ / ₁₆	13 ¹ / ₁₆	5 ¹ / ₁₆	3 ¹ / ₄	8.04	
6	6 ¹ / ₂	3 ¹ / ₂	1 ¹ / ₂	13 ¹ / ₁₆	13 ¹ / ₁₆	5 ¹ / ₁₆	3 ¹ / ₄	10.47	

THE WEIGHT OF STRUCTURAL STEEL POSTS SHOWN IN THE CONTRACT HAS BEEN COMPUTED USING THE WEIGHTS SHOWN.



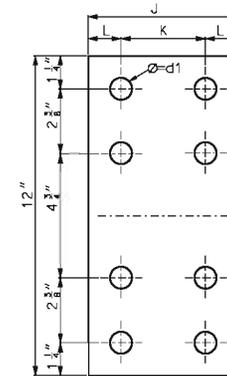
ELEVATION PERFORATED FUSE PLATE AND SPLICE PLATE DETAIL



ELEVATION C-C

ALL HOLES SHALL BE DRILLED. ALL PLATE CUTS SHALL PREFERABLY BE SAW CUTS. HOWEVER: FLAME CUTTING WILL BE PERMITTED PROVIDED ALL EDGES ARE GROUND.

PERFORATED FUSE PLATE AND SPLICE PLATE SHALL BE FABRICATED FROM ASTM A 36 STRUCTURAL STEEL.



ELEVATION D-D

GENERAL NOTE:

FOR ROADWAYS WHERE TRAFFIC MAY STRIKE THE BACKSIDE OF THE POST, PERFORATED FUSE PLATES SHALL BE INSTALLED ON BOTH SIDES OF THE POST.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-23781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 ELECTRONICALLY
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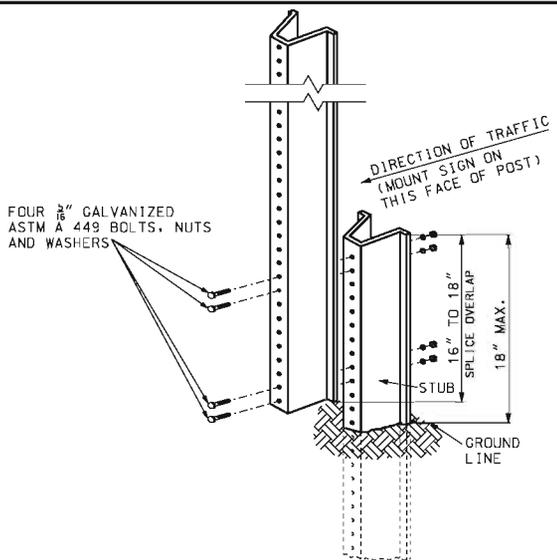
SIGN MOUNTING DETAILS
 BREAKAWAY ASSEMBLIES FOR
 GROUND MOUNTED SIGNS

DATE EFFECTIVE: 02/01/2012
 DATE PREPARED: 12/19/2011

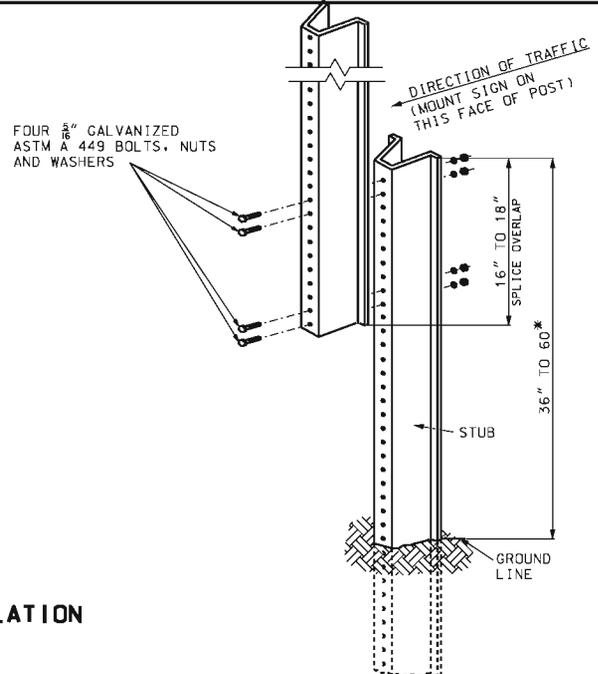
903.03BH

SHEET NO.
 2 OF 11

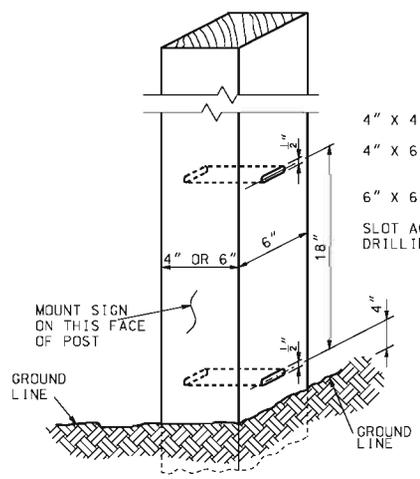
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**U-CHANNEL POST DETAIL
PERMANENT AND TEMPORARY INSTALLATION**

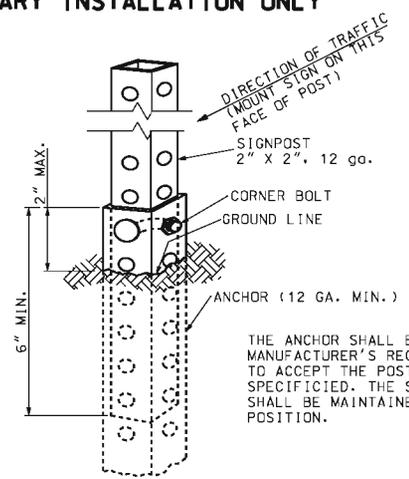


**OPTIONAL U-CHANNEL POST DETAIL
TEMPORARY INSTALLATION ONLY**



WOOD POST DETAIL

4" X 4" WOOD POST - NO SLOTS OR HOLES REQUIRED
 4" X 6" WOOD POST - 1 1/2" X 1/2" SLOT ON 6" SIDE OR 1 1/2" DIA. HOLE ON 6" SIDE
 6" X 6" WOOD POST - 2" X 1/2" SLOT OR 2" DIA. HOLE
 SLOT ACROSS NEUTRAL AXIS FORMED BY SUCCESSIVE DRILLING WITH 1/2" BIT.



**PERFORATED SQUARE STEEL
TUBE POST DETAIL**

THE ANCHOR SHALL BE SIZED AS PER MANUFACTURER'S RECOMMENDATIONS TO ACCEPT THE POST SIZE SPECIFIED. THE SIGN ASSEMBLY SHALL BE MAINTAINED IN A PLUMB POSITION.

SIGN AREA (SQ.FT.)	POST TYPE		
	U-CHANNEL	WOOD	PERFORATED SQUARE STEEL TUBING
≤ 10	1 - 3.0 LB./FT.*	1 - 4" X 4"*	1 - 2" 12 GA.*
> 10 ≤ 16	2 - 3.0 LB./FT.	2 - 4" X 4" 1 - 4" X 6"*	2 - 2" 12 GA.
> 16 ≤ 24	2 - 3.0 LB./FT.	2 - 4" X 6"	3 - 2" 12 GA.**
> 24 ≤ 30	3 - 3.0 LB./FT.	2 - 4" X 6"	N/A
> 30 ≤ 50	N/A	2 - 6" X 6"	N/A

* SIGNS GREATER THAN 4 FEET IN WIDTH, EXCEPT DIAMOND SHAPE SIGNS, REQUIRE TWO POSTS.
 ** REQUIRES SLIP BASE PER MANUFACTURER'S RECOMMENDATION.

POST SIZE REQUIREMENTS

USE OF SPLICE IS OPTIONAL.
 PERMANENT AND TEMPORARY INSTALLATIONS: SPLICE OVERLAP SHALL BE POSITION ENTIRELY BETWEEN GROUND LINE AND 18" ABOVE GROUND LINE.
 OPTIONAL TEMPORARY INSTALLATIONS: SPLICE OVERLAP MAY BE POSITIONED BETWEEN 18" AND 60" ABOVE GROUND LINE.
 * IF A PLAQUE IS USED, NEITHER THE SIGN NOR PLAQUE SHALL BE POSITIONED WITH THE SPLICE OVERLAP.
 ONLY ONE SPLICE WILL BE ALLOWED PER POST.

THE SIGNPOST SHALL BE ATTACHED TO THE ANCHOR WITH THE CORNER BOLT PER MANUFACTURER'S SPECIFICATION.
 THE SPLICE SHALL CONSIST OF A 12 INCH PIECE OF 1 1/2 INCH TUBE, INSERTED 6" INTO BOTH THE UPPER AND LOWER SIGNPOST SECTIONS AND CORNER-BOLTED AT BOTH ENDS.

GENERAL NOTES:
 ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 3 FEET.

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-23781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN
 BOUND, SEALED AND DATED
 ELECTRONICALLY.

**SIGN MOUNTING DETAILS
POST MOUNTING DETAILS**

DATE EFFECTIVE: 02/01/2012	903.03BH	SHEET NO. 3 OF 11
DATE PREPARED: 11/26/2012		

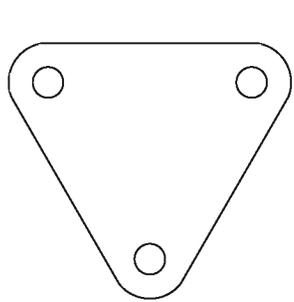
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

ROUND PIPE POST FOR GROUND MOUNTED SIGNS

NOMINAL PIPE SIZE (IN.)	BOLT DATA			BASE CONNECTION DATA TABLE (IN.)					
	SIZE (IN.)	LENGTH (IN.)	TORQUE IN.-LB	A	B	C	R	T	W
2 1/2 & 3	1/2	3 1/2	140	6 1/2	9	1/2	3/32	1	1/2
4	3/8	3 3/4	345	7 1/8	10	1/2	1/8	1	1/8

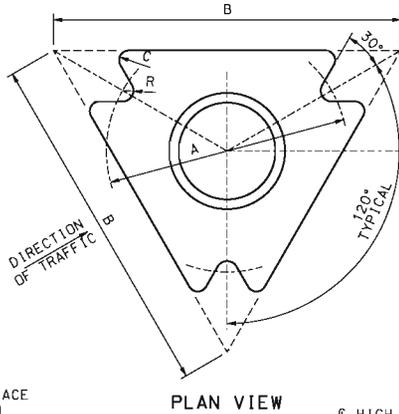
ROUND PIPE POST AND FOOTING DATA TABLE

NOM. SIZE (IN.)	WEIGHT		STUB LENGTH	FOOTING		CONCRETE C.Y.
	LBS/FT	LBS/IN		DTA.	DEPTH	
2 1/2	5.79	0.48	4'-3 1/2"	12"	4'-6"	0.13
3	7.58	0.63	4'-3 1/2"	12"	4'-6"	0.13
4	10.79	0.90	5'-3 1/2"	18"	5'-6"	0.36

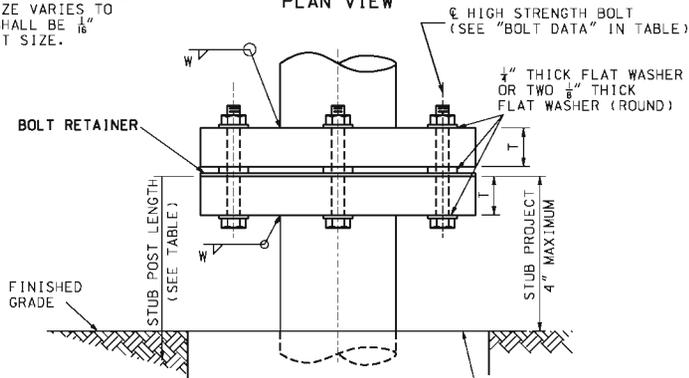


BOLT RETAINER

SHEET METAL BOLT RETAINER CUT FROM 30 GAUGE GALVANIZED SHEET METAL. PLACE BETWEEN BASE PLATES. SIZE VARIES TO FIT PLATE. BOLT HOLES SHALL BE 1/16" LARGER THAN REQUIRED BOLT SIZE.



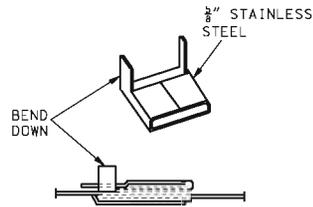
PLAN VIEW



TOP OF FOOTING, WITH FINISHED FLAT GRADE. SEE "FOOTING DETAIL" FOR FOOTINGS ON SLOPES.

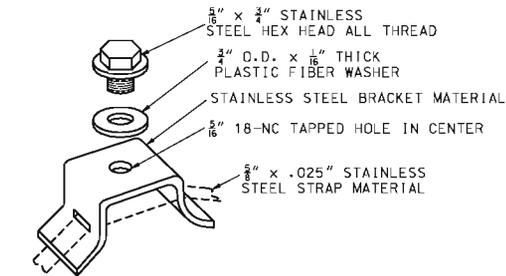
ELEVATION (STEEL PIPE POST BASE CONNECTION) MULTI-DIRECTION SLIP BASE

* PIPE 3" DIA. AND UNDER: 2' MAXIMUM IN ROCK. PIPE OVER 3" DIA.: 3' MAXIMUM IN ROCK

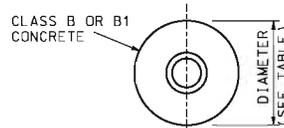


VIEW SHOWING ENDS OF STRAP, CLAMPED IN SEAL

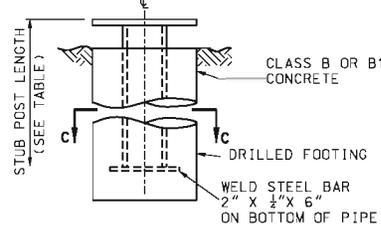
STRAP SEAL



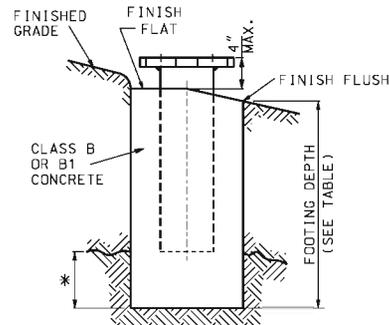
FLARED LEG SIGN BRACKET



SECTION C-C

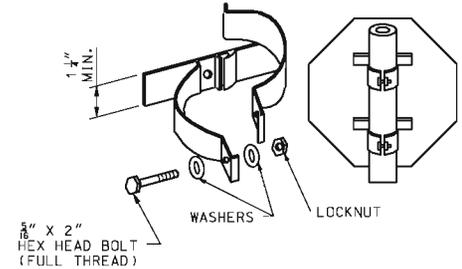


FOUNDATION DETAIL SLIP BASE ASSEMBLIES



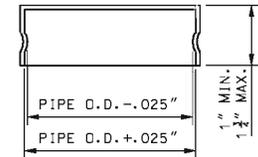
FOOTING DETAIL

ASTM B 308, 6061-T6 OR 6063-T6 ALUMINUM ALLOY EXTRUSIONS



STAINLESS STEEL HARDWARE CLAMP TYPE SIGN SUPPORTS FOR PIPE POST

ROLLED CRIMP TO ENGAGE PIPE O.D.



FRICTION CAP

GENERAL NOTE:
REFER TO THE GENERAL NOTES ON SHEET 1.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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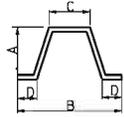
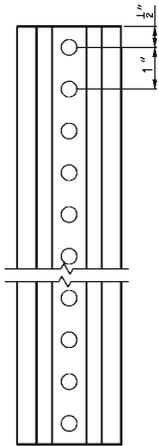
SIGN MOUNTING DETAILS
 POST FOR SIGNS
 30 SQUARE FEET
 OR SMALLER

DATE EFFECTIVE: 02/01/2012
 DATE PREPARED: 12/19/2011

903.03BH

SHEET NO. 4 OF 11

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

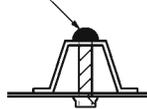


STEEL OBJECT MARKER POST				
LIMITS	LBS/FT (5)	DIMENSIONS - INCHES		
		A	B	C
MIN.	1.80	1 1/2	2 1/2	3 1/32
MAX.	2.25	1 3/8	3 1/4	1 1/4

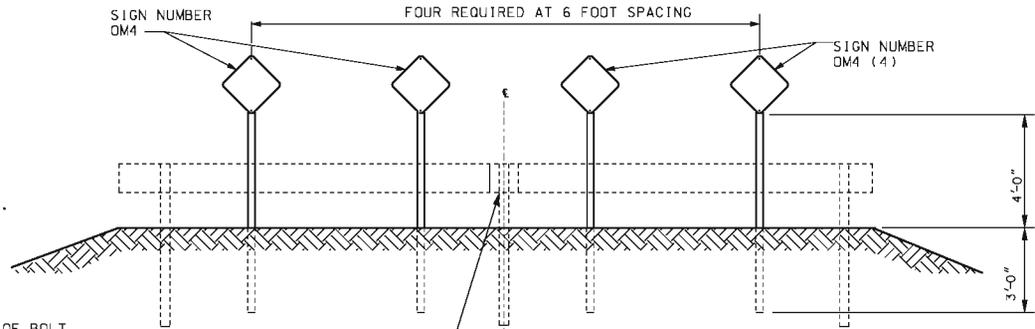
(5) WEIGHT BEFORE GALVANIZING OR PUNCHING. LIMITS SHOWN ARE ABSOLUTE. NO FURTHER WEIGHT, DIMENSIONAL OR COMMERCIAL TOLERANCE WILL BE ACCEPTABLE.

HOLE PUNCHING TO EQUAL 3/8" DIAMETER HOLES, ONE INCH CENTER TO CENTER, BEGINNING ONE-HALF INCH FROM THE END AND CONTINUING THE ENTIRE LENGTH OF THE POST.

FOUL THREADS OF BOLT AS APPROVED BY THE ENGINEER.

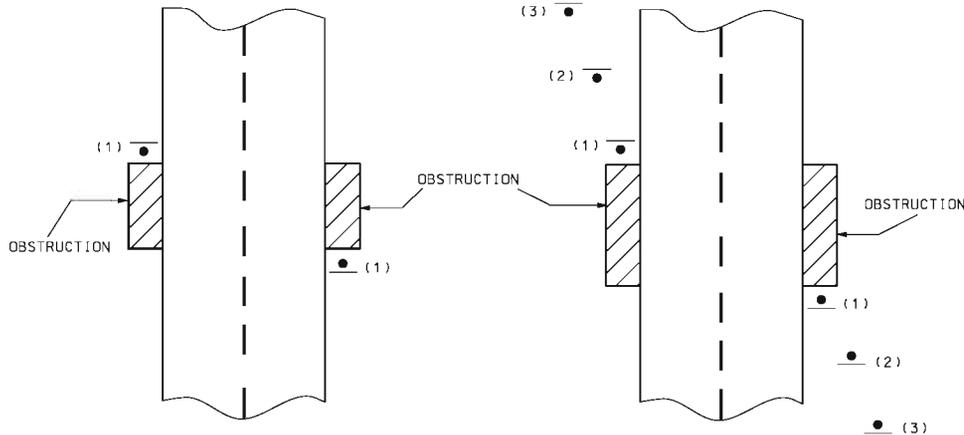


OBJECT MARKER POST AND FASTENER DETAILS



MOUNTING DETAILS (END OF ROAD OR STREET) TYPE 4 OBJECT MARKER SIGN OM4

(4) RED REFLECTIVE SHEETING IN ACCORDANCE WITH SEC 104.2.7.3 ON 0.080 SHEET ALUMINUM.

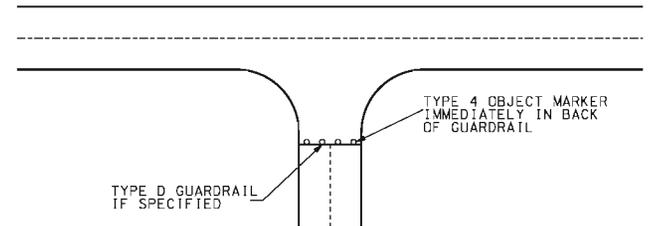


OBSTRUCTION < 20' LONGITUDINALLY

OBSTRUCTION > 20' LONGITUDINALLY

TYPE 3 OBJECT MARKER SIGN OM3

NOTE:
WHERE FIELD CONDITIONS DO NOT ALLOW FOR THE 1.5 FT. AND 3.0 FT. LATERAL OFFSETS OF SIGNS (2) AND (3) RESPECTIVELY, THE SIGNS SHOULD BE OFFSET AS MUCH AS PRACTICABLE.



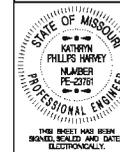
TYPICAL ROAD CLOSURE

GENERAL NOTES:

THE CONTRACT UNIT PRICE FOR EACH TYPE 3 OR 4 OBJECT MARKER SHALL INCLUDE SIGN PANEL, REFLECTIVE SHEETING, AND POST, REGARDLESS OF LENGTH.

STRIPES ON TYPE 3 OBJECT MARKERS SHALL BE SLOPED DOWNWARD IN THE INTENDED DIRECTION OF TRAFFIC.

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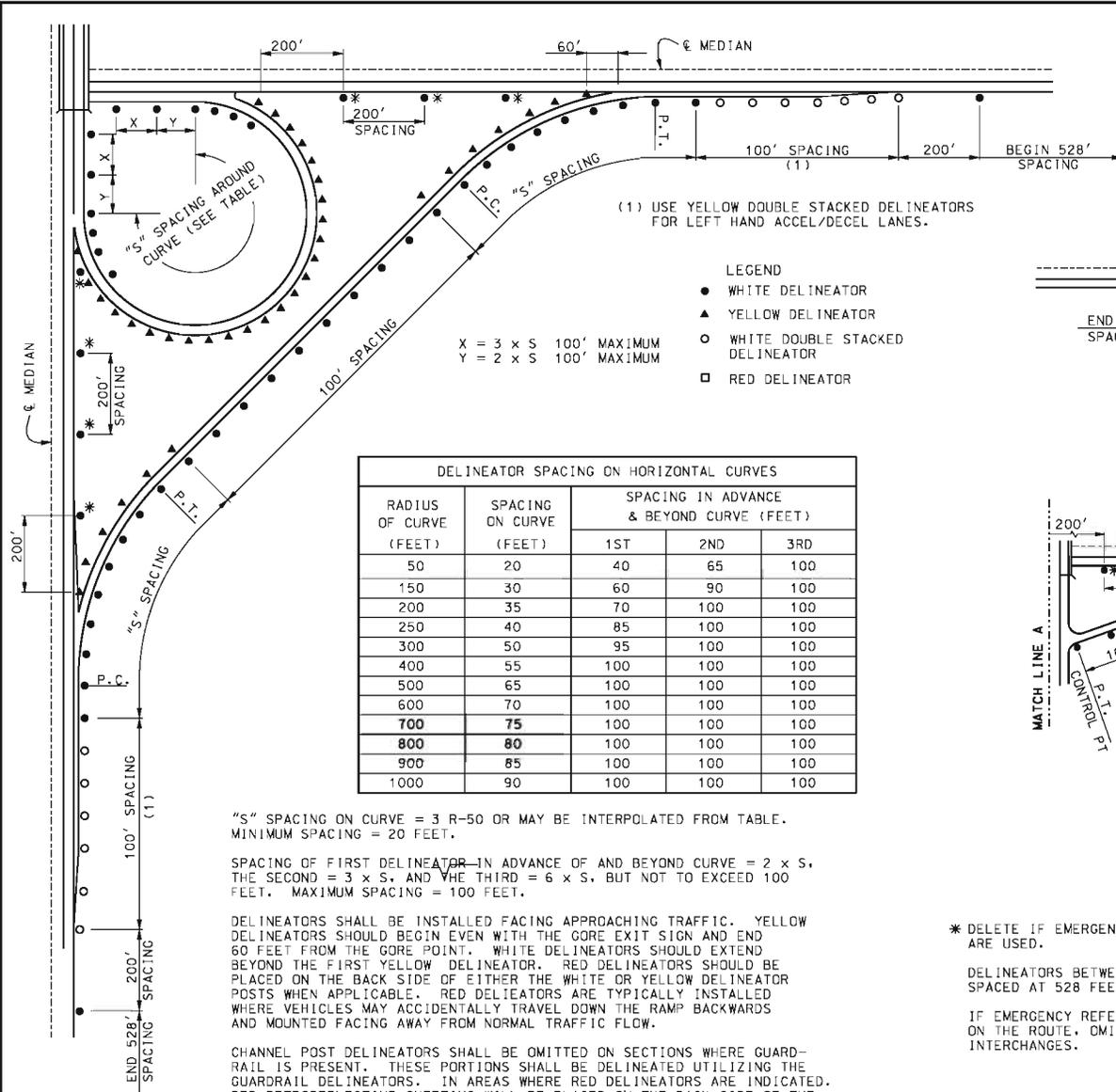
SIGN MOUNTING DETAILS DELINEATORS OBJECT MARKERS

DATE EFFECTIVE: 02/01/2012
 DATE PREPARED: 12/19/2011

903.03BH

SHEET NO.
7 OF 11

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



DELINEATOR SPACING ON HORIZONTAL CURVES				
RADIUS OF CURVE (FEET)	SPACING ON CURVE (FEET)	SPACING IN ADVANCE & BEYOND CURVE (FEET)		
		1ST	2ND	3RD
50	20	40	65	100
150	30	60	90	100
200	35	70	100	100
250	40	85	100	100
300	50	95	100	100
400	55	100	100	100
500	65	100	100	100
600	70	100	100	100
700	75	100	100	100
800	80	100	100	100
900	85	100	100	100
1000	90	100	100	100

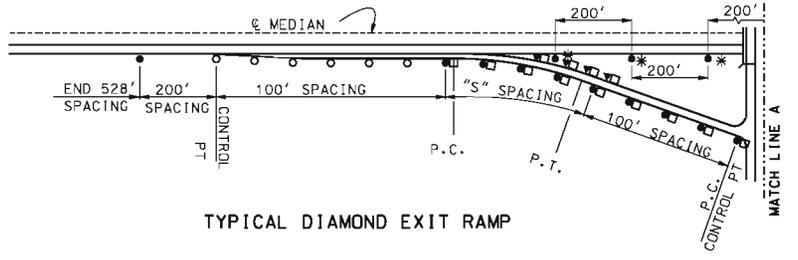
"S" SPACING ON CURVE = $3 R-50$ OR MAY BE INTERPOLATED FROM TABLE. MINIMUM SPACING = 20 FEET.

SPACING OF FIRST DELINEATOR IN ADVANCE OF AND BEYOND CURVE = $2 \times S$. THE SECOND = $3 \times S$, AND THE THIRD = $6 \times S$, BUT NOT TO EXCEED 100 FEET. MAXIMUM SPACING = 100 FEET.

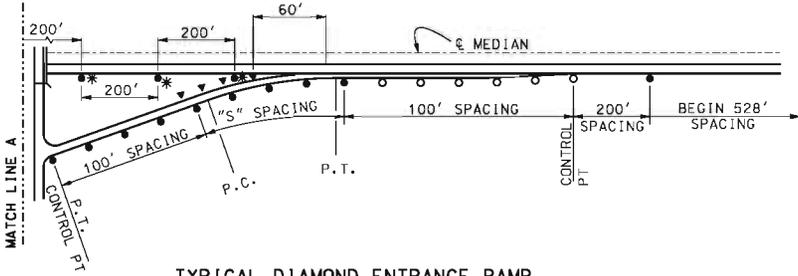
DELINEATORS SHALL BE INSTALLED FACING APPROACHING TRAFFIC. YELLOW DELINEATORS SHOULD BEGIN EVEN WITH THE GORE EXIT SIGN AND END 60 FEET FROM THE GORE POINT. WHITE DELINEATORS SHOULD EXTEND BEYOND THE FIRST YELLOW DELINEATOR. RED DELINEATORS SHOULD BE PLACED ON THE BACK SIDE OF EITHER THE WHITE OR YELLOW DELINEATOR POSTS WHEN APPLICABLE. RED DELINEATORS ARE TYPICALLY INSTALLED WHERE VEHICLES MAY ACCIDENTALLY TRAVEL DOWN THE RAMP BACKWARDS AND MOUNTED FACING AWAY FROM NORMAL TRAFFIC FLOW.

CHANNEL POST DELINEATORS SHALL BE OMITTED ON SECTIONS WHERE GUARDRAIL IS PRESENT. THESE PORTIONS SHALL BE DELINEATED UTILIZING THE GUARDRAIL DELINEATORS. IN AREAS WHERE RED DELINEATORS ARE INDICATED, RED RETROREFLECTIVE SHEETING WILL BE PLACED ON THE BACK SIDE OF THE GUARDRAIL DELINEATOR.

REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.



TYPICAL DIAMOND EXIT RAMP



TYPICAL DIAMOND ENTRANCE RAMP

TYPICAL INTERCHANGE

GENERAL NOTES:

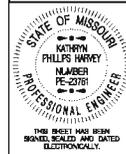
THE CONTRACT UNIT PRICE FOR EACH CHANNEL POST DELINEATOR SHALL INCLUDE THE REFLECTOR, FASTENERS AND POST.

* DELETE IF EMERGENCY REFERENCE MARKERS ARE USED.

DELINEATORS BETWEEN INTERCHANGES SPACED AT 528 FEET.

IF EMERGENCY REFERENCE MARKERS ARE USED ON THE ROUTE, OMIT DELINEATORS BETWEEN INTERCHANGES.

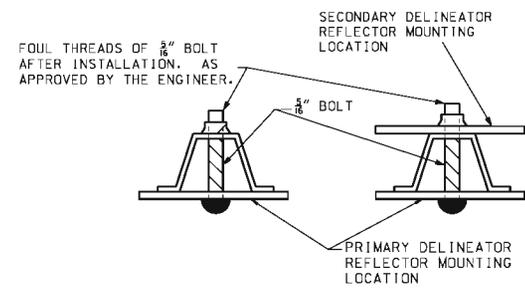
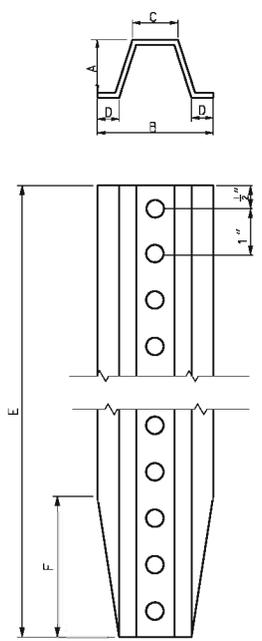
MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
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SIGN MOUNTING DETAILS
 CHANNEL POST DELINEATORS

DATE EFFECTIVE: 02/01/2012	903.03BH	SHEET NO. 8 OF 11
DATE PREPARED: 12/19/2011		

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

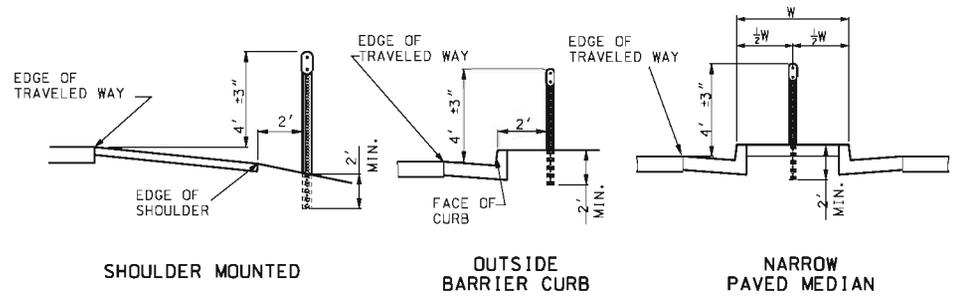


HOLE PUNCHING TO EQUAL $\frac{3}{8}$ " DIAMETER HOLES, ONE INCH CENTER TO CENTER, BEGINNING ONE-HALF INCH FROM THE END AND CONTINUING THE ENTIRE LENGTH OF THE POST.

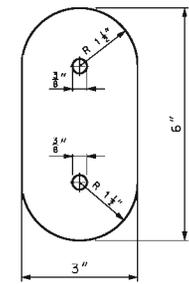
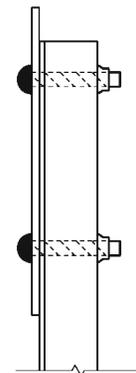
LIMITS		DELINEATOR POST					
LBS/FT (2)		DIMENSIONS - INCHES					
		A	B	C	D	E	F
NOMINAL	1.12	1	2 1/2	7/8	3/8	84	1
TOLERANCE	± 5%	± 1/8	± 1/8	± 1/8	± 3/8	± 1	± 1/4

(2) WEIGHT BEFORE GALVANIZING OR PUNCHING.

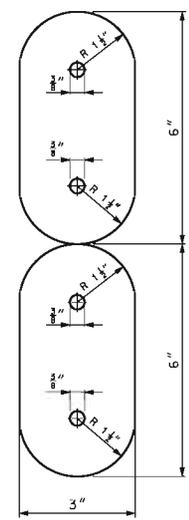
DELINEATOR POST AND FASTENER DETAILS



DELINEATOR MOUNTING DETAILS



CHANNEL POST DELINEATOR REFLECTOR



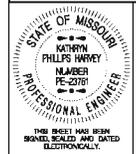
DOUBLE STACKED CHANNEL POST DELINEATOR REFLECTOR

GENERAL NOTES:

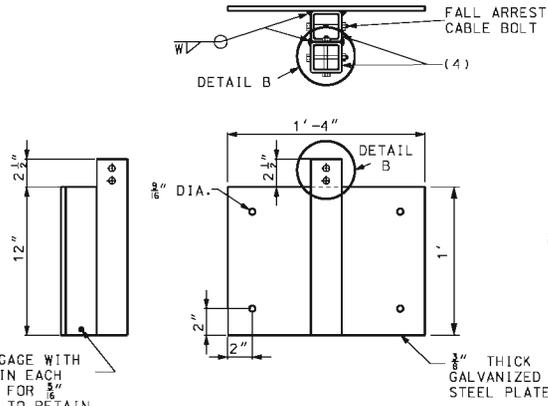
RETROREFLECTIVE YELLOW, WHITE OR RED SHEETING IN ACCORDANCE WITH ASTM D 4956 TYPE 5 OR 8 SHALL BE APPLIED TO ONLY ONE SIDE OF THE CHANNEL POST DELINEATOR MOUNTED TOWARDS THE CHANNEL POST.

REFLECTIVE SHEETING SHALL FOLLOW GUIDELINES OUTLINED IN SEC 1042.2.7 FOR CORRECT APPLICATION OF SHEETING TO DELINEATOR BODY. THE COLOR OF THE SHEETING SHALL MATCH THE CLOSEST ADJACENT PAVEMENT MARKING. A DELINEATOR WITH RED SHEETING SHALL BE APPLIED TO THE BACK SIDE OF THE CHANNEL POST WHEN THE DELINEATION IS PLACED ALONG AN INTERCHANGE RAMP AND COULD BE VIEWED BY WRONG WAY TRAFFIC.

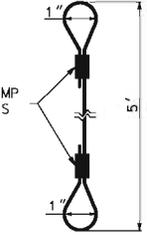
<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p>SIGN MOUNTING DETAILS</p> <p>CHANNEL POST DELINEATORS</p>	
	<p>DATE EFFECTIVE: 02/01/2012</p> <p>DATE PREPARED: 11/26/2012</p>	<p>903.03BH</p>



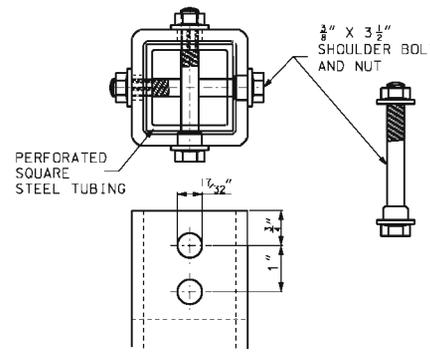
THIS SHEET HAS BEEN
ELECTRONICALLY SEALED AND DATED



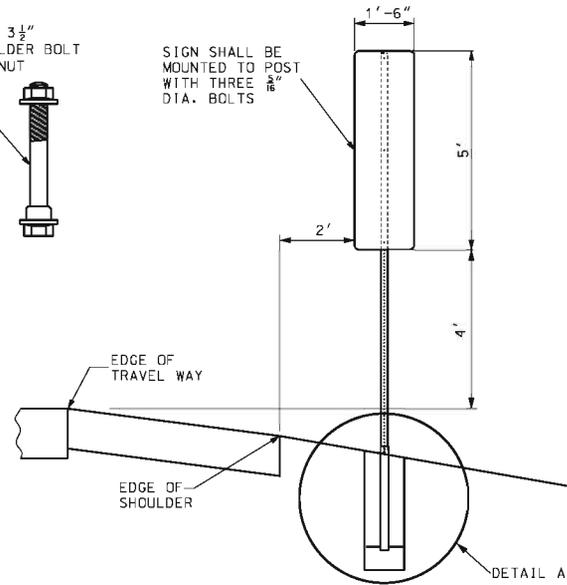
MOUNTING PLATE DETAIL



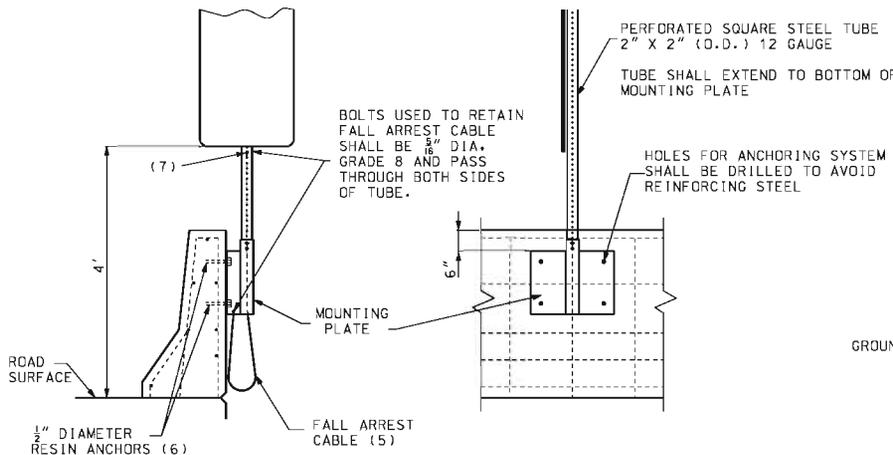
FALL ARREST CABLE DETAIL



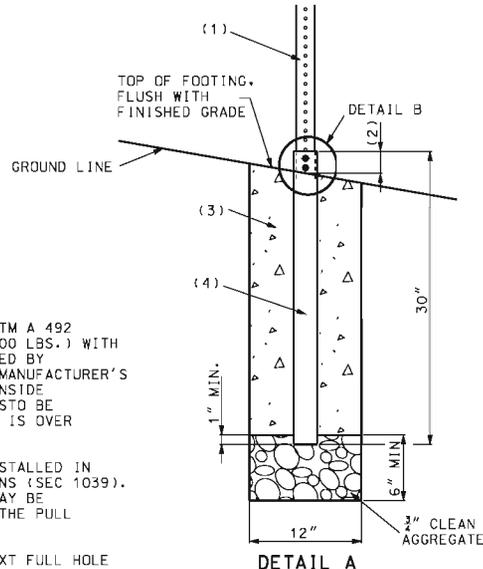
DETAIL B SHOULDER BOLT



GROUND INSTALLATION



BARRIER WALL INSTALLATION



DETAIL A

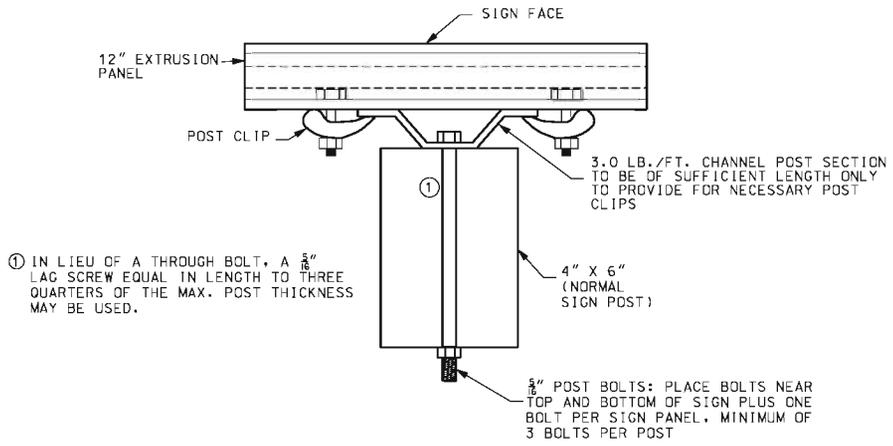
GENERAL NOTES:
 PERFORATED SQUARE STEEL TUBE SHALL BE SECURED TO FOUNDATION TUBE OR BARRIER WALL MOUNTING PLATE WITH A SHOULDER BOLT PER PERFORATED SQUARE STEEL TUBE MANUFACTURER'S SPECIFICATION.

THE CONTRACT UNIT PRICE FOR REFERENCE MARKER SHALL INCLUDE SIGN PANEL, FASTENER, POST AND ALL MATERIAL CONTAINED IN THE FOUNDATION OR BARRIER WALL MOUNTING HARDWARE.

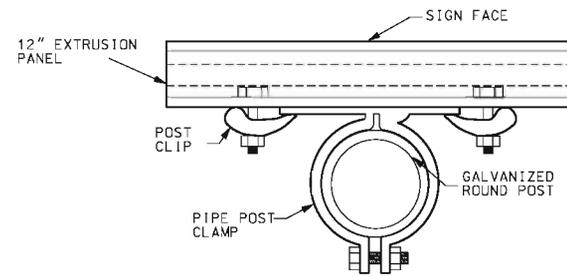
- (1) PERFORATED SQUARE STEEL TUBE 2" X 2" (O.D.) 12 GAUGE. TUBE SHALL EXTEND A MINIMUM OF 24" BELOW THE TOP OF THE FOUNDATION TUBE.
- (2) TUBE TO EXTEND ABOVE FOUNDATION ONLY ENOUGH TO ALLOW BOLT TO BE INSERTED 2 1/2" MAXIMUM.
- (3) CONCRETE MIX TO HOLD FOUNDATION TUBE PLUMB WITHOUT BRACING SHALL HAVE A MINIMUM OF 5.5 SACKS OF CEMENT PER CUBIC YARD AND A MAXIMUM SLUMP OF 2 1/2".
- (4) 2 1/2" x 2 1/2" (O.D.) SQUARE TUBE GALVANIZED 7 GAGE WITH TWO 1 1/2" DIAMETER HOLES IN EACH FACE 1/4" BELOW TOP OF TUBE.
- (5) 1/8" x 5' LONG STAINLESS STEEL CABLE (ASTM A 492 TYPE 304 MINIMUM BREAKING STRENGTH 200 LBS.) WITH A 1" DIA. LOOP AT EACH END LOOPS FORMED BY MECHANICAL CRIMP TYPE CONNECTION PER MANUFACTURER'S SPECIFICATIONS. CABLE IS TO BE RUN INSIDE PERFORATED SQUARE STEEL TUBE. CABLE IS TO BE USED ONLY WHEN SIGN MOUNTING LOCATION IS OVER ANOTHER TRAVELWAY.
- (6) 1/2" DIAMETER RESIN ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD SPECIFICATIONS (SEC 1039). AN APPROVED MECHANICAL TYPE ANCHOR MAY BE USED IF THE DEVICE EQUALS OR EXCEEDS THE PULL TEST REQUIREMENTS OF SEC. 1039.
- (7) FALL ARREST CABLE TO BE SECURED TO NEXT FULL HOLE BELOW SIGN

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	SIGN MOUNTING DETAILS EMERGENCY REFERENCE MARKERS
DATE EFFECTIVE: 02/01/2012 DATE PREPARED: 12/19/2011	903.03BH
SHEET NO. 10 OF 11	

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



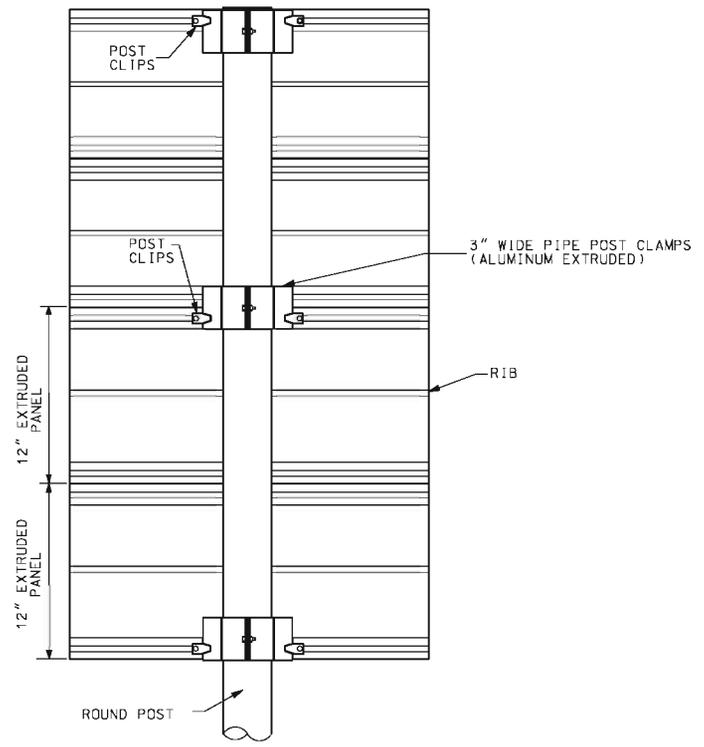
PLAN VIEW
MOUNTING DETAILS FOR EXTRUDED
PANELS ON WOOD 4" X 6" POST



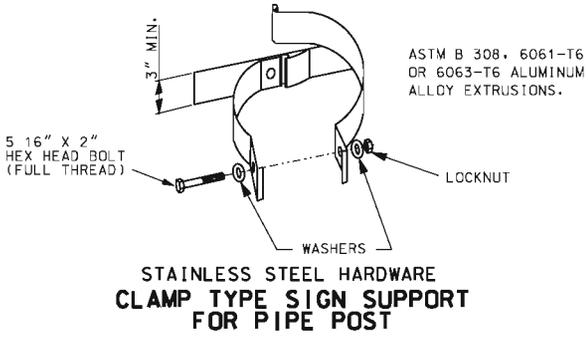
PLAN VIEW
MOUNTING DETAILS FOR EXTRUDED PANELS
ON ROUND PIPE POST

NUMBER OF BOLTS TO ATTACH STEEL CHANNEL TO WOOD POST	
SIGN HEIGHT	NO. OF BOLTS* PER WOOD POST USED
1'	2
2'	3
3'	4
4'	5
5'	6
6'	7
7'	8

*LAG SCREWS MAY BE SUBSTITUTED



TYPICAL POST CLIP MOUNTING DETAILS
FOR ROUND PIPE POSTS



GENERAL NOTES:

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-23761
 PROFESSIONAL ENGINEER

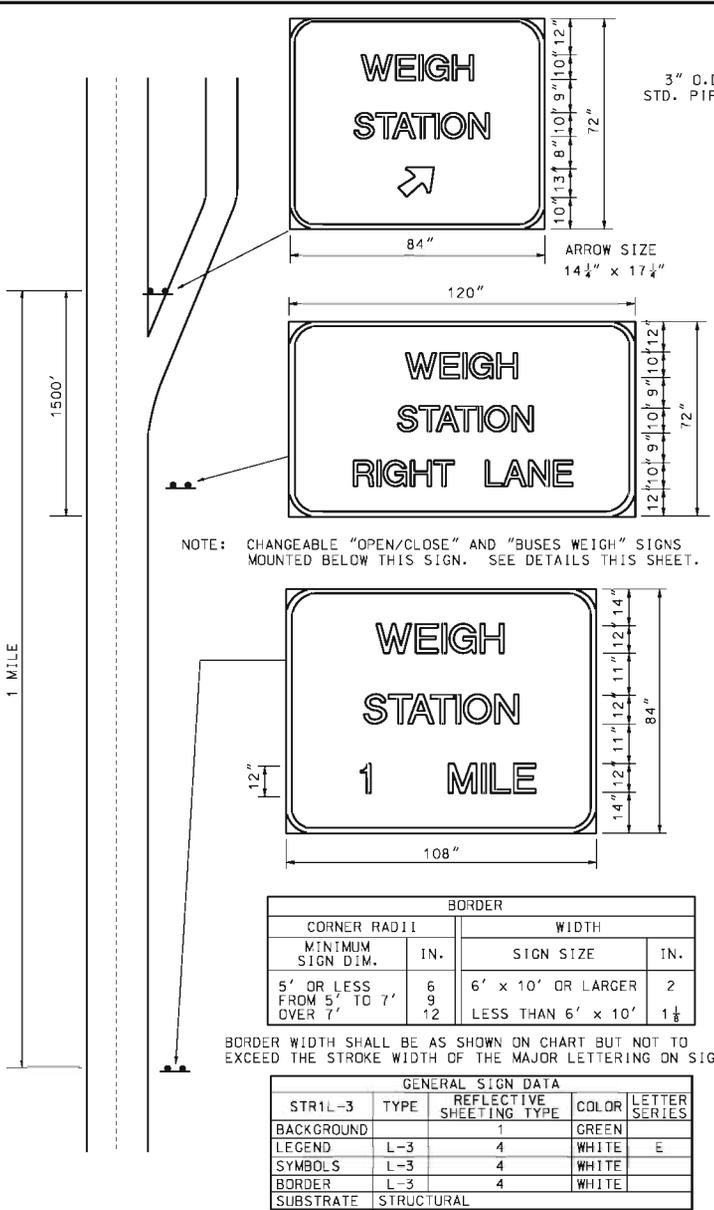
THIS SEAL HAS BEEN BRANDED, SEALED AND DATED ELECTRONICALLY.

SIGN MOUNTING DETAILS
 EXTRUDED PANEL ATTACHMENTS
 FOR SIGNS 30 SQ. FT.
 OR SMALLER

DATE EFFECTIVE: 02/01/2012	903.03BH	SHEET NO. 11 OF 11
DATE PREPARED: 12/19/2011		

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

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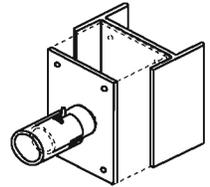
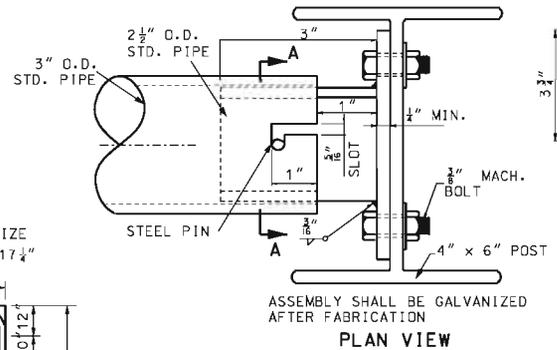
NOTE: CHANGEABLE "OPEN/CLOSE" AND "BUSES WEIGH" SIGNS MOUNTED BELOW THIS SIGN. SEE DETAILS THIS SHEET.

BORDER WIDTH SHALL BE AS SHOWN ON CHART BUT NOT TO EXCEED THE STROKE WIDTH OF THE MAJOR LETTERING ON SIGN.

BORDER			
CORNER RADII		WIDTH	
MINIMUM SIGN DIM.	IN.	SIGN SIZE	IN.
5' OR LESS FROM 5' TO 7'	6/9/12	6' x 10' OR LARGER	2
OVER 7'	12	LESS THAN 6' x 10'	1 1/2

GENERAL SIGN DATA				
STR1L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		1	GREEN	
LEGEND	L-3	4	WHITE	E
SYMBOLS	L-3	4	WHITE	
BORDER	L-3	4	WHITE	
SUBSTRATE	STRUCTURAL			

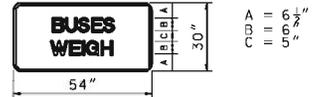
GUIDE SIGN DETAIL



**ISOMETRIC VIEW
BUSES WEIGH MOUNTING ASSEMBLY**



FOR OPEN AND CLOSED SIGN SEE SPECIAL PROVISIONS



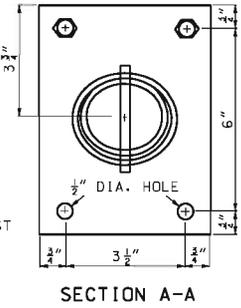
MAXIMUM HEIGHT FROM BOTTOM OF BUSES WEIGH SIGN TO GROUND SHALL BE 60".

GENERAL SIGN DATA				
SHR1L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		1	GREEN	
LEGEND	L-3	4	WHITE	E
SYMBOLS	L-3	4	WHITE	
BORDER	L-3	4	WHITE	
SUBSTRATE	SHEET			

CHANGEABLE SIGN DETAIL

SUBSTRATE ST STRUCTURAL SH SHEET
LEGEND, SYMBOLS, & BORDER L-1 SCREEN PRINT L-3 DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS.)

REFLECTIVE SHEETING R1 ENGINEERING GRADE IN ACCORDANCE WITH SEC 1042.2.7.1 R4 PRISMATIC IN ACCORDANCE WITH SEC 1042.2.7.3



SECTION A-A

SIGN	A	B	C	D	E	F	G	H	J	K	L	M	N	P
R21-1	5 1/4"	6"	4 1/2"	13 1/2"	13 1/8"	8"	7 5/8"	28 3/8"	28 3/8"	28 3/8"	28 1/4"	3/8"	8/8"	3"

GENERAL SIGN DATA				
SHR1L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		1	WHITE	
LEGEND	L-1		BLACK	C
SYMBOLS				
BORDER	L-1		BLACK	
SUBSTRATE	SHEET			

PERMIT SIGN DETAIL

MATERIAL LIST		
NO.	DESCRIPTION	LB.
2	1/4" STEEL PLATE	2.26
1	3" STANDARD PIPE	32.44
2	2-1/2" STANDARD PIPE	3.89
8	3/8" GALV. MACH. BOLT	
8	GALV. WASHER	

GENERAL NOTES:

DESIGN SPECS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS - 1975.

MATERIALS AND FABRICATION SHALL CONFORM TO THE REQUIREMENTS OF THE STATE HIGHWAY AND TRANSPORTATION COMMISSION STANDARD SPECIFICATIONS AND PROVISIONS.

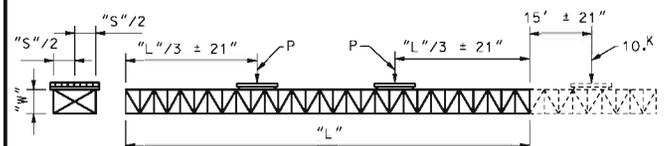
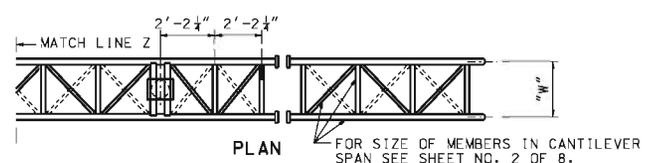
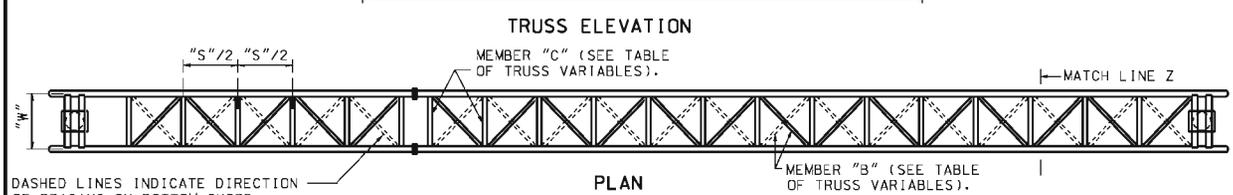
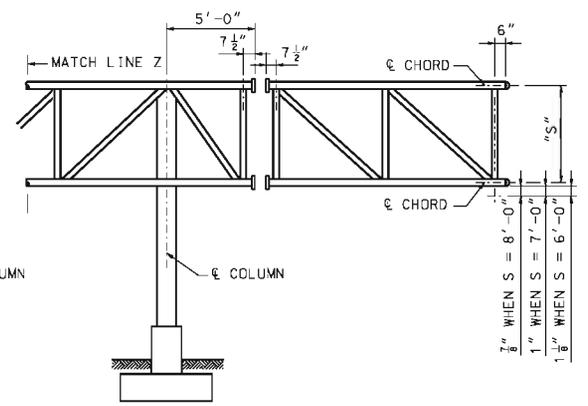
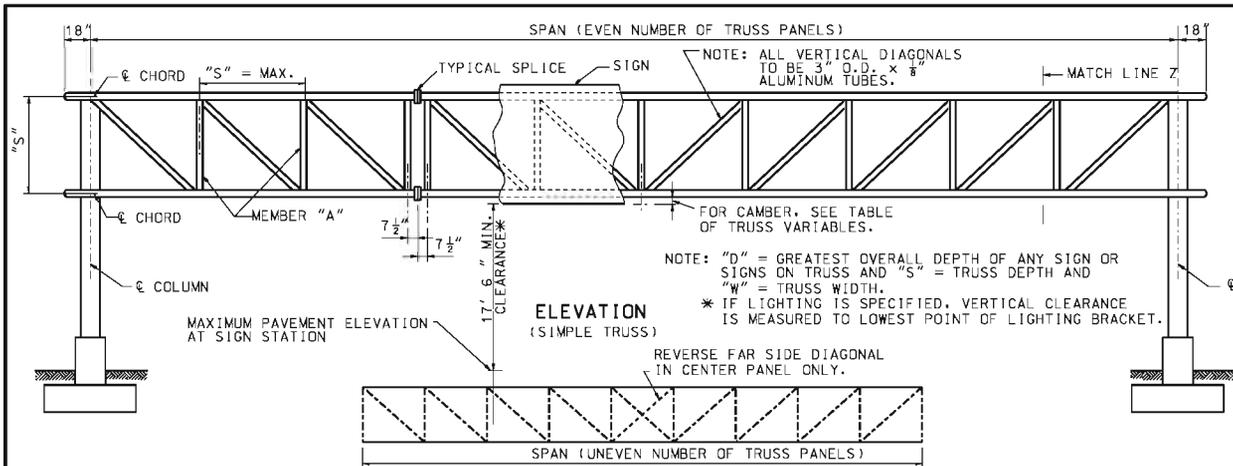
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-22781
 PROFESSIONAL ENGINEER
 THIS SHEET HAS BEEN BONDED, SEALED AND DATED ELECTRONICALLY.

**HIGHWAY SIGNING
WEIGH STATION**

DATE EFFECTIVE: 02/01/2012	903.04F	SHEET NO. 1 OF 1
DATE PREPARED: 12/19/2011		



$$P = \frac{84\alpha w}{L} - 0.02 L$$
 WHERE:

- P = CONCENTRATED LOAD IN KIPS.
- α = AREA OF ONE CHORD TUBE IN SQUARE INCHES. (USE 0.76α FOR 4" DIA. x 1/8" AND 4 1/2" DIA. x 1/4" CHORDS)
- w = WIDTH OF TRUSS IN FEET.
- L = SPAN LENGTH IN FEET.

SAMPLE, GIVEN: α = 4.123 SQ. IN., w = 6'-0" AND L = 100'.
 SOLUTION: $P = \frac{84 \times 4.123 \times 6.0}{100} - 0.02 \times 100 = 20.8 - 2 = 18.8$

NOTE:
 IF CANTILEVERED, REMOVE CONCENTRATED LOAD NEAREST CANTILEVER END AND LOAD CANTILEVER SPAN AS SHOWN ABOVE.
 15' OR LESS CANTILEVER SPANS NEED NOT BE TESTED.
 REPEAT ABOVE TESTS BY ROTATING 180° ITO SIMULATE WIND REVERSAL). NO VERTICAL LOAD (D.L.) TEST WILL BE REQUIRED.
 LOADS P SHALL NOT BE MORE THAN 16° FOR SPANS LESS THAN 55 FEET AND 20° FOR ALL OTHERS.

SIMULATED WIND-SHOP TEST LOADING

TRUSS VARIABLES						
SPAN	"S"	"W"	MEMBER "A"	MEMBER "B"	MEMBER "C"	SHOP CAMBER
UP TO 70'-6"	6'-0"	5'-0"	2 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	1 1/2" DIA. x 1/8"	2"
71' TO 80'-6"	6'-0"	6'-0"	2 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	2" DIA. x 1/8"	1 1/4"
81' TO 90'-6"	6'-0"	6'-0"	2 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	2" DIA. x 1/8"	1 1/2"
91' TO 100'-6"	6'-0"	6'-0"	2 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	2" DIA. x 1/8"	2 1/4"
101' TO 110'-6"	7'-0"	7'-0"	2 1/2" DIA. x 1/8"	3" DIA. x 1/8"	2 1/2" DIA. x 1/8"	2 1/2"
111' TO 120'-6"	7'-0"	7'-0"	2 1/2" DIA. x 1/8"	3 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	2 1/2"
121' TO 130'-6"	7'-0"	7'-0"	3" DIA. x 1/8"	3 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	3 1/2"
131' TO 140'-6"	8'-0"	7'-0"	3" DIA. x 1/8"	3 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	3"
141' TO 150'-6"	8'-0"	7'-0"	3" DIA. x 1/8"	3 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	3 1/4"
151' TO 160'-6"	8'-0"	7'-0"	3" DIA. x 1/8"	3 1/2" DIA. x 1/8"	2 1/2" DIA. x 1/8"	4 1/2"

NOTE:
 FOR SIZE OF CHORD MEMBERS, SEE DATA SHEET. SHOP CAMBER MAY BE PARABOLIC OR STRAIGHT, BUT SHALL BE SYMMETRICAL ABOUT CENTERLINE OF SPAN.

GENERAL NOTES:
 ALL STRUCTURAL STEEL AND COLUMN BASE PLATES ASTM A36.
 ALL ANCHOR BOLTS ASTM A307.
 PROPOSED FIELD SPLICES SHALL BE SHOWN ON SHOP DRAWINGS FOR APPROVAL OF THE ENGINEER.
 TRUSSES SHALL BE FABRICATED WITH A MINIMUM OF SPLICING IN TRUSS CHORDS.
 FIELD SPLICING WILL NOT BE PERMITTED WITHIN THE MIDDLE ONE-THIRD OF SPAN.
 PERMISSIBLE VENT HOLES (MAXIMUM 1/8" DIAMETER) SHALL BE PLACED A MINIMUM OF 3" FROM WELD ON LOW SIDE OF HORIZONTAL, VERTICAL AND DIAGONAL TUBES.
 FOR ADDITIONAL INFORMATION SEE DATA SHEET.

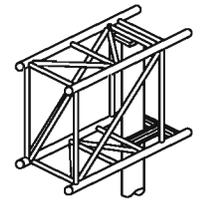
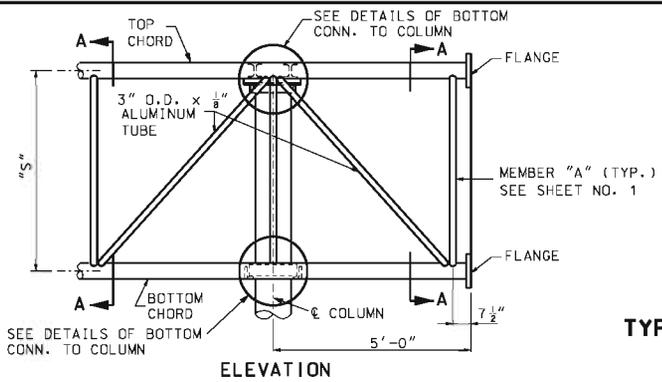
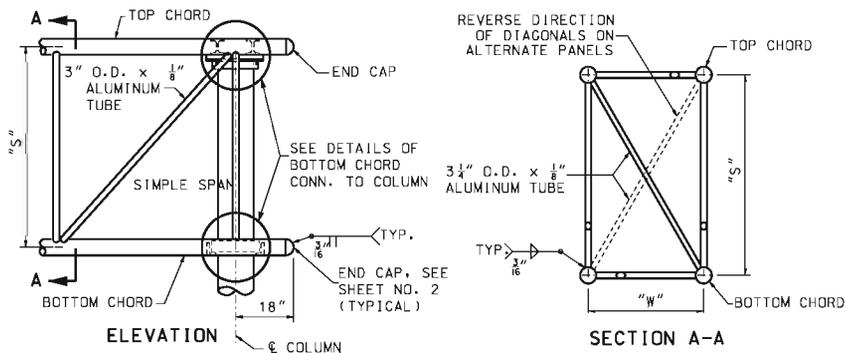
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

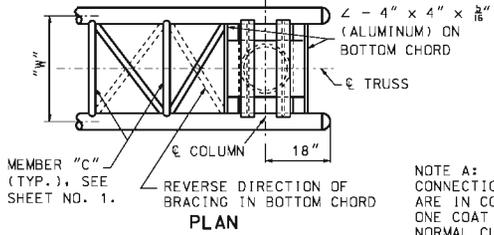
OVERHEAD SIGN TRUSSES
ALUMINUM

DATE EFFECTIVE:	10/01/2011	903.10BB	SHEET NO.
DATE PREPARED:	9/30/2011		1 OF 6

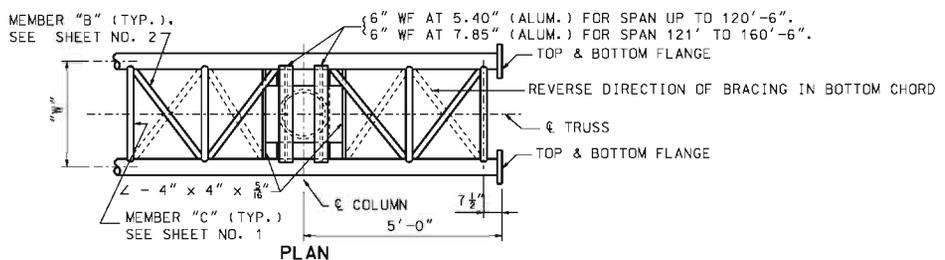
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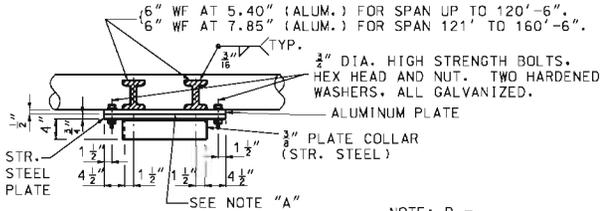
TYPICAL ISOMETRIC VIEW OF END SECTION



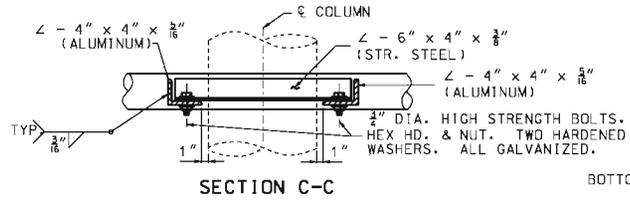
TRUSS END WITHOUT CANTILEVER



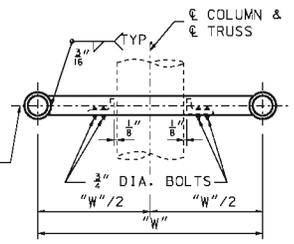
TRUSS END MODIFIED FOR CANTILEVER



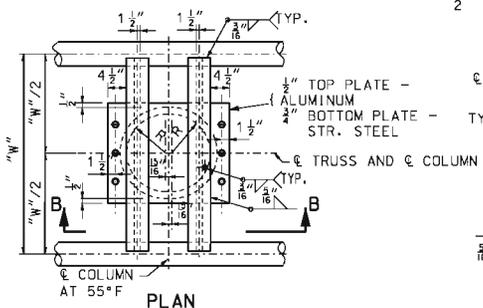
NOTE: R =
D.O.D. PIPE COL. + 1/16"
2



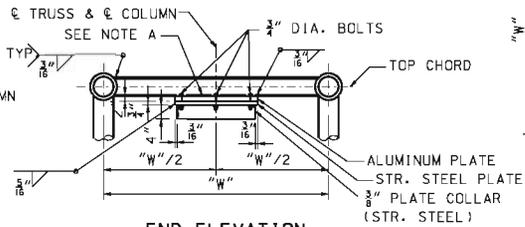
SECTION C-C



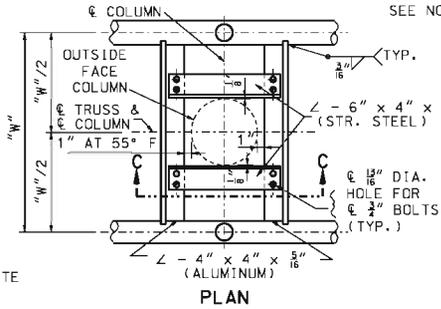
END ELEVATION



DETAIL OF TOP CHORD CONNECTION TO COLUMN



END ELEVATION



DETAILS OF BOTTOM CHORD CONNECTION TO COLUMN

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



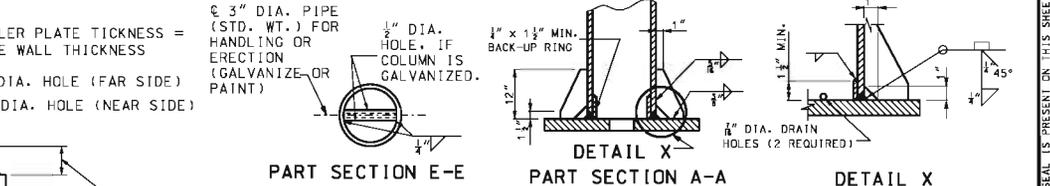
OVERHEAD SIGN TRUSSES
ALUMINUM

DATE EFFECTIVE:	10/01/2011	903.10BB	SHEET NO. 3 OF 6
DATE PREPARED:	9/30/2011		

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

POST TYPE	PIPE COLUMN	DIMENSION "E"	SPLIT	BASE PLATE SIZE*	ANCHOR BOLTS DIA.	PEDESTAL SIZE*		FOOTING SIZE*	LONGITUDINAL FOOTING REINFORCEMENT		CONCRETE C.Y.
						a	b		TOP	BOTTOM	
I	12" STD. AT 65.42	8 1/2"	6"	2'-6" x 23" x 1 1/2"	6 AT 2 1/4"	4'-0"	2'-11"	7'-0" x 14'-6"	7-#5 BARS	7-#6 BARS	10.9
II	14" O.D. AT 72.09	8 1/2"	9 1/2"	3'-0" x 2'-0" x 1 1/2"	6 AT 2 1/4"	4'-4"	3'-0"	8'-0" x 16'-0"	8-#5 BARS	9-#6 BARS	13.2
III	16" O.D. AT 82.77	8 1/2"	11 1/2"	3'-4" x 2'-2" x 1 1/2"	6 AT 2 1/4"	4'-8"	3'-2"	8'-6" x 17'-6"	9-#5 BARS	9-#7 BARS	15.2
IV	18" O.D. AT 93.45	9 1/2"	12 1/2"	3'-7" x 2'-4" x 2"	6 AT 2 1/2"	5'-1"	3'-4"	9'-6" x 19'-0"	10-#5 BARS	10-#8 BARS	18.1
V	20" O.D. AT 104.13	9 1/2"	13"	3'-10" x 2'-9" x 2"	8 AT 2 1/2"	5'-4"	3'-9"	10'-0" x 20'-0"	10-#5 BARS	10-#8 BARS	20.6
VI	24" O.D. AT 125.49	9 1/2"	10 1/2"	4'-0" x 3'-3" x 2"	8 AT 2 1/2"	5'-6"	4'-3"	10'-6" x 21'-0"	11-#5 BARS	11-#8 BARS	23.3
VII	24" O.D. AT 125.49	9 1/2"	13 1/2"	4'-3" x 3'-3" x 2"	8 AT 2 1/2"	5'-9"	4'-3"	11'-0" x 22'-0"	11-#5 BARS	11-#9 BARS	25.1

* BASE PLATES, PEDESTAL, AND FOOTINGS. LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.



PART SECTION E-E PART SECTION A-A

GENERAL NOTES:
A TAPERED TUBE OF EQUIVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.

ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; A.S.T.M. SPECIFICATION A53. NO OBJECTIONABLE SEAMS WILL BE PERMITTED.

ALL STRUCTURES SHALL BE GROUNDED.
BURR THREADS ON ALL ANCHOR BOLTS.

A HORIZONTAL WELDED SPLICE MAY BE FABRICATED IN THE COLUMN BETWEEN THE TOP OF PIPE AND 4'-0" BELOW THE BOTTOM CHORDS OF THE TRUSS WHEN DETAILED ON THE PIPE AND 4'-0" BELOW THE BOTTOM CHORDS OF THE TRUSS WHEN DETAILED ON THE SHOP DRAWINGS AND APPROVED BY THE ENGINEER.

GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND HOLE.

QUANTITIES FOR PEDESTAL, BASED ON NOMINAL HEIGHT OF 2'-0".

QUANTITIES FOR FOOTING, BASED ON NOMINAL DEPTH OF 2'-0".

QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

STATE OF MISSOURI
KATHRYN PHILLIPS HAWRY
NUMBER PE-22781
PROFESSIONAL ENGINEER

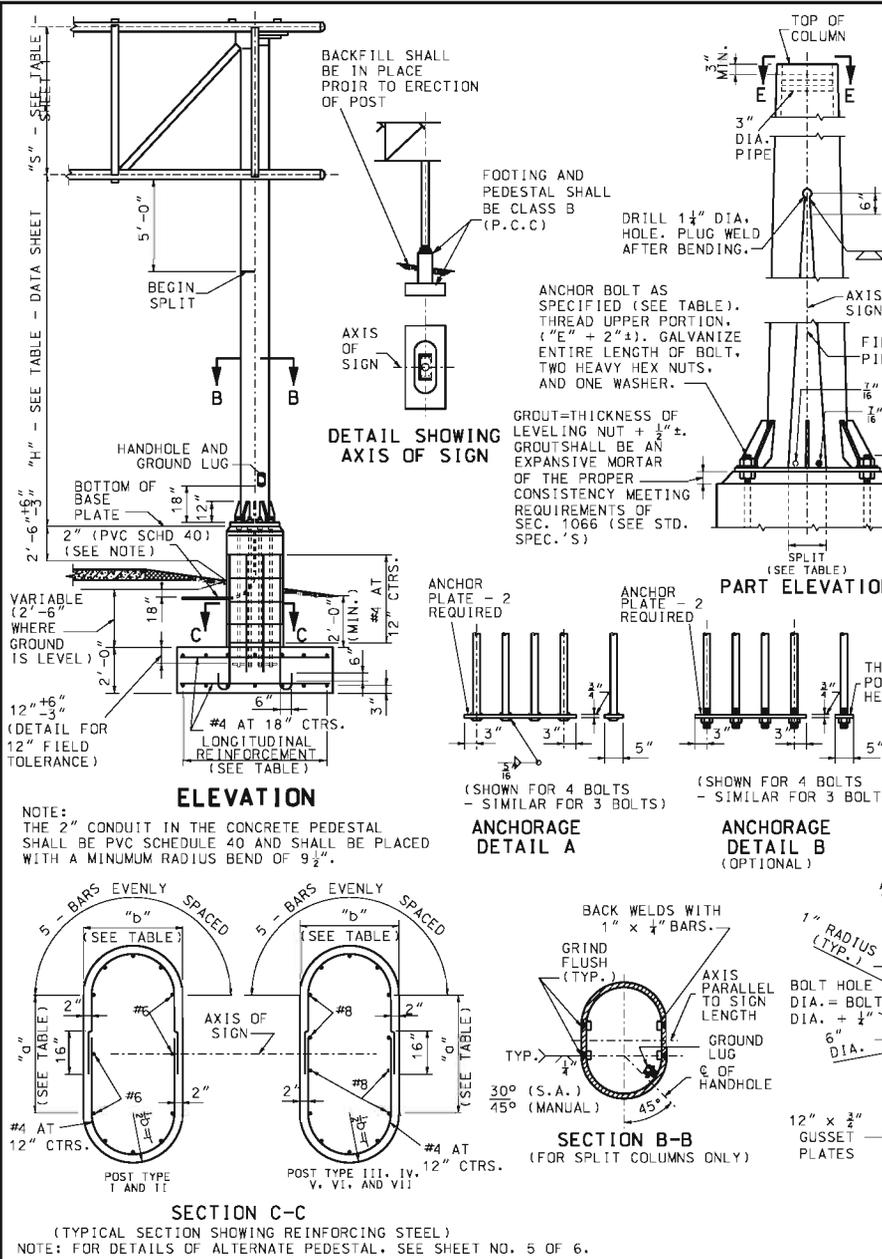
OVERHEAD SIGN TRUSSES

ALUMINUM

DATE EFFECTIVE: 10/01/2011
DATE PREPARED: 9/30/2011

903.10BB

SHEET NO.
4 OF 6

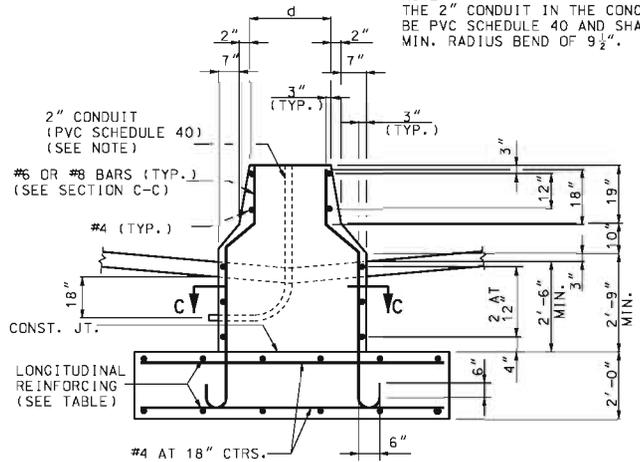


NOTE: THE 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MINIMUM RADIUS BEND OF 9".

NOTE: FOR DETAILS OF ALTERNATE PEDESTAL, SEE SHEET NO. 5 OF 6.

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

NOTE:
THE 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MIN. RADIUS BEND OF 9 1/2".

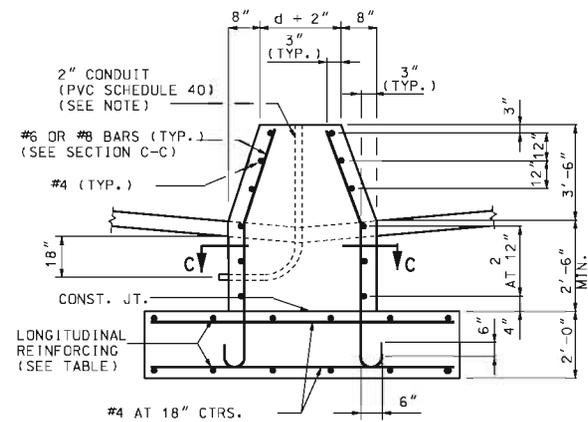


**PART ELEVATION
(TYPE A CONCRETE TRAFFIC BARRIER)**

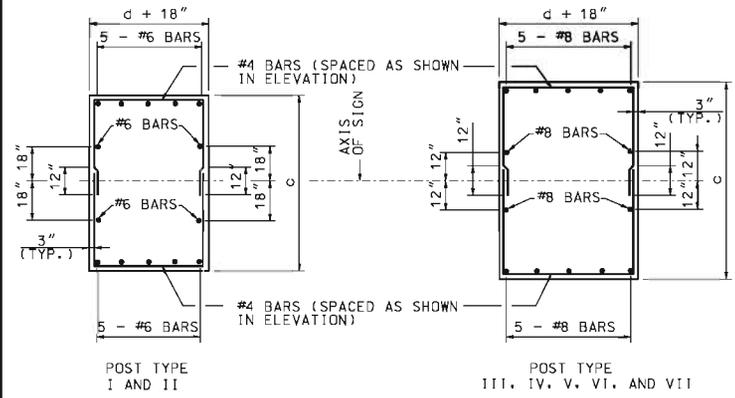
POST TYPE	PIPE COLUMN	PEDESTAL SIZE *		FOOTING SIZE *	LONGITUDINAL FOOTING REINFORCEMENT		CONCRETE C.Y.	
		c	d		TOP	BOTTOM	TYPE A MEDIAN BARRIER	TYPE C MEDIAN BARRIER
I	12" STD. AT 65.42	5'-9"	2'-1"	7'-0" x 14'-6"	7 - #5 BARS	7 - #6 BARS	10.9	11.6
II	14" O.D. AT 72.09	6'-2"	2'-2"	8'-0" x 16'-0"	8 - #5 BARS	9 - #6 BARS	13.2	14.0
III	16" O.D. AT 82.77	6'-7"	2'-4"	8'-6" x 17'-6"	9 - #5 BARS	9 - #7 BARS	15.2	16.1
IV	18" O.D. AT 93.45	7'-1"	2'-6"	9'-6" x 19'-0"	10 - #5 BARS	10 - #8 BARS	18.1	19.1
V	20" O.D. AT 104.13	7'-8"	2'-11"	10'-0" x 20'-0"	10 - #5 BARS	10 - #8 BARS	20.6	21.7
VI	24" O.D. AT 125.49	8'-3"	3'-5"	10'-6" x 21'-0"	11 - #5 BARS	11 - #8 BARS	23.3	24.6
VII	24" O.D. AT 125.49	8'-6"	3'-5"	11'-0" x 22'-0"	11 - #5 BARS	11 - #9 BARS	25.1	26.5

* BASE PLATES, PEDESTAL, AND FOOTINGS LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.

NOTE:
THE 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MIN. RADIUS BEND OF 9 1/2".



**PART ELEVATION
(TYPE C CONCRETE TRAFFIC BARRIER)**

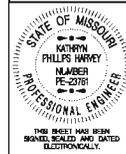


**SECTION C-C
TYPICAL SECTION SHOWING
REINFORCING STEEL
DETAILS OF ALTERNATE PEDESTAL
(TO BE USED ADJACENT TO TYPE "A" OR "C" MEDIAN BARRIER)**

GENERAL NOTES:

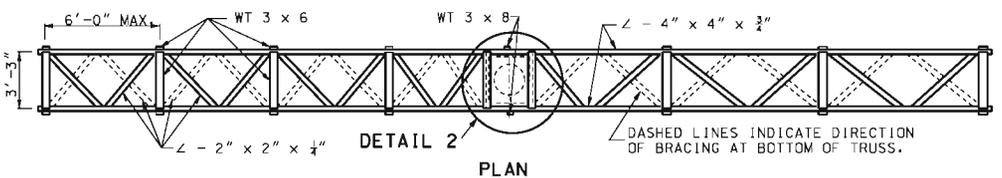
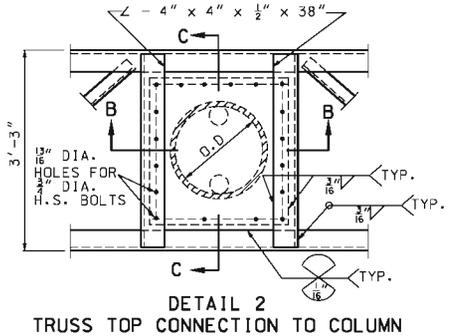
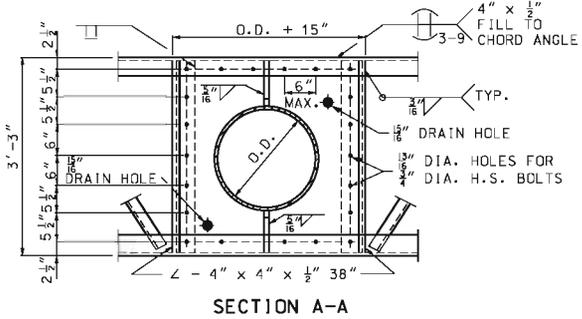
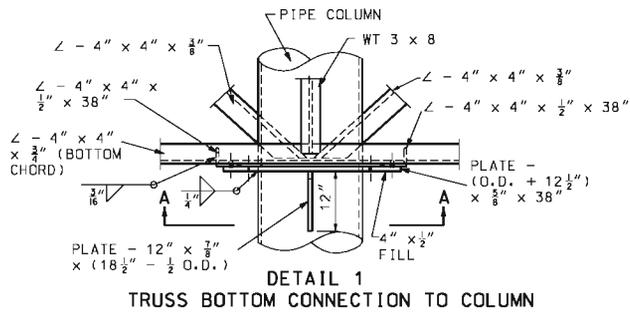
- A TAPERED TUBE OF EQUIVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.
- ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; A.S.T.M. SPECIFICATION A53.
- NO OBJECTIONABLE SEAMS WILL BE PERMITTED.
- ALL STRUCTURES SHALL BE GROUNDED.
- BURR THREADS ON ALL ANCHOR BOLTS.
- PIPE COLUMN, BASE PLATE, ANCHOR BOLTS AND NOTES PERTAINING TO THESE ITEMS HAVE BEEN OMITTED FOR CLARITY. REFER TO SHEET NO. 4 OF 6 FOR DETAILS OF THESE ITEMS.
- GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND HOLE.
- QUANTITIES FOR PEDESTAL, BASED ON NOMINAL HEIGHT OF 5'-2" (TYPE A MEDIAN BARRIER) OR 6'-0" (TYPE C MEDIAN BARRIER).
- QUANTITIES FOR FOOTING, BASED ON NOMINAL DEPTH OF 2'-0".
- QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL
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 1-888-ASK-MODOT (1-888-275-6636)

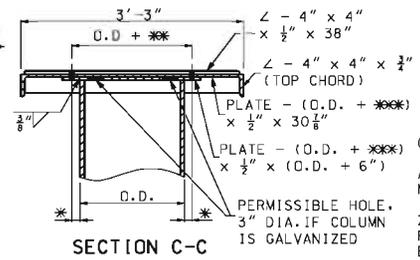
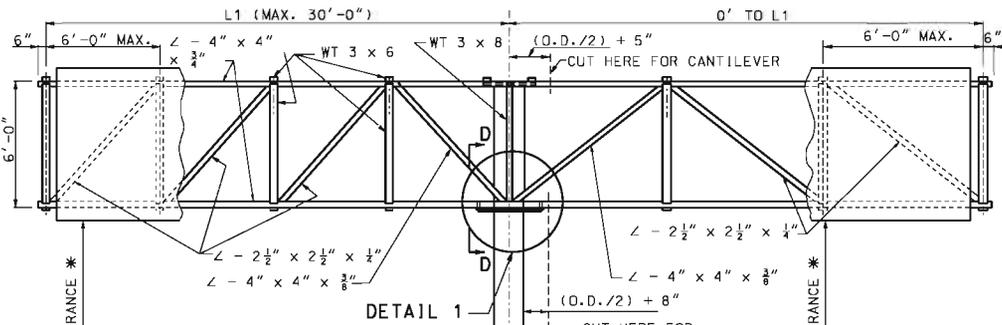


**OVERHEAD SIGN TRUSSES
ALUMINUM**

DATE EFFECTIVE:	10/01/2011	903.10BB	SHEET NO.
DATE PREPARED:	9/30/2011		5 OF 6



- * 1 1/4" FOR POST TYPE VII
- 1 3/4" FOR ALL OTHER POST TYPES
- ** 3" FOR POST TYPE VII
- 3 1/2" FOR ALL OTHER POST TYPES
- *** 5 1/2" FOR POST TYPE VII
- 6" FOR ALL OTHER POST TYPES



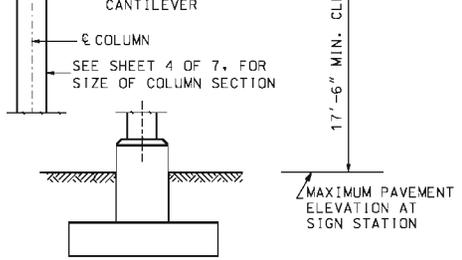
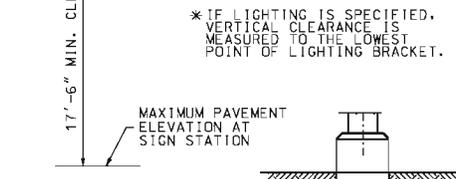
GENERAL NOTES:

ALL FASTENERS SHALL HAVE A HARDENED WASHER UNDER THE NUT OR BOLT HEAD, WHICHEVER IS TURNED IN TIGHTENING.

ZINC CHROMATE PRIMER SHALL MEET THE REQUIREMENTS OF FEDERAL SPECIFICATION TT-P-645 OR TT-P-1757 AND SHALL BE ACCEPTED ON THE BASIS OF THE LABEL SHOWING CONFORMANCE OR A MANUFACTURER'S CERTIFICATION.

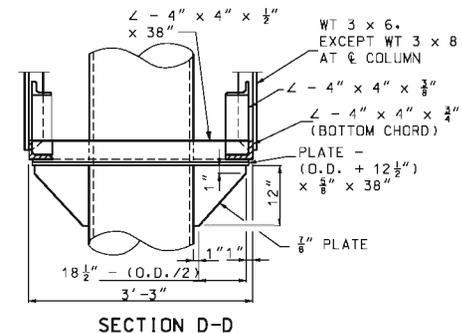
DESIGN OF STRUCTURAL SUPPORTS SHALL COMPLY WITH AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS 2001 AND CURRENT INTERIMS.

DESIGN OF SPREAD FOOTINGS SHALL COMPLY WITH 1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.



NOTE:
TRUSSES AND COLUMN BASE PLATES: ASTM A36. ANCHOR BOLTS: ASTM A307.
FOR ADDITIONAL INFORMATION, SEE DATA SHEET.

ELEVATION DRILLED SHAFT OPTION ELEVATION SPREAD FOOTING OPTION



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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1-888-ASK-MODOT (1-888-275-6636)

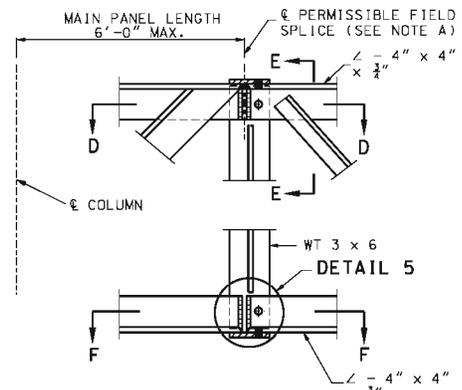
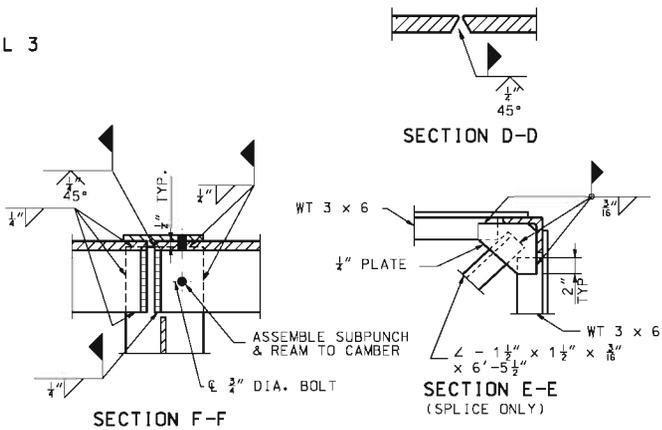
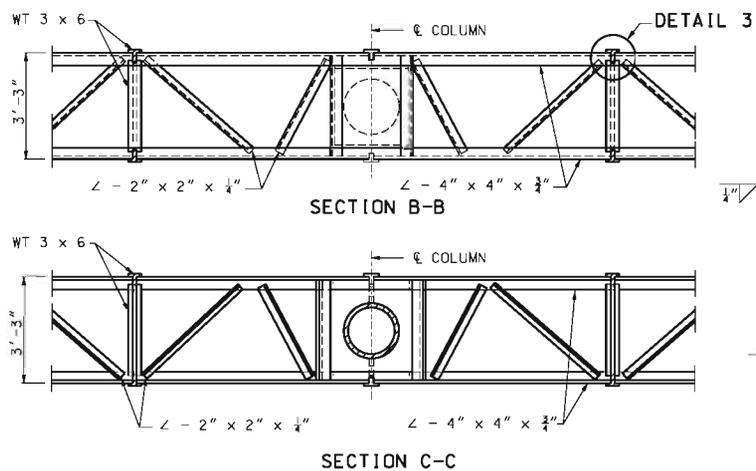
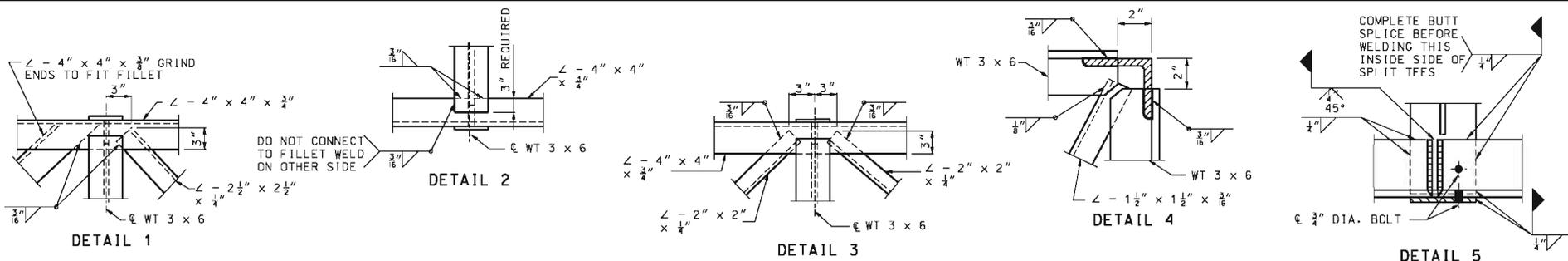
STATE OF MISSOURI
KATHRYN PHILLIPS HAWRY
NUMBER PE-2781
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN
BROAD SEALED AND DATED
ELECTRONICALLY.

OVERHEAD SIGN TRUSSES
BUTTERFLY AND CANTILEVER
STRUCTURAL STEEL

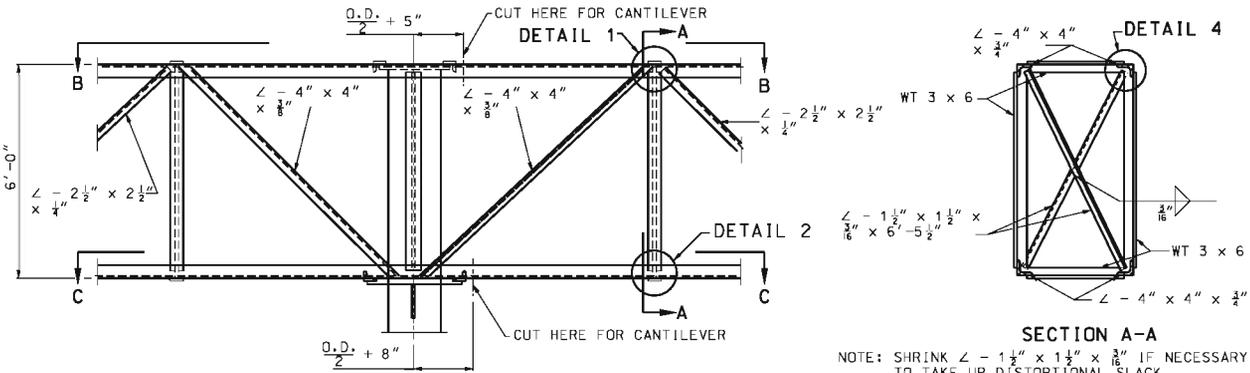
DATE EFFECTIVE: 12-01-2008	903.12Y	SHEET NO. 1 OF 7
DATE PREPARED: 7/19/2012		

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



NOTE: 3/4" DIA. BOLTS SHALL BE REMOVED AFTER WELDING IS COMPLETE. BOLT HOLES SHALL BE PLUGGED AND THE OUTSIDE FACE GROUND SMOOTH.

NOTE A: SPLICING CHORD ANGLES IN THE SHOP AND THE FIELD SPLICE SHOWN IN THIS SHEET WILL NOT BE ALLOWED WITHOUT SPECIAL PERMISSION. IF PERMISSION IS GRANTED SUCH SPLICES SHALL BE LOCATED AT THE CENTER LINE OF MAIN PANEL POINT NEXT TO COLUMN.



SECTION A-A
 NOTE: SHRINK L - 1 1/2" x 1 1/2" x 3/16" IF NECESSARY TO TAKE UP DISTORTIONAL SLACK.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	OVERHEAD SIGN TRUSSES BUTTERFLY & CANTILEVER STRUCTURAL STEEL	
	DATE EFFECTIVE: 12-01-2008 DATE PREPARED: 7/19/2012	903.12Y SHEET NO. 2 OF 7

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

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

DRILLED SHAFT OPTION																				ALTERNATE PEDESTALS									
POST TYPE	PIPE COLUMN O.D.	PIPE WEIGHT (LBS.)	"E"	SPLIT	BASE PLATE SIZE**	ANCHOR BOLT NO. DIA.	C	FA	FB	FC	FD	FH	COLLAR REINFORCEMENT						SHAFT REINFORCEMENT				REBAR TOTAL (LBS.)		CONCRETE (CU. YDS.)				
													MOMENT-C1		SHEAR-C2		SKIN-C3		LONGITUDINAL S1		SHEAR-S2		REBAR TOTAL (LBS.)	CONCRETE (CU. YDS.)	TYPE A	TYPE C			
													BARS	SPACING	BARS	SPACING	BARS	SPACING	QUANTITY	BARS	BARS	SPACING							
III	18"	93.45	8 1/2"	0"	2'-8" x 2'-8" x 1 3/4"	10	2"	2'-10"	4'-0"	7'-6"	1'-6"	4'-6"	14'-0"	#6	6"	#4	12"	#4	12"	19	#10	#5	6"	2126	12.4	2066	2077	13.4	14.5
IV	20"	104.13	8 1/2"	0"	2'-10" x 2'-10" x 2"	10	2 1/4"	3'-0"	4'-0"	7'-6"	1'-6"	4'-6"	14'-0"	#6	6"	#4	12"	#4	12"	19	#10	#5	6"	2126	12.4	2066	2077	13.5	14.6
V	18"	93.45	8 1/2"	7"	3'-3" x 2'-8" x 2"	10	2 1/4"	2'-10"	5'-0"	13'-6"	4'-0"	5'-6"	17'-0"	#6	6"	#4	12"	#4	12"	22	#11	#6	6"	3901	26.5	3763	3782	28.8	30.7
VI	20"	104.13	8 1/2"	8"	3'-6" x 2'-10" x 2 1/4"	10	2 1/4"	3'-0"	5'-0"	14'-0"	4'-0"	6'-0"	18'-0"	#6	6"	#4	12"	#4	12"	27	#11	#6	6"	4742	31.8	4528	4547	34.1	36.2
VII	24"	125.49	9"	8"	3'-10" x 3'-2" x 2 1/4"	10	2 1/2"	3'-4"	5'-0"	14'-0"	4'-0"	6'-0"	18'-0"	#6	6"	#4	12"	#4	12"	27	#11	#6	6"	4742	31.8	4528	4547	34.5	36.8

SPREAD FOOTING OPTION																				
POST TYPE	PIPE COLUMN O.D.	PIPE WEIGHT (LBS.)	"E"	SPLIT	BASE PLATE SIZE**	ANCHOR BOLT NO. DIA.	PEDESTAL SIZE * a	PEDESTAL SIZE * b	FOOTING SIZE * c	LONGITUDINAL FOOTING REINFORCEMENT				PEDESTAL REINFORCEMENT				REBAR TOTAL (LBS.)	CONCRETE (CU. YDS.)	
										TOP		BOTTOM		NO.		NO.				
										NO.	BARS	NO.	BARS	NO.	BARS	NO.	BARS			
III	18"	93.45	8 1/2"	0"	2'-8" x 2'-8" x 1 3/4"	10	2"	4'-2"	3'-8"	10'-0" x 13'-0"	10	#5	10	#5	10	#4	14	#8	695	14.4
IV	20"	104.13	8 1/2"	0"	2'-10" x 2'-10" x 2"	10	2 1/4"	4'-4"	3'-10"	10'-0" x 14'-0"	10	#5	10	#5	10	#4	14	#8	733	15.6
V	18"	93.45	8 1/2"	7"	3'-3" x 2'-8" x 2"	10	2 1/4"	4'-9"	3'-8"	9'-0" x 17'-0"	9	#5	10	#7	10	#4	14	#8	955	16.5
VI	20"	104.13	8 1/2"	8"	3'-6" x 2'-10" x 2 1/4"	10	2 1/4"	5'-0"	3'-10"	9'-0" x 19'-0"	9	#5	10	#7	10	#4	14	#8	1028	18.4
VII	24"	125.49	9"	8"	3'-10" x 3'-2" x 2 1/4"	10	2 1/2"	5'-4"	4'-2"	10'-0" x 20'-0"	9	#5	12	#7	10	#4	14	#8	1196	21.5

SPREAD FOOTING OPTION WITH ALTERNATE PEDESTALS																															
POST TYPE	PIPE COLUMN O.D.	PIPE WEIGHT (LBS.)	"E"	SPLIT	BASE PLATE SIZE**	ANCHOR BOLT NO. DIA.	PEDESTAL SIZE *			FOOTING SIZE * c	TYPE A LONGITUDINAL FOOTING REINFORCEMENT				TYPE A PEDESTAL REINFORCEMENT				TYPE A REBAR TOTAL (LBS.)	TYPE A CONCRETE (CU. YDS.)	TYPE C LONGITUDINAL FOOTING REINFORCEMENT				TYPE C PEDESTAL REINFORCEMENT				TYPE C REBAR TOTAL (LBS.)	TYPE C CONCRETE (CU. YDS.)	
							c	d	e		TOP		BOTTOM		NO.		NO.				TOP		BOTTOM								
							NO.	BARS	NO.		BARS	NO.	BARS	NO.	BARS	NO.	BARS	NO.			BARS	NO.	BARS	NO.	BARS	NO.	BARS				
III	18"	93.45	8 1/2"	0"	2'-8" x 2'-8" x 1 3/4"	10	2"	2'-10"	6'-6"	15"	10'-0" x 13'-0"	10	#5	10	#5	10	#4	14	#8	757	14.4	10	#4	10	#5	12	#4	14	#8	800	15.3
IV	20"	104.13	8 1/2"	0"	2'-10" x 2'-10" x 2"	10	2 1/4"	3'-0"	6'-9"	18"	10'-0" x 14'-0"	10	#5	10	#5	10	#4	14	#8	795	15.6	10	#4	10	#5	12	#4	14	#8	839	16.5
V	18"	93.45	8 1/2"	7"	3'-3" x 2'-8" x 2"	10	2 1/4"	2'-10"	7'-0"	12"	9'-0" x 17'-0"	9	#5	10	#7	10	#4	14	#8	1015	16.5	10	#4	10	#7	12	#4	14	#8	1059	17.5
VI	20"	104.13	8 1/2"	8"	3'-6" x 2'-10" x 2 1/4"	10	2 1/4"	3'-0"	7'-6"	15"	9'-0" x 19'-0"	9	#5	10	#7	10	#4	14	#8	1099	18.4	10	#4	10	#7	12	#4	14	#8	1134	19.5
VII	24"	125.49	9"	8"	3'-10" x 3'-2" x 2 1/4"	10	2 1/2"	3'-4"	7'-10"	15"	10'-0" x 20'-0"	9	#5	12	#7	10	#4	14	#8	1257	21.5	10	#4	12	#7	12	#4	14	#8	1302	22.6

* BASE PLATES, PEDESTAL AND FOOTINGS, LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.
 ** BASE PLATES, PEDESTAL AND FOUNDATIONS, LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

KATHRYN PHILLIPS HAWRY
REGISTERED PROFESSIONAL ENGINEER
NO. PE-23781

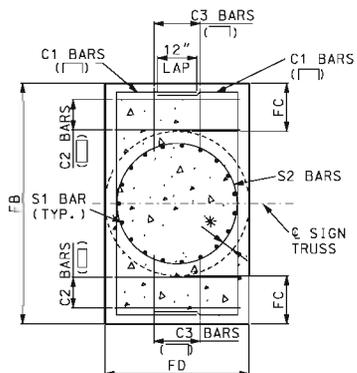
THIS SEAL HAS BEEN ELECTRONICALLY SEALED AND DATED

OVERHEAD SIGN TRUSSES
OPTIONAL SUBSTRUCTURE DATA

DATE EFFECTIVE: 12-01-2008
DATE PREPARED: 7/19/2012

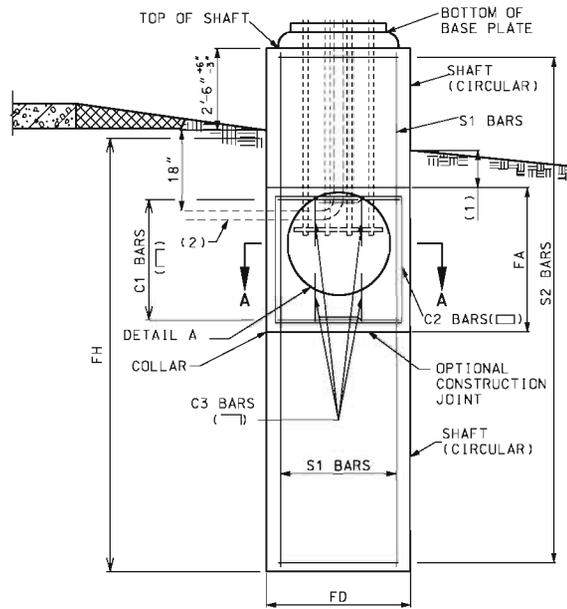
903.12Y

SHEET NO.
4 OF 7



SECTION A-A
(TYPICAL SECTION SHOWING REINFORCING STEEL)

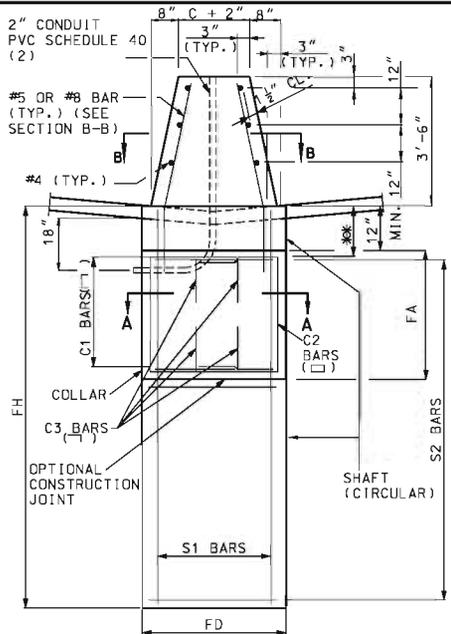
* 4" CLEAR FOR FD = 4'-6"
6" CLEAR FOR FD > 4'-6"
VERTICAL LEG OF C3 SHALL BE PLACED INSIDE SHAFT S2 BARS.



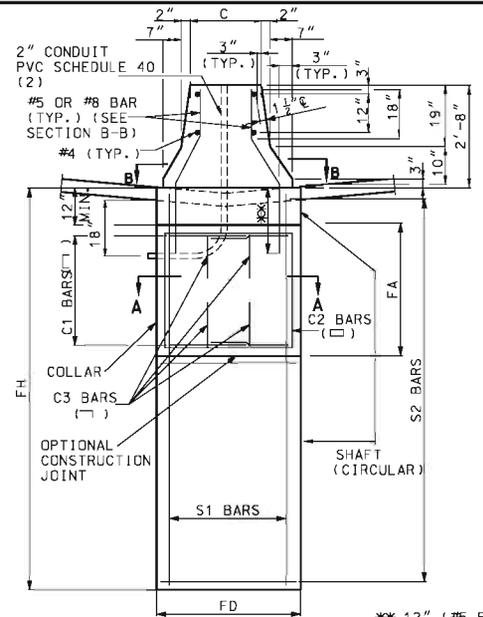
ELEVATION

BACKFILL SHALL BE IN PLACE PRIOR TO ERECTION OF POST

- (1) 12" MIN. TO 24" MAX.
- (2) 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MINIMUM BEND RADIUS OF 9 1/2"



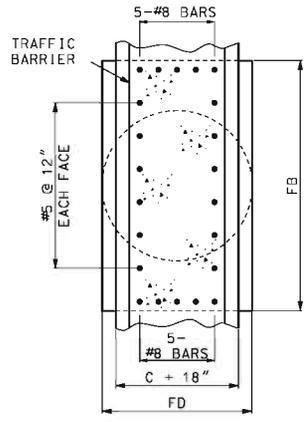
PART ELEVATION
(TYPE C CONCRETE TRAFFIC BARRIER)



PART ELEVATION
(TYPE A CONCRETE TRAFFIC BARRIER)

* 12" (#5 BAR)
2'-4" (#8 BAR)

DETAILS OF ALTERNATE PEDESTAL
(TO BE USED ADJACENT TO TYPE A OR TYPE C MEDIAN BARRIER)

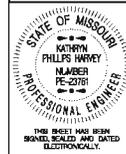


SECTION B-B

GENERAL NOTES:

- SHAFT AND COLLAR SHALL BE CLASS B (P.C.C.).
- MINIMUM CLEARANCE TO REINFORCEMENT IS 3" EXCEPT AS SHOWN.
- WHEN ROCK IS ENCOUNTERED AT A DEPTH NOT EXCEEDING "FH"/2 FOR FD > 3'-0" OR "FH"/4 FOR FD ≤ 3'-0", THE DIMENSION "FH" MAY BE ADJUSTED TO A MINIMUM OF 3 X "FD". SUBJECT TO APPROVAL BY THE ENGINEER.
- CONTACT THE ENGINEER IF WATER TABLE IS ENCOUNTERED DURING EXCAVATION.
- PIPE COLUMN, BASE PLATE, ANCHOR BOLTS AND NOTES PERTAINING TO THESE ITEMS HAVE BEEN OMITTED FOR CLARITY. REFER TO SHEET 3 OF 7 FOR DETAILS OF THESE ITEMS.

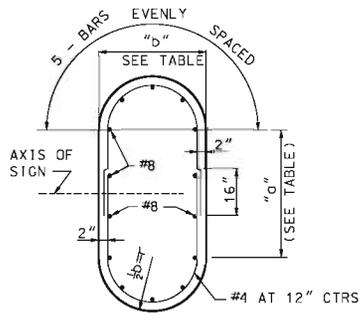
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)



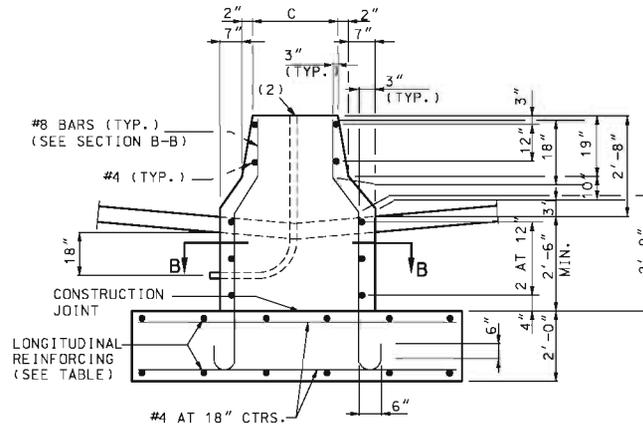
OVERHEAD SIGN TRUSSES
DRILLED SHAFT OPTION

DATE EFFECTIVE:	12-01-2008	903.12Y	SHEET NO.
DATE PREPARED:	7/19/2012		5 OF 7

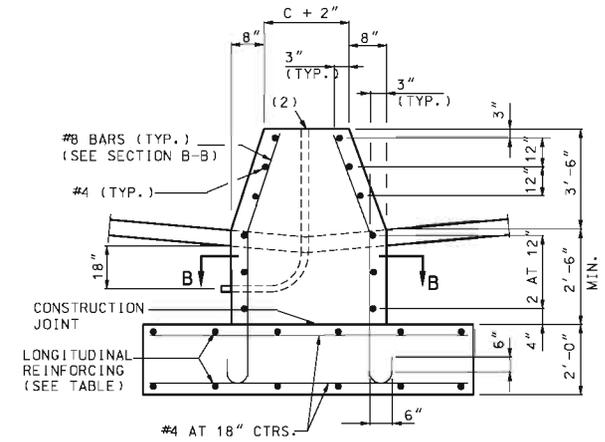
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



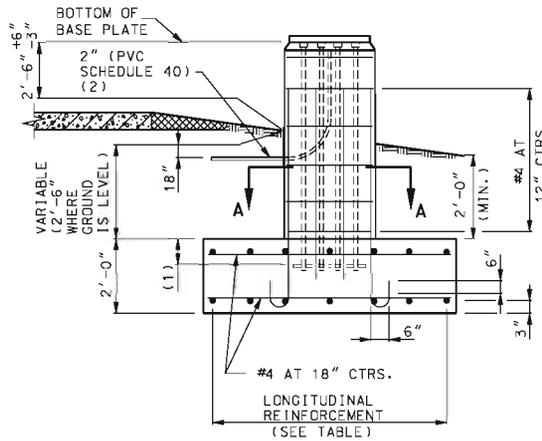
SECTION A-A
(TYPICAL SECTION SHOWING REINFORCING STEEL)



PART ELEVATION
(TYPE A CONCRETE TRAFFIC BARRIER)

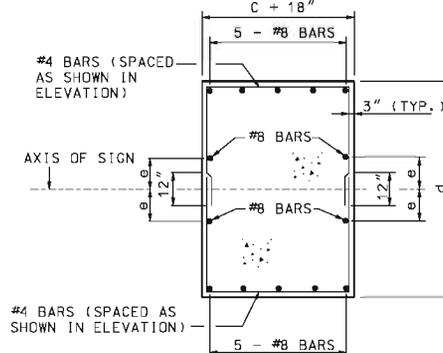


PART ELEVATION
(TYPE C CONCRETE TRAFFIC BARRIER)



ELEVATION

- (1) 12" ^{+6"}/_{-3"} (DETAIL FOR 12" FIELD TOLERANCE)
- (2) 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MINIMUM BEND RADIUS OF 9 1/2".

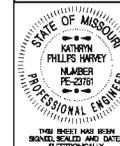


SECTION B-B
TYPICAL SECTION SHOWING
REINFORCING STEEL
DETAILS OF ALTERNATE PEDESTAL

GENERAL NOTES:

- PEDESTAL AND FOOTING SHALL BE CLASS B (P.C.C.).
- MINIMUM CLEARANCE TO REINFORCEMENT IS 3" EXCEPT AS SHOWN.
- CONTACT THE ENGINEER IF WATER TABLE IS ENCOUNTERED DURING EXCAVATION.
- PIPE COLUMN, BASE PLATE, ANCHOR BOLTS AND NOTES PERTAINING TO THESE ITEMS HAVE BEEN OMITTED FOR CLARITY. REFER TO SHEET 3 OF 7 FOR DETAILS OF THESE ITEMS.

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



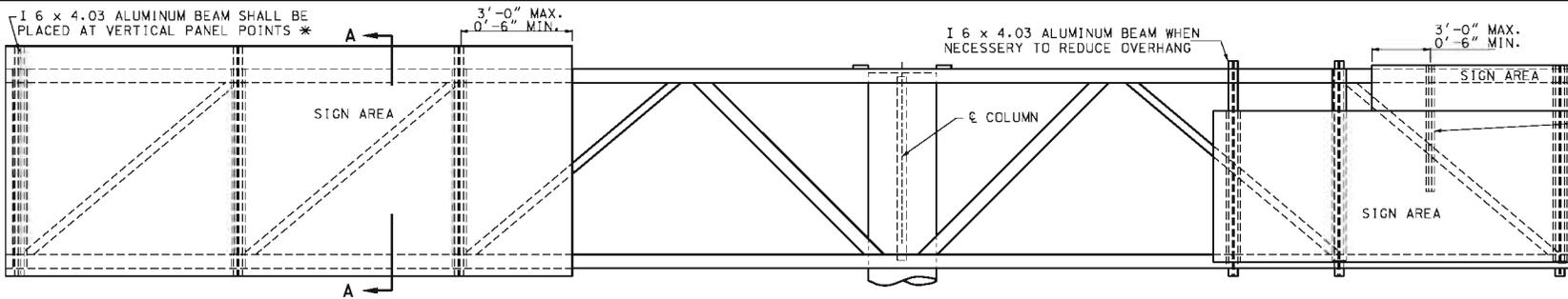
**OVERHEAD SIGN TRUSSES
SPREAD FOOTING**

DATE EFFECTIVE: 12-01-2008
 DATE PREPARED: 7/19/2012

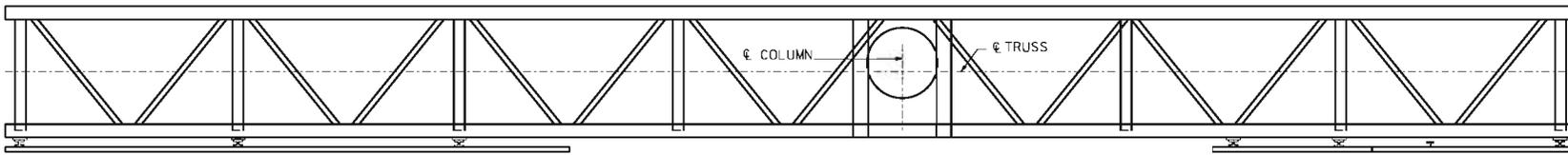
903.12Y

SHEET NO.
6 OF 7

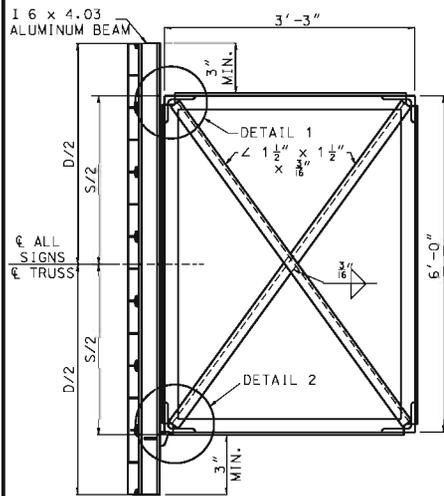
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TYPICAL ELEVATION OF SIGNS COMPONENTS



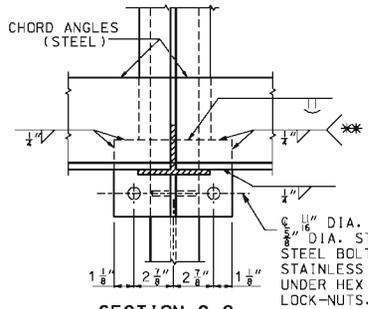
TYPICAL PLAN OF SIGN COMPONENTS



SECTION A-A
TYPICAL SECTION
OF SIGN SUPPORT

NOTE:
"D" = GREATEST OVERALL DEPTH
OF ANY SIGNS ON TRUSSES.

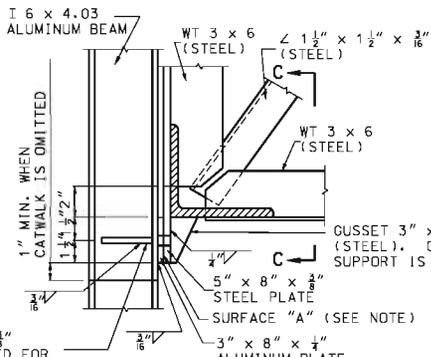
TWO - GUSSETS 5" x 1" x 3/8"
(ALUM.) OMIT WHEN NOT USED FOR
CATWALK SUPPORT.



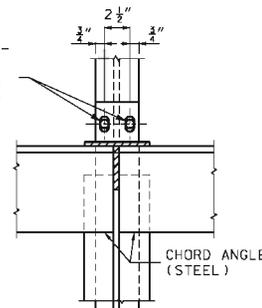
SECTION C-C

3/8" DIA. HOLES IN
ALUMINUM FLANGE.
3/16" x 1" SLOT IN 3/16"
FOR 1/2" DIA. STAIN-
LESS STEEL HEX HEAD
BOLTS AND LOCK-NUTS
WITH FLAT STAINLESS
STEEL WASHERS.

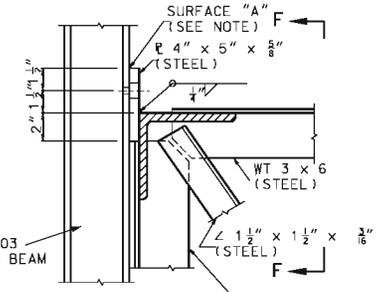
1/16" DIA. HOLES FOR
1/16" DIA. STAINLESS
STEEL BOLTS WITH
STAINLESS STEEL WASHERS
UNDER HEX HEADS AND
LOCK-NUTS.



DETAIL 2



SECTION F-F



DETAIL 1

NOTE:
SURFACE "A", ZINC CHROMATE ON ALUMINUM SURFACES.
NORMAL CLEANING AND PAINTING ON STEEL SURFACES.
ZINC CHROMATE IS NOT REQUIRED WHEN STEEL IS
GALVANIZED.

* FOR SIGN HEIGHTS GREATER THAN 17'-0", BUT LESS
THAN OR EQUAL TO 20'-0" USE ADDITIONAL I 6 x 4.03
ALUMINUM BEAMS TO ACHIEVE A MAXIMUM SPACING OF
4'-0" BETWEEN SIGN SUPPORTS.

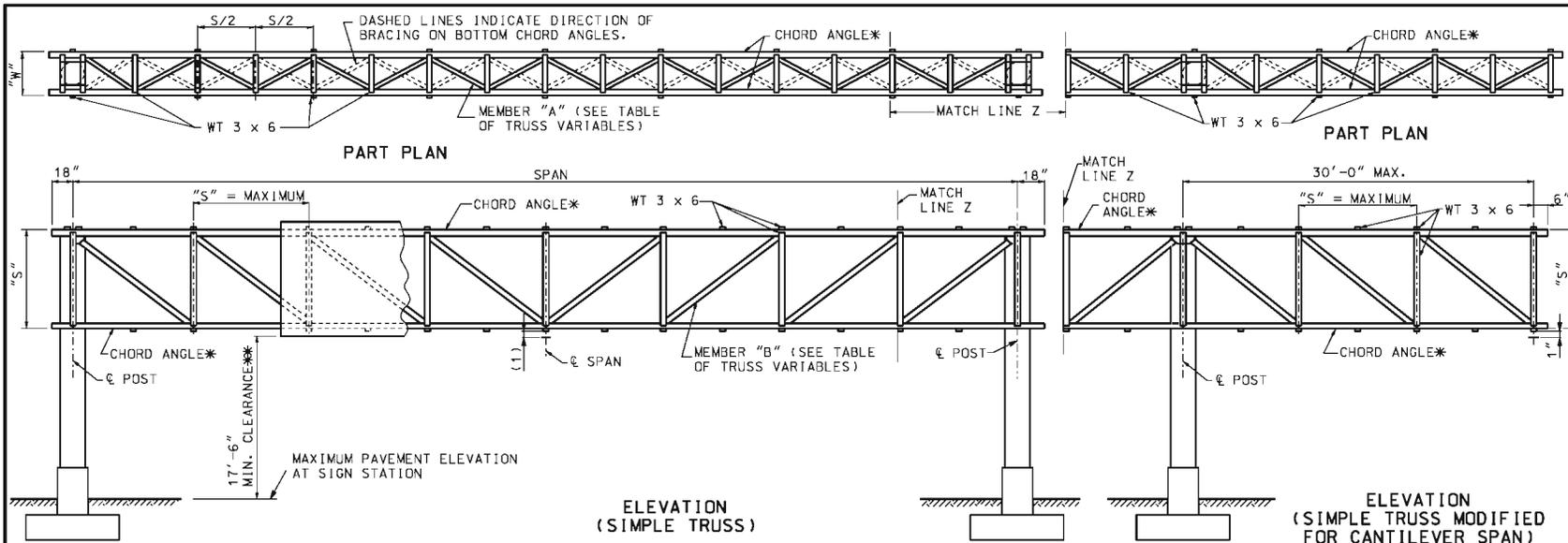
** WHEN SIGN SUPPORTS ARE PLACED BETWEEN VERTICAL
PANEL POINTS AS ILLUSTRATED IN TYPICAL ELEVATION
OF SIGNS COMPONENTS, WELD THE 3/8" STEEL PLATE
TO THE BOTTOM CHORD WITH A 1/4" FILLET WELD.

GENERAL NOTES:
EXIT NO. PANELS SHALL BE MONTED FLUSH WITH THE EXIT
SIDE OF THE GUIDE SIGN.
ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE
HORIZONTAL C OF THE TRUSS.
SEE STANDARD PLAN 903.03 FOR SIGN MOUNTING DETAILS.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		OVERHEAD SIGN TRUSSES STRUCTURAL STEEL BUTTERFLY AND CANTILEVER
DATE EFFECTIVE: 12-01-2008 DATE PREPARED: 7/19/2012	903.12Y	SHEET NO. 7 OF 7

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

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



NOTES:

SHOP SPLICES ON CHORD ANGLES WILL BE ALLOWED ONLY BY SPECIAL PERMISSION. IF PERMISSION IS GRANTED, SUCH SPLICES MUST BE LOCATED AT THE CENTERLINE OF MAIN PANEL POINTS.

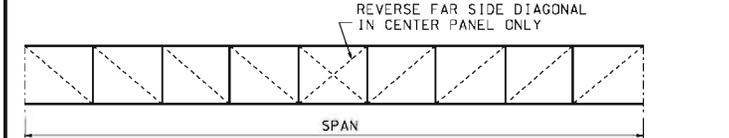
"D" = GREATEST OVERALL DEPTH OF ANY SIGN OR SIGNS ON TRUSS AND "S" = TRUSS DEPTH, AND "W" = TRUSS WIDTH.

3/4" DIA. BOLTS SHALL BE REMOVED AFTER WELDING IS COMPLETE. BOLT HOLES SHALL BE PLUGGED AND THE OUTSIDE FACE GROUND SMOOTH.

* SEE GENERAL NOTES THIS SHEET FOR CHARPY V-NOTCH REQUIREMENTS.

** IF LIGHTING IS SPECIFIED, VERTICAL CLEARANCE IS MEASURED TO LOWEST POINT OF LIGHTING BRACKET.

(1) FOR PARABOLIC CAMBER SEE TABLE OF TRUSS VARIABLES



TRUSS VARIABLES					
SPAN	"S"	"W"	MEMBER "A"	MEMBER "B"	SHOP CAMBER
UP TO 80'-6"	6'-0"	4'-0"	L 2 1/2" x 2 1/2" x 1/4"	L 2 1/2" x 2 1/2" x 1/4"	2"
81' TO 100'-6"	6'-0"	5'-0"	L 3" x 3" x 1/4"	L 2 1/2" x 2 1/2" x 1/4"	2 1/2"
101' TO 130'-6"	7'-0"	6'-0"	L 3" x 3" x 1/4"	L 3" x 3" x 1/4"	3 1/2"
131' TO 150'-6"	8'-0"	6'-0"	L 3 1/2" x 3 1/2" x 1/8"	L 3 1/2" x 3 1/2" x 1/8"	4 1/2"
151' TO 160'-6"	8'-0"	7'-0"	L 3 1/2" x 3 1/2" x 1/8"	L 3 1/2" x 3 1/2" x 1/8"	5 1/2"

NOTE: FOR SIZE OF CHORD MEMBERS SEE DATA SHEET.

GENERAL NOTES:

ALL STRUCTURAL STEEL AND COLUMN BASE PLATES ASTM A36, EXCEPT THAT CHORD ANGLES GREATER THAN 1/4" IN THICKNESS SHALL BE AASHTO M183 WITH SUPPLEMENTAL REQUIREMENTS: S5. CHARPY V-NOTCH IMPACT TEST FOR TEMPERATURE ZONE 2.

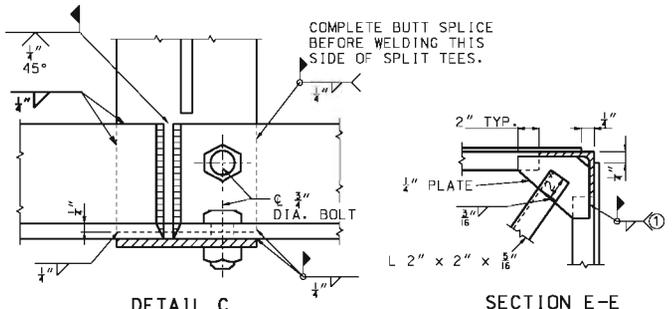
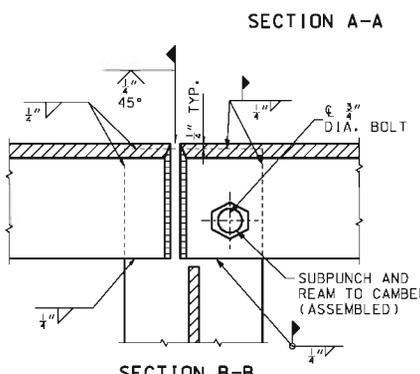
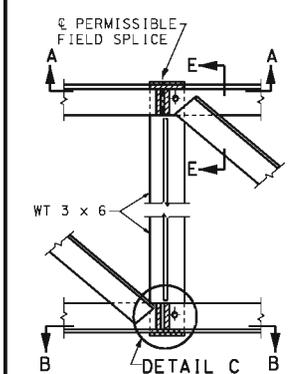
ALL ANCHOR BOLTS ASTM A370.

PROPOSED FIELD SPLICES SHALL BE SHOWN ON SHOP DRAWINGS FOR APPROVAL OF THE ENGINEER.

TRUSSES SHALL BE FABRICATED WITH A MINIMUM OF SPlicing IN TRUSS CHORDS. FIELD SPlicing WILL NOT BE PERMITTED WITHIN THE MIDDLE ONE-THIRD OF SPAN.

FOR ADDITIONAL INFORMATION SEE DATA SHEET.

ZINC CHROMATE PRIMER SHALL MEET THE REQUIREMENTS OF FEDERAL SPECIFICATIONS TT-P-645 OR TT-P-1757 AND SHALL BE ACCEPTED ON THE BASIS OF THE LABEL SHOWING CONFORMANCE OR A MANUFACTURER'S CERTIFICATION.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

STATE OF MISSOURI
KATHRYN PHILLIPS HAWRY
NUMBER PE-22781
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN ELECTRONICALLY SEALED AND DATED.

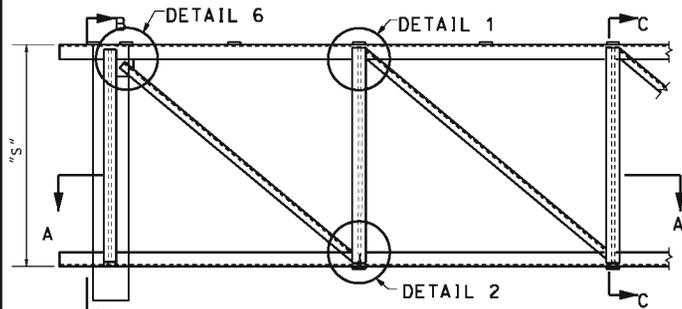
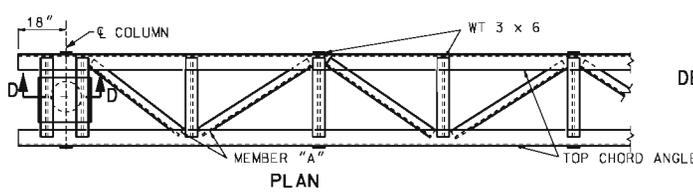
OVERHEAD SIGN TRUSSES
STRUCTURAL STEEL

DATE EFFECTIVE: 10/01/2011
DATE PREPARED: 9/30/2011

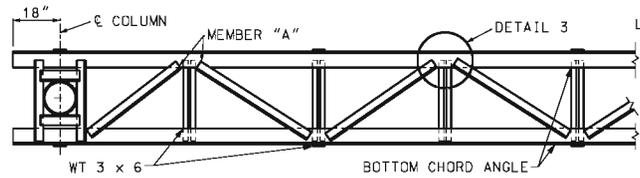
903.60AA

SHEET NO. 1 OF 5

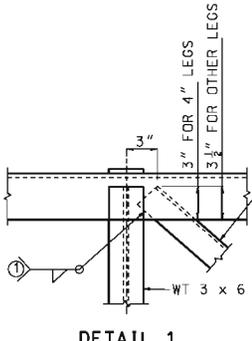
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



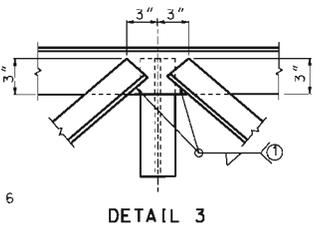
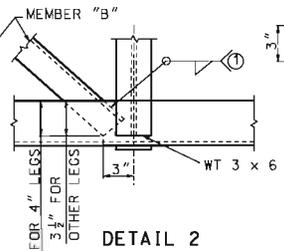
NOTE: FOR SIZE OF MEMBER "A" SEE TABLE OF TRUSS VARIABLES, SHEET NO. 1.



SECTION A-A

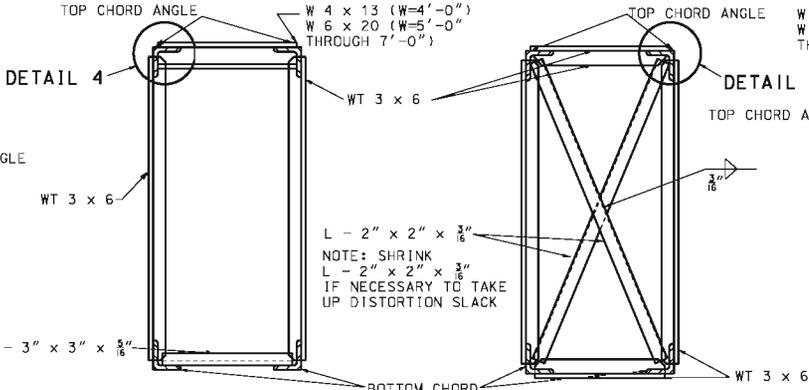


NOTE: FOR SIZE OF MEMBER "B" SEE TABLE OF TRUSS VARIABLES, SHEET NO. 1.



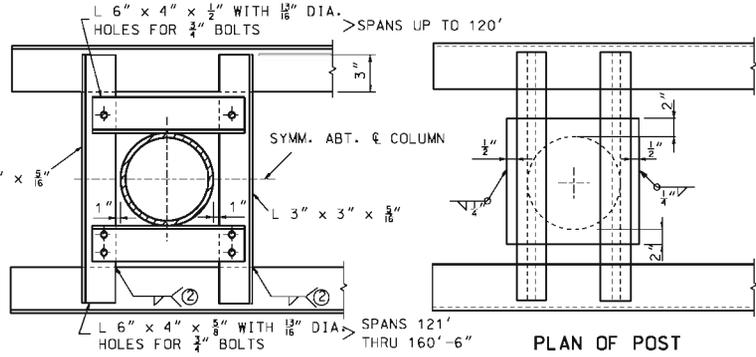
TYPICAL FOR ALL PANEL POINT FRAMING EXCEPT AT FIELD SPLICES, IF ANY, AND COLUMN SUPPORTS.

IF DESIRED THE OUTSTANDING LEGS OF DIAGONAL ANGLES MAY BE CLIPPED AT 45° TO FACILITATE ASSEMBLY AND WELDING.



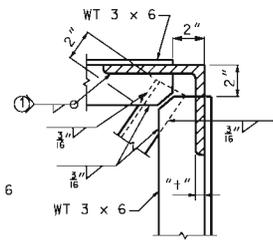
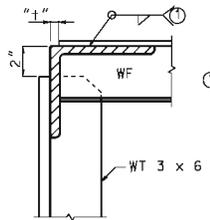
SECTION B-B

SECTION C-C



NOTE: BOLTS SHALL BE HIGH STRENGTH STEEL WITH HARDENED WASHERS UNDER HEAD AND NUT.

SECTION F-F

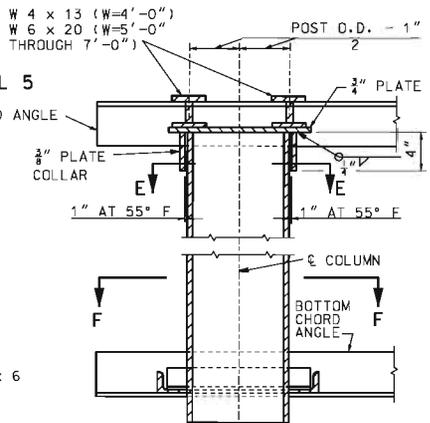


DETAIL 4

DETAIL 5

SLOT WEB OF STRUCTURAL TEE'S AND WIDE FLANGES TO RECEIVE LEG OF CHORD ANGLES (TYPICAL).

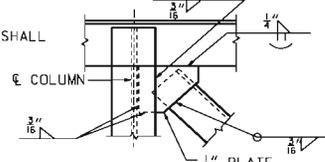
FILLET WELD 1 SHALL BE 3/16" WHEN "t" IS 1/2" OR LESS AND 1/4" WHEN "t" IS GREATER THAN 1/2".



SECTION D-D

SECTION E-E

NOTE: DETAILS OF CANTILEVER END SECTION ARE SIMILAR TO THOSE SHOWN ON THIS SHEET.



DETAIL 6

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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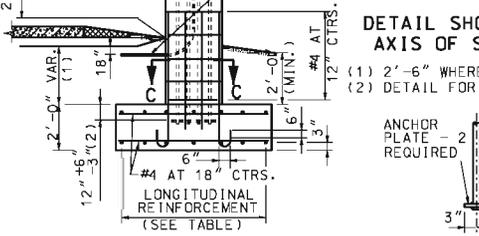
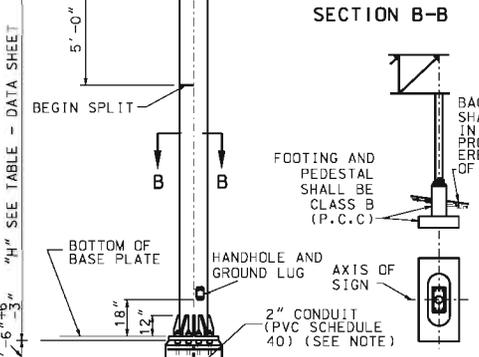
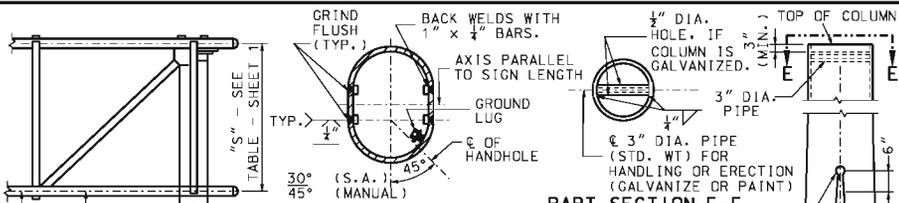
STATE OF MISSOURI
KATHRYN PHILLIPS HAWRY
NUMBER PE-23781
PROFESSIONAL ENGINEER

THIS SEAL HAS BEEN
ELECTRONICALLY SEALED AND DATED

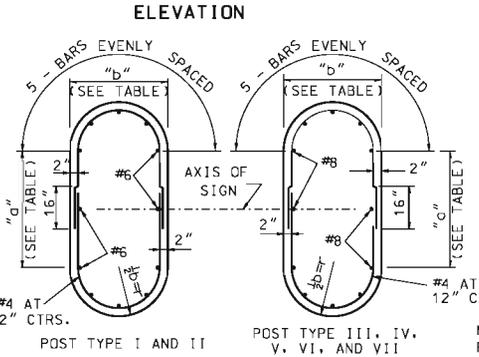
OVERHEAD SIGN TRUSSES

STRUCTURAL STEEL

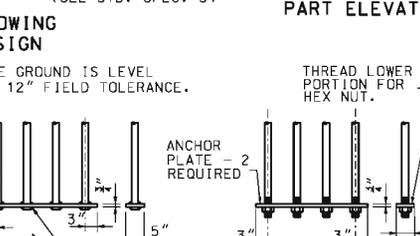
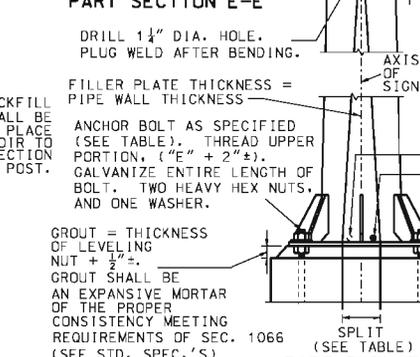
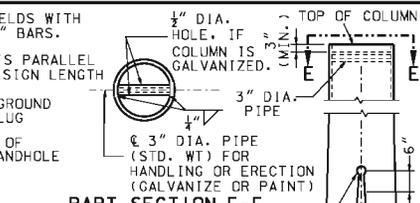
DATE EFFECTIVE:	10/01/2011	903.60AA	SHEET NO.
DATE PREPARED:	9/30/2011		2 OF 5



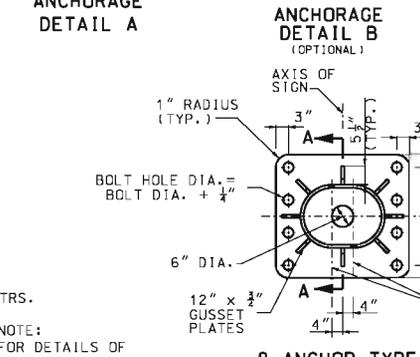
NOTE: THE 2" CONDUIT IN THE CONCRETE PEDESTAL SHALL BE PVC SCHEDULE 40 AND SHALL BE PLACED WITH A MINIMUM RADIUS BEND OF 9 1/2".



SECTION C-C (TYPICAL SECTION SHOWING REINFORCING STEEL)



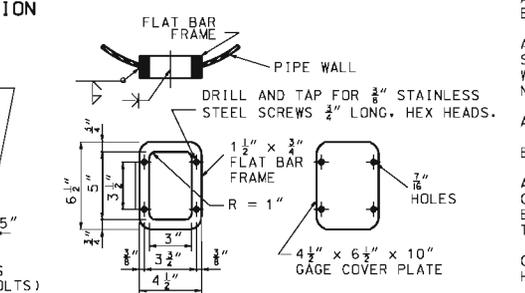
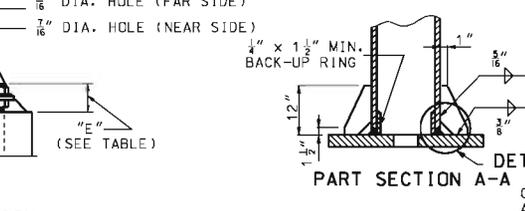
NOTE: FOR DETAILS OF ALTERNATE PEDESTAL, SEE SHEET NO. 4 OF 5.



8 ANCHOR TYPE

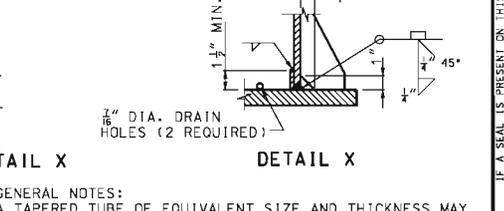
POST TYPE	PIPE COLUMN	DIMEN- SION "E"	SPLIT	BASE PLATE SIZE*	ANCHOR BOLTS DIA.	PEDESTAL SIZE*		FOOTING SIZE*	LONGITUDINAL FOOTING REINFORCEMENT		CON- CRETE C.Y.
						a	b		TOP	BOTTOM	
I	12" STD. AT 65.42	8 1/2"	6"	2'-6" x 23" x 1 1/2"	6 AT 2 1/4"	4'-0" x 2'-11"	7'-0" x 14'-6"	7-#5 BARS	7-#6 BARS	10.9	
II	14" O.D. AT 72.09	8 1/2"	9 1/2"	3'-0" x 2'-0" x 1 1/2"	6 AT 2 1/4"	4'-4" x 3'-0"	8'-0" x 16'-0"	8-#5 BARS	9-#6 BARS	13.2	
III	16" O.D. AT 82.77	8 3/4"	11 1/2"	3'-4" x 2'-2" x 1 1/2"	6 AT 2 1/4"	4'-8" x 3'-2"	8'-6" x 17'-6"	9-#5 BARS	9-#7 BARS	15.2	
IV	18" O.D. AT 93.45	9 1/2"	12 1/2"	3'-7" x 2'-4" x 2"	6 AT 2 1/2"	5'-1" x 3'-4"	9'-6" x 19'-0"	10-#5 BARS	10-#8 BARS	18.1	
V	20" O.D. AT 104.13	9 1/2"	13"	3'-10" x 2'-9" x 2"	8 AT 2 1/2"	5'-4" x 3'-9"	10'-0" x 20'-0"	10-#5 BARS	10-#8 BARS	20.6	
VI	24" O.D. AT 125.49	9 1/2"	10 3/4"	4'-0" x 3'-3" x 2"	8 AT 2 1/2"	5'-6" x 4'-3"	10'-6" x 21'-0"	11-#5 BARS	11-#8 BARS	23.3	
VII	24" O.D. AT 125.49	9 1/2"	13 1/2"	4'-3" x 3'-3" x 2"	8 AT 2 1/2"	5'-9" x 4'-3"	11'-0" x 22'-0"	11-#5 BARS	11-#9 BARS	25.1	

* BASE PLATES, PEDESTAL, AND FOOTINGS, LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.



HANDHOLE AND COVER DETAILS

NOTE: HANDHOLE REQUIRED ONLY IN POWER COLUMN.



DETAIL X

GENERAL NOTES: A TAPERED TUBE OF EQUIVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.

ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; A.S.T.M. SPECIFICATION A53. NO OBJECTIONABLE SEAMS WILL BE PERMITTED.

ALL STRUCTURES SHALL BE GROUNDED. BURR THREADS ON ALL ANCHOR BOLTS.

A HORIZONTAL WELDED SPLICE MAY BE FABRICATED IN THE COLUMN BETWEEN THE TOP OF PIPE AND 4'-0" BELOW THE BOTTOM CHORDS OF THE TRUSS WHEN DETAILED ON THE SHOP DRAWINGS AND APPROVED BY THE ENGINEER.

GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND HOLE.

QUANTITIES FOR PEDESTAL, BASED ON NOMINAL HEIGHT OF 5'-0".

QUANTITIES FOR FOOTING, BASED ON NOMINAL DEPTH OF 2'-0".

QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

OVERHEAD SIGN TRUSSES
STRUCTURAL STEEL

STATE OF MISSOURI
KATHRYN PHILLIPS HAWRY
REGISTERED PROFESSIONAL ENGINEER
NUMBER PE-22781

THIS SHEET HAS BEEN GRADED, SEALED AND DATED ELECTRONICALLY.

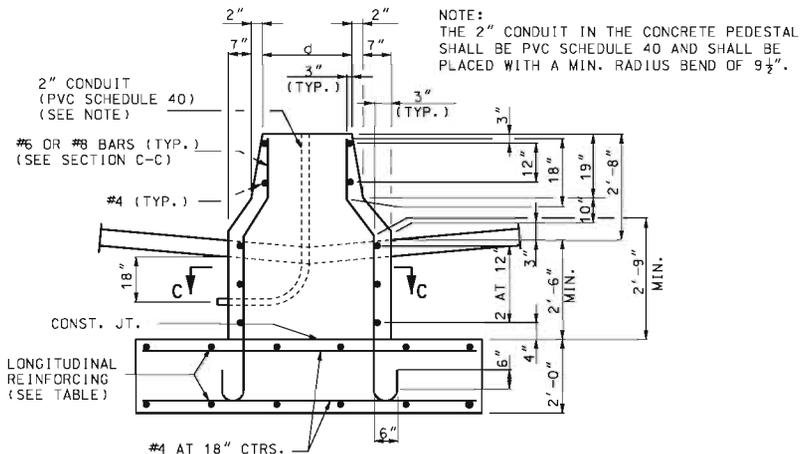
DATE EFFECTIVE:	10/01/2011	903.60AA	SHEET NO.
DATE PREPARED:	9/30/2011		3 OF 5

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

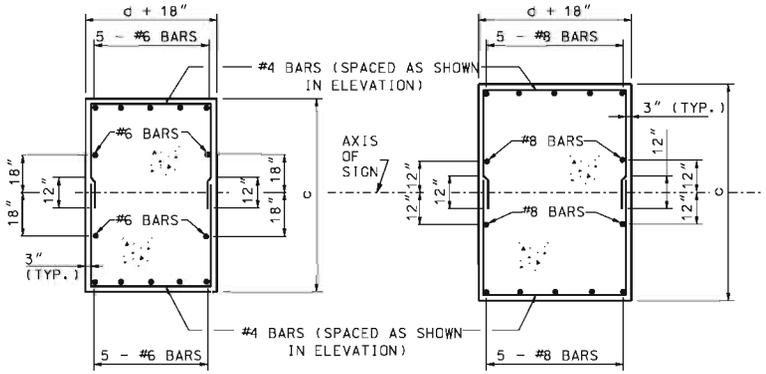
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

POST TYPE	PIPE COLUMN	PEDESTAL SIZE*		FOOTING SIZE*	LONGITUDINAL FOOTING REINFORCEMENT		CONCRETE C. Y.	
		c	d		TOP	BOTTOM	TYPE A MEDIAN BARRIER	TYPE C MEDIAN BARRIER
I	12" STD. AT 65.42	5'-9"	2'-1"	7'-0" x 14'-6"	7-#5 BARS	7-#6 BARS	10.9	11.6
II	14" D.D. AT 72.09	6'-2"	2'-2"	8'-0" x 16'-0"	8-#5 BARS	9-#6 BARS	13.2	14.0
III	16" D.D. AT 82.77	6'-7"	2'-4"	8'-6" x 17'-6"	9-#5 BARS	9-#7 BARS	15.2	16.1
IV	18" D.D. AT 93.45	7'-1"	2'-6"	9'-6" x 19'-0"	10-#5 BARS	10-#8 BARS	18.1	19.1
V	20" D.D. AT 104.13	7'-8"	2'-11"	10'-0" x 20'-0"	10-#5 BARS	10-#8 BARS	20.6	21.7
VI	24" D.D. AT 125.49	8'-3"	3'-5"	10'-6" x 21'-0"	11-#5 BARS	11-#8 BARS	23.3	24.6
VII	24" D.D. AT 125.49	8'-6"	3'-5"	11'-0" x 22'-0"	11-#5 BARS	11-#9 BARS	25.1	26.5

* BASE PLATES, PEDESTAL, AND FOOTINGS LONGER SIDES SHALL BE NORMAL TO AXIS OF SIGN.



**PART ELEVATION
(TYPE A CONCRETE TRAFFIC BARRIER)**



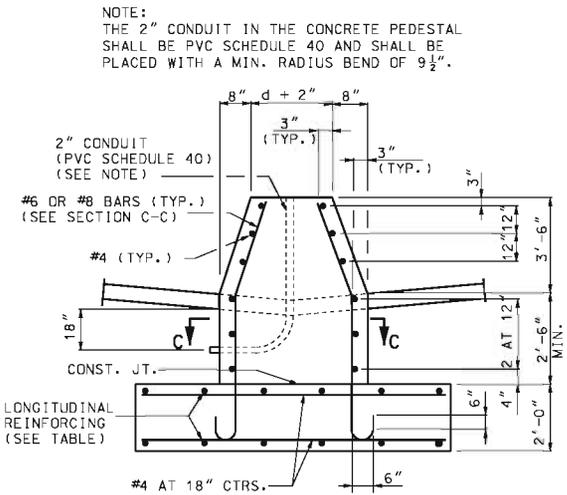
POST TYPE I AND II

POST TYPE III, IV, V, VI, AND VII

**SECTION C-C
TYPICAL SECTION SHOWING
REINFORCING STEEL**

DETAILS OF ALTERNATE PEDESTAL

(TO BE USED ADJACENT TO TYPE "A" OR "C" MEDIAN BARRIER)



**PART ELEVATION
(TYPE C CONCRETE TRAFFIC BARRIER)**

GENERAL NOTES:

- A TAPERED TUBE OF EQUIVALENT SIZE AND THICKNESS MAY BE SUBSTITUTED FOR PIPE POST.
- ALL STEEL PIPE COLUMNS SHALL BE EITHER GRADE "B" SEAMLESS STEEL PIPE OR GRADE "B" ELECTRIC RESISTANCE WELDED STEEL PIPE; A.S.T.M. SPECIFICATION A53.
- NO OBJECTIONABLE SEAMS WILL BE PERMITTED.
- ALL STRUCTURES SHALL BE GROUNDED.
- BURR THREADS ON ALL ANCHOR BOLTS.
- PIPE COLUMN, BASE PLATE, ANCHOR BOLTS AND NOTES PERTAINING TO THESE ITEMS HAVE BEEN OMITTED FOR CLARITY. REFER TO SHEET 3 OF 5 FOR DETAILS OF THESE ITEMS.
- GROUND LUGS SHALL BE LOCATED INSIDE COLUMN NEAR HAND HOLE.
- QUANTITIES FOR PEDESTAL ARE BASED ON NOMINAL HEIGHT OF 5'-2" (TYPE A MEDIAN BARRIER) OR 6'-0" (TYPE C MEDIAN BARRIER).
- QUANTITIES FOR FOOTING ARE BASED ON NOMINAL DEPTH OF 2'-0".
- QUANTITIES SHOWN ARE FOR ONE COLUMN ONLY.

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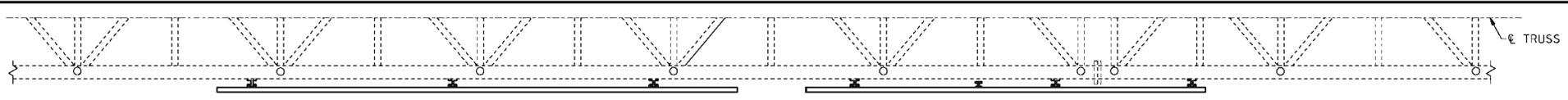
**OVERHEAD SIGN TRUSSES
STRUCTURAL STEEL**

STATE OF MISSOURI
 KATHRYN PHILLIPS HAWRY
 NUMBER PE-23781
 PROFESSIONAL ENGINEER

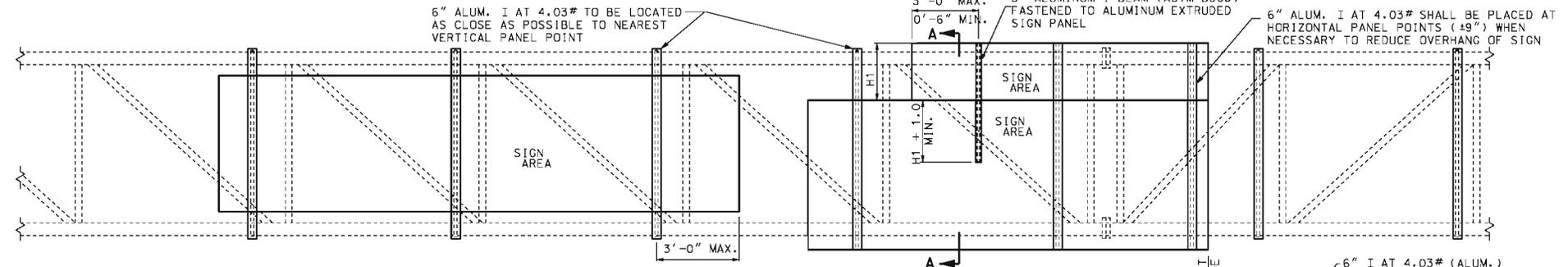
THIS SHEET HAS BEEN
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DATE PREPARED:	9/30/2011		

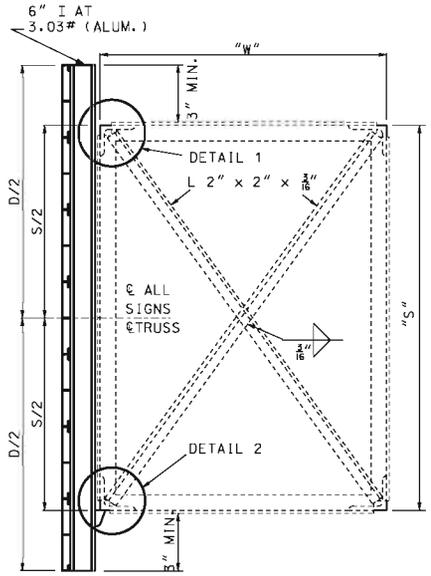
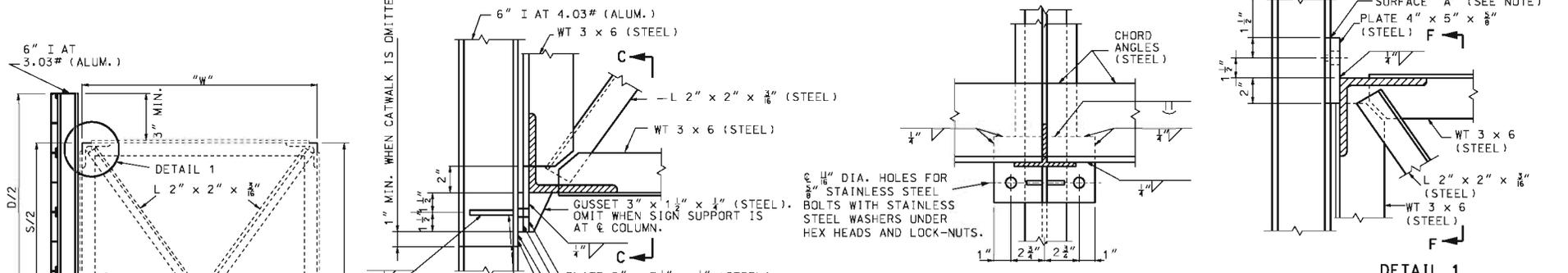
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TYPICAL HALF PLAN OF SIGN COMPONENTS



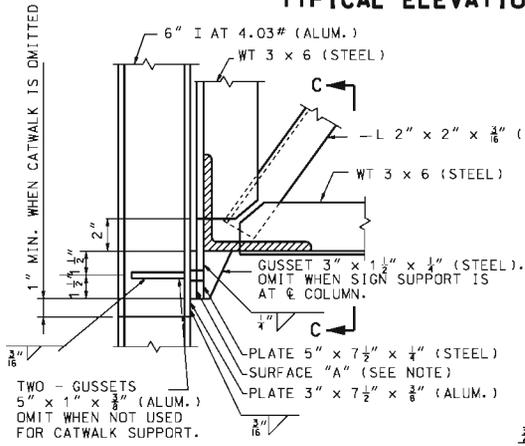
TYPICAL ELEVATION OF SIGN COMPONENTS



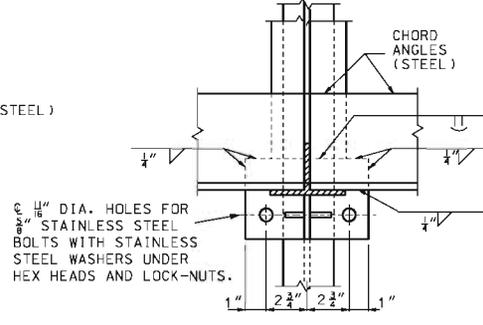
SECTION A-A

TYPICAL SECTION OF SIGN SUPPORT

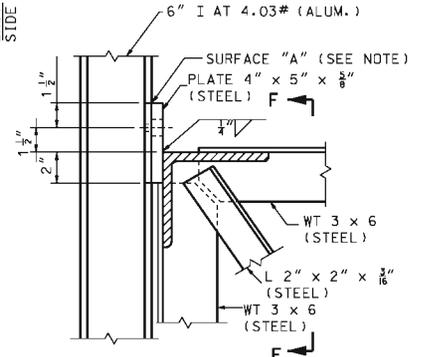
NOTE: "D" = GREATEST OVERALL DEPTH OF ANY SIGN OR SIGNS ON TRUSSES AND "S" = TRUSS DEPTH. SEE SHEET NO. 5 OF 7 FOR LOCATION OF SECTION A-A.



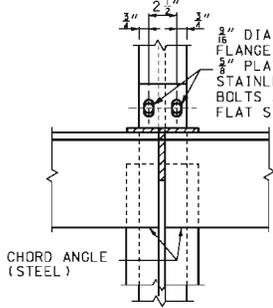
DETAIL 2



SECTION C-C



DETAIL 1



SECTION F-F

NOTE: SURFACE "A", ZINC CHROMATE ON ALUMINUM SURFACES. NORMAL CLEANING AND PAINTING ON STEEL SURFACES. ZINC CHROMATE IS NOT REQUIRED WHEN STEEL IS GALVANIZED.

GENERAL NOTES:
EXIT NO. PANELS SHALL BE MOUNTED FLUSH WITH THE EXIT SIDE OF THE GUIDE SIGN.

ALL SIGNS SHALL BE CENTERED VERTICALLY ABOUT THE HORIZONTAL C OF THE TRUSS.

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	OVERHEAD SIGN TRUSSES STRUCTURAL STEEL	
	DATE EFFECTIVE: 10/01/2011 DATE PREPARED: 9/30/2011	903.60AA