

# **MISSOURI HIGHWAYS and TRANSPORTATION COMMISSION**

**JEFFERSON CITY, MISSOURI**

**SUPPLEMENTAL PLANS TO JULY 2004 MISSOURI STANDARD  
PLANS FOR HIGHWAY CONSTRUCTION**

**EFFECTIVE April 1, 2011**

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
**MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION**  
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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	608.10N	CONCRETE SIDEWALK AND CURB RAMPS	4	10/01/2009
203.10D	TABULATED EARTHWORK AND SECTION DATA	1	02/01/2009	608.20D	CONCRETE STAIRS	2	10/01/1992
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	609.00P	CONCRETE CURB, CURB AND GUTTER AND GUTTER	2	08/01/2008
203.35A	MAILBOX TURNOUTS	1	08/01/1981	609.15C	PAVED DITCHES	1	03/01/1993
203.40G	TYPICAL DETAILS ON AND OFF RAMP	2	10/01/2007	609.40P	DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS	2	02/01/2009
203.41F	TYPICAL DETAILS ON AND OFF RAMPS (ROADWAY WITH 6:1 FORESLOPE)	2	01/01/1995	609.60C	ROCK DITCH LINER	1	03/01/1993
203.50M	TYPICAL MEDIAN OPENINGS (DIVIDED HIGHWAYS)	2	07/01/2004	609.70C	ROCK LINING FOR CULVERT OUTLET	1	10/01/1981
203.61A	DRIVEWAY - TYPE I	1	07/01/2004	611.600	CONCRETE SLOPE PROTECTION	1	01/01/2005
203.62C	DRIVEWAY - TYPE II	2	07/01/2004	612.20D	SAND FILLED IMPACT ATTENUATORS	1	08/01/2008
203.63A	DRIVEWAY - TYPE III	2	01/01/1992	613.00P	PAVEMENT REPAIR	*	06/01/2010
203.64C	DRIVEWAY - TYPE IV	2	07/01/2004	613.20B	PARTIAL DEPTH PAVEMENT REPAIR AT JOINTS AND CRACKS	1	08/01/2007
203.65A	DRIVEWAY - TYPE V	1	10/01/1998	614.10T	GRATES AND BEARING PLATES	1	12/01/2005
204.00D	EMBANKMENT CONTROL - MEASURING DEVICES	1	04/01/1983	614.11C	CURVED VANE GRATE AND FRAME	*	06/01/2010
204.30	PORE PRESSURE MEASUREMENT DEVICES	1	03/01/1996	614.30E	MANHOLE FRAMES AND COVERS	2	07/01/1996
401.00A	TYPE A2 AND A3 SHOULDERS	2	04/01/2009	616.10AN	TEMPORARY TRAFFIC CONTROL DEVICES	*	02/01/2011
413.20	SCRUB SEAL BROOM CONFIGURATION	1	07/01/2004	617.10F	PERMANENT CONCRETE TRAFFIC BARRIER	7	10/01/2008
502.05M	CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15 FT. JOINT SPACING	*	06/01/2010	617.20C	TEMPORARY CONCRETE TRAFFIC BARRIER	6	06/01/2008
502.10K	DOWEL SUPPORTING UNITS	*	06/01/2010	619.10E	PAVEMENT EDGE TREATMENT	*	08/01/2007
504.00H	CONCRETE APPROACH PAVEMENT	3	08/01/2007	620.00J	PAVEMENT MARKING	*	12/01/2009
602.00D	RIGHT-OF-WAY AND DRAIN MARKERS	2	01/01/2003	620.10B	TEMPORARY PAVEMENT MARKING	4	10/01/2008
604.05D	PIPE CULVERT HEADWALLS - TYPE S	2	08/01/2006	620.20	SNOWPLOWABLE RAISED PAVEMENT MARKERS	4	01/01/2003
604.10E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 18" CONCRETE PIPE	1	07/01/2001	625.00	HOLE PATTERN FOR PAVEMENT SLAB STABILIZATION	1	10/01/1998
604.11E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 24" CONCRETE PIPE	1	07/01/2001	626.00H	RUMBLE STRIPS	2	04/01/2009
604.12E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 30" CONCRETE PIPE	1	07/01/2001	702.02F	CAST-IN-PLACE CONCRETE PILES (APPROVED TYPES)	1	07/01/2004
604.13E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 36" CONCRETE PIPE	1	07/01/2001				
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				
605.10H	PAVEMENT UNDERDRAINAGE	3	12/01/2007				
606.00AT	GUARDRAIL	17	10/01/2007				
606.01E	BULLNOSE GUARDRAIL SYSTEM	7	10/01/2003				
606.22S	BRIDGE ANCHOR SECTION - SAFETY BARRIER CURB ON BRIDGE	5	08/01/2007				
606.23H	BRIDGE ANCHOR SECTION (THREE BEAM RAIL ON BRIDGE)	5	04/01/2005				
606.30E	TERMINAL SECTION	1	06/01/2006				
606.40D	ONE-STRAND ACCESS RESTRAINT CABLE	2	07/01/2004				
606.41J	THREE-STRAND GUARD CABLE	7	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

# MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

EFFECTIVE: 04/01/2011

## MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION TABLE OF CONTENTS

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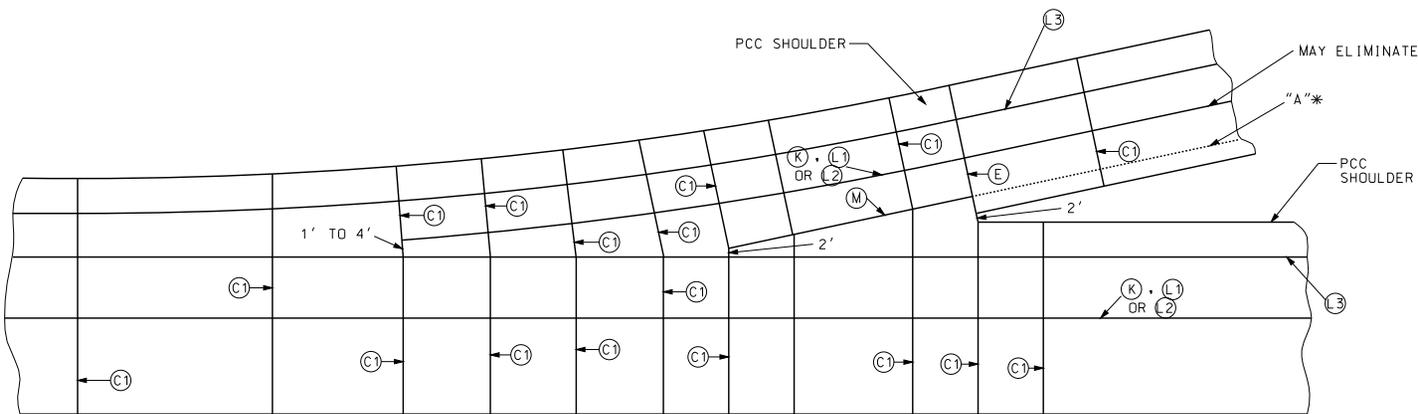
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703.10H	CONCRETE SINGLE BOX STRUCTURE - STRAIGHT WINGS (SQUARE)	* 3	04/01/2011
703.11H	CONCRETE SINGLE BOX STRUCTURE - FLARED WINGS (SQUARE)	* 3	04/01/2011
703.12H	CONCRETE SINGLE BOX STRUCTURE STRAIGHT WINGS (LEFT ADVANCE)	* 3	04/01/2011
703.13H	CONCRETE SINGLE BOX STRUCTURE - FLARED WINGS (LEFT ADVANCE)	* 3	04/01/2011
703.14H	CONCRETE SINGLE BOX STRUCTURE - STRAIGHT WINGS (RIGHT ADVANCE)	* 3	04/01/2011
703.15D	CONCRETE SINGLE BOX STRUCTURE - FLARED WINGS (RIGHT ADVANCE)	* 3	04/01/2011
703.16	CONCRETE SINGLE BOX STRUCTURE - CUT SECTION	* 1	04/01/2011
703.17	CONCRETE SINGLE BOX STRUCTURE - MEMBER SIZES AND REINFORCEMENT	* 14	04/01/2011
703.37C	CONCRETE BOX STRUCTURE - EXTERIOR WING REINFORCEMENT	* 2	04/01/2011
703.38A	CONCRETE BOX STRUCTURE - CUTTING DETAILS	2	10/01/2009
703.40G	CONCRETE DOUBLE BOX STRUCTURE - STRAIGHT WINGS (SQUARE)	2	10/01/2009
703.41G	CONCRETE DOUBLE BOX STRUCTURE - FLARED WINGS (SQUARE)	2	10/01/2009
703.42G	CONCRETE DOUBLE BOX STRUCTURE (CUT SECTIONS)	2	10/01/2009
703.43G	CONCRETE DOUBLE BOX STRUCTURE - STRAIGHT WINGS (SKEWED)	2	10/01/2009
703.44G	CONCRETE DOUBLE BOX STRUCTURE - FLARED WINGS (SKEWED)	2	10/01/2009
703.45B	CONCRETE DOUBLE BOX STRUCTURE - MEMBER SIZES AND REINFORCEMENT	22	10/01/2009
703.60E	CONCRETE BOX STRUCTURE - PIPE INLET	1	07/01/2001
703.80G	CONCRETE TRIPLE BOX STRUCTURE - STRAIGHT WINGS (SQUARE)	2	10/01/2009
703.81G	CONCRETE TRIPLE BOX STRUCTURE - FLARED WINGS (SQUARED)	2	10/01/2009
703.82G	CONCRETE TRIPLE BOX STRUCTURE (CUT SECTIONS)	2	10/01/2009
703.83G	CONCRETE TRIPLE BOX STRUCTURE - STRAIGHT WINGS (SKEWED)	2	10/01/2009
703.84G	CONCRETE TRIPLE BOX STRUCTURE - FLARED WINGS (SKEWED)	2	10/01/2009
703.85B	CONCRETE TRIPLE BOX STRUCTURE - MEMBER SIZES AND REINFORCEMENT	22	10/01/2009
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
726.30G	RIGID CULVERT INSTALLATION METHODS	* 2	04/01/2011
730.00D	CORRUGATED POLYETHYLENE AND POLYVINYL CHLORIDE PIPE INSTALLATION METHODS	* 1	04/01/2011
731.00T	PRECAST MANHOLES	2	10/01/1998
731.10R	PRECAST DROP INLET	8	12/01/2005
732.00P	FLARED END SECTION	2	02/01/2009
732.05C	BEVELED PIPE END TREATMENT	2	07/01/2004
732.10G	SAFETY SLOPE END SECTION	3	08/01/2009
806.10H	TEMPORARY EROSION CONTROL MEASURES	7	04/01/2009
808.00	TYPICAL PLANTING ILLUSTRATIONS	3	07/01/2004
901.00Z	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 30' M.H.	* 4	02/01/2011
901.01AG	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 45' M.H.	* 6	02/01/2011
901.02B	HIGHWAY LIGHTING - CABLE, CONDUIT AND TRENCHING	1	04/01/2002
901.30F	HIGHWAY LIGHTING - BASE MOUNTED CONTROL STATION	2	04/01/2005
901.80D	HIGHWAY LIGHTING - POWER SUPPLY ASSEMBLY - SECONDARY SERVICE	2	04/01/2002
901.85A	HIGHWAY LIGHTING SYMBOLS	1	01/01/2003

STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE
902.00M	TRAFFIC SIGNALS - SIGNAL HEADS MOUNTING - LOUVERS	2	04/01/2008
902.10Q	TRAFFIC SIGNALS - CONTROLLERS CONDUIT LOCATION	1	04/01/2005
902.15K	TRAFFIC SIGNALS - POWER SUPPLY ASSEMBLY	3	07/01/2004
902.20G	TRAFFIC SIGNALS - CONCRETE PULL BOXES	* 3	11/01/2010
902.21C	TRAFFIC SIGNALS - TELEPHONE INTERCONNECT	1	03/01/1996
902.30P	TRAFFIC SIGNALS - POST BASES	2	02/01/2008
902.40Q	TRAFFIC SIGNALS - TUBULAR STEEL POSTS	3	02/01/2008
902.50L	TRAFFIC SIGNALS - INDUCTION LOOP DETECTORS	2	06/01/2009
902.70P	TRAFFIC SIGNALS - RIGID SPAN WIRE DETAILS	2	02/01/2008
902.80J	TRAFFIC SIGNALS - RIDID SPAN WIRE DETAILS SYMBOLS	1	02/01/2009
903.01H	SPECIAL SIGNING CHARACTERS	1	07/01/2004
903.02AK	HIGHWAY SIGNING STRUCTURE SIGNS	* 19	06/01/2010
903.03BG	SIGN MOUNTING DETAILS	11	06/01/2009
903.04E	HIGHWAY SIGNING - WEIGH STATION	1	01/01/1999
903.05H	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE S, ONE TUBE	2	04/01/2005
903.06H	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE S, TWO TUBE	2	04/01/2005
903.07H	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE C	2	04/01/2005
903.08G	HIGHWAY SIGNING - TUBULAR SUPPORT STEEL - TYPE B	2	04/01/2005
903.10AA	OVERHEAD SIGN TRUSSES - ALUMINUM	6	06/01/2006
903.12Y	OVERHEAD SIGN TRUSSES-BUTTERFLY AND CANTILEVER-STRUCTURAL STEEL	7	12/01/2008
903.60Z	OVERHEAD SIGN TRUSSES-STRUCTURAL STEEL	5	06/01/2006

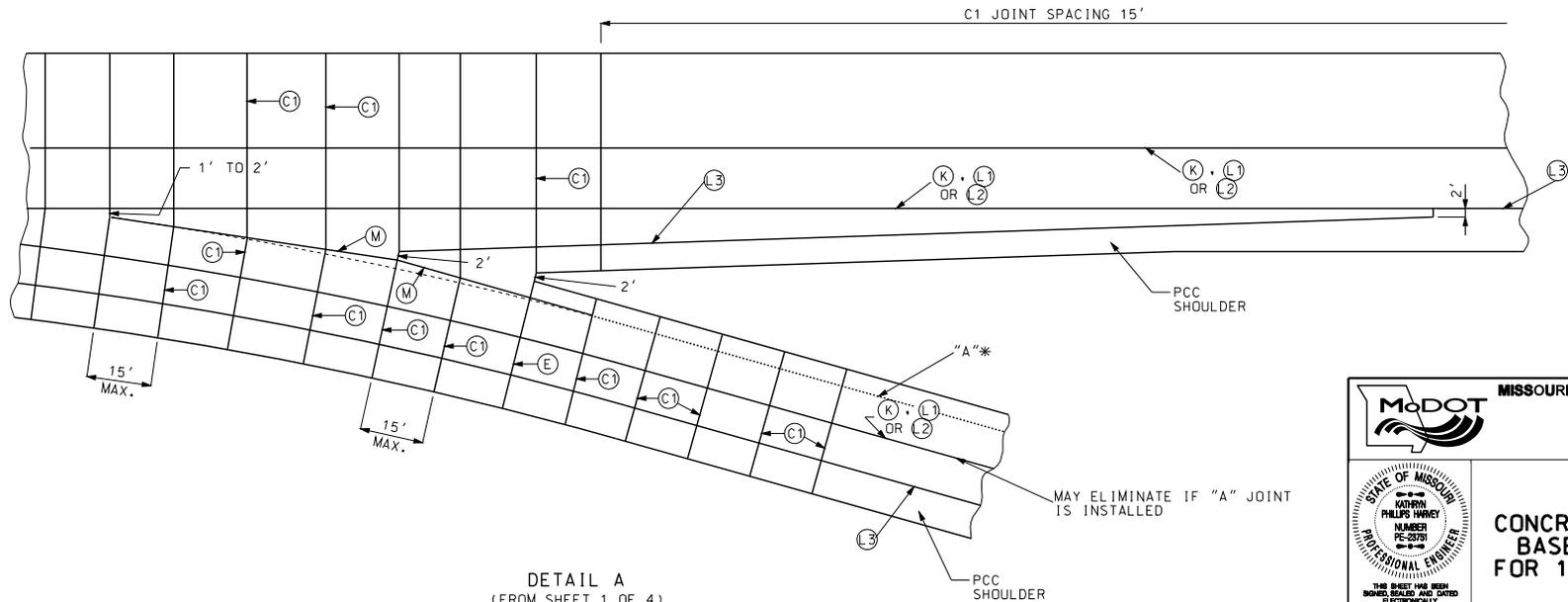
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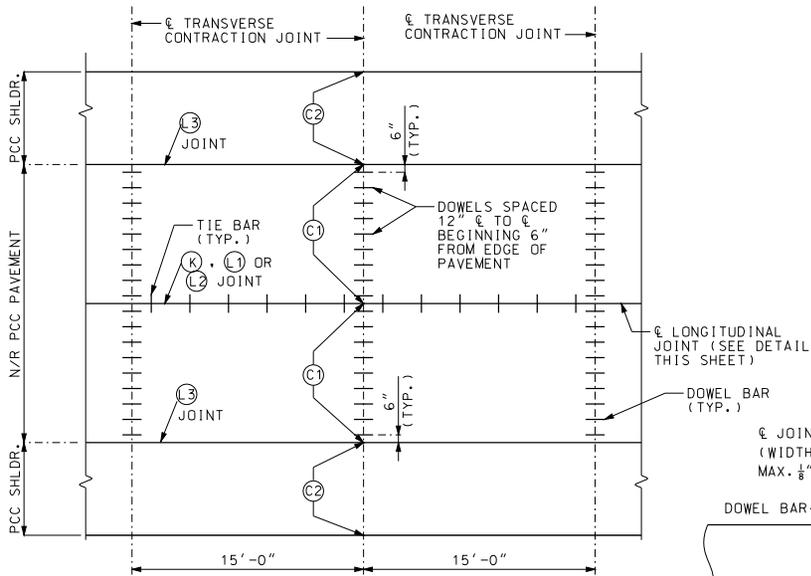


DETAIL B  
(FROM SHEET 1 OF 4)



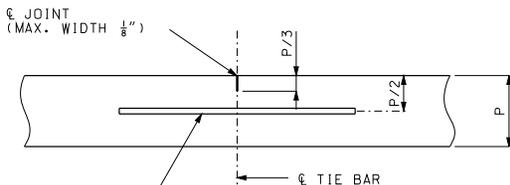
DETAIL A  
(FROM SHEET 1 OF 4)

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING</b>
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>502.05M</b>	SHEET NO. 2 OF 4



**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.

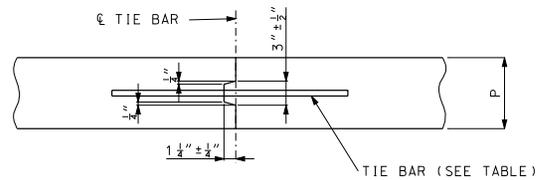


TIE BAR (SEE TABLE) TIE BARS REQUIRED.

**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 1/4"X18"	#5X30"	12" CTR.-CTR.	30" CTR.-CTR.
GREATER THAN 10"	1 1/2"X18"	#6X40"	12" CTR.-CTR.	30" CTR.-CTR.



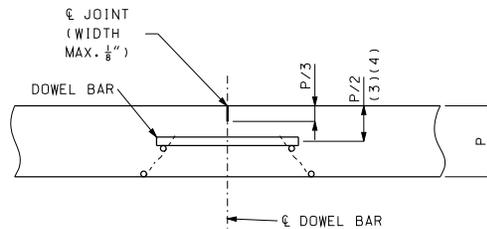
IF METAL IS USED TO FORM KEY DISCONTINUE STRIP FOR DISTANCE OF APPROXIMATELY 3" EACH SIDE OF TRANSVERSE JOINT.

TYPE (K) REQUIRES TIE BAR.

TYPE (M) CONSTRUCTED WITHOUT TIE BARS.

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

**TONGUE AND GROOVE JOINTS (K) AND (M)**

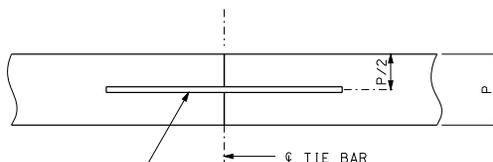


DOWELS REQUIRED. FOR PERMISSIBLE TYPES OF DOWELS SUPPORTING UNITS. SEE OTHER DRAWINGS.

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

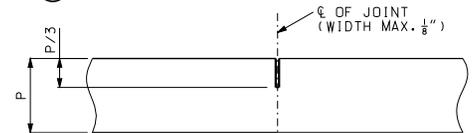
**TRANSVERSE CONTRACTION JOINT (C1) (2)**

- (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.

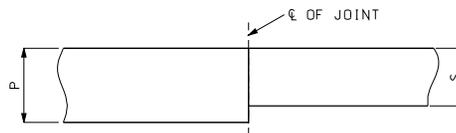


TIE BAR (SEE TABLE) TIE BARS REQUIRED.

**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.

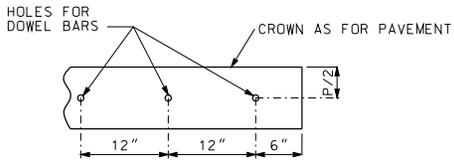
(L3) JOINT FOR FULL DEPTH OR PARTIAL DEPTH SHOULDERS.

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

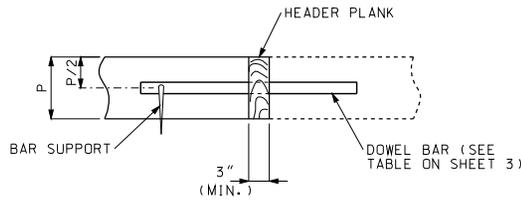
STATE OF MISSOURI  
 KATHRYN PHILLIPS HANNEY  
 NUMBER PE-23791  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING**

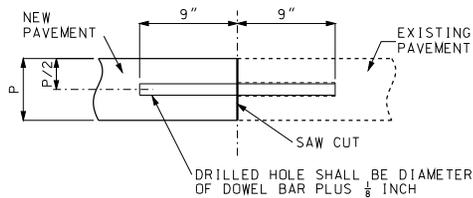
DATE EFFECTIVE: 06/01/2010	502.05M	SHEET NO. 3 OF 4
DATE PREPARED: 4/1/2010		



PART ELEVATION OF HEADER PLANK



HEADER SECTION



SAWED SECTION

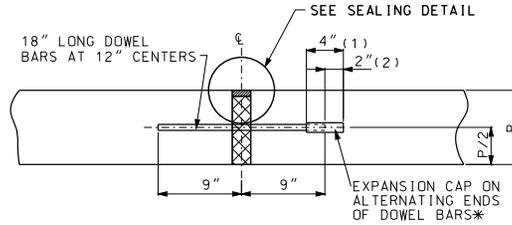
THE HEADER BOARD SHALL BE SUFFICIENTLY RIGID TO PREVENT DISTORTION FROM THE TYPICAL SECTION AND MAINTAIN A STRAIGHT LINE FROM PAVEMENT EDGE TO PAVEMENT EDGE.

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.

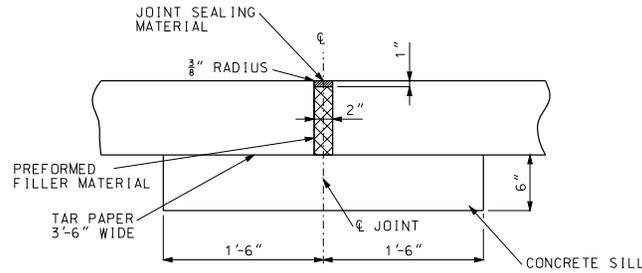
BONDING FOR DOWEL BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

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

**CONSTRUCTION JOINT (C)**

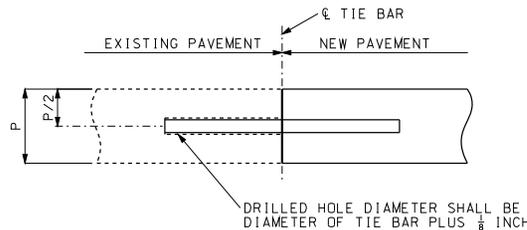


EXPANSION JOINTS (E)



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)**

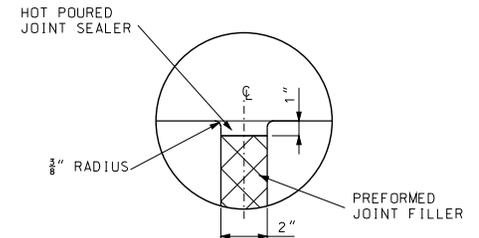
TIE BARS SHALL BE EPOXY COATED, DEFORMED REINFORCING BARS MEETING THE REQUIREMENTS OF SECTIONS 710 AND 1057.

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

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

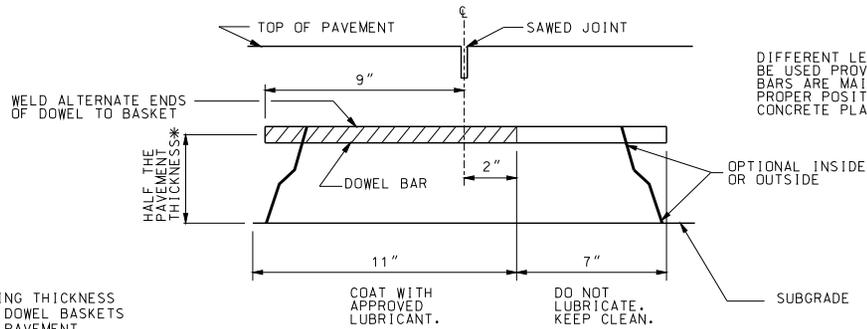
STATE OF MISSOURI  
 KATHRYN PHILLIPS HANNEY  
 NUMBER PE-23701  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING**

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

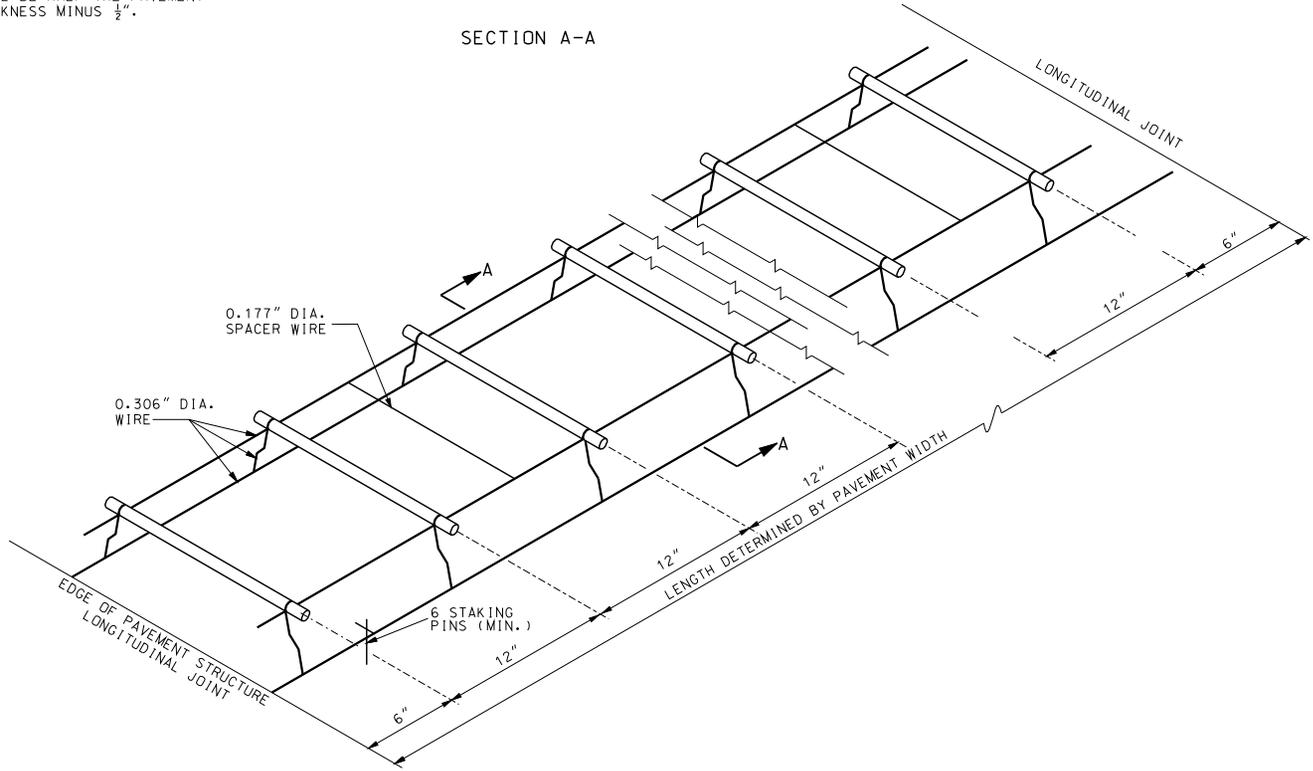
**502.05M**

SHEET NO.  
 4 OF 4



\* FOR PAVEMENTS HAVING THICKNESS IN  $\frac{1}{2}$ " INCREMENTS, DOWEL BASKETS SHALL BE HALF THE PAVEMENT THICKNESS MINUS  $\frac{1}{2}$ ".

SECTION A-A



DOWEL BARS		
PAVEMENT THICKNESS	BAR SIZE	
	DIAMETER	LENGTH
10" AND LESS	1 $\frac{1}{4}$ "	18"
GREATER THAN 10"	1 $\frac{1}{2}$ "	18"

GENERAL NOTES:

THE DOWEL SUPPORTING UNITS SHALL BE FACTORY ASSEMBLED AND CAPABLE OF HOLDING THE DOWELS IN THEIR REQUIRED POSITIONS. IN THE COMPLETED JOINT INSTALLATION, DOWELS SHALL BE POSITIONED WITHIN  $\frac{1}{2}$ " OF THE VERTICAL AND HORIZONTAL PLANE AND IN THE LONGITUDINAL DIRECTION. THE SKEW TOLERANCE SHALL BE  $\frac{1}{4}$ ".

THE FREE END OF EACH EPOXY COATED DOWEL SHALL BE MARKED WITH A SPOT OF PAINT AT LEAST ONE INCH IN DIAMETER AND CONTRASTING IN COLOR WITH THE EPOXY COATING.

WIRE SIZES SHOWN ARE MINIMUM REQUIRED.

WIRES, BARS OR CLIPS SHALL BE USED AS NECESSARY TO STRENGTHEN THE ASSEMBLIES.

THE DIAMETER OF THE SPACER WIRE SHALL NOT EXCEED 0.200".

SPACER WIRE MAY BE CUT OR LEFT INTACT.

STAKING PINS SHALL BE FABRICATED FROM 0.306" DIAMETER WIRE MINIMUM WITH A SUITABLE HOOK. STAKING PINS SHALL HAVE A MINIMUM LENGTH OF 12" FOR DOWEL ASSEMBLIES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

MINOR VARIATIONS IN THE CONFIGURATION OF THE SUPPORT UNITS WILL BE ALLOWED.

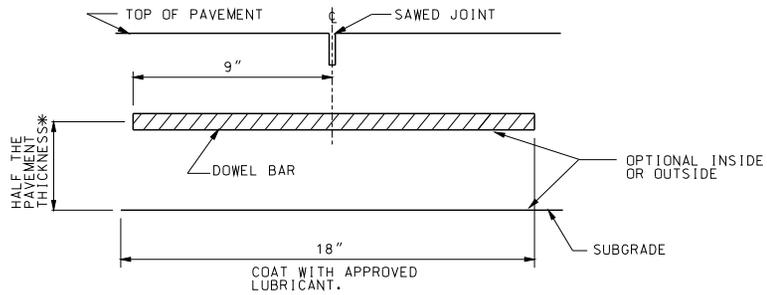
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
 KATHRYN PHILIPS HANNEY  
 NUMBER PE-23701  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**DOWEL SUPPORTING UNITS**  
 APPROVED FOR USE WITH TRANSVERSE JOINTS

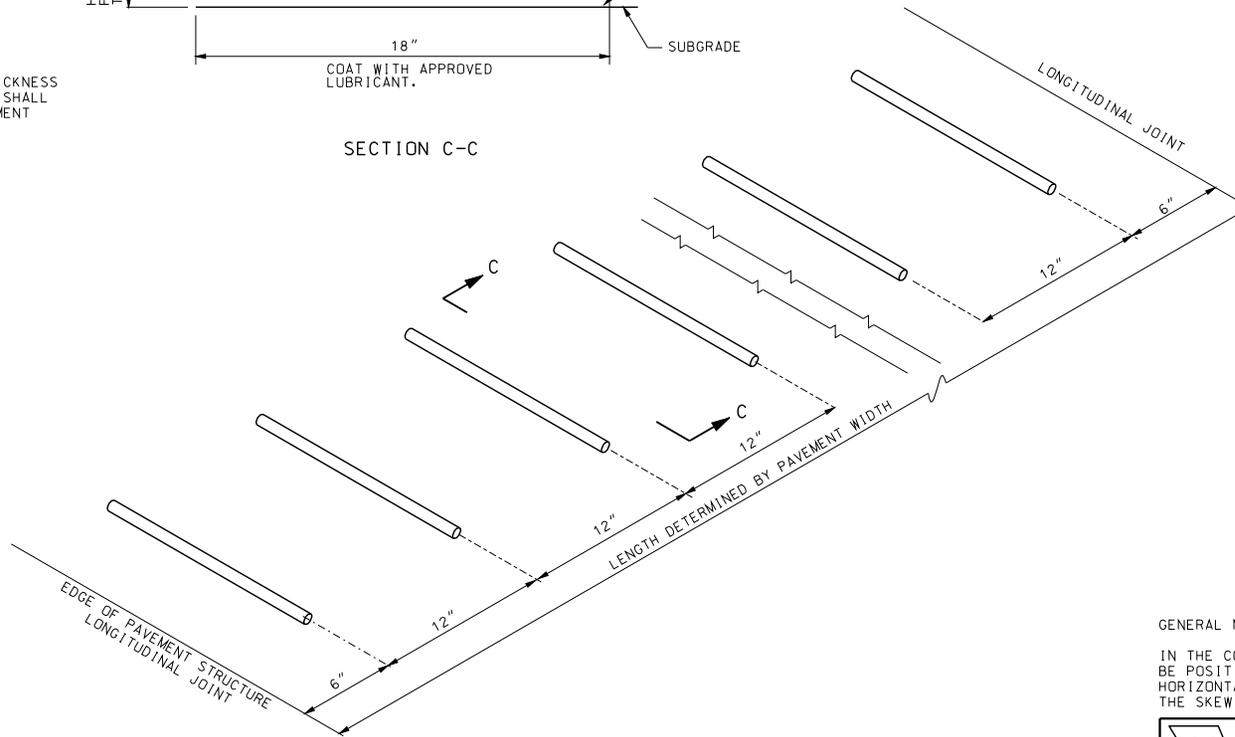
DATE EFFECTIVE: 06/01/2010	<b>502.10K</b>	SHEET NO. 1 OF 2
DATE PREPARED: 4/1/2010		

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



\* FOR PAVEMENTS HAVING THICKNESS IN  $\frac{1}{2}$ " INCREMENTS, DOWEL SHALL BE PLACED HALF THE PAVEMENT THICKNESS MINUS  $\frac{1}{2}$ ".

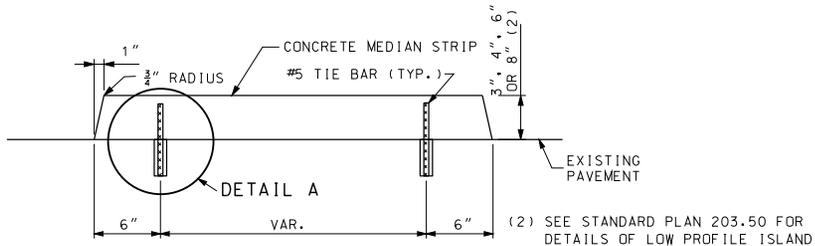
SECTION C-C



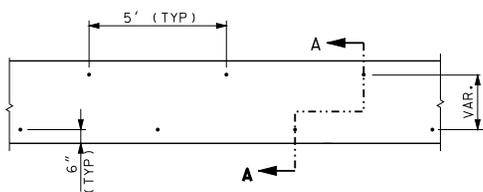
GENERAL NOTES:

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

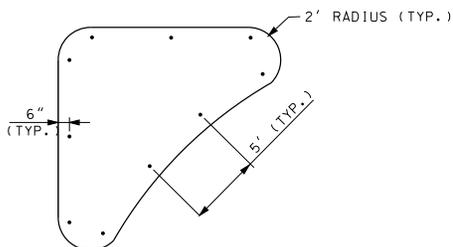
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>DOWEL SUPPORTING UNITS</b> MECHANICAL PLACEMENT
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>502.10K</b> SHEET NO. 2 OF 2



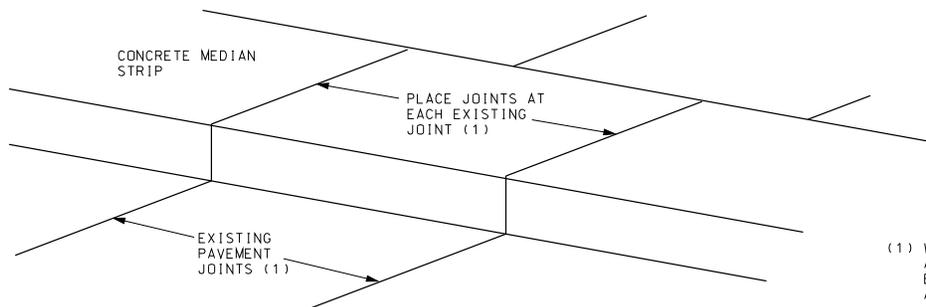
SECTION A-A  
CONCRETE MEDIAN STRIP



TIE BAR LOCATIONS FOR  
CONCRETE MEDIAN STRIP

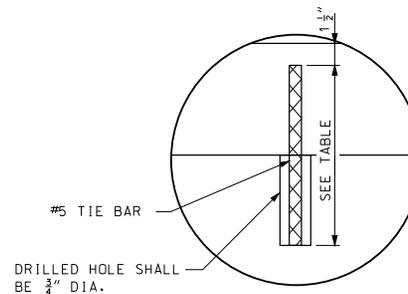


TIE BAR LOCATIONS FOR  
CONCRETE MEDIAN STRIP (ISLAND)



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.

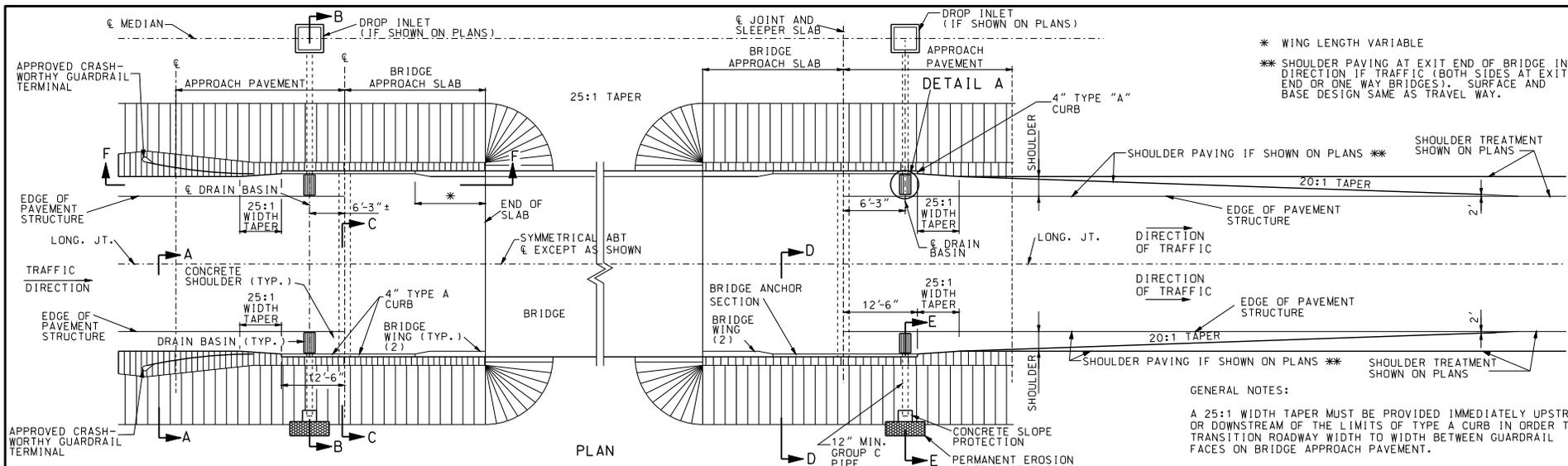
BONDING FOR TIE BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

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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		<b>CONCRETE MEDIAN STRIP</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 3/9/2011	<b>608.30A</b>	SHEET NO. 1 OF 1

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



\* WING LENGTH VARIABLE  
 \*\* 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 UPSTREAM OR DOWNSTREAM OF THE LIMITS OF TYPE A CURB IN ORDER TO TRANSITION ROADWAY WIDTH TO WIDTH BETWEEN GUARDRAIL FACES ON BRIDGE APPROACH PAVEMENT.

FOR DETAILS OF BRIDGE APPROACH SLAB, SEE BRIDGE PLANS.

CONSTRUCT DRAIN BASINS WHEN SHOWN ON 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, BEARING PLATES FOR DROP INLET, SEE STANDARD PLANS 614.10 AND 614.11.

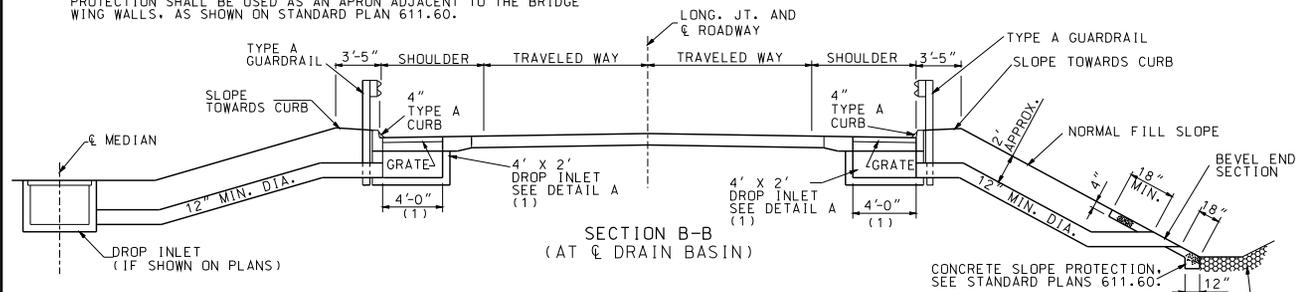
IF REQUIRED, TYPE A GUARDRAIL SHALL BE USED FROM THE END OF THE TRANSITION SECTION FOR THE BRIDGE ANCHOR SECTION TO THE TERMINATION OF THE TYPE A CURB.

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

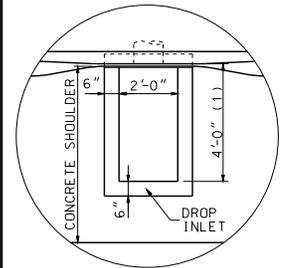
PAYMENT FOR DROP INLET, GRATE, GROUP C PIPE, CONCRETE SLOPE PROTECTION AT PIPE OUTLETS, MATERIAL AND INSTALLATION WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR DRAIN BASIN PER EACH.

FOR DETAILS OF SECTION A-A, C-C, D-D AND E-E, SEE SHEET 2 OF 2.

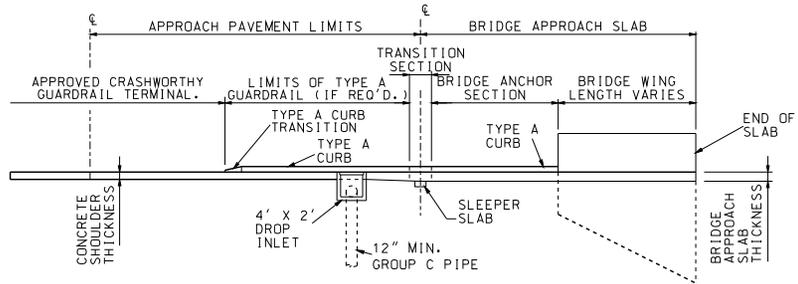
(2) WHEN ROCK BLANKET IS USED UNDER BRIDGE ENDS, CONCRETE SLOPE PROTECTION SHALL BE USED AS AN APRON ADJACENT TO THE BRIDGE WING WALLS. AS SHOWN ON STANDARD PLAN 611.60.



(1) USE 2' X 2' DROP INLET ON 4' OR NARROWER SHOULDERS.



DETAIL A



SECTION F-F

NOTE: DETAILS OF APPROVED CRASHWORTHY GUARDRAIL TERMINAL, TYPE A GUARDRAIL, TRANSITION SECTION AND BRIDGE ANCHOR SECTION ARE NOT SHOWN FOR CLARITY.

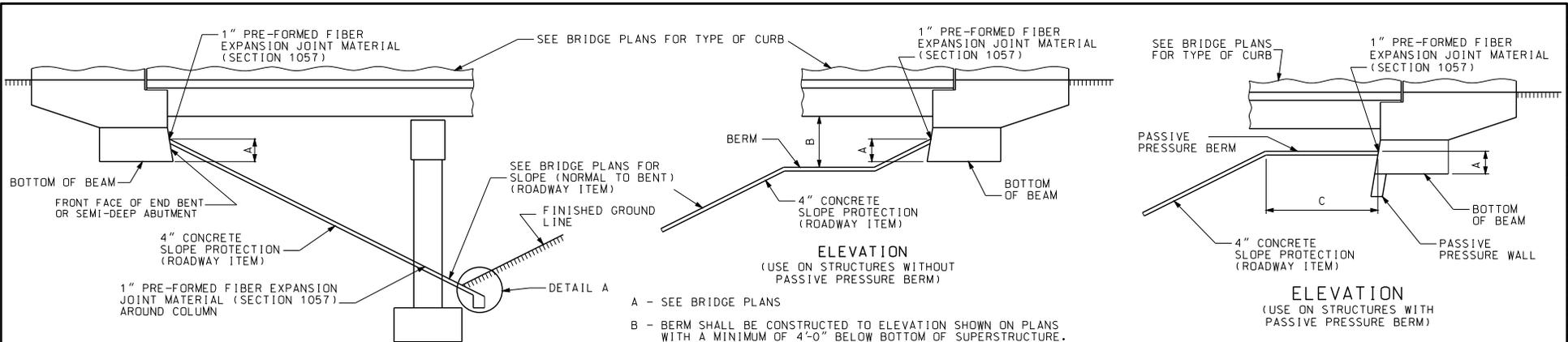
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
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STATE OF MISSOURI  
 KATHY PHILPS HANEY  
 NUMBER PE-23791  
 PROFESSIONAL ENGINEER  
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**DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS**

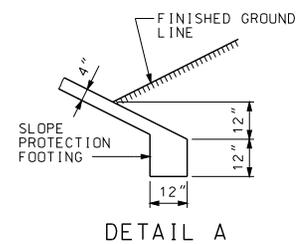
DATE EFFECTIVE: 02/01/2009	<b>609.40P</b>	Sheet No.
DATE PREPARED: 9/3/2010		1 OF 2

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



- A - SEE BRIDGE PLANS
- B - BERM SHALL BE CONSTRUCTED TO ELEVATION SHOWN ON PLANS WITH A MINIMUM OF 4'-0" BELOW BOTTOM OF SUPERSTRUCTURE.
- C - DIMENSION OF BERM (SEE BRIDGE PLANS).

- (1) SLOPE  $\frac{1}{4}$ " PER FOOT MINIMUM.
- (2) PROTECTION SHALL BE PLACED IN CONTINUOUS PANELS FROM TOE OF THE SLOPE TO THE TOP OF THE SLOPE.
- (3) SLOPE PROTECTION SHALL FOLLOW THE CONTOUR OF THE FINAL ROADWAY FILL.

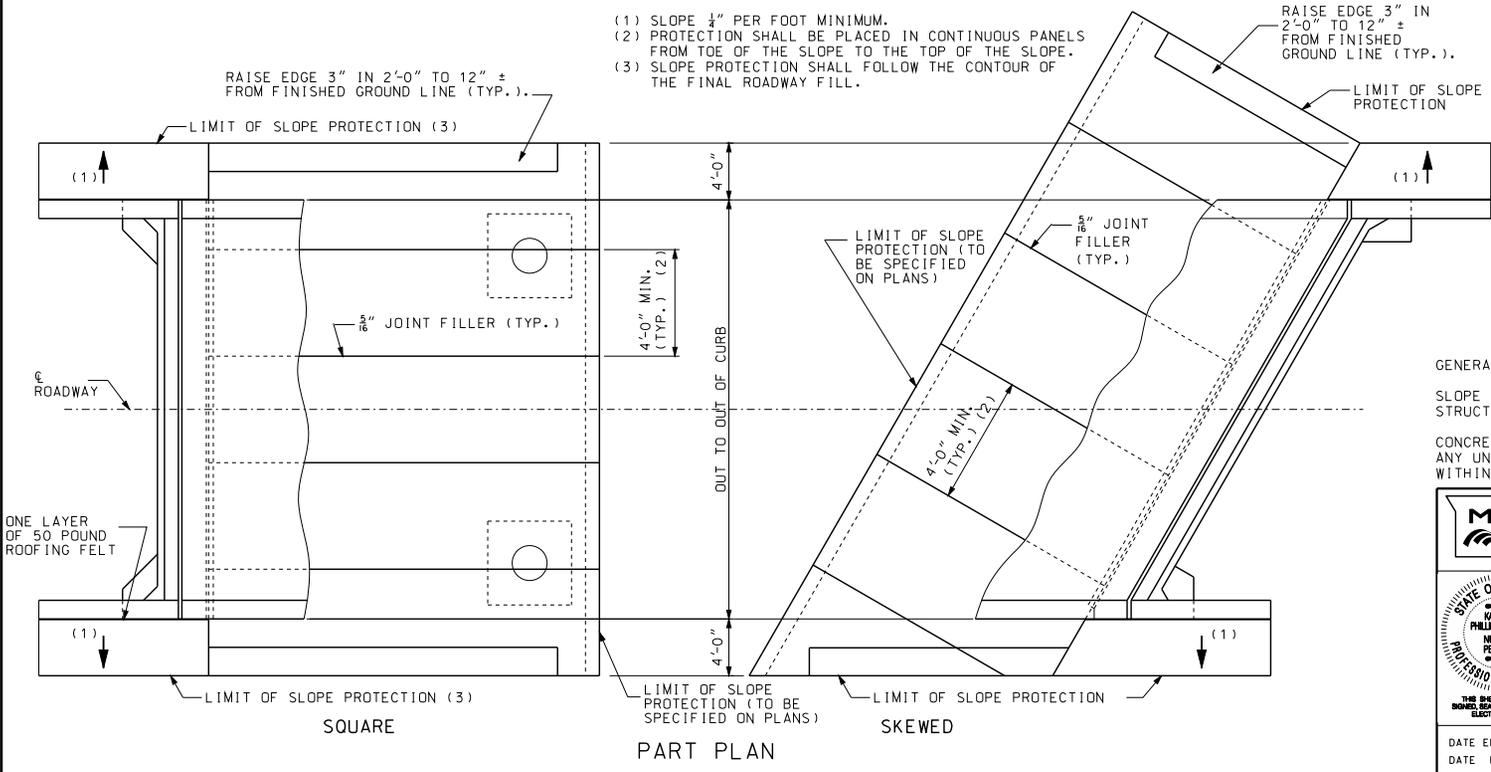


**NOTE:**  
IF SLOPE PROTECTION FOOTING FALLS ON OR AROUND OTHER FOOTINGS, ONE LAYER OF 50# ROOFING FELT SHALL BE PLACED BETWEEN CONTACT SURFACES OF FOOTINGS.

**GENERAL NOTES:**

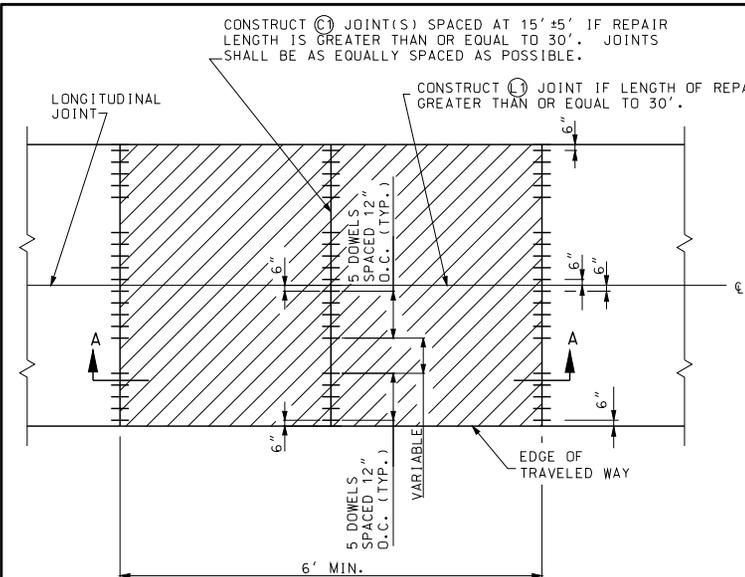
SLOPE PROTECTION SHALL BE MADE CONTINUOUS BETWEEN STRUCTURES WHEN MEDIAN IS 60' OR LESS.

CONCRETE SLOPE PROTECTION SHALL BE FORMED AROUND ANY UNDISTURBED ROCK THAT IS PERMITTED TO REMAIN WITHIN THE SLOPE PROTECTION AREA.

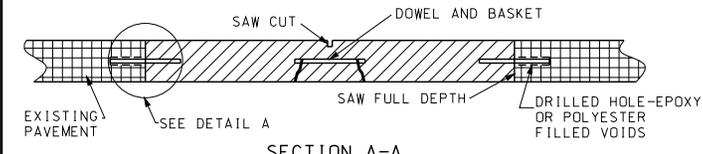


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		<h2 style="margin: 0;">CONCRETE SLOPE PROTECTION</h2>	
DATE EFFECTIVE:	01/01/2005	<h1 style="margin: 0;">611.600</h1>	SHEET NO.
DATE PREPARED:	9/3/2010		1 OF 1

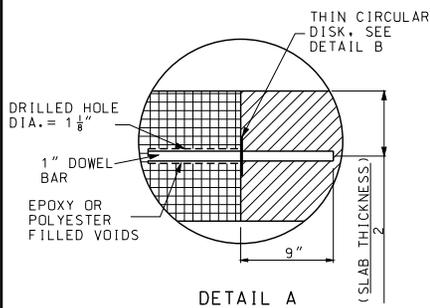
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TWO OR MORE LANES

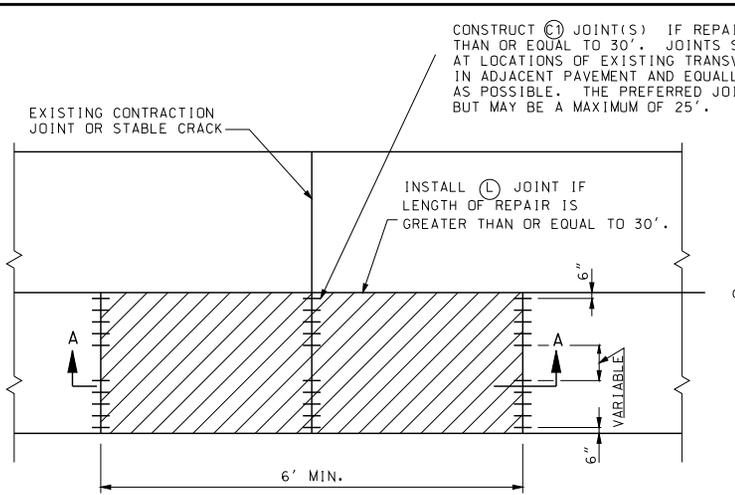


SECTION A-A

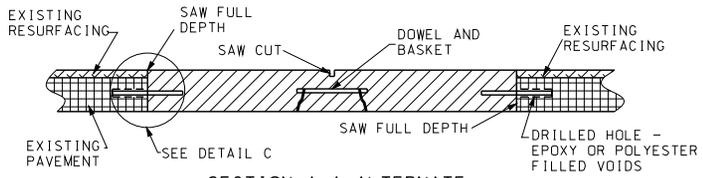


DETAIL A

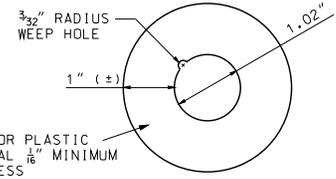
1. SMOOTH EPOXY COATED DOWELS SHALL BE USED IN ALL FULL DEPTH PAVEMENT REPAIR TRANSVERSE JOINTS.
2. THE ANCHORING MATERIAL (EPOXY OR POLYESTER) SHALL BE PLACED TO THE BACK OF THE PREDRILLED HOLE BEFORE INSERTING THE DOWEL BAR.
3. THE DOWEL IS INSERTED INTO THE HOLE WITH A TWISTING MOTION SO THAT THE 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.



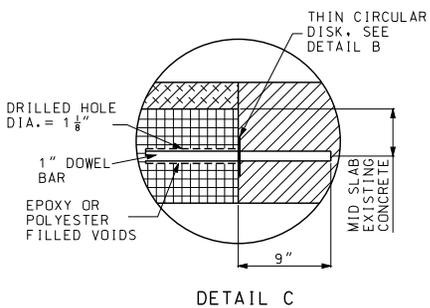
ONE LANE



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.

**NON-REINFORCED AND REINFORCED PORTLAND CEMENT CONCRETE**

**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
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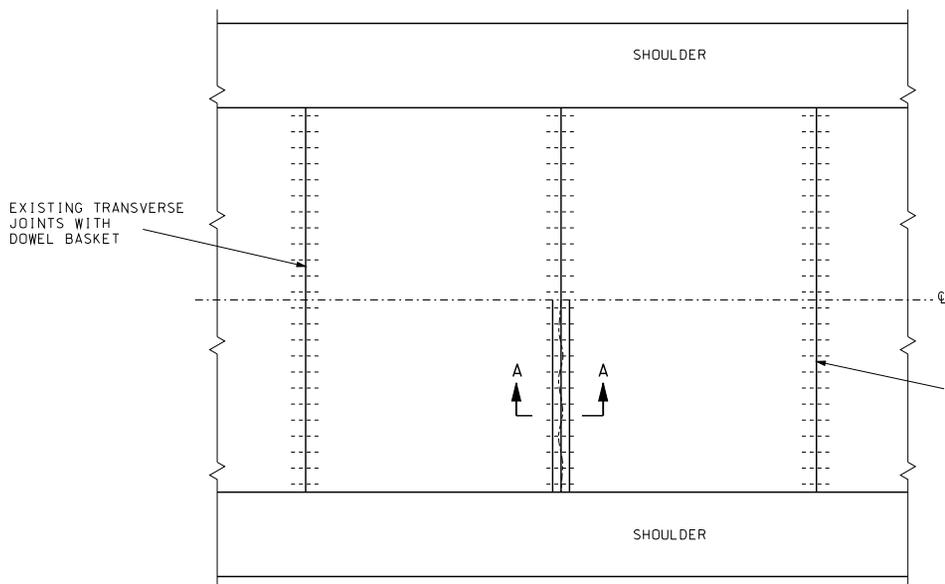
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**PAVEMENT REPAIR**

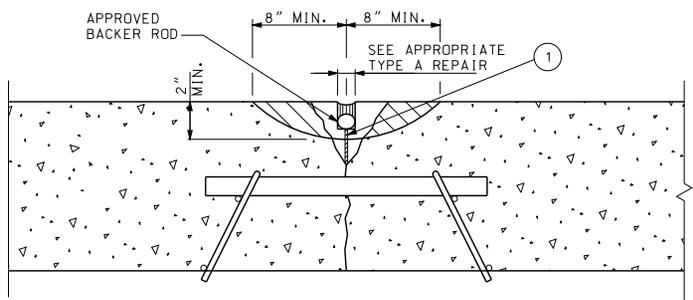
FULL DEPTH

DATE EFFECTIVE: 06/01/2010	<b>613.00P</b>	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



- 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.

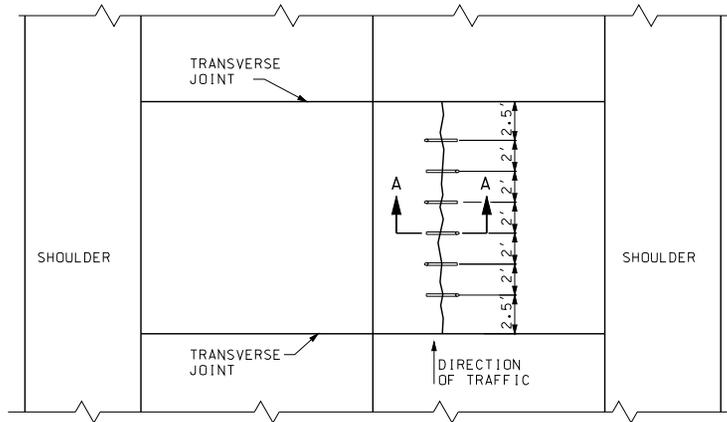
ALL CONCRETE SHALL BE REMOVED TO LIMITS SHOWN IN THE DETAIL, INCLUDING DETERIORATED CONCRETE TO A MAXIMUM OF 1/2 THE PAVEMENT DEPTH OR TOP OF DOWELS BY MILLING.

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

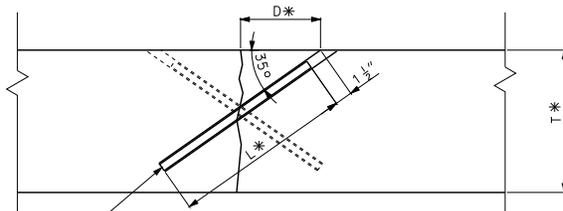
EXPOSED SURFACES OF DOWELS, IF ANY, SHALL BE COATED WITH AN APPROVED BOND BREAKER.

JOINTS AND CRACKS SHALL BE SEALED WITH APPROPRIATE SEALER.

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 <p>STATE OF MISSOURI KATHRYN PHILIPS HAMEY NUMBER PE-23791 PROFESSIONAL ENGINEER</p> <p><small>THIS SHEET HAS BEEN SIGNED SEALED AND DATED ELECTRONICALLY.</small></p>	<p><b>PAVEMENT REPAIR</b> PARTIAL DEPTH AT JOINTS AND CRACKS CLASS A</p>	
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<p><b>613.00P</b></p>	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.

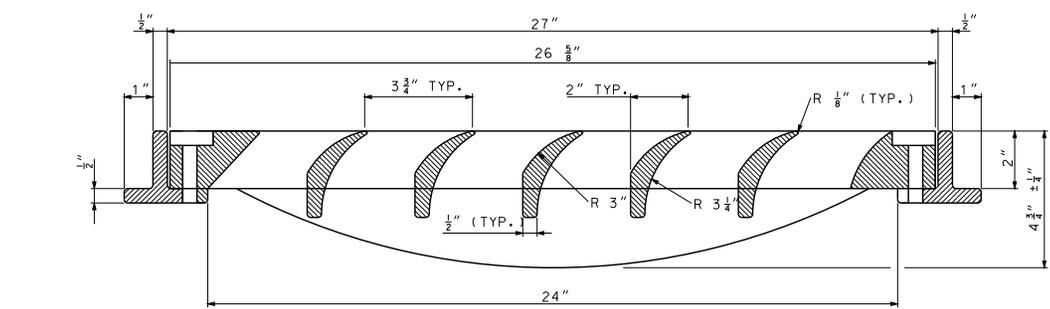
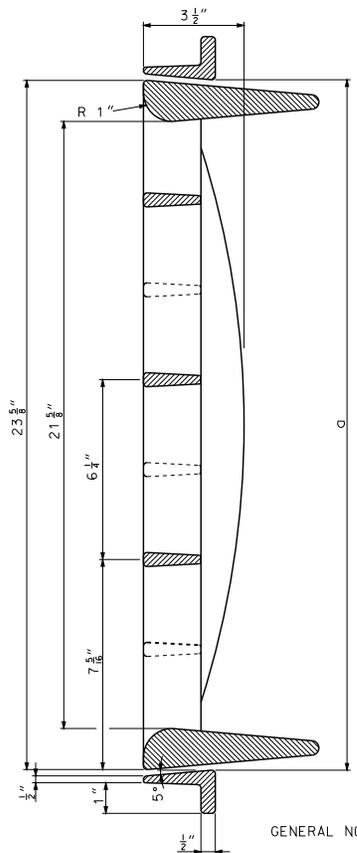
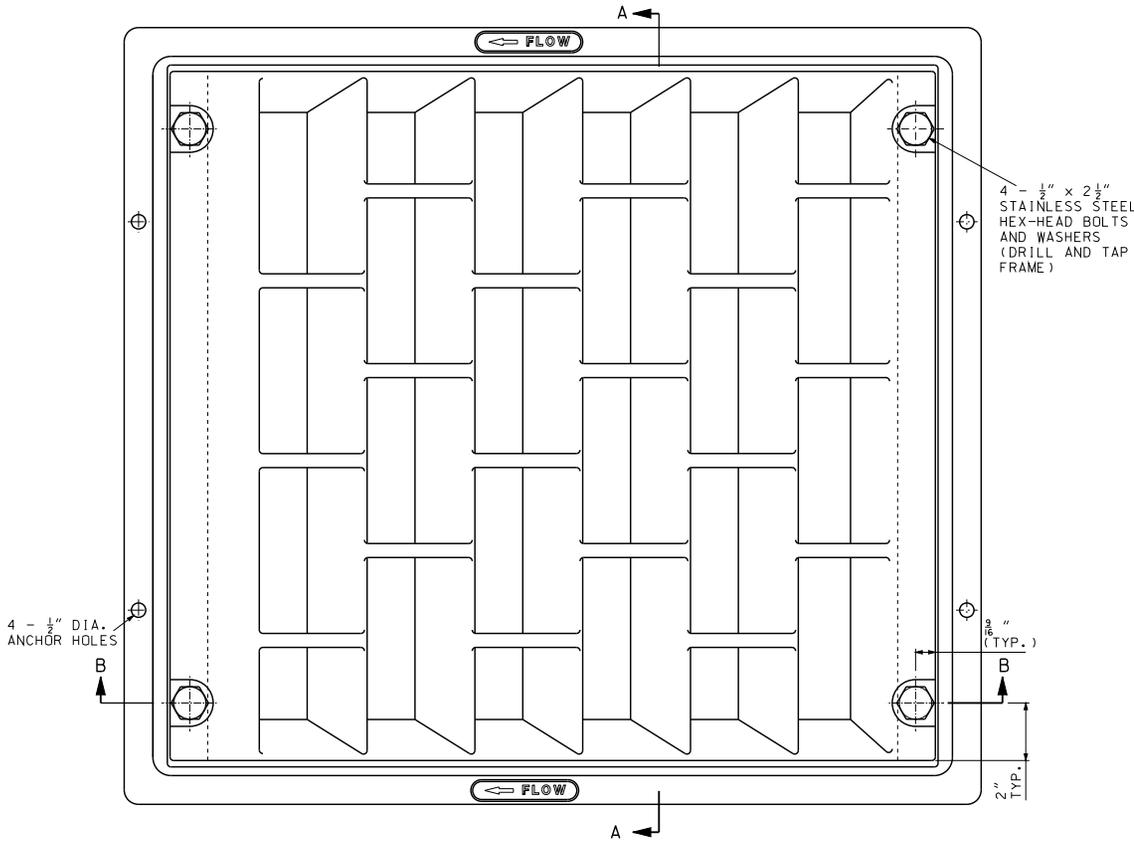
DRILLED HOLES SHALL BE CLEANED OF LOOSE DEBRIS AND DUST. EPOXY OR POLYESTER BONDING AGENTS FOR DOWELS, MEETING THE MATERIAL REQUIREMENTS OF SECTION 1039, SHALL BE INJECTED OR Poured INTO EACH HOLE. A CROSS-STITCH BAR SHALL BE INSERTED IN EACH HOLE SUCH THAT THE EPOXY MATERIAL IS EVENLY DISTRIBUTED AROUND 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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	<p align="center"><b>PAVEMENT REPAIR</b> CROSS STITCHING</p>
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/17/2010	<p align="center"><b>613.00P</b></p>
SHEET NO. <p align="center">3 OF 3</p>	

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



4 - 1/2" x 2 1/2"  
STAINLESS STEEL  
HEX-HEAD BOLTS  
AND WASHERS  
(DRILL AND TAP  
FRAME)

4 - 1/2" DIA.  
ANCHOR HOLES

**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.

SECTION A-A

SECTION B-B

NOMINAL  
DIMENSIONS AND WEIGHTS

OPENING		ø	WEIGHT (LB.)
WIDTH	LENGTH		
2'-0"	2'-0"	24"	200
4'-0"	2'-0"	48"	348

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



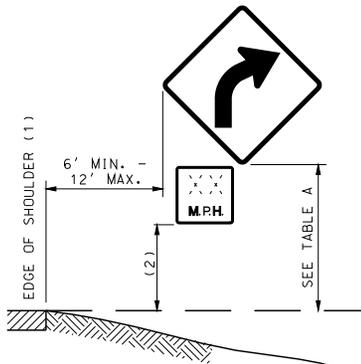
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COMMISSION**

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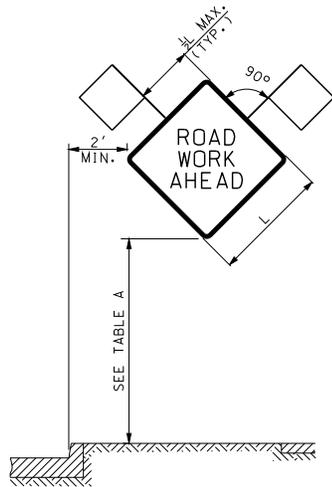


**CURVED VANE GRATE  
AND FRAME**

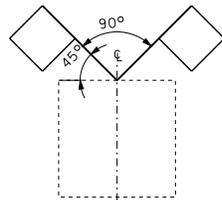
DATE EFFECTIVE:	06/01/2010	<b>614.11C</b>	SHEET NO.
DATE PREPARED:	4/1/2010		1 OF 1



- (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



- (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 CROSWALK/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

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.	

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.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**TEMPORARY TRAFFIC CONTROL DEVICES SIGN MOUNTING REQUIREMENTS**

STATE OF MISSOURI  
KATHRYN PHILIPS HANNEY  
REGISTERED PROFESSIONAL ENGINEER  
NUMBER PE-23791  
EXPIRES 12/31/2010

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

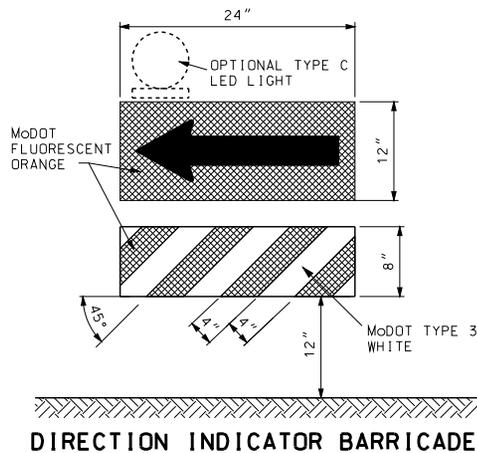
DATE EFFECTIVE: 02/01/2011  
DATE PREPARED: 12/8/2010

**616.10AN**

SHEET NO.  
1 OF 8

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

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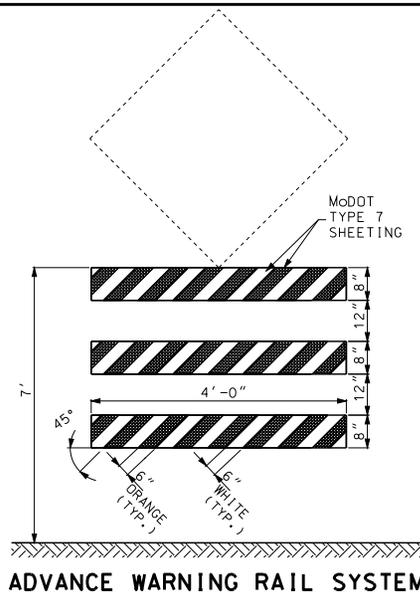


**DIRECTION INDICATOR BARRICADE**

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.



**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.

**GENERAL NOTES:**

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

IF REQUIRED BY THE ENGINEER OR SPECIFIED ON THE PLANS, EACH DIRECTION INDICATOR BARRICADE, DRUMLIKE CHANNELIZER, AND VERTICAL PANEL SHALL BE EQUIPPED WITH ONE TYPE C LED 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.

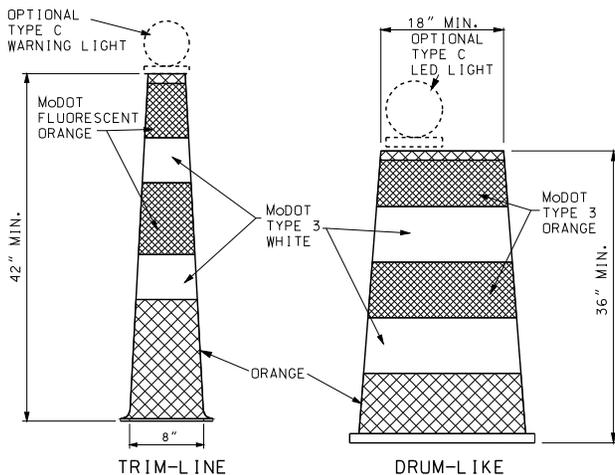
UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE DRUM-LIKE CHANNELIZERS IN LIEU OF TRIM-LINE CHANNELIZERS TO PROVIDE LONGITUDINAL CHANNELIZATION WITHIN THE ACTIVITY AREA WHERE NO RAMPS, INTERSECTIONS OR LIMITED LATERAL CLEARANCE EXISTS.

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.

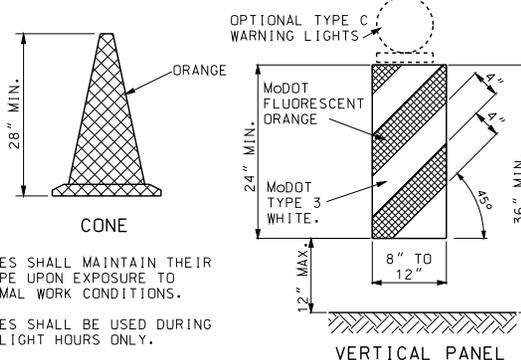
UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE CONES IN LIEU OF TRIM-LINE CHANNELIZERS DURING DAYTIME OPERATIONS ON MINOR ROUTES.

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.



**CHANNELIZERS**

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

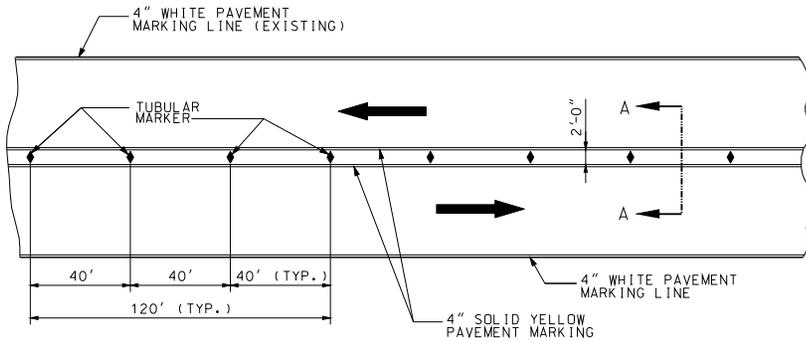


VERTICAL PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE, CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.

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

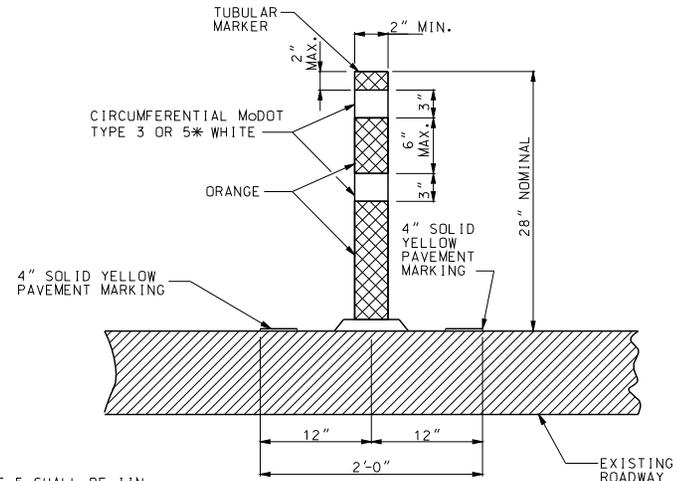
CONES SHALL BE USED DURING DAYLIGHT HOURS ONLY.

<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p><b>TEMPORARY TRAFFIC CONTROL DEVICES</b> CHANNELIZERS AND DIRECTION INDICATOR BARRICADE</p>	
<p>DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010</p>	<p><b>616.10AN</b></p>
<p>SHEET NO. 2 OF 8</p>	



**TWO LANE / TWO WAY TRAFFIC DELINEATION PLAN FOR DIVIDED HIGHWAY**

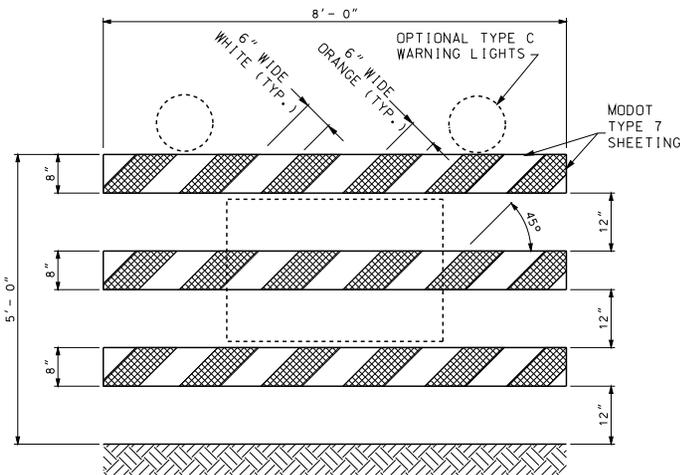
IF RAISED PAVEMENT MARKERS ARE PRESENT, THE LENSES SHALL BE REMOVED OR COVERED TO THE SATISFACTION OF THE ENGINEER.



\* TYPE 5 SHALL BE 1IN ACCORDANCE WITH ASTM D4956.

**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.



**TYPE III MOVABLE BARRICADE**

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. SEE SIGN MOUNTING REQUIREMENTS IN TABLE A ON SHEET 1.

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.

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

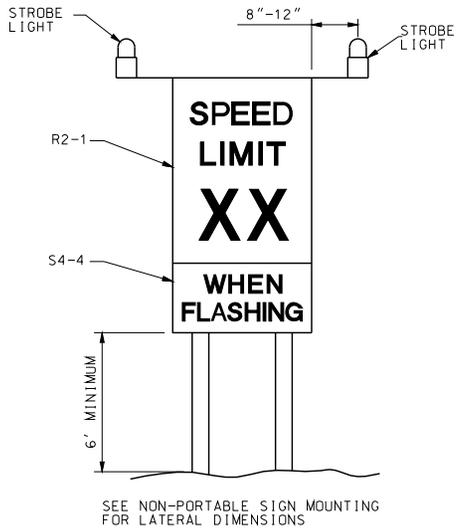
WHERE BOTH RIGHT AND LEFT VEHICULAR MOVEMENTS ARE PROVIDED, THE STRIPES SHALL SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE ARRAY.

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 MoDOT TYPE 7 ORANGE SHEETING MAY BE APPLIED TO THE ENDS OF EACH RAIL TO HELP DELINEATE THE DEVICE.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>TEMPORARY TRAFFIC CONTROL DEVICES</b>	
	SHEET NO. <b>3 OF 8</b>	
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 3/9/2011	<b>616.10AN</b>	

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



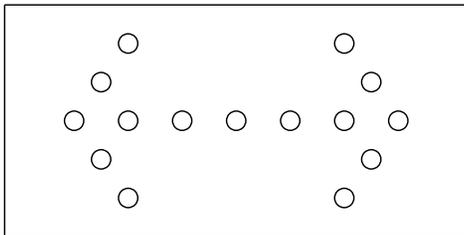
**SPEED LIMIT AND STROBE LIGHT ASSEMBLY**

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.



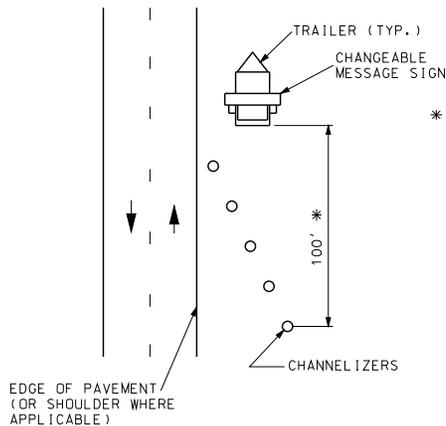
**FLASHING ARROW PANEL REQUIREMENTS**

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.

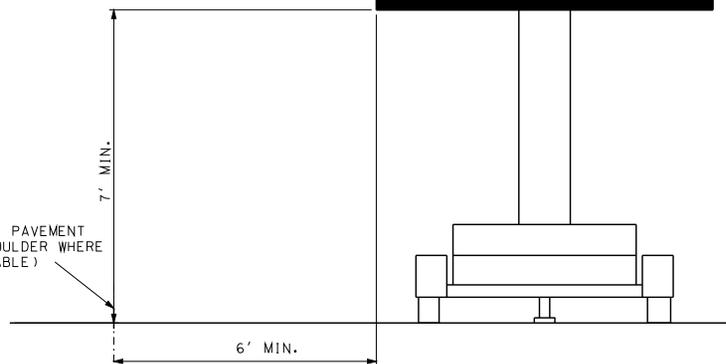
**STROBE LIGHT REQUIREMENTS**

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 SHOULD THERE BE NO SHOULDER), BEYOND THE DITCH LINE, OR BEHIND A CURB OR PHYSICAL BARRIER.



**CHANGEABLE MESSAGE SIGN**

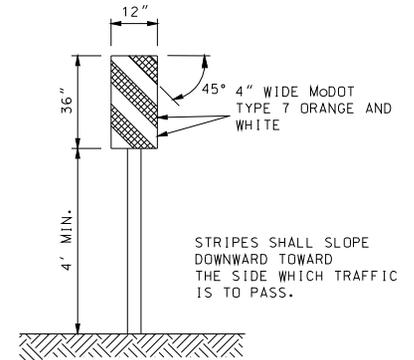
**PORTABLE WARNING LIGHTS**

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

TYPE A AND C 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).  
 (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.



**TYPE 3 OBJECT MARKERS**

**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 PHILIPS HANNEY  
 NUMBER PE-23791  
 PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**TEMPORARY TRAFFIC CONTROL DEVICES**

DATE EFFECTIVE: 02/01/2011  
 DATE PREPARED: 12/8/2010

**616.10AN**

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	OR	MoDOT FL. OR	FRESH OIL/LOOSE GRAVEL (3)
E05-2	48X36	12.00	BK	OR	MoDOT FL. OR	EXIT OPEN
E05-2a	48X36	12.00	BK	OR	MoDOT FL. OR	EXIT CLOSED
W01-1L	48X48	16.00	BK	OR	MoDOT FL. OR	TURN (SYMBOL LEFT ARROW)
W01-1R	48X48	16.00	BK	OR	MoDOT FL. OR	TURN (SYMBOL RIGHT ARROW)
W01-2L	48X48	16.00	BK	OR	MoDOT FL. OR	CURVE (SYMBOL LEFT ARROW)
W01-2R	48X48	16.00	BK	OR	MoDOT FL. OR	CURVE (SYMBOL RIGHT ARROW)
W01-3L	48X48	16.00	BK	OR	MoDOT FL. OR	REVERSE TURN (SYMBOL LEFT ARROW)
W01-3R	48X48	16.00	BK	OR	MoDOT FL. OR	REVERSE TURN (SYMBOL RIGHT ARROW)
W01-4L	48X48	16.00	BK	OR	MoDOT FL. OR	REVERSE CURVE (SYMBOL LEFT ARROW)
W01-4R	48X48	16.00	BK	OR	MoDOT FL. OR	REVERSE CURVE (SYMBOL RIGHT ARROW)
W01-4bL	48X48	16.00	BK	OR	MoDOT FL. OR	DOUBLE ARROW REVERSE CURVE (SYMBOL LEFT ARROWS) (2)
W01-4bR	48X48	16.00	BK	OR	MoDOT FL. OR	DOUBLE ARROW REVERSE CURVE (SYMBOL RIGHT ARROWS) (2)
W01-4cL	48X48	16.00	BK	OR	MoDOT FL. OR	TRIPLE ARROW REVERSE CURVE (SYMBOL LEFT ARROWS) (2)
W01-4cR	48X48	16.00	BK	OR	MoDOT FL. OR	TRIPLE ARROW REVERSE CURVE (SYMBOL RIGHT ARROWS) (2)
W01-6	48X24	8.00	BK	OR	MoDOT FL. OR	HORIZONTAL ARROW (SYMBOL)
W01-6a	72X36	18.00	BK	OR	MoDOT FL. OR	HORIZONTAL ARROW (SYMBOL ON PERMANENT BARRICADE) (1)
W01-7	48X24	8.00	BK	OR	MoDOT FL. OR	DOUBLE HEAD HORIZONTAL ARROW (SYMBOL)
W01-7a	72X36	18.00	BK	OR	MoDOT FL. OR	DOUBLE HEAD HORIZONTAL ARROW (SYMBOL ON PERMANENT BARRICADE) (1)
W01-8	18X24	3.00	BK	OR	MoDOT FL. OR	CHEVRON (SYMBOL)
W01-8a	36X48	12.00	BK	OR	MoDOT FL. OR	CHEVRON (SYMBOL FOR DIVIDED HIGHWAYS)
W03-1a	48X48	16.00	BK	OR	MoDOT FL. OR	STOP AHEAD (SYMBOL)
W03-2a	48X48	16.00	BK	OR	MoDOT FL. OR	YIELD AHEAD (SYMBOL)
W03-3	48X48	16.00	BK	OR	MoDOT FL. OR	SIGNAL AHEAD (SYMBOL)
W03-4	48X48	16.00	BK	OR	MoDOT FL. OR	BE PREPARED TO STOP
W03-5	48X48	16.00	BK	OR	MoDOT FL. OR	SPEED LIMIT XX AHEAD (SYMBOL)
W04-1L	48X48	16.00	BK	OR	MoDOT FL. OR	MERGE (SYMBOL FROM LEFT)
W04-1R	48X48	16.00	BK	OR	MoDOT FL. OR	MERGE (SYMBOL FROM RIGHT)
W05-1	48X48	16.00	BK	OR	MoDOT FL. OR	ROAD/BRIDGE/RAMP NARROWS (4)
W05-3	48X48	16.00	BK	OR	MoDOT FL. OR	ONE LANE BRIDGE
W05-5	48X48	16.00	BK	OR	MoDOT FL. OR	NARROW LANES (3)
W06-1	48X48	16.00	BK	OR	MoDOT FL. OR	DIVIDED HIGHWAY (SYMBOL)
W06-2	48X48	16.00	BK	OR	MoDOT FL. OR	DIVIDED HIGHWAY END (SYMBOL)
W06-3	48X48	16.00	BK	OR	MoDOT FL. OR	TWO WAY TRAFFIC (SYMBOL)
W07-3a	30X24	5.00	BK	OR	MoDOT FL. OR	NEXT XX MILES (PLAQUE)
W08-1	48X48	16.00	BK	OR	MoDOT FL. OR	BUMP
W08-2	48X48	16.00	BK	OR	MoDOT FL. OR	DIP
W08-3	48X48	16.00	BK	OR	MoDOT FL. OR	PAVEMENT ENDS
W08-4	48X48	16.00	BK	OR	MoDOT FL. OR	SOFT SHOULDER
W08-5	48X48	16.00	BK	OR	MoDOT FL. OR	SLIPPERY WHEN WET (SYMBOL)
W08-6	48X48	16.00	BK	OR	MoDOT FL. OR	TRUCK CROSSING WITH FLAGS
W08-6c	48X48	16.00	BK	OR	MoDOT FL. OR	TRUCK ENTRANCE (3)
W08-7	36X36	9.00	BK	OR	MoDOT FL. OR	LOOSE GRAVEL
W08-9	48X48	16.00	BK	OR	MoDOT FL. OR	LOW SHOULDER
W08-9a	48X48	16.00	BK	OR	MoDOT FL. OR	SHOULDER DROP-OFF
W08-11	48X48	16.00	BK	OR	MoDOT FL. OR	UNEVEN LANES
W08-12	36X36	9.00	BK	OR	MoDOT FL. OR	NO CENTER STRIPE
W10-1	42 RND.	9.62	BK	YL	MoDOT TYPE 3	RAILROAD CROSSING
W012-1	24X24	4.00	BK	OR	MoDOT FL. OR	DOUBLE DOWN ARROW (SYMBOL)
W012-2	48X48	16.00	BK	OR	MoDOT FL. OR	LOW CLEARANCE (SYMBOL)
W012-2x	24X18	3.00	BK	OR	MoDOT FL. OR	LOW CLEARANCE (PLAQUE) (3)
W012-3a,b	144X24	24.00	BK	OR	MoDOT FL. OR	OVERHEAD LOW CLEARANCE (FEET AND INCHES) (3)
SPECIAL	120X60	50.00	BK	OR	MoDOT FL. OR	LOW CLEARANCE XX FT XX IN XX MILES AHEAD (3)
SPECIAL	120X60	50.00	BK	OR	MoDOT FL. OR	WIDTH RESTRICTION XX FT XX IN XX MILES AHEAD (3)
W013-1	30X30	6.25	BK	OR	MoDOT FL. OR	ADVISORY SPEED (PLAQUE)
W016-2	30X24	5.00	BK	OR	MoDOT FL. OR	XXX FEET (PLAQUE)
W016-3	30X24	5.00	BK	OR	MoDOT FL. OR	X MILE (PLAQUE)
W020-1	48X48	16.00	BK	OR	MoDOT FL. OR	ROAD/BRIDGE/RAMP WORK AHEAD (4)
W020-2	48X48	16.00	BK	OR	MoDOT FL. OR	DETOUR AHEAD
W020-3	48X48	16.00	BK	OR	MoDOT FL. OR	ROAD CLOSED AHEAD
W020-4	48X48	16.00	BK	OR	MoDOT FL. OR	ONE LANE ROAD AHEAD
W020-5	48X48	16.00	BK	OR	MoDOT FL. OR	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.

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.

GENERAL NOTES:  
ALL PLAQUES SHALL HAVE A BORDER. PLATES SHALL NOT HAVE A BORDER.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)
	<b>TEMPORARY TRAFFIC CONTROL DEVICES WARNING SIGNS</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>616.10AN</b>
	SHEET NO. <b>5 OF 8</b>

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

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WARNING SIGNS						
SIGN	SIZE (IN.)	AREA (SQ. FT.)	COLOR		SHEETING	DESCRIPTION
			SYM. LEG. BRD.	BACK GROUND		
W020-5a	48x48	16.00	BK	OR	MoDOT FL. OR	RIGHT/CENTER/LEFT TWO LANES CLOSED AHEAD (4)
W020-6a	48x48	16.00	BK	OR	MoDOT FL. OR	RIGHT/CENTER/LEFT LANE CLOSED (3)(4)
W020-7a	48x48	16.00	BK	OR	MoDOT FL. OR	FLAGGER (SYMBOL) WITH FLAGS
W021-2	36x36	9.00	BK	OR	MoDOT FL. OR	FRESH OIL
W021-5b	48x48	16.00	BK	OR	MoDOT FL. OR	SHOULDER WORK AHEAD (3)
W022-1	48x48	16.00	BK	OR	MoDOT FL. OR	BLASTING ZONE AHEAD
W022-2	42x36	10.50	BK	OR	MoDOT FL. OR	TURN OFF 2-WAY RADIO AND PHONE
W022-3	42x36	10.50	BK	OR	MoDOT FL. OR	END BLASTING ZONE
W022-6e	21x15	2.19	BK	OR	MoDOT FL. OR	WET PAINT (ARROW PIVOTS) (3)
SPECIAL	48x48	16.00	BK	OR	MoDOT FL. OR	GROOVED PAVEMENT AHEAD (3)
GUIDE SIGNS						
E05-1	36x48	12.00	BK	OR	MoDOT FL. OR	GORE EXIT (3)
G020-1	60x24	10.00	BK	OR	MoDOT FL. OR	ROAD WORK NEXT XX MILES
G020-2	48x24	8.00	BK	OR	MoDOT FL. OR	END ROAD WORK
G020-4	36x18	4.50	BK	OR	MoDOT FL. OR	PILOT CAR FOLLOW ME
SPECIAL	42x30	8.75	BK	OR	MoDOT FL. OR	PLEASE WAIT FOR PILOT CAR (3)
G023-1	36x12	3.00	BK	OR	MoDOT FL. OR	WORK ZONE (PLAQUE) (3)(5)
M04-8a	24x18	3.00	BK	OR	MoDOT FL. OR	END DETOUR
M04-9L	48x36	12.00	BK	OR	MoDOT FL. OR	DETOUR (LEFT ARROW)
M04-9R	48x36	12.00	BK	OR	MoDOT FL. OR	DETOUR (RIGHT ARROW)
M04-10L	48x18	6.00	BK	OR	MoDOT FL. OR	DETOUR (ARROW LEFT)
M04-10R	48x18	6.00	BK	OR	MoDOT FL. OR	DETOUR (ARROW RIGHT)
REGULATORY SIGNS						
R1-1	48x48	13.25	WH	RD	MoDOT TYPE 3	STOP
R1-2	48 TR1.	6.93	RD	WH	MoDOT TYPE 3	YIELD
R1-2a	36x36	9.00	BK	WH	MoDOT TYPE 3	TO ONCOMING TRAFFIC (PLAQUE)
R1-3	20X9	1.25	WH	RD	MoDOT TYPE 3	X-WAY (PLAQUE)
R2-1	36x48	12.00	BK	WH	MoDOT TYPE 3	SPEED LIMIT XX
R3-1	48x48	16.00	BK/RD	WH	MoDOT TYPE 3	NO RIGHT TURN (SYMBOL)
R3-2	48x48	16.00	BK/RD	WH	MoDOT TYPE 3	NO LEFT TURN (SYMBOL)
R3-3	36x36	9.00	BK	WH	MoDOT TYPE 3	NO TURNS
R3-4	48x48	16.00	BK/RD	WH	MoDOT TYPE 3	NO U-TURN (SYMBOL)
R3-7L	30x30	6.25	BK	WH	MoDOT TYPE 3	LEFT LANE MUST TURN LEFT
R3-7R	30x30	6.25	BK	WH	MoDOT TYPE 3	RIGHT LANE MUST TURN RIGHT
R4-1	36x48	12.00	BK	WH	MoDOT TYPE 3	DO NOT PASS
R4-2	36x48	12.00	BK	WH	MoDOT TYPE 3	PASS WITH CARE
R4-7a	36x48	12.00	BK	WH	MoDOT TYPE 3	KEEP RIGHT (HORIZONTAL ARROW)
R4-8a	36x48	12.00	BK	WH	MoDOT TYPE 3	KEEP LEFT (HORIZONTAL ARROW)
R5-1	30x30	6.25	RD	WH	MoDOT TYPE 3	DO NOT ENTER
R5-1a	36x24	6.00	WH	RD	MoDOT TYPE 3	WRONG WAY
R6-1L	48x18	6.00	BK	WH	MoDOT TYPE 3	ONE WAY ARROW (LEFT)
R6-1R	48x18	6.00	BK	WH	MoDOT TYPE 3	ONE WAY ARROW (RIGHT)
R6-2L	24x30	5.00	BK	WH	MoDOT TYPE 3	ONE WAY (LEFT)
R6-2R	24x30	5.00	BK	WH	MoDOT TYPE 3	ONE WAY (RIGHT)
R10-6	24x36	6.00	BK	WH	MoDOT TYPE 3	STOP HERE ON RED (45° ARROW)
R11-2	48x30	10.00	BK	WH	MoDOT TYPE 3	ROAD CLOSED
R11-3a	60x30	12.50	BK	WH	MoDOT TYPE 3	ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY
R11-4	60x30	12.50	BK	WH	MoDOT TYPE 3	ROAD CLOSED TO THRU TRAFFIC
CONST-3A	60x48	20.00	BK	OR/WH	MoDOT FL. OR/TYPE 3	FINE SIGN (3)
CONST-3X	56x12	4.67	BK	WH	MoDOT TYPE 3	SPEEDING/PASSING (PLATE) (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.

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.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>TEMPORARY TRAFFIC CONTROL DEVICES</b> WARNING, GUIDE AND REGULATORY SIGNS
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>616.10AN</b>	SHEET NO. 6 OF 8



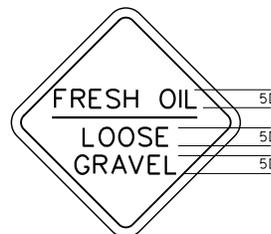
W05-5 (3)



W08-6c (3)



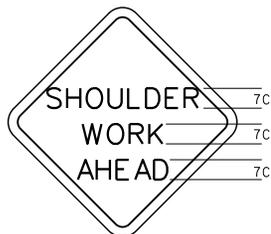
W012-2x (3)



SPECIAL (3)



W020-6a (3)(4)



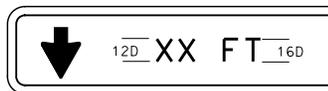
W021-5b (3)



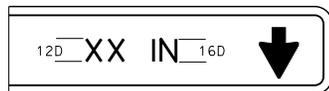
SPECIAL (3)



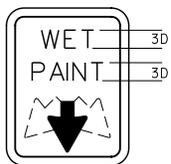
SPECIAL (3)



W012-3a (3)



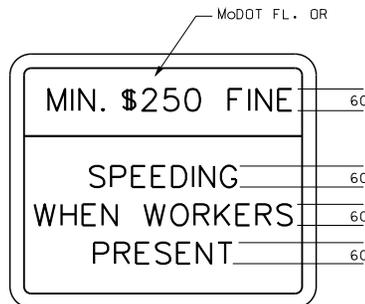
W012-3b (3)



W022-6e (3)



G023-1 (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.

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.

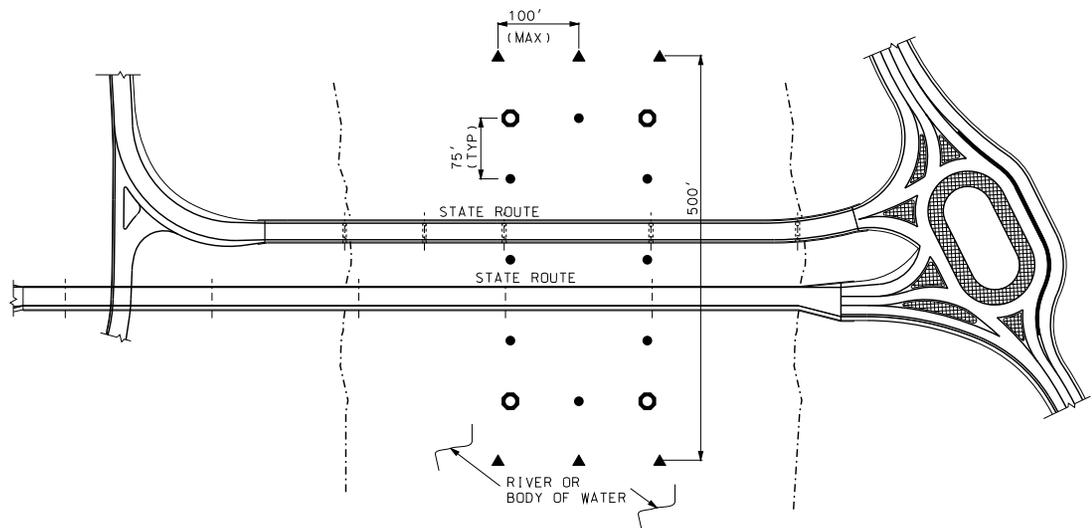
ALL PLAQUES SHALL HAVE A BORDER. PLATES SHALL NOT HAVE A BORDER.

LETTER DIMENSIONS SHALL BE AS SHOWN.

<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p><b>KATHRYN PHILLIPS HAMEY</b> NUMBER PE-23791 PROFESSIONAL ENGINEER</p> <p><small>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</small></p>	<p><b>TEMPORARY TRAFFIC CONTROL DEVICES</b></p>
<p>DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010</p>	<p><b>616.10AN</b></p>
<p>SHEET NO. 7 OF 8</p>	

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)



**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

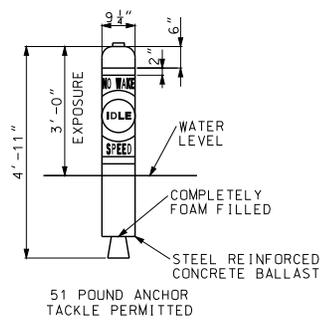
EACH SIGN SHALL BE EQUIPPED WITH TWO (2) FLASHING LIGHT UNITS WITH AMBER LENS. FLASHING LIGHT UNITS SHALL BE FURNISHED AND MAINTAINED BY THE CONTRACTOR

ALL LETTERING TO BE BLACK IN COLOR IN BLOCK FORM.

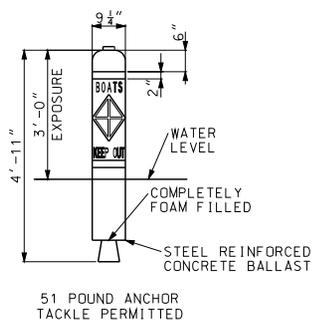
FOR OTHER INFORMATION AND LOCATION OF SIGNS AND BUOYS SEE SPECIAL PROVISIONS.

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

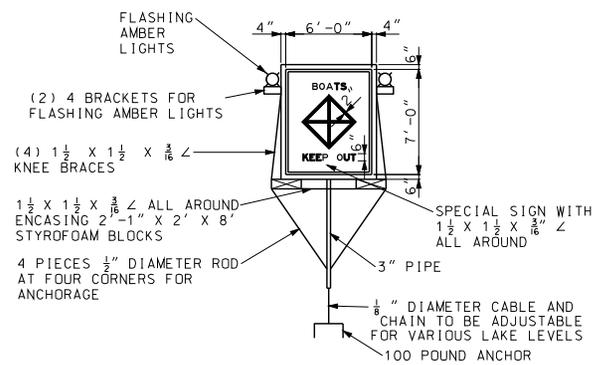
**COLOR:**  
 BACKGROUND - WHITE  
 LEGEND - BLACK  
 2" REFLECTIVE BAND AND SYMBOL - INTERNATIONAL ORANGE



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



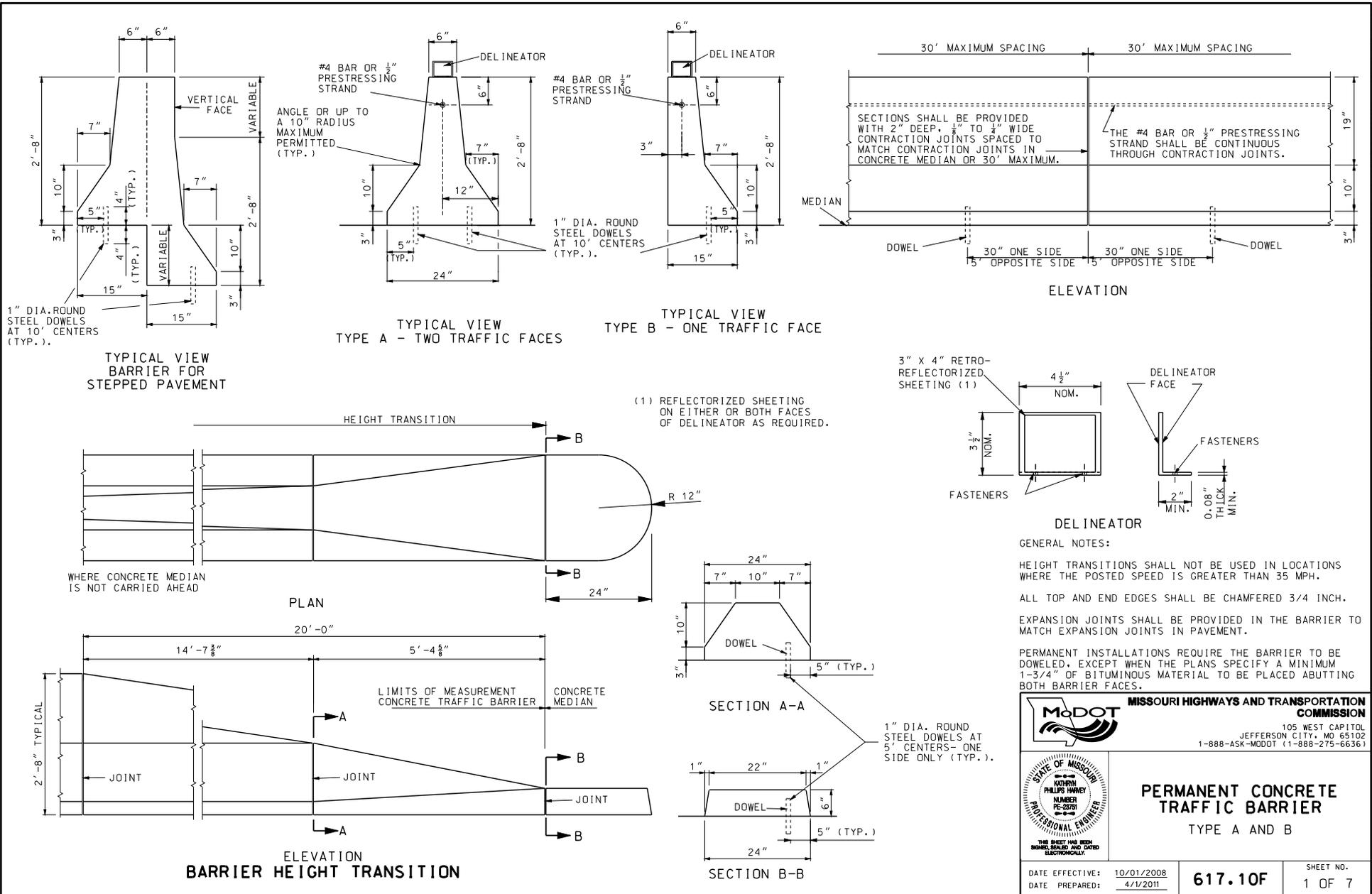
**CONTROLLED AREA BUOY**  
 ("BOATS KEEP OUT")  
 (8 REQUIRED - ROADWAY ITEM)



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

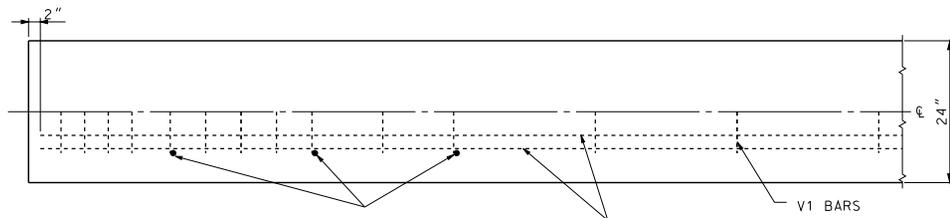
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>TEMPORARY TRAFFIC CONTROL DEVICES</b> TRAFFIC CONTROL FOR WATERWAYS	
	SHEET NO. <b>616.10AN</b> 8 OF 8	

DATE EFFECTIVE: 02/01/2011  
 DATE PREPARED: 12/8/2010



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

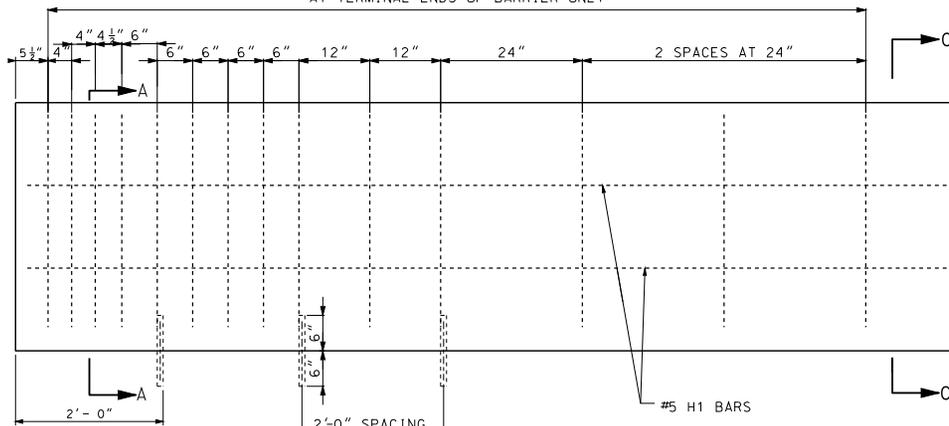
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>PERMANENT CONCRETE TRAFFIC BARRIER</b> TYPE A AND B	
DATE EFFECTIVE:	10/01/2008	<b>617.10F</b>	SHEET NO. 1 OF 7
DATE PREPARED:	4/11/2011		



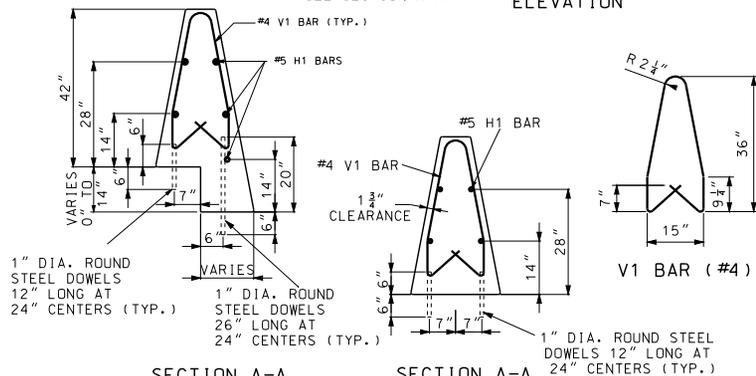
1" DIA. ROUND STEEL DOWELS 12" LONG @ 24" CENTERS #5 H1 BARS V1 BARS

PLAN VIEW  
(SYMMETRICAL ABOUT CENTERLINE)

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

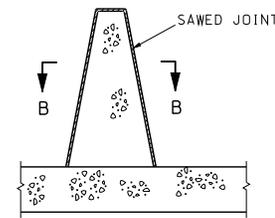


ELEVATION

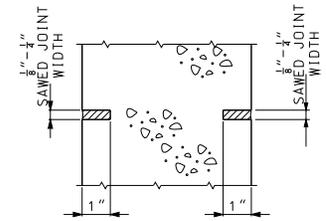


SECTION A-A (STEPPED PAVEMENT) SECTION A-A (NORMAL PAVEMENT)

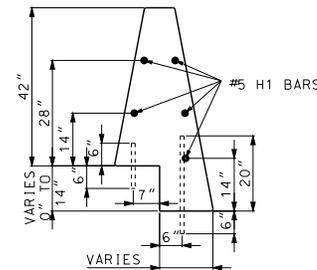
REINFORCING DETAILS



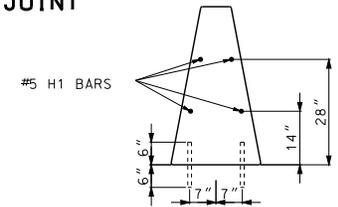
SECTION THROUGH SAWED JOINT



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.

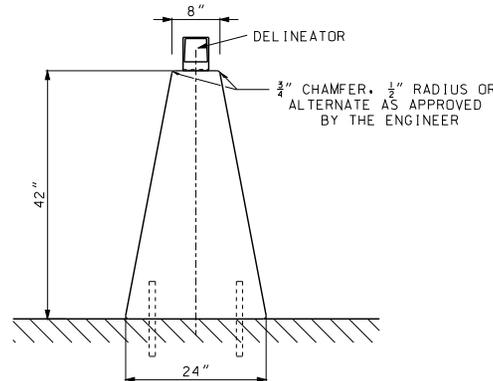
ANY REINFORCING BAR INSTALLATION METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL REINFORCING STEEL WILL BE POSITIONED ±1/2 INCH AS DIMENSIONED WILL BE SATISFACTORY.

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.

SAWED JOINTS SHALL BE LOCATED AT PAVEMENT TRANSVERSE JOINTS.

FOR DELINEATOR DETAILS, SEE SHEET 1.

PERMANENT INSTALLATIONS REQUIRE THE BARRIER TO BE DOWELED, EXCEPT WHEN THE PLANS SPECIFY A MINIMUM 1-3/4" OF BITUMINOUS MATERIAL TO BE PLACED ABUTTING BOTH BARRIER FACES.



TYPE C TYPICAL SECTION

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)
	<b>PERMANENT CONCRETE TRAFFIC BARRIER</b> TYPE C	
DATE EFFECTIVE: 10/01/2008 DATE PREPARED: 4/11/2011	<b>617.10F</b>	SHEET NO. 4 OF 7

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

A = WIDTH AS SPECIFIED IN PLANS.

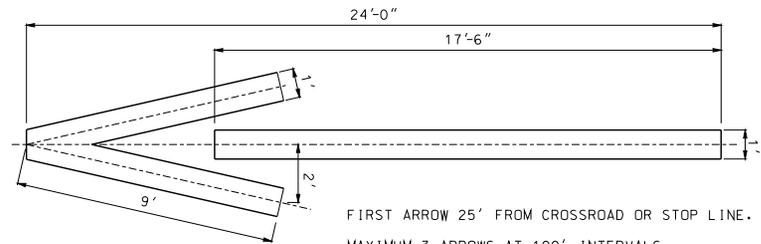
L =  $S \times W$  WHEN POSTED SPEED 45 MPH OR GREATER OR  $WS^2 / 60$  WHEN POSTED SPEED IS 40 MPH OR LESS.

L = LENGTH OF TAPER IN FEET.

S = OFF PEAK 85 PERCENTILE SPEED IN MPH.

W = OFFSET DISTANCE IN FEET.

DISTANCE (L) SHALL BE EXTENDED AS REQUIRED BY SIGHT DISTANCE CONDITIONS.



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:**

REFER TO THE STANDARD PLAN 626.00 WHEN INSTALLING PAVEMENT MARKINGS OVER RUMBLE STRIPS.

LANE LINES SHALL BE AN INTERMITTENT OR SOLID WHITE.

INTERMITTENT LINES SHALL BE 10 FEET IN LENGTH SEPARATED BY 30 FOOT GAPS.

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

"NO PASSING" LINES SHALL BE CONTINUOUS SOLID YELLOW.

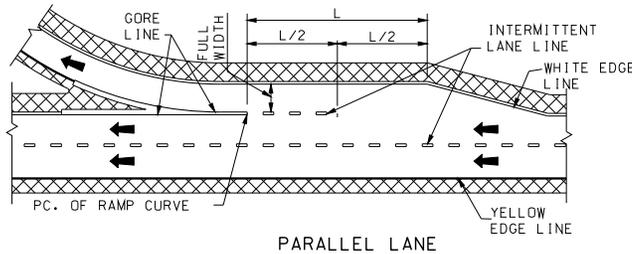
"NO PASSING" LINES SHALL BE PLACED AS SHOWN IN "LINE DETAIL". "NO PASSING" LINES ON A TWO-LANE, TWO-WAY HIGHWAY WHEN PASSING IS PROHIBITED IN EACH DIRECTION SHALL BE PLACED 4 INCHES APART AND THE INTERMITTENT CENTERLINE SHALL BE OMITTED.

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.

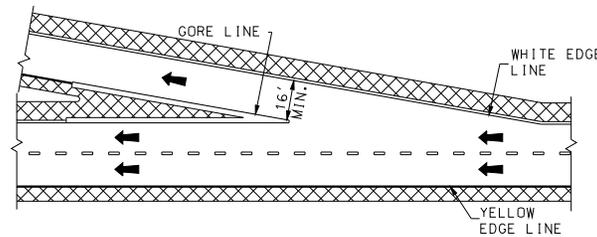
CROSSWALK LINES SHALL BE SOLID WHITE TRANSVERSE LINES 6 INCHES WIDE AT LEAST 6 FEET APART. CROSSWALK LINES ON THE INTERSECTION SIDE OF THE CROSSWALK SHALL MEET AT THE CURB.

GORE LINES SHALL BE A SOLID WHITE LINE WITH A WIDTH TWICE THAT OF THE EDGE LINE.

ARROWS AND WORD SYMBOLS SHALL BE SOLID WHITE.

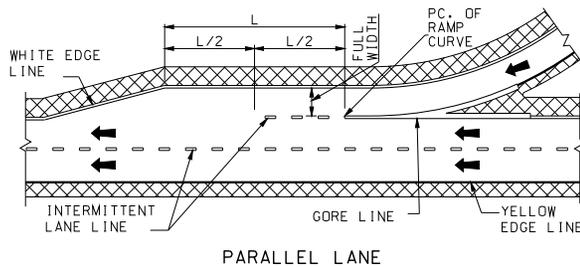


PARALLEL LANE

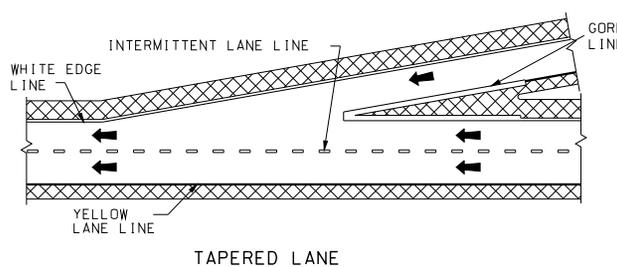


TAPERED LANE

**EXIT RAMP MARKING**

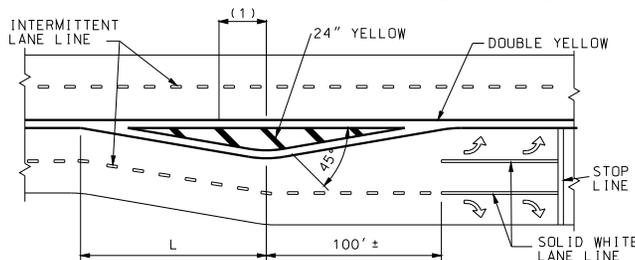


PARALLEL LANE

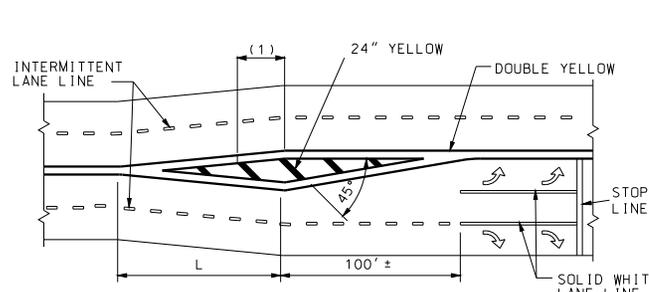


TAPERED LANE

**ENTRANCE RAMP MARKING**



OFFSET ONE LANE



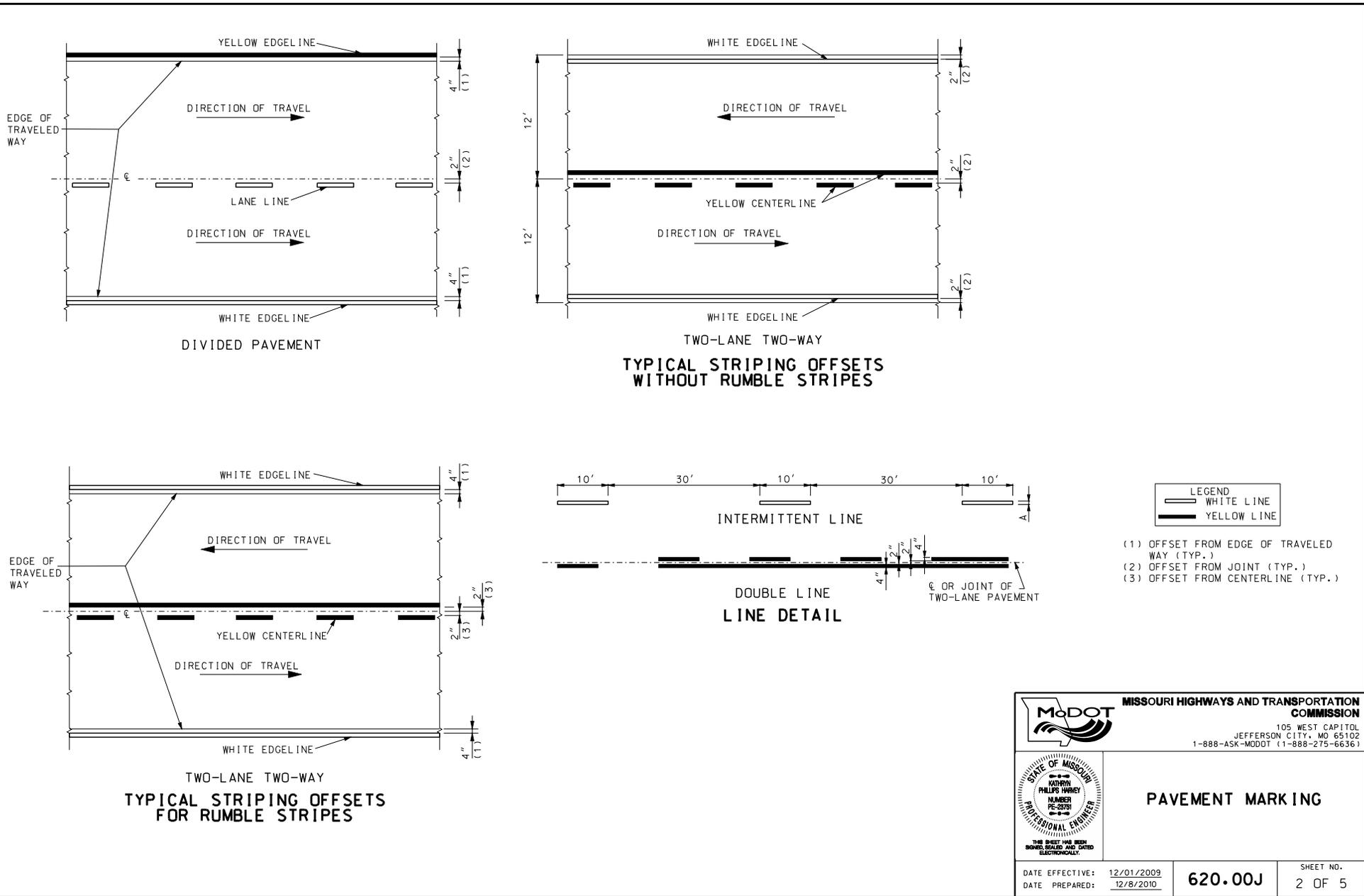
OFFSET BOTH LANES

**MEDIAN ISLAND LEFT TURN LANE MARKING**

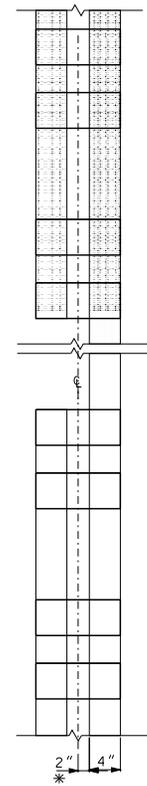
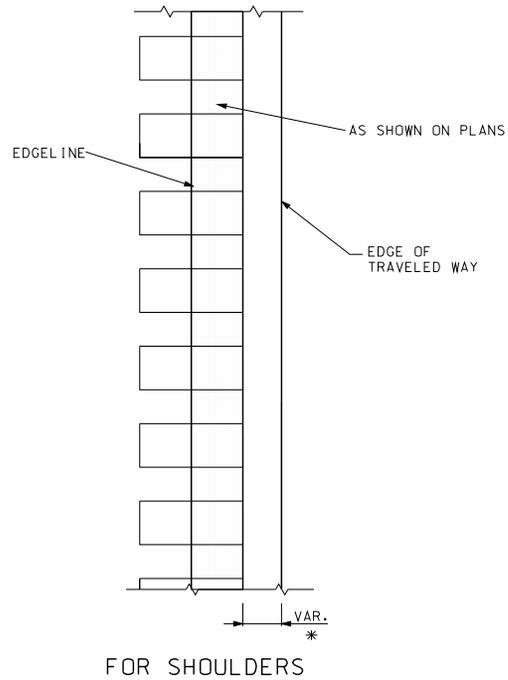
(1) 50' (TYP.) SPACE BETWEEN BARS. A MINIMUM OF 3 BARS ARE REQUIRED. IF NECESSARY, THE DISTANCE BETWEEN THE BARS SHALL BE DECREASED TO INSTALL 3 BARS.

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)		
		
<b>PAVEMENT MARKING</b>		
DATE EFFECTIVE: 12/01/2009 DATE PREPARED: 12/8/2010	<b>620.00J</b>	SHEET NO. 1 OF 5

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



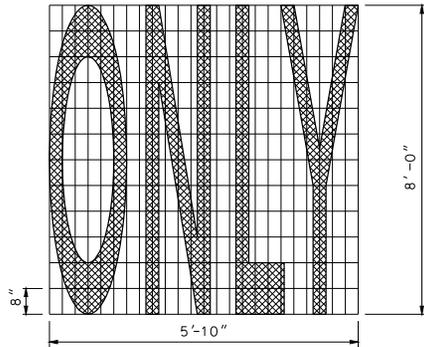
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



2 WAY 2 LANE  
(SEE TYPICAL STRIPING  
FOR RUMBLESTRIPS)

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

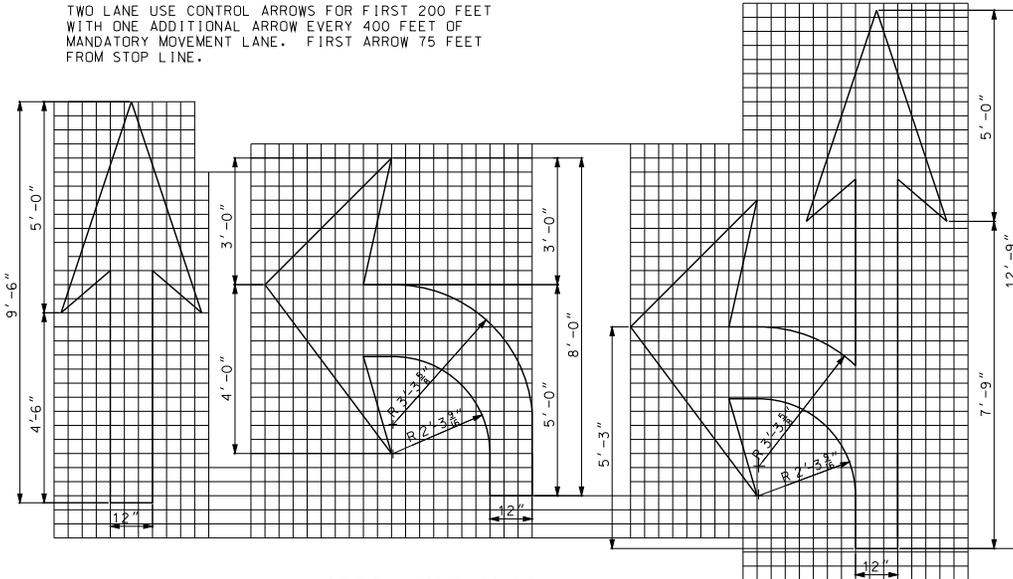
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>PAVEMENT MARKING</b> STRIPING THROUGH RUMBLE STRIPS
DATE EFFECTIVE: 12/01/2009 DATE PREPARED: 12/8/2010	<b>620.00J</b>	SHEET NO. 3 OF 5



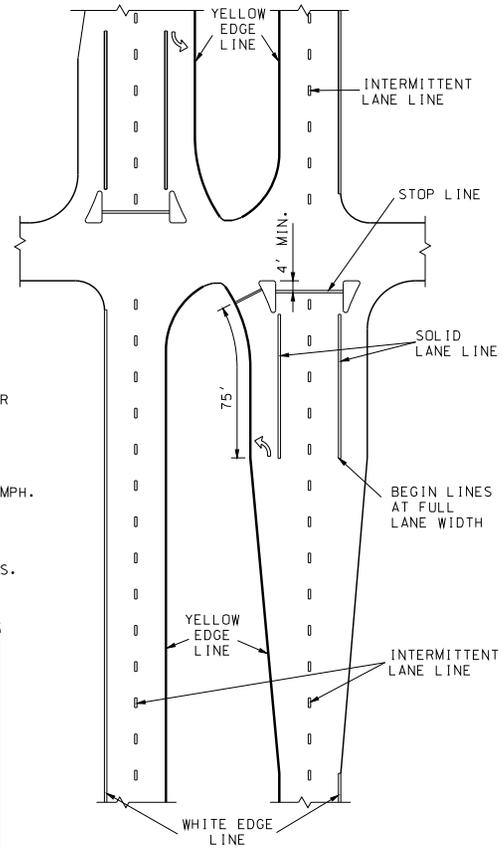
WORD MARKING  
**ELONGATED WORD & SYMBOL**

$L = S \times W$  WHEN POSTED SPEED 45 MPH OR GREATER OR  $WS^2 / 60$  WHEN POSTED SPEED IS 40 MPH OR LESS.  
 L = LENGTH OF TAPER IN FEET.  
 S = OFF PEAK 85 PERCENTILE SPEED IN MPH.  
 W = OFFSET DISTANCE IN FEET.  
 DISTANCE (L) SHALL BE EXTENDED AS REQUIRED BY SIGHT DISTANCE CONDITIONS.

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.



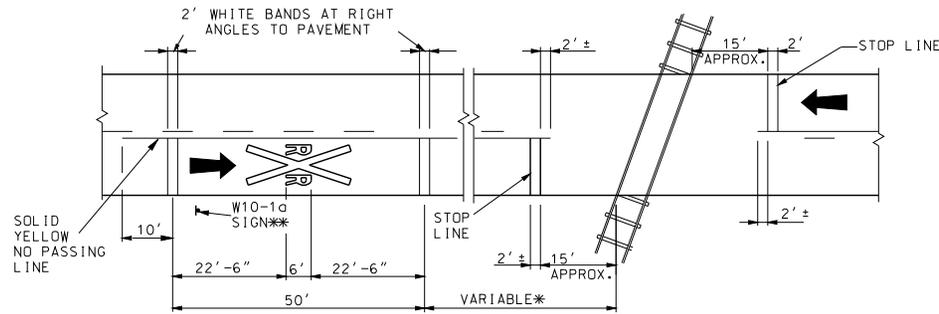
**ARROW MARKINGS**



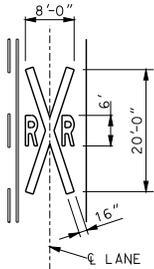
**SIGNALIZED GRADE INTERSECTION MARKING**

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>PAVEMENT MARKING</b>	
	DATE EFFECTIVE: 12/01/2009 DATE PREPARED: 12/8/2010	<b>620.00J</b>
		SHEET NO. 4 OF 5

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

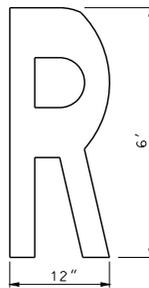


SYMBOL DETAIL

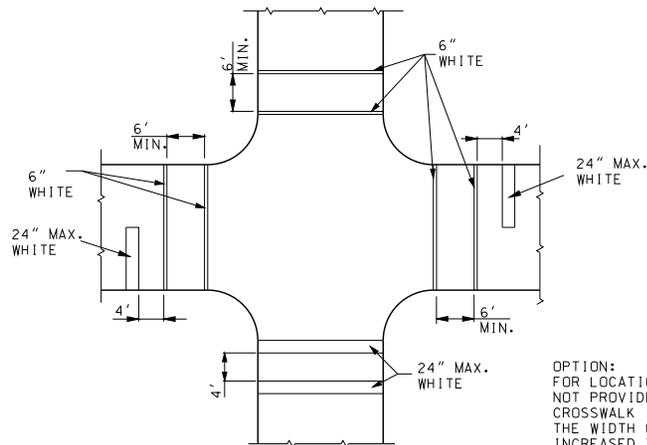
\* THE DISTANCE FROM THE RAILROAD CROSSING MARKING TO THE NEAREST TRACK WILL VARY ACCORDING TO THE APPROACH SPEED AND THE SIGHT DISTANCE OF THE VEHICULAR TRAFFIC APPROACHING, BUT SHALL BE NO LESS THAN 50 FEET.  
 A THREE-LANE ROADWAY SHALL BE MARKED WITH A CENTERLINE FOR TWO-LANE APPROACH OPERATION ON 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 W10-1a SIGN BY OTHERS.

**RAILROAD GRADE CROSSING**

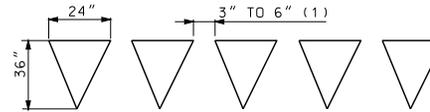


LETTER DETAIL



**SOLID WHITE PEDESTRIAN CROSSWALK**

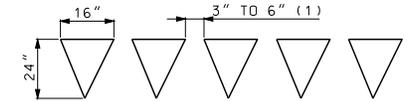
OPTION:  
 FOR LOCATIONS WHERE STOP BARS ARE NOT PROVIDED SPEEDS EXCEED 35 MPH OR CROSSWALK IN AN UNEXPECTED LOCATION, THE WIDTH OF THE CROSSWALK MAY BE INCREASED TO 24 INCHES.



DIRECTION OF TRAVEL

24 INCH YIELD LINE TRIANGLES

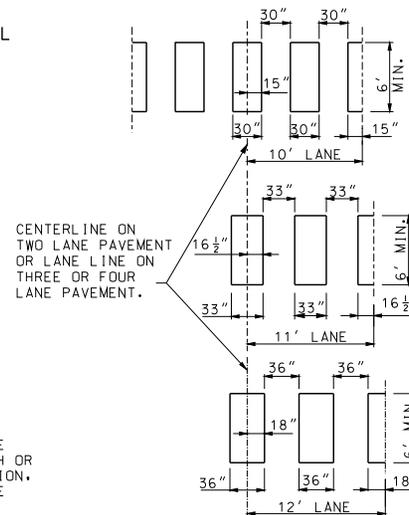
(1) TRIANGLES SHALL BE UNIFORMLY SPACED AND COVER THE COMPLETE WIDTH OF THE TRAVEL LANE. SPACING SHALL BE ADJUSTED SO THERE ARE NO PARTIAL TRIANGLES WITHIN THE YIELD MARKING.



DIRECTION OF TRAVEL

16 INCH YIELD LINE TRIANGLES

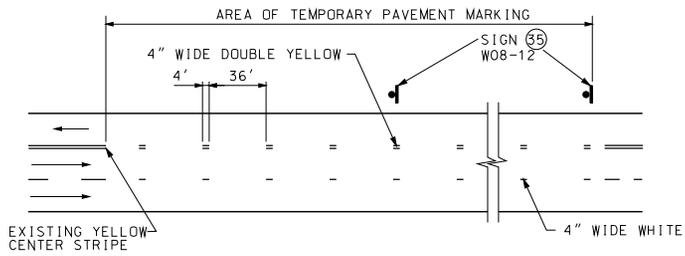
**YIELD LINE TRIANGLES**



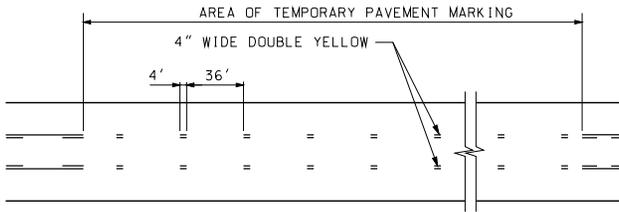
**WHITE MIDBLOCK (ZEBRA)**

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center"><b>PAVEMENT MARKING</b></p>
DATE EFFECTIVE: 12/01/2009 DATE PREPARED: 12/8/2010	<p align="center"><b>620.00J</b></p>
SHEET NO. 5 OF 5	

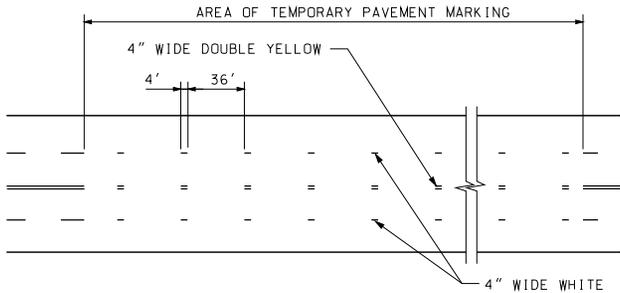
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



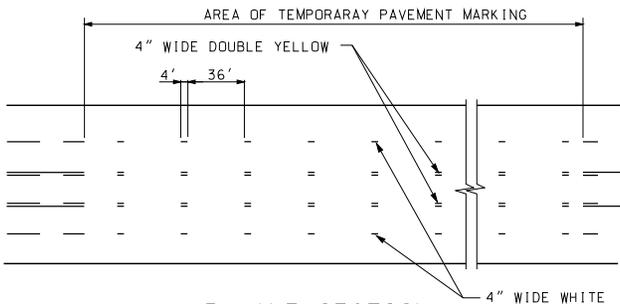
**2-LANE SECTION WITH AUXILIARY LANE**



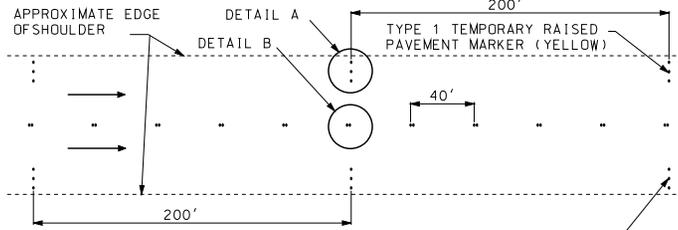
**3-LANE SECTION**



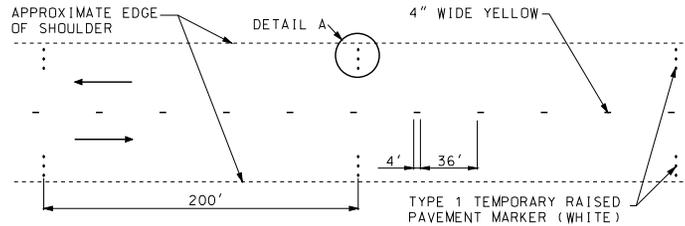
**4-LANE SECTION**



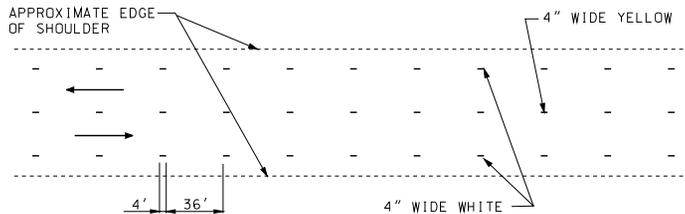
**5-LANE SECTION**



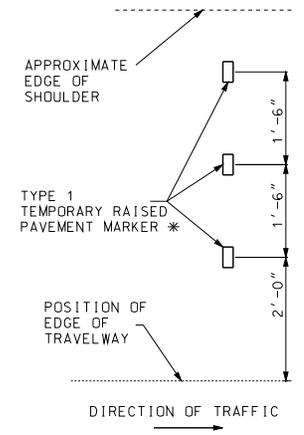
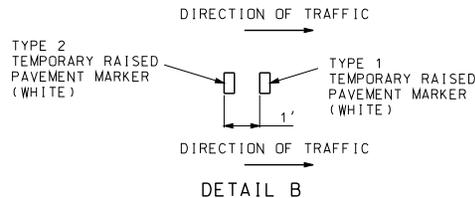
**EDGE LINES ON MULTILANE DIVIDED SECTIONS**



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



**EDGE LINES ON SECTIONS WITH AGGREGATE OR PAVED SHOULDERS 4 FEET OR LESS**



**DETAIL A**

\* 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.



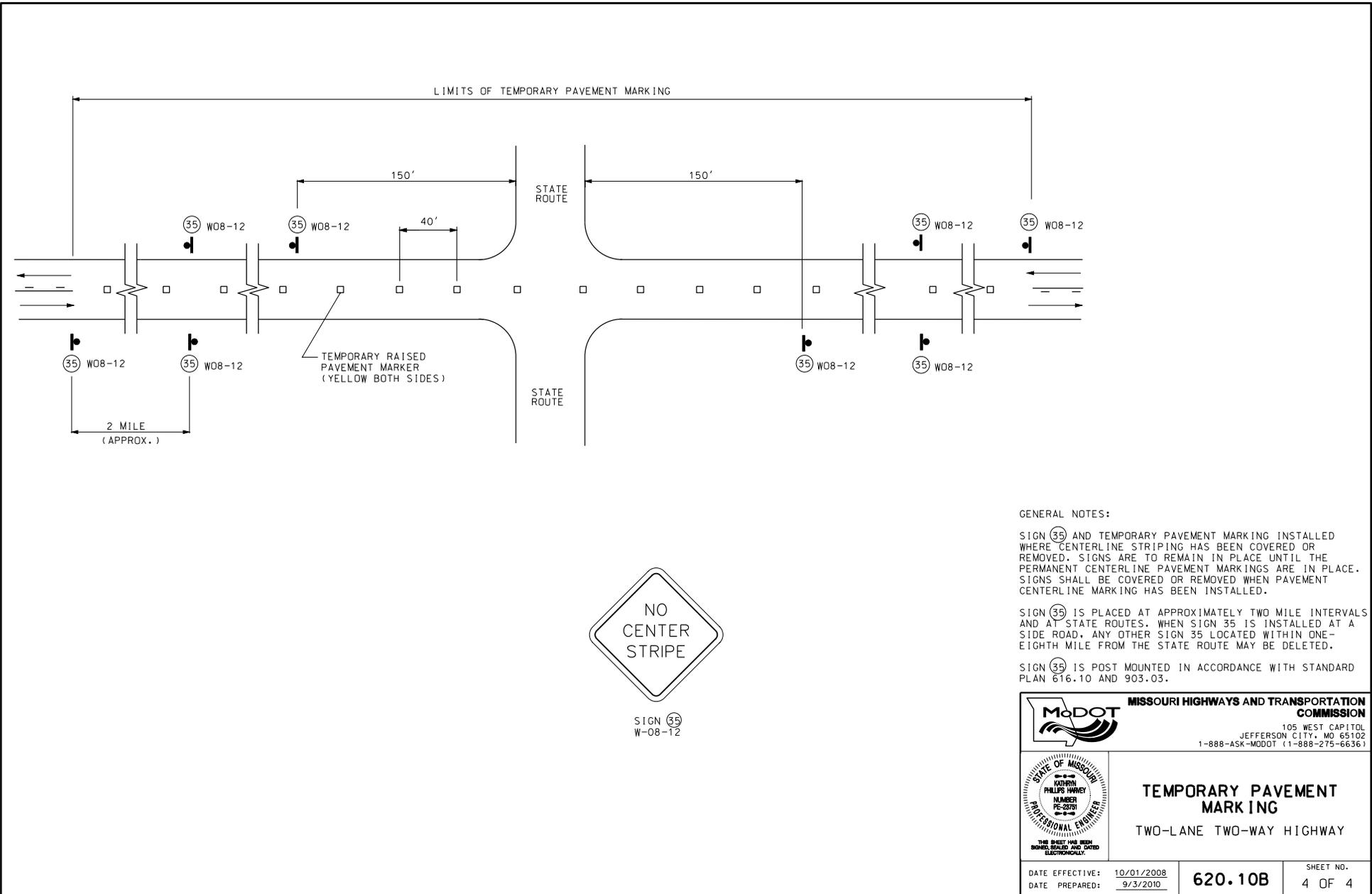
**SIGN (35) W-08-12**

**GENERAL NOTES:**

- SIGN (35) SHALL BE POST MOUNTED.
- SIGN (35) IS PLACED AT APPROXIMATELY TWO MILE INTERVALS AND AT SIDE ROADS. WHEN INSTALLED AT A SIDE ROAD, ANY OTHER SIGN (35) LOCATED WITHIN ONE-EIGHTH MILE FROM THE SIDE ROAD MAY BE DELETED.

<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b></p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p><b>TEMPORARY PAVEMENT MARKING</b></p> <p>TEMPORARY PAVEMENT MARKING</p>
<p>DATE EFFECTIVE: 10/01/2008</p> <p>DATE PREPARED: 12/8/2010</p>	<p><b>620.10B</b></p> <p>SHEET NO. 1 OF 4</p>

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



**GENERAL NOTES:**

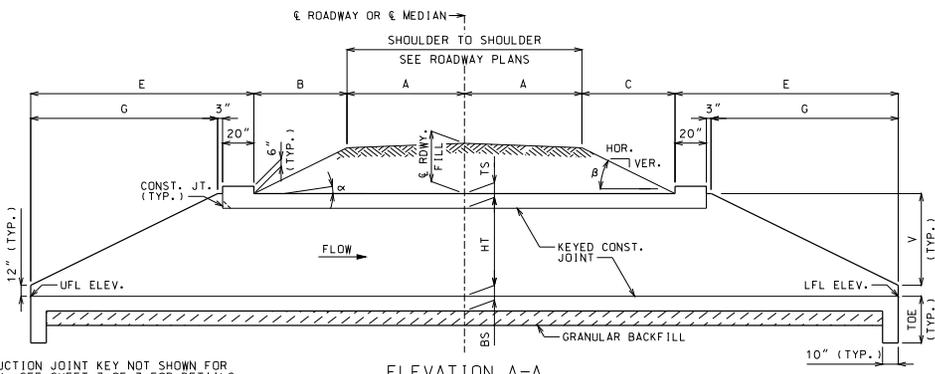
SIGN 35 AND TEMPORARY PAVEMENT MARKING INSTALLED WHERE CENTERLINE STRIPING HAS BEEN COVERED OR REMOVED. SIGNS ARE TO REMAIN IN PLACE UNTIL THE PERMANENT CENTERLINE PAVEMENT MARKINGS ARE IN PLACE. SIGNS SHALL BE COVERED OR REMOVED WHEN PAVEMENT CENTERLINE MARKING HAS BEEN INSTALLED.

SIGN 35 IS PLACED AT APPROXIMATELY TWO MILE INTERVALS AND AT STATE ROUTES. WHEN SIGN 35 IS INSTALLED AT A SIDE ROAD, ANY OTHER SIGN 35 LOCATED WITHIN ONE-EIGHTH MILE FROM THE STATE ROUTE MAY BE DELETED.

SIGN 35 IS POST MOUNTED IN ACCORDANCE WITH STANDARD PLAN 616.10 AND 903.03.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> <small>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</small>
	<p><b>TEMPORARY PAVEMENT MARKING</b></p> <p>TWO-LANE TWO-WAY HIGHWAY</p>
DATE EFFECTIVE: 10/01/2008 DATE PREPARED: 9/3/2010	<b>620.10B</b>
SHEET NO. 4 OF 4	

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



ELEVATION A-A

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 SECTION 206 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

### EQUATIONS FOR COMPUTING $\alpha$ , $\beta$ , B AND C

$\alpha$  = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO  $\epsilon$  ROADWAY OR  $\epsilon$  MEDIAN =  $\text{ARCTAN} \left( \frac{\text{UFL ELEV.} - \text{LFL ELEV.}}{W} \right)$

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

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

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

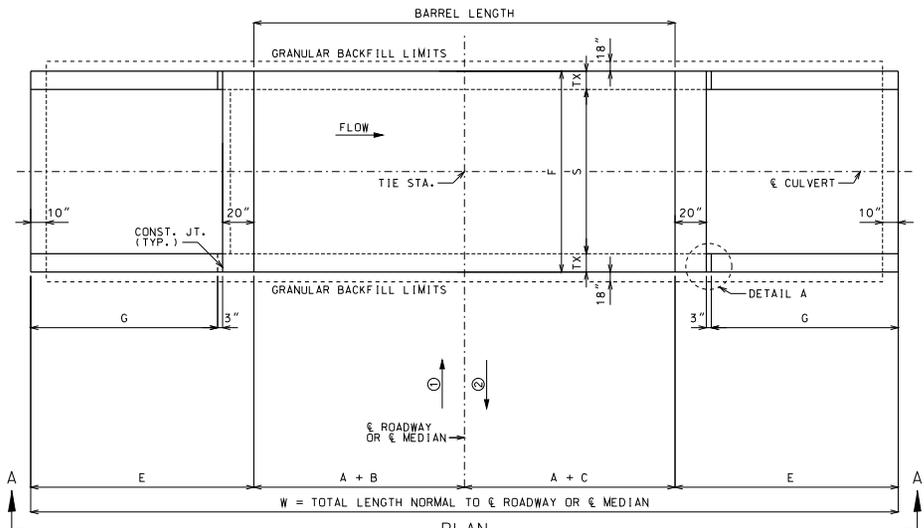
CS = CROSS SLOPE OF EACH PART OF ROADWAY INCLUDING CROWN, LANES AND SHOULDERS. CS IS POSITIVE IF RISING AND NEGATIVE IF FALLING AWAY FROM  $\epsilon$  ROADWAY OR  $\epsilon$  MEDIAN.

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

TO ACCOUNT FOR A VARYING PROFILE GRADE THE  $\epsilon$  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.

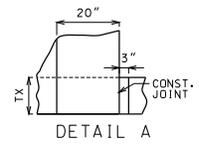
SEE ROADWAY PLANS FOR FILL SLOPES, CROSS SLOPES,  $\epsilon$  ROADWAY FILL, UPPER FLOW LINE (UFL) ELEVATION AND LOWER FLOW LINE (LFL) ELEVATION.

LAYOUT DIMENSIONS	
VARIABLE	DIMENSION
$\alpha$	SEE EQUATIONS
$\beta$	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
TOE	MAX{(BS + 12"), 40"}



PLAN

① AHEAD STATION WHERE STREAMS FLOW LEFT TO RIGHT. ② AHEAD STATION WHERE STREAMS FLOW RIGHT TO LEFT.



**GENERAL NOTES:**

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

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

DESIGN LOADS: VEHICULAR = HL-93 MINUS LANE LOAD  
EARTH = 120 LB/FT<sup>3</sup>  
EQUIVALENT FLUID PRESSURE = 30 LB/FT<sup>3</sup> (MIN.) - 60 LB/FT<sup>3</sup> (MAX.)

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.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**CONCRETE SINGLE BOX CULVERT**

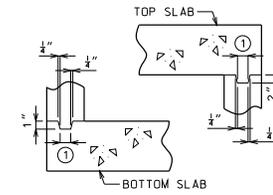
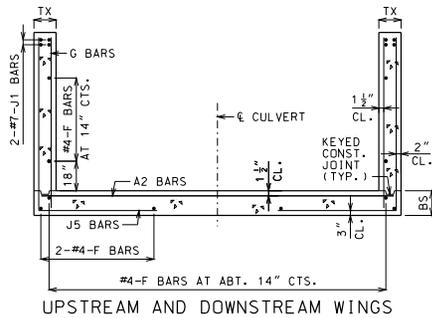
SKEW: SQUARE  
WINGS: STRAIGHT

LAYOUT

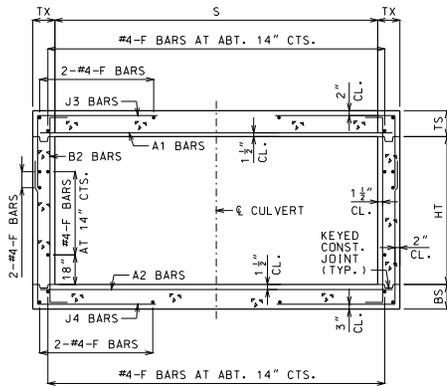
DATE EFFECTIVE: 04/01/2011	<b>703.10H</b>	SHEET NO. 1 OF 3
DATE PREPARED: 4/18/2011		

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

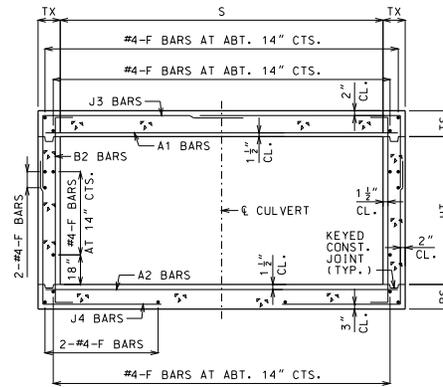




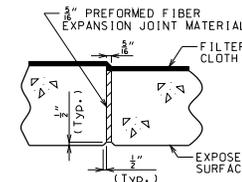
KEYED CONSTRUCTION JOINT  
 ① APPROXIMATELY ONE THIRD OF WALL THICKNESS



BARREL  
 DESIGN FILLS OVER 2'-0"



BARREL  
 DESIGN FILLS 2'-0" OR LESS



TRANSVERSE JOINT THRU BARREL

PERFORMED FIBER EXPANSION JOINT MATERIAL SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH NO. 10 GAGE COPPER WIRE OR NO. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH THREE 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 SECTION 1011 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

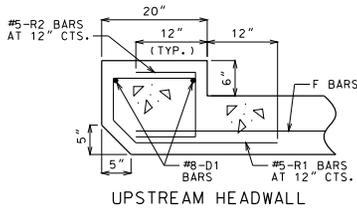
GENERAL NOTES:

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.

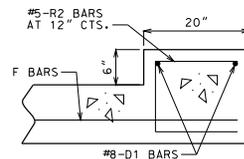
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO  $\epsilon$  CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

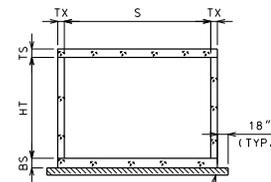
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".



UPSTREAM HEADWALL



DOWNSTREAM HEADWALL



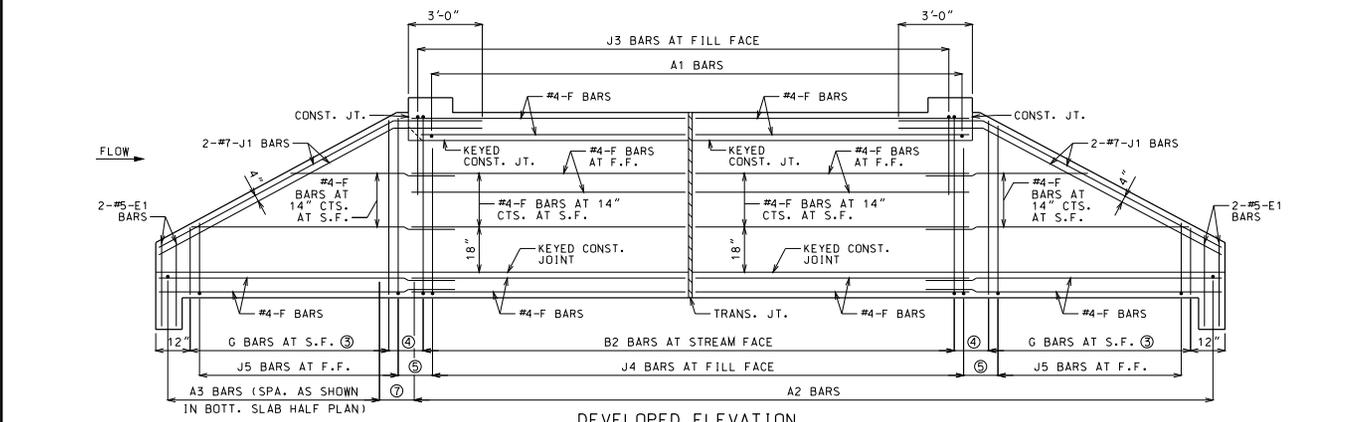
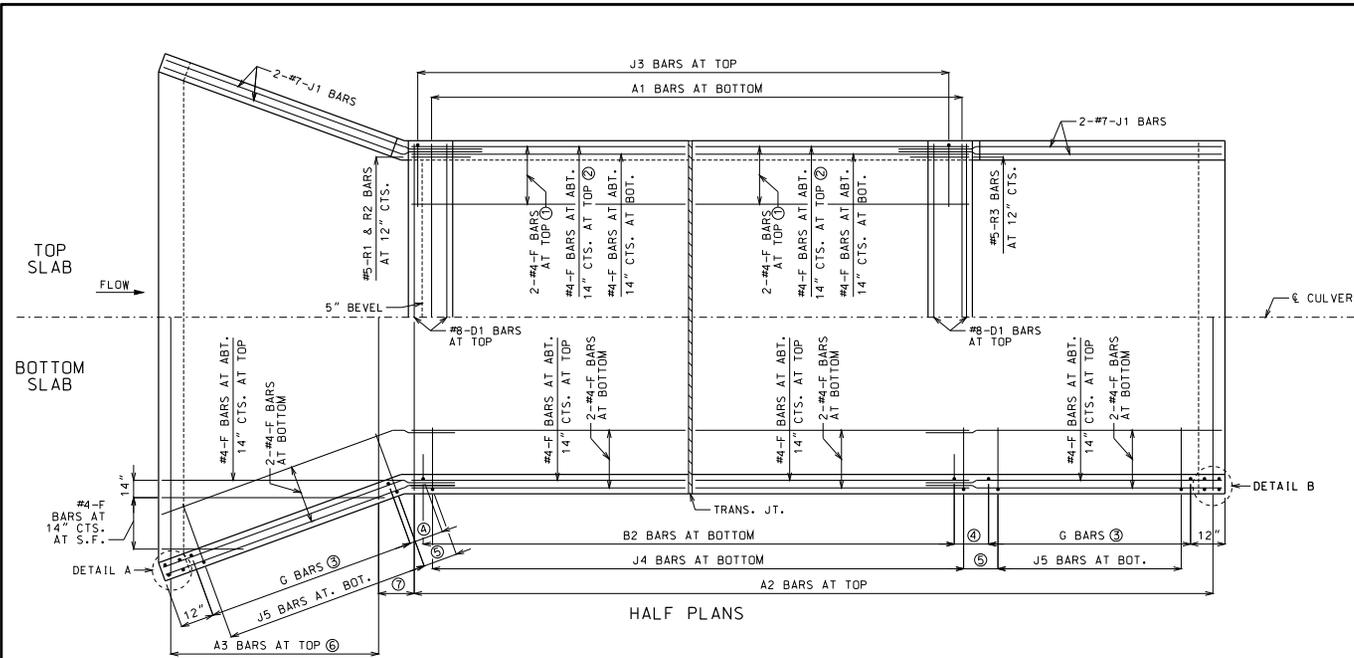
BARREL  
 GRANULAR BACKFILL LIMITS

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b>	
	SKEW: SQUARE WINGS: STRAIGHT	
SECTIONS		
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	<b>703.10H</b>	SHEET NO. <b>3 OF 3</b>

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.



J1 BARS MAY BE BENT IN FIELD OR SHOP.  
CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY, SEE SHEET 3 OF 3 FOR DETAILS.

**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 LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

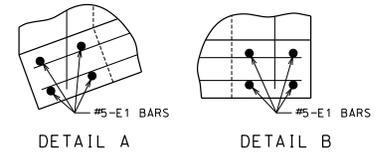
MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

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

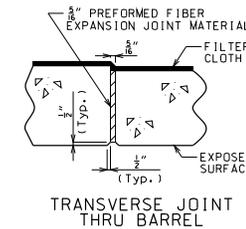
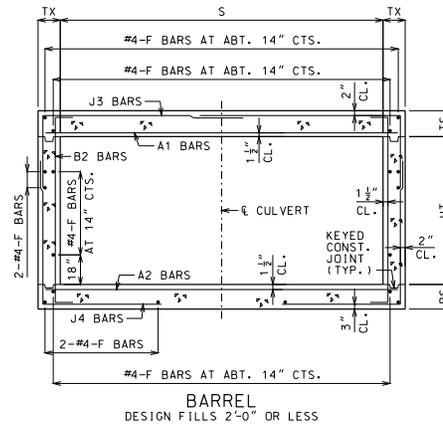
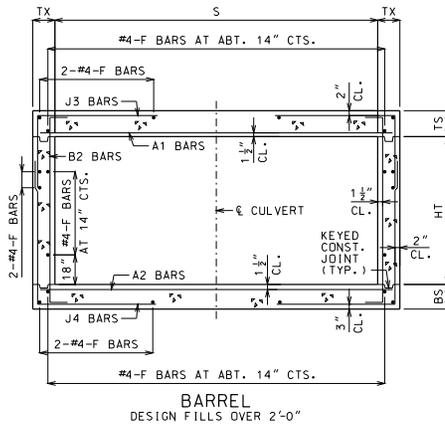
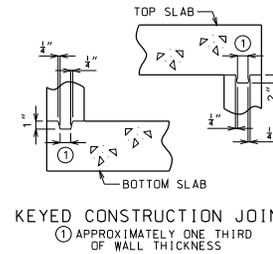
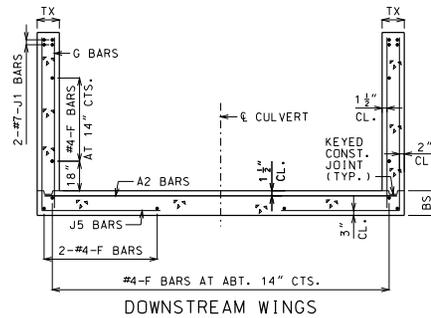
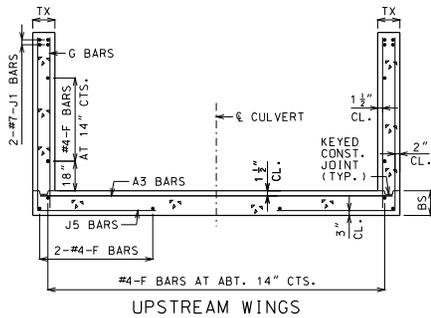
WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

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.
  - HALF PLANS ARE SYMMETRICAL ABOUT  $\epsilon$  CULVERT.
  - 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 TO BE LOCATED AT UPSTREAM END.
  - ① USE THESE BARS FOR DESIGN FILLS OVER 2'-0".
  - ② USE THESE BARS FOR DESIGN FILLS 2'-0" OR LESS.
  - ③ SAME SIZE AND SPACING AS B2 BARS
  - ④ VARIES, 12" MAXIMUM
  - ⑤ J4 BAR SPACING
  - ⑥ SAME SIZE AND SPACING AS A2 BARS
  - ⑦ A2 BAR SPACING

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> <small>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</small>	<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: SQUARE WINGS: FLARED REINFORCEMENT	
	DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	<b>703.11H</b>



PREFORMED FIBER EXPANSION JOINT MATERIAL SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH NO. 10 GAGE COPPER WIRE OR NO. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH THREE 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 SECTION 1011 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

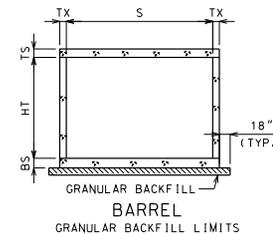
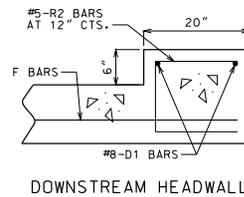
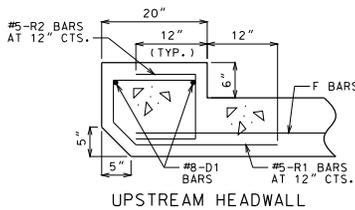
GENERAL NOTES:

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  $\epsilon$  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>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b>	
	SKEW: SQUARE WINGS: FLARED	
SECTIONS		SHEET NO. <b>703.11H</b>
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011		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 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 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:

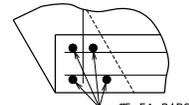
BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT

CUT SECTION LENGTHS UP TO 60 FEET

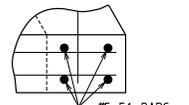
WHEN BARREL AND CUT SECTION LENGTH RESTRICTIONS REQUIRE TRANSVERSE JOINTS TO BE LOCATED UNDER A TRAVELED WAY WITH DESIGN FILLS 2 FEET OR LESS, THE JOINTS SHALL BE LOCATED TO MINIMIZE THE LENGTH OF JOINT UNDER THE TRAVELED WAY.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

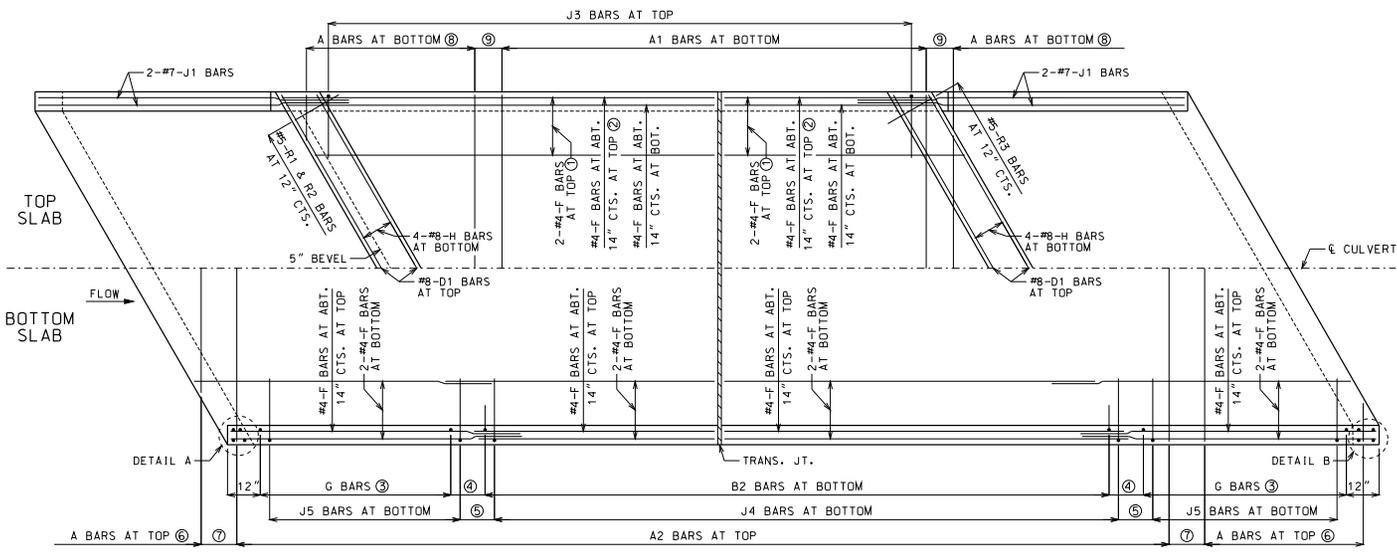
FOR CUT SECTION DETAILS, SEE 703.16.



DETAIL A



DETAIL B



HALF PLANS

**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.

HALF PLANS ARE SYMMETRICAL ABOUT  $\epsilon$  CULVERT.

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 TO BE LOCATED AT UPSTREAM END.

① USE THESE BARS FOR DESIGN FILLS OVER 2'-0".

② USE THESE BARS FOR DESIGN FILLS 2'-0" OR LESS.

③ SAME SIZE AND SPACING AS B2 BARS

④ VARIES, 12" MAXIMUM

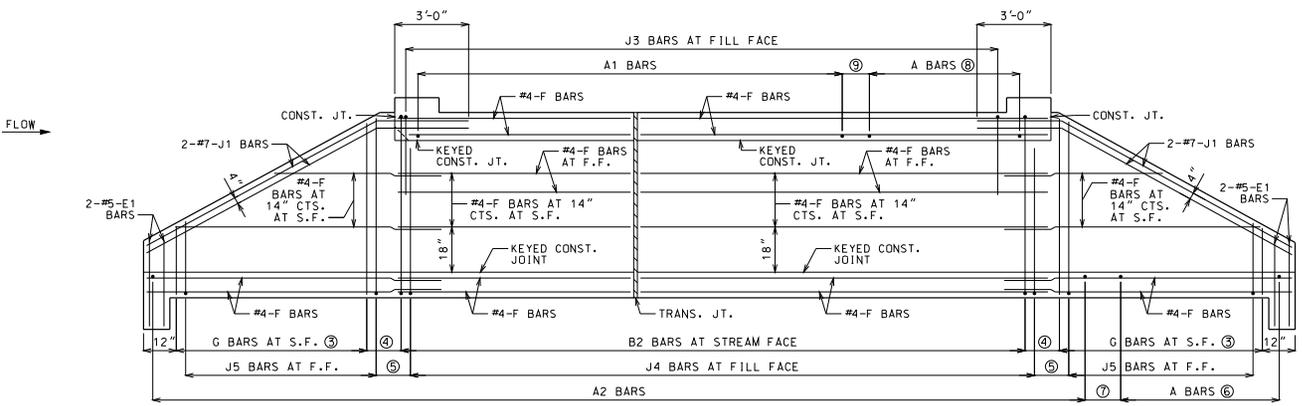
⑤ J4 BAR SPACING

⑥ SAME SIZE AND SPACING AS A2 BARS

⑦ A2 BAR SPACING

⑧ SAME SIZE AND SPACING AS A1 BARS

⑨ A1 BAR SPACING



ELEVATION

J1 BARS MAY BE BENT IN FIELD OR SHOP.

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

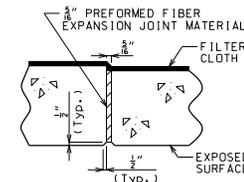
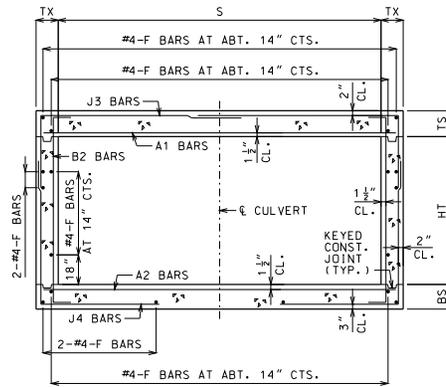
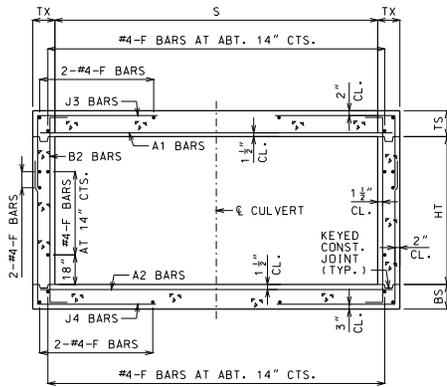
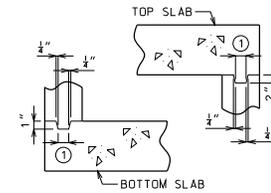
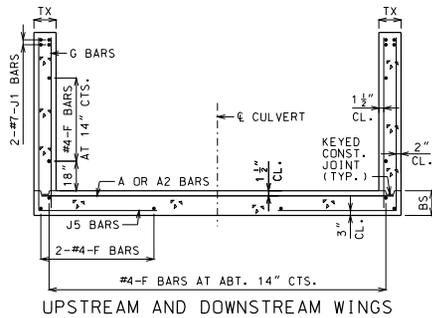
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

**STATE OF MISSOURI**  
 DENNIS W. HECKMAN  
 NUMBER PE-2714  
 PROFESSIONAL ENGINEER

**CONCRETE SINGLE BOX CULVERT**  
 SKEW: LEFT ADVANCE  
 WINGS: STRAIGHT

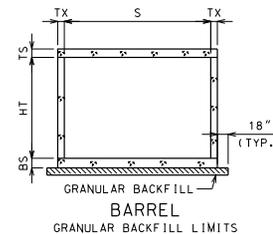
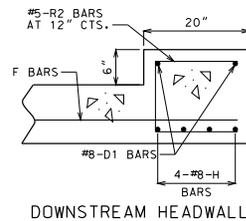
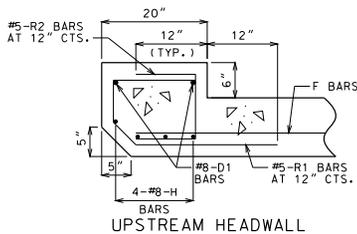
REINFORCEMENT

DATE EFFECTIVE: 04/01/2011	<b>703.12H</b>	DATE PREPARED: 4/18/2011	SHEET NO. 2 OF 3
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PREFORMED FIBER EXPANSION JOINT MATERIAL SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH NO. 10 GAGE COPPER WIRE OR NO. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

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GENERAL NOTES:

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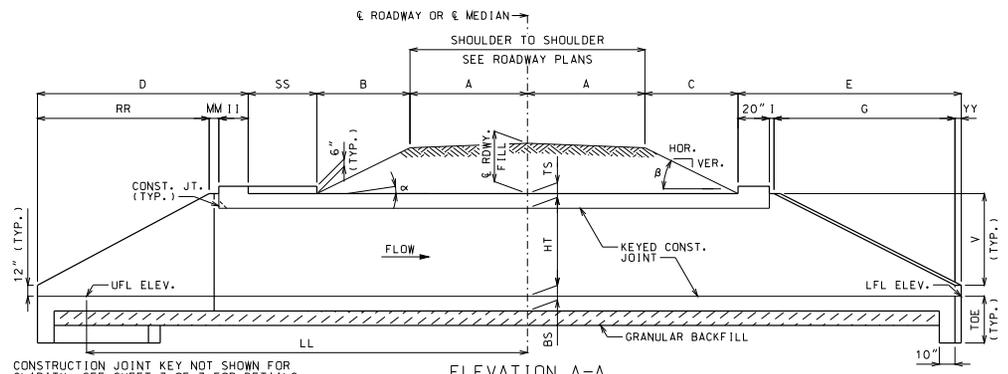
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

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

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: LEFT ADVANCE WINGS: STRAIGHT  SECTIONS	
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011		<b>703.12H</b> SHEET NO. 3 OF 3	

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

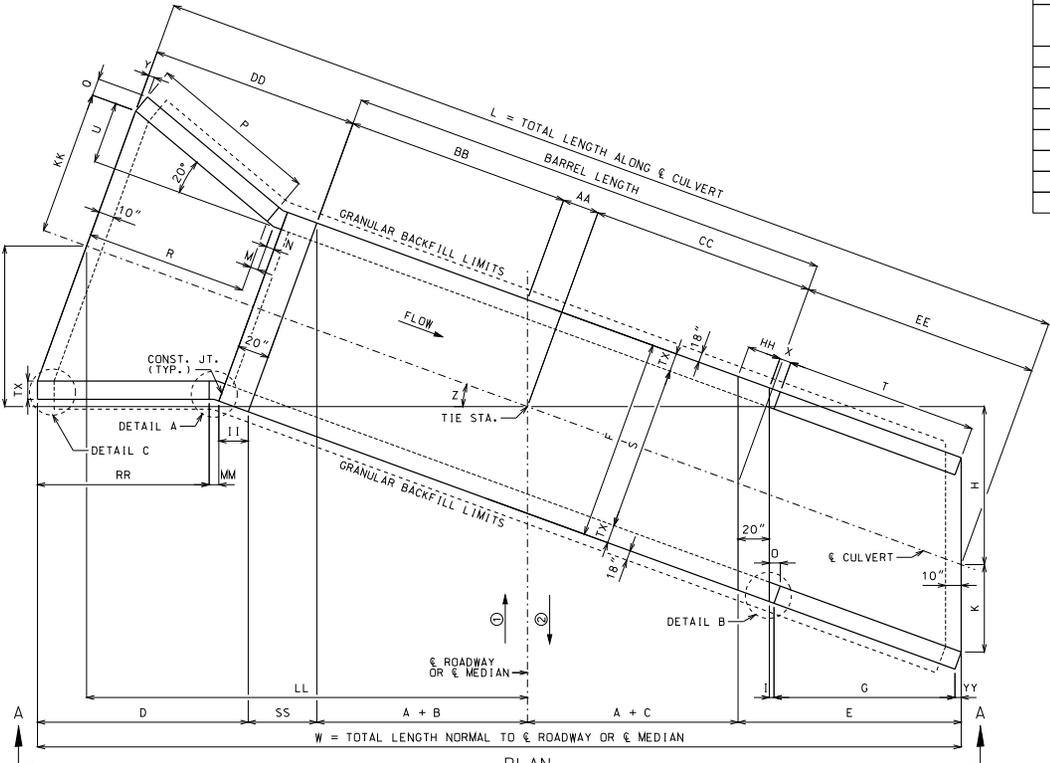
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



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 SECTION 206 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

ELEVATION A-A



① AHEAD STATION WHERE STREAMS FLOW LEFT TO RIGHT. ② AHEAD STATION WHERE STREAMS FLOW RIGHT TO LEFT.

EQUATIONS FOR COMPUTING  $\alpha$ ,  $\beta$ , B AND C

$\alpha$  = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO  $\epsilon$  ROADWAY OR  $\epsilon$  MEDIAN =  $\text{ARCTAN} \left( \frac{\text{UFL ELEV.} - \text{LFL ELEV.}}{W} \right)$

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

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

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

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

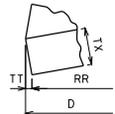
THE TERM "A(CS)" IS THE DIFFERENCE IN ELEVATION BETWEEN  $\epsilon$  ROADWAY OR  $\epsilon$  MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO  $\epsilon$  ROADWAY OR  $\epsilon$  MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS.

TO ACCOUNT FOR A VARYING PROFILE GRADE THE  $\epsilon$  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.

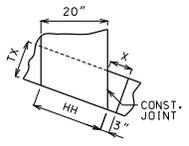
SEE ROADWAY PLANS FOR FILL SLOPES, CROSS SLOPES,  $\epsilon$  ROADWAY FILL, UPPER FLOW LINE (UFL) ELEVATION AND LOWER FLOW LINE (LFL) ELEVATION.

LAYOUT DIMENSIONS

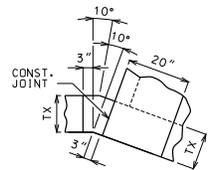
VARIABLE	DIMENSION	VARIABLE	DIMENSION	VARIABLE	DIMENSION
$\alpha$	SEE EQUATIONS	M	$N(\text{COS } 20^\circ)$	BB	$(A + B)(\text{SEC } Z)$
$\beta$	SEE EQUATIONS	N	$3'' + \text{TX}(\text{TAN } 10^\circ)$	CC	$(A + C)(\text{SEC } Z)$
B	SEE EQUATIONS	O	$I + \text{YY}$	DD	$R + M + N + 20''$
C	SEE EQUATIONS	P	$2V[\text{SEC}(Z + 20^\circ)]$	EE	$E(\text{SEC } Z)$
D	$Z \geq 20^\circ: I1 + MM + RR$ $Z < 20^\circ: I1 + MM + RR + TT$	D	$\text{TX}(\text{COS } 20^\circ)$	HH	$20''(\text{SEC } Z)$
E	$G + O + 20''$	R	$P(\text{COS } 20^\circ)$	I1	$20''(\text{COS } Z)$
F	$S + 2\text{TX}$	T	$G(\text{SEC } Z)$	KK	$(S/2) + U$
G	$2V$	U	$(R + M)(\text{TAN } 20^\circ)$	LL	$(AA + BB + DD)(\text{COS } Z)$
H	$(A + C + E)(\text{TAN } Z)$	V	$\text{HT} + \text{TS} - 12''$	MM	$3''[\text{COS } Z + \text{COS}(Z - 20^\circ)]$
I	$3''(\text{COS } Z)$	W	$2A + B + C + D + E + SS$	RR	$P[\text{COS}(Z - 20^\circ)]$
J	$(AA + BB + DD)(\text{SIN } Z)$	X	$3'' + \text{TX}(\text{TAN } Z)$	SS	$F(\text{SIN } Z)$
K	$(S/2)(\text{SEC } Z)$	Y	$\text{TX}(\text{SIN } 20^\circ)$	TT	$\text{TX}[\text{SIN}(20^\circ - Z)]$
L	$AA + BB + CC + DD + EE$	Z	SKREW ANGLE	YY	$\text{TX}(\text{SIN } Z)$
		AA	$(F/2)(\text{TAN } Z)$	TOE	$\text{MAX}\{BS + 12'', 40''\}$



DETAIL C  
For  $Z < 20^\circ$



DETAIL B



DETAIL A

GENERAL NOTES:

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

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

DESIGN LOADS: VEHICULAR = HL-93 MINUS LANE LOAD  
EARTH = 120 LB/FT<sup>3</sup>  
EQUIVALENT FLUID PRESSURE = 30 LB/FT<sup>3</sup> (MIN.) - 60 LB/FT<sup>3</sup> (MAX.)

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)

THIS SHEET HAS BEEN  
ELECTRONICALLY SEALED AND  
DATED

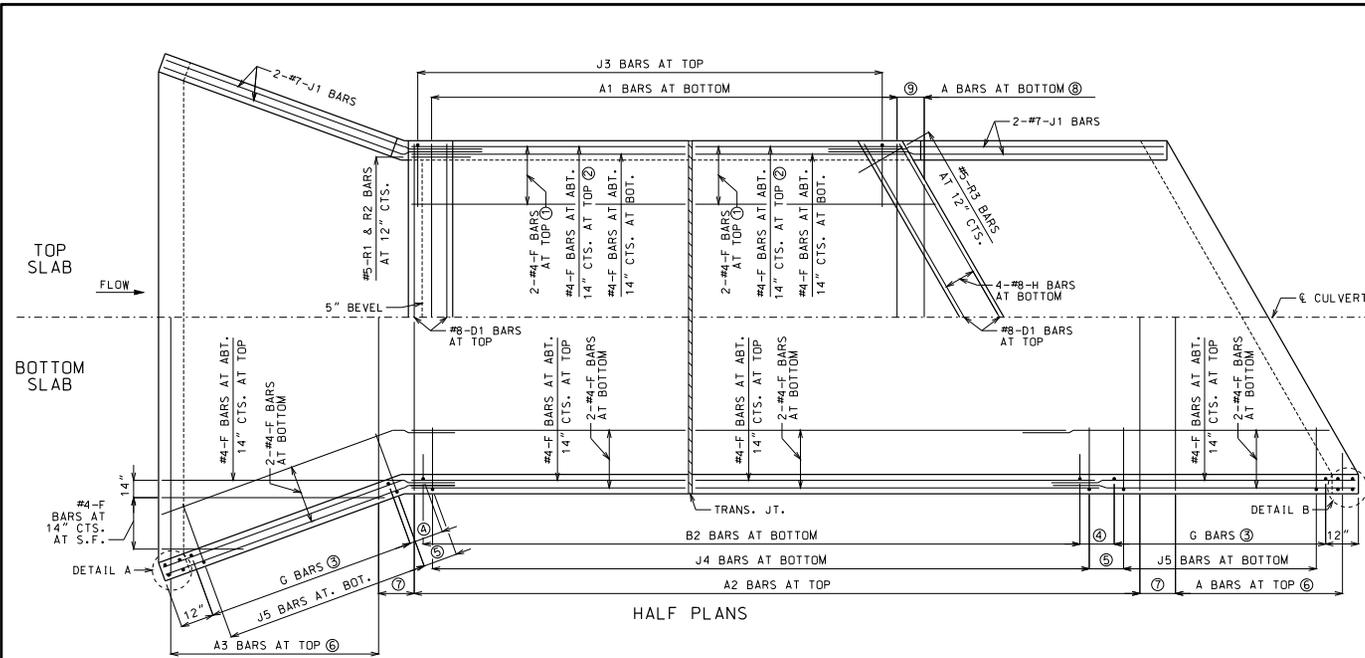
**CONCRETE  
SINGLE BOX CULVERT**

SKREW: LEFT ADVANCE  
WINGS: FLARED

LAYOUT

DATE EFFECTIVE: 04/01/2011	<b>703.13H</b>	SHEET NO. 1 OF 3
DATE PREPARED: 4/18/2011		

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 LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

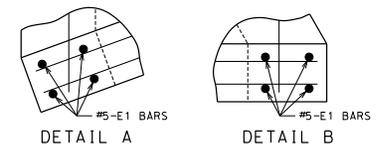
MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

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

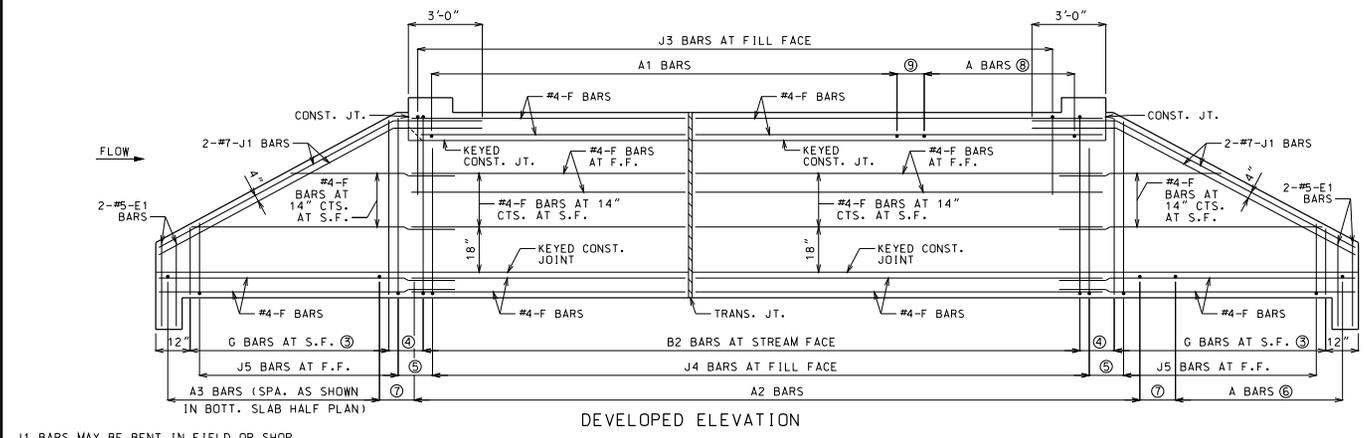
BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT  
CUT SECTION LENGTHS UP TO 60 FEET

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.

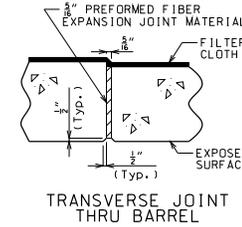
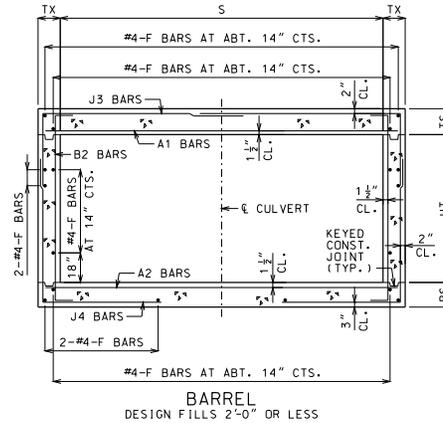
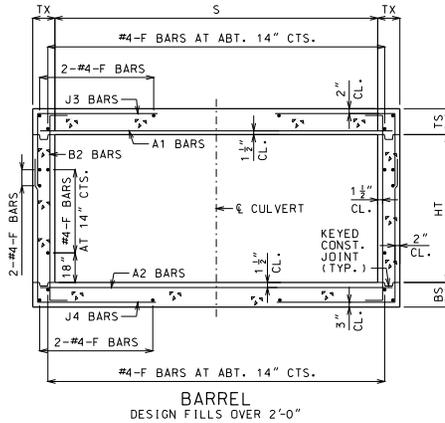
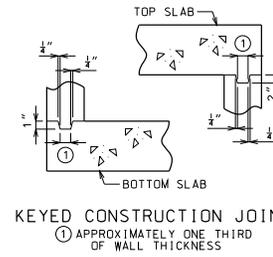
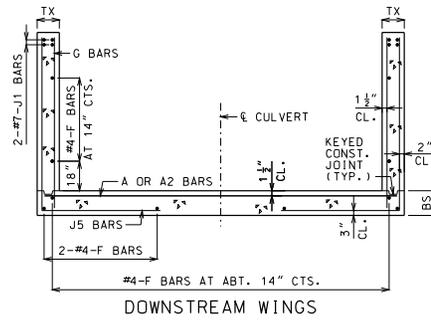
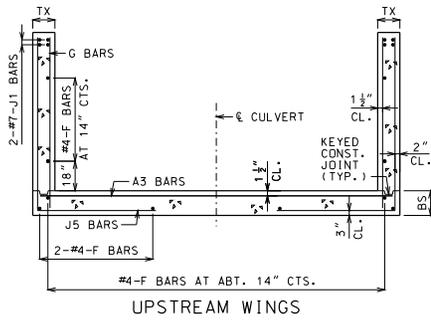


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- HALF PLANS ARE SYMMETRICAL ABOUT & CULVERT.
- DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
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- LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
- BEVELED HEADWALL TO BE LOCATED AT UPSTREAM END.
- ① USE THESE BARS FOR DESIGN FILLS OVER 2'-0".
  - ② USE THESE BARS FOR DESIGN FILLS 2'-0" OR LESS.
  - ③ SAME SIZE AND SPACING AS B2 BARS
  - ④ VARIES, 12" MAXIMUM
  - ⑤ J4 BAR SPACING
  - ⑥ SAME SIZE AND SPACING AS A2 BARS
  - ⑦ A2 BAR SPACING
  - ⑧ SAME SIZE AND SPACING AS A1 BARS
  - ⑨ A1 BAR SPACING



J1 BARS MAY BE BENT IN FIELD OR SHOP.  
CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY, SEE SHEET 3 OF 3 FOR DETAILS.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: LEFT ADVANCE WINGS: FLARED REINFORCEMENT	
	DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	<b>703.13H</b> SHEET NO. 2 OF 3



PREFORMED FIBER EXPANSION JOINT MATERIAL SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH NO. 10 GAGE COPPER WIRE OR NO. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

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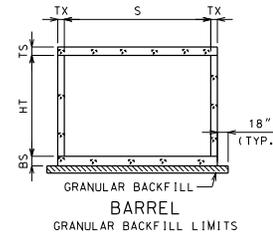
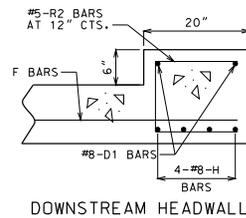
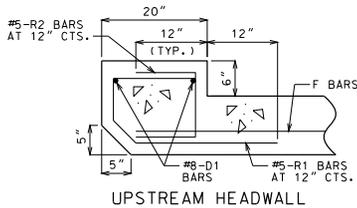
GENERAL NOTES:

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	<b>CONCRETE SINGLE BOX CULVERT</b>	
	SKEW: LEFT ADVANCE WINGS: FLARED	
SECTIONS		
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	<b>703.13H</b>	SHEET NO. <b>3 OF 3</b>

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 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 LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

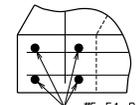
MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

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

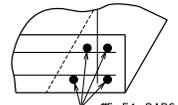
BARREL LENGTH UP TO 90 FEET WITHOUT A TRANSVERSE JOINT  
CUT SECTION LENGTHS UP TO 60 FEET

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.

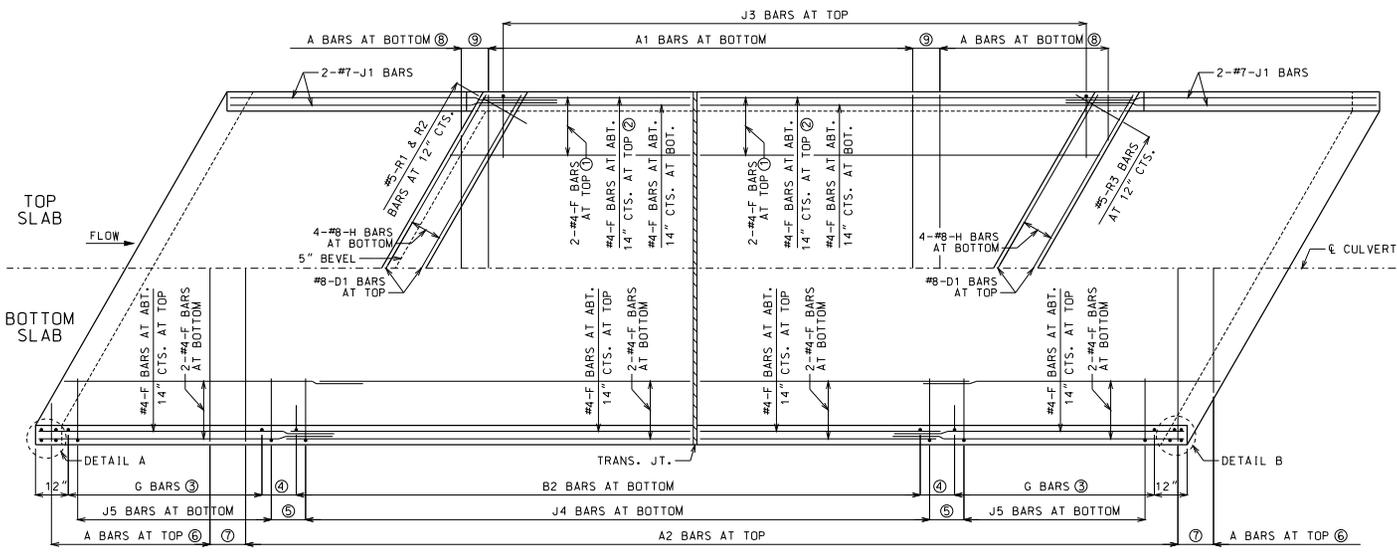
TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.  
FOR CUT SECTION DETAILS, SEE 703.16.



DETAIL A



DETAIL B

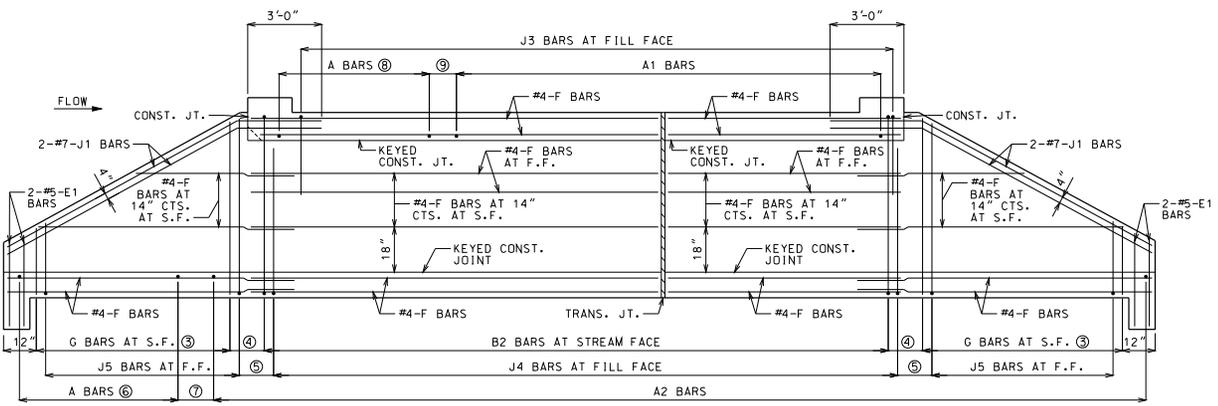


HALF PLANS

**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.

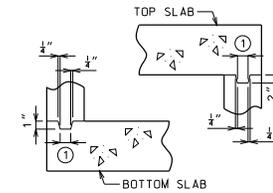
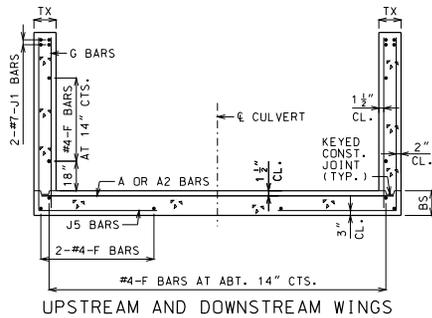
- HALF PLANS ARE SYMMETRICAL ABOUT CULVERT.
- DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.
- MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".
- LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.
- BEVELED HEADWALL TO BE LOCATED AT UPSTREAM END.
- ① USE THESE BARS FOR DESIGN FILLS OVER 2'-0".
- ② USE THESE BARS FOR DESIGN FILLS 2'-0" OR LESS.
- ③ SAME SIZE AND SPACING AS B2 BARS
- ④ VARIES, 12" MAXIMUM
- ⑤ J4 BAR SPACING
- ⑥ SAME SIZE AND SPACING AS A2 BARS
- ⑦ A2 BAR SPACING
- ⑧ SAME SIZE AND SPACING AS A1 BARS
- ⑨ A1 BAR SPACING



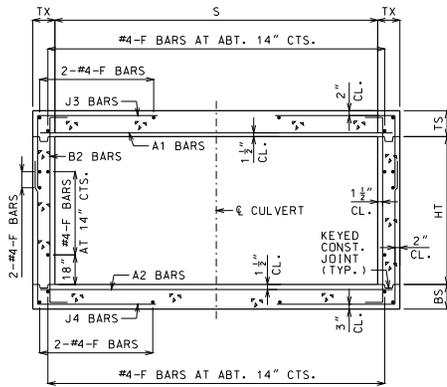
ELEVATION

J1 BARS MAY BE BENT IN FIELD OR SHOP.  
CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY, SEE SHEET 3 OF 3 FOR DETAILS.

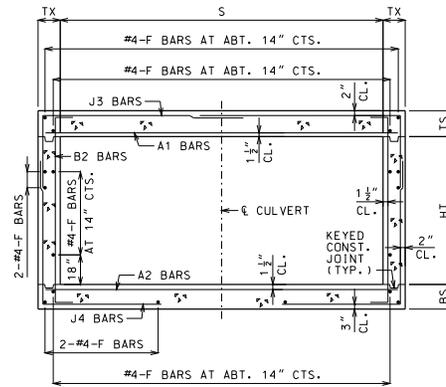
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b>	
	SKEW: RIGHT ADVANCE WINGS: STRAIGHT	
REINFORCEMENT		SHEET NO. <b>703.14H</b>
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	2 OF 3	



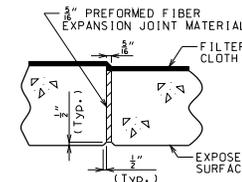
KEYED CONSTRUCTION JOINT  
 ① APPROXIMATELY ONE THIRD OF WALL THICKNESS



BARREL  
 DESIGN FILLS OVER 2'-0"



BARREL  
 DESIGN FILLS 2'-0" OR LESS



TRANSVERSE JOINT THRU BARREL

PERFORMED FIBER EXPANSION JOINT MATERIAL SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH NO. 10 GAGE COPPER WIRE OR NO. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH THREE 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 SECTION 1011 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

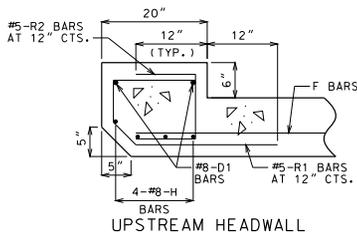
GENERAL NOTES:

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.

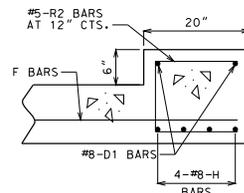
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO  $\epsilon$  CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

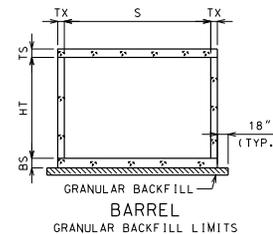
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".



UPSTREAM HEADWALL



DOWNSTREAM HEADWALL

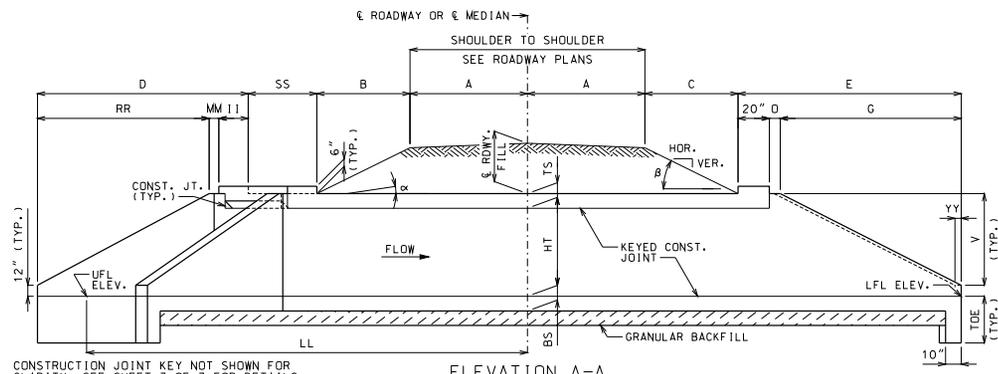


BARREL  
 GRANULAR BACKFILL LIMITS

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>CONCRETE SINGLE BOX CULVERT</b> SKEW: RIGHT ADVANCE WINGS: STRAIGHT	
THIS SHEET HAS BEEN BOUND, SEALED AND DATED ELECTRONICALLY.		SECTIONS	
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011		<b>703.14H</b>	
		SHEET NO. <b>3 OF 3</b>	

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

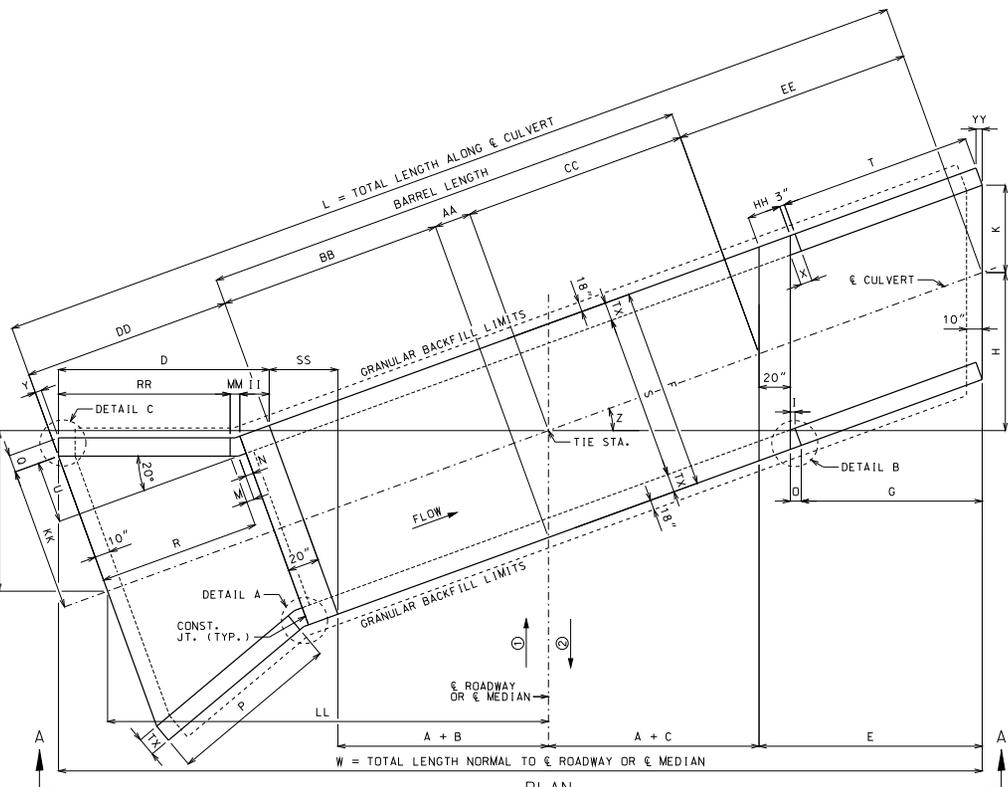
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



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 SECTION 206 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

ELEVATION A-A



① AHEAD STATION WHERE STREAMS FLOW LEFT TO RIGHT. ② AHEAD STATION WHERE STREAMS FLOW RIGHT TO LEFT.

EQUATIONS FOR COMPUTING  $\alpha$ ,  $\beta$ , B AND C

$\alpha$  = ANGLE OF BARREL SLOPE WITH HORIZONTAL NORMAL TO  $\epsilon$  ROADWAY OR  $\epsilon$  MEDIAN =  $\text{ARCTAN} \left( \frac{\text{UFL ELEV.} - \text{LFL ELEV.}}{W} \right)$

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

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

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

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

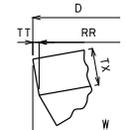
THE TERM " $\Delta(\text{CS})$ " IS THE DIFFERENCE IN ELEVATION BETWEEN  $\epsilon$  ROADWAY OR  $\epsilon$  MEDIAN AND THE TOP OF THE FILL SLOPE NORMAL TO  $\epsilon$  ROADWAY OR  $\epsilon$  MEDIAN. THIS TERM SHALL BE ADJUSTED FOR UNSYMMETRICAL AND NONSTANDARD ROADWAYS.

TO ACCOUNT FOR A VARYING PROFILE GRADE THE  $\epsilon$  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.

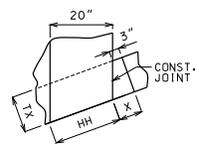
SEE ROADWAY PLANS FOR FILL SLOPES, CROSS SLOPES,  $\epsilon$  ROADWAY FILL, UPPER FLOW LINE (UFL) ELEVATION AND LOWER FLOW LINE (LFL) ELEVATION.

LAYOUT DIMENSIONS

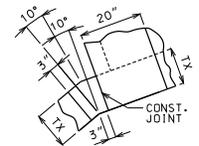
VARIABLE	DIMENSION	VARIABLE	DIMENSION	VARIABLE	DIMENSION
$\alpha$	SEE EQUATIONS	M	$N(\text{COS } 20^\circ)$	BB	$(A + B)(\text{SEC } Z)$
$\beta$	SEE EQUATIONS	N	$3'' + \text{TX}(\text{TAN } 10^\circ)$	CC	$(A + C)(\text{SEC } Z)$
B	SEE EQUATIONS	O	$I + \text{YY}$	DD	$R + M + N + 20''$
C	SEE EQUATIONS	P	$2V[\text{SEC}(Z + 20^\circ)]$	EE	$E(\text{SEC } Z)$
D	$Z \leq 20^\circ: I1 + MM + RR$ $Z > 20^\circ: I1 + MM + RR + TT$	Q	$\text{TX}(\text{COS } 20^\circ)$	HH	$20''(\text{SEC } Z)$
E	$G + O + 20''$	R	$P(\text{COS } 20^\circ)$	I1	$20''(\text{COS } Z)$
F	$S + 2\text{TX}$	T	$G(\text{SEC } Z)$	KK	$(S/2) + U$
G	$2V$	U	$(R + M)(\text{TAN } 20^\circ)$	LL	$(AA + BB + DD)(\text{COS } Z)$
H	$(A + C + E)(\text{TAN } Z)$	V	$\text{HT} + \text{TS} - 12''$	MM	$3''[\text{COS } Z + \text{COS}(Z - 20^\circ)]$
I	$3''(\text{COS } Z)$	W	$2A + B + C + D + E + SS$	RR	$P[\text{COS}(Z - 20^\circ)]$
J	$(AA + BB + DD)(\text{SIN } Z)$	X	$3'' + \text{TX}(\text{TAN } Z)$	SS	$F(\text{SIN } Z)$
K	$(S/2)(\text{SEC } Z)$	Y	$\text{TX}(\text{SIN } 20^\circ)$	TT	$\text{TX}[\text{SIN}(Z - 20^\circ)]$
L	$AA + BB + CC + DD + EE$	Z	SKREW ANGLE	YY	$\text{TX}(\text{SIN } Z)$
		AA	$(F/2)(\text{TAN } Z)$	TOE	$\text{MAX}\{BS + 12'', 40''\}$



DETAIL C  
For  $Z > 20^\circ$



DETAIL B



DETAIL A

GENERAL NOTES:

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

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

DESIGN LOADS: VEHICULAR = HL-93 MINUS LANE LOAD  
EARTH = 120 LB/FT<sup>3</sup>  
EQUIVALENT FLUID PRESSURE = 30 LB/FT<sup>3</sup> (MIN.) - 60 LB/FT<sup>3</sup> (MAX.)

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)

THIS SHEET HAS BEEN  
ELECTRONICALLY SEALED AND  
DATED

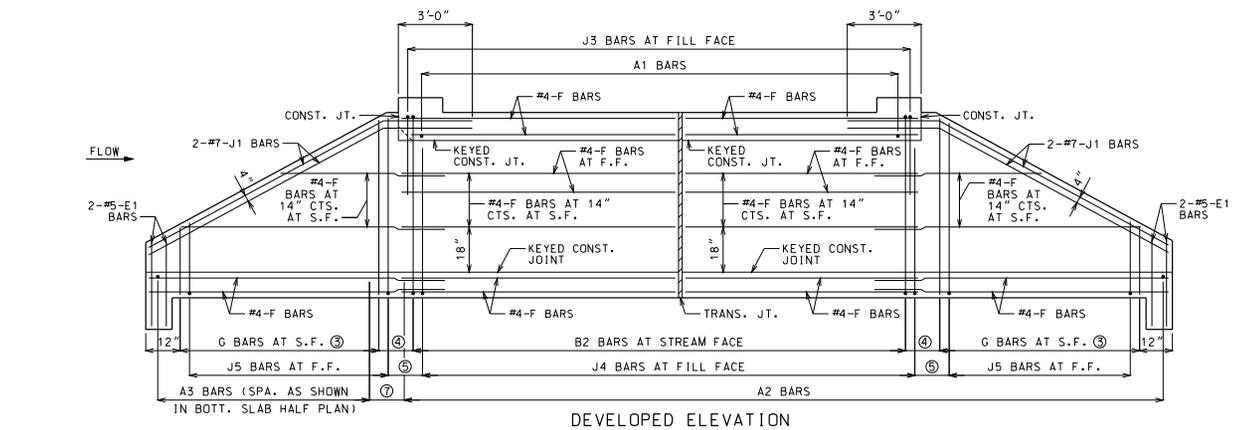
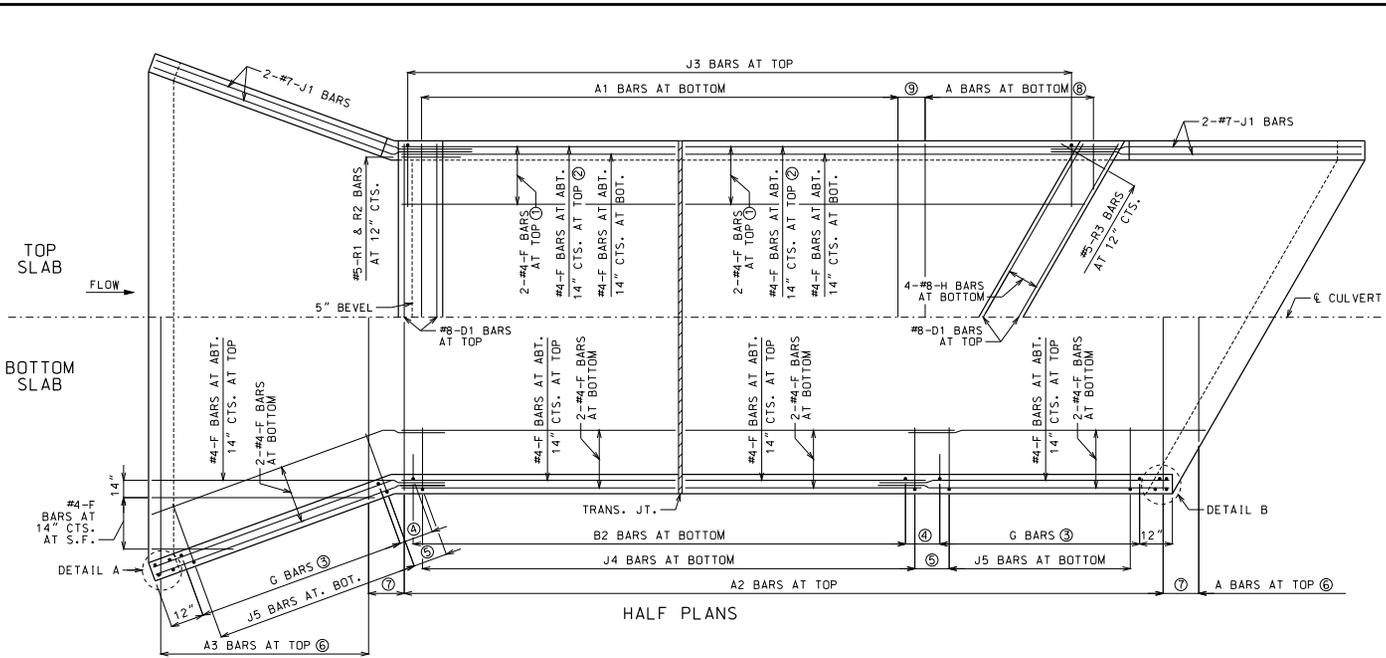
**CONCRETE  
SINGLE BOX CULVERT**

SKEW: RIGHT ADVANCE  
WINGS: FLARED

LAYOUT

DATE EFFECTIVE: 04/01/2011	<b>703.15D</b>	SHEET NO. 1 OF 3
DATE PREPARED: 4/18/2011		

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



J1 BARS MAY BE BENT IN FIELD OR SHOP.  
CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY, SEE SHEET 3 OF 3 FOR DETAILS.

**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 LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO 50 FEET.

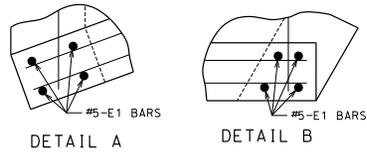
MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE TRANSVERSE JOINT.

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.

HALF PLANS ARE SYMMETRICAL ABOUT  $\epsilon$  CULVERT.

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 TO BE LOCATED AT UPSTREAM END.

① USE THESE BARS FOR DESIGN FILLS OVER 2'-0".

② USE THESE BARS FOR DESIGN FILLS 2'-0" OR LESS.

③ SAME SIZE AND SPACING AS B2 BARS

④ VARIES, 12" MAXIMUM

⑤ J4 BAR SPACING

⑥ SAME SIZE AND SPACING AS A2 BARS

⑦ A2 BAR SPACING

⑧ SAME SIZE AND SPACING AS A1 BARS

⑨ A1 BAR SPACING

**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. HECKMAN  
NUMBER PE-2714  
PROFESSIONAL ENGINEER

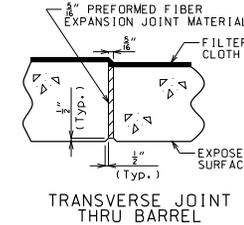
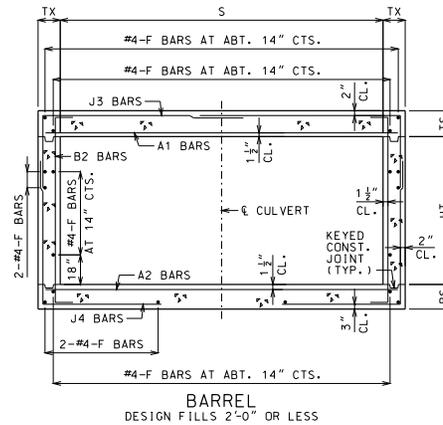
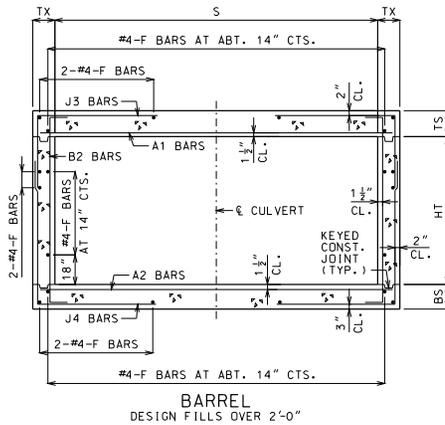
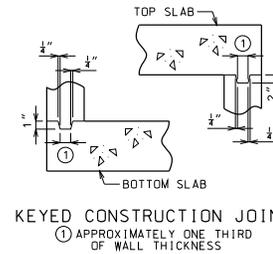
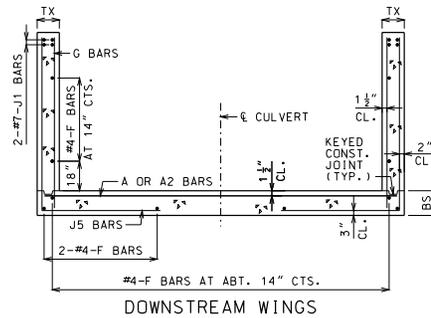
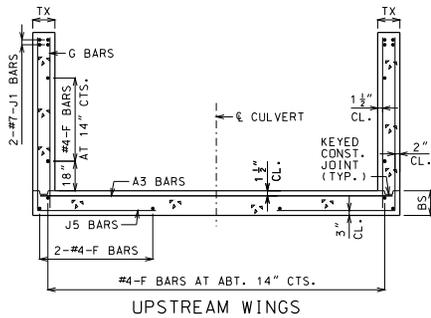
THIS SHEET HAS BEEN  
ELECTRONICALLY SEALED AND DATED

**CONCRETE SINGLE BOX CULVERT**

SKEW: RIGHT ADVANCE  
WINGS: FLARED

REINFORCEMENT

DATE EFFECTIVE:	04/01/2011	<b>703.15D</b>	SHEET NO.
DATE PREPARED:	4/18/2011		2 OF 3



PREFORMED FIBER EXPANSION JOINT MATERIAL SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH NO. 10 GAGE COPPER WIRE OR NO. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH THREE 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 SECTION 1011 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

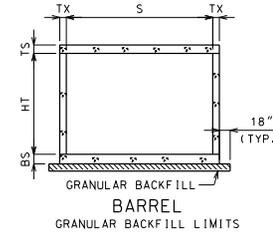
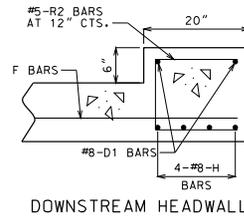
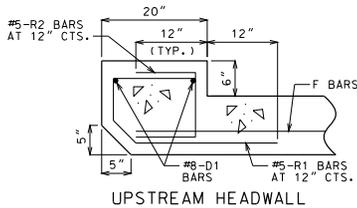
GENERAL NOTES:

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.

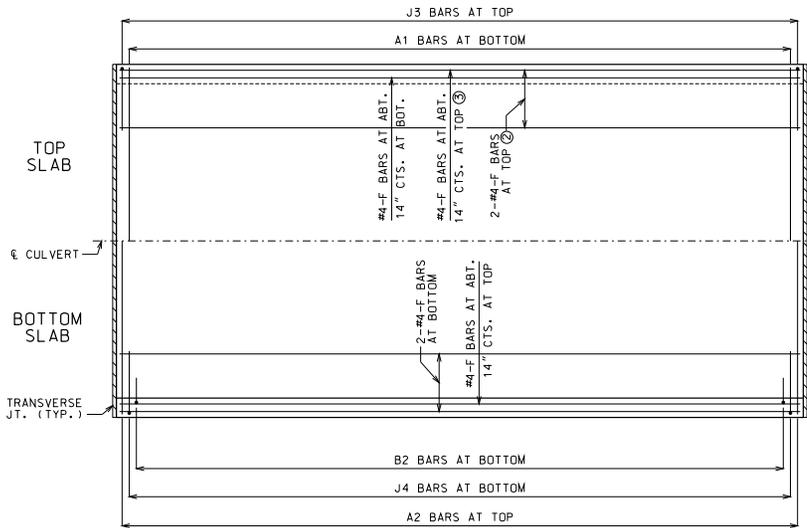
BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO  $\epsilon$  CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

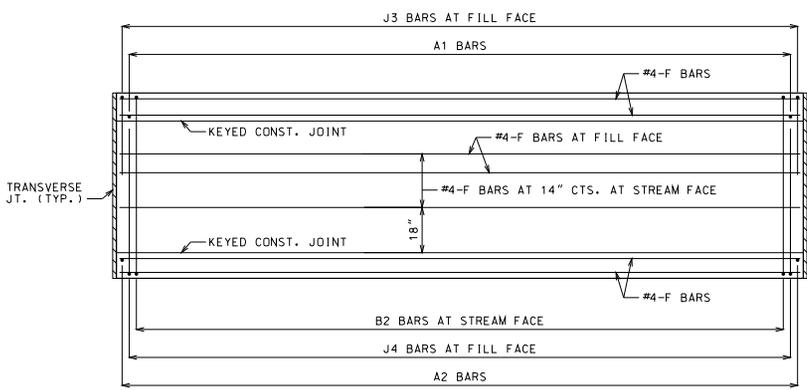
MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".



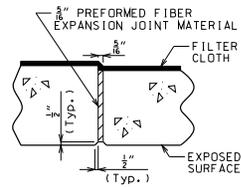
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b>	
	SKEW: RIGHT ADVANCE WINGS: FLARED	
SECTIONS		
DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	<b>703.15D</b>	SHEET NO. <b>3 OF 3</b>



HALF PLANS  
 ② USE THESE BARS FOR DESIGN FILLS OVER 2'-0".  
 ③ USE THESE BARS FOR DESIGN FILLS 2'-0" OR LESS.



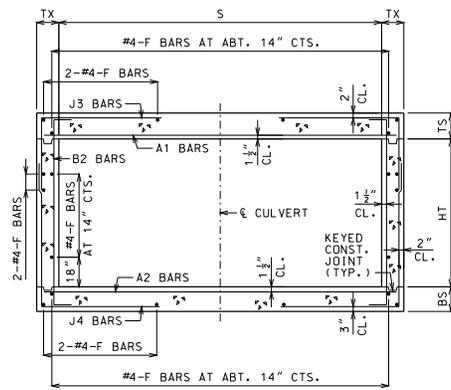
ELEVATION  
 CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY.



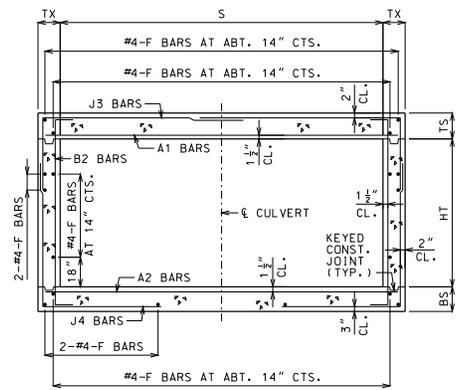
TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH NO. 10 GAGE COPPER WIRE OR NO. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH THREE 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 SECTION 1011 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. COST OF FURNISHING AND INSTALLING FILTER CLOTH WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.

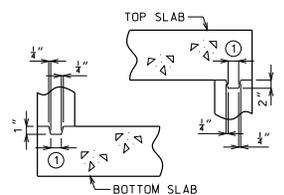


BARREL  
 DESIGN FILLS OVER 2'-0"



BARREL  
 DESIGN FILLS 2'-0" OR LESS

GENERAL NOTES:  
 DESIGN SPECIFICATIONS: 2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS  
 DESIGN UNIT STRESSES: CLASS B-1 CONCRETE  $f'_c = 4,000$  PSI  
 REINFORCING STEEL (GRADE 60)  $f_y = 60,000$  PSI  
 DESIGN LOADS: VEHICULAR = HL-93 MINUS LANE LOAD  
 EARTH = 120 LB/FT<sup>3</sup>  
 EQUIVALENT FLUID PRESSURE = 30 LB/FT<sup>3</sup> (MIN.) - 60 LB/FT<sup>3</sup> (MAX.)  
 SEE 703.17.  
 HALF PLANS ARE SYMMETRICAL ABOUT  $\epsilon$  CULVERT.  
 BARREL SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO  $\epsilon$  CULVERT.  
 DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.  
 MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1 1/2".



KEYED CONSTRUCTION JOINT  
 ① APPROXIMATELY ONE THIRD OF WALL THICKNESS

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b>	
	CUT SECTION	

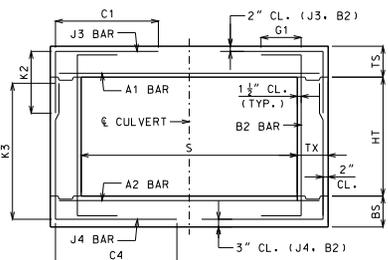
DATE EFFECTIVE:	04/01/2011	703.16	SHEET NO.
DATE PREPARED:	4/18/2011		1 OF 1

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

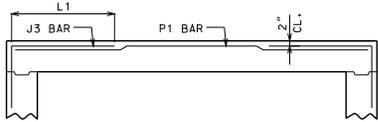
SPAN (S) = 3 FT													HEIGHT (HT) = 2 FT OR 3 FT												
DESIGN FILL	MEMBER THICKNESS			TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS									
				A1 BARS			J3 BARS			A2 BARS			J4 BARS					B2 BARS							
	TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2 HT=2'	K2 HT=3'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=2'	K3 HT=3'	SIZE	SPA.	G1					
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	9	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	9	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	9	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	9	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'	K2 HT=5'	SIZE	SPA.	SIZE	SPA.	C4	K3 HT=4'	K3 HT=5'	SIZE	SPA.	G1					
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	9	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	9	8	4	6	4	6	30.8	24.0	28.8	5	9	4	6	32.5	53	65	5	11	0					
44 FT	8	9	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	9	8	4	6	5	6.5	30.4	24.0	28.8	5	8	5	6.5	34.8	53	65	5	10	0					
48 FT	8	9	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	9	8	4	6	5	6	30.4	24.0	28.8	5	7.5	5	6	34.8	53	65	5	9	0					

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



BAR DIMENSIONS DIAGRAM  
SYMMETRICAL ABOUT CL OF CULVERT.



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.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE SINGLE BOX CULVERT</b> MEMBER THICKNESS BAR SIZE, SPACING & DIMENSIONS SPAN (S): 3 FEET HEIGHT (HT): 2 THRU 5 FEET	
	DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	<b>703.17</b> SHEET NO. 1 OF 14

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

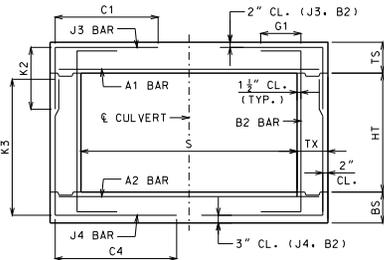
		SPAN (S) = 4 FT						HEIGHT (HT) = 2 FT OR 3 FT												
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS						
		A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS						
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	G1			
1 FT	10	8	8	4	6	4	10.5	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			B2 BARS						
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	G1			
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	35.3	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	8	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	5	7	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	5	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	5	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	5	7.5	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	5	7.5	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	5	7.5	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	5	8	28.0	27.0	32.0	5	6	4	6	29.1	56	68	5	11	0

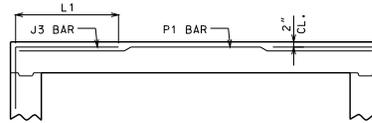
		SPAN (S) = 4 FT						HEIGHT (HT) = 6 FT OR 7 FT												
DESIGN FILL	MEMBER THICKNESS	TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS						
		A1 BARS			J3 BARS			A2 BARS			J4 BARS			B2 BARS						
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	G1			
1 FT	10	8	8	5	8.5	4	10.5	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	10	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	78	90	5	11.5	0
22 FT	8	10	9	4	7.5	4	6.5	40.5	24.6	28.1										

		SPAN (S) = 5 FT						HEIGHT (HT) = 3 FT OR 4 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=3'	HT=4'	SIZE	SPA.	SIZE SPA.	C4	K3 HT=3'	HT=4'	SIZE	SPA.	G1	
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	28.5	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	27.3	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	25.5	24.5	30.6	4	8.5	4	10.5	25.5	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	9	22.5	44	56	5	12	0
36 FT	10	12	8	5	7	5	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	5	7	23.8	27.0	33.0	5	6	4	9	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) = 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.	G1	
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	5	8.5	5	6	41.4	26.8	30.0	5	7.5	5	6	47.6	91	103	5	8.5	0
26 FT	9	11	9	5	8.5	5	6	41.4	26.8	30.0	5	7	6	7.5	49.6	91	103	5	8.5	0
28 FT	9	11	9	5	8.5	5	6	41.4	29.8	33.3	5	6.5	6	7	49.6	91	103	5	8.5	0
30 FT	9	11	9	5	8	5	6	40.8	29.8	33.3	5	6.5	6	6.5	49.6	91	103	5	8.5	0
32 FT	10	11	9	5	8	5	6	46.3	30.0	33.6	5	6.5	6	6	49.6	91	103	5	8.5	0
34 FT	10	11	9	5	7.5	5	6	45.5	30.0	33.6	5	6	6	49.6	91	103	5	8.5	0	
36 FT	10	12	10	5	7	5	6.5	40.6	30.3	33.9	5	6	5	6	49.0	92	104	5	8	0
38 FT	11	12	10	5	7.5	5	6	43.4	31.6	35.4	5	6	6	7	51.1	92	104	5	8	0
40 FT	11	12	11	5	7.5	5	7	41.1	31.6	35.4	5	6	5	6.5	49.8	93	105	5	7.5	0
42 FT	11	13	11	5	7	5	7	41.1	31.9	35.6	5	6	5	6.5	49.8	93	105	5	7.5	0
44 FT	12	13	11	5	7	5	6.5	43.3	32.3	36.0	5	6	5	6	49.8	93	105	5	7.5	0
46 FT	12	13	11	5	7	5	6	43.3	32.3	36.0	5	6	5	6	49.8	93	105	5	7.5	0
48 FT	12	14	12	5	6.5	5	6.5	41.0	32.5	36.3	6	8	5	6.5	51.1	94	106	5	7	0
50 FT	13	14	12	5	6.5	5	6.5	43.3	33.9	37.8	6	8	5	6.5	51.1	94	106	5	7	0



BAR DIMENSIONS DIAGRAM  
SYMMETRICAL ABOUT CULVERT.



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.

		SPAN (S) = 5 FT						HEIGHT (HT) = 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=5'	HT=6'	SIZE	SPA.	SIZE SPA.	C4	K3 HT=5'	HT=6'	SIZE	SPA.	G1	
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	8	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	9.5	4	11	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	29.3	24.5	28.5	5	7.5	4	6	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															

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					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	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
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	5	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	29.5	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	27.4	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	6	8	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	9	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	

		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					A2 BARS					J4 BARS					B2 BARS	
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	C1	K2	HT=6'	HT=7'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=6'	HT=7'	SIZE	SPA.	G1
1 FT	10	8	8	5	8	4	9.5	51.3	26.4	30.1	5	8	5	6	52.8	76	88	5	12	12			
2 FT	11	9	8	5	7.5	4	9.5	51.3	27.9	31.6	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	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	5	8	4	6	41.6	76	88	5	12	0			
8 FT	8	8	8	4	6.5	4	7	38.4	24.1	27.5	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	5	8.5	4	6	35.6	76	88	5	12	0			
12 FT	8	8	8	4	6	4	6	32.8	24.4	27.9	5	8	4	7	33.6	77	89	5	12	0			
14 FT	8	8	8	4	6	5	6.5	32.0	24.4	27.9	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	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	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	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	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	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	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	5	6	5	6.5	33.6	80	92	5	10.5	0			
30 FT	11	12	8	5	6.5	5	6	32.0	31.5	35.8	5	6	5	6	33.6	80	92	5	9.5	0			
32 FT	11	13	8	5	6	6	7	35.3	31.9	36.0	5	6	5	6	33.6	81	93	5	9.5	0			
34 FT	11	13	8	6	7.5	6	6.5	35.3	31.9	36.0	5	6	5	6	33.6	81	93	5	9.5	0			
36 FT	12	13	8	6	8	6	7	35.3	32.3	36.4	6	8	6	7	36.8	81	93	5	9.5	0			
38 FT	12	14	8	6	8	6	6.5	35.3	32.5	36.8	6	8	5	6	34.4	82	94	5	9.5	0			
40 FT	13	14	9	6	8	5	6	32.4	33.9	38.1	6	8	5	6.5	34.0	82	94	5	8.5	0			
42 FT	13	15	10	6	8	5	7	32.8	33.3	37.5	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	6	7.5	5	7.5	34.5	83	95	5	8.5	0			
46 FT	14	16	11	6	7.5	5	7	33.3	34.9	39.3	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	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	6	7	5	7	34.9	84	96	5	8.5	0			

		SPAN (S) = 6 FT										HEIGHT (HT) = 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=8'	HT=9'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=8'	HT=9'	SIZE	SPA.	G1
1 FT	10	10	8	5	8	4	7	51.3	26.6	29.5	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	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	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	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	4	6	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	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	5	8.5	4	6	51.9	102	114	5	11.5	0			
14 FT	8	10	9	4	6	5	6	42.1	26.1	29.0	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	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	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	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	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	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	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	5	6	6	6	55.9	104	116	5	8	0			
30 FT	11	12	9	5	6.5	6	6.5	49.4	35.4	39.0	5	6	6	6	55.9	104	116	5	8	0			
32 FT	11	13	10	5	6.5	6	8	46.8	32.3	35.5	5	6	6	6.5	56.6	105	117	5	8	0			
34 FT	12	13	11	5	6.5	5	6.5	44.0	32.5	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=7'	HT=5'	HT=6'	SIZE	SPA.	SIZE	SPA.	C4	K3	HT=7'	HT=5'	HT=6'	SIZE
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	36.8	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	35.1	24.3	29.1	34.0	5	8	5	6	35.1	52	64	76	5	12	0	
8 FT	8	9	8	4	6	5	6	32.3	24.0	28.8	33.6	5	7.5	4	6	32.3	53	65	77	5	12	0	
10 FT	8	9	8	4	6	4	6	30.4	24.0	28.8	33.6	5	7.5	4	6	28.5	53	65	77	5	12	0	
12 FT	8	9	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	9	8	5	8	6	7.5	33.1	28.3	33.9	39.5	5	7	5	6	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	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	29.1	34.0	39.0	6	7	5	8.5	26.6	59	71	83	5	12	0	
36 FT	14	15	9	6	6.5	5	7.5	26.6	30.3	35.3	40.4	6	7	5	8.5	27.6	60	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.	G1
1 FT	11	9	8	5	7.5	4	8	57.0	27.8	31.1	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	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	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	5	7.5	5	6.5	50.6	89	101	5	12	0			
8 FT	8	9	8	4	6	5	6	41.4	25.0	28.1	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	5	7.5	5	6.5	36.8	89	101	5	12	0			
12 FT	8	9	8	4	6	5	6.5	38.6	28.8	32.4	5	7.5	5	6	36.8	89	101	5	12	0			
14 FT	8	9	8	5	8	6	7.5	37.8	28.8	32.4	5	7	6	6.5	38.6	89	101	5	12	0			
16 FT	8	9	8	5	7	6	7	37.8	32.6	36.8	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	5	6	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	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	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	6	8	5	6.5	36.3	92	104	5	11	0			
26 FT	11	13	9	6	8	6	7.5	38.1	31.9	35.6	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	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	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	6	7	5	6	36.3	94	106	5	8.5	0			
34 FT	13	14	9	6	7	6	7	38.1	35.9	37.8	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	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	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	6	7	5	7	37.0	96	108	5	8	0			
42 FT	15	17	11	6	6.5	5	6	40.9	35.5	39.4	6	7	5	7	37.0	97	109	5	7.5	0			
44 FT	16	17	12	6	6.5	5	6.5	41.3	37.0	40.9	6	6.5	5	6.5	37.5	97	109	5	8	0			
46 FT	16	18	12	6	6.5	5	6.5	41.3	36.1	40.0	6	6.5	5	6.5	37.5	98	110	5	8	0			
48 FT	17	18	12	6	6.5	5	6.5	41.3	37.6	41.6	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	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.	G1
1 FT	11	10	8	5	7.5	4	6	57.0	27.3	29.9	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	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	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	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	5	7	5	6	59.5	114	126	5	9	0			
10 FT	8	10	9	4	6	5	6	46.5	26.6	29.3	5	7.5	5	6	59.5	114	126	5	10	0			
12 FT	8	9	4	6	6	7	47.4	25.6	28.1	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	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	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	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	5	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	5	6	6	62.3	116	128	5	8	0				
24 FT	11	12	9	5	6	6	7	51.1	35.3	38.6	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	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	6	8	6	7	54.1	117	129	5	7.5	0			
30 FT	12	14	11	6	8	5	6	45.6	32.3	35.3	6	8	6	7	56.0	118	130	5	7.5	0			
32 FT	13	14	12	6	8	5	6	46.1	33.8	36.9	6	7.5	6	8	52.8	118	130	5	7	0			
34 FT	13	15	12	6	8	5	6	45.1	34.0	37.													

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) = 4 FT OR 5 FT OR 6 FT											
	TS	BS	TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS											
			A1 BARS	J3 BARS	A2 BARS	J4 BARS	B2 BARS																			
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	38.5	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	37.5	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	32.5	39.0	45.6	5	6.5	6	7	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	8	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	8	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	61	73	85	5	12	0				
36 FT	16	17	8	6	6	5	7	31.3	32.6	37.9	43.0	6	6	5	7	26.0	62	73	85	5	12	0				
38 FT	16	18	8	6	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	6	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	6	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	6	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	6	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	6	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	6	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				

DESIGN FILL	MEMBER THICKNESS		SPAN (S) = 8 FT												HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT											
	TS	BS	TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS											
			A1 BARS	J3 BARS	A2 BARS	J4 BARS	B2 BARS																			
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	28.8	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	53.0	28.8	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	41.1	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	5	6	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	37.6	41.6	45.5	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				

DESIGN FILL	MEMBER THICKNESS		SPAN (S) = 8 FT												HEIGHT (HT) = 10 FT OR 11 FT											
	TS	BS	TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS											
			A1 BARS	J3 BARS	A2 BARS	J4 BARS	B2 BARS																			
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	52.5	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														

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		
		J3 BARS					A2 BARS					J4 BARS					K3 BARS					B2 BARS		
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.
1 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		
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	8	9	8	5	6.5	6	7	42.9	32.4	37.8	43.3	5	6	6	7	42.9	65	77	89	5	12	0		
6 FT	8	9	8	5	7	6	7	40.6	32.4	37.8	43.3	5	6	6	7	39.5	65	77	89	5	12	0		
8 FT	8	10	9	5	6.5	6	7	39.5	24.1	28.0	32.0	5	6	5	6	5	6.5	35.6	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	29.0	33.3	37.5	6	6	5	8.5	27.9	71	83	95	5	12	0		
26 FT	14	16	8	6	6	5	6	29.0	30.6	34.9	39.3	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	31.3	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	36.1	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		
		J3 BARS					A2 BARS					J4 BARS					K3 BARS					B2 BARS		
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.
1 FT	12	11	8	5	6.5	5	8.5	70.8	29.6	32.8	35.9	5	6	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	6.5	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	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	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	7	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	6.5	44.9	106	118	130	5	8	0			
26 FT	14	15	10	6	6	6	6	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	6	7.5	50.4	36.3	39.8	43.3	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	5	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	5	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	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	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	43.3	49.3	53.4	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		
		J3 BARS					A2 BARS					J4 BARS					K3 BARS					B2 BARS		
		TS	BS	TX	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.	SIZE	SPA.
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	6	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	9	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	9	5	7.5	6	7	58.5	30.9	33.4	6	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	8	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										

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

DESIGN FILL	SPAN (S) = 10 FT										HEIGHT (HT) = 5 FT OR 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.	HT=5'	K2	HT=6'	HT=7'	SIZE	SPA.	HT=5'	K3	HT=6'	HT=7'	SIZE	SPA.					
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	8	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	34.5	28.5	33.1	37.9	6	7	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	7	7	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	18	20	8	7	6	6	7.5	35.9	38.1	43.0	48.0	7	6.5	5	6	26.9	76	88	100	5	9.5	0
36 FT	19	21	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	9.5	0	
38 FT	20	21	8	7	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

DESIGN FILL	SPAN (S) = 10 FT										HEIGHT (HT) = 8 FT OR 9 FT OR 10 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.	HT=8'	K2	HT=9'	HT=10'	SIZE	SPA.	HT=8'	K3	HT=9'	HT=10'	SIZE	SPA.						
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	5	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	68.4	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	7	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	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	

DESIGN FILL	SPAN (S) = 10 FT										HEIGHT (HT) = 11 FT OR 12 FT OR 13 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.	HT=11'	K2	HT=12'	HT=13'	SIZE	SPA.	HT=11'	K3	HT=12'	HT=13'	SIZE	SPA.					
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	74.1	32.8	35.4	38.0	6	7	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	7	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	7	7.5	6	7							

		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	32.0	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	13	8	6	6.5	6	6	42.0	31.5	36.3	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	6	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	7	6	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	6.5	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	6.5	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	6.5	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	8	7.5	6	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	8	7.5	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	8	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	7	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	6.5	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	8	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	8	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	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	6	6	70.1	34.0	36.5	39.0	6	6.5	6	6.5	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	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	6	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	169	181	5	6	0	
24 FT	15	17	14	7	7																		



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

DESIGN FILL	MEMBER THICKNESS	SPAN (S) = 13 FT												HEIGHT (HT) = 7 FT OR 8 FT OR 9 FT															
		TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS		TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS	
		TS	BS	TX	A1 BARS		J3 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1
					SIZE	SPA.	HT=7'	HT=8'	HT=9'	SIZE	SPA.	HT=7'	HT=8'	HT=9'															
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	6.5	49.3	91	103	115	5	12	0							
6 FT	10	11	8	7	7.5	6	6	45.9	34.0	38.1	42.1	7	7	6	6	45.9	91	103	115	5	12	0							
8 FT	10	12	8	7	7	6.5	47.5	39.3	33.9	37.5	41.1	7	7	6	6	42.6	92	104	116	5	12	0							
10 FT	11	12	8	7	6.5	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	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	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	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	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	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	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	45.9	38.6	42.6	46.5	8	7	6.5	34.5	100	112	124	5	9.5	0									
26 FT	19	21	9	8	6.5	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	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	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	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	6.5	41.8	43.1	47.3	51.4	8	6.5	5	6.5	33.4	105	117	129	5	8.5	0								
36 FT	24	26	12	8	6	6.5	41.8	43.1	49.4	53.5	8	6.5	5	6	33.4	106	118	130	5	8	0								
38 FT	25	27	12	8	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	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	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	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	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	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	42.0	55.0	59.6	64.4	8	6	6	7.5	37.0	112	124	136	5	7	0								

DESIGN FILL	MEMBER THICKNESS	SPAN (S) = 13 FT												HEIGHT (HT) = 10 FT OR 11 FT OR 12 FT															
		TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS		TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS	
		TS	BS	TX	A1 BARS		J3 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1
					SIZE	SPA.	HT=10'	HT=11'	HT=12'	SIZE	SPA.	HT=10'	HT=11'	HT=12'															
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	6	7	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	63.1	127	139	151	5	9	0							
8 FT	10	12	8	7	7	6.5	6	59.8	34.3	38.3	40.3	7	7	6	6	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	48.1	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	6	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	58.8	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	53.5	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	6.5	48.8	136	148	160	5	7	0								
26 FT	19	21	13	8	7	7	8	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	7.5	7.5	59.1	42.4	45.6	48.9	8	7	6.5	49.0	138	150	162	5	6.5	0								
30 FT	21	23	14	8	7	7	8	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	15	8	6.5	7	7	59.5	44.0	47.3	50.5	8	6.5	6	6.5	49.3	141	153	165	5	6	0							
36 FT	24	26	16	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	6	7	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	6	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	6.5	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	6.5	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	6.5	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	MEMBER THICKNESS	SPAN (S) = 13 FT												HEIGHT (HT) = 13 FT OR 14 FT															
		TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS		TOP SLAB BARS						BOTTOM SLAB BARS						WALL BARS	
		TS	BS	TX	A1 BARS		J3 BARS		A2 BARS		J4 BARS		B2 BARS		SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1	SIZE	SPA.	G1
					SIZE	SPA.	HT=13'	HT=14'	SIZE	SPA.	HT=13'	HT=14'	SIZE	SPA.															
1 FT	12	12	9	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	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	6.5	84.6	35.0	37.4	6	6	6.5	99.6	165	177	5	7.5	0											
8 FT	11	13	10	6	6	6	6	74.8	35.0	37.4	7	7	6	6	80.1	165	177	5	7	0									
10 FT	11	13	11	7	7.5	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	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	65.6	167	179	5	7	0									
16 FT	13	15	12	7	6.5	7	60.5	37.6	40.1	7	6	6.5	58.8	167	179	5	7	0											
18 FT	14	17	13	7	6.5	7	59.1	38.3	40.8	7	6	6.5	59.1	169	181	5	6.5	0											
20 FT	15	18	13	7	6	7	67.6	40.5	43.1	7	6	6	59.1	170	182	5	6.5	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			A2 BARS			J4 BARS												
	TS	BS	TX	SIZE	SPA.	SIZE	HT=8"	HT=9"	HT=10"	SIZE	SPA.	SIZE	HT=8"	HT=9"	HT=10"	SIZE	SPA.	G1							
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	65.8	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	6	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	7	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	8	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	10.5	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	7.5	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	60.3	9	7	6	8	38.4	122	134	146	5	7	0			
38 FT	29	31	12	9	6.5	6	6.5	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												
	TS	BS	TX	SIZE	SPA.	SIZE	HT=11"	HT=12"	HT=13"	SIZE	SPA.	SIZE	HT=11"	HT=12"	HT=13"	SIZE	SPA.	G1							
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	6	6	6.5	64.6	36.5	39.4	42.3	7	6.5	6	6.5	68.4	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	50.5	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	169	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	58.8	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												
	TS	BS	TX	SIZE	SPA.	SIZE	HT=14"	HT=15"	HT=16"	SIZE	SPA.	SIZE	HT=14"	HT=15"	HT=16"	SIZE	SPA.	G1							
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	73.4	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	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	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	7	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	6												

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					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
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	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	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	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	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	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	6.5	47.3	51.4	55.4	49	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	55.4	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	7.5	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	
		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
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	7	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	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	6.5	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	51.3	54.6	58.0	9	7	6	6	49.6	159	171	183	6	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	6	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	6	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	6	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	6	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	60.3	63.9	67.5	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	
		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
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	80.0	178	190	202	5	6.5	0	
10 FT	13	16	13	7	6.5	7	6.5	75.9	38.4	40.8	43.3	8	7.5	6	7	77.9	180	192	204	5	6.5	0	
12 FT	14	17	14	7	6.5	7	6.5	72.1	40.8	43.3	45.8	8	7	6	7	76.3	181	193	205	5	6	0	
14 FT	16	18	14	8	7	7	6.5	78.3	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	78.6	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</									

**AREA OF STEEL REQUIRED FOR J5 BARS IN WINGS (SQ. 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 (SQ. 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.

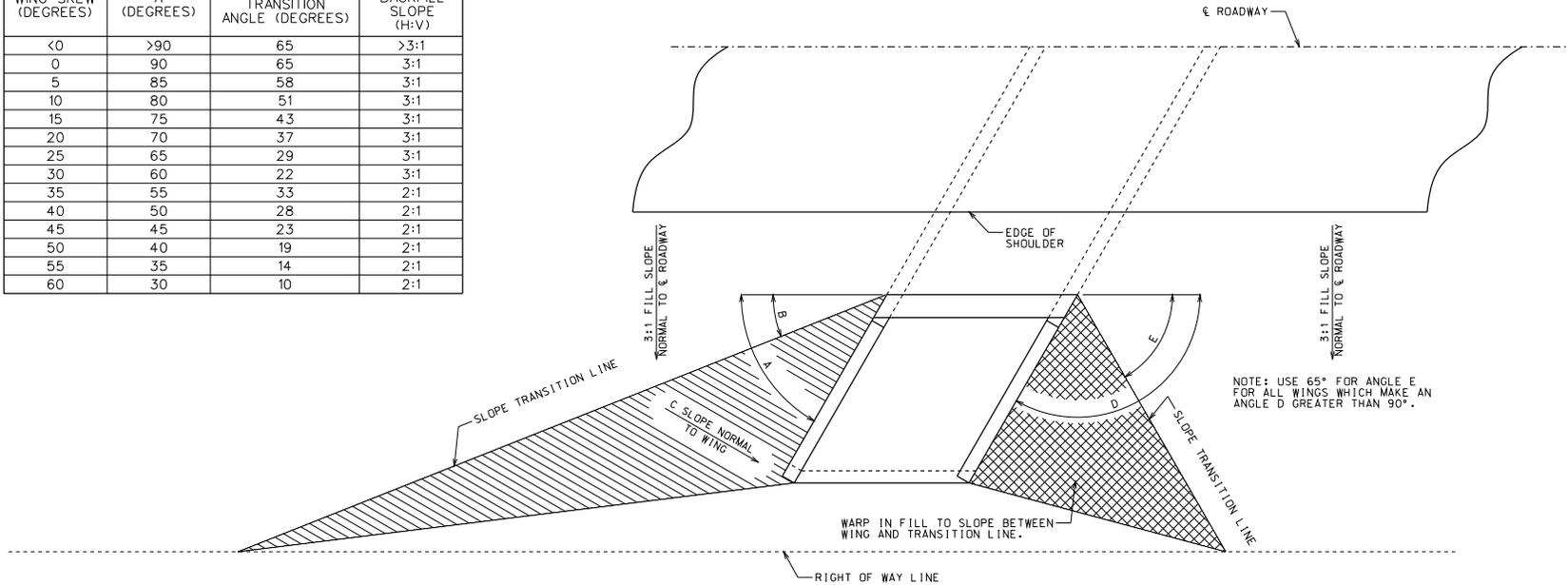
MINIMUM STEEL TO BE USED IN THE WINGS FOR J5 BARS IS #4 BARS AT 14" CENTERS (AREA OF STEEL = 0.1683 SQ. IN./FT.)

⊙ SEE STANDARD PLAN 703.37C, SHEET 2 OF 2 FOR BACKFILL SLOPE TO BE USED BASED ON SKEW.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center"><b>CONCRETE BOX CULVERT</b> EXTERIOR WING REINFORCEMENT</p>	
	DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	
<b>703.37C</b>		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



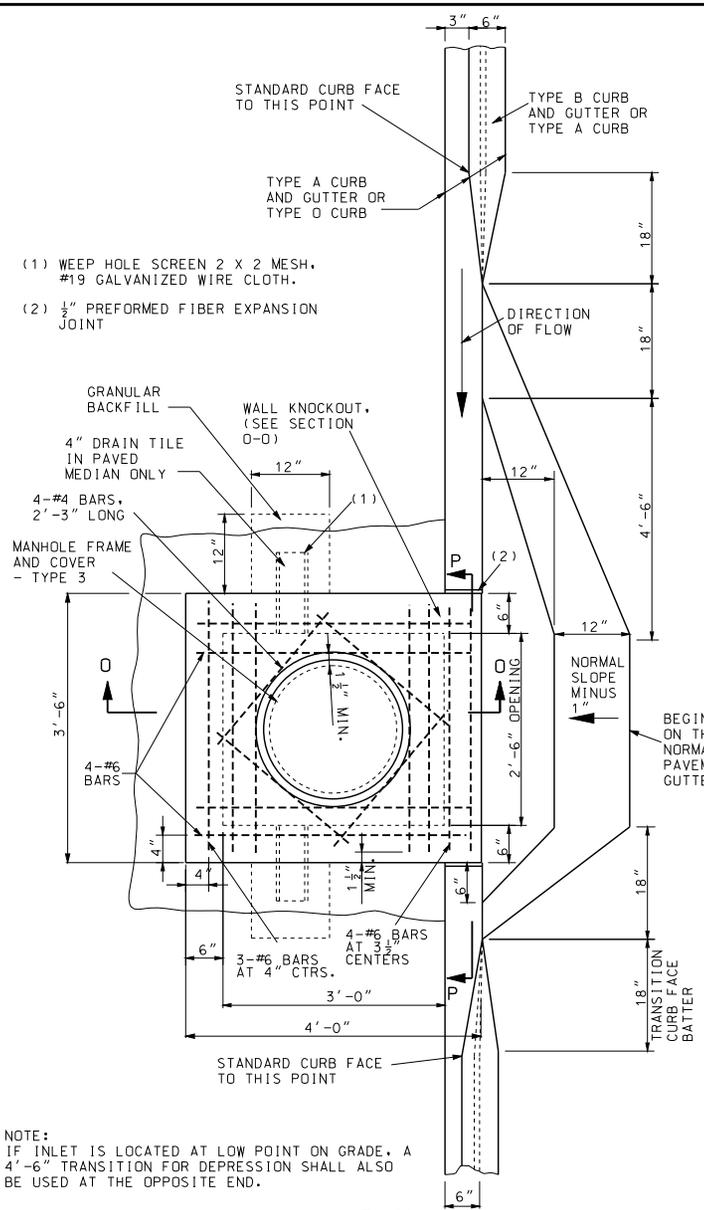
PLAN OF WINGS AND SLOPE TRANSITION LINES

NOTE: BACKFILL TRANSITION ANGLE AND BACKFILL SLOPE SHALL APPLY TO ALL BOX CULVERTS REGARDLESS OF TYPE - SINGLE, DOUBLE, OR TRIPLE.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CONCRETE BOX CULVERT</b> EXTERIOR WING BACKFILL SLOPE TRANSITION	
	DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 4/18/2011	<b>703.37C</b>
		SHEET NO. <b>2 OF 2</b>

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

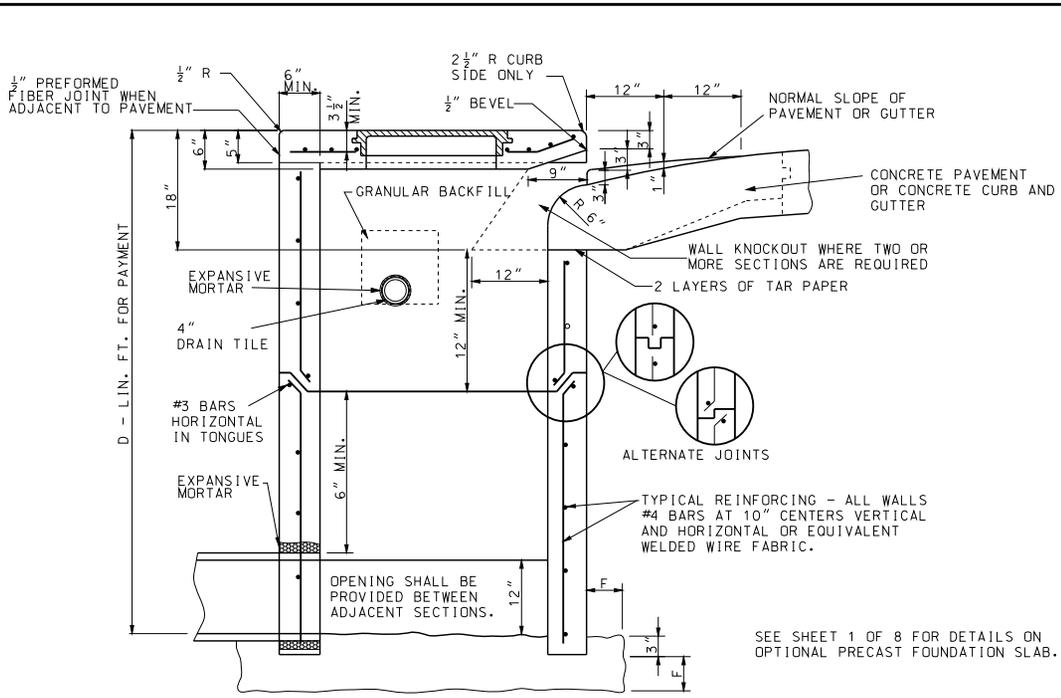
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**PLAN**

- (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 FOR DEPRESSION SHALL ALSO BE USED AT THE OPPOSITE END.

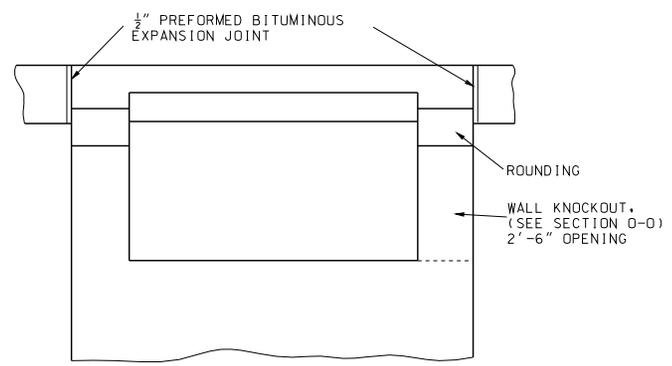


**SECTION O-O**

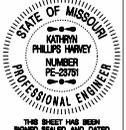
D - LIN. FT. FOR PAYMENT  
 F = 6" FOR D'S ≤ 6'  
 F = 12" FOR D'S > 6'  
 PRECAST BASE SECTION SET ON CONCRETE BLOCKS FOUNDATION SLAB AND INVERT POURED MONOLITHIC.

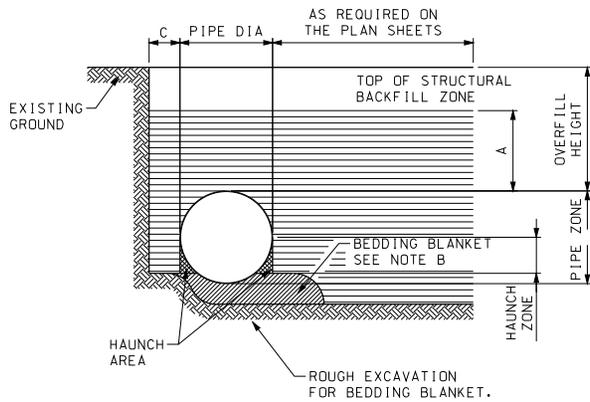
BEGIN DEPRESSION ON THIS LINE, NORMAL SLOPE OF PAVEMENT OR GUTTER TO HERE.

SEE SHEET 1 OF 8 FOR DETAILS ON OPTIONAL PRECAST FOUNDATION SLAB.



**SECTION P-P  
DETAILS OF OPENING**

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>PRECAST DROP INLET CURB INLET - TYPE T</b>
DATE EFFECTIVE: 12/01/2005 DATE PREPARED: 9/3/2010	<b>731.10R</b>
SHEET NO. <b>5 OF 8</b>	



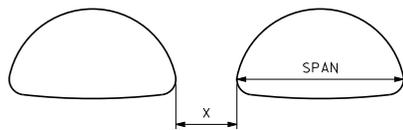
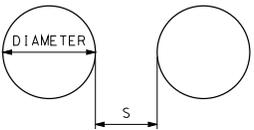
**TYPICAL TRENCH DETAIL  
PIPE INSTALLATION AND BEDDING**

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"

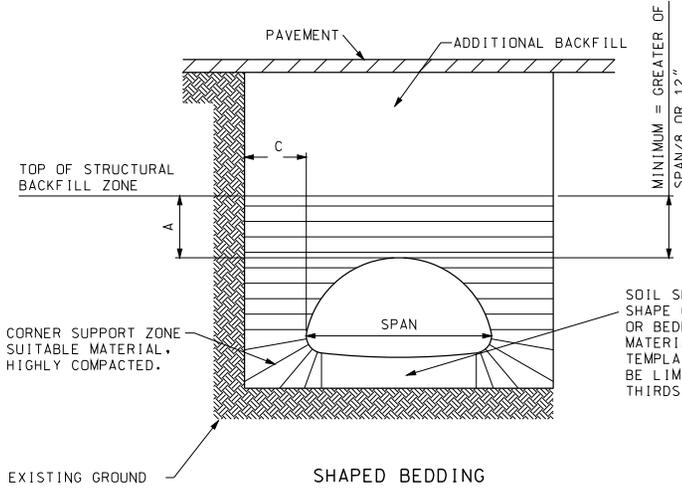
- C) TRENCH INSTALLATIONS - 2 FEET MINIMUM EACH SIDE OF CULVERT. THIS RECOMMENDED LIMIT SHOULD BE MODIFIED AS NECESSARY TO ACCOUNT FOR VARIABLES SUCH AS POOR IN-SITU SOILS. EMBANKMENT INSTALLATIONS - ONE DIAMETER OR SPAN EACH SIDE OF CULVERT.



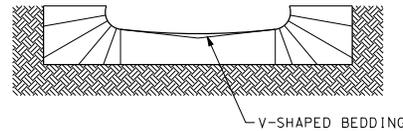
PIPE	
DIAMETER	SPACE S
UP TO 24"	12"
24" TO 72"	1/2 PIPE DIA
72" AND OVER	36"

PIPE-ARCHES	
SPAN	SPACE X
UP TO 36"	12"
36" TO 108"	1/3 ARCH SPAN
108" TO 189"	36"

**MULTIPLE STRUCTURE SPACING**



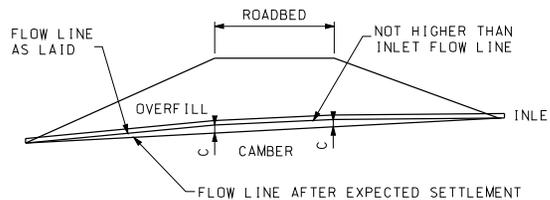
SOIL SHALL BE FINE GRADED TO SHAPE OF BOTTOM OF PIPE-ARCH. OR BEDDING BLANKET OF GRANULAR MATERIAL SHALL BE SHAPED WITH TEMPLATE. BEDDING WIDTH SHALL BE LIMITED TO A MAXIMUM OF TWO-THIRDS THE SPAN.



**ALTERNATIVE-SHAPED BEDDING**

**PIPE-ARCH TRENCH DETAIL**

**BEDDING AND CORNER ZONE TREATMENT FOR PIPE ARCH STRUCTURES**



**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.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**KATHRYN PHILLIPS HARGETT**  
NUMBER PE-23791  
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**CORRUGATED METAL PIPE INSTALLATION METHODS**

SHEET NO.  
**1 OF 5**

DATE EFFECTIVE: 04/01/2011

DATE PREPARED: 3/10/2011

725.00C

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.)																			
				0.064				0.079				0.109				0.138				0.168			
				CORRUGATED		SPIRAL RIB		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.)																			
				0.064				0.079				0.109				0.138				0.168			
				CORRUGATED		SPIRAL RIB		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				61	81
96	1	2								38				55				68				58	76
102	2	3								36				52				64				56	71
108	2	3												49				60				54	67
114	2	3												46				57				52	64
120	2	3												44				54				50	60
126	2	3																52				48	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**

STATE OF MISSOURI  
 KATHRYN PHILIPS HANNEY  
 NUMBER PE-23791  
 PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE:	04/01/2011	<b>725.00C</b>	SHEET NO.
DATE PREPARED:	3/9/2011		2 OF 5

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 THICKNESS OF COATED SHEET (IN.)

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.
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 THICKNESS OF COATED SHEET (IN.)

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								55				72
84	1	3																51				67
90	1	3																48				62
96	1	3																45				58
102	2	4																42				55
108	2	4																40				51
114	2	4																				46
120	2	4																				41
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)

**CORRUGATED METAL PIPE INSTALLATION METHODS**



**KATHRYN PHILLIPS HUME**  
 NUMBER PE-23791  
 EXPIRES 08-31-2011

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 04/01/2011  
 DATE PREPARED: 3/9/2011

**725.00C**

SHEET NO.  
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 THICKNESS OF COATED SHEET (IN.)

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.
12	1	1	159	183		85	199	229		117	278	320		187	358	428		265	437	504		
15	1	1	127	183		68	159	183		93	223	256		150	286	343		212	350	403		
18	1	1	106	213		57	132	153		78	185	213		125	239	286		176	291	336		
21	1	1	91	245		49	113	131		67	159	183		107	205	245		151	250	288		
24	1	1	79	252		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 THICKNESS OF COATED SHEET (IN.)

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											72
84	1	3																				67
90	1	3																				62
96	1	3																				58
102	2	4																				55
108	2	4																				51
114	2	4																				46
120	2	4																				41
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.

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)

**CORRUGATED METAL PIPE INSTALLATION METHODS**

DATE EFFECTIVE: 04/01/2011

DATE PREPARED: 3/9/2011

**725.00C**

SHEET NO.  
4 OF 5

**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.

**PIPE-ARCH REQUIREMENTS  
2-2/3" X 1/2" CORRUGATIONS**

TYPE	SPAN (3)	RISE (3)	GALVANIZED SHEET THICKNESS - GAUGE (IN.)
	(IN.)	(IN.)	
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  
3" X 1" AND 5" X 1" CORRUGATIONS**

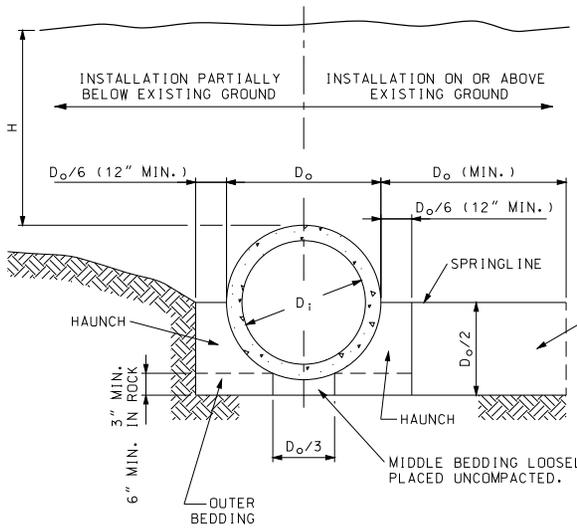
TYPE	SPAN (4)	RISE (4)	GALVANIZED SHEET THICKNESS - GAUGE (IN.)	GALVANIZED SHEET THICKNESS - GAUGE (IN.)	MINIMUM COVER (2)
	(IN.)	(IN.)			
B8A	53 (-2.4)	41 (+2.4)	0.079 - 14	0.109 - 12	12
B9A	60 (-2.7)	46 (+2.7)	0.079 - 14	0.109 - 12	15
B10A	66 (-3.0)	51 (+3.0)	0.079 - 14	0.109 - 12	15
B11A	73 (-3.3)	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

- (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.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>CORRUGATED METAL PIPE INSTALLATION METHODS</b>	
	DATE EFFECTIVE: 04/01/2011 DATE PREPARED: 3/9/2011	<b>725.00C</b>

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.



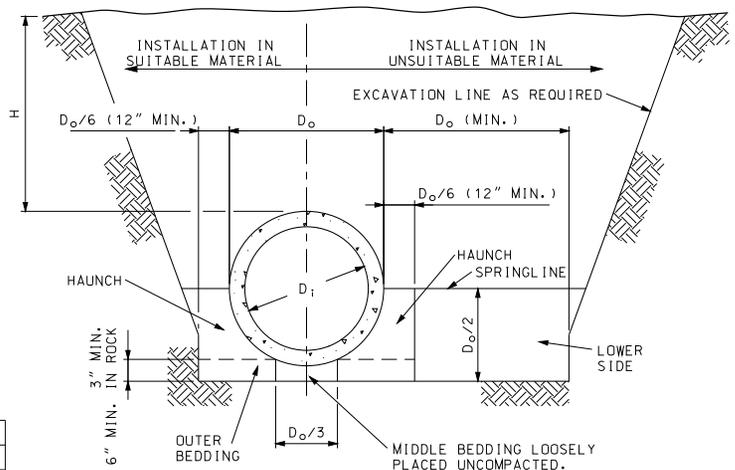
**EMBANKMENT INSTALLATIONS**

- 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.

**MAXIMUM HEIGHT OF FILL OVER R.C. PIPE CULVERTS**

INSTALLATION TYPE	CLASS OF PIPE				
	CLASS I	CLASS II	CLASS III	CLASS IV	CLASS V
	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

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.



**TRENCH INSTALLATION**

- LEGEND -

- D<sub>1</sub> = NORMAL INSIDE DIAMETER OF PIPE.
- D<sub>o</sub> = OUTSIDE DIAMETER OF PIPE.
- H = FILL COVER HEIGHT OVER PIPE (FEET)
- MIN. = MINIMUM
- = UNDISTURBED SOIL

**BEDDING AND COMPACTION REQUIREMENTS**

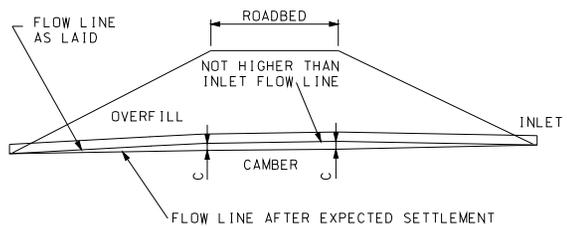
INSTALLATION TYPE	BEDDING THICKNESS	COMPACTION REQUIREMENTS (MIN. STANDARD PROCTOR %)					
		HAUNCH AND OUTER BEDDING			LOWER SIDE BEDDING		
		CATEGORY 1 SOIL (A)	CATEGORY 2 SOIL (B)	CATEGORY 3 SOIL (C)	CATEGORY 1 SOIL (A)	CATEGORY 2 SOIL (B)	CATEGORY 3 SOIL (C)
1	D <sub>o</sub> /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D <sub>o</sub> /12 MINIMUM, NOT LESS THAN 6".	95	N/A	N/A	90	95	100
2	D <sub>o</sub> /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D <sub>o</sub> /12 MINIMUM, NOT LESS THAN 6".	90	95	N/A	85	90	95
3	D <sub>o</sub> /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D <sub>o</sub> /12 MINIMUM, NOT LESS THAN 6".	85	90	95	85	90	95
4	D <sub>o</sub> /24 MINIMUM, NOT LESS THAN 3". IF ROCK FOUNDATION, USE D <sub>o</sub> /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<sub>o</sub> 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.



**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.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**RIGID CULVERT INSTALLATION METHODS**

REINFORCED CONCRETE PIPE CULVERTS

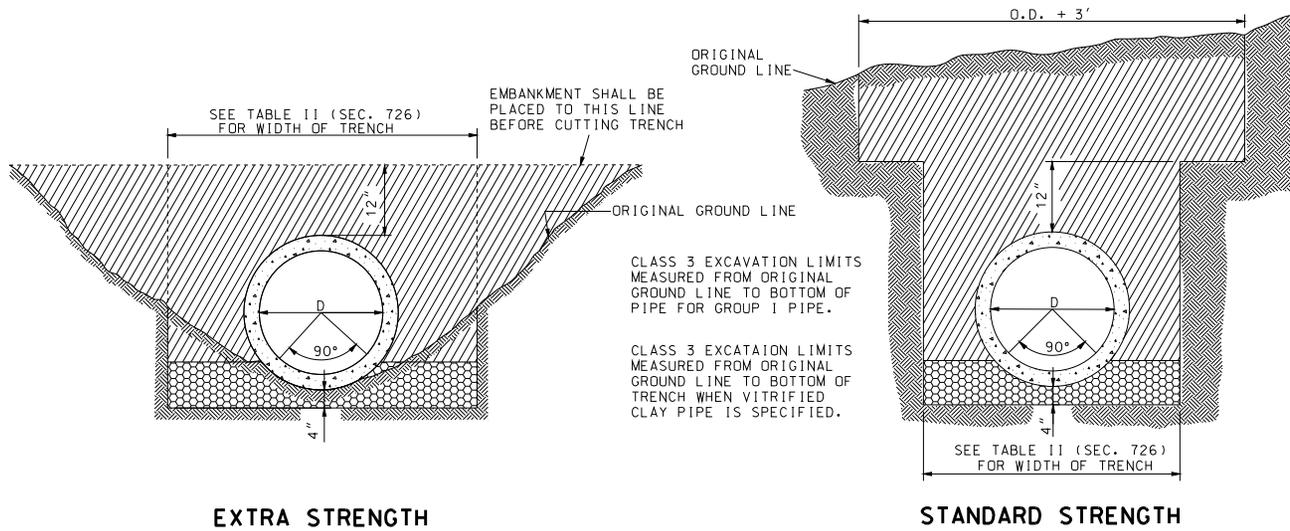
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 04/01/2011

DATE PREPARED: 3/9/2011

**726.30G**

SHEET NO.  
1 OF 2



- 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

**MoDOT** MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

**RIGID CULVERT INSTALLATION METHODS**  
VITRIFIED CLAY PIPE CULVERTS

STATE OF MISSOURI  
KATHRYN PHILIPS HANNEY  
NUMBER PE-23701  
PROFESSIONAL ENGINEER

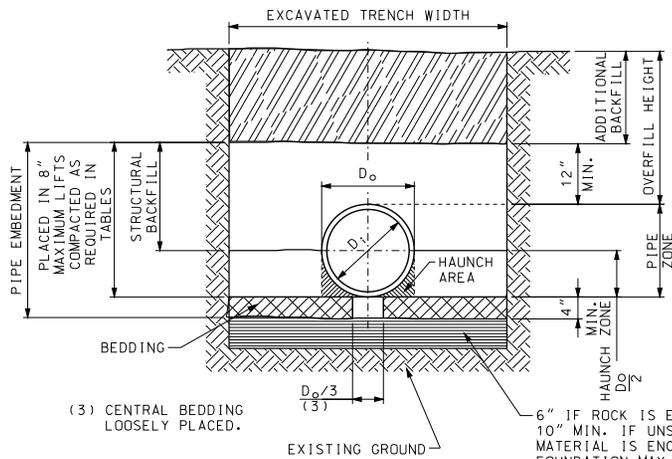
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 04/01/2011  
DATE PREPARED: 3/9/2011

**726.30G**

SHEET NO. 2 OF 2

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



**TYPICAL TRENCH DETAIL**

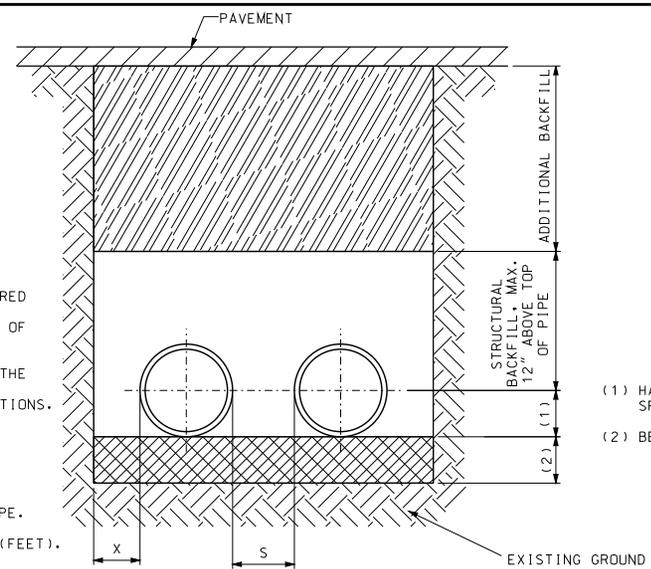
PIPE SIZE	S (IN.)	X (IN.)
12	12	9
15	12	9
18	12	9
24	12	10
30	15	16
36	18	18
42	21	18
48	24	18

**CONSTRUCTION SEQUENCE**

1. PLACE BEDDING MATERIAL TO GRADE AS REQUIRED IN TABLES.
2. COMPACT BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
3. INSTALL PIPE TO GRADE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE SPRINGLINE.
5. COMPLETE BACKFILL ACCORDING TO SPECIFICATIONS.

**LEGEND**

$D_i$  = NORMAL INSIDE DIAMETER OF PIPE.  
 $D_o$  = OUTSIDE DIAMETER OF PIPE.  
 $H$  = FILL COVER HEIGHT OVER PIPE (FEET).  
 MIN. = MINIMUM  
 MAX. = MAXIMUM  
 = UNDISTURBED SOIL



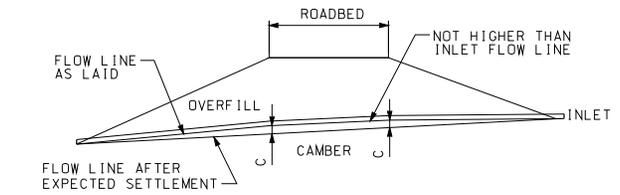
**PARALLEL PIPE INSTALLATION**  
TYPICAL TRENCH CROSS-SECTION  
(FOR PIPE INSTALLATION DETAILS, SEE TYPICAL TRENCH DETAILS.)

FILL LIMITS FOR THERMOPLASTIC PIPE																	
GRAVELLY SAND STRUCTURAL BACKFILL (S <sub>n</sub> TYPES A1 & A3)																	
SPECIFIED DIA OF PIPE (IN.)	TRENCH WIDTH (IN.)	PE				SRPE				PVC				PP			
		COMPACTION 90% S.P.D.		COMPACTION 95% S.P.D.		COMPACTION 90% S.P.D.		COMPACTION 95% S.P.D.		COMPACTION 90% S.P.D.		COMPACTION 95% S.P.D.		COMPACTION 90% S.P.D.		COMPACTION 95% S.P.D.	
		MIN.	MAX.														
12	34	2	19	2	26	--	--	--	--	2	32	2	52	2	20	2	27
15	39	2	20	2	28	--	--	--	--	2	32	2	47	2	21	2	29
18	44	2	17	2	24	--	--	--	--	2	33	2	51	2	18	2	25
24	55	2	14	2	20	2	50	--	--	2	33	2	48	2	15	2	21
30	67	2.5	12	2	17	2	50	--	--	2	33	2	46	2	15	2	21
36	76	2	13	2	19	2	50	--	--	2	33	2	47	2	13	2	19
42	84	2	13	2	19	--	--	--	--	--	--	--	--	2	18	2	25
48	95	2	11	2	17	--	--	--	--	--	--	--	--	2	11	2	15
SANDY-SILT STRUCTURAL BACKFILL (S <sub>n</sub> TYPES A1 & A3)																	
12	34	3.8	10	2	19	--	--	--	--	3.1	15	2	33	3.5	11	2	21
15	39	3.7	10	2	21	--	--	--	--	3.1	15	2	33	3.5	11	2	21
18	44	3.9	10	2	17	--	--	--	--	3.1	15	2	34	3.6	10	2	19
24	55	4.2	7	2	15	2	50	--	--	3	15	2	34	3.8	10	2	16
30	67	4.4	6	2.5	12	2	50	--	--	3	15	2	33	3.7	10	2	16
36	76	4.4	6	2	14	2	50	--	--	3	15	2	33	3.9	9	2	14
42	84	4.3	7	2	13	--	--	--	--	--	--	--	--	3.6	10	2	18
48	95	4.7	6	2	12	--	--	--	--	--	--	--	--	4	7	2	11

NOTE: MAXIMUM OVERFILL MEASURED FROM THE TOP OF PIPE TO SURFACE.

FILL 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.



**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 WILL BE SPECIFIED ON THE DESIGN PLANS.

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
42-48	3.0	3.0	3.5	4.0

MINIMUM COVER LIMITS ARE NOT SUFFICIENT FOR SANDY-SILT STRUCTURAL BACKFILL COMPACTED TO 90% S.P.D. 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.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

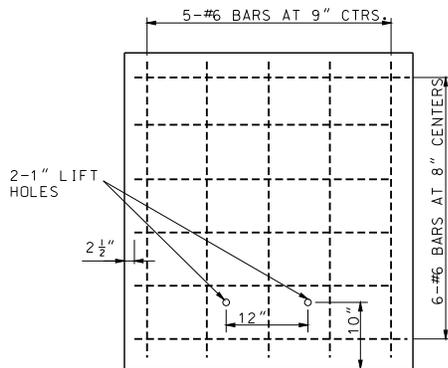
105 WEST CAPITOL JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

**THERMOPLASTIC PIPE INSTALLATION METHODS**

STATE OF MISSOURI  
KATHRYN PHILIPS HANNEY  
REGISTERED PROFESSIONAL ENGINEER  
NUMBER PE-23791  
EXPIRES 12/31/2011  
THIS SHEET HAS BEEN ELECTRONICALLY SIGNED AND DATED ELECTRONICALLY.

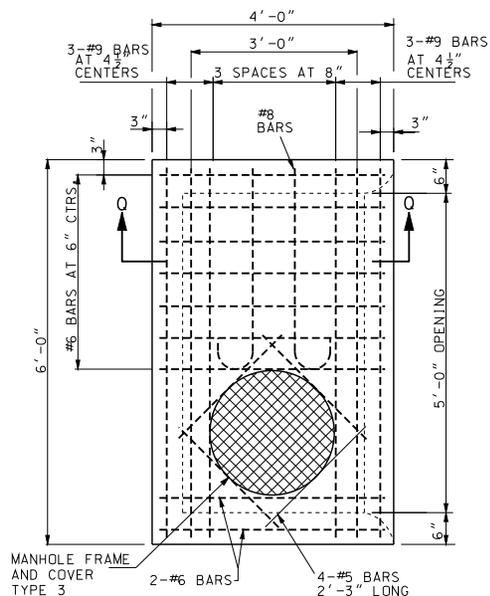
DATE EFFECTIVE: 04/01/2011	730.00	SHEET NO. 1 OF 1
DATE PREPARED: 3/31/2011		

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

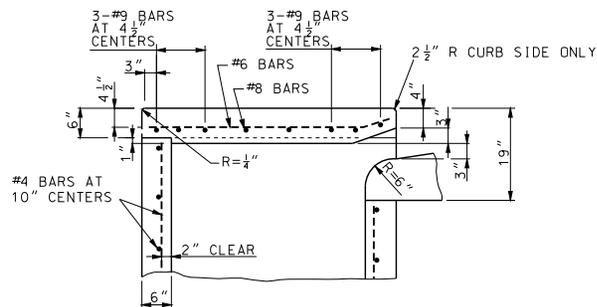


NOTE: REINFORCING FOR LIDS ON UPSTREAM SECTIONS.

**LID FOR ADJACENT SECTIONS**



**PLAN**



**SECTION 0-0**

**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.

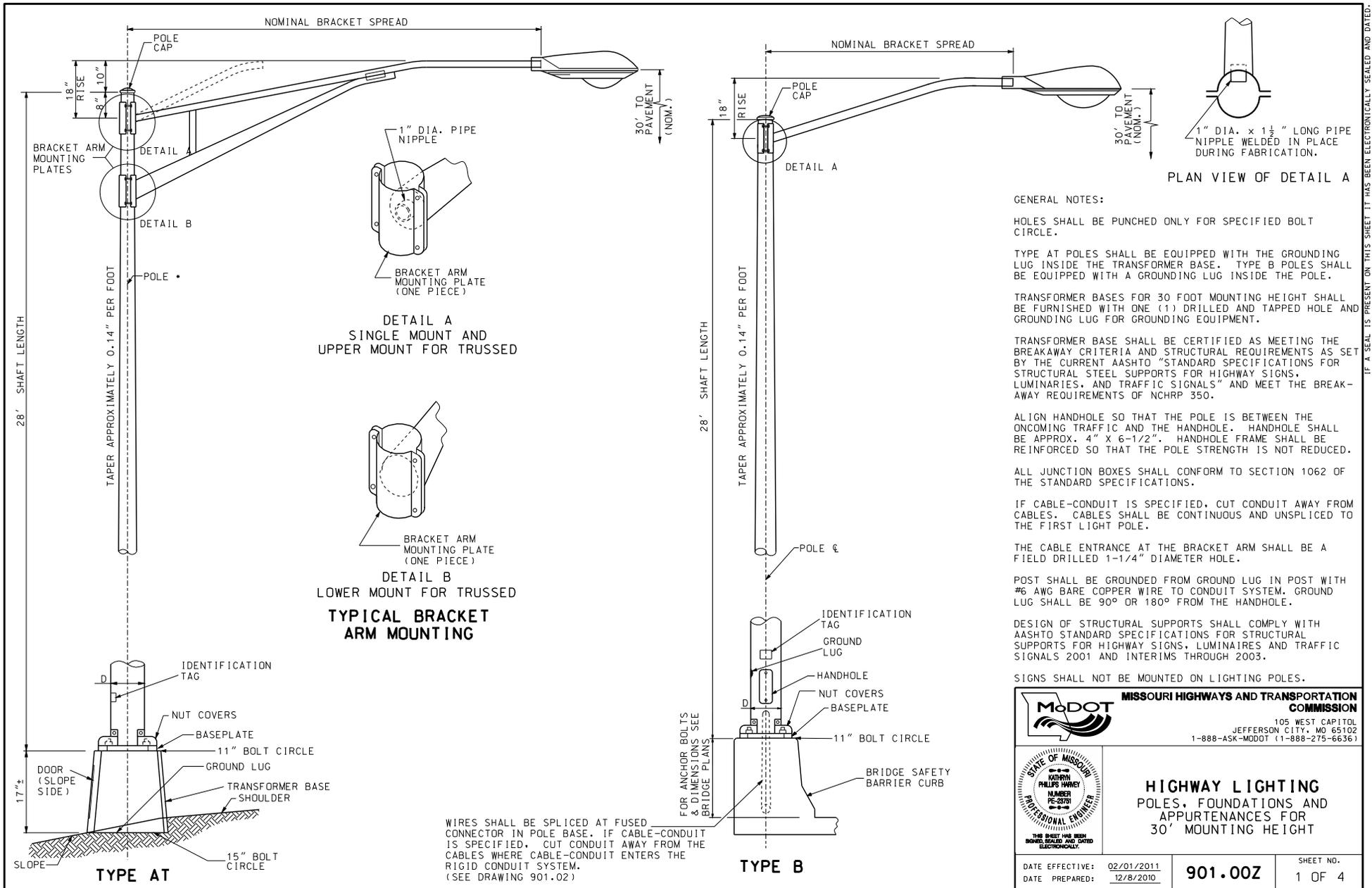
IF TWO OR MORE SECTIONS ARE USED, THE TYPE 3 MANHOLE FRAME AND COVER SHALL BE IN THE DOWNSTREAM SECTION ONLY.

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.

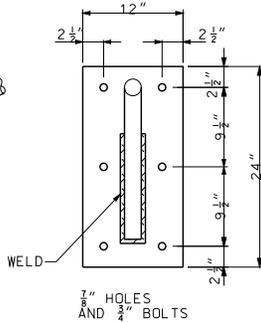
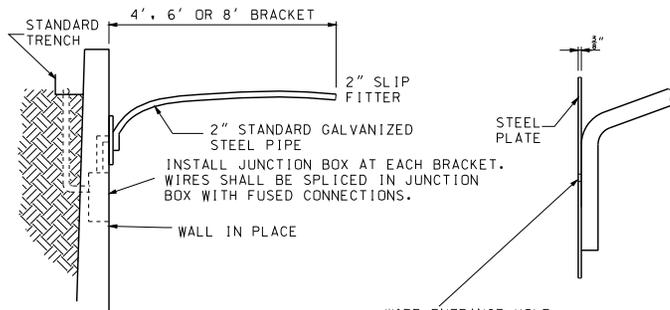
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<p><b>PRECAST DROP INLET CURB INLET - TYPE T</b></p>
DATE EFFECTIVE: 12/01/2005 DATE PREPARED: 9/3/2010	<p><b>731.10R</b></p>	SHEET NO. 6 OF 8

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

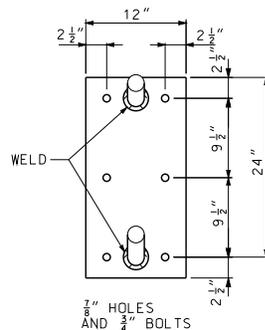
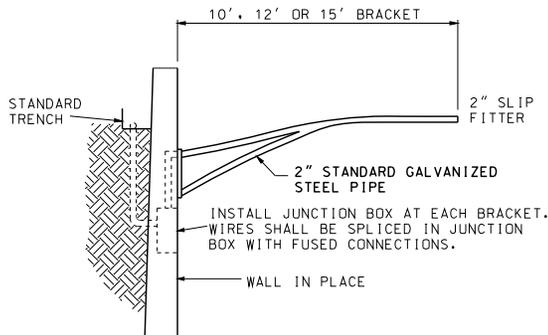


 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY LIGHTING</b> <b>POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>901.00Z</b>
SHEET NO. 1 OF 4	

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.



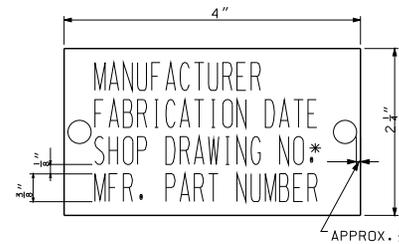
WALL BRACKETS

FACE PLATE DETAILS

ANSI LAMPS			
FUSE RATING	DESIGNATION	WATTS	INITIAL LUMENS
3 A	HPS	150	16,000
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 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" 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

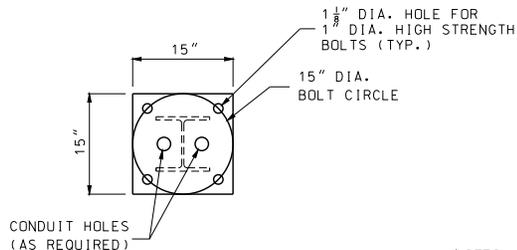
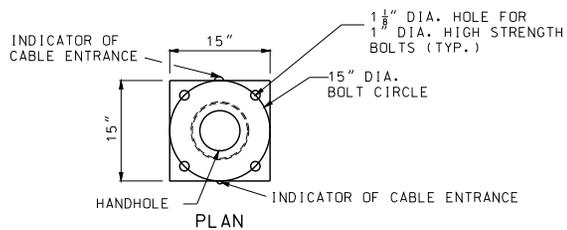
DATE EFFECTIVE: 02/01/2011

DATE PREPARED: 12/8/2010

901.00Z

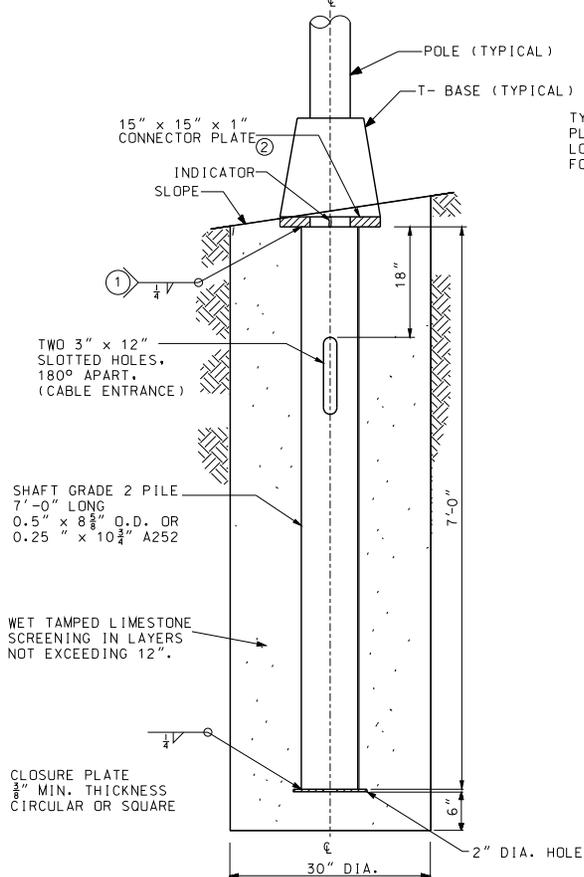
SHEET NO.  
2 OF 4

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

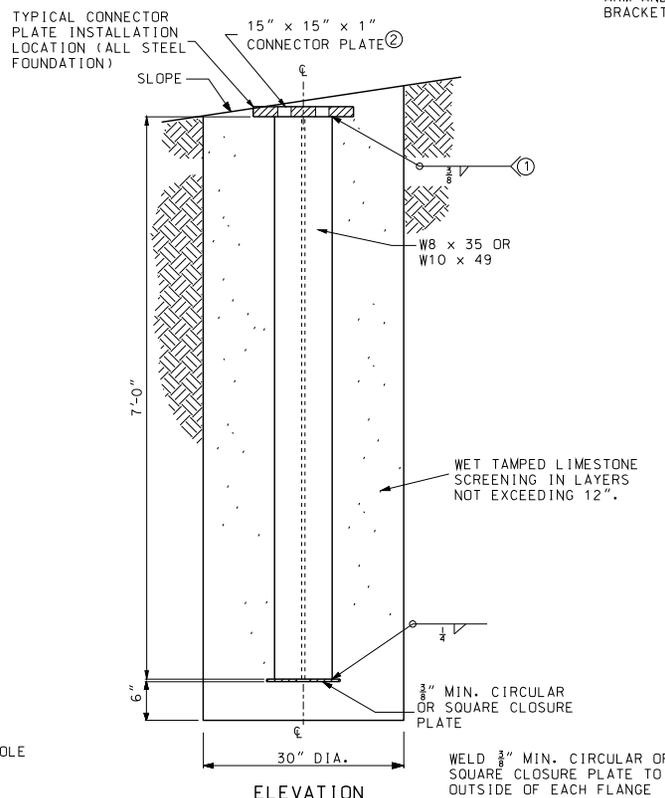


NOTES:

- 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.



DETAILS OF CIRCULAR STEEL PILE FOUNDATION



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)

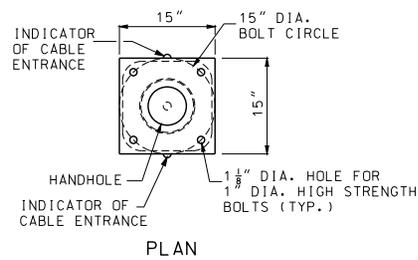
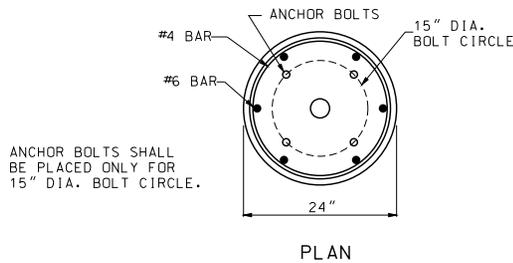
STATE OF MISSOURI  
 KATHRYN PHILIPS HANNEY  
 NUMBER PE-23791  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**HIGHWAY LIGHTING**  
 POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT

DATE EFFECTIVE: 02/01/2011  
 DATE PREPARED: 12/8/2010

901.00Z

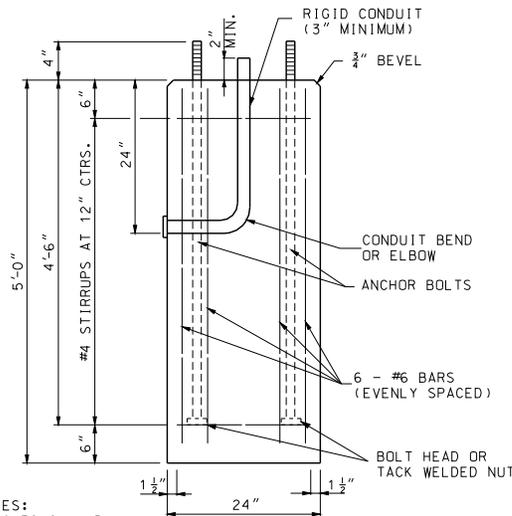
SHEET NO. 3 OF 4



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.

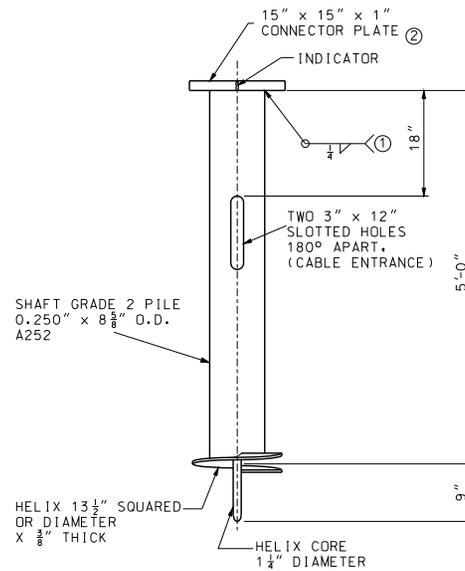
NOTES:

- 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.



QUANTITIES:  
 CONC. = 0.58 CU. YD.  
 REIN. = 64 LBS.

DETAILS OF CONCRETE FOUNDATION ③



DETAILS OF SCREW ANCHOR FOUNDATION

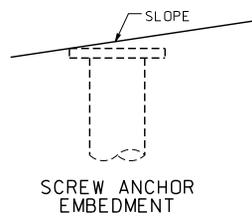
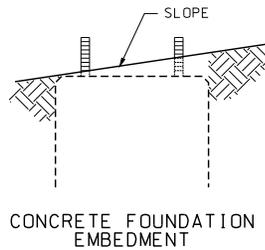
GENERAL NOTES:

ALL CLASSIFICATIONS ARE ASTM UNLESS OTHERWISE NOTED. SEE STANDARD SPECIFICATIONS FOR CLASSIFICATIONS NOT SHOWN.

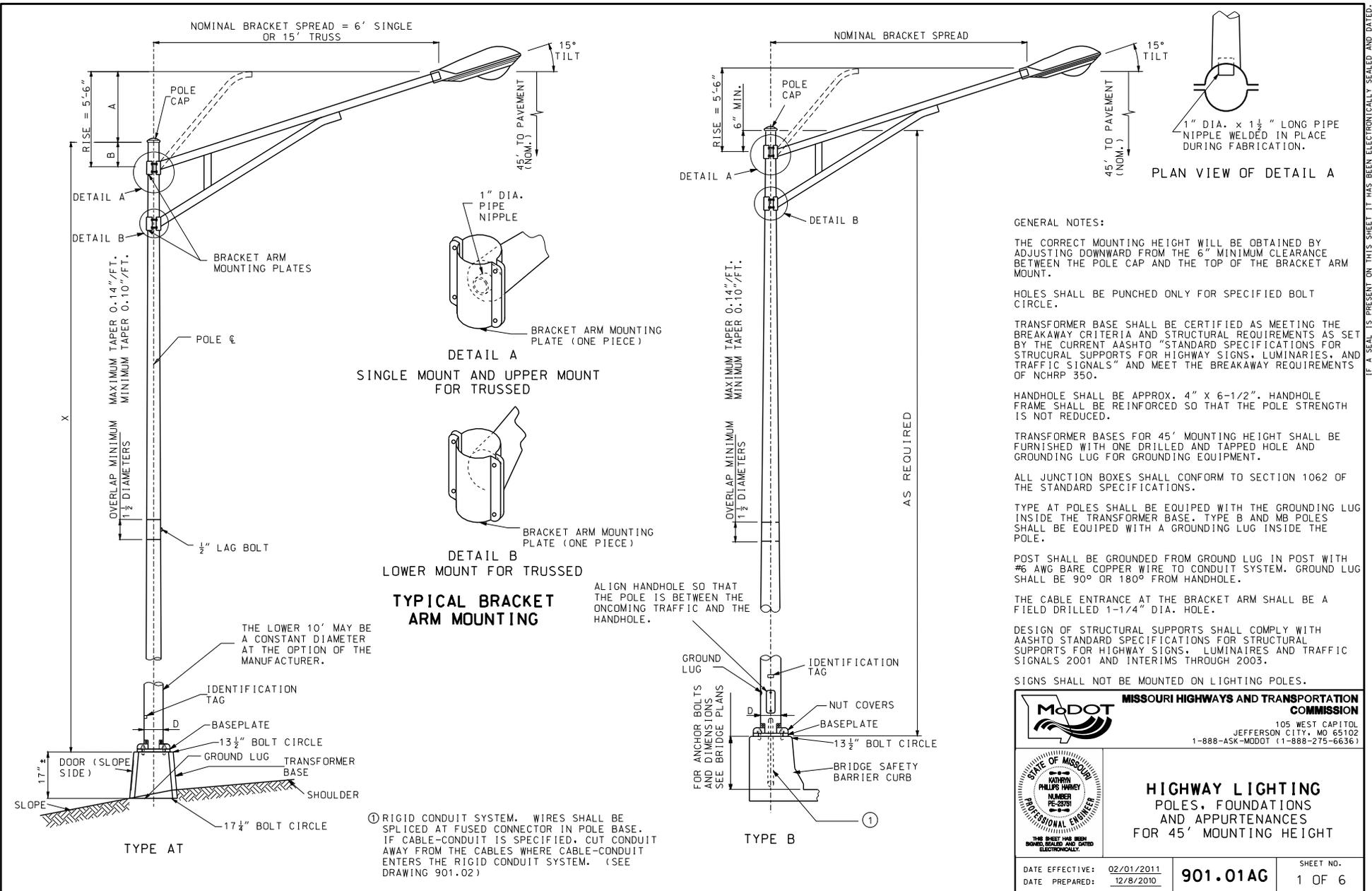
ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

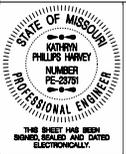
ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

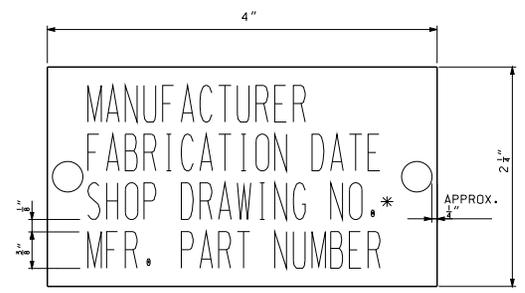
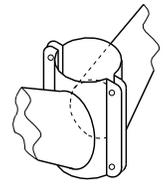
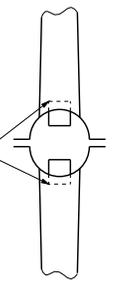
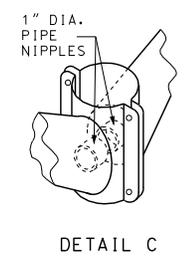
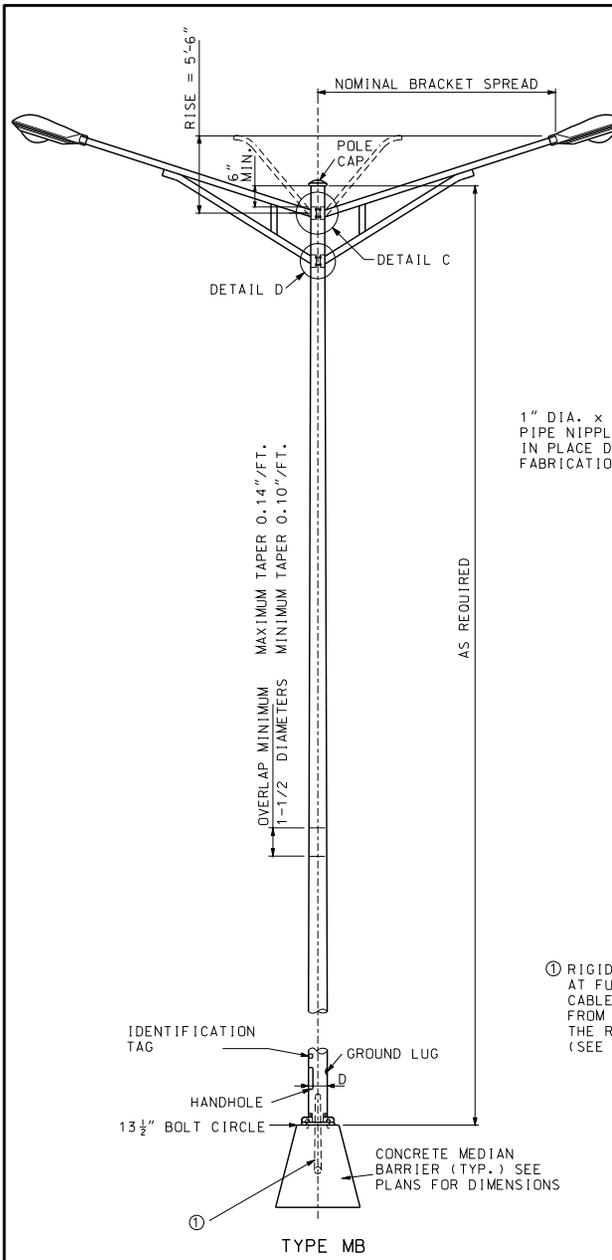


 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY LIGHTING</b> <b>POLES, FOUNDATIONS AND APPURTENANCES FOR 30' MOUNTING HEIGHT</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>901.00Z</b>
SHEET NO. 4 OF 4	



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

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY LIGHTING          POLES, FOUNDATIONS          AND APPURTENANCES          FOR 45' MOUNTING HEIGHT</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>901.01AG</b>
SHEET NO. 1 OF 6	



**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 GROUNDING 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)

		<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT</b>	
DATE EFFECTIVE:	02/01/2011	<b>901.01AG</b>	SHEET NO. 2 OF 6
DATE PREPARED:	12/8/2010		

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, LUMINAIRES, 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.

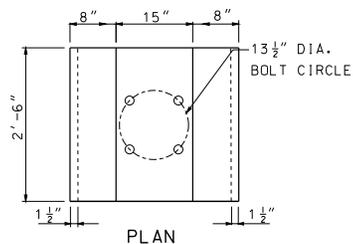
TYPE AT POLES SHALL BE EQUIPPED WITH THE GROUNDING LUG INSIDE THE TRANSFORMER BASE. TYPE B AND MB POLES SHALL BE EQUIPPED WITH A GROUNDING LUG INSIDE THE POLE.

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.

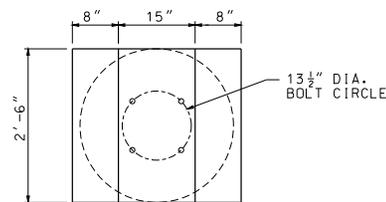
THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1 1/2" DIA. HOLE.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)		
		<b>HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT</b>	
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>901.01AG</b>		SHEET NO. 3 OF 6

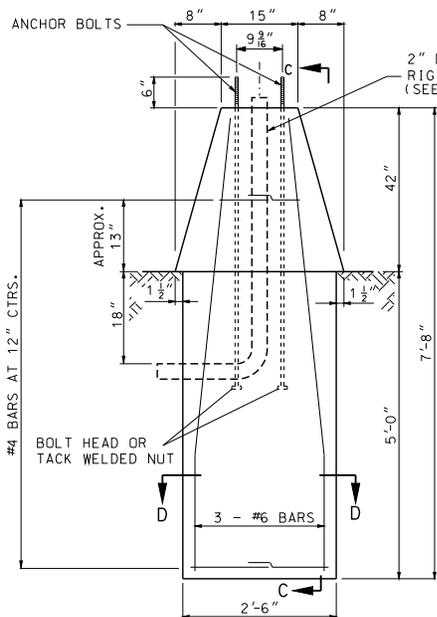
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



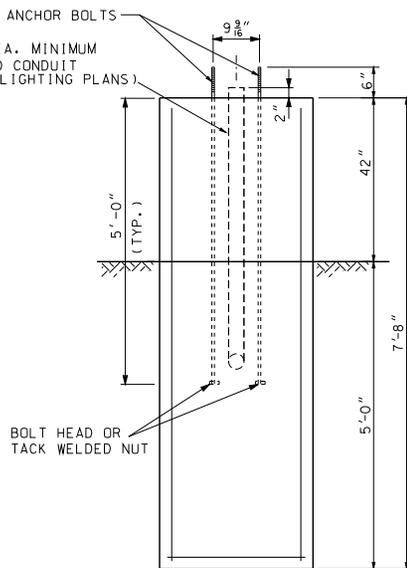
PLAN



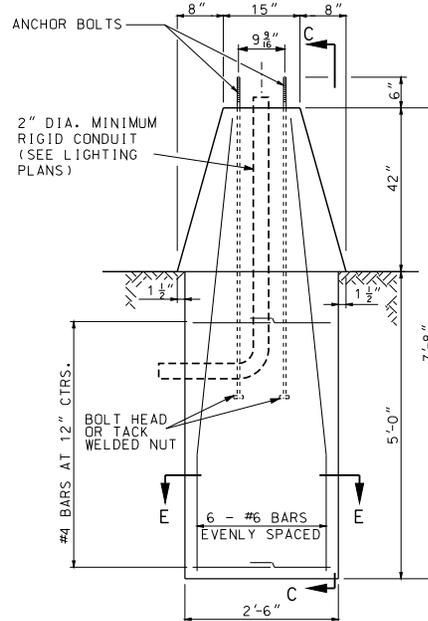
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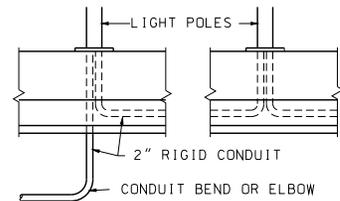
ELEVATION ALTERNATE 1



SECTION C-C



ELEVATION ALTERNATE 2



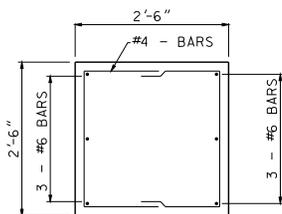
CONDUIT DETAIL FOR ALTERNATE 1 & 2

GENERAL NOTES:

ALL FOUNDATIONS SHALL INCLUDE 4 ANCHOR BOLTS AND NUTS PLACED AS SHOWN.

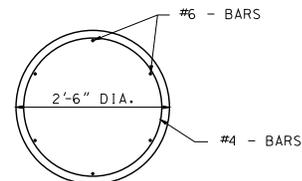
ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1/4" DIAMETER HIGH STRENGTH ANCHOR BOLTS.

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

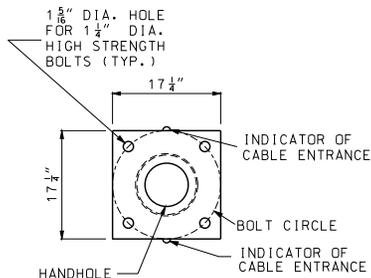
CONCRETE MEDIAN BARRIER AND FOUNDATION DESIGN FOR TYPE MB LIGHT POLE



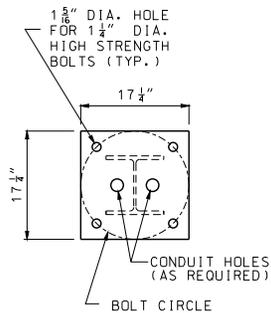
SECTION E-E

		<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT</b>	
DATE EFFECTIVE:	02/01/2011	<b>901.01AG</b>	SHEET NO.
DATE PREPARED:	12/8/2010		4 OF 6

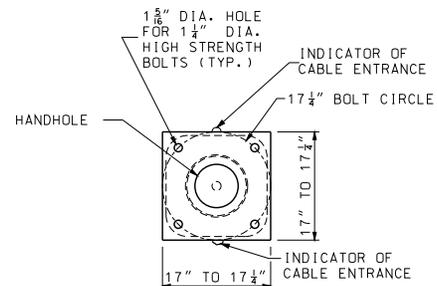
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PLAN

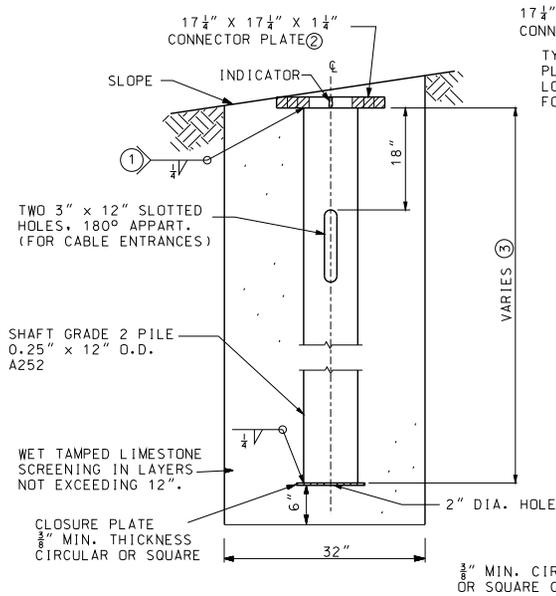


PLAN

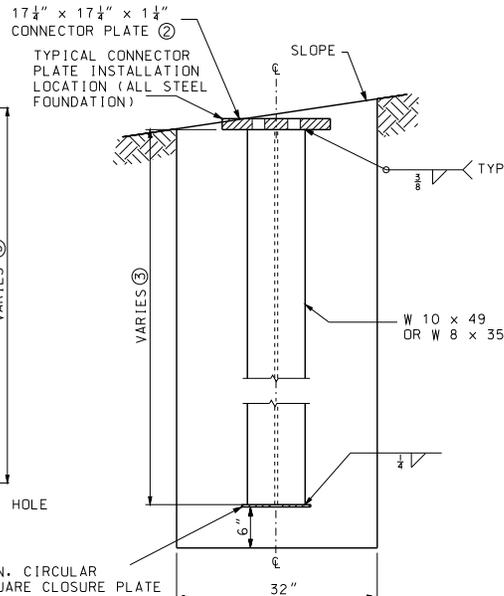


PLAN

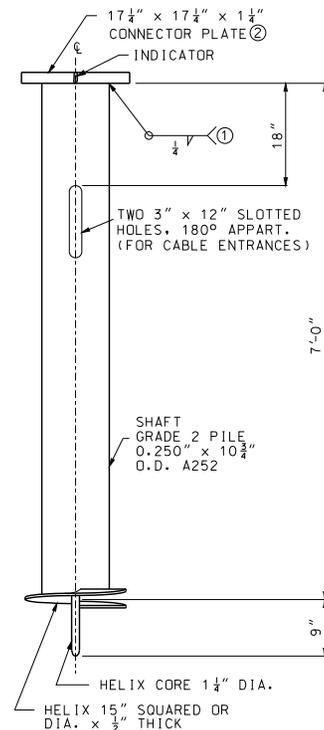
NOTE:  
DRIVE HOLES WILL BE PERMITTED PROVIDED THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE, THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.



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 CONECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

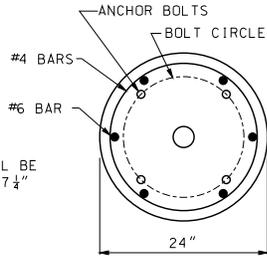
ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1 1/4" DIAMETER HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

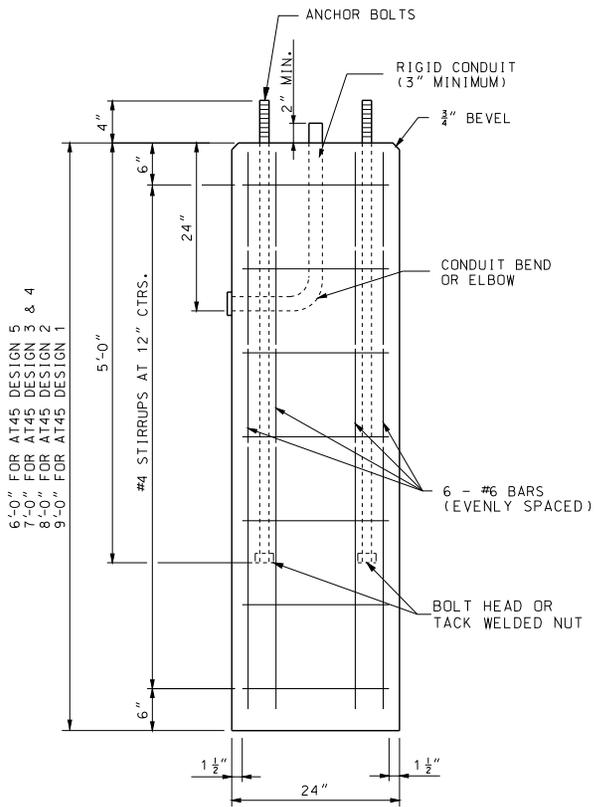
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)
	<b>HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>901.01AG</b>
SHEET NO. <b>5 OF 6</b>	

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

NOTE:  
ANCHOR BOLTS SHALL BE  
PLACED ONLY FOR 17 1/2"  
BOLT CIRCLE



PLAN

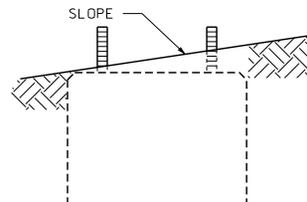


ELEVATION

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.

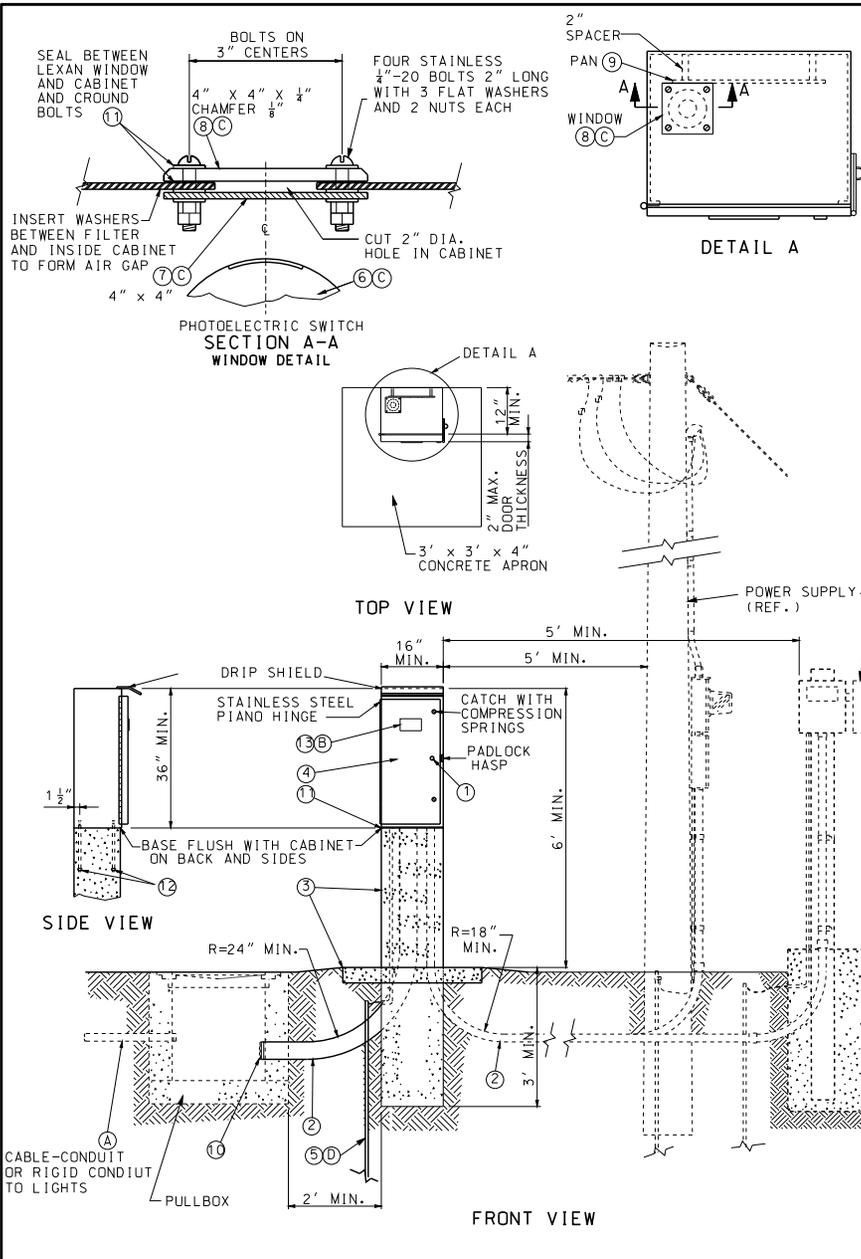
ALL BOLT CIRCLES FOR 45' MOUNTING HEIGHT SHALL BE 17 1/2".

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.

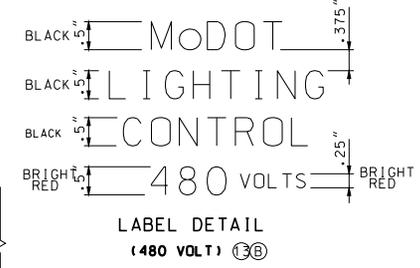
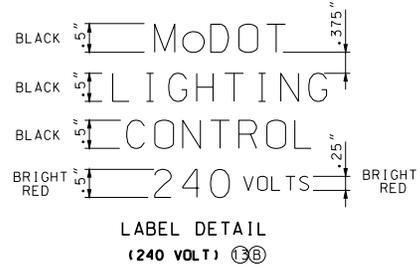
ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>901.01AG</b>
SHEET NO. 6 OF 6	



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, 1/8" 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.

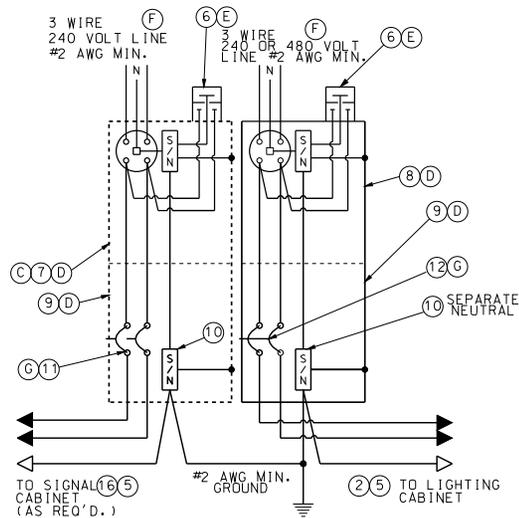
ALL OPENINGS IN CABINET SHALL BE COVERED AND SEALED WITH LIFETIME SILICONE CAULK.

ALL MATERIALS REQUIRED EXCLUDING REFERENCE ITEMS AS SHOWN ON DRAWING SHALL BE INCLUDED IN PRICE BID FOR CONTROL STATION.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY LIGHTING</b> BASE MOUNTED CONTROL STATION 240 V OR 480 V - 4 CIRCUIT	
	DATE EFFECTIVE: 04/01/2005 DATE PREPARED: 9/14/2010	<b>901.30F</b> SHEET NO. 1 OF 2

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

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, RAIN TIGHT, 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.

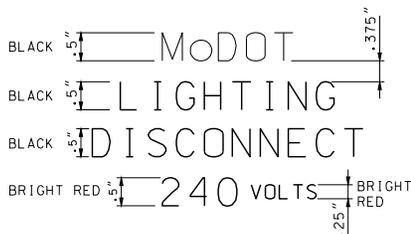
THE POWER SUPPLY ASSEMBLY TYPE IS SHOWN ON THE PLANS OR IS DESIGNATED IN THE CONTRACT.

THE UTILITY COMPANY SHALL BE NOTIFIED IN WRITING 30 DAYS PRIOR TO DATE SERVICE WILL BE REQUIRED.

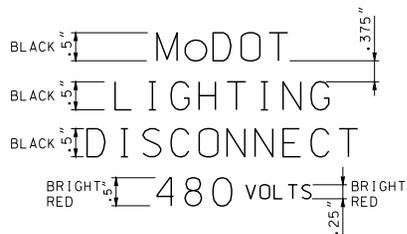
WHERE SIGNAL OR LIGHTING POWER ONLY IS DESIGNATED, OMIT ITEMS NOT REQUIRED.

ALL OPENINGS IN ANY SERVICE BOX OR METER BOX SHALL BE COVERED AND SEALED WITH LIFETIME SILICONE CAULK.

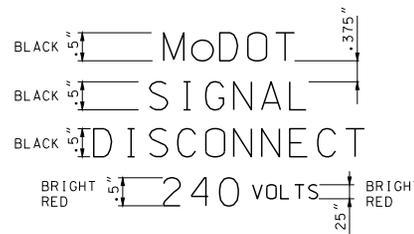
ALL MATERIALS REQUIRED AS SHOWN ON DRAWING, INCLUDING CABLE AND CONDUIT FROM POWER SUPPLY ASSEMBLY TO UTILITY COMPANY FACILITIES, SHALL BE INCLUDED IN UNIT BID PRICE FOR POWER SUPPLY ASSEMBLY.



LABEL DETAIL (19) (240 VOLT) (F)



LABEL DETAIL (19) (480 VOLT) (F)

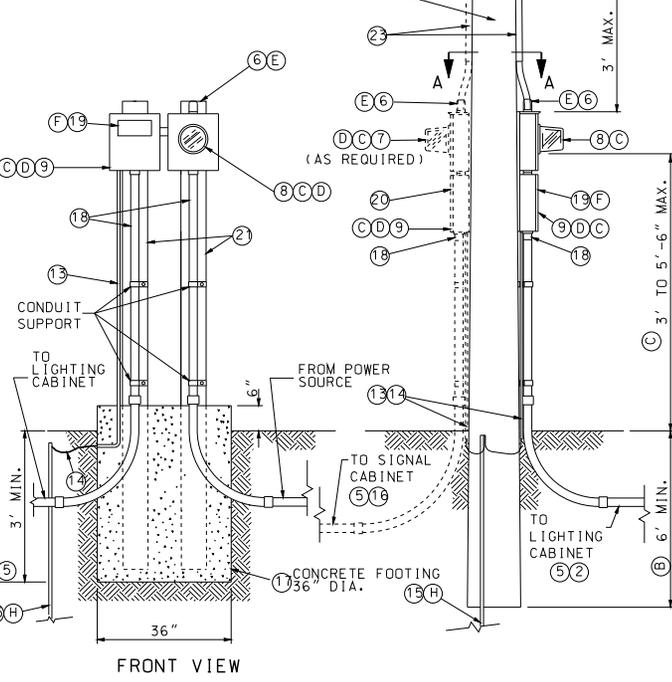
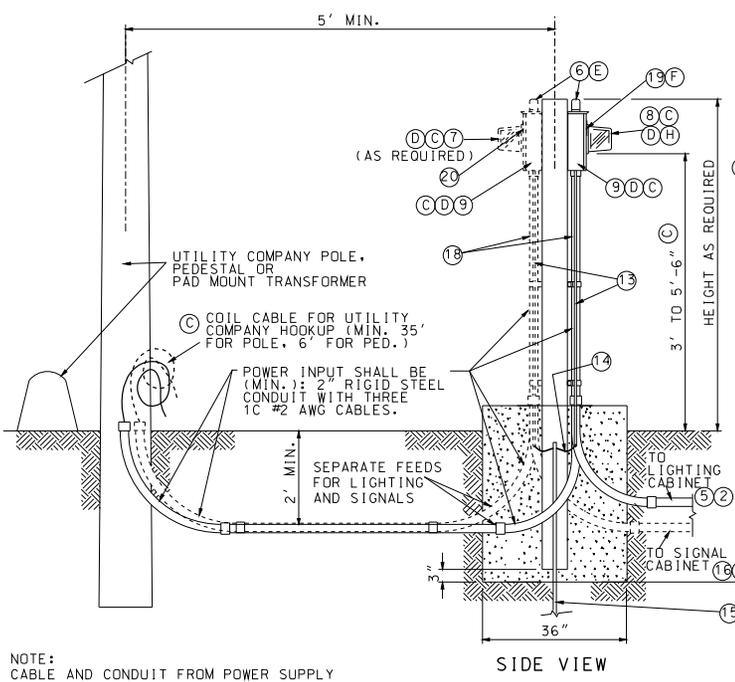
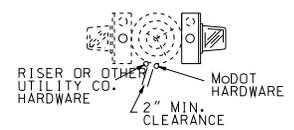
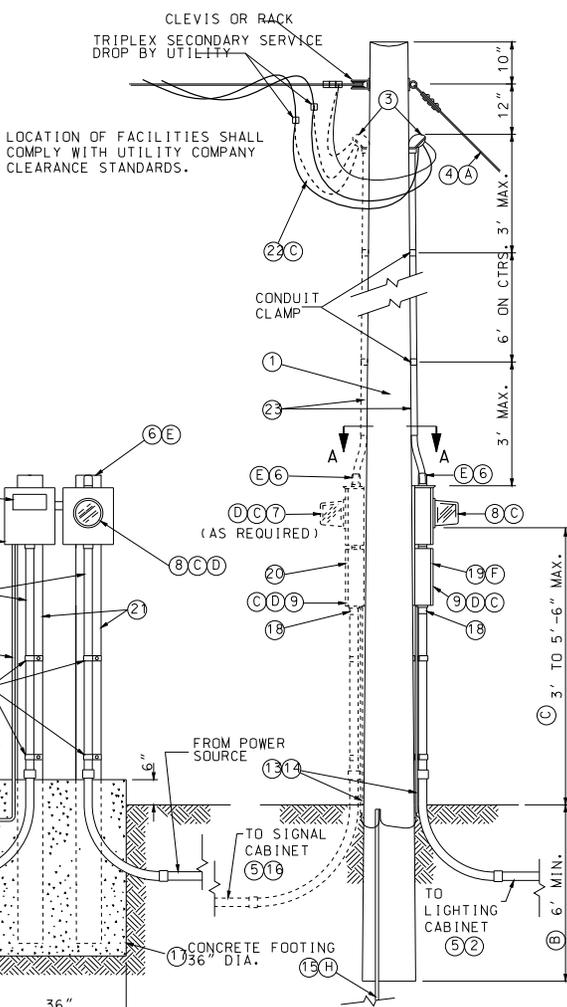
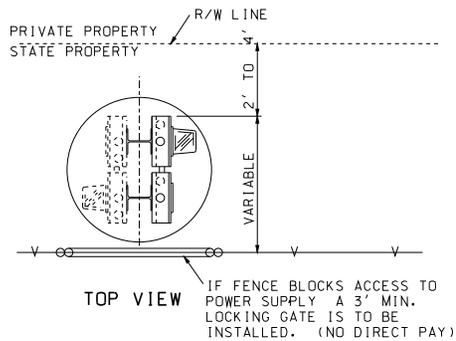


LABEL DETAIL (20)

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY LIGHTING POWER SUPPLY ASSEMBLY SECONDARY SERVICE</b>	
	DATE EFFECTIVE: 04/01/2002 DATE PREPARED: 4/1/2010	<b>901.80D</b> 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.



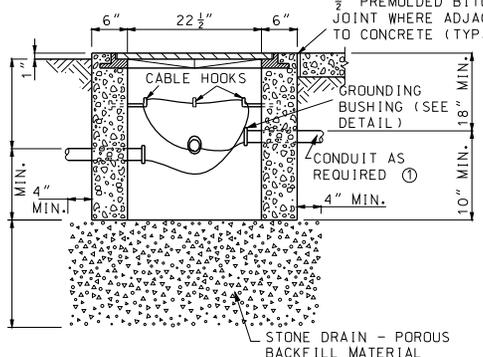
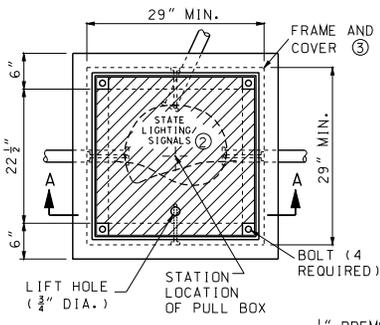
NOTE:  
 CABLE AND CONDUIT FROM POWER SUPPLY ASSEMBLY TO UTILITY COMPANY FACILITIES SHALL BE INCLUDED IN PRICE BID FOR POWER SUPPLY ASSEMBLY.

TYPE 2 (PEDESTAL)  
 UNDERGROUND SERVICE

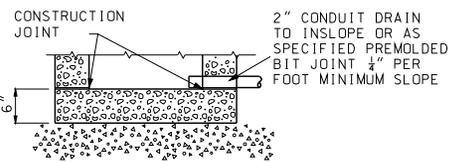
TYPE 1 (POLE)  
 OVERHEAD SERVICE

		<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>HIGHWAY LIGHTING          POWER SUPPLY ASSEMBLY          SECONDARY SERVICE</b>	
DATE EFFECTIVE:	04/01/2002	<b>901.80D</b>	SHEET NO.
DATE PREPARED:	5/19/2010		2 OF 2

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

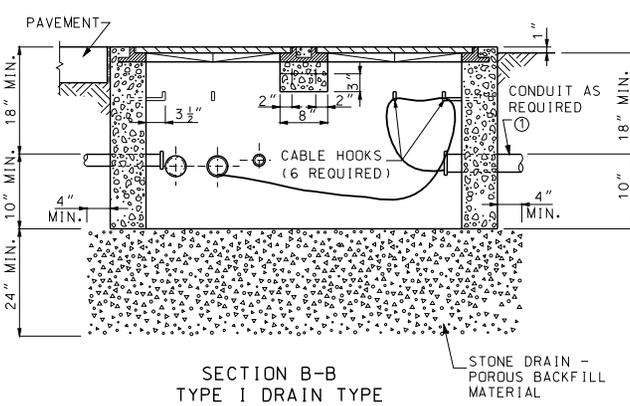
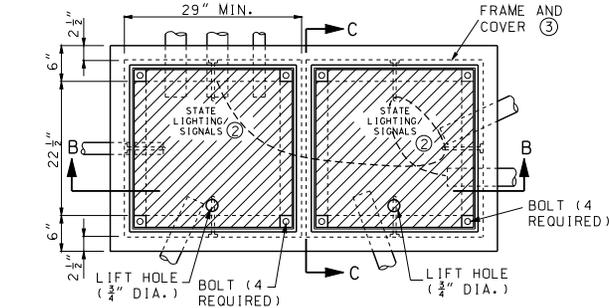


SECTION A-A  
TYPE I DRAIN TYPE

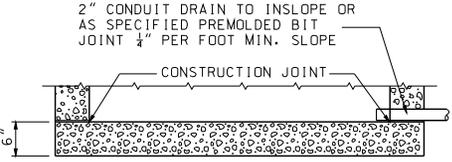


SECTION A-A  
TYPE II DRAIN TYPE  
(SEE DRAIN OUTLET DETAILS)  
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN)

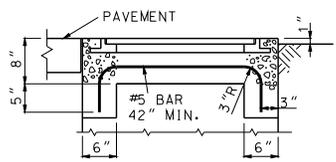
**STANDARD CONCRETE PULL BOX**



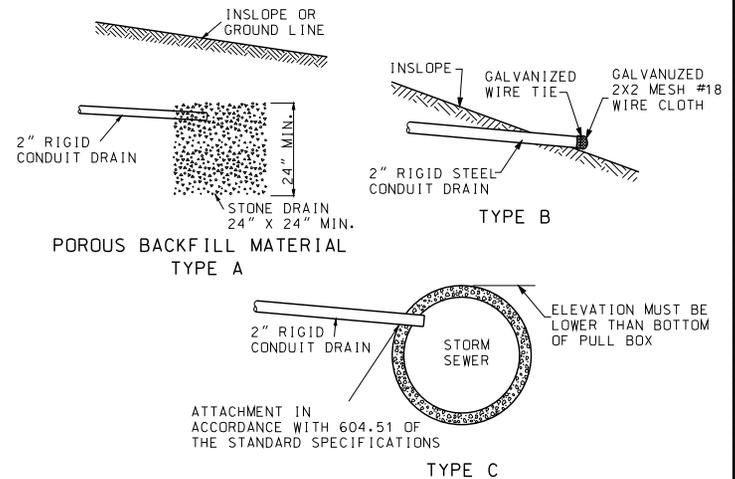
SECTION B-B  
TYPE I DRAIN TYPE



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.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**TRAFFIC SIGNALS**

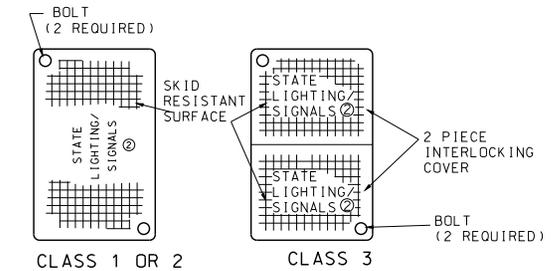
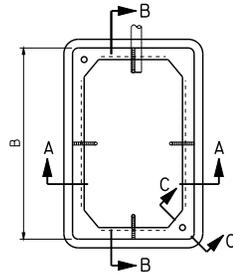
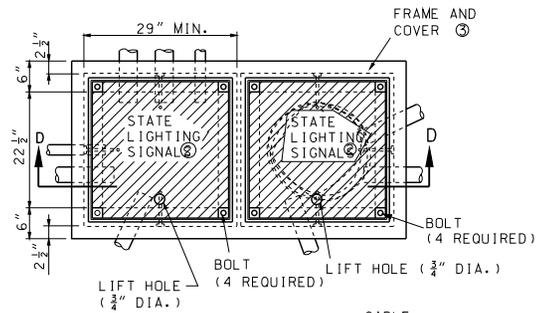
CONCRETE PULL BOXES

DATE EFFECTIVE: 11/01/2010

DATE PREPARED: 9/3/2010

DATE EFFECTIVE: 11/01/2010	DATE PREPARED: 9/3/2010	<b>902.20G</b>	SHEET NO. 1 OF 3
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IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



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"

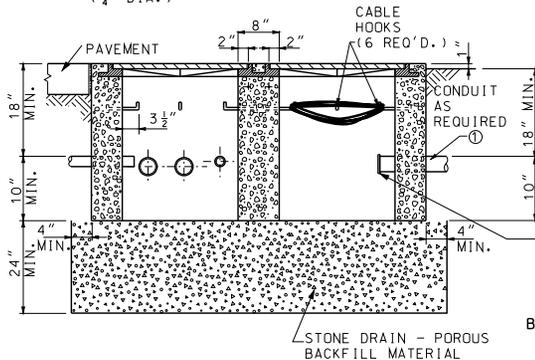
- ALL METAL CONDUITS SHALL BE ELECTRICALLY BONDED BY A GROUND BUSHING AND #6 AWG BARE COPPER WIRE. FOR PVC CONDUIT, ALL GROUND WIRES SHALL BE CONNECTED.
- SIGNAL PULL BOXES SHALL BE EMBOSSED "STATE SIGNALS" AND LIGHTING PULL BOXES "STATE LIGHTING."
- PULL BOX FRAMES AND COVERS SHALL BE CAST IRON AND THE FOLLOWING MINIMUM DIMENSIONS:

FRAME SIZE: 29" x 29"  
 FRAME HEIGHT: 4 1/2"  
 OPENING SIZE: 22 1/2" x 22 1/2"  
 FRAME WEIGHT: 120 LBS.  
 COVER SIZE: 22 3/8" x 22 3/8"  
 COVER THICKNESS: 1/2"  
 COVER WEIGHT: 140 LBS.

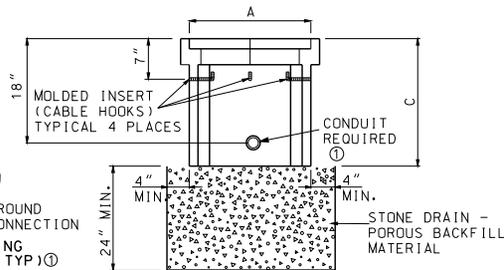
GENERAL NOTES:

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.

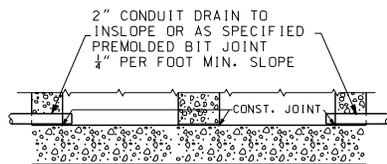
IF PREFORMED PULL BOXES ARE SPECIFIED, THE CONTRACTOR MAY USE THE STANDARD CONCRETE PULL BOX IN LIEU OF THE CLASS 1 OR 2 PREFORMED PULL BOX OR THE DOUBLE CONCRETE PULL BOX, TYPE A, IN LIEU OF THE CLASS 3 PREFORMED PULL BOXES.



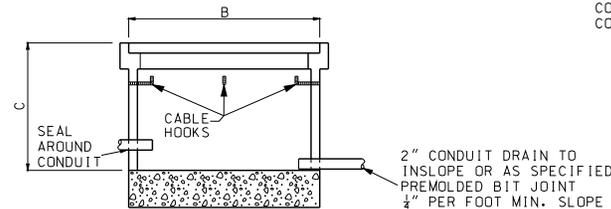
SECTION D-D  
TYPE I DRAIN TYPE



SECTION A-A  
TYPE I DRAIN TYPE

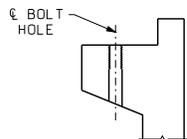


TYPE II DRAIN TYPE  
(SEE DRAIN OUTLET DETAILS)  
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN.)  
DOUBLE CONCRETE PULL BOX, TYPE B



SECTION B-B  
TYPE II DRAIN TYPE

PREFORMED PULL BOX



SECTION C-C  
TYPICAL BOLT CLEANOUT

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

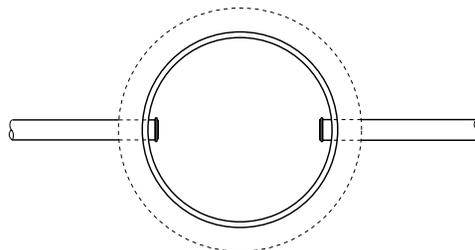
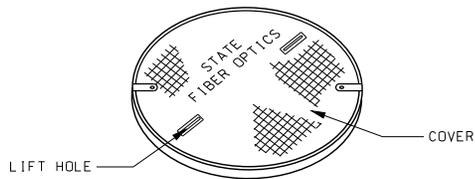
**TRAFFIC SIGNALS  
CONCRETE AND PREFORMED  
PULL BOXES**

DATE EFFECTIVE: 11/01/2010  
DATE PREPARED: 9/3/2010

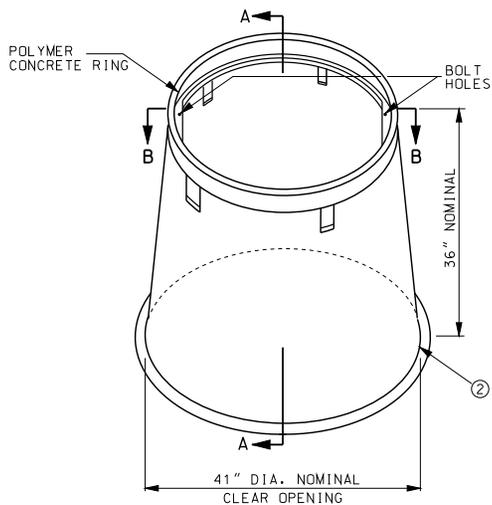
902.20G

SHEET NO.  
2 OF 3

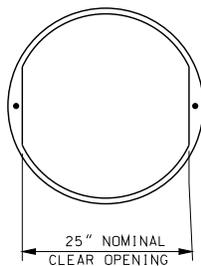
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



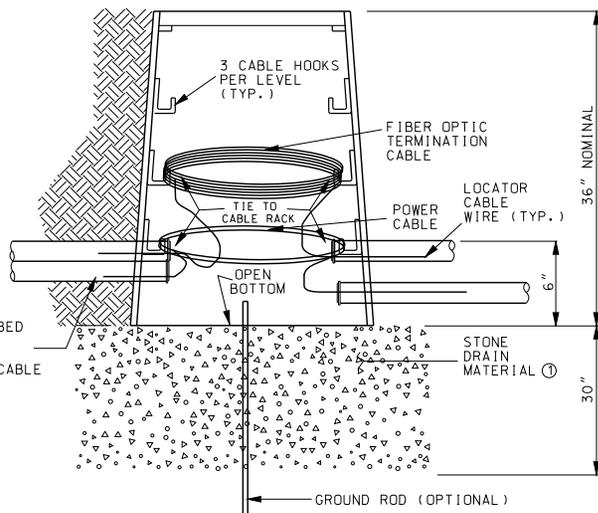
PLAN



CIRCULAR PULL BOX CLASS 5



SECTION B-B



SECTION A-A  
TYPE I DRAIN TYPE

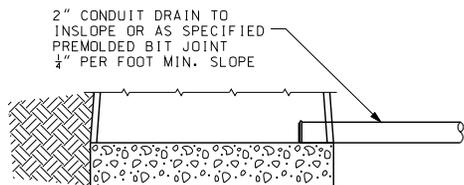
- ① AGGREGATE SHALL BE TYPE 1 CONFORMING TO SEC 1007.
- ② BOX SHALL BE OF A FLARE DESIGN AND HAVE A LIP FOR STABILIZATION.

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".

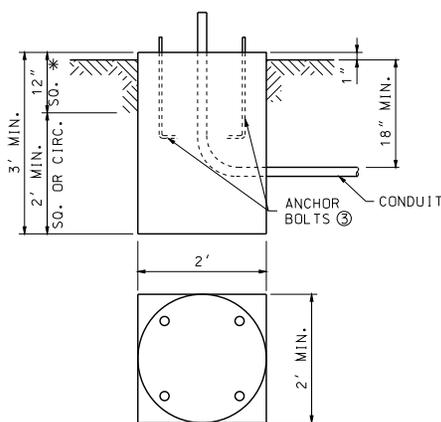
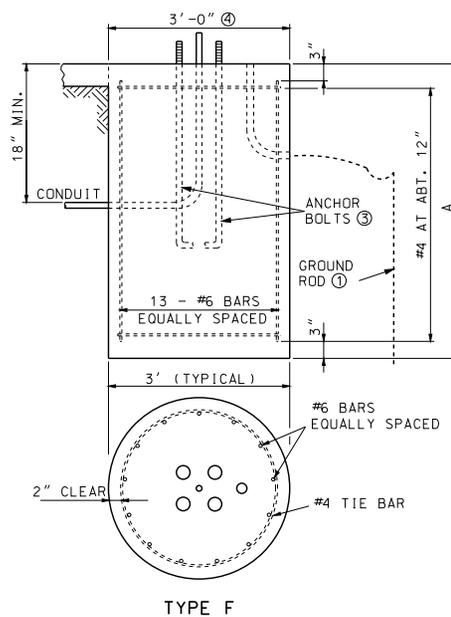
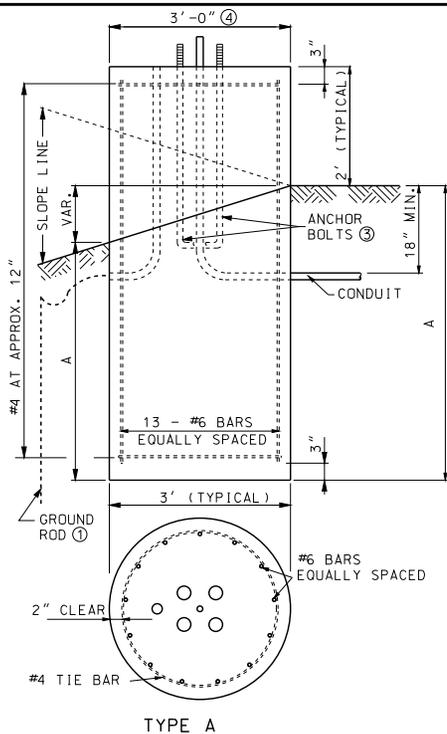


TYPE II DRAIN TYPE

(SEE DRAIN OUTLET DETAILS.)  
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN.)

<p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b></p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p><b>TRAFFIC SIGNALS</b> CONCRETE AND PREFORMED PULL BOXES</p>	<p>DATE EFFECTIVE: 11/01/2010</p>	<p>SHEET NO. 3 OF 3</p>
		<p>DATE PREPARED: 9/3/2010</p>	<p>902.20G</p>

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



\* SURFACE OF BASE TO BE CONSTRUCTED SQUARE FOR A DEPTH OF 12".

TYPE C

POST BASES

STEEL AND CONCRETE REQUIREMENTS FOR POST BASES ⑧ ⑨

BASES		#6 STEEL BAR	CONC.
TYPE	A ⑦	LENGTH	WEIGHT LBS.
A-9	9'-0"	10'-6"	260
A-9.5	9'-6"	11'-0"	270
A-10	10'-0"	11'-6"	285
A-10.5	10'-6"	12'-0"	295
A-11	11'-0"	12'-6"	271
A-12	12'-0"	13'-6"	335
F-9	9'-0"	8'-6"	210
F-9.5	9'-6"	9'-0"	220
F-10	10'-0"	9'-0"	235
F-10.5	10'-6"	10'-0"	250
F-11	11'-0"	10'-6"	260
F-12	12'-0"	11'-6"	285
C*			0.44

\* SURFACE OF BASE TO BE CONSTRUCTED SQUARE FOR A DEPTH OF 12".

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

BASE EMBEDMENT IN SOLID ROCK	
SOLID ROCK ENCOUNTER POINT	REQUIRED EMBEDMENT FOR BASE TYPE
AT SURFACE	4'-9"
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.

- ① APPLICABLE ONLY WHERE CONTROLLER IS MOUNTED TO A SIGNAL POLE.
- ② BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.
- ③ ANCHOR BOLT DIMENSIONS ARE SHOWN ON THE MANUFACTURER'S APPROVED DRAWINGS.
- ④ MAXIMUM BOLT CIRCLE DIAMETER IS 26". BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.
- ⑤ ARM LENGTH DETERMINED BY LENGTH OF LONGEST ARM FOR TYPE B & BL SIGNAL POSTS.
- ⑥ BASE TYPE A OR F DETERMINED BY LOCATION OF POST BASE.
- ⑦ SOIL DEPTH, NO ROCK.
- ⑧ INCLUDE #4 TIE BAR.
- ⑨ 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**

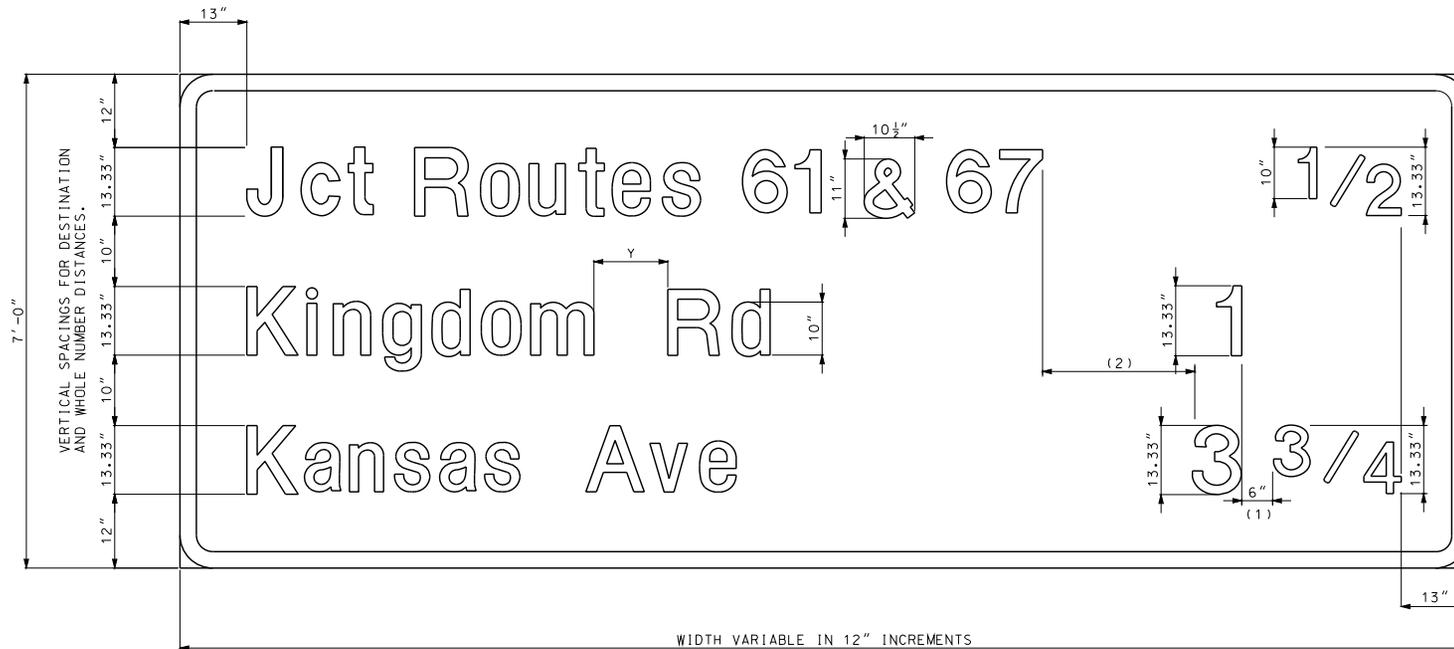
POST BASES

SHEET NO.  
1 OF 2

DATE EFFECTIVE: 02/01/2008  
DATE PREPARED: 4/5/2011

902.30P

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 TYPE 3  
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

**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.

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

(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 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			

**GENERAL NOTES (ALL SIGNS):**

GROUND MOUNTED SIGNS GREATER THAN 6 FEET WIDE OR SIGNS GREATER THAN 30 SQUARE FEET SHALL BE STRUCTURAL.

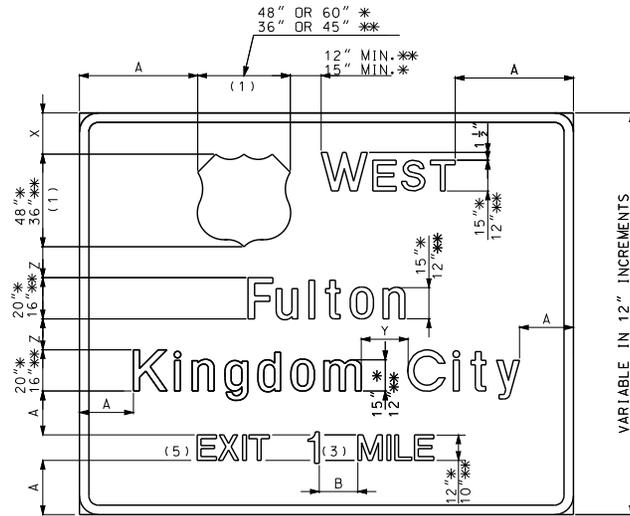
GUIDE SIGN WIDTH VARIABLE IN 12" INCREMENTS.

GUIDE SIGN HEIGHT VARIABLE IN 12" INCREMENTS.

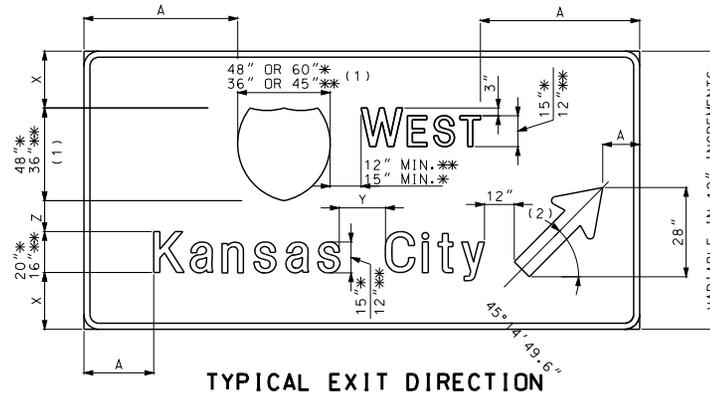
STATE ABBREVIATIONS SHALL BE THE STANDARD 2-LETTER POSTAL ABBREVIATION, AND SHALL BE DETAILED IN ALL-CAPS.

SEE OTHER STANDARD DRAWINGS FOR ARROW DETAILS.

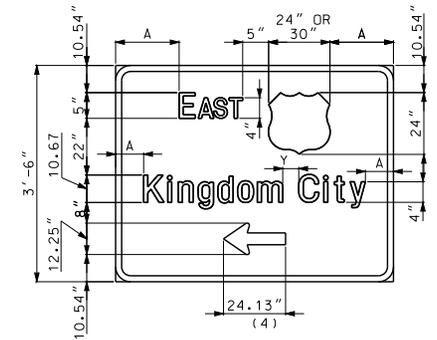
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY SIGNING STRUCTURAL SIGNS</b> INTERCHANGE SEQUENCE	
	DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b> SHEET NO. 1 OF 19



**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 UPPERCASE LETTER HEIGHT. VARY THIS DIMENSION FOR HEIGHT AND WIDTH INCREMENTAL ROUNDING.
- Y = UPPERCASE 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 TYPE 3
- R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

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

**STATE OF MISSOURI**

**KATHRYN PHILIPS HANNEY**

**REGISTERED PROFESSIONAL ENGINEER**

NUMBER PE-23701

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

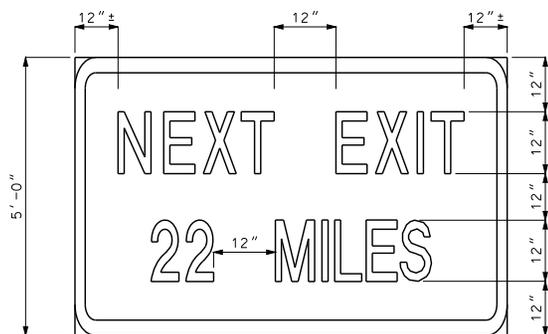
**HIGHWAY SIGNING STRUCTURAL SIGNS**

INTERCHANGE SEQUENCE

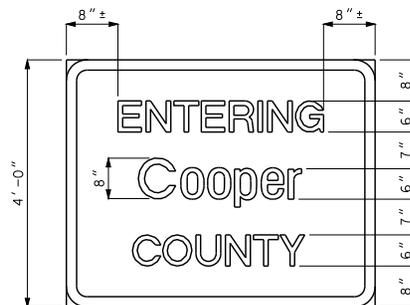
DATE EFFECTIVE: 06/01/2010  
DATE PREPARED: 4/1/2010

903.02AK

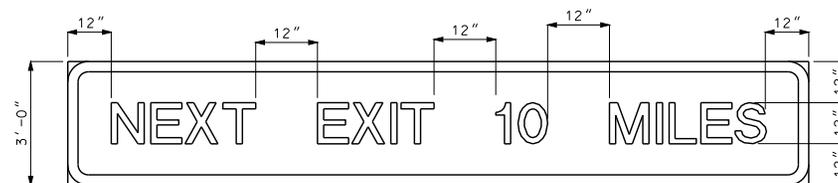
SHEET NO.  
2 OF 19



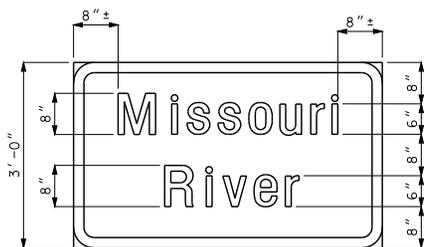
E2-1A



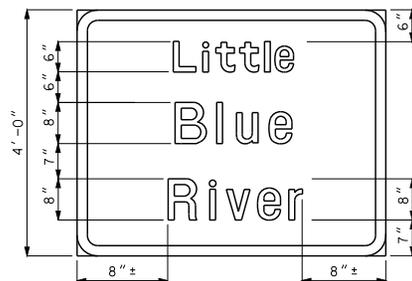
COUNTY LINE



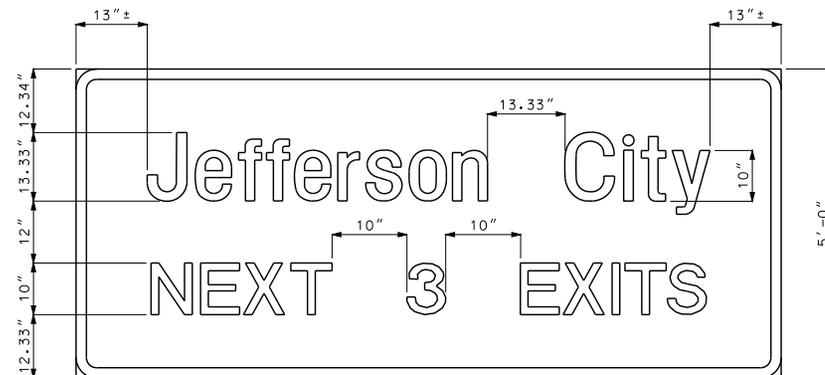
E2-1  
NEXT EXIT SUPPLEMENTAL  
ADVANCE GUIDE



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	YAR.	
BORDER	L-3	R4	WHITE	
SUBSTRATE	STRUCTURAL (SEE GEN. NOTES ON SH. 1)			

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 3  
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
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**HIGHWAY SIGNING  
STRUCTURAL SIGNS**

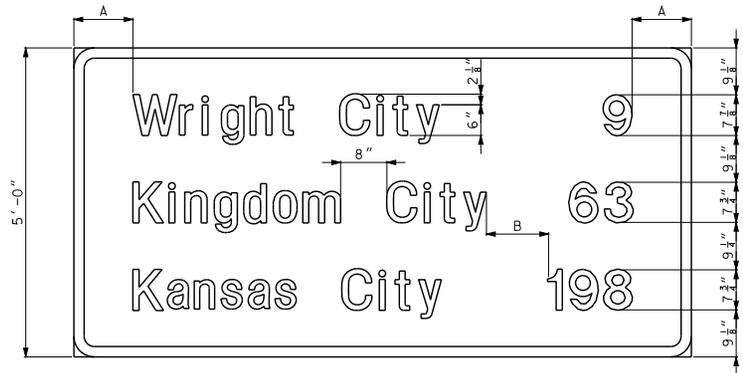
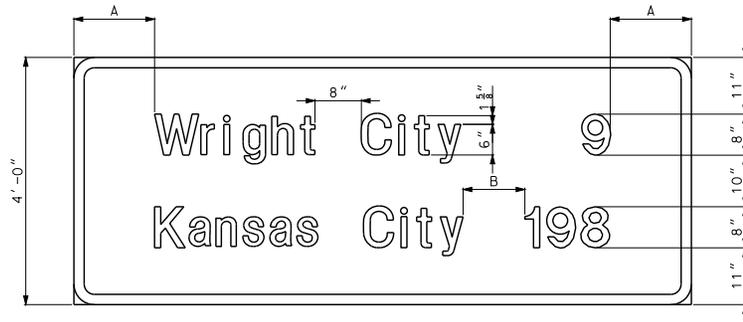
MISC. FREEWAY AND EXPRESSWAY  
GUIDE SIGNS

THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

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

**903.02AK**

SHEET NO.  
3 OF 19



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.

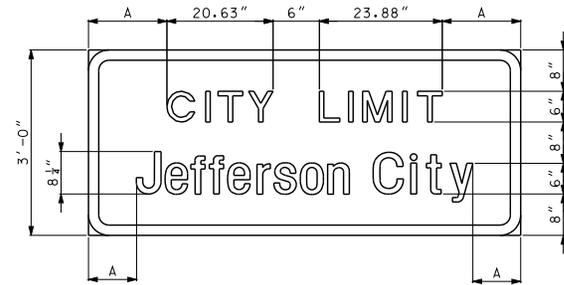
BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6'	6	LESS THAN 12"	1
7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

#### BACKGROUND REFLECTIVE SHEETING

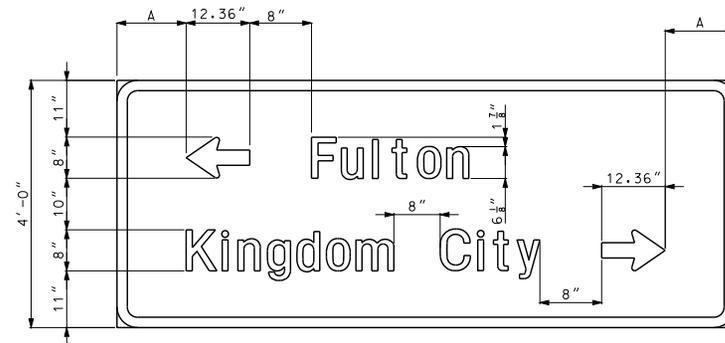
- R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 3
- R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

#### 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

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**HIGHWAY SIGNING STRUCTURAL SIGNS**

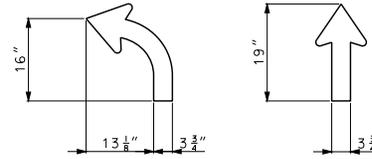
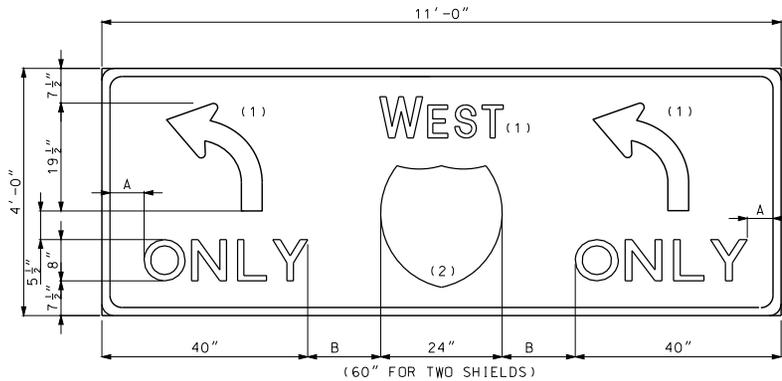
MISC. GOUND MOUNTED FREEWAY AND EXPRESSWAY GUIDE SIGNS

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**903.02AK**

SHEET NO.  
4 OF 19

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



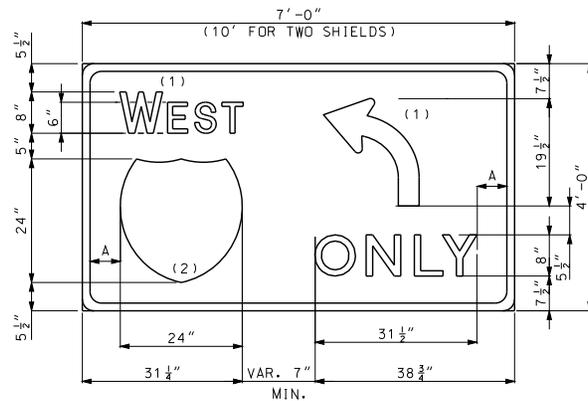
NOTES:

SHEILD 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.



A = VARIABLE SO THAT THE OVERALL SIGN WIDTH IS IN 12" INCREMENTS, MINIMUM 6".

B = VARIABLE, MINIMUM 7".

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 TYPE 3  
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

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**

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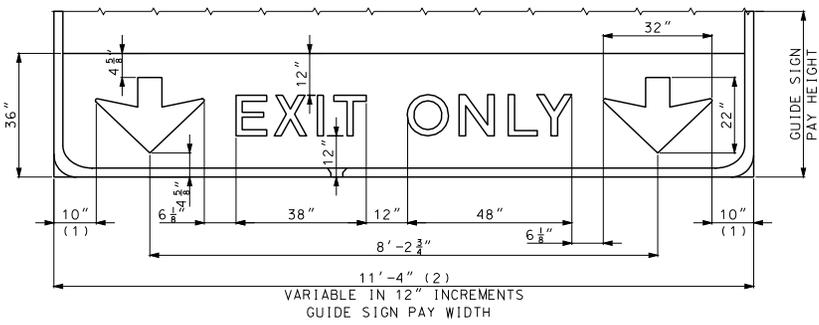
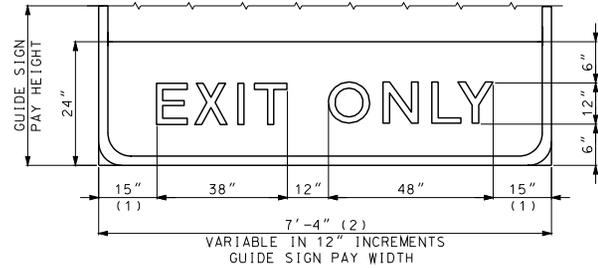
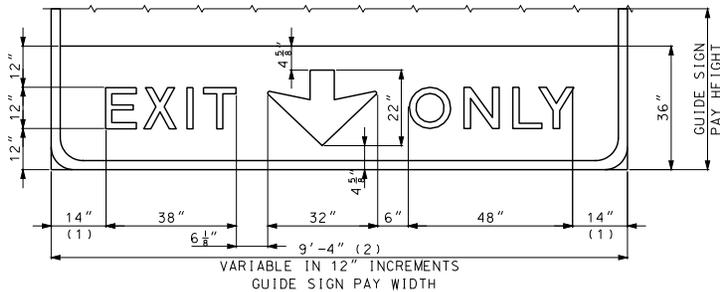
**HIGHWAY SIGNING  
 STRUCTURAL SIGNS  
 LANE CONTROL  
 WITH ROUTE SHIELD**

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 06/01/2010  
 DATE PREPARED: 4/17/2010

**903.02AK**

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  
 R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 3  
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

GENERAL SIGN DATA				
	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.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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 JEFFERSON CITY, MO 65102  
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**HIGHWAY SIGNING STRUCTURAL SIGNS**

**EXIT ONLY PANELS**

STATE OF MISSOURI  
 KATHRYN PHILIPS HANNEY  
 NUMBER PE-23791  
 PROFESSIONAL ENGINEER

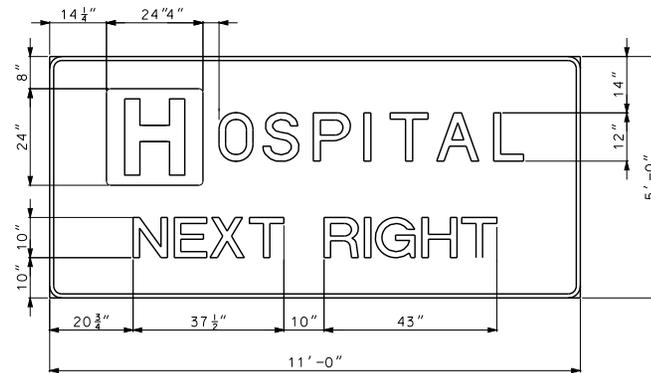
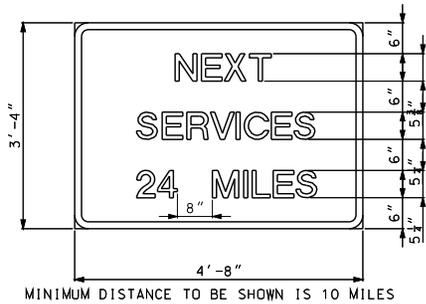
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 06/01/2010  
 DATE PREPARED: 4/11/2010

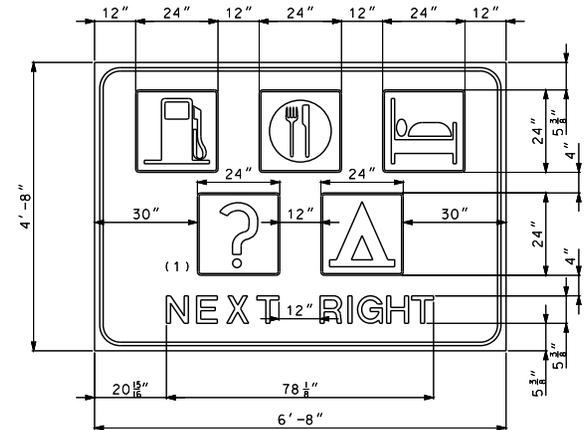
**903.02AK**

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 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 TYPE 3  
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		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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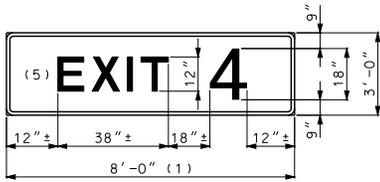
**HIGHWAY SIGNING STRUCTURAL SIGNS SERVICE SIGNS**



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

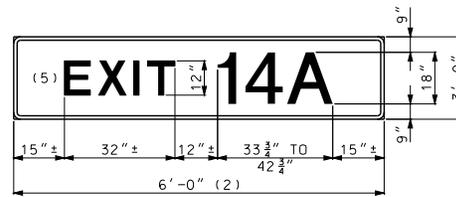
**903.02AK**

SHEET NO.  
7 OF 19



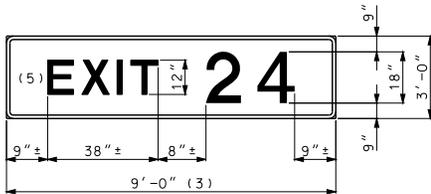
(1) 9'-0" 2 THROUGH 9 WITH A LETTER  
11'-0" FOR "EXITS" 2 THROUGH 9 WITH A-B LETTERS

**1 THROUGH 9**



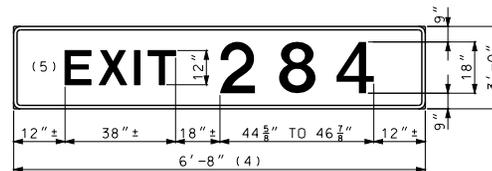
(2) 12'-0" FOR "EXITS" 10 THROUGH 19  
NUMERAL WITH A-B LETTERS

**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**

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.

LEGEND, SYMBOLS & BORDER

L-3 DIRECT APPLIED (CUT FROM  
MATERIAL SHOWN ON PLANS.)

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 3  
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

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			



**MISSOURI HIGHWAYS AND TRANSPORTATION  
COMMISSION**

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

**HIGHWAY SIGNING**

EXIT NUMBER PANELS

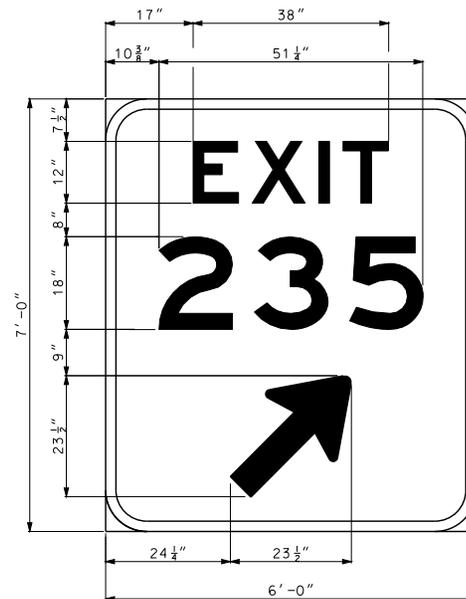
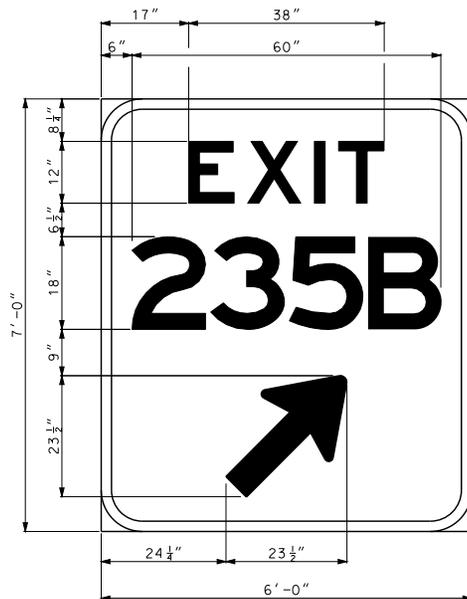
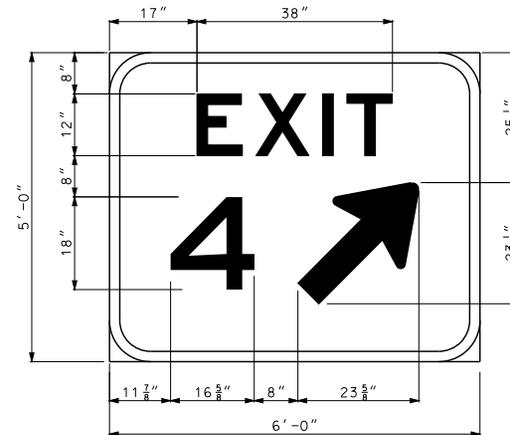
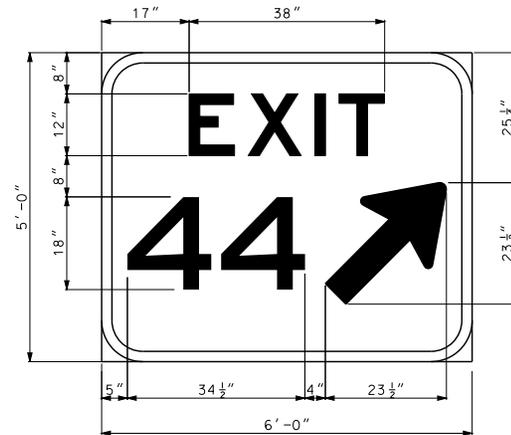
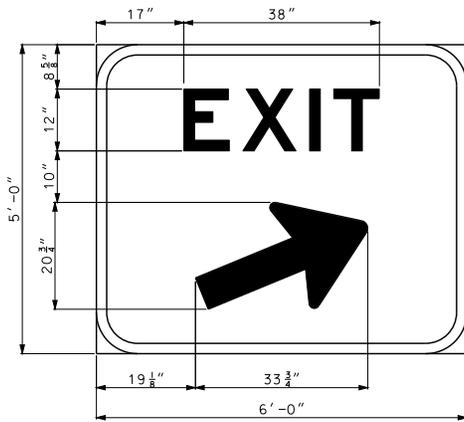


DATE EFFECTIVE: 06/01/2010  
DATE PREPARED: 4/1/2010

**903.02AK**

SHEET NO.  
8 OF 19

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



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 SIGN DATA					
STR2L-3	TYPE	REFL.	SHEETING TYPE	COLOR	LETTER SERIES
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 TYPE 3  
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

GENERAL NOTE:  
FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

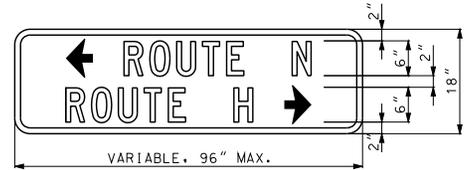
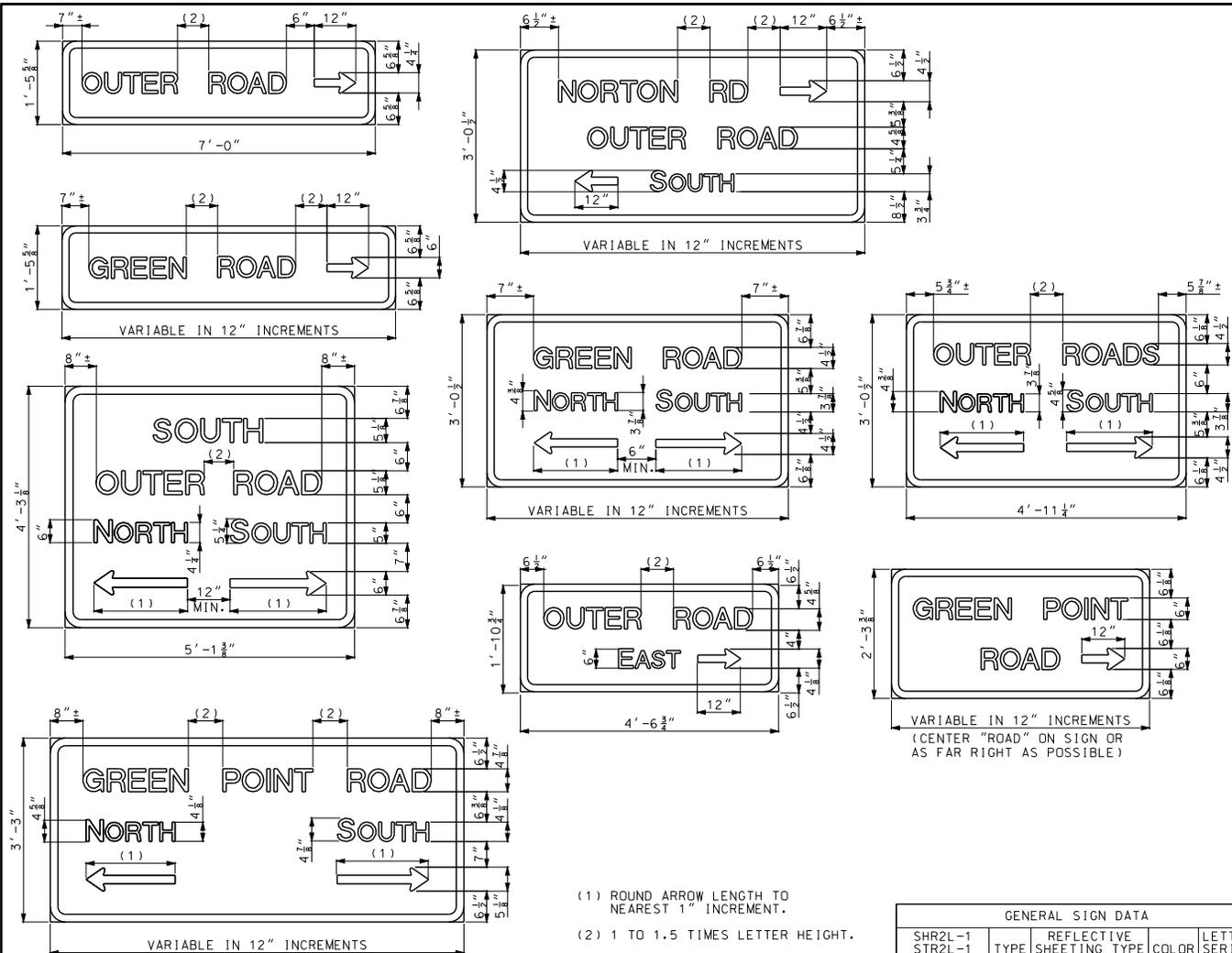
LEGEND, SYMBOLS & BORDER

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.)

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY SIGNING</b> GORE EXIT SIGN	
	DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b>
	SHEET NO. 9 OF 19	

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.

**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.)

GENERAL SIGN DATA				
SHR2L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
STR2L-1		R2	GREEN	
LEGEND	L-1	R4	WHITE	D
SYMBOLS	L-1	R4	WHITE	
BORDER	L-1	R4	WHITE	
SUBSTRATE	SHEET (SEE GENERAL NOTES)			

SUBSTRATE  
 ST STRUCTURAL  
 SH SHEET

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 3  
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

**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)

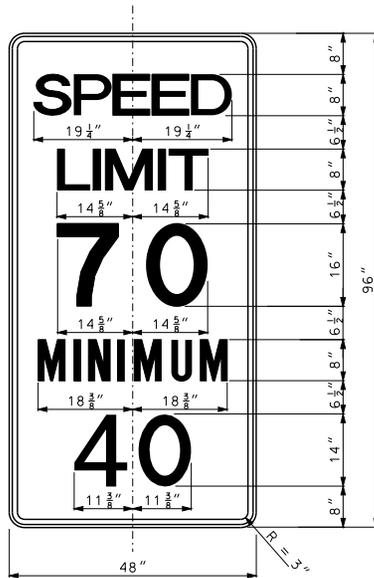
**HIGHWAY SIGNING**

CROSS ROAD AND OUTER ROAD SIGNS

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

**903.02AK**

SHEET NO.  
 10 OF 19



**R2-4a**  
FOR USE ON INTERSTATE ONLY

GENERAL SIGN DATA: R2-4a				
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			

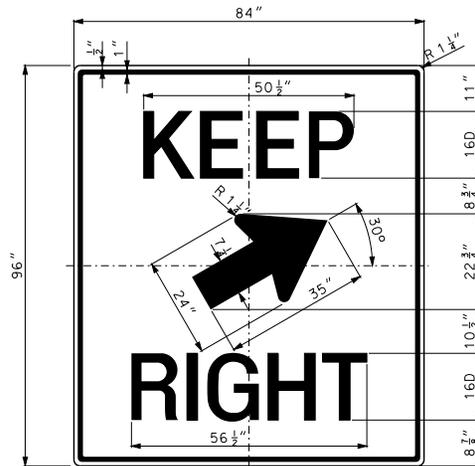
**LEGEND, SYMBOLS & BORDER**

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 TYPE 3



(3) SIGN R4-7d SHALL BE STRUCTURAL

**R4-7d**  
**KEEP RIGHT**  
(WITH 30° ARROW)  
FREEWAY/EXPRESSWAY

GENERAL SIGN DATA: R4-7d				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R2	WHITE	
LEGEND	L-3		BLACK	D
SYMBOLS	L-3		BLACK	
BORDER	L-3		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.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY SIGNING</b> REGULATORY SIGNS	
	DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b> 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

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 3

R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 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..

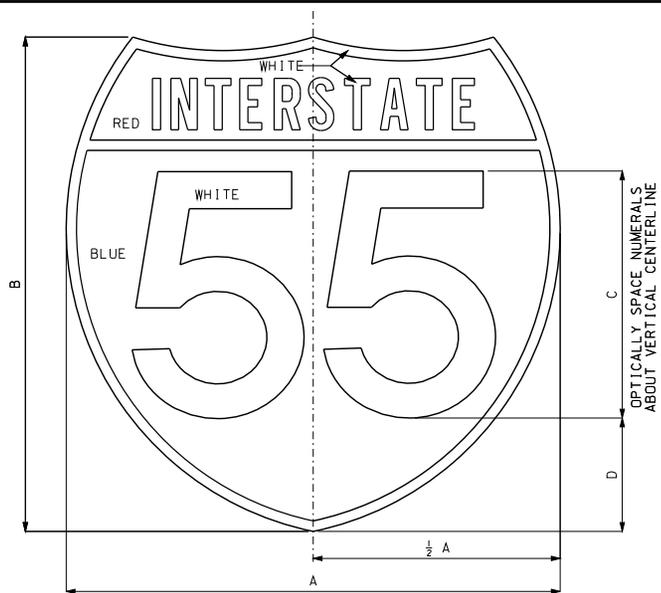
OVER 9 SQUARE FEET TO 16 SQUARE FEET - .100 IN..

16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)		
		<p align="center"><b>HIGHWAY SIGNING</b> WARNING SIGNS</p>	
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b>		SHEET NO. 12 OF 19

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



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 1/2
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 1/2
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 BACKGROUND	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
LEGEND	L-1 *	R2	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 TYPE 3  
R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

**GENERAL NOTES:**

ALL SHIELDS FOR GUIDE SIGN USE SHALL BE SCREEN PROCESS OR ELECTRONIC CUTABLE FILM ON TYPE 7 REFLECTIVE SHEETING.

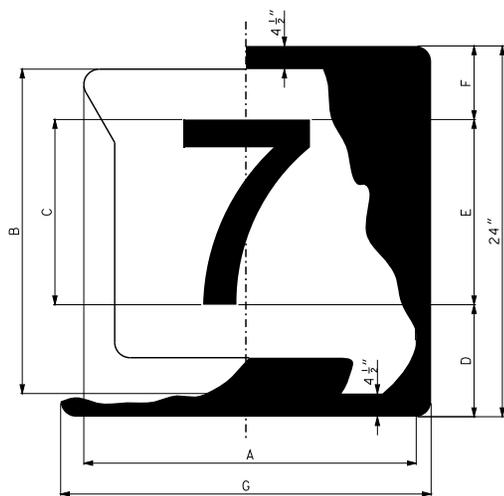
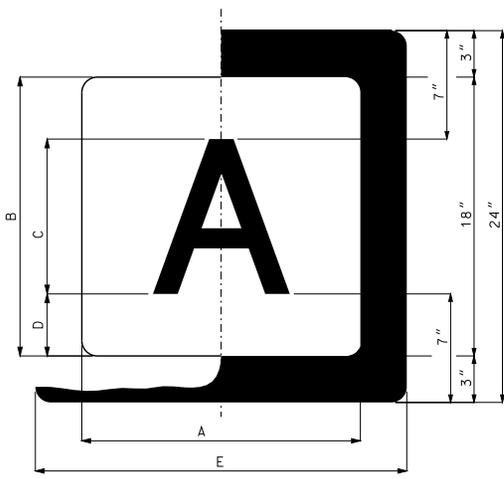
FOR HOLE PUNCHING AND MOUNTING DETAILS SEE OTHER DRAWINGS.

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.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center"><b>HIGHWAY SIGNING</b> SHIELD FOR INDEPENDENT AND GUIDE SIGN USE</p>	
	DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/17/2010	<b>903.02AK</b> SHEET NO. 13 OF 19

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 1/4	12D	4 3/4	24
3 DIGIT	8 1/4	12 B OR C	5 3/4	30

**STATE ROUTE SHIELD**

GUIDE SIGN			
GENERAL SIGN DATA			
	COLOR	REFLECTIVE SHEETING TYPE	LETTER SERIES
BACKGROUND	WHITE	R4	
LEGEND	BLACK		VAR *
SYMBOLS	WHITE		

INDEPENDENT			
GENERAL SIGN DATA			
	COLOR	REFLECTIVE SHEETING TYPE	LETTER SERIES
SHR2L-1	WHITE	R2	
BACKGROUND	WHITE		VAR *
LEGEND	BLACK		
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 TYPE 3  
 R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

GENERAL NOTES:  
 ALL SHIELDS FOR GUIDE SIGN USE SHALL BE SCREEN PROCESS OR CUTTABLE FILM ON TYPE 7 REFLECTIVE SHEETING.  
 ALL SHIELDS FOR INDEPENDENT SIGN USE SHALL BE SCREEN PROCESS OR CUTTABLE FILM ON TYPE 3 REFLECTIVE SHEETING.  
 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**

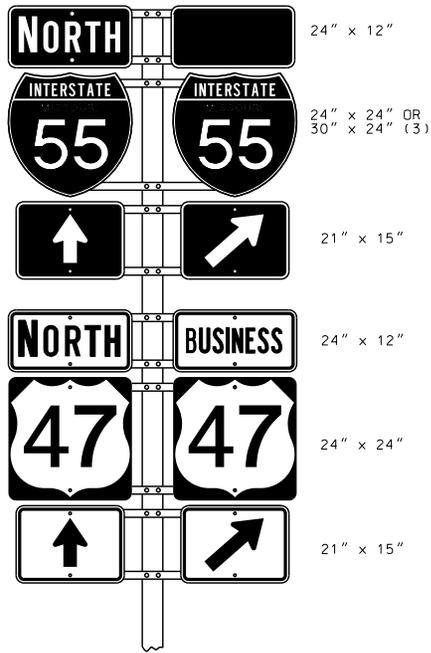
105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

**HIGHWAY SIGNING**  
STANDARD SHIELDS FOR  
INDEPENDENT AND GUIDE  
SIGN USE



THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

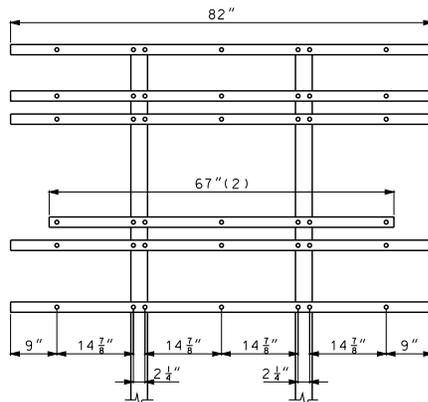
DATE EFFECTIVE: 06/01/2010	<b>903.02AK</b>	SHEET NO. 14 OF 19
DATE PREPARED: 4/1/2010		



TWO-ROUTE ASSEMBLY

NOTE: 1ST DIMENSION - WIDTH OF PLATE  
2ND DIMENSION - HEIGHT OF PLATE

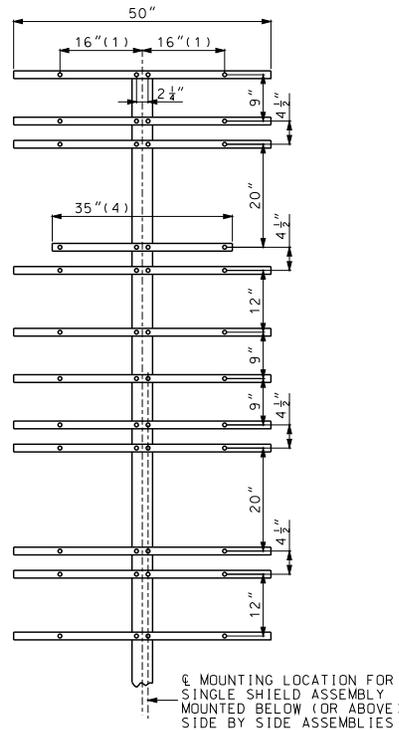
ONE POST  
(WITH BARS)



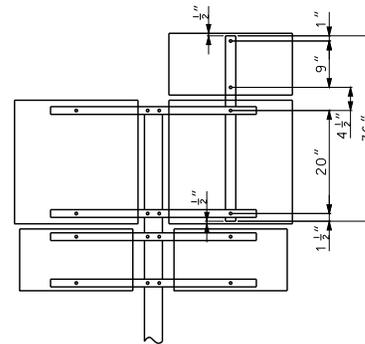
NOTE:  
ASSEMBLIES WITH TWO-ROUTE SHIELDS MOUNTED BELOW  
THREE-ROUTE SHIELDS SHALL BE MOUNTED TO THE POST  
AS SHOWN IN ONE-POST WITH BARS, DRAWING ABOVE.

TWO POSTS

WIDE FLANGE POST MOUNTING



⊕ MOUNTING LOCATION FOR  
SINGLE SHIELD ASSEMBLY  
MOUNTED BELOW (OR ABOVE)  
SIDE BY SIDE ASSEMBLIES



AUXILIARY PLATE MOUNTING

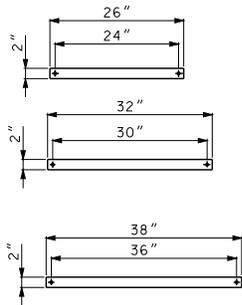
- (1) FOR 30" x 24" SHIELD, DIMENSION WILL BE 22".
- (2) FULL SIZE BARS SHALL BE USED WHEN INTERSTATE SHIELD IS NOT USED. VERTICAL SPACING OF BARS SHALL BE THE SAME AS FOR A SINGLE POST ASSEMBLY.
- (3) 24" x 24" SHALL BE USED FOR 1 OR 2 DIGIT ROUTE SHIELDS.
- (4) FOR SIDE BY SIDE 30" x 24" SHIELDS, DIMENSION WILL BE 41".

GENERAL NOTES:

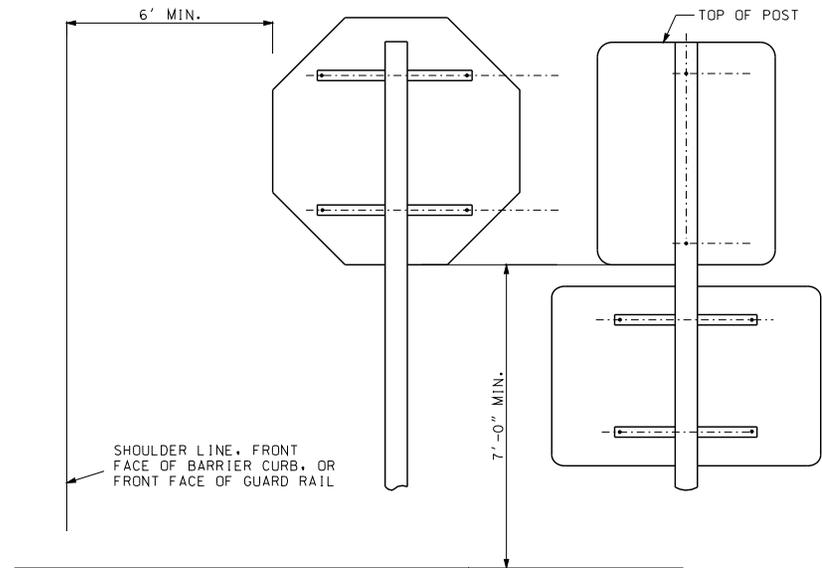
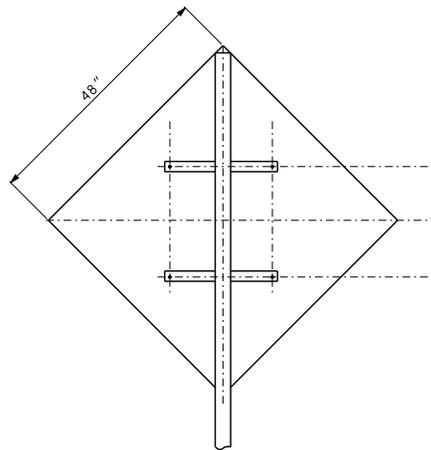
ALL BARS SHALL BE 2" x 3/8" STEEL, GALVANIZED AFTER PUNCHING.  
WEIGHT = 2.55 LBS. PER FOOT. HOLES IN BARS SHALL BE 3/8" AND SHALL BE PUNCHED AS SHOWN ON THIS DRAWING.  
BACKING BARS PAID FOR AS STRUCTURAL STEEL, PER POUND.

FOR POST AND FOOTING DATA AND DETAILS OF SHIELDS AND PLAQUES, SEE OTHER DRAWINGS.

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY SIGNING</b> BACKING BARS SHEET SIGN MOUNTING ROUTE SHIELD AND MARKER ASSEMBLIES
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b>
SHEET NO. 15 OF 19	



THE THREE BACKING BAR LAYOUTS FOR SINGLE POST SIGNS

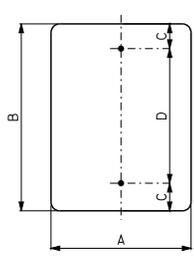


ELEV. OUTSIDE EDGE OF PAVEMENT FOR CLAMP DETAILS, SEE OTHER DRAWINGS.

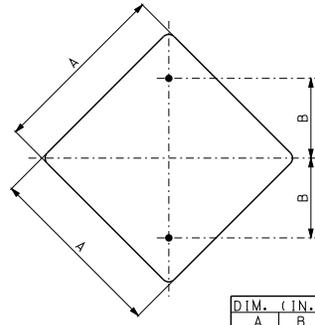
HOLES IN BACKING BARS SHALL BE  $\frac{3}{8}$ " AND PUNCHED AS SHOWN ON THIS DRAWING.

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY SIGNING</b> BACKING BARS DETAILS
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b>
SHEET NO. 16 OF 19	

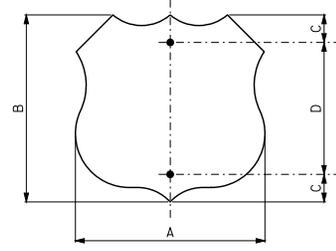
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



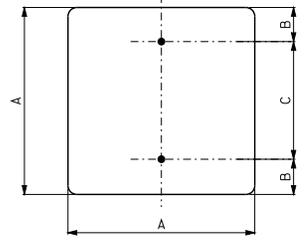
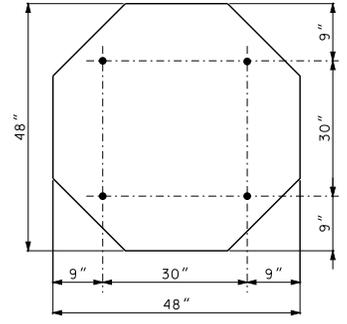
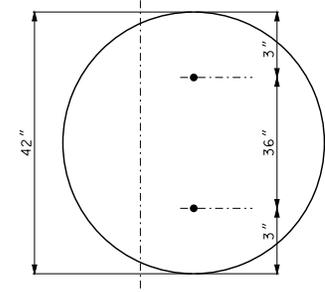
DIMENSIONS (IN.)			
A	B	C	D
6	15	1.5	12
8	24	3	18
9	12	1.5	9
9	48	3	42
10	30	3	24
12	18	3	12
12	24	3	18
12	36	3	30
12	48	3	42
18	24	3	18
24	30	3	24
24	36	3	30
30	36	3	30
30	42	3	36
30	48	3	42



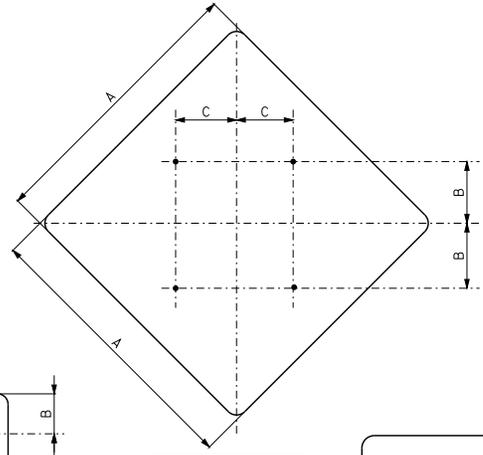
DIM. (IN.)	
A	B
18	9
24	12
30	15
36	18



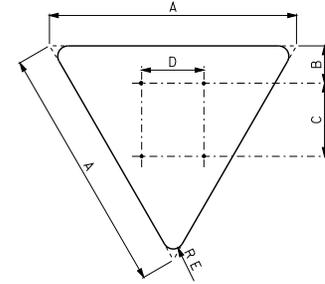
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



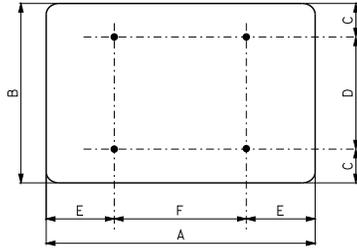
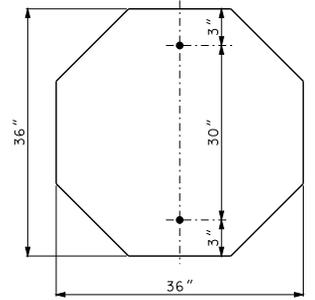
DIMENSIONS (IN.)		
A	B	C
14	3	8
18	3	12
24	3	18
30	3	24



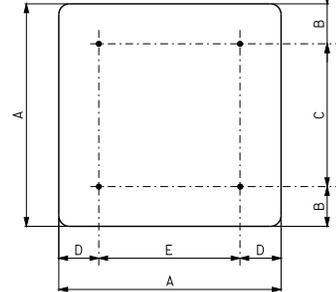
DIMENSIONS (IN.)		
A	B	C
48	15	15
60	18	18



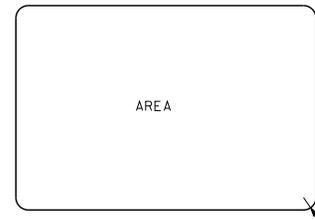
DIMENSIONS (IN.)				
A	B	C	D	E
48	3	12	12	3
60	4	18	15	3



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	RADII
LESS THAN 16 FT <sup>2</sup>	1 1/2"
16 FT <sup>2</sup> OR GREATER	3"

**RADII FOR SHEET SIGNS**

**GENERAL NOTES:**

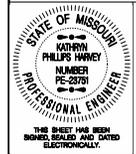
SIGNS WITH FOUR OR MORE HOLES REQUIRE BACKING BARS OR MULTIPLE POSTS.

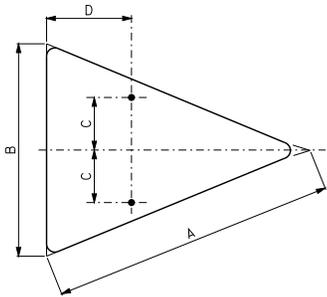
HOLES IN SIGNS SHALL BE 3/8" AND PUNCHED AS SHOWN ON THIS DRAWING.

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS:

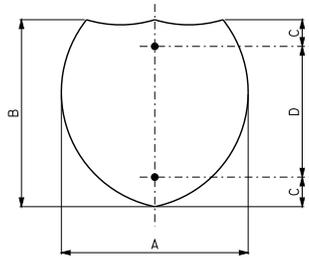
- 9 SQUARE FEET OR LESS - .080 IN.
- OVER 9 SQUARE FEET BUT LESS THAN 16 SQUARE FEET - .100 IN.
- 16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

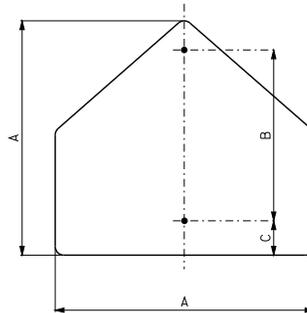
 <p><b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b></p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p><b>HIGHWAY SIGNING</b></p> <p>HOLE PUNCHING</p>
 <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p>SHEET NO.</p> <p><b>903.02AK</b></p> <p>17 OF 19</p>
<p>DATE EFFECTIVE: 05/01/2010</p> <p>DATE PREPARED: 4/1/2010</p>	



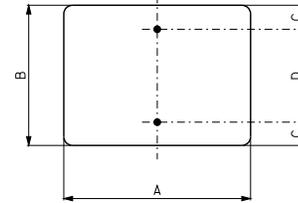
DIMENSIONS (IN.)			
A	B	C	D
40	30	7.5	12
48	36	9	15



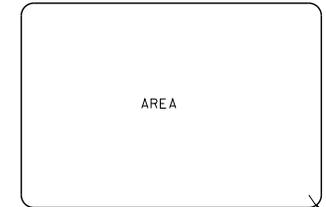
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



DIMENSIONS (IN.)		
A	B	C
36	24	3

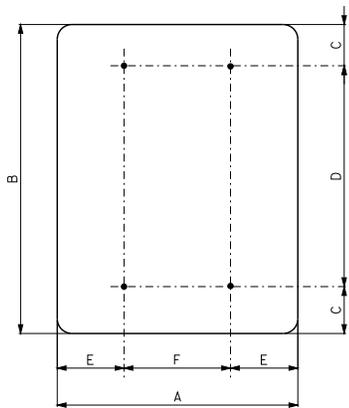


DIMENSIONS (IN.)			
A	B	C	D
5	9	1.5	6
12	9	1.5	6
14	12	1.5	9
18	12	1.5	9
20	9	1.5	6
21	15	1.5	12
24	6	1.5	3
24	8	1.5	5
24	10	1.5	7
24	12	1.5	9
24	18	3	12
30	6	1.5	3
30	12	1.5	9
30	15	1.5	12
30	18	3	12
30	24	3	18
36	12	1.5	9
36	18	3	12

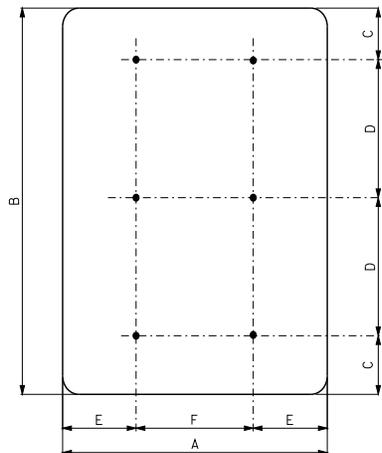


AREA	RADIUS
LESS THAN 16 FT <sup>2</sup>	1 1/2"
16 FT <sup>2</sup> OR GREATER	3"

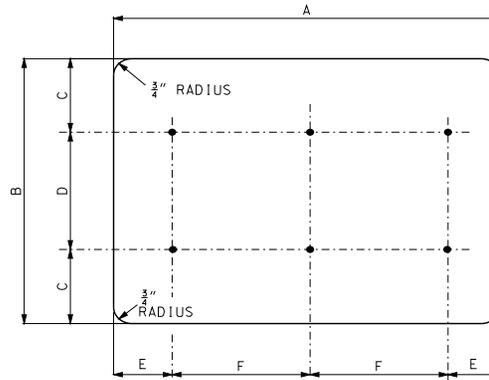
### RADIUS FOR SHEET SIGNS



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.

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY SIGNING</b> HOLE PUNCHING	
	DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b>

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

