

# **MISSOURI HIGHWAYS and TRANSPORTATION COMMISSION**

**JEFFERSON CITY, MISSOURI**

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

**EFFECTIVE July 1, 2011**

# MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

## MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

### TABLE OF CONTENTS

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

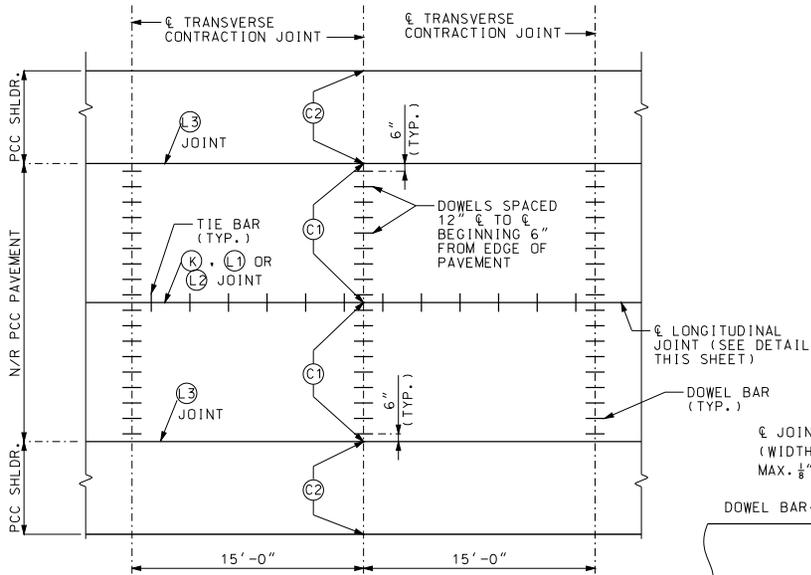
STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE	STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE
203.00E	EXCAVATION AND EMBANKMENT - TYPICAL DETAILS	1	08/01/1998	608.00H	PAVED APPROACHES	2	10/01/2009
203.02F	UNDERGRADING - TYPICAL DETAILS	2	01/01/2004	608.10N	CONCRETE SIDEWALK AND CURB 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	619.10F	PAVEMENT EDGE TREATMENT	*	07/01/2011
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	620.10C	TEMPORARY PAVEMENT MARKING	*	07/01/2011
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



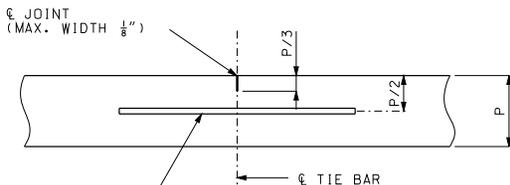




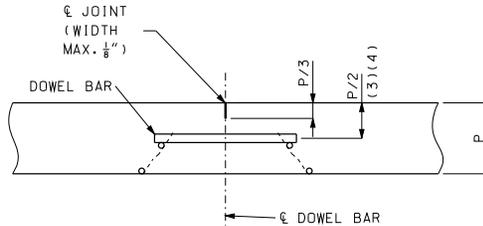


**JOINT PLAN AND SPACING FOR CONTRACTION JOINTS (1)**

(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.



**LONGITUDINAL JOINT (L1)**

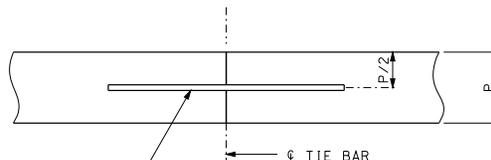


DOWELS REQUIRED. FOR PERMISSIBLE TYPES OF DOWELS SUPPORTING UNITS. SEE OTHER DRAWINGS.

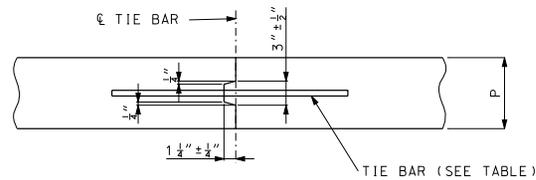
TRANSVERSE CONTRACTION JOINTS FOR CONCRETE PAVEMENT OR BASE WIDENING SHALL MATCH EXISTING JOINTS.

**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.



**LONGITUDINAL CONSTRUCTION JOINT (L2)**



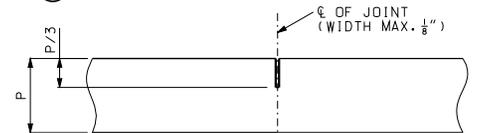
IF METAL IS USED TO FORM KEY DISCONTINUE STRIP FOR DISTANCE OF APPROXIMATELY 3" EACH SIDE OF TRANSVERSE JOINT.

TYPE (K) REQUIRES TIE BAR.

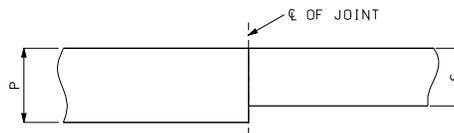
TYPE (M) CONSTRUCTED WITHOUT TIE BARS.

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

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



**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.

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.

**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

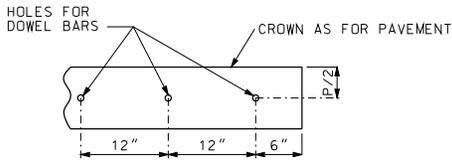
105 WEST CAPITOL JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

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

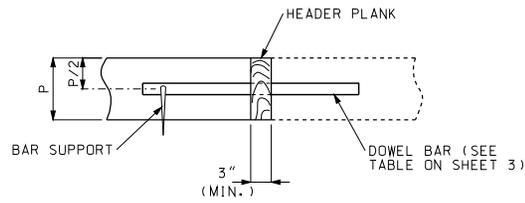
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**CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING**

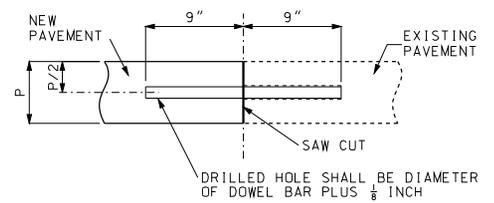
DATE EFFECTIVE: 06/01/2010	<b>502.05M</b>	SHEET NO. 3 OF 4
DATE PREPARED: 4/11/2010		



PART ELEVATION OF HEADER PLANK



HEADER SECTION



SAWED SECTION

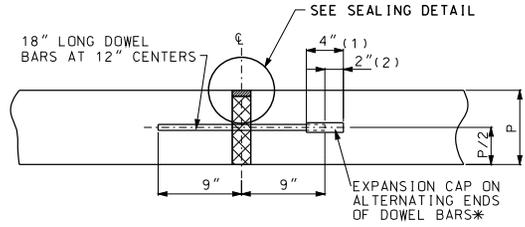
THE HEADER BOARD SHALL BE SUFFICIENTLY RIGID TO PREVENT DISTORTION FROM THE TYPICAL SECTION AND MAINTAIN A STRAIGHT LINE FROM PAVEMENT EDGE TO PAVEMENT EDGE.

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.

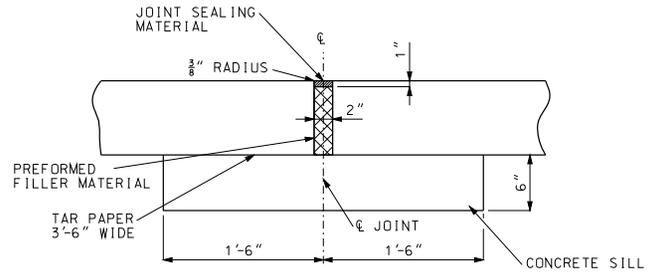
BONDING FOR DOWEL BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

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

**CONSTRUCTION JOINT (C)**

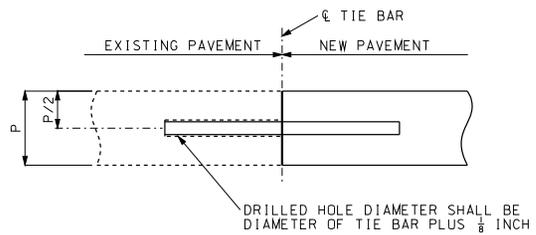


EXPANSION JOINTS (E)



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)**

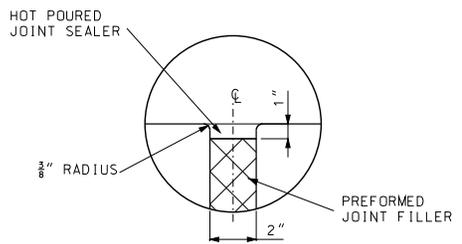
TIE BARS SHALL BE EPOXY COATED, DEFORMED REINFORCING BARS MEETING THE REQUIREMENTS OF SECTIONS 710 AND 1057.

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.

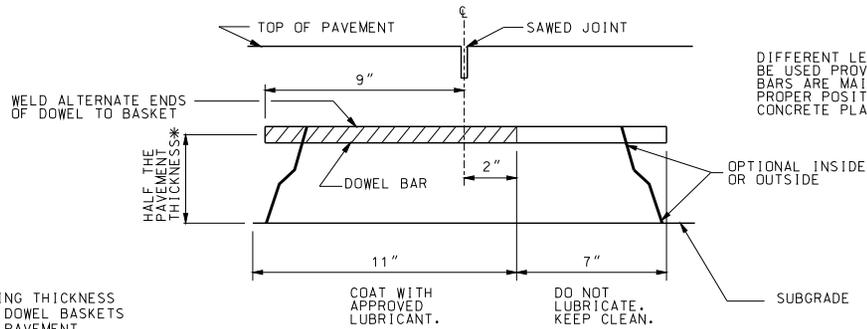
\* FOR EXPANSION JOINTS FORMED USING A CONSTRUCTION HEADER, THE EXPANSION CAPS SHALL BE INSTALLED ON THE EXPOSED END OF EACH BAR ONCE THE HEADER HAS BEEN REMOVED AND THE JOINT FILLER MATERIAL HAS BEEN INSTALLED.



SEALING DETAIL

	<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. 4 OF 4

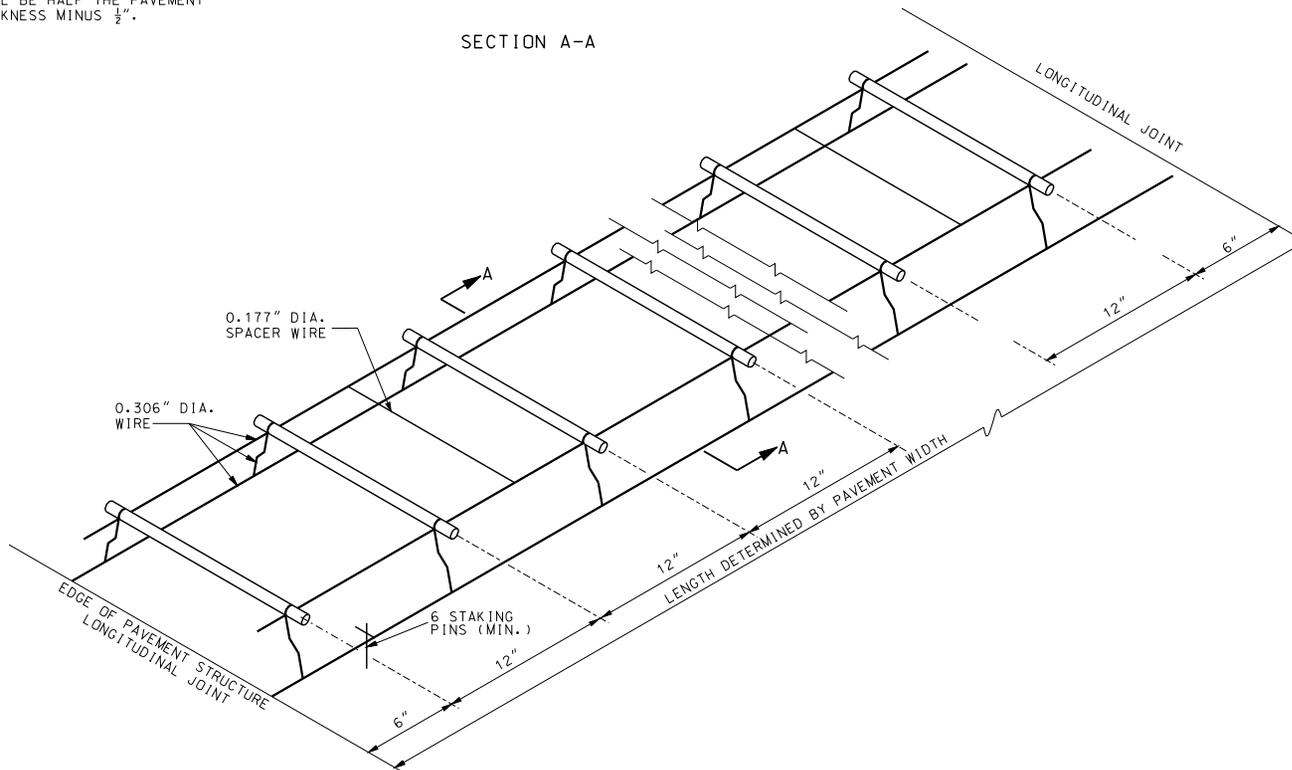
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



DIFFERENT LEG SHAPES MAY BE USED PROVIDED THE DOWEL BARS ARE MAINTAINED AT THE PROPER POSITION DURING CONCRETE PLACEMENT

\* 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.

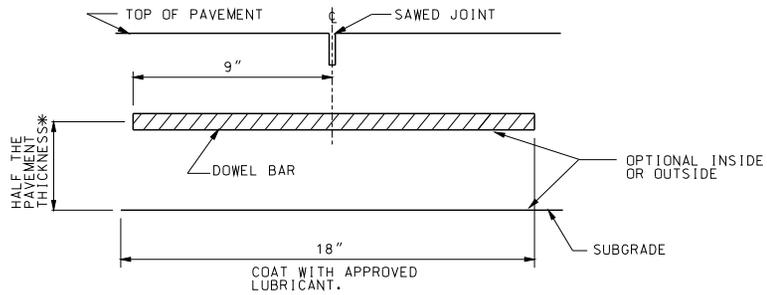
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

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

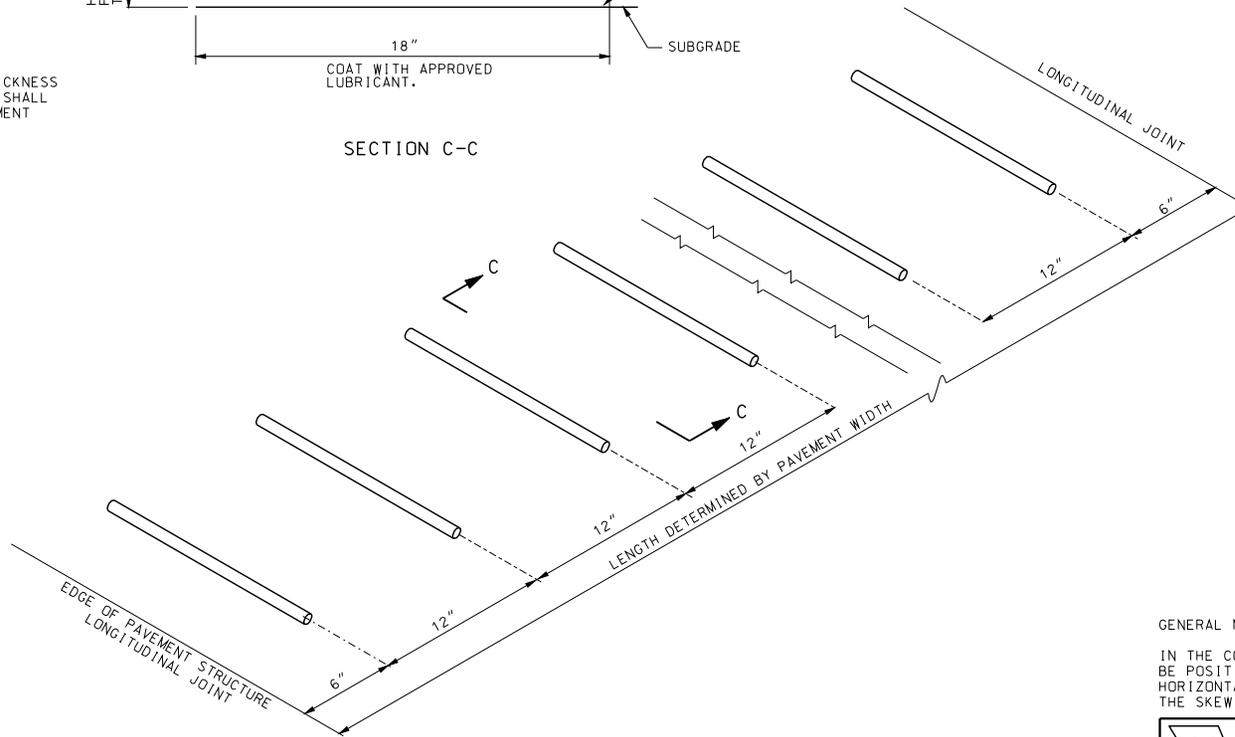
DATE EFFECTIVE: 06/01/2010	502.10K	SHEET NO. 1 OF 2
DATE PREPARED: 4/1/2010		

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  $\frac{1}{2}$ ".

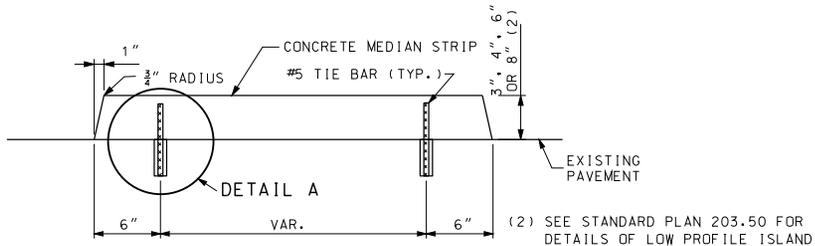
SECTION C-C



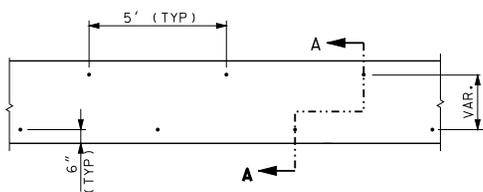
GENERAL NOTES:

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  $\frac{1}{4}$ ".

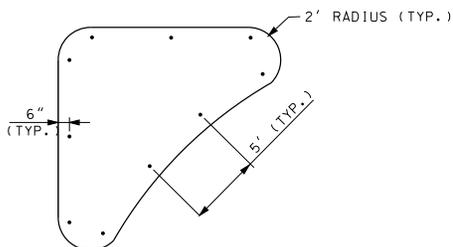
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>DOWEL SUPPORTING UNITS</b> MECHANICAL PLACEMENT
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>502.10K</b> SHEET NO. 2 OF 2



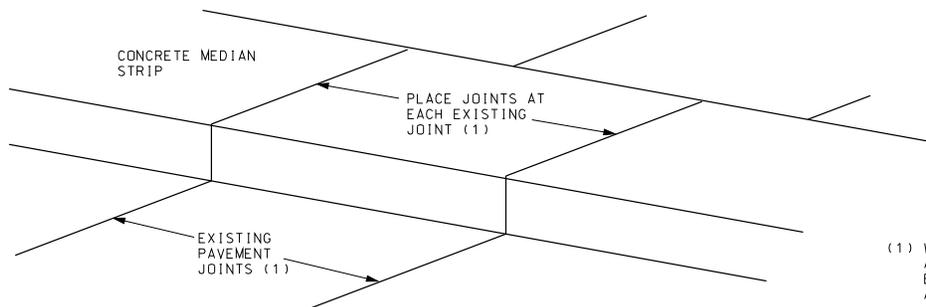
SECTION A-A  
CONCRETE MEDIAN STRIP



TIE BAR LOCATIONS FOR  
CONCRETE MEDIAN STRIP

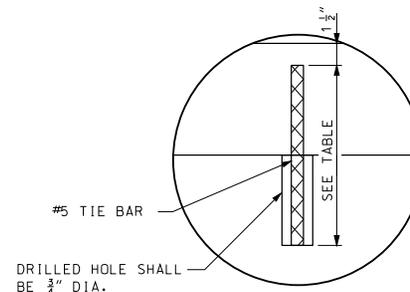


TIE BAR LOCATIONS FOR  
CONCRETE MEDIAN STRIP (ISLAND)



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.

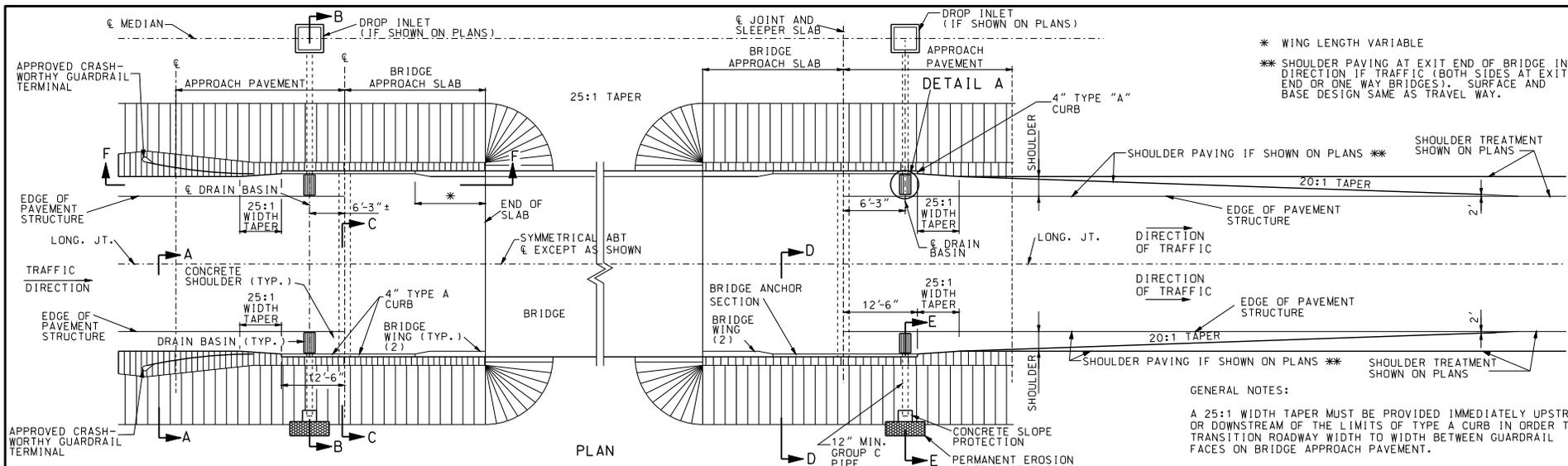
BONDING FOR TIE BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

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".

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

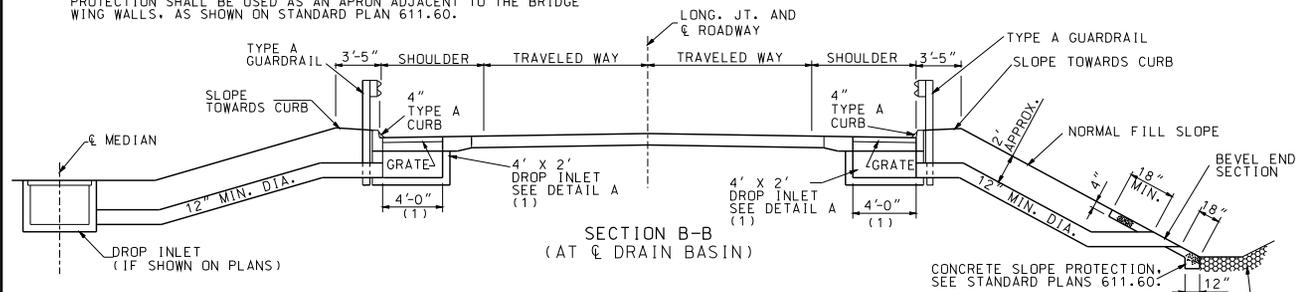
IF REQUIRED, TYPE A GUARDRAIL SHALL BE USED FROM THE END OF THE TRANSITION SECTION FOR THE BRIDGE ANCHOR SECTION TO THE TERMINATION OF THE TYPE A CURB.

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.

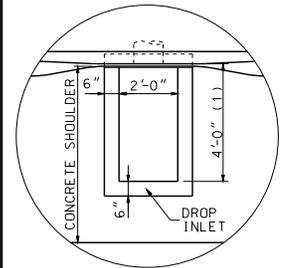
PAYMENT FOR DROP INLET, GRATE, GROUP C PIPE, CONCRETE SLOPE PROTECTION AT PIPE OUTLETS, MATERIAL AND INSTALLATION WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR DRAIN BASIN PER EACH.

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

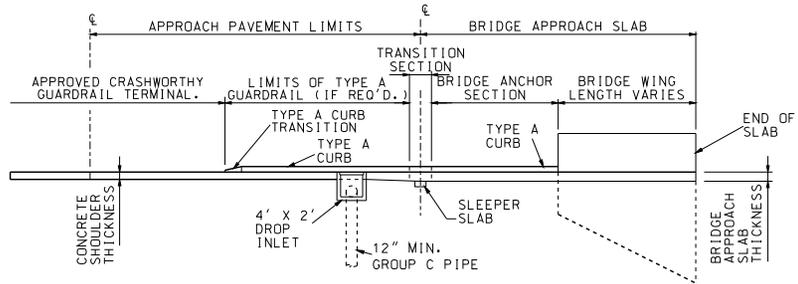
(2) WHEN ROCK BLANKET IS USED UNDER BRIDGE ENDS, CONCRETE SLOPE PROTECTION SHALL BE USED AS AN APRON ADJACENT TO THE BRIDGE WING WALLS. AS SHOWN ON STANDARD PLAN 611.60.



(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.

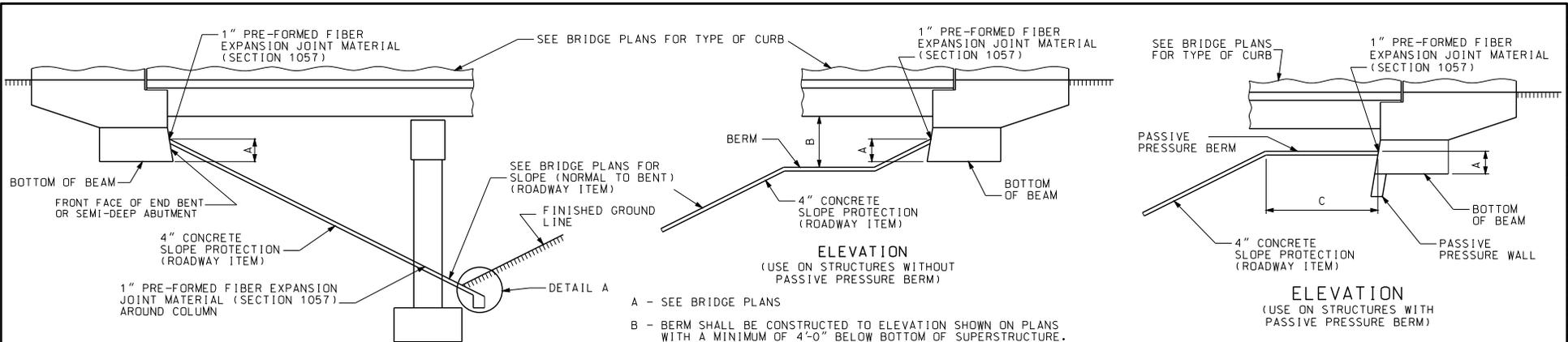
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

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

**DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS**

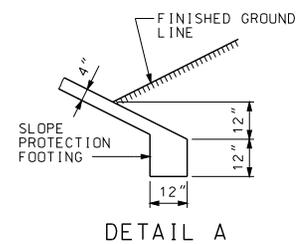
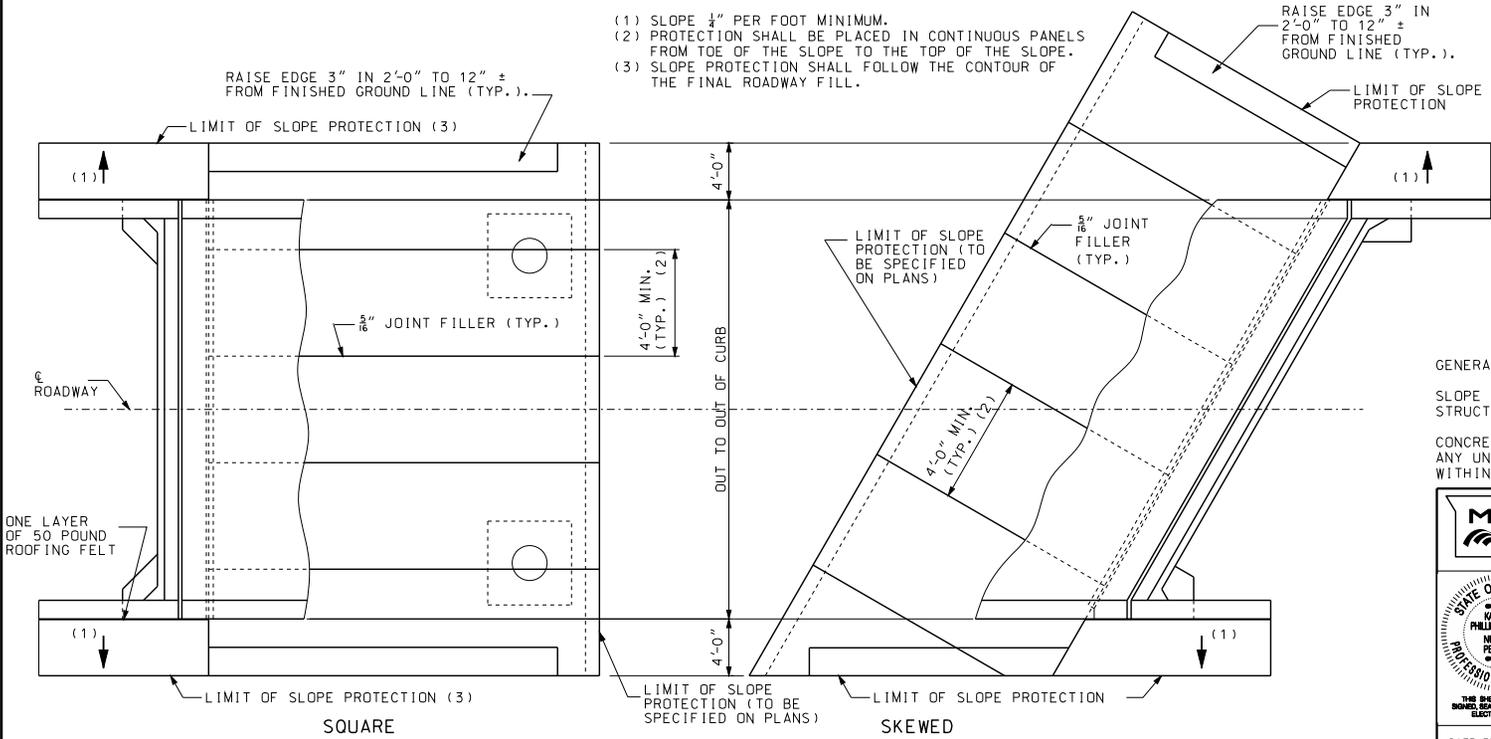
DATE EFFECTIVE:	02/01/2009	<b>609.40P</b>	Sheet No.
DATE PREPARED:	9/3/2010		1 OF 2

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- 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.

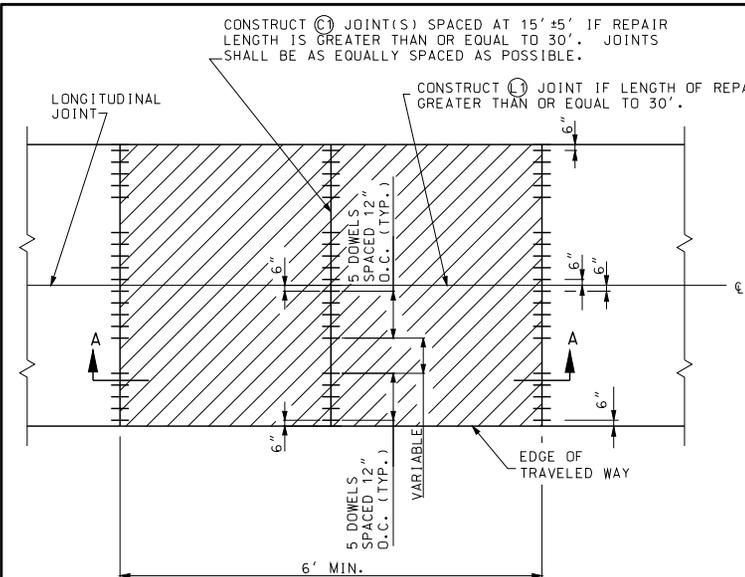
**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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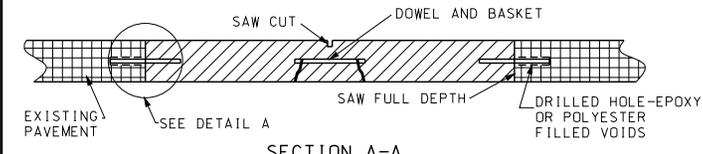
**CONCRETE SLOPE PROTECTION**

DATE EFFECTIVE:	01/01/2005	<b>611.600</b>	SHEET NO.
DATE PREPARED:	9/3/2010		1 OF 1

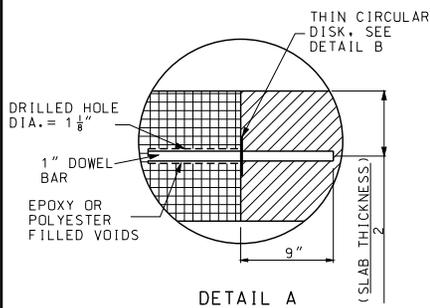
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TWO OR MORE LANES

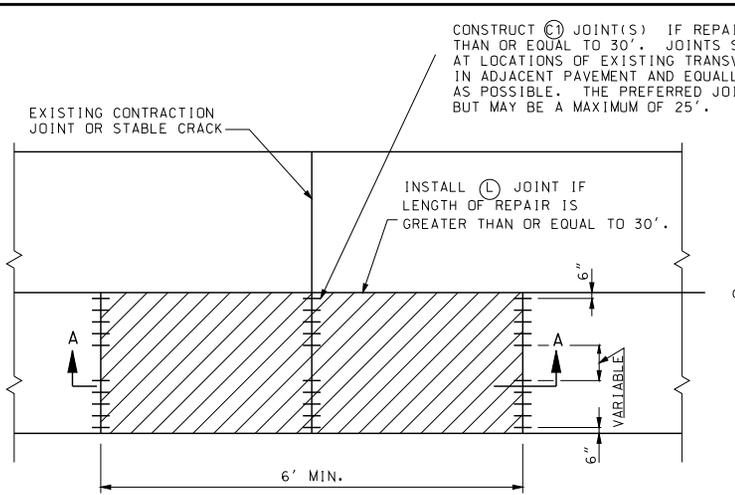


SECTION A-A

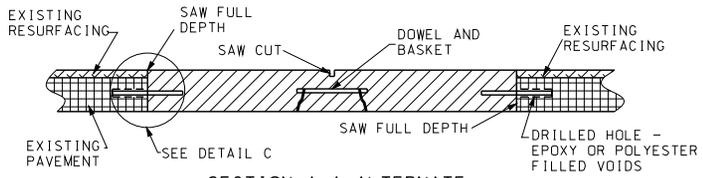


DETAIL A

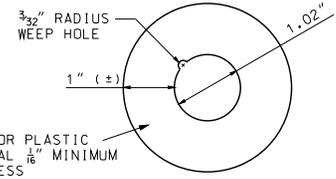
1. SMOOTH EPOXY COATED DOWELS SHALL BE USED IN ALL FULL DEPTH PAVEMENT REPAIR TRANSVERSE JOINTS.
2. THE ANCHORING MATERIAL (EPOXY OR POLYESTER) SHALL BE PLACED TO THE BACK OF THE PREDRILLED HOLE BEFORE INSERTING THE DOWEL BAR.
3. THE DOWEL IS INSERTED INTO THE HOLE WITH A TWISTING MOTION SO THAT THE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



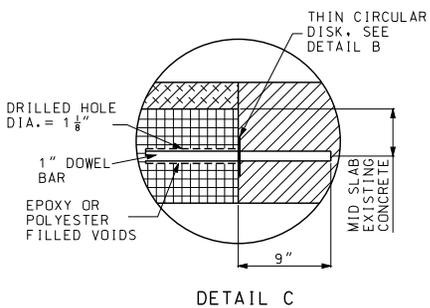
ONE LANE



SECTION A-A ALTERNATE WITH ASPHALT OVERLAY



DETAIL B THIN CIRCULAR DISK



DETAIL C

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

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

**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

KATHRYN PHILIPS HAMEY  
NUMBER PE-23791  
PROFESSIONAL ENGINEER

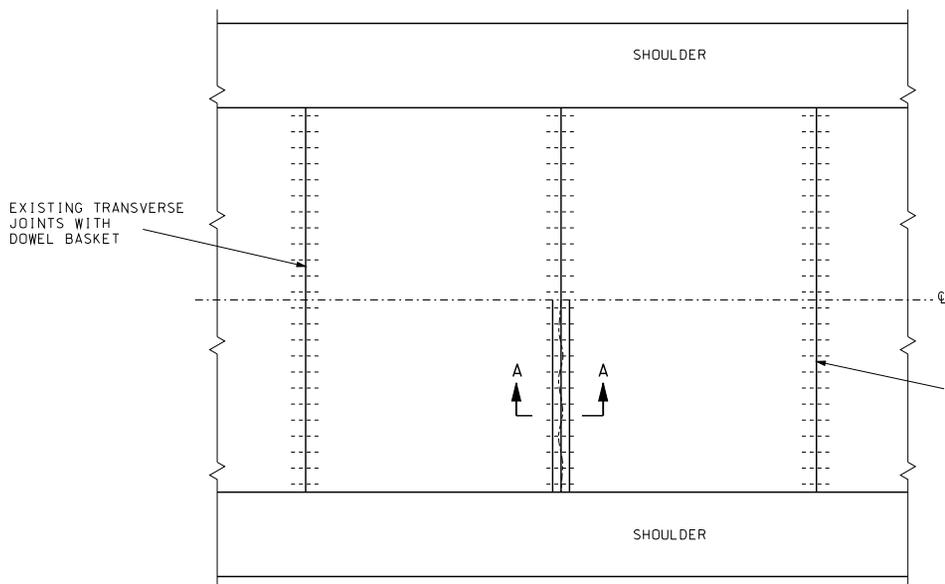
THIS SHEET HAS BEEN  
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**PAVEMENT REPAIR**

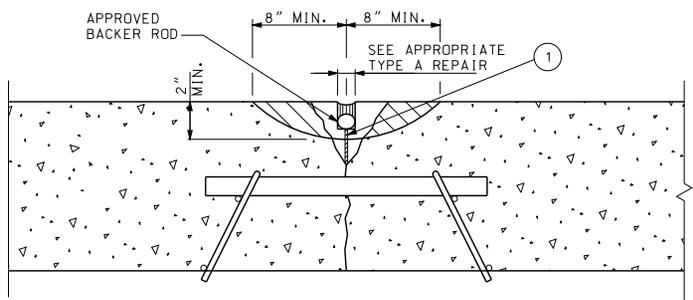
FULL DEPTH

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

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.

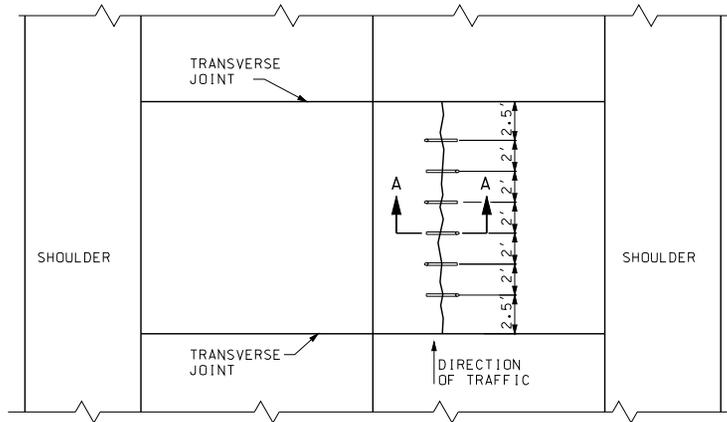
ALL CONCRETE SHALL BE REMOVED TO LIMITS SHOWN IN THE DETAIL, INCLUDING DETERIORATED CONCRETE TO A MAXIMUM OF 1/2 THE PAVEMENT DEPTH OR TOP OF DOWELS BY MILLING.

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

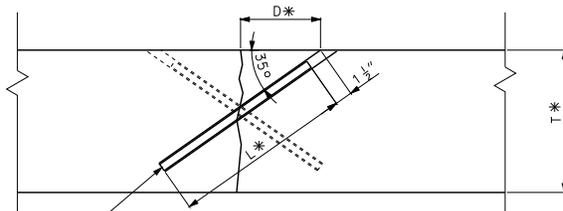
EXPOSED SURFACES OF DOWELS, IF ANY, SHALL BE COATED WITH AN APPROVED BOND BREAKER.

JOINTS AND CRACKS SHALL BE SEALED WITH APPROPRIATE SEALER.

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

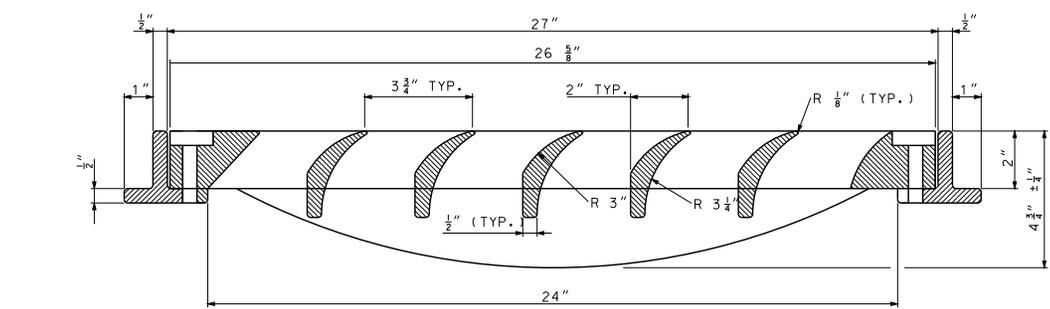
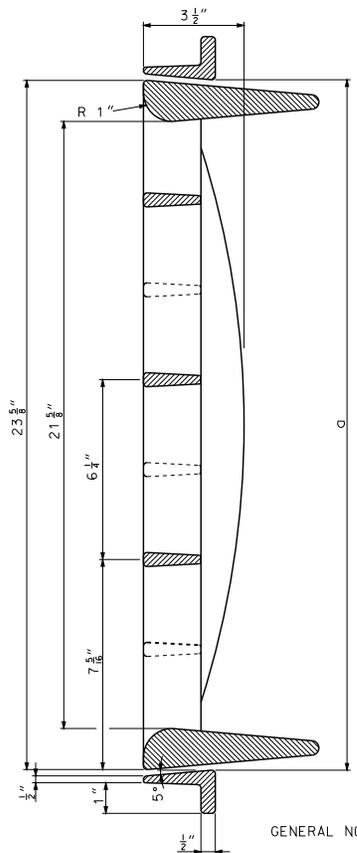
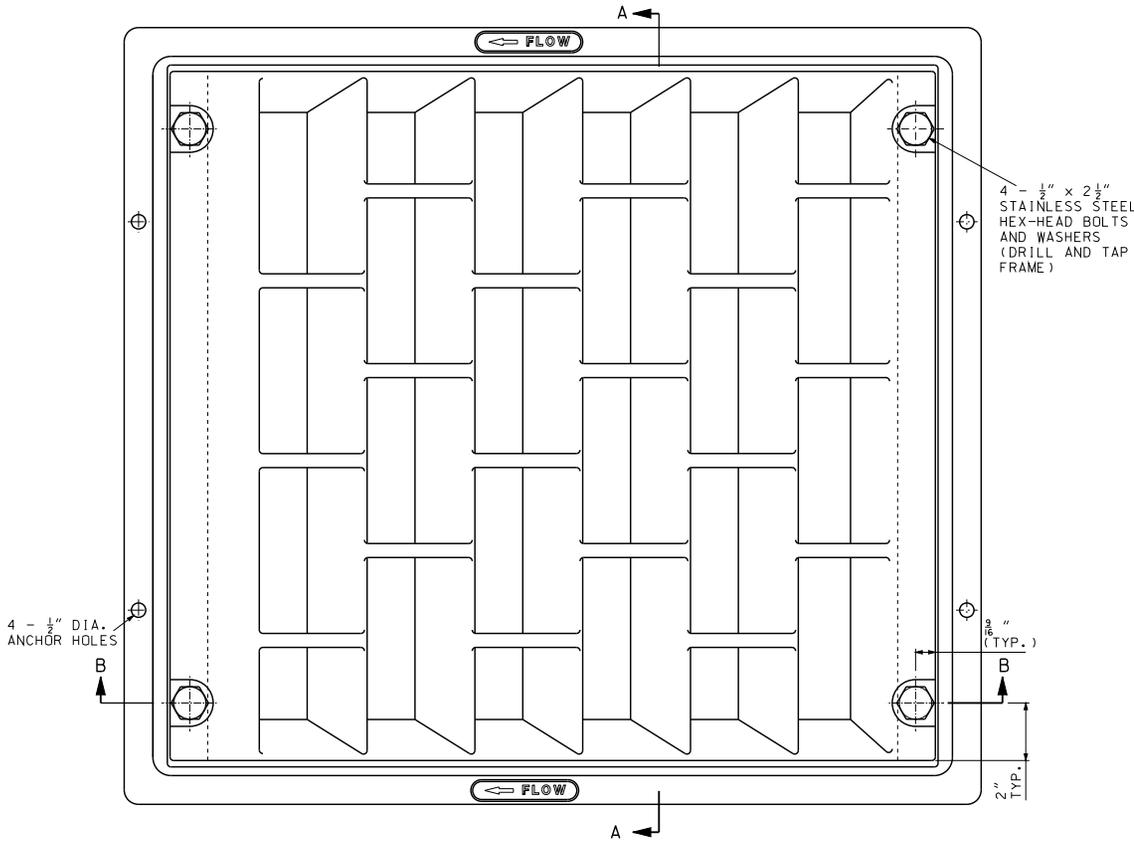
THE SURFACE SHALL HAVE ALL EXCESS EPOXY REMOVED AND HAVE A FLUSH FINISH.

**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	<b>613.00P</b>	SHEET NO. 3 OF 3

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

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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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**KATHRYN PHILLIPS HORNEY**  
REGISTERED PROFESSIONAL ENGINEER  
NO. PE-23791  
STATE OF MISSOURI

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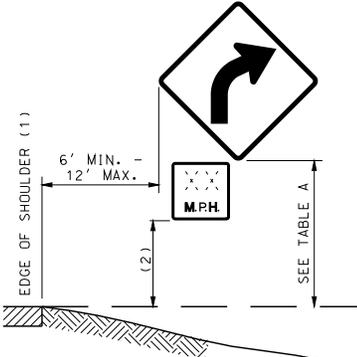
**CURVED VANE GRATE AND FRAME**

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

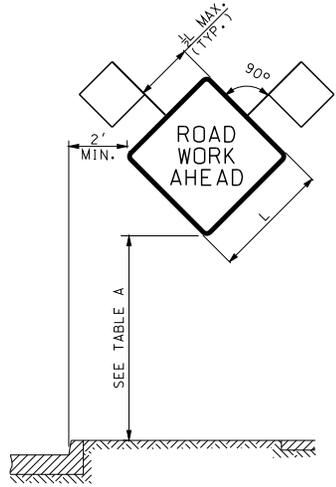
**614.11C**

SHEET NO.  
1 OF 1

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



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



**HEIGHT AND LATERAL LOCATIONS FOR POST AND PORTABLE SIGN MOUNTING**

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

(3) MEASURED FROM THE BOTTOM OF THE SIGN TO THE NEAR EDGE OF THE PAVEMENT.  
 (4) MOUNTING HEIGHTS FOR REGULATORY AND GUIDE SIGNS SHALL BE AS SPECIFIED FOR POST-MOUNTED SIGNS.  
 (5) 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**

**GENERAL NOTES:**

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

SIGNS SHALL NOT BE MOUNTED IN OR ON CHANNELIZERS.  
 ALL POSTS AND SIGNS SHALL BE INSTALLED AND MAINTAINED IN A PLUMB POSITION.

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

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

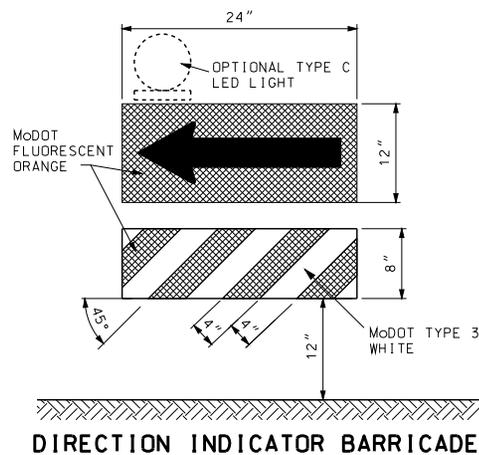
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STATE OF MISSOURI  
 KATHRYN PHILIPS HANNEY  
 NUMBER PE-23791  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**TEMPORARY TRAFFIC CONTROL DEVICES SIGN MOUNTING REQUIREMENTS**

DATE EFFECTIVE: 02/01/2011  
 DATE PREPARED: 5/23/2011  
**616.10AN**  
 SHEET NO. 1 OF 8

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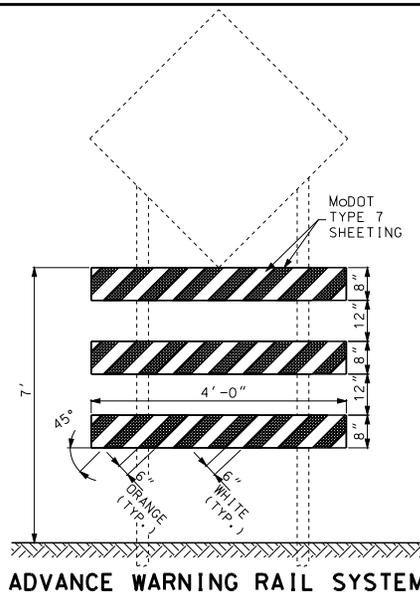


**DIRECTION INDICATOR BARRICADE**

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.

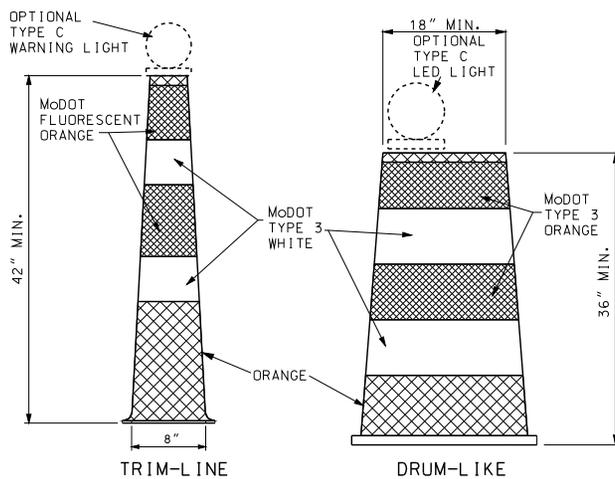
UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE DRUM-LIKE CHANNELIZERS IN LIEU OF TRIM-LINE CHANNELIZERS TO PROVIDE LONGITUDINAL CHANNELIZATION WITHIN THE ACTIVITY AREA WHERE NO RAMPS, INTERSECTIONS OR LIMITED LATERAL CLEARANCE EXISTS.

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.

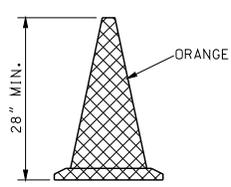
UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY, AT NO ADDITIONAL COST, USE CONES IN LIEU OF TRIM-LINE CHANNELIZERS DURING DAYTIME OPERATIONS ON MINOR ROUTES.

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**

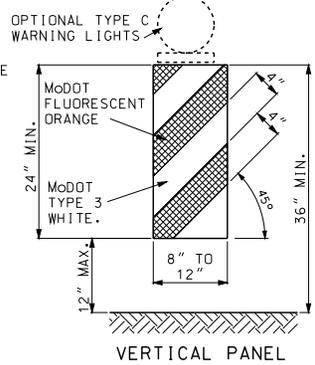
STRIPES ON TRIM-LINE CHANNELIZERS SHALL BE 6" TO 8".  
STRIPES ON DRUM-LIKE CHANNELIZERS SHALL BE 4" TO 6".



**CONE**

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

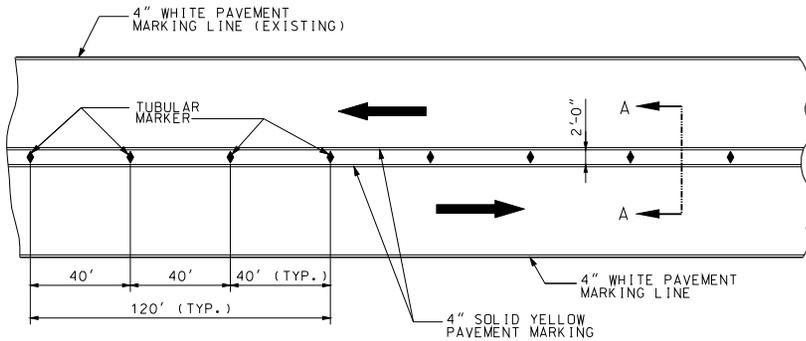
CONES MAY BE USED ON MINOR ROUTES DURING DAYLIGHT HOURS ONLY.



**VERTICAL PANEL**

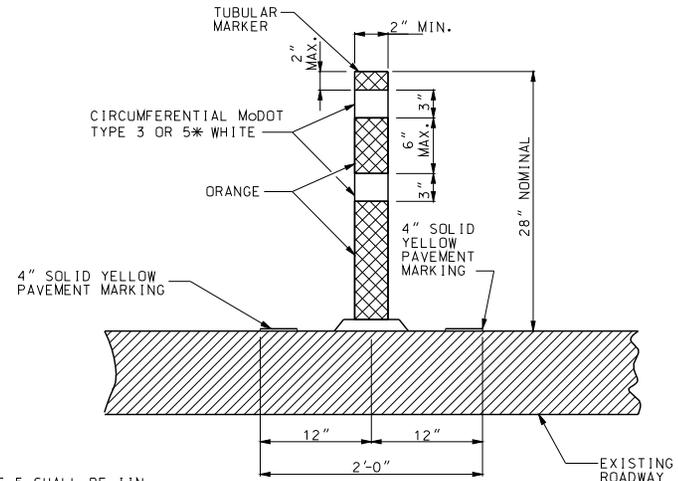
VERTICAL PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE, CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.

 <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> CHANNELIZERS AND DIRECTION INDICATOR BARRICADE
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 5/23/2011	<b>616.10AN</b>
	SHEET NO. <b>2 OF 8</b>



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

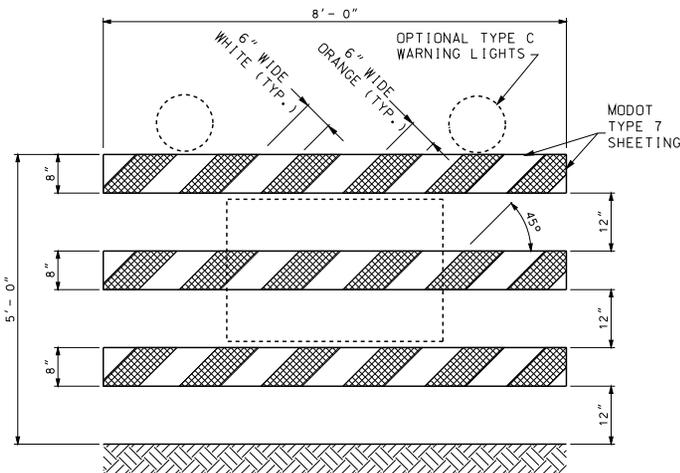
IF RAISED PAVEMENT MARKERS ARE PRESENT, THE LENSES SHALL BE REMOVED OR COVERED TO THE SATISFACTION OF THE ENGINEER.



\* 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.

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 AT HEIGHTS SPECIFIED FOR POST MOUNTED SIGNS, LOCATED IN TABLE A ON SHEET 1.

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

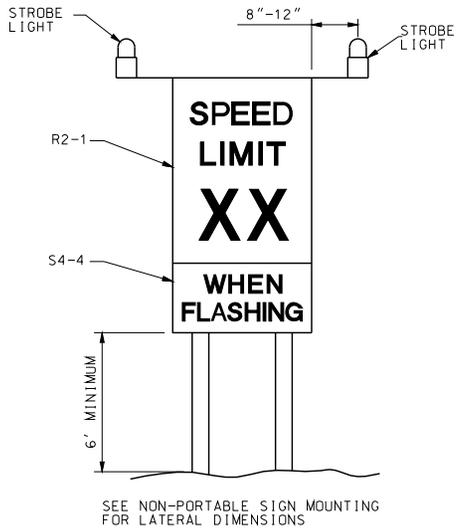
WHERE BOTH RIGHT AND LEFT VEHICULAR MOVEMENTS ARE PROVIDED, THE STRIPES SHALL SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE ARRAY.

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

TYPE III MOVABLE BARRICADES SHALL BE ENTIRELY FREE STANDING AND PORTABLE. MARKING SHALL ONLY BE APPLIED TO THE FRONT OF EACH RAIL OR MAY BE APPLIED TO BOTH THE FRONT AND THE BACK OF EACH RAIL PROVIDED THE MARKING ON THE BACK DOES NOT CONFLICT WITH INTENDED OPPOSING TRAFFIC MOVEMENT. WHERE MARKING IS NOT PROVIDED ON THE BACKSIDE, STRIPS OF 3" WIDE 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: 5/23/2011	<b>616.10AN</b>	

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



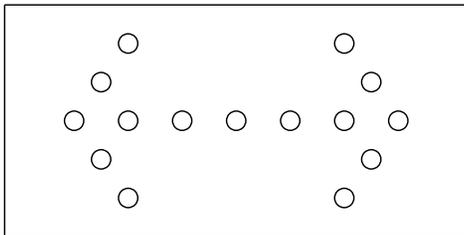
**SPEED LIMIT AND STROBE LIGHT ASSEMBLY**

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.



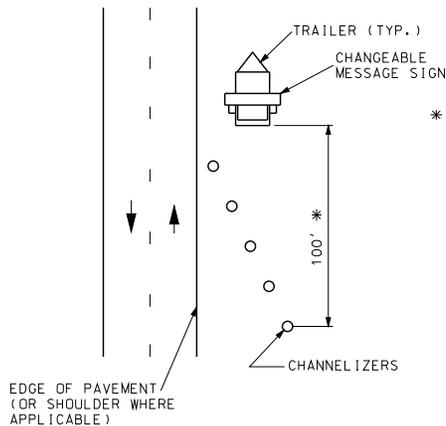
**FLASHING ARROW PANEL REQUIREMENTS**

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**

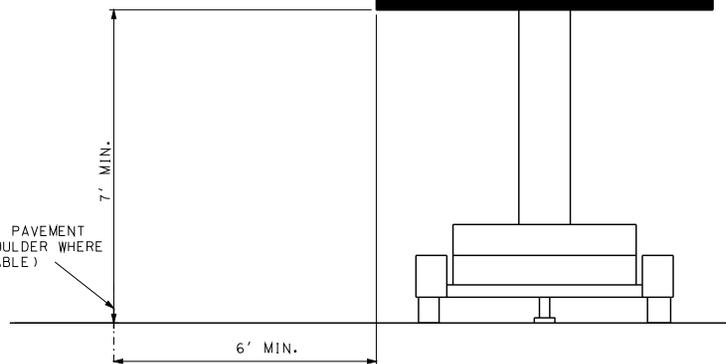
STROBE LIGHTS SHALL BE SHIELDED SO THEY WILL NOT BE DIRECTLY VISIBLE FROM THE REAR. NO DIRECT PAYMENT WILL BE MADE FOR THE BATTERIES REQUIRED TO POWER THE STROBE LIGHTS.

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.

EDGE OF PAVEMENT (OR SHOULDER WHERE APPLICABLE)



**CHANGEABLE MESSAGE SIGN**

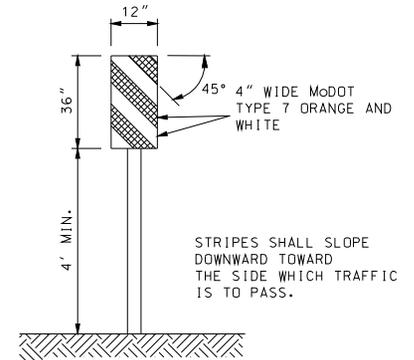
**PORTABLE WARNING LIGHTS**

	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**

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

**TEMPORARY TRAFFIC CONTROL DEVICES**

DATE EFFECTIVE: 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.

 <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>TEMPORARY TRAFFIC CONTROL DEVICES WARNING SIGNS</b></p>
 <p>STATE OF MISSOURI KATHRYN PHILIPS HANNEY NUMBER PE-23791 REGISTERED PROFESSIONAL ENGINEER</p> <p><small>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</small></p>	<p>DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010</p> <p><b>616.10AN</b></p> <p>SHEET NO. 5 OF 8</p>

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		
W020-3a	48X48	16.00	BK	OR	MoDOT FL. OR	ROAD CLOSED XXX FT
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)
GO20-1	60X24	10.00	BK	OR	MoDOT FL. OR	ROAD WORK NEXT XX MILES
GO20-2	48X24	8.00	BK	OR	MoDOT FL. OR	END ROAD WORK
GO20-4	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)
GO23-1	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 TRI.	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:

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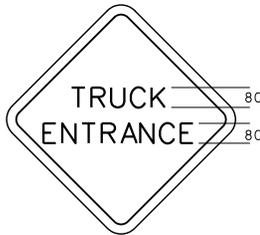
ALL PLAQUES SHALL HAVE A BORDER. PLATES SHALL NOT HAVE A BORDER.

	<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: 5/23/2011	<b>616.10AN</b>	SHEET NO. 6 OF 8

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



W05-5 (3)



W08-6c (3)



W012-2x (3)



SPECIAL (3)



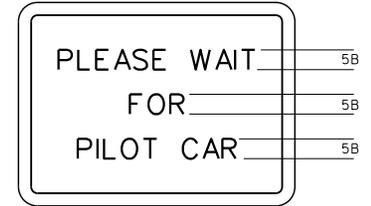
W020-6a (3)(4)



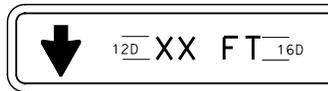
W021-5b (3)



SPECIAL (3)



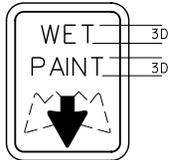
SPECIAL (3)



W012-3a (3)



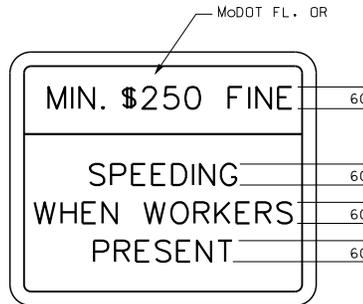
W012-3b (3)



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.

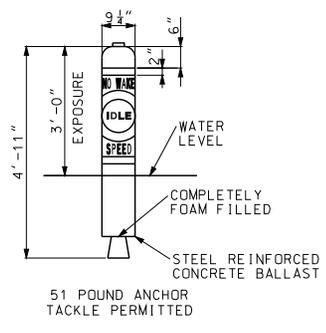
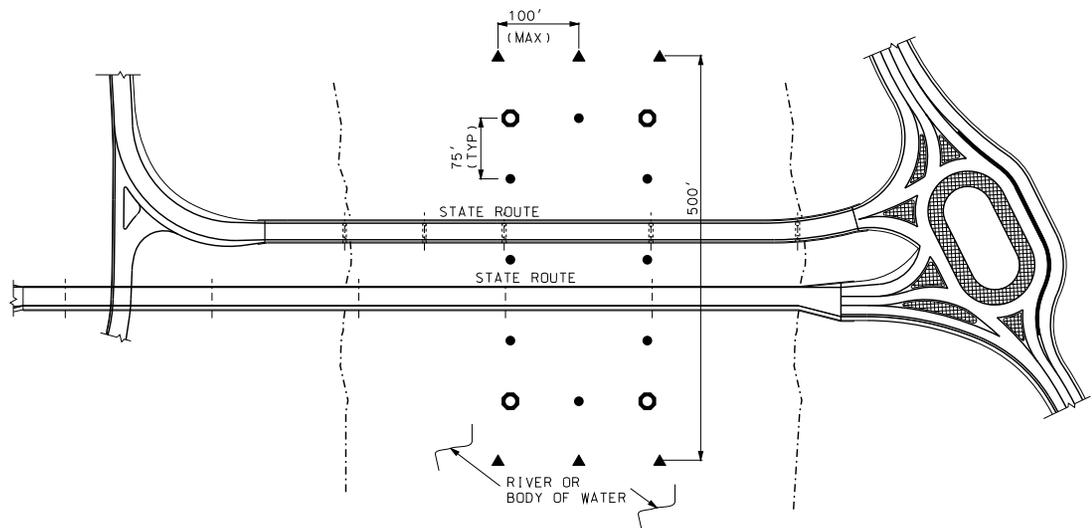
ALL PLAQUES SHALL HAVE A BORDER. PLATES SHALL NOT HAVE A BORDER.

LETTER DIMENSIONS SHALL BE AS SHOWN.

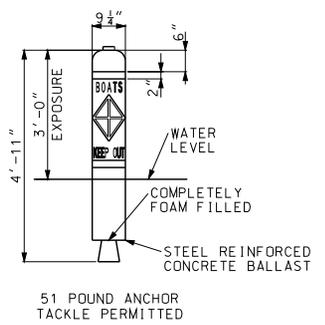
<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>TEMPORARY TRAFFIC CONTROL DEVICES</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>616.10AN</b>
SHEET NO. 7 OF 8	

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

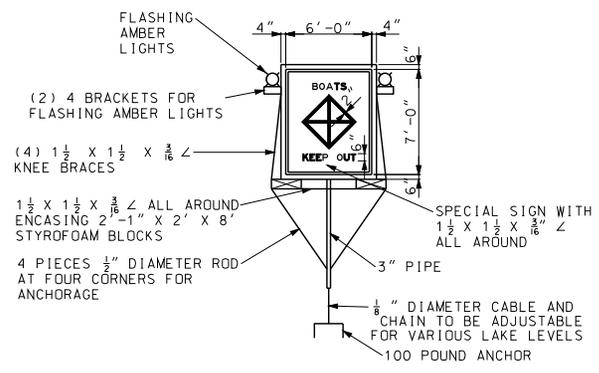
- LEGEND**
- - BOATS KEEP OUT (SIGN)
  - - BOATS KEEP OUT (BUOY)
  - ▲ - NO WAKE (BUOY)



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



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



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

**GENERAL NOTES:**

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

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

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

SIGNS SHALL BE DOUBLE FACED

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

ALL LETTERING TO BE BLACK IN COLOR IN BLOCK FORM.

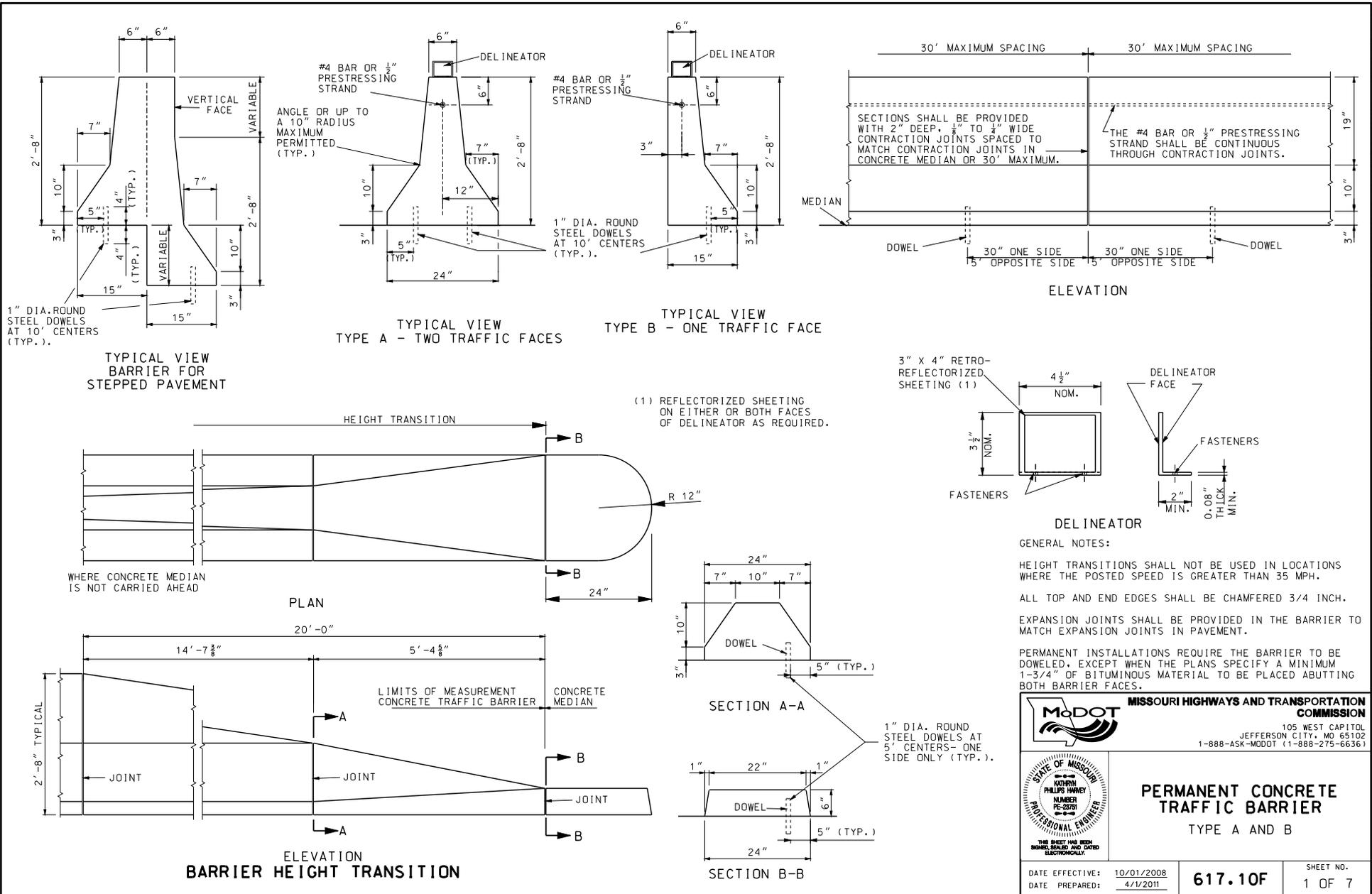
FOR OTHER INFORMATION AND LOCATION OF SIGNS AND BUOYS SEE SPECIAL PROVISIONS.

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

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

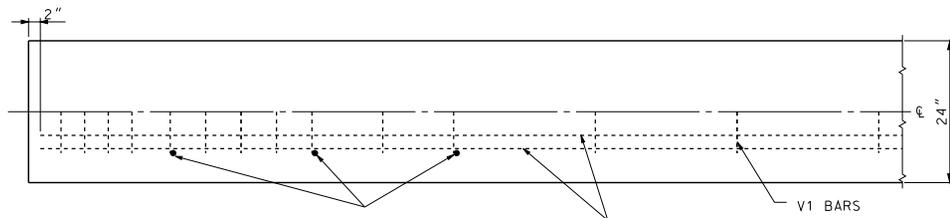
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)
	<p><b>TEMPORARY TRAFFIC CONTROL DEVICES</b></p> <p>TRAFFIC CONTROL FOR WATERWAYS</p>

DATE EFFECTIVE:	02/01/2011	<b>616.10AN</b>	SHEET NO.
DATE PREPARED:	12/8/2010		8 OF 8



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

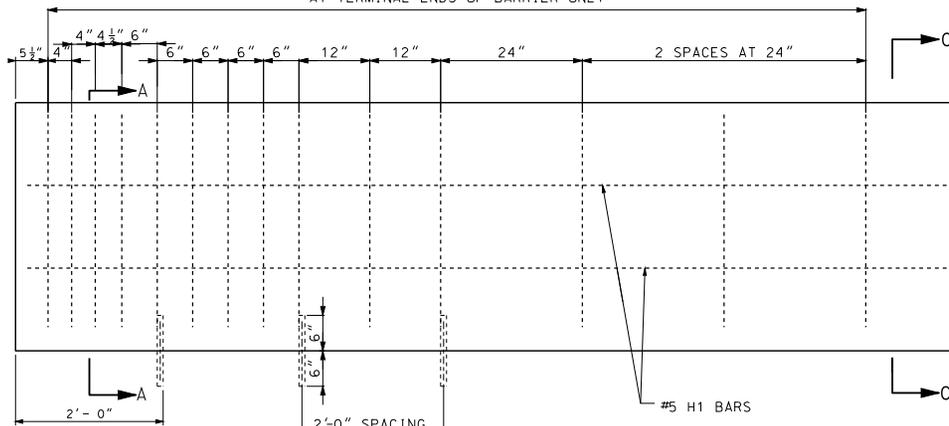
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>		105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>PERMANENT CONCRETE TRAFFIC BARRIER</b> TYPE A AND B	
DATE EFFECTIVE:	10/01/2008	<b>617.10F</b>	SHEET NO. 1 OF 7
DATE PREPARED:	4/11/2011		



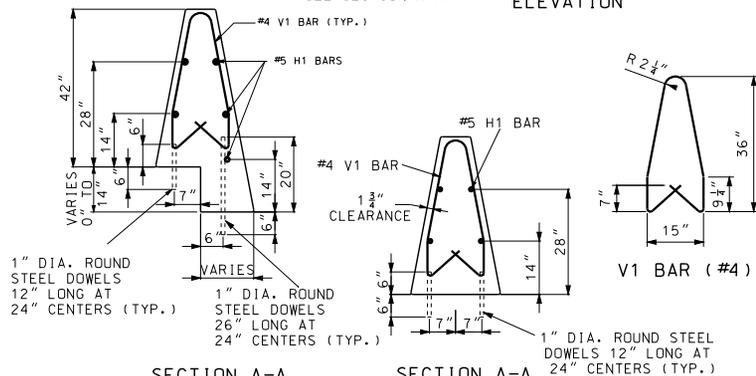
1" DIA. ROUND STEEL DOWELS 12" LONG @ 24" CENTERS #5 H1 BARS V1 BARS

PLAN VIEW  
(SYMMETRICAL ABOUT CENTERLINE)

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

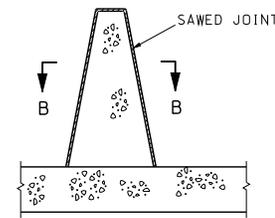


ELEVATION

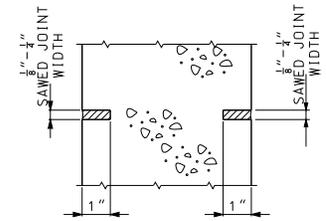


SECTION A-A (STEPPED PAVEMENT) SECTION A-A (NORMAL PAVEMENT)

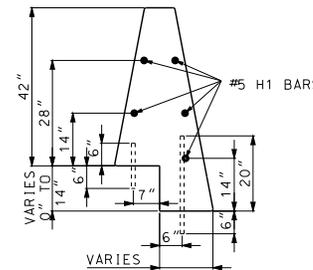
REINFORCING DETAILS



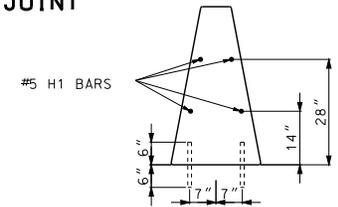
SECTION THROUGH SAWED JOINT



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.

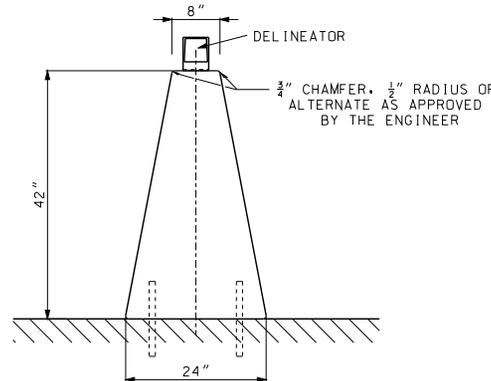
ANY REINFORCING BAR INSTALLATION METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL REINFORCING STEEL WILL BE POSITIONED ±1/2 INCH AS DIMENSIONED WILL BE SATISFACTORY.

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	<b>617.10F</b>	SHEET NO. 4 OF 7
DATE PREPARED:	4/11/2011		

CROSS SECTION	CONDITION		TREATMENT	SIGN		<p>(1) SIGNS SHALL BE VISIBLE TO TRAFFIC ONLY WHEN AND WHERE CONDITIONS EXIST.</p> <p>(2) SIGNS SHALL BE SPACED AT APPROXIMATELY ONE MILE INTERVALS AND LOCATED WITHIN 150 FT. BEYOND ANY STATE ROADS. WHEN A SIGN PLACED AT THE ONE MILE INTERVAL FALLS WITHIN 1/2 MILE OF A SIGN PLACED AFTER AN INTERSECTION, THE SIGN PLACED AT THE 1/2 MILE INTERVAL MAY BE OMITTED. WHEN LOW SHOULDER/SHOULDER DROP-OFF SIGNS WITH UNEVEN LANES ARE BOTH SPECIFIED, ALTERNATING SIGN MESSAGES SHALL BE USED AT 1 MILE SPACINGS.</p> <p>(3) ON SIDE ROADS WITH POSTED SPEED OF 45 MPH OR GREATER, SIGNS SHALL BE PLACED 150 FT. IN ADVANCE OF INTERSECTION WITH MAINLINE.</p> <p>(4) SIGNS SHALL BE LOCATED ON THE SIDE OF THE ROADWAY WHERE THE PAVEMENT EDGE DIFFERENTIAL EXISTS. ON TWO-LANE UNDIVIDED HIGHWAYS, BACK-TO-BACK SIGNS SHALL BE PROVIDED ON THE SIDE OF THE ROADWAY, WHERE THE PAVEMENT EDGE DIFFERENTIAL EXISTS. "BACK TO BACK" SIGNS SHALL BE SEPARATED BY 7-10 FEET.</p> <p>(5) SIGNS TO REMAIN VISIBLE UNTIL SHOULDER SHAPING IS COMPLETE.</p> <p>(6) SIGNS SHALL BE LOCATED ON RIGHT SIDE OF NON-DIVIDED HIGHWAYS AND ON BOTH SIDES OF DIVIDED HIGHWAYS WHERE A LANE LINE DIFFERENTIAL EXISTS.</p> <p>(7) FOR ADDITIONAL SIGN SPACING AND DETAILS SEE STD PLAN 620.10.</p>
	DIFFERENTIAL	TIME		MAINLINE (2)	SIDE ROAD (3)	
	PAVEMENT EDGE DIFFERENTIAL > 2" TO ≤ 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:1H OR FLATTER	 W08-9a (4)(5)	NO SIGNS REQUIRED	
		WORKING HOURS	NO EDGE TREATMENT REQUIRED			
	PAVEMENT EDGE DIFFERENTIAL > 2" TO ≤ 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:1H OR FLATTER	 W08-9a (4)(5)	NO SIGNS REQUIRED	
		WORKING HOURS	NO EDGE TREATMENT REQUIRED			
	PAVEMENT EDGE DIFFERENTIAL > 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:3H OR FLATTER	 W08-9a (4)(5)	 W08-1 (4)	
		WORKING HOURS	DELINEATE DIFFERENTIAL WITH CHANNELIZERS			
	LANE LINE DIFFERENTIAL ≤ 2"	NON-WORKING AND WORKING HOURS	NO EDGE TREATMENT REQUIRED	 W08-11 (6)	NO SIGNS REQUIRED	
	LANE LINE DIFFERENTIAL > 2"	NON-WORKING AND WORKING HOURS WHERE LANES OPEN TO TRAFFIC	WEDGE SLOPE TO 1V:3H OR FLATTER	 W08-11 (6)	 W08-1	
		NON-WORKING AND WORKING HOURS WHERE LANE CLOSED TO TRAFFIC	DELINEATE DIFFERENTIAL WITH CHANNELIZERS			
	ANY PAVEMENT EDGE OR LANE LINE DIFFERENTIAL	NON-WORKING AND WORKING HOURS WHERE PLANS REQUIRE ADJACENT LANE CLOSURE WITH CHANNELIZATION OR PARTIAL LANE CLOSURE WITH BARRIER.	NO EDGE TREATMENT REQUIRED	NO SIGNS REQUIRED	NO SIGNS REQUIRED	

- LEGEND
- RIGID PAVEMENT
  - FLEXIBLE PAVEMENT
  - ALL PAVEMENT TYPES

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**PAVEMENT EDGE TREATMENT**

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

**619.10F**

SHEET NO.  
1 OF 1

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

A = WIDTH AS SPECIFIED IN PLANS.

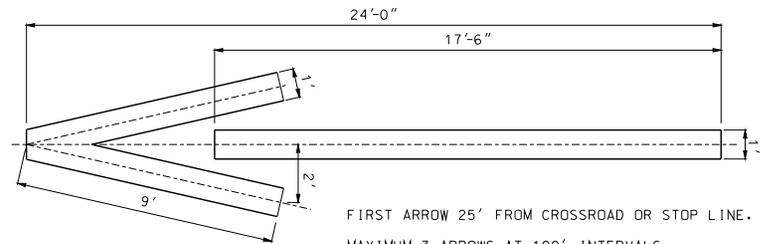
L =  $S \times W$  WHEN POSTED SPEED 45 MPH OR GREATER OR  $WS^2 / 60$  WHEN POSTED SPEED IS 40 MPH OR LESS.

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.

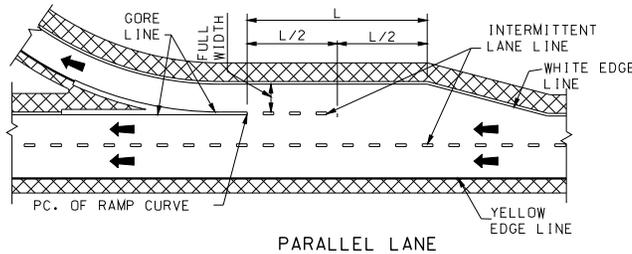
"NO PASSING" LINES SHALL BE PLACED AS SHOWN IN "LINE DETAIL". "NO PASSING" LINES ON A TWO-LANE, TWO-WAY HIGHWAY WHEN PASSING IS PROHIBITED IN EACH DIRECTION SHALL BE PLACED 4 INCHES APART AND THE INTERMITTENT CENTERLINE SHALL BE OMITTED.

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.

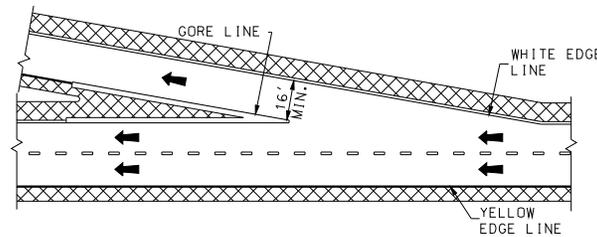
CROSSWALK LINES SHALL BE SOLID WHITE TRANSVERSE LINES 6 INCHES WIDE AT LEAST 6 FEET APART. CROSSWALK LINES ON THE INTERSECTION SIDE OF THE CROSSWALK SHALL MEET AT THE CURB.

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.

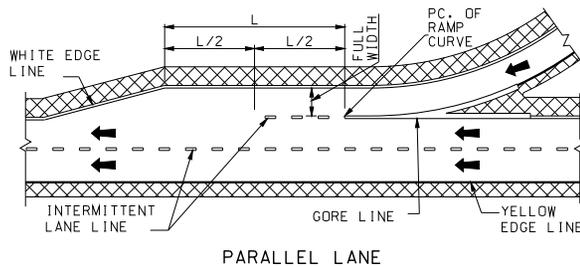


PARALLEL LANE

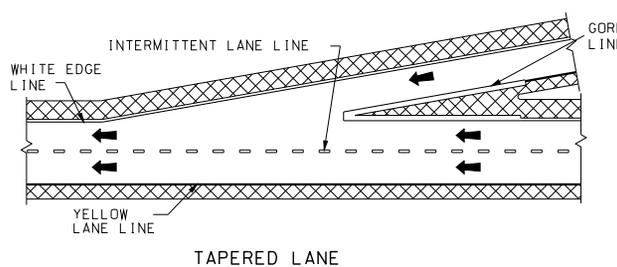


TAPERED LANE

**EXIT RAMP MARKING**

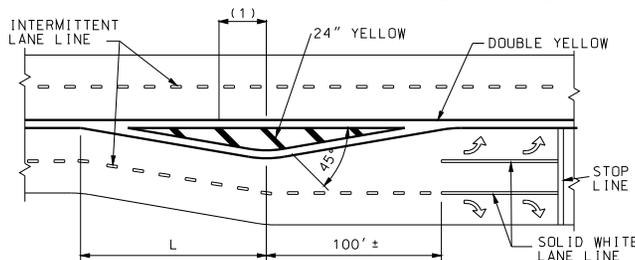


PARALLEL LANE

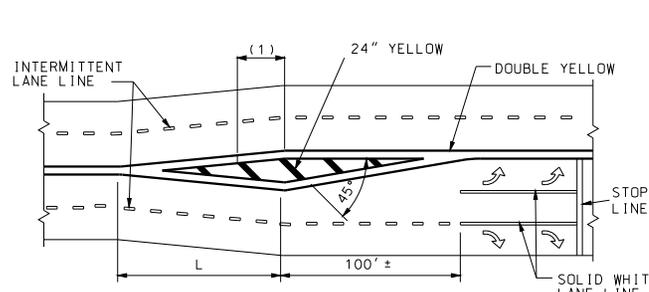


TAPERED LANE

**ENTRANCE RAMP MARKING**



OFFSET ONE LANE



OFFSET BOTH LANES

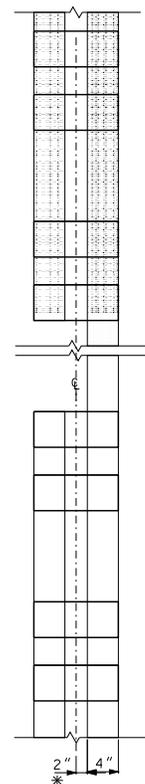
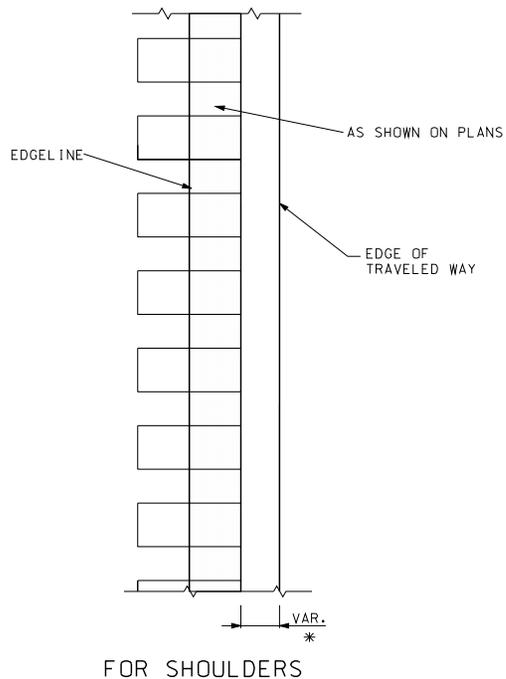
**MEDIAN ISLAND LEFT TURN LANE MARKING**

(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	<b>620.00J</b>	SHEET NO.
DATE PREPARED:	12/8/2010		1 OF 5

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

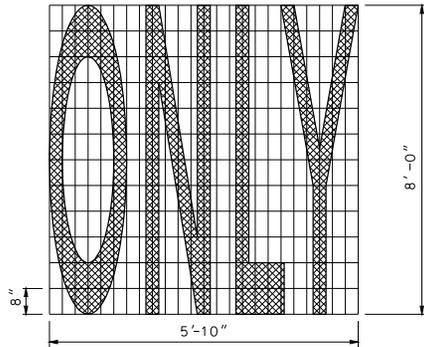




2 WAY 2 LANE  
(SEE TYPICAL STRIPING  
FOR RUMBLESTRIPS)

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

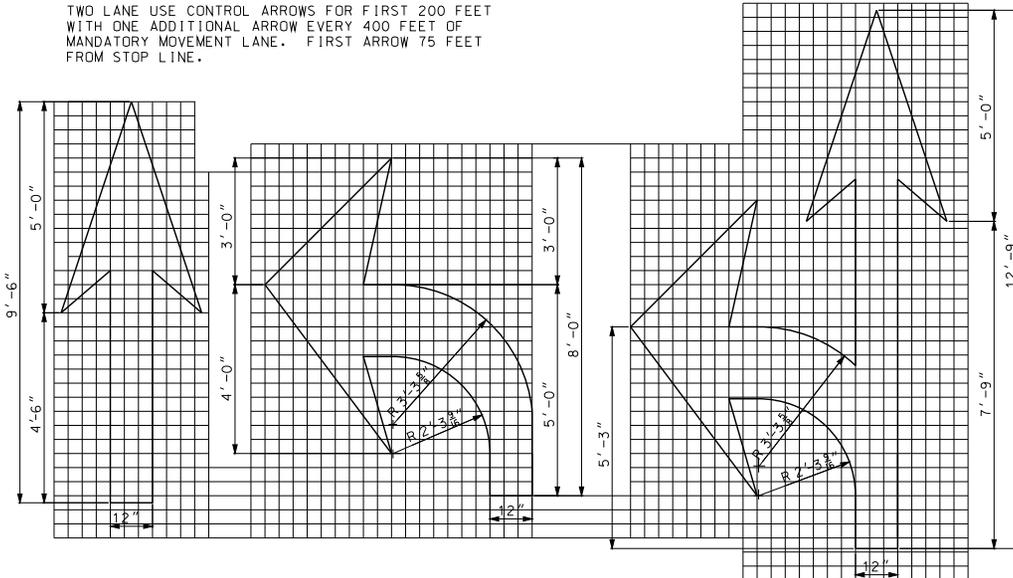
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>PAVEMENT MARKING</b> STRIPING THROUGH RUMBLE STRIPS
DATE EFFECTIVE: 12/01/2009 DATE PREPARED: 12/8/2010	<b>620.00J</b>	SHEET NO. 3 OF 5



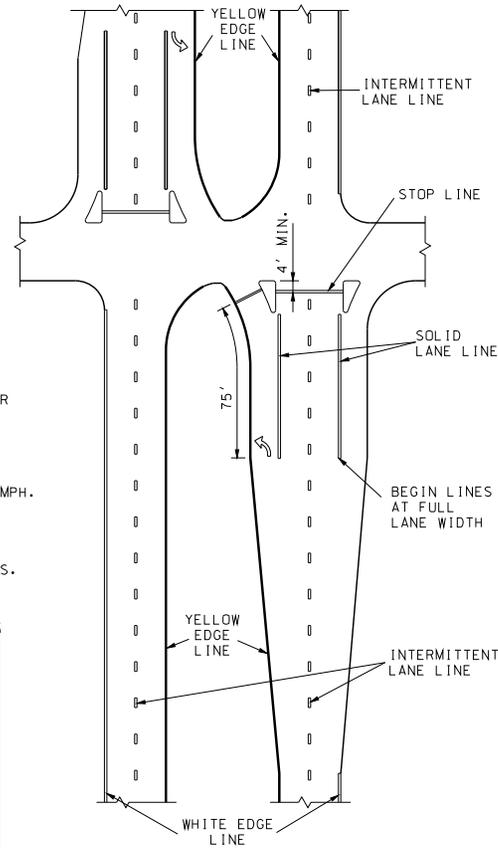
WORD MARKING  
**ELONGATED WORD & SYMBOL**

$L = S \times W$  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.



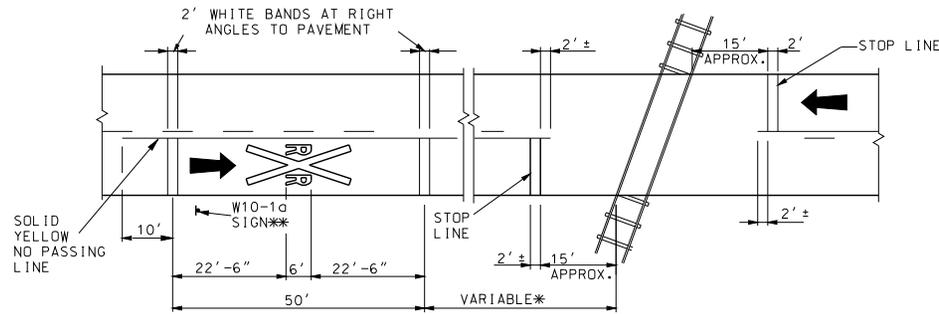
**ARROW MARKINGS**



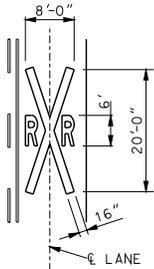
**SIGNALIZED GRADE INTERSECTION MARKING**

	<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. <b>4 OF 5</b>

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

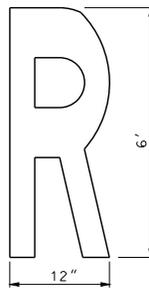


SYMBOL DETAIL

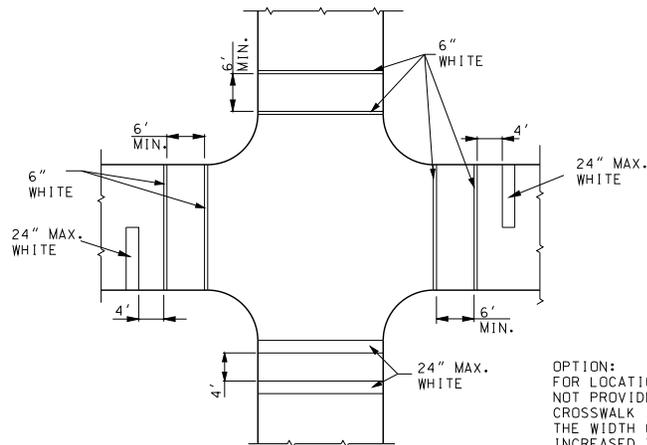
\* THE DISTANCE FROM THE RAILROAD CROSSING MARKING TO THE NEAREST TRACK WILL VARY ACCORDING TO THE APPROACH SPEED AND THE SIGHT DISTANCE OF THE VEHICULAR TRAFFIC APPROACHING, BUT SHALL BE NO LESS THAN 50 FEET.  
 A THREE-LANE ROADWAY SHALL BE MARKED WITH A CENTERLINE FOR TWO-LANE APPROACH OPERATION ON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

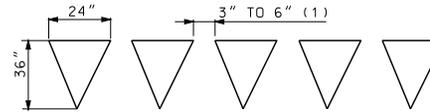


LETTER DETAIL



**SOLID WHITE PEDESTRIAN CROSSWALK**

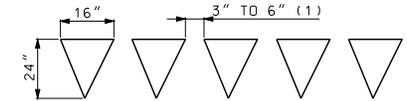
OPTION:  
 FOR LOCATIONS WHERE STOP BARS ARE NOT PROVIDED SPEEDS EXCEED 35 MPH OR CROSSWALK IN AN UNEXPECTED LOCATION, THE WIDTH OF THE CROSSWALK MAY BE INCREASED TO 24 INCHES.



DIRECTION OF TRAVEL

24 INCH YIELD LINE TRIANGLES

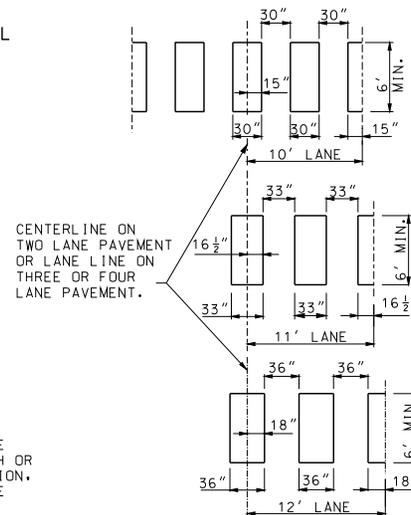
(1) TRIANGLES SHALL BE UNIFORMLY SPACED AND COVER THE COMPLETE WIDTH OF THE TRAVEL LANE. SPACING SHALL BE ADJUSTED SO THERE ARE NO PARTIAL TRIANGLES WITHIN THE YIELD MARKING.



DIRECTION OF TRAVEL

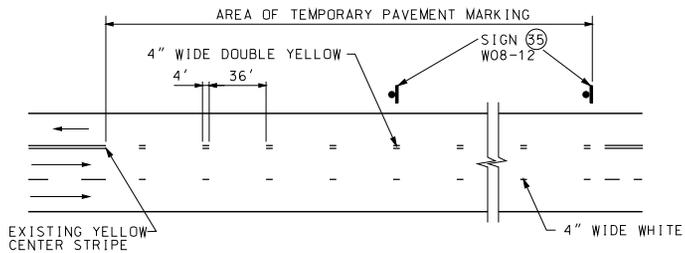
16 INCH YIELD LINE TRIANGLES

**YIELD LINE TRIANGLES**

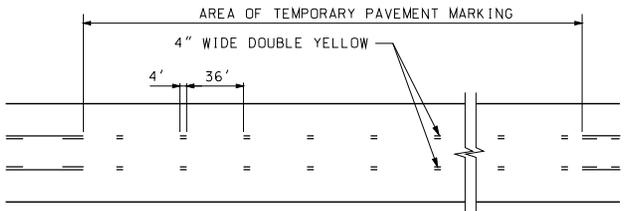


**WHITE MIDBLOCK (ZEBRA)**

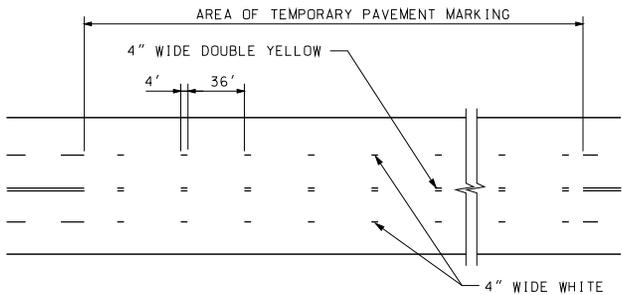
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center"><b>PAVEMENT MARKING</b></p>
DATE EFFECTIVE: 12/01/2009 DATE PREPARED: 12/8/2010	<p align="center"><b>620.00J</b></p>
SHEET NO. 5 OF 5	



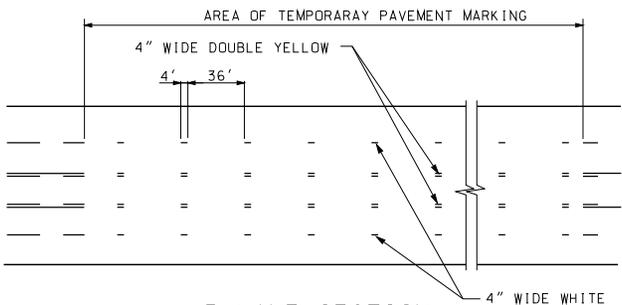
**2-LANE SECTION WITH AUXILIARY LANE**



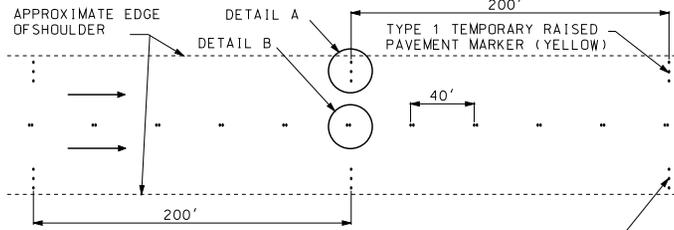
**3-LANE SECTION**



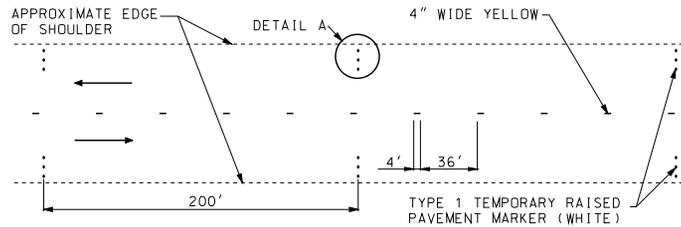
**4-LANE SECTION**



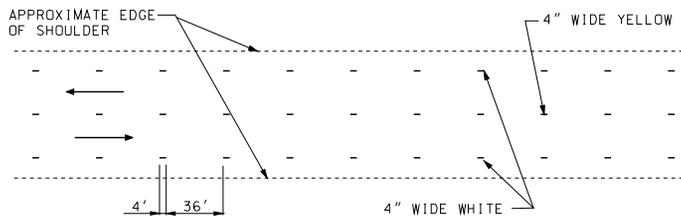
**5-LANE SECTION**



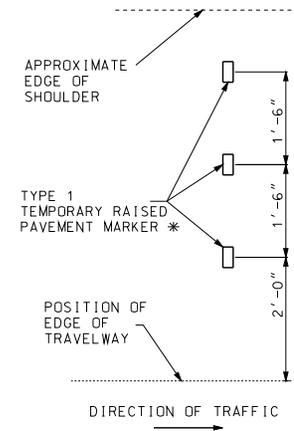
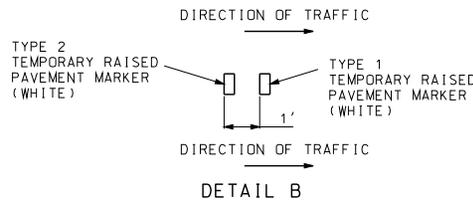
**EDGE LINES ON MULTILANE DIVIDED SECTIONS**



**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.



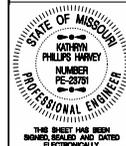
**SIGN (35)  
W-08-12**

**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.

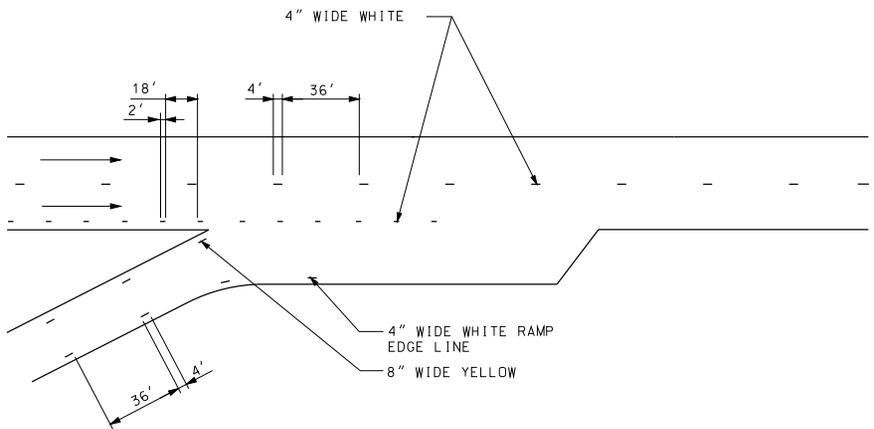
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)



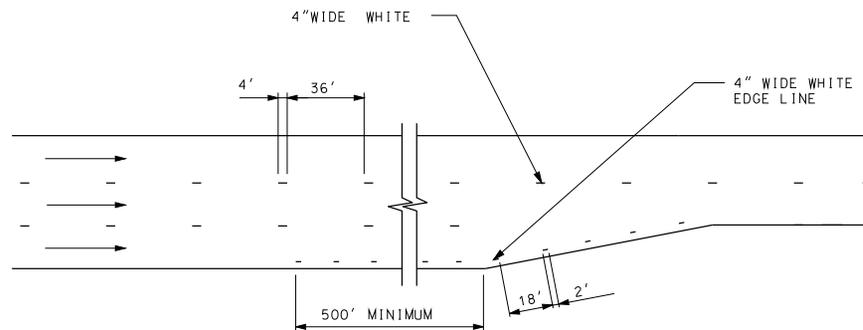
**TEMPORARY PAVEMENT MARKING**  
 TEMPORARY PAVEMENT MARKING

DATE EFFECTIVE: 07/01/2011	<b>620.10C</b>	THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.	SHEET NO. 1 OF 4
DATE PREPARED: 6/20/2011			

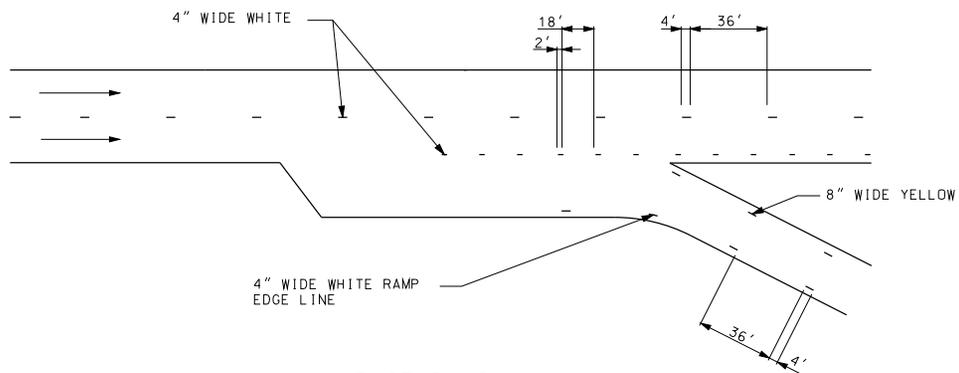
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**ENTRANCE RAMP**



**LANE TRANSITION**



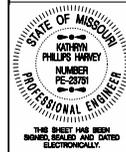
**EXIT RAMP**

**GENERAL NOTES:**

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

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

**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 SIGNED, SEALED AND DATED ELECTRONICALLY.

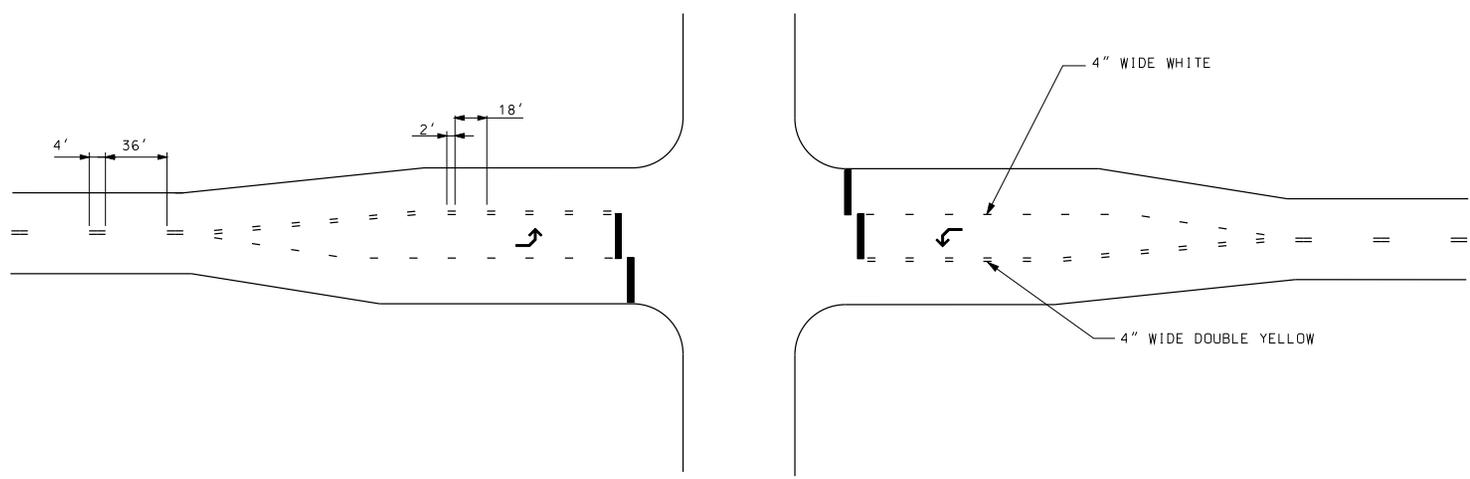
**TEMPORARY PAVEMENT MARKING**  
 LANE TRANSITION AND RAMP AREAS

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

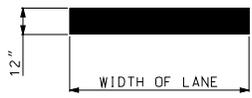
**620.10C**

SHEET NO.  
 2 OF 4

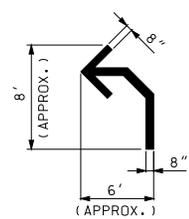
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



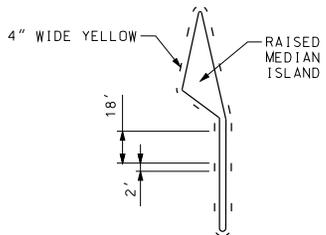
PLAN VIEW



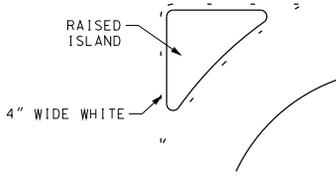
TEMPORARY STOP BAR DETAIL (WHITE)



TEMPORARY ARROW DETAIL (WHITE)



RAISED DIVISIONAL ISLAND



RAISED CHANNELIZING ISLAND

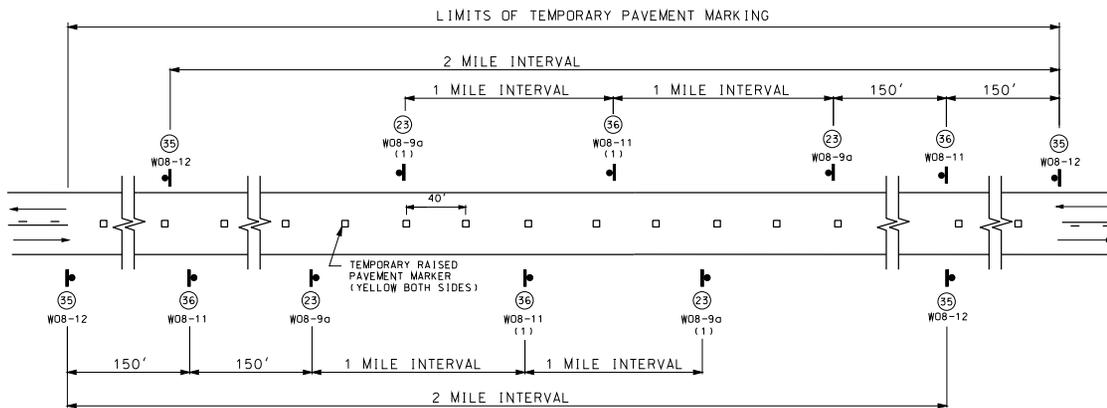
GENERAL NOTES:

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

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

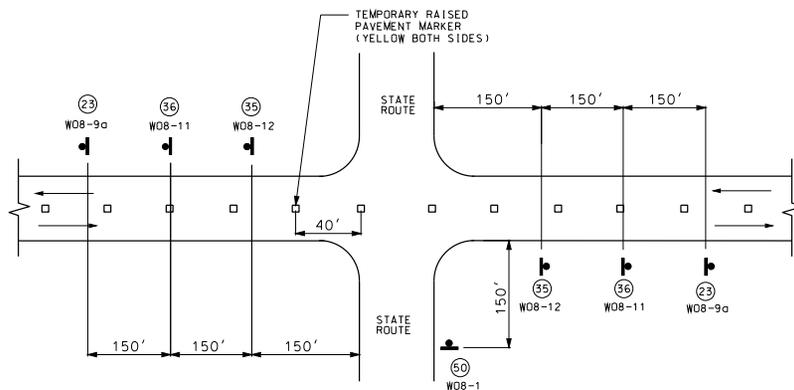
TEMPORARY PAVEMENT MARKING IN INTERSECTIONS, RAMP GORES AND OTHER TRANSITION AREAS USE AN INTERMITTENT MARKING 2' LONG AT A CYCLE OF 20'.

 <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>TEMPORARY PAVEMENT MARKING</b></p> <p align="center">INTERSECTIONS</p>
DATE EFFECTIVE: 07/01/2011 DATE PREPARED: 6/20/2011	<p align="center"><b>620.10C</b></p>
SHEET NO. 3 OF 4	

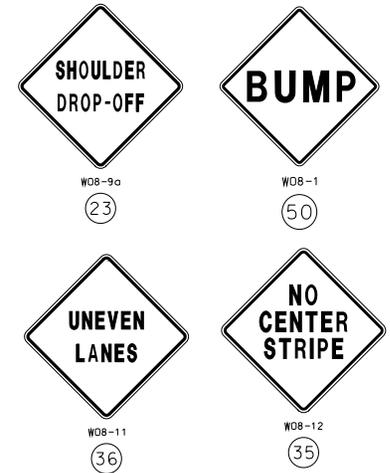


### SIGN SPACING FOR MAINLINE

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



### SIGN SPACING AT STATE ROUTE INTERSECTIONS



#### 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 ROUTE JUNCTIONS. WHEN THE INSTALLATION AT A JUNCTION IS WITHIN ONE-EIGHTH MILE OF THE NORMAL MAINLINE SIGN 35, THE LATTER MAY BE ELIMINATED.

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

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	<b>TEMPORARY PAVEMENT MARKING</b> TWO-LANE TWO-WAY HIGHWAY
DATE EFFECTIVE: 07/01/2011 DATE PREPARED: 6/20/2011	<b>620.10C</b>
SHEET NO. 4 OF 4	

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

AREA OF STEEL REQUIRED FOR "J5" BARS IN WINGS (sq. in./ft.)  
BARREL HEIGHT VS. WALL THICKNESS  
\* BACKFILL SLOPE = 2:1

WALL THICKNESS	BARREL HEIGHT (ft.)															
"TX" (in.)	4	5	6	7	8	9	10	11	12	13	14	15	16			
8	0.1683	0.1683	0.1699	0.2502	0.2677											
9	0.1683	0.1683	0.1683	0.2111	0.2680	0.3071	0.4101	0.5366								
10		0.1683	0.1683	0.1821	0.2573	0.2867	0.3510	0.4573	0.5856	0.7393						
11			0.1683	0.1683	0.2260	0.3061	0.3073	0.3992	0.5095	0.6405	0.7954	0.9780				
12				0.1683	0.2016	0.2748	0.3259	0.3546	0.4515	0.5661	0.7007	0.8580	1.0413			
13					0.1820	0.2479	0.3285	0.3461	0.4058	0.5078	0.6271	0.7658	0.9262			
14						0.2259	0.2990	0.3665	0.3687	0.4608	0.5681	0.6924	0.8355			
15							0.2745	0.3550	0.3871	0.4219	0.5195	0.6323	0.7617			
16									0.4078	0.4078	0.4788	0.5821	0.7004			
17									0.3863	0.4286	0.4442	0.5396	0.6486			
18										0.4495	0.4495	0.5029	0.6041			
19											0.4705	0.4711	0.5654			
20												0.4915	0.5316			

AREA OF STEEL REQUIRED FOR "J5" BARS IN WINGS (sq. in./ft.)  
BARREL HEIGHT VS. WALL THICKNESS  
\* BACKFILL SLOPE = 3:1

WALL THICKNESS	BARREL HEIGHT (ft.)															
"TX" (in.)	4	5	6	7	8	9	10	11	12	13	14	15	16			
8	0.1683	0.1683	0.1683	0.1683	0.2280											
9	0.1683	0.1683	0.1683	0.1683	0.1917	0.2617	0.2680	0.3393								
10		0.1683	0.1683	0.1683	0.1683	0.2255	0.2867	0.2911	0.3708	0.4651						
11			0.1683	0.1683	0.1683	0.1982	0.2626	0.3061	0.3244	0.4059	0.5012	0.6119				
12				0.1683	0.1683	0.1769	0.2342	0.3030	0.3259	0.3605	0.4443	0.5412	0.6527			
13					0.1683	0.1683	0.2113	0.2732	0.3461	0.3461	0.3993	0.4857	0.5846			
14						0.1683	0.1926	0.2489	0.3155	0.3665	0.3665	0.4408	0.5299			
15							0.1769	0.2285	0.2895	0.3608	0.3871	0.4037	0.4848			
16									0.2676	0.3333	0.4078	0.4078	0.4470			
17									0.2488	0.3098	0.3803	0.4286	0.4286			
18										0.2893	0.3551	0.4303	0.4495			
19											0.3330	0.4035	0.4705			
20												0.3799	0.4551			

NOTE:

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 (As = 0.1683 sq. in./ft.)

\* SEE STANDARD PLAN 703.37B, SHEET 2 OF 2 FOR BACKFILL SLOPE TO BE USED BASED ON SKEW.



**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**CONCRETE BOX CULVERT**

EXTERIOR WING REINFORCEMENT  
(HS20 & HS20 MOD. LOADING)



THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

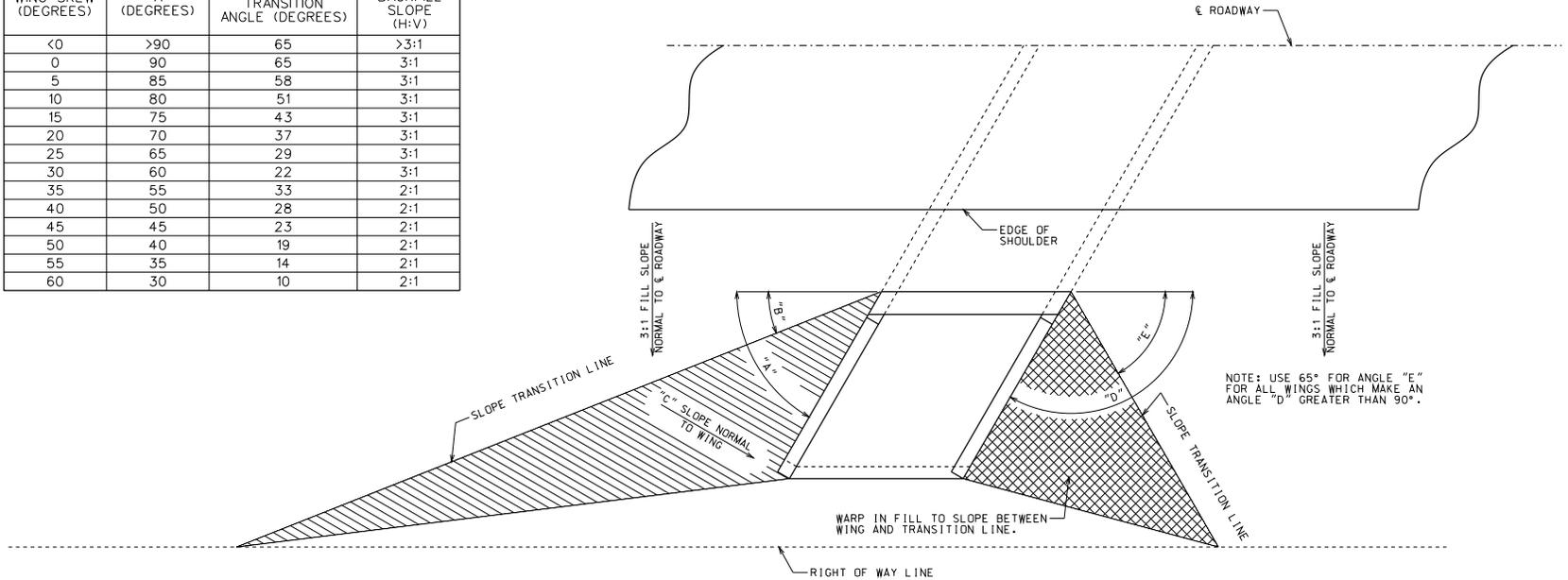
SHEET NO.  
1 OF 2

DATE EFFECTIVE: 10-01-2009  
DATE PREPARED: 10/28/2009

703.37B

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

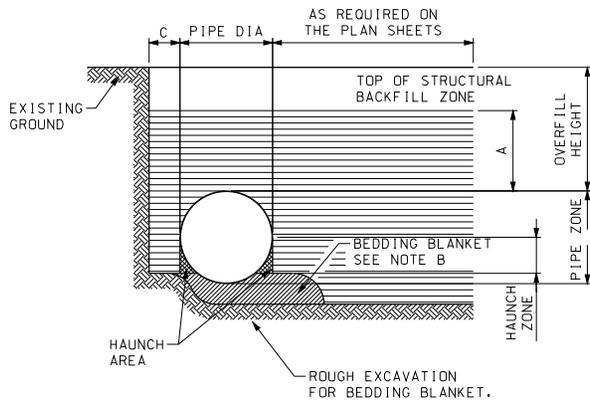


PLAN OF WINGS AND SLOPE TRANSITION LINES

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: 10-01-2009 DATE PREPARED: 10/29/2009	<b>703.37B</b>	SHEET NO. <b>2 OF 2</b>

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



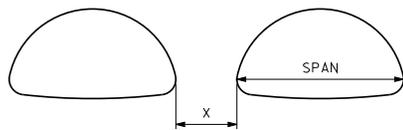
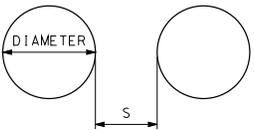
**TYPICAL TRENCH DETAIL  
PIPE INSTALLATION AND BEDDING**

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"

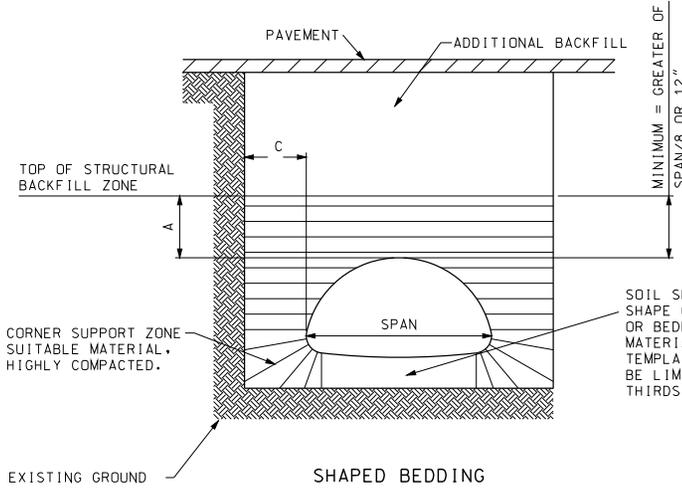
- C) TRENCH INSTALLATIONS - 2 FEET MINIMUM EACH SIDE OF CULVERT. THIS RECOMMENDED LIMIT SHOULD BE MODIFIED AS NECESSARY TO ACCOUNT FOR VARIABLES SUCH AS POOR IN-SITU SOILS. EMBANKMENT INSTALLATIONS - ONE DIAMETER OR SPAN EACH SIDE OF CULVERT.



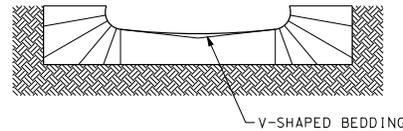
PIPE	
DIAMETER	SPACE S
UP TO 24"	12"
24" TO 72"	1/2 PIPE DIA
72" AND OVER	36"

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

**MULTIPLE STRUCTURE SPACING**



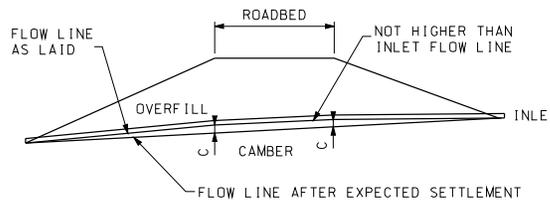
SOIL SHALL BE FINE GRADED TO SHAPE OF BOTTOM OF PIPE-ARCH. OR BEDDING BLANKET OF GRANULAR MATERIAL SHALL BE SHAPED WITH TEMPLATE. BEDDING WIDTH SHALL BE LIMITED TO A MAXIMUM OF TWO-THIRDS THE SPAN.



**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)

**CORRUGATED METAL PIPE  
INSTALLATION METHODS**

DATE EFFECTIVE: 04/01/2011

DATE PREPARED: 3/10/2011

725.00C

SHEET NO.  
1 OF 5

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

**CORRUGATED METALIC-COATED STEEL CIRCULAR PIPE LOCK SEAM**

CORRUGATED METALIC-COATED STEEL CIRCULAR PIPE LOCK SEAM																						
MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)																						
SPECIFIED DIAMETER OF PIPE	MINIMUM COVER		SPECIFIED THICKNESS OF COATED SHEET (IN.)																			
	CORRUGATED	SPIRAL RIB	0.064				0.079				0.109				0.138				0.168			
			A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
IN.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.	FT.
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**

CORRUGATED METALIC-COATED STEEL CIRCULAR PIPE RIVETED SEAM																						
MAXIMUM ALLOWABLE OVERFILL HEIGHTS (1)																						
SPECIFIED DIAMETER OF PIPE	MINIMUM COVER		SPECIFIED THICKNESS OF COATED SHEET (IN.)																			
	CORRUGATED	SPIRAL RIB	0.064				0.079				0.109				0.138				0.168			
			SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET		SINGLE RIVET		DOUBLE RIVET	
IN.	FT.	FT.	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
12	1	1	143		185	245	156		255	305	200		382	440	209		419	544	219		438	604
15	1	1	114		148	196	124		204	244	160		306	352	168		335	436	175		351	483
18	1	1	95		123	164	104		170	203	133		255	293	140		279	363	146		292	403
21	1	1	82		105	140	89		146	174	114		219	251	120		239	311	125		251	345
24	1	1	71		92	123	78		127	153	100		191	220	105		209	272	109		219	302
30	1	1	57		74	98	62		102	122	80		153	176	84		168	218	88		175	242
36	1	1	48		62	82	52		85	102	67		127	147	70		140	181	73		146	201
42	1	1	41		53	70	44		73	87	57		109	126	60		120	156	63		125	173
48	1	1	36		46	61	39		64	76	50		96	110	52		105	136	55		110	151
54	1	2				55	35		57	68	44		85	98	47		93	121	49		97	134
60	1	2				49			61	40			76	88	42		84	109	44		88	121
66	1	2				45			55				80	38			76	99	40		80	110
72	1	2				41			51				73	35			70	91	36		73	101
78	1	2				38			47				68				84	34			67	93
84	1	2				35			44				63				78	31			63	86
90	1	2				33			41				59				73				81	81
96	1	2							38				55				68				76	76
102	2	3							36				52				64				71	71
108	2	3											49				60				67	67
114	2	3											46				57				64	64
120	2	3											44				54				60	60
126	2	3															52				58	58

- A = 2-2/3" X 1/2" CORRUGATIONS.
- B = 3" X 1" CORRUGATIONS.
- C = 5" X 1" CORRUGATIONS
- D = 3/4" X 3/4" X 7-1/2" SPIRAL RIB

(1) MAXIMUM OVERFILL MEASURED FROM THE TOP OF PIPE TO SURFACE.

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.  
2 OF 5

### 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  
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**CORRUGATED METAL PIPE INSTALLATION METHODS**

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						37					72
84	1	3															34					67
90	1	3															32					62
96	1	3															30					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**

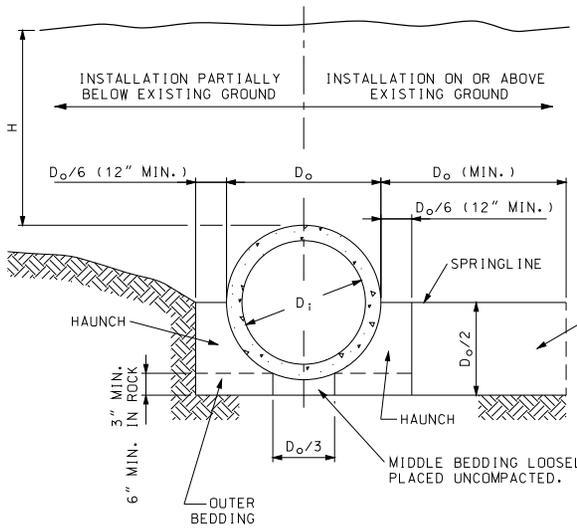
TYPE	SPAN (4)	RISE (4)	GALVANIZED SHEET THICKNESS - GAUGE (IN.)	GALVANIZED SHEET THICKNESS - GAUGE (IN.)	MINIMUM COVER (2)
	(IN.)	(IN.)			
B8A	53 (-2.4)	41 (+2.4)	0.079 - 14	0.109 - 12	12
B9A	60 (-2.7)	46 (+2.7)	0.079 - 14	0.109 - 12	15
B10A	66 (-3.0)	51 (+3.0)	0.079 - 14	0.109 - 12	15
B11A	73 (-3.3)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

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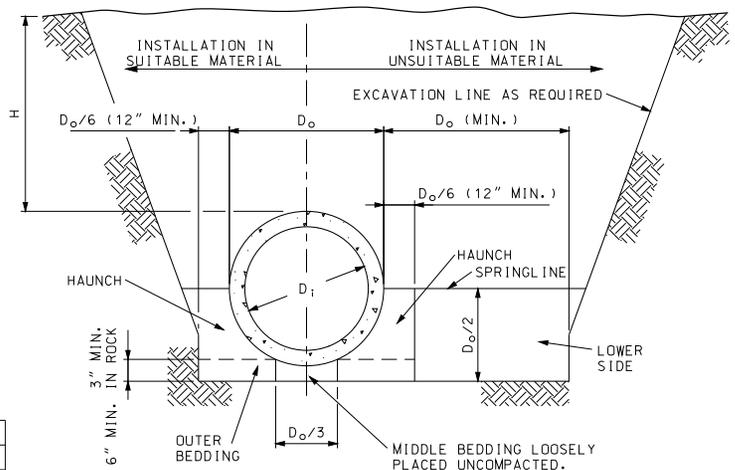
**EMBANKMENT INSTALLATIONS**

- 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**

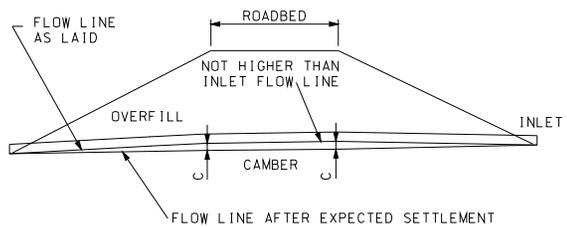
INSTALLATION TYPE	BEDDING THICKNESS	COMPACTION REQUIREMENTS (MIN. STANDARD PROCTOR %)					
		HAUNCH AND OUTER BEDDING			LOWER SIDE BEDDING		
		CATEGORY 1 SOIL (A)	CATEGORY 2 SOIL (B)	CATEGORY 3 SOIL (C)	CATEGORY 1 SOIL (A)	CATEGORY 2 SOIL (B)	CATEGORY 3 SOIL (C)
1	D <sub>o</sub> /24 MINIMUM, NOT LESS 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.

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**RIGID CULVERT INSTALLATION METHODS**

REINFORCED CONCRETE PIPE CULVERTS

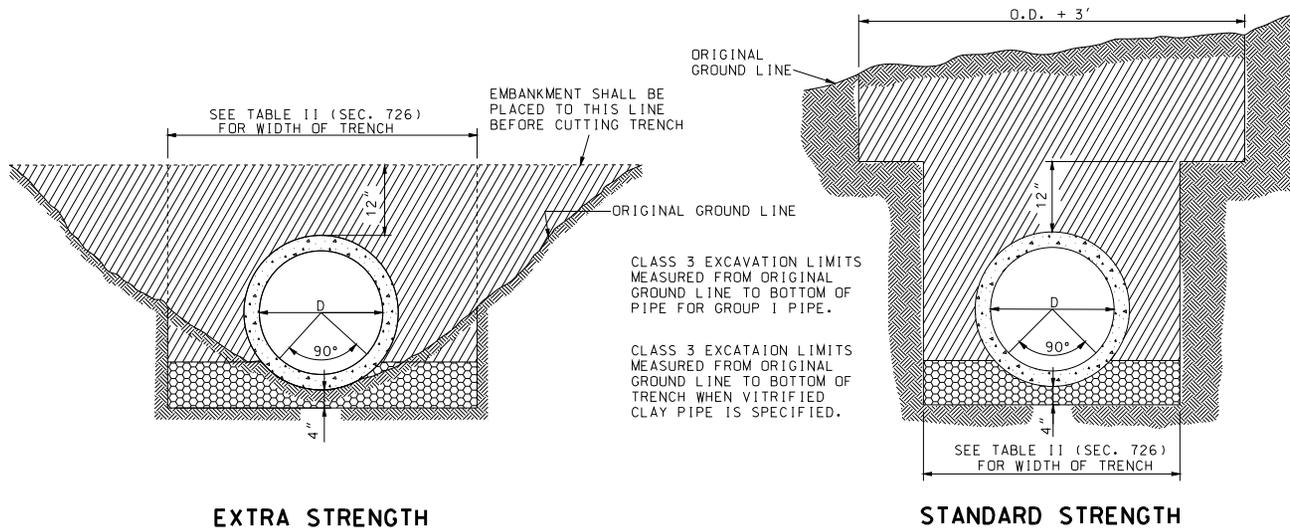
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 04/01/2011

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**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



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**RIGID CULVERT INSTALLATION METHODS**

VITRIFIED CLAY PIPE CULVERTS



THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

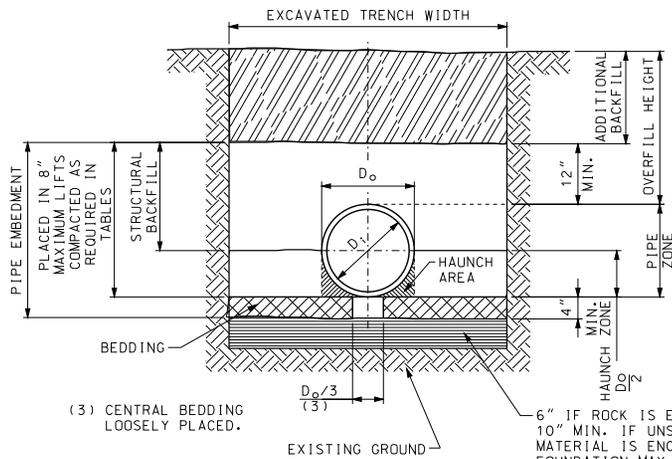
DATE EFFECTIVE: 04/01/2011

DATE PREPARED: 3/9/2011

**726.30G**

SHEET NO.  
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

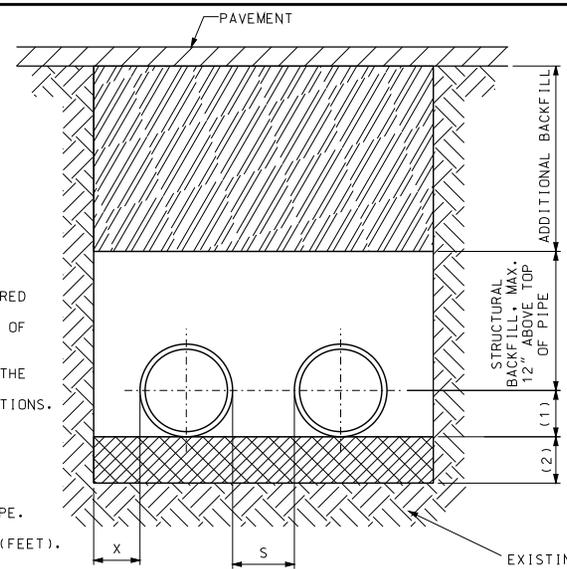
**CONSTRUCTION SEQUENCE**

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.

6" IF ROCK IS ENCOUNTERED, 10" MIN. IF UNSUITABLE MATERIAL IS ENCOUNTERED. FOUNDATION MAY NOT BE REQUIRED

**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.)

- (1) HAUNCHING, TO SPRINGLINE OF PIPE
- (2) BEDDING MATERIAL.

**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

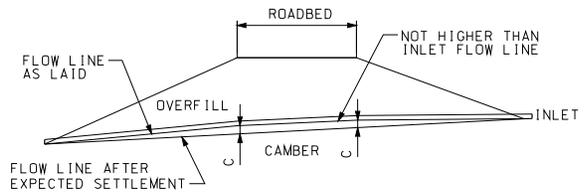
**SANDY-SILT STRUCTURAL BACKFILL (S<sub>n</sub> TYPES A1 & A3)**

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.

**MINIMUM COVER FOR CONSTRUCTION LOADS**

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.

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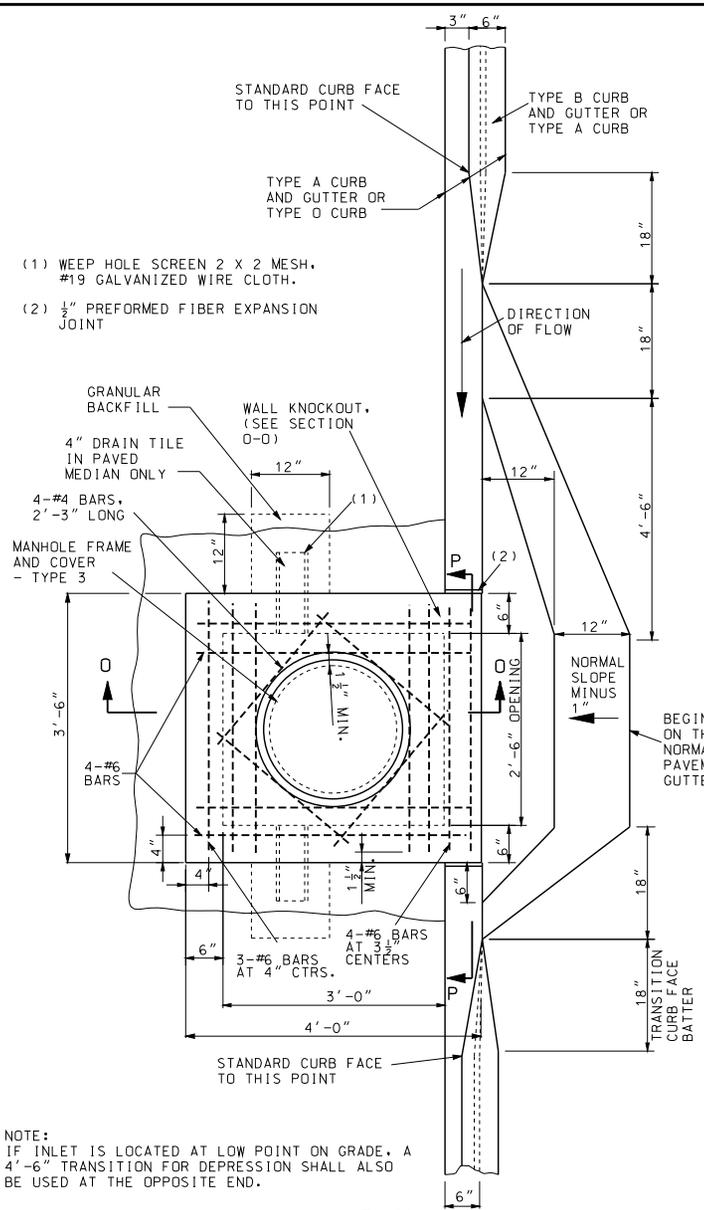
STATE OF MISSOURI  
 KATHRYN PHILIPS HANNEY  
 NUMBER PE-23791  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**THERMOPLASTIC PIPE INSTALLATION METHODS**

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.

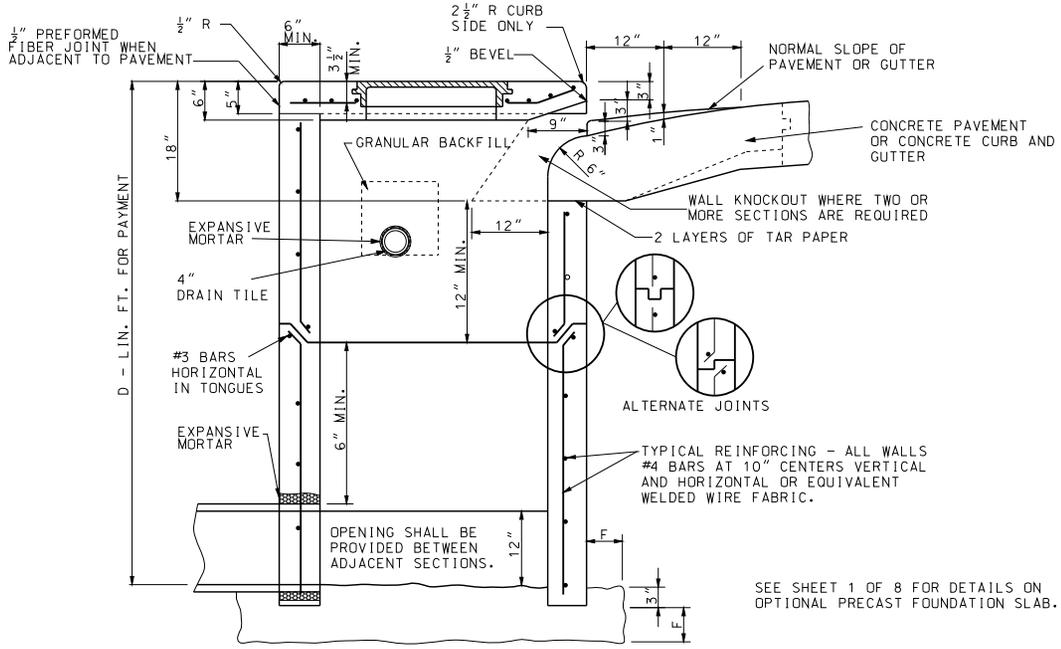
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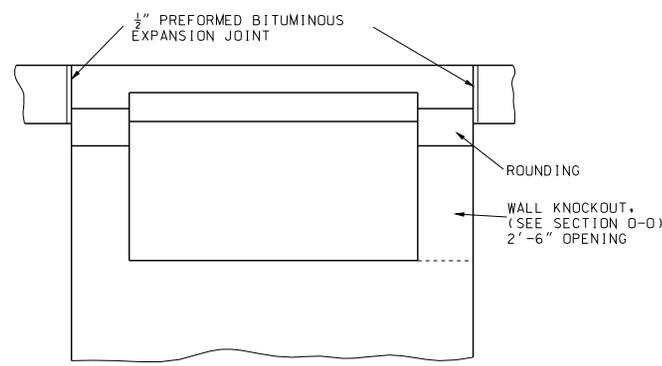
**PLAN**

- (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.



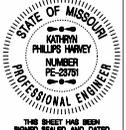
**SECTION O-O**

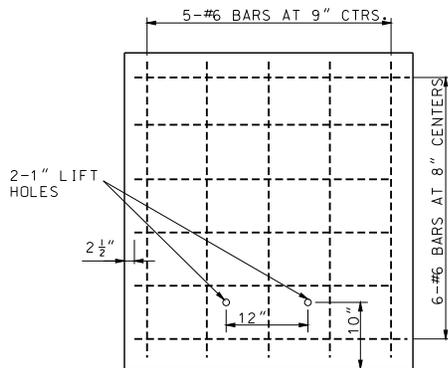


**SECTION P-P  
DETAILS OF OPENING**

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

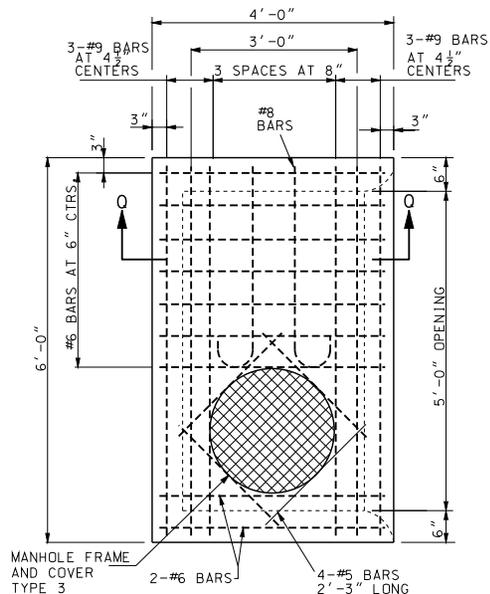
PRECAST BASE SECTION SET ON CONCRETE BLOCKS FOUNDATION SLAB AND INVERT POURED MONOLITHIC.

 <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>	

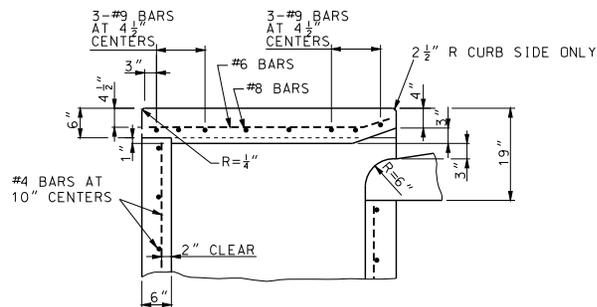


NOTE: REINFORCING FOR LIDS ON UPSTREAM SECTIONS.

**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.

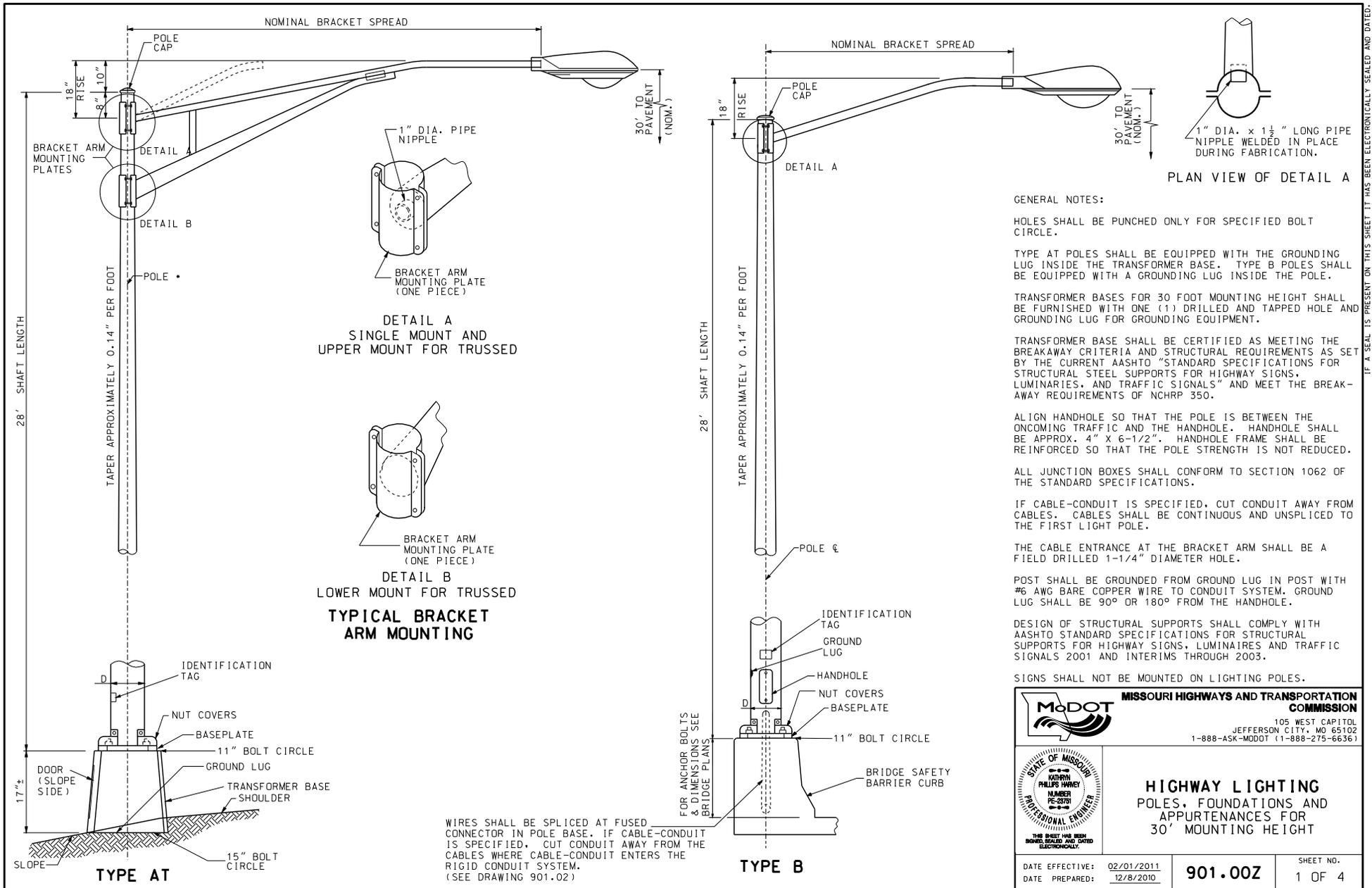
IF TWO OR MORE SECTIONS ARE USED, THE TYPE 3 MANHOLE FRAME AND COVER SHALL BE IN THE DOWNSTREAM SECTION ONLY.

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.

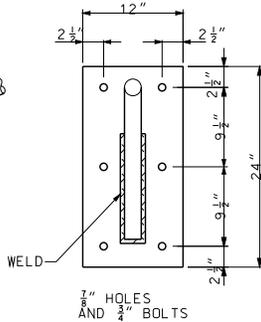
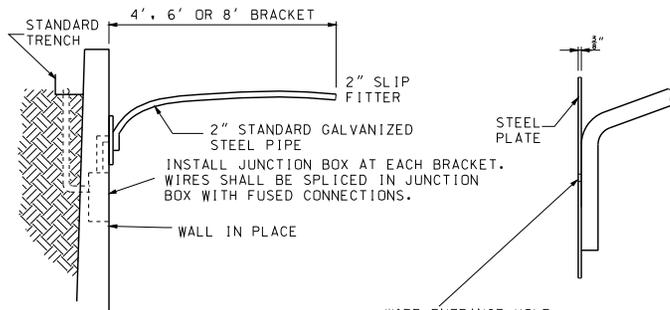
	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<p align="center"><b>PRECAST DROP INLET CURB INLET - TYPE T</b></p>
DATE EFFECTIVE: 12/01/2005 DATE PREPARED: 9/3/2010	<p><b>731.10R</b></p>	SHEET NO. 6 OF 8

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

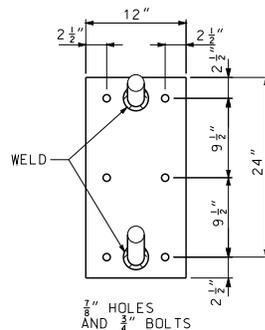
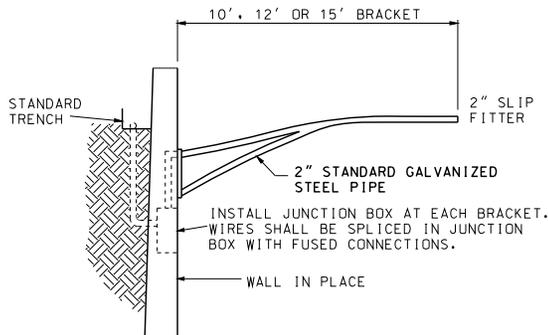


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 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>HIGHWAY LIGHTING          POLES, FOUNDATIONS AND          APPURTENANCES FOR          30' MOUNTING HEIGHT</b>
DATE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



WIRE ENTRANCE HOLE,  
CLEAN AND BEVEL EDGES  
TO PREVENT WIRE DAMAGE.



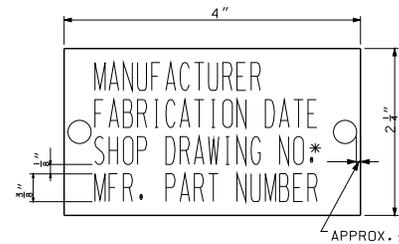
WALL BRACKETS

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)

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

THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

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

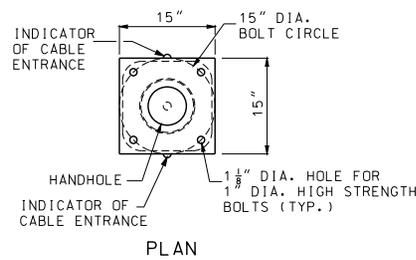
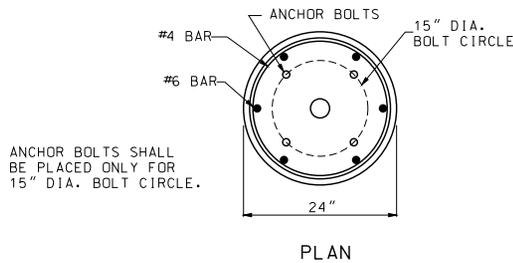
DATE EFFECTIVE: 02/01/2011  
DATE PREPARED: 12/8/2010

901.00Z

SHEET NO.  
2 OF 4

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

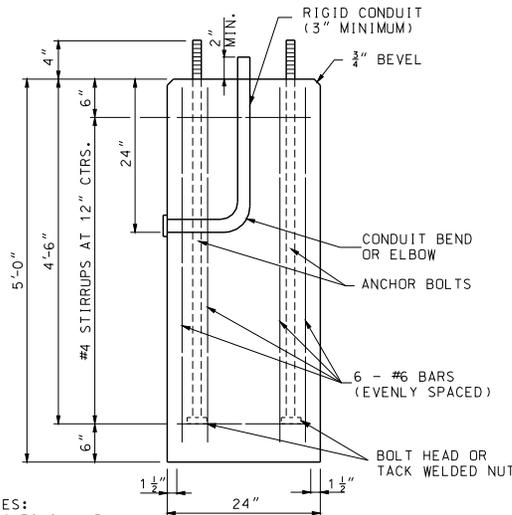




DRIVE HOLES WILL BE PERMITTED PROVIDED THAT THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE. THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.

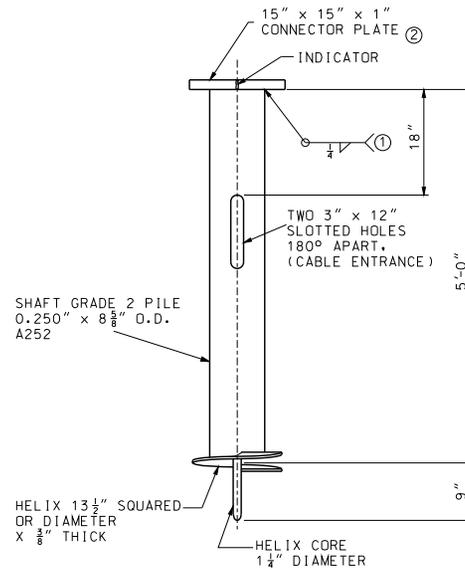
NOTES:

- 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

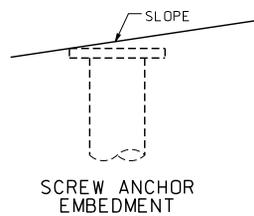
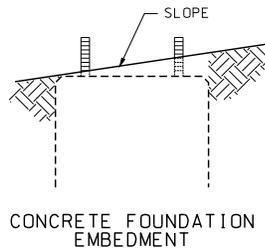
GENERAL NOTES:

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

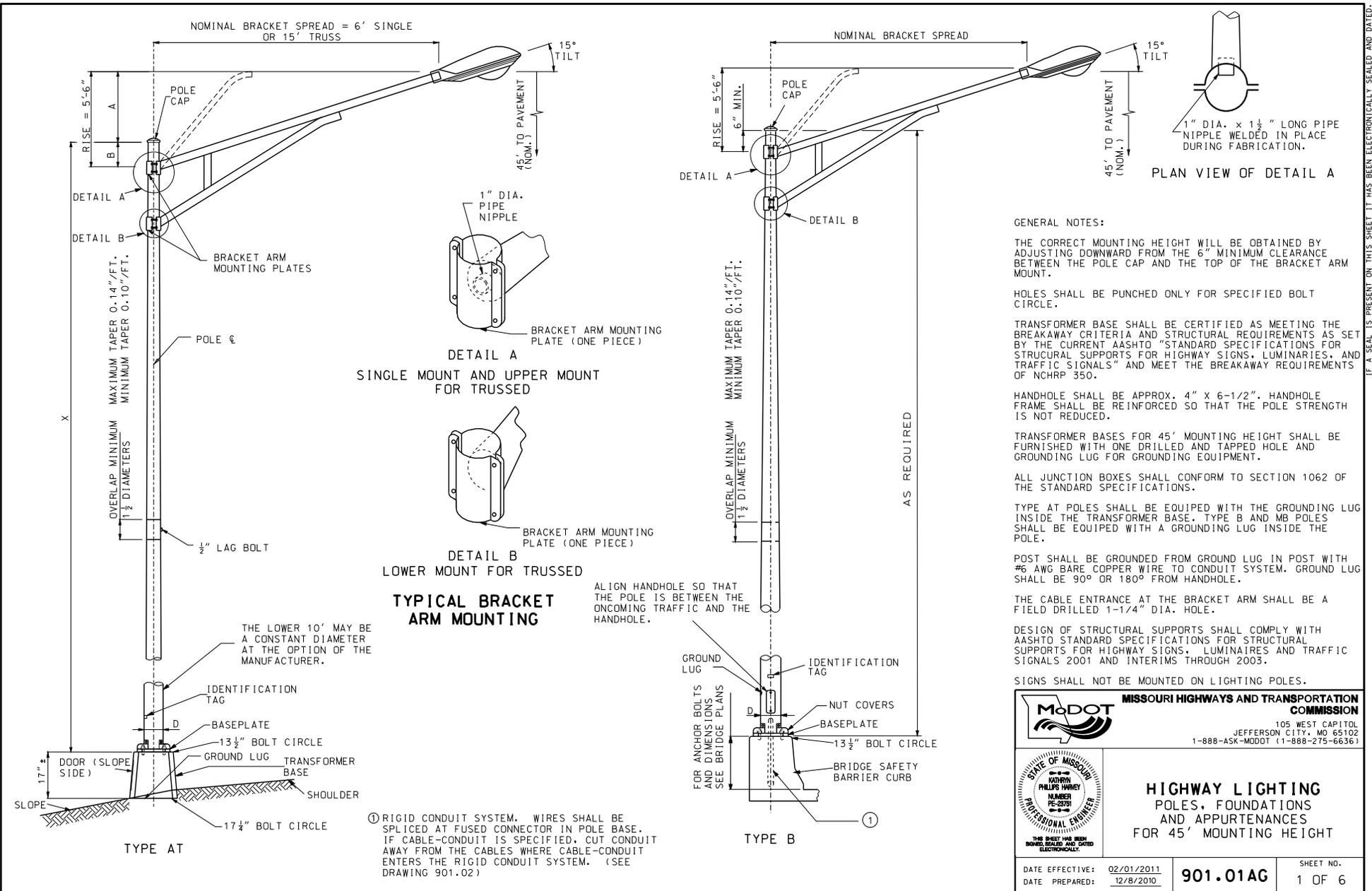
ALL CONNECTOR PLATE AND CLOSURE PLATE THICKNESSES SHOWN ARE MINIMUM DIMENSIONS.

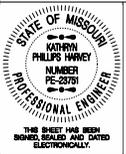
ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1" DIA. HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

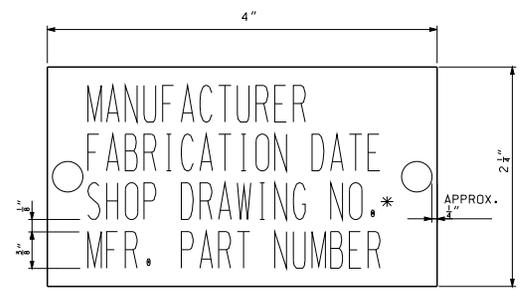
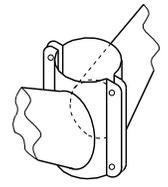
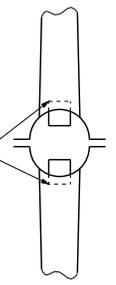
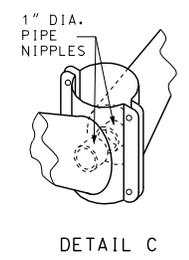
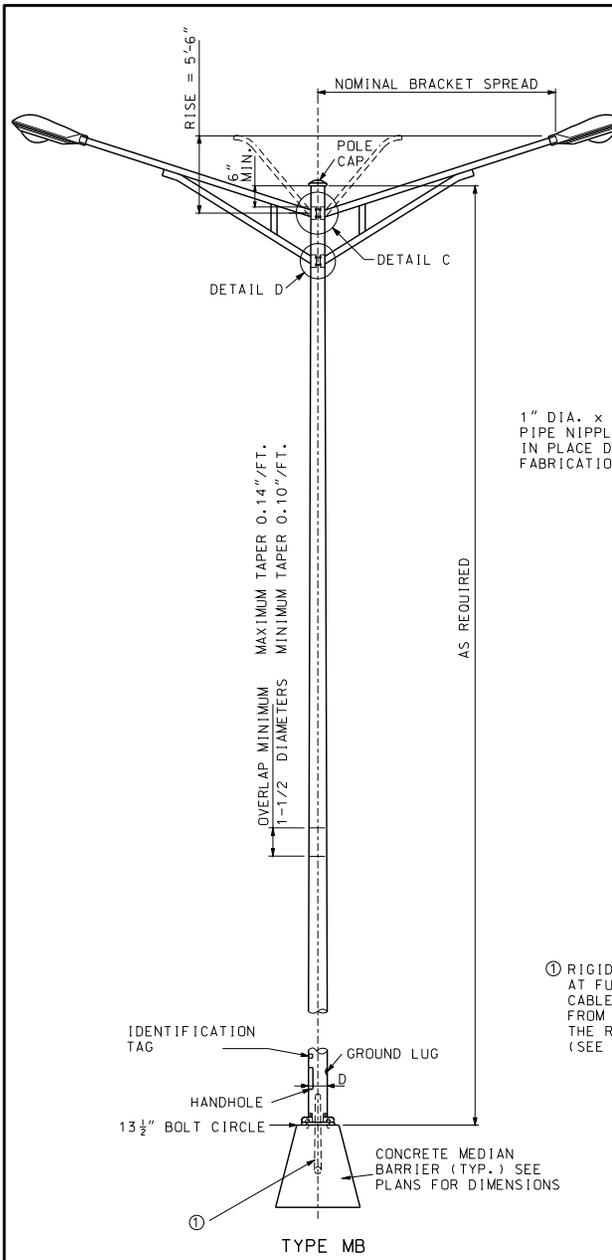


		<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		<b>HIGHWAY LIGHTING          POLES, FOUNDATIONS AND          APPURTENANCES FOR          30' MOUNTING HEIGHT</b>	
DATE EFFECTIVE:	02/01/2011	<b>901.00Z</b>	SHEET NO.
DATE PREPARED:	12/8/2010		4 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>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>1 OF 6</b>	

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)



**IDENTIFICATION TAG**

ID TAG NOTE:  
TAG SHALL BE ALUMINUM OR STAINLESS STEEL AND ATTACHED TO POLE USING TWO RIVETS OR STAINLESS STEEL DRIVE SCREWS. ID TAG HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.

\* INCLUDING REVISION

**GENERAL NOTES:**

THE CORRECT MOUNTING HEIGHT WILL BE OBTAINED BY ADJUSTING DOWNWARD FROM THE 6" MINIMUM CLEARANCE BETWEEN THE POLE CAP AND THE TOP OF THE BRACKET ARM MOUNT.

HOLES SHALL BE PUNCHED ONLY FOR SPECIFIED BOLT CIRCLE.

TRANSFORMER BASE SHALL BE CERTIFIED AS MEETING THE BREAKAWAY CRITERIA AND STRUCTURAL REQUIREMENTS AS SET BY THE CURRENT AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS" AND MEET THE BREAKAWAY REQUIREMENTS OF NCHRP 350.

HANDHOLE SHALL BE APPROX. 4" X 6-1/2". HANDHOLE FRAME SHALL BE REINFORCED SO THAT THE POLE STRENGTH IS NOT REDUCED.

TRANSFORMER BASES FOR 45' MOUNTING HEIGHT SHALL BE FURNISHED WITH ONE DRILLED AND TAPPED HOLE AND GROUNDING LUG FOR GROUNDING EQUIPMENT.

ALL JUNCTION BOXES SHALL CONFORM TO SECTION 1062 OF THE STANDARD SPECIFICATIONS.

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

POST SHALL BE GROUNDED FROM GROUND LUG IN POST WITH #6 AWG BARE COPPER WIRE TO CONDUIT SYSTEM. GROUND LUG SHALL BE 90° OR 180° FROM HANDHOLE.

THE CABLE ENTRANCE AT THE BRACKET ARM SHALL BE A FIELD DRILLED 1-1/4" DIA. HOLE.

SIGNS SHALL NOT BE MOUNTED ON LIGHTING POLES.

① RIGID CONDUIT SYSTEM. WIRES SHALL BE SPLICED AT FUSED CONNECTOR IN POLE BASE. IF CABLE-CONDUIT IS SPECIFIED, CUT CONDUIT AWAY FROM THE CABLES WHERE CABLE-CONDUIT ENTERS THE RIGID CONDUIT SYSTEM. (SEE DRAWING 901.02)

 <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. 2 OF 6	

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.

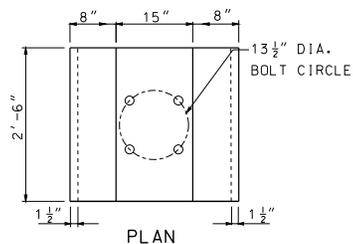
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL  
 JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)



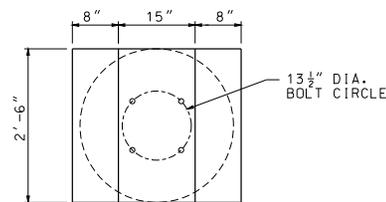
**HIGHWAY LIGHTING  
 POLES, FOUNDATIONS  
 AND APPURTENANCES  
 FOR 45' MOUNTING HEIGHT**

DATE EFFECTIVE: 02/01/2011	<b>901.01AG</b>	SHEET NO.
DATE PREPARED: 12/8/2010		3 OF 6

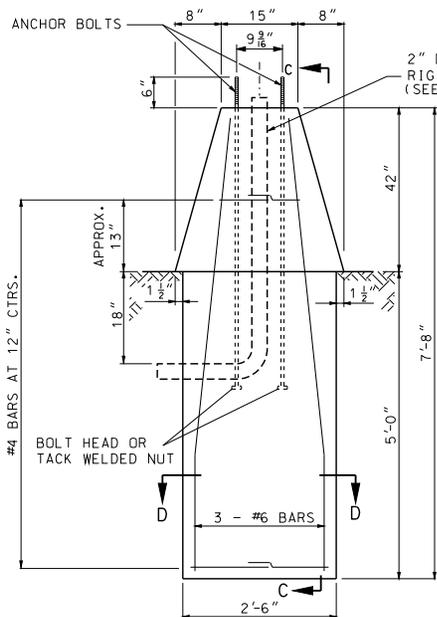
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



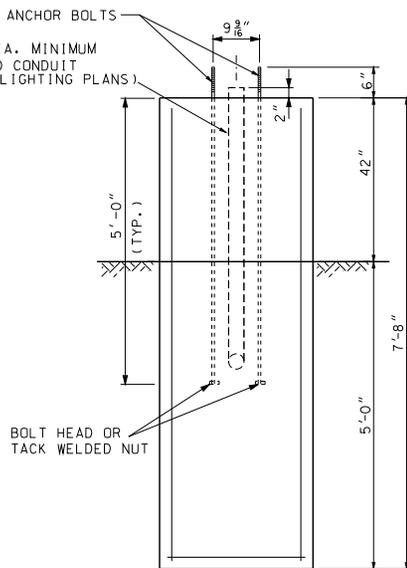
PLAN



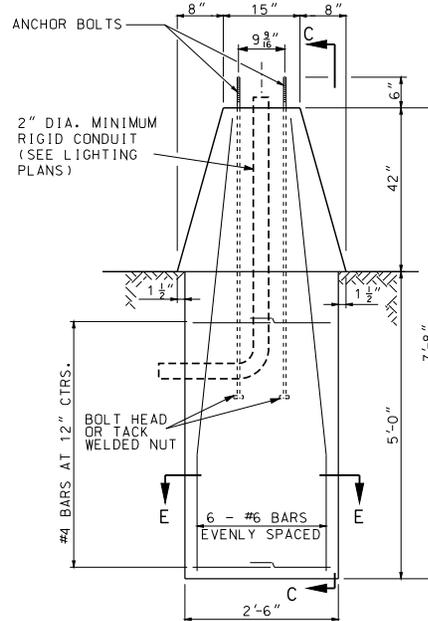
PLAN



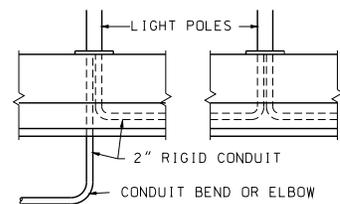
ELEVATION ALTERNATE 1



SECTION C-C



ELEVATION ALTERNATE 2



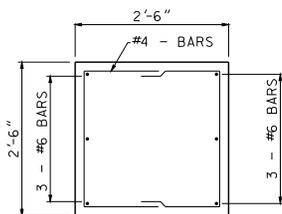
CONDUIT DETAIL FOR ALTERNATE 1 & 2

GENERAL NOTES:

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

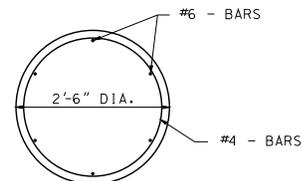
ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1 1/4" DIAMETER HIGH STRENGTH ANCHOR BOLTS.

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

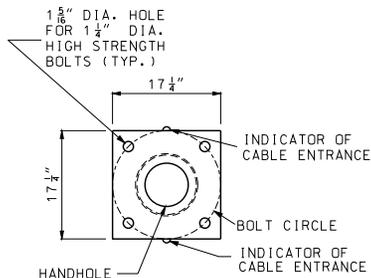
CONCRETE MEDIAN BARRIER AND FOUNDATION DESIGN FOR TYPE MB LIGHT POLE



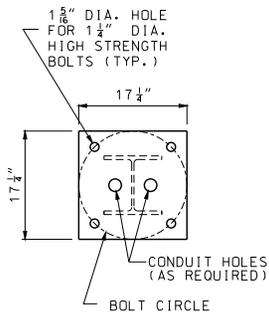
SECTION E-E

 <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 DATE PREPARED: 12/8/2010	<b>901.01AG</b>
SHEET NO. 4 OF 6	

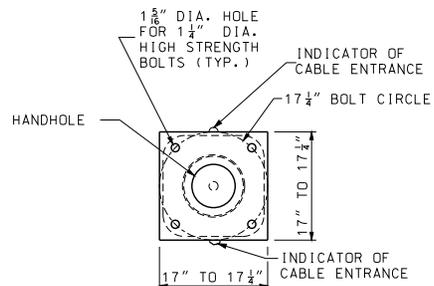
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PLAN

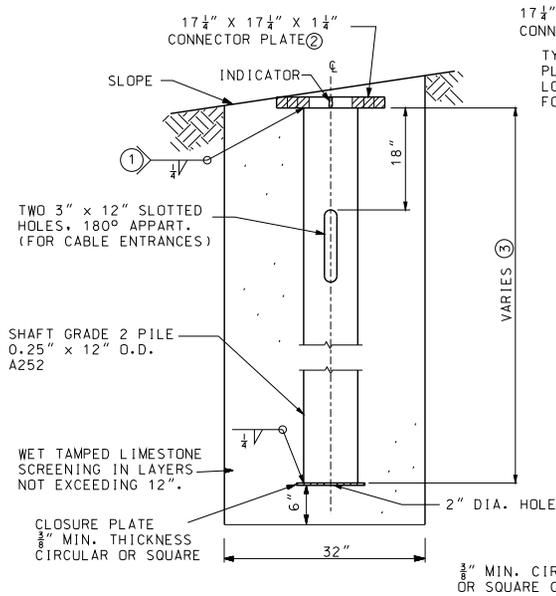


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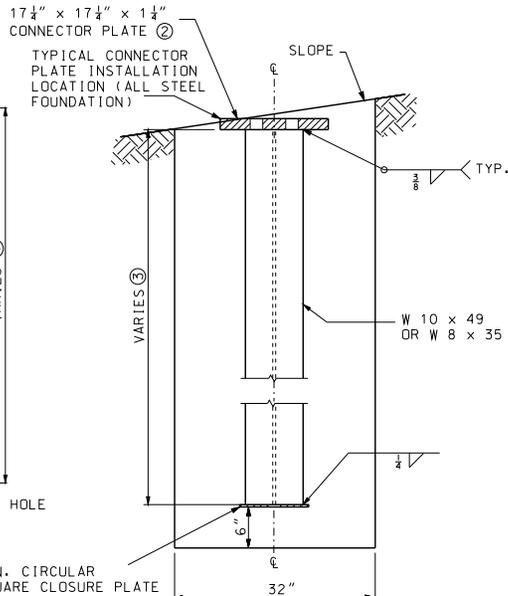


PLAN

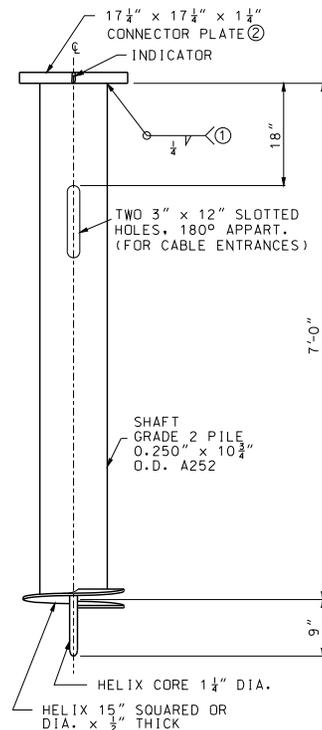
NOTE:  
DRIVE HOLES WILL BE PERMITTED PROVIDED THEY DO NOT CONFLICT WITH OR COMPROMISE THE STRUCTURAL INTEGRITY OF THE PLATE, THE WELD BETWEEN THE PLATE AND SHAFT, OR THE BOLT HOLES.



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.

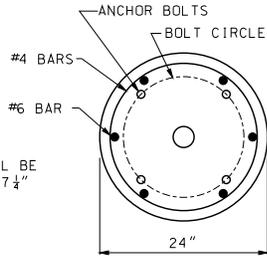
ALL ANCHOR BOLTS SHALL BE FULLY GALVANIZED 1 1/4" DIAMETER HIGH STRENGTH ANCHOR BOLTS.

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

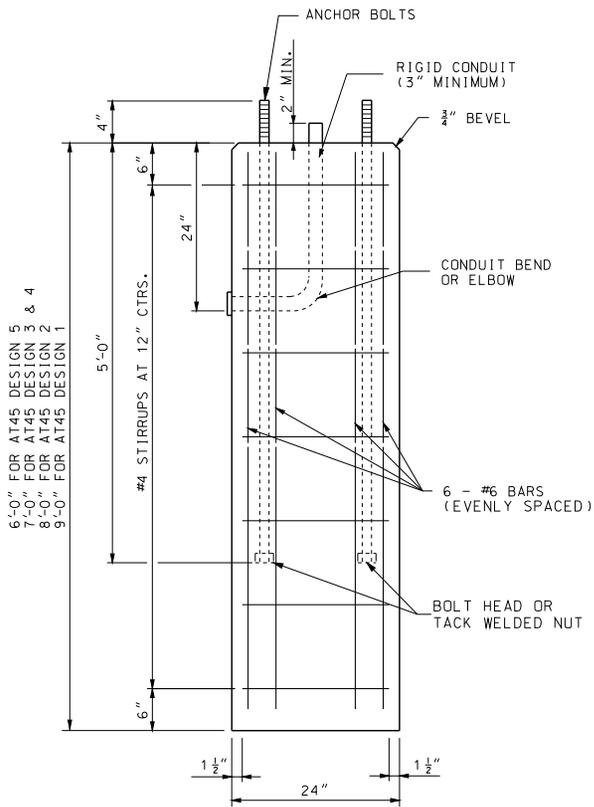
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)
	<b>HIGHWAY LIGHTING POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT</b>
DATE EFFECTIVE: 02/01/2011 DATE PREPARED: 12/8/2010	<b>901.01AG</b>
SHEET NO. <b>5 OF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

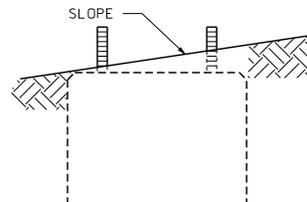


ELEVATION

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.

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

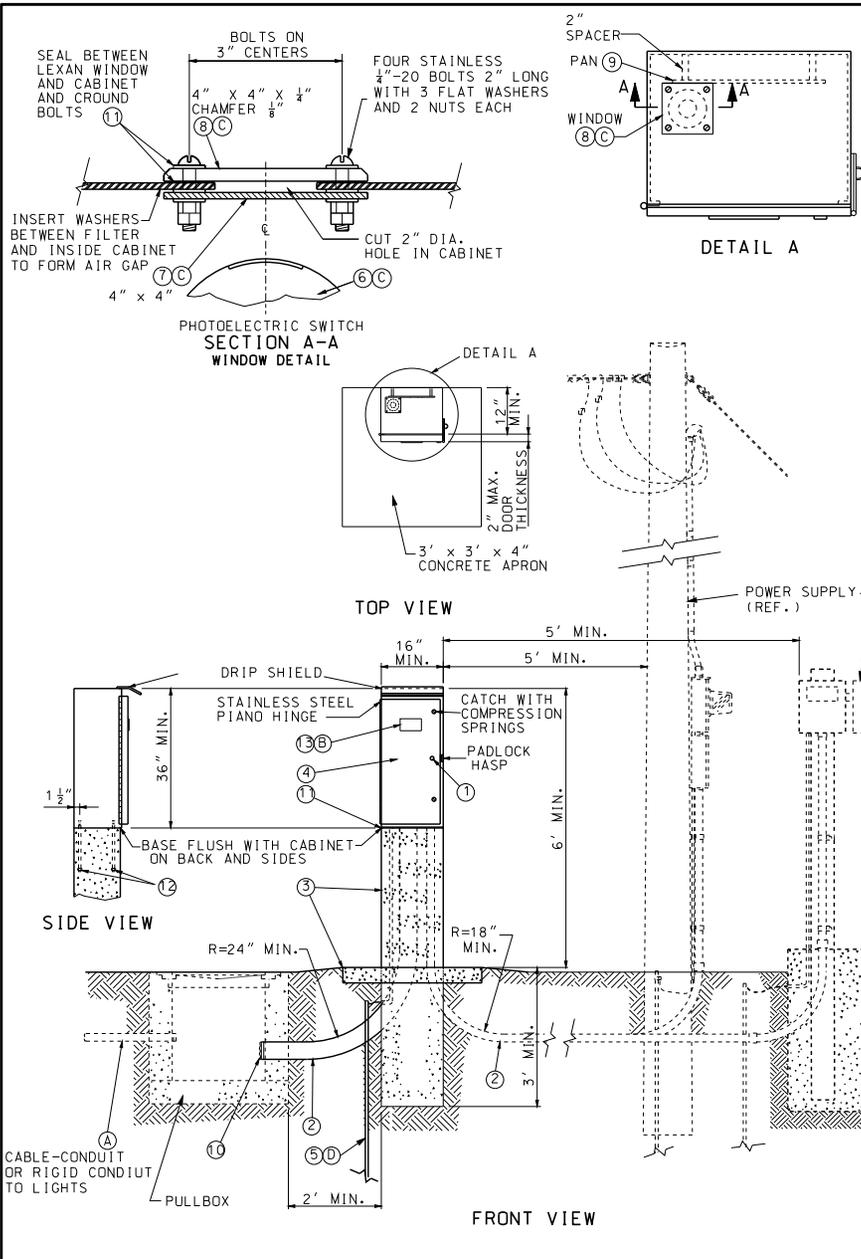
STATE OF MISSOURI  
KATHRYN PHILIPS HANNEY  
NUMBER PE-23701  
PROFESSIONAL ENGINEER  
THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

**HIGHWAY LIGHTING  
POLES, FOUNDATIONS  
AND APPURTENANCES  
FOR 45' MOUNTING HEIGHT**

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

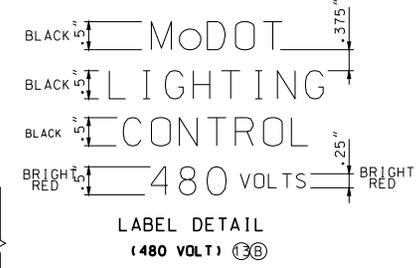
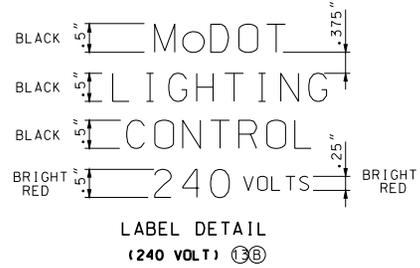
**901.01AG**

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.

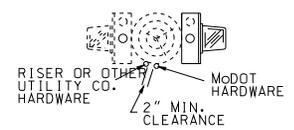
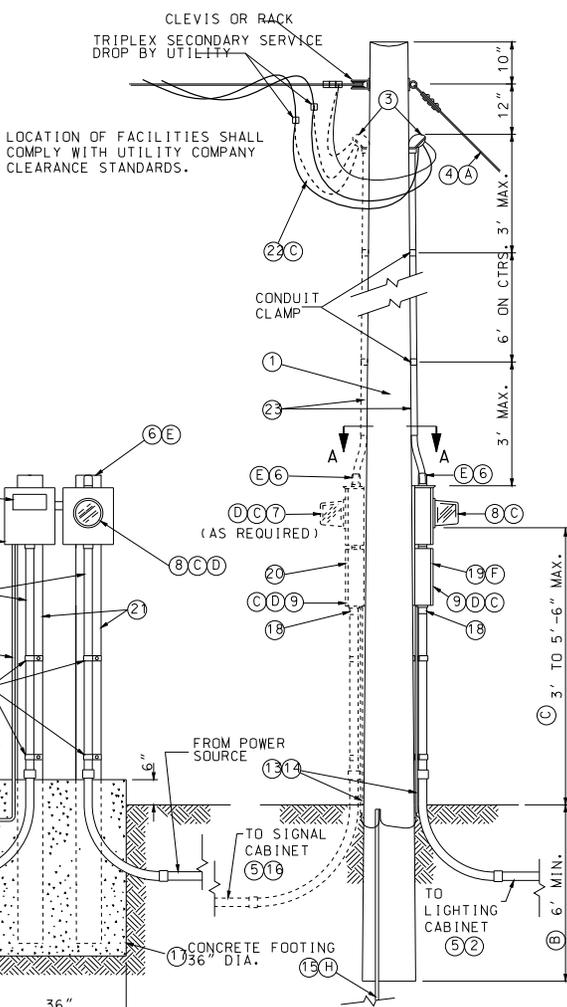
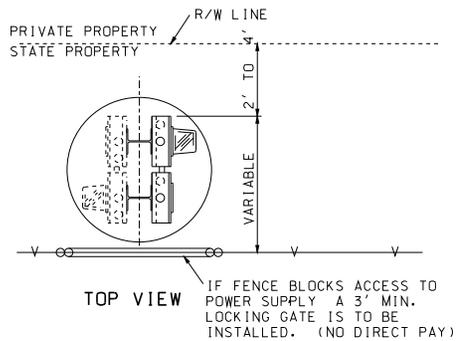
ALL MATERIALS REQUIRED EXCLUDING REFERENCE ITEMS AS SHOWN ON DRAWING SHALL BE INCLUDED IN PRICE BID FOR CONTROL STATION.

<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 LIGHTING</b></p> <p>BASE MOUNTED CONTROL STATION</p> <p>240 V OR 480 V - 4 CIRCUIT</p>	<p>DATE EFFECTIVE: 04/01/2005</p>	<p><b>901.30F</b></p>	<p>SHEET NO.</p>
		<p>DATE PREPARED: 9/14/2010</p>		<p>1 OF 2</p>

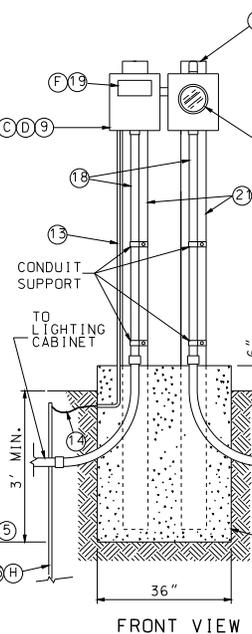
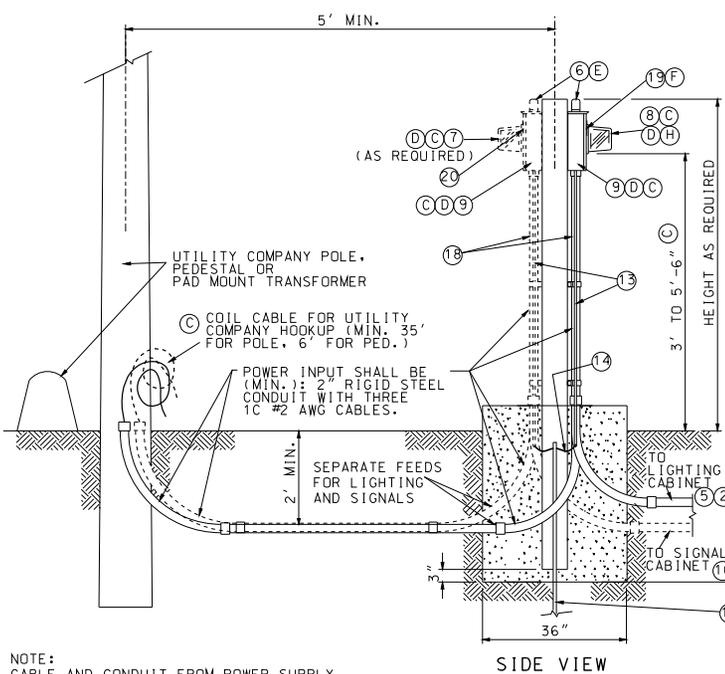
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



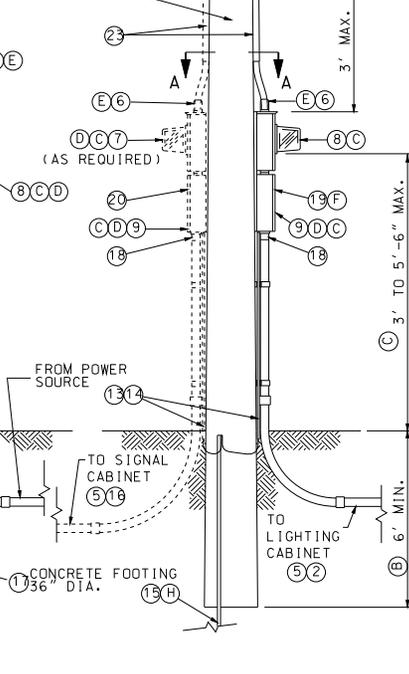
PEDESTAL OR NEW STATE-OWNED POLE TO BE SET WITHIN 2' TO 4' OF RIGHT-OF-WAY LINE.  
 ALL SERVICE POWER SUPPLY ASSEMBLIES ARE TO BE LOCATED ON STATE PROPERTY.



SECTION A-A



TYPE 2 (PEDESTAL)  
 UNDERGROUND SERVICE



TYPE 1 (POLE)  
 OVERHEAD SERVICE

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

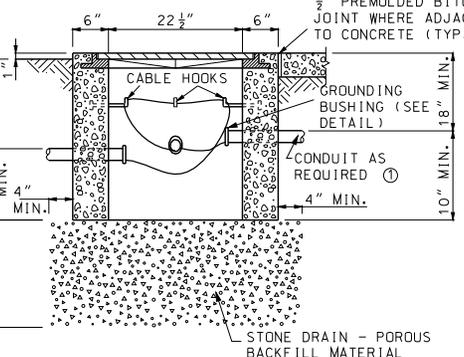
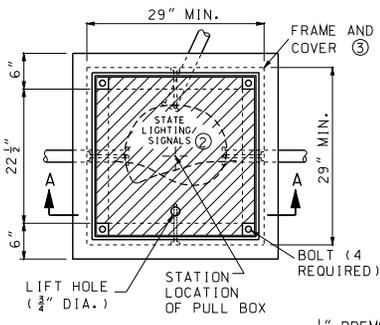
**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**  
 105 WEST CAPITOL JEFFERSON CITY, MO 65102  
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI  
 EILEEN H. FRICKER  
 NUMBER PE-28239  
 PROFESSIONAL ENGINEER  
 THIS SHEET HAS BEEN  
 SIGNED, SEALED AND DATED  
 ELECTRONICALLY.

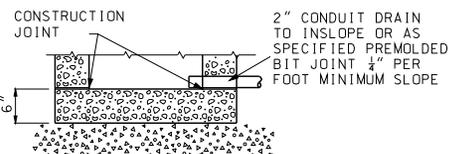
**HIGHWAY LIGHTING  
 POWER SUPPLY ASSEMBLY  
 SECONDARY SERVICE**

DATE EFFECTIVE: 04/01/2002	901.80D	SHEET NO. 2 OF 2
DATE PREPARED: 5/19/2010		

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

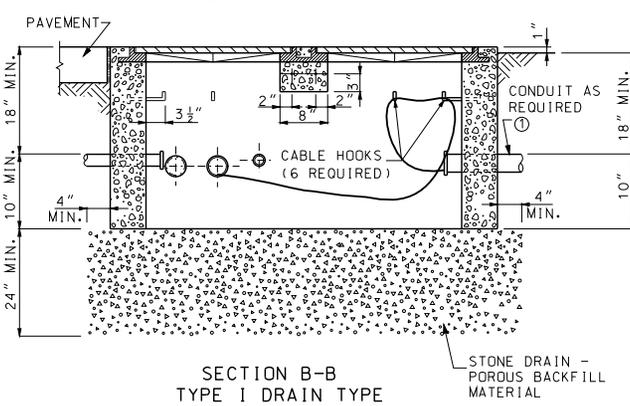
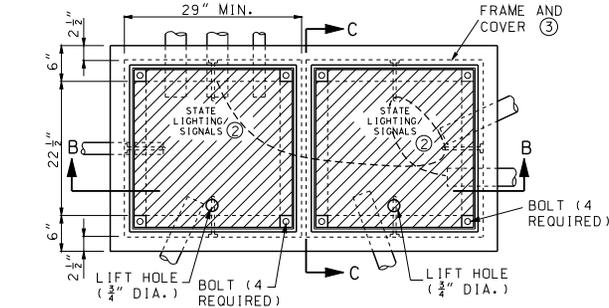


SECTION A-A  
TYPE I DRAIN TYPE

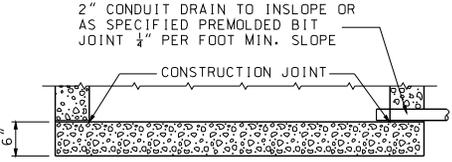


SECTION A-A  
TYPE II DRAIN TYPE  
(SEE DRAIN OUTLET DETAILS)  
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN)

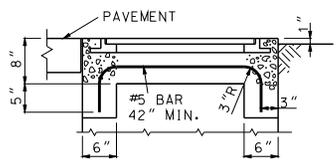
**STANDARD CONCRETE PULL BOX**



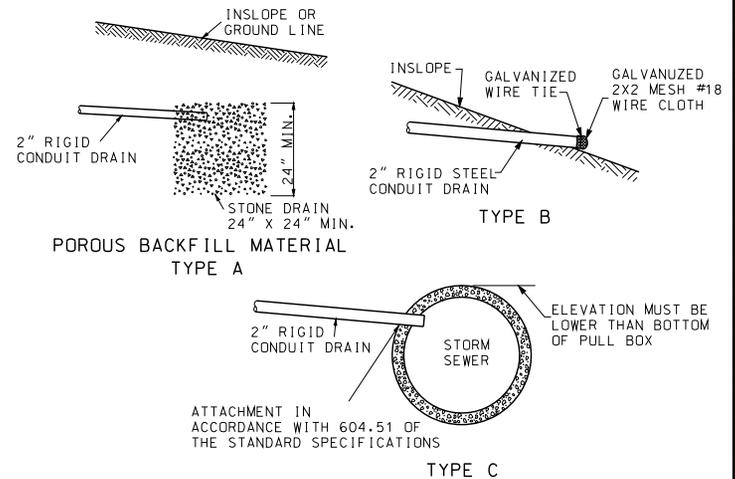
SECTION B-B  
TYPE I DRAIN TYPE



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)

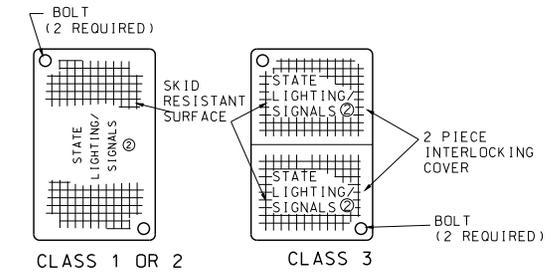
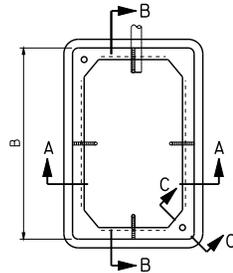
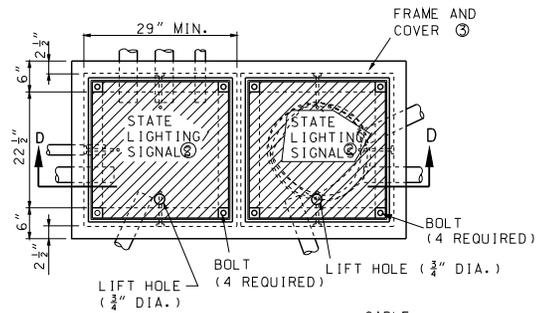
**TRAFFIC SIGNALS**

CONCRETE PULL BOXES

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE:	11/01/2010	<b>902.20G</b>	SHEET NO.
DATE PREPARED:	9/3/2010		1 OF 3

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"

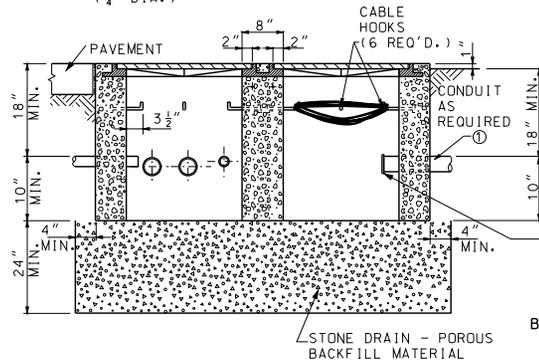
- ALL METAL CONDUITS SHALL BE ELECTRICALLY BONDED BY A GROUND BUSHING AND #6 AWG BARE COPPER WIRE. FOR PVC CONDUIT, ALL GROUND WIRES SHALL BE CONNECTED.
- SIGNAL PULL BOXES SHALL BE EMBOSSED "STATE SIGNALS" AND LIGHTING PULL BOXES "STATE LIGHTING."
- PULL BOX FRAMES AND COVERS SHALL BE CAST IRON AND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

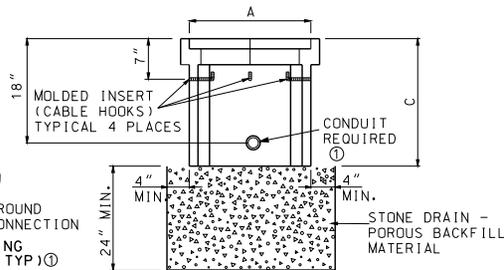
GENERAL NOTES:

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.

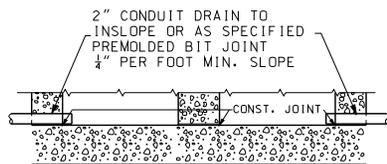
IF PREFORMED PULL BOXES ARE SPECIFIED, THE CONTRACTOR MAY USE THE STANDARD CONCRETE PULL BOX IN LIEU OF THE CLASS 1 OR 2 PREFORMED PULL BOX OR THE DOUBLE CONCRETE PULL BOX, TYPE A, IN LIEU OF THE CLASS 3 PREFORMED PULL BOXES.



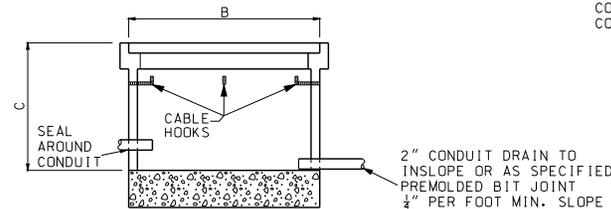
SECTION D-D  
TYPE I DRAIN TYPE



SECTION A-A  
TYPE I DRAIN TYPE

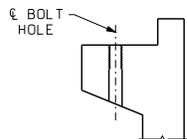


TYPE II DRAIN TYPE  
(SEE DRAIN OUTLET DETAILS)  
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN.)  
DOUBLE CONCRETE PULL BOX, TYPE B



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.

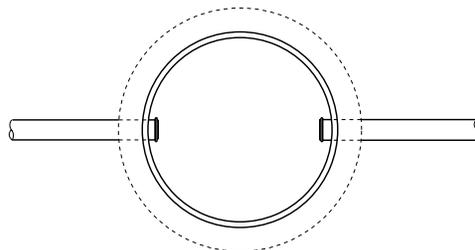
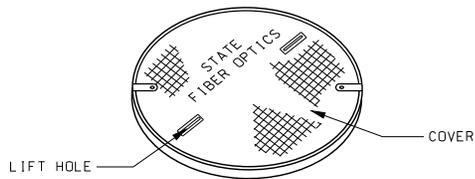
**TRAFFIC SIGNALS  
CONCRETE AND PREFORMED  
PULL BOXES**

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

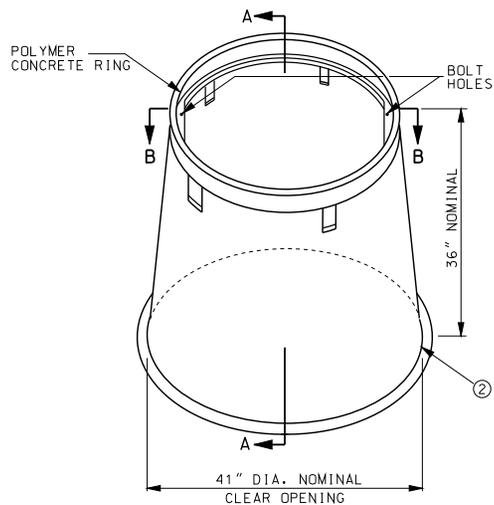
902.20G

SHEET NO.  
2 OF 3

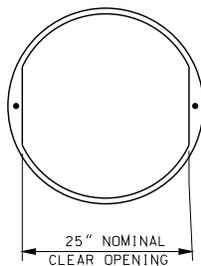
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



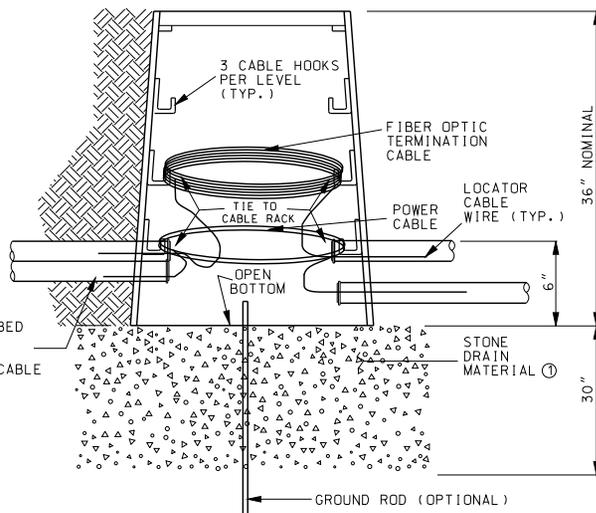
PLAN



CIRCULAR PULL BOX CLASS 5



SECTION B-B



SECTION A-A  
TYPE I DRAIN TYPE

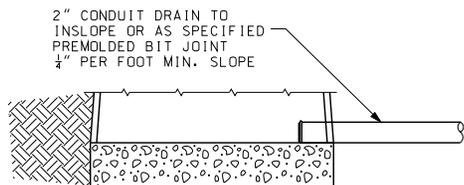
- ① AGGREGATE SHALL BE TYPE 1 CONFORMING TO SEC 1007.
- ② BOX SHALL BE OF A FLARE DESIGN AND HAVE A LIP FOR STABILIZATION.

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".

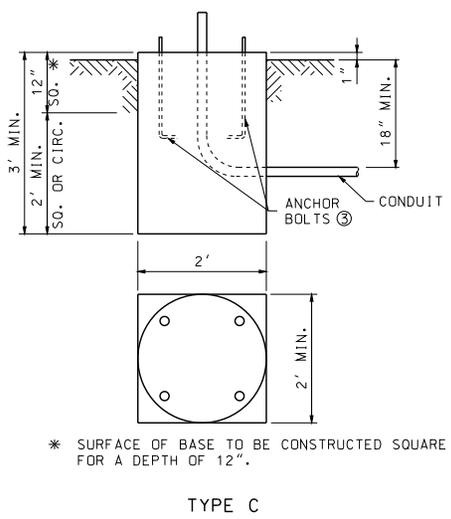
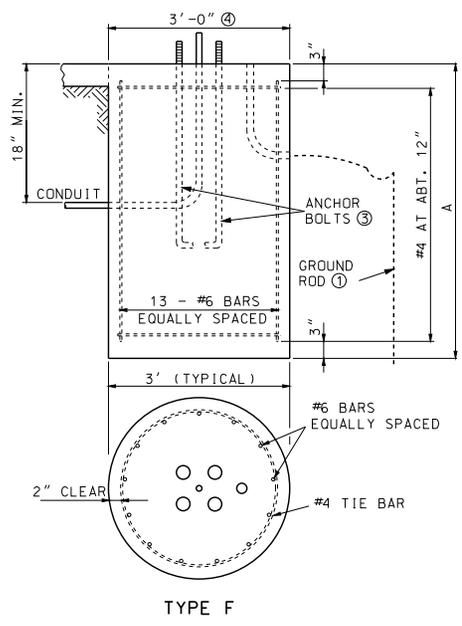
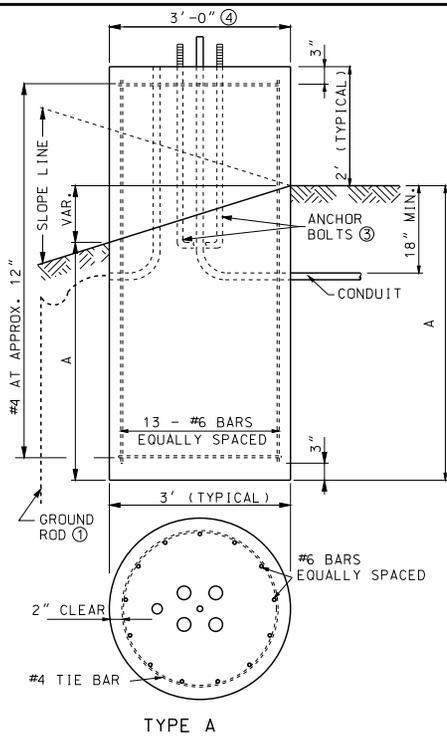


TYPE II DRAIN TYPE

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

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>TRAFFIC SIGNALS</b> CONCRETE AND PREFORMED PULL BOXES	
	DATE EFFECTIVE: 11/01/2010 DATE PREPARED: 9/3/2010	<b>902.20G</b>

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

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".

BASE EMBEDMENT IN SOLID ROCK

SOLID ROCK ENCOUNTER POINT	REQUIRED EMBEDMENT FOR BASE TYPE
	A-10 F-10
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.

- APPLICABLE ONLY WHERE CONTROLLER IS MOUNTED TO A SIGNAL POLE.
- BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.
- ANCHOR BOLT DIMENSIONS ARE SHOWN ON THE MANUFACTURER'S APPROVED DRAWINGS.
- MAXIMUM BOLT CIRCLE DIAMETER IS 26". BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.
- ARM LENGTH DETERMINED BY LENGTH OF LONGEST ARM FOR TYPE B & BL SIGNAL POSTS.
- BASE TYPE A OR F DETERMINED BY LOCATION OF POST BASE.
- SOIL DEPTH, NO ROCK.
- INCLUDE #4 TIE BAR.
- WHEN CONCRETE BASE IS LOCATED WITHIN 8" CONCRETE DIVISIONAL ISLAND, EMBEDMENT LENGTH MAY BE REDUCED BY 1/2 DIAMETER OF THE DRILLED SHAFT.

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

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**TRAFFIC SIGNALS**

POST BASES

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 02/01/2008

DATE PREPARED: 4/5/2011

**902.30P**

SHEET NO.  
1 OF 2

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

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			

(1) 6" STANDARD, HORIZONTALLY ALIGN RIGHT EXTREME EDGE OF WHOLE NUMERALS, REGARDLESS OF LINE OF COPY.

HORIZONTALLY ALIGN RIGHT EXTREME EDGE OF FRACTIONS REGARDLESS OF LINE COPY.

WHEN NO FRACTIONS EXIST, RIGHT EXTREME EDGE OF WHOLE NUMERALS SHALL BE 13" FROM EDGE OF SIGN.

(2) UPPER CASE LETTER HEIGHT FROM LONGEST DESTINATION TO LONGEST DISTANCE.

INCREASE THIS SPACE TO PROVIDE EVEN 12" WIDTH FOR ENTIRE SIGN.

**GENERAL NOTES (ALL SIGNS):**

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

GUIDE SIGN WIDTH VARIABLE IN 12" INCREMENTS.

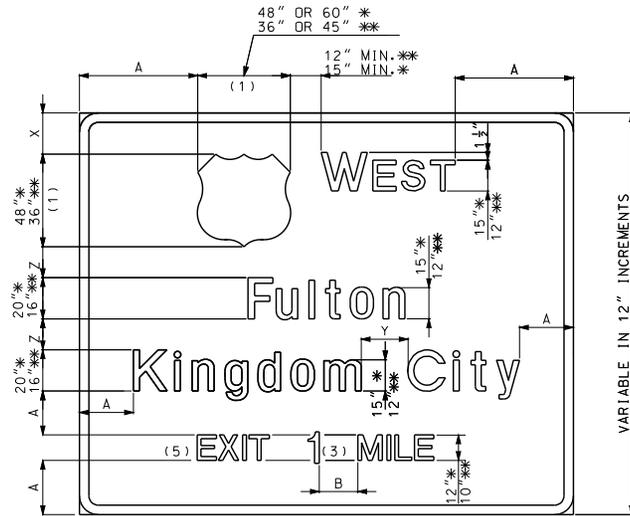
GUIDE SIGN HEIGHT VARIABLE IN 12" INCREMENTS.

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

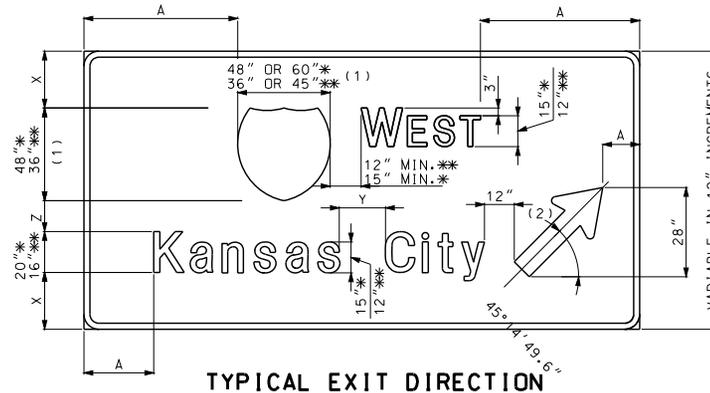
SEE OTHER STANDARD DRAWINGS FOR ARROW DETAILS.

	<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 INTERCHANGE SEQUENCE</b>	
	DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/11/2010	<b>903.02AK</b> SHEET NO. 1 OF 19

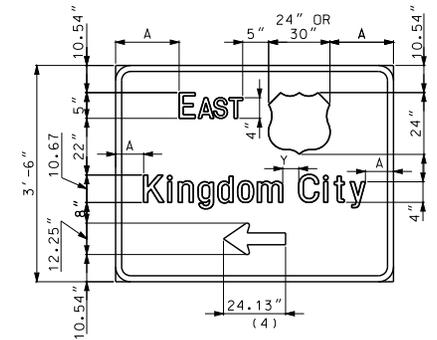
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**TYPICAL ADVANCE GUIDE**



**TYPICAL EXIT DIRECTION**



**CROSSROAD GUIDE**

**GUIDE SIGN LEGEND**

- A = VARIABLE SO THAT THE OVERALL SIGN WIDTH IS IN 12" INCREMENTS MINIMUM LOWER CASE HEIGHT.
- B = 1.5 TIMES WORDING LETTER HEIGHT.
- X = APPROXIMATELY THE 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		COLOR	LETTER SERIES
		GROUND	OVERHEAD		
BACKGROUND	L-3	R2	R2	GREEN	
LEGEND	L-3	R4	R4	WHITE	E(M)
SYMBOLS	L-3	R4	R4	VAR.	
BORDER	L-3	R4	R4	WHITE	
SUBSTRATE	STRUCTURAL (SEE GEN. NOTES ON SH. 1)				

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

105 WEST CAPITOL  
JEFFERSON CITY, MO 65102  
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.

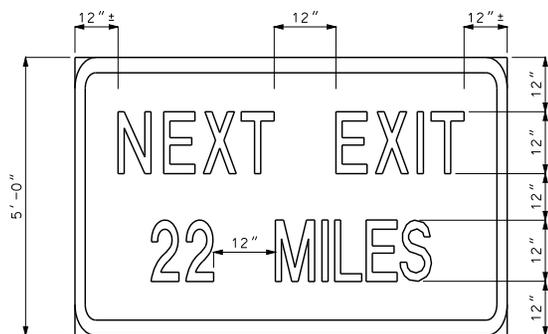
**HIGHWAY SIGNING STRUCTURAL SIGNS**

**INTERCHANGE SEQUENCE**

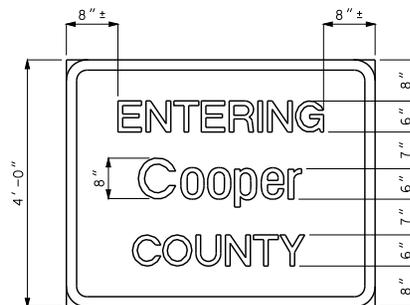
DATE EFFECTIVE: 06/01/2010  
DATE PREPARED: 4/1/2010

**903.02AK**

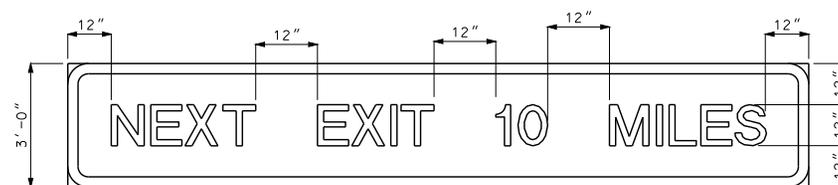
SHEET NO.  
2 OF 19



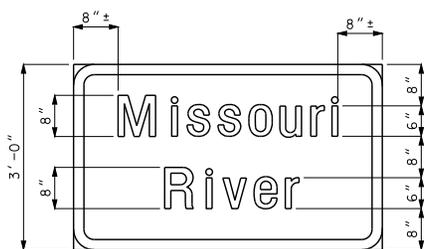
E2-1A



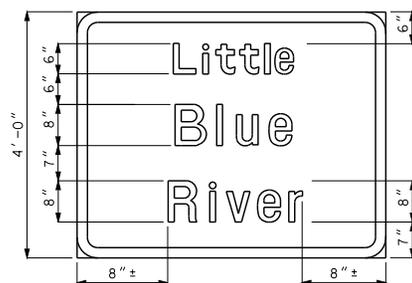
COUNTY LINE



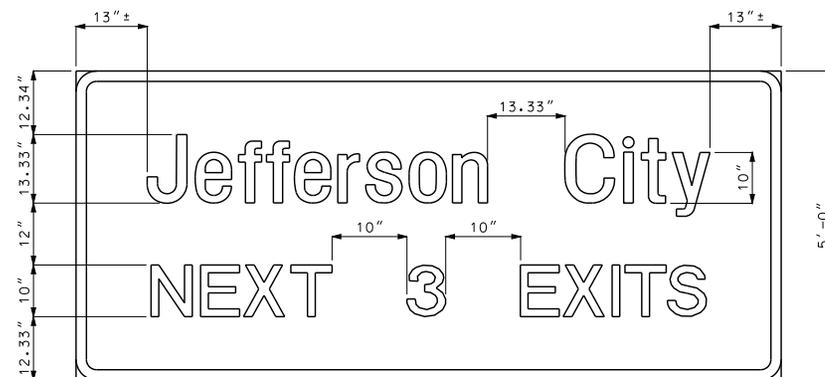
E2-1  
NEXT EXIT SUPPLEMENTAL  
ADVANCE GUIDE



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**

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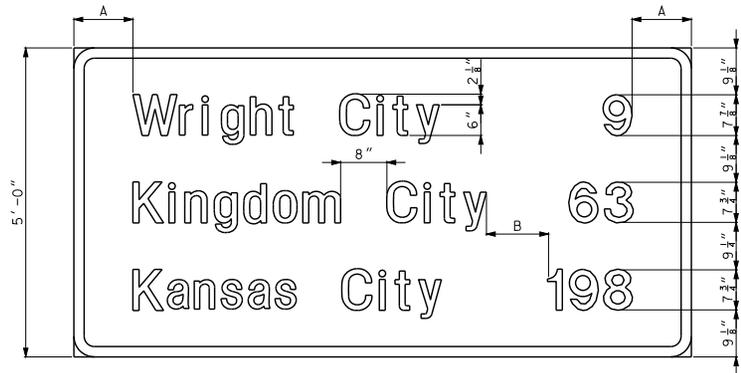
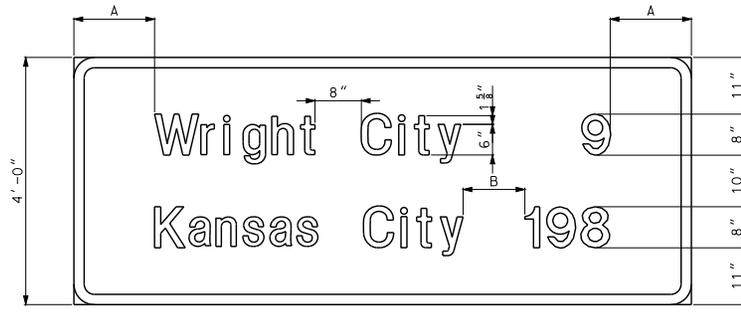
**HIGHWAY SIGNING  
STRUCTURAL SIGNS  
MISC. FREEWAY AND EXPRESSWAY  
GUIDE SIGNS**



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.

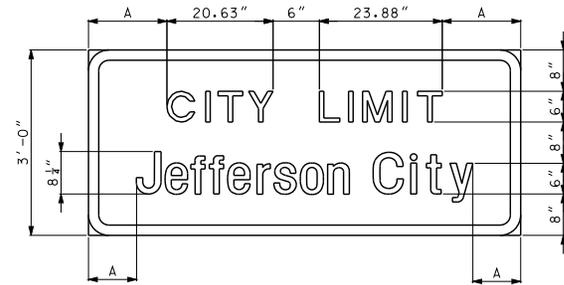
BORDER (ALL SIGNS)			
CORNER RADIUS		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
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7'	9		
GREATER THAN OR EQUAL TO 8'	12	12" OR LARGER	2

#### BACKGROUND REFLECTIVE SHEETING

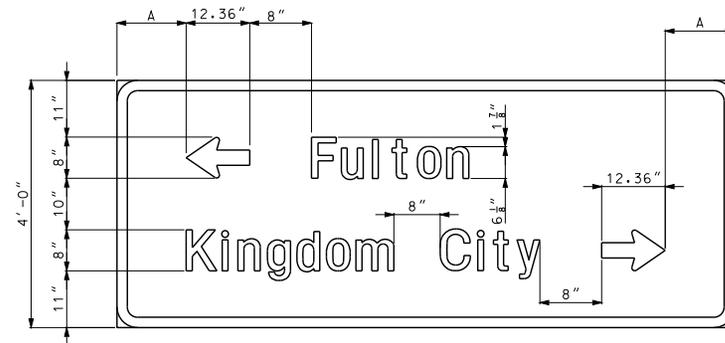
- R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 3
- R4 REFER TO MISSOURI SPECIFICATION SECTION 1042 TYPE 7

#### 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

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R2	GREEN	
LEGEND	L-3	R4	WHITE	E(M)
SYMBOLS	L-3	R4	VAR.	
BORDER	L-3	R4	WHITE	
SUBSTRATE	STRUCTURAL (SEE GEN. NOTES ON SH. 1)			

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

MISC. GOUND MOUNTED FREEWAY AND EXPRESSWAY GUIDE SIGNS

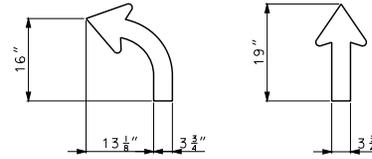
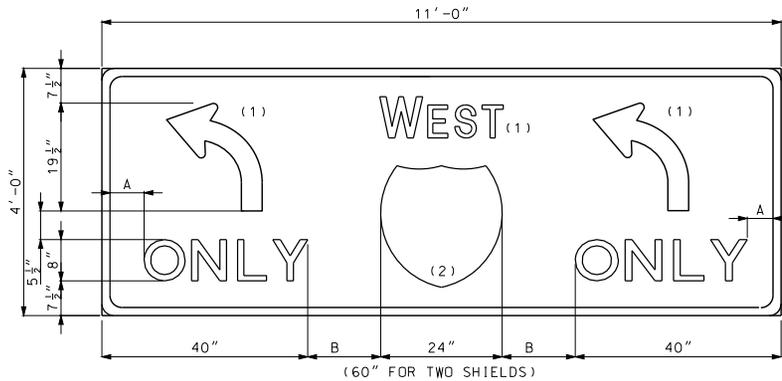
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DATE EFFECTIVE: 06/01/2010

DATE PREPARED: 4/1/2010

**903.02AK**

SHEET NO.  
4 OF 19



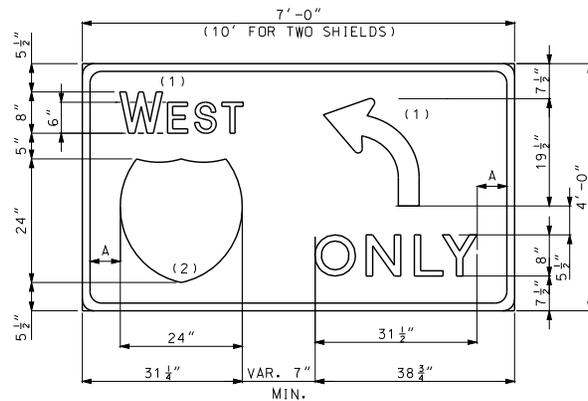
NOTES:

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**

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

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



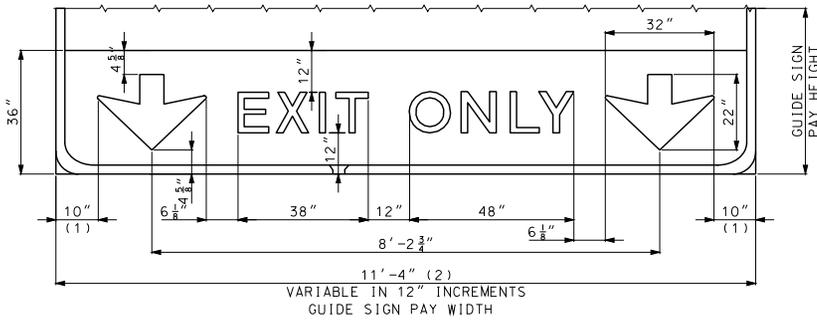
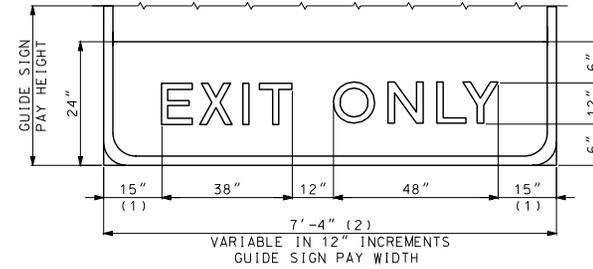
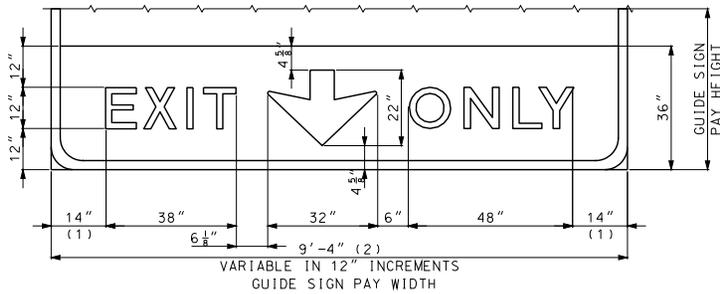
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**903.02AK**

SHEET NO.  
5 OF 19

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

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



- (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:

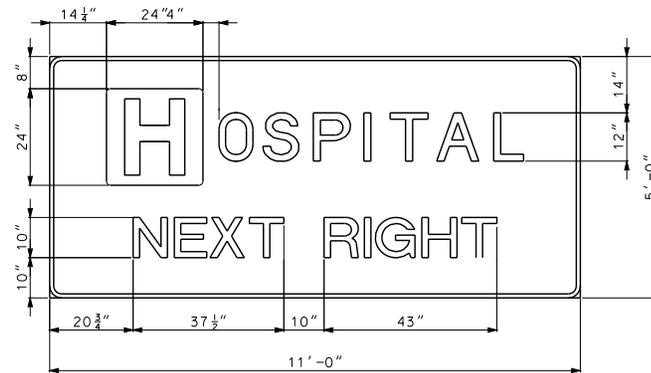
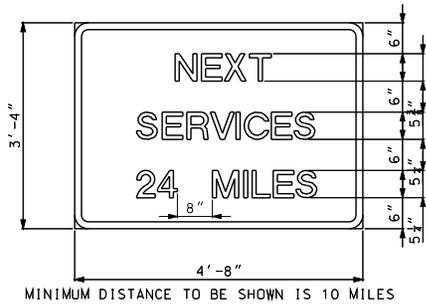
COST FOR PANEL SHALL BE SEPARATE FROM THE COST OF THE GUIDE SIGN TO WHICH IT IS ATTACHED.

FOR OVERHEAD USE ONLY.

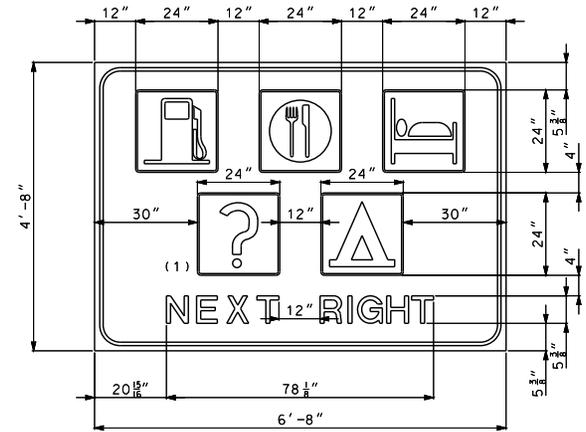
PLACE SIGN ON TRUSS TO ALIGN CENTER OF LANE WITH TYPE C ARROW.

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 SIGNING STRUCTURAL SIGNS</b> EXIT ONLY PANELS	
	DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 5/23/2011	<b>903.02AK</b> SHEET NO. 6 OF 19



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**

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

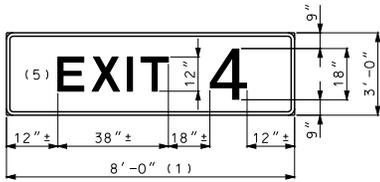


THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**903.02AK**

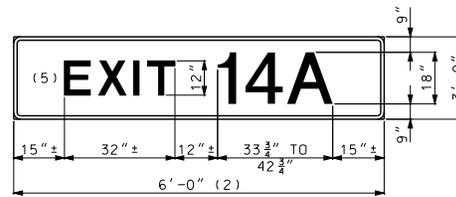
SHEET NO.  
7 OF 19

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



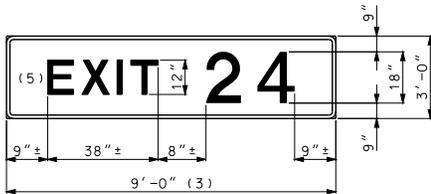
(1) 9'-0" 2 THROUGH 9 WITH A LETTER  
11'-0" FOR "EXITS" 2 THROUGH 9 WITH A-B LETTERS

**1 THROUGH 9**



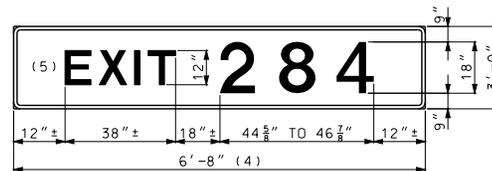
(2) 12'-0" FOR "EXITS" 10 THROUGH 19  
NUMERAL WITH A-B LETTERS

**10 THROUGH 19 NUMERAL  
WITH LETTER**



(3) 9'-0" WITH NUMBER 1 NUMERAL  
11'-0" WITH A LETTER  
10'-0" WITH A NUMBER 1 NUMERAL AND A LETTER  
12'-0" FOR "EXITS" WITH A NUMBER 1 NUMERAL AND  
A-B LETTERS  
13'-0" FOR "EXITS" WITH DOUBLE NUMERAL AND  
A-B LETTERS

**20 THROUGH 99**



(4) 10'-0" WITH NUMBER 1 NUMERAL  
12'-0" WITH A LETTER  
12'-0" WITH A NUMBER 1 NUMERAL AND A LETTER  
13'-0" FOR "EXITS" WITH A TRIPLE NUMERAL  
WITH A NUMBER 1 NUMERAL AND A-B LETTERS  
14'-0" FOR "EXITS" WITH A TRIPLE  
NUMERAL AND A-B LETTERS

**100 AND OVER**

**LEGEND, SYMBOLS & BORDER**

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

**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

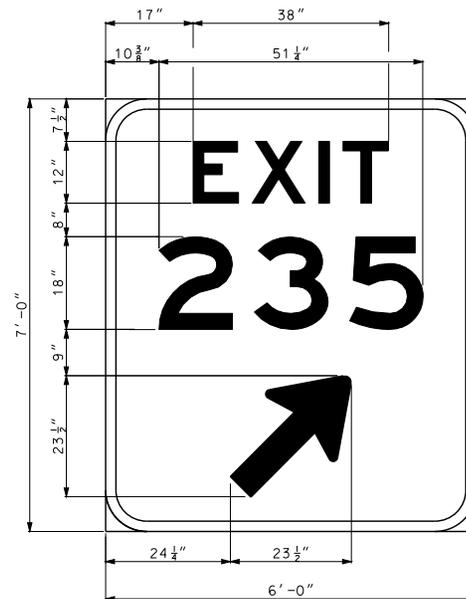
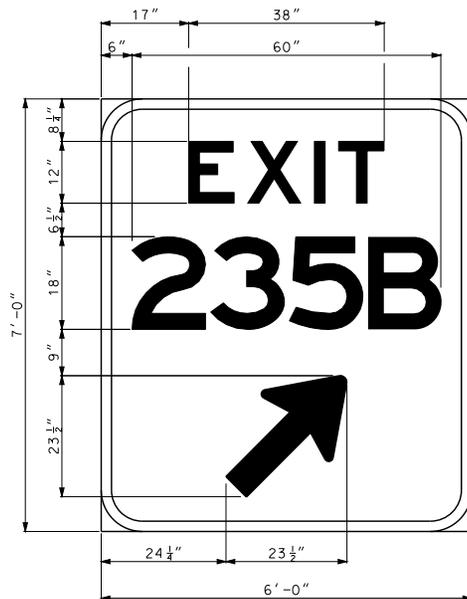
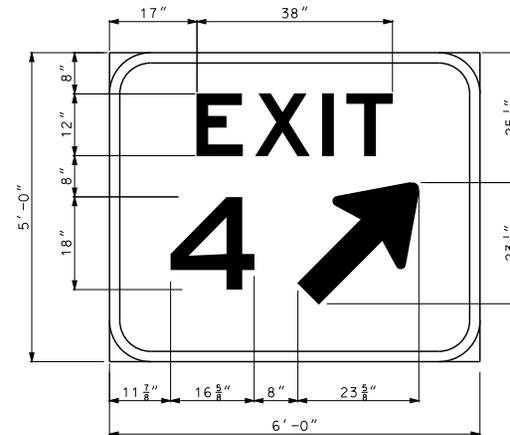
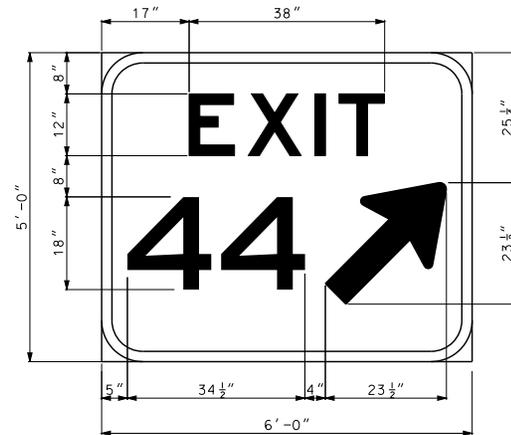
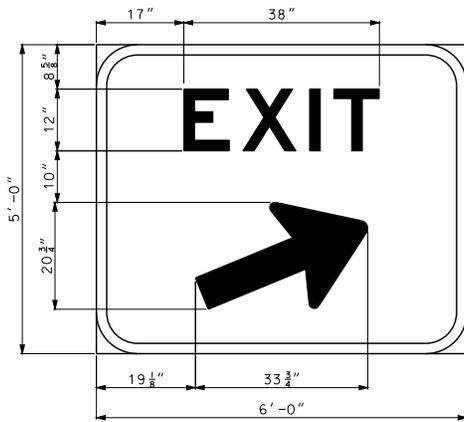
GENERAL SIGN DATA				
STR2L-3	TYPE	REFL. SHEETING TYPE		LETTER SERIES
		GROUND	OVERHEAD	
BACKGROUND		R2	R2	GREEN
LEGEND	L-3	R4	R4	WHITE E(M)
SYMBOLS	L-3	R4	R4	VAR.
BORDER	L-3	R4	R4	WHITE
SUBSTRATE	STRUCTURAL			

**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.

	<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> EXIT NUMBER PANELS	
	DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b> SHEET NO. 8 OF 19



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.)

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**HIGHWAY SIGNING**

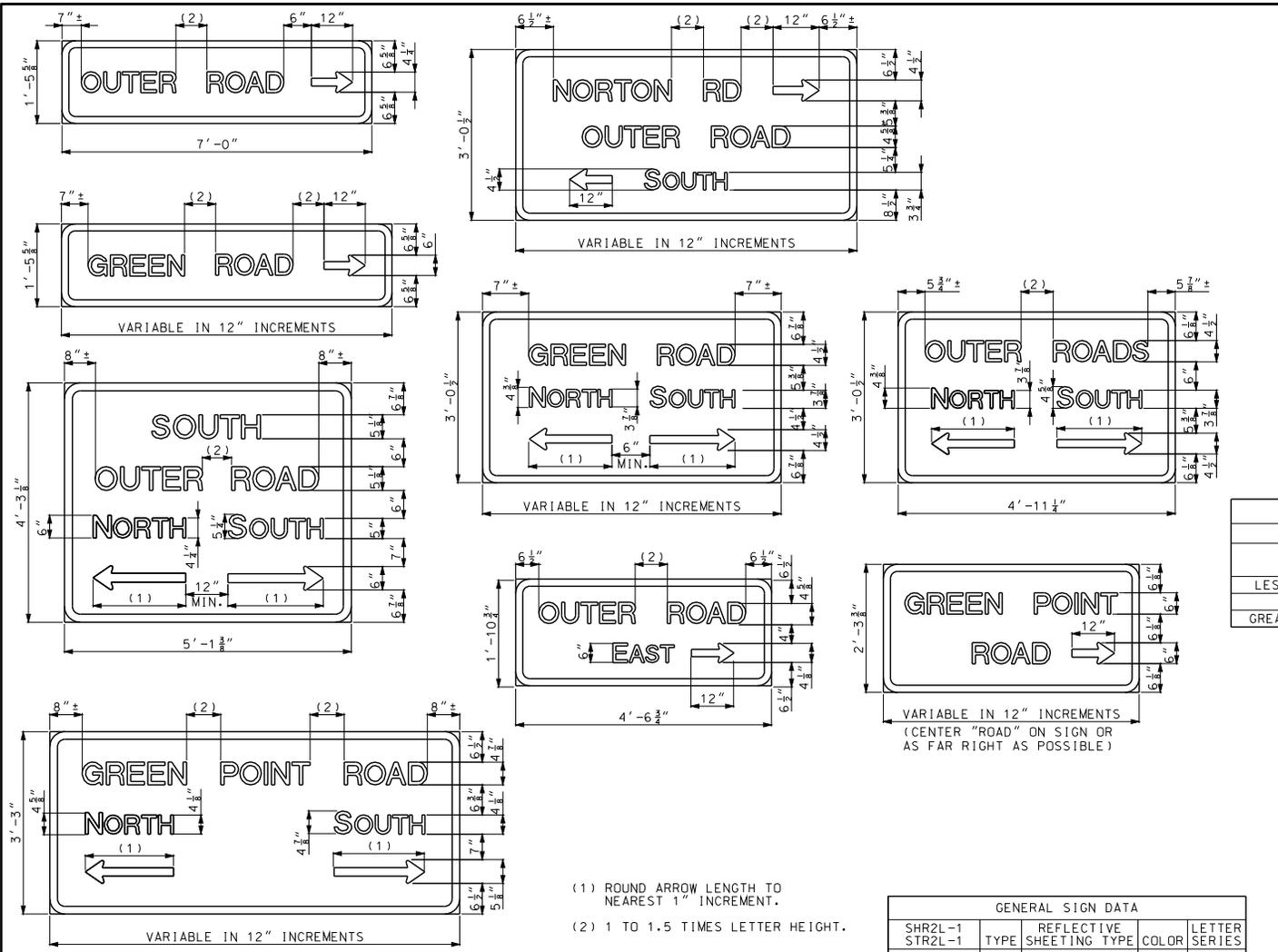
GORE EXIT SIGN

THIS SHEET HAS BEEN  
SIGNED, SEALED AND DATED  
ELECTRONICALLY.

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

**903.02AK**

SHEET NO.  
9 OF 19



**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**

**MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

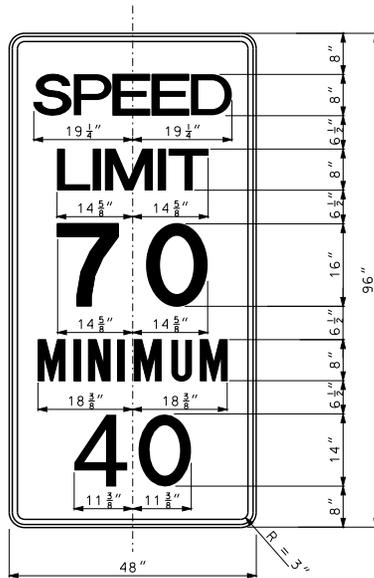
105 WEST CAPITOL JEFFERSON CITY, MO 65102  
1-888-ASK-MODOT (1-888-275-6636)

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

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

**HIGHWAY SIGNING**  
CROSS ROAD AND OUTER ROAD SIGNS

DATE EFFECTIVE: 06/01/2010	<b>903.02AK</b>	DATE PREPARED: 4/1/2010	THIS SHEET IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.
			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			

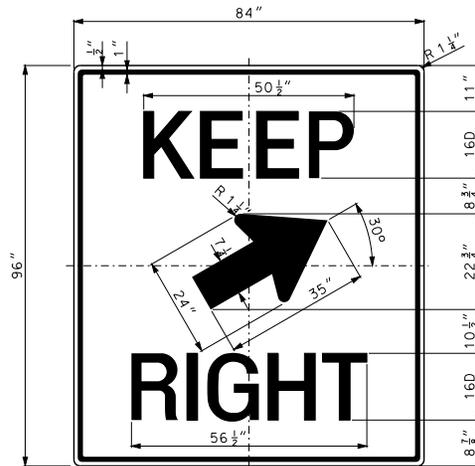
LEGEND, SYMBOLS & BORDER

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..

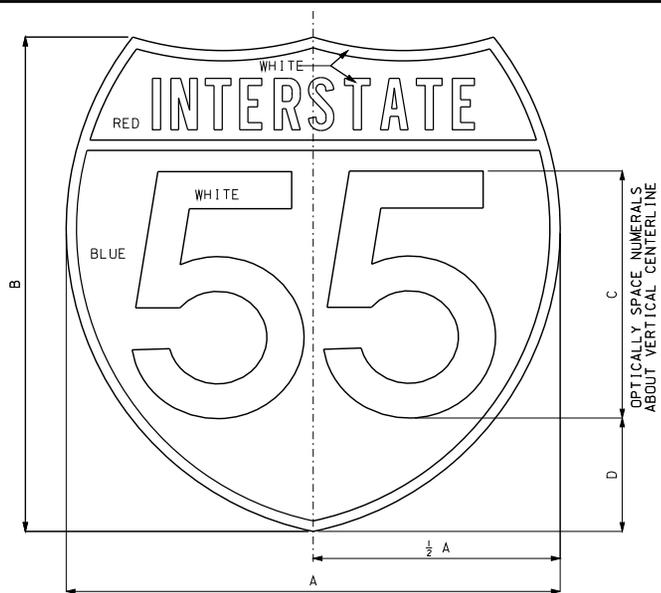
OVER 9 SQUARE FEET TO 16 SQUARE FEET - .100 IN..

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)	
		<b>HIGHWAY SIGNING</b> WARNING SIGNS	
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.

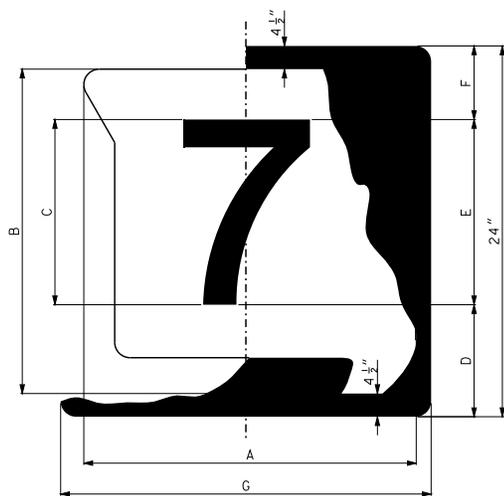
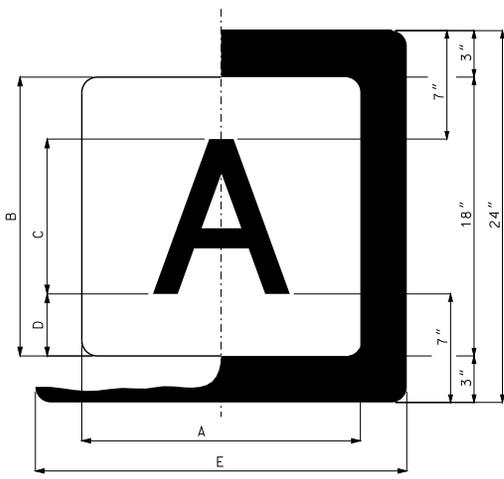
FOR HOLE PUNCHING AND MOUNTING DETAILS SEE OTHER DRAWINGS.

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)	
	<b>HIGHWAY SIGNING</b> SHIELD FOR INDEPENDENT AND GUIDE SIGN USE	
	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.



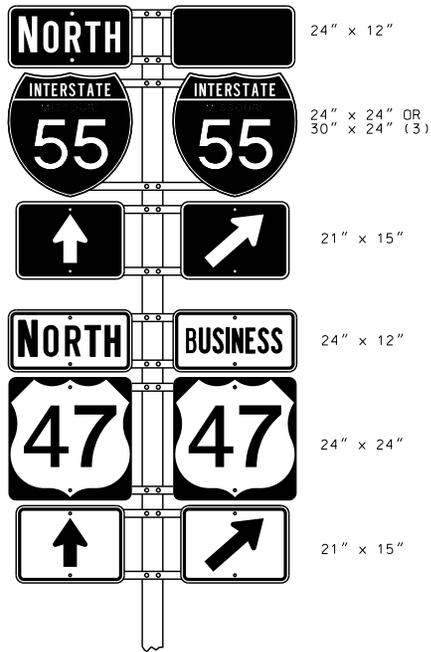
**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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



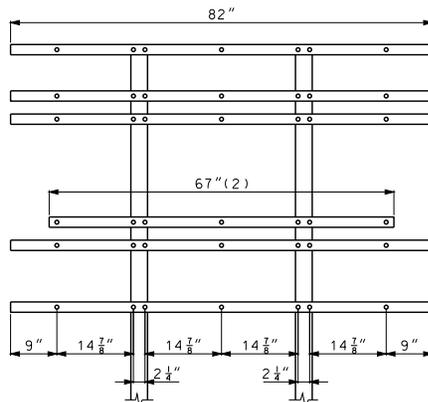
DATE EFFECTIVE: 06/01/2010	<b>903.02AK</b>	SHEET NO. 14 OF 19
DATE PREPARED: 4/1/2010		



TWO-ROUTE ASSEMBLY

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

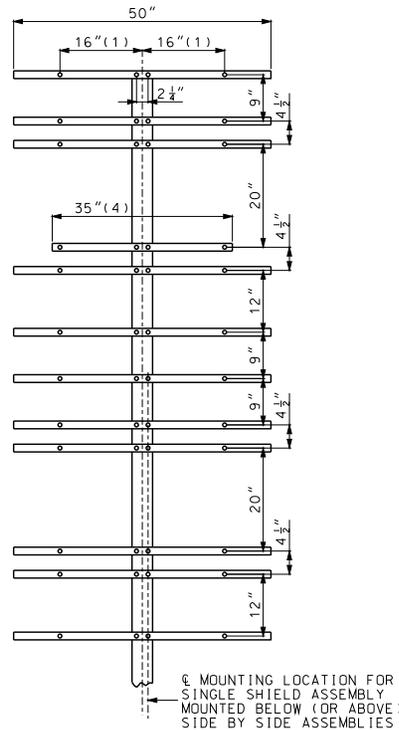
ONE POST  
(WITH BARS)



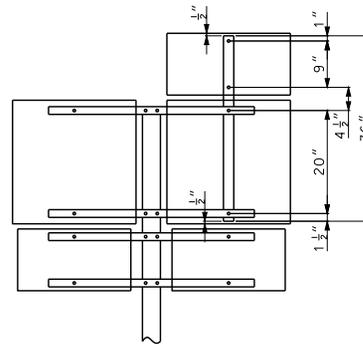
NOTE:  
ASSEMBLIES WITH TWO-ROUTE SHIELDS MOUNTED BELOW  
THREE-ROUTE SHIELDS SHALL BE MOUNTED TO THE POST  
AS SHOWN IN ONE-POST WITH BARS, DRAWING ABOVE.

TWO POSTS

WIDE FLANGE POST MOUNTING



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



AUXILIARY PLATE MOUNTING

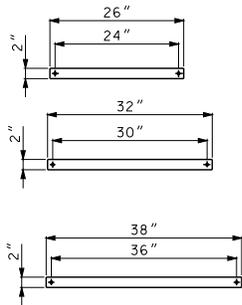
- (1) FOR 30" x 24" SHIELD, DIMENSION WILL BE 22".
- (2) FULL SIZE BARS SHALL BE USED WHEN INTERSTATE SHIELD IS NOT USED. VERTICAL SPACING OF BARS SHALL BE THE SAME AS FOR A SINGLE POST ASSEMBLY.
- (3) 24" x 24" SHALL BE USED FOR 1 OR 2 DIGIT ROUTE SHIELDS.
- (4) FOR SIDE BY SIDE 30" x 24" SHIELDS, DIMENSION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

GENERAL NOTES:

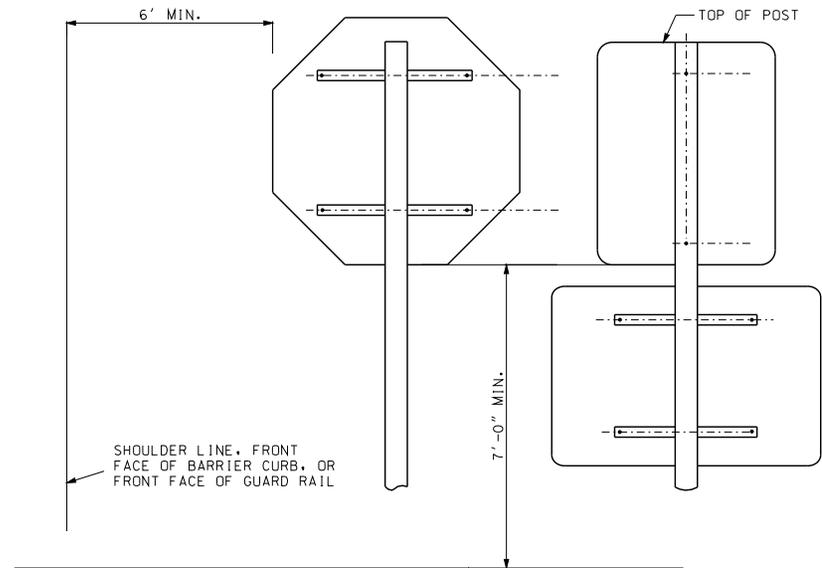
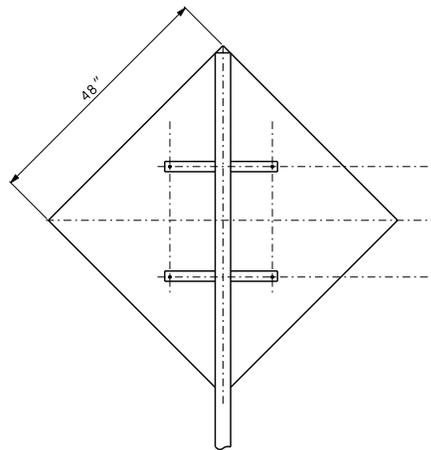
ALL BARS SHALL BE 2" x 3/8" STEEL, GALVANIZED AFTER PUNCHING.  
WEIGHT = 2.55 LBS. PER FOOT. HOLES IN BARS SHALL BE 3/8" AND SHALL BE PUNCHED AS SHOWN ON THIS DRAWING.  
BACKING BARS PAID FOR AS STRUCTURAL STEEL, PER POUND.

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

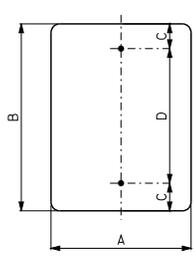


ELEV. OUTSIDE EDGE OF PAVEMENT FOR CLAMP DETAILS, SEE OTHER DRAWINGS.

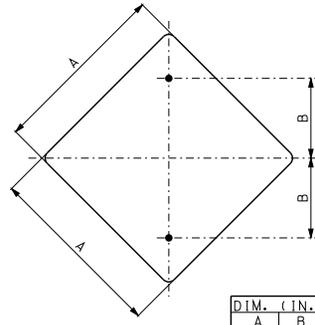
HOLES IN BACKING BARS SHALL BE  $\frac{3}{8}$ " AND PUNCHED AS SHOWN ON THIS DRAWING.

 <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	

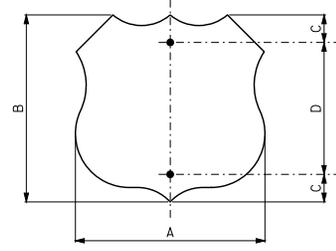
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



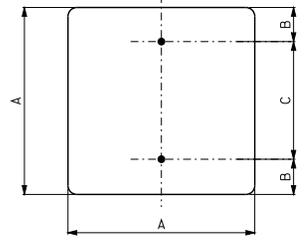
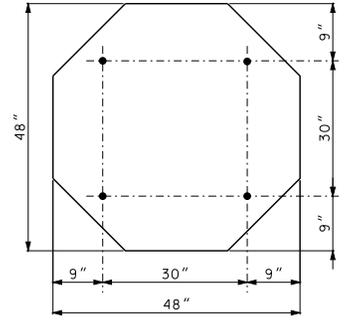
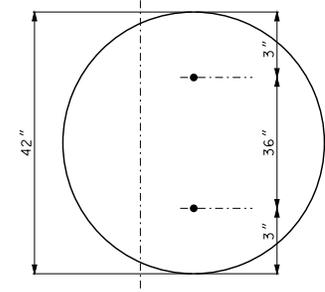
DIMENSIONS (IN.)			
A	B	C	D
6	15	1.5	12
8	24	3	18
9	12	1.5	9
9	48	3	42
10	30	3	24
12	18	3	12
12	24	3	18
12	36	3	30
12	48	3	42
18	24	3	18
24	30	3	24
24	36	3	30
30	36	3	30
30	42	3	36
30	48	3	42



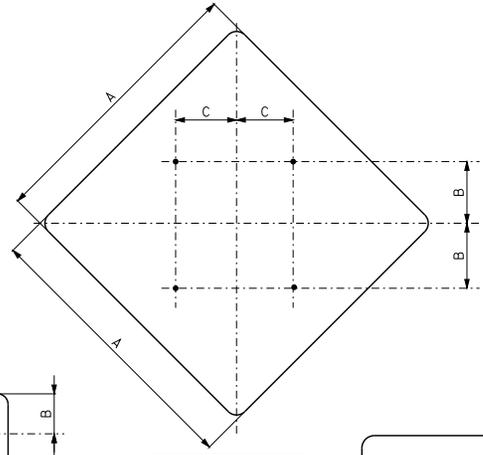
DIM. (IN.)	
A	B
18	9
24	12
30	15
36	18



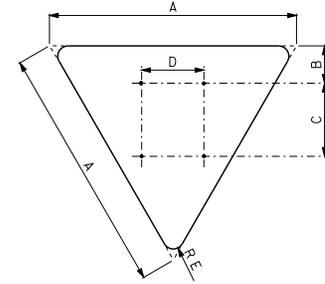
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



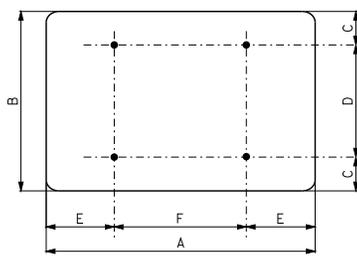
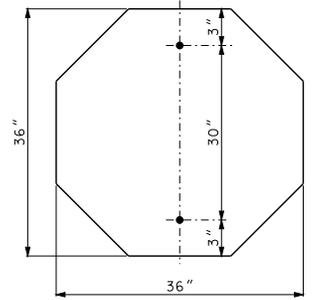
DIMENSIONS (IN.)		
A	B	C
14	3	8
18	3	12
24	3	18
30	3	24



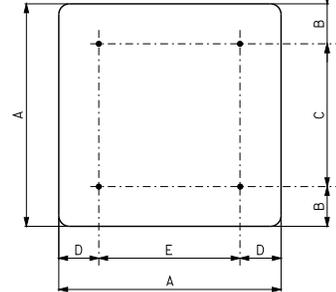
DIMENSIONS (IN.)		
A	B	C
48	15	15
60	18	18



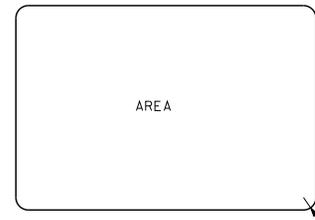
DIMENSIONS (IN.)				
A	B	C	D	E
48	3	12	12	3
60	4	18	15	3



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.

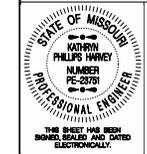
HOLES IN SIGNS SHALL BE 3/8" AND PUNCHED AS SHOWN ON THIS DRAWING.

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS:

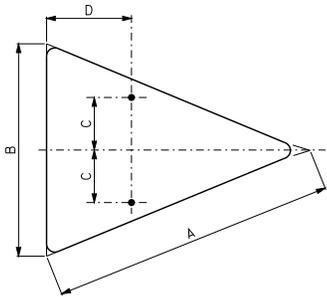
- 9 SQUARE FEET OR LESS - .080 IN.
- OVER 9 SQUARE FEET BUT LESS THAN 16 SQUARE FEET - .100 IN.
- 16 SQUARE FEET OR LARGER - .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

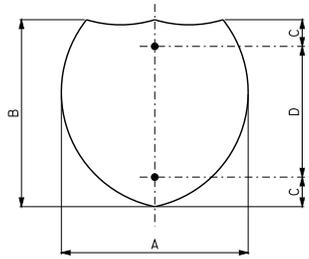
 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	<b>HIGHWAY SIGNING</b> HOLE PUNCHING	
	DATE EFFECTIVE: 05/01/2010 DATE PREPARED: 4/1/2010	<b>903.02AK</b>



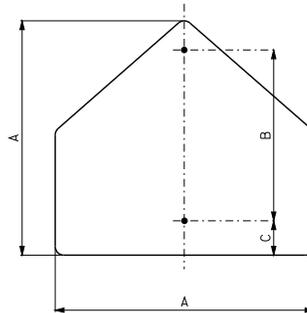
THIS SHEET HAS BEEN ELECTRONICALLY SEALED AND DATED.



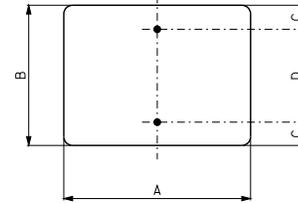
DIMENSIONS (IN.)			
A	B	C	D
40	30	7.5	12
48	36	9	15



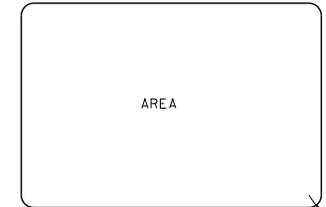
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



DIMENSIONS (IN.)		
A	B	C
36	24	3

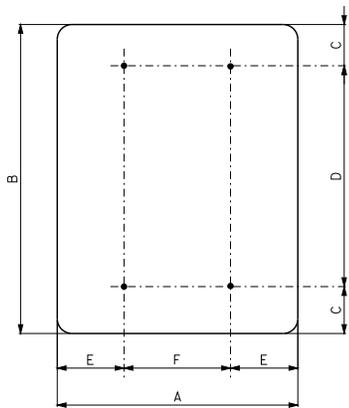


DIMENSIONS (IN.)			
A	B	C	D
5	9	1.5	6
12	9	1.5	6
14	12	1.5	9
18	12	1.5	9
20	9	1.5	6
21	15	1.5	12
24	6	1.5	3
24	8	1.5	5
24	10	1.5	7
24	12	1.5	9
24	18	3	12
30	6	1.5	3
30	12	1.5	9
30	15	1.5	12
30	18	3	12
30	24	3	18
36	12	1.5	9
36	18	3	12

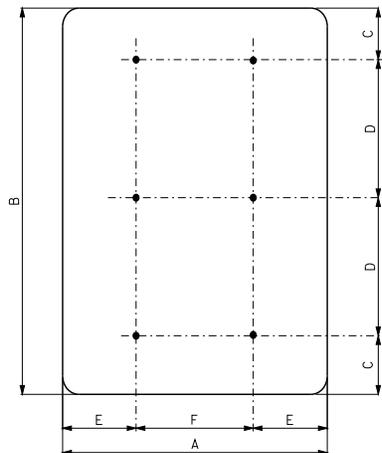


AREA	RADII
LESS THAN 16 FT <sup>2</sup>	1 1/2"
16 FT <sup>2</sup> OR GREATER	3"

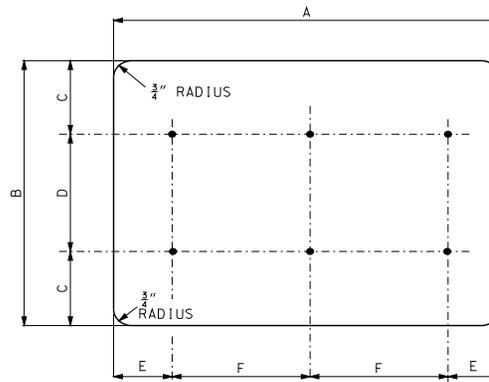
### RADII FOR SHEET SIGNS



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.

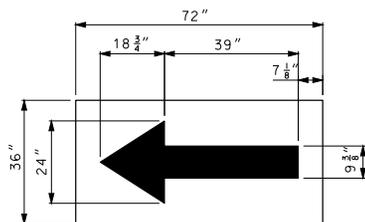
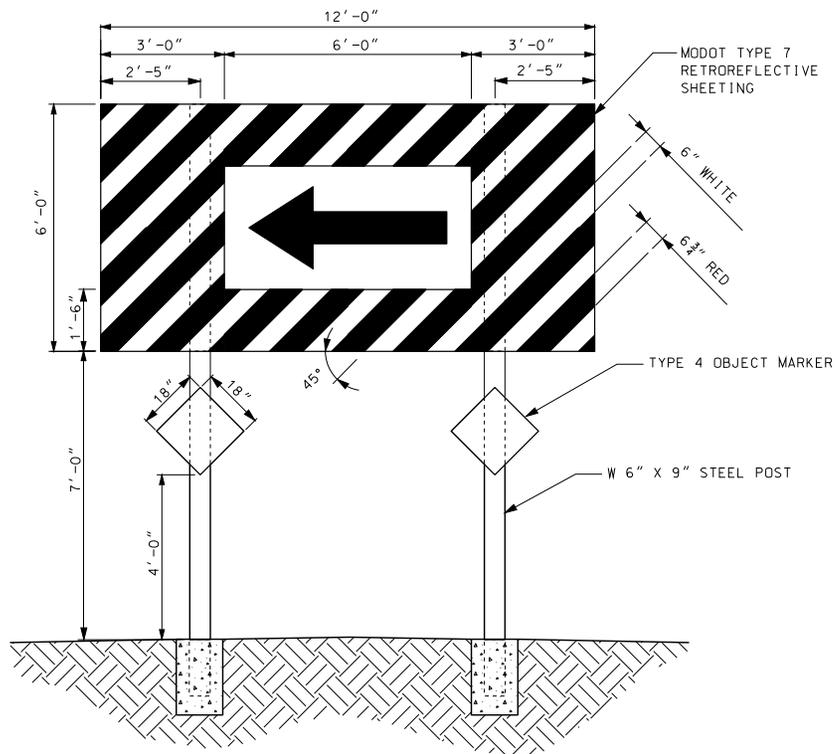
FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

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

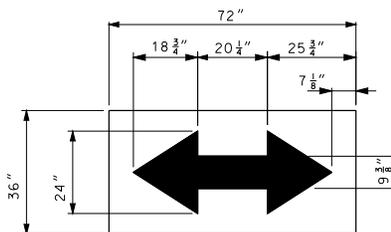
SIGNS WITH FOUR OR MORE HOLES REQUIRE BACKING BARS OR MULTIPLE POSTS.

	<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.



W1-6



W1-7

GENERAL NOTES:

WHERE A BARRICADE 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 BARRICADE STRIPES SHALL SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE.

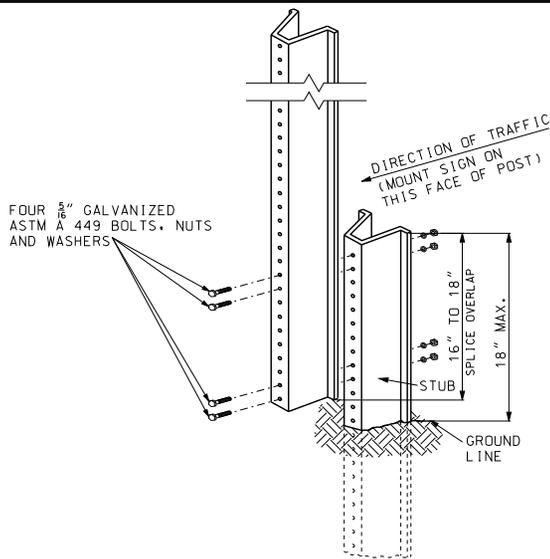
WHERE VEHICULAR MOVEMENTS ARE NOT PROVIDED, THE STRIPES SHALL SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE.

ALL REFLECTORIZED SURFACES SHALL BE MODOT TYPE 7 RETROREFLECTIVE SHEETING. DEMOUNTABLE ARROW SHALL BE IN ACCORDANCE WITH STANDARD PLAN 903.02 FOR WARNING SIGNS. ARROW SHALL BE DIRECT APPLIED (CUT FROM MATERIAL SHOWN ON PLANS)

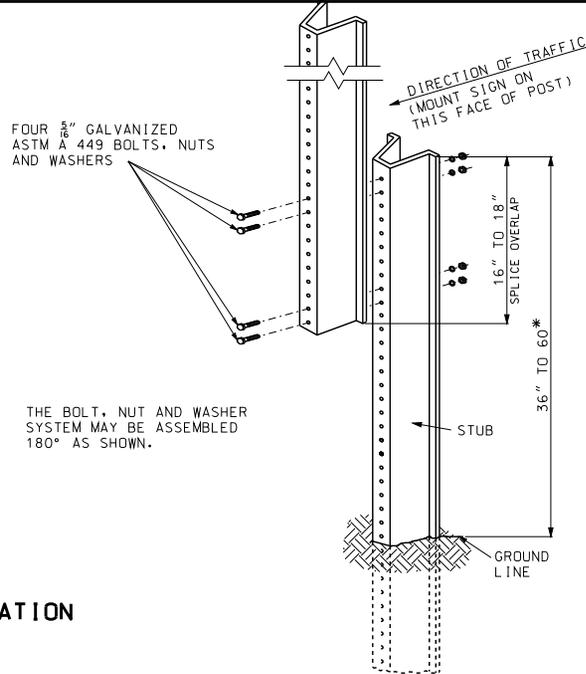
SEE STANDARD PLAN 903.03 FOR BREAKAWAY ASSEMBLY AND TYPE 4 OBJECT MARKER.

 <b>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</b> 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p><b>SIGN BARRICADE</b></p>
DATE EFFECTIVE: 06/01/2010 DATE PREPARED: 5/23/2011	<p><b>903.02AK</b></p>
SHEET NO. 19 OF 19	

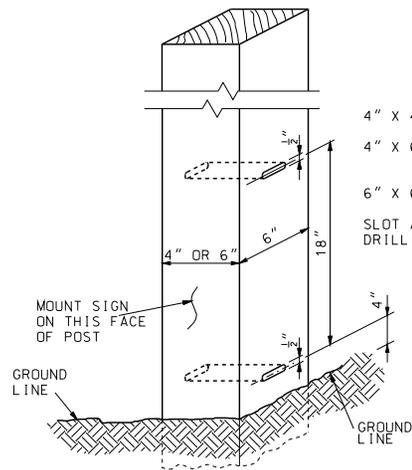
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



**U-CHANNEL POST DETAIL  
PERMAENT AND TEMPORARY INSTALLATION**

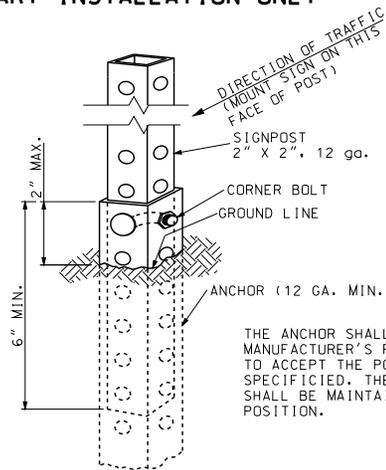


**OPTIONAL U-CHANNEL POST DETAIL  
TEMPORARY INSTALLATION ONLY**



**WOOD POST DETAIL**

4" X 4" WOOD POST - NO SLOTS OR HOLES REQUIRED  
 4" X 6" WOOD POST - 1 1/4" X 1/2" SLOT ON 6" SIDE OR 1 1/2" DIA. HOLE ON 6" SIDE  
 6" X 6" WOOD POST - 2" X 1/2" SLOT OR 2" DIA. HOLE  
 SLOT ACROSS NEUTRAL AXIS FORMED BY SUCCESSIVE DRILLING WITH 1/2" BIT.



**PERFORATED SQUARE STEEL  
TUBE POST DETAIL**

THE ANCHOR SHALL BE SIZED AS PER MANUFACTURER'S RECOMMENDATIONS TO ACCEPT THE POST SIZE SPECIFIED. THE SIGN ASSEMBLY SHALL BE MAINTAINED IN A PLUMB POSITION.

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

\* SIGNS GREATER THAN 4 FEET IN WIDTH, EXCEPT DIAMOND SHAPE SIGNS, REQUIRE TWO POSTS.

\*\* REQUIRES SLIP BASE PER MANUFACTURER'S RECOMMENDATION.

**POST SIZE REQUIREMENTS**

USE OF SPLICE IS OPTIONAL.

PERMANENT AND TEMPORARY INSTALLATIONS: SPLICE OVERLAP SHALL BE POSITION ENTIRELY BETWEEN GROUND LINE AND 18" ABOVE GROUND LINE.

OPTIONAL TEMPORARY INSTALLATIONS: SPLICE OVERLAY MAY BE POSITIONED BETWEEN 18" AND 60" ABOVE GROUND LINE.

\* IF A PLAQUE IS USED, NEITHER THE SIGN NOR PLAQUE SHALL BE POSITIONED WITH THE SPLICE OVERLAP.

ONLY ONE SPLICE WILL BE ALLOWED PER POST.

THE SPLICE SHALL CONSIST OF A 12 INCH PIECE OF 1 1/2 INCH TUBE, INSERTED 6" INTO BOTH THE UPPER AND LOWER SIGNPOST SECTIONS AND CORNER-BOLTED AT BOTH ENDS. NO SPLICE FROM 2" TO 30" ABOVE GROUND LINE. ONLY ONE SPLICE PER POST.

**GENERAL NOTES:**

ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 3 FEET.

**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION**

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

**SIGN MOUNTING DETAILS**

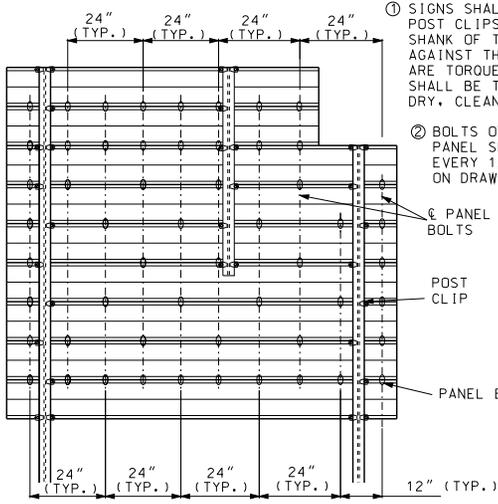
POST MOUNTING DETAILS

DATE EFFECTIVE: 06/01/2009  
DATE PREPARED: 5/23/2011

903.03BG

SHEET NO.  
3 OF 11

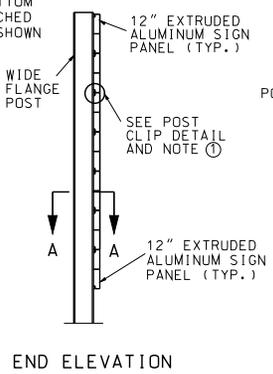
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



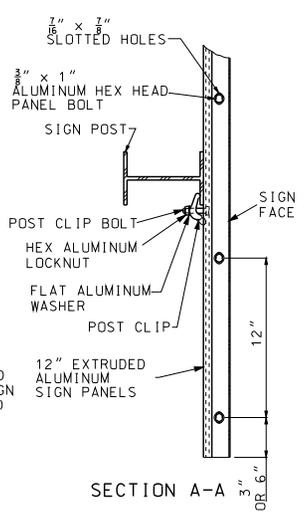
**PANEL BOLT LOCATION**

① SIGNS SHALL BE FIELD ATTACHED TO POSTS WITH POST CLIPS AND BOLTS, SEE POST CLIP DETAIL. THE SHANK OF THE POST CLIP BOLT SHALL FIT TIGHTLY AGAINST THE POST FLANGE AFTER THE LOCKNUTS ARE TORQUED. LOCKNUTS ON THE POST CLIP BOLTS SHALL BE TORQUED TO 225 INCH-POUNDS WHEN USING DRY, CLEAN, UNLUBRICATED THREADS.

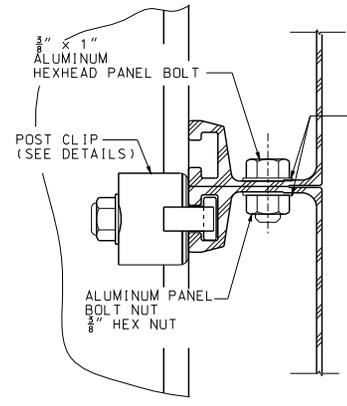
② BOLTS ON TOP AND BOTTOM PANEL SHALL BE ATTACHED EVERY 12 INCHES AS SHOWN ON DRAWING.



**END ELEVATION**

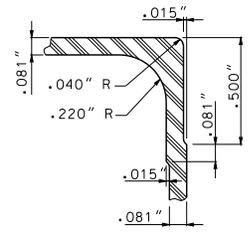


**SECTION A-A**

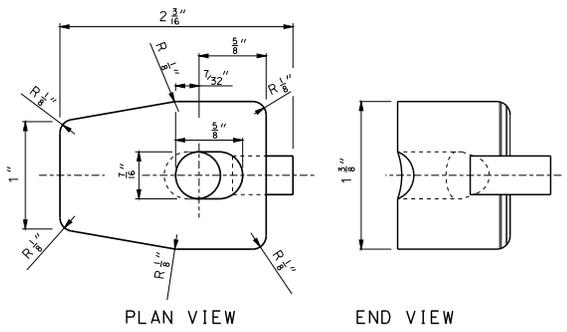


**POST CLIP DETAIL**

ALUMINUM FLAT WASHER  
 $\frac{7}{8}$ " I.D. x 1" O.D.  
 X .091" (TO BE USED ON  
 PANEL BOLT HEAD SIDE  
 AND NUT SIDE) ALUMINUM  
 LOCK WASHER UNDER NUT

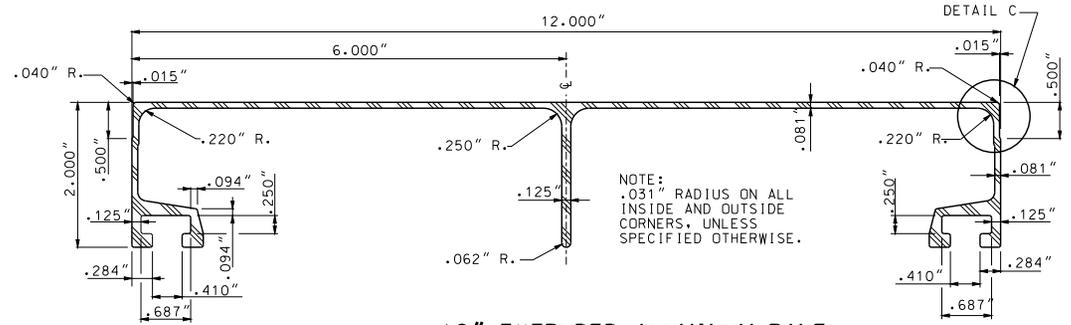


**DETAIL C**



**PLAN VIEW**

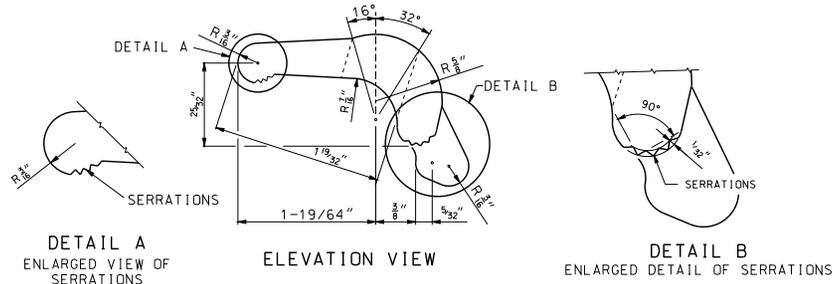
**END VIEW**



**12" EXTRUDED ALUMINUM PANEL**  
 MINIMUM WT. = 2.40 LBS./FT.

NOTE:  
 .031" RADIUS ON ALL  
 INSIDE AND OUTSIDE  
 CORNERS, UNLESS  
 SPECIFIED OTHERWISE.

NOTE:  
 MINIMUM WEIGHT AND THICKNESS DIMENSIONS SHOWN.  
 HEAVIER PANELS MAY BE USED.



**DETAIL A**  
 ENLARGED VIEW OF  
 SERRATIONS

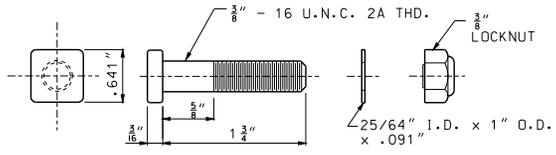
**ELEVATION VIEW**

**DETAIL B**  
 ENLARGED DETAIL OF  
 SERRATIONS

**POST CLIP**

POST CLIPS SHALL BE ASTM B 108, 356-T6 ALUMINUM ALLOY.

SAW GATING AS SHOWN  
 (APPROXIMATELY FLAT PERMISSIBLE)



**POST CLIP BOLT  
 WITH FLAT WASHER AND LOCKNUT**

NOTE:  
 SQUARE BOLT HEAD SHOWN,  
 RECTANGULAR BOLT HEAD WITH  
 LEAST DIMENSION OF .641" MAY  
 BE USED.

BOLT - 1 3/8" x 1 1/8" ALUMINUM  
 HEX LOCKNUT - 3/8" ALUMINUM  
 WASHER - ALUMINUM

	<b>MISSOURI HIGHWAYS AND TRANSPORTATION          COMMISION</b>	
	105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<b>SIGN MOUNTING DETAILS</b> EXTRUDED ALUMINUM PANEL DETAILS	
	DATE EFFECTIVE: 06/01/2009 DATE PREPARED: 5/23/2011	<b>903.03BG</b>

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