MISSOURI
HIGHWAYS and TRANSPORTATION COMMISSION

JEFFERSON CITY, MISSOURI

SUPPLEMENTAL PLANS TO JULY 2004 MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

EFFECTIVE November 1, 2010

EFFECTIVE: 11/01/2010

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

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203.02F	UNDERGRADING - TYPICAL DETAILS	2	01/01/2004
203.10D	TABULATED EARTHWORK AND SECTION DATA	1	02/01/2009
203.20F	SUPERELEVATION SPIRALS AND WIDENING (UNDIVIDED HIGHWAY)	5	04/01/2002
203.21J	SUPERELEVATION SPIRALS AND WIDENING (DIVIDED HIGHWAY)	5	04/01/2002
203.35A	MAILBOX TURNOUTS	1	08/01/1981
203.40G	TYPICAL DETAILS ON AND OFF RAMP	2	10/01/2007
203.41F	TYPICAL DETAILS ON AND OFF RAMPS (ROADWAY WITH 6:1 FORESLOPE)	2	01/01/1995
203.50M	TYPICAL MEDIAN OPENINGS (DIVIDED HIGHWAYS)	2	07/01/2004
203.61A	DRIVEWAY - TYPE I	1	07/01/2004
203.62C	DRIVEWAY - TYPE II	2	07/01/2004
203.63A	DRIVEWAY - TYPE III	2	01/01/1992
203.64C	DRIVEWAY - TYPE IV	2	07/01/2004
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204.00D	EMBANKMENT CONTROL - MEASURING DEVICES	1	04/01/1983
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502.05M	CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15 FT. JOINT SPACING *	4	06/01/2010
502.10K	DOWEL SUPPORTING UNITS *	2	06/01/2010
504.00H	CONCRETE APPROACH PAVEMENT	3	08/01/2007
602.00D	RIGHT-OF-WAY AND DRAIN MARKERS	2	01/01/2003
604.05D	PIPE CULVERT HEADWALLS - TYPE S	2	08/01/2006
604.10E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 18" CONCRETE PIPE	1	07/01/2001
604.11E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 24" CONCRETE PIPE	1	07/01/2001
604.12E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 30" CONCRETE PIPE	1	07/01/2001
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604.14E	PIPE CULVERT HEADWALL - ENERGY DISSIPATOR FOR 42" CONCRETE PIPE	1	07/01/2001
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604.30F	CONCRETE MANHOLES	2	04/01/1983
604.40F	PIPE COLLARS	2	10/01/2000
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605.10H	PAVEMENT UNDERDRAINAGE	3	12/01/2007
606.00AT	GUARDRAIL	17	10/01/2007
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606.22S	BRIDGE ANCHOR SECTION - SAFETY BARRIER CURB ON BRIDGE	5	08/01/2007
606.23H	BRIDGE ANCHOR SECTION (THRIE 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
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607.20F	WOVEN WIRE FENCE	2	10/01/1998

STANDARD NO.	DRAWING TITLE	NO. OF SHEETS	EFFECTIVE DATE
608.00H	PAVED APPROACHES	2	10/01/2009
608.10N	CONCRETE SIDEWALK AND CURB RAMPS	4	10/01/2009
608.20D	CONCRETE STAIRS	2	10/01/1992
608.30	CONCRETE MEDIAN STRIP	1	07/01/2004
609.00P	CONCRETE CURB, CURB AND GUTTER AND GUTTER	2	08/01/2008
609.15C	PAVED DITCHES	1	03/01/1993
609.40P	DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS	2	02/01/2009
609.60C	ROCK DITCH LINER	1	03/01/1993
609.70C	ROCK LINING FOR CULVERT OUTLET	1	10/01/1981
611.60Q	CONCRETE SLOPE PROTECTION	1	01/01/2005
612.20D	SAND FILLED IMPACT ATTENUATORS	1	08/01/2008
613.00P	PAVEMENT REPAIR *	3	06/01/2010
613.20B	PARTIAL DEPTH PAVEMENT REPAIR AT JOINTS AND CRACKS	1	08/01/2007
614.10T	GRATES AND BEARING PLATES	1	12/01/2005
614.11C	CURVED VANE GRATE AND FRAME *	1	06/01/2010
614.30E	MANHOLE FRAMES AND COVERS	2	07/01/1996
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617.10F	PERMANENT CONCRETE TRAFFIC BARRIER	7	10/01/2008
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619.10E	PAVEMENT EDGE TREATMENT *	1	08/01/2007
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620.20	SNOWPLOWABLE RAISED PAVEMENT MARKERS	4	01/01/2003
625.00	HOLE PATTERN FOR PAVEMENT SLAB STABILIZATION	1	10/01/1998
626.00H	RUMBLE STRIPS	2	04/01/2009
702.02F	CAST-IN-PLACE CONCRETE PILES (APPROVED TYPES)	1	07/01/2004

* REVISED OR ADDED SINCE OCTOBER 2009

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

EFFECTIVE: 07/01/2010

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

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703.11G	CONCRETE SINGLE BOX STRUCTURE - FLARED WINGS (SQUARE)	3	10/01/2009
703.12G	CONCRETE SINGLE BOX STRUCTURE (CUT SECTIONS)	1	10/01/2009
703.13G	CONCRETE SINGLE BOX STRUCTURE - STRAIGHT WINGS (SKEWED)	3	10/01/2009
703.14G	CONCRETE SINGLE BOX STRUCTURE - FLARED WINGS (SKEWED)	3	10/01/2009
703.15C	CONCRETE SINGLE BOX CULVERT - MEMBER SIZES AND REINFORCEMENT	23	10/01/2009
703.37B	CONCRETE BOX CULVERT - EXTERIOR WING REINFORCEMENT	2	10/01/2009
703.38A	CONCRETE BOX CULVERTS - CUTTING DETAILS	2	10/01/2009
703.40G	CONCRETE DOUBLE BOX STRUCTURE - STRAIGHT WINGS (SQUARE)	2	10/01/2009
703.41G	CONCRETE DOUBLE BOX STRUCTURE - FLARED WINGS (SQUARE)	2	10/01/2009
703.42G	CONCRETE DOUBLE BOX STRUCTURE (CUT SECTIONS)	2	10/01/2009
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703.60E	CONCRETE BOX STRUCTURE - PIPE INLET	1	07/01/2001
703.80G	CONCRETE TRIPLE BOX STRUCTURE - STRAIGHT WINGS (SQUARE)	2	10/01/2009
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703.82G	CONCRETE TRIPLE BOX STRUCTURE (CUT SECTIONS)	2	10/01/2009
703.83G	CONCRETE TRIPLE BOX STRUCTURE - STRAIGHT WINGS (SKEWED)	2	10/01/2009
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725.00B	CORRUGATED METAL PIPE INSTALLATION METHODS	3	07/01/2006
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732.10G	SAFETY SLOPE END SECTION	3	08/01/2009
806.10H	TEMPORARY EROSION CONTROL MEASURES	7	04/01/2009
808.00	TYPICAL PLANTING ILLUSTRATIONS	3	07/01/2004
901.00Y	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 30' M.H.	4	06/01/2009
901.01AF	HIGHWAY LIGHTING - POLES, FOUNDATIONS & APPURTENANCES FOR 45' M.H.	6	06/01/2009
901.02B	HIGHWAY LIGHTING - CABLE, CONDUIT AND TRENCHING	1	04/01/2002
901.30F	HIGHWAY LIGHTING - BASE MOUNTED CONTROL STATION	2	04/01/2005
901.80D	HIGHWAY LIGHTING - POWER SUPPLY ASSEMBLY - SECONDARY SERVICE	2	04/01/2002
901.85A	HIGHWAY LIGHTING SYMBOLS	1	01/01/2003

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

* REVISED OR ADDED SINCE OCTOBER 2009

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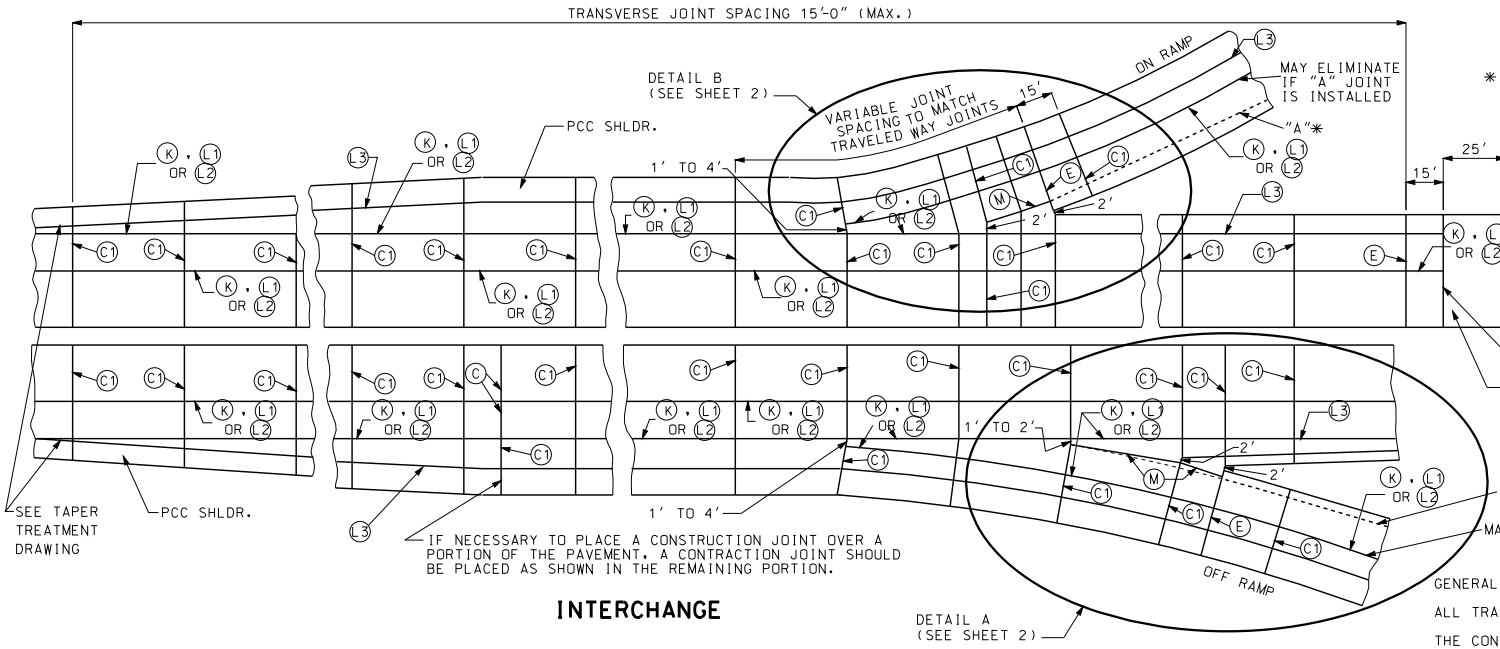
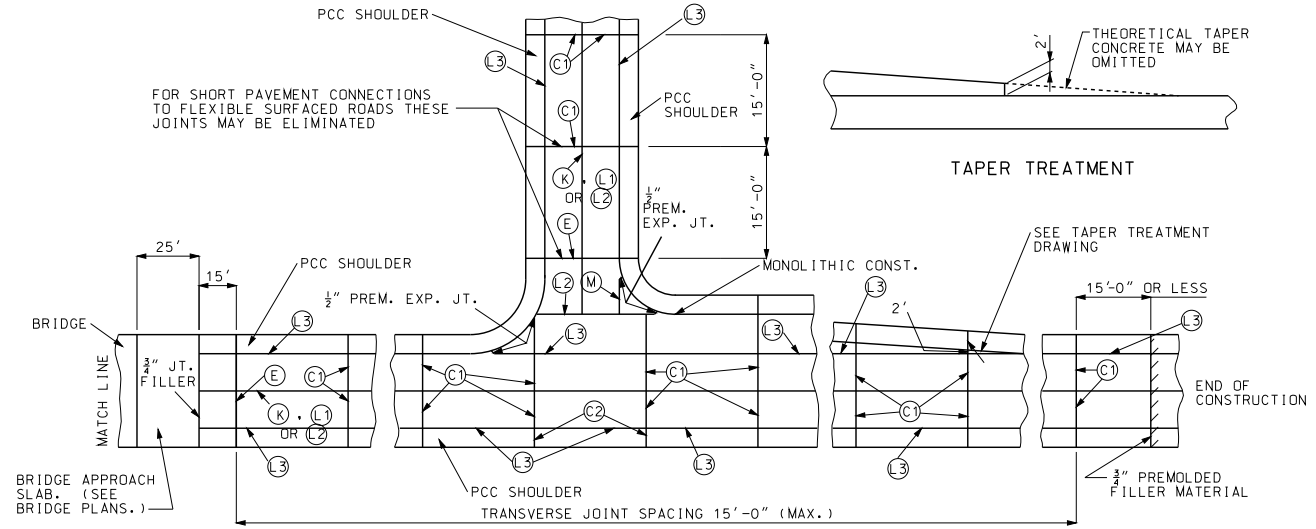


INTERCHANGE

✳ AN OPTIONAL JOINT. IF CONSTRUCTED, USE (L3) JOINTS.

✳ PCC APPROACH PAVEMENT



NON-INTERCHANGE

GENERAL NOTES:

ALL TRANSVERSE JOINTS ON SHOULDERS SHALL BE (C2).

THE CONTRACTOR SHALL DETERMINE THE PAVING WIDTH.

(L3) SHALL BE USED BETWEEN PAVEMENT AND SHOULDER GREATER THAN 4'. THE INTERCHANGE WILL EXTEND FROM THE BEGINNING OF THE ACCELERATION/DECELERATION LANE TO THE GORE RETURN TAPER ON THE MAINLINE. THE INTERCHANGE WILL ALSO INCLUDE THE RAMPS UP TO THE BEGINNING OF THE RADIUS WITH THE ROAD INTERSECTING THE RAMP.

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

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

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

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

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

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

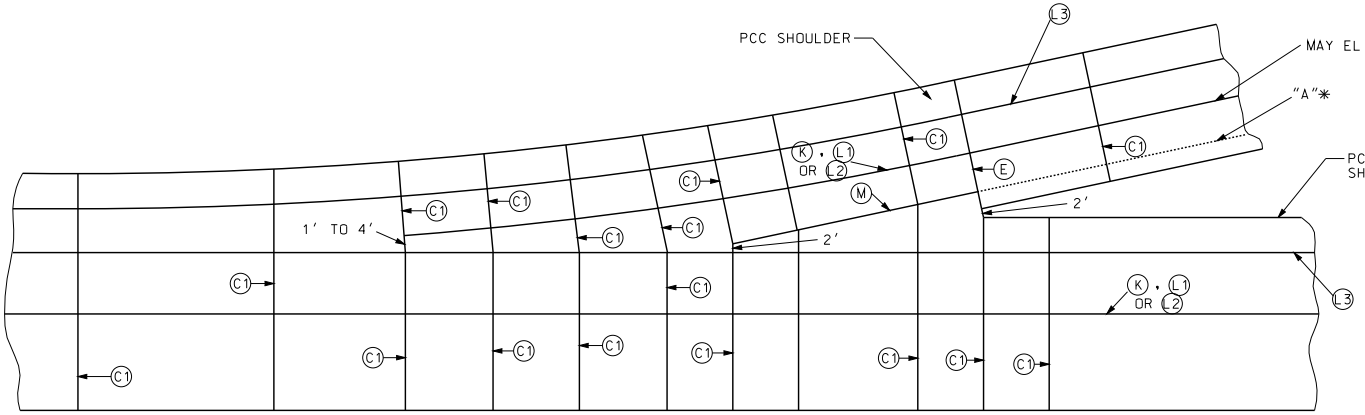
CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING

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

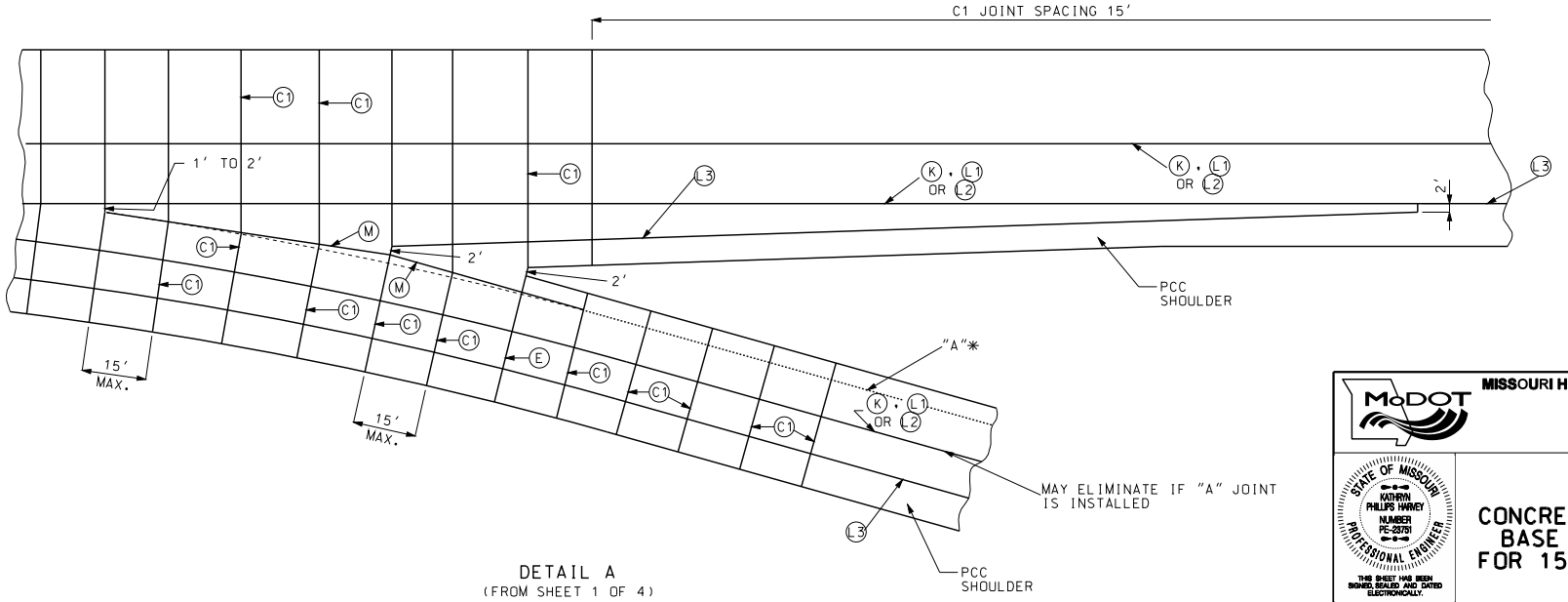
502.05M

SHEET NO. 1 OF 4

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



DETAIL B
(FROM SHEET 1 OF 4)



DETAIL A
(FROM SHEET 1 OF 4)

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CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING

DATE EFFECTIVE: 06/01/2010
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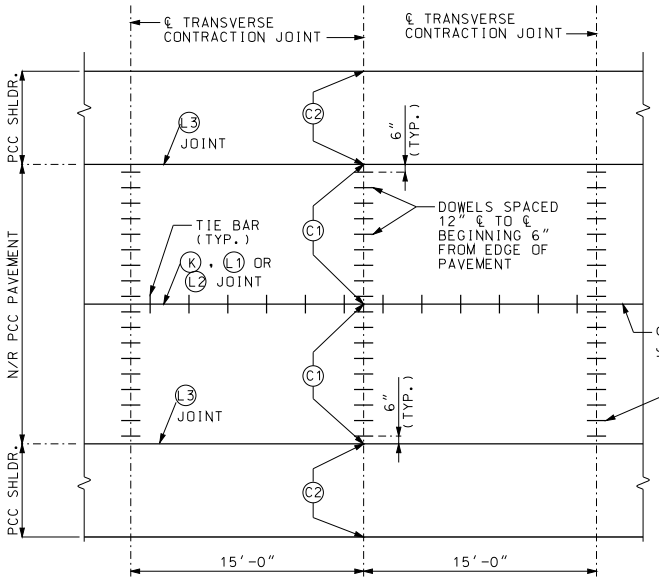
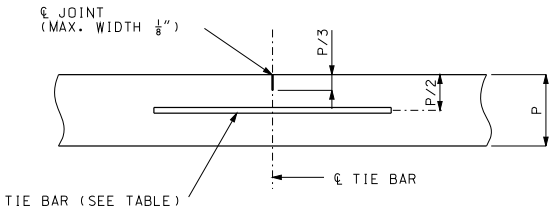


JOINT PLAN AND SPACING FOR CONTRACTION JOINTS (1)

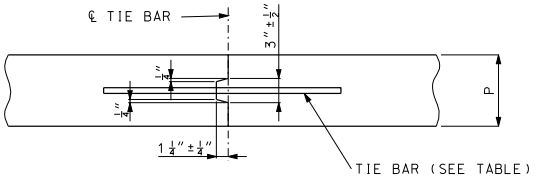
(1) LONGITUDINAL JOINT NOT REQUIRED AT INSIDE SHOULDER ON DIVIDED HIGHWAYS OR AT INSIDE SHOULDER OF RAMPS. FOR 4' OR LESS INSIDE SHOULDERS, DOWELS ARE REQUIRED FOR THE FIRST TWO FEET ADJACENT TO THE TRAVEL LANE.



TIE BARS REQUIRED.

LONGITUDINAL JOINT (L1)

TIE BAR AND DOWEL TABLE				
PCCP THICKNESS (P)	DOWEL SIZE	TIE BAR SIZE	DOWEL SPACING	TIE BAR SPACING
LESS THAN 7"	NONE	#5X30"	NONE	30" CTR.-CTR.
7" TO 10"	1¼"X18"	#5X30"	12" CTR.-CTR.	30" CTR.-CTR.
GREATER THAN 10"	1½"X18"	#6X40"	12" CTR.-CTR.	30" CTR.-CTR.



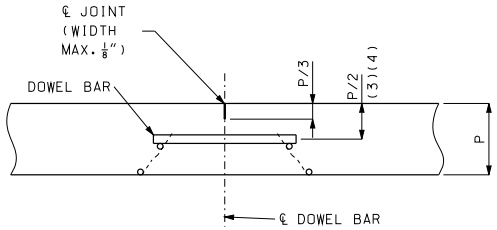
IF METAL IS USED TO FORM KEY DISCONTINUE STRIP FOR DISTANCE OF APPROXIMATELY 3" EACH SIDE OF TRANSVERSE JOINT.

TYPE (K) REQUIRES TIE BAR.

TYPE (M) CONSTRUCTED WITHOUT TIE BARS.

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

TONGUE AND GROOVE JOINTS (K) AND (M)

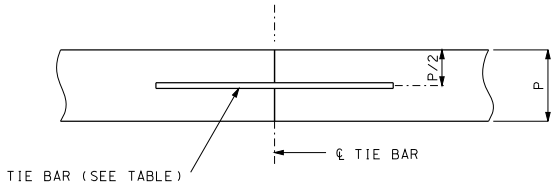


DOWELS REQUIRED. FOR PERMISSIBLE TYPES OF DOWELS SUPPORTING UNITS, SEE OTHER DRAWINGS.

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

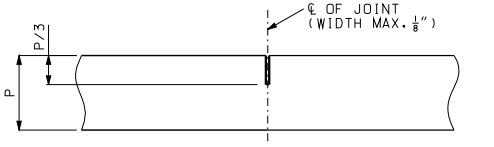
TRANSVERSE CONTRACTION JOINT (C1) (2)

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

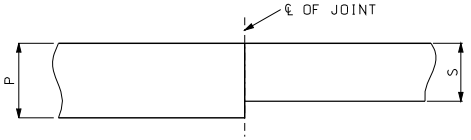


TIE BARS REQUIRED.

LONGITUDINAL CONSTRUCTION JOINT (L2)



TRANSVERSE CONTRACTION JOINT (C2)



LONGITUDINAL CONSTRUCTION JOINT FOR SHOULDER (L3)

S = SHOULDER THICKNESS

GENERAL NOTES:

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

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

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

STATE OF MISSOURI KATHRYN PHILLIPS HARVEY NUMBER PE-23751 PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

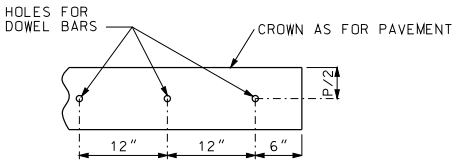
CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING

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

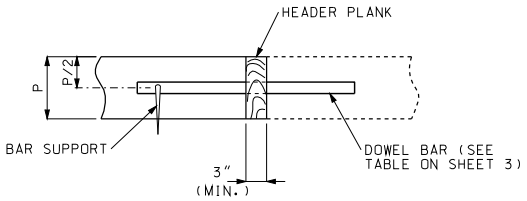
502.05M

SHEET NO. 3 OF 4

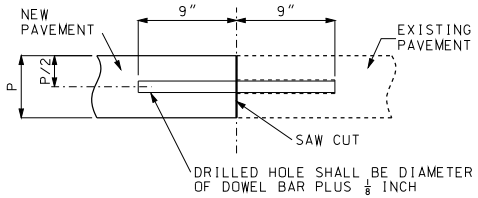
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PART ELEVATION OF
HEADER PLANK



HEADER SECTION



SAWED SECTION

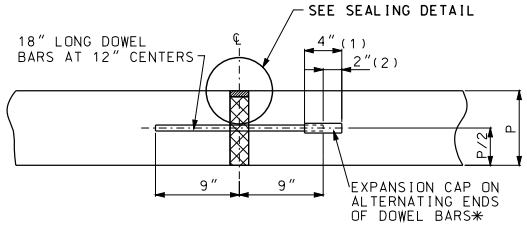
THE HEADER BOARD SHALL BE SUFFICIENTLY RIGID TO PREVENT DISTORTION FROM THE TYPICAL SECTION AND MAINTAIN A STRAIGHT LINE FROM PAVEMENT EDGE TO PAVEMENT EDGE.

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.

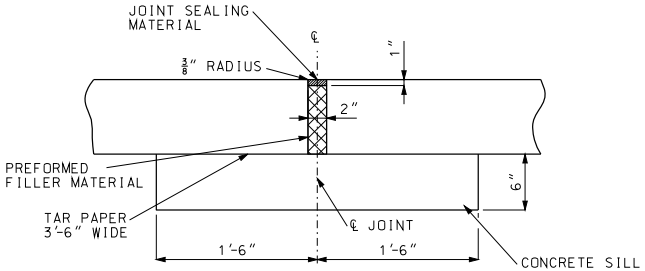
BONDING FOR DOWEL BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

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

CONSTRUCTION JOINT (C)



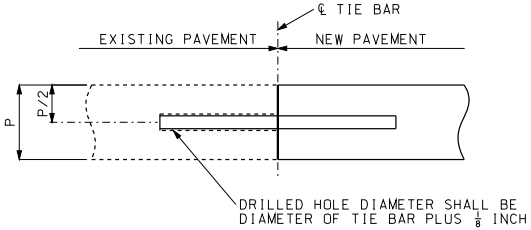
EXPANSION JOINTS (E)



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))



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.

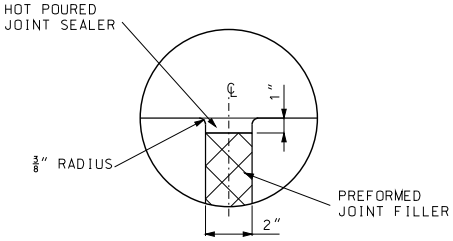
TIE BAR SIZE AND LENGTH SHALL BE BASED ON THE THICKNESS OF THE THINNER PAVEMENT OR SHOULDER TO BE TIED TOGETHER.

LONGITUDINAL CONSTRUCTION JOINT
(EXISTING PAVEMENT) (L)

(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

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

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

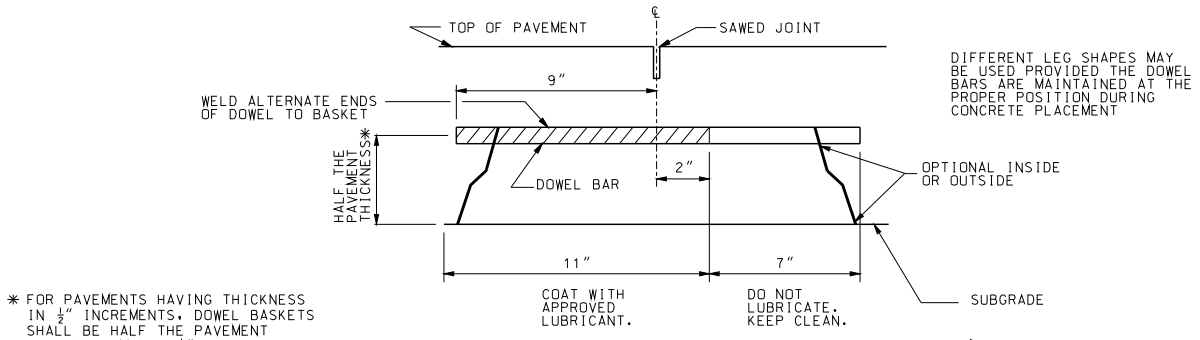
STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

CONCRETE PAVEMENT AND BASE APPURTENANCES FOR 15' JOINT SPACING

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

502.05M

SHEET NO. 4 OF 4

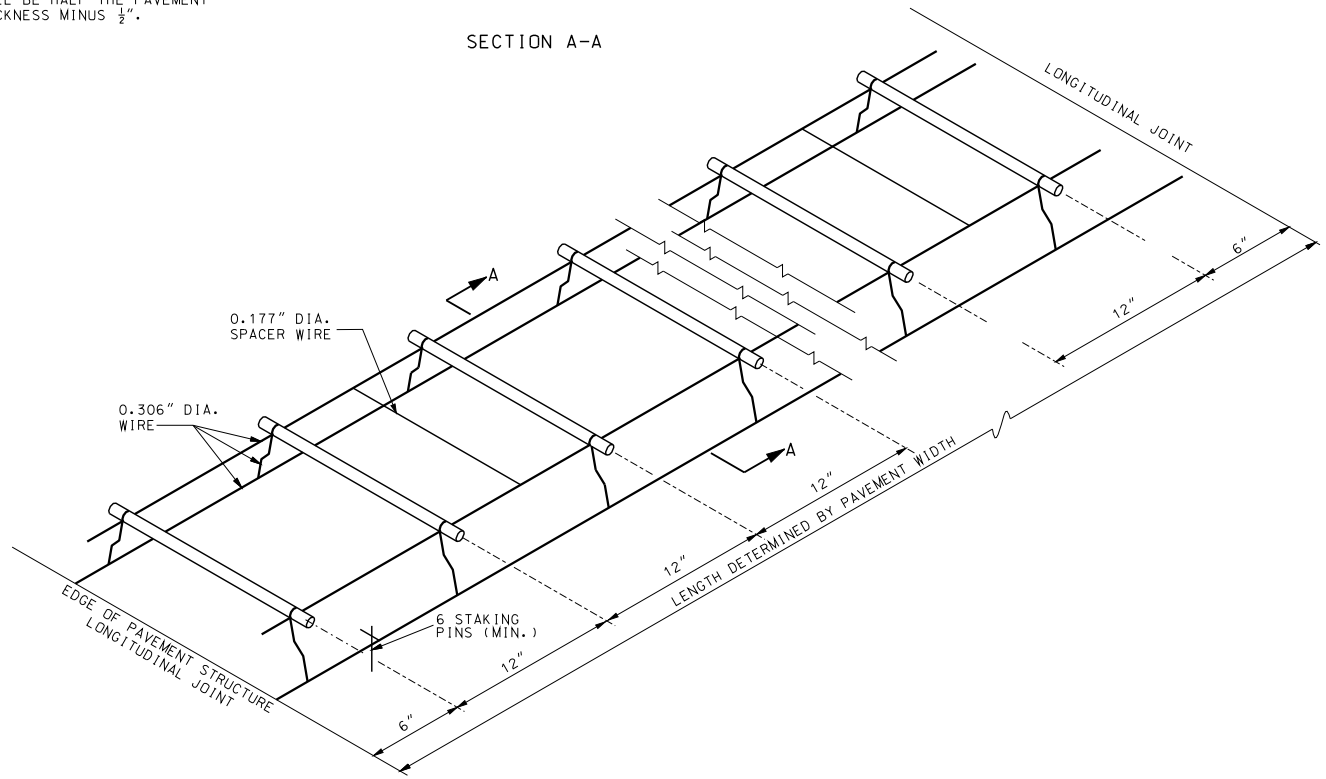


DIFFERENT LEG SHAPES MAY BE USED PROVIDED THE DOWEL BARS ARE MAINTAINED AT THE PROPER POSITION DURING CONCRETE PLACEMENT

DOWEL BARS		
PAVEMENT THICKNESS	BAR SIZE	
	DIAMETER	LENGTH
10″ AND LESS	1 1/4″	18″
GREATER THAN 10″	1 1/2″	18″

* FOR PAVEMENTS HAVING THICKNESS IN 1/2″ INCREMENTS, DOWEL BASKETS SHALL BE HALF THE PAVEMENT THICKNESS MINUS 1/2″.

SECTION A-A



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 1/2″ OF THE VERTICAL AND HORIZONTAL PLANE AND IN THE LONGITUDINAL DIRECTION. THE SKEW TOLERANCE SHALL BE 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″ DIAMENTER 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.

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NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DOWEL SUPPORTING UNITS

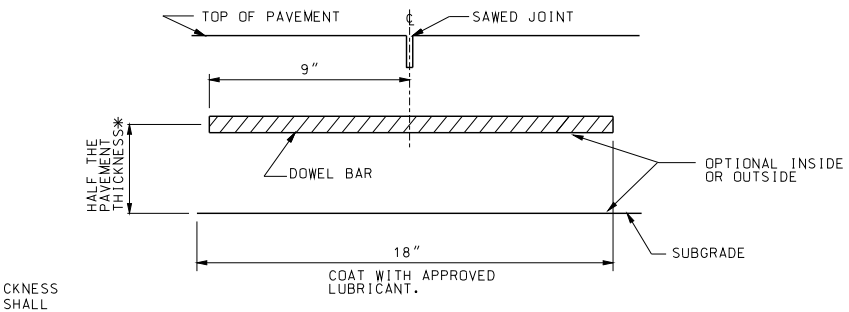
APPROVED FOR USE
WITH TRANSVERSE JOINTS

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

502.10K

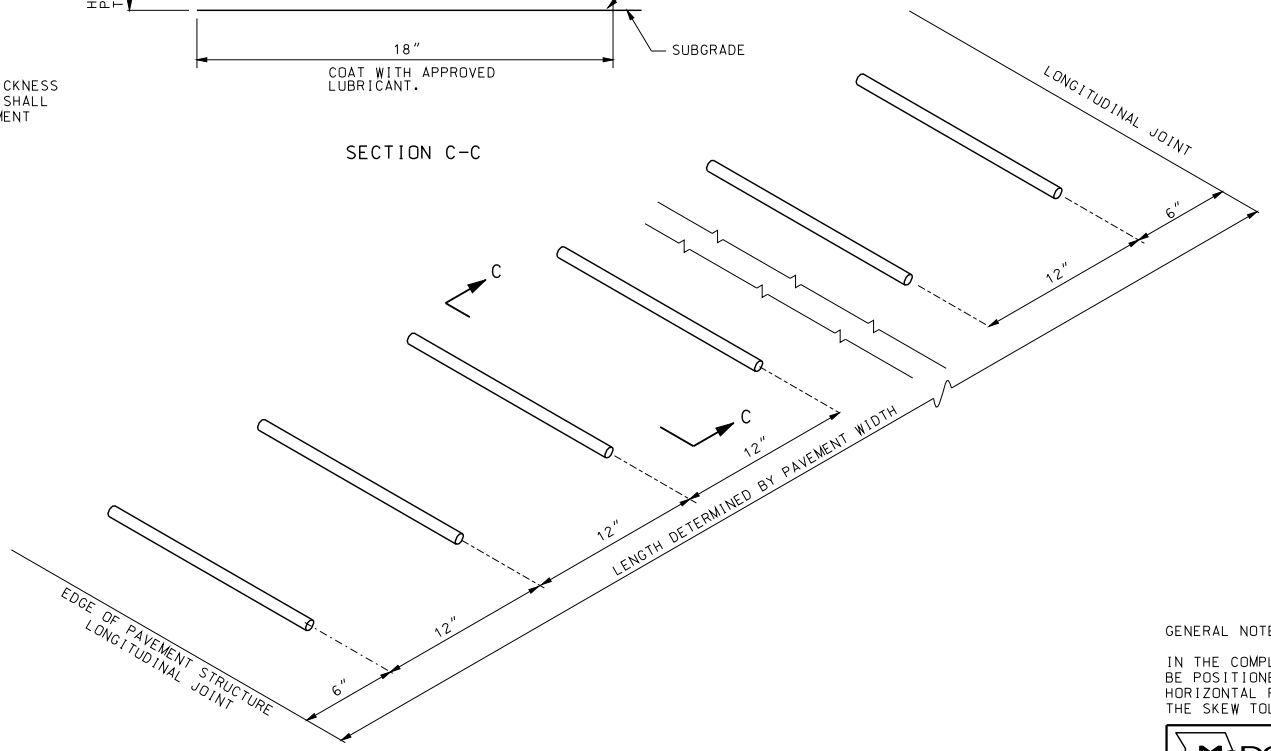
SHEET NO. 1 OF 2

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



SECTION C-C

* FOR PAVEMENTS HAVING THICKNESS IN ½" INCREMENTS, DOWEL SHALL BE PLACED HALF THE PAVEMENT THICKNESS MINUS ½".



GENERAL NOTES:

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

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DOWEL SUPPORTING UNITS

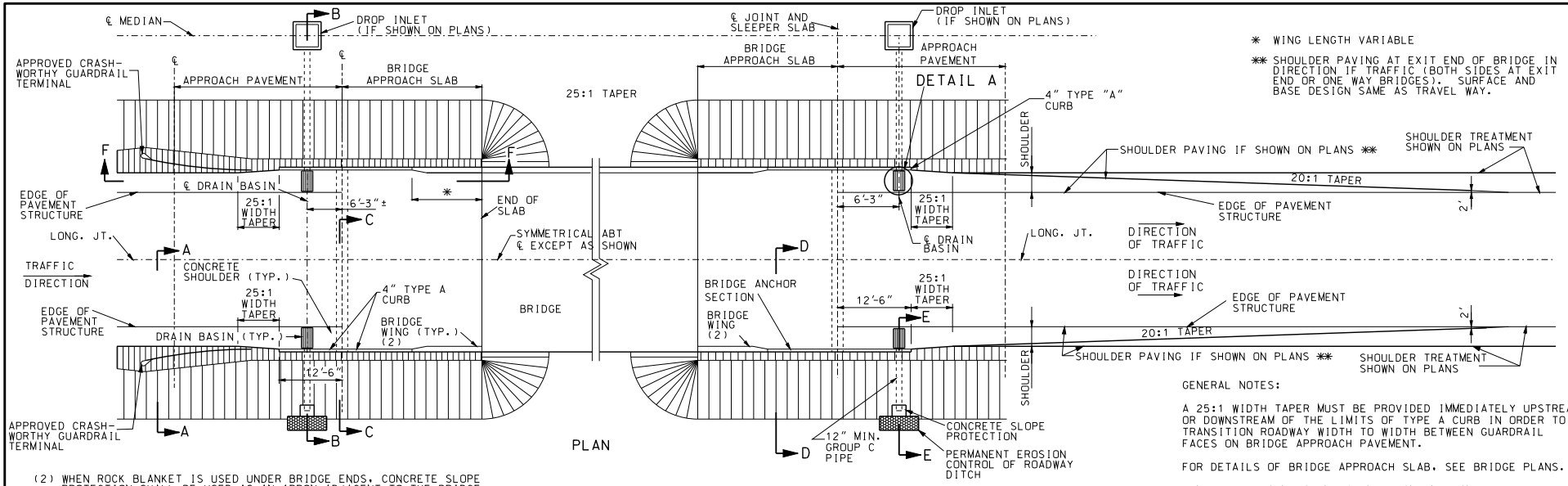
MECHANICAL PLACEMENT

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

502.10K

SHEET NO. 2 OF 2

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

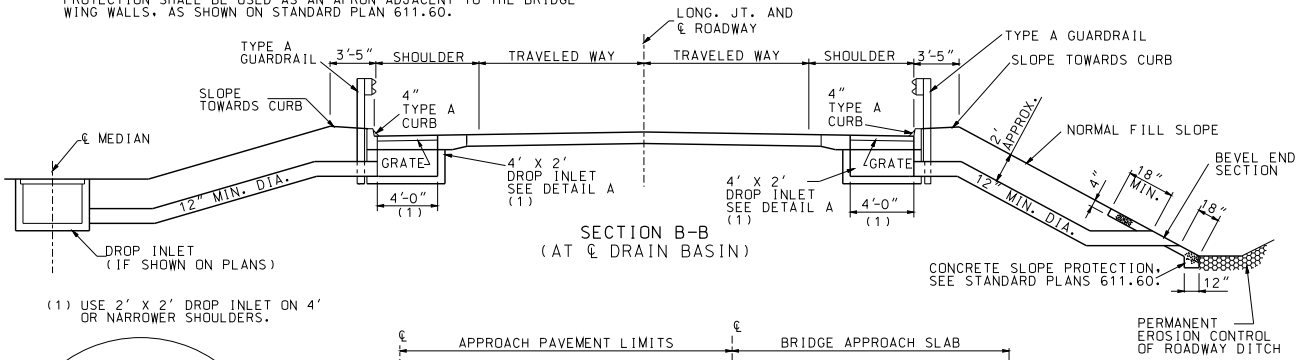


PLAN

* WING LENGTH VARIABLE

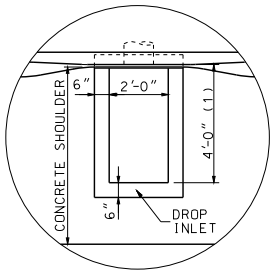
** SHOULDER PAVING AT EXIT END OF BRIDGE IN DIRECTION IF TRAFFIC (BOTH SIDES AT EXIT END OR ONE WAY BRIDGES). SURFACE AND BASE DESIGN SAME AS TRAVEL WAY.

(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.

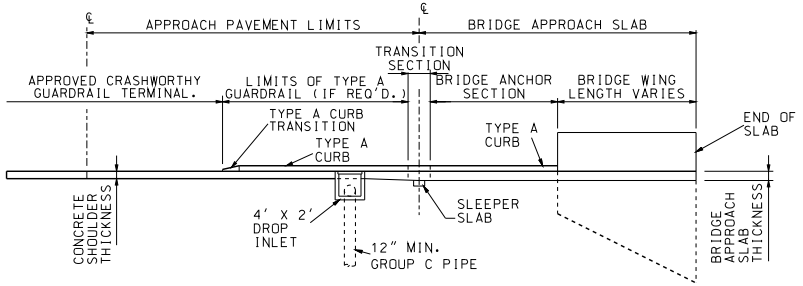


SECTION B-B
(AT ℄ DRAIN BASIN)

(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.

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.

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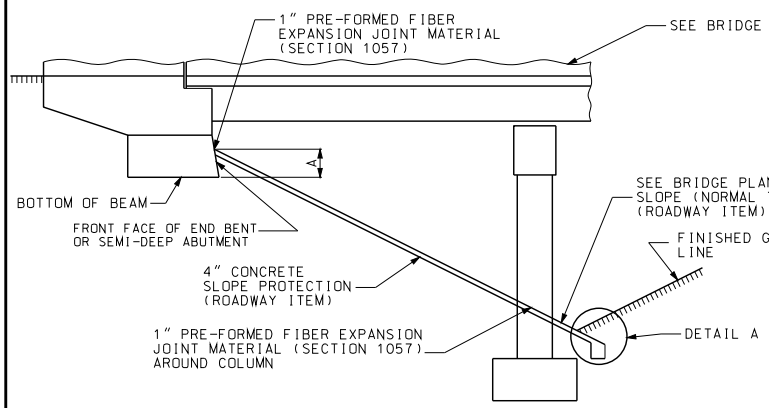
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

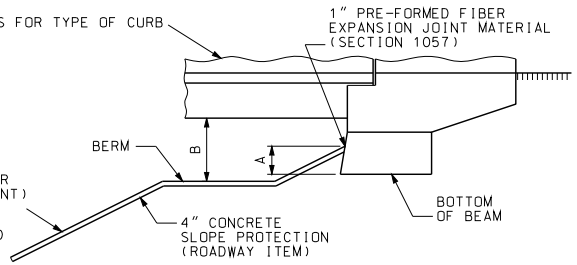
DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS

DATE EFFECTIVE:	02/01/2009	609.40P	SHEET NO.
DATE PREPARED:	9/3/2010		1 OF 2

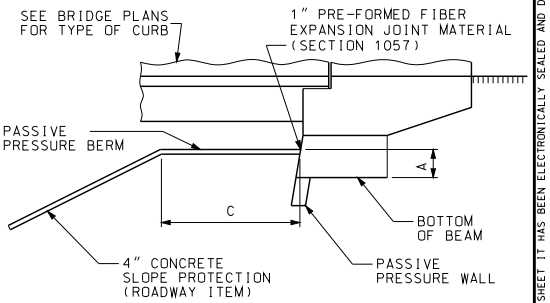
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



ELEVATION
(STRAIGHT SLOPE TYPE)



ELEVATION
(USE ON STRUCTURES WITHOUT PASSIVE PRESSURE BERM)



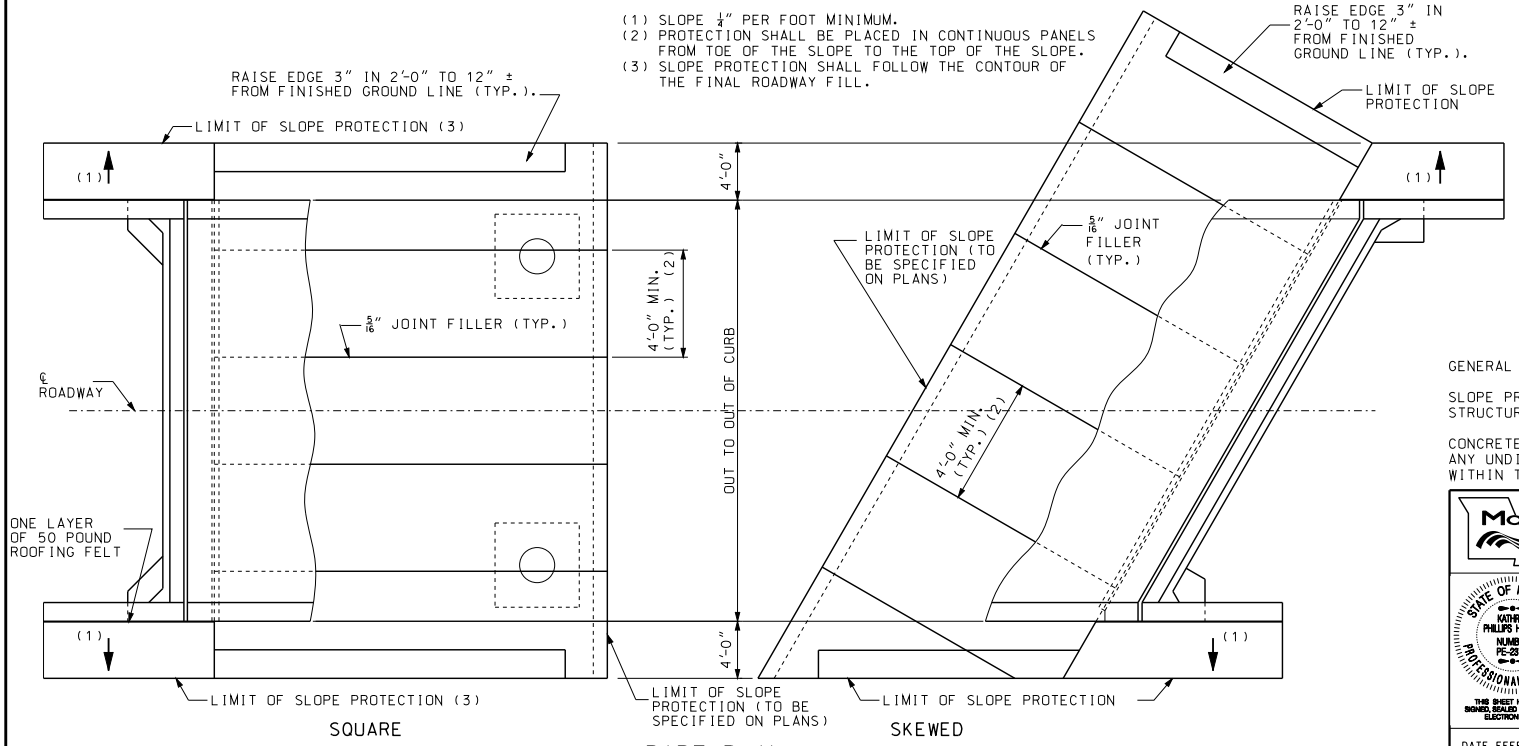
ELEVATION
(USE ON STRUCTURES WITH PASSIVE PRESSURE BERM)

A - SEE BRIDGE PLANS

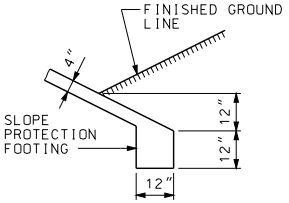
B - BERM SHALL BE CONSTRUCTED TO ELEVATION SHOWN ON PLANS WITH A MINIMUM OF 4'-0" BELOW BOTTOM OF SUPERSTRUCTURE.

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.



PART PLAN



DETAIL A

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

GENERAL NOTES:

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

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

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NUMBER PE-23751
PROFESSIONAL ENGINEER
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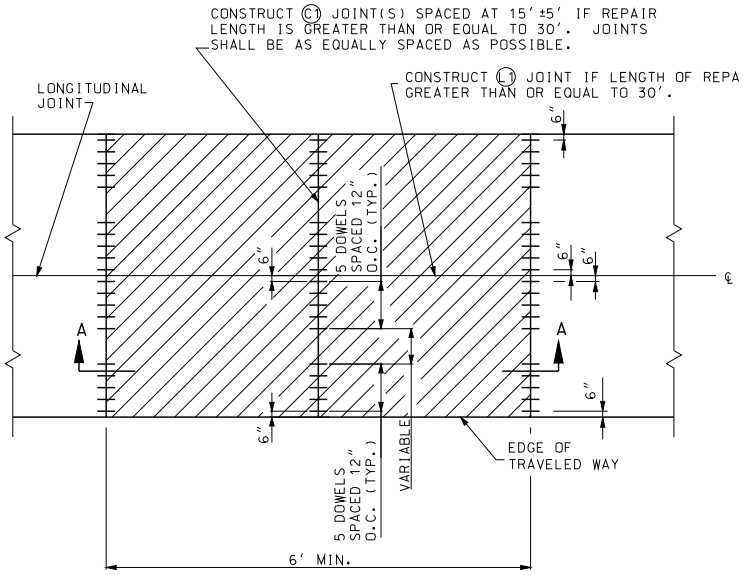
CONCRETE SLOPE PROTECTION

DATE EFFECTIVE: 01/01/2005
DATE PREPARED: 9/3/2010

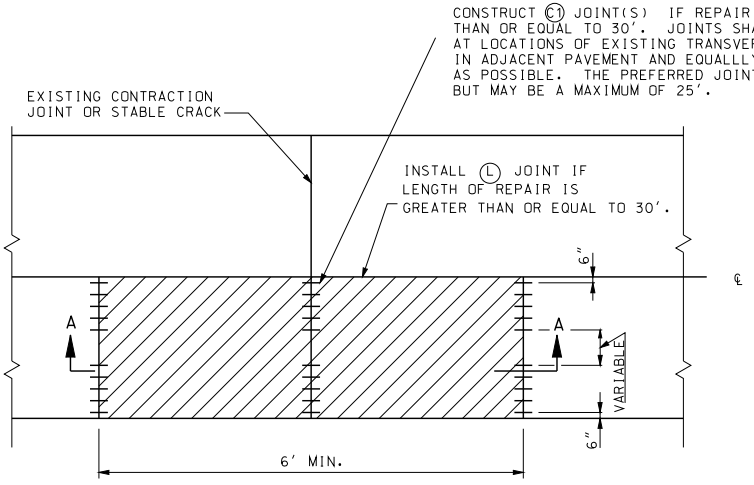
611.600

SHEET NO. 1 OF 1

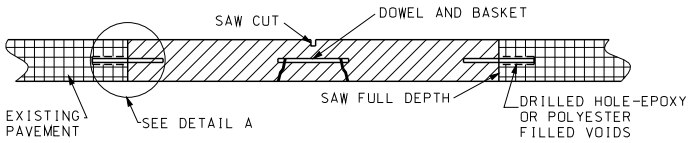
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



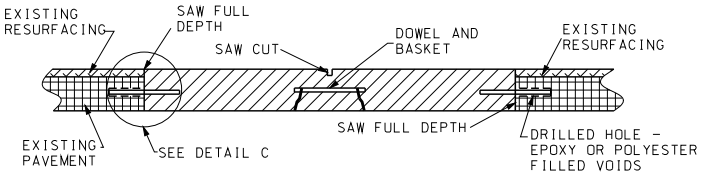
TWO OR MORE LANES



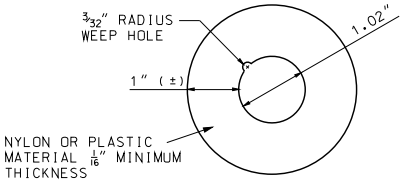
ONE LANE



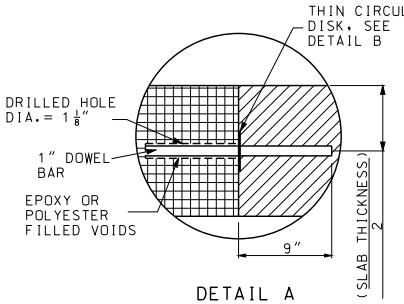
SECTION A-A



SECTION A-A ALTERNATE
WITH ASPHALT OVERLAY

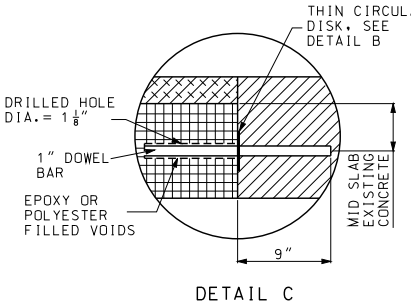


DETAIL B
THIN CIRCULAR DISK



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.



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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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STATE OF MISSOURI
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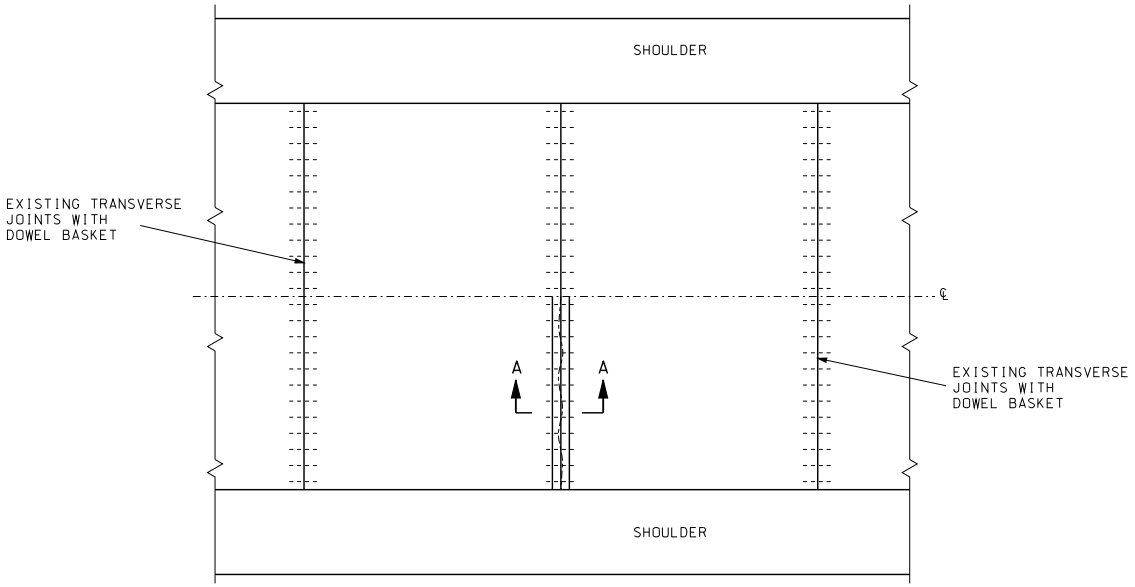
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

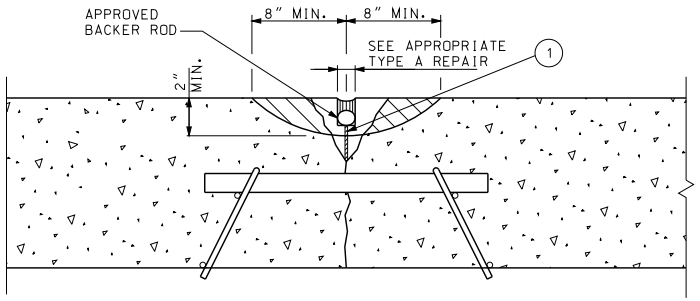
PAVEMENT REPAIR
FULL DEPTH

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

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



PLAN VIEW



SECTION A-A
MILLING OPTIONS

AREA TO BE REMOVED

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

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

GENERAL NOTES:

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

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

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

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

JOINTS AND CRACKS SHALL BE SEALED WITH APPROPRIATE SEALER.

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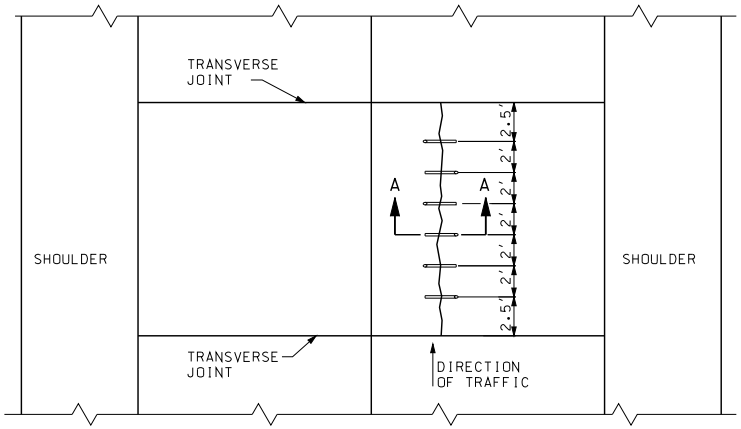
PAVEMENT REPAIR
PARTIAL DEPTH AT JOINTS AND CRACKS CLASS A

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

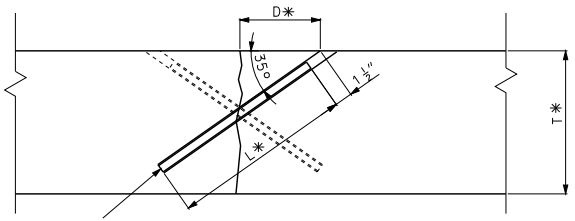
613.00P

SHEET NO. 2 OF 3

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



CROSS STITCHING PLAN



* 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 1½" 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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NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

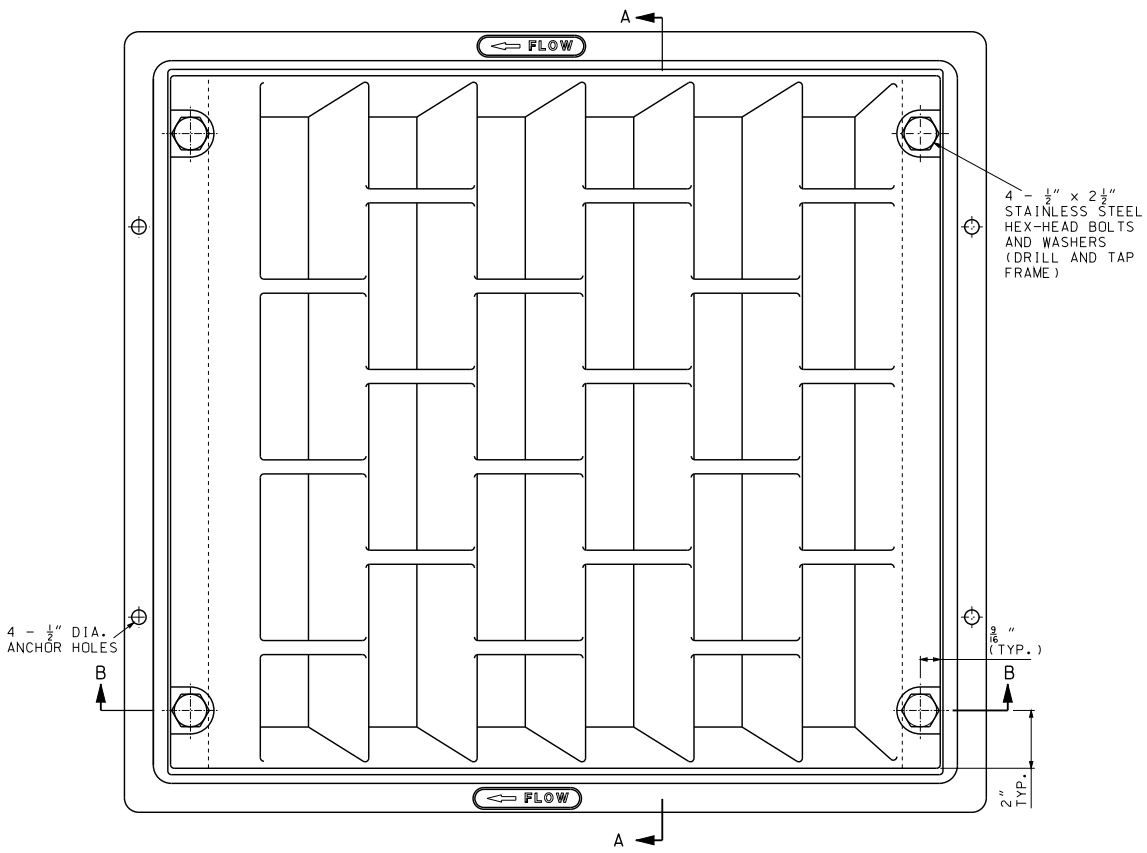
PAVEMENT REPAIR
CROSS STITCHING

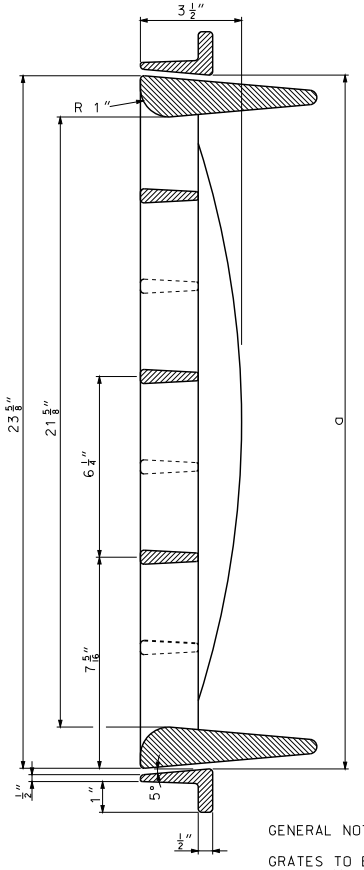
DATE EFFECTIVE: 06/01/2010
DATE PREPARED: 4/1/2010

613.00P

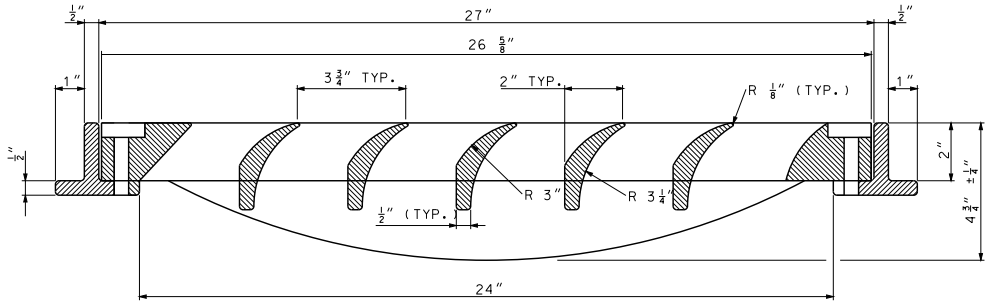
SHEET NO. 3 OF 3

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





SECTION A-A



SECTION B-B

NOMINAL DIMENSIONS AND WEIGHTS			
OPENING			WEIGHT
WIDTH	LENGTH	a	(LB.)
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.

GENERAL NOTES:

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

MINIMUM CLEAR OPEN AREA: 2.10 SQUARE FEET.

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CURVED VANE GRATE AND FRAME

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

614.11C

SHEET NO. 1 OF 1

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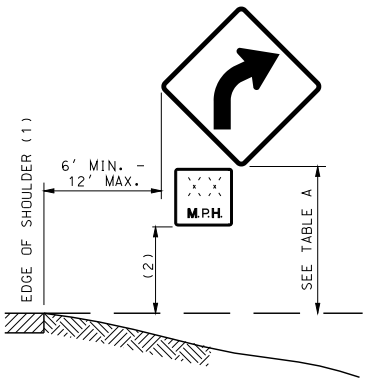
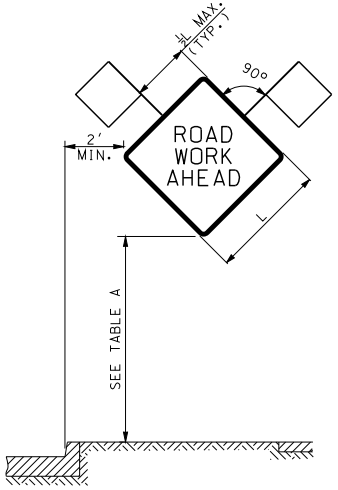
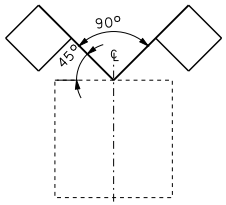


(1) EDGE OF TRAVELED WAY WHERE THERE IS NO PAVED OR STABILIZED SHOULDER.
(2) ONE-FOOT LESS THAN MOUNTING HEIGHT NOTED IN TABLE A.





HEIGHT AND LATERAL LOCATIONS FOR POST AND PORTABLE SIGN MOUNTING

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

(3) MEASURED FROM THE BOTTOM OF THE SIGN TO THE NEAR EDGE OF THE PAVEMENT.
(4) MOUNTING HEIGHTS FOR REGULATORY AND GUIDE SIGNS SHALL BE AS SPECIFIED FOR POST-MOUNTED SIGNS.
(5) SIGNS MOUNTED ON TYPE III BARRICADES, GORE EXIT SIGN, AND SIGNS FOR 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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TEMPORARY TRAFFIC CONTROL DEVICES
SIGN MOUNTING REQUIREMENTS

DATE EFFECTIVE:	11/01/2010	616.10AM	SHEET NO.
DATE PREPARED:	9/3/2010		1 OF 9

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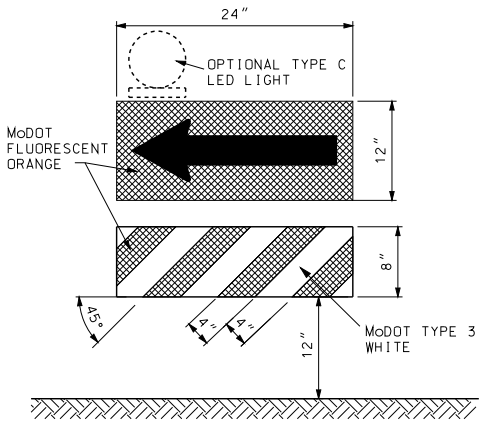
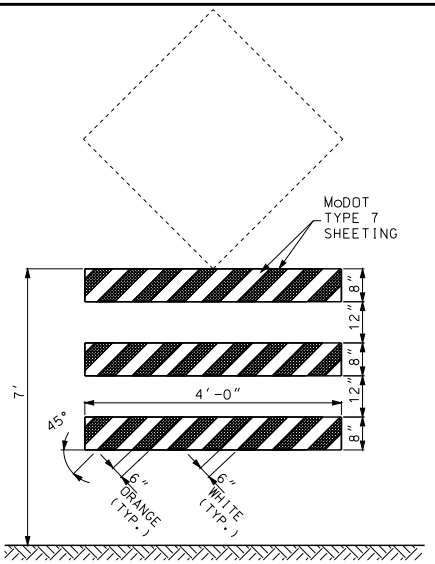


DIRECTION INDICATOR BARRICADE

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.

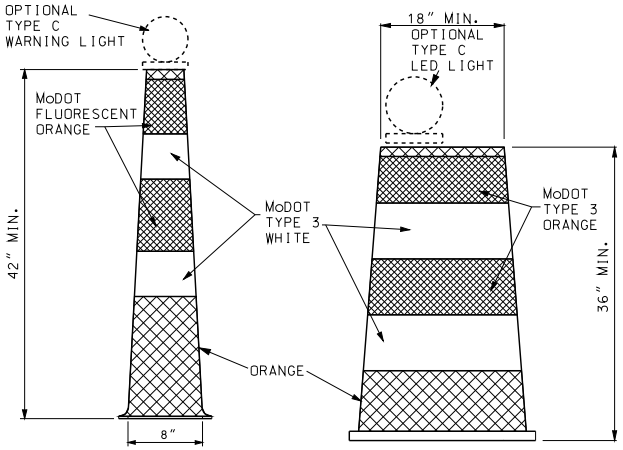


ADVANCE WARNING RAIL SYSTEM

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.

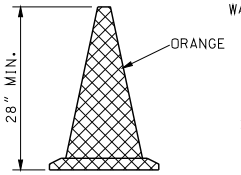
WHERE MARKING IS NOT PROVIDED ON THE BACKSIDE, STRIPS OF 3" WIDE MODOT TYPE 7 ORANGE SHEETING MAY BE APPLIED TO THE ENDS OF EACH RAIL TO HELP DELINEATE THE DEVICE.



TRIM-LINE DRUM-LIKE

CHANNELIZERS

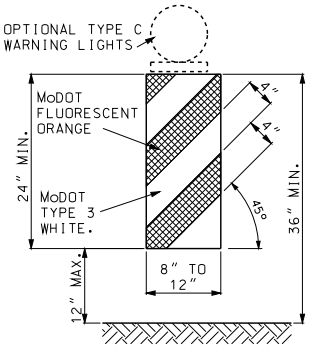
STRIPES ON TRIM-LINE CHANNELIZERS SHALL BE 6" TO 8".
STRIPES ON DRUM-LIKE CHANNELIZERS SHALL BE 4" TO 6".



CONE

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

CONES SHALL BE USED DURING DAYLIGHT HOURS ONLY.



VERTICAL PANEL

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

GENERAL NOTES:

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.

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PROFESSIONAL ENGINEER
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TEMPORARY TRAFFIC CONTROL DEVICES

CHANNELIZERS AND DIRECTION INDICATOR BARRICADE

DATE EFFECTIVE: 11/01/2010
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616.10AM

SHEET NO. 2 OF 9

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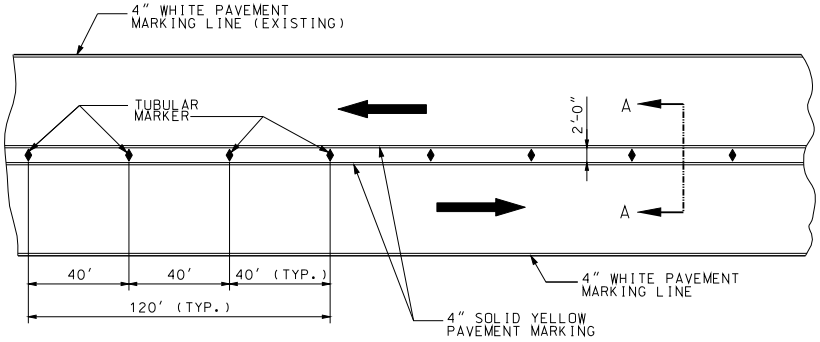
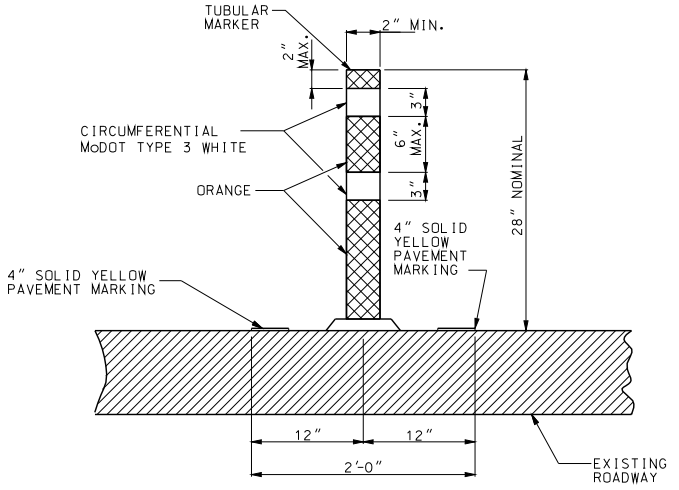


TWO LANE / TWO WAY TRAFFIC DELINEATION PLAN FOR DIVIDED HIGHWAY

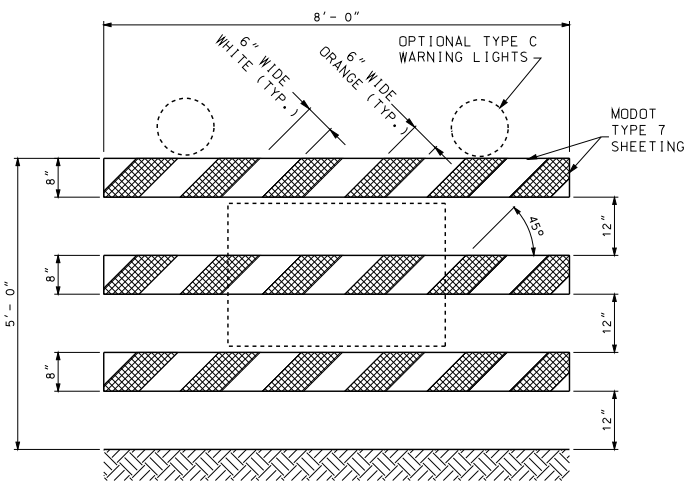
IF RAISED PAVEMENT MARKERS ARE PRESENT, THE LENSES SHALL BE REMOVED OR COVERED TO THE SATISFACTION OF THE ENGINEER.



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.



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

SIGNS SHALL BE LIGHT WEIGHT (ROLL-UP OR PLASTIC) AND OBSCURE NO MORE THAN 50 PERCENT OF THE TOP 2 RAILS OR 33 PERCENT OF ALL THREE RAILS. SEE SIGN MOUNTING REQUIREMENTS IN TABLE A ON SHEET 1.

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

IF SIGNS OR LIGHTS CANNOT MEET THE ABOVE REQUIREMENTS, THEY SHALL BE MOUNTED ON SEPARATE CRASHWORTHY DEVICES, LOCATED 7 TO 10 FEET BEHIND THE BARRICADE.

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

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

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

TYPE III MOVABLE BARRICADES SHALL BE ENTIRELY FREE STANDING AND PORTABLE. MARKING SHALL ONLY BE APPLIED TO THE FRONT OF EACH RAIL OR MAY BE APPLIED TO BOTH THE FRONT AND THE BACK OF EACH RAIL PROVIDED THE MARKING ON THE BACK DOES NOT CONFLICT WITH INTENDED OPPOSING TRAFFIC MOVEMENT. WHERE MARKING IS NOT PROVIDED ON THE BACKSIDE, STRIPS OF 3" WIDE MoDOT TYPE 7 ORANGE SHEETING MAY BE APPLIED TO THE ENDS OF EACH RAIL TO HELP DELINEATE THE DEVICE.

TYPE III MOVABLE BARRICADE

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TEMPORARY TRAFFIC CONTROL DEVICES

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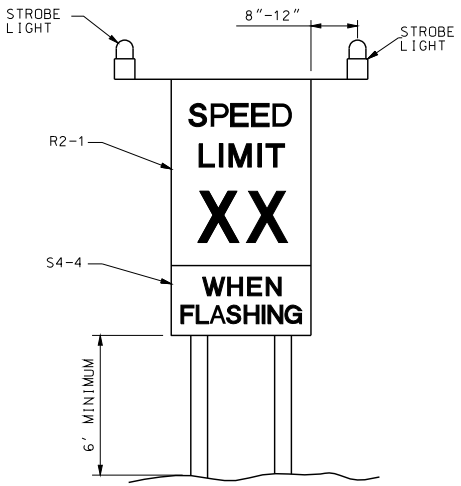


SEE NON-PORTABLE SIGN MOUNTING FOR LATERAL DIMENSIONS

SPEED LIMIT AND STROBE LIGHT ASSEMBLY

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

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

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

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

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.

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

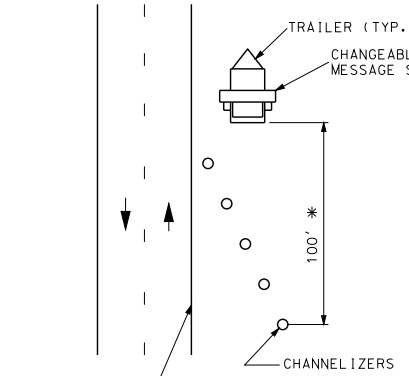
TYPE A AND C LIGHTS SHALL BE VISIBLE ON A CLEAR NIGHT FROM A DISTANCE OF 3000 FEET(2).

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).

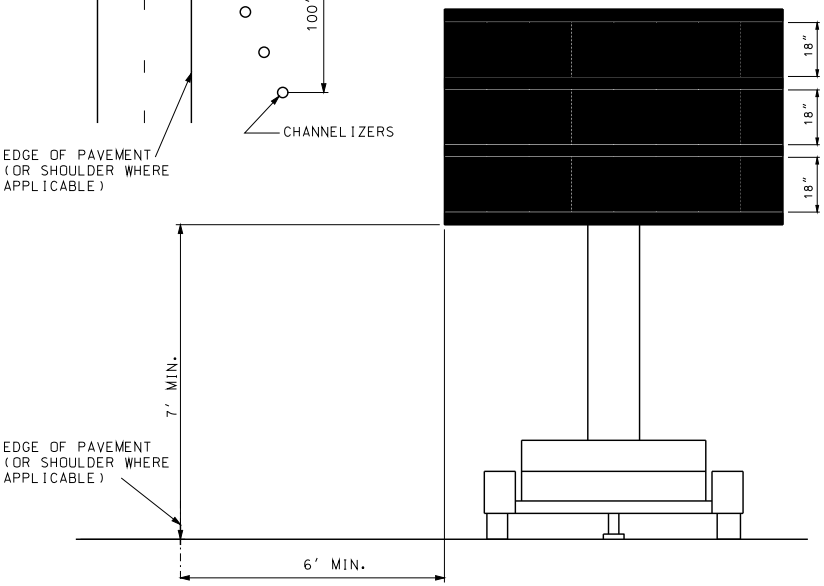
(1) LENGTH OF TIME THAT INSTANTANEOUS INTENSITY IS EQUAL TO OR GREATER THAN EFFECTIVE INTENSITY.

(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.

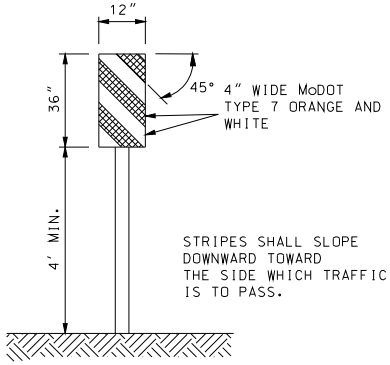
PORTABLE WARNING LIGHTS SHALL BE BATTERY- OR SOLAR-POWERED.



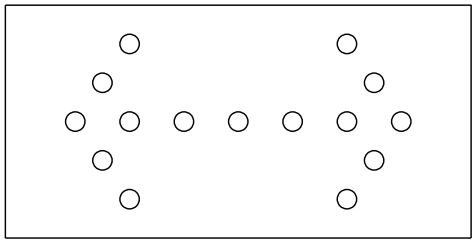
* 5 CHANNELIZERS AT 20' INTERVALS. CHANNELIZERS MAY BE OMITTED WHERE THE CHANGEABLE MESSAGE SIGN IS LOCATED 15' OR MORE FROM THE EDGE OF ANY SHOULDER (EDGE OF ROADWAY WHOULD THERE BE NO SHOULDER), BEYOND THE DITCH LINE, OR BEHIND A CURB OR PHYSICAL BARRIER.



CHANGEABLE MESSAGE SIGN



TYPE 3 OBJECT MARKERS



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.

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TEMPORARY TRAFFIC CONTROL DEVICES

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

616.10AM

SHEET NO. 4 OF 9

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

LOCATION OF ACTIVITY (I.E. WORKERS, EQUIPMENT, MATERIAL) OR TYPE OF OPERATION	POSTED SPEED GREATER THAN 55 MPH		POSTED SPEED LESS THAN OR EQUAL TO 55 MPH	
	PROTECTED	UNPROTECTED	PROTECTED	UNPROTECTED
MULTILANE FACILITY				
BEYOND 30' OF EOTP	POSTED	POSTED	POSTED	POSTED
10' TO 30' OF EOTP	POSTED	POSTED-10	POSTED	POSTED
WITHIN 10' OF EOTP	POSTED	POSTED-10	POSTED	POSTED-10
IN TRAFFIC LANE	POSTED-10	POSTED-20 (MIN. 45 MPH)	POSTED-10	POSTED-10
HEAD-TO-HEAD	POSTED-10	POSTED-10	POSTED-10	POSTED-10
2-LANE / 2-WAY OPERATION				
BEYOND 30' OF EOTP	POSTED	POSTED	POSTED	POSTED
10' TO 30' OF EOTP	POSTED	POSTED-10 (MIN. 55 MPH)	POSTED	POSTED
WITHIN 10' OF EOTP	POSTED	POSTED-20 (MIN. 45 MPH)	POSTED	POSTED-10
1 LANE / 2 WAY OPERATION	35 MPH *			
TEMPORARY CLOSURE WITH FLAGGER	35 MPH *			

* CONDITIONS MAY ALLOW FOR SPEEDS GREATER THAN 35 MPH.

LEGEND:

"EOTP" = EDGE OF THROUGH PAVEMENT

"PROTECTED" INDICATES THAT ACTIVITY IS PHYSICALLY SHIELDED BY A CRASH-WORTHY DEVICE (TRAFFIC BARRIER, GUARDRAIL, IMPACT ATTENUATORS, ETC.).

"UNPROTECTED" INDICATES THAT ACTIVITY IS NOT SHIELDED BY A CRASH-WORTHY DEVICE. IT MAY ONLY BE DELINEATED BY CHANNELIZING DEVICES OR PAVEMENT MARKINGS.

"POSTED" INDICATES POSTED (EXISTING) SPEED PRIOR TO WORK ACTIVITY.

"POSTED-XX" INDICATES A REDUCTION IN THE SPEED LIMIT BY THE AMOUNT SHOWN IN MPH.

"MULTILANE FACILITY" OR "2-LANE/2-WAY OPERATION" INDICATES EXISTING GEOMETRICS PRIOR TO WORK ACTIVITY.

WORK ZONE SPEED LIMIT

GENERAL NOTES:

REDUCED SPEEDS SHALL NOT BE BELOW 35 MPH EXCEPT WHEN LOCAL ORDINANCE PROVIDES FOR A LOWER SPEED. THE LOWER SPEED SHALL BE USED WHEN APPLICABLE.

ON DIVIDED HIGHWAYS, THE REDUCED SPEED IS APPLICABLE TO THE AFFECTED DIRECTION OF TRAVEL ONLY.

IF A SPEED REDUCTION IS USED, EXISTING SPEED LIMIT SIGNS WITHIN THE WORK ZONE SHALL BE COVERED OR REMOVED. SPEED LIMIT SIGNS INDICATING THE NORMAL SPEED LIMIT SHALL BE INSTALLED AT THE END OF THE WORK ZONE. PROVIDED NO FURTHER WORK ZONES WILL BE ENCOUNTERED WITHIN THE NEXT ½ MILE.

IF THERE ARE GEOMETRICS IN THE WORK ZONE THAT REQUIRE A LOWER SPEED THAN THE SPEED INDICATED IN THE CHART (I.E. TEMPORARY BYPASSES, NARROW LANES, ETC.), APPROPRIATE WARNING SIGNS WITH ADVISORY SPEED PLAQUES SHALL BE USED TO ADVISE OF THIS SPECIALIZED SITUATION.

TEMPORARY SPEED LIMIT SIGNS AND SPEED LIMIT XX AHEAD SIGNS SHALL BE COVERED OR REMOVED WHEN THE CONDITIONS REQUIRING REDUCED SPEEDS DO NOT EXIST.

SPECIAL ACTIVITY WITHIN A WORK ZONE MAY REQUIRE A LOWER SPEED LIMIT THAN THE GENERAL WORK ZONE SPEED LIMIT. THE FURTHER REDUCED SPEED LIMIT SHALL BE EFFECTIVE ONLY FOR THE DURATION OF THAT ACTIVITY AND ONLY FOR THE SPECIFIC AREA OF THAT ACTIVITY.

FOR SPEED REDUCTIONS GREATER THAN 20 MPH, THE SPEED LIMIT SHOULD BE REDUCED IN 2 STAGES.

DEVIATIONS FROM THIS CHART SHALL BE DOCUMENTED.

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

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TEMPORARY TRAFFIC CONTROL DEVICES

WORK ZONE SPEED LIMITS

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

616.10AM

SHEET NO. 5 OF 9

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

WARNING SIGNS

SIGN	SIZE (IN.)	AREA (SQ. FT.)	COLOR SYM. LEG. BRD.	COLOR BACK GROUND	SHEETING	DESCRIPTION	
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.

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

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TEMPORARY TRAFFIC CONTROL DEVICES

WARNING SIGNS

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

616.10AM

SHEET NO. 6 OF 9

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

WARNING SIGNS

SIGN	SIZE (IN.)	AREA (SQ. FT.)	COLOR SYM. LEG. BRD.	COLOR BACK GROUND	SHEETING	DESCRIPTION	
W020-5a	48X48	16.00	BK	OR	MoDOT FL. OR	RIGHT/CENTER/LEFT TWO LANES CLOSED AHEAD	(4)
W020-6a	48X48	16.00	BK	OR	MoDOT FL. OR	RIGHT/CENTER/LEFT LANE CLOSED	(3)(4)
W020-7a	48X48	16.00	BK	OR	MoDOT FL. OR	FLAGGER (SYMBOL) WITH FLAGS	
W021-2	36X36	9.00	BK	OR	MoDOT FL. OR	FRESH OIL	
W021-5b	48X48	16.00	BK	OR	MoDOT FL. OR	SHOULDER WORK AHEAD	(3)
W022-1	48X48	16.00	BK	OR	MoDOT FL. OR	BLASTING ZONE AHEAD	
W022-2	42X36	10.50	BK	OR	MoDOT FL. OR	TURN OFF 2-WAY RADIO AND PHONE	
W022-3	42X36	10.50	BK	OR	MoDOT FL. OR	END BLASTING ZONE	
W022-6e	**21X15**	**2.19**	**BK**	**OR**	**MoDOT FL. OR**	**WET PAINT (ARROW PIVOTS)**	(3)
SPECIAL	48X48	16.00	BK	OR	MoDOT FL. OR	GROOVED PAVEMENT AHEAD	(3)

GUIDE SIGNS

E05-1	36X48	12.00	BK	OR	MoDOT FL. OR	GORE EXIT	(3)
G020-1	60X24	10.00	BK	OR	MoDOT FL. OR	ROAD WORK NEXT XX MILES	
G020-2	48X24	8.00	BK	OR	MoDOT FL. OR	END ROAD WORK	
G020-4	36X18	4.50	BK	OR	MoDOT FL. OR	PILOT CAR FOLLOW ME	
SPECIAL	42X30	8.75	BK	OR	MoDOT FL. OR	PLEASE WAIT FOR PILOT CAR	(3)
G023-1	36X12	3.00	BK	OR	MoDOT FL. OR	WORK ZONE (PLAQUE)	(3) (5)
M04-8a	24X18	3.00	BK	OR	MoDOT FL. OR	END DETOUR	
M04-9L	48X36	12.00	BK	OR	MoDOT FL. OR	DETOUR (LEFT ARROW)	
M04-9R	48X36	12.00	BK	OR	MoDOT FL. OR	DETOUR (RIGHT ARROW)	
M04-10L	48X18	6.00	BK	OR	MoDOT FL. OR	DETOUR (ARROW LEFT)	
M04-10R	48X18	6.00	BK	OR	MoDOT FL. OR	DETOUR (ARROW RIGHT)	

REGULATORY SIGNS

R1-1	48X48	13.25	WH	RD	MoDOT TYPE 3	STOP
R1-2	48 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.

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(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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STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

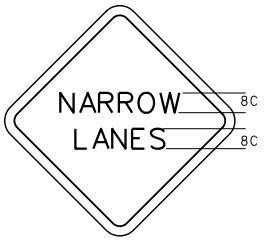
TEMPORARY TRAFFIC CONTROL DEVICES

WARNING, GUIDE AND REGULATORY SIGNS

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

616.10AM

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



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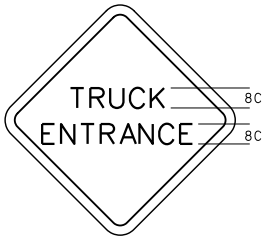
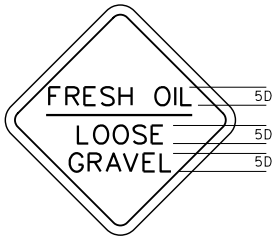


W08-6c (3)

W012-2x (3)



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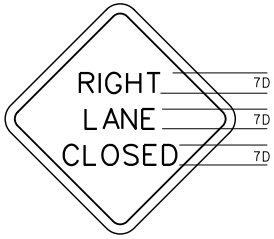

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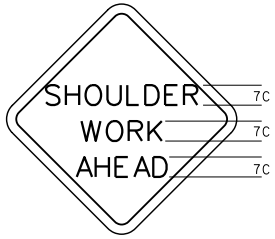

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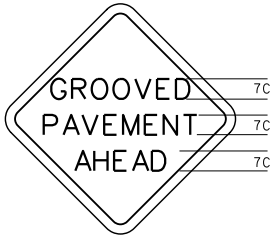

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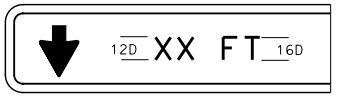

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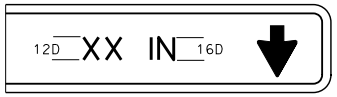

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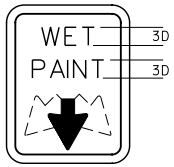
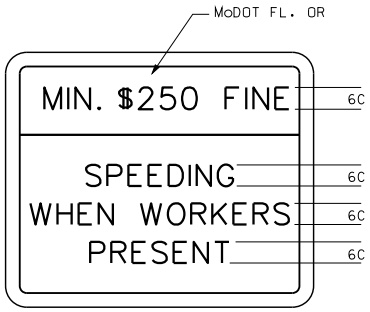


W022-6e (3)

G023-1 (3)

SPECIAL (3)

SPECIAL (3)



CONST-3A (3)

CONST-3X (3)

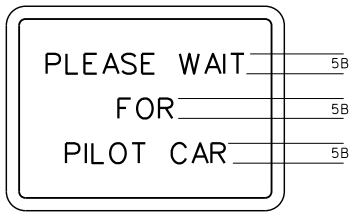
(1) SIGN DEPICTION, ARROW, BORDERS AND SPACING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.

(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.



SPECIAL (3)

GENERAL NOTES:

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

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

NO ADDITIONAL PAYMENT WILL BE MADE FOR PLATES.

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

LETTER DIMENSIONS SHALL BE AS SHOWN.

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

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TEMPORARY TRAFFIC CONTROL DEVICES

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

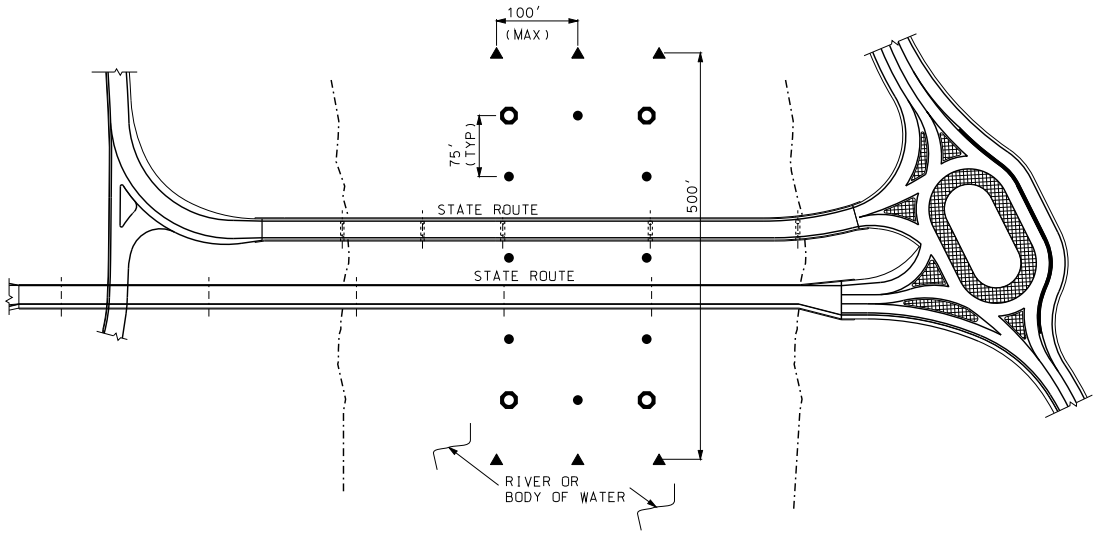
616.10AM

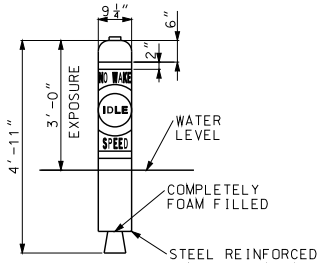
SHEET NO. 8 OF 9

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

LEGEND

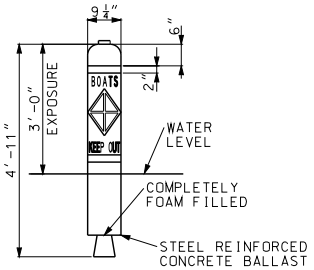
- ○ – BOATS KEEP OUT (SIGN)
- ● – BOATS KEEP OUT (BUOY)
- ▲ – NO WAKE (BUOY)





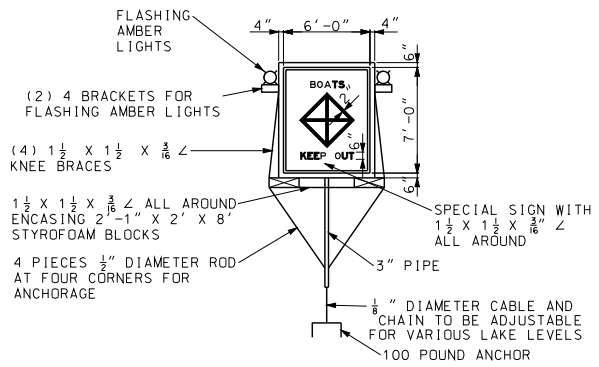
51 POUND ANCHOR
TACKLE PERMITTED

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



51 POUND ANCHOR
TACKLE PERMITTED

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

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

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TEMPORARY TRAFFIC CONTROL DEVICES

TRAFFIC CONTROL FOR WATERWAYS

DATE EFFECTIVE:	11/01/2010	616.10AM	SHEET NO. 9 OF 9
DATE PREPARED:	9/3/2010		

A = WIDTH AS SPECIFIED IN PLANS.

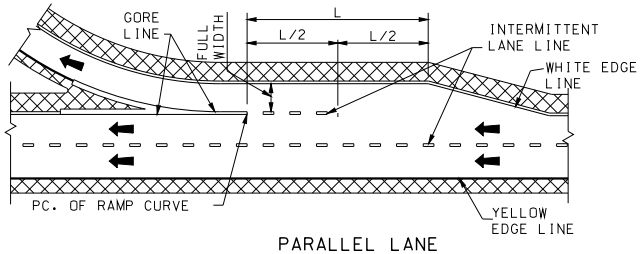
L = S x W WHEN POSTED SPEED 45 MPH OR GREATER OR WS^2 /60 WHEN POSTED SPEED IS 40 MPH OR LESS.

L = LENGTH OF TAPER IN FEET.

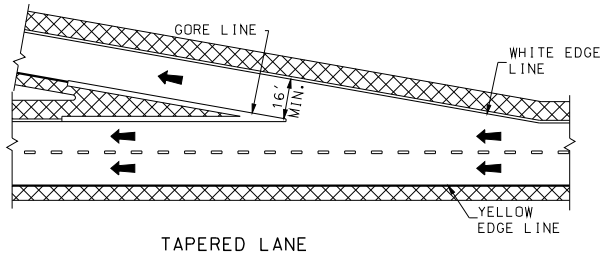
S = OFF PEAK 85 PERCENTILE SPEED IN MPH.

W = OFFSET DISTANCE IN FEET.

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

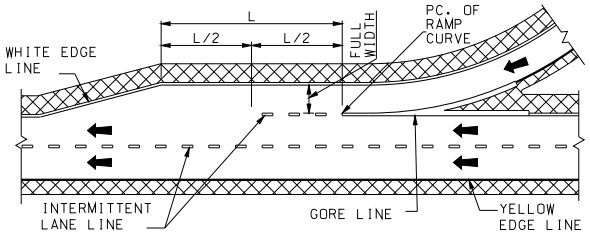


PARALLEL LANE

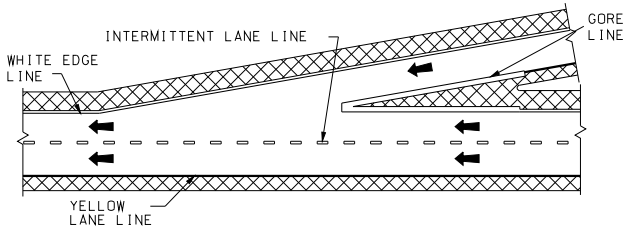


TAPERED LANE

EXIT RAMP MARKING

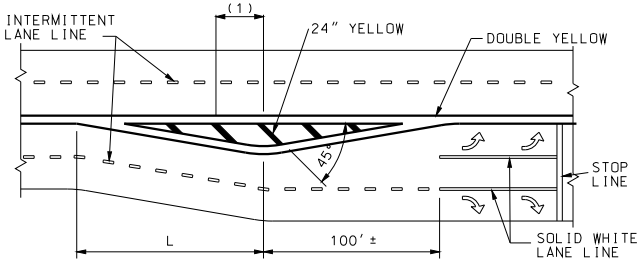


PARALLEL LANE

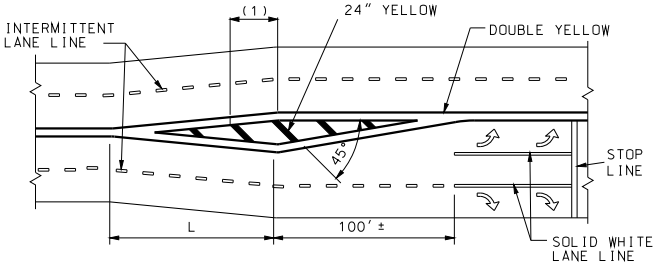


TAPERED LANE

ENTRANCE RAMP MARKING



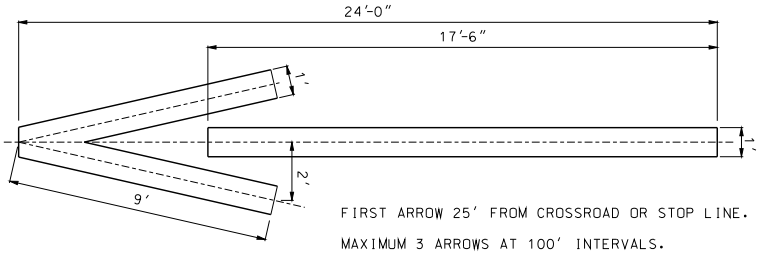
OFFSET ONE LANE



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.



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.

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

"NO PASSING" LINES SHALL BE CONTINUOUS SOLID YELLOW.

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

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

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

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

ARROWS AND WORD SYMBOLS SHALL BE SOLID WHITE.

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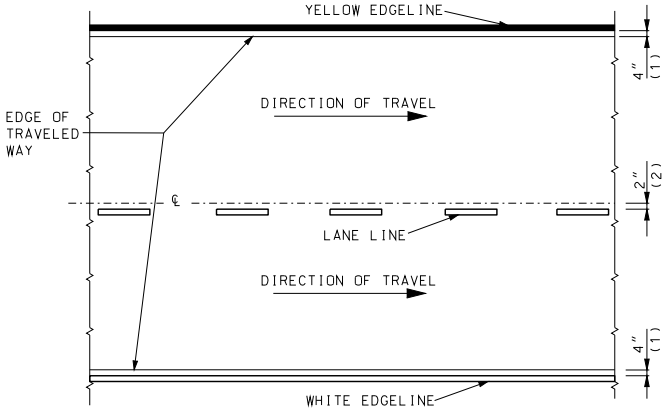
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

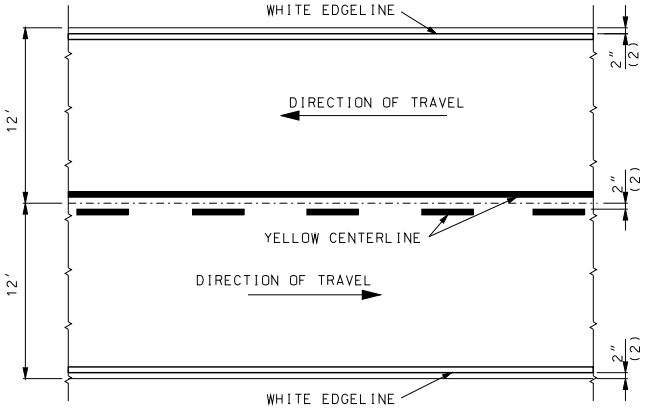
PAVEMENT MARKING

DATE EFFECTIVE:	12/01/2009	620.00J	SHEET NO. 1 OF 5
DATE PREPARED:	10/15/2009		

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

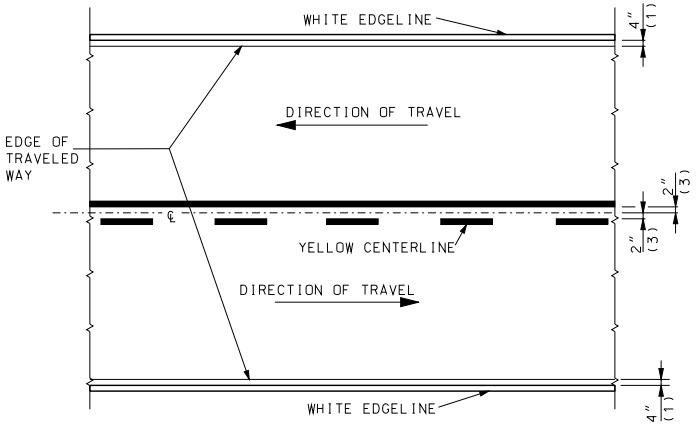


DIVIDED PAVEMENT



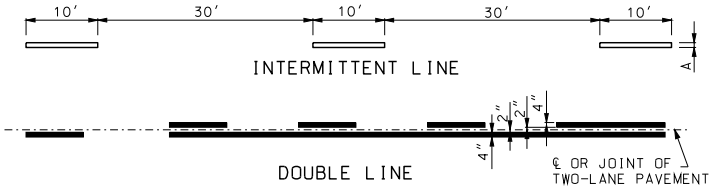
TWO-LANE TWO-WAY

TYPICAL STRIPING OFFSETS WITHOUT RUMBLE STRIPES



TWO-LANE TWO-WAY

TYPICAL STRIPING OFFSETS FOR RUMBLE STRIPES



DOUBLE LINE

LINE DETAIL

LEGEND
WHITE LINE
YELLOW LINE

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

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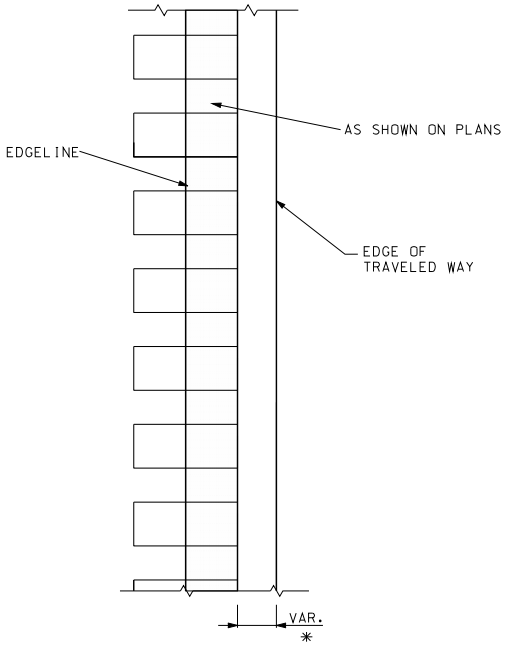
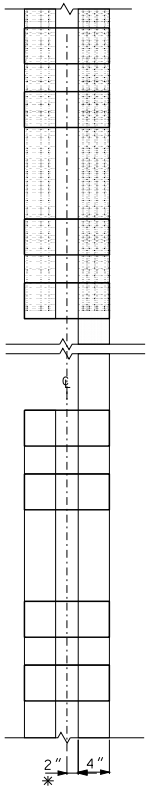
620.00J

SHEET NO. 2 OF 5



FOR SHOULDERS



2 WAY 2 LANE

(SEE TYPICAL STRIPING
FOR RUMBLESTRIPS)

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

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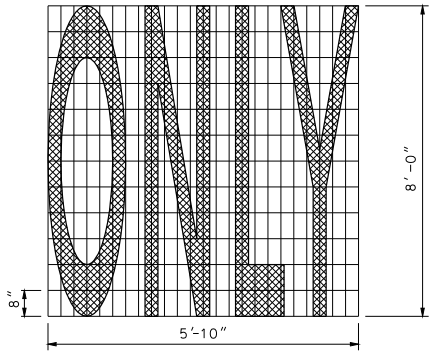
PAVEMENT MARKING
STRIPING THROUGH
RUMBLE STRIPS

DATE EFFECTIVE: 12/01/2009
DATE PREPARED: 10/15/2009

620.00H

SHEET NO.
3 OF 5

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



WORD MARKING

ELONGATED WORD & SYMBOL

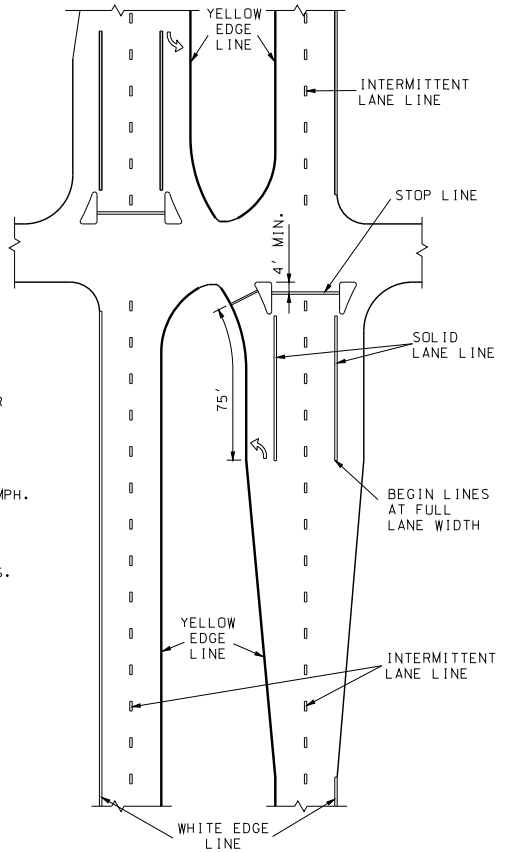
L = S x W WHEN POSTED SPEED 45 MPH OR GREATER OR WS^2 /60 WHEN POSTED SPEED IS 40 MPH OR LESS.

L = LENGTH OF TAPER IN FEET.

S = OFF PEAK 85 PERCENTILE SPEED IN MPH.

W = OFFSET DISTANCE IN FEET.

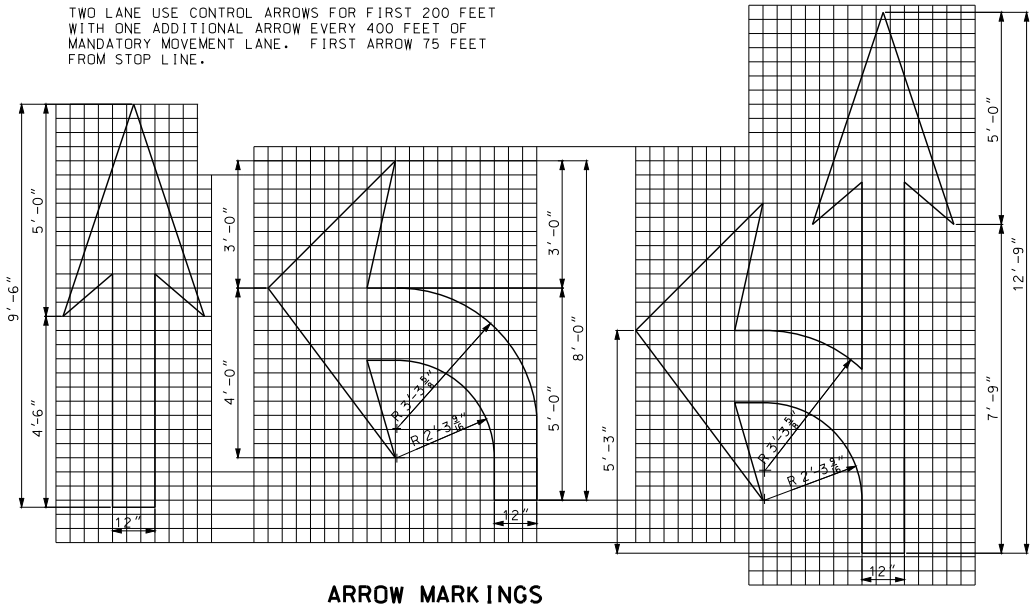
DISTANCE (L) SHALL BE EXTENDED AS REQUIRED BY SIGHT DISTANCE CONDITIONS.



SIGNALIZED GRADE

INTERSECTION MARKING

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

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

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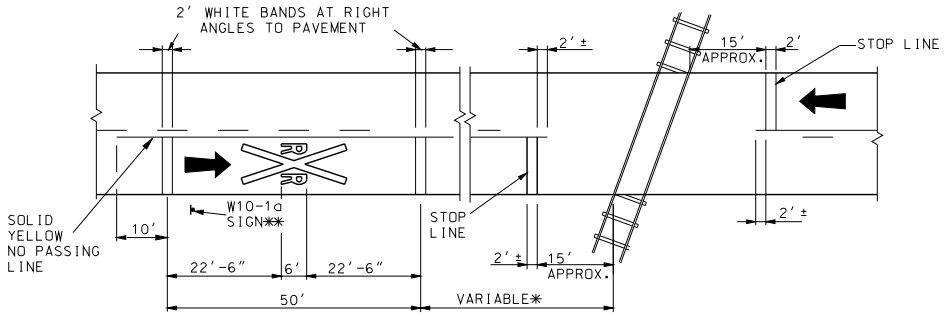
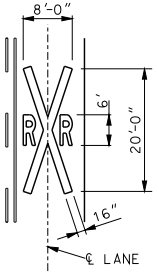
620.00J

SHEET NO. 4 OF 5

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



PAVEMENT DETAIL

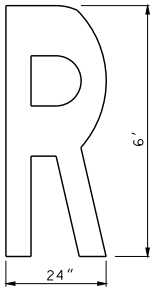


SYMBOL DETAIL

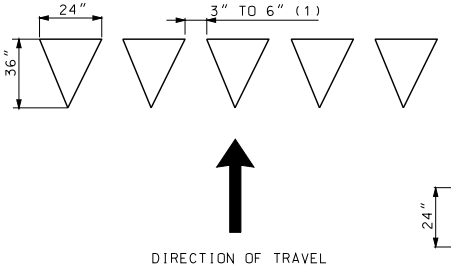
* THE DISTANCE FROM THE RAILROAD CROSSING MARKING TO THE NEAREST TRACK WILL VARY ACCORDING TO THE APPROACH SPEED AND THE SIGHT DISTANCE OF THE VEHICULAR TRAFFIC APPROACHING, BUT SHALL BE NO LESS THAN 50 FEET.
A THREE-LANE ROADWAY SHALL BE MARKED WITH A CENTERLINE FOR TWO-LANE APPROACH OPERATION ON THE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

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

RAILROAD GRADE CROSSING

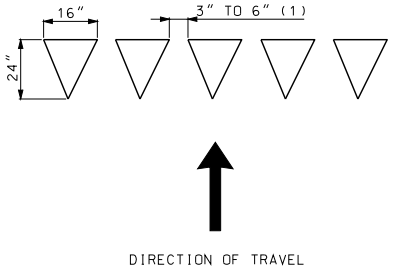


LETTER DETAIL



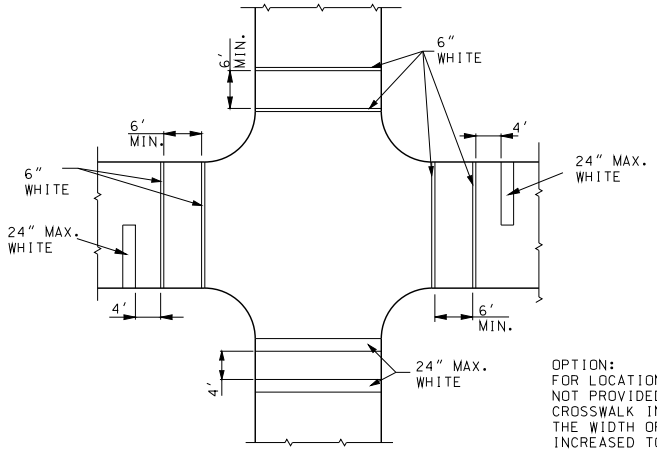
24 INCH YIELD LINE TRIANGLES

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



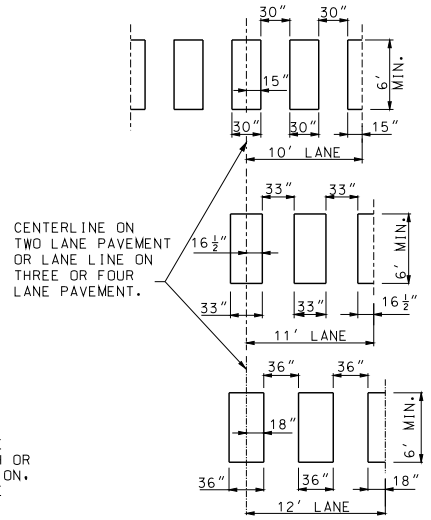
16 INCH YIELD LINE TRIANGLES

YIELD LINE TRIANGLES



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.



WHITE MIDBLOCK (ZEBRA)

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PAVEMENT MARKING

DATE EFFECTIVE: 12/01/2009
DATE PREPARED: 10/15/2009

620.00J

SHEET NO. 5 OF 5

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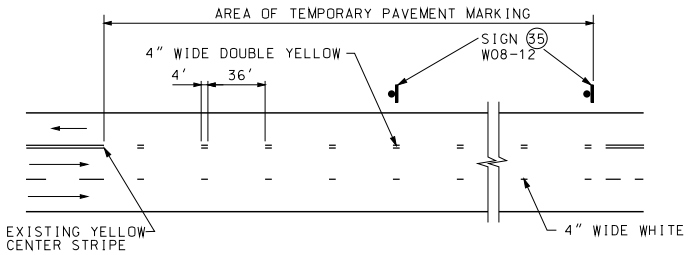
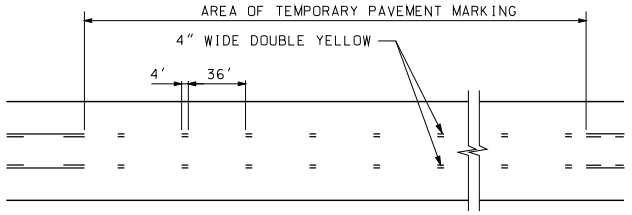
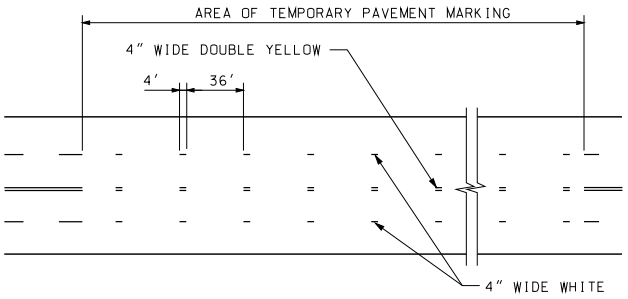


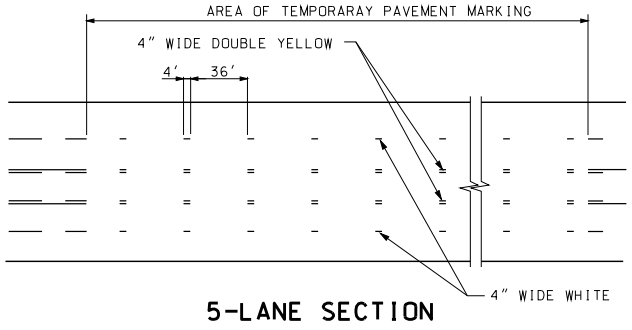
2-LANE SECTION WITH AUXILARY LANE



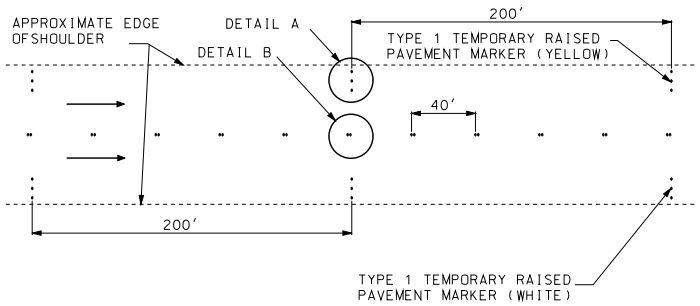
3-LANE SECTION



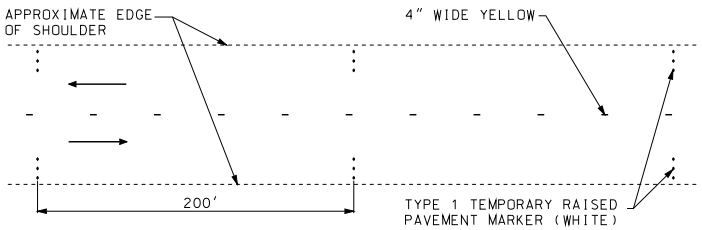
4-LANE SECTION



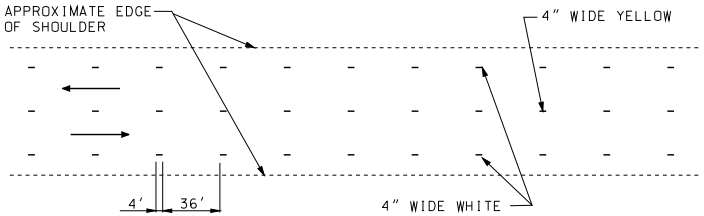
5-LANE SECTION



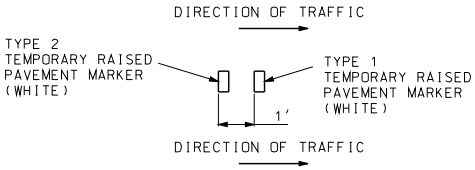
EDGE LINES ON MULTILANE DIVIDED SECTIONS



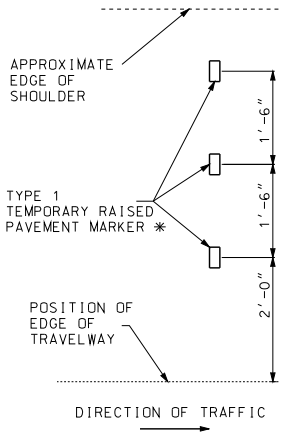
EDGE LINES ON TWO-WAY SECTIONS WITH PAVED SHOULDERS GREATER THAN 4 FEET WIDE



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



DETAIL B



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.

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)

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

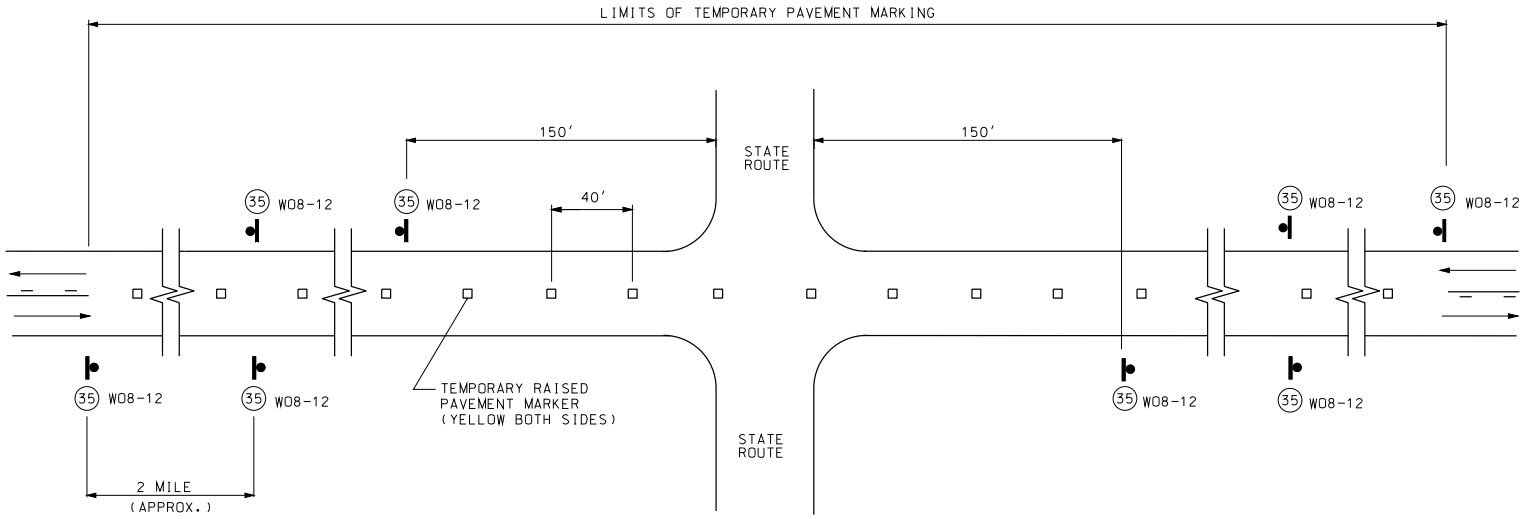
TEMPORARY PAVEMENT MARKING

TEMPORARY PAVEMENT MARKING

DATE EFFECTIVE: 10/01/2008
DATE PREPARED: 9/3/2010

620.10B

SHEET NO. 1 OF 4



SIGN (35) W-08-12

GENERAL NOTES:

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

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

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

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TEMPORARY PAVEMENT MARKING

TWO-LANE TWO-WAY HIGHWAY

DATE EFFECTIVE:	DATE PREPARED:		SHEET NO.
10/01/2008	9/3/2010	620.10B	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 PROVIDEDBY 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.

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STATE OF MISSOURI
DENNIS W. HECKMAN
NUMBER PE-27141
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

CONCRETE BOX CULVERT

EXTERIOR WING REINFORCEMENT
(HS20 & HS20 MOD. LOADING)

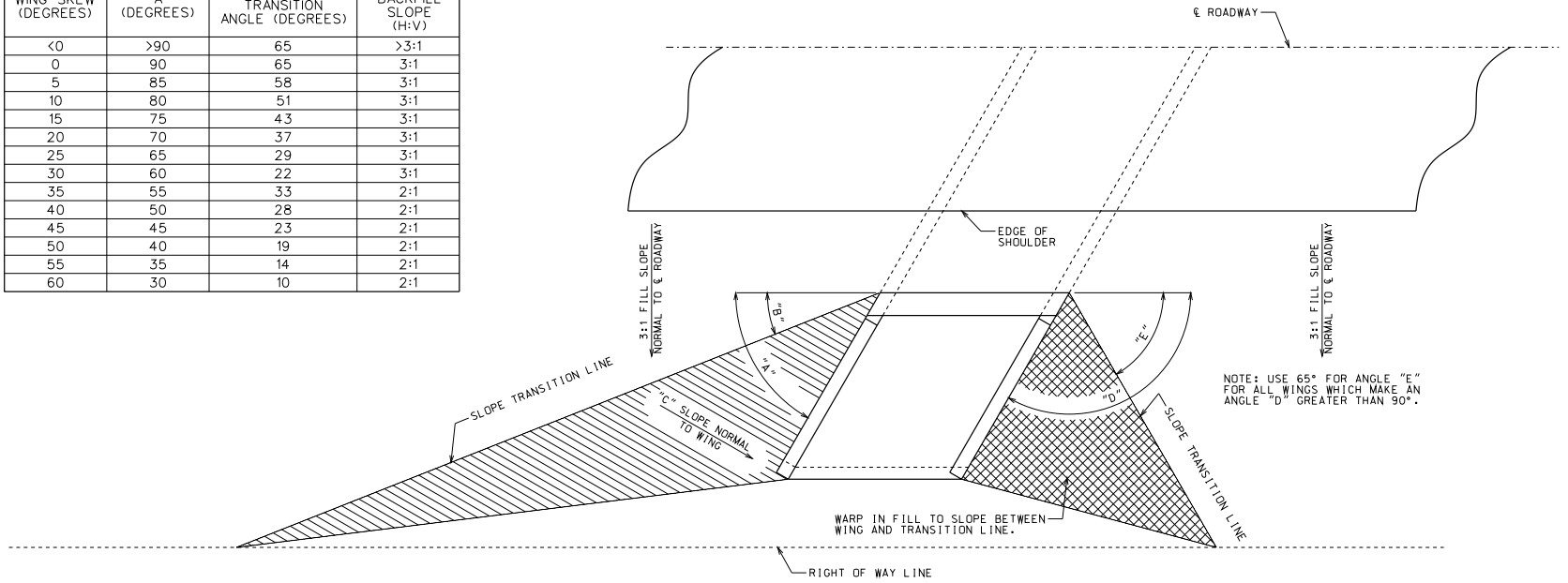
DATE EFFECTIVE: 10-01-2009
DATE PREPARED: 10/28/2009

703.37B

SHEET NO. 1 OF 2

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

WING BACKFILL TABLE			
WING SKEW (DEGREES)	"A" (DEGREES)	"B" TRANSITION ANGLE (DEGREES)	"C" BACKFILL SLOPE (H:V)
<0	>90	65	>3:1
0	90	65	3:1
5	85	58	3:1
10	80	51	3:1
15	75	43	3:1
20	70	37	3:1
25	65	29	3:1
30	60	22	3:1
35	55	33	2:1
40	50	28	2:1
45	45	23	2:1
50	40	19	2:1
55	35	14	2:1
60	30	10	2:1



PLAN OF WINGS AND SLOPE TRANSITION LINES

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

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105 WEST CAPITOL
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STATE OF MISSOURI
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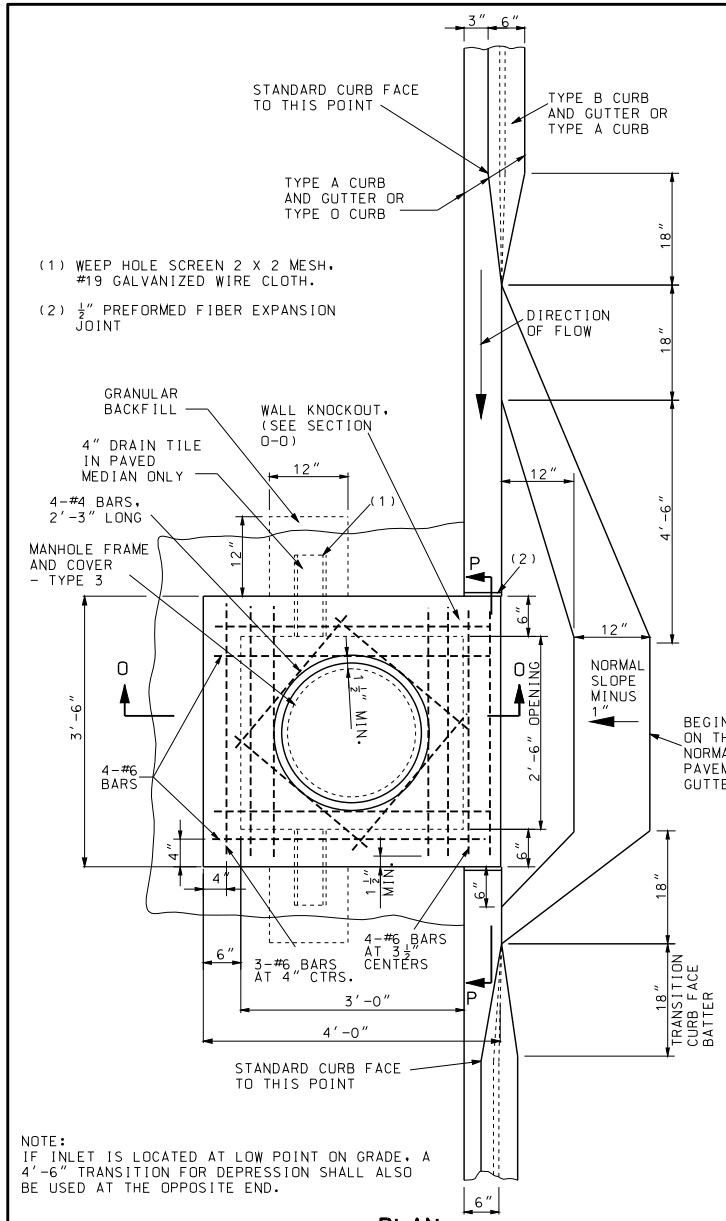
CONCRETE BOX CULVERT

EXTERIOR WING BACKFILL SLOPE TRANSITION

DATE EFFECTIVE: 10-01-2009
DATE PREPARED: 10/29/2009

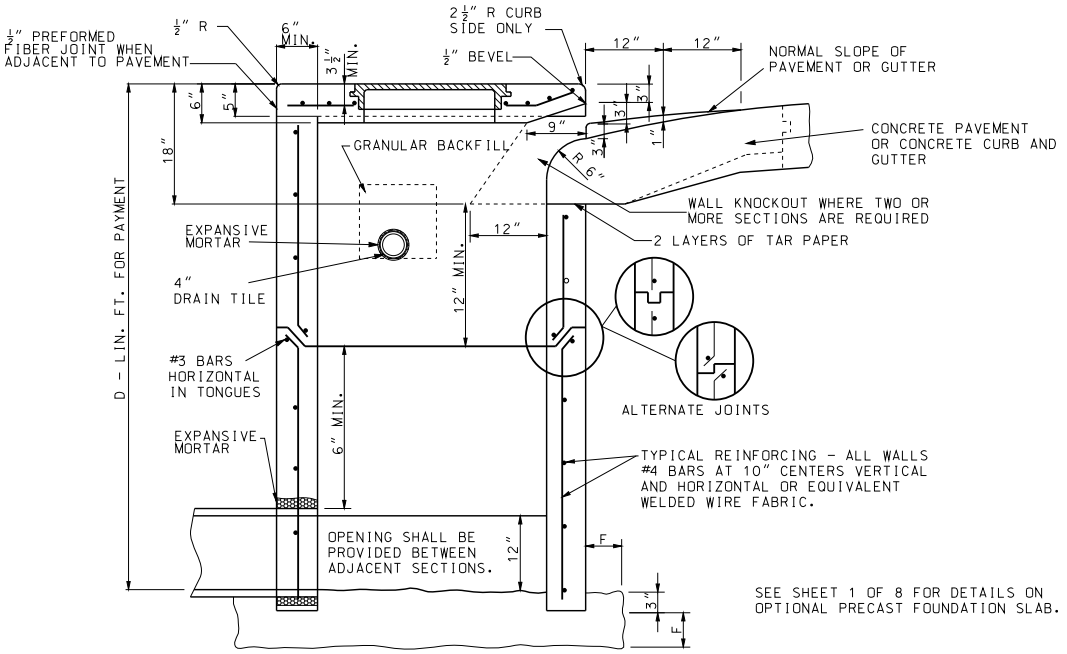
703.37B

SHEET NO. 2 OF 2

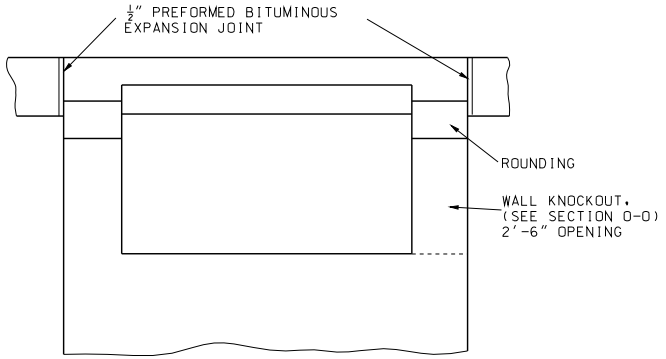


PLAN

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

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

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105 WEST CAPITOL
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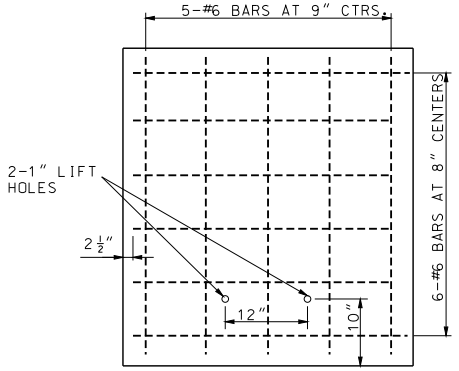
STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

PRECAST DROP INLET
CURB INLET - TYPE T

DATE EFFECTIVE: 12/01/2005
DATE PREPARED: 9/3/2010

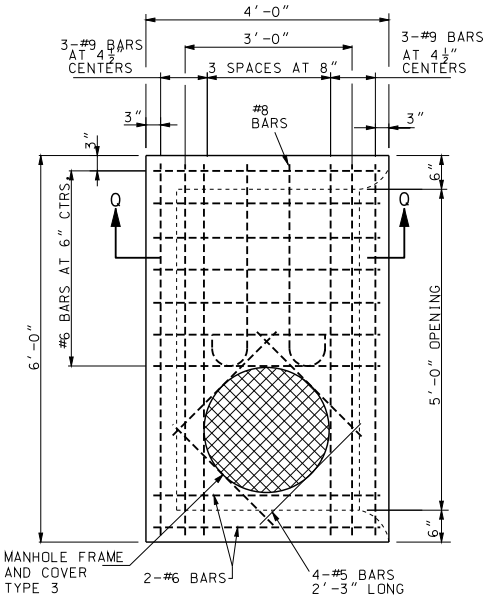
731.10R

SHEET NO. 5 OF 8

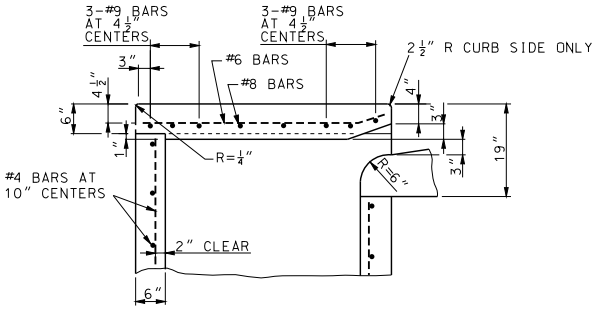


NOTE: REINFORCING FOR LIDS ON UPSTREAM SECTIONS.

LID FOR ADJACENT SECTIONS



PLAN



SECTION Q-Q

OPTIONAL PRECAST CURB INLET 5'-0" OPENING

OTHER DETAILS ARESAME 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 OPEING SECTION MAY BE PROVIDED AT THE CONTRACTOR'S OPTION.

SEE SHEET 1 FOR STEP DETAILS AND SHEET 4 FOR GENERAL NOTES.

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STATE OF MISSOURI
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NUMBER PE-23751
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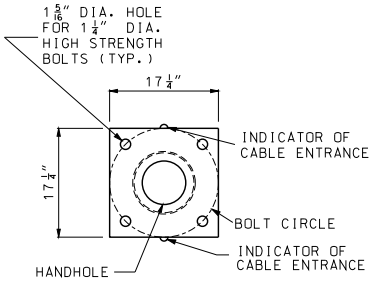
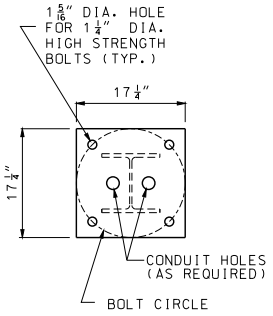
PRECAST DROP INLET
CURB INLET - TYPE T

DATE EFFECTIVE:	12/01/2005	731.10R	SHEET NO. 6 OF 8
DATE PREPARED:	9/3/2010		

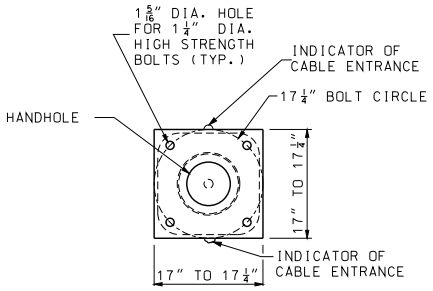
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PLAN

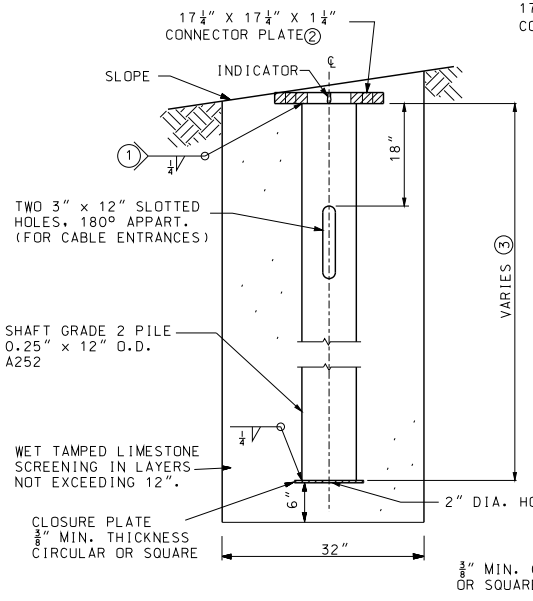


PLAN



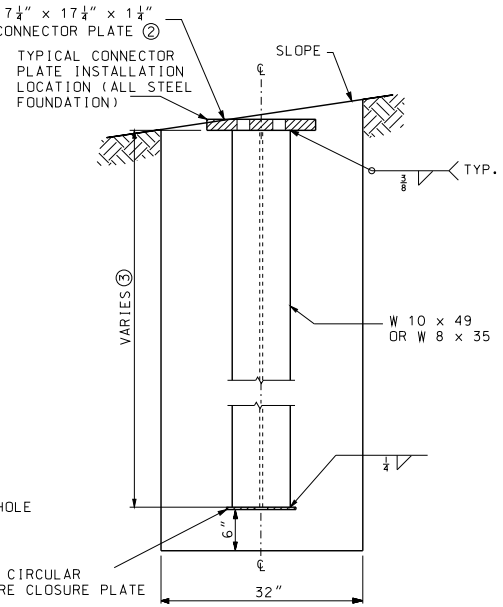
PLAN

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



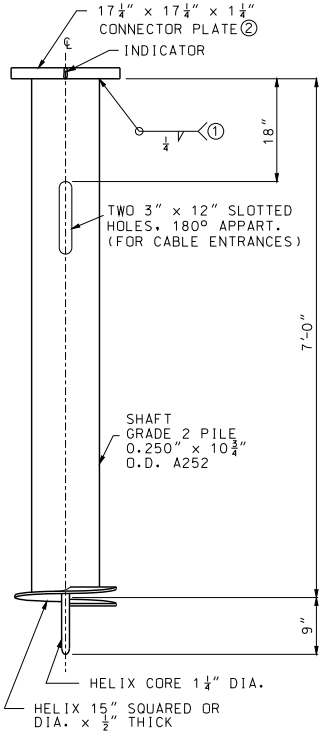
ELEVATION

DETAILS OF CIRCULAR STEEL PILE FOUNDATION



ELEVATION

DETAILS OF STEEL "H" PILE FOUNDATION



ELEVATION

DETAILS OF SCREW ANCHOR FOUNDATION

(1) GRIND WELD AS NECESSARY TO CLEAR BOLT HEAD.

(2) FOUNDATIONS SHALL BE INSTALLED SO THAT CONNECTOR PLATES ARE LEVEL PERPENDICULAR TO THE BRACKET ARM AND SLOPED FOR POLE RAKING PARALLEL TO THE BRACKET ARM.

(3) PILE LENGTHS FOR STEEL PILE FOUNDATIONS:

AT-45 DESIGN NO.	PILE LENGTH
4 & 5	8'-0"
2 & 3	9'-0"
1	10'-0"

GENERAL NOTES:

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

ALL BOLT CIRCLES FOR 45' MOUNTING HEIGHT SHALL BE 17-1/4".

ALL 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.

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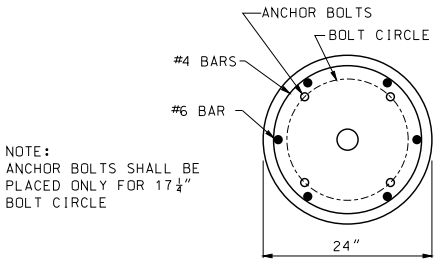
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY LIGHTING

POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT

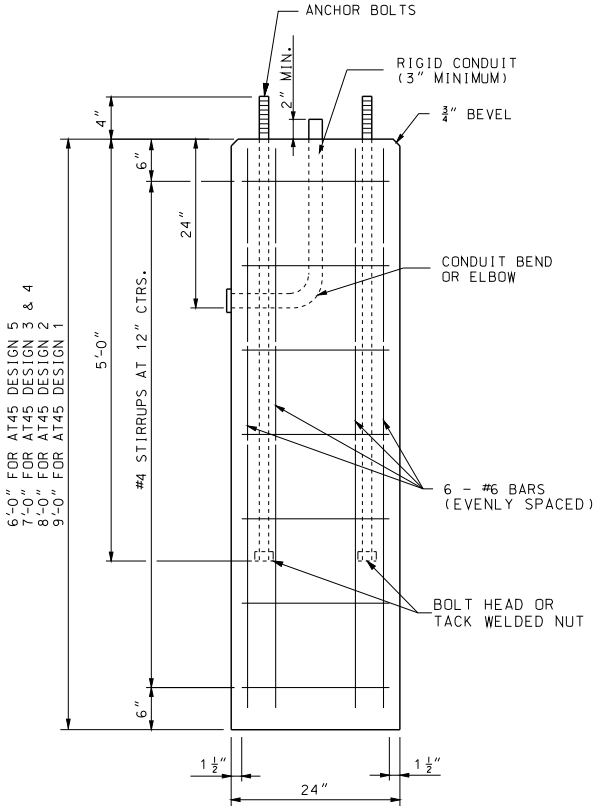
DATE EFFECTIVE:	06/01/2009	901.01AF	SHEET NO. 5 OF 6
DATE PREPARED:	4/1/2010		

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



NOTE:
ANCHOR BOLTS SHALL BE PLACED ONLY FOR 17¼" BOLT CIRCLE

PLAN

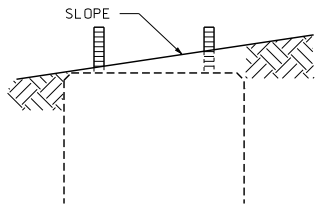


ELEVATION

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		
	CONC.	REINF.
HEIGHT	CU. YD.	LBS.
6'-0"	.70	80
7'-0"	.81	90
8'-0"	.93	104
9'-0"	1.05	120



CONCRETE FOUNDATION EMBEDMENT

GENERAL NOTES:

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

ALL BOLT CIRCLES FOR 45' MOUNTING HEIGHT SHALL BE 17-1/4".

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

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

ALL STEEL COMPONENTS SHALL BE HOT DIP GALVANIZED.

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STATE OF MISSOURI
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NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

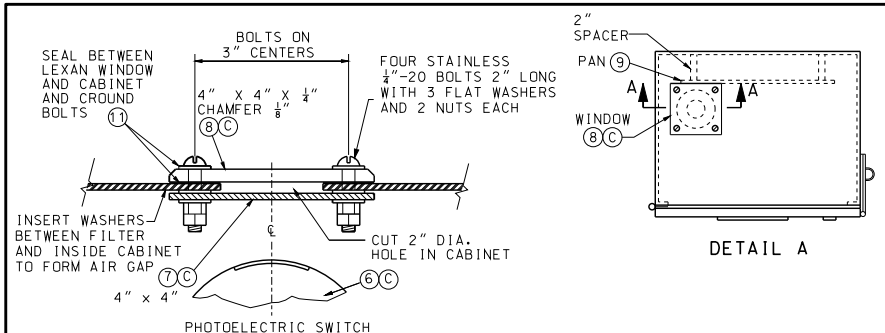
HIGHWAY LIGHTING
POLES, FOUNDATIONS AND APPURTENANCES FOR 45' MOUNTING HEIGHT

DATE EFFECTIVE: 06/01/2009
DATE PREPARED: 4/1/2010

901.01AF

SHEET NO. 6 OF 6

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



SECTION A-A
WINDOW DETAIL

DETAIL A

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

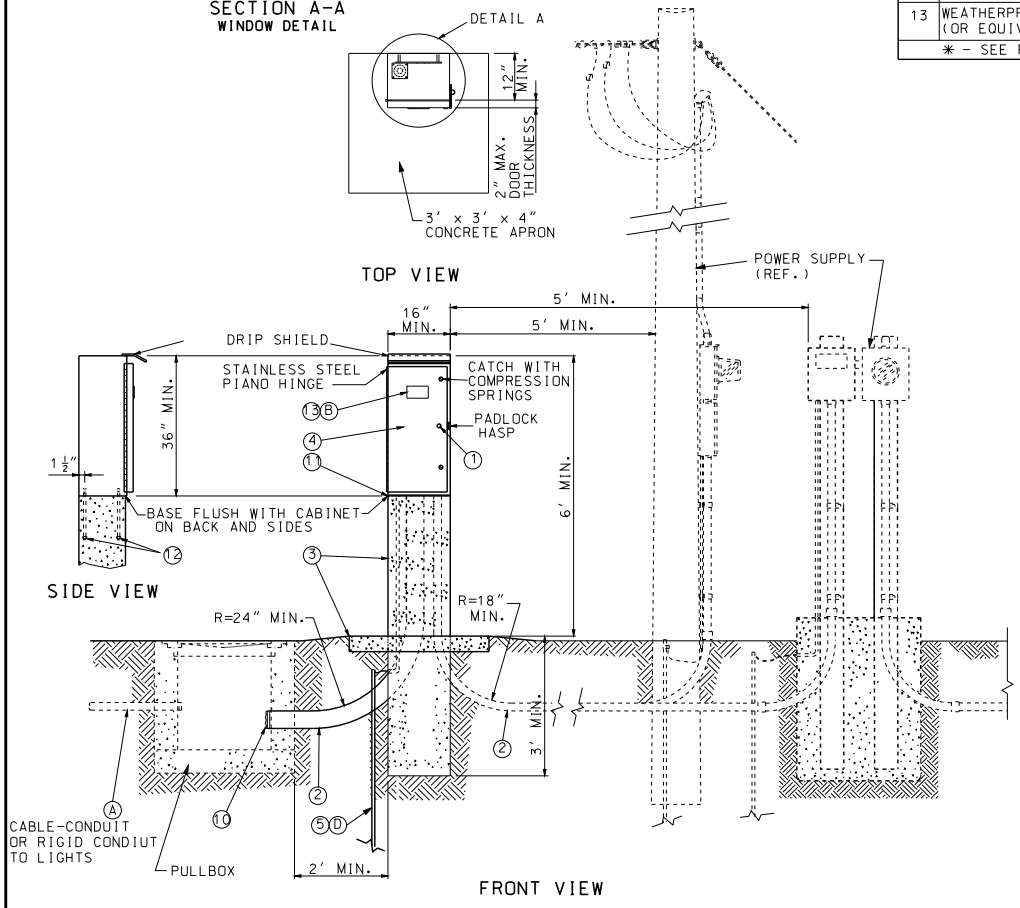
NOTES

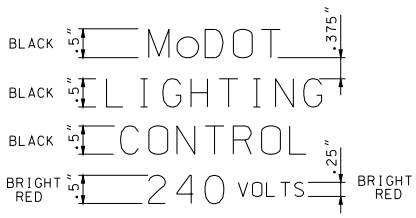
(A) IF CABLE-CONDUIT IS SPECIFIED, THE CONDUIT SHALL BE CUT AWAY FROM CABINET BETWEEN PULL BOX AND CONTROL STATION.

(B) LIGHTING SYSTEM VOLTAGE AS SPECIFIED ON PLANS.

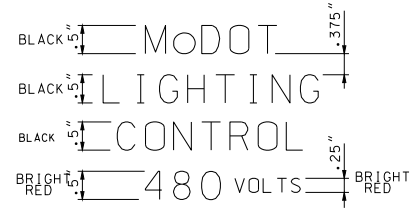
(C) PHOTOELECTRIC SWITCH BRACKETS MAY VARY. LOCATE CENTER OF WIDOW OVER CENTER OF PHOTOELECTRIC SWITCH.

(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.





LABEL DETAIL
(240 VOLT) (13)(B)



LABEL DETAIL
(480 VOLT) (13)(B)

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.

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

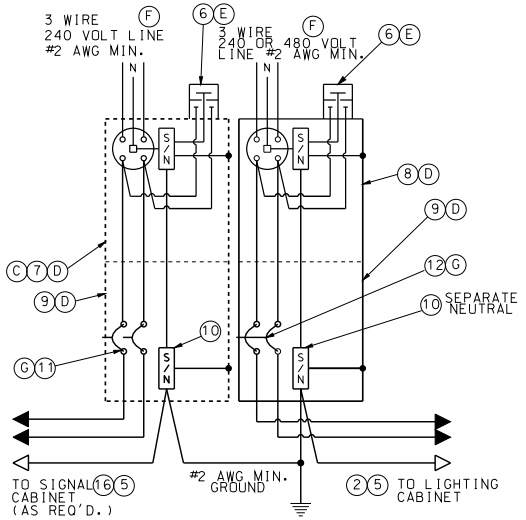
STATE OF MISSOURI
EILEEN H. RACKERS
NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY LIGHTING
BASE MOUNTED
CONTROL STATION
240 V OR 480 V - 4 CIRCUIT

DATE EFFECTIVE:	04/01/2005	901.30F	SHEET NO.
DATE PREPARED:	9/14/2010		1 OF 2

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

LIST OF MATERIALS	
ITEM	DESCRIPTION
1	SERVICE POLE 30' MIN.,CLASS 4 WOOD, CONTRACTOR PROVIDED, MoDOT OWNED*
2	#2 AWG MIN. CABLE, 600 VOLT *
3	SERVICE ENTRANCE HEAD
4	GUY CABLE, AS REQUIRED
5	RIGID CONDUIT, 2" MIN., WITH PREFORMED ELBOWS
6	LIGHTNING ARRESTER, VALVE TYPE, 2 POLE, 650 VOLT
7	METER SOCKET, 200 AMP, FOR SIGNALS
8	METER SOCKET, 200 AMP, FOR LIGHTING
9	LOCKING, RAINTIGHT, NEMA 4 SERVICE DISCONNECT BOX
10	INSULATED, GROUNDABLE NEUTRAL WIRE, 200 AMP MINIMUM
11	SIGNAL BREAKERS, SINGLE POLE, 40A MIN, TYPE A OR B *
12	LIGHTING BREAKER, 2 POLE, 240 VOLT, 100A, TYPE A OR B
13	1/2" METAL CONDUIT
14	#2 AWG MIN. GROUND WIRE
15	GROUND ROD, 3/4" x 8' MIN.
16	#8 AWG MIN. CABLE, 600 VOLT *
17	CLASS B CONCRETE, 0.92 C.Y.±
18	THREADED CONDUIT HUB WITH SEALING WASHERS
19	WEATHERPROOF ADHESIVE LABEL (LIGHTING), VINYL RAISED LETTERING (OR EQUIVALENT, SEE DETAIL)
20	WEATHERPROOF ADHESIVE LABEL (SIGNALS), VINYL RAISED LETTERING (OR EQUIVALENT, SEE DETAIL)
21	W6 x 9 OR W6 x 15 GALVANIZED POST
22	#2 AWG MIN. CABLE, 600 VOLT
23	RIGID CONDUIT, 2" MINIMUM
*	SEE PLANS



WIRING DIAGRAM

LIGHTING AND/OR SIGNALS

NOTES:

(A) SERVICE POLE SHALL BE GUYED WHEN SPAN OF OVERHEAD SERVICE WIRE EXCEEDS 50 FEET.

(B) INCREASE 1 FOOT FOR EACH 5 FEET ABOVE 30 FEET.

(C) SERVICE DISCONNECT BOXES AND METER BOXES SHALL BE ALUMINUM OR STAINLESS STEEL. ALL HARDWARE, HINGES, CATCHES, ETC. SHALL BE STAINLESS STEEL.METER SOCKET FOR SIGNALS OR LIGHTING AND OTHER EQUIPMENT AND MATERIALS SHALL BE U.L. APPROVED, AND CONFORM TO THE REQUIREMENTS OF THE UTILITY COMPANY OR MUNICIPALITY PROVIDING POWER.

(D) SCHEMATIC DIAGRAM SHALL BE MOUNTED ON INSIDE OF CABINET DOOR.

(E) UTILITY COMPANY SHALL DECIDE IF LIGHTNING ARRESTERS ARE TO BE CONNECTED ON THE LOAD OR LINE SIDE OF THE METER. THE UTILITY COMPANY SHALL ALSO DECIDE IF THE LIGHTNING ARRESTER IS TERMINATED IN THE METER OR DISCONNECT CABINET. IF TERMINATED IN THE DISCONNECT CABINET, IT SHALL BE INSTALLED ON THE DISCONNECT CABINET.

(F) LIGHTING SYSTEM VOLTAGE OF 240 VOLTS OR 480 VOLTS AS SHOWN ON THE PLANS.

(G) BREAKERS SHALL CONFORM TO SEC. 901.4 OF THE STANDARD SPECIFICATIONS.

(H) IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION, THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN. DEEP. CONNECTION TO GROUND ROD SHALL BE CADWELDED.

GENERAL NOTES:

FOR CABLE TYPES AND INSTALLATION, SEE STANDARD SPECIFICATIONS.

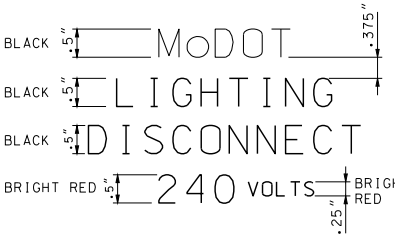
THE POWER SUPPLY ASSEMBLY TYPE IS SHOWN ON THE PLANS OR IS DESIGNATED IN THE CONTRACT.

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

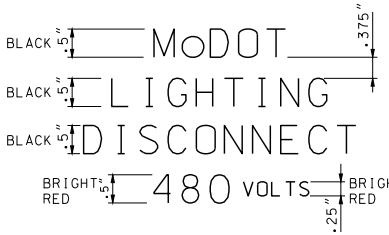
WHERE SIGNAL OR LIGHTING POWER ONLY IS DESIGNATED, OMIT ITEMS NOT REQUIRED.

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

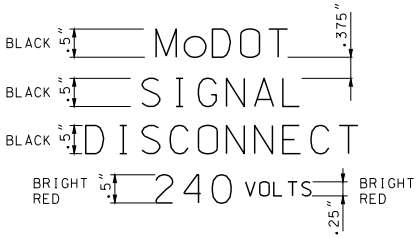
ALL MATERIALS REQUIRED AS SHOWN ON DRAWING, INCLUDING CABLE AND CONDUIT FROM POWER SUPPLY ASSEMBLY TO UTILITY COMPANY FACILITIES, SHALL BE INCLUDED IN UNIT BID PRICE FOR POWER SUPPLY ASSEMBLY.



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



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



LABEL DETAIL (20)

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

STATE OF MISSOURI
EILEEN H. RACKERS
NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY LIGHTING
POWER SUPPLY ASSEMBLY
SECONDARY SERVICE

DATE EFFECTIVE: 04/01/2002
DATE PREPARED: 4/1/2010

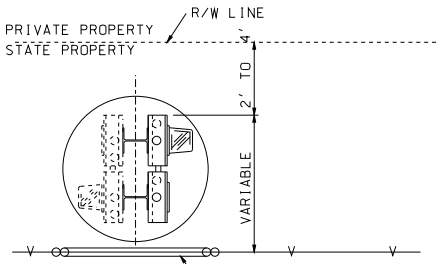
901.80D

SHEET NO. 1 OF 2

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

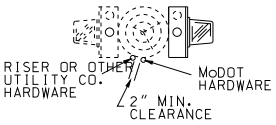
PEDESTAL OR NEW STATE-OWNED POLE TO BE SET WITHIN 2' TO 4' OF RIGHT-OF-WAY LINE.

ALL SERVICE POWER SUPPLY ASSEMBLIES ARE TO BE LOCATED ON STATE PROPERTY.

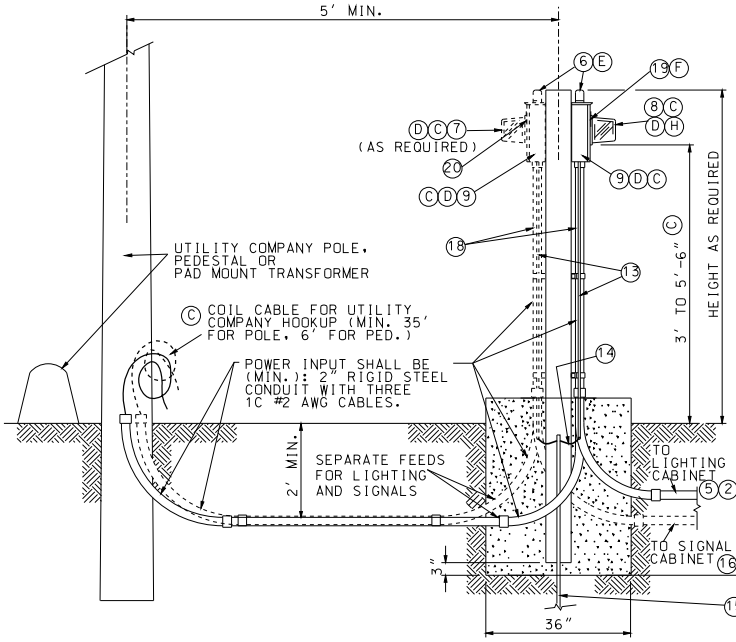


TOP VIEW

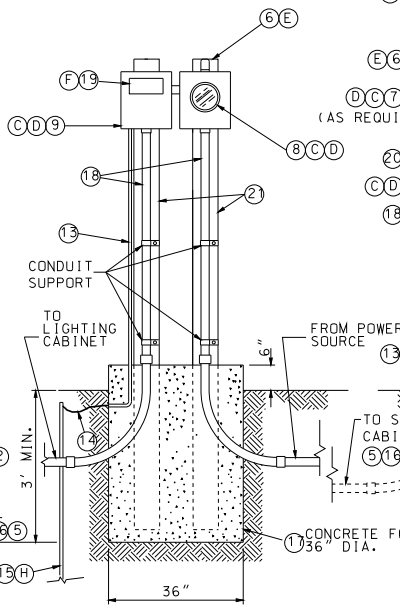
IF FENCE BLOCKS ACCESS TO POWER SUPPLY A 3' MIN. LOCKING GATE IS TO BE INSTALLED. (NO DIRECT PAY)



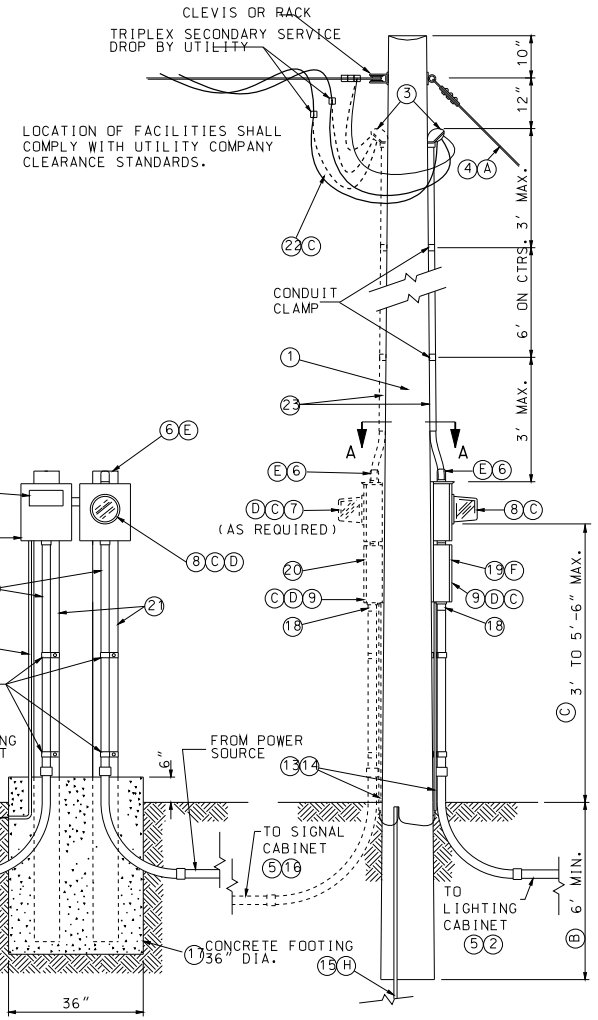
SECTION A-A



SIDE VIEW



FRONT VIEW



TYPE 1 (POLE) OVERHEAD SERVICE

TYPE 2 (PEDESTAL) UNDERGROUND SERVICE

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

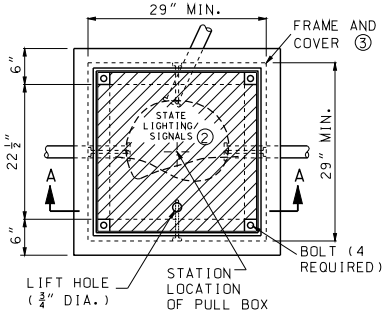
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

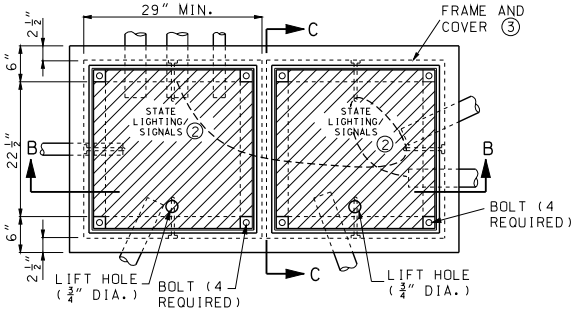
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

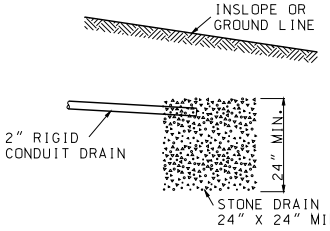
STATE OF MISSOURI EILEEN H. RACKERS NUMBER PE-28336 PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY LIGHTING
POWER SUPPLY ASSEMBLY
SECONDARY SERVICE

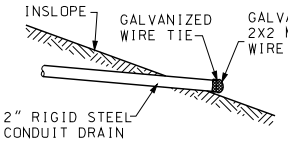
DATE EFFECTIVE: 04/01/2002	901.80D	SHEET NO. 2 OF 2
DATE PREPARED: 5/19/2010		



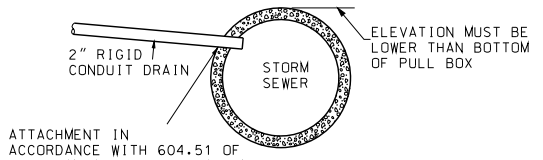




POROUS BACKFILL MATERIAL
TYPE A



TYPE B



TYPE C

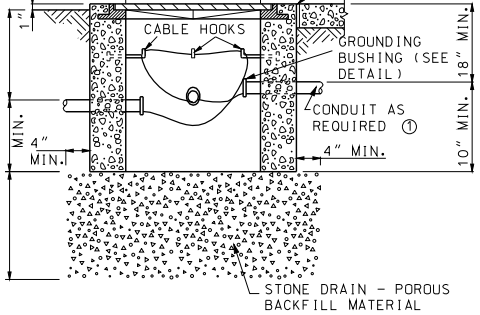
TYPE II DRAIN OUTLET DETAILS

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.

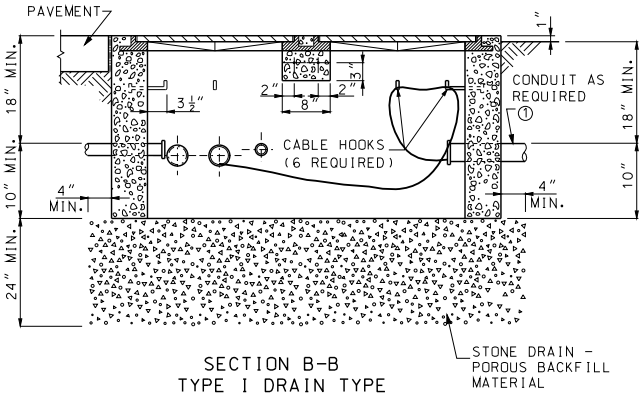
② SIGNAL PULL BOXES SHALL BE EMBOSSED "STATE SIGNALS" AND LIGHTING PULL BOXES "STATE LIGHTING."

③ PULL BOX FRAMES AND COVERS SHALL BE CAST IRON AND THE FOLLOWING MINIMUM DIMENSIONS:

FRAME SIZE:	29" x 29"
FRAME HEIGHT:	4¼"
OPENING SIZE:	22½" x 22½"
FRAME WEIGHT:	120 LBS.
COVER SIZE:	22⅝" x 22⅝"
COVER THICKNESS:	¾"
COVER WEIGHT:	140 LBS.

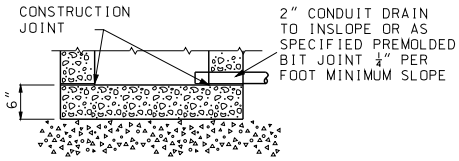


SECTION A-A
TYPE I DRAIN TYPE

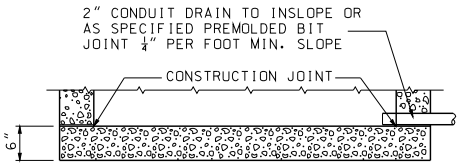


SECTION B-B
TYPE I DRAIN TYPE

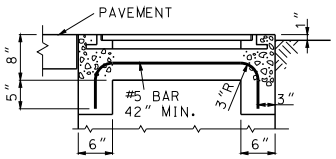
GROUNDING BUSHING (TYP) ①



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



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



SECTION C-C

STANDARD CONCRETE PULL BOX

DOUBLE CONCRETE PULL BOX, TYPE A

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.

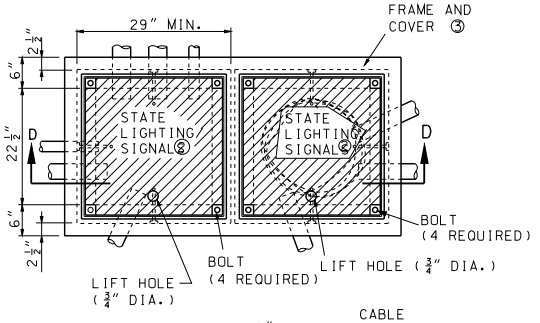
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

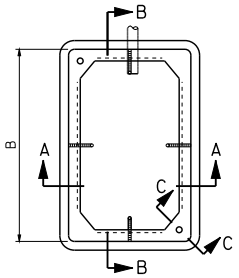
STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

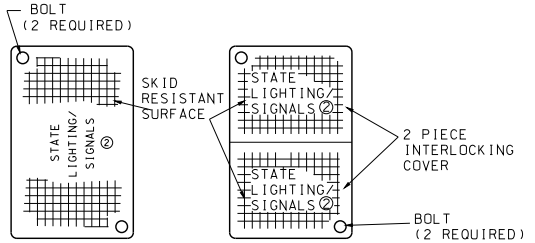
TRAFFIC SIGNALS
CONCRETE PULL BOXES

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

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

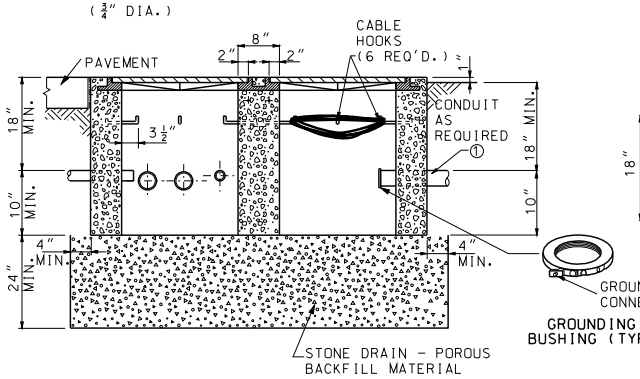




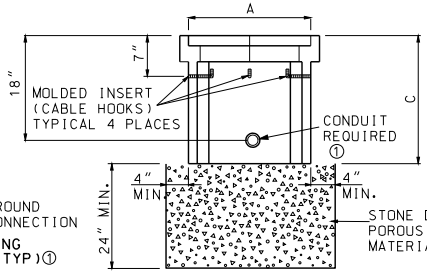


CLASS 1 OR 2 CLASS 3

PREFORMED PULL BOX COVER



SECTION D-D
TYPE I DRAIN TYPE



SECTION A-A
TYPE I DRAIN TYPE

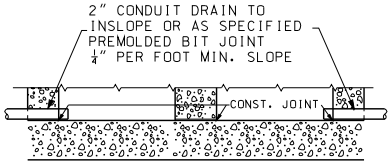
NUMBER OF ENTERING CONDUCTORS	CLASS	PREFORMED PULL BOX MINIMUM DIMENSIONS		
		A	B	C
< 23	1	17"	30"	22"
23 - 68	2	24"	36"	24"
> 68	3	30"	48"	36"

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."

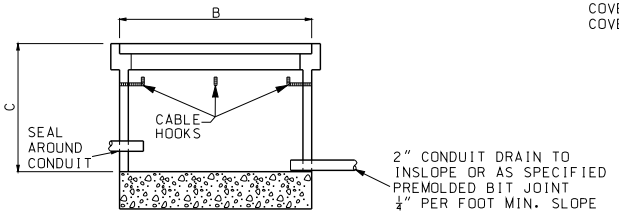
③ PULL BOX FRAMES AND COVERS SHALL BE CAST IRON AND THE FOLLOWING MINIMUM DIMENSIONS:

FRAME SIZE:	29" X 29"
FRAME HEIGHT:	4¼"
OPENING SIZE:	22½" x 22½"
FRAME WEIGHT:	120 LBS.
COVER SIZE:	22⅝" x 22⅝"
COVER THICKNESS:	¾"
COVER WEIGHT:	140 LBS.



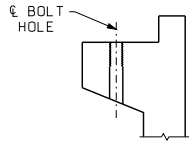
TYPE II DRAIN TYPE
(SEE DRAIN OUTLET DETAILS)
(SECTION ABOVE BREAK APPLICABLE TO TYPE I DRAIN.)

DOUBLE CONCRETE PULL BOX, TYPE B



SECTION B-B
TYPE II DRAIN TYPE

PREFORMED PULL BOX



SECTION C-C
TYPICAL BOLT CLEANOUT

GENERAL NOTES:

IF AN EXTENSION IS USED WITH A PREFORMED BOX, THE LIP OF THE EXTENSION MAY BE INTERIOR OR EXTERIOR. THE EXTENSION SHALL BE COMPATIBLE AND FROM THE SAME MANUFACTURER.

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

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

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

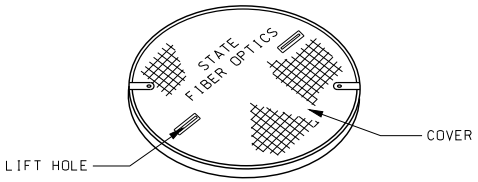
TRAFFIC SIGNALS
CONCRETE AND PREFORMED PULL BOXES

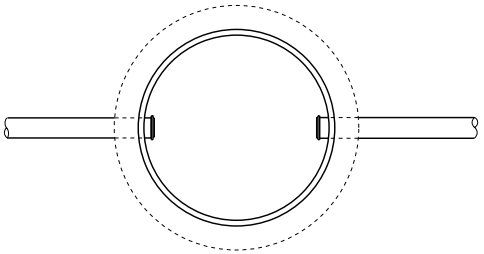
DATE EFFECTIVE: 11/01/2010
DATE PREPARED: 9/3/2010

902.20G

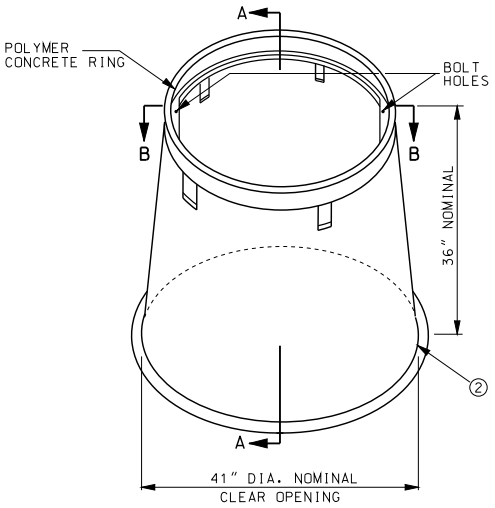
SHEET NO. 2 OF 3

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

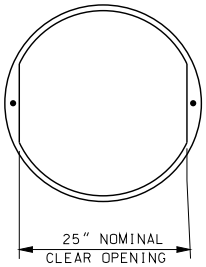




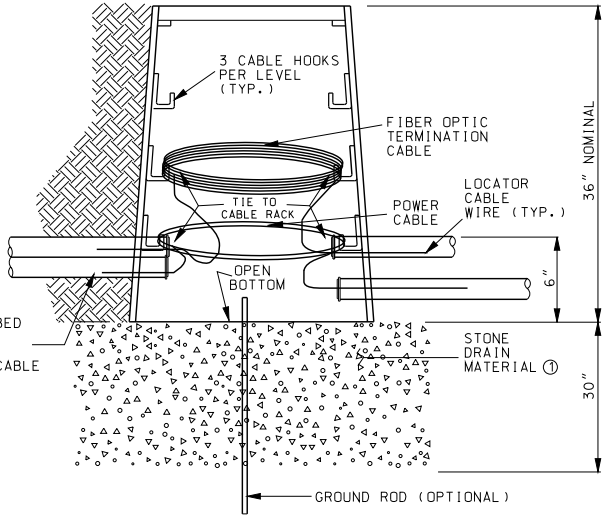
PLAN



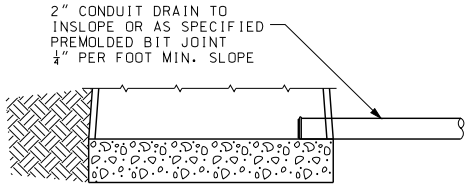
CIRCULAR PULL BOX
CLASS 5



SECTION B-B



SECTION A-A
TYPE I DRAIN TYPE



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

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".

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NUMBER PE-23751
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TRAFFIC SIGNALS
CONCRETE AND PREFORMED PULL BOXES

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

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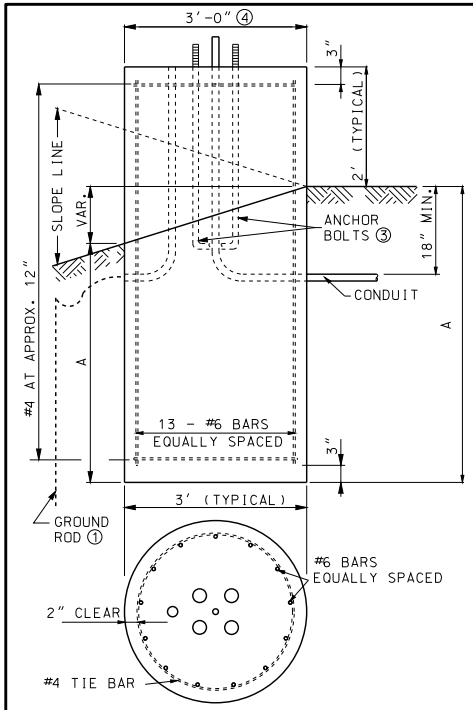
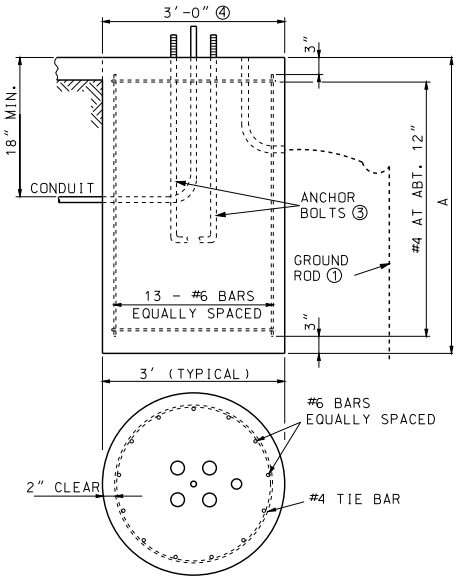
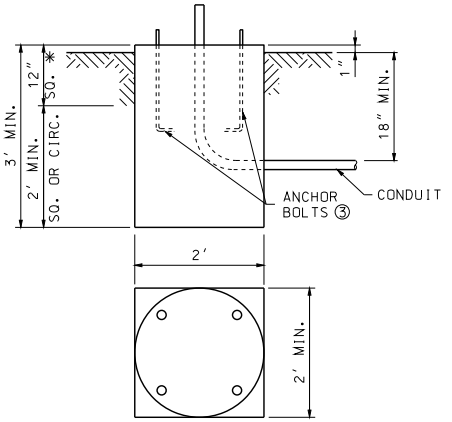


TYPE A



TYPE F



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

TYPE C

① APPLICABLE ONLY WHERE CONTROLLER IS MOUNTED TO A SIGNAL POLE.

② BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.

③ ANCHOR BOLT DIMENSIONS ARE SHOWN ON THE MANUFACTURER'S APPROVED DRAWINGS.

④ MAXIMUM BOLT CIRCLE DIAMETER IS 26". BASE PLATE SHALL STAY WITHIN THE TOP OF THE POST BASE DIAMETER.

⑤ ARM LENGTH DETERMINED BY LENGTH OF LONGEST ARM FOR TYPE B & BL SIGNAL POSTS.

⑥ BASE TYPE A OR F DETERMINED BY LOCATION OF POST BASE.

⑦ SOIL DEPTH, NO ROCK.

⑧ INCLUDE #4 TIE BAR.

⑨ WHEN CONCRETE BASE IS LOCATED WITHIN 8" CONCRETE DIVISIONAL ISLAND, EMBEDMENT LENGTH MAY BE REDUCED BY $\frac{1}{2}$ DIAMETER OF THE DRILLED SHAFT.

POST BASES

POST BASES		
POST TYPE	ARM LENGTH (FEET) ⑤	BASE TYPE ⑥
C OR CL	15 - 25	A-9 OR F-9
C OR CL	30 - 35	A-9.5 OR F-9.5
C OR CL	40 - 55	A-10.5 OR F-10.5
B OR BL	15 - 25	A-10 OR F-10
B OR BL	30 - 35	A-11 OR F-11
B OR BL	40 - 55	A-12 OR F-12

STEEL AND CONCRETE REQUIREMENTS FOR POST BASES ⑨				
BASES		#6 STEEL BAR		CONC.
TYPE	A ⑦	LENGTH	WEIGHT LBS.	C.Y.
A-9	9'-0"	10'-6"	260	2.88
A-9.5	9'-6"	11'-0"	270	3.01
A-10	10'-0"	11'-6"	285	3.14
A-10.5	10'-6"	12'-0"	295	3.27
A-11	11'-0"	12'-6"	271	3.40
A-12	12'-0"	13'-6"	335	3.67
F-9	9'-0"	8'-6"	210	2.36
F-9.5	9'-6"	9'-0"	220	2.49
F-10	10'-0"	9'-0"	235	2.62
F-10.5	10'-6"	10'-0"	250	2.75
F-11	11'-0"	10'-6"	260	2.88
F-12	12'-0"	11'-6"	285	3.14
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"

1. REQUIRED EMBEDMENT DEPTHS CAN BE INTERPOLATED BETWEEN ENCOUNTER POINTS FOR OTHER SOLID ROCK ENCOUNTER DEPTHS.
2. NORMAL LENGTHS FOR ANCHOR BOLTS AND REINFORCING STEEL WILL BE REQUIRED.
3. 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.
4. IF SOIL, SHALE, GRAVEL, FRACTURED ROCK, OR VOIDS ARE ENCOUNTERED DURING CORE DRILLING, THE ROCK SHALL BE REMOVED TO THE POINT OF ENCOUNTER.
5. 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.
6. 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.

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NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TRAFFIC SIGNALS

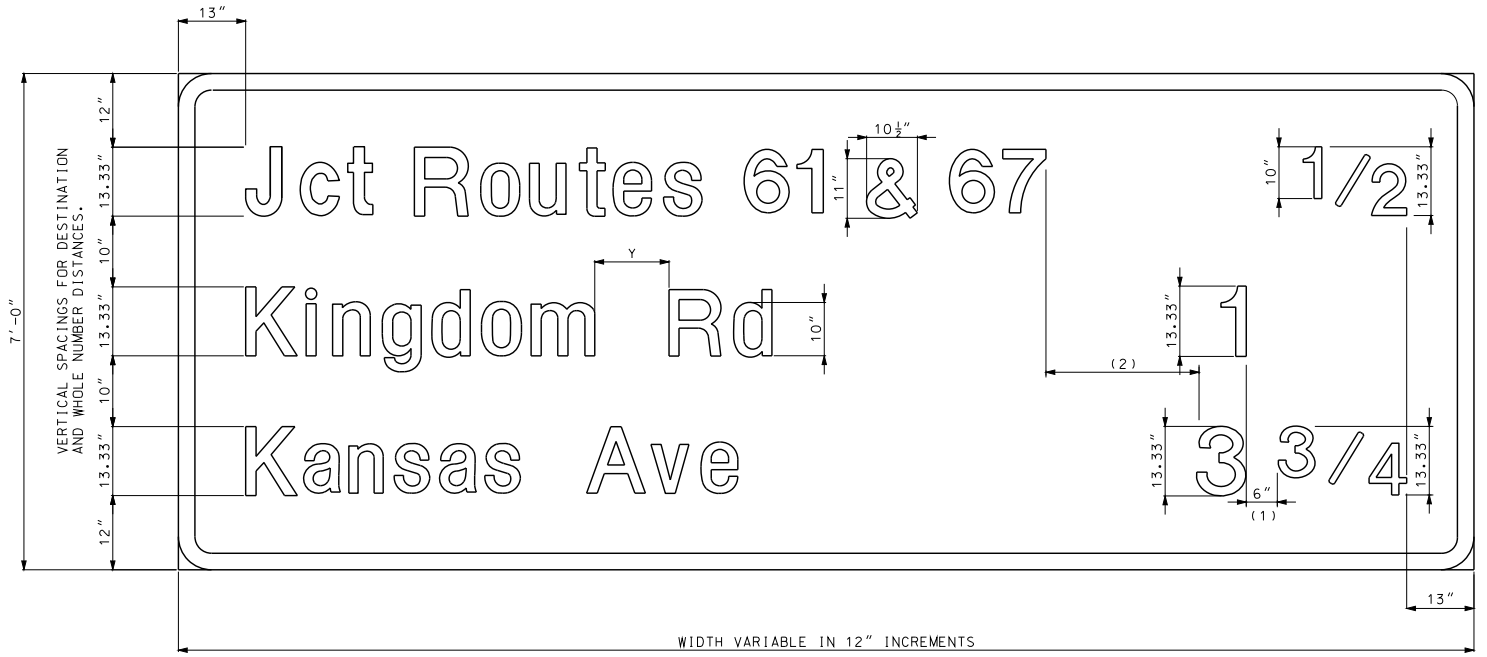
POST BASES

DATE EFFECTIVE: 02/01/2008
DATE PREPARED: 4/1/2010

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.

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

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

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

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

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

GENERAL NOTES (ALL SIGNS):

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

GUIDE SIGN WIDTH VARIABLE IN 12" INCREMENTS.

GUIDE SIGN HEIGHT VARIABLE IN 12" INCREMENTS.

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

SEE OTHER STANDARD DRAWINGS FOR ARROW DETAILS.

BORDER (ALL SIGNS)			
CORNER 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	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			

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PROFESSIONAL ENGINEER
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HIGHWAY SIGNING STRUCTURAL SIGNS

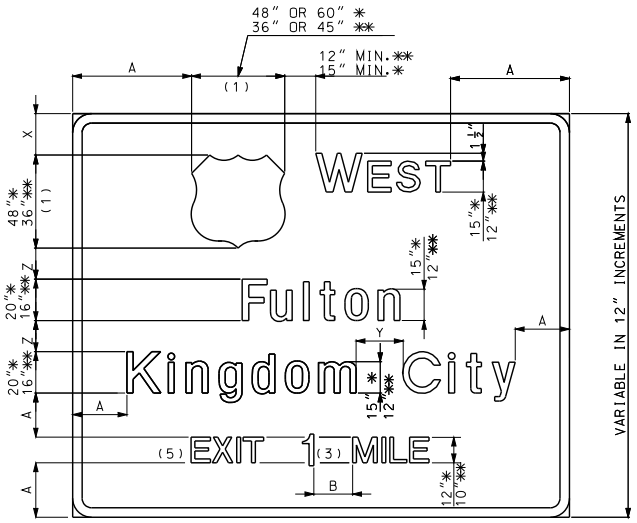
INTERCHANGE SEQUENCE

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

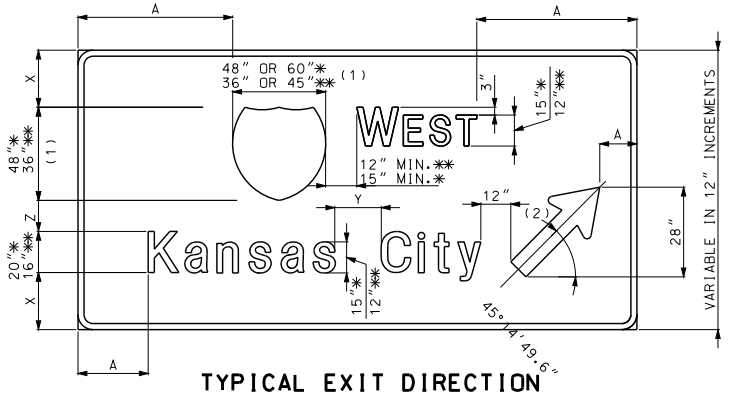
903.02AK

SHEET NO. 1 OF 19

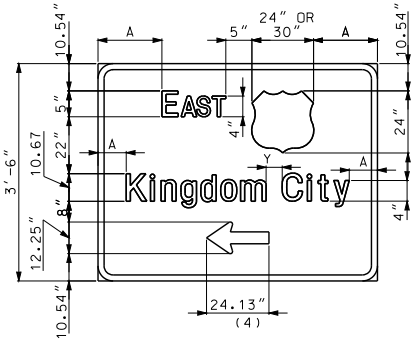
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



TYPICAL ADVANCE GUIDE



TYPICAL EXIT DIRECTION



CROSSROAD GUIDE

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.

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 = UPPER CASE LETTER HEIGHT
Z = LOWER CASE LETTER HEIGHT
* = GROUND MOUNT
** = OVERHEAD

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 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					
		REFL. SHEETING TYPE			LETTER
STR2L-3	TYPE	GROUND	OVERHEAD	COLOR	SERIES
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)				

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HIGHWAY SIGNING STRUCTURAL SIGNS

INTERCHANGE SEQUENCE

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

903.02AK

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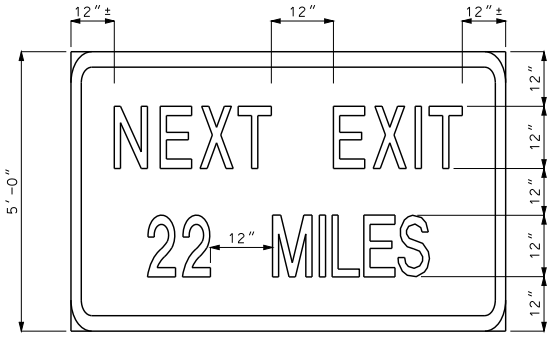
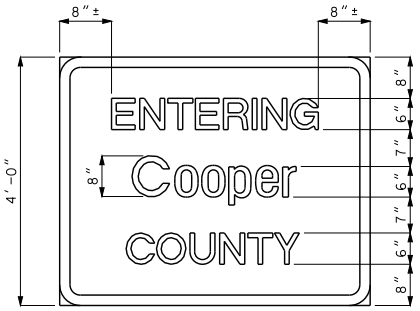
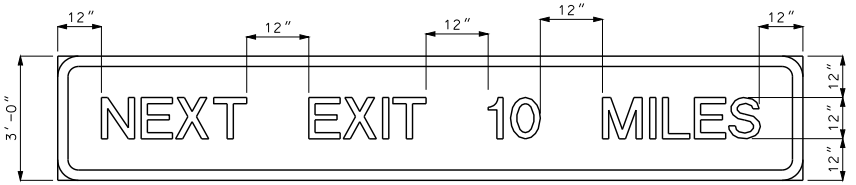


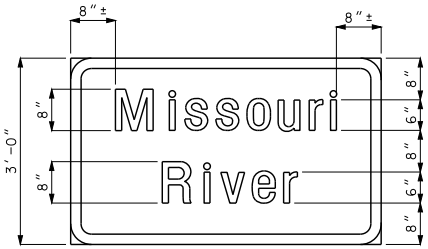
E2-1A



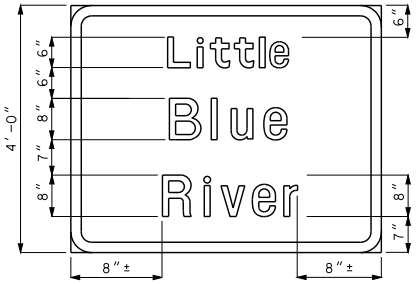
COUNTY LINE



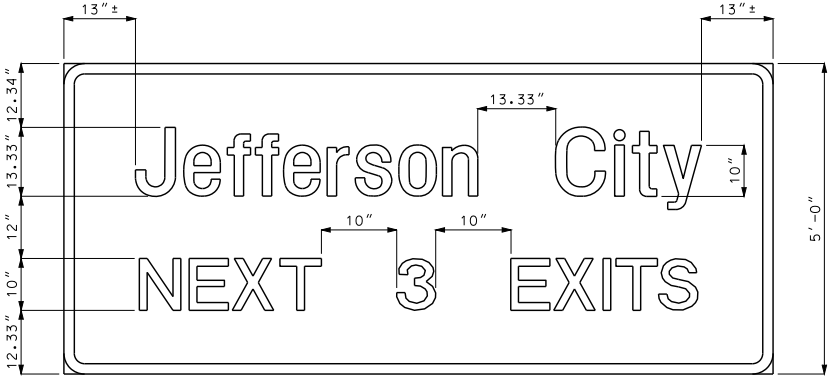
E2-1
NEXT EXIT SUPPLEMENTAL
ADVANCE GUIDE



RIVER/CREEK
(TWO LINES)



RIVER/CREEK
(THREE LINES)



NEXT (X) EXITS

BORDER (ALL SIGNS)			
CORNER 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

LEGEND, SYMBOLS & BORDER

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

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

BACKGROUND REFLECTIVE SHEETING

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

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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

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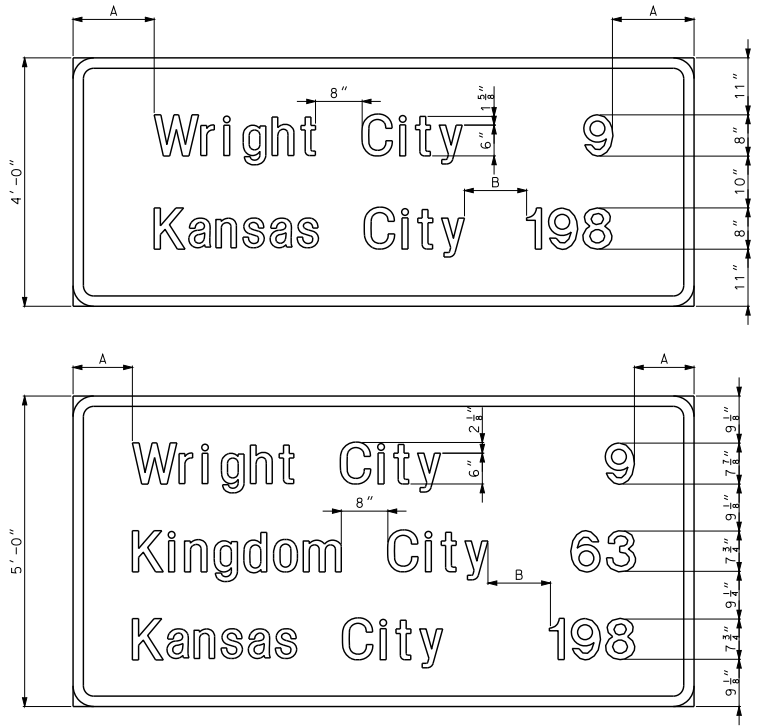
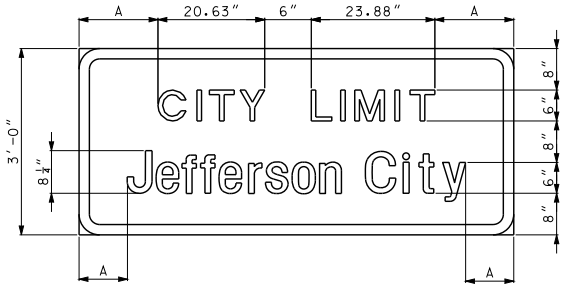
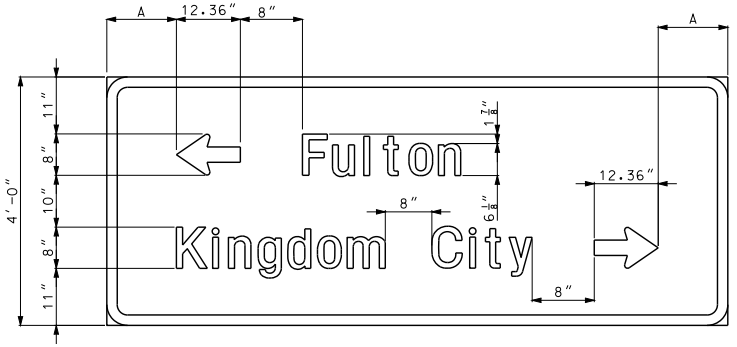


NOTE: FOR INTERSTATE, LAST LINE OF COPY SHALL INDICATE APPROVED AASHTO CONTROL CITY.

POST INTERCHANGE/INTERSECTION DISTANCE



CITY LIMITS



NOTE: DESTINATIONS ARE PLACED IN THE FOLLOWING ORDER: AHEAD, LEFT, RIGHT. TYPE D ARROWS SHALL BE USED.

ADVANCE INTERSECTION DESTINATION

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

BACKGROUND REFLECTIVE SHEETING

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

LEGEND, SYMBOLS & BORDER

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

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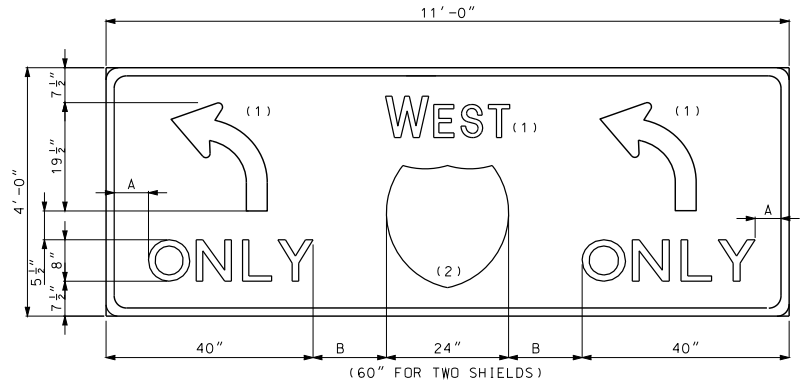
HIGHWAY SIGNING STRUCTURAL SIGNS

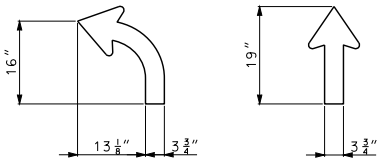
MISC. GOUND MOUNTED FREEWAY AND EXPRESSWAY GUIDE SIGNS

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

903.02AK

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





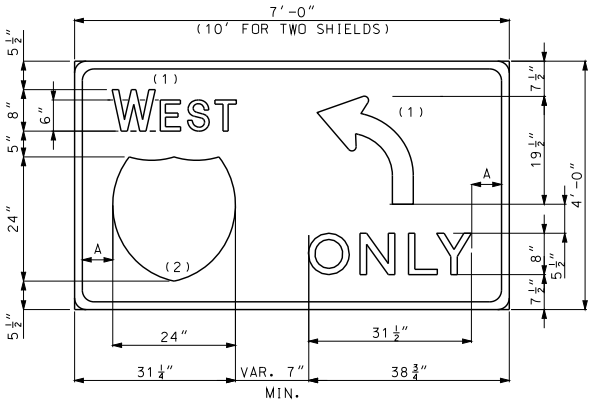
NOTES:

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 RADII		WIDTH	
SIGN HEIGHT	INCHES	LETTER SIZE	INCHES
LESS THAN OR EQUAL TO 6′	6	LESS THAN 12″	1
7′	9		
GREATER THAN OR EQUAL TO 8′	12	12″ OR LARGER	2

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 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.)

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)

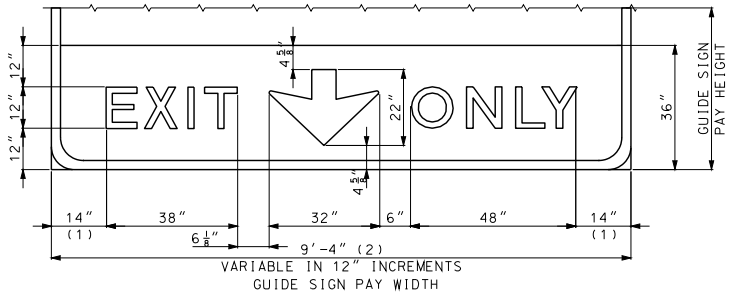
STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

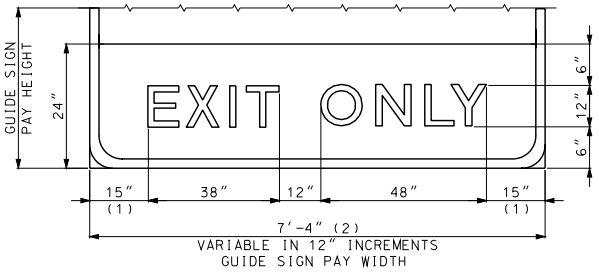
HIGHWAY SIGNING STRUCTURAL SIGNS
LANE CONTROL WITH ROUTE SHIELD

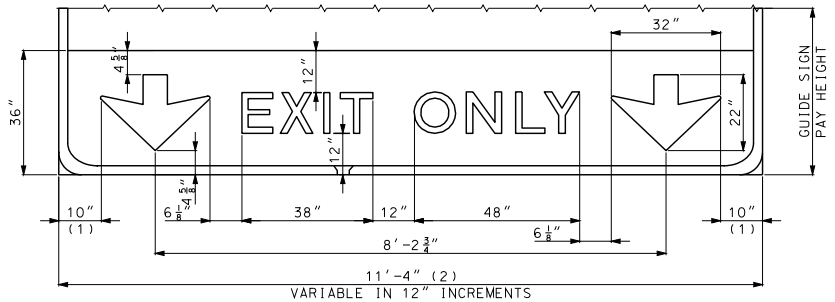
DATE EFFECTIVE: 06/01/2010
DATE PREPARED: 4/1/2010

903.02AK

SHEET NO. 5 OF 19







(1) TYPICALLY VARY THIS DISTANCE TO MATCH WIDTH OF GUIDE SIGN.

(2) MINIMUM GUIDE SIGN WIDTH WHEN EXIT ONLY PANEL IS CONTROL LINE FOR SIGN WIDTH.

GENERAL NOTES:

NO DIRECT PAY MADE FOR THIS PANEL. COST FOR PANEL IS INCLUDED IN THE COST FOR THE GUIDE SIGN TO WHICH THIS PANEL IS ATTACHED.

FOR OVERHEAD USE ONLY.

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

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

BACKGROUND REFLECTIVE SHEETING

R2 REFER TO MISSOURI SPECIFICATION SECTION 1042 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.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING STRUCTURAL SIGNS

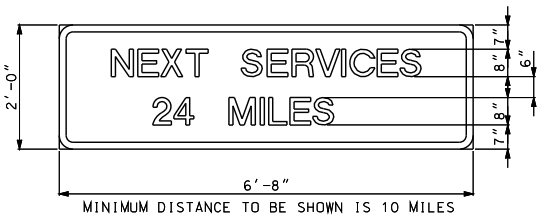
EXIT ONLY PANELS

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

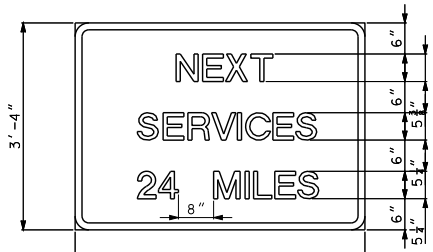
903.02AK

SHEET NO. 6 OF 19

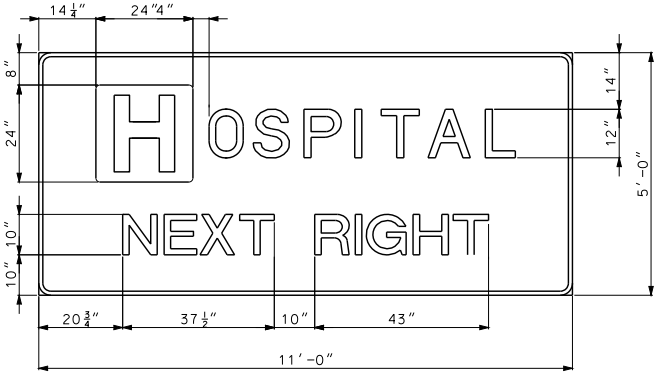
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



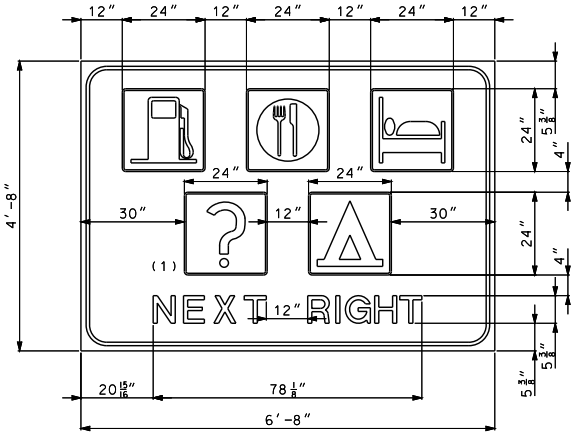
MINIMUM DISTANCE TO BE SHOWN IS 10 MILES



MINIMUM DISTANCE TO BE SHOWN IS 10 MILES



NOTE:
FOR THE LETTER "H" USE THE D9-2 SIGNFACE AS A DEMOUNTABLE SHIELD.



INTERSTATE - USE "EXIT XX"
FREEWAY - USE "NEXT RIGHT" "SECOND RIGHT"

(1) TO BE USED IN CONFORMANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL.

NOTE:
HORIZONTALLY CENTER ALL LINES OF TEXT AND SYMBOLS.

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

BACKGROUND REFLECTIVE SHEETING

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

GENERAL SIGN DATA				
STR2L-3	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		R2	BLUE	
LEGEND	L-3	R4	WHITE	E(M)
SYMBOLS	L-3	R4	WHITE	
BORDER	L-3	R4	WHITE	
SUBSTRATE	STRUCTURAL			

LEGEND, SYMBOLS & BORDER

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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STATE OF MISSOURI
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NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING STRUCTURAL SIGNS

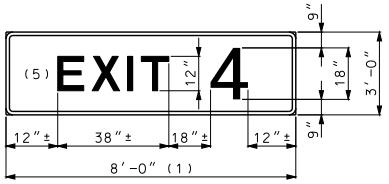
SERVICE SIGNS

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

903.02AK

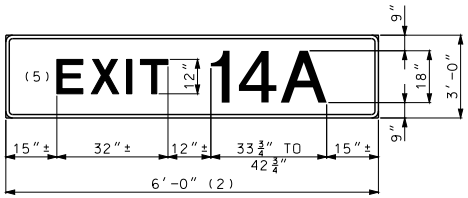
SHEET NO. 7 OF 19

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



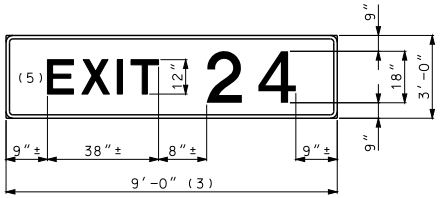
(1) 9'- 0" 2 THROUGH 9 WITH A LETTER
11'- 0" FOR "EXITS" 2 THROUGH 9 WITH A-B LETTERS

1 THROUGH 9



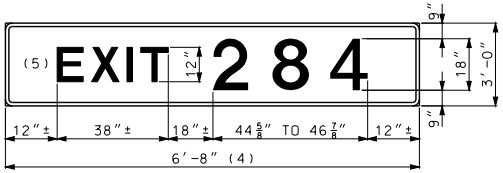
(2) 12'- 0" FOR "EXITS" 10 THROUGH 19
NUMERAL WITH A-B LETTERS

10 THROUGH 19 NUMERAL WITH LETTER



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

20 THROUGH 99



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

100 AND OVER

GENERAL NOTES:

FOR MOUNTING DETAILS SEE OTHER DRAWINGS.

PANEL SHALL BE MOUNTED DIRECTLY TO THE TOP OF THE GUIDE SIGN AND ALIGNED WITH THE EXIT SIDE.

LEGEND, SYMBOLS & BORDER

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

BACKGROUND REFLECTIVE SHEETING

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

BORDER (ALL SIGNS)			
CORNER 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					
		REFL. SHEETING TYPE			
STR2L-3	TYPE	GROUND	OVERHEAD	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				

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

KATHRYN PHILLIPS HARVEY NUMBER PE-23751 STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

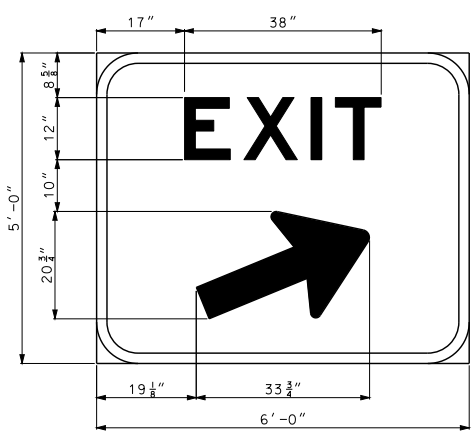
EXIT NUMBER PANELS

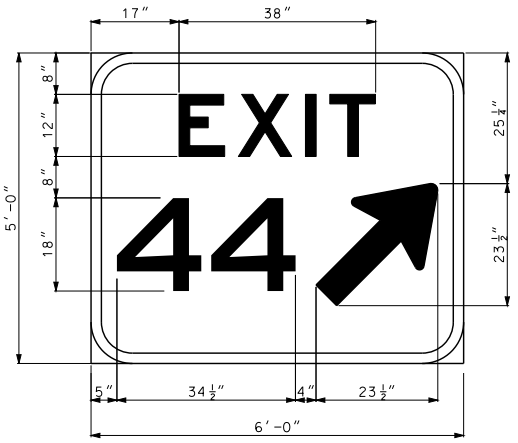
DATE EFFECTIVE: 06/01/2010
DATE PREPARED: 4/1/2010

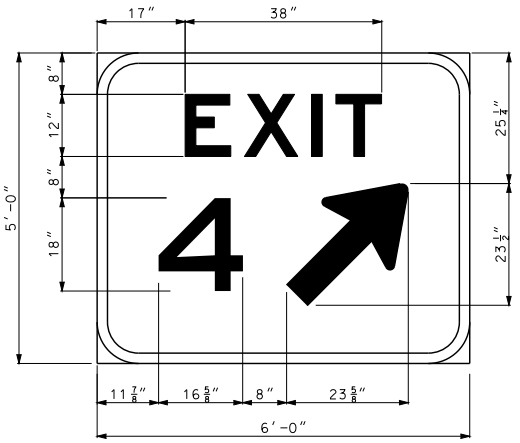
903.02AK

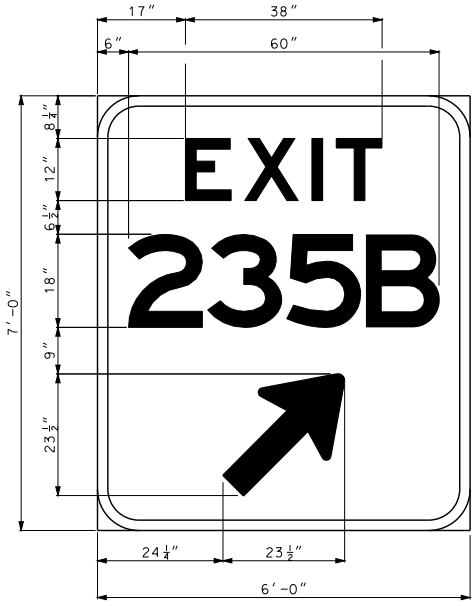
SHEET NO. 8 OF 19

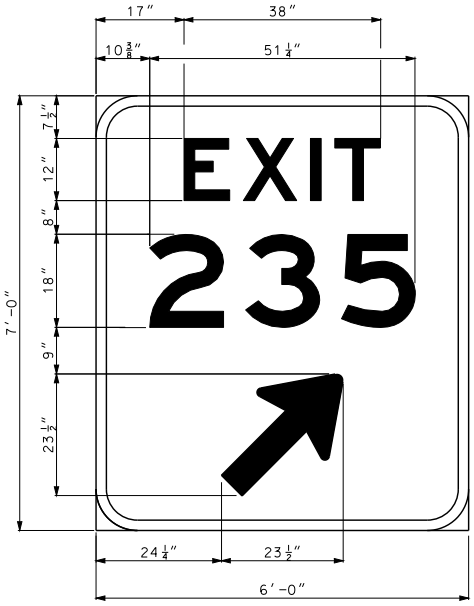
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.











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

GENERAL SIGN DATA					
		REFL. SHEETING TYPE			
STR2L-3	TYPE	GROUND	OVERHEAD	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)

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

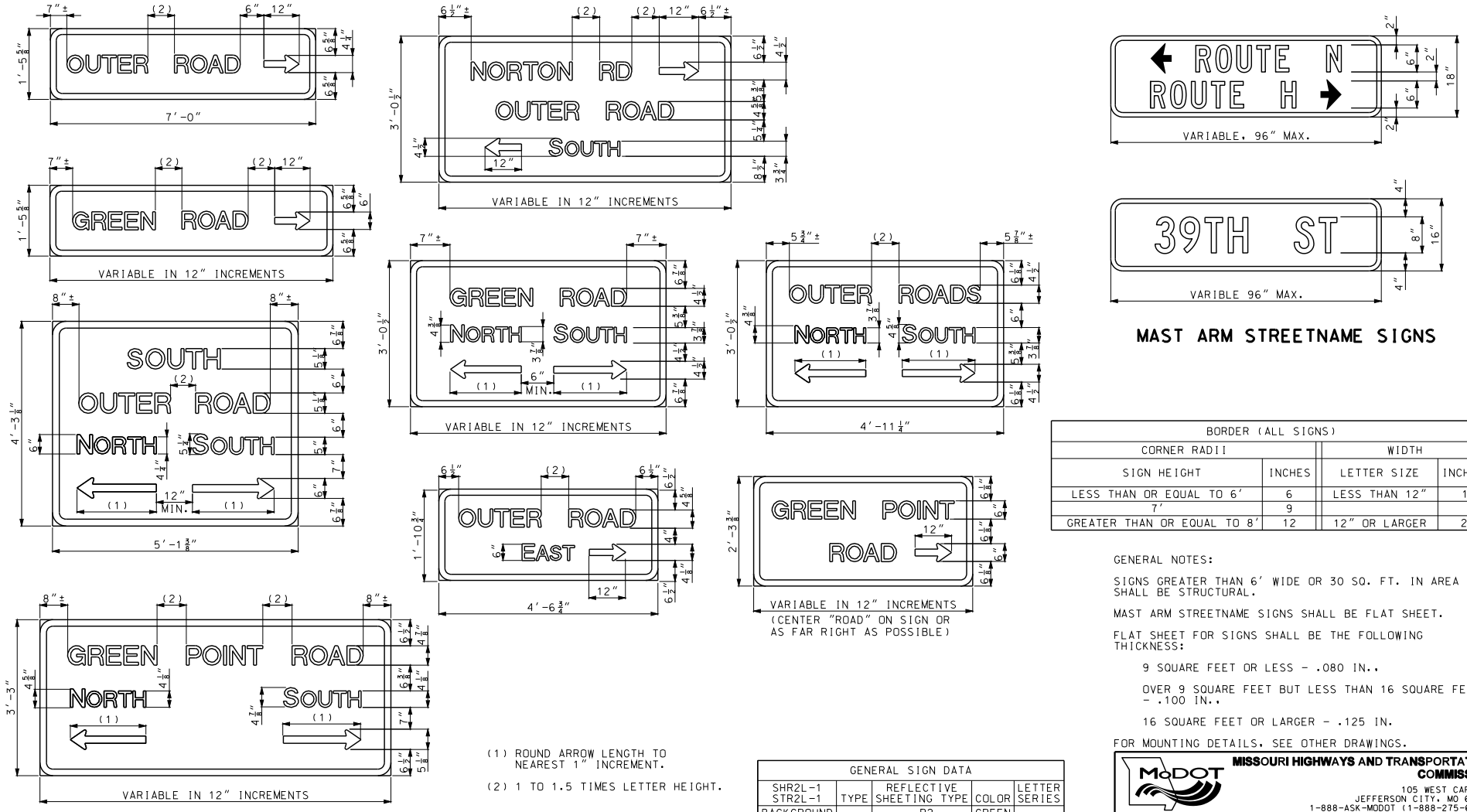
GORE EXIT SIGN

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

903.02AK

SHEET NO. 9 OF 19

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



MAST ARM STREETNAME SIGNS

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

GENERAL NOTES:

SIGNS GREATER THAN 6′ WIDE OR 30 SQ. FT. IN AREA SHALL BE STRUCTURAL.

MAST ARM STREETNAME SIGNS SHALL BE FLAT SHEET.

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS:

9 SQUARE FEET OR LESS – .080 IN..

OVER 9 SQUARE FEET BUT LESS THAN 16 SQUARE FEET – .100 IN..

16 SQUARE FEET OR LARGER – .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

(1) ROUND ARROW LENGTH TO NEAREST 1″ INCREMENT.

(2) 1 TO 1.5 TIMES LETTER HEIGHT.

GENERAL SIGN DATA				
SHR2L-1 STR2L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND		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

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.)

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

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105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

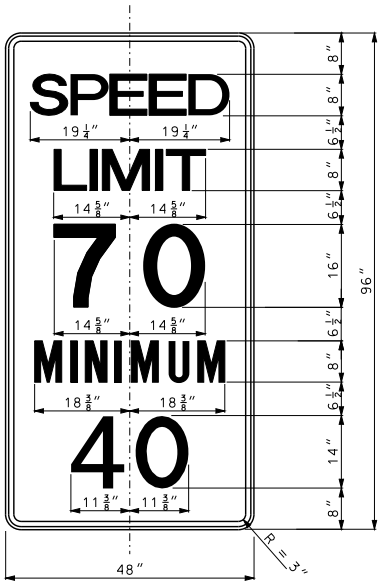
CROSS ROAD AND OUTER ROAD SIGNS

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

903.02AK

SHEET NO. 10 OF 19

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



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			

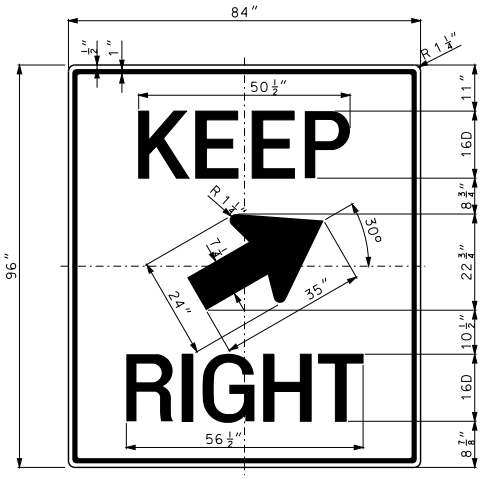
LEGEND, SYMBOLS & BORDER

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: R4-7b				
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.

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
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STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

REGULATORY SIGNS

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

903.02AK

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.

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STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

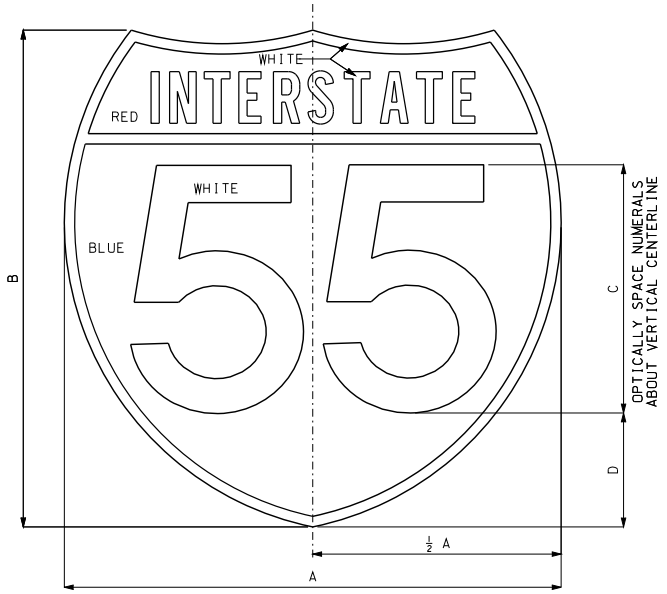
WARNING SIGNS

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

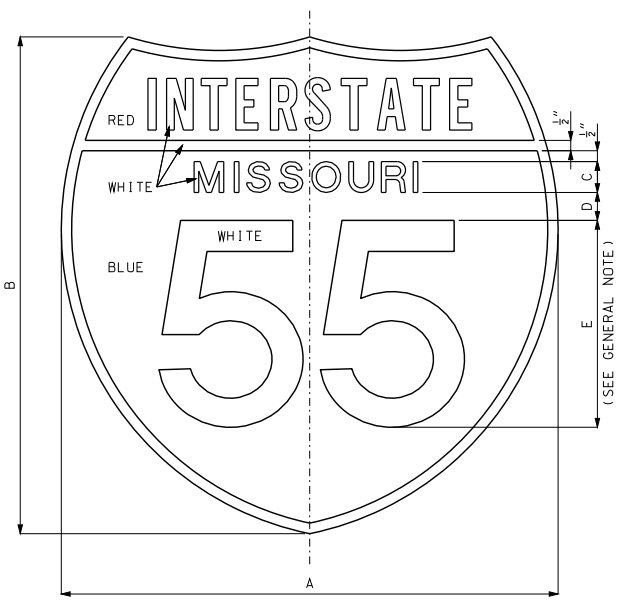
903.02AK

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	5½
OVERHEAD	1,2-DIGITS	36	36	18D	8¼
GROUND MOUNT	1,2-DIGITS	48	48	24D	11
CROSSROAD	3-DIGITS	30	24	12D	5½
OVERHEAD	3-DIGITS	45	36	18D	8¼
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.

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.

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

SIGN	DIMENSIONS (INCHES)				
	A	B	C	D	E
1 & 2 DIGITS	24	24	1½ D	1⅜	10D
3 DIGITS	30	24	1½ D	2¼	10D

DIMENSIONS FOR INDEPENDENT USE SHIELD

INDEPENDENT				
GENERAL SIGN DATA				
SHR2L-1	TYPE	REFLECTIVE SHEETING TYPE	COLOR	LETTER SERIES
BACKGROUND	L-1	R2	VAR.	
LEGEND	L-1 *		WHITE	VAR **
SYMBOLS				
BORDER	L-1 *		WHITE	
SUBSTRATE	SHEET			

* REVERSE SCREEN PROCESS.
** SEE DIMENSION TABLES THIS DRAWING.

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.

OCCASSIONALLY THE NUMERALS CANNOT BE ACCOMODATED 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)

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

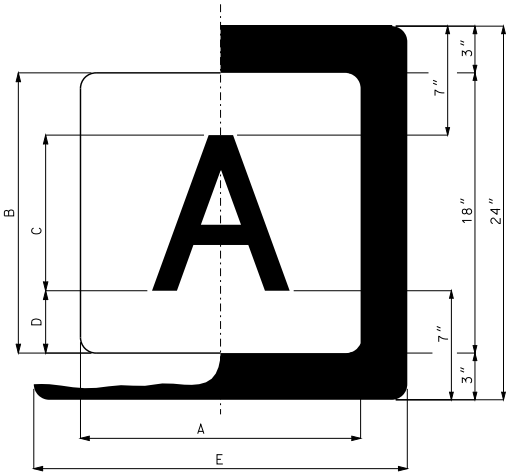
SHIELD FOR INDEPENDENT AND GUIDE SIGN USE

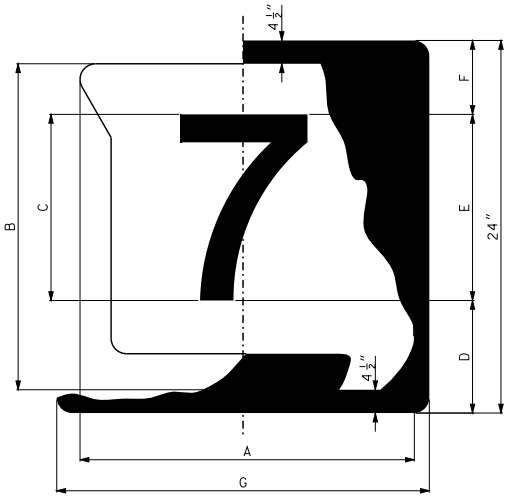
DATE EFFECTIVE: 06/01/2010
DATE PREPARED: 4/1/2010

903.02AK

SHEET NO. 13 OF 19

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





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

INDEPENDENT			
GENERAL SIGN DATA			
SHR2L-1	COLOR	REFLECTIVE SHEETING TYPE	LETTER SERIES
BACKGROUND	WHITE	R2	
LEGEND	BLACK		VAR ✳
SYMBOLS	WHITE		
BORDER	BLACK		
SUBSTRATE	SHEET		

✳ SEE DIMENSION TABLES THIS DRAWING.

LEGEND, SYMBOLS & BORDER

L-1 SCREEN PRINT, REVERSE SCREEN PRINT, OR OPAQUE OR TRANSLUCENT CUTABLE 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

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

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)

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

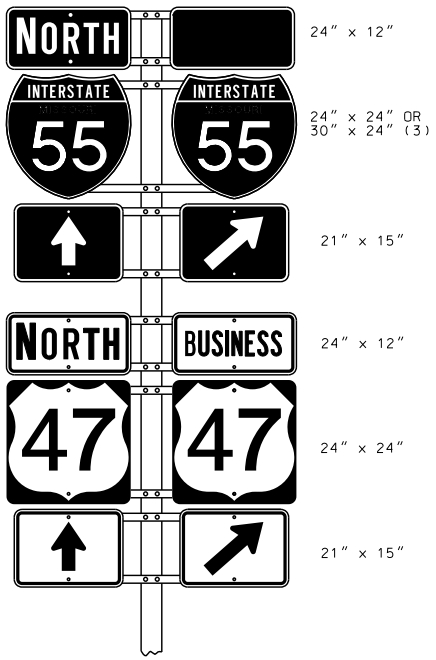
HIGHWAY SIGNING
STANDARD SHIELDS FOR INDEPENDENT AND GUIDE SIGN USE

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

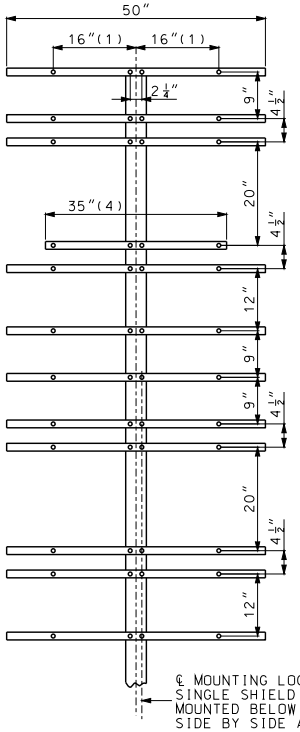
903.02AK

SHEET NO. 14 OF 19

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



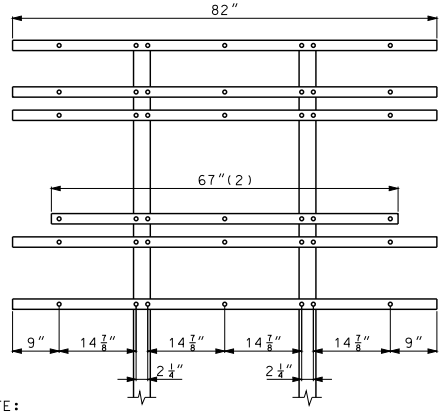
TWO-ROUTE ASSEMBLY



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

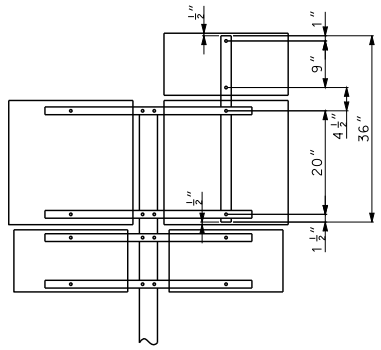
NOTE: 1ST DIMENSION - WIDTH OF PLATE
2ND DIMENSION - HEIGHT OF PLATE

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



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 3/4" AND SHALL BE PUNCHED AS SHOWN ON THIS DRAWING.
BACKING BARS PAID FOR AS STRUCTURAL STEEL, PER POUND.

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

WIDE FLANGE POST MOUNTING

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

STATE OF MISSOURI
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NUMBER PE-23751
PROFESSIONAL ENGINEER
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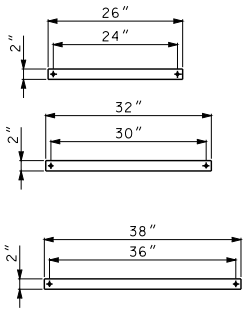
HIGHWAY SIGNING
BACKING BARS
SHEET SIGN MOUNTING
ROUTE SHIELD AND
MARKER ASSEMBLIES

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

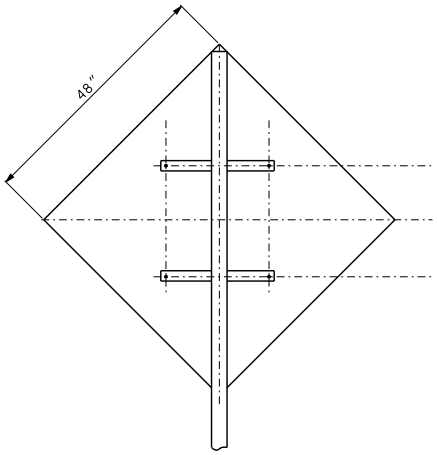
903.02AK

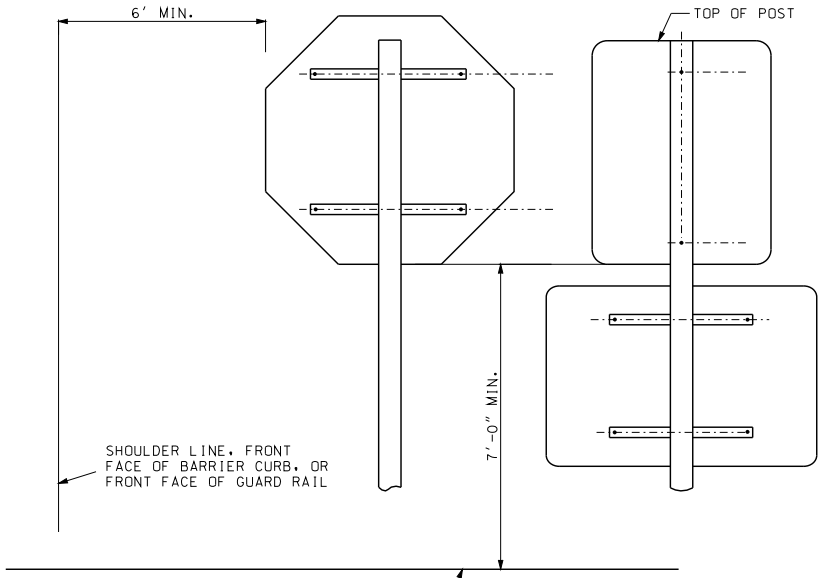
SHEET NO.
15 OF 19

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



THE THREE BACKING BAR LAYOUTS
FOR SINGLE POST SIGNS





HOLES IN BACKING BARS SHALL BE $\frac{9}{16}$″ AND PUNCHED AS SHOWN ON THIS DRAWING.

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)

STATE OF MISSOURI
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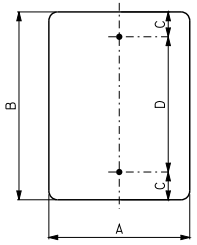
HIGHWAY SIGNING

BACKING BARS DETAILS

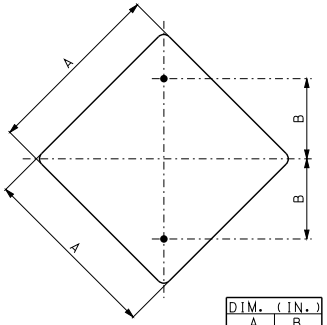
DATE EFFECTIVE: 06/01/2010
DATE PREPARED: 4/1/2010

903.02AK

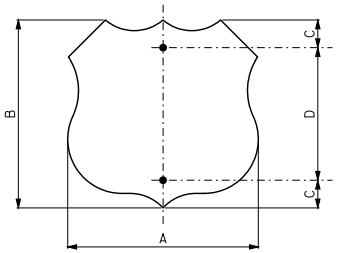
SHEET NO.
16 OF 19



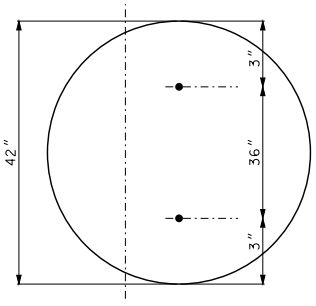
DIMENSIONS (IN.)			
A	B	C	D
6	15	1.5	12
8	24	3	18
9	12	1.5	9
9	48	3	42
10	30	3	24
12	18	3	12
12	24	3	18
12	36	3	30
12	48	3	42
18	24	3	18
24	30	3	24
24	36	3	30
30	36	3	30
30	42	3	36
30	48	3	42

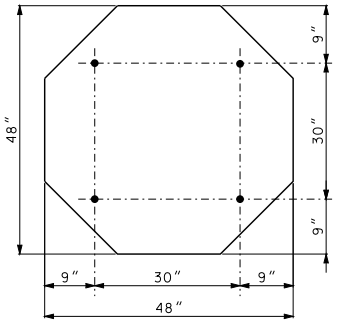


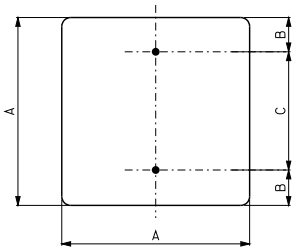
DIM. (IN.)	
A	B
18	9
24	12
30	15
36	18



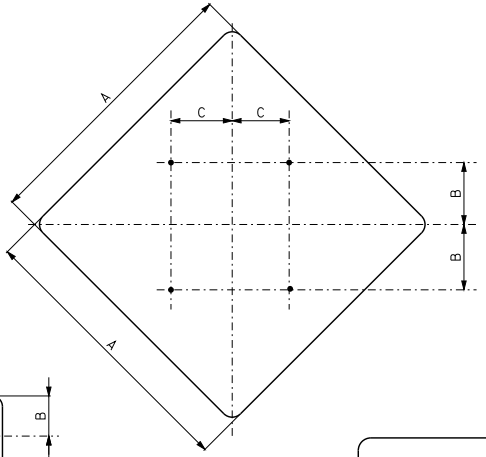
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



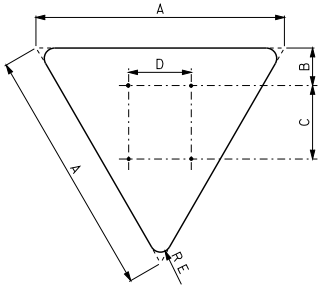




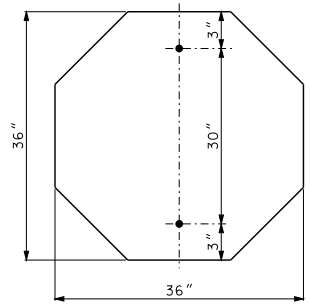
DIMENSIONS (IN.)		
A	B	C
14	3	8
18	3	12
24	3	18
30	3	24

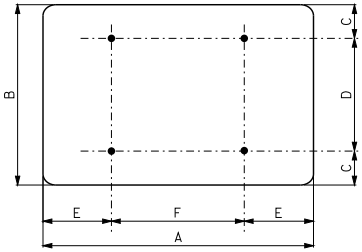


DIMENSIONS (IN.)		
A	B	C
48	15	15
60	18	18

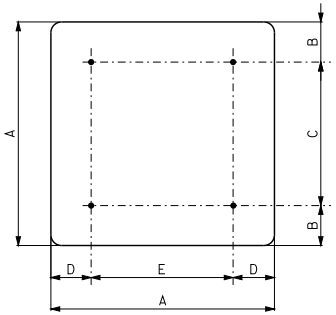


DIMENSIONS (IN.)				
A	B	C	D	E
48	3	12	12	3
60	4	18	15	3

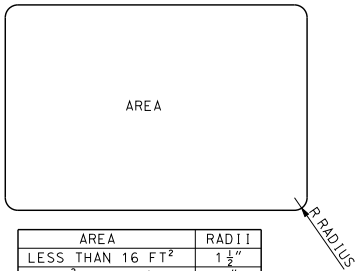




DIMENSIONS (IN.)					
A	B	C	D	E	F
36	24	3	18	6	24
36	30	3	24	6	24
42	30	3	24	6	30
42	36	3	30	6	30
48	12	1.5	9	9	30
48	18	1.5	15	9	30
48	24	3	18	9	30
48	30	3	24	9	30
48	36	3	30	9	30
60	12	1.5	9	12	36
60	24	3	18	12	36
60	36	6	24	12	36



DIMENSIONS (IN.)				
A	B	C	D	E
36	6	24	6	24
48	6	36	9	30



AREA	RADII
LESS THAN 16 FT²	1½″
16 FT² 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 $\frac{3}{8}$″ AND PUNCHED AS SHOWN ON THIS DRAWING.

FLAT SHEET FOR SIGNS SHALL BE THE FOLLOWING THICKNESS:

9 SQUARE FEET OR LESS – .080 IN.,

OVER 9 SQUARE FEET BUT LESS THAN 16 SQUARE FEET – .100 IN.,

16 SQUARE FEET OR LARGER – .125 IN.

FOR MOUNTING DETAILS, SEE OTHER DRAWINGS.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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STATE OF MISSOURI
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HIGHWAY SIGNING

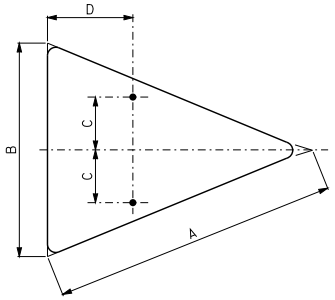
HOLE PUNCHING

DATE EFFECTIVE: 05/01/2010
DATE PREPARED: 4/1/2010

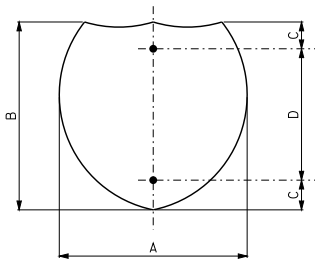
903.02AK

SHEET NO. 17 OF 19

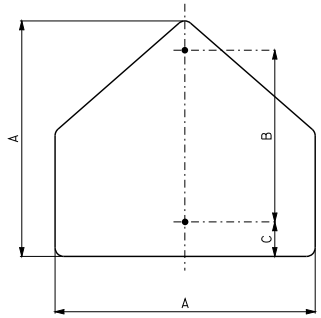
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



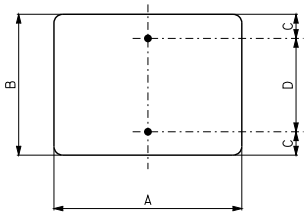
DIMENSIONS (IN.)			
A	B	C	D
40	30	7.5	12
48	36	9	15



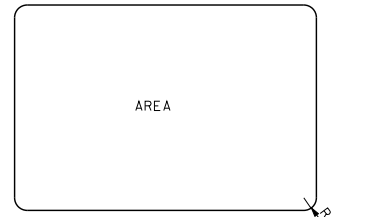
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



DIMENSIONS (IN.)		
A	B	C
36	24	3

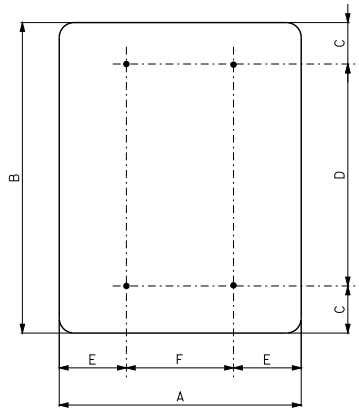


DIMENSIONS (IN.)			
A	B	C	D
5	9	1.5	6
12	9	1.5	6
14	12	1.5	9
18	12	1.5	9
20	9	1.5	6
21	15	1.5	12
24	6	1.5	3
24	8	1.5	5
24	10	1.5	7
24	12	1.5	9
24	18	3	12
30	6	1.5	3
30	12	1.5	9
30	15	1.5	12
30	18	3	12
30	24	3	18
36	12	1.5	9
36	18	3	12

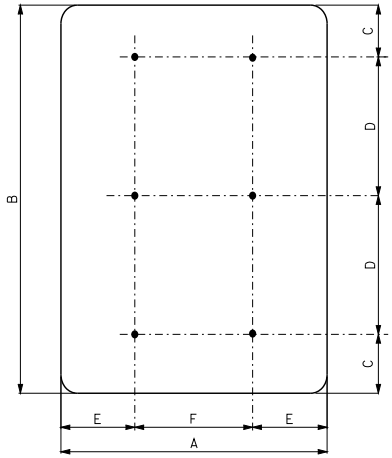


AREA	RADII
LESS THAN 16 FT^2	1 1/2"
16 FT^2 OR GREATER	3"

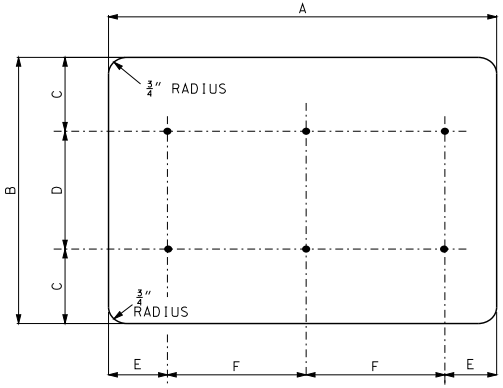
RADII FOR SHEET SIGNS



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.

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

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

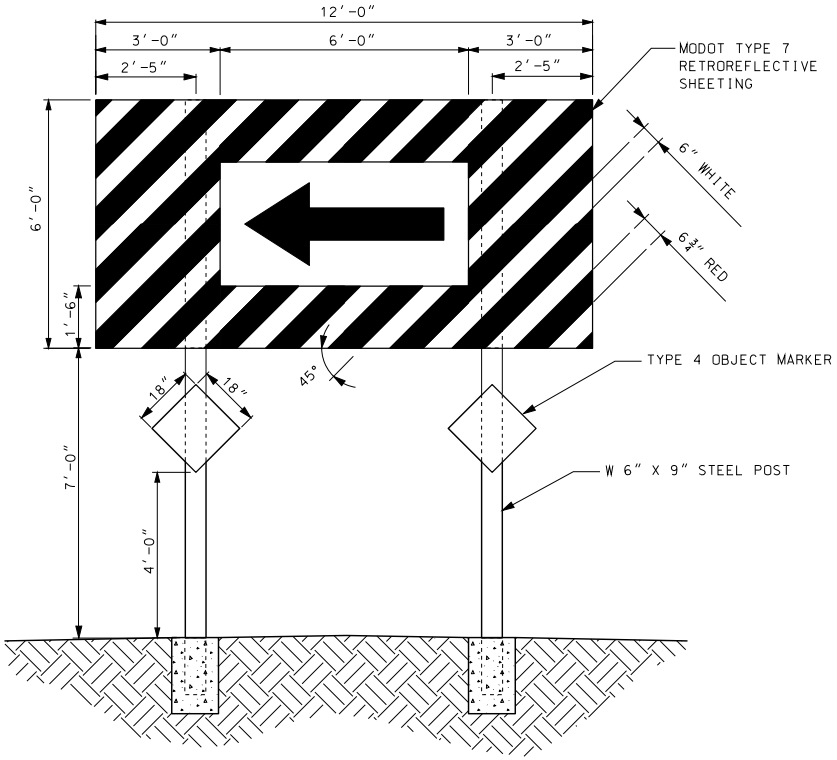
HOLE PUNCHING

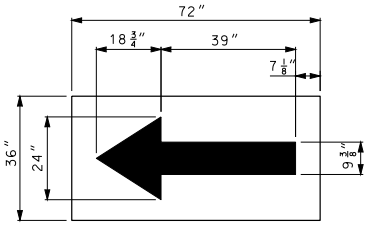
DATE EFFECTIVE: 06/01/2010
DATE PREPARED: 4/1/2010

903.02AK

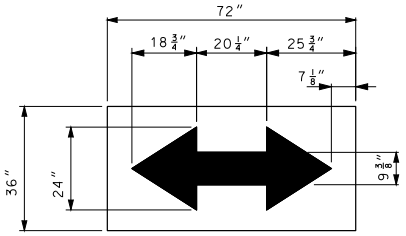
SHEET NO. 18 OF 19

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.

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

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STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

SIGN BARRICADE

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

903.02AK

SHEET NO.
19 OF 19

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