MISSOURI
HIGHWAYS and TRANSPORTATION COMMISSION

JEFFERSON CITY, MISSOURI

SUPPLEMENTAL PLANS TO OCTOBER 2016 MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

EFFECTIVE April 1, 2017

EFFECTIVE: 04/01/2017

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

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* REVISED OR ADDED SINCE OCTOBER 2016

EFFECTIVE: 04/01/2017

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

MISSOURI STANDARD PLANS FOR HIGHWAY CONSTRUCTION

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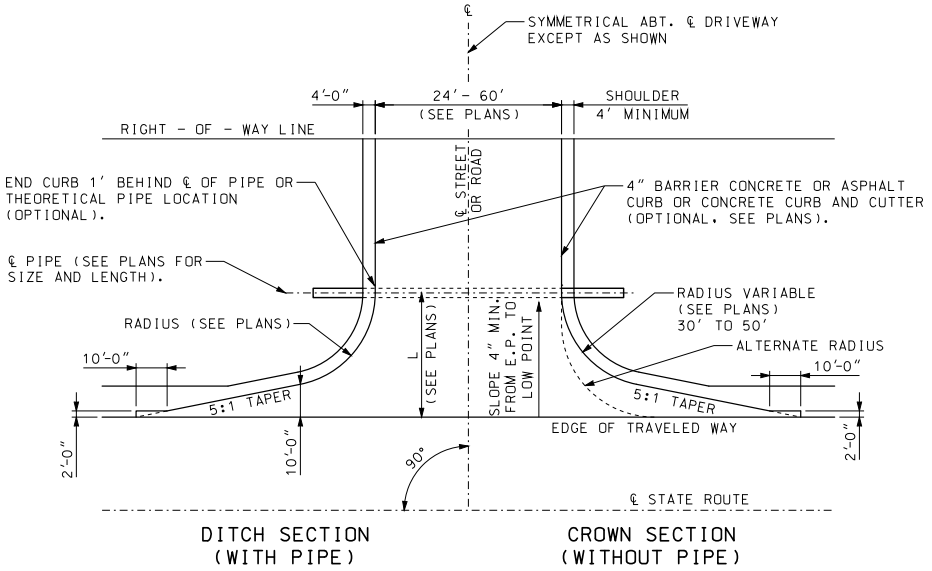
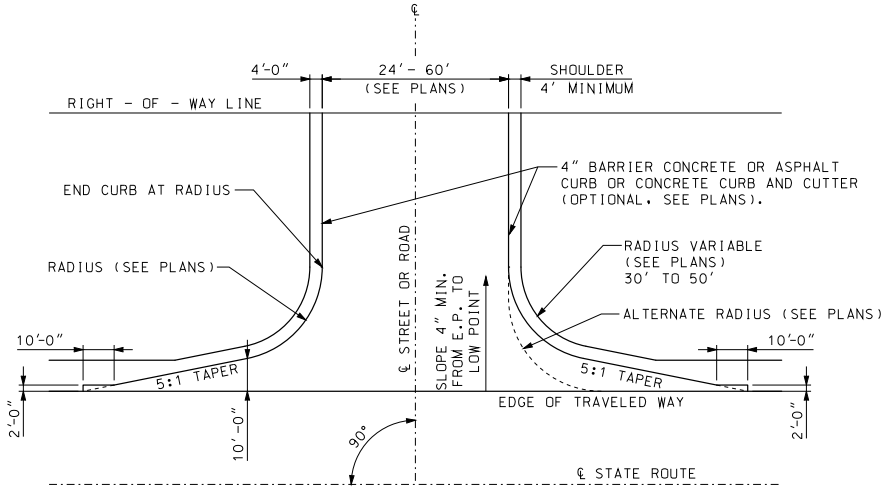
* REVISED OR ADDED SINCE OCTOBER 2016



DITCH SECTION
(WITH PIPE)

CROWN SECTION
(WITHOUT PIPE)

PLAN VIEW



FILL SECTION OR CROWN SECTION
(WITHOUT PIPE)

PLAN VIEW

GENERAL NOTES:

RECOMMENDED WIDTH OF ROADWAY - 24' WITHOUT PARKING ON ROAD AND 32' WITH PARKING ON ROAD.

SURFACING SHALL BE AS SHOWN ON THE PLANS OR PERMIT.

LENGTH OF PIPE SHALL BE DETERMINED BY DEPTH AND LOCATION OF DITCH, (SEE PLANS).

IF A PAVED APPROACH IS REQUIRED, REFER TO STANDARD PLANS 608.00 FOR CONSTRUCTION DETAILS AND CONSTRUCT CURB (IF REQUIRED) TO MEET CURB ON PAVED APPROACH. TRANSITION REQUIRED FROM 4" CURB TO 6" CURB.

CURB OR CURB AND GUTTER BETWEEN RIGHT-OF-WAY LINE AND PIPE MAY MEET LOCAL AGENCY STANDARDS.

THIS DRAWING ILLUSTRATES DETAILS FOR MINIMUM SITUATIONS. TRAFFIC VOLUMES, SAFETY CONSIDERATIONS, DRAINAGE CONSIDERATIONS, LOCAL REQUIREMENTS, ETC., MAY DICTATE MORE EXTENSIVE IMPROVEMENTS THAN ILLUSTRATED.

PIPE SIZE AND LOCATION TO BE DETERMINED BY GEOMETRICS AND DRAINAGE CONDITIONS (SEE PLANS).

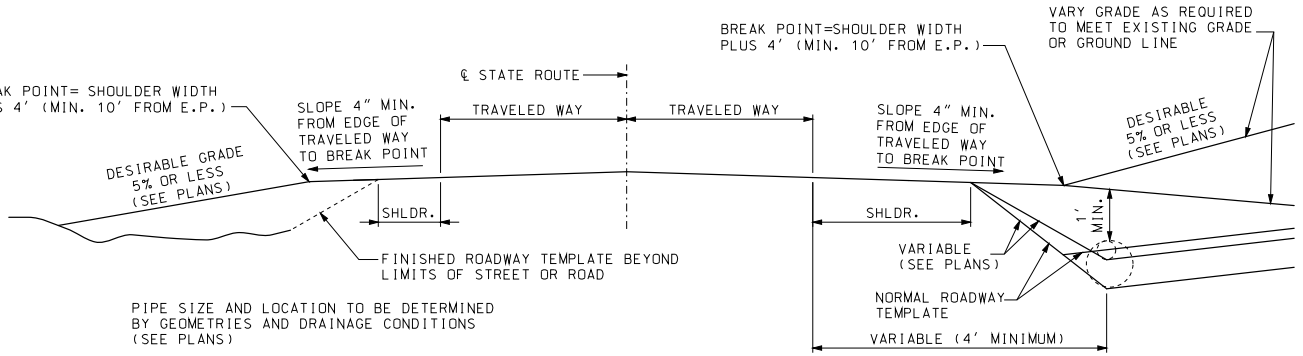
A MINIMUM 100-FOOT SIGHT DISTANCE TRIANGLE, MEASURED ALONG THE CENTERLINE OF THE INTERSECTING ROADWAYS, SHOULD BE PROVIDED.

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

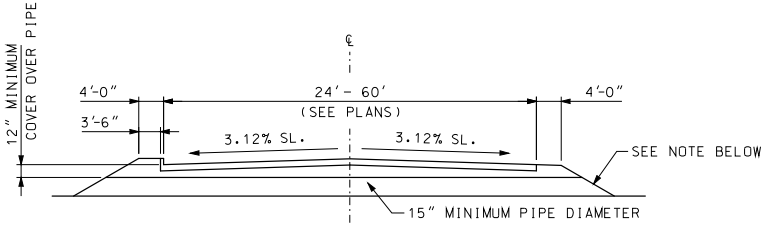
STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

DRIVEWAY
TYPE II

DATE EFFECTIVE:	04/01/2017	203.62D	SHEET NO. 1 OF 2
DATE PREPARED:	1/30/2017		

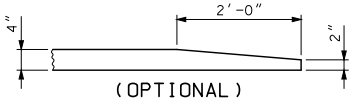


PROFILE



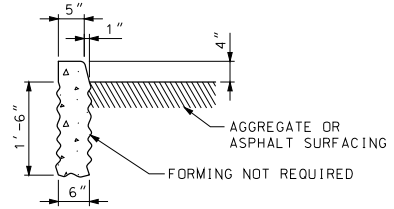
WITH CURB WITHOUT CURB

DRIVEWAY TYPICAL SECTION

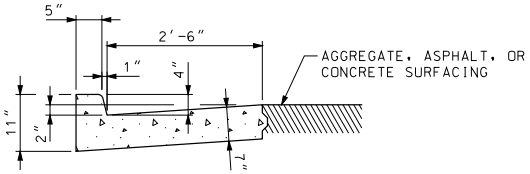


(OPTIONAL)

CURB TERMINUS
DETAIL



SECTION THRU 4" BARRIER CURB



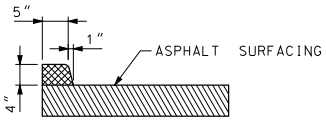
SECTION THRU CONCRETE
CURB AND GUTTER

DRIVEWAY SIDE SLOPES: ✳

1 TO 1700 VEHICLES PER DAY ON STATE ROUTE USE 3:1 SLOPE
(OR 6:1 SLOPE WHERE PRACTICABLE).

OVER 1700 VEHICLES PER DAY ON STATE ROUTE USE 6:1 SLOPE
(OR FLATTER WHERE PRACTICABLE).

✳ IN ORDER TO MINIMIZE THE USE OF 6:1 SLOPED END PIPE SECTIONS ON NEW CONSTRUCTION AND WHERE POSSIBLE ON EXISTING ROUTES. THE LOCATION OF DRAINAGE PIPE SHOULD BE BEYOND THE CLEAR ZONE DISTANCE AS SHOWN IN TABLE 3.1 OF THE "ROADSIDE DESIGN GUIDE".



SECTION THRU 4" ASPHALT CURB

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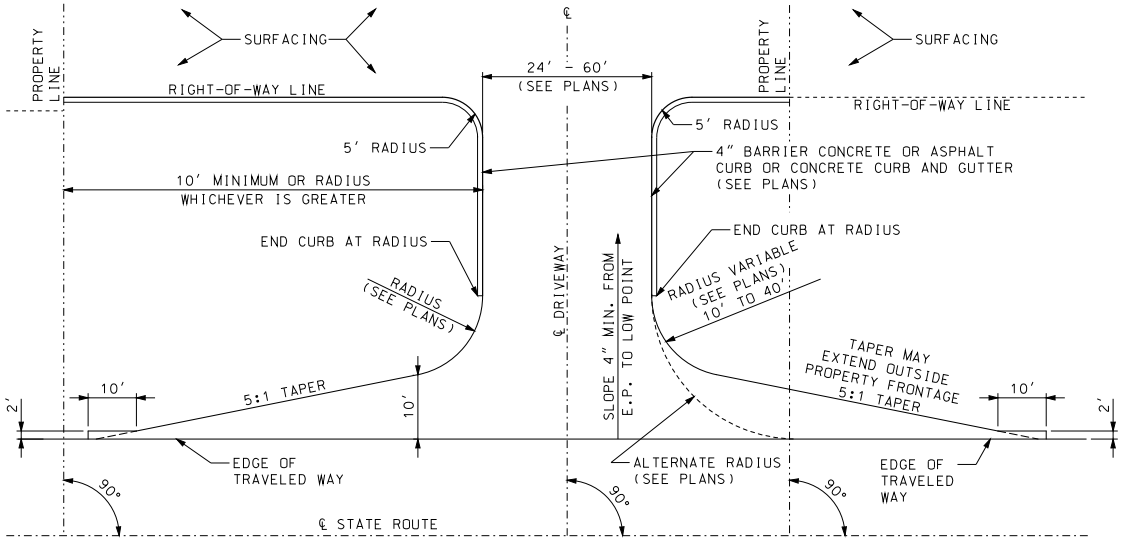
DRIVEWAY
TYPE II

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

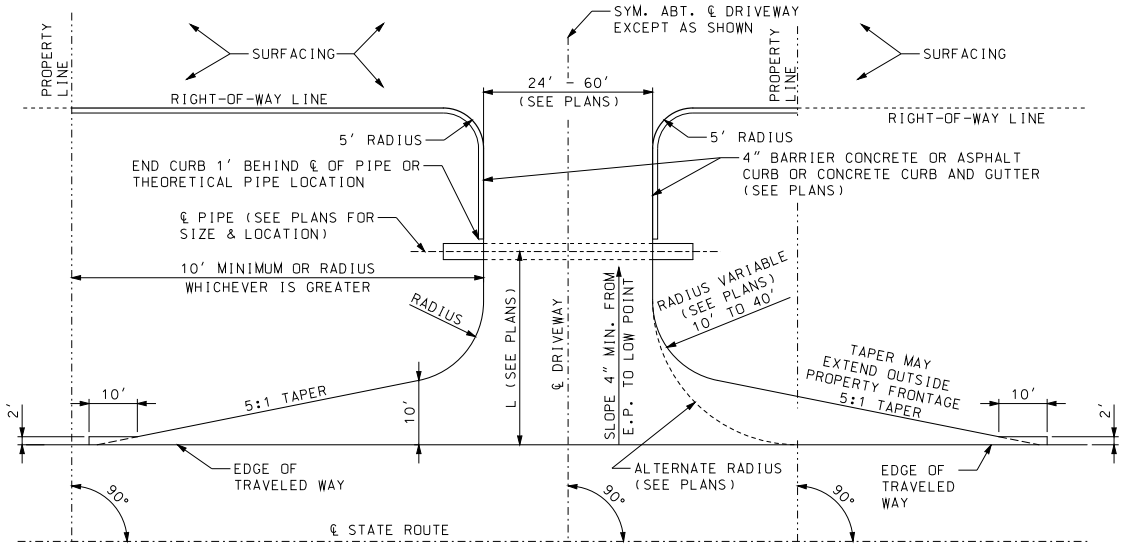
203.62D

SHEET NO.
2 OF 2

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



FILL SECTION OR CROWN SECTION
(WITHOUT PIPE)
PLAN VIEW



DITCH SECTION
(WITH PIPE)
PLAN VIEW

GENERAL NOTES:

FOR LIGHT DUTY PAVEMENT (<3500 ADT) DRIVEWAY BEGINS AT EDGE OF PAVEMENT.

RECOMMENDED WIDTH OF DRIVEWAY - 40'. SKETCH OR PLAN REQUIRED.

NO PART OF THE DRIVEWAY EXCLUDING TAPERS SHALL BE CONSTRUCTED OUTSIDE OF THE PROPERTY FRONTAGE.

SURFACING SHALL BE AS SHOWN ON THE PLANS OR PERMIT.

LENGTH OF PIPE SHALL BE DETERMINED BY DEPTH AND LOCATION OF DITCH. (SEE PLANS).

IF A PAVED APPROACH IS REQUIRED, REFER TO STANDARD PLAN 608.00 FOR CONSTRUCTION DETAILS AND CONSTRUCT CURB (IF REQUIRED) TO MEET CURB ON PAVED APPROACH. TRANSITION REQUIRED FROM 4" CURB TO 6" CURB.

CURB OR CURB AND GUTTER BETWEEN RIGHT-OF-WAY LINE AND PIPE MAY MEET LOCAL AGENCY STANDARDS.

PIPE SIZE AND LOCATION TO BE DETERMINED BY GEOMETRICS AND DRAINAGE CONDITIONS (SEE PLANS).

THIS DRAWING ILLUSTRATES DRIVEWAY DETAILS FOR MINIMUM SITUATIONS. TRAFFIC VOLUMES, SAFETY CONSIDERATIONS, DRAINAGE CONSIDERATIONS, LOCAL REQUIREMENTS, ETC., MAY DICTATE MORE EXTENSIVE IMPROVEMENTS THAN ILLUSTRATED.

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DRIVEWAY
TYPE III

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

203.63B

SHEET NO.
1 OF 2

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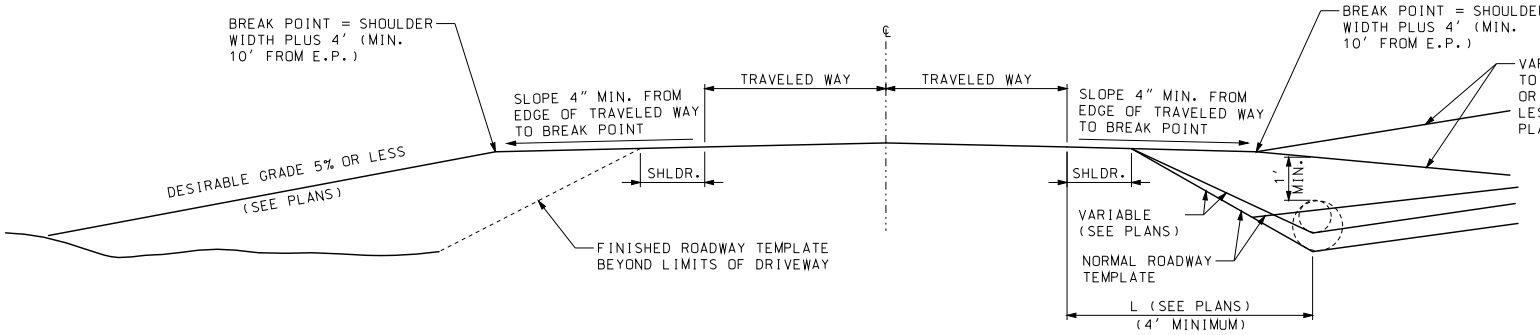
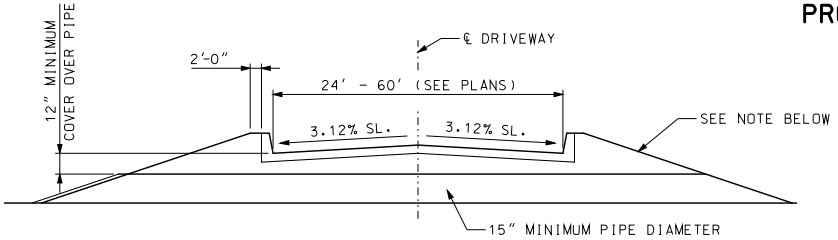


IN FILLS

IN CUTS

PROFILE VIEW



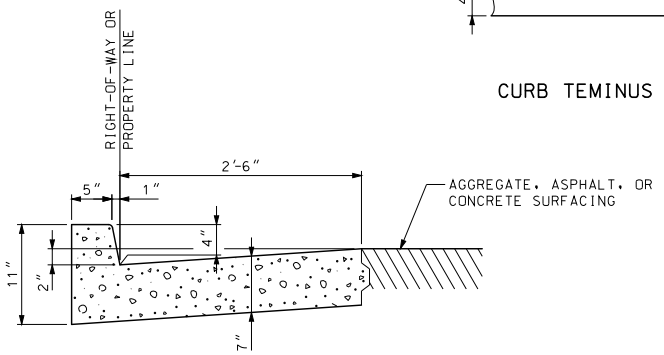
DRIVEWAY TYPICAL SECTION

DRIVEWAY SIDE SLOPES: ✳

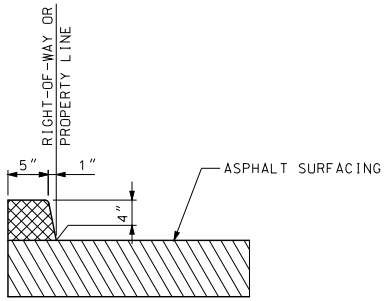
1 TO 1700 VEHICLES PER DAY ON STATE ROUTE USE 3:1 SLOPE (OR 6:1 WHERE PRACTICABLE).
OVER 1700 VEHICLES PER DAY ON STATE ROUTE USE 6:1 SLOPE (OR FLATTER WHERE PRACTICABLE).

✳ IN ORDER TO MINIMIZE THE USE OF 6:1 SLOPED END PIPE SECTIONS ON NEW CONSTRUCTION AND WHERE POSSIBLE ON EXISTING ROUTES, THE LOCATION OF THE DRAINAGE PIPE SHOULD BE BEYOND THE CLEAR ZONE DISTANCE AS SHOWN IN TABLE 3.1 OF THE "ROADSIDE DESIGN GUIDE".

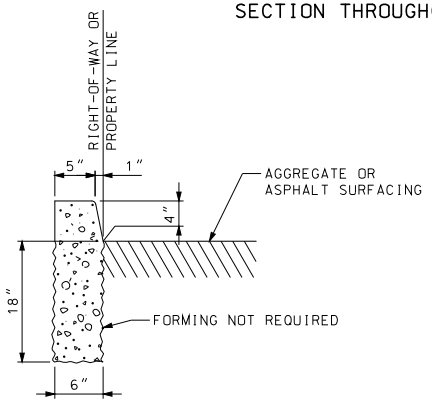
CURB TEMINUS DETAIL



SECTION THROUGHCONCRETE CURB AND GUTTER



SECTION THRU 4" ASPHALT CURB



SECTION THROUGH 4" BARRIER CURB

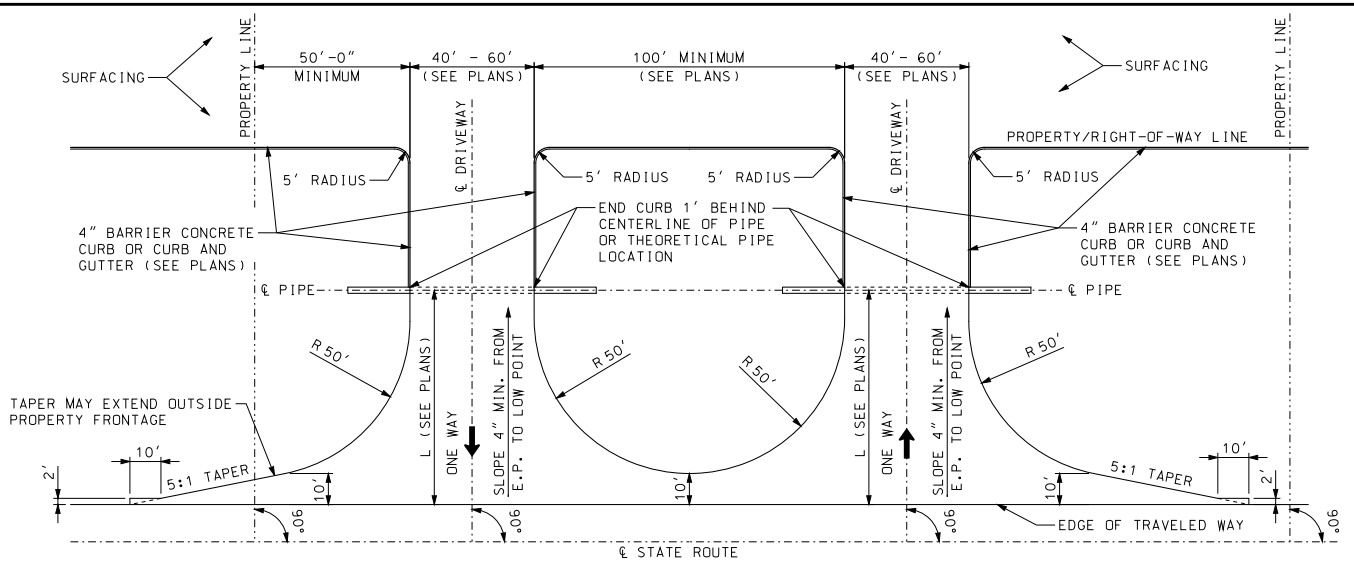
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

DRIVEWAY
TYPE III

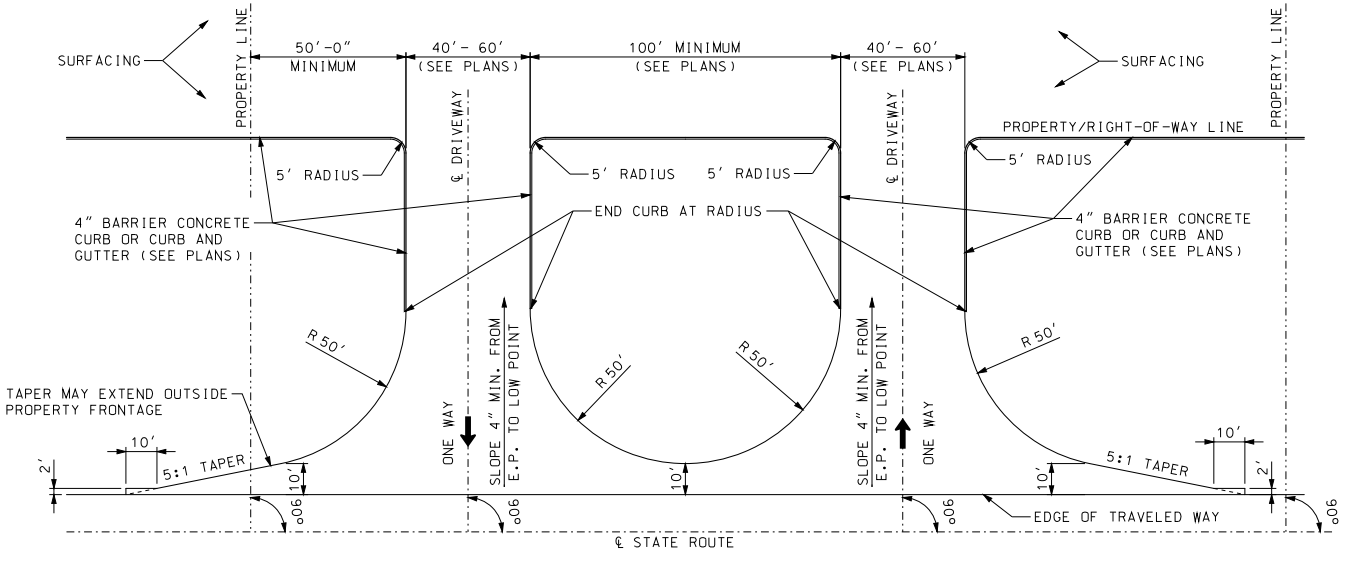
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

203.63B

SHEET NO. 2 OF 2



DITCH SECTION (WITH PIPE)
PLAN VIEW



FILL SECTION OR CROWN SECTION
(WITHOUT PIPE)
PLAN VIEW

GENERAL NOTES:

RECOMMENDED WIDTH OF ROADWAY - 40'.

NO PART OF THE DRIVEWAY EXCLUDING TAPERS SHALL BE CONSTRUCTED OUTSIDE OF THE PROPERTY FRONTAGE.

SURFACING SHALL BE AS SHOWN ON THE PLANS OR PERMIT.

LENGTH OF PIPE SHALL BE DETERMINED BY DEPTH AND LOCATION OF DITCH. (SEE PLANS).

IF A PAVED APPROACH IS REQUIRED, REFER TO STANDARD PLAN 608.00 FOR CONSTRUCTION DETAILS AND CONSTRUCT CURB (IF REQUIRED) TO MEET CURB ON PAVED APPROACH. TRANSITION REQUIRED FROM 4" CURB TO 6" CURB.

CURB OR CURB AND GUTTER BETWEEN RIGHT-OF-WAY LINE AND PIPE MAY MEET LOCAL AGENCY STANDARDS.

THE DRIVEWAY WIDTH SHALL BE DETERMINED AT THE TANGENT POINT OF THE RADIUS AND SIDE OF DRIVEWAY.

THIS DRAWING ILLUSTRATES DRIVEWAY DETAILS FOR MINIMUM SITUATIONS. TRAFFIC VOLUMES, SAFETY CONSIDERATIONS, DRAINAGE CONSIDERATIONS, LOCAL REQUIREMENTS, ETC., MAY DICTATE MORE EXTENSIVE IMPROVEMENTS THAN ILLUSTRATED.

PIPE SIZE AND LOCATION TO BE DETERMINED BY GEOMETRICS AND DRAINAGE CONDITIONS (SEE PLANS).

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NUMBER PE-28411
PROFESSIONAL ENGINEER
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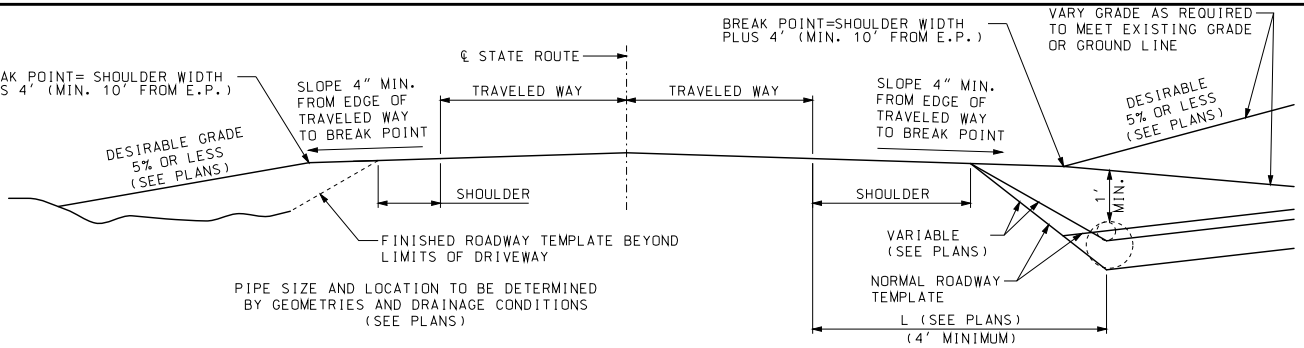
DRIVEWAY
TYPE IV

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

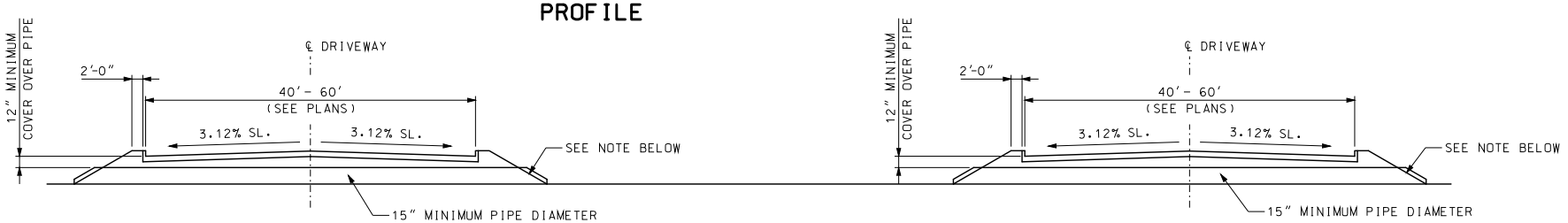
203.64D

SHEET NO.
1 OF 2

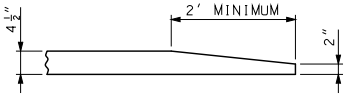
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PROFILE



DRIVEWAY TYPICAL SECTION



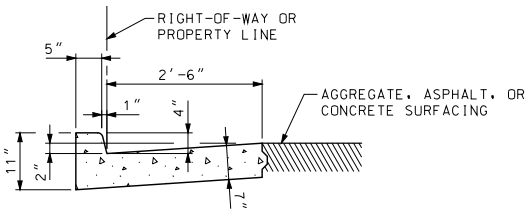
CURB TERMINUS DETAIL

DRIVEWAY SIDE SLOPES: ✳

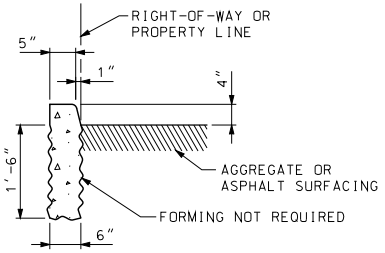
1 TO 1700 VEHICLES PER DAY ON STATE ROUTE USE 3:1 SLOPE (OR 6:1 SLOPE WHERE PRACTICABLE).

OVER 1700 VEHICLES PER DAY ON STATE ROUTE USE 6:1 SLOPE (OR FLATTER WHERE PRACTICABLE).

✳ IN ORDER TO MINIMIZE THE USE OF 6:1 SLOPE AND PIPE SECTIONS ON NEW CONSTRUCTION OF DRAINAGE PIPE SHOULD BE BEYOND THE CLEAR ZONE DISTANCE AS SHOWN IN TABLE 3.1 OF THE "ROADSIDE DESIGN GUIDE".



SECTION THRU CONCRETE CURB AND GUTTER



SECTION THRU 4" BARRIER CURB

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

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

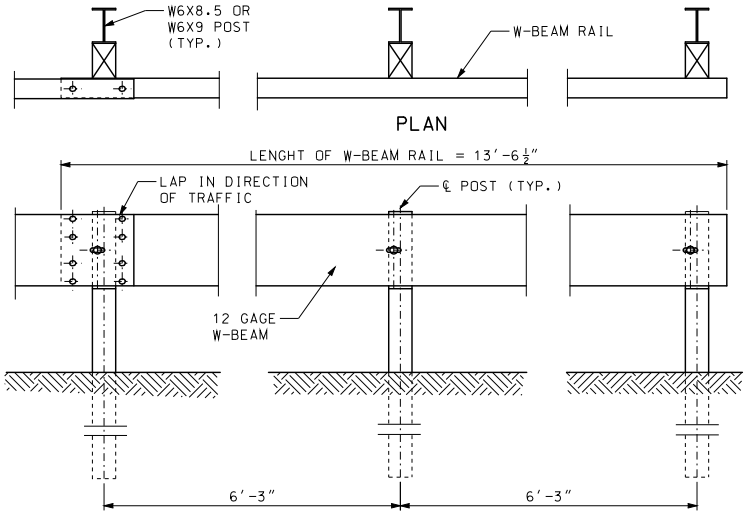
DRIVEWAY
TYPE IV

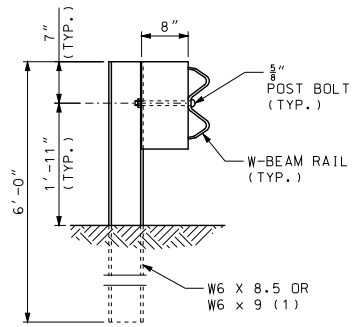
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

203.64D

SHEET NO. 2 OF 2

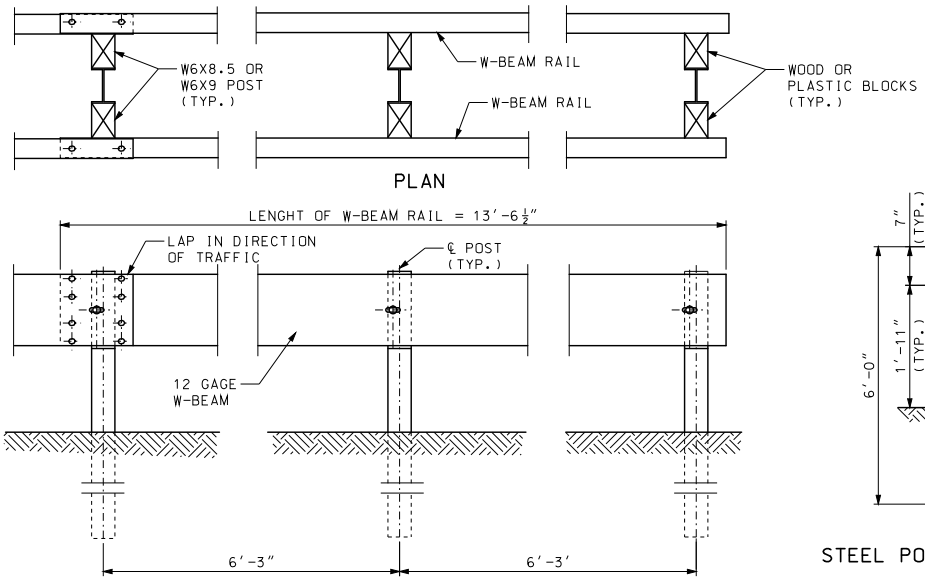
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.

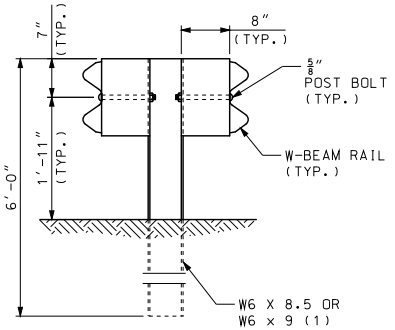




STEEL POST & WOOD OR
PLASTIC BLOCK

TYPE A GUARDRAIL





STEEL POST & WOOD OR PLASTIC
BLOCKS

TYPE B GUARDRIAL

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

GENERAL NOTES:
SEE SHEET NO. 5 OF 7 FOR POST AND BLOCK DETAILS.

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STATE OF MISSOURI
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NUMBER PE-28411
PROFESSIONAL ENGINEER
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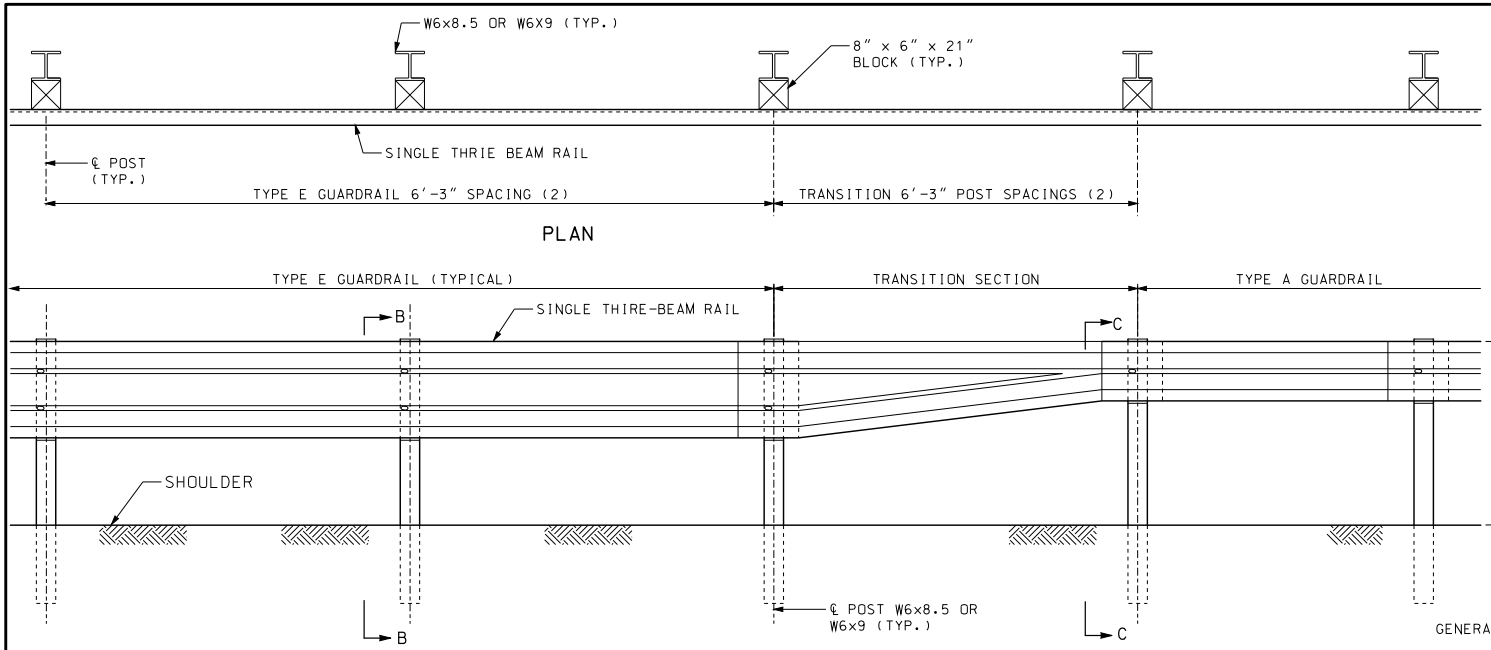
GUARDRAIL
TYPE A AND TYPE B

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

606.00AY

SHEET NO.
1 OF 7

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



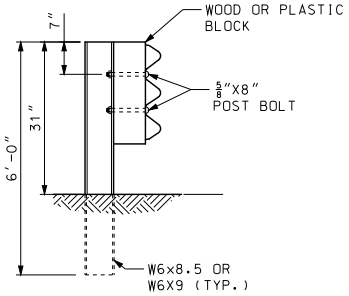
PART SECTION SHOWING TYPE E TO TYPE A GUARDRAIL TRANSITION

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

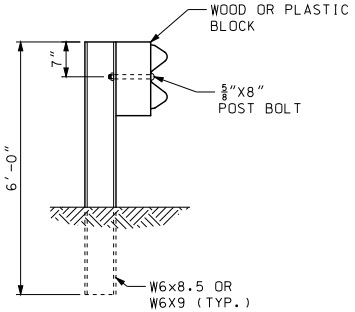
(2) IF THE TRANSITION IS CONNECTED TO A BRIDGE ANCHOR SECTION, POST SPACING FOR TYPE E GUARDRAIL AND THE TRANSITION SECTION SHALL BE 3'-1½" . FOR ALL OTHER CASES, POST SPACING SHALL BE 6'-3".

(3) TRANSITION FROM 31" TO 29" HEIGHT OVER 2-12.5' W-BEAMS OR 25'.

THE OVERALL NOMINAL DIMENSIONS SHOWN SHALL BE MET, ALTHOUGH THE SHAPE OF THE PLASTIC BLOCKS MAY VARY FROM THE SHAPE SHOWN, EXCEPT THE ⅜" ± ¼" FLANGE AND THE OVERALL WIDTH DIMENSIONS MAY BE WAIVED IF APPROVED BY PROJECT OPERATIONS.



SECTION B–B



SECTION C–C

GENERAL NOTES:

TYPE E GUARDRAIL SHALL USE 6'-3" POST SPACING UNLESS 3'-1½" POST IS SPECIFIED.

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

FOR PROTECTIVE COATING AND MATERAL REQUIREMENTS, SEE SEC 1040 OF THE STANDARD SPECIFICATIONS.

SEE SHEET 7 OF 7 FOR REQUIREMENTS FOR SPECIAL INSTALLATIONS.

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

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

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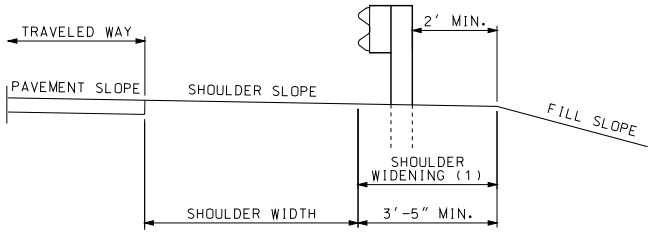
GUARDRAIL
TYPE E

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

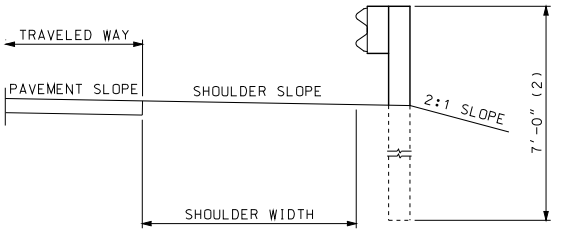
606.00AY

SHEET NO.
2 OF 7

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



TYPCIAL SECTION

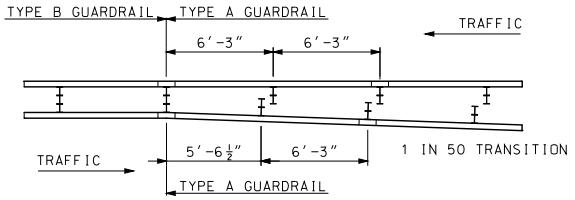


ALTERNATE TYPICAL SECTION AT SLOPE BREAKPOINT

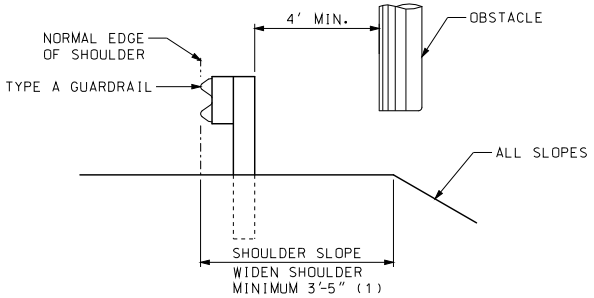
(1) SHOULDER WIDENING SHALL CONSIST OF EMBANKMENT MATERIAL COMPACETED IN ACCORDANCE WITH SEC 203.4 OF THE STANDARD SPECIFICATIONS.

(2) POST SHALL BE SPACED AT 3'-1½" ON CENTER.

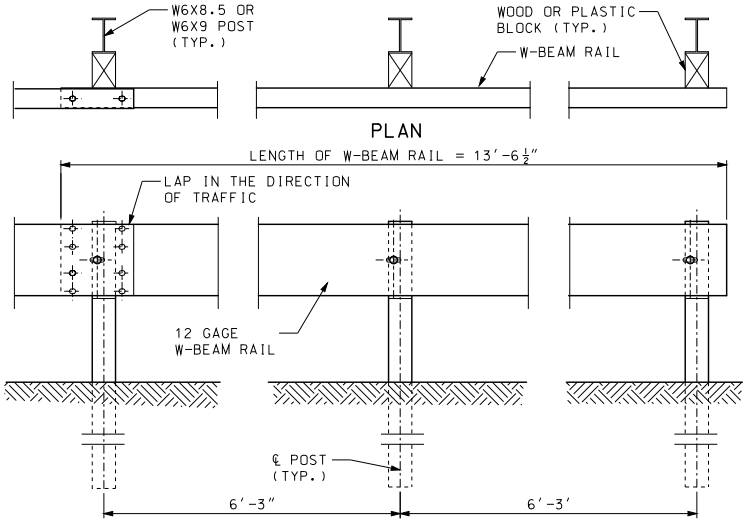
(3) WHEN GUARDRAIL IS CONSTRUCTED OVER CURBS, THE CURBS SHALL BE CONSTRUCTED AS SHOWN.



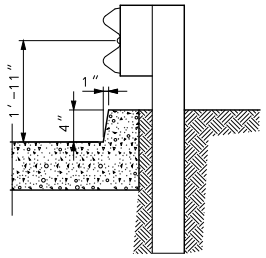
DETAIL FOR TRANSITIONING
BETWEEN TYPE A AND TYPE B GUARDRAIL



LOCATION OTHER THAN ℄ MEDIAN
LATERAL PLACEMENT OF GUARDRAIL
FOR SHOULDER INSTALLATION



ELEVATION



GUARDRIAL AT CURBS (3)

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

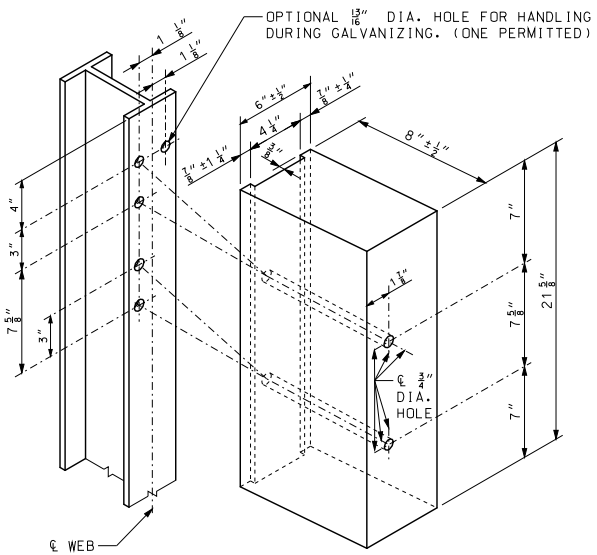
GUARDARIL LAYOUT

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

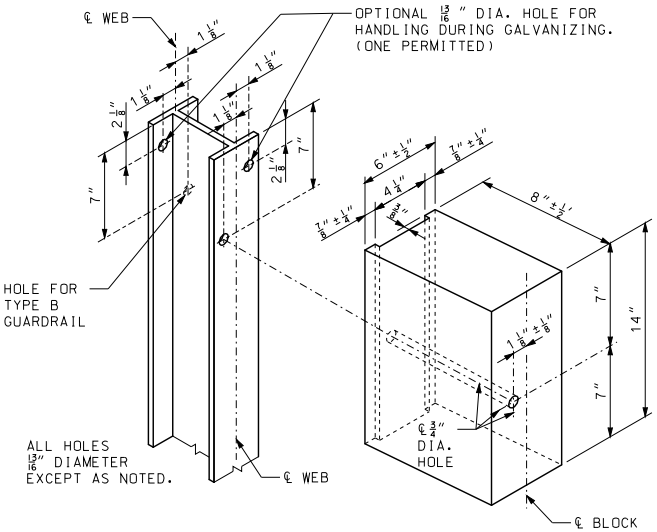
606.00AY

SHEET NO. 3 OF 7

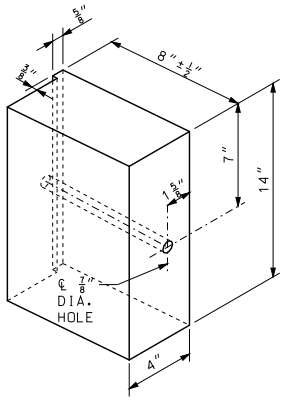
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



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

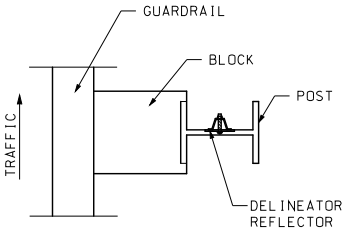


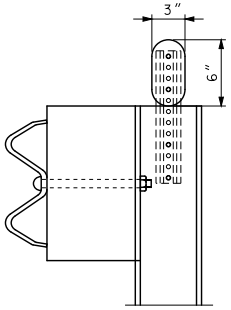
TYPE A AND TYPE B
FOR STEEL POST AND WOOD OR PLASTIC BLOCKS (1)

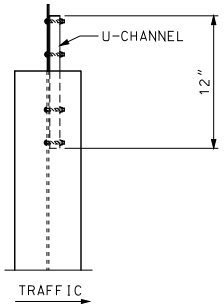


ALTERNATE DESIGN
FOR WOOD BLOCK

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







DELINEATORS ON NEW GUARDRAIL

GENERAL NOTES:

FOR GUARDRAIL DELINEATION DETAILS SEE STD PLAN 903.03.

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STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
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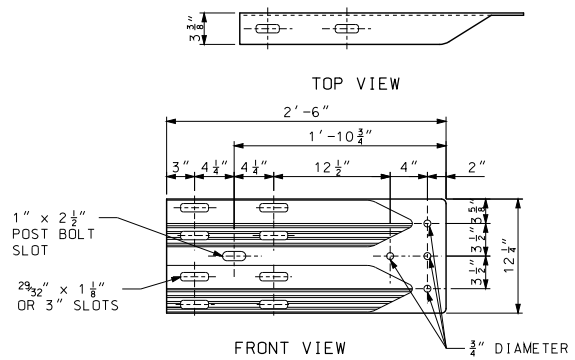
GUARDRAIL
POST AND BLOCK

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

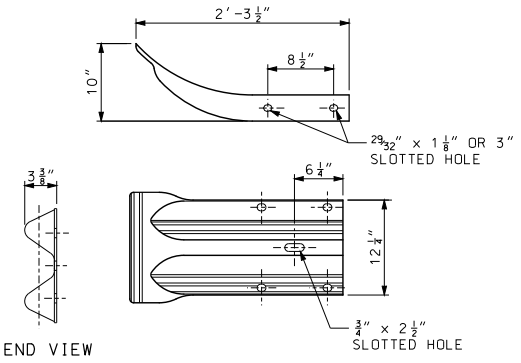
606.00AY

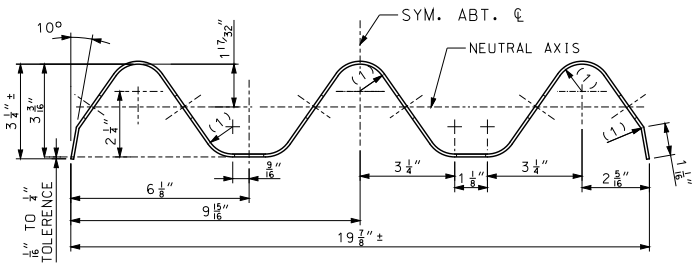
SHEET NO.
4 OF 7

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

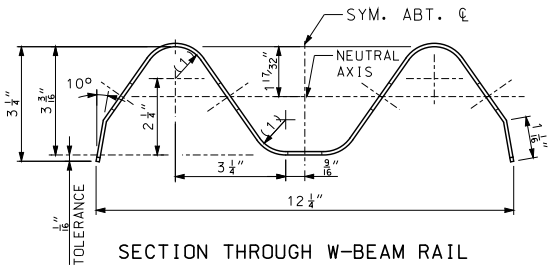


TERMIANL CONNECTOR





SECTION THROUGH THRIE BEAM RAIL



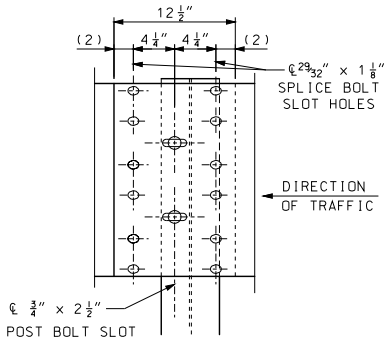
SECTION THROUGH W-BEAM RAIL

(1) 15/16″ RADIUS

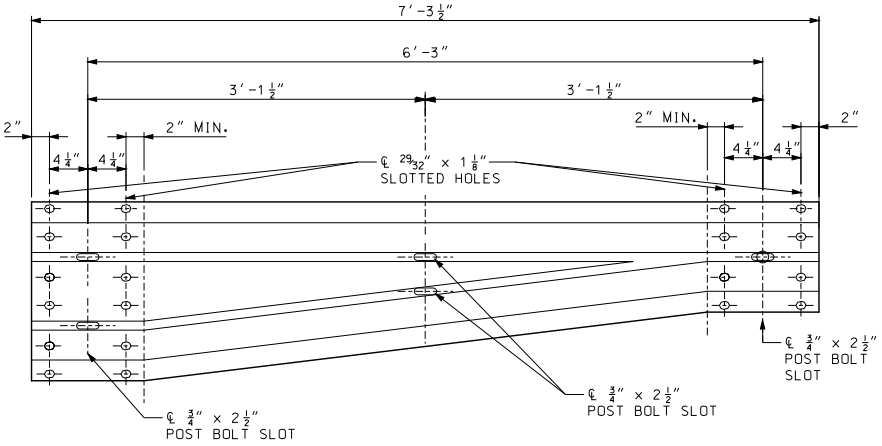
(2) 2″ (TOLERANCE +1 1/4″, -1/4″)

END SECTION

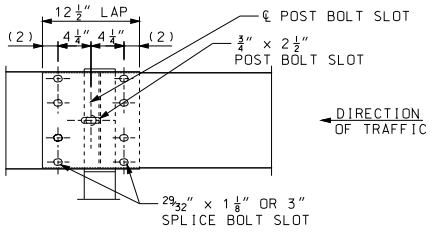
12 GAGE



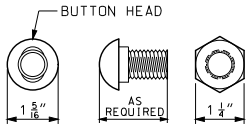
THRIE-BEAM SPLICE AT POST



ELEVATION OF ASYMMETRICAL TRANSITION SECTION

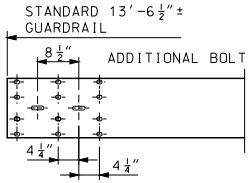


W-BEAM RAIL SPLICE AT POST



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

5/8″ POST OR SPLICE BOLT



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

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

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JEFFERSON CITY, MO 65102
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ERIC E. SCHROETER NUMBER PE-2841 STATE OF MISSOURI PROFESSIONAL ENGINEER
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GUARDRAIL RAIL ELEMENTS

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

606.00AY

SHEET NO. 5 OF 7

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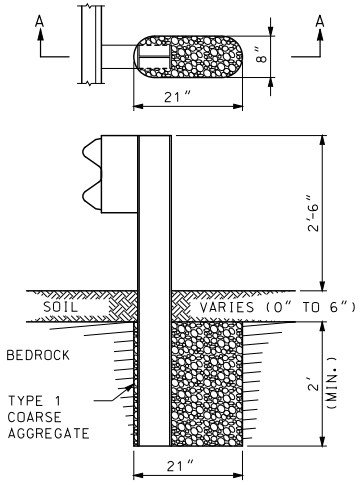
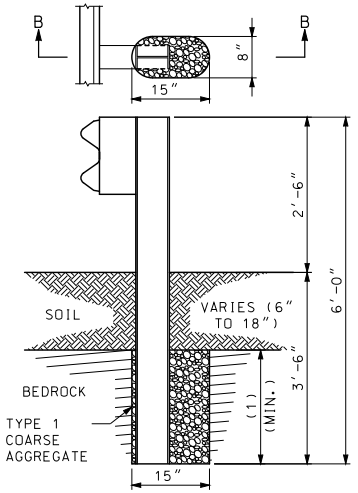
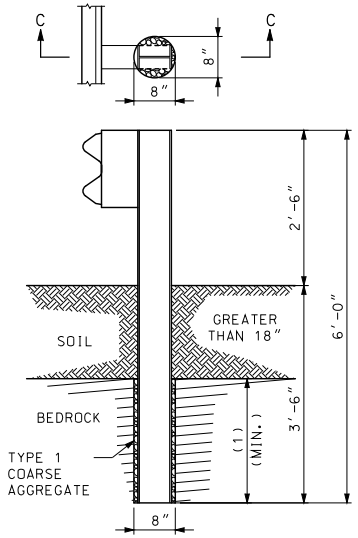


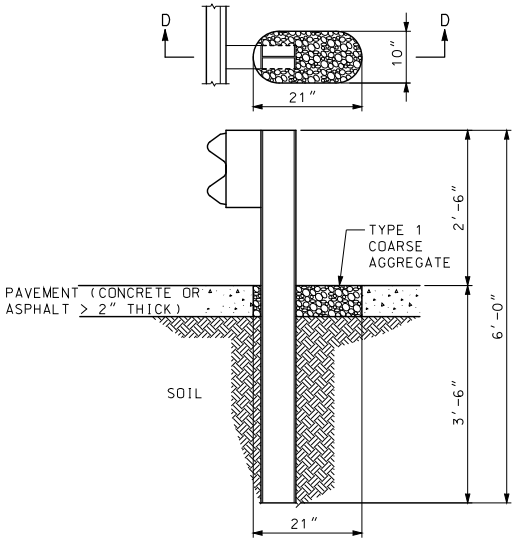
SECTION A–A
ROCK ENCOUNTERED
UP TO 6″ BENEATH SURFACE



SECTION B–B
ROCK ENCOUNTERED
6″ TO 18″ BENEATH SURFACE



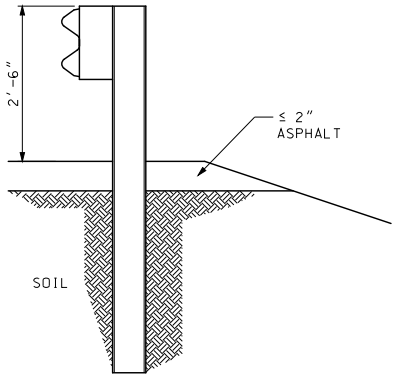
SECTION C–C
ROCK ENCOUNTERED MORE
THAN 18″ BENEATH SURFACE



SECTION D–D
SETTING POST THROUGH PAVEMENT
(CONCRETE OR ASPHALT > 2″ THICK)

SETTING POST IN SOLID ROCK

(1) MINIMUM ROCK EMBEDMENT IS EQUAL TO FULL DEPTH POST EMBEDMENT MINUS SOIL DEPTH.



SETTING POST THROUGH ASPHALT ≤ 2″ THICK

GENERAL NOTES:

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

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

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STATE OF MISSOURI
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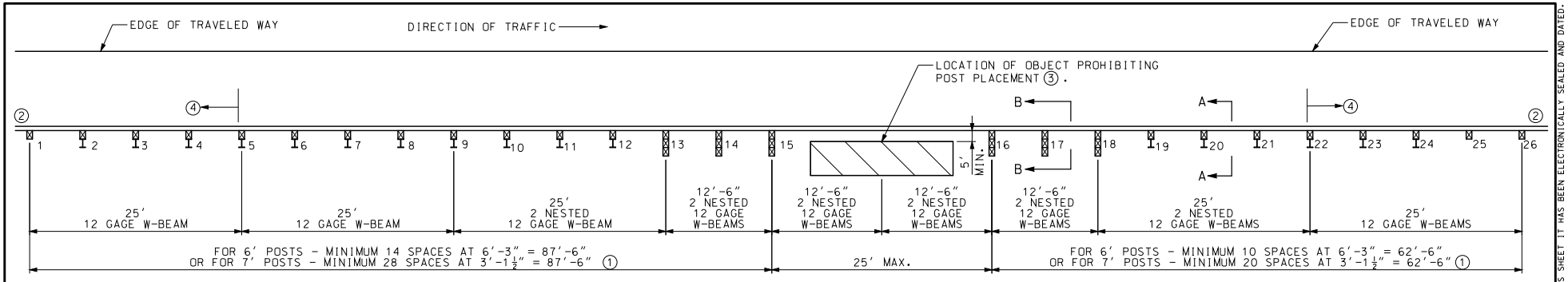
GUARDRAIL
SPECIAL INSTALLATIONS

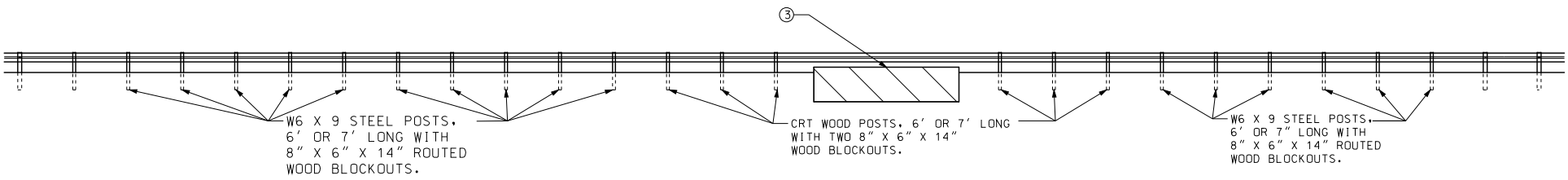
DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

606.00AY

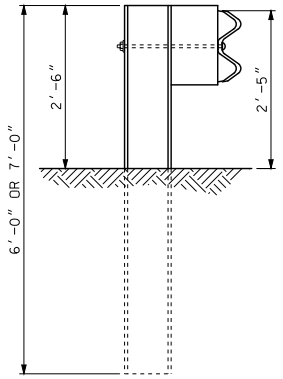
SHEET NO.
6 OF 7



PLAN

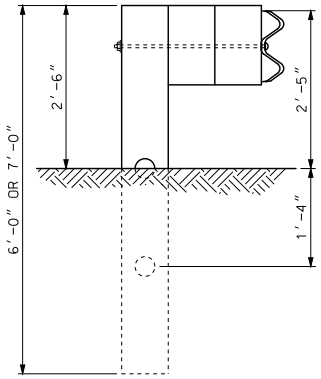


ELEVATION



SECTION A-A

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



SECTION B-B

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

① IF LOCATED WITHIN THE CLEAR ZONE OF A TWO-WAY ROADWAY, THE MINIMUM LENGTH IS 87'-6".

② ADDITIONAL GUARDRAIL AS REQUIRED, INCLUDING END TREATMENT.

③ THE POST MAY BE SKIPPED DUE TO THE PRESENCE OF AN OBSTACLE SUCH AS A CULVERT.

④ PLACE END TREATMENT NO CLOSER TO THE SKIPPED POST THAN POSTS 5 AND 22.

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NUMBER PE-28411
PROFESSIONAL ENGINEER
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GUARDRAIL
LONG-SPAN NESTED W-BEAM

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

606.00AY

SHEET NO. 7 OF 7

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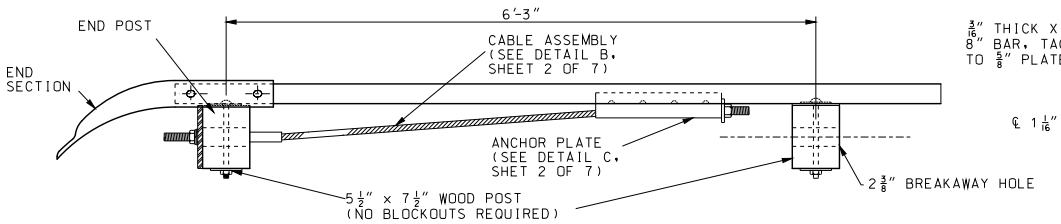
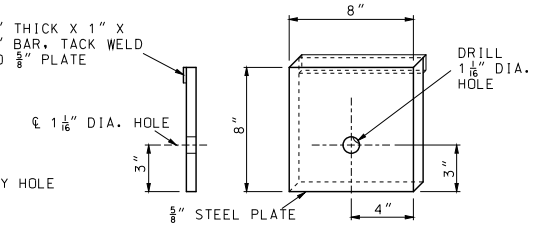
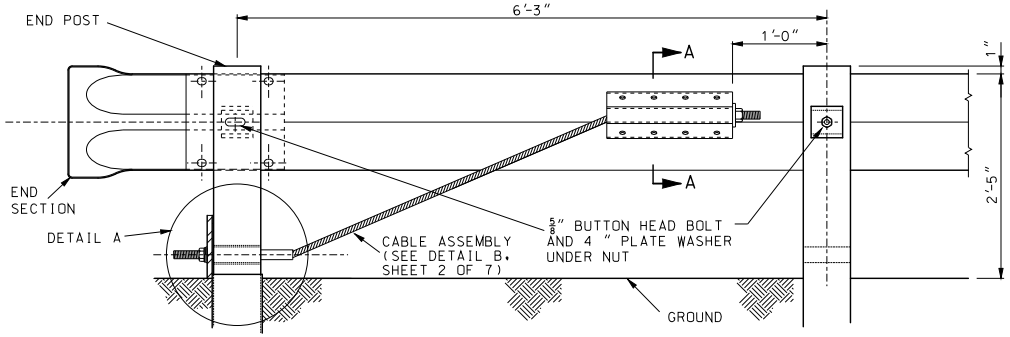


NOTE: FOR DETAILS OF END SECTION, SEE STD PLANS 606.00.

PLAN

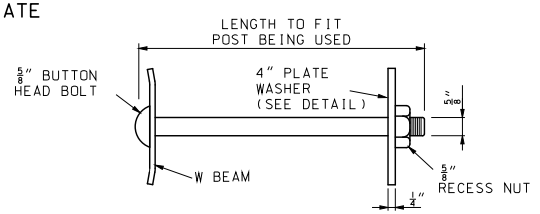


DETAIL OF
STEEL BEARING PLATE

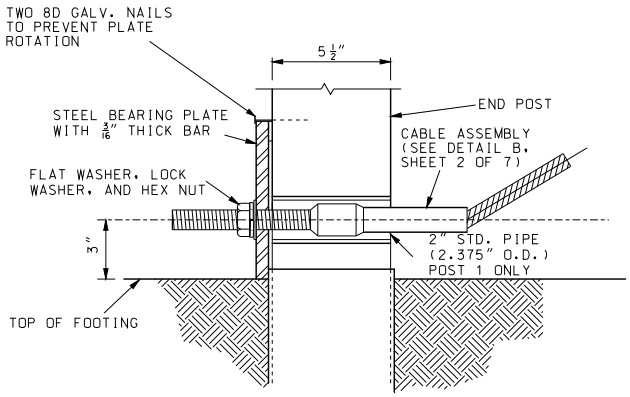


POST 1 ELEVATION (BACK SIDE) POST 2

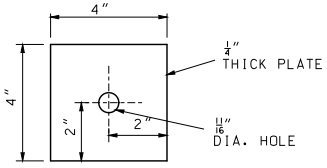
END ANCHOR DETAILS



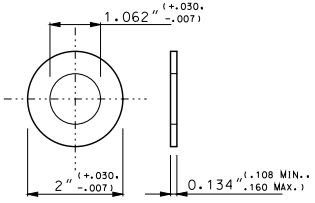
POST BOLT ASSEMBLY



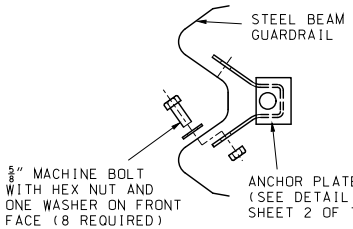
DETAIL A
(END POST DETAIL)



4" PLATE WASHER



TYPE A WASHER



SECTION A–A

GENERAL NOTES:

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

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

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

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

WOOD POSTS 1 AND 2 SHALL BE 5½" X 7½".

SEE SHEET 3 FOR WOOD POST DETAILS.

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NUMBER PE-28411
PROFESSIONAL ENGINEER
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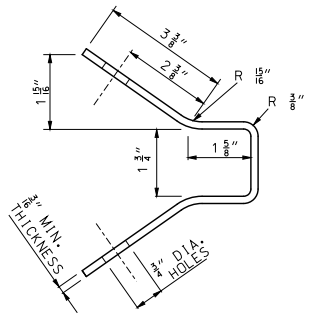
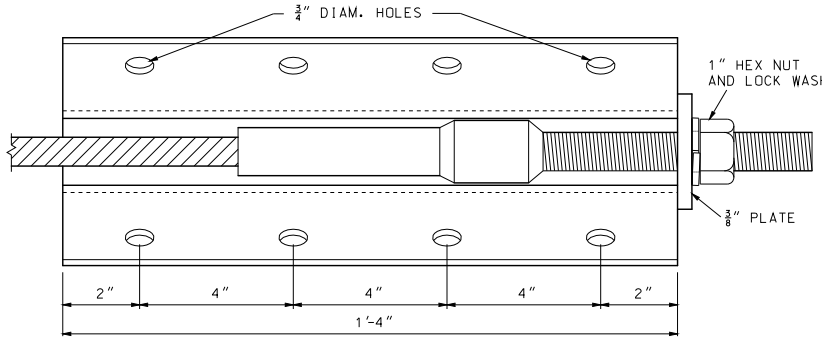
GUARDRAIL

TERMINAL ANCHOR ENDS

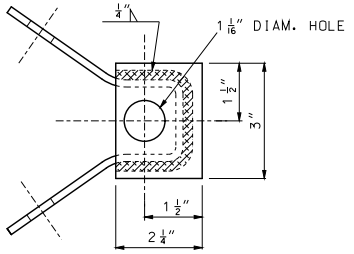
DATE EFFECTIVE:	04/01/2017	606.30K	SHEET NO. 1 OF 7
DATE PREPARED:	1/30/2017		



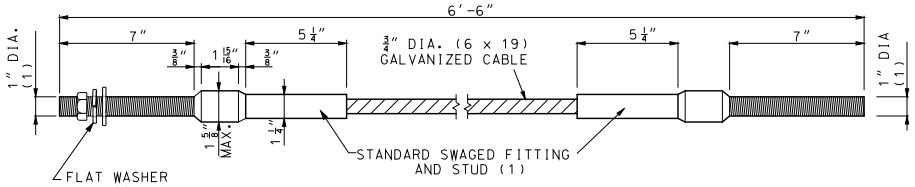
FABRICATION DETAIL



DETAIL C
ASSEMBLED VIEW
(ANCHOR PLATE)

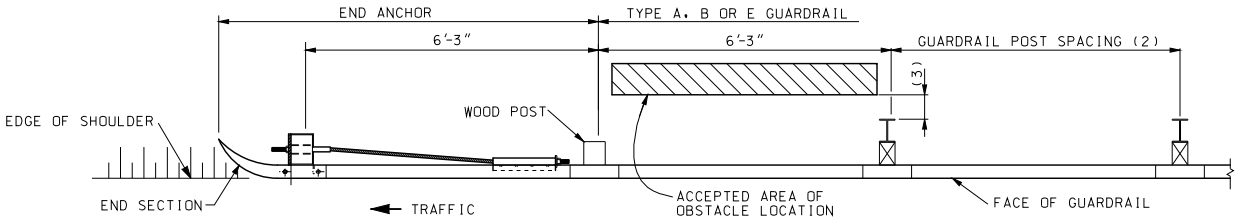


END VIEW

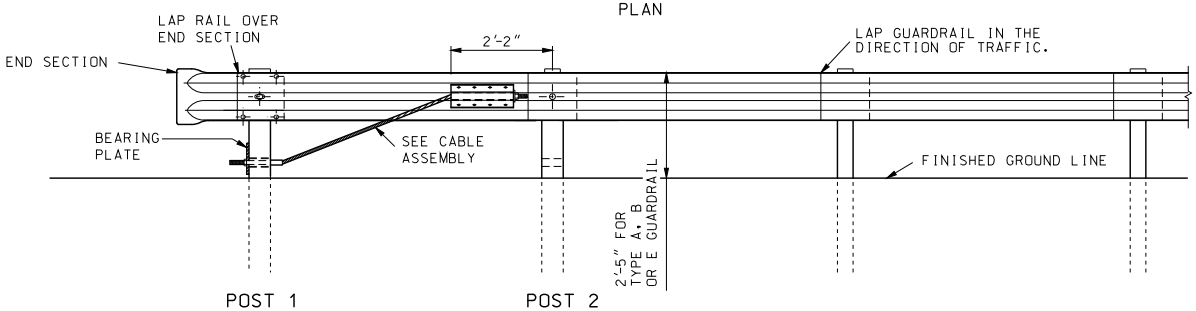


DETAIL B
(CABLE ASSEMBLY)

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



PLAN



ELEVATION
END ANCHOR

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

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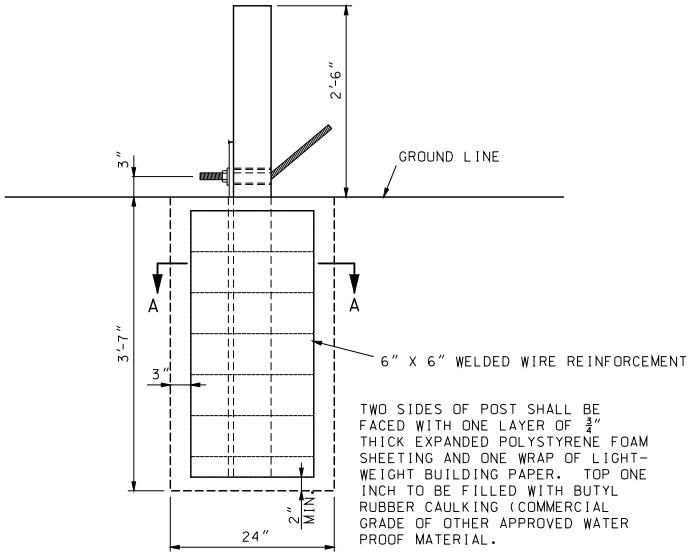
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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

GUARDRAIL

TERMINAL ANCHOR ENDS

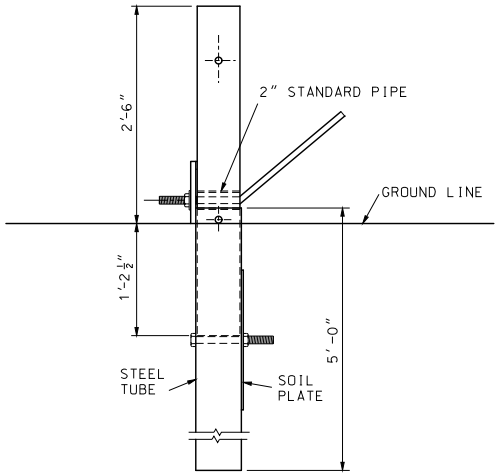
DATE EFFECTIVE: 04/01/2017	606.30K	SHEET NO. 2 OF 7
DATE PREPARED: 1/30/2017		



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

POST 1

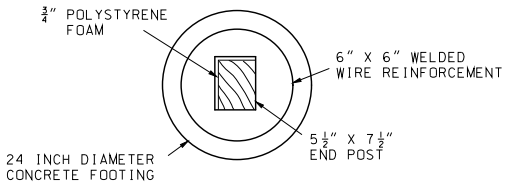
CONCRETE FOUNDATION FOR END ANCHORS



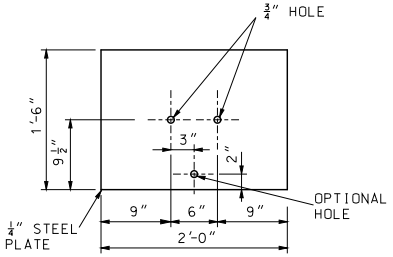
POST 1

STEEL TUBE FOUNDATION FOR END ANCHORS

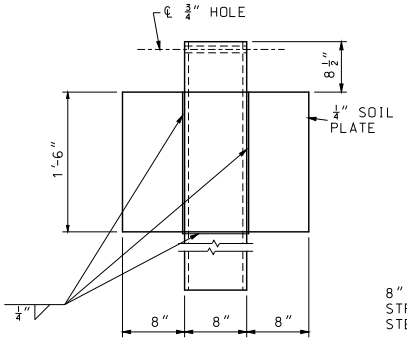
BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M232, OR THEY MAY BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH AASHTO M232 CLASS C.



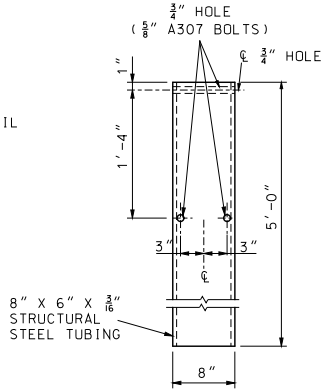
SECTION A-A
EXPANDED POLYSTYRENE FOAM
INSTALLATION DETAIL



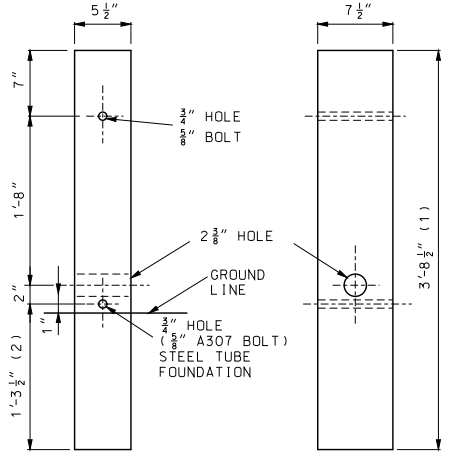
SOIL PLATE



SHOP WELDED
SOIL PLATE CONNECTION



STEEL TUBE



WOOD BREAKAWAY POST
SEE SECTION 1050

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

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

GENERAL NOTES:

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

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

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

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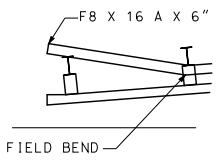
GUARDRAIL

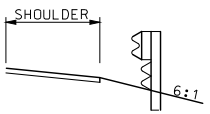
TERMINAL ANCHOR ENDS

DATE EFFECTIVE:	04/01/2017	606.30K	SHEET NO. 3 OF 7
DATE PREPARED:	1/30/2017		

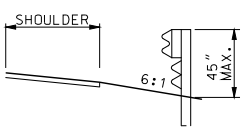
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



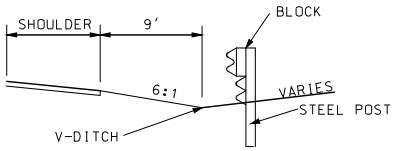
DETAIL A



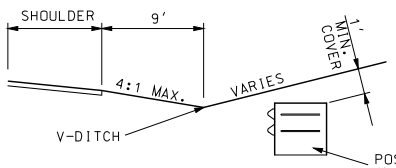
SECTION A-A



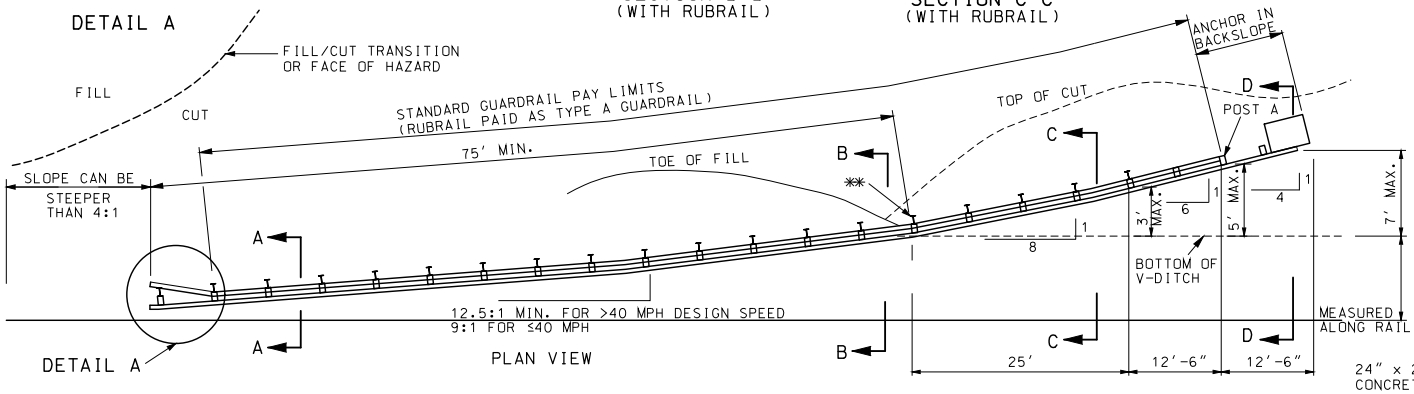
SECTION B-B
(WITH RUBRAIL)



SECTION C-C
(WITH RUBRAIL)

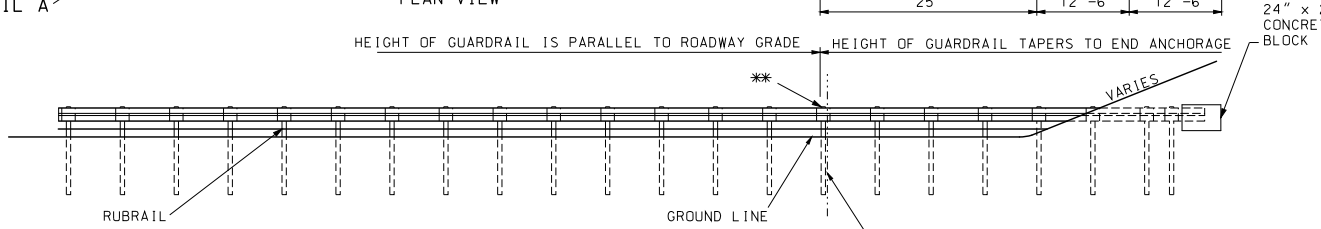


SECTION D-D



DETAIL A

PLAN VIEW

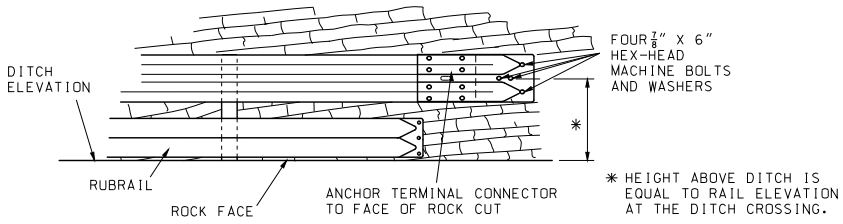


ELEVATION

ANCHORED IN BACKSLOPE GUARDRAIL

** THE POST BEHIND THE DITCHLINE MAY BE SHORTENED TO PROVIDE 48" MIN. EMBEDMENT.

COST OF SHAPING ROCK FACE FOR PLACING OF TERMINAL CONNECTOR, DRILLING HOLES, FURNISHING AND PLACING BOLTS, WASHERS, CAULKING, ANCHORS AND END SHOE TO BE INCLUDED IN THE PRICE OF GUARDRAIL ANCHOR, ROCK FACE.



* HEIGHT ABOVE DITCH IS EQUAL TO RAIL ELEVATION AT THE DITCH CROSSING.

ROCK FACE GUARDRAIL ANCHOR

GENERAL NOTES:

FOR END ANCHOR DETAILS, SEE SHEET 1-3 OF 7.

EIGHT FOOT POST IS REQUIRED WITH RUBRAIL.

RUBRAIL BEGINS WHEN THE DISTANCE BETWEEN THE GUARDRAIL AND THE GROUND IS 18" AND INCREASING.

END ANCHOR POSTS 1 AND 2 SHALL HAVE FOUNDATION TYPE AS SHOWN ON SHEET 3 OF 7.

THE CONTRACT UNIT PRICE FOR EMBEDDED GUARDRAIL ANCHOR SHALL INCLUDE THE CONCRETE ANCHOR. EXCAVATION AND BACKFILLING, OR TERMINAL CONNECTOR, AND ALL INCIDENTIAL HARDWARE AND WORK NECESSARY TO COMPLETE THE INSTALLATION.

THE GUARDRAIL SHALL EXTEND 50'± BEYOND THE DITCH LINE AND TERMINATE A MINIMUM OF 12 INCHES BELOW GROUND ELEVATION OF THE BACKSLOPE.

BLOCKOUTS WILL NOT BE REQUIRED FOR ANY POST WHICH WILL BE COMPLETELY BELOW GROUND. THE ALIGNMENT OF SUCH POSTS SHALL BE APPROVED BY THE ENGINEER.

SEE OTHER DRAWINGS AND STANDARD SPECIFICATIONS FOR MATERIAL AND CONSTRUCTION REQUIREMENTS NOT SHOWN.

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PROFESSIONAL ENGINEER
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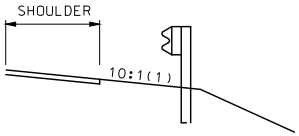
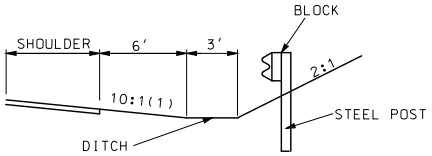
GUARDRAIL
TERMINAL ENDS
EMBEDDED AND ROCK FACE
(V-DITCH STEEPER THAN 10:1, 4:1 MAX. FORESLOPE)

DATE EFFECTIVE:	04/01/2017	606.30K	SHEET NO. 4 OF 7
DATE PREPARED:	1/30/2017		

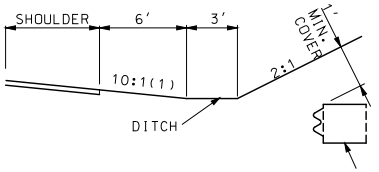
SECTION A-A



SECTION B-B

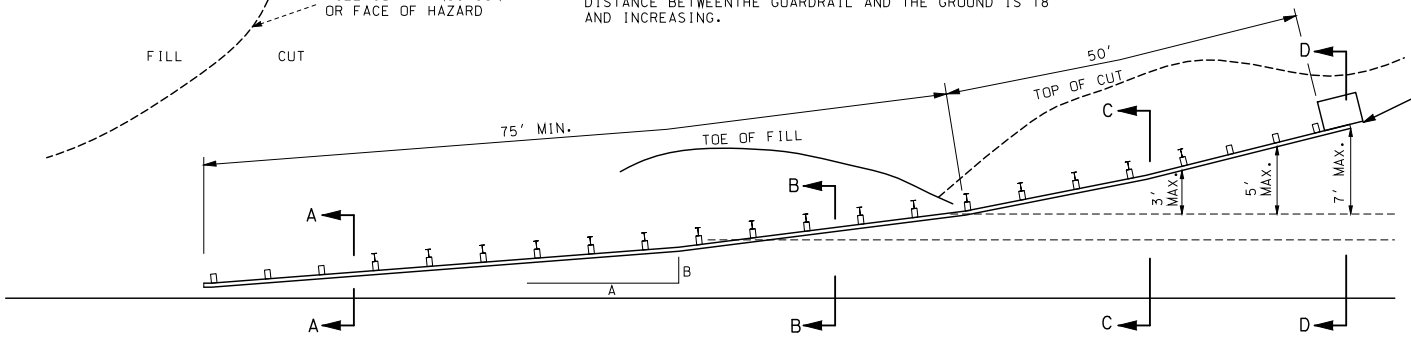


SECTION C-C



SECTION D-D

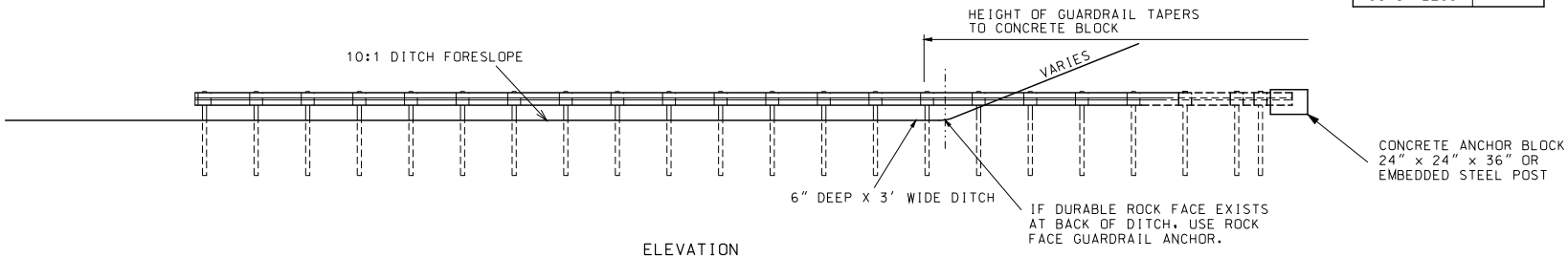
(1) MAX. CROSS SLOPE SHALL NOT EXCEED 6:1. RUBRAIL IS REQUIREDWHEN CROSS SLOPE EXCEEDS 10:1 OR WHEN THE DISTANCE BETWEENTHE GUARDRAIL AND THE GROUND IS 18" AND INCREASING.



PLAN VIEW

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

STEEPER THAN 10:1 CROSS SLOPE (1)	
DESIGN SPEED mph	A:B
45-70	12.5:1
40	9:1
30 OR LESS	7:1



ELEVATION

ANCHORED IN BACKSLOPE GUARDRAIL

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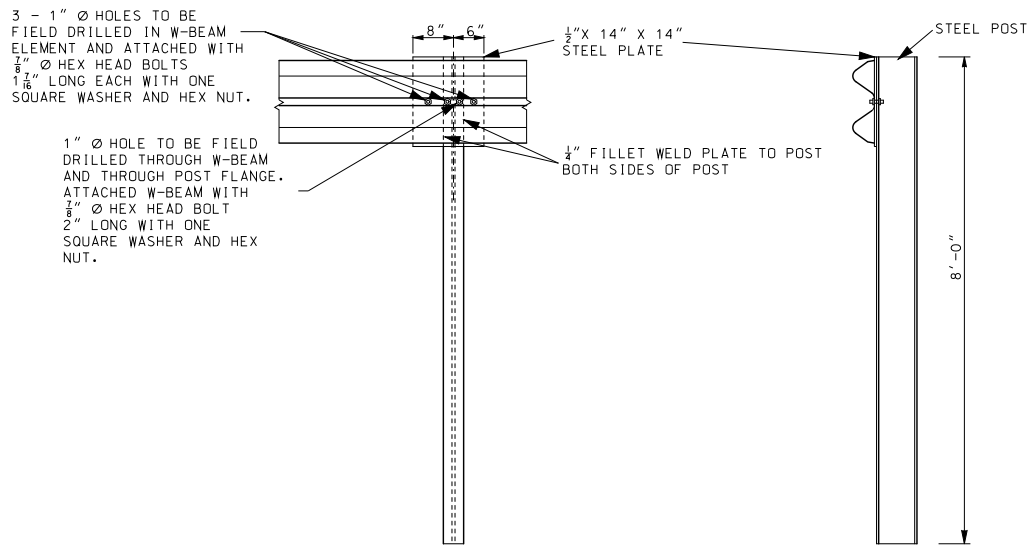
GUARDRAIL
EMBEDDED TERMINAL ENDS (FLAT DITCH)

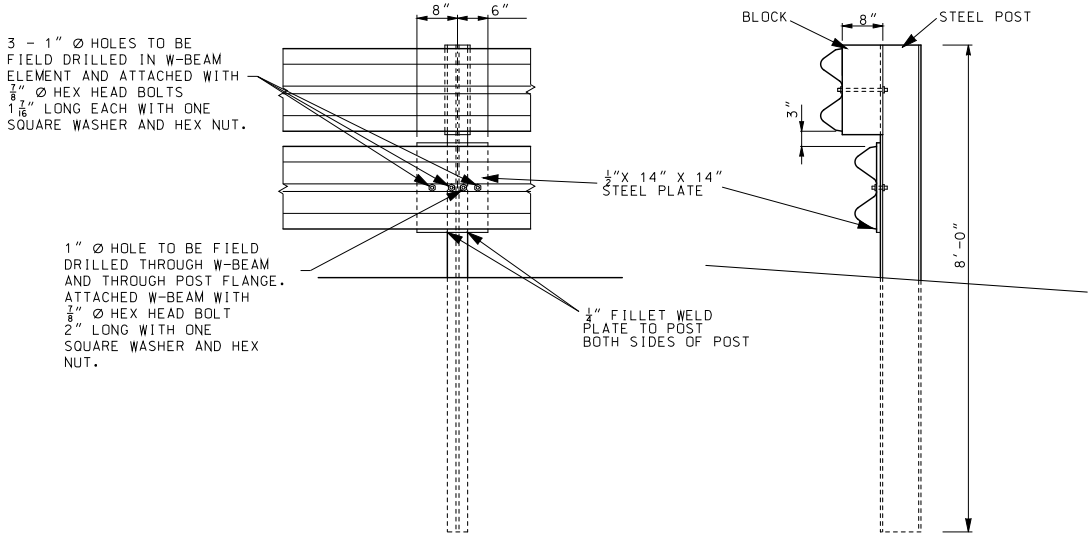
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

606.30K

SHEET NO. 5 OF 7



EMBEDDED STEEL POST



SPECIAL RUBRAIL TO POST CONNECTION AT POST A

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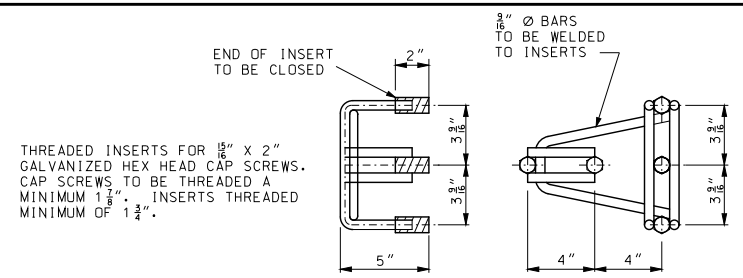
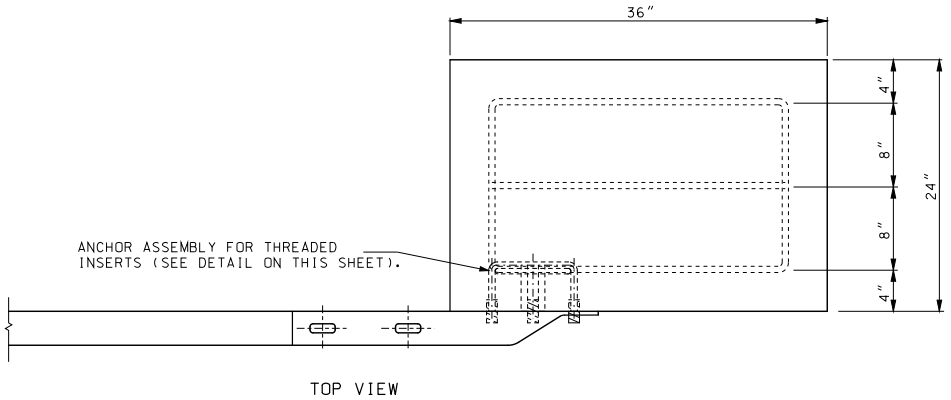
GUARDRAIL
EMBEDDED ANCHOR TERMINAL ENDS (STEEL POST OPTION)

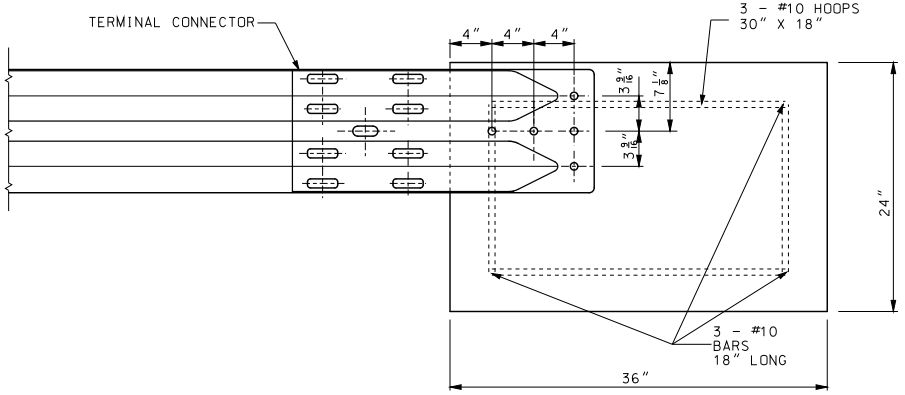
DATE EFFECTIVE:	04/01/2017	606.30K	SHEET NO. 6 OF 7
DATE PREPARED:	1/30/2017		



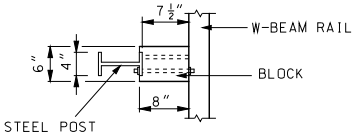
CONCRETE BLOCK ANCHOR
ANCHOR ASSEMBLY



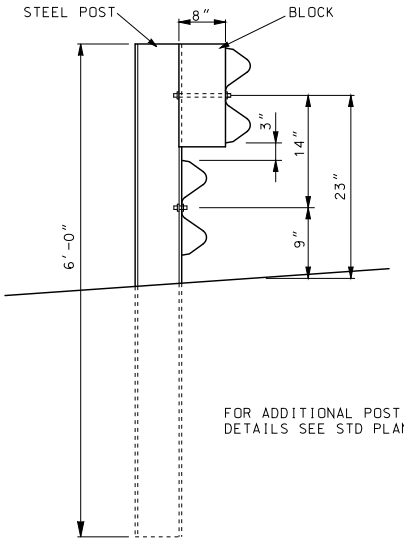
TOP VIEW



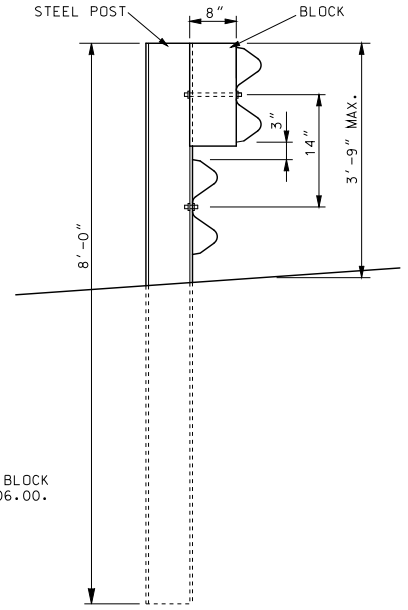
ELEVATION
CONCRETE BLOCK ANCHOR
(24″ X 24″ X 36″)



PLAN



FOR ADDITIONAL POST AND BLOCK DETAILS SEE STD PLANS 606.00.



ELEVATION OF 6′ POST

ELEVATION 8′ POST

STEEL POST AND BLOCK DETAIL

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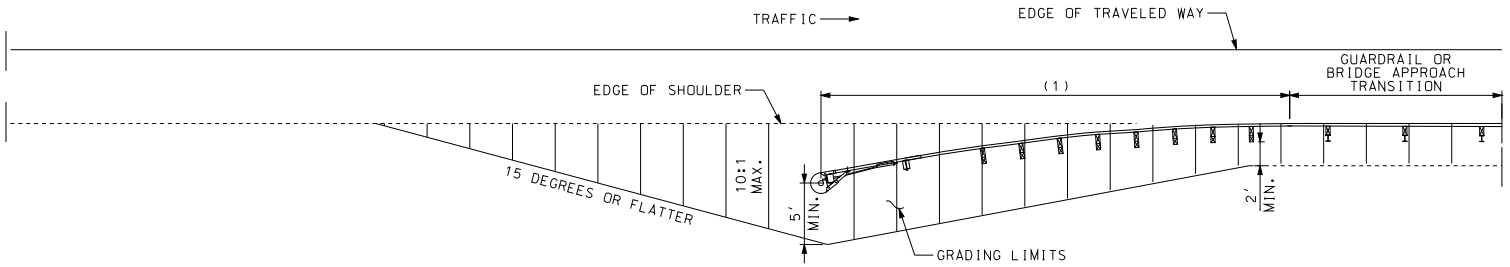
GUARDRAIL
EMBEDDED TERMINAL ENDS
GENERAL DETAILS

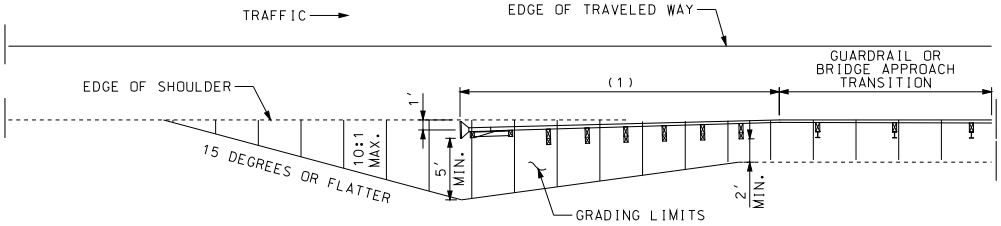
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

606.30K

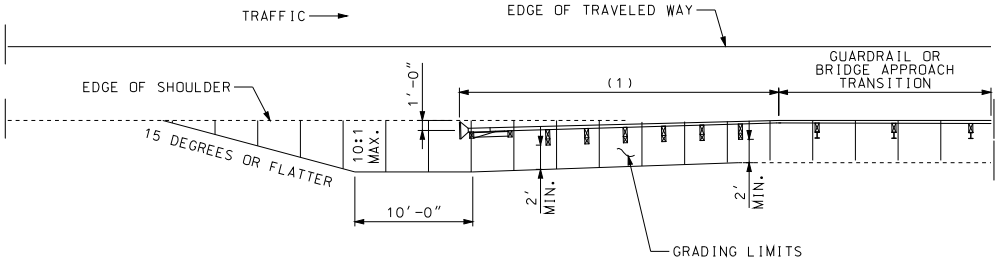
SHEET NO.
7 OF 7



GRADING LIMITS FOR FLARED CRASHWORTHY END TERMINALS



PREFERRED GRADING LIMITS FOR CRASHWORTHY END TERMINALS



ALTERNATE GRADING LIMITS FOR CRASHWORTHY END TERMINALS

(1) APPROVED CRASHWORTHY END TERMINAL

GENERAL NOTES:

THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH APPROVED SHOP DRAWINGS OF THE APPROVED CRASH-WORTHY END TERMINAL.

END ANCHORS SHALL BE INSTALLED ON ENDS OF GUARDRAIL RUNS WHERE CRASHWORTHY END TERMINALS ARE NOT REQUIRED.

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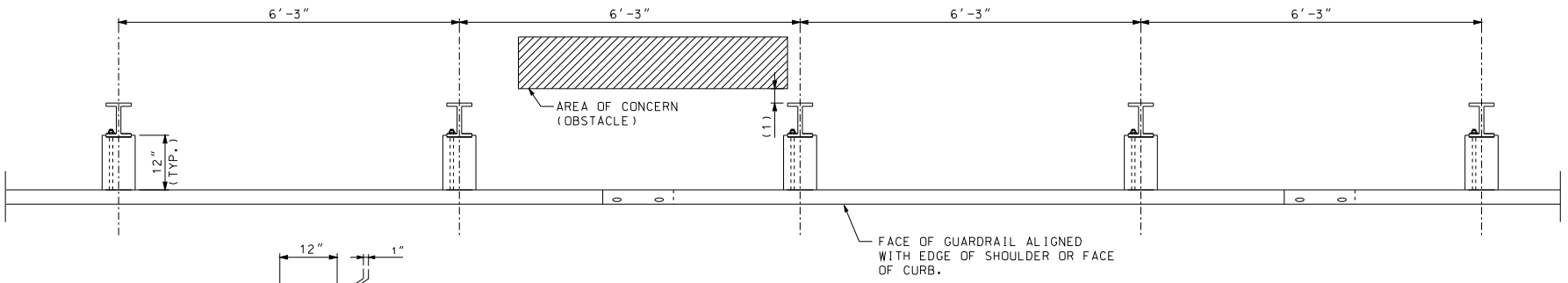
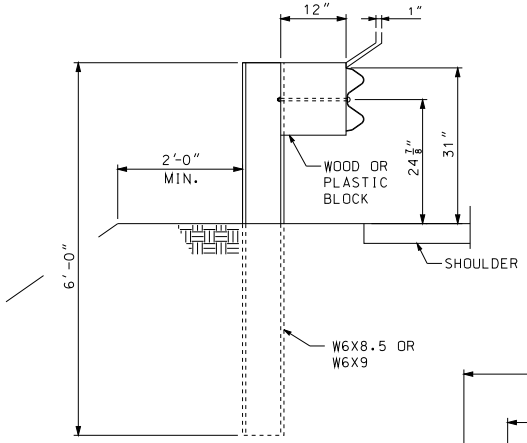
CRASHWORTHY END TERMINALS TYPE A GRADING LIMITS

DATE EFFECTIVE: 01/01/2017	606.31	SHEET NO. 1 OF 1
DATE PREPARED: 10/28/2016		



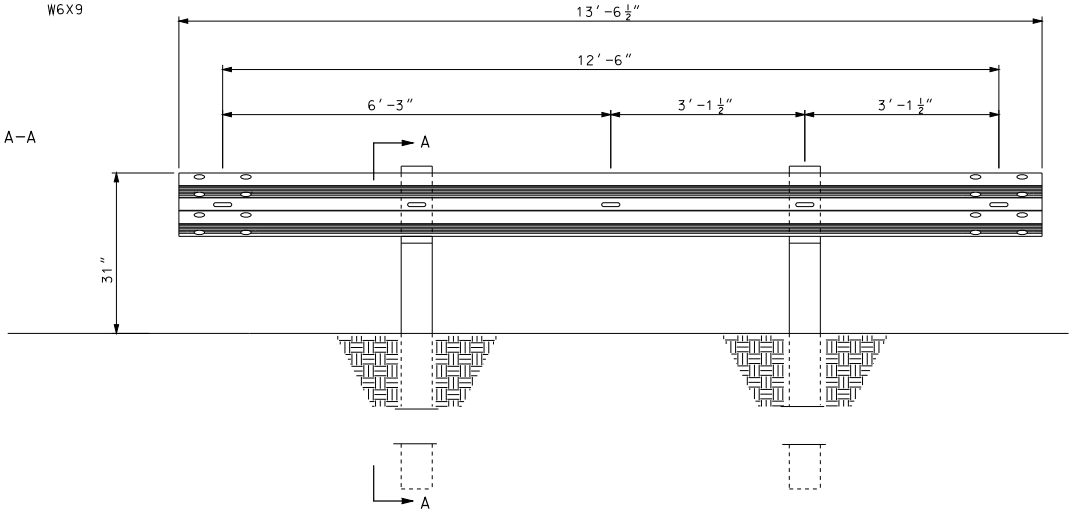
PLAN VIEW

MGS GUARDRAIL



SECTION A-A

(1) 2′-6″ MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 6′-3″ POST SPACINGS, 2′-0″ MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 3′-1 1/2″ POST SPACINGS, OR 1′-6″ MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 1′-6 3/4″ POST SPACINGS. SEE SHEET 4 OF 8 FOR POST SPACING DETAILS.



ELEVATION VIEW

GENERAL NOTES:
FOR INITIAL INSTALLATION, CONSTRUCT THE GUARDRAIL WITHIN 1″ OF THE STANDARD 31″ HEIGHT TO THE TOP OF W-BEAM RAIL. WHEN SUBSEQUENT PROJECTS, SUCH AS RESURFACINGS, AFFECT THE HEIGHT OF EXISTING GUARDRAIL, ADJUSTMENT IS NOT REQUIRED IF THE FINISHED HEIGHT IS WITHIN 3″ OF THE STANDARD HEIGHT.

THE STANDARD POST LENGTH IS 6′-0″ (+3″,-0″ TOLERANCE).

WHERE SITE CONSTRAINTS PROHIBIT THE POST FROM BEING PLACED AT LEAST TWO FEET IN FRONT OF THE SLOPE BREAK POINT, USE LONGER POSTS AS SHOWN ON SHEET 6 OF 11.

REFER TO AASHTO M 180 FOR DIMENSIONAL DETAILS OF W-BEAM, RELATED BUFFER AND END SECTIONS, BEAM SPLICES, POST AND SPLICE BOLTS, NUTS, AND TYPE 1 W-BEAM TO THRIE BEAM TRANSITION SECTIONS.

BEAM WASHERS ARE NOT TO BE USED. BOLT GRADE SHALL BE ASTM A307.

UNLESS OTHERWISE SPECIFIED, W-BEAM RAIL IS 12 GAUGE STEEL WITH AN EFFECTIVE LENGTH OF 12′-6″ OR 25′-0″, WITH 29/32″ X 1 1/8″ SPLICE BOLT SLOTS, AND 3/4″ X 2 1/2″ POST BOLT SLOTS ON 3′-1 1/2″ CENTERS REGARDLESS OF POST SPACING.

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

LAP SPLICES BETWEEN TWO RAILS OR BETWEEN A RAIL AND TERMINAL CONNECTOR IN THE DIRECTION OF TRAFFIC. LAP THE FLARED END SECTIONS IN THE DIRECTION OF TRAFFIC.

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

STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
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MIDWEST GUARDRAIL SYSTEM (MGS) GUARDRAIL

DATE EFFECTIVE: 01/01/2017 DATE PREPARED: 10/28/2016	606.50B	SHEET NO. 1 OF 8

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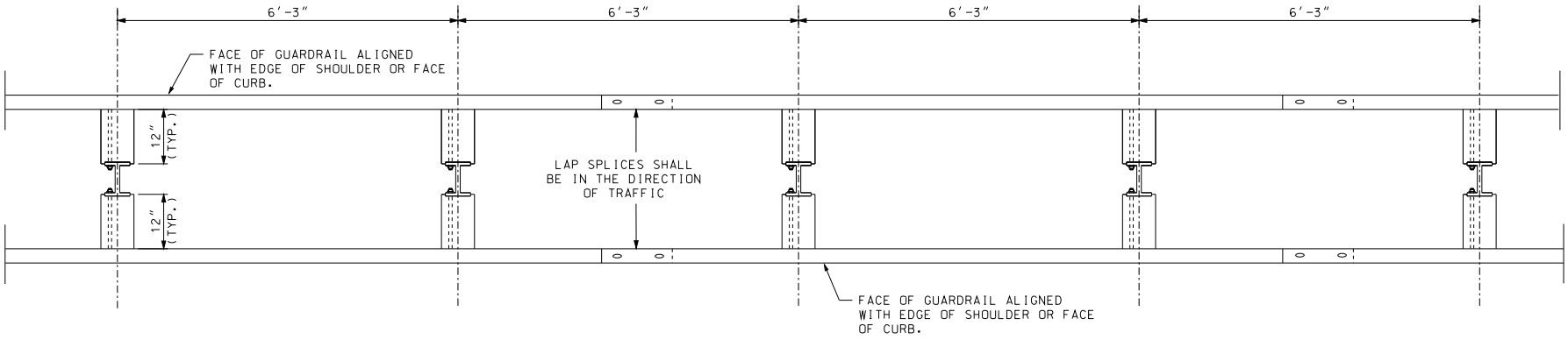
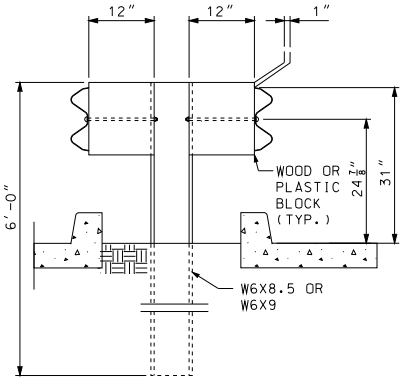


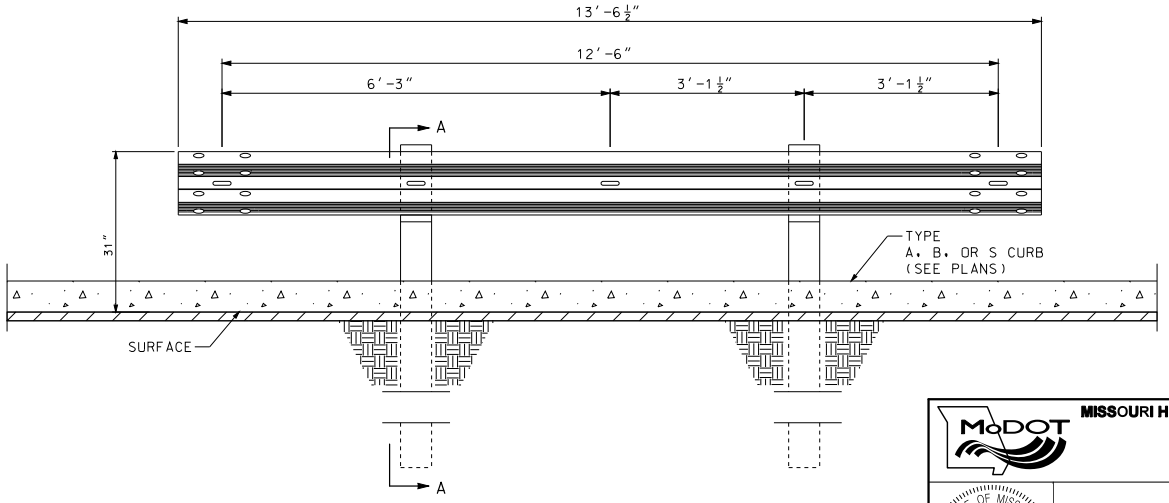
PLAN VIEW

DOUBLE FACED
MGS GUARDRAIL



SECTION A-A

DOUBLE FACED
MGS GUARDRAIL



ELEVATION VIEW

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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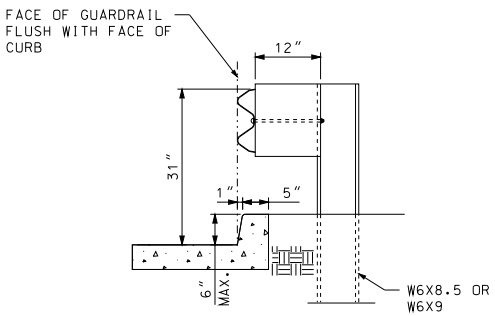
MIDWEST GUARDRAIL SYSTEM (MGS) DOUBLE FACED GUARDRAIL

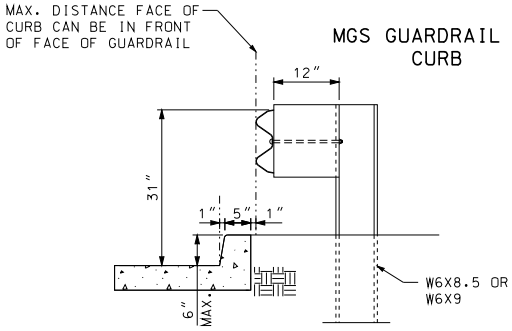
DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

606.50B

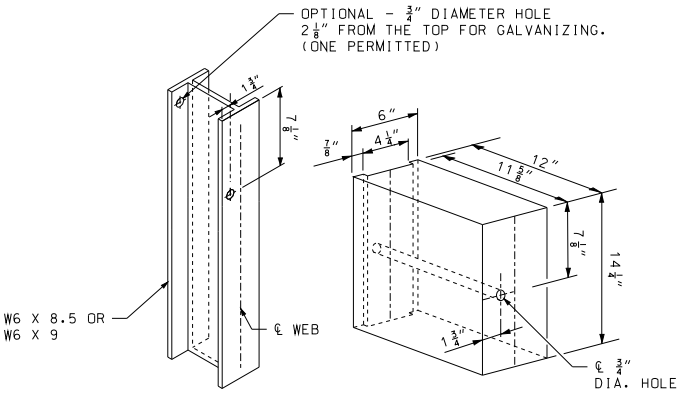
SHEET NO. 2 OF 8



MGS GUARDRAIL AT CURB

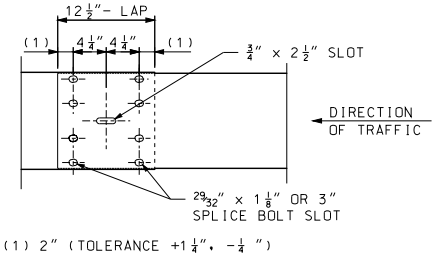


ALTERNATE MGS AT CURB

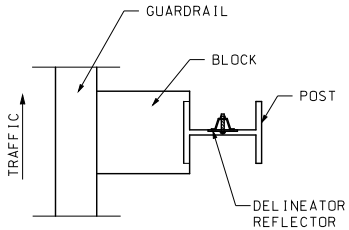


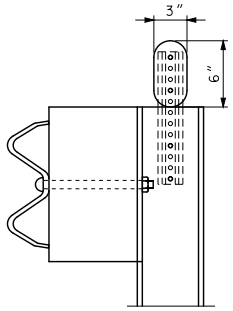
FOR STEEL POST AND NOTCHED WOOD OR PLASTIC BLOCK

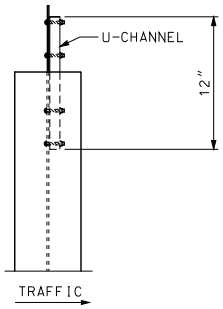
HOLE PUNCHING DETAIL



RAIL ELEMENT SPLICE DETAIL







DELINEATORS ON NEW GUARDRAIL

GENERAL NOTES:

FOR GUARDRAIL DELINEATION DETAILS SEE STD PLAN 903.03.

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MIDWEST GUARDRAIL SYSTEM (MGS) POST AND BLOCK

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

606.50B

SHEET NO. 3 OF 8

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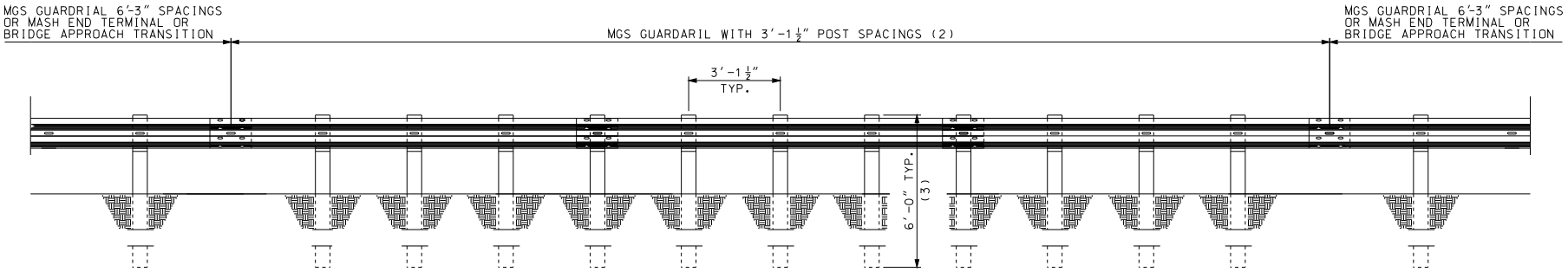
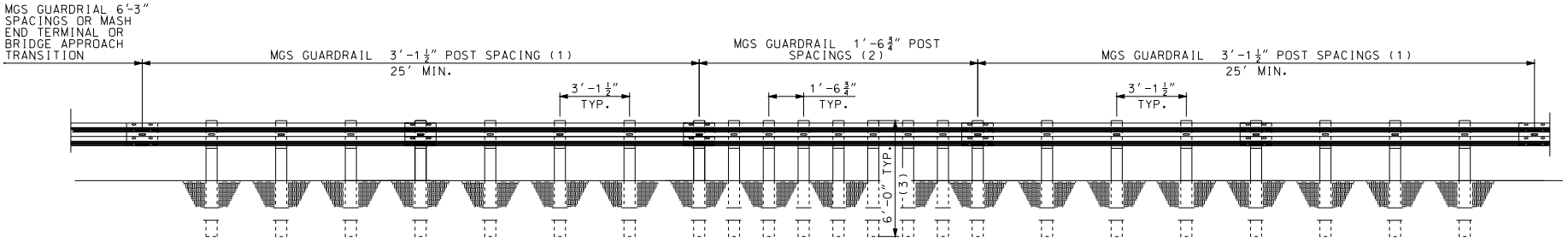


MGS GUARDRAIL WITH 3'-1½"
POST SPACING



(1) 25 FEET OF MGS 3'-1½" POST SPACING GUARDRAIL IS REQIRED ON APPROACH AND DEPARTURE ENDS OF 1'-6¾" POST SPACING MGS GUARDRAIL.

(2) USE AS MANY SEGMENTS AS NECESSARY TO SHIELD THE AREA OF CONCERN.

(3) REDUCED POST SPACING SHALL USE 6'-0" POSTS MAX. ANY DEVIATION OF 6'-0" POSTS WILL ONLY BE ALLOWED IN ACCORDANCE WITH SPECIAL INSTALLATIONS AS SHOWN ON SHEET 5 OF 8.

MGS GUARDRAIL WITH 1'-6¾"
POST SPACING

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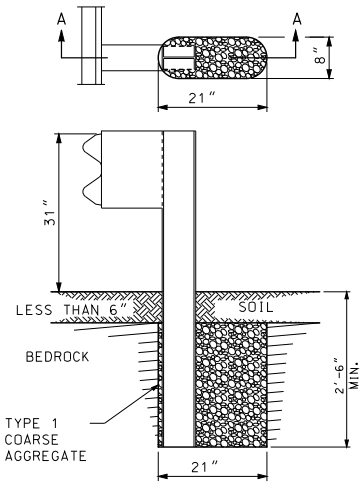
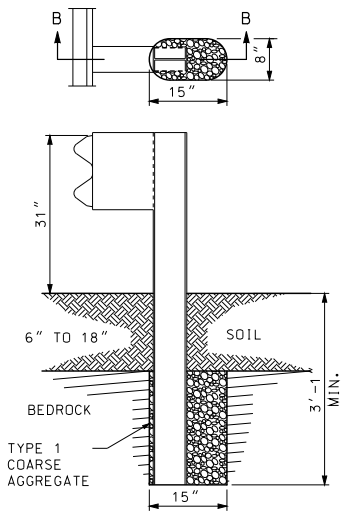
MIDWEST GUARDRAIL SYSTEM (MGS) REDUCED POST SPACINGS

DATE EFFECTIVE:	01/01/2017	606.50B	SHEET NO. 4 OF 8
DATE PREPARED:	10/28/2016		



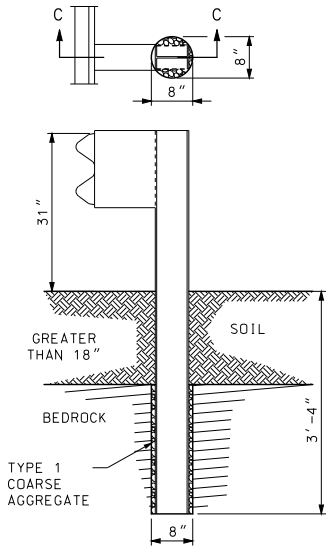
SECTION A–A

ROCK ENCOUNTERED
UP TO 6″ BENEATH SURFACE



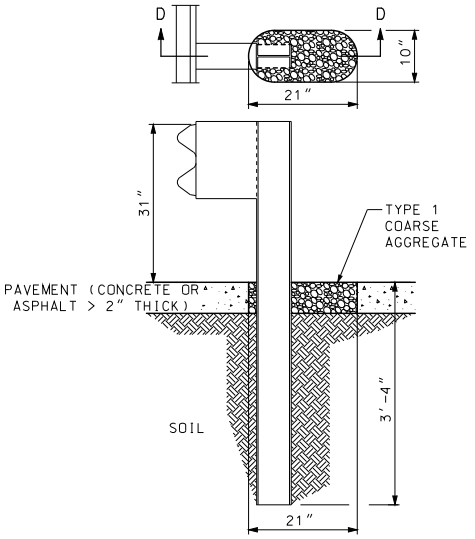
SECTION B–B

ROCK ENCOUNTERED
6″ TO 18″ BENEATH SURFACE



SECTION C–C

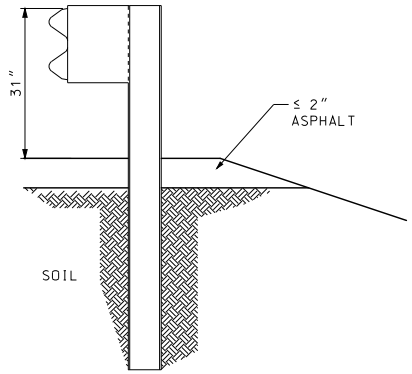
ROCK ENCOUNTERED MORE
THAN 18″ BENEATH SURFACE



SECTION D–D

SETTING POST THROUGH PAVEMENT
(CONCRETE OR ASPHALT > 2″ THICK)

SETTING POST IN SOLID ROCK



SETTING POST THROUGH ASPHALT ≤ 2″ THICK

GENERAL NOTES:

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

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

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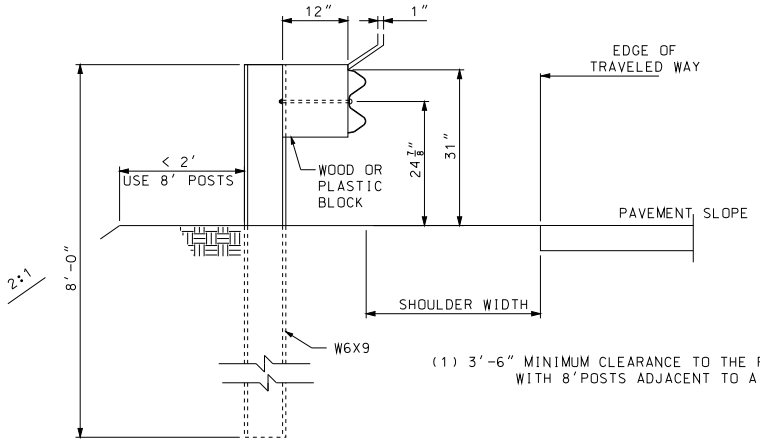
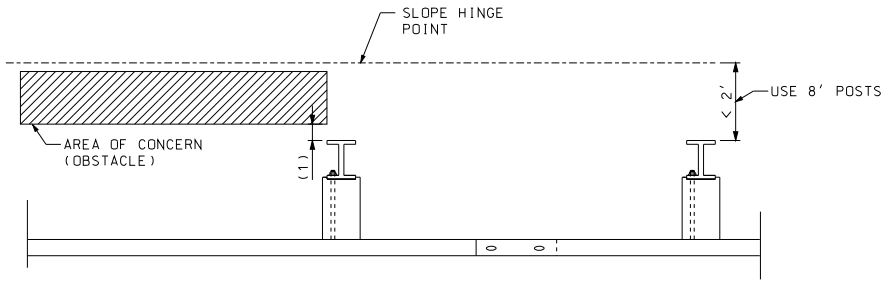
MGS GUARDRAIL SYSTEM (MGS) SPECIAL INSTALLATIONS

DATE EFFECTIVE:	01/01/2017	606.50B	SHEET NO. 5 OF 8
DATE PREPARED:	10/28/2016		

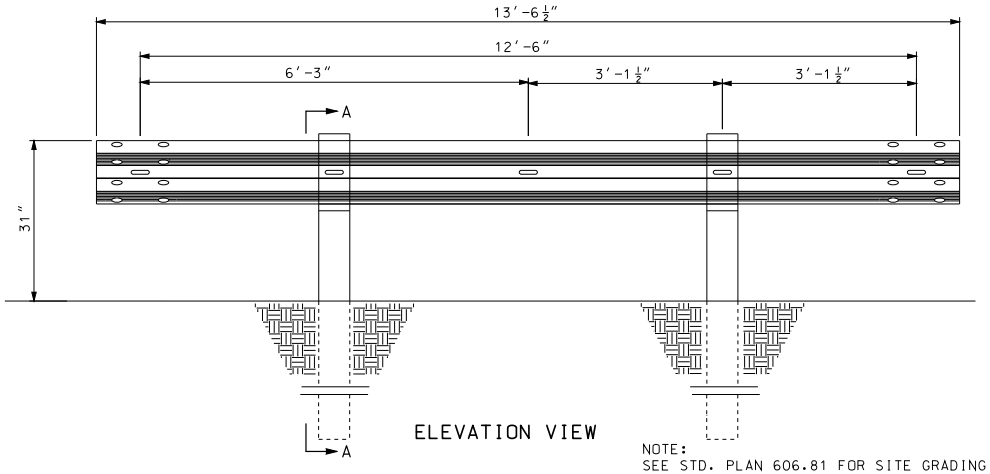


SECTION A–A
8' STEEL POST



PLAN VIEW

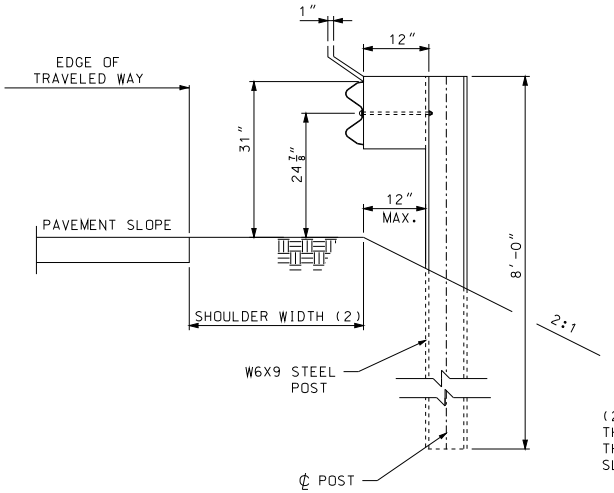
(1) 3'-6" MINIMUM CLEARANCE TO THE FACE OF OBSTACLE WITH 8'POSTS ADJACENT TO A 2:1 SLOPE.



ELEVATION VIEW

NOTE:
SEE STD. PLAN 606.81 FOR SITE GRADING REQUIREMENTS FOR CRASHWORTHY END TERMINALS.

8 FOOT POSTS SHALL BE USED WHEN LESS THAN 2 FEET OF EMBANKMENT IS PRESENT BEHIND THE GUARDRAIL POSTS.



ALTERNATE SECTION A–A
MAXIMUM LATERAL PLACEMENT OF
8' STEEL POSTS ADJACENT TO
SLOPES

(2) WHEN THERE IS NOT SUFFICIENT GRADING BEYOND THE SHOULDER TO PLACE THE GUARDRAIL AND POSTS. THE POSTS MAY BE PLACED A MAXIMUM OF 12" BEYOND THE SLOPE BREAK POINT OF A 2:1 MAXUMUM SLOPE.

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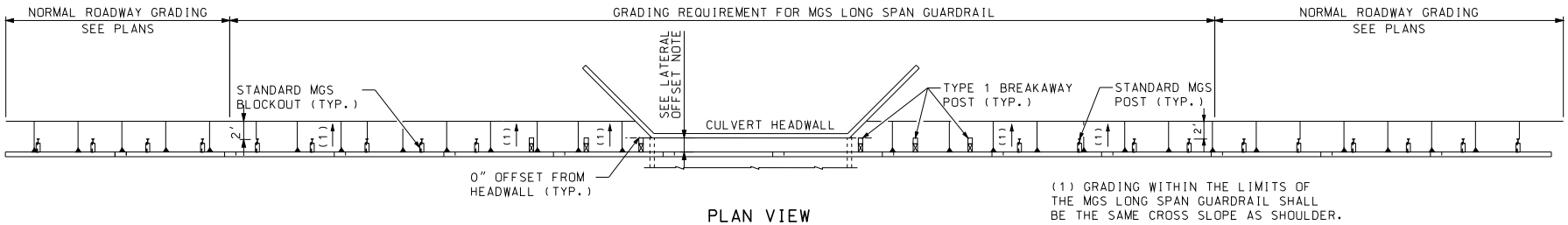
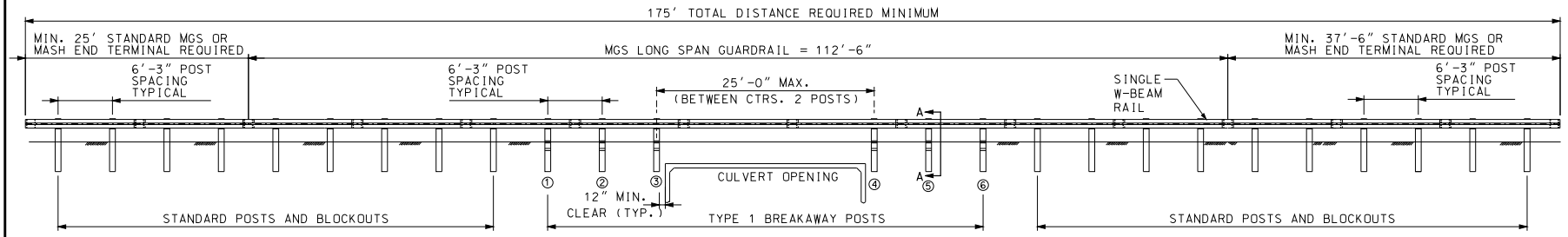
MIDWEST GUARDRAIL SYSTEM (MGS) 8 FT. POST

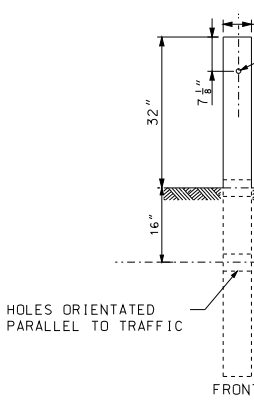
DATE EFFECTIVE:	01/01/2017	606.50B	SHEET NO. 6 OF 8
DATE PREPARED:	10/28/2016		

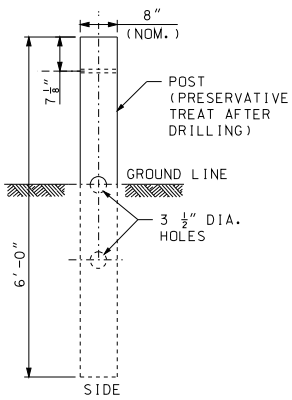


PLAN VIEW

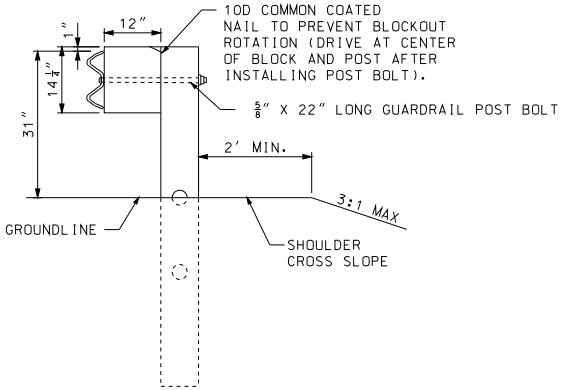


ELEVATION VIEW





TYPE 1 BREAKAWAY WOOD POST



SECTION A-A

NOTES:
A MINIMUM LENGTH OF STANDARD MGS GUARDRAIL OR AN END TERMINAL IS REQUIRED BEFORE THE 112'-6" OF MGS LONG SPAN AND AFTER TO MAINTAIN STABILITY IN THE SYSTEM. 8'POSTS MAY BE USED OUTSIDE THE GRADING LIMITS SHOWN.

USE TYPE 1 BREAKAWAY WOOD POST FOR POSTS NO. 1-6. ALL OTHER POSTS SHALL BE W6X8.5 OR W6X9 STEEL POSTS.

WHEN THE HEADWALL IS FLUSH WITH THE GRADE, THE BACK OF THE POST CAN BE ALIGNED WITH THE NEAR SIDE OF THE HEADWALL. BUT IF THE HEADWALL CONTINUES ABOVE GRADE, THE SYSTEM SHOULD BE OFFSET 8' FROM THE FIXED OBJECT.

FOR LOCATIONS WHERE A GUARDRAIL FLARE IS DESIRED, THE SYSTEM SHOULD REMAIN TANGENT FOR 50'-0" BEFORE POST 1 OR AFTER POST 6, AT WHICH POINT THE GUARDRAIL MAY FLARE AT A MAXIMUM TAPER RATE OF 7:1.

ALL POSTS, BLOCK, RAILS, AND HARDWARE SHALL COMPLY WITH SEC 606, MGS GUARDRAIL AND AS DETAILED ON THIS STANDARD.

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MIDWEST GUARDRAIL SYSTEM (MGS) LONG SPAN GUARDRAIL

DATE EFFECTIVE:	01/01/2017	606.50B	SHEET NO. 7 OF 8
DATE PREPARED:	10/28/2016		

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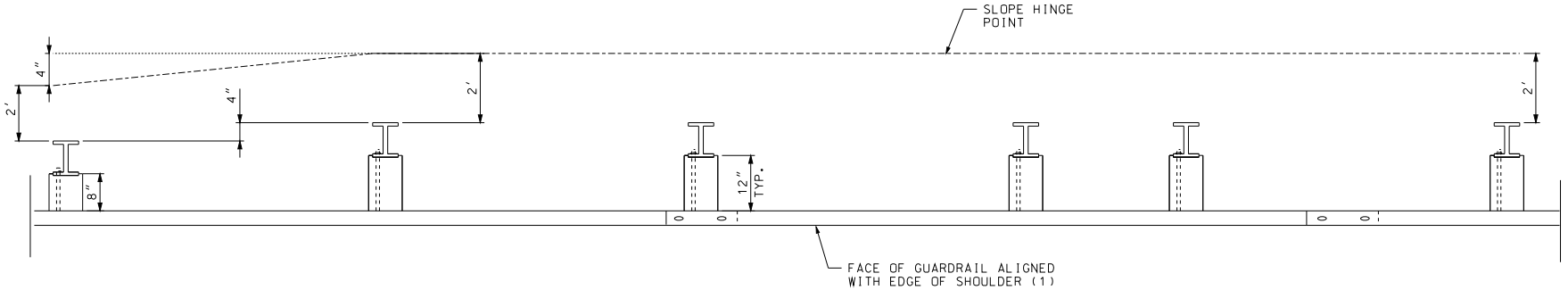
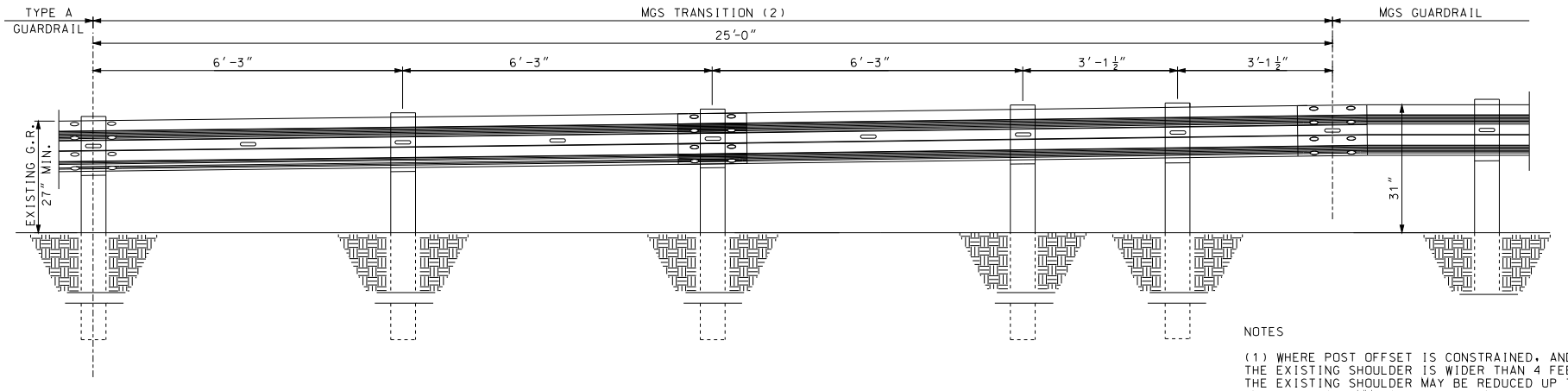


PLAN VIEW

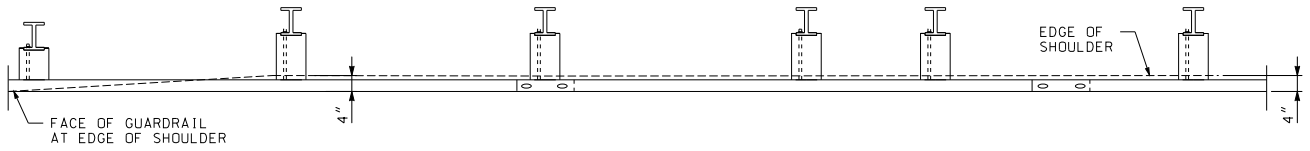


MGS BLOCK AND HEIGHT TRANSITION FROM TYPE A GUARDRAIL TO MGS GUARDRAIL

NOTES

(1) WHERE POST OFFSET IS CONSTRAINED, AND WHEN THE EXISTING SHOULDER IS WIDER THAN 4 FEET, THE EXISTING SHOULDER MAY BE REDUCED UP TO 4 INCHES TO ACCOMMODATE THE 12 INCH BLOCKS OF THE MGS GUARDRAIL OR 9 FOOT POSTS SHALL BE USED. (SEE PLAN VIEW - ALIGNMENT TAPER)

(2) MGS TRANSITION FROM TYPE A GUARDRAIL SHALL BE COMPLETED OUTSIDE THE 50' MGS END TERMINAL LIMITS.



ALTERNATE PLAN VIEW - ALIGNMENT TAPER

SEE NOTE (1)

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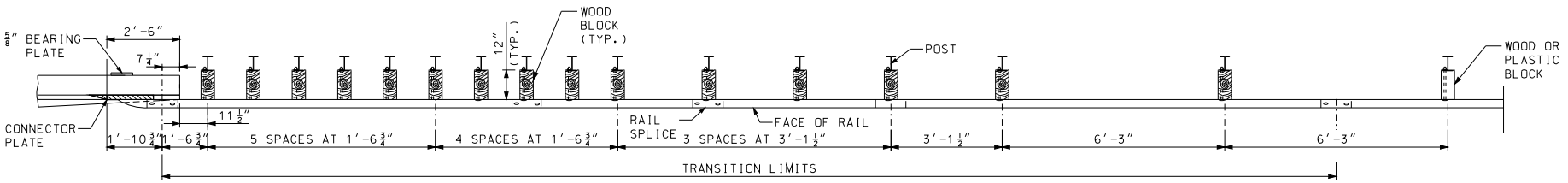
MIDWEST GUARDRAIL SYSTEM (MGS) BLOCK AND HEIGHT TRANSITION

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

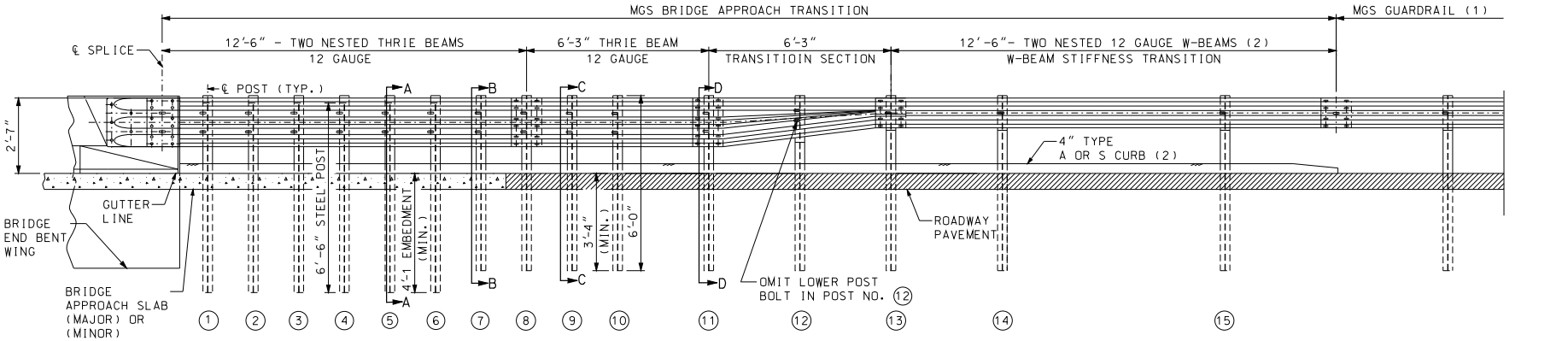
606.50B

SHEET NO. 8 OF 8

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



PLAN VIEW



BRIDGE APPROACH TRANSITION (EXTENDED CURB)(2)

GENERAL NOTES:
MGS GUARDRAIL SHALL BE TANGENTIAL WITHIN 12'-6" OF THE BRIDGE APPROACH TRANSITION.

AT THE CONTRACTORS OPTION, A SINGLE 18'-9" PIECE OF THRIE BEAM MAY BE SUBSTITUTED FOR ONE OF THE 12'-6" PANELS AND THE 6'-3" SECTION AS SHOWN.

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

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

USE 5/8" BUTTON-HEAD OVAL SHOULDER BOLTS WITH HEX NUTS AT ALL SLOTS (THICKNESS OF HEX NUTS = 3/8" MIN.).

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

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

THE COST OF FURNISHING, FABRICATING AND INSTALLING BRIDGE APPROACH TRANSITION (MAJOR ROUTE), COMPLETE IN PLACE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH.

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

(1) PLACE THE FIRST POST OF THE MGS 6'-3" PAST THE LAST POST OF THE BRIDGE APPROACH TRANSITION TO KEEP POSTS OFFSET FROM THE RAIL SPLICES.

(2) WHERE CURB EXTENDS UPSTREAM OF POST NO. (11) FOR DRAINAGE PURPOSES, A STIFFNESS TRANSITION CONSISTING OF AN EXTRA 12'-6" BEAM OF 12 GAUGE W-BEAM MUST BE NESTED PRIOR TO THE TRANSITION SECTION (UPSTREAM OF POST NO. (13)). THE CURB SHALL BE EXTENDED TO THE END OF THE 12'-6" 12 GAUGE W-BEAM STIFFNESS TRANSITION SEE STD. PLAN 609.40 FOR DETAILS. WHEN CURBS DO NOT EXTEND UPSTREAM OF POST NO. (11), PAY FOR A BRIDGE APPROACH TRANSITION (REGULAR CURB/NO CURB). FOR DETAILS OF BRIDGE APPROACH TRANSITION (REGULAR CURB/NO CURB), SEE SHEET 2 OF 5.

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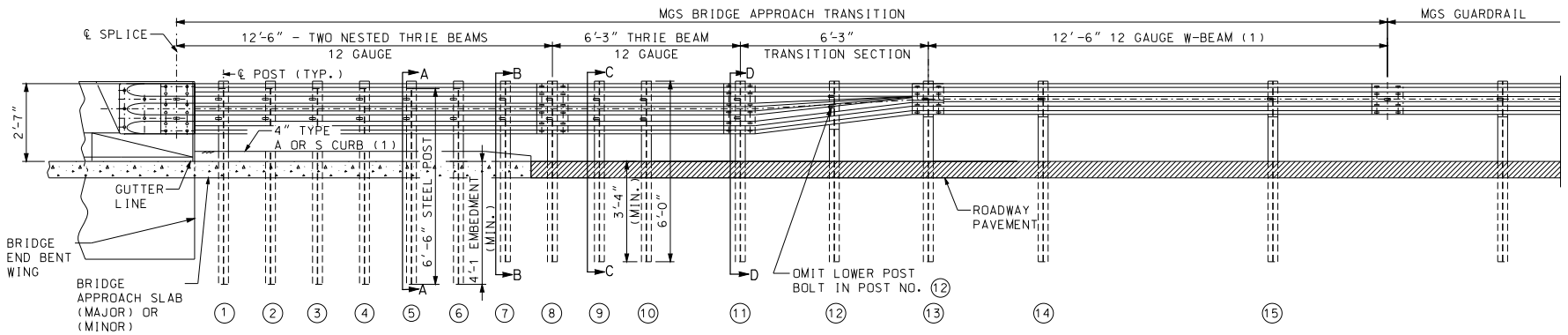
MIDWEST GUARDRAIL SYSTEM (MGS) VERTICAL BARRIER TRANSITIONS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

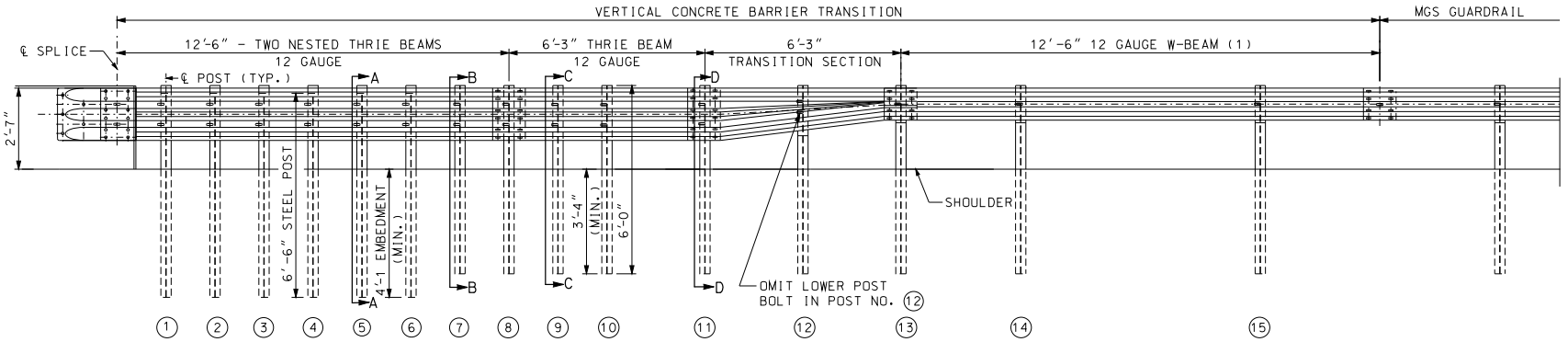
606.60A

SHEET NO. 1 OF 5

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



BRIDGE APPROACH TRANSITION (WITH REGULAR LENGTH CURB OR NO CURB)(1)



VERTICAL CONCRETE BARRIER TRANSITION (REGULAR LENGTH CURB OR NO CURB)(1)

(VIEW SHOWN WITHOUT CURB)

GENERAL NOTES:
SEE SHEET 1 FOR ADDITIONAL NOTES NOT INCLUDED ON THIS SHEET.

(1) WHERE CURB EXTENDS UPSTREAM OF POST NO. (11) FOR DRAINAGE PURPOSES, A STIFFNESS TRANSITION CONSISTING OF AN EXTRA 12'-6" BEAM OF 12 GAUGE W-BEAM MUST BE NESTED PRIOR TO THE TRANSITION SECTION (UPSTREAM OF POST NO. (13)). THE CURB SHALL BE EXTENDED TO THE END OF THE 12'-6" 12 GAUGE W-BEAM STIFFNESS TRANSITION SEE STD. PLAN 609.40 FOR DETAILS. IF CURB EXTENDS BEYOND POST NO. (11), PAY FOR A BRIDGE APPROACH TRANSITION (EXTENDED CURB).

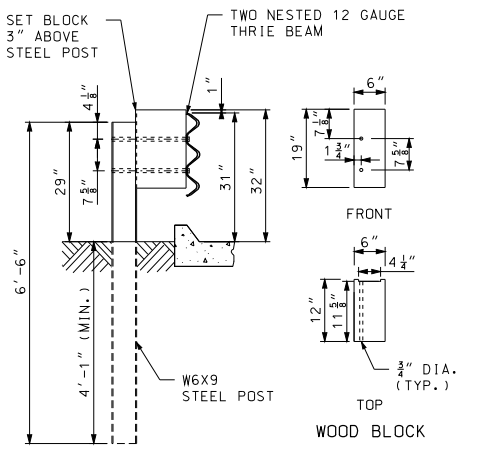
MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

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

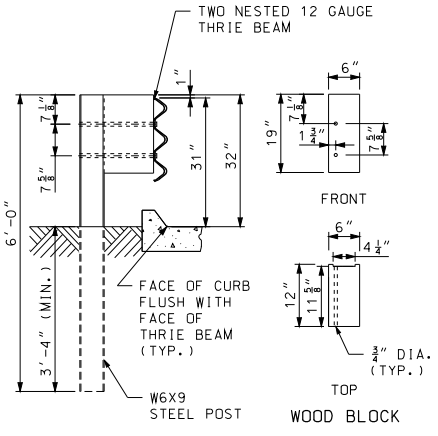
MIDWEST GUARDRAIL SYSTEM (MGS) VERTICAL BARRIER TRANSITIONS

DATE EFFECTIVE:	04/01/2017	606.60A	SHEET NO. 2 OF 5
DATE PREPARED:	1/30/2017		

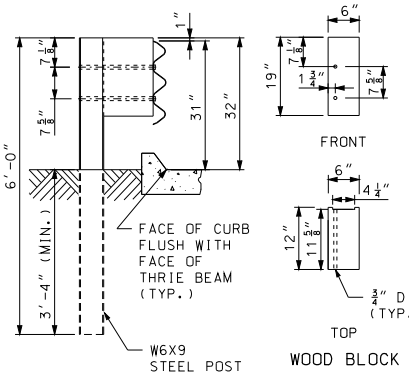
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



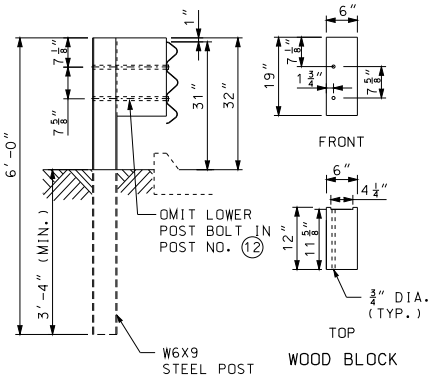
SECTION A–A



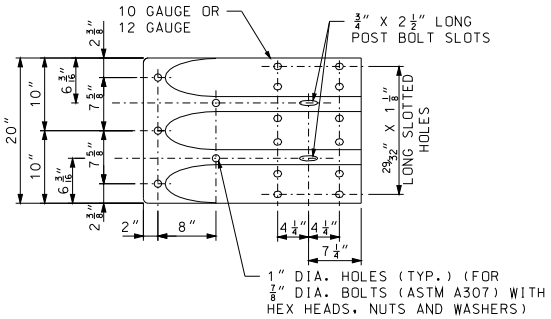
SECTION B–B



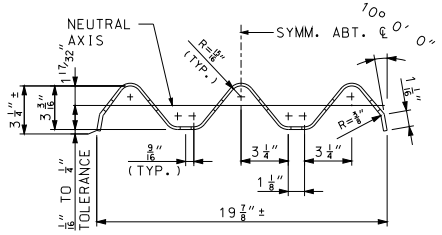
SECTION C–C



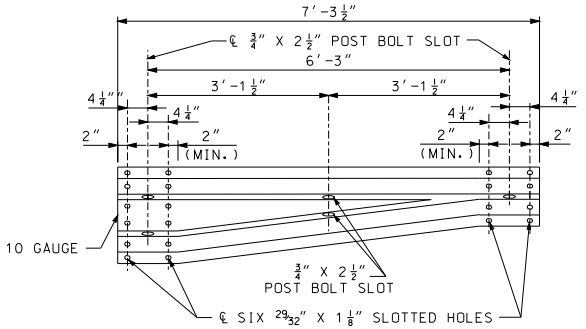
SECTION D–D



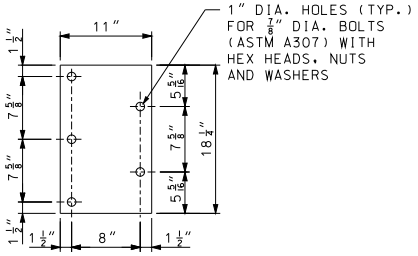
TERMINAL CONNECTOR



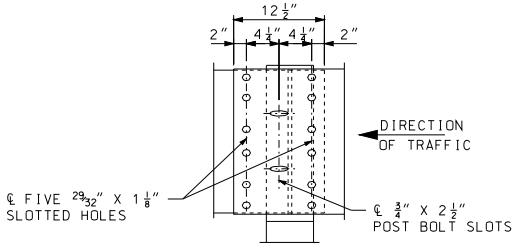
SECTION THROUGH THRIE BEAM RAIL



TRANSITION SECTION



⅝" BEARING PLATE



THRIE BEAM RAIL SPLICE AT POST

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ERIC E. SCHROETER NUMBER PE-28411 STATE OF MISSOURI PROFESSIONAL ENGINEER
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MIDWEST GUARDRAIL SYSTEM (MGS)

VERTICAL BARRIER TRANSITIONS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

606.60A

SHEET NO. 3 OF 5

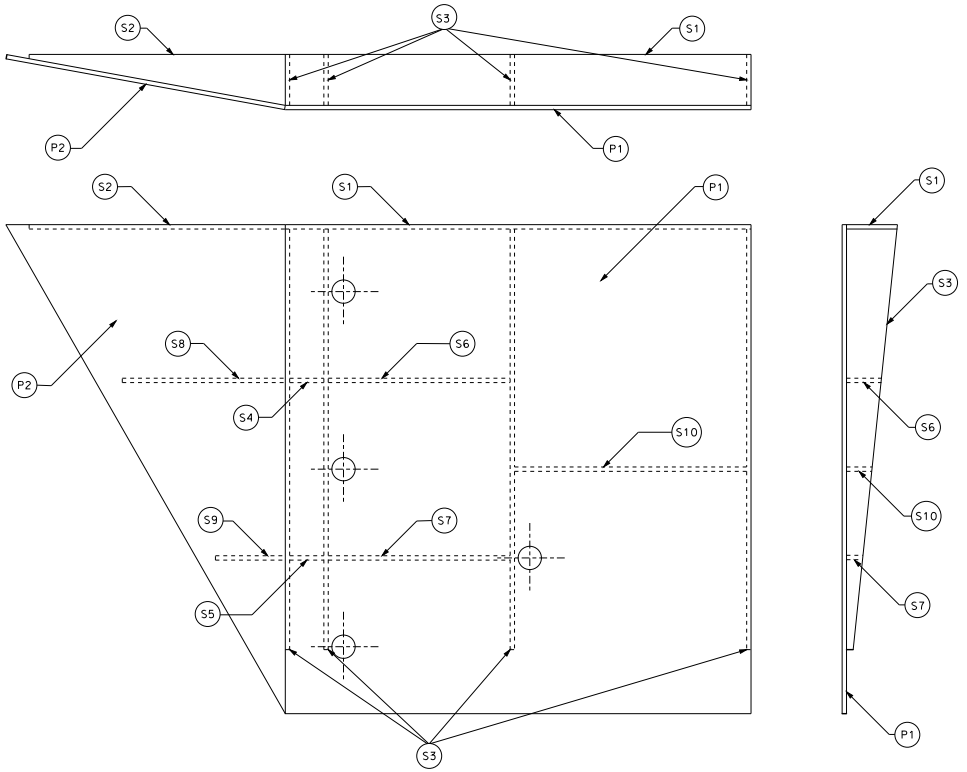
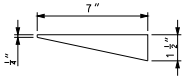
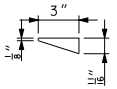


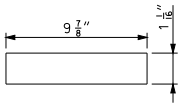
PLATE AND STIFFENER IDENTIFICATION



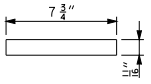
(S8) STIFFENER #8: 1 EACH



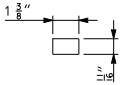
(S9) STIFFENER #9: 1 EACH



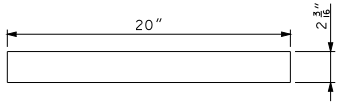
(S10) STIFFENER #10: 1 EACH



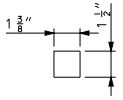
(S7) STIFFENER #7: 1 EACH



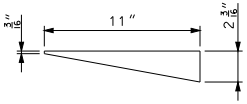
(S5) STIFFENER #5: 1 EACH



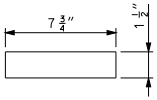
(S1) STIFFENER #1: 1 EACH



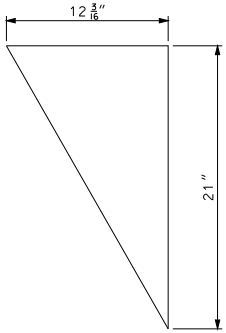
(S4) STIFFENER #4: 1 EACH



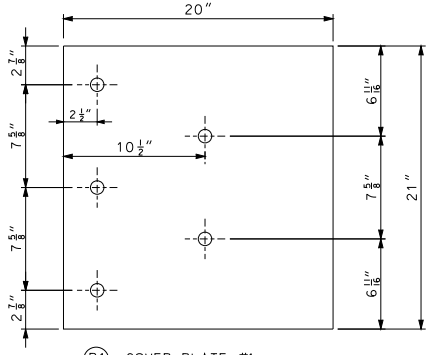
(S2) STIFFENER #2: 1 EACH



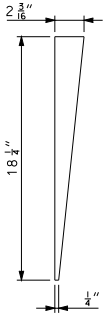
(S6) STIFFENER #6: 1 EACH



(P2) COVER PLATE #2



(P1) COVER PLATE #1



(S3) STIFFENER #3: 4 EACH

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MIDWEST GUARDRAIL SYSTEM (MGS) VERTICAL BARRIER TRANSITIONS (CONNECTOR PLATE DETAIL)

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

606.60A

SHEET NO. 4 OF 5

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

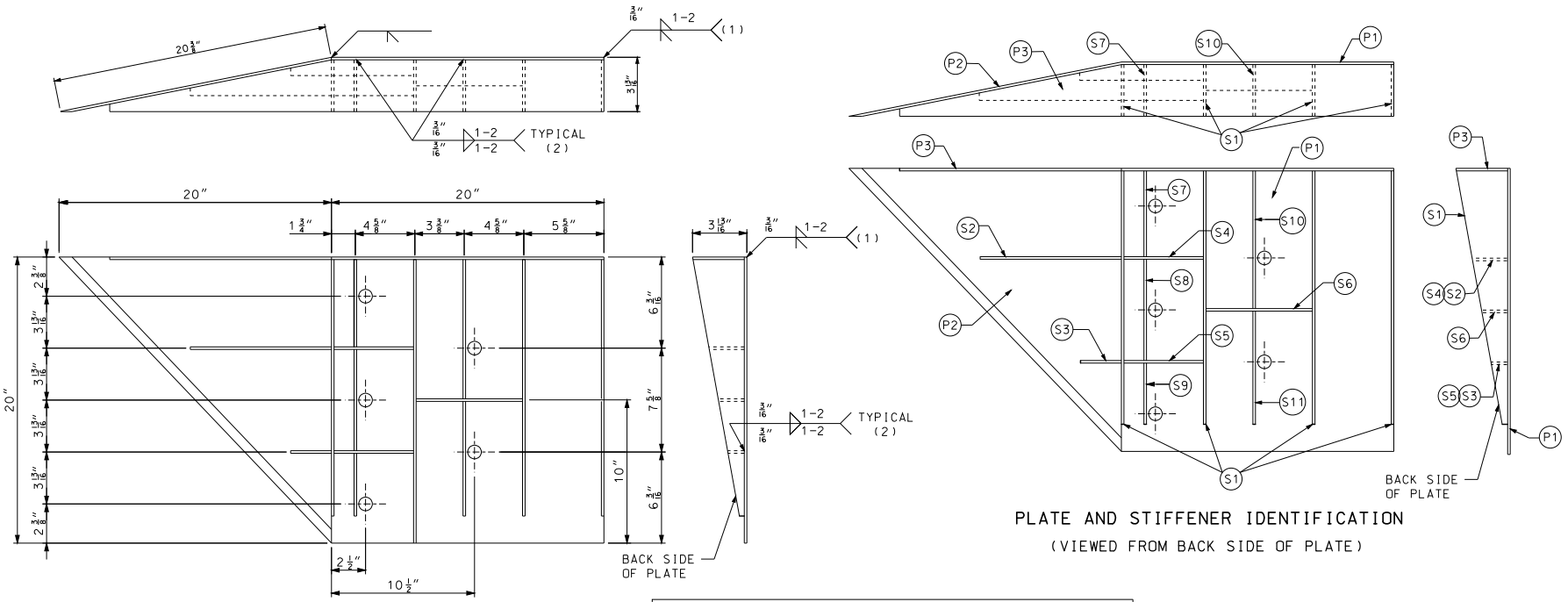

PLATE AND STIFFENER IDENTIFICATION

(VIEWED FROM BACK SIDE OF PLATE)

WELDING INSTRUCTION

(VIEWED FROM BACK SIDE OF PLATE)

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

(2) STEFFENERS LOCATED ON THE INSIDE OF THE COVER PLATE SHALL BE WELDED AS FOLLOWS:
3/16" FILLET WELD BY 1" LONG SPACED AT 2".

CONNECTOR PLATE DIMENSION (PER ASSEMBLY)

PLATE	QUANTITY	SHAPE	SIZE (A x B x C x D)	THICKNESS
P1	1		20" x 20"	3/16"
P2	1		20" x 20" x 28 9/16"	3/16"
P3	1		39" x 3 3/8" x 20" x 19 5/16"	3/16"
S1	4		18 7/16" x 3 5/8" x 18 3/4"	1/4"
S2	1		10 1/4" x 2 7/16" x 10 3/8" x 1/2"	1/4"
S3	1		3" x 1 1/16" x 3 1/8" x 1/2"	1/4"
S4	1		6 1/8" x 2 7/16"	1/4"
S5	1		6 1/8" x 1 1/16"	1/4"
S6	1		7 3/4" x 1 3/4"	1/4"
S7	1		2 3/16" x 6" x 3 5/8" x 5 7/8"	1/4"
S8	1		1 5/32" x 7 1/2" x 2 1/2" x 7 3/8"	1/4"
S9	1		6 1/16" x 6 3/16" x 1 3/32"	1/4"
S10	1		1 7/8" x 9 7/8" x 3 5/8" x 9 11/16"	1/4"
S11	1		8 1/2" x 8 3/4" x 1 13/16"	1/4"

GENERAL NOTES:

COVER PLATE PANELS ARE 3/16" THICK.

ALL STIFFENERS ARE 1/4" THICK.

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

FOR GALVANIZED REQUIREMENTS. SEE SEC 1040 OF THE STANDARD SPECIFICATIONS.

ALL HOLE DIAMETERS SHALL BE 1".

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NUMBER PE-28411
PROFESSIONAL ENGINEER
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MIDWEST GUARDRAIL SYSTEM (MGS)

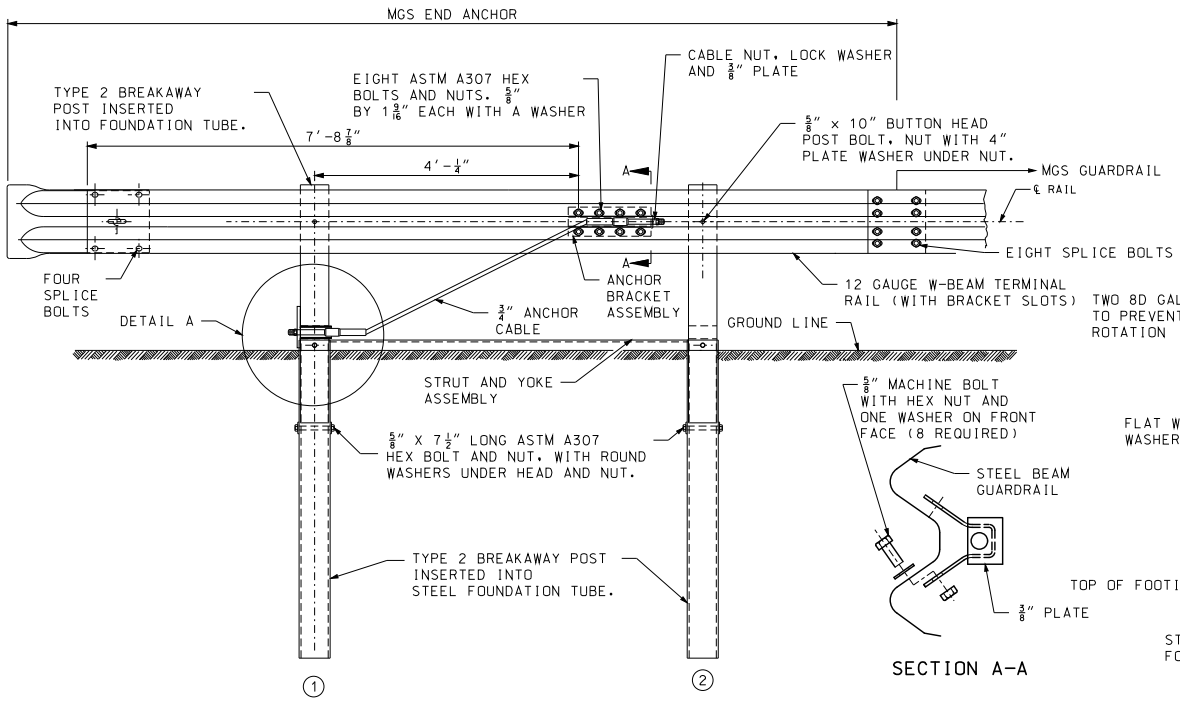
VERTICAL BARRIER TRANSITIONS (CONNECTOR PLATE DETAIL) SINGLE SLOPE BARRIERS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

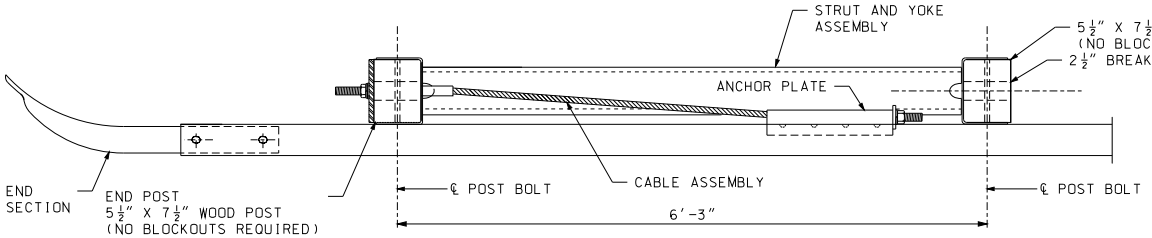
606.60A

SHEET NO. 5 OF 5

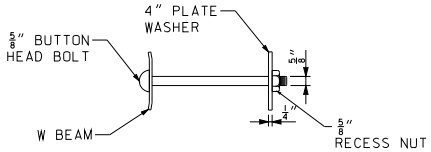
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



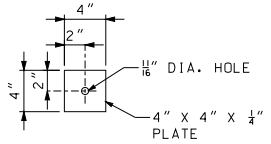
SECTION A-A



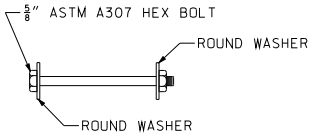
PLAN VIEW



POST BOLT AT W-BEAM



4" PLATE WASHER



POST BOLT AT YOKE

GENERAL NOTES:

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

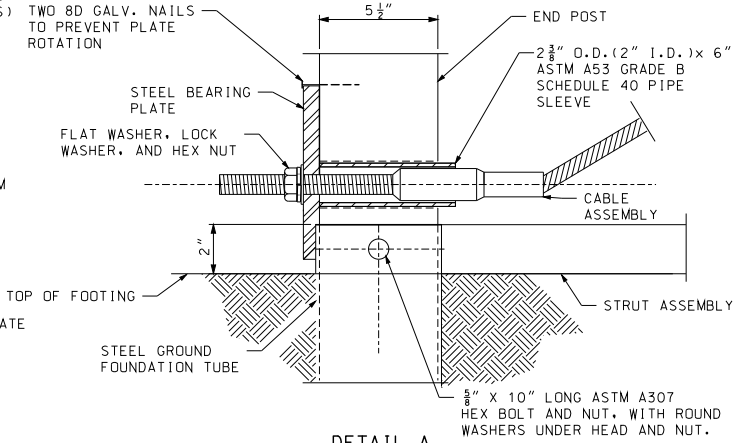
THE DETAILS SHOWN ARE FOR AN END ANCHORAGE SYSTEM FOR GUARDRAIL.

CABLE ASSEMBLY AND ANCHOR PLATE SHALL HAVE A MINIMUM BREAKING STRENGTH OF 20 TONS.

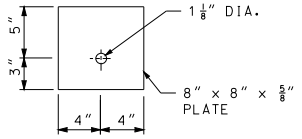
ALL FITTINGS AND HARDWARE REQUIRED SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 1040.

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

SEE SHEET NO. 9 OF 11 FOR WOOD POST DETAILS.



DETAIL A
(END POST DETAIL)



STEEL BEARING PLATE

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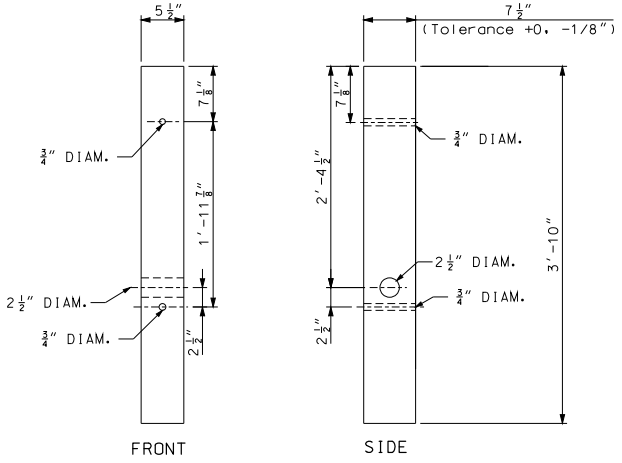
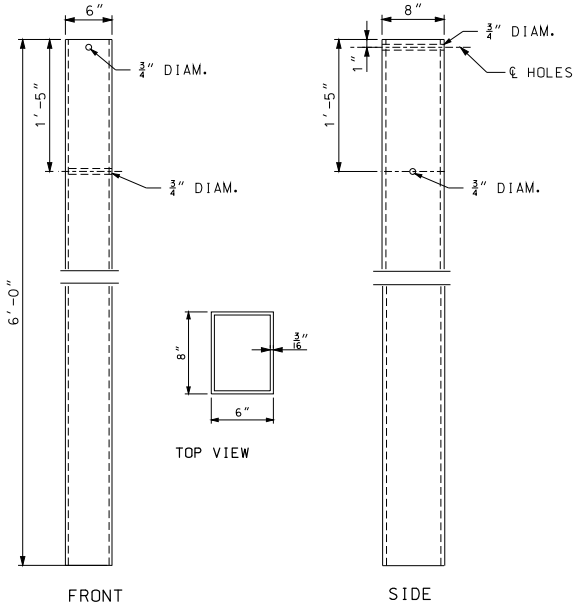
MIDWEST GUARDRAIL SYSTEM (MGS) TERMINAL ANCHOR END

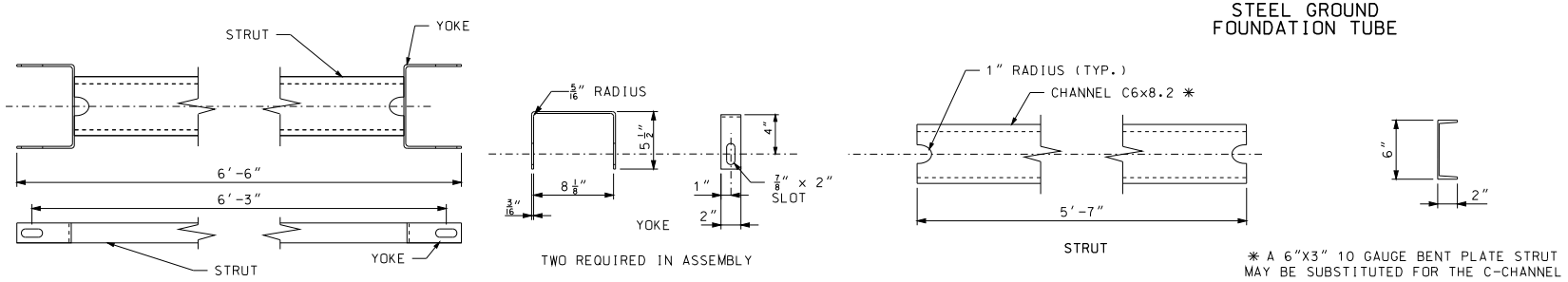
DATE EFFECTIVE: 01/01/2017	606.80B	SHEET NO. 1 OF 7
DATE PREPARED: 10/28/2016		



TYPE 2 BREAKAWAY
WOOD POST



STEEL GROUND
FOUNDATION TUBE



* A 6"X3" 10 GAUGE BENT PLATE STRUT
MAY BE SUBSTITUTED FOR THE C-CHANNEL

STRUT AND YOKE ASSEMBLY

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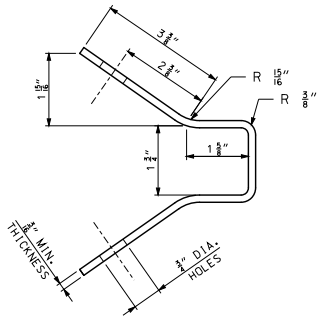
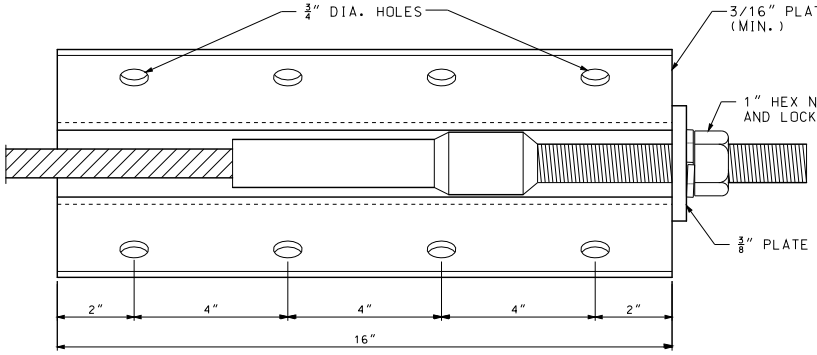
MIDWEST GUARDRAIL SYSTEM (MGS) TERMINAL ANCHOR END

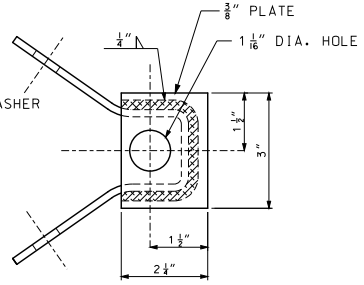
DATE EFFECTIVE:	01/01/2017	606.80B	SHEET NO. 2 OF 7
DATE PREPARED:	10/28/2016		



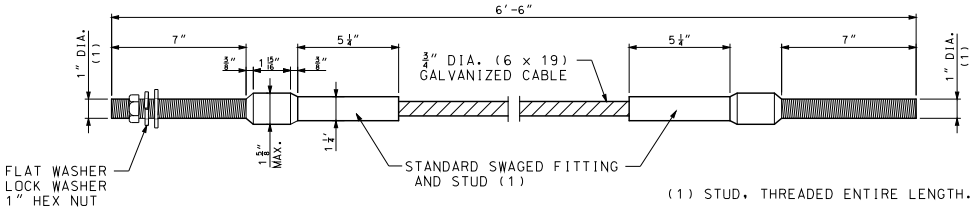
FABRICATION DETAIL



ASSEMBLED VIEW
ANCHOR BRACKET



END VIEW



(1) STUD, THREADED ENTIRE LENGTH.

CABLE ASSEMBLY

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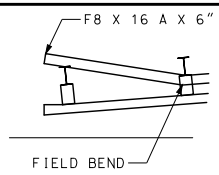
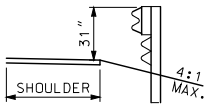
MIDWEST GUARDRAIL SYSTEM (MGS) TERMINAL ANCHOR END

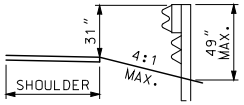
DATE EFFECTIVE:	01/01/2017	606.80B	SHEET NO. 3 OF 7
DATE PREPARED:	10/28/2016		



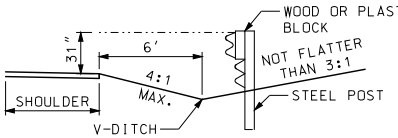
DETAIL A



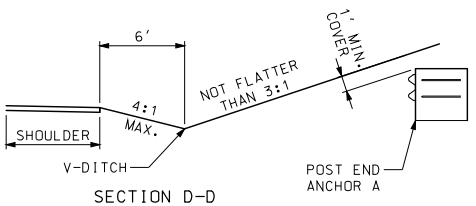
SECTION A-A



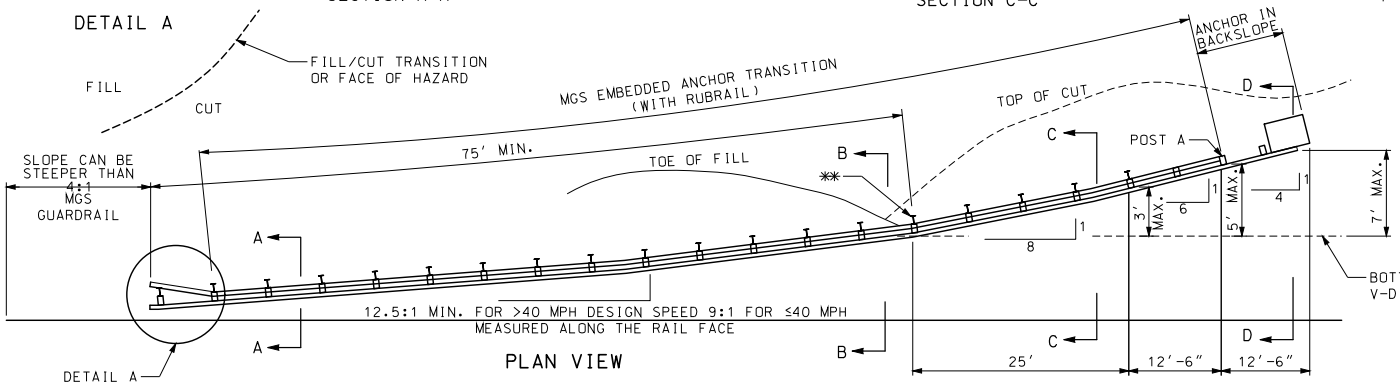
SECTION B-B



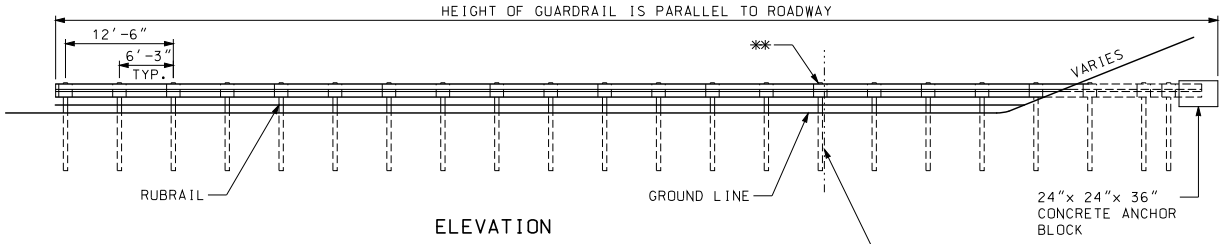
SECTION C-C



SECTION D-D



PLAN VIEW

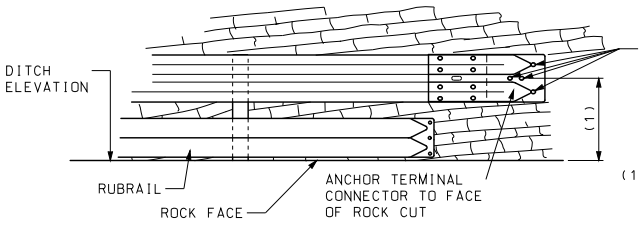


ELEVATION

ANCHORED IN BACKSLOPE GUARDRAIL

✻✻ THE POST BEHIND THE DITCHLINE MAY BE SHORTENED TO PROVIDE 48" MIN. EMBEDMENT.

COST OF SHAPING ROCK FACE FOR PLACING OF TERMINAL CONNECTOR, DRILLING HOLES, FURNISHING AND PLACING BOLTS, WASHERS, CAULKING, ANCHORS AND END SHOE TO BE INCLUDED IN THE PRICE OF GUARDRAIL ANCHOR, ROCK FACE.



(1) HEIGHT ABOVE DITCH IS EQUAL TO RAIL ELEVATION AT THE DITCH CROSSING.

ROCK FACE GUARDRAIL ANCHOR

GENERAL NOTES:

FOR END ANCHOR DETAILS, SEE SHEET 1-3 OF 7.

RUBRAIL BEGINS WHEN THE DISTANCE BETWEEN THE GUARDRAIL AND THE GROUND IS 18" AND INCREASING.

END ANCHOR POSTS 1 AND 2 SHALL HAVE FOUNDATION TYPE AS SHOWN ON SHEET 3 OF 7.

THE CONTRACT UNIT PRICE FOR EMBEDDED GUARDRAIL ANCHOR SHALL INCLUDE THE CONCRETE ANCHOR. EXCAVATION AND BACKFILLING, OR TERMINAL CONNECTOR, AND ALL INCIDENTIAL HARDWARE AND WORK NECESSARY TO COMPLETE THE INSTALLATION.

THE EMBEDED ANCHOR TRANSITION SHALL EXTEND 50' ± BEYOND THE DITCH LINE AND TERMINATE A MINIMUM OF 12 INCHES BELOW GROUND ELEVATION OF THE BACKSLOPE.

BLOCKOUTS WILL NOT BE REQUIRED FOR ANY POST WHICH WILL BE COMPLETELY BELOW GROUND. THE ALIGNMENT OF SUCH POSTS SHALL BE APPROVED BY THE ENGINEER.

SEE OTHER DRAWINGS AND STANDARD SPECIFICATIONS FOR MATERIAL AND CONSTRUCTION REQUIREMENTS NOT SHOWN.

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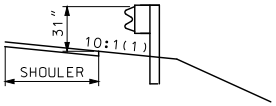
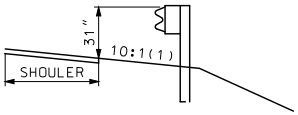
STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

MIDWEST GUARDRAIL SYSTEM (MGS) TERMINAL ENDS EMBEDDED AND ROCK FACE (V-DITCH STEEPER THAN 10:1, 4:1 MAX. FORESLOPE)

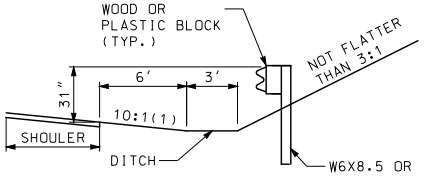
DATE EFFECTIVE: 01/01/2017 DATE PREPARED: 10/28/2016	606.80B	SHEET NO. 4 OF 7



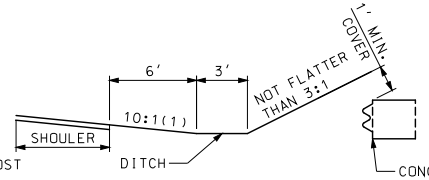
SECTION A-A



SECTION B-B

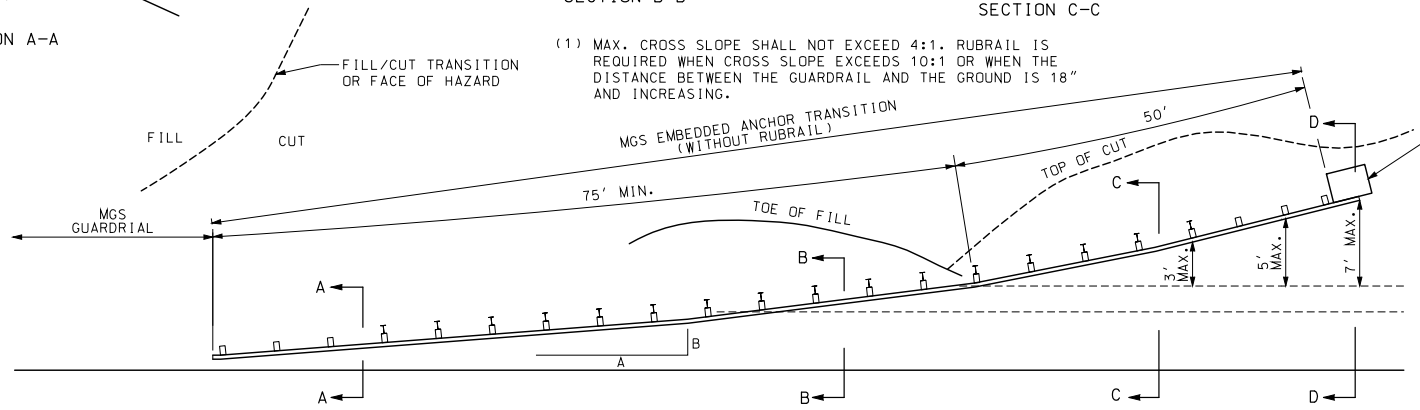


SECTION C-C



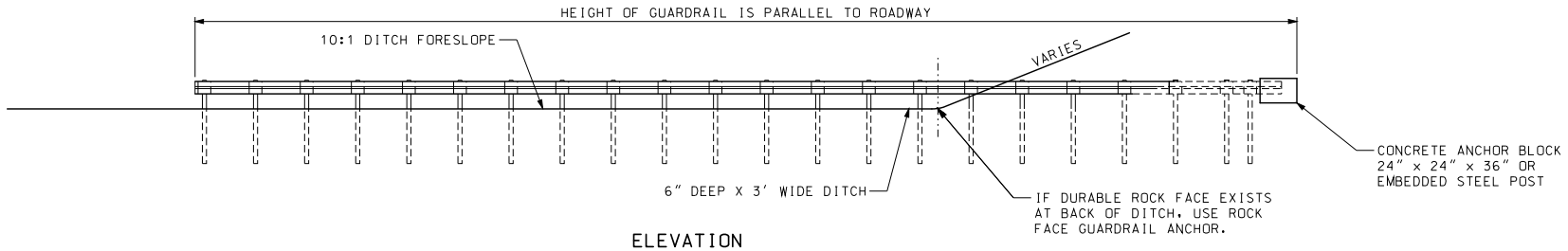
SECTION D-D

(1) MAX. CROSS SLOPE SHALL NOT EXCEED 4:1. RUBRAIL IS REQUIRED WHEN CROSS SLOPE EXCEEDS 10:1 OR WHEN THE DISTANCE BETWEEN THE GUARDRAIL AND THE GROUND IS 18" AND INCREASING.



PLAN VIEW

FLARE RATE	
DESIGN SPEED mph	A:B
70	15:1
60	13:1
55	12:1
50	11:1
45	10:1
40	9:1
30 OR LESS	7:1



ELEVATION
ANCHORED IN BACKSLOPE GUARDRAIL

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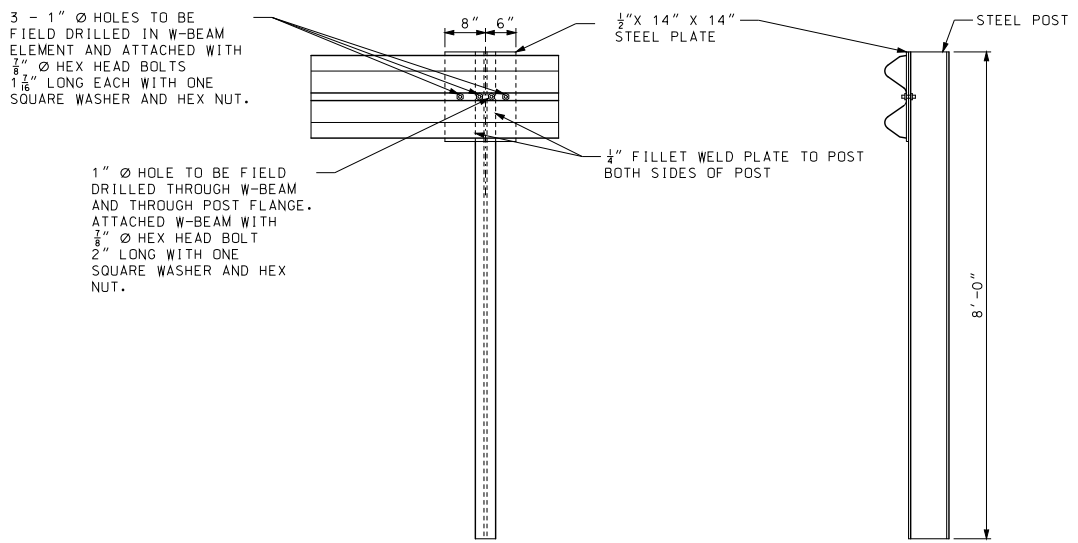
MIDWEST GUARDRAIL SYSTEM (MGS) EMBEDED ANCHOR TRANSITION EMBEDDED TERMINAL ENDS (FLAT DITCH)

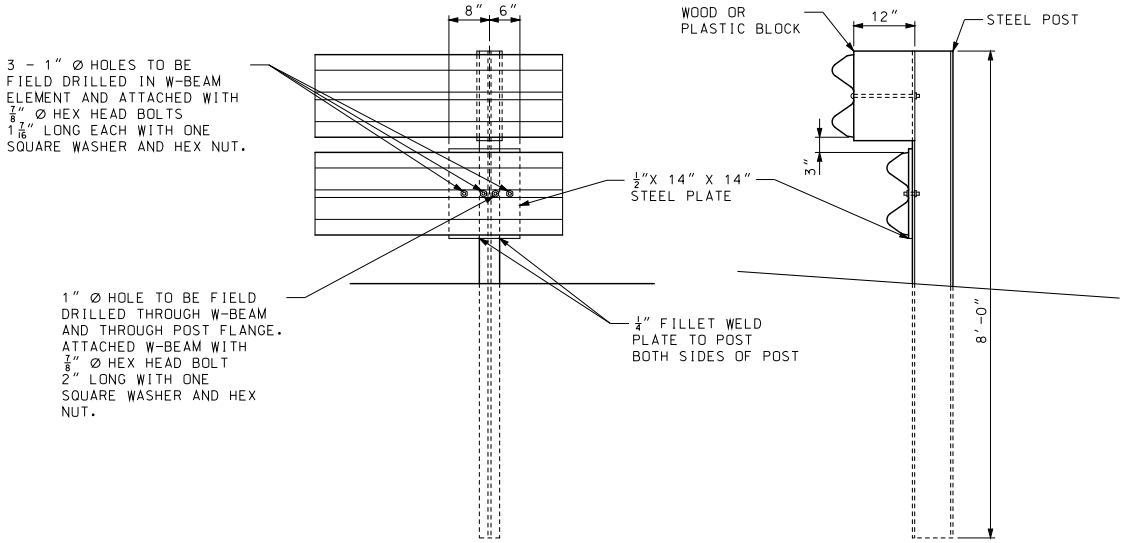
DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

606.80B

SHEET NO. 5 OF 7



EMBEDDED STEEL POST



SPECIAL RUBRAIL TO POST CONNECTION AT POST A

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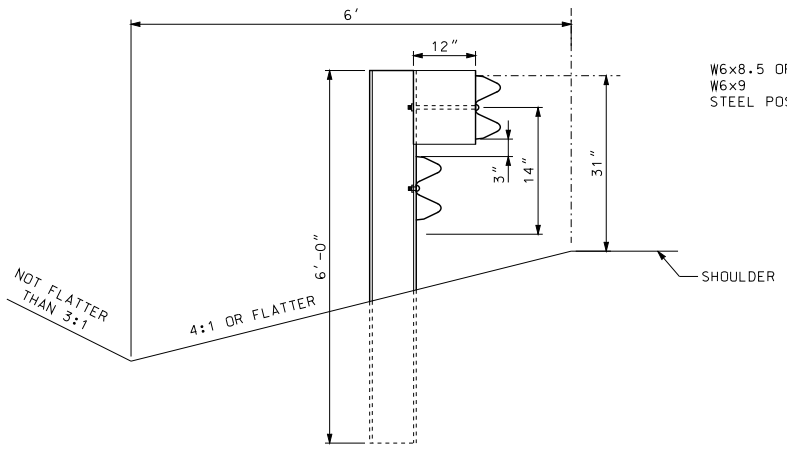
MIDWEST GUARDRAIL SYSTEM (MGS)
EMBEDDED ANCHOR TERMINAL ENDS (STEEL POST OPTION)

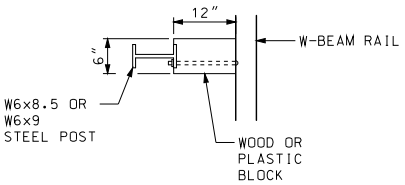
DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

606.80B

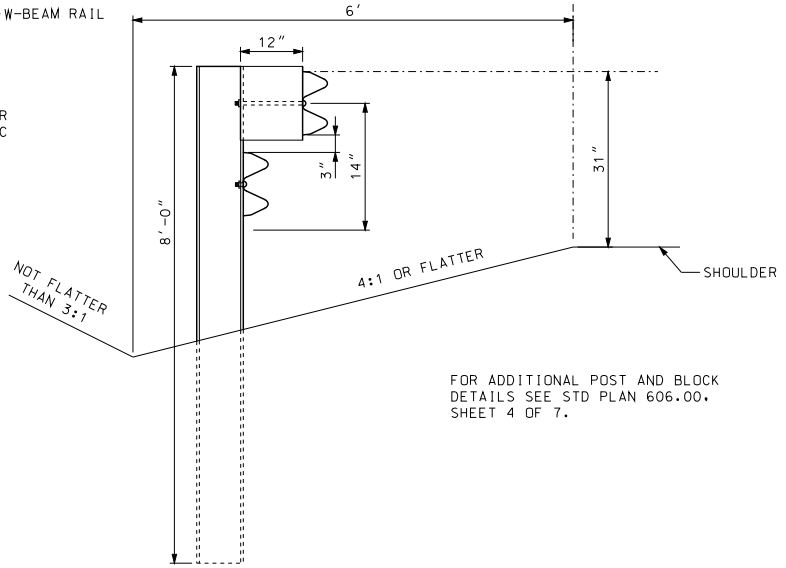
SHEET NO. 6 OF 7



ELEVATION OF 6′ STEEL POST AND BLOCK

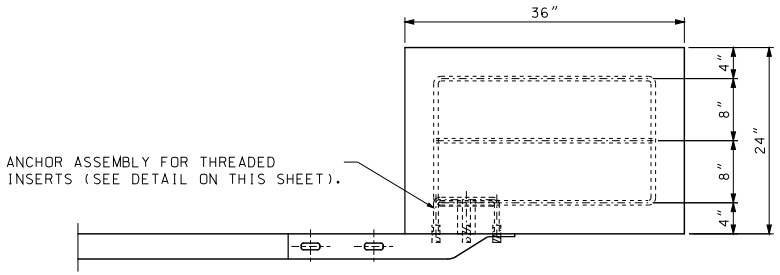


PLAN VIEW

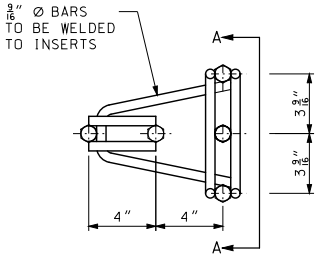


FOR ADDITIONAL POST AND BLOCK DETAILS SEE STD PLAN 606.00, SHEET 4 OF 7.

ELEVATION 8′ STEEL POST AND BLOCK

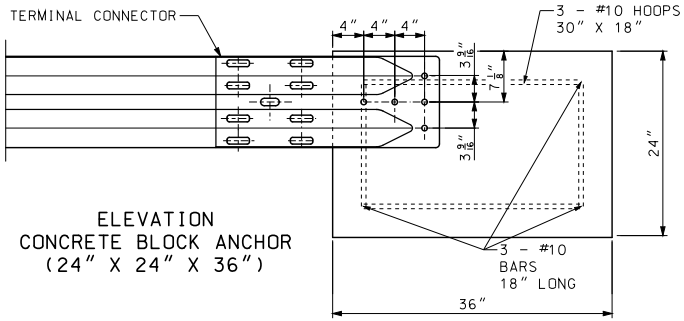


TOP VIEW

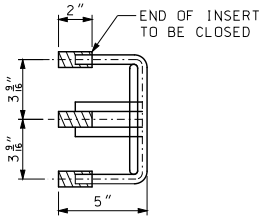


CONCRETE BLOCK ANCHOR
ANCHOR ASSEMBLY

THREADED INSERTS FOR $\frac{15}{16}$″ X 2″ GALVANIZED HEX HEAD CAP SCREWS. CAP SCREWS TO BE THREADED A MINIMUM $1\frac{1}{8}$″. INSERTS THREADED MINIMUM OF $1\frac{3}{4}$″.



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



SECTION A–A

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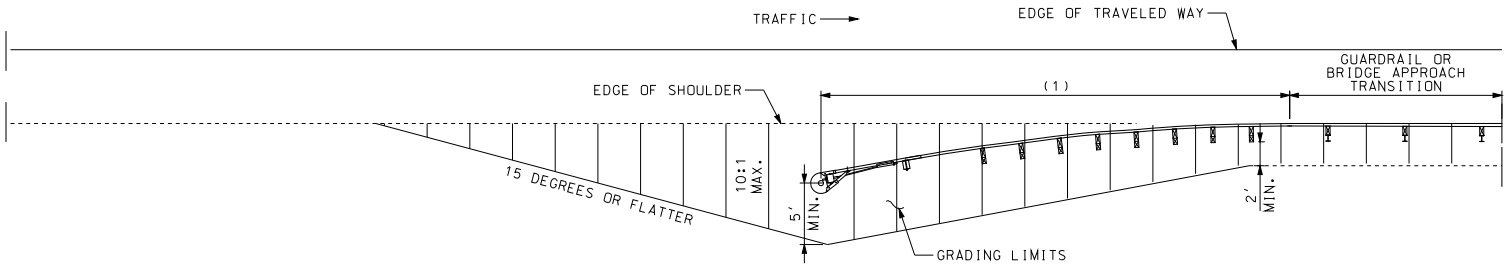
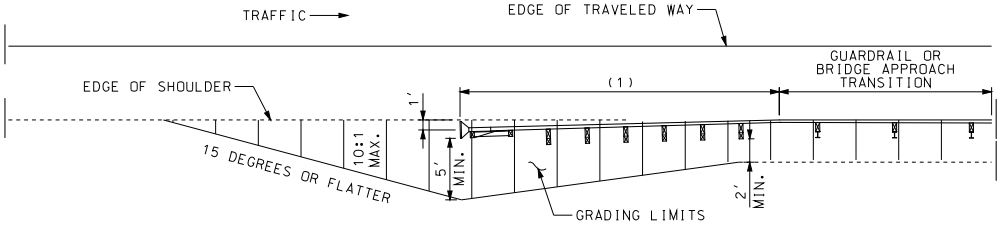
MIDWEST GUARDRAIL SYSTEM (MGS)

EMBEDDED TERMINAL ENDS GENERAL DETAILS

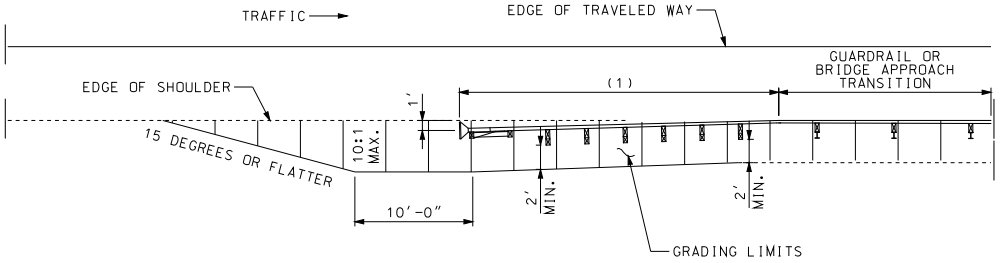
DATE EFFECTIVE: 01/01/2017 DATE PREPARED: 10/28/2016	606.80B	SHEET NO. 7 OF 7



GRADING LIMITS FOR FLARED CRASHWORTHY END TERMINALS



PREFERRED GRADING LIMITS FOR CRASHWORTHY END TERMINALS



ALTERNATE GRADING LIMITS FOR CRASHWORTHY END TERMINALS

(1) APPROVED CRASHWORTHY END TERMINAL

GENERAL NOTES:

THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH APPROVED SHOP DRAWINGS OF THE APPROVED CRASH-WORTHY END TERMINAL.

END ANCHORS SHALL BE INSTALLED ON ENDS OF GUARDRAIL RUNS WHERE CRASHWORTHY END TERMINALS ARE NOT REQUIRED.

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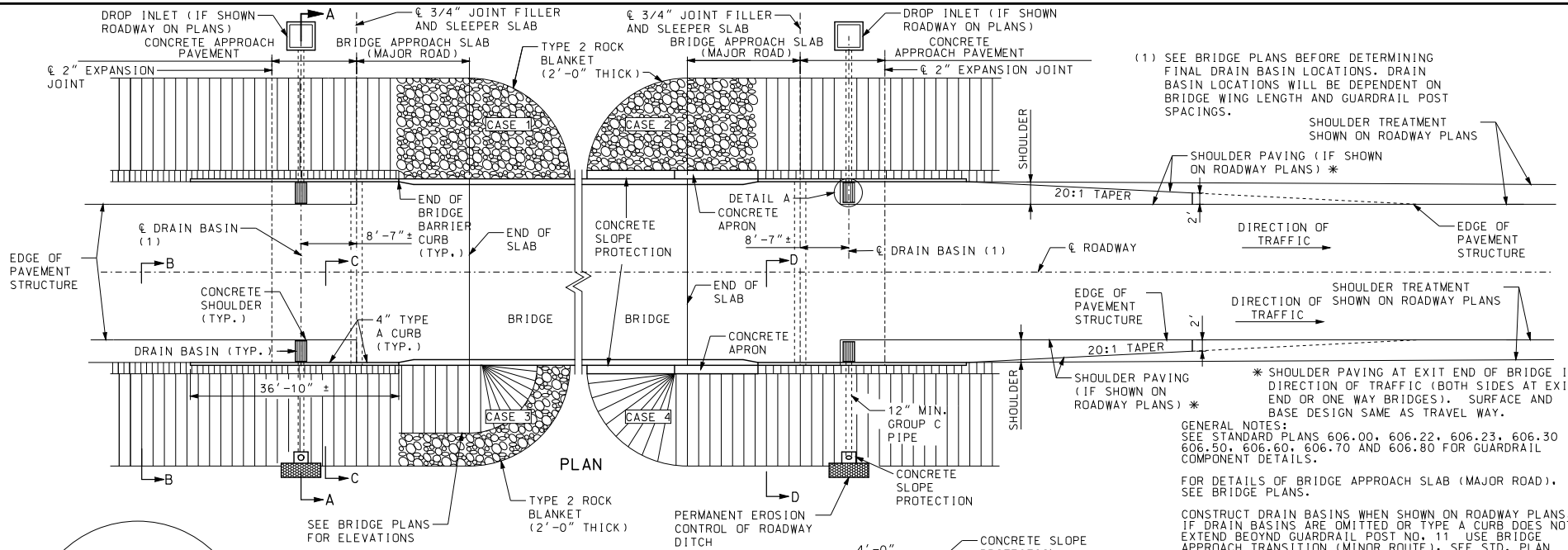
MASH
CRASHWORTHY END TERMINALS
TYPE A
GRADING LIMITS

DATE EFFECTIVE: 01/01/2017	606.81	SHEET NO. 1 OF 1
DATE PREPARED: 10/28/2016		



(1) SEE BRIDGE PLANS BEFORE DETERMINING FINAL DRAIN BASIN LOCATIONS. DRAIN BASIN LOCATIONS WILL BE DEPENDENT ON BRIDGE WING LENGTH AND GUARDRAIL POST SPACINGS.

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

GENERAL NOTES:
SEE STANDARD PLANS 606.00, 606.22, 606.23, 606.30 606.50, 606.60, 606.70 AND 606.80 FOR GUARDRAIL COMPONENT DETAILS.

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

CONSTRUCT DRAIN BASINS WHEN SHOWN ON ROADWAY PLANS. IF DRAIN BASINS ARE OMITTED OR TYPE A CURB DOES NOT EXTEND BEOYND GUARDRAIL POST NO. 11 USE BRIDGE APPROACH TRANSITION (MINOR ROUTE), SEE STD. PLAN 606.60 SHEET 2 OF 5.

TYPE A CURB IS TO BE CONSTRUCTED TO THE END OF THE BRIDGE APPROACH TRANSITION WHEN DRAIN BASINS ARE REQUIRED. SEE STANDARD PLANS 609.00 FOR TYPE A CURB.

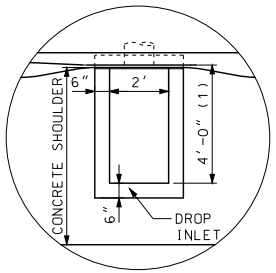
SEE STANDARD PLANS 504.00 FOR DETAILS OF CONCRETE APPROACH PAVEMENT.

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

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

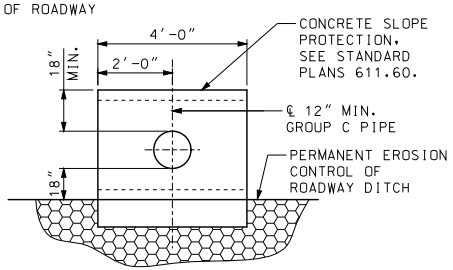
PAYMENT FOR DROP INLET, GRATE, GROUP C PIPE, CONCRETE SLOPE PROTECTION AT PIPE OUTLETS, MATERIAL AND INSTALLATION WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR DRAIN BASIN PER EACH.

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

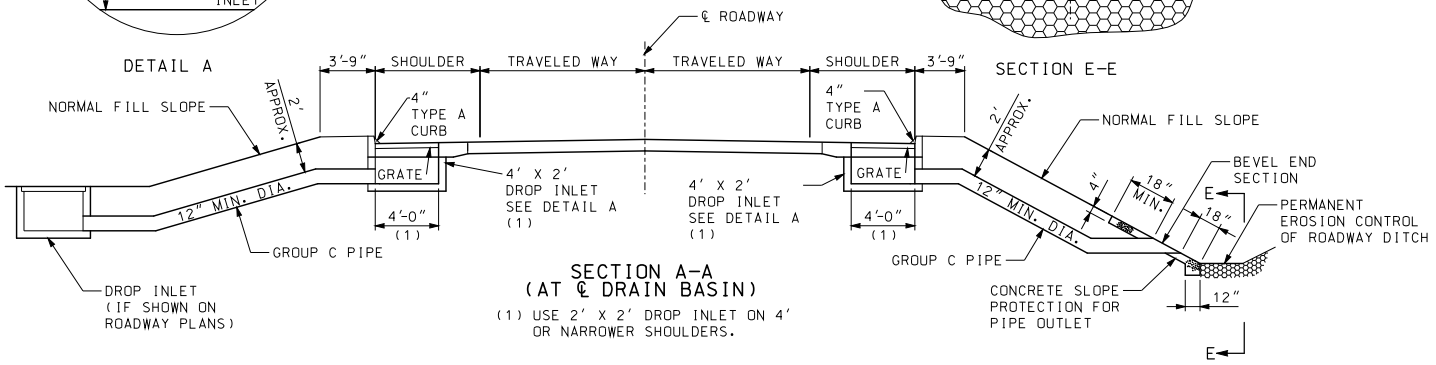


DETAIL A

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



SECTION E-E



SECTION A-A
(AT ℄ DRAIN BASIN)

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

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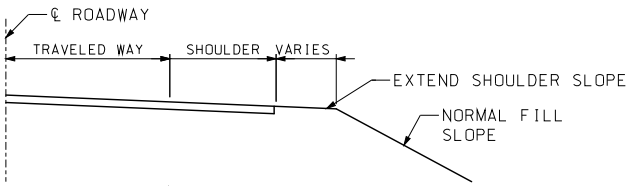
DRAIN BASIN, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS (MAJOR ROAD)

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 11/2/2016

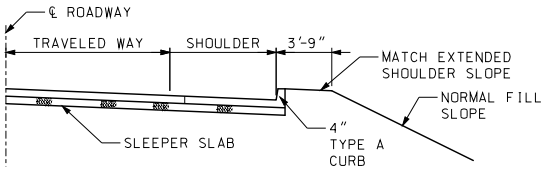
609.40S

SHEET NO. 1 OF 3

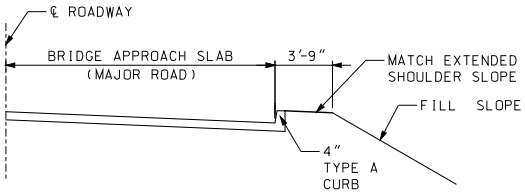
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



SECTION B-B

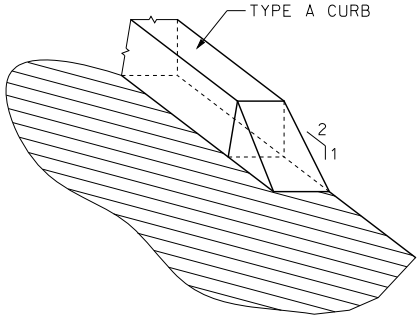


SECTION C-C



SECTION D-D

NOTE: FOR DETAILS NOT SHOWN, SEE OTHER SECTIONS.



TYPE A CURB
TRANSITION DETAIL

GENERAL NOTE:

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

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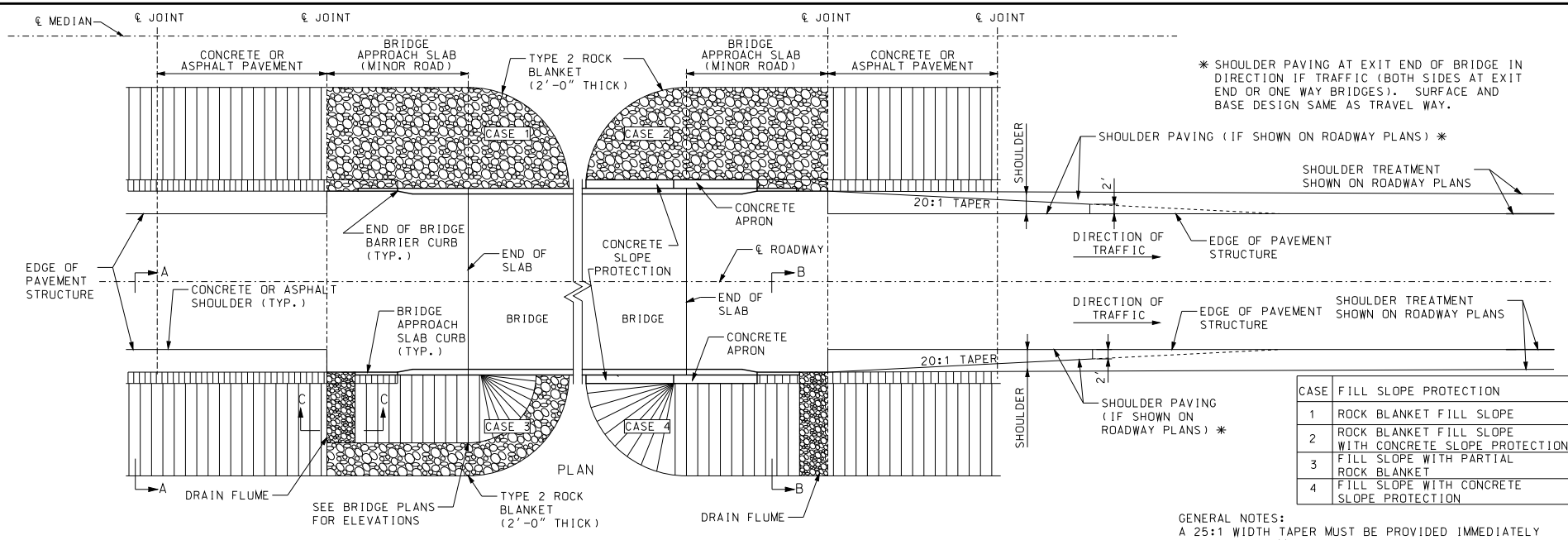
DRAIN BASIN, SHOULDER PAVING AND FILL SLOPE AT BRIDGE ENDS (MAJOR ROAD)

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 11/2/2016

609.40S

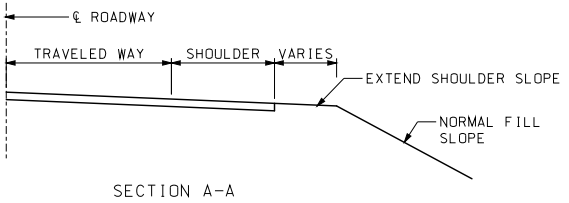
SHEET NO. 2 OF 3

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

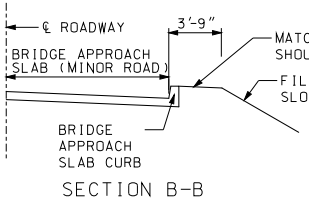


* SHOULDER PAVING AT EXIT END OF BRIDGE IN DIRECTION IF TRAFFIC (BOTH SIDES AT EXIT END OR ONE WAY BRIDGES). SURFACE AND BASE DESIGN SAME AS TRAVEL WAY.

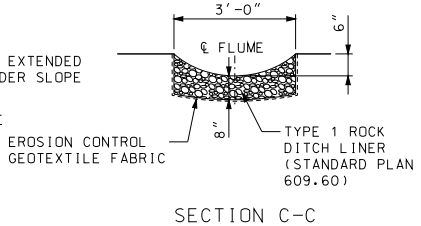
CASE	FILL SLOPE PROTECTION
1	ROCK BLANKET FILL SLOPE
2	ROCK BLANKET FILL SLOPE WITH CONCRETE SLOPE PROTECTION
3	FILL SLOPE WITH PARTIAL ROCK BLANKET
4	FILL SLOPE WITH CONCRETE SLOPE PROTECTION



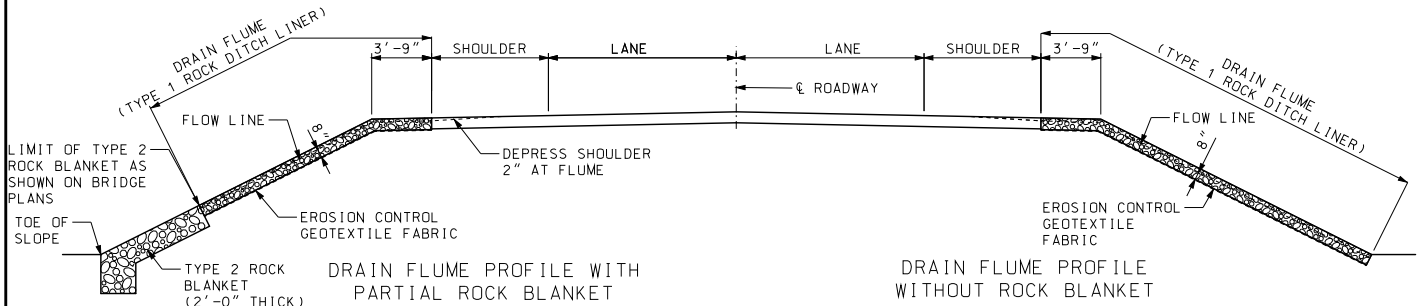
SECTION A-A



SECTION B-B



SECTION C-C



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

SEE STANDARD PLANS 606.00, 606.22, 606.23, 606.30, 606.50, 606.60, 606.70 AND 606.80 FOR DETAILS OF GUARDRAILS AND BRIDGE ANCHOR SECTIONS.

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

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

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

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

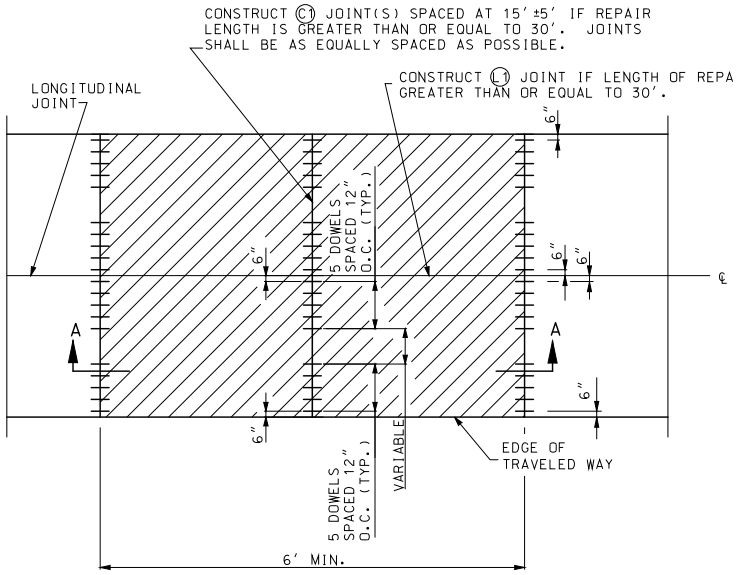
DRAIN FLUME, SHOULDER PAVING AND FILL SLOPES AT BRIDGE ENDS (MINOR ROAD)

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 11/2/2016

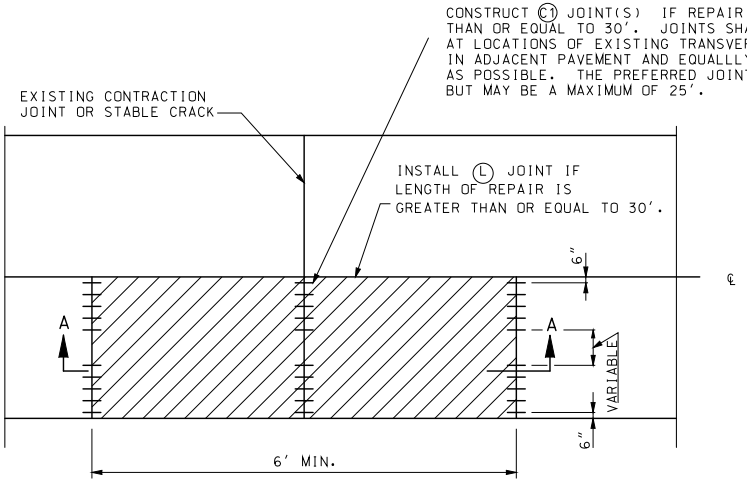
609.40S

SHEET NO. 3 OF 3

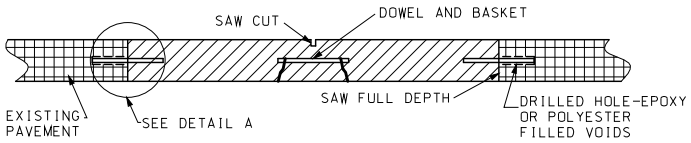
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



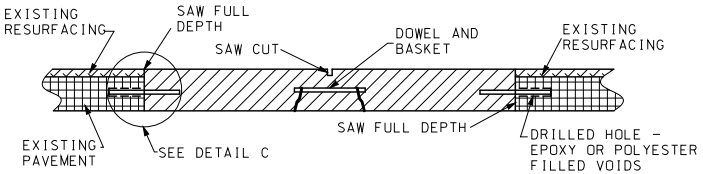
TWO OR MORE LANES



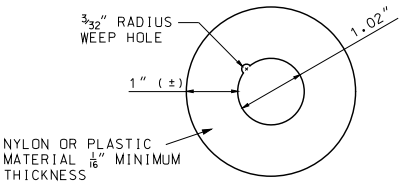
ONE LANE



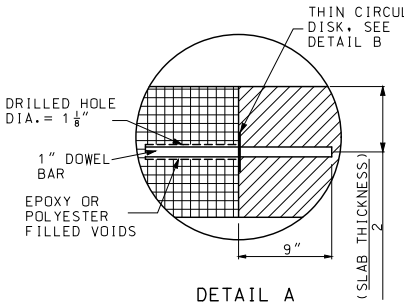
SECTION A–A



SECTION A–A ALTERNATE
WITH ASPHALT OVERLAY

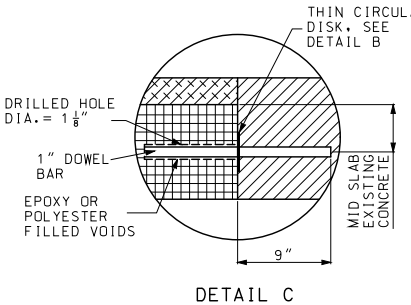


DETAIL B
THIN CIRCULAR DISK



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
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

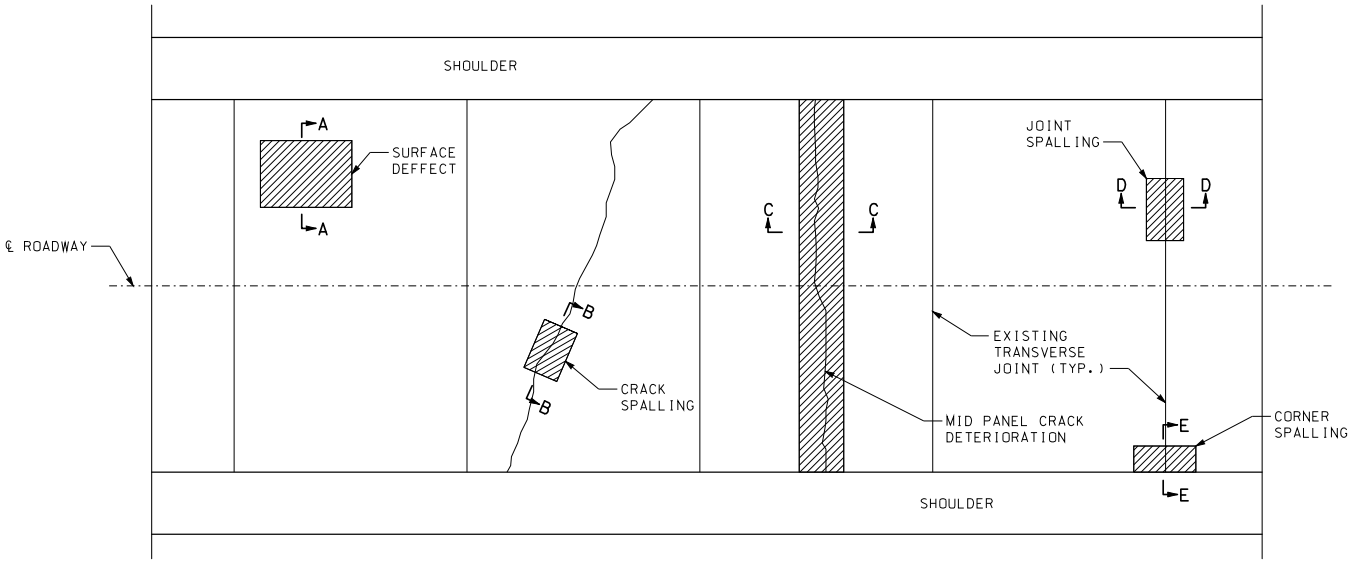
PAVEMENT REPAIR
FULL DEPTH

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

613.00S

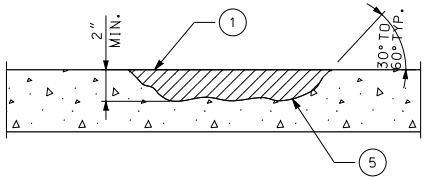
SHEET NO. 1 OF 4

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

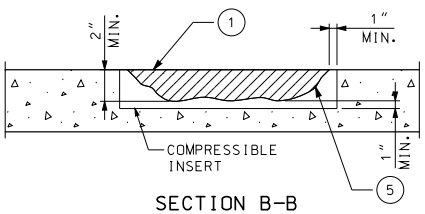


PLAN VIEW

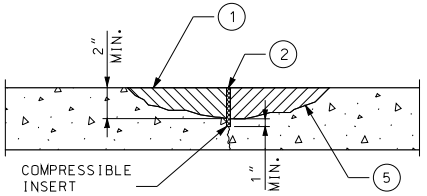
1. REMOVE ALL CONCRETE, TO LIMITS SHOWN, TO MAX. OF $\frac{1}{2}$ THE PAVEMENT DEPTH OR TOP OF DOWELS BY MILLING.
2. PLACE COMPRESSIBLE INSERT IN JOINT OR CRACK. INSERT SHALL BE THICKNESS OF JOINT OR CRACK WIDTH, BUT NOT LESS THAN $\frac{1}{4}$".
3. CHIP VERTICAL REPAIR EDGES AT APPROXIMATE 1:1 SLOPE.
4. PLACE $\frac{1}{8}$" MIN. COMPRESSIBLE INSERT ADJACENT TO LONGITUDINAL LANE OR SHOULDER JOINT.
5. EXPOSED SURFACE SHALL BE CLEANED BY SANDBLASTING, SHOTBLASTING, OR HIGH PRESSURE WATER BLASTING.
6. EXPOSED SURFACE OF DOWEL BARS SHALL BE COATED WITH AN APPROVED BONDBREAKER.



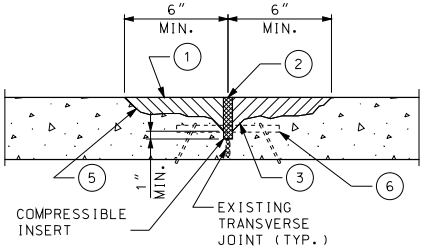
SECTION A–A



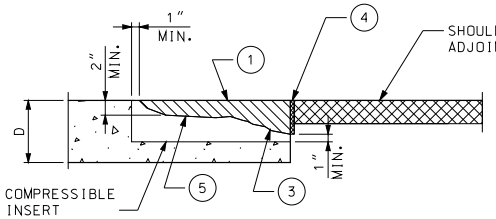
SECTION B–B



SECTION C–C



SECTION D–D



SECTION E–E

AREA TO BE REMOVED

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

PAVEMENT REPAIR

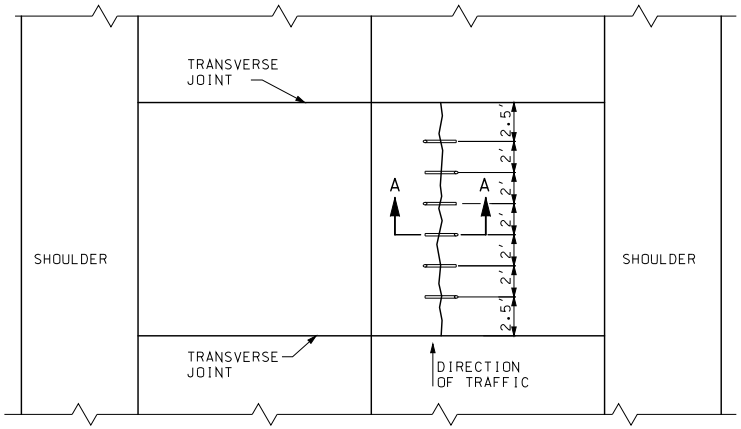
PARTIAL DEPTH CLASS A

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

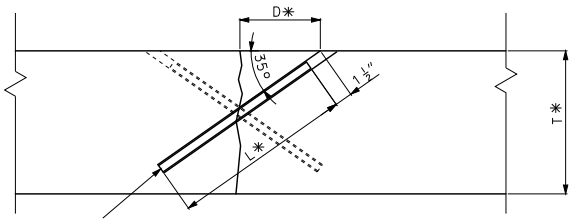
613.00S

SHEET NO. 2 OF 4

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:

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
ERIC E. SCHROETER
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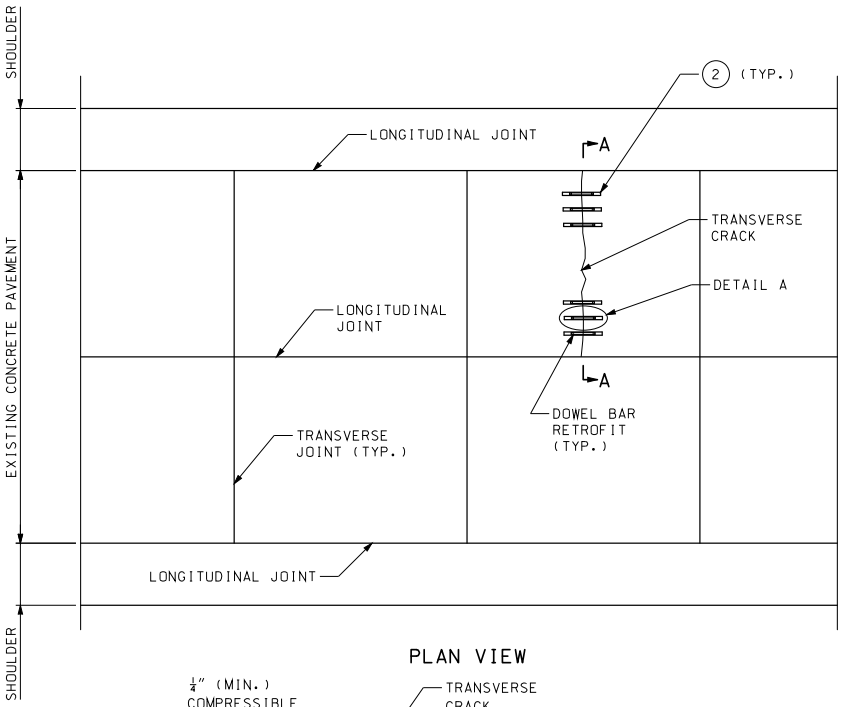
PAVEMENT REPAIR

CROSS STITCHING

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

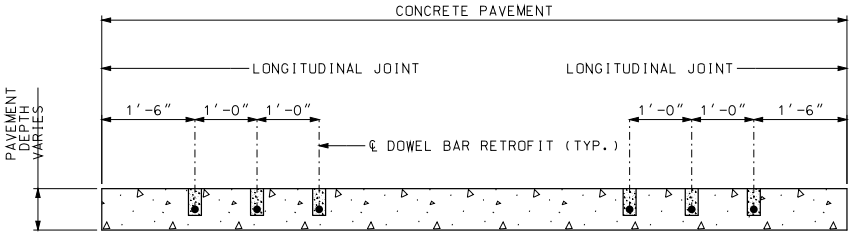
613.00S

SHEET NO. 3 OF 4

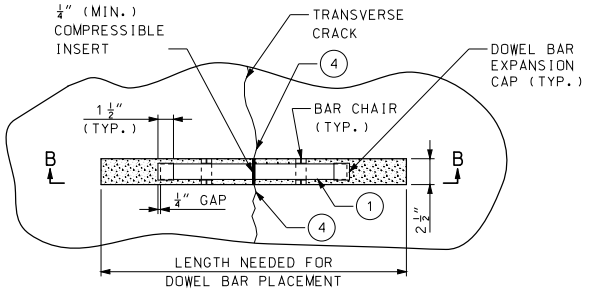


PLAN VIEW

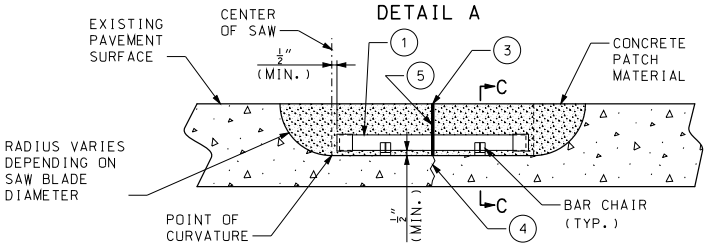
1. $1\frac{1}{2}$" DIAMETER DOWEL BAR X 18" LENGTH.
2. DOWEL BAR SLOTS SHALL BE PARALLEL TO ROADWAY.
3. TOP OF COMPRESSIBLE INSERT SHALL BE FLUSH WITH PAVEMENT SURFACE.
4. CRACK PERIMETER IN SLOT SHALL BE SEALED WITH SILICONE.
5. COMPRESSIBLE INSERT SHALL BE PLACED AT MIDDLE OF DOWEL BAR.



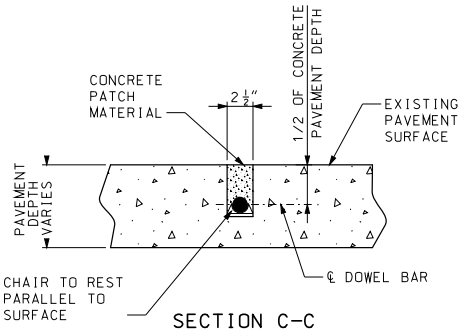
SECTION A-A



DETAIL A



SECTION B-B



SECTION C-C

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

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

DOWEL BAR RETROFIT

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

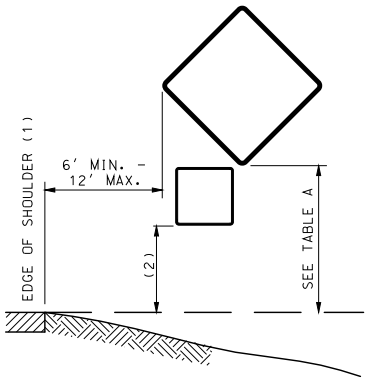
613.00S

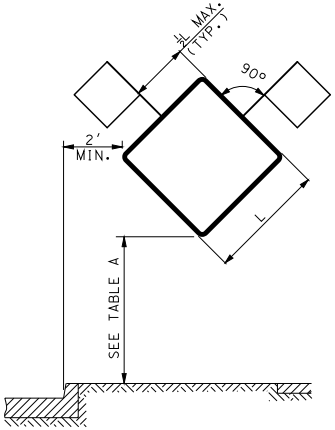
SHEET NO. 4 OF 4

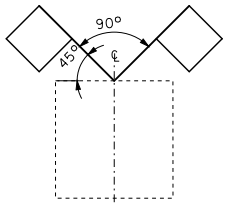
TABLE A
WORK ZONE SIGN MOUNTING REQUIREMENTS

TYPE	SIGN SUPPORT	SIGN SUBSTRATE	MINIMUM MOUNTING HEIGHT(3)	USAGE LIMITATIONS	COMMENTS
POST	PERFORATED SQUARE STEEL TUBE U-CHANNEL WOOD	RIGID	5' RURAL UNDIVIDED HIGHWAYS 7' RURAL DIVIDED HIGHWAYS 7' URBAN HIGHWAYS	NONE	POSTS SHALL BE FREE OF ANY BRACING AND EXTEND NO FURTHER ABOVE THE SIGN EXCEPT AS NEEDED FOR WARNING LIGHT ATTACHMENT. FOR DETAILS OF POST INSTALLATION DETAILS SEE SHEET NO. 2 OF 9. 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/SIDEWALKCLOSURES MAY BE LEFT IN PLACE FOR MORE THAN 3 DAYS.
(6) DEVIATIONS AS APPROVED BY THE ENGINEER.







(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

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.

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PROFESSIONAL ENGINEER
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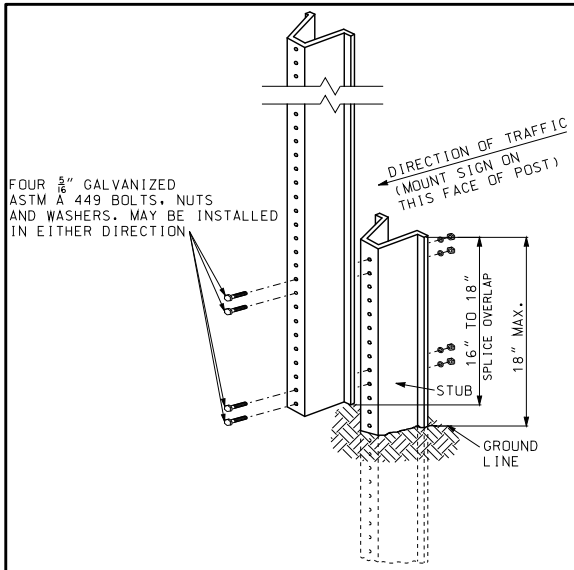
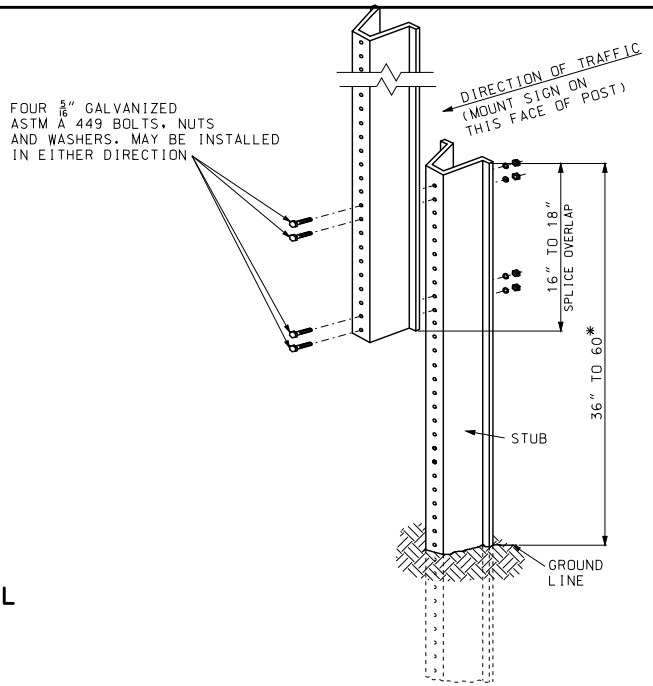
TEMPORARY
TRAFFIC CONTROL DEVICES
SIGN MOUNTING REQUIREMENTS

DATE EFFECTIVE: 04/01/2017 DATE PREPARED: 1/30/2017	616.10AU	SHEET NO. 1 OF 9

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



U-CHANNEL POST DETAIL



OPTIONAL U-CHANNEL POST DETAIL

POST TYPE

SIGN AREA (SQ.FT.)	U-CHANNEL	WOOD	PERFORATED SQUARE STEEL TUBING
≤ 10	1 - 3.0 LB./FT.*	1 - 4" X 4"*	1 - 2" 12 GA.*
> 10 ≤ 16	2 - 3.0 LB./FT.	2 - 4" X 4" 1 - 4" X 6"*	2 - 2" 12 GA. 1 - 2½" 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.

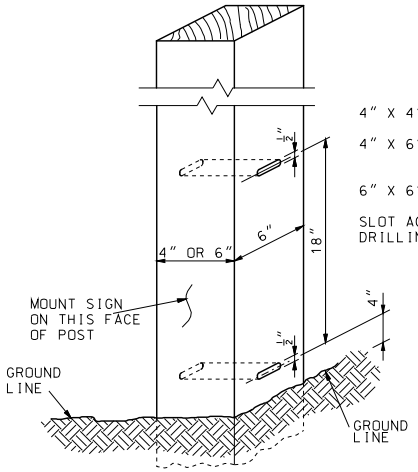
** REQUIRES SLIP BASE PER MANUFACTURER'S RECOMMENDATION.

USE OF SPLICE IS OPTIONAL.

SPLICE OVERLAP SHALL BE POSITION ENTIRELY BETWEEN GROUND LINE AND 18" ABOVE GROUND LINE OR BETWEEN 18" AND 60" ABOVE GROUND LINE.

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

ONLY ONE SPLICE WILL BE ALLOWED PER POST.



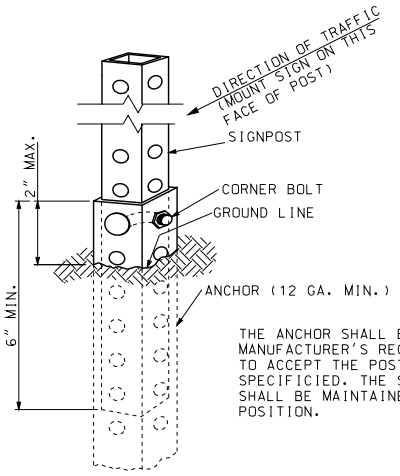
WOOD POST DETAIL

4" X 4" WOOD POST - NO SLOTS OR HOLES REQUIRED

4" X 6" WOOD POST - 1½" X ½" SLOT ON 6" SIDE OR 1½" DIA. HOLE ON 6" SIDE

6" X 6" WOOD POST - 2" X ½" SLOT OR 2" DIA. HOLE

SLOT ACROSS NEUTRAL AXIS FORMED BY SUCCESSIVE DRILLING WITH ½" BIT.



PERFORATED SQUARE STEEL TUBE POST DETAIL

THE SIGN POST MAY BE ATTACHED TO THE ANCHOR WITH A CORNER BOLT OR STRAIGHT BOLT PER MANUFACTURER'S SPECIFICATION.

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

GENERAL NOTES:

ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 3 FEET.

AT THE ENGINEER DISCRETION A FLUORESCENT PAINT SHALL BE APPLIED HEAVILY TO BOTH SIDES OF U-CHANNEL POST STUB FOR A LENGTH OF AT LEAST 6 INCHES BELOW THE TOP OF THE STUB.

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

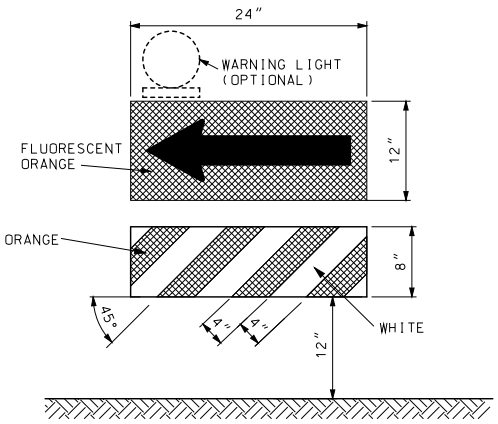
STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TEMPORARY TRAFFIC CONTROL DEVICES POST INSTALLATION DETAILS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

616.10AU

SHEET NO. 2 OF 9

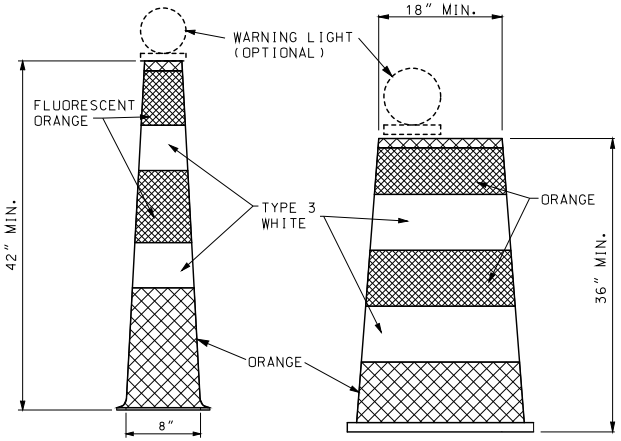


DIRECTION INDICATOR BARRICADE

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

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

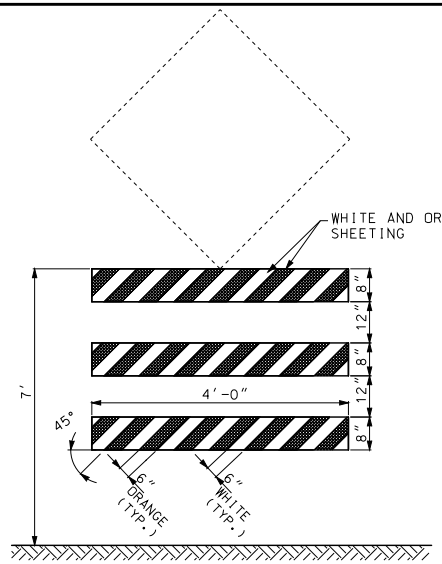
THE PANELS SHALL BE SECURELY ATTACHED TO A SUPPORT THAT IS PORTABLE, CAPABLE OF REMAINING UPRIGHT AND ENTIRELY FREE STANDING.



CHANNELIZERS

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

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



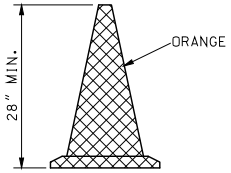
ADVANCE WARNING RAIL SYSTEM

MAXIMUM WEIGHT OF SIGN SHALL NOT EXCEED 25 LBS.

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

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

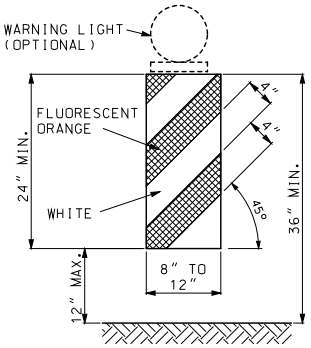
WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.



CONE

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

CONES SHALL BE USED DURING DAYLIGHT HOURS ONLY.



VERTICAL PANEL

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

GENERAL NOTES:

FLUORESCENT ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.

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

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

IF USED, THE WARNING 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.

WARNING LIGHTS SHALL BE IN ACCORDANCE WITH SEC 1063.5.

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.

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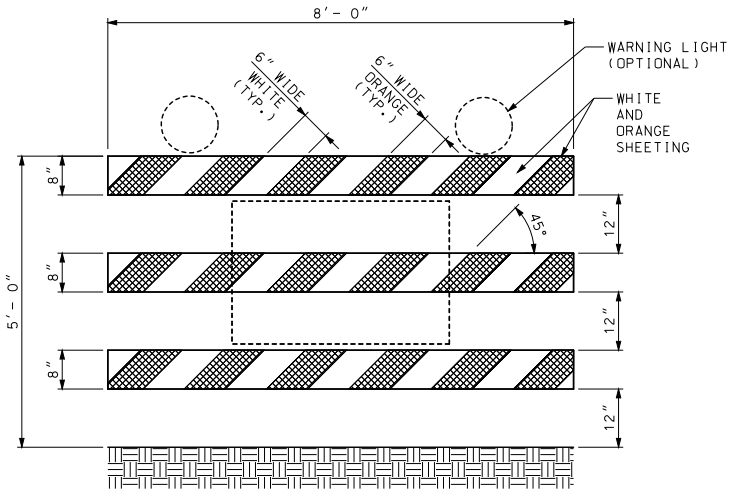
STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

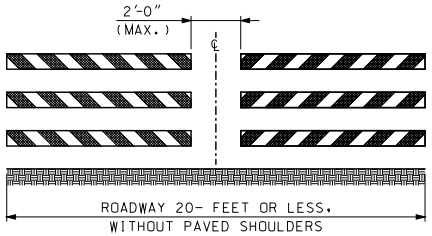
TEMPORARY TRAFFIC CONTROL DEVICES
CHANNELIZERS AND DIRECTION INDICATOR BARRICADE

DATE EFFECTIVE:	04/01/2017	616.10AU	SHEET NO. 3 OF 9
DATE PREPARED:	1/30/2017		

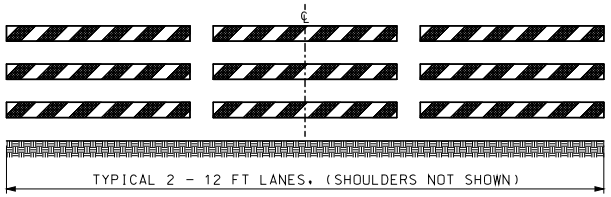
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



EXAMPLE 1

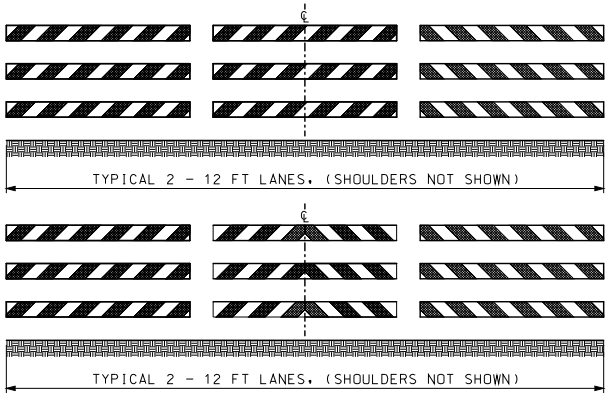


EXAMPLE 2

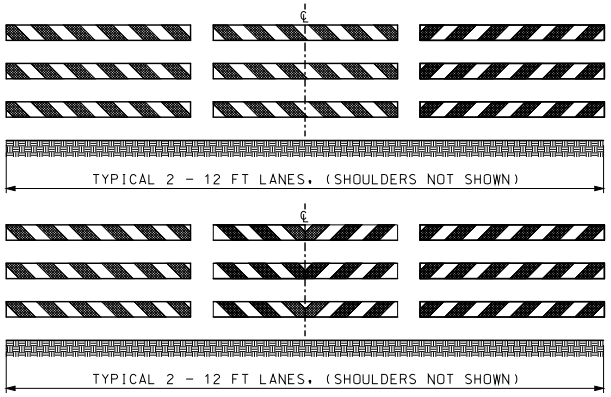


EXAMPLE SHOWS STRIPES SLOPING TO DIRECT VEHICULAR MOVEMENT TOWARD THE LEFT

EXAMPLE 3



EXAMPLE 4



EXAMPLE 5

EXAMPLE 1 - ONE TYPE 3 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 SHOULD NOT OBSCURE MORE THAN 50 PERCENT OF THE TOP 2 RAILS OR 33 PERCENT OF ALL THREE RAILS.

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 BARRICADE FACE.

IF WARNING LIGHTS ARE USED,THE LIGHT SHOULD BE INSTALLED ON THE BARRICADES IN THE DIRECTION OF TRAFFIC.

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

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

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

EXAMPLE 2 - FOR PAVED ROADWAYS WITH A WIDTH OF 20-FEET OR LESS AND WITHOUT PAVED SHOULDERS, TWO BARRICADES ARE ACCEPTABLE.

EXAMPLE 3 - WHERE BARRICADES EXTEND ENTIRELY ACROSS A ROADWAY, STRIPES SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH ROAD USERS MUST TURN.

EXAMPLE 4 - WHERE BOTH RIGHT AND LEFT TURNS ARE PROVIDED, STRIPES SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE OR BARRICADES.

EXAMPLE 5 - WHERE NO TURNS ARE INTENDED, STRIPES POSITIONED TO SLOPE DOWNARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES.

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
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
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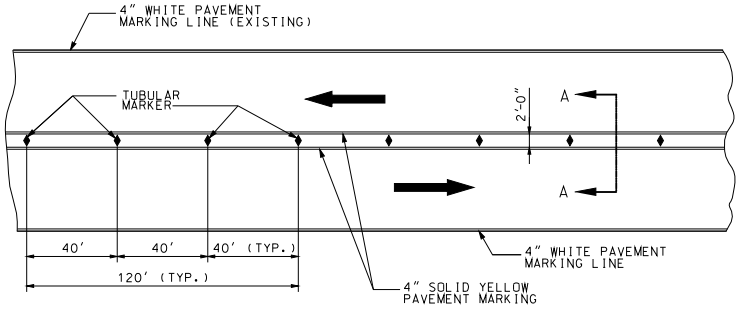
TEMPORARY TRAFFIC CONTROL DEVICES

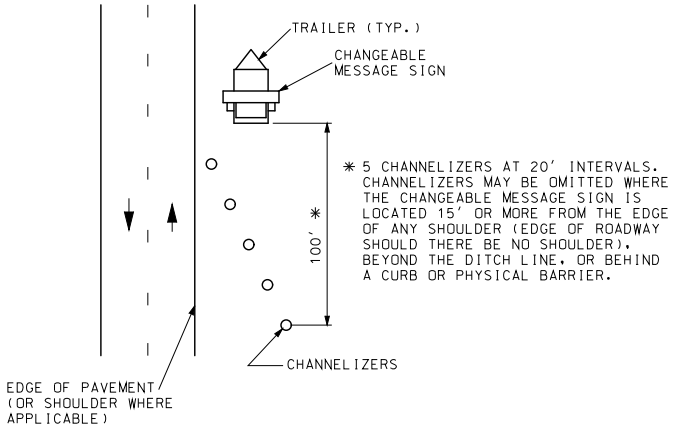
TYPE 3 MOVABLE BARRICADE

DATE EFFECTIVE:	04/01/2017	616.10AU	SHEET NO. 4 OF 9
DATE PREPARED:	1/30/2017		

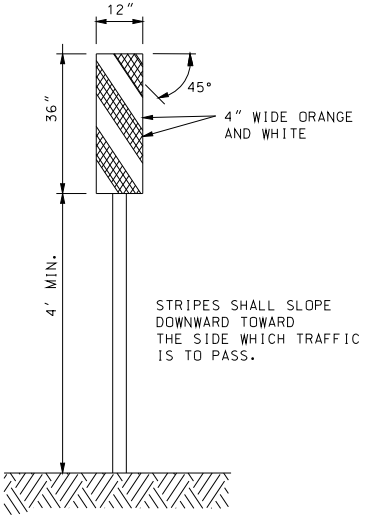


TWO LANE / TWO WAY TRAFFIC DELINEATION PLAN FOR DIVIDED HIGHWAY

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

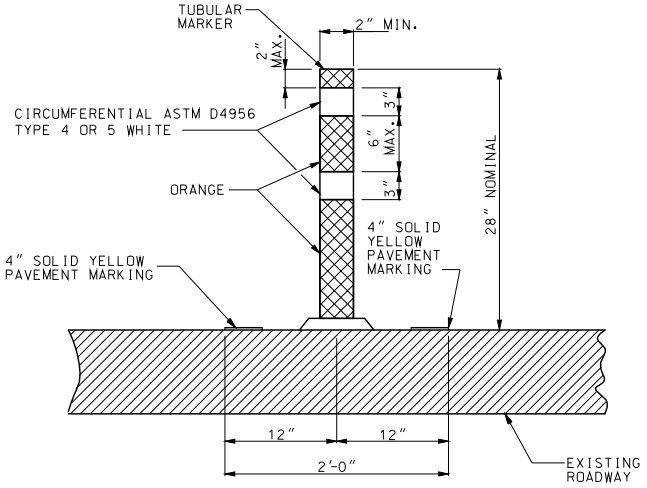


* 5 CHANNELIZERS AT 20' INTERVALS. CHANNELIZERS MAY BE OMITTED WHERE THE CHANGEABLE MESSAGE SIGN IS LOCATED 15' OR MORE FROM THE EDGE OF ANY SHOULDER (EDGE OF ROADWAY SHOULD THERE BE NO SHOULDER), BEYOND THE DITCH LINE, OR BEHIND A CURB OR PHYSICAL BARRIER.



TYPE 3 OBJECT MARKERS

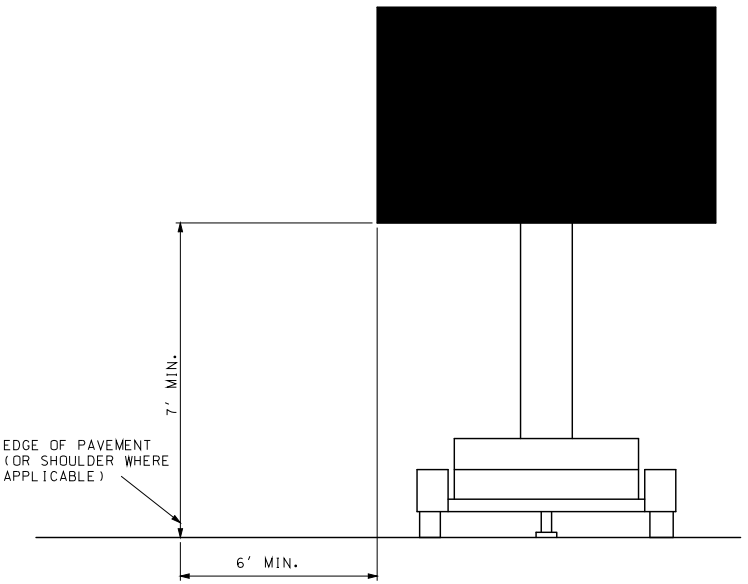
WHITE AND ORANGE REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.



SECTION A–A
TUBULAR MARKER DETAIL

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

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



CHANGEABLE MESSAGE SIGN

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

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

TEMPORARY TRAFFIC CONTROL DEVICES

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

616.10AU

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

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

(2) REFER TO THE LATEST EDITION OF MUTCD PART VI BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA FOR SIGN DEPICTION, ARROW, BORDERS AND SPACING SHALL CONFORM TO THE GUIDELINES SET FORTH IN THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.

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

(4) USE OF A SUPPLEMENTAL PLATE FOR LINE 1 IS ACCEPTABLE.

(5) PLAQUE AND APPLICABLE REGULATORY SIGN MAY BE MANUFACTURED AS ONE SIGN.

(6) R4 REFER TO SEC 1042.2.7.3.

GENERAL NOTES:

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

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

NO ADDITIONAL PAYMENT WILL BE MADE FOR PLATES.

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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JEFFERSON CITY, MO 65102
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ERIC E. SCHROETER NUMBER PE-28411 STATE OF MISSOURI PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TEMPORARY TRAFFIC CONTROL DEVICES
WARNING SIGNS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

616.10AU

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	
W020-3	48X48	16.00	BK	FL. OR	R4	ROAD CLOSED AHEAD	
W020-4	48X48	16.00	BK	FL. OR	R4	ONE LANE ROAD AHEAD	
W020-5	48X48	16.00	BK	FL. OR	R4	RIGHT/CENTER/LEFT LANE CLOSED AHEAD	(4)
W020-5a	48X48	16.00	BK	FL. OR	R4	2 RIGHT/CENTER/LEFT LANES CLOSED AHEAD	(4)
SPECIAL W020-6a	48X48	16.00	BK	FL. OR	R4	RIGHT/CENTER/LEFT LANE CLOSED	(3)(4)
W020-7	48X48	16.00	BK	FL. OR	R4	FLAGGER (SYMBOL) WITH FLAGS	
W021-2	36X36	9.00	BK	FL. OR	R4	FRESH OIL	
SPECIAL W021-5	48X48	16.00	BK	FL. OR	R4	SHOULDER WORK AHEAD	(3)
W021-5a	48X48	16.00	BK	FL. OR	R4	RIGHT/LEFT SHOULDER CLOSED	
W021-5b	48X48	16.00	BK	FL. OR	R4	RIGHT/LEFT SHOULDER CLOSED AHEAD	
W022-1	48X48	16.00	BK	FL. OR	R4	BLASTING ZONE AHEAD	
W022-2	42X36	10.50	BK	FL. OR	R4	TURN OFF 2-WAY RADIO AND PHONE	
W022-3	42X36	10.50	BK	FL. OR	R4	END BLASTING ZONE	
SPECIAL W022-6e	21X15	2.19	BK	FL. OR	R4	WET PAINT (ARROW POINTS)	(3)

GUIDE SIGNS

E05-1	36X48	12.00	BK	FL. OR	R4	GORE EXIT	(3)
G020-1	60X24	10.00	BK	FL. OR	R4	ROAD WORK NEXT XX MILES	
G020-2	48X24	8.00	BK	FL. OR	R4	END ROAD WORK	
G020-4	36X18	4.50	BK	FL. OR	R4	PILOT CAR FOLLOW ME	
SPECIAL	42X30	8.75	BK	FL. OR	R4	PLEASE WAIT FOR PILOT CAR	(3)
G020-5aP	36X24	6.00	BK	FL. OR	R4	WORK ZONE (PLAQUE)	(3) (5)
M04-8a	24X18	3.00	BK	FL. OR	R4	END DETOUR	
M04-9L	48X36	12.00	BK	FL. OR	R4	DETOUR (LEFT ARROW)	
M04-9R	48X36	12.00	BK	FL. OR	R4	DETOUR (RIGHT ARROW)	
M04-10L	48X18	6.00	BK	FL. OR	R4	DETOUR (ARROW LEFT)	
M04-10R	48X18	6.00	BK	FL. OR	R4	DETOUR (ARROW RIGHT)	

REGULATORY SIGNS

R1-1	48X48	13.25	WH	RD	R2	STOP	
R1-2	48 TRI.	6.93	RD	WH	R2	YIELD	
R1-2a	36X36	9.00	BK	WH	R2	TO ONCOMING TRAFFIC (PLAQUE)	
R1-3p	20X9	1.25	WH	RD	R2	ALL WAY (PLAQUE)	
R2-1	36X48	12.00	BK	WH	R2	SPEED LIMIT XX	
R3-1	48X48	16.00	BK/RD	WH	R2	NO RIGHT TURN (SYMBOL)	
R3-2	48X48	16.00	BK/RD	WH	R2	NO LEFT TURN (SYMBOL)	
R3-3	36X36	9.00	BK	WH	R2	NO TURNS	
R3-4	48X48	16.00	BK/RD	WH	R2	NO U-TURN (SYMBOL)	
R3-7L	30X30	6.25	BK	WH	R2	LEFT LANE MUST TURN LEFT	
R3-7R	30X30	6.25	BK	WH	R2	RIGHT LANE MUST TURN RIGHT	
R4-1	36X48	12.00	BK	WH	R2	DO NOT PASS	
R4-2	36X48	12.00	BK	WH	R2	PASS WITH CARE	
R4-7a	36X48	12.00	BK	WH	R2	KEEP RIGHT (HORIZONTAL ARROW)	
R4-8a	36X48	12.00	BK	WH	R2	KEEP LEFT (HORIZONTAL ARROW)	
R5-1	30X30	6.25	RD	WH	R2	DO NOT ENTER	
R5-1a	36X24	6.00	WH	RD	R2	WRONG WAY	
R6-1L	48X18	6.00	BK	WH	R2	ONE WAY ARROW (LEFT)	
R6-1R	48X18	6.00	BK	WH	R2	ONE WAY ARROW (RIGHT)	
R6-2L	24X30	5.00	BK	WH	R2	ONE WAY (LEFT)	
R6-2R	24X30	5.00	BK	WH	R2	ONE WAY (RIGHT)	
R10-6	24X36	6.00	BK	WH	R2	STOP HERE ON RED (45° ARROW)	
R11-2	48X30	10.00	BK	WH	R2	ROAD CLOSED	
R11-3a	60X30	12.50	BK	WH	R2	ROAD CLOSED XX MILES AHEAD LOCAL TRAFFIC ONLY	
R11-4	60X30	12.50	BK	WH	R2	ROAD CLOSED TO THRU TRAFFIC	
CONST-3A	60X48	20.00	BK	WH/FL. OR	R2	FINE SIGN	(3)
CONST-3X	56X12	4.67	BK	WH	R2	SPEEDING/PASSING (PLATE)	(3)

SPECIAL SIGNS

CONST-7-72	72X36	18.00	WH/BL	BK/FL.OR	R2	RATE OUR WORK ZONE	
CONST-7-48	48X24	8.00	WH/BL	BK/FL.OR	R2	RATE OUR WORK ZONE	
SPECIAL	48X36	12.00	BK	FL.OR	R4	WORK ZONE NO PHONE ZONE	

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

(2) REFER TO THE LATEST EDITION OF MUTCD PART VI BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA FOR SIGN DEPICTION. ARROW, BORDERS AND SPACING SHALL CONFORM TO THE GUIDELINES SET FORTH IN THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" BY THE U.S. DEPARTMENT OF TRANSPORTATION - FHWA.

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

(4) USE OF A SUPPLEMENTAL PLATE FOR LINE 1 IS ACCEPTABLE.

(5) PLAQUE AND APPLICABLE REGULATORY SIGN MAY BE MANUFACTURED AS ONE SIGN.

(6) R2 REFER TO SEC 1042.2.7.2.

(7) R4 REFER TO SEC 1042.2.7.3.

GENERAL NOTES:

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

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

NO ADDITIONAL PAYMENT WILL BE MADE FOR PLATES.

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

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

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

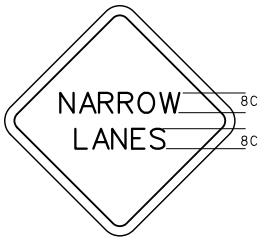
TEMPORARY TRAFFIC CONTROL DEVICES
WARNING, GUIDE AND REGULATORY SIGNS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

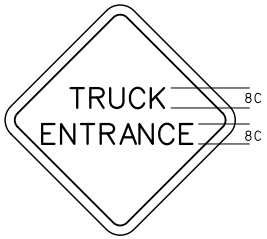
616.10AU

SHEET NO. 7 OF 9

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

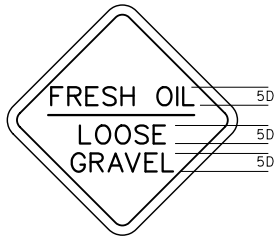


W05-5 (3)



W08-6c (3)

W012-2x (3)



SPECIAL (3)

(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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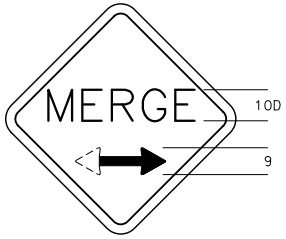
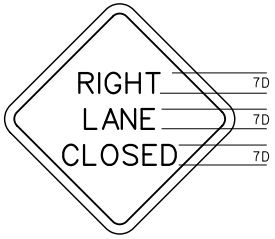
(4) USE OF A SUPPLEMENTAL PLATE FOR LINE 1 IS ACCEPTABLE.

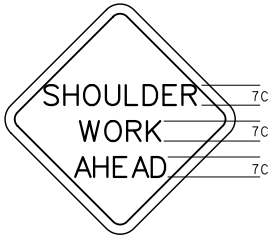
(5) PLAQUE AND APPLICABLE REGULATORY SIGN MAY BE MANUFACTURED AS ONE SIGN.



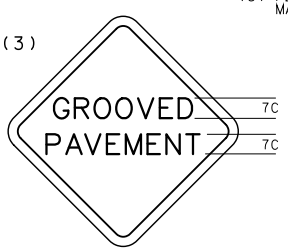
W04-1a

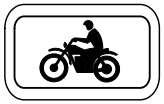


W020-6a (3)(4)

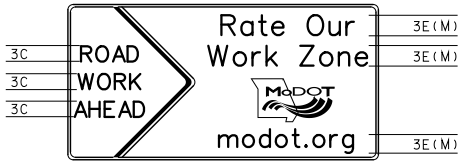


W021-5 (3)

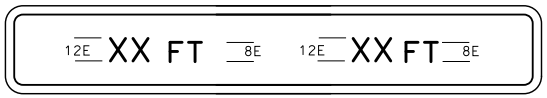




W8-15(3)
W08-15p

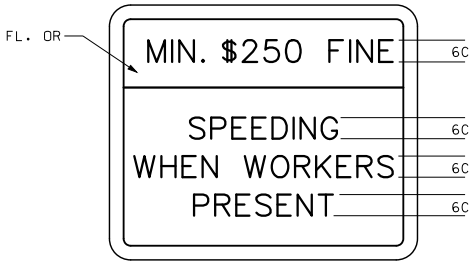


CONST-7-72
CONST-7-48

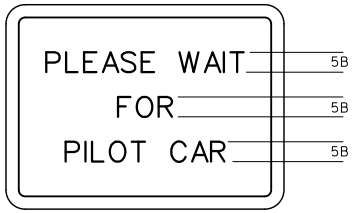


W012-2a (3)

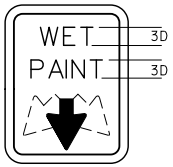
CONST-3X (3)



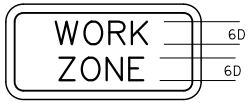
CONST-3A (3)



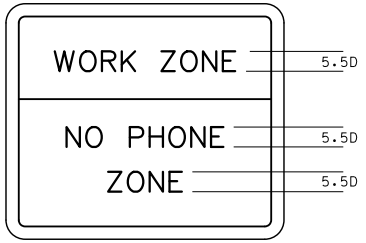
SPECIAL (3)



W022-6e (3)



G020-5aP (3)



SPECIAL

SPECIAL (3)

SPECIAL (3)

GENERAL NOTES:

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

TEMPORARY TRAFFIC CONTROL DEVICES

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

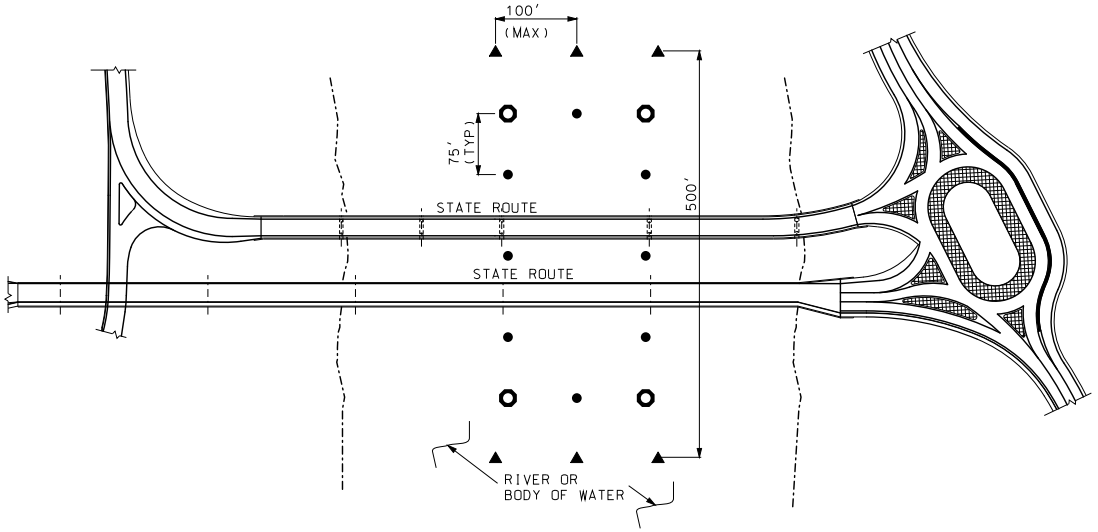
616.10AU

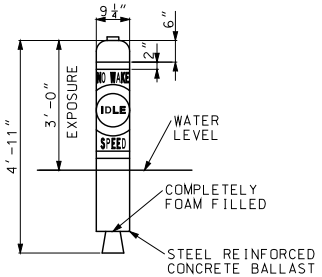
SHEET NO.
8 OF 9

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

LEGEND

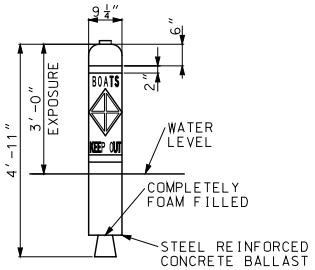
- ○ – BOATS KEEP OUT (SIGN)
- ● – BOATS KEEP OUT (BUOY)
- ▲ – NO WAKE (BUOY)





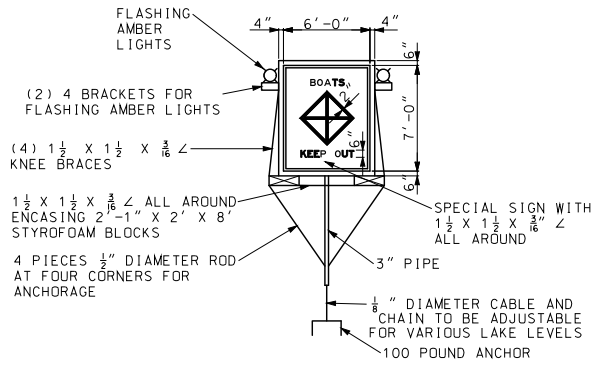
51 POUND ANCHOR
TACKLE PERMITTED

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

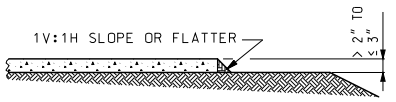
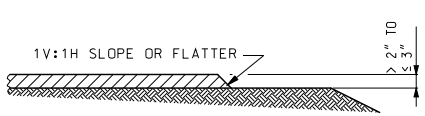
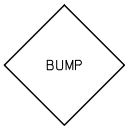
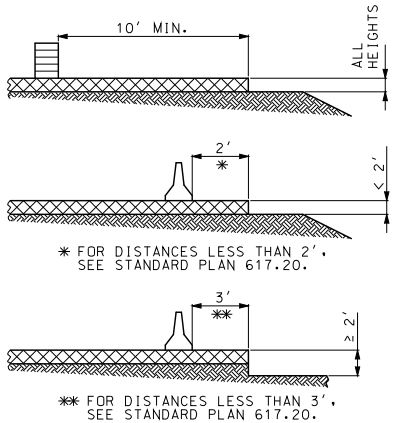
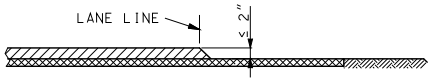
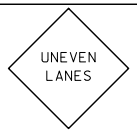
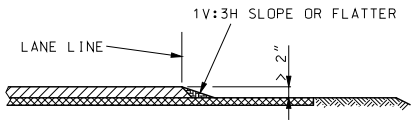
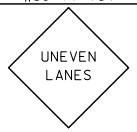
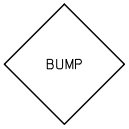
COLOR:
BACKGROUND – WHITE
LEGEND – BLACK
2" REFLECTIVE BAND AND SYMBOL – INTERNATIONAL ORANGE

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

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

TEMPORARY TRAFFIC CONTROL DEVICES
TRAFFIC CONTROL FOR WATERWAYS

DATE EFFECTIVE: 04/01/2017	616.10AU	SHEET NO. 9 OF 9
DATE PREPARED: 1/30/2017		

	CROSS SECTION	CONDITION		TREATMENT	SIGN	
		DIFFERENTIAL	TIME		MAINLINE (1)	SIDE ROAD (2)
EDGE DROP-OFF		PAVEMENT EDGE DIFFERENTIAL > 2" TO ≤ 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:1H OR FLATTER	 WO8-17 (3)(4) WO8-17p (6)	NO SIGNS REQUIRED
			WORKING HOURS	NO EDGE TREATMENT REQUIRED		
		PAVEMENT EDGE DIFFERENTIAL > 2" TO ≤ 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:1H OR FLATTER	 WO8-17 (3)(4) WO8-17p (6)	NO SIGNS REQUIRED
			WORKING HOURS	NO EDGE TREATMENT REQUIRED		
		PAVEMENT EDGE DIFFERENTIAL > 3"	NON-WORKING HOURS	WEDGE SLOPE TO 1V:3H OR FLATTER	 WO8-17 (3)(4) WO8-17p (6)	 WO8-1 (3)
			WORKING HOURS	DELINEATE DIFFERENTIAL WITH CHANNELIZERS		
	 ✳ FOR DISTANCES LESS THAN 2', SEE STANDARD PLAN 617.20. ✳✳ FOR DISTANCES LESS THAN 3', SEE STANDARD PLAN 617.20.	ANY PAVEMENT EDGE OR LANE LINE DIFFERENTIAL	NON-WORKING AND WORKING HOURS WHERE PLANS REQUIRE ADJACENT LANE CLOSURE WITH CHANNELIZATION OR PARTIAL LANE CLOSURE WITH BARRIER.	NO EDGE TREATMENT REQUIRED	NO SIGNS REQUIRED	NO SIGNS REQUIRED
LANE DIFFERENTIAL		LANE LINE DIFFERENTIAL ≤ 2"	NON-WORKING AND WORKING HOURS	NO EDGE TREATMENT REQUIRED	 WO8-11 (5)	NO SIGNS REQUIRED
		LANE LINE DIFFERENTIAL > 2"	NON-WORKING AND WORKING HOURS WHERE LANES OPEN TO TRAFFIC	WEDGE SLOPE TO 1V:3H OR FLATTER	 WO8-11 (5)	 WO8-1
			NON-WORKING AND WORKING HOURS WHERE LANE CLOSED TO TRAFFIC	DELINEATE DIFFERENTIAL WITH CHANNELIZERS		

(1) SIGNS SHALL BE SPACED AT APPROXIMATELY ONE MILE INTERVALS AND LOCATED WITHIN 150 FT. BEYOND ANY STATE ROADS. WHEN A SIGN PLACED AT THE ONE MILE INTERVAL FALLS WITHIN 1/2 MILE OF A SIGN PLACED AFTER AN INTERSECTION, THE SIGN PLACED AT THE 1/2 MILE INTERVAL MAY BE OMITTED. WHEN SHOULDER DROP-OFF SIGNS WITH UNEVEN LANES ARE BOTH SPECIFIED, ALTERNATING SIGN MESSAGES SHALL BE USED AT 1 MILE SPACINGS.

(2) ON SIDE ROADS WITH POSTED SPEED OF 45 MPH OR GREATER, SIGNS SHALL BE PLACED 150 FT. IN ADVANCE OF INTERSECTION WITH MAINLINE.

(3) SIGNS SHALL BE LOCATED ON THE SIDE OF THE ROADWAY WHERE THE PAVEMENT EDGE DIFFERENTIAL EXISTS, ON TWO-LANE UNDIVIDED HIGHWAYS, BACK-TO-BACK SIGNS SHALL BE PROVIDED ON THE SIDE OF THE ROADWAY, WHERE THE PAVEMENT EDGE DIFFERENTIAL EXISTS. "BACK TO BACK" SIGNS SHALL BE SEPARATED BY 7-10 FEET.

(4) SIGNS TO REMAIN VISIBLE UNTIL SHOULDER SHAPING IS COMPLETE.

(5) SIGNS SHALL BE LOCATED ON RIGHT SIDE OF NON-DIVIDED HIGHWAYS AND ON BOTH SIDES OF DIVIDED HIGHWAYS WHERE A LANE LINE DIFFERENTIAL EXISTS.

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

LEGEND

- RIGID PAVEMENT
- FLEXIBLE PAVEMENT
- ALL PAVEMENT TYPES

GENERAL NOTES:

SIGNS SHALL BE VISIBLE TO TRAFFIC ONLY WHEN AND WHERE CONDITIONS EXIST.

FOR ADDITIONAL SIGN SPACING AND DETAILS SEE STANDARD PLAN 620.10.

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)

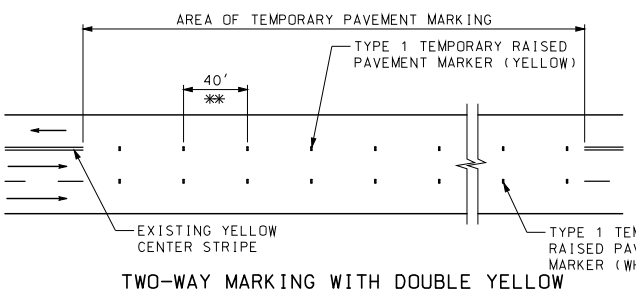
STATE OF MISSOURI — ERIC E. SCHROETER — NUMBER PE-28411 — PROFESSIONAL ENGINEER — THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

PAVEMENT EDGE TREATMENT

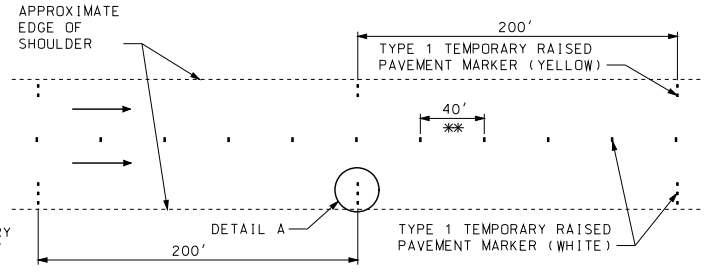
DATE EFFECTIVE: 10/01/2015
DATE PREPARED: 10/28/2016

619.10H

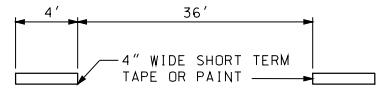
SHEET NO. 1 OF 1



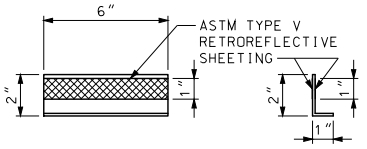
TWO-WAY MARKING WITH DOUBLE YELLOW PROHIBITTED PASSING MARKING SECTION



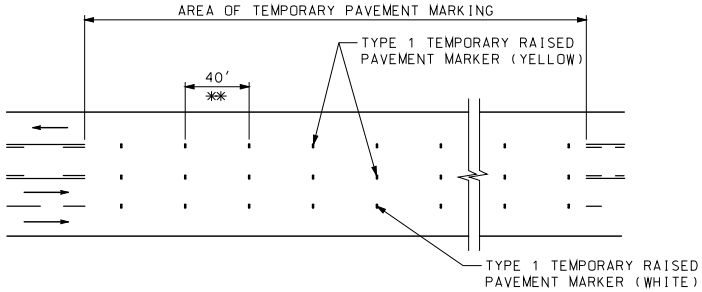
EDGE LINES AND LANE LINES ON MULTILANE DIVIDED SECTIONS



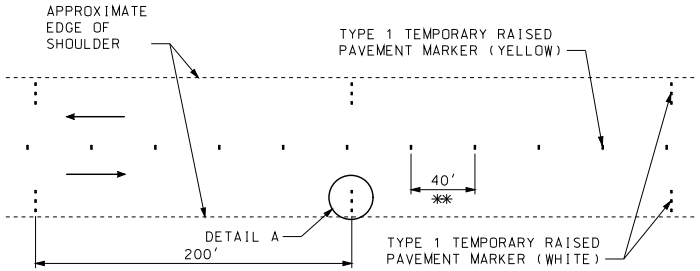
** OPTIONAL TEMPORARY PAVEMENT MARKING DETAIL FOR INTERMEDIATE LIFTS



TYPICAL TYPE 1 TEMPORARY RAISED PAVEMENT MARKER DETAIL



TWO-WAY WITH LEFT-TURN LANE MARKING SECTION



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

GENERAL NOTES:

TEMPORARY PAVEMENT MARKING IS REQUIRED WHEN 200 CONSECUTIVE LINEAR FEET OR MORE OF PERMANENT PAVEMENT MARKING HAS BEEN OBLITERATED, OR AS DIRECTED BY THE ENGINEER.

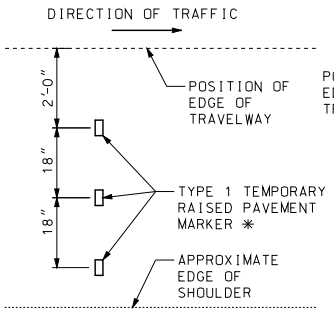
TEMPORARY RAISED PAVEMENT MARKERS (TRPMS), OR THE OPTIONAL 4″X 4′ SHORT TERM TAPE OR PAINT, WHEN ALLOWED, SHALL BE MAINTAINED IN PLACE AND RETROREFLECTIVE UNTIL THE PERMANENT PAVEMENT MARKINGS ARE INSTALLED. MISSING OR NON-REFLECTIVE MARKINGS SHALL BE REPLACED AT NO ADDITIONAL COST TO THE COMMISSION WHEN 10% OR MORE ARE DEFICIENT WITHIN ONE MILE OR WHEN 4 OR MORE CONSECUTIVE MARKINGS ARE DEFICIENT.

FOR INTERMEDIATE LIFTS, 4″X 4′ SHORT TERM TAPE OR TEMPORARY PAINT MAY BE USED IN LIEU OF TRPMS.

TRPMS USED ON INTERMEDIATE LIFTS SHALL BE REMOVED PRIOR TO PLACEMENT OF THE NEXT LIFT.

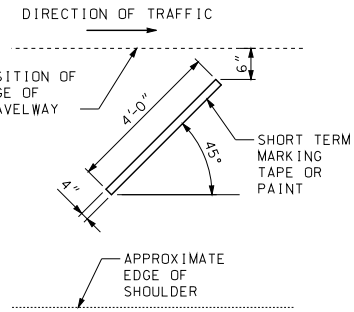
ALL TEMPORARY MARKINGS SHALL BE REMOVED BY THE CONTRACTOR AFTER INSTALLATION OF PERMANENT MARKINGS, EXCEPT WHEN PERMANENT MARKINGS ARE TO BE INSTALLED BY OTHERS.

TEMPORARY TAPE SHALL NOT BE USED FOR TEMPORARY MARKING ON THE FINAL SURFACE EXCEPT WHEN SPECIFIED IN THE PLANS.

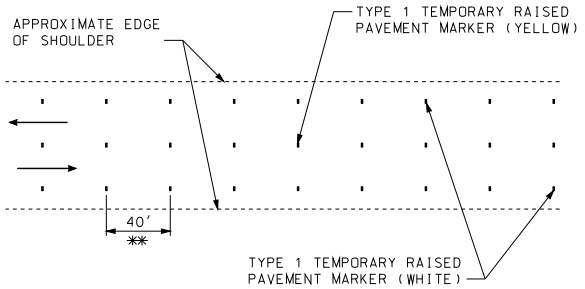


DETAIL A

* 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.



OPTIONAL DETAIL A FOR INTERMEDIATE LIFT



EDGE LINES AND CENTERLINE ON TWO-WAY SECTIONS WITH PAVED SHOULDERS 4 FEET WIDE OR LESS, AGGREGATE OR EARTH SHOULDERS OR NO SHOULDERS

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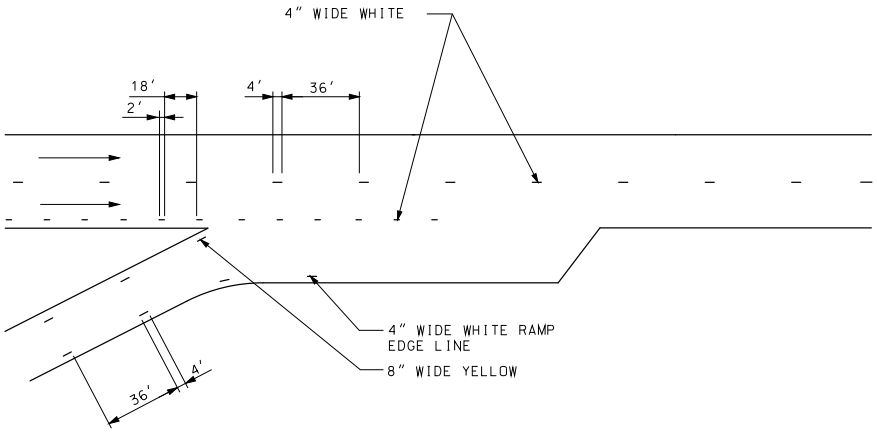
TEMPORARY PAVEMENT MARKING

TEMPORARY PAVEMENT MARKING

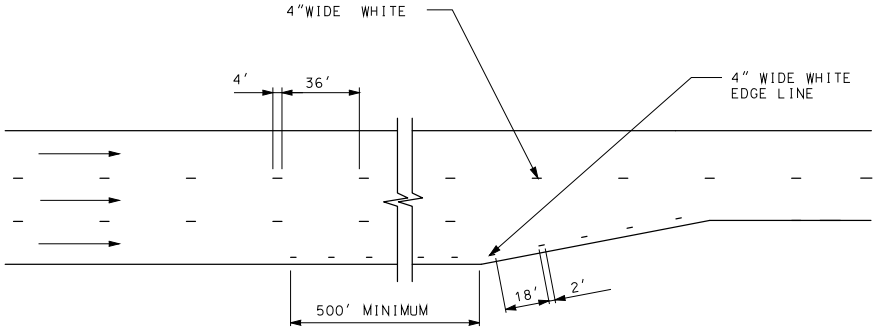
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 2/1/2017

620.10F

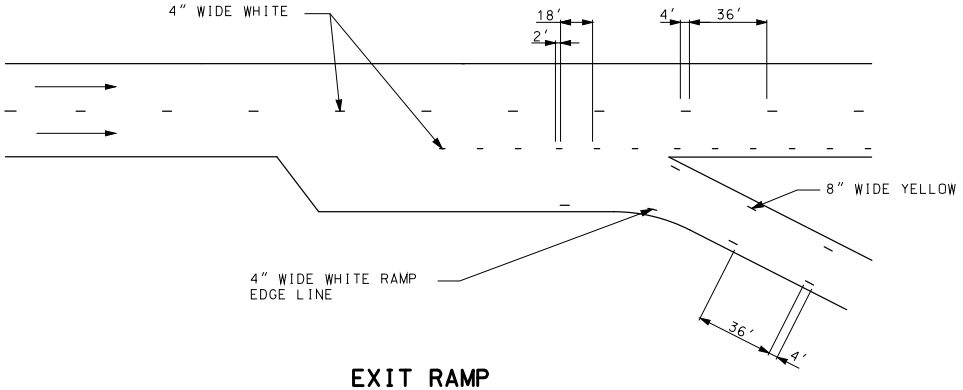
SHEET NO. 1 OF 5



ENTRANCE RAMP



LANE TRANSITION



EXIT RAMP

GENERAL NOTES:

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

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

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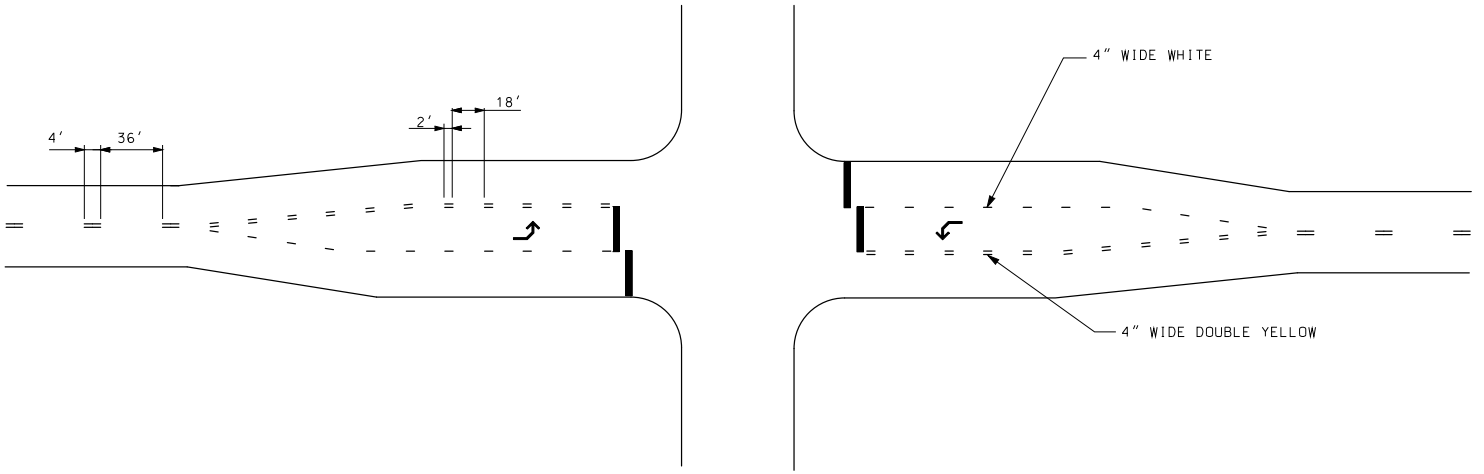
STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TEMPORARY PAVEMENT MARKING

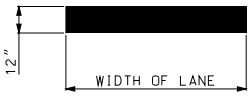
LANE TRANSITION AND RAMP AREAS

DATE EFFECTIVE:	04/01/2017	620.10F	SHEET NO. 2 OF 5
DATE PREPARED:	1/30/2017		

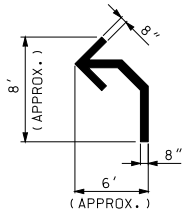
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



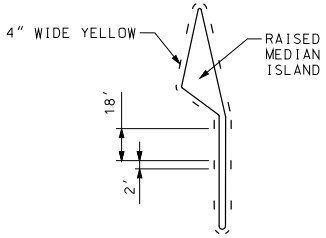
PLAN VIEW



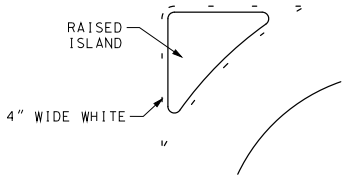
TEMPORARY STOP BAR DETAIL (WHITE)



TEMPORARY ARROW DETAIL (WHITE)



RAISED DIVISIONAL ISLAND



RAISED CHANNELIZING ISLAND

GENERAL NOTES:

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

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

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

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

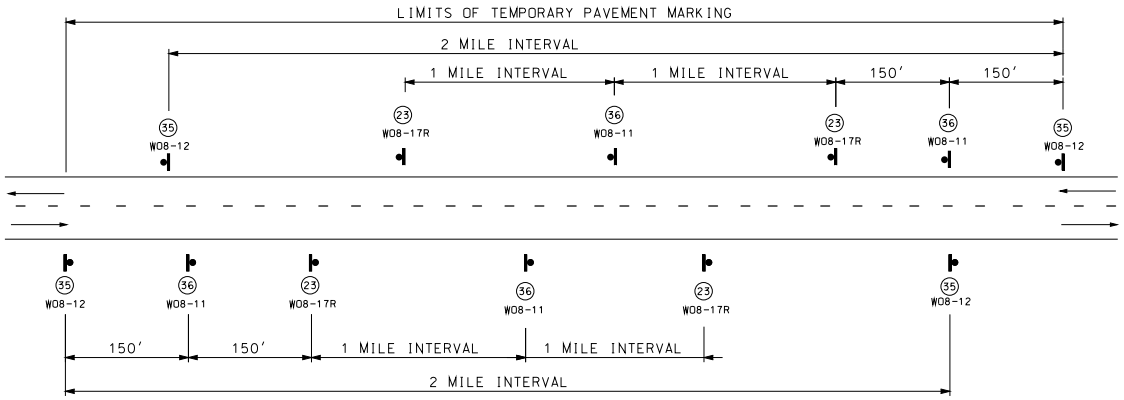
TEMPORARY PAVEMENT MARKING

INTERSECTIONS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

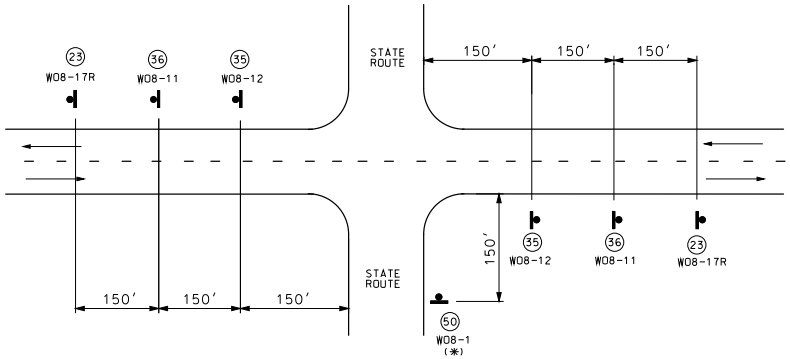
620.10F

SHEET NO. 3 OF 5



SIGN SPACING FOR MAINLINE

(DETAIL SHOWN IS BASED ON A PROJECT MEETING ALL CONDITIONS: NO CENTER STRIPE, UNEVEN LANES, SHOULDER DROP-OFF AND BUMP.)
WHEN BOTH UNEVEN LANES AND SHOULDER DROP-OFF SIGNS ARE USED, BOTH SIGHS SHALL STAY IN PLACE UNTIL BOTH CONDITIONS NO LONGER EXIST.
IF ONLY ONE CONDITION EXISTS (UNEVEN LANES OR SHOULDER DROP-OFF), THE SIGN SPACING SHALL BE AT 1 MILE INTERVALS.



SIGN SPACING AT STATE ROUTE INTERSECTIONS

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

W08-17R
W08-17P
23

W08-1
50
(*)

W08-11
36

W08-12
35

GENERAL NOTES:

FOR DETAILS OF TEMPORARY PAVEMENT MARKING SEE STANDARD PLAN 620.10.

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

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

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

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

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

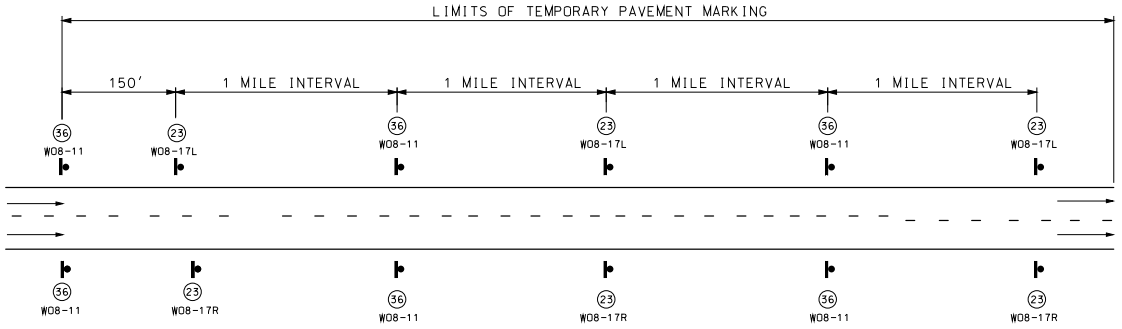
STATE OF MISSOURI
ERIC E. SCHROETER
NUMBER PE-28411
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

TEMPORARY PAVEMENT MARKING

TWO-LANE TWO-WAY HIGHWAY

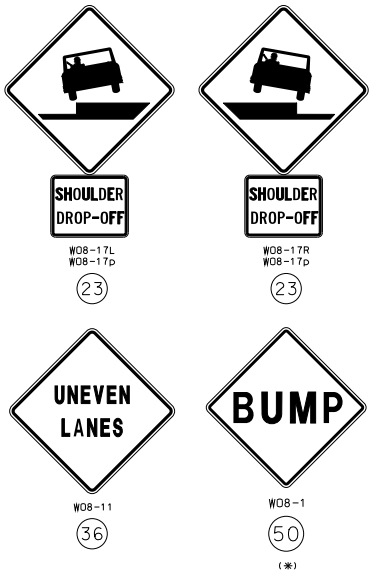
DATE EFFECTIVE:	04/01/2017	620.10F	SHEET NO.
DATE PREPARED:	1/30/2017		4 OF 5

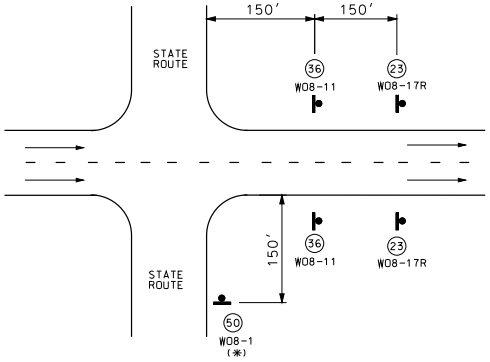
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



SIGN SPACING FOR DIVIDED OR MULTI-LANE HIGHWAY

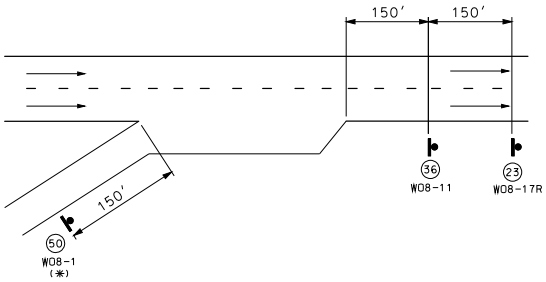
(DETAIL SHOWN IS BASED ON A PROJECT MEETING CONDITIONS OF UNEVEN LANES AND SHOULDER DROP-OFF.)
WHEN BOTH UNEVEN LANES AND SHOULDER DROP-OFF SIGNS ARE USED, BOTH SIGNS SHALL STAY IN PLACE UNTIL BOTH CONDITIONS NO LONGER EXISTS.
WHEN ONLY ONE CONDITION EXISTS (UNEVEN LANES OR SHOULDER DROP-OFF), SIGN SPACING SHALL BE AT 1 MILE INTERVALS





SIGN SPACING AT STATE ROUTE INTERSECTIONS

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



SIGN SPACING AT RAMPS

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

GENERAL NOTES:

FOR DETAILS OF TEMPORARY PAVEMENT MARKING, SEE SHEET 1 OF 5.

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

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

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

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

TEMPORARY PAVEMENT MARKING
DIVIDED AND MULTI-LANE HIGHWAYS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

620.10F

SHEET NO. 5 OF 5

STRUCTURAL SIGN DATA

DESIGNATION	COLOR SCHEME		SHEETING	
	LEGEND	BACKGROUND	LEGEND	BACKGROUND
STRUCTURAL (ST)	BLACK	WHITE	OPAQUE BLACK FILM	ASTM TYPE 4
	WHITE	RED	ASTM TYPE 9 OR 11	ASTM TYPE 4
	WHITE	GREEN	ASTM TYPE 9 OR 11	ASTM TYPE 4
	WHITE	BLUE	ASTM TYPE 9 OR 11	ASTM TYPE 4
	WHITE	BROWN	ASTM TYPE 9 OR 11	ASTM TYPE 4
STRUCTURAL FLUORESCENT (STF)	BLACK	FL YELLOW	OPAQUE BLACK FILM	ASTM TYPE 9 OR 11
	BLACK	FL YELLOW GREEN	OPAQUE BLACK FILM	ASTM TYPE 9 OR 11
	BLACK	FL ORANGE	OPAQUE BLACK FILM	ASTM TYPE 9 OR 11

NOTE: WHITE LEGEND IS DIRECT APPLIED UNLESS SPECIFIED OTHERWISE.

FLAT SHEET SIGN DATA

DESIGNATION	COLOR SCHEME		SHEETING
	LEGEND	BACKGROUND	
FLAT SHEET (SH)	BLACK **	WHITE	ASTM TYPE 4 WHITE
	WHITE	BLACK **	ASTM TYPE 4 WHITE
	RED	WHITE	ASTM TYPE 4 WHITE
	WHITE	RED	ASTM TYPE 4 WHITE
	WHITE	GREEN	ASTM TYPE 4 WHITE
	GREEN	WHITE	ASTM TYPE 4 WHITE
	WHITE	BLUE	ASTM TYPE 4 WHITE
	WHITE	BROWN	ASTM TYPE 4 WHITE
FLAT SHEET FLUORESCENT (SHF)	BLACK **	FL YELLOW	ASTM TYPE 9 OR 11 FL YELLOW
	BLACK **	FL YELLOW GREEN	ASTM TYPE 9 OR 11 FL YELLOW GREEN
	BLACK **	FL ORANGE	ASTM TYPE 9 OR 11 FL ORANGE

** OPAQUE INK OR FILM

NOTE: LEGEND AND BACKGROUND COLORS ARE ACHIEVED THROUGH TRANSLUCENT INKS AND FILMS.

FLAT SHEET THICKNESS	
SIGN SIZE	THICKNESS
9 SF OR LESS	0.080 IN.
OVER 9 SF TO 16 SF	0.100 IN.
16 SF OR LARGER	0.125 IN.

GENERAL NOTES:

GROUND MOUNTED SIGNS GREATER THAN 5 FEET WIDE OR SIGNS GREATER THAN 30 SQUARE FEET SHALL BE STRUCTURAL.

ALL NON STANDARD SIGNS NOT FOUND IN THE MUTCD SHS MANUAL SHALL BE DETAILED BY THE TRAFFIC AND HIGHWAY SAFETY DIVISION OFFICE.

REFER TO STANDARD SPECIFICATION SEC 1042 FOR SHEETING, SUBSTRATE AND FABRICATION DETAILS.

FOR MOUNTING DETAILS, SEE STANDARD PLANS 903.02.

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. RICKERS
NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING
GENERAL SIGN DATA

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

903.02AN

SHEET NO. 1 OF 8

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

MODOT ID LABEL DETAILS

PLACED ON THE SIGN FACE

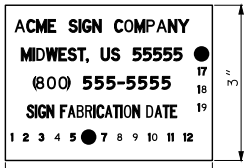
(1) USED ON SIGNS 9 SF AND LARGER

(1) USED ON SIGNS LESS THAN 9 SF

VENDOR ID LABEL DETAILS

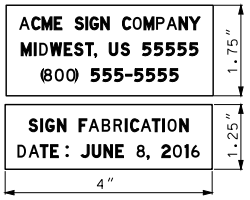
PLACED ON THE BACK OF THE SIGN

OPTIONAL

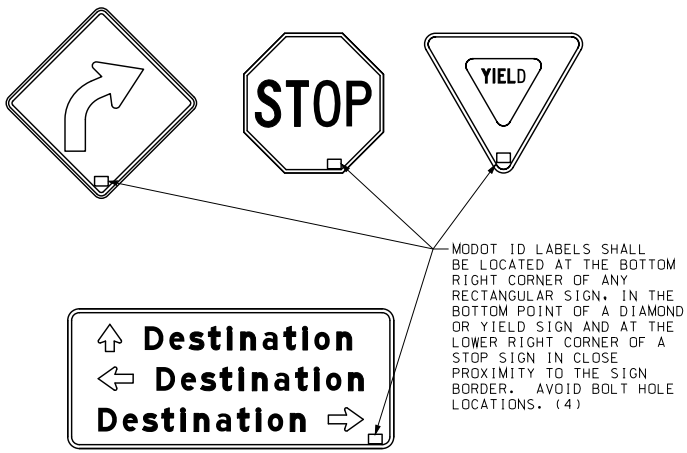


(2)

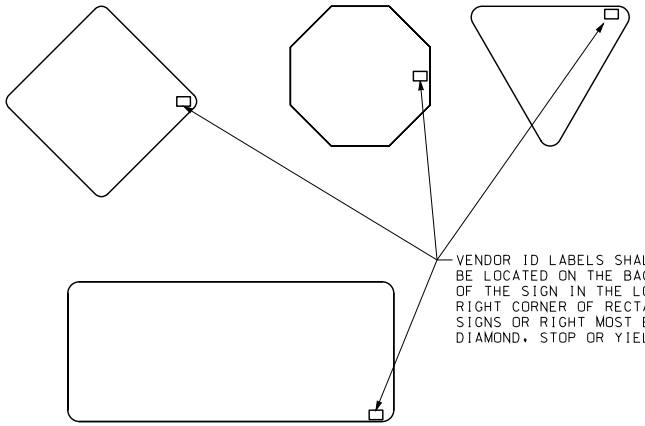
OPTIONAL



(3)



MODOT ID LABELS SHALL BE LOCATED AT THE BOTTOM RIGHT CORNER OF ANY RECTANGULAR SIGN. IN THE BOTTOM POINT OF A DIAMOND OR YIELD SIGN AND AT THE LOWER RIGHT CORNER OF A STOP SIGN IN CLOSE PROXIMITY TO THE SIGN BORDER. AVOID BOLT HOLE LOCATIONS. (4)



VENDOR ID LABELS SHALL BE LOCATED ON THE BACK OF THE SIGN IN THE LOWER RIGHT CORNER OF RECTANGULAR SIGNS OR RIGHT MOST EDGE OF DIAMOND, STOP OR YIELD SIGNS.

(1) MODOT ID LABEL DETAILS AVAILABLE FROM TRAFFIC AND HIGHWAY SAFETY DIVISION.

(2) TO FACILITATE MASS PRODUCTION OF LABELS, THE FABRICATION DATE MAY BE INDICATED BY DISPLAYING NUMBERS FOR MONTHS ALONG THE BOTTOM OF THE LABEL AND NUMBERS FOR YEARS ALONG THE RIGHT SIDE OF THE LABEL. THE FABRICATION DATE WOULD BE INDICATED BY HOLE PUNCHING THE APPROPRIATE NUMBERS (OR SOME EQUIVALENT PERMANENT METHOD TO BLOCK OUT OF THE NUMBERS) FOR THE MONTH AND YEAR BEFORE THE LABEL IS APPLIED TO THE SIGN.

(3) INDIVIDUAL DECALS MAY BE USED TO DISPLAY THE VENDOR INFORMATION AND THE FABRICATION DATE. DECALS SHALL BE INSTALLED IN CLOSE VERTICAL PROXIMITY.

(4) THE MODOT ID LABEL MAY BE PLACED ON THE BACK OF THE SIGN ABOVE THE VENDOR ID LABEL IF THERE IS INSUFFICIENT SPACE AVAILABLE TO DISPLAY THE ID LABEL ON THE SIGN FACE WITHOUT INTERFERING WITH THE SIGN LEGEND OR BOARDER.

GENERAL NOTES:

ALL DECALS SHALL BE SILK SCREEN PRINTED WITH MATCHED COMPONENT INK AND SHEETING MATERIALS TO PROVIDE A LABEL THAT HAS AN EQUAL LIFE EXPECTANCY AS THE SIGN FACE.

MODOT ID LABELS SHALL BE PRINTED ON CLEAR ELECTROCUT FILM BACKGROUND WITH BLACK INK OR IT MAY BE INCORPORATED INTO THE SILK SCREEN DETAIL AND PRINTED ALONG WITH THE SIGN FACE. IF THE LABEL IS APPLIED IN THIS MANNER THE LEGEND OF THE LABEL SHALL MATCH THE COLOR OF THE SIGN LEGEND IT IS BEING APPLIED TO. THE LABEL SHALL NOT HAVE ANY BACKGROUND COLOR OR BORDER.

VENDOR ID LABEL SHALL CONTAIN THE COMPANY CONTACT INFORMATION (INCLUDING FULL NAME, CITY, STATE, PHONE NUMBER) AND THE SIGN FABRICATION DATE.

VENDOR ID LABEL SHALL BE PRINTED ON A WHITE BACKGROUND WITH BLACK INK AND THE LEGEND SHALL BE A MINIMUM OF 1/4".

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. ROGERS
NUMBER PE-28338
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

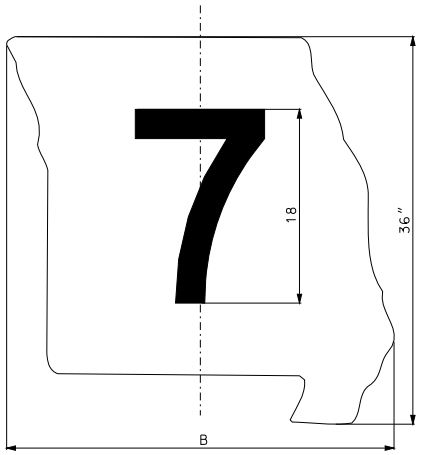
HIGHWAY SIGNING

GENERAL SIGN DATA

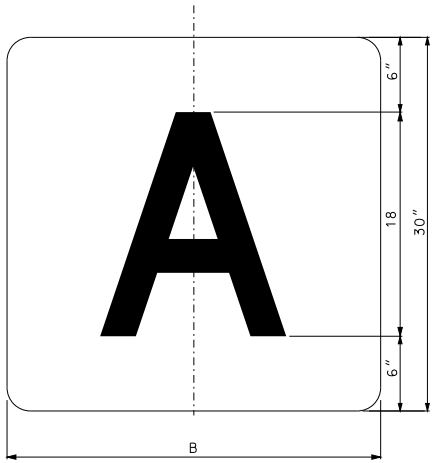
DATE EFFECTIVE: 01/01/2017	903.02AN	SHEET NO.
DATE PREPARED: 10/28/2016		2 OF 8

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

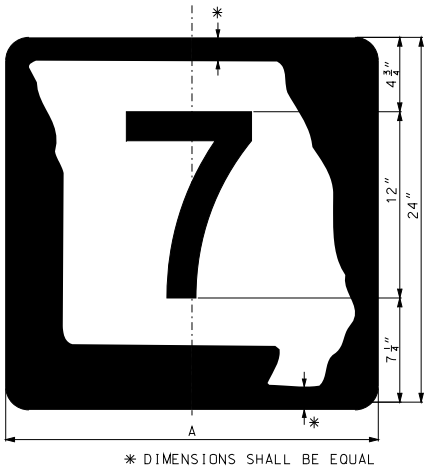
STATE NUMBER ROUTE SHIELD GUIDE SIGN USE



STATE LETTER ROUTE SHIELD GUIDE SIGN USE

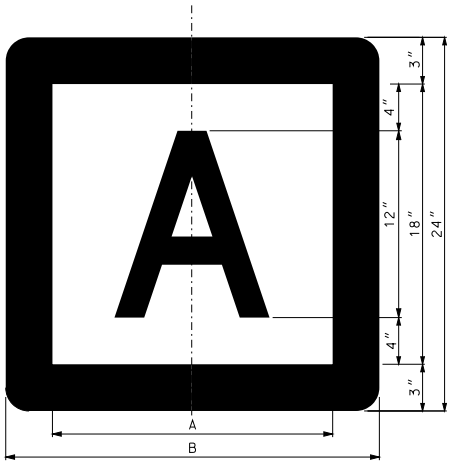


STATE NUMBER ROUTE SHIELD INDEPENDENT USE



✳ DIMENSIONS SHALL BE EQUAL

STATE LETTER ROUTE SHIELD INDEPENDENT USE



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

LOCATION	NO. OF LETTERS	DIMENSIONS (INCHES)		LEGEND FONTS
		A	B	
INDEPENDENT USE	1	18	24	D
INDEPENDENT USE	2	24	30	D
GUIDE SIGN USE	1	–	30	D
GUIDE SIGN USE	2	–	36	D

STATE LETTER ROUTE SHIELD

LOCATION	ROUTE NUMBER	DIMENSIONS (INCHES)		LEGEND FONTS
		A	B	
INDEPENDENT USE	1 & 2 DIGITS	24	24	D,C
INDEPENDENT USE	3 DIGITS	30	30	D,C,B
GUIDE SIGN USE	1 & 2 DIGITS	–	36	D,C
GUIDE SIGN USE	3 DIGITS	–	45	D,C,B

STATE NUMBER ROUTE SHIELD

GENERAL NOTES:

REFER TO STANDARD SPECIFICATION SEC 1042 FOR SHEETING AND SUBSTRATE DETAILS.

FOR HOLE PUNCHING AND MOUNTING DETAILS SEE OTHER DRAWINGS.

FOR GENERAL SIGN DATA DETAILS SEE OTHER DRAWINGS.

THE MISSOURI SHAPE DETAIL MAY BE OBTAINED FROM THE TRAFFIC AND HIGHWAY SAFETY DIVISION OFFICE.

GUIDE SIGN USE SHALL BE DIRECT APPLIED. POST MOUNTED USE SHALL BE APPLIED TO ALUMINUM SUBSTRATE.

FOR NUMBERED ROUTES WITH MORE THAN 1 DIGIT THE LEGEND FONT MAY NEED TO BE REDUCED TO C OR B FONT.

SEE MUTCD SHS FOR DETAILS FOR US AND INTERSTATE ROUTE SHIELDS.

NON-STANDARD SHIELD SIZES MAY BE OBTAINED FROM THE TRAFFIC AND HIGHWAY SAFETY DIVISION OFFICE.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
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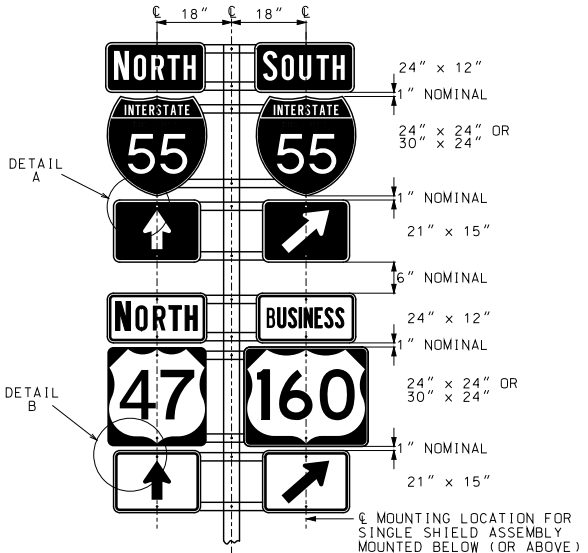
STATE OF MISSOURI
EILEEN H. ROGERS
NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING
STANDARD SHIELDS FOR INDEPENDENT AND GUIDE SIGN USE

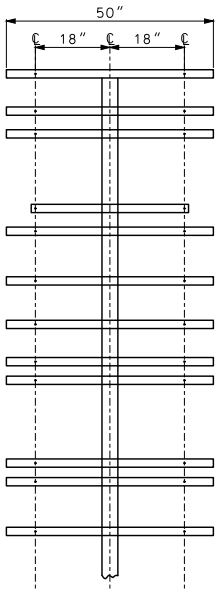
DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

903.02AN

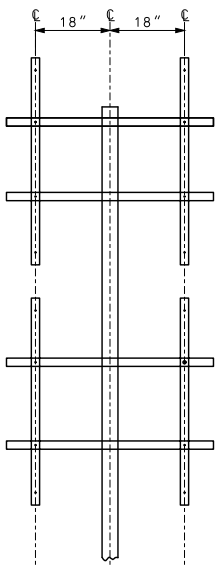


ONE POST ASSEMBLY

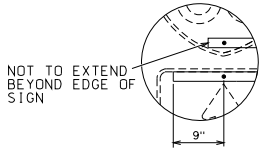
USE TO SUPPORT UP TO 4 ROUTE MARKERS



STANDARD BACKING BAR LAYOUT

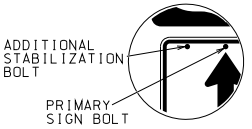


OPTIONAL BACKING BAR LAYOUT



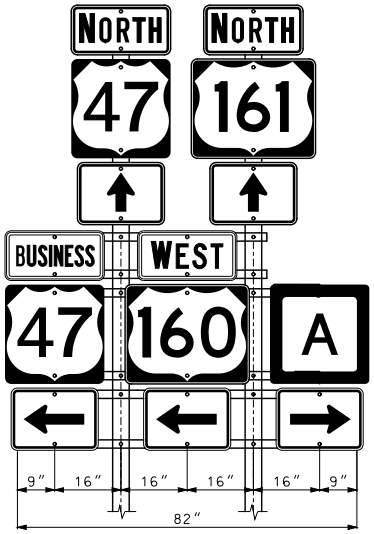
DETAIL A

SEE GENERAL NOTES



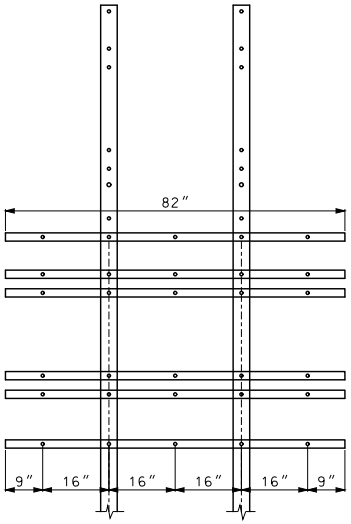
DETAIL B

SEE GENERAL NOTES



TWO POST ASSEMBLY

USE TO SUPPORT 5 OR 6 ROUTE MARKERS



STANDARD BACKING BAR LAYOUT

TWO POST ASSEMBLY NOTE:

OPTIONAL BACKING BAR LAYOUT MAY BE USED WITH TWO POST ASSEMBLY.

FOR 6 ROUTE SHIELD ASSEMBLY ADDITIONAL BACKING BARS ARE REQUIRED.

POST SELECTION

SINGLE POST ASSEMBLIES SHALL USE A 4" PIPE POST OR A 2½" PSST POST.

TWO POST ASSEMBLIES SHALL USE TWO 4" PIPE POSTS OR TWO 2½" PSST POST WITH 2½" PSST INSERTS AND BREAKAWAYS. (SEE STANDARD PLAN 903.03)

GENERAL NOTES:

ALL BACKING BARS SHALL BE 2"x ⅜" STEEL, GALVANIZED AFTER PUNCHING. WEIGHT = 2.55 LBS. PER FOOT. HOLES IN BARS SHALL BE ¾" AND SHALL BE PUNCHED AS SHOWN ON THIS DRAWING.

DETAIL A - FOR SIGNS INSTALLED ON TWO PARALLEL HORIZONTAL BACKING BARS, ONE ADDITIONAL BOLT SHALL BE ADDED TO THE LEFT SIGN TO KEEP ASSEMBLY SQUARE.

DETAIL B - THE END OF THE HORIZONTAL BACKING BARS SHALL EXTEND MAXIMUM OF 9 INCHES PAST THE SIGN BOLT, BUT SHALL NOT EXTEND PAST THE EDGE OF THE SIGN.

WHEN USING OPTIONAL BACKING BAR LAYOUT, VERTICAL BARS SHALL BE MOUNTED BEHIND HORIZONTAL BARS.

BACKING BARS SHALL MEET MISSOURI STANDARD PLANS OR APPROVED PRODUCTS LIST.

BACKING BARS PAID FOR AS STRUCTURAL STEEL, PER POUND.

ALL SIGNS TO BE INSTALLED ALONG VERTICAL CENTERLINES.

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

NOMINAL VERTICAL SPACING INDICATED BETWEEN SIGNS TO BE ACHIEVED BY USING THE CLOSEST AVAILABLE HOLES WHEN USING PSST.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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STATE OF MISSOURI
ELIJAH H. ROGERS
NUMBER PE-28338
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

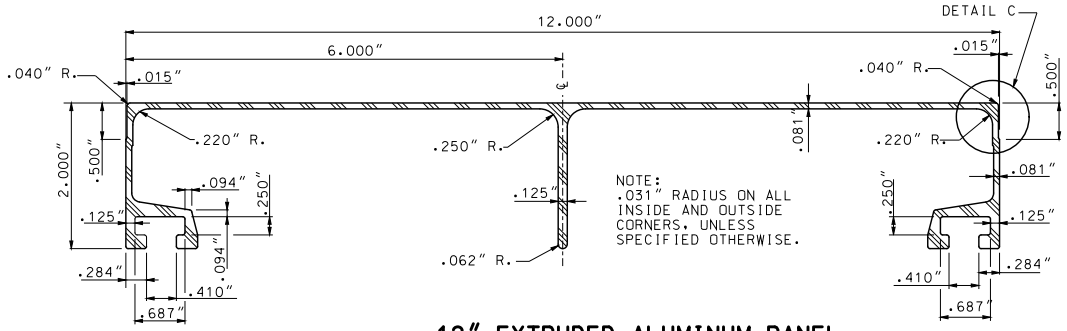
HIGHWAY SIGNING
BACKING BARS
SHEET SIGN MOUNTING
ROUTE SHIELD AND
MARKER ASSEMBLIES

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

903.02AN

SHEET NO. 4 OF 8

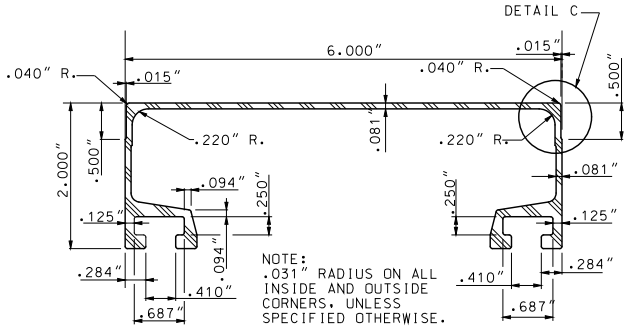
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



12" EXTRUDED ALUMINUM PANEL

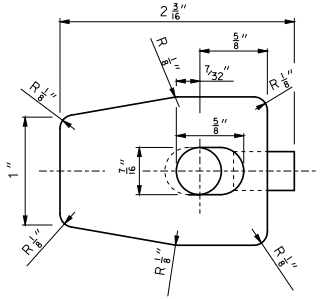
MINIMUM WT. = 2.40 LBS./FT.

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

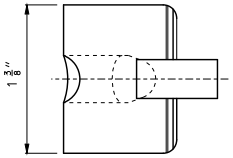


6" EXTRUDED ALUMINUM PANEL

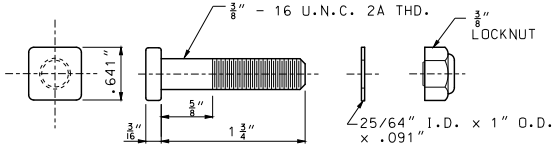
MINIMUM WT. = 2.40 LBS./FT.



PLAN VIEW



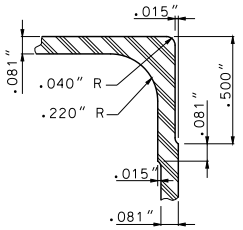
END VIEW



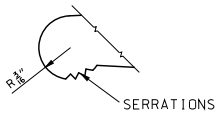
POST CLIP BOLT
WITH FLAT WASHER AND LOCKNUT

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

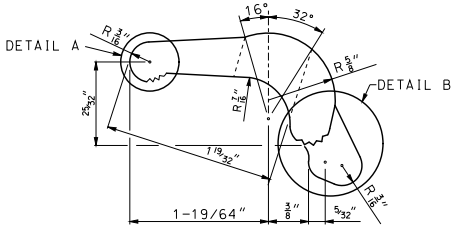
BOLT - 1 3/4 x 3/8 ALUMINUM
HEX LOCKNUT 3/8" ALUMINUM
WASHER - ALUMINUM



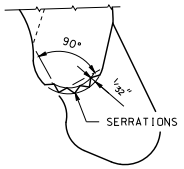
DETAIL C



DETAIL A
ENLARGED VIEW OF SERRATIONS



ELEVATION VIEW



DETAIL B
ENLARGED DETAIL OF SERRATIONS

SAW GATING AS SHOWN
(APPROXIMATELY FLAT PERMISSABLE)

POST CLIP

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

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

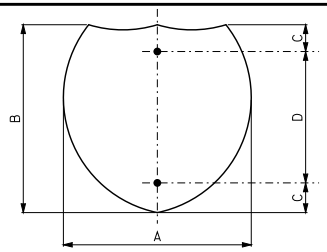
STATE OF MISSOURI
EILEEN H. RICKERS
NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

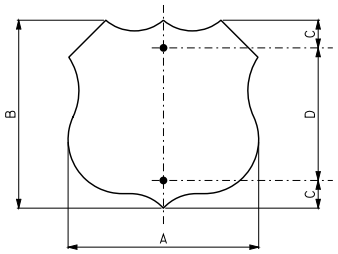
EXTRUDED ALUMINUM PANEL DETAILS

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

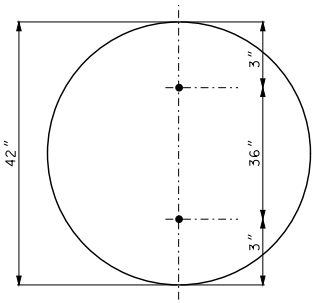
903.02AN

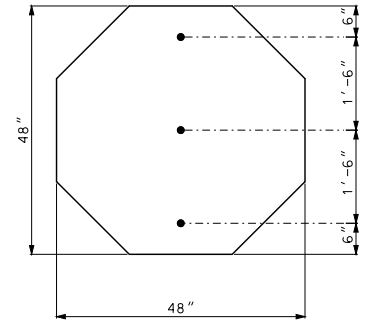


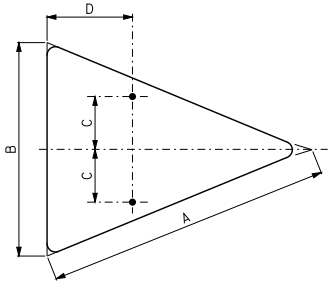
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



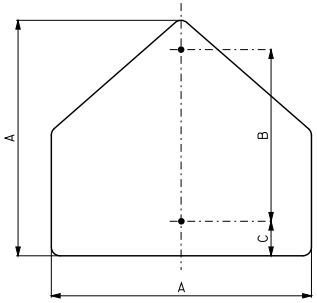
DIMENSIONS (IN.)			
A	B	C	D
24	24	3	18
30	24	3	18
36	36	6	24
45	36	6	24



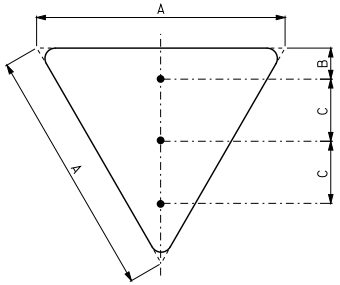




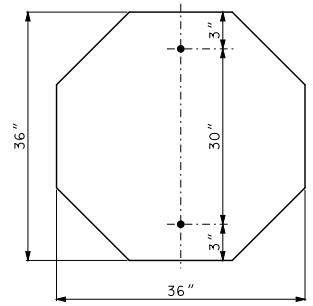
DIMENSIONS (IN.)				
A	B	C	D	RADIUS
40	30	7.5	12	1.875
48	36	9	15	2.25

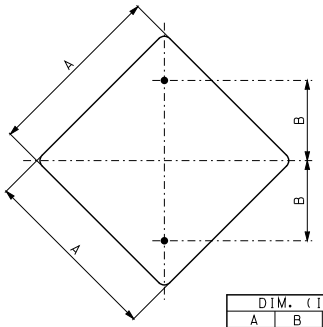


DIMENSIONS (IN.)			
A	B	C	RADIUS
36	24	3	2.25

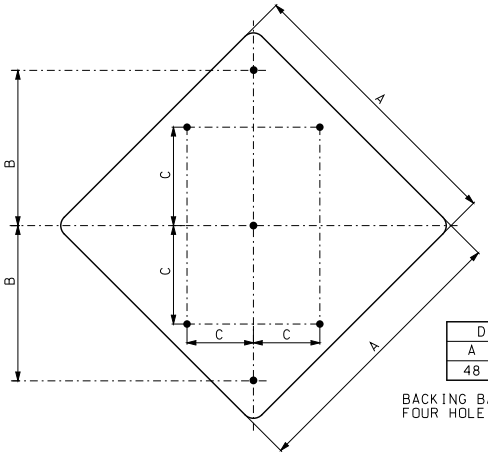


DIMENSIONS (IN.)			
A	B	C	RADIUS
48	6	12	3
60	8	15	4





DIM. (IN.)		
A	B	RADIUS
18	9	1.5
24	12	1.5
30	15	1.875
36	18	2.25



DIMENSIONS (IN.)			
A	B	C	RADIUS
48	24	15	3

BACKING BARS ONLY REQUIRED FOR FOUR HOLE PUNCH INSTALLATION.

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
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
ELIESH H. RICKERS
NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

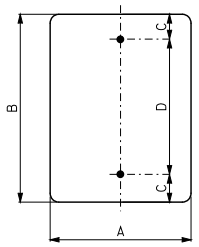
HOLE PUNCHING

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

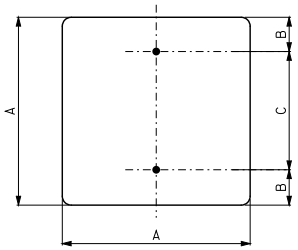
903.02AN

SHEET NO. 6 OF 8

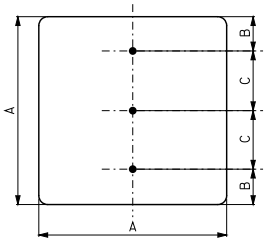
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



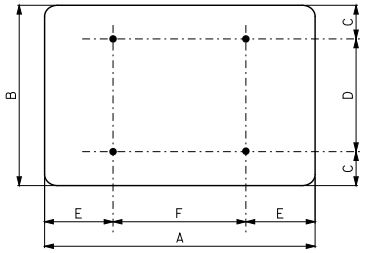
DIMENSIONS (IN.)				
A	B	C	D	RADIUS
4	16	0.75	14.5	SQ
6	12	1.5	9	1
9	12	3.5	5	1.5
9	15	3.75	7.5	1.5
12	18	3	12	1.5
12	24	3	18	1.5
12	36	3	30	1.5
12	48	3	42	1.5
15	21	3	15	1.5
18	24	3	18	1.5
24	30	3	24	1.5
24	36	3	30	1.5
30	36	3	30	1.875
30	42	3	36	1.875
30	48	6	36	1.875



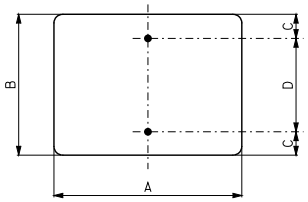
DIMENSIONS (IN.)			
A	B	C	RADIUS
12	1.5	9	1.5
18	3	12	1.5
24	3	18	1.5
30	3	24	1.875
36	6	24	2.25



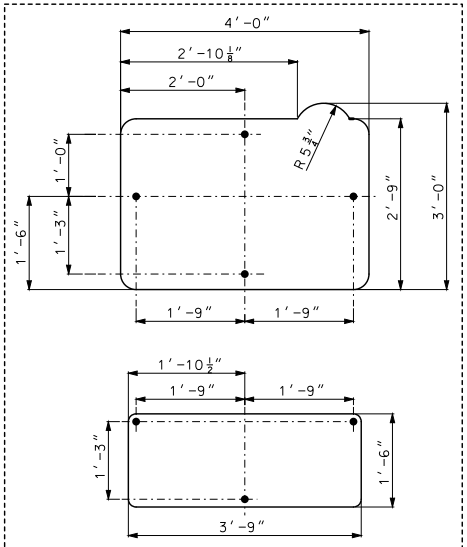
DIMENSIONS (IN.)			
A	B	C	RADIUS
48	6	18	3



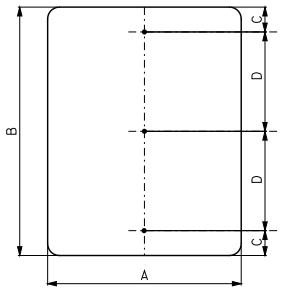
DIMENSIONS (IN.)						
A	B	C	D	E	F	RADIUS
48	12	1.5	9	9	30	1.5
48	18	1.5	15	9	30	1.5
48	24	3	18	9	30	1.5
48	30	3	24	9	30	1.875
48	36	6	24	9	30	2.25
54	18	1.5	15	9	36	1.5
60	12	1.5	9	12	36	1.5
60	18	1.5	15	12	36	1.5
60	24	3	18	12	36	1.5
60	30	3	24	12	36	1.875
60	36	6	24	12	36	2.25
60	48	6	36	12	36	3
72	36	6	24	12	48	2.25
72	48	6	36	12	48	3



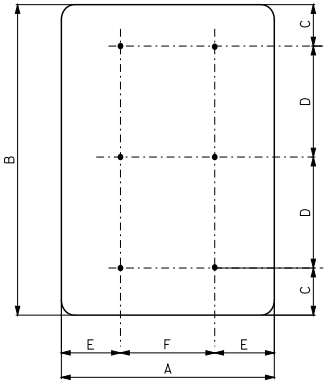
DIMENSIONS (IN.)				
A	B	C	D	RADIUS
4	5	1.5	2	1.5
12	9	1.5	6	1.5
18	9	1.5	6	1.5
18	12	1.5	9	1.5
21	15	1.5	12	1.5
24	8	1.5	5	1.5
24	12	1.5	9	1.5
24	18	3	12	1.5
30	8	1.5	5	1.5
30	12	1.5	9	1.5
30	18	3	12	1.5
30	24	3	18	1.5
36	8	1.5	5	1.5
36	12	1.5	9	1.5
36	18	3	12	1.5
36	24	3	18	1.5
36	30	3	24	1.875
42	8	1.5	5	1.5
42	18	3	12	1.5
42	24	3	18	1.5
42	30	3	24	1.875
42	36	3	30	2.25
48	8	1.5	5	1.5



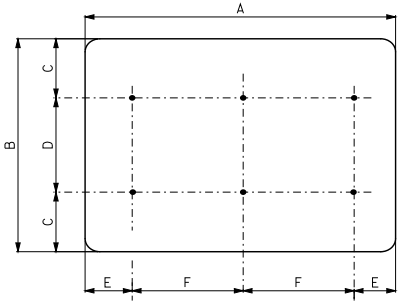
ADOPT A HIGHWAY PRIMARY SIGN AND NAME PANEL



DIMENSIONS (IN.)				
A	B	C	D	RADIUS
4	72	6	30	SQ
12	72	6	30	1.5
18	60	6	24	1.5
24	48	6	18	1.5
36	48	6	18	2.25
36	60	6	24	2.25
36	72	6	30	2.25

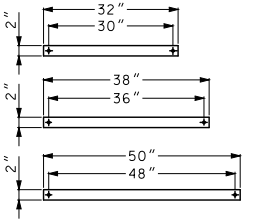


DIMENSIONS (IN.)						
A	B	C	D	E	F	RADIUS
48	60	6	24	9	30	3
48	72	6	30	9	30	3
48	84	6	36	9	30	3
48	96	6	42	9	30	3



DIMENSIONS (IN.)						
A	B	C	D	E	F	RADIUS
84	24	3	18	12	30	3
96	48	6	36	16	32	3

DIMENSIONS (IN.) FOR SIGNS REQUIRING NO HOLE PUNCHING		
A	B	RADIUS
66	18	1.5
72	18	1.5
78	18	1.5
84	18	1.5
90	18	1.5
96	18	1.5
36	78	2.25



BACKING BARS FOR SINGLE POST SIGNS

GENERAL NOTES:

REFER TO GENERAL NOTES ON SHEET 6 OF 8.

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-26336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

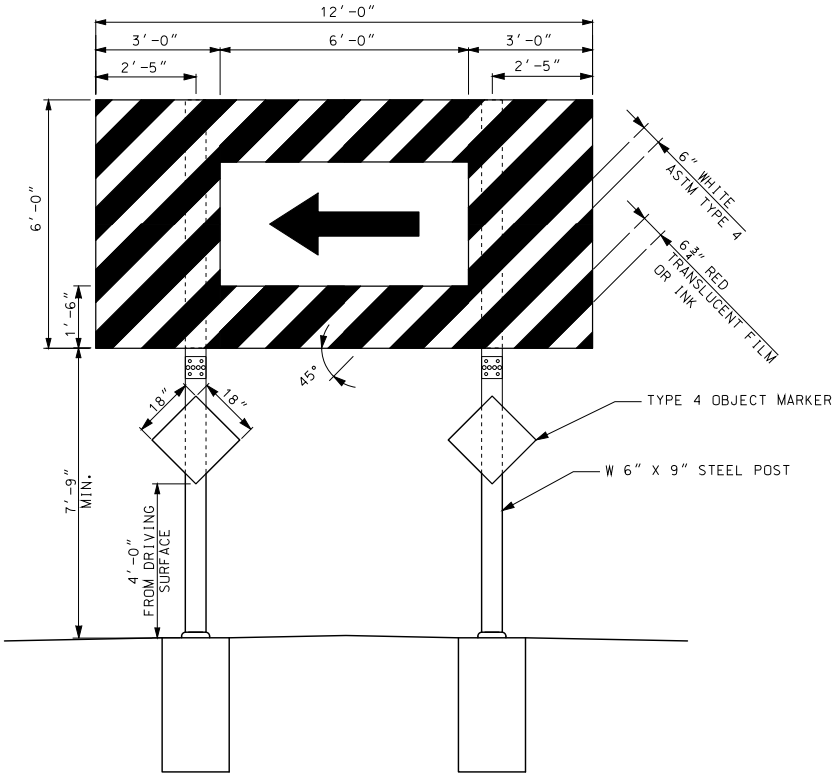
HOLE PUNCHING

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

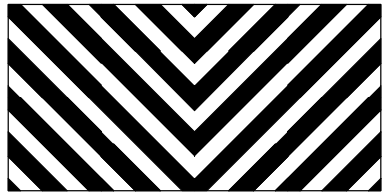
903.02AN

SHEET NO. 7 OF 8

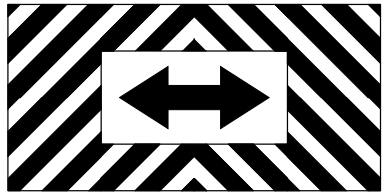
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



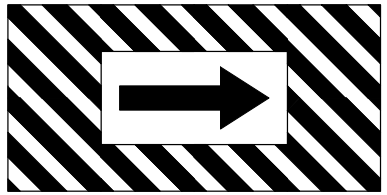
SEE STANDARD PLAN 903.03
FOR MOUNTING HEIGHT ON UNLEVEL GROUND

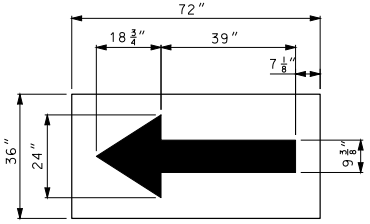


DEAD END

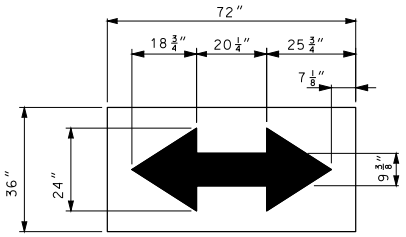


T-INTERSECTION





W1-6



W1-7

GENERAL NOTES:

SEE STANDARD PLAN 903.03 FOR WIDE FLANGE INSTALLATION.

SIGN BARRICADE SHALL BE CONSTRUCTED AS A STRUCTURAL (ST) SIGN.

DIRECTIONAL ARROWS SHALL BE SHF AND CONSIDERED INCIDENTAL TO THE SIGN.

ALL REFLECTORIZED SURFACES SHALL BE RETROREFLECTIVE SHEETING IN ACCORDANCE WITH SEC 1042.

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EILEEN H. ROGERS
NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

HIGHWAY SIGNING

SIGN BARRICADE

DATE EFFECTIVE: 01/01/2017
DATE PREPARED: 10/28/2016

903.02AN

SHEET NO. 8 OF 8

STRUCTUAL STEEL POST FOR GROUND MOUNTED SIGNS

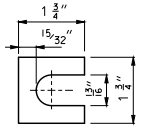
POST		BOLT			WASHER			BASE CONNECTION DATA TABLE (IN.)								
DES. NO.	NOM SIZE (IN. X $\frac{LBS}{FT}$)	DIA	LENGTH	TORQUE	OD	ID	THICK	A	B	C	D	E	F	G	W	R
		IN.	IN.	IN./LB.	IN.	IN.	IN.									
1	W6x9	$\frac{3}{4}$	$2\frac{3}{4}$	345	$1\frac{5}{16}$	$\frac{11}{16}$	$\frac{1}{8}$	5	2	$1\frac{1}{4}$	$2\frac{3}{4}$	$1\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{11}{32}$
2	W6x15															
3	W8x18															
4	W10x22	$\frac{3}{4}$	$3\frac{1}{2}$	555	$1\frac{15}{32}$	$\frac{13}{16}$	$\frac{1}{8}$	6	$2\frac{1}{4}$	$1\frac{3}{8}$	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{5}{16}$	$\frac{13}{32}$
5	W10x26															
6	W12x35															

POST AND FOOTING DATA TABLE

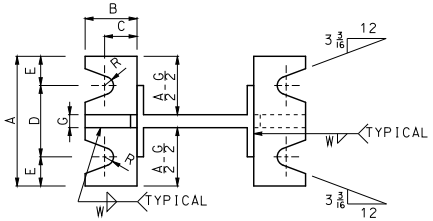
POST					FOOTING								
POST DES. NO.	NOM. SIZE	WEIGHT		STUB LENGTH	DIA.	LEVEL GROUND		6:1 GRADE		4:1 GRADE		3:1 OR 2:1 GRADE	
		LBS/FT	LBS/IN			DEPTH	C.Y.	DEPTH	C.Y.	DEPTH	C.Y.	DEPTH	C.Y.
1	W6	9.0	0.75	3'-0"	15"	3'-0"	0.14	3'-2"	0.15	3'-3"	0.16	3'-6"	0.17
2	W6	15.0	1.25	4'-0"	24"	4'-0"	0.47	4'-2"	0.50	4'-3"	0.51	4'-6"	0.54
3	W8	18.0	1.50	4'-6"	28"	4'-6"	0.71	4'-8"	0.73	4'-9"	0.74	5'-0"	0.78
4	W10	22.0	1.83	5'-0"	36"	5'-0"	1.31	5'-2"	1.36	5'-3"	1.39	5'-6"	1.45
5	W10	26.0	2.17	5'-0"	36"	5'-0"	1.31	5'-3"	1.37	5'-5"	1.43	5'-9"	1.52
6	W12	35.0	2.92	5'-6"	36"	5'-6"	1.44	5'-9"	1.52	5'-11"	1.56	6'-3"	1.65

SHEET METAL BOLT RETAINER CUT FROM 30 GAGE GALVANIZED SHEET METAL. PLACE BETWEEN BASE PLATES. SIZE VARIES TO FIT PLATE. BOLT HOLES TO BE $\frac{1}{16}$" LARGER THAN REQUIRED BOLT SIZE.

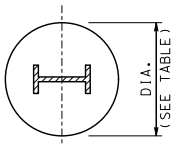
BOLT RETAINER



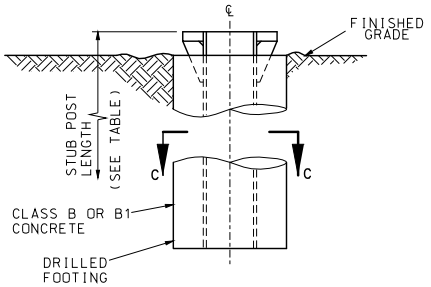
SHIM



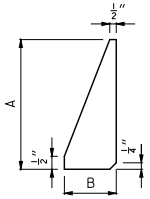
SECTION A-A SECTION B-B
POST AND FOOTING



SECTION C-C



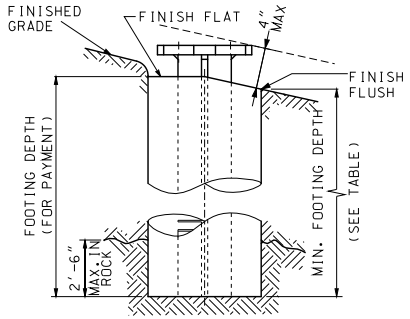
STUB DETAIL



STIFFENER PLATE

ELEVATION

DETAIL A



FOOTING DETAIL

GENERAL NOTES:

DESIGN SPECS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS. LUMINAIRES AND TRAFFIC SIGNALS - 1985 (EXCEPT 2001AND LATEST INTERIMS FOR STRUCTURAL STEEL POSTS).

POSTS, PERFORATED FUSE PLATE AND SPLICE PLATE TO BE GALVANIZED AFTER FABRICATION.

METAL PROJECTING BEYOND THE PLANE OF THE PLATE FACE WILL NOT BE ALLOWED.

REMOVE ALL GALVANIZING RUNS OR BEADS IN THE WASHER AREA.

ALL STRUCTURAL STEEL STIFFENER PLATES AND BASE PLATES, FOR GROUND MOUNTED SIGNS SHALL MEET THE REQUIREMENTS OF ASTM A 36 OR AASHTO M 270 GRADE 50, MINIMUM YIELD 50,000 PSI.

IN THE EVENT THE DISTANCE BETWEEN THE TOP OF THE FOOTING AND THE BOTTOM OF THE SIGN IS LESS THAN 7'-9", THE SIGN HEIGHT AND POST LENGTH IS TO BE INCREASED SUFFICIENTLY TO ACCOMMODATE THIS MINIMUM SPACING.

HINGE PLATES NOT REQUIRED ON SINGLE POST SIGNS OR ANY SIGNS USING PIPE POSTS.

NUTS ON HINGE PLATE BOLTS SHALL BE TIGHTENED TO THE REQUIRED MINIMUM BOLT TENSION VALUES SHOWN IN TABLE 1 SEC. 1080 OF THE STANDARD SPECIFICATIONS.

THE NUT SHALL BE FREE RUNNING. IF THE NUT WILL NOT SPIN ON THE BOLT BECAUSE OF GALVANIZING IRREGULARITIES, A LUBRICANT SHALL BE APPLIED.

ALL BREAKAWAY ASSEMBLY BOLTS SHALL BE TIGHTENED IN A SYSTEMATIC MANNER TO THE PRESCRIBED TORQUE SHOWN ON THIS DRAWING.

EACH BREAKAWAY ASSEMBLY BOLT SHALL BE LOOSENED AND RE-TIGHTENED TO THE REQUIRED TORQUE IN THE SAME ORDER AS THE INITIAL TIGHTENING.

THE THREADS SHALL BE BURRED AT THE NUT USING A CENTER PUNCH TO PREVENT NUT FROM LOOSENING.

POST LENGTH QUANTITY SHOWN ON PLANS INCLUDES STUB.

1" X $2\frac{1}{2}$" HIGH STRENGTH BOLTS FOR PIPE POSTS SHALL BE OF THE 2DESIGNATION AASHTO M 164 OR ASTM A 449. ALL OTHER H.S. BOLTS SHALL BE OF THE DESIGNATION AASHTO M 164.

FURNISH TWO .012"± AND TWO .0032"± THICK SHIMS PER POST FROM BRASS SHIM STOCK OR STRIP. DESIGNATION ASTM B 36. SHIM AS REQUIRED TO PLUMB POST.

HIGH STRENGTH BOLTS WITH HEX NUT AND THREE WASHERS WITH EACH BOLT ARE TO BE GALVANIZED.

OPTIONAL HOLES ($\frac{13}{16}$" ROUND FOR "I" SHAPE POSTS AND $\frac{9}{16}$" ROUND FOR PIPE POST BASE PLATES) AS SHOWN IN "ELEVATIONS" ARE TO BE USED AS AID FOR GALVANIZING ONLY.

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

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
EILEEN H. ROGERS
NUMBER PE-28338
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

POST INSTALLATION DETAILS

POST AND FOOTING DETAILS
WIDE FLANGE (WF) POSTS

DATE EFFECTIVE:	04/01/2017	903.03BK	SHEET NO.
DATE PREPARED:	1/30/2017		1 OF 15

WIDE FLANGE STRUCTURAL STEEL POSTS DESIGN DATA

POST DES. NO.	NOM. SIZE (IN.)	WEIGHT LB/FT	WEIGHT LB/IN	DEPTH (IN.)	FLANGE WIDTH (IN.)	FLANGE THICK (IN.)	WEB THICK (IN.)
1	W6	9	0.75	5 7/8	4	3/16	3/16
2	W6	15	1.25	6	6	1/4	1/4
3	W8	18	1.50	8 1/8	5 1/4	5/16	1/4
4	W10	22	1.83	10 1/8	5 3/4	3/8	1/4
5	W10	26	2.17	10 3/8	5 3/4	7/16	1/4
6	W12	35	2.92	12 1/2	6 1/2	1/2	5/16

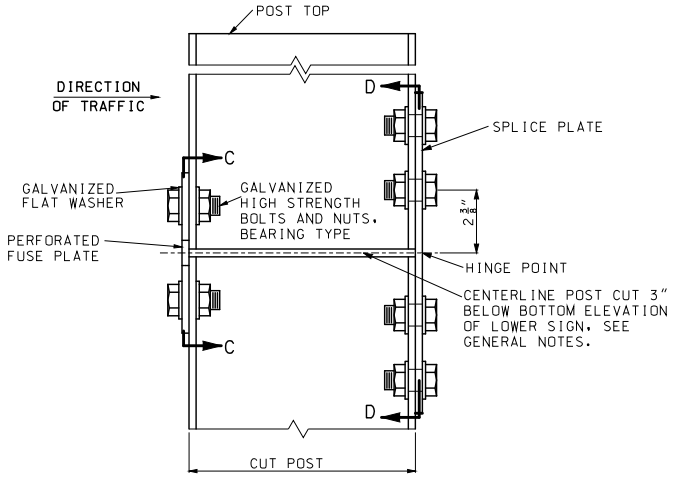
PERFORATED FUSE PLATE DATA TABLE

POST DESIGN NO.	F (IN.)	G (IN.)	H (IN.)	J (IN.)	K (IN.)	L (IN.)	M (IN.)	N (IN.)	d1 (IN.)	d2 (IN.)	P (IN.)	BOLT DIA. (IN.)	WT. (EA.) (LBS.)
1	4 1/4	1	1 1/8	4	2 1/4	7/8	1	1/2	9/16	3/4	3/16	1/2	0.76
2	5	1 1/4	1 1/4	6	3 1/2	1 1/4	1 1/2	3/4	11/16	1 1/4	1/4	5/8	1.67
3	5	1 1/4	1 1/4	5 1/4	2 3/4	1 1/4	1 1/4	3/4	11/16	1 1/16	1/4	5/8	1.51
4	6	1 1/2	1 1/2	5 3/4	2 3/4	1 1/2	1 3/8	13/16	13/16	1 1/8	5/16	3/4	2.52
5	6	1 1/2	1 1/2	5 3/4	2 3/4	1 1/2	1 3/8	13/16	13/16	1 1/8	5/16	3/4	2.52
6	6	1 1/2	1 1/2	6 1/2	3 1/2	1 1/2	1 5/8	13/16	13/16	1 5/16	3/8	3/4	3.35

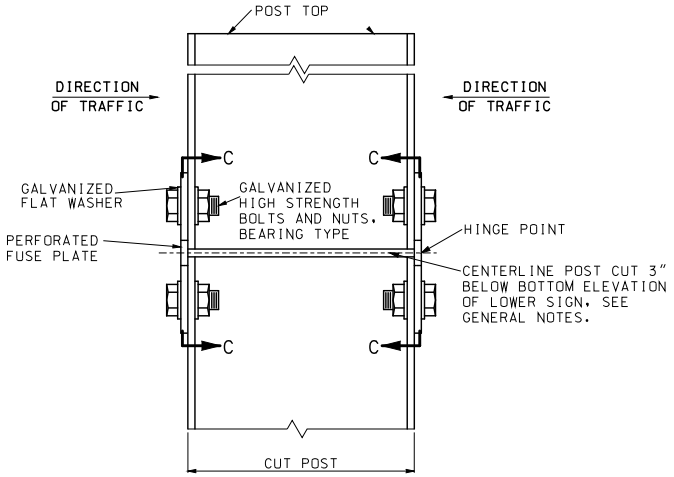
SPLICE PLATE DATA TABLE

POST DESIGN NO.	J (IN.)	K (IN.)	L (IN.)	U (IN.)	d1 (IN.)	BOLT DIA. (IN.)	WT. (EA.) (LBS.)	WASHER OD IN.	WASHER ID IN.	WASHER THICK IN.
1	4	2 1/4	7/8	3/16	9/16	1/2	2.45	1 3/16	5/8	1/8
2	6	3 1/2	1 1/4	1/4	11/16	5/8	4.89	1 5/16	11/16	1/8
3	5 1/4	2 3/4	1 1/4	5/16	11/16	5/8	5.32			
4	5 3/4	2 3/4	1 1/2	5/16	13/16	3/4	5.75			
5	5 3/4	2 3/4	1 1/2	7/16	13/16	3/4	8.04	1 15/32	13/16	1/8
6	6 1/2	3 1/2	1 1/2	1/2	13/16	3/4	10.47			

THE WEIGHT OF STRUCTURAL STEEL POSTS SHOWN IN THE CONTRACT HAS BEEN COMPUTED USING THE WEIGHTS SHOWN.

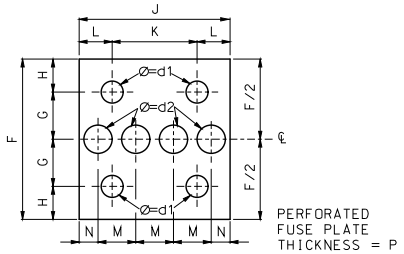


ONE DIRECTION BREAKAWAY



TWO DIRECTION BREAKAWAY

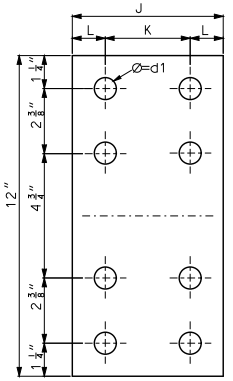
PERFORATED FUSE PLATE AND SPLICE PLATE DETAIL



ELEVATION C-C

ALL HOLES SHALL BE DRILLED. ALL PLATE CUTS SHALL PREFERABLY BE SAW CUTS. HOWEVER: FLAME CUTTING WILL BE PERMITTED PROVIDED ALL EDGES ARE GROUND.

PERFORATED FUSE PLATE AND SPICE PLATE SHALL BE FABRICATED FROM ASTM A 36 STRUCTURAL STEEL.



ELEVATION D-D

GENERAL NOTES:

REFER TO THE GENERAL NOTES ON SHEET 1.

FOR ROADWAYS WHERE TRAFFIC MAY STRIKE THE BACKSIDE OF THE POST, PERFORATED FUSE PLATES SHALL BE INSTALLED ON BOTH SIDES OF THE POST.

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STATE OF MISSOURI
ELSEN H. ROGERS
NUMBER PE-28338
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

POST INSTALLATION DETAILS

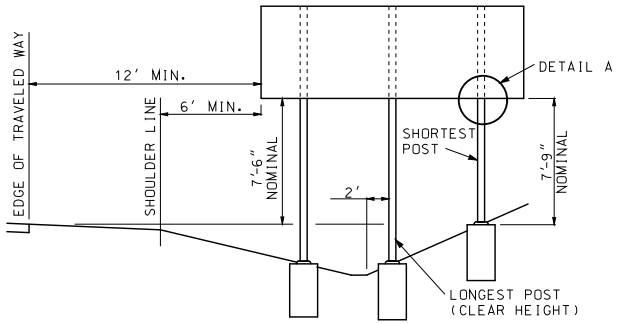
HINGE DETAILS
WIDE FLANGE (WF) POSTS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

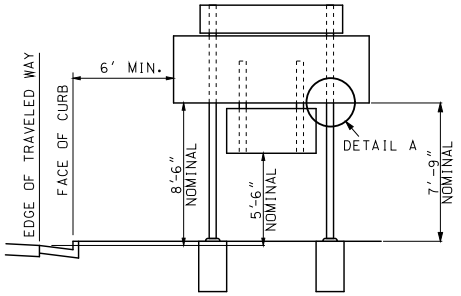
903.03BK

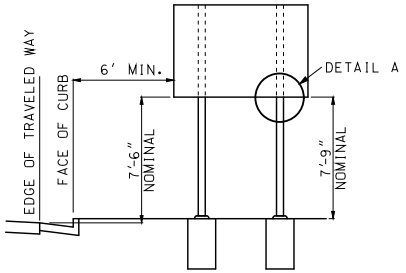
SHEET NO. 2 OF 15

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

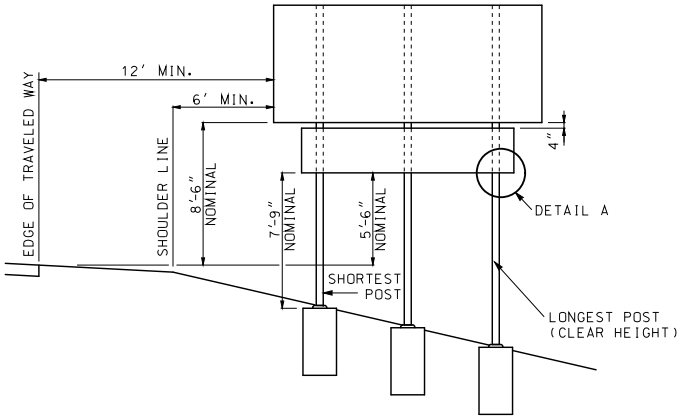


DITCH SECTION

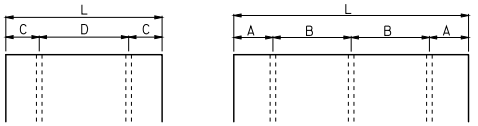




BARRIER CURB SECTIONS



FILL SECTION



A = 1/6(L) C = 1/5(L)
B = 1/3(L) D = 3/5(L)

POST SPACING

FOR POST DESIGNS NUMBERS 3, 4, 5 AND 6 HAVING WEIGHTS GREATER THAN 18LBS./FT., POSTS SHALL BE SPACED AT LEAST 7' APART.

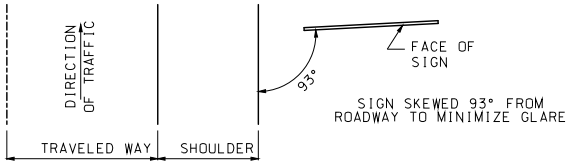
FOR POST DESIGNS NUMBERS 1 AND 2, POSTS MAY BE SPACED LESS THAN 7' APART.

DO NOT USE THREE NUMBER 1 OR 2 POSTS FOR L LESS THAN 11'.

FOR L GREATER THAN 11' AND LESS THAN 17', 3 POSTS MAY BE USED DEPENDING ON SOIL CONDITIONS.

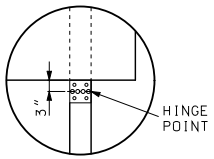
FOR L OF 6' TO 17' TYPICALLY USE 2 POSTS.

FOR L GREATER THAN 17' TYPICALLY USE 3 POSTS.



SIGN SKEWED 93° FROM ROADWAY TO MINIMIZE GLARE

SIGN ORIENTATION



DETAIL A

NOTE: SEE SHEET 2 FOR FUSE PLATE DETAILS.

GENERAL NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

VERTICAL CLEARANCE FROM THE ROADWAY SHALL BE MET AND INCREASED ONLY TO MEET THE 7'9" MINIMUM VERTICAL CLEARANCE FROM THE GROUND.

POST SIZE IS DETERMINED USING SIGN HEIGHT, SIGN WIDTH AND CLEAR HEIGHT. THE CLEAR HEIGHT IS EQUAL TO THE LENGTH OF THE LONGEST POST.

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. RICKERS
NUMBER PE-28338
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

POST INSTALLATION DETAILS

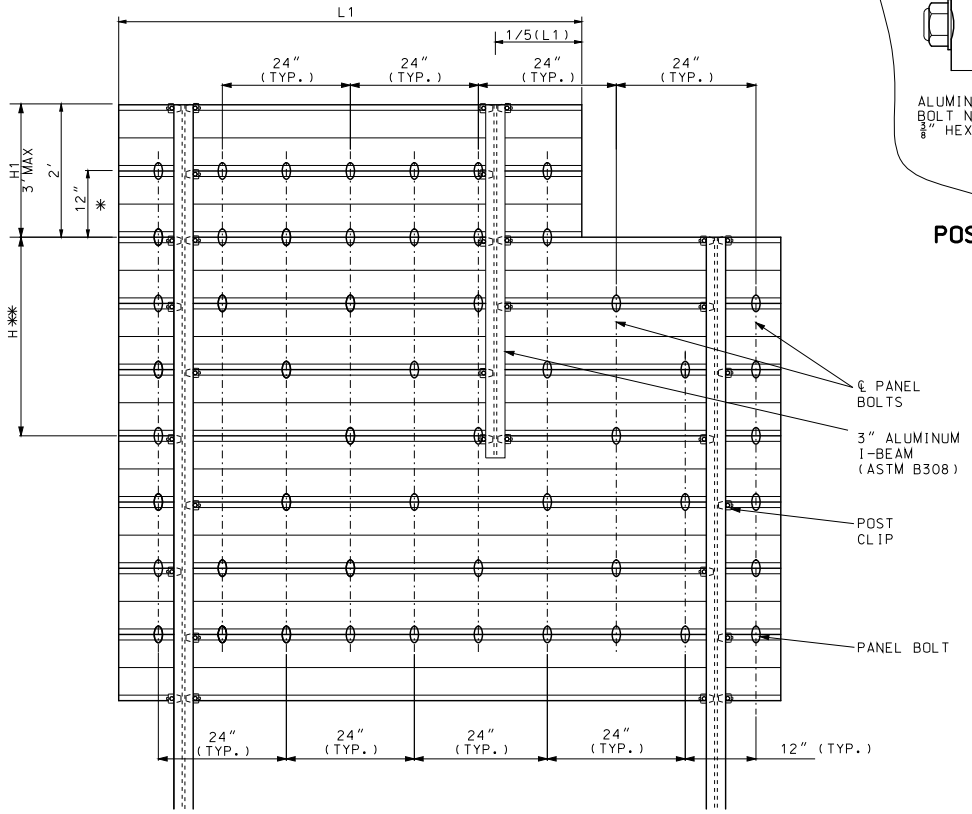
TYPICAL SECTION, MOUNTING HEIGHT AND POST SPACING WIDE FLANGE (WF) POSTS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

903.03BK

SHEET NO. 3 OF 15

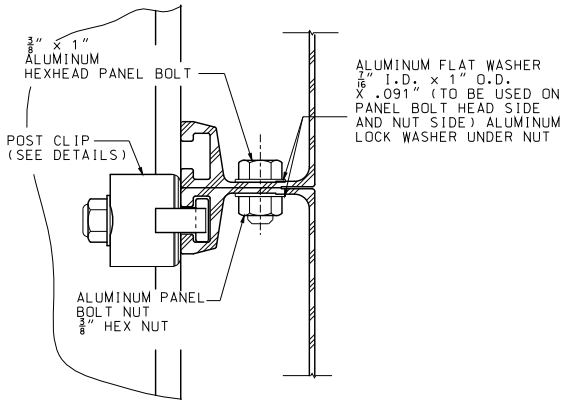
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



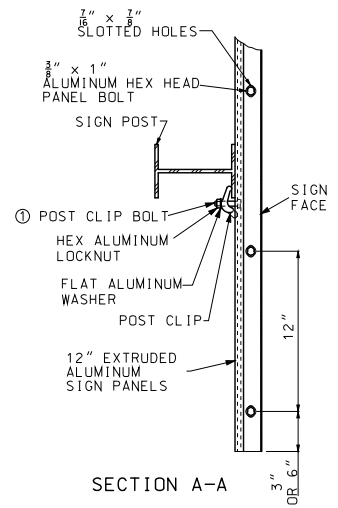
PANEL BOLT LOCATION

* EXTRUDED ALUMINUM PANEL. SEE OTHER DRAWINGS.

** H = H1 + 12". H APPLIES TO SIGNS SUSPENDED ABOVE OR BELOW THE PRIMARY SIGN IF SECONDARY SIGN IS NOT ATTACHED TO THE MAIN SIGN POSTS.



POST CLIP DETAIL



SECTION A-A

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

GENERAL NOTE:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

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SIGN MOUNTING DETAILS

WIDE FLANGE (WF) POSTS

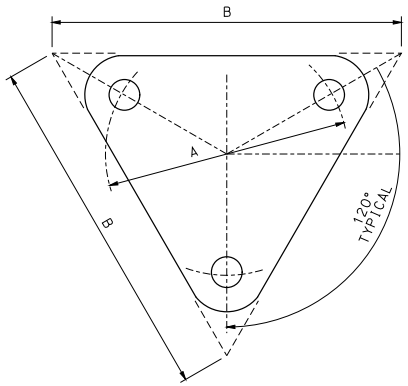
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

903.03BK

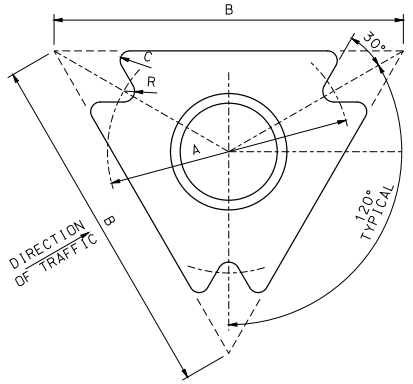
SHEET NO. 4 OF 15

ROUND PIPE POST FOR GROUND MOUNTED SIGNS												
POST	BOLT			WASHER			BASE CONNECTION DATA TABLE (IN.)					
NOM SIZE (IN.-ID)	DIA	LENGTH	TORQUE	OD	ID	THICK	A	B	C	R	T	W
	IN.	IN.	IN./LB.	IN.	IN.	IN.						
$2\frac{1}{2}$	$\frac{1}{2}$	$3\frac{1}{2}$	140	$1\frac{1}{16}$	$17/32$	$\frac{1}{8}$	$6\frac{1}{4}$	9	$\frac{1}{4}$	$9/32$	1	$\frac{1}{4}$
3												
4	$\frac{5}{8}$	$3\frac{3}{4}$	345	$1\frac{5}{16}$	$\frac{11}{16}$	$\frac{1}{8}$	$7\frac{3}{16}$	10	$\frac{1}{4}$	$\frac{3}{8}$	1	$\frac{5}{16}$

ROUND PIPE POST AND FOOTING DATA TABLE						
NOM. SIZE (IN.)	WEIGHT		STUB LENGTH	FOOTING		CONCRETE
	LBS/FT	LBS/IN		DIA.	DEPTH	C.Y.
$2\frac{1}{2}$	5.79	0.48	$4'-3\frac{1}{2}"$	12"	4'-6"	0.13
3	7.58	0.63	$4'-3\frac{1}{2}"$	12"	4'-6"	0.13
4	10.79	0.90	$5'-3\frac{1}{2}"$	18"	5'-6"	0.36

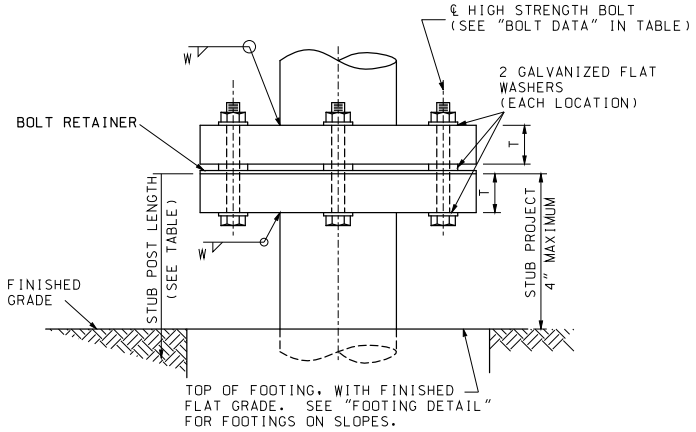


BOLT RETAINER



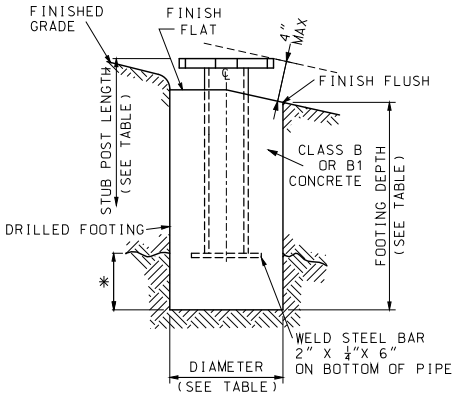
PLAN VIEW

SHEET METAL BOLT RETAINER CUT FROM 30 GUAGE GALVANIZED SHEET METAL. PLACE BETWEEN BASE PLATES. SIZE VARIES TO FIT PLATE. BOLT HOLES SHALL BE $\frac{1}{16}$" LARGER THAN REQUIRED BOLT SIZE.



ELEVATION
(STEEL PIPE POST BASE CONNECTION)

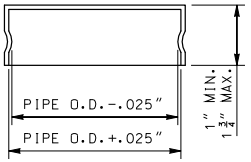
MULTI-DIRECTION SLIP BASE



FOOTING DETAIL

* PIPE 3" DIA. AND UNDER: 2' MAXIMUM IN ROCK, PIPE OVER 3" DIA.: 3' MAXIMUM IN ROCK

ROLLED CRIMP TO ENGAGE PIPE O.D.



FRICTION CAP

GENERAL NOTE:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE STANDARD PLANS SHEET 10 OF 15.

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POST INSTALLATION DETAILS

PIPE POST

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

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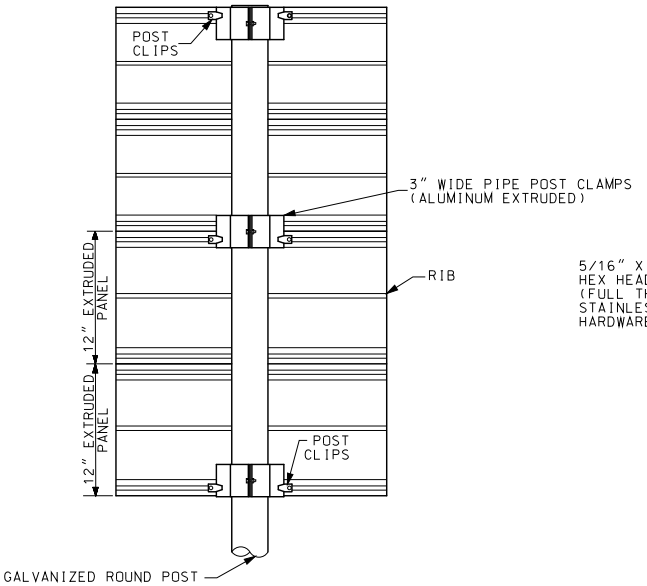
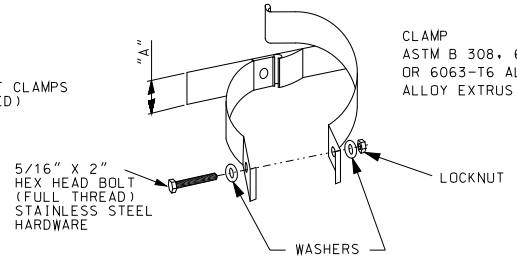
SHEET NO. 5 OF 15

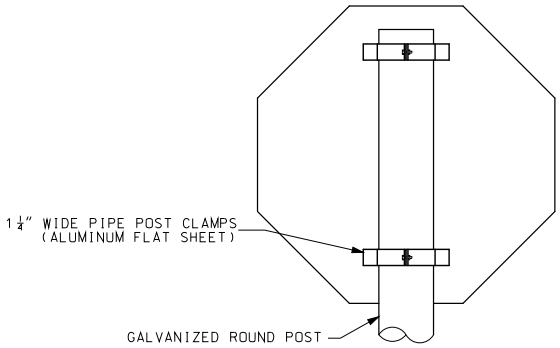


PROFILE VIEW

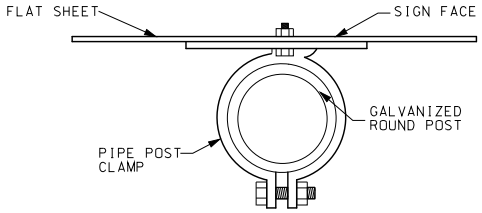


CLAMP TYPE SIGN SUPPORT FOR PIPE POST

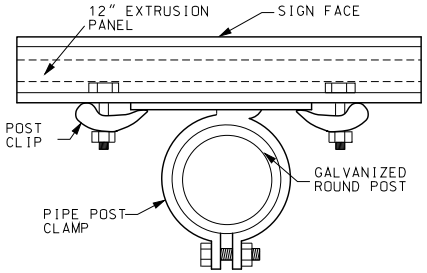
WIDTH OF PIPE POST CLAMP	
SIGN TYPE	MINIMUM "A"
FLAT	1 1/4"
STRUCTURAL	3"



PROFILE VIEW

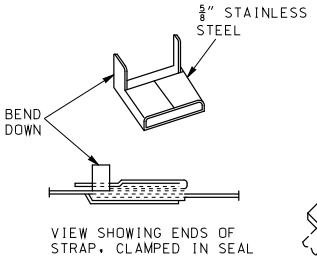


PLAN VIEW

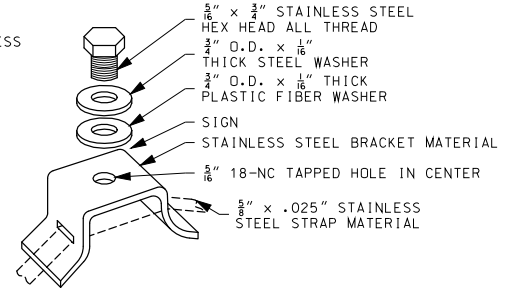


PLAN VIEW

MOUNTING DETAILS FOR EXTRUDED PANELS ON PIPE POST



STRAP SEAL



FLARED LEG SIGN BRACKET

MOUNTING DETAILS FOR FLAT SHEET SIGNS ON ROUND STRUCTURES >4" PIPE POST

MOUNTING DETAILS FOR FLAT SHEET ON PIPE POST

GENERAL NOTES:

FOR GENERAL NOTES, SHEET 1 OF 15.

FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE SHEET 10 OF 15

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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STATE OF MISSOURI
ELSEN H. ROGERS
NUMBER PE-28338
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

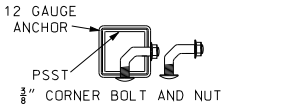
SIGN MOUNTING DETAILS
PIPE POST

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

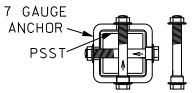
903.03BK

SHEET NO. 6 OF 15

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



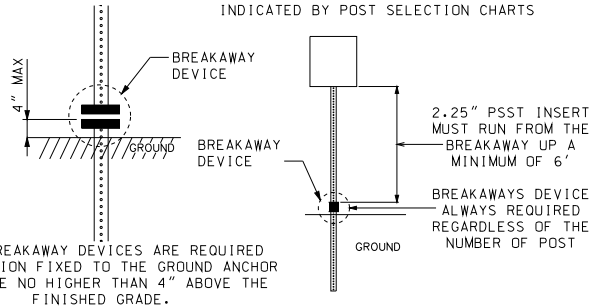
ANCHOR BOLT DETAIL FOR 2" PSST
MINIMUM 1 CORNER BOLT REQUIRED



⅝" x 3.5" SHOULDER BOLT AND NUT
ANCHOR BOLT DETAIL FOR
2.5" AND 2"+ 2.5" PSST
2 SHOULDER BOLTS REQUIRED
INSTALLED PERPENDICULAR TO EACH OTHER

ANCHOR BOLT DETAIL

2.5" + 2.25" POST COMPRISED OF A 2½" PSST POST WITH A 2.25" PIECE OF PSST INSERTED INSIDE TO INCREASE POST CAPACITY. USE AS INDICATED BY POST SELECTION CHARTS



WHEN BREAKAWAY DEVICES ARE REQUIRED THE PORTION FIXED TO THE GROUND ANCHOR SHALL BE NO HIGHER THAN 4" ABOVE THE FINISHED GRADE.

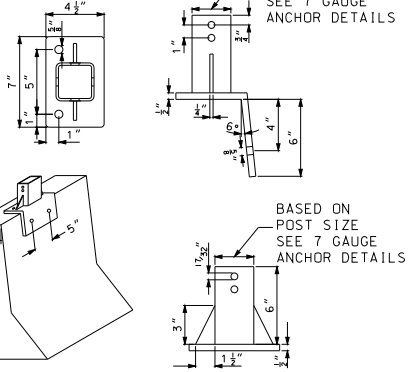
BREAKAWAY DETAILS
2.5" + 2.25" POST DETAIL

ANCHOR TUBE SHALL BE 7 GUAGE

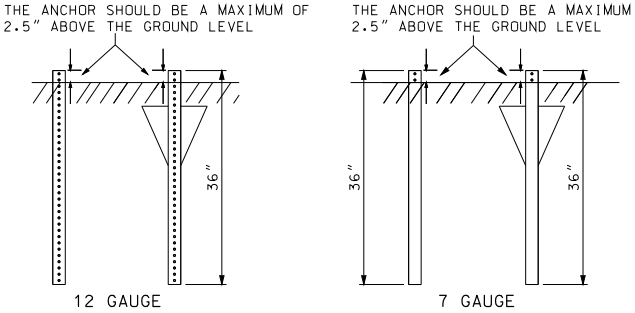
1/2" X 4 1/2"GALVANIZED MECHANICAL FASTENERS SHALL BE USED TO ATTACH ANCHOR TO BARRIER WALL

SHOULDER BOLTS SHALL BE USED TO ATTACH PSST POST TO ANCHOR (SEE STANDARD PLAN 903.03)

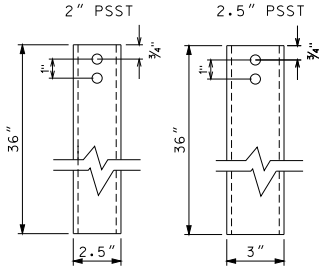
ANCHOR SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER SECTION 1080



BARRIER WALL
MOUNTING DETAIL



ANCHOR INSTALLATION DETAIL



- BOLT HOLE DIAMETER - 17/32"
- 2 PER SIGN ON ALL 4 SIDES

7 GAUGE ANCHOR
FABRICATION DETAIL

POST AND ANCHOR DATA TABLE						
POST		ANCHOR NORMAL OR OMNI-DIRECTIONAL		BREAKAWAY NEEDED NUMBER OF POSTS		
GUAGE	SIZE	GUAGE	SIZE	1	2	3
12	2"x2"	12	2.25" X 2.25" X 36" OD	NO	NO	YES
		7 *	2.5" X 2.5" X 36" OD	NO	NO	YES
12	2.5"x2.5"	7 *	3" X 3" X 36" OD	NO	YES	YES
12	(2.5"x2.5")+(2.25"X2.25")	7 *	3" X 3" X 36" OD	YES	YES	YES

* TO BE USED WITH CONCRETE FOOTINGS OR IS AN OPTION IN ROCK SOIL CONDITIONS

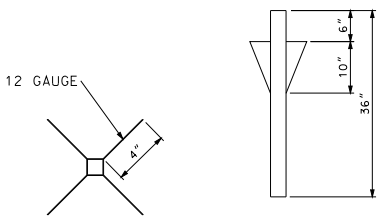
GENERAL NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

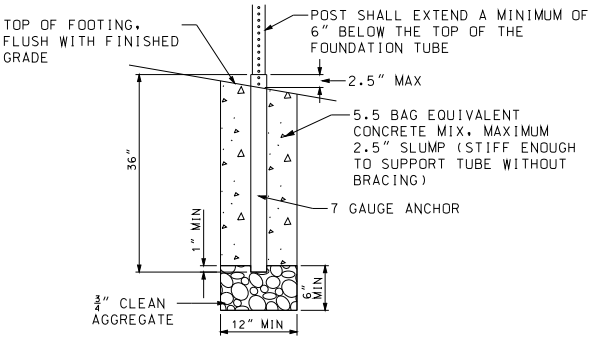
FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE SHEET 10 OF 15.

ALL BREAKAWAY DEVICES USED ON AN INSTALLATION SHALL BE CERTIFIED NCHRP 350 COMPLIANT.

48" FOOTINGS MAY BE USED WITH 12 GAUGE OR 7 GAUGE ANCHORS.



OMNI-DIRECTIONAL ANCHOR DETAIL
FOR BOTH 12 AND 7 GAUGE



CONCRETE FOOTING DETAIL

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STATE OF MISSOURI
EILEEN H. RICKERS
NUMBER PE-26336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

POST INSTALLATION DETAILS
PERFORATED SQUARE STEEL TUBE (PSST)

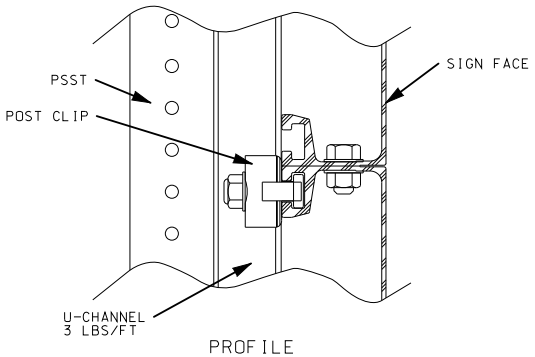
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

903.03BK

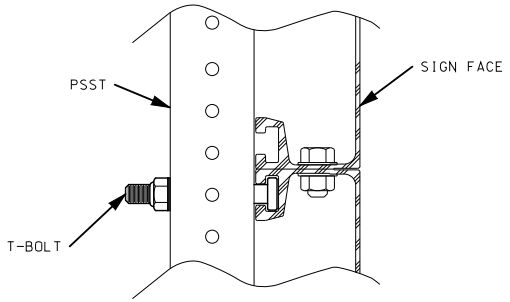
SHEET NO. 7 OF 15

REV.

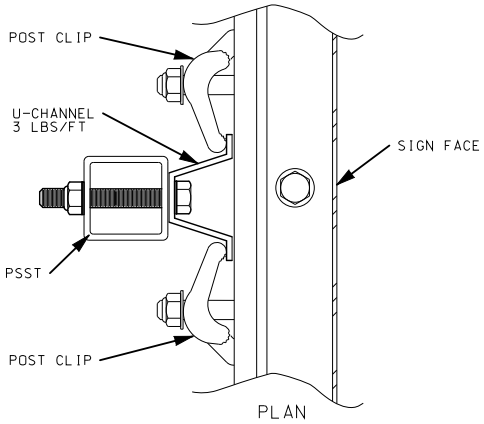
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



PROFILE

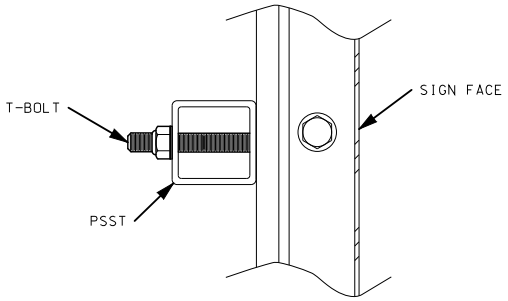


PROFILE



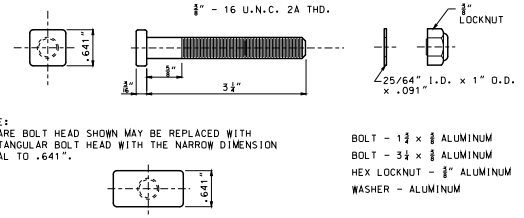
PLAN

POST CLIP METHOD



PLAN

T-BOLT METHOD



T-BOLT DETAIL

NOTES:
- ALUMINUM BOLTS SHALL BE ASTM B 211, 2024-T4 OR 6061-T6
- ALUMINUM FLAT WASHERS SHALL BE ASTM B 209, ALCLAD 2024-T4 OR 2024-T4
- ALUMINUM LOCK NUTS (NYLON INSERT) SHALL BE ASTM B 211 OR 2017-T4

EXTRUDED PANEL MOUNTING DETAIL

NUMBER OF BOLTS TO ATTACH STEEL CHANNEL TO PSST POST	
SIGN HEIGHT	NO. OF BOLTS PER PSST POST USED
1′	2
2′	3
3′	4
4′	5
5′	6
6′	7
7′	8

GENERAL NOTES:

FOR THE GENERAL NOTES, SEE SHEET 1 OF 15.

FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE SHEET 10 OF 15.

FOR POST CLIP DETAILS, SEE SHEET ? OF 15.

ALTERNATE PSST MOUNTING HARDWARE USE SHALL BE ON APPROVED LIST.

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NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

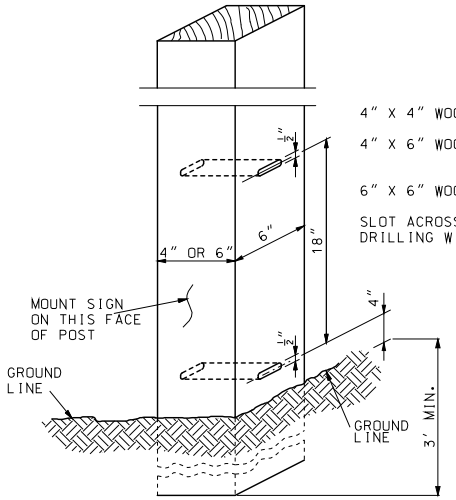
SIGN MOUNTING DETAILS

PERFORATED SQUARE STEEL TUBE (PSST)

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

903.03BK

SHEET NO. 8 OF 15



4" X 4" WOOD POST - NO SLOTS OR HOLES REQUIRED

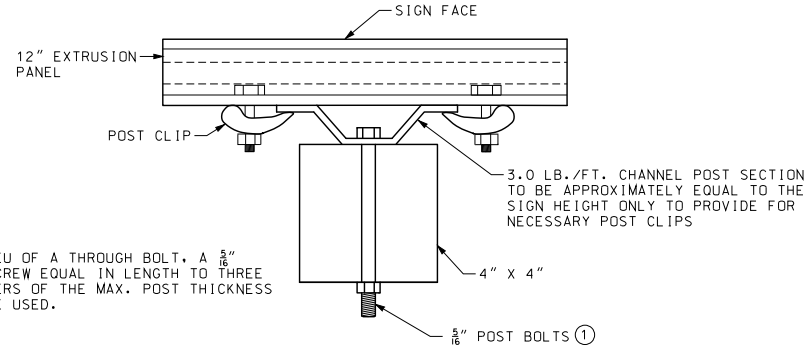
4" X 6" WOOD POST - $1\frac{1}{2}$" X $\frac{1}{2}$" SLOT ON 6" SIDE OR $1\frac{1}{2}$" DIA. HOLE ON 6" SIDE

6" X 6" WOOD POST - 2" X $\frac{1}{2}$" SLOT OR 2" DIA. HOLE

SLOT ACROSS NEUTRAL AXIS FORMED BY SUCCESSIVE DRILLING WITH $\frac{1}{2}$" BIT.

WOOD POST DETAIL

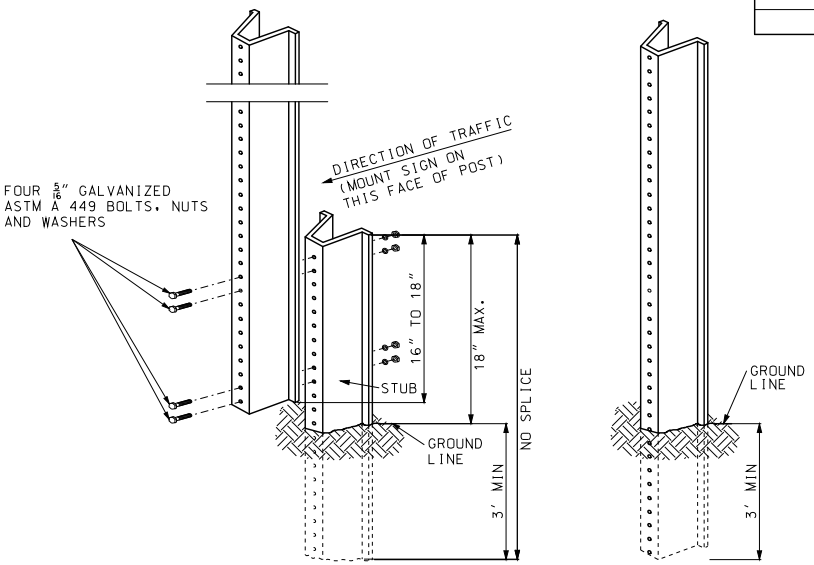
NUMBER OF BOLTS TO ATTACH STEEL CHANNEL TO WOOD POST	
SIGN HEIGHT	NO. OF BOLTS PER WOOD POST USED
1'	2
2'	3
3'	4
4'	5
5'	6
6'	7
7'	8



(1) IN LIEU OF A THROUGH BOLT, A $\frac{5}{16}$" LAG SCREW EQUAL IN LENGTH TO THREE QUARTERS OF THE MAX. POST THICKNESS MAY BE USED.

PLAN VIEW

MOUNTING DETAILS FOR EXTRUDED PANELS ON WOOD POST



U-CHANNEL POST DETAIL OPTIONAL INSTALLATION

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

* SIGNS GREATER THAN 4 FEET IN WIDTH REQUIRE TWO POSTS, EXCEPT DIAMOND SHAPED WARNING SIGNS, YIELD SIGNS, AND ONE WAY SIGNS.

POST SIZE REQUIREMENTS

GENERAL NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 3 FEET INTO THE GROUND.

USE OF SPLICE IS OPTIONAL.

SPLICE OVERLAP SHALL BE POSITION ENTIRELY BETWEEN GROUND LINE AND 18" ABOVE GROUND LINE.

ONLY ONE SPLICE WILL BE ALLOWED PER POST.

FOR POST SIZING SEE ENGINEERING POLICY GUIDE.

FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE SHEET 10 OF 15.

AT THE ENGINEER DISCRETION A FLUORESCENT PAINT SHALL BE APPLIED HEAVILY TO BOTH SIDES OF U-CHANNEL POST STUB FOR A LENGTH OF AT LEAST 6 INCHES BELOW THE TOP OF STUB.

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

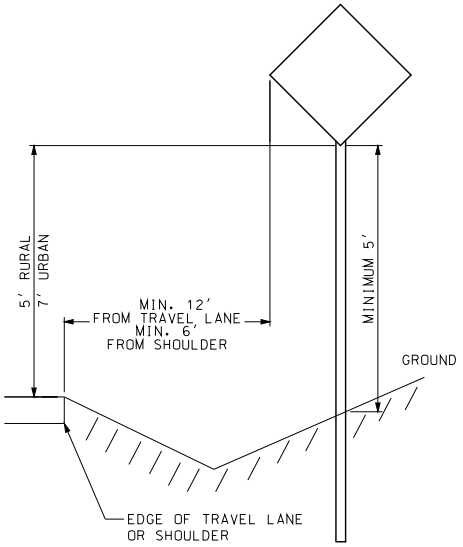
STATE OF MISSOURI
EILEEN H. ROGERS
NUMBER PE-28336
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

SIGN MOUNTING DETAILS
WOOD AND U-CHANNEL POST

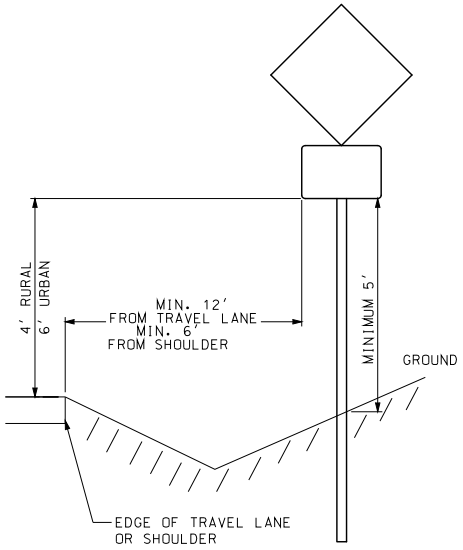
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

903.03BK

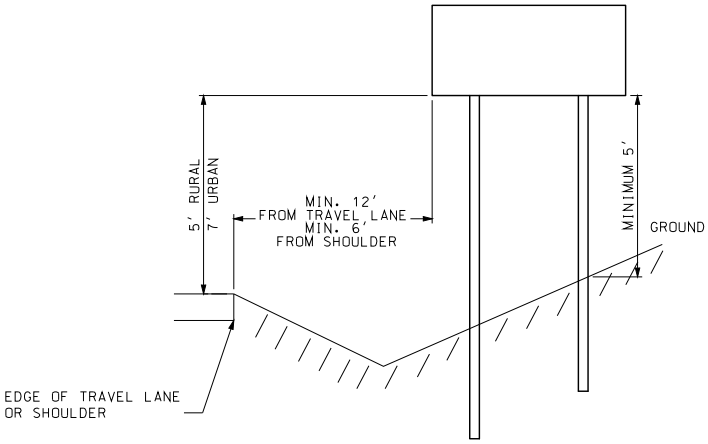
SHEET NO. 9 OF 15



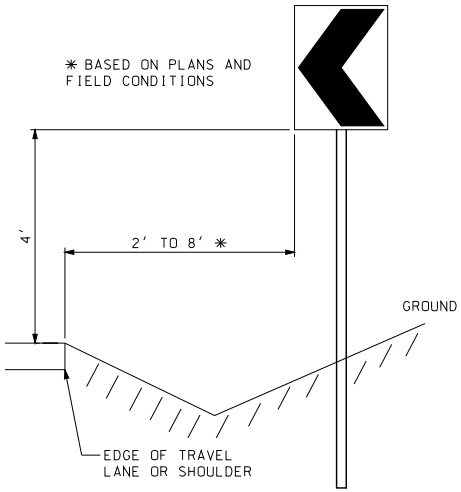
ONE POST – SINGLE SIGN



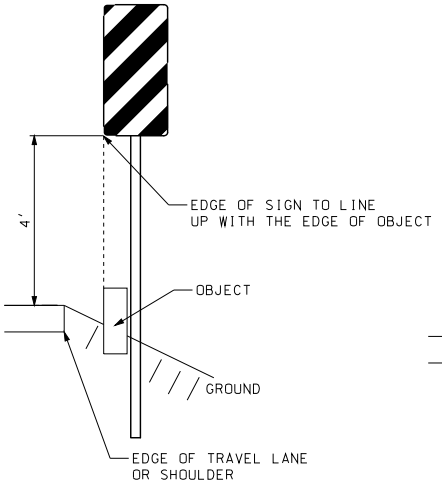
ONE POST – SINGLE SIGN WITH SUPPLEMENTAL PLAGUE



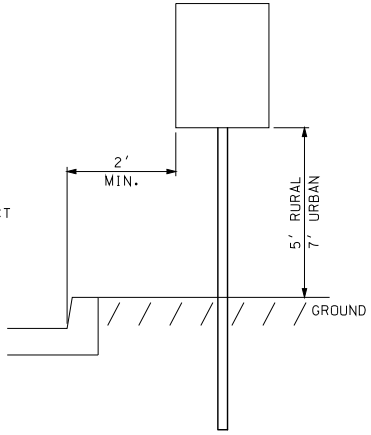
TWO POST



CHEVRON SIGN



TYPE III OBJECT MARKER



ADJACENT TO CURB

MOUNTING HEIGHT DETAILS

GENERAL NOTES:

SIGN MOUNTING BOLTS SHALL BE INSTALLED WITH A NYLON WASHER AGAINST THE SIGN FACE WITH A STEEL WASHER BETWEEN THE NYLON WASHER AND BOLT HEAD.

A LOCKNUT SHALL BE USED TO FASTEN THE SIGN TO THE POST.

VERTICAL CLEARANCE FROM THE ROADWAY SHALL BE MET AND INCREASED ONLY TO MEET THE 5' MINIMUM VERTICAL CLEARANCE FROM THE GROUND.

HORIZONTAL OFFSET MAY BE ADJUSTED BASED ON FIELD CONDITIONS.

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

SIGN MOUNTING DETAILS

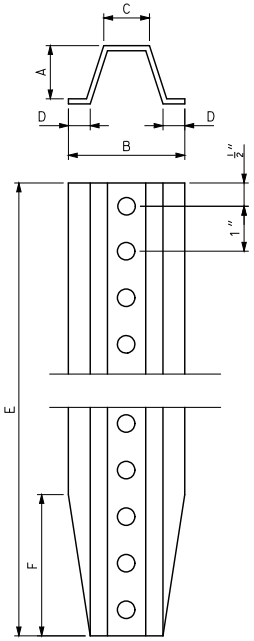
MOUNTING HEIGHT & OFFSET
PIPE POSTS, PSST, WOOD
& U-CHANNEL POSTS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

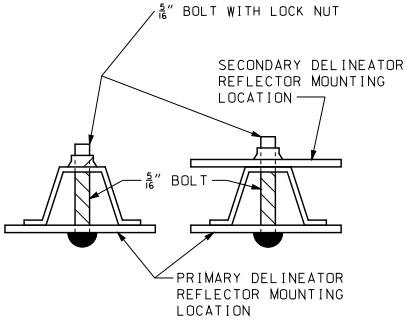
903.03BK

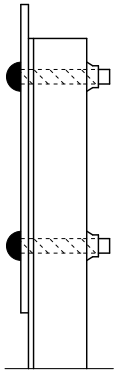
SHEET NO.
10 OF 15

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



GROUND MOUNT
U-CHANNEL





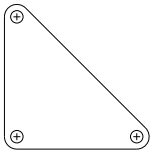
HOLE PUNCHING TO EQUAL 9/16" DIAMETER HOLES, ONE INCH CENTER TO CENTER, BEGINNING ONE-HALF INCH FROM THE END AND CONTINUING THE ENTIRE LENGTH OF THE POST.

DELINEATOR POST							
LIMITS	LBS/FT (2)	DIMENSIONS - INCHES					
		A	B	C	D	E	F
NOMINAL	1.12	1	2 1/4	7/8	9/16	84	1
TOLERANCE	± 5%	± 1/8	± 1/8	± 1/8	± 1/8	±1	± 1/4

(2) WEIGHT BEFORE GALVANIZING OR PUNCHING.

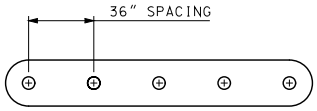
THE CHANNEL POST FOR DELINEATORS SHALL BE MANUFACTURED FROM DUCTILE ASTM A 36 OR ASTM A 1011 GR 60.

DELINEATOR POST AND FASTENER DETAILS

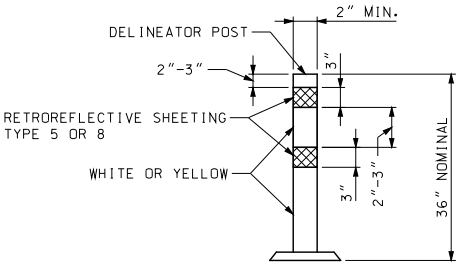


DELINEATOR PLACEMENT LOCATED AT THE RADIUS POINTS

DELINEATOR PLACEMENT FOR ISLANDS



DELINEATOR PLACEMENT FOR MEDIAN STRIPS

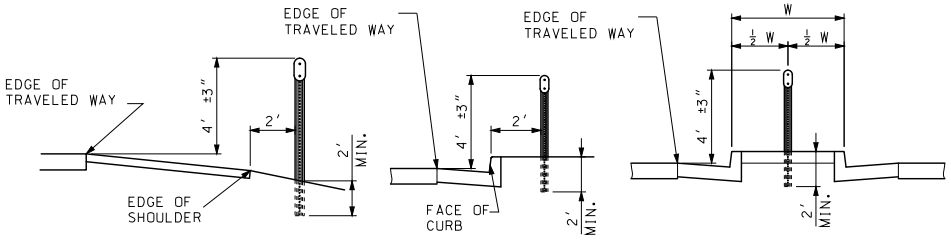


36 INCH SURFACE-MOUNT
DELINEATOR POST

DELINEATOR POST DETAIL

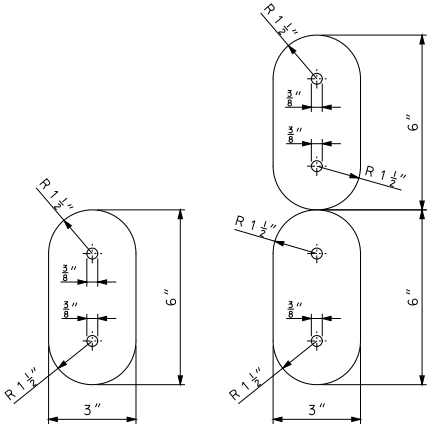
COLOR OF DELINEATOR POST AND REFLECTIVE SHEETING SHALL MATCH THE COLOR OF THE CLOSEST PAVEMENT MARKING OR CURB MARKING.

DELINEATOR POST SHAPE MAY BE ROUND OR T-SHAPED. DELINEATOR POST SHALL BE PERMANENTLY MOUNTED TO THE PAVEMENT SURFACE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.



SHOULDER MOUNTED | OUTSIDE BARRIER CURB | NARROW PAVED MEDIAN

DELINEATOR MOUNTING DETAILS



SINGLE | DOUBLE STACKED

CHANNEL POST DELINEATOR REFLECTOR

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NUMBER PE-28336
PROFESSIONAL ENGINEER
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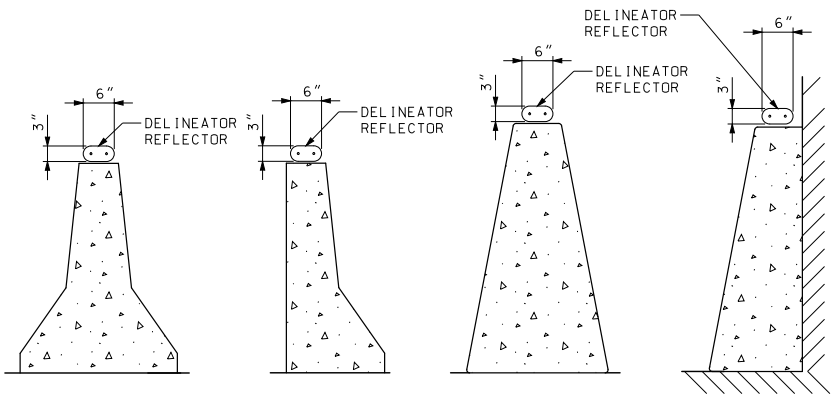
SIGN MOUNTING DETAILS
DELINEATORS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 2/6/2017

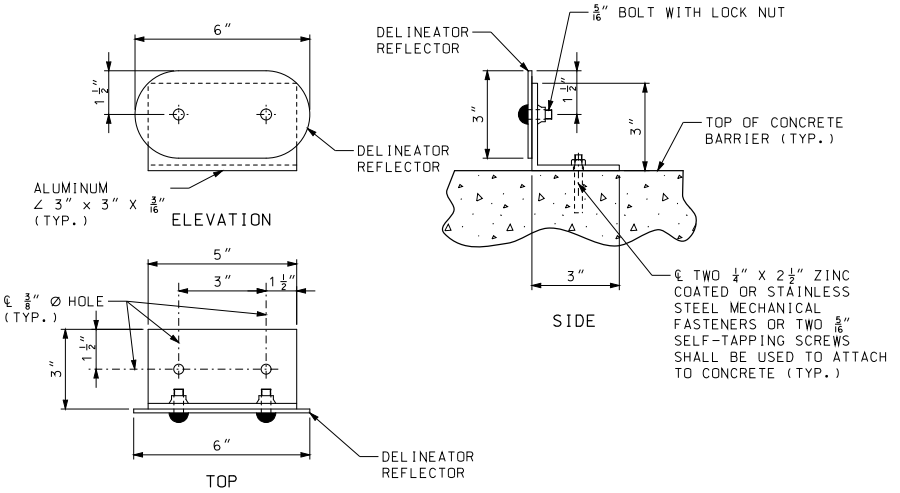
903.03BK

SHEET NO.
11 OF 15

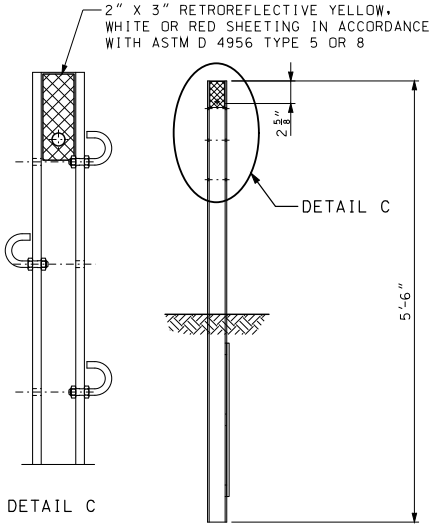


DELINEATORS ON CONCRETE TRAFFIC BARRIER

FOR CONCRETE BARRIER DETAILS, SEE STD PLANS 617.10.

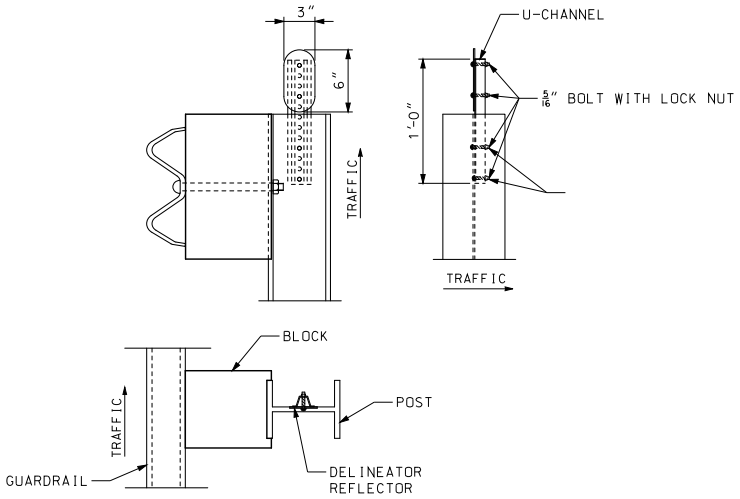


DELINEATOR CONNECTION ON CONCRETE TRAFFIC BARRIER DETAIL



DELINEATORS ON THREE-STRAND MEDIAN GUARD CABLE

FOR THREE-STRAND GUARD CABLE DETAILS SEE STD PLANS 606.41.



DELINEATORS ON NEW GUARDRAIL

FOR GUARDRAIL DETAILS, SEE STD PLANS 606.00 AND 606.50.

GENERAL NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

RETROREFLECTIVE YELLOW, WHITE OR RED SHEETING IN ACCORDANCE WITH ASTM D 4956 TYPE 5 OR 8 SHALL BE APPLIED TO ONLY ONE SIDE OF THE CHANNEL POST DELINEATOR MOUNTED TOWARDS THE CHANNEL POST.

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

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STATE OF MISSOURI
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NUMBER PE-28338
PROFESSIONAL ENGINEER
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SIGN MOUNTING DETAILS

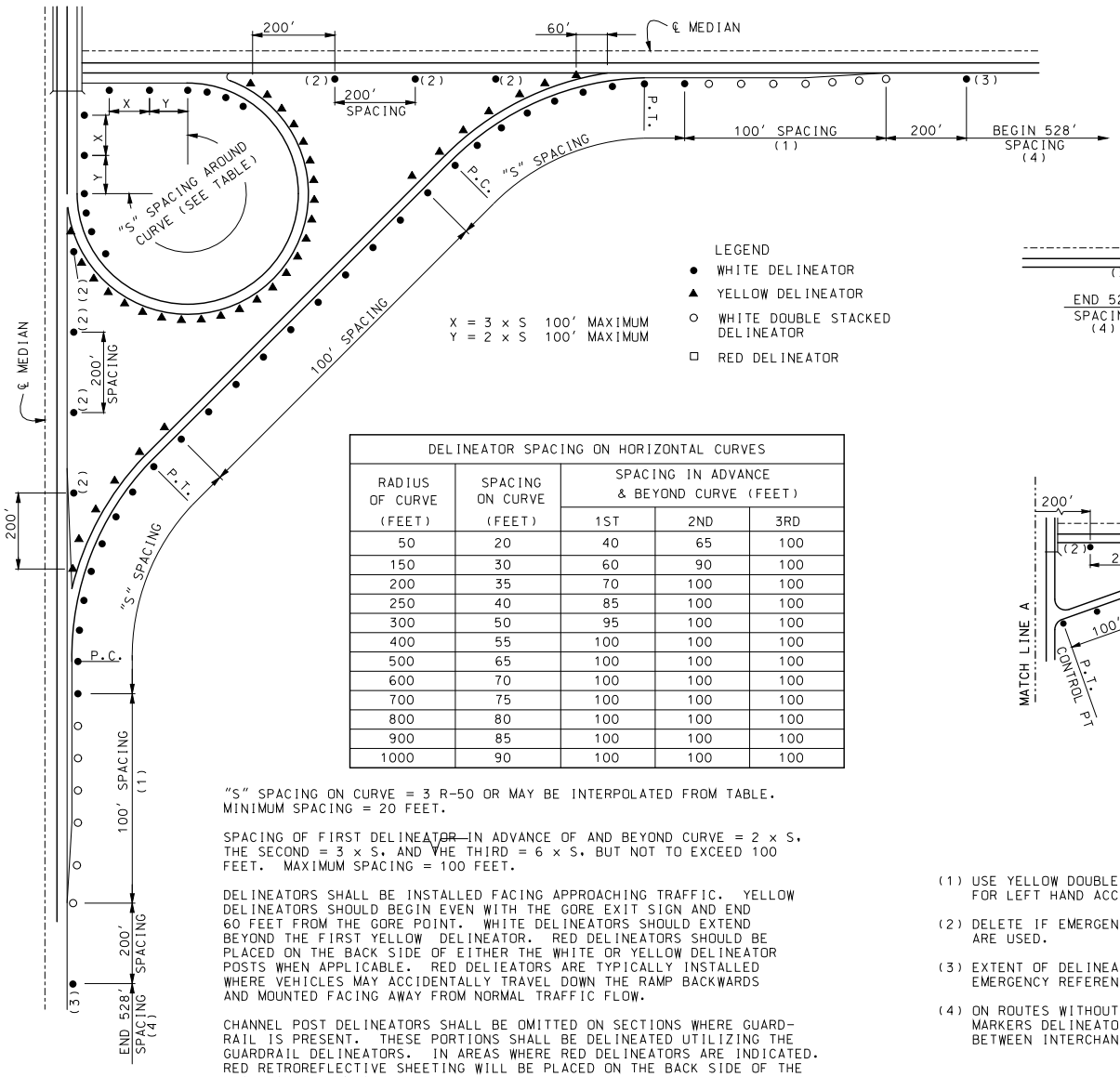
DELINEATORS

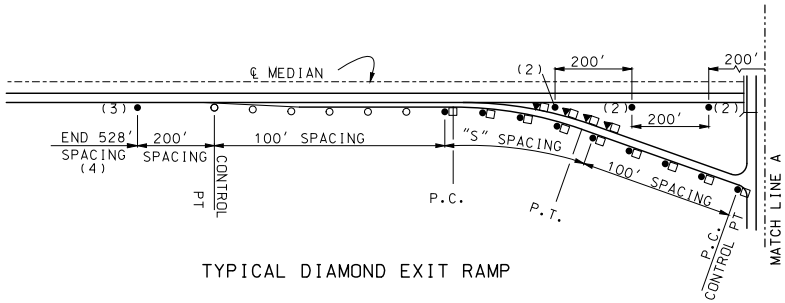
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 2/6/2017

903.03BK

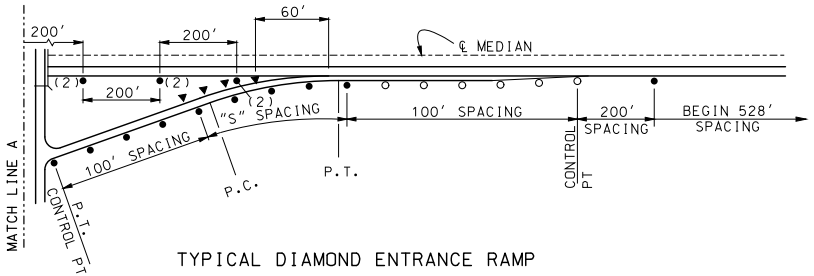
SHEET NO. 12 OF 15

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





TYPICAL DIAMOND EXIT RAMP



TYPICAL DIAMOND ENTRANCE RAMP

TYPICAL INTERCHANGE

DELINEATOR SPACING ON HORIZONTAL CURVES				
RADIUS OF CURVE (FEET)	SPACING ON CURVE (FEET)	SPACING IN ADVANCE & BEYOND CURVE (FEET)		
		1ST	2ND	3RD
50	20	40	65	100
150	30	60	90	100
200	35	70	100	100
250	40	85	100	100
300	50	95	100	100
400	55	100	100	100
500	65	100	100	100
600	70	100	100	100
700	75	100	100	100
800	80	100	100	100
900	85	100	100	100
1000	90	100	100	100

"S" SPACING ON CURVE = 3 R-50 OR MAY BE INTERPOLATED FROM TABLE. MINIMUM SPACING = 20 FEET.

SPACING OF FIRST DELINEATOR IN ADVANCE OF AND BEYOND CURVE = 2 x S. THE SECOND = 3 x S. AND THE THIRD = 6 x S. BUT NOT TO EXCEED 100 FEET. MAXIMUM SPACING = 100 FEET.

DELINEATORS SHALL BE INSTALLED FACING APPROACHING TRAFFIC. YELLOW DELINEATORS SHOULD BEGIN EVEN WITH THE GORE EXIT SIGN AND END 60 FEET FROM THE GORE POINT. WHITE DELINEATORS SHOULD EXTEND BEYOND THE FIRST YELLOW DELINEATOR. RED DELINEATORS SHOULD BE PLACED ON THE BACK SIDE OF EITHER THE WHITE OR YELLOW DELINEATOR POSTS WHEN APPLICABLE. RED DELIEATORS ARE TYPICALLY INSTALLED WHERE VEHICLES MAY ACCIDENTALLY TRAVEL DOWN THE RAMP BACKWARDS AND MOUNTED FACING AWAY FROM NORMAL TRAFFIC FLOW.

CHANNEL POST DELINEATORS SHALL BE OMITTED ON SECTIONS WHERE GUARD-RAIL IS PRESENT. THESE PORTIONS SHALL BE DELINEATED UTILIZING THE GUARDRAIL DELINEATORS. IN AREAS WHERE RED DELINEATORS ARE INDICATED. RED RETROREFLECTIVE SHEETING WILL BE PLACED ON THE BACK SIDE OF THE GUARDRAIL DELINEATOR.

REFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.3.

(1) USE YELLOW DOUBLE STACKED DELINEATORS FOR LEFT HAND ACCEL/DECEL LANES.

(2) DELETE IF EMERGENCY REFERENCE MARKERS ARE USED.

(3) EXTENT OF DELINEATION ON ROUTES WITH EMERGENCY REFERENCE MARKERS.

(4) ON ROUTES WITHOUT EMERGENCY REFERENCE MARKERS DELINEATORS SHALL BE INSTALLED BETWEEN INTERCHANGES EVERY 528'.

GENERAL NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

THE CONTRACT UNIT PRICE FOR EACH CHANNEL POST DELINEATOR SHALL INCLUDE THE REFLECTOR, FASTENERS AND POST.

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ELIESH H. RICKERS
NUMBER PE-28338
PROFESSIONAL ENGINEER
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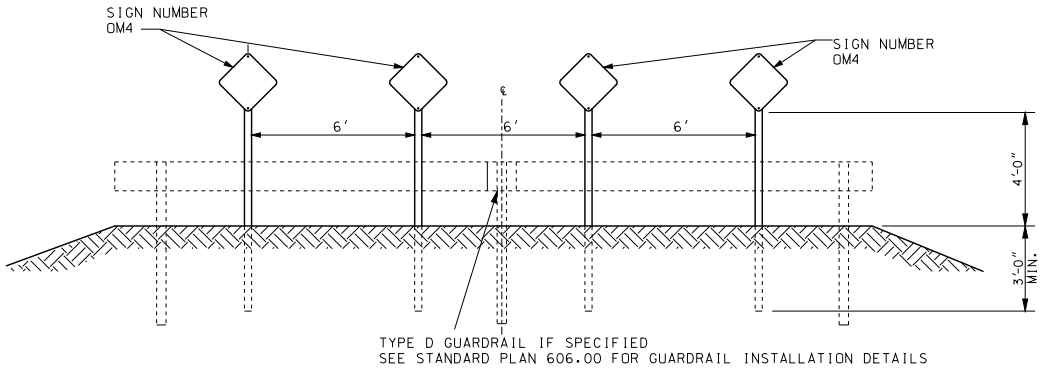
SIGN MOUNTING DETAILS

INTERCHANGE DELINEATION

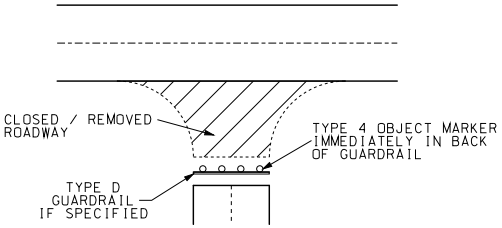
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

903.03BK

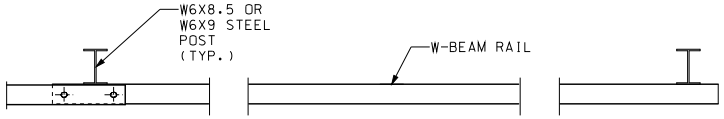
SHEET NO. 13 OF 15



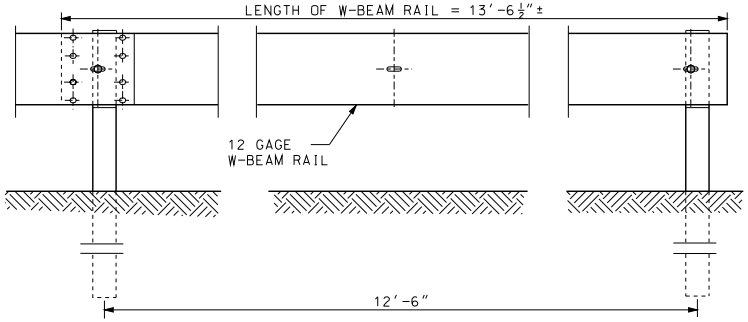
TYPE 4 OBJECT MARKER INSTALLATION



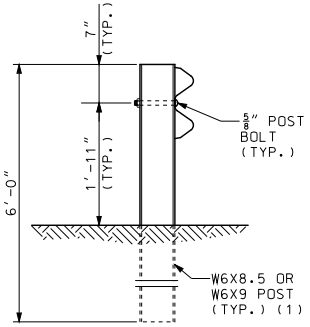
TYPICAL ROAD CLOSURE



PLAN



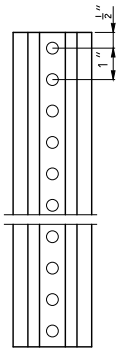
ELEVATION



STEEL POST

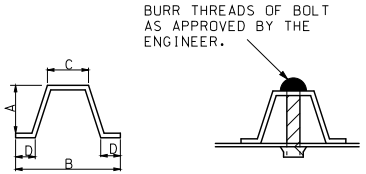
TYPE D GUARDRAIL

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



STEEL OBJECT MARKER POST					
LIMITS	LBS/FT (2)	DIMENSIONS - INCHES			
		A	B	C	D
MIN.	2.40	1 ¼	2 ½	1	½
MAX.	2.80	1 5/8	3 ¼	1 ⅜	¾

(2) WEIGHT BEFORE GALVANIZING OR PUNCHING. LIMITS SHOWN ARE ABSOLUTE. NO FURTHER WEIGHT, DIMENSIONAL OR COMMERCIAL TOLERANCE WILL BE ACCEPTABLE.



HOLE PUNCHING TO EQUAL ⅝″ DIAMETER HOLES, ONE INCH CENTER TO CENTER, BEGINNING ONE-HALF INCH FROM THE END AND CONTINUING THE ENTIRE LENGTH OF THE POST.

OBJECT MARKER POST AND FASTENER DETAILS

GENERAL NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

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

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NUMBER PE-28336
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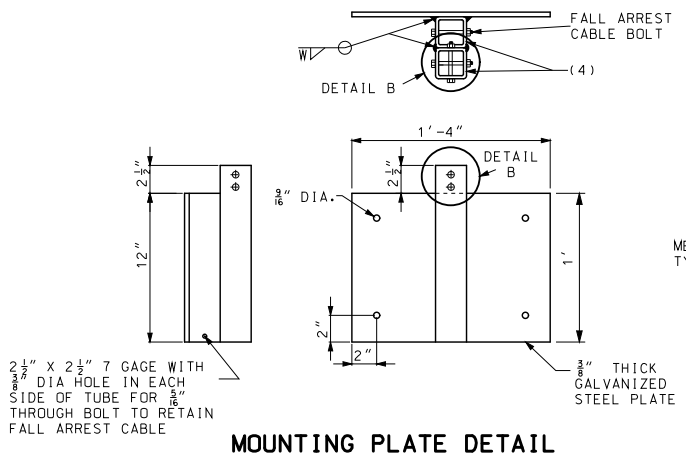
SIGN MOUNTING DETAILS
OBJECT MARKERS FOR ROAD CLOSURE

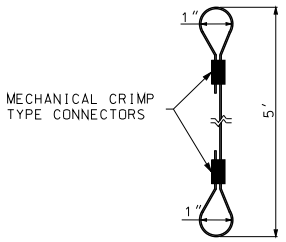
DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

903.03BK

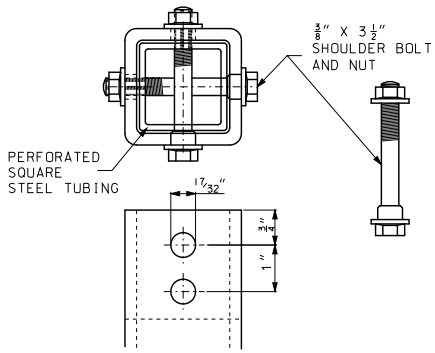
SHEET NO. 14 OF 15



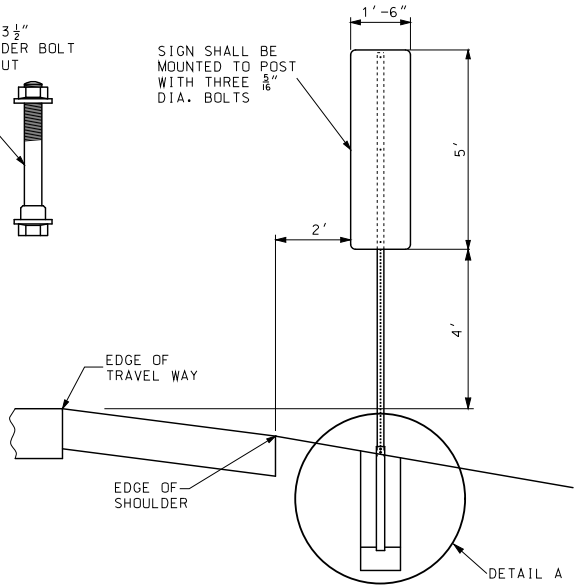
MOUNTING PLATE DETAIL



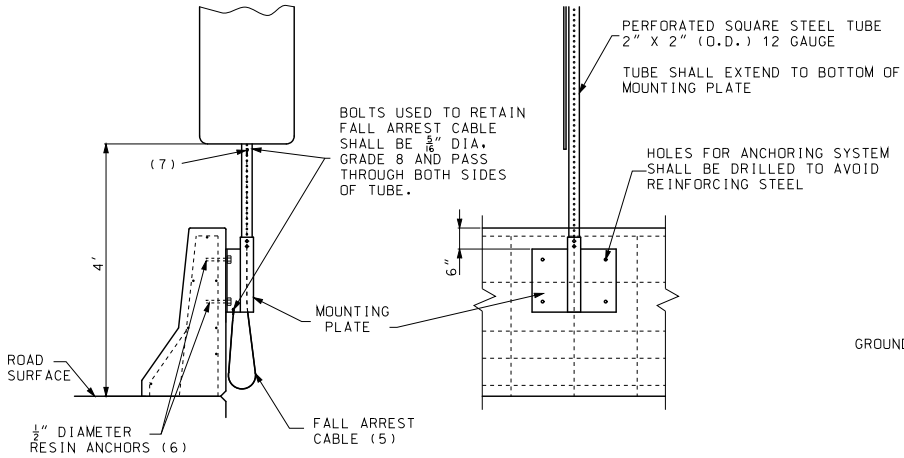
FALL ARREST CABLE DETAIL



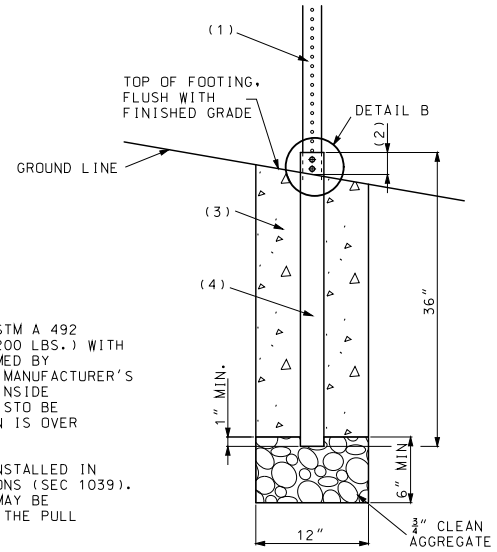
DETAIL B SHOULDER BOLT



GROUND INSTALLATION



BARRIER WALL INSTALLATION



DETAIL A

(1) PERFORATED SQUARE STEEL TUBE 2" X 2" (O.D.) 12 GAUGE. TUBE SHALL EXTEND A MINIMUM OF 6" BELOW THE TOP OF THE FOUNDATION TUBE.

(2) TUBE TO EXTEND ABOVE FOUNDATION ONLY ENOUGH TO ALLOW BOLT TO BE INSERTED 2½" MAXIMUM.

(3) CONCRETE MIX TO HOLD FOUNDATION TUBE PLUMB WITHOUT BRACING SHALL HAVE A MINIMUM OF 5.5 SACKS OF CEMENT PER CUBIC YARD AND A MAXIMUM SLUMP OF 2½".

(4) 2½" x 2½" (O.D.) SQUARE TUBE GALVANIZED 7 GAGE WITH TWO 17/32" DIAMETER HOLES IN EACH FACE ¾" BELOW TOP OF TUBE.

(5) ⅛"x 5' LONG STAINLESS STEEL CABLE (ASTM A 492 TYPE 304 MINIMUIM BREAKING STRENGTH 200 LBS.) WITH A 1" DIA. LOOP AT EACH END LOOPS FORMED BY MECHANICAL CRIMP TYPE CONNECTION PER MANUFACTURER'S SPECIFICATIONS. CABLE IS TO BE RUN INSIDE PERFORATED SQUARE STEEL TUBE. CABLE ISTO BE USED ONLY WHEN SIGN MOUNTING LOCATION IS OVER ANOTHER TRAVELWAY.

(6) ½" DIAMETER RESIN ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD SPECIFICATIONS (SEC 1039). AN APPROVED MAECHANICAL TYPE ANCHOR MAY BE USED IF THE DEVICE EQUALS OR EXCEEDS THE PULL TEST REQUIREMENTS OF SEC. 1039.

(7) FALL ARREST CABLE TO BE SECURED TO NEXT FULL HOLE BELOW SIGN

GENERAL NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 15.

PERFORATED SQUARE STEEL TUBE SHALL BE SECURED TO FOUNDATION TUBE OR BARRIER WALL MOUNTING PLATE WITH A SHOULDER BOLT PER PERFORATED SQUARE STEEL TUBE MANUFACTURER'S SPECIFICATION.

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

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

SIGN MOUNTING DETAILS

EMERGENCY REFERENCE MARKERS

DATE EFFECTIVE: 04/01/2017
DATE PREPARED: 1/30/2017

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