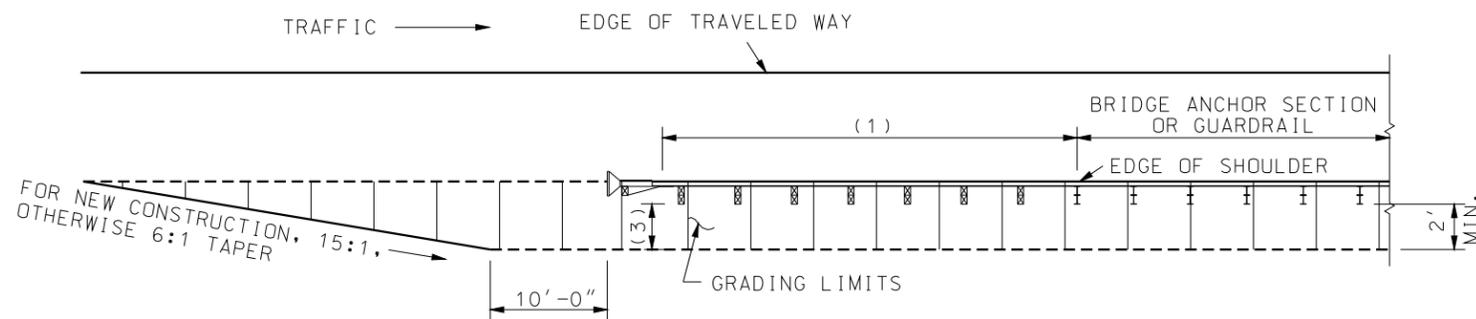
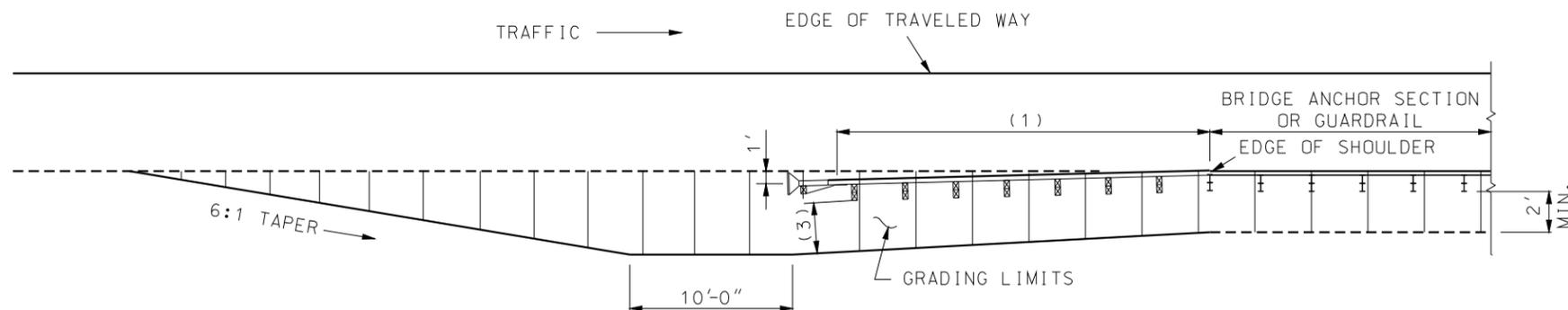


GRADING LIMITS FOR TYPE A FLARED CRASHWORTHY END TERMINAL



GRADING LIMITS FOR TYPE A NON-FLARED CRASHWORTHY END TERMINAL



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

GENERAL NOTES:

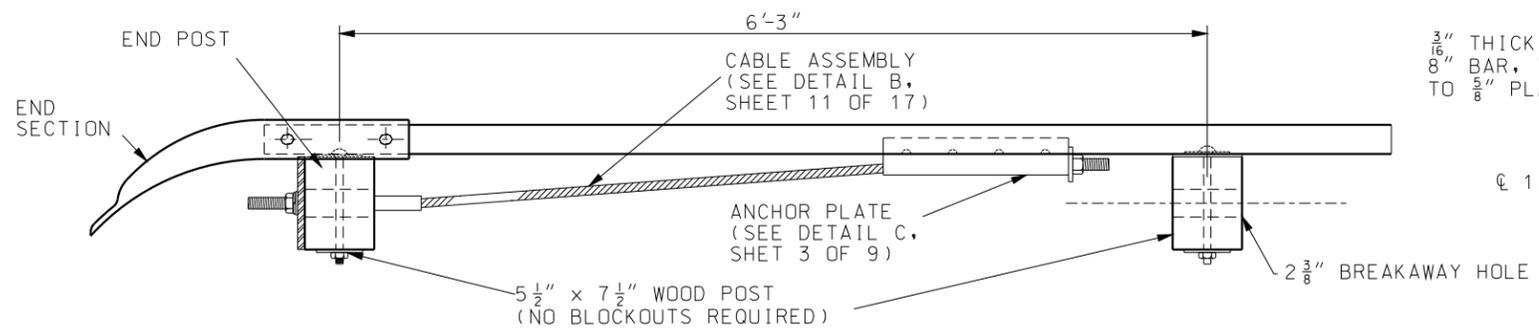
THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH APPROVED SHOP DRAWINGS OF THE APPROVED CRASHWORTHY END TERMINAL.

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

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

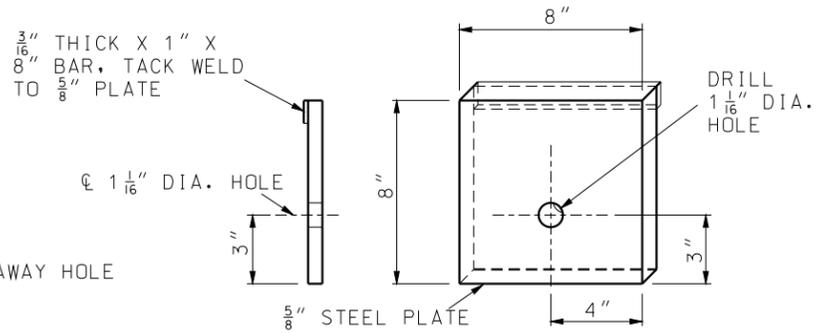
 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center">GUARDRAIL TERMINAL ENDS CRASHWORTHY</p>
DATE EFFECTIVE: 11/01/2012 DATE PREPARED: 9/20/2012	<p align="center">606.30G</p>
SHEET NO. <p align="center">1 OF 8</p>	

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

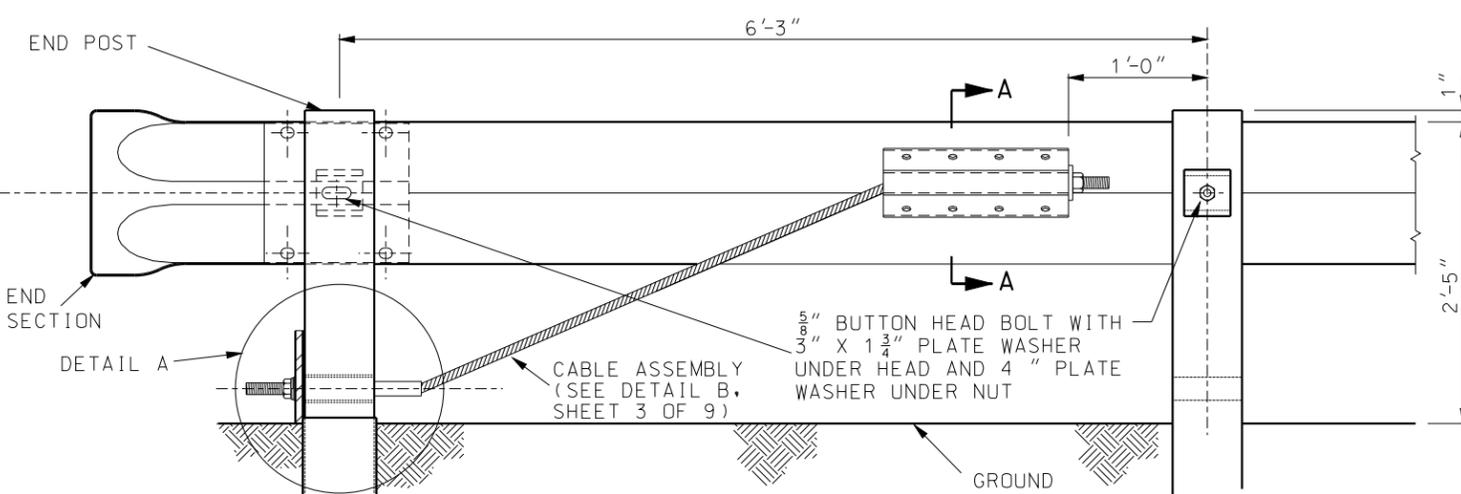


NOTE: SEE SHEET 7 OF 17 FOR DETAILS OF END SECTION.

PLAN



DETAIL OF STEEL BEARING PLATE

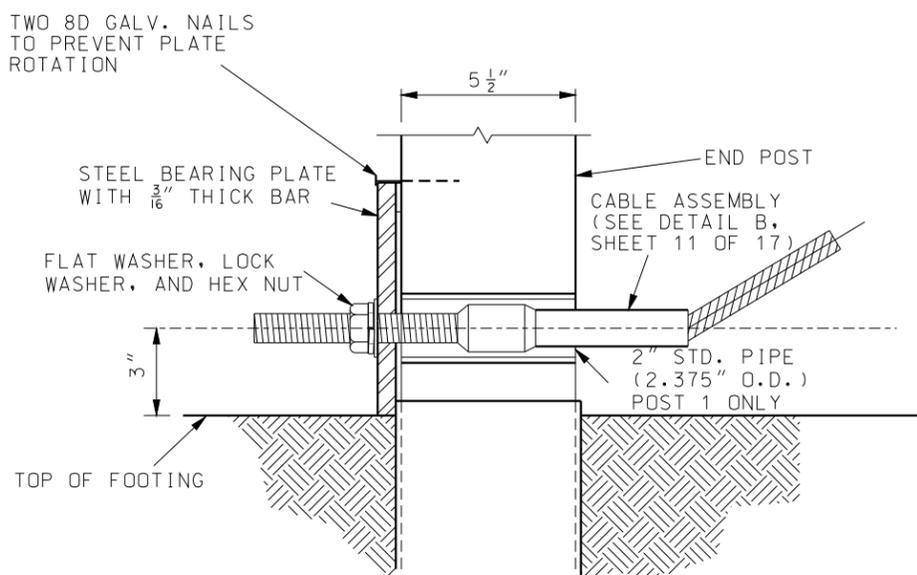


POST 1

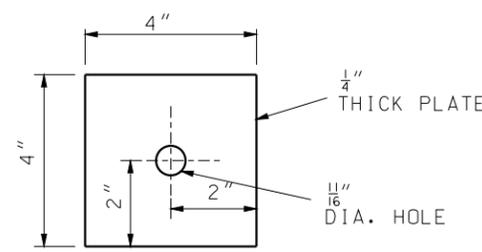
ELEVATION (BACK SIDE)

POST 2

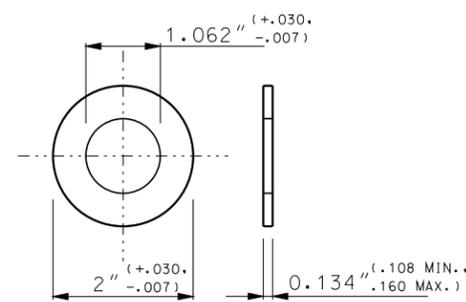
END ANCHOR DETAILS



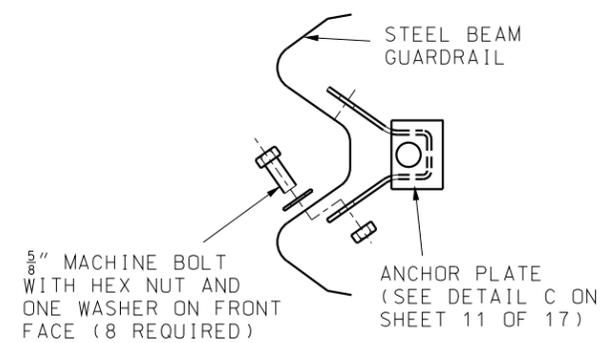
DETAIL A (END POST DETAIL)



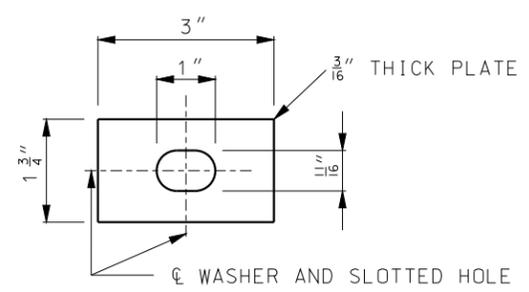
4" PLATE WASHER



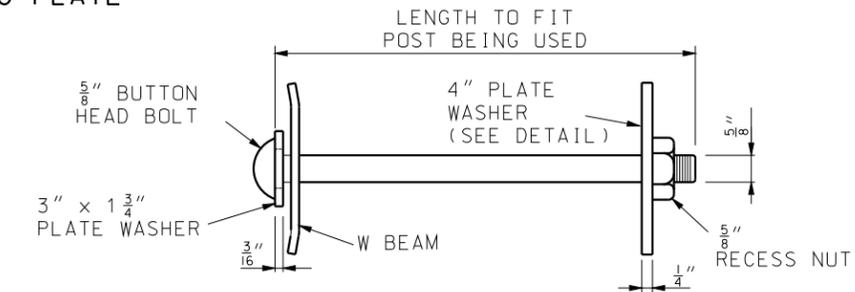
TYPE A WASHER



SECTION A-A



3" x 1 3/4" PLATE WASHER



POST BOLT ASSEMBLY

GENERAL NOTES:

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

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

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

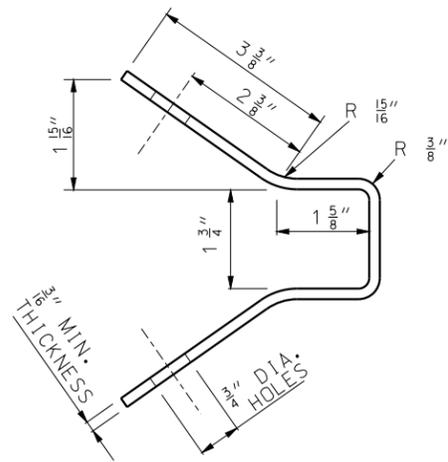
ALL FITTINGS AND HARDWARE REQUIRED SHALL BE GALVANIZED AFTER FABRICATION, SEE SECTION 1040 STANDARD SPECIFICATION.

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

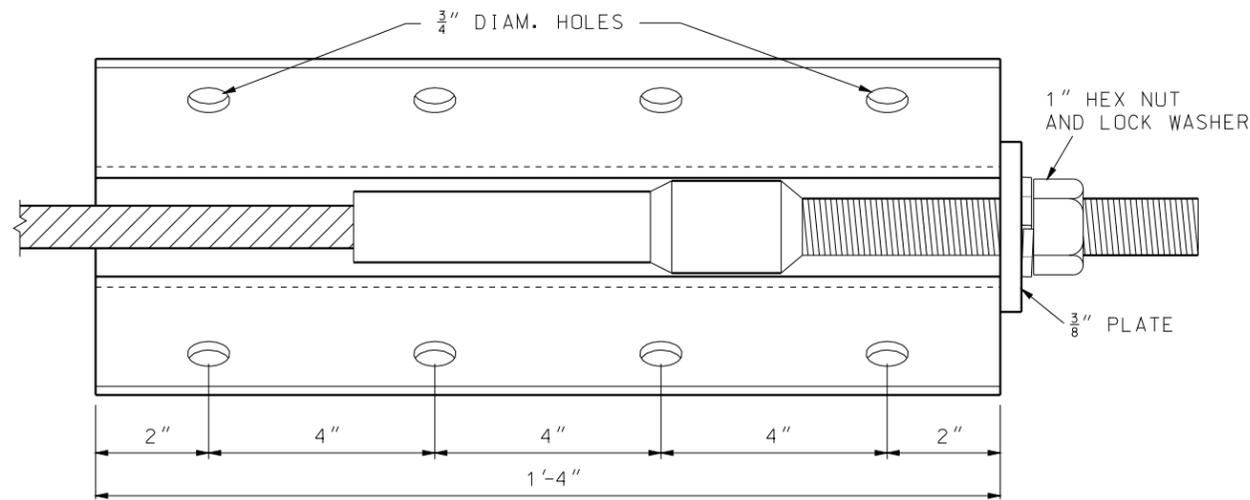
SEE SHEET 4 FOR WOOD POST DETAILS.

<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>KATHRYN PHILLIPS HARVEY NUMBER PE-23751 PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p>GUARDRAIL TERMINAL ANCHOR ENDS</p>
<p>DATE EFFECTIVE: 11/01/2012 DATE PREPARED: 9/20/2012</p>	<p>606.30G</p>
<p>SHEET NO. 2 OF 8</p>	

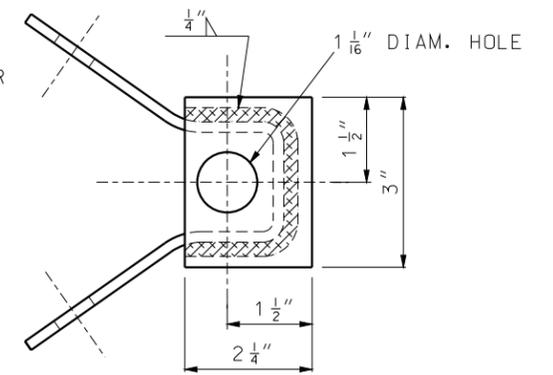
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



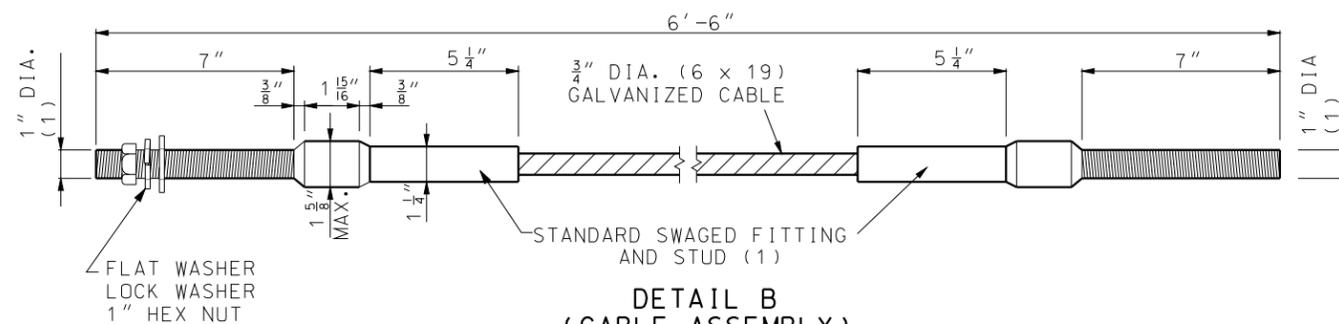
FABRICATION DETAIL



DETAIL C
ASSEMBLED VIEW
(ANCHOR PLATE)

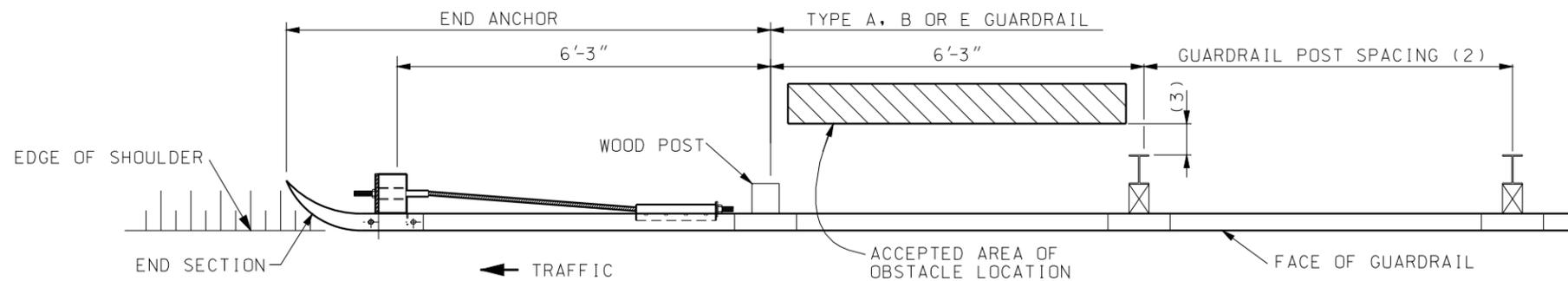


END VIEW

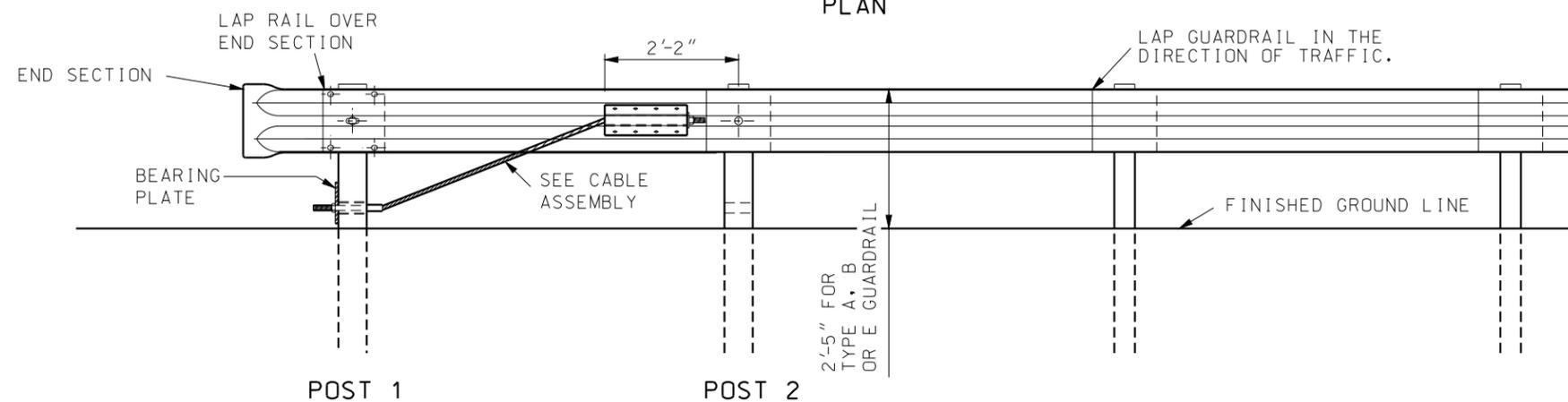


DETAIL B
(CABLE ASSEMBLY)

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



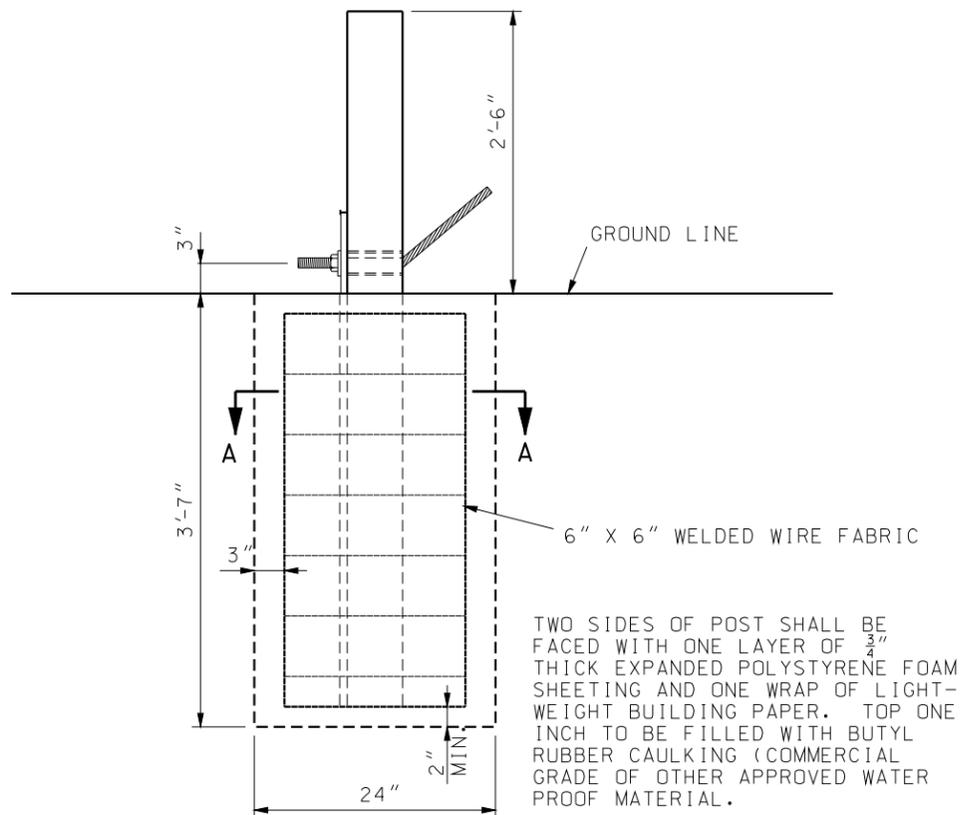
PLAN



ELEVATION
END ANCHOR

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center">GUARDRAIL TERMINAL ANCHOR ENDS</p>
DATE EFFECTIVE: 11/01/2012 DATE PREPARED: 9/20/2012	<p align="center">606.30G</p>
SHEET NO. <p align="center">3 OF 8</p>	

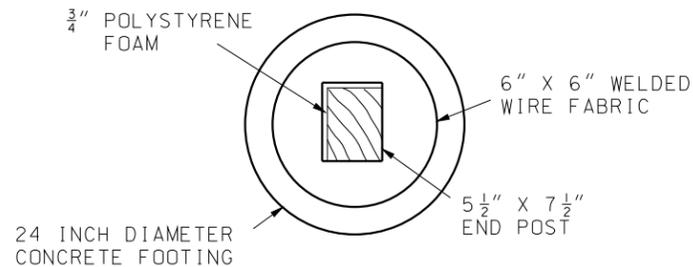
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



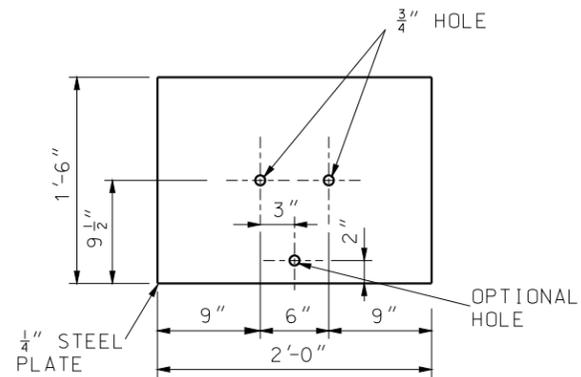
POST 1

CONCRETE FOUNDATION FOR END ANCHORS

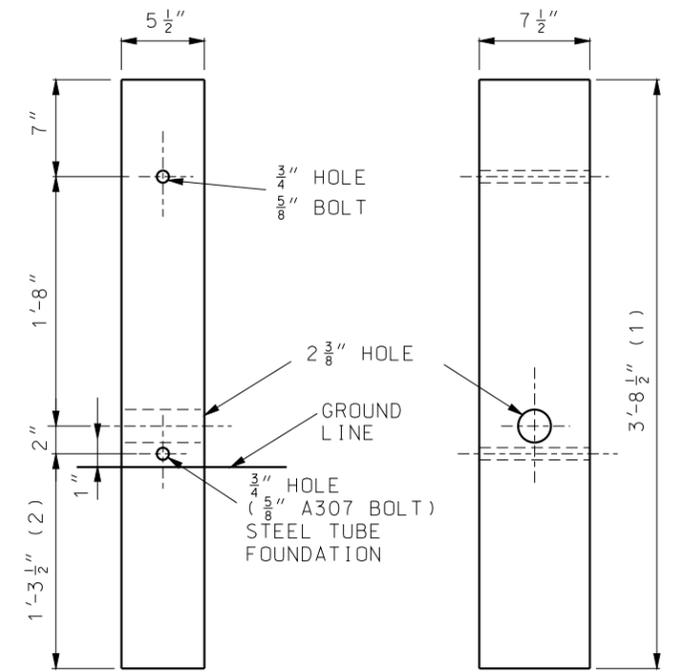
TWO SIDES OF POST SHALL BE FACED WITH ONE LAYER OF $\frac{3}{4}$ " THICK EXPANDED POLYSTYRENE FOAM SHEETING AND ONE WRAP OF LIGHT-WEIGHT BUILDING PAPER. TOP ONE INCH TO BE FILLED WITH BUTYL RUBBER CAULKING (COMMERCIAL GRADE OR OTHER APPROVED WATER PROOF MATERIAL).



SECTION A-A
EXPANDED POLYSTYRENE FOAM
INSTALLATION DETAIL



SOIL PLATE

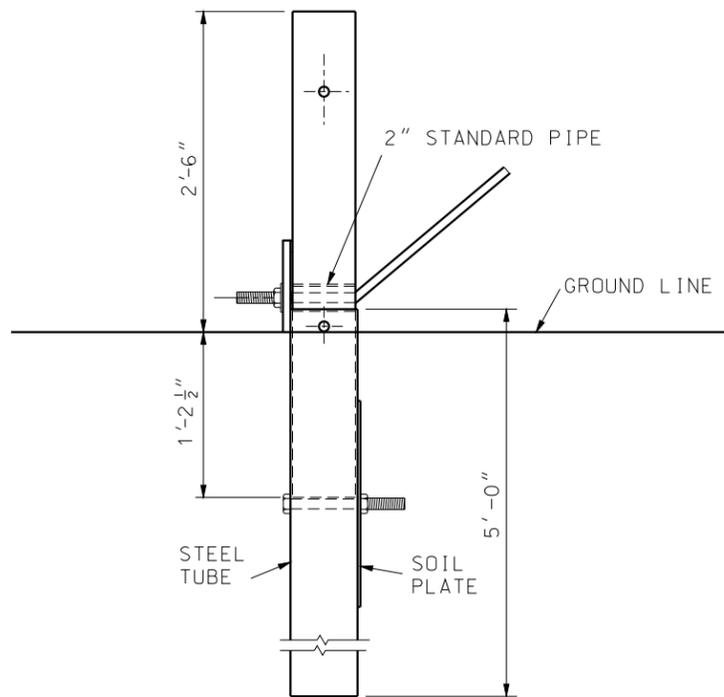


FRONT VIEW

SIDE VIEW

WOOD BREAKAWAY POST
SEE SECTION 1050

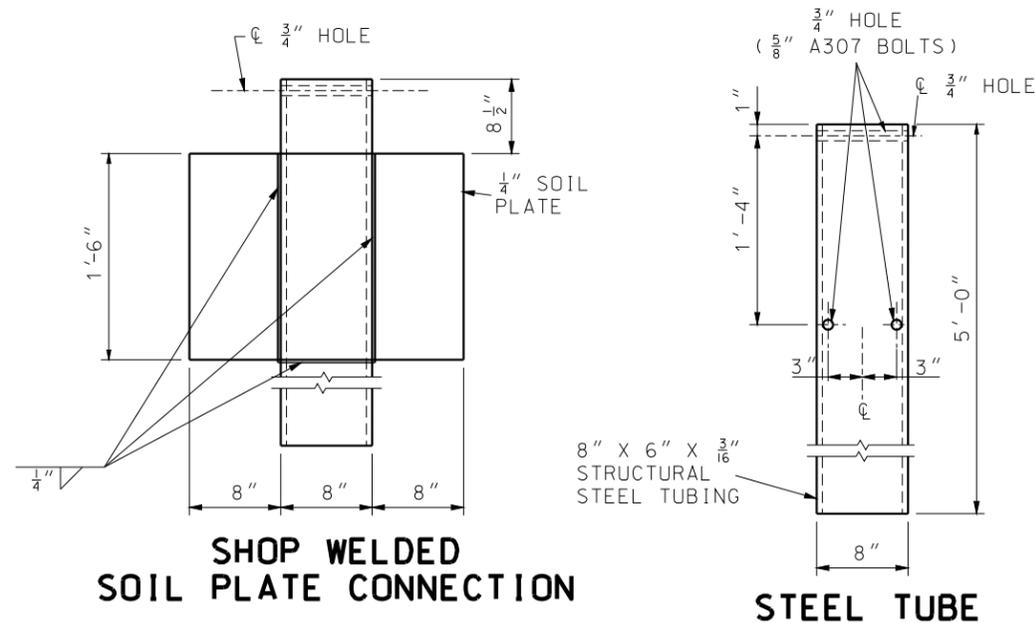
- (1) 5'-11 1/2" FOR CONCRETE FOUNDATION ALTERNATE.
- (2) 3'-8 1/2" FOR CONCRETE FOUNDATION ALTERNATE.



POST 1

STEEL TUBE FOUNDATION FOR END ANCHORS

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



**SHOP WELDED
SOIL PLATE CONNECTION**

STEEL TUBE

GENERAL NOTES:

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

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

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

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

STATE OF MISSOURI
KATHRYN PHILLIPS HARVEY
NUMBER PE-23751
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

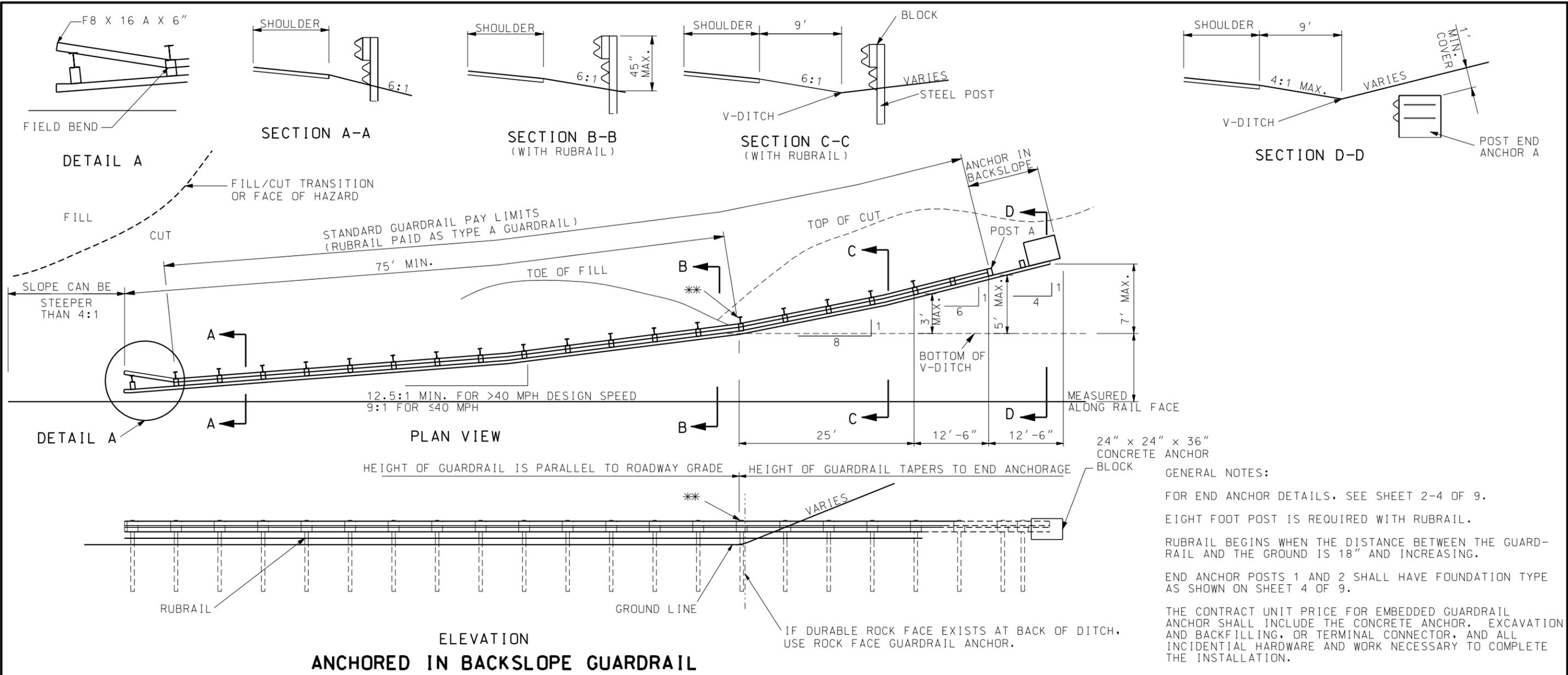
**GUARDRAIL
TERMINAL ANCHOR ENDS**

DATE EFFECTIVE: 11/01/2012
DATE PREPARED: 9/20/2012

606.30G

SHEET NO.
4 OF 8

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



ANCHORED IN BACKSLOPE GUARDRAIL

GENERAL NOTES:

FOR END ANCHOR DETAILS, SEE SHEET 2-4 OF 9.

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 4 OF 9.

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

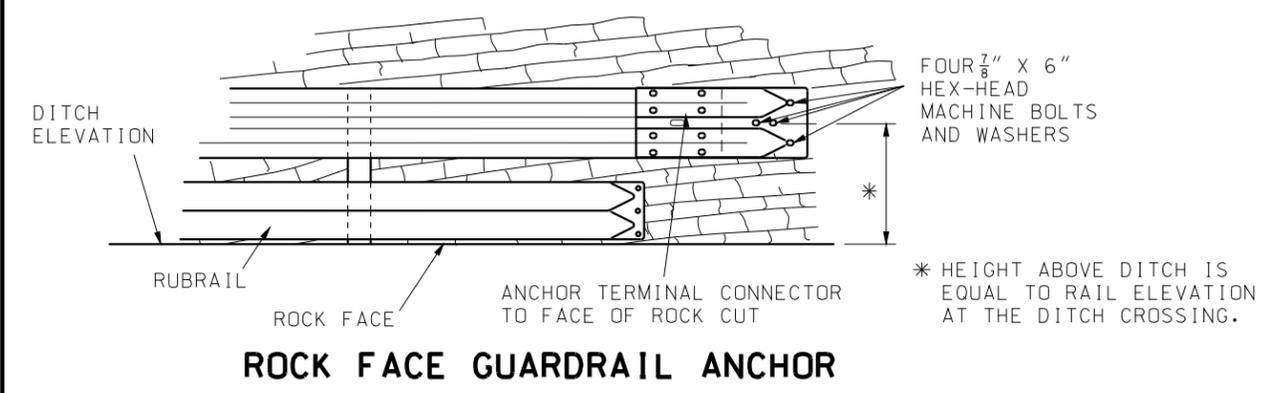
THE GUARDRAIL SHALL EXTEND 50' ± BEYOND THE DITCH LINE AND TERMINATE A MINIMUM OF 12 INCHES BELOW GROUND ELEVATION OF THE BACKSLOPE.

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.

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

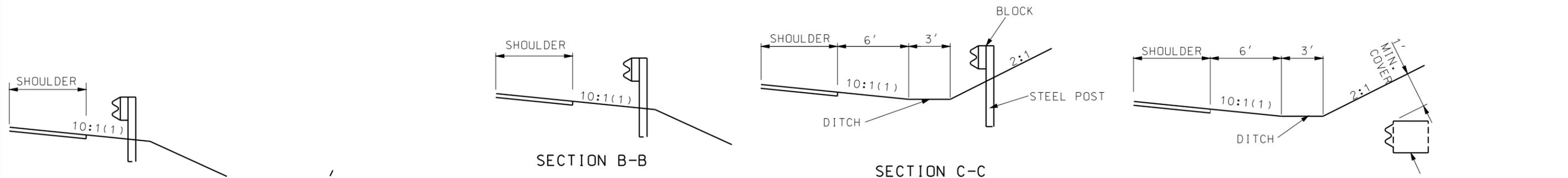
COST OF SHAPING ROCK FACE FOR PLACING OF TERMINAL CONNECTOR, DRILLING HOLES, FURNISHING AND PLACING BOLTS, WASHERS, CAULKING, ANCHORS AND END SHOE TO BE INCLUDED IN THE PRICE OF GUARDRAIL ANCHOR, ROCK FACE.



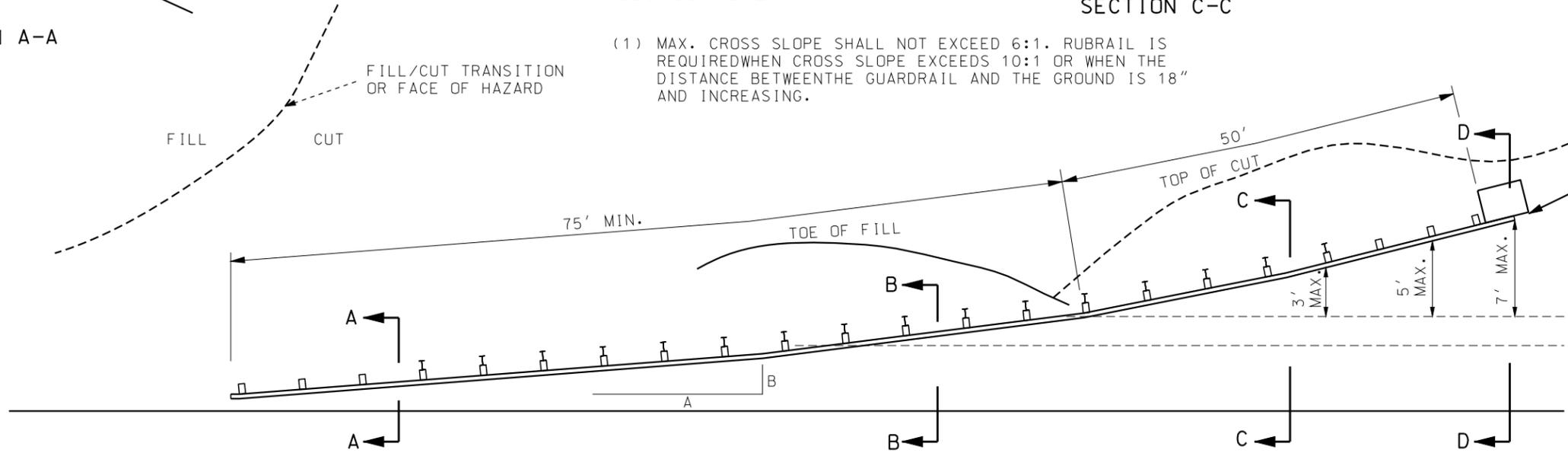
ROCK FACE GUARDRAIL ANCHOR

<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>STATE OF MISSOURI KATHRYN PHILLIPS HARVEY NUMBER PE-23751 PROFESSIONAL ENGINEER</p> <p>THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.</p>	<p>GUARDRAIL TERMINAL ENDS EMBEDDED AND ROCK FACE (V-DITCH STEEPER THAN 10:1, 4:1 MAX. FORESLOPE)</p>
<p>DATE EFFECTIVE: 11/01/2012 DATE PREPARED: 9/20/2012</p>	<p>606.30G</p>
<p>SHEET NO. 5 OF 8</p>	

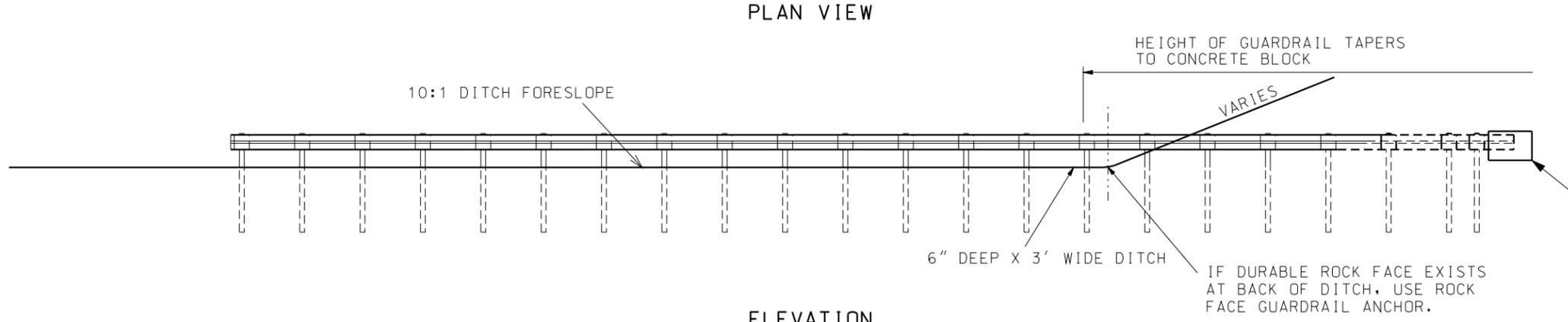
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



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



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



**ELEVATION
ANCHORED IN BACKSLOPE GUARDRAIL**

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

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

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

THIS SHEET HAS BEEN
SIGNED, SEALED AND DATED
ELECTRONICALLY.

DATE EFFECTIVE: 11/01/2012
DATE PREPARED: 9/20/2012

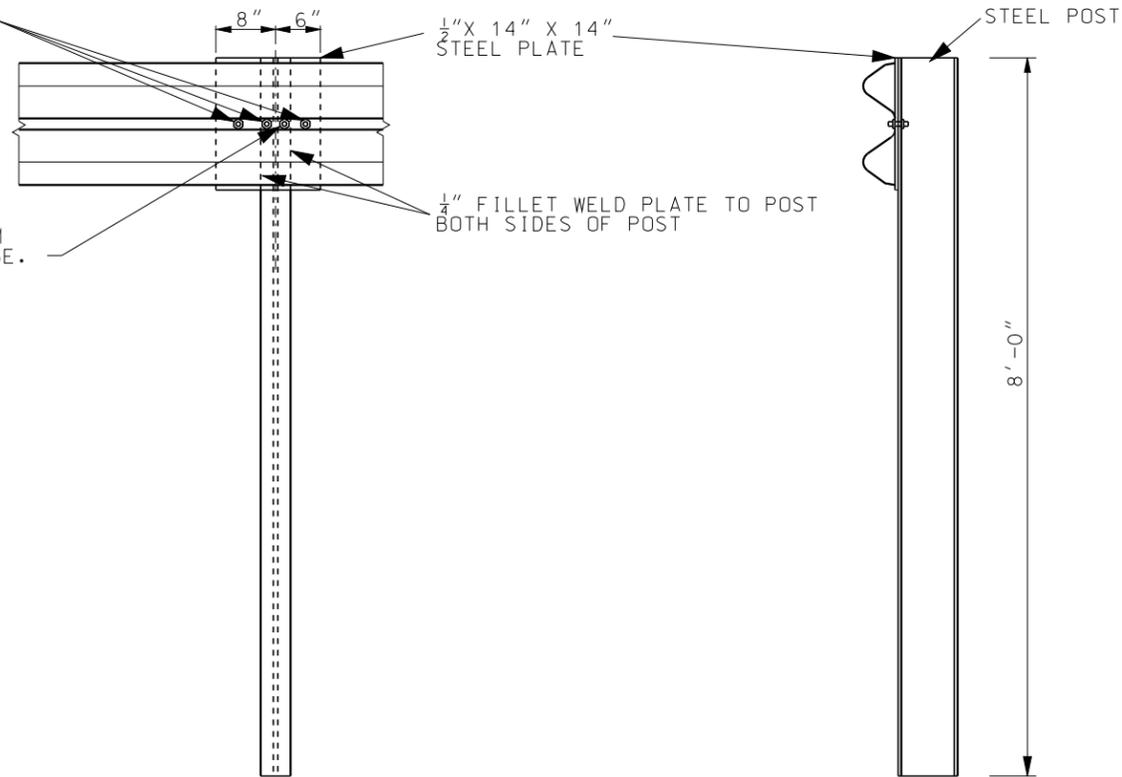
606.30G

SHEET NO.
6 OF 8

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

3 - 1" Ø HOLES TO BE FIELD DRILLED IN W-BEAM ELEMENT AND ATTACHED WITH 7/8" Ø HEX HEAD BOLTS 1 7/16" LONG EACH WITH ONE SQUARE WASHER AND HEX NUT.

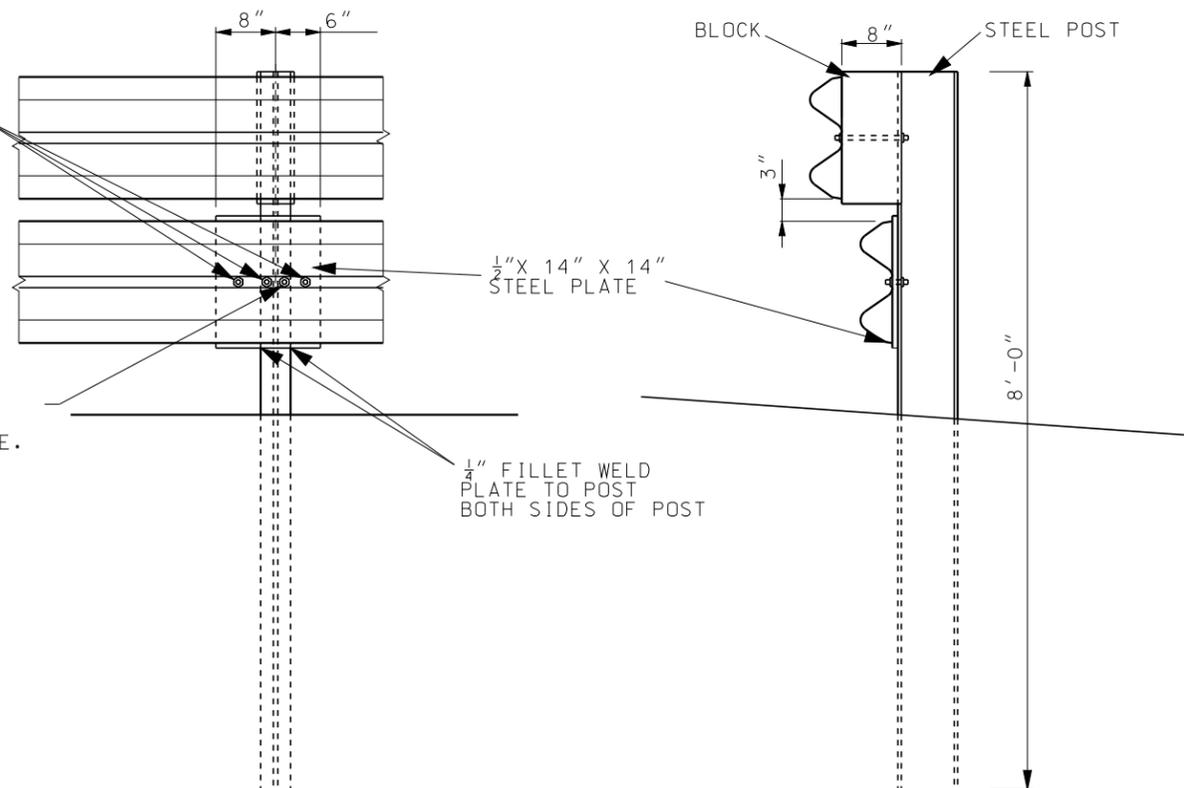
1" Ø HOLE TO BE FIELD DRILLED THROUGH W-BEAM AND THROUGH POST FLANGE. ATTACHED W-BEAM WITH 7/8" Ø HEX HEAD BOLT 2" LONG WITH ONE SQUARE WASHER AND HEX NUT.



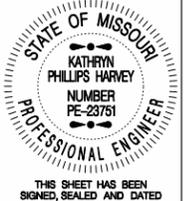
EMBEDDED STEEL POST

3 - 1" Ø HOLES TO BE FIELD DRILLED IN W-BEAM ELEMENT AND ATTACHED WITH 7/8" Ø HEX HEAD BOLTS 1 7/16" LONG EACH WITH ONE SQUARE WASHER AND HEX NUT.

1" Ø HOLE TO BE FIELD DRILLED THROUGH W-BEAM AND THROUGH POST FLANGE. ATTACHED W-BEAM WITH 7/8" Ø HEX HEAD BOLT 2" LONG WITH ONE SQUARE WASHER AND HEX NUT.



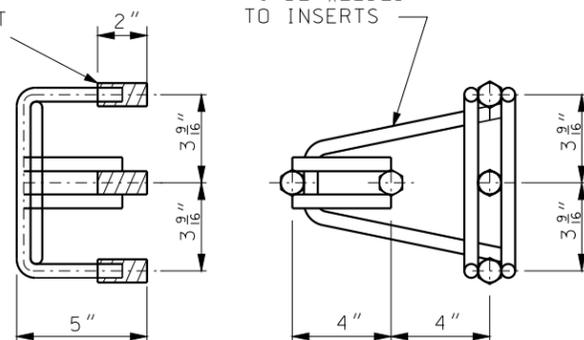
SPECIAL RUBRAIL TO POST CONNECTION AT POST A

 MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	<p align="center">GUARDRAIL EMBEDDED ANCHOR TERMINAL ENDS (STEEL POST OPTION)</p>
DATE EFFECTIVE: 11/01/2012 DATE PREPARED: 9/20/2012	<p align="center">606.30G</p>
SHEET NO. 7 OF 8	

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

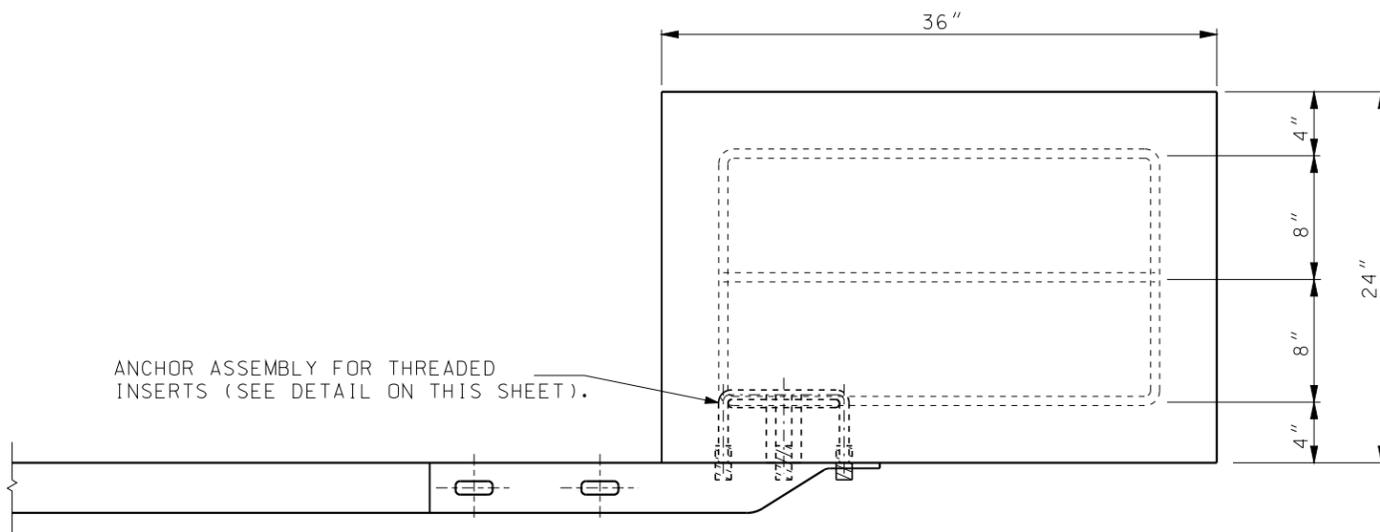
THREADED INSERTS FOR $\frac{15}{16}$ " X 2" GALVANIZED HEX HEAD CAP SCREWS. CAP SCREWS TO BE THREADED A MINIMUM $1\frac{7}{8}$ ". INSERTS THREADED MINIMUM OF $1\frac{3}{4}$ ".

END OF INSERT TO BE CLOSED



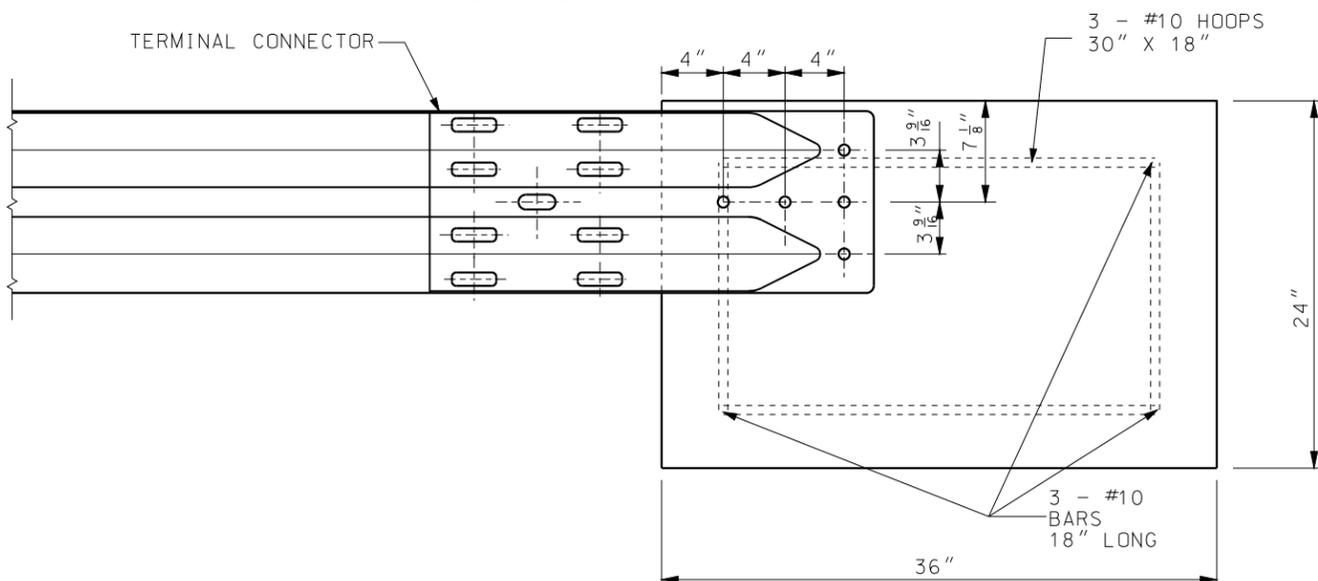
CONCRETE BLOCK ANCHOR ANCHOR ASSEMBLY

ANCHOR ASSEMBLY FOR THREADED INSERTS (SEE DETAIL ON THIS SHEET).

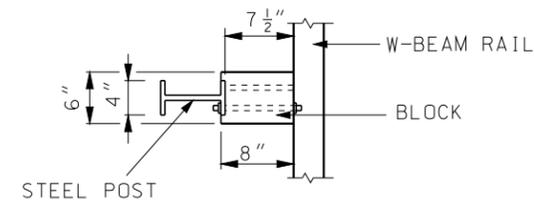


TOP VIEW

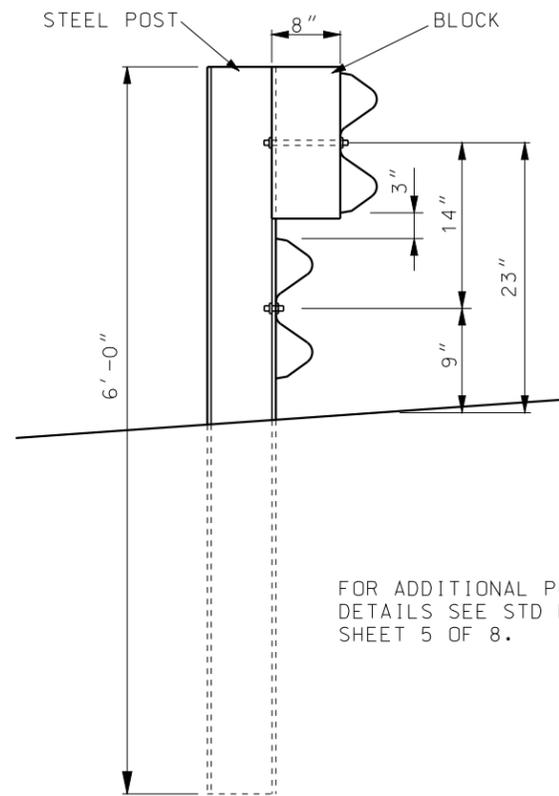
TERMINAL CONNECTOR



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



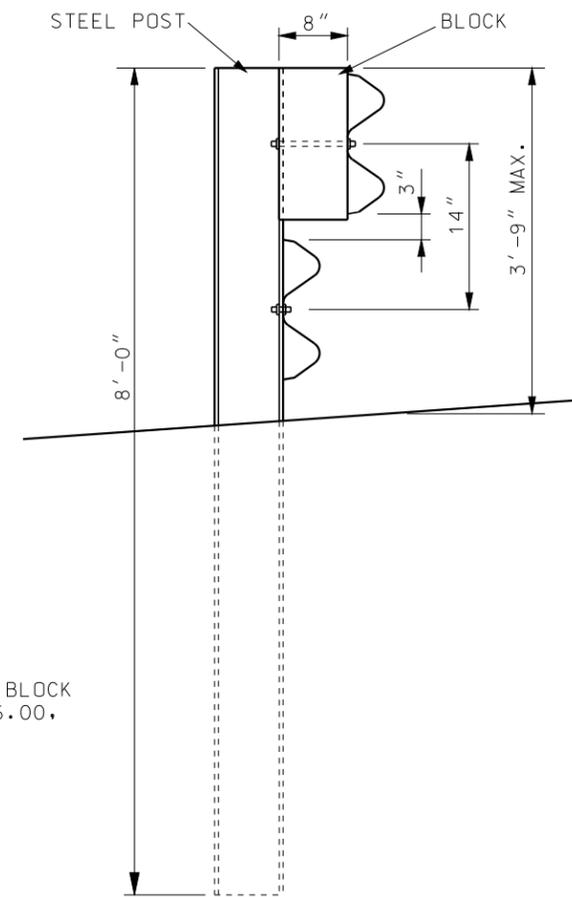
PLAN



ELEVATION OF 6' POST

STEEL POST AND BLOCK DETAIL

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



ELEVATION 8' POST

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

STATE OF MISSOURI
 KATHRYN PHILLIPS HARVEY
 NUMBER PE-23751
 PROFESSIONAL ENGINEER

DATE EFFECTIVE: 11/01/2012
 DATE PREPARED: 9/20/2012

GUARDRAIL EMBEDDED TERMINAL ENDS GENERAL DETAILS

606.30G

SHEET NO. 8 OF 8