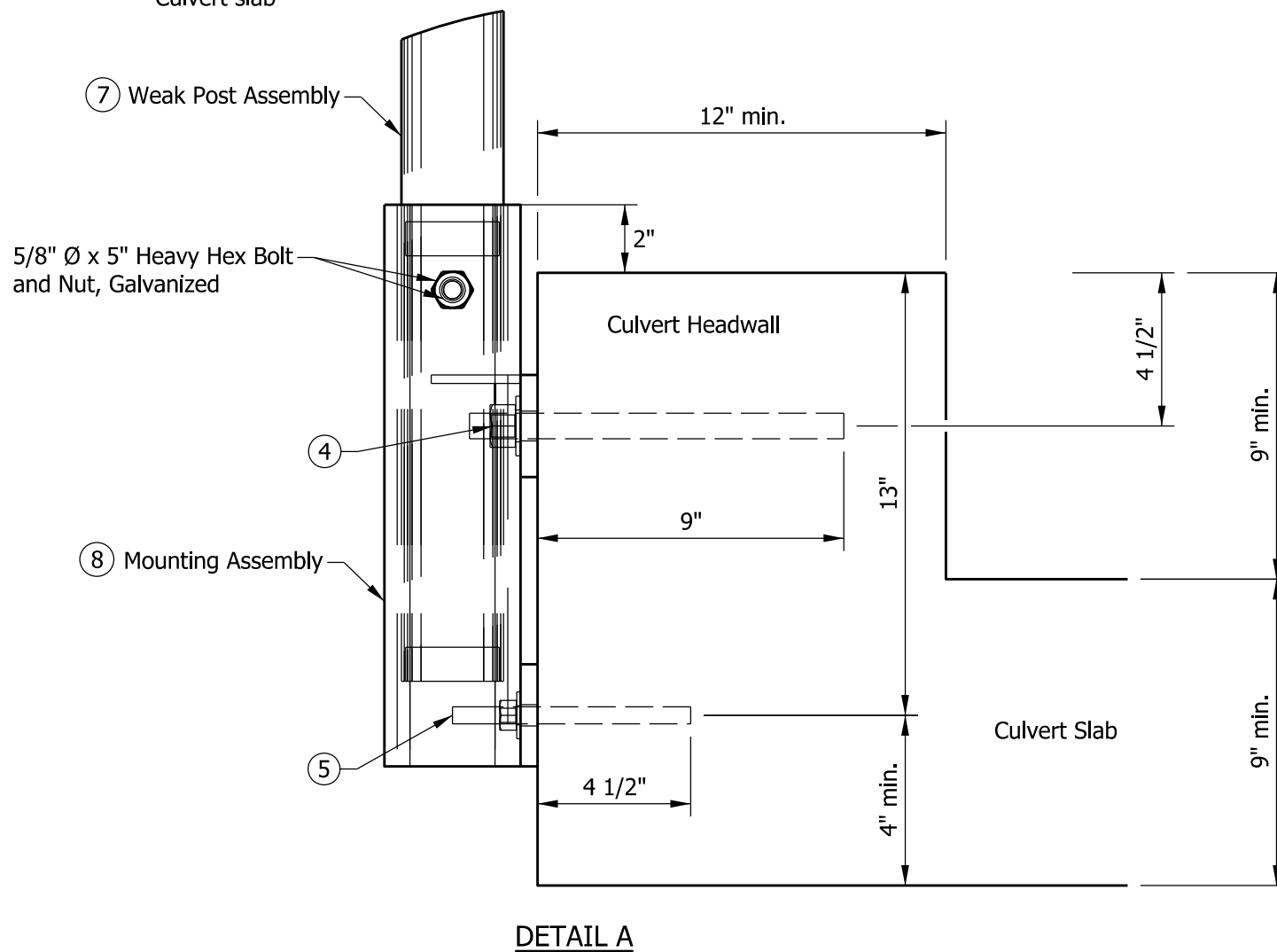

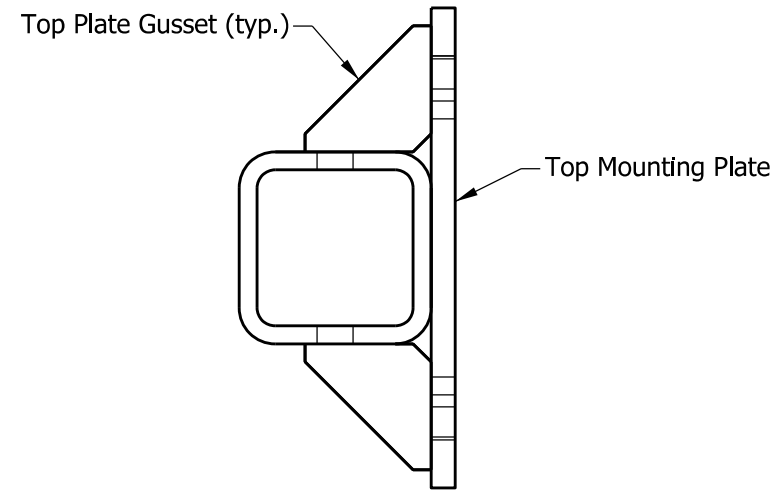


**NOTES:**

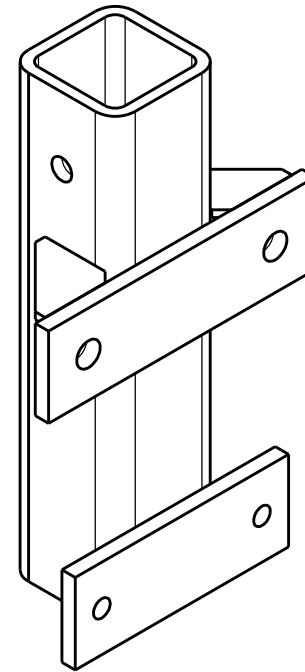
1. Install headwall-mounted post where standard post embedment or a long-span system can not be installed.
2. Headwall-mounted post shall be spaced at 3ft-1 1/2 in. on centers along the culvert headwall. The minimum culvert headwall reinforcement shall be 4-#4 longitudinal steel evenly spaced and #4 transverse stirrups spaced on 12 in. centers. The minimum culvert slab reinforcement shall be #5 longitudinal steel on 12 in. centers and #4 transverse reinforcement on 18 in. centers for both the top and bottom slab reinforcement. Other loads to complete the design of the culvert may call for more reinforcement.
3. The minimum compressive concrete strength shall be 4000 psi.
- ④ The anchor bolt shall be 3/4 in. dia. threaded rod, cut off to 11 in. length, with round washer and nut, galvanized. The minimum embedment shall be 9 in. The minimum epoxy bond strength shall be 1305 psi.
- ⑤ The anchor bolt shall be 1/2 in. dia. threaded rod, cut off to 7 in. length, with round washer and nut, galvanized. The minimum embedment shall be 4 1/2 in. The minimum epoxy bond strength shall be 1305 psi.
6. The top of the post may be field cut to adjust the length. Where the post is field cut, drill holes at appropriate locations. All cut and hole surfaces shall receive a galvanized coating.
- ⑦ See Standard Drawing E 601-MGSA-25 for mounting assembly details.
- ⑧ See Standard Drawing E 601-MGSA-27 for weak-post assembly details.



|   |  |                           |      |                |      |
|---|--|---------------------------|------|----------------|------|
| INDIANA DEPARTMENT OF TRANSPORTATION  |  |                           |      |                |      |
| MIDWEST GUARDRAIL SYSTEM ASSEMBLY,<br>HEADWALL-MOUNTED POST                           |  |                           |      |                |      |
| SEPTEMBER 2019  |  |                           |      |                |      |
| STANDARD DRAWING NO.  | E 601-MGSA-24  |                           |      |                |      |
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| DESIGN STANDARDS ENGINEER   | DATE   |                           |      |                |      |
| CHIEF ENGINEER  | DATE   |                           |      |                |      |

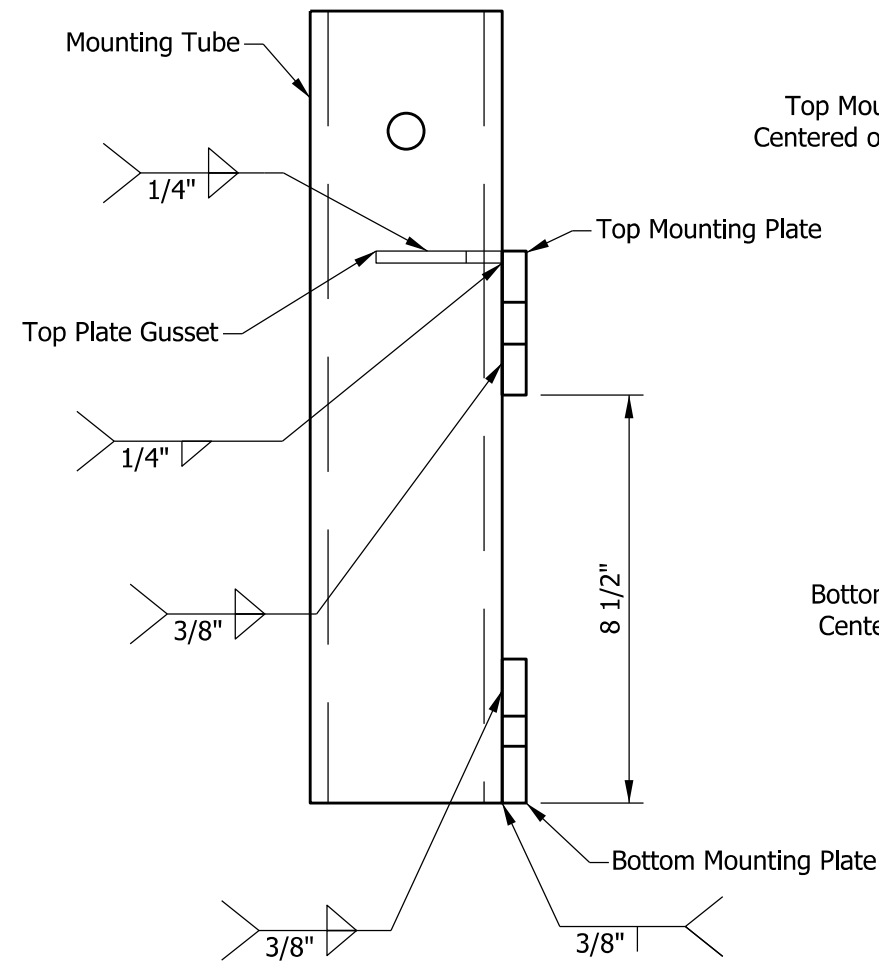


TOP VIEW

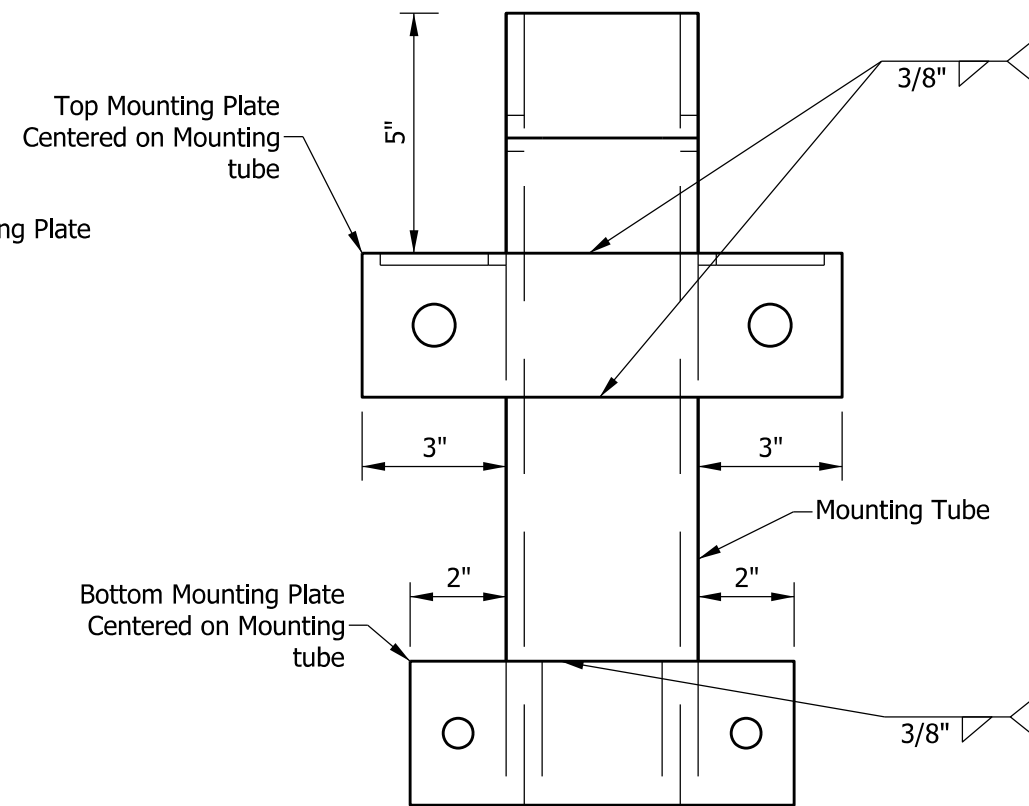


NOTES:

1. See Standard Drawing E 601-MGSA-26 for top and bottom mounting plate, top plate gusset, and mounting tube details.
2. The mounting assembly shall be galvanized after welding.



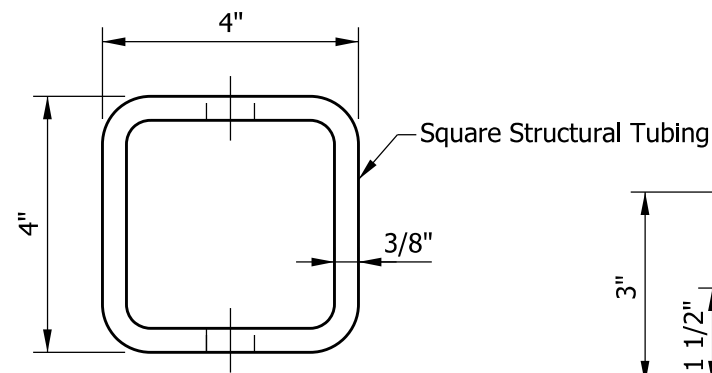
SIDE VIEW



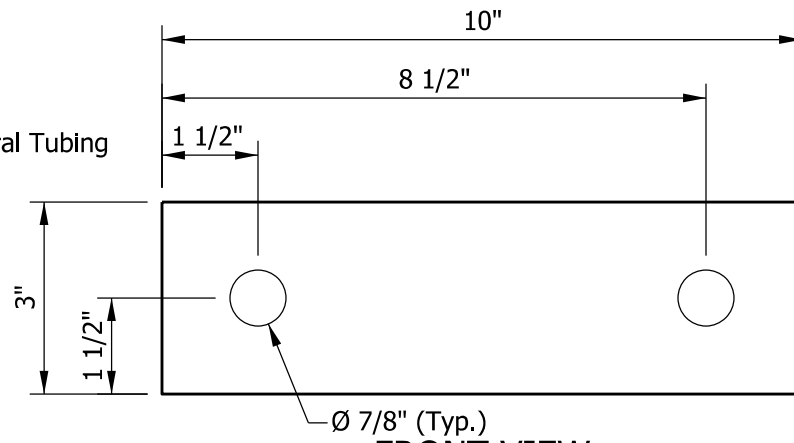
FRONT VIEW

MOUNTING ASSEMBLY

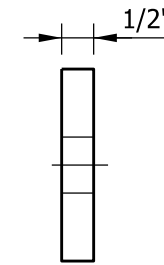
|   |  |
|---|--|
| INDIANA DEPARTMENT OF TRANSPORTATION                        |  |
| MIDWEST GUARDRAIL SYSTEM ASSEMBLY,<br>HEADWALL-MOUNTED POST |  |
| SEPTEMBER 2019  |  |
| STANDARD DRAWING NO.  | E 601-MGSA-25                              |
|   | DESIGN STANDARDS ENGINEER _____ DATE _____ |
|   | CHIEF ENGINEER _____ DATE _____            |



TOP VIEW

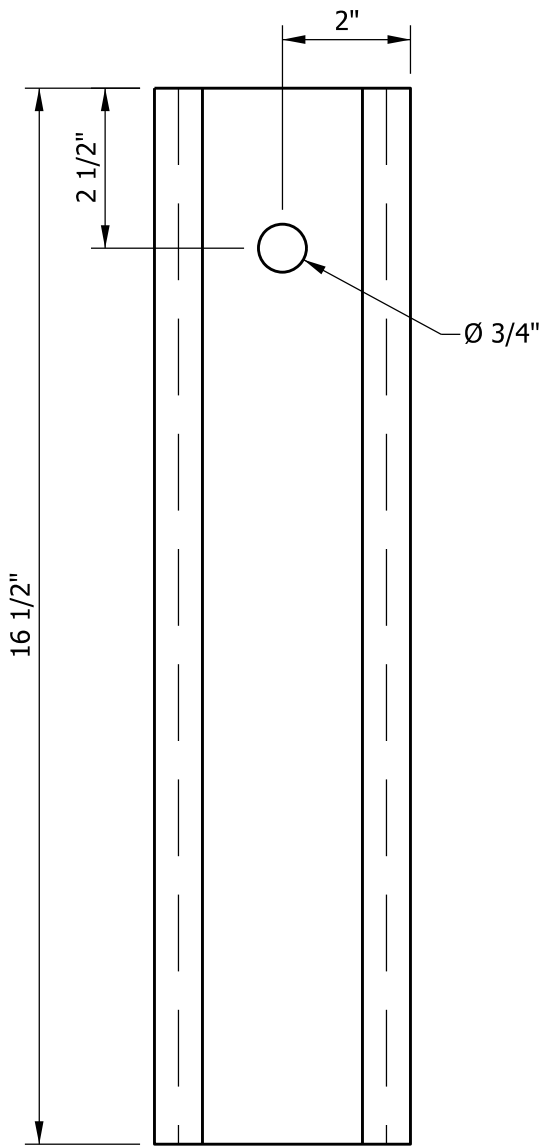


FRONT VIEW



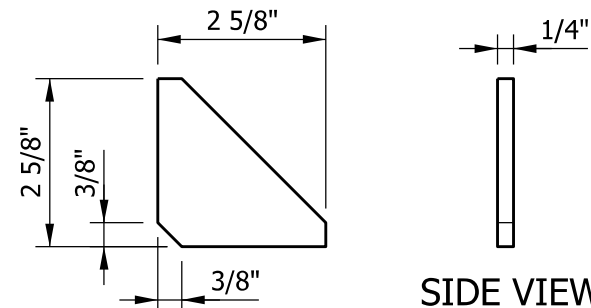
SIDE VIEW

TOP MOUNTING PLATE



SIDE VIEW

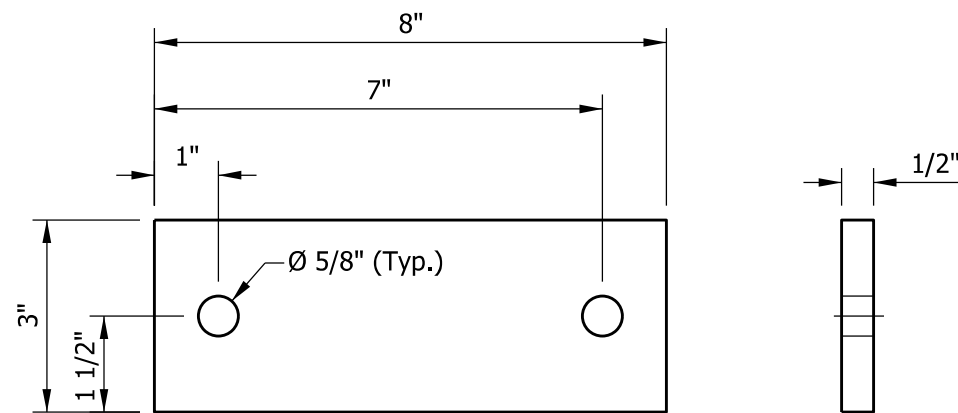
MOUNTING TUBE



TOP VIEW

SIDE VIEW

TOP PLATE GUSSET



FRONT VIEW

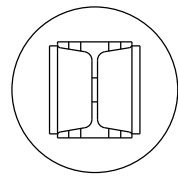
SIDE VIEW

BOTTOM MOUNTING PLATE

NOTES:

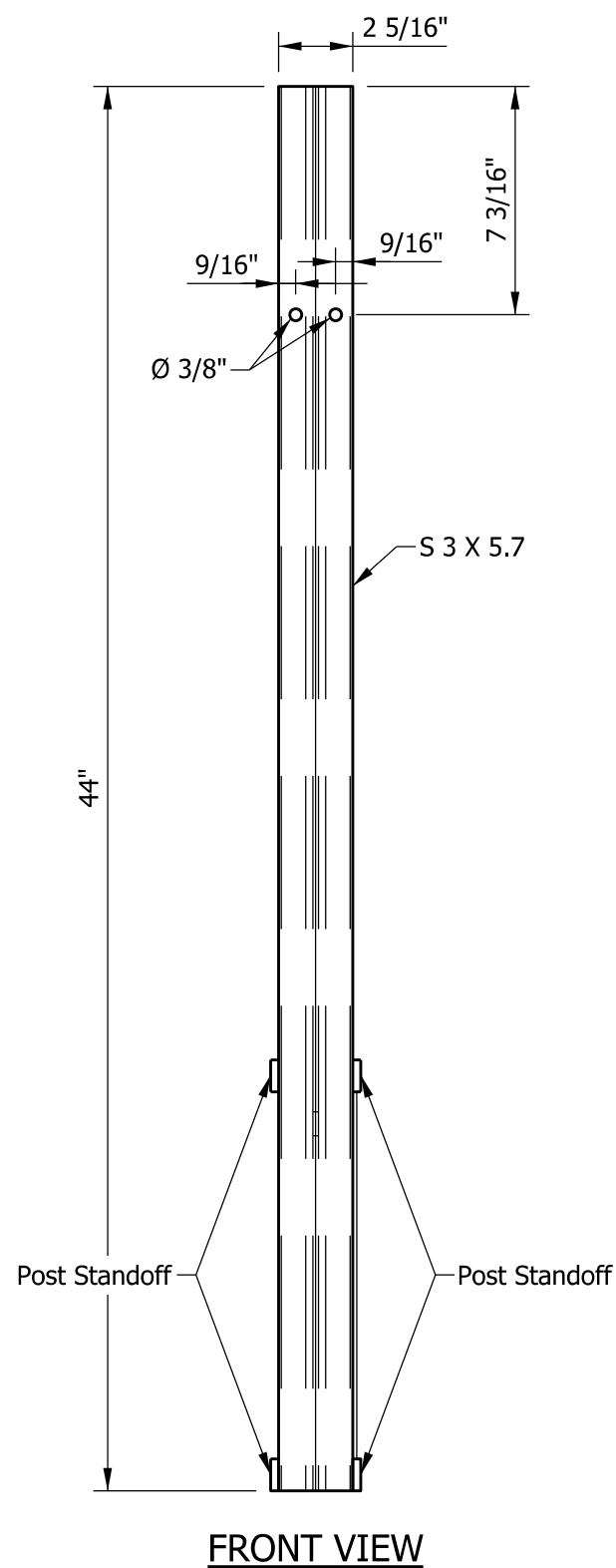
1. The mounting tube shall be ASTM A500 Grade B steel galvanized.
2. All plates shall be ASTM A572 Grade 50 steel galvanized.

|   |   |                           |      |                |      |
|---|---|---------------------------|------|----------------|------|
| INDIANA DEPARTMENT OF TRANSPORTATION                        |   |                           |      |                |      |
| MIDWEST GUARDRAIL SYSTEM ASSEMBLY,<br>HEADWALL-MOUNTED POST |   |                           |      |                |      |
| SEPTEMBER 2019  |   |                           |      |                |      |
| STANDARD DRAWING NO.  | E 601-MGSA-26   |                           |      |                |      |
|   | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-top: 1px solid black; width: 80%; padding: 2px 5px;">DESIGN STANDARDS ENGINEER</td> <td style="border-top: 1px solid black; width: 20%; padding: 2px 5px;">DATE</td> </tr> <tr> <td style="border-top: 1px solid black; padding: 2px 5px;">CHIEF ENGINEER</td> <td style="border-top: 1px solid black; padding: 2px 5px;">DATE</td> </tr> </table> | DESIGN STANDARDS ENGINEER | DATE | CHIEF ENGINEER | DATE |
| DESIGN STANDARDS ENGINEER                                   | DATE  |                           |      |                |      |
| CHIEF ENGINEER  | DATE  |                           |      |                |      |



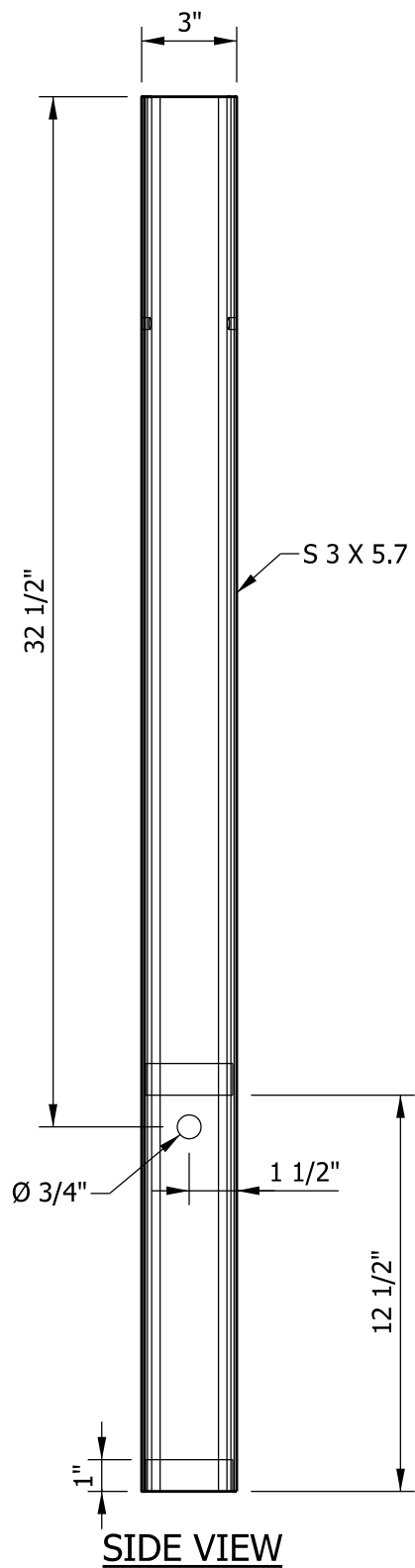
See Detail B

TOP VIEW

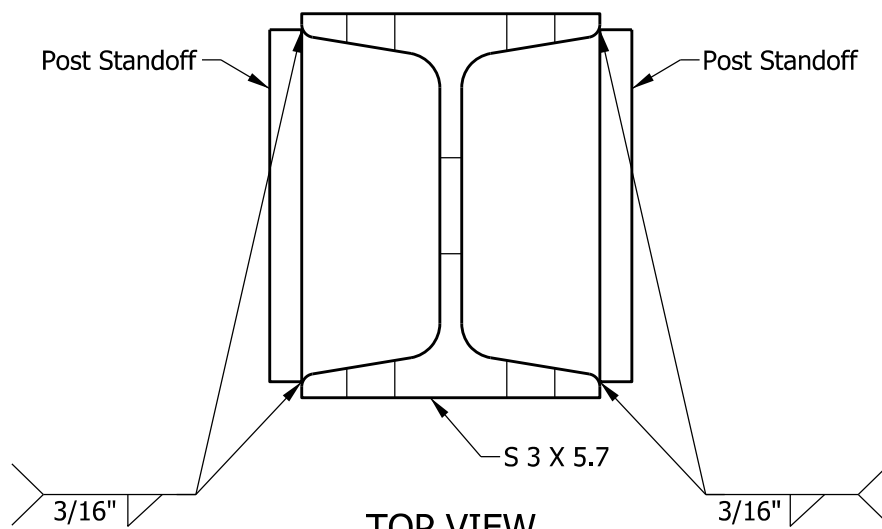


FRONT VIEW

WEAK POST ASSEMBLY

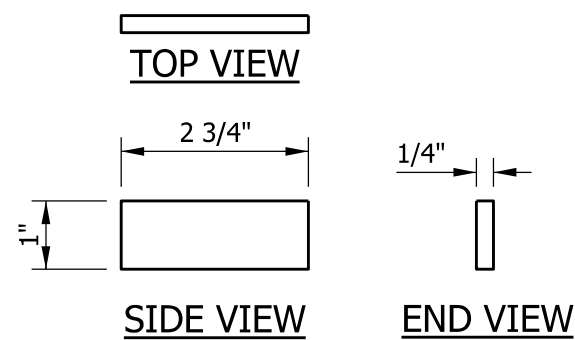


SIDE VIEW



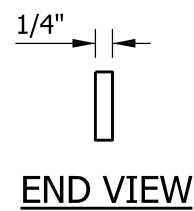
TOP VIEW

DETAIL B



TOP VIEW

SIDE VIEW



END VIEW

POST STANDOFF

NOTES:

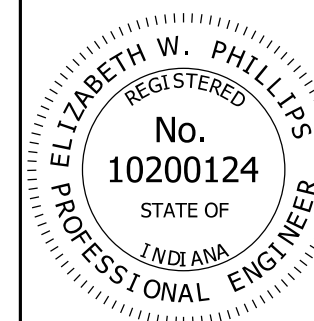
1. The weak post shall be ASTM A992 Grade 50 steel galvanized.
2. The post standoff shall be ASTM A36 steel galvanized.

INDIANA DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM ASSEMBLY,  
HEADWALL-MOUNTED POST

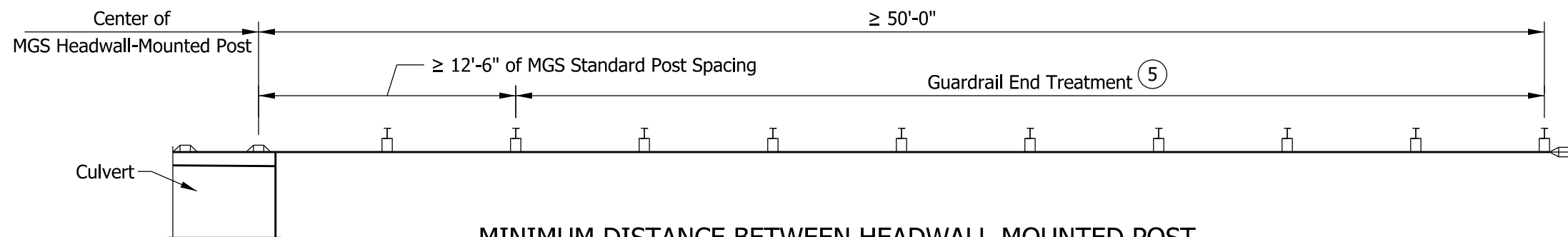
SEPTEMBER 2019

STANDARD DRAWING NO. E 601-MGSA-27

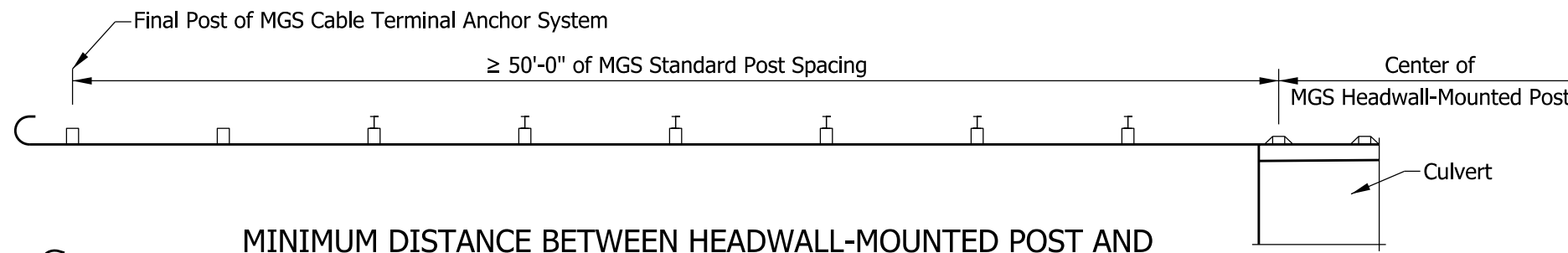


DESIGN STANDARDS ENGINEER DATE

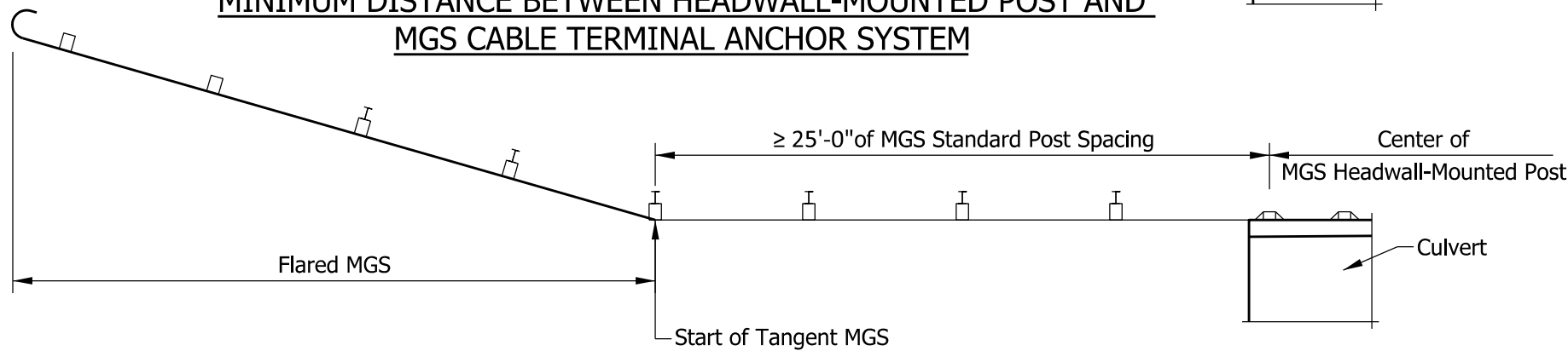
CHIEF ENGINEER DATE



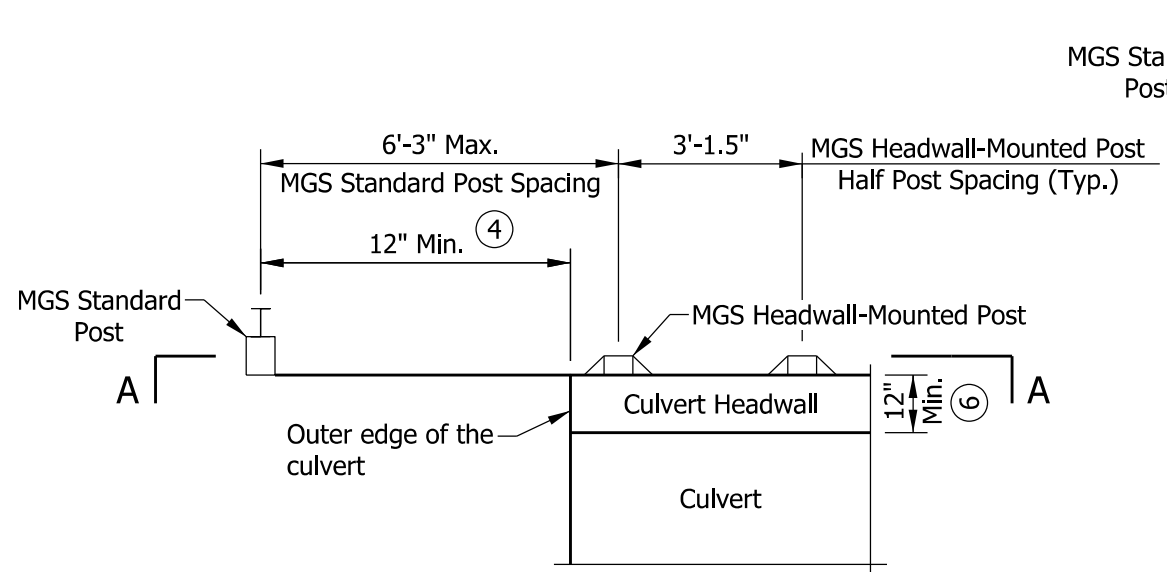
**MINIMUM DISTANCE BETWEEN HEADWALL-MOUNTED POST AND GAURDRAIL END TREATMENT**



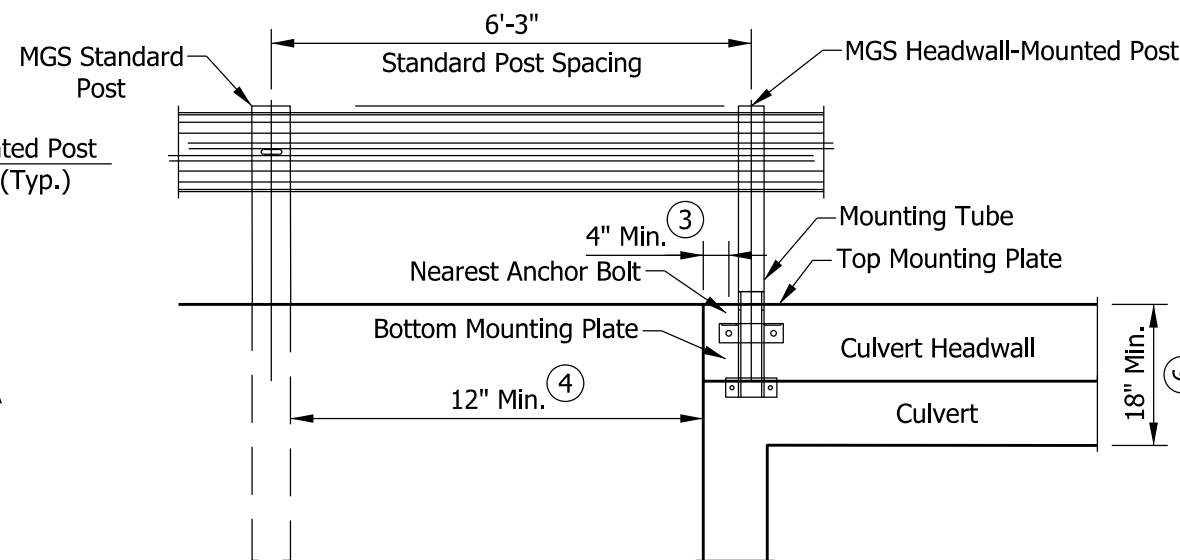
**MINIMUM DISTANCE BETWEEN HEADWALL-MOUNTED POST AND MGS CABLE TERMINAL ANCHOR SYSTEM**



**MINIMUM DISTANCE BETWEEN HEADWALL-MOUNTED POST AND FLARED MGS W-BEAM**



**PLAN VIEW**



**SECTION A-A**

**NOTES:**

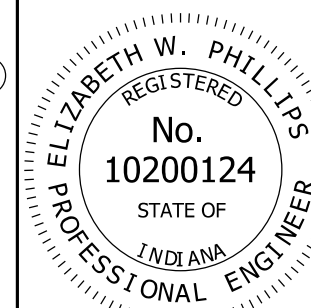
1. Where an MGS W-beam guardrail run contains headwall-mounted posts a minimum length of MGS standard post spacing guardrail shall be placed as shown.
2. MGS W-beam guardrail run containing headwall-mounted posts shall not be placed adjacent vertical or sloping curb.
- ③ The distance between the outer edge of the culvert and the center of the nearest anchor bolt shall be a minimum of 4 in.
- ④ The distance between the outer edge of the culvert and the center of the nearest MGS standard post shall be 12 in.
- ⑤ The guardrail end treatment placed upstream and downstream of a culvert with headwall-mounted post shall be MASH Test Level 3.
- ⑥ The culvert headwall width shall be a min. of 12 in. The minimum combined height of the culvert headwall and the culvert shall be 18 in.

INDIANA DEPARTMENT OF TRANSPORTATION

MIDWEST GUARDRAIL SYSTEM ASSEMBLY,  
HEADWALL-MOUNTED POST

SEPTEMBER 2019

STANDARD DRAWING NO. E 601-MGSA-28



DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE