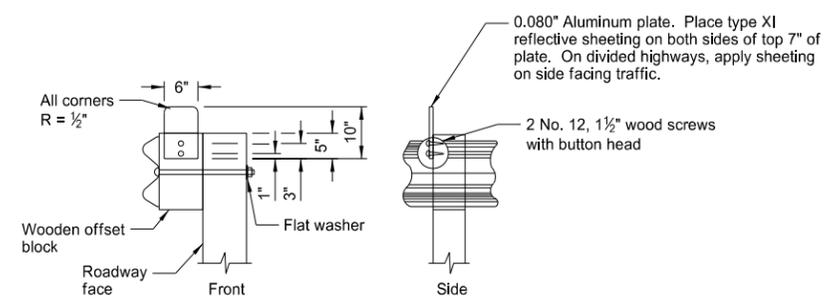
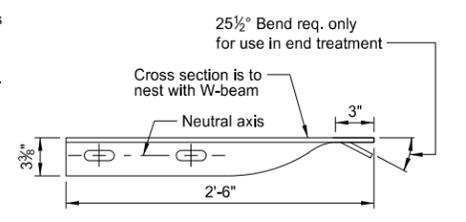
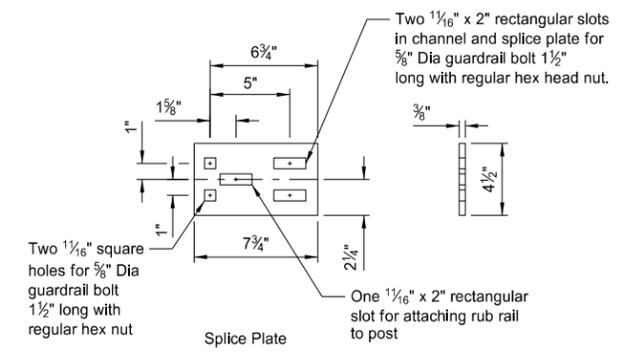
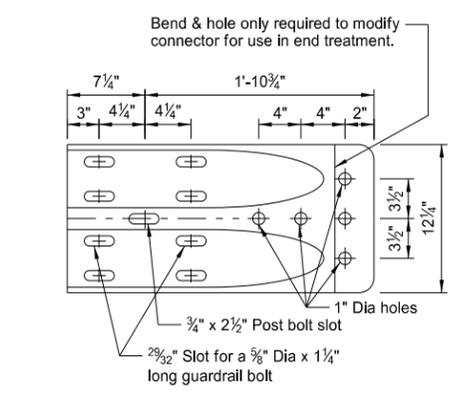
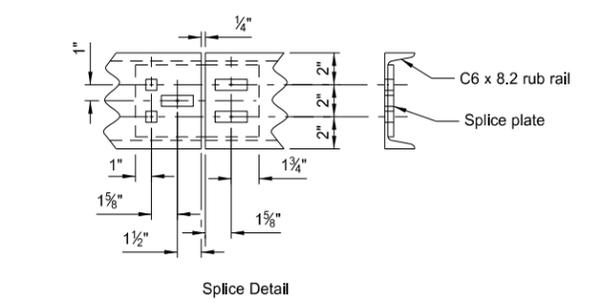


W-BEAM GUARDRAIL GENERAL DETAILS

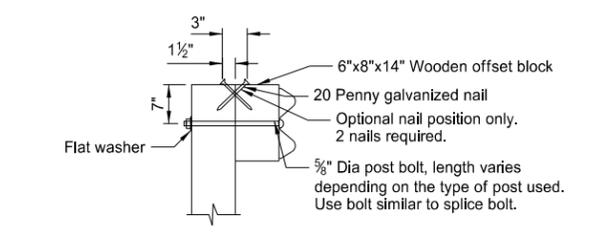
- NOTES:
- Place reflector plates at the first post and spaced at 25' centers on guardrail less than 250' in length and at 50' centers for guardrail over 250' in length. Use reflector the same color as the pavement marking adjacent to that reflector unless noted otherwise on the plans.
 - Dispose of excess earth from excavations for guard posts as directed by the engineer. Replace bituminous material where guardrail is installed after mat is placed. Include cost of excavation and replacing of bituminous material in the price bid for other items.
 - Place Object Marker within the vertical edges of the Impact Plate. Use type XI retroreflective sheeting meeting the requirements of Section 894.02.B of the standard specifications. Apply sheeting to 0.100 Aluminum sheeting meeting the requirements Section 894.01.A. Attach the Object Marker to the Impact Head Plate with non-rust rivets or some other non-rust attachment device. Slope stripes downward toward the roadway side.
 - Guardrail installation height tolerance = $- \frac{1}{4}$ " , + 1".
 - Standard W-Beam rail post bolt slot spacing is 6'-3". Post bolt slot spacing of 3'-1 1/2" is acceptable.



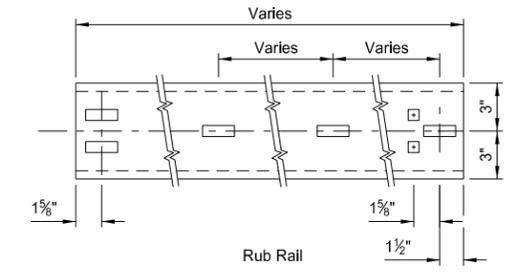
REFLECTORIZED PLATE DETAIL
Additional reflectors are added to the W-beam guardrail quantities for placement on end treatment.



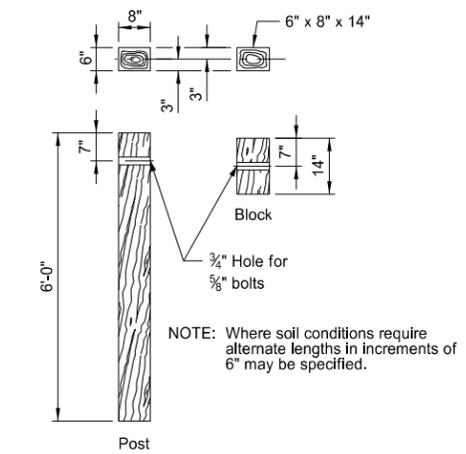
W BEAM TERMINAL CONNECTOR



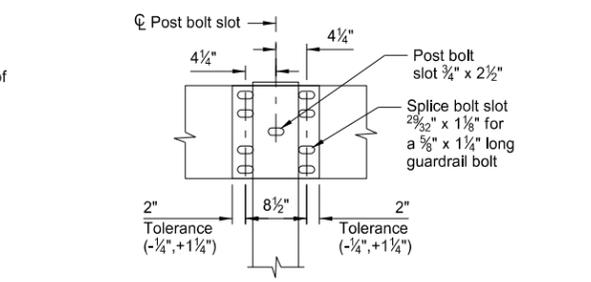
TYPICAL POST ATTACHMENT DETAIL



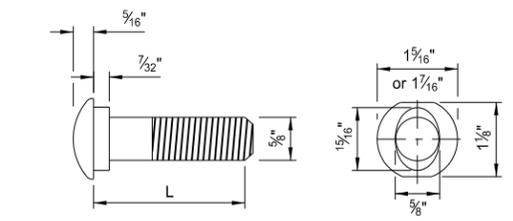
C6x8 RUB RAIL AND SPLICE PLATE



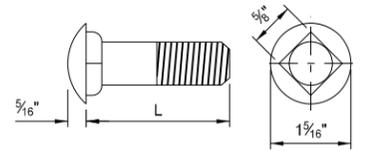
6"x8" TIMBER POST & BLOCK



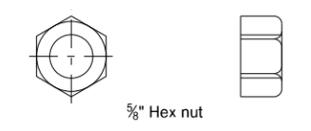
SPLICE DETAIL



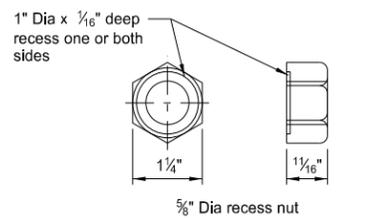
| 5/8" Diameter Guardrail Bolt | |
|------------------------------|--------------------------|
| L | Thread Length |
| 1 1/4" | Full length thread |
| 2" | 1 1/4" Min thread length |
| 9 1/2" | 4" Min thread length |
| 18" | 4" Min thread length |
| 20" | 4" Min thread length |
| 22" | 4" Min thread length |
| 25" | 4" Min thread length |



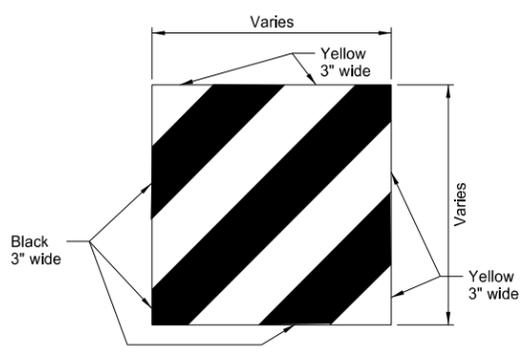
| 5/8" Diameter Carriage Bolt | |
|-----------------------------|--------------------------|
| L | Thread Length |
| 1 1/2" | Full length thread |
| 3" | 1 1/2" Min thread length |
| 11" | 1 3/4" Min thread length |
| 13" | 1 3/4" Min thread length |



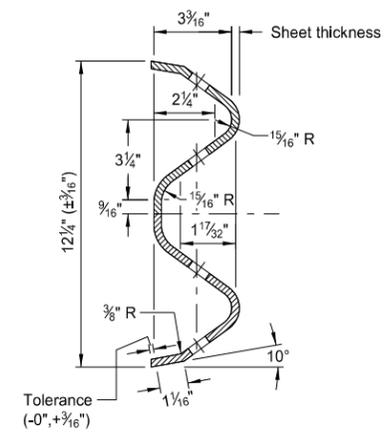
5/8" CARRIAGE BOLT & NUT



5/8" GUARDRAIL BOLT & RECESS NUT



IMPACT HEAD OBJECT MARKER



W-BEAM CROSS SECTION

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 10-11-13 | |
| REVISIONS | |
| DATE | CHANGE |
| 10-25-19 | Updated notes to active voice and added Note 5. |

This document was originally issued and sealed by
 Kirk J Hoff,
 Registration Number
 PE- 4683,
 on 10/25/19 and the original document is stored at the North Dakota Department of Transportation