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## Index 536-001 Guardrail

### ORIGINATION

**Date:** 2/24/26

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### COMMENTARY

The Department has historically required safety considerations for steel guardrail posts when placed within 4 feet of sidewalks or shared use paths. This has included the use of steel "pipe rail" to shield the sharp corners of steel posts. Alternatively, timber posts may be used instead. This revision now adds a third option, where proprietary "post caps" may be placed over steel post tops to shield the sharp corners. For this, updates have been made throughout the Index to allow the contractor the option of using "post caps" as listed on the APL. Corresponding updates have been made to the Standard Specifications to explain the payment and APL approval process.

### COMMENTS AND RESPONSES

**BLACK** = Industry Review Comments   **BLUE** = Standard Plans Response   **GREEN** = Change Made to Index

**Name:** Deborah Ihsan

**Date:** 6/9/26

**COMMENT:** 536-001 Sheet 1 of 25, Note 7 – In some urban/intersection settings, I have had guardrail placed behind a road/curb-adjacent sidewalk. Designers have interpreted the phrase of “When guardrail posts are placed within 4’-0” of a sidewalk or shared use path, use...” and then dictated the use of pipe rail. It would seem that the primary intent of the pipe rail or wood post designation is intended to protect pedestrians and bicyclists who are separated from roadway traffic by a guardrail. If the intent is not to use pipe rail when a sidewalk is on the “panel-side”, but still within 4 feet – then I would advise to clarify the wording of this note

**RESPONSE:** This comment refers to language not proposed for a revision. Regardless, the Pipe Rail usage is clear because Pipe Rail would have no physical purpose for a sidewalk on the panel side. Also, the context for safety treatment on the back of post is included in the note, and the Pipe Rail usage definition on the Sheet 6 drawing shows the sidewalk location that applies for this topic. That said, since comprehension issues are a concern, the notes will be revised to ensure the sidewalk orientation shown on Sheet 6 is known.

**CHANGE MADE TO INDEX:** Yes. Updated Sheet 1, Note 7 and Sheet 23, Note 1.

*Response Date:* 6/22/26

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| 25    | Barrier Delineators - Post Mounted;<br>Clear Space - Reduced Post Spacing for Hazards;<br>5/8" Button-Head Bolt System   |

**GENERAL NOTES:**

1. INSTALLATION: Construct guardrail in accordance with Specification 536.

This Index, along with the plans and the manufacturers' drawings on the Approved Products List (APL), is sufficiently detailed for installation of General Guardrail, Low-Speed Guardrail, End Treatment assemblies, and their connecting options shown herein. This precludes requirements for shop drawing submittals unless otherwise specified in the plans.

2. COMPATIBILITY: The General Guardrail in this Index is based on the Midwest Guardrail System (MGS) design, with an approximate height of 31" at the top of the Panel (2'-1" mounting height at vertical C of Panel) and a midspan panel splice as shown on Sheet 2. Guardrail components included on the APL, which are compatible with this Index, may also be identified as 31" or MGS Guardrail.

3. STANDARD COMPONENTS: Standard guardrail components, including posts, panels, and bolt systems, are based on the Task Force 13 Publication: Guide to ~~Roadside Hardware Components~~ (<http://tf13.org/Guides/componentGuide/>). **Standardized Roadside Hardware.**

4. BUTTON-HEAD BOLTS: Install Button-Head Bolts where indicated using bolts, nuts, and washers as defined on Sheet 25. Place washers under nuts against timber posts. Washers are not required at steel post flanges and panel lap splices. Do not place washers between bolt heads and panels, except where otherwise shown in this Index.

5. HEX-HEAD BOLTS: Install Hex-Head Bolts where indicated using bolts, nuts, and washers in accordance with material properties of Specification 967. Place washers under nuts.

6. MISCELLANEOUS ASPHALT PAVEMENT: Install Miscellaneous Asphalt Pavement where indicated with a tolerance of ± 1/2" depth and in accordance with Specification 339.

7. ~~ADJACENT SIDEWALKS & SHARED USE PATHS~~ **BEHIND GUARDRAIL:** When guardrail posts are placed within 4'-0" of a sidewalk or shared use path, use timber posts, ~~or use steel posts only if treated with Pipe Rail as shown on Sheet 23.~~ **Alternatively, steel posts may be used if treated with Pipe Rail per Sheets 23 or Post Caps per the APL drawings.**

When timber posts are used, one of the following safety treatments is required for the bolt(s) protruding from the back face of the posts:

- After tightening the nut, trim the protruding post bolt flush with the nut and galvanize per Specification 562.
- Use post bolts 15" in length and countersink the washer and nut between 1" and 1 1/2" deep into the back face of the post.
- Use 15" post bolts with sleeve nuts and washers.

When End Treatment posts are within 4'-0" of a sidewalk or shared use path, steel posts are not permitted within the End Treatment segment. Terminate ~~the~~ Pipe Rail outside of End Treatment segments, as noted per Sheet 23. **Where Pipe Rail is shown or quantified in the plans, Post Caps or Timber Posts may substituted unless directly prohibited by the plans.**

8. NESTED W-BEAM: Where called for in the plans, install two W-Beam Panels mounted flush per location, securing all panels with Button-Head Bolts threaded through aligned slots and holes. 2" Button-Head Bolts are permitted for panel splice locations.

9. CONNECTION TO RIGID BARRIER: The connections to Rigid Barrier in this Index only apply to newly constructed bridge Traffic Railing and Concrete Barrier or where the complete Approach Transition Connection to Rigid Barrier shown herein can be installed without conflicting with existing Traffic Railings, structures, or approach slabs. See Sheets 13 thru 21.

For connecting guardrail to existing bridge Traffic Railings, see Indexes 536-002, 521-404, and 521-405.

10. CONNECTION TO EXISTING 27" HEIGHT GUARDRAIL: See the connection options on Sheet 3.


11. PLANS CALLOUTS: Begin/End Station labels are shown throughout this Index as they correspond to the station and offset callouts specified in the plans.

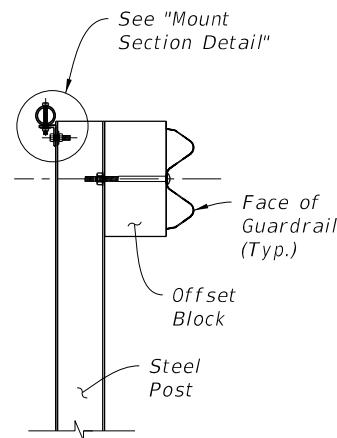
In the plans, Begin/End Guardrail Station refers to the General TL-3 Guardrail Pay Item, and it may be abbreviated as Begin/End GR. Station. Where the Low-Speed TL-2 Guardrail Pay Item is specifically required, the callout in the plans will then specify Begin/End TL-2 GR. Station.

12. QUANTITY MEASUREMENT: Measure guardrail and corresponding components as defined in Specification 536. The Guardrail length is measured along the centerline of installed Panels, between the points labeled Begin/End Guardrail Station shown on the following Index Sheets and defined in the plans (typically measured from the C of the panel's post bolt slots at the approach/trailing ends).

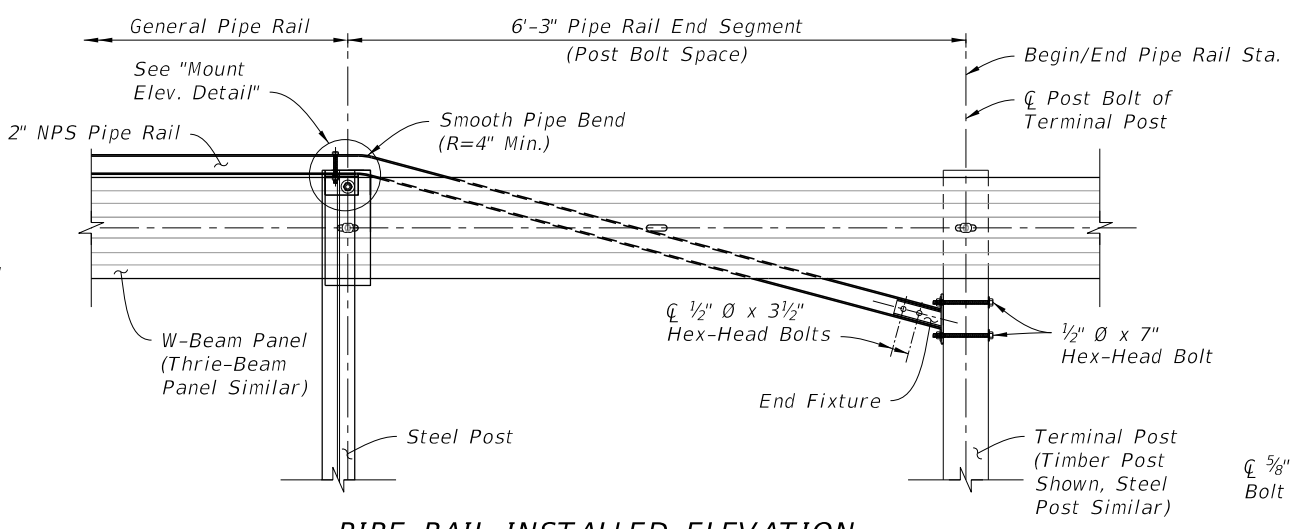
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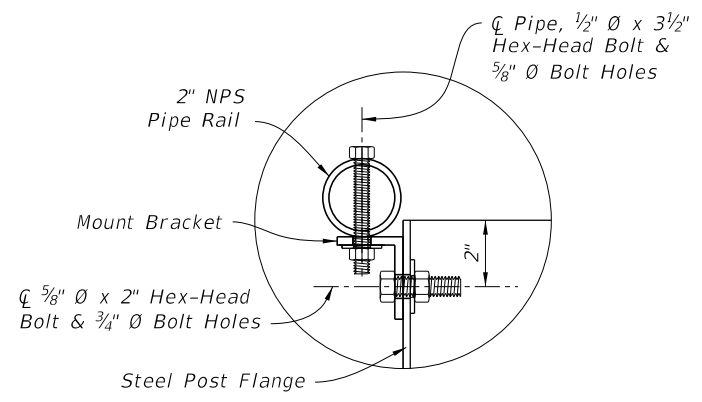
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| LAST REVISION<br><del>11/01/25</del> | REVISION<br><b>11/01/26</b> | DESCRIPTION: | <br><b>FY <del>2026-27</del></b><br><b>STANDARD PLANS</b> | <b>GUARDRAIL</b> | INDEX<br><b>536-001</b> | SHEET<br><b>1 of 25</b> |
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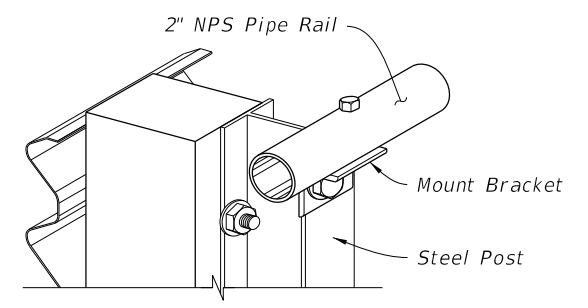
GENERAL PIPE RAIL SECTION



PIPE RAIL INSTALLED ELEVATION (End Segment Shown)



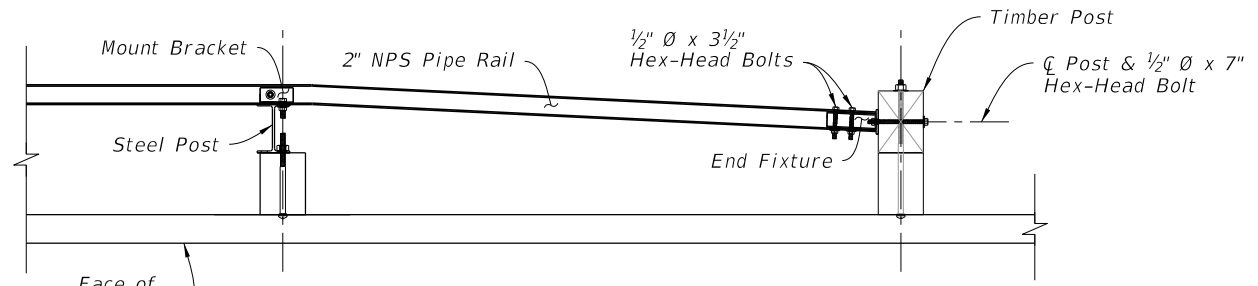
MOUNT SECTION DETAIL



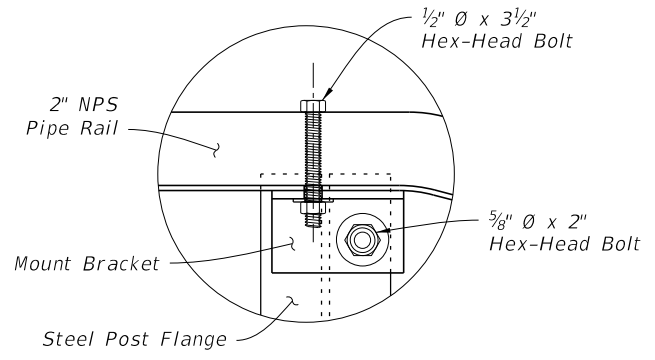
MOUNT ISOMETRIC CUT-AWAY

Install Pipe Rail as indicated per the plans and Sheet 1, General Note 7. See Sheet 6 for general placement orientation.

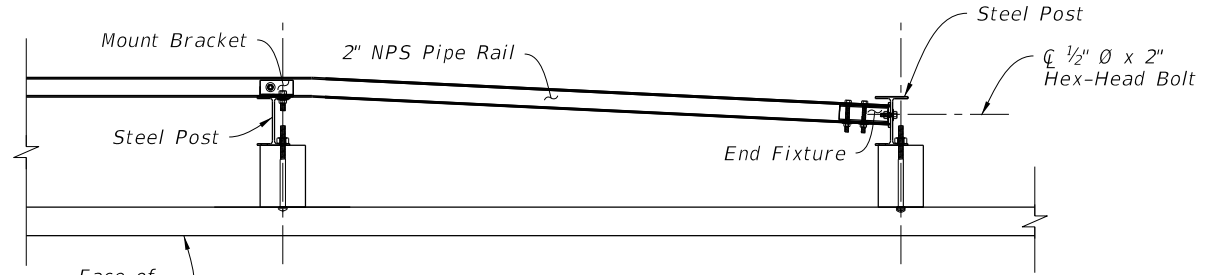
- NOTES:**
- GENERAL: Install General Pipe Rail where indicated in the plans or when existing sidewalks or shared use paths are located less than 4'-0" from the back of Steel Posts as shown on Sheet 6.
  - PIPE RAIL END SEGMENTS: Place End Segments on both ends of General Pipe Rail runs, with End Fixtures mounted to Terminal Posts located outside of Approach Terminal Assembly ('LE'), Trailing Anchorage Assembly ('LT'), and Approach Transition ('LA') segments.
  - MATERIALS: Use steel brackets, fixtures, and pipes in accordance with Specification 967.
  - RAIL SPLICES: Install Rail Splices to join pieces of 2" NPS Pipe Rail into a continuous system. Place splices as needed, at a spacing of 18'-0" or greater. Orient the head of bolt on the top of the pipe.



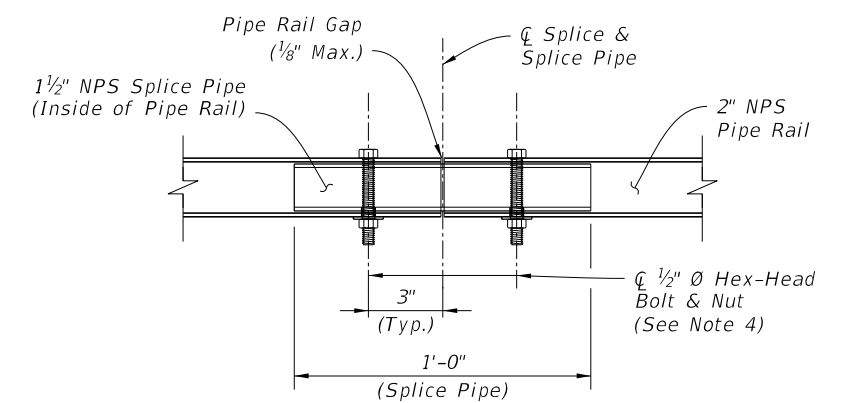
PIPE RAIL INSTALLED PLAN END AT TIMBER POST OPTION



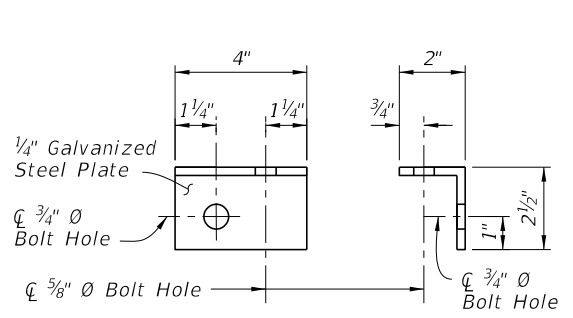
MOUNT ELEVATION DETAIL (Back View - Mirrored)



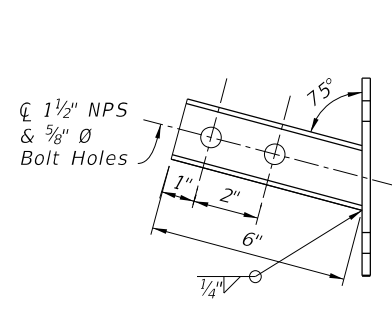
PIPE RAIL INSTALLED PLAN END AT STEEL POST OPTION



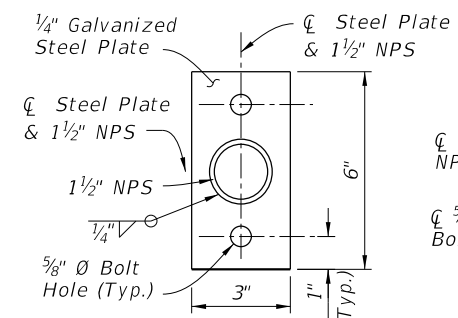
RAIL SPLICE DETAIL



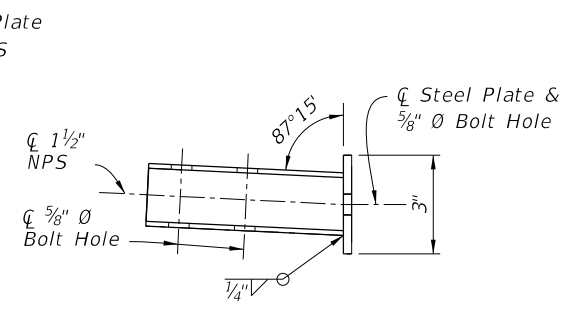
ELEVATION SECTION



ELEVATION



SECTION



PLAN

MOUNT BRACKET DETAIL

END FIXTURE DETAIL

2027-28

PEDESTRIAN SAFETY TREATMENT - PIPE RAIL

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