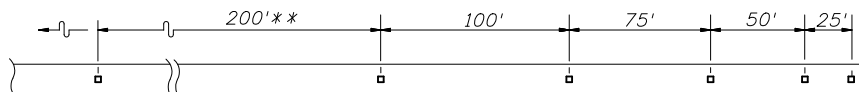


REFLECTOR NOTES

1. Reflectors shall conform to Section 993 of the Standard Specifications.
2. Reflector color (white or yellow) shall conform to the color of the near lane edgeline.
3. Reflectors installed on median guardrail shall have retro-reflective sheeting on both sides of the reflector.
4. The cost for reflectors shall be included in the contract unit price for Guardrail.



Note: Adjustment in spacing may be required to fit exact guardrail lengths as directed by the Engineer. For minimum installations (length 62.5') provide one reflector at each end and one at the approximate center.

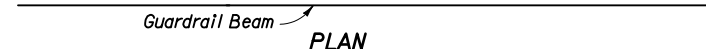
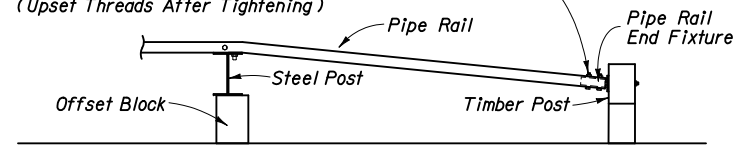
**For curves greater than 2° the spacing shall be reduced to 100' through the curve.

REFLECTOR SPACING

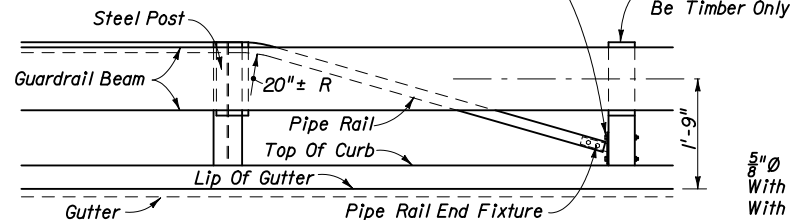
REFLECTORS-DETAIL M

16d NAIL FOR PREVENTION OF OFFSET BLOCK ROTATION

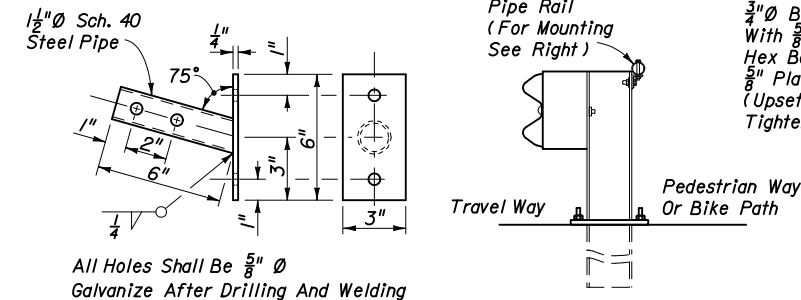
Install Pipe Rail Over Pipe Rail End Fixture And Thru-bolt With $\frac{1}{2}$ " x $3\frac{1}{2}$ " Long Hex Bolts And Nuts With $\frac{1}{2}$ " Plain Round Washers Under Heads And Nuts (2 Req.) (Upset Threads After Tightening)



Attach Pipe Rail End Fixture To Post With $\frac{1}{2}$ " x 7" Long Hex Bolts And Nuts With $\frac{1}{2}$ " Plain Round Washers Under Heads And Nuts (2 Req.) (Upset Threads After Tightening)

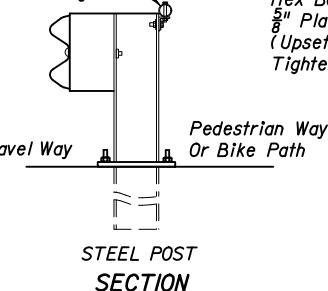


ELEVATION



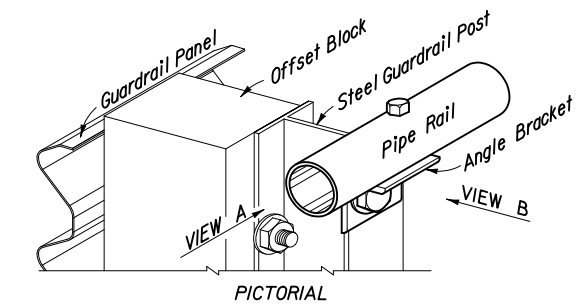
All Holes Shall Be $\frac{5}{8}$ " ϕ Galvanize After Drilling And Welding

PIPE RAIL END FIXTURE

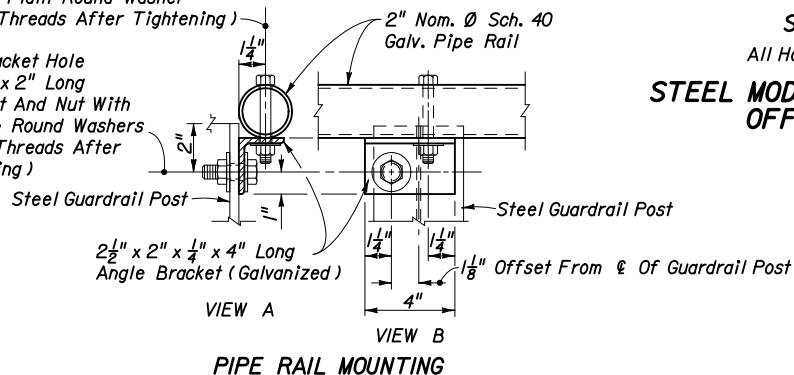


$\frac{5}{8}$ " ϕ Bracket And Pipe Holes With $\frac{1}{2}$ " x $3\frac{1}{2}$ " Long Hex Bolt And Nut With $\frac{1}{2}$ " Plain Round Washer (Upset Threads After Tightening)

$\frac{3}{4}$ " ϕ Bracket Hole With $\frac{3}{8}$ " x 2" Long Hex Bolt And Nut With $\frac{5}{8}$ " Plain Round Washers (Upset Threads After Tightening)



PICTORIAL



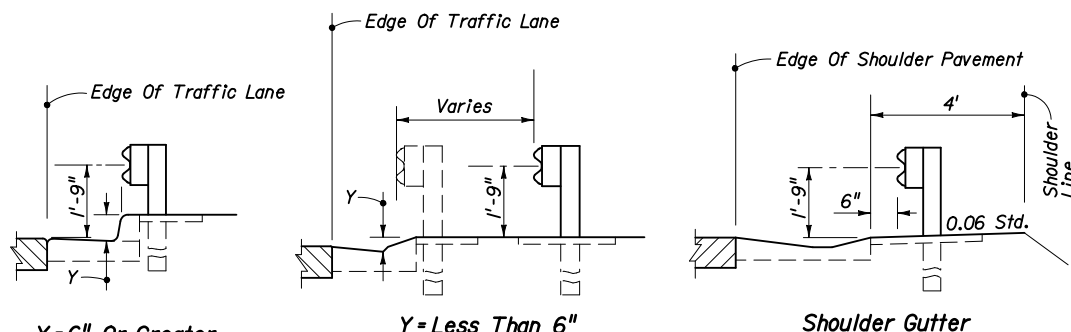
PIPE RAIL MOUNTING

POST FACE

TRAFFIC FACE

SIDE VIEW

STEEL MODIFIED THRIE-BEAM OFFSET BLOCK



NOTE: Y=6" Or Greater For location of guardrail with offset behind curb and gutter refer to the Plans Preparation Manual, Volume 1, Section 4.3.5.

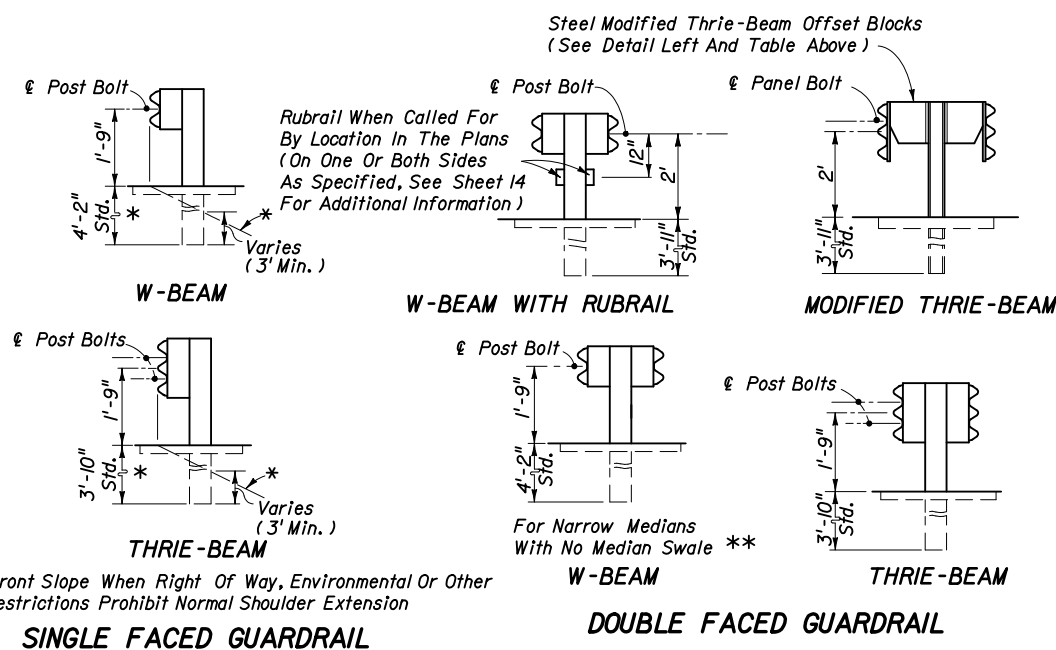
LOCATION AT CURB & GUTTER SECTIONS-DETAIL L

POSTS	OFFSET BLOCKS	REMARKS
Timber	Timber 6" x 8" x 14" (Nominal) For W-Beam And 6" x 8" x 22" (Nominal) For Thrie-Beam Recycled Plastic (See Notes)	Post bolt hole in timber and plastic blocks to be centered ($\pm \frac{1}{4}$ "). All timber offset blocks shall be dressed on all four sides (S4S). One 16d galvanized nail per block is to be used to prevent rotation of block (see detail left).
Steel W6x8.5, W6 x 9 Or 6" C	Timber 6" x 8" x 14" (Nominal) For W-Beam And 6" x 8" x 22" (Nominal) For Thrie-Beam Recycled Plastic (See Notes)	Same as above for timber and plastic blocks except that form fit plastic block holes align with holes in steel posts and do not require nails.
Steel W6x8.5, W6 x 9 Or 6" C	W14 x 22 x 17" (M14 x 18 x 17") (Steel Modified Thrie-Beam)	$\frac{5}{8}$ " ϕ x $1\frac{1}{2}$ " long hex head bolts with full length thread and nuts (2 Req.) and $\frac{5}{8}$ " plain round washers (4 Req.) for mounting steel block to post. Bolts are to be installed in opposite holes, top and bottom.

Notes: 1. Timber and recycled plastic offset blocks of identical size and shape can be intermixed within a run of rail.

2. Recycled plastic offset blocks shall meet the passing evaluation criteria for Test Level 3 of NCHRP 350. The blocks shall be tested as a component in a semi-rigid guardrail test article under full scale crash test conditions. The blocks shall be in conformance with Sections 536 and 972 of the Specifications and be included on the Qualified Products List. W-Beam blocks shall be 14" in height and thrie-beam blocks shall be 22" in height. The blocks shall be capable of providing a $7\frac{1}{2}$ " (Min.) offset.

PERMISSIBLE POST AND OFFSET BLOCK COMBINATIONS



MOUNTING HEIGHTS ON SHOULDERS AND IN MEDIANS

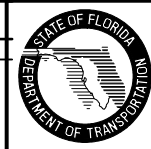
NOTES

1. Pipe Rail required on steel guardrail posts when pedestrian ways and bikeways are located 4' or less from back of the posts. Begin and end the pipe rail in accordance with this detail.
2. When guardrails with timber posts are located with the back of posts 4' or less from the near edge of the pedestrian way or bikeway, the bolt ends will require one of the following treatments:
 - (a) Trimming back flush with the face of nut and metalizing or
 - (b) Use of post bolts 15" in length with the washers and nuts counter sunk into sinks 1" to $1\frac{1}{2}$ " deep or
 - (c) Use of post bolts 15" in length with sleeve nuts and washers.
3. The cost for Pipe Rail, mounting components and installation shall be included in the contract unit price for guardrail. Bolt end treatment for timber post shall be included in the contract unit price for guardrail.

**FOR LOCATIONS USED BY PEDESTRIANS OR CYCLISTS
PEDESTRIAN SAFETY TREATMENTS**

REVISIONS

DATE	BY	DESCRIPTION
HSD	11/14/07	Revised reflector details and notes.



2008 Interim Design Standard

GUARDRAIL

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