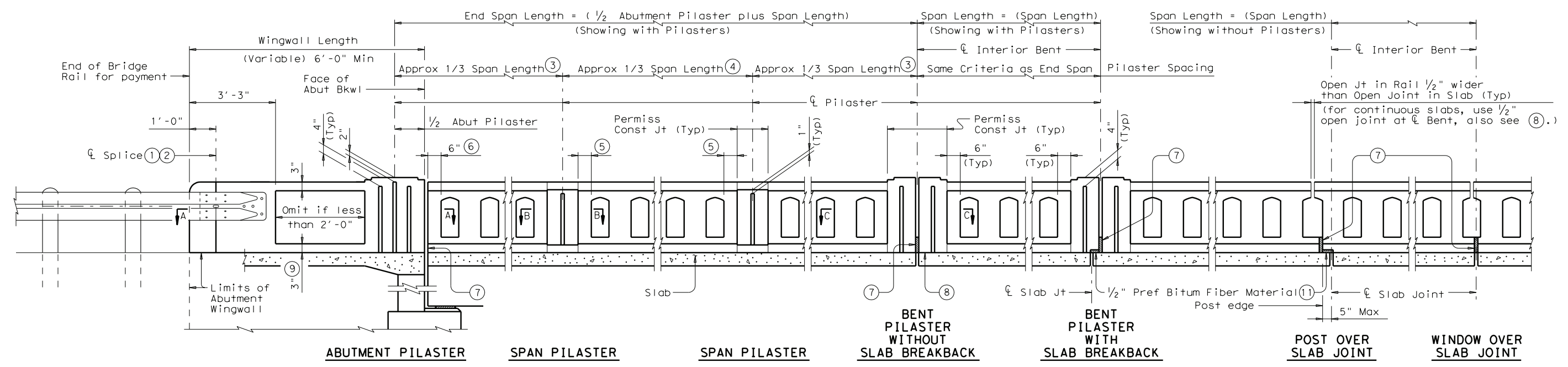
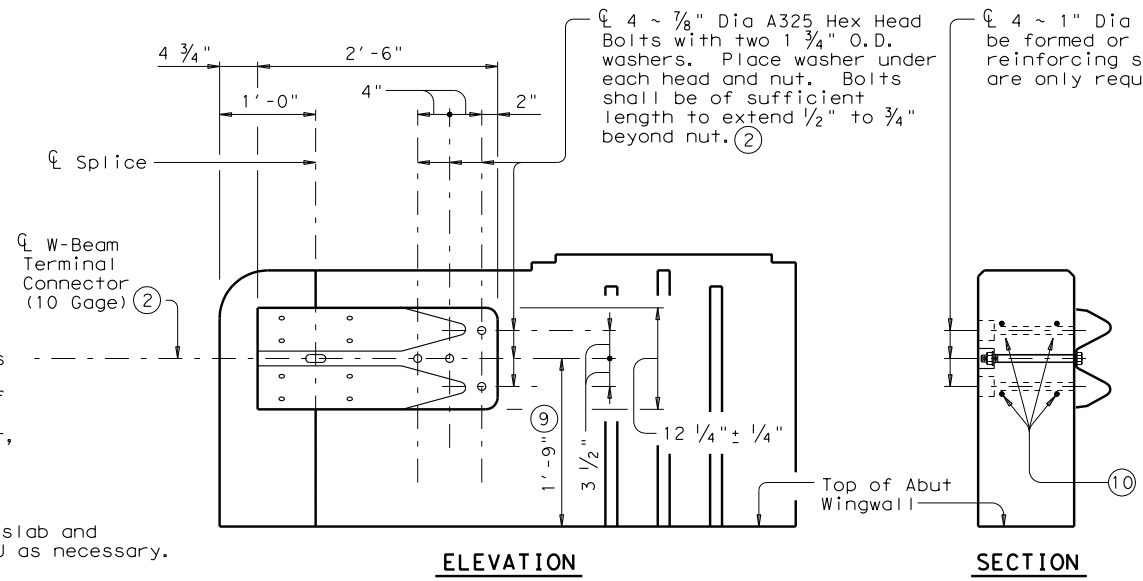


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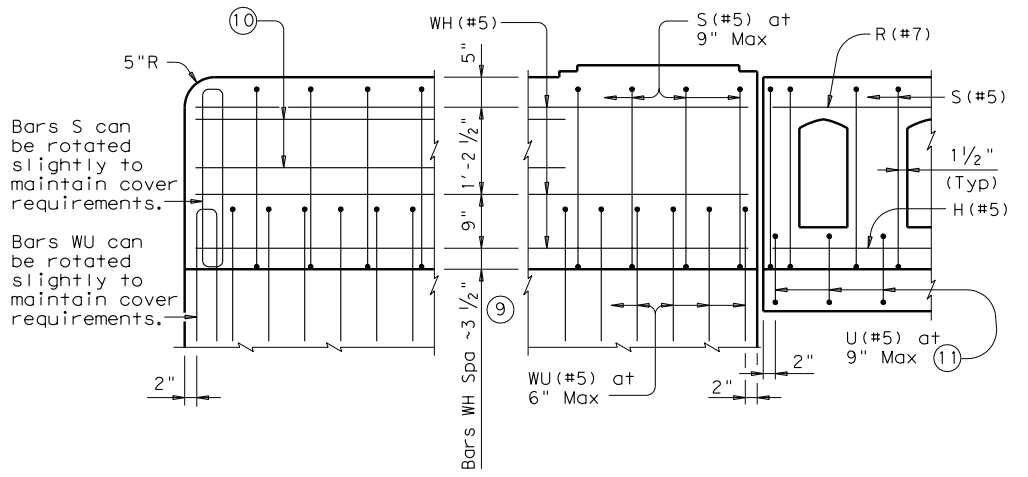


ROADWAY ELEVATION OF RAIL

- ① Metal Beam Guard Fence Transitions must be attached to the bridge rail and extended along the embankment unless otherwise shown in the plans.
- ② Terminal Connector and associated hardware are to be paid for under the Item "Metal Beam Guard Fence".
- ③ Number of windows shall be equal.
- ④ Number of windows shall not be less than the amount in ③. Span Pilasters may be spaced at 1/5 points in long spans. See Bridge Layout or other plan sheets.
- ⑤ Dimension shall be the same for all posts adjacent to Span Pilasters in a span. Dimension may vary from span to span, Min = 3", Max = 7 1/2".
- ⑥ For rail without Pilasters, Min = 6", Max = 1'-3".
- ⑦ Rail Joints shall be provided at ends of all spans and shall be the same width as Slab joint opening, except that Rail Joints over construction joints shall be 1/4" Min to 3/4" Max in width. Joints shall be open if slab joint opening is not sealed. Joints over construction joints and over sealed deck joints shall be plugged. Forming material used in joints may be left in place if it is light in color and compressible, such as the following materials: polystyrene, molded cork granules, sponge rubber sheet, etc. If forming material is not left in place, the bottom 6" shall be plugged with slab joint sealing compound to prevent drainage and staining.
- ⑧ Place 12" x 9" x 1/2" Preformed Bituminous Fiber Material between slab and rail at centerline fixed joints on box beam bridges. Shift Bars U as necessary.
- ⑨ Increase 2" for structures with overlay.
- ⑩ 4 additional Bars WH(#5) 3'-8" in length shall be placed inside Bars S(#5) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.
- ⑪ Shift U Bars from region below 1/2" Preformed Bituminous Fiber Material at joints.

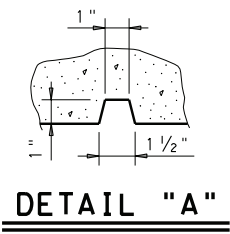
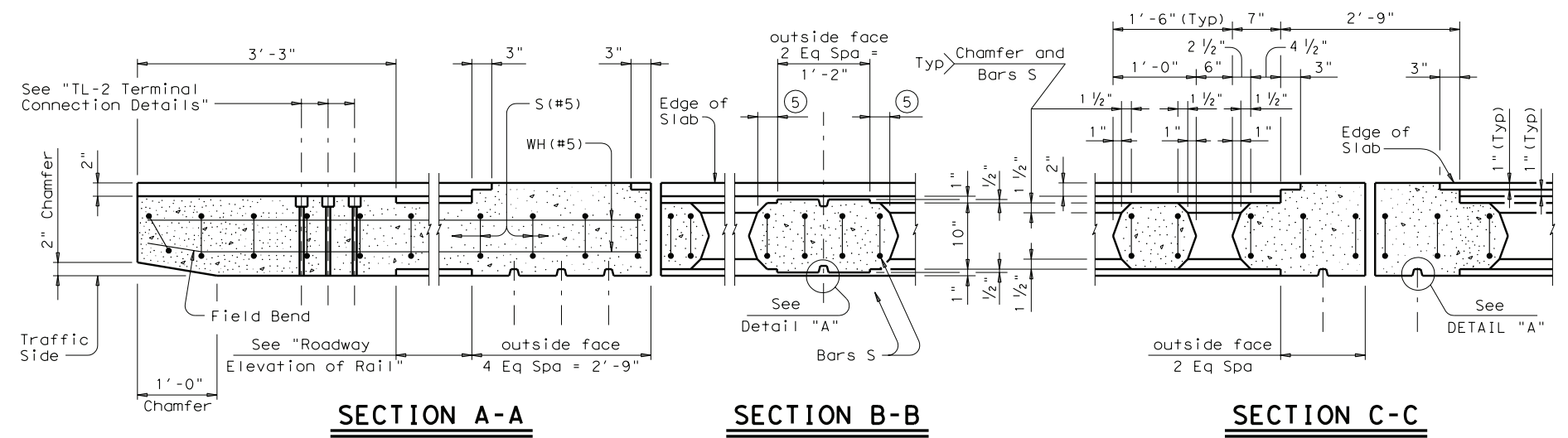


TL-2 TERMINAL CONNECTION DETAILS
(Showing parapet with Pilaster on 6'-0" Wingwall)



ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

The use of this railing is restricted to design speeds of 45 mph or less.



DETAIL "A"

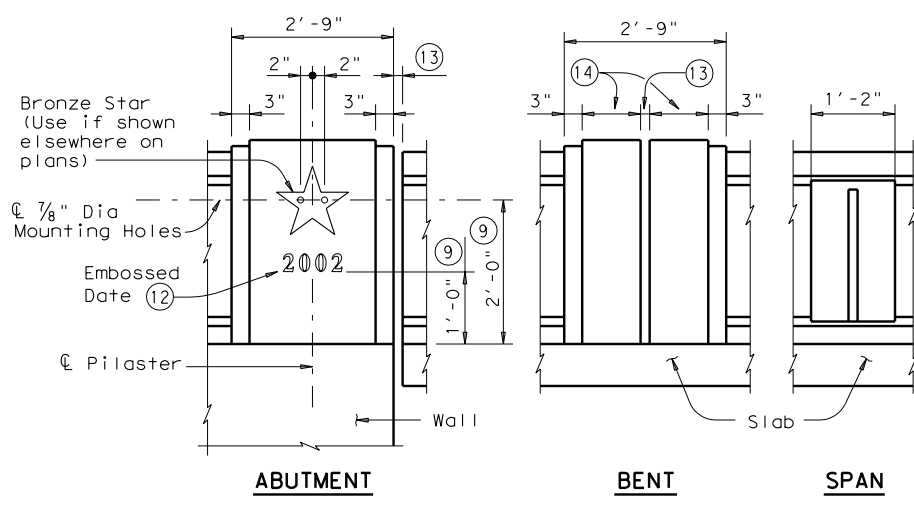
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TRAFFIC RAILING
TEXAS CLASSIC
TYPE T411

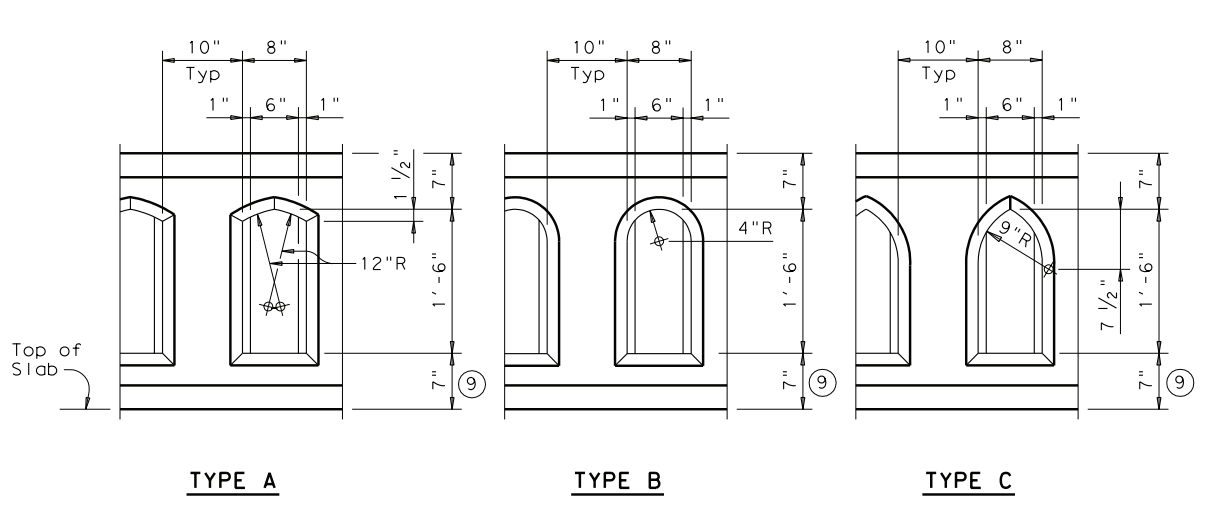
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| FILE: r1std04.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CR: TxDOT |
| © TxDOT February 2003 | DISTRICT | FEDERAL AID PROJECT | SHEET | |
| REVISIONS | | | | |
| 4-05: Replaced TL-3 Terminal Connection with TL-2 Terminal Connection & minor corrections. | | | | |
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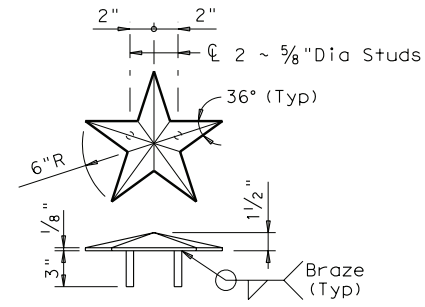


EXTERIOR PILASTER ELEVATIONS



WINDOW TYPES

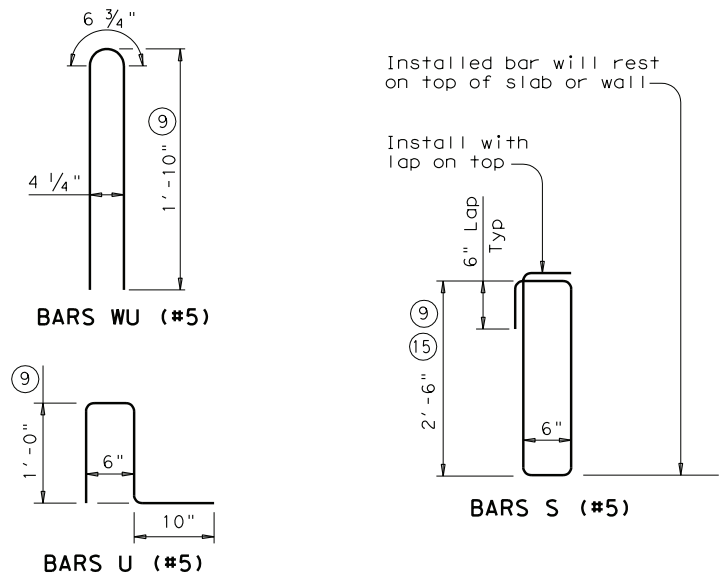
- ⑨ Increase 2" for structures with overlay.
- ⑫ Construction year (use if shown elsewhere on plans) 3" High "Plantin Bold" Typeface with 1/4" recess. Placed at one Abutment only or as directed by the Engineer.
- ⑬ Open rail joint shall be 1/2" greater than largest slab joint on the Bridge. Applies to Bent Pilaster over slab joints and over continuous slabs.
- ⑭ Dimensions shall be the same on each side of joint.
- ⑮ Reduce by 2" or field bend over Preformed Bituminous Fiber Material to gain cover.
- ⑯ 5 1/2" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.
- ⑰ As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars shall be furnished at the Contractors expense.
- ⑱ Top longitudinal slab bar may be adjusted laterally 3" ± to tie reinforcing.



BRONZE STAR DETAIL

Two known manufactures are:

1. Kassons Castings
Austin, Texas
2. Southwell Company
San Antonio, Texas



Installed bar will rest on top of slab or wall

Install with lap on top

GENERAL NOTES:

This rail was evaluated based on the results of previous crash tests and approved for a NCHRP Report 350 TL-2 rating. This rail is only approved for low speed use, design speeds of 45 mph and less.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

All concrete for railing wall shall be Class "C". A Class "C" (one rub) finish shall be applied to all railing surfaces unless otherwise shown elsewhere on the plans.

Shop drawings will not be required for this rail.

Bronze Star shall be cast of architectural bronze having the following composition: Copper 85 %, Tin 5 %, Lead 5 %, Zinc 5 %.

Bronze Star shall be attached with Type V epoxy. Epoxy shall completely fill void in holes after studs are inserted and cover entire star-concrete interface. Clamp star until epoxy achieves set. Care shall be taken to avoid visible epoxy "squeeze out" from under star.

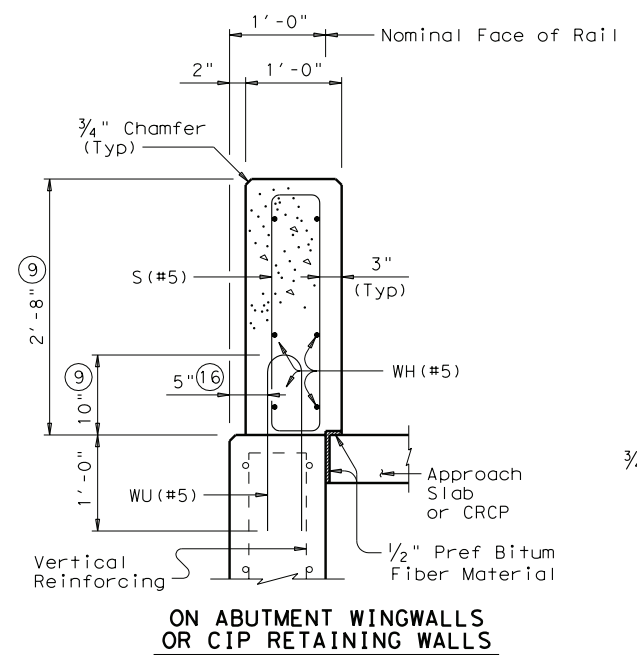
If shown on Bridge Layout or other plan sheets, railing can be constructed without pilasters. See Bridge Layout or other plan sheets for the following: dimensions with the number of windows, dimensions with the number of pilasters (if any), given window type, inclusion of bronze stars, inclusion of construction year with abutment identity.

All reinforcing shall be Grade 60.

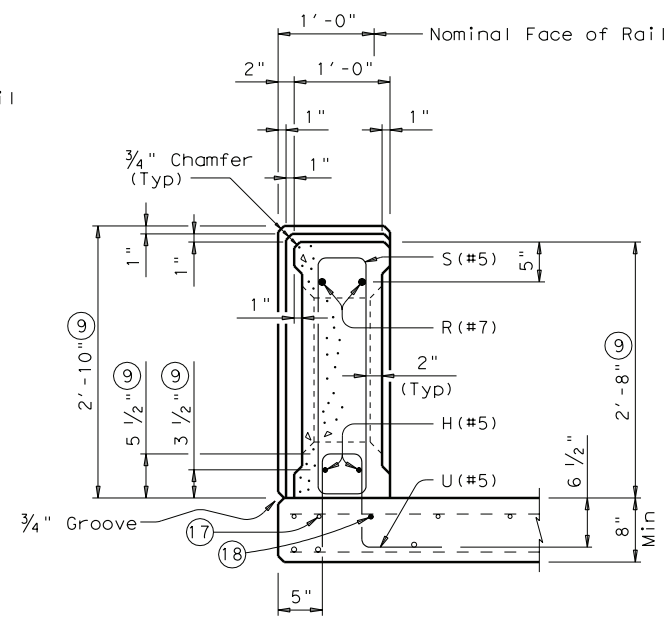
Face of rail and pilasters, parapet shall be plumb unless otherwise approved by the Engineer.

Epoxy coat Bars U and WU if slab bars are epoxy coated.

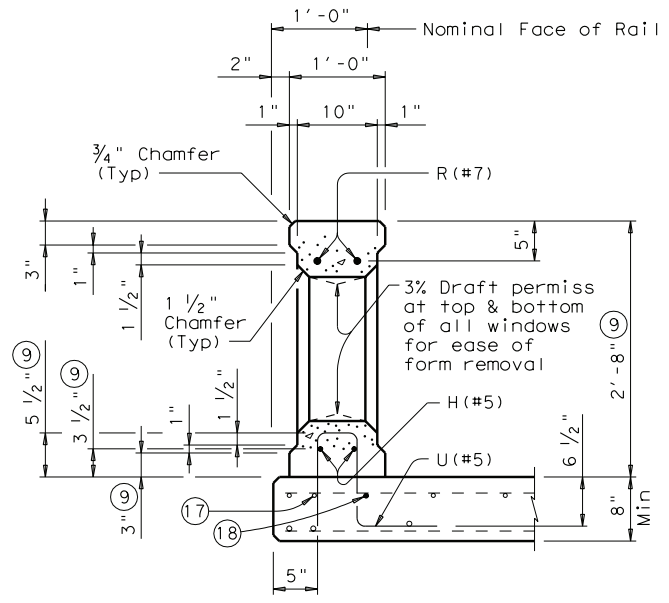
Average weight of railing with no overlay increase and no pilasters is 270 plf.



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



SECTION THRU POST ON BRIDGE SLAB (Showing Pilaster)



SECTION THRU WINDOW ON BRIDGE SLAB

SECTIONS THRU RAIL

Texas Department of Transportation
Bridge Division

**TRAFFIC RAILING
TEXAS CLASSIC**

TYPE T411

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