

New Requirements for Weathering Steel Bridges and Structural Steel Coating Systems

Design Update Training

April 18, 2012



Structures Design Bulletin C12-02

“Implementation of Requirements for use of Uncoated Weathering Steel and Coating Systems for Steel Bridges”

- Issued February 1, 2012
- Details new Department policy for coating of Steel I-Girder and Box Girder Bridges

Department Policy

- Requires use of Uncoated Weathering Steel for all steel I-girder and box-girder bridges where environmental conditions permit
- Requires Inorganic Zinc Coating System for all other locations
- High Performance Coating System will require approval by Chief Engineer
- Not applicable to Bascule or Pedestrian Bridges

Document Revisions

Modifications have been made to the following FDOT documents:

- Plans Preparation Manual
- Structures Design Guidelines
- Structures Detailing Manual
- Standard Specifications for Road and Bridge Construction (January 2012 Workbook)
 - Sect. 460
 - Sect. 560
 - Sect. 975

Site Environmental Criteria

Design Update Training, 4/18/12

Site Environmental Criteria

Site conditions for the use of Uncoated Weathering Steel shall meet the following requirements:

1. Superstructure must be classified as Slightly Aggressive.
2. Yearly average Time of Wetness (TOW), as determined by ASTM Test G84, shall not exceed 60%.
3. If the structure is located within 4.0 miles of the coast:
 - a. The maximum airborne salt deposition rate shall be less than 5 mg/m²/day (measured over a 30 day period).
 - b. The maximum average concentration for SO₂ shall not exceed 60 mg/m²/day (measured over a 30 day period).

Site Environmental Criteria (cont'd)

4. Minimum vertical clearance over normal high water/mean high water shall be 12 feet.

Contact the State Materials Office (SMO) regarding Time of Wetness, airborne salt deposition rate, and average SO₂ concentration at the proposed project site.

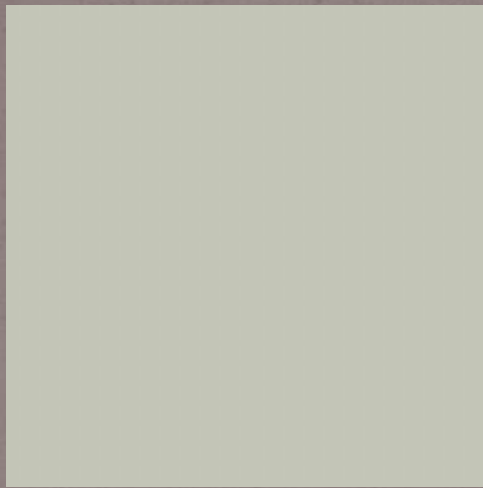
Mario Paredes, State Corrosion Engineer, (352) 955-6690
email: mario.paredes@dot.state.fl.us

Class 5 Finish

Design Update Training, 4/18/12

Class 5 Finish

“If the finish color is other than Federal Color Standard No. 595, color No. 36622 (standard concrete gray) (or color No. 36642 for uncoated weathering steel bridges), specify the appropriate number(s) for the desired color(s).”



No. 36622



No. 36642

Steel Painting Notes

Design Update Training, 4/18/12

Steel Painting Notes

Specify one of the following notes as applicable:

1. Weathering steel is to remain uncoated, except as required by the Specifications. (*Steel Box-Girders*)
2. Paint the outside face and bottom of Exterior Girders with an Inorganic Zinc Coating System. Interior Girders and diaphragms/cross-frames are to remain unpainted.
3. Paint the outside face and bottom of Exterior Girders with a High Performance Coating System. The color of the finish coat shall conform to Federal Standard No. 595, Color No. XXXXX. Interior Girders and diaphragms/cross-frames are to remain unpainted.

Steel Painting Notes (cont'd)

4. Paint all steel with an Inorganic Zinc Coating System.
5. Paint the outside face and bottom of Exterior Girders with a High Performance Coating System. The color of the finish coat shall conform to Federal Standard No. 595, Color No. XXXXX. Paint Interior Girders and diaphragms/cross-frames with an Inorganic Zinc Coating System.
6. Paint all steel with a High Performance Coating System. The color of the finish coat shall conform to Federal Standard No. 595, Color No. XXXXX.

Weathering Steel Details

Design Update Training, 4/18/12

Uncoated Weathering Steel Details

The following details are required for uncoated weathering steel bridges.

- Provide Drip Tabs on the bottom flange of all box-girders and I-Girders up grade from each pier/bent to divert runoff water.
- Provide Drip Strips along the outside edge of exterior I-girders to channel runoff water past pier/bents or to pier/bent troughs adjacent to girder ends.
- Slope the caps at all end bents and at piers located at intermediate deck joints. Provide troughs or other means to drain water from the cap to an embedded pipe drain.

Uncoated Weathering Steel Details

- Provide a 1/2" thick sacrificial end plate at the ends of all I-girders to protect girders from leaky joints.
- Use sealed expansion joints. Avoid any type of open joint that allows runoff to reach the steel.
- Provide details that take advantage of natural drainage. Eliminate details that retain water, dirt, and other debris.
- Paint the interior of box girders and the exterior face of end diaphragms per revised specifications.

Uncoated Weathering Steel Details

Figure 16.12-1 Weathering Steel I-Girder Details (1 of 2)

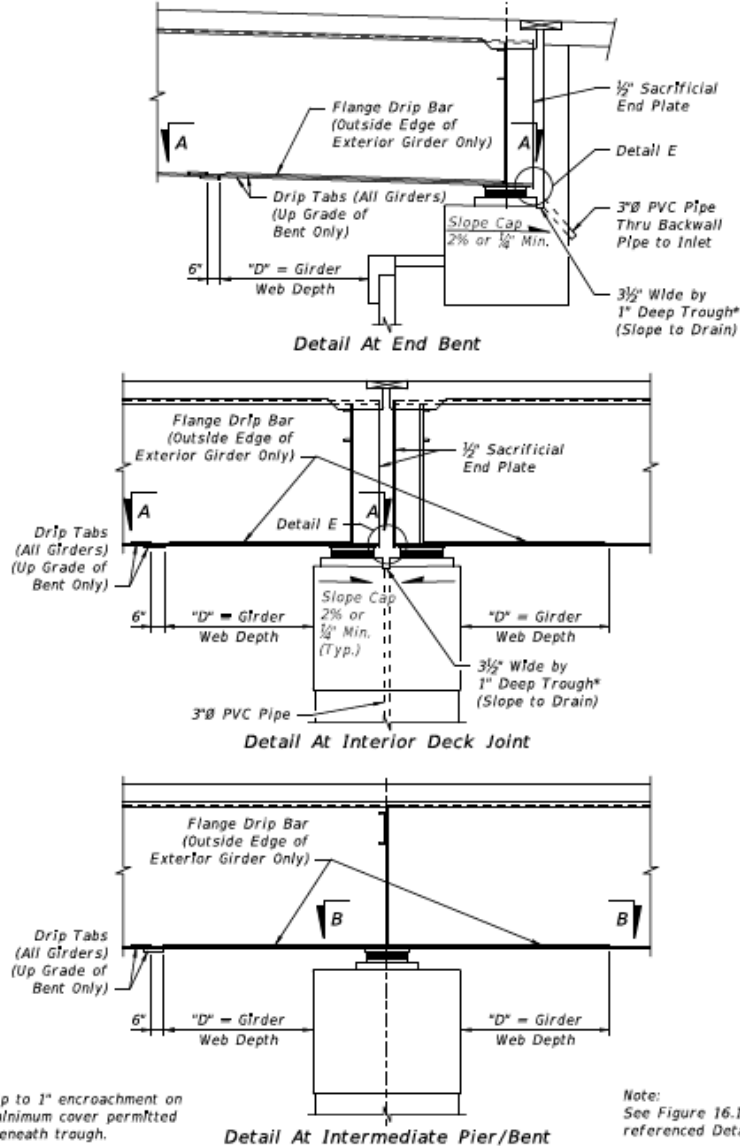
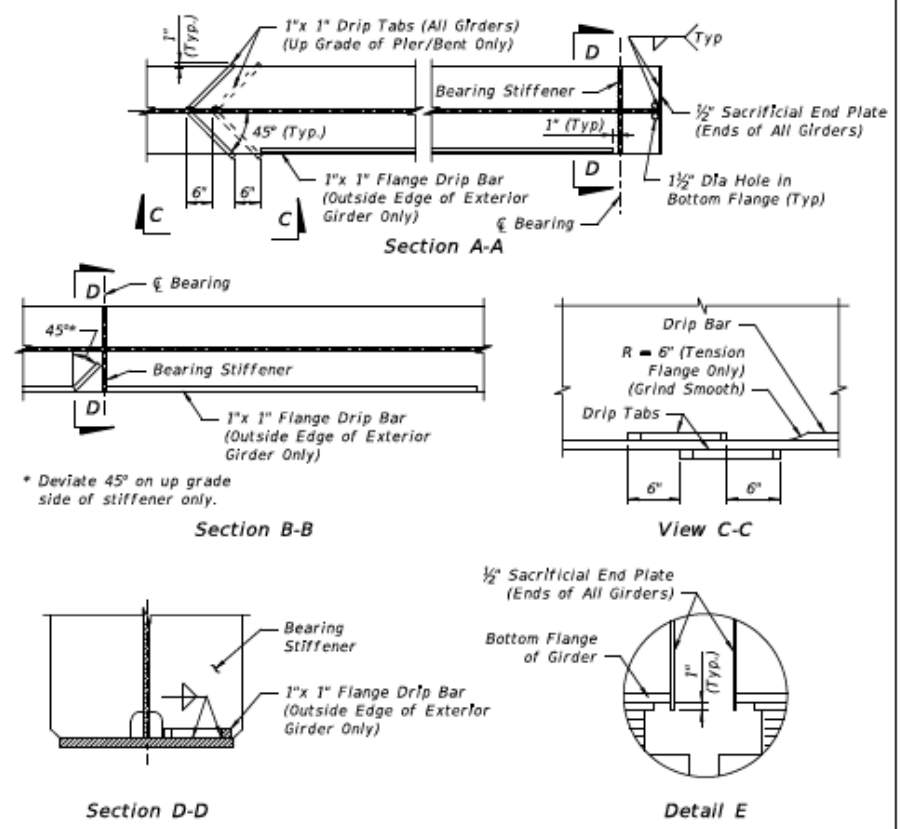
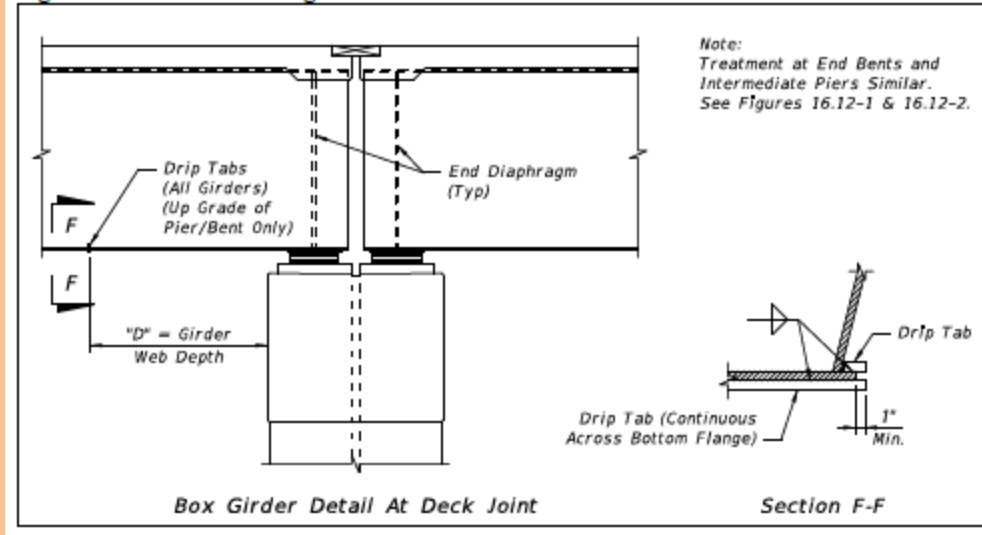


Figure 16.12-2 Weathering Steel I-Girder Details (2 of 2)



Uncoated Weathering Steel Details

Figure 16.12-3 Weathering Steel Box Girder Details



New Requirements for Weathering Steel

Questions???