

BRIDGE DESIGN STANDARD PRACTICES

The following standard practices were established by the Bridge Design Standard Practices Committee in a meeting held on February 9, 1995. They are distributed by Consulting Engineers General Memorandum 95-5.

1. Weathering Steel

- a. In general, the preferred alternative for steel bridges is now ASTM A709 Grade 50 (painted). Unpainted weathering steel (ASTM A709 Grade 50W) will not be considered the material of choice.
- b. Weathering steel will be considered on structures of the following nature:
 - b-1 Highway bridges over electrified railroads. Where these bridges are in locations where aesthetics are of prime importance, such as directly adjacent to a station or in the center of a municipality, local officials must be consulted and must concur with its use.
 - b-2 Highway bridges over waterways or non-electrified railroads in rural areas.
 - b-3 Highway bridges over waterways or non-electrified railroads or populated areas. Where the bridge is readily visible, local officials must be consulted and must concur with its use.
 - b-4 State highway bridges over local roads in rural settings where the ADT of the local road is low and after consultation with local officials who concur with its use.
- c. When weathering steel is proposed to be used on a project, a memorandum of concurrence will be prepared from the Transportation Engineering Administrator to the Chief Engineer. The memorandum should contain a concurrence line and a complete rationale for the request based on the appropriate criteria listed above. In cases where consultation with local officials is appropriate, a letter will be prepared from the Transportation Engineering Administrator to the appropriate officials requesting their concurrence after receiving the concurrence of the Chief Engineer. The concurrence of the Chief Engineer and of any appropriate local officials should be obtained very early in the design process. In special cases, this may also be a subject which should be brought before local residents through the public involvement process.
- d. Where weathering steel has been found to be appropriate in accordance with the guidelines listed above, previously developed guidelines governing its use will remain in force. These include the following:

Weathering steel should not be used in depressed, tunnel-like, overpasses or for very low clearance bridges over salt water where water from wave action would contact the steel on a regular basis. For these exceptions, the use of concrete should be strongly considered.

The design of unpainted weathering steel for bridges subject to vehicular salt spray, near a salt water environment, or a heavy industrial area should incorporate modest increases in flange plate thicknesses to allow for some minor section loss in the future.

The inside of box girders shall be painted white in order to facilitate bridge inspection.

Whenever possible, unpainted weathering steel bridges must be designed to eliminate deck joints. If deck joints cannot be eliminated, the areas adjacent to the joints shall be protected from leakage. Generally, the ends of the beams directly under joints can be painted for protection with a color that closely matches the weathered steel. The steel should be painted for a distance approximately equal to one and one half times the depth of the girder on either side of the joint.

Proper precautions should also be taken to minimize substructure staining for construction conditions and the service life of the bridge. In general, this will include providing catchments and diversion bars at all bearings and ensuring that the Contractor adequately protects the substructure during construction. A revised special provision for stain protection is being prepared and will be distributed in the near future.

Provisions should also be included to control vegetation growth under the structure to reduce the moisture in the air which could have a detrimental effect on the structure.

- e. Other alternatives to painted steel (i.e. concrete structures or galvanized steel) should be seriously considered in order to decrease future maintenance obligations. These alternatives require no special endorsement prior to implementation.

2. **Weepholes in Bridge Decks**

Deck weepholes shall only be provided adjacent to headers and joints at the low end of spans and the low side of cross slopes. All weepholes shall be located on the inside of fascia beams as shown on Bridge Manual Plate 4-9.1, and weepholes shall not be located over travel lanes, shoulders, sidewalks, parking areas, or in spans over railroad tracks. Where easily achieved during rehabilitation projects, existing weepholes should be plugged and paved over where not in accordance with these guidelines.

3. **Paraffin Coated Joints**

Paraffin coated joints will no longer be used in bridge parapets. Parapets shall be cast continuously between deck joints with reinforcing placed continuously. A horizontal construction joint shall be shown at the top of the sloped curb or sidewalk along with a note that this joint is mandatory, not optional.

4. **Shear Connector Quantities**

Quantities for shear connectors will be computed for estimating purposes only. Shear connectors will be bid as a lump sum item and quantities will not be shown on the plans.