

BRIDGE DESIGN STANDARD PRACTICES

The following standard practices were established by the Bridge Design Standard Practices Committee in a meeting held on February 8, 1994. They were distributed by Consulting Engineers General Memorandum 94-3.

1. **Superstructure Replacement Versus Deck Replacement With Painting**

It has been found that bridge deck replacement in conjunction with painting of structural steel may not be cost effective when compared to a new superstructure consisting of concrete or weathering steel.

For bridges that require the replacement of the bridge deck in conjunction with bridge painting, the designer should strongly consider the complete replacement of the superstructure with a low maintenance system such as weathering steel or concrete. The decision should be based on life cycle cost effectiveness, and other factors such as fatigue susceptibility, corrosion, etc.

A guide for life cycle cost analysis for bridge painting is being developed, and will be issued in the near future.

2. **Weathering Steel**

Generally, for all new steel bridge beams, the design should be based on the use of unpainted weathering steel. An exception for this design practice is for depressed, tunnel-like overpasses such as I-84 in downtown Hartford, or any other structure which the Department deems as unsuitable. Another exception will be 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 increases in flange plate thicknesses of 1/8 inch 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.

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.

3. **Lightweight Concrete**

Lightweight concrete should be considered on bridge rehabilitation projects where the reduced dead load is necessary to achieve the required load carrying capacity of the bridge beams and/or the foundations. The design should be based on 115 pcf and 4,000 psi. A special provision for this item is included with the recurring special provisions.

4. **Seismic Design Practice**

The seismic design practice that was distributed in September of 1992 (and forwarded to Consulting Engineers by General Memorandum No. 92-5) has been rewritten as a new section of the Bridge Design Manual (see attached). The rewrite is basically the same as the previous design practice.

The attached Section 29 should be used for the standard design practice for the seismic design of bridges. This will be issued at a later date as an actual revision to the current Bridge Design Manual.