

BRIDGE DESIGN STANDARD PRACTICES

The following standard practices were established by the Bridge Design Standard Practices Committee in meetings held on April 13, 1994, May 11, 1994, and August 30, 1994. They were distributed by Consulting Engineers Memorandum No. 94-7.

1. **Bridge Foundations at River Crossings**

Substructures for bridges over waterways shall be designed to safely support the structure subjected to the design scour.

Foundations subjected to scour shall be designed with footings supported on piles, footings founded on rock, deep footings (located below the maximum estimated scour) or any other approved means provided that adequate scour protection is maintained.

Preference for these foundations will be pile supported footings or direct foundations on rock.

2. **Cantilever Pier Caps**

Where pier caps are designed as a cantilever, the cap shall be post-tensioned. In order to eliminate future cracking, the design shall be based on zero tension in the top of the cap. A concrete sealer shall also be incorporated to prevent deterioration of the pier concrete.

3. **Bridge Parapets and Railing**

The design and detailing of bridge parapets shall be as follows:

A. **Limited Access Highways**

Bridge parapets shall be solid concrete, 42 inches high. Vertical transitions shall be provided at the ends to reduce the height to match the approach railing.

B. **Other Highways**

Use the current standards of 32 inch high concrete with an appropriate railing system.

C. **Scenic Overpasses**

For bridges on non-limited access highways where there is a strong need to provide a scenic view, an aluminum three-rail system should be used in place of a concrete parapet. The use of this system should be limited to very sensitive areas.

D. **Rehabilitation of Existing Parapets**

For bridges that require rehabilitation of the parapets and where the existing bridge railing is deteriorated, the bridge railing should be removed and replaced with a

concrete cap. Vertical transitions shall be provided at the ends to reduce the height to match the approach railing.

Attached are the preliminary details for the new 42 inch high concrete parapet and sample details of a parapet cap. The three-rail aluminum rail system has not been developed. The Bridge Design Unit will be obtaining copies of standards from various states in the area that use this type of system. At that time, end block and curb details will be developed.

4. **Bridge Rehabilitation Within Resurfacing Projects**

Due to limited funds for resurfacing projects combined with the need to spend more resurfacing monies for roadway rehabilitation, the extent of bridge rehabilitation as part of resurfacing projects must be pared back. As a result of this, the following new design practice was developed:

For resurfacing projects, the following criteria should be used to determine the scope of bridge rehabilitation work:

- A. For bridges that require deck patching, the rehabilitation of the bridge should in general be limited to the deck, expansion joints and parapets. If a serious deficiency exists in the bridge beams, bearings or substructure, they should be repaired under the resurfacing project.
- B. Bridges that require deck or superstructure replacement within the limits of a resurfacing project will still be included in resurfacing projects.
- C. Bridges that pass over the highway that is being resurfaced will not be rehabilitated as part of resurfacing projects.
- D. Bridge painting will not be included as part of resurfacing projects.

As a result of changes to bridge design standard practice, the following Bridge Design Manual plates are hereby deleted:

2-1.8	4-5.3
2-2.1 through 2-2.6	4-5.5
3-6.1 and 3-6.2	4-6.1 through 4-6.3
4-3.3 and 4-3.6	4-11.1
4-3.8 through 4-3.11	4-14.9 through 4-14.11
4-4.1	6-1.1 through 6-1.2