

Bridges and Structures

January 2, 2001

All Employees

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Gary Novey

Subject: Bridge Substructure Design-MM No. 2 (Top Bar Factor for Footing Reinforcing Steel Development Length).

There have been questions on whether the office should be using a 1.4 top bar factor for the development length check of the bottom mat of reinforcing steel for pier footings when the mat is placed above the piling. Based on the AASHTO Specification 8.25.2.1 the 1.4 factor should be used any time there is more than 12 inches of concrete placed below the reinforcing. After discussions with the section leaders, it was decided to use the 1.4 factor for the bottom mat of steel when it is placed above the piles. If you have problems getting the development length to work, the following options can be considered:

1. Try and use a smaller size bar to decrease the development length.
2. Reduce the development length by using AASHTO Specifications 8.25.3.2 where the development length can be decreased by a factor based on the $\frac{\text{Areas Steel Required}}{\text{Area Steel Provided}}$.
3. Drop the mat of steel so that it is 6 inches clear from the bottom of the footing. If you have a large number of piles in your footing, this option may not be your best choice. During driving the piles may shift from their correct location making it difficult for the contractor to place reinforcing around the piles.
4. If using options 1 through 3 and you still cannot meet the development length, then provide a hook at the bar ends. Check with your section leader for approval.