

**IOWA DEPARTMENT OF TRANSPORTATION**

To Office Bridges and Structures Date April 6, 2007  
Attention All Employees Ref No. 521.3  
From Gary Novey  
Office Bridges and Structures  
Subject Method's Memo No. 160 (Design Manual Article 6.2.6.1, Revised Allowable Pile Stress)

During the design of the I-80 bridge across the Missouri River, the issue of allowable design stresses for piling when driving to solid rock ( $N > 200$ ) was raised. The piling on this project had been designed for 9 ksi (62 MPa) allowable based on the Bridge Design Manual. However, for this bridge, there was a large quantity of piling, and it was apparent that the H-pile design using the present stress limit of 9 ksi (62 MPa) was not cost effective for the site conditions. The stress limit was raised to 12 ksi (83 MPa), and the redesign reduced the piling cost significantly.

In order to avoid redesign in similar situations in the future, the Bridge Design Manual Article 6.2.6.1 has been revised to include the option for a higher allowable stress when piles are driven to solid rock ( $N > 200$ ). This higher stress 12 ksi (83 MPa) will only be available when recommended by the Soil Design Section or geotechnical consultant, and approved by the Assistant Bridge Engineer.

Before using the higher value, the designer shall contact the Office of Construction and provide pile information, bottom of footing information, and soils data for a preliminary wave equation drivability analysis. If there are drivability concerns, the Office of Construction will work with the designer in house or if it's a consultant project with the Consultant Coordination Section to provide recommendations to the consultant.

This policy should be implemented on all new bridge projects. If you have any questions, please check with me.

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