letters

Comments on Bridge Sustainability

In the April 2011 issue of *Modern Steel Construction* three excellent discussions of bridge sustainability were presented. (See "Bridges: Sustainability," available at www.modernsteel.com/backissues.) Most of my structural engineering career was spent in the Bridge Division, City of Chicago. During my work in the Bridge Division, I found two ways to increase the useful life of bridges:

1. **On bascule bridges we tried to make the deck as light as possible, to reduce the counterweight, foundation loads and operating power. The obvious solution was to use an open grid deck. The open grid deck was much lighter than the concrete deck, and could easily carry the heavy truck load. Several years passed with no signs of trouble. Then during a routine inspection, it was found that the flanges of the small beams supporting the open grid deck were badly corroded. Debris from the tires of thousands of vehicles crossing the bridge had landed on the flanges, and retained water from rain and melting snow. This contaminated water caused the flanges to deteriorate. Is there any way to prevent this situation? The answer is to use an orthotropic steel deck. The orthotropic steel deck is lightweight, and can carry the heavy truck load. Closed ribs can be designed to be airtight, and preclude corrosion of the inside of the ribs. This would reduce maintenance costs, and extend bridge life. An excellent book on the subject of orthotropic deck bridges is *Design Manual for Orthotropic Steel Plate Deck Bridges*, published by the American Institute of Steel Construction. This book contains both design information, and practical considerations, such as corrosion prevention.**
2. **The use of salt to melt snow has caused deterioration of various steel parts of both fixed and movable bridges. The solution to this problem is to make a search of deicing agents that have no corrosive components, and use these on bridges and bridge approaches. Away from the bridges, the standard deicing chemicals can be used.**

The above two items will result in extended bridge life, and reduce the cost of maintenance.

—Peter Kocsis, S.E., P.E.
Barrington, Ill.

Editor's note: More current information regarding the design and construction of steel orthotropic decks will soon be available. The AASHTO Subcommittee on Bridges and Structures recently approved major revisions to the LRFD Bridge Design Specifications *at its annual meeting in May 2011. The new requirements will be published in the next interim specification, available by March 2012. Also, FHWA (by contract with HDR Engineering, Inc.) is finalizing work on a new* Manual for Design, Construction and Maintenance of Orthotropic Steel Deck Bridges. *This document is expected to be released in early 2012.*

A Recommendation, Not a Requirement

I'm troubled by your response in the May 2011 Steel Interchange concerning the minimum number of bolts in a connection during erection.

You state that the two-bolt requirement is an OSHA requirement, and that AISC has no minimum requirement, aside from "the requirement that simple shear connections must extend deeper than *T*/2 of the supported beam." I take exception with this statement. The *T*/2 practice is most definitely not a requirement; it is not found in the AISC *Specification*, or the *Code of Standard Practice*, or any model building code. It is a recommendation, long contained in the *Manual of Steel Construction* (9th edition, pages 4-12, 4-52, 4-84; 13th edition, pages 10-8, 10-49, 10-104, 10-123, 10-129). As such, your response makes the false statement that this is a practice that cannot be deviated from without violating the *Specification*.

Most of our work is connection design, and we are very familiar with the code requirements, industry practice, and recommendations of AISC and other appropriate parties. Sometimes we are challenged by the Engineer of Record on some aspect of our design. Nearly every time, this EOR is not as familiar with connection design and has confused outdated rules of thumb and recommendations as code-mandated requirements. I fear that the next time an EOR gives us a W33 beam framing into the side of a W18, with the W33 dropped down 2½ in. for a joist seat, that the EOR will point to this response and say that the connection we have provided violates the *Specification*, when it actually does not.

Thank you for the work you do. I thoroughly enjoy the magazine each month, and this month is no different.

—Adam W. Boyette, P.E.

The Steel Solutions Center responds:

Thank you for your comments and insights. We try to be very careful with our words, especially the difference between *Specification* requirements and recommendations given elsewhere, like the *Manual*. However, you are correct that it states this as a recommendation in Part 10 of the 13th Edition *Manual* and is not part of the *Specification* requirements. It was intended that the sentence read "recommendation" and not "requirement."

The Value of Forensic Engineering

I agree with your column in the June issue regarding forensic engineering and the benefit of discussing failures.

I've said to my family and friends, "We learn from our mistakes; and at the rate I'm going, I'll end up a genius".

—David M. Barr, P.E.
Pennsylvania

Your Editor's Note in the June edition was excellent! Thank you for bringing that issue into light. It reminds me of a lesson from my very excellent Cal Professor, Alex Scordelis. He said, "Read regularly the periodicals about your industry and your profession… When I open up *ENR*, I read the failures first, to learn what not to do."

—Patrick M. Hassett, S.E.
Castro Valley, Calif.

To read the article, go to www.modernsteel.com/backissues and select June 2011.