FINGER SHIMS IN BOLTED JOINTS

Are there any strength concerns associated with using finger shims in pretensioned bolted joints? Can finger shims be used in seismic applications?

Question sent to AISC's Steel Solutions Center

The strength effects of shims (and fillers) are addressed in the 2000 RCSC Bolt Specification, Section 5.1. For shims equal to or less than ¼-inch thick, the strength is unaffected. For shims over ¼-inch thickness, refer to the RCSC Bolt Specification requirements.

Finger shims can be used in seismic applications. Several connections included in the FEMA 350 series (and the 1997 Seismic Provisions) used finger shims, Provisions), you would need to satisfy design shear strength and panel zone thickness requirements in Section 9.3. Please note that the design shear strength is a function of the total thickness of the panel zone, including the doubler plate(s). Additional information, including sizing and attachment details, is found in AISC Design Guide 13: Stiffening of Wide-Flange Columns at Moment Connections: Wind and Seismic Applications. Some details terminate flush with the transverse stiffeners; others can be used that extend beyond the stiffeners as well.

Keith Mueller, Ph.D.
AISC Steel Solutions Center
Chicago, IL

HOT-DIP GALVANIZING

How long will hot-dip galvanizing protect steel from corrosion?

Question sent to AISC's Steel Solutions Center

The corrosion rate of zinc and how long it will provide protection is a function of the coating thickness and the amount of corrosive elements in the atmosphere. For example, in rural settings where there is less automotive/truck exhaust and plant emissions, galvanized steel can easily last for 100 to 150 years without maintenance. Industrial and marine locations contain significantly more aggressive corrosion elements such as chlorides and sulfides and galvanized steel may last for 50 to 100 years in those cases. The relationship between coating thickness and atmospheric conditions is contained in a popular graph developed by the American Galvanizers Association (AGA). Please refer to the publication Hot-Dip Galvanizing for Corrosion Protection: A Specifier's Guide on the AGA website (www.galvanizeit.org).

Philip G. Rahrig
American Galvanizers Association
Centennial, CO

the plastic hinges form in the flange as previously and cur-