

## Bolt Installation Using Hand Wrenches

### *Question sent to AISC's Steel Solutions Center*

The 2004 *Research Council on Structural Connections (RCSC) Bolt Specification* ( ) allows four different pretensioning techniques (turn-of-nut, calibrated wrench, twist-off bolts, and direct-tension-indicator washers). Since you've already eliminated the calibrated wrench method and it does not sound like the bolts you have are the twist-off type, that leaves you with the DTI method and turn-of-the-nut method. Either one can be used.

One special consideration with bolts that are longer than specified—make sure the nut does not jam on the thread run-out in the installation. Where a nut might jam, you can add a washer or washers under the nut to eliminate the problem. As far as using an open ended wrench, you may have some difficulty. Snug-tight is considered the full effort of an ironworker using a spud wrench. Achieving pretensioning, if required for the connection, by a spud or open ended wrench may be very difficult, considering the effort that would be involved.

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## Column Splice Erection Tolerances

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Providing erection clearance is a smart move. The suggested typical column splice details shown in the *AISC LRFD Manual of Steel Construction*, 3<sup>rd</sup> Edition, Case VI-A (pages 14-38 and 14-39) indicates that erection clearance should be provided and that sufficient strip shims should be provided to obtain 0" to 1/16" clearance on each side. Based on your description of the fit-up, it appears that your connection is within this recommended clearance. A gap such as this is easily drawn together in bolt installation, even with bolts that are snug-tightened.

As far as the installed condition and what gap is permitted, the *RCSC Specification* calls for the plies to be brought into firm contact. RCSC defines firm contact as "... the plies ... solidly seated against each other, but not necessarily in continuous contact."

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## Structural Steel Inspection

### *Question sent to AISC's Steel Solutions Center*

AISC is presently developing a specification for the qualification of steel structures inspectors, which will be a valuable source of information on steel inspection.

The International Code Council (ICC) publishes a document titled *Structural Steel Inspection and Field Practices Workbook*. The workbook is available from the following ICC web link,

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## Shear on Anchor Rods

## *Question sent to AISC's Steel Solutions Center*

None of the qualifying tests for seismic moment end-plate connections used slip-critical bolted joints; therefore, faying surface preparation is not required for this particular connection type.

Section 7.2 of the 2002 *Seismic Provisions* technically does not exclude seismic moment end-plate connections from faying surface preparation requirements. However, the Commentary to Section 7.2 mentions that the faying surface preparation requirement may be relaxed for this particular connection. Hence the source of confusion, as Commentary language cannot be interpreted as a specification provision.

This will be clarified in the upcoming 2005 AISC *Seismic Provisions* as a direct exemption to be found in Section 7.2.

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## **Hot-Dip Galvanizing and Vent Holes**

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## *Question sent to AISC's Steel Solutions Center*

“It is important to properly vent hollow, overlapped, and contacting surfaces to prevent trapped moisture or gas from flashing to steam in the heated galvanized kettle, which may result in localized uncoated surfaces. Additionally, pressure increases resulting from trapped moisture flashing to steam can violently rupture the fabrication, endangering galvanizing plant personnel. ASTM A385 contains guidelines for properly venting numerous types of assemblies.”

(Answer taken from the June 2005 *Modern Steel Construction* article “Specifying and Detailing for Hot-Dip Galvanizing: An Overview for Engineers, Architects, and Detailers” by Rahrig and Krzywicki. The article can be downloaded from MSC's web site at [www.aisc.org](#).)

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