is published in memory of Kurt Gustafson, AISC Director of Technical Assistance, who passed away suddenly and unexpectedly on Saturday, June 19, 2010. It is composed entirely of answers that Kurt wrote. We will miss him greatly. See the article on page 19.

Per AISC 358-05 Section 4.1, "Bolts shall be pretensioned high-strength bolts conforming to ASTM A325 or A490. Twist-off type tension control bolt assemblies of equivalent mechanical properties and chemical composition may be substituted for A325 or A490 fastener assemblies." Do ASTM F1852 bolts have mechanical properties and chemical compositions comparable to A325 and A490 bolts?

Yes, for ASTM A325; no, for ASTM A490. ASTM F1852 is the tension-control bolt equivalent to the ASTM A325 conventional bolt. This is discussed in the Commentary to Section 2.7.2 of the 2004 RCSC *Specification* (a free download at **www.boltcouncil.org**). That Commentary also discusses the use of tension-control bolts with mechanical properties equivalent to ASTM A490 bolts. Subsequent to the publication of the 2004 RCSC *Specification*, ASTM developed the ASTM F2280 standard as a TC equivalent to the ASTM A490 conventional bolt.

Kurt Gustafson, S.E., P.E.

Does the AISC *Specification* require that moment-connected beams can only frame orthogonally to column flanges in moment frames?

The AISC *Specification* does not require that the moment frames must be aligned in any specific orientation. Assumptions as to framing layout and alignment are made by the responsible design professional. Any eccentricities, offsets, or non-orthogonal orientation must be accounted for in the design.

If you are designing moment frames for high-seismic applications, however, and intend to use prequalified moment connections, there are no prequalified connections fo or [illegible] Section 2.3.2 of the RCSC *Specification* (a free download at **www.boltcouncil.org**) as follows:

> "The bolt length used shall be such that the end of the bolts extends beyond or is at least flush with the outer face of the nut when properly installed."

Kurt Gustafson, S.E., P.E.

I am trying to find section properties of a floor beam from a building built in 1931. The designation for the beam is BI 30×137. I tried using the AISC shapes search and had no luck in finding that particular shape. Can you help me identify the shape?

The B designation likely indicated that this was a Bethlehem shape from the era. The "I" was not an official AISC *Manual* designation, but probably referred to the common I-beam nomenclature of the time. There was a 30-in.-deep Bethlehem beam weighing 137 plf produced starting in 1909.

AISC has developed two sources of information pertaining to historic shapes. AISC *Steel Design Guide 15* is a reference for historic shapes and specifications. This document also describes the common ASTM material standards in effect during different eras. There also is an AISC Shapes Database v13.1.1 and 13.1H, where the H stands for Historic. Both of these resources are available as free downloads for AISC members at **www.aisc.org/epubs**, or can be purchased by others.

Kurt Gustafson, S.E., P.E.

What is a snug-tightened connection?

Section 8.1 of the RCSC *Specification* (a free download at **www.boltcouncil.org**) describes snug-tightened joints as follows:

"The snug-tightened condition is the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench to bring the connected plies into *firm contact*."

The definition of *firm contact* is given in the Glossary of the RCSC *Specification* as follows:

> *Firm Contact*: The condition that exists on a faying surface [illegible] the plies are solidly seated against each other but not [illegible] necessarily in continuous contact.

Kurt Gustafson, S.E., P.E.

I would like to design a "Zee" shaped member. A "Zee" has no axis of symmetry, though the principal axis does pass through the center of the vertical web. Therefore, I believe this should be treated as a solid symmetric shape, like a rectangular bar, bent about the major axis. Is this appropriate? The Zee is not bent about its major principal axis.

The basic principals of flexure are described in engineering texts, rather than any version of the AISC *Specification*. When the loading plane of a beam does not coincide with either of the principal planes, but the loading causes no torsion, bending occurs along both principal axes, which is bi-axial bending. So, for your case, flexure of unsymmetrical shapes is covered in Section F12 of the 2005 AISC *Specification*. Look to the Commentary of Section F12 for further discussion and additional references.

Kurt Gustafson, S.E., P.E.