is an open forum for readers to exchange useful and practical professional ideas and information on all phases of steel building and bridge construction. Opinions and suggestions are welcome on any subject covered in this magazine.

The opinions expressed in do not necessarily represent an official position of the American Institute of Steel Construction, Inc. and have not been reviewed. It is recognized that the design of structures is within the scope and expertise of a competent licensed structural engineer, architect or other licensed professional for the application of principles to a particular structure.

If you have a question or problem that your fellow readers might help you to solve, please forward it to us. At the same time, feel free to respond to any of the questions that you have read here. Contact via AISC's Steel Solutions Center:

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SHEAR STUD REDUCTION FACTOR

The 1999 *LRFD Specification*, Section I3.5b states, *"Where there is only a single stud placed in a rib oriented perpendicular to the steel beam, the reduction factor of equation I3-1 shall not exceed 0.75."* Does this requirement apply to ASD design as well?

Question sent to AISC's Steel Solutions Center

Yes, this requirement applies to ASD. See . *1* , a free download from www.aisc.org/freedownloads.

. For bending about the weak axis, the lateral-torsional limit state is not applicable. With thick, stocky flanges and webs thick enough, flange- and web-local buckling are not likely to control, in which case the channel can be designed for flexural yielding. In LRFD, 0.9 ***Z*** is appropriate.

If desired, the LRFD provisions can be converted by comparison to an equivalent ASD format. In ASD, this corresponds to 0.66 . If flange- or web-local buckling does control, the equations in Appendices B and F could apply.

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SECOND-ORDER EFFECTS

When we performed the analysis of a frame, we found that our computed stresses were considerably higher than those computed by the design engineer. Upon further investigation, we found that these higher moments were due to second-order effects. The design engineer claims that he is not required to perform a second-order analysis under the *ASD Specification*. Is this correct?

Question sent to AISC's Steel Solutions Center

The 1989 AISC requires consideration of second-order effects, as it has since the introduction of the 1961 version of that specification. The does not require that a second-order analysis be performed but instead uses a simplified amplification of the first-order analysis to accomplish that goal. This can be found in Equation H1-1 of the 1989 AISC where axial and flexural stresses are combined. The computed first-order bending stress is amplified by a factor to account for the second-order effects.

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FILLET WELD STRENGTH

Are fillet welds stronger when loaded transversely than when loaded longitudinally?

Refer to FAQ 8.3.1 on the AISC website at www.aisc.org/faq, as summarized below:

Yes. This long-known variation in strength as a function of load angle is now formally recognized in the 1999 AISC , Appendix J2.4. The maximum strength increase permitted therein is 50 percent, which occurs for a load perpendicular to the fillet weld. When the load angle is intermediate between longitudinal and transverse, the strength increase will vary between 0 and 50 percent, respectively.

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HOT-DIPPED GALVANIZED BOLTS

Are there any special requirements if we decide to use hot-dipped galvanized ASTM A325 Type 1 (medium carbon) bolts?

Question sent to AISC's Steel Solutions Center