IF YOU'VE EVER ASKED YOURSELF "WHY?" about something related to structural steel design or construction, *Modern Steel Construction*'s monthly Steel Interchange column is for you! Send your questions or comments to solutions@aisc.org.

Wind Connections in Seismic Areas

(2), 4-100 9 -

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Question sent to AISC's Steel Solutions Center

The 13th edition manual's updated information on this type of connection states that flexible moment connections are useful for low-seismic application (design in which the seismic response modification factor R is taken equal to 3). For high-seismic applications (design in which R is taken greater than 3), flexible moment connections are not a recognized structural system.

Sergio Zoruba, Ph.D., P.E.

Composite Steel Beam

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Question sent to AISC's Steel Solutions Center

There is a trade-off of beam weight savings associated with the composite beam system versus the additional cost of adding the studs. Generally, the cost of the installed studs would probably be equivalent to about 10 pounds per linear foot of beam weight.

Shop application of studs to steel beams used in building applications is considered a construction safety hazard, and therefore not permitted by OSHA regulations. To eliminate the tripping hazard for ironworkers, shear studs for composite beams are field-installed in buildings.

The use of composite beam construction in building applications is not unusual, and the use of shear studs to achieve this composite action is also very common. The installation of the shear studs is typically done with a specific "gun" process that is controlled and usually very reliable. Section 7 of AWS D1.1 covers the subject of stud-welding in detail, including the subjects of workmanship, techniques, stud application qualification requirements, production control, and fabrication and verification inspection requirements. Following these requirements should provide a high level of confidence in the quality of the product.

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

Base Plate Bending

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Question sent to AISC's Steel Solutions Center

The thickness of the base plate is determined based on the cantilever dimension(s) and the pressure distribution developed between the base plate and foundation as a result of the applied axial load and/or moment. The only difference in procedure is the assumed pressure distribution caused by the weak-axis bending with respect to the orientation of the W-shape. The plane of bending about the weak-axis of the W-shape is shown in Figure 3.1.1(b) in *Design Guide 1* (a free download for AISC members at /). You will see the assumed bending lines about the weak-axis, designated at $0.80b_f$, as opposed to $0.95d$ for the strong axis bending. The pressure resulting from axial compression is additive in defining the pressure distribution for either case of bending.

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Steel Interchange is a forum 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.

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