



Dr. Ralph M. Richard

Single-plate Framing Connection Designs

Author

Dr. Ralph M. Richard, at the University of Arizona since 1963, is professor of Civil Engineering and Engineering Mechanics and research professor of Optical Sciences. A native of Indiana, Richard earned his B.S. degree in Civil Engineering with honors from the University of Notre Dame, his M.S. in Civil Engineering from Washington University and a Ph.D. from Purdue University. In addition to teaching courses in solid mechanics and structural engineering, he has been active in research sponsored by AISI, AISC, the National Aeronautics and Space Administration and the Dept. of Defense.

Richard has lectured and authored papers and reports on the design of steel connections and lateral bracing systems, including steel-plate shear walls. He has also published papers and lectured on the design of support systems for vibration and shock isolation of high-resolution optical components and electronic systems.

His major consulting work has been with General Dynamics, Welton Becket Associate Architects, the Ballistics Research Laboratory, City Investing Corporation, Mountain States Engineering, the Duval Corporation, IBM, the Ministry of Communications of Saudi Arabia and the National Optical Astronomy Observatories.

He is a member of ASCE and the Structural Engineers Association of Arizona and is a registered professional engineer in Arizona and California. His professional appointments include the AISC, AISI and ASCE Committees on Steel Connections.

Dr. Richard received the 1986 AISC T.R. Higgins Lectureship Award for his research and papers on single-plate framing connections.

Summary

The three most commonly used flexible steel beam connections are single plates, double framing angles and seated connections. Of these three, the single-plate framing connection often is the most economical to use from both fabrication and material considerations. Included here are procedures for the design of the plate, bolts and welds for typical applications of the single plate. Also included are considerations of the effects of the inherent rigidity of the connection on the supporting member. Designs for typical strong and weak axis beam-to-column connections, beam-to-girder connections and beam-to-tube or box-column connections are presented.