

PUBLICATIONS

AISC Design Guide, Constructability of Structural Steel Buildings, Now Available

Design professionals now have a valuable new resource on constructability: AISC Design Guide No. 23, *Constructability of Structural Steel Buildings*, by David Ruby, P.E., chairman of Ruby + Associates. The publication addresses constructability as a design concept that takes advantage of steel materials, fabrication, and installation expertise early in the design phase.

"I consider this Design Guide to be both the culmination of past lessons learned and the catapult to the future relevance of our profession," said Ruby. "The Design Guide details what we have learned over the past several decades in all aspects of design and construction. It is a guide that brings together voices of the steel industry and identifies the different disciplines, tradespeople, and skill sets required to make a project succeed with this philosophy. I am an ardent believer in the value of constructability: the integration of the design and construction processes aimed at maximizing simplicity, economy, and speed of construction.

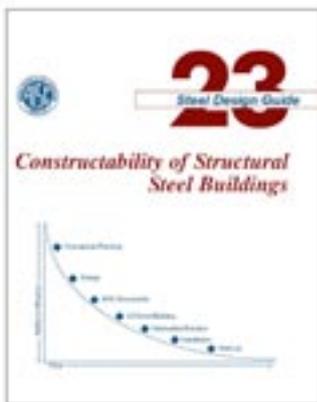
"With the design community and construction industry facing intense economic pressure, the focus will be on the bottom line," continued Ruby. "All members of the construction team will be under increased pressure to complete projects faster and more efficiently. We'll be called upon to thoroughly understand holistic project issues and ask the right questions that positively impact over-

all project objectives. By focusing on constructability, our clients can count on us to make their projects not only possible, but more economical."

The Design Guide highlights constructability as a design philosophy that helps position the structural engineering profession as an evolutionary asset to the client and construction community. It encourages the streamlining of the planning, design, and construction sequence using concept development, design/BIM (building information modeling), and construction processes. The publication covers specific areas such as: early involvement, the design process, issues related to the structural steel framing, detailing and fabrication, steel erection, and special constructability issues (e.g., anchorage to concrete, camber, and tolerances).

"This Design Guide explores an approach that will help all parties to a contract—owners, designers, constructors, everybody," said Charles J. Carter, AISC vice president and chief structural engineer. "It highlights the benefits of early involvement and a team-based approach, where the constructability of the project is the guiding motivation for design and construction decisions. It shows how constructability can result in more creative and relevant solutions that bring enhanced value to clients."

Design Guide No. 23 is available as a free download to AISC members from



www.aisc.org/ePubs and at a price of \$60 for nonmembers. An ePubs subscription is part of AISC's member benefits packages and includes access to more than 10,000 pages of AISC publications in electronic format. AISC also provides freePubs for all of its website visitors. The freePubs section comprises AISC's technical resources, such as specifications and codes, as well as MSC articles.

PUBLICATIONS

Public Review of 2010 AISC Seismic Provisions

The 2010 draft of the AISC *Seismic Provisions for Structural Steel Buildings* is available for public review from May 1 to June 15, 2009. The *Provisions* are available for download from the AISC web site at www.aisc.org/AISC341PR1, along with the review form, during this time. A summary of some of the major revisions is included with the review form. Copies of the draft *Provisions* are also available (for a \$12 nominal charge) by calling 312.670.5411.

Please submit comments using the form provided online to Cynthia J. Duncan, director of engineering, at duncan@aisc.org by June 15, 2009 for consideration.

- Historical and Cultural Aspects
- Structural Design Concepts
- Sustainability: Solutions in Relation to Society, Environment, and Economy
- Urban Context
- Steel Structures in Relation to Architectural Functions and Forms (Wide-Span Solutions, High-Rise Solutions, and Innovative Approaches)
- Structural Issues (Stability, Connections, Constructional Issues, Ultimate Load Design, Wind Effect, and Earthquake Resistance)
- Seismic Isolation and Vibration Control
- Fire
- Spatial Structures
- Composite Solutions
- Cold-Formed Steel Structures
- Codes
- Case Studies

Abstracts for the Symposium will be accepted until November 9, 2009. For more information visit www.sscs2010.com.

EVENTS

Istanbul to Host Steel Cultural and Sustainability Symposium in 2010

The year 2010 will be a big one for Istanbul, Turkey. Not only has it been selected Cultural Capital of Europe for 2010, it will also host the Annual Meetings of the European Convention for Constructional Steelwork (ECCS).

Both events provided the impetus for the creation of the Steel Structures: Culture and Sustainability 2010 International Symposium, sponsored by ECCS and the Turkish Constructional Steelwork Association. The event will be a forum for

architects, designers, structural engineers, steel fabricators and builders, urban psychologists, social planners, and environmentalists to discuss new horizons in steel structures in their relation to present culture, as well as a new European vision for a better and sustainable future. The Symposium will take place September 20-22, 2010.

Besides design issues and research related to steel structures, the Symposium will also cover social and cultural aspects in the field within the following themes:

Second Quarter 2009 Article Abstracts

The following papers appear in the second quarter 2009 issue of AISC's *Engineering Journal*. EJ is available online (free to AISC Members) at www.aisc.org/epubs.

Design of Unstiffened Extended Single-Plate Shear Connections

Larry S. Muir and Christopher M. Hewitt
Extended single-plate shear connections offer many advantages that simplify the construction process. Because the connection to the supported member is moved clear of the support, coping of the supported member is not required, and the only fabrication process required for the supported member is drilling or punching.

Also, because bolted connections are only used in the connection to the supported member, there is no safety concern over the use of shared bolts through the web of the support. Additionally, in some instances, extended single-plate connections are the only practical solution to a framing problem, such as the case of a member framing into the weak axis of a column with continuity plates.

The rigidity of single-plate connections at the support has always been a gray area. Designers have often been concerned about a considerable, unanticipated moment that could be developed in the connection, which could then result in either a moment delivered to the column that the column has not been designed to resist, or a sudden rupture of either the weld or the bolts. Section B3.6a of the AISC *Specification for Structural Steel Buildings* requires that simple shear connections have sufficient rotational capacity to accommodate the required beam end rotation.

This paper will address each of these concerns, and will present a general design procedure for extended single-plate shear connections.

Topics: Connections—Simple Shear

Experimental Evaluation of the Influence of Connection Typology on the Behavior of Steel Structures Under Fire

Aldina Santiago, Luís Simões da Silva, Paulo Vila Real, Gilberto Vaz, and António Gameiro Lopes

The behavior of steel joints under fire loading is a subject that has only recently received special attention by the research community. In fact, as recently as 1995, the European pre-standard on the fire response of steel structures deemed it unnecessary to assess the behavior of steel joints under fire conditions.

This approach was supported by the argument that there is increased thermal mass at the joint area. However, observations from real fires show that, on several occasions, steel joints fail, particularly their tensile components (such as bolts or end plates), because of the high cooling strains induced by the distortional deformation of the connected members.

The main objective of this paper is to describe an experimental test program carried out by the Department of Civil Engineering at the University of Coimbra on a steel sub-frame in order to evaluate the behavior of various types of steel joints under a natural fire and transient temperature conditions along the length of the beam.

The tests were carried out on a purposely developed experimental installation that could reproduce the transient temperature conditions measured in the seventh Cardington test. The results of these tests provide invaluable evidence on how to design joints that are able to survive a fire.

Topics: Fire And Temperature Effects; Connections—Moment; Connections—Simple Shear

Shear Behavior of A325 and A490 High-Strength Bolts in Fire and Post-Fire

Liang Yu and Karl H. Frank

High-strength ASTM A325 and A490 bolts were tested in shear at temperatures up to 800 °C (1,472 °F). The shear strength showed a gradual reduction in both types of bolts as the temperature was increased above 300 °C (572 °F). Strength reduction factors for both types of bolts at elevated temperatures were obtained to provide a means of estimating the bolt shear strength during fire.

The residual strength of A325 and A490 bolts after exposure to elevated temperatures was also investigated by both direct shear tests and hardness tests. Significant strength loss occurs on both types of bolts after exposure to temperature higher than the tempering temperature employed in the manufacturing process. The hardness value at $\frac{1}{2}R$ location on the bolt cross section was found to provide a good estimate of the bolts' residual strength. The hardness test provides a simple and practical method to assess the post-fire strength of a bolt.

Topics: Bolts; Fire and Temperature Effects

People and Firms

- **Friedman Industries, Inc.** has opened a steel coil processing plant in Decatur, Ala. The facility is designed to convert hot-rolled coils received from the adjacent Nucor Steel Company mill into hot-rolled sheet and plate.
- **Thornton Tomasetti** recently acquired California-based DASSE Design, Inc., a structural engineering firm focused on the health-care, education, government, and corporate sectors.
- Seismic design and consulting firm **Miyamoto International** has opened a new office in Istanbul, Turkey and has joined with **Fuji Architectural and Engineering** to provide a full line of seismic engineering services to the region. In other news, Ed Friedrichs, former **Gensler** president and CEO, has joined Miyamoto's board of directors.
- Thomas Langill, Ph.D., technical director of the **American Galvanizers Association**, has received the ASTM International Award of Merit—the highest organizational recognition for individual contributions to ASTM standards activities—and the accompanying title of Fellow.
- **Wiss, Janney, Elstner Associates, Inc.** has appointed **Tim Allanbrook**, **John Fraczek**, and **Terry Paret**—currently principals in its New York, Janney Technical Center, and San Francisco units, respectively—all to senior principal.
- **Chris Poland**, chairman and CEO of **Degenkolb Engineers**, has become a member of the National Academy of Engineering (NAE).
- Metal deck distributor **A.C.T. Metal Deck Supply** has opened its 11th distribution center, in San Antonio.
- **GZA GeoEnvironmental Inc.**, an environmental and geotechnical consulting firm, announced that **Lawrence E. Morse** has been named to the position of vice president.
- The **International Association for Bridge and Structural Engineering** put its publications from 1929-1999—a body of work consisting of more than 80,000 pages of documents on structural engineering worldwide—online for free; visit www.iabse.org.
- Peddinghaus' daughter company, **Structural Steel Systems Limited**, has released a new tool for fabricators to use in the fight to keep costs down and production running smooth: www.sss-machinery.com.