

AWARDS

Innovative Projects Wanted for AISC Awards Competition

Engineers, architects, fabricators, and all other building team members are invited to submit their best recent building projects to AISC's IDEAS² Awards. The Awards recognize those projects where structural steel has been used in an innovative manner. The judges will consider:

- a creative solution to the project's requirements.
- application of innovative design approaches.
- aesthetic and visual impact of steel on the project.
- innovative use of architecturally exposed structural steel.
- advances in the use of structural steel either technically or in architectural expression.
- innovative design and construction methods.
- sustainable design.

To be eligible, the building must be predominantly steel-framed (either wide-flange or hollow structural steel sections)

and must have been completed between Jan. 1, 2004 and Dec. 31, 2006. Projects must be located in North America, and both new and renovated buildings are eligible. Firms may, of course, submit multiple projects.

While the awards are given for a project, all members of the project's team (including the architectural firm, structural engineering firm of record, general contractor, detailer, fabricator, and erector) will be recognized and honored.

There is an entry fee of \$150; however, the fee is waived for all AISC members. Both National and Merit honors will be awarded. In addition, a Presidential Award of Excellence for Structural Engineering or for Architectural Expression may be awarded at the judges' discretion. All awards will be announced at the 2007 NASCC: The Steel Conference, and awards will be presented at the project location with all members of the project team and local media representatives invited.

For more information on the awards program, and a list of last year's winning projects, please visit www.aisc.org/ideas2.

EVENTS

World Steel Bridge Symposium Slated

The National Steel Bridge Alliance (NSBA) has announced the dates for the World Steel Bridge 2007 Symposium. The event will take place December 4-7, 2007 and will be held at the Sheraton New Orleans Hotel in New Orleans, La.

For exhibit and sponsorship information, contact Jody Lovsness at 402.758.9099 or lovsness@nsbaweb.org. Updates regarding workshop programming and exhibits can be found on the NSBA website at www.steelbridges.org. For general information, contact Elizabeth Purdy at 312.670.5421 or purdy@aisc.org.

CONTINUING EDUCATION

AISC Announces Spring 2007 Seminars

AISC's Continuing Education Department will once again offer "Design Steel Your Way with the 2005 AISC Specification." This seminar will accelerate your ability to design steel buildings according to the 2005 AISC specification, whether you design in ASD or LRFD. Presentation topics will include proper material selection, design philosophies and analysis requirements, member and structure stability provisions, member design, and connection design. Each attendee will receive a copy of the course notes and design examples, the AISC *Design Examples* CD, and a copy of the 13th Edition AISC *Steel Construction Manual*, which includes the 2005 AISC specification, the 2004 *RCSC Specification*, and the 2005 *Code of Standard Practice for Steel Buildings and Bridges*.

AISC also continues to offer the "Bring a Buddy" program. If eligible, paid registrants may add one person to their registration at a reduced rate. And, as always, AISC members attend at discounted rates. To become a member and receive the AISC member discount, please visit www.aisc.org/membership. Call 800.809.2364 or visit www.aisc.org/2007seminars for more information or to register. Spring 2007 dates are listed below:

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|------|----------------|------|-------------------|------|------------------|
| 1/23 | Baltimore | 3/6 | Pittsburgh | 5/1 | Boston |
| 1/24 | Little Rock | 3/8 | Philadelphia | 5/3 | Tucson |
| 1/25 | Raleigh, N.C. | 3/13 | Las Vegas | 5/3 | Richmond |
| 2/6 | Los Angeles | 3/14 | Louisville, Ky. | 5/9 | Baton Rouge |
| 2/6 | Edison, N.J. | 3/15 | San Jose, Calif. | 5/10 | San Diego |
| 2/7 | Austin, Texas | 3/15 | Chicago | 5/10 | Houston |
| 2/8 | Portland, Ore. | 3/20 | Syracuse | 5/15 | Los Angeles |
| 2/8 | El Paso, Texas | 3/27 | Denver | 5/15 | Miami |
| 2/8 | Hartford | 3/27 | Atlanta | 5/17 | Columbia, S.C. |
| 2/21 | Des Moines | 3/28 | Columbus | 5/23 | Tulsa |
| 2/22 | New York City | 3/29 | Santa Fe | 5/24 | Reno |
| 2/22 | Seattle | 3/29 | St. Louis | 5/24 | Kansas City, Mo. |
| 2/27 | San Francisco | 3/29 | Charleston, W.Va. | | |

UNIVERSITY RELATIONS

Seismic Teaching Aid Available at NASCC 2007

A new steel teaching aid will be introduced to educators at the North American Steel Construction Conference in April, 2007. The aid, "Teaching the Principles of Seismic-Resistant Design of Steel Buildings," will be presented to educators in two sessions on April 17 and 18 in New Orleans.

The aid will be presented to educators in two sessions and will cover six modules, including moment-resisting frames, eccentrically braced frames, buckling restrained braced frames, and steel plate shear walls. A travel stipend will be available to qualified educators.

Please register for the educator sessions by contacting either Shanna Quinn at 312.670.5418, quinn@aisc.org; or Fromy Rosenberg at 312.670.5408, rosenberg@aisc.org. More information about NASCC: The Steel Conference can be found online at www.aisc.org/nascc.

ENGINEERING JOURNAL

Fourth Quarter 2006 Article Abstracts

The following papers appear in the fourth quarter 2006 issue of AISC's *Engineering Journal*. EJ is also available online to AISC members and ePubs subscribers at www.aisc.org/epubs.

Failure of Welded Moment-Resisting Connections

ANDREW SHORT, WOLFRAM WOERNER, W. GEORGE FERGUSON, AND G. CHARLES CLIFTON

Potential failure modes in moment resisting connections (MRCs) subject to seismic loads must be controlled, so that adverse modes such as brittle fracture are avoided and ductile modes develop in a predictable manner. To simulate volumetric imperfections in fillet welds, an unfused region was created by removing a section of the weldment, thus creating a full-depth lack of penetration imperfection. Five large-scale MRC specimens were tested, with these imperfections varying in both size and location. Critical "loss of area" parameters for establishing a threshold are determined for the minimum required deformation capacity of a connection and for establishing a threshold between desirable and undesirable failure mechanisms. Increasing the resistance to deformation in the panel zone is considered likely to provide enhanced weld performance. This paper also provides evidence and discussion of the effect of strong and very strong panel zones on the integrity of connection welds.

Topics: Connections-Moment, Welds, Seismic Design

Cold Bending of Wide-Flange Shapes for Construction

REIDAR BJORHOVDE

In addition to complete structures such as arches, curved structural members are also used extensively in construction. Some of the individual members are curved about the strong axis of the shapes; others are curved about the weak axis. Common to the examples presented and to most building applications is the fact that the curving of such members is mostly done at ambient temperature. Such cold bending places greater demands on the curving equipment that is used, to the effect that larger curving forces are needed. Higher temperature curving is certainly feasible for many applications, and a number of bending companies use it on a regular basis. It is almost always used when straightening repair of bridge girders is needed. For practical reasons the material that is presented focuses on applications of bent structural members for building-type structures. Bridge structures rarely use members that are curved as much as those described, and therefore, fatigue and similar considerations are not addressed.

Topics: Beams and Flexural Members; Material Properties and Specifications; Fabrication; Structural Shapes

Evolution of Shear Lag and Block Shear Provisions in the AISC Specification

LOUIS F. GESCHWINDNER

AISC has published two standards for design of steel structures for the past 19 years: an allowable stress specification, ASD, and a limit states specification, LRFD. The AISC Committee on Specifications has developed a new standard that includes provisions for design according to both ASD and LRFD. For connection design, the specification evolved as provisions from the previous specifications were integrated into the new provisions. This paper highlights the provisions for shear lag and block shear from

the 2005 AISC *Specification for Structural Steel Buildings* provisions and the changes that have taken place from previous editions of the specifications.

Topics: Connections and Joints, Specifications, Codes & Standards, Tension members

Evaluating Single-Angle Compression Struts Using An Effective Slenderness Approach

LEROY A. LUTZ

This paper describes a simple procedure for evaluating the capacity of single-angle compression struts that are supported at each end by one leg to a gusset plate or directly to a leg or stem of the chord of a truss. This procedure allows the single angle to be treated for analysis and design as a pinned-end axially loaded compression member by use of an effective slenderness ratio. The procedure considers two levels of end restraint and addresses both equal and unequal-leg angles. This procedure has been added for use in the 2005 version of the AISC *Specification for Structural Steel Buildings* (AISC, 2005).

Topics: Columns and Compression Members; Specifications, Codes, & Standards

New Method of Design for Combined Tension and Bending

ABBAS AMINMANSOUR

A new method and aids for design of steel members subjected to combined tension and bending are presented based on the AISC specification using the load and resistance factor design method. While the basic concepts utilized in this process apply to prismatic singly or doubly symmetric shapes subjected to flexure and axial tension, the focus of the discussions as well as the design aids developed in this paper apply to W-shapes only. The new design aids developed and presented in this paper offer the following advantages:

- Save time in design. For example, compactness is already accounted for.
- Can select more efficient sections with appropriate t , b_x , and b_y coefficients, depending on the relative magnitude of the applied axial force and bending moments.
- Can choose from a wide range of sections.
- Designer can easily judge the efficiency of a section by observing its values of t , b_x , and b_y coefficients.
- Tables provide means for easy calculation of $\phi_t P_n$ for a large number of sections.

Topics: Beams and flexural members; combined loading; tension members

Reliability of the Member Stability Criteria in the 2005 AISC Specification

THEODORE V. GALAMBOS

The notional reliability of steel beams, columns and beam-columns designed according to the 2005 AISC *Specification for Structural Steel Buildings* is determined by using first-order or second-order reliability methods (FORM or SORM). The reliability index β is evaluated for contemporary material properties and new evaluations of experimental strength data. It is concluded that the notional reliability of the new specification is essentially identical to the level inherent in the first Load and Resistance

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Factor (LRFD) specification of 1986.

Topics: Beams and Flexural Members; Combined Loading; Columns and Compression Members; Specifications, Codes & Standards; Material Properties and Specifications

Technical Note: Determination of Allowable Strength Design Safety Factors in the 2005 AISC Specification

CYNTHIA J. DUNCAN AND STEVEN J. FENVES

Topics: Specifications, Codes & Standards

CURRENT STEEL STRUCTURES RESEARCH

REIDAR BJORHOVDE

This regular feature of the *Engineering Journal* provides infor-

mation on new and ongoing research around the world. In the 8th installment, research projects are summarized on the following topics: high-strength steel moment connections, column splices, seismic response of structures and connections, and composite bridge structures.

Topics: Research

Got News?

Send your news items, announcements, and industry events to Keith Grubb, grubb@modernsteel.com.