

## NASCC: The Steel Conference

February 8–11, 2006

### Register Early and Save!

Early registration is still open for the 2006 North American Steel Construction Conference! The 2006 "Steel Conference" will take place February 8-11 in San Antonio, TX. Visit [www.aisc.org/nascc](http://www.aisc.org/nascc) for a complete schedule of conference events and instructions for pre-registration.

NASCC is a premier education event aimed at providing structural engineers, steel fabricators, erectors, and detailers with practical information and the latest design and construction techniques. In addition, NASCC offers an extensive trade show, featuring products and services ranging from fabrication machinery, galvanizing, and connection products to detailing and engineering software. NASCC also incorporates the Structural Stability Research Council's Annual Stability Conference.

Mailed registration forms for the 2006 NASCC will be accepted until January 23, 2006, while online registration will be open until February 3 at [www.aisc.org/nascc](http://www.aisc.org/nascc). After these dates, registration must be completed on site at an increased rate. Don't miss this opportunity for a great value for this incredible event—register today!

### New AISC Seminar Debuts

AISC Continuing Education will debut its newest full-day seminar in conjunction with the 2006 North American Steel Construction Conference. "Design Steel Your Way with the 2005 AISC Specification" will be offered for the first time as a short course on February 11, 2006 in San Antonio, TX during NASCC. Throughout 2006, the seminar will be presented in approximately 60 cities across the United States.

Whether you design in ASD or LRFD, this seminar will accelerate your ability to design steel buildings according to the 2005 AISC *Specification for Structural Steel Buildings* and the 13th Edition *Steel Construction Manual*. You will gain valuable insight into:

- The 2005 specification, which unifies ASD and LRFD into a single method and includes the specifications for single angles and hollow structural sections
- The Basic Design Values cards—two 5"×8" cards that dis-

till the most widely needed and often used specification provisions

- The *Manual*, which presents design aids for ASD and LRFD side by side for ease of use
- The Design Examples CD, which provides an illustration for each of the *Specification* provisions, as well as examples illustrating the use of all tables in the *Manual*. Presentation topics will include proper material selection, design philosophies and analysis requirements, member and structure stability provisions, member design, and connection design. This is the AISC seminar you've been waiting for!

In addition, AISC will continue to offer in 2006 the popular seminar "Seismic Braced Frames—Design Concepts and Connections" in select cities throughout the Midwest and eastern United States.

Look for the full seminar schedule, available soon, at [www.aisc.org/seminars](http://www.aisc.org/seminars).

### Stipend Available for Educators

A \$250 stipend is available for educators attending the AISC University Relations Department educator session at the 2006 NASCC: The Steel Conference. The 2006 Steel Conference will take place in San Antonio, TX, February 8-11, 2006. This stipend is meant to be used for the \$125 educator registration fee and travel expenses.

The educator session will be held Wednesday, February 8 and will feature a presentation of new AISC teaching aids, including writing assignments for steel design courses. The session will also feature an introduction to forthcoming improvements to the University Relations section of the AISC web site, which includes resources for web enhanced teaching (WET) of structural steel design.

Information about this and other 2006 NASCC sessions can be found at [www.aisc.org/nascc](http://www.aisc.org/nascc). More information about opportunities for educators can be found in the "Learning Opportunities" section of AISC's web site at [www.aisc.org](http://www.aisc.org).

For information about eligibility for this stipend, contact Fromy Rosenberg at 312.670.5408 or [rosenberg@aisc.org](mailto:rosenberg@aisc.org); or Megan Maurer at 312.670.5418 or [maurer@aisc.org](mailto:maurer@aisc.org). ★

## AISC Releases Sophisticated Paint Endorsement Standard

The American Institute of Steel Construction, Inc. (AISC) has revised and updated its Sophisticated Paint Endorsement (SPE) program, which helps owners and specifiers select structural steel fabricators who are able to provide the special project quality needs for sophisticated painting systems such as zincs, epoxies, urethanes, and multi-coat systems.

The SPE is part of the AISC Certification program for steel fabricating shops. Release of the new criteria as a standard, rather than the previous checklist, is part of an ongoing effort by AISC to support a system-based approach to quality man-

agement and to better communicate to project owners and specifiers exactly what the certification programs provide. AISC recommends that facility owners require all shops hired for the fabrication of structural steel with sophisticated paint requirements be certified to the AISC SPE program. This helps ensure that the owner's contracts are awarded to capable shops that have been evaluated independently to the highest standards.

AISC expects to completely implement auditing to the revised SPE program criteria by the end of 2006. (To view the full standard, go to [www.aisc.org/](http://www.aisc.org/)

[www.aisc.org/](http://www.aisc.org/)spe.) Newly certified fabricators will be required to comply with the *SPE Standard* beginning July 1, 2006. Currently certified companies will be required to comply with the *SPE Standard* beginning January 1, 2007 with the expectation that all companies carrying the Sophisticated Paint Endorsement will be certified to the new standard by the end of 2007.

A list of Quality Certified Fabricators is available at [www.aisc.org/certification](http://www.aisc.org/certification). For more information on the AISC SPE or certification program, call 312.670.2400 or e-mail [certinfo@aisc.org](mailto:certinfo@aisc.org). ★

## AISC 2005 Specification Now in Print

Printed copies of the 2005 *Specification for Structural Steel Buildings* are now available to purchase through AISC's online bookstore at [www.aisc.org/bookstore](http://www.aisc.org/bookstore).

This specification provides the generally applicable requirements for the design and construction of structural steel buildings and other structures. This ANSI-approved specification is the first edition to incorporate both allowable stress design (ASD) and load and resistance factor design (LRFD) methods. The design provisions for single angles and hollow structural sections (HSS) are also included. A dual-units format provides for both U.S. customary and S.I. units.

Electronic copies of the 2005 specification, as well as the associated Commentary and Basic Design Values, are also available to download from the AISC web site at [www.aisc.org/2005spec](http://www.aisc.org/2005spec). ★

## SECB Grants Certification to more than 800 Structural Engineers

The Structural Engineers Certification Board (SECB) has completed its second round of certifications for structural engineers. Eight hundred sixty-three structural engineers are now certified in the practice of structural engineering through SECB.

There now are SECB certified structural engineers in nearly all 50 continental states (with the exception of Alaska), as well as in Puerto Rico and the U.S. Virgin Islands. The states with the greatest representation are California, with over 160 certified structural engineers; Florida with over 80; New York, totaling over 50; and Massachusetts, with nearly 50 certified structural engineers.

The next round of review for the Structural Engineering Certification Board will be in February 2006 for March 2006 certification. For more information about SECB and certification for structural engineers, please visit [www.secertboard.org](http://www.secertboard.org). ★

## ASSE Pushes 'In Case of Emergency' Program for Cell Phone Users

The American Society of Safety Engineers (ASSE) is now promoting the use of "In Case of Emergency" (ICE) contacts for cell phone users. ICE numbers are programmed into cell phones so emergency personnel can easily reach the emergency contacts of people rendered unconscious.

The ICE initiative was first promoted by a British paramedic in early 2005 and is now being adopted around the world. ASSE has prepared a power point presentation that provides information about how to program ICE numbers into cell phones, as well as other information about ICE's benefits.

"This was suggested by our members," said Diane Hurns of ASSE public relations. "They see what's happening firsthand, and we want to help provide them with the tools they need to help reduce injuries and fatalities in the long run."

The presentation is available free through ASSE's web site at [www.asse.org/newsroom](http://www.asse.org/newsroom). ★

### Got News?

Submit your news items and events to Keith Grubb, Managing Editor, at [grubb@modernsteel.com](mailto:grubb@modernsteel.com).

## steelmail

### Clarkson Pinkham

Your well-written profile on Clarkson Pinkham (October 2005) failed to note that he was responsible for the first study on the diaphragm stiffness of steel roof and floor decks, which S.B. Barnes did for the H.H. Robertson Company in 1963.

The report is a model of organizational clarity with the same refreshing user friendliness as Roger Brockenbrough's old U.S. Steel reports.

*William E. Moore II, P.E.  
Charleston, WV*

## QMC Names New Lead Auditor

Quality Management Company LLC has named Pat Thomashefsky as its Lead Auditor. As Lead Auditor, Thomashefsky has prime responsibility for auditor training and calibration to ensure audit consistency for AISC Certification programs.



Pat Thomashefsky

Thomashefsky will interpret field cases for auditors and will resolve post-audit interpretation issues. In addition, she will collaborate with the QMC Operations Manager to address field issues related to the auditing process. She will be instrumental in the development of new AISC certification programs and will conduct beta audits with AISC's Standard Development Manager to help establish practical audit criteria.

Thomashefsky has nearly 20 years of experience in the manufacturing and steel fabrication and erection industries, with a focus on quality, manufacturing, training, auditing, program management, and customer technical services. She has held quality management leadership roles in self-directed team steering committees, process capability studies, statistical process control, and designed experiments, as well as in ISO-9001-2000 and AISC certification efforts.

Thomashefsky holds several certifications, including: American Society for Quality Certified Quality Auditor (ASQ-CQA); American Welding Society Certified Welding Inspector (AWS-CWI); the American Society for Non-Destructive Testing ACCP Level II Ultrasonic and Magnetic Particle testing; and RABQSA Lead Auditor (PA). ★

## Safety Strategies from AISC Safety Committee at 2006 Steel Conference and Beyond

By Lena Singer

**D**estroyed vegetables, shattered glass, and fire: These are a few of things the AISC Safety Committee will use to demonstrate to fabricators at the 2006 Steel Conference how to give safety training presentations their employees will never forget. Safety Committee members will present these and other visual demonstrations to illustrate what can happen when hard hats, safety goggles, or proper shop attire are forgotten or ignored.

Their presentation, "Fabrication Safety Issues" will be held Friday, February 10 in San Antonio, TX and will offer other effective employee safety training strategies, ideas on creating training programs, training resources, and visual aids to "bring home the message" and leave a lasting impression. This presentation is just one part of the safety committee's ongoing efforts to increase safe work practices for structural steel fabricators and erectors.

According to Safety Committee Chairman Lawrence Kruth of Douglas Steel Fabricating Corporation, insufficient employee training leads to a large number of safety-related incidents in fabrication shops. Together, the AISC Safety Committee members have decades of experience in providing training for their own shops to mitigate these incidents. The committee includes Kruth, Terry Peshia of Garbe Iron Works, W. Duff Zimmerman of Cooper Steel, David Sailing of Zalk Josephs Fabricators, and Tom Schlafly, AISC's Director of Research.

"All of us [on the committee] are dealing with safety on a day to day basis in our own shops," Kruth said. "We knew what issues needed to be addressed."

### The Elements

The conference presentation follows the release of the committee's "Sample Safety Program Elements for Structural Steel Fabricators," a do-it-yourself guide for people developing safety programs for steel fabrication facilities. The elements are available for AISC members to download free in the "Publications" section of the AISC safety web site at [www.aisc.org/safety](http://www.aisc.org/safety). They contain guidelines for facility evaluation, emergency preparedness, personal protective equipment, accident reporting, and accident investigation, to name a few. General safety rules for personnel and equipment are also outlined, including rules specifically related to steel fabrication equipment—something no other safety manual contains, according to Kruth.

"We've never seen that anywhere else," he said.

The committee wrote these rules based on experiences with equipment in their shops. They include safety guidelines for use of bench grinders, drill presses, punch presses, ironworkers, saws, and threading machines. The committee urges fabricators to consider the equipment, practices, and needs of their own shops, however, when adopting the elements.

"One of the key issues is that you can't take this book of elements and just put it on the shelf," Kruth said. "You have to edit it to suit your steel fabrication facility."

### Awards

The safety committee recognizes that many fabricators

have already developed innovative safety programs and have been using unique tactics for training their employees in safety. As part of its ongoing programming, the committee invites fabricators and erectors to submit their best ideas for safety practices. The committee selects the most creative and effective contribution to recognize with an award, which is given periodically.

As a recognition of all fabricators and erectors who maintain safe work practices, the committee also presents annual awards for outstanding performance based on the Lost Work Case Incident Rate (LWCIR). LWCIR measures the number of recordable cases of work lost due to accidents per 200,000 man hours worked. Awards are given for perfect records (LWCIR equals zero), excellent records (LWCIR is greater than zero but less than or equal to one), and commendable records (LWCIR is greater than one but less than or equal to two).

### Getting Involved

The Safety Committee welcomes comments from fabricators and erectors at all times. The committee would like to hear about how AISC's safety program is working, as well as suggestions about what it can do for fabricators and erectors in the future.

"This is what we have to offer," Kruth said. "Let us know what you can offer to us, and how you'd like to get involved."

The committee is seeking new participation and will hold a meeting the morning of Wednesday, February 8, 2006 in San Antonio, TX in conjunction with the Steel Conference. Safety professionals from steel fabrication companies are welcome. For more information about attending this meeting, please contact Tom Schlafly, AISC Safety Committee secretary, at [schlafly@aisc.org](mailto:schlafly@aisc.org). Schlafly may also be contacted with suggestions for the committee or safety awards submissions.

For more information about the Safety Committee's upcoming presentation at the 2006 Steel Conference, as well as a full program of all other conference presentations, please visit [www.aisc.org/nascc](http://www.aisc.org/nascc). ★

### Vote for Best 2005 EJ Paper, Win Free Trip to NASCC

Cast your vote for the best *Engineering Journal* paper of 2005 at [www.aisc.org/ejsurvey](http://www.aisc.org/ejsurvey) and become eligible for a free trip to the 2006 Steel Conference in San Antonio, TX! One name will be drawn from the survey participants to receive free conference registration, round trip airfare, and a one night stay at the conference hotel.

All *Engineering Journal* articles published in 2005 are included in the survey, with the exception of discussions of previously published papers.

The winning author will also receive round trip airfare, a one-night hotel stay, and free registration to the conference, where the award will be presented.

Votes will not be accepted after December 15, 2005. Cast your vote today! ★

The following articles appear in the Fourth Quarter, 2005 issue of AISC's *Engineering Journal*. AISC members can access EJ online at [www.aisc.org/epubs](http://www.aisc.org/epubs).

## Cyclic Behavior of Steel Moment-Resisting Connections Reinforced by Alternative Column Stiffener Details

### Part I: Connection Performance and Continuity Plate Detailing

*Daeyong Lee, Sean C. Cotton, Jerome F. Hajjar, Robert J. Dexter, and Yanqun Ye*

Experimental and corroborating computational research was performed to reassess the design and detailing of column reinforcement (in other words, continuity plates and doubler plates) according to U.S. specifications for both seismic and non-seismic design and to explore economical alternative stiffener details. The performance of six full-scale girder-to-column cruciform specimens that use the Welded Unreinforced Flange-Welded Web (WUF-W) connection detail was evaluated. The effects on the cyclic behavior of three different doubler plate details, including a back-beveled fillet-welded detail, a square-cut fillet-welded detail, and a box (offset) detail, were investigated. In addition, the performance of a continuity plate approximately half the thickness of the girder flange fillet-welded to both the column flanges and doubler plates was investigated. Current local flange bending and local web yielding design criteria were evaluated and the applicability of the suggested alternative column stiffener details was verified. A companion paper outlines findings with respect to panel zone behavior and design for seismic applications.

Topics: Connections and Joints; Moment Connections; Detailing; Seismic Design

### Part II: Panel Zone Behavior and Doubler Plate Detailing

*Daeyong Lee, Sean C. Cotton, Jerome F. Hajjar, Robert J. Dexter, and Yanqun Ye*

A study has been conducted to reassess the current AISC seismic panel zone design criteria for the Welded Unreinforced Flange-Welded Web (WUF-W) steel moment-resisting connections and to investigate acceptable minimum seismic panel zone design criteria for moment-resisting connections. Five full-scale WUF-W cruciform specimens were tested in this research, coupled with corroborating nonlinear finite element analysis. All had relatively weak panel zones designed to cause large localized strain concentrations in the girder flange-to-column flange connection region and to exceed the panel

zone shear deformation of the 4gy (in other words, four times the panel zone shear yield strain, gy). This paper presents the cyclic panel zone behavior of the WUF-W cruciform specimens and an assessment of the current AISC seismic panel zone design criteria for these connections. Two possible modifications for seismic panel zone design criteria are then proposed and verified against these tests as well as experiments from the literature. One equation provides a more accurate assessment of panel zone nominal strength for steel moment-resisting connections, and the second equation provides a panel zone required strength equation that targets permitting up to 8gy panel zone shear deformation for WUF-W and similar connections.

Topics: Connections and Joints; Moment Connections; Detailing; Seismic Design

## Performance of the AISC LRFD Specification in Predicting the Capacity of Eccentrically Loaded Single-Angle Struts

*Sherief S.S. Sakla*

Experimental load-carrying capacities of eccentrically-loaded single-angle struts are used to evaluate the predictions of the current and previous AISC LRFD specifications. Some 91 tests conducted on equal-leg angles and 42 tests conducted on unequal-leg angles were examined. It is shown that the current AISC LRFD specification (AISC, 2000) compares satisfactorily with available experimental results and provides a much better estimate of the load-carrying capacity when compared with the previous version of the specification (AISC, 1993). The current specification provided a lower bound for all unequal-leg test results and slightly overestimated the load-carrying capacity of 15 equal-leg test results. A reliability study, using Monte Carlo simulation, revealed that both equal- and unequal-leg single-angle struts exceeded the target reliability index in the current specification. The common practice of detailing the end connection of single-angle members in such a manner that the load point, located along the connected leg, is as close as possible to the projection of the angle centroid on the connected leg has been investigated using the provisions of the current AISC LRFD specification. As per the current specification, locating the load point at the projection of the centroid on the connected leg does not result in the largest achievable load-carrying capacity.

Topics: Columns and Compression Members

## Strengthening Open-Web Steel Joists

*James M. Fisher*

The paper presents procedures and suggested details for the strengthening of open web steel joists. Strengthening of open web steel joists is often required due to the addition of roof top units, under hung conveyors, or other loading increases not contemplated in the original specification for the joists. Three basic methods of strengthening a joist or joist system are discussed: load redistribution, adding new joists or beams, and reinforcing existing joists.

Topics: Beams and Flexural Members; Repair, Retrofit and Rehabilitation

## Effects of Cope Geometry on the Strength and Behavior of Cellular and Castellated Beams

*R. M. Hoffman, D.W. Dinehart, S.P. Gross, J.R. Yost, and J.M. Hennessey*

Topics: Beams and Flexural Members; Connections and Joints

This paper reviews an experimental and analytical investigation of the effect of cope geometry (distance) on the strength and failure behavior of non-composite, doubly symmetric, uniformly loaded open web expanded beams. Thirty-six beams, 18 cellular (circular openings) and 18 castellated (hexagonal openings), of various cope geometries and depths, each instrumented to measure load, strain and displacement, were tested to failure. A linear elastic finite element (FE) analysis for service loading conditions and a nonlinear FE buckling analysis were performed in parallel with the experimental testing program. The experimentally validated models were then extended to uncoped and intermediately coped beam geometries to investigate the effect of cope geometry on beam capacity and failure mode. Through this study, it was found that failure loads for the beams exceeded calculated design loads (ASD) by a minimum factor of 1.8 regardless of cope size or beam type. Further, cellular beams experienced less percent capacity loss with increasing cope size than did castellated beams.

## DISCUSSION

### Beam-Column Base Plate Design—LRFD Method

Paper: *Richard M. Drake and Sharon J. Elkin*

Discussion: *James M. Doyle and James M. Fisher*

Topic: Base Plates