news

COMPETITION

2012 Student Steel Bridge Contest Rules Available

The 2012 ASCE/AISC Student Steel Bridge Competition rules have been posted on the AISC website. Among other changes, the formula for determining structural efficiency has been reworked for 2012, generally increasing the cost based on weight compared to the deflection-based cost.

The site conditions for this year's challenge prohibit the use of temporary piers or barges in the river, although there will be a midstream cofferdam (furnished by others). The bridge again requires a cantilever section on one end, although the bridge dimensions have been changed from last year. Numerous other updates have been incorporated into the 2012 rules.

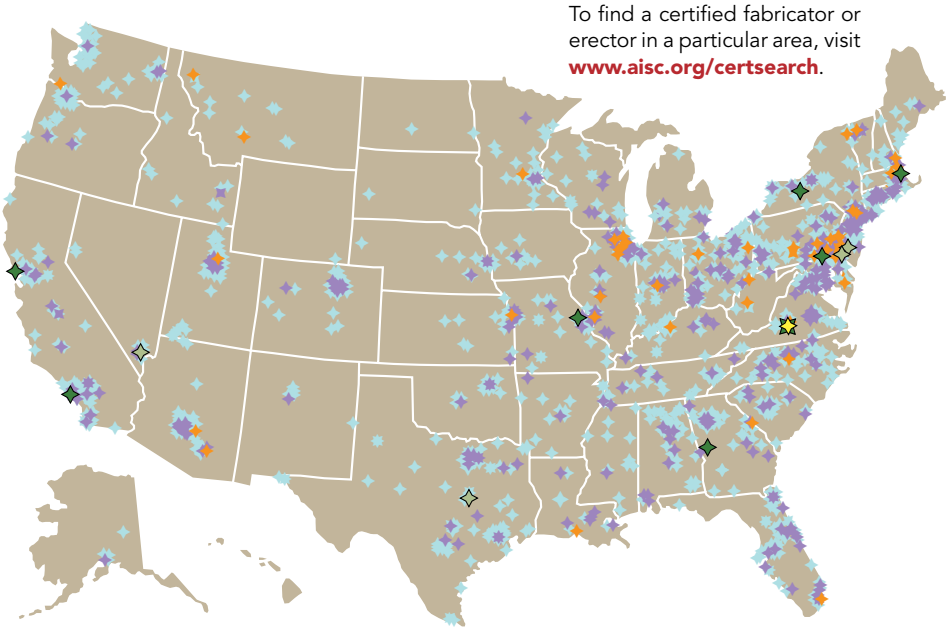
The preliminary round of bridge competition consists of 18 regional events held each year throughout the spring. The 2012 National Competition will take place at Clemson University on May 25-26.

To view the rules and other Student Steel Bridge Competition related information, go to **www.aisc.org/steelbridge**.

To watch the Lakehead University team, which was the fastest at the 2011 national competition, build its bridge in just less than five minutes, go to **http://bit.ly/jLQvFc**.

Newly Certified Facilities: August 1–31, 2011

To find a certified fabricator or erector in a particular area, visit **www.aisc.org/certsearch**.



Existing Certified Fabricator Facilities
Existing Certified Erector Facilities
Existing Certified Bridge Component Facilities
Newly Certified Fabricator Facilities
Newly Certified Erector Facilities
Newly Certified Bridge Component Facilities

Newly Certified Fabricator Facilities

Tuckerman Steel Fabricators, Inc., East Boston, Mass.
Washington Ornamental Iron Work, Inc., Gardena, Calif.
Bohling Steel, Inc. dba Cavalier Steel, Lynchburg, Va.
Trinity Products, Inc., O'Fallon, Mo.
Baltimore Steel Erectors, LLC, New Freedom, Pa.
Kwan Wo Ironworks, Inc., San Francisco, Calif.
Rodgers Metal Craft, Inc., Fortson, Ga.
Rochester Rigging & Erectors, Inc., Bloomfield, N.Y.

Newly Certified Erector Facilities

Nevada Prefab Engineers, Inc., Las Vegas, Nev.
Tom Wright Construction, LLC dba Built Wright Construction, Waco, Texas
Steel Suppliers Erectors, Inc., Wilmington, Del.
Roma Steel Erection, Inc.- Central Metals, Inc., Camden, N.J.

Newly Certified Bridge Component Facilities

Bohling Steel, Inc. dba Cavalier Steel, Lynchburg, Va.

People and Firms

- **Anjana Kadakia**, P.E., LEED AP, of Thorton Tomasetti's Newark, N.J., office has been promoted to senior principal. An AISC Professional Member, she has published many professional papers, including articles in *Modern Steel Construction*, *Civil Engineer* and *Structural Engineer*. She holds a bachelor's degree in structures from Bombay University, India, and a master's degree in civil engineering from Rutgers University.

- **Jared Keller** has been promoted to associate in Lochsa Engineering's Boise, Idaho, office by principal **Riley Mahaffey**, P.E. An AISC Professional Member, Keller is a graduate of Idaho State University and joined Lochsa in 2006.

- **Jason Hoover**, S.E., P.E., has joined Laguna Hills, Calif.-based SidePlate Systems as regional structural engineer in charge of technology sales and customer servicing for areas east of the Rockies. Prior to joining SidePlate, Hoover was responsible for sales of Bentley Systems' structural engineering software throughout the U.S. and Canada. His joining SidePlate coincides with RAM's incorporation of SidePlate FRAME technology into its RAM FRAME software.

- **Buckland & Taylor Ltd.**, Seattle, which is a member of the COWI Group, will provide erection engineering for the "Oculus" at the World Trade Center Transportation Hub in New York. Skanska Koch Inc., New York, will be the project lead. A complex signature structure designed by architect Santiago Calatrava, the Oculus will include more than 11,000 tons of steel and will rise to 150 ft at its highest point. The project is expected to be completed in 2013.

EDUCATION

Celebrating 25 Years of the AISC Steel Sculpture

As a new professor at the University of Florida in Gainesville, Duane Ellifritt dreamt up a full-size 3D model to provide engineering students with hands-on exposure to structural steel components and connections. Ellifritt's original steel sculpture was erected on the UF campus in 1986 and celebrates its 25th anniversary this year on October 29.

For more information on its development, visit **www.aisc.org/steelsculpture** and **www.ellifritt.com**.

Steel sculptures have been erected on university campuses around the world, including schools in India, Brazil, Venezuela, Puerto Rico, Canada and Mexico, according to Ellifritt. A quick review of the AISC website shows more than 135 registered locations. To see photos of steel sculptures at various universities, or to learn how to have a sculpture constructed on your campus, please visit **www.aisc.org/steelsculpture**.

If you know of a steel sculpture that does not appear on the AISC website, please contact AISC education specialist Maria Mnookin by sending an email to **mnookin@aisc.org**. Additional photos are also welcomed. To learn more about Duane Ellifritt, see the profile on page 66 of this issue of *MSC*.

Southern Illinois University Edwardsville

University of Tennessee Martin

Polytechnic University of Puerto Rico

CONTEST

Entries Sought for 2012 Prize Bridge Competition

Entries are now being accepted for the 2012 National Steel Bridge Alliance Prize Bridge Competition. The program, which began in 1928, honors significant and innovative steel bridges constructed in the U.S. in a variety of categories based on structure type and span.

To be eligible a bridge must be built of fabricated structural steel and located within the United States (defined as the 50 states, the District of Columbia, and all U.S. territories). It must also have been completed and opened to traffic between May 1, 2009 and September 30, 2011.

There is no fee to enter, and entries may be judged in more than one category, but an entry can only receive one award. An independent panel will judge entries based on innovation, aesthetics, design and engineering solutions.

The 2012 Prize Bridge Award winners will be announced at the 2012 World Steel Bridge Symposium, scheduled for April 18-21 in Dallas and co-located with NASCC: The Steel Conference.

To submit a bridge project for consideration, download the 2012 Prize Bridge Award entry form at **www.steelbridges.org/PrizeBridgeAwards**. The deadline for entries is November 30, 2011.

EDUCATION

AISC Rolls Out Sustainability Course

AISC's course, "Sustainability and Steel," has been approved by The U.S. Green Building Council (USGBC) and is now available for one hour of LEED/GBCI continuing education credit. The course explains why environmental impact should be a consideration with any new or renovated building and discusses the sustainable attributes of structural steel. Those who attend this live learning presentation will report the credit hour directly to the Green Building Certification Institute (GBCI) and receive certificates of completion from AISC.

The presentation is suitable for a small group setting, such as a conference room, but also can be incorporated into programs for larger gatherings. For a more detailed description of this course, visit USGBC's website at **http://bit.ly/ru9UmT**. To arrange for a presentation in your office, contact your AISC regional engineer (**aisc.org/myregion**).

STANDARDS AND SPECIFICATIONS

Nuclear Specification Available for Second Public Review

A draft of the 2011 ANSI/AISC 690, *Specification for Safety-Related Steel Structures for Nuclear Facilities*, is now available for public review on the AISC website. This is the second public review of this document; therefore, only revisions made since the first public review are open for comment. The document is written as a supplement to the 2010 AISC *Specification for Structural Steel Buildings*.

The document and public review form are available on the AISC website at **www.aisc.org**. Please submit your comments electronically to **duncan@aisc.org** using the review comment form, or mail to Cynthia Duncan, AISC, Suite 700, 1 East Wacker Drive, Chicago, IL 60601-1802 by October 17, 2011. A hard copy is also available for a nominal fee of $15 by calling 312.670.5411 or by emailing **cummins@aisc.org**.

NEWS

Abstracts for Recent 2011 *Engineering Journal* Articles

Engineering Journal is published quarterly by AISC. This peer-reviewed publication is dedicated to the improvement and advancement of structural steel construction.

AISC member firms receive one printed copy of *EJ* per firm by opting in through AISC's subscriptions department at **subscriptions@aisc.org**. Beginning in 2010, AISC added an online interactive digital edition format available at **www.aisc.org/ej**. Each quarter, the current issue is available in digital edition format and is free to the public.

A complete, searchable PDF archive of all *EJ* articles since 1964 is also available. AISC members can download PDFs of *EJ* articles for free at **www.aisc.org/ej** and non-members can download articles for a nominal fee. All AISC members receive an email each quarter as new digital issues become available.

The following are some of the articles that have appeared in the first three issues of *EJ* in 2011. At **www.aisc.org/ej** you can read the articles by viewing the electronic journal or you can download the articles as PDFs (free to members; $10 for non-members).

First Quarter 2011

➤ **Fillet Weld Design for Rectangular HSS Connections**

Jeffrey A. Packer and Min Sun

The 2010 AISC *Specification for Structural Steel Buildings* has expanded the scope in Chapter K ("Design of HSS and Box Member Connections") with a new Section K4, "Welds to Branches." This paper describes the background to this development and examines the structural reliability of the weld effective length provisions contained therein. The latter is achieved by using a database of 31 welded square/rectangular hollow structural section (HSS) K-, T- and cross- (or X-) connections in which all test specimen failures were reached by fracture of the welded joints. The potential inclusion (or exclusion) of the sin θ effect, whereby fillet weld capacity is increased for loading not parallel to the axis of the weld, has also been investigated. Design examples are given to illustrate the weld design method, performed to the 2010 AISC *Specification* in both LRFD and ASD.

Second Quarter 2011

➤ **The Development of a New Design Procedure for Conventional Single-Plate Shear Connections**

Larry S. Muir and William A. Thornton

Conventional single-plate shear connections are common and economical connections. The design procedure outlined in the AISC 13th Edition *Steel Construction Manual* relies on the bolt shear values given in the 2005 AISC *Specification for Structural Steel Buildings*. The nominal bolt shear values listed in *Specification* Table J3.2 have historically been 20% lower than the theoretical bolt values to account for uneven force distribution among the bolts in end-loaded connections, such as bolted lap splices. The reduction served the secondary function of providing an additional factor of safety for all bolted connections designed in accordance with the *Specification*. The design procedure for conventional single-plate shear connections contained in the 13th Edition *Manual* relied on this reduction to justify the practice of neglecting eccentricity in the bolt group for most configurations. The 2010 AISC *Specification* increases the nominal bolt shear values, necessitating a revised design procedure for single-plate shear connections in the 14th Edition AISC *Manual*. This paper outlines the revised procedure.

➤ **A Yield Line Component Method for Bolted Flange Connections**

Bo Dowswell

Bolted connections are often used in steel structures to transfer tension loads into wide-flange members. The strength of these connections is determined with a prying action design procedure outlined in the AISC 13th Edition *Steel Construction Manual* that checks the limit states of bolt tension rupture and bending of the flange. This procedure is valid only for fittings with limited bolt spacing and limited edge distance. This paper discusses a method to determine the local flange bending strength of a wide-flange member using the yield line method. The proposed design method includes the effect of prying action on the bolts, and can be applied to many different connection configurations, including connections with large bolt spacing and edge distances and connections with web stiffeners.

➤ **On the Need for Stiffeners for and the Effect of Lap Eccentricity on Extended Single-Plate Connections**

William A. Thornton and Patrick J. Fortney

The design procedure for extended single-plate connections presented in the AISC 13th Edition *Steel Construction Manual* contains many design checks to ensure satisfactory performance but does not include a check of lateral-torsional stability of the extended single plate, which resembles a double-coped beam. Research has shown that coping of beams can reduce their lateral-torsional buckling strength. This paper presents a proposal to use the double-coped-beam concept to ensure the lateral-torsional stability of the extended plate. The question of stiffeners and the effect of the small eccentricity due to the lapping of the plate with the beam web also is addressed.

Third Quarter 2011

➤ **Design of Steel Buildings for Earthquake and Stability by Application of ASCE 7 and AISC 360**

R. Shankar Nair, James O. Malley and John D. Hooper

Design of steel buildings in the U.S. typically combines application of ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, and ANSI/AISC 360, *Specification for Structural Steel Buildings*. For buildings designed for seismic effects, ANSI/AISC 341, *Seismic Provisions for Structural Steel Buildings*, may also be applicable. The ASCE 7 *Minimum Design Loads* standard includes specific design provisions related to stability under seismic loading that overlap and, in some instances appear to conflict with, the stability design requirements of the AISC *Specification*. This paper explores the areas of overlap and apparent conflict between ASCE 7 and AISC 360 and offers practical recommendations for seismic design incorporating the provisions of both.

ENVIRONMENT

Lincoln Electric Builds 443-ft Wind Tower at Headquarters

A major supplier to the structural steel and wind tower fabrication industries, The Lincoln Electric Company, an AISC member firm, this year has stepped further into the world of renewable energy. It recently built a wind tower on the grounds of its world headquarters and manufacturing campus in Euclid, Ohio, just east of downtown Cleveland. The 2.5 megawatt turbine is expected to generate up to 10% of the energy used for Lincoln Electric's main plant in Euclid and save the company up to $500,000 a year in energy costs.

The tower is nearly as tall as a 45-story building, measuring 443 ft tall from base to the tip of its blades. The structure is one of the largest urban wind towers in North America and evolved out of a strategic partnership between The Lincoln Electric Company and the Great Lakes Energy Development Task Force.

"The tower represents important cost savings, as well as our commitment to integrating renewable energy sources, among other ongoing green initiatives, into our manufacturing processes," said George Blankenship, president, Lincoln Electric North America. "It stands as a visible symbol of Lincoln Electric's commitment to the wind tower industry by showcasing the benefits our welding solutions offer to a prominent, fast-growing business segment."

A portion of funding for the $5.9 million project came from a $350,000 loan from Cuyahoga County, while another $1.125 million in funds came from the American Recovery and Reinvestment Act of 2009 via a State Energy Program Grant from the Ohio Department of Development and the U.S. Department of Energy. The Lincoln Electric Company funded the remainder of the cost. The company, however, credits the assistance of the local, state and federal governments with making this landmark project a reality.