UNIVERSITY RELATIONS

Bridge Competition Showcases Student Design Skills

Like the Dallas Cowboys of the early 1990s and the Michael Jordan-era Chicago Bulls, North Dakota State University has created its own dynasty. This past May, a team of NSDU civil engineering students gave the school its fifth National Student Steel Bridge Competition (NSSBC) title and its second in a row; the school also won in 1995, 2002, 2004, and 2006. Coming in second and third place this year were the University of California, Davis and the University of Wisconsin – Madison.

This year's competition, which took place May 25–26 at California State University, Northridge, marked the 16th anniversary of the annual event and the 20th anniversary of the Regional Student Steel Bridge Competitions. Each year, the NSSBC offers future structural engineers the opportunity to display their skills in steel design, steel fabrication, and teamwork. Teams fabricate the parts and practice erection in the months leading up to the competition, creating 20-ft spans that must be capable of supporting a load of 2,500 lb. During the actual competition, erection time is of the essence, and NSDU's team was able to put their 108-lb bridge together in around five minutes.

Forty-three student teams from across the country participated in this year's competition, and more than 600 students, faculty, and guests, including AISC president Roger Ferch, attended the awards banquet on May 26.

Besides the overall category, awards were also given in the categories of construction speed, stiffness, lightness, economy, display (formerly aesthetics), and efficiency.

Fromy Rosenberg, AISC's Director of University Relations, commented, "Every student team competing in the regional and national competition, regardless of rank, is a winner. Student teams work for months perfecting the design, fabrication, and construction of each steel bridge. The dedication, hard work, and ingenuity shown by each team is impressive."

Next year's NSSBC will be held on May 23–24 at the University of Florida in Gainesville. Visit the official 2008 NSSBC site at **www.2008steelbridge.com** for more details and information.

Shanna Quinn

The student bridges are on display (above) the day before testing takes place (below).

Shanna Quinn

WELDING

Welding Poster Now Available

Continuing its educational outreach efforts, Hobart Brothers now offers "Welding Types and Positions," the second in a series of electrode technical posters.

The newly available poster shows the five types of welds and the 12 welding positions with clear and easy-to-understand diagrams, including descriptions and corresponding welding terminology.

The "Types of Welds" section covers fillet, plug (slot), arc seam (spot), groove, and surfacing welds. The Welding Positions section covers everything from 1F through 4F in the fillet weld configuration and 1G through 6G in the groove weld configuration.

Both this poster and the first in the series, covering tensile and impact strength, are also available in Spanish.

To request a free copy of Hobart Brothers' Welding Types and Positions technical information poster, call Database Solutions at 888.462.2789 or e-mail databs@mindspring.com.

Corrections

- In the August 2007 article "Designing for Long Spans," we incorrectly tallied the number of structural elements for the 40-ft bay spacing in Figure 3. Visit the back issues section of **www.modernsteel.com** for an updated version of this article featuring the correct numbers for the 40-ft grid.
- In the news story "Revised ASTM Spec Opens the Door for Hot-finished HSS" (July 2007, p. 19), the use of the term "hot-finished" should be uniformly replaced with the term "hot-formed." The ASTM A501 specification is for hot-formed material only. The confusion in terminology arises from the broader use of the term "hot-finished" in the equivalent European standard, EN10210. A corrected version of the article is available in the back issues section of **www.modernsteel.com**.

INDUSTRY AWARDS

AISI Award Recognizes Bridge Innovation

The American Iron and Steel Institute presented the 2007 Market Development Industry Leadership Award to Ed Wasserman, P.E., director of the Tennessee Department of Transportation's Structures Division, during steel bridge industry meetings held recently in Nashville, Tenn. The award was established by AISI to recognize individuals who have made significant contributions in advancing the competitive use of steel in the marketplace as a direct result of AISI Market Development initiatives in the automotive, construction, and container markets.

Dan Snyder

Wasserman was presented with the award by David Jeanes, P.E. (left), AISI's senior vice president of market development; and Alex Wilson (right), Chairman of AISI's Steel Bridge Task Force and manager of customer technical services for ArcelorMittal.

The award recognizes the "unified approach" that was developed after a multi-year research project championed by Wasserman. The research, performed at the Federal Highway Administration's Turner Fairbanks Research Laboratories, included testing of a full-scale curved girder bridge that was erected in the lab. Principal funding for the research was generated by joint funding from dozens of state departments of transportation and led to a complete overhaul of the AASHTO specifications to simplify the design of straight and curved steel girders, resulting in more cost-effective steel designs.

The award also recognized that the quick progression from concept to application resulted in large part from Wasserman's leadership and contributions toward this effort. The first bridge designed specifically with high-performance steel (HPS) 70W steel plate was constructed by the Tennessee Department of Transportation in 1998 (the State Route 53 bridge over Martin Creek in Jackson County, Tenn.). Since then, Wasserman has specified 24 additional HPS bridges in Tennessee and has contributed greatly towards educating other bridge engineers on the cost-effective benefits of HPS. HPS can provide up to 18% in weight reduction and up to 20% in cost reduction over conventional steels.

As the result of a partnership between AISI, the Federal Highway Administration, and the U.S. Navy to create cost-effective, durable steels for bridge design, HPS went from concept to application in just five years and is now being used in 44 states on more than 400 projects.

PUBLICATIONS

New Steel Joist Guide Now Available

The second edition of *Technical Digest No. 3*, now available from the Steel Joist Institute, aids design and construction professionals in selecting steel joists that meet stability requirements when water accumulation (ponding) on a flat or low-sloped roof is a design consideration. Much of the new information is a direct result of changes adopted by recent building codes.

This 44-page guide details the structural behavior of steel joists that may be susceptible to ponding conditions. It makes use of the standard load tables found in the SJI 42nd edition catalog to assist designers in complying with the *Standard Specifications for Open Web Steel Joists, K-Series* Section 5.10, *Standard Specifications for Long-Span Steel Joists, LH-Series and Deep Long-Span Steel Joists, DLH-Series* Section 104.11, and *Standard Specifications for Joist Girders* Section 1004.8. In addition, the benefits of camber and pitch of joists in reducing the effects of ponding are discussed.

Equations for the determination of reactions, equivalent uniform loads, and deflections for cambered joists subjected to water loads are included in Appendix A. A method for calculating the effective moments of inertia for standard SJI joist products is provided in Appendix B. Appendix C offers several design examples worked out in detail. When appropriate, the examples utilize the refined ponding criteria found in the 2005 AISC *Specification for Structural Steel Buildings* Appendix 2, Design for Ponding. Appendix D contains an extensive bibliography of journal articles, conference proceedings papers, research reports, and other publications related to ponding.

Technical Digest No. 3 sells for $25.00, plus $5.00 per order for regular handling and shipping within the continental U.S. To order a hard copy, download an order form, or download the document, visit **www.steeljoist.org**.

news & events

PROJECTS

New Stadium to Feature World's Longest Single-Span Roof Structure

Earlier this summer, Dallas Cowboys Stadium celebrated a milestone in construction with the installation of the first piece of a monumental arch truss that will serve as the primary element of the roof structure. This installation signified the beginning of many noteworthy design, construction, and engineering innovations that will be part of the new retractable-roof stadium and entertainment venue, which is scheduled to open in time for the 2009 NFL season.

The roof structure is comprised of twin 17-ft-wide by 35-ft-deep arch box trusses weighing 3,255 tons each and spanning 1,225 ft, creating the longest single-span roof structure in the world. The 84-ft-long, 180,000-lb section (left) was put into place at the stadium's southwest abutment, 128 ft beyond the perimeter of the stadium's seating bowl structure. The arch truss bears on a 64,000-lb cast steel arch pin assembly atop the concrete abutment. Steel for the stadium was fabricated by W & W Steel Co., Oklahoma City, and Prospect Steel Co., Little Rock, Ark. (both AISC members). Walter P Moore performed the structural design.

letters

The Numbers Don't Add Up

A few months ago, I saw a press release with renderings of the Grand Canyon Skywalk and was very impressed. When I read through the release and saw the 71 million-lb, "71 fully loaded Boeing 747s" statistic, I punched a couple of buttons on my calculator and dismissed these claims as unfounded early Internet blab. To see the same stats in MSC (July 2007, p. 74), a respected industry publication, astounds me. I don't know where those numbers came from, but they are undoubtedly false. I would be very surprised if the walkway's live *and* dead loads totaled over two million lb past the edge of the cliff. Run a few quick numbers yourself.

David Soulier, P.E.
Baton Rouge, La.

*MSC responds: The statistics mentioned above and in the article appear on the official web site for the Grand Canyon Skywalk (**www.grandcanyonskywalk.com**). However, other sources suggest that the Skywalk itself can support 70 tons and it is the* foundation *of the structure that can support approximately 71 fully loaded Boeing 747s.*