

STEELDAY

SteelDay Gears up with Chicago High-Rise Tour

An 11-story, 157,000-sq.-ft steel residential high-rise known as Circa 922 is currently under construction just west of the Chicago Loop. It's the first project in the city to be built using the Girder-Slab system, and AISC recently hosted a tour of the building, which drew more than 100 construction professionals.



The project site tour and presentation served as a “pre” SteelDay event, offering a sneak peak at the dozens of events scheduled in Chicago and around the country on SteelDay. Set for Friday, September 19, SteelDay is an annual event, sponsored by AISC and hosted by its members and partners, celebrating structural steel. It offers events all over the country for AEC professionals, university faculty and students and the general public to get an inside look at how the structural steel industry works to build America. You can also keep up with SteelDay updates and discussions via AISC’s social media channels at www.facebook.com/AISCdotORG, www.twitter.com/aisc and www.youtube.com/AISCsteelTV.

NSBA

Jeff Carlson Joins NSBA as Western Regional Director

The National Steel Bridge Alliance welcomes Jeff Carlson, P.E., as its Western Regional Director. Carlson is responsible for working with state DOTs, bridge design consultants and construction professionals in Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming, providing technical and project assistance and communicating the advantages that structural steel brings to bridge projects.

“Jeff’s background adds another dimension and a fresh perspective to the NSBA team,” said Bill McEleney, NSBA’s managing director. “His experience dealing directly with owners will surely be appreciated by our DOT colleagues as we work to better quantify the life-cycle advantages of steel bridges.”

Carlson brings more than a decade of project management and engineering



experience to NSBA. Most recently, he was a financial analyst and project manager for Omni Development Corporation in Denver, where he was responsible for managing real estate redevelopment projects, overseeing several construction professionals, providing financial recommendations and developing budgets for presentations to the owner. Prior to that, he was a research analyst for Cornerstone Real Estate Advisors in Hartford, Conn. Before entering the real estate market, he worked for six years as a professional engineer and project manager for Martin/Martin Consulting Engineers in Lakewood, Colo.

Carlson lives in Englewood, Colo., and can be reached at 720.440.3011 or carlson@steelbridges.org. To view a map of NSBA staff’s territories, visit the NSBA website homepage (www.steelbridges.org).

People and Firms

- **Victor Technologies** will award more than \$30,000 in equipment and cash prizes as part of its 2014 “A Cut Above” student contest. The contest is open to students in cutting, welding and related programs at secondary and post-secondary schools. Entries are accepted now through October 31, with rules and entry forms available at www.victortechnologies.com/acutabove.
- **Carney Engineering Group**, a multi-discipline structural engineering firm serving the Mid-Atlantic region, has hired **Eric Alwine** as a structural project manager. His previous experiences include projects ranging from the \$110 million renovation of a historical 23-building campus to building hotels and casinos in San Juan, Puerto Rico.



- **Dexter + Chaney**, provider of **Spectrum Construction Software**, has unveiled its new **Project Plan Room** mobile app, which allows users to distribute construction documents, communicate data and relay project information in real time to employees’ and subcontractors’ mobile devices on the job site. (Visit www.dexterchaney.com.)

New Format for EJ; Q3 Now Available

Engineering Journal has replaced its digital edition browser with a single downloadable PDF file at www.aisc.org/ej. The current issue—third quarter 2014—will be available for download and viewing until the next issue is posted.

Articles for the complete collection of *EJ* will remain available individually in the searchable archives. Downloads of current and past articles in PDF format are free to AISC members and ePubs subscribers. Non-AISC members may subscribe to *EJ* at the AISC bookstore.

The Q3 2014 of *EJ* is the second of two issues with a special focus on the “simple for dead load–continuous for live load” (SDCL) design concept. The premise behind the concept is that girders erected as simple spans can be made to function under live load as continuous spans by providing continuity with a unique field connection. In addition to covering research, the issue highlights a successful SDCL bridge project from the engineer’s perspective.

Here are the Q3 articles:

► 2013-02

HSS Truss Connections with Three Branches

Jeffrey A. Packer

Hollow structural section (HSS) three-branch (or KT) connections frequently occur in modified Warren trusses, but the design of these planar welded connections is beyond the scope of Chapter K of the 2010 AISC *Specification for Structural Steel Buildings*. Such connections are also not covered by other contemporary HSS design guides and standards. This paper reviews the many potential member and loading arrangements, for both gapped and overlapped KT connections, and offers some design guidance. A worked example for an overlapped square HSS KT connection is then given, in both LRFD and ASD formats, in accordance with the 2010 AISC *Specification for Structural Steel Buildings*.

Keywords: Hollow structural sections, trusses, connections, KT, welded joints, overlapping branches.

► 2012-25R

Field Application Case Studies and Long-Term Monitoring of Bridges Utilizing the Simple for Dead–Continuous for Live Bridge System

Aaron Yakel and Atorod Azizinamini

The performance of three bridges constructed using the SDCL bridge system for steel girders was monitored during and after construction to compare actual performance with predicted performance. The structure types were a box-girder bridge, an I-girder bridge and a box-girder bridge built using accelerated construction details. During construction, strains and deflections were monitored so that the degree of continuity over the pier could be determined. The design concept assumes that a simply supported condition exists during casting of the concrete deck. However, to provide lateral bracing, the concrete diaphragm—or turnout—over the pier is cast and cured prior to casting the deck. As expected, encasement of the girders provides some continuity over the pier during casting of the deck. The degree of continuity over the pier can be reduced by lowering the height of the construction joint and through the use of crack-inducing details. Long-term monitoring of the structures showed the behavior to be consistent over time with no significant deviations from the predicted bridge behavior. During the initial time period of approximately 18 months, a slight overall change in strain values was observed in concrete elements. The rate of change slowed during this period and eventually ceased. Subsequently, the response of the structure has been consistent with only small seasonal fluctuations observed. These fluctuations are expected and are generally attributable to changes in ambient temperature, relative humidity, incident solar radiation and ground freeze/thaw conditions.

Keywords: Steel bridges, steel girders, SDCL, simple for dead load, continuous for live load.

► 2012-26

Experimental Investigation, Application and Monitoring of a Simple for Dead Load–Continuous for Live Load Connection for Accelerated Modular Steel Bridge Construction

Saeed Javidi, Aaron Yakel and Atorod Azizinamini

The inherently modular nature of the SDCL system makes it a natural fit for the accelerated construction paradigm. A detail capable of connecting pre-topped girders over the middle supports is developed and described in this paper. To evaluate the performance of the proposed connection, a full-scale specimen was built and subjected to cyclic and ultimate load testing. The connection showed very little change during cyclic loading equivalent for 70 years of traffic. During the ultimate load test, the connection demonstrated large displacement ductility, reaching its ultimate capacity after complete yielding of the longitudinal reinforcement. After the successful experimental test, a field application bridge was constructed using a modular pre-topped steel box girder system, which allows much of the construction process to be performed prior to placing the girders. The bridge consisted of three pre-topped steel box units placed side by side and connected using longitudinal joints between pre-topped units. The steel box girders used 70-ksi high-performance steel in the bottom flange and 50-ksi steel in the top flanges and webs. The use of high-performance steel combined with the SDCL system allows eliminating the need for section transitions through the length of the structure and using constant cross-section throughout the length of the girders. Long-term monitoring of the structure was performed and showed that the system worked as intended.

Keywords: Steel bridges, steel girders, SDCL, simple for dead load, continuous for live load.

► 2013-03

Existing Simple Steel Spans Made Continuous: A Retrofit Scheme for the I-476 Bridge over the Schuylkill River

Daniel Griffith and John A. Milius

The rehabilitation of the SR 476 Bridge over the Schuylkill River near Philadelphia converted existing steel multi-girder simple spans into three- and four-span continuous units. Employing a design method typically used for construction of new simple-span-made-continuous (SSMC) steel girder bridges, it is believed to be the first bridge rehabilitation project in Pennsylvania to use such a scheme. The rehabilitation design upgraded load capacity of the girders to meet current LRFD code requirements. The SSMC design, coupled with other deck joint elimination techniques, was able to reduce the combined number of deck joints on the north-

bound and southbound structures from 25 to 8. With nearly all previous steel deterioration occurring at deck joints, this substantial reduction in deck joints will aid in extending the remaining life of the bridge. This paper will illustrate the construction methods employed for conversion of the bridge from multiple simple spans to continuous spans. It will also provide detailed insight into the many design requirements for this structural conversion, from substructure retrofits and sequential bearing replacements to superstructure continuity and full-depth concrete diaphragm details.

Keywords: Simple-span-made-continuous (SSMC), bridge rehabilitation, modified fixity conditions, steel wedge plates, bolted steel splice plates, full-depth concrete diaphragm, staged construction, sequential bearing replacement, steel bolsters.

Evolving Innovation

While reading your July editorial, I could not help but think of something I read in a book about Steve Jobs. He hated marketing studies. It was mentioned that if Henry Ford would have asked a focus group what they wanted, they would have said a faster horse. Jobs and Ford had the same idea. They invented something that the public did not even know they could not live without. Innovation and evolution will continue. I think Girder-Slab fits into this category.

We need to look from the outside into our operations, visualize the future and look back to where we are now.

—*Daniel G. Fisher, Sr.*
Managing Partner
Girder-Slab Technologies, LLC