

NASCC

## Working Across Generation Gap Focus of NASCC Keynote

This year's keynote speaker at NASCC: The Steel Conference in Nashville (March 25-27) is Haydn Shaw, the author of *Sticking Points: How to Get 4 Generations Working Together in the 12 Places They Come Apart* and FranklinCovey's bestselling workshops "Leading Across Generations" and "Working Across Generations"; he also writes on generations and leadership for the *Huffington Post*. Shaw's keynote presentation "Leading Across the Generations" will explain why generations are different and how to turn those differences into productivity. You'll learn the differences between Traditionalists, Baby Boomers, Gen-Xers and Millennials and how to get through their sticking

points to get stuff done. The presentation will also help you in gaining, training and retraining the "text message" generation.

For more information on the keynote and NASCC, including the complete schedule, travel information, how to register and more, visit [www.aisc.org/nascc](http://www.aisc.org/nascc). In addition, next month's issue of *Modern Steel* will feature the full exhibitors list.



BRIDGES

## 60 Minutes Reports on America's Neglected Infrastructure



Corroded steel, crumbling concrete and lack of investment are hurting America's infrastructure, CBS's "60 Minutes" reported recently in the segment "Falling Apart: America's Neglected Infrastructure."

The feature story by CBS correspondent Steve Kroft highlighted the crumbling state of the nation's infrastructure, looking at the problem as it relates to economics, America's competitiveness in the world and life safety.

Kroft stressed that nearly 70,000 bridges in America—one out of every

nine—is now considered to be structurally deficient. He also spoke with former U.S. Department of Transportation Secretary Ray LaHood, who stated that the nation's roads and bridges are "on life support."

The report reinforces that the government's current infrastructure investments are unsustainable, as evidenced by the Highway Trust Fund insolvency, and questions Congress' ability to come up with a long-term fix.

To watch the segment, visit [www.cbsnews.com](http://www.cbsnews.com).

## People and Firms

- AISC member **Gerdau's** new **GGMULTI** merchant bar product satisfies 10 different steel grades and standards and is offered in varying shapes and sizes of angles, channels and flats. Designed for high performance in various operations of steel fabrication, the product is developed with consistent 50-ksi minimum yield strength for improved steel toughness, ductility and weldability. For more information, visit <http://ggmulti.com/>.
- **Meridian Community College** recently opened a new welding technology center on its Workforce Education campus in Meridian, Miss. The 11,500-sq.-ft facility will have 30 welding booths, classrooms, office space and a 3-ton overhead crane, reports *The Meridian Star*. **Tony Dean**, executive vice president and general manager at Meridian-based **Structural Steel Services, Inc.** (an AISC Member and Certified fabricator) helped design the facility to give it a real-world shop feel. For more information, visit [www.meridiancc.edu](http://www.meridiancc.edu).
- **Troy Brooks**, an 18-year veteran of **Nucor Corporation**, was recently named as the vice president and general manager of **Vulcraft-Nebraska, Cold Finish-Nebraska and Nucor Detailing Center**, which are all located in Norfolk, Neb. Brooks succeeds **Doyle Hopper**, who had served as vice president and general manager of the three Norfolk-based facilities since 2008. Hopper transferred to **Nucor Steel** in Wallingford, Conn., in September.

## SPECIFICATIONS

**New Revision to Steel Erection Specification now Available**

The latest revision to the AASHTO-NSBA *Steel Bridge Erection Guide Specification*, S10.1 is now available. This document establishes and defines the basic minimum requirements for the transportation, handling and erection of steel bridge components.

The document has been revised based upon input from the bridge design and construction communities. The majority of revisions occur in Section 2, which was expanded from four to five subsec-

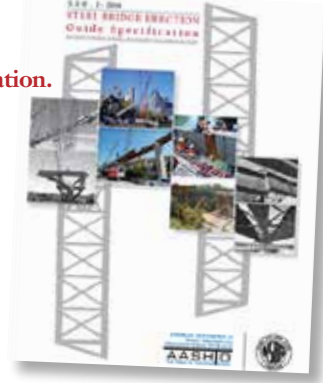
tions and retitled “Erection Engineering.” These updates further refine the processes that should be in place prior to field erection to better ensure safety, reliability and economy.

The work was developed by the AASHTO/NSBA Steel Bridge Collaboration Task Group 10, which is comprised of contributing members from the design consulting, DOT and fabrication communities. S10.1’s revisions continue the collaboration’s mission of distribut-

ing standardized best practices between owners, designers and contractors.

The revised document is available for free from at [www.aisc.org/nsba](http://www.aisc.org/nsba) and AASHTO’s website,

[www.transportation.org](http://www.transportation.org).



## MARKET NEWS

**Dodge Predicts Construction Growth this Year**

Construction starts will rise in 2015 for commercial and institutional building, according to a 2015 Construction Outlook report released by Dodge Data and Analytics. The report predicts that total U.S. construction starts for 2015 will rise 9% to \$612 billion—a larger gain than the 5% increase to \$564 billion estimated for 2014.

“The construction expansion should become more broad-based in 2015, with support coming from more sectors than was often the case in recent years,” said Robert Murray, chief economist and vice president for Dodge Data and Analytics. “The economic environment going forward carries several positives that will help to further lift total construction starts. Financing for construction projects is becoming more available, reflecting some easing of bank lending standards, a greater focus on real estate development by the investment community and more construction bond measures getting passed. While federal funding for construction programs is still constrained, states are now picking up some of the slack. Interest rates for the near term should stay low, and market fundamentals (occupancies and rents) for commercial building and multifamily housing continue to strengthen.”

This 32-page report covers the major sectors of the U.S. construction market, with breakouts for detailed categories within the residential, nonresidential and engineering sectors. In addition, it provides an outlook for the broad types of construction within each of the five major regions of the country.

Commercial building is expected to increase 15%—slightly faster than the 14% gain estimated for 2014. Office construction has assumed a leading role in the commercial building upturn, aided by expanding private development as well as healthy construction activity related to technology and finance firms. Hotel and warehouse construction should also strengthen, although the pickup for stores is more tenuous.

Institutional building will advance 9%, continuing the moderate upward trend that’s been established during 2014. The educational building category is now seeing an increasing amount of K-12 school construction, aided by the financing made available by the passage of recent construction bond measures. Healthcare facilities are expected to show some improvement relative to diminished activity in 2014.

Multifamily housing will also increase 9% in dollars and 7% in units to 405,000 (Dodge basis). Occupancies and rent growth continue to be supportive, although the rate of increase for construction is now decelerating as the multifamily market matures.

Copies of the report, with additional details by building sector, can be ordered from the Dodge Data and Analytics website, <http://construction.com/dodge>.

Also, see *Modern Steel’s* January Economics article, which features AISC vice president John Cross’ 2015 forecast for the steel industry ([www.modernsteel.com](http://www.modernsteel.com)).

## CERTIFICATION

**AISC Completes Bridge Fabricator Certification Program Conversion**

All participants in AISC’s certification program for bridge fabricators have now transitioned to a standard-based bridge certification program, which replaces the previous checklist criteria. “The transition is part of AISC’s efforts to advance the bridge fabricator certification to best serve both the industry (including applicants and certified participants) and the bridge marketplace (including contracting authorities, specifiers and general contractors),” explained Jacques Cattan, AISC’s vice president responsible for certification.

The transition completes a two-year process of converting bridge participants and applicants to the AISC Bridge Certification Requirements. In addition, the program requirements introduce the certification categories of Certified Bridge Fabricator: Simple (SBR), Intermediate (IBR) and Advanced (ABR).

Certificates will temporarily continue to include either the “Intermediate/Major” or “Advanced/Major” designations to allow transportation departments additional time to update their standard specifications. If you have additional questions, please contact AISC Certification at [certification@aisc.org](mailto:certification@aisc.org) or 312.670.7520.

## ENGINEERING JOURNAL

## Q1 EJ Now Available

The first quarter 2015 issue of *Engineering Journal* is now available in PDF format at [www.aisc.org/ej](http://www.aisc.org/ej). You can view, print and share the current digital edition.

► 2013-14

**Recommended Procedures for Damage-Based Serviceability Design of Steel Buildings under Wind Loads**

*Kevin Aswegan, Finley A. Charney and Jordan Jarrett*

This paper provides a recommended procedure for nonstructural damage control of steel buildings under serviceability-level wind loads. Unlike traditional procedures that provide a single drift limit under a given reference load, the recommended procedure provides a decision space that spans a range of wind hazards and associated damage states. Central to the procedure are the use of shear strain in nonstructural components as the engineering demand parameter and the use of component fragility as a reference for limiting damage.

**Keywords:** wind, drift, serviceability; damage, fragility, performance-based engineering

► 2013-17R

**Panel Zone Deformation Capacity as Affected by Weld Fracture at Column Kinking Location**

*Dong-Won Kim, Colin Blaney and Chia-Ming Uang*

Three full-scale specimens were tested to evaluate the cyclic performance of rehabilitated pre-Northridge steel beam-to-column moment connections. A Kaiser bolted bracket (KBB) was used on the beam bottom flange for all specimens, but different rehabilitation schemes (another KBB, a notch-tough beam flange replacement weld, or a double-tee welded bracket) were used to strengthen the top flange. All specimens were able to sustain an interstory drift angle of 0.04 radian, with large inelastic deformations in the panel zone. Two specimens experienced fracture at the replacement

complete-joint-penetration (CJP) welds, mainly due to the large shear deformation in the panel zone. Because it may not be economically feasible to mitigate weak panel zones in seismic rehabilitation, an analytical model was developed to predict the panel zone deformation capacity and the associated strength. In this model, it was postulated that the ultimate panel zone deformation capacity corresponded to that when each column flange was fully yielded and excessive kinking would cause fracture of the beam flange CJP welds. This postulation was verified by the test data of two specimens that experienced weld fracture due to excessive panel zone deformation. It was shown that the deformation capacity is a function of  $d_f/t_f$  (beam depth-to-column flange thickness ratio). The effect of column axial load was also studied.

**Keywords:** special moment frame, moment connection, panel zone, shear deformation, Kaiser bolted bracket, rehabilitation

► 2013-21

**Plastic Strength of Connection Elements**

*Bo Dowswell*

Many connection elements are modeled as rectangular members under various combinations of shear, flexural, torsional and axial loads. Strength design is now used for steel members and connections; therefore, the traditional method of combining loads using beam theory needs to be updated to comply with strength design philosophy. Due to the extensive research available on the plastic interaction of rectangular members, a review of existing equations forms the basis of this paper. In cases where existing research is unavailable, new derivations are provided. An interaction equation is developed for strength design of rectangular connection elements under any possible loading combination.

**Keywords:** connections, plastic design, rectangular elements

► 2013-28

**Behavior and Response of Headed Stud Connectors in Composite Steel Plate Girder Bridges under Cyclic Lateral Deformations**

*Hamid Babrami, Eric V. Monzon, Ahmad M. Itani and Ian G. Buckle*

Most of the mass of steel plate girder bridge superstructures is concentrated in the reinforced concrete deck. During a seismic event, the inertia force that is generated in the reinforced concrete deck is transferred to the support cross frames through the headed stud connectors. Seismic analyses showed that these connectors are subjected to combined axial tension and shear forces. If not designed properly, these connectors may fail prematurely during an earthquake, altering the load path and subjecting other bridge components to forces they are not designed for. To verify these observations, two half-scale models of plate girder bridge subassembly were constructed and subjected to cyclic testing. The two specimens represented two different configurations of headed stud connectors in transferring the deck seismic forces. The connectors in the first specimen connected the girder top flange to the reinforced concrete deck, while the connectors in the second specimen connected the cross-frame top chord to the deck. These experiments showed that the connectors were indeed vulnerable under transverse lateral loading. The failure mode of these connectors is a combination between shear and tensile forces or concrete breakout. Based on this investigation, design equations were proposed and adopted in the AASHTO LRFD Bridge Design Specifications to evaluate the resistance of such connectors under shear and tensile forces.

**Keywords:** stud connectors, seismic design, steel plate girders, reinforced concrete deck, steel girder bridge