

IN MEMORIAM

Keith Landwehr, Steel Construction and Quality Control Consultant, Dies

Keith Landwehr, a highly respected structural steel construction and quality control consultant who was involved in numerous AISC activities, passed away in late April after a battle with cancer. He was 63.

Keith worked in steel construction for over 30 years and started contributing to AISC, including Certification Committee



activities, in the mid-1990s. He served as the Chair of an ad hoc committee that brought quality concepts learned from the North-

ridge Earthquake into the AISC *Seismic Provisions* and later chaired the task committee that defined quality requirements in Chapter N of the *Specification for Structural Steel Buildings*. He was a member of the AISC Committee on Specifications and the Seismic Subcommittee, TC9, and was also a member of the AISC Committee on the *Code of Standard Practice*. In addition, he was a contributor to the Steel Solutions Center and various American Welding Society structural welding code committees.

In 2012, he was honored with AISC's Special Achievement Award for his leadership on the AISC Certification Committee and his significant contributions to quality certification, as well as for his work on the 2010 AISC *Specification* (including the development of Chapter N).

Keith is survived by his wife, Mary Jo, two sons and two granddaughters.

PODCASTS

Lawrence Griffis Featured in Latest Steel Profiles Podcast

"I wish I learned how to type. When I was in high school, everybody took woodshop," quips Lawrence Griffis, P.E., one of the world's leading experts on long-span structures. Griffis, senior principal and senior consultant at Walter P Moore and Associates, is featured in the latest episode of AISC's Steel Profiles podcast series.

In the podcast, AISC's Margaret Mathew, host of the Steel Profiles series, chats with Griffis about his pioneering efforts in long-span roof structures and retractable roof systems, his take on the ASCE-7 wind provisions and his admiration for Gustave Eiffel. Griffis is a co-author of AISC Design Guide No. 28 *Stability Design of Steel Buildings* and has also received AISC's J. Lloyd Kimbrough Award (2009), AISC's Lifetime Achievement Award (2002) and AISC's T.R. Higgins Lectureship Award (1994). You can learn more about his thoughts on the engineering profession in his article "A Culture of Discipline" (12/06, available at www.modernsteel.com).

You can play or download this episode and all past episodes of Steel Profiles at www.aisc.org/podcasts or in iTunes (www.iTunes.com). In iTunes, simply search "Steel Profiles" to access all 25 episodes. You can also subscribe to the series for free, and each new episode will automatically be downloaded for you.



People and Firms

• Michelmann Steel Celebrates 150 Years in Business

AISC Member fabricator Michelmann Steel Construction Company, located in Quincy, Ill., is celebrating a century-and-a-half of business this year.

The company was founded 1865 and had its beginnings as a boiler and tank shop. Founder J.H. Michelmann was born in Prussia in 1830 and came to America at the age of 23, where he went to work for a boilermaker named Valentine Stegemueller in Evansville, Ind. In 1855, Michelmann moved to Quincy with the business, and a year later he bought a small boiler and tank shop from Stegemueller and started the Michelmann Boiler Company with his son, Henry L. Michelmann.

In 1898 the company moved to its present Quincy location, taking over the old Aetna Iron Works. The building has been enlarged several times, most recently in 1956. In July of 1900 the company was incorporated, and due to the increased emphasis on fabricated structural steel, its name was changed to Michelmann Steel Construction Company.

Michelmann's current president, Laura Gerdes Ehrhart, is the great-great-granddaughter of founder J.H. Michelmann and the daughter of the company's fourth president, William F. Gerdes, III.



PROJECTS

Vikings Stadium Reaches Halfway Mark

Construction of the new Minnesota Vikings Stadium in Minneapolis has reached halftime. Steel erection for the roof frame is expected to be finished by this fall and the stadium is on schedule to open in August 2016. The project's steel team is made up of AISC Member/Certified fabricator Lejeune Steel Company and AISC Member/Advanced Certified steel erector Danny Construction Company. Morten-

son Construction, the project's general contractor, says crews have erected about 5,000 of the 11,000 tons of steel that will be used for the roof, including five of the 11 queen post trusses that will span from the ridge truss to the ring beam on the east and west sides of the stadium. The ridge truss is close to completion, with two segments remaining to be linked to complete the span of about 1,000 ft.

To follow the stadium's construction progress, visit www.vikings.com.



AWARDS

AISC Now Accepting 2016 Higgins Award Nominations

AISC is now accepting nominations for its annual T.R. Higgins Lectureship Award. The award recognizes an outstanding lecturer and author whose technical paper or papers, published during the eligibility period, are considered an outstanding contribution to the engineering literature on fabricated structural steel. It is named for former AISC director of engineering and research Theodore R. Higgins, who was widely acclaimed for his many contributions to the advancement of engineering technology related to fabricated structural steel.

The winner will receive a framed certificate, which is presented at AISC's annual NASCC: The Steel Conference. They will also receive a \$15,000 cash award and will present their lecture, upon request, at professional association events. The current T.R. Higgins Lecturer is Chia-Ming Uang, who received the 2015 award at The Steel Conference in Nashville in March.

AISC encourages everyone involved with steel construction to submit nominations. Include the following information:

- Name and affiliation of the individual nominated (past winners may not be nominated again)
- Title of the paper(s) for which the individual is nominated, including publication citation
- If the paper(s) have multiple authors, identify the principal author
- Reasons for nomination
- A copy of the paper(s), as well as any published discussion

The award will be made to a nominated individual on the basis of two criteria:

- His/her reputation as a lecturer
- The jury's evaluation of the paper or papers named in the nomination

Papers are judged on originality, clarity of presentation, contribution to engineering knowledge, future significance

and value to the fabricated structural steel industry.

The winner will give a minimum of six presentations of the lecture on selected occasions throughout the year. Eligible papers must have been published between January 1, 2010 and January 1, 2015.

Nominations for the 2016 award must be received by August 3, 2015, and the 2016 award will be presented at the 2016 Steel Conference in Orlando, Fla. Nominations should be sent to:

T.R. Higgins Award Nomination
c/o Janet Cummins
Engineering and Research Coordinator
AISC

1 E. Wacker Dr., Ste. 700
Chicago, IL 60601

Contact Janet Cummins (cummins@aisc.org) or visit www.aisc.org/higgins for further information.

MARKET NEWS

Construction Industry Sees Employment Increase

Construction firms added jobs in 43 states and the District of Columbia during the past year while construction employment also increased in 31 states between December and January, according to recent data from the Associated General Contractors of America (AGC). Texas had the largest 12-month gain, with 49,600 new construction jobs (state employment data is available by rank and state).

"Most of the country experienced a welcome rebound in construction employment last year," said AGC's chief economist, Ken Simonson. "Yet it is unclear how public sector demand and new regulatory requirements will overshadow relatively robust private-sector demand."

AGC officials noted that further construction gains could be undermined if Congress and the Presidential

administration fail to address infrastructure funding challenges growing regulatory burdens.

"If Congress and the Obama administration are serious about wanting to help the middle class, they will need to find a way to fund infrastructure investments over the long term," said Stephen E. Sandherr, AGC's chief executive officer.

The report is available at www.agc.org.

ENGINEERING JOURNAL

Second Quarter EJ Now Available

The second quarter 2015 issue of AISC's *Engineering Journal* is now available at www.aisc.org/ej, where you can view, download and print the current digital edition. Articles in this issue include:

► 2013-24R

Seismic Response of Partial-Joint-Penetration Welded Column Splices in Moment-Resisting Frames

Sean M. Shaw, Kimberly Stillmaker and Amit M. Kanvinde

Current standards require that welded column splice connections in special or intermediate moment resisting frames (SMRFs or IMRFs) feature complete-joint-penetration (CJP) groove welds to develop the full flexural strength of the column. CJP welds are often costly, requiring additional material, inspection and labor. Compared to beam-to-column connections, column splices have modest deformation demands. This suggests that perhaps with modern, toughness-rated weld filler materials and welding practices, PJP welded splices may offer acceptable performance under seismic loads. A study featuring five full-scale tests on PJP-welded column splices is presented. The test matrix investigates a range of parameters including column sizes as well as variations in connection details. Specimens were loaded cyclically in a three-point bend configuration subjecting the splice to demands consistent with those in severe earthquakes; a loading protocol was developed specifically for this purpose based on nonlinear time history simulations. All the full-scale specimens exhibited excellent performance. A series of finite element fracture mechanics

simulations is also presented to assist with the generalization of test results. The test and simulation data are encouraging from the perspective of adoption of PJP welded splices in IMRFs and SMRFs in seismic regions. Limitations of the research are outlined, along with discussion of future work to develop the concept further.

Keywords: partial-joint-penetration groove welds, PJP welds, column splices, moment frames

► 2013-25R

Effect of Link-Beam Stiffener and Brace Flange Alignment on Inelastic Cyclic Behavior of Eccentrically Braced Frames

Reza Imani and Michel Bruneau

Finite element analysis was used to investigate the effects of the misalignment of the brace flange-to-beam connection point with the link-end stiffener (referred to as the offset in the paper) on the ductility of eccentrically braced frames (EBF). The offset was speculated to be a possible reason for the unexpected EBF failures observed in the aftermath of the Christchurch earthquake series of 2010 and 2011. EBF models with different detailing at the offset area were analyzed under monotonic and cyclic displacements. Results showed severe stress and strain concentration in the offset area, preventing the EBF from developing its expected ductility, and suggested possible initiation of a failure from the part of link flange located in the offset area. Simulation using the ductile fracture model implemented in ABAQUS resulted in a fracture pattern in agreement with the actual failed EBF. Results from analyses on different detail

configurations showed that removal of the offset by modifying the brace section to build an ideal case, or by a simple change in the location of the link stiffener, can mitigate the problem of possible premature failure, with the latter solution being slightly less effective but much easier to be used in practice.

Keywords: Eccentrically braced frames, EBF failure, eccentricity, offset at brace flange-to-beam connection

► 2014-12

The Chevron Effect – Not an Isolated Problem

Patrick J. Fortney and William A. Thornton

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: Gusset plates, chevron braces, V-braces, brace forces, analysis, design

► Research 36

Steel Structures Research Update: Resilient Steel Plate Shear Walls

Judy Liu