news

INDUSTRY PROMOTION

Reaching Future "Tinkerers"

A new entity dedicated to inspiring America's youth to consider careers in manufacturing has been created through the partnership of two leading foundations—one of which was founded by Cliff Clavin of *Cheers*.

The Nuts, Bolts and Thingamajigs Foundation (NBTF), founded by actor John Ratzenberger, has joined with the Fabricators and Manufacturers Association (FMA) Foundation to create a charitable organization: Nuts, Bolts and Thingamajigs, the Foundation of the Fabricators and Manufacturers Association, Intl. (NBT). The new organization will feature an 18-member board of directors; six members from the former NBTF will join the 12 former FMA Foundation board members.

The initiative allows NBT to broaden operations and increase charitable activities that include providing grants to educational institutions offering manufacturing camps and awarding scholarships to students pursuing manufacturing careers.

Former FMA Foundation executives Gerald Shankel and Terrence Egan will direct the new organization, serving as president and director, respectively, and John Ratzenberger will continue to serve on the governing board and lead the Foundation's national public policy and media campaigns.

"This partnership combines John Ratzenberger's voice and passion on an issue so dear to his heart with FMA's infrastructure and resources to spread the message that manufacturing is a viable career option," said Shankel. "We will be even more effective working together to spark interest among young people in the industry and help revitalize the future of manufacturing in America."

"As a champion of manufacturing, John Ratzenberger will have a great impact on fostering media coverage on this quest and help us spread the word that it's honorable to work with your hands," said Egan. "The focus is on inspiring young people to ultimately explore the manufacturing career path by getting them to tinker, fix, and make stuff, and dream about inventing things. The groundwork we've laid and the programs we've implemented in the past will continue to be the core of our work."

Ratzenberger will contribute his extensive experience with American manufacturers and valuable relationships in the entertainment, political, social and corporate arenas.

"I can think of no enterprise more worthy than one devoted to inspiring the next generation of engineers, builders and manufacturers," said Ratzenberger. "I am proud to join forces with FMA and know that with each child who attends one of our camps or receives one of our scholarships, we are rebuilding America's foundation one tinkerer at a time."

Visit **www.fma-foundation.org/nbtf** for more information.

BRIDGES

Steel Bridge Kicks Off Infrastructure Stimulus Program

The first infrastructure project to move forward under the new federal economic stimulus package was recently announced. The project, a replacement bridge in Miller County near Tuscumbia, Mo., was approved for construction as a top priority for the State of Missouri at a cost of $8.5 million, which will be funded by the stimulus plan. Because of the desire for rapid and economical construction, steel was selected for the bridge's main span.

"Today, the Show Me State again showed the nation we are leaders in transportation by having the first economic recovery act project in the country under construction," said Missouri Department of Transportation director Pete Rahn. "We promised we would be ready to go to make the best use of every dollar we receive through the economic recovery act to create jobs and make our highways safer. We delivered on that promise and then some."

The new 1,000-ft long, 28-ft-wide steel bridge will replace the existing 75-year-old Osage River Bridge, which is the same length and just 20 ft wide. The bridge crosses a Missouri River tributary near the middle of the state, where the average daily traffic is more than 1,000 cars per day. However, it has been off-limits to large trucks since 2007 because of its poor structural condition.

The new bridge, built by general contractor APAC of Kansas City, will use 395 tons of structural steel for the 570-ft main span and will be positioned just upstream from the existing bridge. The steel is scheduled to be delivered by DeLong's, Inc. (an AISC/NSBA Member and AISC Certified bridge fabricator) this fall.

"We're pleased to have a project so close to home—only about 35 miles from our fabricator shop—close enough for our employees to be able to see and use," said Gary Wisch, DeLong's vice president of engineering. "We're also proud to be the steel fabricator for the first project built with funds made available by the federal stimulus bill."

Roger E. Ferch, P.E., president of AISC, said, "The speed of construction and longer term benefits of flexibility and durability from using fabricated structural steel in this project provide Missouri residents with a bridge that will serve extremely well for a long time."

STANDARDS

New Coatings Standard from ASTM

American Society for Testing and Materials (ASTM) International Committee A05 on Metallic-Coated Iron and Steel Products has approved a new standard, ASTM A1059/A1059M, *Specification for Zinc Alloy Thermo-Diffusion Coatings (TDC) on Steel Fasteners, Hardware and Other Products*. The new standard is under the jurisdiction of Subcommittee A05.13 on Structural Shapes and Hardware Specifications.

The technology described in ASTM A1059/A1059M has, over the last 15 years, become a popular means for providing an environmentally friendly way to replace toxic materials, such as cadmium and chromium compounds, used for corrosion protection.

Visit **www.astm.org** for more information.

IN MEMORY

Long-Time Certification Committee Member Bill Ashton Dies

William Ashton with his wife, Judy.

William Ashton, 65, died peacefully at Dougherty Hospice House in Sioux Falls, S.D. on February 13, from complications from ALS (also known as Lou Gehrig's Disease). He had been diagnosed with the disease just last October.

Bill was born in St. Paul, Minn. on July 14, 1943. Upon graduating high school, he joined the U.S. Navy, where he served until he was 21. His career in the steel industry began in July of 1964, when he joined steel fabricator St. Paul Structural Steel in the sales department. Shortly thereafter, he enrolled at the University of Minnesota to pursue an engineering degree. After many years of attending late-afternoon and night courses, he received his Bachelors of Civil Engineering degree in 1983.

Over the 19 years he spent working at St. Paul Structural Steel, Bill moved up the ladder to one of the top positions in the company and served as project manager on several notable projects in the Twin Cities, including the IDS Tower and the Hennepin County Government Center. As with many other steel companies, St. Paul Structural closed in 1983 and that September, Bill accepted a position as production manager for fabricator Egger Steel Company (AISC Member) in Sioux Falls. He was eventually promoted to vice president of production for the company. After 20 years with Egger Steel, he started his own structural steel detailing business, which grew into a highly successful company.

Bill was also heavily involved with AISC. He was a member of the Certification Committee for more than 20 years and was recently honored with the Special Citation Award for his key role in developing standards that ensure safe steel structures.

With twinkling blue eyes and an engaging smile, Bill was easy to get to know and often had interesting stories of travel and recreational adventures to share. One of his many proud accomplishments was the hole-in-one that he hit on July 7, 2005 on the 17th hole at Prairie Green Golf Course in Sioux Falls.

Bill is survived by his wife, Judy, his sons William Jr. and Steven (Kristine), his siblings Richard, Carol Ashton McMahon, Charles (Jeanne) and Michael, and his stepchildren Chad (Nicole) Schilmoeller and children Luke and Brooklyn, and Nicole (Thomas) Benning and children Ashley and Austin.

IN MEMORY

Certification Innovator Farnham Jarrard Dies

C. Farnham Jarrard, Jr.

Charles Farnham Jarrard, Jr. died March 8, 2009 at his home in Bristol, Va. after a battle with cancer.

Farnham was born April 8, 1933 in Berwyn, Ill. During his youth, his family moved to Lake Geneva, Wisc., where he attended schools and graduated high school. Upon graduation, he attended the University of Wisconsin, served two years in the Army, and graduated from Lawrence University in Appleton, Wisc. in 1958.

He entered the steel business shortly after college and eventually became president and CEO of fabricator Allied Structural Steel in Hammond, Ind. Following his career at Allied, he spent 16 years as a senior vice-president at fabricator Bristol Steel and Iron Works in Bristol, Va. He also served a term as Bristol's mayor.

Farnham served as the first president of Quality Auditing Company, the precursor to AISC's Quality Management Company. In that role, he initiated the hiring and activities of the company, participated with the Certification Committee, and was instrumental in initiating the Erector Certification Program. He was also the first chairman of AISC's Quality Criteria and Inspection Standards Committee.

He was made an honorary life member of AISC in 1989—one of only 11 to achieve this dinstinction—and received an AISC Special Achievement Award in 1999 for his advancement of the AISC Certification program.

"Farnham helped get the quality assurance program started and was instrumental in its success," said former AISC Board president Bob Stupp, chairman of fabricator Stupp Bros., Inc. (AISC Member) in St. Louis.

"Farnham encouraged, took time to teach, and cared about everyone he was in contact with," said Sandi McCracken, formerly of Quality Management Company and Allied. "His kindness and willingness to give a female a chance in the auditing of steel construction has enhanced my life beyond my biggest dreams."

Prior to his involvement in Certification, Mr. Jarrard was a leader on the committee that wrote the Quality Control and Inspection Criteria, a document which has now evolved into some of AISC's original FAQs. He is also a past president of the Central Fabricators Association.

He is survived by his wife, Amelia Osborne Jarrard, two sons—Charles Farnham Jarrard, III, his wife Geri, and their daughter, Kaysa; and David Stewart Jarrard—step-daughter Amelia Stone Rose, her husband, Scott and their son Will; and a step-daughter in-law, Teresa Stone, and her children Farnham and Evelyn Stone.

news & events

EVENTS

Sawing Symposium and Exhibition

Behringer Saws is inviting professionals involved in metal cutting and fabrication operations to its Morgantown, Pa. headquarters May 12-14 for a sawing symposium and exhibition. The free event will feature practical technical seminars while also spotlighting an extensive offering of product introductions. Attendees will learn about the latest trends in metalworking during daily seminars, and live cutting demonstrations will also be presented, using sawing technologies developed from interaction with customers and real-world applications.

Seminar schedules are staggered across all three days to accommodate visitors' schedules. For more information visit **www.behringersaws.com** or call 888.234.7464.

EVENTS

2010 Structures and Analysis Conferences: Call for Proposals

AISC and the Structural Engineering Institute (SEI) of ASCE are joining forces in 2010 to host the first-ever combined Structures Congress/North American Steel Construction Conference (NASCC) May 12-14, 2010 in Orlando, Fla. Technical programs are being developed for each, with close coordination between the program committees.

Proposals are currently being accepted for complete sessions and individual papers to be presented in the Structures Congress section of the program. Presentations will be selected from the open call and by invitation. For more details on how to submit a proposal to the Structures Congress, visit **www.seinstitute.org**.

The event will also include the 19th Analysis and Computation Specialty Conference, and presentation proposals are also currently being accepted for this event. Visit **www.asce.org**.

Proposals for both conferences are due June 10, 2009.

EVENTS

Hong Kong to Host 2010 Tube Symposium

The University of Hong Kong will host the 13th International Symposium on Tubular Structures in Hong Kong, December 15-17, 2010. Held in a different international city every year, the symposium is a showcase for tubular structures and an international forum for the discussion of research, developments, and applications in the field of hollow steel. Attendees include manufacturers of hollow sections or related construction products, architects, trade associations, design engineers, steel fabricators, owners or developers of tubular structures, researchers, academics, and postgraduate students.

Prospective authors of papers and presentations are invited to submit abstracts of 300 to 400 words (in English) before August 15, 2009 on the following topics: Tubular Structures, Static and Fatigue Behavior of Connections, Earthquake and Dynamic Resistance, Specification and Standard Developments, Fire Resistance, and others. Authors will be notified of provisional acceptance on November 30, 2009. For more information visit **www.hku.hk/civil/ISTS13**.

Jessica Sladek

SPECIFICATIONS

Public Review of 2010 AISC *Specification*

The 2010 draft of the AISC *Specification for Structural Steel Buildings* will be available for public review until May 4, 2009. This specification will be available for download on the AISC website at **www.aisc.org/AISC360PR1** along with the review form during this time. Copies are also available (for a $12 nominal charge) by calling 312.670.5411.

Please submit comments using the form provided online to Cynthia J. Duncan, AISC's director of engineering, at **duncan@aisc.org** by May 4, 2009 for consideration.

news

CONSTRUCTION MARKET

It's not All Doom and Gloom

The Fabricators and Manufacturers Association, International's (FMA) economic analyst is painting a slightly rosier picture of the economy than we've been hearing lately—or at least is offering some perspective.

"Unless the current doom and gloom becomes something of a self-fulfilling prophecy, the recession is on a par with past downturns, and real improvement will start to manifest itself in 2010," said Chris Kuehl in the latest FMA economic update newsletter *Fabrinomics*.

Kuehl bases his assertions on how the National Bureau of Economic Research (NBER) defines recessions. "The NBER has a reputation as being pretty conservative and reacts to factors beyond GDP to declare a recession," Kuehl explained. "It uses six criteria to determine when a recession has started and when it ends. These are GDP, real income, employment, industrial production, wholesale sales, and retail sales."

After an analysis by Kuehl of government charts that track GDP, income, unemployment and production since 1970, he concluded that "it is pretty apparent the recession of 2008-09 is not worse than those in the past four decades. In fact, the recessions of the 1970s and 1980s were arguably more painful on almost every level."

Kuehl acknowledged many U.S. businesses are suffering despite the numbers. "To those who are frantically trying to hold their business together, the recession is as bad as it gets," he said. "But for those who are trying to decide how radical they need to get to protect their business, a realistic assessment is needed. At this stage, the recession is on a par with what has been endured previously, which means it can and will be survived."

"The strategy now should be to hunker down and wait out the downturn—without taking steps that gut a company's ability to react to the turnaround," Kuehl said. "This means hanging on to valued employees who soon will be needed again. It means making those investments in capital goods that keep a company competitive, and it means staying true to strategic goals in marketing.

"If this is a normal recession people can overcome, a wait-and-see attitude is more palatable than if the conclusion is that we are facing the end of the economic world. According to the numbers, we are not facing the latter situation."

letters

Where's the Weak Link?

In Benjamin Baer's article "Holding On" (02/09, p. 44), Figure 3 on page 46 shows a post-to-stringer connection, with a full penetration weld on two sides of the post to the flange of the stringer channel.

Shouldn't the weak link in this system be considered to be the web of the channel? I don't see how a thin web can adequately resist the bending imposed by horizontal guardrail forces.

Edward J. LeNormand, P.E.

Response from Benjamin R. Baer:

To answer your question, I'll start with something I included near the end of the article: "Each handrail is unique, and each requires architectural and structural design by licensed professionals." There are a lot of factors that can affect stair and handrail design including the type of treads and risers, how these are connected to the stringer, the floor construction, the stair opening and how it is framed (including the type of pour stops), and, of course, aesthetic considerations.

For a very common concrete-filled metal pan stair, there are two situations that have some similarities. The first is for the sloping stringer, where the treads and risers are connected to the inside of the stringer (back side of the channel). In this case, tread/riser pan is welded to the carrier angle, which is welded to the stringer. The tread/riser pan provides resistance for lateral load from the handrail (sort of a diaphragm on a very small scale). At the other end of the spectrum, bolted grating treads may not provide enough resistance, and local stiffeners could be necessary.

The second situation is a horizontal railing around a stair opening. In some cases, the railing is attached to the floor slab, the pour stop (should be headed studs on the inside), or other parts of the structural framing. In other cases, the same stringer channel is used for appearance purposes, and the railing is attached to the top of the channel. This case is similar to the sloping stringer; how the channel is attached to the structure determines if there will be local bending of the channel.

More than Math and Science

In response to Tom Schlafly's January Topping Out article titled "SteelWize" (p. 66):

- The plural of "you" is "you," although the plural of U is W—but it looks more like a double-V!
- Also, two wrongs don't make a right, but three rights make a left!
- How many "vaganzas" does it take to have an "extravaganza?" (I'm guessing at least two!)

I enjoy MSC every month. English is a difficult language and takes a lifetime to learn. When I was in high school, I blew off English class because I was planning on being an engineer and I thought all I needed was math and science. Boy, was I wrong!

Patrick M. Petrone, P.E., S.E.
In-house Design Unit Chief
Illinois Department of Transportation
Bureau of Bridges and Structures

Credit where Credit is Due

I have a couple of corrections regarding Keith Grubb's February 2009 article "Out in the Open" (p. 57):

- Metals USA policy stipulates that we share no specific numbers. Circumventing this restriction, we currently have possibly the largest inventory of A588 products in the U.S. The A588 and A572 Steel Co. is not an AISC member and has a limited range of A588 products. Metals USA inventories flats, rounds, angles, channels, miscellaneous channels, squares, wide-flange, and standard beams and plate. One could easily argue that Metals USA is the first call for rare A588 shapes. Non-stock items are routinely supplied from rolling or outsourcing and include all products listed above including HSS tubing.
- While we cannot quote tonnage linked to our name, we inventory 5,000 tons.

Jim Collins
Vice President, Metals USA

Not Quite the Whole Story

The July 2008 article "The Hole Story" (p. 46) was a well-written and very useful summary of the AISC 360-05 requirements. However, the article should have also addressed AISC 341-05, which requires that bolted joints that are part of the SLRS must be installed as pretensioned, even though they are designed as bearing-type. In addition, the article should have clarified that detailing of steel structures in accordance with AISC 341-05 is required whenever prescribed by the applicable building code. Although it is always

required when R is greater than three, there are four examples in ASCE 7-05, Table 15.4-1 that require seismic detailing in accordance with AISC 341-05 when R is less than three.

As a suggestion, you might consider devoting some future SteelWise articles to "clarifying the mystery" of seismic detailing for those Midwest and East Coast engineers who now find themselves designing structures for seismic considerations.

Rick Drake, S.E.
Director, Design Engineering
Civil/Structural/Architectural
Fluor Enterprises, Inc.

Response from AISC:

We did focus on AISC 360 requirements in the article. However, questions about bolts in high-seismic connections are relevant, and hopefully this response will serve to expand a bit on the original article.

Regarding the design and detailing of bolted joints in an SLRS, ANSI/AISC 341-05 *Seismic Provisions for Structural Steel Buildings*, the Commentary to Section 7.2 indicates the following:

> "The potential for full reversal of design load and the likelihood of inelastic deformations of members and/or connected parts necessitates that pretensioned bolts be used in bolted joints in the SLRS. However, earthquake motions are such that slip cannot and need not be prevented in all cases, even with slip-critical connections. Accordingly, the Provisions call for bolted joints to be proportioned as pretensioned bearing joints but with faying surfaces prepared for Class A or better slip-critical connections... The resulting nominal amount of slip resistance will minimize damage in more moderate seismic events... Where the faying surface is primarily subject to tension or compression, for example in bolted end-plate connections, the requirement on preparation of the faying surfaces may be relaxed."

Thus, the resulting joint will resist slip in smaller earthquakes that may occur with a greater frequency than the design-level earthquake. Furthermore, this approach recognizes that slip cannot be prevented in the design-level seismic event.

Regarding seismic detailing requirements, ASCE 7-05 Chapter 14, Material Specific Seismic Design and Detailing Requirements, outlines the seismic design and detailing requirements for structural steel buildings. Section 14.1.2 indicates that if the structure is assigned to seismic design categories B or C the system can be designated as a structural steel system not specifically detailed for seismic resistance and designed with R = 3. For seismic design category A, an R factor is not used in the seismic force calculation. Ultimately, normal detailing practices corresponding to the traditional designs associated with the requirements in ANSI/AISC 360-05 are used in these cases.

AISC 341 requirements are applicable, however, in the following cases:

1. For seismic design category B or C systems for which an $R > 3$ is used.
2. For structures assigned to seismic design categories D, E, or F (Section 14.1.3).

It also should be noted that ASCE 7-05 Chapter 15, Seismic Design Requirements for Non-Building Structures, outlines the seismic detailing requirements for non-building structures. If the non-building structure is determined to be similar to buildings, the seismic detailing requirements are found in Table 15.4-1: Seismic Coefficients for Non-Building Structures Similar to Buildings. This table illustrates whether the seismic detailing requirements for specific SLRS are found in ANSI/AISC 360-05 or ANSI/AISC 341-05. And as you pointed out, there are a number of framing systems with R values less than 3 that are required to be detailed according to ANSI/AISC 341-05. These systems include:

- Ordinary steel concentrically braced frame with permitted height increase (R = 2½)
- Intermediate steel moment frames with permitted height increase (R = 2)
- Intermediate steel moment frames with unlimited height (R = 1)
- Ordinary moment frames of steel with permitted height increase (R = 2)
- Ordinary moment frames of steel with unlimited height (R = 1)

Jacinda L. Collins
AISC Steel Solutions Center
Advisor

Thomas J. Schlafly
AISC Director of Research

Charles J. Carter
Vice President and Chief
Structural Engineer

Protectionism not the Answer

As a Canadian, I was disappointed to see your Buy America pitch ("Made in America," 02/09, p. 23). While I personally was opposed to both the Free Trade Agreement and NAFTA, this is not the time for protectionism. If you want to scrap these agreements, wait until times are good. Look at history; the Depression was made worse by a wave of protectionism. Do not think that the U.S. can unilaterally apply protectionist measures and everyone else is just going to sit by and do nothing. Once you start, the wave will spread around the world and things will go from bad to worse.

We already have unions in Canada pushing for a made-in-Canada clause. Our military has just ordered trucks, which are to be built in Texas; they could be built in St. Catherines, Ontario. Just last month, Canada lost twice as many jobs per capita than the U.S. lost. We are all hurting and quite frankly, I expect it will be tough for a few more years.

Despite being registered in the U.S., I have never done any work in the U.S., so per se, I am not going to lose any work directly whether a Buy America strategy is adopted or not.

Ralph Watts, P.Eng., P.E.
North Island Engineering Ltd.

Response from author Angela R. Stephens:

Contrary to Mr. Watts' assertions, we are not asking for protectionism. Instead, we want the laws and regulations that are currently on the books to be enforced as they were intended to be enforced.

Furthermore, Section (d) of the Buy American provision, Section 1605, contained in the American Reinvestment and Recovery Act of 2009 (ARRA) provides that "this section shall be applied in a manner consistent with United States obligations under international agreements." This means that companies from countries like Canada, who have signed trade agreements with the U.S., will be treated similarly to U.S. companies when the government is purchasing products over the dollar value thresholds outlined in those trade agreements.

Perhaps someday our two governments will enact and enforce coordinated laws that will make our shared border less relevant and our combined economy appreciably stronger.

Angela R. Stephens
Civil Engineer and Lawyer
Stites & Harbison, PLLC

news

ENGINEERING JOURNAL

Second Quarter 2009 Article Abstracts

The following papers appear in the second quarter 2009 issue of AISC's *Engineering Journal*. EJ is available online (free to AISC Members) at www.aisc.org/epubs.

Design of Unstiffened Extended Single-Plate Shear Connections

Larry S. Muir and Christopher M. Hewitt

Extended single-plate shear connections offer many advantages that simplify the construction process. Because the connection to the supported member is moved clear of the support, coping of the supported member is not required and the only fabrication process required for the supported member is drilling or punching.

Also, because bolted connections are only used in the connection to the supported member, there is no safety concern over the use of shared bolts through the web of the support. Additionally, in some instances, extended single-plate connections are the only practical solution to a framing problem, such as the case of a member framing into the weak axis of a column with continuity plates.

The rigidity of single-plate connections at the support has always been a gray area. Designers have often been concerned about a considerable, unanticipated moment that could be developed in the connection, which could then result in either a moment delivered to the column that the column has not been designed to resist, or a sudden rupture of either the weld or the bolts. Section B3.6a of the AISC *Specification for Structural Steel Buildings* requires that simple shear connections have sufficient rotational capacity to accommodate the required beam end rotation.

This paper will address each of these concerns, and will present a general design procedure for extended single-plate shear connections.

Topics: Connections–Simple Shear

Experimental Evaluation of the Influence of Connection Typology on the Behavior of Steel Structures Under Fire

Aldina Santiago, Luís Simões da Silva, Paulo Vila Real, Gilberto Vaz, and António Gameiro Lopes

The behavior of steel joints under fire loading is a subject that has only recently received special attention by the research community. In fact, as recently as 1995, the European prestandard on the fire response of steel structures deemed it unnecessary to assess the behavior of steel joints under fire conditions.

This approach was supported by the argument that there is increased thermal mass at the joint area. However, observations from real fires show that, on several occasions, steel joints fail, particularly their tensile components (such as bolts or end plates), because of the high cooling strains induced by the distortional deformation of the connected members.

The main objective of this paper is to describe an experimental test program carried out by the Department of Civil Engineering at the University of Coimbra on a steel sub-frame in order to evaluate the behavior of various types of steel joints under a natural fire and transient temperature conditions along the length of the beam.

The tests were carried out on a purposely developed experimental installation that could reproduce the transient temperature conditions measured in the seventh Cardington test. The results of these tests provide invaluable evidence on how to design joints that are able to survive a fire.

Topics: Fire And Temperature Effects; Connections–Moment; Connections–Simple Shear

Shear Behavior of A325 and A490 High-Strength Bolts in Fire and Post-Fire

Liang Yu and Karl H. Frank

High-strength ASTM A325 and A490 bolts were tested in shear at temperatures up to 800 °C (1,472 °F). The shear strength showed a gradual reduction in both types of bolts as the temperature was increased above 300 °C (572 °F). Strength reduction factors for both types of bolts at elevated temperatures were obtained to provide a means of estimating the bolt shear strength during fire.

The residual strength of A325 and A490 bolts after exposure to elevated temperatures was also investigated by both direct shear tests and hardness tests. Significant strength loss occurs on both types of bolts after exposure to temperature higher than the tempering temperature employed in the manufacturing process. The hardness value at ½ R location on the bolt cross section was found to provide a good estimate of the bolts residual strength. The hardness test provides a simple and practical method to assess the post-fire strength of a bolt.

Topics: Analysis, Specifications

People and Firms

- **Friedman Industries, Inc.** has opened a steel coil processing plant in Decatur, Ala. The facility is designed to convert hot-rolled coils received from the adjacent Nucor Steel Company mill into hot-rolled sheet and plate.
- **Thornton Tomasetti** recently acquired California-based **DASSE Design Inc.**, a structural engineering firm focused on the health-care, education, government, and corporate sectors.
- Seismic design and consulting firm **Miyamoto International** has opened a new office in Istanbul, Turkey and has joined with **Fuji Architectural and Engineering** to provide a full line of seismic engineering services to the region.
- **Chris Poland**, Chairman and CEO of **Degenkolb Engineers**, has become a member of the National Academy of Engineering (NAE).
- Metal deck distributor **A.C.T. Metal Deck Supply** has opened its 11th distribution center, in San Antonio.
- **GZA GeoEnvironmental Inc.**, an environmental and geotechnical consulting firm, announced that **Lawrence E. Morse** has been named to the position of vice president.
- Minneapolis-based law firm **Fredrikson & Byron** recently launched a Construction Group to help clients navigate the current challenges of the construction industry.
- Plate technology manufacturer **W.A. Whitney** has unveiled its redesigned website at www.wawhitney.com.