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COLD-FORMED STEEL ENGINEERS INSTITUTE – NEWS AND UPDATES

2017 CFSEI EXPO Heads to Fort Worth, Texas May 22,23

Dust off your Stetsons and boots and join us for the 2017 CFSEI Expo being held in Fort Worth, Texas. More

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MARKETPLACE

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Steel Floor Assembly Tests Fuel Dispute over Fire-Protection-Material Needs

Steel groups at odds with fire-protection-materials interests over code compliance for structural-steel floor assemblies. More

Steel Brings Transparency to Construction Sustainability

Sustainability and environmental issues are becoming more prominent and widely acknowledged throughout the construction industry, and school construction is no exception. More

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Steel Framing Alliance Fire and Acoustic Guide Update Now Available

The Steel Framing Alliance has updated, ***A Guide to Fire and Acoustic Data for Cold-Formed Steel Floor, Wall and Roof Assemblies*** (February 2017). This guide is a compilation of available assemblies from six sources; Underwriter Laboratories, Underwriter Laboratories of Canada, National Research Council of Canada, Gypsum Association, and Factory Mutual Global Research and Intertek Testing Services. Some of the changes include:

- 35 new assemblies added.
- 52 assemblies with some modifications.
- 10 obsolete assemblies deleted.
- New Intertek section for Floor/Ceiling assembly
- New UL section for Non-Load Bearing Suspended Shaft Wall Ceiling

The guide is available on the Steel Framing Alliance homepage at www.steelframing.org as a free download as well as a searchable online directory.

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2017 CFSEI EXPO Heads to Fort Worth, Texas May 22,23

Dust off your Stetsons and boots and join us for the 2017 CFSEI Expo being held in Fort Worth, Texas. The 2-day event is the only one dedicated to the cold-formed steel industry and is a great opportunity to learn from the experts. Plan to be in Fort Worth Sunday, May 21 for a pre-Expo tour of the University of North Texas Structure Testing Laboratory at UNT Discovery Park. The conference is an excellent opportunity to learn from the experts with you choosing from 15 different educational sessions and visiting the exhibitors for the latest and greatest information on cold-formed steel.

For additional information on sponsorship and to register visit www.cfsei.org.

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COLD-FORMED STEEL ENGINEERS INSTITUTE

CFSEI Accepting Entries for 2017 Awards Program Through March 30

New category recognizes innovative cold-formed steel framing details

The Cold-Formed Steel Engineers Institute (CFSEI) is accepting entries through March 30, 2017 for its annual awards program, which acknowledges outstanding and innovative cold-formed steel (CFS) projects and individuals who have advanced the industry through their significant contributions of time and expertise. This year's awards will be presented in three categories. Winners will be announced at the 2017 CFSEI Expo, which will be held May 22-23 in Dallas-Ft. Worth, Texas.

The 2017 CFSEI Awards Program is seeking entries in these categories:

- Category 1 – Design Excellence: The award recognizes outstanding achievement in creative design, technical innovation and best practices for CFS framing. Small and large projects constructed in 2016 that exemplify excellence in the structural design of new or renovated structures utilizing CFS products are eligible. Awards will be presented for First Place, Second Place and Third Place.

- Category 2 – Innovative Detail: A new category, this award recognizes any CFS detail that exemplifies creativity or ingenuity to solve a design challenge. Participants must submit a single engineering detail along with a brief summary that outlines how the detail was used to resolve the design challenge. Awards will be presented for eligible engineered details at the discretion of the Awards Committee regardless of the total number of entries submitted.

- Category 3 - John P. Matsen Award for Distinguished Service: The award recognizes the contributions of an individual who has volunteered significant time, talent and resources to the cold-formed steel industry. One Award for Distinguished Service will be presented.

The rules of eligibility, entry instructions, and mailing address are available at the CFSEI website at http://www.cfsei.org/2017cfseiawardsprogram.

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CFSEI Updates Technical Note on the Design of Bypass Slip Connectors in Cold-Formed Steel Construction

Updated Version Replaces CFSEI Tech Note W103-11

The Cold-Formed Steel Engineers Institute (CFSEI) has updated "Design of Bypass Slip Connectors in Cold-Formed Steel Construction," designated as Tech Note F103-17. It examines the various structural elements of a curtain wall system and introduces the subjects of design load and framing analysis.

Tech Note F103-17 replaces Tech Note W103-11. It provides information on the common types of slip connectors, their functions, and placement in cold-formed steel structural design. It covers drift connectors, testing and design of slip connectors for capacity, stacked wall conditions, and other conditions.

Tech Note F103-17 was written by Don Allen, P.E., director of engineering for Super Stud Building Products, Inc., who has worked in the cold-formed steel industry since 1990. He is the original author of Tech Note W103-11.

This Technical Note is the latest in CFSEI's continuing series of instructional documents on topics related to cold-formed steel framing for commercial and residential construction.

CFSEI Technical Notes are available free of charge to CFSEI members at www.cfsei.org. Non-members can purchase them at the online AISI Steel Store. For more information on joining CFSEI, visit www.cfsei.org.

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The American Iron and Steel Institute (AISI) has published three new cold-formed steel framing research reports: 1) "RP15-3: Advancing Seismic Simulation of Cold-Formed Steel Framed Buildings," 2) "RP17-1: Experimental Study on System Reliability of Cold-Formed Steel Roof Trusses," and 3) "RP17-2: Monotonic and Cyclic Response of Single Shear Cold-Formed Steel-to-Steel and Sheathing-to-Steel Connections." All of the research reports are available for free download here.

Each research project was undertaken to increase knowledge of the behavior of cold-formed steel in order to advance design efficiency and ensure safety. The reports cover the following topics:

- **"RP15-3: Advancing Seismic Simulation of Cold-Formed Steel Framed Buildings"** – This report advances performance-based seismic design of cold-formed steel framed buildings by introducing computationally efficient and accurate modeling tools that predict the behavior of the building, the individual cold-formed steel components, and connections in a seismic event. The research was conducted at Virginia Tech.

- **"RP17-1: Experimental Study on System Reliability of Cold-Formed Steel Roof Trusses"** – This experimental study of cold-formed steel roof trusses is part of a project funded by the National Science Foundation, "Advancing System Reliability With Application to Light-Framed Structures." Test data are provided for examining cold-formed steel structural reliability in roof trusses as a system versus individual components. The research was conducted at the University of North Texas.

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- **"RP17-2: Monotonic and Cyclic Response of Single Shear Cold-Formed Steel-to-Steel and Sheathing-to-Steel Connections"** - This research project resulted in the development of load-deformation response models to simulate the performance of screw fasteners in a seismic event. Since screw fasteners are the primary connectors in light steel framing, this research provides designers with more accurate performance-based data for conducting whole building seismic analysis. The research was conducted at Virginia Tech.

Source: American Iron and Steel Institute, February 13, 2017

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The test standards include:

- **AISI S917-17, *Test Standard for Determining the Fastener-Sheathing Local Translational Stiffness of Sheathed Cold-Formed Steel Assemblies, 2017 Edition*** – This new standard provides a method for determining the local translational stiffness supplied by sheathing, fastened to cold-formed steel members. The test method can be used for wall studs braced solely by sheathing to experimentally determine the lateral bracing restraint developed at the fastener-sheathing connection. It may be extended to purlins, girts, joists or any cold-formed steel member in which restraint is provided, in part, by the localized translational stiffness that develops at the connection between a cold-formed steel member and sheathing, such as steel panels, plywood, gypsum board, etc.

- **AISI S918-17, *Test Standard for Determining the Fastener-Sheathing Rotational Stiffness of Sheathed Cold-Formed Steel Assemblies, 2017 Edition*** - AISI S918 is a new test standard that provides a method for determining the rotational restraint supplied by sheathing, fastened to cold-formed steel members. When a cold-formed steel member is connected to sheathing, the sheathing can provide beneficial rotational restraint of the member, such as a stud, joist, etc. One direct mechanism for developing such rotational restraint is a combination of bearing between the flange and sheathing, and pull-through resistance at a fastener location, as the member rotates.

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This mechanical combination may be idealized as a rotational restraint at the fastener location. The rotational restraint provides the primary bracing restraint against distortional buckling.

- AISI test standards are updated every five years and facilitate research and development leading to improved state-of-the-art solutions in steel for the construction market. They are often referenced in industry acceptance criteria, and lead the way in establishing the performance characteristics of unique products and applications.

Source: American Iron and Steel Institute, January 4, 2017

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AISI Publishes New Report on Direct Strength Prediction of Cold-Formed Steel Beam Columns

The American Iron and Steel Institute (AISI), in partnership with the Metal Building Manufacturers Association, has published a report on the results of a research project that developed a new Direct Strength Method (DSM)-based design method for cold-formed steel (CFS) beam-columns. The new method advances knowledge of the behavior of cold-formed steel beam-columns and results in more economical designs for cold-formed steel members subject to combined bending and compression. The research report, titled "RP16-3: Direct Strength Prediction of Cold-Formed Steel Beam-Columns," is available for free download here.

The project team, which included faculty from The Johns Hopkins University and Drexel University who are members of AISI's Committee on Specifications for the Design of Cold-Formed Steel Structural Members, conducted tests to validate the performance of the new proposed Direct Strength Method for beam-columns and developed new strength expressions for each limit state. The report provides a detailed analysis of the research process and results, as well as technology transfer to introduce design professionals to the new method and its related tools.

"The Direct Strength Method enables a unified, robust and flexible design approach for cold-formed steel shapes that enables lower-cost steel construction," said Jay Larson, P.E., managing director of AISI's Construction Technical Program. "We undertook this research to apply DSM specifically to cold-formed steel beam-columns because it has the potential to provide a more mechanically sound solution to determining their strength, eliminates excessive conservativism, and encourages the next generation of optimized, high-performance, cold-formed steel shapes."

Source: American Iron and Steel Institute, December 6, 2016

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MARKETPLACE

The Steel Deck Institute Updates Five Standards

The Steel Deck Institute (SDI) has updated five standards and has made them available for free download at www.sdi.org. The SDI standards are included by reference in the 2018 International Building Code. SDI's suite of standards has been approved by the American National Standards Institute (ANSI) and is intended for use in the United States, Canada and Mexico.

The updated standards include:

- ANSI/SDI C-2017 — Standard for Composite Steel Floor Deck – Slabs
- ANSI/SDI QA/QC-2017 — Standard for Quality Control and Quality Assurance for Installation of Steel Deck
- ANSI/SDI T-CD-2017 — Test Standard for Composite Steel Deck – Slabs
- ANSI/SDI RD-2017 — Standard for Steel Roof Deck – Slabs
- ANSI/SDI NC-2017 — Standard for Non-Composite Steel Floor Deck

"SDI's updated suite of standards reflects recent research advancements and correlates with diaphragm design references in AISI S310-16, *North American Standard for the Design of Profiled Steel Diaphragm Panels, 2016 Edition,"* said Bob Paul, P.E., managing director of the Steel Deck Institute. He commented that AISI S310-16 is available for free download at www.aisistandards.org.

The updated SDI standards also include:

- Specific provisions to ANSI/SDI NC-2017 for situations where non-composite steel deck is used to carry all dead and live loads without a structural concrete slab. This commonly occurs when gypsum concrete or other non-structural fill is used as the floor surface.
- Harmonized construction loading requirements in the non-composite floor deck standard (ANSI/SDI NC-2017) with the composite floor deck C standard (ANSI/SDI C-2017).
- Revision of the permitted upper flexural strength limit for composite steel deck-slabs from the yield moment to the ultimate moment, reinstating the long-used ultimate strength model for composite steel deck-slabs.
- A change in the maximum deck support attachment spacing from 12" to 16" on center to reflect current practice.
- Editorial changes to clarify intent and improve usability of the standards without changing their requirements.

Source: Steel Deck Institute, February 23, 2017

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MARKETPLACE

Wood-Frame Apartment Fires Prompts Call for Examination of State Building Codes

New Jersey voters overwhelmingly support legislative changes to make buildings in the state more resistant to fires and natural disasters.

On Saturday, February 4th, a six-alarm fire in Maplewood, New Jersey destroyed part of an apartment complex under construction, reigniting the debate over the use of lightweight, wood-framing.

The fire marks a troubling recent history for wood-framed construction in New Jersey. In January 2015, a fire destroyed a 240-unit apartment building in Edgewater, burning for seven hours and leaving 500 people homeless. Ironically, the same apartment complex burned down 15 years prior, while it was still under construction using the same wood-frame construction methods. The two fires are considered the worst in Bergen County's history.

"These fires should cause state lawmakers and members of the building code community to pause and consider the consequences when analyzing regulations and legislation that permits the use of vulnerable construction methods," said Kevin Lawlor, a spokesperson for Build with Strength. "Fortunately, no one was killed in these fires, but as long as the regulatory environment authorizes this type of development, the threat will remain, it's up to state lawmakers to protect their constituents."

The Edgewater Zoning Board recently approved AvalonBay to rebuild the twice-destroyed Edgewater Apartment complex – again using the same lightweight wood-frame construction – although this time with added fire safety features beyond the state building code minimum, including an extensive fire sprinkler system, masonry firewalls, and storage space for fire ladders.

According to reports, the Maplewood building, also an AvalonBay project, was built using a higher fire safety standard than what was featured at the 2015 Edgewater site, including additional sprinklers. It remains unclear whether the Maplewood complex was constructed at the same standard as the Edgewater complex currently under development.

"The Edgewater and Maplewood fires should serve as a catalyst for change to strengthen our building codes and fire prevention efforts. We can't wait for another tragedy where lives may be lost," said Assemblyman John Wisniewski, chairman of the New Jersey Fire Safety Commission.

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Assemblyman Wisniewski has introduced legislation seeking to amend the New Jersey state construction code for fire safety reasons.

A September 2016 poll of registered New Jersey voters found respondents were very supportive of the state making changes to construction codes in the wake of the 2015 Edgewater fire. According to the poll, ninety-five percent are supportive of changes to construction codes.

New Jersey voters overwhelmingly support legislative changes to make buildings in the state more resistant to fires and natural disasters. This includes support for a requirement for concrete and steel frames for buildings over three stories high, as well as proposed legislation that would place limits on construction with wood. In addition to the poll, a new video and infographic examining the Edgewater fire and the reaction from the community was released.

Source: Concrete Construction, February 13, 2017

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MARKETPLACE

Steel Floor Assembly Tests Fuel Dispute over Fire-Protection-Material Needs

Steel groups at odds with fire-protection-materials interests over code compliance for structural-steel floor assemblies.

Revisions to UL Design No. D982 in the UL Fire Resistance Directory, based on recent fire tests, have heated up long-standing differences between structural-steel interests and fire-protection suppliers and installers about the amount of sprayed-on fire-protection material needed for structural-steel floor assemblies.

The American Institute of Steel Construction and the American Iron and Steel Institute (AISI), which sponsored the UL 263 tests that resulted in the revised D982, maintain that structural steel assemblies now qualify for half the customary fire-protection thickness, regardless of the building's design detail (ENR 11/28/16-12/5/16 p. 13). D982 covers all common steel-framed floor configurations, says Charles J. Carter, AISC's president. D982 does not and never has covered steel joist assemblies or roof assemblies, he adds.

John A. Dalton, technical services manager for fire protection with Grace Construction & Packaging, disagrees. The model code developer, the International Code Council (ICC), has "repeatedly stated that the use of the D982 would place the applicator-architect-engineer in a position where they have violated the requirements stated in the International Building Code," he says. "While the test does comply with the requirements given in the ASTM E-119 test standard, it does not meet the intent" of the IBC, he says.

Part of the disagreement is over whether the building official considers the floor assembly to be restrained construction, which requires less fire-protection material than unrestrained construction.

In the tests, the specimens had the fire-protection material thickness of a restrained assembly—half the amount typically used for unrestrained assemblies. The tests showed unrestrained assemblies can be considered restrained, Carter says.

ICC agrees, with a caveat. In the IBC, "steel can be considered restrained, if so documented," says Mike Pfeiffer, ICC's senior vice president. The code says "fire-resistance-rated assemblies … shall not be considered to be restrained unless evidence satisfactory to the building official is furnished by the registered design professional showing that the construction qualifies for a restrained classification."

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Luke C. Woods, a principal engineer for building fire resistance and life safety at UL, formerly Underwriters Laboratories, weighs in, saying, "The testing conducted by UL on behalf of the AISI and AISC, as represented in the UL design D982, identifies a floor-ceiling assembly with various ratings that have demonstrated compliance with UL 263. As with any UL design, it is the ultimate decision of the authority having jurisdiction on its applicability for building construction and compliance with the building code."

There has been confusion over "restrained" and "unrestrained." AISC's "Specification for Structural Steel Buildings-ANSI/AISC 360-10," clearly defines the classifications, says Carter. According to AISC 360, for floor assemblies and individual beams, "a restrained condition exists when the surrounding or supporting structure is capable of resisting forces and accommodating deformations caused by thermal expansion throughout the range of anticipated elevated temperatures. Steel beams, girders and frames supporting concrete slabs that are welded or bolted to integral framing members shall be considered restrained construction. Steel beams, girders and frames that do not support a concrete slab shall be considered un-restrained, unless the members are bolted or welded to surrounding construction that has been specifically designed and detailed to resist effects of elevated temperatures."

Carter says AISC 360 provides the basis upon which the engineer can decide whether the construction is restrained or not. It also serves as the supporting documentation to the building official.

In a related dispute, Dalton maintains the IBC says the beam rating must equal the assembly fire-resistance rating because the beam is considered part of the primary structural frame. He references a Sept. 22, 2013, letter he received from Gary L. Nelson, ICC's senior staff engineer. It says, "The repetitive steel beams … directly support the composite floor deck. They are not part of the primary structural frame but are part of the floor construction. These steel beams are required to have a two-hour fire-resistance rating."

In Rebuttal

In rebuttal, Carter says there is a difference between a two-hour fire-resistance rating for the assembly and a one-hour beam rating. He emphasizes that the letter states the beams "are not part of the primary structural frame but are part of the floor construction."

The revised D982 provides a two-hour fire-resistance rating. The tests show this can be done safely using a "fire-protection thickness sufficient to produce a one-hour unrestrained-beam rating," says Carter.

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"This one-hour nuance has nothing to do with the assembly rating," he adds. "Rather, it is a generic means of specifying the fire-protection thickness so that any manufacturer's material can be used."

Dalton concedes D982 can be useful in areas where the building official accepts a one-hour beam and two-hour floors. But he still disputes Carter's claim that using D982 would result in half the material and labor costs to apply the fire protection. A two-hour thickness could be less than double a one-hour thickness, and the labor does not change because it is all sprayed in a single coat, he says.

Source: Engineering News-Record, February 8, 2017

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MARKETPLACE

Steel Brings Transparency to Construction Sustainability

Sustainability and environmental issues are becoming more prominent and widely acknowledged throughout the construction industry, and school construction is no exception. As school planners' objectives shift to include sustainability and earning green building certifications like the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) for projects, it is vital for them to have access to the potential environmental impacts of the materials and products they use in building designs. In an effort to increase transparency and help architects and designers fully understand these impacts, the North American steel industry has developed a range of industry-wide Environmental Product Declarations (EPDs) for steel construction products.

EPDs help construction professionals make more informed material decisions by going beyond single sustainability attributes to summarize comprehensive cradle-to-gate impacts of a product.

EPDs can also contribute to planners' efforts to earn LEED v4 credits. Simply providing EPDs for a minimum number of building products allows architects to earn points through the EPD — specific credit in LEED v4. Other materials and resources credits can be achieved by disclosing and optimizing material environmental impacts. EPDs and other transparency resources can help enable construction professionals to demonstrate the products used in their building projects are environmentally responsible.

Partly due to the availability of steel product EPDs and partly due to its inherent characteristics, steel offers immediate advantages by helping construction professionals earn LEED v4 credits in categories such as recycled content, life-cycle impact reduction, sourcing of raw materials, building product disclosure and optimization, and construction and demolition waste management. In addition, the steel industry EPDs are set apart from competing materials, like wood, by covering all relevant potential environmental impacts — from the extraction of natural resources through the production of a finished product — for a fully transparent life-cycle view.

To demonstrate the overall sustainability of projects in the planning phase, some architects have also begun to employ whole-building-life-cycle assessments, using data from various product EPDs and other available life cycle inventory data to assess potential project environmental impacts early in the design process.

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Construction professionals interested in viewing and using EPDs and other transparency resources in their building projects can visit www.buildusingsteel.org for a list of steel product EPDs and updates on other resources. Currently, the site includes EPDs for the following product categories:

- Cold-Formed Steel Studs and Track — from the Steel Recycling Institute
- Open Web Steel Joists — from the Steel Joist Institute
- Steel Roof Deck and Steel Floor Deck — from the Steel Deck Institute
- Roll-Formed Steel Panels (Canada) — from the Canadian Sheet Steel Building Institute
- Roll-Formed Steel Panels for Roofs and Walls — from the Metal Construction Association
- Insulated Metal Panels — from the Metal Construction Association
- Fabricated Steel Plate — from the American Institute of Steel Construction
- Fabricated Hot-Rolled Structural Sections — from the American Institute of Steel Construction
- Primary Structural Steel Frame Components — from the Metal Building Manufacturers Association
- Secondary Structural Steel Frame Components — from the Metal Building Manufacturers Association
- Roll-Formed Metal Wall and Roof Panels — Metal Building Manufacturers Association

Source: School Planning and Management, January 1, 2017

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