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www.BuildSteel.org is Live! – Content-Driven Website Brings Design Professionals and Information Together

A new website dedicated to providing valuable resources, education, and complimentary project assistance related to the use of cold-formed steel framing in low- and mid-rise and multi-family construction projects has just been launched. More

COLD-FORMED STEEL ENGINEERS INSTITUTE – NEWS AND UPDATES

CFSEI Updates Technical Note on Welding Cold-Formed Steel

The Cold-Formed Steel Engineers Institute (CFSEI) has updated "Welding Cold-Formed Steel" (Technical Note F140-16). More

CFSEI to Host Webinar on Introduction to AISI S400-15, North American Standard For Seismic Design of Cold-Formed Steel Structural Systems

The Cold-Formed Steel Engineers Institute (CFSEI) will host a webinar on "Introduction to AISI S400-15, *North American Standard for Seismic Design of Cold-Formed Steel Structural Systems, 2015 Edition*" on Thursday, October 13, 2016 at 3:00 p.m. EDT. More

AISI and CFSEI Kick Off 2016-2017 International Cold-Formed Steel Buildings Student Design Competition

The American Iron and Steel Institute (AISI) and the Cold-Formed Steel Engineers Institute (CFSEI) are joining the American Society of Civil Engineers, Committee of Cold-Formed Members; and the University of North Texas as co-sponsors of the 2016-2017 International Cold-Formed Steel Buildings Student Design Competition. More

AISI and CFSEI to Co-Sponsor Wei-Wen Yu International Specialty Conference on Cold-Formed Steel Structures

The American Iron and Steel Institute (AISI) and the Cold-Formed Steel Engineers Institute (CFSEI), in cooperation with the Wei-Wen Yu Center for Cold-Formed Steel Structures at the Missouri University of Science and Technology in Rolla, Missouri, are co-sponsors of the Wei-Wen Yu International Specialty Conference on Cold-Formed Steel Structures 2016. More

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MARKETPLACE

North American Steel Associations Show Sustainability of Building Products With EPDs

The Steel Market Development Institute (SMDI), a business unit of the American Iron and Steel Institute (AISI), has compiled a comprehensive list of industry-wide Environmental Product Declarations (EPDs) for steel building products. More

AISI Announces Organizational and Leadership Changes To Its Standards Council and Standards Development Committees

The American Iron and Steel Institute (AISI) has announced several organizational and leadership changes put in place for the 2016 – 2022 standards development cycle. More

Atlanta Suburb Bans Wood Mid-Rise Construction

In most of North America, building codes and regulations are being changed to allow taller wood buildings. More

Sandy Springs Bars Wood Framing in Mid-Rise Construction

Over the objections of the wood products industry, the Sandy Springs City Council has approved a building code change to prohibit wood-framed construction for future buildings taller than three stories and larger than 100,000 square feet. More

San Francisco Tower Shakes Up Seismic Design

A unique mega-brace system is at the heart of a new 70-story mixed-use tower in San Francisco. 181 Fremont Street is a 244-m (800-ft) building designed to be resilient against structural damage in a 500-year earthquake. More

Long-Span CFS Trusses Reach New Heights

When starting something new, it is a good idea to start small, work out the kinks and make the inevitable mistakes on a small scale before expanding a product or a process. More

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A new website dedicated to providing valuable resources, education, and complimentary project assistance related to the use of cold-formed steel framing in low- and mid-rise and multi-family construction projects has just been launched.

SFA and CFSEI members, meet www.BuildSteel.org.

The new site, called BuildSteel, is a resource for architects, engineers, building officials, contractors, academics and other design professionals who want to learn more about the various aspects of cold-formed steel framing so they can utilize it in their projects. It offers a centralized source to find personalized content that can help a project move forward efficiently and effectively. Original and curated content—such as blogs, industry articles, case studies, infographics, research and more— are included on the site. Information is consistently updated to ensure that the content is current and relevant. SFA and CFSEI are a founding investor and major contributor to this initiative.

Today, most websites offer the same experience to every visitor, every time, regardless of their interest or job function. Not BuildSteel—everyone who visits BuildSteel is one in a million. Using a feature known as real-time personalization, BuildSteel treats users as unique individuals. Within the next few months, BuildSteel will provide users with the option to enable a more personalized experience to create a dynamic, relevant web experience specific to their interests. This will allow each user to quickly find information that is relative to his/her projects, saving time and ensuring regular visits to BuildSteel as new content is developed. SFA and CFSEI members are encouraged to sign up for the BuildSteel newsletter on the home page or by clicking here to start this personalized experience.

The site also provides complimentary project assistance, enabling the BuildSteel team to provide industry experts to assist users in the design and construction of future projects.

www.BuildSteel.org is an innovative and forward-thinking resource, matching time-challenged design professionals with quick, customized information to move projects ahead when choosing cold-formed steel framing solutions. The BuildSteel team is putting together a comprehensive marketing plan to introduce the site to design professionals. We invite SFA and CFSEI members to take a look and let us know what you think. Please send responses to Dan Snyder at dsnyder@steel.org. For a list of the BuildSteel investors/partners response for developing the site and providing new information, view the BuildSteel Investors section.

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CFSEI
COLD-FORMED STEEL ENGINEERS INSTITUTE

CFSEI Updates Technical Note on Welding Cold-Formed Steel

The Cold-Formed Steel Engineers Institute (CFSEI) has updated "Welding Cold-Formed Steel" (Technical Note F140-16). In cold-formed steel construction, welding may be the preferred joining method for roof trusses, panelization of walls, and hardware connections. This Tech Note provides information on the applicable codes, processes, procedures, design considerations, fabrication and inspection involved in welding cold-formed steel members and hardware components. It replaces Tech Note F140-10.

Tech Note F140-16 introduces common welds and their uses; covers processes such as shielded metal arc welding (SMAW), flux cored arc welding (FCAW), submerged arc welding (SAW), gas metal arc welding (GMAW), and gas tungsten arc welding (GTAW); discusses fabrication; provides information on design considerations for arc seam, fillet, flare groove, groove, arc spot and arc plug welds; and summarizes safe practices.

Tech Note F140-16 was updated by Roger LaBoube, Ph.D., P.E., Curator's Teaching Professor Emeritus of Civil Engineering and Director of the Wei-Wen Yu Center for Cold-Formed Steel Structures at the Missouri University of Science and Technology. Dr. LaBoube is coauthor of the original Tech Note on this topic with R. Scott Funderburk.

Dr. LaBoube has an extensive background in the design and behavior of cold-formed steel structures including cold-formed steel beams, panels, trusses, headers and wall studs, as well as bolt, weld and screw connections. He is a member of the American Iron and Steel Institute's Committee on Specifications and the Committee on Framing Standards. He is a Registered Professional Engineer in Missouri.

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 AISI Steel Store. For more information on joining CFSEI, visit www.cfsei.org.

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CFSEI
COLD-FORMED STEEL ENGINEERS INSTITUTE

CFSEI To Host Webinar On Introduction To AISI S400-15, North American Standard For Seismic Design of Cold-Formed Steel Structural Systems

The Cold-Formed Steel Engineers Institute (CFSEI) will host a webinar on "Introduction to AISI S400-15, *North American Standard for Seismic Design of Cold-Formed Steel Structural Systems, 2015 Edition*" on Thursday, October 13, 2016 at 3:00 p.m. EDT. The webinar is designed for architects, engineers, building officials and contractors. Participants are eligible for 1.5 PDHs.

The webinar will:

- Introduce participants to this new standard.
- Cover the purpose, scope and objectives of AISI S400-15, which addresses the design and construction of cold-formed steel structural members and connections used in the seismic force-resisting systems (SFRS) in buildings and other structures.
- Review a design example of strap wall bracing.

AISI S400-15 is available for free download at www.aisistandards.org.

Robert L. Madsen, P.E., will conduct the webinar. He is a senior engineer with Devco Engineering, Inc. in Enterprise, Oregon, and specializes in the design of cold-formed steel framed structures. He serves on the American Iron and Steel Institute's Committee on Specifications (COS) and Committee on Framing Standards (COFS). He is chairman of the COFS Lateral Design Subcommittee, which developed the new standard. Mr. Madsen is also chairman of the Technical Review Committee of CFSEI and received the organization's Distinguished Service Award in 2014. The award recognizes the significant contributions of an individual who has volunteered time, talent and resources to the cold-formed steel industry.

More information on the webinar and registration details are available at http://www.cfsei.org/webinar-october-13-2016.

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CFSEI
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AISI and CFSEI Kick Off 2016-2017 International Cold-Formed Steel Buildings Student Design Competition

The American Iron and Steel Institute (AISI) and the Cold-Formed Steel Engineers Institute (CFSEI) are joining the American Society of Civil Engineers, Committee of Cold-Formed Members; and the University of North Texas as co-sponsors of the 2016-2017 International Cold-Formed Steel Buildings Student Design Competition. Now in its sixth year, the competition was previously known as the International Student Competition on Cold-Formed Steel Design. The competition is now officially under way and will conclude on March 31, 2017.

"This year's competition is different in many ways than those held in previous years," said Maribeth Rizzuto, LEED AP – BD+C, managing director of the Cold-Formed Steel Engineers Institute. "Previously, the design problems involved cold-formed steel components. This year, the design problem is a three-story cold-formed steel condominium building, and we are challenging students to push the creative bounds of structural design with light cold-formed steel framing. We are extending the deadline for entries and are encouraging students to work as either individuals or teams. Upon request, we will also provide an engineering mentor from CFSEI for project support. With these changes, our goal is to provide an expanded experience for students to work on a specific project while interacting with other team members, as they would in the workplace."

The design problem is a three-story cold-formed steel condominium building located at 8601 Scholar Lane in Las Vegas, Nevada. It has 26,912 sq. ft. of usable floor space.

The primary load-bearing and lateral structural system shall be cold-formed steel framing, designed to IBC 2012 and governing AISI specifications with load combinations taken from ASCE 7-10.

The competition is open to students around the world who are enrolled in undergraduate and graduate college programs. Teams can register as individuals or as groups. Each group may request an engineer mentor from CFSEI to support their work.

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Entries will be judged by a jury of engineers, architects, contractors, and cold-formed steel manufacturers in three main categories:

- Design – Resourcefulness, constructability, creativity;
- Structure – Structural system performance and efficiency reflected in the calculations, details and use of cold-formed steel framing in combination with other construction materials; and
- Impact – Impact on the surrounding community and the environment.

Cash prizes for competition winners will be awarded at the 2017 CFSEI Expo to be held in Spring 2017. For more information on the design competition, visit the CFSEI website at http://www.cfsei.org/student-competition.

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CFSEI
COLD-FORMED STEEL ENGINEERS INSTITUTE

AISI and CFSEI To Co-Sponsor Wei-Wen Yu International Specialty Conference on Cold-Formed Steel Structures

The American Iron and Steel Institute (AISI) and the Cold-Formed Steel Engineers Institute (CFSEI), in cooperation with the Wei-Wen Yu Center for Cold-Formed Steel Structures at the Missouri University of Science and Technology in Rolla, Missouri, are co-sponsors of the Wei-Wen Yu International Specialty Conference on Cold-Formed Steel Structures 2016. This year's conference will be held November 9-10 at the Royal Sonesta Harbor Court Baltimore Hotel in Baltimore, Maryland. A total of 1.6 continuing education units (CEUs) will be available for participants.

The biennial event brings together leading scientists, researchers, educators and engineers in the field of research and design of cold-formed steel structures to discuss recent research findings and design considerations. Eleven technical sessions will be presented during the two-day event, with presentations on:

- Member design
- Compression members
- Flexural members
- Shear and web crippling
- Technology transfer
- Rack structures
- Behavior of systems and frames
- Connections
- Roof and wall systems
- Shear walls
- Light steel framing

AISI Manager of Construction Standards Development Helen Chen, Ph.D., P.E., LEED AP; Roger Brockenbrough, P.E., R.L. Brockenbrough & Associates, Inc.; and Richard Haws, P.E., Nucor Buildings Group will present a paper on "AISI Standards Developed and Updated in 2015 and 2016." The presentation will provide an overview of the following AISI standards:

- AISI S220-15: *North American Standard for Cold-Formed Steel Framing – Nonstructural Members, 2015 Edition*
- AISI S230-15: *North American Standard for Cold-Formed Steel Framing – Prescriptive Method for One and Two Family Dwellings, 2015 Edition*

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- AISI S240-15: *North American Standard for Cold-Formed Steel Framing, 2015 Edition*
- AISI S400-15: *North American Standard for Seismic Design of Cold-Formed Steel Structural Systems, 2015 Edition*
- AISI S915-15: *Test Standard for Through-the-Web Punchout Cold-Formed Steel Wall Stud Bridging Connectors, 2015 Edition*
- AISI S916-15: *Test Standard for Cold-Formed Steel Framing – Nonstructural Interior Partition Walls With Gypsum Board, 2015 Edition*
- AISI S100-16: *North American Specification for the Design of Cold-Formed Steel Structural Members, 2016 Edition*
- AISI S310-16: *North American Standard for the Design of Profiled Steel Diaphragm Panels, 2016 Edition*

The recipients of the Wei-Wen Yu Student Scholars Program and the Wei-Wen Yu Outstanding Student Paper Award will be recognized on November 9, 2016. These students are selected based on papers they submit and given the opportunity to present them during the conference. A volume of conference proceedings will be available to participants at the outset of the conference.

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MARKETPLACE

North American Steel Associations Show Sustainability of Building Products With EPDs

The Steel Market Development Institute (SMDI), a business unit of the American Iron and Steel Institute (AISI), has compiled a comprehensive list of industry-wide Environmental Product Declarations (EPDs) for steel building products. These EPDs summarize the results of a life cycle assessment (LCA) for specific steel products in the construction industry to describe their potential environmental impacts.

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

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

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"Similar to a nutrition label on food packaging, these Environmental Product Declarations present concise information to help building professionals make better-informed product decisions," said Mark Thimons, vice president of sustainability for SMDI. "In an effort to be as transparent as possible, these steel industry EPDs are more comprehensive than those for many other building materials, creating a truly all-encompassing view of each product's environmental impacts."

Building professionals can use this list of EPDs to help earn credits in green building rating systems such as the U.S. Green Building Council's LEED v4, which offers opportunities for steel in a revamped materials section including credits for life cycle assessment, EPDs and transparency.

SMDI will update its list as the steel industry continues to develop EPDs to maintain an informative, up-to-date resource for building professionals interested in the sustainability of steel building products.

SMDI increases and defends the use of steel by developing innovative materials, applications and value-added solutions for customers in the automotive, construction and packaging markets. For more information on SMDI, visit www.smdisteel.org or follow @SMDISteel on Twitter.

Source: Steel Market Development Institute, August 1, 2016

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MARKETPLACE

AISI Announces Organizational and Leadership Changes to Its Standards Council and Standards Development Committees

The American Iron and Steel Institute (AISI) has announced several organizational and leadership changes put in place for the 2016 – 2022 standards development cycle. The AISI Standards Council is responsible for maintaining an effective leadership structure for the Committee on Framing Standards (COFS), Committee on Specifications (COS), and Administrative Committees; monitoring the complete suite of ANSI (American National Standards Institute)-accredited AISI standards; and identifying needs for developing new standards.

The 2016-2022 leadership team includes the following (new appointments and subcommittees are identified in italics):

AISI Standards Council (changes effective as of September 1, 2016)

- Chairman – *Rick Haws, P.E., Nucor Buildings Group*
- Vice Chairman – *Roger LaBoube, Ph.D., P.E., Wei-Wen Yu Center for Cold-Formed Steel Structures (CCFSS)*
- *Pat Ford, P.E., Steel Framing Industry Association (SFIA)*
- Steve Fox, Ph.D., P.Eng., Canadian Sheet Steel Building Institute (CSSBI)
- *Jeff Klaiman, P.E., ADTEK Engineers*
- Greg Ralph, ClarkDietrich Building Systems
- Lee Shoemaker, Ph.D., P.E., Metal Building Manufacturers Association (MBMA)
- *Tom Sputo, Ph.D., P.E., Steel Deck Institute (SDI)*

Administrative Committees (changes effective as of April 1, 2016)

- Strategic Planning – *Ben Schafer, Ph.D., The Johns Hopkins University*
- Education – *Don Allen, P.E., SuperStud Building Products*
- Editorial – Vince Sagan, P.E., MBMA

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Committee on Framing Standards (changes effective as of April 1, 2016) – A consensus group which maintains and updates the suite of North American cold-formed steel framing standards.

- Main Committee – Chairman – *Roger LaBoube, Ph.D., P.E., CCFSS*
- Main Committee – Vice Chairman, Steve Fox, Ph.D., P.Eng., CSSBI
- Framing Design – *Pat Ford, P.E., SFIA*
- Lateral Design – Rob Madsen, P.E., Supreme Steel Framing System Association (SSFSA)
- Prescriptive Methods – Sutton Stephens, Ph.D., P.E., S.E., Pacific Northwest Engineering
- Standard Practices – Jeff Klaiman, P.E., ADTEK Engineers

Committee on Specifications (changes effective as of September 1, 2016) – A consensus group which maintains and updates the *North American Specification for the Design of Cold-Formed Steel Structural Members* (AISI S100), the *North American Standard for the Design of Profiled Steel Diaphragm Panels* (AISI S310), and the suite of cold-formed steel test standards (AISI S900 series).

- Main Committee – Chairman – *Rick Haws, P.E., Nucor Buildings Group*
- Main Committee – Vice Chairman – *Steve Fox, Ph.D., P.E., CSSBI*
- CF-3: Connections and Joints – Perry Green, Ph.D., P.E., Bechtel Power Corporation
- CF-4: Assemblies and Systems – *Vince Sagan, P.E., MBMA*
- CF-6: Test-Based Design – Randy Daudet, P.E., S.E., Simpson Strong-Tie
- CF-22: Stability and Combined Actions - Jim Crews, P.E., Unarco Material Handling
- CF-24: Member Design – *Bob Glauz, P.E., RSG Software*
- CF-31: General Provisions – *Al Harrold, P.E., BlueScope Steel*
- CF-33: Diaphragm Design – *Tom Sputo, Ph.D., P.E., SDI*

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"These changes reflect the completion of work related to the previous standards development cycle and an increased focus on analysis methods, mid-rise framing design and diaphragm design in the new cycle," said Jay Larson, P.E., F.ASCE, managing director of AISI's Construction Technical Program. "We are pleased to welcome these experts to their new leadership roles. We gratefully acknowledge the many contributions of those who are completing their committee work and in many cases, moving on to new committee responsibilities. We would like to especially acknowledge the leadership and contributions of Roger Brockenbrough, who is retiring as chairman of AISI's Committee on Specifications after more than 25 years of service. Under Roger's leadership, six editions of the Cold-Formed Steel Specification were published, including the 'harmonized North American standard.'"

Source: American Iron And Steel Institute, August 18, 2016

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MARKETPLACE

Atlanta Suburb Bans Wood Mid-Rise Construction

In most of North America, building codes and regulations are being changed to allow taller wood buildings. There are so many reasons to use wood, the most important being that it is a renewable resource that stores carbon, unlike concrete, which is the source of about 5 percent of the world's CO2 output.

But the Atlanta suburb of Sandy Springs has just banned wood construction in buildings more than three storeys high and over 100,000 square feet, going in exactly the opposite direction from everywhere else in America. The ordinance says that "the Mayor and Council wish to locally amend the state minimum standard building code to provide for increased building quality, sustainability, durability, and longevity." It passed unanimously, to the unbridled joy of the local Georgia Ready Mixed Concrete Association, whose director noted in a press release:

"Our organization advocates for the construction of durable and more resilient building statewide," he stated. "Sandy Springs is leading the way in Georgia by prioritizing the long-term benefits of non-combustible construction for its citizens and property owners. The City Council has taken a huge step here in making buildings safer."

Perhaps a pawn of the steel industry, Mayor "Rusty" Paul tells AJC “I know how important wood products are for the state and region,” he said, “but this change is not going to result in long-term damage” to Georgia’s lumber industry."

In fact, the lumber industry is huge and powerful in the state, with Koch Industries' Georgia Pacific headquartered just down the road in Atlanta. But the concrete and masonry have been running a strong rearguard action to preserve their turf, including their fancy Build with Strength campaign.

In Curbed, Michael Kahn notes that developers aren't happy about this either; wood is faster and cheaper for mid-rise construction.

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Rumblings coming from established developers in the city indicate that the new rule effectively means they will no longer view Sandy Springs as a viable place for further development of apartments. If that turns out to be the case, some in Sandy Springs could see the halting of new development — which has been going gangbusters...

Wood construction is favored by developers for low rise construction because it is cheaper and faster, which makes housing more affordable. With governments, many environmentalists and the development industry all behind it, it's likely that the cement and masonry industries have won a small battle but are losing the war.

Source: Treehugger, September 8, 2016

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MARKETPLACE

Sandy Springs Bars Wood Framing in Mid-Rise Construction

Over the objections of the wood products industry, the Sandy Springs City Council has approved a building code change to prohibit wood-framed construction for future buildings taller than three stories and larger than 100,000 square feet.

The city noted it had asked the Georgia Department of Community Affairs to review the ordinance amendment; the state said it had no comments on the proposal and that it was a local decision to adopt the change.

Supporters of the change cited safety issues, as well as matters of quality, durability and longevity of buildings in turning to steel and masonry. But the American Wood Council and Georgia Forestry Association objected, saying wood construction was more sustainable and that adoption of the ordinance could hurt the industry.

Mayor Rusty Paul said wood continues to be widely used in local construction. “I know how important wood products are for the state and region,” he said, “but this change is not going to result in long-term damage” to Georgia’s lumber industry.

Source: Atlanta Journal Constitution, August 23, 2016

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MARKETPLACE

San Francisco Tower Shakes Up Seismic Design

A unique mega-brace system is at the heart of a new 70-story mixed-use tower in San Francisco, 181 Fremont Street is a 244-m (800-ft) building designed to be resilient against structural damage in a 500-year earthquake. The steel and glass tower is anchored by construction shafts measuring more than 29 m (260 ft) down into the bedrock, allowing it to respond to wind forces and seismic events in an optimal way.

The tower's aluminum exoskeleton structural support system allows for column-free interior floorplans by behaving like a giant shock-absorber whenever there is seismic activity. A series of sub-foundation viscous dampers allow for the elastic super structure, with plumbing and electrical lines given enough flexibility to move without disruption. Further, the building's foundation is able to 'lift' itself slightly to create additional space for movement.

Located at the cultural center of South of Market, the $665-million tower includes 40,134-m2 (432,000-sf) of Class A office space, 67 luxury condominium residences on the top 17 floors, and 279 m2 (3000 sf) of retail space. The tower is situated adjacent to the new Transbay Transit Center, with direct access to the 'Grand Central Station of the West.'

Exceeding California construction codes, 181 Fremont's design features can help safeguard lives, as well as ensure business continuity by allowing immediate return to the tower and for it to be fully functional within one month. Its elevator systems are also designed for continuous operation during a catastrophic event, with exclusive contingencies for emergency evacuation.

Residents of the condominiums on the top 17 floors of the tower would also be assured of minimal interruption in their quality of life due to the resilience-based design, which is focused on minimizing structural damage, property loss, and protection of mechanical, engineering and plumbing (MEP) systems, as well as the operation of building transportation.

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"The seismic design is consistent with our approach to position 181 Fremont as the preeminent tower in San Francisco in every aspect of design and development," said Matt Lituchy, CIO of Jay Paul Company, the project's developer. "With a strong, unified visual appearance created by the unique structural exoskeleton and saw-tooth curtain wall, the tapering design of the tower will be an iconic presence on the city's skyline. This San Francisco residential tower is pre-certified to Platinum under the Leadership in Energy and Environmental Design (LEED) program. It boasts innovative sustainability features, such as a water recycling system to reduce water consumption, a glass curtain wall to allow for maximum light and air for residents, regionally sourced building materials, and passive solar energy saving systems."

Source: The Construction Specifier, August 11, 2016

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MARKETPLACE

Long-Span CFS Trusses Reach New Heights

When starting something new, it is a good idea to start small, work out the kinks and make the inevitable mistakes on a small scale before expanding a product or a process. Businesses do not start off as Fortune 100 companies. Musicians do not purchase Stradivarius violins or P. Mauriat saxophones before they spend hours of practice honing their skill. Churches begin meeting in school gymnasiums before breaking ground on their first small building, with hopes to expand as their memberships grow.

Such has been the case with cold-formed steel trusses. When steel trusses were first introduced as a framing option for commercial and institutional projects, they were used in areas of relatively short spans. For example, small mansard trusses on a store front or a small office building with sloped roofs. These trusses paved the way for larger and more complex roof shapes. Today, it is safe to say that the cold-formed steel truss industry has advanced to the point where architects are taking advantage of the strength capabilities and design flexibility of CFS trusses to regularly stretch the envelope with longer clear spans, complex intersecting roof planes and girders supporting large roof areas.

One example of starting small and growing is the First Baptist Church of Lake St. Louis (FBCLSL). From the small original chapel to the current expansion of the sanctuary and office, this church building has seen many changes over the last several decades. Moreover, in 2013, they were ready to expand again.

As with any successful construction project, there must be a vision from the owner, combined with the construction expertise of the building designers to bring that vision to life. LePique & Orne Architects, Inc. has worked with FBCLSL several times during previous projects and understood the goals. According to Dennis Elledge (architect), “Based on the client’s requirements and to more fully integrate the building facade design into the primarily residential community of Lake St. Louis, we were led to the use of sloped and shingled roof construction. With this sloped roof direction in mind, the use of pre-engineered trusses seemed to be the right fit.

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After considering the various pros and cons of wood trusses versus steel trusses, we concluded that steel trusses were the correct solution, especially regarding longevity, strength and deflection requirements." Ædifica Case Engineering had worked with cold-formed steel trusses in the past and agreed that the strength, as well as the design versatility, would be the best fit for the long spans of almost 80 feet.

Throughout the design phase, several critical discussions were required so that all systems involved would work in conjunction with the new roof structure. The open dialogue between the architect, structural engineer, and cold-formed steel truss designer was instrumental in assuring that all systems went together well. Stephen Sacco, P.E., structural engineer and principal at Ædifica Case stated, "During the design phase, our structural engineers needed to take into account the additional horizontal deflection due to live loading (snow, etc.), and take this lateral movement into account when reviewing outward movement of exterior bearing walls and detailing the interior drywall joints at the wall/ceiling interface. An Aegis representative ran various load conditions for dead and live loads at our request to get a range of deflections we would need in design and detailing, so we could consult with and advise the architect and owner." For Elledge, his focus was on the goal of the client. "The new and larger sanctuary required open and vaulted space to accommodate state-of-the-art audiovisual elements as well as the impressive and open worship environment they desired. The unobstructed sanctuary space was accomplished with the use of CFS scissors trusses."

As if 78-foot scissors trusses were not enough of a challenge, the church expansion faced delays due to a significant rainy season, substandard soil properties as well as an increase in the project scope half way through the project. The timeline for design, manufacture, and delivery of the trusses was squeezed significantly to minimize any delays in the construction schedule. To meet the new time restraints, the design expertise of the specialty truss engineer, Aegis Metal Framing, and the extensive truss experience of the truss fabricator, Engineered Steel Products, were put to the test. With 441 individual trusses to build and 153 unique truss profiles to design to form this roof, it was critical that all parts of the roof system fit together, with all trusses and connections properly designed and installed, to create the desired architectural look that blended in with the neighborhood.

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The variety of truss shapes and connections, along with the long-span scissors trusses, created the potential for a challenging installation for the truss installer, Bender Construction. However, using the appropriate spreader bar for the long trusses, the crew set 19 of the 78-foot scissors trusses in one 8-hour shift (Figure 2), which was quite an accomplishment. Installation included all required lateral and diagonal restraint bracing for the webs and chord members. As trusses were erected, hat channel was installed for bracing using self-drilling screws as required per the plan. Although the installation crew was a little timid when setting the first of those large clear span truss, after getting a few set and braced, they found their rhythm and made quick work of the 24,700 square foot of roof area. Adding to the efficiency of the installation was the fact that the truss-to-truss and truss-to-bearing connections were simple to install. Connection to the supporting walls was made with standard Aegis HD clips with self-drilling screws into the trusses and supporting walls. Truss to truss connections were aided by factory installed skewable connectors on the tie-in trusses and receiving girder plates on the girder trusses.

As illustrated by the FBCLSL project, long clear-span CFS truss projects can present a variety of challenges to consider during the roof layout and design phase of the project. One such challenge results from the combination of slope and span of the truss that creates a truss profile that is too tall to ship from the manufacturing plant to the job site. One common solution is to design the truss in multiple pieces: a base truss designed with a height feasible for shipping (10-12 feet) and a cap truss, sometimes called piggyback truss, designed to be installed on top of the base trusses to finish the slope. In this application, it is critical that lateral and diagonal bracing is installed along the flat portion of the top chord of the base truss to ensure stability before installing the cap trusses, and to provide permanent lateral bracing/restraint of the unsheathed flat portion of the base truss. The Building Code, by reference to the Code of Standard Practice for Cold-Formed Steel Structural Framing, AISI S202, provides for three options for truss member restraint/bracing: Standard Industry Details, Substitution with Reinforcement, or Project Specific Design. The specialty truss engineer is an excellent resource for specifying and designing member lateral and diagonal restraint/bracing for the roof system.

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They are generally more informed regarding requirements, limitations and general understanding of the CFS roof system than the EOR or building designer. Handling, storage, delivery and installation are critical processes for all CFS trusses and require careful and thorough attention. With long-span CFS trusses, the importance is magnified. Particular care must be taken to ensure trusses are not damaged and are installed properly, with all required connections and bracing, so they function as designed. The Cold-Formed Steel Building Component Safety Information (CFSBCSI), published by The Cold-Formed Steel Council of the Structural Building Components Association, is one reference for standard industry details as well as information covering truss handling, storage, and installation.

There are many different types of buildings that can take advantage of the long-span capabilities of cold-formed steel trusses. Church sanctuaries with an open cathedral ceiling are one excellent example. Fire stations with open mechanical bays are another. As Stephen Sacco closed out his discussion of the expansion of the First Baptist Church of Lake St Louis, his words fit well for other projects: "In the end, long-span, cold-formed steel roof trusses proved to be the correct and obvious choice for this high-profile project."

FBCLSL Project Team
Owner: First Baptist Church, Lake St. Louis, MO
Structural Engineer: Ædifica Case Engineering, Fenton, MO
Architect: LePique & Orne Architects, Inc., St. Charles, MO
Truss Engineer: Aegis Metal Framing, Chesterfield, MO
Truss Fabricator: Engineered Steel Products, Wright City, MO
General Contractor: Demien Construction, Wentzville, MO
Truss Installer: Bender Construction, St. Louis, MO

Source: Structuremag, August 2016

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