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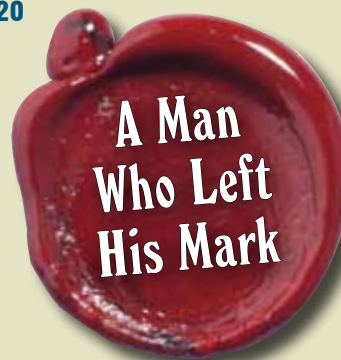
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The mission of *Structural Building Components Magazine (SBC)* is to increase the knowledge of and to promote the common interests of those engaged in manufacturing and distributing structural building components. Further, *SBC* strives to ensure growth, continuity and increased professionalism in our industry, and to be the information conduit by staying abreast of leading-edge issues. *SBC's* editorial focus is geared toward the entire structural building component industry, which includes the membership of the Structural Building Components Association (SBCA). The opinions expressed in *SBC* are those of the authors and those quoted, and are not necessarily the opinions of Truss Publications or SBCA.





## Supplier Members' Support

# truss plate manufacturers

Our supplier members provide services and expertise that can help you improve your business and your bottom line. This year, *SBC Magazine* will profile several aspects of the component manufacturing industry and highlight the supplier companies that serve those business segments.

This month, we draw your attention to our industry's truss plate manufacturers. These companies are the backbone of the wood truss industry who supply everything from metal connector plates to truss design software to truss production equipment. While every component manufacturer is a customer of one of these companies, it's important to note that each of them does things a little bit differently. The trick is finding the one that fits your business the best.

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## From a McDonald's Napkin to BCSI: Educating Customers on Proper Installation & Bracing

If you are not currently providing BCSI documents with every job, please consider this article as my plea for you to immediately start this simple practice.

In recent years, I have come to the realization that there's a great need to educate our customers on the fundamentals of handling and bracing trusses, which are covered extensively in the BCSI book, B-Series Summary Sheets and Jobsite Packages. Simply put, good information never gets old. While we're in agreement that the component manufacturer (CM) is not responsible for ensuring that customers brace their jobs correctly, it should be our goal to guide them in the right direction. Far too many times, I have been on jobsites where the contractor did not use enough bracing or, even worse, simply didn't use any bracing at all. I have also witnessed the handling of trusses in ways that would make your skin crawl. There's a fine line between the component manufacturer filling in or being perceived as the engineer of record, which we do not want, and the concerned component manufacturer who feels the need to ensure successful erection and installation of our products.

So how do we accomplish this goal? If you have ever picked up the BCSI book and skimmed through it, you know there is a lot of good information in it. For those of us who have read the BCSI book from cover to cover, you truly understand just how awesome that book is and how very critical these instructions are to the contractor. After reading the best practices laid out in the BCSI documents, it's all too clear that many individuals do not know the essential requirements of handling, installing, restraining and bracing trusses.

Like me, you may be gripped by fear at times when you think about how many jobs have been built incorrectly with a wide variety of products, including trusses not installed and permanently braced per building code requirements and without code compliance installation inspections to boot. What a tragic fact. Of course, if you do business in an area where everything must be approved by an engineer and thoroughly inspected by a building official, then these concerns may not be at the top of your list. For those of us in areas that do not adhere to those requirements, this should be cause for alarm.

As a component manufacturer in Louisiana, we must deal at times with customers who have drawn their house plans on a McDonald's paper napkin. If they decide to make any changes, they simply fold the McDonald's napkin to hide the section that is wrong and then tape a Wendy's napkin to it with the revision. I wish I were making this up! Working on a project as delicate as this, we know right away that we shouldn't bet on the customer hiring an engineer of record. Nevertheless, we do encourage it.

In an unfortunate scenario like this with the fast food napkins, the BCSI book and Summary Sheets are our saving grace. It literally could be the difference between life and death. This is especially true if the customer plans to install the trusses on his own. If this customer is given the BCSI documentation when he orders the trusses, he may be very eager to go over them with a member of your staff. Although we give the customer a brief overview of what the documentation covers, we still make it very clear that an engineer of record is needed to ensure complete safety on the jobsite. The fact remains, however, that some individuals will not spend the money to do so. Lately, I have seen more and more multi-million dollar homes built that never have an architect or engineer review the plans or check the jobsite at any time during construction. There are many other states that have this same problem.

### at a glance

- CMs deal with customers with a wide range of skill sets, including those who have drawn their house plans on a McDonald's paper napkin. I wish I were making this up!
- While CMs are not responsible for ensuring that customers brace jobs correctly, they can provide BCSI documents to help customers build a better building and stay safe.
- The BCSI book and B-Series Summary Sheets are a CM's saving grace, especially if the customer plans to install the trusses on their own or not hire an engineer of record.

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## Editor's Message

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How do we help our customers build a better building and stay safe? We give them the tools necessary for success. If you are not currently providing BCSI documents with every job, please consider this article as my plea for you to immediately start this simple practice. For just a few dollars a job, you can provide the industry best practices included in the Jobsite Package, educate your customer, and protect your business. Better yet, include the Jobsite Package, BCSI book or Summary Sheets as a line item on the customer's invoice to document that you provided this information. It is absolutely necessary that we do our very best to protect our industry. What better way to accomplish this than to provide our customers with the very documents that teach them the fundamentals of proper installation, handling, restraining and bracing of truss systems. **SBC**

*SBC Magazine encourages the participation of its readers in developing content for future issues. Do you have an article idea for a future issue or a topic that you would like to see covered? Email your thoughts and ideas to [editor@sbcmag.info](mailto:editor@sbcmag.info).*



Keep BCMC alive throughout the year with the SBCA Annual Workshop & Conference. On the second Tuesday of every month at 2 pm ET/1 pm CT/12 pm MT/11 am PT, the Workshop will feature the great speakers and sessions from BCMC 2012 and lead into BCMC 2013. Mark your calendar and join us online with SBC Connection. You can save time and travel expenses by attending online.

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- April 9 – Your Litigation Playbook w/ SBCA Legal Counsel Kent Pagel
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For more details, visit [sbcindustry.com/workshop.php](http://sbcindustry.com/workshop.php). **SBC**

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For more details about SBCA membership, contact Anna (608-310-6719 or [astamm@qualtim.com](mailto:astamm@qualtim.com)) or visit [sbcindustry.com](http://sbcindustry.com).



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## Transforming the Future of Framing Through Testing & Technical Evaluation Reports (TERs)



I believe engineering, building design, intellectual property development and engineering innovation can change the SBC world for the better.

Like so many of you who have weathered the past five-plus years, SBCA has gone through the kind of forced economic transition that no one ever wants to go through. To put this transformation into business terms, from 2006 to 2011, SBCA's total revenue dropped by more than half. Over this same period of time, SBCA embarked on a new industry testing program and testing business through the creation of the SBC Research Institute (SBCRI).

Not only was it paramount that we keep SBCA, *SBC Magazine* and BCMC solvent, we also had to find a way to bring in enough revenue to cover the additional cost of carrying out a brand new and innovative approach to testing structural performance—accuracy through loads-in/loads-out technology with full roof, floor and wall systems tests. Since we had never faced this situation before, there was no proven roadmap to follow that guaranteed success.

This forced transformation had the unfortunate consequence of not allowing us to be as good as we would have liked on several fronts, the most notable being communication with our members. Further, we were unable to fully establish the SBCRI foundation needed to best conduct and provide the industry testing value we had anticipated during SBCRI's initial planning stages. In fact, these efforts are just now getting underway at a level to meet industry testing goals and objectives. Any delay or shortcomings over the past few years are due to survival being job number one.

As with any period of hardship, challenge and survival, we were forced to re-think all of our businesses. This included the private contract testing business that SBCRI needed to keep cash flowing in a positive direction. This work led to the creation of benchmark testing and code compliance tools called Technical Evaluation Reports (TERs). Customers told us they wanted to get their new products to market as quickly as possible so they could generate the cash needed to pay for past testing and innovation into the future. As it turns out, professional engineering, ANSI/ACCLASS-certified testing, investment in code-based assembly benchmark testing, and helping customers get their new products into the code compliance mainstream has been a key driver of SBCA survival.

All SBCA members have benefited, whether they were aware of it or not, from the creation of the TER concept. TERs have already bailed out several CMs in situations where they had a code compliance issue that was easily taken care of through the TER process. In the future, SBCRI and TERs will continue to show how valuable components and engineering are when directly compared to actual stick-frame benchmarks.

During a crisis, survival is the first step in the healing process. Now that we are out of intensive care, we will be getting our health back on track. All of us at SBCA believe one thing and one thing only—the future of the structural building components industry is before us. We have never truly exploited our engineering acumen and innovation. We have two choices: 1) embrace engineering, building design, intellectual property development and engineering innovation, or 2) become commodity producers.

If you are a smaller CM, I know choosing the first option is a challenge. However, when you think about it, your highly capitalized suppliers should be willing to help given that you provide a source of profit to them—your success is important to their success. When is the last time your lumber supplier played a role in your success? **SBC**

### at a glance

- Challenging times force hard and bold decisions that are risky. The survival of SBCA, BCMC, *SBC Magazine* and SBCRI were dependant on risk-taking.
- Private contract testing business through SBCRI led to the creation of the new and very valuable concepts of benchmark testing and code compliance tools called the Technical Evaluation Report (TER).
- The SBC industry can easily be the center of the universe for providing the structural framework of all light-frame construction and offering great value in engineering innovation.





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## Holes & Notches in Trusses

**Whenever material from a truss is removed, analysis by a licensed engineer is required.**

**E**ngineered to achieve optimum efficiency, metal plate connected wood trusses are manufactured to handle specific stresses. If everything goes according to plan, a truss should perform exactly as it was designed. Not every job goes as planned though. Shipping, handling, storage and other trades may unintentionally alter a truss, leaving holes or notches, which can affect a truss's performance.

### Question

*If there are holes or notches in a truss, is there an easy way to tell whether a repair will be needed?*

### Answer

Whenever material from a truss is removed, analysis by a licensed engineer is required.

Sel Str	No. 1	No. 2	No. 3	
				<p><b>Sel Str</b> Sound, firm, encased and pith knots are to be tight, well spaced and limited up to 7/8". Unsound or loose knots or holes are limited up to 3/4", one per 4' lineal.</p> <p><b>No. 1</b> Knots must be of same type as in Sel Str grade, up to 1-1/2". Unsound or loose knots or holes are limited up to 1", one per 3' lineal. Wane is allowable.</p> <p><b>No. 2</b> Well-spaced knots of any quality up to 2", with one hole up to 1-1/4" per 2' lineal. Wane and skips are included.</p> <p><b>No. 3</b> Knots of any quality can be up to 2-1/2", with one hole up to 1-3/4" per lineal foot. Wane and skips are included.</p>

Figure 1. Summary of grade requirements for common visual grades of lumber. (Taken from SBCA's *Truss Technology in Building: Lumber Grades*)

### at a glance

- A repair may not be needed if, after adding the holes, visually graded lumber still meets an adequate grade according to the appropriate grading criteria.
- The Combined Stress Index (CSI) is the summation of axial and bending stresses divided by their respective allowable stresses, which represents the structural "efficiency" of the member; the CSI shall not exceed 1.00.
- Coordinating with trades before construction is a good way to avoid holes and notches in trusses, and the costly repairs associated with them.

For small holes or notches, such as for electrical wiring, it may be possible to avoid a repair in visual graded lumber. A repair may not be needed if, after adding the holes, the lumber still meets an adequate grade according to the appropriate grading criteria. If the original lumber is relatively free of knots and holes, an engineer may determine that no repair is required. (See Figure 1.)

For example, No.2 lumber allows for one hole up to 1-1/4" per lineal foot. If the existing lumber does not have any holes or knots within 1 lineal foot, and the hole added does not exceed 1-1/4", the lumber may be acceptable without a repair. Altered lumber is also subject to edge distance requirements (among others), which are not listed in the summary in Figure 1 above. See sidebar at top of page 11 for more information on lumber grading rules publishing agencies.

If the lumber in question is not visually graded, or does not meet the visual grading criteria by inspection, an engineer will look at the Combined Stress Index (CSI) of the lumber to determine what extent of a repair is needed. The CSI is defined as the summation of axial and bending stresses divided by their respective allowable stresses for a specific truss member. This ratio, or index, represents the structural "efficiency" of the member. The CSI shall not exceed 1.00.



When material has been removed from a board, a greater percentage of the board's capacity must withstand the same stresses. Therefore, the CSI will increase. If the original CSI was low, removing small amounts from certain locations on a stick of lumber may be acceptable, if doing so does not result in the CSI exceeding 1.00. The new CSI of the board can be determined by hand or spreadsheet calculations, or by using one of many software programs available. However, the CSI of the repair material plus the CSI of the remaining lumber from the original board must not exceed 1.00. This is why members with very high grades of lumber may require a similarly high grade of lumber on the repair, instead of more commonly available lower grades of lumber.

It is also important to note that, depending on the shape and location of the hole or notch, stresses may occur during handling that create further damage to the truss. In cases like this, a repair would be wise to prevent further damage.

Ultimately, the best way to deal with holes or notches is to avoid them altogether. By coordinating with trades before construction (for example locating plumbing drops and needed chase returns on a truss layout), holes in trusses, and the costly repairs associated with them, can be avoided. **SBC**

*To pose a question for this column, call the SBCA technical department at 608-274-4849 or email [technicalqa@sbcmag.info](mailto:technicalqa@sbcmag.info).*

## more info:

### Lumber Grading Rules Publishing Agencies

For more information on lumber grading requirements, consult a lumber grade handbook from one of the following organizations:

- Northeast Lumber Manufacturers Association (NeLMA): [nelma.org](http://nelma.org)
- Northern Softwood Lumber Bureau (NSLB): [nelma.org](http://nelma.org)
- Redwood Inspection Service (RIS): [calredwood.org](http://calredwood.org)
- Southern Pine Inspection Bureau (SPIB): [spib.org](http://spib.org)
- West Coast Lumber Inspection Bureau (WCLIB): [wclib.org](http://wclib.org)
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March 26	Dallas, TX	10:00 am – 1:00 pm	Lunch
March 27	San Antonio, TX	9:00 am – 12:00 pm	Lunch & Golf
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# Shiver Me Timbers!



## Fire, Boats & Really Big Trusses

by Sean D. Shields

**T**his is the story of how a fire, a yacht race and America's third wealthiest citizen proved a boon for one Texas-based structural component manufacturer. Around 1:50 p.m. on June 20, 2012, a spark from a welder's work fell upon a pile of dry wood and started a four-alarm fire that caused significant damage to the historic bulk work of Pier 29 in San Francisco's waterfront district. The timing couldn't have been worse, as the fire destroyed the roof and a large portion of the façade of the building, which was to be the home of the 2013 America's Cup competition. The City of San Francisco was contractually obligated to provide the building for the race, and suddenly found itself in its own race against time to rebuild the structure in a few short months.



In order to pull it off, the city had to appease many different interests, from historical preservationists to community activists to race organizers; re-engineer the building structure based on practically hundred-year-old drawings and schematics; and do so in an impossible time-frame. Enter Eric Lincoln and Building Products Plus Company, based in Houston, TX, a leading producer of large-scale timber trusses and beams. In the end, they were the only company capable and willing to commit to not only design the trusses, but also manufacture and deliver them on time.

To truly appreciate the momentous task Lincoln and his team accomplished, we're going to have to back up and explore the unique challenge Pier 29 posed, the many constraints facing the project, and, finally, the process of engineering, manufacturing and installing the 70-foot roof trusses needed for the project.

### Pier 29 Hosts the America's Cup

Pier 29 is one of the 18 pier buildings on the waterfront that are within the San Francisco Embarcadero Historic District, which includes the famous Fisherman's Wharf, and is listed in the National Register of Historic Places. Pier 29 was built in 1915 by the State Board of Harbor Commissioners, and extends 800 feet into the San



Francisco Bay with a 164,000 square foot pier shed. The pier was likely built as part of a competition between the cities of San Francisco and New York to construct the world's preeminent commercial port system.

The bulkhead portion of Pier 29 fronting on The Embarcadero roadway was built in 1918 in the neoclassical architectural style in an effort to add aesthetic beauty to what was largely a heavily industrial waterfront. The structure of the bulkhead featured 70-foot wood roof trusses, creating an impressively large open pavilion at the entry to the pier shed. It was this history and grandeur that likely led the America's Cup organizers to choose Pier 29 to serve as their base of operations.

At the time of the fire, the building did not have any tenants, and work was underway to begin preparing the building to host the 34<sup>th</sup> America's Cup yacht race. Fire investigators concluded the blaze caused \$2.4 million in damage, though the destruction was primarily limited to a relatively small portion of the overall pier building.

One of the America's Cup key organizers, Larry Ellison, a co-founder and CEO of Oracle Corporation made it clear to the City of San Francisco that it was in their best interest (not to mention they were contractually obligated) to ensure Pier 29 would be repaired and ready when the race series officially begins July 4, 2013. While America's third-wealthiest person (whose current personal worth exceeds \$41 billion) is used to getting his way,

he also raised a very good point. The America's Cup is expected to create 8,000 jobs in San Francisco and bring in more than \$1.4 billion into the region's economy. With an anticipated 5 million total spectators—with 500,000 on "peak" days—there was a great deal of pressure to successfully rebuild Pier 29.

### Pressure Cooker

Recognizing that time was not on their side, on July 10, 2012, the City and County of San Francisco's Board of Supervisors passed a resolution declaring a state-of-emergency regarding Pier 29, which allowed the city to approve emergency contracts entered into by the Port of San Francisco. The resolution further directed the Port of San Francisco to take "all necessary and appropriate measures to perform repair work to Pier 29 in the most expeditious manner." In essence, it did away with lengthy bid processes and gave the port the authority to get the work done as quickly as possible.

While the city wrangled through the politics, the insurer of the building quietly began putting out feelers to find sub-contractors who could accomplish the work. They contacted Lincoln at Building Products Plus. "They said they were looking for someone who could engineer and build these 70-foot trusses quickly," Lincoln recalled. "Because the building was on this Historic Register, they wanted the trusses to look as close to the originals as they could get." Lincoln said he thought they could do it, so when the bid documents were

Continued on page 16




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## Shiver Me Timbers!

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put together, Building Products Plus was listed as a possible candidate for supplying the roof trusses.

Turner Construction was hired as the general contractor (GC) in early September, only three short months after the fire. Turner subcontracted the roof trusses to Bellcore Engineering, Inc. "One of the biggest challenges we faced was that we were trying to copy the design and assembly of a hundred-year-old building," said Ken Burg, the Project Manager for Bellcore on Pier 29. "The city engineers couldn't get the trusses to work, primarily because of the changes to load requirements between then and now."

While putting together the initial bid package, Burg contacted their lumber suppliers to see who they would recommend to provide the trusses. He also contacted Lincoln, based on the insurance company's recommendation, "In the end, we had several bidders say they could accomplish the job, but Building Products Plus was the only one who said they could engineer, design, manufacture and deliver the trusses within the necessary timeframe."

That timeframe ended up being a little less than two months. Within that time, Lincoln and his team had to design each truss and then coordinate communication between Bellcore, Turner, the Port of San Francisco, and the insurance company, to ensure the plans met the needs and requirements of each group. "One of the most significant requirements we had in accepting the contract was that the city had to agree to turn around and approve any drawings we sent them within 48 hours," said Lincoln. "Without that stipulation, this project could never have been completed so quickly."

### Design, Manufacturing & Delivery—Oh, My!

In total, Building Product Plus had to design six different truss layouts and manufacture 15 trusses. "We had to do all the engineering, and supply drawings and design calculations, including hand calculations for each joint," said Chris Newhouse, P.E.,

Vice President of Engineering, SCA Consulting Engineers and the lead designer on the project for Building Products Plus. "All we had to start with were the spans and loads, along with architectural drawings the city supplied. We certainly had a lot of room to be creative. There were a number of things that we were able to do to simplify the retrofit of the building, one of these being a redesign of the truss-to-truss connection required to support and transfer the considerable loads."

Eight of the trusses were 70-feet long with a top chord pitch so slight, it rose no more than two feet over the entire length of the truss. "The most challenging truss was the 58-foot, parallel chord girder truss, which carried the load of several other trusses," said Newhouse. "The reaction loads on the truss at the bearing points averaged 22,000 pounds, so we ended up having to clad the top and bottom chords with a solid piece of half-inch steel that had to be cut into three lengths for shipping and then welded back together and affixed to the truss chords at the jobsite."

Manufacturing these enormous trusses (some weighed in excess of 10,000 pounds) was not without its logistical challenges. "We had to create all the timber used in the trusses ourselves," said Lincoln. "Most of it was 38-foot 10x10s and 10x12s that needed to be No. 1 and kiln dried to 19 percent." In other words, when the contract was signed, the trees used in the project were still growing in a forest. Building Products Plus had to identify the trees they needed, have them harvested and delivered, and then cut and dry them. "The drying was one of the most difficult parts, getting that low of moisture on such large timbers without splitting them was a challenge."

Beyond producing the timbers, they also had to find a third-party to inspect and grade each board. "Fortunately, we were able to locate an independent grader through Timber Products Inspection to come into our plant and grade each board," said Lincoln.



Time was constantly a factor. They had to produce the lumber before some of the trusses were even designed. Further, they had to begin production on some of the trusses before the drawings were completely approved. "Fortunately, we never had a case where we had to rebuild a truss because of changes to the drawings," said Newhouse.

Once the trusses were built, they had to be loaded onto trucks and hauled from Houston to San Francisco. "We've manufactured 89-foot trusses before, but these were a particular challenge because they had to stay under cover to maintain the moisture content," said Lincoln.

The entire job was delivered in three separate truck loads. Loading each trailer took the better part of a day. "We had to back the trailer in and out in order to have enough room to lift and manipulate each truss, as it was stored in our facility, in order to load it onto the trailer," explained Lincoln. Of course, after all the work that went into constructing each truss, there was the constant pressure to avoid handling the truss wrong, bending the truss too much or damaging the wood fiber in any way.

Hauling these massive trusses presented its own challenges. The trusses required a significant number of oversized load permits, and each load needed to be delivered before 4:00 a.m. The Embarcadero is one of the busiest streets in San Francisco, and with Pier 29 right up on the street, each truck load would have to block the road during delivery. "Delivery was one of the

most significant logistical challenges," said Burg. "Each truck arrived exactly when we needed it to, but that was just the first hurdle. We then had to crane each truss up and install them in a few short hours before rush hour started."

Complicating matters was a temporary fabric roof that was installed over the building shell to allow workers to repair and construct the inside of the building long before the roof trusses arrived. This meant that each truss had to be lifted into place from inside the building. "We only had a few feet of clearance between the fabric roof and where these trusses needed to be placed. There were several times when I thought there was no way it was going to work, but the crane operator stuck with it and made it work," said Burg.

### Pieces in a Puzzle

"This job would have been a challenge regardless," said Burg. "However, the tight timeline required everything to fit together perfectly like pieces in a puzzle." It was a project that required every party involved to do their job efficiently and flawlessly.

"I can't say there weren't a few minor hiccups along the way, but, in the end, it was an immensely satisfying project to complete," said Lincoln. "The best part is that we made money on the project." Now that's a storybook ending. **SBC**

*To view more photos of this massive project as well as the Pier 29 fire, check out the online version of this article at [sbcmag.info](http://sbcmag.info).*

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# Honoring Edward Callahan, Jr.

by Sean D. Shields

**E**d Callahan was a quintessential professional engineer," remembers Dr. Frank Woeste, P.E., Professor Emeritus at Virginia Tech University. "He was always striving to do what was right for his clients and the public at-large." Indeed, regardless of who you speak to about Ed Callahan, Jr., you'll hear the same thing: He was a man of principle who was constantly focused on doing things as they should be done.

"He is, to me, was one of the greatest professional engineers that I will ever have the privilege to know," echoed Bill Black, Jr. of Simpson Strong-Tie. "I always called Ed the 'Great White Father' because of my deep respect for him."



**Ed Callahan, Jr. passed away on January 20, 2013, one day shy of his 80<sup>th</sup> birthday.**

From his early involvement in the Truss Plate Institute (TPI), to his authorship of the structural building component industry's first wood truss handbook, from his involvement in countless structural advisory committees to his relentless testing of metal-plate connected wood trusses, Callahan, Jr. played an integral part in establishing the strong engineering foundation the components industry now builds upon.

"I think one of the things that drove my father was his motivation to leave something tangible behind to show he made his mark here on earth," explained his son, Ed Callahan, III. "He wanted to make the world a better place, and through ensuring that homes were built safety and correctly, I think he did that."



## The Birth of an Industry

Callahan, Jr. was a first-generation Irish-American, born in Philadelphia on January 21, 1933. He attended Catholic schools through high school and graduated from the University of Miami in 1954 with a degree in Architectural Engineering. The timing and location of his education was perfect, as A. Carroll Sanford had invented his Gri-P-Late in Miami only a couple years earlier, and by 1955, Sanford's invention was issued the first Engineered Bulletin by the Architectural Standards Division of the Federal Housing Administration (FHA). According to TPI, "prior to founding of [TPI], plate manufacturers had to work with the Federal Housing Administration (FHA) and the many various local code jurisdictions to have their products and designs recognized."

That same year, J. Calvin Jureit, founder of Gang-Nail Systems Inc. (now MiTek USA, Inc.), created the Gang-Nail plate, the first metal connector plate for trusses that did not need additional nail fastening. From the beginning, Callahan, Jr. immersed himself in the work of these early



pioneers and captured the vision of how the metal connector plate could change the light-frame construction industry.

"I place Ed in position as one of the pioneers of the metal plate industry," said Charlie Hoover, Executive Vice President, ITW Building Components Group. "He is one of the individuals I think of when I recall the people that influenced my career."

Until its formation, TPI states, "a plethora of truss design methodologies and testing procedures existed for plate connectors, nailed plywood or nail-glued plywood, bolts, split rings, and so on." It was clear to men like Jureit, Sanford and Callahan that this promising new industry needed a collective voice. It needed an organization that could help establish national truss design standards and criteria that would allow truss fabricators across the country to gain acceptance by local building officials without the need for continual empirical testing. TPI was officially born in 1960, and with it *TPI-60: Design Specification for Light Metal Plate Connected Timber Trusses*, the standard we know today at ANSI/TPI 1.

### TPI & the Wood Truss Handbook

Callahan, Jr. played an integral role in the early development of TPI. He was hired as the organization's first full-time Managing Director in 1966. He also established the organization's first headquarters in Washington, DC, in the early 1970s. During his early tenure, he was responsible for developing the third-party in-plant inspection and quality control program that continues to be a cornerstone of TPI today.

"In his early relationship with TPI, Ed worked hard to promote the product and the industry," said Hoover. "At meetings, you could always depend on his depth of knowledge and his friendly, persuasive manner."

By 1973, Callahan, Jr. had left TPI and settled in the Baltimore, MD area, where he opened his own structural engineering firm, Callahan Associates, Inc. In addition to working with many truss plate manufacturers across the country, he began working on the industry's first "wood truss handbook." This early work would eventually serve as his guide when he drafted the first edition of the *Metal Plate Connected Wood Truss Handbook* for publication by SBCA (then the Wood Truss Council of America) in 1993. This definitive manual on the truss industry is now in its third edition.

"This project was one of the WTCA Marketing Committee efforts when I first got re-engaged in the truss industry in 1989. The goal of the WTCA member group was to write a book that would provide a good foundation for broad-based university, design professional and building official educational

purposes and document the history of the wood truss industry," remembers Kirk Grundahl, Executive Director of SBCA. "Ms. Pam Sabean, Ed and I got together during the summer of 1992 and pulled together the final edition of the *Wood Truss Handbook*. Ed was great to work with given that this ended up being a much bigger effort than anyone could possibly have imagined going into it."

"I remember Ed asked me to check a few of the standard truss configuration hand calculations he had done that were to go in the *Wood Truss Handbook*," remembered Steve Cabler, P.E., Sr. Vice-President, Engineering and Technical Services, MiTek USA, Inc. "He was so meticulous, I remember matching almost every one of his numbers. If I thought he had made a mistake, I looked carefully because I knew it was more likely that I had done something wrong."

### Contributions Through Involvement

Callahan, Jr. contributed to the wood truss industry in several different ways. In addition to his early work with TPI and later work with SBCA, he was an active member of the National Institute of Building Sciences (NIBS) consultative council. In addition, he provided his considerable expertise to the American Society for Testing Material (ASTM) in the development of several consensus-based standards still used in the industry today.

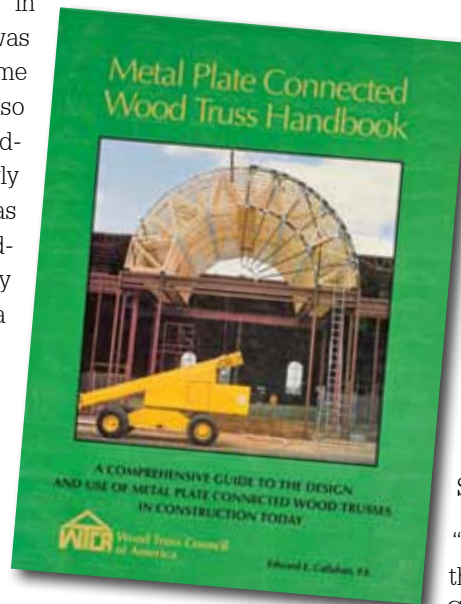
He also served as Chairman of the Wood Buildings Design Subcommittee of the American Society of Civil Engineers (ASCE) and was an ASCE Fellow. Of particular significance, Callahan, Jr. was the session chairman for the 1992 ASCE Structure Conference on Design of Wood Frame Structures and the 1993 Structural Conference on Design of Wood Structures for Fire and Seismic Loads.

"I had the privilege of working with Ed on the Truss Plate Institute Technical Advisory Committee," said Cabler. "Ed had such a wealth of experience and knowledge about the truss industry. His contributions on the code development side were always significant and well thought out."

### A Respected Consultant

Callahan Associates, Inc. is the oldest firm specializing in wood structures in the mid-Atlantic States. "Over the years, he developed a reputation as someone who always did things the right way," said Callahan, III. "It was so critical to him that everything was done by the book."

This straight-forward, honest approach did not make him wealthy. At times, it may also have led to some frustration on the part of his clients and his employees. However, it was exactly that approach that made him one of the country's preeminent forensic consultants for wood structures. "He got



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## A Man Who Left His Mark

Continued from page 19

much of his forensic work through his reputation,” said Callahan, III. “His clients knew they could always trust him and that the work would be done right.”

“As a consulting engineer, Ed investigated and reported on many truss-related construction incidents for MiTek over the years,” said Cabler. “His work was always extremely professional, and in the case of a construction failure investigation, he knew how to identify the important elements and explain why things happened in a practical way that people could understand.”

Callahan, Jr. also led the way in providing a variety of testing services for the wood truss industry, from laboratory testing and on-site testing of existing building products, to structural component development of new building products. “My father, William Black, started TEE-LOK in the 1950s. Ed helped us to develop what are still, to this day, the strongest truss plates the industry has ever seen,” said Black. “Ed even went with me to visit Tinius Olsen to select the proper testing equipment to ensure that we would get the most accurate results for our truss plate testing.”

Through years of testing, the data Ed collected contributed to the establishment of several standards for engineered wood trusses. “I think one advantage he had was that he grew up in the industry involved in those trade associations and standards groups,” said Callahan, III. “That involvement helped him develop a big-picture perspective on both the direction of the industry and effective ways to influence change.”

“Ed and I worked on several forensic investigation cases together, with Ed defending the plate supplier and me defending the component manufacturer;” said Grundahl, also a professional engineer and President of Qualtim, Inc. “It was always a comfort knowing that Ed was involved because you knew that common sense would be applied to the issue at hand and a focused and correct evaluation was his goal. This is refreshing as many forensic engineers today provide advo-

cacy for the side they are representing rather than focus on the proper evaluation and correct answer.”

## A Man of Principle

“He was a good father; he pushed us to do what made us happy,” said Callahan, III. “He also drove into us the power of positive thought. If you believed in it, you could accomplish it.”

His son is quick to point out that Callahan, Jr. was defined by his work, and he frequently brought his engineer-based approach home with him. Whether it was applied to the shelving unit in the garage, or lighter endeavors, his approach was one of doing it right or not doing it at all. “I think I won my Boy Scout troop’s pinewood derby race every single year,” remember Callahan, III. “He probably designed the first three-wheeled derby car by planning the wood till it balanced perfectly. Other parents complained it was unfair, but it definitely met all the requirements.”

Even when he “retired” to Florida, he found he couldn’t be happy if he wasn’t still involved in some consulting project or forensic work. Over his career, he authored countless articles on structural engineering and wood truss performance, and even as he approached 80 (an age he missed attaining by exactly one day), he was still working to finish two books.

“Ed was an intelligent, dedicated and practical engineer, never hesitant to share his expertise with others,” said Cabler. “He was a true professional in every sense of the word. He will be missed, but his legacy and contribution to our industry live on.”

“He was always a gentleman and we will miss his counsel,” echoed Hoover.

“Ed’s devotion to the industry was second to none, and we in the truss plate industry are forever in his debt,” added Black. “Thank you, Ed, you will be greatly missed as a colleague and a friend.”

He certainly was a man who made his mark—in the industry, and in the lives of his wife, three children, eight grandchildren and four great-grandchildren. **SBC**



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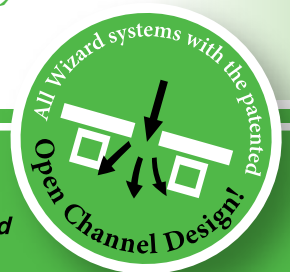
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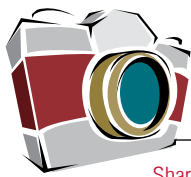
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To assist in the ROP BITA project, instructor John Puckett requested BCSI documents—sponsored by the California Chapter, CalSBCA—to educate his students on proper installation and bracing practices. Mr. Puckett thanked SBCA for the BCSI materials:

[BCSI] is awesome—as are you guys! They will be a huge help in the classroom this year. Interestingly, I was reading through the book last night, and I found that the carpenters that installed the trusses at the house my students are training on did not follow your guidelines. I am learning already! I will share this information with the framer. Hopefully, he will incorporate it into his next job. **SBC**





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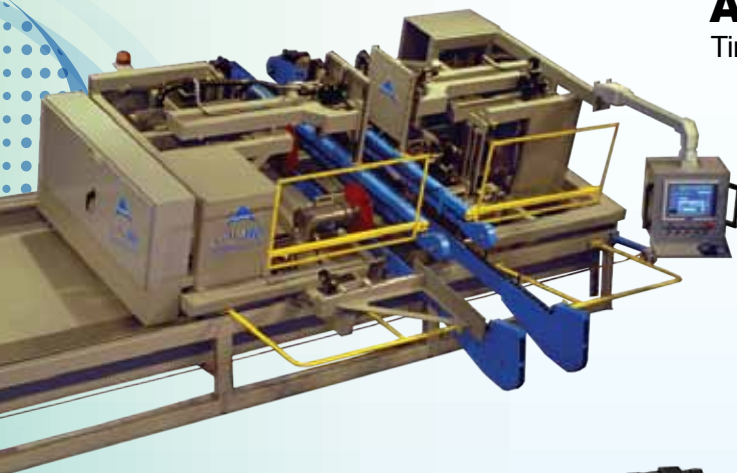


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