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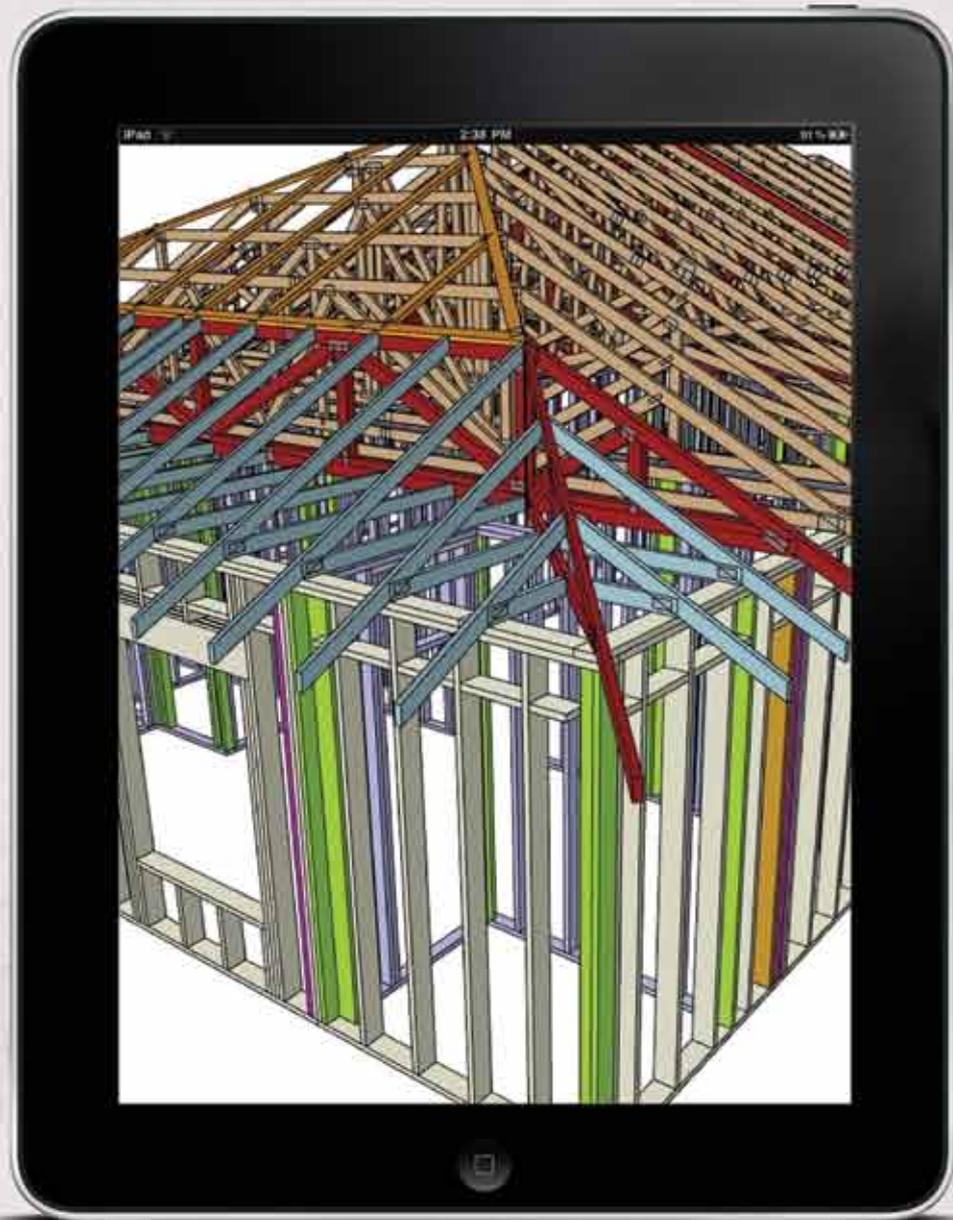
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6300 Enterprise Lane • Suite 200
Madison, WI 53719
Phone: 608-310-6706 • Fax: 608-271-7006
trusspubs@sbcmag.info • www.sbcmag.info

Editor

Steven L. Stroder
ProBuild • editor@sbcmag.info

Managing Editors

Emily Patterson
608-310-6747 • epatterson@sbcmag.info
Sean Shields
608-310-6728 • sshields@sbcmag.info

Art Director

Melinda Caldwell
608-310-6729 • mcaldwell@sbcmag.info

Editorial Review

Kirk Grundahl
608-274-2345 • kgrundahl@sbcmag.info
Suzi Grundahl
608-310-6710 • sgrundahl@sbcmag.info

Advertising Sales & Marketing

Peggy Meskan
608-310-6723 • pmeskan@sbcmag.info

Staff Writers for August

Larry Wainright

Accountant

Mike Younglove
608-310-6714 • myounglove@sbcmag.info

Computer Systems Administrator

Jay Edgar
608-310-6712 • jedgar@sbcmag.info

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An Engineer of the Highest Caliber

by Sean D. Shields

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May You Live in Interesting Times

Good things happen when you
bring people together.

There's an old Chinese proverb that says, "may you live in interesting times." Certainly, the last five years qualify as "interesting" in the structural components industry, although you could just as easily describe them as "scary" or "challenging." To me, some of the most interesting things have actually occurred in the last six months.

When the Southern Pine Inspection Bureau put forward a recommendation to immediately reduce the Southern Pine lumber design values by 25-30%, our industry responded swiftly and effectively. Out of that response, we began to have fruitful two-way conversations with lumber producers. This discourse culminated in a Lumber Summit held May 14-15 in Charlotte, NC. At this inaugural summit, 71 participants, including key lumber industry leaders, the top five lumber producers in North America, and component manufacturers representing approximately 700 million board feet of U.S. structural lumber purchases, were in attendance.

The summit was hosted by SBCA, but the meeting itself was run by the component manufacturers and lumber producers. We spent the first day touring the Builders FirstSource truss plant, which gave many of the lumber producers their first opportunity to see how we actually use their products. I overheard a few of the lumber producers in my tour group express surprise at the level of sophistication involved in what we do.

After the plant tour, we took a tour of the Charlotte Motorspeedway and had dinner there. It was an informal opportunity for all the attendees to get to know one another and start building relationships. In the end, it's those relationships that will likely prove to be the most valuable outcome of the summit. Having the opportunity to talk one-on-one with various mills gave me greater insight into the opportunities and challenges we as component manufacturers face with regard to lumber supply.

The next morning, we all gathered together and spent a few hours talking about lumber properties, design values and how they affect component design and performance. It was a ground-breaking discussion for both industries, and revealed a number of areas where there were misconceptions or misunderstandings about how the other operates and produces its respective products. These discussions have prompted the BCMC Committee to put together three educational sessions on lumber for component manufacturers at BCMC in October, which will be presented by the lumber producers who attended the summit. Look for more information on those sessions in the BCMC Attendee Promo included with this month's issue or online at bcmcshow.com.

Finally, out of the summit we created the SBCA Lumber in Components Council (LCC). The LCC will continue to gather periodically throughout the year in order to bring component manufacturers and lumber mills together to continue building relationships and working through issues to the mutual benefit of both industries on a manufacturer-to-manufacturer basis. We really have much in common in many ways.

Another interesting recent event was the plant tour and wood truss workshop that took place at Shelter Systems Limited in Westminster, MD. Held on June 2 during

at a glance

- The inaugural Lumber Summit held May 14-15 in Charlotte, NC, brought together key lumber industry leaders, the top five lumber producers in North America, and component manufacturers representing approximately 700 million board feet of U.S. structural lumber purchases.
- The SBCA Lumber in Components Council (LCC) resulted from the success of the summit.
- A recent industry plant tour furthered relationships with the fire service and is a strong reminder to embrace plant tours as our most effective outreach tool.

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Editor's Message

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the U.S. Fire Administration's National Fire Academy's annual conference for their Fire and Emergency Services Higher Education (FESHE) Program, 112 fire service officials from across the country turned their focus to light-frame construction. During this educational event, attendees learned a great deal about the capabilities and functions of a structural building component operation with particular emphasis on how components are engineered and manufactured.

The tour was actually several years in the making, because the SBCA Capital Area Chapter has been working with the FESHE conference for four years. Last year, Shelter's Director of Technical Operations, Bob Dayhoff, gave a presentation at the FESHE conference, and, based in part on the feedback from that presentation, Dayhoff, the Chapter and SBCA successfully convinced FESHE to include the tour and truss workshop as part of this year's event.

The plant tour was a powerful opportunity to have a significant impact on the minds of fire service educators from across the country. These are the people who are training the current and next generation of emergency responders, and giving them a first-hand glimpse at what we do and how we do it will pay dividends for decades to come. All of the evaluations from the tour were positive, but to pick just a few:

"The tour during the FESHE Conference is one of the most informative I've ever participated in. It was beneficial to have so many knowledgeable individuals present to explain structural components backed up by what appeared to be valid and objective evidence. The knowledge gained during the tour will greatly enhance my ability to present topics to my Building Construction for Fire Protection course." —Terry Spoor, Fire Protection Technology, Southeast Community College, Nebraska

"It was a great tour. I learned a lot. As first responders, we can learn how to be safer by attending events like these." —Melvin Byrne, Virginia Department of Fire Programs

"Thank you for having us tour the truss plant and the excellent presentation. I know that your time is valuable and I appreciate your dedication to further enhance the positive relationship between the fire service and the building industry." —Doug Smith, Portland Community College, Fire Protection Program, Oregon

It's comments like these that convince me our industry needs to embrace plant tours as our most effective outreach tool and commit to hosting many more in the future with the fire service, lawmakers and building officials. These are certainly interesting times, and now that the economy and the housing industry are finally headed in the right direction, it is events like these that will ensure our industry is poised to thrive like it never has before. **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.



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Karen and Theodore Williams

Excitement is building for the 2012 BCMC Build project in New Orleans, LA. This year’s project will build a three-bedroom home for Karen and Theodore Williams (see figure below). Both born and raised in New Orleans, Karen works for Louisiana State University Health Sciences Center and Theodore is a proud veteran currently looking for employ-

ment. Together, they have five children and seven grandchildren, and the couple is excited to start a new chapter as homeowners.

“Not only does Habitat help low-income families, they also build brand new lives,” said Karen.

The SBC industry will play a vital role in making the Williams dream a reality through cash and in-kind material donations. For more information, visit bcmcbuild.com/donate.php or contact Melanie Birkeland at 608-310-6736 (mbirkeland@qualtim.com). **SBC**



Front elevation of the 1,024 sq. ft. home that will be built for the Williams family the week of BCMC



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Single Top Plate in a Wood Stud Wall

Weigh the pros and cons of using a single top plate in a wood stud wall.

Question

In a residential home, is it possible to use a single top plate in a wood stud wall supporting a trussed roof? Is it beneficial to use a single top plate?

Answer

In answer to your first question: Yes, it is possible to use a single top plate in lieu of the traditional double top plate in a wood stud wall. While a single top plate isn't the norm, it cuts the volume of lumber in the top plate in half and can contribute to a building's overall energy efficiency by reducing thermal bridging through the lum-

ber and allowing a bit more space for insulation. This increases the thermal efficiency of the wall system.

The 2012 International Residential Code (IRC) allows for the use of a single top plate in a wood stud wall if the design meets specific requirements. IRC Section R602.3.2 outlines the top plate requirements, and then the exception lists the qualifications for using a single top plate. The 2012 IRC Commentary further explains the requirements for a single top plate in Figure R602.3.2 (see Figure R602.3.2).

R602.3.2 Top plate.

Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset at least 24 inches (610 mm). Joints in plates need not occur over studs. Plates shall be not less than 2-inches (51 mm) nominal thickness and have a width at least equal to the width of the studs.

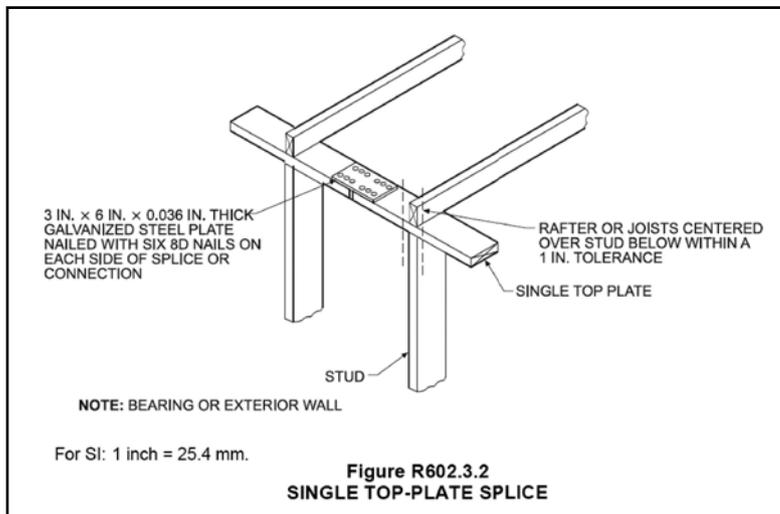
Exception: A single top plate may be installed in stud walls, provided the plate is adequately tied at joints, corners and intersecting walls by a minimum 3-inch by 6-inch by a 0.036-inch-thick (76 mm by 152 mm by 0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch (25 mm). The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.

To summarize, in order to use a single top plate per the IRC's prescriptive requirements:

- Plate must be tied at the joints, corners and intersecting walls.
- Minimum 3" x 6" x 0.036" galvanized steel plate must be fastened to each wall or segment by six 8d nails.
- Trusses, rafters or joists must be centered over the studs with a tolerance of not more than 1".

The minimum connector and fastener schedule, along with the 1" tolerance, provide the strength needed to transfer loads from member to member when less wood is used in the wall. When trusses are used on a project, the stud spacing can be increased to 24" o.c., which removes more lumber, improves energy efficiency and still allows a continuous load path.

Continued on page 18



at a glance

- The exception to IRC Section R602.3.2 allows for the use of a single top plate in a wood stud wall if the design meets specific requirements.
- By cutting the volume of lumber in the top plate in half, a single top plate allows more space for insulation and can reduce thermal bridging through the lumber, which increases the thermal efficiency of the wall system.
- When trusses are centered over the studs with a tolerance of not more than 1", the stud spacing can be increased to 24" o.c., which removes more lumber, improves energy efficiency and still provides a continuous load path.
- To determine if the use of a single top plate is beneficial, a number of factors must be weighed.



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Men of Steel

Forging a Brand New Company

by Sean D Shields

Take raw ore, throw it into the fires of hell, and out comes steel. Yeah, that's kind of like the story of the two guys who started Integra Steel Truss: Jon Moore and Rick Ponce. Both of them fell into the cold-formed steel (CFS) component industry (that's the raw ore part), struggled through the collapse and slow recovery of the light-frame construction industry (residential, multi-family and commercial) in Southern California from 2008 to present (i.e., fires of hell), and emerged with their own CFS start-up company that recently delivered its first big steel job.

Their tale is one part luck, one part bravado and three parts hard work. What component manufacturers can take away from their story is that, if you have a good idea, good people and a strong work ethic, anything is possible in this industry (for another example, just read the tribute to Bill McAlpine on page 16). To see what they accomplished and how they did it, we'll first look at the journey Jon and Rick took, the challenges they faced in starting their own company, and how their first project revealed a great deal about the character of their company.

Men of Ore

Jon Moore's journey into the CFS component industry started with several large flat sheets of aluminum. He was tasked with designing and building an athletic score-board made from these sheets—from scratch. "We didn't have 3D software back when I started designing," remembered Jon. "So everything was done by hand. It's probably no surprise it was the truss design and layout software that most intrigued me about the components industry." As Jon continued his career building score-boards, he began working on the structural framework designed to hold them up.

"I had an engineering background, so it was just a natural extension of my skills," said Jon. "Becoming a truss design manager wasn't much of a leap from there." Jon started working for a steel component manufacturer in 2003. In 2007, the housing market began to tank. "It was hard watching our industry unravel in waves. The first



wave was layoffs, then the second wave had some closings and further contraction," said Jon. "The third wave saw a bunch of competitors just disappear."

Yet, while residential was falling off, the commercial market was still strong. Hence, the CFS component side of the business had opportunities for success. That's where Rick enters the story.

Rick Ponce had an architectural degree, but didn't know much about trusses. "I remember when I found out about an open truss designer position. I thought to myself, 'I think we spent 15 minutes talking about those in class one time,'" said Rick. Disregarding the failings of the educational system to adequately prepare him for his future career, he started designing wood trusses. Unfortunately, when the residential market dried up, so did his employer. While it was unusual for anyone to be hiring during the downturn, Rick had already made a name for himself in the market and landed on his feet with a different job.

"Rick is just that kind of guy," said Jon. "His attitude differentiates him from most other people. I can understand why someone would go out on a limb and hire him at that time. You couldn't afford to lose him."

Then one day, management at Rick's new job approached him and asked him if he wanted to start a CFS component line at their plant in Southern California. "I didn't know anything about steel or that part of the market," said Rick. "But I thought, why not?" He started doing research and figured he needed \$5,000 to build his production line. He was also given a sales guy to help, but quickly it was determined he was too expensive, so essentially Rick had to do it all on his own.

Fires of Hell

"The wood truss side of the business was really struggling, so when I landed a few jobs, the company asked what else I needed to succeed," said Rick. "Then I landed a big military barracks job at Camp Pendleton, which

really got the company's attention." Unfortunately, the timing couldn't have been worse (it was late 2009), and shortly after they produced and delivered the CFS components for the first barracks, the company decided to close the entire Southern California plant.

"I still had the Pendleton Contract, so I quickly wrote up a business plan to successfully continue building steel components in the Southern California market," said Rick. "I shopped it around to a few companies, and one of them agreed to invest in it." That company happened to be Jon's employer.

"We got involved in the Southern California market in 2007," said Jon. "And while the residential market fell apart, commercial was still strong. So we ended up having a lot of success offering complete designs, which our competitors weren't doing." However, as the commercial market began to dry up in 2009, it was evident there wasn't enough work for multiple CFS component manufacturers. Rick's proposal couldn't have come at a better time, and so the two steel operations became one entity.

Had the construction market improved more swiftly, Integra Steel Truss might never have been born. However, as we all know, from late 2009 through 2011, conditions got steadily worse. The company Jon and Rick worked for struggled along with everyone else to survive the economic downturn. By early 2012, both Jon and Rick, who by then had a strong working relationship, both felt it was time to try something different.

"I started interviewing at different companies," said Jon. "But it quickly became evident that moving into another industry facing the same struggles wasn't really what I was looking for." Jon decided to forge out on his own, but he knew the only way he could succeed would be to have Rick start the journey with him.

Fortunately, Rick was more than willing. "I had joked with Jon earlier that we

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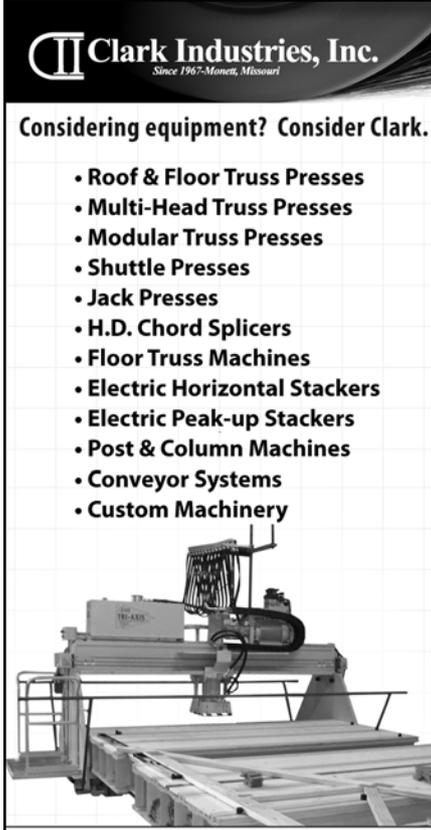
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Men of Steel

Continued from page 13

should parachute together when we left," remembered Rick. "The funniest part was that he took me seriously."

Making Steel

"What we really needed for Integra to get off the ground was one big contract," said Jon. "Throughout my career, we had made a number of contacts and built relationships with builder clients across the country." It was one of those companies that Jon turned to when the time came to pitch Integra. The builder had a large military barracks project in Washington and they were finally bidding it out after months of delay. "I went to them and essentially asked them to be our first customer," said Jon.

Rick put his own two-cents in and practically promised they could deliver the CFS components in four weeks, even though they didn't have a production facility or any employees at the time. How's that for bravado? "

So, while Jon focused on securing financing and worked with their new client on all the design work, Rick once again figured out the bare minimum he needed to start a CFS component production line. "This time, I had the benefit of knowing I could do it," said Rick.

Beyond the four-week timeframe, there were some significant

challenges Jon and Rick faced. On the design side, Jon found out from the builder they needed to do what was called a "blast load" analysis. "Because one side of the building fronted along a road, we had to design the trusses to withstand a potential explosion," said Jon. "Even our CFS supplier hadn't done it before, so there was a lot of coordination that needed to happen, including a top secret computer modeling computation the government supplied." Essentially, they had to model the truss stiffness, and eventually had to modify the truss design to accommodate the blast load.

In addition, the builder decided to construct the entire roof system on the ground and hoist it as a single unit for installation. "So we ended up working with a specialty engineer of theirs to identify the pick points and then we modified the truss and bracing design to accommodate those loads," said Jon. Finally, this job had a series of Building Information Management (BIM) requirements. To help in that regard, Integra's designer created the 3D computer model of the building for the builder to use.

The production side was not without its challenges either. "First off, we didn't have a production facility," said Rick. "We ended up leasing a building simply because I drove past it one day and noticed the 'for lease' sign." Rick also had to design and set up the production lines at the new facility, a task that included several trips to Home Depot.

In the end, their suppliers were the heroes. "If it hadn't been for the support of our suppliers, I don't know if we would have pulled it off," admitted Rick. From their CFS supplier to the screw fastener supplier, they worked with the vendors they had known from their previous employer. "All of them went the extra mile to help ensure this first job was a success," agreed Rick and Jon.

A First Step on a (Hopefully) Long Journey

"Our first delivery of components had to fit on eight trucks; that's all the room we had," said Rick. Fortunately, they all fit, and with that delivery, Integra Steel Truss was officially in business.

With that project delivered, Integra has already turned its sights onto another large military contract. "That's one cool aspect of steel jobs: you get to approach each job with a new design," said Jon. Fortunately, both Jon and Rick have the design experience to make it work. "I envision we will both be doing our fair share of design on the jobs we each bring in," agreed Rick.

"Ultimately, with the help of the state-of-the-art software and a trusted, tested design team, we are limited only by our creativity," commented Jon. "That's one of the best things about the components industry."

Indeed, these two "men of steel" are proving a new company can be forged out of the ashes of the past years of struggle and succeed in this industry. **SBC**

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The Consummate Gentleman

An Engineer of the Highest Caliber

by Sean D Shields

In the building construction industry, everything relies on a strong foundation. In the structural components industry, the success of the individual truss relies on the engineering behind it. No matter who you talk to, these two important concepts converged in one person: William “Bill” McAlpine.

“The thing about Bill was that, when you first met him, you immediately respected him,” said longtime friend and associate Charlie Vaccaro. “He had immediate credibility, and that has always been of the utmost significance in this industry.”

To really appreciate McAlpine’s contributions to the structural components industry, you have to start by looking at where he started from, and then take in the big-picture view of how he had a hand in transforming the industry into what it is today. To appreciate him as a man, you need go no further than what his contemporaries have to say about how he conducted himself and lived his life. He was truly the consummate engineer and gentleman.

William “Bill” McAlpine passed away on Saturday, May 26, 2012. Born on June 23, 1931 in Rochester, NY, he graduated from the University of Notre Dame with a degree in civil engineering. While it was Carroll Sanford who is credited with taking the plywood gusset concept and making it out of metal, it was entrepreneurs like Cal Juriet, Bill Black Sr., Charlie Harnden, Bill McAlpine and George Eberle, who developed the “nail-plate” between 1952 and 1960.

The Man Behind the Name

McAlpine got his start in the truss business by responding to an advertisement looking for an engineer to design connector plates. At the time, he told his soon-to-be former boss that he thought he would just design a few truss plates and be done with it. As it turned out, he had a lot more to contribute. He started work in 1958 as the Chief Engineer at Sanford Industries in Pompano Beach, FL. Carroll Sanford was an architect by trade, but he saw the possibilities of truss construction and is credited with inventing the nail plate and the gantry system used in truss assembly.

The truss industry was just getting off the ground at this time, and faced numerous obstacles. One of the most significant was doubts within the building inspection and engineering communities that trusses could withstand the loads they were purported to handle. “The truss business was, and still is in some ways, the Rodney Dangerfield of the building industry,” said Vaccaro. “It got no respect. Building officials didn’t understand how the 2x4 in a truss could suddenly replace a 2x10. They didn’t understand the theory behind trusses.” It was this constant confrontation with skepticism that continually drove McAlpine toward full-scale controlled testing of his truss designs—a pursuit that would define him over the years, and contribute to his reputation as one of the best engineers in the business.

During the industry’s early years, McAlpine met Charlie Harnden, one of Sanford’s lead salesmen. They quickly became friends, and when Harnden forged out on his own, McAlpine joined him soon after to start their own company. In 1966, Harnden and McAlpine founded Alpine Engineered Products (which today is part of the ITW Building Components Group). Bill once remarked he got the better end of the arrangement; while Harnden was President of the company, Bill joked he got the naming rights. Possibly it was that simple, but in looking back, many of his contemporaries argue that it was the strong engineering reputation McAlpine had already established in the field that differentiated Alpine from its many competitors.

Qualities of a Leader

“Many competitors” could possibly be an understatement. In the mid-1960s, 40-50 companies produced their own plates, and some produced trusses as well. Harnden and McAlpine decided to focus on producing plates and providing the engineering to use them. But to be successful, they needed help.

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There's the old adage that great leaders surround themselves with great people. Harnden and McAlpine did just that. "Find good people and grow old together, that's what Bill always used to say," remembered Charlie Hoover, Executive Vice President.

From their days at Sanford, they called upon two key individuals: Walt Friedly and Charlie Vaccaro. Walt was the money man. He was an accountant who had earned a lot of respect already in the industry, and he was instrumental in working with banks and investors to raise the funds necessary to start Alpine off on a good foot, including purchasing the plate designs and equipment from a company called WoodLoc East.

Charlie Vaccaro was another important piece to the puzzle. Harnden found himself struggling early on to secure customers. Vaccaro, an accomplished salesman in the industry, brought a little of his swagger to the endeavor. Even though all three of them were engineers, Vaccaro warned McAlpine, "Hire another engineer, you'll need him to be ready for all the business that's about to come our way."

So how did Alpine distinguish itself and rise above its considerable competition? "First, it was their product. Bill was just a superior engineer, and that showed through the reliability of their product," said Hoover. "Second, it was their salesmanship. Finally, it was their customer service."

Alpine expanded rapidly, first to Atlanta, GA, then to San Rafael, CA (where they bought WoodLoc West), and finally to St. Charles, IL. As the company grew, McAlpine's focus increasingly shifted from one of growing his company to one of growing the entire components industry. As an engineer, he understood, possibly better than many of his competi-

tors, what the truss industry truly was capable of accomplishing in the building construction industry.

"Bill came up with many ideas that others have since taken credit for," said Vaccaro. "But that was fine with him, as long as it helped the industry." Indeed, it was McAlpine's commitment to seeing things done correctly that led him and a group of others to found the Truss Plate Institute (TPI) and develop the TPI design criteria that today is known as *ANSI/TPI 1 National Design Standard for Metal Plate Connected Wood Truss Construction*. Bill emulated TPI's mission statement: "To maintain the truss industry on a sound engineering basis."

McAlpine was also a man of principle, and very active in his church. "Charlie Harnden used to refer to Bill as our moral

leader," said Hoover. "To which, Bill always joked back, 'does that make you, Charlie, our immoral leader?'" That strong sense of morality drove McAlpine to continually steer Alpine toward what he felt was right as opposed to what was expedient.

Embracing Change, the Right Way

The best example that illustrated McAlpine's character could have also led to Alpine's failure if it hadn't been for their already strong reputation. In the late 1960s and early 1970s, computer software was being developed to handle much of the design calculation work. By the mid 1980s it was also possible to purchase personal computers, which allowed companies to do the design work for themselves in-house.

"Initially, Bill resisted using the software to do the engineering," said Vaccaro. "He was very concerned the software that was out there would allow designers to make mistakes." However, the software's advantages were quickly embraced by the industry, and McAlpine's reluctance started to cost Alpine customers.

It took almost three years, but McAlpine succeeded in developing a software system that addressed his concerns. "The approach he took made sure that everything was double-checked," said Vaccaro. "It ensured there wasn't a mistake. That was just one of many instances where Bill's need to do things right had a profound impact on the industry." As a result, Alpine's software became an industry standard that others quickly tried to emulate.

From 1966, until the time Harnden died in 1998, the two of them ran their business as a team. "They never argued," both Hoover and Vaccaro agreed. "They both ran their respective sides of the business and collaborated so well together," said Vaccaro.



McAlpine (1st row, 2nd chair) with the Alpine management team in 1986.

Respectful & Respected

"Bill was an absolute gentleman and an absolute professional. Everything about him was quality," said Hoover. "I looked up to him and respected him, and I think most people felt the same way."

"Bill respected everyone at the company," echoed Vaccaro. "He treated everyone like family." His involvement with TPI and WTCA was apparently no different. "When Bill showed up for those meetings, his peers recognized his intelligence and respected him and his opinion," added Vaccaro.

In recognition of his significant leadership and engineering prowess in the development of the truss industry, as well as the respect his peers had for his dedication for doing things the right way, McAlpine was inducted into the SBCA Hall of Fame in 1995.

He ensured the structural components industry was built on a strong foundation. **SBC**

Share your remembrances of Bill McAlpine by adding a comment to the online version of this article at sbcmag.info.



McAlpine was inducted into the SBCA Hall of Fame in 1995 at the association's annual meeting by Past President John Herring.

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parting shots

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The modern truss was invented in the 1900s, but using triangles in construction has been a common practice for ages. While on vacation, a member of **SBC** staff stumbled upon this interesting truss-like ceiling at the Duomo di Pistoia or Cattedrale di San Zeno in Pistoia, Italy. This ornately decorated portion of the roof spans a large section of pews running from an entrance up to an altar. **SBC**

If you have an interesting photo to share with our readers, drop us a line at info@sbcmag.info.

Technical Q&A

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Is It Beneficial to Use a Single Top Plate?

Determining if a single top plate is more beneficial than a double top plate depends on the project and the professionals involved. A single top plate can decrease lumber use and boost energy efficiency, but less lumber also decreases the bearing capacity of the top of the wall. The fastener requirements for a single top plate compensate for less lumber while still providing adequate connections of framing. The tolerance requirements ensure adequate bearing capacity by directing the loads from the framing above the top plate directly into the studs below. To determine if the use of a single top plate is beneficial, increased energy efficiency and reduced lumber usage must be weighed against the cost of galvanized steel plates and the attention required to ensure framing is placed within the given tolerances. **SBC**

To pose a question for this column, call the SBCA technical department at 608-274-4849 or email technicalqa@sbcmag.info.

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