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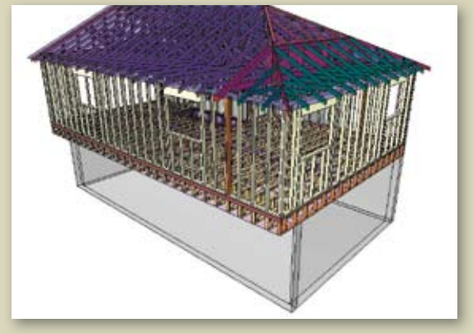

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STRUCTURAL BUILDING COMPONENTS™ THE FUTURE OF FRAMING

Editor's Message

The Business Teacher I Never Had

by Ben Hershey

"If I ran a school, I'd give the average grade to the ones who gave me all the right answers, for being good parrots. I'd give the top grades to those who made a lot of mistakes and told me about them, and then told me what they learned from them."

—R. Buckminster Fuller

I found this quote in a journal I was recently reading and it gave me pause to think. I certainly did not have a teacher or professor like that, but isn't that what seems to get us ahead in business? Here it is, May 2009, and we have seen 100 days of a new administration go by. I'm not sure what kind of grade you would give our government, but I believe they sure have a lot to learn about accepting responsibility and making the changes that are going to be positive for our society. In businesses across our industry, we make mistakes, we accept responsibility, we learn from it, and move forward with positive changes. Design and engineering has certainly been one of those areas over the years that we keep tinkering with, trying to find the best way to produce a package of truss design drawings and placement diagrams for our customers. The challenges with this are numerous and range from the personnel you have, the design software that works best for you and what will help you stand out from your competitors.

This issue of ***SBC Magazine*** covers some articles on Design & Engineering that may inspire you, or cause you to think. In Joe Falis' article on page 14, he discusses the issue of recovering design costs when you incur them. If there is one mistake our industry as a whole has made, it's that we have allowed ourselves to produce truss designs, details and placement diagrams (work product) that we do not get paid directly for at the time we perform that work. I assure you that architects and engineers will not allow work product to go out without getting paid for it. If someone is willing to do it for free, all that work will go to the free providers. And yet, our industry has grown over the years from simply supplying trusses to interpreting building designers' construction documents and producing component design information, which are then incorporated into the final plans. Imagine what your cash flow would be like, especially right now, if you were being paid up front for that work.

That is just one idea to consider, but is certainly better than doing nothing. Training your personnel is another area for you to focus on. Are your technicians or the candidates you hire getting training through the SBCA's Truss Technician Training program? What better time than now to assess your team's skill set and training needs. Through several conversations I have had, people seem to believe we will be out of our recession sometime in the future (notice I left the exact date open ☺). But in every down cycle we retool our businesses to change how we go to market with our products and services. Take advantage now of the personnel assessment and training tools available from SBCA; you will be glad you did.

Having worked with the association for several years now, I can tell you that our organization has faced many challenges, but we have never been just an average group. We have always tried to do what is right for our industry and YOU, our component manufacturer members. One of the events we do every year and do our best to produce the best we can is the BCMC Show. I have had the privilege to work with the BCMC Committee since 2000, and can tell you that each year after the show we spend a lot of time discussing what we did well and what we can improve. This year is no different, and the challenge is perceived to be even greater based on the recession. But, I remember the 2001 BCMC Show vividly. September 11, 2001 was a very tragic day for our country. At that time, we were just weeks

Continued on page 8

at a glance

- ❑ This issue focuses on Design & Engineering.
- ❑ Our companies would be better positioned for success if we charged for our truss designs, details and placement diagrams at the time they are complete.
- ❑ BCMC 2009 will take place September 30-October 2 in Phoenix. See you there!

Editor's Message

Continued from page 7

ahead of the BCMC Show in Louisville. The country was already into a mild recession and that day shocked our society. I recall the committee discussed attendance for the upcoming show and what we could do to bolster it. But what we did NOT do was bury our heads in the sand. Even though attendance was down, we had a great show.

There has been discussion amongst some in our industry regarding what to do about this year—BCMC or no BCMC. The show is going to go on; the more important question is, will you be there? Or better yet, can you risk not gaining the value of the knowledge, networking and planning for 2010?

One of the bright spots is that it seems people are now saying we are at the bottom and by either the last quarter of this year or the first of 2010, we should see some significant signs of recovery. I cannot think of a better time for you to go to a tradeshow that is geared to our industry and network with not only suppliers, but also your fellow manufacturers. We have shared quotes year after year from component manufacturers sharing the benefits of BCMC and what they learned from their experience. Each of us can use the quote above and share mistakes we have made in a setting where we can learn from our peers in other markets that may help us, give us a good idea, and learn from the educational sessions.

You will also find incredible value from the exhibitors who will be there discussing the services and products they supply and can also give you insightful advice specific to your business. Now, tell me...Where in today's economy can you get that kind of opportunity to learn from vendors, speakers and your fellow manufacturers?

BCMC 2009 is September 30 through October 2 in Phoenix, AZ. Start planning now to attend and set the foundation for your research, business evaluation and strategic planning. If you say "my time is too valuable," or "it's not worth it," you just might be that student above who gets an average grade for good answers, but misses the real opportunities to proactively advance your business' best interests.

On a personal note, as some of you know, I am one of many people in our industry who have had to battle some form of cancer this year. My recent surgery was successful and I am very grateful for the outpouring from those who have left phone messages or sent cards. Thank You!

Thank you to all of our ***SBC*** advertisers, BCMC Exhibitors and SBCA staff; I really appreciate what each of you do for the betterment of our industry. Have a wonderful month! **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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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.

SBCA Launches Green Building Roadmap for Component Manufacturers

The Structural Building Components Association (SBCA) has announced a new green building initiative that will benefit cold-formed steel and wood component manufacturers supplying products to green-built projects. Several green building rating systems for commercial and residential construction have been developed, resulting in significant confusion surrounding the extent to which structural components are eligible for "green" points. One of the areas most commonly misunderstood involves the use of certified wood in trusses and wall panels, and the chain of custody certifications often required for supplying it.

At its March Open Quarterly Meeting, SBCA's Board of Directors voted to develop a roadmap for component manufacturers to better understand how structural components are eligible for points within various green building programs. Its first task was to develop green information sheets for component manufacturers to share with customers or include in structural component submittal packages. SBCA is also considering a truss tag to expand this education to building component installers, building officials and green building verifiers. These new resources are designed to provide information on the points available for wood and steel building components within LEED for Homes, LEED-NC and NAHB ICC-700. (See examples below, downloadable from www.sbcindustry.com/greenbuild.)

The new information sheets demonstrate that there are many points available in green building programs that component manufacturers can help builders and contractors attain. Unfortunately, many people in the building community have adopted a distorted view about how only certified lumber makes components eligible for green building points. The fact is, component manufacturers play a significant role in helping builders erect homes that are highly engineered with virtually no waste in the framing process. There are points in each of the programs for value engineering, componentized framing and reducing jobsite waste.

Additionally, SBCA has reformatted its green building web pages. The pages now outline ways component manufacturers can help their customers earn green points by complying with the requirements set forth in green building programs. This new information allows manufacturers to see that there are many points available beyond certified lumber. Visit www.sbcindustry.com/greenbuild to download SBCA's green info sheets and see why the SBC industry has been green since 1952. **SBC**

THIS WOOD COMPONENT IS GREEN®

This wood component may contribute the following green points:

LEED-New Construction	LEED for Homes	ANSI ICC 700-2008 NAHB National Green Building Standard™
Total points available with wood components – 5	*Total points available with wood components – 10 or 11*	*Total points available with wood components – 51*
MR Credit 2.1 Construction Waste Management – 1 point MR Credit 2.2 Construction Waste Management – 1 point MR Credit 5.1 Regional Materials – 1 point MR Credit 5.2 Regional Materials – 1 point MR Credit 7 Certified Wood – 1 point	MR Credit 1.4 Framing Efficiencies – 3 points max – or – MR Credit 1.5 Off-Site Fabrication – 4 points MR Credit 2.2a Environmentally Preferable Materials (certified wood) – 2 points max MR Credit 2.2c Environmentally Preferable Materials (local production) – 2 points max MR Credit 3.2 Construction Waste Reduction – 3 points max	601.2 Advanced Framing Techniques – 9 points max 601.5 Pre-Assembled Components – 12 points 602.2 Roof Overhangs – 4 points 605.1 Construction Waste Management Plan – 6 points 606.2 Certified Wood – 4 points 607.1 Products Using Fewer Materials – 6 points 608.1 Indigenous Materials – 10 points max
Refer to LEED-NC Summary Sheet for specific credit language.	*Refer to LEED for Homes Summary Sheet for specific credit language.*	*Refer to NAHB Green Summary Sheet for specific credit language.*

** The National Resources Defense Council (NRDC), SBCA and green building programs and standards confirm that structural building components play a central role in framing a green building. Materials like wood and cold-formed steel building components supplied by SBCA members reduce jobsite waste, use raw materials efficiently, are renewable and/or made from recycled material. Visit www.sbcindustry.com/greenbuild*

SBC GREEN BUILDING WTCA

THIS COLD-FORMED STEEL COMPONENT IS GREEN®

This cold-formed steel component may contribute the following green points:

LEED-New Construction	LEED for Homes	ANSI ICC 700-2008 NAHB National Green Building Standard™
Total points available with steel components – 6	*Total points available with steel components – 10 or 11*	*Total points available with steel components – 53*
MR Credit 2.1 Construction Waste Management – 1 point MR Credit 2.2 Construction Waste Management – 1 point MR Credit 4.1 Recycled Content – 1 point MR Credit 4.2 Recycled Content – 1 point MR Credit 5.1 Regional Materials – 1 point MR Credit 5.2 Regional Materials – 1 point	MR Credit 1.4 Framing Efficiencies – 3 points max – or – MR Credit 1.5 Off-Site Fabrication – 4 points MR Credit 2.2a Environmentally Preferable Materials (recycled content) – 2 points max MR Credit 2.2c Environmentally Preferable Materials (local production) – 2 points max MR Credit 3.2 Construction Waste Reduction – 3 points max	601.2 Advanced Framing Techniques – 9 points max 601.5 Pre-Assembled Components – 12 points 602.2 Roof Overhangs – 4 points 604.1 Recycled Content – 6 points max 605.1 Construction Waste Management Plan – 6 points 607.1 Products Using Fewer Materials – 6 points 608.1 Indigenous Materials – 10 points max
Refer to LEED-NC Summary Sheet for specific credit language.	*Refer to LEED for Homes Summary Sheet for specific credit language.*	*Refer to NAHB Green Summary Sheet for specific credit language.*

** The National Resources Defense Council (NRDC), SBCA and green building programs and standards confirm that structural building components play a central role in framing a green building. Materials like wood and cold-formed steel building components supplied by SBCA members reduce jobsite waste, use raw materials efficiently, are renewable and/or made from recycled material. Visit www.sbcindustry.com/greenbuild*

SBC GREEN BUILDING CFSC

Technical Q & A

Cold-Formed Steel Restraint & Bracing

by Tim Noonan, Cascade Mfg Co

Important details about the properties of hat or furring channel.

Photo 1.

Question

What material is commonly used for the restraint and bracing of cold-formed steel trusses?

Answer

A material known as hat (aka "furring") channel is most commonly used for restraining and bracing cold-formed steel (CFS) trusses. Hat channel used for these applications is typically 1-½" 20 gauge (33 mil). The term "mil" is the designation that specifies the base metal thickness in thousandths of an inch, so 33 mil is .033 inches thick, or 33 one-thousandths of an inch.

Hat channel is commonly supplied by the component manufacturer for use as temporary or permanent restraint/bracing of chords and web members as well as with the connection of a piggyback assembly. Photo 1 illustrates the attachment of hat channel to the bottom chord of the trusses.

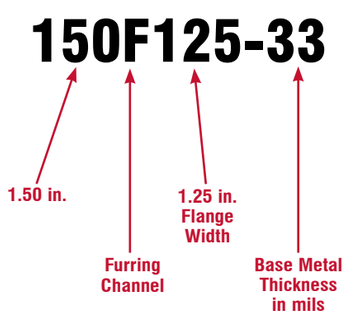
Question

What are the differences between structural and non-structural grade hat channel?

Answer

The terms "structural" and "non-structural" are used by the roll-forming industry to differentiate between a 33 mil (structural) and 30 mil or less (non-structural) product. It's important to note that a non-structural product still has structural capacity (there is an ASTM standard C645 that sets the minimum standards). Ask any drywall installer for a piece of hat channel and he/she will most likely give you a piece of non-structural "drywall" or furring channel; this is the readily available type that most suppliers keep in stock. Drywall channel is often referred to as "non-structural" and should not be used as structural restraint and bracing for trusses unless designed by an engineer.

One of the most common sizes of "structural" furring channel used to restrain and brace CFS trusses is designated as 150F125-33. The Steel Stud Manufacturers Association (SSMA) identifies this designation as follows:



at a glance

- SBCA's Cold-Formed Steel BCSI booklet recommends using material that is a minimum of 33 mil for permanent restraint/bracing applications.
- Framers should verify that they are getting structural grade hat channel (150F125-33) to be in conformance with the industry governing documents.
- If the preference is to use non-structural hat channel, the truss design engineer should evaluate the structural capabilities of the material.

Another major difference between non-structural and structural is the non-structural is typically G40 galvanized, where structural is typically G60. The significance to this is that the cold-formed steel truss specifications will typically require all materials used in structural framing, including trusses, clips, bracing, framing accessories, etc. be G60 galvanized.

Industry documents such as the *Field Installation Guide for Cold-Formed Steel Trusses* (published by the Cold-Formed Steel Engineers Institute – CFSEI) and the newly published CFSCBCSI – *Guide to Good Practice for Handling, Installing, Restraining & Bracing of Cold-Formed Steel Trusses,* recommend that restraint and bracing be a minimum 33 mil material. Additionally, the 2006 International Residential Code® (IRC) requires any load-bearing cold-formed steel roofing member (of which restraint and bracing would most certainly apply) to have a minimum uncoated thickness of 0.033 inches (33 mil).

The following language is taken from CFSBCSI regarding restraint/bracing material and connections:

> The minimum size of a steel section used as Lateral Restraint and Diagonal Bracing is 33 mil 1-1/2" furring (hat) channel (150F125-33) or 33 mil 2-1/2" stud section (250S162-33) unless specified by the Building Designer.

Taken from CFSBCSI, Figure 1 illustrates that the hat channel can be installed on either the top or bottom edge of the chord and can be "nested" or "overlapped."

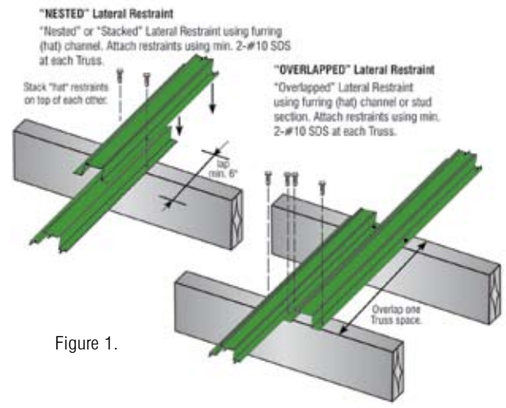


Figure 1.

As previously mentioned, most drywall contractors and supply yards have no reason to stock or supply 33 mil hat channel. If you are in the business of designing or supplying cold-formed steel trusses, and are going to recommend restraint and bracing per the guidelines provided in CFSCBCSI or any other prescriptive method, you should verify that you are getting structural grade hat channel (150F125-33) so that you are in conformance with the industry governing documents.

If a component manufacturer is going to provide the permanent truss bracing designs, it will be necessary to indicate to the engineer performing this design the preferred type of bracing material. As discussed above, non-structural hat channel still has structural properties, though obviously less than those of the structural grade. If the component manufacturer's preference is to use non-structural hat channel in a permanent restraint/bracing application, the engineer performing the designs needs to evaluate the structural capabilities of this material and design to those capabilities. This could result in additional restraint and bracing being required. The cold-formed steel specifications should also be checked to ensure that the galvanization requirements are met.

Likewise, CFS truss installers should determine the grade of hat channel purchased. If there is a major discrepancy in price, it could be because the lower priced product is non-structural.

Remember that inadequate, improper or lack of restraint and bracing is one of the most common causes of truss failure. It is very important to make sure that the required grade of restraint and bracing is specified and supplied. SBC

Safety Scene

Finding Time for Fitness

The benefits of regular exercise may surprise you!

by Molly E. Butz

May is, according to the U.S. Department of Heath and Human Services (HHS), National Physical Fitness and Sports Month. Moreover, May 20, 2009 is National Employee Fitness & Health Day. So although Safety Scene often focuses on specific hazards as they relate to steel and wood component manufacturing, this month it seems appropriate to encourage discussion about a health issue that affects everyone at your facility: basic physical fitness.

Exercise, even a moderate amount, is good for us. To begin with, exercise can improve cardiovascular health, help you sleep better or even result in dropping a little excess weight, all of which will help you feel (and look) better. Exercise can also lower your stress level, increase stamina and boost your mood.

All of those benefits translate to the workplace as well. Exercise can contribute to consistent employee attendance and increased productivity. In addition, it stands to reason that healthier employees will help decrease the company's health care costs and have fewer injuries and illnesses. With that in mind, it makes sense to spend a little time this month talking with your employees about health and fitness, and if possible, provide them with access to as much information as possible.

There are plenty of free and inexpensive ways to provide positive, reputable information to your employees. Consider posting some simple wellness snippets on bulletin boards and in restrooms in your facility. If you'd like to take it a little further, create a brief "wellness newsletter" to distribute to your staff. Not sure where to start? Use a website like Google to search for interesting tips and articles using phrases like "benefits of exercise," "fitness tricks" and "health tips."

If it's feasible, implement a few things at the office to promote better health like bike racks for people who want to ride to work, a shower/small locker room for folks that need to freshen up before work or a "wellness library" of books and other resources on various health and fitness topics. If a whole library seems overwhelming, there are numerous online "libraries" you can suggest or even make available during breaks including: www.wellnessproposals.com, www.mayoclinic.com, meriter.staywellsolutionsonline.com/library/wellness/ and wellnesscenter.meridianhealth.com/Library/Wellness/.

Contact a local fitness center and ask if they have any corporate programs; many places offer special packages that include discounted rates, incentive packages and special programs for your employees. You may also find that your insurance provider offers kickbacks and/or discounts for people that take part in health and wellness activities such as attending Weight Watchers® meetings, taking yoga classes or joining a health club. Often times you can request speakers from local groups and businesses to present for little or no fees. Check out organizations like the American Cancer Society and Red Cross or tap a local nutritionist's or doctor's office for a knowledgeable professional. If you're hesitant because you're afraid it might take too much time, invite the speaker to present during your typical safety training timeslot.

No matter how you go about it, May is the perfect time to talk to your group about health and fitness. This is an easy opportunity to help your staff get into better shape and, in return, gain a healthier more productive workforce. Safety (and health) first! SBC

Visit **SupportDocs** at www.sbcmag.info to find more information about the 2009 National President's Challenge and some quick tips for fitting fitness into your routine.

at a glance

- There are plenty of free and inexpensive ways to provide positive, reputable information to your employees.
- Use a website like Google to search for interesting tips and articles using phrases like "benefits of exercise," "fitness tricks" and "health tips."
- Contact a local fitness center and ask if they have any corporate programs.

The Big Picture

Recovering Design Costs When They Are Incurred

by Joe Falis

Thoughts on receiving compensation for design services from an SBCA chapter president.

One of the often overlooked areas of true cost in a truss company is design costs. Not only are we most of the time not adequately compensated for design costs, but we only derive income to cover those costs when the job actually ships—often many months after the design process is completed, even in a slow market!

No construction design professional gives away their services, only hoping to be paid later, when and if the building is constructed. Surveyors, residential designers, architects, and engineers all are paid upon completion of their services. In fact, the plans often are not released until they are paid. Most of our highest paid employees (spelled "overhead") are truss design technicians and truss design managers. Shouldn't we recover the costs for these individuals as they occur?

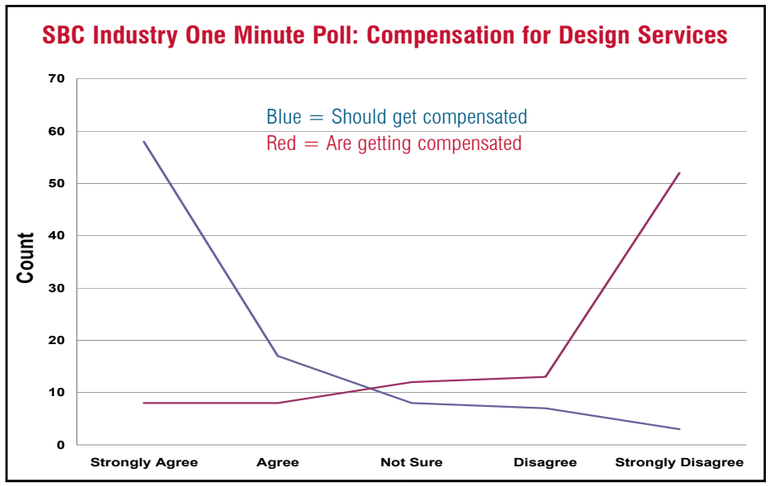


Figure 1. Of 93 component manufacturer respondents, 58 believe they should be compensated for design services even if a job is cancelled. Conversely, 52 respondents said that they do not receive compensation for their design services in the event a job is cancelled.

A recent ***SBC* One Minute Poll** on this topic yielded interesting results. Component manufacturers can log in to www.sbcindustry.com/designcosts to complete the survey. (The results can only be viewed upon completion of the survey.) Although an overwhelming majority of component manufacturers surveyed—roughly 62 percent—agree that component manufacturers should be compensated for design costs, about the same number of respondents concur that we are not. Figure 1 illustrates this discrepancy.

Some examples of situations where costs are not typically recovered:

1. Cancelled jobs: In both good and bad economic times over the past few years many jobs were cancelled after truss designs were completed. During the "Boom Years" some builders simply "flipped" their lots, making more profit on the bare property than if they built anything on them. Some owners could not build due to soaring construction costs during that time. Conversely, in a declining market, inability to get financing, loss of employment, and existing inventory has caused many jobs to be cancelled. Although some of our contracts specify "cancellation fees," they are difficult to collect.

2. Went to another supplier: After "using" you for the layout for permitting, the contractor hires another company to fabricate the products (easy to negotiate the competitor's price down when the contractor provides them your layout with all the kinks worked out). Many who answered the poll indicated they did not bill for truss layouts, even though they knew that a competitor built the job and may have used the truss layouts in the process.

3. Delayed jobs: Even in this slow market, from the time a truss layout is done several months may pass before until the job actually ships. The largest, most complex custom jobs, which have the highest design costs, take the longest. Our company has found that oceanfront jobs that must be approved by the Department of Environmental Protection, the Department of Natural Resources, the Army Corps of Engineers, and local property owners associations, to name a few, BEFORE the builder can apply for a building permit. In these instances costs are incurred for the layout, but not recovered until many months or years later.

4. Code Changes: The Florida Building Code in particular changes every three years. Imagine how much each Florida fabricator spent a few years back redesigning all their "repeat" models. Many companies had two-thirds of their staff working on code upgrades—with no compensation! The residential designers, architects and engineers were all paid for the new code revisions. While our company believed we would be "paid" for building those repeat models, market conditions did not allow that to occur before the next code change. Now we are required to do it again for the 2007 code (which went into effect March 2009).

5. Customer Revisions: Changes cost money. Design costs are incurred in addition to the physical truss change costs. There are also costs to print/email new layouts, and write an addendum. These are costs we are often not recovering.

at a glance

- Component manufacturers are not often compensated for the costs they incur for their design services.
- A recent One Minute Poll suggests that although an overwhelming majority of CMs believe they should be compensated for these costs, most are not.
- A way to address it is to provide contract language that details separate charges for the completion of design services and the delivery of products to the jobsite.

What Are Some Suggested Solutions?

Revise your contracts to allow for invoicing design work at the time the service is completed. Wouldn't you like to have your design staff paid for each week—even if you shipped nothing? In this situation it is important to spell out in your contract the amount to be billed upon completion of layouts and/or truss engineering, and the subsequent amount to be billed upon delivery. With an executed contract, the builder will be legally obligated to pay you. Before doing this, however, make sure to contact your attorney and insurance broker to discuss the implications of your company selling services in addition to products.

Revision costs could be added to the final amount due after fabrication (if specified in the customer contract). This shift in procedure could create cash flow, eliminate hidden shrinkage, and ultimately protect the future of your company, in good times and bad.

Contact me with your thoughts! **SBC**

Joseph P. Falis is the General Manager of Scosta Corporation in Sebring, FL. He is also President of the Southwest Florida Truss and Component Manufacturers Association. Contact him at joef@scostacorp.com.

Visit **SupportDocs** at www.sbcmag.info to find more information about this topic from past articles in ***SBC Magazine.***

Historic Iowa Church Reborn with Components, SBCA Member

Originally built in 1908, the church's Byzantine-style design was unique to the Midwest. A pair of Boston architects loosely based the design on St. Mark's Basilica in Venice, Italy. All Saints has been named an historic landmark by the National Register of Historic Places.

by Libby Maurer

After All Saint's Church burned in 1995, it wasn't clear whether the structure located in Stuart, IA would ever be rebuilt, let alone rebuilt with building components. But almost 14 years later, the historic southwest Iowa church has risen again, thanks in part to wood and steel structural elements and an SBCA member.

When an arsonist set fire to it, parishioners of All Saint's and citizens of Stuart quickly formed Project Restore, determined to raise funds and rebuild the historic landmark. Over the course of several years, the group collected donations from private citizens and businesses. Additional funding was secured with a grant from a state tourism program and a bond referendum approved by Stuart voters. Then in 2007, a project team was established to start organizing the near-$2.5 million restoration project. This is how Lumber Specialties in Dyersville and Story City, IA, got involved.

The project team, comprised of architects, engineers, contractors and the Restoration Committee, started working on the large-scale renovation in November 2007. The architect, HLKB in Des Moines; contractor Koester Construction in Grimes; and the Committee met weekly to coordinate plans and hash through details.

Lumber Specialties' primary business model is two-step: selling components wholesale to lumberyards. One of the company's customers is Beisser Lumber Co., a retail building material dealer; it was ultimately this relationship that led to its involvement in restoring All Saint's. Beisser Lumber Co., as it turns out, supplies building materials to Koester Construction; Beisser recommended Lumber Specialties to supply the complicated structural components for the church.

at a glance

- Historic All Saint's Church in Stuart, IA burned in 1995, and was rebuilt with building components in 2008.
- The project team included SBCA member Lumber Specialties, who designed and built an intricate roof truss system for the main dome of the church.
- To properly transfer loads, the trusses tied into custom steel compression and tension rings placed in the center of the dome.

Designing the Dome

All Saint's tallest tower burned in the fire, so Lumber Specialties' challenge was to design and build the roof components for this key element of the restoration. All Saint's may have been stick framed originally, but Lumber Specialties and the project team were adamant about trussing the steeply vaulted roof this time around. The challenge was how to frame a dome measuring 34' in diameter that would rest on a base or "drum." (See photo above.) Salesman Dick Weise said cost, safety, quality and weather were factors in the decision. "The main dome is some 60' in the air. They didn't want to 'stick' it because of the crane cost, and the time involved," he said. Having workers more than 60' in the air for an extended amount of time wasn't a safety risk anyone was eager to take. Not to mention the very real possibility that the framing phase may well take place during the brutally cold Iowa winter. "They were considering the winter weather conditions (it was fall 2008 at that point) and quality control—maintaining good quality high in the air would be difficult," said Weise.

Weise said his company had a lot of freedom in terms of how to design the dome. Since the masonry walls were the only portion of church left standing after the fire, the Restoration Committee had already decided to keep the façade. "There were some mammoth steel beams deemed to have structural integrity that remained after the fire. So one option was to incorporate them in some way," he said.

That's when Steve Kennedy, E.I. of Lumber Specialties took over. He said the design took several days to complete, and included two unconventional elements to resist gravity and wind loads. According to Kennedy, the biggest challenge was to match the geometry of the trusses to the dimensions of the dome. "We had to use AutoCAD to draw several circles and arcs [representing the curve of the dome] and then design the trusses to fit inside of them," he said.

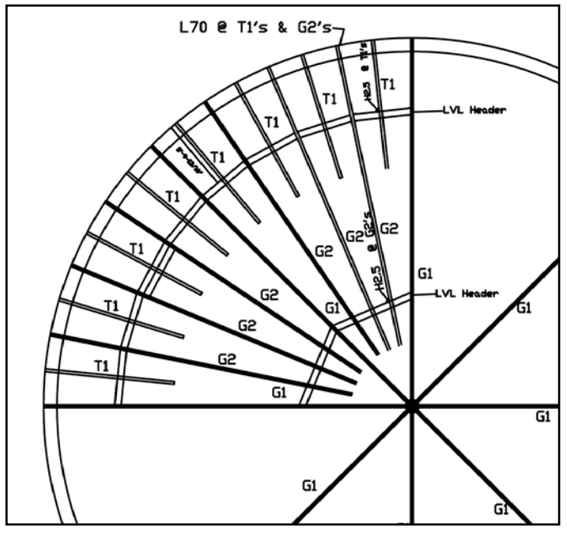
Additionally, Kennedy came up with the concept to use steel compression and tension rings to tie the trusses into, and worked with a local engineer to design them. "There's a ring located at the top and bottom chord connections to handle both gravity and wind loads," he said. A local certified welder custom made the rings. (See photo at left.)

Resurrection of All Saint's

Construction on All Saint's began in March 2008. Special ground accommodations had to be made on the jobsite to assemble the drum and dome. First, Koester staged a platform assembly area on the jobsite. The drum of the tower was reconstructed on this platform with a combination of wood and steel materials. Weighing in at 12 tons (and measuring 22' high and 33' in diameter), it was lifted by crane in October.

Then, using measurements of the diameter of the dome, the framing crew constructed the base of the 33-foot dome out of engineered wood and steel. (See photo at right.) The trusses—64

Continued on page 18



Historic Iowa Church • Continued from page 17

in all—and steel rings were shipped loose to the jobsite in addition to detailed drawings of how the structure should be assembled, Kennedy said.

Next, eight 16' wide by 10' tall one-ply girder trusses (designated G1 in drawing above) were raised and bolted to each of the center rings. The rings were necessary to safely transfer loads throughout the dome. Once secured to the rings, the G1 trusses cut the dome into eight congruent sections. In each section, three girder trusses (labeled G2 in drawing above) were set. These trusses are the same slope as the G1 trusses, but do not tie into the steel rings. Together, the G1 and G2 girders form the dome's rounded shape. Finally, 32 smaller trusses (7-ft. tall) were set between each G2 girder. As shown in the pictures above, sections of LVL blocking (secured with hangers) connected the G2 and G1 trusses in two places.

"[The rings] were essential to the project, so this was the only way you could do something like this from the air and get all the connections so the loads wouldn't collapse it," said Weise. After the inside of the dome was complete, it was sheathed with three layers of ¼" plywood. (See photos above.)

Hoisting the Drum

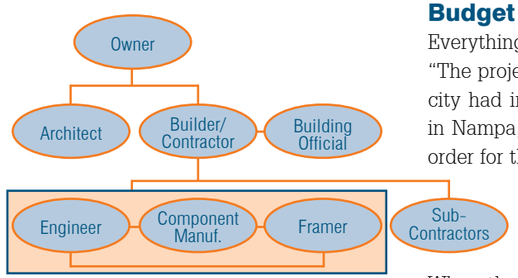
The 13-foot high dome was hoisted onto the drum on December 29, 2008 with a 160-foot crane. "They'd been waiting around for a nice calm day [to lift it]," Weise said. Numerous meetings were held to plan the event. The last step was for workers to cover the dome with sheets of solid copper.

Construction on All Saint's continues as of this writing. In addition to the roof system, Lumber Specialties also supplied trusses for one smaller dome, a floor system and various types of engineered wood for the project. When asked to reveal the secret of carrying out a successful design like this, Kennedy said, "Ingenuity and the willingness to tackle the more difficult projects." **SBC**

Communicating Success:

A Case Study about Communication on a Design-Build Project

by Kirk Grundahl, P.E. & Emily Patterson



This flow chart shows some of the players involved in the Star City Hall project. There was a contractual relationship between Performance Engineers (Engineer) and Benchmark Construction (Contractor) and between SteadFast Framing (Framer) and the Contractor. Idaho Truss (Component Manufacturer) had a supply relationship with the Framer and did not transact directly with the Contractor.

at a glance

- Initially planned to be a design-bid-build project, the bid for a new city hall building for Star, ID, came in at $800,000 over budget.
- Performance Engineers, who provided value engineering services, helped to bring the project back within its $1.4 million budget.
- Synergy between the engineering firm, the component manufacturer and framing company further reduced costs by streamlining communication.

The project for a new city hall in Star, ID, posed design, cost and scheduling challenges, as most projects do. What's unique is how the construction professionals used teamwork and effective communication to tackle these issues and find solutions. Working together, the main players on the project turned what once was a budget crisis into a finished structure that was completed on time, within budget, and that met the client's needs.

The project began in early 2007 with the client, the City of Star needing a new city hall. Located behind the old city hall, the site for the new Star City Hall posed no major zoning issues. Working with a budget of $1.4 million, the city hired a civil engineer and also contracted with JJDS Architects, PLLC in Boise. The project began as a design-bid-build project, and JJDS Architects went through the zoning process and started work on renderings. The concept called for a two-story, 9,200 sq. ft. wood framed building in a grand lodge style. The design included an elevator shaft and a combination lower and upper roof structure with parapet walls.

Budget Challenges

Everything proceeded as planned until the bid came in nearly $800,000 over budget. "The project was very well defined; it was just [almost] twice as much as what the city had in the bank," said Clayn Sonderegger, owner of Benchmark Construction in Nampa, ID, contractor on the project. The budget would have to come down in order for the project to move forward. JJDS Architects and Benchmark Construction worked on reducing costs and lowered the bid by $400,000. These costs savings primarily involved changing the outside of the structure by removing iron hardware, finishes and other aesthetic features.

When the city said that costs still had to be reduced, it decided to contract with Benchmark Construction and change it to a contractor-led design-build project. To further reduce costs, Benchmark Construction asked structural engineering firm Performance Engineers of Boise if the roof and overall structure could be altered to save money. Sonderegger admits there were some risks in reevaluating the design at this stage in the project. It was very possible that further changes could result in a cost increase. "We took the gamble," Sonderegger said.

Value Engineering

Maintaining the original footprint for the building based on the architect's drawings, Performance Engineers provided value engineering to adjust costs. Changes included removing two columns and reducing the number of hold downs from 28 to eight. The gamble on reevaluating the structure paid off. Instead of incurring additional costs, value engineering the location and specification of structural members actually saved approximately $10,000 on the structural design (structure costs) and contributed toward the project's overall cost savings. Reevaluating the structure prevented additional costs that the project couldn't absorb and helped move the construction forward. For a summary of changes and cost savings on the project, see Table A.

These changes not only brought the project within budget, but they also aligned with the client's needs, for example, adjusting costs while keeping a second conference room. "We were able to meet what they wanted by changing construction types and material usage," said Shawn Reeder, engineer on the project for Performance Engineers.

Materials

Adjustments made to bring the project within budget involved a number of material changes. Keith Randall, Construction Manager for Benchmark Construction, said that reevaluating materials allowed costs to come down without compromising design or quality. "No corners were cut whatsoever," he said. For example, the initial design called for a sandwich panel over the top of the roof trusses and shingles made from recycled tires, which could only be installed by one company in the area. Switching to a more conventional single membrane roof with asphalt shingles achieved significant costs savings. Changes made inside the building included removing or using more conventional materials to replace recycled glass for counters, stainless steel tops for handrails and cloth clouds hanging in the board rooms. (See table B for some examples of material-related changes on the project and their cost savings).

Communication on the Project

When Performance Engineers began work on the project, the engineering firm worked with sister company Idaho Truss (now InteFrame Components, LLC) on truss and structural elements as well as cost analysis. Throughout the structural engineering and design phase, Performance Engineers worked closely with Idaho Truss and fellow sister company SteadFast Framing, exchanging information regarding loading conditions, flow of loads, framing issues and overall structural performance. "It is not uncommon for [Performance Engineers] to consult with Idaho Truss and SteadFast Framing to talk about the ease or difficulty of construction for design decisions," said Kendall Hoyd, President of InteFrame, the parent company of Performance Engineers, Idaho Truss and SteadFast Framing.

When the design was complete, Idaho Truss worked with SteadFast Framing on a quote for turnkey framing for the project. Framing for the city hall was completed in 14 days, reducing the framing schedule by three weeks. Sonderegger said the quick turnaround even surprised some subcontractors on the project, who thought the framing might take up to six weeks. The framing deadline was especially important because Continued on page 22

Division	Changes	Cost Savings
General Requirements	Shorter schedule & less profit & overhead	$30,000
Site Work	Removed playground equipment, exterior furnishings, fountain, sundial & removed some landscaping	$85,000
Concrete	Removed colored concrete, concrete bench around fountain, pavers & size of foundation due to wall design	$55,000
Masonry	Removed a double wall (block with a brick face), lessened the amount of brick to only a wainscot	$67,000
Metals	Removed the stainless steel & powder coated the finishes, removed the exterior awnings at all of the windows but four, removed one set of stairs & some interior columns	$82,000
Woods & Plastics	Removed some of the hold downs, removed the insulated panels on the sub sheeting on the roof, changed half of the roof system to trusses on the building & changed the finishes on the casework	$81,000
Thermal & Moisture Protection	Removed the recycled rubber tire shingles	$35,000
Doors and Windows	Removed some of the aluminum storefronts & custom color & changed all of the other windows to a colored vinyl	$45,000
Finishes	Removed the carpet & stained the floors, removed the cloth clouds, antique pictures, hand painted murals, sealing all the trusses, glass counter tops & changed the bathroom hardware	$103,000
Elevator	No changes	$0
Mechanical	Removed the spiral ductwork, used roof top HVAC units, changed all the plumbing fixtures & plumbing rough-in material	$110,000
Electrical	Removed an alarm system, changed the location of the service, removed & changed all of the light fixtures	$85,000
	TOTAL COST SAVINGS:	**$778,000**

Table A summarizes changes made to the Star City Hall project to bring it within budget. The city determined the finishes and extras it wanted to keep or remove, while Benchmark Construction determined structural changes.

Communicating Success • Continued from page 21

the City of Star needed construction to be complete in time for a dedication ceremony at a community event that summer.

The synergy between engineering firm, component manufacturer and framing company offered many benefits on the project. "We offer a much more closely integrated and higher level of cooperation," said Hoyd. Although the three sister companies worked together on this project, Performance Engineers is a separate, stand-alone corporation with its own books, profits and losses, and management structure. More often than not, Performance Engineers and Idaho Truss work on separate projects, while SteadFast Framing typically only works with Idaho Truss building components and framing materials.

Communication played an important role in the Star City Hall project, especially considering the need to lower costs and shorten the construction schedule. "When you shorten up a construction schedule, you've got to offer more communication for a successful project," said Reeder. He added, "One of the things with projects like this is you roundtable with people in the field and people who work on paper. When those things are laid out and talked about openly, that's when the magic starts to happen."

While getting all of the parties talking is a step in the right direction, Reeder pointed out that effective communication is much more than just words. "We found that if you work directly with a contractor you have to make sure paperwork is followed correctly.

Construction Type	Original Concept	Final Concept	Estimated Cost Savings
Hold Downs	28	8	$10,000
Columns	4	0 (eliminated steel stud columns and incorporated into wood stud walls)	$4,000 - $5,000
Framing Method	Conventional On Site Framing	Turnkey Framing with Structural Building Components	$4,000 - $5,000 & 3 weeks off of the framing schedule
Roof	Standing Seam Metal Roof with Recycled Rubber Shingles	Thermoplastic Olefin (TPO) Single Membrane Roof with Asphalt Shingles	$35,000
Concrete	Pavers	Stamp Concrete	$20,000
Finishes	Stainless Steel	Powder Coated Steel	$40,000

Table B compares some portions of the original bid to the methods and materials used in the final concept along with the estimated cost savings for each.

Make sure direct communication is followed up with paperwork so the client gets a building that fills their needs," he added.

Another benefit of this collaboration was how quickly the players could address and resolve issues. The normal process of communicating through the contractor, architect, engineer, subcontractors and then back through the chain to the contractor can often take a number of days. The model used for this project sped up that process, with issues often resolved within a day.

Conclusion

The high level of communication and collaboration between

Continued on page 25

Chapter Corner

For more information about SBCA Chapters and how to become more involved, contact Anna L. Stamm (608/310-6719 or astamm@qualtim.com) or Danielle Bothun (608/310-6735 or dbothun@qualtim.com). Contributions to Chapter Corner, including pictures, are encouraged. Submissions may be edited for grammar, length and clarity.

Chapter Highlights

California Structural Building Components Association

In March, the name change from California Engineered Structural Components Association (CalESCA) to California Structural Building Components Association (CalSBCA) was ratified by the members. The chapter meeting also featured a roundtable discussion on industry issues and the economy. Key topics covered included our legislative work and the rule of 41 assistance we could use, three truss plant tours, our green building work and an update on current testing and how it will affect the California market.

Missouri Truss Fabricators Association

For its March meeting, the Missouri Chapter offered the option of participating remotely via ***SBC Connection*** or attending the meeting at Advantage Framing Systems in Olathe, KS. The members discussed forming committees to handle issues in Missouri and Kansas. Updates were provided on the SBCA Board and Committee meetings in Denver as well as the schedule of sessions for the Annual Workshop & Conference.

Structural Building Components Association of the Carolinas

At their March meeting, the North Carolina and South Carolina Chapters moved closer toward their merger. Having selected a new name, the Structural Building Components Association of the Carolinas, a new logo was chosen along with a new website address, www.sbcacarolinas.org. The North Carolina bylaws are being revised to allow membership by companies in South Carolina, and the South Carolina Chapter will be dissolved.

In addition, chapter members are working with staff to tackle a change in the North Carolina Building Code for commercial construction that now requires sealed truss placement diagrams. We are pulling together code and professional engineering law into a series of ***SBCA Tech Notes*** to lay the foundation for a positive outcome with the North Carolina Department of Insurance (NCDOI) and path forward.

SBCA – Northeast

Northeast Chapter members welcomed Mike Guigli, Technical Director, Massachusetts Department of Public Safety, as guest speaker in January. With a presentation on the building code, Mike emphasized sections of interest to members including Chapter 53 on wind/snow loads, Chapter 58 on roof/ceiling, and Chapter 59 on roof assemblies. He encouraged members to visit the Massachusetts Public Safety website, www.mass.gov/dps, to review frequently-asked questions and other code postings and information. Following the meeting, the group prepared three questions, and answers, that were not yet posted in the FAQ section and on which they would like a code interpretation/clarification: electronic seals, adjustments for ground snow loads and deferred submittals.

The chapter's active winter educational work was reviewed, and members voted to move forward with a live fire demonstration at the New England Fire, Rescue and EMS show in June if arrangements can be finalized. The chapter's name change from WTCA – Northeast to SBCA – Northeast was approved also. **SBC**

Go to www.sbcindustry.com/calendar for details about upcoming chapter meetings and SBCA events.

Communicating Success • Continued from page 22

construction professionals proved to be a winning combination. "That was a great project," Sonderegger said. "Everyone was happy." Making repeat trips back to the drawing board played a vital role in moving the project forward, and ultimately its success. Noting today's economic challenges, Sonderegger says that it was especially wise that the team worked to reduce costs, for the good of the project and the good of the client. "The city paid for it with what they had in the bank. They're looking like heroes now," he said. **SBC**

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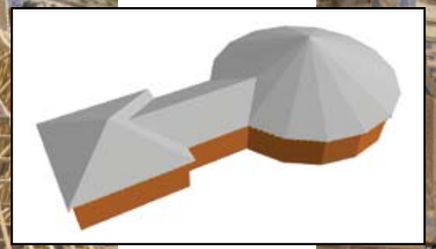

Daniel Snell, truss technician at Niagara Truss & Pallet in Lockport, NY submitted these shots of a 16-sided single-family home located in Basom, NY. Snell designed the roof trusses for the project.

Each of the 16 roof planes are sloped identically. A single girder truss spans the diameter of the home and ties into a steel pole set in the center of the "roundhouse." Snell said the home owners wanted a very distinct vault inside the home (as well as outside). So eight planes on one side of the girder have interior vaults parallel to the roof planes.

The ceiling plane on the opposite side of the girder is flat. Each wall in the roundhouse measures 8'7", with the exception of two shorter walls that lead to a breezeway connecting the house to the garage. "My boss calls [the house] the Starship Enterprise," he laughed.

"[The design] took a lot of preliminary work with the architect and framer," Snell said, noting that his company has strong relationships with local architectural firms. "They look to us to solve design challenges like this." SBC

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