

STRUCTURAL BUILDING COMPONENTS MAGAZINE

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Design Software – What Does the Future Hold? by Keith Dietzen

Engineering. Every truss manufacturer knows that their primary product, the metal plate connected truss, needs engineering and nobody gives a second thought to the notion that as truss suppliers, engineering is part of the value-added proposition for the customer. Engineering of light framed structures has become a more common practice in many markets, and that practice has posed some challenges to the component manufacturing community. They may view this development as a threat or as an opportunity.

The distinction between component engineering and building engineering has been fairly clearly defined in the design responsibility provisions of the revised ANSI/TPI 1-2002. Component engineering is the engineering that justifies the individual truss provided that the geometry, loads and supports identified do occur. The engineer of the building, or engineer of record (EOR), on the other hand, takes responsibility for designing a structure to resist gravity and lateral loads applied to it.

Rapid adoption of IBC and IRC 2000 by building departments and increasing concerns over quality and liability have led to an increase in the involvement of EORs. In my opinion, this trend promises to continue in most markets. The occasional practice of some EORs delivering component engineering has caused alarm in the ranks of some component producers. Is the manufacturer being marginalized? Is the manufacturer's value addition being reduced? Will this reduction erode price levels and profits?

The challenge to the component manufacturer is about to be magnified because of another growing phenomenon. The building industry has forever engaged in a process where the building is described multiple times for multiple purposes—once for architecture, again for building engineering, yet again to specify components, etc. There is huge economic pressure for that practice to change, and the development of Single Building Model (SBM) software that consolidates these functions in one program means it is starting to change already.

Much like the EOR practice, the arrival of these SBM tools poses a challenge to manufacturers—do EORs run this new software, design complete buildings and include truss designs? Or is there a way component manufacturers can take the lead and turn these developments to their advantage?

A CASE STUDY

Idaho Truss & Component Co. of Meridian, ID is a company with typical component manufacturers' concerns. In their market, there are many manufacturers chasing too few jobs. Price is all too often the variable used to get the job.

Kendall Hoyd, President, did what most progressive company leaders have done. Get into other value-added products to become a more comprehensive supplier who builds greater “builder stickiness.” Wall panels, engineered wood products and other framing materials were added to the Idaho Truss “package.”

In 2001, Kendall decided to get into the building design business. He hired a full time structural engineer and some CAD technicians. His strategy was to generate working drawings and engineering for builders the old fashioned way—use CAD to draw drawings and whatever tools to help automate engineering calculations. Then, he would use separate software to design trusses, walls and wood I-joists. Even at that, the design services should serve to create builder loyalty.

Recently, Kendall decided to better the design equation by implementing Single Building Model (SBM) software. Given that Idaho Truss was already in the EOR business, the strategy for implementing SBM software was a no-brainer:

- Use SBM software to build complete 3-D models of buildings.
- Generate engineering and architectural information with SBM software.
- Generate revenue and profits from the design business.
- Because the building model is already built, automatically generate bids for the roof, wall, floor and materials systems.

On the one hand, this strategy preempts the potential threat from the EOR community. Will structural engineers perform truss engineering? For Idaho Truss customers, the company will perform EOR work as well as component engineering, thereby eliminating the concern. In fact, by filling the role of EOR, Idaho Truss is building bonds with customers that should help overcome intense price pressure on components.

At the same time, SBM technology should help Idaho Truss generate revenue for building 3-D models (selling building design services) that are used to generate bid and production information. This, in contrast to modeling buildings to bid components with all costs being absorbed as part of the normal quoting process!

How's it going so far for Idaho Truss? According to Hoyd, “Builders know that we can solve their building design problems. That service is cementing our relationship with a number of builders and has helped us capture some new business. Generally speaking, if we design the building, we end up selling the components.”

What about the financial proposition? “Unfortunately, the building design market is also competitive, which means that it has been tough to become profitable. We are making progress and we would probably stay in the business whether or not it was profitable because of how it positions us with our customers. We have become more than a price-driven material supplier.”

How does SBM technology play a role? “I think it will make all the difference in the world. We are still in the process of implementing this technology, but our first time savings were enormous. One of our technicians told me that he literally saved three days on a building design. On this job, our component technical people built the model to do bids. The building design

technician used the model to create building design information without doing much input. That is how we plan to make money in the design business!”

BUILDING DESIGN – A BUSINESS TO BE IN?

When Idaho Truss decided to enter the building design business, they hired several people and increased overhead. For anyone entering the design business, Errors and Omissions (E & O) insurance, if available, should be considered as well. Like any business, the building design business requires commitments and involves risk. Is there an alternative?

As is the case with so many services, building design services can be outsourced. Companies can be contracted out to generate working drawings and engineering documents. The use of SBM technology makes this option more practical and effective since the component manufacturer and building designer can communicate via the 3-D data model.

SINGLE BUILDING MODEL TECHNOLOGY – THE FUTURE?

Whether or not a manufacturer decides to engage in building design, what role will SBM software play? Again, we seem to be facing a no-brainer. It makes no sense for our industry to describe a structure many times over. The cost of redescribing is passed along to the homebuyer. So is the cost in terms of time. The confusion and waste that results from different descriptions is also costly and will become unnecessary. SBM technology makes sense and should prevail. The question today is who will bring the technology to market and how will component manufacturers participate?

Engineering will be demanded in more markets in the future, so component manufacturers have a technical advantage and a significant opportunity here. To optimize the value-added opportunities it is clear that component manufacturers need to get as close to the building design process as possible and certainly need to retain all the truss design functions, while working to make this process as streamlined and accurate as possible for all involved in the construction process.

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WTCA Policy-Making

On the facing page you will find a copy of WTCA’s policy on Component Design Software Products. This is one of many WTCA policies that has been developed over the years as a result of member concern, committee work and board resolution. Having written policies helps the

membership of WTCA better understand the positions its organization has taken on a variety of issues. It also minimizes any confusion or misunderstanding with respect to WTCA's position on any given topic.

All of WTCA's policies were reviewed and approved by the Board at the WTCA Open Quarterly Meetings on March 1-2, 2002. The policies were then compiled into a binder format, a copy of which was sent to all WTCA Chapters for review and approval. The policies are also posted on the WTCA web site and will be continuously updated when Board actions take place to change them.

If you have questions about any of these policies, think WTCA should re-address an issue or would like to see the Board attend to an issue for which there is no current policy, please contact WTCA staff and your concern will be added to the agenda of the pertinent committee to be addressed at the next Open Quarterly Meeting. Member participation and open communication will facilitate the development of a concise set of policies that most accurately reflects the concerns of WTCA membership.

WTCA Policy – Component Design Software Products

BACKGROUND

The issue is whether the construction industry is best served, and whether component manufacturing industry is harmed, through the licensing of Component Design Software Products ("Software Products") to a person or entity other than a Component Manufacturer for its own design, manufacturing and sale of structural components.

DISCUSSION

The component manufacturing industry has grown due to the fact that the products component manufacturers design and manufacture meet the needs and demands of the building construction industry. Product acceptance and the growth of the industry are attributable to the tremendous abilities of the industry participants to design and manufacture trusses and components creatively, efficiently and cost effectively.

In achieving the goal of providing builders and contractors with safe and economical products each component manufacturer utilizes a unique combination of component design, raw material selection, manufacturing equipment, specifically trained labor and specifically defined manufacturing procedures. WTCA component manufacturer members have a unique set of experiences, are uniquely trained in the context of these experiences, and possess the requisite technical expertise to undertake their scope of work professionally in the context of their unique manufacturing environment. Utilizing Software Products without a sufficient understanding of the unique skills and characteristics of each manufacturer could negatively impact actual performance or the perception of performance of components in the marketplace in very

significant ways. The impact could also include reduced safety for truss plant workers, component installers and consumers.

Truss and component manufacturers are furthermore required to stand behind the products they manufacture and warrant that the products conform to the design and otherwise comply with industry standards and building code requirements. Not only is this a legal requirement, but also a matter of meeting customer expectations. The warranty provided by the component manufacturer includes that the product has been adequately designed as well as properly manufactured. Component manufacturers may also be called upon to indemnify and hold harmless customers and others from any property damage or bodily injury caused by the products they manufacture. If the design parameters for components are determined by and the components are designed by other than the component manufacturer, the component manufacturer will most likely be left with the following issues:

- No legal or effective way to insure that the design work is ultimately done correctly in the context of producing the manufactured product that must conform to the design and application requirements of the construction project, and
- The certainty that those persons doing the design are adequately capitalized and insured in case there are problems resulting from their designs.
- There is also a great deal of intellectual property tied up in the design and manufacturing of components. If the value of such intellectual property is allowed to diminish, which is almost certain if persons or entities other than component manufacturers are designing trusses and components, the likelihood of further investment in enhancing current technology and developing new technology with respect to the design of trusses and components will diminish as well. Ultimately, the reduction in value of intellectual property could lead to the reduction in value of component manufacturing commerce overall.

POLICY SUPPORT

From conversations with connector plate suppliers, we have received feedback that they generally agree with the Component Manufacturers about this policy and the discussion set forth above. Furthermore, it is understood that many if not all connector plate suppliers currently restrict by license or contract the use of Software Products for other than a customer's own design, manufacturing and sale of structural components.

WTCA POLICY

The construction industry is not best served, and the component manufacturing industry will be harmed, if Software Products are leased to, sold to, licensed to or used by any person or entity that does not design, manufacture and sell components. The Software Products should therefore only be used by licensed Component Manufacturers for their own design, manufacturing and sale of structural components. Excluded from this policy would be any sale and design companies who sell and design components only for a particular Component Manufacturer under contract or any design companies who design components only for a particular Component Manufacturer under contract. In such cases the licenses to use the Software Products should contain appropriate restrictions.

For more information about this or any other WTCA policy, please contact WTCA staff at 608/274-4849 or wtca@woodtruss.com. Or, visit the WTCA web site at www.woodtruss.com.

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