STRUCTURAL BUILDING COMPONENTS MAGAZINE (FORMERLY WOODWORDS)
June/July 2000

"WTCA Members on Engineering Advancements" by Melinda Caldwell

The last two issues of *WOODWORDS* took an in-depth look at how and why technology has impacted the component industry. From software technology to innovations in machinery and automation the pace of technology is moving the industry forward at record speeds. The engineering side of this business has also seen its share of changes, improvements and challenges due to the increasing role of technology. A few of WTCA's members recently took some time to reflect on the past, present and future of engineering advancements in the component industry.

WOODWORDS: WHAT TECHNOLOGICAL ADVANCES ARE BEING MADE AND HOW DO THEY HELP YOUR CUSTOMERS?

Jay H. Crandell, P.E., Director, Structures & Materials Division, NAHB Research Center, Upper Marlboro, MD: "Some of the biggest advances are mainly in the increased availability of alternative materials and methods of construction. Each of these newer alternatives involves a host of engineering advances. Not only do they provide solutions, but healthy competition."

David Gromala, Senior Engineering Specialist, Weyerhaeuser Technology Center, Tacoma, WA: "The technical support of our products has never been more efficient. We have hundreds of engineers and technical representatives who respond to thousands of technical inquiries more quickly than ever. The same advances in information technology enjoyed by the public at large (email, faxes, voicemail, cell phones, pagers, etc.) enable our technical staff to respond to customer needs almost as quickly as the need arises.

"We are also facing a division of opinion in our industry regarding the need for technical field support for our products. Some say that the Internet can provide basic information about our products and that our customers should hire outside engineers to deal with any field engineering issues that arise. Others believe that our industry is best-served by providing not simply raw materials but structural solutions to our customers—and that providers of structural solutions will, by definition, service our customers' technical support needs as well. The technological challenge is to provide a structural-solutions level of support to our customers in a manner that is so efficient that they wouldn't even dream of accepting the alternative.

"The 'commodization' of our technologically-advanced LVL, I-joist and PSL products will occur when new entrants into the business turn to lumber/panel pro-duct industry associations to provide all of the engineering expertise while retaining no qualified engineers in their own companies. The skills and processes needed to ensure product quality and application oversight must be inside the company—they cannot be 'contracted' to third-party organizations without losing something in the process. And, if all technical functions are contracted rather than inherent in the company, who will lead the next wave of LVL, I-joist and PSL product or process innovation? Or, will we simply compete on a minimum-quality, minimum-cost basis?

"As we move toward a single national building code, it is also unclear whether the model code evaluation system will become more 'competitive'—moving toward lowering of review costs and review quality in the process—and eliminating one of the 'balances' in our current system of checks and balances.

"We face an additional challenge related to the technical talent in our industry—that of recruiting and retaining high-quality people. Unfortunately, we're not in a sexy industry (like the dot-com's). We need to work hard to get students to understand the opportunities that exist in our industry.

"Finally, the industrial engineering/automation side of our business is one of the bigger challenges in manufacturing today. The amount of information that can be collected by automated systems is enormous—overwhelming, if not managed properly. This concept extends to that of 'customer-specific' grades of lumber—very efficient in concept, unworkable if not managed properly."

Gregg Renner, Market Manager, TrusJoist, Duluth, GA: "Advances in a 'systems' approach to wood design will allow structures to be put in place faster and with less wood fiber waste. Benefits to the industry are more building for the same money, or the same building for less money, these may also help preserve reasonable profitability for the long term."

Scott Coffman, Engineering Manager, Builders FirstSource, Sumter, SC: "Computer software is consistently being improved to analyze various geometric truss shapes requested by design professionals. Our customers now expect the truss industry to quickly create exterior views to visually show builders and homeowners how the completed structure looks."

***WOODWORDS*: WHAT ARE THE MAJOR TECHNOLOGICAL ISSUES THAT YOU ARE CURRENTLY TRYING TO RESOLVE?** How have these issues changed from the past?

Crandell: "For me, the issues include construction quality (effective process management and process simplification), conventional construction versus conventional engineering (reconciling the differences through system-based studies, testing and analysis), the durability and performance of existing products/materials, and barriers to technology (regulatory, perception, uncertainty, etc.). As for how these issues have changed from the past, I tend to believe that 'there's nothing new under the sun.' Mankind has been faced with the issue of change and technological advancement (or regression) since day one."

Gromala: "In the design software area, the call for fast turnaround has never been greater. Just as the transition to overnight delivery of architectural drawings chopped many days off each 'turn' of the engineering documents and became the new expectation of our users, the transition to electronic delivery of information is leading our customers to demand virtually immediate engineering answers. We are searching for ways to jump the hurdles of inefficiency that stand between the formats of the customer's architectural data (paper drawings, line-based electronic drawings, etc.) and the object-based formats of our 'smart' engineering software."

Renner: "Technological advances are simply moving much faster and the need to resolve direction is more urgent because of the negative impact of standing still. Considering the trend for proliferation of technology and service providers, technological advantage is no longer the exclusive privilege of the largest companies. It will belong to the most innovative and quickly-moving companies. No one can afford to rest on their laurels in the current and future environment."

Coffman: "Truss profiles are more complex and production quantities for each type are minimal. Quick results demanded by the customer cause an inefficient and sometimes erroneous structural design....Providing wall and truss components requires coordination between the respective designers. This also requires some connection design not typically provided; roof truss to wall plate and wall panel to wall panel where sheathing is not continuous across the stud. The ANSI/TPI 1-1995 code indicates that connections between two or more members, all of which are designed or specified by the truss designer, shall be designed by the truss designer. Contractors and professional building designers are applying this thinking to truss-to-wall panel connections."

***WOODWORDS*: WHAT IS YOUR PICTURE OF THE FUTURE OF ENGINEERING TECHNOLOGY? WHAT ARE YOUR SHORT- AND LONG-TERM VISIONS?**

Crandell: "My concern is that engineering technology will become a replacement for the engineer and that the profession will become more and more dependent on technology to produce answers with an increasing demand for speed and number-crunching power. At the same time, this demand to use sophisticated approaches will render obsolete those ideas or approaches considered to be 'archaic,' but which have served a very functional and practical purpose. Sophistication in engineering emphasizes 'quantification' over 'judgment,' when both are actually very important. In short, we may lose an important historical aspect of how we discern good and bad when it comes to applying new technology (or old technology for that matter) if we don't persistently reinforce our understanding of 'tried-and-true' methods while exploring new ground."

Gromala: "Unfortunately, I don't share some of the 'revolutionary' visions of the future espoused by some of my colleagues. I believe that in five, ten or even twenty years, structures will be built largely the same way they're built today. I believe that we'll use lightning-quick communications technologies to wring out every little delay from the construction process that's currently due to someone waiting for information from someone else. I believe that many of the structural products that we supply to our customers will be much better than those we provide today—stronger, stiffer, straighter, more durable. Unfortunately, I also believe that some of the products that we'll supply will be worse than those we provide today—if manufacturing efficiencies let us wring out all of the excess cost and if our customers only demand lower costs and not higher quality from our products or better technical support from our suppliers."

Renner: "As the rate of change in products and technology increases, so will the need for tools to make those changes user-friendly in their real world application. This will be especially true as we deal with a tight, under-trained labor force. I expect to see the engineering technology moving more quickly toward systems design, and incorporating that approach into packages that arrive on site with less labor required to install them."

Coffman: "Poor architectural/structural plans and labor pools will result in the total design performed by the truss engineer….The software tools would analyze the overall building structural requirements, download this information to the component design module and determine 'loose' materials that need to be provided by the lumber yard. The entire framing package cost, including installation, could then be provided."

If you are interested in sharing your thoughts on this topic or responding to an individual idea presented here, you can do so through the *WOODWORDS* "From Our Readers" column. Simply send a letter to the editor via fax at 608/274-3329 or email at editor@sbcmag.info. *WOODWORDS* encourages feedback and dialogue of this kind. The staff does reserve the right to edit submissions for length, grammar and clarity.

SBC HOME PAGE

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 of structural building components to ensure growth and continuity, and to be the information conduit by staying abreast of leading-edge issues. SBC will take a leadership role on behalf of the component industry in disseminating technical and marketplace information, and will maintain advisory committees consisting of the most knowledgeable professionals in the industry. The opinions expressed in SBC are those of the authors and those quoted solely, and are not necessarily the opinions of any of the affiliated associations (SBCC, WTCA, SCDA & STCA).