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Editor's Message

Ready, Get Set for Whole House Design

by Barry Dixon

Whole House Design (WHD) holds tremendous opportunity for component manufacturers.

Whole house design" (WHD) seems to be the industry's latest buzz word or catchphrase. However, I wonder how many component manufacturers are really sure what it actually means. WHD offers countless benefits in efficiency and cost savings for builders and homeowners—not to mention a great way for manufacturers to find a niche in their market by offering a value-added service. With that being said, having worked in WHD for more than a decade, I've seen that there are complex but crucial issues manufacturers must consider before offering WHD services. Let's take a walk through WHD and shed some light on this catchphrase. We'll touch on the areas of software, the importance of load paths, single element design vs. system design, and industry testing that can take WHD to new heights.

Software developers fueled much of the talk about WHD that began a few years ago when many of them announced they were integrating roof and wall systems. This initial integration that allows for modeling the components in a structure—wall panels, roof and floor trusses—in the same software program was an important step. This advanced modeling brings the industry closer to developing a solution that will eventually allow manufacturers to follow the flow of loads down to the foundation. While this initial integration is a major first step to WHD, there will have to be dozens of advancements beyond that to have complete WHD software or automated "one-push-of-the-button" solutions that not only include all components in the structure, but the foundation, soil and all loads.

...WHD is here to stay, building momentum and bringing the structural integrity of buildings to a whole new level.

One of the first steps to a true software solution was the transfer of design capabilities from a 2-D to a 3-D drawing. Moving design into a 3-D format allows the software to begin to analyze the real dimensions of a component, not just the lines. The next step now lies in the flow of loads, which consists of gravity, wind and lateral applied load conditions acting individually or simultaneously. Our industry and codes are based around single element design properties where each product is rated as if it is stand-alone and not part of a system. For example, trusses are single element designs comprised of single element parts, such as 2x4 lumber and truss plates. Today's software does not take into account the entire quantity of trusses in the system. Likewise, the software does not account for the plywood sheathing, sub-fascia, permanent web member bracing, or the sheetrock on the bottom chord.

While software solutions are in development, component manufacturers can offer WHD today by working with an engineering firm. More than ten years ago, True House started working with an engineering firm to offer WHD and bridge a gap in our market for this value-added service. After a few years, we expanded our WHD offerings by forming our own engineering company. Through the use of spreadsheets, formulas, code and individual element analysis, engineering firms can tie all the pieces together and evaluate an entire structure. By forming these partnerships, manufacturers can deliver a complete solution on the design side by offering

Continued on page 8

at a glance

- ❑ To fully understand how loads interact with each other, they must be tested as a system instead of as an individual element.
- ❑ WHD is here to stay, building momentum and bringing the structural integrity of buildings to a whole new level.

...the SBC Research Institute will give us the in-depth analysis from testing that can be integrated into the modeling needed to take the next steps toward true WHD, as well as advance the use of all structural building components.

Editor's Message

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an extra level of connectivity between the truss and structural design. These advancements are becoming increasingly important especially in the wake of catastrophic disasters such as tornados and hurricanes and resulting changes to the codes. By partnering with an engineering firm, manufacturers can go the extra mile for their customers without personally taking on the education, training and additional liability of being the engineer.

Component manufacturers' current work in WHD and the hard work that our suppliers are undertaking with software developments on the horizon are a testament to the need within the industry for a comprehensive understanding of the flow of loads within a structure. To fully understand how these loads interact with each other, they must be tested as a system instead of as an individual element. Realizing how imperative this kind of testing is, the WTCA Board of Directors elected to build the SBC Research Institute, our industry's research and testing facility, which will look at these issues and then share the findings with the construction industry as well as the building code community. This testing will have the capability to follow the load path on four axes simultaneously, thus allowing us to begin to understand how individual components work within a system. By looking at the flow of loads through a structure and not just a single element, the SBC Research Institute will give us the in-depth analysis from testing that can be integrated into the modeling needed to take the next steps toward true WHD, as well as advance the use of all structural building components. For more on the SBC Research Institute, see the article on page 44.

Whether it's working with an engineering firm or our suppliers working with component manufacturers to develop comprehensive software solutions, WHD is here to stay, building momentum and bringing the structural integrity of buildings to a whole new level. Much how truss design software revolutionized the industry years ago, WHD can revolutionize the industry again. Along with developing structurally sound buildings, component manufacturers can use value engineering to realize the proper use of materials and connections and ultimately drive down construction costs. And that's just with the knowledge we have today! Our understanding of the flow of loads within a structure will expand with testing conducted at the SBC Research Institute and is sure to push WHD to new heights. Get ready; this is only the beginning. **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.

STRUCTURAL BUILDING COMPONENTS™

THE FUTURE OF FRAMING

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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 WTCA – Representing the Structural Building Components Industry. The opinions expressed in *SBC* are those of the authors and those quoted, and are not necessarily the opinions of Truss Publications or WTCA.

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