

# COMPONENT MANUFACTURERS WEIGH IN ON WHOLE HOUSE DESIGN SOFTWARE

The discussion about this cutting edge software technology continues.

by Libby Maurer & Kirk Grundahl, PE.

**T**he next piece of technology with the potential to revolutionize the industry won't have a blade or machine guards. It could increase your liability, but also your bottom line. And, its inventors are saying it has tremendous potential to bolster the marketability of all structural components and related engineered products to builders and general contractors.

While it's anyone's guess when the first fully integrated whole house design software package/suite will be released to the marketplace, it seems that component manufacturers (CMs) are ready. SBC One Minute Poll results indicate that the majority of component manufacturers are looking forward to the day when one software program and one designer is all that is required to complete the design of a structure. We asked CMs whether their companies have considered expanding their design services to undertake more structural element design, and **74 percent** of you indicated you have.

So the vast majority of you have WHD on your radar screens, but not everyone has the same ideas about what this new technology will mean for your businesses. In fact, the range of feedback we received reflects an ongoing industry-wide exchange that is timely, healthy and critical to our evolution, growth and sustainability. So join this discussion; read on for an inventory of component manufacturers' most pressing questions and find out where you fall in this conversation. (Names have been omitted to preserve anonymity.)

## Question: How Do You Define WHD Software?

This question has been at the crux of this discussion for many years, so once again, we asked how you would define the capabilities of WHD software. The majority of respondents—**32 percent**—said their impression is that the user will input the loads; and the software will design and optimize all structural elements and diaphragms to resist all the loads. About one-quarter of you (**23 percent**) feel that WHD will require the user to input the loads, while the software does the design of the individual roof elements; flows those loads onto the support structural below them; designs the headers, beams, walls elements; flows those loads onto the floor elements; and designs the individual floor elements. **26 percent** feel that WHD will perform one or both of the functions described above, but also has the functionality to complete construction drawings, perform material take-offs, and import all this directly into a third party CAD program. Another **19 percent** admitted they haven't thought much about what this software might entail.

While it seems that most of us understand that this technology will ultimately allow us to undertake more of the design process *more* efficiently than we currently do, we still don't share a common definition of how *much more* we can expect. The answer to this question lies in the level of sophistication written into the various software versions. We do know that your perceptions about what WHD can and will do are, in fact, where the software is headed. As these products develop and get used in the market both in full release versions and through the beta process, we will continue to learn more about just how closely our perceptions match reality.

## Question: Will We Have Increased Control over Building Design?

Many of you are looking forward to the added control you will gain when you have the ability to design the whole house. Some of you pointed out that WHD software

will allow your companies to become more involved in the overall construction process.

Some noted that the more control they have, the greater the overall market share of components you will be able to capture in your markets. And many of you are excited to be able to offer more to your customers. One manufacturer said WHD will enable component manufacturers to "effectively spec out and provide beams, shear walls and other components they previously could not."

In theory, a fully integrated software product that designs and optimizes all structural elements (roof, walls and floor) and maps the flow of loads down to the foundation will give manufacturers the opportunity to expand their roles. But the extent to which they expand will ultimately depend on the software capabilities and where in the evolution process component manufacturers begin this journey. For instance, will the software allow the user to carry out more than just the design and engineering of all the individual components that make up the structure? Will we design shear walls, diaphragms, load transfer through multiple members, and architectural effects?

## Question: Will We Be More Efficient?

Many of you commented that the presence of WHD software will increase your efficiency and reduce the occurrence of errors within the design process. Comments like "[WHD] will assist in providing uniformity in design and assist in alleviating errors" and "should help reduce the need for multiple designers" suggest that component manufacturers are optimistic that moving to a single source software solution will provide a streamlining effect.

Greater efficiency and a decrease in redundancy may turn out to be the case with respect to the specific design functions of the business. The real question here then turns to the internal processing of plans and how does WHD fit current technical/design operations? What changes will need to be made to in the way that you undertake your design process to get the more productivity improvements from WHD.

It remains to be seen how the changes necessary to move to a full WHD business model will make the overall construction process more efficient. This will ultimately be determined by component manufacturers' relationships with their marketplace and the demands that their customers place on everyone for change. Included in this mix is how we will interact with architects and engineers. It is yet unclear as to how this process will evolve. And finally, framers still have a very large influence on how much forward progress gets made in the



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building business. They could either find advantages inside the use of WHD software or put up barriers to its use.

## Question: Will We Get Paid?

While most of you see this as huge opportunity to capitalize on a new revenue stream, a good number are wary of whether you will be sufficiently compensated for assuming a bigger role in building design. One person said, "[WHD] will be a very positive move for our industry as long as we remember that we need to charge for this service and not 'include' it," which is something that component manufacturers will have to take a hard look at as they choose to move to a whole house business model. A few also talked about the additional liability they may assume: "Whole house design may increase profitability if we can get paid for taking on the liability." We need to ask ourselves whether architects and builders build the homes they want today without using component engineering and manufacturing. The answer to this question will help us address whether or not we are getting all the value out of the unique technology that we bring to the construction process today. Furthermore, we will need to seriously consider how to get all the value we can from future WHD technology.

## Conclusion

While we're not sure exactly when all the various elements of the complete WHD software's potential will come together, it does seem certain that whole house design software will become increasingly available in the near future. When it happens, the foregoing will be just the beginning of the questions that we all will need to address. Rest assured that this topic is with us for a long time. Our best course of action is to continue to discuss these critical questions as WHD within our industry evolves. **SBC**

## at a glance

- ❑ Component manufacturers don't all share the same definition of whole house design software.
- ❑ As we move closer to fully integrated WHD software, component manufacturers wonder if it will make them more efficient, if they will get paid for their work, and if it will increase their liability.
- ❑ The best economic framing solution will likely inform the evolution of the industry.





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## Business Considerations & Whole House Design

Due to an increase in the "one-stop shop" trend on the part of builders and general contractors, component manufacturers are now selling things like headers, connectors, and miscellaneous framing lumber—in addition to wall panels or wall framing lumber, roofs and floors—in packages. The goal of WHD is to allow a component manufacturer, with the help of an aligned structural engineer, to take a holistic view of engineering the structure. This results in truss designs that are compatible with header, girder, wall and floor below designs where the goal for the structure is to incorporate the most efficient framing techniques possible into the design of each of these components. The entire process of design, manufacturing, delivery, handling and installation accounts for ease of application on the jobsite. This even includes all the miscellaneous framing lumber and other "accessories" needed by the framing crew to progress through the construction process without delay.

Done properly, WHD's goal would be to optimize the engineering for each structural component, connection and installation detail, thereby encouraging everyone in the construction process to figure out how to be most efficient. This ultimately should lead to the best economic framing solution for each construction project.

The following concepts/challenges are being driven by a market-place looking for solutions to the construction issues at hand:

- Builders absolutely want to turn the land they develop as quickly as they can. This provides them with a greater return on dollars they invest. Therefore, efficiently designing and framing of houses they build and sell becomes an important aspect of their business strategy. The challenge to design and frame quickly and efficiently ultimately leads to increased pressure on suppliers with respect to building design, material supply and installation.
- The challenge revolves around integrating our industry's truss and structural element design work into the building design process.
- For component manufacturers, the key is predicting the impact of taking on more of the design and framing work given the manufacturer's traditional role of component design and manufacturing and delivery to the jobsite.
- The current industry business models are a highly fragmented combination of the following independent businesses: component manufacturers, lumber dealers, truss designers, building designers, framers/installers, builders/general contractors and developers.
- In the market today, there is also a continual push to eliminate steps in the distribution process or to consolidate to improve profitability. Therefore, it seems inevitable that a good percentage of construction will eventually integrate component design with building design.

The best predictor of how an industry will evolve is usually simple economics. The driver of this change will be what business structure or combination of businesses will provide the best and most economical structural framing solution. WHD could very well facilitate an evolution of the traditional model to one that is more streamlined and involves

greater coordination among component manufacturers, truss designers, building designers and framers. These market-based solutions could run a gamut that includes the following:

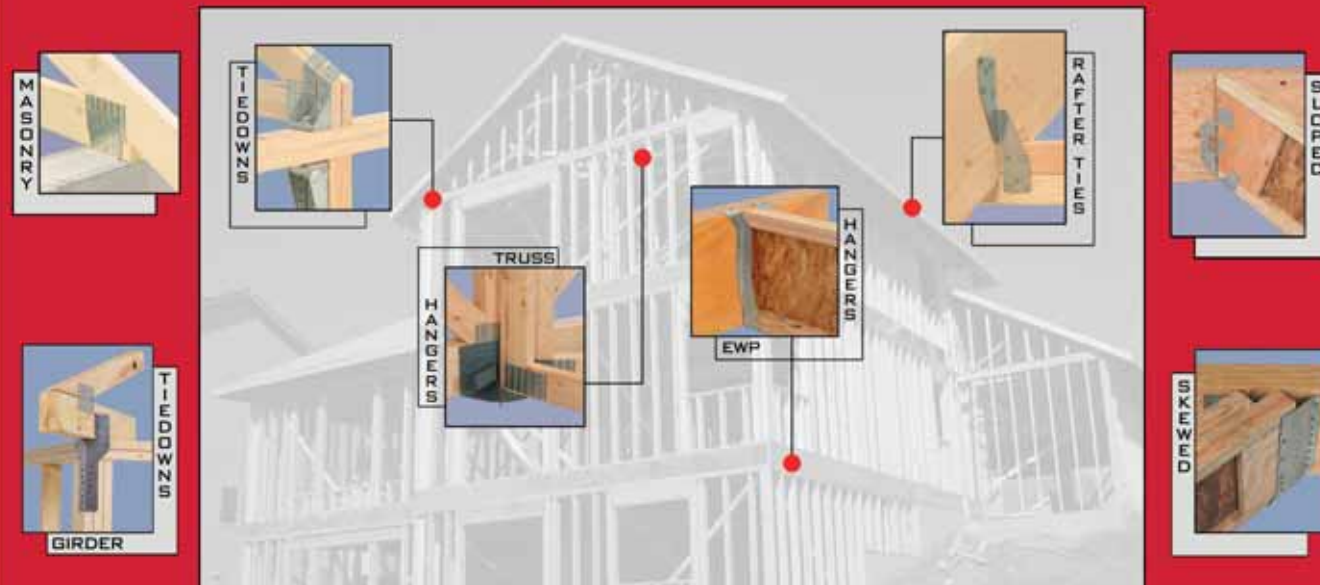
- Component manufacturers/suppliers, truss designers, building designers, and framing crews creating loosely formed alliances.
- Component manufacturers/suppliers, truss designers, building designers, and framing crews creating formal alliances or joint ventures.
- Component manufacturers/suppliers, truss designers, building designers, and framing crews creating new consolidated companies.
- Builder/Developers buying component manufacturers/suppliers, truss designers, building designers, and framing crews, etc.

Each of these scenarios provides the "one-stop shop" that the builder owner/developer desires to have.

If one believes that the aforementioned concepts describe the optimum economic and business model, then it is only a matter of time that this approach to the construction business will become the norm. The market and economics are usually pretty unemotional and efficient about determining what the best and most competitive business solution will be.

Given this, the key question is: How will the vision your team has for your business fit into the optimum economic and business model in the near and long term? This is not an all or nothing question—it is probably a game of inches of consistent persistent forward progress. **SBC**

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