

Stick or prefab?

wood product research builds hope

by Rusti L Lehay

On any given day on a Habitat for Humanity build site you can encounter a myriad of people each with an interesting story to tell about why they are giving of their time to help build homes for low income families. If you were on a build site in Edmonton, Alberta in April 2007, you would likely have noticed a competitive air about the workers on two of the three tri-plexes under construction.

That competition was ignited by an exciting research project conducted by Forintek, a division of FPInnovations. The wood products research project set out to prove which is better—stick building or prefabrication. The research considered speed, quality, waste materials, and cost.

Dalibor Houdek, Ph.D., Group Leader, Alberta for FPInnovations – Forintek Division says he keeps hearing the same question repeatedly from members of the construction industry. “Everyone wants to know if you can actually make money with prefab. The perception out there is that prefab is more expensive than stick frame building.”

Houdek pitched a research project proposal to Alberta Sustainable Resource Development (SRD) and Western Economic Diversification (WED). The only way to objectively study the two building methods was to actually build two homes/structures side-by-side with experienced companies comparable in years of business and measure all the factors that are important to the industry.

After SRD and WED approved the project, Houdek faced the challenge of location. “We could have built these homes in a parking lot and made them ready to move afterwards. We felt that might be discounted by the industry,” says Houdek. The parking lot also meant limitations on space. “We wanted to be as realistic as possible.”

Memories of meeting a representative from Habitat for Humanity Edmonton at several tradeshowes related to forestry and construction clicked into an idea. “Suddenly it came to me: why not work with Habitat for Humanity? That’s where the fun started.”

The next challenge Forintek faced boiled down to financing and getting the project started. It helped that Habitat for Humanity Edmonton was in the process of standardizing their construction processes and had plans to begin construction on a site in the Norwood area in downtown Edmonton. Plans included three tri-plexes side-by-side.

Thinking this was too big for the study and to finance, Houdek proposed doing two side units. Engineering problems prevented that from happening. “We then tried to get more dollars to pay for more construction. We were successful doing that.” Everyone agreed the project was important. Working with forest industry members and HfH-E staff, they collected donated materials for the construction of two of the tri-plexes. “HfH-E had very good relationships with companies we worked with and members of FPInnovations. It

wasn't as difficult as we had anticipated.”

Next on the list of challenges to be overcome: choosing the construction companies to collaborate on the project. In the midst of a very hot construction market, would two professional companies commit valuable time fitting this project into their schedule with their other obligations. “We wanted them to treat this like any other project. We wanted to orchestrate this experiment to go as smoothly as construction could be with as little interference from us or anyone else that they would experience on any regular job sites.”

With the builders in place, Houdek also realized there could be issues related to timing and experience working with trades as HfH-E didn't necessarily have the same time constraints for building. “I guess my biggest fear was meeting deadlines. When you have professionals, time and money on the table, timelines have to be met or the entire project would be in jeopardy.”

Details were worked out. HfH-E understood the importance of meeting the timings. A date was set for construction to begin on April 23, 2007. HfH-E agreed to take responsibility for the basement, the subfloor on the main level and obtain all the ground and engineering permits.

Alfred Nikolai, President and CEO, Habitat for Humanity Edmonton, concurs with Houdek. There were major challenges involved in synchronizing schedules between the build and the construction workers Forintek hired for the project. “We ended up meeting the first of several deadlines by using a large group of volunteers throughout the Easter long weekend to get the site ready. It was tight—the weather was wet and it was cold, but we pulled it off and were ready to go as planned.”

Meeting deadlines throughout the project was an ongoing challenge. “A builder called in and canceled three weeks before the project began.” Thankfully, Forintek anticipated they had to have a backup because the construction industry was so hot. Glynn Construction stepped in with thirty years of experience in stick framing. Forintek may have held their breath a bit without a back up for the prefab. “There were few experienced prefab construction companies. We had worked with LTC construction in the past. That made a world of difference.”

The whistle was blown at the beginning of day one and the sounds of construction added to the buzz of excitement captured and documented from beginning to end in a movie. Researching the difference fairly between the two systems of construction required accurate documentation and an open mind. An audiovisual tracking of the construction progress would help to provide irrefutable answers for Forintek.

The movie would also be used for education after the study. “We certainly had our expectations and it was quite clear if we bring in a house in panels and we do 30-40 percent of the work off-site, we expected the pre-fab construction to go a lot quicker,” says Houdek. “We weren't sure how much quicker.” One unanswered question was if the difference in the time it took to build would offset the cost of the components. Prefab

industry standup crews are paid less because there are more entry-level workers and the productivity is higher.

LTC worked and communicated with Forintek on an ongoing basis regarding what they needed and how they needed it. “They helped shaped the project to deliver a credible, believable and acceptable outcome by industry. Actually that made me sleep a little better at night. They were committed.”

Glynn Construction, no less committed, had to deal with a delay on the delivery of some components. “They were quite understanding and knew we tried.” They kept busy somewhere else for two days and they didn’t allow it to derail their efficiency,” says Houdek.

Based on known numbers and held assumptions, Forintek compared costs by approaching manufacturers of panels in western Canada asking for quotes on prefab packages applicable to a medium volume builder. The range of price, averaged \$10,250.00. “Using that as an average cost for the panel package, the actual prices came very close to each other,” says Houdek. “That told us panels are not more expensive. The actual cost is identical.”

As a result of the build comparison study and partnering with Habitat for Humanity Edmonton successfully, Forintek can now respond with proof to questions coming from the industry. “It allows us to build information packages for the industry to consider and allows us to transfer this knowledge through seminars and industry attended events,” says Houdek. Ultimately it puts the information in credible data for the entire industry to use.

The results have impacted HfH-E too. In addition to receiving a donation of six homes built to lock-up stage, they now have a model to use in prefabricating future homes.

“This is a tremendous advantage since we have the space in our warehouse to set-up a prefabrication system,” said Nikolai.

Habitat now has homes for six more families. Forintek has their answers and for the first time has a powerful tool to convey valuable information to the industry. “According to the stats, the movie we made of the process is the number one or two top download.” Using audiovisual media to transfer information is proving to be quite effective. Houdek says, “We will look at using that medium more often.”

The research would have been done, however using the research to help HfH-E meet their mandate to build homes and build hope, means the outcomes will have a life-long impact on the industry and the community.