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OCTOBER 16, 2008 ISSUE

Thinking Outside The Box By Using The Box

High Country Green Boxes LLC Unveils New DwellBox Residential Line in Boone

Story by Sam Calhoun

Sometimes, entrepreneurs have to use the box to think outside the box.

Partners Casey Pond, Ethan Anderson and Jeffrey Scott—collectively known as High Country Green Boxes LLC—are doing just that, as they are nearing completion on the first permanent inter-modal steel building unit (ISBU) residential home in North Carolina. The home, made from two 40-foot wind- and water-resistant shipping containers that are cut in half and stacked in a square, is located near the ASU campus and will be completed by the end of the month, just 34 days after the partners broke ground.



“And the best part is that when you take out the learning curve, [the construction cost] will be under \$100 per square foot,” said Pond.

Once completed, the project will be home to a local business person and will serve as the first project for the residential line of High Country Green Boxes LLC DwellBox. The DwellBox is one of 75 permitted ISBU housing projects in the nation and the first in North Carolina, according to Pond.

Background on ISBUs

ISBU housing is new to the residential world, but the idea of using shipping containers as public and commercial structures has been in practice for many years. In Africa, ISBU structures are used for schools, universities and medical facilities. The United States military uses ISBUs for temporary structures at Fort Bragg, and European travel lodges are starting to use ISBUs for framework.

According to an article on InvestorGeeks.com, entrepreneurs across the country are beginning to build affordable homes with inter-modal steel building units because of a surplus of the units in America. China exported \$243 billion worth of goods to America in 2005, but the United States only exported \$41.5 billion worth of goods to China, leaving a trade deficit of \$201.5 billion. As a result of this disproportionate balance, tens of millions of empty cargo containers are



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collecting in America, and it is cheaper to stockpile the containers than return them empty to the Far East. The surplus is leading many communities in California, for instance, to look at building with ISBUs.

"Architects, designers, planners and homeowners are finding renewed interest in these inter-modal steel building units as they look for affordable, sustainable housing options for the 21st century," said American home improvement guru Bob Vila in the article.

"You see a lot of these [ISBU housing units] on the Internet but it is mainly an academic exercise—just drawings," said Pond. "But when we found out that no one could find a real example in North Carolina, we jumped on it."

Preparing To Build The DwellBox

The partners came up with the DwellBox idea 1.5 years ago. They felt their idea was solid, but the concept was new to most everyone, from the Town of Boone all the way up to the North Carolina Department of Insurance, the governing body of building codes in North Carolina. Even after the partners decided that the first DwellBox would be small and low risk, it took four months for the partners to get enough information on the structures to even get the permitting process started.



After looking at the partners' plans, the Town of Boone Development Services Department referred the decision for a building permit to the North Carolina Department of Insurance. When a new product or process comes along, explained Pond, the North Carolina Department of Insurance has to decide how it fits into existing building code and also how to properly modify the building code. Because ISBUs are engineered for shipping goods across the ocean and on trains and not for building units, no information exists

on their structural integrity in relation to a home, so all parties involved were breaking new ground, and new code had to be established.

"There's a huge disconnect between how these things are used traditionally and what we are doing," said Pond.

"This was a research and development experiment," said Anderson, who owns the DwellBox.

Pond, Scott and Anderson are very thankful to the Town of Boone's Development Services Department for working with them on this project, and said that many Boone employees had helpful suggestions that enhanced the project.

"We've proven we can do this in municipalities with stringent building codes," said Pond.

The DwellBox

The partners chose a simple two-story design that features a two-car garage and one bedroom and one bath.

"We thought it was much easier to learn on a small project than on a big one," said Pond.

The structure features 320 square feet of heated living space upstairs, and 320 square feet of unheated space downstairs for a garage and storage area. The cost per square foot is roughly \$100, and the partners said that figure wouldn't change much if the square footage increased.

"You'd actually save more money on a bigger one," said Anderson.

The partners hired David King of Construction Solutions to be the general contractor on the project.

The base of the structure, of course, is shipping containers. Shipping containers are available used, but you can also buy them new. The cost of a brand new shipping container tops out at \$5,000, but they come in different designations and for cheaper prices. Some are sold after one trip—called "one-trippers"—some are sold as non-cargo worthy and some are sold as wind and water resistant, such as the two used for the



DwellBox. Both shipping containers used in the Boone home cost roughly \$2,600 apiece, according to Pond.

All shipping containers are built to ISO standards that dictate their size within one-eighth of an inch, so the boxes can be stacked securely for travel. These exact dimensions also help assure builders that different containers will match up correctly. For the DwellBox, the partners used two 40-foot shipping containers that they cut in half, placing two half-lengths beside each other and then again for the second story. Shipping containers also come in lengths of 20 feet and 53 feet. The 20-foot shipping containers are 8 feet tall and the partners wanted a higher ceiling, so they bought the 40-foot varieties that are 9 feet, 6 inches tall to provide more headroom.

"They're just like big, big Legos," added Anderson.

All shipping containers also come with similar corner castings that Pond, Anderson, Scott and King used to secure the containers to 3-foot deep concrete piers in lieu of a foundation.

To create the DwellBox, the boxes were welded to each other and the space in between the two stories was filled with spray foam insulation. Welders modified the boxes by cutting holes for doors, plumbing and electrical wires. Workers installed windows from the Watauga County Habitat for Humanity ReStore, and built a wooden deck around the side and front of the house.

DwellBoxes can have siding, but the partners chose not to put it up on their first project so people could see the base of the structure. In addition, the partners think that once painted, the structure will look aesthetically pleasing. The partners, however, decided to put a roof on the DwellBox even though it was not needed or required. In the future, they hope to build DwellBoxes that have rooftop gardens.

"It's all about public perception. It's a perception game we are playing," said Pond. "If people get a good perception of what we are doing, then the idea can be taken to many different markets and it can provide affordable and desirable housing to the working class—teachers, police, firemen, small business owners. We chose to do this in town because it can be a visible project; people can see that it is affordable, aesthetically pleasing and they can see how they can be tricked out if people want that."

"And at the baseline of this construction, there's sustainability and energy efficiency," added Scott. "Think about it; you have a completely renewable resource as your starting structure."

"And once you are done with the house, you can just melt it down and recycle it," said Pond.

What's Next?

Through the process of building the DwellBox, the partners learned a wealth of information about the permitting process for ISBU housing and developed plans for building the structures, minus the learning curve. They hope to package all that information and market it nationwide because they could find no such information during their research and development.

"We hope to get to a point where we can send technical directions, modified boxes and working plans anywhere in the world," said Pond, who, with his partners, has ideas to get shipping units, cut door holes and rough openings, install windows and doors and then ship them to customers around the world. "We have learned we can modify the ISBUs without being classified as a modular home because we wouldn't install wiring or plumbing," he said.

The next challenge is getting banks to approve mortgages for the homes. Pond said some local bankers have said they see no problem with approving mortgages for the houses at the community bank level.

For more information about building with ISBUs, click to www.fabprefab.com, www.dwellbox.com/dwellblog/ and www.isbu-info.org.

To set up an appointment to take a look at Boone's DwellBox, call 828-265-9812 or email info@dwellbox.com.

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