



NOT YOUR GRANDFATHER'S TRAILER

ENERGY EFFICIENT MANUFACTURED HOUSING

By Edna O. Schack

I'm riding with Josh Trent, Frontier Housing's Communities and Design Division Manager. We pull up over the newly cleared knoll onto the ridge and the October sky envelops us, magnifying the yellow and orange forested mountainsides visible in every direction. It seems as clear as the blue sky why Appalachian people choose to stay here despite the economic hardships of the region.

We've come to this eastern Kentucky ridge to chronicle the arrival and setting of Frontier Housing's first single section manufactured home, an ENERGY STAR qualified home built to Frontier's quality specifications at the Norris plant of Clayton Homes. While this plant generally builds only multi-section homes, they agreed to this single section venture after working with Frontier for several years to provide quality, energy efficient multi-section homes for the affordable housing market that Frontier serves. Up here on this narrow ridge, this single section fits perfectly.

Frontier Housing is a nonprofit organization with a 34-year history of providing safe, affordable housing in nine eastern Kentucky counties and the city of Ashland. In 2004, realizing a market demand, Frontier added the option of quality manufactured multi-section homes in addition to its line of site-built homes. All Frontier homes, whether

manufactured or site-built, meet rigorous standards of quality, energy efficiency, and aesthetics.

Frontier expects the single section manufactured home to address the housing needs of very low-income customers who once were a significant and successful part of Frontier's market, comprising 50 percent of their \$10 million loan portfolio with a foreclosure rate of less than 1 percent. Funding declines, rising housing costs and the lure of quick turn-around in obtaining a singlewide "off the lot" of the local mobile home dealer made it difficult for Frontier to meet the housing needs of this sector of the population – those with an income less than 50 percent of the area median income (AMI), in Frontier's service area, about \$12,000 annually.

This Frontier/Clayton single section offers multiple upgrades, but two that are key in allowing Frontier to serve this sector of the market are the FHA Title II foundation and the home's energy efficient features. The FHA Title II foundation qualifies the home as real property that is eligible for traditional mortgage loans rather than the high interest rate personal loans common with a singlewide product. With Frontier's ability to offer low interest home mortgages, these customers will be able to enjoy both efficient, affordable homes and affordable financing.

FHA Title II Foundation

On the ridge, the Frontier crew has prepared the site, including the concrete, steel-reinforced footers and grid foundation, the first step in the FHA Title II permanent foundation system, for placement of the 1,165 square foot home. At 3:00 pm, the home arrives by Clayton transport at a designated location about a mile from its final site on the ridge. At this point, the cab is switched and a local transport

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Photo provided by Frontier Housing.

The first single section manufactured home built to Frontier Housing's energy-efficient specifications was completed and ready for occupancy less than two weeks after it arrived at its site.

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company begins to negotiate the 76-foot long, shingle-roofed, vinyl-sided home along the last mile of winding mountain road. By 4:00 pm, the home is in position over the foundation, maneuvered by the transport team with greater ease than I can negotiate a parallel parking spot.

Within minutes, the team is dry stacking double block piers, the next step of the FHA Title II foundation. By nightfall, the wind-anchor straps will be wrapped and attached to the J-bolts embedded in the concrete foundation and the transport crew's job is complete. The next day Frontier's crew will continue work on the Title II foundation, further anchoring the home with a proprietary lateral resistance system. While the primary goal of the wind anchor straps is to keep the home firmly on the ground, this system protects the home against lateral sway from a variety of potential forces.

The final step in the FHA Title II foundation is a textured concrete block perimeter wall. With required venting and access door, this wall is not only aesthetically pleasing, but also contributes to the energy efficiency of the home, helping to maintain a clear crawl space where critters are less likely to intrude and compromise the ductwork. In addition, the ductwork is sealed in a tarped area, providing additional security against leaks. Leaky ductwork is a common problem in manufactured homes with open crawl spaces.

Energy Efficient Features

Frontier Housing has always tried to balance the purchase cost of a home with ongoing affordability for the homeowner. To this end, this home is designed with ENERGY STAR energy efficient features. The primary energy cost-saving feature is the heating and cooling system. While the industry standard is generally an electric furnace and no air-cooling system, the Frontier model is cooled and heated with a 13 SEER (Seasonal Energy Efficiency Ratio)/7.7 HSPF (Heating Seasonal Performance Factor) heat pump.

To enhance the energy efficiency of the heating and cooling system, this single section has upgraded exterior walls and all envelope insulation. Exterior walls are all 2" x 6" with R-19 insulation in place of the industry standard of thinner walls with R-11 insulation. Floor insulation is R-22 in place of R-19. Instead of the standard mobile home ceiling, the Frontier specifications require R-30 batting.

Other Frontier energy saving specifications include oriented strand board, or OSB, wrap under the vinyl siding, upgraded roof decking, upgraded windows, and a programmable thermostat. All windows have been upgraded to double pane Argon low-E windows.

A tour through the home reveals other energy efficient features. Compact fluorescent lamps are used in most applications throughout the home. Just one CFL in place of a 75 watt incandescent bulb can save approximately \$9 per year at \$0.118/kWh (U.S. residential average) and four hours use per day. This may seem small, but when multiplied by five (just one CFL in each main room – kitchen, living room and each of the three bedrooms) it equals a savings of \$45 per year, a valuable amount to a homeowner whose income may be less than \$1,000 per month, not to mention the benefit of conservation to everyone.

With all energy efficient features factored in, overall energy costs are projected to be 34 percent lower in this Clayton single section manufactured home with Frontier Housing specifications and located in eastern Kentucky than in a standard single section. Frontier will monitor utility costs of this single section over the coming year to refine this estimate.

Other Quality Features

The finished home is a spacious three-bedroom, two-bath home with a modern kitchen containing ample oak cabinets and a double stainless steel sink. In addition to energy efficiency and the Title II foundation, Frontier and Clayton have worked to make this home attractive. It has six-panel interior doors; crown molding; drywall in the main living area; fiberglass tubs, showers, and sinks, including a garden tub in the master bath; and levered locks on all doors.

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Claude Simmons of Simmons Transport maneuvers the single section while Garret Ward of G & G Mobile Home Transport and Tom Lewis of Frontier Housing assist with guiding him.


Single Section Market

The 2007 American Housing Survey indicated that 6.3 percent of all occupied homes were manufactured/mobile homes, and that at least four of every five of them were not placed on permanent foundations. A study by Frontier Housing estimated that in their nine-county service region alone, one-third of the 15,000 manufactured homes on the ground are in deteriorating condition and in need of replacement. The vast majority of these manufactured homes are not placed on FHA Title II permanent foundations and they have inefficient design features. In some winter months homeowners' energy use can top \$500, and this figure is for a state where energy costs per kWh are well below the national average.

Frontier Housing has been surveying potential customers regarding the features they would give greatest priority when choosing a new home. Energy efficiency is consistently the first priority. With this single section manufactured home, Frontier Housing and Clayton Homes are offering energy efficiency that is unequalled in this market. In the words of Stacey Epperson, CEO and President of Frontier Housing, "this is a long-term investment in homeowner affordability."

The hard work, development, and potential of this endeavor is summed up by Kathryn Gwatkin Goulding of CFED,

an economic development organization that has worked with Frontier. "Frontier has forged a business-to-business relationship with Clayton Homes, the largest manufacturer in the country," Goulding says. "Frontier has set nearly 30 high-quality manufactured homes themselves, and, perhaps even more importantly, they have developed a model to serve as a broker to other nonprofit housing developers for Clayton products. This model is currently being tested with Frontier's sister organizations in Appalachia. Frontier, CFED, and our other partners believe it has promise as a model to be rolled out regionally or even nationally."

While economic hardships continue to challenge Appalachia and other regions of the country, Frontier Housing works to meet the challenge of providing quality and energy efficiency through the addition of this single section manufactured home to its line of homes. The cultural preference for remaining on family land in a single-family home is made more attainable through the efforts of this Frontier Housing project. 

~Edna O. Schack is a professor at Morehead State University on sabbatical this fall with Frontier Housing in Morehead, Kentucky. More information on Frontier Housing may be found at www.frontierhousing.org.