



BUILT TO LAST

Insulated concrete forms provide strong building structures to withstand unpredictable weather.

By Donna Campbell

The history of severe weather events in Central Florida has been volatile, unpredictable, and deadly. Even so, millions of people flock to the state to enjoy the warmer climate. When the Rafiki Foundation, a nonprofit organization in Texas, began its search to build a new home office complex, a gift of 57 acres in Central Florida made their choice of location clear. Knowing Florida had unpredictable weather, the foundation wanted to ensure a safe and secure complex, so its design team planned to use a building material designed to withstand the damaging effects of hurricanes, tornadoes, and fire—insulated concrete forms.

RAFIKI FOUNDATION

The construction of a new Rafiki office complex in Eustis, Florida, will enable the foundation to work from its first permanent home. The 14-building complex will resemble a Rafiki Village in Africa, a living and educational space for orphans. The complex will house all of the administrative offices, meeting spaces, and training facilities needed to continue its work in Africa.

Mark Construction Company, located in Longwood, Florida, is donating 100 percent of the project management and pre-construction services to the Rafiki Village project, which began in late February 2008 and is scheduled to conclude in early September 2008.

“The project footprint will only affect 11 acres of the 57-acre site, so there was only a small amount of trees and foliage that had to be removed,” says Luke Flynn, project manager for Mark Construction.

2-4-2™ FORM SYSTEM

The construction of the building’s exterior walls, using insulated concrete forms (ICFs), was awarded to Greenblock Worldwide Corporation, a company based in Stuart, Florida, that used professional installers from Insulated Concrete Walls, Inc., to complete the job.

Greenblock specializes in a wall-forming system that consists of two pieces of expanded polystyrene (EPS) held together by plastic web ties. The forms are much like Lego® blocks that are stacked to construct a wall, 100 percent recyclable. Rebar is placed inside the block cavity between the two pieces of foam, on top of the web ties for added reinforcement. The straight blocks are assembled on-site, and the corners are delivered from the factory assembled.

The first layer of ICFs is adhered to the slab using expandable sealant foam. The foam is caulked onto the slab, and the ICFs are set into place. If the concrete slab has an unlevel surface, the block can be shaved or the foam can fill the small holes to ensure a level fit.

If, during construction, the project experiences rain, the ICFs can be drained of collected water by simply cutting a hole in the bottom of the wall near the



Photos courtesy of Greenblock

FOR more
INFORMATION



For additional information about insulated concrete forms, please contact John Riddle, Central Florida territory manager for Greenblock Worldwide Corporation, at 800.216.1820, ext. 418, e-mail jriddle@greenblock.com, or visit www.greenblock.com. For more on Mark Construction Company, visit www.markconstruction.com. To learn more about the Rafiki Foundation, visit www.rafiki-foundation.org.

slab. The hole can be patched with expandable sealant foam.

The 2-4-2 form consists of 2 inches of EPS, 4 inches of concrete, and 2 inches of EPS. The window openings are precut into the block using a handsaw. The easily cut window openings are framed using VBuck, a vinyl block-out system, instead of using pressure-treated lumber. The window framings were pre-assembled and literally slid into place as the walls were built. Rafiki wanted to eliminate wood from the building materials used.

BRACING FOR CONCRETE

When the wall is constructed about halfway, the wall alignment system is put in place. The aluminum bracing keeps the stacked block plumb, supports the blocks as the concrete is poured, and provides a scaffolding platform for the concrete pump crew. The bracing system is screwed into the block wall with an adjustment bar at a 45-degree angle, which is anchored into the slab. The adjustment bar screws to either push the wall out or pull the wall in to ensure a straight wall.

Cement trucks haul 3,000-psi (pounds per square inch) concrete to the site, which is pumped into the top cavity of the block using a hose connected to a concrete pump. The concrete is pumped in 3- to 4-foot lifts. The crew literally corkscrews around the building, following the walls until the forms are completely filled, all in just 1 day.

To finish concrete walls, hurricane strapping (required by local code) is placed into the concrete at marked intervals. The concrete is then troweled to create a smooth finish to accept the placement of the steel roof truss system. The concrete usually takes about 72

hours to cure before the wall alignment system is removed.

"The concrete is in the perfect curing environment," says John Riddle, Central Florida territory manager for Greenblock. "The forms keep the temperature steady, and when the forms lock together, there's no way for the moisture to escape, keeping the concrete plenty moist as it cures."

THE END RESULT

The blocks have a vertical indicator every 6 inches that says "Greenblock." Behind the indicator is the 1⁵/₈-inch-wide web tie, which is the attachment point for sheetrock for interior finishing and also the exterior covering, which in this project is wire lathe-backed stucco. No additional studding is needed. The end result is a steel-reinforced, solid concrete wall that is fully insulated.

Thirteen of the 14 buildings at the Rafiki Village will be constructed using more than 25,000 square feet of ICFs. With a 10-member crew, the exterior walls were finished in 42 days versus the contracted 65 days, allowing the other trades to get access to the structures earlier and begin their portion of the work ahead of schedule.

Once the buildings are completed, the Rafiki Foundation will have a superb environment for work and training. The use of ICFs creates a superior thermal and sound envelope where outside noises are nearly inaudible, with a sound transmission coefficient of 50.

ICFs are a premium product, costing more than concrete block and wood framing. Although more is spent on the capital side, the operational side reaps the benefits with increased energy efficiency and sustainability. ♦

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