Concrete Portables More Durable, Cost Effective

Full Mitigation Best Practice Story

Palm Beach County, Florida

West Palm Beach, FL - Florida school systems often rely on portable classrooms to ease overcrowded schools. Typically constructed of inexpensive materials that are quickly assembled, traditional portables are easily damaged during severe weather. With concerns from parents and students about the poor design of traditional portables, concrete units are being explored as a safer, cost-effective, and more durable option.

“When you hear your kids are going to school in portables, the first thing that pops into your head is a vision of a beat–up old trailer on cinderblocks,” said Starr Hallman, a parent of a child attending Elbridge Gale Elementary School in West Palm Beach, Fla.

A new method of constructing portable classrooms is being utilized more frequently. Companies are developing more durable forms of construction, while maintaining the advantages of portability.

Some designs incorporate concrete and steel. Wall panels with embedded plates are welded together and a composite beam runs through the middle portion of the building at the seam. This reinforces the roof and supports the center of the classroom. The roof is also made of concrete, which is rated to withstand winds of 187 mph and includes a waterproof membrane. The concrete is composed of a reactive waterproof mixture, which crystallizes and re-seals itself when exposed to water infiltration.

The impact-resistant windows are enclosed in a pre-cast concrete frame (buck), set inside the wall. The windows are rated to withstand hurricane-force winds as well as large- object impacts without the need for additional shutters.

In many cases, the concrete portables are designed and built in a factory setting. This allows for a greater degree of quality control. It takes an average of 30 days to build a unit, and then the portables are delivered to the site. After that, it takes only another day or two to install them.

“When we first saw the new classrooms, we couldn’t believe these were portables,” said Hallman. “They were as nice as any classroom I had ever been in. And as an added bonus, we were told they were built to withstand a Category 5 hurricane.”

In the past, due to the temporary nature of portables, more attention was paid to cost-effectiveness rather than sturdiness or longevity. While this reduced the initial cost of portables, the constant need to replace them after each hurricane season caused long-term expenditures to increase dramatically.

“I’ve worked with all the different kinds of portables,” said Dennis McCabe, maintenance supervisor for the School District of Palm Beach County. “I think the concrete portables are the best. There’s very little maintenance and when a storm comes through, the other portable types are destroyed. With these new portables, there’s no damage.”

Concrete portables can be integrated into a modular design. No longer limited to one-story, one-room buildings, concrete portables can be configured to almost any shape or for any purpose. The variable configuration makes possible multi-story school buildings containing several classrooms apiece. This flexible design allows a school system to set up a two-story, ten-classroom building on short notice – then move the same building to a new location, as needed.

Several companies have begun exploring expanding portable design into the residential market. The inherent strength of the structure and variety of design options make the portables ideal for use in areas where housing needs are fluid. The expandability and portability allow homes to be moved and configured as necessary to conform to available space.

Activity/Project Location

Geographical Area:	**Single County in a State**
FEMA Region:	**Region IV**
State:	**Florida**
County:	**Palm Beach County**
City/Community:	**Wellington**

Key Activity/Project Information

Sector:	**Public**
Hazard Type:	**Hurricane/Tropical Storm**
Activity/Project Type:	**Education/Outreach/Public Awareness**
Activity/Project Start Date:	**06/2003**
Activity/Project End Date:	**06/2004**
Funding Source:	**Private funds**

Activity/Project Economic Analysis

Cost:	**$150,000.00 (Estimated)**

Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster?	**No**
Value Tested By Disaster?	**Unknown**
Repetitive Loss Property?	**Unknown**

Reference URLs

Reference URL 1:	**http://www.ibhs.org**
Reference URL 2:	**http://www.flash.org**

Main Points

- Concrete units are being explored as a safer, cost-effective, and more durable option to easily damaged traditional classroom portables
- The portables feature, reinforced roofing, impact-resistant windows, and are rated to withstand winds of 187 mph.
- Concrete portables can be integrated into a modular design and can be configured to almost any shape or for any purpose.

Concrete portable classrooms

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