ENGINEERS HELP ELEMENTARY SCHOOL EARN LEED CERTIFICATION

BY BERNADETTE DOMBROWSKI

An elementary school in Monongalia County has earned the U.S. Green Building Council's LEED Gold certification, thanks in part to innovative research and construction development being explored at WVU.

Tasked with designing and building an environmentally and economically responsible building to house Eastwood Elementary, Williamson Shriver Architects looked for innovative and original solutions to deliver on its goal. A contractor suggested they look into the work being done at WVU's Constructed Facilities Center, housed in the Statler College of Engineering and Mineral Resources.

Hota GangaRao, director of the CFC and the Maurice A. and JoAnn Wadsworth Distinguished Professor of Civil Engineering, was happy to introduce the Center's fiber-reinforced polymer – or FRP – panels into the design.

The panels, which were created with a modular concept in mind, are the culmination of years of research by GangaRao and his team to make building construction simpler, safer and more economical.

Much of the research behind the panels was developed thanks to funding from the National Science Foundation, the lead sponsor for the Center for the Integration of Composites into Infrastructure, an Industry/University Collaborative Research Center housed in the CFC.

These panels can be manufactured with bio-resin made from soybeans or organic resins. The panels use recycled material and surpass conventional building materials in insulation and safety rating, all while creating less waste during production.

Before production on the panels began, they were shipped to Intertek's fire and flammability testing laboratory in Elmendorf, Texas, to be put through rigorous fire safety tests. After passing, the panels were put through more mechanical and thermal testing at WVU before being finalized for Eastwood Elementary.

"We were glad to be a part of this project that has a large variety of sustainable and innovative, energy-saving techniques," said GangaRao. "This is an example of the great benefits to society when universities, industry and government work together."

P.V. Vijay, co-principal investigator and assistant professor of civil and environmental engineering, involved WVU students in the project. Vijay used the project for senior capstone courses throughout the building's design and implementation.

"Our students gained a great deal of knowledge in green design principals from thinking about design in terms of water and energy efficiency to materials reuse, indoor air quality and site utilization," said Vijay. "Being a part of this experience was a gift for our students, while the building is a gift to the community of Morgantown."

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GangaRao and Vijay also credited colleagues Mark Skidmore and Jerry Nestor for their assistance in lab work, field installation and shipping.

The use of FRP panels is an approach GangaRao hopes to see widely implemented in construction of commercial and residential buildings.

"This work is a small piece of the complex puzzle that, when solved, leads to using the modular concept associated with these panels to create manufactured housing," said GangaRao. "For most buildings, we could cut the cost and construction time in half, and eliminate most of the waste typically seen in construction."

Only two school buildings in West Virginia have earned the U.S. Green Building Council's LEED Gold certification, a designation based on materials and resources used, location, environment quality, innovation, efficiency and sustainability among other qualities.

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