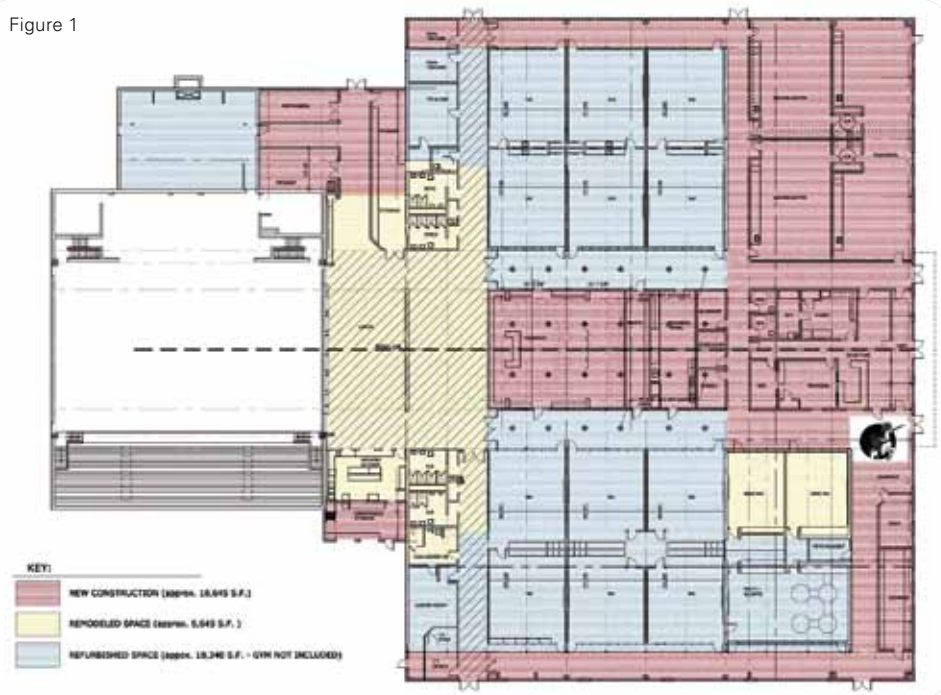


Figure 1



Modern Education

Enclosing an existing school building with a new metal building creates a brand new school

By Marcy Marro



The project at Elmwood-Murdock Elementary School in Elmwood, Neb., is a unique one. Instead of bulldozing the original school and starting all over, the architects, Omaha, Neb.-based Archi+Etc LLC, enclosed the existing building with a new metal building and retrofit metal roofing infill system to create one entirely new facility.

A New Idea

The two small towns' consolidated school board, superintendent, staff and community realized upfront that they could not sell a big enough bond issue to provide a new school for both towns. They knew they wanted to



spend their very tight budget of \$90 per square foot wisely, by getting air conditioning, and upgraded security and technology, while increasing the number of classrooms and existing classroom size if possible, for both existing schools, explained Richard B. Hawks Jr., AIA, principal at Archi+Etc LLC.

"The idea to enclose this existing building came to me right after seeing that I did not have the space for mechanical ductwork or equipment in the existing building, and looking at the minuses of having exposed expensive ductwork, units and all the penetrations going through the existing flat roof," Hawks said.

"The owner also wanted to change to sloped metal roofs where possible, reinforcing my design concept further," Hawks continued. "This solved many of the major problems of having room for ductwork, mechanical units and technology right away, and also allowed us to use the existing structure to support all of the new equipment in lieu of adding the loads to the new structure."

Hawks said that approaching the project this way also allowed them to add new perimeter corridors around the school, while turning existing corridors into additional space for the existing classrooms. "This also allowed us to put in high-bay windows in the new corridors for daylighting, while keeping outside vision of the students at a minimum for security."

How it was Done

The project took about 16 months to construct with Lincoln, Neb.-based Kingery Construction as the construction manager, including the remodeling of the existing facility. The school received approximately 18,645 square feet (1,732 m²) of new construction, along with approximately 5,645 square feet (524 m²) of remodeled space and approximately 18,340 square feet (1,704 m²) of refurbished space, not including the gymnasium.

The colored floor plan (Fig. 1) shows the new addition areas in red, with the blue and white being the existing portions of the school and roof where the architects utilized a retrofit metal roofing system, making a simple monolithic gable structure to go over the majority of the original building. Because the existing school did not have any space to add the mechanical and ductwork system, it is now located in the new attic.

The cross-section (Fig. 2) shows how the pre-fab metal building system spans over and encloses the existing school, creating room for the mechanical and ductwork systems.


In addition to the metal building, Chief Buildings, Grand Island, Neb., supplied the metal wall and roof panels. Behlen Manufacturing Co., Columbus, Neb., provided the retrofit structural system that was utilized underneath approximately 25,000

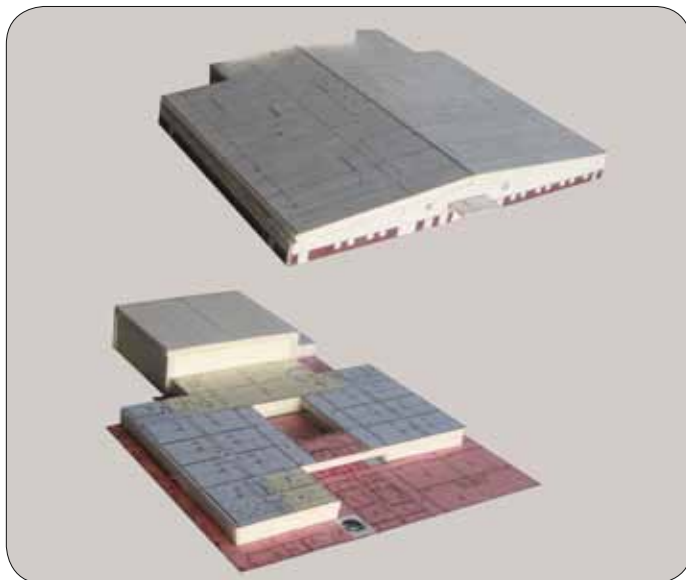
square feet (2,323 m²) of the 45,000-square-foot (4,181-m²) standing-seam metal roofing system. There are approximately 6,000 square feet (557 m²) of metal wall panels.

Sustainable Education

The school features a variety of sustainable features, including a high-efficient heat pump system with energy recovery units and an energy management system. The lighting consists of energy-efficient lamps with control sensors. The school's original insulation was left in place, which when added to the additional insulation included with the new metal building system, provided an R-38 roof system. Natural daylighting was incorporated in the hallways and classrooms where possible.

By approaching the project this way, approximately 90 percent of the existing exterior building materials and structure were saved and reutilized in the new design instead of being sent to the dump, which was good for the environment and the school's budget, Hawks explained.

"In the end our goal was to hide the existing school so well that even past students, teachers and community members could not easily recognize where they were in the old building," Hawks said. "We succeeded until they get to the kitchen and gym, which stayed in their original location." 



Elmwood-Murdock Elementary School, Elmwood, Neb.

Architect: Archi+Etc LLC, Omaha, Neb.

Construction manager: Kingery Construction, Lincoln, Neb.

Erection contractor: Capital General Contractors, Waverly, Neb.

Structural engineer: Structural Design Group, Lincoln

M/E engineer: Advance Engineer Systems, Lincoln

Civil engineer: TD2, Omaha

Metal building, roof and wall panels: Chief Buildings, Grand Island, Neb., www.chiefbuildings.com, Circle #57

Retrofit structural system: Behlen Manufacturing Co., Columbus, Neb., www.behlenmfg.com, Circle #58

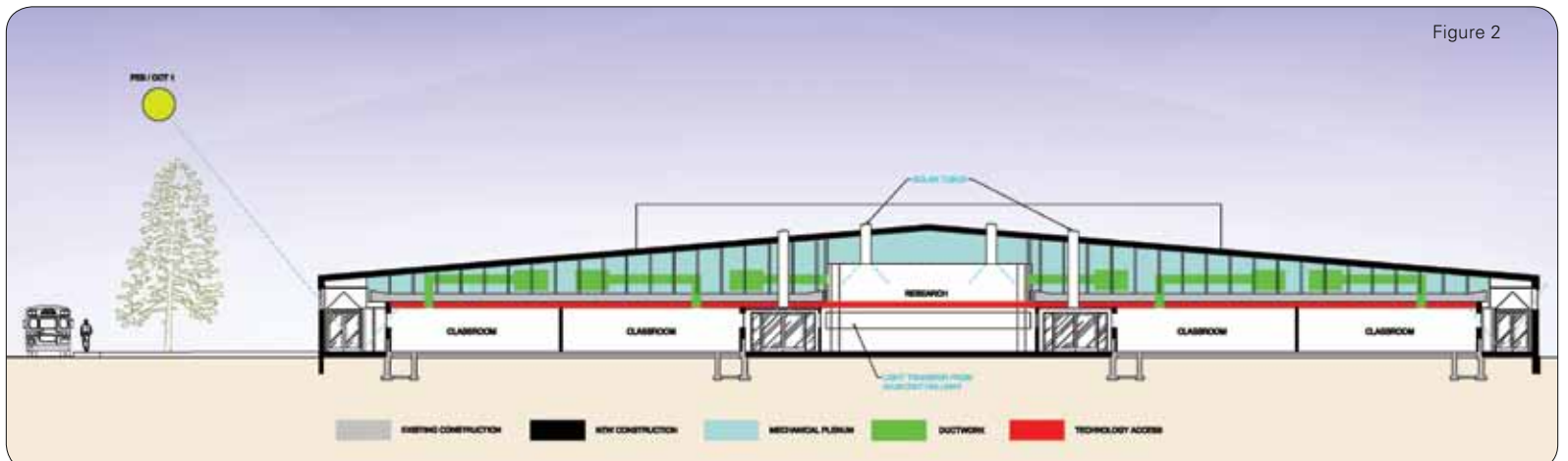


Figure 2