A structural rehabilitation keeps the heart of Elmira College beating.

CAMPUS Revival

BY JOHN FRITZ AND JORDAN YOUNG

Photos on this spread: Elmira College

COWLES HALL is at the center of Elmira College's campus. But at one point it was the entire campus.

The facility was built in 1855 when the college was founded in Elmira, N.Y. Listed on the National Register of Historic Places, it served as the sole facility for the all-female college (which has been coeducational since 1969), functioning as a student dormitory, dining hall, classroom space and library; it was later named after Dr. Augustus Cowles, the College's first president.

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In 2010, Elmira College, which now has nearly 1,200 students, commissioned an extensive $29 million stabilization and restoration of Cowles Hall, which had been out of use for nearly 20 years. The project was completed in two parts: 1) stabilization of the foundation and construction of a shell in preparation for interior demolition and 2) rebuilding the interior floor by floor.

In addition to the critical structural stabilization, rebuilding the interior meant restoring the building's main level to its original function as a public campus space. This included a new four-story, 3,345-sq.-ft chapel in the east wing and a lounge, offices and conference room in the west wing, all connected by an octagonal central Remembrance Hall reception area. The upper three floors were prepared as flex space for a future nursing school.

Maintaining an Icon

Given Cowles Hall's symbolic value for Elmira College alumni and students, as well as the local community, maintaining its aesthetic and historic characteristics was of the utmost importance. The complexity and intricacy of the project required a careful sequence of exploratory work, shoring, demolition and new construction in a fragile building at risk of collapse.

▲ Reinforcing old with new.

◀ Framing for the central Remembrance Hall.

▼ The four-story, 3,345-sq.-ft chapel.

The first challenge for construction manager Welliver and architect QPK Design was to plan and design the safest possible restoration scheme for a 65,000-sq.-ft, 150-year-old brick building. The existing building had solid brick wythe exterior walls and wood-framed interior structural system. When reviewing the overall plan for stabilizing the building, the condition and vulnerabilities of the existing brick structure were evaluated to determine whether they could be saved. Despite the age of the walls, the team concluded that they could still be considered serviceable as an exterior envelope with a reduced work load as a bearing structure.

▲ Signed steel painted Elmira College purple.

▼ Cowles Hall, hollowed out.

The plan called for a structural steel framing system to carry the new loads of the building and give the existing brick structure something to tie onto for stability. The installation design allowed a sequenced approach to cautiously install new concrete footers within the basement and cut holes through the existing wood floors to install full-length non-spliced W14×159 steel columns into the building. Once installed, the columns were then tied together through rafters at the roof level and

horizontal wind girt framing at each floor. The girts were tied into the brick then bolted through the windows using a 6-in. by 6-in. timber beam on the outside. From there, the construction team was able to start the removal of the existing wood floors from the top down.

The initial stabilization involved the excavation of the existing field stone foundation for concrete footer and wall installation. A large portion of the excavation was completed by hand, with many workers shoveling out old dirt and coal from the depths of the expansive basement. This entailed demolition of all non-brick material throughout the entire existing structure, followed by the installation of a completely new structural steel and concrete system.

Once the interior concrete was installed, 15 ft of interior excavation was filled with stone, and new steel columns were also installed. Horizontal steel was tied into the columns and then braced through each window opening, pinching the brick wall between steel and 8-in. by 8-in. timbers. This bracing secured the exterior brick walls while complete demolition of all of the wood interior framing, floors and walls continued.

Everything had to be demolished, removed and installed from above. The site allowed for two cranes—a tower crane and steel

Photos on this spread: Dave Revette

◄ ► ▲ ▼ The newly renovated chapel.

Photos on this page: Dave Revette

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erection crane—to be located in two spots. The tower crane was remote-controlled or operated using a two-person team, with operation taking place in the cab outside of the building and a project superintendent directing crane movements from inside (communicating with two-way radios).

A temporary interior structural wall stabilization system was used and coupled with a temporary exterior structural wall stabilization system on the five-story octagon. Once securely stabilized, teams were then free to build the steel-framed elevated deck back up from the ground level. After the completion of each level, the bracing steel from the elevation below was removed and modified for reuse on the next level. Once the interior steel framing and concrete were completed, the outside of the existing field stone foundation wall was excavated and encapsulated with a new concrete foundation wall and post-tensioned steel rods to ensure that it would maintain its bearing. Today, the brick walls carry only their own weight, and the rest of the building relies on the new steel structure built within.

At no extra cost to the owner, the steel was primed purple, the college's principal color. Intumescent paints were used on the ground-floor interior columns to provide an efficient fire-resistant barrier to enable the columns to be wrapped in oak while maintaining a minimal size. New steel beams installed to support the new elevated concrete floors ranged from W12×35, W14×26 and W14×30 to W18×60, W18×76 and W18×86.

Building a steel-framed structure with a brick veneer is not a new concept. Building it backwards, however—an existing brick veneer and a new steel structure within—is less common. The Cowles Hall project is living proof that if a project team can gather enough information about an existing building, the possibility is there to salvage it and give it new life. In this case, it allowed Elmira College to pay respect to the building that was truly the foundation of the institution. ■

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