Renovations for Building 1 at Camp Mabry, Texas, required innovative thinking to preserve its historical look while updating it to modern code compliance.
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Preserving History at Camp Mabry

A complete renovation of the century-old Building 1 at Camp Mabry required special precautions and flexibility throughout design and construction to accommodate a modern mission while preserving priceless historical elements.

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Established in the 1890s and located a few miles from the Texas State Capitol building in the City of Austin, Camp Mabry serves as headquarters for the Texas National Guard. Its 400-acre campus contains a number of structures on the Camp Mabry Historic District and the State Antiquities Landmark Listing, including Building 1, which was built in 1918 to house the U.S. Army School of Automobile Mechanics.

Today, Building 1 is a command center for the Texas Adjutant General, the commander of the Texas Military Department. Despite multiple renovations over the years, the facility was still in need of an overhaul in order to accommodate its latest mission.

Modernizing the structure with contemporary systems, including energy efficiencies, proved to be a journey of discovery. Finding solutions tested the project team's expertise and ingenuity and resulted in a renovation that preserved the vintage look and feel on the outside while providing a sleek, modern office environment within.

STRUCTURAL INTEGRITY

Renovating and restoring a registered Texas Historical Landmark presented multiple challenges. The interior of Building 1 needed to be gutted and the roof replaced, which required extra precautions to make sure exterior walls were not damaged. Complicating efforts was a requirement to not undermine the foundation because of the original brickwork. Heavy machinery could not move too close to the building's perimeter.

Structural and architectural teams often could not be certain of the strength of the materials they were working with, so multiple field tests took place as demolition and construction progressed. To avoid overstressing exterior walls, for instance, especially as the roof was being replaced, an elaborate shoring system was set up to brace the walls and minimize damage. The existing first floor, second floor, and roof diaphragms supported the existing walls laterally. During construction, all of these elements were demolished and replaced with new structural systems.

To protect the walls from becoming overstressed while they were unsupported during construction, a shoring system was attached to the walls using through bolts located in the mortar joints of the exterior wythe of brick. This preserved the historical brick while adequately supporting the walls.

When the old roof was removed, layers of deteriorated brick became visible. Replacing these meant meshing new materials with historical brick, which required training the contractors in proper techniques. This portion of the wall was critical structurally since the new roof system bears on the existing wall. Care was essential in removing the top layers of brick and replacing them to prevent damaging the remaining brick courses.

Building 1 has 93 wood-framed, operable windows dating from the early 1970s that needed to be restored. The units were all carefully removed, itemized, and transported 200-mi for restoration that incorporated new hardware and weatherseals to make them energy efficient. The windows were replaced without altering the brickwork around them.

NAVIGATING THE INTERIOR

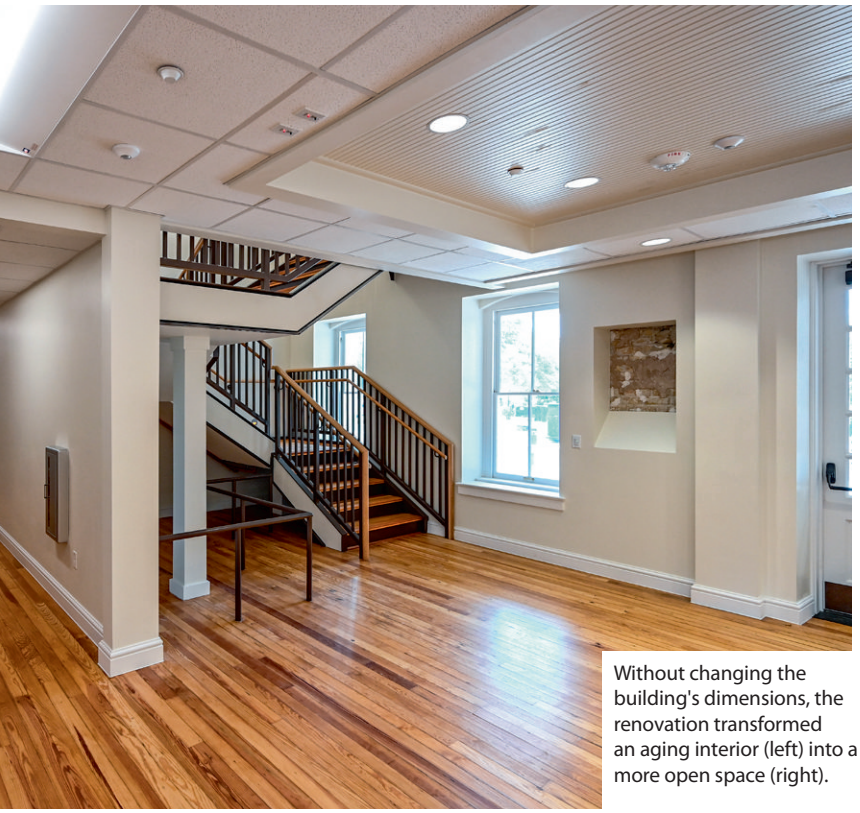
The staff who would inhabit Building 1 wanted offices and spaces with taller ceilings and more open space. The design had to accommodate these goals without changing the structure's dimensions or raising the roof line along with working around columns on the first floor.

The modern mechanical, electrical, fire alarm/suppression, and technology systems had to be installed into tight interior spaces that could not be enlarged. As a result, the systems were designed to navigate the small interstitial space between the first and second floors. In order to maximize air circulation, the interior structure had to be minimized.

Additionally, all areas had to be made accessible for persons with disabilities, which required the addition of ramps to the porch and an elevator to be installed.

Perhaps the largest interior hurdle was fitting a new, code-compliant HVAC system into the historical structure. The solution included installing the machinery in the attic and using a system with minimal ductwork in the ceiling space to improve thermal comfort throughout. In order to remain accessible for repairs, a

An extensive wall shoring system was used during the roof replacement phase to avoid overstressing the historical brickwork.



Without changing the building's dimensions, the renovation transformed an aging interior (left) into a more open space (right).

catwalk system was created most of the length of the building.

The design team created open spaces above the ceiling to accommodate these systems. Column lines for the second-floor framing were adjusted to create a space approximately 6-ft wide that the deck could span, eliminating cross beams in this bay. This provided more room for installing ducts, fire sprinkler pipe, and trays for telecommunications cabling and electrical lines. Close coordination among multiple disciplines and the use of 3D modeling during construction allowed the contractor and subcontractors to know beforehand that there was adequate space to install all the equipment without conflict.

Higher ceilings in the conference rooms and office area are accommodated by special trusses with stepped bottom chords. This allowed for keeping the exterior dimensions of the building while creating a more open feel in these larger spaces.

To keep the stresses on the historical brick walls low, the entire second floor is supported on columns with footings set back from the walls. Since the columns were not located directly over their footings, they could not be recessed and had to be located at the top of slab elevation.

The interior face of the exterior masonry wall was covered with metal studs infilled with insulation beneath drywall panels. A deeper wall profile increases energy efficiency and provides space for more articulated window and door sills.

UPDATING THE PORCH

An exterior porch with a covered balcony extends along the entire south side of Building 1. This porch required reconstruction in a manner resembling the original version but that was structurally sound and conformed to current codes.

Current building codes require far more strength than the porch framing on Building 1 would have if it was constructed from typically available wood materials. Meeting the goal of retaining the same look while rehabbing and updating the structural integrity required multiple adjustments. For example, the stronger wood originally specified for the second-floor porch framing was unavailable. As a result, a combination of steel and wood beams were used and painted white to replicate the original all-wood look.

The original porch beams also were spaced farther apart than is standard today. Because deflection and loading tables for decking were not available at that spacing, on-site testing was needed to confirm that the replicated porch met current code requirements. Deeper roof beams were used to frame the porch roof and then tapered to the original roof beam depth to give the look of the original porch while providing the required strength.

Additionally, during construction, it was determined that sprinklers were needed on the exterior of both levels of the porch. To accommodate, bricks were strategically removed and modified where sprinklers were added.

Lastly, a more substantial connection between the second-floor and first-floor columns was required for current codes. This was achieved using a mechanical strap. Decorative wood trim pieces were added onto the inside face of each column to hide the strap and still keep the look of the original porch.

MULTI-YEAR EFFORT

The renovation of Building 1 started in 2017, with design finished in fall 2018. Construction began in 2019 and was substantially complete by spring 2021. Demolishing the interior revealed surprises that required the team to make revisions and continually test components to make sure they would work. For instance, asbestos was discovered early on and required abatement. In addition, the tops of the existing walls were found to not have sufficient strength to resist uplift forces from the roof. The roof tie-down system was then reconfigured to tie the roof trusses to the second floor through tie rods, eliminating uplift forces on the walls.

The design team gained real insight into working on a historical structure and the research required to marry antiquity with modern design without letting one overpower the other. In the summer of 2021, the renovation of Building 1 was fully complete and ready for its new mission as a command center for the Texas Adjutant General.

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