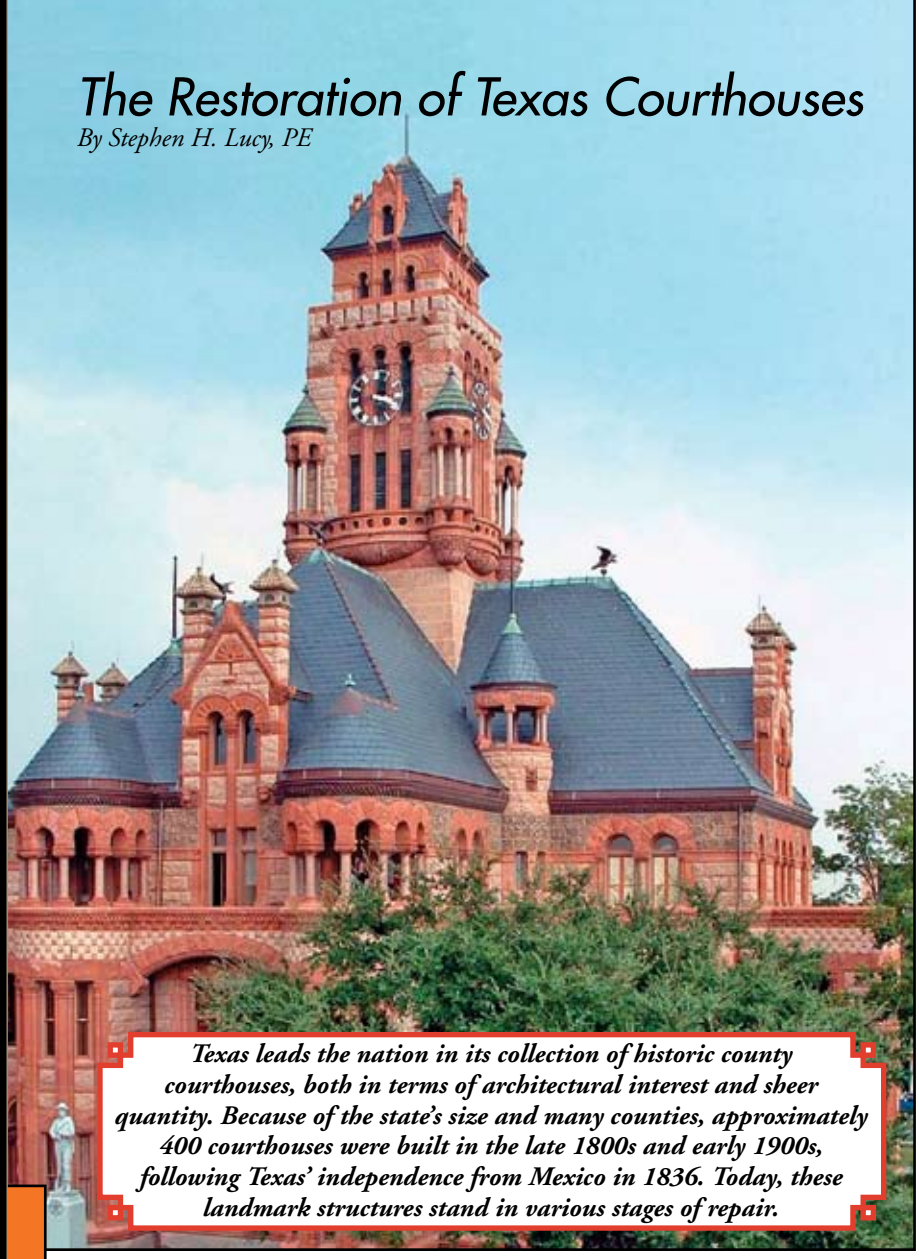
The Restoration of Texas Courthouses

By Stephen H. Lucy, PE



Texas leads the nation in its collection of historic county courthouses, both in terms of architectural interest and sheer quantity. Because of the state's size and many counties, approximately 400 courthouses were built in the late 1800s and early 1900s, following Texas' independence from Mexico in 1836. Today, these landmark structures stand in various stages of repair.

As the seat of county government, the Texas courthouse has become an icon of Texas' independent spirit and served as a community anchor for patriotic celebrations, political rallies, picnics, concerts and other community events. Texas courthouses also represent some of the best work of highly-regarded architects of their times: W.C. Dodson, Alfred Giles and James Riely Gordon to name a few.

In 1998, the National Trust for Historic Preservation in Washington, DC, added Texas' historic courthouses to its "11 Most Endangered Historic Places" list, which prompted then Governor George W. Bush to make courthouse preservation a priority. The Governor's initiative led to the establishment of the Texas Historic Courthouse Preservation Program (THCPP), administered today through the Texas Historical Commission for funding and stewardship.

Restoration Process of a State Archeological Landmark

The Ellis County Courthouse in Waxahachie, Texas is designated as a State Archeological Landmark (SAL). As an SAL, every aspect of the restoration work, both interior and exterior of the courthouse, is subject to review and approval by the State Historic Preservation Office (SHPO). All projects are reviewed for conformance with *The Secretary of the Interior's Standards for the Treatment of Historic Properties* (**www.cr.nps.gov/hps/tps/standguide/index.htm**).

From an architectural and historic preservation standpoint, the regulatory processes are considerable. In addition to following the guidelines of an SAL designation, Texas courthouse restorations must conform to regulations and reviews from the Texas Historical Commission, as defined by the THCPP. Both the landmark designation and the funding source trigger the highest level of regulatory oversight possible.

The Standards also dictate that historic materials be preserved wherever possible, and, where new infrastructure is incorporated, that it be done in as seamless a manner as possible. Every effort must be made to preserve the original design, appearance and workmanship of the building to the last detail.

In the case of adding new structural components, they may be designed with modern materials and techniques, but the structural system must support overlying finishes that match the historic design and detail.

For the restoration process to be successful, the architect, structural engineer and other consultants must work closely together to find ways to integrate new systems as discreetly as possible.

Furthermore, the restoration itself typically relies on various funding sources, which include local community fundraising efforts with additional funding through ISTEA (Intermodal Surface Transportation Efficiency Act) and TEA21 (Transportation Equity Act for the 21st Century), as administered by the Texas Department of Transportation (TxDOT). On average, an historic courthouse restoration project budget will be in the low millions and may range higher, depending upon scope of work. Projects require a highly coordinated effort to ensure successful completion within the limited budgets available.

Case Study: The Ellis County Courthouse, Waxahachie, Texas

The restoration of the Ellis County Courthouse was significant because it is considered one of the grand dames of courthouses in the Southwest. Ellis County encompasses a population of 111,360 based on the 2000 Census. The town of Waxahachie, the county's seat, is known as "The Gingerbread City" for its large collection of 19th century Victorian homes and buildings. Approximately 20 percent of these structures are listed in the National Register of Historic Places in Texas.

As the centerpiece of this collection and one of the most significant courthouses in the Southwest, restoration of the Ellis County Courthouse was considered vital to the local community and the state officials who administer the grant program.

The Ellis County Courthouse, a James Riely Gordon design, was built in 1895. The structure itself incorporates a Richardsonian Romanesque architectural style that was originally developed by Boston architect Henry Hobson Richardson. Gordon adapted the design style and popularized it throughout Texas. The $11 million restoration project was led by a team that included preservation-based architects from ARCHITEXAS and the engineering firm of Jaster-Quintanilla/Dallas.

Small interior hallway

The restoration effort addressed each of the exterior elevations of the Courthouse. Texas courthouses were built with four equally prominent facades that ensured that businesses on all four sides of the square were at the "front door." No business had the disadvantage of being "behind" the courthouse. This fact is no less pertinent today than it was at the time of the courthouse's construction.

Key Engineering Challenges

Challenge # 1 – Complying with Codes in an Historic Context

The most critical aspect of this restoration project was the ability of the engineering firm to be responsive to the historical context of the building. The majority of the structural design components required for the Ellis County Courthouse and other courthouse projects are related to the reconstruction and/or replication of historical elements, and the integration of contemporary code-compliant MEP systems.

The historical integrity of the building is the primary factor guiding every aspect of the design. Compromises are made only where the safety of the building and its occupants are at risk. In such cases, the design solution must be one that has the least visual impact on the original design.

Although modern building codes have codified provisions for historic structures, as typical with many code requirements there is often flexibility of interpretation. There are fine lines between what is considered a restoration and what is considered a renovation, and through experience one must learn how to negotiate the application of today's code requirements. Strict interpretation can lead to the inclusion of building components that are not truly required under the circumstances, thereby significantly increasing the project cost.

Second-floor courtroom with gallery

Code-required changes incorporated in the Ellis County Courthouse restoration plans included providing ADA ramp access, a second egress stair, an elevator, areas of refuge, a smoke evacuation system, sub-grade areaways on the exterior for air intake, and installing OSHA-compliant ladders and catwalks for access to attic and bell tower equipment.

These code-required installations were carefully designed to have minimal impact on the historic appearance. In cases where new elements were entirely visible, the elements were designed to be as visually unobtrusive as possible. For example, building codes required the installation of a new elevator and fire exit stair.

These elements were installed in secondary areas and arranged in a manner that had very little visual impact on important historic spaces, such as the rotunda and courtrooms. When a new element is visible, it is designed to be compatible with the historic building, but clearly discernable as new construction. The goal is to ensure the average visitor to the building can easily differentiate the historic elements from the new.

Challenge # 2 – Reconstructing and/or Correcting Structural Conditions

Historic courthouse restorations have structural issues that fall into four primary categories:

1. Correction of structural flaws in the original design,
2. Reconstruction of missing historic elements,
3. Correction of structural problems caused by inadequate maintenance, and
4. Modifications necessary to allow for the integration of new mechanical, electrical, plumbing, technological, or egress systems.

One of the more challenging aspects of the Ellis County Courthouse project was the reconstruction of the historic courtroom balcony. In a previous remodel of this courthouse in the 1940s, an intermediate floor was added to the original two-story courtroom to create more office space. Adding this new floor required the removal of the original courtroom balcony.

continued on next page

Exterior south stairs scaffolding, Ellis County Courthouse

As is typical of many historic preservation projects, no original construction documents or as-built drawings existed. In such cases, the architect and structural engineer must rely on evidence the building provides. For example, they must assess what support might exist behind a plaster wall, but do so with a limited amount of demolition.

To restore the balcony, the previously-added floor system was removed and evidence of the original structural system that supported the balcony exposed. Remnants of the balcony existed in the form of embedded steel C-channels in the perimeter walls and patches in the wood flooring where intermediate supporting columns once existed.

In addition to physical evidence, reconstructions often rely on information gained by researching architectural plans and courthouse buildings designed by the same architect.

To properly reconstruct the balcony, historic drawings by the original architect, James Riely Gordon, were evaluated. While no historic drawings of the Ellis County Courthouse existed, the architect had designed an almost identical building for Denton County, a building that was never constructed, but for which the drawings survived.

In addition to this, similar existing buildings by the architect were examined in detail. Most notably, the Gonzales County Courthouse offered a very similar courtroom design that retained its original balcony.

Because most courthouse structures were built with rudimentary building systems, the creation of new penetrations and chases to accommodate modern MEP and technology services has an impact on the structural system. Moreover, use of patented structural systems during original construction — the equivalent of what would be considered performance specs for today's contractor — requires that today's structural engineer identify and work with unfamiliar or nontraditional systems.

At the time of their construction, historic courthouses were designed with what was considered cutting-edge technology for that era. While the concepts of load-bearing masonry construction were well-established, integrating steel and concrete into the design was relatively advanced technology during the period of original construction.

In fact, it was not until the last quarter of the 19th Century that Portland cement concrete came into common use in the United States, and, even then, the various concepts of reinforcement were not fully developed. In restoring historic buildings, the architect and structural engineer must be cognizant of historic design techniques and work diligently to preserve significant structural design features. At the same time, they must recognize and carefully correct historic design features that do not meet modern standards for safety or structural stability.

Project Team

Owner: Ellis County
Owner Representatives: County Judge Al Cornelius, Joginder Bhore
Architect of Record: ARCHITEXAS
Lead Engineers: Jaster-Quintanilla/Dallas
Building Envelope Specialist: Restoration Technology
Construction Managers: Thos S. Byrne

Historical concerns about the structural integrity of the central tower led the county to install a stabilizing steel frame within the shaft in the mid-20th Century. Upon inspection of the tower for this restoration project, it was determined that, while the stability of the tower was reasonably adequate, removal of the added structural frame and repairs to the shaft were cost prohibitive. The architect and engineer determined that restoration of the tower interior would be better left for a future phase of work.

The restoration of the central clock tower elements (i.e., stone, slate, clock-faces) of the Ellis County Courthouse was particularly challenging. The building's design and roof finishes required that the scaffolding system for the tower not be supported from the building below. Consequently, a special scaffolding system was designed to be suspended on large steel beams inserted through the existing masonry openings in the tower.

Dramatic illuminated view at dusk of the Ellis County Courthouse

Challenge # 3 – Integrating New with Old Systems

According to Larry Irsik, principal with ARCHITEXAS, "The need to extensively penetrate existing masonry walls for integration of new systems, reconstruct the original serpentine balcony to its original configuration, and a desire to integrate conduit infrastructure into the existing floor topping slab created structural challenges that made this project one of our most complex restoration projects to date."

Building materials used in original courthouse construction often succumbed to fire, and were replaced with fire resistant structures of steel, concrete, and load-bearing stone or masonry. These materials make the incorporation of elevators, additional staircases, and new building systems in restoration design a structural challenge.

Including large ductwork to support modern heating and cooling needs would destroy the historic fabric of a building, so the designs incorporate less invasive piped mechanical systems, such as geothermal systems.

The Ellis County Courthouse was originally designed to be of fireproof construction. Floor systems were constructed of steel I-beams supporting a vaulted corrugated metal deck with an overlying layer of concrete. This system was effective for the time, and considered so interesting that the steel panning system was actually left exposed as the finished ceiling.

The monolithic nature of the system, and the need to preserve its historic intent as a primary finish, required extreme sensitivity and creativity in the integration of new systems.

Ducts, piping and other systems were designed to follow paths that avoided important historic spaces and that required a minimum of modifications to walls and ceilings. Structural evaluation and intervention were required at every penetration through the load-bearing masonry walls.

Challenge # 4 – Deferred Maintenance of the Structure

Deferred and improper maintenance causes special structural issues, too. Most often, this is related to water infiltration affecting the integrity of structural systems.

In Ellis County, the use of stone, steel and concrete as the primary structural materials helped the building survive many problems that affect similar wood-framed buildings, but significant corrections were required.

For example, moisture in the brick masonry at the core of the building led to the gradual deterioration of the building's lime-based mortar. In many areas of the basement, the mortar had deteriorated so much that brick was entirely unsupported and could be lifted from the wall by hand.

To resolve these issues, the underlying source of moisture infiltration had to be eliminated. The structural integrity of the masonry then required careful re-pointing of all deteriorated mortar. This was accomplished by reusing the original brick with mortar that matched the historic construction materials and techniques, including texture and tooling. The result was a restoration virtually indistinguishable from the original.

Modified elevators that comply with the Texas Architectural Barriers Act (the state's version of the ADA) and reuse of non-compliant historic stairs also required collaboration with both state and local fire marshals. In a previous renovation, the decorative iron staircase in the central rotunda was removed and an elevator installed in its place.

To restore the rotunda to its original 1895 appearance, the elevator was removed and the iron staircase reconstructed to match the original. To compensate for the removal of the elevator and the need for a second means of fire egress, three floor levels were removed at the north quadrant of the existing building to accommodate a new fire stair and elevator shaft.

Additionally, both the reuse of building materials and the use of indigenous materials for the Ellis County Courthouse project, such as locally quarried granite and sandstone, were LEED-based initiatives implemented by the design team.

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Summary

The restoration of the Ellis County Courthouse is not simply a matter of local importance; it is of statewide and even national significance. Due to its whimsical design, the building has for years been the favorite of all of Texas' courthouses, drawing visitors from across the country.

The average Texas courthouse restoration process takes five to six years, and, sometimes, longer due to funding resources. The Ellis County Courthouse restoration took 6 years for completion with an $11 million budget. Because many of Texas' counties are in sparsely populated, rural areas, raising the minimum 15 percent of the funds to match the State's requirements can take years of effort.

Still, the impact on the community is enormous. As the shining, new centerpiece of community activity, now awash in the splendor of its original architectural details, these restored beacons of independence provide a glimpse into the decorated history of the Lone Star State and the brave men and women who settled there.▪