

# REBUILDING A LANDMARK

An extensive reconstruction salvaged a beloved courthouse after it was devastated by fire

By Mark B. Peterman, P.E.



*The Hill County Courthouse (shown circa 1990 bottom right) was severely damaged in a New Year Day fire in 1993.*

*Pictured opposite top is a portion of the attic level, while shown opposite middle is the completed exterior sheathing plus partially installed light-gage purlins on the rebuilt tower.*



ON NEW YEAR'S DAY THREE YEARS AGO, THE PEOPLE OF HILLSBORO AND HILL COUNTY, TX, LOST THEIR BELOVED COURTHOUSE to a devastating fire. All too quickly, the 70-ft.-tall clock and bell tower was gone, and much of the three-story, 45-ft. tall main building was severely damaged. Built in 1890 of load-bearing limestone walls with both timber and steel floor framing and a wood-framed roof, the 40,000-sq.-ft. building had been the most prominent landmark in town.

The structure had significant architectural import and was considered to be among the 10 finest courthouses—out of more than 200—in the state. It was originally designed by civil war veteran Wesley Clark Dodson, a noted architect who designed approximately 20 courthouses in Texas. During the past century, the building had undergone several renovations, including an excavation in the 1930s of its crawlspace to create a basement, the replacement of wooden windows with aluminum frames in the 1960s, and the installation of an HVAC system and an elevator.

Originally, steel framing was located only under the vault floors in the southwest corner of the building, in the two stairwells, and in the main public corridors at the ground floor. Except for two steel beams and columns that supported part of the existing central portion of the central portion of the third floor, all other floor framing was wood. All of the steel beams, except for the two on the third floor, were encased in concrete, and all of

the concrete-encased steel beams survived the fire.

The fire destroyed the entire roof and attic, the central portion as well as the northwest and southeast corners of the third floor, and most of the central portion of the second floor.

### SHORING AND STABILIZATION

The ashes and debris from the burned roof, attic and third floor settled onto the second floor framing. The first step taken by Hill County to save the building was to shore the second floor framing that was sagging under weight of the wet, blackened mass from above. This shoring was installed almost immediately after the fire was extinguished. Although the four tall, slender, unbraced limestone masonry chimneys were judged unstable and had to be dismantled, each stone was marked and saved for future use. Severely damaged stone arches below the gabled entry roofs also were dismantled.

The debris was then removed from the surviving floors. Architecturally sensitive items—wood moldings, doors, windows, wainscoting and hardware—were removed for restoration and eventual reuse.

The existing load-bearing limestone masonry walls, measuring 18- to 24-in. thick, suffered only surface damage by the fire. After inspections revealed no significant deformation or cracking of the walls, preparations for reconstruction of the damaged floors and roof began. The reconstruction effort would consist of repairing the stone walls as needed and replacing damaged wood floor deck and framing with steel framing.

Restoration costs were estimated at \$9 million and fundraising efforts began shortly after stabilization and structural evaluations were completed. These efforts ranged from a Willy Nelson benefit concert held on the courthouse lawn to federal funding administered by the Texas Department of Trans-



portation. In addition, property insurance benefits provided approximately one-third of the needed funds and private donations also played a role.

### RECONSTRUCTION

The first phase of the reconstruction—replacement of the floor and roof structure, and architectural restoration of the exterior—is being completed now. The second phase will be the renovation of the interior of the building.

This project is not a true restoration in the strict sense of the word. While every effort is being made to restore the exterior of the building as accurately as possible, much of the existing wood framing will be replaced with steel framing. Structural

steel beams and steel bar joist framing were chosen for economy and for their non-combustible nature. New decks are reinforced concrete slabs on metal form deck, except in the attic and tower. The attic level was decked with nominal 2-in.-thick wood decking and the tower levels were decked with both wood and steel bar grating.

In work unrelated to the fire, new structural steel framing was used in the basement. Wood beams and columns had been damaged by termites and needed to be replaced. Also, heavily corroded steel lintels over areaway openings were replaced with hot-dipped galvanized steel supports.

New second floor framing consists of steel beams and bar joists spanning between load-



*Shown above is the new second floor framing during construction. Pictured opposite is a view of some of the diagonal ridge and valley trusses, along with the stone chimney in the background.*

bearing masonry walls. The exterior walls and two main north-south walls extend from the foundation to the roof. However, numerous interior masonry walls terminate at the second floor. Above these walls, tubular steel columns were added where required to support the new third floor framing. Bar joists and beams bear on top of the lower walls and in pockets in the taller walls. Existing masonry pockets constructed originally for the existing wood joist framing were spaced at 16-in. on center. Existing pockets were enlarged for the new steel joists and reused (at 32-in. on center). Unused pockets were filled in with masonry and grout.

The third floor framing within the central portion of the building includes a stepped, curved balcony area that will overlook the future main courtroom on the south side of the second floor. Steel framing at the third floor also includes an elevator pit, and elevator access will one day provide wheelchair access to the attic.

The attic level includes floor framing at each of the four corners of the building, where sufficient clear height is available, and beneath the bell-and-clock

tower. Steel floor framing supports wood deck at the attic and observation levels. Bar grating is used for the floor deck and at the clock and bell levels. General contractor on the project was Bryan Construction Co., Bryan, TX, and structural engineer was L.A. Fuess Partners, Dallas.

### ROOF FRAMING

One of the greatest challenges of this project was reproducing the complex geometry of the roof. The gentle radii of the tower wall faces, and the intricate intersecting angles of the ridges and valleys of the roof, were determined by the restoration architect, ArchiTexas of Dallas, using old photographs, hand measurements of surviving elements of the original roof, and field measurements of a courthouse in a nearby county. That courthouse, the Hood County Courthouse in Granbury, TX, was designed by the same architect and constructed in the same year as the Hill County Courthouse.

The central roof structure consists of two 10-ft.-deep primary steel trusses with vertical extensions to frame the north and south sides of the tower and two secondary vertical trusses on the

east and west sides of the tower. The primary trusses span 60-ft. between the two main load-bearing limestone masonry walls and extend upward 70 ft.

The tower framing consists of the inner skeleton framed with linear beams and columns—including floor framing at the observation, clock, bell and high roof levels—and an outer layer of gently curved tubular steel framing to match the original architectural radii visible in elevation.

At the roof, longer ridge and valley spans on the north and south sides of the building were framed with steel trusses fabricated from WT sections and double angles. Shorter spans on the east and west sides of the building were framed with wide flange beams. Lightgauge steel purlins and a wood roof deck completed the structure.

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