

PRECISION Preservation

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A wedge of a building in New Orleans receives a much-needed do-over
in the form of a makeover and expansion.

NEW ORLEANS KEEPS ON letting the good times roll—and not just in the French Quarter.

In an effort to expand the city's already impressive nightlife, dining and entertainment options—as well as keep the expansive Ernest N. Morial Convention Center filled—the area surrounding the convention center, known as the Warehouse District, has seen significant growth in recent years in terms of new construction and rehabilitation of historic structures.

One of most recent renovation projects is The Howard at 833 Howard Avenue. In December of 2013, Woodward Engineering Group (a division of Woodward Design + Build)

commenced the structural design of a full-height addition to the existing seven-story structure. And just one year later, the renovated and expanded building received its certificate of occupancy.

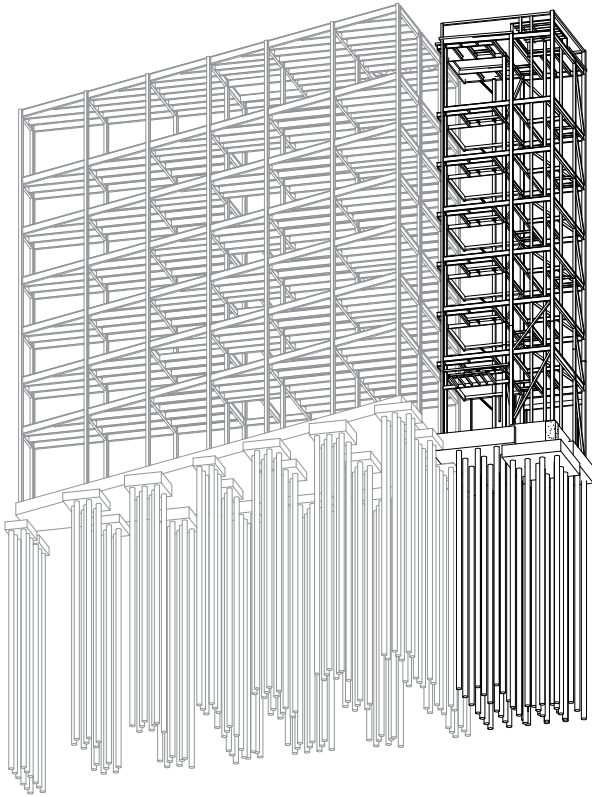
Originally known as the Southern Building, the historic edifice was designed as an office building by architect W. E. Spink and erected by W. Horace Williams Company in 1926. Its triangular, wedge shape, dictated by the intersecting streets that border its lot, is reminiscent (albeit on a smaller scale) of the Flatiron Building in New York. Available existing building information consisted of a single, partially legible plan sheet indicating the steel framing layout. Also available was a 1939 case study of the foundation prepared by the Work Projects Administration of Louisiana as part of a larger survey of soils and foundations in the New Orleans vicinity (the study included the pile plan and driving data as well).

The existing building is steel-framed, with a masonry facade, and the floors are constructed of a lightweight concrete slab on metal lathe, which is supported on open-web steel joists. These joists are in turn supported on the structural steel framing consisting of both rolled and built-up members. The exterior masonry walls are constructed of terracotta tile with a brick veneer, and timber piles grouped in pile caps located at the building columns provide the foundation support.



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- A full-height addition was built onto the back of the original structure.
- Existing and new steel framing and foundations.



- ◀ The building was originally called the Southern Building and has stood since 1926.
- Original steel framing behind the façade.

A New Scheme

The renovation scheme called for maintaining the ground floor as leasable retail space and adding upscale apartments on the upper floors. Trapolin-Peer Architects' design required that critical building elements (elevator, stairs and trash chute) be provided in a new seven-story addition. Because these elements necessitate significant floor openings, the new addition would essentially be a tower with relatively little solid floor and would be located on the short leg of the triangle, in an existing parking lot.

A steel framing system (using approximately 30 tons) was selected as it addressed: the necessity to create a structurally independent addition with a minimally-invasive lateral force-resisting system; the foundation limitations, which required that the new structure be as light as possible; and the schedule and site constraints, which mandated a structural system that could be erected quickly with minimal laydown area.



- The exterior masonry walls are made of terracotta tile with a brick veneer.



◀ In order to avoid the existing foundations, the new HSS columns could be no closer than 3 ft to the existing structure.



▲ Steel was erected directly off of delivery trucks due to the limited lay-down area.



Early in the conceptual design, the decision was made to provide an expansion joint between the proposed new addition and the existing building. This was primarily due to the design team's decision not to impose new loads on to the antiquated lateral system of the existing building. (Section 3403.4 of the *International Building Code* allows the existing lateral load-carrying structural elements of a building to remain unaltered, provided that any new addition is structurally independent.) The existing lateral system, partially fixed steel framing with exterior brick and terracotta walls serving as unreinforced masonry shear walls, is typical for similar buildings of this era and is functioning adequately. Steel framing for the addition allowed it to be completely self-supporting, with a minimally invasive lateral force-resisting system. This system, a combination of HSS cross bracing and wide-flange beams with bolted moment connections, was most suitable because it could be most easily integrated into the architect's elevation concept.

Easy on the Foundations

Due to typical New Orleans soil conditions—silt-heavy clays overlaying dense sand layers—the existing building foundation is supported on 50-ft timber piles. The new foundation design was based on a geotechnical exploration and report as well as a pile load test. Based on this data, 50-ft Class B treated timber piles were specified, with an allowable capacity of 20 tons. Because the addition is essentially a tower, a pile-supported mat foundation was determined to be the most economical solution. This foundation system, which was relatively efficient to construct, was made possible because the steel framing minimized the weight of the addition.

In order to avoid the existing foundations, the new 8-in.-square HSS columns could be no closer than 3 ft to the existing structure. This necessitated designing the portion of the addition closest to the existing building to cantilever out beyond the new foundation mat and column lines to meet the existing building. Additional complexity was introduced to the framing because of the floor openings required for the elevator, stairs and trash chute. And because the addition floor was required to align with the existing floor, the structural depth of the new steel framing was limited to 18 in. and was achieved with a composite slab supported on W12 beams.

As the site was highly constrained, with only a small parking lot (partially taken up by the addition) for the laydown area, the steel was erected directly off of the delivery truck, requiring close coordination between steel fabricator-erector New Orleans Iron Works, Woodward's on-site operations personnel and a New Orleans Police Department traffic detail. And since the project schedule was compressed

◀ Interface of the old and new structures.



- ◀ Framing for the addition allowed it to be completely self-supporting, with a minimally invasive lateral force-resisting system.

(due to historic tax credit requirements) shop drawings were created and reviewed as the design was finalized. Approved shop drawings went directly into fabrication, with steel erection proceeding as quickly as possible. Overall, the steel structure was erected in five weeks and Woodward Engineering Group made frequent site visits throughout the building process to observe the construction and ensure adherence to the engineering design intent.

The team met the schedule and the new and improved incarnation of 833 Howard opened this past December and is now occupied. A mesh of historic preservation and modernization, it stands as an example of a well-planned yet expedient expansion project as well as a symbol of the city's continued growth and recovery. ■

Owner

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Design-Builder

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