

Parkland Hospital

Dallas County, TX



Team

Owner:

Parkland Health & Hospital System, Dallas

Architect: HDR and Corgan, Dallas

Structural Engineer: Datum Engineers,
Gojer & Associates, and AG&E, Dallas

General Contractor: BARA (Balfour Beatty,
Austin Commercial, HJ Russell & Company,
Azteca Enterprises, joint venture), Dallas

Concrete Contractor: Capform Inc.
Carrollton, Texas

Reinforcing Bar Fabricator:
CMC Rebar, Dallas

Reinforcing Bar Placer:
Desert Steel, Irving, TX

Total Project Cost: \$950,000,000

Total Project Size: 2.1 million sq ft

Floor System: CIP concrete, pan & joist
braced with shear walls

Framing System: Concrete pan & joist

Award: 2016 CRSI Merit Award –
Healthcare Buildings Category

Photography:

Charles Davis Smith Photographer, Frisco, TX
Datum Engineers, Dallas, TX

The Parkland Hospital replacement project was primarily driven by the need to create a facility that would meet the functional requirements of today's medical environment. The original facility, (built in the 1950s) was functionally inadequate for 21st century needs, and many complaints and state-issued mandates pushed the owner to reach out to consultants to develop a new architectural and engineering vision. The new structure is a 2.1 million square-foot facility that is 17 floors in height with 862 private patient rooms and state-of-the-art technology. The facility is sustainable, utilized green building methods and energy sources as well as environmentally friendly building materials, earning Leed® Gold Certification.

UNIQUE DESIGN CHALLENGES

Based on the defined requirements, a large structure evolved, resulting in unusual structural engineering challenges. One unique structural feature of the hospital includes bridging the top eight floors of the Acute Tower creating an opening that spans 120' and a 60-foot cantilever over the WISH Tower. The cantilever was accomplished by a series of 30-foot deep post tension girders. This concept allowed for more windows and minimized the distances to the elevator core.

STRUCTURAL FRAMING SYSTEM

Reinforced Concrete Competed with other Structural Systems. The architectural team and the owner recognized the magnitude of the concept and cost became a prominent issue. For the concept to advance, the structural team was challenged to select the most economical method of creating the desired form. After all of the structural systems were evaluated, the concrete system was priced its cost came in under a steel truss system, and the concrete structure was chosen. The premium associated with this system was determined to be acceptable considering the functional benefits of the layout of the medical spaces. The post-tensioned transfer girders were the most practical and, by far, the best solution for deflection control. Post-tensioning allowed the use of staged stressing to control the elevation and deflection of the floors as the building was being constructed. The structural team worked very closely with the general contractor and post-tensioning supplier to aid in this effort.

REASONS FOR CHOOSING REINFORCED CONCRETE

Design Criteria for Constructability. The next step was to investigate the final details of the transfer girder and the stage stressing associated with the post-tensioned solution. Since the transfer girder is considered to be a deep beam by the American Concrete Institute (ACI), a considerable amount of calculations and information had to be developed before the design could be completed. For a girder of this size and importance the team used bonded post-tensioning cables.

Project Cost Results and Schedules. This was a public hospital financed primarily by public bonds and meeting the budget was extremely critical. The total cost of the building project was on budget at \$950,000,000. The design began in late 2009 and was delivered to the user in December 2014, several months ahead of State approval and owner readiness to move patients to the new building.



Concrete Reinforcing
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