

Patriots Plaza

Washington, D.C.



Team

Owner:

Trammell Crow Co., Washington, D.C.

Architect:

Gensler, Washington, D.C.

Engineer:

Haynes Whaley Associates Inc., Reston, VA

General Contractor:

Helix Constructors LLC, Washington, D.C.

Reinforcing Bar Fabricator:

CMC and Rebar Virginia, Farmville, VA

Total Project Cost:

\$29 million

Total Project Size:

Building – 301,400 sq ft (12- stories);

Parking Structure – 125,000 sq ft

STRUCTURAL FRAMING SYSTEM

The owners of Patriots Plaza, a 12-story office building in southwest Washington, D.C., wanted a facility with security features to satisfy post-9/11 concerns. As part of that plan, designers provided a structural system to effectively prevent progressive collapse in the event of an explosion. Achieving all of the owners' goals were aided by the use of a cast-in-place concrete framing system with reinforced steel.

The design for the system optimized its functionality while remaining cost effective. Perimeter reinforced concrete beam and column members were connected in critical locations to create alternate load paths in the event that any one structural member was destroyed by an explosion. Perimeter spandrel beams were located on every floor on all sides to enhance ductility and create a tubular frame that will provide redundant load path.

Additional reinforcement bar ensured the structure's ductility was enhanced throughout the building to increase its ability to contain damage and withstand attack.

UNIQUE DESIGN FEATURES

In order to provide additional security in areas accessible to the public, additional reinforcing bar (rebar) was used in reinforced concrete components. Sloped columns provide a transition from the garage's column layout to the office layout, satisfying a security requirement for traffic flow.

The use of reinforced concrete allowed structural members to remain shallow, meeting the overall building height requirements while maximizing the number of floors. This increased potential lease income while still allowing sufficient plenum space for mechanical ducts. A post-tensioned concrete slab was used as the entry canopy.

REASONS FOR CHOOSING REINFORCED CONCRETE

In addition to safety features, efficiency was a key goal for the project, to maximize the number of constructible floors while meeting the city's height restrictions. A two-way reinforced concrete flat-slab system helped achieve that goal. Once the first-floor design challenges were addressed and construction was finished, work on the upper 11 floors moved quickly, due to the repetitive design and construction process, which saved time and money.

Additional reinforcing bar was used in areas more accessible to the public, such as the lobby, loading dock and parking ramps.