Kamal Mixed-Use Development

Doha, Qatar

Client/Developer
Diafah Investment Company

Architect
Kohn Pedersen Fox
Diwan al Emara

Total Area
223,000 m^2 (2.4 million sf)
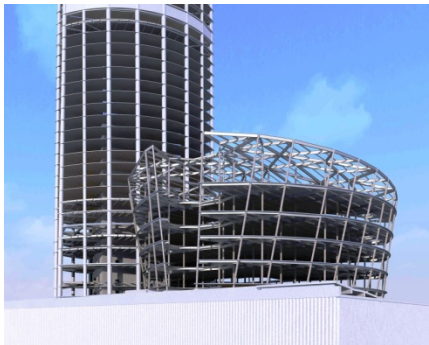
Total Height
410 meters (1,339 ft)

Number of Stories
79 Above Grade
7 Below Grade

LEED Certification Level
LEED Registered

Thornton Tomasetti provided structural engineering services for a new 410-meter, 79-story mixed-use tower accommodating offices, hotel and apartments. Offices occupy floors seven through 40, service apartments on floors 43 through 55, and hotel rooms on floors 57 through 74. The hotel sky lounge is located on the 78th floor. The five-story podium with seven below grade levels will have retail space and parking garage.

The tower, located near the waterfront, has a deep foundation of seven stories. Foundation walls and basement slabs have been designed to resist the lateral earth and water pressure imposed by 20 meters of hydrostatic water pressure caused by the neighboring bay.

The super-tall tower features a slender body with varying curves that slope in two directions. Our structural team worked closely with the architect and the wind tunnel consultant to develop a form that is both structurally efficient and consistent with the design vision. We determined the balance between mass distribution and column stiffness to minimize the wind-induced accelerations at the top of the building, eliminating the need for a tune-mass damper.

A large 33-story opening on the top half of the building creates a unique design challenge because the two smaller towers each having independent movements. Our structural team quantified this behavior, which was implemented into the wind tunnel consultant's model.

Each floor has unique floor plate geometry. The complexity of column sizes and locations posed construction challenges. The usable floor space was maximized by using composite column design. With assistance from our automation team, our structural team accurately and quickly modeled the columns and their locations, which were driven by the curtain wall geometry.

Thornton Tomasetti