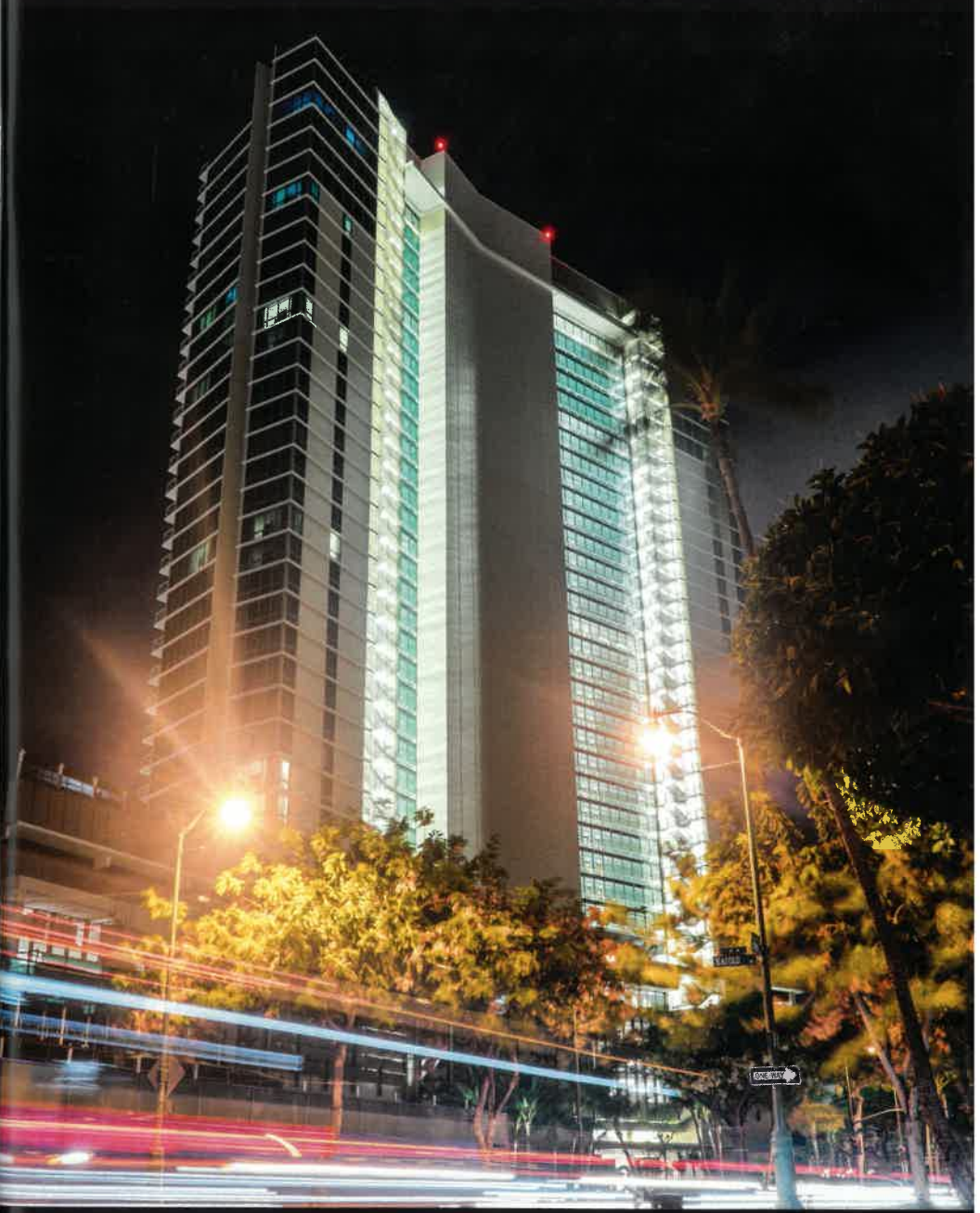
2017 PTI AWARDS

Recognizing Excellence in Post-Tensioning Applications



May 1, 2017 | Hyatt Regency Atlanta | Atlanta, GA

The Ritz-Carlton Residences Waikiki Beach, Phase 1

Location:	Honolulu, HI
Submitted by:	Baldridge & Associates Structural Engineering (BASE)
Owner:	PACREP, LLC
Architect:	Guerin Glass Architecture
Engineer:	Baldrige & Associates Structural Engineering (BASE)
Contractor:	Albert C. Kobayashi, Inc.
PT Supplier:	Suncoast Post-Tension
Other Contributor:	Associated Steel Workers, Ltd.

Project Overview:

The Ritz-Carlton Residences Waikiki Beach, Phase 1, which recently opened its doors to the public, is a 38-story, 350-foot tall, 459-unit luxury tower in the center of bustling Waikiki. The tower sits atop an eight-story podium. This tower is Phase 1 of a two phase project and both towers will share common spaces at the podium floors.

The project and unique site was encumbered by numerous easements, extensive access to loading zones for adjacent retail space, and an underground electric utility power station. Offset foundations and columns, as well as sloping columns were incorporated to avoid impacting various utility and private easements around and within the site, and also to allow for large open spaces at the ground floor for drop-off and loading dock areas. The eight-level podium uses a number of transfer girders at level 8 to transfer the tower walls and columns onto a different set of podium level columns and walls. This transition of vertical elements at level 8, with the use of deep post-tensioned transfer girders, allowed for the most efficient design of sellable spaces at podium and tower levels. 7 in. thin post-tensioned slabs used in the parking and tower levels allowed the project to maximize the number of floors within the 350 ft height limit in Waikiki.

The project was encumbered by height limits, numerous easements, and truck maneuvering areas under the building. The only way for the building to meet all project requirements was through the use of post-tensioning.

First, the majority of the floors were 7 in. thick post-tensioned slabs to stay within height limits. Second, to meet the goal of optimizing sellable residential area the podium used 17 post-tensioned transfer girders to transfer tower walls and columns onto a different grid of podium and parking level columns and walls. Third, the ground floor truck maneuvering areas also had constraints that would not allow the podium's vertical elements over the loading dock to extend down to the foundation level. The solution to this was a two-story, post-tensioned concrete truss spanning 120 ft. Lastly, the penthouse levels were designed with some spectacular large double-story atrium spaces. The atrium openings were achieved by hanging partial floor post-tensioned slabs with steel hanger columns from the roof level. The roof slab not only had to support the loads from the hanging columns, but also the loads from heavy mechanical loads in the center and landscaped rooftop terrace loads on the perimeter. The roof level transfer slab could only be achieved using post-tensioning.

Jury Comments:

- The designers were able to use post-tensioning to mitigate the height restrictions by using thinner post-tensioning slabs and transfer girders.
- This building is a wonderful example of the advantages of post-tensioned concrete in tall buildings.
- Without post-tensioning, this building would be much taller, much heavier, much more expensive, and would present many more architectural challenges.