

**Location:** London

**Client:** St George Plc

**Frame Contractor:** Stephenson

**Main Contractor:** Brookfield Multiplex

**Post-tensioning Design:** CCL

**Post-tensioning Installation:** CCL

**Year of Completion:** 2012

Standing 181 metres tall, slender and circular and containing 212 luxury apartments, The Tower, One St George Wharf is one of the tallest, wholly residential buildings in Europe.

The tower was originally designed as a traditional reinforced concrete (RC) structure, with a saw-toothed floor-plate design creating steps in the facade. The high-specification cladding needed strict deflection control, which would have required excessive levels of back propping to the RC slabs, potentially impacting on follow-on trades.

CCL's objective was to provide a faster, more efficient method of construction than that of the original RC design. This comprised a partial post-tensioned (PT) solution for levels 3-45, which were of the same basic layout, consisting of post-tensioned overlapping circumferential rings, with reinforcement in the secondary direction.

At level 46, the cantilevered winter gardens present in floors 3-45 were dispensed with and the building became fully circular. This change in geometry required RC slabs be installed from levels 46 to 48. At level 49 post-tensioned ring beams were installed to help support penthouse apartment pools. CCL provided design support and installed its post-tensioning systems within the transfer ring beams.

In addition to providing the PT design CCL supplied and installed its XF20 flat-slab post-tensioning system in 25,000m<sup>2</sup> of slabs over 44 levels. CCL's solution coped with the complex geometry of the structure, and provided crack control, and therefore deflection control, in a situation where tolerance for the latter was tight. PT slabs also accelerated the speed of construction and reduced slab thickness by 25 mm to 250 mm.

