Team

Architect:
Weber Thompson, Seattle, WA

Structural Engineer:
Cary Kopczynski & Company, Bellevue, WA

General Contractor:
Holland Construction, Seattle, WA

Concrete Contractor:
Conco, Kent, WA

Total Project Size:
$120 million

Total Project Size:
490,000 sq ft

Floor System:
Two-way cast-in-place (CIP) concrete

Framing System:
Cast-in-place reinforced concrete frame with central core

Award:
2016 CRSI Award Winner–Residential Building Category

Photography:
John Granen

Featuring stunning views of downtown Seattle, Elliott Bay and South Lake Union, Premiere on Pine recently joined Seattle’s skyline as one of the tallest residential towers in the city. At 440 feet, this 42-story apartment tower includes 10 levels of parking (five above and five below grade), and features a dramatic hotel-inspired rooftop Sky Lounge with an outdoor terrace and indoor clubroom.

The owner of this contemporary building desired large, open living spaces with a minimum of columns. Cary Kopczynski & Company (CKC), the structural engineer, and the design team responded with an efficient system using high-strength concrete, high strength reinforcing steel (rebar), and hybrid two-way slabs to maximize floor space and ceiling height.

**STRUCTURAL FRAMING SYSTEM**

Premiere on Pine took maximum advantage of the high-strength concrete available in the Seattle market, which is reflective of steady advances in concrete materials technology and understanding over the last several decades. It used 15,000psi concrete in all tower columns – the highest concrete strengths ever specified in the construction of a west coast residential tower. This ‘super concrete’ allowed for fewer and smaller columns, which maximized interior unit layout and formwork productivity. Combined with high strength reinforcing steel (rebar), this resulted in smaller columns and core walls, which helped achieve the owner’s open space objectives.

Due to the International Building Code’s 240-ft height regulation for shear wall structures in zones of high seismicity, the structural engineer opted for a coupled shear wall core system using Performance-Based Design (PBD). The PBD shear wall core minimized the floor area required for the seismic system. Also, the PBD design required less reinforcing than for a code prescriptive design. Working with both structural and geotechnical peer reviewers, the structural engineer used non-linear analysis to cycle the building’s seismic system through numerous input ground motions. The result was a reduction of core reinforcement.

**Sustainability Objectives.** Premiere on Pine is LEED Silver certified. The project incorporated the green living ethos with energy efficient appliances and sustainable materials. Flat plate slabs were used at all levels, including the subterranean parking levels. This resulted in smaller columns and reduced mass, which decreased the foundation sizes and lateral forces under seismic ground shaking. It also lowered the floor-to-floor height and, importantly, in this modern era of sustainability, reduced the building’s carbon footprint. Additionally, the effective use of high strength concrete and reinforcing steel (rebar) allowed standardization of column sizes throughout, which maximized formwork productivity and reduced waste.

**REASONS FOR CHOOSING REINFORCED CONCRETE**

**Long Floor Spans, Open Spacious Units**

Premiere on Pine’s structural system consists of cast-in-place concrete with $7\frac{1}{2}$", flat plate floor slabs and a shear wall core for seismic and wind resistance. Flat plate slabs at all levels allowed long spans and exceptionally long cantilevers, fewer columns, and reduced floor-to-floor height.