2201 Westlake/Enso Building

Seattle, WA

Team

Owner:
Vulcan Inc., Seattle, WA

Architect:
Callison, Seattle, WA

Engineer:
Cary Kopczynski & Co., Bellevue, WA

General Contractor:
Sellen Construction, Seattle, WA

Reinforcing Bar Fabricator:
Harris Rebar, Tacoma, WA

Total Project Cost:
$110 million

Total Project Size:
750,000 sq ft

Award:
2010 CRSI Design Award Winner–
Commercial Buildings Category

Photography:
Larry Gill

STRUCTURAL FRAMING SYSTEM

Enso is one of the most successful mixed-use projects to hit the Seattle market in many years. Combining high-end condominiums with long-span office space, ground level retail, and subterranean parking, Enso is a unique mix of urban uses. Cast-in-place concrete was used for all structural framing. Although other structural materials were studied early in the design process, concrete was selected for its design flexibility, construction economy, and local availability. The sustainability advantages of cast-in-place concrete helped Enso achieve rare LEED Gold certification.

Enso incorporated many unique structural framing features, such as the subterranean parking structure which was completely constructed prior to the basement walls. This allowed the use of long-span slab systems utilizing a hybrid mix of reinforcing bar and post-tensioning cable. Slabs were allowed to cure and shorten prior to restraining them with perimeter basement walls. The walls were shotcreted against the shoring system after completion of all five subterranean levels.

Both the parking structure and office tower were framed with wide-shallow beams spanning approximately 45'. This improved parking efficiency since it eliminated many of the interior columns that would have otherwise been required, and allowed use of identical formwork throughout the garage and office tower. Spans were increased, constructability was improved, and construction cost was reduced.

UNIQUE DESIGN FEATURES

A unique drophead system was utilized around the condominium core to maximize slab spans. This allowed 8-1/2 foot slabs to span nearly 40 feet without interior columns. It also transfers the majority of the building's dead load to the core, which reduces net tension under seismic load and minimizes overturning moments at the foundation. High strength rebar of 100 ksi yield was used for seismic confinement in the core. This reduced steel quantities, increased boundary element tie spacing, and dramatically enhanced the buildability of the core reinforcing bar (rebar).

The core at the office tower was a rectangular shape above grade and an H shape below. The conversion from a rectangle to an H at the parking levels resulted in nearly 40 additional stalls in the garage. The commercial and residential loading dock between the ground floor and Level 2 is supported by a 112' long mildly reinforced deep transfer girder with added post-tensioning to control deflections, The girder also supports the parking access speed ramp connecting the street level with the first subgrade parking level.

REASONS FOR CHOOSING REINFORCED CONCRETE

Reinforced concrete was the only logical choice for the structural framing of Enso, All original design objectives were met or exceeded. Construction cost was below the original budget and the project was delivered on time.

The inherent durability, aesthetic quality, and efficiency of construction inherent in reinforced concrete greatly assisted in Enso becoming a handsome addition to the downtown Seattle urban core.

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