

# Symantec Headquarters

Culver City, CA



## Team

### Owner:

Symantec Corporation Inc.

### Architect:

HOK, Culver City, CA

### Engineer:

Nishkian Menninger, San Francisco, CA

### General Contractor:

WEBCOR Builders Inc., Los Angeles, CA

### Reinforcing Bar Fabricator:

Pacific Coast Steel Inc., San Diego, CA

### Total Project Size:

527,231 sq ft (Buildings Total)

285,675 sq ft (Building #1)

241,556 sq ft (Building #2)

619,000 sq ft (Parking Structure)

### Photography:

Craig Chamberlain

## STRUCTURAL FRAMING SYSTEM

Constructing Symantec's headquarters posed a number of key challenges due to the need to locate a six-story parking structure adjacent to the two-building complex and fit all of the structures onto a steeply sloped site. Executives also wanted to ensure the building was flexible enough to meet future expansion needs for the high-technology company in a cost-effective way. To achieve these goals, designers created two buildings with cast-in-place reinforced concrete structural systems to complement the parking structure's cast-in-place, post-tensioned reinforced concrete system.

The complexity of the site provided a challenge in designing the radial reinforced concrete retaining walls around the north and west sides of the buildings, where the existing grades sloped dramatically away from the building, varying at the low point of the building's perimeter and rising up 25' at the northeast corner. Some of the retaining walls went as deep as 25' below the lowest level to retain the cuts made below the building's footprint.

## UNIQUE DESIGN FEATURES

The office buildings' framing systems consist of post-tensioned, two-way flat slabs supported by reinforced concrete columns and walls. Reinforced concrete shear walls provide lateral resistance. The foundations consist of a combination of spread and mat footings. The magnitude of the two buildings' footprints, 430 by nearly 726', presented obstacles with sequencing the concrete pours and locating construction and pour strips in the post-tensioned the flat slabs.

Challenges arose with the parking structure because 2½ levels of the six-level garage are below grade. This created obstacles to designing and laying out the slab and beam blockouts needed to stress the slab and beam tendons from the inside of the building at below-grade levels.

Additional considerations for tendon-anchorage layouts were needed for the changes in slab and beam elevations between the ramps and floors and in the stressing sequences of the tendons to ensure the beams didn't crack. Here, too, the large footprint of 250 by 408' presented construction issues with sequencing the pours and locating construction and pour strips in the post-tensioning of the flat slabs.

Cast-in-place reinforced concrete was chosen for these needs due to its flexibility, compatibility in creating all of the needed structural framing and its cost effectiveness. The post-tensioned reinforced concrete slabs allow unobstructed floors and ceilings while providing a lower floor-to-floor height than any other system could have provided.

## REASONS FOR CHOOSING REINFORCED CONCRETE

The reinforced concrete lateral system, which consists of shear walls at the core and moment frames at the perimeter, provided the flexibility necessary to meet the high seismic demands. Innovative formwork solutions allowed the concrete to be placed at an accelerated rate, which gave other trades access to the interior ahead of schedule. As a result, the project was completed faster than any other approach would have achieved.