

# Golden West College Learning Resources Center

Huntington Beach, CA



## Team

### Owner:

Coast Community College District  
Costa Mesa, CA

### Architect:

Steinberg Architects, Irvine, CA

### Engineer:

IDS Group, Inc., Irvine, CA

### Construction Manager:

URS Corporation, Los Angeles, CA

### Reinforcing Bar Fabricator:

Harris Rebar Southern California  
Pomona, CA

### Total Project Cost:

\$35 million

### Total Project Size:

55,000 sq ft

### Award:

2012 CRSI Award Winner –  
Education Facility Category

### Photography:

RockinExposures (post-construction and  
interior shots)

## STRUCTURAL FRAMING SYSTEM

The Golden West College (GWC) Learning Resources Center (LRC) is a unique, cast-in-place concrete structure consisting of 55,000 square feet over three stories. The GWC campus is comprised of over 20 one- to two-story concrete buildings originally designed by the renowned architect William L. Pereira in the 1960s; it is a landmark facility known in the City of Huntington Beach and surrounding Southern California communities for its striking architecture.

The building is supported by 200 24"-diameter cast-in-drilled-hole piers that support a highly irregular arrangement of columns and shear walls. The irregular shear wall layout resulted from the full height glass façade at the front of the building. The substantial drilled pier foundation system, with piers ranging from 60' to 80' deep, was required due to the mass of the building in conjunction with a high seismic hazard and site soils containing multiple layers of peat and liquefaction zones. The floors are flat slab construction with thicknesses varying from 11" to 15" and column and wall spacing from 30' to 40'. Stud rails were used to avoid column drop panels at the request of the architect. Lateral loads, primarily earthquake, are resisted by 12" thick concrete shear walls.

## UNIQUE DESIGN FEATURES

This building is the first known application of a concrete mix design composed of both Type III and Type K shrinkage-compensating cements selected to achieve a striking, nearly white appearance with minimal cracking. The 24" diameter building columns and 12" thick walls contain this mix. Casting sequences for floors and walls were carefully orchestrated to accommodate dimensional changes during curing and to prevent significant cracking. The main concern with combining Type III and Type K cements is that Type III cement hydrates quickly; the chemistry of the Type K shrinkage compensating components add to the challenges of producing a pumpable mix that can be delivered in high volumes to wall forms congested with reinforcement.

IDS Group was further challenged by the combination of high seismic loading and building torsional behavior during strong earthquake shaking. Southern California is one of the world's most active seismic regions, with numerous major faults within striking distance. A great deal of reinforcing steel, above and beyond the normal reinforcing levels to support gravity and floor live loads, was required to soundly connect the walls to the floor slabs and tie the building together.

## REASONS FOR CHOOSING REINFORCED CONCRETE

The main campus of over 20 buildings is largely cast-in-place, reinforced concrete. The LRC is the newest and most technological facility on the campus. The College and architect wanted to maintain style continuity but make a bold, modern, and dramatic statement by constructing large, bright concrete wall areas that are sandblasted with a rectangular pattern of raised and inverted ribs and exposed-form tie pockets. Much of the façade is a glass mullion system with stainless steel accents that create a striking juxtaposition with the concrete walls and columns inside and outside.

**CRSI** Concrete Reinforcing  
Steel Institute

[www.crsi.org](http://www.crsi.org)