PCI
Precast/Prestressed Concrete Institute

LEED CERTIFICATION CRITERIA

UNIVERSITY OF PHOENIX RIVERPOINT CENTER

Project Type:	Office
Location:	Phoenix, Ariz.
Owner:	Apollo Group, Phoenix, Ariz.
Architect:	Carpenter Sellers Architects (now Carpenter Sellers Del Gatto Architects), Las Vegas, Nev., in association with SmithGroup, Phoenix, Ariz.
Engineer:	CTS (formerly Caruso Turbey Scott), Tempe, Ariz.
Contractor:	Sundt Construction, Tempe, Ariz.
Precaster:	T-Pac—a division of Kiewit Western Co., Phoenix, Ariz.

OVERVIEW

Build on the site of an old riverbed, the 37-acre University of Phoenix campus includes three precast concrete and curtainwall office buildings, two six-story and one 10-story structures totaling 630,000 sq. ft, as well as two all precast parking garages with 3,779 parking spaces. The structures house the UF corporate headquarters, as well as their on-line campus operation.

Major goals were to design buildings that were sustainable, required minimal long-term maintenance, and complemented the complex's southwest desert environment.

The latter was achieved by utilizing such natural-feeling materials as copper, stone, glass and concrete.

The design combines precast concrete structural components and spandrel panels with a cast-in-place concrete structural frame and aluminum curtainwalls. Also utilized are precast columns, beams, shear walls, spandrels, and flooring composed of double-tees. Color is integrated in the wall panels, eliminating the need for future painting.

The buildings are sited on an east-west axis with major wall and glass exposure to the north and south. East and west façades feature narrow, deep set windows. Major glass walls face north and south. To protect against high summer sun, the South façades incorporate horizontal metal shade fins. This design allows maximum daylight to enter the structures, reducing the need for artificial lighting and reducing energy consumption.

An under-floor plenum system handles HVAC distribution and electrical cabling, reducing the amount of conduit and ductwork required and providing occupant control of the thermal comfort system. Elimination of ductwork also reduces the ceiling-to-floor space requirements, cutting down the overall height of the buildings, saving material usage.

"Precast concrete was chosen for this project because of the quality, durability, and looks of the material, as well as being almost completely maintenance free," says Stacy Howell, marketing director, Carpenter Sellers Del Gatto Architects. "Precast concrete is consistently used through-out the project on the garages and buildings and provides thermal mass for the harsh east and west exposures."

On the project, Sundt Construction pioneered the use of an innovative process developed by the Lean Construction Institute, called the Last Planner System (LPS). The process involved subcontractors creating a detailed schedule based on project milestones. One attribute of the process is to greatly minimize waste. In addition, over $15 million in value engineering was utilized throughout preconstruction.

The project was designed to meet LEED certification standards.

100 PERCENT

Amount of precast concrete materials that were manufactured locally

0 PERCENT

Amount of maintenance required by integral-colored precast panels

0 PERCENT

Amount precast concrete contributed to construction waste

LEED CERTIFICATION CRITERIA

Project includes 2 six-story, 1 10-story offices, plus 2 parking structures.

Photo: Carpenter Sellers Del Gatto Architects.

Precast structural components and spandrels combine with cast-in-place frame and aluminum curtain walls.

Photo: Carpenter Sellers Del Gatto Architects.

Precast concrete was chosen for its durability, aesthetics, quality, and low maintenance.

Photo: Carpenter Sellers Del Gatto Architects.

PCI

Precast/Prestressed Concrete Institute

200 West Adams Street
Suite 2100 Chicago, IL 60606
Phone: 312-786-0300
Fax: 312-621-1114
www.pci.org

PRECAST CONCRETE'S CONTRIBUTION TO SUSTAINABLE CONSTRUCTION PRACTICES

Sustainable Sites:

Covered parking garages, in place of open asphalt-surface lots, reduce the heat island effect. Landscaping consists of native plants to minimize irrigation needs. Storm water is collected and retained on the site. A "microclimate" including trees and a water feature was created for an exterior dining area.

Water Efficiency:

The plant material utilized on this project is appropriate for the desert and minimizes irrigation. Low-flow plumbing fixtures are used in all restrooms.

Energy & Atmosphere:

Thermal mass of concrete helps minimize heat gain and lowers energy consumption. Limited window area minimizes the solar gain and maximizes the benefit of the precast concrete thermal mass. High-efficiency air-handling units have variable speed drives. Energy recovery outside air units incorporate outside air in the conditioning system and use evaporative cooling to indirectly cool the incoming air. In summer, two-thirds of the cooling required for outside air is provided by the recovery coil and one-third by a chilled water system. The chilled water system is a variable primary system in which the chilled water pumps modulate based on demand. The design includes water-cooled screw chillers, a heat exchanger for free cooling, and cooling towers. The system also includes two-way control values to minimize flow.

T-5 light fixtures with lighting controls were selected over standard parabolic fixtures, reducing energy use by 33%. Outside illumination is provided by efficient, cut-off fixtures that reduce light trespass. Insulated, thermal glass is used for all windows.

Materials & Resources:

Specifications emphasized materials that were manufactured or extracted locally and that contained a high recycled content. Even the gabion retaining system was built with river rocks collected from the site.

All materials, both harvested and manufactured, in the precast concrete were from within the region, including fly ash, aggregates, and rebar. The fly ash, rebar and strand in the concrete contributed to the recycled content of all materials. Recycled water and waste was utilized in the manufacturing of the precast components.

The precast concrete panels with integral color will patina over time and require no further maintenance.

The use of precast components did not contribute to construction waste, do not leach VOC toxins, and greatly reduced site disturbance.

Generally used on the east and west façades of the building, the precast panels help shield the structure from the desert sun. Windows on these elevations are shaded. Thermal mass of the concrete added to the project's energy efficiency.

Indoor Environmental Quality:

Energy-efficient, indirect lighting supplements the extensive daylighting system. An under-floor air distribution system provides every occupant with the ability to control their own thermal comfort. Supply air is introduced from ground surface via a small underground plenum, therefore placing the air directly where it is needed at the user. Heating is provided along the perimeter by the under floor air units, which also maximizes efficiency.

Innovation & Design Process:

"The overall design concepts pay tribute to the region while showcasing the University of Phoenix as a corporation designed to meet the needs of the future," adds Howell. "All concepts take into consideration the region, historical references and a corporate identity that is a model for twenty-first century education. The design is uniquely regional in the response to the desert Southwest incorporating natural materials of stone, copper, glass, concrete, and steel."

PCI