



PRECAST CONCRETE & SUSTAINABILITY

POPULOUS HEADQUARTERS

Project Type:	Office
Location:	Kansas City, MO
Owner/Developer:	Opus Northwest, Kansas City
Architect:	Populous, Kansas City
Contractor:	Opus Northwest, Kansas City
Precaster:	IPC, Inc, Des Moines, IA



OVERVIEW

The team at Populous (formerly HOK Sport Venue Event), has designed some of the most unique sports facilities around the world, including many projects in the U.S. such as: Kohl Center at the University of Wisconsin, Reliant Stadium in Houston, PNC Park in Pittsburgh, Oriole Park at Camden Yards in Baltimore, and the new Dallas Cowboys Stadium. These structures have all utilized precast concrete elements in the form of risers, beams, columns, stairs and wall panels. When designing their 225,000 ft² headquarters in Kansas City, MO; it comes as no surprise that Populous opted for a total-precast concrete structure.

The project consists of 105,000 ft² of office and retail space as well as a parking structure with 400 spaces below grade. The project has several unique features, including an all-glass exterior facade. The total precast concrete structural system, including columns, beams, hollow-core, stairs, double-tees, and wall panels, were left exposed and can be seen clearly through the 12-ft-tall glass windows. To match the 4-ft-wide window panes, 8-ft-wide precast, prestressed concrete double-tees were utilized so that each double-tee stem lined up at 4-ft on center.

The double-tee stems were left exposed to accentuate the structural aspects of the product. "Sleek, contemporary lines and layering were the driving forces behind the building's design," explains Jon Knight, design principal. "We wanted to create a modern building that sat lightly on its site amid a sea of 100-plus-year-old brick warehouse buildings."

Although not registered with USGBC, this project was built with sustainable features and was recognized in 2007 as the Best Office Building in the PCI Design Awards competition. Many project attributes would contribute towards the LEED program as noted in the following.

100 PERCENT
of the parking spaces were covered

8 FOOT WIDE
double-tees align with window mullions

100 PERCENT
of the precast concrete was manufactured within 500 miles of the jobsite

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HOK's designers implemented sustainable features into the building to maintain the firm's corporate policy of energy conservation and environmental consciousness.

Courtesy of Aaron Dougherty.



The precast concrete frame and many of the connections are intentionally visible through the glass.

Courtesy of Aaron Dougherty.



Columns are left exposed on the interior in order to reinforce the honesty of the materials approach.

Courtesy of Aaron Dougherty.

PRECAST CONCRETE'S CONTRIBUTION TO SUSTAINABLE CONSTRUCTION PRACTICES

Materials & Resources:

Recycled Content

Recycled materials used in this project included: fly ash, man-made sand, reinforcing bars, strand, and embed plates. Fly ash made up a portion of the cementitious materials. In addition to the fly ash, steel products greatly contributed to the recycled content.

Local/Regional Materials

100% of the precast concrete used in the project was manufactured in two plants – both within 500 miles of the jobsite; the Des Moines, Iowa plant is 200 miles from the jobsite and the West Burlington, Iowa plant is 300 miles from the jobsite. Additionally, almost all the overall precast concrete components were “extracted regionally” within a 500 mile radius of the jobsite. This includes use of: local aggregates and close cement and fly ash sources.

Energy & Atmosphere:

While no formal energy performance testing has been done on the building at the time of this case study, the thermal mass benefits of an all-precast concrete solution (even non-insulated) are extensive and well documented. The use of precast helps optimize a building's overall energy performance.


Sustainable Sites:

Heat Island Effect – Roof

With the exception of the site's perimeter street parking, 100% of the parking spaces are underground or covered by the structure, reducing the urban heat-island effect in its urban location.

Indoor Environmental Quality:

Construction IAQ Management Plan During Construction

The exposed use of precast concrete components and the elimination of more traditional drywall-based materials with higher volatile-organic compounds positively influence the indoor environmental quality. Additionally, the precast concrete components produce no dust or airborne contaminants during construction or service, which influence this credit. 



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