



Beverly Hills Hilton Parking Structure

PCI's 50 Most Significant

As noted almost a year ago, to celebrate the 50th Anniversary of the Precast/Prestressed Concrete Institute, the organization selected the 50 most significant projects using precast, concrete components. Since this month's focus was scheduled to be parking garages, let's look back at some structures from that retrospective. We've come a long way in 50 years!

Beverly Hills Hilton Parking Structure, 1961

This five-story, 400 car parking structure featured a unique, prestressed concrete structure for its day. Long spans eliminated columns in parking areas while lightweight aggregates minimized seismic and gravity loading. Durability was insured by using 6,500 psi concrete. The result was an open, airy design that maximized parking layout.

Baylor Hospital Parking Garage, Dallas 1974

A new concept for constructing precast Concrete parking structures was conceived for this project. Precast concrete walls ("stack walls") were used for the first time, incorporating haunches to support the sloping ramp floor on one side and the horizontal floor on the opposite side. After this project, many parking structures were designed using this notion, with either solid walls or with punched openings, commonly called "lite walls".

PCANY / ABCD BRIDGE DESIGN WORKSHOP May 19, 2005 Batavia, NY

Similar to the half day workshop held February 23 in Albany, this expanded, full day workshop on numerous aspects of bridge design, bridge types, and design tools offers 7 PDH for engineers. Announcement details and registration form included with this newsletter.

Credit and thanks for all photos and text relating to the PCI's 50 Most Significant Projects go to the Precast/Prestressed Concrete Institute, Chicago, Illinois. All 50 projects may be found on their website, www.pci.org.



Baylor Hospital Parking Structure



Sky Harbor International Airport

**Sky Harbor International Airport
Phoenix 1965 – 2000**

One of the busiest airports in the country, processing 35 million passengers per year, this facility also is the fifth fastest-growing in the U.S. To maintain the capabilities to handle the growing Sun Belt area's needs, the airport has continued to build and has used structural and architectural precast concrete components in more than 35 separate projects.

This work began with Terminal #2 with some structural precast components. The terminal later was remodeled to project an image more complementary to the terminals constructed later.

Precast began to dominate the design with the construction of Terminals #3 and #4, as designers wanted to use a material that could limit movement caused by the desert's wide temperature fluctuations. The terminals feature precast concrete floor and roof units and precast wall panels. Perimeter beams on these structures consist of precast structural components, which were completed

with an architectural finish. The wall panels were finished with an integral color while offering a low-maintenance, durable finish. Several additional parking structures, cargo facilities, bridges and other support structures feature precast concrete as well.

**Northwest Airlines Midfield Terminal
Parking Structure, Detroit, 2001**

This 10-level, all precast concrete parking structure contains parking for 11,600 vehicles, making it the world's largest parking facility ever built at one time. Containing 3.86 million square feet, it includes state of the art baggage handling equipment as well as some office space. Specifying precast concrete for the structure was estimated to have saved \$15 million compared to the cast-in-place alternative. Total cost of the project was about \$125 million. Nearly 5000 pretopped double tees were needed to complete the massive project, with five precasters using seven plants to produce components. Two cast-in-place double-helix ramps, located at each end of the structure, along with eight interior express ramps, move cars through the vertical levels quickly. The project was completed on a modified design-build process, with work taking only 17 months from contract award to completion.

The massive size and complexity of the project, completed in such a short time period, have made it notable to engineering firms everywhere. It is expected that the design will be emulated at other major airports to make more effective use of ground space.



Northwest Airlines Midfield Terminal Parking Structure



Blue Cross-Blue Shield Parking Structure

Blue Cross-Blue Shield Parking Structure North Haven 1989

This 1400 car facility was a key component in a phased development plan that required the parking structure to blend with existing and other planned buildings on the site while offering functional efficiency. To achieve these goals, designers created a lateral-load resisting system that featured a combination of reinforced precast concrete shear walls, precast fixed-based columns and precast prestressed girders.

The design features two symmetrical structures connected by two flat cross-overs with a courtyard between. The 3 supported levels feature a minimum 12' floor to ceiling height and 30'x62' bays. To provide the necessary lateral expansion and contraction, designers separated the two facilities into three sections, using joints and stabiliz-

ing each section with a reinforced shear wall. This jointing pattern was created with double columns in the parking decks and slide bearings at the crossovers.

**Rock Island Parking Structure
Rock Island, Ill**

This 3 level parking deck features four bays With 59' clear spans that provide column-free space for parking. The perimeter of the structure was kept level, while the central 2 bays slope in the same direction, permitting one way traffic with angled parking. The outstanding factor in its design was the use of Vierendeel trusses to provide a distinctive look and structural efficiency. Eight foot wide, 24 inch deep precast, prestressed double tees were used for the floors, with 6' high precast "L" beams used at sloping floors and inverted tee beams measuring 2'3" used at cross-overs. The Vierendeel trusses, 16" wide and 11'10" tall, span 32' between the columns. Bottom and top chords that were 16" wide and 22" deep support the double tees at the second level and roof, respectively. Precast spandrels around the perimeter of the structure act as guardrails. The trusses were specified because they could carry two floors, halving the number of perimeter beams. Supporting the double tees on top and bottom chords without any eccentricity as would happen in a conventional single-ledge beam, eliminated the need for extra reinforcement and special connections. They also provided a distinctive look that fit with the owner's goals.



Rock Island Parking Structure

Calendar of Coming Events:

- April 5-9** PCI Committee Days, Chicago, IL
- April 17-20** ACI Spring Convention, New York, NY
- April 20-24** ASCE Structures Congress, New York, NY
- May 5-6** ACI Certification Program, Troy, NY
- May 16-18** PCI QC Levels I/II, Nashville, TN
- May 19** Bridge Design Workshop, Batavia
- Sept. 23-26** NPCA IOC (Industry Outlook Conference), Sarasota, FL

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On-site Wastewater Treatment Seminar and Plant Open House

Producer Member Jefferson Concrete Corp., Watertown, NY hosted a half day seminar, lunch, and plant tour last March 8 for close to 100 engineers, code enforcement officers, and contractors, all from their immediate area. The keynote speaker was Ed Pennypacker of Jepco Sales; his presentation was "On-site Wastewater Treatment – Where We've Been and Where We're Going". His talk reviewed some interesting history and went into emerging technologies. Next was Stephen E. Powers, P.E., District Sanitary Engineer, NYSDOH in Watertown, who gave an overview of existing design standards for individual household wastewater treatment, discussed the role of the licensed design professional in these systems, and discussed design changes and other modifications to wastewater treatment regulations. Following lunch, two industry experts spoke about their products and their role in advanced secondary treatment units. They were David Charette from Elgen Corporation and Dan Moellman from Advanced Drainage Systems.

The day concluded with a question and answer period engaging all the various constituencies in the group. We encourage every producer in the state to organize similar programs in their areas. The 5 PDH's offered also helped!