

Universal Building Products Acquires Two WESTMINSTER, CALIF.

Universal Building Products has acquired Accubrace Shoring LLC and Atlas Anchoring LLC, both based in Howard Lake, Minn. The two companies will operate as **Accubrace Inc.** and will continue doing business as usual, the company says. The companies focus on soil-anchor installations and heavy shoring and will supplement Universal's existing line of concrete accessories.

Holcim Receives Award THEODORE, ALA.

The **Holcim (U.S.) Inc.** cement plant received the Environmental Performance Award from the Portland Cement Association and *Cement Americas* magazine as part of the 2008 Cement Industry Energy & Environmental Awards. The awards recognize facilities that take steps beyond those required by environmental laws and regulations to minimize their impact on the environment. To reduce its impact, the plant developed programs to respond to air, water, and solid-waste emissions.



Correction

The photo depicted with the Project Spotlight on the American Family Insurance Regional Headquarters in the **Barber Architecture** profile in the Spring 2008 issue showed the incorrect building. The Spotlight showed a different view of the Starz Encore project depicted in another Spotlight.



Wachovia Tower Features Double Tees CHARLOTTE, N.C.

The 50-story Wachovia Tower office building under construction is using precast concrete double tees for its flooring system, an unusual design that architects say helped speed up construction and provide design flexibility for office layouts. Dropped ceilings will be provided on each level, covering the double-tee stems and creating a plenum above each level's ceiling.

The double tees, typically 12 ft wide, are being produced and erected by **Prestress of the Carolinas LLC** in Charlotte. The double tees are being used to span 45 ft from the core to the perimeter to create open floors on the office floors (consisting

of all but the top three floors) of the 1.4 million ft² project, explains Tommy Hagood, principal and division manager for TRC Worldwide Engineering Inc. in Sarasota, Fla. In some cases, double tees will be created as long as 60 ft for special applications.

The architect of record on the project is **Thompson, Ventulett, Stainback & Associates** in Atlanta, Ga. Batson Cook Co. in West Point, Ga., is serving as general contractor, while Rutledge & Sons in Woodstock, Ga., erected the precast concrete components. The project is scheduled for completion in late fall of 2009.

The double tees are supported by a 70 ft x 70 ft concrete core at the building's center and by a cast-in-place tube frame along the perimeter. Each double tee spans this distance, with cast-in-place brackets providing support at each edge. "Pinwheel girders" were used to allow for a change in direction of the girders at each corner of the building, Hagood notes.

The double tees are providing fast erection of the project, eliminating any need for shoring or falsework, as would be required for a cast-in-place structure, he says. A variety of structural systems were investigated before deciding on the double tees as the best solution. "We worked closely with the architect, contractor, and precaster to ensure the scheduling would run smoothly and that we could efficiently create the spans we needed."

September Is Precast Concrete Month CHICAGO, ILL.

The **Precast/Prestressed Concrete Institute** will celebrate Precast Concrete Month again this September with plant tours at participating Producer Member sites. This year's programs will focus on using precast concrete components to achieve sustainable design.

Details of the programs in each area are being posted at PCI's website, www.pci.org, and at individual members' sites. The programs typically include a plant tour and seminar program about precast concrete's applications. Each program, however, is produced by the local plant and may differ in its specifics.

The programs qualify for AIA/CES Learning Units, and a certificate is provided at the site at the end of the program.

Concrete Aids Sustainable Designs: Study

SKOKIE, ILL.

Concrete was used as a sustainable material by more than three out of every four design professionals recently surveyed about their preferences of materials.

The study, conducted by the **Portland Cement Association**, found that 77% of the 500 architects, engineers, and other design professionals who responded used concrete in their sustainable projects due to its energy efficiency, durability, and reduced maintenance.

In ranking 22 attributes that were important when selecting building materials, respondents named energy efficiency as the most important, with a mean rating of 4.5 out of 5.0. Durability (4.4) and aesthetics (4.2) were next. When asked which material they preferred for providing those attributes, concrete was the most common response for energy efficiency and durability.

The group also developed an index of how various materials ranked as a green material based on the findings. Concrete's "green factor" was 4.20, followed by wood (4.03) and steel (3.85). Additionally, 42% agreed or strongly agreed that predominantly cement or concrete structures provided greater sustainability than other materials.

The study was conducted earlier this year through an electronic form on a third-party-hosted website. Respondents were asked to answer questions based on projects they had worked on the most during the last year.

Tindall Opens New Plant

MOSS POINT, MISS.

Tindall Corp. has opened a new precast, prestressed concrete plant north of this city. The \$26 million plant was designed for high output. It features a 110 ft clear span and is 720 ft long. The batch plant will deliver concrete into the production bay using an automated concrete-delivery system based on European technology.

The 165,000 ft² plant has more than 600 tons of aggregate storage capacity and more than 480 tons of storage capacity for cement and fly ash. It offers a 4.5 yd³ mixer and is designed to accommodate another.

Development took advantage of the Gulf Opportunity Zone Act of 2005 to offer economic incentives to rebuild the Gulf Coast following Hurricane Katrina. Tindall's previous plant in the region, in Biloxi, Miss., was damaged extensively by the hurricane. The plant was restarted, but officials decided to relocate and construct a more modern facility.

Tindall has also appointed Corey R. Cummings as Technical Sales Representative for its Corrections Division covering the West Coast.



Geil joins IPC Inc.

MINNEAPOLIS, MINN.

Bob Geil joined **IPC Inc.** as regional manager of its new Minneapolis, Minn., office.

Geil's responsibilities include providing information on IPC's capabilities to architects, engineers, and general contractors and ensuring satisfaction with all company products and services.

IPC is opening the new Minneapolis office to make products and services more accessible for designers and builders in the Minnesota area.



— Bob Geil

Gundrum named president of JW Peters

BURLINGTON, WIS.

JW Peters Inc., owned by Cretex Cos., has promoted Brad W. Gundrum to president from his previous position as director of operations. In his new capacity, Gundrum will oversee all daily operations at JW Peters.



— Brad W. Gundrum

PCI Tests Parking Structure on Outdoor Shake Table

On May 7, 2008, more than 100 professionals in the precast concrete structures industry, researchers, members of research grant foundations, and journalists gathered to witness the first public shake-table test on the precast concrete parking structure constructed as a part of the Diaphragm Seismic Design Methodology (DSDM) program at the University of California at San Diego's (UCSD's) Network for Earthquake Engineering Simulation/Englekirk Structural Engineering Research Center in San Diego, Calif. The event was exciting to witness: five years of research, innovation, coordination, and cooperation among PCI, academia, industry, and research foundations culminated in this test.

The test specimen is a one-half-scale model of a typical parking structure, and all of the components and connections were carefully manufactured to meet the scaling requirements. The 393 ton, three-story parking structure is 56 ft long, 6 ft 8 in. wide, and 21 ft tall. At each short end of the structure is a post-tensioned shear wall, which serves as the lateral-force-resisting system. The two walls are each 8 ft long, 8 in. thick, and 23 ft tall. Each wall is prestressed with ten 0.5-in.-diameter unbonded tendons, and each wall also has two no. 7 energy dissipaters between the foundation beam and wall. It features three types of flooring components, one on each of its levels: untopped double tees, topped double tees, and topped hollow-core concrete slabs. The double-tee and hollow-core-slab diaphragm toppings incorporated the ductile ladder developed at Lehigh University to transfer shear across the joints in the floor units.

Fourteen 4-ft-wide, 11-in.-deep, 16-ft-long topped double tees with a 1-in.-thick flange and 1½-in.-thick topping compose the lower level of the parking structure. **Mid-State Precast** in Corcoran, Calif., supplied the double tees and played a major role in the production and erection of the test structure.

Twenty-eight 20-in.-wide, 4-in.-deep, 16-ft-long hollow-core slabs with a 1½-in.-thick topping compose the intermediate floor diaphragm. Hanson Structural Precast in Irwindale, Calif., supplied the hollow-core slabs.

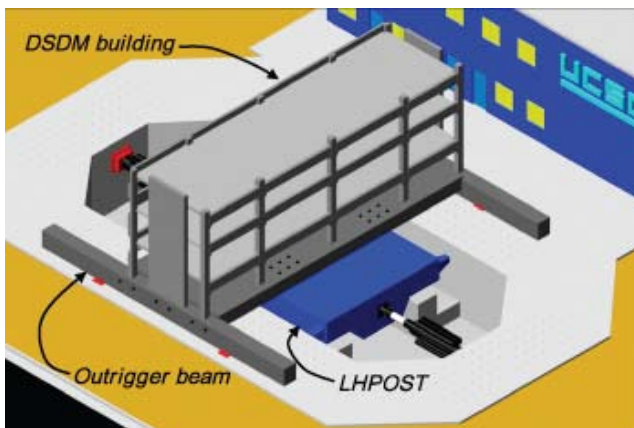
Fourteen 4-ft-wide, 12-in.-deep, 16-ft-long, pretopped double tees with a 2-in.-thick flange and a 1-in.-thick, 18-in.-long concrete wash compose the upper-floor diaphragm. These units are connected with miniature JVI connectors, manufactured at half scale specifically for this project. The floor units sit on pretensioned gravity columns with corbels. Mid-State Precast also supplied the pretopped double tees.

The structure is wider than the shake table. Thus, it is partially supported on the shake-table platen and also supported on two hydraulic bearings on the outrigger beams at each end. The shake table measures 25 ft × 40 ft and has a load capacity of 2240 tons. Hundreds of instruments were placed throughout the test structure and provided readings that will be evaluated following the testing period, which ended in June.

The researchers performed a series of four tests for the



A one-half-scale parking structure underwent seismic testing on the shake table on May 7, 2008, at the University of California at San Diego's Englekirk Structural Engineering Research Center.



This schematic illustrates the setup for the shake-table tests of the parking structure for the Diaphragm Seismic Design Methodology program.

Industry, Academia Cooperation Key to Success of Future Research

invited guests. The third and fourth tests of the day, scaled versions of the 8.0 magnitude 2007 Peruvian earthquake and 6.5 magnitude 1979 Imperial Valley earthquake in California, respectively, were the most dramatic. These final tests, lasting only 2 minutes and 20 seconds, respectively, shook the parking structure like it was a toy. On close inspection after the tremors subsided, the structure had a few hairline cracks but no damage in the three concrete diaphragms, leaving all of the attendees with high hopes for the success of the program.

The high-profile DSDM research program is being conducted by a consortium of three universities and an industry task group. It is led by Robert B. Fleischman, associate professor in the Department of Civil Engineering & Engineering Mechanics at the University of Arizona in Tucson. Full-scale static tests of the reinforcement details and precast concrete connections have been conducted at Lehigh University in Bethlehem, Pa., under the direction of Clay Naito and Richard Sause. The shake-table testing is under the direction of Jose Restrepo from UCSD. Tom D'Arcy is leading the industry advisory committee.

An advisory committee chaired by D'Arcy of the Consulting Engineers Group and PCI's Research and Development Committee, chaired by Doug Sutton, will review the experimental results.

Once the tests are completed and the results evaluated, the group will work toward providing data and supplementary information to allow the design approaches to be accepted into code. That process involves peer review of various technical publications and a broad participation of professionals who are knowledgeable in the development of code provisions.

The May 7 demonstration received extensive coverage in the local newspapers, national television, and the *Los Angeles Times*. A web camera at the jobsite provides views of the construction and testing of the structure and can be accessed at <http://137.110.165.19>.

After the opening remarks at the shake-table test site, Steven McCabe, chief executive officer of the Network for Earthquake Engineering Simulation (NEES), was glowing in his remarks about PCI. It was NEES that commissioned the construction of the country's largest shake table at the University of California at San Diego's Englekirk Structural Engineering Research Center test facility in San Diego, Calif., and then provided further operating and management funds for the Diaphragm Seismic Design Methodology (DSDM) project. McCabe says that PCI had remarkable foresight, not only to recognize a deficiency in the current codes, but also to recognize the need for researchers to work with industry to develop a feasible solution and design methodology to address these deficiencies.

Five and a half years ago, PCI recognized the need to develop and demonstrate a reliable seismic design methodology for precast, prestressed floor diaphragms. The intent was to develop these methodologies and introduce them into building codes. The Research and Development Committee, then chaired by Tom D'Arcy, advertised a request for proposal (RFP) in the *PCI Journal* to address these concerns. Their objective was to develop an industry-endorsed recommended practice for the design and construction of diaphragms that use precast, prestressed concrete components.

Not only did the committee outline specific tasks that it wanted to accomplish through this research program, it also made it paramount that the research team include the industry as a part of the entire process, ensuring that a strong partnership was set up from its infancy.

As a part of the RFP, the first task was to develop an industry advisory panel to interact with the researchers in developing the design concepts and test plan. It was this task that laid the foundation for all future contributions to this research. The project ballooned from PCI's original \$200,000 grant to an amazing \$2.3 million research project. The committee also required the winning team to submit a package requesting funds from the National Science Foundation (NSF) under its Grant Opportunities for Academic Liaison with Industry initiative. Because of the industry involvement required by PCI's RFP, the DSDM consortium was able to qualify for the NSF grant in August 2003.

The National Science Foundation and NEES have provided grants of \$569,000 and \$250,000, respectively, for this research program. In addition, the Charles Pankow Foundation has provided two grants totaling \$410,000. These contributions have been combined with the PCI research and development budget and industry support from PCI Producer and Associate Members.

HEADLINES

Finrock signs up Florida and Virginia projects

MERRIFIELD, VA., AND TAMPA, FLA.

Finrock Construction has been selected as design-builder for two parking structures for the new Merrifield, Va., mixed-use Town Center just outside of Washington, D.C. The value of the two projects is \$26.1 million.

In Florida, Finrock Construction has signed contracts with Skanska USA for the Met Life Phase 1 parking structure in Tampa, Fla., for \$9.9 million, and with Hardin Construction for Darden Restaurants in Orlando, Fla., for \$7.7 million. In both contracts, Finrock will act as the design-builder and the precast concrete supplier.

In addition, Finrock Design-Manufacture-Construct continues its teaming with Jack Jennings & Sons in contracting for the design-build delivery of the 9-level, 2246-space parking structure for Orlando Regional Healthcare. The structure will sit atop a campus-wide drainage/exfiltration system and will include upper-level sun shades and two pedestrian bridge links.

Revel Builds Precast Parking Structure

ATLANTIC CITY, N.J.

High Concrete Group LLC in Denver, Pa., has been selected to build the 12-story parking structure for the new Revel Entertainment Group LLC beachfront casino entertainment resort. The \$2 billion project will offer more than 7500 spaces, making it among the largest precast concrete parking structures on the East Coast.

The project, slated to open in 2010, will include \$81 million worth of precast concrete components, the largest contract ever awarded to High Concrete, the company says. The contract, awarded by Tishman Construction Corp., is 2½ times High's previous largest project, the Caesar's Transportation Center. For more on that project, see the feature article on page 34.

Designing with Precast Seminars Set

DENVER, COLO.

Two seminars aimed at aiding designers and engineers in understanding the efficiencies and complexities of architectural precast concrete will be held in Colorado this fall. The programs are sponsored by **Rocky Mountain Prestress, Stresscon Corp.**, and the **Colorado Prestressers Association**.

The programs will be held 8 a.m. to 5 p.m. on October 28 at the Hilton-Antlers Hotel in Colorado Springs and during the same hours on October 30 at the Renaissance Denver Hotel in Denver.

The programs are being run in conjunction with the publication of the third edition of PCI's *Architectural Precast Concrete* manual. Attendees will earn 6.75 AIA/CES (HSW) Learning Units (LU) or 6.75 Professional Development Hours (PDH). A certificate of completion will be provided.

Similar programs have been run in other regions, with more planned for future months. For more details on these programs, contact Wally Prebis, CPA, at wallycap@aol.com or (303) 238-5674.

High Concrete Wins Awards

DENVER, PA.

High Concrete Group LLC has won the 2008 Grand Prize Award for Architectural Concrete Precast Cladding given by the American Concrete Institute's Eastern Pennsylvania & Delaware chapter. The company also received an Award for Excellence from the International Parking Institute (IPI).

The ACI award was presented in recognition of the company's work in designing and construction of the precast concrete

components for Symphony House, a 32-story luxury condominium and theater in downtown Philadelphia, Pa. The 525,000 ft² tower, designed by Bower Lewis Thrower, was finished in red sandblasted precast concrete panels.

The 24 residential floors were clad in lightweight carbon-fiber-reinforced panels that weigh more than 50% less than conventional precast concrete. The cladding will allow the panels to withstand Category 5-force wind and rain and also provided significant savings on foundation and superstructure costs.

The IPI 2008 Award of Excellence was presented for High's work on the Lehigh University Alumni Parking Garage in Bethlehem, Pa., one of five awards in the category of Architectural Achievement. The project previously won a 2007 Design Award from PCI as Best Parking Structure.

