

# Notable Concrete in Anaheim

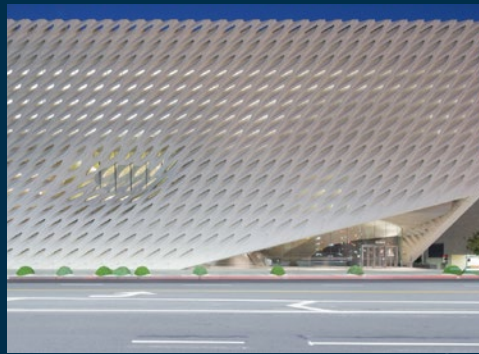
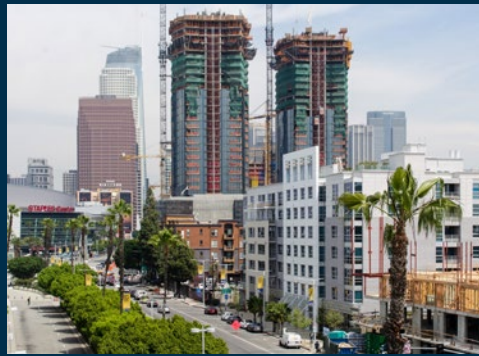
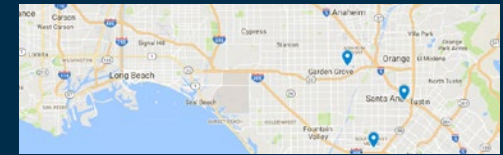


American Concrete Institute

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## Examples of concrete construction in the vicinity of the ACI convention

As ACI prepares to meet for The ACI Concrete Convention and Exposition, October 15-19, 2017, at Disneyland® Hotel, in Anaheim, CA, here are several nearby projects of interest:



Thanks to Michael Paul of ACI Committee 124, Concrete Aesthetics, and the Southern California Chapter – ACI for compiling this information.

# Cathedral of Our Lady of the Angels

555 W. Temple St., Los Angeles, CA 90012



This cathedral replaced a church that suffered substantial damage in the 1994 Northridge earthquake. The building rests on base isolators to minimize damage from future earthquakes. Its prominent architectural concrete has a light tan color reminiscent of the sun-baked adobe construction of the California missions. The project features 18 to 58 in. (457 to 1470 mm) thick cast-in-place walls and is designed to last 500 years.

Following extensive testing of several cements, a Danish Type V white portland cement was selected and used in 59,000 yd<sup>3</sup> (45,100 m<sup>3</sup>) of concrete. The cement helped control the heat of hydration in the massive walls, and it facilitated a uniform color in the pigmented concrete.

Project credits: Rafael Moneo, Design Architect; Leo A. Daly, Architect of Record; and Morley Builders, General Contractor.

Submitted by Larry Rowland, Manager Marketing and Technical Services, Lehigh White Cement Co., Allentown, PA, +1.610.366.4645, [lrowland@lehighcement.com](mailto:lrowland@lehighcement.com).

# Circa

1200 S. Figueroa St., Los Angeles, CA 90015



Twin high-rises form the focal point of this \$500 million residential mega-project in downtown Los Angeles. The development features two levels of below-grade parking, ground-level commercial space, six levels of above-grade parking, an amenities podium deck, and 26 stories of residential apartments. Located near the Staples Center arena, the Los Angeles Convention Center, and the Metro Pico Station in the city's South Park District, the high-rise buildings feature a curved north face to enhance views of the city skyline and mimic design themes from surrounding architecture. When complete, the project will total nearly 110,000 yd<sup>3</sup> (84,100 m<sup>3</sup>) of concrete and nearly 600,000 worker-hours to form and place.

Project credits: Harley Ellis Devereaux, Architect; Cary Kopczynski & Co., Structural Engineer; LendLease Corp., General Contractor; Largo Concrete, Concrete Contractor; and Holliday Rock Co., Concrete Supplier.

Submitted by Michael Buresh, Marketing & Communications, Largo Concrete, Inc., Tustin, CA, +1.714.731.3600, mburesh@largoconcrete.com.

# Great Wolf Lodge

12681 Harbor Blvd., Garden Grove, CA 92840



The indoor waterpark at this resort features two of the tallest and heaviest tilt-up panels in the United States, per the Tilt-Up Concrete Association. A total of 40 panels created 40,000 ft<sup>2</sup> (3700 m<sup>2</sup>) of wall area enclosing the 102,000 ft<sup>2</sup> (9500 m<sup>2</sup>) facility. The largest panel was 84 ft (25.5 m) tall and weighed 260,000 lb (117,900 kg). Each panel had full-height edge pilasters and included some combination of changes in thickness, steps at the bottom, slopes at the top, massive openings, and large embedments. Because there was no slab to anchor the panels inside the building, with the space given to landscaping, pools, and a state-of-the-art water conservation system, the design team devised practical and economical connections between the panels and footings to meet California's seismic design requirements. The project won ENR's Regional Best Project in the Specialty Contracting Category and the Southern California Chapter – ACI Pankow Award for Outstanding Performance in Design and Engineering.

Project credits: Ware Malcomb, Architect; Englekirk Partners, Structural Engineer; Turner Construction Co., General Contractor; Largo Concrete, Concrete Contractor; and Holliday Rock Co., Concrete Supplier.

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# Historical Concrete Pavements

in Newport Beach and City of Whittier, CA



Southern California roads built in the 1920s continue to carry traffic, and so they provide lessons about good design, construction, maintenance, and repairs. Examples include East Ocean Boulevard in Newport Beach, Sapphire Avenue on Balboa Island, Washington Avenue in Whittier, and Beverly Boulevard in Whittier, which were built in 1924, 1925, 1926, and 1928, respectively. For more information, visit <http://cncement.org/wp-content/uploads/2017/07/CNCA-Historic-Pavements-Complete-Final-Report-2017.pdf>.

Submitted by Nathan Forrest, Pavement Engineer, California Nevada Cement Association, Anaheim, CA, +1.520.235.0480, [nathan.forrest@cncement.org](mailto:nathan.forrest@cncement.org).

# Segerstrom Center for the Arts

600 Town Center Dr., Costa Mesa, CA 92626



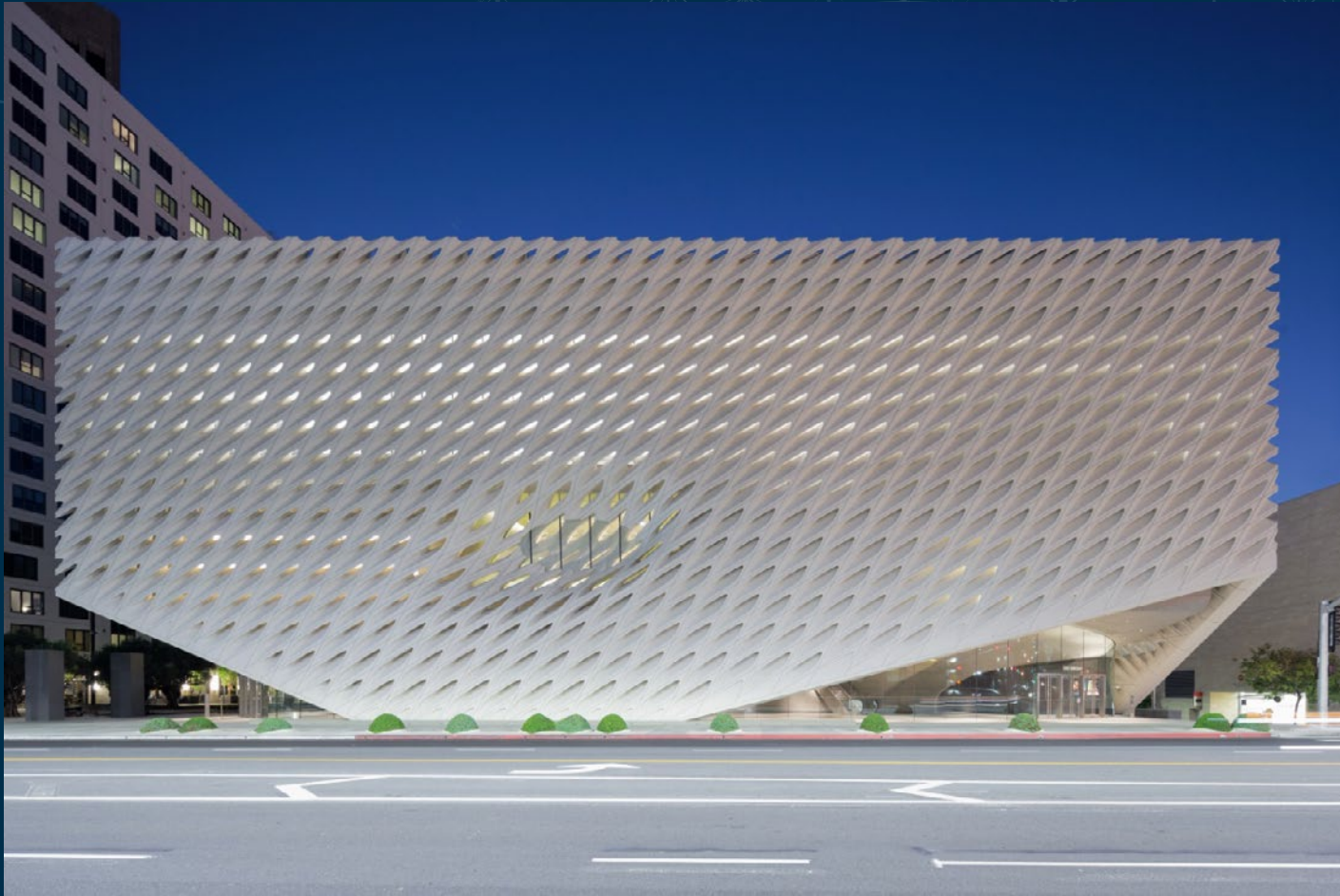
Designed by renowned architect César Pelli, this five-story concert hall seats 1704 in front of the performance platform and 250 in choral seating behind the platform. Adjustable acoustics are accomplished through four reverberation chambers and 128 concrete and wood doors used to adjust volume and reverberation time. Placing embedments in the concrete for structural steel elements, acoustical mountings, and anchorage for over 1 acre (0.4 ha) of serpentine-glass façade was challenging due to the congested reinforcement. The undulating theme is carried on throughout the building with the decks in the multi-level lobby and the balcony seating levels twisting toward the platform. At 290,000 ft<sup>2</sup> (26,900 m<sup>2</sup>), this cast-in-place structure is one of Southern California's cultural destinations and won the Southern California Chapter – ACI Pankow Award in 2007.

Project Credits: Pelli Clark Pelli, Architect; John A. Martin & Assoc., Structural Engineer; Fluor Enterprises, Construction Manager; Largo Concrete, Concrete Contractor; and National Ready-Mix, Concrete Supplier.

Submitted by Michael Buresh, Marketing & Communications, Largo Concrete, Inc., Tustin, CA, +1.714.731.3600, mburesh@largoconcrete.com.

# The Broad

221 S. Grand Ave., Los Angeles, CA 90012



With its innovative “veil and vault” concept, this museum’s design merges the two key components of the building: public exhibition space and collection storage. The central museum “vault” is a heavy opaque mass for the gallery’s collection that is always in view. The vault is enveloped on all sides by a 120,000 ft<sup>2</sup> (11,150 m<sup>2</sup>) “veil,” or cellular exoskeleton, made up of 2500 glass fiber-reinforced concrete (GFRC) panels. The airy, honeycomb-like veil spans the block-long gallery and provides filtered natural daylight. Architectural GFRC was selected as the most cost-effective of all the materials analyzed, while meeting schedule and durability requirements.

Project credits: The Broad Art Foundation, Owner; Diller Sofidio + Renfro and Gensler, Architects; Matt Construction Corp., General Contractor; and Willis Construction, GFRC Producer.

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# The 50 Monkey Ferris Wheel, Santa Ana Zoo

1801 E. Chestnut Ave., Santa Ana, CA 92701



The 50 Monkey Ferris Wheel, which honors the heritage of the Santa Ana Zoo's signature monkey exhibits, is destined to become a treasure to the community and a popular, new field-trip destination for students and families. The Ferris wheel rises 64 ft (19.5 m) and is supported by a system of eight reinforced concrete, drilled-pier friction piles. Four piers support the unit's main legs and are 18 ft (5.5 m) deep and 4 ft (1.2 m) in diameter. Four other piers support the unit's brace legs. Designed to resist significant uplift loads, these piers are 17 ft (5 m) deep and 3.5 ft (1 m) in diameter. Four temporary footings were used as anchors during the raising of the wheel. The construction of the foundations sparked much interest among young zoo visitors, perhaps inspiring them to pursue careers in science, technology, engineering, or mathematics.

Project credits: Friends of the Santa Ana Zoo, Owner; Exline Design and Architecture, Architect; Bert L. Howe & Associates, Structural Engineer; Laguna Geosciences, Inc., Geotechnical Engineer; Brownco Construction Co., General Contractor; and Chance Rides, Ferris Wheel Manufacturer.

Submitted by Brad Dybel, Laguna Geosciences, Inc., Laguna Beach, CA, +1.949.499.7874, bdybel@lagunageosciences.com.





# The Mint

1136 W. 6th St., Los Angeles, CA 90017



This eight-story, 45,000 ft<sup>2</sup> (4180 m<sup>2</sup>) concrete building was seismically retrofitted to convert it from an aging outpatient medical center to a 42-unit luxury residential apartment building in the heart of downtown. New concrete shear walls and coupling beams were added to the 1920s Chicago Beaux Arts style building, along with a new foundation and collector elements to strengthen the existing diaphragms. Challenges included shoring existing columns to eliminate the need for sequencing the foundation work in the basement, which also expedited the construction schedule. Existing structural drawings were not available and, due to the structure's age and the city's emphasis on mitigating the vulnerability of older nonductile concrete buildings, a comprehensive testing program was used to evaluate the existing structural material properties. The building's historic designation triggered restrictions on retrofit options and methods while also requiring preservation of the entire external façade and internal spiral staircase.

Project credits: NASH-Holland Bixel & Lucas Investors, Owner; AC Martin, Architect; Miyamoto International, Structural Engineer; Holland Construction, General Contractor; and American Gunite, Concrete Contractor.

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# Map

Click on the map below to view the Google map.

