CC's 2011 GreenSite Awards

CONCRETE DOES ITS PART TO PROMOTE SUSTAINABLE CONSTRUCTION.

By Tom Bagsarian

THERE IS MORE than 1.6 billion square feet of LEED-certified commercial space in the U.S., according to the U.S. Green Building Council (USGBC). The concrete industry can hold its head high in significantly contributing to this impressive total.

As evidence, one does not have to look any further than the annual GreenSite Awards, presented by Concrete Construction and its sister publication The Concrete Producer. This year's entries, which were the most we've received in the award program's four years, covered the gamut. They ranged from an innovative concrete heating tower inside a home to tilt-up wall panels in a water authority's headquarters building to pervious concrete sidewalks, curbs, and gutters at a pilot street project.

Concrete, however, contributed to the sustainability of many projects that were not officially recognized by the LEED program. Concrete contractors and producers do their part every day, through recycling efforts, using local materials, and building energy-efficient and long-life-cycle structures.

This year, we recognize projects in eight categories, in addition to our Readers' Choice winner. For more details and photographs of the winning projects and to see all of the entries, visit www.greensiteawards.com. The winners also will be recognized at 2012 World of Concrete.

* For a complete list of participants in this project and the other winners, go to concreteconstruction.net.

Residential

Flamm Home / Cambria, Calif.

The Flamm project took the site, architecture, and detailing components of a building to their creative limits. Curve board formed concrete retaining walls at the entry and rear, and concrete planters with built-in stairs help fit the house comfortably into the site. Using a 28-foot tapered concrete tower with 11 curving glulam beams (the branches) also contributed to the feeling that the home belonged there.

Much of the concrete and rammed earth is exposed, both inside and outside the home. Fly ash was substituted for more than 25% of the portland cement for the concrete. The exposed black concrete slab with artistic brass inlays was polished to a 3000-grit low-maintenance finish.

Using a concrete post-and-beam system solved the complicated earthquake structural challenges. Blending the rammed earth in between the concrete post-and-beam system provides a texture that simulates much of the sedimentary rock formations in the area. This also provides thermal mass to stabilize the home's temperature.

Rammed earth uses local graded and sifted earth with one and a half to two sacks of portland cement per yard, hydraulically rammed into substantial forms with some water.

The concrete tower is a key element. Besides supporting the roof, it provides a chase for the chimney pipe from the woodstove which, when running, heats up the concrete like a thermal battery. Oval openings in the tower let heat enter the living space. The reverse is true for cooling. Vents on top of the tower remove built-up heat and draw in cool ocean breezes.

Project Participants

Concrete Contractor: Andy Easterbrook Concrete, San Miguel, Calif.

GENERAL CONTRACTOR: Semmes & Co Builders Inc., Atascadero, Calif.

The concrete tower is a unique element in the Flamm home, helping to heat and cool the interior.

Multifamily

Rosa Parks Apartments / Chicago

As an affordable housing development, the Rosa Parks Apartments needed to be economical to build and sustainable in long-term operation and maintenance. To achieve these goals, the designers chose a straightforward approach with a limited number of parts and as few complicated details as possible. It also was necessary that the project—an eight-building, 94-unit rental apartment development—be built quickly and securely.

The plan consisted of a system of 739 precast exterior load-bearing wall panels. These were filled with 5 ½-inch, blown-in fiberglass insulation. Steel frame and metal panel bays that only touch the precast resulted in economical and sustainable structures.

Although all of the buildings are built to the same specifications, only the largest, a 27-unit, four-story elevator building, is in the process of being certified as LEED Silver. It includes solar thermal heat for domestic hot water and a geoexchange (geothermal) system with individual heat pumps.

ANDREAS LARSSON

A system of precast exterior load-bearing wall panels contributed to the Rosa Park Apartments' efforts to secure a LEED Silver designation.

Project Participants

CONCRETE CONTRACTOR/PRODUCER: Presstress Engineering Corp., Prairie Grove, Ill.

GENERAL CONTRACTOR: Humboldt Construction Co., Chicago

Landscape

Taltree Railway Garden / Valparaiso, Ind.

What was once a field of prairie grasses has been turned into an ornate model railway garden that uses stormwater captured with permeable concrete pavement. Opened in spring 2011, large winding walkways allow visitors to stroll through the garden. Mountains of natural stone up to 14 feet high are set to create a miniature world for G-scale (1/24 actual size) trains to travel on more than 3000 feet of track through mountains and valleys, past waterfalls, and along streams. The trains cross more than 30 bridges, and pass through educational vignettes, which teach visitors about the impact of railroads in the early 20th century.

Permeable concrete pavement contributes to the project's sustainability by capturing rainwater to irrigate the specialized plants and for use in the streams and waterfalls throughout the exhibit.

The project surpassed the owner's desire to create a sustainable addition to its facility with this cutting-edge approach to sustainability.

Project Participants

General Contractor: Smock Fansler Construction, Indianapolis

CONCRETE PRODUCER: Smith Ready Mix, Valparaiso, Ind.

Permeable concrete pavement helped allow the Taltree Railway Garden to capture rainwater, which is used throughout the exhibit.

HYCRETE INC.

Institutional

Thomas Jefferson School of Law / San Diego

Thomas Jefferson School of Law in downtown San Diego is an eight-story classroom building, with ground-level retail space, and three levels of underground parking. The structure is concrete from the parking structure to a podium slab at the first floor and eight levels aboveground. The owner's objective was to contain costs while still achieving a structure with superior environmental performance and LEED Gold certification.

By using Hycrete's integral concrete waterproofing system, the contractor was able to eliminate external waterproofing membranes. This membrane-free approach to waterproofing reduced construction by four weeks and saved an estimated $187,000 in construction costs, a 32% improvement over traditional waterproofing approaches. The USGBC awarded the structure a credit for Membrane Free Construction Through Integral Concrete Waterproofing, (Innovation in Design Credit 1.1). This was due to the elimination of excavation/backfill required for membrane installation and the enhancement of the concrete's recyclabiity.

Project Participants

Concrete Contractor: JT Wimsatt, San Marcos, Calif.

CONCRETE PRODUCER: Vulcan Materials Co., Poway, Calif.

An integral waterproofing system eliminated external waterproofing membranes.

Transportation

Ohio Street Abatement Project / Indianapolis

The Ohio Street CSO Abatement Pilot Project was a partnership effort to beautify a significant transportation corridor into Indiana's capital. Incorporating 2650 square feet of pervious concrete sidewalk, 900 feet of pervious concrete curb and gutter, and 750 square feet of rain garden, the project improved drainage and handicap accessibility. The contractor hand-formed pervious concrete curbs to get the desired form and compression for optimal void space and compressive strength. This project helps to manage runoff from 60,000 square feet of impervious surface and will remove more than 1.35 million gallons of stormwater from the combined sewer overflow in an area that lacked any existing stormwater infrastructure. It also creates a safer corridor for pedestrians.

Project Participants

General/Concrete Contractor: Smock Fansler Construction, Indianapolis

CONCRETE PRODUCER: Irving Materials Inc., Greenfield, Ind.

JENNIFER SANCHEZ

The Ohio Street project consists of 2650 sq. ft. of pervious concrete sidewalk and 900 ft. of pervious concrete curbs.

Municipal

Toho Water Authority Headquarters / Kissimmee, Fla.

As the first LEED Gold-certified project in Kissimmee, this 54,000-square-foot facility used concrete tilt-up wall construction to reduced the project's environmental impact. The number of panels was reduced by using multiple cranes during lifting. According to the Tilt-Up Concrete Association, the project has the world's largest panel by area at 2950 square feet, the second heaviest panel ever lifted at 330,000 pounds, and the ninth widest panel at 56 feet 3¼ inches.

Originally intended to be built with precast concrete panels over a steel frame, the design and construction teams collaborated to analyze many alternative solutions and finally decided on tilt-up. These modifications not only allowed for a reduction in structural steel and a cleaner installation of insulation, but also reduced costs and saved time. Larger panels reduced the number of panel joints, limiting the potential for air and moisture intrusion, and improved the performance and health of the building.

Concrete also was used for the parking lots and sidewalks, increasing the solar reflectivity (SRI) of the hardscapes. The project's concrete mixes included about 20% fly ash.

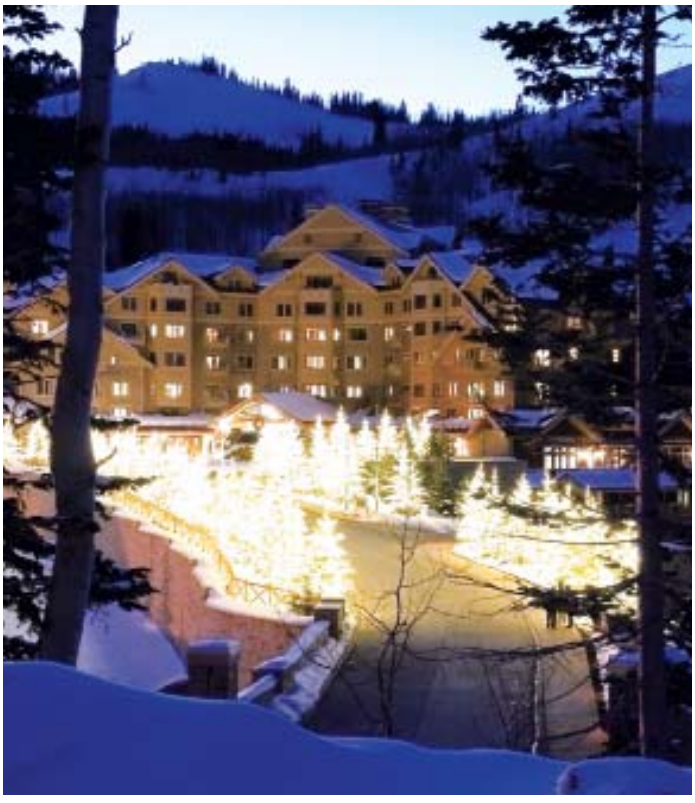
The finish face of the tilt-up panels was smooth, requiring no texture in its finish coating. The architect also insisted on 90-degree corners at all openings, no chamfers, and 45-degree sharp corners at the panel miter joints.

KZF DESIGN

The world's largest tilt-up panel was erected during construction of the Toho Water Authority headquarters.

Project Participants

Concrete Contractor: Tilt-Con, Altamonte, Fla.



LAYTON CONSTRUCTION CO.

Commercial

Montage Deer Valley / Park City, Utah

Concrete played a significant role in building Montage Deer Valley, a 988,000-square-foot luxury resort and spa. The primary structural system is made of concrete. The superstructure consists of more than 60,000 cubic yards of concrete over three levels of heated underground parking, accommodating 532 vehicles, as well as an additional 10 levels aboveground. The project also contains 3000 cubic yards of concrete manufactured onsite.

Using concrete led to a reduction in floor-to-floor sound transmission. Also, by self-performing the concrete work, the contractor was able to control the quality and provide the owner with the desired look—one that maintains the expected overall commitment to elegance, high quality, and luxury, along with sustainability and green practices.

Montage Deer Valley received LEED Silver certification in July 2011, becoming Utah's first LEED-certified resort/hotel.

Project Participants

General/Concrete Contractor: Layton Construction Co., Salt Lake City

CONCRETE PRODUCER: Geneva Rock Products, Orem, Utah

The Montage Deere Valley resort includes more than 60,000 cubic yards of concrete.

Readers' Choice

The Refinery / Lake Forest, Calif.

Concrete's sustainability and versatility are showcased in The Refinery—a 45,000-square-foot, two-story building on the Saddleback Church campus. It includes dining and kitchen facilities, a theater, game rooms, an 800-seat auditorium, a full-court basketball gymnasium, and classrooms.

Recycled materials, including concrete, steel, wall framing, and wall board, were used as much as possible throughout the building; 4000 cubic yards of concrete were placed during construction. Ninety-five percent of the construction waste was recycled.

About one-half of the interior concrete slabs were stained and polished. Also adding to the project's sustainability was extensive use of polished concrete countertops. Concrete's low maintenance needs is another sustainable benefit.

Industrial

TreePeople Center / Beverly Hills, Calif.

TreePeople is a nonprofit organization that addresses urban issues, such as water and energy conservation, flood prevention, and stormwater pollution. The TreePeople Center for Community Forestry is a state-of-the-art environmental education campus in California's Coldwater Canyon Park.

Designed to achieve a LEED Platinum rating, the center features a 250,000-gal-

Project Participants

GENERAL/CONCRETE CONTRACTOR: PCL Construction Group, Edmonton, Alberta, Canada

Concrete Producer: Catalina Pacific, Los

The 250,000-gal. concrete cistern captures rainwater to irrigate the TreePeople Center's gardens and forests.

Stained and polished concrete and other sustainable attributes are featured in many areas of The Refinery.

Project Participants

Concrete Contractor: Saddleback Development Corp., Lake Forest, Calif.

CONCRETE PRODUCER: Robertson's Ready Mix, Corona, Calif.

The Refinery will use 40% less water and consume 35% less energy than most buildings its size in California.

lon underground concrete cistern. The largest of its kind in the continental U.S., this tank captures rainwater to irrigate the center's gardens and forests. The cistern is covered with landscaping, including an elaborate labyrinth. Because access for maintenance and repairs is almost impossible, the owners needed a permanent waterproofing solution for the structure.

Conventional waterproofing membranes deteriorate over time, so the center's owners opted instead to add Kryton waterproofing admixture to the fresh concrete. When added to the concrete mix, this admixture cures to form crystals that fill the spaces between concrete particles, permanently waterproofing the structure. It also reacts with incoming water to self-seal any small concrete cracks, providing lasting protection against leakage. CC

KRYTON INTERNATIONAL