

New Saint Louis Zoo Sea Lion Sound Exhibit

Xypex® concrete waterproofing admixture helps prevent leakage of saltwater pools

Since its inception in 1910, the Saint Louis Zoo has been renowned for its beautiful, naturalistic exhibits and its diverse collection of animals. The zoo's exhibits will soon include a new \$18 million, 1.5 acre (0.6 ha) habitat and arena that will house sea lions and harbor seals. Scheduled to open this summer, the exhibit features concrete hardscapes and structures produced using a Xypex® admixture designed to help prevent leakage in the habitat's saltwater pools, underwater viewing areas, and a 35 ft (10.5 m) long underwater walk-through tunnel.

The Xypex admixture was used in all of the shotcrete for the exhibit's streams and waterfalls, and it was used in three cast-in-place concrete walls. About 1200 yd³ (920 m³) of shotcrete was applied. An overall total of 4800 lb (2200 kg) of Xypex Admix C-500 was used for both shotcrete and cast-in-place concrete.

The Key Participants

Xypex Concrete Waterproofing by Crystallization™ was specified by the project's architect, St. Louis-based PGAV Destinations (Peckham Guyton Albers & Viets, Inc.), a leader in the planning and design of zoos, aquariums, and cultural sites. PGAV Destinations has been involved in some of the most recognizable destinations in the United States, including Busch Gardens (Tampa, FL), Universal Studios (Orlando, FL), and the Biltmore Estate (Asheville, NC).

"Through research and value engineering on multiple exhibit projects," says Project Manager Mariusz Bleszynski of PGAV Destinations, "we discovered that a concrete pool vessel made watertight by a crystalline concrete admixture or surface treatment is a very economical construction method. This is especially true for the sculptured artificial rockwork pools, where a surface-applied waterproofing is not aesthetically or economically viable. We have found the Xypex line of products works well for free-formed shotcrete exhibit pools, as well as cast-in-place concrete basins for water treatment processes."



The completed Saint Louis Zoo Sea Lion Sound Exhibit (photo courtesy of Roger Brandt, Zen Pirate Photography, St. Louis, MO)



Close-up of the new habitat and arena designed to house sea lions and harbor seals at the Saint Louis Zoo (photo courtesy of Roger Brandt, Zen Pirate Photography, St. Louis, MO)



Shotcreting for the Sea Lion Sound Exhibit (photo courtesy of Cemrock)



Construction at the Saint Louis Zoo (photo courtesy of Cemrock)



Final detailing (photo courtesy of Cemrock)

The new exhibit's thematic concrete rock work was constructed by Cemrock, based in Tucson, AZ, and Seattle, WA. Cemrock specializes in the construction, fabrication, and installation of artificial and themed elements, including artificial rock work, water features, animal and aquarium habitats, and trees. Other firms involved in the construction of the project included Alberici Constructors, Rhodney Construction, Raineri Building Materials, and Ameristar Building Products.

Xypex Technology

The Xypex technology uses concrete's inherent water permeability to deliver crystalline chemicals that plug pores and bridge microcracks that develop as the concrete dries and

shrinks. The product's chemicals migrate through the waterways of the saturated pore network, where they react and grow nonsoluble, needle-like crystals that plug the pores. Within a few weeks of crystal growth, liquids can no longer pass through and the transmission of gases is significantly restricted.

Crystallization becomes an integral, permanent part of the concrete matrix. The technology will self-seal new microcracks, even if they occur years after the original application. The crystalline technology resists high hydrostatic pressure and is not affected by humidity, ultraviolet light, or oxygen levels. Because it modifies the concrete itself, the system is permanent and will not blister. The chemistry can be easily introduced into new concrete as an admixture, a dry-shake product, or a surface-applied coating.

Crystalline waterproofing protects the environment from contamination caused by leakage. The Xypex waterproofing technology makes the construction process greener by eliminating the need for membranes produced with asphalt, polymer resins, solvents, aromatics, and other materials with high energy manufacturing costs. The product is nontoxic, contains no volatile organic compounds, and is approved for potable water by NSF International, a widely accepted independent source of public health and safety standards.

Xypex Chemical Corporation, Vancouver, BC, Canada, is one of the world's leading manufacturers of products for waterproofing, protecting, and repairing concrete structures. The company's distribution network supplies its products in more than 70 countries.

—Xypex Chemical Corporation
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