

Cleaning Up the Air

When two sculptures were built for the new I-35W St. Anthony Falls Bridge in Minneapolis, the decision was made to use a new form of concrete—photocatalytic concrete—a mixture that removes carbon monoxide, nitrous oxides, and sulfur dioxide from the atmosphere. Cemstone in Mendota Heights, Minn., provided the photocatalytic concrete for the two sculptures, shaped to look like the international cartographic symbol for water, standing 30 feet tall.

The concrete mix is based on Essroc's TX Active photocatalytic cement technology and uses ultraviolet sunlight to promote and accelerate oxidation at the surface of the structures. "It basically oxidizes, or burns everything for the lifetime of the concrete, making it look just as it did when it was built," says Kevin MacDonald, vice president of engineering at Cemstone. In addition to keeping the sculptures a bright white color, the concrete converts smog-causing gases to higher oxidized states.

When used in concrete exposed to daylight, photocatalysts decompose

The concrete used on the 30-foot-tall sculptures is North America's first use of a concrete that removes pollutants from the atmosphere. Photo: Tim Davis

organic materials that foul the surface, and catalyzed compounds break down into oxygen, carbon dioxide, water, sulfate, nitrate, and other molecules that are either beneficial to or have a relatively benign impact on the environment. Though the cement is more expensive than traditional cement, MacDonald notes that if 10% of vertical surfaces were made with this cement, air quality would improve by 50%.

"Concrete has many environmental benefits as a sustainable building material, and this form of concrete takes environmental stewardship to another level," says Thor Becken, president of Cemstone. "Not only are these monuments beautiful, but they will help clean the air we breathe for years to come. ■

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