Smog-Eating Concrete

In a Nutshell

Smog-eating concrete is concrete mixed with a titanium oxide additive. Originally developed to ensure that the concrete remained a bright white color, it was discovered that the compound breaks down nitrogen oxide molecules in addition to other pollutants. Adding this compound to any concrete construction has the capability of improving the air quality of the surrounding area.

The “How To”

Smog-eating concrete orginated in Europe and is making its way to the United States. American based Essroc is the leading producer of smog-eating concrete. Essroc provides the concrete for other construction companies to pave roads or construction buildings with. Essroc sells two smog-eating products: TX Arca and TX Aria. Both products are self-cleaning, meaning the concrete resists "most organic and inorganic pollutants that gather on the surface." The latter product also cleans the air of environmental pollutants in the immediate area. These products work through a process known as photocatalysis, which relies on the sun to aid in the chemical reaction that eats away the smog.

Essroc has been sold throughout the country. Two notable examples occuried in a recent development in Chicago and another in St. Louis on a stretch of Missouri Highway 141. Information on other Essroc projects throughout the country is available on their website.

Planning & Zoning

Since the "smog-eating" additive was developed for aesthetic purposes and remains simply an additive, using it remains an option for construction and building sites. Due to its lack of effect on the strength or durability of the concrete mixes it is added to, it should not be in conflict with any building code or concrete construction codes. The use of smog-eating concrete on Highway-141 in Missouri did not require any special zoning or land use ordinance.

Dollars & Cents

TX Active cements are currently manufactured and available in the United States directly from Essroc. TX Active cements are available in either white or gray, in either bags of 47 lb or 1500 lb, or bulk truckload shipments.

Pricing is available upon request by contacting Essroc at 610-837-6725 or info@essroc.com.

Measuring Success

The benefits of the photocatalytic concrete can be measured by measuring the air quality of the surrounding area of the site. Measurements for nitrogen oxide compounds, ammonia, sulfur oxide compounds, and volatile organic compounds can be taken. Surveying residents of the surrounding neighborhoods is also a method which can be used in order to assess the effectiveness and benefits of the concrete additive.

The stretch of Highway-141 that was paved with smog-eating concrete is the subject of two on-going studies. Researchers from University of Missouri-Kansas City are conducting water qaulity analysis tests, while Iowa State University is conducting air quality tests. Please check back for an update on the results of these studies.

Air Quality is one of the regional performace measures tracked by OneSTL.

Discover More

More information on smog-eating concrete can be found on TX Active's website.

Case Studies

Pilsen Sustainable Streetscape

Contact

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Address

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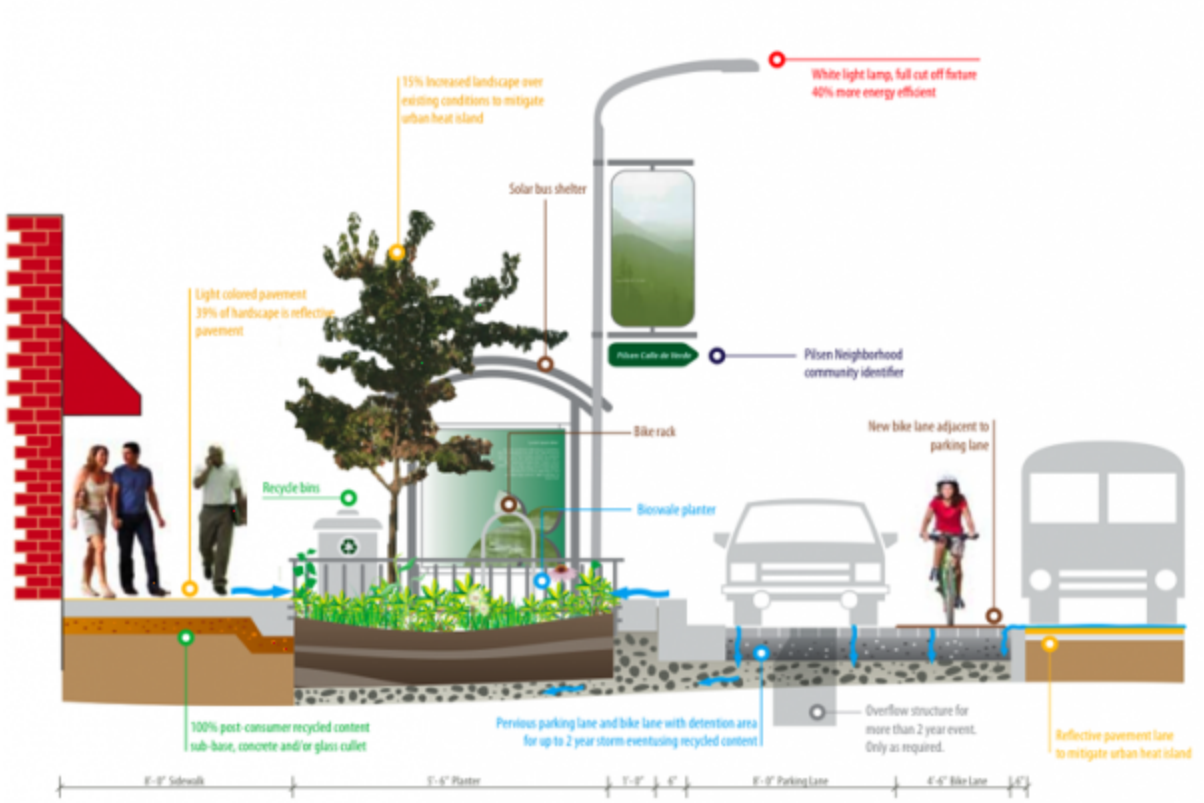
Description

The Pilsen Sustainable Streetscape spans a 2-mile stretch of West Cermak Road in the Pilsen neighborhood of Chicago, including the intersection at Blue Island. The project was completed in Spring 2013 and marks the first time that photocatalytic (smog-eating) concrete has been used in the United States, earning the streetscape its title as the “Greenest Street in America.” While the Pilsen neighborhood is experiencing a transition to a more mixed-use neighborhood, industrial areas nearby make West Cermak a common truck route, and an excellent opportunity to utilize smog-eating concrete. The streetscape also includes many other sustainable features, such as permeable pavement and bioswales for stormwater management, solar- and wind-powered streetlights, drought-resistant plants for landscaping, and bike lanes to encourage non-polluting modes of transport. In addition, 23% of construction materials used for the project contained recycled material and 60% of construction waste produced was recycled.

Video: Pilsen Sustainable Streetscape

Chicago Department of Transportation website



Cost $14 million

Lessons Learned

While the environmental benefits of smog-eating concrete are an important aspect of the Pilsen Sustainable Streetscape, the city is also focused on the social benefits. Beautification, placemaking, public safety, and

creating an outdoor space for students at nearby Benito Juarez High School were all goals in the planning of the streetscape as well. Because the streetscape was just completed a few months ago, it is hard to measure its success at this point. However, the City of Chicago is looking to incorporate sustainable practices that are now being used in pilot projects like the Pilsen Sustainable Streetscape into official city planning and building guidelines. In the future, city officials hope the smog-eating concrete and other sustainable materials will become standard on roadways and in new construction.