



Workers, over 87 feet underground, prepare forms for the next pour of self consolidating concrete at the Valley Creek Wastewater Treatment Plant in Jefferson County, Alabama.

SELF CONSOLIDATING CONCRETE IN ALABAMA:

Valley Creek Wastewater Plant First Major Project in Alabama to Use SCC

What does a wastewater treatment plant in Alabama have in common with Atlanta's new Georgia Aquarium, other than processing large amounts of liquids? Like the entertainment venue, construction crews are using Self Consolidating Concrete (SCC) in work at the Valley Creek Wastewater Treatment Plant.

SCC is being used to strengthen the perimeter walls in one of the pump stations at the plant. Daniel White, Chief Civil Engineer of Jefferson County's Environmental Services Department, says "the product has met all the required specifications and is performing as it should."

He says this mix is "unique because of its high strength." Among the challenges presented on this project is pumping the concrete some eighty feet underground through small holes inside a pump station. Crews needed a product that would fill around the forms and rebar without leaving voids. Project contractor, Brasfield and Gorrie, suggested the county use SCC to address the unique set of circumstances presented on this construction work.

Pat Popwell, project foreman, gives SCC a "big thumbs up." He says, "We are pouring down inside holes we can't get to with a crane. A lot of it is being poured through a six inch hole."

When work is finished reinforcing the underground walls, they will be twelve feet thick. Popwell says, "SCC is easier to work with. You don't have to move the hoses as it flows. And that means you don't need as many people on the job." With 29 crew members, he says everything is going well. While it can be more expensive on the front end for the product, a savings on time, labor and durability can make SCC more cost efficient in the end.

Self Consolidating Concrete is promoted as a concrete that can flow down into small spaces without segregating. Another big plus, "SCC requires no vibration." That's especially useful on a project like the Valley Creek Plant where crews are working in extremely tight areas.

Tom Marcum, Valley Creek Project Manager for Brasfield and Gorrie says this is the first time his company has tried SCC in Alabama. He adds, "I'm happy with it. It's good for this specific use."

He echoes Popwell's satisfaction with SCC saying, "Its flow and our lack of access to the point of placement on this project mesh well together."

The Valley Creek Plant, one of nine wastewater treatment plants in Jefferson County, is the largest in the state of Alabama. Slated to open in January of 2008, the plant is located in the city of Bessemer off Interstate 20/59 near the Alabama Adventure Theme Park. White says it will serve customers in "Bessemer, Hoover, parts of Birmingham and Irondale." The new plant is designed to handle growth in the area.

While SCC has been used quite a bit in larger metropolitan areas like Atlanta, local companies say this is the first time this particular mix has been used in Alabama. Now that everyone is seeing how it performs, contractors believe you will see more of it in the future. SCC helped shape the Georgia Aquarium in Atlanta which opened in 2006 to huge crowds.

The aquarium is the "largest in the world and holds eight million gallons of fresh and saltwater," according to managers. SCC was the choice for use in the massive tank walls because of all the pipes and congested steel. Project designers say SCC helped save costs and construction time on the aquarium.

With economic, engineering and design benefits, some predict Self Consolidating Concrete will be the wave of the future when it comes to high performance concrete (*see page 15*).

Self Consolidating Concrete (SCC), as defined by ACI Committee 237) is "highly flowable, nonsegregating concrete that can spread into place, fill the formwork, and encapsulate the reinforcement without any mechanical consolidation." Contractors are currently exploring the use of SCC because it may produce members with homogeneous quality even in highly congested, narrow members such as prestressed concrete.

The use of SCC may also reduce construction costs because it is quicker and easier to pour, requiring less labor. Safety and noise concerns are also reduced because there is no need for consolidation. "Whatever conventional concrete can do, Self Consolidating Concrete can do better, faster, and cheaper, especially for

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concrete elements with special textures, complex shapes, and congested reinforcements," says Myint Lwin, Director of the Federal Highway Administration's (FHWA) Office of Bridge Technology. (*Focus Magazine*, Nov. 2005)

Recently some large-scale projects have used SCC like the Trump Tower in Chicago, Georgia Aquarium in Atlanta, and Stockholm Airport Tower. Transportation departments in states like New York and Virginia have used SCC to build bridges.

Experts say this product gives architects much more flexibility when it comes to vertical and horizontal designs creating

structures that are more aesthetically appealing with few defects. There are also more options when it comes to the color and texture of surfaces.

SCC, which is known in Europe and Japan as self-compacting concrete, was first developed in the 1980's.

In the United States statistics show over the past five years, use of SCC in Precast/Prestressed Concrete applications has risen by more than 14%, up from .22% in 2000 to 14.6% in 2005. By comparison, SCC use in Ready-Mixed Concrete has been very slow, growing only 1.45% over the same time period.

