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A Tennessee auto manufacturing facility test-drives three erosion control solutions

By Tom Wedegaertner

What do Volkswagen and the Dynamo of Dixie have in common? Both are now synonymous with Chattanooga, Tenn., home to the German car company's newest U.S. manufacturing facility. And according to Chattanooga Mayor Ron Littlefield, both are serious about environmental sustainability and 21st century manufacturing.

When Volkswagen announced in June 2008 that Chattanooga's 1,600-acre Enterprise South Industrial Park would make way for its new mega-facility, there was plenty of work to be done. However, before surface construction could take place, the deeper issue of stabilizing the site had to be addressed.

Formerly a military weapons armory, Enterprise South Industrial Park sat on unlevel land. "The western side of the site had to be filled in, and the eastern side needed to be cut down," said Chris Miller, owner of Erosion Control Specialists, the company hired by East Tennessee Grading to provide erosion protection for the site.

Workers were tasked with leveling the land, and with 6 million to 8 million yd of dirt to move from the back of the site to the front, "the pad elevation changed several times as leftover dirt was evenly distributed," according to Miller.

Once the site was balanced, 40- to 60-ft slopes surrounded it on all sides. Loose from the cut-and-fill process,

the dirt needed to be protected by vegetation before construction in other areas could begin.

Specification

Open to new erosion control methods, Miller was offered a product demonstration by Joe Stephens, the Tennessee representative for Jenn Hill Construction Materials. The distributor provides erosion control products and assesses site challenges, offering solutions to address viable construction concerns. "Joe had a tankload of HydraCM delivered, and I agreed to give it a try," Miller said.

The site already featured two different hydraulically applied products that had been put down two months earlier, but Miller was discontent with how each had sprayed from the hose and the form they took upon drying. "They dried crusty, and I believe that inhibited the grass from its maximum growth potential because it couldn't push through to the surface," he said, noting that he was able to drag his fingers through the new product once dried.

Miller discovered that there was more to the solution than met the eye, or the fingertips. "The Volkswagen Group and Chattanooga had made a commitment to environmental responsibility, including the use of sustainable products and the conservation of water and energy, during the development of this facility," said Stephens. "I proposed [the product] because it is less

labor-intensive and creates less of an environmental impact."

Installation

In February 2009, after a sampling of the product led to the approval of its use on the 40- to 60-ft cut-and-fill slopes, workers began the application. They mixed it with a fescue-rye grass-clover seed mixture and applied it on slopes beside where the first two products had been sprayed.

"The first thing I noticed was the efficiency," Miller said. "We were able to mix a lot more product per tank and spray the same amount of surface area with only three to four hydroseeder tank loads, as opposed to five to seven tank loads like we experienced with other products."

Typically, hydraulically applied products are sprayed on a site from three different directions to ensure complete coverage. However, due to the extreme slope of the Volkswagen site, vehicles could only access and spray from top to bottom and bottom to top.

"HydraCM seemed to be much more forgiving, allowing us to forego that third direction, and the coverage was really apparent after spraying the slopes only twice," Miller said.

How It Works

The erosion control solution is made from a combination of straw, reclaimed cotton plant material and a blend of performance-enhancing tackifiers and additives that form a protective matrix to help hold soil in place.

"[It] contains beneficial nitrogen, phosphorus and potassium nutrients which, when made available to the soil, are important for plant growth," said Wae Ellis, vice president of sales and marketing for Mulch and Seed Innovations, Centre, Ala. "[The hydraulic mulch] also is absorbent and has a beneficial water-holding capacity, which assists with germination and encourages the establishment of vegetation. The cotton plant material



retains moisture in the seedbed for germination and growth, and the interlocking matrix provides enough porosity for seedlings to push through with little barrier."

Featuring postindustrial waste from the cotton-ginning process, the cotton plant material is a new reclaimed option that has proven to be an effective and sustainable alternative to virgin wood and recycled paper, which have previously dominated the erosion control industry.

The product features a low water-to-mulch ratio, requiring a maximum of 100 gal of water per 50 lb of mulch. Water-to-mulch ratio is important when considering the cost of water and the time, labor and fuel consumption for trips to and from the water source.

Results

Shortly after the new application, a significant rain event pelted Chattanooga. With ground temperatures averaging 35°F, Miller was concerned how the erosion control solutions would hold up and how quickly germination would take place.

"Thanks to the chilly ground temperatures, germination had not yet begun where the first two products had been applied," he said. "To be honest, I was concerned that all three of the products would wash away with the heavy rainfall."

HydraCM was the only one of the three products that fully survived the downpour, with not one covered area washing away. Vegetation was quickly established and its grass grew most quickly and thickly.

After significant growth time, site engineers surveyed the slopes without knowing that multiple erosion control products had been used. They expressed concern over several patchy areas that needed to be hydroseeded again. Miller did just that, but this time he replaced the other products with the new solution to save time and achieve the best growth results.

Today, engineers at the Volkswagen site are literally knee-deep in lush, green grass and trying to decide if it should be kept wild or maintained through regular mowing. Either way, one thing is for sure: the state of Tennessee, Chattanooga-area organizations and the Volkswagen Group remain focused on environmental sustainability. The partnership will distribute two saplings for every tree displaced by the project, and the new trees will be planted by local schoolchildren. [SWS]

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