

STABLE POWER SOURCE

Geocells stabilize soil for hospital power line installation

By Bob Crossen

The Alabama Power Co. (APC) saw a need to help out Providence Hospital in Mobile, Ala., with a second substation to provide it a reliable alternative power source. Wetlands near the project site complicated installation of the substation and power line. Construction of the access road also was wrought with environmental and regulatory concerns from citizens and local officials.

Nearby residents worried the project would damage the environment during installation, which also became a matter of concern for Mobile city officials. Construction would cross wetlands the U.S. Army Corps of Engineers (ACE) did not want disturbed, so APC chose to complete the work without driving vehicles into the wetland portions of the project.

Sensing the hospital's need for stable



To avoid disrupting the sensitive wetlands, helicopters were used to carry in materials, install a portion of the line and haul away debris.

electricity, Pamela McDaniel, head of storm water environmental compliance for APC, developed a plan that addressed environmental concerns and complied with regulatory limitations.

Weaving an Unwavering Web

Construction is strictly governed in wetland areas, McDaniel said, noting APC could not fill the wetland for

soil stability. City of Mobile regulations required the project to establish storm water retention areas due to its size. Rather than retain the water, however, APC used Presto Geosystems' Geoweb confinement system to stabilize the soil to ensure the access road was permeable in the upland portion of the project.

"The city of Mobile has a regulation in place that says you can't have more than

1,400 sq ft of pervious surface without building a storm water retention pond. When you're talking about something like a road, that's literally impossible to do," McDaniel said. The three-dimensional plastic geocellular structure, she said, was placed on a sand base and filled with gravel. "We were able to demonstrate to the city of Mobile that it was not impervious as a normal road would be; that it would infiltrate water at an even greater rate than the surrounding earth did."

The geocellular system stabilizes the aggregate, preventing movement under vehicle load, and also allows storm water to drain into the soil rather than run off and create problems for residents and the environment.

Because water so easily infiltrated the access road, Mobile did not require APC to build the retention pond per its regulations. Had an impervious surface been installed, McDaniel said storm water would deviate from established flows and nearby residences likely would have complained about storm water on their properties.

"You would have an increase in water flows, probably some erosion along the roadway, and possibly increased flooding during extreme rainfall events," McDaniel said. "All of that was alleviated by utilizing this project."

Preserving Natural Beauty

Flooding was not the only concern for residents; they wanted to preserve the natural wetland ecosystem as well. APC heeded the voices and addressed those concerns in plan development.

"The residents in the area were very environmentally sensitive and there had been problems with their sewage line, so we had to be doubly careful that not only did we not make any additional impacts [but] that we [also] might try to remediate some of the impacts already there," McDaniel said.

Routing the power line from the substation to the hospital stretched electric cable through a forested wetland on the south side of Providence Hospital. McDaniel said workers cut out the foliage in the area by hand. Then, debris was hauled away with a helicopter to ensure the wetland was not disrupted

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by large machinery, which could have added to the soil stabilization problem.

"[ACE] did not want to make any impact on the wetlands, so basically, the portion of the line that was installed in the wetlands area was installed utilizing helicopters," McDaniel said.

Under normal circumstances, APC would have loaded utility poles onto trucks to take them to their destination and used excavators to dig holes. With the limitation imposed by ACE in mind, APC sought a solution that had been used in other projects, most notably near the Mobile-Tensaw River Delta.

The 70-ft concrete transmission poles dangled from the underbelly of a helicopter, and workers guided them into caissons that had been prepared with a foundation. McDaniel noted the



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helicopters are used only in extremely sensitive areas.

Solid Connections

The substation provided Providence Hospital with two sources of power. In the event of a power failure at one, electricity would shift to the other, keeping the hospital's expensive machinery online.

"They have a lot of equipment that's very sensitive to voltage and amperage changes there. It is very important to them," McDaniel said. The relationship formed with the hospital also extended to the city of Mobile. By adhering to its requirements and showing some alternative ways to address soil stabilization, APC improved its standing with local officials.

"They have some pretty stringent requirements at the city and we had to do a good deal of negotiation," McDaniel said.

"We worked through all their issues ... and it ended up being very good for them and us because it helped us build a relationship with the city." **SWS**

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PRESENTERS:



Gabe Weaver - Detention Product Manager, Contech Engineered Solutions
Gabe has been the Detention Product Manager for Contech Engineered Solutions since February of 2014. Prior to Contech, he worked at Tensor North American Green where he held a multitude of positions.

He was also the Director of Engineering at Armortec, which was acquired by Contech. Gabe holds a degree in Civil Engineering from the University of Kentucky and he also has a Master's in Business Administration from the University of Louisville. He has served on multiple industry committees such as ASTM. His professional experience ranges from new product development, commercialization, marketing and sales



Patrick Valentine - Senior Stormwater Design Engineer, Contech Engineered Solutions

Patrick graduated from Virginia Tech with a Bachelor of Science degree in Civil & Environmental Engineering. He has been a Stormwater Design Engineer for Contech since July 2013. His role at Contech requires him to design stormwater solutions that address challenges including treatment for water quality, underground detention storage, subsurface infiltration, and rainwater harvesting. He is responsible for providing engineering support to clients in Kentucky, Ohio, and Michigan.

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