North America's Largest-Diameter Swagelining Project

Plans to complete road work are rarely as easy as simply repairing the pavement. In League City, Texas, public works officials wanted to widen Calder Road under a planned street expansion. But a failing 39-in. reinforced concrete cylinder pipe water main running under the street complicated the project.

ISCO Industries Hal Smith came up with a solution that avoided traffic delays, interference with buried service lines and cables and environmental disruption—all while saving time and money.

Swagelining a new Texas water main

Working with the city and Murphy Pipeline Contractors, Smith helped design options to trenchlessly rehabilitate the water line using HDPE pipe and swagelining technology. Swagelining is a method of sliplining pipe that closely adheres the external surface of the HDPE to the internal surface of the existing pipe. This means there is a very limited reduction of the pipe cross section and any decrease in flow capacity is reduced to a minimum or not affected at all.

HDPE, listed as an alternative to fusible PVC, was selected for value and constructability.

This municipal water project is the largest-diameter swagelining project ever performed in North America. ISCO supplied not only the HDPE pipe, custom-fabricated fittings and specialized fusion equipment, but also the technical expertise and on-site fusion training for public works crews and project engineers to complete the job quickly and successfully with minimal disruption. ■

GCCs Support MSE Walls Just in Time

The District of Columbia Dept. of Transportation undertook the $260-million 11th Street Bridge project as a best value design-build-to-budget stipulated sum procurement. With time constraints, and no extra budget for ground improvement, Skanska/Facchina JV (contractor) and Johnson, Mirmiran & Thompson (lead designer) had to find an economical, timely solution.

The original two-stage approach consisted of installing wick drains and surcharging compressible organic alluvial soils with a mechanically stabilized earth (MSE) wire wall, resulting in wall settlements between 10 to 45 in., followed by construction of a permanent concrete facing, attached to the MSE wire wall to create a permanent wall system. This introduced variables concerning the time required to settle, and added an additional step in building the wall facing.

GeoStructures, Inc. and Geopier Foundation Company designed a solution utilizing Geopier GeoConcrete™ columns (GCCs) to reinforce the compressible soils and transfer MSE wall loads to the stiffer underlying sand and gravel layers below the organic alluvium soils. GCCs allowed the MSE wall to be built in one stage and settlement to be controlled to less than 3 in. GeoStructures, Inc. designed the MSE wall system and load transfer platform and supplied the wall system.

Installation of GCCs supports 35-ft-tall MSE abutment over compressible soils.

Over 1,300 GCCs support the MSE walls, with subsequent settlement monitoring showing a total settlement ranging from 1 to 2.5 in. The Geopier® system was a key factor in keeping the project on schedule for the Skanska/Facchina JV. ■

Crews use Direct Pipe method to install pipeline.

One-Pass Method Used to Install Texas Pipeline

Michels Directional Crossings recently used the one-pass, single-step Direct Pipe® method—a pipe installation method that combines microtunneling with horizontal directional drilling—to install a 42-in. casing pipe in Groves, Texas. "The 1,200-ft installation crossed under a busy highway and rail tracks, which made it ideal for a Direct Pipe project," says Matt Smith, Michels' Direct Pipe manager.

Initially, the project team had planned to use a combination of open-trench pipeline construction and auger bore crossings. Michels was called in to suggest trenchless options and ultimately selected the Direct Pipe method. The pipeline contractor and owner agreed that the Direct Pipe method would mitigate many of the risks involved with this particular crossing including numerous subsurface utilities and the shallow cover that was originally suggested across the wetland section of the pipeline alignment. Additionally, the railroad company required a casing to be installed under the tracks along a portion of the alignment.

Direct Pipe provided the added advantage of dramatically reducing the original proposed schedule. The project was completed in less than two weeks of around-the-clock drilling. Limited space at the site meant 80-ft pipe sections needed to be welded during installation instead of one continuous string, as is traditionally done with Direct Pipe.

Michels is a leader in the use of this advanced, one-pass trenchless method for the installation of pipe from 30 in. to 60 in. dia. ■

Aluminum Trench Shield Beginning To Turn Heads

The Lite Guard™ Aluminum Shield, a trench shielding product that has significantly impacted Australian and European markets which rely on the system's unique strength-to-weight properties, is now moving into the North American trench safety market.

On mid-depth utility projects, the shield is the perfect complement to the emergence of lighter excavation machinery, which offers lower fuel consumption and emissions while lessening the carbon footprint.

National Trench Safety (NTS) has been working exclusively with the Australian firm responsible for the creation of the Lite Guard to adapt the shield to the unique challenges of the North American market. The shield's internal structure has been reinforced to increase the depth ratings so that an 8-ft x 20-ft Lite Guard aluminum shield will be able to achieve a depth rating of 12 ft in Type C-60 soil, at roughly one-third the weight of a conventional steel trench shield. NTS has also designed the shield to function as a true "drag" box complete with a knife edge, a very uncharacteristic trait in an aluminum shield.

"I've seen an increased emphasis on functional, lightweight shoring and shielding systems over the last decade," explains Joe Turner, PE, director of engineering for NTS. "The lightweight requirement typically leads a contractor to aluminum construction, which in the past has had some tradeoffs in terms of strength and depth ratings. This Lite Guard aluminum shield bridges the gap between steel and aluminum trench shields. A contractor can now substitute the Lite Guard aluminum shield, use a lighter machine on the project and lower fuel consumption, carbon emissions and excavator rental charges."

NTS has begun rolling these shields out for limited field testing and initial results have been extremely positive. Customers have found the shields to be quite rugged and to provide the necessary soil support for the projects. NTS anticipates the shield will be available to all branch locations nationwide by the end of the third quarter of 2014. ■

SHIELD SIZE	PSF	DEPTH RATING		
		B	C-60	C-80
6-in. wall 8-ft x 12-ft	1,950	20	20	20
6-in. wall 8-ft x 16-ft	1,100	20	18	14
6-in. wall 8-ft x 20-ft	700	16	12	9

Lite Guard™ Aluminum Shield Strength/ Depth Ratings