

# Digging Deep in 2013

From transportation improvements to infrastructure repairs, replacements and upgrades, this year will unearth some of the underground sector's most innovative, advanced and impressive solutions.

By Vicki Speed

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## Thermal Integrity Profiler Checks Quality of Concrete Foundations

From the Vancouver Rail Bypass Project in Washington to the Tampa Port Authority REK Docks in Florida to London's Canary Wharf, transportation engineers and contractors have adopted the Thermal Integrity Profiler (TIP) to evaluate the integrity of cast-in-place (CIP) deep foundations with more flexibility, speed and accuracy than more traditional concrete testing solutions.

The TIP concept was initially conceived and researched by the University of South Florida and has been further developed through a partnership between Pile Dynamics Inc. and Foundation &

Geotechnical Engineering (FGE). TIP uses heat generated by cement as it cures to estimate the shape of the shaft including the local thickness of the concrete cover as well as the alignment of the reinforcement



cage—typically within 24 hours after concrete is poured. The ability to determine the cross-sectional area at any point along the shaft is also useful when analyzing data from instrumented static or dynamic load tests.

Compared to other methods for evaluating deep foundations—such as low strain integrity testing, cross-hole sonic logging and gamma-gamma logging—TIP has few limitations. TIP operates via wires attached directly to the reinforcing cage or by lowering a probe down conventional integrity access tubes that run down the entire shaft length. Data is transferred to the TIP handheld computer and downloaded for further analysis using the TIP Reporter software.

While the standard for using the TIP methodology is still in development by ASTM, TIP has been tested and utilized by transportation agencies and consulting engineers across the country and around the world. ■

## HDPE Piping Resolves Complex Underground Challenges in Wastewater Piping Rehab

When old leaking pipes at a wastewater treatment plant in Northern Michigan forced a plant shutdown, plant owners looked to install a new collection system that could withstand the corrosive environment and still transfer an average of 150,000 gallons of leachate per day.

The plant owner hired contractor Matt's Underground, LLC to fabricate, install and redesign the water treatment and leachate collection lines. The original design for the plant called for PVC. However, when the pipelines were "pigged" or cleaned by shooting a missile-type cleaning mechanism through the liner, the PVC shattered. Therefore, the contractor worked with pipe supplier ISCO Industries and the customer to specify a different piping material to complete the project.

The team selected high-density polyethylene (HDPE) pipe as the new material for the piping system. HDPE pipe is corrosion, pressure and impact resistant. In addition, HDPE pipe is ideal



Matt's Underground, LLC installs HDPE piping systems supplied by ISCO Industries.

for trenchless installation and is more cost-effective than line-cleaning PVC. HDPE is also stronger, more impact resistant than PVC, and when fused, HDPE pipe has a leak-free joint.

ISCO Industries supplied tens of thousands of feet of HDPE pipe (ranging from 4- to 8-in. pipe), valves, fittings, McElroy fusion machines (#2, #14, #28, #412 and #618) and accessories and provided technical and service assistance as needed, allowing the contractor to complete the piping project in the allocated short time frame, meeting the deadline. ■