



A LOOK BELOW THE SURFACE

Utility and Sewer Lines Located
Using Imaging Technology



Operators scanned 9,670 linear feet of surface in the specified areas.

Opposite Page:
GPR imaging and utility detection helped to identify hidden objects beneath soil, concrete and asphalt.

To help a general contractor discover exactly what was below the surface of almost 10,000 linear feet of state highway and greenery near the city of Middletown, New York, a specialist Ground Penetrating Radar (GPR) imaging company was called to action.

In May 2013, Atlantic Subsurface Imaging, a company under the umbrella of CSDA member Atlantic Concrete Cutting, Inc. in Mount Holly, New Jersey, was asked to survey and locate objects beneath parts of New York State Route 17M, not far from Middletown. Beneath the surface was an unknown quantity of utility lines that had to be identified and considered for the design and installation of a new sewer system. Any damage to unidentified utility lines would have caused severe disruptions throughout the city, so the imaging work had to be extremely accurate to avoid such complications.

The general contractor for the work, Alpine Environmental Consultants of Montgomery, New York, needed Atlantic Subsurface Imaging to identify water, sewer, gas, electric, telephone and any other service lines that ran parallel or intersected with the route of the existing sewer system. This would allow engineers to design a new sewer system that would not interfere with these lines. The specialty contractor used a combination of GPR imaging and electromagnetic equipment with scanning techniques to meet the specifications of the general contractor.

“An alternative method to GPR imaging on this job would have been to use the existing hard copy schematics and records for the underground sewer system and utility routes,” said Rassoull Salaam, project manager and lead technician for Atlantic Subsurface Imaging. “The problem was that the existing drawings and records were out of date and did not indicate any recently installed utilities. It would have been impossible to plan an excavation route for the new sewer system without interfering with some of these utilities, as they were placed at varying depths. A non-destructive method like GPR imaging was necessary.”

The locating of utilities started at a proposed sewer pump station approximately 2,000 feet west of an intersection at Route 6 and Route 17M. From there, the proposed route took the team north and led them to the grounds of the City of Middletown Wastewater Treatment Facility. The route was planned so that work began at the location of the proposed sewer pump station. This was because this area had the least amount of traffic and buildings. There were 11 manholes along the route, which the contractor accessed to confirm some utility runs. It was specified that ASI would locate and mark out underground utilities from curb to curb and 15 feet beyond each side, all within the New York Department of Transportation’s right of way. This would make sure that all underground utility services that crossed roadways were correctly identified.

A utility locator from Vivax-Metrotech was used to identify and map out existing property utility services to the main supply. Each utility service

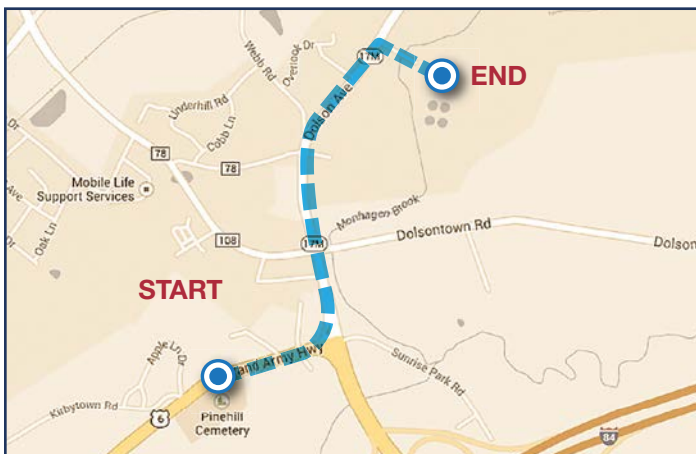


The equipment was used to cover an average of 460 feet per hour.

and main was identified on the surface using spray paint in accordance to The American Public Works Association (APWA) Uniform Color Codes.

The team from Atlantic Subsurface Imaging used a SIR 3000 GPR unit with 400 and 270 MHz antennas supplied by CSDA member Geophysical Survey Systems, Inc. (GSSI) to identify non-metallic utilities. This included sewer lines and other unknown subsurface obstructions. Any unknown obstructions detected by the GPR equipment were identified by a mark of fluorescent spray paint on the surface. An operator moved the unit between points, covering an average of 460 feet each hour and at depths of up to 8 feet below the surface.

The obvious danger while working on public roadways comes from vehicle traffic. ASI coordinated with the general contractor to have flaggers direct traffic away from the scanning team. Warning flags were placed ahead and behind the equipment to alert motorists of workers in



Map of the scanning/imaging route

Color	Utilities
RED	Electric power lines, cables, conduit and lighting cables
ORANGE	Telecommunication, alarm or signal lines, cables or conduit
YELLOW	Natural gas, oil, steam, petroleum or other gaseous or flammable material
GREEN	Sewer and drain lines
BLUE	Water

APWA Color Codes



All electrical, gas, telephone, sewer and water lines were identified with APWA uniform color codes.



The results have helped engineers with the design of a new sewer system.

the road, but the operators also remained vigilant of distracted or unobservant drivers. These safety precautions enabled ASI to complete all scanning and imaging work without incident.

Another challenge encountered by the team from ASI, was locating sewer services through different materials. Small plastic piping for these services was buried beneath different types of soils, concrete and asphalt, making it sometimes difficult to locate. This was especially problematic in areas of wet soil. In these situations, the team slid a metallic snake line through an area of cleanout and traced the line using a radio-detecting RD4000 utility locator.

Atlantic Subsurface Imaging completed all imaging work in three work days, performing 9,670 linear feet (approximately 1.8 miles) of surface imaging over various materials. This was a successful project for the contractor, finishing all work within budget and on time.

"I was satisfied with the project. Naturally, my biggest concern was the safety of the operators. The majority of the work was done on a busy roadway with many intersections, but the flaggers did an excellent job. They directed all traffic around us and the scanning was completed without any interruptions or incidents," said Salaam.

"I believe Atlantic Subsurface Imaging was selected for this project because we specialize in GPR imaging, a technique that was necessary to identify all unknown obstructions within the work area. This form of non-destructive testing saved the City of Middletown a lot of money that would have been spent on excavation crews and road closures," he added.

The findings of this contractor's scanning work have provided the City of Middleton with key information that will help engineers form a strategy for the installation of a new sewer system. The use of GPR and utility locating equipment helped to determine what was beneath the surface, making sure the design phase of this new project can be completed as accurately as possible.

COMPANY PROFILE

Atlantic Subsurface Imaging operates under its parent company Atlantic Concrete Cutting, Inc., a 22-year CSDA member based in Mount Holly, New Jersey. The subsurface imaging company has been in business for 10 years, has one truck and has three employees. Atlantic Subsurface Imaging offers the services of GPR and utility location within New Jersey and surrounding states. Atlantic Concrete Cutting Inc. is a CSDA Certified Company and a CSDA Certified Operator company with DBE / WBE certifications issued by numerous state agencies and authorities.



RESOURCES

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Methods Used: GPR Imaging, Electromagnetic Testing

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