Contractor William B. Hopke Co. Inc. ran into a challenge in Spring 2010 when installing a new sewer main via open trench to provide future service for the James Bland Public Housing Redevelopment project in Alexandria, Va. Because a portion of the sewer main route crossed beneath busy U.S. Route 1 in the historic center of town, the Alexandria contractor hired Midwest Mole, a national trenchless contractor from Indianapolis, to assist in this area.

In order to minimize disruption to traffic and the historic district, Midwest Mole opted to use the new Vermeer AXIS guided boring system to install its portion of the sewer main. The boring system is a pit-launched, laser-guided trenchless installation method designed to achieve more accurate, on-grade pipe installation. Utilizing elements of both pilot-tube microtunneling and horizontal directional drilling, the new system offers the option of pullback pipe installation in addition to the jack bore installation method.

**Pipe Selection**
Midwest Mole’s next step was selecting the best pipe product for the job, which called for 820 ft of 12-in.-diameter pipe. Having previous positive experiences with the CertainTeed Certa-Lok line of restrained-joint polyvinyl chloride (PVC) pipe products, the company chose its CertaFlo Greenline pipe, designed for trenchless installation in congested areas.

“We were already familiar with the Certa-Lok joint mechanism and thought the Certa-Flo pipe would be a good fit for use with the AXIS guided boring system,” said David Howell, project manager for Midwest Mole. “We knew the pipe could handle the pressure of the pullback and that it would be easy to assemble. In addition, the shorter pipe lengths allowed us to use a smaller reception pit.”

CertaFlo GreenLine is a high-impact PVC pipe
that features a Certa-Lok Integral Bell restrained joint system. The pipe is available in 10- and 20-ft lengths to facilitate rapid assembly and allow the use of smaller, more economical construction pit sizes. In addition, the light green color of the pipe makes it more visible during camera inspection of sewers.

**Smooth Installation**

Midwest Mole began work in June 2010 with a crew of 11 people, joined by four Vermeer trenchless equipment specialists for onsite technical support. In addition to the boring system, the crew used a Vermeer HP300 high-pressure mud mixing system, a Vermeer MX240 bentonite mixing system and a 5,400-cu-ft-per-minute vacuum truck. Drill heads used included a flat-faced sand cutter, an underwater cutter, a three-bar shark, a two-bar scraper and a 14-in. reamer/cutter for the pullback.

After the trenchless pipe installation equipment was lowered into the launch pit, workers made a series of four bores through sand and sandy clay. The bores ranged in length from 109 to 289 ft and in depth from 18 to 22 ft. The crew adjusted its production rates and drilling fluid amounts to adapt to the changing soil conditions from bore to bore and found that the bore system’s vacuuming function supported the bore holes well, preventing cave-ins.

After each bore was completed, the 12-in. pipe was attached in a series of 10-ft lengths onto the 14-in. reamer and pulled back through the bore hole. The shorter pipe lengths and fast joint assembly of the CertaFlo helped move the pipe installation along more quickly and efficiently.

"The pipe allowed the crew to pull the pilot tubes back in a matter of seconds," said Mike Spaulding, sales representative for Vermeer Midwest Sales. "When you’re working with fused pipe, it tends to move much slower. With the CertaFlo, as fast as the crew could remove a tube, they could attach another length of pipe. We set eight lengths of pipe down in the pit at a time, and it went a lot faster than we had anticipated."

With the laser-guide equipment of the boring system, the crew was able to monitor the bore path and make adjustments if the boring got off course. This helped to maintain a consistent grade for the pipe installation.

Midwest Mole finished the project in 12 days and eliminated several disturbances to the surrounding area that may have been caused by an open-trench installation. William B. Hopke Co. Inc. excavated the manholes and made all necessary connections. Midwest Mole received positive feedback for its work and was pleased with how the new trenchless equipment performed to help make the job a success.

"The overall job, even with the learning curve of the new equipment, flowed a lot more smoothly than we expected," Howell said. "Our crew was already exposed to a lot of the technologies that were used to develop the AXIS system, so they were able to learn how to use it fairly quickly. It was a good job for us."