

PROJECT SUMMARY

Application:
Curtain Grouting

Product Used:
AV-275 Soilgrout™

Contractor:
Progressive Pipeline
Management

Sub-Contractor:
Camden Group

Owner:
Public Service Electric and
Gas Company (PSE&G)

Location:
East Orange, New Jersey

NOT YOUR AVERAGE GAS MAIN GROUTING PROJECT

Public Service Electric and Gas Company (PSE&G) is a regulated gas and electric company serving the state of New Jersey and is New Jersey's oldest and largest investor owned utility company. PSE&G was experiencing significant leaks through one of their critical high pressure cast iron and steel conveyance gas mains in East Orange, New Jersey. Upon abandoning the leaking gas main under the Garden State Parkway which required lining as a renewal technique, PSE&G called on Avanti for product and applicator recommendations.

PROBLEM

The water infiltration coming into the pipe was hindering PSE&G from lining a 42" gas main pipe constructed of cast iron with a small section of steel installed in the 1950s. In order for the pipe to be sand blasted and liner to be installed properly, they need an infiltration free environment. Before the pipe could be lined, the infiltration had to be stopped. Camden Group out of Camden, New York and Butler, New Jersey was recommended by Avanti and the sub-contractor selected for this challenging project and first application in a gas main.

CHALLENGE

The layout of the gas main pipe system was a challenge in itself. The pipe was not straight throughout – it had multiple bends, and intense grade changes throughout. Direct access to the infiltration site was not available, so Progressive Pipeline – the general contractor - and the Camden team had to get creative. They created their own pulley system and utilized a body board on wheels to transport their team down the pipe system – 335 feet - which had many angled declines before reaching the infiltration location.

The 42" gas main pipe was angled at a 45° decline that would lead to a flat area, then another 60° angled decline to another flat area, where there was a 45° bend to yet another 45° decline. At the bottom of this last pipe drop, there was a steel elbow and short section of steel pipe that connected two cast iron pipes which was the source of the infiltration.

Extensive safety precautions were taken with this project: the pipe was flushed prior to anyone entering, forced 15 mph air flow was present to provide adequate ventilation, gas monitoring equipment was worn, and a confined space rescue team was on site for the three days of this project.



SOLUTION

Camden Group selected Avanti's AV-275 Soilgrout™ for the fact that it is an expansive grout that fills voids and binds loose soils. AV-275 with AV-276 Soilcat™ (catalyst) is a hydrophilic grout that permeates well, and reacts quickly with water to form a dense, impermeable semi-rigid foam. AV-275 is designed to bind together and waterproof loose granular soils and withstands wet/dry cycles. AV-275 was to be used to curtain grout around the exterior of the pipe.

After mixing AV-275 with its AV-276 catalyst, Camden began pumping through drilled holes in the pipe with a Graco 495 pump into the soil. Scott Laubshire of Camden expected to use between 60-120 gallons of grout for this project. "As a grouter, you can generally estimate the amount of grout that will be needed based on project specifics, so we prepared to pump at least 60 gallons into the soil" says Laubshire. "You can imagine the look on my face when we pumped five gallons of AV-275 and the infiltration stopped – if I had not seen it happen, I would not have believed it. This was one of those odd-ball projects."

The night after grout injection, there was a significant rain event in the area and 2.5" of rain fell overnight. The day after the rain event, Progressive Pipeline Mangement checked the infiltration site and it was completely dry – they were completely satisfied that the remainder of the project could go on as planned.

"This project is a world-record diameter CIPL renewal of a natural gas main." says George Ragula of PSE&G. "Our options were extremely limited from a renewal perspective due to the number of bends creating a u-tube configuration for crossing the Garden State Parkway (GSP) – a major heavily trafficked thoroughfare in NJ. The GSP roadway was 25' below surrounding streets and the gas main was over 30' deeper than the surrounding streets creating an environment for significant water intrusion once the high pressure leaking main was taken out of service. The main was a critical feed with a very short outage window of June 1st to September 1st. Considerable planning went into the project and my active participation with NASTT naturally led me to explore grouting options with Avanti. This is the first time injection grouting was used on a gas main to mitigate water intrusion to provide a dry environment for sandblast cleaning the inside diameter of the pipe in preparation for the liner installation."