

Monroe Township, NJ Receives One Of The Deepest PVC Installations Ever



Trench boxes were stacked for this deep installation. Import material is shovel sliced into the haunches.

by Tom Switalski
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One of the deepest recorded New Jersey sewer installations recently took place at Monroe Township, New Jersey, using 30" (750mm) circumferentially ribbed PVC sewer pipe.

Prior to 1994, Monroe Township had ductile iron pipe and concrete steel cylinder pipe in their Monroe Township Municipal Utility Authority (MUA) Specifications for large diameter gravity sewer pipe. As a result of corrosion in several places due to hydrogen sulfide generation, the Authority was looking for a non-corrosive sewer pipe.

Simultaneously, there was an additional problem of replacing an existing force main as a result of maintenance problems which existed with the pump stations. There was also a concern that the existing 18" (450mm) diameter concrete force main was deteriorating as a result of hydrogen sulfide corrosion. As a short term solution to this problem, the MUA was injecting a biocide into the force main to deter hydrogen sulfide generation. This bio-

cide was an expensive ongoing cost which the MUA wanted to eliminate. Since gravity sewers require far less maintenance, Richard Domalewski, Township Engineer, was investigating whether a 30" diameter gravity sewer pipe could replace this force main, considering that depths could reach 50 feet (15.2m).

Several criteria were developed which were necessary for this gravity sewer pipe:

1. The pipe must withstand 50 foot deep burial in silty, sandy soil, which varied from loose, wet soil to hard sand.

2. The pipe must be corrosion resistant. That is, able to withstand corrosive sewer gasses.

3. The pipe must have tight joints. Zero infiltration was required since the pipeline was to be installed through a New Jersey protected wetland, and contamination of the

ground water could not be permitted.

The engineer chosen for the design of the project was Stetler and Guldin Engineers from Clinton, New Jersey.

The contract was awarded on March 12, 1995 to the low bidder, Underground Utilities Corporation of Linden, New Jersey. The Monroe Township MUA was pleased with Underground Utilities Corporation since they worked well on other pipeline projects in Monroe and had a reputation as a safety-oriented and conscientious contractor. The MUA was also pleased with the contractor's selection of 30" PVC sewer pipe. This PVC pipe has a seamless, uniform cross-sectional wall, radial ribs which are perpendicular to the axis of the pipe, a smooth interior with excellent flow characteristics and is able to withstand the extreme earth loads associated with a 50 foot deep burial. The field cuts were quick since no beveling was needed and the gasket could easily be positioned between ribs. Also, the narrow right of way granted through the wetland would have caused much difficulty with heavy traditional piping. This was not the case with the maneuverable PVC pipe.

The entire project consisted of 10,700 feet (3,300m) of

30" circumferentially ribbed PVC sewer pipe manufactured in accordance with ASTM F794-89.

The depth of bury varied from 20 feet (6.1m) deep to 52 feet (15.2m) deep. To reach these depths, the contractor had to remove the top 10 feet (3.1m) of soil or bench down to where the backhoe could reach the trench bottom. As a result of the high water table in the area, constant de-watering was required, approximately 700 feet (200m) before and after the area of excavation.

The bedding used was 3 / 8 " (9.5 mm) stone. The stone was shovel sliced under the pipe to the spring line. Mechanical tamping was used in 3 foot (900mm) lifts to the surface. Although the rate of installation varied with depth, at 35 feet (10.5m) deep seven to ten lengths of pipe were installed per day. The project took approximately nine months to install the 10,700 feet (326m) of 30" (750mm) PVC pipe, including testing.

The line is now in service

and the Monroe Township Municipal Utility Authority is completely satisfied with the performance of the PVC pipe. As Mr. Domalewski commented, the line was bone dry before they accepted it. This was most impressive since parts of the line were below 40 feet (12m) of groundwater. The complete line also passed the deflection test.

As a result of this successful installation, the Monroe Town-

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ship MUA plans to replace other pump stations with gravity sewer systems, using circumferentially ribbed sewer pipe. This will lower costs over

the long term as a result of the elimination of costly chemicals, which must be added to deter hydrogen sulfide corrosion, and eliminating costly maintenance and energy requirements of force main pumping systems. In fact, one force main scheduled to be replaced with a gravity line may be 75 feet (22.86m) deep, which doesn't worry Rich Domalewski, Authority Engineer at all. ❖



Workers shown shaping and placing material for bedding pipe.