CASE STUDY
MICROTUNNELING | SLURRY MICROTUNNELING

Project Name:
Government Siphon J7825 Project

Prime/Sub Contractors:
Lametti & Sons Inc.

Location:
Rochester, Minnesota

Owner:
Rochester Public Works Department

Ground Conditions:
Cobblestone, sand, limestone, sandstone. dolomite

Akkerman Equipment:
SL38C MTBM

Pipe:
36-in

Total Length/Longest:
393-lf / 393-Lf

PROJECT OVERVIEW

As part of the Destination Medical Center Project (DMC), the Rochester Public Works Department needed to improve a sanitary sewer along 1st Avenue SE to 2nd Street SE, the storm sewer along 2nd Street SE to 3rd Avenue SE, as well as a new siphon located from the 3rd Avenue SE Bridge from the Rochester -Olmsted Government Center to 2nd Street. The packaged result was the 1st Avenue SE Relief Sewer for the Government Siphon J7825 Project.

THE CHALLENGES

- Complex tunnel design
- Flood control walls limited the ability to open-cut the alignment and structure modifications to perform open cut were not cost effective
- High groundwater levels
- High traffic main thoroughfare to Mayo Clinic and Downtown Rochester
- Inconsistent soil types including hard rock
- Installation below Zumbro River
- Limited space for equipment setup and shafts
- MTBM to emerge into the reception shaft from a full-face of sandstone and dolostone
- Operations during record cold temperatures
- Seasonal delays

THE SOLUTION

An Akkerman SL38C MTBM System was launched from a 40-ft deep shaft located on the east side of the Zumbro River, near the Government Center. Since microtunnel operations were conducted during the cold Minnesota winter months, Lametti and Sons Inc. built temporary heated structures around the launch shaft and separation plant to prevent freezing.

A critical piece of this project was a tunnel that ran northeast just feet from the side entrance to the Rochester-Olmsted Government Center, continuing under the Zumbro River to emerge to the siphon connection on the east side, across the street from the Rochester Public Library. The siphon casing was filled with two 8-in. and one 10-in. HDPE siphon carrier pipes and then encased in cellular concrete.

Flood control walls were installed due to high groundwater, sandy soils, and fractured limestone within the tunnel's route. The flowing soil allows for water to easily make its way into the shaft. While not very long, the tunnel design was complex and ran the gamut of the varying ground conditions.

The Lametti & Sons Inc. had never undertaken a microtunneling project, but Akkerman Inc. was able to send over field technicians to train their crew.

OUTCOME

Once mining was underway, installation of the 36-in. Permalok steel pipe moved along swiftly. At the 170 lf, the MTBM started to encounter consistent pockets of rock. At 260lf, the advance rate of the MTBM was adjusted to allow time for the completion of the reception shaft. At 290 lf, the MTBM was encountering a full-face of rocks, including limestone. Evidence of timber did come back through the slurry lines at the set of pipe No. 32, coming from an old wooden flood wall that was buried 35 ft below the existing grade. After two weeks, on a day featuring negative 10-degree temperatures, the MTBM successfully reached the reception shaft wall at the necessary grade.

source: Trenchless Technology

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