BRIERLEY ASSOCIATES
Creating Space Underground

IN DEPTH

December 2019

Greenmeadow Interceptor Tunnel, Waukesha, Wisconsin

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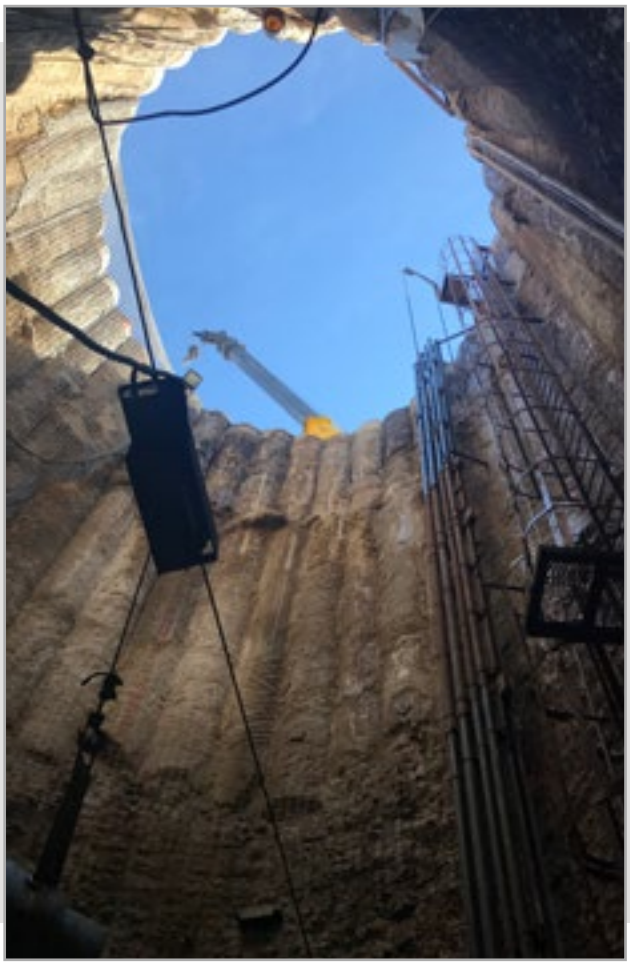
The City of Waukesha saw an opportunity to upgrade their aging wastewater infrastructure by converting the existing Greenmeadow Forcemain Sewer into a gravity flow system, a solution that eliminates the long-term operating, maintenance and replacement costs of the deteriorating force main and two pump stations. Brierley and its partner, Donohue & Associates, Inc., performed the geotechnical investigation and designed the replacement gravity system comprising about 10,000 feet of 36-inch diameter gravity line. Challenging conditions were encountered including glacial till containing large cobbles and boulders; zones of high hydraulic conductivity; hard dolomite with chert nodules; and contaminated soil from previous industrial activities.

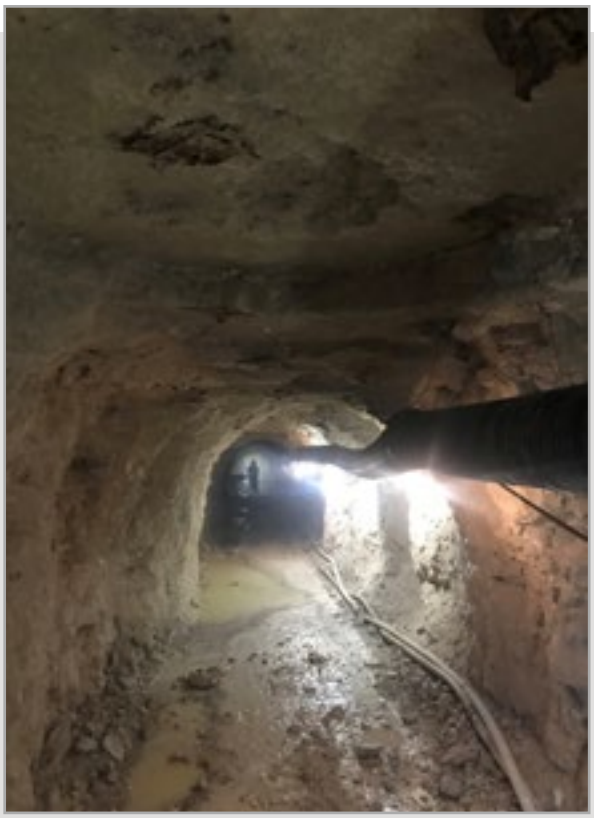
Three techniques were used to address the varying site conditions and accommodate dense residential areas: Horizontal directional drilling, tunneling, and open cut techniques.

Shaft Construction and Tunneling

To reach the tunnel depth, three shafts were constructed up to 70 feet deep, through up to 40 feet of glacial soil overburden with Silurian dolomites below. The soil support for the shaft consisted of secant piles with one liner plate shaft, and rock was supported with split sets, mesh, and shotcrete.



About 180 feet from the end of the drive, the MTBM failed mechanically. Super Excavators contracted Drill Tech to excavate a 180 foot drill and blast horseshoe tunnel to rescue the machine, driven from the retrieval shaft. The machine was successfully retrieved and the tunnel was completed with minimal delay. The drill and blast excavation was conducted in the span of approximately 1 month.



Horizontal Directional Drilling

As part of the design, Brierley Associates incorporated HDD into the project Geotechnical Baseline Report, which served the project well with respect to bidding as well as during claims mitigation when rock was encountered. HDD was the selected means to install 600 feet of 18-inch diameter HDPE pipe to construct a dual siphon structure to cross beneath a recreational trail, an active rail line, and the Fox River.

Open Cut Techniques

The project also included 7000-feet of open-cut to depths of approximately 30-feet in high groundwater and glacial till for the installation of 36-inch PVC.