



# OPW 52223 (CSO) South Interceptor Force Main North Segment and North Gravity Sewer

**LOCATION:** Omaha, NE

**OWNER:** City of Omaha, Public Works Dept.

**OWNER CONTACT:** Richard Murch  
(402) 444-5220 / rick.murch@cityofomaha.org

**ARCHITECT OR ENGINEER:** HDR, Inc.

**CONTACT:** Steve Marks, (319) 270-9043  
steven.marks@hdrinc.com

## PROJECT PROFILE

This project includes 2,652 lf of 102-in. ID rock and mixed face tunnel using conventional tunneling methods, adjacent to the Missouri River, with ring and beam lagging, at approximately 100 vf (completed by MTBM, as described below); construction of a 64-in. steel cased tunnel under UPRR tracks by auger bored tunnel method; and installation of two 90in. steel casing tunnels under the UPRR Bridge embankment; and two 54" RCP Microtunnels totaling 750 LF installed with an Akkerman SL74. Aside from tunneling, the project also includes: the installation of 42-and 48-in. restrained joint force main installed by open-cut methods and supported on piles; construction of a vault valve structure; blasting; and vibration control and monitoring;

Also included in the scope are the construction of shafts including three secant pile shafts (32' diameter) using a Soilmec SR-90 drill rig; and drill and blasting work in limestone rock (with rock bolt anchors and mesh) to complete construction of the lower 35+ feet of the launch shaft which will be approximately 75-feet deep (the 38-foot overburden was constructed with 38-inch diameter secants).

The original geotechnical baseline report for this project indicated that the entire job would be constructed in competent rock (limestone with traces of shale layers), so the project team elected to use a Lovat 102" TBM with a rock cutter head designed for these ground conditions. We successfully completed approximately 1,800 LF of rock tunnel with no issues in the rock ground that was described in the GBR.

On May 25, 2016 the TBM was tunneling towards through the retrieval shaft with approximately 800 LF to complete when suddenly the TBM lunged forward and started to take on water. The team sealed the machine and discovered running gravels, silts, boulders, and sands in front of the TBM.



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After further investigations, and additional borings along the alignment, it was discovered that there was anomaly 150 LF along the alignment - no boring were initially performed at this location. Initial observations indicated all alignment would be constructed in shale and limestone, but conditions encountered at this location included alluvial soils, sands, fill / stabilized fill, high ground water flows, river rock, sand silt and wood debris. Due to the boulders and soft ground conditions in this stretch, the project team decided to install a rescue secant shaft and retrieve the rock tunnel boring machine. The remaining 803 LF of the project was constructed utilizing an Akkerman SL86 Microtunnel Boring Machine which can handle both the rock and the soft ground conditions. For this MTBM drive, SEI installed a 87.5" OD Permalock steel casing.



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**TOTAL VALUE OF CONTRACT:**

\$32,998,658

**COMPLETION TIMELINE:**

SEPTEMBER 2014 - DECEMBER 2017

**COMPLETED AS:**

PRIME CONTRACTOR