

#### PROJECT ELEMENTS

- Tunnel Lining Evaluation & value engineering
- Tunnel rock support system design
- Construction support

#### ROLE:

- Design Support

#### PERIOD OF SERVICE

- Nov 2018 – Current

#### COST

- Est. Construction: \$200Million

#### OWNER

- Louisville/Jefferson County Metropolitan Sewer District (MSD)

#### CLIENT

- J.F. Shea Construction Inc.

## Ohio River Tunnel Project

### Louisville, KY



*Ohio River Tunnel – Initial Rock Support*

The Ohio River Tunnel (ORT) project is a component of the Louisville/Jefferson County Metropolitan Sewer District (MSD) integrated overflow abatement plan to address excess discharges from the metropolitan sewer systems, combined sewer overflow (CSO) systems, and water quality centers.

The ORT project, consisting of eight shafts (pumping shaft, working shaft, and 6 drop shafts), pumping stations, and a conveyance deep rock tunnel, will store CSO during rainfall events to mitigate excess untreated discharges, after a rain event.

The ORT, a 20,405-ft. long tunnel, extends from the pump station shaft to the retrieval/DS-06 shaft and a 1,117-ft. tunnel bifurcation with a finished diameter of 20 ft. (for both tunnels). The tunnel was constructed using a Tunnel Boring Machine (TBM) with initial support consisting of several rock support classes and a cast-in-place concrete final lining.

Subsurface & Tunnel Engineering llc (STE) provided design services including rock support system, alternative tunnel CIP concrete lining and construction support services.

#### DESIGN PACKAGES:

- Rock Class II support redesign including bolt arrangements to correlated to the TBM configuration, thereby mitigating significant schedule and cost impacts to the project. The geotechnical baseline report (GBR) was analyzed for existing rock properties and discontinuities, followed by a complex rock wedge analysis, using RocScience In. Unwedge 4.0 software, to evaluate the stability of the rock.
- Provided alternative design for the steel reinforced final lining section, reducing schedule and cost. STE also performed a value engineering analysis of the designed working shaft lining (wall) to evaluate the feasibility of eliminating/reducing steel reinforcement, initially specified in the contract document.