

**Fort Wayne (Indiana, U.S.A.)**

# Three Rivers Protection & Overflow Reduction Tunnel

MAPEI UTT PRODUCTS CONTRIBUTED TO A PROJECT AIMED AT REDUCING COMBINED SEWAGE OVERFLOWS

The Three Rivers Protection & Overflow Reduction Tunnel (3RPORT) is a major portion of the effort to clean up Fort Wayne's rivers and protect neighborhoods from basement backups and street flooding. This project is crucial in reducing the number of Combined Sewage Overflows (CSOs) events caused when heavy rains overwhelm the combined sewage and stormwater system and result in untreated discharges into the St. Marys, St. Joseph, and Maumee Rivers. Fort Wayne City Utilities has thus designed Tunnel Works, a large tunnel and network of pipes which extends through the bedrock 75 m below the city. This tunnel system will collect and redirect sewage from the

combined sewer system to the sewage treatment plant. Tunnel Works is the City's main project for reducing the amount of diluted sewage discharged into the rivers. The 3RPORT project includes consolidation sewers, nine drop shafts, and a deep rock tunnel to collect and convey Combined Sewer Overflows (CSOs) from 22 outfalls along the St. Marys and Maumee Rivers. The tunnel has a life expectancy of 100 years. The tunnel has a length of 7.480 m, an internal diameter of 4.87 m and was excavated by means of a Herrenknecht slurry shield TBM with boring diameter 5.81 m which was designed to operate with a support pressure of up to 6.5 bar.

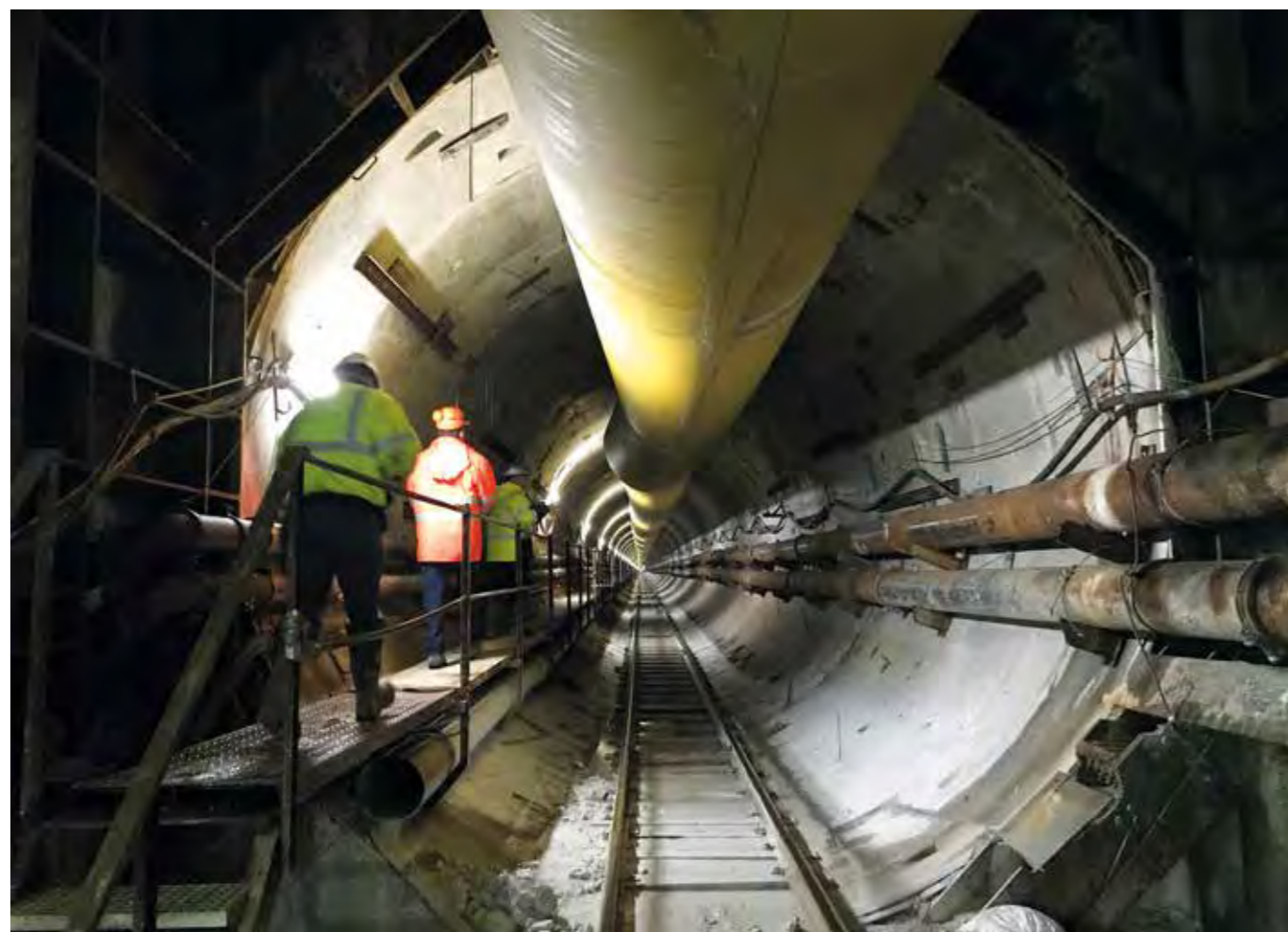
Due to the presence of open vertical and horizontal discontinuities, the hydraulic conductivity is expected to be extremely high, making the management of the water inflow during advance and during standstill the greatest challenge for the contractor.

**Mapei products for different uses**

Mapei products were used for several kinds of applications during tunneling works. Some of them, like EPOJET LV, PLANITOP 12SR, and PLANITOP 18 were used for repairing concrete elements; others like CABLEJET, MICROCEM 12000, RESFOAM SS 75, RESFOAM HBA 5, RESFOAM 1K-M and RESFOAM 1K-M AKS were used for injections to improve the properties of the ground, stop water leakages, improve internal cohesion, anchoring, bolting, etc. MAPEBENT API 5 and MAPEFLOCK 10 were, on the other hand, used to prepare slurries to help the TBM excavation operations; MAPEQUICK CBS SYSTEM 1 NA, MAPEQUICK CBS SYSTEM 2, MAPEBENT CBS 5 were used as back-filling grouts for TBM operations. MAPEBLOX T was used as a tail sealant and continuously pumped during the TBM advance, in order to seal the tail brushes and to prevent inflows of water, mud, grout, etc. through them into the TBM working area.



**IN THE FACING PAGE.** The 3RPORT project includes a deep rock tunnel to collect and convey Combined Sewer Overflows (CSOs) from 22 outfalls along the St. Marys and Maumee Rivers. **ABOVE.** One of the shafts included in the 3RPORT project.



Find out more  
**MAPEQUICK CBS SYSTEM 2**

**TECHNICAL DATA**  
**Three Rivers Protection & Overflow Reduction Tunnel (3RPORT),** Fort Wayne (Indiana, USA)  
**Period of construction:** 2018-2021  
**Owner:** City of Fort Wayne, Indiana  
**Main contractor:** Salini-Lane Healy  
**Period of the Mapei intervention:** 2018-2022

**Intervention by Mapei:** supplying products for TBM tunneling operations and concrete repair  
**Mapei coordinators:** James Pinkley, Cristina Oñate, Tanner Murt, Mapei Corp. (USA)  
**MAPEI PRODUCTS**  
**Concrete repair:** Epojet LV, Planitop 12SR\*,

Planitop 18\*  
**Injections:** Cablejet, Microcem 12000, Resfoam SS 75\*, Resfoam HBA 5\*, Resfoam 1K-M, Resfoam 1K-M AKS  
**Slurries for TBM:** Mapebent API 5\*, Mapeflock 10,  
**Back-filling grouts for TBM operations:** Mapequick CBS System 1 NA\*, Mapequick CBS System 2, Mapebent CBS 5

**Tail sealant for TBM:** Mapeblox T  
  
\*These products are manufactured and distributed on the US market by Mapei Corp., a US subsidiary of the Group.  
  
For further info on products: [mapei.com](http://mapei.com), [utt.mapei.com](http://utt.mapei.com)