

Worldwide Activities



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TUNNEL DESIGN

GEOTECHNICAL ENGINEERING

CONSTRUCTION MANAGEMENT

INSTRUMENTATION & MONITORING

WATERPROOFING & WATER CONTROL

TUNNEL REHABILITATION

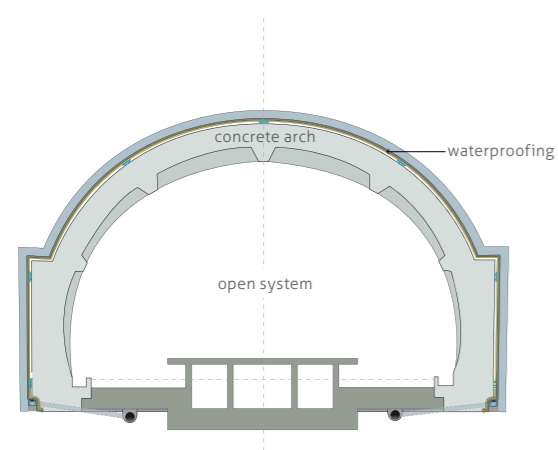
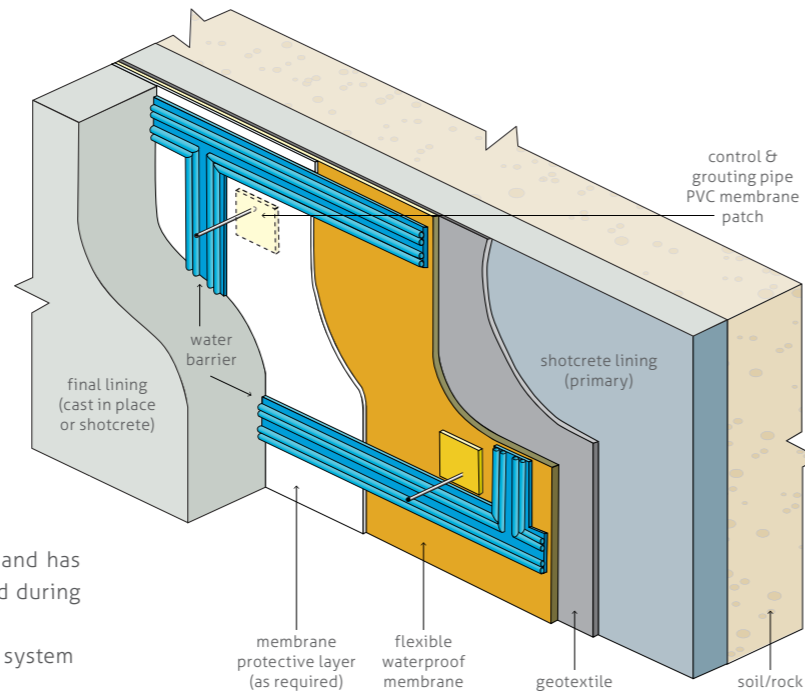


Dr. Sauer & Partners (DSP) promotes the use of flexible membranes for providing dry underground spaces. Our services range from detailed design of waterproofing systems to providing experienced inspectors on site to ensure quality installation.

A waterproofing system used in underground applications must not only remain permanently impervious over the lifetime of the structure, but also:

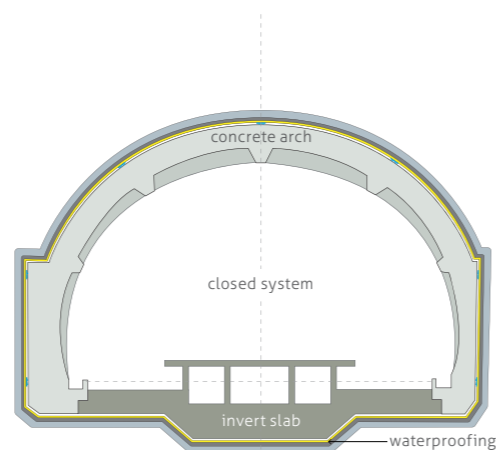
- Adapt to surface irregularities
- Bridge cracks
- Resist aggressive water
- Install on wet surfaces

A flexible membrane can fulfil these requirements and has the advantage that the seams can be pressure-tested during installation to ensure the integrity of the membrane. In addition, **DSP** incorporates a sectioning and control system to detect and treat leaks locally.



OPEN SYSTEM

Open systems guide the groundwater into the sidewall drainpipes through the permeable geotextile fabric that separates the waterproofing membrane from the support of excavation. The system then feeds the groundwater into the main track drain or drainage sumps.



CLOSED SYSTEM

Closed systems completely encase the underground structure in the watertight membrane. In permeable soils, a closed system eliminates the continuous pumping of groundwater, thereby minimizing surface settlement associated with groundwater drawdown.



< PEDESTRIAN WALKBACK TUNNEL – VA, USA
Dulles Airport

WE OFFER THE FOLLOWING SERVICES:

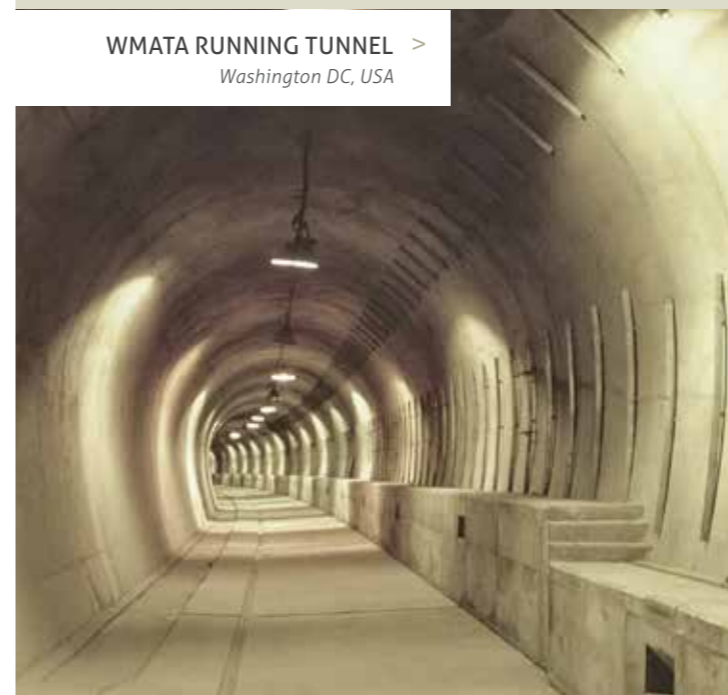
- Identify suitable waterproofing systems based on groundwater levels, geometric constraints, and maintenance considerations
- Develop conceptual and detailed waterproofing designs for tunnels and underground stations
- Provide experienced supervisors and inspectors for waterproofing installations
- Devise leak remediation concepts for existing tunnels that are in need of rehabilitation



THIRRA TUNNEL – Albania >
Ministry of Public Works and Transportation

The positive effect of membrane waterproofing systems on the durability of structures and reduced maintenance costs have been acknowledged by the Federal Transit Administration (FTA) in their Lessons Learned Program.

WMATA RUNNING TUNNEL >
Washington DC, USA



FTA – LESSONS LEARNED PROGRAM

The new waterproofing system, coupled with proper installation techniques and a rigorous quality control inspection process, has vastly improved the dryness of Washington Metropolitan Area Transit Authority (WMATA) underground tunnels and stations.

WMATA anticipates the waterproofing system will remain intact for a long time. The incorporation of compartmental sectioning permits a logical approach to repairing future leaks. WMATA expects this new system for water control will result in a significant reduction in costs over the long term for operations and maintenance.

Rail car air filters will require more frequent replacement, however, due to increased dust levels created by the drier tunnel conditions, a relatively minor increase in maintenance costs.