

Penetrations Through Below Grade Waterproofing Systems

This Technical Bulletin establishes minimum requirements, best practices, and limitations for detailing and installing penetrations through below-grade waterproofing systems. Proper implementation is critical to minimizing the risk of water intrusion and ensuring long-term system performance.

Penetrations through below-grade waterproofing systems represent high-risk areas for leakage. These conditions are typically installed by Mechanical, Electrical, and Plumbing (MEP) trades and are often configured in a manner incompatible with standard waterproofing details.

Examples of problematic conditions include:

- Clusters of conduits with little or no spacing
- Pipes bearing directly on footings or substrates
- Penetrations installed at angles other than 90-degrees
- Insufficient clearance for proper detailing

These conditions significantly increase the difficulty of achieving a watertight detail, particularly in applications subject to hydrostatic pressure.

Penetration layout, spacing, and types must be defined during the design phase and clearly indicated on construction documents. Penetration type, spacing, and sequencing must all be reviewed during the waterproofing pre-construction meeting with the MEP contractors and construction team.

Best practices and considerations for waterproofing penetrations:

- All penetrations must be secured firmly in place and free of contaminants. If installing penetrations through compacted, stone or earth each penetration must be grouted in place to eliminate any movement that may compromise the waterproofing detail.
- Penetrations should be spaced a minimum 6 inches apart, be free of fittings, couplings, pipe supports etc. for a minimum of 9 inches (23 cm), above the waterproofing in a pre-applied condition to ensure a standard detail inclusive of a waterstop can be installed. Thickened or haunched slabs should be considered at penetrations in thinner slabs. For post-applied conditions, the penetration should be free of fittings, couplings, pipe supports etc. for a minimum of 6 in. (15 cm) beyond the waterproofing membrane.
- Penetration clusters should be avoided at all costs. If a penetration cluster is required on a project, Polyglass will review each cluster on a case-by-case basis to determine if a watertight detail can be achieved. The spacing, number of penetrations, and access to each penetration are just some of the variables that will be considered.
- All penetrations need to extend perpendicular at a 90-degree angle to the waterproofing.
- If penetrations need to be supported within the structural slab pour, they must be supported within the reinforcing cage or on a concrete dolly without penetrating the waterproofing membrane.
- Any electrical grounding penetrations coming through the waterproofing system must be solid penetrations. Braided cables cannot penetrate the waterproofing as they CANNOT be waterproofed and made watertight. If a braided cable is required, it should be coupled/connected per applicable codes to a solid rod that penetrates the waterproofing and extends a minimum of 9 in. (23 cm), above the waterproofing in a pre-applied condition to ensure a standard detail inclusive of a waterstop can be installed. For post-applied conditions, the solid rod should extend a minimum of 6 in. (15 cm), beyond the waterproofing membrane.

All penetrations through the waterproofing system must be inspected prior to concrete placement or backfill to ensure compliance with the manufacturer's details, best practices, and construction documents.