WATERPROOFING INJECTION TO MASONRY & BACKFILL

Grout injection into masonry is at the heart of our business. Typically, we are called in to waterproof an existing brick or masonry structure where excessive water ingress has deteriorated the masonry, mortar, or backfill over time. Sometimes a waterproofing system has been compromised by utility works. Waterproofing injection is a cost-effective solution to repair deteriorated or compromised structures and to extend their life span.

A typical application involves the drilling of a grid, followed by injecting of a waterproofing resin from the bottom up, utilising gravity to aid penetration. Any voids are slowly filled, and water within the structure is pushed out. The diameter of the injection packers is usually 10mm (but can be as small as 4mm), helping to retain the visual appearance of the structure. If indicated, a second staggered grid is sometimes overlaid to ensure good coverage. Upon completion, all packers are removed, any excess resin is cleared, and the holes are carefully sealed with mortar. Where brick repairs or pointing are required beforehand, these are carried out by our in-house bricklayer. All Tempo-PCE staff are highly experienced and Confined Space trained.

BENEFITS OF WATERPROOFING INJECTION

The key advantage of injection over more traditional waterproofing methods like tanking, is that it is carried out with minimal disruption and little or no traffic management. Injection is completed from below, through the intrados, allowing road or rail traffic to run above without disruption. As the pumping of the resin is carried out at low pressure, the brickwork and backfill are not subjected to any movement. The injected resin is absorbed into the brick rings or backfill and replaces water, or air, in the structure. The resins can penetrate hairline cracks and fine capillaries in the brickwork. This is particularly the case with injection of low viscosity acrylic resins.

A further advantage is that the waterproofing of a structure achieved by injection cannot be weakened by subsequent services works, as often happens with more traditional approaches. With the manufacturer guarantees of a lifespan of 60 up to 120 years for the resins, depending on specification, waterproofing injection can considerably add to the longevity of a structure.

Pointing before waterproofing injection

ACRYLIC RESIN FOR WATERPROOFING

The use of an acrylic resin can give a long open-time, improving absorption into the brick or backfill and giving increased flexibility over polyurethane. Acrylic resin can also be used with very short open times allowing the injector to control carefully the amount of injected material and therefore its location. This way, only specific areas can be waterproofed if required, e.g. only the brick rings. Good chemical resistance of acrylic resin helps protect highway structures against road salts.

Acrylic waterproofing injection off a raft

BACKFILL WATERPROOFING INJECTION

Another option is waterproofing the backfill: this allows subsequent strengthening injection of the masonry, and is particularly indicated with the masonry is in too poor condition to contain injection. A common solution is an acrylic waterproofing injection into the backfill, followed by a lime or cementitious strengthening injection into the brickwork.

Raft being set up for waterproofing injection over a watercourse

TYPICAL APPLICATIONS

- Pipesubway Tunnels
- Brick arch barrel bridges
- Brick vaults
- Brick culverts
- Brick retaining walls

KEY BENEFITS

- Full control of setting time
- Non-jacking resins-Compatible with existing water management, e.g. weep holes
- Good saturation
- Good chemical resistance
- Appearance is retained
- Quantities can be measured and recorded
- Good cost control: can be used reactively, i.e. spot injection
- Longevity of resin
- Resins can be potable water safe/ WRAS approved

PU waterproofing injection and noting of quantities

APPLICATION CONDITIONS & LIMITATIONS

- Acrylic resins have permanent open times until an accelerator is added, giving maximum flexibility.
- PU is injected at the same time as the catalyst and its set time can be controlled from hours to seconds
- Resins are affected by temperatures, with lower temperatures slowing down reaction time, and PUs become more viscous when cold, reducing penetration
- Structures showing missing pointing or cracking might require either surface repair or waterproofing with the (thicker) PU to avoid material loss.
- Acrylic has no structural strength, which means it can surround services and is can be easily removed by hand