RESTEK

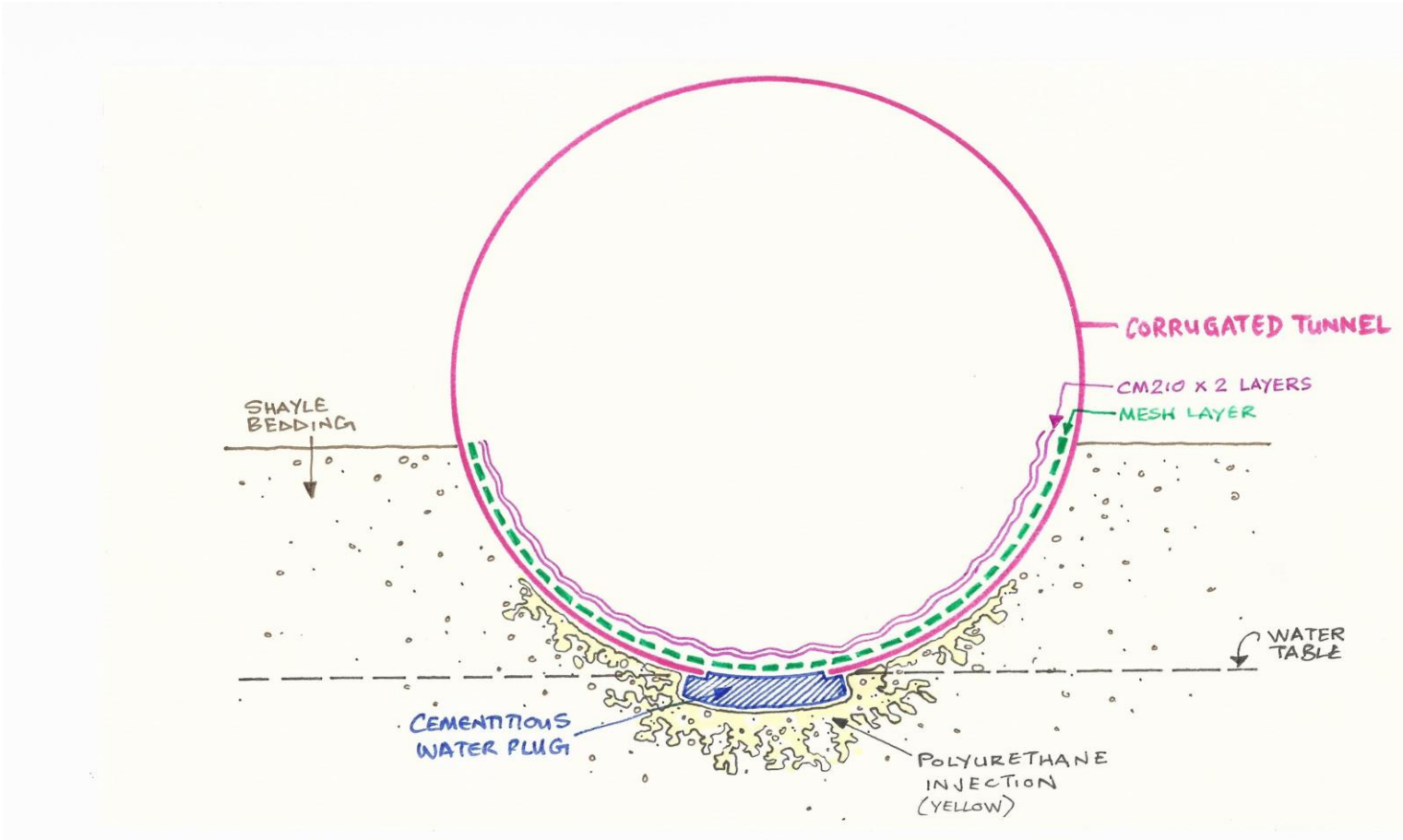
Leicester University Sports Centre **June 2016**

Water ingress to ducting

Restek were asked by Leicester University to assess a steel corrugated pipe approximately 1.8 metres diameter by 23 linear metres which was showing signs of persistent water infiltration resulting from corrosion to the base of the ducting. We were asked to devise a suitable solution that could be carried out in a confined space whilst extending the service life of the duct by some 25years.

We looked at many options of reducing all the points of ingress and decided that the level of ingress required a unique solution that would give three effective barriers against water infiltration and enable the ducts to remain in situ whist extending the design life of the corrugated pipe.

The Approach:



Injection Resins:

SealBoss* ® 1510 *Water-Stop-Foam

Hydrophobic water (hydro) activated water cut-off grout and foam seal grout based on a MDI (methylene-diphenyl-isocyanate) polyurethane.
The resin is 100% solvent free and 100% solids. The gel-time of the product is adjustable by the mandatory adding of a certain percentage of **15x *Accelerator***.
Upon contact with water **1510 *Water-Stop-Foam*** reacts to a semi flexible foam while expanding its volume 30 to 40 times. The cured material is of a constant volume. Since water is not a component of the foam structure, the cured material is essentially not effected by water or dryness. The reacted material does not shrink or swell. Depending on the amount of accelerator added and the pressure of injection, **1510 *Water-Stop-Foam*** reacts to a very dense, closed cell, semi rigid material or a more open cell, semi flexible product. For best waterproofing results the closed cell structure is desired.

1510 *Water-Stop-Foam* is designed for cutting off gushing water of high pressure and speed. Due to the low viscosity of the material, **1510 *Water-Stop-Foam*** offers superior penetration in hairline crack injection. The product is also suitable for the filling of larger spaces, cracks and honeycombing in stone or concrete structures. The product can be applied as a non-shrink, high strength soil stabilization grout when used with very little accelerator. The moisture content of the soil must be sufficient to ensure reaction.

Methodology:

Restek recommended using a selection of structural waterproofing polyurethane resins, modified to suit the site conditions. *Sealboss Water Stop Foam1510* was used for fractures that displayed severe pressing water conditions.

The benefit of using this type of waterproofing injection procedure is for its ability to seal the finest of pores in building components that would otherwise enable water to find a path to the surface. This is due to the ultra-low viscosity and specially designed formula for absorbing into the building components and sealing all capillaries and pores in the injection procedure.

There are added benefits with this method of structural waterproofing. The resin has a controlled expansion of four times its volume compared to that of forty times expansion with most polyurethane resins. Due to its controlled expansion, the resin will cure to form a tough flexible resin designed to maintain a good bonding strength with the advantage of absorbing any movement without losing adhesion. Once the injection process has been undertaken the resin will also provide a watertight seal to the concrete and prevent any further decay of the building components from water infiltration and frost, due to the ability to displace any water within the structure in the injection process.

Casting a new concrete section that could withstand negative water pressure