OXFORD HYDROTECHNICS

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CASE HISTORY

Client: Network Rail **Duration:** 52 hour possession **Budget:** Within budget

Oxford Hydrotechnics specialises in controlling ground water ingress within structures and have a proven track record of providing bespoke solutions to difficult problems.

The company has recently worked with Network Rail to find a solution to a water ingress problem within a precast concrete segmental tunnel. The ingress typically occurred through concentric joints between rings. In this particular tunnel the tracks were mounted directly on the concrete base slab and the volume of water was sufficient to bridge the gap between running rails, causing signalling problems outside the tunnel.

Several methods to deal with the ingress over the tracks were used at the time of construction including caulking to joints, and more recently plastic drip trays were installed around the intrados to catch the water and divert it to either side of the track where it could be channelled away in the tunnels drainage channel system. However this solution proved ineffective due to the volume of water; the effect of moving the problem elsewhere within the tunnel and the ongoing maintenance costs.

On examining the problem, OH's engineers decided on a system of resin injection within the leaking joints, using a single component polyurethane resin, which cured to a hydrophobic flexible foam. This flexibility was thought to be of paramount importance to take up the thermal, cyclical and vibration movements typically encountered within a rail tunnel environment.

A 52 hour weekend possession was set aside for a trial of the proposed system and Network Rail selected some of the most problematical joints to give the system a stern test. Network Rail removed the drip trays from the joints and four Oxford Hydrotechnics injection crews were rotated in 12 hour shifts over the weekend. During a 44 hour productive time period, 12 joints were successfully sealed, within the overall works budget, negating the need for reinstating the drip trays.