

Project:
A3 Hindhead Improvement
Scheme

Location:
Surrey

Contractors:
Balfour Beatty

Consultants:
Mott MacDonald

Market sector:
Underground Construction

Products used:
MasterSeal 345

Area treated:
80,000 m²

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Hindhead Tunnel, Surrey

Spray-on waterproofing membrane solution for tunnel



Our reference in Surrey (United Kingdom): Hindhead Tunnel

The background

The A3 Hindhead Tunnel was one of the projects in the Government's programme of major road schemes.

It completed the dual carriageway link between London and Portsmouth, removing a major source of congestion, particularly around the A3/A287 traffic signal-controlled crossroads.

The new road is 6.5km (4 miles) long and includes 1.8km (1.1 miles) of twin-bored tunnels under the Devil's Punch Bowl, a Site of Special Scientific Interest.

The challenge

The Hindhead tunnel is 1.83 kilometres long comprising 1.77km of bored tunnels and 30 metres of cut and cover at either end. The tunnel has two separate bores, each including a 7.3-metre-wide two-lane carriageway with 1.2-metre-wide verges on each side. The tunnelling method proposed by Balfour Beatty was the Sprayed Concrete Lining method (SCL). Despite predictions of low ground water ingress and good self-supporting sandstone, the reference design for the tunnel included a drained PVC-membrane waterproofing system behind an *in-situ* concrete final lining. However, consultants Mott MacDonald felt an alternative solution could offer significant time savings and flexibility advantages for the contractor and major time and money savings for the client.

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Our solution

Mott MacDonald proposed a spray-on waterproofing system with shotcrete as the final permanent lining in the crown. The tunnels would have cast concrete sidewalls to allow a painted reflector surface and easier wash-down maintenance.

They specified MasterSeal 345, which is applied in a simple sandwich construction. The waterproofing system's performance lies in the excellent bonding properties between the membrane and concrete lining on both sides, which mitigates the risk of water ingress by eliminating groundwater paths.

MasterSeal 345 closes and isolates any cracks so that stresses resulting from water pressure can be transferred to the outer lining, leaving the inner lining virtually unaffected.

Benefits to the customer

- The same workers who carried out the shotcreting were able to apply 5m layer of MasterSeal 345 using a Meyco Piccola dry spray pump
- Saved three months of construction time in comparison to more traditional options

Projects facts at a glance

- A3/A287 improvement works including twin bore tunnels under Devil's Punch Bowl
- 80,000m² treated with MasterSeal 345

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