



Project information

VolkerLaser developed an innovative solution that allowed major repairs to be carried out on the elevated section of the M4 with minimal disruption to this arterial route into West London.

Client

Birse Civils Ltd
on behalf of The Highways Agency

Consultant

Mott MacDonald

Contract Value

£2.2 million

Services included

- Cathodic Protection
- Sprayed Concrete Repairs
- Hydro-demolition

The two-lane M4 is elevated along a 5.5km stretch through Chiswick, above the A4. These two roads carry more than 138,000 vehicles each day into and out of London. De-icing salts used on the elevated section during winter had seeped past the asphaltic plug joints and penetrated the crosshead concrete beams

that form the soffit of the road deck. This penetration had caused the near-surface reinforcement to corrode, weakening the elevated M4 section and posing a risk to the A4 below.

Highways Agency trials had shown that wide-scale replacement of the beams would require a 9.1km detour of all M4 traffic onto the A4, which would itself require major traffic management to enable the works. This solution was impractical, with the cost estimated at £5million per beam. VolkerLaser were appointed to apply our specialist knowledge to this complex problem.

Our solution comprised the installation of improved deck drainage and reinforcing the near-surface strength of the beams with a titanium mesh and cementitious overlay. A discrete anode cathodic protection system would introduce a direct current to the reinforcement, which would prevent future corrosion.

The execution of the works called for innovation, with access to the underside of the beams restricted by high volumes of traffic on the A4 below by day, and prohibited by noise during the night. To address this, a scissor-lift was modified to create a fully enclosed, movable roofless cabin providing safe, unrestricted access that minimised noise emissions. Additionally, rather than conventionally threading the cathodic anodes through multiple holes drilled along the beam, they were threaded through a single hole drilled from end-to-end of the 18m crosshead beams. This reduced the drilling time alone by 90%.

VolkerLaser's innovations not only allowed vital repair and protection works to be undertaken cost effectively and with minimal disruption to the road network, but also resulted in a 20% cost saving per pier and a 60% reduction in energy use.