

Matthew Murray Tunnel, Leeds - Repair and Strengthening



North portal during night-time possession



A deep trench was needed for access



Hit and miss bays on the side wall



Nearly 5,000 rebar couplers used



Spray concrete repair underway



Carbon fibre composite strengthening

Balvac repairs and strengthens strategically important urban road tunnel using sprayed concrete and carbon fibre composites.

Client	Leeds City Council
Principal Contractor	Balvac Limited
Contract Value	£ 1,000,000
Programme	16 weeks
Completion	Autumn 2004

Matthew Murray Tunnel, named after a local Victorian railway pioneer, is a 160 m long twin-bore reinforced concrete portal structure. It carries the busy A643 dual carriageway under open ground close to Leeds city centre. The 1970's structure was suffering from spalling of the cover concrete caused by reinforcement corrosion and the central wall dividing the bores was found to be vulnerable to impact. The need to keep Leeds traffic flowing during the working day meant that Balvac undertook the project during overnight and weekend possessions. Traffic was put into contra-flow sharing the adjacent bore.

The majority of the damaged concrete needing removal, over 30m³, was concentrated along the side wall within the splash zone. A 1.7 m high band of concrete, up to 160 mm deep, was removed along the length of the tunnel in 5 m bays, hit and miss, using hydrodemolition. Corroded vertical bars were cut back to the edges of the repair and new bars spliced in using couplers. New lacers were then tied on. Reinstatement used SikaCem 133, a pre-bagged, polymer modified, cementitious material, applied using the dry sprayed method.

The central wall had been assessed to be vulnerable to vehicle impact, with Leeds designers opting to strengthen the majority of the wall, over 900 m², with SikaWrap 230C, a unidirectional carbon fibre fabric. This was bonded to the prepared concrete surface using cold cured epoxy adhesive. Up to 8 layers of fabric were applied at the centre of the wall, tapering off to 2 layers towards the top and bottom.

The structure was finally waterproofed in the splash zone and then the walls further treated with spray applied Ceramicoat, a specialist water based epoxy tunnel coating.

Balvac

Sherwood House, Gadbrook Business Centre, Rudheath, Northwich,
Cheshire. CW9 7TN

Tel: 01606 333 036 Fax: 01606 812 497

Email: enquiries.balvac@balvac.co.uk

www.balvac.co.uk