

Travis Street Railway Arches Strengthening

Client :
Network Rail

Designer :
Mouchel Parkman

Main Contractor :
BAM Nuttall Ltd

Location :
Manchester

Date :
2004



Two railway arches carrying mainline rail traffic into Manchester's Piccadilly Station had deteriorated due to movement cracking and brick loss. A strengthening contract was awarded to BAM Ritchies to construct two new reinforced concrete arches, including foundations, walls and arch sections within the existing brickwork structures.

The new 400mm thick arches comprise traditionally reinforced, shuttered and poured concrete walls with the arch sections being constructed using sprayed concrete techniques.

The concrete arch is reinforced with a standard two layers of 10mm matting and an additional 40 kg/m³ of stainless steel fibre reinforcement in the sprayed concrete mix to increase the load bearing capacity.

To enable an economically viable construction method for the sprayed concrete, BAM Ritchies chose to use a 10mm aggregate ready-mixed concrete shotcrete mix, incorporating MBT/Feb superplasticiser and Delvocrete hydration control additives. Stainless steel fibres were added at site and the sprayed concrete placed by the use of a Suprema shotcrete pump and robotic nozzle.

The robotic arm enabled remote operation, simplifying access and removing the nozzle man from the harsh working environment normally associated with the traditional operation. Higher outputs were also achieved by reducing the manual physical effort.