

Dover Tunnels - Lining Repairs

Client :
Network Rail

Designer :
Donaldson Associates

Main Contractor :
BAM Nuttall

Location :
Dover

Date :
2009



This high profile tunnel maintenance contract undertaken by the Network Rail/BAM Nuttall Southern Civils Framework team involved remediation works in two tunnels in Dover, Kent. Abbotscliffe and Dover Harbour Tunnels required attention to strengthen and repair areas of brickwork and lining.

Specialist geotechnical and sprayed concrete skills were provided by BAM Ritchies who worked closely with the Souther Civils team and designer Donaldson Associates. Trials were executed in Abbotscliffe tunnel in January of 2009 with the purpose of determining milling capabilities of equipment and brickwork quality followed but development work at the depot.

Abbotscliffe Tunnel

Removal of 153m³ of common and engineering brick from the tunnel walls was by both a bespoke Milling tool fabricated from a reduced boom and a Webster wheel (road header) mounted on a RRV and hydraulic breakers mounted on Case 998 RRVs. The 5m wide panels were removed in a hit and miss technique allowing the spray concrete works to gain sufficient strength as linking in to existing spray concrete in the crown.

Spray concrete works utilised a self batched dry mix which allowed for greater working hours and flexibility. This mix contained a locally sourced damp sand and high tensile steel fibres. Water was added at the nozzle and daily sampling was implemented. In total 177m³ of spray material were used. This figure included some overspray works required in the crown.

Dover Harbour Tunnel

These works consisted of the installation of 720 x 0.7m long stitching bars in crown and haunches of the tunnel. Holes for stitching bars were drilled using a Hilti drill and filled with Hilti HY-70 resin. 60 dowel bars, 350 L-bars and 80 Ø28mm, 3m long Weldgrip Fibregrip rockbolts in crown were also installed.

Rockbolts were installed using a purpose built rig mounted on a rail trailer and moved by an assisting RRV. The rig installed rockbolts at different angles using the articulating arm and a 5m long mast. Drilling behind brickwork lining was in chalk.

The final phase of works comprised a layer of spray concrete, 6.7m x 34m to a depth of 0.15m and used 35m³ of concrete, produced by a local BAM Ritchies batching plant.

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