

Project: Porthkerry Tunnels Refurbishment

Client: Railtrack

Consultant: Haswell Consulting Engineers

Main Contractor: Amalgamated Construction Co. Ltd.

Product Used: Weldgrip Fibregrip® Rockbolts



The Porthkerry No.1 and No.2 Tunnels were the first in a series of twelve tunnels to be refurbished on the Great Western Region rail network

The maintenance work involved the reinforcement of the tunnel lining by casting concrete toe blocks 1.5 metres long at 4 metre centres either side of the tunnel. The toe blocks were anchored to the brickwork by Weldgrip Fibregrip® Rockbolts. Between opposite toe blocks on either side of the tunnel a 250mm wide waterproofing membrane was positioned round the brickwork before shotcreting a 150mm thick permanent arch strip to complete each section.

Two Weldgrip Fibregrip® Rockbolts were used to secure each toe block at 750mm centres. The rockbolts were 22mm diameter, 3 metres long and fitted with a standard 80kN nut and high load 150mm square plastic end plate. They were installed into 32mm diameter holes which had been drilled by pneumatic rotary drilling machines. Full encapsulation was achieved by spinning the rockbolts through polyester resin.

Other Great Western Region Tunnels to use the same system were:- Box Tunnel, Caerphilly Tunnel, Whiteball Tunnel, Crocket Tunnel, Sugerlaof Tunnel and Cogan Tunnel.

The 205 metre long Tytherington Tunnel was also refurbished as part of this program.

Weldgrip Gripforce Rockbolts were used as the sole means of reinforcement into areas of the Limestone roof. These were 25mm diameter, 3 metres long, installed into 32mm diameter holes and spun through polyester resin capsules. The nut was tightened to a 150mm square high load plastic end plate assembly.



Fibregrip® Rockbolts installed at 750mm centres to secure the toe blocks.



Toe block cast around Fibregrip® Rockbolts.



Shotcreting a 150mm thick permanent arch between toe blocks.



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