



Farnworth Tunnel Upgrade Network Rail

Location: Farnworth, United Kingdom

Date: 2014 - 2016

Structure: Existing brick-lined tunnels

Length: 270 meters (886 feet)

Cross-Section: Down Tunnel - 4.5m ID; Up Tunnel – 8m ID

Geology: Glacial till deposits

Cost: N/A

Client: OTB Engineering Ltd

Owner: Network Rail



Figure 1. TBM assembly (courtesy OTB Engineering).

Independent Category 3 Design Check Services:

Network Rail is investing more than £1 Billion in railway improvement projects in the northwest of England. As part of this upgrade program, enlargement and strengthening works of the existing Farnworth tunnels are necessary at this critical choke point in the system. The Farnworth tunnels are Grade II listed brick-lined tunnels which were originally constructed in the 1800s and not large enough to accommodate new overhead electrification being installed as part of the overall program. A shield Tunnel Boring Machine was used to partially demolish and over excavate the 'Up Tunnel', while new shotcrete and steel strengthening measures were installed in the 'Down Tunnel'.

Gall Zeidler Consultants (GZ) provided expert design review services as the Category 3 independent design-checking engineer. Civil structures included in this check included segmental TBM tunnel linings, demolition sequence design, underpinning works, embedded pile retaining walls, soil nail walls, tunneling temporary works, and Sprayed Concrete Lining (SCL), amongst others.



Figure 2. Demolition and enlargement of brick-lined tunnel (courtesy OTB Engineering).