

Nant Pibwr Culvert Works

Client:	Network Rail
Location:	South Glamorgan
Value:	£0.5m
Duration:	2 Months



Triple bore masonry culvert at high tide



Refurbished culvert with concrete lining

In Brief...

Nant Pibwr culvert is a triple bore masonry culvert structure carrying the Up and Down main lines between Fishguard and Swindon, Carmarthen, South Wales. The structure comprises of three side by side masonry arch culverts founded on masonry abutments and spandrel walls over a length of approximately 28m. There were areas of defective joints and spalling masonry throughout the length of the culverts and visible signs of general dilapidation. The culverts accommodate a tidal river flow of varying depths, which often exceeds the culvert capacity and floods the surrounding pasture land. A concrete lining was attached to the culverts to improve the structural integrity and the smooth flow of water.

Customer Benefits...

- Initially the failing culverts were set to be filled in and abandoned; instead Barhale relined the culverts using the innovative Tunneline system, providing Network Rail with an equivalent, yet far more economical solution
- A cofferdam designed by our in-house consultants was used to control the tide during the lining of the culverts. This allowed each tunnel to be closed off independently and ensured a safe and dry working area when tides allowed
- Network Rail were extremely pleased with the outcome of the works that they backed Barhale in their bid for a UKSTT award.
- The refurbishment of the culverts has provided a 120 year design life, which saved Network Rail over 20% on their original scheme as well as increasing the flow capacity

Technical Features...

The objective was to strengthen 3 existing stone culverts and give them an extended 100 year life span. The horseshoe shaped culverts were 30m long and averaging 1500mm x 1500mm in diameter. The lining reduced the internal size to 1270mm but improved the culverts ks value significantly increasing the hydraulic capacity.

Dramix stainless steel fibres were used, as traditional reinforcing was not suited to the constant flooding conditions. This had the added advantage of removing a time consuming operation. The formwork was built to a pre-designed line and level, which Donaldson (the project designers) had created using a computer model. Once erected the ends were sealed to prevent water ingress and concrete poured at the next low tide. Each culvert took 24 cubic meters and 3 hours to complete.