



Tay Rail Bridge

United Kingdom



Project

The Tay Rail Bridge spans the Firth of Tay, linking the city of Dundee to Fife. It plays a key role in the region by carrying the Great North Eastern Railway. It took just five years to build and set new engineering standards for bridge building at the time. When it opened in 1887 it brought increased travel and trade opportunities to the east coast of Scotland.

The bridge was built to replace an earlier structure, which was destroyed by a gale in 1879 in what was Britain's worst rail disaster. The current structure is 3,265 m in length and includes 85 cast iron piers that support a steel deck. Construction included 25,000 tons of cast iron and steel, 70,000 tons of concrete, ten million bricks and three million rivets.

The bridge stands in an aggressive environment with high levels of humidity and salinity from the tidal Firth below. Network Rail required 25 years anti-corrosion paint protection system. Based on the protection afforded on other major bridge protection schemes including the Forth Rail and Royal Albert Bridges, Network Rail specified a glass flake epoxy system. The Principal Contractors, Xervon Palmers (Phases 1 and 2) and Taziker Industrial Ltd (Phases 3 and 4) selected Sherwin-Williams as their paint supplier.

Substrate: A steel deck and supporting structure, with cast iron piers.

Requirements: Providing anti-corrosion protection for 25 years.

Specifications: Network Rail M21 Specifications – Macropoxy™ L674 Epoxy Blast Primer, Macropoxy™ C123 Glass Flake Epoxy, Acrolon™ C137V2 Acrylic Urethane Finish.

Area coated: 242,000 m².

Client: Network Rail.

Principal Contractor: Xervon Palmers (Phases 1 and 2), Taziker Industrial Ltd (Phases 3 and 4).

System

The existing paintwork was totally removed by abrasive blast-cleaning to Sa2½ surface standard (BS EN ISO 8501-1).

The coating system comprised Macropoxy™ L674 Epoxy Blast Primer, Macropoxy™ C123 Glass Flake Epoxy and Acrolon™ C137V2 Acrylic Urethane Finish. A stripe coat of Macropoxy™ C123 Glass Flake Epoxy was applied between the first and second coats to all rivets, sharp edges and joints, etc.

The system eliminates the need for ongoing maintenance, significantly reducing environmental impact, saving on expensive maintenance costs and extending asset life.

This three coat system provides excellent adhesion and anti-corrosion properties and acts as a powerful barrier against the harsh weather conditions in this aggressive marine environment.

Benefits to the asset owner of adopting this three coat system to the bridge and highways sector comes in terms of labour costs, lower energy usage and volumes of paint required. In addition, the higher volume solids coatings means that fewer volatile organic compounds (VOCs) are emitted during the process.



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