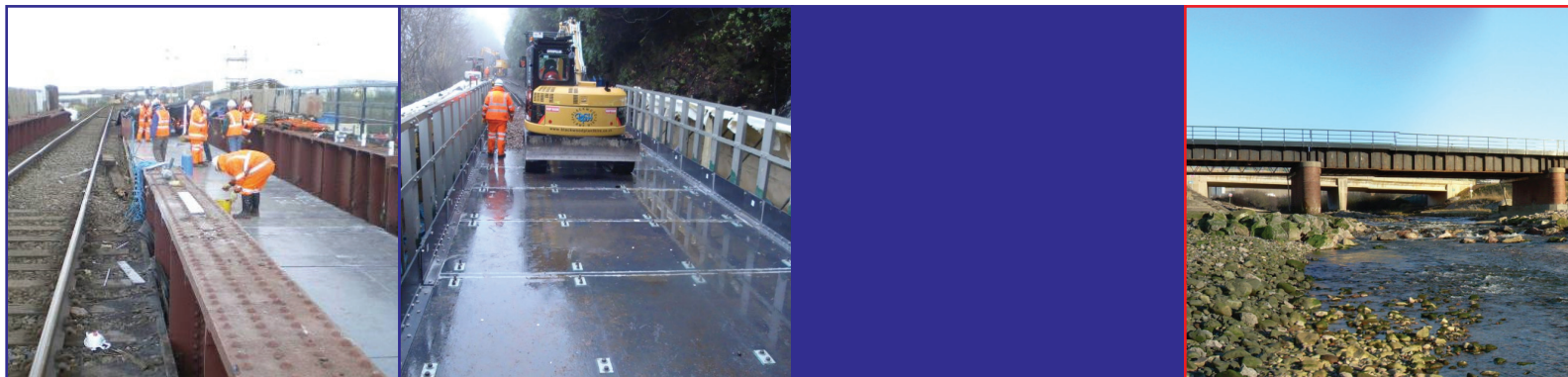


Calder & Rubha Gas Viaducts



Overview

Glass-fibre reinforced polymer composite railway deck replacement on steelwork viaducts.

Details

Location	Calder Viaduct – near Sellafield, Cumbria, UK. Rubha Glas Viaduct – near Loch Lomond, Scotland, UK.
Description	GFRP railway deck replacement on steelwork viaducts.
Client	Network Rail
Date of project	2009 (Calder Viaduct) 2011 (Rubha Glas Viaduct)
Where FRP composites are used and why	Lightweight pre-fabricated GFRP decking units used to construction duration within overnight railway possessions and provide a more durable system compared with conventional timber or steel plate deck.
Specific design details	GFRP railway decking of less than 100mm depth spanning 1.2m between existing steelwork stringers, comprising GFRP plate up to 1" thickness bonded to top and bottom of 2.5" thick GFRP open mesh grid (Duragrid HD-3000), with full railway and derailment capacity. Prefabricated decking units (typically 4m x 2m in plan) weighed only 1 Tonne allowing installation using cost-effective railway craneage. Replacement GFRP deck also allowed improvement in ballast depth.
Type of composite used	Bonded pultruded multi-axial plate and uni-directional bar and grid system (all E-glass fibre in vinylester resin).
Performance in service	No change in structural condition (2015). Some water leakage at non-structural joints between GFRP decking units.
Project partners	Designer – Mouchel Contractor – Carillion Manufacturer - Pipex px

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