

FLOW BRIDGE – A USER ORIENTED FRP MODULAR FOOTBRIDGE Research paper



Abstract

Keywords: Bio-composites; FRP; Fiber Reinforced Polymers; Carbon Fiber; Glass Fiber; Flax; Design; Parametric; Modular; Aesthetics; Prototype; User Experience.

This paper describes a unique approach to the design and fabrication of composite FRP (Fibre Reinforced Polymer) level-crossing replacement footbridges in rural and semi-rural environments Network Rail, the rail network operator in the United Kingdom. The team set out to design a lightweight, cost-effective, and aesthetically pleasing modular system as an alternative to existing solutions within the industry.

The team's workflow challenged conventional procurement methodologies and allowed for quick decision making and out-of-the-box thinking. Through early contractor involvement in the design process, continuous cat-3 checks, a centralised parametric BIM model, and swift procurement tactics, a working full size prototype was delivered in record time.

The design was conceived around the user experience, aesthetics, functionality, materiality, cost, and structural performance. This holistic design approach resulted in an innovative and eye-catching solution that blends route-wide repeatability and off-site manufacture, with adaptability to local context.