



Bracklinn Falls Footbridge: efficient modular design

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Abstract

The construction and access constraints of the Bracklinn Falls site drove the development of a new modular system and governed the structural and aesthetic design for the new footbridge. The resulting structure consists of perforated panels, formed from single sheets of weathering steel folded into a z-shape. These panels were bolted to cross frames and assembled to create a half through beam that spans 21.4m. The structure was assembled bay-by-bay and push launched along a set of temporary rails, before being jacked onto the permanent bearings.

By using a folding process, the modular system minimised welding and hence fabrication time and energy use. This paper looks at how the multiple constraints of a particular project enabled the design team to deliver a footbridge with an exemplary embodied carbon rating [1] as well as achieving economic, robustness, durability and aesthetic goals.

Keywords: Design; Fabrication; Collaboration; Sustainability.

1 Introduction

Generally, the advantages of modular bridge construction are speed of installation; construction quality (due to offsite fabrication); and overall capital cost. It is not often associated with a focus on sustainability and durability. This project approaches these advantages from the other direction and is modular by necessity. Taking as a starting point a complex site, this paper describes the design process and key design decisions. The modular nature of the final scheme [Figure 1] is shown to be a necessary outcome of the site

constraints, and shows another avenue for repeatable processes that could be used as a bridge product.

2 Site

Bracklinn Falls is situated in a gorge surrounded by ancient woodland within the Loch Lomond and the Trossachs National Park. The park authority required a replacement footbridge to cross the gorge and to provide views of the falls. However, access for construction plant and materials was extremely difficult, with the sole access via a steep and sharp cornered path.