

Medway River Bridge

Project case study



Picture courtesy BAM Nuttall

Client

BAM Nuttall

Product

Hanson concrete containing Regen GGBS

Volume supplied

10,000m³

Overview

An unconventional construction technique has been used to build a new concrete bridge across the River Medway in Kent.



Medway River Bridge

Infrastructure



Picture courtesy BAM Nuttall

Project description

The new crossing provides road access between Wouldham and Halling, near Maidstone, to facilitate the construction of 1,000 homes at Peters Village. Both ends of the 50 metre, three-span bridge are supported by a bored pile abutment with the mid span supported by two monolithic piers.

Due to its location, a condition of the planning consent was to maintain a navigable channel for vessels at all times during construction.

The initial tender for the crossing was a balanced cantilever two-lane bridge but analysis of the client's programme requirements found that this option posed too great a risk to the project's tight delivery schedule. Consequently, contractor BAM Nuttall proposed an alternative solution using a post-tensioned box girder bridge, with the concrete cast in situ.

This technique, not routinely used since the 1970s, provides flexibility to work on multiple construction activities at once. On this project it meant that the critical

path could be shortened by carrying out multiple construction activities concurrently. However, the decision to cast the bridge in situ, with the resulting bridge redesign, took time out of the site team's construction programme for design of temporary works, procurement and mobilisation to site. This was mitigated by early contractor involvement to enhance collaboration throughout the supply chain. For example, the decision to engage with the post tensioning specialist early in the process meant that buildable post tensioned details could be included in the design.

The right concrete mix was critical to the project's success and Hanson developed and trialled three C40/50 concrete designs to ensure the criteria set out in the specification were met. The concrete mixes incorporated 50 per cent Regen GGBS (ground granulated blastfurnace slag) and a combination of modified polycarboxylate and lignosulphonate based water reducing admixtures to maintain the specified consistency during transit and on site in the summer months.

The concrete was supplied locally from Hanson's Maidstone and Rochester plants with the two sites working in tandem to ensure a seamless supply and deliver excellent customer service. During the project, both plants changed the primary aggregate from marine flint to limestone in order to meet the specification, which included resistance to freezing and thawing. In addition, a comprehensive maintenance programme and production planning regime were stepped up to keep deliveries on track.

Ben Goodman, BAM Nuttall sub agent, said: "This was a fairly complex project in civil engineering terms, with the added constraints of replacing a road bridge over an operational railway line to connect the access roads.

"Hanson understood that consistent quality and continuity of supply were critical in order for us to achieve our tight timeframes and, with restricted access to parts of the site, guaranteed delivery was a 'must have'. The team absolutely delivered on this project and were supportive and professional throughout."