

Proven performance

Technical collaboration with Align JV for readymix concrete

Overview

In July 2017, the Align joint venture was awarded the C1 package of the UK High Speed 2 line (HS2). C1 consists of;



21.6km

of high speed rail infrastructure in a rural environment

3.37km

viaduct

16.04km

twin-bored tunnel

5 vent shafts

handling both intervention and tunnel ventilation facilities

Tarmac were awarded preferred concrete supplier status in February 2019 to deliver 820,000m³ of concrete across three onsite batching plants.

The challenge

All permanent works concrete to be used on the HS2 project has to obtain client approval prior to supplies commencing onsite. It was therefore important to mobilise our technical team quickly following our award as preferred supplier for the C1 section. Mixes needed to be developed as they were to be used in a number of challenging applications including; tunnel segment production, D-Walls, piling and infrastructure works.

Our solution

Our dedicated Project Manager coordinated our approach to the technical approvals, providing a main point of contact for Align and being available at their offices. Our technical experts worked closely with the Align Materials Engineers to explore mix design and constituent materials in more detail, including the use of steel fibres in concrete. Our experts were able to build on their experience and knowledge from other major schemes to ensure we met specification requirements.

Mix trials

The most complicated mix developed was the steel fibre reinforced tunnel segment mix, which accounted for almost 50% of the overall concrete volume. We worked alongside the Align design team to understand the detailed specification and we jointly developed a plan to prove the mix design, firstly in the laboratory and then in full scale production. The customer and our key supply chain worked collaboratively with the Tarmac technical team at our National laboratory in Shawell. Shortlisted mixes were trialled in bulk production at Tarmac's pre-cast facility, Tallington. Several tunnel segments were manufactured for strength and factory acceptance testing along with a number of panels for fire testing at the Building Research Establishment (BRE).

Through early engagement and working closely together over a number of months, HS2, Align, Tarmac and our supply chain ensured a mix was developed which met the needs of the project in the most cost-effective manner.

Customer feedback

John McEvoy – Materials Engineer, ALIGN JV

"From bid through to delivery Tarmac have delivered a consistent approach in their technical capability. They had clearly demonstrated that they understood our requirements and how they would deliver this on the project. Moving into the mobilisation phase, relationships were quickly established between teams with alignment of key project delivery goals. This has resulted in our teams working together to develop concrete mix designs which meet the HS2 specification, whilst reduce risk and minimise cost in an open and transparent way."

Outcomes

Along with the segment mix we have jointly developed a further 35 HS2 approved mixes with Align, and now have an agreed technical and commercial process in place where new mixes can be added. In addition, we have also been working with other HS2 Main Works Contractors and currently have over 100 approved mixes for use on the project, with a variety of raw materials packages. Our work so far on HS2 and our understanding of the materials approval process will enable us to efficiently move through a similar process with SCS and manage resource effectively.

**February
2019**

Tarmac announced as preferred supplier

**March
2019**

Dedicated Project Manager in place at Align JV office

**April/May
2019**

Laboratory trials conducted at Shawell

**April-
September
2019**

Materials approval process

**June-
September
2019**

First segments and panels cast at Tallington