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Concrete concert for Ordsall Chord

A major upgrade to Manchester's rail network as part of Network Rail's Northern Hub project, called for a range of concrete products in olympic-sized quantities, all delivered to a tight construction programme.

To ensure that the UK's rail infrastructure is equipped to meet increased capacity demand and new train technologies, Network Rail is undertaking a huge investment programme to improve services nationwide. In Manchester, this has included a major scheme to alleviate congestion in some of the North West's biggest train stations. The Ordsall Chord will connect the city's Victoria, Piccadilly and Oxford Road stations. But building an elevated 300m section of railway through the centre of one of the country's biggest cities presented challenges to the whole project team. The extensive works included: a new bridge over the River Irwell; two new bridges over Water Street; a bridge over Trinity Way (Manchester's Inner Ring Road and a dual carriageway); widening of the existing Grade II listed Castlefield Viaduct; and a major refurbishment of the Grade I listed Stephenson Bridge.

Not least of the challenges was ensuring consistent delivery of thousands of tonnes of high-performance concrete to support construction on a project with ambitious timescales. With a project of this scale and importance, close communication between the principal contractors and subcontractors from the earliest stages was key to success. Tarmac was brought on board by the principal contractor, a Skanska/BAM Nuttall joint venture, to supply both concrete and aggregates.

To meet the challenging demands of the fast-track programme, Tarmac provided specialist support through a range of bespoke mix designs. The concrete it delivered was used for all aspects of the project, including foundations, bridge construction, abutments, tracks, infills and other associated building elements.

The company identified high-early-strength concrete as a means of dealing with the project's challenging architectural concrete requirements.

"Using our high-early-strength concrete, Toproc Rapid, meant that we could complete key time-critical aspects of the project more quickly."

James Macintosh, Readymix Business Manager, Tarmac

Whereas a traditional concrete requires anywhere up to 28 days to reach full strength, high-early-strength concrete can achieve this in just 48 hours. This therefore helps speed up project delivery and improves efficiency by enabling the next phase of construction to commence sooner. Tarmac's ready-mix business manager, James Macintosh, explains:

"We worked closely with the principal contractor and other subcontractors to make sure that we understood their bespoke requirements and were able to recommend a range of concrete solutions to meet their programme.

"Using our high-early-strength concrete, Toproc Rapid, meant that we could help them to complete key time-critical aspects of the project more quickly, such as those associated with preparing the track beds.

"This helped to reduce the overall programme time and saved labour, while minimising disruption to the rail network," adds Macintosh.

Elsewhere, a specialist coloured concrete, Toptint, in a grey Welsh slate finish was used for aesthetic reasons to help the new structures blend into the existing landscape and structures around East Ordsall Lane.

Tarmac also supplied its lightweight aggregate, Lytag, to reduce deadweight on the new bridges. This helped to improve on design and save construction costs by reducing the weight of the bridge deck without compromising the structural integrity.

"The Ordsall Chord was a hugely ambitious project with a number of contractors working continually in different locations," comments Macintosh. "We had to make sure our infrastructure was in place to supply the required concrete and aggregates at significant milestones in the project timetable, getting the materials exactly where they were needed, when they were needed."

To achieve this, Tarmac's existing network of plants was crucial, allowing multiple plants – including those at Trafford Park, Salford and Stockport The project team even devised a bespoke solution to upgrade the Salford batching plant with a hot water facility. This protective measure was put in place to cope with seasonal cold snaps and guaranteed that supplies of quality-assured concrete could be consistently delivered during winter months.

Brian Price, senior buyer for the Skanska/Bam Nuttall JV, comments: "Tarmac was chosen to deliver this project after extensive research into the capability, capacity and the technical expertise to deliver this complex project.

"Its support on this project has been crucial to its success and the way the local team communicated with construction team has been a major factor in this," adds Price.

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