

SAS13 Bridge Replacement, Birmingham

PROJECT TEAM

Structural Engineer: **Tony Gee & Partners LLP**

Steelwork Contractor: **Severfield**

Main Contractor: **Skanska UK**

Client: **Network Rail**



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Situated near Birmingham City Centre on the Stechford to Aston (SAS) rail line, the SAS13 bridge is a single-span weathering steel Warren truss structure spanning 92m, making it the longest railway bridge in the midlands. The bridge paves the way for the HS2 line approach into Birmingham City Centre and the planned HS2 Midlands Maintenance Depot.

The new bridge replaced eight spans of an 1890s nine-span viaduct, which consisted of eight masonry spans with a single steel span over the Birmingham to Derby lines. In May 2022, the main contractor demolished the old railway viaduct during a blockade.

Building and installing the new bridge involved precision planning, engineering, and the use of some heavy-duty equipment. A key constraint to the project was to minimise disruption to the operational railways. With two railway lines to contend with, alongside an overhead line equipment (OLE) system, which also feeds the West Coast Mainline (WCML), this proved to be a great challenge.

The whole scheme was designed to make the structure buildable within a short rail blockade, with limited time available to install the bridge. This led to the decision to build offline and use Self-Propelled Modular Transporters (SPMTs) to lift and transport the bridge into its final position.

The replacement bridge comprises 1,095t of weathering steel and 26,715 bolts, which themselves weigh a further 25t. Weathering steel was chosen to minimise future maintenance requirements, as access to such rail over rail structures is difficult, and chimes with the overall aim to minimise disruption to the operational railways.

Once the steel bridge structure was assembled offline, it was jacked up to a height of 5m from a build height of 1.5m. The fibre-reinforced concrete deck slab, upstands and walkways were then cast, comprising 3,601m³ of concrete, which added a further 1,600t to the overall weight of the bridge. Upon completion of the deck construction, 18 SPMTs were used to lift and transport the bridge into its final position. The entire installation period took just under three hours to complete.

On 23rd May 2022, the first train passed over the new £85M structure, reopening the important SAS rail freight route and marking a huge milestone to ready the existing railway for HS2. Close collaboration within the project team, and with the local community, from design to engineering and ultimately installation, was key to delivering this complex project successfully, on time, and safely.

Judges' comment

Spanning 92m over a busy rail line this Warren truss bridge replaces eight masonry arches with a single span. With careful planning, taking full advantage of lessons learned on earlier projects, the bridge was installed fully assembled with minimal line closures. Constructed in weathering steel it provides a handsome addition to the local environment.