

CASE STUDY - Leigh Road Bridge

Modern Methods of Construction




Customer:	SEGRO
Location:	Leigh Road Slough
Our Design Partner:	Peter Brett Associates
Our Design Checker:	Tony Gee & Partners
Contract:	NEC3 Option A - Activity Schedule
Value:	£4.75m
Delivered on Time:	Yes
Delivered on Budget:	Yes
Supply Partners:	<ul style="list-style-type: none"> • Mabey Bridge Ltd - Steelwork • Mammoet UK Ltd - Heavy Lifting/SPMT's • Reinforced Earth Company - Retaining Wall • Duncan's Groundworks - Groundworks • Tag Construction - Formwork and Concrete • Van Elle - Piling



Creating a new infrastructure road link over the Great Western Railway was a major hurdle to our customer SEGRO expanding their Slough Industrial Estate facilities.

Expansion of the estate would maximise SEGRO's revenue from their property assets, create sustainable economic growth and provide long term employment opportunities for the local Slough and surrounding communities.

The scarcity of rail closure opportunities and associated high costs of closing such a major railway artery to construct a crossing at this location was a major risk to SEGRO's planned investment programme.

SEGRO took the critical decision and made an early contractor appointment with Osborne. The collaborative team then went to work to identify the programme risks and consider the wider possibilities, methods and solutions that most suited to this location.

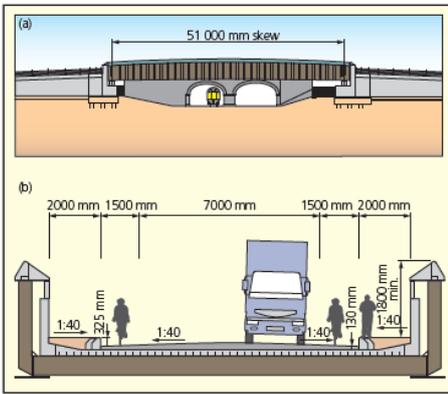
The outcome was a technically innovative and challenging solution that addressed all the method and commercial related risks, satisfying the many stakeholders, including Network Rail, and critically at a cost £265,000 below the original concept design.

"It's more than a bridge - it's a demonstration of our commitment to continuing to make the Trading Estate the best location with the best infrastructure for current and future customers. It will also play a huge part in attracting the inward investment Slough needs to grow its economy and maintain its status as a world-class place to do business."
SEGRO's Business Unit Director for the Thames Valley, Gareth Osborn

Sustainable Design Optimised by ECI

SEGRO had a traditional steel arch bridge in their conceptual model for the Slough Estate. Invited to an early meeting we recognized the proposal carried high risk of delay from Network Rail's stringent approval process, adverse weather during installation and cancellation of rail possessions on this busy West Coast Mainline. Challenging it, we worked with our trusted designers to present two innovative alternatives that significantly reduced SEGRO's risk and provided a more sustainable whole life solution to satisfy Network Rail.

The cutting edge solution to launch a steel Through Girder Deck bridge over the railway using self-propelled transporters was selected. This option significantly reduced risk, as the 1000T structure was steered into position over the railway without reliance on cranes and in a very short 5



hour rail closure. Once the temporary steel cantilever 'nose' section had spanned the railway the whole structure was slid into position during normal train operations, greatly reducing rail operational risk.

At £265k below the conceptual design our proposal gave the best Capex option to SEGRO. Operational expenditure was also minimized through the use of weathering steel, and the through deck design and location of the abutments which allowed safe access over the operational rail for inspection and maintenance. This was critical to gaining Network Rail design approval.

Collaboration Saves Time

Collaboration and trust was fundamental to project success and a key differentiator. Our extensive knowledge of Network Rail's processes and people ensured their exacting requirements were met and SEGRO fully supported this by proactively discharging the legal process to prevent delay.

Our strong multidisciplinary team of designers and specialist partners held early collaborative workshops with Network Rail and SEGRO to successfully exploit the team's expertise for innovative and efficient 'whole life' solution. Taking learning from a similar scheme at Hemel Hempstead the innovative 'launch' concept improved safety, cost and time certainty.

Following the successful launch, collaborative relationships were tested by an unforeseen movement of the structure during the final 'push'. By immediately convening experts we openly developed a safe method to continue the push with no impact on completion or train operations. This was a true testament to the professionalism of the team and the trust they engendered in SEGRO and Network Rail.

Planning Mitigates Risk

At 1000 Tonne, it was the biggest launch ever by a wheeled vehicle in the UK and across one of the busiest sections of railway into London. Safety and programme management were critical to maintaining organizational reputations.

Launch risk for the 90m long structure was actively mitigated by incorporating learning from a smaller launch, constructing a scale model, a 3D digital model to verify logistics along with a full scale advance test launch. As a result the 5 hour launch possession went exactly to plan!

Sustainable Whole Life Solution

A whole life solution which minimized future interventions was critical to SEGRO and to Network Rail. The through deck design and placement of the abutments simplified inspection and the weathering steel negated the need for protection systems. This whole life approach to design development greatly assisted in gaining Network Rail approval within the timescales.

Further sustainability measures included reinforced earth mechanical ground stabilisation system to avoid high carbon



Through Girder Deck
£2.44m
Plate Girders
£2.55m
Lattice Arch
£2.66m





traditional reinforced concrete retaining walls. Innovatively approval was gained for locally sourced engineering fill by incorporating non degradable polymer straps that enhanced the design life.

Social Sustainability – Future Engineers Inspired

Supporting the local community and reducing impacts was a key driver for SEGRO and reflects Osborne’s own social sustainability goals. To inspire young engineers for the future, seventy children from Lynch Hill Enterprise Academy spent a fantastic day at the Slough Aspire Centre designing and constructing their own bridges, with the winning design receiving a special award from the broadcaster Johnny Ball.



“This is a great opportunity for our students to develop practical science and engineering skills while learning more about careers in civil engineering. As a school we specialise in science, technology, engineering and maths - as well as educating pupils for the working world - so this event is a perfect fit for us.”

Gillian Coffey, Lynch Hill Enterprise Academy Executive Head Teacher

