KILNBRIDGE

CASE STUDY

Mastering complexity:
Kilnbridge delivers seamless engineering at The Triangle Bridge

Overview: The Triangle Bridge is a standout addition to Stratford's evolving landscape. Designed by award-winning architect William Matthews Associates, in association with the London Legacy Development Corporation and developers, Ballymore.

Kilnbridge was contracted early to offer buildability advice, technical input and support during the planning phase. This advice helped derisk the build, improve buildability and sustainability and shape the future of the project, leading to Kilnbridge being appointed to deliver the project in full. Kilnbridge's role covered the removal and demolition of the original 1930s bridge, installation of a temporary structure for utilities, piling, marine works, steel fabrication and final assembly.

This project showcases Kilnbridge's structural and multi-disciplinary capabilities, working as One Kilnbridge, bringing together almost every team in the business, from fabrication and demolition, to temporary works and environmental services. It is a clear example of how Kilnbridge delivers complex projects through integrated teams, practical thinking and strong collaboration. Kilnbridge is proud to have played a key role in a project that supports both local development and long-term infrastructure.

Marine-Based Installation

The site was tightly constrained on all sides. Once the ageing 1930s bridge was removed, heavy vehicles could no longer reach the west side. At the same time, Bridgewater Road, running alongside the site, was too narrow to allow for large cranes. This ruled out many conventional construction and lifting approaches from the outset.

Removing the original bridge was far from straightforward. Every cut had to be planned precisely, with debris floated away by barge and lifted out safely, all while protecting the river environment. The demolition had to be completed within a strict three week window, adding further pressure to get it right first time.

During early enabling works, asbestos was discovered on site. This required immediate action and the involvement of specialist contractors to ensure safe and compliant removal, all without disrupting the overall schedule.

Given the limited access and lack of space for cranes, a marine-based installation was the only viable option. The bridge was assembled on a pontoon, floated into position and jacked down onto its abutments. The team's previous experience on similar projects and strong partnerships with specialist suppliers made this complex method both possible and efficient.

A Proactive Approach

Demolition had to happen during a fixed winter closure window, agreed with the Canal and River Trust. Missing that window would have delayed the programme by a full year. To stay on track, Kilnbridge also had to install a temporary bridge to carry live utilities such as gas, water, power, and district heating, before the existing structure could be safely removed.

To stay ahead of the tight programme, Kilnbridge took a proactive approach. Steel was ordered, at risk, before the final designs were complete so that fabrication could begin without delay. This decision was supported by close, hands-on collaboration with the design team, working to resolve details in real time and keep momentum on site.

One of the project's greatest strengths was Kilnbridge's ability to self-deliver nearly every element. From steel fabrication and marine works to demolition, lifting, RC works, and waste management, internal teams worked side by side. This avoided delays, reduced handovers and ensured everyone from pre-construction to site shared the same understanding of programme risks and technical constraints. It also meant faster decisions, fewer surprises, and no silos, just clear communication and focused delivery.

Complex Structural Geometry

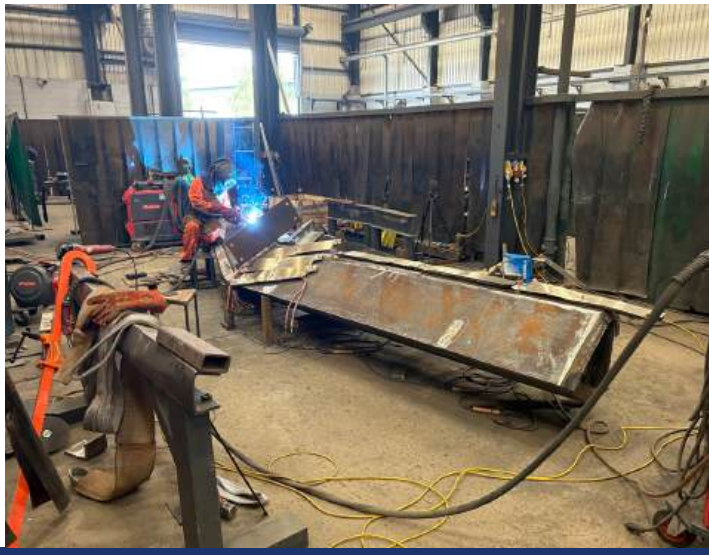
The bridge's design, particularly the pentagonal tapering top chord and apex, demanded fabrication precision. These elements were fabricated from S460 high-strength steel, a material that requires strict control during preheating and welding to avoid distortion. There was no opportunity for a trial assembly, so tolerances had to be exact.

Wherever possible, components were prefabricated in Kilnbridge's own facilities, K FAB, to reduce on-site work and minimise time spent on the barge. High strength friction grip bolted connections were used to limit the need for welding in the field. Bespoke lifting beams, reinforced modules, and carefully designed formwork allowed jacks to be inserted at the final stage without disrupting the build sequence.

Quality, Craftmanship, and Innovation

Some welds were so intricate they resembled additive manufacturing. In the most complex areas, welding took up to a week per square metre. Achieving consistent quality under these conditions required specialist skills and constant attention to detail.

The team developed new welding procedures for S460 high-strength steel and passed independent audits to meet Execution Class 3, a high standard typically reserved for bridges carrying live traffic. Full compliance and traceability were maintained throughout. To safely remove the bridge piers from the river, marine divers were brought in to install underwater wire saws, and specialist UXO consultants were engaged to clear the riverbed before any piling took place.



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