CASE STUDY

SUSTAINABLE BRIDGE ASSET MANAGEMENT FOR A HIGH-HAZARD COMAH SITE

CLIENT: CONFIDENTIAL

LOCATION: UK

Highlights:

- **Foundation Reuse**
- **Reduced Carbon**
- **Operational Resilience**

PROJECT OVERVIEW

A major UK COMAH installation engaged a full-site bridge inspection programme across its 160-hectare footprint to understand the condition, risks, and long-term viability of its ageing structures. Many bridges were approaching 80 years in service, and the client needed a clear, risk-based strategy to maintain operational continuity while avoiding unnecessary capital spend.

The inspection confirmed that most structures remained serviceable, but a meaningful proportion required restrictions or removal from service. Two bridge types dominated the failure profile, highlighting systemic issues that needed a strategic, site-wide response.

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THE CHALLENGE

The inspection identified two recurring structural themes:

- Precast Concrete C-Section Bridges
- Larssen Sheet Pile Bridges with Concrete Decks

Across both types, deterioration was being driven by two primary mechanisms:

- Water penetrating through bridge decks
- Congested service corridors restricting access for maintenance

These issues were manifesting as soffit spalling, exposed reinforcement, and progressive deterioration around joints and abutments. In several cases, access constraints were so severe that bridge decks had to be cut or removed to reach failed pipework.

The site's geotechnical conditions added further complexity. Built on reclaimed land with soft clays and spent shale, the ground offered limited bearing resistance. Any long-term solution needed to address structural reliability, operational risk, and sustainability performance in equal measure.

THE SOLUTION

We reframed the inspection findings into a clear, actionable asset strategy built around three core interventions:

- **Targeted structural remediation —** Prioritising early spalling treatment, stopping water ingress, and protecting reinforcement, with design adjustments to ensure future access to both structure and services.
- **Ground-appropriate foundation strategy —** Using raft or piled solutions where required to manage soft-clay conditions and ensure long-term stability.
- **Reuse of existing foundations —** Retaining foundations wherever feasible to reduce geotechnical risk, accelerate construction, minimise service interference, and significantly cut embodied carbon.

RESULTS

The programme delivered a clear, actionable roadmap for the client's bridge assets, enabling:

- Improved safety and reliability across critical access routes
- A substantial reduction in embodied carbon
- Faster construction cycles with minimal operational disruption
- Lower long-term maintenance costs through improved access and design
- A future-proofed asset strategy aligned with COMAH resilience and sustainability goals

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