

SHOTCRETE

CASE STUDY



Shotcrete Services Ltd were appointed to deliver specialist concrete repairs to the bridge abutments supporting a section of the M1 motorway spanning Elstree Road in Bushey, Hertfordshire.

The scheme formed part of an essential structural maintenance programme designed to extend the operational life of the bridge infrastructure while minimising disruption to one of the region's busiest transport corridors.

Works were completed in carefully planned phases to ensure the structural integrity of the bridge was maintained throughout the programme. The project involved hydro-demolition, concrete breakout, reinforcement treatment, cathodic protection installation, concrete reinstatement and installation of GRP drip angles to improve long-term water management.

The project required a highly coordinated delivery strategy due to restricted access, live traffic constraints and environmental controls associated with hydro-demolition operations.

CLIENT

M1 Elstree Road Bridge

LOCATION

Elstree Road | Hertfordshire

COMPLETION DATE

2026

SECTOR

Highways Infrastructure /
Bridge Repair

www.shotcrete.co.uk

SCOPE OF WORKS

- ✓ Phased bridge abutment concrete repairs
- ✓ Hydro-demolition of deteriorated concrete
- ✓ Localised manual breakout to smaller repair areas
- ✓ Preparation and treatment of exposed reinforcement
- ✓ Application of protective coatings to reinforcement
- ✓ Installation of Galvashield XP2 cathodic protection anodes
- ✓ Reinforcement of structural repair zones
- ✓ Spray and hand application of high-strength repair mortars
- ✓ Installation of GRP drip angles to control water runoff
- ✓ Containment, collection and licensed disposal of hydro-demolition wastewater



KEY CHALLENGES

Live Traffic Environment

Elstree Road is a heavily trafficked route beneath the M1 motorway. Sections of the north abutment were located immediately adjacent to the live carriageway, requiring critical operations such as scaffold erection and hydro-demolition to be undertaken during night-time traffic management closures.

Careful logistical planning and close coordination with the principal contractor ensured works could proceed safely while minimising disruption to the public and surrounding network.

Complex Access Constraints

The bridge beam arrangement created significant access challenges. The beams were set back from the face of the abutment and the soffit height varied continuously along the wall length.

To overcome these constraints, Shotcrete Services Ltd designed and implemented a bespoke access solution using a combination of scaffold systems and multi-deck working platforms. This enabled safe access to all repair areas while maintaining operational efficiency throughout the programme.

Environmental Containment

Hydro-demolition generates large volumes of contaminated wastewater which must be effectively controlled and disposed of in accordance with environmental regulations.

A substantial amount of preparatory work was undertaken to establish a fully contained working environment. A 4-metre-wide double polythene bund was constructed at ground level and sealed to the existing brickwork using aluminium tape. The scaffold system was then erected within the bunded area to ensure complete containment of all runoff water and debris.

Wastewater generated during hydro-demolition activities was continuously pumped into IBC storage tanks before being transported by licensed carrier to Shotcrete Services Ltd's Cranbrook facility for compliant disposal.



DELIVERY METHODOLOGY

The repair programme was delivered in controlled phases to maintain bridge stability and ensure safe working practices throughout.

Where practical, deteriorated concrete was removed using hydro-demolition techniques to provide a clean substrate and minimise damage to surrounding sound concrete and reinforcement. Smaller or restricted areas were broken out manually.

Following breakout operations:

1. Exposed reinforcement was cleaned and prepared.
2. Protective anti-corrosion coatings were applied.
3. Galvashield XP2 anodes were installed to provide embedded cathodic protection.
4. Structural repairs were reinstated using Fosroc Renderoc HBS high-build repair mortar.
5. Repairs were predominantly spray applied using a Compact Pro 25 system, with hand application used for localised detailing.
6. GRP drip angles were installed to improve long-term drainage and reduce future water ingress.

The project also benefited from the availability of an on-site water main hydrant. Following the acquisition of the necessary licence, this provided a reliable and efficient water supply for hydro-demolition operations.





OUTCOME

Shotcrete Services Ltd successfully delivered the bridge abutment repair works to programme while overcoming significant access, environmental and logistical challenges.

The completed repairs restored the structural integrity of the bridge abutments and implemented long-term durability enhancements through cathodic protection and improved water management systems.

The project demonstrated our capability to deliver complex structural repair schemes within constrained live infrastructure environments, making the business a reliable delivery partner for Tier 1 contractors operating across the highways and civil engineering sectors.

HEALTH, SAFETY & ENVIRONMENTAL MANAGEMENT

Safety and environmental compliance were central to the successful delivery of the project.

Key measures included:

- Night-time working under controlled traffic management
- Segregated and fully encapsulated working zones
- Comprehensive hydro-demolition containment systems
- Controlled wastewater collection and licensed disposal
- Safe access systems using scaffold and multi-deck platforms
- Continuous coordination with the principal contractor and site management teams

The works were completed while maintaining safe operation of the surrounding transport infrastructure.

PROJECT HIGHLIGHTS

- Complex bridge repair works beneath the live M1 motorway
- Phased structural repair methodology
- Hydro-demolition and specialist concrete reinstatement
- Bespoke scaffold and access solutions
- Full environmental containment and wastewater management
- Installation of embedded cathodic protection systems
- Delivery within a live, high-traffic infrastructure environment



WHY TIER 1 CONTRACTORS PARTNER WITH SHOTCRETE SERVICES LTD

Shotcrete Services Ltd combines specialist structural repair expertise with practical delivery experience across complex infrastructure environments. Our ability to manage challenging access conditions, environmental controls, live traffic interfaces and specialist repair systems enables us to deliver high-quality, compliant and programme-focused solutions for major infrastructure clients.

From hydro-demolition and cathodic protection through to sprayed concrete repair systems and long-term durability solutions, Shotcrete provides an end-to-end repair capability tailored to the requirements of critical infrastructure assets.

MATERIALS USED

Fosroc Renderoc HBS

A high-strength structural repair mortar selected for its excellent durability, build characteristics and compatibility with bridge repair applications. The material was predominantly spray applied to maximise productivity and consistency of finish.

Compact Pro 25 Spray System

Used to efficiently apply repair mortars across large repair areas while maintaining high-quality compaction and finish.

Galvashield XP2 Anodes

Embedded galvanic anodes were installed to provide ongoing cathodic protection to reinforcement within the repaired concrete zones, helping to extend the service life of the structure.

GRP Drip Angles

Installed to manage water runoff from the carriageway above and reduce the risk of future deterioration caused by uncontrolled water ingress.



THANK YOU

FOR YOUR INTEREST IN SHOTCRETE.

SHOTCRETE

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