

**SHOTCRETE**

# CASE STUDY



SSL was appointed by Morgan Sindall to deliver complex sprayed concrete lining (SCL) works at the portal of the historic Campden Tunnel. The structure, originally built in the 19th century, required targeted relining to improve long-term durability and structural integrity.

The project involved 24-hour working to meet strict rail possession requirements and ensure minimal disruption to the operational line.

The works included substrate cleaning, installation of overhead soil nails and dowels, construction of shutters and stop-ends, and the application of steel fibre-reinforced dry spray concrete. A regulating layer was also applied, followed by comprehensive EAS, beam and bond testing.

## CLIENT

Morgan Sindall

## LOCATION

Chipping Campden

## COMPLETION DATE

2025

## SECTOR

Rail/ Tunnels

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# CHALLENGE / SCOPE



## 1. OVERHEAD MULTI-DIRECTIONAL DRILLING IN UNKNOWN SUBSTRATE

The installation of 11 overhead soil nails into the tunnel crown presented a significant engineering challenge due to the unknown material behind the historic brickwork. SSL carried out detailed tool and resin trials to establish the most effective drilling heads and injection materials. MasterBuilders Masterroc RB 380 resin was selected for its rapid-curing properties and strong overhead performance. SSL also organised specialist training to ensure the correct use of this equipment, reducing operational risks and ensuring a smooth delivery.

## 2. RESTRICTED TRACK ACCESS AND COMPLEX LOGISTICS

Access to the site was only possible through a railway crossing located approximately 1 km from the tunnel, and this crossing was restricted to scheduled road closures. This required exceptionally precise planning to ensure that all plant, materials and equipment arrived within tight time windows. To achieve this, SSL produced detailed loading plans and diagrams for each trailer, ensuring that nothing was forgotten and no unnecessary movements occurred.

## 3. PROGRAMME PRESSURES AND EARLY-AGE STRENGTH REQUIREMENTS

The project demanded rapid early-age concrete strength to permit timely track hand back. SSL selected Natcem 430F and Natcem 530, which offered excellent fast-setting characteristics suitable for possession-based works. Efficient, transport and spraying processes were implemented to ensure consistent curing, structural performance and overall quality. EAS testing was used to produce hand back QA documentation and evidence.

# THE PROCESS

SSL began by mobilising all necessary plant and transporting it to the worksite using RRV's and trailer units, with comprehensive track protection installed. A test soil nail was drilled and injected to verify the effectiveness of the selected materials and methods.

The team then installed 11 overhead soil nails using an RRV-mounted drilling rig, ensuring proper alignment and consistent resin distribution. Six dowel bars were also drilled and fixed to anchor the sprayed concrete. Spider plates were fitted to all nails and dowels.

Shutters and stop-ends were installed to shape the works and protect a designated bat roost in the tunnel portal area. The client and SSL worked collaboratively with environmental specialists to ensure compliance with wildlife legislation.

Sprayed concrete operations were undertaken using SSL's in-house dry-spray equipment. Operators applied a steel fibre-reinforced structural layer followed by a regulating layer. Each layer was tested to confirm thickness, compaction and curing performance, with EAS, beam and bond tests completed as required.



# CONCLUSION / SOLUTION / OUTCOME

The project was completed on time, incident-free, and to an exceptionally high standard. The upgraded lining improved structural stability, increased durability and delivered a clean, well-finished appearance. The client praised SSL for its professionalism, technical expertise and seamless delivery.

SSL's digital documentation platform enabled efficient reporting, allowing the client to review real-time progress updates and testing data throughout the project.



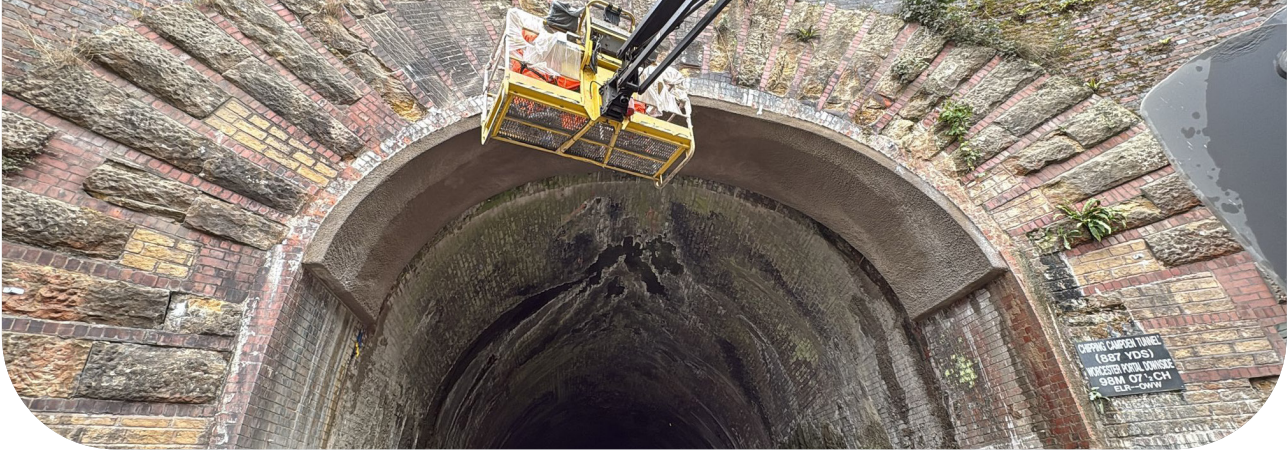
## MATERIALS USED

- Natcem 430F – Steel fibre reinforced dry spray concrete offering rapid early strength, durability and excellent adhesion.
- Natcem 530 – Fast-setting regulating layer providing a stable base for structural sprayed concrete.

## WHY WHERE THEY NEEDED?

- MasterBuilders Masteroc RB 380 – Rapid-setting resin used for overhead soil nailing, offering consistent flow and reliable curing even in challenging substrates.





# THANK YOU

FOR YOUR INTEREST IN SHOTCRETE.

**SHOTCRETE**

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