Rail

The Fast, Non-Disruptive Solution for Rail Infrastructure

mainmark

Preferred Ground Engineering Partner

- **Founded in 1989**, Mainmark pioneered Resin Injection technology in Australia.
- **Our in-house engineers** bring extensive knowledge and experience to every project.
- **ISO Accreditation:** Guaranteeing risk mitigation and operational excellence.
- **Award-winning** global ground engineering organisation delivering the world's most advanced, innovative, and accurate solutions.

Keeping Railways on Track with Innovative Remediation Solutions

The fast non-disruptive solution for rail track subsidence.

As a leading provider of innovative solutions, Mainmark is at the forefront, offering cutting-edge technologies tailored to meet the evolving needs of the rail sector. With a deep understanding of the challenges inherent in rail operations, Mainmark delivers innovative solutions that enhance productivity and mitigate risk.

Mainmark has successfully delivered thousands of projects to rail infrastructure for over thirty years.

We understand the importance of working collaboratively and efficiently within tight timeframes of scheduled shutdowns or emergency works, with minimal interruption to track operations and prioritising safety.

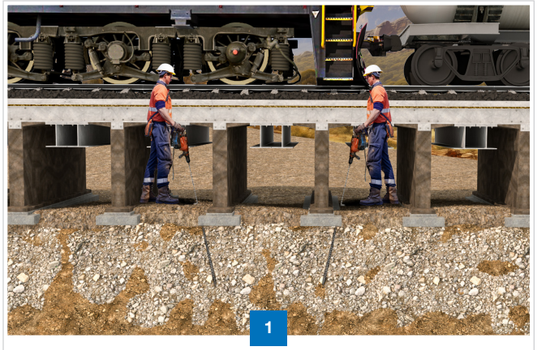
A proudly Australian-owned innovator Since 1989, one of Mainmark's key offerings to the rail industry is its advanced ground engineering solutions. Through proprietary technologies, Mainmark specialises in ground improvement, re-levelling and void filling, addressing and providing cost-effective and non-invasive solutions that minimise downtime and maintain operational continuity.

Problems We Solve

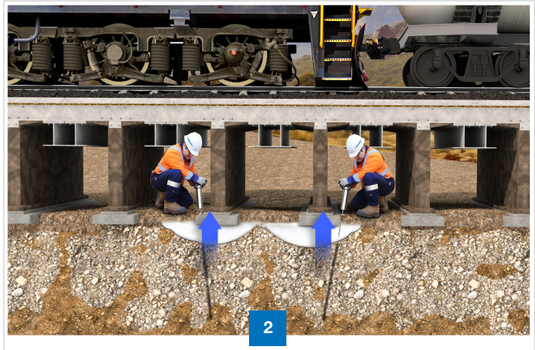
Common remediation applications include:

- Enhancing weak subgrade soils across railway networks and rail crossings
- Filling voids beneath rail platforms
- Raising subsided sections to original levels
- Bolstering rail ballast
- Restoring proper drainage and alignment
- Ensuring railway safety

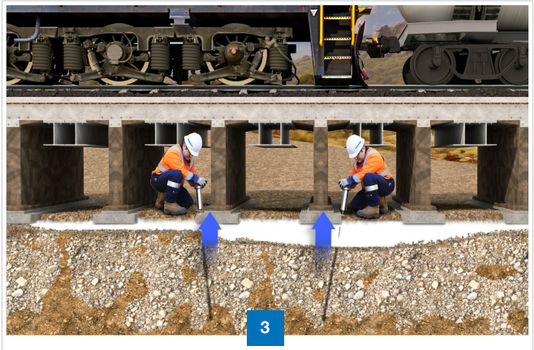
Teretek® Injection Process



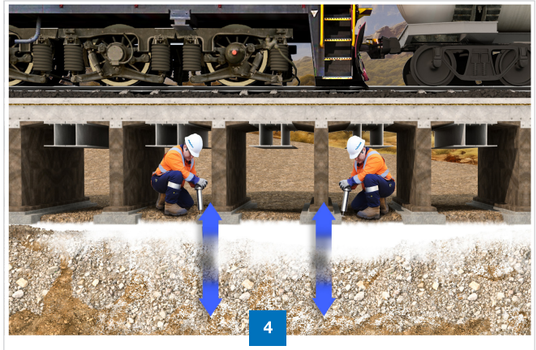
Small holes are drilled.



Multi-component structural resin is injected. It expands immediately, filling any voids and compacting the substrate.



Continued injection raises and re-supports the treated area, guided by the laser level.



The treated sections are returned to full operation immediately after the repair work, and no curing time is required.

Features & Benefits

Cost Effective

Compared to traditional methods, our solutions are more cost-effective.

Fast & Clean

Our solutions have fast curing times and treated areas can be used immediately or without the delays compared to traditional repair methods.

Immediately Trafficable

As soon as the repair is completed, the area can be re-opened to full operation.

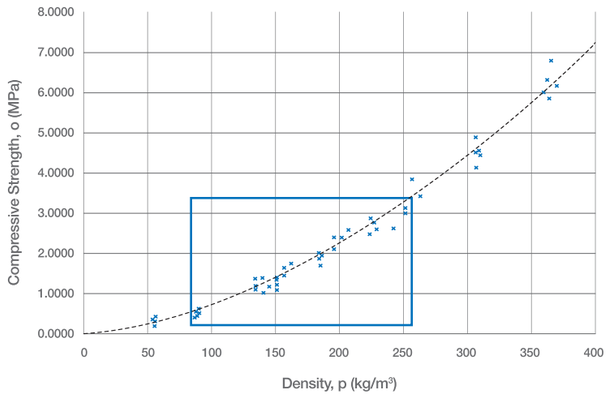
Non-Invasive

Repairs are performed without the need for excavation or extensive disruption to the area.

Technical

Compressive Strength

The applied density and correlated compressive strength of Teretek® materials is typically between 0.3 - 3 MPa.



Durability

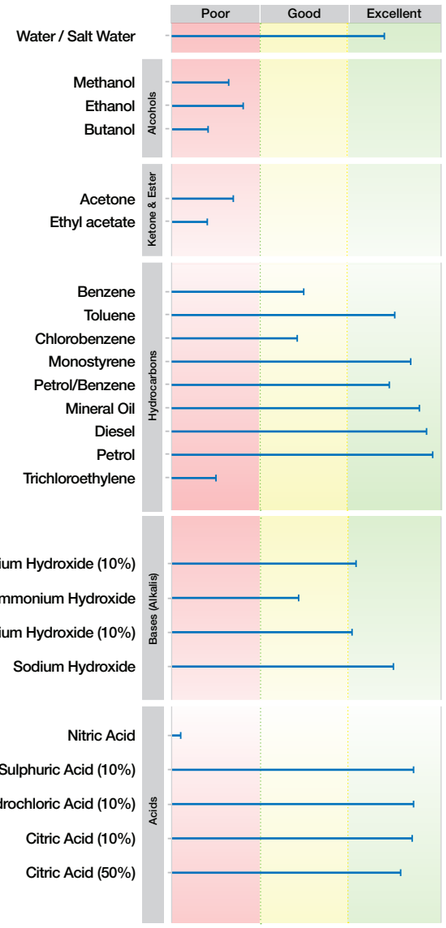
Based on extensive research and experience of Teretek® and in combination with accelerated ageing tests comprising mechanical stresses, heat, moisture, temperature cycling, and chemical, mechanical and biological degradation, it was concluded that Teretek® materials under geological conditions will maintain their mechanical properties for well in excess of 50 years.

Environmental

Based on several environmental impact studies of Teretek® materials to soil and groundwater, it was concluded that the Teretek® materials are environmentally inert and do not generate leachate.

Chemical Resistance

The chemical resistance of Teretek® materials has been investigated by way of immersion testing. The degree of swelling has been used as a measure for the material's chemical resistance. Teretek® materials are very stable and resistant to a broad range of chemicals often encountered within the wide range of industries served.



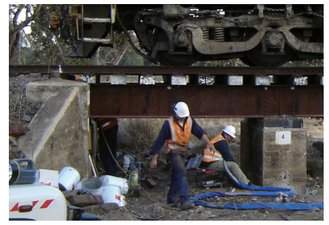
Chemical Resistance Rating	Volume Change
Excellent	<3%
Good	3-6%
Poor	>6%

Chemical resistance of the Teretek resins according to DIN 53428 and ISO 2869.

Case Studies

Railway Bridge Re-levelled and Re-supported

SCAN HERE TO VIEW ONLINE



Problem

A rail bridge in Southern New South Wales had experienced significant subsidence, with all four supporting piers sinking over time and a single-track bridge leaning to its western side.

This subsidence compromised the bridge's stability, prompting authorities to impose a strict speed limit of 40kph for trains crossing the structure to ensure safety.

Solution

A locomotive was positioned on the bridge to maximise the overburden and increase the subsequent degree of subgrade compaction as the Teretek® Resin was injected beneath the pier footings. The expanding resin compacted the soil and then lifted the piers, the bridge structure, and the rails.

Result

The bridge was successfully re-levelled in a single shift, with the piers raised back to original levels and the differential settlement across the track corrected. Rail traffic could safely resume at normal speeds 30 minutes after the work was completed.

Rail Bridge Strengthened and Re-Supported

SCAN HERE TO VIEW ONLINE

Problem

The two Bredalbane rail bridges support two rail lines as part of Australia's Main South Railway Line, connecting capital cities. Over time, the structural integrity of these bridges had been compromised, with the piers deflecting by as much as 300mm with each passing train. This excessive movement caused the footings to crack, and the piers themselves started to shear, posing a significant risk to the safety and stability of the rail infrastructure. Urgent remediation was required to prevent further deterioration and ensure the safe passage of trains along this vital transport route.

Solution

Teretek's Deep Injection method was used to re-support the pier footings and consolidate the ground. A stationary 129-tonne locomotive acted as a superimposed load, providing overburden resistance and enabling maximum sub-grade compaction while the crew supported, strengthened, and raised the rail bridge.

Result

Using Teretek Resin Injection, the piers and rail were lifted and restored to their original levels. Upon completion, the brick piers were reinforced with steel bands, and the cracks were filled using epoxy grout, allowing trains to safely resume operation on the railway track hours after the work was completed.

Celebrating 35 YEARS Excellence - Innovation - Success

mainmark

As a global ground engineering and asset preservation company, we draw on over three decades of experience and knowledge in leading, developing and delivering the most advanced and accurate ground improvement, re-levelling and void-filling solutions across residential, commercial, infrastructure and mining sectors.

With an extensive portfolio of completed projects across Australia, New Zealand, Japan, and the United Kingdom we have achieved a global reputation for delivering innovative solutions to some of the most iconic projects worldwide, earning us international recognition as an award-winning ground engineering organisation.

CERTIFIED ISO 9001 ADAPTIVE

CERTIFIED ISO 14001 ADAPTIVE

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