

Railway Bridge Re-levelled and Re-supported

INDUSTRY

Infrastructure

STRUCTURE

Railway

PROBLEM

Sinking Bridge and Track

LOCATION

NSW, Australia

DURATION / YEAR

1 day / 2005

TECHNOLOGY

Uretek Deep Injection

BUSINESS UNIT

Mainmark Australia



Summary

All four piers supporting the rail bridge at Henty in Southern NSW had subsided so that for safety, train speed over the bridge had been limited to a maximum of 40kph.

With Uretek structural resin injection to strengthen the foundation ground, the bridge piers were re-supported and raised back to their exact design levels.

Objectives

The objective was to re-level the rail lines and re-support the bridge piers quickly and efficiently to enable both passenger trains and goods trains to use the rail line safely, without the need to reduce speed.

Solution

The greatest possible load applied to the foundation to be strengthened enables the greatest possible compaction of the subgrade. In this case a heavy locomotive was used to provide a superimposed load as overburden resistance.

The piers were shaped like an upside down T and were around 1200mm wide by the width of the bridge. The piers were founded at 1150mm deep. The National Rail

Surveyor on site advised that the abutments at each end were unaffected, so they were used as the datum. Not only had all four piers subsided, but also this single track bridge was leaning to its western side.

Structural expanding resins were injected directly under the pier footings. At first the pressure of the resins expanding compacted the foundation ground beneath the bridge piers.

Then when maximum compaction had been achieved, the pressure was exerted upwards, lifting the piers, the bridge structure and rails.

In a single shift, the bridge was re-levelled, raising the four piers by as much as 40mm and correcting the differential settlement across the track by as much as 20mm. Rail traffic was able to resume safe use of the line at normal speeds, just 30 minutes later.