



## CASE STUDY

# Forbes Overbridge

Forbes, NSW, Australia

Reinforced Earth Walls- TerraPlus®  
TechSpan® Arches

Owner: Rail Infrastructure Corporation  
 Consultants: Cardno MBK (NSW) Pty Ltd  
 Contractor: Rail Infrastructure Group  
 Construction: January 2002

### Background

With many of Australia's inter-urban rail links being a popular method of transport for passengers and goods alike, the Rail Infrastructure Corporation (RIC) undertook an upgrade of a number of existing wooden bridge structures in NSW. One such structure was located just outside the township of Forbes, southwest of Sydney.

### Challenge

The Forbes overbridge was an aging wooden structure, used extensively for goods transport. Due to the rail lines heavy trafficking, it was imperative that the upgrade, involving dismantling of the existing bridge and the erection of the new structure, take place within a single weekend to minimise disruption to the rail traffic.

### Solution

The Reinforced Earth Company (RECO) was contracted to design, supply and supervise the erection of the Forbes Rail Overbridge in January 2002.

A 10 lineal metre precast tunnel incorporating approximately 70m<sup>2</sup> of TerraPlus® concrete retaining wing walls was designed to accommodate the current rail specification 300LA (AS 5100). Due to a low clearance to the rail

loading, a 1m thick layer of 4% cement stabilised material was installed above the arch to guarantee uniform bearing.

The stringent time restraints required all the construction materials to be onsite prior to erection commencement. The arch/wall footings were poured and cured by rail hand-over at 6am Saturday morning and dismantling of the existing structure then began.

The rail lines were cut and the existing structure removed, seeing the erection of the tunnel beginning at 12pm Saturday afternoon. Completed by 4pm, the assembly of the wingwalls could begin.

The base row of panels had been located and propped accordingly, allowing for the commencement of backfilling. The panels and backfill were placed continuously throughout the night with the final compaction layer completed at 7am Monday morning.

The contractor then worked tirelessly to ensure the structure was completed by 12 noon Monday. The ballast was reset with the rail lines being re-attached and completed on time. The first train passed over the new structure at 6pm Monday evening.

On this particular project it was necessary to briefly close the railway line, however TechSpan®



Main Picture: Saturday 16h00: TechSpan® Arch Tunnel erection completed.

Top: Saturday 06h00: Rail handover and commencement of dismantling existing structure.

Centre: Sunday 03h00: Compaction of backfill.

Above: Sunday 13h00: Placement of geotextile on crown beam.

Transport infrastructure



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Left: Monday 12h00 Finishing touches going on above the structure. Rail line ready for replacement.

Above: Monday 18h00: First train passes over the new structure.

arches can also be easily constructed over existing roadways and railways without the need to stop or divert the traffic.

Similarly, a great benefit of building a Reinforced Earth retaining wall along a road or railway is that it does not need scaffolding or any structural footing in front of the facing. As a result, the wall can be built from the rear without interruption to traffic. All components were precision manufactured to ensure RECO's TechSpan® tunnel and TerraPlus® walls worked seamlessly together. This high level of detail was critical to the projects success.

#### Special features/benefits

- Complete replacement of the Railway Bridge with 10m of TechSpan® arch and 70m<sup>2</sup> TerraPlus® wingwalls in 60 hours.
- Stringent time constraints requiring precision planning and execution of installation.
- The ability of RECO to provide a total precast solution ensured the successful delivery of this project on time.

#### Project specifications

<b>System</b>	<b>TechSpan®</b>
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<b>Arch Type</b>	TSB
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<b>Span</b>	6.5m
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<b>Height</b>	3.975m
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<b>Length</b>	10m
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<b>Thickness</b>	250mm
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<b>No. Units</b>	8
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<b>System</b>	<b>TerraPlus®</b>
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<b>Finish</b>	Plain
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<b>Structure</b>	Wing Walls
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<b>Area</b>	70m <sup>2</sup>
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<b>Max. Height</b>	3.78m
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<b>Length</b>	35m
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<b>Design load</b>	100kPa (DL) 130kPa (DL+LL)
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<b>Design life</b>	100 years
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#### Reinforced Earth Pty Limited

Level 2, 20 George Street  
Hornsby NSW 2077 Australia

Ph +61 2 9910 9910

Fax +61 2 9910 9999

[www.reinforcedearth.com.au](http://www.reinforcedearth.com.au)

#### Reinforced Earth Limited

PO Box 72 734

Papakura Auckland New Zealand

Ph +64 9 236 3385

Fax +64 9 236 3385

[www.reinforcedearth.co.nz](http://www.reinforcedearth.co.nz)



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