



## CASE STUDY

# Granard Road Duplication

Brisbane, QLD Australia

Reinforced Earth Walls  
TerraClass®

Owner: Main Roads QLD

Consultants: RECO design  
reviewed by Main Roads QLD

Contractor: Bielby Holdings Pty Ltd

Construction: September 2005

### Background

Several roads on Brisbane's southside – Granard Road, Riawena Road, Kessels Road and Mt Gravatt-Capalaba Road – form the 11km Brisbane Urban Corridor, part of the Australian Government's AusLink National Land Transport Network.

This busy road corridor links the Gateway Motorway and the Ipswich Motorway, and carries up to 50,000 vehicles per day through largely residential areas.

In 2002, Main Roads began a comprehensive planning study to investigate traffic issues along the corridor. This study, which involved extensive consultation with the community and the transport industry, concluded in late 2003 with 55 recommendations for the Australian Government.

### Challenge

One of the recommendations was to upgrade the Granard Road interchange, duplicating an existing bridge that was supported on a TerraClass® bridge abutment. The original bridge was constructed in June 1989. The new abutment was to be built alongside the existing one and new facing panels had to be engineered to merge with the existing panel finish.

The angle of the existing wingwalls precluded the construction of a conventional Reinforced Earth wall because a significant amount of the existing road would have to be removed to allow space for the reinforcing strips. Partial demolition would have compromised the stability of the remaining wall and the road pavement above. This was unacceptable to Main Roads Queensland.



Main Picture: TerraClass® at Granard Road Duplication, March 2007. (After Upgrade)

Top: TerraClass® at Granard Road, Constructed in June 1989. (Before Upgrade).

Above: Installation of specially designed REhas connection unit, which will allow for differential settlement.

Transport infrastructure



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Left: Construction: showing old and new walls and REhas reinforcing strips.

Top: Detailing of corner unit at Granard Road Duplication.

### Solution

The Reinforced Earth Company's (RECO's) design team developed a hybrid wall design to merge the new wall into the existing one at an acute angle. This reduced the amount of interference with the existing Reinforced Earth soil block, which was shotcreted immediately after excavation to avoid scouring.

As the designer of the original wall, RECO was able to assess its current condition and its capacity to take additional loads imposed by the new Australian Standards. The panels of the new wall were fixed to the existing panels with using specially designed brackets and dynabolts. The twisted brackets allowed for the anticipated differential settlement between new and existing walls.

Where the distance between the new and existing wall was too narrow, in-situ concrete was placed. Where there was sufficient space in-between the walls the void was filled with compacted cement stabilised select fill. The balance of the wall and the abutment was constructed with conventional Reinforced Earth techniques.

### Special features/benefits

RECO has been able to demonstrate the sustainability of its retaining walls and its design principles. The inbuilt quality of the original seventeen-year-old design and materials enabled an extension to the existing wall rather than replacing it. This has significantly reduced the carbon footprint of this bridge duplication project.

### Project specifications

<b>System</b>	TerraClass®
<b>Finish</b>	Smooth, grey concrete
<b>Structure</b>	False bridge abutment (road-over-road)
<b>Area</b>	530m <sup>2</sup>
<b>Max. Height</b>	7m
<b>Length</b>	103m
<b>Design load</b>	20kPa
<b>Design life</b>	100 years



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