



## CASE STUDY

# Ballina Bypass

Ballina, NSW Australia

Reinforced Earth™ Walls  
TerraPlus®

Owner: Roads and Traffic Authority

Consultants: Hyder Consulting (Australia) Pty Ltd

Contractor: Leighton Contractors Pty Ltd

Construction: 2010

### Background:

The Pacific Highway upgrade is one of the largest road infrastructure projects in New South Wales. This upgrade incorporates the Ballina Bypass section which will upgrade 12 kilometres to a four lane divided carriageway, extending from South Ballina at the intersection of the Bruxner and Pacific Highways to just north of Ross Lane, Tintenbar. It will bypass a 19km section of the Pacific Highway and deliver significant safety improvements and time savings for traffic.

The Roads and Traffic Authority (RTA) formed an alliance with Leighton Contractors, Maunsell AECOM, SMEC and Coffey Geotechnics to design and construct the Ballina Bypass.

Major construction commenced in June 2008 with completion scheduled for 2012.

Leighton Contractors engaged **The Reinforced Earth Company** (RECO) to design and supply Reinforced Earth™ walls for the Pacific Highway Upgrade – Ballina Bypass. In 2010, RECO completed construction of the 17M High (4977sqm) TerraPlus® Reinforced Earth™ walls.

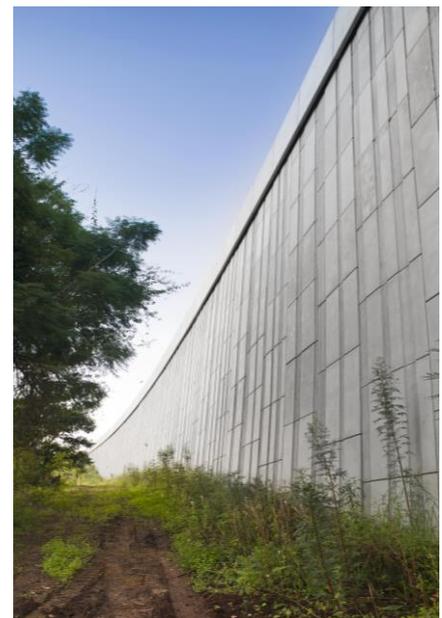
### Challenge for the Roads and Traffic Authority:

The Pacific Highway was becoming extremely congested and unsafe for road users. As a result, The Roads and Traffic Authority developed a plan to upgrade new sections and construct a new bypass at Ballina which would result in major improvements to road conditions.

The new bypass will provide safer travel, reduced travel times with improved transport efficiency, more consistent and reliable travel and improved amenity for local communities.

### Design Challenges:

After RECO had commenced work on retaining wall designs, the contractor identified foundation issues at various locations throughout the site. Soft ground with predicted high settlement at some structures resulted in specific design changes for certain structures. Another challenge for Reinforced Earth™ was the interface design of the RECO supplied head walls and the arch structures supplied by another precast manufacturer.



Main picture and above: TerraPlus® at the Pacific Highway Upgrade – Ballina Bypass.

Transport infrastructure



Left: TerraPlus® Reinforced Earth™ walls at the Pacific Highway Upgrade - Ballina Bypass. Above: Construction of the Reinforced Earth™ walls, Ballina, NSW.

**Construction Challenges:**

The foundation issues at the site severely delayed the contracts original retaining wall construction program. As a result, RECO were continually required to stop then restart the manufacture and supply of the various structures throughout the project. This staged construction combined with program delays created major storage issues at the precast yard.

**Solution:**

Hyder Consulting Pty Ltd – developed the bypass concept. Head contractor Leighton Contractors Pty Ltd awarded RECO the contract for the detailed design and supply of the 17M High (4977sqm) TerraPlus® Reinforced Earth™ walls.

RECO worked closely with the clients’ project team to incorporate site specific changes and requirements throughout the design and construction stage.

This also included ongoing site inspections in order to monitor construction progress, confirm the performance of the structures and resolve specific project issues.

This project was particularly successful for RECO and Leighton Contractors have recently been pleased to endorse RECO’s performance stating that, RECO’s level of service (design and operations) was outstanding and that “...quality, cost and ease of construction progress were major factors when selecting RECO for this particular project”.

**Special Features/Benefits:**

Precast panels for some structures comprised a project specific facing finish developed by the project architect. In addition, the facing panels also comprised of 4% Green Slate Oxide colour.

**Project specifications**

<b>System</b>	TerraPlus®
<b>Finish</b>	Special
<b>Structure</b>	Reinforced Earth™ wall
<b>Area</b>	4977m <sup>2</sup>
<b>Max. Height</b>	17.0
<b>Length</b>	655m
<b>Design load</b>	SM1600
<b>Design life</b>	100 years



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