

CASE STUDY

South Road Superway Adelaide, SA, Australia

Reinforced Earth® Retaining Walls
TerraPlus® (Reckli® Durance) and
TerraTilt®

Owner: DTEI
Contractor: Urban Superway Alliance
(comprising John Holland
Pty Ltd, MacMahon
Contractors Pty Ltd and
Leed Engineering &
Construction Pty Ltd)

Construction: Apr 2011 – Mar 2014



Background

The South Road Superway project is the single most expensive and most complex road construction in South Australia to date. It is the second stage of the north-south corridor upgrade, from Gawler to Old Noarlunga, which delivers a 4.8km non-stop corridor and comprises a 2.8km elevated roadway.

The elevated roadway was selected as the most suitable design given the local circumstances. It would also provide the least disruption to local businesses and residents during the entire period of construction.

The project aims to boost the growth of local businesses as well as the prosperity of the entire Wingfield and Regency Park industrial and commercial precinct.

The Reinforced Earth Company (RECO) was engaged by the Urban Superway Alliance (USJV) to design and supply 1200 m² of Reinforced Earth® retaining walls to the South Abutment 201/301.

Challenge

Despite the fact that the structure detailed a typical design of the abutment, the design of the abutment headstock restraint remained challenging. The headstocks were subject to extreme high lateral loading due to its full height arrangement. In addition, they were required to support the launch of the precast concrete bridge units. RECO had to take into account both those factors when designing the headstock restraint.

Solution

The bridge headstock in this structure is a very rigid full height concrete block, unlike the traditional RE wall which has relatively thin and flexible facing panels. RECO decided to abandon the conventional in-house programs which are normally used in the designing process.

After careful consideration, RECO designers chose to use two different approaches of analysis. As a result the Microstran and Strand7 programs were both used to design the headstock restraint.



Main: The completed Reinforced Earth® TerraPlus® Walls on the South Abutment

Above first picture: the bridge launching on top of the south abutment

Above second picture: Close-up of the Reckli® Durance finish of the walls.

Transport infrastructure


REINFORCED EARTH
SUSTAINABLE TECHNOLOGY



Left: Precast concrete bridge unit

Right above: Close-up look of the curved walls during construction

Other Considerations

The design of the fascia panels in front of the abutment was also challenging. The curved fascia wall was to be installed after the installation of the precast bridge units.

RECO employed 3D modelling for the top line of the fascia wall such that when the panels were installed, they would not clash with the bridge soffit.

The 3D model created by RECO designers was based on the as-built survey data and the purpose was to accurately determine the profile of each panel to ensure all panels have perfect marriage with the precast bridge units. This is the most complicated project where

the 3D modelling is used in the designing process.

If tailoring these panels around the precast bridge wasn't challenging enough, there were a number of different types of connections that RECO needed to cast in each panel to provide permanent support, internal fitting and site erection.

Conclusion

South Australia's first elevated roadway will cut travel times for up to 45,000 vehicles that use it daily, improve safety and efficiency for freight transport and reduce the impact of traffic congestion.

The new structure will be designated as the North-South Motorway M2 and was fully opened in March, 2014.

Project specifications

System TerraPlus® and TerraTilt®

Finish Reckli® Durance texture with a charcoal oxide colouring

Structure Retaining Wall

Area 1200 m²

Max. Height 8.12m

Length 419.26m (total)

Design load 20kPa

Design life 100 years



Left: The completed structure showing the Reinforced Earth® TerraPlus® curved panels