



CASE STUDY

STUART HIGHWAY RAIL OVERPASS

Alice Springs, NT, Australia

Reinforced Earth® Piled Abutment
TerraPlus®

Owner: NT Government

Consultants: Cardno

Contractor: Ostojic Group Pty Ltd

Construction: Dec '14 – July '15

Background

The Stuart Highway Rail Overpass in Alice Springs, is replacing the last remaining level crossing in the Northern Territory. It is located approximately 11kms south of Alice Springs at the intersection of the Stuart Highway and the Central Australian Rail Line from Tarcoola to Alice Springs. The Stuart Highway is the main road link between Adelaide and Darwin whilst also providing vital access to regional areas. The highway caters to high levels of freight, tourist and local traffic.

The Australian Government provided \$24 million to fund the project as part of the Northern Territory Government's Infrastructure Investment Programme.

The project was awarded to Ostojic Group Pty Ltd, a local Northern Territory company, who contracted the Reinforced Earth Company (RECO) for the design and supply of 1490m² of Reinforced Earth® TerraPlus® Retaining Walls.

Challenge

The rail overpass comprises of a 40m long bridge with 700m constructed road approaches on either side of the bridge line. The overpass will consist of a bridge structure over the existing rail

alignment, with the development of 9.5m high embankments either side to raise the road pavement formation up to the level of the bridge. The Reinforced Earth® walls will essentially form the abutment walls for the new bridge. These will consist of 4 sections: 2 abutment walls to support the bridge and 2 wing walls that will support the ends of embankment adjacent to the railway line. The vertical bridge loading will be supported by piles that will pass through the Reinforced Earth® block. Part of the horizontal bridge loading will be supported by Reinforced Earth® reinforcing strips attached to the rear of the bridge sill beams.

Reinforced Earth® railway applications use the same technologies as those used for roads. However, the design needs to be modified to take into account specific requirements concerning the surcharges or coefficients for safety, with regards to intensity, frequency and associated vibrations. Primary advantages of Reinforced Earth® structures being the load bearing capacity, resilience, speed of construction and economy, they also require little space. These walls are built very close to the railway tracks so they need to withstand any impact loads from possible collisions.



Main: Compacting the embankment soil on one of the Reinforced Earth® wing retaining walls.

Above: Close-up of the Reinforced Earth® TerraPlus® abutment wall.

Transport infrastructure



Above Left: A train travels through the overpass as work begins on the road surface above.



Above Right: Stabilizing the foundation soil by utilizing cement sand backfill.

Solution

The decision was made to utilise a cement stabilised backfill directly behind the concrete facing panels. This provides impact protection against any collision from the heavy freight trains which travel between Darwin to Adelaide along this line. If the concrete facing panels are damaged the backfill will remain with only the damaged panels needing to be replaced. Pilings embedded within the Reinforced Earth® structure were driven prior to construction of the embankment requiring that the backfill be carefully placed and compacted around each column. Sleeves were used to separate the supports from the fill, leaving sufficient clearance to prevent any

transmission of lateral load. To accommodate horizontal stresses from the roadway without transmitting these stresses to the piling, additional reinforcements were placed in the sill beam.

Conclusion

The Stuart Highway Rail Overpass Project is due to be finished in August 2015. It will contribute to reducing disruption to the traffic flow on the Stuart Highway from rail crossings and improve road safety.

Below: Constructing the 9.5m high embankments.

Project specifications

System	Reinforced Earth® with TerraPlus® concrete facing panels
Finish	Smooth
Structure	Bridge abutments
Area	1490m ²
Max. Height	10.7m
Length	243m (total)
Design load	20kPa
Design life	100 years

