



CASE STUDY

SINO IRON ORE

Pilbara Region, WA, Australia

TerraMet® Dump Wall

Owner: Citic Pacific Mining

Consultants: BGC Contracting Pty Ltd

Contractor: Reinforced Earth Pty Limited

Construction: 2011

Background:

The massive Sino Iron Ore project is a \$7.4 billion investment by Hong Kong-based Citic Pacific Mining and was developed at Cape Preston, 100 kilometres south west of Karratha in Western Australia's Pilbara region.

It is the largest magnetite mining and processing operation in Australia and is focused on delivering a world class magnetite iron ore development which will add value to the Western Australian economy through significant downstream processing, employment, community benefits and international technology transfer.

The project is one of China's largest investments into the Australian resources sector. Production and export of concentrate commenced in November 2012. CPM also has rights to acquire an additional three billion tonnes of resources which would lift production and export to 70 million tonnes per year.

The Sino Iron Ore project is an important project both for Australia and China. As Citic Pacific Mining has become the first Chinese-owned mining company to ship iron ore products from WA to China.

Australia and China will enjoy mutual wide-ranging benefits from the Sino Iron project including

long term economic, social and community dividends for decades to come.

The Reinforced Earth Company (RECO) were engaged by BGC Contracting to design and supply two 19.6M high TerraMet® dump walls for the Sino Iron Ore project. The design of these structures included sloping of the wing walls.

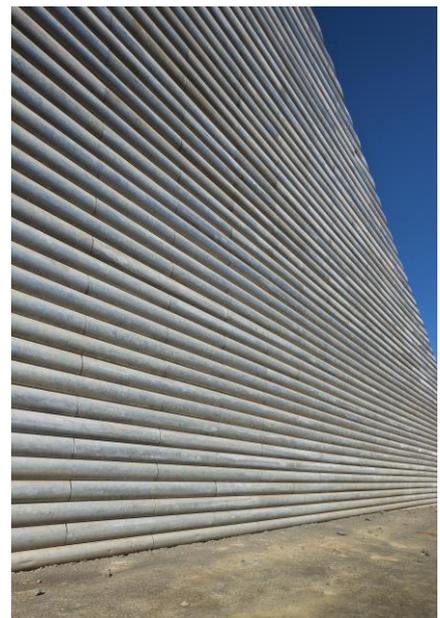
RECO constructed the two dump structures which are being used for both crusher 3 and 4 and provided full-time site supervision. Construction of these walls commenced in 2010 and were completed in 2011.

Challenges and solutions for Citic Pacific Mining and Reinforced Earth®:

The Sino Iron project actually consists of four crusher units however, The Reinforced Earth Company only constructed the walls for crushers 3 and 4.

Citic Pacific Mining already had two structures in place (crusher 1 and 2) using an alternative construction methodology by the time RECO was approached.

This is due to each crusher being installed in to an existing natural insitu embankment (for crushers 1 and 2) that was excavated and soil nailed using a top down construction methodology to create the crusher walls.



Main picture: Reinforced Earth's® two TerraMet® walls for crushers 3 and 4 – Sino Iron Ore project. This picture also includes a full view of the Sino Iron Ore site still under construction.

Above: One of RECO's TerraMet® walls and construction of the Sino Iron Ore Mine.

Mining infrastructure





Left and above: One of RECO's completed TerraMet® dump walls.

The difficulty this method posed was the non homogeneous and unreliable nature of the geotechnical conditions below ground which could only be identified as the excavation proceeded. This resulted in continuous redesign to accommodate the changing ground conditions in conjunction with increased costs and delays.

Thus by the time crushers 3 and 4 were to be erected, the stakeholders sought a more reliable construction methodology and turned to RECO. Using the Reinforced Earth® method in this situation meant that the embankments would have to be over excavated to the full width of the Reinforced Earth® block in order to accommodate the necessary strap lengths to support the wall – plus an additional volume of excavation to support the batter angle.

Whilst seemingly a lot of excavation compared to the original methodology, there was no ambiguity or delay undertaking the operation and the embankment could be quickly and efficiently removed as needed.

Once excavation was complete, the RE TerraMet® walls could be erected and installed using an equally efficient and systematic earthworks process. The select fill obtained locally was excellent for the application and resulted in perfectly vertical walls.

The Reinforced Earth® method provided a cost effective solution, fast erection and a robust structure with a 30 year design life. Reinforced Earth's® reliability produced the sound result needed for structures 3 and 4. Our company looks forward to establishing a strong relationship in the future with our new Chinese clients as they embark on further developments in the Pilbara iron ore industry.

Special Features/Benefits:

- RECO designed, supplied and constructed two TerraMet® dump structures for crushers 3 and 4
- Excellent select fill (obtained locally) was used resulting in perfectly vertical walls
- RECO provided full-time site supervision for this project

Project specifications

System	TerraMet®
Panel Type	Galvanised Steel
Structure	Dump walls (two)
Area	5206sqm
Max. Height	19.6M
Length	194M
Design load	680T
Design life	30 years