



CASE STUDY

ADARO BRIDGES

Tanjung, South Kalimantan, Indonesia

Reinforced Earth Walls
TerraMet®

Owner: Adaro Indonesia PT

Consultants: Golder Associates Pty Ltd

Contractor: FLSmidth

Construction: August 2012 – December 2012

Background

The Reinforced Earth Company (RECO) supplied 1725 m² of TerraMet® walls to Adaro Indonesia PT for the construction of two bridges in Tanjung, South Kalimantan in Indonesia.

Adaro Indonesia PT was looking to improve its existing transportation network by introducing a 10km conveyor system which required two bridge overpass structures. The overall aim of the project was to reduce the reliance on heavy haulage vehicles, increase productivity and lower costs.

Each bridge required abutment retaining walls. Previously, the client had adopted gabion walls for similar applications and had found them to be slow, labour intensive and unreliable. The client then sought an alternative construction methodology.

Adaro Indonesia PT identified TerraMet® as a promising solution both in terms of its speed and ease of construction. RECO provided a considerable amount of guidance to the client due to their unfamiliarity with the system and with regard to some of the technical challenges such as poor foundation soils.

The structures have a 10 year design life due to the limited physical capacity of the overburden dump that the conveyor system services. It was calculated by Adaro Indonesia PT that after 10 years, the overburden dump would reach full capacity and could no longer be used, thus negating the need for the conveyor and bridges.

The TerraMet® system consists of galvanised semi-elliptical, modular steel panels to which were attached galvanised steel soil reinforcement straps. The system is lightweight, easily transportable, labour efficient and fast to erect without the need for specialised machinery or highly skilled labour.

Widely used in the mining industry, the qualities of our product – economy, portability, capacity for rapid construction and capability of achieving great heights and supporting heavy loads – are highly valued. In particular, TerraMet® is considered the system of choice by BHP and Rio Tinto throughout the Pilbara iron ore mines.

Construction

The construction required all materials to be delivered from Australia to Indonesia. The strict standards of Indonesian customs meant that RECO had to implement rigorous document



Main picture: TerraMet® bridges located in Kalimantan, Indonesia.

Above first picture: Conveyor system approaching the top of the Reinforced Earth® wall

Above second picture: Onsite RECO team working to ensure a smooth construction process and respond to the challenges of the tropical climate.

Mining infrastructure



Left and above: RECO's completed TerraMet® bridge structure. Note the flood preventative measures provided by the batter slope protection.

control to ensure that all materials were delivered to site together and on time. Construction of the project commenced in August 2012 and the structures were completed in December 2012.

Challenges and Solutions

The isolated site location required careful logistics to ensure all materials would safely arrive at the site.

Materials were shipped from RECO's warehouse in Tuggerah, NSW to Balikpapan in Indonesia. Shipping time for the containers was 25 days. On arrival in Balikpapan the client took ownership of the materials and road freighted them on the narrow roads of the Borneo jungles to site.

The tropical climate of Indonesia posed another challenge during construction. Heavy rain and flooding at the site throughout the year had the potential to seriously disrupt the earthworks processes and slow down construction. To counteract this, during construction foundations were covered at the end of each shift and during

periods of high rainfall. Covering and sealing off fill minimised the impact of the heavy water flow, and batter slopes and water bunds were constantly strengthened throughout construction.

In addition, to ensure the long term stability of the structure, RECO's design involved the installation of concrete barriers at finished surface level and batter slope protection along all slopes. This was to ensure that future flood water would always be diverted away from the structure to prevent erosion.

RECO provided onsite supervision to the installation contractor to ensure that the structures were built quickly and efficiently in accordance with the design.

Exceptional feedback

RECO has received positive feedback from Adaro Indonesia PT, indicating that they are very happy with their choice of system for these two structures, and RECO service. We expect the success of this project will lead to many future projects in Indonesia.

Project specifications

System	TerraMet®
Finish	Steel
Structure	Bridge
Area	1725 m ²
Max. Height	10 m
Design life	10 years



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