CASE STUDY

HOPE DOWNS 4 EXPLOSIVES STORAGE FACILITY

Pilbara region, WA, Australia

TerraTilt® Retaining wall

Owner: Rio Tinto

Engineer: Halcrow

Contractor: Cimeco

Construction: Completed by Rio Tinto in 2013

Background
The Hope Downs 4 iron ore mine is located north west of Newman in the Pilbara region of Western Australia. Owned by Rio Tinto, the Hope Downs mine is home to a new explosives storage facility containing ammonium nitrate, a highly reactive compound used to assist in exposing and mining the iron ore deposits. Explosive force breaks up the ground, which then allows for easy extraction of the mineral.

Pursuant to a similar structure completed for Rio Tinto at Brockman approximately 5 years ago, The Reinforced Earth Company (RECO) was contracted by Cimeco to again design and supply a number of retaining walls for this new storage facility. The nature of ammonium nitrate is both explosive and dangerous and the compound needs to be securely isolated in a dry and chemically neutral environment. Reinforced Earth TerraTilt® walls are ideal for the purpose.

RECO's TerraTilt® system was primarily chosen for its ease of erection, durability and robustness. TerraTilt® also has proven capacity to effectively absorb shock should an explosion occur. TerraTilt® utilizes a full height precast concrete panel and galvanized steel soil reinforcement. An approved select fill is required to backfill the structure.

Design, Supply and Transport
The design required a number of walls both internally and externally. Internal walls were designed to support a dump bridge and effective joint sealing to prevent water ingress and contamination of the explosives. The large full height TerraTilt® concrete panels are particularly good for this with relatively few, vertical joints to seal and no horizontal joints. The panels also have efficiencies in precasting and erection due to their size. For this project, full height panels to a maximum of10m tall were required.

Challenges and Solutions
The remote location of the facility was a logistical challenge as Hope Downs is 2000 kilometres from Perth. Panels needed to be transported with care to ensure no loss or damage to panels in transit.

Special Features
A particular feature of this project is that RECO, through its "RESafe" capability, was also engaged to design and supply the propping mechanism for the full height panel walls. By using our RESafe design capability and props, the client can be assured that fit for purpose propping design and equipment is used, and certified in accordance

Main picture: Site View of the Explosives Storage Facility

Above first picture: Full height precast TerraTilt® panels with a smooth concrete finish

Mining infrastructure

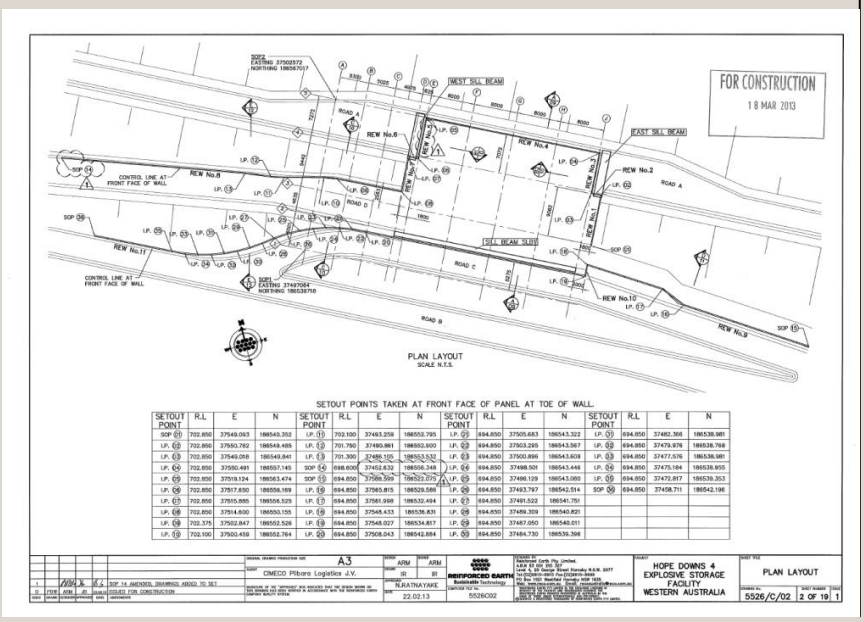
REINFORCED EARTH
SUSTAINABLE TECHNOLOGY

Left: View of the completed Reinforced Earth® retaining walls awaiting the finish of the surrounding structure
Above: REsafe Reinforced Earth braces used during construction.

with the requirements of the relevant Australian standards. The RESafe service also offers guardrail safety systems, propping solutions and diligent onsite installation guidance.

The Reinforced Earth TerraTilt® system was an ideal solution for this structure as it minimized the amount of on-site labour required during construction, which in the remote Pilbara location is costly to provide and maintain. In addition the system also allowed for minimal exposed galvanized steel permanent structural components which have a high reactivity with the ammonium nitrate chemical being stockpiled.

The structures were successfully delivered and erected in accordance with the program.



Project specifications

System	TerraTilt®
Finish	Smooth Concrete
Structure	Retaining Wall
Area	1110 m²
Design life	30 years

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