



## CASE STUDY

# MONGOLIA

Southern Gobi Desert, Mongolia

Reinforced Earth® Walls  
TerraClass®

Owner: Hunnu Coal

Consultants: Sedgman Engineering  
Technology (Beijing)  
Co Ltd

Contractor: Energy Resources  
Technology LLC

Construction: May 2011

### Background:

Reinforced Earth® Australia joint ventured with Reinforced Earth® Pacific of Hong Kong to design and supply 1057sqm of TerraClass® dump wall in Mongolia.

Design of the dump walls was carried out in the Sydney offices of Reinforced Earth® Australia while pre-casting of the TerraClass® facing panels and supply of the construction materials was contracted through sister company, Freyssinet (Hong Kong).

Sedgman Engineering Technology (Beijing) Co Ltd are the EPCM Contractor on behalf of Energy Resources Technology LLC who are undertaking a 10M tonne per annum expansion of their Ukhaakhudag (UHG) Coal Mine near the village of Tsogttsetsiy in Omnogovi Province. The site is located approximately 700 kilometres south of the Mongolian capital, Ulaanbaatar and 200km north of the Chinese border.

Sedgman Engineering Technology commenced site works for this 15 million tonnes per annum (15Mt/a) coal handling and preparation plant (CHPP) in the South Gobi region of Mongolia in August 2009. The project is being implemented in three phrases with production planned to double at the UHG mine on completion of a new rail link to China in 2011.

The plant provides a benchmark for Mongolia and its modular design is ideal for multiple phase implementation.

### Precasting, storage & transport:

Reinforced Earth® concrete wall panels were cast in the Sun Wah precast factory in main land China in the Zu Hai region, not far from Macau. Throughout the precasting period, Freyssinet, Reinforced Earth® and Sedgman Limited made frequent visits to the Sun Wah yard to check on the quality of casting and the end product. Upon inspection, all parties confirmed the acceptance of the precast products, without reservation. As a result, the concrete panels were signed off and shipped to Freyssinet's Hong Kong storage facility, where they were stacked into groups of four panels. From there, they were prepared for the long 1600km overland transport from China to Mongolia and into the site. A logistical challenge by any stretch!

### Construction:

Construction of the walls commenced on 16 May 2011 with RECO supervision provided from Australia for the duration. Sedgman contracted a local Mongolian road building company (Anand Road) to carry out the installation of the TerraClass® precast concrete facing panels, works.



**Main picture:** TerraClass® dump wall located in the Southern Gobi Desert – Mongolia.

**Above first picture:** The RECO project management team worked from these Gers. Combined with the Siberian winds and strong dust storms, this became an interesting experience for everyone involved!

**Above second picture:** Same as main picture.



**REINFORCED EARTH**  
SUSTAINABLE TECHNOLOGY

Mining infrastructure



**Left:** Working together to deliver solutions to the mining industry anywhere in the world.  
**Above:** Construction of the Reinforced Earth® walls located in the Southern Gobi Desert, Mongolia.

The structure was completed on 4 July 2011.

**Challenges and solutions for Reinforced Earth®:**

The condition of the roads in Mongolia made shipping extremely perilous for the product to arrive safely undamaged and as a result, some panel damage did occur to around one fifth of the precast units. The main area of damage occurred where the stacks had contacted each other during the journey on the poor Chinese and Mongolian roads.

As a result, Reinforced Earth® decided to load the panel stacks using a forklift. This worked well in conjunction with installation of extra dunnage which reduced the amount of movement of the stacks during the journey to the site. Furthermore, the containers could be loaded with galvanised steel strips and other construction fittings.

The containers were transported to the Chinese border with Mongolia where they were reloaded onto Mongolian trucks for the balance of the journey.

**Interesting features of the project:**

During the construction period, which ranged from the end of winter to the Mongolian summer, the site crew experienced extremely cold Siberian winds and very strong dust storms which made working conditions some of the most difficult we have ever experienced. The isolation, interesting food options and local customs in the Southern Gobi Desert ensured an interesting experience for all those involved.

**Exceptional feedback and additional projects:**

All parties concerned with this project have stated that they are very happy with Reinforced Earth's® performance and the quality of the finished product.

In addition, Sedgman have confirmed that the next expansion project – dump structure in phase 3 works will be another (duplicated) precast concrete paneled structure.

**Project specifications**

|                    |                        |
|--------------------|------------------------|
| <b>System</b>      | TerraClass®            |
| <b>Finish</b>      | Plain                  |
| <b>Structure</b>   | Reinforced Earth® wall |
| <b>Area</b>        | 1045sqm                |
| <b>Max. Height</b> | 13.5M                  |
| <b>Length</b>      | 73.51M                 |
| <b>Design load</b> | 390T                   |
| <b>Design life</b> | 50 years               |



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