MACCAFERRI

CASE HISTORY

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NEW AIRPORT IN MOUNTAINOUS REGION

SHENNONGJIA, HUBEI PROVINCE, CHINA

Reinforced Soil Walls and Slope Reinforcement

Problem

A new airport was determined to support the initiative to try and unlock tourism and growth in the region. Already a tourist destination, the Shennongjia Nature Reserves are nearby in this highly forested area; UNESCO added Shennongjia to its World Network of Biosphere reserves in 1990.

Although construction of any infrastructure in these unspoilt areas is controversial, the overall goal is attracting tourists and improving the local economy in this western area of Hubei Province.

Compounding the construction of any infrastructure is that the project site is located high in the mountains (+2,580m above sea level) and would be the highest airport in China outside of the Tibetan plateau.

The construction of the flat runway plateau within this mountainous area would require the cut-and-fill of the steep slopes. Retaining structures of over 40m high would be required to minimize the footprint of the construction works. Furthermore, the reforestation and environmental restoration works were an important part of the project.

Solution

The cut-and-fill operations would enable the insertion of the 2,800m runway and airport buildings. To stabilise and reinforce the ‘fill’ (valley) side of the project, soil reinforcement offered the most effective solution:

-Use of the ‘cut’ waste material as structural back-fill within the soil reinforcement ‘fill’ walls would minimize the export/import of construction materials -It would minimise the footprint / land-take of the solution compared to traditional earthworks -It would be more cost-effective and with a lower carbon footprint than comparable height traditional retaining structures -It would be a flexible system able to accommodate differential settlements and removes the need for a rigid foundation structure.

Maccaferri were approached to assist in the design and supply of the reinforced soil slope on account of their deep experience in these very tall mega-structures.

Terramesh® and MacGrid® WG were determined to offer the optimum solution. The reinforced soil wall reached nearly 50m high.

In this project, the Terramesh® System was supplemented with MacGrid® WG geogrids

Client: SHENNONGJIA AIRPORT CONSTRUCTION PROJECT HQ

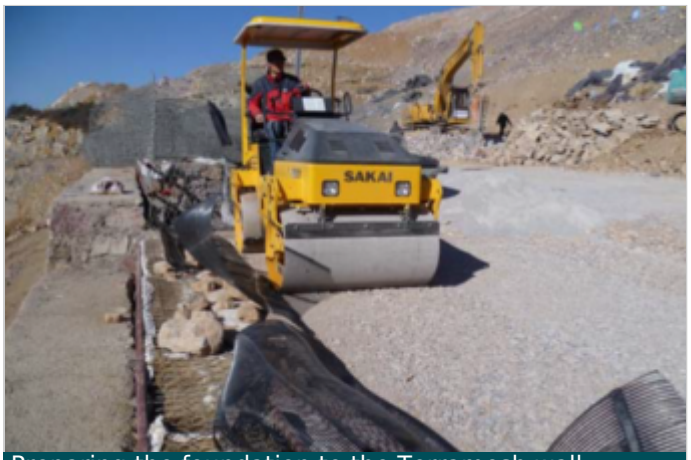
Designer / Consultant: NEW TIMES AIRPORT DESIGN INSTITUTE

Contractor: CHINA AIRPORT Co. LTD. AVIATION

Products used (Qty.)

- Terramesh 9999
- MacGrid WG 9999

Date of construction: 03/2011 - 12/2013



Preparing the foundation to the Terramesh wall

Terramesh gabion fascia units - optional temporary formwork

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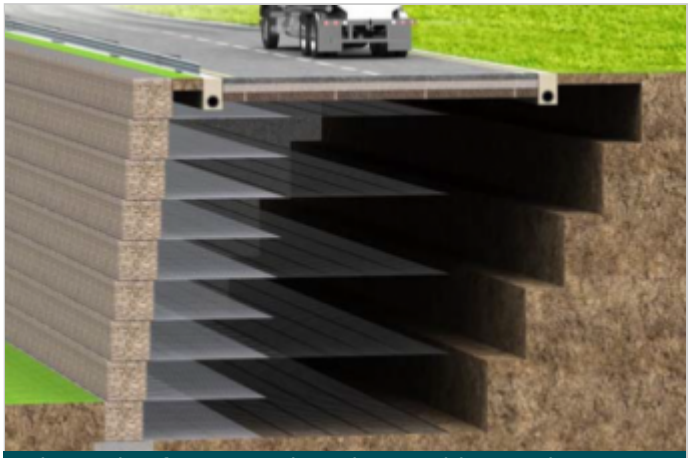
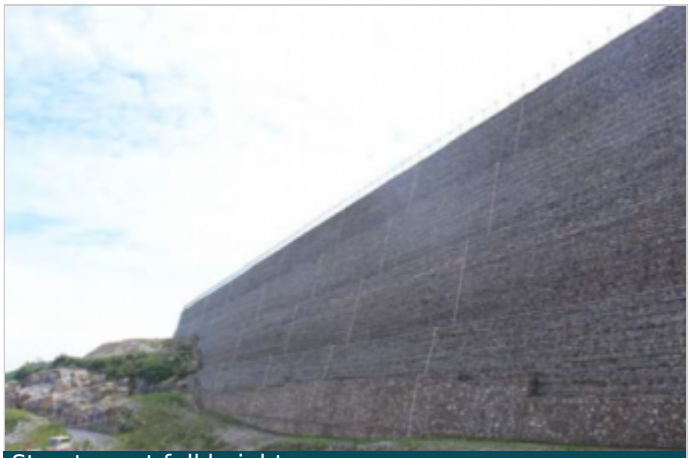
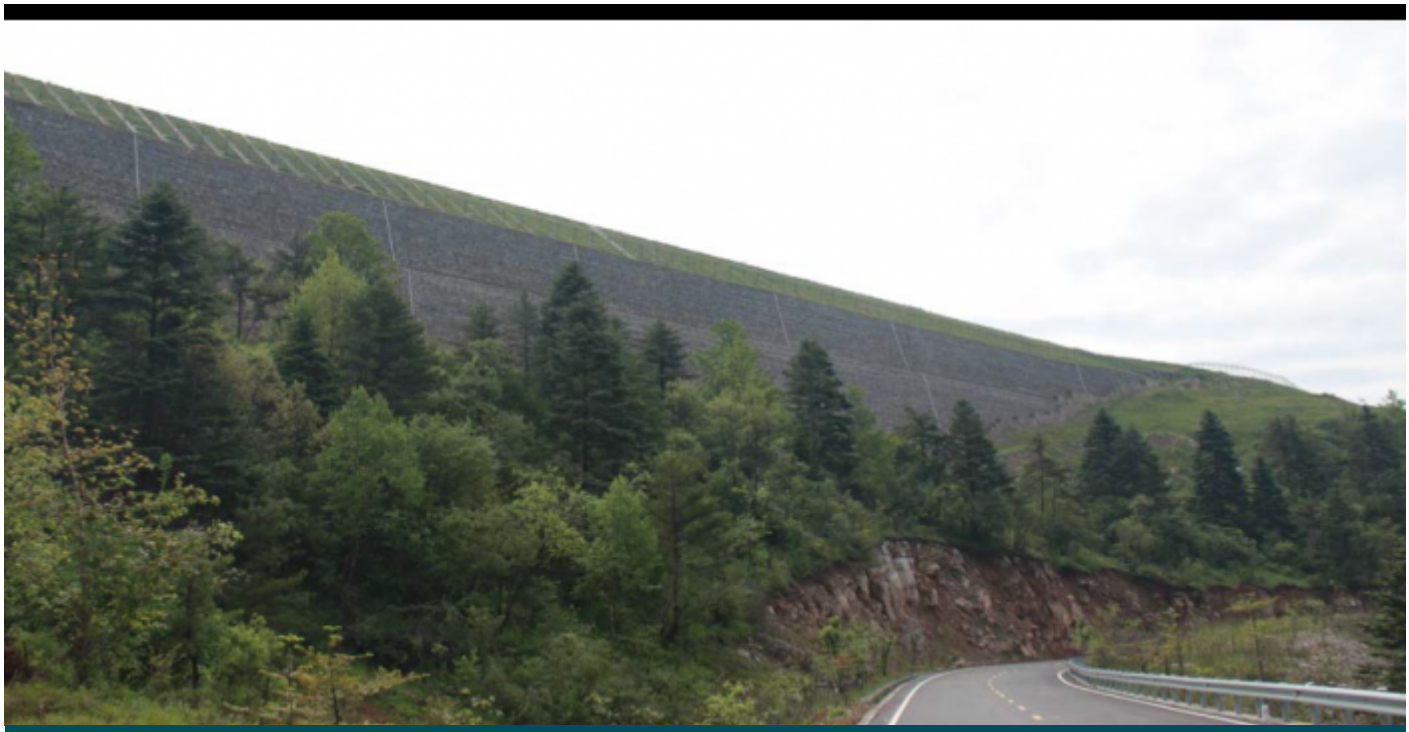


Schematic of Terramesh and MacGrid WG primary geogrids

Reinforced soil wall under construction



Structure at full height



Completed Terramesh structure supporting runway

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