TANA TORAJA AIRPORT PARAMESH

SOUTH SULAWESI, SOUTH SULAWESI, INDONESIA

Reinforced Soil Walls and Slope Reinforcement

Problem

The new airport runway is 2 km long and approximately 210 m wide, suitable for ATR type aircrafts. Since a plane surface is required for the construction of the runway, and due to the presence of hills and spurs clashing with the runway area, massive cut and fill heart works have to be undertaken in order to get the required level of runway.
Thus, the filling soil has to be retained with technically suitable and economically feasible structures. It is worth to note that the maximum embankment height to be retained is almost 40 m. The main technical constraints have been: the high seismicity of the area, the heavy rainfall encountered every year and the presence of clay shale foundation soils.
Clay shales are originally dry and hard with high shear strength, but when they absorb water during the unloading process, they can rapidly turn to stiff or even to soft clay with extremely low shear strength. For this reason, excavation and construction operations require noteworthy care and adequate planning in order to minimize the exposure of the foundation soils to weathering agents.

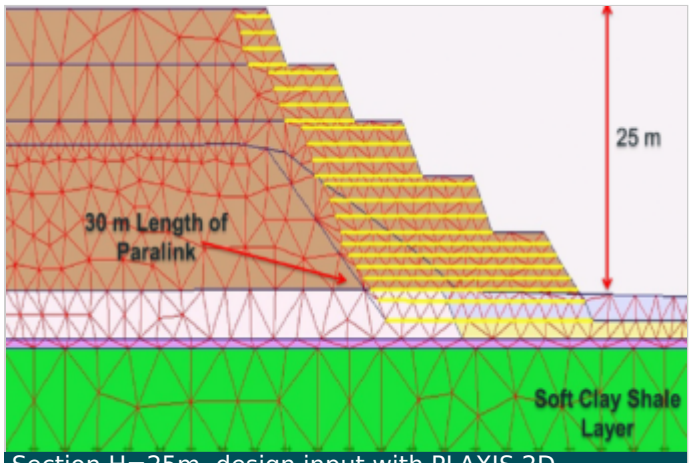
Solution

Maccaferri hybrid MSE structures (DT + Paralink) have been selected as the best solution.
In October 2015, the construction of the first Paramesh retaining structure using Maccaferri products started. It has a maximum retained height equal to 25 m, distributed in 5m-high berms. The berms are realized using both Terramesh System and Green Terramesh elements (60 degrees). The primary reinforcements are Paralink geogrids having an ultimate tensile strength equal to 300 kN/m.
The design has been carried out first with the Maccaferri in-house Limit Equilibrium Method software Macstars W, then with the commercial FEM software PLAXIS.

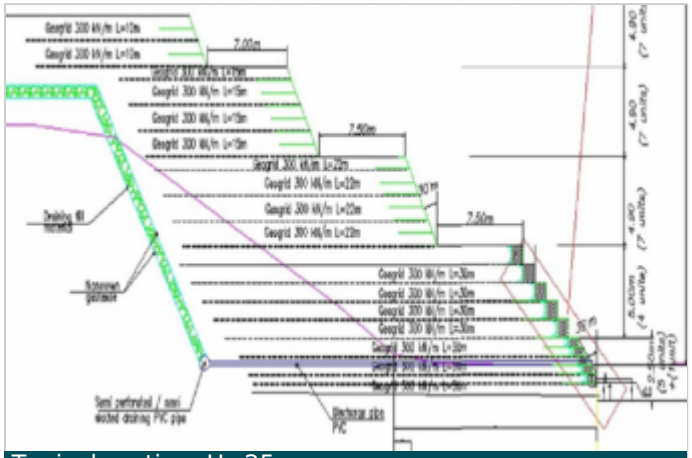
Client: INDONESIAN MINISTRY OF PUBLIC WORKS
Designer / Consultant: PT BREMA
Contractor: INDONESIAN MINISTRY OF PUBLIC WORKS
Products used (Qty.)

- Terramesh 9999
- ParaLink 999
- MacLine GCL 999
- MacTex H 999

Date of construction: 10/2015 - 01/2016



Section H=25m, design input with PLAXIS 2D


Typical section, H=25m

Paralink installation

Stage 1 completed

Stage 1, progress

TMS and GTM installation

Stage 1, progress

Officine Maccaferri S.p.A.
Via Kennedy, 10 40069 Zola Predosa (Bologna) Italy
Tel: +39 051 6436 000
E-mail: info@hq.maccaferri.com