

An Unusual Land-Fill: the Highest Geogrid-Reinforced Slope in China



Authors: Dai, Z. J., *BOSTD Geosynthetics Ltd., Qingdao, China*
Wrigley, N. E., *NewGrids Ltd., Poole, England*
Chen, M.F., *Yellow River Engineering Consulting Co., Ltd., Zhengzhou, China*
Chen, L.L., *BOSTD Geosynthetics Qingdao Ltd., Qingdao, China*

Background:

- In Dai et al, 2008, the construction of a 52m-high slope for the access road to Jinping Power Station at Mianshagou was described. The finished structure is shown in Figure 1.
- As design of the road progressed it became clear that about 400,000m³ of surplus fill would be generated from tunneling and cuts into the mountain sides
- No normal landfill site was available in this mountainous territory for this surplus fill.
- A steep-side gully was available at the side of the road at Jinbazigou but without sufficient capacity at a non-reinforced slope angle.
- Foundation conditions at the foot of this gully were not suitable for a retaining wall to hold the fill.



Figure 1: Jinping Mianshagu Slope

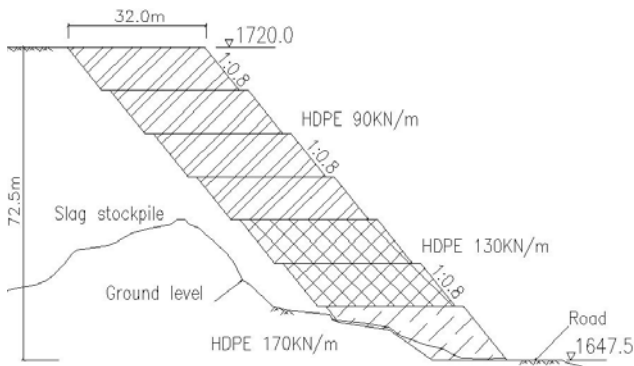


Figure 2: Design of 72.5m Slope

Selected Solution:

- Following the success of the Mianshagou slope an even higher geogrid-reinforced slope face was selected for design.
- Design height was 72.5m to allow space for all possible fill. See Figure 2
- Internal sand-bag formwork was chosen for ease of construction. See Figure 3



Figure 3: Start of construction



Figure 4: Finished Slope at 66m high

Result:

- At 66m height all available fill used so construction stopped at that height.
- 397,590m³ of fill absorbed
- 9,790m² of level ground was created in a region where it is said that "an inch of ground is worth an inch of gold"
- A porous, self-draining structure
- A flexible structure well able to withstand the seismic conditions of the site
- A major cost saving over all other solutions for disposing of the surplus fill with the bonus of the generation of a 1 hectare level site for future use.

Reference:

Dai Z.J., et al: *Geogrid reinforcement on high embankment/slope application in Jinping power station project*, Geoasia 2008, Shanghai.