

The Tabing-Duku project near the town of Padang on the largest of the Indonesian islands, Sumatra, required an existing road from the airport to the city center to be widened at the most cost-efficient price possible.

In spite of extremely problematic ground conditions on the site with low load-bearing properties and a high ground-water level, NAUE worked out a possible solution in cooperation with BBG Bauberatung für Geokunststoffe (consultants for geosynthetics) in Lemförde. The solution involved an embankment reinforced with multi-layer Secugrid® R-geogrids.

The decision for the Tabing-Duku project was taken in favor of the installation of around 15,200 m² of Secugrid® 120/40 R1 geogrids made of polypropylene (PP) which were installed at right angles to the embankment axis with an anchorage length of 10.0 m (lower layer) and 6.0 m (layers 2-5). The spacing between layers of Secugrid® geogrids was 1.0 m and the outer layer (embankment slope >50°) was constructed with the wrap-around method and additionally greened. The original design envisaged a geogrid reinforcement with 60 - 80 kN/m tensile strength with layer spacing of 0.50 m. However, the limited budget did not allow the implementation of this version and so the decision fell on Secugrid® 120/40 R1. The selected type of product allowed installation with a greater layer spacing because of its higher short-term and long-term tensile strength and this led to greatly reduced installation costs. The Secugrid® solution in installation widths of 4.75 m likewise allowed faster and more costefficient installation in particular as the loss through overlapping is less compared with narrower products. As subsoil conditions were extremely adverse and because, in some parts, it was necessary to install Secugrid® "under water", the bottom layer of the embankment suffered extreme deformation, as was expected. But Secugrid® was able to absorb these enormous forces without any problems and without any visible damage. The deformations were remedied as further layers of Secugrid® were installed to reinforce the body of the embankment. Finally, the whole of the visible surface of the embankment was covered with soil and greened. Measurements were taken on the upper edge of the embankment to determine the degree of subsidence and deformation.

Hardly any deformation was noted and confirmed that Secugrid® had allowed an existing road on an extremely soft subsurface to be successfully widened - at a favorable cost, measurably and safely.

Year of construction: 2003

City / Country: Tabing-Duku, Sumatra / Indonesien

Installed products:

Secugrid® 120/40 R1 15,200 sqm



Embankment on 'extrem' soft soil



'Wrap-around' of Secugrid®



Layer spacing 1,0 m; Height 5,0 m