Secugrid® - Tabing-Duku Road Development - Indonesia

Stable embankment on soft soil

- **Project Name**
  Tabing-Duku Road Development, Indonesia
- **Client**
  Ministry of Public Works and Public Housing of the Republic of Indonesia (Kementrian PUPR)
- **Contractor**
  PT. Waskita Karya
- **Product**
  Secugrid® 120/40 R1

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Challenge

Padang is the capital city and considered as the largest city of West Sumatra, Indonesia. As part of the urban development, it was planned to widen the main road from Tabing to Duku (main access road of Minangkabau International Airport). It was proposed to extend the 2-lane road to a 4-lane road. The main significance of this project was the increase in accessibility and the economic impact on the local com-munity and international tourists.

The road was 9.9km long and 15m wide, with a total investment of 81.8 billion Indonesian Rupiah (US$5.89 million). Site investigations were carried out along the route and in some sections of the project it was found out that the load bearing capacity of the in-situ soil was low. Results of stability analyses showed that the original design would fail without any reinforcement implemented.

Solution

After considering several options, the client decided to construct a geogrid reinforced soil embankment as part of the road extension. The design was given for a uniaxial Secugrid® geogrid with 120kN/m tensile strength. Secugrid® is a geogrid made of stretched, monolithic flat bars with welded junctions. The main feature of Secugrid® is its high strength mobilisation at low strain together with its low creep tendency. It perfectly matched the project conditions to reinforce the backfilled soil. Secugrid® provides interlocking of the granular fill material and friction on both sides to increase the shear resistance. Secugrid® also helps to distribute the vertical load from the pavement more evenly, ensuring the stability of the entire structure and reducing the ten-dency for differential settlements within the reinforced soil structure.

The 5m high embankment is divided into 5 layers of Secugrid® reinforcement. The first reinforcement layer (10m) was used to improve the bearing capacity of the soft soil. Some deformation was allowed in the first reinforcement layer in order to provide a stable working platform for the embankment. After some allocated time for consolidation, the second to fifth layer were installed using 6m of reinforcement length. The Naue Wrap system was chosen as facing system for the 50° inclined slope angle.

A total of 15.200m2 of Secugrid® was supplied to site.

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