

Secugrid®

Basal reinforced embankment

Project name
Srinakarin – Romklao Road, Thailand

Responsible authority
Bangkok Metropolitan Administration

Naue's sales representative in Thailand
Vigor Merger Co. Ltd.

Contractor
KRR – KRC Joint Venture

Product
Secugrid® 120/40 R6



 Naue



Fig. 1: Installation of Secugrid® to construct basal reinforced embankment

Challenge

Over the past 10 years the Bangkok Metropolitan Region has experienced an increase in the traffic volume due to rapid urbanisation. Bangkok Metropolitan Administration as the local government considered it necessary to accommodate the changing traffic flow with the realisation of the Srinakarin – Romkiao Road Project. The 11.2km long road is expected to reduce the traffic between the western and eastern region of Bangkok, especially in the Hua Mak Region. A total of 5.5 billion Baht (150 million US\$) investment has been made for this project.

Beneath the proposed section of Srinakarin – Romkiao road, a 15m thick layer of Bangkok soft clay with low bearing capacity was observed. The preliminary design showed that the soil alone could not safely carry the expected traffic load from the proposed road. A solution to increase the bearing capacity while ensuring the global stability of the road embankment was to build a basal reinforced embankment in a staged construction process.

Solution

In order to comply with the project demands at that time, Naue's partner in Thailand proposed to construct the basal reinforced embankment using Secugrid® geogrids. Secugrid® is a geogrid made of stretched, monolithic polyester (PET) flat bars with welded junctions. The main features of Secugrid® are high strength mobilisation at low

strain with immediate force absorption without any construction-related strain. It adapts perfectly to the project condition to reinforce and stabilise the embankment. Secugrid® provides interlocking with the granular fill material as well as friction on both sides to increase the shearing resistance. Made of PET flat bars, Secugrid® has a low creep tendency, which ensures the stability of the structure over a long service life. Secugrid® also helps to distribute the vertical loads from the pavement more evenly, which ensures the stability of the whole structure and reduces the tendency for differential settlements within the reinforced soil structure.

A design analysis was carried out using the Finite Element Method (FEM). It was found that Secugrid® was suitable to improve the embankment stability during the overall preloading period.

The embankment was constructed in several stages to allow some time for consolidation. Preloading was implemented to reduce the overall consolidation time.

A total of 329.000m² of Secugrid® was supplied to the project site. The improved load distribution behaviour of the Secugrid® reinforced embankment reduces the stress concentration over the Bangkok soft clay layer and additionally reduces differential settlements in the pavement surface.



Fig. 2: Secugrid® installed in wrap around method at the edge of embankment

Secugrid® is a registered trademark of Naue GmbH & Co. KG in various countries.

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