

Road widening and reconstruction of Tarif-Madinat-Liwa Contract 2A Tarif interchange

Location:	Tarif-Madinat-Zayed-Liwa Emirate of Abu Dhabi
Client:	Emirate of Abu Dhabi Public Works Department
Designer:	Ove Arup & Partners
Contractor:	Saif Bin Darwish Civil Engineering Contractor
Product:	TENAX LBO 303 SAMP Bioriented Geogrids

The Problem

In order to increase the traffic flow on the main highway connecting the Emirate of Abu Dhabi with the Saudi Arabian border, it was decided to widen the existing highway from four to eight lanes.

Due to the poor underlying soil conditions and the cost of importing engineered fill material the designers looked at geotechnical solutions that would increase both the bearing capacity of the subsoil and decrease the thickness of the fill material, that would normally be required. Due to the aggressive nature of the fill material the chosen geosynthetic product had to demonstrate a high degree of resistance to mechanical damage.

The existing subgrade soil was identified as a typical Subkha soil with a low bearing capacity.

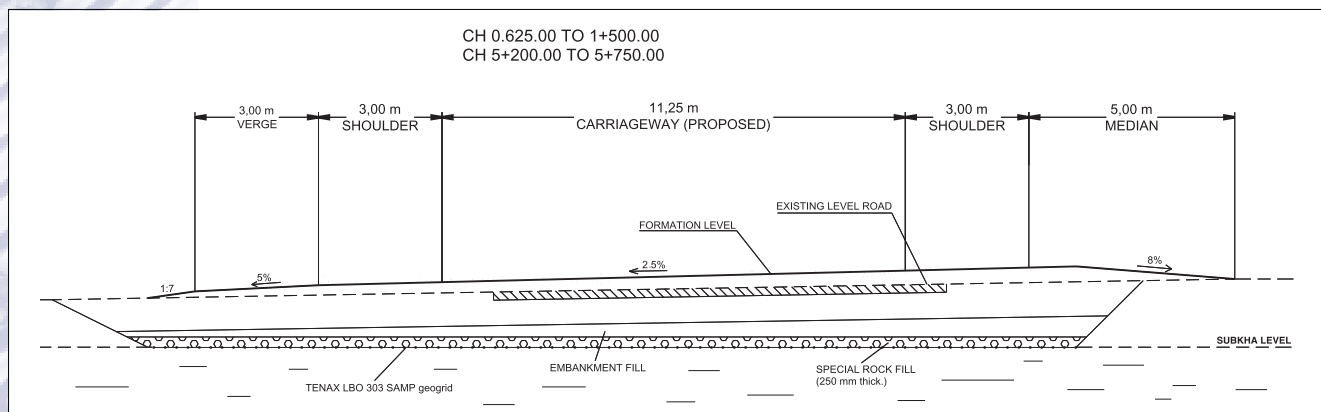
To enable the project to be completed on time, ease of installation was also of prime importance.



Fig. 1: Geogrid layers during rock fill operation. The overall project required 700.000 m² of **TENAX LBO 303 SAMP** bioriented geogrids.

Fig. 2: Geogrid installation by easy unrolling and overlapping.

Fig. 3: Tenax Geogrids rolls are 100 m long. TENAX Geogrids are ideal for highway projects with all soil conditions.



Typical details showing the geogrid reinforcement installed on the full road base section.

The Solution

To stabilize the road embankments and to avoid differential settlement, the consultant engineers opted for an integral extruded PP geogrid offering both high junction strength and resistance to mechanical damage. The same product has been used also to reinforce and decrease the thickness of imported fill of the slip roads.

As **TENAX LBO 303 SAMP** geogrids met in full the project and design requirements, the product was proposed by the contractor and approved by the engineers. **TENAX LBO 303 SAMP** geogrids are specifically designed for base reinforcement through uniform load distribution. The geogrid reinforces the soil through two main mechanisms: direct resistance to tensile stresses and interlocking, which prevents any lateral movement of the soil.

To extend the road width, excavations were made on either side of the existing road and **TENAX LBO 303 SAMP** geogrids were installed at the base and special rock fill, between 0,25 m and 0,40 m thick depending on the area, was then placed and compacted.

For the slip roads **TENAX LBO 303 SAMP** geogrids were installed for the full width of the new road base, back filled and compacted with the special rock fill. In total, in excess of 700,000 m² of **TENAX LBO 303 SAMP** geogrids were installed on the project.



TENAX Geogrids are designed to interlock with large aggregate rock fill and do not suffer construction damage.

Conclusions

The consultants and contractor were pleased with both the efficiency of the product and the technical service supplied by TENAX .

Working to a very tight schedule, delivery and service was of prime importance to the contractor.

Tenax set up an in-house logistics team working in close contact with the contractor to ensure that all deliveries were made on time.

Including **TENAX LBO 303 SAMP** geogrids within the design allowed the engineers to:

- Increase the bearing capacity of the Subkha subgrade;
- Decrease the required thickness of the special fill material without reduction in long term performances;
- A reduction in construction time due to the ease of installation of **TENAX LBO 303 SAMP** geogrids;
- A reduction in cost due to the savings incurred in the reduction of the special fill material.

TENAX LBO SAMP bioriented geogrids are specifically designed for the stabilization and the reinforcement of soil.

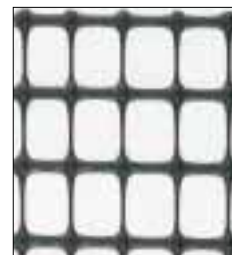
The geogrids are manufactured from polypropylene (PP), produced by a patented extrusion method and successively biaxially drawn to increase their tensile characteristics.

TENAX LBO SAMP geogrids have an elevated tensile modulus and optimal construction damage resistance during installation. Interlocking of the aggregate within the apertures allows for the effective confinement and reinforcement of the soil.

**TENAX
LBO 303 SAMP**
Bioriented geogrids

DIMENSIONAL CHARACTERISTICS:

Mass per unit area:	330 g/m ²
Roll width:	4.00 m
Roll length:	100 m



TECHNICAL CHARACTERISTICS:

Test method ISO 10319

Peak tensile strength:	
Longitudinal:	19.5 kN/m
Transversal:	31.5 kN/m
Yield point elongation:	
Longitudinal:	12.0%
Transversal:	11.0%



The TENAX Quality System is certified in accordance with the ISO UNI EN 9002 Standard.



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