



Completed road open for traffic



Subgrade Stabilisation Nº 448

Internal Roads in Al Ramla

📍 Umm Al Quawain, UAE

CONSTRUCTED IN 2019 - 2020

Benefits

50% cost savings

by not replacing the subgrade formation

75% reduction

in carbon emissions

Time and resource savings

from an accelerated construction programme

Tensor stabilises Al Ramla's Roads

The Ministry of Energy & Infrastructure (MOEI) decided to upgrade the existing internal roads in the Al Ramla area in Umm Al Quwain by rehabilitating the existing lanes and constructing new ones. The project was aimed at providing better connectivity between local communities and the main adjacent highways, thereby improving the standard of living.

CLIENT'S CHALLENGE

The project was designed for conventional pavements over competent subgrade. During construction, soft soils were encountered in the Al Ramla area. The existing soils were Sabkha (sandy silt) and the ground water table was shallow. The conventional solution would be to excavate to up to 1m and build a platform with crushed aggregate base, then construct the pavement over it - however, a limited budget prohibited this.

TENSAR SOLUTION

The construction site featured Sabkha areas and Tensor's assessment took this problem into account. Tensor determined the need for a Mechanically Stabilised Layer (MSL) featuring Tensor stabilisation geogrids which helps to distribute the load, thereby increasing bearing capacity and ensuring long term stability and performance.

Tensor geogrid also strengthens the aggregate layer, enabling the layer thickness to be reduced which results in time, cost and carbon savings. It also removed the need to remove and replace more than 1m of weak soils, which helped keep the construction programme on schedule.



Low CBR areas with high ground water table

PROJECT BACKGROUND

The project for the construction and completion of internal roads in Al Ramla was designed with timings and budget for a conventional pavement over competent subgrade.

The lower layer of Tensor geogrid was placed at formation level under a layer of well graded granular fill to form a mechanically stabilised layer for access over the areas with a low CBR value. The upper layer of Tensor geogrid was placed under the aggregate base course to form a mechanically stabilised layer as part of the optimised whole pavement design. Excavating the fill and replacing it with at least 1m of good quality fill would have been time consuming, unbudgeted and uneconomical.

Therefore Tensor designed the road with a solution to address the existing weak sabkha conditions and shallow water table. The lower layer of Tensor geogrid was to create a stable platform at low CBR areas. The second layer of Tensor geogrid was placed under the aggregate base course thus forming a mechanically stabilised layer for the optimised pavement design. A layer of geotextile was included at bottom to prevent migration of fines possible due to the high ground water table encountered at site.

Section comparing the reduction in excavation

Conventional Section Tensor Mechanically Stabilised Section



Client

Ministry of Energy and Infrastructure (MOEI)

Consultant

CHSS MENA

Contractor

Darwish Engineering Emirates, UAE

Distributor

Pioneers of the Middle East (POME)