

# PROJECT DESCRIPTION EARTH- AND TRAFFIC ROUTE CONSTRUCTION RAILWAY EMBANKMENT

**Project:** CTW 120  
**Location:** Jubail, Saudi Arabia  
**Year:** 2012

Design of railway embankment over weak soil considering geogrid reinforcement



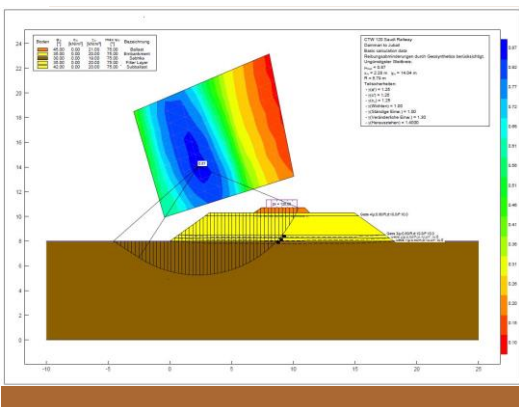
## PROJECT DESCRIPTION

The CTW 120 railway track is located on the east coast of Saudi Arabia and connects the cities of Daman (south) and Jubail Industrial City (north) over a length of nearly 115 kilometres. The railway track is constructed on embankments with heights ranging from 1 to 33 meters. Around 21 km are constructed over Sabkha subsoil requiring additional geogrid reinforcement to increase bearing capacity, slope stability and reduce embankment settlement as well as differential settlement.



## PROJECT FACTS

- Sabkha subsoil is characterised by high compressibility and low shear strength resulting in large deformations
- Sensitivity depends on water content and loading
- SPT-N values of 0 to 5, relative density of 0.20 to 0.35
- Low shear strength parameters ( $\varphi = 30^\circ$ ,  $c = 10$  kPa)
- Low stiffness modulus  $E_s = 10$  MN/m<sup>2</sup>
- The track is to be designed for design pressures up to 120 kPa according to RILEM
- Allowable settlements limited to 5 cm at end of service life



## OUR SERVICE

- Determination of representative cross sections for the embankment design
- Recommendations for soil and field testing
- Design of geogrid reinforcement for the embankments
- Ultimate limit state (ULS) and serviceability analysis (SLS)
- Slope stability design according to BS 8006 and DIN 4084
- Settlement analysis by numerical methods; estimation of settlements during construction and use of railway track