



Foundations for 6 tanks of liquefied hydrocarbons in Gabès

Buildings and Industrial installations

2010 - 2011



TUNISIA - Gabes

Client

ENTREPOSE PROJETS

Project owner
SNDP AGIL S.A.

Miscellaneous

6 tanks o 4000 m³ unit capacity,
150 piles of 0.6 m in diameter and 13 m long by tank,

Liquefaction risk,
unconfined zones due to gypsum dissolution



Description of the project

In the framework of the construction of a storage zone for liquefied hydrocarbons in Gabes (Tunisia), TERRASOL, together with TERRASOL TUNISIA, was entrusted with the detailed design for 6 storage spheres of 4000m³ capacity each, and more particularly for their foundations.

The storage spheres are protected with a reinforced concrete containment structure filled with sand. Each sphere, with a total weight of 105000 kN, is lying on an annular raft of 24m diameter. Very strict settlement limitations have to be complied with (maximum absolute settlement: 15mm).

Key features

- Geotechnical synthesis
- Preliminary studies of different foundation solutions
- Foundations design
- Settlement predictions, liquefaction risk analysis
- On-site works follow-up.

Description of the mission

The local geology is composed of a succession of sandy and clayey layers with 3 main typical layers: fine and loose sands close to liquefiability (5 to 10 m deep); fine to medium-grained very dense sands (10 to 22 m deep); stiff clay with gypsum nodules (from 24 m deep). Soil investigations highlighted several unconfined and compressible zones (corresponding to gypsum dissolution) within the deep clay layer.

This major hazard as well as the strict settlement limitations have played an important role in the choice of the foundation system. The geotechnical design, including a combination of finite element and analytical methods, led us to adopt a piled-raft foundation solution, with short piles embedded in fine dense sands. Each sphere is thus founded on 150 CFA (Continuous Flight Auger) piles of 0.6 m diameter and 13 m long.