



EL MERK CENTRAL PROCESSING FACILITIES EL MERK – ALGERIA DYNAMIC COMPACTION

Category: Oil and Gas
 Developer: Berkine JV (Sonatrach + Anadarko)
 Engineer: Geomag (testings)
 Contractor: Petrofac
 Area / Quantity: 345,516 m²



PROJECT DESCRIPTION

On beginning of March 2009, the design and build of the El Merk's future Central Processing Facilities project has been awarded to Petrofac, a contractor specialized in Oil & Gaz projects.

The project is located in Algeria, in the Berkine basin of Sahara desert, 90km south of Hassi Berkine city (HBNS) where are implemented Sonatrach/Anadarko JV installations.



The project will have to be completed in 44 months as exploitation of the facilities by Sonatrach/Anadarko is scheduled to start on 2012 for Sonatrach, Anadarko, Maersk Oil, Eni, Conoco Phillips and Talisman (Algeria) BV oil and gas companies.

SOIL CONDITION / GEOTECHNICAL PROBLEM

Project soil profile:

Located in Block 208 of the Sahara desert, the sandy platform for the future facilities has been prepared using cut and fill method.

After completion of the site preparation, geotechnical soil investigations highlighted locally the presence of loose sand.

Project specifications:

The structures (Pipe racks, sleepers, storage tanks, Buildings, Vessels) were designed on various type of foundations such as isolated footings of 2mx2m to 4mx4m, ring beam foundations with diameter up to 60m or open foundations (octagonal of 10mx10m or rectangular of 8mx8m).

Required Bearing Capacity for the various structures was ranging from 100 to 200 kN/m² with a factor of safety of 3

Total Settlement was defined as 25mm for the footings and open foundations.

For the tanks, the following settlements criteria had to be achieved :

- 100mm edge settlement at hydrotest
- 13mm over 10m differential settlement along the tank edge
- 100mm center to edge differential settlement.

A quick verification criteria has been agreed between all parties using SPT and PMT tests in order to assess achievement of the specifications.



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MENARD SOLUTION

In order to safely support future structures, Menard through its Middle East subsidiary, has been invited to propose a soil improvement solution ensuring achievement of the project's specifications.

Menard has implemented Dynamic Compaction technique invented in the early 60s by Mr. Louis Menard and successfully implemented worldwide on many projects.

This technique is used for buildings and structures foundations or to stabilize large areas of fill.



It allows densification of deep granular soils thanks to high energy compaction waves.

Menard used pounders ranging from 15 to 20 tons dropped from a height of 20m.

Parameters such as treatment grid, energy to be applied, resting time, number of phases, height of drop have been defined according to the soil characteristics and to the initial calibration areas.

QUALITY CONTROL

Standard Penetration Tests (SPT) and Pressuremeter Tests (PMT) results showed improvement of the Bearing Capacity of the soil and successful achievement of the project design criteria.

The soil improvement soil of work has been completed in one month and a half using up to 5 Dynamic Compaction cranes working 7 days a week.

