



South Yoloten Gas Field Development - Turkmenistan Dynamic Compaction

Category: Oil and Gas
Developer: Turkmengas
Contractor: Petrofac
Engineer: Langan
Total Area: 1,060,000 m²



PROJECT DESCRIPTION

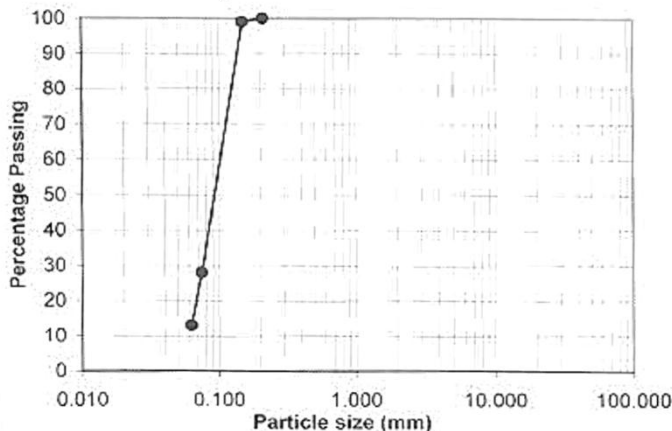
The South Yoloten Gaz Field development Project is located approximately 70km South East of the city of Mary in Turkmenistan and about 20km Southern to Yoloten. The project area covers 1,060,000 m² where the initial ground conditions were dunes sand.

The Platform to be compacted was constructed by Cut and Fill up to 15m thick. The project includes the construction of Central Processing Facility, comprising Power Plant, Production Units, Storage tanks, and Pipe Racks.



GEOTECHNICAL CHARACTERISTICS

The main problem of this site was the heterogeneity of the soil density underneath the Working Platform after site Preparations. Pre-test results have highlighted the presence of very loose, very fine monogranular dune sand up to depth of 15m. No water table was encountered throughout the site.



PROJECT DESIGN CRITERIA

Bearing Capacity and Settlement Criteria were as follow:

- ~ Maximum settlement 25 mm under 150 to 250 kPa for isolated footings.
- ~ Maximum settlement of 40 mm under service for raft foundations.
- ~ Maximum settlement of 100 mm at hydro test and 70 mm during operations for storage Tanks foundations.

MENARD SOLUTION

In order to safely support the structures, and taking into account the tight schedule given to Petrofac to construct the future Gas Plant, MENARD was awarded the contract to perform Soil Improvement by Dynamic Compaction. The schedule was 4 months including mobilization of the 8 Dynamic Compaction Rigs.

The challenge of the production team was to optimize the production parameters function of the initial topography to respect the short time frame allocated for Soil Improvement, and ensuring the quality of the works to allow further subcontractors for Civil Works.



Despite the difficulties related to delay on mobilization, remote location, extreme weather conditions, Menard has been able to complete the works on time and deliver the platform with partial handover to allow continuity of different activities.



South Yoloten Gas Field Development - Turkmenistan Heavy Dynamic Compaction

Category: Oil and Gas
Developer: Turkmengas
Contractor: Petrofac
Engineer: Langan
Total Area: 1,060,000 m²

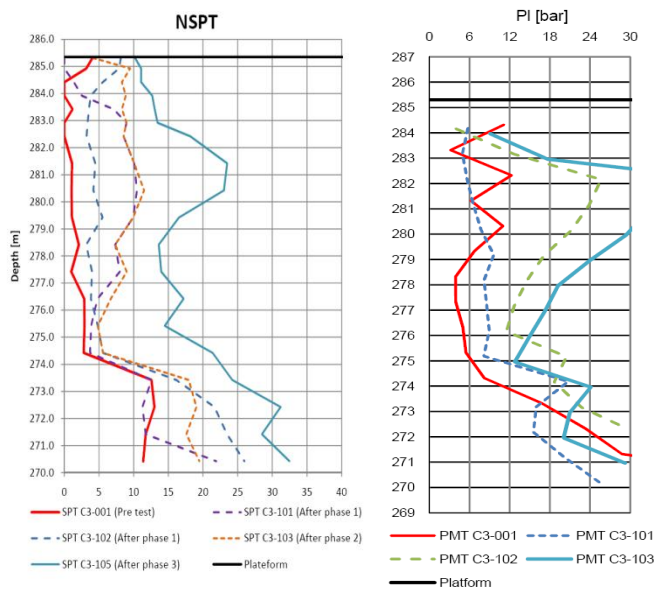


QUALITY CONTROL

Not less than 3 calibration areas were designed at the beginning of the works and during the production depending on the variation of Ground conditions and Project criteria.

The quality control of the Works were performed by using Standard Penetration Tests (SPT) and Pressuremeter Tests (PMT) based on agreed frequency. Around 200 tests were carried out during the calibration and production phases to ensure that specifications were reached.

The graphs below show the net improvement of the ground within the fill areas.



In addition to the SPT and PMT tests for verification of Bearing Capacity and Settlement, MENARD and SOLDATA have commonly performed and analysed the site using Multichannel Analysis of Surface Wave technique (MASW) in order to confirm the initial topography and also to determine the effect of the soil improvement on the velocity of Surface Waves.

This experimentation intends to elaborate correlation between the geotechnical parameters of specific ground conditions and would be a potential solution to verify the global homogeneity of a site after Soil Improvement.

