

12 UNITS GRAIN SILOS IN TALAVERA, NUEVA ECIJA NUEVA ECIJA, REGION III, PHILIPPINES

Ground Improvement

Problem

HG Silos will be constructing 12 units of 1500 metric tons of grain silos in Talavera, Nueva Ecija. Based on the soil investigation report, the soil is underlain by five to six meters of silty sand having a standard penetration test (SPT) - N value range of six to ten. It is recommended that an allowable bearing capacity of 175 kPa should the soil obtain for it to be able to carry all the loads induced by the grain silos.

For tank farm facilities situated on soft soils, the solution of the geogrid reinforced foundation is often used to address the low bearing capacity. Geogrids address the issue of low bearing capacity by increasing their load-carrying capacity. HG Silos sought a recommendation to Maccaferri Philippines to increase the capacity of the soil.

Solution

Maccaferri recommended installing two layers of cross-laid 80 kN/m geogrids 0.25 m below the base of the footing having a spacing of 0.25 m as well. The footing of the tank farm will be installed at 0.5 m below the ground with good backfill material. The target bearing capacity to be achieved after reinforcing with geogrids is 260 kPa to address all possible induced loads.

A layer of woven geotextile was installed first at the very bottom of the excavated area and then overlain by the first layer of cross-laid geogrids. A good granular backfill material was used which added to the improvement of the soil. After backfilling up until a height of 0.5 m, a plate load test was done on the four corners of the area. A 17-tonner equipment was used to load the plate. The results came out to have an ultimate bearing capacity of 5000 kPa with a 1.65 mm settlement only. Evidently, the soil improved its load-carrying capacity while decreasing the settlement because of the layers of geogrids.

Client: FMJR Oliver Grains Corporation

Designer / Consultant: FMJR Oliver Grains Corporation

Contractor: FMJR Oliver Grains Corporation

Products used (Qty.)

- MacGrid WG	MacGrid WG8 - 23400 sqm
- MacTex Non-woven Geotextile	MacTex WF 55.60 - 6675 sqm

Date of construction: 06/2022 - 07/2022



During Construction



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During Construction



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During Construction

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