



Newton Feed Center Grain Storage Expansion

Newton, Iowa

Terracon recommends the Geopier GP3® system as an alternative to deep foundations or a combination of shoring and overexcavation and replacement for support of large diameter grain bins

Description: Two 75-foot diameter grain storage bins placed between existing large diameter bins. Uniform slab pressures of 4,100 psf and ring wall loads of 31 klf resulted from 90 feet of grain. Previous bin construction used overexcavation and granular replacement for support. Due to the confined area this method was not considered feasible.

Subsurface Conditions: Soft to medium stiff lean clay loess extended 11 to 13 feet below grade. Undrained shear strengths ranged from 500 psf to 1,000 psf. The upper clay layer was underlain by stiff fat clay Paleosol and stiff to hard sandy lean clay glacial till materials to the maximum explored depths. Groundwater was located about 6 to 10 feet below grade.

Geopier Solution: The Geopier GP3® system was selected because of excavation difficulties in the area confined by existing tanks. Rammed Aggregate Pier® elements were installed at 5.75 foot centers below the slab and at 2.67 foot centers beneath the ring wall footing to satisfy the bearing and settlement criteria. In addition, several lattice tower structures requiring uplift elements to resist overturning moments from



wind were planned to transfer the grain to the storage bins. Geopier uplift anchors capable of 40 kip load resistance were installed below the tower foundations.

PROJECT TEAM

Owner:

Newton Feed Center

Geotechnical Engineer:

Terracon

Structural Engineer:

C & C Engineering

Geopier Installer:

Peterson Contractors, Inc.

Geopier Designer:

GFC-Midwest