GP3®

Mid-Missouri Energy Ethanol Plant

Malta Bend, Missouri

The Geopier GP3® system provided the most economic foundation solution for the project, providing significant cost savings as compared to the auger cast pile deep foundations alternative

Description: Construction of an ethanol refining facility containing numerous liquid storage tanks ranging from 16 to 58 feet in diameter exhibiting contact pressures ranging from approximately 3,000 to 4,000 psf.

Subsurface Conditions: A deep soil overburden of medium to soft consistency lean clay and silty clay loess soils underlain by loess mixed with sand. The loess soils are underlain by glacial deposits ranging in composition from silt, clay and sand.

Geopier Solution: Due to the presence of the compressible loess soils, the geotechnical engineer recommended either auger cast pile deep foundations, embedded to depths of up to 70 feet below grade, or the Geopier GP3® system, penetrating the compressible loess soils, to be considered for foundation and floor support beneath the larger tanks. The design-build contractor determined that the use of Rammed Aggregate Pier® (RAP) elements would provide significant cost savings as compared to auger piles as well as limit settlement to an acceptable magnitude. Over 600 RAP elements were installed to depths of up to over 25 feet below grade to limit total settlements and control differential settlements beneath the tank floors and stem-wall foundations. Modulus testing for the project revealed less than 0.2 inch of deflection within the RAP reinforced zone at the maximum design stress.

PROJECT TEAM

Geotechnical Engineer:
GeoSystems / Kleinfelder

General Contractor:
Fagen Engineering, LLC

Geopier Installer:
Intermediate Foundations, Inc.

Geopier Designer:
GFC-Midwest

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