IMPACT®

Motiva Terminal Railcar Rack Expansion

Sewaren, New Jersey

Motiva calls on the Geopier Impact® system to provide foundation support and prevent contamination migration

Description: The MOTIVA RailCar Facility will off-load ethanol from Midwest producers. A 620-foot long containment structure will be built to collect any spillage. Design pressures are up to 1,000 psf.

Subsurface Conditions: Approximately 6 to 10 feet of silty sand fill and silty sand was underlain by organic silt and sand. The organic silt was soft to very soft with SPT N-values ranging from W-O-H to three blows per foot. Tidal ground water levels were indicated at a depth of 8 to 10 feet.

Geopier Solution: The project team was concerned about differential settlement along the length of the rack expansion with the variable thicknesses of organics. To address the differential settlement, a reinforcement system that could reduce settlement was developed. A total of 175 grouted Impact® piers designed for a capacity of 40 kips were installed to control settlement of the structure in specific areas underlain by organic silt identified by the geotechnical engineer. The design team worked closely with Geopier® designers to increase the composite settlement characteristics at the site. The Rammed Aggregate Pier® (RAP) layout and depth was based upon a composite RAP/in situ soil stiffness that was 2.5 to 5 times the in situ soil modulus. Due to contamination, all RAP elements had to be grouted to prevent downward migration of heavy oil products.

PROJECT TEAM

Owner:
Motiva Enterprises, LLC - Shell Oil

Geotechnical Engineer:
French & Parrello

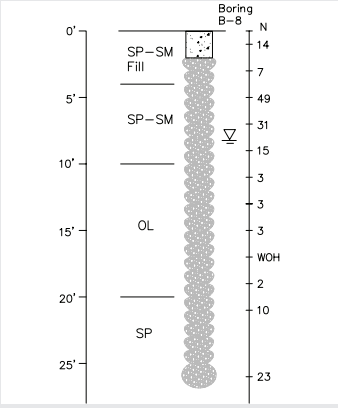
Structural Engineer:
RPMS Inc.

General Contractor:
Motiva Enterprises, LLC

Geopier Installer:
GeoConstructors, Inc.

Geopier Designer:
GeoStructures, Inc.

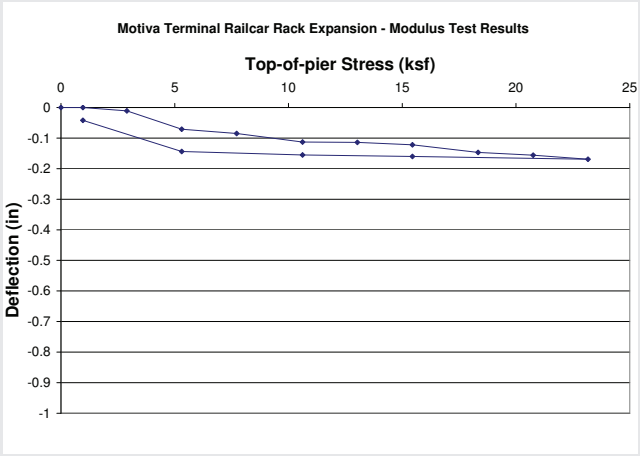
MODULUS TEST PIER SETUP



Trial RAP installations were performed using different grout mixtures to verify the consistency of the grout was sufficient for RAP construction. After selection of the suitable grout mix, a non-production grouted RAP was installed to penetrate the silty sand fill, and organic silt and terminate in the clean sand. A 2-foot thick, 24-inch diameter concrete cap was placed over the top of the pier for testing purposes.

Motiva calls on the Geopier Impact® system to provide foundation support and prevent contamination migration.

MODULUS TEST RESULTS



The results of the modulus test indicate that a deflection of 0.12 inches was observed at the top-of-pier design stress of 15,500 psf. The corresponding grouted RAP stiffness modulus was 880 pci. At a design stress level of 23,200 psf, a deflection of only 0.16 inches was noted. The corresponding grouted RAP stiffness value was 950 pci. The high stiffness resulting from the use of grout in the RAP met the required stiffening criteria established by the design team, while also controlling the migration of contamination.

130 Harbour Place Drive, Suite 280, Davidson, NC 28036
800.371.7470 | www.geopier.com | info@geopier.com | marketing@geopier.com

GEOPIER®
Tensar