

Commercial Container Building Minneapolis, Minnesota

Impact™ Rammed Aggregate Piers

Project Team

Geotechnical Engineer: Allied Test Drilling

Structural Engineer: Anderson Urlacher, PA

Owner: Commercial Container, LLC

GFC Installer: Peterson Contractors, Inc.

GFC Designer: GFC – Midwest

Impact™ Rammed Aggregate Piers (RAPs) densified and reinforced the very loose sand and supported the shallow foundations.

Project Overview

Description:

Construction of a new 12,500 square foot, single story, slab-on-grade facility. The building will be supported on perimeter strip and column foundations. The strip footing loads between the columns will be one kip per lineal foot, and the column loads will vary from 5 to 80 kips.

Subsurface Conditions:

Very loose to medium dense sand beneath surficial topsoil. The SPT N-values in the sand ranged from 2 to 16. No ground water was encountered.

Impact Solution:

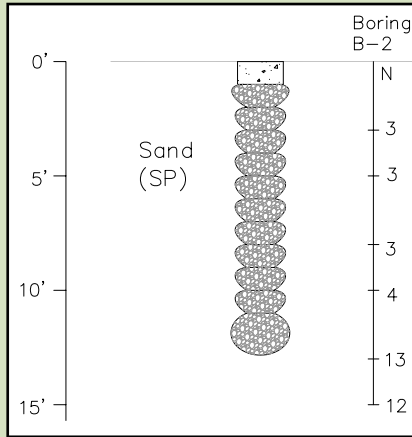
Following the stripping of the top soil layer, Rammed Aggregate Piers (RAPs) were installed to densify and reinforce the very loose sand for intermediate foundation support. RAPs were installed to approximately ten feet below bottom of footing elevations to encounter medium dense sand. RAP capacity of 40 kips and an allowable bearing pressure of 3,000 psf were used in design. A total of 59 RAPs were installed to support column and wall footings.



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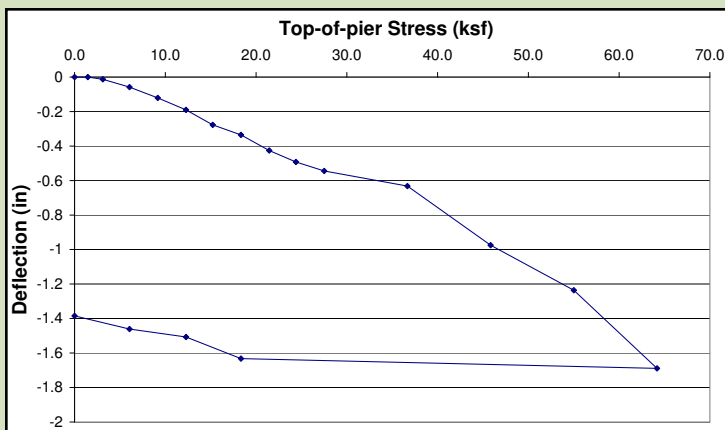
Modulus Test RAP Setup



The non-production RAP used for modulus testing was installed through loose sand near Boring B-2. The pier extended a depth of 11 feet below grade to encounter the medium dense sand (SPT N-value = 13 bpf). Following RAP installation, a one foot thick concrete cap was placed over the RAP. Deflection measurements were taken on cap during modulus test performance.

Modulus test results showed less than 0.4 inches of movement at top-of-pier stress levels of 20,000 psf.

Modulus Test Results



The results of the modulus test indicate that a deflection of about 0.35 inches was observed at the maximum top-of-RAP design stress of 18,200 psf. The corresponding RAP stiffness modulus of 365 pci exceeded the assumed design stiffness of 100 pci by more than triple. At the 150% design stress level of 27,300 psf, a deflection of 0.55 inches was noted. The corresponding RAP stiffness value was 345 pci. The results of the modulus test on the non-production RAP verified the superior performance of the Impact Solution.

FOR MORE INFORMATION

Contact Geopier Foundation Company at **800-371-7470**

or at **www.geopiers.com**



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The Intermediate Foundation System