

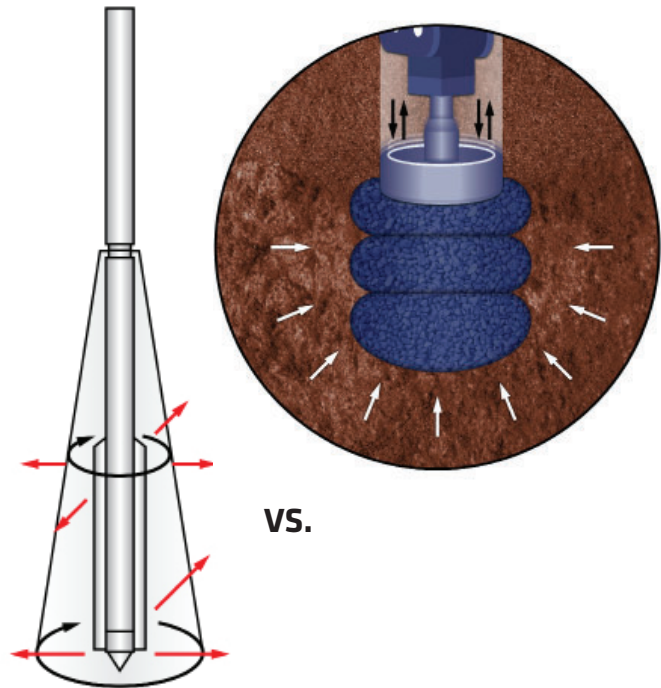
## RAP ADVANTAGE

### GEOPIER RAMMED AGGREGATE PIER® (RAP) ELEMENTS

Because of their unique construction method, Geopier Rammed Aggregate Pier® (RAP) elements provide greater capacity than traditional stone columns.

Both Geopier RAP elements and traditional stone columns are constructed with sequential lifts of aggregate. However, traditional stone columns are installed using suspended vibratory probes that only deliver horizontal vibration, while Geopier RAP elements are constructed using the patented Geopier beveled tamper to deliver a high magnitude of vertical compaction energy. This results in a stiffer pier as well as significantly increased horizontal stresses in the matrix soil.

The unique Geopier direct ramming process provides unsurpassed strength and stiffness of the RAP element and matrix soil.



## GEOPIER IS GROUND IMPROVEMENT®

### THE GEOPIER PROCESS

- ▶ **VERTICAL RAMMING** Thin lifts of aggregate are rammed to form a pier with undulating sides. Thin lifts allow for better compaction of the aggregate and results in high shear strength and stiffness. The tamper forces aggregate into the RAP element sidewalls, providing excellent pier-soil coupling.
- ▶ **ALTERNATIVE AGGREGATES** The Rammed Aggregate Pier® (RAP) construction method is easily adaptable to use recycled concrete or cement treated aggregate.

- ▶ **SOIL CONDITIONS** Geopier RAP elements may be installed in almost all soil conditions. The vertical ramming process contributes to increasing the lateral stresses in the matrix soils, which is especially important for soils with silt or clay content that do not respond well to horizontal vibrations only.

# GEOPIER RAMMED AGGREGATE PIER® ELEMENTS VS. STONE COLUMNS

## ► GREATER CAPACITY

The ramming process produces the superior strength of a Geopier Rammed Aggregate Pier (RAP) and develops constructed aggregate friction angles greater than 48 degrees, almost 40% greater than those reported for stone columns. Higher friction angles provide greater pier capacity, which means fewer Geopier elements versus stone columns.

## ► HIGHER BEARING PRESSURE

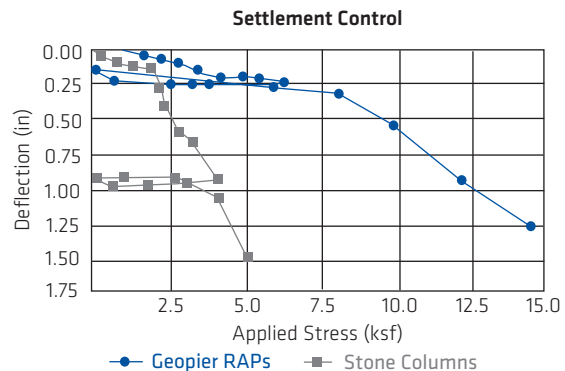
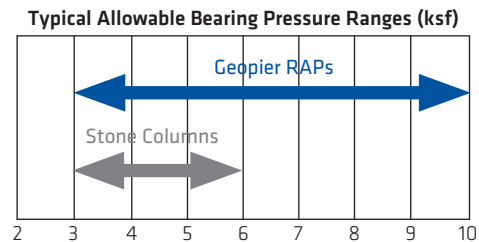
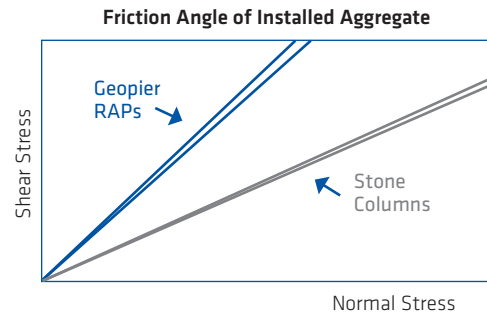
Higher friction angles allow for higher bearing capacities, which results in smaller footings and lower foundation costs.

## ► BETTER SETTLEMENT CONTROL

The unique ramming process creates piers that are two to five times stiffer than stone columns. Versatile Geopier RAPs can be used for light to heavily loaded structures.

## ► PROVEN ADVANTAGES

Side by side comparisons demonstrate significant performance differences between Rammed Aggregate Piers and traditional stone columns. Please reference [TP41](#) for more information.



White, et al 2002

## THE GEOPIER® ADVANTAGE

- Stiffness of Rammed Aggregate Pier® systems offer two to five times stronger than stone columns
- Greater support capacity and higher bearing pressure
- Greater pier capacity with smaller footings and less foundation costs
- Better settlement control

Geopier Foundation Company developed the Rammed Aggregate Pier® (RAP) system to provide an efficient and cost effective Intermediate Foundation® solution for the support of settlement sensitive structures. Through continual research and development, we've expanded our system capabilities to offer you more. Our design-build engineering support and site specific modulus testing combined with the experience of providing settlement control for thousands of projects provides an unmatched level of support and reliability to meet virtually all of your ground improvement challenges.