



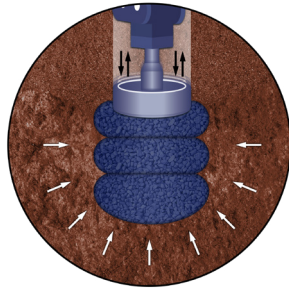
# GEOPIER®

INTERMEDIATE  
FOUNDATION®  
SOLUTIONS

GEOPIER  
IS GROUND  
IMPROVEMENT®

# GEOPIER® RAP SYSTEM SOLUTIONS

Geopier introduced Rammed Aggregate Pier® (RAP) technology to the industry in 1989 as an Intermediate Foundation® solution that cost clients 20 to 50 percent less than deep foundations.



Today over 10,000 structures worldwide are supported by RAP technologies — GP3®, Impact®, Rampact®, and X1® systems. Geopier Systems are used to reinforce inadequate soils, including soft to stiff clay and silt; loose to medium dense sand; organic silt and peat; variable, uncontrolled fill; including soils below the ground water table.

Our patented RAP technologies are constructed by applying direct vertical ramming energy to densely compact successive aggregate layers to form high stiffness engineered elements and increase the lateral stress that improves the surrounding matrix soils. This process provides superior support capacity, increased bearing pressures (up to 10,000 psf), and greater settlement control. Depending on site requirements, RAP systems can be installed using replacement “drill and fill” or displacement methods.

## GEOPIER® APPLICATIONS

- Foundations
- Floor Slabs
- Industrial Facilities
- Storage Tanks
- Grain Bins
- MSE Walls & Embankment Support
- Liquefaction Mitigation
- Railways
- Slope Reinforcement

# GEOPIER® RIGID INCLUSION SOLUTIONS

Geopier rigid inclusion systems are ground improvement elements used to transfer loads through weak, compressible soils to deeper underlying competent soils. Our rigid inclusions are comprised of either plain concrete, aggregate/grout mixture, cement-treated aggregate, or an HDPE shell.

Geopier rigid inclusions are used to increase bearing capacity (up to 12,000 psf) and minimize total and differential settlements in soft soil profiles, such as peat or organics, soft silt, or soft clay.

Geopier Rigid Inclusion systems include Armorpack®, GeoConcrete® Columns and the Grouted Impact® system.

## GEOPIER® RAIL AND SLOPE REINFORCEMENT SOLUTIONS

Through continued research and development, Geopier has expanded its system offerings to include two turn key solutions for specialty ground improvement applications.

The Geopier GeoSpike<sup>SM</sup> system provides a rapid installation process to strengthen weak railroad track subgrades without track tie or ballast removal. The use of the GeoSpikes have proven to reduce the need to re-build and repair track sections.

Designed for shallow slides or constrained sites, the Geopier SRT® system provides a fast and easy solution that allows for emergency response and immediate stabilization. The SRT method has been used to repair landslides within roadway slopes, commercial and residential developments and pipeline alignments.

Both of these ground improvement methods provide additional Intermediate Foundation® solutions that are cost-effective, reliable engineered foundation systems to meet your geotechnical challenges.



Watch system installation videos at [www.geopier.com](http://www.geopier.com)

# RAMMED AGGREGATE PIER® SYSTEMS



## GEOPIER GP3® SYSTEM

Known as the original Geopier® system, the patented Geopier GP3® system reinforces inadequate soils, including soft to stiff clay and silt, loose to medium dense sand, organic silt and peat, and variable, uncontrolled fill. The GP3 system allows for visible inspection of the spoils, and the opportunity to address changing ground conditions as they happen. GP3 is an effective alternative for massive over-excavation and replacement or deep foundations, including driven piles, drilled shafts, or auger cast-in-place piles.

**“We were looking for speed and predictable cost, and we found that with Geopier Technology.”**

**Jeff Garrett**  
Regional Project Manager  
Vista Reality

### GP3® KEY PROJECTS

- Carroll Wind Farm, IA
- Castle Oil Bulk Diesel Storage, NY
- Big River Resources Ethanol Plant, MO
- Amtrak Platform, RI
- Sienna Parkway MSE Wall, TX
- Marquee Condominiums, CA

**Installation was completed ahead of schedule and within budget, which lead other contractors to complete their work earlier as well.**

**Josh Pfarr**  
General Contractor  
Elevator Works, Inc.



# RAMMED AGGREGATE PIER® SYSTEMS



## GEOPIER IMPACT® SYSTEM

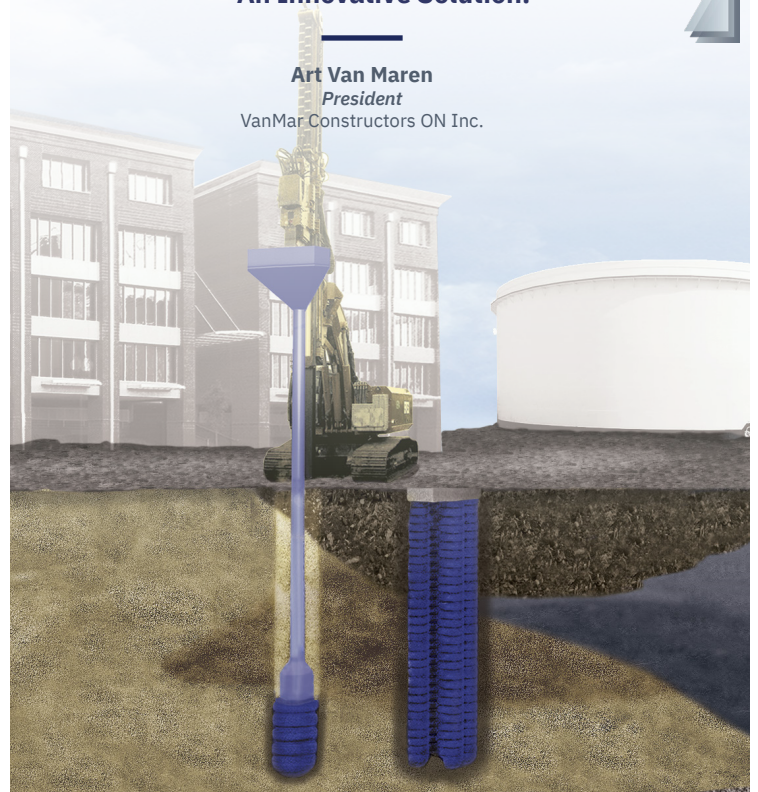
The Geopier Impact® system uses a patented displacement mandrel to reinforce inadequate soils, including loose sand, soft silt and clay, mixed soil layers, uncontrolled fill, contaminated soils and soils below the groundwater table. The displacement process allows for installation with no spoils and eliminates the need for casing. Its performance and cost-effectiveness make it the ideal solution for soils that are subject to caving. \*Grout may also be added to create a rigid inclusion.

**The Impact system doesn't generate spoils, so there are fewer equipment and transportation needs, which also provides a cost benefit.**

**Ken Lightbody**  
Project Manager  
GeoConstructors, Inc.

**Geopier worked closely with our design team to improve our soil bearing capacity resulting in significant cost savings to this 22-story building – An Innovative Solution.**

**Art Van Maren**  
President  
VanMar Constructors ON Inc.



## IMPACT® KEY PROJECTS

- Cascades Mixed-Use Development, FL
- Kinder Morgan Liquid Tanks, TX
- Large Power Plant, MD
- Caroline Street Residences, Ontario
- Premium Outlet Mall, Perú
- Bogazici Shipyard, Turkey
- Purzien Wind Park, Germany



# RAMMED AGGREGATE PIER® SYSTEMS



## GEOPIER RAMPACT® SYSTEM

The Geopier Rampact® system is recommended for installation in soils subject to caving because construction is facilitated using a patented tapered displacement mandrel, eliminating casing risks resulting in increased installation productivity. The tapered mandrel also helps in debris-laden fill soils.

**Geopier provides solutions to unique problems, stands behind their work and always finishes the job early.**

**Stuart Schneider, P.E.**  
*Vice President*

Anderson Engineering Consultants, Inc.

**When budgeting jobs for Owners, Geopier provides estimates that hold throughout the design period.**

**Dwight Morgan, Jr.**  
*President*  
Morgan Constructors, Inc.

## RAMPACT® KEY PROJECTS

- Chinatown Library, IL
- Petroleum Storage Tanks, MN
- Century Village at Cabrillo, CA

## GEOPIER X1® SYSTEM

The Geopier X1® system is a combination of both replacement and displacement methods, which allows for construction flexibility and the ability to build through caving zones that are encountered during drilling operations. Like the original Geopier system, the X1 system's drilling operation allows for visual inspection of the hole and the opportunity to address changing ground conditions as they happen. Its performance, flexibility, and cost-effective qualities make it the ideal solution for reinforcing clay, silt, sand, and organic soils.

## X1® KEY PROJECTS

- NASA Stennis Space Center, MS
- Refrigerated Distribution Center, TN
- Mantador Grain Storage Bin, ND



# RIGID INCLUSION® SYSTEMS



## GEOPIER ARMORPACT® SYSTEM

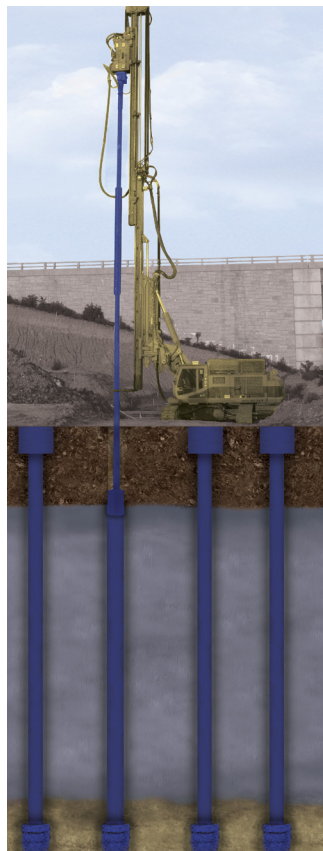
The Geopier Armorpack® system is an ideal solution for supporting buildings and structures in soft clay and organic soils. Construction begins by driving a patented Armorpack sleeve to the design depth. Aggregate is placed within the confining sleeve and compacted with the mandrel. Applied loads are supported by the densely compacted aggregate that is laterally confined by the sleeve. The system provides greater economy for settlement control in soft, compressible soils.

Geopier performed their critical path soil improvement work in less than three weeks, ensuring that the 16-month construction schedule would be completed on time.

**Glenn Hofer**  
Project Executive  
Amek

### ARMORPACT® KEY PROJECTS

- CarMax Auto Superstore, SC
- Automated Freezer Warehouse, IA
- Elven Sted Apartment Buildings, WI



## GEOPIER GEOCONCRETE® COLUMNS (GCCs)

Geopier GeoConcrete® Columns (GCCs) provide a unique solution to support heavy applied loads and control settlement at sites with weak and compressible cohesive and organic soils overlying dense soils or rock. The system provides this support by installing high modulus elements through the low modulus soil to control settlements. GCCs provide an increased bearing capacity and are an effective replacement for deep foundations.

### GCC KEY PROJECTS

- 11th Street Bridge, Washington, D.C.
- College Avenue Office Building and Garage, CT
- Grand Condominiums, Ontario

# RAIL AND SLOPE REINFORCEMENT® SYSTEMS



## GEOPIER GEOSPIKE<sup>SM</sup> SYSTEM

The Geopier GeoSpike<sup>SM</sup> system is a cost-effective method for strengthening weak railroad track subgrades. The system creates strong elements in weak subgrade soils, and can be installed without removing railroad tracks, ties, or ballast. Construction begins by driving a HDPE shell in pairs between rail ties to the design depths. The expanded top of the shell compresses between ties and expands back to its original shape after clearing the rail ties. Aggregate is then placed within the shell and compacted. The dynamic loads from the passing rail cars arch through the ballast and transfer down to a bearing layer.



## GEOSPIKE® KEY PROJECTS

- Canadian National, Ontario
- Norfolk Southern, AL

**We are continuously looking for VE opportunities and was aware of the Plate Piles method. We evaluated the Plate Pile method and decided the method would be a perfect tool to solve our problem.**

**Joe Seto**  
*Engineering Chief*  
United States Department of Defense

## GEOPIER SRT® SYSTEM

The Geopier SRT® system allows for the stabilization of new slopes and active slides up to 15 feet thick. The patented system is comprised of Plate Pile™ elements, that are rapidly driven through unstable soil into a competent layer in a staggered spacing based on slope grades and soil properties to form a series of horizontal barriers. The Plate Pile elements transmit slide forces to the underlying stable soil to resist lateral movements and increase the factor of safety against instability. Designed to stabilize slopes where the soil conditions consist of an upper zone of weathered, loose, soft or disturbed soil over a stable zone of soil or soft rock. Plate Pile installations are fast and allow for immediate stabilization without the need for massive earthwork and site disruption.

## SRT® KEY PROJECTS

- VDOT HOT Lanes Slope Reinforcement, VA
- Riverside Drive Slope Stabilization, TN
- Pleasant Hill Slide Repair, CA

# GEOPIER IS GROUND IMPROVEMENT®

Whether you are an engineer, contractor, or owner - We can help.

For more information call 800-371-7470, email [info@geopier.com](mailto:info@geopier.com),  
or visit [geopier.com](http://geopier.com).

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**GEOPIER®**  

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**Tensor®**