

# THE GEOPIER GP3® SYSTEM

## INTERMEDIATE FOUNDATION® SOLUTIONS



The original Geopier® system was developed in 1989 as an efficient and cost-effective Intermediate Foundation® solution for the support of settlement sensitive structures. Today, the patented Geopier GP3® system uses replacement Rammed Aggregate Pier® (RAP) elements to reinforce good to poor soils, including soft to stiff clay and silt, loose to 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. It is an effective replacement for massive over-excavation and replacement or deep foundations, including driven piles, drilled shafts or auger cast-in-place piles.

The RAP elements are constructed by applying direct vertical ramming energy to densely compact successive lifts of high quality crushed rock to form high stiffness engineered elements. The vertical ramming action also increases the lateral stress and improves the soils surrounding the cavity, which results in foundation settlement control and greater bearing pressures for design.



### ADVANTAGES OF THE GP3® SYSTEM

- ▶ **STRONG AND STIFF** Vertical impact ramming results in high density and high strength RAP elements providing superior support capacity, increased bearing pressure up to 10,000 psf and excellent settlement control.
- ▶ **PROVEN** Thousands of structures are currently supported – proven experience that ensures high levels of performance and reliability.
- ▶ **ECONOMICAL** Often results in 20% to 50% savings compared to traditional deep foundations.
- ▶ **FAST** Rapid installation process means shorter construction schedules.
- ▶ **QUALITY** Superior on-site quality control is maintained through observing, inspecting and testing the system, including visual spoil observation and full-scale modulus load tests.
- ▶ **ENGINEERED** Projects are engineered in-house by a Geopier Professional Engineer, allowing for rapid response when design or construction changes.

## THE CONSTRUCTION PROCESS

The unique installation process utilizes pre-augering and vertical impact ramming energy to construct RAP elements, which exhibit unsurpassed strength and stiffness. RAP solutions are designed to provide superior total and differential settlement control and increased bearing support to meet project requirements.

1. The process first involves drilling a cavity. Drill depths normally range from about five to 30 feet, depending on design requirements. Pre-drilling allows you to see the soil between the borings, ensuring that the piers are engineered to reinforce the right soils.
2. Layers of aggregate are then introduced into the drilled cavity in thin lifts. A patented beveled tamper rams each layer of aggregate using vertical impact ramming energy, resulting in superior strength and stiffness. The ramming action densifies aggregate vertically and forces aggregate laterally into cavity sidewalls. This results in excellent coupling with surrounding soils and reliable settlement control.
3. Following installation, RAP elements support shallow foundations, floor slabs and tank pads and reinforce slopes and embankments. The footing stresses are attracted to the stiff RAP elements, resulting in engineered settlement control.

## APPLICATIONS

Geopier systems have become preferred replacements for massive over-excavation and replacement or deep foundations, including driven piles, drilled shafts or augered cast-in-place piles. Local Geopier engineers and representatives work with you and your specific soil conditions and loads to engineer a project-specific practical solution to improve your ground. With multiple systems we are able to engineer support for virtually any soil type and groundwater condition across many applications, including:

- ▷ Foundations
- ▷ MSE Walls/Embankment Support
- ▷ Floor Slabs
- ▷ Slope Stabilization
- ▷ Industrial Facilities
- ▷ Transportation
- ▷ Storage Tanks
- ▷ Wind Turbines
- ▷ Liquefaction Mitigation
- ▷ Uplift & Lateral Load Resistance



*International Place Towers III  
Memphis, Tennessee*



*Houston Fuel Oil Terminal Company  
Houston, Texas*



*The Home Depot  
Provo, Utah*



*I-10 and Picardy Avenue Interchange  
Baton Rouge, Louisiana*

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.

Work with regional engineers worldwide to solve your ground improvement challenges.

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