

## PROJECT DESCRIPTION

<b>PROJECT:</b>	Terwilliger Plaza – Assisted Living and Parking Structure		
<b>LOCATION:</b>	Portland, Oregon		
<b>DESIGN TEAM:</b>	<i>Architect:</i>	BOOR/A Architects	
	<i>Structural Engineer:</i>	KPF Consulting Engineers	
	<i>Geotechnical Engineer:</i>	David J. Newton, Associates	
<b>CONTRACTOR:</b>	JE Dunn Construction Company		



### DESCRIPTION:

- 7-story (3 levels of parking and 4 levels of living facilities)
- Cast-in-place concrete, shear wall design
- Critical differential settlement control
- Column loads: 750 kips gravity and 330 kips uplift

Undocumented silty fill, compressible native silty soils, and basalt bedrock sloping from 0-75° across the site combined to make the control of total and differential settlement the primary issue in foundation design.

The presence of existing steel piles from previous buildings on the site complicated the foundation design.

During the Design Development phase of the project, the Geopier® System was selected as the most cost effective foundation system. Other options included various deep pile systems socketed into the steeply sloping bedrock.

The Geopier design resulted in an allowable design bearing pressure of 7500 psf (with 1/3 increase allowed for seismic) for conventional spread footings. To support the 37 building columns and shear walls, some 188 Rammed Aggregate Pier® (RAP) elements were installed, 34 of which were constructed to resist seismic uplift loads of 40 kips each. To control differential settlements, design shaft lengths for the Geopier elements ranged from 8-12', with individual pier-cell loading ranging typically from about 60-94 kips.

To confirm Geopier design parameters, one full-scale compression modulus (load) test and one pull-out test were performed. Test results confirmed the design bearing pressure and pier compression loading, and revealed that a design uplift load of at least 100 kips per pier would have been feasible on the 12' long tension piers.

A total of 190, 30" diameter RAP elements were installed in only 10 working days on-site.

<b>REFERENCES:</b> Douglas Grassman, Vice President JE Dunn Construction Company (503) 978-0800	Mathew Spicer, Project Architect BOOR/A Architects (503) 226-1575
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