

GEOPIER®



CLIENT'S CHALLENGE

The 35,000 square-foot, 7-story residential building was planned at a property underlain by variable-density urban fill and organics, typical of the Boston region. Given the building loads of over 600 kips for single columns and required settlement tolerance of 1-inch total and ½" differential, an effective and economic foundation and slab support alternative was desired for the project. Geopier® rigid inclusions elements were selected to provide a reliable alternative to support a shallow spread footing and slab-on-grade system.

SUBSURFACE CONDITIONS

Subsurface conditions consisted of urban fill underlain by a highly organic layer, followed by native sand, marine clay (clay crust over very soft clay), and medium dense to very dense glaciomarine sand.

GEOPIER® SOLUTION

A hybrid solution of Geopier® rigid inclusions was selected to provide an economical ground improvement system over deep foundation systems. Rigid inclusions were necessary to transfer building loads through the variable urban fill and organic materials to suitable native bearing layers below. GeoConcrete® Columns (GCCs) were selected for foundation support, given the high capacity achievable with these elements. The GCC elements were constructed to lengths of up to 66 feet, deriving their capacity in the deep glaciomarine sands. The lighter-loaded slab-on-grade was supported using Grouted Impact® Piers, effectively transferring the slab loads to the over-consolidated clay crust. A full-scale modulus test was performed on a GCC element to maximum load of 200% of the design capacity of 205 kips, and indicated a deflection of less than 1/8-inch at the 100% design capacity.



Revere Beach Apartments

Revere, Massachusetts

Hines

Owner

The Congress Companies

General Contractor

SLR International Corp.

Geotechnical Engineer

Veitas & Veitas Engineers, Inc.

Structural Engineer

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