

VIRGINIA TECH BRODIE HALL

Location: Blacksburg, Virginia

Project Type: School



DUROTERRA



DUCTILE IRON PILE ADVANTAGES

- Rapid installation
- Easily adjust to variations in rock elevation
- Compatibility with other foundation support systems

PROJECT DESCRIPTION

Construction of the new Brodie Hall on the Virginia Tech campus required support for lightly to heavily-loaded footings and mats. Limiting footing settlement was a critical design consideration to prevent cracking of the exterior "Hokie Stone" façade. The foundation support design incorporated Geopier® ground improvement extending to rock beneath heavily-loaded footings and mats. However, during ground improvement installation beneath the F-4 mat, drilling revealed the rock levels dipped from 40 feet to greater than 70 feet – making it impractical to construct ground improvement elements.



SOIL CONDITIONS

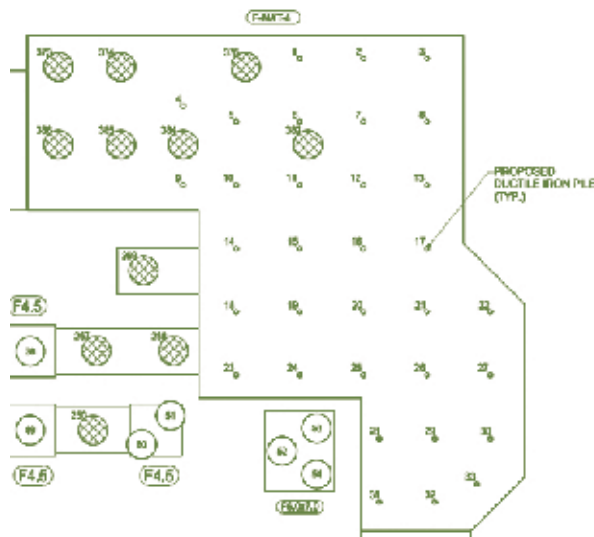
Typically, soft to stiff residual silt and clay to depths of 30 to 40 feet followed by partially weathered rock (PWR) and rock. Rock depths at the F-4 mat location were discovered during construction to increase to more than 75 feet.

PROJECT CHALLENGES

Rapidly implement an alternative foundation solution for support of the F-4 mat foundation loaded up to 3,600 kips to address the greater rock depth and avoid costly construction delays.

DUCTILE IRON PILE SOLUTION

GeoStructures, Inc./GeoConstructors, Inc. immediately identified the Ductile Iron Pile system as a solution that could be implemented rapidly to address the deeper rock profile and effectively manage variation in rock depths. The GeoStructures/GeoConstructors design/build team designed and implemented a solution consisting of 118/7.5 series piles (118 mm diameter with 7.5 mm wall thickness) to provide a working capacity of 80 kips. Once design team approval was granted, a total of 33 Ductile Iron Piles were installed in only 2 ½ working days. Pile lengths were easily varied from 39 to 75 feet by adding the modular Ductile Iron Piles sections featuring the specialty Plug and Drive connection.



PROJECT TEAM

DIP Design/Build Partner: GeoStructures / GeoConstructors

Geotechnical Engineer: Froehling & Robertson

General Contractor: Barton Malow

Structural Engineer: Clark Nexsen

Owner: Virginia Tech