

WEST BERLIN COTTAGE

Location: West Berlin, Nova Scotia

Project Type: Residential



DUROTERRA™



DUCTILE IRON PILE ADVANTAGES

- Small equipment for easy mobilization
- Rapid installation
- Improved lateral capacity with grouted friction piles compared to helical piles

PROJECT DESCRIPTION

Construction consisted of a new single-storey cottage near the beach in West Berlin, Nova Scotia. While the structure was generally lightly-loaded, the possibility of extreme tides combined with poor soil conditions required the building be elevated above existing ground.

GEOTECHNICAL CONDITIONS

The subsurface conditions encountered were loose homogenous sand for approximately 10 feet deep over bedrock.

PROJECT CHALLENGES

Providing a foundation support solution for the one-storey cottage located in a remote area to address the poor soil conditions and need to elevate the building to protect against extreme tides.



DESIGN AND CONSTRUCTION SOLUTION

Initially AMCON Limited conducted a soil probing program to determine the depth of the bedrock. Once the bedrock elevation was determined at only 10 feet, AMCON concluded that grouted Ductile Iron Piles (DIPs) would be the most economical solution given the loading of the structure and soil conditions encountered during the soil probing. Not only would the Ductile Iron Piles be installed to sound bearing on rock, the installation of the oversized conical cap and exterior grout encapsulation of the pile would create a larger perimeter area to resist uplift and lateral loading demands on the structure.

The design featured Series 118/7.5 (118mm diameter with 7.5mm wall thickness) Ductile Iron Piles installed with a 220mm oversized conical grout shoe to create an effective 8-inch diameter pile. The DIPs were continuously grouted during the installation by driving the piles through a Portland cement grout bath at the surface as well as pumping the neat cement grout through the piles and out the tip of the shoe to completely encapsulate the pile and develop the necessary grout-to-ground bond to resist uplift and enhance lateral capacity. In total, 17 grouted, end-bearing DIPs were installed to terminate on rock by achieving "set". The piles were installed to support the structure using a mid-sized excavator and hydraulic hammer. The unique spigot and socket joint also allowed for all the DIPs to be installed in just a few days thus greatly accelerating the construction schedule on the remote site.



PROJECT TEAM

DIP Design/Build Partner: AMCON Limited
Structural Engineer: ABLE Engineering Inc.