



GEO-FOUNDATIONS Contractors Inc.

Pembroke Courthouse



Date: 2005
Technology: Micropiles

During six weeks of extremely hot weather in the summer of 2005, Geo-Foundations installed a total of 70 micropiles to support and tie down the new Pembroke Courthouse. Selection of percussion drilled, hollow bar micropiles satisfied the three principle performance requirements of the new foundation system - a system capable of passing through numerous boulders, able to resist significant uplift loading, and installed in a manner that prevented damaging nearby existing, shallow-founded structures.

Top-hammer percussion drilling, using carbide button drill bits (typically 175mm diameter) left in place at the tip of each pile, enabled the micropiles to pass through several significant layers of large, hard rock boulders.

Use of low-energy jet grouting enabled the development of the micropiles' required geotechnical capacity in both tension and compression without the need for engagement of bedrock - particularly valuable considering that bedrock is located more than 20 metres below grade at this site.

Location of numerous principal columns tight to the shallow-founded jail walls required an installation process energetic enough to penetrate layer after layer of large boulders, but small enough to concentrate its installation energy in a manner that would not jeopardize the safety of the circa 1867 footings and walls. Continuous grout flush, with its real-time stabilization

of the bore wall and its natural attenuation of percussive energy achieved these disparate system requirements.

Quality assurance at this site included load testing the first production micropile to 2600 kN applied compression and 1400 kN applied tension.



Installation of grout-flushed micropiles within 600mm of heritage masonry walls



Exhumed micropile tops being prepared for dressing with plates and nuts



Tension-compression micropile foundations for the West Elevator Core