



CASE STUDY

Project: Hudson House Saannich, B.C.	Structural Engineer: Somerset Engineering, Burnaby, B.C.	Geotechnical Engineer: Geopacific Consultants Burnaby, B.C.	Contractor: Vickars Construction Burnaby, B.C.
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Job Description:

Two floor residential wood frame seaside home just outside the city of Victoria, B.C. in the municipality of Saannich, B.C., Canada.

30 year old house, sitting on wood pile supported foundation assemblies of reinforced concrete in Cadboro Bay. The house had recently exhibited signs of foundation movement with massive settlement of the crawl space skim coat of up to 2' (600 mm) .

Independent materials investigation complete with testing, found degradation of the variably untreated wooden pilings of the home, some with crushing and failure of support of a main section of the living room and guest room. This was noted as changes in the fit and finish of the master bedroom of the second floor and the living room of the main floor. Drywall cracks at post support areas and binding of doors in the two areas was evident. Direct differential settlement was measured at more than 2" in 20' in the involved sections of the home.

Soils:

Soils in the area are 2-3' of fills and sandy topsoils, 15'-20' of silts heavily contaminated with woody debris a relic of the sawmills and beehive burners existing throughout the site during the early 20th century. Thereafter sands increasingly dense with depth including dense gravels at 30'-35'.

Repair:

Due to the high water table and proximity to the ocean it was elected to simply replace the degraded wooden pilings with HELICAL



PULLDOWN™ Micropiles. This allowed use of hand held piling rig capable of placing pilings of ultimate capacities of 70+ Kips (315kN), including three inside the four foot high crawlspace. A series of reinforced concrete grade beams coursing across the crawlspace allowed direct connection of the pilings to the existing concrete foundations as well as elevation of settled foundation section re-approximating the structure to its post construction “as built” levels, during the repairs. This also allowed preservation of existing hard and soft landscaping as pilings were also placed through removed sections of Cedar decking and garden areas, easily replaced to pre-repair finish without extra costs or damage.



Production Piling and Installation:

Pilings were all placed under the direction and auspices of Geopacific consultants of Burnaby, B. C. A 6” pvc sleeve 10’-15’ long was pulled down with the lead section of each pile. Once in position the remaining pile section were turned into undisturbed bearing soils at depth through the sleeve adding grout as needed and recording installation torques ensuring an adequate “bite” into the soils to support the design loads at each point. Total grout take and continuous torque measurements were recorded and submitted to the geotechnical engineer of record for certification of pile capacities.



Once all pilings were certified, attachments of reinforced concrete from new pilings to the old foundations were made using epoxy grouted rebar and/ or a reinforced series of grade beams spanning from the pile placement areas at the exterior through the centre bearing posts of the crawlspace. This made it possible to replace all pilings without having any of the work necessary for their placement to be done from the living space in the home, isolating the residents from the structural repair of the home.



As is usual for all repair works done by Vickars a fully transferable 20 year warranty was made on the repaired foundations of the home. This then replacing any value lost in the building, due to the major structural problems with its piled foundations.