



## CASE STUDY

<b>Project:</b> Industrial Pile Repairs Beta Avenue Burnaby, B. C.	<b>Geotechnical Engineer:</b> Geopacific Consultants Burnaby, B. C.	<b>Structural Engineer:</b> Somerset Engineering Burnaby, B. C.	<b>Contractor:</b> Dragonwood Enterprises Burnaby, B.C.
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### Job Description:

During the tenancy changes at this 80 plus years (industrial building), the pilings supporting the roof were found to be rotten and damaged by impact approximately 4'-5' above the concrete floor slab on the interior of the building. Investigation of this revealed that the heart of the creosoted pilings which extended in pairs terminating 6' and 14' above the slab, were rotten in the core and needed to be replaced. The pilings extend down approximately 27' through the top of the slab to undisturbed adequate bearing ground or glacial till. They were found to be continuous and brought through the floor to support post loads in turn supporting roofing truss structures for the high industrial ceiling, over.



### Soils:

Geotechnical investigations by means of a drilling rig revealed the soil profile within 10' of the subject (degraded) piles was approximately 4-5' of mixed contaminated fill over about 22' of silts and sandy silts with a sudden transition into dense glacial till with SPT blows in excess of 80 blows per foot within 2' of the top surface of the till.



### Repair:

Helical PULLDOWN™ Micropiles were selected due to the smaller and lightweight equipment that we use for their installation which can be better controlled around degraded pilings so inadvertent danger from any contact would be minimized. The helical PULLDOWN™ Micropiles selected were 1 1/2" SS5 square shaft using a 6-8-10 triple helix lead. The piles were placed through the bottom of a shallow surface excavation around the piles, 27' – 30' deep, including 2'-3' penetration into the dense underlying glacial tills.

Access to the area surrounded the degraded piles was made by cutting a hole through the existing floor slab and excavating down approximately 3'-4' to get rid of deleterious and contaminated fills including metal slag heaps, which initially precluded placement of the pilings. Once that was completed, the PULLDOWN™ pile was placed through a 6" PVC sleeve to minimize any negative skin friction or downdrag forces following the repair. The sleeve was brought up to within 6" of the underlying slab

surface and terminated with the steel plate assembly as instructed by the structural engineer of record.

The helical PULLDOWN™ piles were all placed in turn similarly through the PVC sleeve, employing continuous torque monitoring and measurement of grout takes placed into the reservoir. These records are provided to the geotechnical engineer for confirmation of capacity and certification of the piling. All of the production piles installed were placed with the grout bath using a proprietary silica fume grout manufactured by Basalite Concrete Products of Vancouver B.C., PULLDOWN PILE™ Type A . Grout was reinforced by adding 1 pound of polyfibrils per cubic yard of mixed grout that was placed into the PVC tube or grout reservoirs.