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PROJECT REPORT

Deep Secant Wall Shaft

Sarnia, Ontario

Birmingham's experience and expertise were instrumental in the installation of a secant wall shaft, consisting of eighty 1.0 m diameter caissons 27 m deep (89 feet), at the Devine Street Pumping Station in Sarnia. The project, which was completed in November 2009, was initially tendered as a sheet pile cofferdam. A post tender review of the soil conditions determined that the initial parameters were incomplete. After a subsequent geotechnical investigation, the project shifted to a secant wall from sheet pile in an attempt to counteract the geotechnical condition known as basal heave.



Isherwood Associates was contracted by Birmingham to design a circular cofferdam (17 m in diameter with caissons installed 27 m deep) with the majority of its strength in "ring compression" -- when a load from one side of the secant wall is distributed evenly along the entire opposite wall.

"The challenge," according to Birmingham Project Manager, Andrew Wertz, "was the fact that the caissons would have to be installed vertically as close to the intended location as possible. The on-site General Contractor McLean Taylor worked with Birmingham to help

achieve this by creating a unique circular concrete guide wall." Wertz emphasized that Birmingham's project team: Jaime MacArthur, Superintendent, Steven Delaney, Front-end man, and Mark Petch, Drill Operator were very attentive at ensuring the strict verticality of the caisson wall and instrumental in the project's overall success.

The cofferdam also relied on a tremie poured slab to resist basal heave. Interestingly, the slab was keyed into the wall at the base of the excavation to utilize the weight of the wall to help resist uplift.



Phone: 1-905-528-7924

Toll Free: 1-800-668-9432

Web: www.berminghammer.com