

Pile-Integrated Geo-Exchange System

Grid Innovation Fund Project Details

Lead Proponent: Innovia GEO Corp.

Partners: H.C. Matcon Inc., Waterloo North Hydro Inc.

Strategic Area(s):	Enabling Non-Wire Alternatives
Project Total Cost:	\$576,261
Year Contracted:	2018
Status:	Active
Location:	Waterloo
Economic Development:	N/A

Project Objectives

A demonstration of an innovative system integrating a geo-exchange system into a helical steel pile will be installed at the Eby Rush Transformer Station in Waterloo, Ontario, which is a facility owned and operated by Waterloo North Hydro Inc. The system will consist of a conventional geo-exchange ground loop as well as a geo-exchange pile array to enable the side-by-side comparison of the two systems.

The geo-exchange pile array will consist of a total of eight piles, 50 to 60 feet in length. The building's mechanical system will be modified to enable the geo-exchange pile array to be connected in parallel with the existing conventional geo-exchange ground loop so that either array can provide heating/cooling capacity to the building either independently or together.

Typical geothermal systems, which use the temperature of the ground to efficiently heat and cool buildings, have high up-front costs due to the requirement to install plastic piping in the ground. The

Innovia GEO system integrates the geothermal capabilities directly into the building’s steel foundation pillars.

The objective of this demonstration project is to compare the heating and cooling performance of helical steel geo-exchange piles versus conventional plastic piping in geothermal systems in a real-world setting in Ontario.

Expected Outcomes

The performance of both systems, the geo-exchange pile array and the high density polyethylene (HDPE) ground loop array, will be analyzed and benefits quantified.

If successful, this project will advance geo-exchange heating, ventilation and air conditioning (HVAC) systems by successfully demonstrating an innovative approach which integrates geo-exchange capability into steel helical foundation piles, thereby significantly reducing the total costs and effort to implement these systems into buildings and providing a signal to the market that such systems are viable and cost-effective.



Installation of Innovia’s GEO system in Waterloo.