



**Geo-Energie** inc.  
*Engineering - Design*

*TEAM Presentation  
&  
Case Studies*

**GEO-ENERGIE Inc.**

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## General Team Presentation

ENGINEERING, DESIGN

Geo-Energie performs mechanical and electrical engineering. We specialize in the integration of the latest technological advances in energy efficiency. Since our founding in 2004, we have participated in over 500 projects, including various cutting edge technologies.

Our team consists of engineers and technicians that have an extensive combined expertise in both commercial and industrial ventilation, integration of technologies supporting sustainable development as well as HVAC systems integration.

**Our mandates regularly included the following responsibilities:**

- Conceptual Development
- Systems Engineering
- Commissioning (CBCP Certified)
- Systems Troubleshooting
- Training

**Offered Services:**

- Mechanical Engineering
- Electrical Engineering
- Advice on energy efficiency and sustainable development
- Commissioning, recommissioning and Retrocommissioning
- Validation and Regulatory Compliance
- In situ Soil Thermal Conductivity Testing
- Energy Monitoring
- Preparation of tender documents

**Our clients**

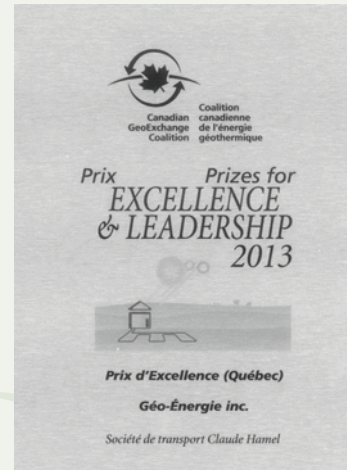
Société immobilière du Québec, Travaux publics Canada, Société des Alcools du Québec, Centre sportif de Gatineau, Excellence Peterbilt, Centretown Citizens Ottawa Corporation, STCH (Services en transport Claude Hamel), Johnson Controls, EXP, SNC-Lavalin, Forages Technic-Eau, Puits Bernier, SPA Mont St-Hilaire, GEOS Spa Sacacomie and many others.

Geo-Energie is an active member of several professional associations and enjoys an enviable reputation at an international level. Geo-Energie is the proud winner of the 2013 Canadian GeoExchange Coalition Award of Excellence.



ENGINEERING, DESIGN

### THE FIRME



### THE TEAM



### OFFERED SERVICES



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## Project: CCOC - Beaver Barracks Phase 2

Ottawa, Ontario



Centertown Citizens Ottawa Corporation (CCOC) is a non-profit corporation of social housing offering more than 1600 affordable housing units. CCOC and its partners decided to offer social housing units presenting low energy consumption and reduced ecological footprint.

Beaver Barracks Development, a 65 million dollars project, allows CCOC to add 254 apartments to its portfolio. The development includes a district heating plant, geothermal heating and cooling system, green roofs with little gardens, heat recovery air exchanger, recycling and compost points, high efficiency lighting system and Energy Star household appliances.

Geo-Energie was awarded the commissioning mandate by CCOC, covering the entire electromechanical aspects of the project. As such, Geo-Energie assisted every stakeholder on the project, hosting meetings and coordinating commissioning activities inherent to the process.


Geo-Energie skilled team used its leadership and know-how to comply with client's demand and objectives. Geo-Energie managed the commissioning process to ensure healthy and efficient communication all the way through the design, construction, commissioning and training phases.

Our staff of professionals provided technical support, commissioning management and guidelines on the following elements:

- Normal/Emergency electrical distribution systems
- Every HVAC system component;
- BAS Control system and Access control system;
- Plumbing, sumps, and domestic water systems;
- Staff training coordination, hosting and video-recording



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*Ingénierie, design*



Project: Fortis Gas & School District #37  
Vancouver, British-Columbia



Johnson Controls Canada mandated Geo-Energie to design a retrofit heating plant program for eleven (11) schools and administrative buildings, part of Delta #37 School District, in British Columbia. This project was based on an ambitious energy saving objective put forth by Fortis Gas, to reduce the energetic footprint of School Districts across BC.


Geo-Energie was responsible for every mechanical, acoustical and structural engineering services, the supervision of the work and the commissioning. Targeted establishments are equipped with an average nominal heating power of 320 kW (90 tons). Given diversity of local geology, Geo-Energie custom-tailored his solutions for each building's locations and needs. In total, nine (9) buildings received a geothermal-based new heating system, while the other two received air-source heat pump/chiller solutions. Geothermal exchangers have been designed using either horizontal trenches, directional drilling, vertical deep or shallow boreholes.

In order to reduce even more some building's energetic consumption, existing standard gas boilers were replaced by condensing boilers offering up to 97% efficiency.

This project depicts the ambition and professionalism of Geo-Energie as a professional engineering service supplier. The firm provides its clients with great innovative and environmentally friendly integrated solutions related to mechanical or energy management, from Coast to Coast.

Globally, the project allows an energy saving of 66 000 gigajoules (18.5 millions kWh) annually.





Projet: Sorel-Tracy Detention Facility  
Sorel-Tracy, Québec



The new Sorel-Tracy Detention Facility was inaugurated on May 23, 2017. The Institution has eight lodges for a total of 300 spaces. In addition, an additional 80 places are distributed in dormitories for people serving an intermittent sentence.


This new suburban-type construction makes it possible to better meet functional requirements and security needs. Cost of building design, construction, maintenance and asset maintenance for 30 years: \$ 267.1 million in present value.

Geo-Energie was commissioned to design and supervise the installation of the innovative geothermal heat exchanger. Indeed, because of the particular geological conditions, making a conventional vertical design very inefficient, Geo-Energie proposed a horizontal closed-loop design of "Slinky" type in hybrid primary-secondary configuration. There are 10 groups of double Slinkys in parallel, containing more than 44 kilometers of pipes.

The geothermal heat exchanger of this project, with a 9 football fields covering area, makes it the largest horizontal geothermal heat exchanger of its kind in Canada.



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*Ingénierie, design*



Project: Le Mistral and St-Hubert Schools  
Rimouski / Mont-Joli, QC




The energy efficiency program launched for two educational establishments by Des Phares School boards, gave positive results beyond expectations. Des Phares School Board received an Excellence Mention from Hydro-Québec for the performances reached by Mistral School of Mont-Joli. It was ranked among the three finalists in the Institutional Category for the best energy saving's project. Energy savings reached during the first year of the program exceeded the previsions by 24%. Targeted savings were 600 000\$, the real ones reached 745 000\$.

Geo-Energie was mandated by Technika-HBA to provide design and supervision services for all geothermal exchangers and heating production plant. On Geo-Energie's advises, the client accepted that all mechanical equipment be pre-assembled into a functional system, before its delivery. It was the first Quebec's school project to be lead on this basis of design. This new approach played a key role in the project's success and budgetary target compliance.

Principal stake was to convert the existing heating system without interfering in the everyday operation of the school and assuring the student's security. The adaptation of the existing distribution system to a low temperature operation was an ambitious challenge proudly met by the team.



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*Ingénierie, design*



Project: Salus Ottawa  
Clementine street, Ottawa



Ottawa SALUS is a community-based, volunteer directed, private non-profit housing organization. Salus offers a range of supportive housing options for adults with serious mental illness and concurrent challenges including addictions, homelessness and cycles of hospitalization. Salus housing helps provide a stable environment where people can become part of a community and be supported in their journey to independence and happiness.

Salus-Clementine project, allows the organisation to offer another 42 housing units to its clientele. This four-storey, 42 units, apartments project was ambitiously developed with one of a kind well being and environmentally responsible targets. As such, it employs a light frame structure and state-of-the art technologies to reach a LEED Platinum Mid-Rise Housing, and European Passive House standard. This makes Salus-Clementine the world's first light frame, multi-residential building in northern climate to reach Passive House certification. As a pioneering project, it was closely followed by governmental and institutional entities, looking forward lessons learned from this ambitious construction process.

Geo-Energie was mandated by Salus Ottawa to act as a third-party commissioning agent. The enhanced commissioning mandate aimed at overseeing every phase of the project, from initial design charrette to near year-end review and video-recording of staff training sessions.


This project also required pioneering in energy efficiency measurement and testing. As such, Geo-Energie developed the first VDI-4707 & ISO-25745 compliant elevator testing programs in North-America.



*Where Hope Finds a Home.  
Là où l'avenir trouve un chez-soi.*



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Project: Hyatt Hotels, Claridge Home - Andaz  
Ottawa, ON


*Hyatt Hotels Corporation, in partnership with Claridge Homes, have recently inaugurated a brand new Hotel in Ottawa. Located in Ottawa's famed Byward Market neighborhood this new Andaz Hotel is surrounded by more than two dozen embassies and consulates. Its 17 floors, nearly 200 rooms, also feature a destination restaurant, six Andaz Studios for meetings, and a rooftop bar offering panoramic views of the city.*

State of the Art technologies in cooling, heating and energy recuperation allow Andaz's clientele to benefit from a comfortable and ecologically responsible building environment.

Geo-Energie acted as the Commissioning agent within an *Enhanced Commissioning Program*, to follow the entire project construction, elaborate technical solutions to problems, coordinate HVAC/Electric system start-ups and provide complete training to Andaz technical staff.








Projet: CCOC - 143 Arlington  
Ottawa, Ontario



Centretown Citizens Ottawa Corporation (CCOC) is a private non-profit housing corporation founded more than 35 years ago and provides nearly 1,600 housing units in 54 different properties in the greater Ottawa area. CCOC and its partners have embarked on the ambitious project to offer social housing rental units geared towards sustainable development. 143 Arlington Street in Centretown will be Passive House certified. In this sense the building envelope and electromechanical systems have been standardized to reduce the energy and environmental footprint of the project.

Geo-Energie was commissioned by CSV ARCHITECTS for the mechanical and electrical design (plans and specifications) for this 16 apartment building. "143 Arlington Street in Centretown" is a hybrid and superimposed townhouse configuration.





Project: Westcast Industries  
Wingham, ON



Westcast is the largest global manufacturer of cast exhaust manifolds and turbocharger for passenger cars and light trucks. Wecast has manufacturing facilities, sales offices and engineering centres in North America, Asia and Europe. At Wingham's casting plant (Ontario), seven (7) inductive electric furnaces, totaling 18.3 megawatts and 77 000 metric ton capacity, are used to melt iron. A hybrid dry cooler / cooling tower system is used to cool down all furnace and inductive current generating equipments.

Geo-Energie provided energy consumption analysis / improvement solution track's development for the cooling plant, under the Save On Energy (Ontario) program.



Project: Excellence Peterbilt, phase #1  
Laval, QC,



Founded in 1967 by Gabriel Lussier, the Society's activities were initially centered on used & recycled trucks parts, and renovated parts. Lussier's Group enjoyed, during the last 50 years, an incredible growth. The visionary competence of his founder made his Group adaptive to its client's growing needs. Doing so, Lussier's Group diversified his activities to include Truck Dealership, under the highly reputed Peterbilt's banner. The construction, in 2007, of Laval's dealership includes 1 100 m<sup>2</sup> in office space and a 1 780 m<sup>2</sup> service area. The entire building is heated and cooled via geothermal energy.

Building's thermal loads are about 150 tons (527 kW) in cooling and 210 tons (738 kW) in heating. At the time, Peterbilt pioneered the industry by being the first in Quebec to install a Regent-Eco air exchanger system. A 7.64 l/s (28 000 cfm) fresh airflow is being pre-treated by two large HRV, independently feeding the office and services areas.

The office space is provided with a network of sixteen heat pumps ensuring heating and cooling capabilities, year-round.

The geothermal field counts no less than 40 wells, totalizing over 6 kilometers of vertical drilling.

The garage is entirely heated with radiant floor. Even the service pits are radiant floor heated. Furthermore, it is one of the first air-conditioned truck service center in eastern Canada thanks to cooling coils. Summertime comfort in the service area was a client's requirement.

The control system is entirely centralised via BAS and is user friendly for the owner.

Globally, this state-of-the-art system allows Lussier's Group to save 1 600 MWh per year. Geo-Energie was the engineering firm in charge of every electro-mechanical design aspects of this unique project.

Central heat pumps



Geothermal field



Mechanical room



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Projet: STCH Inc.  
Chateauguay, QC, phase #1, #2 et #3



Specialized in Transportation's Logistics, STCH is a company that has been growing steadily since its founding. In 2005, anticipating and constantly adapting to the rapid transformations of the industry, STCH decided to expand in a brand-new head quarter. Located in Chateauguay, QC, the 3-phase construction includes 700 m<sup>2</sup> of offices and 10 500m<sup>2</sup> of warehouse, all fully heated and air conditioned by geothermal energy.


All premises are served by three partially independent systems totalizing 78 tons (275 kW). Geothermal fields comprise 3 000 m of boreholes. Warehouse areas are fully heated by radiant floors. These radiant floors allow, in summer, passive thermal recharge of the field while providing, at no extra cost, a more comfortable working environment and a temperate warehouse space. Moreover, radiant floor strategy paid off by offering less than 2°C difference between floor and ceiling level, 12 meters above. This significant benefit allows more storage flexibility for temperature-sensitive products.

Office spaces combine radiant floor heating with hydronic fan coil systems for heating, cooling and dehumidifying. Three heat recovery air exchangers maintain the air quality of the workspaces while allowing significant energy savings. The control system is fully centralized and allows the user a user-friendly access. The integration of the geothermal systems serving the various phases of expansion of the premises was carried out in such a way as to minimize the duplication of the additional heating equipment while optimizing the energy saving. On its own, the third phase of expansion has allowed the homeowner to save 184,000 kWh per year, or about 55% savings compared to a standard storage area.

Geo-Energie was repeatedly mandated by STCH to design every mechanical element of the project. **The exceptional design performance and quality of this project was recognized in 2013, by the Canadian GeoExchange Coalition prize for Excellence Achievement.**



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Project: Strøm Spa Sherbrooke  
Sherbrooke, QC



Strøm Spa has recently opened a facility in Estrie, Sherbrooke.

This \$ 7 million project includes multiple services and equipment dedicated to the comfort and relaxation of its customers but also to the well being of its employees and respectful of the environment.

This is a building with a dozen massage rooms and relaxation areas, spacious locker rooms, bistro and a commercial kitchen, and sauna was built, together with several outdoor hot and cold pools and an annex building with steam room and relaxation room.

For this project, Géo-Énergie worked closely with the architect firm Lemay Michaud to issue electro-mechanics plans and specifications of the entire project. The mandate included HVAC, electricity, plumbing, thermo therapy, site monitoring and coordination of a commissioning program. Geothermal energy is used for heating and cooling all outdoor bassin and snowmelt system for 300m<sup>2</sup> of pathways. VRF Heat-Pumps are providing year round heating and cooling capacity to every interior zones.

Throughout the design process, Géo-Énergie has been interacting with professionals. The goal being to achieve the most energy savings possible, the entire design was turned in the optics to create an efficient and low-energy system. Energy recovery is widely used in this project.

