

# Cadillac Fairview Geo-Exchange

## Case Study

### Challenge

The Cadillac Fairview Corporation Limited is one of North America's largest owners, operators and developers of commercial real estate. Cadillac Fairview focuses on developing and managing high quality office, retail and mixed-use properties in Canada and the United States, as well as international investments in real estate companies and investment funds.

With a portfolio valued at more than \$23 billion, Cadillac Fairview and its affiliates own and manage nearly 44 million square feet of leasable space at 75 properties across North America, including some of Canada's landmark developments, such as Toronto-Dominion Centre, Toronto Eaton Centre, Pacific Centre and Chinook Centre.

Cadillac Fairview is wholly-owned by the Ontario Teachers' Pension Plan, which invests to secure the retirement income of 307,000 active and retired teachers in Ontario.

Four years ago, Cadillac Fairview conducted a feasibility study on installing Canada's first geo-exchange system in an occupied 17-storey office tower in downtown Vancouver. The system would serve both 777 Dunsmuir Street and the adjacent Pacific Centre shopping centre, in downtown Vancouver, a combined area of 471,000 square feet. The project would establish Cadillac Fairview as a sustainability and innovation leader in the city, enhancing their brand in the market.

Geo-exchange is a process which involves using the consistent temperature of the earth to store captured heat, typically vented from the building. The heat is stored in a field consisting of pipes inserted in the ground. This energy is used to supplement the regular methods of heating or cooling a building, while dramatically reducing the carbon emissions produced.

With the commercial real estate market changing and new buildings and office space coming onto the market, Cadillac Fairview is focusing on innovative retrofits to keep their buildings competitive and reduce their environmental impact. Leveraging a prior relationship, Cadillac Fairview engaged JLL's Project and Development Services (PDS) team to provide full project management services to oversee the implementation of 777 Dunsmuir Street's new geo-exchange system.

### Solution

While geo-exchange is a tried and tested form of capturing and recirculating energy to a building, it has traditionally been limited to new construction. Where implemented on new projects, a shallow geo field is commonly installed immediately below or adjacent to the building. Fēnix Energy, the design-build contractor, sought to do something different, taking full benefit of the consistent geology below downtown Vancouver. Their unique low-clearance drilling rigs allow them to drill down vertically within the building's underground parkade, drilling 30 boreholes 400 feet into the earth.

To ensure zero impact to the building's occupants and retail shoppers, JLL faced several unique logistical challenges. All drilling was scheduled afterhours to avoid both acoustic and vibration transmissions to the parkade users. The layout of the bore holes and the associated piping overhead had to be carefully strategized due to the parkade's limited vertical clearance and to minimize any lost revenue from occupied parking stalls.



### Client Profile

**Industry:** Commercial Real Estate

**Geography:** Vancouver, BC, Canada

**Square Footage:** 471,000 s.f.

**Length of Relationship:** 4 Years

### Services Provided

- Project management
- Building retrofitting



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### Results

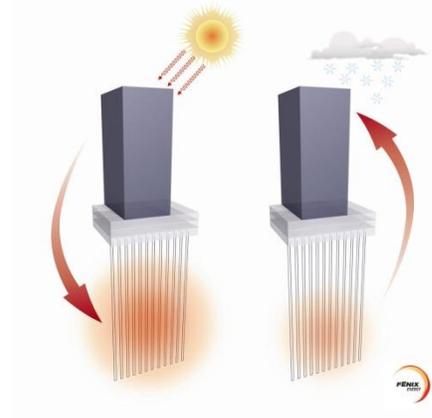
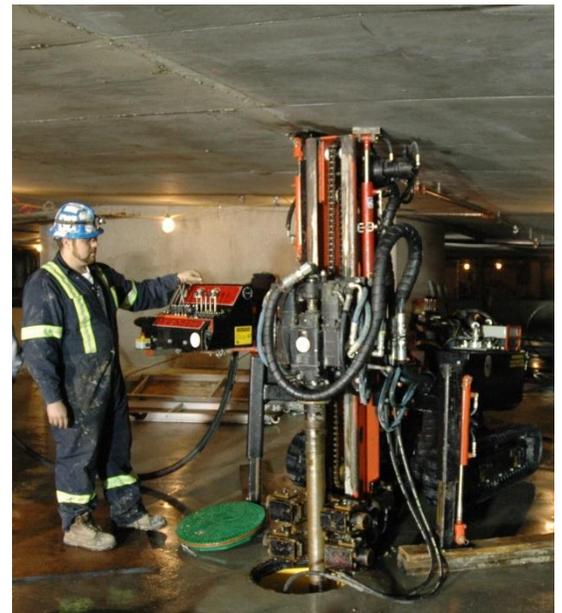
The scope and caliber of the project was complex. To effectively deliver, JLL acted as a catalyst, working closely with the various stakeholders. Completing the project on time and within budget was critical, and JLL applied PDS' best practices to keep the project on track.

Not only did the project align with Cadillac Fairview's corporate sustainability initiatives, it provided an alternate energy source to the building and created significant financial savings.

The successful retrofit of Cadillac Fairview's building is expected to reduce carbon emissions from heating energy by up to 85 percent, the equivalent of 900 tons of CO<sup>2</sup> or taking 190 cars off the road. Investment in the new technology is scalable to other large existing buildings in the downtown core. For 777 Dunsmuir Street, the size of the geo field could be increased in the future to store and provide heat for adjacent buildings.

### Value-add

JLL identified the prudence in exercising thorough due diligence early in the project. PDS advised and guided Cadillac Fairview on engaging an independent third-party engineer to perform a peer review on the design and projected performance of the system. As a result, the proposal for geo-exchange was backed by third-party qualification and it led to the approval of the business case within Cadillac Fairview, finally moving the project off the drawing board and into the parkade below 777 Dunsmuir.



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