

WestJet Corporate Campus

Energy Pile GeoExchange System



Who We Are

ThermaStor Solutions Inc. ("TSS") is a specialized engineering firm advancing geothermal and energy storage, delivering superior building lifecycle performance while supporting ambitious environmental targets. Our patented low-clearance drill rig enables geothermal retrofits even in constrained urban sites such as underground parking garages, unlocking decarbonization opportunities for both new construction and existing buildings. By integrating advanced hot and cold underground long-duration thermal storage (LDES) with base-building design conditions, we create unique HVAC demand management strategies that can reduce cooling-related electrical demand by up to 80% during peak hours and shift thermal production to higher-efficiency off-peak periods. This innovative approach provides a compelling financial case while ensuring grid-friendly, resilient, and scalable decarbonization solutions.

Contact:

Evan Ericson, Director
ericson@thermastorsolutions.com
587-998-4090

Year	2009
Client	WestJet Airlines
Project Location	Calgary, AB
Building Size	~314,000 SQFT
Contract Size	\$ 80,000 CAD
Project Size	\$ 600,000 CAD
System Size	545 tons



Lead mechanical engineer and piling contractor reviewing how the caisson piles are having geothermal piping attached to the rebar. Photo taken by the lead geothermal engineer.

ThermaStor Solutions' founding team (with previous firm) led the geothermal system design for WestJet's iconic head office campus, delivering the first-ever implementation of energy piles in Western Canada. The system used structural caissons as dual-purpose thermal piles, embedding heat exchange piping directly into concrete foundations.

This innovative approach eliminated the need for conventional boreholes, reduced capital costs, and maximized heat transfer via the thermal mass of the building's deep foundation.

A hybrid geothermal system was engineered to provide up to 545 tons of heating and cooling capacity, enabling year-round thermal balance through heat pump integration and on-site energy storage. The project achieved high energy savings and carbon reduction, contributing to the facility's LEED Gold certification and delivering long-term

operational resilience. TRNSYS modeling informed lifecycle cost projections and validated energy performance, while the system's integrated controls optimized efficiency.

This pioneering design showcases the durability and effectiveness of energy pile-based thermal infrastructure.

Lessons Learned

The concrete caissons must be filled from the bottom up to avoid damaging embedded borefield piping. Early coordination between structural and MEP disciplines is critical when integrating energy piles into foundation design.