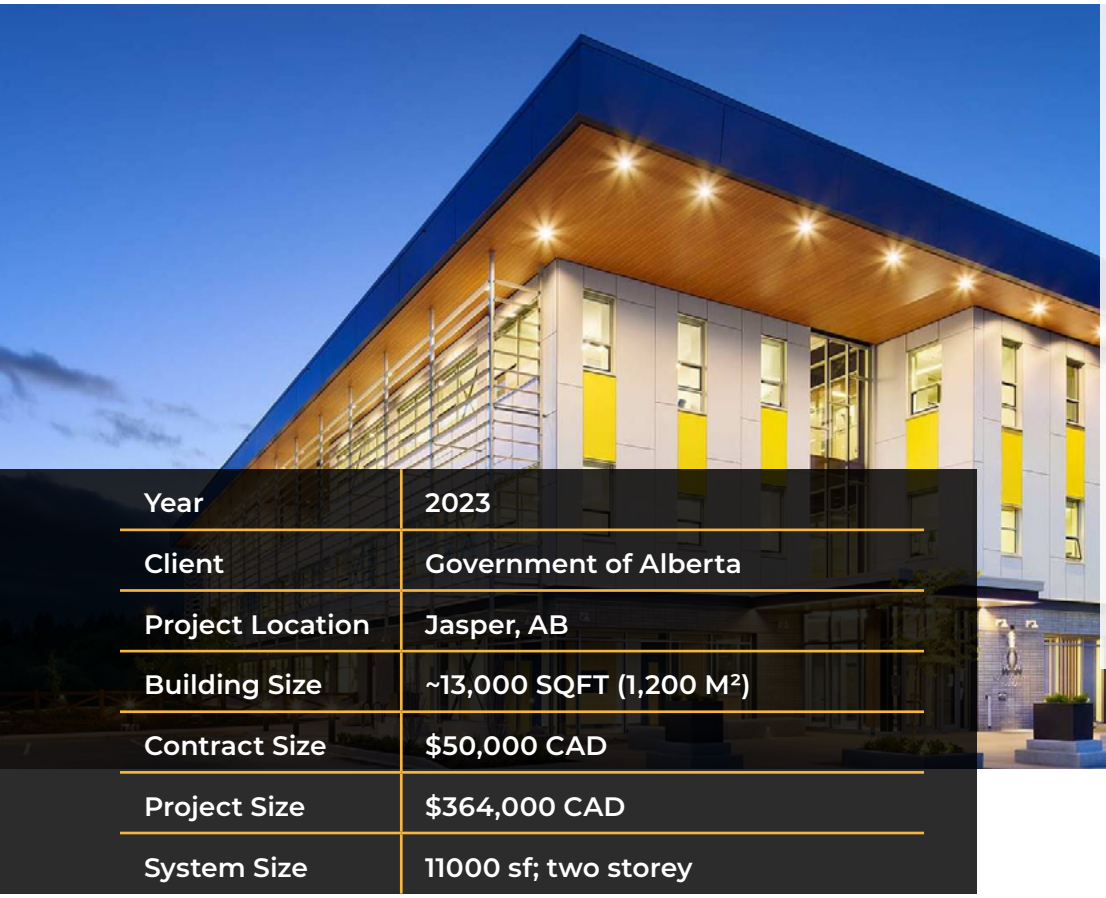
RCMP Detachment

Net Zero with Borehole Thermal Energy Storage



Year	2023
Client	Government of Alberta
Project Location	Jasper, AB
Building Size	~13,000 SQFT (1,200 M²)
Contract Size	$50,000 CAD
Project Size	$364,000 CAD
System Size	11000 sf; two storey

Who We Are

ThermaStor Solutions Inc. ("TSS") is a specialized engineering firm advancing geoexchange 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.

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ThermaStor engineers provided engineering support (with previous firm) for the integration of a Borehole Thermal Energy Storage (BTES) system at a confidential new-build RCMP detachment located in Jasper, Alberta. The facility, targeting Net Zero performance, required a resilient and low-emission energy system that could withstand extreme mountain climate conditions while minimizing lifecycle operating costs.

Working closely with the design team, TSS engineers contributed to a high-performance mechanical strategy incorporating PVT (photovoltaic-thermal) panels, a vertical borefield, and hybrid air- and water-source heat pumps. A pair of thermal response tests were conducted on pilot boreholes to validate in-situ thermal conductivity and inform the final system sizing. The BTES system was optimized to deliver long-duration thermal storage, leveraging renewable energy sources for both heating and cooling throughout the year.

This project demonstrates the effectiveness of combining multiple energy technologies to achieve deep decarbonization goals, even in remote and climatically challenging locations.

Lessons Learned

Early thermal testing of pilot boreholes proved essential not only for refining system sizing, but also for building confidence among stakeholders unfamiliar with seasonal storage technologies. Transparent validation of performance assumptions helped align expectations and streamline regulatory and funding approvals.