



BILLY HALCROW SUBDIVISION

An ingenious use of a geothermal system saves energy and reduces construction costs

With a growing population of more than 6,200, the Cross Lake Band of Indians (CLBI) faces a substantial housing backlog. Like many communities aiming to create affordable housing, the Band has limited funds. As well, Cross Lake is 450 km (280 mi.) north of Lake Winnipeg, Manitoba, where winter temperatures often dip to -40°C (-40°F), so conserving energy and money are essentially the same thing.

The Band contracted White Horse Management Group to create a new subdivision on the Cross Lake reserve, partnering with Southern Comfort Mechanical, Inc, which specializes in geothermal heating. Together, they arrived at a design that would build on a thickened-edge concrete slab interlaced with pipes to allow for geothermal heating and cooling—which is safer and saves on operating costs. Slab-on-grade construction helps prevent flooding and avoids the use of sump pumps, which can be prone to failure. Perhaps most importantly, geothermal heating would substantially reduce the burning of fossil fuels both during construction and in the operation of the house; this attracted \$4.4M in funding from Manitoba Hydro, which has been promoting green and efficient energy solutions for Manitobans.

However, curing concrete slabs in cold weather remained a challenge. Traditional heating methods were energy-intensive and created an uneven cure. The engineers proposed an innovative solution: why not use cheaper, movable propane water heaters and run a warm glycol fluid through the slab?

Through the use of in-slab heating and construction of a cover-all enclosure, the heat would spread evenly through the slab, and contribute directly to the curing, rather than heating the surrounding air. Ultimately, the concrete slabs cured in 3–4 days, with a daily heating cost reduced to \$124 from \$584, and allowed construction to run continuously, translating into a savings in labour and more efficient use of equipment.

The Billy Halcrow Subdivision is an affordable group of 34 three-bedroom housing units with the usual amenities of a rural neighbourhood, such as paved roads, piped water and sewer and street lighting—and a geothermal heating and cooling system that is unique in First Nation communities in Canada. But the subdivision might not be unique for long: other communities are interested in replicating CLBI's success, and Band representatives have been invited to give presentations about it across the West and on Aboriginal Peoples Television Network.

Key facts

- Target group: low-income Aboriginal families
- 34 three-bedroom units (eight four-plexes and one duplex)
- Cost to build: \$230 per square foot
- Cost to rent: \$344 per month

Contributors

- Cross Lake Band of Indians: infrastructure contribution
- Manitoba Hydro: funding
- Indian and Northern Affairs Canada: infrastructure contribution
- Canada Mortgage and Housing Corporation: funding through the On-Reserve Non-Profit Housing Program

Billy Halcrow (1951-2008)

One of the driving forces behind the Albert's Lake Subdivision was Billy Halcrow, a CLBI community planner who was responsible for the overall design. Tragically, he did not live to see the results of his work; he was killed in a car accident in June 2008.

Still, the partnerships he developed created a team that recognizes his contribution; they re-named the subdivision (originally the Albert's Lake Subdivision) in his honour.

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