DELIVERING A GREEN SCHOOL

BY STEVE WEATHERBE

Three years in the making, the Nak'azdli Band's new Nak'albun Elementary School in Fort St. James is welcoming its first 115 students this September. Designed by Evans Architecture, the 25,000 square foot building design is based on green building principles featuring natural ventilation and a geo-exchange heat source.

As students settle into their new classrooms, the finishing touches are still being done by some of the 52 sub-contracts.

That includes RL7 Mechanical of Williams Lake and J.C.Waterworks of nearby Vanderhoof, which each landed $2-million shares of an overall $12-million contract with the Nak'azdli.

"Why so many trades?" ponders J.C.Waterworks owner Jim Moon. "I think they knew that the contractors around here would have been overwhelmed by the scale of this project if they had been doing more than one part of it."

Several successful bidders, his own firm included, had the experience to do several other components of the job.

Why three years? Winter is one reason, plus the lack of urgency, since the band's existing school was still usable. "We just decided that working through the winter wasn't necessary," says Moon. Fort St. James sits under 20 inches of snow all winter.

J.C. Waterworks performed all the civil work including foundations, sewers, natural gas as well as electrical conduits for the school, its parking lot and driveway, and laying the pipes up to the building, where other trades took over.

One challenge with the site was drainage during construction given the 269 mm of rain the town gets during the work season.

"Because I'm originally a pump guy," chuckles Moon, "I know when I don't need a pump. [Instead, we created a gravity system], to collect the rainfall, pass it through a 'French Drain' of large rocks, and into a retention pond."

The retention pond raised a second challenge: site contamination with diesel fuel residues from the school's heating system over many decades.

"Certainly in the past people weren't as careful as they are now about such things," says Moon diplomatically.

The drain water proved to be clean, however, so using a pump in the end, the pond was emptied. But concern about contaminants over the long term was addressed in the design.

A specialist contractor came from Edmonton to lay a rubber seal beneath the structure's concrete slab to repel toxic diesel fumes, while J.C. Waterworks' crew laid a network of perforated pipe between the slab and flooring — to collect anything that got through the rubber and concrete. A fan vents the pipe outside, where an attached monitor is showing. So far, the vapour management system has not collected or had to abate any contaminants

What the J.C. Waterworks crew did turn up was artifacts from the early days of Fort St. James, before the first townsite of log cabins was bought by the Catholic Church for the original school and Our Lady of Good Hope Church, built in 1857 and still standing.

"We found the shoemaker and turned up a bunch of shoes, and elsewhere some enamel cookware," says Moon.

The church was an issue or rather its towering steeple. "My contract called for me to build a driveway near it, including drainage, but I refused to do it. That steeple is 100 feet high. I didn't want to bring it down. The church foundation is just wood," he said. The plans were redone.

Working on a project this big for this long has its downside. "The good news is what it does for the firm's bottom line," says Moon. "The bad news is that we've had to neglect our service work, which is our bread and butter when there are no contracts."

Moon tried to find a journeyman plumber to do repairs but failed. Happily, because gold and copper mining has been booming in the region, work has been abundant. And as the Nak'albun job comes to an end, Moon has been bidding again, and is waiting word on at least one likely prospect.

Moon and his wife started a plumbing firm 31 years ago and sold it a half dozen years later and started J.C. Waterworks. While "pumps and hydraulics" were his first specialities, he has needed to diversify to keep his company viable.

Another crucial player on this project was RL7 Mechanical owned by Ron Whittingham, which won the contract to install the plumbing and innovative, integrated, radiant floor heating and venting systems.

Likening the heating and ventilation system to a wind tunnel, foreman Quintin Duhamel describes how the design called for a three-storey-high wooden tower to be built between the renovated gymnasium and entirely new school that used the convection created by strong and constant winds blowing off Stuart Lake to draw fresh air into both structures, distribute it through vents in the building's four-foot thick concrete slab to all the rooms and on outside. Passing through the slab the air is heated by the hot water pipes embedded there, which are also heating the floor itself.

Kai Laukien of Linear Services of Prince George, who helped Whittingham's crew set these systems up, explains how the water is heated in two ways: primarily by a geothermal system using pipes buried under the school's soccer field filled with an environmentally-benign heat transfer fluid to tap ground heat. A heat pump then transfers the heat into the water circulating through the slab. A second heat pump reverses the process. A boiler heated by natural gas provides backup while a computer monitors and optimizes the system.

School principal Diana Erickson says students and staff are all "thrilled" with their new school, which has a capacity of 160 in eight classrooms with space for another 30 children in a nursery. Funding came from Aboriginal Development and Northern Affairs Canada and the band itself. PM