

A lot of determination and a little luck:

Cliff Heating and Cooling Plant is brought back on line in record time



On October 19, an explosion tore through the Cliff Street Heating Plant. Although the 90-year-old building was declared structurally sound soon after the event, the sophisticated mechanical equipment it housed—which supplied heating and cooling to more than 50 Government of Canada buildings and more than 50,000 federal employees—was beyond repair.

It didn't take long for facilities managers at Public Works and Government Services Canada (PWGSC) to recognize they had a potential catastrophe on their hands. Winter was fast approaching and the department faced the unenviable prospect of being unable to supply buildings such as the Supreme Court of Canada, the Bank of Canada and the Department of National Defence headquarters with heat. Happily, engineers from PWGSC were able to install additional boilers and increase the heating capacity of the Government Printing Bureau heating plant to address the load for the first weeks of the heating season. The solution, however, was always a temporary one. Cliff Plant's heating and cooling capacity needed to be restored—and quickly.

Phase one: more than just boilers

To accomplish this massive task, PWGSC's procurement team appointed PCL Constructors Canada and Genivar to assemble a team that would manage phase one of the project: the design and construction of a temporary steam plant adjacent to the Cliff Street facility. The job wasn't going to be easy. To heat 52 buildings, the new building required a capacity of 310,000 lbs of steam per hour. The construction

team was asked to source four boilers that could fill the bill in short order—and have this sophisticated equipment installed and tested to the highest safety standards in a matter of weeks.

Peter Jowsey of Black & McDonald—the project's prime mechanical contractor—recalls discussions about the project schedule in a meeting in late October. The project team wanted to have the temporary plant fully operational by December 4.

“At the time, I thought the schedule was insane,” he recalls. “The scope of the job wasn't established. We didn't even have any design documents prepared. Even if all of these things were done, I would have still balked at the schedule.”

David Coyle, building systems manager with PCL, says his team wasted no time tracking down the boilers.

“We got the call to find these boilers at 3 p.m. on a Tuesday and we sourced them within two hours,” he says. “That's amazing. These aren't machines that you just pick off a shelf. They can take months to find.”

Early on, the project's exact scope was far from certain. While the construction team knew it had to install new boilers, the methods it would use to execute that task were up in the air. For example, a site investigation showed that the team's original plan to install the new boilers in a parking lot behind the plant was flawed. Genivar's engineers reported that the existing asphalt wasn't stable enough to bear the load from the boilers. Therefore, a new slab had to be designed and installed right away.



“We caught a bit of luck,” says Coyle. “The weather in late October and early November was ideal for pouring that slab. And the team at Genivar designed us the perfect solution for the site.”

A new slab in place, the construction team was able to move quickly on the process of installing the boilers—itsself no small task. The units arrived on site on November 13, leaving the team little more than three weeks to install and commission the equipment. Undaunted, the construction teams worked around the clock to deliver the job. It wasn’t uncommon, Coyle says, to see people on the site as early as 6 a.m. and as late as 11 p.m. Some of the team’s key managers worked through the weekends to ensure the project’s minutest details were addressed.

One of the project’s principal group of unsung heroes was the team at Black & McDonald’s Ottawa fabrication shop. Two shifts of as many as 16 people worked nine- and 10-hour days to build the steam lines, condensate lines, natural gas header and support structures to ensure the boilers could be tied into the existing systems.

“Such an aggressive schedule demanded not only that we make sure our employees didn’t burn themselves out, but also that our office didn’t compromise the projects it was completing for other clients,” says Jowsey. “But I didn’t get a single complaint from anyone, so we did something right!”

As work progressed on the boiler installation, the construction crew began design on a structure in which to house the equipment. By all accounts, the approach appeared to be backwards. Conventional wisdom suggests the team builds a shell in which to house the boilers and then installs the

machinery. That wasn’t the case with this job, where the boiler installation was by far the most critical project element.

Again, Genivar was called upon to deliver a detailed structural design in short order. Materials were sourced rapidly and construction of the steel-framed building proceeded quickly.

“We had the shell installed and the building enclosed in less than a month,” says Coyle. “It was incredible. The task of coordinating two very different aspects of a tricky construction project that involved 80 trades workers on a tight schedule was unbelievable.”



Phase one of the temporary Cliff Plant went online on December 8. Although the team missed its December 4 deadline, Coyle said the group took its time to ensure the system worked perfectly before it concluded operations. Winter's warm start gave the team the luxury of extra time at the end of the installation to ensure all deficiencies were corrected before the system was brought online.

Phase 2: experience pays off

Flush with the success of their work on the first phase of the Cliff Plant project, the construction team from Genivar, PCL and Black & McDonald bid on and won phase two of the Cliff Plant project. The scope of this phase saw the team source and install the superheated steam boilers that drive the Cliff Plant's turbine chillers.

Just as in phase one, the construction team got lucky early. Coyle says PCL approached the same Illinois-based company that supplied the boilers in the first phase of construction about supplying more machinery for the second phase. Again, the supplier came through in short order. And when the time came to design a solution to install and commission the new machinery, the team was fortunate to be able to re-use many of the systems it introduced in the first phase of construction.

"We had a much better idea of what we were getting into during phase two," says Coyle. "The lessons we learned in phase one helped make phase two a success."

As planned, the team delivered the completed second phase of construction by its April 15 deadline. Again, the weather cooperated to the extent that the team was able to work outdoors with few, if any, delays. It was just as fortunate that none of the buildings to which the Cliff Plant supplies chilled water needed air conditioning before May.

Cooperation was the key

It goes without saying that a demanding project requires the full commitment of the entire project team. That was exactly the case in both phases of the Cliff Plant project. Coyle and Jowsey report that every individual from all the members of the construction team kept their focuses on the end goal. And no matter the day or the time, key people made themselves available to ensure the job wasn't delayed.

"On most projects, you talk about making decisions in days or weeks," says Coyle. "In this case, we talked in terms of hours. We had people from PWGSC, Genivar, Black & MacDonald, Wired Synergy and PCL resolving complex problems in a matter of minutes when we needed them to. It was a dream project in that respect.

"Really, this job would not have been a success without leadership from the PWGSC teams and Genivar. They were instrumental to the project's success."



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