O'DELL ASSOCIATES INC.

Canadian Centre for Inland Waters

The Canadian Centre for Inland Waters (CCIW) is an Environment Canada building located in Burlington, Ontario. The CCIW staff conduct environmental research aimed at better understanding and predicting the effects of contaminants and other substances on our water systems, which plays a major role in the management of the Great Lakes and other water ecosystems.

In late 2015, Mattina Mechanical began construction in the facility. This included rejuvenating some of the more outdated mechanical systems as well as installing new ones for repurposed areas.

The Challenge

Since this was an existing building with current employees working, there were many time and space restrictions that needed to be addressed.

The main air handling unit (AHU), which was in need of a fan upgrade, was located in the building's mechanical room. The existing supply and return fans were too large for a direct replacement to fit through its double doors, so an alternative fan selection was required.

In addition, the building itself had inadequate humidification and the winter months led to very dry rooms. This not only influences the outcome of lab procedures; it can also cause adverse health issues if the rooms are not maintained above a suggested minimum relative humidity of 35%.

Another challenge was the fact that the existing fume hoods all had their

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own dedicated exhaust fans, which were also located in the mechanical room. These fans were inefficient, needed replacement, took up a lot of space and provided zero redundancy if one were to fail. A failure for just one of these fans could create unwanted downtime for the lab technician working under that fume hood.

The O'Dell Solution

By working with our vast line of product offerings, we were able to come up with a solution to each on of the project's challenges.

The AHU replacement fans needed to be small in dimension while also providing large quantities of air at high static pressure. PennBarry's line of plenum array fans allowed for us to provide 73,000 cubic feet per minute @ 6.0 inch water gauge, using just five fans set up in a pyramid-like array with three fans on the bottom and two fans centred on top. The largest dimension of these fans was 48 inches, which fit easily through the provided door.

The low relative humidity throughout the building was addressed by retrofitting new humidifiers into the existing AHUs. The Nortec line of SETC steam exchange humidifiers were utilized by taking advantage of the accessibility of plant steam and safely turning it into clean atmospheric steam through its stainless steel heat exchangers. Where plant steam was not available, a Model GS gas-fired humidifier was used, which included Nortec's new line of high-efficiency condensing-style humidifiers, which allowed for savings for the owner—not just through energy costs, as the system is over 10% more efficient than any current competitors' gas-fired humidifier—but also through installation costs because the condensing style systems allow for CPVC venting to be used instead of expensive stainless steel venting.

For the fume hoods, Plasticair's SKYPLUME was a great solution as it addressed all the concerns of the older-style exhaust fans. The FRP construction warranted a long system lifetime due to its resistance to the corrosive chemicals used in the labs. Also, the high-velocity dilution exhaust nozzles ensured that all fumes being extracted from the building would be done so safely, with low concentrations of caustic chemicals. The three-exhaust stack arrangement allowed for 100% redundancy as well as the potential for higher exhaust rates for future building expansion. A run around glycol loop was installed in the inlet plenum of the fan, which was used for heat recovery going back to the loop in the building's main AHU. This system was also installed outdoors, opening up much needed space in the mechanical room as the twenty-two existing fume hood fans could be removed.

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