

LANDMARK SAVINGS

tvo
A COMMERCIAL
FACILITY
CASE STUDY



Managers at 2180 Yonge St. were outside their comfort zone in selecting Design Envelope pumps with integrated controllers, but it turned out to be the right decision. The energy savings and reduced carbon footprint of the building represent an achievement they can be proud of.

2180 Yonge Street

Armstrong Design Envelope Vertical In-Line pumps operate at variable speed in response to system demand using demand-based control and variable speed. Design Envelope technology, combined with advanced control features, make part-load operation extremely efficient and yield a quantum improvement in HVAC efficiency.

Background

2180 Yonge Street is a complex of three inter-connected office buildings located in downtown Toronto. The complex includes a small shopping concourse, an office tower and a multiplex cinema.

Constructed in 1972, the office tower at has 18 floors and a total of 402,277 square feet (37,373 m²) of commercial office space. Armstrong supplied the pumps for the HVAC system. At the time, Vertical In-Line Pumps were a relatively new design, but the developers saw the benefits of floor space savings and maintenance savings and decided to try the Vertical In-Line configuration.

Forty years later, the building managers launched a project to upgrade the HVAC system to use variable speed pumps. After replacing some of the original pumps with pumps controlled by wall-mounted drives, they discovered they did not have sufficient space on the walls of the mechanical room to accommodate all of the required control boxes. The project managers turned to Armstrong when they learned that the Armstrong Design Envelope solution integrates the pump, motor and controller, eliminating the need for wall space.

Armstrong met with facility managers to discuss the requirements of the HVAC system and collaborated with the project engineers, The Mitchell Partnership, to select the Design Envelope pumps.

Review of the operating data revealed that the retrofit pumps with wall-mounted drives were oversized. Instead of pumps sized for 138 feet of pressure at 1700 GPM, Armstrong recommended Design Envelope 4300 VIL pumps sized for 136 feet of pressure. Post installation it was discovered that the maximum required pressure was actually 85 feet. Most days the pumps were operating well below that, and still meeting the demands of the system for both fluid flow and pressure. Some days the pumps were operating at less than 39 amps, or approximately 39 hp, 45% lower than the original design point.

Benefits

The Design Envelope pumping solution allowed the system designer to support the requirements of the HVAC system with a smaller pump and motor combination. The selection of the smaller pump operating at variable speed in response to system demand provided 50% energy savings over constant speed. This represents cost savings of approximately \$38,000 per year.

Tech-facts

Equipment list

- (2) Design Envelope 4300 Vertical In-Line pumps flow: 1700 USgpm, Head: 136 ft
- Flotrex FTV-8GA
- Suction Guides
- 75 hp motor

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