

# Truth in numbers:

## Sheppard Centre Apartments

The November 2015 issue of *RHB Magazine* included an article on booster pumps, and their impact on electricity bills in multi-unit rental properties. It described options involved with retrofitting older equipment, replacing existing systems with more efficient models, and using incentives to cover a portion of your project costs and improve payback. This article examines the reasons for, and the results of, replacing the booster pumps at Sheppard Centre Apartments.

“The current booster pump system worked, but it was very inefficient and used a lot of electricity.”

— Wolfgang Osada, President,  
RIKOS Engineering Ltd.

**Subject**  
Tandem Property Management owns and manages Sheppard Centre Apartments, located at 2, 4 and 6 Forest Laneway, which is situated near Yonge and Sheppard in the North York neighbourhood of Toronto. The towers were built between 1974 and 1976. The three buildings are 30 storeys tall and have a total of 1008 units.

**Issue**  
Each building used a 40-HP booster pump to circulate hot water, and was equipped with a 25-HP backup pump. The equipment was original to the buildings, and had been maintained over the years. The 40-HP booster pumps were oversized for the buildings, which was a common engineering practice at the time they were installed. They also operated at 100 per cent capacity at all times, which was very inefficient as capacity always exceeded the systems’ requirements. The booster pumps were equipped with pressure regulating valves (PRVs) that regulated water pressure and water flow.

“The current booster pump system worked, but it was very inefficient and used a lot of electricity,” said Wolfgang Osada, President, RIKOS Engineering Ltd. “Electricity costs were not a concern when the system was first installed. Today’s engineers are

also more capable of matching the size of the booster pumps to the building’s requirements.”

Tandem Property Management had been working with its consultants to evaluate its buildings’ plumbing and mechanical equipment throughout the complex, such as addressing pinhole leaks and replacing hot water boilers. Ownership had received a number of recommendations to upgrade its booster pumps with variable frequency drives (VFDs). They decided to look into other options to improve their booster pump efficiency.

“It was quickly realized that the method of repairing or replacing equipment with the same old parts just wasn’t the way to do things any longer,” said James Medeiros, Property Manager, Tandem Property Management. “We knew that there had to be a better way. We decided to work from the ground up, almost like constructing a new building. At the heart of any building’s plumbing are the booster pumps, and ours were extremely oversized and inefficient.”

**Solution**  
RIKOS’ engineers evaluated the buildings’ size, height and number of units and designed a more efficient booster pump system. They proposed replacing the two oversized booster pumps with three 7.5-HP booster pumps that were equipped with variable frequency drives (VFDs). Two booster pumps would alternate every 24 hours, while the third pump would serve as an emergency pump should the other two break down.

“The new booster pumps are much more efficient,” said Osada. “Our system’s variable speed drives enable the pumps to work at various capacities, from 30 per cent and up as needed. The pumps can provide more power during peak times and shut off completely when necessary. Since the pumps alternate and are not running all the time, they should also last longer than the original pumps.”

Once the project was approved and incentives were confirmed, RIKOS delivered and assembled the new booster pumps on site. It took less than three hours to cut out the old system and hook up a new electrical panel to the new booster pumps. Hot and cold water were shut off at 9:00 AM and were back on by noon the same day.

**Cost and incentive**  
RIKOS helped Tandem Property Management to apply for the SaveOnEnergy program, which is administered by Ontario’s Independent Electricity System Operator (IESO). The program provides incentives for up to 50 per cent of the cost to retrofit or replace booster pumps, up to a maximum of \$25,000. It cost \$36,000 per building to replace the booster pumps, so each building received



a rebate of \$18,000, for a total rebate of \$54,000.

The IESO had to pre-approve the project before it could qualify for the SaveOnEnergy program. Rebates are based on the projected energy savings from installing the new booster pumps. Since the incentive was greater than \$10,000, the IESO sent a third party to use flow meters and other tools to check the new booster pumps to ensure that the calculated energy savings were accurate.

**Savings**  
RIKOS calculated that the original booster pumps consumed about 897,453 kWh in electricity per year, while the new booster pumps would consume about 118,752 kWh per year. That resulted in an approximate 87 per cent reduction in annual electricity usage. At the current rate of \$0.14 per kWh, this reduced their annual electricity costs from \$125,643 to \$16,623, saving Tandem Property

Management more than \$109,000, or about \$36,000 per building. This meant that they would achieve payback on their investment in the new booster pumps in less than one year.

RIKOS calculated Tandem Property Management’s electricity costs and savings over the next 10 years, assuming that electricity rates would increase at five per cent per year. According to long-term projections, the new booster pumps are expected to save Tandem Property Management more than \$1.37 million in electricity costs over the next decade.

**Conclusion**  
Although the existing 40-HP and 25-HP booster pumps were working at the time, it made financial sense to replace the inefficient equipment with a set of three 7.5-HP booster pumps. The new system now operates more efficiently and produces significant long-term savings on the electricity bill – and with energy costs on the rise, savings will continue to increase. With the incentive from the SaveOnEnergy program, Tandem Property Management will see payback on their investment in the new booster pumps within the year.

“We are very satisfied with the final result,” said Medeiros. “Both the RIKOS team and their technology have proven to be a valuable resource. The project went so well that we are moving on to other phases, including replacing our hot water boilers and pursuing combined heat and power cogeneration.” **RHB**

By David Gargaro, in collaboration with  
Wolfgang Osada of RIKOS Engineering Ltd. and  
James Medeiros of Tandem Property Management Inc.

Sheppard Centre Apartments	
Project cost	\$36,000 per building
Rebate	\$18,000 per building
Annual energy savings	\$39,000 per building
Payback	Less than 1 year



# Truth in numbers:

## The Effort Trust Company

The September 2015 issue of RHB Magazine included an article on interior lighting, and how replacing your existing lighting with LED fixtures and bulbs can have a great impact on your building. It described different locations and types of lighting, potential energy savings and incentives to make the transition more affordable. This article examines the reasons for, and the results of, replacing interior lighting at buildings managed by The Effort Trust Company.

### Subject

Effort Trust manages more than 11,000 residential apartment suites in over 150 buildings throughout the Hamilton, Niagara and Kitchener-Waterloo regions. They brought in MultiLogic to upgrade the lighting in 36 of its buildings, which are located throughout the Hamilton area.

“We chose to work with MultiLogic to upgrade our lighting because they handled all aspects of the project from start to finish.”

—Hersel Tehranzadeh, The Effort Trust Company

### Issue

About five years ago, MultiLogic Energy Solutions upgraded all the lighting in nine of Effort Trust’s buildings with compact fluorescent bulbs and fixtures. At the time, the work helped to reduce the electrical lighting load by 30 per cent, and produced an annual savings of \$190,000 across the group of buildings. Thanks to an Ontario Power Authority (OPA) incentive of \$170,000, Effort Trust was able to realize payback within 1.5 years.

The price of electricity has continued to increase by about 8 to 10 per cent per year. While compact fluorescent lighting (CFL) is more efficient than incandescent bulbs, it is not as efficient as LED, nor does it last as long. CFLs have a life span of about 5000 hours, which means that in-suite lighting must be replaced every two years, while lighting in common areas must be replaced at least once a year. Due to the mercury content of CFL bulbs, disposal is also an issue.

“LED technology has matured over the last few years,” said Shane Blanchard, Vice President, Sales and Marketing, MultiLogic Energy Solutions. “New technology standards for LED lighting have driven the quality up, as well as the volume of production, which has also helped to lower the cost of LED bulbs.”

### Solution

MultiLogic conducted a detailed lighting audit of Effort Trust’s buildings for in-suite, exterior and common areas. This included evaluating and counting fixtures and bulbs, analyzing the electrical consumption of the existing fixtures, and conducting light level measurements in different parts of the buildings. They calculated

fixture loads, operating hours for different fixtures, and determined the total electrical costs for the existing fixtures.

MultiLogic then put together a report with recommendations for the best available replacement light fixtures, and areas that would benefit from redesign to optimize lighting conditions. The report included suggested fixture selections to match the existing aesthetics, as well as options that would improve the lighting levels and energy efficiency. They also walked the client through the different component options in every area of each building.

“We provided the client with a proposal for each building, as we treat each building differently, and reviewed the various specifications for the new fixtures,” said Blanchard. “We discussed different types of fixtures for different locations in each building, as some areas would benefit from lighting upgrades, while others would work with standard LED fixtures.”

The goal of the project was to change all lighting elements in every building to LED. Some of the work involved some simple changes, such as replacing LED lamps in garages, as well as parking garage re-designs to improve lighting levels and meet current Code requirements. In some cases, MultiLogic was able to replace lighting without wiring or electrical work.

“Although these projects were paid for by the resulting cost savings, much of the work could be classified as building renewal,” said Blanchard. “The easy solution may be to change a lamp but often the best long-term solution is to change the fixtures. In this way you get efficiency while also minimizing long-term maintenance and making the building more attractive for the tenants.”

### Cost and incentive

Once the specifications were finalized, MultiLogic submitted their findings to the Ontario Power Authority (OPA). This was required to obtain

### The Effort Trust Company

Project cost	\$1,800,000
Rebate	\$480,000
Annual energy savings	\$600,000
Payback	2.5 years

approval for incentives, which ranged from 25 to 50 per cent of the total project cost. The overall project cost was \$1.8 million, and the project qualified for \$480,000 in incentives.

“We chose to work with MultiLogic to upgrade our lighting because they handled all aspects of the project from start to finish,” said Hersel Tehranzadeh, Engineer and Project

Manager, The Effort Trust Company. “In addition to conducting audits and choosing the best lights for our buildings, they handled the incentive applications, which ensured that we were able to cover as much of the cost of the retrofit as possible.”

Upgrades were scheduled over a period of 12 months, so as to not overwhelm the property management company with too many projects at the same time. MultiLogic worked on two to three buildings at a time. It also handled the collection and removal of CFL bulbs, bringing the material to a central site that specialized in this type of disposal.

### Savings

MultiLogic projected that the lighting upgrades would produce electricity savings of \$600,000 per year. Payback was expected to occur within 2.5 years, with annual savings to increase as electricity prices rise. Effort Trust will also realize ongoing savings due to lower maintenance costs associated with replacing their CFL lighting with LEDs.

“Replacing CFLs with LEDs will also produce savings in maintenance costs,” said Blanchard. “LED bulbs can last from 50,000 to 70,000 hours, compared to CFLs that have a life span of only 5000 hours. This means that bulbs will not need replacement in common areas for six to nine years, while in-suite bulbs could last 20 to 30 years.”

### Conclusion

While the existing light bulbs and fixtures were the right choice at the time they were installed, LEDs are much more energy efficient. With LED bulbs decreasing in cost and increasing in design options, it made a lot of financial sense to replace the bulbs and fixtures. In addition to improving lighting conditions and reducing maintenance costs, the new fixtures will reduce electricity costs across the group of buildings by \$600,000 per year. **RHB**

By David Gargaro, in collaboration with  
Shane Blanchard of MultiLogic Energy Solutions  
and Hersel Tehranzadeh of The Effort Trust Company



# Truth in numbers:

## 50 Speers Road

The September 2015 issue of *RHB Magazine* included an article on efficient toilets, and their impact on water bills in multi-unit rental properties. It described how changing technology has promoted the replacement of older toilets with more efficient models, the importance of maintenance and monitoring, and the effect of incentives and water savings on water bills. This article examines the reasons for, and the results of, replacing toilets and aerators at 50 Speers Road.

### Subject

Arcanos Property Management Corporation manages 50 Speers Road in Oakville, Ontario. The apartment building was constructed in 1965. It is seven storeys tall and has 59 units. Each unit has one bathroom but different toilets are used throughout the building.

### Issue

Every unit in the building had a 6L or 13L toilet that was from eight to twelve years old. The toilets were using more water per flush than originally intended because many of them were equipped with non-OEM (original equipment manufacturer) flappers. This caused the toilets to use more water than they were originally designed for, and sometimes they would empty the entire tank. The showerheads and sink aerators were also inefficient in their water usage.

Water Matrix performed a water audit to determine the property's actual water consumption and associated costs. This began with analyzing the building's water bills over the past couple of years. They calculated the building's annual water cost, and divided this number by the number of suites in the building. Water Matrix found that the average annual water bill exceeded its benchmark level of \$350 per unit, which meant there was significant opportunity for Arcanos to reduce its building's operating costs.

"About 80 per cent of a building's water is consumed in suite, so there are a lot of opportunities to reduce water usage here," said Jordan Edl, Sales Executive, Water Matrix. "Conducting a water

audit will enable the building manager to get a better understanding of where to achieve the greatest savings in their water bill."

### Solution

Water Matrix replaced the existing toilets with its more water-efficient 3L models. The newer toilets use much less water than the previous models because they combine air and water, along with a natural gravity siphon process, to flush waste. Other recommendations included installing more efficient sink aerators, which use 1.5 gallons per minute (down from 3.0 gallons per minute), and new bathroom tap aerators, which use 1.0 gallon per minute.

"The aerators are also vandal-resistant, which means that renters cannot remove them when they leave the unit," said Edl. "When you install a tap that comes from the store, there is no protection against their removal. Using vandal-resistant technology is the best way to protect your investment and ensure that your fixtures stay installed for the long term."

Once the project was approved, toilets were dropped off and assembled on site on the morning of the installation. Each toilet was placed on cardboard outside the unit's front door. Upon entering, installers turned off the water, cleaned and removed the existing toilet, installed the new toilet with new gaskets and supply lines, and ensured that each toilet operated properly before they left the unit. The process to replace the toilets took less than 20 minutes per unit (aerators took just a few minutes each). Every unit in the building received new toilets and aerators over a period of two days.

After the installation, Water Matrix provided Arcanos with a report of every item that was installed, and any issues that occurred during the process. They also provided leak reports or details on anything that required extra work. Water Matrix ensured that the building was running as efficiently as possible when they left.

"We did a test run of the toilets in some of the suites in other buildings for more than a year before we decided to install them in this building," said Nadine Sarich, President, Arcanos Property Management Corporation. "We are very happy with the results, and we've had nothing but positive feedback since the toilets were installed. Water Matrix accommodated our schedule and made the process very convenient for our tenants. Within two weeks of approving the project, they were on site and ready to go."

### Cost and incentive

Halton Region provided a \$75 rebate for each toilet. Qualification for the toilet rebate

involved pre-inspection of the existing toilets, approval to go ahead with the installation and inspection to ensure that the proper toilets were installed. Rebates were to be sent to Arcanos after the work was completed and the paperwork was submitted. Water Matrix handled all the rebate paperwork on Arcanos' behalf. The total project cost to replace the toilets, showerheads and aerators was \$16,000. Arcanos will receive a rebate cheque for \$4425 for the toilets.

"Since we've been installing the three-litre toilets, we've heard nothing but positive feedback and very few problems," said Edl.

"Even after 24 months, building owners are still happy with their water savings. We remind our clients that flappers will typically need to be replaced after four to five years, and these toilets need to use the right flappers to maintain their water efficiency."

### Savings

Water Matrix projected that Arcanos will reduce its annual water usage by 18.3 per cent. This will result in savings of \$4700 per year, and payback will occur in about 31 months. Water Matrix will monitor Arcanos' water usage for one year

after installation to make sure that the toilets and aerators are functioning as planned, and savings are being realized.

"The client could reduce their water cost by another \$1200 per year, and reduce water usage by an additional eight to twelve per cent, by replacing their existing showerheads with more efficient models," said Edl. "With the \$6 rebate per showerhead from Enbridge, they could shorten their payback period by six to eight months."

### Conclusion

The existing toilets were working as well as could be expected given their age. With water prices continuing to increase, it made sense to replace the toilets and aerators at this time. Incentives made the project more affordable, and the water bill will be reduced by \$4700 per year going forward.

"The toilet rebate helped us to take advantage of the opportunity to improve our building's water efficiency," said Sarich. "We're very happy with the results, as well as the service provided by Water Matrix." **RHB**

*By David Gargaro, in collaboration with Jordan Edl of Water Matrix and Nadine Sarich of Arcanos Property Management Corporation*