

# A Water Conversion Case Study

UEA PUBLICATION FORUM/VOL 165 - SUMMER 2008

## Ferris State University Bond Halls

***“The testing that our staff performed on some of the components before the renovation convinced us that we could actually improve the functionality of the existing system, and save a tremendous amount of water at the same time. It was a win, win situation for us.”***

### **Description:**

Ferris State University is located in Big Rapids, MI. The University consists of eight colleges offering 4-year degrees in Allied Health Sciences, Arts and Sciences, Business, Education and Human Services, Optometry, Pharmacy, Technology, and Art and Design.

Home of the Ferris State Bulldogs, Ferris State has a total enrollment of over 12,500 full time students and also grants doctorate degrees via its Optometry and Pharmacy Colleges.

Bond Halls are coed student housing located on the heart of the campus and housing approximately 342 students (170 male, 172 female).

### **Goals:**

The goal of the University Facility Management Staff was to reduce the consumption of water as much as possible in the student housing without affecting the functionality of the plumbing systems. Toilets had to clear when flushed and students using the facilities had to feel like they were getting plenty of water from the sinks and showers for their daily use or complaints could cause problems for the maintenance staff.

### **Solutions:**

The renovation focused on three areas of water use in the bathrooms. These were the toilets, the showers and the lavatory sinks.

The 146 toilets were pre 1971 Sloan Flushometers utilizing a minimum of 3.5 gallons of water per flush (GPF). These were fitted with new Slone A-38-A repair kits and a special inside cover or pressure cap called Conservacap. This new pressure cap shortens the flush cycle of the fixture by several seconds, thereby saving almost a gallon of water with each flush. Because Conservacap saves this water without affecting functionality of the fixture this part of the renovation was inexpensive and very cost effective.

The 138 showers were the next high water use item to be

retrofitted. The existing units were using more than 2.5 gallons of water per minute (GPM). These were replaced with new solid brass showerheads that utilized 2.0 GPM and still gave a strong wet shower.

The third item to be addressed in the renovation was the 154 sink faucets. The old faucets were operating at approximately 2 GPM. The new moderators that were installed reduced the water consumption down to 1.0 GPM and still supplied more than ample water to wash your hands, shave or brush your teeth.

### **Results:**

The renovation results were nothing less than spectacular. The Retrofitted Flushometer Toilets are saving over 38,000 gallons of water a month. The retrofitted Showers are saving a minimum of 51,000 gallons of water per month. And the converted sink faucets are also saving over 41,000 gallons of water per month. This 130,000 plus gallons of water saved each month equals over 910,000 gallons saved per 7-month school year. At the current combined water/sewer rate of \$8.05 per 1,000 gallons the annual savings should surpass \$7,325.00

These savings are water use savings only and do not include the over \$1,000 per 7-

month school year energy savings from heating less hot water for use in the sinks and showers.

As the total cost of the renovation was \$10,887, the Return on Investment (ROI) for the entire project is 77%. This ROI also produces a pay back period for the renovation of only 15.5 months.

Also, all leaks found within the building during the renovation were eliminated and the requirements to maintain the plumbing system have been dramatically reduced.

### **Environmental:**

This renovation will save over 910,000 gallons of water per year. At the current water/sewer rate of \$8.05 per thousand gallons, that is approximately \$7,325.00 a year in cost savings.

When hot water energy and maintenance savings are combined and projected rate increases are added in to the projections, the total savings created by this renovation during the next ten years could be well over \$85,000.



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