PMI/Consulting-Specifying Engineer Article

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Facilities managers have been very receptive to the modern trends to green up their buildings. Buildings are typically large consumers of water and water today has become a hot subject among those trying to reduce their impact on our precious environment. As water and sewer rates climb rapidly, water consumption has also become a hot topic when considering how to reduce costs and impact the bottom line.

But facilities engineers have had some bad experiences with early versions of plumbing fixtures claiming to help them reduce water consumption. The recent change in plumbing code requirements subsequent to the Environmental Policy Act of 1992 which required that all new toilets manufactured for US installation flush no more than 1.6 gallons, forced manufacturers to make drastic changes to the designs of these products. For several years after the change there were only a few models whose performance could be considered satisfactory. So there has been a natural reticence of facilities engineers to make the big step to changing out all of their toilets.

For a number of reasons this reticence has been fading during the past few years. The most influential of these is a movement started by the water utilities that have been seeking ways to reduce the demand on their infrastructure. Consumption of potable water in many cities has grown dangerously close to their capacity. There have been droughts that compounded the problems. But a less talked about concern is about the ability to properly treat the wastewater produced by this consumption. It is much easier to talk about water problems in polite company than sewage problems! But the latter of the two seems to be a just as, if not more, compelling reason to reduce the amount of water that runs through our buildings. Because of the utility's interest in finding ways to reduce consumption, and their experience with encouraging retrofits of existing buildings by investing in rebates for lower consuming fixtures, the performance of these fixtures has been scrutinized. Now a new consumer-driven supplementary performance standard is being developed due to research funded by these utilities. The result is it is now possible to refer to third party tests that can identify the products that work. In the past, the national standards in the U.S. and Canada, having been written by the manufacturers in the industry, did not expect toilets, especially, to perform up to the consumer's expectations.

These third party tests are referred to as Maximum Performance Tests (MaP tests). Toilets are now tested to see "how much" they will flush away instead of if they will flush away some minimal amount of media. And the MaP test media being used is far more realistic, and therefore discerning about real performance, than the media used in the various tests included in the American ANSI 112.19.2 and Canadian B-45 standards for vitreous china toilets. This MaP testing is new to the industry but has already caused most manufacturers to go back to the drawing boards and design their products to score well. Unfortunately, until there is a greater variety of MaP test media, such as floating waste and dissolved waste, results with the current sinking waste media alone do not give the whole story. But what it does give certainly goes a long way to fill the end users' knowledge gap about performance. This is giving the facilities engineer greater confidence in making the right choice when selecting replacement toilets. After all they are “the most important seats in the house!”

MaP test scores will be an important credential in earning the right to bear a new label called WaterSense in a program to be launched early next year by EPA. EPA has developed this program with the help of a large number of stakeholders including the above-mentioned utilities as well as manufacturers and environmentalists. The label will help a specifier or end-user identify water efficient products based on third party, independent testing not solely on the marketing claims of manufacturers. The WaterSense labeling program was announce by EPA’s director, in June and it is expected to be launched in early 2007. The program promises to be of great assistance in giving end users and specifiers more valid criteria on which to base their selections of plumbing fixtures and fittings as well as other water using equipment.

Case in point: The University of Mary Washington, Fredricksburg, VA

Original 4.0+ gallon per flush (gpf) floor-mount rear spud toilets with poor flush characteristics were replaced with Toto toilets.

New Toto 1.6 gpf floor mount top spud toilets were installed. Toilet water savings exceeded 50% and clogs were reduced significantly.

In December of 2001, the Commonwealth adopted the Virginia Energy Plan with the goal of operating the Virginia state government as a model of energy efficiency. By 2002, plans were being formulated to make greater use of the private sector through the use of "performance contracting". Only fourteen contractors were licensed to work on energy efficiency "performance contracts" in state and local facilities throughout the Commonwealth. Both Noresco and Water Management, headquartered near Washington, D.C., (WMI) were among these elite firms. Noresco has a solid reputation as a large-scale, broad-based energy service provider, while WMI specializes in only water efficiency.

The University of Mary Washington is located in Fredricksburg, VA was strongly encouraged by the Commonwealth to look into "Performance Contracting". The Engineering staff for the University was very skeptical of any effort to introduce low-flush toilets because a review of their maintenance logs showed the large majority of their maintenance was devoted to unclogging toilets and it was felt that this would only be exacerbated with the introduction of toilets that used less water for flushing.

Prior to the start of the water portion of the project WMI conducted a detailed water-efficiency audit of the thirty-eight buildings that comprise Mary Washington's main campus. The audit showed that a majority of sanitary fixtures were old and obsolete. Most of the water to these buildings ran through only two water meters. Water analysis showed that the campus was using over 46,000,000 gallons of water every year. WMI replaced toilets, urinals, sinks, faucets, aerators, showerheads and more, installing new high-efficiency sanitary fixtures that often use less than 50% the water to achieve the same flushing or rinsing effect as the outdated fixtures. None of these changes required an adjustment in operation or in the way people perceive or used the devices.

In implementing various conservation measures at Mary Washington, WMI estimated it would save over 18,983,000 gallons of water a year – over 45% of the total water usage of the campus! Actual savings have exceeded this amount. Between the cost of the water and the energy needed to heat it, the savings to the University is over $112,000 a year!

WMI was so certain of the savings that it guaranteed it in writing. In fact, all of WMI's "performance contracts" are structured to guarantee reductions in water, sewer, energy and operational costs over time.

This successful project provided Mary Washington University with guaranteed energy and monetary savings and also upgraded the comfort and appearance of aging facilities that faculty, staff, and students all call home. By replacing antiquated toilets, faucets, and showerheads with new high-efficiency fixtures in campus dorm bathrooms and public restrooms, WMI dramatically reduced water usage while, in most cases, actually improving both the quality of water delivery and aesthetics of the facility. And while WMI provides comprehensive service, these new devices will require less maintenance and upkeep than their less efficient predecessors.

Water Management, Inc. (WMI) has been the preeminent water demand management company in the United States since 1980. WMI designs and implements water efficiency programs for multi-unit residential properties, public housing authorities, schools, federal and state facilities, military complexes, hotels, industrial, commercial, and institutional properties. WMI is an independent, privately owned firm with no affiliation to any manufacturer or product – this allows them to always use the best products available.