

The economics of water pricing in urban areas favors looking at the full system costs, including meter charges and connection fees. Reclaiming all the rainwater from a site, so that no storm-sewer connection is needed, can often result in savings that are greater than the cost of rainwater catchment and treatment. The same holds for onsite sewage treatment, particularly if the treated wastewater can be used for toilet flushing, cooling-tower makeup water and irrigation without ever leaving the project site. Why not take a more detailed and expansive look at the opportunities for 40%, or better, water conservation in your next project?



## Water-free Urinals

Urinals waste more than 150 billion gallons of fresh water per year, equivalent to the water use of 1,500,000 homes, at an average use of 300 gallons per day per home.<sup>157</sup> The average urinal installed since 1992 uses 1 gallon per flush, which is the code requirement, based on the 1992 federal Energy Policy Act. (Overall, the average might be closer to 2 gallons per flush for all urinals now installed.) Think of more than 78 million men at work,<sup>158</sup> making an average of three flushes per day, five days a week, most of them older urinals using 2 to 3 gallons per flush, just to flush away a liquid that's sterile and more than 99% water.



Waterless Co. LLC



Falcon Waterfree Technologies

Two types of water-free urinals.

The design of water-free urinals includes an oil seal below the drain, which prevents sewer gases from rising up (one of the purposes of the flush and the drain) into a bathroom. The seal has to be changed periodically. According to one manufacturer:

This pleasant-smelling sealant liquid trap provides an airtight barrier between urine and the restroom to prevent odors from escaping the drain, but allows urine to pass through because it is lighter than water. Urine immediately penetrates the sealant liquid and flows to the drain. Uric sediment is collected by the cartridge, leaving an odor-free environment, clean pipes and absolutely no water waste.<sup>159</sup>

Basically, water-free urinals work just fine in situations where there is a large, often anonymous population of users, such as office buildings, restaurants, airports, schools, stadiums and theaters. With proper design and installation, routine maintenance (including quarterly treatment-cartridge replacements) and a little signage to tell users what's going on, water-free urinals work just fine, reducing overall water consumption in buildings by up to 40,000 gallons per year per urinal.<sup>160</sup>

Water-free urinals are used in such places as the Jackie Gleason Theater in Miami Beach; the Evergreen State College in Olympia, Washington; the Harold Washington Social Security Center in Chicago; the twin Petronas Towers in Kuala Lumpur, Malaysia; and the Jimmy Carter Presidential Library, in Atlanta, Georgia.<sup>161</sup> Over the long run, widespread adoption of water-free urinals will also help reduce future infrastructure development costs by reducing water demand and sewage generation. From the standpoint of economics, water-free urinals, either in new buildings or in renovations, pay for themselves in water savings in a relatively short period of time.



## Wetlands, Constructed

Constructed wetlands are an integral part of stormwater management and onsite sewage treatment solutions for green building projects. When there is enough land available, such as in suburban office park development, these systems function both to hold stormwater and to use treated sewage