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Urinals: CA IOUs Response to CEC's Request for Information on drainline clogging and 0.125 gpf urinals

Summary: While 0.125 gallons per flush (gpf) urinals, or “pint urinals,” have now been installed at many locations for a period of several years, including the University of Washington, the Seattle Public Utilities District, the City of Los Angeles, and California State Government facilities, the CA IOUs were unable to find any evidence that these fixtures cause damage to an existing building’s sanitary drainage system or drainlines. Given this information, plumbing in existing buildings will not need to be replaced as a result of installing 0.125 gpf urinals. Therefore, there is no cost associated with replacing plumbing in existing buildings. Below is a summary of our findings from examination of installation manuals and plumbing codes, as well as customer satisfaction with pint urinals. Lastly, we present the results of research regarding high-efficiency toilets, which conclude that installing higher efficiency toilets has no direct negative impact on drainlines.

1 Installation Manuals & Plumbing Codes: No Specification for Plumbing Retrofit

An inspection of manufacturer literature (e.g., specification sheets, installation manuals, warranty information, care and maintenance instructions, etc.) for 8 unique brands of WaterSense® certified pint urinals reveals that none of the manufacturers include recommendations on building drainage systems when installing pint urinals.¹ Some manufacturers include design specifications for the building’s water supply system (e.g., a urinal is appropriate if the water supply pressures is between 20 psi and 125 psi), but nothing is mentioned about the building’s drainlines. One would suspect that if manufacturers of pint urinals have received complaints about drainline clogging as a result of installing pint urinals in existing buildings, they would publish literature instructing against installing pint urinals if drainlines do not meet specific conditions. In fact, manufacturers of waterless urinals do publish information that recommends drainlines where waterless urinals are installed to have the appropriate slope to allow proper drainage.² Manufacturers have not extended recommendations on drainline design to pint urinals, presumably because drainline clogging has not been problematic when pint urinals are installed in existing buildings.

The California Plumbing Code (Part 5 of Title 24, which is based on the International Association of Plumbing and Mechanical Officials’ (IAPMO) Uniform Plumbing Code) does not include any unique requirement on the drainline system if pint urinals are installed, nor does it recommend or require that drainage systems be upgraded if pint

¹ The following manufacturers were included in the review of installation manuals and specifications for 0.125 gpf urinals: American Standard, Kohler, Sloan Valve Company, Toto, and Zurn Industries. Several of the installation manuals applied to more than one pint urinal model.

² Sloan publishes recommendations for drainline cleaning and design specifications for consideration when installing waterless urinals (http://www.sloanvalve.com/Installation_Guides/0816560.pdf). Sloan does not publish similar information for consideration when installing pint urinals.

urinals are installed. In fact, Section 402.9 of the California Plumbing Code requires that “water-conserving fixtures shall be installed in strict accordance with manufacturer’s installation instructions to maintain their rated performance.” As previously described, manufacturer literature does not include requirements for drainlines or require modification to the existing drainage system.

Given the absence of manufacturer recommendations for building drainage systems and the lack of concrete evidence correlating drainline damage with pint urinals, re-plumbing an existing building to accommodate a pint urinal is not necessary. As such, there is no associated cost with re-plumbing existing buildings in order to effectively accommodate the installation and use of 0.125 gpf urinals.

2 Building Retrofits and Maintenance

As buildings age so do their drainage systems. Eventually, these existing systems will need to be upgraded regardless of reductions in water flow from water-conserving devices. Proper maintenance of urinals will help reduce potential issues that could arise in the system. As mentioned previously, manufacturer guidelines do not include instructions or recommendations for cleaning and maintaining the drainlines, only the fixture itself. Some fixtures are now designed to reduce maintenance needs. For example, American Standard’s WASHBROOK® FloWise® 0.125 gpf urinal system has a self-cleaning piston that helps prevent clogging and reduces maintenance for the fixture itself. One consumer review on the manufacturer’s website states that no maintenance calls have been received since installing the urinal system.³ The lack of definitive data linking drainline damage to high-efficiency urinals combined with positive consumer reviews implies that pint urinals are an effective water-conserving device.

While we maintain our position that there is no evidence that pint urinals lead to drainline clogging, there are maintenance practices that can be deployed to help maintain clean drainlines. For example, one facility manager we interviewed, who manages a boys’ dormitory building, indicated that he pours a gallon of hot water down each pint urinal once a month to help maintain the clean trap and drainline. Our water savings analysis conservatively assumes that urinals are flushed, on average, 18 times per day. The gallon of hot water used to help maintain the urinal and the drainline barely impacts the water savings that are achieved when using a pint urinal as opposed to a 0.5 gpf urinal. There are also chemicals that are designed to help clean drainlines. These chemicals can be poured down the urinal on a prescribed schedule to help maintain drainline.

In buildings that may be most prone to drainline clogging, we believe that building owners will opt to adopt an aggressive maintenance protocol to keep drainlines clean as opposed to re-plumbing. As opposed to considering the cost of re-plumbing a small number of buildings, it would be more appropriate to account for a small portion of buildings using an aggressive maintenance protocol that might include flushing urinals with hot water, and in extreme cases, using chemical cleaners to maintain drainlines.

³ There was only one review of the WASHBROOK® FloWise® 0.125 gpf urinal system. It received 5 of 5 stars. <http://www.americanstandard-us.com/urinals/washbrook-flowise-0.125-gpf-urinal-system/>

3 No impacts of Low-Flow Toilets

It should also be noted that there have been studies conducted by the U.S. Environmental Protection Agency, Plumbing Efficiency Research Coalition, Environment Agency (United Kingdom), and Canadian and Australian governments that have researched the impacts of high-efficiency toilets on drainlines. Findings from these studies indicate that reduced flows from high-efficiency toilets do not have a direct negative impact on drainlines.⁴

⁴ Alliance for Water Efficiency. "The Impacts of High-Efficiency Toilets on Plumbing Drainlines and Sewers." 2011. <http://www.map-testing.com/assets/files/AWE-Drainline-Article-2011-07.pdf>.
Environment Agency. "Less Water to Waste: Impact of reductions in water demand on wastewater collection and treatment systems." February 2008. Science project SC060066.
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U.S. EPA WaterSense. "Responses to Issues Raised During Public Comments on April 2006 Draft Specification for WaterSense Labeling of Tank-Type High-Efficiency Toilets." 2006. http://www.epa.gov/WaterSense/docs/comment_response_het508.pdf. (See Appendix A for information on drainline carry).