Design Considerations for **FLUSHING TOILETS** and **URINALS** with **Reclaimed Water**

Background

The City of Austin is the first utility in Texas to provide customers with reclaimed water for use in restrooms. While the majority of our customers have used reclaimed water without incident for flushing toilets and urinals since 2009, we have learned a few lessons regarding the design and use of reclaimed water in restrooms.

Flushometer Valve Selection

Several plumbing fixture manufacturers make flushometer valves fabricated with corrosion-resistant components because reclaimed water is generally more aggressive than drinking water. Just as drinking water varies from city to city, so does reclaimed water.

Tip: Austin Water is conducting experiments to determine whether our reclaimed water is sufficiently aggressive to warrant special corrosion-resistant components. Until these experiments are complete, designers may want to specify flushometer valves specifically designed for use with reclaimed water.

Urinal Flush Volumes

Waterless urinals are well known to have clogging issues. When the flow to a traditional urinal is reduced it begins to behave, and clog, like a waterless urinal.

Tip: Austin Water is conducting experiments on flush volumes to avoid clogging. Until these experiments are complete, designers may want to specify the largest flush volume allowed by the plumbing code (0.5 gallons per flush).

Surge Protection (water hammer arrester)

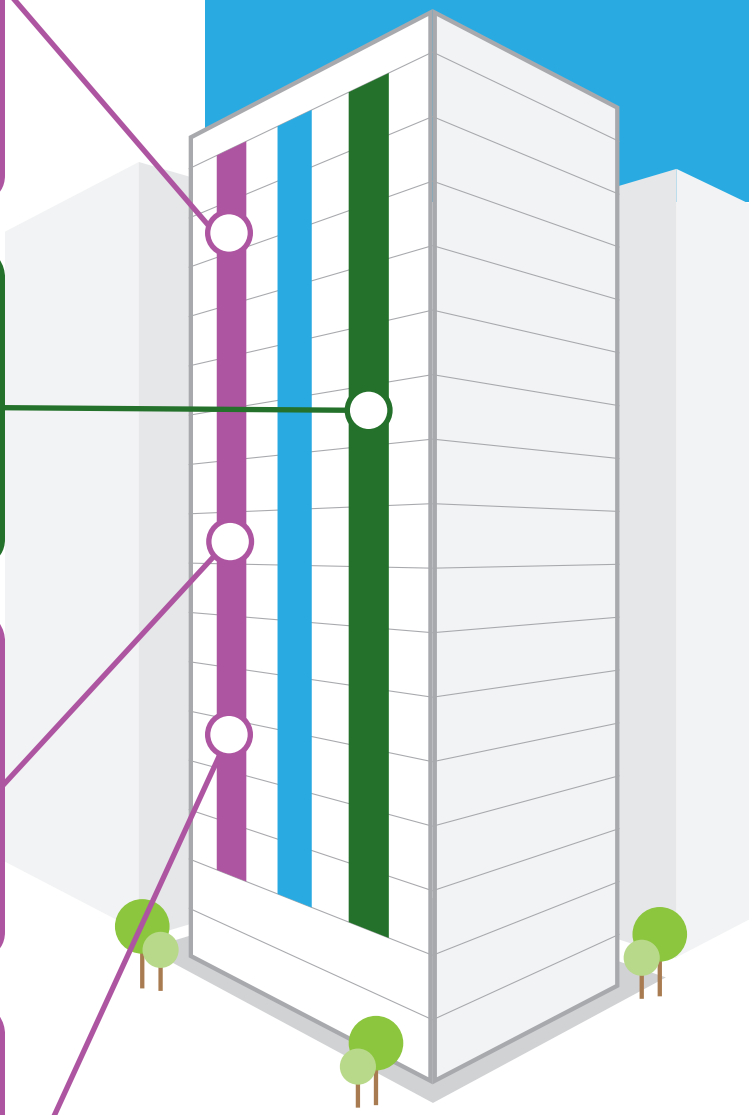
Toilets and urinals in commercial buildings are flushed with quick-acting flushometer valves. While these feature low water use, the flow occurs in bursts that are 4-5 seconds with correspondingly high flow volumes that can generate water hammer.

Tip: The Uniform Plumbing Code requires that building plumbing with quick-acting valves be provided with devices to absorb water hammer.

Surge Protection (day tank)

Drinking water and reclaimed water systems can experience water hammer from the starting/stopping of pumps, the quick opening/closing of valves, and sudden large customer demands.

Tip: Austin Water has hired a design consultant to analyze and make recommendations to minimize water hammer. In the meantime, customers concerned about water hammer may want to install a day tank to maintain service for toilet and urinal flushing while physically separating building plumbing from Austin Water's reclaimed water system. An advantage to this approach is that rainwater and ac condensate can be harvested and placed in the day tank for use as flush water.



Austin Water staff is available to help you make the most of reclaimed water in your building design. Please contact us for more information.

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Pressure Reducing Valves

Austin Water's reclaimed water system operates over a broader range of pressures than does our drinking water system.

Tip: If reclaimed water pressure is higher than 80 psi, designers may want to install a pressure reducing valve to lower the reclaimed water pressure to a more typical range. Feel free to contact Austin Water for anticipated reclaimed water pressures at your building site.

Locating Hand Washing Sinks Upstream of Toilets/Urinals

With the advent and widespread adoption of ultra-low flow plumbing fixtures, there are documented instances of building drain lines having insufficient flow to sweep away wastes generated at toilets and urinals.

Tip: Some designers have placed additional fixtures, like hand washing sinks, upstream of ultra-low flow toilets and urinals to provide extra water to keep wastes moving.

Strainers with Pucks

Urinal salts, like calcite and struvite, form more quickly in alkaline conditions.

Tip: Building maintenance staff may want to use urinal pucks to facilitate cleaning and to acidify water to prevent urinal salts from forming.

Maintenance/cleaning

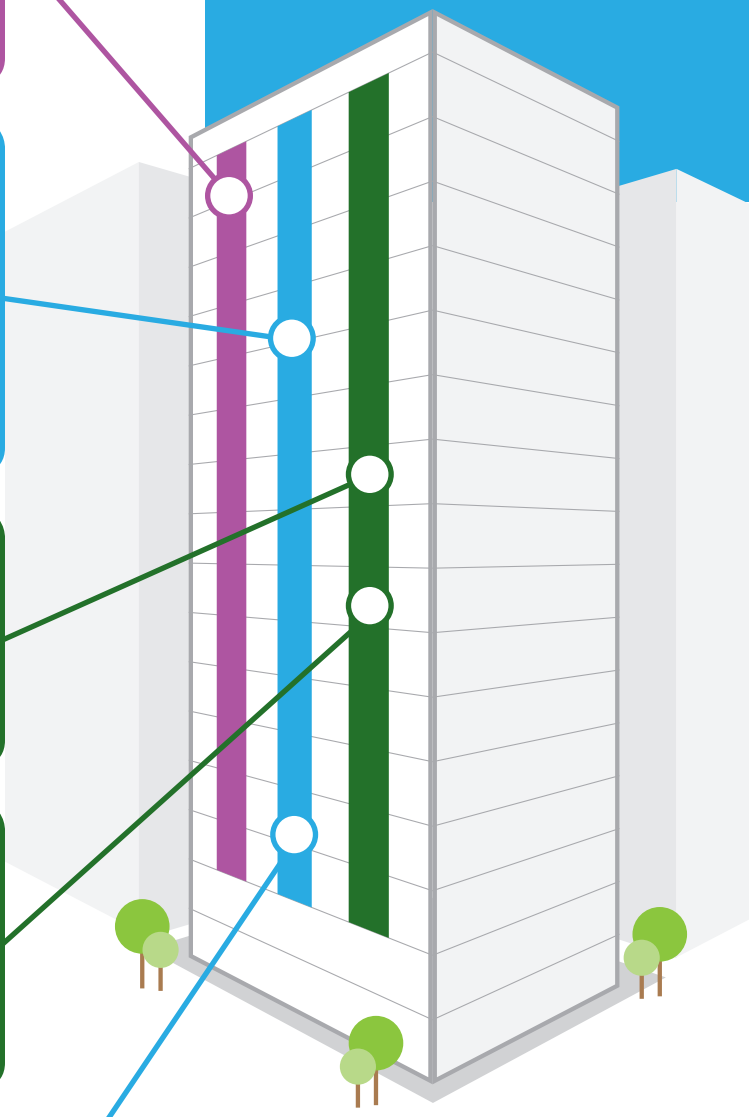
Manufacturers of toilets and urinals are vague on maintenance, its frequency, and cleaning frequency.

Tip: The more frequently these plumbing fixtures are used, the more frequently they need to be maintained and cleaned. With maintenance being periodic additional flushing or addition of water to the fixture.

Annual Cross-Connection Test

On an annual basis, the plumbing code requires that reclaimed water customers test backflow preventers and also test to prove there is not a cross-connection. The test prescribed in the plumbing code is awkward, particularly for large buildings.

Tip: Designers may want to consider dye testing for the annual cross-connection test as it is easier and accomplishes the same goal.



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