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

Background

Austin Water 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 with corrosion-resistant components because reclaimed water is generally more aggressive than drinking water. Just as drinking water varies from city to city, so too does reclaimed water.

Tip: Austin Water is currently 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 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: *Preliminary results from flush volume experiments indicate that designers should specify the largest volume allowed by the Plumbing Code (0.5 gallons per flush). As a conservation measure, a higher flush volume will not affect a LEEDs rating.*

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 4-5 second bursts with correspondingly high flow rates that can generate water hammer.

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

SURGE PROTECTION (hydropneumatic tank)

Plumbing systems in large buildings can generate damaging water hammer from pumping changes, quick acting valves, and sudden changes in demand.

Tip: Austin Water hired a design consultant to investigate water hammer in the reclaimed water system who determined that water hammer was frequently generated on site. Designers should specify a bladder type surge vessel downstream of booster pumps to moderate pumping changes and sudden changes in demand.

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

The reclaimed water system operates over a broad range of pressures.

Tip: *If incoming reclaimed water pressure is higher than 80 psi, designers should 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 should 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: *Essentially the more frequently 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 by the Plumbing Code is awkward, particularly for large buildings.

TIP: *Designers should consider pressure testing or dye testing for the annual cross-connection test as it is easier and accomplishes the same goal.*

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