Rehabilitating Stagnant Building Water Systems – A Timely Reminder from the IAPMO Group

By Peter DeMarco, The IAPMO Group

It’s an understatement to say that dealing with the Coronavirus has presented a new set of challenges to society and particularly to the plumbing industry. Across the globe, social distancing practices are being enforced in an effort to suppress the number of infected individuals needing medical services to a level that our healthcare infrastructure can manage. However, we can look forward to a time when we will be advised that it’s safe to reopen places of business and places of assembly that have been shut down for weeks or perhaps even months as life returns to normalcy. As building reopenings occur, one of the first things that facility managers, building superintendents, maintenance crews, and business owners should attend to is the safety of all building water systems.

**Important:** This guidance applies only to buildings that have been shut down or sparsely used as a result of the COVID-19 pandemic. It does not apply to homes or buildings that have had their water systems turned off for longer periods of time. In those cases, extensive remedial measures will be required that are specific to those buildings and the involved water systems and components. This paper does not provide guidance for those situations.

**Water stagnation:** When water is not drawn through a plumbing system or other building water system over an extended period of time, the water becomes stagnant. Indicators of stagnation include bad or “off” taste, unpleasant odor or a slight color appearance which can indicate bacteriological growth and pipe corrosion. Stagnation supports the accelerated growth of many microorganisms and pathogens, such as Legionella, that can cause great harm to building occupants. Just as with the coronavirus, those that are at the greatest risk of becoming ill from such pathogens are the elderly and those who are immuno-compromised.

**Flushing of all water systems:** All water systems in buildings that have been vacant or sparsely utilized for weeks or months must be thoroughly flushed prior to being put back into service. For potable water systems, flushing includes the opening of all water outlet valves, such as faucets and showers, and the flushing of all toilets and urinals. This will allow a high velocity flow through the system to purge the stagnant water and improve water quality. Outlets at the greatest distance from the service connection should be allowed to flow a minimum of 10 minutes. Also, flush all drinking water fountains, water coolers, bottle fillers (especially in schools) and any other operable end point device for at least 5 minutes. Extreme care should be taken when flushing stagnant water systems as stagnant water is likely to contain higher levels of Legionella and other pathogens. Personnel doing this work should be advised to open outlets slowly to avoid splashing and the creation of aerosols. For ice makers, dispose of old ice and flush the water supply to the ice maker.

**Other building water systems:** It’s important to also remember all other water systems in a building, such as water reuse systems, decorative water features such as fountains, and landscape irrigation systems. Follow manufacturer recommendations for disinfecting all water systems after periods of non-use.

**Floor drains:** Importantly, if the building has floor drains, be sure to pour water into the drain to make sure that the trap is fully restored in order to keep sewer gases from entering the building. Remember, sanitary systems have been implicated in the spread of the coronavirus, so any dry traps would provide a pathway for exposure to the virus and other pathogens.
**Additional considerations:** Another best practice, especially for schools and day care facilities, is the removal and cleaning of end-point devices such as faucet aerators and drinking fountain filters. This is particularly important if any disruption of supply pressure occurred or is suspected while the building was shut down. Pressure disruptions can dislodge particulates, including lead, which can get trapped in aerators and filters, spiking lead levels and reducing water quality.

**Water treatment systems and drinking water filters:** If there are water treatment or filtration products used in the plumbing system, such systems may need to be regenerated and flushed. It’s possible for bacteria to grow in water filters under stagnant water conditions so replacing water filters is highly recommended. Always consult and follow manufacturer disinfection procedures and recommendations.

**At-risk populations:** Finally, for all buildings serving high-risk populations, consider testing for Legionella at least 7 days prior to re-opening the building. Water samples for testing should be collected after taking the remedial steps recommended above.

**Protect water system rehabilitation personnel:** As mentioned above, personnel that will work to rehabilitate stagnant building water systems will be at some risk and should be advised to take precautions. As such, wearing of Personal Protection Equipment (PPE) including safety goggles, rubber gloves and NIOSH approved N95 facemasks, if available, are recommend best practices.

All of the above work should be done prior to the building being re-occupied. Buildings that have maintenance staff, security crews or other staff available throughout a period of reduced activity may consider having that staff flush water systems for shorter periods, if performed on a regular basis, such as every 3-4 days.

**Building water safety management plans:** Water is essential to life, but it is also an efficient carrier of disease. The COVID-19 pandemic is reminding us just how critically important proper design and maintenance of building water systems are toward protecting public health. While the COVID-19 pandemic social distancing requirements remain in effect, IAPMO encourages building owners and facility managers to review and consider establishing a building water safety management plan as detailed in ASHRAE 188-2018 – Legionellosis: Risk Management for Building Water Systems and having water teams trained and certified to ASSE International’s Series 12000 Standard – Professional Qualifications Standard for Infection Control Risk Assessment for All Building Systems.

IAPMO is dedicated to protecting the public health across the globe. It would indeed be tragic to neglect to rehabilitate building water systems as we emerge from the COVID-19 pandemic, which could result in additional illnesses and potential loss of life. Our industry experts, along with water utility experts and academia, are currently working on the development of new standards and specifications that will provide more comprehensive and explicit building water system remedial procedures and recommendations. Please monitor our website at [www.iapmo.org](http://www.iapmo.org) for additional resources as they become available.