Facilitator — December/January 2014

Backflow Prevention

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The success of a restaurant takes more than a top-notch menu, ideal location and dedicated employees. The success relies on many unique factors that require planning, attention and efficiency. One factor is backflow prevention.

Backflow prevention requires an immense amount of attention in order to prevent contamination and, ultimately, protect the consumers who dine in your restaurant. The installation of backflow prevention devices produces a potable water supply.

What is Backflow?

Backflow is the reversal of the flow of water or mixture of water and other substances such as liquids, gases or solids into the pipes of the potable water supply. There are three types of backflow conditions that exist:

- Cross connection: Described as any potential connection between potable (drinking) water system and any other source or system of contamination, which includes used water, industrial fluid, gas or substance that should not enter the potable drinking water system. When a cross connection is not properly protected, backflow can occur and contaminants have the potential to enter the drinking water system or pipes of your restaurant.

- Backsiphonage: This type of backflow is caused by negative or reduced pressure in the supply piping.

- Backpressure: A potable system that is connected to a nonpotable supply operating under higher pressure by means of a pump, boiler, elevation difference, air or steam pressure. There is a risk that non-potable water may be forced into the potable system whenever these interconnections are not properly protected.

Backflow preventative devices (also known as cross-connection controls) can be a difficult topic to comprehend, due to the variety of units and stipulations each municipality and building code imposes; yet, they all function in a similar way and provide the same amount of protection from contamination. Backflow preventers are predetermined by a professional engineer, registered architect or licensed plumber in the initial stages of the building process or during a renovation of any kind. Each municipality sets the standard (which may differ, depending on the area) for these devices. The restaurants within the designated areas must abide by these stipulations and pass each annual test and inspection to remain compliant.

Backflow Prevention Devices

Typical backflow prevention devices include double-check valve assemblies, reduced pressure principle assemblies, pressure vacuum breakers, dual-check valves, dual check with atmospheric ports, atmospheric vacuum breakers, air gaps and spill-resistant vacuum breakers. Each device is selected based on the degree of hazard to public health and whether the fluids that can backflow are toxic.

In a typical restaurant, backflow preventers are most frequently found in ice makers, coffee machines, soda machines, dishwashers, sinks, irrigation systems, lawn sprinklers, fire sprinkler systems and any other device that provides access to water coming into the building. Restaurant owners are responsible for maintaining each backflow preventer with annual testing, replacement and repairs, as well as keeping records of the proper documentation. Many local authorities with jurisdiction over the water supply require annual testing and inspection of all cross-connection and backflow prevention devices by a certified and licensed plumber. These mechanical prevention devices must be tested annually with properly calibrated equipment to ensure all internal seals, springs and moving parts, which have the potential to wear out and build up dirt over time, are functioning properly.

Understanding the need for backflow prevention and how these devices function in the restaurant is vital to their quality and upkeep. Billy Pipe, who is in charge of Operations at Action Wastewater, shared some of his expertise and knowledge from working in the backflow prevention industry, and how important these devices are. Pipe made it clear that protecting the customer from contamination is the No. 1 priority when it comes to backflow preventers.

When asked what the importance of the backflow preventer is, Pipe said, “The backflow device protects the water supply from being contaminated. There will be occasions when there is a significant drop in pressure or the pressure is interrupted by a possible watermain break, power outage, pipes freezing or nearby firefighting, and the water in the restaurant’s pipes is sucked back into the public drinking water system (backflow). The backflow preventer will avert the potable water supply from being contaminated.” Pipe said each device needs to be tested by a licensed plumber according the local jurisdiction at least once a year. “Each device needs to be tagged with the date of prior testing and accompany proper documentation in order to pass or fail inspection.”

Mark Gomolla, Director of Facilities at Red Robin Gourmet Burgers, spoke about backflow prevention and the importance of this device within his establishment. “Backflow devices are a very integral part of the restaurant. They prevent the potable water supply from possible contamination in the event that a line breaks underground and forces contaminants or any other pollutants into the system. Typically, within our restaurants we have between one and three backflow preventers, including domestic, fire sprinkler and irrigation, which are the most common areas these devices are needed.”

Red Robin Gourmet Burgers stays on top of the maintenance of each backflow preventer by scheduling an annual certification completed by a national provider. This annual testing covers maintenance on the valves where they are taken apart, cleaned and inspected for wear.

“We comply by sending the certification completion to the local jurisdictions when required; we also verify the tags left on the valves are up to date,” Gomolla said. “Municipalities require annual testing; some are strictly enforced, and others are not. However, we require the records be kept onsite in case it’s needed for verification.”

When asked what problems (if any) he has faced with this device within their restaurants, he said, “The problems encountered have been primarily discovered during the certification. Typically the valve tends to leak after a few years and needs the gasket replaced. Another issue we’ve encountered is that the springs within the valve can get weak and the valve gets rebuilt. We’ve not had a valve fail to where it affected the restaurant.”

Thermal Expansion

If you have a backflow prevention assembly, it may require additional plumbing adjustments to prevent thermal-expansion damage. When a backflow prevention assembly is installed, a “closed” plumbing system is created. This means that any increased pressure caused by the expansion of heated water in the hot water tank or pipes heated by the sun has nowhere to escape. This can lead to serious consequences such as a ruptured or distorted hot water tank or a collapsed flue within the tank, which can lead to the release of toxic gases, such as carbon monoxide.

Normally, a small thermal expansion tank is installed near the hot water tank. This thermal expansion tank has a builtin bladder to absorb excess pressure and gradually release it back into the plumbing system. The Uniform Plumbing Code requires all plumbing systems classified as a “closed” system to include a thermal expansion tank.

Cold Temperatures and Freezing

Every winter, the temperatures dip below freezing, and frost forms. Inevitably, some backflow prevention assemblies freeze and are damaged. However, there are some simple solutions to prevent this from happening. Not only is it a nuisance when backflow units freeze or frost up, the repairs are expensive.

Note the difference between freeze and frost protection:

Backflow Freeze Protection incorporates an electric heating source that provides enough warmth to prevent water within the unit from freezing, even in harsh temperatures over extended periods of time.

Backflow Frost Protection is designed to protect the valve components from internal damage due to flash freezes in spring, fall or winter months, where inside damage to the seals and o-rings may result.

A temporary solution is to wrap a blanket or a towel around the assembly on cold nights. An insulation bag or backflow protection enclosure can also provide enough warmth to ward off expensive damage. A covered enclosure or pipe insulation wrap will also protect the assemblies.

Backflow prevention not only affects the restaurant and the consumers within the facility, but also the public water supply. Without this integral piece of equipment running efficiently, major problems can arise. Luckily, most jurisdictions have strict mandates in place to ensure these issues do not affect the public or the potable water system. As long as restaurants remain compliant and abide by these regulations on an annual basis, contamination will not be a threat.

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