One Good Turn: What Every Operator Should Know About Restaurant Plumbing

Stephani K. A. Robson
Cornell University, skr4@cornell.edu

Follow this and additional works at: https://scholarship.sha.cornell.edu/articles
Part of the Food and Beverage Management Commons

Recommended Citation
Robson, S. (2013). One good turn: What every operator should know about restaurant plumbing [Electronic version]. Restaurant Startup and Growth, 10(1), 41-46. Retrieved [insert date], from Cornell University, School of Hospitality Administration site: http://scholarship.sha.cornell.edu/articles/177/

This Article or Chapter is brought to you for free and open access by the School of Hotel Administration Collection at The Scholarly Commons. It has been accepted for inclusion in Articles and Chapters by an authorized administrator of The Scholarly Commons. For more information, please contact hotellibrary@cornell.edu.
One Good Turn: What Every Operator Should Know About Restaurant Plumbing

Abstract
Water and sewer costs are climbing across the country. Choosing the right equipment or fixtures and making sure they are installed and operating correctly will help improve your bottom line and be friendlier to the environment.

Keywords
restaurant, plumbing, water costs, sewer costs, plumbing fixtures

Disciplines
Food and Beverage Management

Comments
Required Publisher Statement
This article is courtesy of RestaurantOwner.com / Restaurant Startup & Growth magazine. For more information, visit www.RestaurantOwner.com.
One Good Turn
What Every Operator Should Know About Restaurant Plumbing

Water and sewer costs are climbing across the country. Choosing the right equipment or fixtures and making sure they are installed and operating correctly will help improve your bottom line and be friendlier to the environment.

By Stephani Robson

Restaurateurs usually don’t give much thought to plumbing until there is a problem—and in restaurants, any plumbing problem is usually a big plumbing problem. Some of the most costly pieces of equipment in your kitchen require water supply or drainage, to say nothing of the importance of quality plumbing service to your restrooms.

So knowing a little bit about a restaurant’s plumbing system and how to take care of it will serve you well both during the planning stages and once your restaurant is in operation. And if you are putting in a restaurant from scratch, you’ve got an opportunity to design out some of the most common plumbing problems.

Smart plumbing can also save you money. Water and sewer costs are climbing across the country. Choosing the right equipment or fixtures and making sure they are installed and operating correctly will help improve your bottom line and be friendlier to the environment.

Plumbing System Basics
Most modern buildings will have three water supply loops: one for cold water, one for hot water, and one that recirculates chilled water that services the air-conditioning system.

(Depending on the age of your building, you might also
have recirculating hot water used for heating.) Ambient temperature (cold) supply water enters the building below grade and usually passes through a meter before being distributed throughout the space, either directly to fixtures or to a hot water heater first. There will be a main water shut-off valve near the meter that you can use to cut off water supply to your entire space as well as fixture shut-offs under all sinks and many pieces of equipment, which allow you to stop water flow when you need to make a repair or remove something from service.

The piping that distributes water around your restaurant varies by material depending on where it is: underground piping that brings water into the building is generally made from copper, brass, cast iron or even steel, while pipes that distribute water throughout the space can be made of polyvinyl chloride (better known as PVC) as well as more traditional metals. Plumbers tend to avoid galvanized steel and iron piping, as these corrode over time, and brass piping is generally thicker and tougher to work with than the expensive but high-performing copper or less costly synthetics.

You'll need drains from any fixture or piece of equipment that uses water, as well as additional drains to keep water from collecting on your kitchen or restroom floors. (Plumbers often call drains “wastes.”) You may also need a drain from your refrigeration to remove condensate, especially if it’s a walk-in. Drains can either be “direct,” i.e., connected directly to a fixture, or “indirect,” which have some kind of air gap between the item being drained and the drain line itself. There will also be “empty” pipes called vents running up and out of your building that remove sewer gases and prevent air pressure buildup in closed plumbing systems like the one servicing your restrooms.

**Equipment and Fixture Selection**

There are a few plumbing-related issues to keep in mind when you are in the design phases of your first or next project. One of these is the type of drain line running from your prep sinks. Your sinks at home typically have a direct drain, which work great until there is a backup in the drain line. Your coffee machine or ice machine uses an indirect drain to prevent wastewater from backing up into the equipment and possibly making someone ill from tainted beverages or ice.

In newer restaurant kitchens, the trend is to give prep sinks an indirect drain too so that foul water doesn’t have the opportunity to back up into a sink where you may have food items draining. True, with an indirect drain any backup water will end up all over your floor instead, but at least on the floor it has minimal chances of spoiling any food and can be easily cleaned up.

Another key piece of equipment that has implications for your plumbing system is the dishwasher. When selecting your dishwasher, double-check the temperature of the hot water provided to your space before you make your final purchase.

Commercial dishwashers need to increase the water temperature to 180 degrees Fahrenheit to make sure all foodborne pathogens are killed off, so you may require a booster heater above and beyond the heater built into the washer if your building’s hot water isn’t hot enough to begin with.

Also check that any water-cooled refrigeration or ice machines you purchase are designed to tap into the recirculating chilled water loop that is part of the building’s air-conditioning system. You don’t want to be dumping cooling water down the drain after it passes through your refrigeration systems, as that wastes both money and valuable water. In general, water-cooled equipment is more expensive to buy but cheaper to operate, provided that you have that chilled water loop to tap into. If your space doesn’t have access to a chilled water loop, you’ll need to go with air-cooled refrigeration equipment.

Hard water also affects your plumbing system choices. The calcium and other minerals in hard water affect the taste of beverages, damage equipment, and make it tough for detergents to do their job. Use a carbon filter to treat water that will be used to make beverages. For dishwashers, hot water heaters and other users of no-potable (that is, nondrinking) water, you can use a water softener that treats the water with salts or other chemicals.

Lastly, make sure that the fixtures and hardware you select for your restrooms comply with the Americans with Disabilities Act and are correctly installed. Make sure that...
THE ADAAG ON RESTROOMS

If you are in a building or build-out project, you need to be aware of the Americans with Disabilities Act Architectural Guidelines (ADAAG) for restrooms. Every reputable architect knows these; however, you might inquire to spare you claims from inadvertent violations.

The regulations provide configurations for accessible restroom stalls depending on the location of the toilet and the stall door. The ADAAG provides dimensions for the height of the toilet, its position from the rear and side wall(s) of the stall, and the flush control, among other things. In standard accessible stalls, the front partition and at least one side partition must provide at least 9 inches of toe clearance “above the finished floor” (AFF). If the stall’s depth is greater than 60 inches, no toe clearance is required. The regulations also contain requirements for the widths of stall doors and the amount of space for the approach to the stall so that an individual in a wheelchair can maneuver into the stall. Grab bars are required behind and beside each accessible toilet. Toilet paper dispensers must permit continuous paper flow and must be placed 19 inches AFF.

In a men’s restroom, urinals must be hung at a maximum height of 17 inches AFF, and there must be a certain amount of clear floor space in front of the urinal to allow a front approach. There are regulations for the height of paper towel dispensers and the mechanisms on the dispensers, and the amount of clear floor space beneath the dispensers for a front or parallel approach. The ADAAG also includes certain requirements for sink height, knee and toe clearance beneath the sink and clear floor space to provide a front approach.

Installation Hints

After you’ve chosen your equipment and fixtures, another way to help prevent plumbing problems is to pay attention during the installation process. Whenever it’s feasible, have a single plumbing contractor install all of your plumbing — the kitchen, the restrooms, and anywhere else you need water or drainage. It will save you a lot of headaches in coordination and you’ll have a single source to go to if there are any problems down the line. While most contractors are reliable and professional, there are always a few who fall back on finger-pointing when things go wrong, and with one plumbing firm responsible for the entire place you’re less likely to get bounced around if there are installation errors.

First of all, make sure you have decided on all of your fixtures and equipment before the floor is installed. The placement and size of drains and water connections should be determined as early as you can to prevent expensive retrofitting after your floor is poured.

Building codes usually determine the slope of horizontal drain lines to help keep things flowing. But many building contractors miss an easy way to help drains do their job by sloping the floor slightly toward a floor drain. The slope shouldn’t be that noticeable but it should be enough to prevent water from standing on your floors. Your flooring installer can often achieve an effective slope by adjusting the amount of mortar they apply as the floor approaches a drain location, or your contractor might tweak the concrete underflooring during pouring. Either way, put pressure on your contractors to give you a gentle slope to all open drains because standing water is a prime source of slips and falls in kitchens.

Make sure to have a floor drain located discreetly in each restroom as well to make cleaning that much easier and help prevent accidents. If you have any tilting cooking equipment, you’ll want a floor drain in front of that too, as well as at least one in the warewashing area, one behind the cooking line, and one or more at any prep station that has a sink.

A Word On FOG

Then there’s the issue of “FOG,” or “fats, oil and grease.” Many cities put regulations in place that require any restaurant that prepares food using high amounts of fat to install a grease trap. These traps, also called interceptors, are large metal boxes typically installed in a depression in the floor of the restaurant. (Occasionally you will see them retrofitted into an above-ground location, which is less desirable.) Drain lines from the dishwasher, pot sinks, prep sinks and other equipment that can generate greasy wastewater must pass through the trap, which contains a set of baffles to remove grease before it clogs your pipes downstream. The size of the trap is related to what equipment needs to connect to it and the volume of wastewater it needs to treat. But even low-volume grease traps are not small items: They start at 5-gallon models that take up about 2 cubic feet of space in your floor and go up to high-flow models that can hold more than 60 gallons and are more than 4 feet long. Your engineers should determine the right size for your operation once your kitchen equipment has been selected, which is another argument for making your equipment decisions well before you begin any construction.

The trick with grease traps is where to put them. You don’t want them located too far from the source of greasy
wastewater because the grease may settle in the drain lines before they get to the trap, leaving you with a recurring clog. But if the grease trap is too close to the dishwasher, the residual heat from that 180-degree rinse water is likely to wash the grease right through the trap. And if there is too much grease in your waste line once it leaves the building, you are likely to get a fine from the city to add to your headaches from clogged drains.

Make sure that your grease trap is placed in a location where you can get to it for cleaning. I have seen installations where the grease trap was nestled under a pot sink or dishtable, which is a bad idea, as the table legs and bracing make it really hard to get in there to do the routine maintenance necessary to prevent clogs and backflow. If you have the luxury of new construction, work with your design and construction team to get the grease trap depressed into the floor in a low-traffic location and at an appropriate distance from your dishwasher. (See “Cure for the Common Clog” at right.)

Routine Maintenance

A well-installed plumbing system doesn’t require a lot of time and attention but it shouldn’t be completely ignored either. A few minutes spent checking and doing minor upkeep every few months will add life to your plumbing system and, more importantly, help prevent catastrophes.

The biggest plumbing problem in restaurants is usually clogged drains. Drains can clog for lots of reasons, including food waste or other matter getting caught in drains, grease buildup in drain lines, and everyone’s favorite: employees or guests putting things down toilets that they shouldn’t. You can keep ahead of clogs through employee training, but people are human and mistakes are made. Anything foreign that goes down the drain should be taken out manually rather than flushed away. Tree roots and waste buildup are the most common causes of clogs that occur over time and both can be managed if you catch them early. Arranging for a video camera inspection by a drain maintenance company is a smart way to spot problem areas before they get out of hand.

Grease is the most likely cause of a major clog. The constant washing of greasy smallwares every day, coupled with food scraps entering drain lines during preparation, are the typical sources of grease buildup in most restaurants, and if you have a water wash ventilator over your cooking equipment, you’ll be pumping even more grease down the drain whenever you run the self-wash cycle. Of course, grease traps can help but they only do so if you take care of them. It’s never a fun job, but regular cleanout of the grease trap is important and should be done every two to four months depending on your restaurant’s volume. There are services that will come on site and clean out your trap for you or you can save a little money and do it yourself. Just make sure that you are gentle when removing the lid so you don’t damage the gaskets and that you are familiar with how the baffles and other removable parts are configured and seated before you take them out for cleaning. Scooping out any standing water and thorough removal of the greasy waste itself should be followed by a soap-and-warm-water scrub of all surfaces before you put the lid back on. Check with your local municipality regarding how they want you to dispose of the greasy waste.

Then there’s corrosion, which can cause pipes of all types to clog or, worse, to fail, usually at a very inconvenient time. Pipes corrode for lots of reasons but pipe failure is most common when two different metals meet or if corrosive chemicals like salt or chlorine come into frequent contact with the plumbing. Periodically check all
plumbing for signs of rust or leakage, paying close attention to joints — a half-hour spent crawling around with a flashlight may save you from a kitchen flood later on, and routine video inspection of your lines performed by a professional can identify any internal buildup of corrosion or other problems.

Your sprinkler system also should be regularly inspected to make sure all sprinkler heads are in good condition, water pressure is adequate, and there are no leaks or weak spots in the piping.

Drain line and sprinkler inspection is best left to professionals but you can still do a lot of plumbing work yourself. It will save you money and angst if you don’t have to call a plumber for every problem that comes along. Have at least one person on every shift who knows how to deal with a running toilet tank, dripping faucet or simple clog, and everyone should know where the main water shut-off valve is located. You’ll want to have a few items on hand for day-to-day plumbing emergencies. Here’s what to have in your plumbing emergency tool kit:

• A plunger.
• Snakes of various lengths.
• An adjustable wrench.
• Washers of varying sizes.
• A toilet tank repair kit.

In general, the first line of defense when confronted with a clogged drain is to run a snake down to try to clear the line. Avoid using caustic drain-clearing chemicals. If you cannot clear the clog with a snake, that’s when to call in the professionals. As a preventive measure, you may want to investigate high-pressure hydrojet cleaning of your drain lines every few months or more often if you have high volume or a finicky plumbing system. Note, however, that the 3,500 psi of water pressure used in hydrojetting will quickly identify any points of failure in your system, so if your building is old or you are relying on anything other than a brand-new plumbing installation, approach this cleaning method with caution.

Finally, find out whether your water is being metered and make sure that any metering is for your space only — you don’t want to be paying for another tenant’s utilities. It’s helpful to periodically record your own meter reading so that you can check it against the statements from your water utility. Work with your local utility or city works department to conduct an audit of your existing restaurant’s plumbing system to see if there are effective ways to reduce your water use that won’t compromise your service or cost you a bundle, such as low-flow faucets and automatic shutoff valves. Have them check your water meter for accuracy as well so you don’t pay for what you don’t use.

Keep an Eye Out for Problems

When it comes to the restaurant’s own staff, preventing plumbing problems is largely a matter of watching what gets put into the floor drains and keeping a sharp eye on the plumbing that can actually be seen, such as water lines that are out in the open, or water softeners and heaters.

You’re looking for any kind of corrosion or green damage. The green color is an unmistakable indication of the wearing away of brass or copper. Another dead giveaway of problems in the offing is telltale leaks, drips or other signs of moisture.

ADDITIONAL WORDS OF WISDOM

Keep a set of the plumbing plans in the office. Pipes are running everywhere in a restaurant building and having a set of plans for the plumber to look at can save time, and at plumber rates that can mean a lot of money.

Protect disabled guests from scalds. Pursuant to the Americans with Disabilities Act Architectural Guidelines, hot water or drainpipes under sinks must be insulated or otherwise protected to guard against contact with individuals. Guests in wheelchairs with limited sensation in their lower extremities can unwittingly burn themselves when their legs touch hot water lines under restroom sinks.

Make sure your water pipes are not exposed to cold weather and/or are adequately insulated. A cold spell could mean an expensive mess. As a double backup, your managers should know where the main shut-off value is located, if a pipe breaks. Finally, check with your insurer to see if your business is insured for water damage. With the amount of water coming in and out of your business, this is a significant risk for any restaurant.

In designing your restaurant, remember that grease traps smell when opened and can chase people out of the restaurant if it is placed too close to where customers congregate and dine. When it is cleaned out, which is accomplished with a big “sucker” hose on the truck, much like the kind that empty portable toilets, make sure it is early in the morning or late at night so the smells are not noticed.

Every plumbing system should be ‘balanced.’ At one restaurant the pressure in the hot water system was overwhelming the pressure of the cold water system and the result was water in the ladies bathroom, enough to scald a guest. The “balancing” unit in line with the hot water heater had gone bad and the pressure was set too high. You might want to have this checked periodically.