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Facility Construction, Fixtures, Lighting, and Cleanliness

Facility and Utility Construction

Properly constructed and maintained facilities and utilities increase safe production and efficiency. These specifications reflect FDA recommended standards. Local codes may vary.

Construction

Walls. Walls made of glazed cinderblock are recommended (1). The FDA recommends walls that are a light, pleasant color, smooth and nonabsorbent, and easily cleaned. Some jurisdictions add "durable" to their recommendations. Utility installations, covered studs, joists, and rafters must not be exposed.

Many people use glassboard in smaller kitchens. This is acceptable in a medium-duty environment. In this case, there must be a cement riser 6 inches above the floor, so that the studs will not rest on the floor. If studs rest on the floor, they become rotted within 2 years due to normal floor mopping in a properly cleaned kitchen.

Floor. Non-slip quarry tile or brick floors are recommended (2). Epoxy-poured floor are hard to repair and do not last long. Sandpaper-type strips are sometimes used to attain a non-slip surface. They are effective for a limited period of time and can become a hazard themselves when they begin to peel from the floor surface.

The FDA allows some other types of floor materials. Mats and duckboards are acceptable, but no carpeting is allowed in food preparation area. Hardwood floors are approved in bakeries because these floors are vacuumed. Junctures between floors and walls must be closed to 1/32 of an inch.

Base Coving. Floors should be sealed at wall junctures (3). "Sealed" means sufficiently tight to prevent moisture transmission for the life of the wall. A cement riser with a 3-inch painted or tiled white strip for rodent and dirt detection is best.

Ventilation. Outside vents must be sufficient to remove undesirable odors, heat, steam, prevent condensation, and minimize escape of grease from under the hood during frying. Air intakes must prevent dust and contamination from entering.

There should be a filter in the air intake system to trap dust and filth.

The exhaust system and hood over deep-fat frying areas must be degreased at regular intervals. If a kitchen is used to prepare a lot of broiled or fried foods, this system should be cleaned every 3 months.

Fixtures

Doors. Doors to the outside must be rugged, self-closing and tight fitting, with gaps of less than 1/4 inch to prevent entrance of rodents. Hinges must be in good working condition (4). Openings to the outside must be appropriately screened or otherwise protected to prevent entrance of insects or vermin. Any screens must be made of #16 mesh (16 wires per inch) for insect control. A small window to see people coming from the other side should also be provided.

Utility Floor Basin. There must be a separate utility sink or floor basin (5) for dirty cleaning and mop water. This water must not be poured into food sinks or other plumbing fixtures, since contamination will result.

Drains. Floors must be sloped and graded about 1/4 inch per foot to drain properly. There can be no direct connection between foodservice equipment and the sewer. Drains must be trapped. Water must be kept in them to maintain a seal. The drains should be capped to prevent backflow of sewage and sewer gas, and to prevent insects and rodents from entering. There must be a surface drain to eliminate standing puddles of water inside and outside of the preparation areas.

Overhead pipes. Food must not be stored under overhead pipes or beams (6). A stainless steel "V"-shaped trough should be placed under overhead pipes in food areas to catch condensation and dirt and to help direct sewage away from food areas, should any leaks or breaks develop.

Overhead Lights. All overhead lights must be shielded to prevent glass in food if breakage occurs (7). When infrared lights are used, only the sides must be covered. Overhead lights must provide a minimum of 20 foot candles of light, but more are recommended. The light intensity should be 30 foot candles for permanently fixed, artificial light in walk-in refrigerator units, dry food storage, and other areas as measured 30 inches from the floor. The light intensity should be 70 foot candles for permanently fixed, artificial light in utensil and equipment storage areas, and in lavatory and toilet areas, as measured 30 inches from the floor. The light intensity should be 100 foot candles of light on all food preparation surfaces and at equipment or utensil washing work levels. High intensity lights (100 foot candles) are recommended for cleaning. They can be turned off for regular operations.

Waste Disposal

Inside Trash Containers. Trash containers must be insect- and rodent-proof, cleanable, leak-proof, and non-odor absorbent (8). The operation must have a sufficient number of correctly sized trash containers. If these containers are outside, they must be covered. If the containers are inside and not in everyday use, they should also be covered. Push-lids should be used for inside trash containers. It is acceptable to allow trash containers in dish scraping areas to remain open during mealtime cleanup. Garbage containers must be cleaned daily.

Outdoor Disposal Units. Outdoor disposal units must be covered with properly fitting lids to exclude birds, insects, and rodents, and prevent odors from escaping (9). The doors of dumpsters must stay closed. Garbage containers should be placed on a hard surface made of concrete or asphalt. These areas should be cleaned often to prevent an accumulation of debris. A supply of hot water, a hose, and a drain in the middle of the concrete pad are features that allow this area to be cleaned easily. Disposal units must be emptied frequently enough to prevent a nuisance.

Cleaning System

All faucets with hose attachments (10) in the cleaning supply area must have backflow prevention valves.

A pressurized cleaning wand can be used to clean floors, walls, and behind equipment (11).

The best way to clean a floor is to spray on the cleaner under pressure, let it soak the dirt loose, and mop with a clean mop (12). Additional agitation can be applied with a floor brush. Pressure washing alone is often insufficient to remove dirt and grease; elbow grease is necessary. After the floor is rinsed thoroughly, the floor should be squeegeed or wet vacuumed and allowed to air dry.

The second best way to clean a floor is to use one mop to remove the dirt and another mop to rinse. A third mop is used to sanitize the floor. Using one mop to both clean and rinse floors is essentially worthless.

Splash surfaces are most effectively cleaned by using a detergent solution and agitating the surface with a brush or scrubbing pad, followed by hot water rinse.

All bulk cleaning and sanitizing chemicals must be stored in areas separate from food supplies (13). They must be measured carefully when used, for safety as well as cost considerations.

WOOD: HARD MAPLE OR NON-ABSORBENT



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Wooden Equipment

Usually, stainless steel is required as a food contact surface. Hard maple and other non-absorbent, FDA acceptable materials may be used for cutting blocks, cutting boards, salad bowls, and bakers' tables. Wood may be used for single-service articles such as chopsticks, stirrers, or ice cream spoons. Once used, single-service wooden items must be discarded.

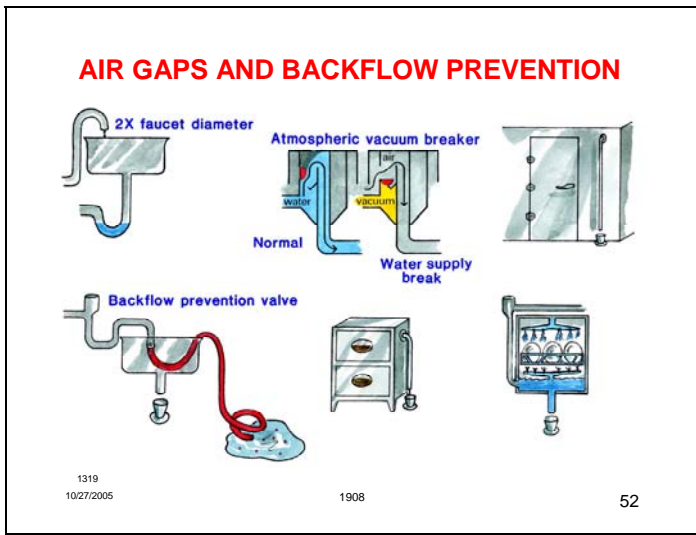
Wood may also be used for flooring and tables in a bakery because, while a flour-water dough may contain some pathogens, they do not grow due to competitive inhibition by yeast.

Wooden equipment must be non-toxic, and should be smooth, free of faulty seams, crevices, and cracks that could harbor pathogens. If wood is solid and dense, it is an acceptable material to use in food preparation.

In the past, cutting boards were cleaned effectively by placing salt on the surface and then scraping the surface with a metal scraper or brush. This scraping caused salt to penetrate the surface of the wood and remain at a concentration that inhibited microbial growth. Lemon juice was also used in combination with salt to sanitize wood surfaces effectively.

HITM research has shown that wooden cutting boards can be effectively sanitized in a properly operating dishwashing machine. When wooden cutting boards become worn, they can be planed and sanded until their surfaces are smooth. However, this procedure does not guarantee hazard control because the cutting boards become scratched as soon as they are placed back in operation.

To control hazards on cutting boards, all cutting boards must be cleaned with a stiff brush and hot, clean water to remove grease and debris (potential sources of microorganisms) in the grooves.



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Air Gaps and Backflow Prevention Plumbing Hazards

Plumbing connections and drains are microbiological critical control points. Drains are heavily contaminated with microorganisms, especially *Listeria monocytogenes*. If drainage systems are connected directly to sewage lines, contamination of potable water can occur as a result of backflow and back-siphonage of non-potable water or sewage. The potential for backflow and back siphonage from drains or other non-potable water sources into potable water lines must be prevented with proper plumbing connections and techniques.

If sewage water is allowed to re-enter the kitchen or service area, a number of microorganisms and viruses can be carried into the facility. In some places where municipalities have an old water system or water comes from an underground stream, there are also problems with cockroaches, other insects, and rodents entering through floor drains. Effective plumbing and drainage systems must control this problem.

Certain plumbing regulations apply to all facilities, and local health officials have the ultimate authority for plumbing specifications and requirements. A local regulation which is applied nation-wide to foodservice facilities is that no foodservice equipment can have a direct connection to sewer lines.

Negative pressure can develop in a water line when large volumes of water are pulled out of the system (for example, during fire fighting). An example of this type of occurrence is a sink faucet with a threaded end to which a hose is attached. The end of the hose is immersed in a sink or bucket of dirty water. If a negative pressure develops within a plumbing system containing no backflow or back-siphonage design and devices, the dirty water in the sink or bucket can be suctioned or flow back into the potable water system through the hose connection if the potable water pressure is decreased. As a consequence, the potable water system becomes polluted.

This negative pressure problem is controlled with backflow and back-siphonage plumbing techniques that use air or a mechanical means of blocking gases, water, insects, or other contaminants from entering the potable water system. Plumbing that does not contain backflow and back-siphonage devices or

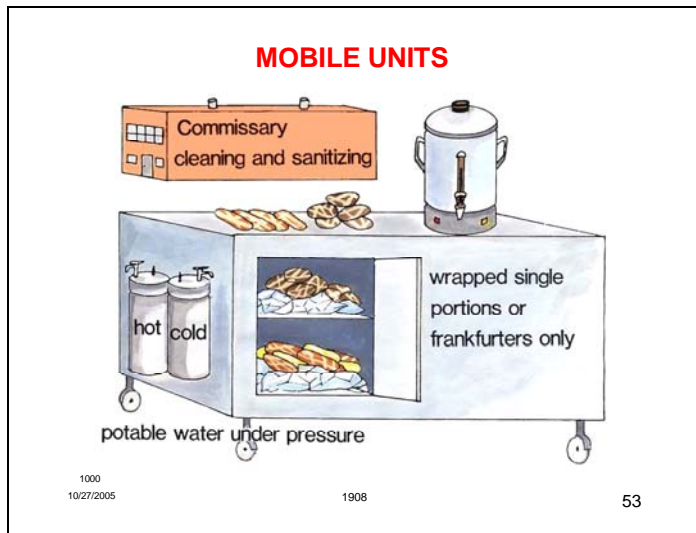
plumbing installation techniques that prevent this problem can become a pathway for the entrance of pollutants or contaminants into the potable water system.

Air Gaps and Backflow and Back-Siphonage Prevention Methods for preventing backflow and backsiphonage are:

1. Air gaps
2. Siphon breakers (must be above water line)
3. Pressure vacuum breakers
4. Atmospheric vacuum breakers.

Examples of Backflow and Back Siphonage Prevention

1. Backflow can be prevented, as shown by the sink illustration, if the distance from the top of the sink to the bottom of the faucet outlet is more than two times the faucet outlet diameter. A backflow valve is not needed in this situation because there is an air gap.
2. The illustration shows an **atmospheric vacuum breaker**. If the water system drops to negative pressure, this mechanical device closes. Thus the vacuum within the water pipe is prevented from suctioning up contaminated liquid. This type of problem can occur in a dishwasher or if hose from a water faucet is connected to a floor drain. If the faucet or pipe is threaded for a hose connection, there must be a backflow prevention valve.
3. Refrigerators that have condensate flowing through an air gap by the door allow drainage of condensation that occurs within the refrigerator. Having the drain just outside the door also allows water to flow to the drain when refrigerators are cleaned.



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Mobile Foodservice Units Operating Away from a Commissary

Mobile Foodservice

Mobile food units include human-powered pushcarts and motor-driven vehicles that carry extremely limited preparation and pre-packaged foods. Mobile food units or pushcarts must serve prepared food that is packaged in individual servings, and transported and stored under conditions of safe food handling. Cook-and-serve items such as frankfurters may be prepared and served.

They may serve beverages that are not potentially hazardous and are dispensed from covered urns or other protected equipment.

Potable Water

Water that is safe for human consumption is potable. Greywater is potable water that contains soap or detergent residues, dirt, sanitizers or other chemicals. A mobile food unit requiring water must have a potable water system under pressure and a greywater storage tank that exceeds the capacity of the potable water tank by a specified percentage (usually 15%). There must be sufficient hot and cold potable water available for hand washing, food preparation, and utensil and equipment cleaning and sanitizing. Water and sewage systems are not required if facilities for cleaning and sanitizing exist at the commissary. The mobile food unit must report to the commissary at least daily for supplies and cleaning and servicing operations.

Catering

Catering vehicles are not mobile food units. Catering vehicles simply transport food from the commissary to the serving point. The only requirements, which are not enforced in all jurisdictions, are that the vehicle has approved equipment for maintaining food temperatures below 41°F or above 135°F and that the interior (the "food contact surface") of the vehicle be maintained in a clean and sanitary condition. No food preparation is done within the vehicle and there are no potable water requirements.

The use of a car to transport food that is not below 41°F or above 135°F is not permitted.

