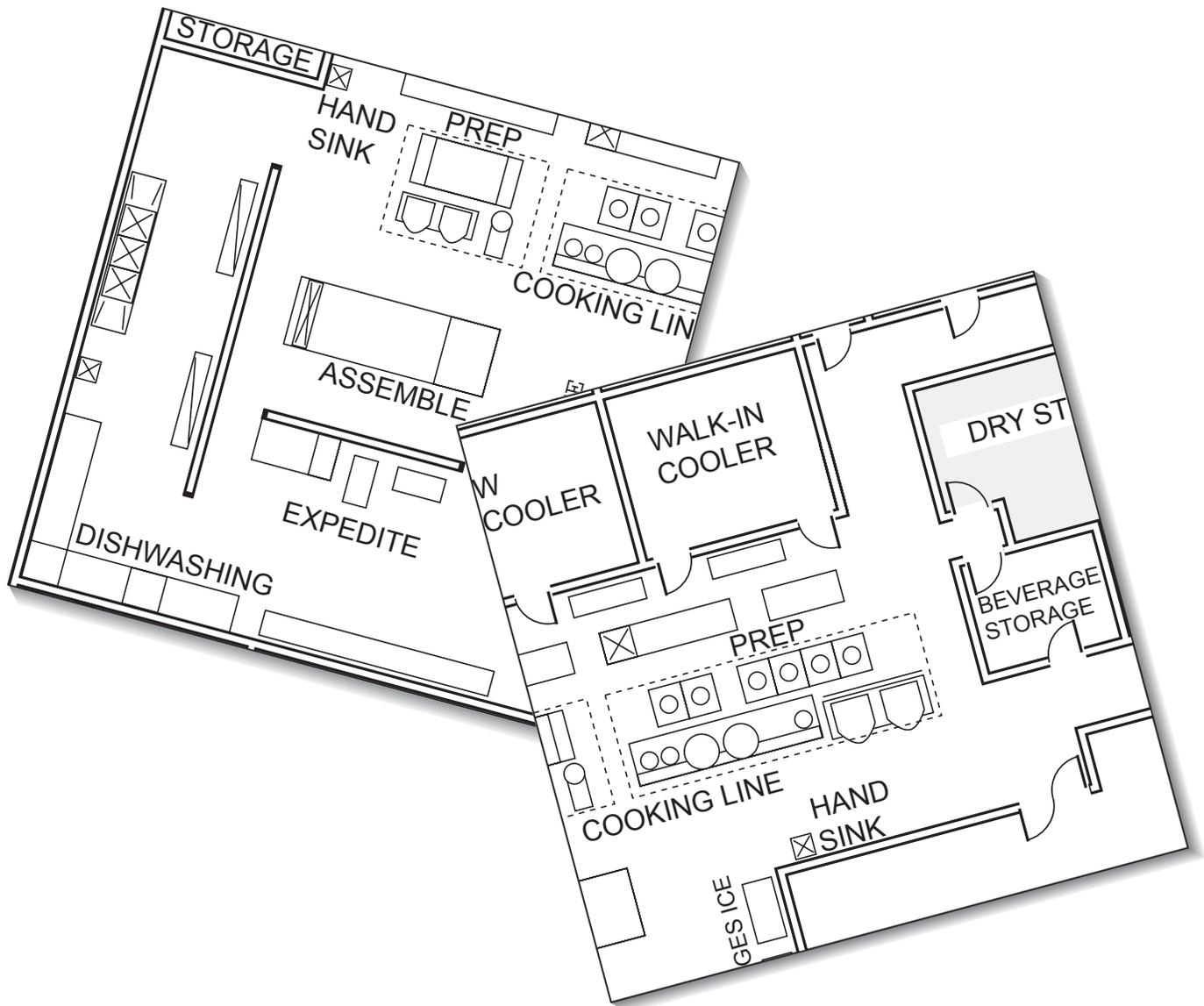


Food Service Design & Construction Manual



Crawford County Health Department

202 N. Christopher Blvd. • Robinson, IL 62454 • (618) 544-8798

<http://www.cchd.net>

Introduction

This manual is for architects, building contractors, food service equipment dealers, food service operators, consultants and other interested professionals. The purpose of this manual is to help in the development of plans to meet the standards of the Crawford County Health Department. Our goal is to provide you with useful information that will enable you to design the best food service facility possible.

In addition to this guide, our department can supply you with a copy of the Crawford County Food Sanitation Ordinance, which contains information pertaining to the food permit, fees, and enforcement provisions, etc. that pertain to retail food service establishments in Crawford County. We can also supply you with a current copy of the Illinois Department of Public Health Food Service Code, which is enforced by this department.

This manual is intended to serve only as a guide. Examples or figures given in this guide do not necessarily represent ordinances or requirements for design or construction. Since local municipalities have building, zoning, mechanical, electrical, plumbing and fire protection requirements, you should contact these other agencies as soon as possible to clarify their requirements. In all cases, you will need an approval by the Crawford County Health Department before beginning any construction.

Purpose

A plan review is required for each proposed new or remodeled food service facility in Crawford County. The purpose of the plan review is twofold. First, the plan review will help eliminate complications in your facility's design, subsequent construction schedules, and final approval before the opening of your business. Second, the Crawford County Food Sanitation Ordinance requires a plan review for the construction or remodel of a building to be used as a food establishment. Our objective is to eliminate potential problems before actual construction starts to keep building costs to a minimum.

The layout and design of the plans should be based on HACCP (Hazard Analysis Critical Control Point) quality assurance concepts. A menu is a critical part of the plan review process. The type of foods and the service style will influence the type of equipment required. Consider the steps you will use to produce the foods on your menu. This will aid in providing equipment best suited for your operation.

Some important points to remember:

- Anticipate your equipment needs to meet food storage, preparation, holding and serving demands.
- Install the equipment to be easily accessible for cleaning.
- Develop an efficient food flow, from the point of delivery to final service.

Should you have any questions during the planning or construction process, please contact the Crawford County Health Department's Environmental Health Division at (618) 544-8798.

Acknowledgement

We would like to thank the Crawford County Health Department for assistance in the preparation of this construction guide. Their construction guide provided us a very useful model on which to base our guide.

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I. Plans, Inspections and Fees

A. Plan Review

Your plans must receive approval from the Crawford County Health Department before you begin constructing, enlarging, altering or converting any building for use as a restaurant, tavern, retail food store, etc. Provide one set of detailed plans drawn to scale.

Include with your plans:

1. Food service equipment specifications with manufacturers' names and model numbers. You should also include equipment specification sheets.
2. Floor plans and food service equipment layouts. We may ask for equipment elevations if they are not shown on specification sheets.
3. Plumbing plans and layouts.
4. Room and area finish schedules for floors, coved surfaces, walls, doors and ceilings.
5. Mechanical kitchen ventilation exhaust plans.
6. A copy of your menu.

Plans that are incomplete will not receive approval. Please refer to Figure 1 on page 3 to see an acceptable floor layout plan.

If you want to make any changes after the health department has approved the plans, you must submit those changes and receive approval before the start of construction.

Only finishes, fixtures, materials, equipment or installations that are *equal to or better than* the requirements outlined may be substituted after the review and approval process.

B. Inspections

During construction, the Crawford County Health Department will make inspections of your facility's construction and the installation of your equipment.

Pre-final and final inspections are required. You may arrange these inspections, and additional inspections or field consultations, by calling (618) 544-8798. Health department staff, in conjunction with the appropriate city officials, must make an inspection and grant approval before any food products can be brought into the facility.

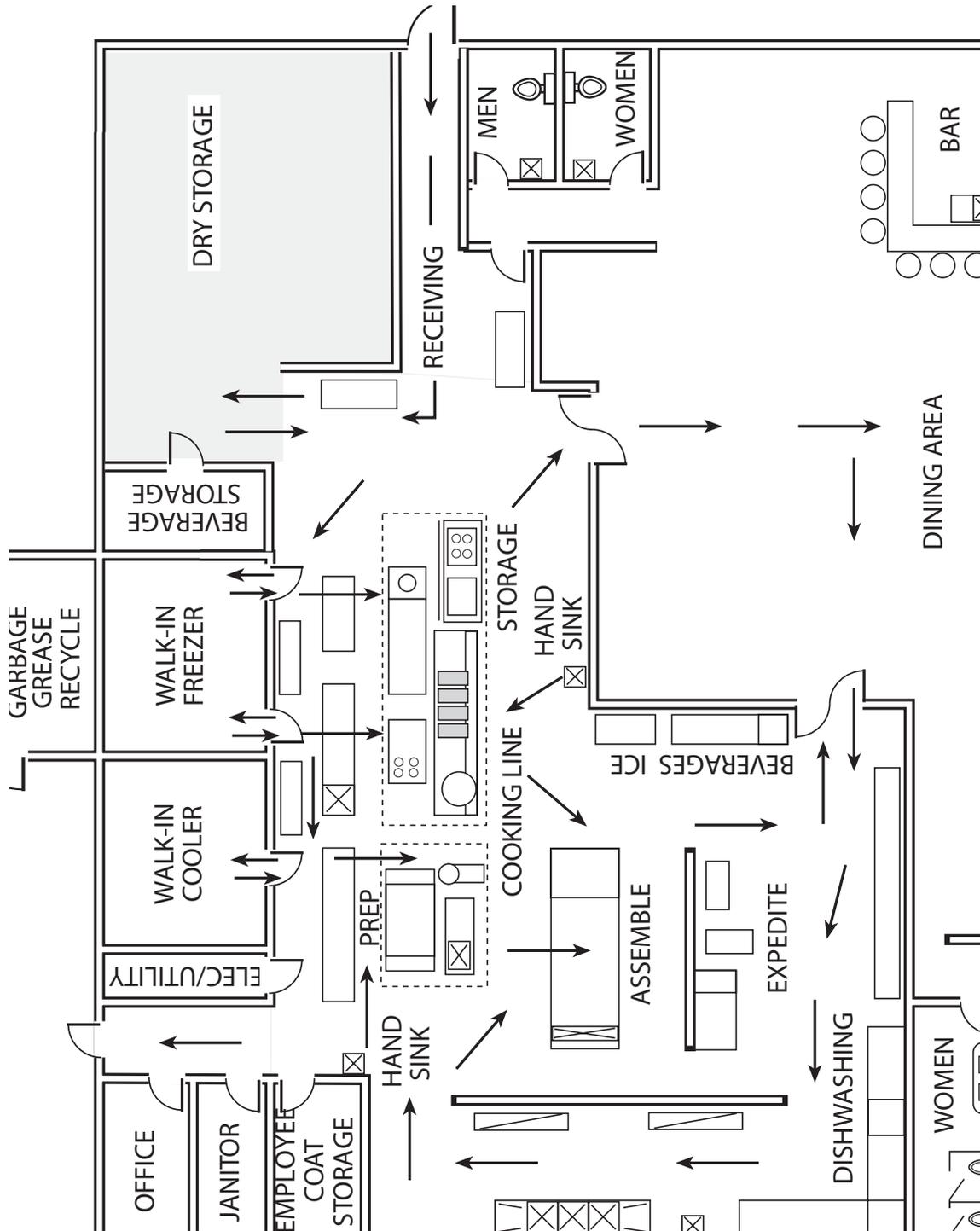
The health department will issue a permit to the business owner after all necessary factors have been brought into compliance with applicable state and local codes. In some cases, a certificate of occupancy, issued by the City of Robinson, must be granted prior to the health department staff giving approval of the food permit and granting permission to open.

C. Fees

Fees are charged on an annual basis for all permits issued to full time and seasonal food establishments. The annual fees for food permits are based on which particular risk classification an establishment is placed. Such fees are due by July 31 of that calendar year.

The fee for the first permit issued to an owner, for each food service establishment owned or operated, shall be increased. If a business changes location, the owner shall be required to pay the surcharge for the first permit at the new location. A late penalty fee of \$50.00 shall be assessed for permit renewal payments received after August 30 of the permit renewal year. The late penalty fee shall be increased to \$100.00 for payments received after October 1 of the renewal year.

Figure 1: Partial Kitchen Layout



Plan Review Process Checklist

Did you remember to...

Submit complete plans?

Submit one copy of your proposed menu?

Submit specification sheets on equipment?

Review the Food Service Design and Construction Manual?

Do you have a State Certified Food Service Manager? You may request information on courses being offered in Crawford County. Remember, you only have three months from the date you open to become certified.



II. Equipment

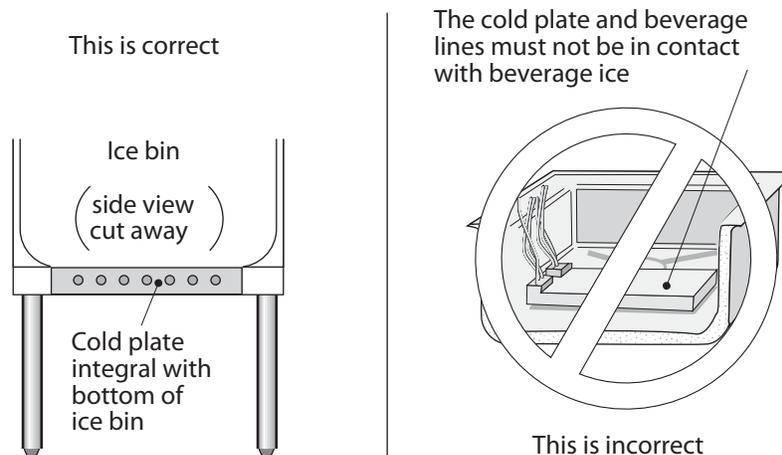
A. Materials and Design

All food service equipment shall meet or be equivalent to applicable National Sanitation Foundation (NSF) standards or, equivalent food equipment standards of another recognized testing agency that tests to NSF food equipment standards. If NSF food equipment standards do not exist for a piece of equipment, the equipment must be inspected and approved by this department before being placed into service. Unmarked equipment may not meet the standards. Include the make and model numbers on your plans so that equipment approval can be verified.

B. Specialty Equipment

1. Cold Plates: When installed in ice bins, the cold plates must be an integral part of the bin. Drop-in cold plates are not allowed. Refer to Figure 2.

Figure 2: Cold Plates

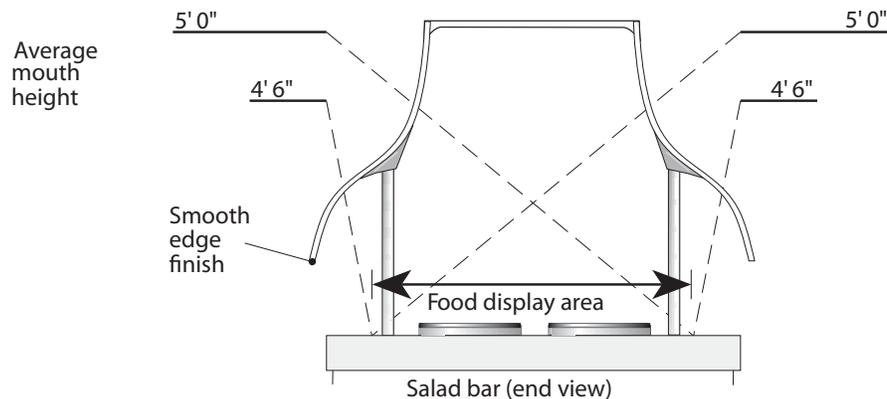


2. Dipper Wells: Provide dipper wells with running water where you dispense bulk ice cream. Also consider using dipper wells with dispensing utensils for other bulk foods such as cooked rice, whipped butter, etc.
3. Food Preparation Sink: Install separate sinks designed for vegetable washing or food preparation only in the food preparation area. Options to be considered are multiple compartments, overhead spray faucets and drainboards.
4. Single Service Dispensing Equipment: Install equipment for properly handling single service items like paper cups, lids and straws.
5. Food Contact Surfaces: Install work surfaces made of stainless steel. NSF approved cutting surfaces are acceptable where food is prepared and assembled. They must be durable under conditions of normal use and cleaning.

6. Buffets

- a. Open Food Display: Protect food on display from consumer contamination by using easily cleanable sneeze shields, display cases and similar equipment. Design and install these devices to intercept a direct line between a customer's mouth and foods on display. Refer to Figure 3 as an example.

Figure 3: Food Display Protection Example



- b. Temperature Control: Provide equipment to maintain all readily perishable foods at required temperatures. Provide thermometers in all hot and cold food holding units.

7. Drive-Thru and Walk-Up Windows

Both types of windows shall be self-closing. Exterior pass-through food drawers, with removable plans, shall have seamless coved corners, smooth counters, and open-sided slide channels for easy cleanability

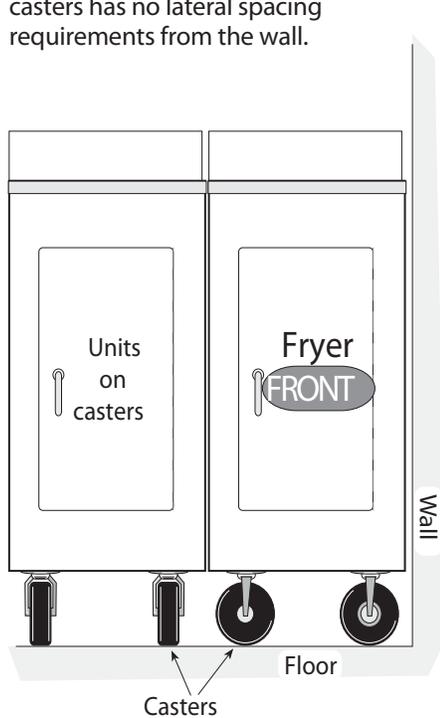
C. Equipment Installation Directions

1. Table-Mounted Equipment: Install table-mounted equipment on 4 inch legs, or seal the equipment to the table using silicone caulk, unless it is portable. Portable equipment weighs less than 75 pounds and has no rigid utility connections. Keep pieces of table-mounted equipment at least 6 inches apart to ensure access for cleaning.
2. Floor-Mounted Equipment: Install floor-mounted equipment using method a, b or c:
 - a. Casters: The preferred method of installation is to put equipment on casters. Use coated steel, commercial-grade utility connections that are smooth and flexible with quick disconnects. They must meet NSF standards. Connections must be long enough to move the equipment so the area around and behind can be cleaned. When you cannot meet other equipment spacing criteria, you must mount the equipment on casters. Refer to Figure 4, pg. 7.
 - b. Spacing: Install equipment, other than portable equipment, with sufficient space between adjacent equipment, floors, walls, cabinets and ceilings to facilitate proper cleaning. Floor mounted equipment that you plan to install on legs must have a minimum floor clearance of 6 inches. Measure this clearance from the lowest obstruction under the piece of equipment (i.e. drain lines, water lines, electric lines, etc.). The equipment's dimensions determine the space needed for cleaning access.
 - 1) Maintain 8 inches of spacing when the area to be cleaned is less than 4 feet long.
 - 2) Maintain 18 inches of spacing when the area to be cleaned is 4 feet long or more.

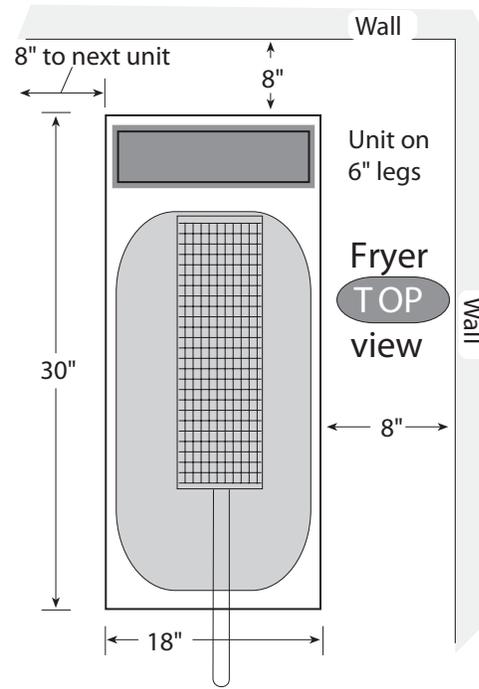
Figure 4: Comparing Caster & Leg Installation Methods

Fryers on casters take up less floor space and are easier to clean.

Equipment that you can roll on casters has no lateral spacing requirements from the wall.

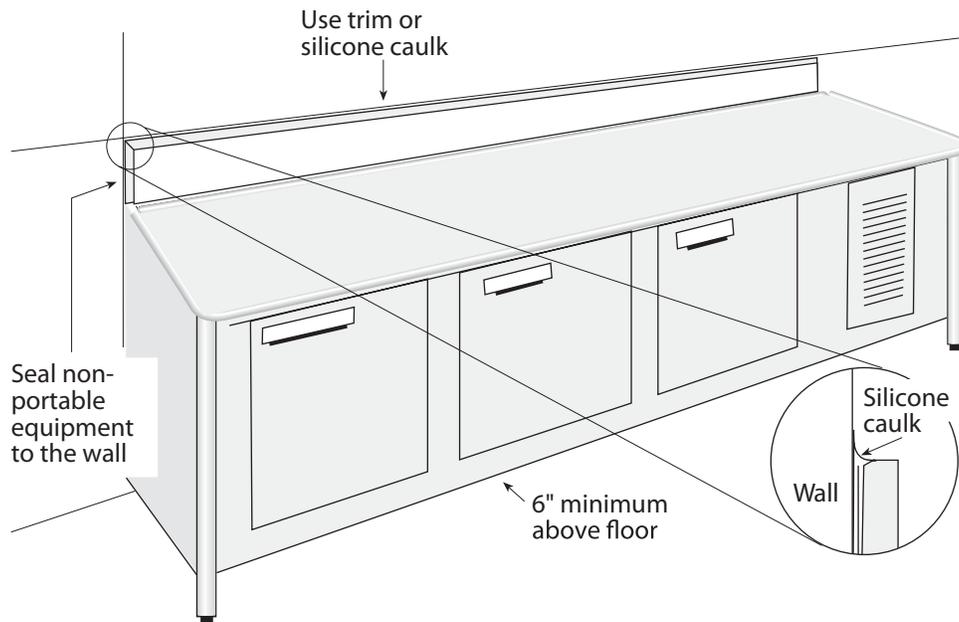


Fryers on legs must meet minimum spacing requirements, according to their size.



- c. Sealing: Use 100 percent silicone caulk or cleanable trim to seal spaces. This includes spaces between non-portable equipment, accesses to cabinet voids, around pipes, around wall-mounted equipment, etc. The silicone bead must be smoothed and covered (3/8 inch radius). Avoid excessive application in large gaps. Refer to Figure 5.

Figure 5: Sealing in Place



- d. Seal cabinet, flooring and wall interfaces that are larger than 1/32 inch and smaller than 6 inches. Seal all gaps, voids and protrusions using silicone caulk or trim that meets the finish material standard.
 - e. While allowed by code, raised floor platforms are not a recommended method of food service equipment installation.
3. Conduits: Keep all exposed utility lines (plumbing, gas, electrical, refrigeration, etc.) to a minimum. Keep exposed lines at least 6 inches off the floor, and at least 1/2 inch away from walls and ceilings.
 4. Walk-In Coolers: Choose whether the space between the top of a walk-in refrigerator or freezer and the ceiling will be closed or open.
 - a. If closed, enclose the space with a panel (either fixed or removable).
 - b. If open, provide an unobstructed open space of at least 30 inches between the top of the unit and the ceiling.
 - c. The area between the top of a walk-in refrigerator or freezer cannot be used for storage purposes.

III. Refrigeration

General Storage

Refrigeration and freezers are required to maintain potentially hazardous foods below 41°F and 0°F respectively. These units must meet NSF design and material standards. Therefore, domestic-type refrigerators and freezers are not approved for retail food service. Refrigeration and freezer storage involves six major areas:

1. Storage for short-term holding of perishable and potentially hazardous food items.
2. Freezer storage for long-term storage.
3. Storage space for quick chilling of foods.
4. Space for assembling and processing of potentially hazardous foods.
5. Display storage.
6. Display storage for customer service.

Calculating the amount of refrigeration and freezer space must be based on menu and the expected food volume. The amount and location of refrigeration and freezer equipment must complement the food flow of the operation from receiving, storage and food processing, to the point of service.

When assessing the refrigeration needs, shelving space within refrigeration and freezer units must be designed to prevent the cross-contamination of foods. Consideration must be given to separate raw meats and poultry from ready-to-eat foods such as produce and pre-prepared food items.

Thermometers must be conspicuously located in all units. Thermometer sensing elements should be located near the door(s). Additional measures such as high-temperature alarms should be installed when storing large quantities of potentially hazardous foods.

A. Walk-In Coolers

Walk-in coolers must be installed when there is a need for long-term storage of perishable and potentially hazardous foods or when quick chilling space is needed for prepared and cooked foods. These coolers should be located near delivery or receiving areas. Remote outdoor walk-in refrigerators or freezers are not approved.

B. Reach-In Refrigerators

These units are for short-term storage of perishable and potentially hazardous foods. These units must be considered to meet the daily demands of the kitchen operation. They are to be conveniently located at points of food preparation and food assembly. These units are not to be considered for the quick chilling of cooked and prepared foods.

C. Freezers

Freezers are for long-term storage. They are not designed to be used as quick-chill units. These units should be located near delivery and dry storage areas.

D. Blast Chillers

These units should be considered to handle large volumes of food that require quick chilling. A blast chiller is an efficient cooling mechanism for any amount of food to be chilled, and where refrigeration storage space is limited.

E. Refrigerated Worktables

These units are needed when the menu includes assembling potentially hazardous foods. These units provide easy access of foods from the top of the unit. These units are not designed for long-term storage or for quick chilling.

F. Refrigeration Processing Rooms

These areas should be considered when there is extensive handling of cold potentially hazardous foods.

G. Display Storage Refrigerators

These units are designed to display potentially hazardous foods under refrigeration. Examples of these units are deli display, fresh fish display, fresh meat and poultry display cases.

H. Customer Service Display Units

These units are designed for holding foods under refrigeration for customer access. They are designed for short-term display and are not designed to cool foods. Beverage display coolers are not approved for storing potentially hazardous foods.

I. Cold Buffet Units

Cold buffets and salad bars are designed for short-term display. They must be mechanically refrigerated.

J. Ice Machines

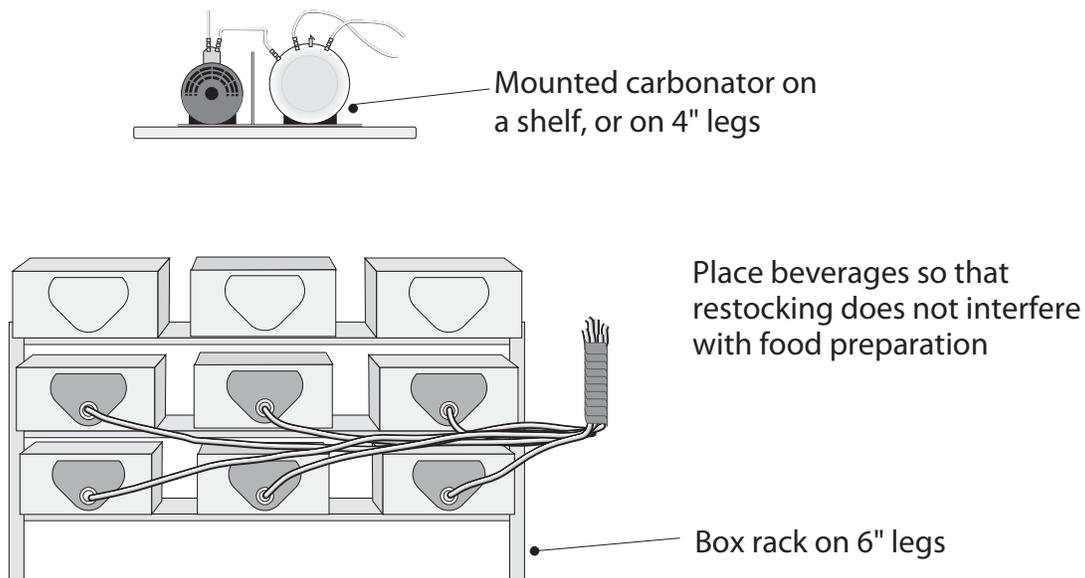
If ice is to be used as a cooling medium, the unit must be adequately designed and sized to meet all operational needs.

IV. Storage

A. Dry Storage Area

1. General: Provide suitable space on your plans for storing all food-related items. Equip dry storage areas with adequate approved shelving. Storage space does not include floor areas where desks, equipment, ladders or other items may be placed. You should have an exterior door near the storage area so that delivery personnel do not have to walk through your food preparation area.
2. Installation: All shelving must be at least 6 inches above the floor .
3. Liquor, Canned, and Bottled Beverages: All containers of liquor, canned, and bottled beverages must be stored on approved shelving units that are constructed of smooth, durable and easily cleanable materials. Kegs of beer may be stored on the floor provided the floor surface is sufficiently strong for such load factors and is maintained in good condition.

Figure 6: Bag in a Box & Carbonator



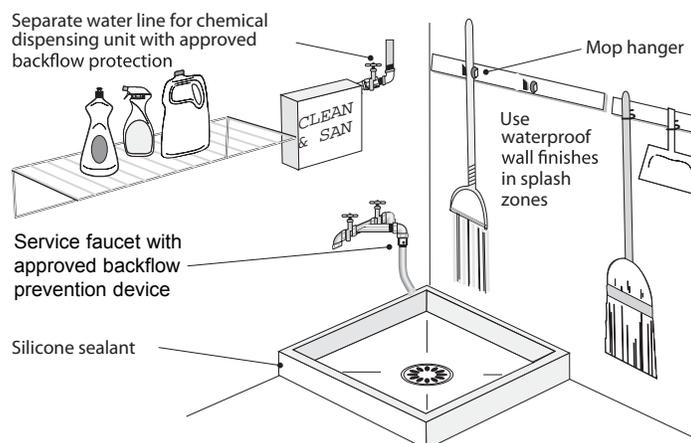
B. Wet Storage

1. Storage of packaged food in contact with water from undrained ice is prohibited. Wrapped sandwiches and wrapped food items shall not be stored in direct contact with ice.
2. All equipment and containers used for the storage of packaged food items in contact with ice shall be designed to allow gravity drainage only of melted ice to a floor sink with an approved air gap.

C. Storage Locations

1. **Cooking Utensils:** Designate an area for clean cooking utensils, cutting boards, glassware and dishware. Store them off the floor in a clean, dry location where they will be protected from dust and splash.
2. **Clean Linen:** Provide a storage area for linens, if you use them. Protect clean linens from contamination, and store them away from soiled linens.
3. **Soiled Linens:** Specify the location of covered, non-absorbent containers or washable laundry bags designated for holding damp or soiled linens, soiled uniforms, aprons, etc.
4. **Chemicals:** Designate an area for toxic materials storage that is away from food and clean utensils. Install cages, cabinets or physically separated shelves for storing chemicals in each of the two following categories:
 - a. **Pesticides approved for food service use:** These must be in a secured cabinet.
 - b. **Cleaners:** These include detergents, sanitizers, related cleaning or drying agents and caustics, acids, polishes and other chemicals.
5. **Maintenance Equipment:** Designate an area for storing maintenance equipment and cleaning supplies. See Figure 7.
 - a. **Wall-Hung Storage:** Specify adequate broom racks to keep brooms, dust pans, etc., off the floor.
 - b. **Mop Hooks:** Install heavy-duty mop hooks that can support wet mops over the janitorial sink so that wet mops may drip dry into the sink basin.
 - c. **Shelving:** Provide open wire or solid metal shelving at each janitorial station for a working supply of cleaning items.
 - d. **Peg Board:** The use of peg board is unapproved.
6. **Firewood:** If firewood is used, designate an area for firewood separate from food service and storage areas. Provide special measures to ensure insect and rodent control.

Figure 7: Janitorial Station



D. Shelving

1. General: Kitchen shelving must meet NSF standards. Shelves must be constructed of metal or material which has been finished so as to have smooth, easily cleanable, non-absorbent surfaces. Shelves subject to heat or moisture must be of rust-resistant metal. Shelving not approved by NSF may be used in dry storage provided:
 - a. The particular area used is a separate room isolated from other food service operations.
 - b. Stored items do not consist of open foods.
 - c. Shelves are designed and fabricated in accordance with Illinois Food Service Sanitation Code 705.
 - d. Final approval is reserved for on-site inspection by the Crawford County Health Department.
2. Refrigerators and Freezers: All shelving must meet NSF standards. In addition, shelving installed in refrigerators must be made of rust-resistant metal or other impervious material. The minimum height of a bottom shelf above the floor of a walk-in refrigerator or freezer is 6 inches.

V. Employee Areas, Restrooms and Hand Washing Sinks

A. Employee Area

1. Personal Belongings: Specify a coat rack, coat hooks or other suitable facilities for employees to store their clothing and other personal belongings. Consider installing lockers in a designated area.
2. Dressing Rooms: If employees change clothes on-site, provide a dressing room where they may change and store their personal, non-work garments. This cannot be in areas used for storing, preparing or serving food, or for washing or storing utensils.
3. Break Area: Designate a separate break room or area away from food preparation and utensil washing areas if employees are not allowed to eat in the dining room.
4. Personal medications and first aid kits shall not be stored in food storage, preparation or service areas.

B. Restrooms

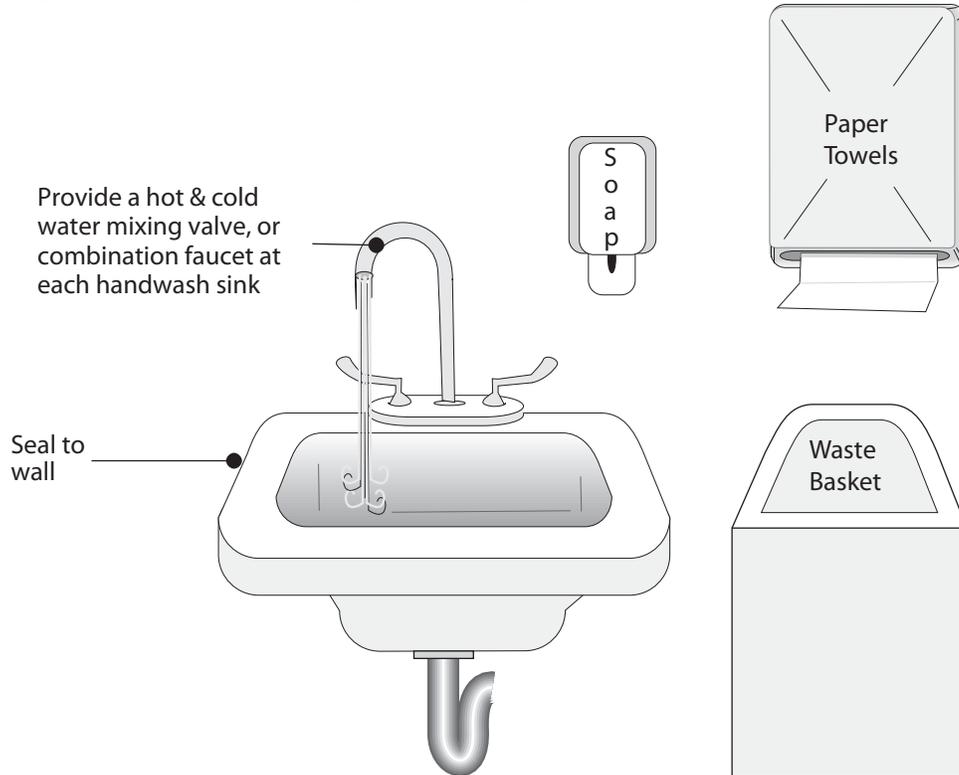
1. Number: Provide at least the minimum number of toilet facilities for employees required by the local building department and/or the Illinois Plumbing Code.
2. Location: Restrooms must be conveniently placed and accessible to employees.
3. Access: Public access to restrooms through food preparation or utensil washing areas is prohibited.
4. Fly Control: Provide completely enclosed toilet rooms with tight-fitting, self-closing doors.
5. Toilets and Urinals: Equip flush tanks with anti-siphon ballcocks. Equip urinals with vacuum breakers on flush valves.
6. Ventilation: Mechanically vent restrooms to the outside of the building.
7. Dispensers: Each sink used for hand washing must have a supply of dispensed hand cleansing soap and a supply of disposable paper towels. Dispensers must be conveniently located near each hand washing sink. Toilet rooms must be provided with dispensed disposable paper towels or approved hot air drying devices.
8. Water Supply: Provide each hand washing sink with hot and cold water by means of a mixing valve or combination faucet. Any self-closing, slow-closing, or metering faucet used must provide a flow of water for at least 15 seconds without the need to reactivate the faucet.
9. Refuse Containers: Provide covered refuse containers.
10. Diaper Changing: If you provide diaper changing tables, you must provide covered waste containers. We recommend the containers have tight-fitting lids.

C. Hand Washing Sinks

1. Location: Provide a sufficient number of hand washing sinks. Place hand washing sinks to allow convenient use in food preparation and utensil washing areas. Hand washing sinks are not accepted in counter tops in the kitchen area. Porcelain hand sinks are approved for use.
2. Bar Areas: A hand washing sink must be provided in bar areas.
3. Water Supply: Provide each hand washing sink with hot and cold water by means of mixing valve or combination faucet.
4. Dispensers: Provide a supply of hand cleansing soap and a sanitary hand drying device at each food preparation hand washing sink. A waste receptacle must be provided near the sink. The use of common towels is prohibited. Hand sanitizers or gloves may be used **in addition to** conventional hand washing. They should be placed near your hand washing sinks.

NOTE: The use of hand sanitizers and gloves are not substitutes for proper hand washing. Handwashing is one of the key ways to stop the transfer of bacterial organisms from one surface to another.

Figure 8: Handwashing Sink Design



5. **Splash Protection:** Splash guards are needed when a hand washing sink is less than 18 inches within a food contact surface, food storage shelves, food service areas, vegetable preparation sink or utensil washing sink. The splash guard must be at least 8 inches high. We suggest you use stainless steel. Securely fasten splash guards to the wall and counter top or sink. Allow 24 inches of access front and adjacent to hand sink. Use Silicone to seal the seam created by the splash guard.

VI. Plumbing

Install and maintain plumbing according to the Illinois State Plumbing Code and local requirements.

A. Water Supply

Provide an adequate supply of potable water to satisfy the needs of the food service establishment. Water must come from a public water supply or from a private water supply approved by the Crawford County Health Department.

B. Sewage Disposal

All water-carried sewage must go to a public sewage system or to a health department approved private sewage disposal system.

C. Grease Interceptors

State and local codes determine the number and size of grease traps, grease interceptors or catch basins for establishments in all municipalities and rural county areas. If required, verify these installation requirements in your plans:

1. Install an outside grease catch basin with access for maintenance purposes.
2. If an outside grease catch basin is not feasible, install a recessed grease trap in the following manner:
 - a. The lid must be flush with the floor.
 - b. Inlets and outlets that are a minimum 3 inches in diameter are required.
 - c. The interceptor must be durable, corrosion-resistant and have a watertight lid securely fastened in place.
 - d. The lid and baffles must be easily accessible for maintenance.

D. Janitorial Sinks

1. Design: Provide janitorial stations for general clean up activities in all food handling facilities. Include either a floor basin sink or a janitorial sink. Connect the basin or sink with a drain to the sanitary sewer. Provide hot and cold water, under pressure, with a mixing faucet and approved backflow protection. Refer to Figure 7 (page 11).
2. Location: Janitorial stations must be conveniently placed for maintaining food service areas. They should be separate from the food preparation and food storage areas. The janitorial basin or sink must be accessible for use during food service operations. More than one janitorial station may be necessary, depending on the size of the operation.
3. Additional Equipment: Other stationary equipment, such as water softeners or water filter systems may not obstruct the mop basin or sink. Allow for space adjacent to the mop sink for storage of mop buckets. Place chemical dispensing systems so they do not interfere with maintenance equipment storage or use. Install a separate water line for chemical cleaning systems and include appropriate backflow protection. If you suspend a hot water heater over the mop basin, maintain a minimum clearance of 80 inches to provide adequate space for the storage of wet mops.

E. Overhead Sewer Lines

1. Location: Waste lines and roof drains must not be directly above food preparation, food display, food storage and utensil washing areas.

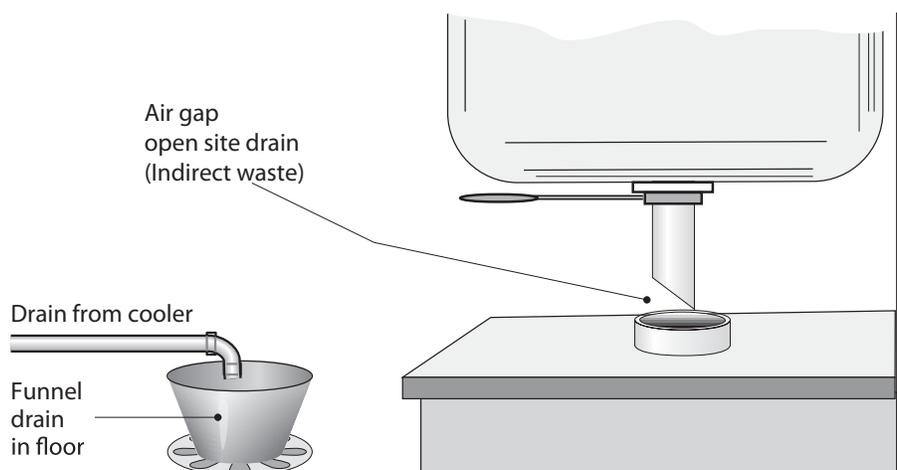
F. Potable Water Backflow Protection

1. Inlets: All water inlets (faucets, etc.) must have an air gap between the water inlet and the fixture it is serving. The air gap must be twice the diameter of the water inlet or faucet. Any water inlet, faucet, etc., that does not meet this requirement is a submerged inlet. A water faucet that can have a hose attached to it is a submerged inlet.
2. Vacuum Breakers: Provide vacuum breakers on submerged inlets such as toilets, urinals, dish washing machine, garbage grinders and any threaded water outlets.
3. Special Conditions: Provide double check valves with atmospheric vents or reduced pressure zone backflow preventers capable of being submerged on water inlets where you cannot install a vacuum breaker after the last shut-off valve or solenoid switch (i.e. pressure spray hoses).
4. Carbonators: Carbonators must have double check valves plus equipment to meet any other specific Plumbing Code requirements. Refer to Figure 6, page 10.

G. Indirect Waste Connections

1. Equipment Drains: Provide indirect wastes for dish washing machines, dish washing sinks, pot washing sinks, pre-rinse sinks, silverware sinks, bar sinks, soda fountain sinks, potato peelers, ice machines, steam tables, steam cookers, ice bins, salad bars, dipper wells, walk-in refrigerator or freezer condensate and other similar fixtures. Refer to Figure 10.
 - a. An indirect connection discharges waste through an air gap into the drainage system. Do not connect it directly with the drainage system.
 - b. The indirect piping from the fixture to the air gap must not exceed 5 feet.
 - c. Indirectly connected fixtures must discharge to a vented trap placed as close as possible to the fixture and in the same room. To avoid cross connections, each fixture will require a separate line.
 - d. Install receptors (floor sinks, etc.) receiving indirect wastes in accessible and ventilated areas. Design and size receptors to prevent overflows and splashing. When installed inside cabinets, you must extend the drain hub receiving waste through the base of the cabinet and seal the base around the drain.
 - e. Food service equipment, sinks or buckets cannot receive the discharge of an indirect waste pipe.

Figure 10: Air Gaps & Indirect Wastes

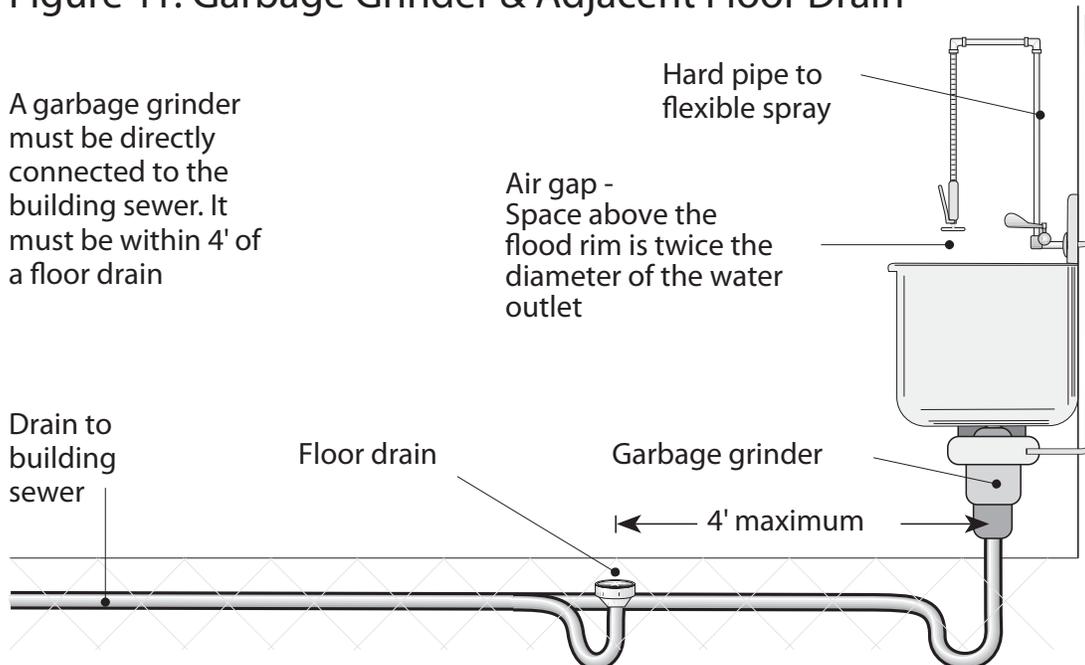


2. Adjacent Floor Drain: You may directly connect a utensil washing sink or a dish washing machine with a floor drain provided that the following conditions are met:
 - a. The floor drain is trapped and vented as required by the State of Illinois Plumbing Code.
 - b. The floor drain is placed within 4 feet horizontally of the utensil washing sink or dish washing machine, and in the same room.
 - c. Additional fixtures are not to be connected upstream from the floor drain trap, utensil washing sink or dish washing machine.
 - d. Garbage grinders, if installed, must meet the above provisions and be directly connected. Refer to Figure 11.

H. Floor Drains

1. Number: A sufficient number of floor drains must be located throughout the establishment to facilitate cleaning.
2. Location: Floor drains must be located in areas that require frequent water flushing to clean the floor or equipment. Floor drains must not be installed in walk-in refrigeration units except under the following conditions:
 - a. When required by another jurisdiction, the floor drain must have an approved backwater valve installed.
 - b. Floor drains may be located in refrigerated processing rooms or high moisture storage areas, such as produce coolers, provided that the doors to the area or room have been undercut or are swing doors.

Figure 11: Garbage Grinder & Adjacent Floor Drain



VII. Sanitizing Equipment

A. Hot Water System

1. **Minimum Size:** A 40-gallon minimum capacity water heater is required for a facility with a three-compartment sink, hand wash sink and utility sink. For limited facilities with less need for hot water, we can evaluate the capacity according to the type of fixtures provided.
2. **Dish Washing Machine Demand:** Facilities using a commercial dish washing machine must provide hot water (temperature and volume) to meet the maximum demand for the make and model of machine to be installed.
3. **Heat-On-Demand Units:** A hot water system that does not provide any storage capacity is not approved for use in food service facilities.

B. Manual Utensil Washing

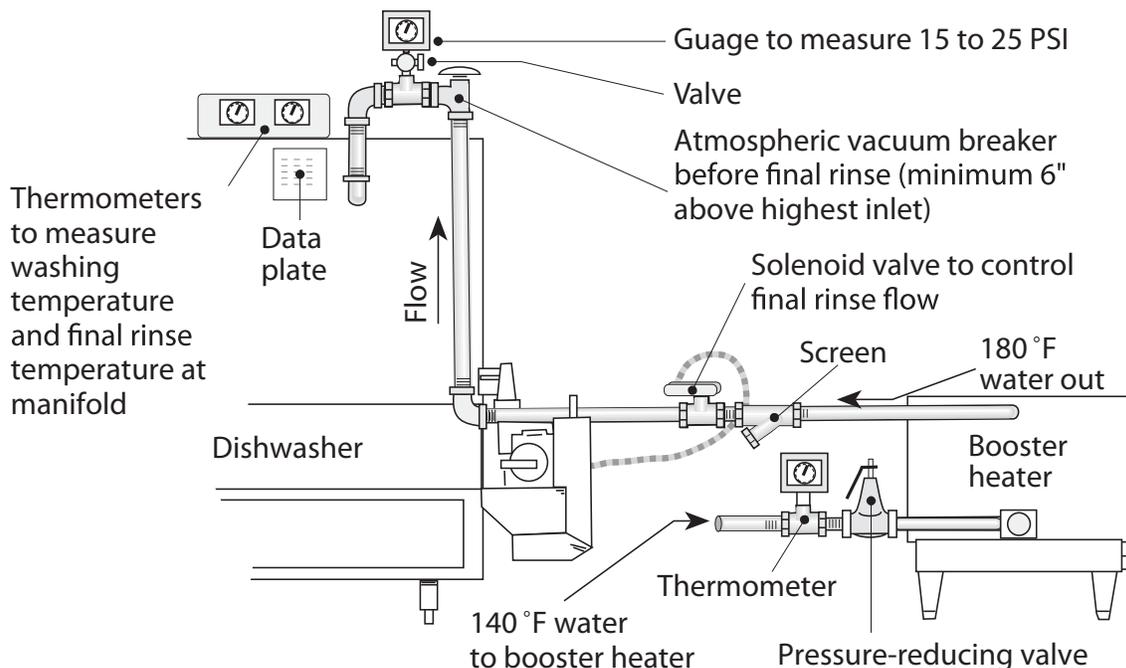
1. **Design:** Provide a three-compartment, stainless steel sink with two integral drainboards where pots, pans or reusable eating and drinking utensils are washed by hand. Install this sink to minimize cross-contamination to, or from, your janitorial station or food processing tables.
2. **Size:** Each compartment must be large enough to submerge the largest item to be washed. Each drainboard must equal the area of the largest compartment.

C. Mechanical Utensil Washing

1. **General Requirements**
 - a. All spray-type dish washing machines must comply with the current edition of NSF Standard #3.
 - b. A soiled dish table of adequate size is needed to handle soiled utensils before washing. The soiled dish table must not drain into the washing compartment of the dish washing machine. Install a drain board across the entire flat section of the table to prevent soiled water and debris from draining into the wash tank. Install a pre-rinse sink as needed so that larger food particles can be rinsed off before entering the dish washing machine.
 - c. A clean dish table or drainboard large enough to allow water to evaporate from dishes and utensils is needed. This installation must provide room for the temporary storage of utensils and racks immediately after being removed from dish machines. Slope the clean dish table to drain into the machine. It must be at least the size of the soiled dish table.
 - d. Easily readable, numerically scaled indicating thermometers are needed. They must be accurate to $\pm 3^{\circ}\text{F}$ and show the temperature of the water in each tank of the machine, including the temperature of the final rinse water as it enters the manifold.
 - e. Heat sanitizing dish machines must have mechanical exhaust ventilation to exhaust steam and vapors to the exterior of the building.
 - f. The installation of integral manual and mechanical dish washing drainboards will not be accepted due to cross-contamination concerns.

2. Chemical Sanitizing Machines
 - a. A sanitizer alert system which includes a visual and audible alarm, designed and approved for the specific machine installed, is needed to warn the user automatically when the sanitizer supply has depleted.
 - b. Additional drainboards or dish tables for air drying utensils after being washed in a low-temperature machine will be needed.
3. Hot Water Sanitizing Machines
 - a. A booster heater is needed to heat 140°F water to at least 180°F for the final rinse of the dish washing machine. The temperature rise demand of the dish washing machine will determine the heater size.
 - b. A temperature gauge on the service line just before the booster heater is required.
 - c. Installation of the hot water heater and the booster heater must be as close as possible to the dish washing machine to avoid heat loss in the lines.
 - d. The water system must deliver hot water to the final rinse when the rinse valve opens. Machines designed for intermittent operation will require special equipment. When the length of the line from the booster to this type machine exceeds 50 feet, the system must be recirculating.
 - e. A pressure regulator is needed on the final rinse line. The flow pressure needs to be 15 to 25 pounds per square inch.
 - f. A thermometer and pressure gauge on the final rinse line is needed. You must install the pressure gauge after the pressure regulator as close to the manifold as possible. Install a valve with standard threads upon which you may attach a pressure gauge to check flow pressure. Refer to Figure 12.

Figure 12: Hot Water Sanitizing Machine



VIII. Lighting

A. Food Service Areas and Restrooms

Food preparation and utensil washing areas must be well lit. A light intensity of 20 footcandles measured 30 inches above the floor is necessary.

B. Walk-In Refrigerators and Freezers

Walk-in units must be well lit to provide at least 10 footcandles of light throughout. Install fluorescent lights with cold-tolerant ballasts and vapor-proof fixtures. Install lights so that lighting will not be obstructed by food stored on shelves. Provide at least 10 footcandles of light, measured 30 inches above the floor in storage rooms and restrooms.

C. Storage, Ware Washing and Toilet Rooms

The light intensity shall be at least 10 footcandles of light measured 30 inches above the floor in storage rooms and 20 footcandles in the toilet rooms and ware washing areas.

D. Bars

Dimmer switches may be a suitable alternative for use in bar areas. Lighting must be increased to a minimum of 10 footcandles for cleaning purposes. Lighting above food preparation areas and dishwashing areas must provide a minimum of 20 footcandles of light at the work surface.

E. Protection Against Breakage

Protective shielding for light fixtures is required over all food preparation, display, service, storage and utensil washing areas. Explosion tubes with end caps or shatterproof fixture lenses may be used. Protect heat lamps against breakage with a shield surrounding and extending beyond the bulb, leaving only the face of the bulb exposed. You may use coated, shatterproof bulbs instead of shielding.

IX. Laundry

A. Location

Laundry facilities in a food service establishment shall be restricted to the washing and drying of linens, clothes, uniforms, and aprons necessary for the operation of the facility. Such operations may be conducted in storage rooms containing packaged foods or packaged single-service articles. Food preparation areas cannot be used for laundry operations.

B. Clothes Dryer

If you provide a clothes washing machine, you must also provide a dryer. Dryers must be vented to the outside and in compliance with local codes.

C. Linens and Clothes Storage

Clean clothes and linens shall be stored in a clean place and protected from contamination until used. Soiled clothes and linens shall be stored in non-absorbent containers or washable laundry bags until removed for laundering.

X. Room and Area Finishes

A. Food Preparation and Food Storage Areas

1. Floors: Floor finishes must be of durable, light-colored, waterproof, grease-resistant and easily cleanable material. Commercial grade vinyl composition flooring is the minimum grade material acceptable. The use of poured monolithic floors may require specific approval for kitchen applications.
2. Coving: A minimum 4 inch high coved base must be provided at the juncture of the floor and wall or cabinet.
3. Walls: Construct walls with a smooth and easily cleanable material that has a light-colored finish.
4. Ceilings: Install smooth, non-absorbent and light-colored ceilings that can withstand frequent cleaning. Exposed joists, studs or other support structures will not be accepted.

B. Cookline

Wall finishes behind the cookline must be of stainless steel or equivalent wall covering or other approved finish.

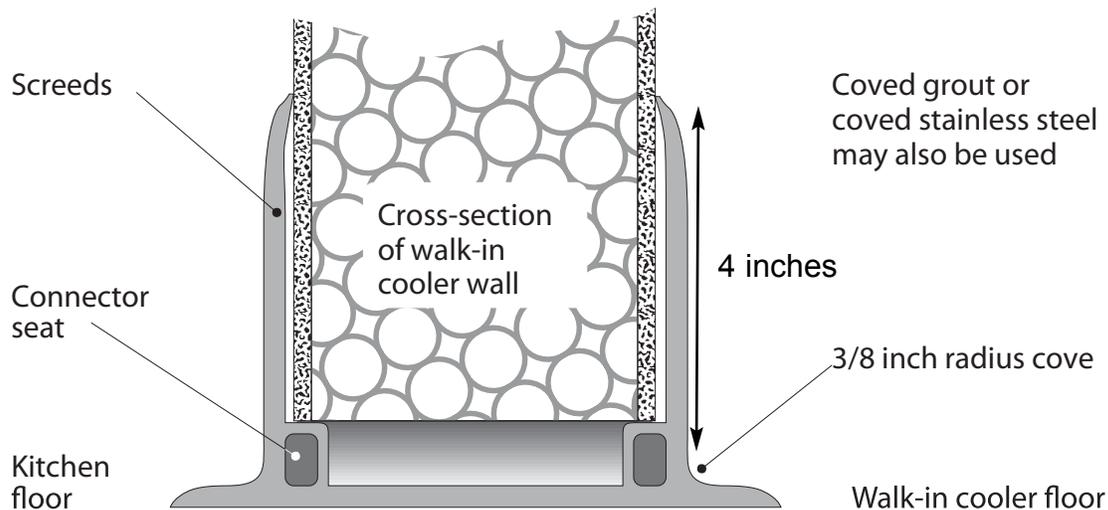
C. Utensil Washing and Janitorial Station Areas

Finishes must meet the same requirements as Section X. A, Food Preparation and Food Storage Areas. In addition, the splash areas must be finished with a durable and waterproof material such as fiber glass reinforced panels (FRP) or stainless steel. Painted drywall is not acceptable.

D. Walk-In Refrigerator or Freezer Units

1. Floors, Walls and Ceiling: Fabricate and install finishes that are NSF approved, waterproof, corrosion resistant, free of difficult-to-clean internal corners and crevices, and durable under conditions of normal use.
2. Coving: We recommend the installation of a coved base so that you have an effective 3/8 inch radius cove on both the interior and exterior of the unit. Other approved methods include a grout radius as an integral part of the flooring material or corrosion-resistant metals. Because of breakage and separation problems, you should avoid using tile or vinyl base as a coved base in refrigeration or freezer units. Refer to Figure 13.

Figure 13: Screeds in Coved Base in Walk-Ins



E. Server, Pick-Up or Wait Stations

Server stations without plumbing connections, located within a dining room, may use the same wall and ceiling finishes as the dining room. Server stations with plumbing connections or those extending from the kitchen must utilize the same room and area finishes as stated in Section X.

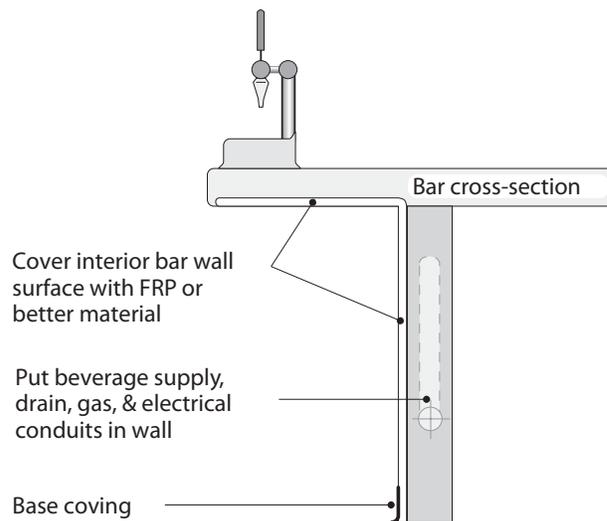
a. Food Preparation and Storage Areas, with the following modifications.

1. Floors: In food pick-up stations or wait stations with plumbing, specify floors of durable, waterproof and easily cleanable material extending a minimum of 3 feet from the counter
2. Coving: A 4 inch high coved base must be provided at the juncture of the floor and wall or cabinet. Kick plates are not to be used because they do not adequately seal the area from the entrance of debris.
3. Walls: Walls must be easily cleanable.
4. Ceilings: Smooth, non-absorbent and light-colored ceilings that can withstand frequent cleaning must be installed at any station where food is picked up.

F. Bar

1. Floors: Floor finishes must be of durable, light-colored, waterproof, grease-resistant and easily cleanable material.
2. Coving: A 4 inch high coved base must be provided at the juncture of the floor and wall or cabinet.
3. Walls: Walls may have the same finish as the rest of the room except that the interior bar wall surfaces and undersides of the bar counter tops must have smooth, non-absorbent and light-colored finishes that can withstand frequent cleaning. Exposed joints or other support structures will not be accepted. In addition, the splash areas must be finished with a durable and waterproof material such as ceramic tile, FRP or stainless steel. Refer to Figure 14.
4. Ceilings: Ceilings may be of the same finish as the dining room.

Figure 14: Interior Bar Wall Surface



G. Restrooms, Dressing and Locker Rooms

1. Floors: Floor finishes must be of durable, light-colored, waterproof, grease-resistant and easily cleanable material.
2. Coving: A 4 inch high coved base must be provided at the juncture of the floor and wall or cabinet.
3. Walls: Construct walls with a smooth and easily cleanable material that has a light-colored finish. In addition, partitions and wall finishes behind fixtures subject to splash such as toilets and urinals are to be upgraded using waterproof materials such as stainless steel, FRP or ceramic tile.

H. Dining Rooms

Carpeting, if used as a floor covering, must be of closely woven construction, properly installed, easily cleanable and maintained in good repair.

I. Buffets, Salad Bars and Beverage Stations

1. Floors in Dining Areas: Floor finishes must be of durable, light-colored, waterproof, grease-resistant and cleanable materials extending at least 3 feet from the serving side(s) of buffets, salad bars and beverage stations.
2. Coving: A 4 inch high coved base must be provided at the juncture of the floor and wall or cabinet.
3. Walls: When the buffet is placed against a wall, the wall must be smooth and non-absorbent.
4. Ceilings: You may use the same finish as the dining room.

J. Areas with Multiple Uses

Any area used for a combination of previously defined activities must meet the more stringent requirements imposed on that area or activity.

K. Summary of Room and Area Finishes

See Table 1 (page 25).

1. Floors: Quarry tile is a preferred flooring because of its durability . The use of diamond-plate steel or corrosion-resistant aluminum as flooring under beer kegs, or where durability is essential, should be considered.
2. Walls: Stainless steel, fiberglass reinforced panel (FRP), and ceramic tile meet the standard for durability and being waterproof in splash zones. Oil-based epoxy paints are appropriate in food preparation areas. High-gloss enamel paints work well in most other areas. We recommend stainless steel corner guards in high-traffic areas.
3. Ceiling: Lay-in smooth, non-fissured, vinyl-clad gypsum board for dropped ceilings. Drywall painted with a washable finish may also be used.

Table 1: Summary of Room and Area Finishes

Room or Area Examples	Floors	Coving	Walls	Ceilings
Food Preparation Food Storage Cookline	<ul style="list-style-type: none"> • Light colored • Waterproof • Grease resistant • Easily cleanable • Durable 	<ul style="list-style-type: none"> • 4 inch high • Sealed 	<ul style="list-style-type: none"> • Light colored • Easily cleanable • Stainless steel behind cookline 	<ul style="list-style-type: none"> • Light colored • Non-absorbent • Smooth • Durable
Utensil Washing Janitorial Stations	<ul style="list-style-type: none"> • Light colored • Waterproof • Grease resistant • Easily cleanable • Durable 	<ul style="list-style-type: none"> • 4 inch high • Sealed 	<ul style="list-style-type: none"> • Light colored • Easily cleanable • Durable • Waterproof in splash zones 	<ul style="list-style-type: none"> • Light colored • Non-absorbent • Smooth • Durable in splash areas
Walk-in Coolers Refrigerators & Freezers	<ul style="list-style-type: none"> • Corrosion resistant • Waterproof • Easily cleanable 	<ul style="list-style-type: none"> • 4 inch high • Sealed • Inside and outside unit 	<ul style="list-style-type: none"> • Corrosion resistant • Easily cleanable 	<ul style="list-style-type: none"> • Corrosion resistant • Waterproof • Easily cleanable
Server Areas	<p>Within 3 feet of counter:</p> <ul style="list-style-type: none"> • Waterproof • Easily cleanable 	<ul style="list-style-type: none"> • 4 inch high • Sealed • Include cabinets 	<ul style="list-style-type: none"> • Easily cleanable 	<ul style="list-style-type: none"> • Light colored • Smooth • Durable
Bar	<ul style="list-style-type: none"> • Light colored • Grease resistant • Easily cleanable • Durable 	<ul style="list-style-type: none"> • 4 inch high • Sealed 	<p>Back of the bar & under bar top:</p> <ul style="list-style-type: none"> • Light colored • Waterproof • Easily cleanable • Durable 	<p>May be the same as the dining room</p>
Restrooms Dressing Areas Locker Rooms	<ul style="list-style-type: none"> • Light colored • Waterproof • Grease resistant • Easily cleanable • Durable 	<ul style="list-style-type: none"> • 4 inch high • Sealed 	<ul style="list-style-type: none"> • Light colored • Waterproof • Easily cleanable • Durable 	<ul style="list-style-type: none"> • Light colored • Smooth • Durable
Buffets Salad Bars Beverage Stations	<p>Within 3 ft. of counter:</p> <ul style="list-style-type: none"> • Light colored • Waterproof • Grease resistant • Easily cleanable • Durable 	<ul style="list-style-type: none"> • 4 inch high • Sealed 	<p>If placed against a wall:</p> <ul style="list-style-type: none"> • Smooth • Waterproof 	<p>May be the same as the dining room</p>
Combination Areas	Any area used for a combination of activities must meet the more stringent requirements			

XI. Insect and Rodent Control

A. Building

1. All masonry or cement foundations must be rodent proof.
2. Cover all building vents with a minimum of 16 mesh per inch wire screen.
3. Seal openings into the foundations and exterior walls around pipes, wires or conduits.
4. Tightly seal the opening around conduits or pipelines entering a wall, ceiling or floor .

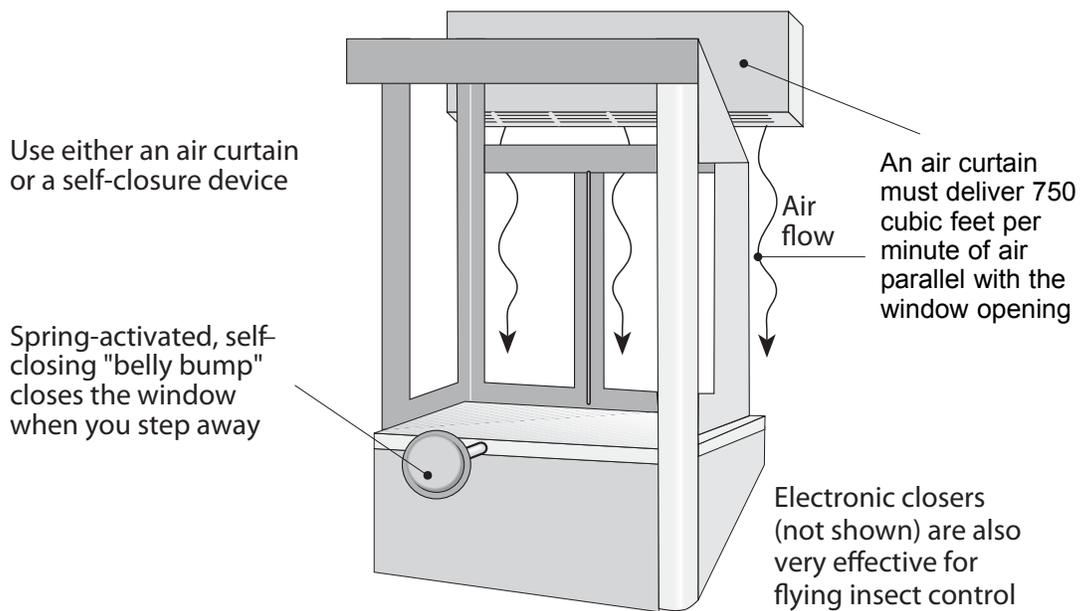
B. Delivery Doors

1. Pest Control: All delivery doors leading to the outside must be self-closing and tight fitting.
2. Garage Doors: Vertically-opening, garage-type delivery doors must be protected against pests. They should have an overhead air curtain with a minimum velocity of 750 cubic feet of air per minute measured 3 feet above the floor. We will consider suitable alternatives for pest control for this type of door .
3. Entrance Doors: Make all outside customer doors self-closing and tight fitting. You may need to adjust the threshold sweep to prevent the entrance of insects and rodents.

C. Windows

1. Screen all openable windows, except drive-thru or walk-up windows, with at least 16 mesh to the inch screening.
2. Drive-thru or walk-up windows may be equipped with additional insect control by using the following methods:
 - a. Self-Closing: Equip windows with a self-closure device, such as a spring-loaded bump pad or an electronic opener. Refer to Figure 15.
 - b. Air Curtain: Install an air curtain so that a layer of fast moving air is produced vertically downward. The air flow runs parallel with the window and within 1 inch (inside or outside) of the window opening. The air curtain must protect the entire width of the window opening. Minimum air velocity is 750 cubic feet per minute, measured at the furthest point in the window opening from the air curtain. Use a solenoid switch to activate the unit. Manual switches will not be accepted.
 - c. Fly Fans: Mount one fan, within 12 inches of the wall, over each window . Each fan must produce a minimum downward air velocity of 750 cubic feet per minute along the entire horizontal width of the window opening.

Figure 15: Drive-Thru Windows



XII. Garbage and Refuse

A. Garbage Containers

1. Number: Each food facility is to secure their own garbage service. Remember to provide sufficient garbage containers, sized to hold any garbage or refuse in a nuisance-free manner, until it can be picked up by a disposal company.
2. Trash Compactors: Consideration as to the cleaning and proper disposal of the liquid waste requirements may vary from municipality to municipality.
3. Incinerators: Incinerators must have EPA approval and comply with all state and local regulations, if operated.

B. Garbage Area

1. Outside Storage: Place outside refuse containers and compactor systems on smooth surfaces of non-absorbent material such as concrete or machine-laid asphalt. Use a concrete pad for storing grease containers. These areas should be as far as possible from the building's doors and windows.
2. Pest Control: All openings to the building are required to be protected against rodent and insect entry. Garbage receptacles must be covered at all times and restrict rodent and insect access.
3. Enclosures: If you propose a garbage enclosure, construct it of durable, non-absorbent materials and a washable interior finish able to withstand frequent cleaning.

4. Recycling: If you plan to recycle, check with your local municipality or waste management company for additional rules, guidelines or details. You should plan for possible mandatory recycling and make arrangements for future outside storage of the recycled materials.
5. Inside Storage, Interior Garbage Storage, Refuse Rooms, Grease Storage:
 - a. If used, garbage room and area finishes must meet the same requirements as the food preparation area. See Section X. A, Food Preparation and Food Storage Areas.

XIII. Heating, Ventilation, & Air Conditioning (HVAC)

A. Exhaust Plan Submittal

Submit complete HVAC plans, including restroom ventilation. Indicate the type of equipment being proposed for installation under the cook line exhaust hood. *HVAC requirements vary amongst jurisdictions. Check with local building inspections department for requirements.*

B. When Exhaust Hoods Are Required

1. General: Commercial cooking or display equipment, which produces smoke, steam, grease, mists, particulate matter, condensation, vapors, fumes, odors, or create sanitation or indoor air quality problems, will require a hood. Hoods shall be designed and installed to prevent grease and condensation from collecting on walls, ceilings, and dripping into food or onto food contact surfaces. Canopy hoods must have at least a 6-inch overlap, over all cooking surfaces, on all open sides. All hoods shall be flashed solid to the ceiling or adjacent walls approved solid material. All hoods must comply with the most recent International Mechanical Code and all local building and fire safety codes.

A high temperature sanitizing dishwashing machine will require an overlapping canopy or pant leg hood with forced ventilation to the outside air. The hood system must properly remove steam, heat, and moisture to the outside air.

2. Make-up Air: The amount of air to be exhausted must be in accordance with the most recent International Mechanical Code, where make-up air shall be balanced, tempered, and in proximity of the exhaust system. The minimum make-up air to replenish exhausted air shall be:

Minimum CFM (Cubic Feet of air per minute, volume of air) = 80% x Hood Exhaust CFM.

Make-up air intakes must be screened and filtered to prevent the entrance of dust, dirt, insects, and other contamination material.

3. Type I or Type II Hood Requirements: Every Type I or Type II hood shall be constructed of stainless steel, galvanized steel, copper or other material approved by the local fire department for the use intended and of

The interior of vent hoods are not allowed to be painted. We recommend that you do not paint the exterior of the vent hood.

Type I hoods are required over equipment that produce grease, smoke, excessive steam, heat, and condensation, particulate matter, odors, or create indoor sanitation or indoor quality problems.

Type II hoods shall be installed over equipment that produce steam, heat, mists, condensation, fumes, vapors, and non-grease laden foods.

4. Lights: Canopy hoods must have adequate lighting to provide a minimum of 20 footcandles to all areas of the cookline and the hood filters. ~~Appropriate UL listed lights are required.~~
5. Exceptions: A commercial exhaust hood is required for each cooking appliance, with the following exceptions:
 - a. Approved completely enclosed convection type ovens
 - b. Steam tables
 - c. Auxiliary cooking equipment that does not create a sanitation or indoor air quality problem

Examples include toasters, coffee makers, sandwich makers, electric rice cookers, electric cheese melters, soup wells, special event set ups, and temporary events.

6. Other Examples: Equipment that would require installation under a hood include kettles, pasta cookers, hot plates, salamanders, Mongolian style grills, gas cooking equipment, table side cooking equipment, such as Teppan Yaki style cooking, Tandoori ovens, rotisserie units, etc.