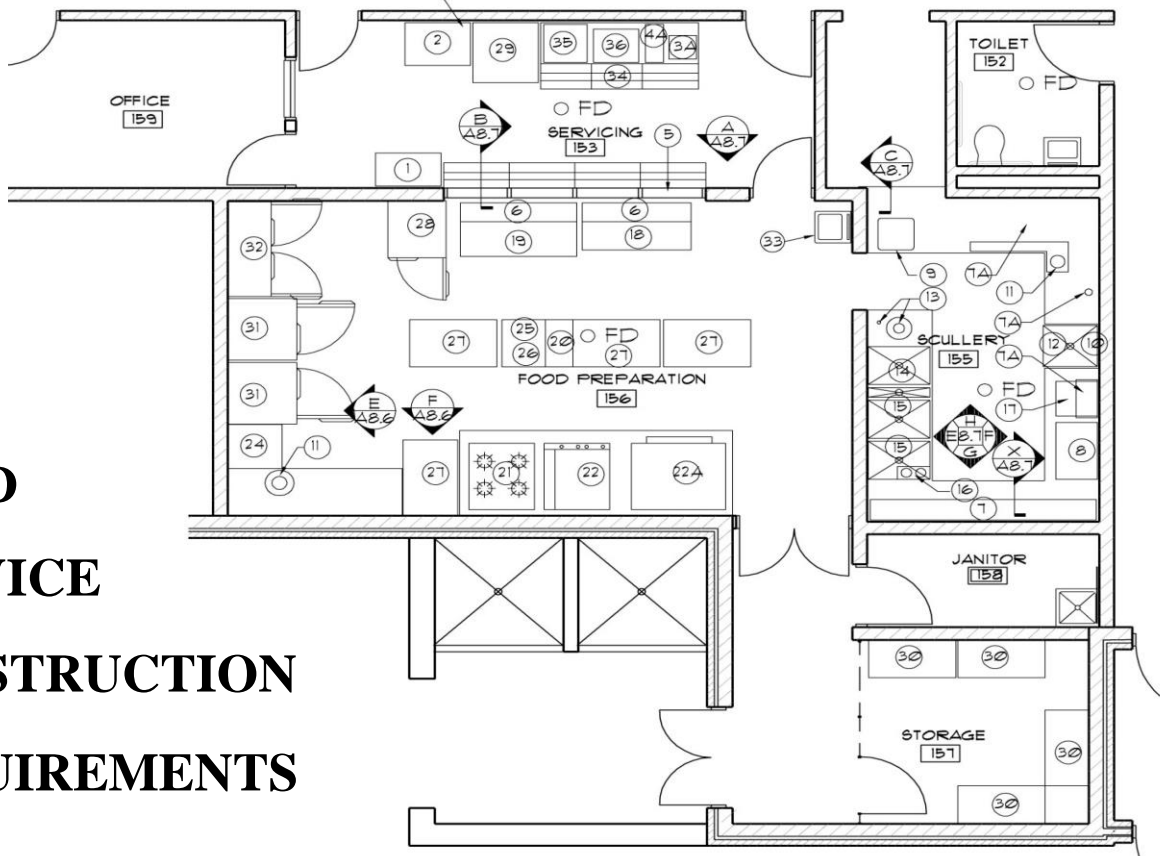




kanehealth.com

ALL TAGS FOR KITCHEN EQUIPMENT  
REFER TO KITCHEN EQUIPMENT  
SCHEDULE 9HT, A8.8.



# FOOD SERVICE CONSTRUCTION REQUIREMENTS

2 NORTH  
ENLARGE KITCHEN EQUIPMENT PLAN  
SCALE: 3/16"=1'-0"

*Drawing courtesy of  
Cordogan Clark & Associates*

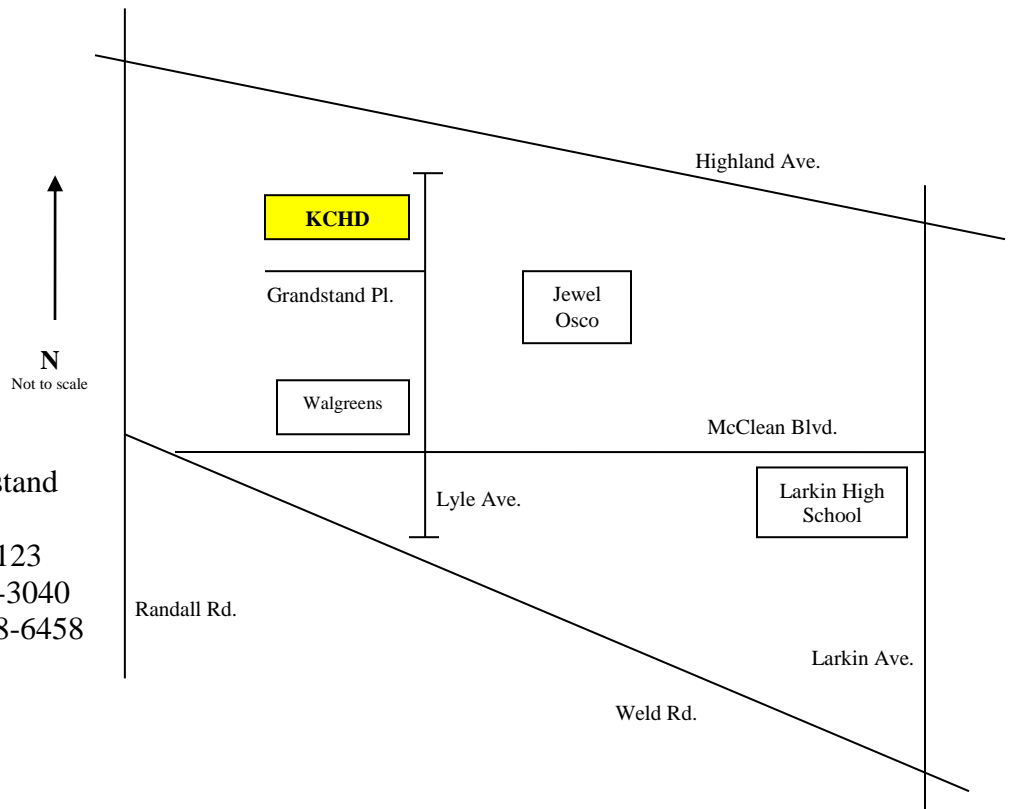
*Eighth Edition - September 2005  
Fees updated 12/2010*

## KANE COUNTY ENVIRONMENTAL HEALTH LOCATIONS

### ELGIN

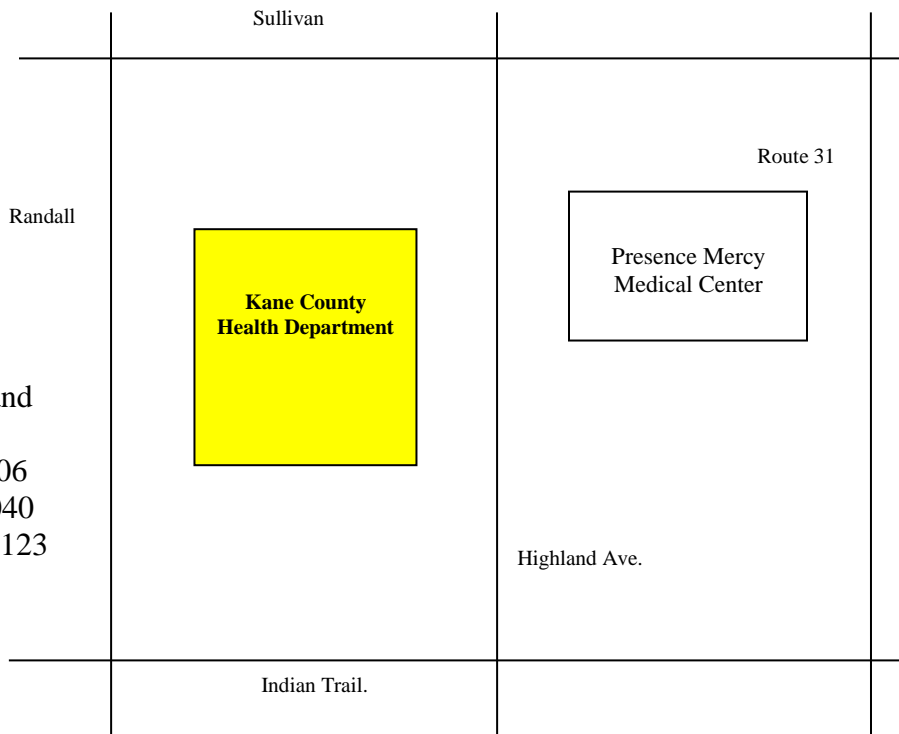
1750 Grandstand  
Pl. Ste. 2  
Elgin, IL 60123  
Ph. 630-444-3040  
Fax. 847-888-6458

### DIRECTIONS



### AURORA

1240 N. Highland  
Ave. Ste. 5  
Aurora, IL 60506  
Ph. 630-444-3040  
Fax. 630-897-8123



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## INTRODUCTION

This information is made available to architects, building contractors, food equipment suppliers, consultants, and other related professions for the purpose of developing plans and specifications that meet the requirements of the Kane County Health Department and at the same time allow for individual freedom of design. For local building, mechanical and plumbing codes, the local building and zoning departments should be contacted.

## OBJECTIVES

The primary objective of the plan review process is to have a completed food establishment that is easily maintained, designed with efficient food flow patterns, and equipped to serve a maximum number of customers for an indefinite period of time.

A second objective is to eliminate any unnecessary complications regarding planning, design, construction or final approval before opening for business.

## DESIGN

Completion of the operator's plan review form will help ensure that proper equipment and space will be provided, and that the layout is based on HACCP (Hazard Analysis and Critical Control Point) quality assurance concepts. Typical menus should be planned before designing the facility. The type and variety of foods to be served will influence the type and quantity of equipment, and the amount of storage space needed. A menu must be submitted with your plans.

Food preparation, storage and dishwashing areas must be large enough to accommodate the number of customers being served, type of menu and type of operation. An orderly flow of food from the point of delivery through the storage, processing, preparation and service to the customers must be provided.

Equipment must be designed for cleanability and installed where it is most useful and will not create an unsanitary condition.

If smoking is permitted on the premises, a designated smoking area must be established using physical barriers and ventilation systems to protect the nonsmoker as required by the 1990 Illinois Clean Indoor Air Act.

## PLAN REVIEW PROCESS

Your plans must be approved by the Kane County Health Department before constructing, enlarging, altering, or converting any building for use as a restaurant, bar, or other food service facility. Submit completed plan review forms, including the operator's plan review form, and two sets of plans drawn to scale.

These plans must include:

1. Complete floor plans pre-labeled with food service equipment and numbered; elevation drawings of equipment.
2. All food service equipment specifications with manufacturer's name and model number, and equipment specification sheets.
3. Plumbing: plumbing layout and waste/vent diagram.
4. Finish schedule for walls, floors, ceilings, counter surfaces and lighting in walk-in coolers.
5. Complete ventilation plans including kitchen exhaust, make-up air and completed exhaust plan review form.
6. Submit two (2) sets of complete plans. One 8 ½ x 11 in. set and a set using ¼ in. = 1ft. scale approximately 24 x 36in. Both sets of plans are to be numbered and labeled.

***Incomplete information will not be accepted.***

# I. Inspections, Fees and Plans

## A. Inspections

### FIELD INSPECTIONS

During the course of construction, field inspections of the facility construction and installation of the equipment may be made by representatives of the health department. Pre-opening inspections are required. At the time of the pre-opening inspection, major construction must be complete and all foodservice equipment installed. In addition, hot water must be operational, refrigeration must be maintaining temperature and a ventilation balance sheet must be available for review. Approval must be obtained from the health department before food may be brought into the facility.

A final inspection is required prior to your opening date. Final health department approval is dependent upon the following:

1. Correction of all items noted on the pre-opening inspection.
2. All food contact surfaces must be cleaned and sanitized.
3. Submission of a completed permit application and food establishment permit fee.
4. Approval of other regulatory department including building departments, fire departments and plumbing inspectors.

## B. Fees *(Call or visit [kanehealth.com](http://kanehealth.com) for current Plan Review Fees)*

### CATEGORY I

- 1) All large (greater than 25,000 square feet) multi-departmental retail grocery stores

Example of Category I facilities would include large multi-departmental retail grocery stores which may include delicatessen, bakery, meat/seafood, produce and food service. State certified food handler must be on the premises at all times that potentially hazardous food is being handled.

### CATEGORY II

Includes facilities that routinely:

- 1) All small (less than 25,000 square feet) grocery stores.
- 2) Prepare potentially hazardous foods 12 hours or more before serving, or
- 3) routinely cool and/or reheat potentially hazardous food, or
- 4) prepare food for off premise service, or
- 5) prepare complex menu items, or those requiring extensive handling of raw ingredients, or
- 6) perform vacuum packaging, or
- 7) serve a majority population of immunocompromised individuals.

Examples of Category II facilities would include full-menu restaurants, caterers, hospitals, grocery stores (smaller than 25,000 square feet) and child care centers with preschool age or below. State certified food handler on the premises at all times that potentially hazardous food is being handled.

### **CATEGORY III**

Has few food handling operations and includes facilities that routinely:

- 1) hold hot or cold food for use that day, or
- 2) prepare menu items that require minimal handling, or
- 3) menu items requiring complex preparation are prepared from canned, frozen, or fresh-prepared foods to limit handling.

Examples of Category III facilities would include fast food restaurants. State certified food handler shall be employed at each restaurant

### **CATEGORY IV**

Have few or no food handling operations and include facilities that routinely:

- 1) serve only pre-packaged foods, or
- 2) prepare and serve only non-potentially hazardous food such as snack foods or soda, or
- 3) serve only non-alcoholic or alcoholic beverages.

Examples of low risk facilities would include retail outlets selling only pre-packaged foods, movie theaters with popcorn and soda, and bars that do not prepare potentially hazardous food. State certified food handler recommended but not required.

### **RUSH or Resubmission after initial approval for new construction or remodeling an existing restaurant \$675.00**

**EXCEPTIONS** – Charitable not-for-profit organizations can petition for waiver of fee

#### **Plan Review Fees Are Non-Refundable After Initial Approval**

## **INSPECTIONS AND PLANS**

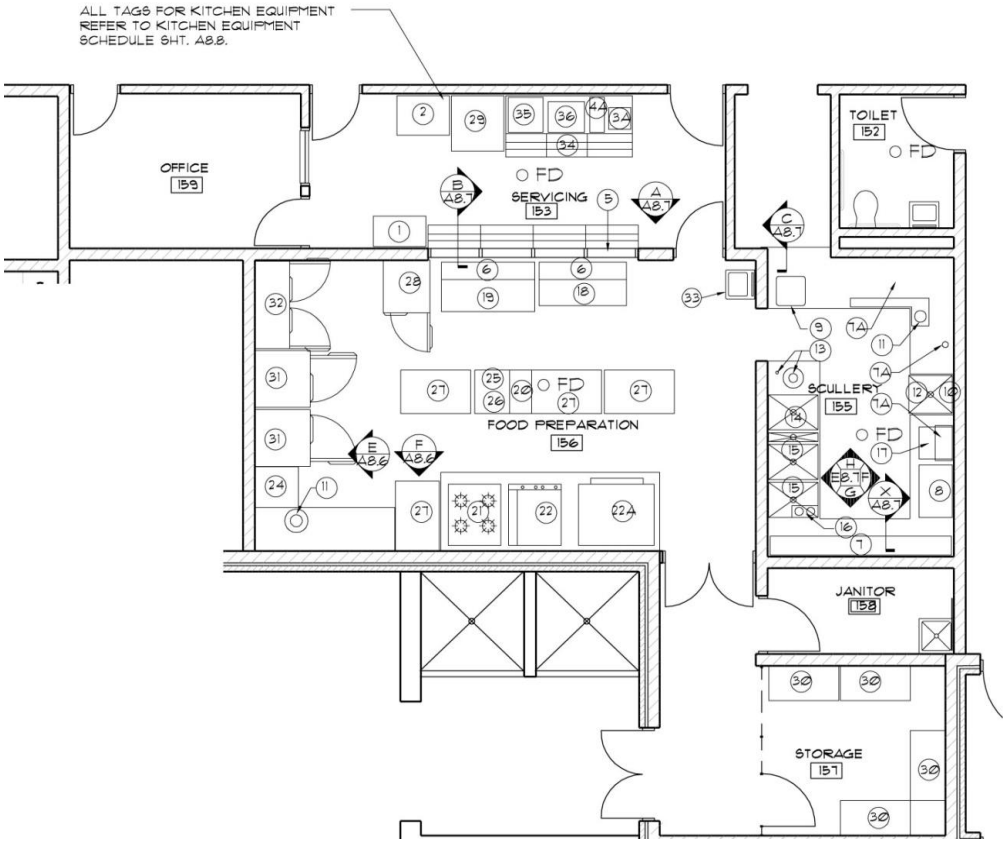
#### **Plan Review Process Checklist**

Did you remember to...

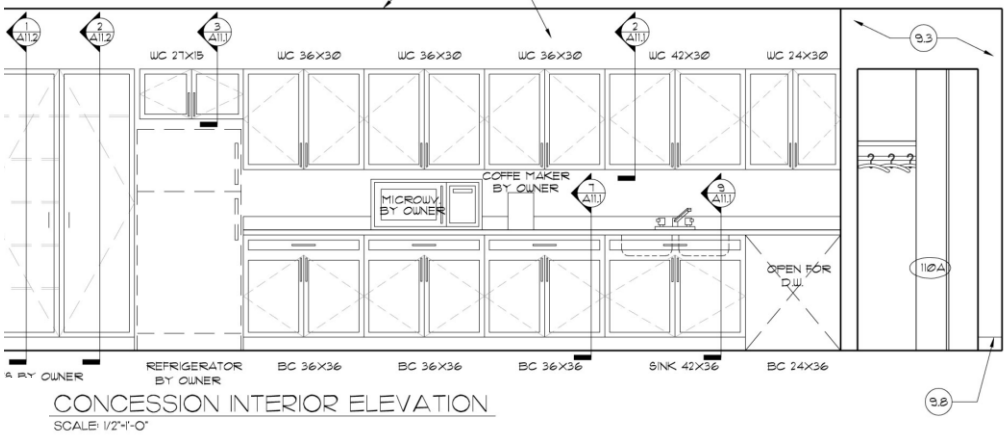
- ☐ Submit two (2) sets of complete plans. One 8 ½ x 11in. set and a set using ¼ in. = 1ft. scale approximately 24 x 36in. Are both sets of plans numbered and labeled?
- ☐ Submit one copy of your proposed menu?
- ☐ Submit the plan review fee?
- ☐ Submit the Plan Review Packet?
- ☐ Review the Food Service Design and Construction Manual?
- ☐ Do you have a State Certified Food Service Manager? You may request information on courses being offered near you. Remember, you only have three months from the date you open to become certified.
- ☐ Contact the Kane County Health Department to obtain your local sanitarian contact information at (630) 444-3040.



Figure 1: Partial Kitchen Layout



INSPECTIONS  
AND  
PLANS





## II. Equipment

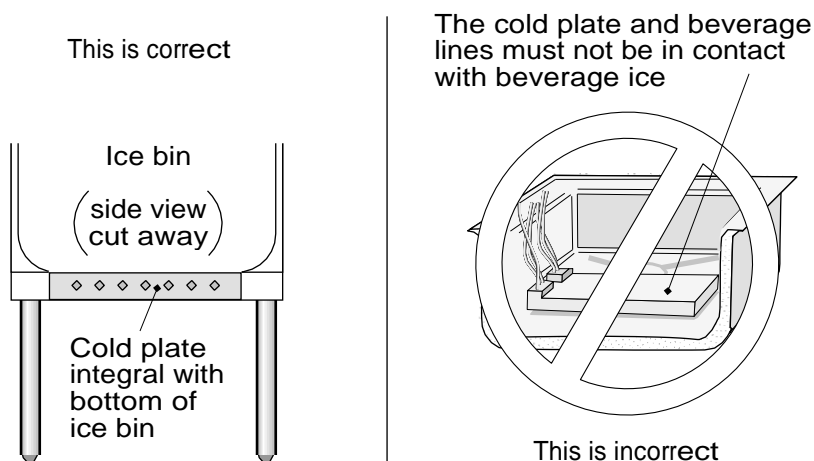
### A. Materials and Design

All food service equipment is to be commercial and meet the standards regarding design, materials and workmanship of the National Sanitation Foundation International (NSF). An NSF or other recognized testing agency seal is usually a good indicator the equipment is approved. Unmarked equipment may not meet the standards. Include 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



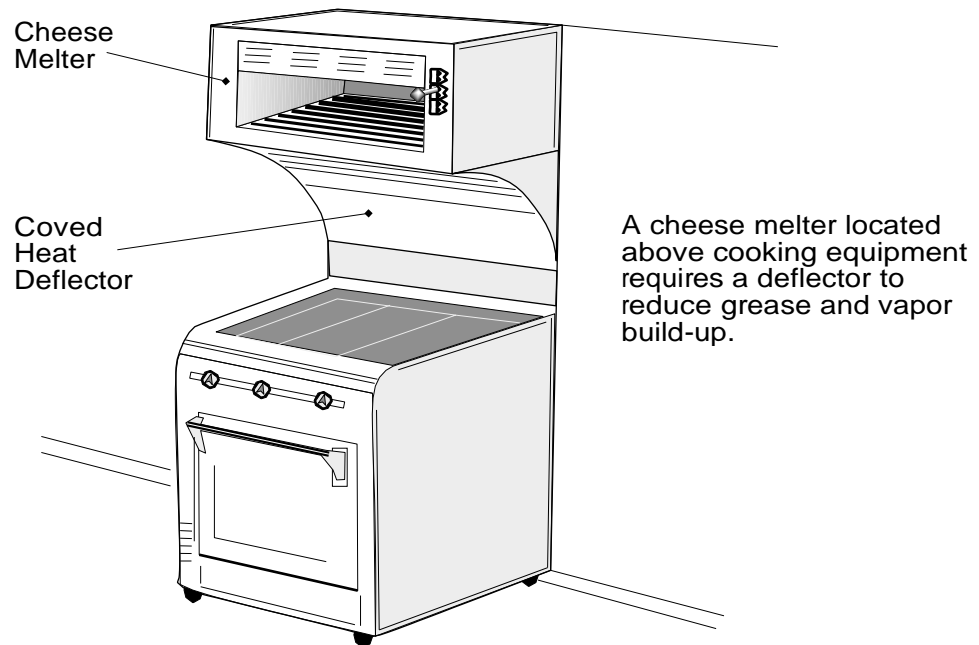
EQUIPMENT

2. Dipper Wells: Provide dipper wells with running water where you dispense bulk ice cream and 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. Refer to Figure 11.
4. Single Service Dispensing Equipment: Install equipment for properly handling single service items like paper cups, lids and straws.

5. All counter tops to be installed in an establishment must be made of stainless steel, Corian, quartz, or sealed granite. Counter tops for point of sale stations may be made of Formica, however if the point of sale counter is located within a waitress station with plumbing the counter top must be stainless steel, Corian, quartz, or sealed granite. Other materials will be evaluated on a case-by-case basis.
6. Cheese Melters: When installed, these must be under an exhaust ventilation system and over non-cooking equipment or low heat producing equipment. If you install the cheese melter over cooking equipment, you must install an angled or coved deflector that completely encloses the bottom and sides of the cheese melter. The deflector must direct vapor and hot gases toward the front of the cheese melter. The deflector must be constructed of stainless steel. Refer to Figure 3.

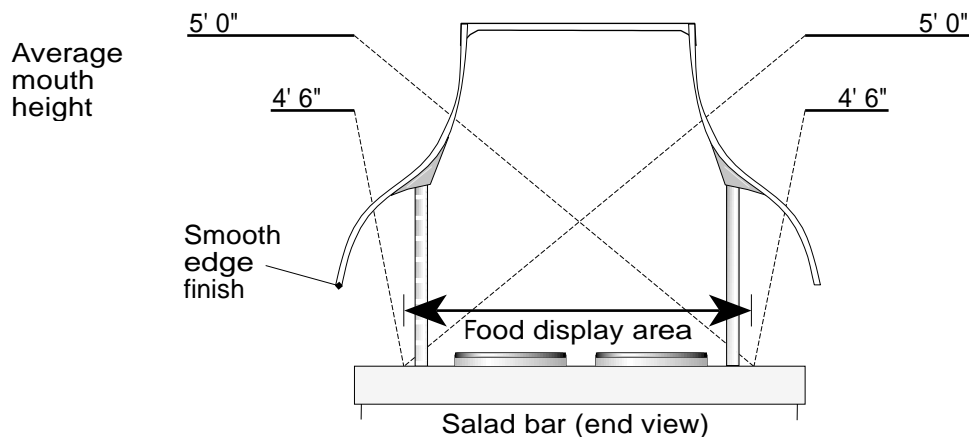
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Figure 3: Cheese Melter Installation



7. 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. Temporary buffet setups also require sneeze shield setups. Submit a scaled drawing of this equipment to this Department for approval. Refer to Figure 4.

Figure 4: Food Display Protection



- b. Temperature Control: Provide equipment to maintain all readily perishable foods at 41° Fahrenheit or below, or 140° Fahrenheit or above.
- c. Provide thermometers to monitor all hot and cold food temperatures in the holding units.
- d. In addition, incorporate the following factors into the design of a self-service food operation:
  - 1) Serving Utensils: Provide one serving utensils (spoons, tongs, etc.) of adequate size to each food item and to prevent the handle of the utensil from falling into the food. Keep the serving utensil in the food to prevent bacterial growth.
  - 2) Eating Utensils: Protect food contact surfaces of plates and eating utensils from contamination by customers.

8. Drive-Thru and Walk-Up Windows

- a. Windows: Exterior food pass-thru windows:
  - 1) The counter surface of the pass-thru window should be made of stainless steel or other solid NSF approved surface. They must be durable under conditions of normal use and cleaning.

## C. Equipment Installation Directions

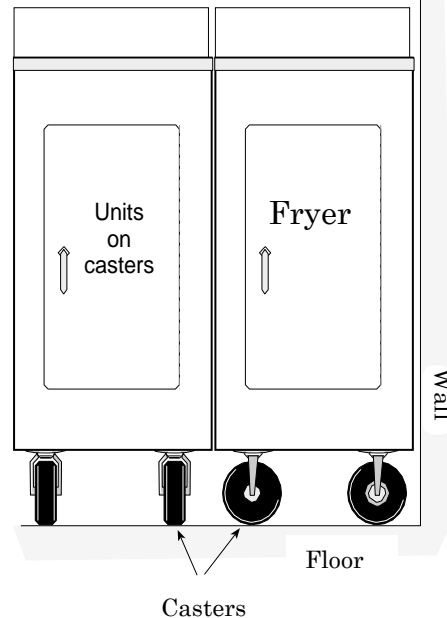
- 1. Table-Mounted Equipment: Install table-mounted equipment on 4-inch legs, or seal the equipment to the table using silicone caulk, unless it is portable. Portable equipment weighs less than 75 pounds, has no rigid utility connections and is no greater than 36 inches in any plane. Keep pieces of table-mounted equipment at least 6 inches apart to ensure access for cleaning.

## EQUIPMENT

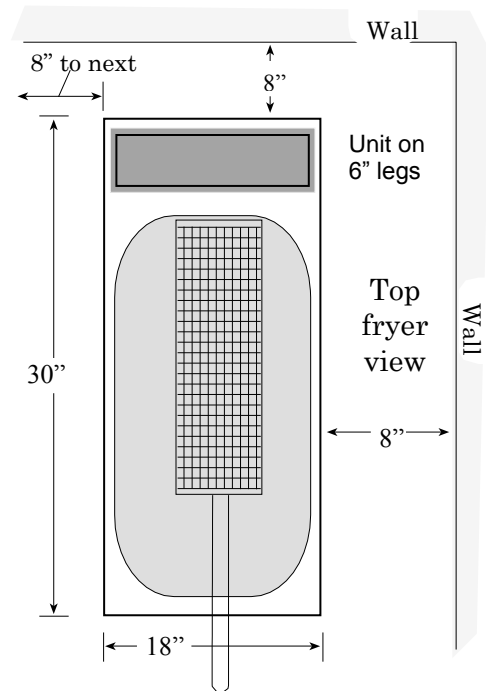
Figure 5: Comparing Caster & Leg Installation Methods

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.



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 5.



**TIP**

*For long equipment banks, consider integrating moveable equipment on casters with stationary equipment on legs for cleaning and servicing access.*

- 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.
- 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 coved (3/8 inch radius). Avoid excessive application in large gaps. Refer to Figure 6.
- d. Seal cabinets, 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.

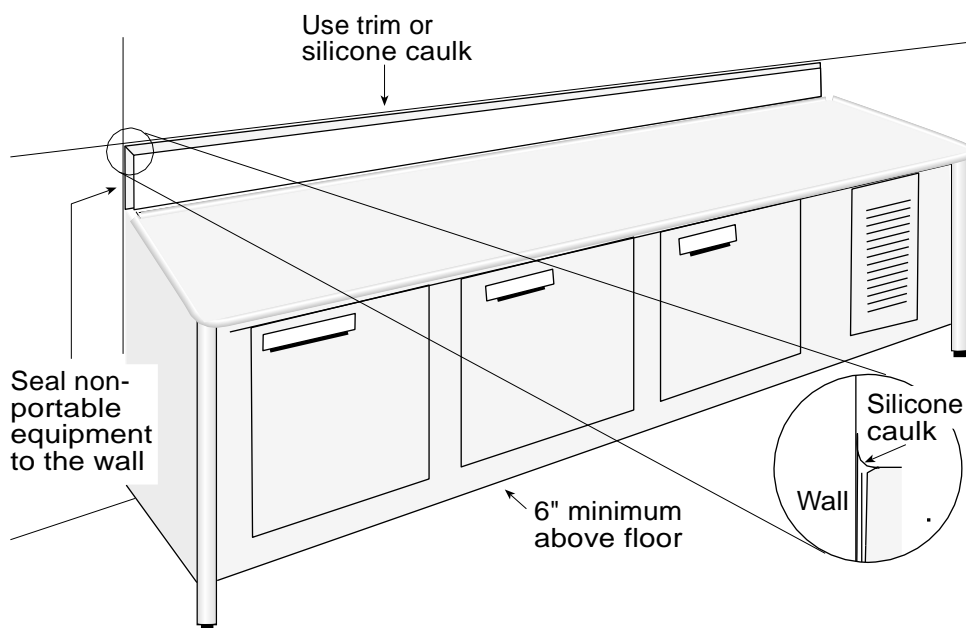


**TIP**

*If you can slide a business card between a crevice, you can be sure that it needs to be sealed.*

## EQUIPMENT

Figure 6: Sealing in Place



## Section II

EQUIPMENT

-----

REFRIGERATION

Section

II-III

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 Refrigeration Units: 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 to permit access for cleaning and servicing.
  - c. The space between the side of the walk-in refrigerator or freezer and adjacent walls must be sealed.

### 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, material standards and performance. 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 should be based on menu and the expected food volume. The amount and location of refrigeration and freezer equipment should 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 should 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 Refrigerators

Walk-in refrigerators should 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 refrigerators should be located near delivery or receiving areas.

**Remote outdoor walk-in refrigerators or freezers are prohibited.**

➤ *TIP* When walk-in refrigerators are to be used for storage and to chill food quickly, it is recommended that portable racks be provided to help maximize usable floor space.

## REFRIGERATION

## B. Reach-In Refrigerators

These units are for short-term storage of perishable and potentially hazardous foods. These units should 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.

➤ *TIP* Locating refrigeration units under or adjacent to heat-generating pieces of equipment is not recommended.

## 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.

**REFRIGERATION**

**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 Refrigerators and Freezers**

These units are designed for holding foods under refrigeration for customer access. They are designed for short-term display and are not designed to quick-chill 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 shall be mechanically refrigerated.

**J. Ice Machines**

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

---

**Refrigeration Facilities Sizing**

Total interior storage volume needed:

$$\frac{.050 \text{ Cu.ft. (volume per meal)} \times \text{number of meals}}{.40}$$

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## IV. Storage

### A. Dry Storage Area

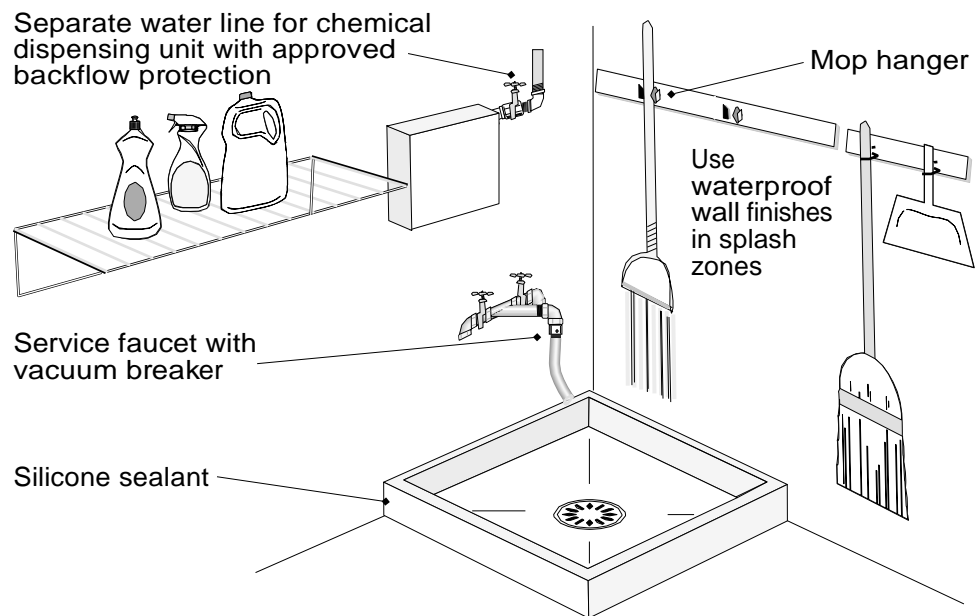
1. General: Provide suitable space on your plans for storing all food-related items. The minimum space required is 25 percent of all kitchen areas, based on wall-to-wall dimensions. Equip dry storage areas with adequate approved shelving. Storage space does not include floor areas where desks, equipment, 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. A separate dry storage room is strongly recommended; this room should be located near an exterior door so delivery people do not have to walk through your kitchen.

### B. Storage Locations

#### STORAGE

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. We highly recommend contracting the service of a professional, licensed pest control operator for proper integrated pest management.
  - b. Cleaners: These include detergents, sanitizers, related cleaning or drying agents and caustics, acids, polishes and other chemicals.

Figure 7: Janitorial Station



## STORAGE

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.
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.

### C. Shelving

1. General: Kitchen and dry storage shelving must meet NSF standards. Shelves should 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 made of rust-resistant metal or other impervious material.

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.



**TIP**

---

*Consider using heavy-duty dunnage racks for storing case products, heavy containers and bulk products.*

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## 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 with sloped tops in the 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. Manger's Desk: If located in food preparation area must be wall hung; filing cabinets and extra shelving for office supplies must also be wall mounted. We strongly recommend a separate room for manager's office.

**STORAGE**  
-----  
**EMPLOYEE**  
**AREAS**

**RESTROOMS**  
-----  
**HAND  
WASHING  
SINKS**

**B. Restrooms**

1. Number: Provide at least the minimum number of toilet facilities for employees required by the local Building Department.
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. Provide completely enclosed toilet rooms with tight-fitting, self-closing doors. To meet ADA requirements self-closing doors must open into the restroom.
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 hand-washing sink must have a supply of dispensed hand soap and dispensed disposable paper towels. Dispensers must be conveniently located near each hand-washing sink. Hand washing sinks for public use may have hot air hand drying devices. If employees share restrooms, it is recommended to provide dispensed, disposable paper towels. Restrooms specifically for employees are to be provided with dispensed disposable paper towels only.
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 or metered faucet must provide a flow of water for at least 15 seconds without the need to reactivate the faucet. Public restrooms must have a maximum of 110°F hot water. It is recommended to provide between 100°F and 110°F hot water.
9. Refuse Containers: Provide refuse containers for the disposal of paper towels.
10. Sanitary Containers: Provide covered sanitary containers for the disposal of feminine hygiene products.
11. Diaper Changing: It is recommended to provide diaper changing tables. If you provide diaper changing tables you must provide covered waste containers with 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. Porcelain hand sinks are approved for use.
2. Bar Areas: A hand-washing sink is required with dispensed soap and dispensed paper towels. Splashguards are also required on each side of the hand sink.
3. Water Supply: Provide each hand washing sink with hot and cold water by means of mixing valve or combination faucet.

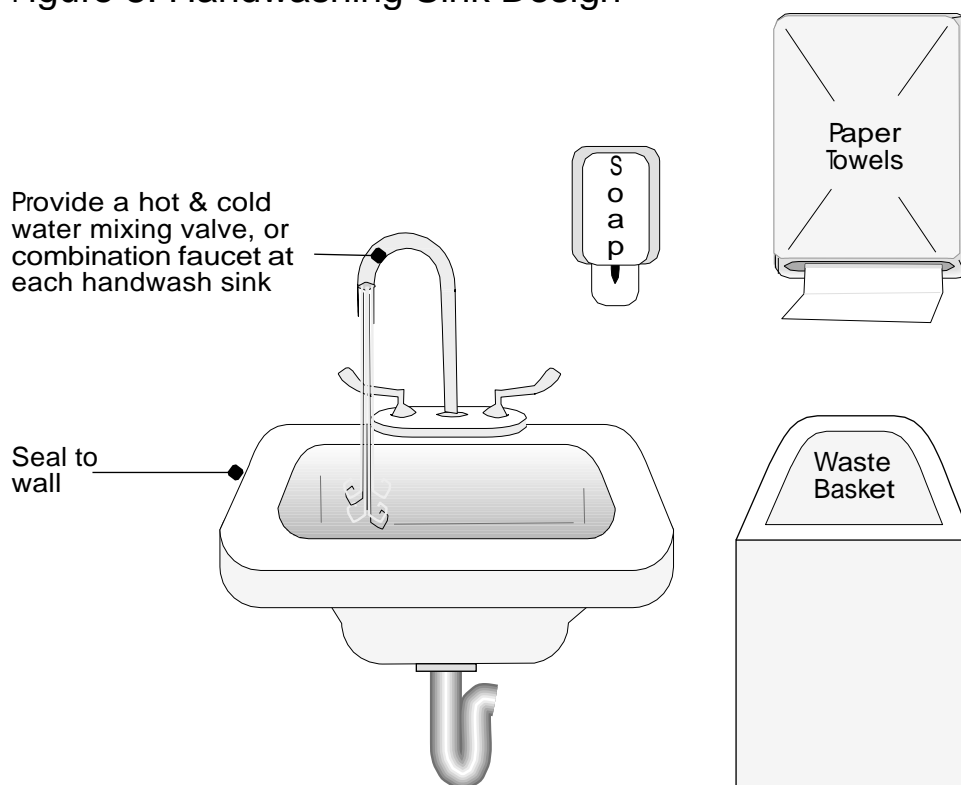
4. Dispensers: Provide a supply of dispensed hand soap and a supply of dispensed disposable paper towels at each kitchen hand-washing sink. A waste receptacle should be near the sink. The use of common towels is not allowed. Hand drying devices using air are not allowed in food preparation and utensil washing areas. Hand sanitizers or gloves may be used in addition to conventional hand washing. They should be placed near your hand washing sinks. Refer to Figure 8
5. Splashguards are needed when a hand-washing sink is less than 18 inches from 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 and of a cleanable, non-absorbent material such as stainless steel or plexiglass.
6. Foot pedal hand sinks are not allowed.
7. Mirrors: The installation of mirrors and medicine cabinets is not allowed at hand washing sinks except if eye wash stations are installed.

Remind employees to wash hands frequently and in between tasks for a minimum of 15-20 seconds.

**HAND SANITIZERS DO NOT REPLACE  
GOOD HANDWASHING PRACTICES.**

**HAND  
WASHING  
SINKS**

Figure 8: Handwashing Sink Design



## VI. Plumbing

Install and maintain plumbing in accordance with the Illinois State Plumbing Code and local requirements including those of local sanitary districts.

### 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 Kane County Health Department.

### B. Sewage Disposal

Dispose of all water-carried sewage by means of a public sewage system or a private septic system approved by the Kane County Health Department.

### C. Grease Interceptors

Grease Interceptors are required by the Illinois State Plumbing Code to be installed on all fixtures from which grease, fats, or culinary oils are wasted including three-compartment sinks, food prep sinks, dump sinks, mopsinks, and floor drains located within the kitchen.

1. Install an outside grease catch basin with access for maintenance purposes. If an outside grease catch basin is not feasible, install an indoor 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.
2. Minimize Size  
Individual municipalities may have stricter codes regarding the sizing and location of grease interceptors. According to the Illinois State Plumbing Code, the minimum size for a grease interceptor is:
  - a. one-half the liquid holding capacity of the fixture if the grease interceptor is installed on the same floor as the fixture, or
  - b. sixty percent of the liquid holding capacity of the fixture if the grease interceptor is installed on a floor below the fixture.
  - c. if two or more sinks or fixtures are connected to an interceptor, base the interceptors size in gallons on the combined volume of the fixtures served.
  - d. to determine the volume or liquid-holding capacity in gallons of a fixture, use the following formula:

$$\frac{\text{length} \times \text{width} \times \text{height (inches)} \times \text{\# of compartments}}{2.31} = \text{gallons}$$

## 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 greasetrap. Provide hot and cold water, under pressure, with a mixing faucet and approved backflow protection. Refer to Figure 7.
2. Location: Janitorial stations should be conveniently placed for maintaining food service areas. They should be separate from the food preparation food storage and utensil washing 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

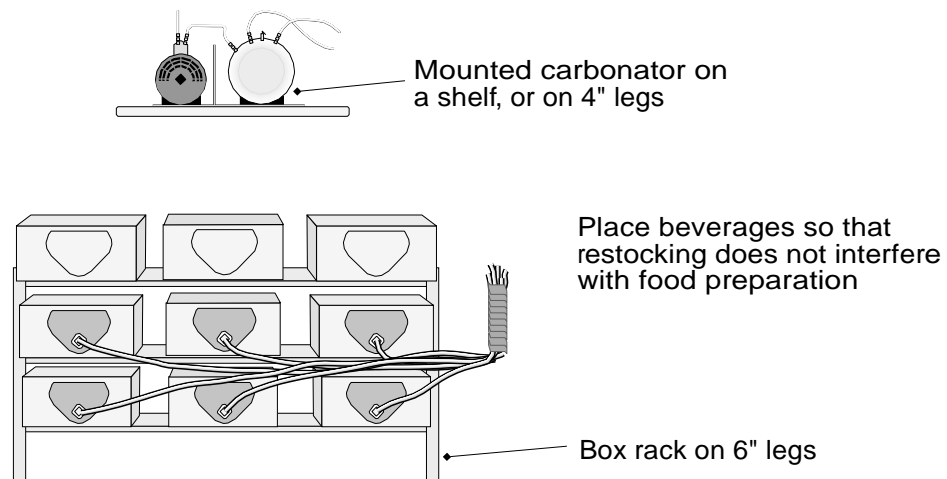
1. Location: Waste lines and roof drains should not be directly above food preparation, food display, food storage and utensil washing areas, except automatic fire protection sprinkler heads that may be required by law.
2. Shielding: If you have sewer lines over any of these areas, provide seamless gutters under the pipes that will divert leakage away from the food or utensil zone. Gutters may have an open end at the wall.

## 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 has a hose attached to it , can be 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 dual check valves with intermediate 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 dual check valves with intermediate atmospheric vents plus equipment to meet any other specific Plumbing Code requirements. Refer to Figure 9.

Figure 9: Bag in a Box & Carbonator



PLUMBING

## G. Indirect Waste Connections

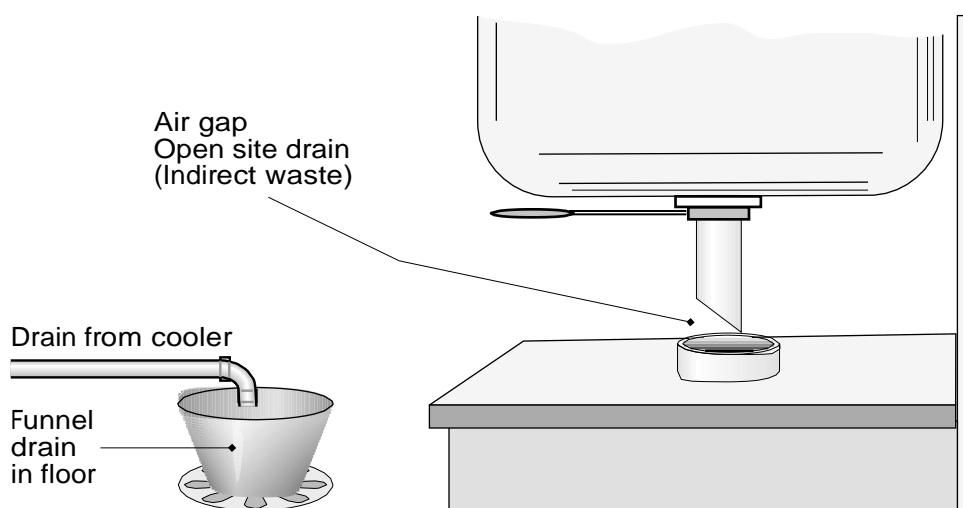
1. Equipment Drains: Provide indirect waste connections for dish washing machines, dish washing sinks, pot washing sinks, pre-rinse sinks, food prep sinks, silverware sinks, bar sinks, soda fountain sinks, ice machines, steam tables, steam cookers, ice bins, salad bars, dipper wells, walk-in refrigerator 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 vent.
  - 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. However, a mopsink can receive the discharge of an indirect clear waste water.

Figure 10: Air Gaps & Indirect Wastes



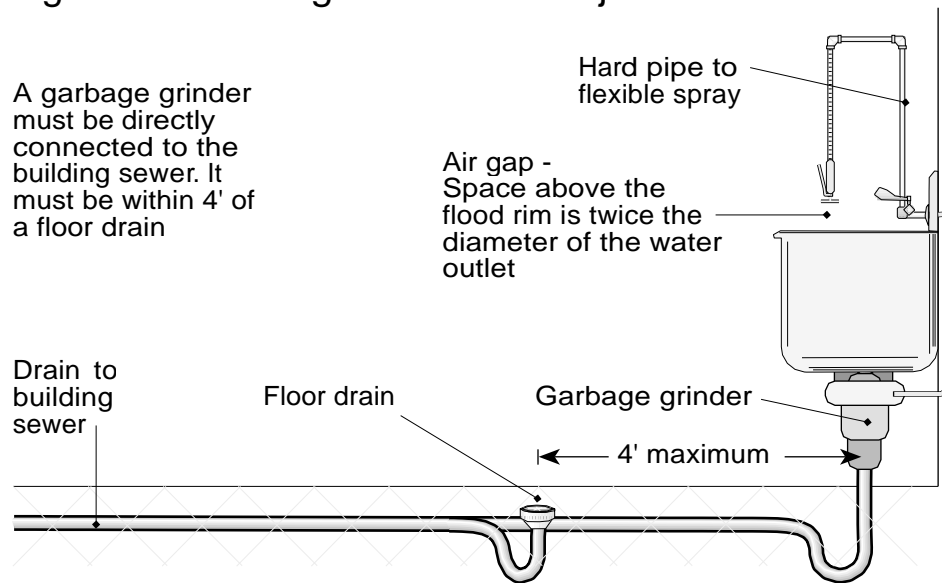
**PLUMBING**

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.
  - e. Refer to Figure 11.

## H. Floor Drains

1. Number: A sufficient number of floor drains should be located throughout the establishment to facilitate cleaning.
2. Location: Floor drains should 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. Sizing in an establishment without a dishmachine.

The hot water system must be capable of supplying 140°F water to fill the three-compartment sink, and to operate all other sinks and equipment using hot water during periods of maximum demand. The hot water heater size required is equal to the number of gallons the sink can hold, use the following formula:

$$(\text{length} \times \text{width} \times \text{depth of one sink}) = \text{gallons}$$

**The minimum size hot water heater that  
can be installed is 40 gallons.**

2. Sizing in an establishment with a dishmachine.

Establishments using a commercial dishmachine in addition to the three-compartment sink must provide 140°F water to the dishmachine. The hot water heater size required is equal to one-and-a-half times the maximum demand of the dishmachine per hour. The minimum size hot water heater that can be installed is 40 gallons.

**B. Manual Utensil Washing**

1. Design: Provide a three-compartment, stainless steel sink with two integral drainboards where pots, pans or multi- use eating and drinking utensils are washed by hand. Install this sink to minimize cross-contamination to your food processing area or from your janitorial station.
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.
3. Storage: Provide adequate storage for clean and soiled dishware and utensils.
4. A clean dish table or drainboard large enough to allow water to evaporate from dishes and utensils is needed.

**C. Mechanical Utensil Washing**

**A dishmachine, if provided, does not eliminate the need for a three-compartment sink, and cannot discharge through the grease interceptor.**

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 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.

**SANITIZING  
EQUIPMENT**

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**VII**

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. Mechanical exhaust ventilation is required over the dish washing machine to remove steam and vapors effectively.
- f. The installation of integral manual and mechanical dish washing drainboards will not be accepted due to cross-contamination concerns.

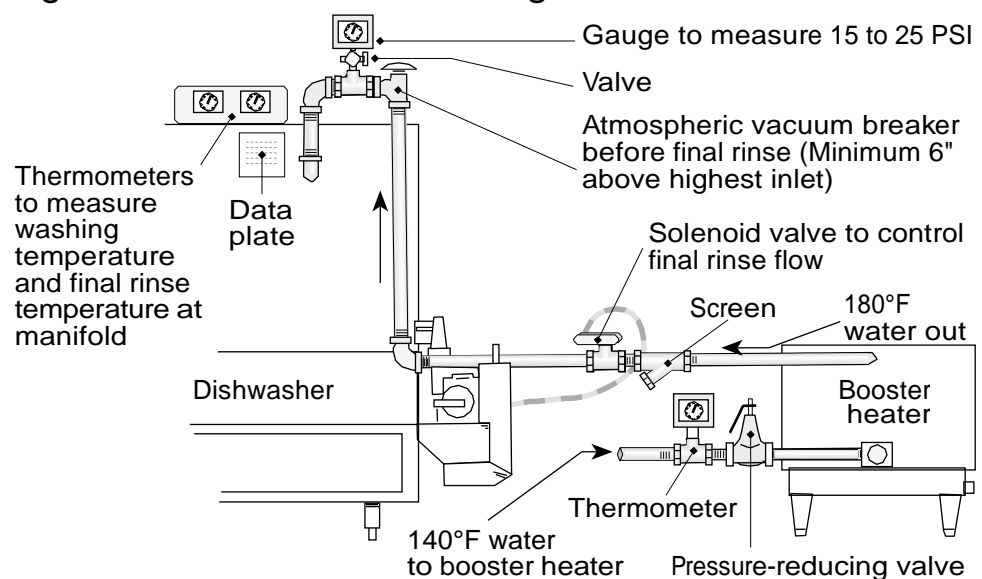
2. Chemical Sanitizing Machines

- 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 will be needed.

3. Hot Water Sanitizing Machines

- a. A booster heater is needed to heat  $140^{\circ}\text{F}$  water to at least  $180^{\circ}\text{F}$  for the final rinse of the dish washing machine. The temperature rise demand of the dish washing machine will determine the heater size.

Figure 12: Hot Water Sanitizing Machine



- 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 should be as close as possible to the dish washing machine to avoid heat loss in the lines.
- d. The water system should 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 should 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.

## VIII. Lighting

**SANITIZING  
EQUIPMENT  
-----  
LIGHTING**

### A. Food Service Areas

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 20 footcandles of light throughout measured 30 inches above the floor is necessary. Fluorescent strip lights with cold-tolerant ballasts and vapor-proof fixtures must be installed. Install lights so that lighting will not be obstructed by food stored on shelves.

### C. Storage and Restrooms

Provide at least 20 footcandles of light, measured 30 inches above the floor, in storage rooms and restrooms.

### D. Bars

Provide at least 20 footcandles of light in the bar area. Dimmer switches may be a suitable alternative for use in bar areas for clean-up purposes and glass washing.

## E. Protection Against Breakage

Protective shielding for light fixtures is needed over all food preparation, display, service, storage and utensil washing areas. Protect heat lamps against breakage with a shield surrounding and extending beyond the bulb, leaving only the face of the bulb exposed.

Plastic tubes with end caps or shatterproof bulbs may be used instead of shielding.

# IX. Laundry

## A. Location

Install laundry in a separate room with a door to separate food service operations from any laundry area. We recommend that you provide a vented door grill to exhaust heat from the room.

## B. Clothes Dryer

If you provide a clothes washing machine, you must also provide a dryer. Dryers must be vented to the outside.

## C. Linens

1. Clean Linen: Provide a storage area for linens, if you use them. Protect clean linens from contamination, and store them away from soiled linens.
2. 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.

# 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 will require specific approval for kitchen applications.
2. Coving: A 3/8 inch base coving must be provided at the juncture of the floor and wall or cabinet. Wood base coving is not acceptable.
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.

## ROOM AND AREA FINISHES

## 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 fiberglass reinforced panels (FRP) or stainless steel. Painted drywall is not acceptable.

## D. Walk-In Refrigerator or Freezer Units

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*TIP: Galvanized metal will rust when used as a finish in a walk-in cooler. It is not recommended.*

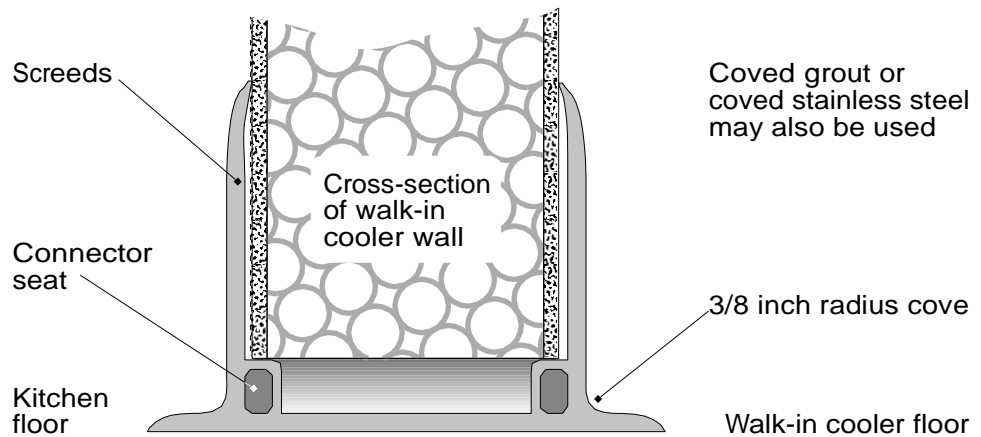
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1. Floors, Walls and Ceiling: Fabricate and install finishes that are NSF approved, waterproof, corrosion resistant, free of difficult-to-clean internal corners and crevices, and durable under conditions of normal use.
2. Coving: The installation of screeds are recommended so that you have an effective 3/8 inch radius cove on both the interior and exterior of the unit.

## Section X

Other approved methods include 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 coving. Refer to Figure 13.

Figure 13: Screeds in Walk-Ins



**ROOM AND  
AREA  
FINISHES**

**E. Server, Pick-Up or Wait Stations**

Server stations without food pick-up or 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 3/8 inch base coving must be provided at the juncture of the floor and wall or cabinet.
3. Walls: Walls must be light-colored, smooth, non-absorbent and 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.

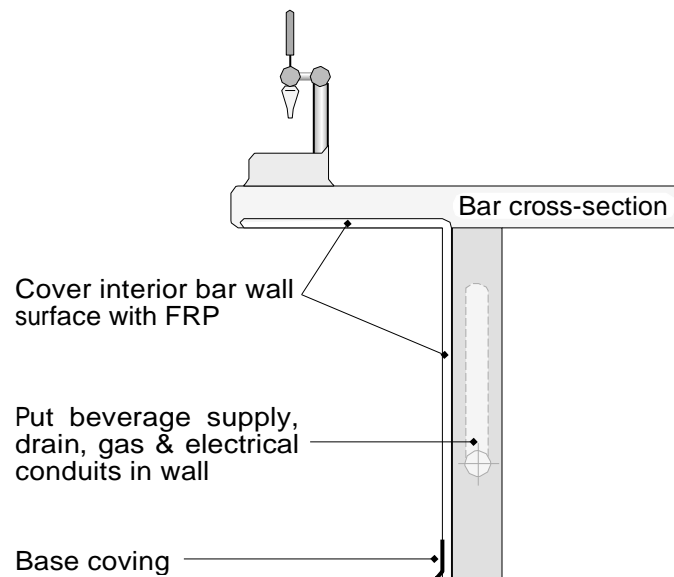
Section  
**X**



## F. Bar

1. Floors: Floor finishes must be of durable, light-colored, waterproof, grease-resistant and easily cleanable material.
2. Coving: A 3/8 inch base coving 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 (FRP) that can withstand frequent cleaning. Exposed joints or other support structures will not be accepted. Refer to Figure 14.
4. Ceilings: Smooth, non-absorbent and light-colored ceilings that can withstand frequent cleaning must be installed.

Figure 14: Interior Bar Wall Surface



**ROOM AND  
AREA  
FINISHES**

## 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 3/8 inch base coving 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. Ceiling: Smooth, non-absorbent and light-colored ceilings that can withstand frequent cleaning must be installed.

## H. Dining Rooms

Carpeting, if used as a floor covering, must be of tightly woven construction 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 3/8 inch base coving 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 light colored, easily cleanable, 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.

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. 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.
4. Mats or other types of supplemental flooring, if used, must be constructed for easy cleaning, and designed to permit easy removal for floor cleaning.

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"> <li>•Light colored</li> <li>•Waterproof</li> <li>•Grease resistant</li> <li>•Easily cleanable</li> <li>•Durable</li> </ul>	<ul style="list-style-type: none"> <li>•3/8" radius cove</li> <li>•Sealed</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Easily cleanable</li> <li>•Stainless steel behind cookline</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Non-absorbent</li> <li>•Smooth</li> <li>•Durable</li> </ul>
Utensil Washing Janitorial Stations	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Waterproof</li> <li>•Grease resistant</li> <li>•Easily cleanable</li> <li>•Durable</li> </ul>	<ul style="list-style-type: none"> <li>•3/8" radius cove</li> <li>•Sealed</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Easily cleanable</li> <li>•Durable</li> <li>•Waterproof in splash zones</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Non-absorbent</li> <li>•Smooth</li> <li>•Durable in splash areas</li> </ul>
Walk-In Coolers Refrigerators & Freezers	<ul style="list-style-type: none"> <li>•Corrosion resistant</li> <li>•Waterproof</li> <li>•Easily cleanable</li> </ul>	<ul style="list-style-type: none"> <li>•3/8" radius cove</li> <li>•Sealed</li> <li>•Inside &amp; outside unit</li> </ul>	<ul style="list-style-type: none"> <li>•Corrosion resistant</li> <li>•Easily cleanable</li> </ul>	<ul style="list-style-type: none"> <li>•Corrosion resistant</li> <li>•Waterproof</li> <li>•Easily cleanable</li> </ul>
Server Areas	Within 3 ft of counter: <ul style="list-style-type: none"> <li>•Waterproof</li> <li>•Easily cleanable</li> </ul>	<ul style="list-style-type: none"> <li>•3/8" radius cove</li> <li>•Sealed</li> <li>•Include cabinets</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Waterproof</li> <li>•Easily cleanable</li> <li>•Durable</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Smooth</li> <li>•Durable</li> <li>•Non-absorbent</li> </ul>
Bar	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Grease resistant</li> <li>•Easily cleanable</li> <li>•Durable</li> </ul>	<ul style="list-style-type: none"> <li>•3/8" radius cove</li> <li>•Sealed</li> </ul>	Back of the bar & under bar top: <ul style="list-style-type: none"> <li>•Light colored</li> <li>•Waterproof</li> <li>•Easily cleanable</li> <li>•Durable</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Smooth</li> <li>•Durable</li> <li>•Non-absorbent</li> </ul>
Restrooms Dressing Areas Locker Rooms	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Waterproof</li> <li>•Grease resistant</li> <li>•Easily cleanable</li> <li>•Durable</li> </ul>	<ul style="list-style-type: none"> <li>•3/8" radius cove</li> <li>•Sealed</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Easily cleanable</li> <li>•Durable</li> <li>•Water resistant</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Smooth</li> <li>•Durable</li> <li>•Non-absorbent</li> </ul>
Buffets Salad Bars Beverage Stations	Within 3 ft of counter: <ul style="list-style-type: none"> <li>•Light colored</li> <li>•Waterproof</li> <li>•Grease resistant</li> <li>•Easily cleanable</li> <li>•Durable</li> </ul>	<ul style="list-style-type: none"> <li>•3/8" radius cove</li> <li>•Sealed</li> </ul>	If placed against a wall: <ul style="list-style-type: none"> <li>•Smooth</li> <li>•Light colored</li> <li>•Smooth</li> <li>•Durable</li> <li>•Non-absorbent</li> </ul>	<ul style="list-style-type: none"> <li>•Light colored</li> <li>•Non-absorbent</li> <li>•Smooth</li> <li>•Durable</li> </ul>
Combination Areas	Any area used for a combination of activities must meet the more stringent requirements.			

## ROOM AND AREA FINISHES

## **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**

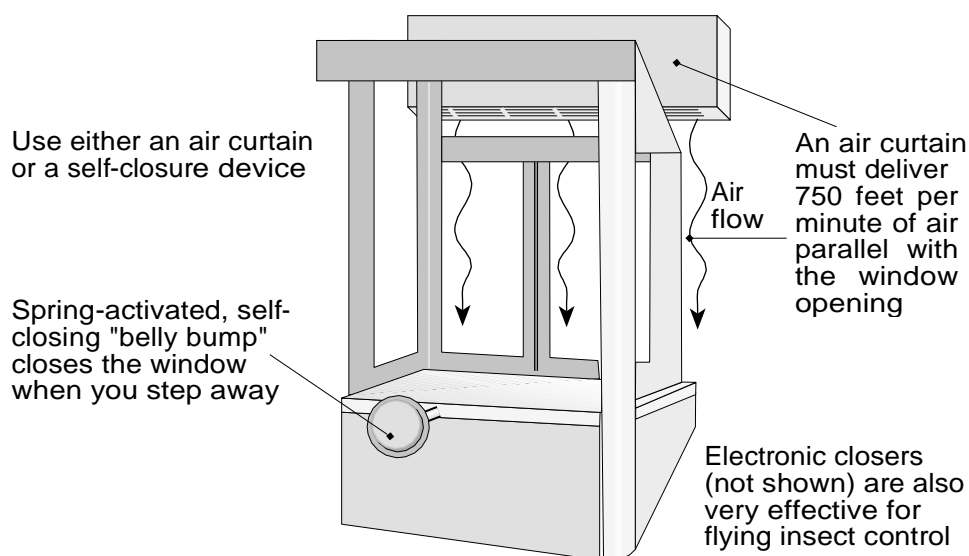
1. Pest Control: All delivery doors leading to the outside must be self-closing and tight fitting.
2. Garage Doors: Vertically-opening, garage-type delivery doors must be protected against pests. They should have an overhead air curtain with a minimum velocity of 750 feet of air per minute measured 3 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.
4. We recommend installing sodium vapor lights near delivery doors to avoid attracting insects.

### **C. Windows**

1. Screen all openable windows, except drive-thru or walk-up windows, with at least 16 mesh to the inch screening.
2. Provide fly protection by one or more of 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 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.

Figure 15: Drive-Thru Windows



**INSECT AND  
RODENT  
CONTROL**

## Insect and Rodent Control Tips

1. Keep dumpster lid closed to prevent access by pests.
2. Keep dumpster area clean and free of loose debris at all times, and bag all garbage from the establishment.
3. Keep exterior doors and windows closed at all times. Screen doors are an option to install to provide airflow to the establishment. The screen must be at least 16 mesh/inch material.
4. Install UV light traps with an integral glue boards.
5. Do not install fly strips over food preparation, utensil washing or serving areas.
6. Install air curtains at all outside entrances including drive thru windows.
7. Install self-closing devices on all doors that open to the exterior of the building.

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## 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 a disposal company can pick it up.
2. Trash Compactors: Consideration as to the cleaning and proper disposal of the liquid waste requirements may vary from municipality to municipality.

### B. Garbage Area

1. Outside Storage: Place outside refuse containers, grease containers and compactor systems on smooth surfaces of non-absorbent material such as concrete or machine-laid asphalt. These areas should be as far as possible from the building's doors and windows.
2. Pest Control: When outside refuse containers are within 20 feet of the food facility's door or window, install an air curtain, in addition to a self-closure device on doors. Air curtains must maintain a minimum velocity of 750 feet of air per minute measured 3 feet above the floor.
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*.
  - b. Indoor garbage temperatures of 50°F or less should be maintained to eliminate fly breeding.

# XIII. Exhaust Hood Ventilation for Cookline Equipment

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## A. Exhaust Plans Submittal

1. Specifications: Complete the *Exhaust Plan Review* form(s) for new exhaust system installations, or modifications to existing systems for approval (one form per hood).
2. Equipment: Submit exhaust plans indicating the type of equipment being proposed for installation under the cookline exhaust hood.

## B. Codes and Requirements

1. Install all ventilation systems as specified by all municipal, county, state, fire, and building department's requirements. Use the 2003 B.O.C.A. Mechanical Code, or subsequent editions. Many local fire departments also require compliance with the International Fire Code (IFC) 2000.
2. For all proposed installations that are not of conventional design, a detailed review may be required to determine the system's adequacy.
3. Prior to the opening of the establishment, the owner or operator must submit an air balance report to the Kane County Health Department. A field approval may be required to assure ventilation performance requirements.

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## C. When Exhaust Hoods are Required

1. General: Commercial cooking, dishmachine, or display equipment, which when used produces smoke, steam, grease, mists, particulate matter, odors, or creates sanitation or indoor air quality problems, will require a hood.
2. Exceptions: A commercial exhaust hood is required for each cooking appliance, with the following exceptions:
  - a. Completely enclosed ovens
  - b. Electric steam tables
  - c. Auxiliary cooking equipment that does not create a sanitation or indoor air quality problem, for example: Toasters, coffee makers, sandwich makers, electric rice cookers, electric cheese melters and soup wells.

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3. Other Examples: Non-traditional equipment that would require installation under a hood include: Kettles, pasta cookers, hot plates, salamanders, gas cooking equipment.

#### D. Design

##### a. General

The hood is to be fabricated and reinforced to withstand the actions of normal use without buckling, cracking, or significantly distorting. Design hoods to not interfere with normal combustion processes and/or exhaust from cooking equipment.

##### b. Materials

Construct the hood of a minimum 20 U.S. Standard Gauge (0.037 inch) stainless steel and the other parts of the primary collection system of low carbon steel (2-10%). The minimum thickness of steel must be number 18 Manufacturers Standard Gauge (0.048 inch). Galvanized steel and black iron steel are not acceptable materials. Paint or epoxy coatings are also not acceptable on the hood.

##### c. Joints and Seams

All joints must be structurally sound without the use of solder. Design and construct joint and seams to be easily cleanable by normal cleaning methods. Seal joints and seams on surfaces of the plenum, hood, or other portions of the system containing exhaust air.

##### d. Reinforcing and Framing

Minimize exposed bracing, channels, crevices, or other areas in which dirt, grease, and similar materials may accumulate.

##### e. Gutters

Design and construct gutters for grease extractors to be easily cleanable. Locate drip pans outside of the plenum and in an easily accessible location.

##### f. Lights

Install a sufficient number of fire-resistant and properly shielded lights on the inside of the hood.

##### g. Grease Extractors

Follow grease extractor manufacturer's recommendations in the design and construction of new systems so as to have optimum total grease removal, air movement, and air velocity.

#### E. Size of the Exhaust Hood

An exhaust system that meets U.L. requirements for NSF standard 2 does not need to meet Kane County's performance requirements.

##### General

The area of the open-faced portion of the hood will determine the cubic feet per minute (CFM) required by the entire system. All exhaust hood systems must maintain a minimum of 50 feet per minute capture velocity at the cooking surface.



1. Wall-Mounted Hoods: Canopy hoods attached to a wall must have a minimum air removal of 100 CFM per square foot of open-faced portions of the hood.
2. Island Hoods: Canopy hoods exposed on all sides must have a minimum air removal of 150 CFM per square foot of open-faced portions of the hood.
3. Ventilators: Non-canopy hoods must have a minimum air removal of 300 CFM per linear foot of hood length.
4. Skirted Hoods: Wall-mounted canopy hoods, which are less than 6 feet in length and have only one side exposed, must have a minimum air removal of 50 CFM per square foot of the open-faced portion of the hood.
5. General: All exhaust hood systems must maintain a minimum of 50 feet per minute (FPM) capture velocity at the cooking surface. Factory engineered cookline exhaust systems must follow the manufacturer's recommendations in the performance of new systems to have optimum grease removal, air movement and air velocity, in addition to meeting the above criteria. A letter stating that this standard will be met must accompany documentation supporting compliance with NSF criteria, C-2.

## F. Type of Exhaust Hood

1. Canopy Coverage: Each wall-hung canopy or island canopy hood must be designed as an overhead hood that completely covers the equipment it is designed to serve. The hood must overhang all open sides by at least 6 inches.
2. Ventilators: Any ventilator-type non-canopy hood must be designed as a wall hood that has a maximum height of 3 feet above the cooking surface and a maximum 1-foot setback from the front of the cooking surface. This hood is often referred to as a low sidewall hood.
3. Water Wash Hoods: Water wash hood systems must be designed to include the following additional requirements:
  - a. Provide a floor drain.
  - b. Keep exposed piping below the filter bank to a minimum. Do not install exposed horizontal piping.
  - c. Drain through the building grease interceptor, or provide an additional grease interceptor specifically for the hood system.
  - d. Install an RPZ (Reduced Pressure Zone backflow preventor) on the potable water supply. Locate the RPZ to be accessible for inspection.
4. Steam Only: Box condensate hoods must be designed for removing steam and vapor only and include all or part of additional requirements.
  - a. Provide a floor drain.
  - b. Provide duct work with a fan.

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5. **Filters and Durability:** Exhaust hoods must be designed for collecting vapors, mists, particulate matter, grease, steam, heat and smoke before entering the exhaust duct via filters or extractors. The hood is to be fabricated and reinforced to withstand the actions of normal use without buckling, cracking or significantly distorting.

## G. Exhaust Ducts

Use the formula on the *Exhaust Plan Review* form.

1. **Construction:** All ducts should be constructed with a minimum of bends. Ducts are to be smooth, easily cleanable and made of a corrosion-resistant metal.
2. **Number:** Multiple takeoff ducts are required for all hoods 10 feet or more in length. When required, multiple ducts must be equally spaced. Refer to Table 2.
3. **Velocity:** Duct air velocity must be a minimum of 1,500 feet per minute, with a maximum of 2,200 feet per minute.
4. **Outside Exhaust:** Kitchen exhaust systems must be designed and constructed to exhaust the air through duct(s) directly to the outside atmosphere in a safe and nuisance-free manner.
5. **Interference With Other Fuel-Burning Equipment:** Kitchen hoods and ducts must be designed so they will not interfere with normal combustion processes or combustion exhausts from commercial cooking or heating equipment. Locating a water heater or a furnace near the kitchen exhaust system is not recommended.
4. **Cleanouts:** Provide cleanouts every 20 feet in a horizontal exhaust duct, and at every change in direction. Openings must be at the sides and large enough to permit cleaning. In horizontal sections, the opening must be at least 1 ½ inches from the bottom of the duct. Covers must be made of the same material as the duct and be grease-tight when in place.

Table 2: Multiple Take-Off Ducts

Hood Length	Number of Ducts
10 ft. or less	1
10 ft. to 16 ft.	2
16 ft. to 24 ft.	3
24 ft. to 32 ft.	4
32 ft. to 40 ft.	5

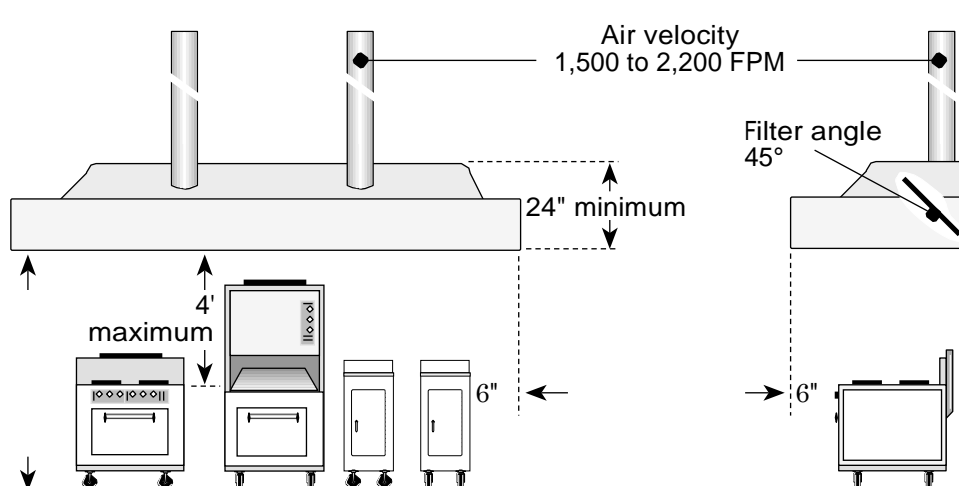
## H Exhaust Filter and Extractors

1. Size: All exhausted air, before entering the duct work, must pass through approved, removable filters or extractors. Calculate the appropriate number of filters needed, based on the length of the filter bank.
2. Design: Grease filters or extractors must be installed at a 45 degree angle to horizontal, and be sized appropriately to fit the filter bank.
3. Type: Filters or extractors specified must be of the same type so they will not adversely affect the static pressure of the total system.
4. Grease Extractors: Kitchen exhaust systems using grease extractors must follow the manufacturer's recommendations in the design and construction of new systems so as to have optimal grease removal, air movement and air velocity.
5. Grease Filters: Grease filters must be tested and listed in accordance with UL 1046.
6. Mesh filters are not allowed for grease removal.

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A hood cleaning schedule will be requested. The schedule must indicate methods of cleaning and the time interval between cleanings.

Figure 16: Typical Hood Installation



## I. Exhaust Fan

1. Size: The number and size of the fan(s) specified are required to remove the total CFM of exhausted air as determined by the type of hood at a specified static pressure.
2. Specifications: All fan specifications (make and model) need to be included on the *Exhaust Plan Review* form and indicated on the plans.
3. Location: All fans must be located to direct exhaust away from the building.

## J. Make-Up Air

1. Make-up air must be supplied during the operation of the kitchen exhaust system. The amount of make-up provided must be approximately equal to the amount of exhausted air.
2. Balanced Air Flow: Exhaust systems with air removal of over 1,500 CFM must be provided with sufficient make-up air equal to or slightly less than the total CFM to be exhausted.
3. Tempering: The make-up air is to be introduced in a manner, which will not interfere with the capture characteristics of the exhaust system nor create discomfort to the employees. It is recommended that the temperature differential between the make-up air and air in the conditioned space should not exceed 10°F.
4. Quality: The air supplied to the kitchen and food preparation areas must be free from contamination by dust, vapors or gases. Screening must be provided to prevent entry of foreign matter.

## K. Construction and Criteria Checklist

1. The maximum distance between the bottom edge of hood and the floor is 7 feet.
2. The maximum height of the bottom edge of the hood above the cooking surface is 4 feet.
3. The minimum height of the hood itself is 24 inches.
4. The minimum static pressure is 1/2 inch.
5. Hoods less than 18 inches from the ceiling or wall must be closed with approved material to the ceiling and wall. *Closed* means having an opening of not more than 1/32 of an inch.
6. The minimum distance between the lowest edge of a grease filter or extractor and the cooking or heating surface is:
  - a. For exposed or unexposed flame units, 3 feet.
  - b. For charcoal, 4 feet.

7. There must be no horizontal runs of piping, electrical conduit or fusible links of the fire protection system exposed below the filter bank in the hood or the make-up air plenum. All piping, including electrical conduit, exposed on the exterior of the exhaust hood must be spaced 1/2 inch to 1 inch away from all surfaces.
8. Air intakes must be located at least 10 feet from any exhaust outlet or vent.
9. Insulation must not be applied on the interior of the duct work.
10. All installations must be in complete accordance with all municipal, county, state, fire and building department requirements and recommendations. Note: Many local fire departments require compliance with the International Fire Code (IFC) 2000.
11. For all proposed installations that are not of conventional design, a detailed review and conference may be required with design engineers to determine the system's adequacy.
12. Field approval must be obtained. A smoke test may be performed.
13. Fire suppression tanks must not be located over food preparation areas.

## EXHAUST HOOD VENTILATION

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**TIP** Check with local building/fire departments, they may have more restrictive codes.

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### REMINDER:

- Submit two (2) sets of complete plans. One 8 1/2 x 11in. set and a set using 1/4 in. = 1ft. scale approximately 24 x 36in. Are both sets of plans numbered and labeled?
- Submit one copy of your proposed menu?
- Submit the plan review fee?
- Submit the Plan Review Packet?
- 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 near you. Remember, you only have three months from the date you open to become certified.
- Contact the Kane County Health Department to obtain your local sanitarian contact information at (630) 444-3040.