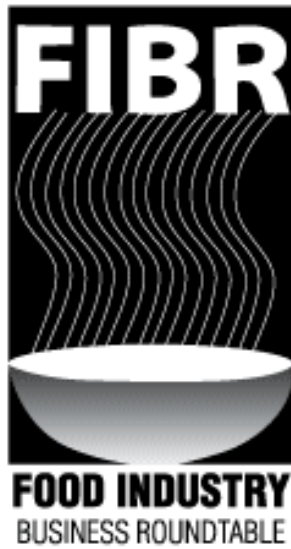


CONSTRUCTION GUIDEBOOK FOR WHOLESALE FOOD FACILITIES

Regional Wholesale Food
Processor Committee



May 2011
(Second Edition)

CONSTRUCTION GUIDEBOOK FOR WHOLESALE FOOD ESTABLISHMENTS

INTRODUCTION

This guidebook is a product of the Regional Wholesale Food Processors Committee (RWFPC), a collaborative partnership between the Food Industry Business Roundtable (FIBR) and the Environmental Health Departments of Los Angeles, Orange, San Bernardino and San Diego Counties and the City of Vernon. The RWFPC is an effort to expand communications and services among the food industry and regulatory communities of Southern California.

It must be emphasized that this document is intended to provide guidance and must not be interpreted as code requirements. This document suggests best construction practices that owners, builders, and developers are encouraged to adopt and implement.

Wholesale food facilities or establishments are businesses that receive, store, handle, process and/or distribute food items to retail facilities. Generally, wholesale food facilities or establishments such as warehouses do not conduct retail sales or distribution. Wholesale food facilities include dry and cold storage warehouses that do not handle open food products. Wholesale food establishments also include commercial food processing facilities that are subject to inspections by federal and state agencies

The Food and Drug Branch of the California Department of Public Health is the administrative authority for most of the wholesale food facilities or establishments in the State of California. However, under the Food Sanitation Act, four local jurisdictions are given authority to conduct wholesale food establishment inspections. These jurisdictions include environmental health departments from Los Angeles County, Orange County, San Bernardino County and City of Vernon. In addition, San Diego County's local ordinance allows their Environmental Health Section to oversee wholesale food distribution facilities.

Although the Food Sanitation Act has general requirements that apply to wholesale food facilities, it does not require a plan approval prior to construction or renovation of the facilities. Similarly, federal agencies such as the Food and Drug Administration (FDA) and United States Department of Agriculture (USDA) also have requirements for these facilities but they too do not have an active or formal plan review process. These agencies may review plans, conduct inspections and approve the constructed facilities prior to use.

One of the main goals of this document is to provide regulators, owners, and contractors a uniform document that contains reasonable and compliant standards for the construction or renovation of wholesale food facilities. Again it must be emphasized that this document is strictly a guide. Some jurisdictions may or may not have statutory authority for the items stated in this document.

Please note that individual agency plan check guides have been included in an appendix attached to this document. It is recommended that these guides also be considered when preparing plans for a facility that will be reviewed by a specific agency.

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I. Approval and Permits from other Programs and Agencies

The type of food product being produced, manufactured or used for wholesale purposes determines the federal and/or state agency that maybe involved in the construction and operational aspects of the facilities. Local agencies are typically involved in the plan review of these facilities and may or may not be involved in the routine inspections of these facilities.

For instance, a facility in Los Angeles County that intends to manufacture poultry items must contact the USDA Regional office for approval of their operations. Prior to construction of the same facility, plans must be submitted for review and approval by Los Angeles County Environmental Health.

In another instance, a company in the City of Vernon that intends to construct a produce warehouse with refrigeration systems must submit plans to the Vernon Health Department for review and approval. This facility is also required to obtain a health permit from the city and is subject to routine inspections. Although these warehouses also require registration with the State of California Department of Public Health, they are not required to submit plans to this agency prior to construction.

II. Plan Submission

Before constructing, enlarging, altering, or converting any building, room, or area for use for food processing or storage, three (3) sets of complete plans must be submitted to the appropriate local environmental health department. Most environmental health jurisdictions will require a fee for the review and approval of the plans. Depending on work to be done, separate Building, Electrical, Plumbing, Mechanical, and Fire Construction Permits may be required.

Plans shall be drawn to scale and include a complete floor plan with plumbing, electrical and equipment details. In addition, a finish schedule for floors, walls and ceilings indicating the type of material, finish, color and type of cove base at the floor-wall juncture shall be provided. Brand names with specific product numbers as well as samples of materials may be requested to ensure acceptability.

The following information is a guide only and is not intended to cover every situation that may arise. Some jurisdictions may have additional requirements.

Please note that some jurisdictions can now accept electronic plans via the internet. It is recommended that plans be submitted in an AutoCAD format (DWF, DWG, .DXF) or in a .PDF format. A digital copy of the file, on a CD, showing all the corrections must be submitted prior to final approval of the project.

III. Plan Check Contacts

The following are local, state and federal agencies that conduct plan reviews of proposed wholesale food establishments. This list excludes local building departments. As with any other commercial construction, plans are required to be reviewed and approved the local building department.

Los Angeles County Environmental Health Division
Plan Check Section
5050 Commerce Drive
Baldwin Park, CA
(626) 430-5557 / 5400

Orange County Environmental Health
1241 E. Dyer Rd., Suite 120
Santa Ana, CA 92705
(714) 433-6000

San Bernardino County Environmental Health
Wholesale Department
8575 Haven Ave, Suite 130
Rancho Cucamonga, CA
909-948-5058 (909) 458-9673

San Diego County Environmental Health
5500 Overland Ave., Suites 110 & 210
San Diego, CA 92123
(858) 508-6700

City of Vernon
Health & Environmental Control
4305 S. Santa Fe Ave.
Vernon, Ca 90058
(323) 583-8811 Ext. 288

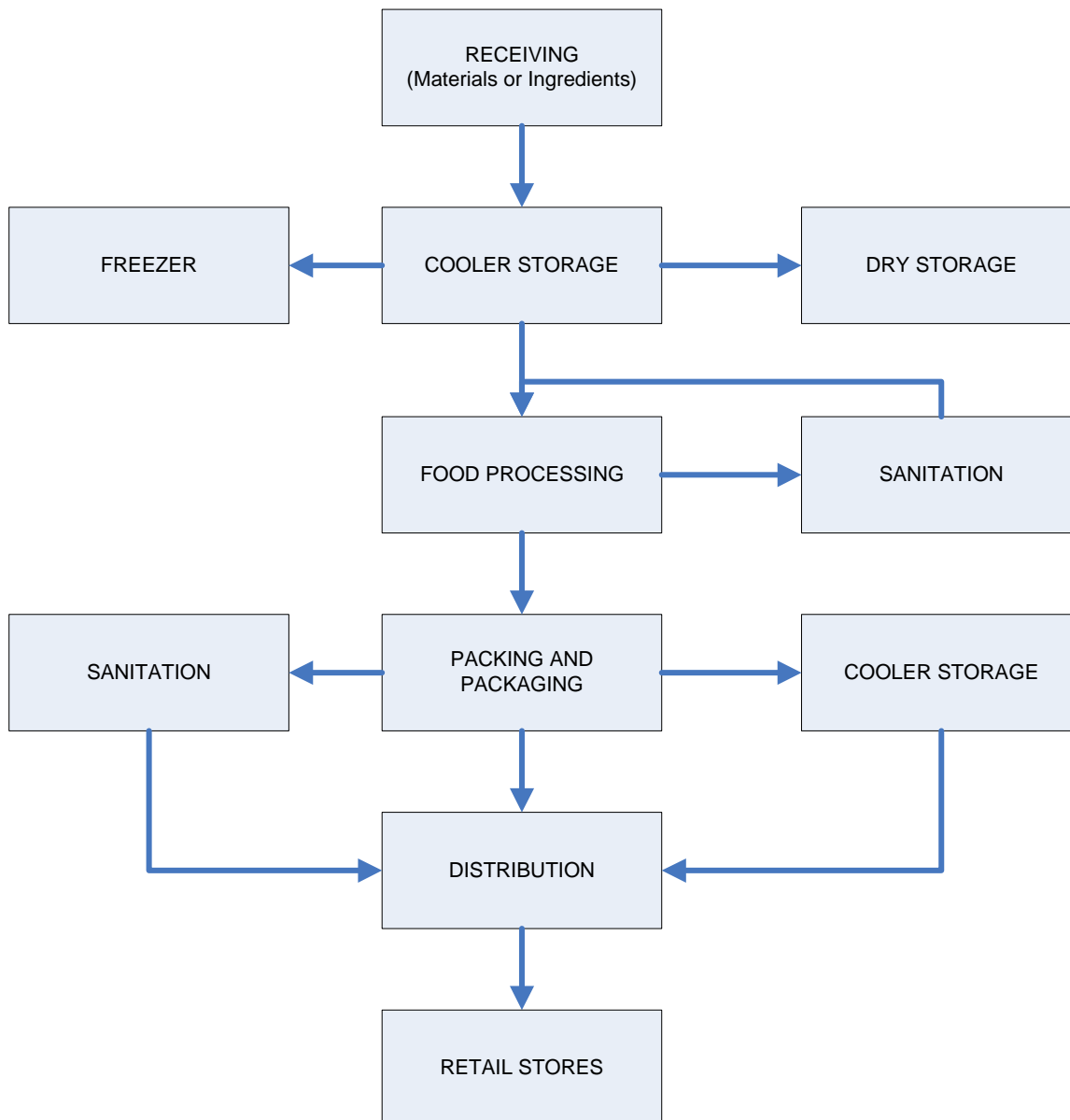
USDA (New Facility Information)
620 Central Ave.
Alameda, CA 94501
(510) 337-5000

California Department of Food and Agriculture
2403 W. Washington St., Room 10
Stockton, CA 95203
(209) 466-7168

IV. Product Flow

An analysis of the physical flow of raw materials, food processing steps and finished products in the plant is highly recommended. Cross contamination and allergen contamination of products are food safety threats that can be avoided with a well-designed facility and operations. Designers should consult with owners and plan checkers prior to officially submitting of plans. Hopefully, this can reduce the time required for review and approval of submitted plans.

V. Sample Product Flow – Food Processing



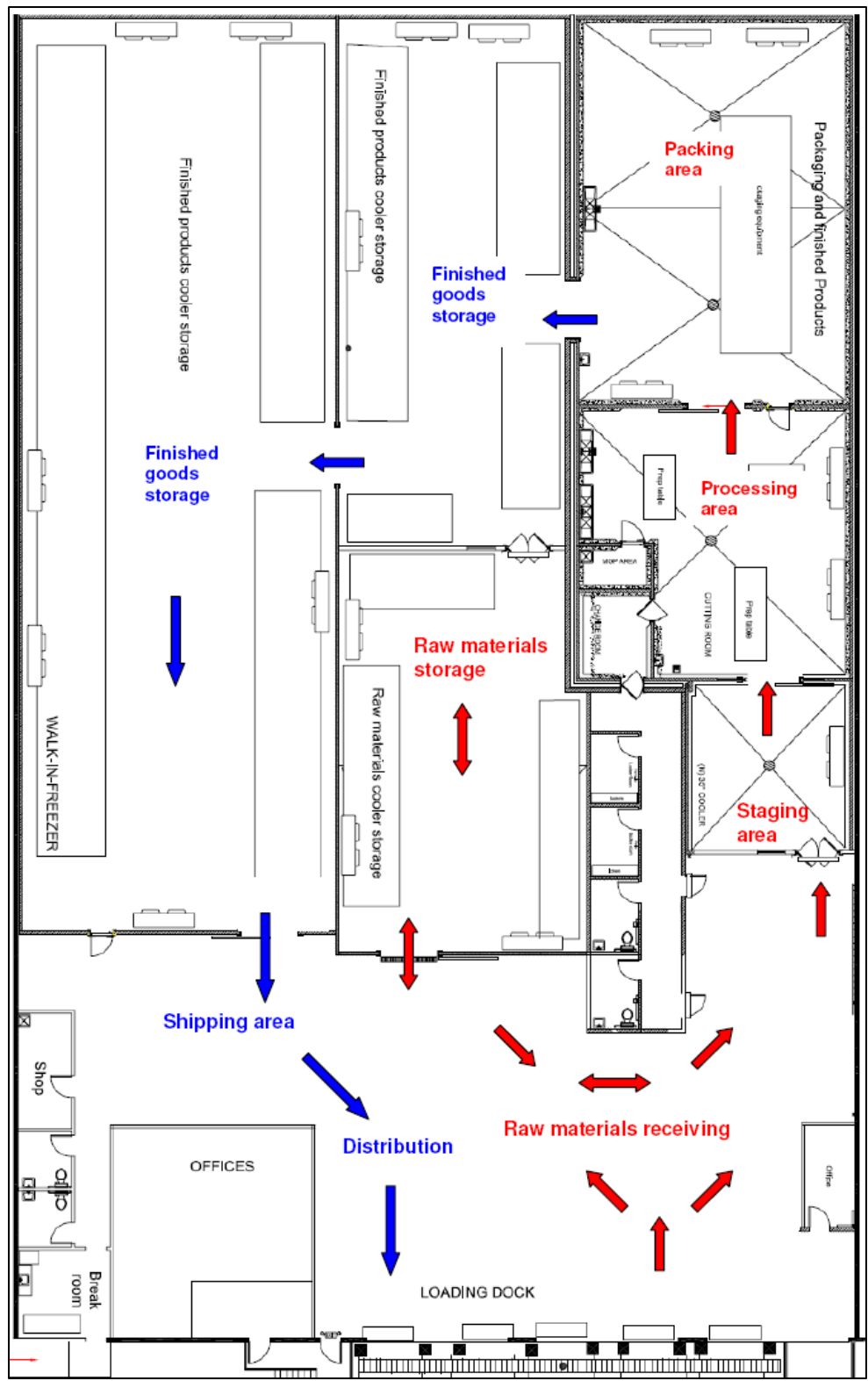


Figure 1 – Processing floor plan and product flow

VI. Room Requirements

The following are typical rooms found or are required in a food processing facility:

- Food processing room
- Slaughter rooms
- Male and female restrooms
- Locker rooms and change rooms
- Warehouse and storage rooms
- Janitorial and sanitation rooms
- Loading dock areas
- Shop and equipment maintenance areas
- Office / Administrative rooms
- Designated USDA office

Food processing, manufacturing and packing activities must be conducted in separate rooms with the requirements indicated in this document.

VII. Construction Requirements

The following are recommended elements that should be included in the construction of wholesale food establishments. Please note that most of these elements are typically required by state and local health ordinances, building and fire codes and federal recommendations. Construction requirements and guides from regulatory agencies are provided in the appendices to this document.

A. Floors

Floor finish materials in large food processing and warehouse facilities are typically subject to significant impacts from the following activities:

- Heavy foot traffic depending on the number of workers
- Forklift traffic
- Power washing
- Heat and moisture from processing activities
- Slightly corrosive sanitizing chemicals from sanitation activities
- Movement of heavy equipment

Choosing the right floor finish during construction is critical because any necessary floor repairs or renovations during production periods or operations can be costly, disruptive, and can potentially create food safety hazards. The floor surfaces shall be of such construction and material so as to be durable, smooth, impervious to water, grease, and acid, and easily cleanable in the following areas:

- Food or beverage preparation, processing rooms and storage rooms
- Produce and product packing rooms
- Slaughter rooms
- Walk-in refrigerators
- Utensil or equipment washing rooms

- Refuse or garbage storage rooms
- Restrooms, dressing rooms and locker rooms

1. Acceptable floor covering materials

The following flooring materials, when properly installed, are acceptable for use in wholesale food establishments:

a) Concrete

Concrete floors which are smooth, readily cleanable, and properly covered up the wall are acceptable if they have been sealed with a penetrating sealer which is clear, nonabsorbent, grease and acid resistant. All proposed sealers must be approved by the local health agency prior to application.

Concrete floors which have been damaged, cracked, excessively worn, or that have been saw cut and re-poured are required to be covered with an approved flooring material.

b) Epoxy or Resin Based Materials

Troweled-on Seamless Resin Based Materials - the troweled-on resin based flooring shall be installed with a dried uniform thickness of at least 1/8 of an inch. Resin based materials which are rolled, brushed, or sprayed-on are not acceptable.

Resin based materials must be compatible with the existing substrate. For instance, concrete floors must be properly prepared for the bonding of the resin to the underlying concrete material. Improper application of resin based materials may lead to resin layers peeling creating potentially unsanitary conditions.

A metal cap shall be installed at the top of the cove base in order to provide a base which is thicker and more durable. Resin based materials that are feathered at the top of the base are prone to chipping.

Obtaining a manufacturer's warranty for the resin based flooring material and installation is highly recommended

c) Quarry and Ceramic Tiles

The minimum thickness for quarry and ceramic tiles is 1/4 inch. All tiles, regardless of thickness, will be evaluated on the basis of their density and porosity.

The tiles and grout must be impervious to water, grease, and acid.

Ceramic tiles must also be sufficiently durable to withstand heavy equipment traffic such as forklifts or pallet jacks.

d) Commercial Sheet Vinyl

Sheet vinyl is generally not acceptable for use in high moisture areas where floor drains are present, in cooking areas and areas which are subject to extreme temperatures or in

areas with heavy equipment.

Sheet vinyl is ideal for use in locker rooms, and break areas. It is not recommended in large processing rooms or warehouses. The sheet vinyl shall be commercial grade with a minimum wear layer thickness of .050 inches.

Sheet vinyl shall extend continuously up the wall at least six (6) inches forming a minimum 3/8 inch radius at the floor/wall juncture. The covered floor/wall juncture shall be supported by a cove-stick and a metal cap shall be installed at the top of the base.

All seams in the sheet vinyl must be properly heat welded or chemically sealed to be smooth and impervious to water, grease, and acid.

Sheet vinyl with abrasive or embossed surfaces is generally not acceptable for use.

e) Alternative Flooring

Other flooring materials may be approved upon submittal of samples. Specifications and samples of alternative flooring materials must be submitted to the local environmental health department for approval prior to installation. Alternate flooring materials should be consistent and compatible with the proposed operations.

f) Unacceptable Floor Covering Materials

The following floor covering materials unacceptable in food related areas:

Unsealed concrete or concrete sealed with an unapproved sealer (e.g. stains or sealers which are absorbent and not grease and acid resistant).

- Sheet vinyl with foam backing.
- Vinyl composite tile (VCT).
- Laminated flooring materials.
- Wood.
- Carpeting

B. Cove Base

Certain portions of wholesale food establishments will require an effective cove base to facilitate cleaning and provide sanitary conditions. Approved cove base materials are typically required in the following areas:

- Inside food processing rooms
- Inside wet cold storage rooms
- Around janitorial facilities or areas
- In employee restrooms
- In employee locker areas or rooms

C. Acceptable cove base materials

The use of approved topset cove base complying with the following criteria is generally acceptable:

1. Quarry or Ceramic Tiles

Topset “slimfoot” tiles as cove base are typically acceptable for use after review and approval of a sample by the local health agency (See figure 3). In larger wholesale food facilities, the use of these tiles as base coving must be carefully considered when activities such as power washing or forklift / pallet storage are conducted in the areas. These activities will likely damage these tiles during operations and will require constant and potentially disruptive maintenance.

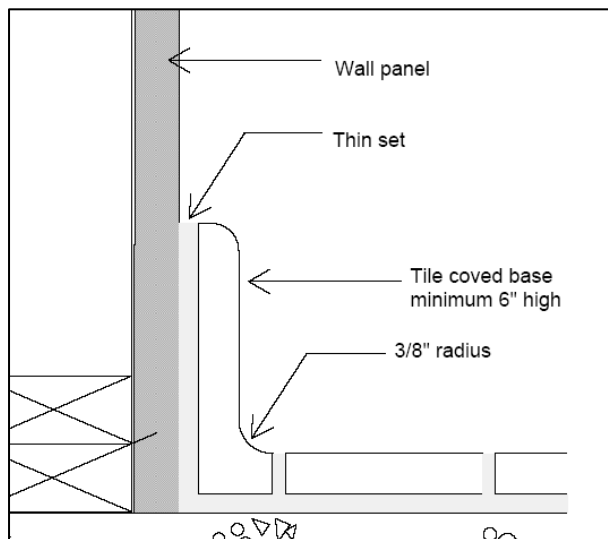


Figure 2 – Ceramic floor and cove base

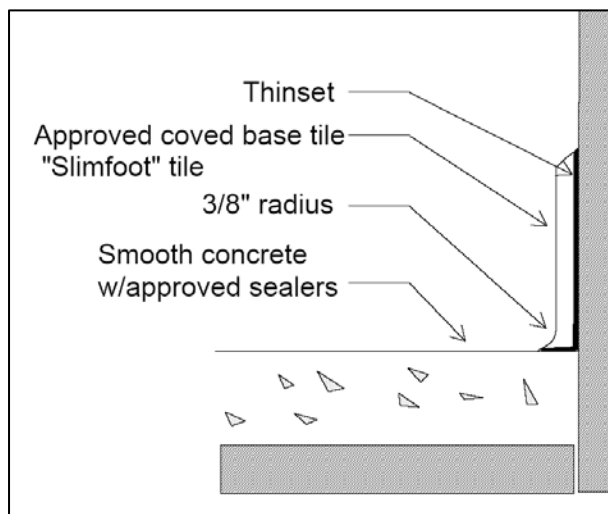


Figure 3 – Sealed concrete floor and “slimfoot” ceramic cove base

2. Metal Cove Base

- A metal cove base is acceptable on metal walls, such as behind cooking equipment and the internal and external surfaces of a smaller walk-in refrigeration units.
- Metal cove base may be acceptable on equipment which is designed to be sealed to the floor, such as large pizza ovens and roll-in baking ovens. The metal used for the cove

base shall be the same material as the wall or equipment, such as an aluminum base on an aluminum wall.

- Metal base coving is NOT recommended in processing rooms or refrigeration rooms where wet “wet” products are stored, where extensive power washing or wash down activities are conducted, and where forklift or pallet movement are frequent. These materials typically do not withstand the impacts of above activities and often require maintenance or replacement.

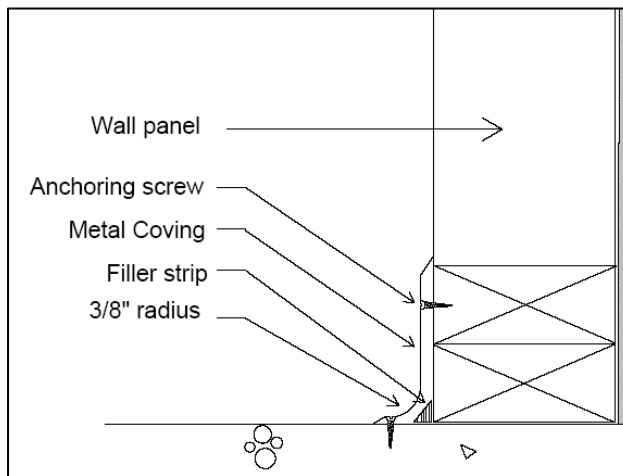


Figure 4 – Metal coved base on sealed concrete floor

3. Concrete curb

A concrete curb is an ideal base coving finish in areas where high impacts are likely. In addition to the durability of concrete curbs to from inadvertent impacts from the movement of pallets or heavy storage items protect and underlying wall. (Figure 5)

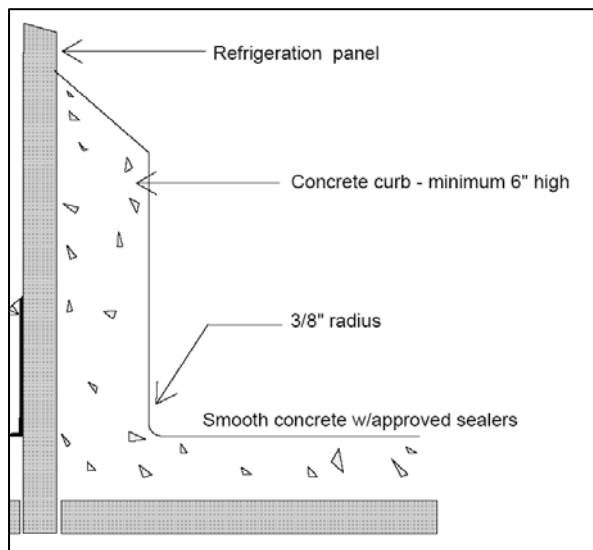


Figure 5 – Concrete curb and concrete floor

D. Floor Drainage

1. Floor drains

Adequate floor drains should be provided in food preparation rooms, utensil or produce washing rooms, toilet rooms, garbage rooms, and in rooms subject to wash down type cleaning or wet conditions. The floors shall be sloped towards the floor drains at least 1/8 inch per foot. In larger rooms, multiple floor drains may be required to avoid significant differences in the floor levels. Uneven floors may impact equipment foundation and installation (Figures 6 and 7).

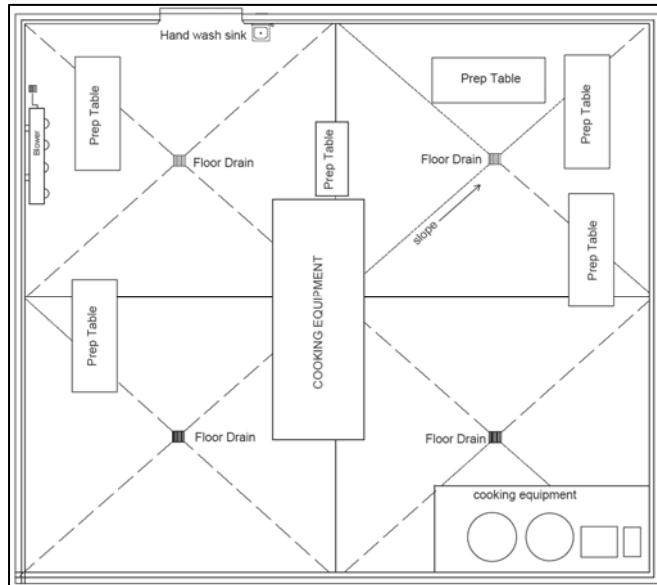


Figure 6 – Processing room with multiple floor drains

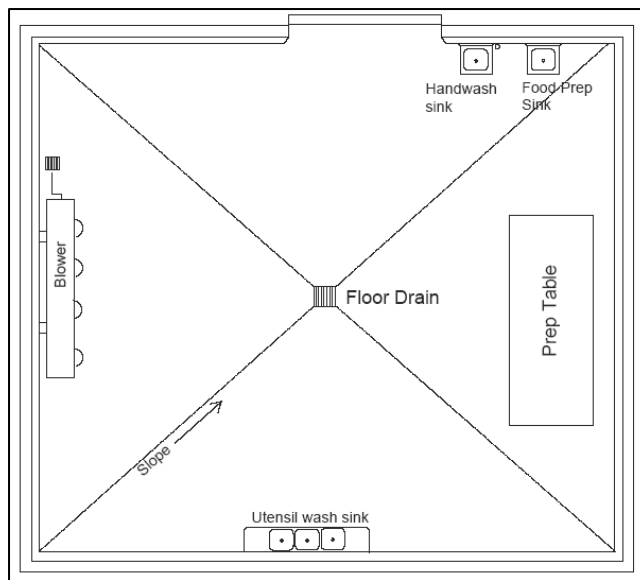


Figure 7 – Processing room with a single floor drain

2. Trench Drains

Trench drains must be installed with approved materials or finishes. Poured in place trench drains must also be provided with approved finish materials. Pre-fabricated trench drains must also be compatible with the proposed activities in the room. The floors in the room shall also slope to the trench drains at least a 1/8 inch per foot.

Alternatively, in very large rooms, a portion of the floors may be sloped to a floor drain. This may be considered when the operator proposes the use of only small equipment that does not require extensive cleaning. Many warehouses often require icemakers to replenish packing ice the melts during storage. Because of the anticipated spillages that occur with this activity, floor drains may be required with a limited floor area sloped to the drains. Ideally, the floor should begin its slope at least three feet beyond the footprint of the ice machine or equipment (see Figure 6).

Floor drains located directly outside walk-in refrigerators are acceptable if the floors in the walk-in units are sloped toward the drains (Figures 8).

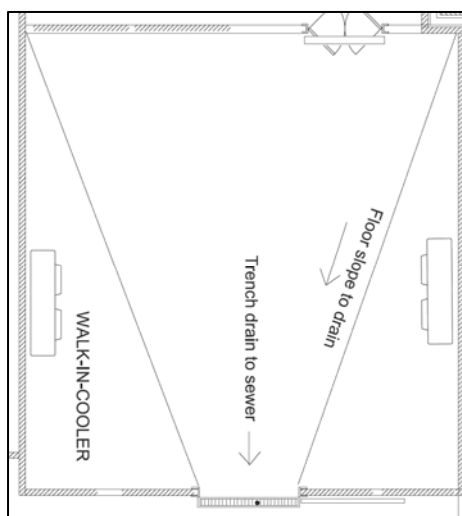


Figure 8 – Trench drain by cooler doorway

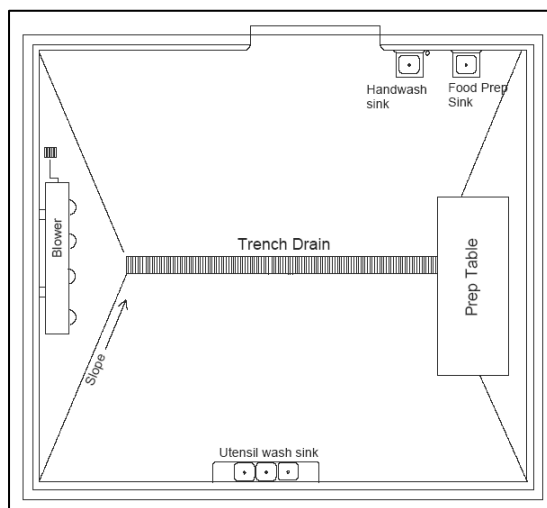


Figure 9 – Processing room with trench drain

3. Floor Drains in Storage Coolers

The Uniform Plumbing Code does not allow the installation of floor drains inside refrigerated food storage areas unless the drains indirectly drain to the site sewer system. In many instances, floors drains may be required inside walk in refrigeration units due to incidental spillages from ice melt from the storage of certain produce items or poultry items. In some instances, other agencies such as USDA may require these facilities to install these drains. Figure 10 provide alternative area drains in these situations.

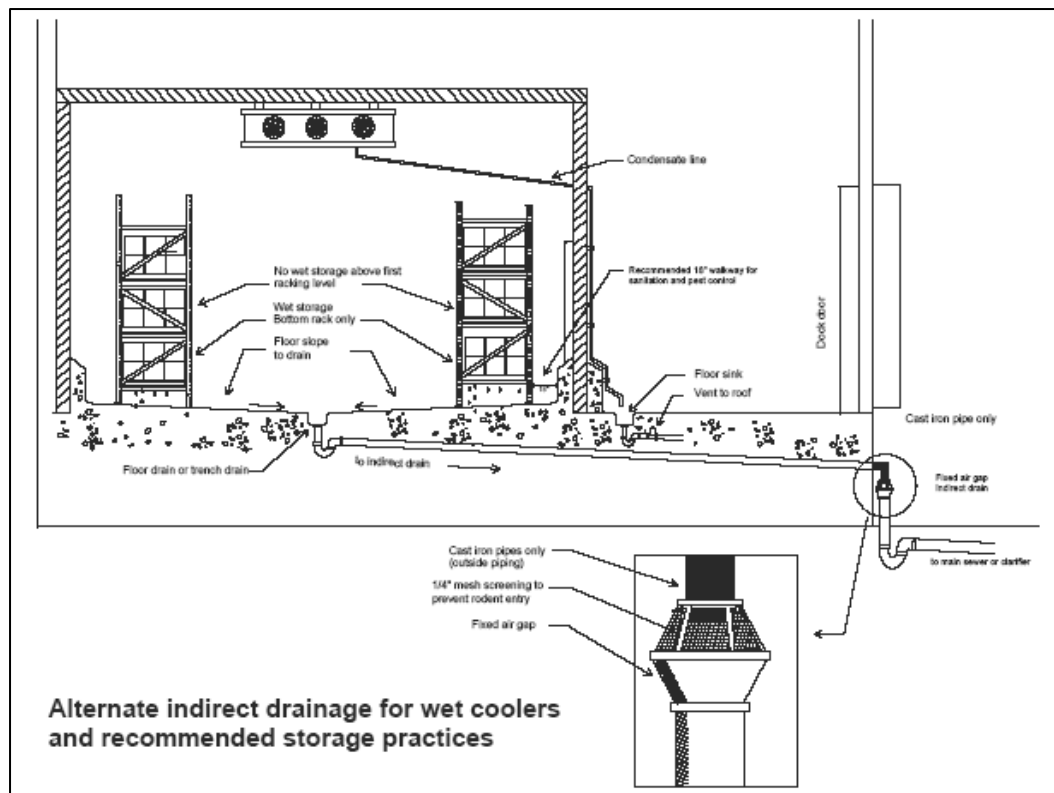


Figure 10 – Alternate indirect drainage for “wet” coolers

4. Floor Sinks

All equipment, refrigerators (including walk-in boxes), steam kettles, ice machines, and food equipment with water related discharges shall drain into floor sinks.

Floor sinks shall be properly plumbed and installed with the sink top flush with the floor surface. All condensate and similar liquid waste shall be drained by means of indirectly connected waste lines into open floor sinks. Horizontal runs of drain lines shall be at least six inches (6") off the floor, sloped toward floor sinks at a rate of one quarter inch (1/4") per foot, and shall terminate at least one inch (1") above the overflow rim of the floor sink.

Floor sinks shall be located so that they are readily accessible for inspection, cleaning, and repairs, and not located in a walkway. Waste lines shall not cross any aisle, traffic area, or door opening. Floor sinks are not permitted inside walk-in units unless they are indirectly connected to the sewer system through a legal air gap.

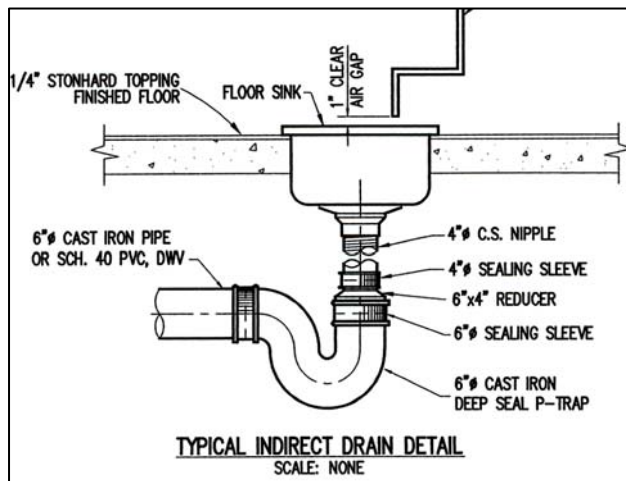


Figure 11 – Floor sink details and air gap

E. Walls

Most wholesale food establishments consist of large areas. Unlike the smaller retail food establishments, these facilities are typically built at a larger scale. For example, an operator who is proposing a new processing plant from the ground up may consider constructing a 50,000 square feet “tilt-up” building. Essentially, the sides of the building walls are monolithically poured on a flat concrete floor and allowed to cure. Each wall is then tilted or pulled up to a standing position and secured (Photo 1). If planned properly, the walls may be finished with a smooth consistency that meet the requirements stated in this document.



Photo 1 – “Tilt-up” building wall

In other instances, existing warehouses that were not originally designed or constructed for food storage are converted into food warehouses or food processing. In these situations, extensive renovations may be required depending on the proposed uses of the facility.

The following are basic wall guidelines in wholesale establishments:

- Smooth, durable, non-absorbent, light colored and easily cleanable walls.

- Under wall paneling tightly butted together and to the floor and ceiling.
- Seams between drywall panels properly taped and finished prior to painting.
- Wall paneling, such as FRP, securely attached to the under wall surfaces with the appropriate adhesives and screws so as to eliminate any bowing or buckling. Compatible end strips should be installed along the edges of the paneling.
- Plumbing, gas, electrical and ventilation conduits installed within walls and ceilings as practicable. When an in-wall installation is not feasible, conduits should be mounted or enclosed in a chase to facilitate cleaning.
- Where plumbing, gas, and electrical lines enter a wall or ceiling, tightly seal the opening around the lines. When foam is used to seal openings, the exposed foam shall be smooth and readily cleanable. Install escutcheon plates around sprinkler nozzles and similar piping protrusions.

1. Acceptable Wall Finish Materials

The following materials, when properly installed, are generally acceptable for use in areas of food establishments that are required to have smooth, durable and easily cleanable wall and ceiling finishes:

a) Drywall

Drywall shall be taped to finish and sealed. Painted drywall should not be used in rooms / areas where extensive wash down activities are conducted unless a durable and waterproof material such as stainless steel or FRP is installed over the drywall. Painted drywall is also not recommended near areas with high humidity or heat. Paint layer failures (peeling) often occur near these areas.

b) Stainless steel or galvanized steel wall flashing

Stainless steel is an ideal wall material but can be very expensive when installed in larger areas. Stainless steel should be installed behind high heat cooking equipment.

c) Fiberglass Reinforced Plastic Panels (FRP)

These panels are relatively inexpensive, lightweight and easy to install. They also provide an easily cleanable surface for facilities. These panels should be installed with both adhesives and anchoring screws or nails. Finishing strips also be provided at the edges and seams.

d) Hardboard

Hardboard materials include those with baked enamel finish, such as marlite. This type of wall or ceiling material is not acceptable in high moisture areas or areas subject to power wash downs.

e) Glazed ceramic tiles

f) Smooth finished concrete tilt-up slabs (Treated with approved sealers)

g) Prefabricated Insulated Panels

These panels are prefabricated with an insulating material between both sides (Figure 12). These panels are commonly used in food processing rooms.

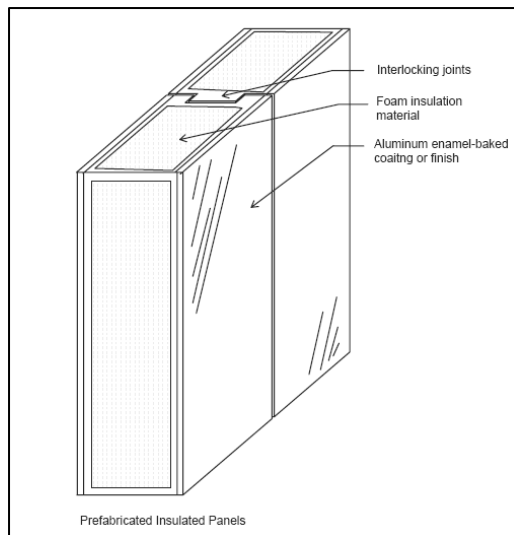


Figure 12– Prefabricated Insulated Panels – “Reefer panels”

It must be noted that temperature differences between the inside of the refrigerated areas and warmer or outside walls have the potential of “sweating” that can result in the growth of mold especially during the warmer seasons. This condition is usually corrected with the installation of approved insulation between the two varying temperatures.

F. Ceilings

Food processing facility ceilings shall be smooth, non-absorbent and easily cleanable. The ceiling materials should also be light colored and consist of materials that can withstand the impacts from the proposed activities in the room. These activities include pressure washing and exposures to slightly corrosive sanitizing chemicals. These activities are often seen in facilities that process “ready to eat” (RTE) food items and employ extensive sanitation procedures.

In many very large food warehouses, the ceilings may extend as high as 35 feet. More often, the ceilings in these buildings consist of open beams and trusses with the exposed roof underlayment. These surfaces can be acceptable if these surfaces are in good condition, reasonable free of dust and debris accumulation and free of peeling paint layers. These types of ceiling could be acceptable in packaged food warehouses only. The acceptance of this type of ceiling may vary with every jurisdiction.

1. Acceptable Ceiling Materials

The following materials, when properly installed, are generally acceptable for use in areas of food establishments that are required to have smooth, durable and easily cleanable wall and

ceiling finishes:

a) Drywall

Drywall taped to finish and sealed. Painted drywall should not be used in rooms / areas where extensive wash down activities are conducted unless a durable and waterproof material such as stainless steel or FRP is installed over the drywall. Painted drywall is also not recommended near areas with high humidity or heat. Paint layer failures (peeling) often occur near these areas.

b) Stainless steel or galvanized steel wall flashing

Stainless steel is an ideal wall material but can be very expensive when installed in larger areas. Stainless steel should be installed behind high heat cooking equipment.

c) Fiberglass Reinforced Plastic Panels (FRP)

These panels are relatively inexpensive, lightweight and easy to install. They also provide an easily cleanable surface for facilities. These panels should be installed with both adhesives and anchoring screws or nails. Finishing strips also be provided at the edges and seams.

d) Hardboard

Hardboard materials include those with baked enamel finish, such as marlite. This type of wall or ceiling material is not acceptable in high moisture areas or areas subject to power wash downs.

e) Suspended ceiling

The panels used in this type of ceiling must be smooth and easily cleanable. The panels shall be reasonable free of pinholes that penetrate the entire thickness of the panels and shall not comprise more than 25 percent of the exposed panel surface.

f) Prefabricated Insulated Panels

These panels are prefabricated with an insulating material between both sides (Figure 12). These panels are commonly used in food processing rooms as walls and ceilings.

G. Lighting

Light intensities are crucial in food processing activities. Adequate lighting allows for a thorough visual examination of products during production and inspection. Food preparation, utensil/equipment washing, toilet, and dressing rooms in wholesale food establishments require at least twenty (20) foot candles of light measured 30 inches above the floor or at the work surfaces. Food and utensil storage rooms require at least five (10) foot candles of light, and twenty (20) foot-candles of light during clean up activities. The following are recommended lighting intensities for the typical rooms:

ROOM TYPE	LIGHTING LEVELS (foot-candles)
Food processing rooms	20
Food processing room on food preparation surfaces	50
Male and female restrooms and locker rooms	20
Warehouse and storage rooms	5 - 20
Janitorial and sanitation rooms	20
Equipment and maintenance rooms	20
Slaughter rooms	50



Photo 2 – Light Fixture with shatter shields

Lighting fixtures in food preparation and dishwashing areas shall be protected against breakage through the use of plastic shields, plastic sleeves with end caps, shatterproof bulbs and/or other approved devices (Photo 2).

In some processing rooms, ceilings are also washed and sanitized as part of routine sanitation activity. In this case, the light fixtures must be water proof and the resistant to the corrosive nature of certain sanitizing chemicals.

H. Conduits

All plumbing, electric, and gas conduit lines shall be concealed within the wall whenever possible. When it is not possible, all conduit runs should be at least one half inch (1/2") away from the walls or ceiling and at least six inches (6") off the floor. Conduit or pipelines shall not be installed across any aisle, traffic area, or door opening. Multiple runs or clusters of conduit or pipelines shall be furred in, encased in an approved runway, or other approved sealed enclosure.

I. Ventilation

Approved ventilation shall be provided throughout the establishment (including toilet rooms, and dressing rooms) to keep all areas reasonably free from excessive heat, steam, condensation, smoke, and vapor, dust and to provide reasonable comfort for all employees.

Ventilation in wholesale establishment should be evaluated through the following critical components:

- Ventilation air supply for employees
- Exhaust and make up air supply for processing equipment
- Exhaust and make up air for operational contaminants such as steam, and combustible dust.
-

1. Ventilation Air Supply

In general, all rooms and occupied spaces such as processing rooms, warehouses and offices shall be provided with adequate ventilation (outdoor) air in accordance to the Mechanical Code. This requirement may be achieved through the following methods:

a) Natural ventilation

Natural ventilation includes building openings to the outside air. When used to meet this requirement, building openings must be at least 4 percent of the net occupiable floor area. All operable openings shall be readily accessible to the occupants whenever the area is occupied. All openings must be properly screened to exclude the entry of insects and other pests. Engineered natural ventilation may be provided with the approval of the local authority.

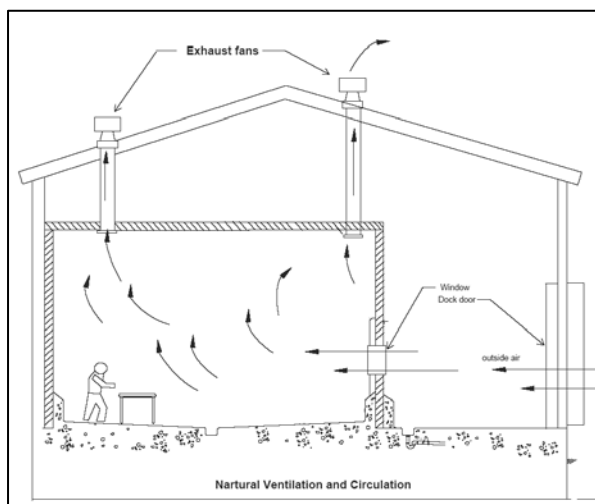


Figure 13 – Natural ventilation

b) Mechanical Ventilation

Where natural ventilation is not feasible, a mechanical ventilation system shall be designed and provided with the approval of the mechanical section of the appropriate building department. The mechanical ventilation should be designed to deliver the appropriate volume of outdoor air to the occupant breathing zones in accordance to Section 403.1.1 of the Mechanical Code.

The sizing of ventilation (outdoor) air is determined by the following formula:

$$Vbz = RpPZ + RaAz$$

- R_p - The outdoor air required per person (Table 4.1 of the Mechanical Code)
- P_Z - the number of occupants on the target zone or work areas
- R_a – the outdoor air flow rate (Table 4.1 of the Mechanical Code)
- A_z – The net occupied floor area

As an example, a medium sized unrefrigerated produce packing room is proposed with the following data:

- R_a – 0.18 cfm / square feet
- P_Z – 14 production workers
- R_p - 7.5 cfm / person (Table 4.1)
- A_z - actual production area is 5,000 square feet,

$$V_{bz} = (7.5)(14) + (0.18)(5,000) = 1005 \text{ cfm}$$

For the proposed facility, a minimum of 1,005 cfm of ventilation (outdoor) air will be required. This volume may be distributed to several zones. Ventilation (outdoor) air requirements are not intended to replace exhaust systems make-up air. Where equipment exhaust is required, the volume determined by the above shall be separate from the cooking equipment ventilation requirements.

Note: Refrigerated food processing areas (55F and below) are often not required to provide ventilation (outside) air by many building departments.

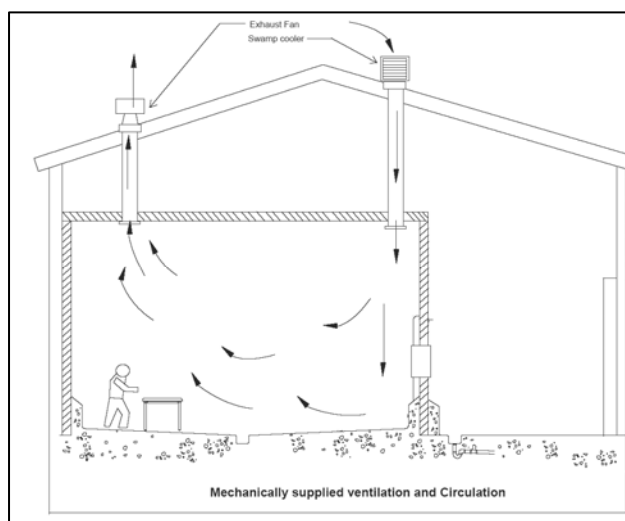


Figure 14 – Mechanical ventilation

c) Equipment Exhaust and Make-Up Air

Adequate mechanical exhaust ventilation hoods shall be installed above all heating or cooking equipment where heat, smoke, steam or vapors are released.

Hoods with adequate exhaust fans are also required over areas where significantly large amounts of heat, steam and vapors are generated such as equipment steam cleaning rooms. Hoods shall extend at least six inches (6") horizontally beyond the equipment or conform to manufacturer’s ventilation specifications.

Equipment such as steam-jacketed kettles, ranges, griddles, ovens, deep fat fryers, tortilla ovens and similar equipment shall have an exhaust system. Adequate make-up air throughout the establishment shall be provided. All equipment, construction, and installation shall be in accordance with manufacturer's specifications, local building and safety requirements and the Uniform Mechanical Code.

Please refer to appendix for further information on equipment ventilation specifications and calculations.

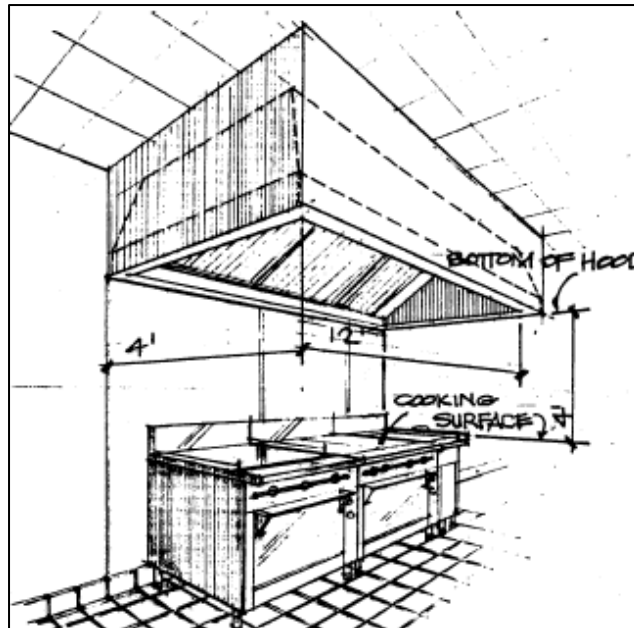


Figure 15 – Cooking equipment with 3-sided canopy hood

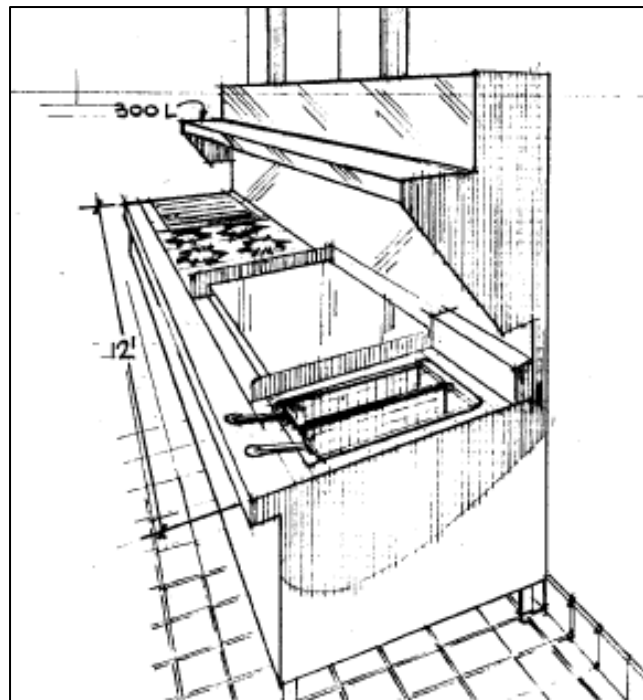


Figure 16 – Cooking equipment with hood

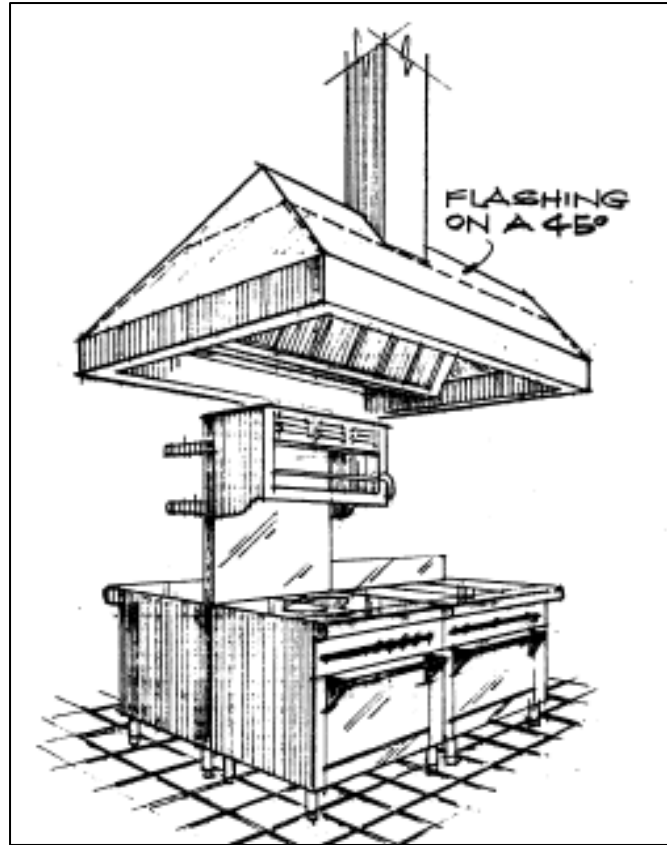


Figure 17 – Cooking equipment with 4 sided hood

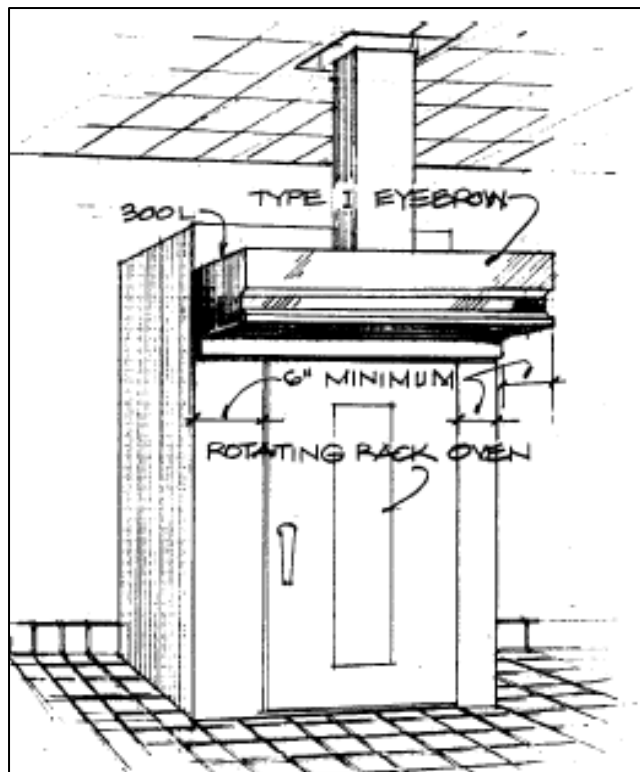


Figure 18 – Cooking equipment with eyebrow hood

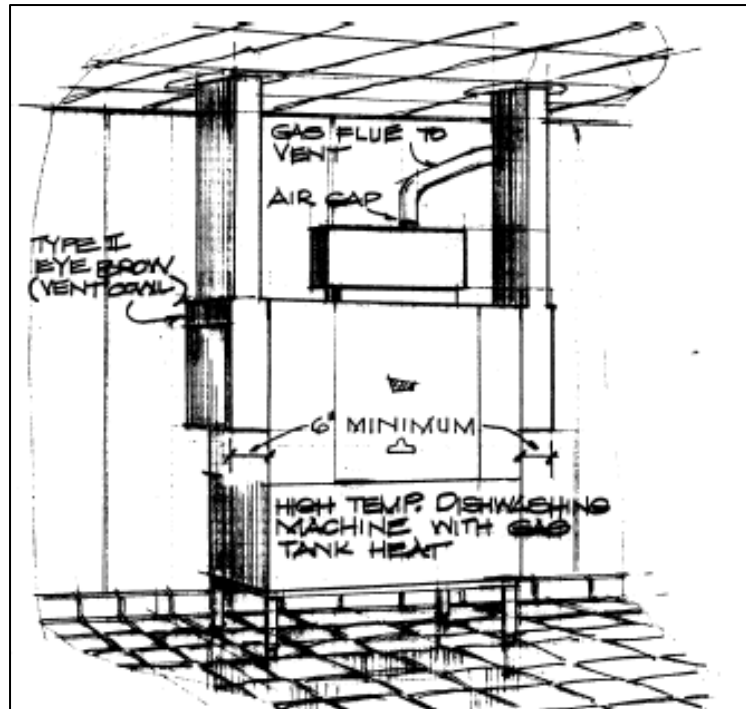


Figure 19 – Commercial dishwashing machine with hood

d) Ventilation for Operational Contaminants

Food processing activities often produce several potential contaminants that are dispersed throughout the room and potentially contaminating food and food equipment. The following are typical contaminants that may be encountered in food processing facilities:

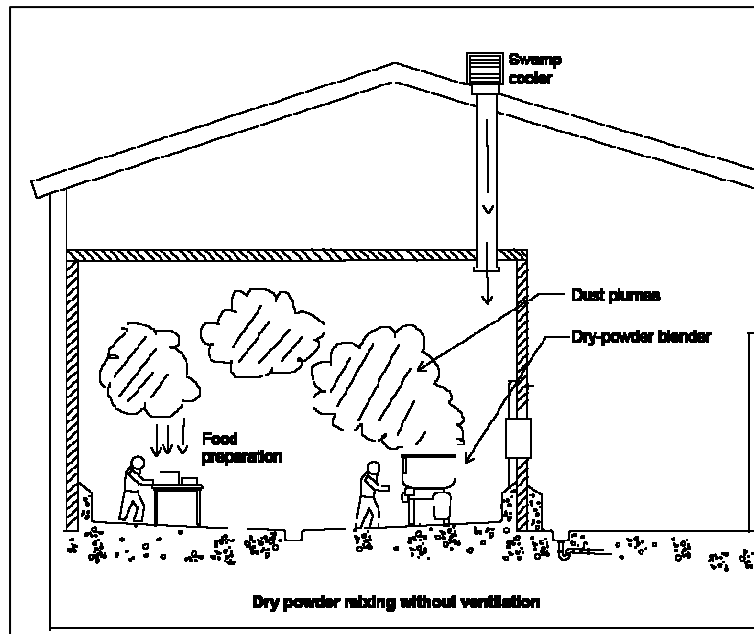


Figure 20 – Operational contaminants

(1) Steam and mist from unvented cooking processes

The handling and preparation of hot recently cooked foods in cold rooms typically generate large amounts of steam because of the temperature differences between the food and the ambient environment. Steam can collect on walls and ceilings and can potentially lead to the growth of mold and mildew.

(2) Steam and mist from sanitation activities

During the cleaning and sanitation periods hot water will likely be used. Rooms are often overwhelmed with steam which can potentially lead to mold and mildew growth.

Sanitation activities also often use slightly corrosive chemicals which are aerosolized during the activities. These conditions can potentially corrode certain metal surfaces in the room. Slightly corrosive mists are potentially hazardous to the workers conducting the sanitation activities.

(3) Ozone

Ozone generating units are increasingly becoming more popular with many food facilities as a sanitizer. Ozonated water is frequently used in the cleaning and sanitizing of equipment. During this process, mists created from the wash down activities may be hazardous to the sanitation workers. It must be noted that the Occupational Safety and Health Administration has placed limits on ozone exposure to workers. See attachment

(4) Carbon monoxide

Many food facilities utilize forklifts to move pallets as part of their operation. Many forklifts operate propane to run the engines. Resulting exhaust from these units can create dangerous carbon monoxide in the rooms or areas. Other sources of carbon monoxide inside food processing areas include gas powered floor cleaning units and gas powered pressure washers.

(5) Vapors from packing and labeling activities

The packaging of food products are often accompanied by printing units. In many instances the packaging and printing units will utilize glues and inks that emit volatile compounds.

(6) Combustible dusts

A particularly hazardous condition that exists in some food processing facilities is the presence of airborne combustible dusts. Combustible dusts are fine particles, 420 microns or smaller in diameter, that present an explosion hazard when suspended in air in certain conditions such as processing or packing activities or during the cleaning process. Typical food related combustible dusts include flour, powdered sugar, spices, starch and grain.

In several flour or grain facilities, a common cleaning practice is the use of air or sweeping to cleaning dust accumulations on surfaces. By doing so, combustible dust is suspended in air increasing the likelihood of catastrophic dust explosions.

Combustible dusts are specifically addressed in the Uniform Fire Code and Mechanical Code. OSHA also mandates businesses to take employ measures that minimize the workers injuries relative to combustible dusts.

The above processes typically are not required to have specific exhaust systems, however, these contaminants eventually become hazards to the workers, the work environment and the food products.

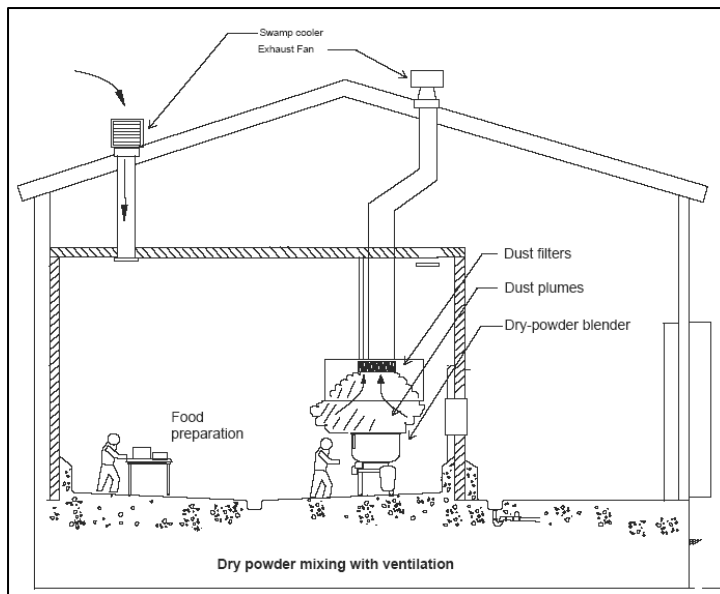


Figure 21 – Ventilation for operational contaminants

Ventilation systems for the above activities may likely require the services of professional ventilation contractors. Any ventilation systems created for the above processes must be independent of ventilation (outside) air supply and equipment related ventilation systems.

J. Fly, Rodent, and other Pests Exclusions and Control

(1) Pest Exclusion

Windows - Any operable window shall be provided with screening of no greater than fourteen (14) meshes. Openable windows to exterior areas in processing rooms are not recommended.

Delivery doors and large cargo-type doors shall not open directly into the food processing areas from the outside unless approved by an enforcement agency.

Entrance Doors: Approved doors are required at all entrances into the processing room, including entrances between the warehouse (storeroom), and the processing area. All doors shall be self-closing and/or may be equipped with an effective fly

exclusion device, e.g. air curtain.

Entrance doors shall not open directly to the outside areas unless they are designated as exclusively as emergency exits.

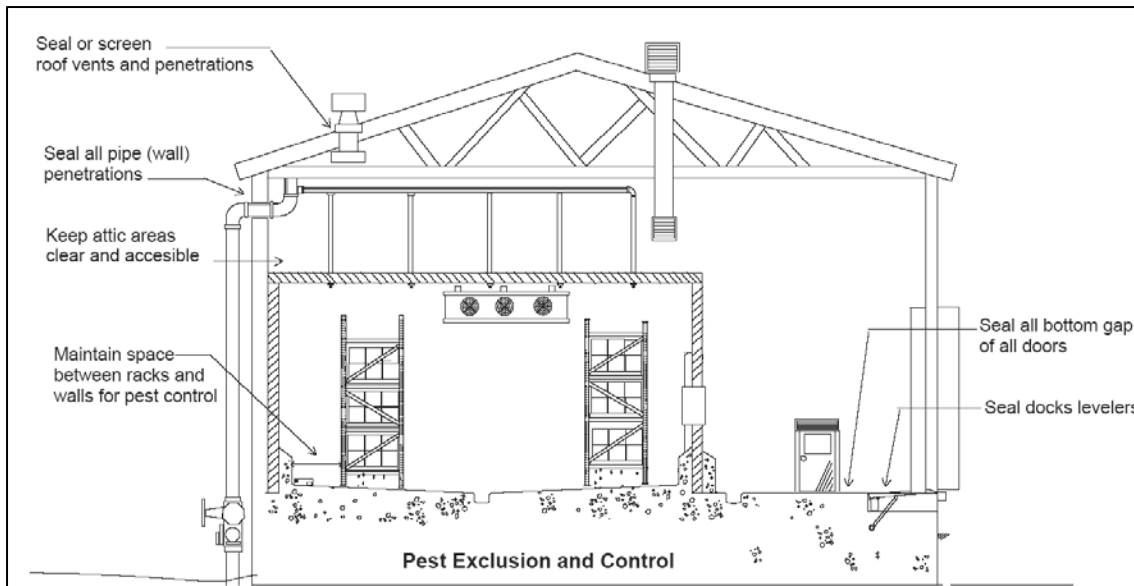


Figure 22 – Pest exclusion and control for wholesale food facilities

(2) Rodent Exclusion

Openings at exterior doors (base and sides) shall be no greater than one-quarter inch (1/4"). All openings in exterior walls, including openings around pipes and other conduits are to be tightly sealed. All exterior wall vents shall be properly screened with one-quarter inch (1/4") wire mesh screen.

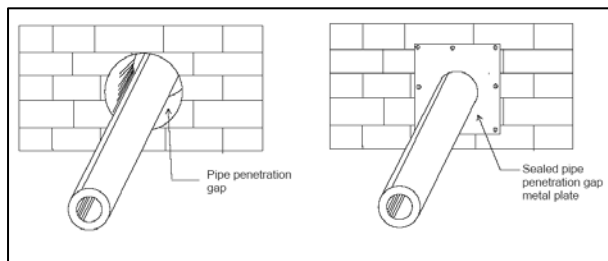


Figure 22– Eustechon plates around pipe penetration

(3) Pest Control

A minimum of 18” aisle space between the wall and storage shelving or racks throughout the storage facilities provides an effective means of pest control prevention, inspection and cleaning.

The services of a reliable pest control company are highly recommended for wholesale food facilities. Regular inspections and placement of the appropriate traps help prevent damaging rodent and insect infestations in food production and storage facilities.

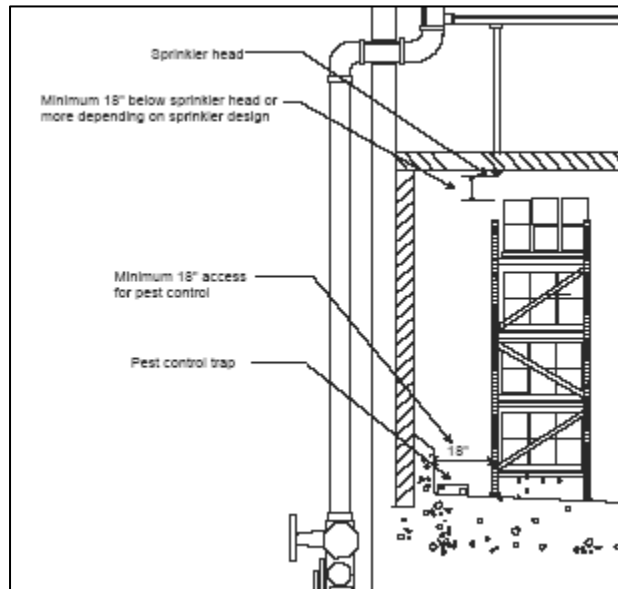


Figure 23 – Recommended storage practices for pest control

Destructive electronic fly zappers should not be placed directly over exposed food items and food preparation areas. The FDA (Food and Drug Administration) recommends the following:

- Electronic Fly zappers shall be wall mounted only
- Fly zappers shall be commercial grade
- Electronic fly zapper shall be installed to no more than 3 feet above the floor and no less than 5 feet to any exposed food items.

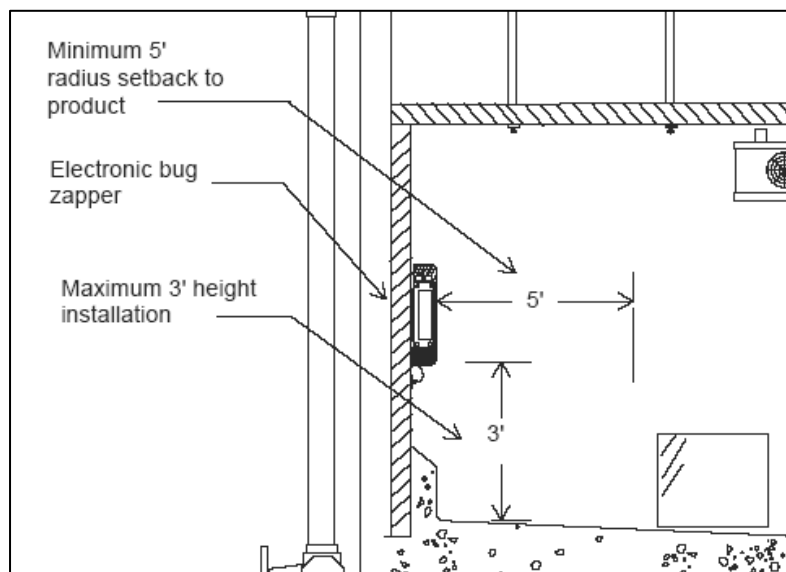


Figure 24 – Recommended fly zapper installation requirements

Recent studies have revealed that electronic bug zappers are capable of spreading insect particles to up to six feet from the unit. Destructive electronic fly zappers are not recommended in side the processing rooms. Newer insect control devices include trapping systems which do not destroy the insects and do not spread the

insect particles that may carry viruses and bacteria.

K. Toilet Facilities

Separate toilet facilities for each sex are required if there are five or more employees per shift. For male restroom fixtures, one (1) urinal may substitute every third toilet fixture. Toilet rooms shall be provided with an openable window or approved ventilation system. Toilet facilities shall not open directly into a food processing area. All doors leading to toilet facilities must be equipped with self-closing devices. The required number of toilets is dependant upon the number of employees.

L. Lockers and Locker Rooms

A dressing room separate and apart from food preparation, food storage, and toilet rooms, is required where five or more employees of different sexes are on duty at any one time. If there are never more than five (5) employees on any shift, lockers or wardrobe closets are acceptable if provided and located in an area away from the food storage and processing. Please note that the size of the locker rooms must also comply with requirements of the American Disabilities Acts.

M. Storage Requirements and Equipment

In general, adequate warehouse and storage facilities shall be provided for the storage and distribution of food. Food items shall not be stored outside. Food processing facilities must have adequate storage facilities for both raw and finished materials. It is highly recommended that separate storage facilities must be provided for both raw and finished goods. All food shall be properly stored a minimum of six inches (6") above the ground on approved shelving. Pallets may be used in lieu of shelving if equipment is available to move the pallets on demand. Only one day's use of raw materials shall be permitted in the food processing areas.

Storage shelving shall be of such construction and material as to be smooth and easily cleanable. Storage shelving inside the food processing portions of the plant and that are constantly subjected to wash down activities as part of the sanitation schedule must be of such material that is resistant to the corrosive effects of some sanitizers. Wooden shelves are not allowed in areas that are subjected to pressure wash downs.

In large warehouses, racking systems are typically installed. The bottom bar of the racking system must be at least 6" above the floor. Pallets may be used in lieu of the bottom rack if equipment is available to move the pallets on demand.

A public health critical factor in food warehousing and processing is the control of rodents. A minimum of 18" aisle space between the wall and storage shelving or racks throughout the storage facilities provides an effective means of pest control prevention, inspection and cleaning.

The design of the racks and the maximum height is regulated by the local fire code. It is recommended that the racking design for the facility be approved by the local fire code inspector. For instance, according to the Uniform Fire code the maximum storage height in a non-sprinklered warehouse is eight feet.

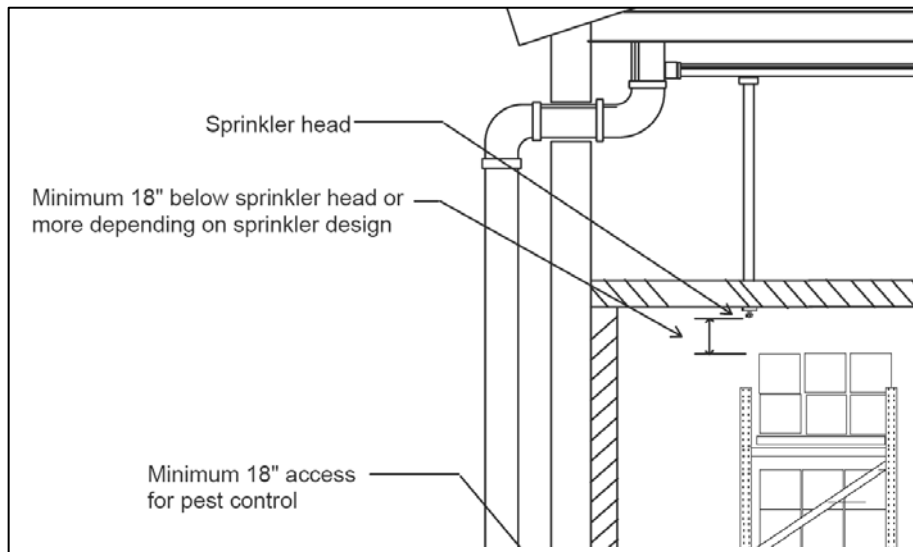


Figure 25 – Storage setbacks to fire sprinkler head

N. Dock Areas

Large wholesale food establishments frequently have large dock areas where products are staged for delivery or receiving. These areas should have approved floor and coved base finishes. It must be noted that these areas are typically busy with forklift and foot traffic. Concrete curbs as coved base for these areas are highly recommended to avoid damages to the area walls due to the movement of heavy equipment and cargo.

These areas are also subject to frequent cleaning either by sweeping or by pressure washing. Wastewater from this process should drain into an approved sewer system. The wastewater from the dock clean up should not be allowed to flow outside the facility unless an approved drain system is located immediately outside the dock doors. Please note that if the outside drains that are exposed to storm water runoff from a cumulative outside area of more than 400 square feet, an approved rain switch and dual pumps may be required to avoid overwhelming the sanitary sewer system with rain water run-off.

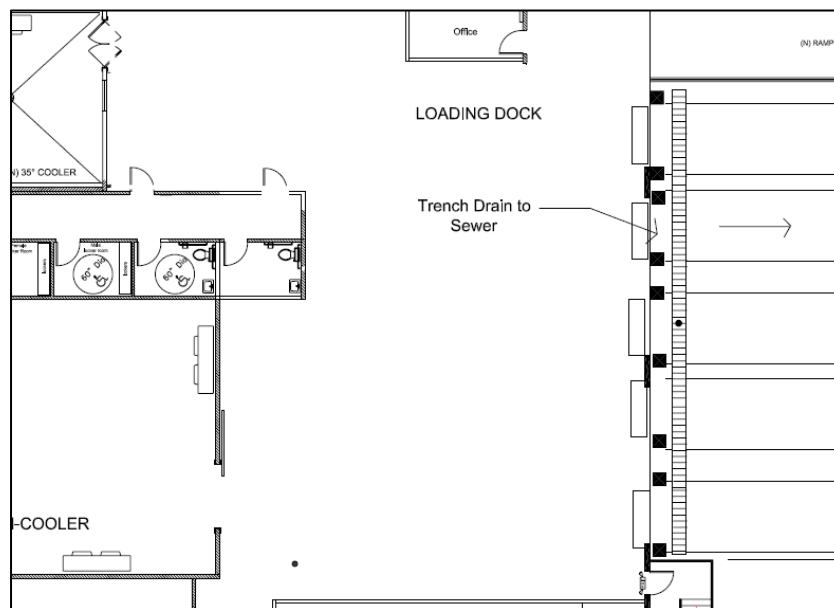


Figure 26 – Trench drain (to sewer) by dock doors

O. Maintenance Shops and Rooms

Due to the presence of many large equipment and vehicles in wholesale food establishments, shops are often established as it becomes more expedient to repair equipment or vehicles onsite. In many instances these rooms are not reflected in the original plans and are established during the course of operations. Maintenance shops or rooms will often store chemicals such as welding gases, lubricating oils and corrosive cleaners.

Maintenance rooms should be provided with adequate ventilation relative to activities conducted in the rooms

Maintenance rooms should be separate from food storage or processing areas

Operational airborne contaminants such as smoke or dusts should not be allowed to migrate into the food processing or storage areas

Pest control activities should also be established in these rooms

P. Garbage and Trash Areas

Adequate trash containers for the plants must be provided. Trash container lids must be kept closed at all times. An area of adequate size for the proper storage of garbage and trash shall be provided for trash containers. The walls and floor of this area shall be constructed so as to be smooth, impervious to moisture and grease, easily cleanable, and light in color. Trash containers must be provided with fitting lids and must be reasonably leak proof. One of the basic Best Management Practice (BMP) for storm water protection is to assure that leakage from trash containers do not enter the storm water system.

With increased focus on sustainability, areas suitable for storing recyclables are needed. It is recommended that adequate areas be designed and incorporated into new facilities.

Locations of proposed trash dumpster areas must have drainage from adjoining roofs and the pavement diverted around the areas.

Unless secured within the facility perimeter, trash container lids should be kept lock and secured to avoid scavenging of waste items.

Q. Janitorial Facilities and Storage

A room, area, or cabinet, separated from any food preparation or storage area, or utensil washing area, shall be provided for the storage of cleaning equipment and supplies, such as mops, buckets, brooms, and cleaners.

Proper storage of chemicals must be followed. Incompatible chemicals such as acids and bases must not be stored next to each other or on the same secondary containment pallet.

Floor drains inside chemical storage rooms are prohibited unless secondary containment facilities are provided for the stored chemicals. Hazardous materials or waste cannot be

discharged into the sanitary sewer without approval from the local sanitation district and the hazardous materials regulatory agency.

Rooms with substantial storage of hazardous materials or waste must be posted with the appropriate NFPA (National Fire Protection Association) placard.

R. Equipment

1. Sinks

a) Utensil Wash Sinks

Where utensils are routinely washed by hand, there shall be provided at least a three (3)-compartment metal sink (NSF approved or equivalent) with dual integral metal drain boards sloped towards the sink compartments. The sink compartments and drain boards shall be large enough to accommodate the largest utensil to be washed. The sink must be provided with adequate hot and cold running water. The minimum hot water supply for this sink will be 120°F. Utensil wash sinks may be either directly or indirectly connected to waste lines.



Photo 4 – Three compartment utensil wash sink

b) Food Preparation Sinks

Where food is washed or rinsed, a food preparation sink will be required. Produce, meat and/or food preparation/wash sinks shall be dedicated sinks.

Preparation/wash sinks may not be used for hand washing or utensil/pot washing. Preparation/wash sinks shall be indirectly connected to waste lines.

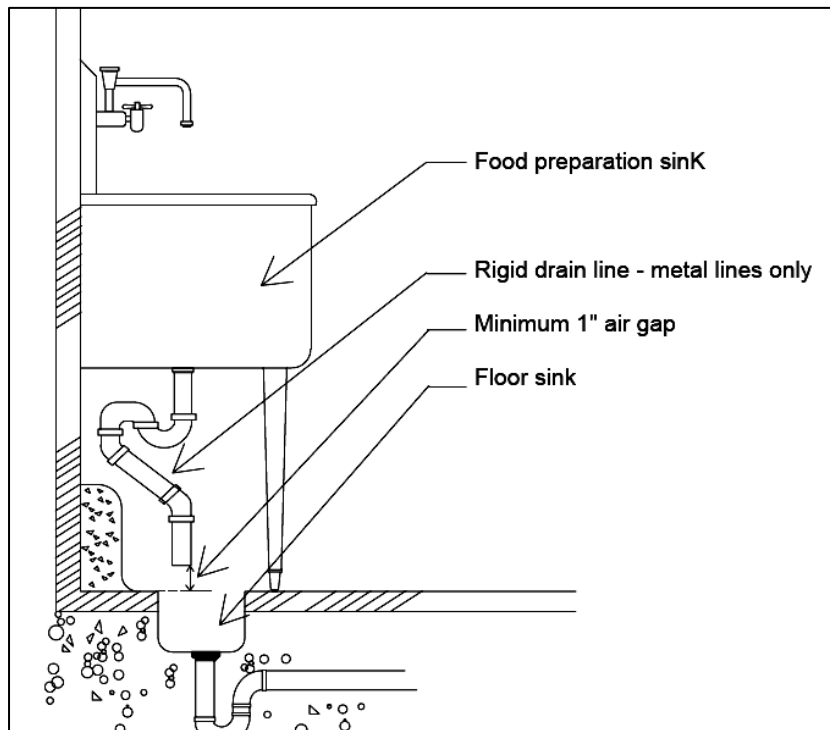


Figure 27 – Food preparation sink installation

c) Hand Wash sinks

Employee hand wash lavatories shall be provided within or adjacent to toilet rooms. Hand washing facilities must also be located within the food processing rooms. Additional and easily accessible hand wash sinks help assure that hand washing practices are followed.



Photo 6 – Hand wash sink

Hot and cold running water under pressure shall be provided through a mixing valve or combination faucet. The minimum hot water temperature for the facility is 120° F. Automated hand washers with integral hand sanitizers or infrared controlled faucets capable of dispensing at the minimum hot water temperature may be acceptable based on prior review and approval by the local health department. Faucets with spring operated shut-off mechanisms are not permitted. Hand washing detergent/soap and sanitary towels shall be provided in permanently installed

commercial grade dispensing devices at all hand washing sinks.

d) Janitorial Fixtures and Mop sinks

All food facilities shall be equipped with at least one of the following, to be used for general cleaning purposes and for the disposal of mop bucket waste and other liquid wastes:

A one-compartment, non-porous janitorial sink/mop sink (stainless steel, porcelain or fiberglass).

A slab, basin, or floor constructed of concrete or equivalent material, curbed and sloped to a drain and connected to approved sewerage, and provided with hot and cold running water (through a mixing valve).

Frequently, non-food warehouses are converted into food storage facilities. These facilities will require the installation of an approved mop sink. Figure describes the recommended installation of a mop sink in a previously non-food warehouse.

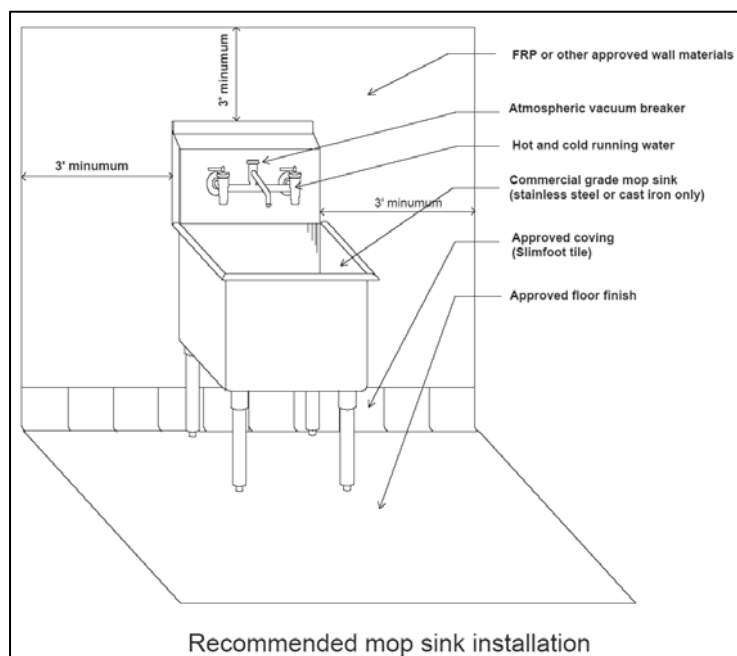


Figure 27– Recommended mop sink installation

e) Food Processing Equipment

All equipment and utensils used in food processing establishments must be of such material and construction that facilitate thorough cleaning, ensure that their use will not cause the adulteration of product during processing, handling or storage.

Materials that are used in the construction of food processing and handling equipment shall not allow the migration of deleterious substances or impart colors, odors, or tastes to food and under normal use conditions shall be:

- Safe and non-toxic
- Durable and corrosion resistant to cleaning activities
- Finished to have smooth, easily cleanable surfaces
- Resistant to pitting, chipping, scratching, scoring, distortion and decomposition.

Some jurisdictions and agencies may require all equipment and fixtures shall be certified or classified for sanitation by an accredited American National Standards Institute (ANSI) or by National Sanitation Foundation (NSF) or equivalent standards, for material, construction, fabrication, and design. All equipment installation shall be subject to field evaluation. Specifications for equipment shall be available upon

demand. The following are applicable ANSI /NSF Standards that apply to many types of food processing equipment:

All equipment shall be either easily moveable (e.g. on casters), light enough so as to be easily moved by one person (e.g. a light table), installed on raised six inch (6") rounded metal legs, or sealed to a minimum two inch (2") solid masonry island with minimum three eighths inch (3/8") radius cove base. If on an island, equipment shall overhang the base at least two inches (2"), but not more than the height of the island. Sealing to the floor is acceptable only on bulky equipment such as refrigerators and large bakery ovens. Gaps and spaces between pieces of equipment or equipment and walls, shall be sealed with silicone sealant (caulking is not an approved sealant). All equipment on counters, tables, and shelves that cannot be easily lifted shall be installed on approved four-inch (4") legs, or sealed to the table, shelves, etc.

2. Water Heaters and Boilers

All wholesale food facilities shall be provided with an adequate supply of hot water at a temperature of at least 120 F to all handwash sinks, utensil wash sinks, janitorial facilities and other equipment and fixtures that use hot water at all times.

Hot water may be delivered through a conventional water heater, a tankless water heater, medium sized instantaneous heaters or boilers.

a) Water Heaters

Water heater must be adequate and size and capable of delivering hot water to all sinks and fixtures in the facility. Water heaters may be centrally located or may be installed multiple locations in a larger establishment.

In sizing water heaters, the peak hourly demands for all the sinks and fixtures are added together to determine the minimum required recovery rate. (See Supplemental for more information)

b) Boilers

Most food processing will require the installation industrial boilers or hot water heaters for generating steam or hot water for processing, cooking, or sanitation. Industrial boilers are typically located in a room or area apart from the food processing activities. Boilers and boiler rooms should be provided with adequate ventilation and with adequate floor drains.

Water going into the boilers is usually treated with water softening units or reverse osmosis filtration units. In addition, treated water is further enhanced with the addition of chemicals that prevent corrosion in the boilers and the piping systems. If the hot water or steam generated will be used food processing activities, the chemical additives shall comply with requirements indicated in Title 21 CFR Part 173.310 – Boiler Water Additives

3. Refrigeration

Wholesale food establishments where perishable foods are prepared or stored must have

adequate refrigeration facilities. More often, these refrigeration facilities are large in scale with significant storage capacities. Food is stored in large totes and pallets and moved by forklifts and pallet jacks onto multi-level racking systems.

Condensate from walk-in refrigeration units must drain to properly located and approved floor sinks. Upright or reach-in refrigeration units may drain into an adequate self-contained evaporative unit. Domestic type refrigeration is not allowed.

All walk-in refrigeration or freezer units must have approved floors, walls, ceilings, and have approved base coving at wall and floor junctures. Adequate shelving must be available in the units to prevent food products from being stored on the floor. Floor drains or floor sinks are not permitted inside the walk-in units unless they are indirectly connected to the sewer system through a legal air gap.

Large cold storage facilities often use Freon or ammonia as the refrigerant materials. Ammonia is considered an acutely hazardous material and is subject to local hazardous materials permitting requirements and oversight. Large amounts of Freon stored in large pressure vessels may also require permit and oversight by the local hazardous materials regulatory agency. Large refrigeration systems also require other maintenance related chemicals such as refrigeration oil and anti-corrosion chemicals. Additionally, large cold storage facilities may install emergency generators which require diesel fuel.

The following are basic requirements to the installation of refrigerated facilities in wholesale food facilities:

4. Ice Machines

All icemakers shall be located within the approved food establishment. Condensate and ice melt shall be drained to an approved floor sink by means of an indirect connection. Many wholesale establishments require ice makers as to replenish melted packing ice in certain products such as whole fish and produce.

When ice makers are proposed, the floors underneath the unit and the wall on which the ice dispensing utensils such as shovels must be constructed of approved and durable materials. Additionally floor drains shall be required underneath the ice maker to facilitate adequate drainage for incidental spillages during the dispensing of ice.

Figure 28 depicts a typical ice maker installation and storage of dispensing utensils.

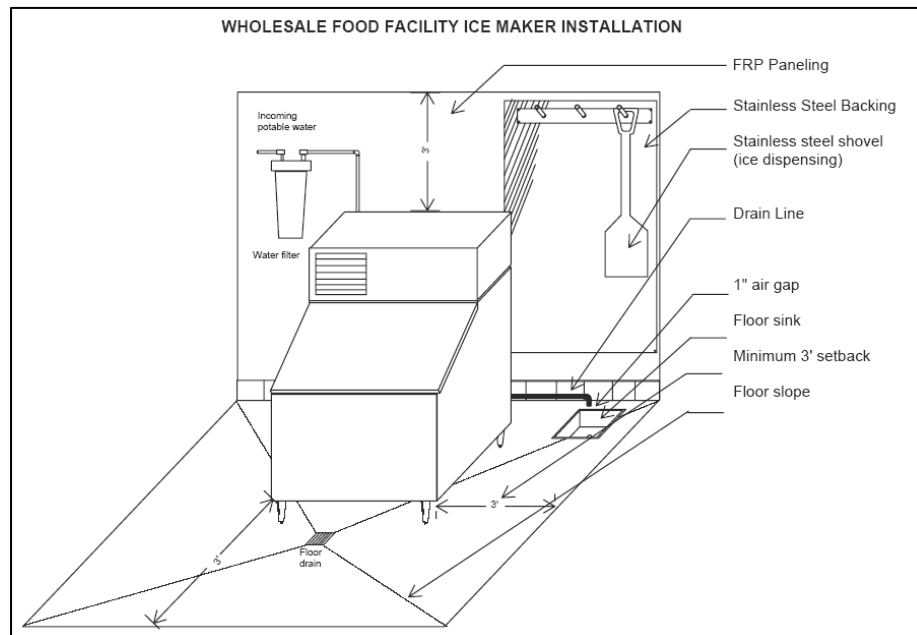


Figure 28 – Recommended installation for commercial ice-makers

5. Bulk Storage Tanks

Many food facilities will require the installation of bulk food containers such as flour silos and oil storage tanks. Typically, these containers are stored outdoors. The filling of these vessels are also conducted outside.

Bulk storage tanks shall have the following requirements:

- Potential leakage and spills to the storm water drain systems shall be minimized either by constructing an adequately sized secondary containment
- The tank shall be constructed of materials that are non-toxic, corrosion resistant, and easily cleanable.
- Potential leakage and spillage from filling operations shall be minimized
- The fill port and drain ports of the tanks shall be properly protected from potential exterior contaminants such as dusts, filth, rodents and birds.
- External fill ports must be provided with an adequate secondary containment to prevent the follow of spills into the area storm drains
- Product or material piping systems to and from the tanks(s) shall be properly marked as to their contents

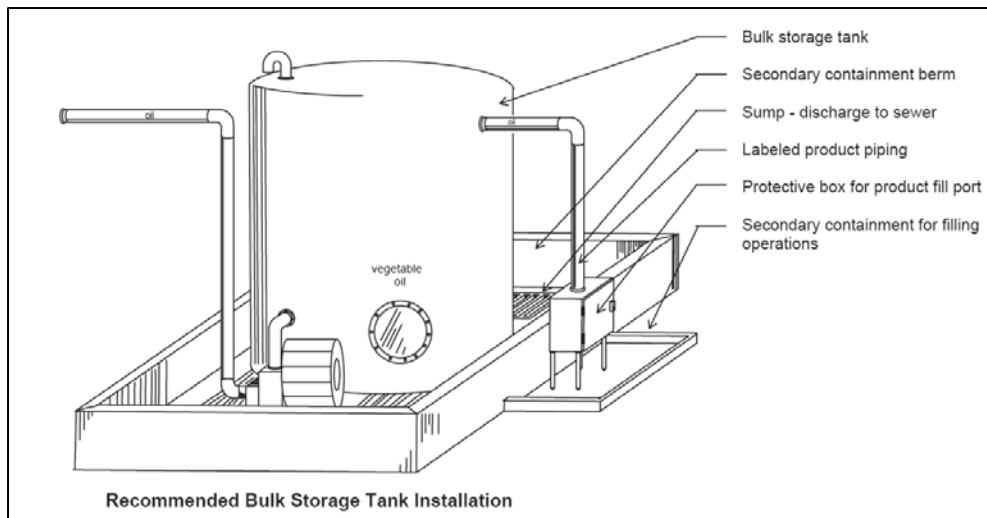


Figure 29 – Recommended installation for bulk storage tanks

6. Storage Equipment

Adequate storage shall be provided for all food establishments. Shelves shall be designed and constructed so as to be smooth, easily cleanable metal or wood, which has been finished and sealed. Shelves installed on a wall shall be sealed to the wall with silicone sealant or equivalent. The lowest shelf shall be at least six inches (6") above the floor, with a clear unobstructed area below. All shelves are to be set back at least two inches (2") from the drip line of the surface above. If shelves are supported by legs on the floor, the legs shall be round metal equipment legs. Establishments, which store food on pallets, must have pallet-moving equipment immediately available.

The Uniform Fire Code regulates the height of the storage racks and additional sprinkler heads within the racking system. We highly recommend that designers check with the local fire code inspector prior to the installation of any racking system.

S. Cross Connections and Backflow Prevention Devices

When designing a wholesale food facility, detailed plumbing plans relative to the potable, industrial or process water uses must be carefully evaluated to prevent potential cross connections. A cross connection is defined as an actual or potential connection between a potable and non-potable water supplies and constitutes a serious public health hazard. Water from non-potable contamination sources or uses may enter the potable water supply or lines by back siphonage or from back pressure.

To control or mitigate cross connections in any facility, backflow prevention devices or assemblies are installed in the appropriate locations. Backflow prevention device or assemblies are both mechanical and non-mechanical plumbing equipment designed to prevent backsiphonage and backpressure and installed in the plumbing lines.

When carefully designed, the number of backflow prevention devices or assemblies can be minimized resulting is less maintenance with an equally protective plumbing design. Backflow prevention devices shall be installed with the appropriate plumbing permit. The backflow prevention devices may be installed at the point of use or near the potential cross connection or centrally where they serve as protection for multiple equipment or operations.

Approved backflow protection shall be provided for all faucets, hose bibs, wash down stations and industrial water use sites. Backflow devices are required when food or sanitation equipment are connected directly to a water supply line that concurrently supplies water to other sinks in the plant.

1. Examples of Typical Equipment Requiring Backflow Prevention Devices

The following are the suggested backflow device type for typical uses and equipment found in food processing facilities:

Equipment or water use	Recommended devices
All hose bibs	Atmospheric Vacuum Breaker
Wash down faucets with fixed hose and spray nozzles	Pressure vacuum breaker
Wash down faucets without fixed hose connection	Atmospheric Vacuum Breaker
Assorted food processing equipment such as vacuum packing unit and product rinsing units	Atmospheric Vacuum Breaker or Pressure Vacuum Breaker
Boilers	Reduced Pressure Principle Device
Foot Sanitizer Dispensers	Pressure Vacuum Breakers
In line chemical dispensing units	Pressure Vacuum Breaker Or Reduced Pressure Principle Device
Ozonators	Reduced Pressure Principle Device

*** Please note the numerous pieces of equipment having built in backflow devices. These units must be evaluated by health department prior to determining if the built in device is adequate.*

2. Examples of Backflow Prevention Devices

a) Air Gap

An air gap is a common non-mechanical backflow preventer that consists of an actual gap between the end of the potable water supply line and the receiving reservoir or equipment. Air gaps are also the most dependable protective backflow prevention method. The height of the air gap must be at least twice the diameter of the incoming water supply line (Figure 30).

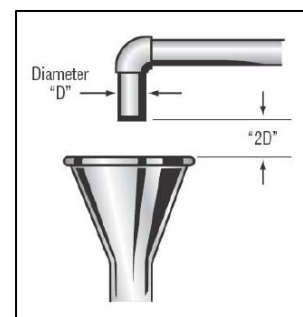


Figure 30 – Air Gap

b) Atmospheric Vacuum Breakers (AVB)

These are simple mechanical devices that provide excellent protection against back siphonage only. These devices are not to be used against backpressure as they may easily provide a false sense of protection. However, there are limitations to the use of this type of device. The following are conditions and limitations with the use of this type of device:

- Not effective against backpressure

- There should not be any shut off valves downstream of the device
- The device should be installed at least six inches above the highest outlet or usage
- These devices are not testable and their effectiveness over time is suspect

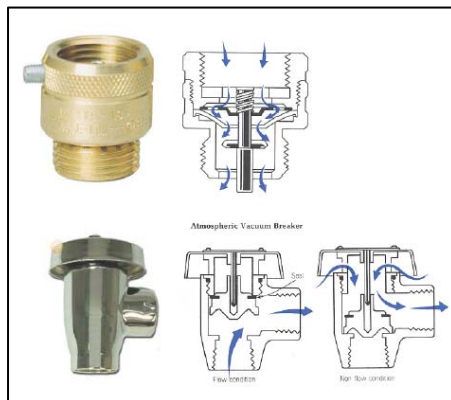


Figure 31 – Atmospheric Vacuum Breakers

c) Pressure Vacuum Breakers (PVB) and Spill Prevention Vacuum Beakers

This type of device provides a slightly higher level of protection similar to atmospheric vacuum breakers but can be used with a shutoff valve downstream of the device, under constant pressure and is testable. PVBs have a tendency to spill water and should be installed in areas where unsafe conditions such as food contamination, ponding or slip hazards can occur.

Spill Prevention Vacuum Breakers are similar to PVBs except for the potential of discharging water with backflow conditions occur. Similar to AVB, these PVBs and SPVBs have limitations and installation conditions. These can include the following:

- Not effective against backpressure
- There should not be any shut off valves downstream of the device
- The device should be installed at least twelve inches above the highest outlet or usage
- As a function of this unit, water can be discharged potentially creating unsafe conditions both in food production operations or as slip hazards.

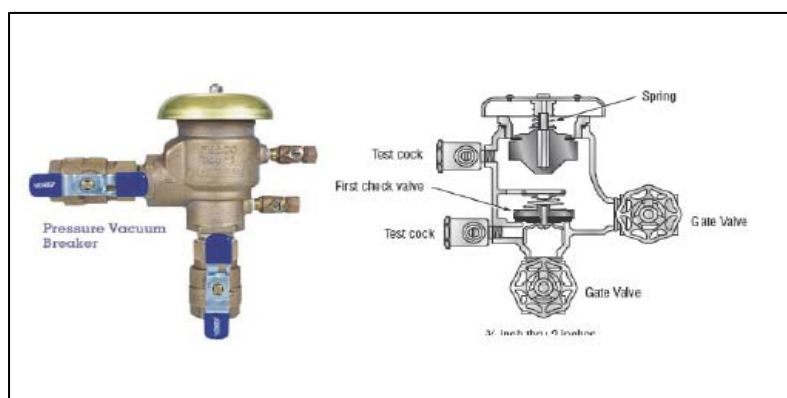


Figure 32 – Pressure Vacuum Beakers

d) Double Check Valves (DC)

These devices are comprised of two integral check valves in the assembly and are testable. These units can be used in backsiphonage and backpressure conditions. However, these units cannot be used to protect potable water from hazardous materials or health hazards. These devices are often used in the fire service lines.

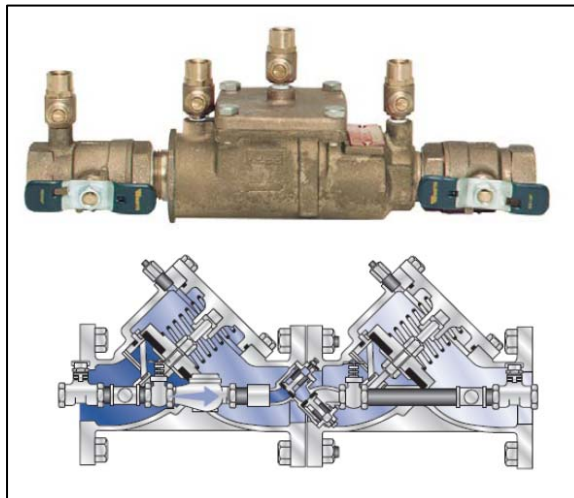


Figure 33 – Double check backflow device

e) Reduced Pressure Principle Backflow Preventer (RP)

This is the most protective mechanical backflow preventer and can be used in most applications and hazards. These units are also testable and have no limitations to the installation location relative to the highest point of use, backpressure and backsiphonage. Many water purveyors require the installation of this device as “meter protection” to assure that the public water supply is protected from any hazards”

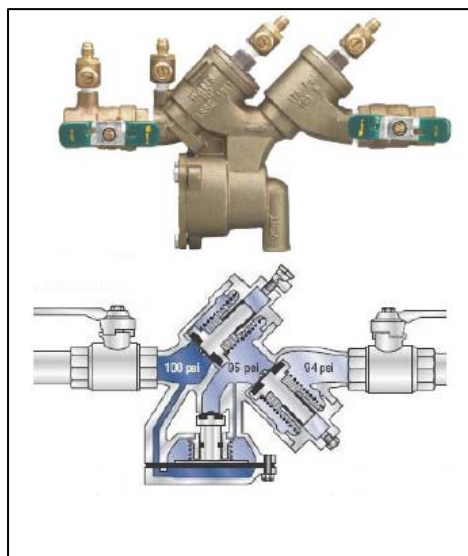


Figure 33– Reduced Pressure Principle Device

T. Construction Inspections

All construction and equipment installations are subject to on-site inspections. During the course of construction, and particularly well before operating, operators or contractors are advised to call to have questions answered, or to request interim inspections.

It is highly recommended that construction inspections at 80% to completion be conducted to assure the progress of the work is in accordance to the approved plans.

U. Final Inspections

Final inspection and approval is required prior to beginning operation. Building departments and environmental health staff require AT LEAST THREE (3) WORKING DAYS PRIOR NOTICE TO ARRANGE FOR A FINAL INSPECTION. IT IS A MISDEMEANOR VIOLATION OF MOST LOCAL ORDINANCES TO BEGIN OPERATING WITHOUT A VALID PUBLIC HEALTH LICENSE.

THE GUIDELINES CONTAINED IN THIS DOCUMENT ARE INTENDED TO PROVIDE A BASIS FOR THE CONSTRUCTION OF FOOD ESTABLISHMENTS THAT WILL FACILITATE OPERATION AND MAINTENANCE IN COMPLIANCE WITH LOCAL, STATE AND FEDERAL FOOD SAFETY LAWS AND REGULATIONS. ANY CONCEPTS THAT DEVIATION FROM THESE GUIDELINES MUST BE SUBMITTED FOR EVALUATION AND DECISION BY THIS DEPARTMENT FOR ACCEPTANCE OR DENIAL.

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FOOD FACILITY CONSTRUCTION SPECIFICATIONS

The following are basic construction specifications. Please contact THE LOCAL AGENCY office for other specifications.

	FOOD WAREHOUSE 2 Dry, Non - refrigerated and Packaged	FOOD WAREHOUSE 2 Refrigerated Packaged Perishable Food Areas (Seafood)	FOOD PROCESSING 1,2 Separate Room required
Floors / Coving	Smooth cleanable floors, Coving not required	Approved floor and coving required	Approved floor and coving required
Walls	NA	Approved walls must be smooth durable and cleanable	Approved wall materials / finish required
Ceilings	NA	Approved ceiling	Approved Ceiling –Smooth and cleanable
Utensil Washing Sink (three compartment sink)	NA	NA	Required when utensils are used and washed by hand
Food Preparation Sink	Not- required	Not-required	Required when food is washed or rinsed
Utility / Mop sink	Required	Required	Required
Hand wash Sink	NA	Required (Seafood)	Required in each process room
Janitorial Room	Recommended	Recommended	Required
Lighting	NA	Required	Required
Locker Rooms	Required with 5 or more employees	Required with 5 or more employees	Required with 5 or more employees
Fly Exclusion over doors	NA	Required (Seafood)	Required
Door self closing devices	NA	Required	Required

1. Food Processing includes packaging, packing and repacking, making, cooking, baking, mixing processing, bottling, canning, slaughtering, salvaging, preparing and/or handling open food products. Whole produce items can be considered packaged. Trimming of whole produce is considered as food processing. Repacking produce items will require an approved hand wash sink near repacking areas.

2. Restrooms are required in all food facilities. All food facilities require approved floors, walls, ceilings, base coving, hand wash sinks and ventilation. Doors must be equipped with self-closing devices.

APPENDIX

V. Agency Construction Guides

1. Los Angeles County Environmental Health
2. Orange County Environmental Health
3. San Bernardino County Environmental Health
4. City of Vernon Environmental Health
5. City of Long Beach Environmental Health
6. California Department of Public Health – Food and Drug Branch (Food Sanitation Act)
7. United States Department of Agriculture
8. California Department of Food and Agriculture
9. United States Food and Drug Administration – Good Manufacturing Practices

W. Supplemental Construction Guides

1. Hot Water Calculations
2. Ventilation Calculations (long version)
3. Ventilation Calculations (short version)

1. Los Angeles County Environmental Health

2. Orange County Environmental Health

3. San Bernardino County Environmental Health

4. City of Vernon Environmental Health

5. San Diego County Environmental Health

6. City of Long Beach Environmental Health

**7. California Department of Public Health – Food and Drug
Branch (Food Sanitation Act)**

8. United States Department of Agriculture

9. California Department of Food and Agriculture

**10. United States Food and Drug Administration – Good
Manufacturing Practices**

11. Sizing Tables for Hot Water Heaters

**12. Mechanical Exhaust Ventilation System Design,
Calculations (long version)**

13. Mechanical Exhaust Ventilation Design Calculations (short version)