CONSTRUCTION GUIDEBOOK FOR WHOLESALE FOOD FACILITIES



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 RanchoCucamonga,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

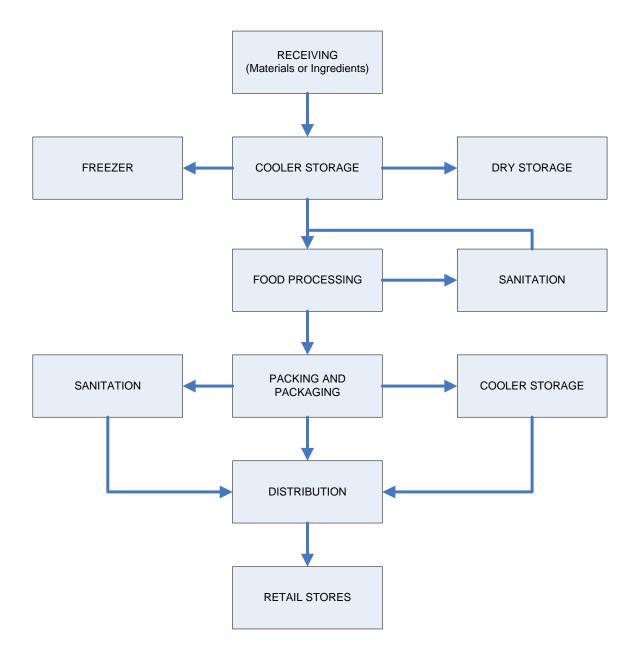
USDA (New Facility Information) 620 Central Ave. Alameda, CA 94501 (510) 337-5000

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



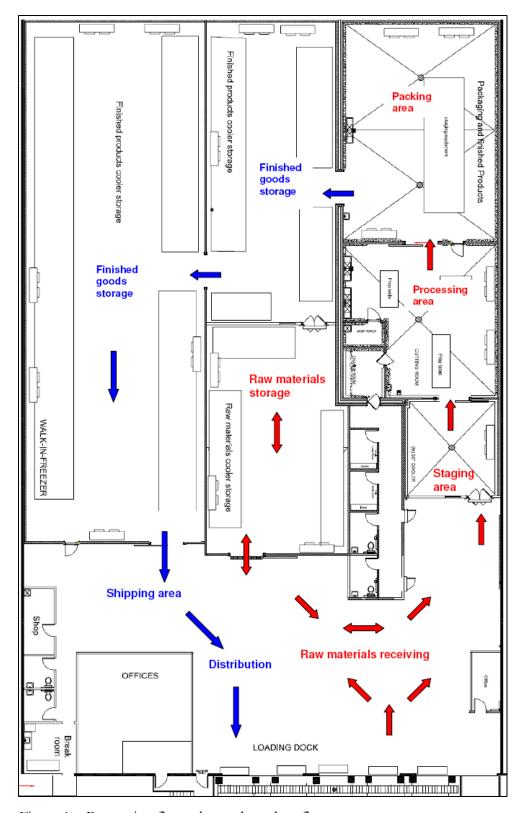


Figure 1 – Processing floor plan and product flow

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 coved 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 ½ 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 coved 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.

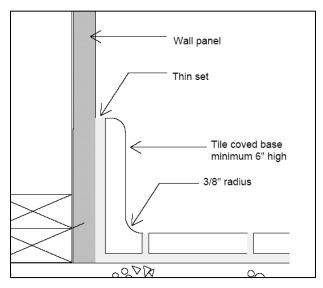


Figure 2 – Ceramic floor and cove base

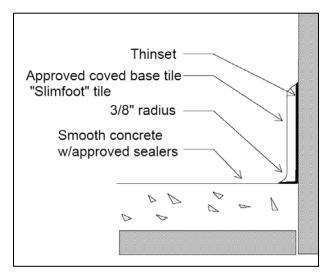


Figure 3 – Sealed concrete floor and "slimfoot" ceramic cove base

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.

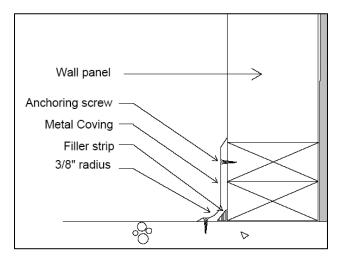


Figure 4 – Metal coved base on sealed concrete floor

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)

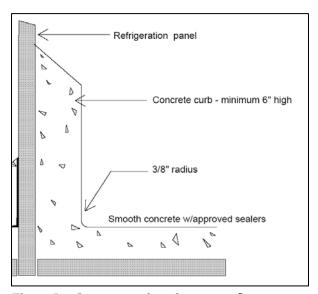


Figure 5 – Concrete curb and concrete floor

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).

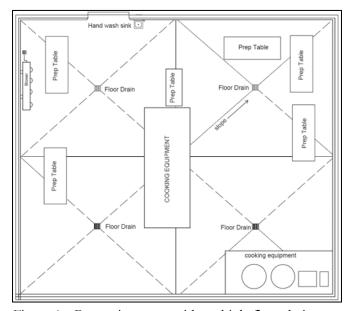


Figure 6 – Processing room with multiple floor drains

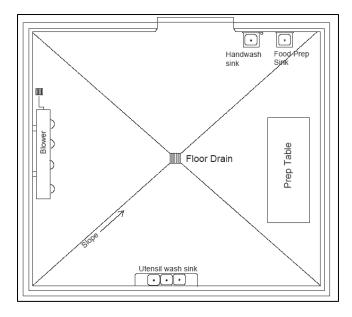


Figure 7 – Processing room with a single floor drain

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).

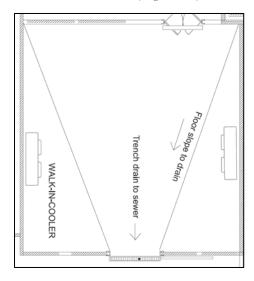


Figure 8 – Trench drain by cooler doorway

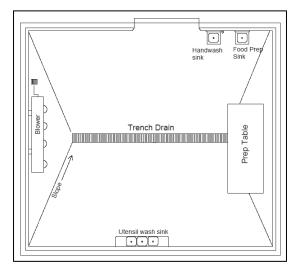


Figure 9 – Processing room with trench drain

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.

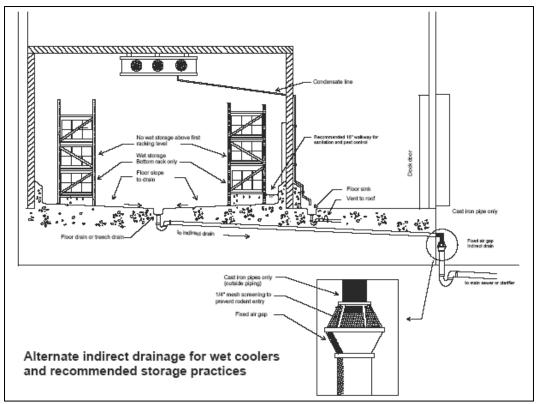


Figure 10 – Alternate indirect drainage for "wet" coolers

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.

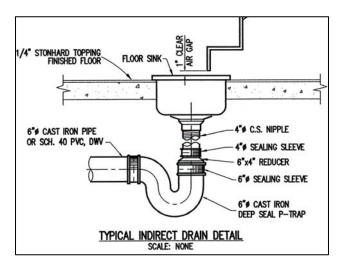


Figure 11 – Floor sink details and air gap

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 nears theses 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.

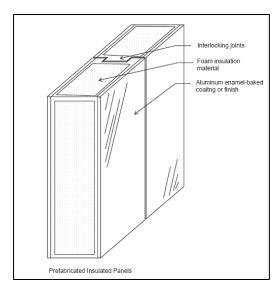


Figure 12- Prefabricated Insulated Panels - "Reefer panels"

It must 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 nears theses 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.

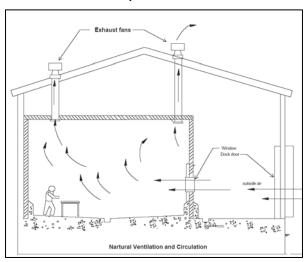


Figure 13 – Natural ventilation

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:

$$Vbz = RpPZ + RaAz$$

Rp - The outdoor air required per person (Table 4.1 of the Mechanical Code)

PZ - the number of occupants on the target zone or work areas

Ra – the outdoor air flow rate (Table 4.1 of the Mechanical Code)

Az – The net occupied floor area

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

Ra - 0.18 cfm / square feet

PZ – 14 production workers

Rp - 7.5 cfm / person (Table 4.1)

Az - actual production area is 5,000 square feet,

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

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.

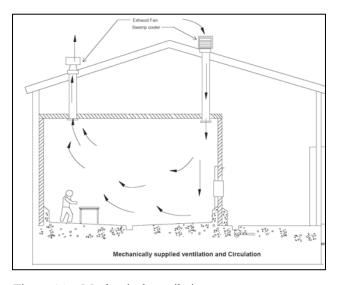


Figure 14 – Mechanical ventilation

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.

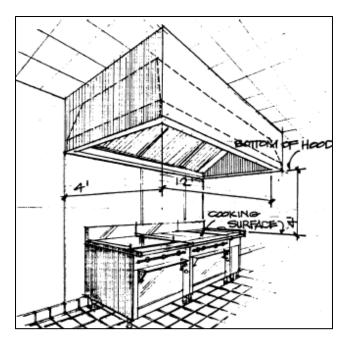


Figure 15 – Cooking equipment with 3-sided canopy hood

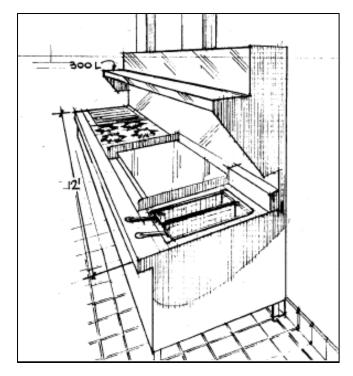


Figure 16 – Cooking equipment with hood

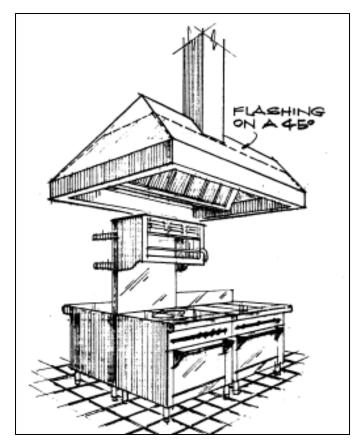


Figure 17 – Cooking equipment with 4 sided hood

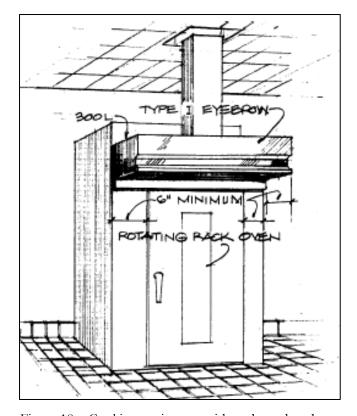


Figure 18 – Cooking equipment with eyebrow hood

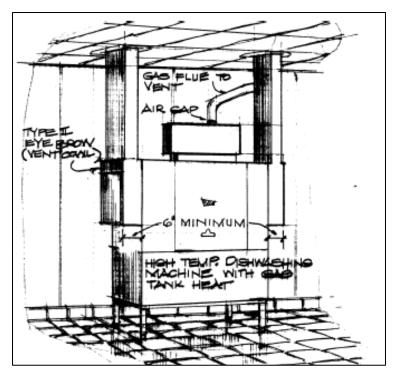


Figure 19 – Commercial dishwashing machine with hood

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:

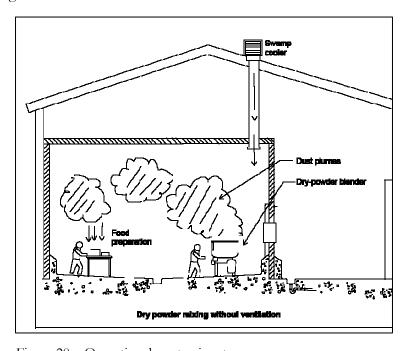


Figure 20 – Operational contaminants

(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.

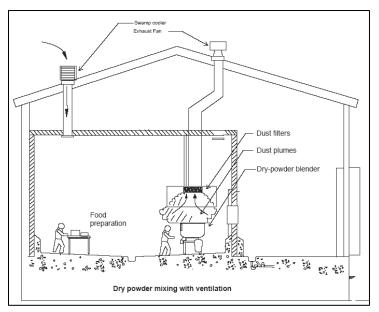


Figure 21 – Ventilation for operational contaminants

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.

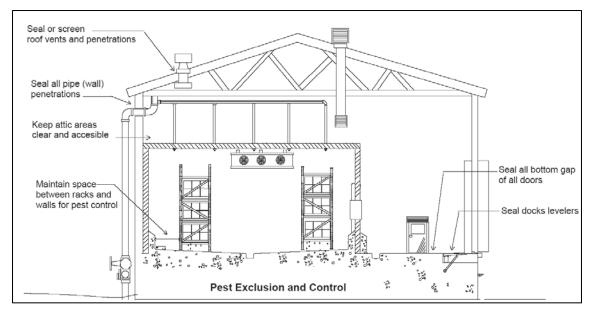


Figure 22 – Pest exclusion and control for wholesale food facilities

(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.

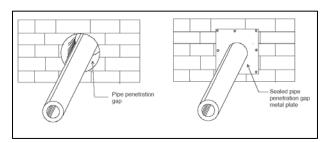


Figure 22– Eustecheon plates around pipe penetration

(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.

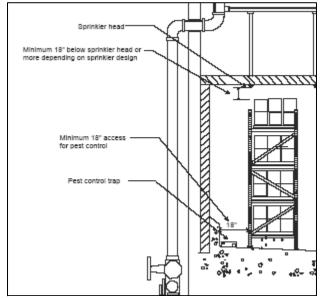


Figure 23 – Recommended storage practices for pest control

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.

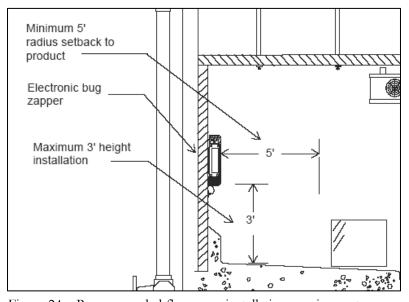


Figure 24 – Recommended fly zapper installation requirements

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.

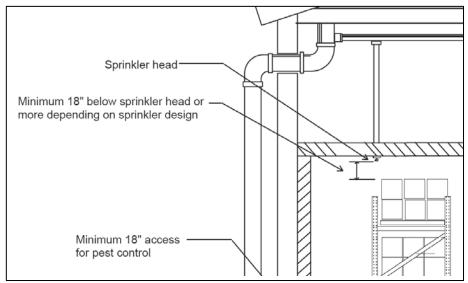


Figure 25 – Storage setbacks to fire sprinkler head

N. Dock Areas

Large wholesale food establishments frequently have large dock areas where products are staged for delivery or receiving. These areas are 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.

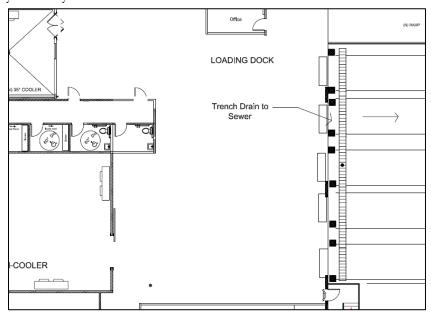


Figure 26 – Trench drain (to sewer) by dock doors

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.

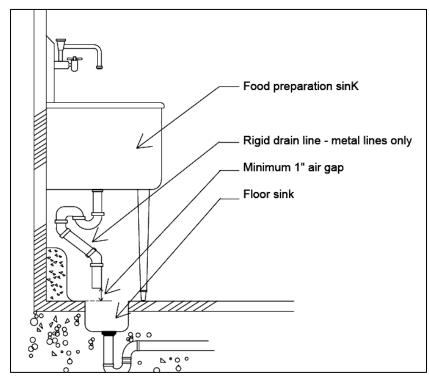


Figure 27 – Food preparation sink installation

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.

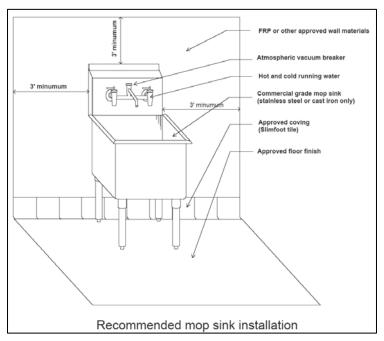


Figure 27– Recommended mop sink installation

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 eights 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.

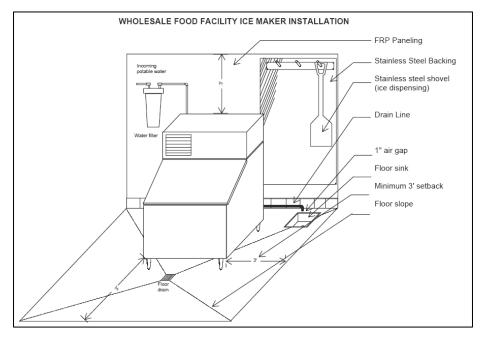


Figure 28 – Recommended installation for commercial ice-makers

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

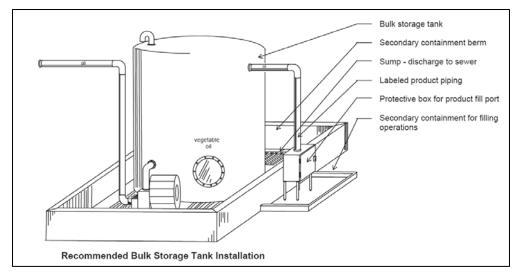


Figure 29 – Recommended installation for bulk storage tanks

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.

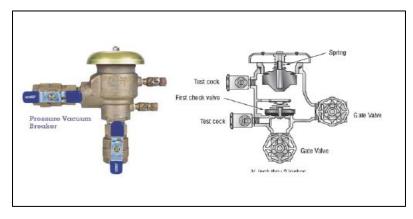


Figure 32 – Pressure Vacuum Beakers

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.

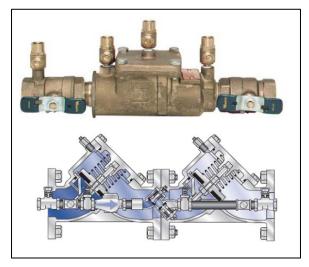


Figure 33 – Double check backflow device

e) Reduced Pressure Principle Backflow Preventer (RP)

The 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"

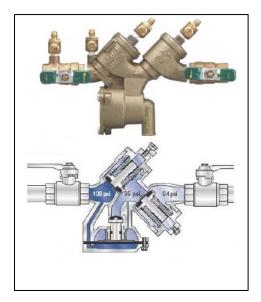


Figure 33– Reduced Pressure Principle Device

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.

Construction Guidebook for Wholesale Food Facilities - RWFPC

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)

Construction Guidebook for Wholesale Food Facilities - RWFPC
1. Los Angeles County Environmental Health
1. Los Angeles County Environmental Health



ENVIRONMENTAL HEALTH PLAN CHECK PROGRAM

5050 Commerce Drive Baldwin Park, CA 91706 Ph. (626) 430-5560



WHOLESALE

CONSTRUCTION REQUIREMENTS FOR WHOLESALE FOOD ESTABLISHMENTS: FOOD PROCESSING, WHOLESALE FOOD MARKETS AND FOOD WAREHOUSES

A WHOLESALE FOOD ESTABLISHMENT means:

a food establishment where food (including fruits and vegetables) is received, shipped, stored, prepared for distribution to a retailer, warehouse, distributor, or other destination; and / or operated for the purpose of commercially packaging, making, cooking, baking, mixing, processing, bottling, canning, slaughtering, salvaging, storing or otherwise preparing or handling food including ice, for human or animal consumption, which is not offered for retail sale or gift on the premises; or a commissary. A wholesale food establishment also includes "central kitchens" (commissaries) which process foods for distribution to satellite facilities under the same ownership, wholesale food markets and warehouses. (LAC 11.12.005)

A FOOD PROCESSING ESTABLISHMENT means:

any room, building, place or portion thereof, maintained, used or operated for the purpose of trimming, cutting, washing, rinsing, commercially packaging, making, cooking, baking, mixing, processing, bottling, canning, slaughtering, salvaging, storing or otherwise preparing or handling food including ice (or the addition of ice, additives or preservatives), for human or animal consumption, which is not offered for retail sale or gift on the premises. Each food process will be evaluated individually, based on the method used and the type of foods to be processed. **(LAC 11.12.005)**

FOOD MARKET, WHOLESALE means:

a food establishment in which whole, uncut food (including fruits and vegetables) is received, shipped, stored, **prepared for distribution** to a retailer, warehouse, distributor, or other destination for resale by others. A food market, wholesale shall not be permitted to conduct sales at the retail level or to process food. Food market, wholesale shall not include any food salvaging activities and shall not conduct any food processing within its establishment. **(LAC 11.12.005)**

FOOD MARKET COMPLEX, WHOLESALE means:

An establishment, its contents, and the contiguous land or property that rents, leases, or lends facilities within said establishment, for the purpose of conducting business as a food market, wholesale. A food market complex, wholesale, that rents, leases, or lends space of no more than two food market, wholesale, or dedicates a combined total of less than 1500 square feet for the purpose of operating as a food market, wholesale, is exempt from this definition. (LAC 11.12.005)

COMMISSARY means:

A wholesale food establishment in which food, containers, equipment, or supplies are stored or handled; food is prepared or prepackaged for sale; utensils are washed; liquid and solid wastes are disposed of; or potable water is obtained for use in mobile food facilities. (LAC 11.12.005)

WAREHOUSE means:

any place, building, structure, room or portion thereof where fruit, vegetables, or any foods are commercially stored, kept or held at any temperature, where any foods are commercially stored at any artificial temperature of less than 45 F, or where ice is stored.

NEW CONSTRUCTION is:

any building or structure that is being constructed for use, for the first time, as a wholesale food processing establishment **OR** a facility that previously operated as a wholesale food establishment but has been closed / out-of-business for greater than 90 days. Additionally, any wholesale food establishment undergoing a change of use or change of business classification shall be deemed "new construction".

A REMODEL is:

construction or renovation to a wholesale food establishment that requires a permit from the local building authority. Remodel may also refer to any replacement or significant modification of an integral piece of equipment or any part of the building structure. A establishment that has been closed for less than 90 days may be permitted to open without structural / operational modification.

THE IMPORTANCE OF PLANNING...

PROPER, PRIOR PLANNING...

PREVENTS FUTURE LOSSES!!



This guide is based on requirements found in the Los Angeles County Code, Title 11.12, entitled Wholesale Food. Plans and specifications must show that all applicable requirements will be complied with. Please refer to the Los Angeles County Code for additional requirements and details. The Los Angeles County Code may be downloaded at: www.lapublichealth.org/eh.

Code numbers within this document reference those sections of the Los Angeles County Code where the requirements are found in law. Recommendations which follow the requirement contained within the Guide are not requirements in state law or regulation. They are included for clarification and to give examples of materials and methods which may be used for meeting the intent of the law. The recommendations may not be applicable in all circumstances. This Guide is intended to serve as a general overview of the requirements and should not be considered all-inclusive.

Additionally, this Guide only encompasses the health aspects of construction and should not be construed to encompass other agency's requirements, e.g. such as the local planning and zoning departments, the local building and safety authority or local fire department. Owners and their agents should be advised to contact the appropriate local agencies involved to obtain any permits and/or to clarify other local codes.

Pursuant to the Los Angeles County Code, Title 11, Section 11.12.150, The director shall require from the owner-operator, submission the following data pertaining to construction or remodeling; the installation of new equipment; or when a facility has closed and remained closed for a period of ninety (90) days or more: (1) Three (3) complete sets of easily readable plans, drawn to scale showing floor plan. The plans shall indicate the location of all floor drains, floor sinks, and plumbing fixtures; lighting; equipment specifications; mechanical exhaust/ventilation plans including make-up air system; finish schedule for floors, walls, and ceilings that indicate the type of material, the surface finish, the color, and the type of coved base at the floor-wall juncture; the location of all fixed food storage, preparation and processing equipment, furnishings and machinery. If a facility is to be a wholesale food processor, a general description of the type of food(s) and the methods of processing shall be included.

WHO SHOULD SUBMIT PLANS?

The following situations require that plans and specifications be submitted to the Plan Check Program for review and approval:

- a) A person who is constructing or remodeling any building for use as a food establishment
- A person who plans to reopen a food establishment which has been closed for 90 days or more
- c) A person who plans to open an existing food establishment wherein the equipment has been removed or is being replaced
- d) A person who plans to change the operation of a food facility, e.g. changing the operation from catering to a food processing operation.

HOW LONG DOES THE PLAN REVIEW PROCESS TAKE?

Plans and specifications are handled on a first come, first served basis. It is important that you allow time for the plan review process when scheduling your project. Turn-around time for plan review is normally twenty (20) working days. However, it can be longer if your plans are incomplete or in conflict with design rules.

Before commencing construction, approvals must be obtained from Environmental Health, Plan Check Program, the local Building and Safety Department and any other applicable authorities. If any changes to the approved plans become necessary, revised plans shall be submitted for review and approval prior to construction.

BEFORE YOU BEGIN CONSTRUCTING, ENLARGING, ALTERING OR CONVERTING ANY BUILDING FOR USE AS A FOOD ESTABLISHMENT:

- 1. CONSULT WITH THE HEALTH DEPARTMENT:
- 2. DO YOUR HOMEWORK, AND ASK QUESTIONS;
- 3. SUBMIT THREE (3) SETS OF COMPLETE CONSTRUCTION AND EQUIPMENT INSTALLATION PLANS FOR REVIEW AND APPROVAL BY ENVIRONMENTAL HEALTH;
- 4. PLANS THAT ARE INCOMPLETE OR THAT REQUIRE EXCESSIVE CORRECTIONS WILL BE RETURNED FOR REVISION PRIOR TO APPROVAL;
- 5. OBTAIN THE APPROPRIATE PERMITS FROM YOUR LOCAL BUILDING AND SAFETY DEPARTMENT;
- 6. PURCHASE ONLY EQUIPMENT THAT IS CERTIFIED OR CLASSIFIED FOR SANITATION BY AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) ACCREDITED CERTIFICATION PROGRAM FOR MATERIAL, CONSTRUCTION, FABRICATION AND DESIGN:
- 7. INSTALL EQUIPMENT AND FIXTURES ACCORDING TO THE PLANS AND REQUIREMENTS.
- 8. MAINTAIN A COPY OF THE APPROVED PLANS ON THE JOB SITE UNTIL THE FINAL INSPECTION AND ISSUANCE OF YOUR PUBLIC HEALTH LICENSE/PERMIT.
- 9. ANY REVISIONS TO THE ORIGINAL PLANS SHALL BE RE-SUBMITTED TO THE HEALTH DEPARTMENT FOR ADDITIONAL REVIEW AND APPROVAL.
- 10. PLAN APPROVAL IS <u>ONLY</u> VALID FOR A PERIOD OF 12 MONTHS FROM THE DATE PLANS ARE STAMPED "APPROVED".

Plans should be easily readable, drawn to scale, (e.g. $\frac{1}{4}$ " = 1') and shall include:

- A complete description of the food(s) to be processed and a brief overview of the manufacturing process to be utilized; product flow.
- A vicinity plan.
- A site plan including proposed waste storage receptacle location.
- A finish schedule for floors, walls, and ceilings that indicate the type of material, the surface finish, the color, and the type of coved base at the floor-wall juncture.
- Complete floor plan with plumbing, electrical, and equipment lay-out.
- Reflective ceiling plan including lighting; ventilation.
- Complete mechanical exhaust ventilation plans including hoods equipment, elevations and make-up air. Indicate the type of comfort cooling in building, e.g. "building is cooled by refrigerated air condition," "evaporative cooling," or "no cooling system is installed."

<u>NOTE:</u> Additional equipment and construction information may be obtained at <u>www.ccdeh.com</u>. Specific equipment requirements may be provided upon request.

FLOW CHART

SUBMIT THE FOLLOWING: • 3 sets of detailed plans ♦ Completed Plan Check Application ♦ Plan Check fee payment (no cash, no credit card) ◆ For remodel, provide copy of current Public Health permit Plan Check reviews plans in order it was received **PLANS NOT APPROVED** ♦ Correction list will be issued **RESUBMIT REVISED PLANS FOR** PLANS APPROVED BY THE HEALTH **APPROVAL DEPARTMENT** ◆ Provide all requested additional information Ţ **SUBMIT PLANS TO LOCAL BUILDING & SAFETY** ♦ Obtain all necessary permits for construction CONSTRUCTION, REMODEL OR ALTERATION BEGINS **Building & Safety conduct** Contact Plan Check office to request pre-final rough inspections inspection upon 80% completion of construction. *SUBJECT TO AVAILABILITY

OBTAIN FINAL APPROVALS FROM BUILDING & SAFETY

♦ Temporary Certificate of Occupancy, Certificate of Occupancy and/or signed Building inspection card will be issued



CONTACT PLAN CHECK OFFICE TO SCHEDULE FINAL INSPECTION

• UPON HEALTH DEPARTMENT APPROVAL, A PUBLIC HEALTH PERMIT SHALL BE ISSUED



OBTAIN ALL NECESSARY BUSINESS PERMITS AND/OR LICENSES FROM THE CITY AND/OR OTHER AGENCIES

(ex. Seller's Permit, Business license, Alcoholic Beverage Commission license)



FOOD ESTABLISHMENT OPENS FOR BUSINESS

THE PLAN CHECK PROGRAM SERVICE OFFICES ARE LOCATED AS FOLLOWS:

ENVIRONMENTAL HEALTH ADMINISTRATIVE HEADQUARTERS 5050 COMMERCE DRIVE, ROOM 150 BALDWIN PARK, CA 91706 (626) 430-5560 FAX: (626) 813-1444

LANCASTER HEALTH CENTER 335-A EAST AVENUE, K-6 ROOM 23 LANCASTER, CA 93534 (661) 723-4551 FAX: (661) 948-9354

METROPLEX OFFICE 3530 WILSHIRE BLVD., 9TH FLOOR LOS ANGELES, CA 90010-2313 (213) 351-7352 FAX: (213) 351-2789

SOUTH BAY ENVIRONMENTAL HEALTH 122 W. 8TH STREET ROOM 20-A SAN PEDRO, CA 90731 (310) 519-6081 FAX: (310) 514-0170

WEST HEALTH CENTER 6053 BRISTOL PKWY. 2ND FLOOR CULVER CITY, CA 90230 (310) 665-8483 FAX: (310) 348-1868

WEST VALLEY HEALTH CENTER 6851 LENNOX AVE., 3RD FLOOR VAN NUYS, CA 91401 (818) 902-4490 FAX: (818) 902-4411

EAST LOS ANGELES 4801 E. 3RD STREET LOS ANGELES, CA 90022 (323) 881-7075 FAX: (323) 264-7628 The plans shall show and specify in detail the following:

1. **FLOORS:** The floor surfaces in all rooms in which food or beverage is stored or prepared; where utensils are washed; where refuse or garbage is stored; and in toilet rooms, dressing rooms, locker rooms, and walk-in refrigerators shall be of such construction and material so as to be smooth, impervious to moisture, grease, and corrosives and easily cleanable. (Examples include but are not limited to, sealed concrete, quarry tile, epoxy or other approved material). A minimum six (6) inch high, approved cove base, with a minimum three-eighths inch (3/8") radius shall be provided at the juncture of the wall and floor (except storage rooms for food in unopened containers). All floors shall be maintained smooth, clean and in good repair. (LAC 11.12.040)

<u>Floor Drains</u> shall be installed in all rooms where food is prepared or packaged; where utensils are washed; where a refuse enclosure is located inside the premises; in those areas where pressure spray methods for cleaning equipment (CIP) are used; and rooms in which floors are water-flushed for cleaning. Floor surfaces in these areas shall be sloped 1/8" per foot (1:100) to the floor drains. Trench drains may be installed, in lieu of floor drains, if approved by the director. (LAC 11.12.040)

2. WALL & CEILINGS: The walls and ceilings of all rooms where food is processed, prepared or packaged, utensils are washed, refuse or garbage is stored, where janitorial facilities are located, toilet rooms, dressing or locker rooms, and walk-in refrigeration/freezer units shall be constructed of cement, metal, plaster, wall board or other approved material. The surfaces shall be finished with tile, metal, plastic, semi-gloss paint, or other manufactured material, which is smooth, easily cleanable, impervious to moisture and grease, capable of withstanding repeated washing and be of a light color approved by the director. Exposed brick, concrete block, rough concrete, rough plaster or textured gypsum board is not acceptable. Light color shall mean having a light reflectance value of 70 percent or greater. Walls and ceilings shall be maintained clean and in good repair. (These requirements do not apply to areas where food is stored only in unopened bottles, cans, cartons, sacks, or other original shipping containers or to office areas). (LAC 11.12.040)

Conduits of all types shall be installed within walls as practicable. When otherwise installed, they shall be mounted or enclosed so as to facilitate cleaning (e.g., at least ½ inch from the wall and six (6) inches above the floor surface).

3. <u>LIGHTING:</u> In every room and area in which food is prepared, processed or packaged, or in which utensils are cleaned, sufficient natural or artificial lighting shall be provided to produce an intensity of not less than 215 lux (20 footcandles) as measured thirty inches (30") above the floor. Food and utensil storage rooms, refrigeration, toilet rooms and dressing rooms shall be provided with at least 108 lux (10 footcandles) of light as measured thirty inches (30") above the floor surface. (LAC 11.12.060)

Light fixtures in areas where food is prepared, processed, stored in open containers, or packaged, or in which utensils are cleaned, shall be protected against breakage through the use of plastic shields, plastic sleeves with end caps, shatterproof bulbs, and/or other approved device. During general cleanup activities, at least 215 lux (20 footcandles) of light measured 30 inches above the floor, shall be provided in the area being cleaned.

4. <u>VENTILATION:</u> Approved ventilation shall be provided throughout the food establishment to keep all areas reasonably free from excessive heat, steam, condensation, smoke, and vapor, and to provide reasonable comfort for all employees. (LAC 11.12.090)

Toilet rooms, dressing rooms and janitorial rooms shall be vented to the outside by means of an openable window with a screen of not less than 16 mesh per square inch, or a light-switch activated exhaust fan. All construction and installation shall be in accordance with the applicable building and plumbing codes.

Mechanical Exhaust Ventilation shall be provided at or above all newly-installed cooking equipment such as ranges, broilers, fry grills, steam jacketed kettles, griddles, ovens, deep fat fryers, barbecues, rotisseries, and 180°F rinse water (high temperature) dishwashers and similar equipment to effectively remove gases, steam, heat, grease vapors and smoke from the food establishment. Usually chemical sanitizing or under-counter dishwashing machines do not require exhaust hoods. Ventilation plans for each system shall include front and side elevation of the exhaust hood and duct details to the roof fans (both exhaust and make-up air.) Provide manufacturer specification sheets for exhaust fan, make-up air fan and hood filters along with the static pressure calculations (see Attachment I). Refer to the *Uniform Mechanical Code Chapter on Commercial Kitchen Ventilation Systems*. Refer to *CCDEH Recommendations for Mechanical Exhaust Ventilation and Hood Systems for Commercial Food and Utensil Heat Processing Equipment Guidelines*. Specify the number and location(s) of make-up air diffusers. A balance report completed by a third party may be required prior to final clearance.

5. **FLIES, RODENT AND VERMIN EXCLUSION:** A continuous masonry foundation is required at every food facility. A food facility shall at all times be constructed, equipped, maintained, and operated to prevent the entrance and harborage of animals, birds and vermin, including, but not limited to, rodents and insects. **(LAC 11.12.050)**

<u>Windows:</u> All openable windows shall be provided with approved screening not less than 16 mesh per square inch set in tight fitting frames. Openable windows are not approved in processing rooms.

<u>Delivery Doors:</u> All delivery doors leading to the outside from the processing room shall open outward and be self-closing. Overhead air curtains must be provided and are necessary at delivery doors. LARGE CARGO-TYPE DOORS SHALL NOT OPEN DIRECTLY INTO A FOOD PROCESSING AREA FROM THE OUTSIDE.

Entrance Doors: All entrance doors leading to the outside shall be self-closing. Air curtains or fly fans may be used as auxiliary fly control but are not considered substitute devices allowing a door to remain open.

Garbage and Trash Area: Each food facility shall be provided with facilities and equipment necessary to store or dispose of all waste material. An area shall be provided for the storage and cleaning of garbage and trash containers. The walls, floors, and ceiling of this room or area shall be constructed so as to be smooth, durable, easily cleanable, impervious to grease and moisture, light in color, and capable of withstanding the expected impacts.

<u>Vector Control</u>: Openings at the base and side of exterior doors shall not exceed one-fourth inch ($\frac{1}{4}$ "). All exterior wall pipes or other openings shall be tightly sealed. All exterior wall vents shall be properly screened with one-fourth inch ($\frac{1}{4}$ ") hardware cloth screening.

6. <u>TOILET FACILITIES:</u> Separate toilet facilities are required if there are five (5) or more employees of different gender per shift. One (1) toilet for each multiple of fifteen (15) employees is required. Urinals may be substituted for toilets but cannot exceed one half (½) the number of toilets otherwise required. Toilet facilities shall not open directly into a food processing areas. "Employee" shall include managers and/or owners. (LAC 11.12.070)

Hand washing facilities shall be provided within or adjacent to toilet rooms and shall be equipped with an adequate supply of hot and cold running water under pressure. Handwashing sinks shall have water provided from a combination faucet, or water from a premixing faucet which supplies warm water for a minimum of ten (10) seconds while both hands are free for washing. Lavatories shall be provided upon the basis of one lavatory for each two toilets. Hand washing cleanser and single-use sanitary towels or hot-air blowers, shall be provided in dispensers at all hand washing facilities.

- 7. **EMPLOYEE CHANGING ROOM:** When there are five or more employees, a separate changing room with lockers shall be provided for each gender, for employees to change and store their outer garments. Such room shall be a minimum of 20 square feet, provided with self-closing, well fitting doors, and separated from toilet rooms, food storage rooms, or food preparation areas. "Employee" shall include managers and/or owners. The number of dressing rooms required shall be in accordance with local Building and Safety ordinances. (LAC 11.12.070)
- 8. **EQUIPMENT:** All equipment shall be certified or classified for sanitation by American National Standards Institute (ANSI) accredited certification program for material, construction, fabrication and design. All equipment and equipment installation shall be subject to field evaluation. Specifications of equipment shall be available upon demand. **(11.12.130)**

Installation of Equipment:

All equipment shall be either easily movable (i.e., on casters), light enough so as to be easily moved by one (1) person (i.e., a light table), installed on raised minimum six inch (6") rounded metal legs, or sealed to minimum four inch (4") solid masonry island with minimum three-eighths inch (3/8") coved radius. If on an island, it 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 if no other means are available, such as beer coolers behind bars, walk-in refrigerators, and large bakery ovens. (LAC 11.12.130)

Gaps and spaces between equipment base and top of islands shall be sealed with a non-hardening silicone sealant. All equipment on counters, tables, and shelves that are not easily lifted are to be installed on approved four-inch (4") legs or sealed to table, shelves, etc.

All equipment flashings and backsplashes are to be adequately sealed to the wall and to abutting equipment or moved away from the wall six inches (6") for every four (4) linear feet of equipment frontal length, or away from each other. Soldering, welding, approved sealants, or "T" cap molding may be used. A minimum of thirty inches (30") clearance is to be provided for all aisles and working areas.

<u>Hand Wash Sink:</u> A minimum of at least one hand washing sink shall be provided within each food processing area. (Additional handwashing facilities may be required). Handwashing sinks shall be installed so as not to contaminate food or food contact surfaces. All hand wash sinks shall be provided with single service soap and towels in dispensers. (**LAC 11.12.160**)

<u>Food Preparation Sink:</u> Food processing establishments are required to have a separate sink for food preparation when they are engaged in activities such as, but not limited to, thawing, washing or soaking of foods. Depending on the type of operation, a minimum one compartment food preparation with an attached drain board or adjacent worktable may be required. A food preparation sink must drain indirectly through an air gap into a floor sink. Food preparation sinks must meet the applicable NSF/ANSI standards for certification. (LAC 11.12.160)

<u>Utensil Wash Sink:</u> All food establishments in which food is prepared shall provide a minimum three-compartment metal sink with two integral metal drain-boards sloped toward the sinks. The sink must be NSF/ANSI certified, all metal and free standing (not installed in cabinets). The sink compartments and drainage facilities shall be large enough to accommodate the largest utensil or piece of equipment to be cleaned therein. A one-compartment or two-compartment sink that is in use on January 1, 2005 may be continued in use until replaced due to disrepair/deterioration, change in food handling operation, remodeling that requires a building permit or as necessitated, based on performance. Hot and cold running water under pressure shall be provided through a mixing valve to each compartment. Verify with the local building department for the proper connection of the drainage system to sewer. A direct connection of the drainage system to the sewer will result in the requirement of a floor drain adjacent to the three-compartment sink in compliance with the Uniform Plumbing Code Section 704.3. When the 3-compartment sink is installed next to a wall, a metal "back splash", a minimum of eight (8) inches high, extending up the wall, shall be formed as an integral part of the unit and sealed to the wall. (LAC 11.12.160)

<u>Dishwashing Machines:</u> When utensils, dishes, or equipment are machine washed, the machines shall conform to applicable NSF/ANSI certification standards, and shall be installed and operated in accordance with those standards. Dishwashing machines may be connected directly to the sewer immediately downstream from a floor drain or may be drained through an approved indirect connection. Dishwashing machines must have two integral stainless steel drain-boards. The drain-boards shall be sloped and drained to an approved waste receptor. Installation of a dishwasher does not eliminate the requirement for a 3 compartment sink.

<u>Janitorial Sink:</u> A room, area, or cabinet separated from any food preparation or storage area or utensil washing shall be provided for the storage of cleaning equipment and supplies, such as mops, buckets, brooms, cleansers and waxes; and shall be equipped with at least one (1) of the following to be used for general cleaning purposes and for the disposal of mop bucket wastes and other liquid wastes: (LAC 11.12.160)

- 1. A one-compartment, non-porous janitorial sink.
- 2. A slab, basin, or floor constructed of concrete or equivalent material, curbed and sloped to a drain. Such facilities shall be connected to an approved sewerage, provided with hot and cold running water through a mixing valve and protected with a back flow protection device. Janitorial sinks and basins shall be separated from other equipment by at least 30 inches; or a solid partition that extends a minimum of 18 inches above the rim or top of the janitorial sink or basin.

Such facilities shall be connected to approved sewerage, and provided with hot water at least 49°Celcius (120°F) and cold running water through a mixing valve and protected with a backflow protection device.

<u>Garbage Disposals:</u> Garbage disposals may be installed in drain boards if the drain board is lengthened to accommodate the disposal cone in addition to the minimum required drain board size. Garbage disposals may <u>not</u> be installed under a sink compartment, unless an additional compartment is provided for the disposal.

Reach-In Refrigeration: Refrigeration units shall open into an approved area of the food facility, be provided with an accurate, readily visible thermometer; shelving that is nonabsorbent, non-corrodible, easily cleanable, and shall meet all applicable NSF/ANSI standards. Wood is not acceptable. Condensate from refrigeration units shall be conducted in a sanitary manner to a floor sink, or other approved device by an indirect connection or to a properly installed and functioning evaporator. Plumbing waste receptors, including floor drains, floor sinks and evaporators are to be located outside of refrigeration units.

<u>Walk-In Refrigeration:</u> Walk-in refrigerators must be designed to be closed and sealed to the floor; be constructed integral with the floor; coved base shall be provided at the intersection of interior floors and walls; be flashed or sealed to walls and/or ceiling as needed to prevent rodent and vermin harborage or inaccessible areas; have non-corrodible shelving that is at least six (6) inches above the floor; meet or be equivalent to applicable sanitation standards. Wood is <u>not</u> acceptable.

9. STORAGE FACILITIES: PLEASE NOTE - ONLY ONE DAY'S USE OF RAW MATERIAL SHALL BE PERMITTED IN THE FOOD PROCESSING AREA(S). Adequate and suitable space shall be provided for the storage of food, separated by a door(s) from food processing and preparation. Except for large or bulky food containers, all food shall be stored at least six (6") off the floor. Containers may be stored on dollies, racks, or pallets not meeting this height requirement, provided that these items are easily movable. If pallets are to be used, pallet jacks or forklifts should be available for ease in movement. (LAC 11.12.250)

Storage Shelving: Adequate storage shelving shall be provided for all food establishments. Shelving shall be of such construction and material (NSF/ANSI certified) as to be smooth and easily cleanable (e.g. metal or wood which has been finished and sealed). Shelves installed on a wall shall have at least a one inch (1") open space between the back edge of the shelf or 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 located below a counter or work surface are to be set back at least two inches (2") from the drip line of the surface above. Shelves supported by legs on the floor are of a round metal equipment type leg.

10. <u>PLUMBING, GAS AND ELECTRIC:</u> All plumbing and plumbing fixtures shall be installed in compliance with local plumbing ordinances, shall be maintained so as to prevent any contamination, shall be kept clean, shall be fully operative, and shall be in good repair. All liquid wastes shall be disposed of through the plumbing system, which shall discharge into the public sewerage or into an approved private sewage disposal system. (LAC 11.12.030)

All steam tables, ice machines and bins, food preparation sinks and other similar equipment which discharge liquid waste, shall have this waste conveyed by a rigid drain line and disposed therein by an **INDIRECT CONNECTION INTO A FLOOR SINK**, funnel drain, or equivalent device. Indirect waste receptors shall be located to be readily accessible for inspection and cleaning. Waste lines shall not cross any aisle, traffic area, or door opening.

Effective July 1, 1999, Los Angeles City, all unincorporated areas of Los Angeles County and most incorporated cities have adopted the California Plumbing Code. These jurisdictions will require that all utensil/pot washing sinks and machines shall be connected **DIRECTLY** to the sewage system. Per the Uniform Plumbing Code, Section 704.3, a floor drain shall be provided adjacent to the fixture, and the fixture shall be connected on the sewer side of the floor drain trap, provided that no other drainage line is connected between the floor drain waste connection and the fixture drain. Contact the local Building and Safety Department for further information.

Water Supply: An adequate, protected, pressurized, potable supply of hot water at least 49° Celsius (120°F) and cold running water shall be provided from an approved source. The potable water supply shall be protected with a backflow or back siphonage protection device, as required by applicable local plumbing codes.

In sizing the water heater, the peak hourly demands for all sinks, dishwashing machines, etc. are added together to determine the minimum required recovery rate. (Refer to "CCDEH Water Heater Sizing Guidelines"). The minimum required hot water heater is 20 gallons.

Sewage Disposal, Grease Traps and Interceptors

Contact the local Building and Safety, Sanitary, or Public Works agencies for information or regulations regarding special sewerage, grease trap and grease interceptor requirements. In general, grease traps should be installed flush with the floor to prevent sanitation problems. Check with the local Building and Safety officials for the requirements.

Floor Drains: Adequate floor drains should be provided in food preparation rooms, utensil or produce washing rooms, toilet rooms, and garbage rooms. A floor drain directly outside a walk-in refrigerator or freezer is acceptable if the floor in the walk-in is sloped towards the drain. **(LAC 11.12.040)**

Conduit: All plumbing, electrical, and gas lines shall be concealed within the wall to as great extent as possible. Where it is not possible, all runs should be at least one half inch (½") away from the walls or ceiling and six inches (6") off the floor. Conduit or pipe lines shall not be installed across any aisle, traffic area, or door opening. Multiple runs or clusters of conduit or pipe lines shall be furred in, encased in an approved runway, or other Department approved sealed enclosure. **(LAC 11.12.040)**

Floor Sinks: All steam tables, refrigerators (including walk-in boxes), steam kettles, ice machines, and similar type of equipment shall drain into floor sinks. Floor sinks shall be installed flush with the floor surface. All condensate and similar liquid waste shall be drained by means of indirect waste lines into open floor sinks. Horizontal runs of drain lines shall be six inches (6") off the floor, slope one quarter inch (¼") 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, repairs, and not in a walkway. Waste lines shall not cross any aisle, traffic area, or door opening. Floor sinks are not permitted inside walk-in units (except in USDA processing plants) where an air gap is required. (LAC 11.12.040)

SUMMARY OF THE GUIDELINES FOR FOOD MARKET, WHOLESALE / WAREHOUSE REQUIREMENTS ONLY (SEE CONSTRUCTION REQUIREMENT GUIDELINES FOR DETAILS)

- 1. Building is to be rodent-proofed. Doors leading to the outside are to be self-closing and have no more than ¼ inch gap around the perimeter of the door. Seal all holes / gaps in the walls / ceilings. Screen window openings with tight-fitting fly screens.
- 2. Provide at least one toilet and one lavatory conveniently located, with single-use soap and paper towels; adequate lighting; proper ventilation; and a self-closing door.
- 3. Provide janitorial facilities (area, room or cabinet) including a mop sink installed with a backflow prevention device, separated from the food storage area; approved shelves for storage of cleaning supplies; and a mop and broom hanger are recommended.
- 4. Provide a minimum 20-gallon hot water heater; specify the location; specify all sinks that are to be supplied with hot water from this water heater.
- 5. When there are 5 or more employees, an employee dressing area must be provided for each gender with lockers and adequate storage shelving.
- 6. When there is refrigeration, specify if it is self-contained or if the condensate drains into an open floor sink. Walk-in cold storage units must drain into an open floor sink or other approved indirect waste receptacle. Provide specifications for all refrigeration equipment and ensure that it meets ANSI certification standards.
- 7. Provide a finish schedule for all areas, except office space. Walls, floors and ceilings in the restrooms, janitorial areas and locker areas must be smooth, durable, of light color, nonabsorbent, and easily cleanable.

NOTE: FOOD MARKETS, WHOLESALE:

- I. SHALL PROVIDE AT LEAST ONE ADDITIONAL HAND WASH SINK IN ANY APPROVED AREA WHERE FOOD IS PREPARED FOR DISTRIBUTION.
- II. SHALL PROVIDE APPROVED FLOOR, BASE COVE, WALL AND CEILING FINISHES IN ANY AREA WHERE FOOD IS PREPARED FOR DISTRIBUTION.



ENVIRONMENTAL HEALTH PLAN CHECK PROGRAM 5050 Commerce Drive Baldwin Park, CA 91706



COMMERCIAL HOODS/MECHANICAL EXHAUST DATA INFORMATION

BA:		DATE:	
DDRESS:		PLAN CH	
REPARED BY:		PHONE #	:
ovide the following information concerning mech evated drawing of hood, make-up air, duct elbow parate sheet. You must comply with the Uniform	s & fans, and cook	ing equipment	
<u>barate sneet.</u> You must comply with the Uniform	i Mechanicai Code,	, Chapter 5.	
WOOD-FIRED OVEN6" OVERHANG ON SIDES OF EQUIPMENT		arcoal, wood etc.)	□ N/A
TYPE OF HOOD TYPE I (check below that applies to hood) Canopy type Noncanopy type Compensating hood		g/Ductless/Ventl	
		*PRO	IDE MANUFACTURER
MINIMUM AIRFLOW CALCULATIONS: • A (area) = Hood opening: feet x	feet =		square feet
• Formula used: Q (quantity of air in cubic feet/minute) =		<u>ww.ccdeh.com</u> Venti l	
	x A (area) *see w formu. • Number of	<u>ww.ccdeh.com</u> Ventii la	ation- Mechanical Calculation
 Formula used: Q (quantity of air in cubic feet/minute) =	• Number of • Size of gre (makeup air shall 20% supply air:	ww.ccdeh.com Ventila ida ida ida ida ida ida ida	ation- Mechanical Calculation
 Formula used: Q (quantity of air in cubic feet/minute) =	• Number of • Size of gre (makeup air shall 20% supply air:	ww.ccdeh.com Ventila Fducts: ase filters: be provided at the VES	ation- Mechanical Calculation.

NOTE: PROVIDE SEPARATE HOOD/MECHANICAL EXHAUST DATA SHEET(S) FOR EACH HOOD

GOVERNMENT AGENCIES WITH RESPONSIBILITY OVER FOOD

<u>Food and Drug Administration (FDA)</u> is responsible for the safety of all foods except meat, poultry, and commercially processed eggs, which are regulated by the USDA. They are also responsible for registering all food processors in accordance with the Public Health and Safety and Bioterrorism Preparedness and Response Act. *FDA contact (949) 608-2900 or go to their website at www.fda.gov.*

<u>United States Department of Agriculture (USDA)</u> is responsible for the inspection of meat and poultry plants, egg processing (washing, sorting, breaking, pasteurizing), nutrition labeling, egg grading, products containing greater than 3% meats or 2% poultry, and open faced meat or poultry sandwiches. *USDA contact (800) 535-4555 or go to their website at www.usda.gov.*

California Department of Health Services Food and Drug Branch (CFDB) is responsible for assuring the foods are not adulterated, misbranded, or falsely advertised. *CFDB contact (909) 396-9515 or go to their website at www.dhs.ca.gov/ps/fdb*.

<u>California Department of Food and Agriculture (CDFA)</u> is responsible for the inspection of shell eggs and their labeling, products containing egg products, retail sausage facilities, and custom slaughter facilities and dairy product inspections. *CDFA contact (213) 580-0504 or go their* website at *www.cdfa.gov*

For more information and applicable laws go to www.lapublichealth.org/eh
Or you can e-mail Environmental Health at eh@dhs.co.la.ca.us

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

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The following agencies certify to ANSI standards:

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800 – NSF-MARK

www.nsf.org

789 N. Dixboro Road

P.O. Box 130140

Ann Arbor, MI 48113-0140

OR

Los Angeles Area Service Representative

Gregory F. Bowlby, RS, R.E.H.S.

Telephone: (909) -945-9888

Fax (909)- 945-9299

bowlby@nsf.org

8780 19th Street, #277

Alta Loma, CA 91701

UL – Underwriters Laboratories Inc.

877-854-3577

www.ul.com/

www.ul.com/eph

333 Pfingsten Road

Northbrook, IL 60062-2096

OR

Los Angeles Area Representative

Donna Douglas, Senir Project Chemist

Dona R. Douglas @us.ul.com

2929 E. Imperial Hwy, Suite 100

Brea, CA 92821

Telephone: (714)-223-3600

Fax: (714)- 223-3660

ITS – Intertek Testing Services

ETL SEMKO

888-ETL-MARK

www.etlsemko.com

OR

Los Angeles Area Representative

Jill Fisher

Jill.fisher@intertek.com

Telephone: (949)-448-4100

Fax: (949)-448-4111

27611 La Paz Road, Suite C

Laguna Niguel, CA 92677

(electrical, sanitation, gas)

CSA International

www.csa-international.org

www.certinfo@csa-international.org

Tel: (866)-797-4272

(216)524-4990

Fax: (216)-642-3081

(sanitation)

OR

Los Angeles Area Representative

Mark Christopherson

2805 Barranca Parkway

Irvine, CA 92606

Telephone: (949)-733-4310

Fax: (949)-733-4320

(gas, electrical)

L.A. CITY TEST LAB

(213)485-2314

Test for electrical safety for installations

within boundaries of L.A. City

(213)482-0000 general information

ITS, CSA and UL

Also test for electrical and gas safety

Construction Guidebook for Wholesale Food Facilities - RWFPC
2. Orange County Environmental Health
2. Orange County Environmental Treatm



CONSTRUCTION GUIDELINES FOR WHOLESALE FOOD PROCESSING FACILITIES



County of Orange Health Care Agency Public Health, Environmental Health 1241 E. Dyer Road, Suite 120, Santa Ana, CA 92705 Phone (714) 433-6074 ~ Fax (714) 433-6424

Introduction

This construction guide is for any person wanting to construct or remodel a wholesale food facility in Orange County. This guide provides an overview of the plan check process, a checklist, and an outline of all the structural details that this Agency requires for wholesale food processing facilities. A separate guide is available for wholesale food facilities which will handle only prepackaged food. Please contact us if you are unsure about your particular type of facility.

First, let's take an overview of the Environmental Health Plan Check process from beginning to your grand opening:

Plan Check Process Overview

Plan Submittal -

Before beginning any construction or remodeling work, you must submit three (3) copies of detailed plans/blueprints and specifications to the Environmental Health office (see below for plan specifics). The plans may be prepared by an architect, draftsperson, contractor, or owner. All plans must be drawn in a professional manner encompassing all applicable requirements of this construction guide. In addition, you must obtain all approvals from your local building and fire authorities prior to construction.

Plan Check Fee -

A plan check fee must be paid at the time of submittal. The fee is based upon square footage and whether it is new construction or a remodel. Current fee schedules are available upon request.

A remodel is any construction or alteration to an existing wholesale food processing facility. Remodeling also includes the installation of equipment or repairs to a food facility which alters its configuration or method of operation. Installing a food facility in a new structure or in an empty building is new construction. Also, installing a food facility in a former non-food related facility, such as a shoe store, falls under the new construction category. If you are starting from a former food facility where all the equipment and interior structures have been removed, that also is considered new construction.

Initial Plan Review -

Plans that are submitted will be reviewed and either approved or denied. In order for plans to be approved, they must include all the structural requirements that are listed in this guide, and the plans themselves must be drawn to scale (e.g., $\frac{1}{4}" = 1'$), using non-erasable ink or print (no pencil). Your plans must include:

- Complete floor plan with plumbing and electrical outlets and electrical panels.
- Complete equipment layout, including elevations of equipment and equipment specifications.
- Complete exhaust ventilation plans, including make-up air. Indicate the type of comfort cooling in building (e.g. "building is cooled by refrigerated air conditioning", "evaporative cooling" or "no cooling system is installed").
- ✓ Finish schedule for walls, ceilings and floors that indicates the type of material, surface finish and color. Samples of proposed finish materials should be submitted with the plans.
- ✓ Remodel plans must identify all proposed changes to existing structures, spaces, and equipment.

Approval or Denial –

If the plans you submitted do not meet all the requirements or if the plans are incomplete, they will require revisions before approval is granted. If your plans do meet all the requirements, your plans will marked with approval stamps and you will be given back two sets of the originals that you submitted. One of these copies must be kept at the jobsite up until the end of the construction/remodel project. It is only after you receive the approval of your plans that you can begin construction/work at your facility.

Modification of Plans -

If any changes are proposed to the plans *after* approval, they must be reviewed and re-approved by this Agency prior to being implemented.

Preliminary Inspection –

When construction is approximately 75% to 80% completed, with plumbing, rough ventilation, and rough equipment installed, you must call your Plan Checker (the person indicated on your approved plans) for a preliminary construction inspection. Requests should be made at least two (2) working days in advance. The preliminary inspection is usually scheduled at least two weeks prior to the proposed opening of the food facility. Note that approved materials and good workmanship are significant factors in the evaluation and field approval of food facility construction and equipment installation.

Final Inspection –

Upon completion of 100% of the construction, including all finishing work, you must call your Plan Checker to arrange for a final construction inspection. Contact your Plan Checker at least two (2) working days in advance for an appointment for the final inspection.

Issuance of Permit -

Once your facility has passed the final inspection, you will be issued a Health Permit and are then able to open for business, or begin using the newly remodel areas of your business.

CHECKLIST GENERAL CONSTRUCTION & EQUIPMENT REQUIREMENTS

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WHOLESALE FOOD FACILITY GENERAL STRUCTURAL REQUIREMENTS

1. FLOORS:

- a. Floors in food facilities shall be smooth and impervious to water, grease and acid, and be made of easily cleanable construction.
- b. Floor drains are required in floors that are water-flushed for cleaning where pressure spray methods for cleaning equipment are used. Trench drains may be used in doorways or when the amount of water used for cleaning will be excessive.

2. WALLS / CEILINGS:

- a. Walls and ceilings in all rooms shall be smooth and nonabsorbent with an easily cleanable finish.
- b. Wall materials other than smooth plaster or putty coat plaster, drywall with sealed and taped joints, or plywood with properly sealed joints require submission of a sample.
- c. All wall surfaces shall be sealed with a cleanable paint such as: gloss or semigloss enamel, epoxy, varnish or other approved sealer.

3. EXHAUST HOODS AND DUCTS:

Proper ventilation is a requirement of the Food Sanitation Act. The following are excerpts from the Mechanical Code:

- a. Mechanical exhaust ventilation shall be required at or above all cooking equipment such as ranges, griddles, ovens, deep fat fryers, barbecues, and rotisseries to effectively remove cooking odors, smoke, steam, grease and vapors.
- b. All hoods, ducts and exhaust outlets shall be installed in accordance with the current edition of the Uniform Mechanical Code as adopted by the local building department.
- c. Canopy-type hoods: The lower lip of canopy-type hoods shall not be more than seven (7) feet above the floor and shall not be more than four (4) feet above the cooking surface. The hood shall overhang or extend at a horizontal distance not less than six (6) inches beyond the outer edges of the cooking surfaces on all open sides. It shall have grease troughs and drip pans that are easily cleanable.
- d. Noncanopy-type hoods: Noncanopy-type hoods will be approved providing they are constructed to be easily cleanable and they comply with the minimum exhaust air velocity requirements. Shielding at the ends of the hood may be necessary to prevent interference from cross drafts.

- e. Make-up air: Make-up air shall be provided at least equal to that amount which is mechanically exhausted. Windows and doors shall not be used for the purpose of providing make-up air.
- f. Fire extinguishing systems may be required by local fire department codes. They shall be installed so as to allow easy cleanability of the hood and duct systems and, whenever possible, shall not be installed above food or utensil handling areas.

4. WINDOW SCREENS:

All openable windows, such as restroom windows, shall be screened with not less than 14 mesh screening.

5. RESTROOMS:

- a. Toilet facilities shall be provided within each food facility convenient for the employees.
- b. The floors, walls and ceiling shall have surfaces that are smooth, nonabsorbent and easily cleanable.
- c. Handwashing sinks shall be provided within each toilet room. The sink shall be provided with soap and sanitary towels.

6. CLOTHING CHANGE ROOMS / DESIGNATED AREAS:

Provide a room, lockers or similar enclosure, separated from toilet, food storage, and food preparation areas, where employees may change and store their outer garments and personal belongings.

7. DOORS:

- a. All dedicated delivery doors leading to the outside shall open outward and be self-closing.
- b. Large cargo-type doors shall *not* open directly into a food preparation area.

8. LIGHTING:

All food preparation areas, utensil storage rooms, toilet rooms, refrigeration storage rooms, and all dishwashing areas shall be provided with adequate light.

9. WATER AND SEWAGE DISPOSAL:

All liquid waste, including sewage, generated by a food facility, shall be disposed in an approved manner into either a public sewer system or to an approved private on-site sewage disposal system.

SUPPLEMENTAL INFORMATION FOR WHOLESALE FOOD PROCESSING FACILITIES

The information below contains specifications required by the State Department of Health, local building departments, and local fire departments. The following are excerpts from Building, Fire or Mechanical Codes or are part of the Good Manufacturing Practices. This information is being provided to you to assist you in obtaining registration or permits from these other agencies. Please contact each respective department to confirm current requirements, and to ensure that you will be in compliance with all applicable codes.

1. REFRIGERATION:

- a. All refrigeration units should be adequate in capacity to meet the needs of the proposed operation and should comply with the following requirements:
 - (i) Be capable of operating so as to maintain the refrigerated foods at or below 41°Fahrenheit at all times.
 - (ii) Be specifically constructed for commercial use. Domestic model refrigeration units are not acceptable.
 - (iii) Be provided with an accurate, readily visible thermometer.
 - (iv) Have smooth, nonabsorbent and easily cleanable surfaces. If cement, plywood or other similar absorbent materials are used, the surfaces must be sealed. All joints must be sealed.
 - (v) Condensate waste from reach-in refrigeration units may be drained into a floor sink or an approved evaporator unit.
 - (vi) Cooling coils and related electrical, drainage and refrigerant lines should be installed in a safe and easily cleanable manner. Drainage and refrigerant lines shall be constructed of nontoxic materials or properly insulated and covered with an approved, easily cleanable and nontoxic material.
- b. Walk-in refrigeration units should also:
 - (i) Have a coved base with a radius of at least 3/8 inch at the floor/wall juncture; the floor material shall extend up to a height of at least four (4) inches on the walls. Four (4) inch approved metal topset coving with a minimum 3/8 inch radius is acceptable against metal wall surfaces of walk-in refrigeration units.
 - (ii) Open into an area with approved finishes within the facility.
 - (iii) Have shelving that is at least six (6) inches off the floor with smooth, easily cleanable legs, or cantilevered from the wall for ease of cleaning. Small, easily movable, castered dollies may be used in place of a lower shelf inside a walk-in refrigeration unit.
 - (iv) Have condensate waste drained into a floor sink. The floor sink should not to be located inside the walk-in refrigeration unit.

2. UTENSIL SINK:

- a. Where food equipment has small, cleanable parts, or where multiservice utensils, i.e., pots, pans, etc., are utilized, provide a three (3)-compartment stainless steel sink with dual, integrally installed stainless steel drainboards to accomplish proper washing and sanitizing. This sink should have an indirect connection to a floor sink.
- b. The minimum compartment sizes should be at least 18" x 18" x 12" deep with minimum 18" x 18" drainboards, or 16" x 20" x 12" deep with 16" x 20" drainboards. The sink must otherwise be capable of accommodating the largest utensil to be washed, and the drainboards shall be as large as the largest sink compartment.
- c. When a sink is installed next to a wall, a stainless steel "backsplash" extending up the wall at least eight (8) inches should be formed as an integral part of the sink, and be sealed to the wall. The ends of the sink must be installed with a minimum two (2) inch separation from walls, or be equipped with integrally installed "end returns".
- d. For equipment that is affixed in place or is otherwise too large to be washed and sanitized in a sink, please describe the facilities and method used to clean and sanitize these food contact surfaces. Please further describe methods for the removal of waste water or waste products.

3. JANITORIAL SINK:

- a. A one-compartment, wall-mounted janitorial sink with hot and cold running water should be installed for general cleanup activities.
- b. A curbed area properly sloped to a drain that is provided with hot and cold running water, a mixing faucet, and an approved backflow prevention device, is also acceptable. All curbed area surfaces should be of smooth, impervious and easily cleanable construction. Where duckboards or floor mats are used, a curbed area with a drain is recommended.
- c. Free standing janitorial sinks must be provided with easily cleanable legs. Legs with "L" angles are not recommended as they inhibit the ability to easily clean the floor around them and also trap dirt and food debris.

4. HANDWASHING SINKS:

- a. Handwashing sink(s) should be provided in the food preparation areas.
- b. Soap and sanitary towels should be provided in single-service, permanently installed dispensers at all handwashing sinks.

5. FOOD PREPARATION SINKS:

Food facilities that prepare raw vegetables or meat are required to have a separate food preparation sink to prevent cross contamination. This sink must have an indirect connection to a floor sink.

6. FLOOR SINKS:

- a. All condensate and similar liquid waste shall be drained by means of indirect waste pipes into an open floor sink.
- b. Floor sinks shall be installed flush with the floor surface unless local building authorities require a raised floor sink.
- c. Horizontal runs of drain lines shall be at least 1/2 inch from the wall and six (6) inches off the floor and shall terminate at least one (1) inch above the overflow rim of the floor sink.
- d. Floor sinks shall be located so that they are readily accessible for inspection, cleaning and repair. The floor sink must be located within fifteen (15) feet of the drain opening of the equipment served.
- e. Waste lines may not cross any aisle, traffic area or door opening.
- f. Floor sinks or floor drains are not permitted inside walk-in refrigeration units.

7. GENERAL PURPOSE HOT WATER:

- A water heater, which is capable of constantly supplying hot water at a temperature of at least 120° Fahrenheit to all sinks, and other clean-up facilities should be provided.
 In sizing the water heater, the peak hourly demands for all sinks, etc., are added together to determine the minimum required recovery rate.
- b. You may contact Environmental Health for assistance in sizing the water heater.

8. BACKUP DRY FOOD AND BEVERAGE STORAGE:

- a. Adequate and suitable floor space should be provided for the storage of food, beverages, and related products. In addition to working storage and refrigeration storage, additional back-up storage must be provided. Working storage is considered to be cabinets over and under food handling equipment and wall mounted shelves which are located in, and used in, conjunction with food preparation areas. Reference the following to determine the minimum recommended amount of backup storage space:
 - (i) Within food facilities that have food preparation areas which total 400 square feet or less, a minimum 100 square feet of floor space shall be dedicated for back-up dry food storage. At least 32 linear feet of approved shelving units shall be installed in the 100 square feet of dedicated floor space.
 - (ii) Within food facilities that have food preparation areas which total more than 400 square feet, the floor space required for back-up dry food storage shall be determined by dedicating one square foot of floor space or by dedicating a space equal to 25% of the food preparation area, whichever is greater. The quantity of shelving units to be installed in this dedicated space shall be based upon the following formula:

Required linear footage of shelving units = $32 \times (sq. \text{ ft. of preparation areas})$

400

- (iii) Where remote dry food and beverage storage is proposed, at least half of the required storage must be located within the food preparation areas. The remaining storage must be located within the food facility in an approved storage room.
- b. A shelving unit should be a minimum eighteen (18) inches in depth and three (3) tiers high. For example, eight shelving units, each of which is four feet long and three tiers high, would equal 32 linear feet of shelving units.
- c. Shelving shall be constructed in an easily cleanable design of smooth metal or wood, which has been finished and sealed. Shelves installed on a wall shall have at least one (1) inch of open space between the back edge of the shelf and the wall surface, otherwise, the back edge of the shelf shall be sealed to the wall with silicone sealant or equivalent. The lowest shelf shall be at least six (6) inches above the floor, with a clear unobstructed area below, or be the upper surface of a completely sealed continuously coved base, with a minimum height of six (6) inches. All shelves located below a counter or work surface shall be set back at least two (2) inches from the drip line of the surface above. If shelves are supported by legs on the floor, the legs shall be smooth and easily cleanable.
- d. Electrical panels, large fire prevention system components or similar wall-mounted equipment shall *not* be installed in food storage rooms unless adequate approved provision is made to compensate for the space required for the installation.

9. RESTROOMS:

- a. The sink should be provided with hot and cold running water from a pre-mixing faucet. Soap and sanitary towels in a single service, permanently installed dispenser(s) shall be provided at the handwashing sink.
- b. Toilet tissue should be provided in a permanently installed dispenser at each toilet.
- c. The restrooms should be provided with tight-fitting, self-closing doors.

10. EQUIPMENT:

- a. All show and display cases, counters, shelves, tables, refrigeration equipment, sinks and other equipment used in connection with the preparation, service and display of food, shall be made of nontoxic materials and so constructed and installed as to be easily cleanable.
- b. All equipment should be placed on minimum six (6) inch high, easily cleanable legs, or on a four (4) inch high, continuously coved curb, or on approved casters, or cantilevered from the wall in an approved manner.

11. CONDUIT:

a. All plumbing, electrical and gas lines shall be concealed within the building structure to as great an extent as possible. Where this is not possible, all runs shall be at least 1/2 inch away from the walls or ceiling, and six (6) inches off the floor.

- b. Where conduit or pipelines enter a wall, ceiling or floor, the opening around the line shall be tightly sealed.
- c. Conduit or pipelines shall *not* be installed across any aisle, traffic area or door opening.
- d. Multiple runs or clusters of conduit or pipelines shall be furred in, and encased in an approved runway or other sealed enclosure approved by this Agency.

12. ICE MACHINES:

All ice machines should be located within the building in an easily cleanable, well-ventilated area, and shall be drained to a floor sink.

13. GARBAGE DISPOSALS:

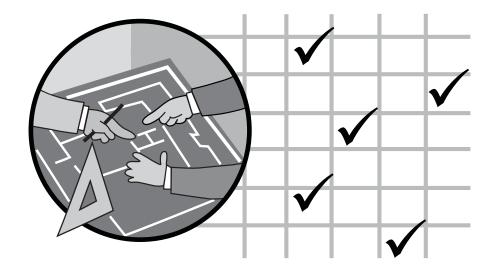
This Agency does not regulate garbage disposals. Most building departments and/or sanitation agencies prohibit the installation of garbage disposals. Contact your local building and your local sanitation agency for limitations within your area.

14. GREASE TRAPS AND GREASE INTERCEPTORS:

This Agency does not regulate the installation of grease traps or grease interceptors. If you do decide to install one, please indicate its location on the plan and contact your local building department for design, construction, installation and approvals.

	Construction Guidebook for Wholesale Food Facilities - RWFPC
3.	San Bernardino County Environmental Health
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BUILD IT RIGHT



Guidelines for Wholesale Food Facilities

- Processors
- Warehouse/Distribution
- Cold Storage
 Food Facilities
- Food Carts and Food Vehicle Commissaries
- Food Salvagers



BUILD IT RIGHT

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

SAN BERNARDINO COUNTY ENVIRONMENTAL HEALTH SERVICES WHOLESALE DEPARTMENT 385 N. Arrowhead Ave. San Bernardino (909) 387-0214

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CONSTRUCTION PLAN APPROVAL PROCEDURES FOR FOOD FACILITIES

Pursuant to the San Bernardino County Ordinance, Section 33.021, a plan approval must be obtained from the County of San Bernardino, Division of Environmental Health Services (DEHS) before constructing, altering, converting or remodeling any building used as a food facility. ("Remodel" means construction, building, or repair to the food facility that requires a permit from the local building authority.) For purposes of this section, remodel means any replacement or significant modification of an integral piece of equipment or change in the scope of the operation. The following is required to process and obtain approval to open for business:

- 1. Submit three (3) sets of detailed plans and specifications, complete an application for Food Service Plan Review and pay the required plan check fees.
- 2. The plans must include sufficient information to demonstrate compliance with the California Food Sanitation Act and Local Regulations in order to be approved (see "Requirements For Food Facility Plan Approval," page 2.)
- 3. Plans may be prepared by an architect, draftsman, contractor or owner. All plans must be drawn in a professional manner encompassing all applicable requirements of this construction guide.
- 4. Plans will be approved or rejected within twenty (20) working days after receipt and the applicant will be so notified. Plans that are incomplete, or have a multitude of required changes will have two (2) sets returned for revision before approval will be granted.
- 5. Upon approval, two (2) sets of plans will be returned to the applicant, and the third (3rd) set will be kept on file until construction has been completed. An approved set of plans must be maintained at the construction site until the final inspection has been made.
- 6. If any changes on the plans are desired after approval has been obtained, additional approval from DEHS must be obtained for such changes. (Amended plans will be required.)
- 7. If plans are not picked up or arrangements made by the applicant or his agent within ninety (90) days after notification of approval or rejection, plans shall be discarded.
- 8. Obtain approval from appropriate planning department.
- 9. Before beginning construction, a building permit must be obtained from the appropriate Department of Building and Safety. (By law, building permits for food facilities are not to be issued until plan approval has been obtained from DEHS.)
- 10. Call for first construction inspection when floors, walls, cove base, and ceiling materials are completed, just prior to installing major equipment. Call two (2) working days prior to needed construction inspection for scheduling with the Plan Check Specialist.
- 11. All construction and equipment installations are subject to final on-site inspection. If there are any questions during the construction phase and/or prior to the facility opening (one to two weeks), the applicant should call the DEHS Wholesale Plan Check Specialist to avoid possible delays in opening.
- 12. The food facility shall not be open for business, or stock any food items until final approval is granted by the Plan Check Specialist. Appointments for pre-opening final inspections must be coordinated at least two (2)

working days in advance with the inspector to prevent opening delays. Final approvals will be contingent on the following:

- a. The facility must conform to the latest set of approved plans.
- b. Proof that the appropriate Building & Safety and Fire Departments have inspected/approved the facility on site, (i.e., final sign off on respective "Job cards", conditional final, etc.)
- c. Permanent utilities (electric, gas, potable water, sewage disposal) must be provided at time of final inspection to determine operation of all equipment.
- 13. The owner/operator will receive an application for an Environmental Health Permit when final approval is granted. A receipt of fees paid for a permit must be posted prior to opening the facility. NOTE: It is the owner's responsibility to annually renew this permit prior to the expiration date or a penalty will incur.

REQUIREMENTS FOR WHOLESALE FOOD FACILITY PLAN APPROVAL

The plans shall show and specify in detail the following:

GENERAL:

- 1 Provide exact name and address of the food facility, the name and telephone number of the owner, contractor and contact person.
- 2. Plans shall be drawn to scale, e.g., minimum 1/4" =1 foot, or as approved, using nonerasable ink or print (no pencil), and shall include:
 - a. The site plan shall include proposed exterior rubbish and food waste storage receptacle location with approved drainage.
 - b. Floor plan of entire food facility including but not limited to processing and storage areas, walk-in refrigerators and freezers, docks, janitorial areas, trash storage areas, chemical storage areas, toilets, dressing room, break rooms, storage, garbage and trash areas, etc., including all interior and exterior doors. (Include total square footage of the facility.)
 - c. Complete equipment layout, including equipment specifications. List type, make and model numbers of all equipment. (Supplement I and II.)
 - d. Complete plumbing layout showing sewer, waste drains, floor sinks, grease interceptors vents, cleanouts, etc.
 - e. Electrical layout including lighting.
 - f. Complete finish schedule for walls, ceilings, and floors that indicates the type of material, the color, the surface finish, and the type of integral coved base at the floor/wall juncture.
 - g. Complete mechanical/exhaust ventilation layout including make-up air. Indicate type of hoods, calculations, etc. (See Supplement V and VI.)

- State on the plans whether the food facility is served by a Public Water System or individual water wells. If
 water wells are to be the source of potable water, contact the Environmental Health Division, Water Program
 for water supply permit requirements. (Requirements include chemical analysis and a minimum of 50 foot
 seal on well.)
- 4. State on the plans whether the food facility is served by a sewer district or by an on-site sewage disposal system.

NOTE: If an on-site sewage disposal system is to be installed, approval must be obtained from San Bernardino County Environmental Health Services Water and Waste Management/LEA section, at (909) 387-4655.

- 5. Approved materials and good workmanship are significant factors in the evaluation and final approval of food facility construction and equipment installation.
- All new and replacement food processing utensils and equipment shall meet or be equivalent to American National Standards Institute (ANSI). In the absence of approved applicable sanitation standards, food processing utensils and equipment shall be approved by the enforcement agency. Nothing in this section shall preclude the department from approving nationally recognized sanitation standards. Until the department approved standards pursuant to this section, standards adopted by nationally recognized testing organizations, as of January 1, 1997, may be used.

FIELD CONSTRUCTION INSPECTIONS

1. PRELIMINARY CONSTRUCTION INSPECTION

When finished surface materials are completed, i.e., walls, ceilings, floors and coved base, with plumbing, rough ventilation, and rough equipment installation, you must contact the Plan Check Specialist who reviewed your plans for a *preliminary construction inspection*. Requests should be made at least two (2) working days in advance. A preliminary inspection should be scheduled for no less than two weeks prior to the proposed opening of the food facility.

2. FINAL CONSTRUCTION INSPECTION

Upon completion of all construction, including all finishing work, *you must contact* the Plan Check Specialist who reviewed your plans to arrange for a *final construction inspection*. You will not be approved to operate or issued a Health Permit until the establishment passes a final inspection. In no case should a final inspection be requested less than two (2) working days prior to the proposed opening of the establishment. *Final construction must be approved by DEHS prior to receiving food items, commencing food processing, or opening for business or use of remodeled areas.*

GENERAL CONSTRUCTION AND EQUIPMENT REQUIREMENTS

1. FLOORS

a. Floors in food facilities shall be durable, smooth and impervious to water, grease, acid, and of easily cleanable construction in areas where food is prepared, stored, packaged, dispensed, where any utensil is washed, janitorial areas, walk-ins, toilet and handwashing areas. Floors in the above areas shall be an approved type e.g., smooth sealed concrete, quarry or ceramic tile, *commercial grade* sheet vinyl with bonded joints (vinyl tiles are not acceptable). Floor surfaces in these areas (except in

- pre-packaged food storage rooms and warehouse areas) shall *continue up the wall* or toe-kicks on counters, at least four (4) inches, in a seamless manner, forming a 3/8 inch minimum radius cove as an integral unit. Vinyl rubber topset base is not acceptable. (See Supplement VIII.)
- b. Floor drains or trench drains are required in floors that are water-flushed for cleaning, and/or where pressure spray methods for cleaning equipment are used. Where floor drains or trench drains are utilized, the floor surface shall be sloped 1:50 to the floor drains. Trench drains and floor drains located directly outside walk-in refrigerators are acceptable if the floors in the walk-in units are sloped towards the drain.
 - NOTE: Floor drains, and trench drains are not permitted inside the walk-in unit unless they are indirectly connected to the sewer through a legal air gap.
- c. High pressure hot water cleaning systems may be required in addition to floor *drains* if the degree of roughness of the slip resistant agent is deemed excessive upon evaluation by this Division.
- d. Flooring under equipment and on the coved bases shall be completely smooth. Floor surfaces which contain slip resistant agents shall be restricted to traffic areas only.

2. WALLS

- a. Except as provided in subdivision (e) the walls and ceilings of all rooms including food preparation or processing rooms, walk-in refrigerators, equipment or utensil washing areas, toilet rooms, dressing/ locker rooms, refuse areas, shall be of a durable, smooth, nonabsorbent, light colored, and washable surface. For purposes of this chapter, light- colored shall mean having a light reflectance value of 70 percent or greater.
- b. All wall surfaces shall be covered with a gloss or semi-gloss enamel, epoxy, fiberglass reinforced polyester panels (FRP), ceramic tile or other approved materials.
- Wall surface materials are subject to evaluation and may require submission of samples.
- d. All walls behind sinks, utensil washers, or other areas exposed to water, must be protected with at least a 4-foot high water resistant material (e.g., FRP, stainless steel, ceramic tile or other approved material).
- e. This section shall not apply to the following warehouse areas:
 - Areas where food is stored only in unopened bottles, cans, cartons, sacks, or other original shipping containers.
 - 2.) Areas where surplus or non-used equipment is stored, storage for packaging or labeling supplies.

3. CEILINGS

- a. Ceilings in food processing, utensil or equipment washing areas, janitorial areas, shall be smooth, non-absorbant, and have a light colored washable finish.
- b. Blown acoustical-type ceiling is not acceptable.
- c. An approved list of acoustic ceiling panels is available. (See Supplement IX.)

NOTE: Ice machines storage areas, janitorial areas, areas where floors are washed down, utensil washing areas, must comply with floor, wall and ceiling requirements.

4. CONDUIT/ PIPELINES

- a. All plumbing, electrical, and gas lines shall be concealed within the building structure as much as possible. Where this is absolutely not possible, all runs shall be at least 1/2 inch away from the walls or ceiling and at least six (6) inches off the floor.
- b. Where conduit or pipelines enter a wall, ceiling or floor, the opening around the line shall be tightly sealed.
- c. Conduit, pipe or drain lines shall not be installed across any aisle, traffic area or door opening at or near the floor surface.
- d. Multiple runs or clusters of conduit or pipelines shall be furred out and encased in an approved raceway or other sealed enclosure to prevent a vermin harborage.

5. VENTILATION

a. 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, and to provide reasonable comfort for all employees.

6. EXHAUST HOODS AND DUCTS

- a. Mechanical exhaust ventilation shall be required at or above all ranges, griddles, ovens, deep fat fryers, and high temperature dishwashing machines or similar equipment to effectively remove grease, smoke, steam, vapors, heat or odors.
 - A *Type I Hood* is a hood for collecting and removing grease and smoke. This hood shall be equipped with approved grease filters or grease extractors designed for that specific purpose.
 - NOTE: This section shall not apply to cooking equipment that has been evaluated by the State Health Department and found to produce no heat, smoke, grease or gases.
 - A *Type II Hood* is a general hood for collecting and removing steam, vapors, heat or odors.
- b. All hoods, ducts, and exhaust outlets shall be installed in accordance with Chapter 20 of the current edition of the Uniform Mechanical Code as adopted by the local building department.
- c. Detailed requirements: Provide an illustration sheet showing hood exhaust data. (See Supplement VI.) Contact this Division for more detailed requirements.
- d. All joints and seams shall be sealed or soldered for ease of cleaning. Riveted seams are not acceptable.

- e. Canopy-type hoods shall not be more than four (4) feet above the cooking surface unless approved. The hood shall overhang or extend a horizontal distance not less than six (6) inches beyond the outer edges of the cooking surfaces, on all open sides. It shall have grease troughs or drip pans that are easily cleanable.
- f. Noncanopy-Type (High Velocity) or Back Shelf Hoods: Noncanopy-type hoods will be approved providing they are constructed to be easily cleanable and comply with the minimum exhaust air velocity requirements. Shielding at the ends of the hood may be necessary to prevent interference from cross drafts.
- g. Make-Up Air: Make-up air shall be provided equal to that amount which is mechanically exhausted, and shall be electrically interconnected on a single switch. Windows and doors shall not be used for the purpose of providing make-up air.
- h. Hot holding or warming equipment placed above other equipment yet beneath an exhaust hood may create an air flow obstruction to proper ventilation of the equipment for which the hood ventilation system is designed. The design, construction and installation of such warming devices under a hood are thereby subject to evaluation and approval by this Division prior to installation.
- i. Fire Suppression Systems: Fire suppression systems may be required by local fire department codes. They shall be installed so as to allow ease of cleaning in the hood and duct systems.

7. REFRIGERATION/FREEZERS

- a. All refrigeration/freezer units shall be adequate in capacity to the needs of the proposed operation and shall comply with the following requirements:
 - 1.) Be specifically constructed for commercial use (ANSI listed). (*Domestic model refrigeration/freezer units will not be accepted.*)
 - 2.) Be provided with an accurate, readily visible thermometer.
 - 3.) Have shelving that is nonabsorbent and easily cleanable. (Wood is not acceptable.)
 - 4.) Have smooth, nonabsorbent and easily cleanable surfaces. All joints must be sealed.
 - 5.) Condensate waste from refrigeration/freezer units must be drained into a floor sink via legal air gap (*two times the diameter of the pipe*) or to a built in evaporation tray.
 - 6.) Rapid cool down facilities may be required depending on the food operation.

b. WALK-IN REFRIGERATION/FREEZER UNITS SHALL ALSO:

- 1.) Have an integrally coved base with a radius of at least 3/8 inch at the floor/wall juncture; the floor material shall extend up to a height of at least four (4) inches on the walls. Four (4) inch approved metal topset coving with a minimum 3/8 inch radius is acceptable against metal wall surfaces of walk-in refrigeration/freezer units. (Wood is not an acceptable interior finish.)
- 2.) Have shelving that is at least six (6) inches off the floor with smooth, round, metal legs or cantilevered, suspended directly from the wall, for ease of cleaning. Wood shelving IS NOT

acceptable. Solid shelving is not permitted. Use only approved open-grate type shelving to facilitate air circulation. Small, easily movable, castered dollies may be used in place of a lower shelf inside a walk-in refrigeration/freezer unit.

- 3.) In large refrigeration or freezer walk-ins, where fork lifts are used to store food items on pallets, commercial pallet racking is acceptable for food storage.
- 4.) Condensate waste shall drain into a floor sink via legal air gap. The floor sink must be located outside the walk-in refrigeration/freezer unit and within the building.
- 5.) Walk-ins shall be flashed and sealed to adjacent wall unless sufficient access is available between walk-in and wall for cleaning and maintenance. Walk-ins may be required to be flashed up to the ceiling.

NOTE: Floor drains, and trench drains are not permitted inside the walk-in unit unless they are indirectly connected to the sewer through a legal air gap.

Walk-in refrigeration/freezer units shall open into the food facility.

8. ICE MACHINES

All ice machines shall be located inside the food establishment in an easily cleanable, well-ventilated area, and shall be drained to a floor sink via legal air gap of at least two pipe diameters.

9. FLOOR SINKS

- a. All condensate from equipment shall be drained by means of indirect waste pipes into a floor sink via legal air gap of at least two pipe diameters.
- b. Floor sinks shall be installed flush with the floor surface and have strainers and proper grates.
- c. Horizontal runs of drain lines shall be at least 1/2 inch from the wall and six (6) inches off the floor with a 1/4" per foot slope until terminating above the overflow rim of the floor sink by at least two pipe diameters.
- d. Floor sinks shall be located so that they are readily accessible for inspection, cleaning and repair. The floor sink must be located within 15 feet of the drain opening of the equipment served or otherwise slope at a rate of ¼ inch per foot.
- e. Waste lines shall not cross any aisle, traffic area or door opening at or near the floor.
- f. Waste lines, condensate lines, shall not be installed directly over food, food processing equipment, or food containers.

g. A cleaning and servicing area with approved drain(s) or floor sink(s) is required for the disposal of liquid wastes and the cleaning of food carts or food vehicles.

NOTE: Floor drains, and trench drains are not permitted inside the walk-in unit unless they are indirectly connected to the sewer through a legal air gap.

10. UTENSIL SINKS

- a. Where food processing utensils and equipment are cleaned and sanitized, there shall be provided a three-compartment stainless steel sink with dual integral installed stainless steel drainboards that drains into a floor sink via a legal air gap of at least two pipe diameters.
- b. The minimum compartment size shall be at least 18"x 18" x 12" deep with minimum 18" x 18" drainboards, or 16" x 20" x 12" deep with minimum 16" x 20" drainboard. However, the sink must otherwise be capable of accommodating the largest utensil to be washed and the drainboards shall be as large as the largest sink compartment.
- c. When a sink is installed next to a wall, a metal "backsplash" extending up the wall at least eight (8) inches shall be formed as an integral part of the sink, and sealed to the wall.
- d. In large food facilities which may contain separate sections or departments, additional three-compartment sink(s) may be required for utensil washing and sanitizing procedures in processing areas.
- e. A utensil sink may not be required if facility is 100% prepackaged, e.g., no food or drink preparation.
- f. A three-compartment sink is required for a salvaging facility.
- g. No food preparation or hand washing is allowed at a utensil washing sink.
- h. Three compartment sinks used for sanitizing utensils or equipment shall be provided with a sanitizing test kit or test strips to monitor sanitizer levels

11. FOOD/VEGETABLES PREPARATION SINKS

Food facilities utilizing a sink for food preparation, such as thawing, washing vegetables, etc., shall have at least one (1) one-compartment food/vegetable preparation sink, separate from utensil washing sinks, that drains to a floor sink via air gap of at least two pipe diameters. At least one attached drainboard is recommended. No handwashing or utensil washing is allowed at food preparation sinks.

12. AUTOMATIC UTENSIL WASHERS

- a. All automatic utensil washers must meet or be equivalent to American National Standards Institute (ANSI) and must drain to a floor sink or other approved method via a legal air gap of at least two pipe diameters.
- b. All spray-type utensil washers which are designed for a hot water sanitizing rinse shall be provided with a booster heater that meets or is equivalent to approved applicable sanitation standards or be

connected to an approved recirculating water system which is capable of maintaining the rinse water at not less than 180°F. These dishwashers require an approved exhaust hood. The dishwasher must also be provided with thermometers and pressure gauges to indicate the proper water flow pressures, and temperatures. Appropriate valves for testing the accuracy of the gauges and thermometers shall also be properly installed.

- c. Utensil washing machines are to be provided with a pre-rinse unit. Garbage disposals are recommended if large amounts of food debris exists on utensils.
- d. A minimum three-compartment, stainless steel sink with dual integral drainboards is required in addition to any utensil washing machine.
- e. Chemical sanitizing utensil washers shall be provided with a sanitizing test kit or test strips to monitor sanitizer levels.

13. GARBAGE DISPOSALS

Garbage disposals, if proposed, must be installed in drainboards if the drainboard is lengthened to accommodate the disposal unit in addition to the minimum 18" required drainboard size. Garbage disposals shall not be placed in or under any sink compartment. The waste piping shall be connected directly to the sewage system.

14. JANITORIAL SINK AND SUPPLIES

- A janitorial room, area, or cabinet, separate from any food preparation or storage area, shall be
 provided for the storage of cleaning equipment and supplies, such as mops, buckets, brooms and
 cleaning agents.
- b. A janitorial sink shall be located within the building, in a separate janitorial room or separated from the rest of the food establishment by a solid-wall partition. The partition must be a minimum six (6) foot high, durable, smooth and an easily cleanable surface.
- c. A one-compartment, wall-mounted janitorial sink or a floor mounted janitorial sink, or a curbed area, (properly sloped to a drain), that has hot and cold running water through a mixing faucet, with an approved backflow-prevention device, shall be installed for general cleanup activities. All curbed-area surfaces shall be smooth, impervious and of easily cleanable construction. Where duckboards or floor mats are used in the food facility, a curbed area with a drain is required for cleaning.
- d. All poisonous substances such as detergents, bleaches, cleaning compounds, and all other injurious or poisonous materials shall be stored and used only in a manner that is not likely to cause contamination or adulteration of food, food contact surfaces, utensils, or packaging materials.

NOTE: Only authorized, trained personnel shall have access to cleansers, sanitizers, or other chemicals.

15. HANDWASHING SINKS

- a. Hand sinks shall be provided in the food preparation areas that are sufficient in number and conveniently located so as to be accessible at all times for use by food handlers. Hot and cold water through a premixing faucet is required. Faucets shall be operated by foot or knee activated valves.
- b. Soap and sanitary towels shall be provided in single-service, permanently installed dispensers at the hand sinks. When used, hand sanitizing dispensers are to be located adjacent to handwash sinks.
- c. A separate, approved hand sink must be conveniently located in each area of a food facility which handles unpackaged food.

16. GENERAL PURPOSE HOT WATER

- a. Provide a water heater which is capable of constantly supplying hot water at a temperature of at least 120°F at all times to all sinks, hand sinks and other cleanup facilities. In sizing the water heater, the peak hourly demands for all sinks, etc., are added together to determine the minimum required recovery rate. (See Supplemental X, Computing Hot Water Demands.)
 - The water heater should not be purchased until this Division has determined the minimum required recovery rate for the particular food establishment.
- b. All sinks shall be provided with hot and cold running water from a mixing faucet.

17. WAREHOUSE / STORAGE FACILITIES

- a. Adequate warehousing or storage facilities shall be provided and be separated by a door(s) from food processing and preparation rooms with an effective fly exclusion device. All food shall be properly stored a minimum of six inches (6") above the floor on approved shelving. Pallets may be used in lieu of shelving if equipment is available upon demand to move the pallets.
- b. Shelving in food processing areas shall be impervious and have smooth easily cleanable surfaces. Wood shelving in walk-in refrigerators or processing areas is NOT approved. Shelves installed on a wall shall have at least one (1) inch of open space between the back edge of the shelf and the wall surface, otherwise, the back edge of the shelf shall be sealed to the wall with approved silicone sealant or equivalent The lowest shelf shall be at least six (6) inches above the floor, with a clear, unobstructed area below, or be the upper surface of a completely sealed, continuously coved base, with minimum height of four (4) inches. All shelves located below a counter or work surface shall be set back at least two (2) inches from the drip line of the surface above.
- c. In processing areas, where shelves are supported by legs on the floor, the legs shall be smooth, round, metal equipment legs.
- d. Rodent Line. In warehousing areas all pallets and racking are to be located at least 18 inches from walls. In addition, an 18-inch smooth, white, rodent line shall be painted along the interior perimeter of the warehouse.
- e. A wall with the appropriate finish schedule may be required to provide a separation between the storage of food carts and vehicles and the preparation and storage of food items.

18. RESTROOMS

- a. Toilet facilities shall be provided within each food facility, convenient for the employees. (Check with local Building and Safety departments for special circumstances, such as the American Disability Act.)
- b. The floors, walls and ceilings shall have surfaces that are smooth, nonabsorbent and easily cleanable. A four-foot-high wainscot of a durable impervious material shall be installed above the 4inch coving on all restroom walls.
 - Fiberglass reinforced polyester paneling (FRP) ceramic tile, or stainless steel, may be used as a wainscot.
- c. Handwashing sinks shall be provided within or immediately adjacent to the toilet rooms. The sink(s) shall be provided with hot and cold running water from a premixing type faucet. Faucets shall be automatic, pedal or knee activated, or wrist blade type to avoid recontamination of hands. Faucets with spring operated shut off mechanisms are NOT permitted. Additional handwashing sink(s) may be required after employees leave the restroom or prior to entering the food processing area. Sanitary towels in single-service, permanently installed dispensers shall be provided at the restroom handsink sink(s). Approved air driers may be used instead of towel dispensers. Each handsink shall have its own permanently installed soap dispenser.
- Toilet tissue shall be provided in a permanently installed dispenser at each toilet.
- Restrooms doors shall be tight-fitting and self-closing.
- f. Toilet facilities shall not open directly into a food processing area.
- g. All toilet rooms shall be provided with a ventilation system approved by this Division. Mechanical ventilation is required in each toilet room.

19. EMPLOYEE CHANGE ROOMS

- a. A room with lockers or shelf and pole at least 4-foot x 5-foot minimum with door, separated from toilets, food storage or food preparation areas shall be provided where employees may change their clothes and store their outer garments and personal belongings. A larger change room or an additional room may be required, depending upon the total number of employees. The change room(s) shall be large enough to accommodate a standard locker for each employee per shift. Sufficient ventilation must be provided in each employee dressing room.
 - *NOTE: Check with local Building and Safety departments for American Disability Act requirements.
- b. The clothing change rooms shall not be used as an office or for other food establishment activities.
- c. No telephone jacks, computer jacks, water heaters or other appurtenances will be accepted in this room.

20. PEST EXCLUSION

a. Processing Room(s). Approved doors are required at all entrances into the processing room, including entrances between the warehouse / storeroom and the processing area. Doors between the warehouse and the processing area shall be self-closing, have adequate weather stripping, and / or may be required to be equipped with an effective fly exclusion device, e.g. air curtain.

All delivery doors leading to the outside from the processing room shall open outward, have adequate weather stripping, be self-closing and SHALL be provided with an overhead air curtain. An air curtain device must provide 750 feet per minute at all delivery doors that are four (4) feet or less in width. An air curtain device must provide 1,600 feet per minute at all delivery doors that are over four (4) feet in width. An air curtain is not a substitute device to permit a door to remain open. Large cargo-type doors shall not open directly into a food processing area from the outside.

- b. **Warehouse**. Cargo-type doors that open into any food warehouse, associated with a processing facility, may only be open during deliveries.
- c. All personnel entrance doors leading to the outside shall be tight fitting, have adequate weather stripping, open outward and be self-closing to effectively prevent the entrance of insects and rodents.
- d. Truck docks shall have effective pest exclusion devices such as cushion type seal around the roll-up doors, dock plate brushes, etc., to prevent any vermin entrance.
- e. All openable windows, such as restroom windows, shall be screened with not less than 16 mesh screening. Openable windows in a processing room are not approved.

21. GARBAGE AND TRASH AREAS

- a. An area shall be provided for the storage and cleaning of garbage and trash containers.
- b. The walls, floor and ceiling of this room or outside area shall be constructed so as to be smooth, impervious and easily cleanable.
- c. Inside trash storage areas shall properly drain (slope 1:50) to a floor drain.
- d. Outside trash storage areas shall properly drain so as not to create a nuisance.
- Outside trash storage areas should be situated as far away from delivery doors as possible.

22. LIGHTING

- a. All food preparation and utensil washing areas shall be provided with at least 20 foot-candles of light, 30 inches above the floor.
- b. Food and utensils storage rooms, refrigeration, storage, toilet rooms and dressing rooms shall be provided with at least 10 foot-candles of light.

- c. A minimum of 20 foot-candles of light shall be provided in all areas during cleanup activities.
- d. Light fixtures in areas where food is prepared, open food is stored or utensils are cleaned shall be of shatterproof construction or shall be protected with shatterproof shields.

23. EQUIPMENT

- a. All new and replacement food processing utensils and equipment shall meet or be equivalent to approved applicable sanitation standards (ANSI). In the absence of approved applicable sanitation standards, all new and replacement food processing utensils and equipment shall be approved by the Division. Nothing in this section shall preclude the department from approving nationally recognized sanitation standards. Until the Division approves standards pursuant to this section, standards adopted by nationally recognized testing organizations, as of January 1, 1997, may be used.
- b. All counters, shelves, tables, refrigeration equipment, sinks and other equipment used in connection with the preparation and storage of food shall be made of nontoxic materials and so constructed and installed as to be easily cleaned.
- c. All equipment shall be placed on minimum six-(6) inch high metal legs, be completely sealed in position, or be on approved casters or cantilevered from the wall in an approved manner.

24. WATER

An adequate, protected, pressurized, potable water supply shall be provided to serve the facility. The water supply shall be from an approved source. Private water sources shall comply with the Division of Environmental Health Services / Water Program.

25. BACKFLOW PROTECTION

An approved backflow prevention device or approved air gap shall be properly installed upstream of any potential hazard between the potable water system and a source of contamination, i.e., all faucets, hose bibs, wash down stations, chemical pre-mixing devices, or other equipment or devices directly connected to the water supply.

26. SEWAGE DISPOSAL/GREASE INTERCEPTORS

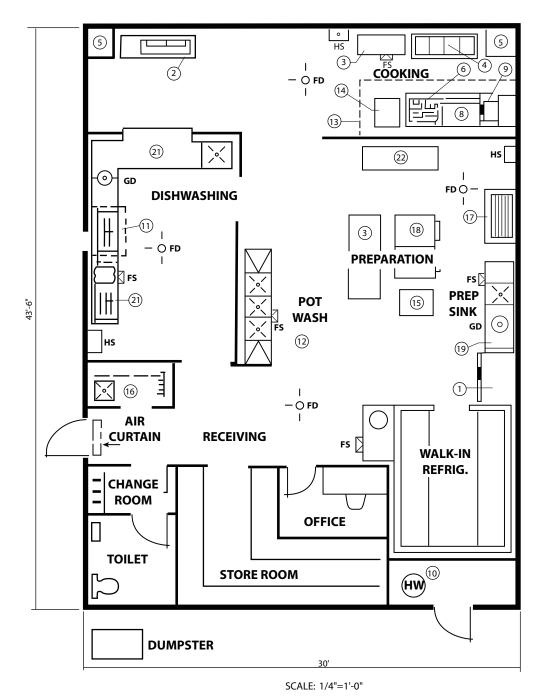
- a. All liquid waste, (except hazardous waste, grease, etc.), including sewage, generated by a food facility shall be disposed of in an approved manner into either a public sewer system or to an approved on-site sewage disposal system.
- b. When a grease interceptor or grease trap is required by the local Building and Safety department, the unit should be installed outside the food facility in the ground. If the unit is installed inside the food facility, it shall not be installed in the food preparation area and must be flush with the floor.
- c. All grease waste must be stored in an approved leak proof container with a tight fitting lid. All grease waste must be removed from the premises and disposed in an approved manner.
 - NOTE: Check with local agencies (i.e., Building and Safety Department and Local Sewage District) for special sewerage and grease interceptor requirements.

PRELIMINARY FOOD FACILITY PLAN REVIEW SHEET

Establi	shmen	t Name							
Addres	SS								
Contac	t Name	e and Phone N	lo						
Yes	Yes No								
		Three (3) iden	tical complete sets o	f plans.					
		Site plan inclu	ding trash enclosure.						
	Floor plan drawn to scale, showing all equipment.								
		Name of estab	olishment, address, o	wner or contract	tor's ac	ddress, contact phone	number on plans.		
		Finish Schedu	le – Indicate materia	ls and color.					
									0 "
Janit	torial Are	a	Floor	Integral Cov	ving	4' Wainscot	Walls		Ceiling
	d Prep A								
Ware	ehouse /	Storage		<u> </u>				,	
Walk	-In Refr	igeration			Α:	schedule simil	ar to this is		
Rest	Restroom(s) to appear on your plans								
Dres	Dressing Room								
Utensil Washing Area									
Addi	Additional Areas								
Yes	No	40							
		Dressing Room – MINIMUM size 4' x 5' with door							
		*Restrooms							
		Make, manufacturer and model number of all equipment. If installing dishwasher, submit information on unit							
		Exhaust Hood – Detailed drawings, specifications, and calculations. 100% make-up air required and electrically inter-connected with exhaust system on one switch.							
		Commercial Hood – Mechanical Exhaust Data Information Sheet							
		Three (3) compartment sink with equal sized metal drainboards attached to both ends. Sink must indirect waste to floor sink.							
		Food Prep Sink							
		Handwashing Sink – to be located in food prep area							
		Mop Sink – for disposal of dirty mop water and cleaning mops. (Area to store mops, brooms, etc.)							
		Cabinet or Sec	cured Area with lock	to store cleaning	gagent	s and poisons.			
		Type and Size	of water heater (nun	nber of BTUs or	KWs)				
*See su	ıppleme	ntal XI							
Date_			Owner/	Agent Signature					
			Environ	mental Health S	peciali	st/Technician Signatur	re		

PLAN CHECKER MAY BE REACHED BETWEEN 8:00 AND 9:00 AM

SAMPLE FLOOR PLAN



NOTE: FLOOR TO SLOPE TO FDs

 $\label{thm:constraint} \textbf{Each piece of equipment is numbered to correspond to the listing on Supplemental III.}$

Floor Drains: FD; Floor Sinks: FS; Hand Sinks: HS; Hoods at or over equipment.

Note: This is not intended as a model layout but ONLY to illustrate procedure for submitting plans and data for approval.

Scale has been reduced for illustration only.

SAMPLE EQUIPMENT SCHEDULE

E Q U I P M E N T	*EQUIPMENT MAKE AND MODEL	G A S C O N N E C T I O N	E L E C T R I C A L	H O T W A T E R	C O L D W A T E R	W A S T E W A T E R	COMMENTS
1,	Reach-in Refrigerator Forte: Side Model EHS		110V 20A			F.S.	
2	Food PreparationTable Coltor: Model DLM		110V 20A				Self-contained
3	Work Table, Stainless Steel Top – Coltor, Custom						Made to dimensions supplies by General Contractor
4	Heavy Duty Range Fulton, Model I.A.N.	3/4"					
5	Steam Cooker Fulton, SC5				1/2"	F.S.	Anti-siphon Valve
6	Deep Fat Fryer Meier, Type L	1/2"					
7	Hot Water Heater Mills G-BT155	3/4"		1"	1"		155,000 BTU
8	Dish machine and Hood Warford., QF-1		220V	1"	1"	F.S.	High-temperature dishwasher hood
9	Utensil Sink Coltor, 18" x 18" x 18" F			1/2"	1/2"	2"	
10	Hood Custom by General Contractor						See mechanical drawing, detail
11	Bake Oven Meier, O/B	3/4"					
12	Proofing Cabinet Meier, P-C	1/2"					
13	Janitorial Sink Coltor, STD			1/2"	1/2"	2"	18x18x18 fiber glass/cantilevered from wall
14	Bakers Table Custom by CONRAD						Hardwood top
15	Freezer Forte: Side Model F		110V				Self-contained
16	Food Preparation Sink Coltor, Custom			1/2"	1/2"	F.S.	One compartment w/drainboard extended for disposal

*ABOVE EQUIPMENT LISTINGS ARE FICTITIOUS

THIS IS A SAMPLE ONLY: Specific Brand Names and colors for materials should be specified to insure acceptability.

SAMPLE FINISH SCHEDULE

	FLOOR	FLOOR BASE OR COVE	WALLS	CEILING
FOOD PREPARATION	QUARRY TILE	QUARRY TILE, UP WALL 4 INCHES 3/8" RADIUS COVE	F.R.P.	WASHABLE NON-ABSORBENT LAY-IN CEILING PANELS
UTENSIL WASHING	QUARRY TILE	QUARRY TILE, AS ABOVE	F.R.P.	WASHABLE NON-ABSORBENT LAY-IN CEILING PANELS
WAREHOUSE	**SEALED SMOOTH CONCRETE		DRYWALL WITH WHITE GLOSS ENAMEL	WASHABLE NON-ABSORBENT LAY-IN CEILING PANELS
RESTROOMS	CERAMIC TILE	CONTINUOUS WITH FLOOR UP WALL 4 INCHES WITH 3/8" RADIUS COVE	GREENBOARD, 4 FT. CERAMIC WAINSCOT	WATER-RESISTANT DRYWALL, WHITE ENAMEL
CLEANING EQUIPMENT/ MOP EQUIPMENT	QUARRY TILE	CONTINUOUS WITH FLOOR UP WALL 4 INCHES WITH 3/8" RADIUS COVE	F.R.P.	WASHABLE NON-ABSORBENT CEILING PANELS
DRESSING ROOM(S)	CERAMIC TILE	CONTINUOUS WITH FLOOR UP WALL 4 INCHES WITH 3/8" RADIUS COVE	DRYWALL WITH WHITE ENAMEL	LIGHT-COLORED ENAMEL PAINTED DRYWALL
WALK-IN REFRIGERATOR	**SEALED SMOOTH CONCRETE	PREFABRICATED STAINLESS STEEL WALL UP WALL 4 INCHES, 3/8" RADIUS SANITARY COVE	PREFABRICATED STAINLESS STEEL	PREFABRICATED STAINLESS STEEL

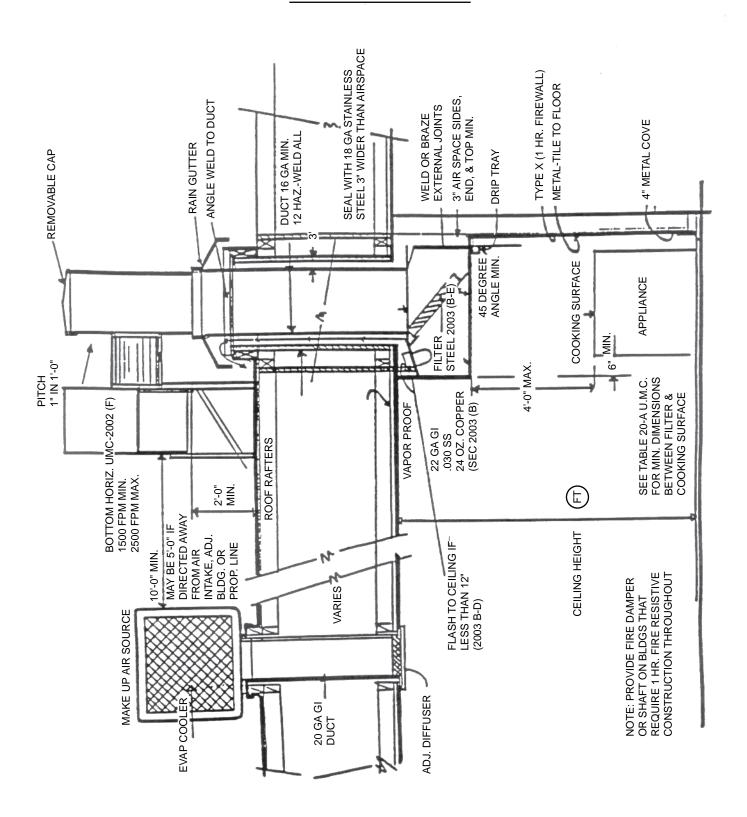
**SMOOTH CONCRETE IS SEALED TO BE GREASE RESISTANT WITH AN APPROVED SEALER.

COMMERCIAL HOODS/MECHANICAL EXHAUST DATA INFORMATION SHEET

Establishment Name:	
Job Address:	
Owners Name:	Phone:
Contractor/ Agent: _	Phone:
 Provide the following information conce One set of data sheets for each hood s 	erning mechanical exhaust and hood design (3 sets required). system.
Size of Hood:	
CFM: F	Formula & Calcs as per current Uniform Mechanical Code
Number of duct(s):	Size of duct(s):
Number of grease filters:	
Size of grease filters:	
Rating of each filter: (CFM or FPM)	
Type of filter:	Mesh Baffle
Make-up Air (CFM): (100% make-up air required to be electrically interest.)	connected to exhaust system on 1 switch).
Elevated drawing of hood and cooking e	quipment shown on page # of plans.
ICBO#_	Must be listed for compensating hoods only
Hood Manufacturer (required for listed h	oods)
Hood design and construction shall me	eet recognized standards.
Flashing shall extend from hood to floo	r coving.
Wall surfaces within 18" of all cooking 6	equipment shall be flashed.

Revised 02/02

SAMPLE HOOD DETAIL



NOTE: Code sections refer to Uniform Mechanical Code (U.M.C.) Excerpts from Chapter 20 of the U.M.C.

EXCERPTS FROM CURRENT UNIFORM MECHANICAL CODE

SECTION 508 COMMERCIAL HOODS

508.1 Where Hoods Are Required. Hoods shall be installed at or above all commercial-type deep-fat fryers, broilers, fry grills, steam jacketed kettles, hot-top ranges, ovens, barbecues, rotisseries, dishwashing machines and similar equipment which produce comparable amounts of steam, smoke, grease or heat in a food-processing establishment. For the purpose of this section a food-processing establishment shall include any building or portion thereof used for the processing of food but shall not include a dwelling unit.

508.2 Materials and Installation. Types I and II hoods shall be constructed of galvanized steel, stainless steel, copper or other material approved by the building official for the use intended.

508.2.1 Type I hoods. Type I hoods constructed of galvanized steel shall be at least 0.030 inch (0.76 mm) (No. 22 gauge) steel.

508.2.2 Type II hoods. Type II hoods shall be constructed of at least 0.024-inch (0.61 mm) (No. 24 gauge) steel. Hoods constructed of copper shall be of copper sheets weighing at least 24 ounces per square foot (7.3 kg/m2). Hoods constructed of stainless steel shall have a minimum thickness of 0.030 inch (0.76 mm).

508.2.3 Supports. Hoods shall be secured in place (for OSHPD 1, 2 & 4] to resist the lateral loads given in the California Building Code, Title 24, Part 2, by noncombustible supports.

508.2.4 Joints and seams. Joints and seams shall be substantially tight. Solder shall not be used except for sealing a joint or seam. 508.3 Cleaning and Grease Gutters. When installed, a hood shall be designed to provide for thorough cleaning of the entire hood. When grease gutters are provided, they shall drain to a collecting receptacle, fabricated, designed and installed to be accessible for cleaning.

508.4 Clearances for Type I Hood. A Type I hood shall be installed with clearance of at least 18 inches (457 mm) from combustible construction. This clearance may be reduced to 3 inches (76 mm), provided the combustible material is protected with materials as specified for one-hour fire-resistive construction on the hood side. Hoods less than 12 inches (305 mm) from the ceiling or wall shall be flashed solidly with materials of the thickness specified in Section 508.2 or materials conforming to one-hour fire-resistive construction.

508.4.1 Hoods penetrating a ceiling. Type I hoods or portions thereof penetrating a ceiling, wall or furred space shall comply with all the requirements of Section 507.6.

508.5 Grease Filters. Type I hoods shall be equipped with approved grease filters designed for the specific purpose. [For SFM, A DHS, DSA/SSJ] Grease filters shall be Class I when tested in L C accordance with the test method in SFM 12-71-1. Grease-collecting equipment shall be accessible for cleaning. The lowest edge of a grease filter located above the cooking surface shall be at least the height set forth in Table 5-D.

508.5.1 Criteria. Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or approved. Filter units shall be installed in frames or holders with handles by which they may be readily removed without the use of tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. They shall be sized and made removable so they may be passed through a dishwashing machine or cleaned in a pot sink and so arranged in place or provided with drip intercepting devices as to avoid grease or other condensate from dripping into food or on food preparation surfaces.

508.5.2 Mounting position. Filters shall be installed at an angle greater than 45 degrees from the horizontal and shall be equipped with a drip tray beneath the lower edge of the filters.

508.6 Canopy Size and Location. For canopy-type commercial cooking hoods the inside edge thereof shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the cooking surface on all open sides, and the vertical distance between the lip of the hood and the cooking surface shall not exceed 4 feet (1219 mm).

EXCEPTION: Listed exhaust hoods are to be installed in accordance with the terms of their listing and manufacturer's installation instructions.

508.7 Capacity of Hoods. Canopy-type commercial cooking hoods shall exhaust through the hood a minimum quantity of air determined by application of the following formulas:

WHERE:

- A = the horizontal surface area of the hood, in square feet (m2).
- D = distance in feet (m) between the lower lip of the hood and the cooking surface.
- P = that part of the perimeter of the hood that is open, in feet.
- Q = quantity of air, in cubic feet per minute (m3/s).

When cooking equipment is installed back to back and is covered by a common island-type hood, the airflow required may be calculated using the formula for three sides exposed. Type II hood airflow requirements shall be in accordance with the requirements for low-temperature appliance hoods.

508.7.1 Solid fuel. Type I hoods for use over solid-fuel cooking equipment shall be provided with separate exhaust systems. Undefined cooking equipment other than solid-fuel cooking equipment may be installed under a common hood. The minimum airflow for solid-fuel cooking equipment, grease-burning charboilers, and undefined equipment shall be:

Number of Exposed Sides Formula For SI:

4 (island or central hood) Q = 300A Q = 0.46A3 or less Q = 200A Q = 0.31AAlternate formula Q = 100PD Q = 0.16PD

EXCEPTION: Listed exhaust hoods are to be installed in accordance with the terms of their listing and the manufacturer's installation instructions.

508.7.2 High temperature. Type I hoods when the cooking equipment includes high-temperature appliances such as deep-fat fryers:

Number of Exposed Sides Formula For SI:

4 (island or central hood) Q = 150A Q = 0.23A3 or less Q = 100A Q = 0.16AAlternate formula Q = 100PD Q = 0.16PD

EXCEPTION: Listed exhaust hoods are to be installed in accordance with the terms of their listing and the manufacturer's installation instructions.

508.7.3 Medium temperature. Type I hoods when the cooking equipment includes medium-temperature appliances such as rotisseries, grills and ranges:

Number of Exposed Sides Formula For SI:

4 (island or central hood) Q = 100A Q = 0.16A3 or less Q = 75A Q = 0.12AAlternate formula Q = 50PD Q = 0.08PD **EXCEPTION:** Listed exhaust hoods are to be installed in accordance with the terms of their listing and the manufacturer's installation instructions.

508.7.4 Low temperature. Type I hoods where the cooking equipment includes low-temperature appliances such as medium-to-low-temperature ranges, roasters, roasting ovens, pastry ovens and equipment approved for use under a Type II hood, such as pizza ovens:

Number of Exposed Sides Formula For SI:

4 (island or central hood) Q = 75A Q = 0.12A3 or less Q = 50A Q = 0.08AAlternate formula Q = 50PD Q = 0.08PD

EXCEPTION: Listed exhaust hoods are to be installed in accordance with the terms of their listing and the manufacturer's installation instructions.

508.8 Capacity for Noncanopy Hoods. In addition to all other requirements for hoods specified in this section, the volume of air exhausting through a noncanopy-type hood to the duct system shall not be less than 300 cubic feet per minute per lineal foot [0.046 m3/(s•m)] of cooking equipment. Listed noncanopy grease hoods and filters shall be sized and installed in accordance with the terms of their listing and the manufacturer's installation instructions.

508.9 Exhaust Outlet. An exhaust outlet within the hood foot (3658 mm) section of hood. EXCEPTION: Listed exhaust hoods are to be installed in accordance with terms of their listing and the manufacturer's installation instructions.

508.10 Performance Test. Upon completion and before final approval of the installation of a ventilation system serving commercial food heat-processing equipment, a performance test may be required to verify the rate of airflow and proper operation as specified in this chapter. The permittee shall furnish the necessary test equipment and devices required to perform the tests.

FLOORING MATERIALS INFORMATIONAL BULLETIN

The California Food Sanitation Act requires that floors in the following areas shall be "of impermeable construction and of a nonabsorbent material which is easily cleaned ".

Approved floor materials are required in the following areas:

- Food preparation and food handling areas
- Sink areas
- Utensil/Equipment washing areas
- Ice machine areas
- Janitorial and mop sink areas
- Food/ packaging storage
- Warehouse areas
- Hand wash sink areas
- Restrooms
- Garbage and refuse storage areas

The Division of Environmental Health Services considers the following finish materials to meet the criteria for the areas stated above:

- 1. Quarry tile floor with a quarry tile coved base.
- 2. Ceramic tile floor with a ceramic tile coved base. The ceramic tile must be slip resistant.
- 3. Commercial grade sheet vinyl flooring coved up the wall with properly installed coving board behind for support.
- 4. Concrete floor with an approved grease resistant sealer and one of the following coved bases:
 - A. slim foot ceramic tile
 - B. metal coving properly installed
- 5. Approved troweled on epoxy floor with integrally formed epoxy cove. Slip resistant textures to be used only in foot traffic areas.
- 6. Other equivalent materials may be allowed on a case-by-case basis upon review of the manufactures literature and a product sample.

NOTE: Floor surfaces (except in pre-packaged food/ warehouse areas) shall be coved at the juncture of the floor and wall with a 3/8 inch minimum radius coving and shall extend up the wall at least 4 inches.

NOTE: FLOOR MATERIALS MUST BE COMPATIBLE WITH COVING

Four (4) inch vinyl or rubber topset cover base and vinyl composition tile floor will be permitted only in the following areas:

- Original bulk container packaged dry food storerooms
- Other nonfood areas
- Dressing rooms
- Offices

ACOUSTIC CEILING PANELS

The following acoustic lay-in ceiling panels are approved for use in the following areas of food establishments in San Bernardino County.

· Food preparation areas

All sink areas (dishwashing, utensil sink, hand sink, janitorial sink)

Restrooms

MANUFACTURER PRODUCT

Armstrong #870: Mina board ML (metal laminate; nonperforated)

Acoustic-Clad (nonperforated)

Armstrong #1721: Mylar Fire Guard (nonperforated)

Capaul: Envirogard with Clean Room Facing

Domtar Gypsum: White Vinyl Facing Pane

Marlite: FRP Ceiling Panels

a) .090 inch Pebble Finish

b) .030 inch Laminated to 5/8" Gypsum Panel c) .030 inch Laminated to Class A/1 5/8"

U. S. Gypsum #3270: Vinyl Rock

U. S. Gypsum #56091: Envirogard with Clean Room Facing

This list is subject to revision at any time. Persons wishing approval on panels other than those listed above may submit them to the Division of Environmental Health Services for review. Call (909) 458-9673 for details.

NOTE: Tiles should be held in place by hold down clips or two-way tape on T-Bars.

COMPUTING HOT WATER DEMANDS FOR FOOD ESTABLISHMENTS

A. Hot and cold water under pressure shall be provided through a mixing valve to each sink compartment.

1. Fixture	# of Compartments	Gallons per Hour
Utensil Sinks 18"x18"	1	14
Utensil Sinks 18"x18"	2	28
Utensil Sinks 18"x18"	3	42
2. Food preparation sink	1	5
3. Janitorial sink	1	15
4. Hand washing sink	1	5

If any other plumbing fixtures will be installed such as bar sinks, dishwashing machines, pre-wash (dishwashing), etc., please consult the Plan Check Specialist in either the Ontario, San Bernardino, or Victorville office for assistance.

Example:

Plumbing fixtures	GPH (peak demand)
3 Compartment Sink	42
Janitor Sink	15
Food Prep Sink	5
3 Hand Sinks	15
	77 GPH

Factors of Formula

Wt. of water per gal = 8.33 lbs

Temp. rise (average) 120°F - 70°F change

Thermal efficiency...gas = .75

Thermal efficiency....electric = .98 (round off to 1.0 for ease of calculation)

1 KW = 3,412 BTU's (round off to 3,400)

1. GAS HOT WATER SYSTEMS

Formula

BTU input = gph x wt. Per gal x temp. rise

Thermal efficiency of equipment

 $77GPH \times 8.33 \times 50^{\circ}F = 32,071 BTUs$

.75 .75 = 42,761 BTUs

2. ELECTRIC HOT WATER HEATER SYSTEMS

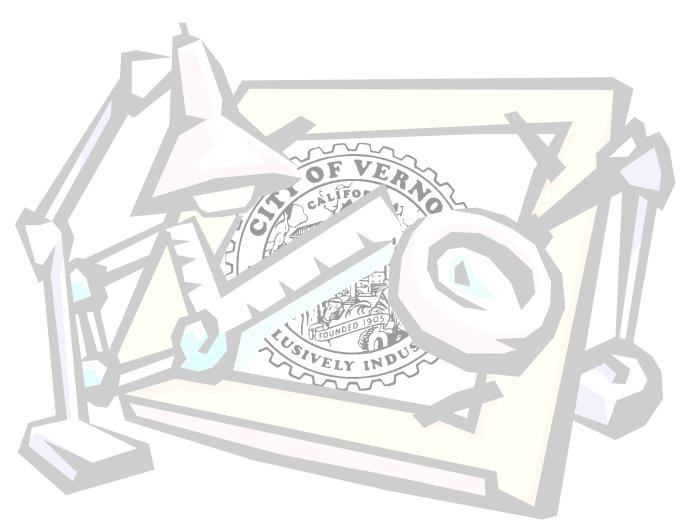
Formula

Kws=gph x st water x temp rise / thermal efficiency / kw conversion

 $= \frac{77 \times 8.33 \times 50^{\circ}F}{1} = \frac{32071 \text{ BTU}}{3400 \text{ KW Conversion}} = 9.4 \text{ KW}$

Construction Guidebook for Wholesale Food Facilities - RWFPC
4. City of Vernon Environmental Health

FOOD ESTABLISHMENT CONSTRUCTION GUIDE



CITY OF VERNON

ENVIRONMENTAL HEALTH DEPARTMENT

4305 S. Santa Fe Ave., Vernon CA 90058 (323) 583-8811 Ext. 288 FAX (323) 588-4320 E-mail longyiu@ci.vernon.ca.us



GUIDELINES FOR CONSTRUCTION OF WHOLESALE FOOD PROCESSING AND MANUFACTURING ESTABLISHMENTS

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 City of Vernon for review and approval by the Community Services and Environmental Health Departments. Depending on work to be done, separate Building, Electrical, and Plumbing/Mechanical Construction Permits may be required.

Plans shall be drawn to scale and include a complete floor plan with plumbing, electric and equipment details. In addition, a finish schedule for floors, walls and ceilings that indicate type of material, finish, color and type of coved base at the floor-wall juncture (see attached) 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 facilities may have additional requirements.

Electronic Submissions / Storage

Plans may be submitted electronically via e-mail to longyiu@ci.vernon.ca.us or in a CD. A written letter must be submitted to this office indicating the delivery of electronic plans. This letter must be delivered prior to review of electronic plans. Plans must be submitted in an Autocad format (DWF, DWG, .DXF) or in a .PDF format. A digital copy of the file, in a CD, showing all the corrections must be submitted to this office prior to final approval of the project.

I. CONSTRUCTION

A. FLOORS

The floor surfaces shall be of such construction and material so as to be smooth; impervious to water, grease, and acid; and easily cleanable in the following areas:

- 1. Food or beverage preparation, processing or storage rooms or areas;
- 2. Walk-in refrigerators;
- 3. Utensil or equipment washing rooms;
- 4. Refuse or garbage storage rooms;
- 5. Restrooms, dressing rooms, and locker rooms.

Acceptable floor surfaces may be smooth, sealed concrete; quarry tile; ceramic tile; approved epoxy coating or other comparable approved material. A minimum of a four-inch (4") cove base with a minimum three-eighths inch (3/8") radius shall be provided at the juncture of the wall and floor (except in food storage rooms for unopened containers). The base material may be quarry or ceramic tile, smooth concrete, approved epoxy coating or other comparable approved material. Metal coved bases are approved only for walk-in refrigerators. Top set vinyl or rubber bases are not acceptable. (See IV – Installation requirements).

B. WALLS

Food preparation or processing rooms, walk-in refrigerators, equipment washrooms, utensil/dishwashing rooms, toilet rooms, and dressing rooms shall have walls, which are

smooth, washable, and light in color. Acceptable materials include plaster, smooth concrete, five-eighths inch thick (5/8") wallboard, or fiberglass reinforced plastic panels (FRP). Panels shall be tightly sealed to the wall with finished joints and edges.

Concrete block walls are acceptable if the mortar joints are flush and the walls are plaster

coated to block walls are acceptable if the mortar joints are flush and the walls are plaster coated to a smooth finish. All pervious or porous surfaces shall be sealed with a high gloss enamel, epoxy, or other approved sealer.

C. CEILINGS

The ceilings in food processing, packaging, and utensil/equipment washing areas shall be smooth, nonabsorbent, and have a light-colored washable finish. An acoustical plaster or aluminum foil type ceiling is not acceptable. Lay-in ceiling tile (T-bar), with hold down clips, may be approved if it complies with the above requirements (submit a sample for pre-approval). Perforated ceiling tiles are acceptable if the perforations do not penetrate the entire depth of the tile and do not comprise 25 or more percent of the exposed panel surface. Drop ceiling systems are not allowed in food processing areas with frequent processing of baking flour or other flammable dust activities. FISSURE TEXTURE ON THE CEILING TILE IS NOT ACCEPTABLE.

D. LIGHTING:

Food preparation, utensil/equipment washing, toilet, and dressing rooms of food processing establishments require ten (10) foot candles of light measured at work or use surfaces. Food and utensil storage rooms require five (5) foot candles of light, and ten 10) foot-candles of light during clean up activities. Lighting fixtures/lights 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.

E. 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, and to provide reasonable comfort for all employees. Adequate mechanical exhaust ventilation hoods shall be installed above all heating or cooking equipment where heat, smoke, steam or vapors are released. Hoods shall extend at least six inches (6") horizontally beyond the equipment or conform to manufacturer's ventilation specifications. Equipment such as 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.

F. FLY, RODENT, AND OTHER PESTS EXCLUSIONS:

- 1. Windows: Any openable windows shall be provided with screening of no greater than fourteen (14) mesh. Openable windows in processing rooms are <u>not approved</u>.
- 2. Delivery Doors: All delivery doors leading to the outside from the processing room shall be provided with an effective fly exclusion device, e.g. air curtain. LARGE CARGO-TYPE DOORS SHALL NOT OPEN

DIRECTLY INTO A FOOD PROCESSING AREA FROM THE OUTSIDE.

- 3. 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.
- 4. 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.

II. FACILITIES

A. LAVATORIES (HAND WASHING):

Employee hand wash lavatories shall be provided within or adjacent to toilet rooms. Hot and cold running water under pressure shall be provided through a mixing valve or combination faucet. The minimum hot water temperature for hand wash sinks is 110° F. Automated hand washers with integral hand sanitizers or infrared controlled faucets capable of dispensing at minimum hot water temperature may be acceptable based on prior review and approval by the 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 dispensing devices at all hand washing sinks. A conveniently located hand wash sink is required in all food preparation rooms and areas. The number of hand washing sinks required is dependant upon the number of employees, the size of the processing rooms, and accessibility.

B. TOILET FACILITIES:

Separate toilet facilities for each sex are required if there are five or more employees per shift. Urinals may be substituted for toilets in toilet rooms for males but shall not exceed one-third (1/3) of the required number of toilets. 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 a self-closing device. Required number of toilets is dependant upon the number of employees. To calculate the number of employees, the calculation shall include managers and/or owners. For specific number and type of toilet facility fixtures, refer to Uniform Plumbing Code.

C. DRESSING ROOMS:

A dressing room with a minimum of eighteen (18) square feet of floor space, 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 preparation and storage rooms. Employees shall include managers and/or owners.

D. WAREHOUSE/STORAGE FACILITIES:

Adequate warehousing or storage facilities shall be provided and be separated by a door(s) from food processing and preparation rooms with an effective fly-exclusion device. All food shall be properly stored a minimum of six inches (6") above the floor on approved shelving. Pallets may be used in lieu of shelving if equipment is available upon demand to move the pallets. If warehouse facilities are located in a separate building, the building shall be vermin proof and restroom facilities shall be provided in accordance with the above requirements. RAW MATERIALS STORED IN THE FOOD PREPARATION AREAS SHALL NOT EXCEED THE AMOUNT PROCESSED IN ONE DAY.

E. GARBAGE AND TRASH AREA:

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.

F. GENERAL PURPOSE WATER:

All sinks are to be provided with hot and cold running water. Approved backflow protection shall be provided for all faucets, hose bibs, wash down stations and industrial water use sites.

G. JANITORIAL FACILITIES AND CLEANING CHEMICAL STORAGE ROOMS:

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.

H. JANITORIAL FIXTURES:

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:

- 1. one-compartment, non-porous janitorial sink/mop sink (stainless steel, porcelain or fiberglass).
- 2. 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).

III. EQUIPMENT

A. APPROVED TYPE:

All equipment and fixtures shall comply with National Sanitation Foundation (**NSF**) or equivalent standards, for material, construction, fabrication, and design. All equipment and equipment installation shall be subject to field evaluation. Specifications for equipment shall be available upon demand.

B. 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.

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.

C. REFRIGERATION:

Each food establishment where perishable food is prepared or stored must have adequate NSF approved or equivalent refrigeration. 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.

D. 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.

E. STORAGE EQUIPMENT:

Adequate storage shall be provided for all food establishments. Shelving 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 palletmoving equipment immediately available.

IV. INSTALLATION REQUIREMENTS:

A. 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 eights inch (3/8") radius coved 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.

B. 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. Floor drains located directly outside walk-in refrigerators are acceptable if the floors in the walk-in units are sloped toward the drains.

C. 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.

D. FLOOR SINKS:

All steam tables, refrigerators (including walk-in boxes), steam kettles, ice machines, and similar items 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.

V. SPECIAL REQUIREMENTS

A. CONSTRUCTION INSPECTIONS:

All construction and equipment installations are subject to on-site inspections. During the course of construction, and particularly well <u>before</u> operating, operators or contractors are advised to call to have questions answered, or to request interim inspections. The contact phone number is: (323) 583-8811, Ext. 233 (Monday - Thursday).

B. FINAL INSPECTIONS:

Final inspection and approval is required <u>prior</u> to beginning operation. Community Services 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 THE VERNON CITY CODE TO BEGIN OPERATING WITHOUT A VALID PUBLIC HEALTH LICENSE.

C. 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 DEVIATE FROM THESE GUIDELINES MUST BE SUBMITTED FOR EVALUATION AND DECISION BY THIS DEPARTMENT FOR ACCEPTANCE OR DENIAL.

CITY OF VERNON FOOD FACILITY CONSTRUCTION REQUIREMENTS

THE FOLLOWING ARE <u>BASIC</u> CONSTRUCTION REQUIREMENTS. PLEASE CONTACT THIS OFFICE FOR OTHER SPECIFIC REQUIREMENTS.

	FOOD WAREHOUSE ² Dry, Unrefrigerated and Packaged	FOOD WAREHOUSE ² Refrigerated and Packaged Perishable Food Areas	FOOD PROCESSING ^{1,2} Separate Room required	RESTAURANT OR PLANT CAFETERIAS ²	FOOD MARKET RETAIL STORE 2 No food preparation
Floors / Coving	Smooth cleanable floors, Coving not required	Approved floor and coving required	Approved floor and coving required	Approved floor and coving required	Approved Floor required Coving not required
Walls	NA	Approved walls must be smooth durable and cleanable	Approved wall materials / finish required	Approved wall materials / finish required	Approved Walls required
Ceilings	NA	Approved ceiling	Approved Ceiling –Smooth and cleanable	Approved Ceiling – Smooth and cleanable	Approved ceiling required
Utensil Washing Sink (three compartment sink)	NA	NA	Required when utensils are used and washed by hand	Required	Required when utensils are used e.g. coffee urns, tongs and scoops)
Food Preparation Sink	Not- required	Not-required	Required when food is washed or rinsed	Required	NA
Utility / Mop sink	Required	Required	Required	Required	Required
Hand wash Sink	NA	NA	Required in each process room	Required in food preparation areas	NA
Janitorial Room	NA	NA	Required	Required	NA
Lighting	NA	NA	Required	Required	NA
Locker Rooms	Required with 5 or more employees	Required with 5 or more employees	Required with 5 or more employees	Required with 5 or more employees	Required with 5 employees or more
Fly Exclusion over doors	NA	NA	Required	Required	NA
Door self closing devices	NA	NA	Required	Required	NA

- 1. Food Processing includes packaging, packing and repacking, making, cooking, baking, mixing processing, bottling, canning, slaughtering, salvaging, preparing and handling open food products. Whole produce items can be considered packaged unless they are trimmed for any reason. 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 covings, hand wash sinks and ventilation. Doors must be equipped with self-closing devices.

Construction Guidebook for Wholesale Food Facilities - RWFPC
5. San Diego County Environmental Health



FOOD AND HOUSING DIVISION

PLAN SUBMITTAL AND CONSTRUCTION GUIDE FOR OPENING A NEW FOOD ESTABLISHMENT IN SAN DIEGO COUNTY



PLAN CHECK UNIT (619) 338-2364

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INTRODUCTION

The purpose of this document is to provide you with assistance in the opening of a new food establishment. The procedures and the information contained are intended to assist you in a step by step manner, and to provide a checklist of items necessary for the successful submittal, review, and ultimate approval of plans and specifications for your establishment. This portion of the document will provide you with a general overview of what the steps will be. Later in the document, there will be specific checklist items, which should better explain what details would need to be addressed on your plans.

- 1. Food establishments which are built from the ground up, from existing building spaces, or those that will be renovated to have a food establishment are required by State law to have plans submitted to the Department of Environmental Health (DEH). The Plan Check Unit of the Food and Housing Division performs the review and ultimate approval of the plans. They will also conduct construction inspections while your establishment is being built.
- 2. After this Department has approved your plans, you will also have to obtain approvals from the local building department. By law, a DEH plan approval is needed before the local building department will review the plans for their approvals. Depending on your locality, additional review may be needed by the local Fire Marshall.
- 3. Please keep the DEH stamped set of plans on the job site. Our staff will retain a set for construction inspection purposes. However, if the set is very large, we do not carry it onto the site. We will then need to use your DEH stamped set for construction inspections. Also, it is required by the local building department to have an approval plan set on-site.
- 4. Construction inspections of the establishment conducted by the DEH Plan Check Specialist after plans have been approved are as follows:
 - a. Preliminary Inspection. This inspection is for the purposes of ensuring that the plumbing installed in the establishment is installed according to your plans. Any piping installed in the ground or in the walls must be left uncovered until our Specialist inspects it. If there are no discrepancies, then the Specialist will approve this portion of the construction and allow you to cover the open plumbing and proceed with construction.
 - b. Mid-Construction Inspection. When your establishment is approximately 80% completed and/or within two weeks of your proposed opening date, this inspection is scheduled. Generally we will be checking your installed

floor, wall and ceiling surfaces, and any equipment that may be installed such as a hood exhaust system, cooking equipment, dishwasher, sinks, and everything specified on your plans. This is a very important inspection since you will be very close to your opening date. Any corrections can be accomplished without delaying your proposed opening date. When the Specialist has approved this inspection, you will then need to apply for your Annual Health Permit.

- Final Inspection. When you have finished all of your construction and the local building department has granted their final approval or an equivalent approval, this Department can conduct the Final Inspection for your opening. Hot and cold water must be available and all plumbing operational. All of your equipment such as the hood-exhaust system, refrigerators, and dishwashing machines must be functioning. Additionally, the establishment must be clean and sanitary and food handlers should have received their training and certification. Also, State law requires an owner or employee to have CA approved Food Safety Certification. Schedule food safety training prior to calling for final approval to open. Failure to comply may result in further legal action. When this final approval is granted, you can open to the public. It is vital that everything in your establishment is functioning properly. You should schedule your final inspection well in advance of your proposed opening date. This way you can stock your establishment and prepare your foods for the opening.
- 5. Construction Inspections must be scheduled at least three to five days in advance of the desired day of inspection. Our Specialist will be there on the date that you request. We, however, cannot always guarantee the time period. You are encouraged to contact our staff of the Plan Check and Construction Unit if you have any questions or problems in the building of your food establishment.

PROCEDURES FOR FOOD FACILITY PLAN APPROVAL AND CONSTRUCTION

- 1. Submit at least three complete sets of the plans and specifications. The list of items, which are considered to constitute a complete set of plans and specifications, are listed under "Requirements For Food Facility Plan Review."
- 2. Fees are charged for the review of the plans and are based upon the square footage of the establishment. This fee includes the inspections performed during construction of the establishment. The plan review fee does not include the Annual Health Permit, which is separate and is always applied for prior to opening.
- 3. An architect, draftsman, contractor, food facility consultant, or owner may prepare the plans. The plans must be drawn in ink, in a professional manner, to a scale which is indicated on the plans (i.e., 1/4"=1', 1/2"=1', etc.) and on a minimum 11" by 17" size paper.
- 4. The person submitting the plans will be notified of approval or the need for correction after the plans has been reviewed. Plans approved by this Department are considered ready for construction, provided permits from the local building inspection agency have been granted.

Plans needing correction or further information will have the deficiencies listed on a correction list. Plans having a significant number of corrections will need to be corrected prior to submitting for re-check. A fee for this re-check will be needed. Corrected, approved plans are considered ready for construction with appropriate building inspection permits.

Plans needing minor corrections will be "Red Tagged", which means that the corrections may be made at our office in the presence of our staff. Once corrected and approved, these plans are considered ready for construction with appropriate building inspection permits.

- 5. Once approved, two sets of the plans will be returned to the submitter. The specialist from the department who will be conducting the construction inspections will retain the third set. One of the Department of Environmental Health's (DEH) returned stamped plan sets must be kept at the site for reference to health code requirements during construction.
- 6. Inspected plan sets, once approved or those needing correction, will be retained for a maximum of thirty calendar days after the date of notification to the submitter. Submitters are encouraged to pick up their plan sets as soon as possible after notification.

- 7. If there are to be deviations from the approved plans once construction begins, it is imperative that these changes be discussed with the Plan Check Specialist assigned to your project. Changes involving health code matters must be approved prior to implementing the change. Minor modifications may be handled directly with the Plan Check Specialist. Major changes may require a re-submission of amended plans for review.
- 8. During the construction of the establishment, please make the appointments for the construction inspections already described. The person on the job site, most directly responsible for the establishment construction should be the person calling for the construction inspection appointments. Appointments must be scheduled at least three days in advance of the desired date. The phone number for the Scheduling Desk is stamped on the DEH approved plan set.
- 9. Prior to the granting of the DEH Final Approval, the following must be completed:
 - a. Any discrepancies noted during the DEH Mid-Inspection must be corrected.
 - b. The local building inspection agency and fire department must grant their final approvals. Proof of these approvals must be on the job site (i.e., final sign off on respective "job cards", etc.). The DEH Final Approval cannot be granted without these approvals.
 - c. Utilities (electric, gas, and potable water) must be provided at the time of the DEH Final approval.
 - d. All equipment must be in operating condition (i.e., hood exhaust system, refrigeration, food heating units, hot water heater(s), dishwashing, ovens, sinks, washbasins, toilet fixtures, etc.).
 - e. Application must be submitted and all fees paid for the Annual DEH Health Permit.

The DEH Final Approval inspection should be scheduled at least three days in advance of the desired final inspection date. Please remember that the approval of the final inspection clears the establishment to operate. At this time, the establishment must be clean and ready.

PLAN	CHECK	Ε#	
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FOOD ESTABLISHMENT PLAN CHECKLIST

The following review at:	items are needed on plans to be acceptable for plan
Teview at:	(Name and Address of Establishment)
pe	ans must be submitted in non-erasable ink, or print (no encil), to a stated scale (i.e., 1/4" per ft.), and done a professional manner. One (1) set is required on a nimum 11" by 17" size paper.
a. b. c. d. e.	Floor plan of establishment Equipment list, type and elevation required Plumbing plans and schedule
na	ovide exact name and address of the food facility, the me, phone number, and mailing address of tenant/owner and ontractors on the title page of plans.
	ate on plans whether the food facility is served by nicipal water, or by well water.
mu	ate on plans whether the food facility is served by a nicipal sewer district, or by a subsurface disposal stem-septic tanks, etc.
an Us	establishment is on a septic tank or private well, then approval for their use must be obtained from the Land e Division of the Department of Environmental Health DEH).
7. Th	e total square footage of the establishment in sq. ft.
co th Pr De	the establishment project (new/remodel/ti) is being instructed within the City of San Diego, then approval the Food Establishment Wastewater Discharge Permit ogram is needed prior to the initial submittal to the spartment of Environmental Health. For appointment call 58) 654-4188 to schedule an appointment.
T have reviewe	d the above listed items and certify that all required

I nave reviewed the above listed items and certify that all required information is addressed in the plans to be submitted.

I understand that if the plans are incomplete due to a lack of any of the required information, the plans will be rejected and upon resubmission, a plan re-review fee will be charged.

Signature	
Title	Date_

REQUIREMENTS FOR FOOD FACILITY PLAN REVIEW

The following information is needed on plan submittals:

GENERAL REQUIREMENTS

- 1. Provide the name and address of the food facility. Provide the name and telephone number of the owner, contractor, and contact person.
- 2. Plans are to be drawn to scale (e.g., 1/4" = 1') using non-erasable ink or print (pencil drawings are not acceptable), and are to include:
 - a. A detailed site plan.
 - b. Floor plan of the entire establishment. Include all interior and exterior doors, toilets, dressing rooms, garbage and trash areas, food preparation, dining, dishwashing, office space, dressing rooms, etc. (SEE ATTACHMENTS)
 - c. Complete equipment layout, including equipment specifications. Equipment shall be listed as meeting the applicable standards as established by NSF International or equivalent testing lab.
 - d. Complete plumbing layout showing sewer, waste drains, floor sinks, floor drains, grease traps, grease interceptors, and all fill faucets. (SEE ATTACHMENTS)
 - e. Complete hood-exhaust ventilation system layout including location of make-up air ducts. Indicate the type of hood specified for the particular cooking equipment being ventilated. (SEE ATTACHMENT)
 - f. Location of exterior trash enclosure, if part of plan.
 - g. Complete finish schedule for walls, ceiling, and floors which indicates the type of material, the color, the surface finish, and the type of integral cove base at the floor/wall juncture. (SEE ATTACHMENTS)

Samples of proposed finish material may be required prior to plan approval. (SEE ATTACHMENT)

- h. Provide door and window schedule.
- i. When all corrections have been made and verified, three sets of plans will be required, one for the Health Department, one for the Building Department and one for the Owner/Contractor.
- 3. DEH Note(s) Section (the following information is required):
 - a. State on plans whether the facility will be connected to a

- municipal water system (e.g., City of San Diego, Helix, Sweetwater, Padre Dam, etc.) or if the facility is served by a water well (mostly remote rural areas).
- b. State on plans whether the facility will be connected by a municipal sewer system (i.e., City of San Diego, Escondido, etc.), or if the facility will be served by a sub-surface sewage disposal system (septic system--mostly remote rural areas).
- NOTE: If water provided to the food facility is from a water well, and/or the facility is connected to a sub-surface sewage disposal system, then an approval for their use, including design and testing, shall be obtained from the Land Use Division of this Department prior to plan approval.
- c. Provide total square footage of the establishment.
- d. Indicate the type of food facility (i.e., 100% pre-packaged food, restaurant-single service utensils, restaurant-multi service utensils, bar only, bakery, etc.).
- e. Indicate if alcoholic beverages will be served. If no alcoholic beverages will be served indicate "No alcoholic beverage service."
- f. Indicate on plans that all food related and utensil related equipment and installation will meet NSF, ETL, or applicable sanitation standards.
- g. Indicate on plans that all lavatories and/or handsinks will have a combination faucet or premixing faucet capable of supplying warm water for a minimum of ten seconds.
- h. Indicate on plans that approved backflow prevention devices will be properly installed upstream of any potential hazard between the potable water supply and a potential source of contamination.
- i. Indicate on plans that the hot water heater will be a commercial type, capable of constantly supplying hot water at a temperature of 120°F to all sinks, hand lavatories, and other cleanup facilities. "Guidelines for Sizing Hot Water Heaters" available upon request.
- j. Indicate on plans the number of employees per shift.
- 4. The use of approved materials and good workmanship are significant factors in the evaluation and final field approval of food facility construction and equipment installation. A properly constructed establishment enhances cleanability and operation and lessens the necessity for early repair or replacement of equipment or structure.

GENERAL CONSTRUCTION AND EQUIPMENT REQUIREMENTS

Please remember that our Plan Check and Construction staff must interpret how you have designed your food establishment by looking at your plans. The more information you provide in the following areas, the better we can assess how your design will conform to the laws and regulations pertaining to food establishment construction.

Your set of plans must show and specify the following in detail:

- 1. FLOORS. The floor surfaces of a food establishment must be durable; cleanable; and impervious to water, food, food by-products, and chemicals used on the floor for cleaning or other purposes.
 - a. Floor surfaces in all areas where food is prepared, packaged, dispensed or stored, where any utensil is washed, where refuse or garbage is stored, where janitorial facilities are located, in all toilet and hand washing areas, and in employee change and storage rooms, is to be of an approved floor surface that continues up the wall at least four inches with a 3/8 inch minimum radius cove as an integral unit. This extension of the floor includes toe-kicks of counters and equipment that sets flush on the floor. Examples include self-service food and beverage counters, and equipment that have open food or beverages. Vinyl Rubber Topset Cove Base is not acceptable. (SEE ATTACHMENT ON CONTINUOUS COVING DETAIL)
 - b. Floor drains are required in new toilet rooms, in areas where dish machines are used, in janitorial rooms with mop sinks, in bars equipped with bar sinks or glass washers, and in front of walk-in coolers or equipment which are cleaned by water flushing or where products are iced down. The floor surface needs to slope to the floor drains (1/4" per foot).
 - c. Flooring under equipment shall be completely smooth for cleanability. Floor surfaces that contain anti-slip agents or surfaces are limited to foot traffic areas only.
- 2. WALLS. Wall surfaces of a food establishment are required to be smooth for cleanability and light colored in order to assist in detecting dirty areas and for light reflectance onto the working surfaces. Walls in certain areas are also required to be durable in order to withstand moisture, repeated cleaning, and chemicals used in cleanup activities.
 - a. Walls in all areas except the dining spaces are required to be durable, smooth surfaced, light colored,

- and have an easy to clean and washable surface. Wall surfaces that cannot be used include brick, concrete block, rough concrete, rough plaster, grooved paneling, wallpaper, and vinyl wall coverings. These surfaces are either too rough, not cleanable, or don't have sufficient durability.
- b. Acceptable wall surfaces include gloss or semi-gloss enamel paint, approved epoxy coatings, Fiber Reinforced Plastic (FRP) panels, ceramic tile (light-colored), synthetic enamel paint, or other approved materials with a Light Reflectant Value (LRV) of 70% or more. Polished stainless steel sheeting is acceptable in lieu of the required LRV.
- c. Wall surfaces behind sinks (pots and pans, janitorial, utensil, food preparation, hand basins) and dishwashers must have a minimum eight (8) foot high water resistant wall material. FRP, stainless steel, ceramic tile, or other approved materials are acceptable in these areas. FRP and metal flashing surfaces need to be sealed to the sub-wall surface.
- d. Wall surfaces of toilet rooms are required to be smooth and cleanable. Walls behind hand basins, toilets, and urinals will need wainscoting that complies with local building department requirements. If wainscoting is required, the surface needs to be smooth surfaced, durable, and water-resistant.
- e. If you have a wall surface material that you desire to use in your food establishment and are not sure if it would meet these requirements, please submit a sample for evaluation. We will be able to assist you in your decision.
- f. Wall surfaces of 70% LRV or greater are not required in bars where alcoholic beverages are sold or served directly to the customer (except behind bar sinks, dining and sales areas, offices, and restrooms that are used exclusively by patrons.
- 3. CEILINGS. Ceiling surfaces are also required to be smooth for cleanability; light colored in order to assist in detecting dirty areas and for light reflectance onto the working areas; and durable in order to withstand moisture, repeated cleaning, and chemicals used in cleaning.
 - a. Ceiling surfaces in all food preparation areas are required to be smooth, light-colored, easy to clean, and possess a Light Reflectant Value (LRV) of 70% or more. Acceptable surfaces include gloss or semi-gloss light colored enamel paint, approved epoxy coatings, smooth surfaced lay-in vinyl panels (sample may be required) and similar approved surfaces.

- b. Blown on acoustical ceiling material and textured layin acoustical ceiling panels may be used only in dining rooms and non-food preparation or handling spaces (e.g., hallways, pure office spaces, etc.).
- c. Waitress stations, salad bars, food serving, or selfservice open food counters or other similar stations located immediately adjacent to, or in the dining areas, need to have floor, wall, and ceiling surfaces that meet food preparation area requirements.
- 4. CONDUIT. Conduit must be properly installed in the food establishment so that it does not cause or contribute to cleanability problems.
 - a. All plumbing, electrical, and gas lines are required to be concealed within the building structure to the greatest extent possible (STATE IN HEALTH NOTES). If you are remodeling an existing building into a food establishment, careful planning is needed to address all plumbing, electrical, and gas line installations so that they can be installed behind wall surfaces and are not exposed.
 - b. In circumstances where it is (primarily structural limitations or restrictions of the building) not possible to install conduit behind the walls, all conduit runs are to be located at least 3/4 inch away from the walls or ceilings and a minimum of six (6) inches above the floor. Conduit is to be installed so that it is secure.
 - c. Where conduit or plumbing lines enter a wall, ceiling or floor, the opening around the conduit or plumbing is required to be tightly sealed to prevent the entry of rodents or vermin. The sealant material needs to be rodent proof.
 - d. Conduit, plumbing or piping cannot be installed across any aisle way, traffic area or door opening.
 - e. Multiple runs or clusters of conduit or pipelines are required to be furred out and encased in an approved runway or other sealed enclosure.
- 5. EXHAUST HOODS AND DUCTS. A hood-exhaust system is required in your food establishment to remove the by-products (smoke, steam, grease, vapors and heat) of cooking. While the aroma of cooking food is enticing to your customers, insufficient removal of the by-products leads to cleanability problems when the vapors, smoke, and grease deposit on your equipment, the floors, walls, and ceilings.

- a. Mechanical exhaust ventilation system equipment is required for all ranges, griddles, ovens, deep fat fryers, barbecues, rotisseries, and high temperature dishwashing machines.
 - 1) A Type I Hood is a kitchen hood for collecting and removing grease and smoke. These hood systems are equipped with approved grease filters or grease extractors designed for that specific purpose.
 - 2) A **Type II Hood** is a general kitchen hood for collecting and removing steam, vapors, heat or odors.
- b. All hoods, ducts, and exhaust outlets are required to be installed in accordance with Chapter 5 of the current edition of the Uniform Mechanical Code as adopted by the local building inspection department.
- c. Plan Detail Requirements: Provide an illustration sheet showing hood exhaust data and refer to Hood-Exhaust System Drawings Attachment. Contact us if you need further information or assistance.
- d. All joints and seams of the hood and exhaust duct(s) are required to be sealed, welded, or soldered for ease of cleaning.
- e. Canopy Type Hoods.

Canopy type hoods cannot be more than seven (7) feet above the floor and are not permitted to be more than four (4) feet above the cooking surface. This dimension is measured to the lower edge of the hood canopy. (If the hood is too far above the cooking equipment, there is insufficient "draft" to remove the cooking by-products).

The hood canopy is required to overhang or extend a horizontal distance of not less than six (6) inches beyond the outer edges of the cooking equipment to the inner lip of the hood canopy on all open sides. Canopy type hoods are required to have grease gutters or drip pans that are easy to clean.

Hood canopies for pizza ovens and barbecue pits require an eighteen (18) inch overhang, with a twelve (12) inch overhang on the sides, as measured from the door opening and or cooking surface.

Charbroilers require 12 inch overhangs.

f. Non-canopy Type (high velocity) Hoods.

Non-canopy type hoods extract the by-products of cooking horizontally across the cooking surface into the exhaust system versus the vertical extraction of a canopy type system.

Non-canopy type hoods will be approved provided they are constructed to be easy to clean and that they comply with the minimum exhaust air velocity requirements. Shielding at the ends of the hood may be necessary to prevent interference from cross drafts.

- g. Make-Up Air System. All exhaust systems are required to have a mechanical make-up air system that replaces 100% of the exhaust air. Windows, doors, or other openings into the establishment cannot be used for the purposes of providing make-up air. A separate fan system providing air into the building is required. The make-up air control switch is required to be interlocked with the exhaust air system switch so that both systems are functioning at the same time.
- h. Careful consideration must be taken into account when placing food heating or warming devices such as cheese melters, plate warmers, etc., above other equipment located under an exhaust system. Disturbance of the airflow may result with inefficient exhausting of cooking by-products. The design, construction, and installation of such devices under a hood need to be reviewed by this Department prior to the actual installation of the equipment.
- i. Fire extinguishing systems may be required by the local fire prevention codes. When fire suppression systems are installed, they must be installed so that all exposed components under the hood are easy to clean and accessible for cleaning.
- 6. REFRIGERATION. Adequate refrigeration spaces, equipment, and start/stop capacity is an essential element in the operation of a food establishment. In order to quickly chill perishable foods from cooking temperature to refrigeration temperature adequate capacity is needed. Adequate space must be provided to properly hold all foods needing refrigeration and be able to handle the needs of the food establishment.
 - a. General Requirements: Refrigeration equipment must be specifically constructed for commercial usage. Refrigeration equipment that is listed by the National Sanitation Foundation International (NSF), or on a listing equivalent to NSF standards, is generally accepted as equipment acceptable for installation in food establishments.

<u>food establishments.</u> Domestic refrigeration units do not have sufficient refrigeration capacity, are not easily cleanable, and generally do not withstand the usage associated with commercial food establishment.

1) All refrigeration units are required to have an accurate, readily visible working thermometer. The thermometer should be placed in the "warmest" part

- of the compartment, usually near the door.
- 2) Shelving of the refrigerator unit needs to be nonabsorbent and easily cleanable. Wood is not an acceptable shelving material.
- 3) The interior of the refrigerator must have smooth, nonabsorbent, and easily cleanable surfaces. All joints must be sealed.
- 4) Condensate waste from reach-in refrigerator units must be drained into the public sewer via a floor sink with legal air gap.
- 5) Rapid cool down facilities may be required depending upon the food operation.
- b. Walk-In Refrigeration Units.
 - 1) The floor of a walk-in refrigerator unit is required to have an integral cove base with a radius of at least 3/8" at the floor-wall juncture. The floor material is required to extend up the wall at least four (4) inches and be of one-piece construction. Four inch approved metal topset coving with a minimum 3/8" radius is acceptable only against metal wall surfaces of walk-in units.

Wood and vinyl are not acceptable floor surfaces for walk-in units.

- 2) The interior walls of the walk-in unit are required to be smooth surfaced, light colored, moisture proof, durable, and able to withstand prolonged exposure to low temperatures.
- 3) Shelving of a walk-in unit is required to be listed by NSF or have an equivalent certification. The shelving must keep foods off the floor of the walk-in unit by a minimum of six (6) inches, be constructed of smooth metal, have NSF-type metal legs, or be cantilevered from the wall surface for ease of cleaning. Small, easy to move, castered dollies may be used in place of a lower shelf inside of a walk-in unit.
- 4) Condensate waste lines are required to drain to a floor sink via legal air gap, located outside of the walk-in unit. Floor sinks, floor drains, or sewer cleanouts are not permitted inside a walk-in refrigerator unit.
- The condensate line must be routed to the nearest wall and then exit the walk-in unit. The condensate line cannot be located closer than 3/4 inch to the wall or ceiling, and no closer than six (6) inches to the floor. The condensate line must be constructed of rigid piping that is secured to the adjacent wall with the clearances as indicated.

6) Walk-in refrigerator units are required to open directly into the food establishment.

7. ICE MACHINES.

- a. Ice machines are required to be located inside of the food establishment. The area in which the ice machine(s) are located must have adequate ventilation and be easy to clean.
- b. Condensation and ice melt drippage is required to drain into a floor sink via legal air gap. The floor sink to be adjacent to ice machine.
- 8. FLOOR SINKS. Floor sinks are the plumbing fixtures required for the receipt and disposal of liquid waste. Careful planning is needed to ensure the proper placement of all required floor sink installations so that equipment generating a liquid waste is properly drained.
 - a. Floor sinks are to be installed flush with the floor surface and have appropriate cover grate(s).
 - b. Floor sinks must be installed so that they are readily accessible for inspection, cleaning, and maintenance. A protective enclosure will be required around the back side of half-exposed floor sinks installed under curb or base mounted equipment to prevent any wastewater back flow under the equipment.
 - c. The floor sink must be located within fifteen feet of the drain opening of the equipment served. However, floor sinks for ice machines must be located immediately adjacent to the ice machine.
 - d. Waste line plumbing draining to the floor sink must be located at least 3/4 inch from the wall and six (6) inches off the floor. The piping is to terminate at least one (1) inch above the overflow rim of the floor sink, or the minimum clearance needed to provide a legal air gap (2X pipe diameter of discharge pipe).
 - e. Waste line plumbing to a floor sink may not cross any aisle way, traffic area, or door opening.
- 9. KITCHEN UTENSIL SINK. When kitchen utensils, food preparation equipment, and related utensils are washed by hand, a properly sized sink is required to adequately handle the equipment and utensils to be washed.
 - a. A three (3) compartment stainless steel sink with dual, integrally installed stainless steel drainboards meeting current NSF standards is required for food establishments washing multi-service kitchen utensils (i.e., pots, pans, knives, utensils, etc.).
 - b. The minimum compartment size is required to be at least

18" by 18" by 12" deep. The drainboards are required to be a minimum of 18" by 18". Although minimum sink compartment dimensions are specified, the sink must be able to accommodate the largest utensil to be washed while the drainboards need to be enlarged to match the sink dimensions. (INDICATE SINK DIMENSIONS ON HEALTH NOTES)

- When a sink is installed next to a wall, a metal "backsplash" extending up the wall at least eight (8) inches will be required as part of and integral to the sink. The backsplash needs to be sealed to the wall to close any gaps between the sheet metal and wall surface.
- d. A kitchen utensil sink is not required if the food establishment serves 100% pre-packaged food items. This means that there is no preparation of food or drink; no ice packing or handling; no unpackaged snacks, candy, or beef jerky; and no liquid beverage tap dispensers. If you have any questions on how this affects your food establishment, please ask.
- Large food establishments that have separately operating food sections (i.e., bakery, deli, meat market, etc.) handling unpackaged foods will require three compartment sinks in each location.
- 10. FOOD PREPARATION SINKS. Food establishments utilizing a sink for food preparation such as thawing, washing, etc. are required to have at least a one- (1) compartment food preparation sink separate from utensil washing sinks. The food preparation sink with one drain board is required to drain to an adjacently located floor sink via legal air gap.

Food preparation sinks must meet all NSF standards.

- 11. BAR UTENSIL SINKS. Where multi-service drinking utensils are washed by hand, a minimum three- (3) compartment sink is required. Drinking utensil sinks must meet all NSF standards.
 - Bar sinks are to have a minimum compartment size of 10" by 14" by 10" deep (or a minimum of 140 square inches in surface area), with dual integral drainboards, and a minimum of 18" long. Bar sinks are also required to have a quick drain or 4th sink compartment for disposal of drink/ice waste. Bar sinks are required to drain to an adjacent floor sink via a legal air gap.
 - When a sink is installed next to a wall, a metal "backsplash" extending up the wall at least six inches for bar sinks and eight inches for utensil sinks is required to be formed as an integral part of the sink and sealed to the wall.
 - Provide sanitizing testing equipment and materials to adequately measure the applicable chemical sanitizer at the sinks for multi-service utensils.
- 12. AUTOMATIC DISHWASHER/GLASS WASHERS. The food establishment operator may choose to use automatic glass and dishwashing machinery in their operation in addition to the required three-compartment kitchen utensil sink.

- a. The National Sanitation Foundation International (NSF) must list all automatic dishwashers, pan washers, and glass washers in the latest issue of Standard #3. Devices not listed in Standard #3 may not be used in public food establishments.
- b. All spray type dishwashers, pan washers and glass washers which are designed for a hot water bactericidal rinse are required to be provided with a booster heater that meets the requirements of Standard #5 of the NSF International, or be connected to an approved hot water recirculating system which is capable of maintaining the rinse water at not less than 180°F. These types of dishwashers will require the installation of an approved exhaust hood to remove steam, heat and vapors generated by the dishwashing machine.
- c. Dishwashers, pan washers, and glass washers are required to have two (2) integral stainless steel drainboards at least 18 inches long. Drainboards for under counter dishwashers may be adjacent to the machine. Counters located above dish machines are not considered as drainboard space. Soil side drainboard must slope and drain to an approved waste receptacle such as a quick drain.
- d. The dishwasher must also be provided with thermometers and pressure gauges to indicate the proper water flow pressures and temperatures.
- e. All waste from dishwashers, pan washers, and glass washers are required to drain to an adjacent floor sink via legal air gap. The under drain plumbing for the floor sink must have a minimum 3" trap.
- f. If a **glasswasher** is proposed at a bar area, one of the following must be provided:
 - 1) A three- (3) compartment sink within the area or an adjacent kitchen.
 - 2) A dishwasher in an adjacent kitchen.
- g. Provide sanitizing testing equipment and materials to adequately measure the applicable chemical sanitizer at the dishwasher/glass washer.
- h. Undercounter-type automatic dishwashers need to be placed on curbing if the machine is not mounted on castors.
- 13. GARBAGE DISPOSALS. Garbage disposals, if proposed, must be installed in drainboards. The drainboard must be lengthened to accommodate the disposal unit in addition to the minimum 18" required drainboard size. Garbage disposals may not be placed in or under any required sink compartment.

- Some municipalities prohibit the installation of garbage disposals. Check with your local building department.
- 14. JANITORIAL SINK AND SUPPLIES. A separate janitorial sink is required for mops, cleaning solutions, and other cleanup materials.
 - a. The janitorial sink is required to be located in a separate janitorial room or separated from the rest of the food establishment equipment by a solid partition. The partition must be wall mounted, free standing, durable, smooth, and easily cleanable.
 - b. At least a one (1) compartment janitorial sink is required. The janitorial sink shall be floor mounted or constructed using a curb on all four sides that properly slope to a drain. Curbed area surfaces need to be smooth, impervious, and of easily cleanable construction.
 - c. All janitorial sinks are to be supplied with hot and cold running water to a mixing type faucet with %" hose outlet. The faucet fixture is to have an approved back-flow prevention device attached. No chemical dispensing system to be attached to mop sink faucet.(STATE ON PLUMBING PAGE OR HEALTH NOTES).
 - d. A janitorial room or cabinet is required to be provided for the storage of cleaning equipment (mops, buckets, brooms, etc.) and supplies (soap, cleansers, waxes, bleach, etc.) and is to be kept separate from any food preparation, utensil washing, or food or utensil storage area.
- 15. HANDWASHING SINKS. Conveniently located handwash sinks are needed in food preparation and cooking areas so that foodhandlers may wash their hands whenever the need arises.
 - a. Handsinks are required to be placed in each food preparation area. Each handwash sink shall provide hot and cold running water under pressure through a mixing type faucet.
 - b. Soap and sanitary towels are required to be provided in single-service, permanently installed dispensers at each handsink.
 - c. A separate handsink must be installed in each section of a food establishment that handles unpackaged food (i.e., deli, meat, bakery, beverage bars, sushi bar, oyster bar, etc.).
 - d. If a handsink is located directly adjacent to a food preparation or utensil-washing sink, then a barrier is required to prevent splash over from the handsink to the food preparation/utensil sink. The barrier is to

be the length of the sink and at least twelve (12) inches in height, whichever is greater. The barrier must be constructed of waterproof material and firmly attached to the wall or other approved structure. If the handsink is centrally located in a counter top, then barriers must be located on both sides of the sink.

- 16. DIPPER WELL. A running water dipper well is required if scoops or other reusable serving utensils are used for dipping ice cream, butter, tuna salad, etc. The continuous flow of water into the dipper well cleanses the scoops.
 - a. The dipper well needs to drain into a floor sink via a legal air gap separation.
 - b. The water spigot supplying water into the dipper well needs a legal air gap separation.
- 17. WINDOW SCREENS. To prevent the entry of flies, dust, and other undesirable conditions into the food establishment, all openable windows located anywhere in the establishment opening to the outside are required to be screened. The screening must fit the window opening securely. Minimum sixteen (16) mesh per inch screen material is required.
- 18. SERVICE OF UNPACKAGED FOODS/UTENSILS DIRECTLY TO OR BY THE CUSTOMER. Self-service displays of unpackaged foods or utensils are required to be shielded so as to prevent "droplet" contamination from the customer. A properly designed "sneeze shield" serves to intercept a direct line between the customers "mouth and nose zone" and the food or utensils being displayed. (In other words, we want to prevent sneezing, spitting, and coughing onto the food we all eat).
 - a. The sneeze guard design is to meet the critical dimensions (See Sneeze Guard Drawings in Attachments).
 - b. Sneeze guards are required for cafeteria, buffet and salad bar service, food preparation equipment, and food preparation areas.
 - c. Cleaned and sanitized glasses and stemware that are displayed or stored in bar areas over customer service counters are required to be protected from customer contamination (touching, cigarette/cigar smoke, etc.)
 - d. Approved self-service containers are required to have tight-fitting individual lids.

19. BACKUP DRY FOOD AND BEVERAGE STORAGE. A suitable amount of floor space needs to be dedicated within the establishment for the storage of food, beverages, and related products. Storage is classified into two types of storage. Back-Up storage is space dedicated for the storage of all products to be used in the establishment. Working Storage is storage space located over and under food handling equipment used in conjunction with food preparation areas. Examples of this are cabinets, wall mounted shelving, etc.

General Requirements.

a. In most cases, at least ninety-six lineal (96) feet of approved shelving units are required for back-up dry storage space. Additional storage shelving may be required depending on the size and type of operation.

The lineal footage of storage shelving is calculated by multiplying the number of tiers by the number of feet in length of each shelf. A minimum of 18 inches is required for the width of each shelf. The minimum 18" width, however, is only a standard for width and is not used in calculating lineal footage. For example a 5-tier shelving rack whose shelves are 5 feet in length and 18 inches in width, would amount to 25 lineal feet. These shelves should be arranged into a metro-type shelving unit. Acceptable shelf lengths are 3 feet, 4 feet, 5 feet, and 6 feet.

- b. For larger facilities, the storage footage is based on 25% of the floor space of the kitchen, storage and food preparation areas. EXAMPLE: Combined floor space of kitchen, storage and food preparation areas is 1000 square feet. Twenty-five percent of 1000 square feet is 250 feet. This facility would need 250 feet of storage space.
- c. Shelving needs to be designed and constructed so that it is easy to clean. Shelving constructed of pressboard, pressed wood or plywood is not acceptable unless laminated with a smooth, durable material on all sides and edges. Shelving located over sinks and other wet areas must be constructed of metal.

Shelves installed on a wall are to have a minimum one (1) inch gap or open space between the back edge of the shelf and the wall surface. The back edge of the shelves can also be sealed to the wall with an approved sealant, such as silicone or equivalent instead.

The lowest shelf must be constructed at least six (6) inches above the floor surface with the space under the shelf clear and unobstructed for cleaning underneath. If the space below the bottom shelf is less than six

(6) inches, then the opening must be sealed with a continuous cove base. If the space below is not to be accessible, then the opening is to be sealed off a continuous cove base. The continuous cove base should be a minimum of four (4) inches with a 3/8-inch radius.

To prevent contamination from a work surface above storage shelves, shelving located below a working surface must be set back at least two (2) inches from the drip line of the working surface above.

If shelving is mounted on legs, the legs are to be at least six (6) inches in height, and constructed of metal meeting the requirements of the NSF for metal legs.

- Electrical panels, large fire prevention system control components, or similar wall-mounted apparatus shall not be placed in a food storage room unless adequate provisions are made to compensate for the loss of storage space caused by the placement of the apparatus. Storage shelving is not to be placed where access to this equipment is impeded.
- Each separate food department of a grocery store which handles unpackaged foods (deli, meat, bakery, etc.), and satellite food service facilities in restaurants (sushi bars, oyster bars, etc.), must provide for its own back up dry food storage space based on previously stated minimum requirements.
- f. Storage space for bars and taverns shall consist of a separate room with forty-eight (48) lineal feet of approved storage shelving. Depending on the size of the operation, additional storage may be required. When a bar is located in a restaurant, the back-up storage requirement for the bar is included in addition to the required dry food storage footage for the restaurant.
- For produce departments of grocery markets or produce stores selling produce only, a segregated room of at least fifty (50) square feet of floor surface shall be dedicated for back up storage of food and packaging supplies, or at least forty-eight (48) lineal feet of approved shelving are required. Additional shelving may be required depending on the size and scope of the operation.
- Properly designed, adequate, accessible and 20. well-maintained toilet rooms must be provided for employees of the food facility.
 - Toilet facilities are required within each food facility and must be accessible for the employees. Existing toilet facilities must be a minimum of twenty square feet in floor surface area.

constructed toilet rooms will be larger in order to comply with handicap requirements under the Americans With Disabilities Act (ADA). Contact your local inspection department building for specific requirements under the ADA prior to designing the toilet rooms and before submitting plans to this department for review.

- Separate men and women toilet rooms will be required, if there are five or more employees working per shift.
- c. Public toilet facilities are required for establishments larger than 20,000 square feet.
- Toilet facilities are to be located so that patrons do not pass through the food preparation, food storage, or utensil washing areas when they need to access the toilet facilities.
- The floors of toilet rooms shall be smooth surfaced, easy to clean, and continuously coved up the wall a minimum of four (4) inches with a three-eights (3/8) inch cove radius. A floor drain with the floor sloped 1/4 inch per foot from the walls to the drain is required.

The walls and ceilings of toilet rooms shall be smooth surfaced, cleanable, and preferably light colored. Light surface texturing may be acceptable, provided that the final finish surface is cleanable. The lower four feet of toilet rooms walls shall be wainscot (FRP board, etc.) behind any plumbing device (handbasin, toilet or urinal).

- Handwashing lavatories shall be provided within each toilet room. The lavatory shall be provided with hot and cold running water dispensed from a mixing type faucet. The lavatory shall be connected and wastewater dispensed to the sanitary sewer system.
- Soap and single service paper towels shall be dispensed from permanently affixed dispensers mounted on the nearest wall or partition adjacent to the handsink. Toilet paper dispensers shall be provided for each toilet.
- Toilet room doors shall be self-closing and tight fitting with 1" air gap. (ADD TO HEALTH NOTES)
- All toilet rooms shall be provided with ventilation meeting the requirements of the Uniform Mechanical Code and/or Uniform Building Code. Mechanical ventilation is preferred; however, ventilation of a toilet room is considered adequate with an openable, screened window.

21. CLOTHING CHANGE ROOMS/AREAS.

- a. A change room of twenty (20) square feet in floor surface area is required for employees to change from street clothes to work clothes. The room is also used to store clothes and other outer garments. In situations where there are ten (10) or more employees per shift, a separate change room for each sex is required. These change rooms are to be separate from bathrooms, food storage areas, and food preparation areas.
- b. A designated area separate from toilets, food storage or food preparation areas shall be provided to store outer garments and personal belongings when the change rooms are not required.
- c. Once the change room or designated area is established, it cannot be used for other purposes such as an office, food storage, etc.
- 22. PASS-THROUGH WINDOWS. Openings in the walls of food facilities may be constructed in order to serve food prepared in the facility to customers waiting outside. The following requirements are designed to facilitate this type of operation and to ensure that openings do not contribute to the entry of undesirable insects and dirt.
 - a. The maximum openable area of a pass through window is 432 square inches.
 - b. Pass through windows that are 216 square inches or less of openable area are required to have a sliding closure of solid construction or a screened sliding closure.
 - c. Pass-through windows, whose open area is greater than 216 square inches, but not larger than 432 square inches, are required to be equipped with an air curtain device. The air curtain will produce an air flow eight (8) inches in thickness at the discharge opening and with an air velocity of not less than 600 feet per minute across the entire opening at a point three feet below the air curtain plenum. Air curtains for these types of openings will be micro-switch activated when the sliding door is opened.
 - d. Facilities with multiple pass-through windows will need to space the pass-through windows a minimum of 18" apart, measured on edge.
 - e. Avoid installing slide rail guide in the surface of the pass-through counter. The pass-through counter surface must be smooth, without cracks, crevices, or channels.
- 23. EXTERIOR, ENTRY, EXIT, AND CARGO DOORS. Door openings to the outside need to be protected to prevent the entry of rodents, insects, dust, and dirt.

- a. All exterior doors of a food facility are to open outward and are to be self-closing. (STATE IN HEALTH NOTES). If an exterior door cannot be made to open outward, then a tight-fitting self-closing screen door that opens outward will need to be installed in the If situations opening. (building limitations) preclude the installation of an outwardopening door, then an air curtain device is to be installed over the door opening. The air curtain device is to provide an air velocity of at least 1600 feet per minute, measured three feet above ground level at the door opening. The air curtains for these types of doors will be micro-switch activated when the door is opened. Sliding doors must be automatic type.
- b. Large cargo type doors can only open directly into a room or where food is stored only in unopened bottles, cans, cartons, sacks, or other original shipping containers. Cargo type doors that open into any food warehouse or food facility may only be open during deliveries. In order to prevent the entry of rodents and undesirable insects, cargo type doors must be installed to be tight fitting.

Additionally, an air curtain is required on these types of doors to prevent the entry of flying insects and dust when the door is open.

- 24. LIGHTING. Adequate levels of light are essential in the food preparation areas. Food service workers need to be able to clearly see the items that they are preparing for your customers in order to ensure freshness and wholesomeness of the food. During times of cleanup and maintenance, adequate lighting is necessary to assist in determining where cleanup efforts are needed and to ensure the adequacy of cleanup operations. (STATE THE FOLLOWING AS APPLICABLE IN HEALTH NOTES).
 - a. A minimum of twenty (20) foot candles of light, measured thirty (30) inches above the floor is necessary in food preparation areas, dishwashing areas, and the glass washing areas of bars (except where alcoholic beverages are served).
 - b. A minimum of ten (10) foot-candles of light is necessary in food and utensil storage rooms, bar washing, refrigeration storage spaces, toilet rooms, and dressing rooms.
 - c. During times of cleanup, all areas are to have a minimum of twenty (20) foot-candles of light.
 - d. Light fixtures installed over areas where food is prepared, open food is stored, and where utensils are washed need to be of shatterproof construction or equipped with approved shatter containment shields.
- 25. VENTILATION. Proper ventilation is needed to remove undesirable odors in order to maintain a pleasing atmosphere for your customers and an efficient working

atmosphere for your staff. (STATE THE FOLLOWING AS APPLICABLE IN "HEALTH NOTES").

- a. A minimum of twelve (12) air changes per hour is needed in all toilet rooms, janitor closets with mop sinks, anterooms leading to toilet rooms, and dressing rooms. The rating of exhaust fan, expressed in Cubic Feet per Minute (CFM) must be indicated for each room needing this ventilation. The light switch for the room should activate exhaust fans in these areas. Mechanical exhaust fans are to exhaust only to the outside air. Dead space exhausting is not permitted.
- b. An acceptable alternative method of ventilation for toilets, toilet anterooms, and dressing rooms may be a screened window opening of at least three (3) square feet in area, one-half of which is open area.
- c. Ductless fans are not approved for ventilation use.
- 26. EQUIPMENT. To ensure that food service and related equipment installed in a food facility is designed to be cleanable, only equipment that is listed by NSF International or by a recognized equivalent testing laboratory or agency tested to NSF International standards, will be permitted in a food facility.
 - a. All new and replacement equipment shall meet or be equivalent to applicable ETL, UL, Food Sanitation, and NSF International standards.
 - b. All show and display cases, counters, shelves, tables, refrigeration equipment, sinks, and other equipment used in connection with the preparation, service, and display of food shall be made of non-toxic materials and be constructed and installed to be easy to clean.
 - c. All equipment shall be placed on minimum six (6) inch high, NSF International type metal legs; completely sealed in position on a four (4) inch high continuously coved base or concrete curb; on approved casters; or cantilevered from the wall in an approved manner. (SEE ATTACHMENT)
- 27. BACKFLOW PREVENTION. Backflow prevention devices and methods are necessary to protect the public water system from contamination or backsiphonage and to prevent the backflow of sewage into food preparation sinks, ice machines, beverage dispensers, and similar types of equipment.
 - a. Any type of drain dispensing into a floor sink requires a legal air gap separation of no less than one (1) inch measured vertically from the end of the discharge pipe to the overflow rim of the floor sink, or an air gap separation which is twice the diameter of the discharge pipe. The greater of the two air gap separations if required.
 - b. Submerged inlets require backflow prevention devices installed consistent with the requirements of the local

Department of Environmental Health

plumbing inspector.

- 28. GREASE TRAPS/INTERCEPTORS-SEWAGE DISPOSAL. In order to prevent blockage of the sewer system due to accumulated grease and oils discharged from a food establishment, many wastewater treatment agencies are requiring the installation of grease traps or interceptors.
 - a. Check with the Wastewater Treatment Agency to see what size grease trap or interceptor is required. Once the requirements have been established, design the waste plumbing system to accommodate the required device.
 - b. Grease interceptors (large volume tank) are to be installed outside of the food establishment. These large volume tanks are installed in the ground.
 - c. Grease traps (small volume tank) shall be installed outside of a food establishment (wherever possible) in compliance with plumbing codes.

29. TRASH DISPOSAL.

- Trash enclosure areas constructed outside of the establishment are to have smooth surfaced interior walls (no exposed cinder block or brick work--putty coat plaster is acceptable), and a smooth surfaced concrete floor slab. Gates installed for the enclosure may be constructed of chain link fencing with plastic inserts. If the gate is constructed out of wood, it must have sealed surfaces for durability and weatherproofing. (Bumper quards are suggested to prevent damage to enclosure walls).
- Trash enclosure areas constructed inside of the food establishment are to be separated from the interior of the food facility by a self-closing, tight-fitting, outward opening door from the establishment. Wall and ceilings shall be smooth surfaced, light-colored, and the walls constructed to be durable. Floor surfaces shall be smooth concrete or equivalent, and sloped 1/4" per foot to one or more floor drains. The trash room shall be vented to the outside air either by mechanical ventilation meeting applicable building department requirements, or by natural ventilation through screened openings whose open area is equal to or exceeds 1/10 of the floor surface of the trash room. Service doors shall be outward opening and tight fitting. Provide a hose bib inside this room with an approved vacuum breaker attached to hose bib.

30. MISCELLANEOUS ITEMS.

- If soft drink, ice, or other dispensers are selfservice by the customer, then they must be of the pushbutton type or other approved dispenser where the cup is not used in the actuation of the dispenser. needed, single service cups and lid dispensers should be provided at the self-service areas. Indicate this information on the equipment specifications of the plan.
- Marlite wall panels are not acceptable in "wet" areas (behind sinks, and other plumbing).
- "Green" board drywall must have an approved wall c. covering in wet areas. Painting of the drywall is not acceptable as a waterproof wall surface behind wet areas.
- Water type steam tables, steam kettles, woks, and other water using equipment must have a fill faucet for replenishing/adding water to the device. These devices also need to be properly drained to a floor sink with a legal air gap separation. These items need to be clearly indicated on plans.
- All overhead exposed waste lines, regardless of location in the food establishment or type of piping, must have a catch trough installed under the line. The

trough is to be waterproof, running the entire length of the exposed waste line, and of a width one inch wider than the outside diameter of the exposed waste line, fittings, and couplings. (Trough ends should terminate at a wall or drain through plumbing that will dump to a floor sink or other approved waste plumbing connection.)

- f. Water supply to carbonators shall be protected by an approved reduced pressure principle back flow preventor. The relief valve shall drain indirectly to sewer with a legal air gap. Indicate on plans if applicable.
- g. If reclaimed water is going to be used to irrigate the landscape, please indicate on plans.

ATTACHMENTS

Sinks

Exhaust Hood

Bake Oven

High Temperature Dishwashers and Certain Ovens

Exhaust Steam Hood Section

Commercial Hoods/Mechanical Exhaust (Data Information Sheet)

Exhaust Hood Worksheet

Typical Equipment Floor Plan

Foodservice Equipment Schedule

Finish Schedule

Sample Material Sheet

Continuous Coving Detail @ Counters

Plumbing Floor Plan

Sneeze Guard @ Buffet Counter

Sample Letter (Preparing to Use Common Restroom Facilities)

Food Establishment Wastewater Discharge (FEWD) Permit Program

SAMPLE LETTER FROM A FOOD FACILITY PREPARING TO USE COMMON RESTROOM FACILITIES

Although the criteria in the Policy Memorandum of the Department of Environmental Health calls for an on-site management entity to maintain the common restroom facilities (owners and operators of food facilities), understands that the legal responsibility to provide properly maintained and readily available restrooms still rests with each individual food facility. Letter to be signed by Owner of food facility.

COMMERCIAL HOODS/MECHANICAL EXHAUST DATA INFORMATION SHEET

Provide the following information concerning mechanical
exhaust hood design:
1. Size of
Hood:
2. List of equipment under
hood:
3. CFM:

4. Size of
duct:
5. Number of grease
filters:
6. Size of grease
filters:
7. Rating of filters (CFM or
FRM):
8. Make-up air
(CFM):

Job	
Address:	
Operator's	
Name:	_
Operator's	
Phone:	_
Doing Business	
As:	
Contractor's	
Name:	
Contractor's	

EXHAUST HOOD WORKSHEET

- 1. Proper overhang provided:
 - a. 6 inches from outer edge of cooking device to inner edge of grease qutter
 - b. 18 inches in front and 12 inches from edge of door on pizza ovens and barbecue pits
 - c. 6 inches minimum distance between wall and behind cooking units or oven under hood
- 2. Hood Area "A" (L \times W):
 - a. Cross (outside dimensions)=
 - b. Net (inside dimension)=
 - c. Lineal feet of cooking units (non-canopy hood only)
- 3. CFM to be removed: (use net area only)
 - a. 50 or 100 PD (alter note formula)
 - b. 200, 100, 75, 50 A (for three open sides or less)
 - c. 300, 150, 100, 75 A (for island types)
 - d. *300 x lineal ft. of cooking units (non-canopy hoods)
- 4. Duct cross sectional in inches (L x W) =
- 5. Duct velocity (to be between 1,500 and 2,500 fpm)

```
Total CFM to be removed =
```

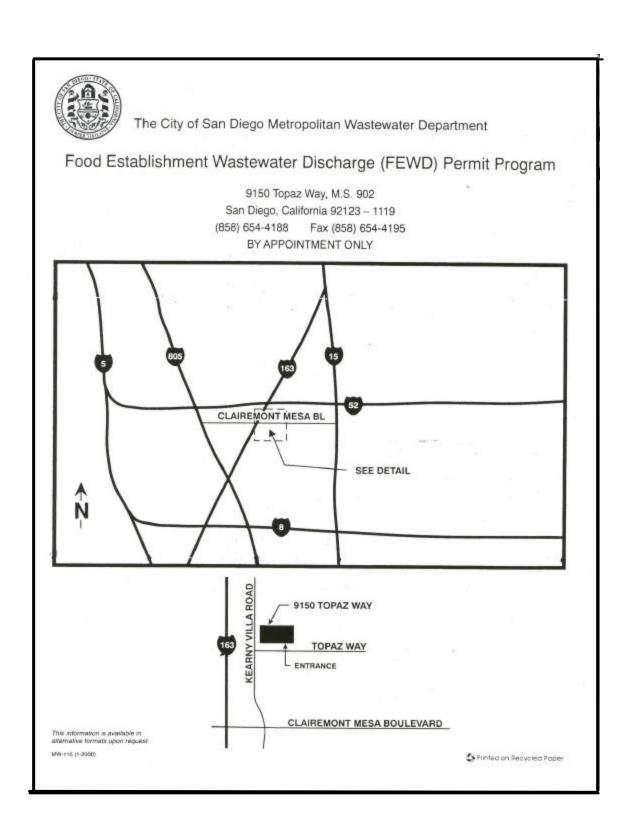
Duct Area

6. Grease Filters: (1 square inch/ 3 CFM removed)

```
Number =
```

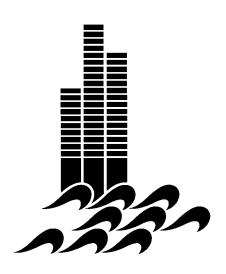
Size =

- 7. Gauge metal of hood (minimum 22)
- 8. Gauge metal of duct (minimum) Type I hood duct to have welded seams
- 9. Height of lower edge of hood from floor (maximum 7 feet)
- 10. Make-up air to be provided 100-percent mechanical. Hood and make-up air systems to be connected by an electrical interlocking switch (show or state on plans).
- * Regarding 1976 & 1979 UMC only, the average air velocity shall not be less than 30 from around the perimeters of the cooking device or the cooking surface.



Construction Guidebook for Wholesale Food Facilities - RWFPC
6. City of Long Beach Environmental Health
o. City of Long Beach Environmental freath

PLAN CONSTRUCTION GUIDE FOR FOOD FACILITIES IN LONG BEACH



BUREAU OF ENVIRONMENTAL HEALTH
DEPARTMENT OF HEALTH AND HUMAN SERVICES
2525 GRAND AVENUE, ROOM 220
REVISED 2003

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PLAN CONSTRUCTION GUIDE FOR FOOD FACILITIES

CITY OF LONG BEACH
DEPARTMENT OF HEALTH AND HUMAN SERVICES
BUREAU OF ENVIRONMENTAL HEALTH
2525 GRAND AVE, ROOM 220
(562) 570-4132

PROCEDURE FOR PLAN SUBMITTAL

Pursuant to the California Health & Safety Code, Section 113915, approval must be obtained from the local Health Department before constructing, enlarging, altering, converting or remodeling any building for use as a food facility (A remodel is defined as an addition, repair, or enlargement to the existing permitted facility, which may or may not require a permit from the Department of Building and Planning). The following requirements are necessary to process and approve food facility plans as well as to obtain final approval to open for business:

- 1. Submit a minimum of (3) sets of detailed plans and specifications, complete a food construction plan application form and pay the required plan check fees.
- 2. The plans must include sufficient information to demonstrate compliance with the California Uniform Retail Food Facilities Law in order to be approved (see Requirements for Food Facility Plan Approval, page 4).
- Plans may be prepared by an architect, draftsman, contractor or owner. All plans must be drawn in a professional manner encompassing all applicable requirements of this construction guide. Plans must be drawn at minimum scale of ¼ inch = 1 ft.
- 4. The applicant will be notified after the plans are approved or rejected. Plans that are incomplete, have a multitude of changes or are otherwise not approved, will be returned for revision before approval may be granted.
- 5. Upon approval, two (2) sets of plans will be returned to the applicant, and the third set will be kept on file until construction has been completed. An approved set of plans must be maintained at the construction site until the final inspection has been made.
- 6. If any changes on the plans are desired after approval has been obtained, additional approval from this Division must be obtained for such changes. Amended plans shall be required.

- 7. If plans are not picked up by the applicant or his or her agent within sixty (60) days after notification of approval or rejection, plans shall be discarded.
- 8. Before commencing construction, a building permit must be obtained from the Department of Planning and Building. By law, building permits for food facilities are not to be issued until plan approval has been obtained from the Bureau of Environmental Health.
- 9. All Construction and equipment installations are subject to final onsite inspection. If there are any questions during the construction phase and well before facility opening (one to two weeks), the applicant should call the plan checker to avoid possible delays in opening.
- 10. The food facility shall not be cleared to open for business until final approval is granted by the Bureau of Environmental Health. To prevent opening delays, appointments for pre-opening final inspections must be coordinated at least two (2) days in advance with the plan check specialist. Final approvals will be contingent on the following:
 - a. The facility must conform to the latest set of approved plans.
 - b. Proof that the Building and Fire Departments have approved/inspected the facility on site (final sign off on respective "job cards,"etc.). A certificate of occupancy must be obtained prior to health department approval for any new buildings or major remodels.
 - c. Utilities (electric, gas, potable water) must be provided at time of final inspection.
 - d. The facility must have approval for a valid Public Health Permit prior to operating.

REQUIREMENTS FOR FOOD FACILITY PLAN APPROVAL

The plans shall show and specify in detail the following:

GENERAL:

- 1. Provide exact name and address of the food facility, the name and telephone number of owner, contractor and contact person.
- 2. Plans shall be drawn to scale, e.g., minimum 1/4" = 1', using noneraseable ink or print (no pencil), and shall include:
 - a. A detailed site plan.
 - b. Floor plan of entire food establishment, e.g., toilets, dressing room, storage, garbage and trash areas, etc., including all interior and exterior doors (Include total square footage of the facility).
 - c. Complete equipment layout, including equipment specifications meeting National Sanitation Foundation (NSF) standards or equivalent. SEE ATTACHMENT IA &IB.
 - d. Complete plumbing layout, showing sewer, waste drains, floor sinks, vents, cleanouts, etc.
 - e. Complete electrical layout.
 - f. Complete exhaust ventilation layout including location of make-up air ducts. Indicate types of hoods, etc. SEE ATTACHMENT IIA & IIB.
 - Indicate the type of comfort cooling in the building, "refrigerated air conditioning", "evaporative cooling", or "no cooling system".
 - g. A site plan showing the proposed exterior rubbish and food waste storage receptacle location. Show hose bibs and approved drainage.
 - h. Complete finish schedule for walls, ceilings, and floors that indicates the type of material, the color, the surface finish,and the type of integral coved base at the floor/wall juncture. SEE ATTACHMENT IC.

Samples of proposed finish materials may be required prior to plan approval.

- Location of the manager's or chef's office. Spaces such as change rooms or food storage areas cannot be used for office space.
- 3. Approved materials and good workmanship are significant factors in the evaluation and final field approval of food facility construction and equipment installation, i.e., smooth washable surfaces for ease of cleaning and to minimize insect and rodent harborage.
- 4. All new and replacement equipment shall meet or be equivalent to applicable NSF standards or, in the absence of applicable NSF standards, equipment design, construction and installation is subject to approval by this agency (All used equipment is subject to field evaluation).

FIELD CONSTRUCTION INSPECTION

PRELIMINARY CONSTRUCTION INSPECTION
 When construction is approximately 75% to 80% completed
 with plumbing, rough ventilation, and rough equipment
 installed, you should contact the Health Department for a
 <u>preliminary construction inspection.</u> Requests should be
 made at least two (2) working days in advance. A
 preliminary inspection should be scheduled for no less
 than two weeks prior to the proposed opening of the food
 establishment.

2. FINAL CONSTRUCTION INSPECTION

Upon completion of all construction, including all finishing work, <u>you must contact the Health Department for a final construction inspection.</u> You will not be approved to operate or issued a Health Permit until the establishment passes a final inspection. In no case should a final inspection be requested less than five (5) working days prior to the proposed opening of the establishment. <u>Final construction must be approved by this agency prior to opening for business or use of remodeled area.</u>

GENERAL CONSTRUCTION AND EQUIPMENT REQUIREMENTS

The plans must show and specify in detail the following:

1. FLOORS:

a. Floors in food establishments (except in dining areas) shall be durable, smooth and impervious to water, grease and acid, and of easily cleanable construction, e.g., quarry tile, ceramic tile, sealed concrete, sheet vinyl, etc. Floor surfaces in all areas where food is prepared, packaged, dispensed or stored, where any utensil is washed, where refuse or garbage is stored, where janitorial facilities are located, in all toilet and handwashing areas and in employee change and storage areas, shall be of an approved type that continues up the wall or toe-kicks, at least four (4) inches (recommended six (6) inches), forming a 3/8 inch minimum radius cove as integral unit (Vinyl rubber top set base is not acceptable).

- Floor drains are required in floors that are water-flushed for cleaning, and/or where pressure spray methods for cleaning equipment are used.
 Where floor drains are utilized, the floor surface shall be sloped to the floor drains.
- c. Flooring under equipment and on the coved bases shall be completely smooth. Floor surfaces which contain non skid agents shall be restricted to traffic areas only.
- d. High pressure hot water cleaning systems are required in addition to floor drains if the degree of roughness of the nonskid agent is deemed excessive upon evaluation by this Division.

2. WALLS:

- a. Walls in all areas except dining areas shall be durable, smooth and nonabsorbent, with a light colored, easily cleanable washable finish. Note: Brick, concrete block, rough concrete, rough plaster, grooved paneling, wall paper or vinyl wall covering are not acceptable.
- b. Wall surface materials are subject to evaluation and may require submission of samples.
- All wall surfaces shall be covered with a gloss or semigloss enamel, epoxy, fiberglass reinforced polyester (FRP), ceramic tile, or other approved materials.
- d. All walls behind sinks must be protected with at least an 8' high water-resistant material (e.g., green board, FRP, stainless steel, ceramic tile or other approved material).

3. CEILINGS:

a. Ceilings in all areas except dining areas shall be durable, smooth and nonabsorbent with a lightcolored, easily cleanable, washable finish. Blown acoustical type ceiling is not acceptable. b. Ceiling panels may be acceptable if they comply with the preceding requirements and if approved by this division.

<u>Note:</u> Waitress stations, salad bars, food serving or self-service open food counters, or similar stations located immediately adjacent to, or in dining areas must comply with floor, wall and ceiling requirements.

4. CONDUITS:

- a. All plumbing, electrical, and gas lines shall be concealed within the building structure to as great an extent as possible.
- Where conduit or pipe lines enter a wall, ceiling or floor, the opening around the line shall be tightly sealed.
- c. Conduit or pipe lines shall not be installed across any aisle, traffic area or door opening.
- d. Multiple runs or clusters of conduit or pipelines shall be furred out and encased in an approved runway or other sealed enclosure.

5. EXHAUST HOODS AND DUCTS:

a. Mechanical exhaust ventilation shall be required at or above all ranges, griddles, ovens, deep fat fryers, barbecues, rotisseries and high temperature dishwashing machines or similar equipment to effectively remove grease, smoke, steam, vapors, heat or odors.

A <u>Type I Hood</u> is a kitchen hood collecting and removing grease and smoke. They shall be equipped with approved grease filters or grease extractors designed for that specific purpose.

A <u>Type II Hood</u> is a general kitchen hood for collecting and removing steam, vapors, heat or odors.

- All hoods, ducts, and exhaust outlets shall be installed in accordance with Chapter 20 of the current edition of the Uniform Mechanical Code as adopted by the Department of Planning and Building.
- c. Detailed Requirements: Provide an illustration sheet showing hood exhaust data. SEE ATTACHMENT IIA & IIB.

- d. All joints and seams shall be sealed, welded or soldered for ease or cleaning.
- e. Canopy-Type Hoods: Canopy-type hoods shall not be more than (7) feet above the floor and shall not be more than four (4) feet above the cooking surface. The hood shall overhang or extend a horizontal distance of not less than six (6) inches beyond the outer edges of the cooking equipment to the inner lip of the hood on all open sides. It shall have grease troughs or drip pans that are easily cleanable.
- f. Noncanopy-Type (High Velocity) Hood: Noncanopy-type hoods will be approved providing they are constructed to be easily cleanable and they comply with the minimum exhaust air velocity requirements. Shielding at the ends of the hood may be necessary to prevent interference from cross drafts.
- g. Make-up Air: Make-up air shall be provided that is at least 95% equivalent to the air that is mechanically exhausted and shall be inter-connected by a single control switch. Windows and doors shall not be used for the purpose of providing make-up air.
- h. Food heating or warming devices, cheese melters, etc., that are installed above other equipment beneath an exhaust hood may create an air flow obstruction to proper ventilation of the basic equipment for which the hood ventilation system is designed. The design, construction and installation of such warming devices under a hood are subject to evaluation and approval prior to installation.
- Fire Extinguishing System: Fire extinguishing systems are required by the Fire Department. They shall be installed so as to allow easy cleaning of the hood and duct systems.

6. REFRIGERATION:

- a. All Refrigeration units shall be adequate in capacity to meet the needs of the proposed operation and shall comply with the following requirements:
 - i. Be specifically constructed for commercial use, i.e., NSF or equivalent. Domestic model refrigeration units will not be accepted.
 - ii. Be provided with accurate, readily visible thermometer.

- iii. Have shelving that is nonabsorbent and and easily cleanable. Wood is not acceptable.
- iv. Have smooth, nonabsorbent and easily cleanable surfaces. All joints must be sealed.
- v. Open into an approved food handling area of the building.
- vi. Condensate waste from reach-in refrigeration units must be drained into a floor sink via legal air gap or an approved evaporator unit.
- vii. Rapid cool down facilities may be required depending on the food operation.

b. Walk-in Refrigeration Units shall also:

- i. Have an integrally coved base with a radius of at least 3/8 inch at the floor/wall juncture; the floor material shall extend up to a height of at least four (4) inches on the walls. Four (4) inch approved metal top set coving with a minimum 3/8 inch radius is acceptable against metal wall surfaces of walk-in refrigeration units (Wood is not an acceptable interior finish).
- ii. Have shelving that is at least six (6) inches off the floor with smooth, NSF type metal legs, or cantilevered from the wall, for ease of cleaning. Small, easily movable, castered dollies may be used in place of a lower shelf inside a walk-in refrigeration unit.
- iii. Have condensate waste drained into a floor sink via legal air gap. Floor sinks, floor drains or sewer cleanouts are not permitted inside walk-in refrigeration units.
- iv. Open into the building.

7. ICE MACHINES:

All ice machines shall be located inside the food establishment in an easily cleanable, well ventilated area, and shall be drained to a floor sink via legal air gap.

8. FLOOR SINKS:

- a. All condensate and similar liquid waste shall be drained by means of indirect waste pipes into a floor sink via legal air gap.
- b. Floor sinks shall be installed flush with the floor surface and have appropriate grates.
- c. Horizontal runs of drain lines shall be at least ³/₄ inch from the wall and six (6) inches off the floor and shall terminate at least one (1) inch above the overflow rim of the floor sink.
- d. Floor sinks shall be located so that they are readily accessible for inspection, cleaning and repair. A protective enclosure will be required around the back side of half-exposed floor sinks installed under curb or base mounted equipment, to prevent any waste water backflow under the equipment, e.g., storage cabinet, display refrigerators, etc.
- e. The floor sink must be located within 15 feet of the drain opening of the equipment served.
- f. Waste lines may not cross any aisle, traffic area or door opening.

9. KITCHEN UTENSIL SINK:

- a. Where multi-service kitchen utensils (i.e., pots pans, etc.) are utilized, there shall be provided at least a three-compartment stainless steel sink with dual, integrally installed stainless steel drain boards meeting current NSF standards. This sink shall be drained in accordance with City Building & Planning Department requirements.
- b. The minimum compartment size shall be at least 18" x 18" x 12" deep with minimum 18" x 18" drain boards, however, the sink must otherwise be capable of accommodating the largest utensil to be washed and the drain boards shall be as large as the largest sink compartment.
- c. When a sink is installed next to a wall a metal "back splash" extending up the wall at least eight (8) inches shall be formed as an integral part of the sink, and sealed to the wall.
- d. An additional three-compartment sink must be installed within each separate section of a large food establishment which handles unpackaged

foods, i.e., delis, meat sections, bakeries, sushi bars, oyster bars, etc.

e. A kitchen utensil sink is not required if the facility is 100% pre-packaged, i.e., no food or drink preparation or serving, no coffee service, no ice packing, no unpackaged snacks, candy, beef jerky, no beer tappers, no beverage dispensing, etc.

10. FOOD/VEGETABLE PREPARATION SINKS:

Food facilities utilizing a sink for food preparation, such as thawing, washing, etc. shall have at least a one (1) compartment food/vegetable preparation sink, separate from utensil washing sinks, that drains to a floor sink via legal air gap.

11. EATING AND DRINKING UTENSIL SINKS:

- a. Where multi-service eating and drinking utensils are washed by hand, a three (3) compartment stainless steel sink with dual integrally installed stainless steel drain boards shall be provided. This sink shall be drained in accordance with City Building & Planning Department requirements.
- b. The minimum compartment size shall be at least 18" x 18" x 12" deep with minimum 18" x 18" drain boards, however, the sink must otherwise be capable of accommodating the largest utensil to be washed, and the drain boards shall be as large as the largest sink compartment that is over 18 inches.
- c. Bar sinks must have a minimum compartment size of 10" x 14" x 10" deep (or a minimum of 140 square inches in surface size), with dual integral drain boards, a minimum of 18" long. Bar sinks shall have a quick drain or a fourth sink compartment for disposal of drink/ice waste. Bar sinks shall be drained in accordance with City Building & Planning Department requirements.
- d. When a sink is installed next to a wall, a metal "back splash" extending up the wall at least eight (8) inches shall be formed as an integral part of the sink, and sealed to the wall.
- e. Provide sanitizing testing equipment and/or materials to adequately measure the applicable concentration or sanitizer at the sinks for multi-use utensils.

12. AUTOMATIC DISHWASHER/GLASS WASHERS:

- All automatic dishwashers and glass washers must be listed by the National Sanitation Foundation (NSF) under Standard No. 3, and must drain to a floor sink or other approved method via legal air gap.
- All spray type dishwashers and glass washers which are designed for a hot water bactericidal rinse shall be provided with a booster heater that meets the requirements of NSF Standard No. 5, or be connected to an approved recirculating water system which is capable of maintaining the rinse water at not less than 180 F. These dishwashers require an approved Type II exhaust hood.
- Dishwashers and glass washers must have two (2) integral stainless steel drain boards at least 18 inches long.
- d. The dishwasher must also be provided with thermometers and pressure gauges to indicate the proper water flow pressures and temperatures.
- e. A minimum of a (3) three-compartment stainless steel sink with dual integral drain boards is required in addition to any dishwashing machine.
- f. If a glass washer is proposed, one of the following should be provided:

A 3-compartment sink within the area of an adjacent kitchen.

A "backup" glass washer.

A dishwasher in an adjacent kitchen.

g. Chemical sanitizing dishwashers and glass washers shall be provided with a sanitizing test kit.

13. GARBAGE DISPOSAL:

Garbage disposals, if proposed, may be installed in drain boards if the drain board is lengthened to accommodate the disposal unit in addition to the minimum 18" required drain board size. Garbage disposals shall not be placed in or under any required sink compartment.

14. JANITORIAL SINK AND SUPPLIES:

a. A janitorial sink shall be located in a separate janitorial room or be separated from the rest of

- the food establishment by a solid partition. The partition must be durable, with smooth and easily cleanable surfaces.
- b. A one compartment, wall-mounted janitorial sink or a curbed area properly sloped to a drain, that is provided with hot and cold running water through a mixing faucet, with an approved backflow prevention device, shall be installed for general cleanup activities. All curbed area surfaces shall be smooth, impervious, and of easily cleanable construction. Where duckboards or floor mats are used in the food establishment, a curbed area with a drain is required for cleaning.
- c. Free standing janitorial sinks must be provided with NSF type metal legs.
- d. A janitorial room, area or cabinet, with a mop and broom rack, separated from any food preparation, utensil washing or food or utensil storage area shall be provided for the storage of cleaning equipment (mops, buckets, brooms, etc.) and supplies (soap, cleanser, waxes bleach, etc.).

15. HANDWASHING SINKS:

- a. Hand sinks shall be provided in all food preparation areas. Hot and cold water through a mixing faucet is required.
- b. Soap and sanitary towels shall be provided in single-service, permanently installed dispensers at the hand sinks.
- c. A separate, approved hand sink must be installed within each section of a food establishment which handles unpackaged food, i.e., deli, meat, bakery, sushi bars, oyster bars, etc.
- d. Hot water temperature for customer handwashing sinks must be a maximum temperature of 110 F.

16. GENERAL PURPOSE HOT WATER:

a. Provide a water heater which is capable of constantly supplying hot water at a temperature of at least 120 F to all sinks and other cleanup facilities (except for customer handwashing sinks, see 15d). In sizing the water heater, the peak hourly demands for all sinks, etc., are added together to determine the minimum required recovery rate. A water heater should not be

purchased until the health department has determined the minimum required size for the particular food establishment.

b. All sinks shall be provided with hot and cold running water from a mixing faucet.

17. DIPPER WELL:

A running water dipper well must be provided if scoops or other reusable serving utensils are used for dipping ice cream, butter, etc. The dipper well shall be drained to a floor sink via legal air gap.

18. WINDOW SCREENS:

All openable windows, such as restroom windows, shall be screened with not less than 16-mesh screening.

19. SERVICE OF UNPACKAGED FOODS/UTENSILS DIRECTLY TO OR BY THE CUSTOMER:

Displays of unpackaged foods or utensils shall be shielded so as to intercept a direct line between the customer's mouth and the food or utensils being displayed, or shall be dispensed from approved self-service containers.

- a. Cafeteria, buffet and salad bar self-service, food preparation equipment and food preparation areas, etc., shall be protected by approved sneeze guards.
- b. Cleaned and sanitized glasses and stemware that are displayed or stored in bar areas over customer service counters shall be protected from customer contamination.
- c. Approved self-service containers shall have close-fitting individual covers.

20. BACK-UP DRY FOOD AND BEVERAGE STORAGE:

- a. Adequate and suitable floor space shall be provided for the storage of food, beverages, and related products. In addition to working storage and refrigeration storage, back-up storage must be provided. Working storage is considered to be cabinets over and under food handling equipment and wall mounted shelves which are located in and used in conjunction with food preparation areas.
 - I. The floor space required for back-up dry

food storage shall be a space equal to 25% of the food preparation area. A minimum of 100 square feet of floor space is required for backup dry storage.

- II. In most cases, at least 32 linear feet of approved shelving is required for each 100 square feet of floor space. However, depending on the size and type of operation additional shelving may be required.
- III. Shelving units shall be a minimum of 18 inches in depth at least three tiers high.
- b. Shelving shall be constructed in an easily cleanable design of smooth metal or wood which has been finished and sealed. Shelves installed on a wall shall have at least one inch of open space between the back edge of the shelf and the wall surface, otherwise, the back edge of the shelf shall be sealed to the wall with an approved silicone sealant or equivalent. The lowest shelf shall be at least (6) inches above the floor. with a clear unobstructed area below or be completely sealed to the floor with a continuously coved base, a minimum height of four (4)inches. All shelves located below a counter or work surface shall be set back at least two (2) inches from the drip line of the surface above. If shelves are supported by legs on the floor, the legs shall be smooth, NSF type metal equipment legs.
- c. Electrical panels, large fire prevention system components or similar wall-mounted equipment shall not be installed in food storage rooms unless an adequate approved provision is made to compensate for the space required for the installation.
- d. Each department in a grocery store which handles unpackaged food, i.e., deli, meat, bakery, etc., and satellite food service areas in restaurants, i.e., sushi bars, oyster bars, etc., must provide its own backup dry food storage space based upon the minimum requirements contained in this section.
- e. Within bars/taverns, a separate room or area with at least 50 square feet of floor space shall be dedicated for backup beverage and bar supply storage. At least 16 linear feet of approved

shelving units shall be installed in the 50 square feet of dedicated floor space. When a bar is located within a restaurant, the backup storage requirement for the bar must be provided in addition to the required backup dry food storage.

- f. Within produce departments of grocery stores or produce stores, a separate room or area with at least 50 square feet of floor space shall be dedicated for backup storage of food and packaging supplies. At least 16 linear feet of approved shelving units shall be installed in the 50 square feet of dedicated floor space.
- g. Adequate suitable space shall be provided for storage of clean linens, including apparel, towels and cleaning cloths.

21. RESTROOMS:

- a. Toilet facilities shall be provided within each food establishment, convenient for the employees.
- b. If there are five or more employees, separate toilet rooms for each sex shall be provided.
- c. Toilet facilities shall be situated so that patrons do not pass through food preparation, food storage or utensil washing areas when they are allowed access to the toilet facilities.
- d. The floors, walls and ceilings shall have surfaces that are smooth, nonabsorbent, and easily cleanable.
- e. Handwashing lavatories shall be provided within or immediately adjacent to the toilet rooms. The lavatory shall be provided with hot and cold running water from a mixing type faucet. Soap and sanitary hand towels in single-service, permanently installed dispensers shall be provided at the handwashing sink.
- f. Toilet tissue shall be provided in a permanently installed dispenser at each toilet.
- g. The restrooms shall be provided with tight fitting, self-closing doors.
- h. All toilet rooms shall be provided with approved ventilation. If adequate ventilation cannot be

- provided by an openable screened window mechanical ventilation will be required.
- i. Food facilities constructed on or after January 1, 2004, that provide space for consumption of food on the premises, shall provide customer toilet facilities.

22. CLOTHING CHANGE ROOMS/AREAS:

- a. A room or enclosure with lockers separate from toilets, food storage, or food preparation areas, shall be provided where there are five (5) or more employees per shift or when employees change their clothes and store their outer garments on the premises. The change room(s) shall be large enough to accommodate a standard locker for each employee per shift.
- A designated area with lockers separate from toilets, food storage, or food preparation areas shall be provided to store outer garments and personal belongings when a change room is not required.
- c. Clothing change rooms/areas shall not be used as an office or for other food establishment activities.

23. PASS-THROUGH WINDOWS:

- a. When food is passed through a window to a customer on the outside of the building, the size of the window opening may not exceed 432 square inches.
- b. Food service pass-through window openings exceeding 216 square inches shall be equipped with an air curtain which will produce an air flow eight inches wide at the discharge opening and with an air velocity of not less than 600 FPM (feet per minute) across the entire opening at a point three feet below the air curtain. Window openings must be closed when not in use.
- c. Food service pass-through window openings less than 216 square inches shall be equipped with a sliding screen or solid closing panel.
- d. If there are two pass-through windows, the minimum distance between the window openings may not be less than eighteen (18) inches.
- e. The counter surface of the pass-through window must be smooth, free of channels and crevices and easily cleanable.

24. DELIVERY DOORS:

- a. All delivery doors leading to the outside shall be self-closing and shall be provided with an overhead air curtain. The air curtain, when installed inside the building, must produce a downward-outward air flow not less than three inches thick at the nozzle with an air velocity of not less than 1600 FPM (feet per minute) across the entire opening at a point three feet above the floor. When installed outside the building, the same velocity of air must be directed straight down over the entire door opening. The air curtain shall turn on automatically when the door is opened.
- b. Large cargo-type doors shall not open directly into food preparation areas. Cargo-type doors that open into any food warehouse or food facility may only be open during deliveries.
- c. An air curtain is not a substitute device to permit a door to remain open.

25. CUSTOMER ENTRANCE DOORS:

All entrance doors leading to the outside shall be tight fitting, open outward and be self-closing to effectively prevent the entrance of flies and rodents.

26. GARBAGE AND TRASH AREA:

- a. An area shall be provided for the storage and cleaning of garbage and trash containers.
- b. The walls, floor and ceiling of this room or area shall be constructed so as to be smooth, impervious and easily cleanable.
- c. Inside trash storage areas shall properly slope to a floor drain.
- d. Outside trash storage areas shall properly drain so as not to create a nuisance.
- e. Outside trash storage areas should be situated as far away from delivery doors as possible.

27. LIGHTING:

a. All food preparation areas, dishwashing areas, and all bar and fountain glass washing sink areas (except where alcoholic beverage utensils are

- washed), shall be provided with at least 20 foot candles of light, 30 inches above the floor.
- b. Food and utensil storage rooms, refrigeration storage, toilet rooms and dressing rooms shall be provided with at least 10 foot candles of light.
- c. A minimum of 20 foot candles of light shall be provided in all areas during clean up activities.
- d. Light fixtures in areas where food is prepared, open food is stored, or utensils are cleaned shall be of shatterproof construction or shall be protected with shatterproof shields.

28. VENTILATION:

Provide adequate ventilation to remove gases, odors, steam, heat, grease, vapors or smoke from all rooms in the facility including toilet, janitorial, change room and similar rooms.

29. EQUIPMENT:

- a. All new and replacement equipment shall meet or be equivalent to applicable National Sanitation Foundation (NSF) standards or, in the absence of applicable NSF standards, equipment design, construction and installation is subject to approval by this Division.
- b. All show and display cases, counters, shelves, tables, refrigeration equipment, sinks and other equipment used in connection with the preparation, service and display of food, shall be made of nontoxic materials and so constructed and installed as to be easily cleanable.
- c. All equipment shall be placed on minimum six (6) inch high, NSF type legs or completely sealed in position on a four (4) inch high continuously coved base or concrete curb, or on approved casters, or cantilevered from the wall.

30. WATER:

An adequate, protected, pressurized, potable water supply shall be provided to serve the facility.

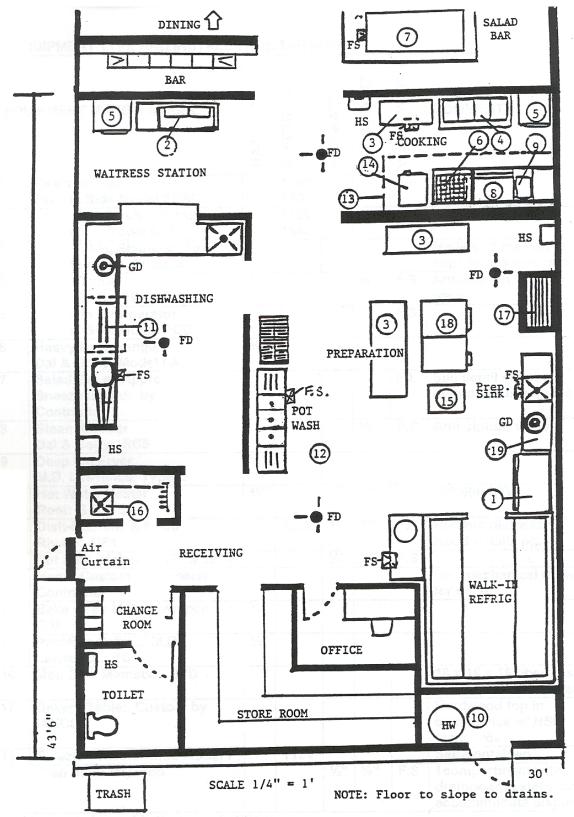
31. BACKFLOW PROTECTION:

An approved backflow prevention assembly shall be

properly installed upstream from any potential hazard between the potable water system and a source of contamination, e.g., all threaded water outlets, mop sinks, sprayers, dishwashers, etc.

32. SEWAGE DISPOSAL/GREASE INTERCEPTORS:

- a. All liquid waste, including sewage, generated by a food establishment, shall be disposed of in an approved manner to the public sewer system.
- b. The grease interceptor shall be installed <u>outside</u> the facility. NOTE: Check with the Water Department for sewerage and grease interceptor requirements.



Each piece of equipment is numbered to correspond to the listing on Attachment IB.

Floor drains: FD; Floor Sinks: FS; Hand Sink: HS; Hoods over equipment: [_______]

Finish Schedule is found on Attachment III. Garbage Disposal:GD.

NOTE: THIS IS NOT INTENDED AS A MODEL LAYOUT, BUT ONLY TO ILLUSTRATE A

PROCEDURE FOR PLAN SUBMITTAL & APPROVAL.

*EQUIPMENT TYPE AND INSTALLATION METHODS

<u></u>	QUIPMENT TYPE AND INSTALLATI	UN IV	IETHOL	72	ı	T	T
*EQ	UIPMENT MAKE & MODEL	GAS	ELECTRICAL	HOT WATER	COLD WATER	WASTE WATER	COMMENTS
1	Reach-in Refrigerator Rivers: Side Model EHSD		110V 20A.			F.S	
2	Salad and Sandwich Table Meinsco: Model DLM		110V 15A.				Self-contained
3	Work Table, Stainless Steel Top Miensco: Custom						Made to dimensions supplied by contractor
4	Steam Table Dal & Getty: FW-100	1/2"			1/2"	F.S	Anti-siphon valve at water
5	Reach-in Refrigerator Rivers: Side Model PCG					F.S	Water
6	Heavy Duty Range Dal & Getty: Model I.A.N.	3/4"					
7	Salad Bar w/ Approved Sneeze Guard: by General Contractor					F.S	See detail sheet for diagram & elevations
8	Steam Cooker Dal & Getty: SC5				1/2"	F.S	Anti-siphon valve
9	Deep Fat Fryer M.D. Lawrence: Type L	1/2"					
10	Hot Water Heater Root: G-BT155	3/4"		1"	1"		155,000 BTU
11	Dish-Machine & Hood Riv-co: QF1		220V	1"	1"	F.S	Hi-temp dishwash Hood details pg. A5
12	Pot Sink Meinsco:18" x 18" x 12"			1/2"	1/2"		LxWxD
13	Hood: Custom by General Contractor						See mechanical drawings for details
14	Bake Oven M.D. Lawrence O/B	3/4"					
15	Proofing Cabinet M.D. Lawrence: PC	1/2"					
16	Mop Sink Meinsco: STD						18 x 18 x 18 fiberglass cantilevered from wall
17	Bakers Table: Custom by IANCO						Hardwood top in compliance w/ NSF standards
18	Freezer: Rivers-Side Model F		110V				Self-contained
19	Prep Sink: Meinsco			1/2"	1/2"	F.S	1compartment with drainboard extension to accommodate disposal
**/	Above equipment listings are fictition	us.	•	•	•	•	•
	22 (example o	ATTA	CHMEN	IT IB			

THIS IS A SAMPLE ONLY:

Specific brand names and colors for materials should be specified whenever possible to insure acceptability.

FINISH SCHEDULE

WALK-IN REFRIGERATOR	DRESSING ROOM(S)	MOP ROOM/ EQUIPMENT CLEANING	RESTROOMS	SALAD BAR*	BAR	WAITRESS SERVICE STATION	STOREROOM	FOOD PREPARATION & DISWASHING	
** Sealed smooth concrete	Ceramic tile	Quarry tile	Ceramic tile	Quarry tile: Extends 24" beyond table on all sides	Quarry tile	Quarry tile	Commercial grade Sheet vinyl	Quarry tile	FLOOR
Prefabricated Stainless steel wall, 3/8" radius cove	Continuous with floor up wall 4" with 3/8" radius cove	Continuous with floor, 3/8 inch radius sanitary cove	Continuous with floor, 3/8 inch radius sanitary cove	Quarry tile, Same as above	Quarry tile, Same as above	Quarry tile, up wall 4 inches with 3/8" radius cove	Continuous w/floor up wall 4" with 3/8" radius	Quarry tile, up wall 4inches, 3/8" radius cove	FLOOR BASE OR COVE
Prefabricated Stainless steel	Drywall with white enamel paint	F.R.P.	Water-resistant drywall, 4 foot ceramic wainscot	N/A	Light colored, enamel painted drywall	Water resistant dry wall with 4" ceramic wainscot, light color	Drywall with white gloss enamel	F.R.P.	WALLS
Prefabricated Stainless steel	Light colored enamel paint on drywall	Washable, non absorbent lay-in ceiling panels	Water-resistant drywall with white enamel paint	Same as above	Same as above	Same as above	Same as above	Washable, Non-absorbent lay-in ceiling panels	CEILING

*Salad bar is covered on top and sides by an approved sneeze guard: see detail sheet
**Smooth concrete is sealed to be water resistant with an approved sealant.

Construction Guidebook for Wholesale Food Facilities - RWFPC
7. California Department of Public Health – Food and Drug
7. California Department of Public Health – Food and Drug Branch (Food Sanitation Act)
7. California Department of Public Health – Food and Drug Branch (Food Sanitation Act)

Excerpts from the Health and Safety Code

FOOD SANITATION ACT

DIVISION 101, PART 6, CHAPTER 4

CHAPTER 4 WHOLESALE FOOD PROCESSORS

ARTICLE 1 Food Processing Establishments

111950. "Food," as used in this chapter, includes all articles used for food, drink, confectionery, or condiment, whether simple or compound, and all substances and ingredients used in the preparation thereof.

111955. "Food processing establishment," as used in this chapter, shall mean any room, building or place or portion thereof, maintained, used or operated for the purpose of commercially storing, packaging, making, cooking, mixing, processing, bottling, canning, packing, slaughtering or otherwise preparing or handling food except restaurants.

111960. Every food processing establishment shall be properly lighted, drained, plumbed, and ventilated; and shall be conducted with strict regard to the influence of lighting, drainage, plumbing, and ventilation upon the health of persons therein employed, and upon the purity and wholesomeness of the food therein produced, prepared for sale, manufactured, packed, stored, kept, handled, sold, or distributed.

111965. The floors, side walls, ceiling, furniture, receptacles, utensils, implements, and machinery of every food processing establishment shall at no time be kept in an unclean, unhealthful, or unsanitary condition. Any of the following is deemed to be "an unclean, unhealthful, or unsanitary condition":

- (a) If food in the process of manufacture, preparation, packing, storing, sale, or distribution is not securely protected from flies, dust, or dirt, and from all other foreign or injurious contamination.
- (b) If refuse, dirt, and waste products subject to decomposition and fermentation incident to the manufacture, preparation, packing, storing, selling, and distributing of food, are not removed daily.
- (c) If all trucks, trays, boxes, baskets, buckets, other receptacles, chutes, platforms, racks, tables, shelves, knives, saws, cleavers, and all other utensils, receptacles, and machinery used in moving, handling, cutting, chopping, mixing, canning, and all other processes employed in the preparation of food are not thoroughly cleaned daily.
- (d) If the clothing of employees is unclean or if they dress, undress, or leave or store their clothing in the place where the food is produced, prepared, manufactured, packed, sold or distributed.

111970. No live animal or fowl shall be kept or allowed in any establishment where food is prepared, manufactured, kept, stored, offered for sale or sold unless the

establishment is exclusively devoted to the slaughter, processing and/or sale of the animal or fowl. This section does not apply to dogs used by uniformed employees of private patrol operators and operators of a private patrol service who are licensed pursuant to Chapter 11.5 (commencing with Section 7580) of Division 3 of the Business and Professions Code, while those employees are acting within the course and scope of their employment as private patrolmen. The state department may adopt regulations as it determines are reasonably necessary under this section for the protection of the public health and safety.

- 111975. The side walls and ceilings of every bakery, confectionery, hotel, or restaurant kitchen shall be well plastered or ceiled with metal or lumber, or shall be oil painted or kept well lime washed, or otherwise kept in a good sanitary condition.
- 111980. All interior woodwork of every bakery, confectionery, hotel, or restaurant kitchen shall be kept well oiled or painted with oil paint, and shall be kept washed clean with soap and water, or otherwise kept in a good sanitary condition.
- 111985. Every building, room, basement, or cellar occupied or used for the preparation, manufacture, packing, storage, sale, or distribution of food shall have an impermeable floor, made of cement, or of tile laid in cement, brick, wood, or other suitable, nonabsorbent material that can be flushed and washed clean with water.
- 111990. Where practicable, the doors, windows, and other openings of every food producing or distributing establishment shall be fitted with stationary or self-closing screen doors and wire window screens, of not coarser than 14 mesh wire gauze.
- 111995. Every building, room, basement, or cellar occupied or used for the production, preparation, manufacture, packing, canning, sale, or distribution of food shall have convenient toilet or toilet-rooms, separate and apart from the room or rooms where the process of production, preparation, manufacture, packing, canning, selling, or distributing is conducted.
- 112000. The floors of toilet-rooms shall be made of cement, or of tile laid in cement, wood, brick, or other nonabsorbent material, and shall be washed and scoured daily.
- 112005. The toilets shall be furnished with separate ventilating pipes or flues discharging either into soil pipes or on the outside of the building in which they are situated.
- 112010. Lavatories and washrooms shall be adjacent to toilet-rooms and shall be supplied with soap, running water, and towels, and shall be maintained in a clean and sanitary condition.

112015. Employees and others who handle the material from which food is prepared or the finished product shall before beginning work and immediately after visiting a toilet or lavatory, wash their hands and arms thoroughly in clean water.

- 112020. No employee or other person shall sit or lie upon any table, bench, trough, shelf, or other equipment that is intended for use in connection with any food manufacturing process.
- 112025. No employee or other person shall expectorate or discharge any substance from his or her nose or mouth on the floor or interior side wall of any building, room basement, or cellar where the production, preparation, manufacture, packing, storing, or sale of any food is conducted.
- 112030. No person shall, nor shall any person be allowed to, reside or sleep in any room of a bake-shop, public diningroom, hotel or restaurant kitchen, confectionery, or other place where food is prepared, produced, manufactured, served, or sold.
- 112035. No employer shall require or permit any person to work, in a food processing establishment or vehicle used for the production, preparation, manufacture, sale, or transportation of food if the person is infected with any contagious, infectious, or communicable disease that can be transmitted by the food involved.
- 112040. (a) Prior to January 1, 2001, the department, its inspectors and agents, and all local health officers and inspectors may at all times enter any building, room, basement, cellar, or other place occupied or used, or suspected of being occupied or used, for the production, preparation, manufacture, storage, sale, or distribution of food, and inspect the premises and all utensils, implements, receptacles, fixtures, furniture, and machinery used.
- (b) Commencing January 1, 2001, only the department, its inspectors and agents, and the local health officers and inspectors of Los Angeles, San Bernardino, and Orange Counties and the City of Vernon may exercise the authority to enter and inspect granted in subdivision (a) except as provided in subdivision (c).
- (c) Commencing January 1, 2001, the local health officer or inspector of each city or county, or city and county may exercise the authority to enter and inspect granted in subdivision (a) for the sole purpose of inspecting a food processing establishment that only holds warehouses processed food, provided that:
 - (1) The warehouse does not manufacture or pack processed food.
 - (2) The warehouse does not hold fresh seafood, frozen seafood held in bulk for further processing, or fresh or frozen raw shellfish.
 - (3) The warehouse is not operated as an integral part of a food processing facility required to be registered pursuant to Section 110460.
 - (4) The warehouse facilities are located entirely within the area under the jurisdiction of the local health department.

(5) The warehouse does not salvage food as the primary business.

(d) All inspections of food processing establishments conducted by local health departments shall be reported to the department within 60 days. The department shall consider this information when scheduling the department's inspection activities.

112045. If upon inspection any building, room, basement, cellar, or other place, or any vehicle, employer, employee, or other person is found to be in violation of or violating any of the provisions of this article, or if the production, preparation, manufacture, packing, storing, sale, or distribution of food is being conducted in a manner detrimental to the health of the employees or to the character or quality of the food being produced, prepared, manufactured, packed, stored, sold, distributed, or conveyed, the person making the inspection shall at once make a written report of the violation to the district attorney of the county, who shall prosecute the violator. He or she shall make a like report to the department. The department, from time to time, may publish the reports in its monthly bulletin.

112050. Every building, room, basement, cellar, or other place or thing kept, maintained, or operated in violation of this article, and all food produced, prepared, manufactured, packed, stored, kept, sold, distributed, or transported in violation of this article, is a public nuisance dangerous to health. Any such nuisance may be abated or enjoined in an action brought for that purpose by the local or state department or may be summarily abated in the manner provided by law for the summary abatement of public nuisances dangerous to health.

112055. The sections contained in this article are to be known as the California Food Sanitation Act.

ARTICLE 2 Food Containers

Section 112060. "Bottle," as employed in this article, includes any bottle or any glass or crockery food container, other than one not previously used, that is used or sold for use in the manufacture, production, preparation, compounding, blending, or packing for sale of any food, drug, or liquor.

Section 112065. This article is not applicable to containers subject to Division 15 (commencing with Section 32501) of the Food and Agricultural Code.

Section 112070. The provisions of this article in reference to sterilization procedures and methods in cleaning bottles, as in this article defined, shall apply to all persons cleaning previously used bottles who are engaged in the business of packaging food,

drugs, or liquors and to all persons maintaining a place of business for the cleaning and resale of the bottles sold for and to be used for packing a food, drug or liquor. The sale for use of any such bottle by any person not licensed by the board as herein provided, when the use intended by purchaser is to package for sale a food, drug or liquor produced or packaged by the purchaser is unlawful, except in the case of a sale to a purchaser for export out of this state or who is engaged in the business of packaging food, drugs, or liquors at a fixed place of business in this state and is equipped to cleanse and sterilize bottles as in this article provided.

Section 112075. The department shall issue a license to an applicant therefor upon the receipt of the evidence as the department may require showing that the applicant is properly equipped for the cleansing and sterilization of bottles as provided in this article, or at its option upon the recommendation of a city, county or city and county health officer. This license is nontransferable.

The license provisions of this article shall not apply to food, drug or liquor manufacturers or packers who buy bottles for their own use and purposes, but do apply to any other person, firm or corporation engaged in the business of cleaning, sterilizing and reselling bottles to manufacturers or packers except as hereinabove provided. Section 112080. An establishment is deemed properly equipped for the cleansing and sterilization of bottles if it maintains and employs the following standards:

- (a) Cleanses and sterilizes bottles by first soaking them in a hot caustic solution of not less than 120 degrees F. for a period of not less than five minutes which temperature shall be indicated by a thermometer. The solution shall contain not less than 212 percent of caustic soda expressed in terms of sodium hydrates.
- (b) Changes the cleansing solution frequently so as to prevent its becoming foul and insanitary.
- (c) Thoroughly rinses the bottles after the soaking.

Section 112085. All bottles shall be cleansed and sterilized as specified in Section 112080, and shall be kept free from rust or contamination.

Section 112090. A licensee shall issue a certificate of sterilization with each shipment of bottles to a purchaser, stating that the licensee has cleansed and sterilized the bottles in the manner required by this article.

Section 112095. If any licensee fails to maintain his or her equipment and to cleanse or sterilize any bottle in the manner required by this article, and issues a certificate knowing its contents to be untrue the state department may revoke or suspend his or her license after a hearing. The proceedings for the revocation or suspension of a license shall be conducted in accordance with Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code, and the state department shall have all the powers granted therein.

Section 112100. Any purchaser of a bottle who shows a certificate of sterilization signed by a licensed seller thereof complies sufficiently with this article.

Section 112105. Nothing in this article prohibits the sale for use of any uncleansed or unsterilized bottle to a purchaser who is licensed under this article.

Section 112110. Food containers manufactured from second-hand tin plate and intended for the packing of hermetically sealed canned food products intended to be used for human consumption shall not be so used unless the tin plate from which they are manufactured has, prior to their manufacture, been cleansed and sterilized by thorough immersion in boiling water, and then dried on hot rolls or by the use of heated air.

The board may inspect any place where the containers are manufactured for the purpose of enforcing this section.

Section 112115. This article, with the exception of any licensing provisions, may be enforced by any local enforcement division, which shall be construed to mean the local health department, headed by the duly appointed, qualified and acting health officer of any county, city or city and county. The territory may include one or more counties, cities, or cities and counties.

Section 112120. A nonalcoholic soft drink, whether or not carbonated, shall be deemed to be misbranded if in a bottle or other closed container unless the name and address of the bottler or distributor thereof appears on the container by being molded, printed, or otherwise labeled thereon, or the name and address is shown on the crown or cap of the container if the container is a permanently and distinctively branded bottle. The beverage shall not be deemed to be misbranded under this section if in a bottle or other closed container on which is molded, printed or otherwise labeled the product name, trademark or brand of the distributor or bottler thereof and if a sworn affidavit has been filed with the department stating the name, trademark, or brand of the beverage, a full and complete description of each territory or area of the state in which the beverage is to be distributed, and the names and addresses of the persons as are responsible for the Miscellaneous Food, Food Facility, and Hazardous Substances Act (Section 27) in the bottling and distribution of the beverage in each territory or area of the state in which the beverage is distributed. Nothing in this section shall be deemed to exempt any bottler or distributor of a beverage or beverages from any provision of Part 5 (commencing with Section 109875).

ARTICLE 3
Closed Containers

Section 112125. Except when sold in bulk for manufacturing purposes, it is unlawful to sell or otherwise dispose of at retail jams, jellies, preserves, marmalades, peanut

butter, horse-radish, mayonnaise, or salad dressings other than in closed containers approved by the department, when the department determines that any other method of sale or disposition of any such food or food product is conducive to its contamination by flies, insects, dust, dirt, or foreign material of any kind whatsoever.

ARTICLE 4 Violations

Section 112130. Any person, whether as principal or agent, employer or employee, who violates any of the provisions of this chapter is guilty of a misdemeanor punishable upon conviction by a fine of not more than one thousand dollars (\$1,000), or by imprisonment in the county jail for not more than six months, or by both the fine and imprisonment. Each day's violation is a separate and distinct offense.

C	Construction Guidebook for Wholesale Food Facilities - RWFPC
	8. United States Department of Agriculture
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USDA/NCDA&CS FACILITY GUIDELINES FOR MEAT PROCESSING

Appendix A—Guidance on Establishment Facilities and Equipment

PLANTS

OVERVIEW

This Guidebook is intended for use by meat and poultry establishments in considering decisions about design and construction of their facilities, as well as the selection of equipment to be used in their operations. The material that forms the basis for this Guidebook is drawn principally from technical knowledge and experiences used by the Food

Safety and Inspection Service in making its prior approval decisions about the acceptability of facilities and equipment.

The Agency is no longer making these prior approval decisions for inspected establishments; however, the technical considerations on which those decisions were based may be of interest to establishments in the future. That is the material which is reflected in this Guidebook.

Chapter 1 LOCATION

Selecting the location for your establishment is an important factor in providing a sanitary environment for producing meat and poultry products. When selecting a location, you will need to consider the physical environment of the site, accessibility, separation of your premises from other businesses, common areas shared by you and other establishments, and whether or not you will conduct uninspected businesses such as retail stores or custom slaughter on or near your premises. This chapter provides guidelines you may wish to consider when the select a location for your establishment.

1. Site

The size of the site should allow for all buildings, parking lots, access roads, and future expansion. The site should be large enough to accommodate a potable water supply for your processing needs, and a sewage system that can efficiently handle liquid waste and process water created by your establishment. In addition, potential building locations should be evaluated for sanitation hazards. In determining that possibility, consider the following guidelines:

- To the extent possible, establishments should be located in areas free of industries that attract vermin such as sanitary landfills and junk yards.
- To the extent possible, establishments should be located in areas free of odors and airborne particulate matter that may be produced by neighboring industries or other outside sources, such as oil refineries, trash dumps, chemical plants, sewage disposal plants. dyeworks, and paper pulpmills.
- The prevailing winds are an important factor in site determination because substances emanating from more distant sources may be a problem if the winds carry them to the establishment site.

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2. Separation of Official and Non-Official Establishments

Sometimes an establishment is located next to or in the same building as other businesses which are not under FSIS inspection. In those circumstances you should take great care to keep product from becoming contaminated from the operation of the adjoining business.

Chapter 2

LAYOUT

One of the most important decisions you make in building or modifying an establishment is how you plan the layout of your building, including the placement of rooms and equipment, product flow and people traffic patterns. Not only does a poorly designed establishment affect your productivity, but it may result in congested operations that can lead to unsanitary conditions. This chapter provides guidelines that you may wish to consider in planning any modifications to your existing establishment or in building a new one.

1. Flow of Operations

The direction in and means by which product moves or flows within a plant is an important but often neglected consideration that can have enormous influence on sanitation and the safety of finished products. From a product flow standpoint, all raw meat and poultry products ought to be considered as potentially microbiologically contaminated and handled accordingly. Product being processed should flow progressively from highest potential exposure to contamination to the least potential exposure to contamination, with intervening processes designed to remove or otherwise reduce the contaminants whenever possible. The flow of air and people should be just the opposite, moving from the cleanest areas progressively toward less clean areas.

When designing product flow, consider the following:

* Moving product from raw to final cooked product areas to systematically reduce the risks of contamination along the way.

* Locating trash dumpsters and receptacles so that they do not create a risk of product contamination.

* Selecting rooms large enough to permit the installation of all necessary equipment with space for establishment operations and inspection.

* Locating people passageways to provide maximum clearance to products, work areas, and production equipment.

* Keeping truckways unobstructed.

2. People Traffic Flow

Inadequate control of the flow of people through product operational areas is one of the most serious risks for production contamination. People can act as carriers and bring from the outside contaminants such as dirt, debris, and vermin which are ideal vectors for microbiological growth and which can both directly and indirectly contaminate product. Ways in which you can reduce and control the flow of people include the following:

- * Establishment design should not require personnel not routinely assigned to specific work areas to be routed through those work areas. For example, personnel working in the live animal areas should not be required to travel through cooked product areas to use welfare rooms.
- * Welfare rooms, such as toilet rooms, dressing (locker) rooms, and cafeterias, should be designed to minimize contamination because of the traffic patterns of the people.

3. Separation of Raw and Ready-to-Eat Product

Cross contamination of ready-to-eat product by raw products may occur if the layout does not provide for separation of these products. To prevent cross contamination in the preparation of products, the following are guidelines for you to consider:

- * Exposed cooked product areas should be physically separated from other areas of the establishment. Nonpedestrian passage openings may be present for the transfer of product or supplies.
- * A ventilation system should be used to direct air flow away from exposed cooked product areas.
- * Environmental control equipment such as fans and evaporator condensation pans should not be located above the product.
- * Welfare rooms, dry storage, maintenance, box/carton make up, packaging, and palletizing areas should be separate, but adjacent to, the exposed cooked product rooms.
- * Cooked product should be covered in rigid containers to protect it from contamination while in storage.
- * Separate coolers and/or freezers should be available to use for exposed cooked product.
- * All cooking apparatuses for exposed products should have separate entry and exit portals.
- * No cooked product wash or reconditioning sinks should be used.

4. Perishable Product Rooms

Special care should be taken in perishable product rooms to inhibit growth of microorganisms in operations which could contaminate product. In addition, care should be taken to prevent contamination from other operations such as where raw ingredients are prepared. Non-meat or non-poultry ingredients should be prepared in a room or rooms separate from meat or poultry processing rooms. For example, preparation of raw vegetables for use in product should be performed in a room separate from meat or poultry processing rooms.

5. Edible and Inedible Products Rooms and Areas

Edible product can be easily contaminated by contact with inedible products, grease or sewage from inedible product areas. In order to prevent this contamination from occurring, consider the following in the placement of these rooms:

* The flow of inedible and condemned product should be designed so that it does not come into contact with edible product.

- * An inedible products department should be separate and distinct from the areas used for edible products. Inedible product rooms, grease interceptors, and sewage treatment equipment must be located away from edible product rooms.
- * Hooded, closed chutes that lead directly from the slaughter room to the inedible handling room are designed to prevent objectionable odors from inedible and condemned products from entering edible products rooms.
- * If rendering facilities are not available at the establishment watertight storage facilities should be provided to hold these products before their removal to rendering plant. These storage facilities should be separate and apart from edible products rooms, and constructed to prevent unsanitary conditions including attraction or harborage for vermin.
- * Areas for inedible trucks should be paved and enclosed for ease of cleaning and to control odors and vermin.
- * Where necessary, the boiler room should be a separate room to prevent dirt and objectionable odors entering from it into rooms where meat products are processed or handled.

6. Byproducts for Use in Animal, Pet, or Fish Food

Establishments that process byproducts into animal, pet, or fish food should provide rooms for decharacterizing, chilling, packaging, or otherwise preparing the byproducts. Consider the following guidelines when designing and constructing these rooms:

* Byproducts to be used as animal, pet, or fish food should be stored separately to prevent cross contamination and commingling with edible products.

7. Coolers and Freezers

Coolers and freezers need to have enough space to refrigerate and store product. Product should be stored in a manner that will preclude conditions which may lead to contamination of product. The following guidelines will assist you in preventing conditions which could lead to contamination of your product:

* Coolers and freezers, including doors, should be constructed of materials that can be readily and thoroughly cleaned, and durable, rigid, impervious to moisture, non-toxic, and non-corrosive. Freezer doors should be constructed and installed to prevent accumulation of frost.

* Coolers and freezers should be equipped with floor racks, pallets or other means to ensure protection of product from contamination from the floor.

8. Dry Storage

Packaging materials and ingredients should be stored to preclude conditions which may lead to contamination of product. The following are guidelines which may assist you in the planning of your dry storage area:

* Dry storage materials should be stored in a room dedicated to dry

storage only.

* The dry storage area should be constructed so that racks can be spaced away from the walls and passageways maintained between rows. This facilitates cleaning of the area. In addition, the construction should allow for all meat or poultry ingredients and/or packaging materials to be stored in closed containers on racks or pallets.

9. Incubation Room for Canned Products

A room or incubator for incubating samples of fully-processed canned meat or poultry must be provided in all establishments conducting regular canning operations. Consider the following guidelines when building this room:

* An accurate time/temperature recorder must be provided. To prevent temperature variations, a means for air circulation should be provided.

* Shelves should be provided to hold canned product. The shelves should be made of expanded metal or heavy gauge wire mesh and be removable for cleaning.

* The floor in the room should be pitched to a floor drain equipped with a removable screw-plug.

* The door of the room should be equipped for sealing by the inspector, if necessary.

10. Vehicular Areas Outside the Building

Special care should be given in the design of vehicular areas outside your building, not only to provide room for trucks and other vehicles to operate without damaging your building, but to prevent unsanitary conditions which might contaminate product in your establishment. You should consider the following in designing your vehicular areas:

- * Areas outside the building where vehicles are loaded or unloaded should be paved with concrete or a similar hard surface. Hard surface areas allow these areas to be kept clean and eliminate the potential for water puddles or dust.
- * Areas outside the building where vehicles are loaded or unloaded should be drained. Drainage from the loading docks should be confined to the immediate area of the dock.
- * The vehicular areas should be large enough to accommodate the turning radius of the largest trucks or shipping vehicles used by the establishment.
- * The vehicular areas adjacent to the establishment should have hose connections for cleaning.

Chapter 3

WELFARE FACILITIES FOR ESTABLISHMENT EMPLOYEES

One source of potential contamination of product is cross contamination from employee welfare facilities. In designing and locating employee facilities, great care should be given to preventing overcrowding and congestion and to providing enough handwash sinks and toilets for your employees. This chapter provides additional guidelines that you may wish to consider in making any modifications to or building any welfare facilities for your employees.

1. Dressing (Locker) Rooms

Dressing rooms must be provided for employees. In addition to privacy considerations, these dressing rooms should be located where they will not be a potential source of cross contamination of product. Consider the following guidelines for these dressing rooms:

* Dressing rooms should be separate from rooms or compartments where product is prepared, stored, or handled.

- * Dressing rooms should be separated from the toilet area.
- * Separate dressing rooms should be provided for each sex if both sexes are employed by the establishment.

* Dressing rooms should have abundant, well-distributed light of good

quality.

* Separate dressing rooms for raw product and other product department employees will help prevent cross contamination of product.

* Receptacles for soiled clothing should be provided adjacent to employees' dressing rooms.

2. Lockers

Lockers should be provided for employees clothing and personal items. To prevent insanitary conditions, consider the following guidelines when choosing the type of lockers and the arrangement and locations for them:

* To prevent the potential for cross contamination, the location of lockers should be separate from rooms or compartments where product is prepared, stored, or handled.

* Lockers should be large enough to store a change of clothing and other

personal items.

* For ease of cleaning, lockers should be constructed of materials that are rigid, durable, non-corrosive, easily cleaned and inspected, impervious to moisture, a light, solid color, with a smooth or easily cleaned texture, and have sloping tops.

* Lockers should either be installed so that there is enough room under them that they can be easily cleaned and inspected, or they should be sealed to

the floor.

3. Drinking Fountains

Sanitary drinking water fountains should be provided. Consider the following guidelines when installing drinking water fountains:

- * Drinking water fountains should be provided at convenient locations throughout the establishment to minimize the distance that employees need to travel to reach a fountain. This is especially important in preventing cross-contamination from employees working in raw or inedible areas and traveling to processing or ready-to-eat areas to use a fountain. Consider the following locations for placing drinking fountains:
- ** welfare areas including cafeterias, dressing (locker) rooms, and toilet rooms
 - ** inspectors' offices
- ** edible product areas including kill floor, deboning, and cut-up areas

** inedible product areas

** immediately outside freezers and coolers

** storage areas

- * Drinking water fountains should be connected to the potable water supply and either directly connected to the underfloor drainage system or should discharge through an air gap to a hub drain.
- * Drinking water fountains should be other than hand operated, and if placed as part of handwash sink, should be located high enough to avoid splash from the sink.

4. Toilet Rooms

Toilet rooms can easily become a source of potential contamination of product. Care should be taken in the design of these rooms from their location in the establishment's layout to the number of toilets provided. Consider the following guidelines:

* Toilet rooms need to be separated from the rooms and compartments in which products are prepared, stored, or

handled.

- * Toilet rooms that open directly into rooms where meat products are exposed should have self-closing doors and should be ventilated to the outside of the building.
- * Toilet rooms should be arranged so they are entered through an intervening dressing room or vestibule and not directly from a production or storage room.

5. Eating Rooms and Areas

To prevent employees from contaminating products or contaminating their food with microorganisms from the raw products or from their working environment consider the following:

* Separate eating rooms or areas should be provided for employees.

6. Handwash Sinks

One of the most important steps you can take to prevent cross contamination of product by your employees is to provide conveniently located handwash sinks. Handwash sinks are needed in toilet rooms, dressing (locker) rooms, and production rooms. Consider the following guidelines when making decisions as to where you need a handwash sink:

- * Handwash sinks are needed near toilet rooms and dressing (locker) rooms. They should be other than hand operated. There should be hot and cold running water, soap, and towels. Single use towels should be used.
- * Handwash sinks in welfare rooms and areas should have a combination mixing faucet delivering both hot and cold water with an high enough above the rim of the bowl to enable the washing of arms as well as hands.

7. Ventilation

In designing your welfare rooms, such as toilet and dressing rooms, care should be taken to make sure that they are ventilated to prevent odors from entering production areas. Consider the following guidelines:

- * Welfare rooms that are not air conditioned should be mechanically ventilated through an exhaust fan taking air to the outside. Airflow from welfare rooms should be released outside the establishment.
- * Toilet and dressing rooms that are located where no natural ventilation is available should be equipped with an exhaust fan (activated by a common switch with the lighting in the area) and a duct leading to the outside. Doors to dressing and toilet rooms ventilated in this manner should have a louvered section about 12 inches by 12 inches minimum in the lower panel to facilitate airflow.

8. Employees Working in Inedible Product Areas

Association of employees working in inedible product areas with other employees through common welfare rooms increases the risk of crosscontamination of product. To minimize this risk to product, consider the following guidelines:

* Separate welfare rooms for employees working in areas such as hide cellars, condemned or inedible product rooms, or live animal holding areas, from welfare rooms of other employees working with raw or heat processed, exposed, edible product.

Chapter 4 CONSTRUCTION

A frequently overlooked area of construction design is the selection of appropriate construction materials for the establishment. This chapter provides guidelines for construction and the selection of construction materials that you may wish to consider when making modifications to your current establishment or building a new one.

1. Building Construction Materials for Rooms (Finished Surfaces)

Production and storage areas need to be constructed with materials that are readily and thoroughly cleaned. Product in production and storage areas is at risk for contamination from indirect contact with materials used for construction of the building. In order to be readily and thoroughly cleaned, building construction materials in production and storage areas must be:

Rigid and durable.

* Non-toxic and non-corrosive.

* Impervious to moisture.

* A light, solid color such as white.

* Smooth or textured with an easily cleaned, open pattern, for example, a pattern where the veins and depressed areas are continuous or have an outlet and are not enclosed.

In addition, consider the following guidelines for selecting construction materials:

- * In non-production and non-storage areas, building construction materials should be easy to clean thoroughly.
- * Special consideration should be given before using wood as a construction material.
- ** Wood is absorbent and can absorb not only water but other substances including chemicals that create a risk for contamination of meat or poultry products.

** Wood is easily damaged and may create wood particles (splinters) that contaminate meat or poultry products.

- ** If wood is used as a construction material in exposed product areas of the official establishment, it is recommended that the wood be milled smooth and completely sealed with a coating to prevent the wood from adulterating meat or poultry product. The coating should be able to be readily and thoroughly cleaned durable, rigid, impervious to moisture, non-toxic, and non-corrosive.
- ** The use of hot linseed oil to treat or coat wood in exposed product areas is not recommended because it promotes the growth of molds and fungi.

2. Floors

In addition to any obvious debris on a floor, product can become contaminated by the flooring or microorganisms living in debris in tiny crevices in the floor. In order to avoid these sources of contamination, consider the following guidelines when selecting and installing flooring in your establishment:

- * Floors in areas where product is handled or stored should be constructed of durable, easily cleanable materials, and be impervious to moisture. Commonly used materials are concrete, quarry tile, brick, and synthetic material.
- * Floors should be installed and maintained to reduce the likelihood of cracks, depressions, or other low areas that would accumulate moisture.
- * Floors where operations are conducted should have a slip-resistant surface. Good results are obtained by using brick or concrete floors with abrasive particles embedded in the surface. Concrete floors should have a rough finish.

* Floors should be sloped to avoid puddles or depressions within the slope where water will stand.

3. Coving/Curbs

Coving is used at the wall-floor juncture, column (post)—floor juncture, and equipment support-floor juncture to provide a smooth transition for ease of cleaning and inspection. Consider the following guidelines when using coving or curbs:

- * Coving in production and storage areas should include the following criteria:
- ** All seams should be tight-fitting and sealed to eliminate all cracks and crevices which may shelter insects, vermin, and microorganisms.
- ** The coving should eliminate any sharp angles that allow the accumulation of materials.
- * Curbs should be provided to protect walls and wall finishes. Curbs should be high enough to protect the walls from pallets, trucks, or containers used in the establishment. Coving should be provided at the base of the curb.

4. Stairs

In selecting stairs consider the following:

* Stairs should have solid treads and closed risers and should have side curbs of similar material.

5. Catwalks and Access Platforms

When installing catwalks and access platforms consider the following guidelines:

- * Catwalks and access platforms in edible product handling departments should be constructed of materials that meet the same guidelines as flooring.
- * Open grating should not be used for the flooring of catwalks and access platforms inside the establishment, particularly in production areas. Dirt and other debris from shoe soles can be scraped off by the grating and contaminate product, packaging material, and equipment.
- * Catwalks and access platforms should not be installed over production lines and processing equipment.

6. Interior Walls Including Posts and Partitions

To prevent product from becoming contaminated by contact with interior walls, care needs to be taken in selection of materials for the finished surface of walls. Consider the following when selecting a finish:

* Interior walls, in areas where product is stored or handled, should be finished with materials that will make them susceptible to being readily and thoroughly cleaned and impervious to moisture. Examples of such materials are glazed brick, glazed tile, smooth concrete, and fiberglass reinforced plastic (FRP).

* Walls should have a smooth texture, not one that is rough or uneven.

* Fasteners for wall covering material should be solid, smooth headed, and not have recesses which allows the collection of foreign material.

7. Ceilings

Ceilings, in areas where product is stored or handled, should be constructed to prevent the collection of dirt or dust that might sift through from the areas above or fall from overhead collecting surfaces onto equipment or exposed products. Therefore, it is recommended that ceilings and overhead structures be maintained free of sealing paint or plaster, dust, condensate, leaks, and other materials or defects. In addition, ceilings in areas where product is stored or handled should be constructed and finished with materials that can be thoroughly cleaned and are moisture resistant. Examples of such materials are smooth concrete and fiberglass reinforced plastic.

8. Windows and Skylights

Windows (and skylights) can be a potential source of contamination of product by dirt, water, debris, or broken glass. Consider the following when selecting and installing windows:

* All outside windows, except for those in receiving and feed rooms, should have protection to exclude insects, birds, and other vermin.

* Window ledges should be sloped about 45 degrees to prevent the accumulation of dirt, water, or debris.

- * To avoid damage to window glass from impact of hand trucks and similar equipment, the sills should be at least 3 feet above the floor.
- * Windows that are installed in walls in exposed product rooms should have panes of acrylic or polycarbonate plastic or other shatter-proof material.

9. Doorways and Doors (General)

Doors are barriers that allow the movement of product and people, but also present a barrier to contamination such as dirt, insects, and other vermin as well as the microbiological hazards that they carry. The door type, construction material, and room in which the door is located are all important considerations when doors are installed in the establishment. Doors are important in maintaining sanitary conditions especially in production and storage areas. In production and storage consider the following guidelines for doors:

The most effective doors have the following characteristics:

- * They are impervious to moisture.
- * They are tight fitting to minimize air exchange and to prevent the entry of insects and vermin into the establishments.
- * They are self-closing and used throughout the establishment, especially in areas where toilet rooms open directly into rooms where meat and poultry are exposed, to prevent contamination of products with odors and their associated contaminants.

* They are high and wide enough to allow the movement of exposed product through the doorways without it coming into contact with the door or jamb.

- * They are rigid and durable, and the junctions at jambs, walls, and floors are sealed to eliminate all cracks and crevices for debris, insects, and dirt to collect.
- * Doors that open directly to the outside of the building from production rooms should have an intervening closed space, such as a vestibule or enclosed lock, to prevent the direct access of contaminants and microbial organisms to areas inside the establishment.

10. Types of Doors

In selecting a type of door for your establishment you need to consider the location of the door and whether or not product will be traveling through it. The following guidelines for different types of doors may be useful to you when selecting a door:

* The horizontal double-swinging, impact door is a bi-parting, inflexible panel door with plastic windows (vision panels) that swings only in the horizontal plane. If you select this door, consider the following:

** This door may be useful in rooms with dimensions that would not permit the use of a roll-up, vertical sliding or horizontal sliding door.

** Because this door must be manually opened, the door can be damaged creating sanitation and

maintenance problems.

* The horizontal sliding door (manual and automatic) is a single or biparting, inflexible door that moves only in the horizontal plane. If you select this door, consider the following:

** This door may be useful in rooms with dimensions that would not permit the use of a roll-up or vertical sliding

door.

** The automatic opening option is recommended not only for sanitation reasons, but it also prevents damage.

* The vertical sliding door (manual or automatic) is a single, inflexible panel door that moves only in the vertical plane. If you select this door, consider the following:

- ** This door may be useful in rooms with dimensions that would not permit the use of a roll-up or horizontal sliding door.
- ** The automatic opening option is recommended not only for sanitation reasons, but it also prevents damage.
- * The overhead garage-type door (manual or automatic) is a hinged, multi-paneled door that moves from the vertical to the horizontal plane. If you select this door, consider the following:
- ** This door may be an excellent choice for sheds or buildings used to store equipment, such as a lawn mower, that is used for the outside maintenance of the establishment's property.
- ** It is recommended that these types of doors not be used in exposed product areas or areas subject to wet clean-up because these doors have spaces between the panels that allow the collection of product, such as meat and fat, as well as contaminants.
- * The roll-up door (manual or automatic) is a single flexible panel door that moves only in the vertical plane and when open, coils tightly onto a drum assembly. If you select this door, consider the following:
- ** This door can be an excellent alternative especially where space for opening a door is limited.
- ** Several additional features should be installed on this type of door to make it an effective barrier against contamination.
- * The air curtain or air door is a door that uses a layer of air generated by mechanical fans to separate two rooms or areas. If you select this door, consider the following:
- ** This door needs to be carefully selected, installed, and maintained to be effective.
- ** If an air imbalance (pressure imbalance) develops at the door opening, the separation effect may be diminished or eliminated. Air imbalance can occur from air flow changes from any other openings in the rooms especially other doors.
- ** The movement of the air can stir up contaminants, such as dirt and dust, if the area around the door is not kept clean.

Chapter 5

LIGHTING, VENTILATION, REFRIGERATION, AND EQUIPMENT

Controlling the manufacturing environment is important in maintaining a sanitary environment in meat and poultry operations. This chapter provides guidelines concerning lighting, ventilation, refrigeration, and equipment for meat and poultry establishments that you should consider in building or modifying an establishment.

1. Lighting

Well-distributed, good-quality artificial lighting is needed at all places where natural light is unavailable or insufficient. Lighting is critical to maintaining a sanitary environment for slaughter and processing operations. Without adequate lighting, insanitary conditions are often difficult to see and correct. When selecting and installing lighting systems, consider the following requirements:

* Light fixtures in rooms where exposed meat or poultry is handled should ensure maximum safety, to preclude contamination of products with broken glass and prevent the collection of dirt, product, and debris on lamp surfaces, including fixture surfaces not easily cleaned or inspected.

* Lighting must be intense enough to allow both the establishment and inspection personnel to see insanitary conditions and product contamination. The intensity of lighting is measured in foot candles. The following charts provide recommendations for minimum foot candles for artificial lighting:

TABLE 1.—GUIDELINES FOR MINIMUM LIGHTING INTENSITY IN MEAT ESTABLISHMENTS

Area	30 ft. candles	50 ft. candles
General lighting (in areas where animals are killed, eviscerated,		
and products are processed or		
packaged)	X	
Offal cooler	X	
Freezers	X	
Dry storage	X	
Ante-mortem inspection	×	
Suspect pen inspection		
area		Х
Inspection stations		X
Establishment quality		
control inspection		×
areas		^
Reconditioning and rein-		×
spection areas	X	_ ^
All Utilet aleas	_ ^	

TABLE 2.—GUIDELINES FOR MINIMUM LIGHTING INTENSITY IN POULTRY ESTABLISHMENTS

Area	30 ft.	50 ft.	200 ft.
	candles	candles	candles
Ante-mortem in- spection	Х		

TABLE 2.—GUIDELINES FOR MINIMUM LIGHTING INTENSITY IN POULTRY ESTABLISHMENTS—Continued

Area	30 ft. candles	50 ft. candles	200 ft. candles
Inspection station (traditional)		х	
tion (NELS/ SIS/NTI) Pre and post			х
chill inspec- tion areas Reconditioning			х
and reinspec- tion areas Establishment quality control			X
inspection areas	x		х

2. Ventilation

There should be enough ventilation for all areas of the establishment including workrooms, processing, packaging, and welfare rooms to ensure sanitary conditions. A good ventilation system is important to the production of wholesome meat and poultry products. Without controlling the quality of the air coming into the establishment, products may become contaminated with dust, insects, odors, or condensation. When designing your ventilation systems, you should consider the following guidelines:

- * The ventilation system should be designed so that turbulence is avoided. The longer the distance the air has to flow, the greater the resistance the air encounters not only from static air, but from solid objects such as walls, equipment, people, and product.
- * The ventilation system should be designed with the size of the establishment in mind. The larger the facility, the greater the volume of air that must be moved.
- * The ventilation system should be designed to compensate for changes in outside temperature and humidity that cause condensation problems within the establishment.
- * Screens and filters should be used where needed to screen out dust, odors, and insects brought in from the outside to prevent product contamination.
- * Mechanical ventilation should be used to bring in fresh air to areas where natural ventilation is inadequate.
- * Ventilation should prevent vapor formation, such as steam or fog, that would affect sanitation or interfere with the inspector's ability to perform inspection.

* When exhaust fans are installed, provision should be made to provide enough outside make up air to prevent air from being drawn into and through docks, coolers, and production areas to the area served by the exhaust fan.

3. Equipment (General Design and Construction)

Equipment materials should comply with 21 CFR, Parts 170–190 of the Food and Drug Administration (FDA) regulations for direct food contact.

Equipment and utensils used for handling as preparing edible product or ingredient in any official establishment should be easily cleaned and not be a source of contamination. Consider the following guidelines when selecting equipment.

- * All direct product contact surfaces should be smooth; maintained free of pits, cracks, crevices and scale; corrosion and abrasion resistant; non-absorbent; shatterproof; nontoxic; and not capable of migrating into food products.
- * Equipment should not be painted on areas in or above the direct product contact area.
- * Construction materials that are sources of contamination include cadmium, antimony or lead as plating or the plated base material, lead exceeding 5 percent in an alloy and enamelware and porcelain used for handling and processing product.
- * Equipment should be designed and installed in such a way that foreign materials, such as lubricants, heat exchanger media, condensate, cleaning solutions, sanitizers and other nonfood materials, do not contaminate food products.
- * Equipment is self-draining or designed to be evacuated of water.
- * All product contact surfaces allow contact with cleaning solutions and rinse water.
- * Clean-in-place (CIP) systems should have sanitation procedures that are as complete and effective as those for cleaning and sanitizing disassembled equipment. To remove all organic and inorganic residues, CIP systems should meet the following criteria:
- ** Cleaning and sanitizing solutions and rinse water should contact all interior surfaces of the system.
- ** The system should be selfdraining, with no low or sagging areas.
- ** The pipe interiors should be highly polished (120–180 grit) stainless steel for easy inspection.
- ** Easily removable elbows with quick-disconnect mechanisms should be installed at each change of direction. Elbows should be short enough to

permit verification that the interior has been cleaned.

Chapter 6 WATER SUPPLY

The water supply should be ample, clean, and potable with adequate pressure and facilities for its distribution in the establishment and its protection against contamination and pollution.

1. Potable Water

An adequate supply of fresh clean water is of primary importance in plant operations. The first requirement is that the water supply to the plant be potable or safe for human consumption or food processing. The plant water supply must meet the potability standards in the National Primary Drinking Water Regulations issued by the Environmental Protection Agency (EPA).

2. Backflow

Public health officials have long been concerned about cross-connections that may permit backflow in potable water supply distribution systems. Crossconnections may appear in many forms and in unsuspected places. Reversal of pressure and flow in the water system may be unpredictable. Plumbing crossconnections between a potable and nonpotable water supply may constitute a serious public health hazard. There are numerous cases where crossconnections have been responsible for contamination of potable water and have resulted in the spread of disease. These concerns, as they relate to meat and poultry plants, deserve special attention. The problem is continual as potable water and piping systems are installed, repaired, replaced, or extended.

Two basic types of hazard may be created in piping systems: the solid pipe with valved connections and the submerged inlet. The solid pipe connection is often installed to supply an auxiliary piping system from the potable source. It is a direct connection of one pipe to another pipe or receptacle. Solid pipe connections may be made accidentally to waste disposal lines when it is incorrectly assumed that the flow will always be in one direction. An example would be connecting a line carrying used, nonpotable cooking water from a water jacket or condenser directly to a waste line without an air gap (see below). "Backflow" will occur with a submerged inlet if the pressure differential is reversed without an air gap. Submerged inlets are created when the outflow end of a potable water line is covered with water or other liquid.

The other liquid may not be potable. Submerged inlets could be created by a hose lying in a pool or puddle of water on the floor.

Once a cross-connection exists, any situation that causes a pressure differential with the potable line having the lower pressure can result in contamination of the entire water distribution system and potable water supply. This is called backflow and can be produced under a variety of circumstances as illustrated below:

* Backsiphonage is one form of backflow. It is caused by negative pressure in the delivery pipes of a potable water supply and results in fluid flow in the reverse direction. It may also be caused by atmospheric pressure exerted on a pollutant liquid source that forces the pollutant into a potable water supply system that is under vacuum. The action in this case is the common siphon phenomenon. The negative pressure differential that will begin the siphoning action is a potential occurrence in any supply line.

* Differential pressure backflow refers to a reversed flow because of backpressure other than siphonic action. Any interconnected fluid systems in which the pressure in one exceeds the pressure of the other may cause flow from one to the other because of the differential. This type of backflow is of concern in buildings where two or more piping systems are maintained. The potable water supply is usually under pressure from the city water main. Occasionally, a booster pump is used. The auxiliary system often is pressurized by a centrifugal pump, although backpressure may be caused by gas or steam pressure from a boiler. A reversal in differential pressure may occur when pressure in the potable system drops below that in the system to which the potable water is connected. The best method of preventing this type of backflow is the complete separation of the two systems and/or an air gap. Other safety methods involve the installation of mechanical backflow prevention devices. All methods require regular scheduled inspection and maintenance to ensure ongoing effectiveness of installed devices.

Some areas that you should consider providing some form of protection from backflow and back siphonage include the following:

- * Water supply to pens for wash down or livestock watering.
- * Water supply to compressor cooling systems, cooling towers, and boiler rooms.
- * Water supply to cleanup systems, clean in place (CIP) systems, etc.
 - * Water supply to hose connections.

Various mechanical antibackflow devices are available to prevent backflow into a potable water supply system. Generally, the selection of the type and number of fail-safe devices should be based upon the degree of hazard from contamination. Additional considerations include piping size, location, and the need to test periodically the backflow devices to ensure proper operation.

There are six basic types of devices that can be used to correct cross-connections:

- * Air gap
- * Barometric loops
- * Vacuum breakers—both atmospheric and pressure type
- * Double check valves with intermediate atmosphere vent
 - * Double check valve assemblies
- * Reduced pressure principal backflow preventers
- * Specific requirements concerning backflow can be found in local building and board of health codes.

Chapter 7

GENERAL PLUMBING FACILITIES

One of the most important factors to consider in the design and modification of establishments is the plumbing system. If the plumbing system is not properly installed, contamination of products can occur from flooding, back siphonage, stoppages and crossconnections with the potable water system. This chapter provides guidelines concerning the plumbing facilities, in meat and poultry establishments. For additional information on the design and modification of plumbing facilities, consult the National Plumbing Code.

1. Hose Connections and Hoses

There should be enough conveniently located hose connections with steam and water mixing valves or hot water connections provided throughout the establishment for cleaning purposes. Hose connections are important in promoting routine cleaning of the establishment. Consider the following guidelines when determining how many hose connections, location of hose connections, and storage of hoses:

- * The number of hose connections depends on the number of drains.
- * If a shut-off nozzle is provided on the hose after the hot and cold water mixing valve, the vacuum breaker at the hose connection to the mixing valve will not work. Vacuum breakers should be installed on the hot and cold water supplies prior to the mixing valve to prevent such problems.

* Hose connections should be provided with vacuum breakers to prevent back siphonage.

2. Establishment Drainage System

There need to be efficient drainage and plumbing systems for the prompt removal of liquid and suspended solid wastes from the processing environment. Consider the following guidelines when designing or modifying your drainage system:

- * All plumbing should be sized, installed and maintained in accordance with applicable state and local plumbing codes, ordinances, and regulations.
- * Drainage lines should be located so that if leakage occurs, it will not affect product or equipment.

3. Floor Drains

All parts of floors where operations are conducted should be well drained. There are two basic types of drains: point drains and trench drains. Point drains, the most commonly used drain in most areas, are located in strategic points in the room with the floor sloped toward the drain. The waste water flows over the surface of the floor until it reaches and is carried away by the drain. Trench drains involve a trough or trench that collects the waste from a larger area and directs the flow to a drain opening. The flooring is sloped toward the trench.

In a typical plant, one four-inch (10.16 cm) drainage inlet is provided for each 400 square feet (37.16 square meters) of floor space. A slope of about one-quarter inch per foot (2.08 cm per meter) to drainage inlets is generally adequate to ensure proper flow with no puddling. In dry production areas, where only a limited amount of water is discharged on to the floor, an adequate slope may be about one-eighth inch per foot (1.04 cm per meter). It is important that floors slope uniformly to drains with no low spots to collect liquid.

- * The location of floor drains depends upon many factors such as the type of task conducted in the space, the geometric shape of the area drained, truck traffic patterns, and equipment locations.
- * There are special drainage considerations in areas where there is a high volume of water usage. The water in trench drains should flow in the opposite direction of the product flow, for example, from the poultry evisceration to the picking areas.
- * All parts of floors where wet operations or where floors are to be frequently hosed down should be pitched to floor or trench drains.

- * Floor drains should not be located under equipment because it makes them inaccessible cleaning.
- * Rooms without floor drains such as dry storage, large finished product coolers, and distribution warehouses may prefer to use mechanical cleaning machines instead of installing drains. Examples of such cleaning devices are floor scrubbers and dry/wet vacuum machines.

4. Trap Seals

Each floor drain should be equipped with a deep seal trap and vented properly to the outside. The purpose of such traps is to seal off the drainage system so that foul odors (sewer gases) cannot enter the plant. Effectiveness of the trap depends upon enough water remaining to constitute a seal. As water flows through the trap and down the drainpipe, suction is created that will pull the water out of the trap and break the seal unless the suction is broken by venting the drainpipe on the effluent side of the trap to the outside air. The seal can also be broken by evaporation of trapped water. This is not a problem in frequently used drains, but does occur where drains are seldom used.

5. Drainage Lines

All drainage lines must comply with local code requirements. They should be installed and maintained to be leakproof. To prevent drainage lines from becoming entrances into the plant for pests, including rats and mice, all lines must be equipped with effective rodent screens. Secure drain covers, in addition to keeping out pests, also serve to prevent blockage of the traps and drainage lines with product scraps or other material too large to flow freely.

6. Cleanouts

Cleanouts should be installed in the drainage system to prevent sewer blockages. Consider the following guidelines when installing cleanouts:

* Cleanouts should be located so they are readily accessible, and can be used without constituting a threat of contamination to edible products.

* To help avoid water puddling, cleanouts should be located on the "high lines" of floor slopes and away from traffic patterns.

Chapter 8

ESTABLISHMENT SEWAGE TREATMENT

The design and construction of sewage treatment facilities must comply with local code requirements. An improperly designed sewage system can contaminate the ground and water supply. This chapter provides guidelines concerning sewage treatment at meat and poultry establishments that you may wish to consider in the installation of a sewage treatment facility.

1. Establishment Sewage Treatment

Sewage, one the most dangerous sources of human pathogens, should never be allowed to come into contact with products, equipment, utensils, or any food contact surfaces. When installing an establishment sewage treatment facility, consider the following guidelines:

- * The system should be large enough to handle the amount of sewage that the establishment produces and accommodate future increases.
- * If a private septic tank, pretreatment, or treatment system is used, it should be designed and operated to prevent contamination of products.
- * The sewage facility should be located away from product operations and ingredient and packaging storage areas.
- * An area for cleaning solid waste containers with hot water, drains, and curbing should be located near any solid waste disposal facility.

2. Grease Catch Basins or Interceptors

Grease catch basins can be a source of contamination of products if not properly designed and located. Consider the following guidelines when constructing a grease catch basin:

- * Catch basins or interceptors for recovering grease should not be located in or near edible product departments or areas where edible products are shipped or received.
- * When a catch basin is located inside an establishment, it should be sealed with a gastite cover and located in a ventilated room.
- * Grease catch basins should be constructed so they can be completely emptied of their contents for cleaning.
- * The area surrounding an outside catch basin should be paved with impervious material, such as concrete, and drained.

Chapter 9

MEAT SLAUGHTER ESTABLISHMENTS

Although the flesh of healthy livestock is practically sterile, when the animal is killed many factors can contribute to contamination of the carcass including improperly designed and constructed slaughter facilities. This chapter provides guidelines for meat slaughter facilities to consider in building or modifying slaughter facilities.

Because different species of livestock need different slaughter facilities, this chapter is organized in the following

* Sections 1 through 8 describe general guidelines for facilities that slaughter cattle, calves, sheep, goats, hogs, and equines.

* Sections 9 through 37 describe additional guidelines for slaughter facilities as follows:

* Sections 9 through 19 contain

additional guidelines for cattle slaughter operations;

* Section 20 contains additional

* Section 20 contains additional guidelines for calf, sheep, and goat slaughter operations;

* Sections 21 through 26 contain additional guidelines for hog slaughter operations; and

* Section 27 contains additional guidelines for equine slaughter operations.

Note: The guidelines in this chapter are in addition to Chapters 1 through 8 which contain general guidelines which apply to all official meat and poultry establishments.

Meat Slaughter—General Facilities Guidelines

The following guidelines apply to all establishments that slaughter cattle, calves, sheep, goats, hogs and equines. If you are building or modifying an establishment that slaughters these species, consider these facilities guidelines to prevent contamination of carcasses during slaughter operations.

1. Livestock Pens

In addition to preventing contamination of the slaughter department and minimizing contaminates on the hides of the animals, proper design and construction of livestock pens prevent injury to the animals. Consider the following facilities guidelines when designing and constructing livestock pens:

* Livestock pens should be located outside the slaughter department to prevent contamination of products from dust, odors, and other contaminates. If possible, the livestock pens should be separated from the department by full-height partitions of impervious material.

* Livestock pens, driveways, and ramps should be free from sharp or protruding objects which could cause injury or pain to the animals.

* Floors of the pens, ramps, unloading chutes, and runways should be constructed to provide good footing for livestock. Waffled floor surfaces and cleated ramps are effective construction designs.

* Floors of the pens, ramps, unloading chutes, and runways should be sloped for drainage and cleaning. * Pen enclosures (except gateways) should be high and sturdy enough to prevent livestock from escaping.

* Gates, fences, and chutes should have smooth surfaces that are easily cleaned.

* Man gates or, if the walls are concrete, toe holds formed in the walls should be present to allow people to escape from pen enclosures in an emergency.

* To help prevent livestock from slipping and falling on floors covered with excess water, thereby further contaminating their hides, water troughs should be provided with overflows located above or adjacent to pen floor drains.

* Hose connections should be provided for cleanups.

- * Covered pens should be provided to protect crippled or downer animals from adverse climatic conditions. If held overnight, the pens should be large enough to allow the animals to lie down and have facilities for feed and water. Pens and driveways should be arranged so that sharp corners and direction reversals of driven animals are minimized.
- * A "U.S. suspect" or "U.S. condemned" pen should be available at all times and designed to allow for complete separation, including the drainage system, from other livestock.

2. Ante-mortem Inspection Areas

Ante-mortem inspection areas should be designed and constructed to facilitate inspection and to prevent animals from being injured. Consider the following guidelines in designing and constructing these areas:

* To avoid delays in slaughter operations, pens for ante-mortem inspection should have the capacity for holding the maximum number of animals of the various species that will be slaughtered in a single day.

* To facilitate the ante-mortem inspection of animals, a separate suspect pen with a squeeze chute should be provided, where the temperature of the animals may be taken.

- * At least 50 percent of the livestock pen, including the area where the suspect pen and squeeze chute are located, should be under a weather tight roof to provide an area for proper antemortem inspection in inclement weather.
- * Special consideration should be given to designing ante-mortem inspection facilities to allow for humane transporting of crippled or downer animals into the slaughtering department. Because crippled and downer animals have difficulty moving,

special doorways and hoists to transport them to the stunning area should be provided.

3. Slaughter Area

The slaughter area is one of the most difficult areas to keep sanitary because of the nature of slaughter operations. Consider the following guidelines in designing and constructing slaughter areas to minimize contamination of carcasses:

- * The slaughter area should be separated from the outside by a fullheight partition or wall made of impervious material.
- * Any doors to the outside of the slaughter area should be self closing to minimize the risk of contamination, including contamination by vermin.
- * Slaughter areas should have floor space arranged to facilitate the sanitary conduct of operations and efficient inspection. For example, to prevent contamination of carcasses, truckways through which products are conveyed from the slaughter area to rooms such as the offal cooler, should be located so that the material is not trucked beneath rails from which dressed carcasses and products are suspended. For the same reason, personnel traffic should not move through lines of carcasses.

4. Stunning Areas Including Chutes and Alleys

Stunning areas, chutes and alleys, should be designed to prevent congestion, injury to animals, and minimize contamination of hides which can lead to contamination of the carcasses. Consider the following guidelines when designing these facilities:

- * All pathways, chutes, and alleys leading to stunning areas, and the stunning areas, should be large enough for the species being slaughtered.
- * All pathways, chutes, and alleys leading to stunning areas, and the stunning areas, should be free from pain-producing restraining devices, sharp projections such as loose boards, exposed bolt ends, splintered or broken planking, protruding metal, and exposed wheels or gears.
- * All pathways, chutes, and alleys leading to stunning areas, and the stunning areas, should be free of unnecessary holes and openings where the animals' feet or legs may be injured.
- * Overhead gates should be covered at the bottom edge to prevent, injury to the animals.
- * Flooring should be constructed of roughened or cleated cement to reduce falls.

- * Stunning areas should be provided for confining animals for stunning before bleeding.
- * If ritualistic slaughter operations are conducted in the stunning area, shackles to confine the animals also should be provided.
- * When captive bolt stunners are used, the stunning areas should be designed and constructed to limit the free movements of animals so that the operator can locate the stunning blow with a high degree of accuracy.
- * When electrical stunning is used, the stunning area should be constructed so that any power activated gates will not cause injury to the animals.

5. Rail Arrangement and Truckways

To prevent contamination of carcasses, rails should be arranged to provide enough room for carcasses to move without touching equipment, walls, columns, other fixed parts of the building, and other carcasses. Consider the following guidelines when arranging rails in your establishment:

- * Consideration should be given to the type of rail and the rail speed when determining how rails are to be arranged.
- * Trim rails should be arranged so that carcasses pass the final carcass inspection position after the final trim.
- * To prevent the carcass from becoming contaminated by debris on the floor and from splashes during cleanups, the cooler rails should provide for clearance from the lowest part of the carcass to the highest point of the floor.
- * A room or area for washing gambrels, hooks, and trolleys should be provided. The room or area should have an exhaust fan in an outside wall to dispense steam.

6. Viscera Separation and Edible Byproducts Refrigeration

Because edible organs and parts (offal) are handled at temperatures conducive to bacterial growth, care must be taken in providing facilities for separation of viscera and for refrigeration of edible byproducts to prevent them from becoming contaminated. Consider the following guidelines for holding edible by products:

- * Facilities, such as viscera trucks or pans, should be provided for separating and handling viscera of the various species of animals to prevent commingling.
- * To prevent cross contamination, a separate cooler or a separately drained part of a carcass cooler should be provided for holding edible organs and parts (offal) under refrigeration.

- * To convey the edible byproducts to a cooler, a truck with removable metal drip pans should be provided.
- * To prevent cross contamination, establishment and inspection personnel from the slaughter department should be able to access the edible byproduct cooler without passing through a line of carcasses or through a congested carcass cooler.

7. Carcass Washing

Special facilities for washing inspected carcasses are needed to remove bone dust and other accidental contamination from the carcass. Consider the following guidelines when designing and constructing this area:

- * A separately drained area or an area that is sloped to a floor drain should be provided where inspected carcasses are washed.
- * If the carcasses are washed manually by establishment personnel, a platform should be provided to allow establishment personnel to be able to reach all parts of the carcass.

8. Retain Room/Compartment

- * A retain room, cage, compartment, or receptacle may be required by inspection. Depending on the needs of inspection, consider the following guidelines for designing and constructing this room:
- * The retain room or compartment must be equipped for locking or sealing.
- * The room or compartment needs to be marked conspicuously "U.S. Retained."
- * If the retain compartment is located in the cooler, the compartment should be separated from the remainder of the cooler to prevent cross-contamination of inspected and passed carcasses. The separation can be accomplished by creating a compartment constructed of partitions of corrosion resistant wire screen or flat expanded metal.

Cattle—Additional Facilities Guidelines

In addition to the guidelines (sections 1 through 8) for all establishments that slaughter livestock, the guidelines in the following sections 9 through 19 apply to establishments that slaughter cattle.

9. Cattle Dressing Layout

There are a number of different cattle dressing layouts that can be used in a cattle slaughtering operation. Depending on the number of animals slaughtered, rate of inspection, and number of inspectors, you should carefully consider your options for a layout for slaughter operations.

10. Rail Heights, Distances, and other Slaughter Area Dimensions

To assist you in planning the layout of your slaughter area, the following is a chart for recommended distances including rail heights, rail distances, and other cattle slaughter area dimensions:

TABLE 3.—Guidelines DIS-FOR TANCES IN CATTLE SLAUGHTERING **ESTABLISHMENTS**

Item	Vertical distance	Horizontal distance
Bleeding rail (distance from rail to point of application of shackle to shackle foot—4 feet (1.2 m)).	16 feet (4.9 m)	
Dressing rails (trolley length—1 foot 3 inches. (.4 m))	12 feet 3 inches (3.7 m)	
Beef cooler rails (trolley length—1 foot 3 inches. (.4 m))	11 feet (3.4 m)	
Moving equip- ment—heights of conveyor rails, platforms, top of viscera inspec-		
tion table. Dry landing area in front of stunning pen.		7 by 8 feet (2.1 by 2.5 m)
Curb of bleeding area to pitch plates (no head-		5 feet (1.5 m)
er rails). Between header rail and carcass washing rail, if parallel.		6 feet (1.8 m)
Between header or washing rails and wall of slaughtering room.		3 feet (.9 m)
Between center lines of dressing beds.		8 feet (2.5 m)
Between moving top table and dressing rail at inspector's platform.		5 feet 6 inches (1.7 m)
Area for sterilizing viscera inspection truck.		7 by 8 feet (2.1 by 2.5 m)

Note.—When rails are involved in horizontal distance measurements, the distance is measured from the center of the rail. When rails are involved in vertical distance measurements, the distance is measured from the top of the rail to the highest part of the floor.

11. Dry Landing Area

A dry landing area large enough to accommodate stunned animals removed from the stunning pen should be

provided adjacent to the stunning pen. Consider the following guidelines in designing and constructing this area:

- The area should allow enough room for the livestock.
- * The dry landing area should be located and drained separately from the bleeding area.
- * The dry landing area should be enclosed by a fence high enough and sturdy enough to prevent escape of inadequately stunned animals.

12. Bleeding Area

To contain blood and prevent it from contaminating carcasses, a curbed bleeding area should be provided. Consider the following guidelines in designing and constructing this area:

- * The bleeding area should be located so that blood will not be splashed on stunned animals lying in the dry landing area or on carcasses being skinned on the cradle beds, if they are
- * The curb around the bleeding area should be located far enough from the dressing bed or cradle to allow room for the carcasses to be maneuvered into the bed or cradle.

13. Facilities for Head Removal

To avoid contamination of the carcasses from rumen contents, facilities for head removal need to be carefully designed:

- * Space should be provided for dehorning, flushing, washing, and inspecting heads; for storing heads on racks or trucks after removal from carcasses; and for head workup.
- When a down hide puller is used, the head drop and head removal area should be curbed and drained.
- A head wash cabinet should be provided.

14. Facilities for Hide Removal

To limit contamination by hides, a hide chute should be provided near the point where hides are removed from carcasses. Consider the following guidelines when designing and constructing these facilities:

- * The chute should have a hood of sturdy rust-resistant metal with a pushin door closely fitting a metal frame inclined so as to be self-closing. In order to evacuate airborne contaminants from hides such as scurf, dirt, spores, odors, and hairs, a vent pipe should extend from the hood vertically to a point above the roof.
- Space needs to be provided between hide pulling and carcass evisceration to permit cervical inspection prior to viscera inspection.

15. Facilities for Feet and Udders

Because of the high risk of contamination of carcasses from feet and udders which have been removed from carcasses, special facilities, such as a chute or slide, should be used for transferring these parts to containers. Consider the following guidelines for these facilities:

* A chute or slide should be used to avoid splashing of milk or other contaminants onto the carcasses, floor, equipment, and personnel.

16. Foot Platforms

Foot platforms installed for establishment employees performing various carcass dressing operations need to be carefully designed and installed to prevent contamination of carcasses. Consider the following guidelines:

If elevated foot platforms are used, they should be located so they do not touch skinned portions of the carcass.

If stationary platforms are used, they should be set far enough away from the dressing rail to prevent contact with the forelegs of cattle.

To provide space for operations and to prevent cross contamination by carcasses, push fingers or rail stops on powered conveyor or gravity flow rails should be spaced far enough apart to prevent contact between carcasses.

17. Viscera Trucks

In establishments with a limited rate of slaughter, viscera are usually placed in a specially designed handtruck for inspection. Consider the following guidelines for use of viscera trucks:

For ease of cleaning, viscera trucks should be constructed of stainless or galvanized steel.

* Viscera trucks should have an inspection pan and a lower viscera compartment.

* When viscera trucks are used, a separately drained area should be available for washing and sterilizing

such equipment.

To prevent contamination of products, the washing facilities should be located at or near the point where condemned products are discharged from the trucks. When placed where splash might contaminate edible products, the truck washing area should have walls high enough to contain any splash.

18. Moving-Top Inspection Tables

In some establishments, viscera are placed on a moving-top table for inspection. These tables have special considerations as follows:

* The table should be of a length that provides for evisceration, inspection, and viscera removal.

* A continuous cleaning and sanitizing system should be available for the table.

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- * To prevent contamination of products and the surrounding area, the viscera inspection table should have a drain under the table to prevent water from draining across the floor to other areas of the room.
- * To prevent contamination of carcasses, the foot platform, handwash sinks, hand tool disinfection unit (sterilizer), boot washing cabinet, and boot storage locker should be located alongside the loading end of the table.

19. USDA Post-mortem Inspection Station and Retain Rail

Special facilities are needed for USDA post-mortem inspection for cattle.

- Consider the following provisions that must be met when designing these stations:
- * An inspection station consisting of 5 feet (1.5 m) of unobstructed line space for each head or carcass inspector.
- * When viscera tables are used, there must be 8 feet (2.5 m) for each viscera inspector on the inspector's side of the table needs to be provided.
- * A minimum of 50 foot candles of shadow-free lighting at the inspection surfaces of the head, viscera, and carcass.
- * A handwash sink (other than one which is hand operated), furnished with soap, towels, and hot and cold water, and located adjacent to the inspector's work area.
- * For each head and viscera inspector on cattle slaughter lines a sterilizer

- located adjacent to the inspector's work area.
- * For mechanized operations, a line control switch adjacent to each inspection station.
- * Facilities to position tally sheets or other recording devices, such as digital counters and facilities to contain USDA condemned brands.
- * Rail(s) for holding retained carcasses for final disposition along with platforms and handwash sinks. To prevent possible cross contamination, the retain rail must be long enough to prevent carcasses from touching.
- 20. Calves, Sheep, and Goats—Chart of Guidelines for Distances for Rails and Other Facilities

TABLE 4.—GUIDELINES FOR DISTANCES IN CALF, SHEEP, AND GOAT SLAUGHTERING ESTABLISHMENTS

Item	Vertical distance	Horizontal distance	
Bleeding rail for calves (distance from top of rail to point of application of shackle to shackled foot—2 feet 6 inches (.8 m)).	11 feet (3.3 m)		
Bleeding rails if only sheep or goats are slaughtered	9 feet-11 feet (2.7 m-3.4 m)		
Dressing rail (trolley length—1 foot (.3 m))	8 feet 6 inches (2.6 m)		
Cooler rails, calf carcasses (trolley length—1 foot (.3 m)).	8 feet 6 inches (2.6 m)		
Cooler rails, sheep or goat carcasses (trolley length—1 foot (.3 m)).	7 feet 6 inches-8 feet 6 inches (2.3 m-2.6 m).		
Moving equipment			
Vertical of rail to edge of viscera inspection stand		2 feet (.6 m)	
Length of rail from point of evisceration to point where carcass inspection is completed.		6 feet (1.8 m)	

Note.—When rails are involved in horizontal distance measurements, the distance is measured from the center of the rail. When rails are involved in vertical distance measurements, the distance is measured from the top of the rail to the highest part of the floor.

Hogs—Additional Facilities Guidelines

In addition to the general guidelines in sections 1 through 8, the following guidelines apply to those establishments that slaughter hogs. Consider these additional guidelines when building or modifying an establishment that slaughters hogs.

21. Livestock Pens

* To prevent hogs from overheating, pens for hogs should have either a roof for shelter or a shower system to keep the animals cool in weather with temperatures greater than 70 °F (21 °C).

22. Location of Certain Operations

- * To prevent contamination, the following equipment and operations should be located in an area or areas separate from the carcass dressing area, except for the openings for access and passage of carcasses:
 - ** Hoisting, sticking, and bleeding.
 - ** Scalding vat.

- ** Dehairing machine located within a curbed area having nonclogging drainage outlet.
 - ** Gambrelling table.
 - ** Singeing operations.

23. Rail Arrangements for Hogs

The following chart gives guidance for recommended distances for rails and other facilities for hog slaughter operations.

TABLE 5.—GUIDELINES FOR DISTANCES IN HOG SLAUGHTERING ESTABLISHMENTS

Item	Vertical dis- tance
Bleeding rail to sticker's plat- form.	10 feet 6 inches (3.2 m).
Extension of bleeding rail to top of scalding vat. Dressing rails ¹	9 feet (2.7 m). 11 feet (3.3
Gambrels (suspending car- casses to floor (1 foot (.3 m)).	m). 10 feet (3 m).

TABLE 5.—GUIDELINES FOR DISTANCES IN HOG SLAUGHTERING ESTABLISHMENTS—Continued

ltem	Vertical dis- tance
Distances from rail to bottom of inspection pans and various foot platforms. Rails in coolers for hog carcasses with heads removed (1 foot (.3 m)). Rails to coolers for carcasses with heads attached (1 foot (3 m)). Vertical of dressing rail to various foot platforms and widths of platforms.	9 feet (2.7 m). 10 feet (3 m).

¹ Heads dropped but still attached.

Note.—When rails are involved in vertical distance measurements, the distance is measured from the top of the rail to the highest part of the floor.

24. Scalding

To avoid contamination of the carcass, a scalding tank is used to remove hair and other contaminants.

Consider the following when installing a scalding tank:

* A mechanical exhaust fan above the scalding tank will disperse steam.

25. Shaving, Singeing, and Carcass Washing

* A shaving rail (throw-out rail) should be provided prior to the head dropping operation, so that unclean hogs can be removed from the dressing line for cleaning.

* If a singer is used to remove hair, it should have an automatic cut off and starter switch to prevent the carcass from burning when the chain stops.

* If a polisher is used, water sprays to clean the carcass of hair should be provided.

provided. * To rei

* To remove hair from the hide which was missed by the scalder and dehairing process, a carcass washer should be located at a point after completion of shaving operations and before the head dropper's station.

26. Inspection Facilities

Special facilities are needed for USDA post-mortem inspection for swine. Consider the following guidelines when designing these stations:

* An inspection station consisting of 5 feet (1.5 m) of unobstructed line space for each head or carcass inspector must

be provided.

* When viscera tables are used, there must be 8 feet (2.5 m) for each viscera inspector on the inspector's side of the table needs to be provided.

* A minimum of 50 foot candles of shadow-free lighting at the inspection surfaces of the head, viscera, and carcass must be provided.

* A handwash sink (other than one which is hand operated), furnished with soap, towels, and hot and cold water, must be provided adjacent to the inspector's work area.

* For each head inspector on swine slaughter lines, a sterilizer must be located adjacent to the inspector's work area

* For mechanized operations, a line control switch must be provided adjacent to each inspection station.

* For swine slaughter lines requiring three or more inspectors, and for those one-and two-inspector configurations where the establishment installs a mirror, special facilities are needed. At the carcass inspection station one glass or plastic, distortion-free mirror, at least five by 5 feet (1.5 by 1.5 m), must be mounted at the carcass inspection station. The mirror should be mounted far enough away from the vertical axis of the moving line to allow the carcass to be turned, but not over 3 feet (90 cm) away, to allow any inspector standing at

the carcass inspection station to readily view the back of the carcass.

* Facilities to position tally sheets or other recording devices, such as digital counters and facilities to contain USDA condemned brands must be provided.

Equines—Additional Facilities

In addition to the general guidelines in sections 1 through 8, and the guidelines for cattle in sections 9–19, if you plan to slaughter equines, such as horses, mules, donkeys, and ponies, the following are additional guidelines when building or modifying equine slaughter facilities.

27. Equine Slaughter Facilities

* The facilities for equine slaughter establishments are essentially the same as those for slaughtering cattle. Exceptions include the following rail heights and clearances.

TABLE 6.—GUIDELINES FOR DIS-TANCES IN EQUINE SLAUGHTERING ESTABLISHMENTS

Items	Vertical distance	Horizontal distance
Bleeding rail Dressing rails (trolley length—1 foot 3 inches (.4 m)). Cooler rails (trolley length—1 foot 3 inches (.4 m)). Cooler rails for carcasses in quarters. Line of drop-offs to line of half hoists. Clearance between walls, posts, etc. and adjoining rails in slaughter rooms and coolers. Curb of bleeding area to pritch	18 feet (5.5 m) 12 feet 6 inches (3.8 m) 12 feet 6 inches (3.8 m) 8 feet 6 inches (2.6 m)	17 feet (5.2 m) 3 feet (.9 m)
plates. Dry landing area (minimum).		7 by 8 feet (2.1 by 2.5 m)

Note.—When rails are involved in horizontal distance measurements, the distance is measured from the center of the rail. When rails are involved in vertical distance measurements, the distance is measured from the top of the rail to the highest part of the floor.

Chapter 10

POULTRY SLAUGHTER ESTABLISHMENTS

Although the flesh of healthy living poultry is practically sterile, when the bird is killed many factors can contribute to contamination of the carcass including improperly designed and constructed slaughter facilities. This chapter provides guidelines for facilities for poultry slaughter establishments for you to consider in building or modifying your slaughter facilities. If you slaughter small animals such as rabbits or migratory fowl under voluntary inspection, use this chapter for guidance. See Chapters 1 through 8 for general information which applies to all official meat and poultry establishments.

1. Holding Sheds or Coops

When building holding sheds or coops for poultry, consider the following guidelines:

* A minimum of 30 foot candles of lighting must be provided to facilitate ante-mortem inspection.

* The holding sheds should be weather tight.

2. Docks for Receiving and Hanging Live Poultry

Consider the following guidelines to prevent dust, feathers, and other obnoxious substances from entering areas where edible products are being prepared, handled, or stored:

* The live hanging dock needs to be physically separated from these areas. The separation should be accomplished by full height impervious walls with self-closing impervious doors, and openings limited to that necessary for poultry conveyor systems.

3. Slaughter Area

Consider the following guidelines for the slaughter area to minimize risk of contamination to products:

* The slaughter area (including stunning, bleeding, picking, scalding, and eviscerating operations) should be separated from those areas of the establishment where edible products are prepared or stored to minimize the risk of contamination.

* The blood in the slaughtering area, especially the stunning and bleeding area, should be contained in as small an area as possible.

4. USDA Post-Mortem Inspection Station

There are four systems of post-mortem inspection: Traditional Inspection, the Streamlined Inspection System, the New Line Speed Inspection System, and the New Turkey Inspection System. Each of the systems has mandatory requirements to minimize the risk of contamination to products and to promote efficient inspection. However, with the exception of the lighting requirements, there are no facilities guidelines for these post-mortem systems.

5. Facility Guidelines for Poultry Inspection Stations

Note: There are no facility guidelines for Traditional Inspection System facilities except for lighting.

TABLE 7.—FACILITY GUIDELINES FOR POULTRY INSPECTION STATIONS

Facility	SIS	NELS	NTI
The conveyor line should be level for the entire length of the inspection station	Х	Х	Х
when it is set in its lowest position, should be a minimum of 60 inches (150 cm)	Χ	X	X
station and 16 feet (4.9 m) for two inspection stations	X		x
There should be a minimum of 42 feet (12.8 m) of space along the conveyor line for three inspection stations		X	
There should be a minimum of 6 feet (1.8 m) of space along the conveyor line for the establishment employee presenting the birds		X	
There should be a minimum of 4 feet (1.2 m) of space for inspector and a minimum of 4 feet (1.2 m) of space for the establishment helper along the conveyor line	X	X	x
There should be selectors or "kick-outs" with birds on shackles with 12 inch (30 cm) centers (two inspection stations on line)	X		
There should to be selectors or "kick-outs" with birds on shackles with 18 inch (45 cm) centers (three inspection stations on line)	,	X	
A distortion-free mirror should be located at each inspection station which is: at least 3 feet (.9 m) wide and 2 feet (.6 m) high; adjustable between 5 inches (12.5 cm) and 15 inches (38 cm) behind the shackles; positioned in relation to the inspection platform so that the inspector is positioned opposite it 8 to 12 inches (20.3 cm to 30.5 cm) from the downstream edge; installed so that guide bars do not extend in front of the inspection mirror; and illuminated by a light which is positioned			
above and slightly in front of the mirror to facilitate the illumination of the bird and mirror surface There should be a slip-resistant inspection platform with a 42 inch (105 cm) high rail on the back	.,	X	.,
side and with ½ inch (4 cm) foot bumpers on both sides and front	X	X	X
of 2 feet (.6 m)	X	X	X
inches (35 cm) vertically while standing	Х	X	X
splash	Χ	X	X
the inspector A minimum of 200-foot candles of shadow-free lighting with minimum CRI value of 85, which can be	X	X	X
met by deluxe cool fluorescent lighting, must be provided	X	X	X
each inspector and establishment helper	Х	X	X
establishment presenter	Χ	X	X
Hang-back racks should be provided and located within easy reach for establishment helpers	X	X	X

6. Facility Guidelines for Poultry Reinspection Stations

Note: There are no guidelines for Traditional Inspection System facilities except for lighting.

TABLE 8.—FACILITY GUIDELINES FOR POULTRY REINSPECTION STATIONS

Facility		Reinspection stations	
		NELS	NTI
	SIS		
There should be a minimum of 6 feet (1.8 m) of space along the conveyor line for the establishment presenter		X	
There should be a minimum of 3 feet (.9 m) of space along each conveyor line and for SIS after each chiller	x		×

TABLE 8 — FACILITY	GUIDELINES FOR	POULTRY	REINSPECTION	STATIONS—Continued
IADEL O. IACIEIII	OUIDELINES I OF	I OOLINI	INCHING ECHON	OTATIONS CONTINUES

Facility	Prechill and postchill re- inspection stations	Reinspection stations	
		NELS	NTI
	SIS		
A table for reinspecting sample birds should be provided which is at least 2 feet (.6 m) wide, 2 feet (.6 m) deep, and 3 feet (.9 m) high; readily cleanable; and drainable	х	×	· ·
A space which is level and protected from all traffic and overhead obstructions should be provided The vertical distance from the bottom of the shackles to floor needs to be a minimum of 48 inches (120 cm) should be provided	x x	x x	x x
A minimum of 200-foot candles of shadow-free lighting with a minimum CRI of 85 at the table surface, which can be met by deluxe cool white fluorescent lighting, must be provided	X X	X	X
Handwash sinks within easy access of all persons working at the station should be provided	X	x	X
tion, and designed to hold 10 carcasses	X	X	X

7. Evisceration and Reprocessing Areas

The evisceration area should be arranged to facilitate efficient sanitary operations and inspection. Consider the following guidelines when designing these areas:

- * Production lines should have drip pans installed beneath them, when these lines are located above areas such as walkways, truckways, work stations, and equipment, to prevent water, poultry products, or any other material from falling on the production areas below
- * An area should be provided for a reprocessing station for the reconditioning of retained products including removal of contamination.

8. Inedible Offal

In poultry establishments, the facilities for handling inedible offal should be designed to accommodate the size of the poultry being handled and to prevent the contamination of edible products. Consider the following guidelines when designing these areas:

- * The facilities, whether troughs or otherwise, should be large enough to allow clean and orderly removal of inedible offal during processing, without a pile up and without cross contamination of edible products.
- * The water rail for semi-dry poultry offal systems for young chickens should range from 34 to 36 inches (86 to 90 cm) in height above the standing surface and be positioned 7 to 10 inches (18 to 26 cm) horizontally from the vertical line of the shackle.
- * The water rail for semi-dry poultry offal systems for turkeys should range from 34 to 36 inches (86 to 90 cm) in height above the standing surface and be positioned 13 to 15 inches (33 to 38 cm) horizontally from the vertical line of the shackle.
- * The floor gutter should be distinct, with vertical sides inside the post supporting the water rail (a minimum of 6 inches or 15 cm is suggested to prevent workers feet from being in the gutter). Gutters should also be wide enough to catch all material dropping from the carcass.

- * Splash protectors should be installed at all points along the evisceration line where splashing of employees might occur.
- * Pipes for conveying offal should be constructed to permit daily cleaning and positioned so that sanitation will not be a problem, i.e., no pipes lying on the floor or bottom of a gutter.
- * Side walls of hoppers should be pitched to assure that material deposited in the hopper will slide to the point where the offal is being mechanically conveyed.

Chapter 11

PLANT WASTE DISPOSAL

Control and disposal of plant wastes are major concerns. Optimum use and reduction of waste are essential goals of economic production in all plants. From a plant sanitation standpoint, there are two vital concerns with waste disposal: (1) Plant waste contains most of the contaminants and disease-producing and product-spoiling microorganisms from the plant production processes; (2) plant wastes attract pests such as insects and rodents.

1. Organic Waste Disposal

When disposing of organic wastes such as feathers, viscera, blood, and manure, the following guidelines should be considered:

- * Waste materials should not be allowed to accumulate on or near the premises.
- * Waste should be disposed of without creating insanitary or objectionable conditions.
 - * Waste should be removed daily.
- * Holding bins should be cleaned before reuse and protected from insect and rodent harborage and infestations.

2. Rubbish Removal

Rubbish, such as paper towels, cartons, office waste, and labeling materials, can become a sanitation problem. The following guidelines should be followed when removing rubbish:

- * Suitable containers should be conveniently located throughout the plant and emptied frequently.
- * The accumulation of rubbish before its removal should not cause a nuisance.
- * Plant refuse should be removed daily, or more often if necessary, to prevent a nuisance.

Appendix B—Guidelines for Developing Partial Quality Control Programs (PQC's)

Guidelines for Developing Partial Quality Control Programs Overview

Quality control programs are essential to the proper functioning of any meat or poultry processing establishment. Processors have found quality control is good business because it can reduce costs, control product uniformity, and ensure that proper standards are being maintained throughout the production cycle. By increasing controls over raw ingredients, processes, and other variables, effective quality control systems can ensure compliance with company specifications and with the guidelines and requirements of the Department of Agriculture. Although inplant inspectors have a role in the oversight of these programs, quality control is a management function and plant management should develop and implement effective quality control plans specific to their process and products.

There are many approaches plants can take to ensure quality control. Some plants do not take any special measures during production, and changes are made only on finished product. Some plants incorporate preventive measures, such as product testing, during processing, and others undertake a series of specific actions to prevent mistakes and to ensure that products meet consumer expectations. Whether

limited or comprehensive, a quality control system should be in the written record of the plant. As experience is gained, the record keeping system may be improved by focusing on "hot spots" which are responsible for the major problems, revising specifications, or upgrading them to include sensitive testing devices, for example.

Proper documentation of plant activities will become increasingly important in a HACCP inspection environment. Proper documentation of any in-plant process can save time and money and result in fewer mistakes by the establishment. The degree and complexity of the records depend on the scope of the processing operation; completeness of the records is also a reflection of management commitment to quality control.

Plant or corporate management support is the key to a successful quality control program. Plant personnel will sense a lack of commitment to quality if management support is not apparent.

Good quality control managers do not necessarily have to use complex, expensive methods to ensure control. Experience has shown that successful establishments function smoothly by paying close attention to the basics, documenting the process when it is running smoothly and when problems occur, and making necessary corrections as quickly as possible.

Chapter 1. Introduction

Title 9 of the Code of Federal Regulations at Parts 318.4(d) and 381.145(d) require Federal meat and poultry processing plants to establish and maintain written records for each critical check or critical control point and make the records available to FSIS inspection personnel upon request.

- * Although the regulatory requirement for FSIS to review and approve PQC programs has been rescinded, the new regulatory requirements in 318.4(d) and 381.145(d) provide information to plants about the necessary steps they must take to meet the new record keeping requirements in a Pathogen Reduction and HACCP inspection environment.
- * FSIS will continue to provide guidance to establishments to ensure that their Partial Quality Control (PQC) programs for specific products and processes are adequate to ensure product compliance with regulatory requirements. The information in this document is intended to be used as guidance material and is based on FSIS' experience and historical perspective reviewing and approving PQC programs.

A few model PQC programs, representative of many products and processes, are presented below.

Chapter 2. Components of PQC Programs

PQC programs should address four areas: (1) raw materials control; (2) process control; (3) records control; and (4) corrective/preventive action.

1. Raw Materials Control

Raw materials control involves the receiving and stocking of only those materials that conform to established specifications. To ensure successful control of raw materials, establishments should consider the following:

* To begin the development of a raw materials control procedure, plants should list each of the materials used to produce the product.

* Once the list has been created, establishments should develop a

receiving inspection procedure.

* The procedure may address raw materials specifications, proper materials handling, proper storage, and

disposal of nonconforming materials.

* Materials should be routinely monitored to ensure they are meeting the established procedures.

2. Process Control

Process control programs ensure continuous control of particular processes so that product standards will be met. Process control programs should meet the following criteria:

* They should identify the products or processes to be controlled.

- * They should identify the control features necessary for product compliance.
- * They should establish control limits.
- * They should establish procedures for meeting the established limits.
- * They should provide monitoring procedures for ensuring that procedures are followed.

An important aspect of process control is effective data collection and analysis. Process control programs should include sampling plans that permit reliable collection and analysis of data. After sampling plans have been developed, process limits can be established.

- * The limits established should be appropriate to ensure that quality standards will be met.
- * The limits established should be appropriate to ensure that meet regulatory or label limits for the product or process will be met.

* Variation in materials, methods, processes, and products requires the setting of a tolerance for each quality

standard. A tolerance limit is the total allowable deviation from an established standard. The limit allows for the normal variability which is inherent in any process.

- * Tolerance limits may need to be continuously adjusted to prevent problems.
- * Limits for certain processes have been established and used historically by industry; these limits are reflected in PQC programs previously approved by FSIS. The tolerances meet the intent of the requirements in 318.4(d) and 318.145(d)(2)(ii) and may continue to be used.
- * Establishments may elect to use these previously established tolerances or develop their own by following the requirements outlined in the regulation.

3. Records

An important aspect of quality control is process documentation. Adequate records are essential to the system's capacity to provide the necessary controls. The records provide a history of the process and document when the process is working and when problems are occurring. The use of standard sheets, check-off forms, and other simple records is generally more successful than a complicated system. Charts and graphs already in use may be all that is necessary to document the system. The degree of record keeping and the complexity of the records depend, in large part, on the scope of the processing operation. In reviewing records, plant management should:

- * Look at those aspects of production most likely to cause problems. This procedure also can be useful in determining what critical checks need to be incorporated into a quality control program.
- * Correct problems as they occur. Proper documentation of the process can save time and money because it provides an establishment an opportunity to correct a problem before the finished product has been completed.

4. Corrective/Preventive Action

Corrective action plans address the action to be taken when problems develop in a production process.

Corrective action plans are essential components and important indicators of the strength of quality control programs. The primary emphasis of the plans should be on correction/prevention of problems in the production process. The type of plan used in a particular quality control program will be determined by the establishment and the processes conducted at the plant. Generally,

corrective action plans should include the following features:

They should provide for the identification of problems or deviations in processes.

They should provide for the identification of the causes of problems.

They should specify the corrective steps to be initiated and the criteria for determining how noncompliant products should be handled.

The plans should provide that corrective/preventive measures be implemented after a determination that

no safety hazards exist.

* The plans should provide for documentation of the corrective and preventive measures taken.

Models

The following models are intended to be used as general guidelines to developers of quality control programs. They are not intended to be complete QC programs or a complete listing of all rotational QC programs but offer a framework and one approach to QC program development. In actual QC programs, details regarding tests, action criteria, corrective actions, and responsible personnel would reflect the specific process and establishment circumstances. Any specifications or limits cited are only examples and do not establish or imply Agency standards.

Model 1—Preparation of a PQC Program for the Addition of 10-Percent Solution to Poultry

Raw Material Control

 Poultry—Chicken breasts will be received frozen, examined for condition, and immediately placed in the receiving dock freezer. (Specifications to be set by establishment.)

* Dry ingredients—Upon receipt, the dry ingredients will be visually inspected for acceptance and immediately placed in the dry storage warehouse. (Specifications to be set by

establishment.)

Corrective action—If either the poultry or the dry ingredients is found to be unacceptable, it will be tagged immediately and Quality Control will be notified. QC will evaluate and initiate appropriate product disposition.

Documentation—All critical checks and corrective actions will be recorded

on the receiving log.

Process Control

Formulation control.

** Formulation control—A pumping solution will be formulated according to the label formulation. One ingredient of the solution will be weighed by a quality control technician for each

batch. If an ingredient is found to be m0ore than 0.5 percent above or below the weight stated on the formula, the following will result: (1) the problem will be evaluated and the appropriate corrective action taken; (2) each ingredient of every batch will be checked until five consecutive batches are found to be in compliance.

Documentation—All formulation check results and corrective actions, if needed, will be recorded on the

formulation log.

** Scale accuracy control.

*** Scale checks—All scales associated with the pumping operation will be verified for accuracy before operations begin. Scale accuracy will be checked against a known weight. If a scale is found to be inaccurate, it will not be used until it has been calibrated.

*** Documentation—All scale check results and corrective actions, if required, will be recorded on the scale

maintenance record.

Lotting

* A lot will be defined as one shift's production; a sublot as approximately 500 pounds of product.

Added Solutions

* Green weight determination—Each sublot will be identified with a unique code representing date and time of day the sublot is being produced.

* The sublot will be weighed before

pumping.

The identifying code and weight will be written on a tag, which will be attached to the combo bin containing

the sublot.

Pumping—Every 30 minutes, 10 turkey breasts will be selected from a sublot before it is pumped. The 10 turkey breasts will be weighed, then passed through the pumping machine. The turkey breasts will be allowed to drain for 5 minutes, then weighed again.

** Tolerances—Each pump check will not be more than 0.5 percent over the target pump of 10 percent. If a pump check is found to exceed the tolerance, all product back the last pump check will be retained and allowed to drain until it reaches the target pump. In addition, the pumping operations will be stopped, evaluated by a QC technician, and not allowed to start until the problem has been corrected.

** Documentation—All pump checks and corrective actions, if needed, will be documented in the pumping log book.

Finished weight determination-After a sublot has been pumped, a final weight will be obtained and recorded on the pumping tag.

Tolerances—No sublot will be more than 1.2 percent above the target

pump of 10 percent. The average of all sublots will meet the target pump. If any sublot or the average of the sublots exceeds tolerances, all product will be retained and allowed to drain until the target pump has been reached.

** Documentation—All green weights, finished product weights, and corrective actions, if needed, will be recorded in the finished product log

book.

Note: Model also can be used in developing the following PQC programs:

Percent Labeling Control Water-misted/Ice-glazed Meat and Poultry Products

Addition of Solution to Raw/Cooked Meat and Poultry Products (Injection, Massaging, Tumbling, Basting, Marination, and Tenderization)

Fat and/or added water for Raw Product

Model 2.. Preparation of a PQC Program for Fat-Content-per-Serving Labeling for Meat and Non-Meat Products

Scales/Meters

* Establish verification procedures to ensure that all scales/meters used in the formulation and analytical testing of the product are accurate. The procedure should include checks against a standard weight or measurement.

Lotting

Define lot and sublot.

Establish a standardized procedure for identifying the lot throughout the process

Formulation

- * Establish a procedure to verify the formulation of each lot/sublot in compliance with the approved label formulation.
- * Establish tolerances for nonrestricted ingredients.
- No ingredient in the formulation should be substituted for another. Fat content of the meat portion (ground beef, ground pork, or products with a declared fat limit on the label)
- Establish a statistically sound sampling procedure for each lot/sublot of the meat portion.

Identify the analytical method used, such as an AOAC method. Weight Control (serving and component).

* Establish a statistically sound sampling procedure to ensure that each portion and component of the product within a lot/sublot is checked against the label transmitted.

Raw weights—The weight is checked on all portions and components on finished raw and cooked products.

* Cooked weights—Cooked weights are checked and compared with the portion size stated on the transmittal

and on the Child Nutrition (CN) label. Weights also are checked for precooked components of products against information on the label transmittal.

The sampling plans and tolerances should be based on generally recognized statistical process control methods and should ensure that the process is in control and that applicable product or label limits are being met.

* Each CN product should have its

own lot average.

Batter and Breading (if applicable)

* Establish a procedure to verify that the batter/breading application does not exceed regulatory limits, label declarations, or product standards. The monitoring procedure should identify the following:

** pre-batter/breading application

weight

sample size

** sample frequency

** post-batter/breading application

weight

Post-batter/breading weight should be determined at the end of the application procedure and before further processing. Note: Model also can be used in developing the following PQC programs:

Batter and Breading

FES Labeling Content for Meat and Non-Meat Products

Precooked Breakfast Sausage Yield

Model 3. Low Temperature Rendering for the Production of Partially Defatted Chopped (P.C.) Beef/Pork, Fat-Reduced Species, and Partially Defatted Beef/ Pork Fatty Tissue

Raw Materials Control

* Define a lot and sublot

If producing P.C. beef/pork or fatreduced species, establish a statistically based sampling procedure to ensure the lot is in compliance with raw material requirements (12 percent lean).

Heat Processing

 Identify processing temperature (minimum and maximum).

* Identify the target processing time, which is the time the product is subjected to the target.

Establish procedures for monitoring processing temperatures and times.

Cooling and Freezing Controls

* Identify the cooling and freezing temperatures for the finished product.

* Identify the amount of time the cooling and freezing process will take to reach established temperatures.

Microbiological

* If the cooling/freezing process (starting from the time heat is applied until the product is 40 degrees F for less) exceeds 30 minutes, a microbiological sampling procedure should be developed. The following sampling procedures and limits have been used in PQC programs in the past, and current regulations permit their continued use.

* Using a statistically based sampling plan, select two samples per lot from the raw material and finished

products.

Test samples for total plate count, coliforms, E. coli, and C. Perfringens.

** Demonstrate that the process does not increase the product's microbial load by 1 log or more.

** Šampling can be reduced to one per lot when control has been demonstrated in three consecutive lots.

Finished Product Controls

 If producing finely textured lean or finely textured extra lean, product should be tested for fat, protein, and protein efficiency ratio (PER) or essential amino acid (EAA).

Incorporate the sampling procedure

for fat and protein.

Individual—Obtain a one-pound sample from each lot. After 10 consecutive analyses are in compliance with single sample limits, sampling may be reduced to one randomly sampled lot out of every three lots.

** Process Average—A process (moving) average of 10 lots should be maintained.

Sampling Procedures for PER/EAA

- * Initially, each lot should be held and tested until compliance has been established. Once compliance has been established in three consecutive lots, sampling may be reduced. Sampling frequency should begin with at least one sample per month until compliance has been established. When three consecutive samples are in compliance, the frequency may be reduced to one sample every three months.
 - * Analytical Standard Limits

Finely Textured Lean Product

Individual:

Fat—Maximum 30%

Protein—Minimum 13%

Process Average:

Fat-Maximum 30%

Protein—Minimum 14%

PER 2.5 or

EAA 33%

Finely Textured Extra Lean Similar **Products**

Individual:

Fat-Maximum 11%

Protein—Minimum 13%

Process Average:

Fat—Maximum 10%

Protein—Minimum 14%

PER 2.5 or

EAA 33%

Corrective and Preventive Actions

* Develop corrective and preventive actions for each critical check point established.

Note: Model also can be used in developing the following PQC programs: Low Temperature Rendering for Control of

Partially Defatted Chopped Beef/Pork Fat-Reduced Species and Partially Defatted Beef/Pork Fatty Tissue

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Construction Guidebook for Wholesale Food Facilities - RWFPC
9. California Department of Food and Agriculture



California Department of Food and Agriculture

CONSTRUCTION REQUIREMENTS FOR

MILK PRODUCTS OR PRODUCTS RESEMBLING MILK PRODUCTS PLANT

Minimum construction standards for milk products plants shall include a separate room for each of the following operations:

(a) Receiving and weighing of milk or cream, and washing and sterilizing of containers in which milk or cream is received.

(b) Pasteurization, processing, cooling, and manufacturing.

(c) Washing and sterilizing bottles or cans which are used in the delivery of milk or cream to the wholesale or retail trade.

(d) Bacteriological and chemical analyses.

(e) Adequate and efficient cold storage room and/or ageing rooms mechanically equipped and operated.

(f) Boiler, compressor, and other machinery.

(g) Storing of supplies.

(h) Toilets, lavatories, and lockers.

A separate room is required for conducting each of the operations which is listed, except that, if any of the functions which are specified in (a) to (g), inclusive, of that section are not performed at a milk products plant, there need not be a separate room provided for such function.

Rooms associated with functions (a), (b),(c),and (e) above must meet all the requirements in items 1 through 14 below:

1. Floors:

Floors must be smooth-surfaced (may be non-slip however no exposed aggregate) to permit proper cleaning, and sloped (recommended ¼" per foot) from all points in the room to a trapped drain.

A two-inch radius cove is required at the junction of floor and walls to eliminate sharp corners. Where standard tile base is used the cove may be less than 2" radius.

Floors may be constructed of concrete, tile, epoxy, or other non-absorbent material approved by the Director.

2. Walls:

New wooden frame walls must be constructed on a concrete curb not less than 8" above the finished floor level. A key-way must be provided in top edge of curb to permit wall-surfacing material to extend about 1" below the sill and form a tight bond with the curb.

Existing wooden frame walls, with department approval, may be treated with an appropriate waterproof flashing to assure wood framing will not be exposed to water. For masonry construction the curb may be just high enough to provide the required cove.

The height of curb when needed at doorway should be 3" to form a threshold. The sides of curb should be rounded. A grated trapped trench drain across the inside edge of the threshold may be used in lieu of a curb. Walls 3' must be constructed of waterproof materials and be tight, sound, smooth and readily cleanable. The following materials may be used:

- a. Smooth-finished concrete or cement plaster with not over 10% lime over galvanized metal lath, or masonry.
- b. Ceramic Tile, over "green board" or other water resistant material.

c. Metal with welded seams.

- d. F.R.P. sheathing with waterproof adhesive and with proper sealant in all seams or crevices, over "green board" or other water resistant material.
- e. Other material approved by the Director.

Walls above 3' must be washable and light color.

Wallpaper is not acceptable.

3. Ceilings:

Ceiling height must be not less than 8' from finished floor at the lowest point.

Only smooth, tight, sound and cleanable materials are permitted. Acoustic tile is not acceptable.

Ceilings must be a light color.

4. Floor Drains:

Floor drains must be trapped and also vented to outside atmosphere and must be not less than 2" in diameter. All drain lines must be connected to a public sewer system or an approved septic system. Consult with the local Health and Building Departments having jurisdiction. No direct discharge without the Regional Water Quality Control Board approval.

Drains must not be located under any equipment. Pipe drains and condensate drain lines must not extend into floor drain.

5. Lighting:

Not less than 50 watts of electric light per 100 square feet of floor area is required. It must be evenly distributed.

6. Ventilation:

Ventilation must be adequate to provide sufficient clean air to prevent condensation of moisture on walls or ceiling and prevent accumulation of stale air. It may be by either gravity or forced draft system.

If gravity system is used, a low vent must be provided not less than 1 square inch in size for each square foot of floor area together with a top vent sufficient in size to assure adequate air movement. Low vents must be screened and the bottom surface of vents must slop toward the inside floor.

If forced draft is used it is preferable to force clean air into the room.

Cross ventilation is desirable when low vents are used.

7. Water:

Hot and cold running water must be provided at wash sinks. A hose bib and a hose sufficient in length to reach all areas of the milk products plant must be provided.

The water supply must be potable and abundant.

8. Wash Sinks:

A two-compartment wash sink and drain board sufficient in size to permit the submerging of the largest piece of equipment to be washed must be provided.

Sinks must be constructed of stainless steel.

9. Hand Washing Facilities:

Hand washing facilities, separate from the two-compartment sink, must be provided in the processing room or convenient to it.

Hand washing facilities must be provided in all toilets. Hand washing facilities located in a toilet, which has access only from outside of the building, are not considered convenient to the processing room.

All hand wash facilities will include soap and single service towels.

10. Windows:

When windows are capable of being opened, effective screens must be provided.

11. Doors & Door Openings:

Doors leading into the processing plant should open outward and they must be equipped with a self-closing device. Double-acting doors are acceptable.

Doors must be so placed that they center over threshold. A three-inch curb or trapped trench drain is required in the threshold to contain spilled or wash down liquids.

Inside doors may be screened in part except when odors from cooking, or undesirable odors from any source exist, or in a case where dust or other air-borne contamination may constitute a hazard to sanitation.

Wood doorjambs and casings must not extend below 6" from the floor. The bottom of the jambs should be cut at a right angle but beveled inward and upward on a 45-degree angle. Fill in the space below the jambs with cement plaster. The bevel cut will form a plaster key.

12. Metal Rack:

A metal rack of sufficient size for storage of cans and equipment must be provided when the operation warrants one.

13. Equipment Installation:

All dairy contact equipment must meet 3-A sanitary standards or equivalent. All non-contact equipment must meet NSF requirements or equivalent.

All equipment must be elevated 3" (more recommended for large equipment) above floor on capped pipe or metal legs. Wood or other absorbent material is not permitted.

Equipment must not be located closer than two feet from walls unless it is mounted on casters and is readily movable for cleaning under and around. A three foot unimpaired working space is required in front of equipment. Equipment may be flashed to the wall if sealed in a tight, seamless manner.

14. Dry Storage Space/Room:

Rooms for dry storage of supplies and packaging/labeling materials do not need to meet the wet clean room requirements above.

Cabinets and/or shelves must be provided for the storage of all ingredients and miscellaneous items necessary in the operations of the plant. Storage of all supplies must be kept in a clean environment and protected from insects, vermin, splash, drippage, or any other contamination. No items may be stored directly on the floor.

15. Refrigeration and /or Ageing Rooms:

Provide facilities for proper temperature storage of mix, milk, and other products.

16. Bulk Tanker Receiving:

Bulk tanker receiving bay shall be a concrete pad sloped to a trapped drain not less than 2" in diameter connected to a public sewer system or an approved septic system.

17. Toilets:

Toilet rooms may not open directly into any room used for handling milk or its products or with any room used for the washing, sterilizing, or storage of containers or supplies. Toilet room must be fly-proof. Toilet doors must be self-closing. Toilet must be vented to the outside atmosphere. Human excreta or other human wastes shall be properly disposed of by the use of flush toilets and septic tanks, approved pits, composting or chemical toilets. Such toilets shall be conveniently located and properly constructed, operated, and maintained, so that the waste is inaccessible to flies and does not pollute the surface soil or contaminate any water supply. No local health department approved pit, composting or chemical toilet, however, shall be permitted within 100 feet of the plant.

18. Septic Tanks:

Where septic tanks are used, consult the local Health Department having jurisdiction for proper installation. It is recommended that a separate septic tank be used for toilet waste.

19. Food Establishments:

In establishments where other foods are prepared in addition to frozen milk products, the food preparation rooms are subject to the provisions of the California Restaurant Act, usually administered by the local Health Department.

20. Plans:

The Food and Agricultural Code requires that three copies of standard blueprint type plans addressing all above items be submitted to the local Regional Administrator. After approval received in writing, and the local health and building/code enforcement departments have given their approvals and permits. Construction or alteration of a milk products plant may begin.

21. Labels:

All labels must meet the requirements in the Code of Federal Regulations (CFR) title 21 parts 101 through 105 and must be submitted for review to the Milk and Dairy Foods Control Branch.

22. Production Laws:

All dairy products and products resembling dairy products must be stored, handled and processed in accordance with the California Food and Agricultural Code Division 15 and the Code of Federal Regulations (CFR) title 21.

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	Construction Guidebook for Wholesale Food Facilities - RWFPC
10.	United States Food and Drug Administration – Good Manufacturing Practices

TITLE 21--FOOD AND DRUGS CHAPTER I--FOOD AND DRUG ADMINISTRATION DEPARTMENT OF HEALTH AND HUMAN SERVICES SUBCHAPTER B--FOOD FOR HUMAN CONSUMPTION

PART 110 CURRENT GOOD MANUFACTURING PRACTICE IN MANUFACTURING, PACKING, OR HOLDING HUMAN FOOD

Subpart A--General Provisions

Sec. 110.3 Definitions.

The definitions and interpretations of terms in section 201 of the Federal Food, Drug, and Cosmetic Act (the act) are applicable to such terms when used in this part. The following definitions shall also apply:

- (a) Acid foods or acidified foods means foods that have an equilibrium pH of 4.6 or below.
- (b) Adequate means that which is needed to accomplish the intended purpose in keeping with good public health practice.
- (c) Batter means a semifluid substance, usually composed of flour and other ingredients, into which principal components of food are dipped or with which they are coated, or which may be used directly to form bakery foods.
- (d) *Blanching*, except for tree nuts and peanuts, means a prepackaging heat treatment of foodstuffs for a sufficient time and at a sufficient temperature to partially or completely inactivate the naturally occurring enzymes and to effect other physical or biochemical changes in the food.
- (e) Critical control point means a point in a food process where there is a high probability that improper control may cause, allow, or contribute to a hazard or to filth in the final food or decomposition of the final food.
- (f) Food means food as defined in section 201(f) of the act and includes raw materials and ingredients.
- (g) Food-contact surfaces are those surfaces that contact human food and those surfaces from which drainage onto the food or onto surfaces that contact the food ordinarily occurs during the normal course of operations. "Food-contact surfaces" includes utensils and food-contact surfaces of equipment.
- (h)Lot means the food produced during a period of time indicated by a specific code.
- (i) *Microorganisms* means yeasts, molds, bacteria, and viruses and includes, but is not limited to, species having public health significance. The term "undesirable microorganisms" includes those microorganisms that are of public health significance, that subject food to decomposition, that indicate that food is contaminated with filth, or that otherwise may cause food to be adulterated within the meaning of the act. Occasionally in these regulations, FDA used the adjective "microbial" instead of using an adjectival phrase containing the word microorganism.

- (j) Pest refers to any objectionable animals or insects including, but not limited to, birds, rodents, flies, and larvae.
- (k) Plant means the building or facility or parts thereof, used for or in connection with the manufacturing, packaging, labeling, or holding of human food.
- (I) Quality control operation means a planned and systematic procedure for taking all actions necessary to prevent food from being adulterated within the meaning of the act.
- (m) Rework means clean, unadulterated food that has been removed from processing for reasons other than insanitary conditions or that has been successfully reconditioned by reprocessing and that is suitable for use as food.
- (n) Safe-moisture level is a level of moisture low enough to prevent the growth of undesirable microorganisms in the finished product under the intended conditions of manufacturing, storage, and distribution. The maximum safe moisture level for a food is based on its water activity (aw). An awwill be considered safe for a food if adequate data are available that demonstrate that the food at or below the given awwill not support the growth of undesirable microorganisms.
- (o) Sanitize means to adequately treat food-contact surfaces by a process that is effective in destroying vegetative cells of microorganisms of public health significance, and in substantially reducing numbers of other undesirable microorganisms, but without adversely affecting the product or its safety for the consumer.
- (p) Shall is used to state mandatory requirements.
- (q) Should is used to state recommended or advisory procedures or identify recommended equipment.
- (r) Water activity (aw) is a measure of the free moisture in a food and is the quotient of the water vapor pressure of the substance divided by the vapor pressure of pure water at the same temperature.

Sec. 110.5 Current good manufacturing practice.

- (a) The criteria and definitions in this part shall apply in determining whether a food is adulterated (1) within the meaning of section 402(a)(3) of the act in that the food has been manufactured under such conditions that it is unfit for food; or (2) within the meaning of section 402(a)(4) of the act in that the food has been prepared, packed, or held under insanitary conditions whereby it may have become contaminated with filth, or whereby it may have been rendered injurious to health. The criteria and definitions in this part also apply in determining whether a food is in violation of section 361 of the Public Health Service Act (42 U.S.C. 264).
- (b) Food covered by specific current good manufacturing practice regulations also is subject to the requirements of those regulations.

Sec. 110.10 Personnel.

The plant management shall take all reasonable measures and precautions to ensure the following:

- (a) Disease control. Any person who, by medical examination or supervisory observation, is shown to have, or appears to have, an illness, open lesion, including boils, sores, or infected wounds, or any other abnormal source of microbial contamination by which there is a reasonable possibility of food, food-contact surfaces, or food-packaging materials becoming contaminated, shall be excluded from any operations which may be expected to result in such contamination until the condition is corrected. Personnel shall be instructed to report such health conditions to their supervisors.
- (b) Cleanliness. All persons working in direct contact with food, food-contact surfaces, and food-packaging materials shall conform to hygienic practices while on duty to the extent necessary to protect against contamination of food. The methods for maintaining cleanliness include, but are not limited to:
- (1) Wearing outer garments suitable to the operation in a manner that protects against the contamination of food, food-contact surfaces, or food-packaging materials.
- (2) Maintaining adequate personal cleanliness.
- (3) Washing hands thoroughly (and sanitizing if necessary to protect against contamination with undesirable microorganisms) in an adequate hand-washing facility before starting work, after each absence from the work station, and at any other time when the hands may have become soiled or contaminated.
- (4) Removing all unsecured jewelry and other objects that might fall into food, equipment, or containers, and removing hand jewelry that cannot be adequately sanitized during periods in which food is manipulated by hand. If such hand jewelry cannot be removed, it may be covered by material which can be maintained in an intact, clean, and sanitary condition and which effectively protects against the contamination by these objects of the food, food-contact surfaces, or food-packaging materials.
- (5) Maintaining gloves, if they are used in food handling, in an intact, clean, and sanitary condition. The gloves should be of an impermeable material.
- (6) Wearing, where appropriate, in an effective manner, hair nets, headbands, caps, beard covers, or other effective hair restraints.
- (7) Storing clothing or other personal belongings in areas other than where food is exposed or where equipment or utensils are washed.
- (8) Confining the following to areas other than where food may be exposed or where equipment or utensils are washed: eating food, chewing gum, drinking beverages, or using tobacco.
- (9) Taking any other necessary precautions to protect against contamination of food, food-contact surfaces, or food-packaging materials with microorganisms or foreign substances including, but not limited to, perspiration, hair, cosmetics, tobacco, chemicals, and medicines applied to the skin.
- (c) Education and training. Personnel responsible for identifying sanitation failures or food contamination should have a background of education or experience, or a combination thereof, to provide a level of competency necessary for production of clean and safe food. Food handlers and supervisors should receive appropriate training in proper food handling techniques and food-protection principles and should be informed of the danger of poor personal hygiene and

insanitary practices.

(d) Supervision. Responsibility for assuring compliance by all personnel with all requirements of this part shall be clearly assigned to competent supervisory personnel.

[51 FR 24475, June 19, 1986, as amended at 54 FR 24892, June 12, 1989]

Sec. 110.19 Exclusions.

- (a) The following operations are not subject to this part: Establishments engaged solely in the harvesting, storage, or distribution of one or more "raw agricultural commodities," as defined in section 201(r) of the act, which are ordinarily cleaned, prepared, treated, or otherwise processed before being marketed to the consuming public.
- (b) FDA, however, will issue special regulations if it is necessary to cover these excluded operations.

Subpart B--Buildings and Facilities

Sec. 110.20 Plant and grounds.

- (a) *Grounds*. The grounds about a food plant under the control of the operator shall be kept in a condition that will protect against the contamination of food. The methods for adequate maintenance of grounds include, but are not limited to:
- (1) Properly storing equipment, removing litter and waste, and cutting weeds or grass within the immediate vicinity of the plant buildings or structures that may constitute an attractant, breeding place, or harborage for pests.
- (2) Maintaining roads, yards, and parking lots so that they do not constitute a source of contamination in areas where food is exposed.
- (3) Adequately draining areas that may contribute contamination to food by seepage, foot-borne filth, or providing a breeding place for pests.
- (4) Operating systems for waste treatment and disposal in an adequate manner so that they do not constitute a source of contamination in areas where food is exposed.

If the plant grounds are bordered by grounds not under the operator's control and not maintained in the manner described in paragraph (a) (1) through (3) of this section, care shall be exercised in the plant by inspection, extermination, or other means to exclude pests, dirt, and filth that may be a source of food contamination.

- (b) *Plant construction and design.* Plant buildings and structures shall be suitable in size, construction, and design to facilitate maintenance and sanitary operations for food-manufacturing purposes. The plant and facilities shall:
- (1) Provide sufficient space for such placement of equipment and storage of materials as is necessary for the maintenance of sanitary operations and the production of safe food.

- (2) Permit the taking of proper precautions to reduce the potential for contamination of food, food-contact surfaces, or food-packaging materials with microorganisms, chemicals, filth, or other extraneous material. The potential for contamination may be reduced by adequate food safety controls and operating practices or effective design, including the separation of operations in which contamination is likely to occur, by one or more of the following means: location, time, partition, air flow, enclosed systems, or other effective means.
- (3) Permit the taking of proper precautions to protect food in outdoor bulk fermentation vessels by any effective means, including:
- (i) Using protective coverings.
- (ii) Controlling areas over and around the vessels to eliminate harborages for pests.
- (iii) Checking on a regular basis for pests and pest infestation.
- (iv) Skimming the fermentation vessels, as necessary.
- (4) Be constructed in such a manner that floors, walls, and ceilings may be adequately cleaned and kept clean and kept in good repair; that drip or condensate from fixtures, ducts and pipes does not contaminate food, food-contact surfaces, or food-packaging materials; and that aisles or working spaces are provided between equipment and walls and are adequately unobstructed and of adequate width to permit employees to perform their duties and to protect against contaminating food or food-contact surfaces with clothing or personal contact.
- (5) Provide adequate lighting in hand-washing areas, dressing and locker rooms, and toilet rooms and in all areas where food is examined, processed, or stored and where equipment or utensils are cleaned; and provide safety-type light bulbs, fixtures, skylights, or other glass suspended over exposed food in any step of preparation or otherwise protect against food contamination in case of glass breakage.
- (6) Provide adequate ventilation or control equipment to minimize odors and vapors (including steam and noxious fumes) in areas where they may contaminate food; and locate and operate fans and other air-blowing equipment in a manner that minimizes the potential for contaminating food, food-packaging materials, and food-contact surfaces.
- (7) Provide, where necessary, adequate screening or other protection against pests.

Sec. 110.35 Sanitary operations.

- (a) General maintenance. Buildings, fixtures, and other physical facilities of the plant shall be maintained in a sanitary condition and shall be kept in repair sufficient to prevent food from becoming adulterated within the meaning of the act. Cleaning and sanitizing of utensils and equipment shall be conducted in a manner that protects against contamination of food, food-contact surfaces, or food-packaging materials.
- (b) Substances used in cleaning and sanitizing; storage of toxic materials. (1) Cleaning compounds and sanitizing agents used in cleaning and sanitizing procedures shall be free from undesirable microorganisms and shall be safe and adequate under the conditions of use. Compliance with this requirement may be verified by any effective means including purchase of these substances under a supplier's guarantee or certification, or examination of these substances for contamination. Only the following toxic materials may be used or stored in a plant

where food is processed or exposed:

- (i) Those required to maintain clean and sanitary conditions;
- (ii) Those necessary for use in laboratory testing procedures;
- (iii) Those necessary for plant and equipment maintenance and operation; and
- (iv) Those necessary for use in the plant's operations.
- (2) Toxic cleaning compounds, sanitizing agents, and pesticide chemicals shall be identified, held, and stored in a manner that protects against contamination of food, food-contact surfaces, or food-packaging materials. All relevant regulations promulgated by other Federal, State, and local government agencies for the application, use, or holding of these products should be followed.
- (c) Pest control. No pests shall be allowed in any area of a food plant. Guard or guide dogs may be allowed in some areas of a plant if the presence of the dogs is unlikely to result in contamination of food, food-contact surfaces, or food-packaging materials. Effective measures shall be taken to exclude pests from the processing areas and to protect against the contamination of food on the premises by pests. The use of insecticides or rodenticides is permitted only under precautions and restrictions that will protect against the contamination of food, food-contact surfaces, and food-packaging materials.
- (d) Sanitation of food-contact surfaces. All food-contact surfaces, including utensils and food-contact surfaces of equipment, shall be cleaned as frequently as necessary to protect against contamination of food.
- (1) Food-contact surfaces used for manufacturing or holding low-moisture food shall be in a dry, sanitary condition at the time of use. When the surfaces are wet-cleaned, they shall, when necessary, be sanitized and thoroughly dried before subsequent use.
- (2) In wet processing, when cleaning is necessary to protect against the introduction of microorganisms into food, all food-contact surfaces shall be cleaned and sanitized before use and after any interruption during which the food-contact surfaces may have become contaminated. Where equipment and utensils are used in a continuous production operation, the utensils and food-contact surfaces of the equipment shall be cleaned and sanitized as necessary.
- (3) Non-food-contact surfaces of equipment used in the operation of food plants should be cleaned as frequently as necessary to protect against contamination of food.
- (4) Single-service articles (such as utensils intended for one-time use, paper cups, and paper towels) should be stored in appropriate containers and shall be handled, dispensed, used, and disposed of in a manner that protects against contamination of food or food-contact surfaces.
- (5) Sanitizing agents shall be adequate and safe under conditions of use. Any facility, procedure, or machine is acceptable for cleaning and sanitizing equipment and utensils if it is established that the facility, procedure, or machine will routinely render equipment and utensils clean and provide adequate cleaning and sanitizing treatment.
- (e) Storage and handling of cleaned portable equipment and utensils. Cleaned and sanitized portable equipment with food-contact surfaces and utensils should be stored in a location and

manner that protects food-contact surfaces from contamination.

[51 FR 24475, June 19, 1986, as amended at 54 FR 24892, June 12, 1989]

Sec. 110.37 Sanitary facilities and controls.

Each plant shall be equipped with adequate sanitary facilities and accommodations including, but not limited to:

- (a) Water supply. The water supply shall be sufficient for the operations intended and shall be derived from an adequate source. Any water that contacts food or food-contact surfaces shall be safe and of adequate sanitary quality. Running water at a suitable temperature, and under pressure as needed, shall be provided in all areas where required for the processing of food, for the cleaning of equipment, utensils, and food-packaging materials, or for employee sanitary facilities.
- (b) Plumbing. Plumbing shall be of adequate size and design and adequately installed and maintained to:
- (1) Carry sufficient quantities of water to required locations throughout the plant.
- (2) Properly convey sewage and liquid disposable waste from the plant.
- (3) Avoid constituting a source of contamination to food, water supplies, equipment, or utensils or creating an unsanitary condition.
- (4) Provide adequate floor drainage in all areas where floors are subject to flooding-type cleaning or where normal operations release or discharge water or other liquid waste on the floor.
- (5) Provide that there is not backflow from, or cross-connection between, piping systems that discharge waste water or sewage and piping systems that carry water for food or food manufacturing.
- (c) Sewage disposal. Sewage disposal shall be made into an adequate sewerage system or disposed of through other adequate means.
- (d) *Toilet facilities*. Each plant shall provide its employees with adequate, readily accessible toilet facilities. Compliance with this requirement may be accomplished by:
- (1) Maintaining the facilities in a sanitary condition.
- (2) Keeping the facilities in good repair at all times.
- (3) Providing self-closing doors.
- (4) Providing doors that do not open into areas where food is exposed to airborne contamination, except where alternate means have been taken to protect against such contamination (such as double doors or positive air-flow systems).
- (e) Hand-washing facilities. Hand-washing facilities shall be adequate and convenient and be furnished with running water at a suitable temperature. Compliance with this requirement may be

accomplished by providing:

- (1) Hand-washing and, where appropriate, hand-sanitizing facilities at each location in the plant where good sanitary practices require employees to wash and/or sanitize their hands.
- (2) Effective hand-cleaning and sanitizing preparations.
- (3) Sanitary towel service or suitable drying devices.
- (4) Devices or fixtures, such as water control valves, so designed and constructed to protect against recontamination of clean, sanitized hands.
- (5) Readily understandable signs directing employees handling unprotected food, unprotected food-packaging materials, of food-contact surfaces to wash and, where appropriate, sanitize their hands before they start work, after each absence from post of duty, and when their hands may have become soiled or contaminated. These signs may be posted in the processing room(s) and in all other areas where employees may handle such food, materials, or surfaces.
- (6) Refuse receptacles that are constructed and maintained in a manner that protects against contamination of food.
- (f) Rubbish and offal disposal. Rubbish and any offal shall be so conveyed, stored, and disposed of as to minimize the development of odor, minimize the potential for the waste becoming an attractant and harborage or breeding place for pests, and protect against contamination of food, food-contact surfaces, water supplies, and ground surfaces.

Subpart C--Equipment

Sec. 110.40 Equipment and utensils.

- (a) All plant equipment and utensils shall be so designed and of such material and workmanship as to be adequately cleanable, and shall be properly maintained. The design, construction, and use of equipment and utensils shall preclude the adulteration of food with lubricants, fuel, metal fragments, contaminated water, or any other contaminants. All equipment should be so installed and maintained as to facilitate the cleaning of the equipment and of all adjacent spaces. Food-contact surfaces shall be corrosion-resistant when in contact with food. They shall be made of nontoxic materials and designed to withstand the environment of their intended use and the action of food, and, if applicable, cleaning compounds and sanitizing agents. Food-contact surfaces shall be maintained to protect food from being contaminated by any source, including unlawful indirect food additives.
- (b) Seams on food-contact surfaces shall be smoothly bonded or maintained so as to minimize accumulation of food particles, dirt, and organic matter and thus minimize the opportunity for growth of microorganisms.
- (c) Equipment that is in the manufacturing or food-handling area and that does not come into contact with food shall be so constructed that it can be kept in a clean condition.
- (d) Holding, conveying, and manufacturing systems, including gravimetric, pneumatic, closed, and automated systems, shall be of a design and construction that enables them to be

maintained in an appropriate sanitary condition.

- (e) Each freezer and cold storage compartment used to store and hold food capable of supporting growth of microorganisms shall be fitted with an indicating thermometer, temperature-measuring device, or temperature-recording device so installed as to show the temperature accurately within the compartment, and should be fitted with an automatic control for regulating temperature or with an automatic alarm system to indicate a significant temperature change in a manual operation.
- (f) Instruments and controls used for measuring, regulating, or recording temperatures, pH, acidity, water activity, or other conditions that control or prevent the growth of undesirable microorganisms in food shall be accurate and adequately maintained, and adequate in number for their designated uses.
- (g) Compressed air or other gases mechanically introduced into food or used to clean food-contact surfaces or equipment shall be treated in such a way that food is not contaminated with unlawful indirect food additives.

Subpart D [Reserved]

Subpart E--Production and Process Controls

Sec. 110.80 Processes and controls.

All operations in the receiving, inspecting, transporting, segregating, preparing, manufacturing, packaging, and storing of food shall be conducted in accordance with adequate sanitation principles. Appropriate quality control operations shall be employed to ensure that food is suitable for human consumption and that food-packaging materials are safe and suitable. Overall sanitation of the plant shall be under the supervision of one or more competent individuals assigned responsibility for this function. All reasonable precautions shall be taken to ensure that production procedures do not contribute contamination from any source. Chemical, microbial, or extraneous-material testing procedures shall be used where necessary to identify sanitation failures or possible food contamination. All food that has become contaminated to the extent that it is adulterated within the meaning of the act shall be rejected, or if permissible, treated or processed to eliminate the contamination.

- (a) Raw materials and other ingredients. (1) Raw materials and other ingredients shall be inspected and segregated or otherwise handled as necessary to ascertain that they are clean and suitable for processing into food and shall be stored under conditions that will protect against contamination and minimize deterioration. Raw materials shall be washed or cleaned as necessary to remove soil or other contamination. Water used for washing, rinsing, or conveying food shall be safe and of adequate sanitary quality. Water may be reused for washing, rinsing, or conveying food if it does not increase the level of contamination of the food. Containers and carriers of raw materials should be inspected on receipt to ensure that their condition has not contributed to the contamination or deterioration of food.
- (2) Raw materials and other ingredients shall either not contain levels of microorganisms that may produce food poisoning or other disease in humans, or they shall be pasteurized or otherwise treated during manufacturing operations so that they no longer contain levels that would cause the product to be adulterated within the meaning of the act. Compliance with this requirement may be verified by any effective means, including purchasing raw materials and other ingredients

under a supplier's guarantee or certification.

- (3) Raw materials and other ingredients susceptible to contamination with aflatoxin or other natural toxins shall comply with current Food and Drug Administration regulations and action levels for poisonous or deleterious substances before these materials or ingredients are incorporated into finished food. Compliance with this requirement may be accomplished by purchasing raw materials and other ingredients under a supplier's guarantee or certification, or may be verified by analyzing these materials and ingredients for aflatoxins and other natural toxins.
- (4) Raw materials, other ingredients, and rework susceptible to contamination with pests, undesirable microorganisms, or extraneous material shall comply with applicable Food and Drug Administration regulations and defect action levels for natural or unavoidable defects if a manufacturer wishes to use the materials in manufacturing food. Compliance with this requirement may be verified by any effective means, including purchasing the materials under a supplier's guarantee or certification, or examination of these materials for contamination.
- (5) Raw materials, other ingredients, and rework shall be held in bulk, or in containers designed and constructed so as to protect against contamination and shall be held at such temperature and relative humidity and in such a manner as to prevent the food from becoming adulterated within the meaning of the act. Material scheduled for rework shall be identified as such.
- (6) Frozen raw materials and other ingredients shall be kept frozen. If thawing is required prior to use, it shall be done in a manner that prevents the raw materials and other ingredients from becoming adulterated within the meaning of the act.
- (7) Liquid or dry raw materials and other ingredients received and stored in bulk form shall be held in a manner that protects against contamination.
- (b) Manufacturing operations. (1) Equipment and utensils and finished food containers shall be maintained in an acceptable condition through appropriate cleaning and sanitizing, as necessary. Insofar as necessary, equipment shall be taken apart for thorough cleaning.
- (2) All food manufacturing, including packaging and storage, shall be conducted under such conditions and controls as are necessary to minimize the potential for the growth of microorganisms, or for the contamination of food. One way to comply with this requirement is careful monitoring of physical factors such as time, temperature, humidity, aw, pH, pressure, flow rate, and manufacturing operations such as freezing, dehydration, heat processing, acidification, and refrigeration to ensure that mechanical breakdowns, time delays, temperature fluctuations, and other factors do not contribute to the decomposition or contamination of food.
- (3) Food that can support the rapid growth of undesirable microorganisms, particularly those of public health significance, shall be held in a manner that prevents the food from becoming adulterated within the meaning of the act. Compliance with this requirement may be accomplished by any effective means, including:
- (i) Maintaining refrigerated foods at 45 deg. F (7.2 deg. C) or below as appropriate for the particular food involved.
- (ii) Maintaining frozen foods in a frozen state.

- (iii) Maintaining hot foods at 140 deg. F (60 deg. C) or above.
- (iv) Heat treating acid or acidified foods to destroy mesophilic microorganisms when those foods are to be held in hermetically sealed containers at ambient temperatures.
- (4) Measures such as sterilizing, irradiating, pasteurizing, freezing, refrigerating, controlling pH or controlling awthat are taken to destroy or prevent the growth of undesirable microorganisms, particularly those of public health significance, shall be adequate under the conditions of manufacture, handling, and distribution to prevent food from being adulterated within the meaning of the act.
- (5) Work-in-process shall be handled in a manner that protects against contamination.
- (6) Effective measures shall be taken to protect finished food from contamination by raw materials, other ingredients, or refuse. When raw materials, other ingredients, or refuse are unprotected, they shall not be handled simultaneously in a receiving, loading, or shipping area if that handling could result in contaminated food. Food transported by conveyor shall be protected against contamination as necessary.
- (7) Equipment, containers, and utensils used to convey, hold, or store raw materials, work-in-process, rework, or food shall be constructed, handled, and maintained during manufacturing or storage in a manner that protects against contamination.
- (8) Effective measures shall be taken to protect against the inclusion of metal or other extraneous material in food. Compliance with this requirement may be accomplished by using sieves, traps, magnets, electronic metal detectors, or other suitable effective means.
- (9) Food, raw materials, and other ingredients that are adulterated within the meaning of the act shall be disposed of in a manner that protects against the contamination of other food. If the adulterated food is capable of being reconditioned, it shall be reconditioned using a method that has been proven to be effective or it shall be reexamined and found not to be adulterated within the meaning of the act before being incorporated into other food.
- (10) Mechanical manufacturing steps such as washing, peeling, trimming, cutting, sorting and inspecting, mashing, dewatering, cooling, shredding, extruding, drying, whipping, defatting, and forming shall be performed so as to protect food against contamination. Compliance with this requirement may be accomplished by providing adequate physical protection of food from contaminants that may drip, drain, or be drawn into the food. Protection may be provided by adequate cleaning and sanitizing of all food-contact surfaces, and by using time and temperature controls at and between each manufacturing step.
- (11) Heat blanching, when required in the preparation of food, should be effected by heating the food to the required temperature, holding it at this temperature for the required time, and then either rapidly cooling the food or passing it to subsequent manufacturing without delay. Thermophilic growth and contamination in blanchers should be minimized by the use of adequate operating temperatures and by periodic cleaning. Where the blanched food is washed prior to filling, water used shall be safe and of adequate sanitary quality.
- (12) Batters, breading, sauces, gravies, dressings, and other similar preparations shall be treated or maintained in such a manner that they are protected against contamination. Compliance with this requirement may be accomplished by any effective means, including one or more of the

following:

- (i) Using ingredients free of contamination.
- (ii) Employing adequate heat processes where applicable.
- (iii) Using adequate time and temperature controls.
- (iv) Providing adequate physical protection of components from contaminants that may drip, drain, or be drawn into them.
- (v) Cooling to an adequate temperature during manufacturing.
- (vi) Disposing of batters at appropriate intervals to protect against the growth of microorganisms.
- (13) Filling, assembling, packaging, and other operations shall be performed in such a way that the food is protected against contamination. Compliance with this requirement may be accomplished by any effective means, including:
- (i) Use of a quality control operation in which the critical control points are identified and controlled during manufacturing.
- (ii) Adequate cleaning and sanitizing of all food-contact surfaces and food containers.
- (iii) Using materials for food containers and food- packaging materials that are safe and suitable, as defined in 130.3(d) of this chapter.
- (iv) Providing physical protection from contamination, particularly airborne contamination.
- (v) Using sanitary handling procedures.
- (14) Food such as, but not limited to, dry mixes, nuts, intermediate moisture food, and dehydrated food, that relies on the control of awfor preventing the growth of undesirable microorganisms shall be processed to and maintained at a safe moisture level. Compliance with this requirement may be accomplished by any effective means, including employment of one or more of the following practices:
- (i) Monitoring the awof food.
- (ii) Controlling the soluble solids-water ratio in finished food.
- (iii) Protecting finished food from moisture pickup, by use of a moisture barrier or by other means, so that the awof the food does not increase to an unsafe level.
- (15) Food such as, but not limited to, acid and acidified food, that relies principally on the control of pH for preventing the growth of undesirable microorganisms shall be monitored and maintained at a pH of 4.6 or below. Compliance with this requirement may be accomplished by any effective means, including employment of one or more of the following practices:

- (i) Monitoring the pH of raw materials, food in process, and finished food.
- (ii) Controlling the amount of acid or acidified food added to low-acid food.
- (16) When ice is used in contact with food, it shall be made from water that is safe and of adequate sanitary quality, and shall be used only if it has been manufactured in accordance with current good manufacturing practice as outlined in this part.
- (17) Food-manufacturing areas and equipment used for manufacturing human food should not be used to manufacture nonhuman food-grade animal feed or inedible products, unless there is no reasonable possibility for the contamination of the human food.

[51 FR 24475, June 19, 1986, as amended at 65 FR 56479, Sept. 19, 2000]

Sec. 110.93 Warehousing and distribution.

Storage and transportation of finished food shall be under conditions that will protect food against physical, chemical, and microbial contamination as well as against deterioration of the food and the container.

Subpart F [Reserved]

Subpart G--Defect Action Levels

Sec. 110.110 Natural or unavoidable defects in food for human use that present no health hazard.

- (a) Some foods, even when produced under current good manufacturing practice, contain natural or unavoidable defects that at low levels are not hazardous to health. The Food and Drug Administration establishes maximum levels for these defects in foods produced under current good manufacturing practice and uses these levels in deciding whether to recommend regulatory action.
- (b) Defect action levels are established for foods whenever it is necessary and feasible to do so. These levels are subject to change upon the development of new technology or the availability of new information.
- (c) Compliance with defect action levels does not excuse violation of the requirement in section 402(a)(4) of the act that food not be prepared, packed, or held under unsanitary conditions or the requirements in this part that food manufacturers, distributors, and holders shall observe current good manufacturing practice. Evidence indicating that such a violation exists causes the food to be adulterated within the meaning of the act, even though the amounts of natural or unavoidable defects are lower than the currently established defect action levels. The manufacturer, distributor, and holder of food shall at all times utilize quality control operations that reduce natural or unavoidable defects to the lowest level currently feasible.
- (d) The mixing of a food containing defects above the current defect action level with another lot of food is not permitted and renders the final food adulterated within the meaning of the act, regardless of the defect level of the final food.

(e) A compilation of the current defect action levels for natural or unavoidable defects in food for human use that present no health hazard may be obtained upon request from the Center for Food Safety and Applied Nutrition (HFS-565), Food and Drug Administration, 5100 Paint Branch Pkwy., College Park, MD 20740.

[51 FR 24475, June 19, 1986, as amended at 61 FR 14480, Apr. 2, 1996; 66 FR 56035, Nov. 6, 2001]

Construction Guidebook for Wholesale Food Facilities - RWFPC	
11. Sizing Tables for Hot Water Heaters	

GUIDELINES FOR SIZING WATER HEATERS

California Conference of Directors of Environmental Health September, 1995

I. BACKGROUND

A critical factor in preventing foodborne illnesses in a food facility is the provision of an adequate supply of hot water for the washing of hands, utensils, equipment, and the facility itself. The installation of a properly sized water heater will ensure that a sufficient amount of hot water will be available at all times.

II. PURPOSE

The purpose of these guidelines is to provide a set of criteria that will assist architects, designers, contractors and owners in properly sizing water heaters to adequately meet the anticipated hot water demands of food facilities in California.

Food facilities with water heaters sized according to these criteria should be capable of complying with the requirements for providing an adequate hot water supply as required by the California Uniform Retail Food Facilities Law.

III. LEGAL AUTHORITY

California Health and Safety Code, Chapter 4, Article 8, Sections 27623, 27624, 27625, 27627, and 27627.3.

IV. DEFINITIONS

- Booster Heater: An instantaneous water heater designed and intended to raise the temperature of <u>hot</u> water to a higher temperature for a specific purpose, such as for the sanitizing rinse on a high temperature automatic dishmachine.
- **BTU (British Thermal Unit):** The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit.
- **GPH (Gallons Per Hour):** The amount of water, in gallons, that is used each hour by the plumbing fixtures and equipment, such as dishmachines.
- **GPM (Gallons Per Minute):** The amount of water, in gallons, flowing through a plumbing fixture or through an instantaneous water heater per minute.
- **Instantaneous Water Heater:** A water heater that generates hot water on demand.
- **KW (Kilowatt):** A unit of electric power equal to 1,000 watts.
- **Rise:** The temperature of water as it leaves the water heater minus the temperature of the water entering the water heater.
- Storage Water Heater: A water heater that incorporates a thermostat, a storage tank, and a burner or heating elements, to heat and maintain the water within the tank at a specific temperature.
- Thermal Efficiency: The measure of the overall efficiency of the water heater, taking

into consideration loss of energy due to combustion, radiation, convection and conduction of heat from the unit.

V. GENERAL REQUIREMENTS

- A. A water heater shall be provided which is **capable** of generating an adequate supply of hot water, at a temperature of at least 120° Fahrenheit, to all sinks, janitorial facilities, and other equipment and fixtures that use hot water, at all times.
- B. Water heaters and their installation must be in compliance with all local building code requirements.
- C. Water heaters that use reclaimed heat from equipment to heat water must be evaluated on a case by case basis.

VI. SIZING REQUIREMENTS FOR STORAGE WATER HEATERS

- A. For food facilities that utilize multiservice eating and drinking utensils, the water heater shall have a recovery rate equal to or greater than 100% of the computed hourly hot water demand, in gallons per hour (GPH).
- B. For food facilities that use only single-service eating and drinking utensils, or don't use utensils at all, the water heater shall have a recovery rate equal to or greater than 80% of the computed hourly hot water demand, in GPH.
- C. For food facilities that handle and sell **only** prepackaged foods, a water heater with a minimum storage capacity of ten gallons must be provided.
- D. The hourly hot water demand for the food facility, in GPH, is calculated by adding together the estimated hot water demands for all sinks and other equipment, such as dishmachines, which utilize hot water. The estimated hot water demands for sinks and other equipment that utilize hot water are listed in Appendix I. The hot water demands for automatic warewashers, such as dishmachines, glasswashers, and potwashers are found in NSF International listings or listings established by other nationally recognized testing laboratories.
- E. The following examples are provided to explain how to calculate the total hourly hot water demand:
 - 1. Food facility that utilizes only single service eating and drinking utensils:

Assume:

1 18" X 18" three compartment sink 42 GPH

2 hand lavatories 10 GPH (5 GPH each)

1 janitorial sink 15 GPH

_____67 GPH total hourly hot water demand

67 GPH X 80% allowance for single service utensils = 54 GPH For the food facility in this example, a water heater would be required which will recover 54 GPH.

2. Food facility that utilizes multiservice eating and drinking utensils:

Assume:

1 18" X 18" three compartment sink	42 GPH
automatic dishmachine	80 GPH
hand spray pre-rinse	45 GPH
one compartment food preparation sink	5 GPH

2 hand lavatories 10 GPH (5 GPH each)

1 janitorial sink 15 GPH

______ 197 GPH total hourly hot water demand

Since the food facility in this example uses multiservice eating and drinking utensils, 100% of the computed hourly hot water demand must be provided. Therefore, a water heater would be required which will recover 197 GPH.

F. To compute a BTU or KW rating for the required hourly hot water demand found in example #1 the following formulas should be used:

Formula 1 (for gas water heaters)

_____BTU input = GPH X °Rise¹ X 8.33 lb./ gallon of water Thermal Efficiency²

BTU input = 29,988

Formula 2 (for electric water heaters)

_____KW input = GPH X °Rise X 8.33 lb./ gallon of water Thermal Efficiency¹ X 3412 BTU/KW

KW input = 6.7

¹ The average temperature of tap water varies throughout the State depending upon the location, elevation, and time of year. In order to properly size the water heater check with your local health agency to determine the required rise. For the purposes of these guidelines a tap water temperature of 70° Fahrenheit will be used. Therefore, to achieve a temperature of 120° Fahrenheit at the faucet, the required rise would be 50°.

² The thermal efficiency for gas water heaters, unless otherwise listed by NSF International or other nationally recognized testing laboratories, will be assumed to be 75%.

¹ The thermal efficiency for electric water heaters, unless otherwise listed by NSF International or other nationally recognized testing laboratories, will be assumed to be 98%.

Sizing tables for gas and electric water heaters are found in Appendices II and III respectively.

VII. SIZING REQUIREMENTS FOR INSTANTANEOUS WATER HEATERS

- A. One of the advantages of an instantaneous water heater is its ability to provide a continuous supply of hot water. However, since the water passes through a heat exchanger, the water must flow through the unit slowly to ensure proper heat transfer. Therefore, the quantity, or rate, at which the hot water is delivered can be significantly less than that provided by a storage water heater. When hot water is utilized at several locations of the food facility at the same time the flow of hot water to each fixture can be severely restricted. As a result of the restricted output of instantaneous water heaters, more than one unit may be required, depending on the numbers and types of sinks and equipment present. Due to the limitations inherent in the design of instantaneous water heaters, some local health agencies may restrict or prohibit their usage. Check with your local health agency prior to installing an instantaneous water heater in order to determine their requirements.
- B. Instantaneous water heaters must be sized to provide hot water of at least 120° Fahrenheit, and at a rate of at least two gallons per minute (GPM), to each sink and fixture that utilizes hot water. (Note: Hand lavatories must receive at least 1/2 GPM.) The following example is provided to explain how this sizing criteria is applied:

Assume:

1	18" X 18" three compartment sink	2 GPM
2	hand lavatories	1 GPM (1/2 GPM each)
1	janitorial sink	2 GPM
		5 GPM

- C. In the example given above, one or more instantaneous water heaters would have to be provided in order to supply a total of at least 5 GPM.
- D. Food facilities that install an automatic warewashing machine that utilizes a large quantity of hot water may be required to provide an instantaneous water heater exclusively for the warewashing machine. NSF International listings or listings established by other nationally recognized testing laboratories are used to determine the minimum GPM hot water demand for automatic warewashing machines.

VIII. REQUIREMENTS FOR BOOSTER HEATERS

- A. When a hot water sanitizing warewashing machine is used, a booster heater must be provided that will raise the incoming general purpose hot water up to at least 180° Fahrenheit for the final sanitizing rinse cycle.
- B. When sizing a booster heater, the hot water demand for the warewashing final sanitizing rinse cycle should be obtained from the NSF International listings or listings established by other nationally recognized testing laboratories.
- C. The formulas for calculating BTU or KW input listed in section VI.F. should be used when determining the minimum required size for a booster heater.

D. When a booster heater is installed below a drainboard, it shall be installed at least six inches above the floor and away from the wall, and in a manner that will allow accessibility for proper cleaning and servicing.

IX. RECIRCULATION PUMPS

- A. Where fixtures are located more than sixty feet from the water heater, a recirculation pump must be installed, in order to ensure that water reaches the fixture at a temperature of at least 120° Fahrenheit.
- B. In some cases it may be more practical to install a separate, smaller water heater for remote fixtures, such as for restroom handsinks.

X. <u>INSTALLATION REQUIREMENTS</u>

- A. Where feasible, water heaters should be located in an area of the food facility separated from all food and utensil handling areas.
- B. The Uniform Building Code prohibits the installation of gas water heaters in restrooms or change rooms.
- C. Water heaters shall be mounted in one of the following manners:
 - 1. On six inch high, easily cleanable legs.
 - 2. On a four inch high coved curb base. All openings between the water heater and the base must be sealed in a watertight manner.
 - 3. On a properly finished and installed wall pedestal, positioned so that it is out of the work and traffic space.
 - 4. In an easily accessible location above a suspended ceiling. Where a permanently installed ladder is required to access the water heater, the ladder shall not be installed above a food or utensil handling area.

Note: The local health agency may allow alternate installation methods when a water heater is installed in an area separated from food and utensil handling areas, such as in a mechanical room.

D. A common mistake with electric water heaters is the ordering and installing of a water heater with an upper element of 4500 watts, a bottom element of 4500 watts, and a total connected (or maximum) wattage of 4500 watts. On such a water heater only one element is operating at any one time. Many individuals do not observe the total connected wattage and assume that because each of the elements is 4500 watts their water heater has an input rating of 9000 watts.

Water heater manufacturers have specific procedures for rewiring an electric water heater so that the upper and lower elements are operating simultaneously. Some manufacturers only permit rewiring in the factory. Field modifications will normally void warranties and any listings that the unit comes with. Prior to acceptance of a field modified water heater, the local health agency should ensure that the modifications were performed according to the manufacturer's recommendations and with the approval of the local building officials. The data plate on a field modified water heater

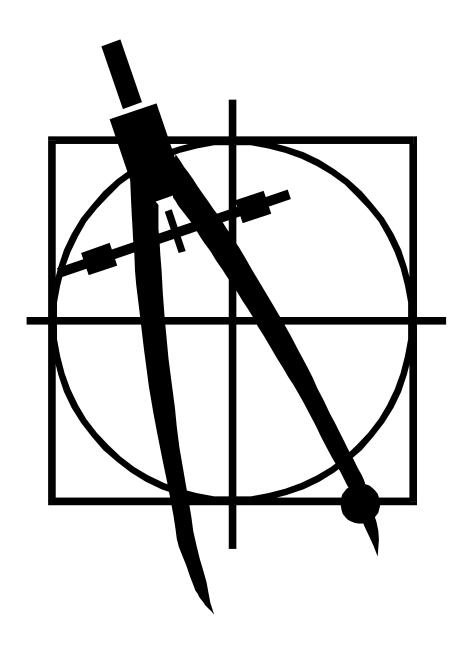
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must be changed to reflect the total connected wattage rating with both elements operating simultaneously.

E. When multiple water heaters are connected, they must be installed in parallel, not in series (See Appendix IV).

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

MECHANICAL EXHAUST VENTILATION SYSTEMS Design, Calculations, and Operational Guidelines



California Conference of Directors of Environmental Health
September, 2003

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MECHANICAL EXHAUST VENTILATION SYSTEMS Design, Calculations, and Operational Guidelines

California Conference of Directors of Environmental Health

I. <u>Background</u>

Proper venting and capture of the gases, heat, grease, vapors, and smoke generated by cooking equipment is important; not only for fire prevention and sanitation purposes, but also for maintaining the health and well being of food service workers. In order to help prevent dangerous or unhealthful conditions within a food facility, it is critical that exhaust ventilation systems be designed, constructed, and operated in compliance with all applicable requirements.

II. Purpose and Scope

- These guidelines are intended to assist in determining mechanical exhaust ventilation requirements for equipment that generates grease, vapors, fumes, smoke, steam, heat, and/or odors.
- Exhaust ventilation systems are also reviewed and inspected by local building and fire authorities to determine compliance with applicable building and fire codes.
- The requirements contained within this document represent minimum standards, which may be superseded by local ordinances. Where there is a contradiction in the requirements, the stricter should apply.
- Due to the differing roles of the local enforcement agencies and local building departments not all health jurisdictions will be applying all portions of these guidelines.

III. Legal Authority and Applicable Codes and Standards

- A. California Uniform Retail Food Facilities Law, Section 114140.
- B. California Code of Regulations, Title 17, Article 10.4, Commencing with Section 13670.
- C. California Code of Regulations, Title 24, Part 4, Chapter 4-20, commencing with Section 4-2000.
- D. Applicable Codes and Standards (refer to Appendix 1).

IV. Definitions

- A. Canopy Hood a hood designed so the inside edge overhangs or extends a horizontal distance not less than six inches beyond the outer edges of the cooking surface.
- B. Compensating Hood a hood designed to introduce outside make-up air through an integrated section of the hood with little or no thermal conditioning. This design will typically provide 60-80% of the required make-up air through four basic discharge methods: short-circuit, face-discharge, back-discharge, and down-discharge. These methods may also be combined, such as a face and down-discharge arrangement. Short-circuiting hoods must be tested and listed by a qualified testing agency and installed/operated according to the listing conditions.
- C. Convection Oven a gas or electric heated oven that uses a fan or blower to recirculate the heat throughout the interior of the oven.
- D. *Ducting* the conduit that is used to convey exhausted air from the exhaust hood to the outside of the food facility.
- E. Grease Extractor a series of baffles installed in the exhaust hood in such a way as to remove grease from the exhausted air using centrifugal force.
- F. Grease Filter a device that is installed in the exhaust hood in such a way as to remove grease from the exhausted air by entrapment, impingement, adhesion, or other similar means.
- G. Hood an air-intake device connected to a mechanical exhaust ventilation system for collecting and removing cooking effluent which contains grease, vapors, fumes, smoke, steam, heat, or odors which are generated by cooking equipment and warewashing machines.
- H. Listed Equipment equipment and materials which, following evaluation and acceptance by a qualified testing agency, are placed on a list of certification. The listing shows that the equipment and materials comply with accepted national standards, which have been approved or evaluated for conformity with approved, or national standards.
- I. Noncanopy Hood a hood that does not extend completely over the cooking equipment. A noncanopy hood is designed to be as close as possible to the cooking surface, usually 18 to 24 inches above it.
- J. *Plenum* an air compartment or chamber to which one or more ducts are connected and which forms part of the supply-air, return-air, or exhaust air system.
- K. *Portable* equipment having the properties of being portable, weighing less than 80 pounds, not exceeding three feet in any plane, and having utility connections

- designed to be disconnected or of sufficient length to permit equipment movement for cleaning.
- L. Recirculating Hood System (Ductless hoods or Ventless hoods) a self-contained air exhaust system that removes grease, vapors, fumes, smoke, steam, and odors from the exhausted air; and then reintroduces the filtered air back into the food facility. The grease, vapors, fumes, smoke, and steam are normally removed using a variety of systems such as water sprays, electrostatic precipitators, or multiple filter banks. The odors are typically removed using activated charcoal filters. Recirculating hood systems are not designed to eliminate heat from the exhausted air. Recirculating hood systems are also known as ductless or ventless hoods.
- M. Type I Exhaust Hood a hood that is designed to collect and remove all types of cooking effluent from the exhausted air.
- N. Type II Exhaust Hood a hood that is designed to collect and remove **only** steam, vapors, heat, or odors.
- O. Water-Wash-Type Exhaust Hood a Type I hood which uses water to remove accumulated grease from the grease extractors.

V. <u>General Requirements</u>

- A. Section 114140 of CURFFL states in part, "Ventilation shall be provided to remove toxic gases, heat, grease, vapors, and smoke from the food establishment. All areas shall have sufficient ventilation to facilitate proper food storage and to provide a reasonable condition of comfort for each employee, consistent with the job performed by the employee. On or after January 1, 1985, there shall be provided mechanical exhaust ventilation at or above all newly installed cooking equipment as required in Article 10.4 (commencing with Section 13670) of Title 17 of, and Chapter 4-20 (commencing with Section 4-2000) of Part 4 of Title 24, of the California Code of Regulations. "
- B. The Uniform Mechanical Code states, "Hoods shall be installed at or above all commercial-type deep fat fryers, broilers, fry grills, steam-jacketed kettles, hot-top ranges, ovens, barbecues, rotisseries, dishwashing machines and similar equipment which produce comparable amounts of steam, smoke, grease or heat in a food-processing establishment. For the purpose of this section, a food-processing establishment shall include any building or portion thereof used for the processing of food but shall not include a dwelling unit."
- C. Listed ventilation equipment shall be installed and used according to the manufacturer's installation and operating instructions. A copy of the instructions

- shall be readily available for review by the enforcement officer. Nonlisted ventilation equipment, when approved by the authority having jurisdiction, shall be constructed, installed and used in accordance with all applicable requirements contained in the codes identified in Appendix I of these guidelines.
- D. Exhaust ventilation systems shall conform to all local building and fire codes and have all necessary approvals from the local building and fire authorities.

VI. <u>Exemptions From Providing Mechanical Exhaust Ventilation</u>

A. Section 114140 of CURFFL also states, "This section shall not apply to cooking equipment when such equipment has been submitted to the department for evaluation, and it has found that the equipment does not produce toxic gases, smoke, grease, vapors, or heat when operated under conditions recommended by the manufacturer. The department may recognize a testing organization to perform any necessary evaluations." In this case, the department means California Department of Health Services.

Note: Local building and fire authorities may still require mechanical exhaust ventilation over equipment exempted by the department.

B. Refer to items marked with an asterisk in Section VIII of this document for examples of recommended equipment exemptions.

VII. Exhaust Hood Capacity Sizing

A. General requirements

- 1. Hoods that have been evaluated and listed shall be sized and installed in accordance with the terms of their listing and according to the manufacturer's instructions.
- 2. Type I hoods for use over charcoal and other solid-fuel charbroilers shall be provided with separate exhaust systems (e.g., separate exhaust duct and exhaust fan).
- 3. When different types of cooking equipment are installed under a common hood, the entire hood shall be designed using the formula that produces the highest flow rate. For example, a single hood installed over a gas charbroiler, fryer, and range, shall be designed using the formula for the charbroiler (Formula 1).

- 4. When cooking equipment is installed back to back and is covered by a common island-type hood, the minimum airflow required may be calculated using the formula for three sides exposed.
- 5. In sizing exhaust hood airflow, the formulas are intended to meet the needs of most installations. Due to variables at each installation site, such as cross currents, alterations may be required in order to provide an exhaust system which properly removes the cooking effluent from the kitchen.

B. Minimum airflow calculations for canopy hoods

The Uniform Mechanical Code separates cooking equipment into the following four categories for the purpose of calculating minimum required withdrawal airflow:

1. Key to formulas

- A = The horizontal surface area of the hood, in square feet.
- D = The distance, in feet, between the lower lip of the hood and the cooking surface.
- P = That part of the perimeter of the hood that is open, in feet.
- Q = Quantity of air in cubic feet per minute (CFM).

2. Formula 1

For Type I hoods located above solid-fuel cooking equipment and greaseburning charbroilers.

Number of Exposed Sides	<u>Formula</u>
4 (island or central hood)	Q=300A
3 or less	Q=200A
Alternate formula	Q=100PD

3. Formula 2

For Type I hoods located above high-temperature cooking equipment, such as deep-fat fryers and woks.

Number of Exposed Sides	<u>Formula</u>
4 (island or central hood)	Q=150A
3 or less	Q=100A
Alternate formula	Q=100PD

4. Formula 3

For Type I hoods located above medium-temperature cooking equipment, such as rotisseries, grills, ranges.

Number of Exposed Sides	<u>Formula</u>
4 (island or central hood)	Q=100A
3 or less	Q=75A
Alternate formula	Q=50PD

5. Formula 4

For Type I hoods located above low-temperature cooking equipment, such as medium-to-low-temperature ranges, roasters, roasting ovens, and pastry ovens. This formula is also used for Type II hoods located above nongrease generating equipment, such as high-temperature dish machines.

Number of Exposed SidesFormula4 (island or central hood)Q=75A3 or lessQ=50AAlternate formulaQ=50PD

6. Examples

The following two examples will demonstrate the use of the hood sizing formulas for canopy hoods.

For these examples, we will use the dimensions provided in Figures 1 and 2.

a. In the first example, we will assume that all of the cooking equipment under the hood is of the medium-temperature category. Therefore, we will use formula 3.

Since there are three exposed sides, the first formula we will use is Q=75A.

The area (A) is obtained by multiplying the length times the width; 12 ft. x 4 ft. = 48 sg. ft.

This A value is then inserted into the Q=75A formula; Q=75 x 48; Q=3,600 CFM.

Therefore, a minimum of 3,600-CFM airflow would be required for this particular hood.

b. In the second example, we will use the same dimensions and cooking equipment as in the first example. However, this time we will use the alternate formula, Q=50PD.

The P in this example is obtained by adding together the length and width dimensions for the exposed sides, 4 ft. + 12 ft. +4 ft. = 20 ft.

The D in this example is 4 ft.

By inserting these figures into the formula we obtain the required CFM;

Q=50 x 20 x 4; Q=4,000 CFM.

Therefore, using the alternate formula, a minimum airflow of 4,000 CFM would be required for this hood.

C. Minimum airflow calculations for noncanopy hoods

The volume of air exhausting through a noncanopy hood to the duct system shall not be less than 300 CFM per linear foot of cooking equipment. The formula to use when determining the minimum airflow for a noncanopy hood is Q=300 L.

1. Key to the formula

Q=Quantity of air in CFM

L=Linear footage of the cooking equipment.

2. Example

The following example will demonstrate the use of the hood sizing formula for noncanopy hoods.

For this example we will use the dimensions provided in Figure 3.

The lineal footage of cooking equipment is given as 12 feet. By inserting the 12 feet into the formula for noncanopy hoods, Q=300 L, we get Q=300 x 12; Q=3.600 CFM.

Therefore, this hood requires a minimum airflow of 3,600 CFM

Note: In designing kitchen exhaust systems, designers must determine the resistance to airflow (static pressure) that is inherent in every system. By doing so, properly sized fans and motors may be selected. This will result in a quieter, smoother operating, and more efficient system.

VIII. Recommended Formulas for Specific Equipment

<u>Equipment</u>	<u>Hood Type</u>	Formula To Use
Bain Marie	II	4
Barbecue (solid fuel, e.g., wood or charcoal)	+	1
Broiler (Gyro)		3
Charbroiler		
 Underfired (solid fuel or gas-fired, including radiant up 	nits) I+	1
 Overfired or salamander 	1	2
Underfired (electric)	1	3
Cheese Melter (top browning and melting only)	II	4
Chinese Range (wok)	I	2
Coffee Equipment		
Urn or brewer	*	_
Roaster (gas)	II	4
Roaster (electric)	*	_

Corn on the Cob Warmer	*	_
Crepe Maker		
 Portable 	*	_
 Nonportable 	II	4
Deep Fat Fryer	I	2
Dishwashing Machine		
High temperature	II	4
 Chemical sanitizing or any undercounter unit 	*	_
Griddle, Grooved Griddle or Grill	I	3
Hot Dog Warmer	*	_
Hot Plate		
 Electric (one burner only) 	*	_
 Gas (Maximum of 5,000 BTU's) 	*	_
 Multiple hot plates or larger than exempted units 	I	3
Kettle (steam jacketed)	II	4
Kettle (candy)	II	4
Masa Cookers	II	4
Mongolian Barbeque	Ī	1
Ovens		
 Maximum temp. of 250°F (thermostatically controlled) 	*	_
 Electric convection oven, 12 KW or less, without 	*	
grease vapor generation (for baking bread products).		
 Gas or electric (except 12 KW or less conv. ovens), 	II	4
greater than 250°F, without grease vapor generation		
(such as enclosed ovens for baking pizza and bread produ	ucts only)	
 Gas or electric, greater than 250°F, with grease 	I	3
vapor generation (such as conveyor pizza ovens,		
roasting ovens, and rotisseries)		
 Portable ovens (microwave, cook and hold) 	*	_
 Solid fuel-fired pizza and baking ovens 	+	4
 Tandoor Oven (solid fuel or gas-fired) 	+	1
Combi Oven	I	3
Popcorn Popper		
 Without external grease vapor release 	*	_
 With external grease vapor release 	I	3
Pressure Fryer	I	2
Range		

High temp, e.g., "hot tops"	1	2
All others	1	3
Rethermalizer		
 Without external grease vapor release 	II	4
 With external grease vapor release 	1	3
Rice Cookers		
Electric	*	-
• Gas	II	4
Rotisserie		
Open or high temp	1	3
 Enclosed with max. ambient cavity temperature of 250°F 	*	_
Skillet (tilting or braising)	1	2
Steam Cooker	II	4
Steam Table (hot holding only)	*	_
Toaster (bread only)		
Portable	*	_
 Nonportable 	II	4
Waffle Cone Maker / Waffle Iron		
Portable	*	_
Nonportable	II	4

- + Cooking equipment that uses solid fuel must be provided with a separate exhaust system.
- * Equipment marked with an asterisk <u>typically</u> does not need mechanical exhaust ventilation. However, the following criteria should be taken into consideration when determining the need for mechanical exhaust ventilation:
 - Installation of other unventilated heat generating equipment in the same area, e.g., refrigeration condensers, steam tables, or counter-top equipment;
 - Presence of heating/cooling (HVAC) system;
 - Size of the room or area where the proposed equipment will be installed, including ceiling height;
 - How the proposed equipment will be operated, e.g., the types of food prepared, how often, etc.;
 - Relative size of the proposed equipment, e.g., physical size and weight, BTU's/KW's;
 - Nature of the emissions, e.g., grease, heat, steam, etc.;

- Temperature at which the proposed equipment operates. Cooking equipment that has a factory-set thermostat that cannot exceed 250°F normally does not need mechanical exhaust ventilation:
- Method of producing heat, e.g., gas, electricity, solid fuel, etc.
- Adequate amount of general ventilation: In poorly ventilated confined areas where
 the proposed equipment (like ovens and low-temp. dishwashers) is located,
 adequate general ventilation could be provided by a ceiling or wall exhaust fan that
 provides an air change rate of 3-5 minutes per change.

IX. <u>Grease Filters</u>

- A. Grease filters are designed to remove grease particles from the exhaust air stream. Exhaust systems that have broken, missing, or undersized filters are prone to collect accumulations of highly combustible grease deposits throughout the entire duct system. Because of the chimney effect created in vertical ductwork, a very intense rapidly spreading flash fire can engulf the entire system.
- B. Type I hoods shall be equipped with approved grease filters or grease extractors designed to remove grease from the exhausted air.
- C. The most common grease filters currently in use are the baffle-type. Baffle-type filters simplify the cleaning process since most of the grease deposits run off the baffles to a collection device. The old style mesh-type filters are not acceptable in new installations. NFPA 96, ANSI NSF Standard 2, and UL 1046 no longer recognize the old style mesh type filters. They may present a fire hazard and decrease airflow as they become clogged with grease.
- D. Grease filters and extractors shall be of such size, type, and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or extractor was designed and approved. The optimum operating velocities, measured in feet per minute (FPM), vary from filter to filter. Therefore, the manufacturer's specifications should be consulted to obtain the appropriate rates for each specific filter.

E. Number of Filters Required

- 1. It is important to select the proper number of grease filters for the hood. Too few filters increase the resistance to airflow and raise the filter cleaning frequency.
- 2. The minimum required number of filters for a particular hood can be calculated by dividing the total volume of air to be exhausted, in CFM, by the optimum operating velocity of the filter, in FPM. This number is then divided

by the actual square footage of the filter (excluding the frame). The resulting figure represents the minimum number of filters required to efficiently remove the grease from the exhausted air.

Example:

Assume the following:

- An exhaust hood with a minimum required airflow of 3,250 CFM.
- Baffle type filters with a nominal size of 16" x 20", have an actual filtering surface of 14" x 18". (Nominal size minus the frame equals the actual filtering area.)
- An optimum operating velocity of 360 FPM for the filter.

```
<u>Volume of Air Exhausted</u> = Filter Area Needed (sq. ft.)

Operating Velocity of Filter(FPM)
```

```
3,250 \text{ CFM} = 9 \text{ sq. ft.}
360 FPM
```

Next, convert the actual filter area to square feet:

14 in. x 18 in. = 252 sq. in. 252 sq. in. = 1.75 sq. ft. 144 sq. in./sq. ft.

Then divide the 9-sq. ft. of needed filter area by sq. ft. per filter:

```
<u>9 sq. ft.</u> = 5 filters
1.75 sq. ft.
```

Therefore, in this example, 5 filters would be required to provide adequate removal of the grease.

- F. Any space in the hood not occupied by a filter should be blanked off with sheet metal. Blanks may be placed above nongrease producing equipment such as a steam table, in order to achieve a better draw where it is needed the most. As much as possible, the blanks should be divided equally between the filters. This will ensure optimum performance and will equalize the air velocity over the entire length of the hood opening.
- G. It is important to install filters at the ends of the hood. However, grease filters should not be installed directly over a broiler flue, or any other flue from cooking equipment. Hot gases can make the filters very difficult to clean and may damage them.
- H. The minimum distance between the lowest edge of a grease filter and the actual cooking surfaces shall be as follows:

Type of Cooking

No exposed flame grills, french fryers, etc. 2 feet
Exposed flame and burners 2 feet
Exposed charcoal and charbroiler-type fires 3 1/2 feet

- I. Filters shall be installed at an angle not less than 45 degrees from the horizontal and shall be equipped with a drip tray beneath the lower edge of the filter. This enables the grease to be collected in the drip tray and avoids grease dripping into food, or on food preparation surfaces.
- J. All grease collecting equipment shall be accessible for cleaning. Filter units shall be installed in frames or holders with handles so as to be readily removable without the use of tools, except where the system is designed for in-place cleaning.
- K. Proper hood design will keep the temperature at the filters less than 200° Fahrenheit. When the temperature at the filters is less than 200° Fahrenheit, the grease deposits will be brownish in color and can be easily removed. When the temperature exceeds 200° Fahrenheit, the grease deposits tend to bake on the filters. The color of the deposits will darken and become extremely difficult to remove.
- L. Filter equipped exhaust systems shall not be operated with damaged or missing filters.

X. Exhaust Hood Ducting

- A. A separate duct system shall be provided for each Type I hood, except that a single duct system may serve more than one hood located in the same story of the building, provided that all hoods served by the system shall be located in the same room or adjoining rooms.
- B. Ducting shall be installed in compliance with local building and fire codes.
- C. Exhaust ducts from hoods shall be totally separated from all other ventilation systems.
- D. If the hood length exceeds 12 feet, it is necessary to provide two discharge ducts from the top of the hood to the main exhaust duct. For listed hoods, refer to the manufacturer's installation and operating conditions to determine if a distance of greater than 12 feet between ducts is permitted.
- E. Exhaust outlets for the exhaust hood ducting shall extend through the roof unless otherwise approved by the local building official. Such extension shall be at least 24 inches above the roof surface; at least ten feet from an adjacent building, adjacent

property line, or air intake into any building; and shall be located at least ten feet above the adjoining grade level. However, exhaust outlets for ducting may terminate at least five feet from an adjacent building, adjacent property line, or air intake into a building if the air from the exhaust outlet is discharged away from such locations. Exhaust air may be reintroduced into the food establishment only through a properly designed and approved air recovery system, such as a ductless hood system.

- F. Exposed duct systems serving a Type I hood shall have a clearance of at least 18 inches from unprotected combustible construction. This clearance may be reduced to not less than three inches, provided the combustible construction is protected with material required for one-hour fire-resistive construction. Hoods less than 12 inches from the ceiling or wall, including the space between the duct and the duct shaft, shall be flashed solidly. Flashing shall be of either the same materials used in the construction of the hood, or of other materials conforming to one-hour fire-resistive construction. Check with your local building and fire authorities to determine other acceptable means of meeting this requirement.
- G. Duct systems serving a Type I hood shall be designed and installed in a manner to provide an air velocity within the duct system of not less than 1,500 FPM and not to exceed 2,500 FPM. The optimum duct velocity is 2,000 FPM.
- H. Duct Sizing
 - 1. The duct leading from the exhaust hood to the exhaust outlet shall be sized correctly. The velocity of the exhaust air shall be high enough to minimize condensation on the various parts of the duct system.
 - The following formula shall be used to determine the correct duct size:
 Volume of air exhausted (CFM) = Duct area needed (sq. ft.)
 Duct Velocity (FPM)

In an example of this calculation we will assume the following:

- An exhaust hood with a minimum required airflow of 3,600 CFM.
- A duct velocity of 2,000 FPM.

By inserting this data into the formula we will obtain the required duct size:

3,600 CFM = 1.8 sq. ft.

2,000 FPM

- I. A circular duct requires a smaller space. If rectangular ducts are used, they should be as nearly square as possible.
- J. The duct take-off at the top of the hood should be transitioned. This will reduce the entrance loss and resistance offered to airflow at the ducting entrance point.

- K. The bends and elbows of the ductwork should be kept at a minimum. When elbows are used, a radius of 2 to 2 1/2 times the duct diameter is recommended. This will minimize the resistance against which the blower must move the air.
- L. Duct systems serving a Type I hood shall be constructed and installed so that grease will not collect in any portion of the ducting. The ducting shall slope not less than 1/4 inch per linear foot toward the hood or toward an approved grease reservoir. Where horizontal ducts exceed 75 feet in length, the slope shall be not less than one inch per linear foot.
- M. Any portion of the ducting that is inaccessible from the duct entry or discharge shall be provided with cleanout openings. Cleanout openings shall be equipped with tight fitting doors that are constructed of the same material and thickness as the ducting. The doors shall be equipped with latches that will hold the door tightly closed. Doors shall be designed so that they can be opened without the use of tools.
- N. Ducts and plenums shall be constructed of carbon steel not less than .055 inch (No. 16 gage), or stainless steel not less than .044 inch (No. 18 gage) in thickness.
- O. All seams and joints shall have a liquid-tight, continuous external weld.
- P. All ducting that is exposed to the outside atmosphere and subject to corrosion shall be protected against such corrosion. Galvanization of metal parts, protection with noncorrosive paints, or installation of waterproof insulation are acceptable methods of protection.

XI. Exhaust Hood Installation Requirements

- A. Canopy hoods must overhang, or extend a horizontal distance of at least 6 inches beyond the outer edge of the cooking surfaces on all open sides. This distance is to be measured from the inside lip of the hood.
 - Note: The minimum six-inch overhang may not be sufficient to capture all of the smoke, vapors, or grease generated by some cooking equipment. A 12-18 inch overhang is recommended for large or stacked ovens, conventional steamers, large tilting kettles, and bain maries. A 12-18 inch overhang at the side of the hood is also recommended for charbroilers when the equipment is located at the end of the cookline. (The minimum recommended overhang around the perimeter of an island hood installed over solid fuel cooking equipment is 12 inches.)
- B. The vertical distance between the lower lip of the hood and the cooking surface shall not exceed 4 feet.
- C. Every portion of a Type I hood shall have a clearance from combustible construction of not less than 18 inches. This clearance may be reduced to not less than three

- inches, provided the combustible material is protected with materials as specified for one-hour fire-resistive construction on the hood side.
- D. Canopy hoods shall be flashed to the ceiling and adjacent walls. The flashing shall be constructed of the same material and thickness as the hood. **See Figures 4 and 5 for illustrations of the flashing methods.**
- E. Exhaust hoods shall be constructed of galvanized steel, stainless steel, or copper in compliance with the Uniform Mechanical Code.
- F. All joints and seams shall be liquid-tight and smooth for ease of cleaning. Approved construction methods and materials shall be used for sealing joints and seams.
- G. Pop rivets, metal screws, or other similar exposed fasteners shall not be used on the internal surfaces of a hood.
- H. Every hood shall be securely fastened in place by noncombustible supports. Exposed support hangers shall be of an easily cleanable design and construction. Threaded rods and chains are not acceptable.
- I. All conduit and fire protection piping shall be installed outside the hood, except for conduit or fire protection piping that leads from outside the hood directly to approved lighting fixtures or fire protection nozzles located inside the hood. All conduit or piping installed inside the hood shall be installed at least 3/4 inch away from the hood surface to facilitate cleaning.
- J. Light fixtures installed inside exhaust hoods shall be marked, "For use within commercial cooking hoods", or equivalent.

XII. <u>Eye-Brow Hoods</u>

- A. Eye-brow hoods are acceptable for use with either Type I or Type II hoods.
- B. The minimum required airflow shall be calculated using the formula for noncanopy-type hoods, i.e., Q = 300L.
- C. The eye-brow hood shall overhang, or extend a horizontal distance of at least six inches, beyond all areas of the equipment out of which steam, grease, odors, smoke, or heat will be emitted. See Figures 6 and 7 for examples of this type of installation.
 - *Note:* The minimum six inch overhang may not be sufficient to capture all of the smoke, vapors, or grease generated by some cooking equipment. A 12-18 inch overhang is recommended for large or stacked ovens, conventional steamers, large tilting kettles, and bain maries.
- D. When eye-brow hoods are equipped with grease filters or grease extractors, the filters or extractors shall be readily accessible for cleaning and servicing.

XIII. <u>Water-Wash-Type Exhaust Hoods</u>

- A. Water-wash-type hoods operate under the following principles: As the exhausted air moves at a high velocity past a baffle system, the heavier-than-air particles of grease are thrown out of the airstream by centrifugal force. The extracted grease is collected in grease gutters within the hood until removed by the daily cleaning cycle. The cleaning cycle is initiated when the exhaust hood is turned off. Hot detergent water is automatically sprayed onto the baffle system, thereby removing the grease deposits from the baffles. This wastewater is then drained off to the sewer or other approved waste removal system.
- B. In order to protect the potable water supply, an approved backflow prevention device, such as a reduced pressure principle device (RP device), is required to be installed on the water inlet pipe, prior to the detergent pump solenoid.
- C. The wastewater from a water-wash-type hood shall be drained through an air gap separation into an approved receptacle, such as a floor sink.

XIV. Recirculating Hood Systems (Ductless hoods or Ventless hoods)

- A. Where it is not possible to exhaust the air to the out-of-doors, a nonducted, self-contained exhaust system may be a viable option for the food establishment.
- B. Gas cooking equipment, when approved by the authority having jurisdiction, may only be installed below those hoods that are equipped to remove combustion byproducts.
- C. The cooking equipment and exhaust system shall be interlocked such that when the hood is not functional or when the hood is operating at less than 85% efficiency, the cooking equipment will not operate.
- D. An approved backflow prevention device shall be installed when potable water is plumbed to the hood system, e.g., on the water inlet pipe, prior to the water pump solenoid. The wastewater from the scrubbing operation shall be drained through an air gap separation into an approved receptacle, such as a floor sink.
- E. Since a nonducted exhaust system does not normally remove the heat from the exhausted air, additional air conditioning may be required.

XV. Make-up Air

- A. Each room provided with an exhaust system shall have supplied to the room an amount of filtered and tempered make-up air equal to the amount of air to be exhausted. If make-up air were not provided, the building would be under a negative pressure which could cause the following problems:
 - 1. The exhaust fan would not be capable of exhausting the design volume of air because the air would not be available.
 - 2. Negative pressure would cause improper venting of water heaters, space heaters, or other individually vented gas appliances in the building.
 - 3. A negative pressure will cause a surge of unconditioned outside air into the building whenever the doors are opened, which may also allow the entrance of flies into the facility.
- B. In order to provide an efficient air exchange system, the following factors should be taken into consideration when evaluating a make-up air system:
 - 1. The number and location of return air registers should be such as to provide uniform distribution of make-up air throughout the facility, taking into consideration cross drafts, room configurations, and required air flows.
 - 2. The use of properly designed registers and diffusers will help to slow down the air velocity and evenly distribute the make-up air.
 - 3. The make-up air registers should be located so as to prevent a short-circuiting of the air being supplied for the exhaust system.
- C. Windows and doors shall not be used for the purpose of providing make-up air.
- D. The exhaust and make-up air systems shall be connected by an electrical interlocking hardwired connector so that one system cannot be operated when the other system is off.
- E. Compensating hoods shall extract at least 20 percent of their required exhaust airflow from the kitchen area around the hood. Compensating hoods, that have been evaluated and listed, shall be sized and installed in accordance with the terms of their listing, and according to the manufacturer's instructions.

XVI. Fire Extinguishing Systems

A. Approved automatic fire extinguishing systems shall be provided for the protection of commercial-type cooking equipment. The requirement for protection does not include equipment that does not create or generate grease-laden vapors, such as steam kettles and steam tables.

- B. Deep fat fryers, ranges, griddles, broilers, and other cooking equipment which may act as a source of ignition for grease in the hood, grease removal device, or duct, shall be protected by approved fire extinguishing equipment installed in accordance with the fire code adopted by the jurisdiction. Necessary approvals must be obtained from the local fire authorities prior to putting equipment into operation.
- C. The operation of any fire extinguishing system shall automatically shut off all sources of fuel and heat to all equipment requiring protection by an extinguishing system. Any gas appliance not requiring protection, but located under ventilating equipment, shall also be shut-off. All shut-off devices shall be considered an integral part of the system, and shall function when the system is in operation. The automatic shut-off device must be manually resetable prior to fuel or power being restored.
- E. Exhaust hood fans shall continue to operate after the fire extinguishing system has been activated, unless fan shutdown is required by any component of the ventilation system, or by the design of the extinguishing system.

XVII. Ventilation Requirements for Special Cooking Equipment and Operations

A. Table-top cooking operations

Cooking equipment, which is located at customer dining tables, must be provided with approved mechanical exhaust ventilation. Korean barbecues and Japanese Teppan-style cooking typify these table-top cooking operations.

B. Table-side serving display operations

Traditional serving display operations, such as flambéing, may not be required to provide mechanical exhaust ventilation, unless excessive amounts of smoke, grease, steam, vapors, and/or heat are emitted. These serving display operations are not intended to cook the food, but merely "finish off" the product prior to serving. Local building and fire officials should be contacted for their requirements.

APPENDIX I

Installation Codes and Standards

Uniform Building Code

Uniform Fire Code

Uniform Mechanical Code

Uniform Plumbing Code

International Fuel Gas Code

National Electrical Code (NFPA 70)

Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations (NFPA 96)

International Building Code
International Fire Code
International Mechanical Code
International Plumbing Code

Product Standards Used by Listing Agencies for Cooking System Components

ANSI Z83.11, CGA 1.8 - Gas Food Service Equipment

ANSI/NSF 2 – Food Service Equipment

ANSI/NSF 4 — Commercial Cooking, Rethermalization and Hot Food Holding and Transport Equipment

ASTM E814 – Fire Tests of Through Penetration Fire Stops

IAPMO PS 98 – Backflow Protection for Grease Fire Suppression Systems

ICBO AC101 – Grease Ducts, Flexible Enclosure Systems

ICBO AC105 – Recirculating Commercial Kitchen Hoods

ICBO AC121 - Grease Duct Systems, Self-Enclosed

UL 197 – Commercial Electric Cooking Appliances

UL 296 - Oil Burners

UL 300 – Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas

UL 705 - Power Ventilators

UL 710 – Exhaust Hoods for Commercial Cooking Equipment

UL 762 – Power Ventilators for Restaurant Exhaust Appliances

UL 795 – Commercial-Industrial Gas Heating Equipment

UL 1046 - Grease Filters for Exhaust Ducts

UL 1254 – Pre-Engineered Dry Chemical Extinguishing System Units

UL 1479 – Fire Tests of Through Penetration Fire Stops

UL 1570 – Fluorescent Light Fixtures

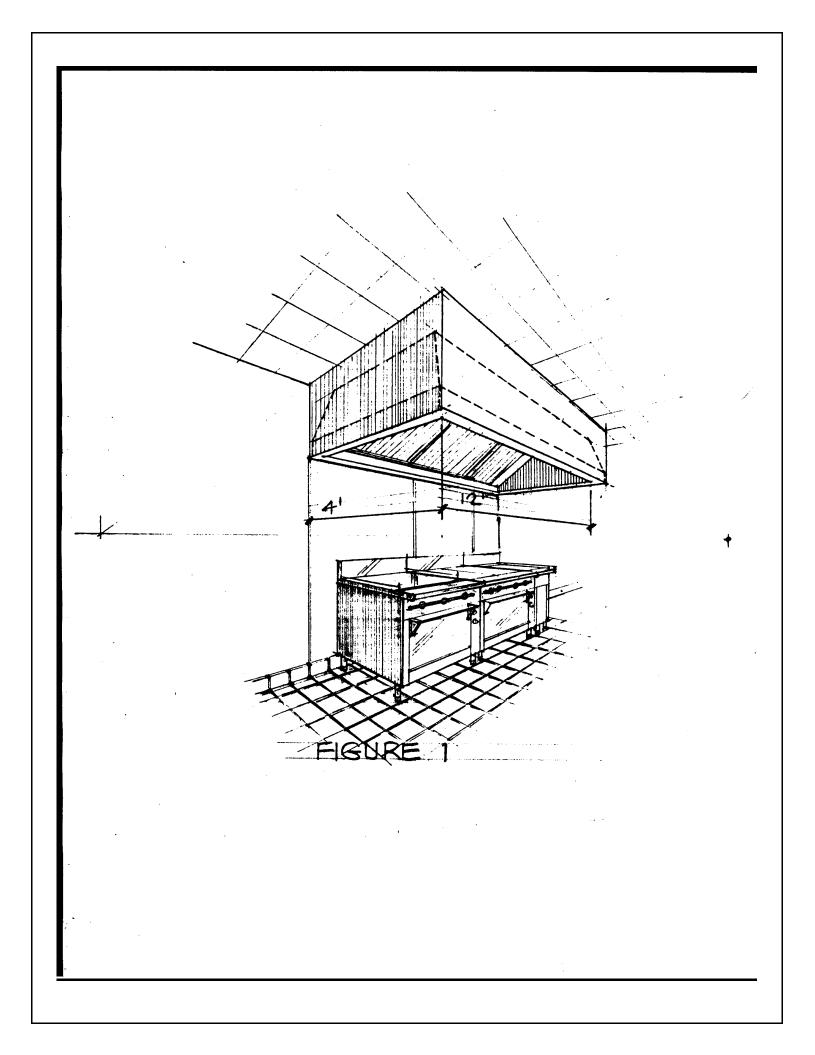
UL 1571 – Incandescent Light Fixtures

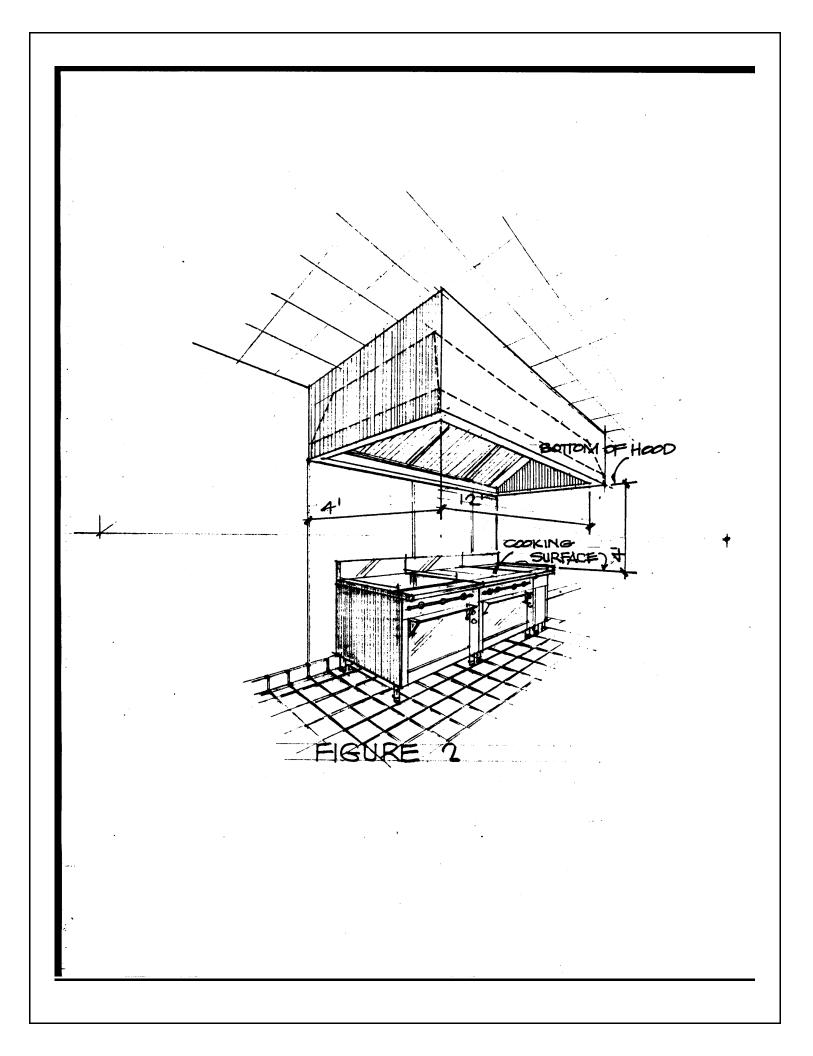
UL 1572 – High Intensity Discharge Fixtures

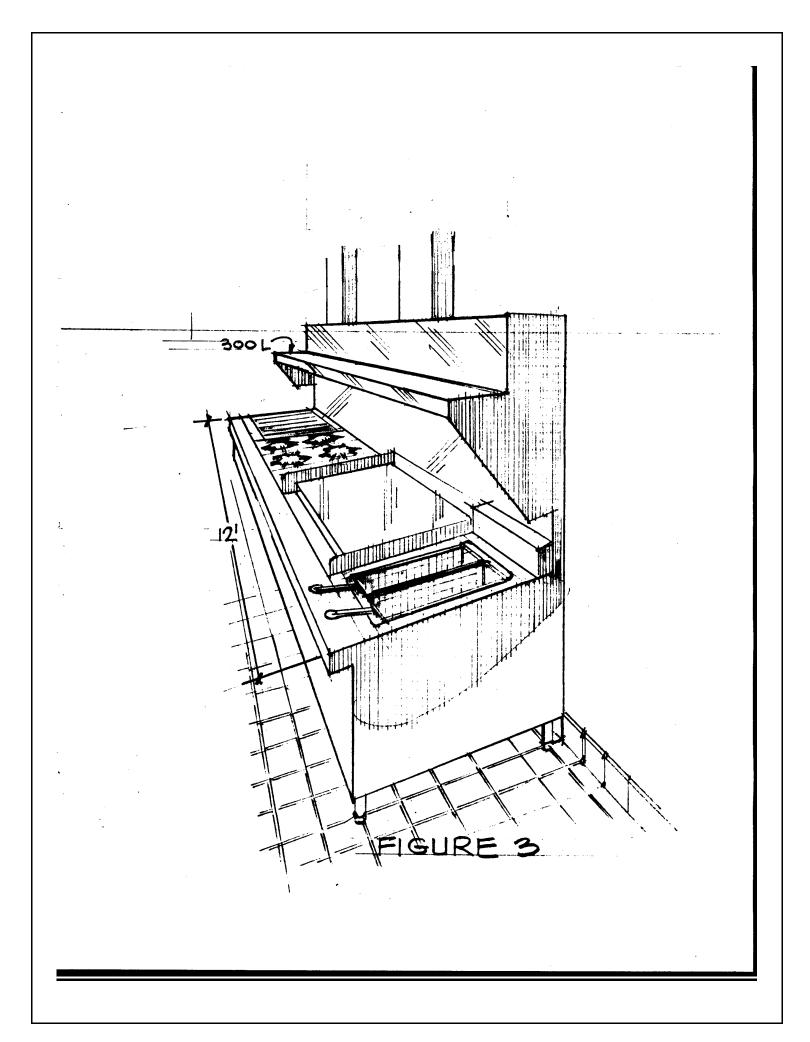
UL 1978 - Grease Ducts

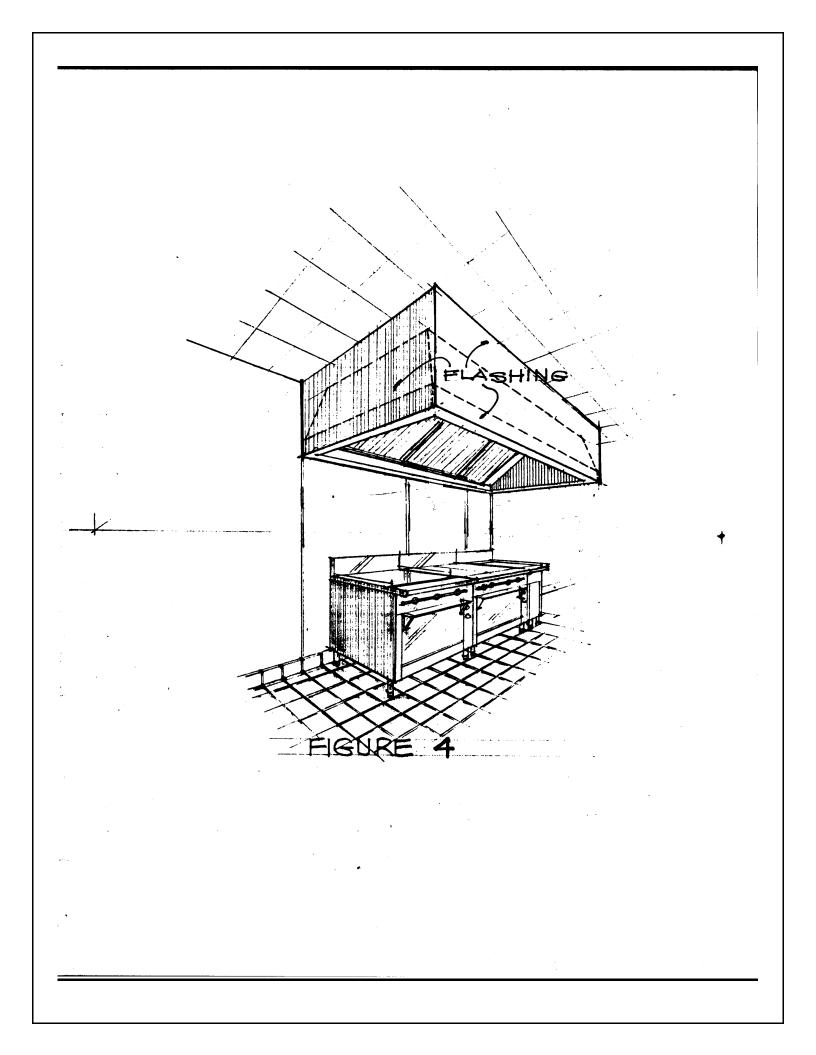
UL 2162 – Wood-Fired Baking Ovens – Refractory Type

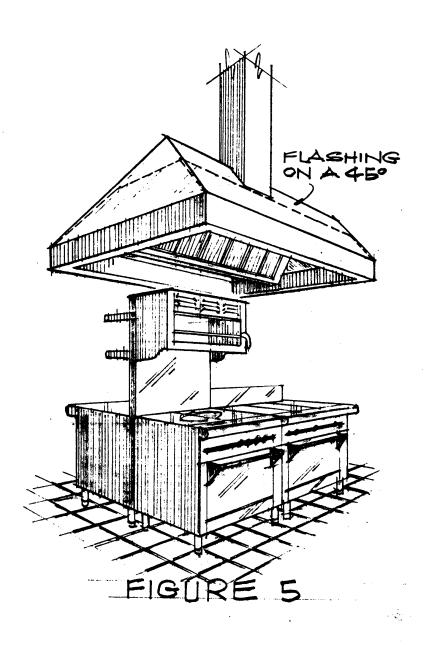
UL 2221 – Fire Endurance Performance of Grease Duct Enclosure Assemblies Grease Ducts

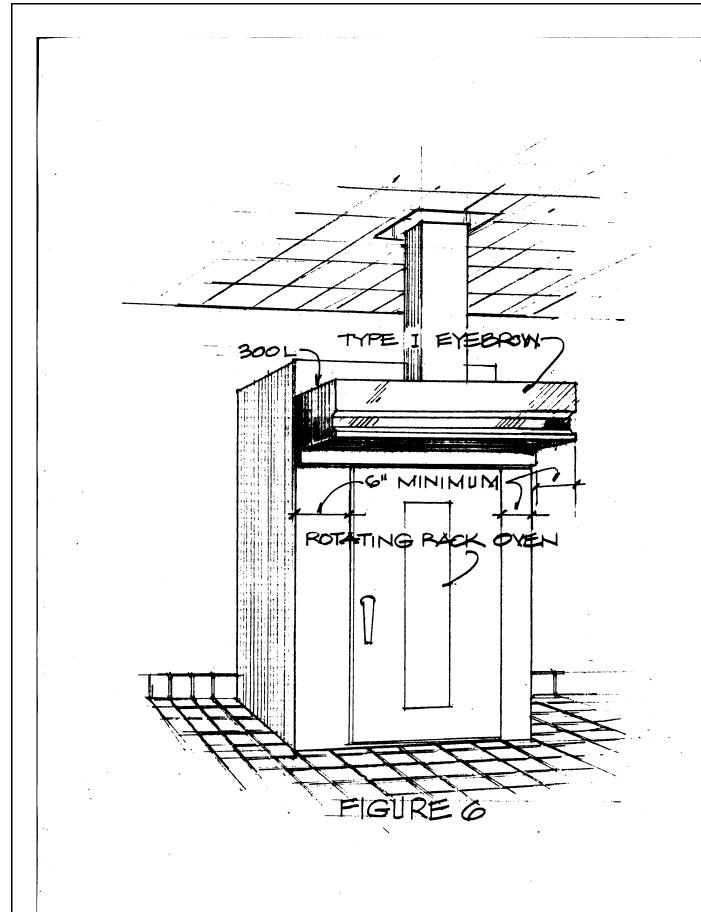


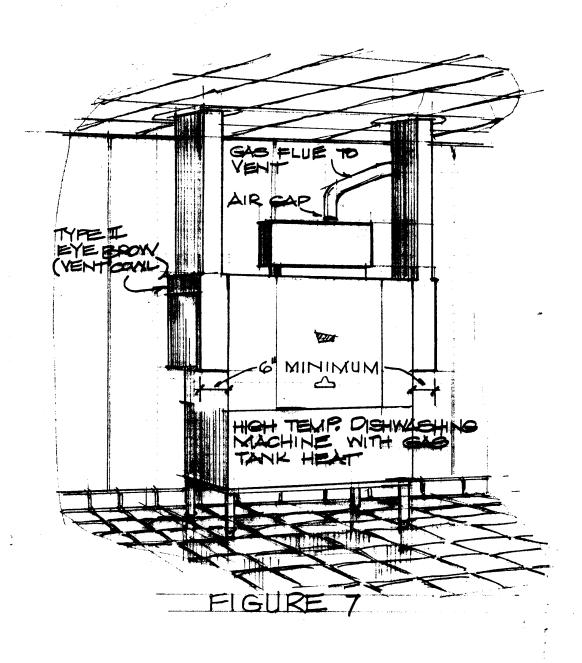












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MECHANICAL EXHAUST VENTILATION SYSTEMS OPERATIONAL GUIDELINES-REVISED 2003

California Conference of Directors of Environmental Health

I. Background

Proper venting and capture of the gases, heat, grease, vapors, and smoke generated by cooking equipment is important; not only for fire prevention and sanitation purposes, but also for maintaining the health and well being of food service workers. In order to help prevent dangerous or unhealthful conditions within a food facility it is critical that exhaust ventilation systems be designed, constructed, and operated in compliance with all applicable requirements.

II. Purpose and Scope

- These guidelines are intended to assist in determining mechanical exhaust ventilation requirements for proposed equipment that generates grease, vapors, fumes, smoke, steam, heat, and/or odors.
- Exhaust ventilation systems are also reviewed and inspected by local building and fire authorities to determine compliance with applicable building and fire codes.
- The requirements contained within this document represent minimum standards, which may be superseded by local ordinances. Where there is a contradiction in the requirements, the stricter should apply.
- Due to the differing roles of the local enforcement agencies and local building departments not all health jurisdictions will be applying all portions of these guidelines.
- If more detailed information is needed regarding the design, construction, and installation of exhaust ventilation systems, refer to the expanded version of these guidelines entitled, "Mechanical Exhaust Ventilation Systems – Design, Calculations, and Operational Guidelines."

III. <u>Legal Authority</u>

- A. California Uniform Retail Food Facilities Law, Section 114140.
- B. California Code of Regulations, Title 17, Article 10.4, Commencing with Section 13670.

- C. California Code of Regulations, Title 24, Part 4, Chapter 4-20, commencing with Section 4-2000.
- D. Applicable Codes and Standards (refer to Appendix 1).

IV. <u>Definitions</u>

- A. Canopy Hood a hood designed so the inside edge overhangs or extends a horizontal distance not less than six inches beyond the outer edges of the cooking surface.
- B. Compensating Hood a hood designed to introduce outside make-up air through an integrated section of the hood with little or no thermal conditioning. This design will typically provide 60-80% of the required make-up air through four basic discharge methods: short-circuit, face-discharge, back-discharge, and down-discharge. These methods may also be combined, such as a face and down-discharge arrangement. Short-circuiting hoods must be tested and listed by a qualified testing agency and installed/operated according to the listing conditions.
- C. Hood an air-intake device connected to a mechanical exhaust ventilation system for collecting and removing cooking effluent which contains grease, vapors, fumes, smoke, steam, heat, or odors which are generated by cooking equipment and warewashing machines.
- D. Listed Equipment equipment and materials which, following evaluation and acceptance by a qualified testing agency, are placed on a list of certification. The listing shows that the equipment and materials comply with accepted national standards, which have been approved or evaluated for conformity with approved, or national standards.
- E. Noncanopy Hood a hood that does not extend completely over the cooking equipment. A noncanopy hood is designed to be as close as possible to the cooking surface, usually 18 to 24 inches above it.
- F. Portable equipment having the properties of being portable, weighing less than 80 pounds, not exceeding three feet in any plane, and having utility connections designed to be disconnected or of sufficient length to permit equipment movement for cleaning.
- G. Recirculating Hood System (ductless hoods or ventless hoods) a self-contained air exhaust system that removes grease, vapors, fumes, smoke, steam, and odors from the exhausted air; and then reintroduces the filtered air back into the food facility. The grease, vapors, fumes, smoke, and steam are normally removed using a variety of systems such as water sprays, electrostatic precipitators, or multiple

- filter banks. The odors are typically removed using activated charcoal filters. Recirculating Hood Systems are not designed to eliminate heat from the exhausted air. Recirculating Hood Systems are also known as ductless or ventless hoods.
- H. Type I Exhaust Hood a hood that is designed to collect and remove all types of cooking effluent from the exhausted air.
- I. Type II Exhaust Hood a hood that is designed to collect and remove <u>only</u> steam, vapors, heat, or odors.

V. <u>General Requirements</u>

- A. Section 114140 of CURFFL states in part, "Ventilation shall be provided to remove toxic gases, heat, grease, vapors, and smoke from the food establishment. All areas shall have sufficient ventilation to facilitate proper food storage and to provide a reasonable condition of comfort for each employee, consistent with the job performed by the employee. On or after January 1, 1985, there shall be provided mechanical exhaust ventilation at or above all newly installed cooking equipment as required in Article 10.4 (commencing with Section 13670) of Title 17 of, and Chapter 4-20 (commencing with Section 4-2000) of Part 4 of Title 24, of the California Code of Regulations."
- B. The Uniform Mechanical Code states, "Hoods shall be installed at or above all commercial-type deep fat fryers, broilers, fry grills, steam-jacketed kettles, hot-top ranges, ovens, barbecues, rotisseries, dishwashing machines and similar equipment which produce comparable amounts of steam, smoke, grease or heat in a food-processing establishment. For the purpose of this section, a food-processing establishment shall include any building or portion thereof used for the processing of food but shall not include a dwelling unit."
- C. Listed ventilation equipment shall be installed and used according to the manufacturer's installation and operating instructions. A copy of the instructions shall be readily available for review by the enforcement officer. Nonlisted ventilation equipment, when approved by the authority having jurisdiction, shall be constructed, installed and used in accordance with all applicable requirements contained in the codes identified in Appendix I of these guidelines.
- D. Exhaust ventilation systems shall conform to all local building and fire codes and have all necessary approvals from the local building and fire authorities.
- E. There are additional requirements for grease filters, ducting, hood installation, make-up air, fire extinguishing systems, and specific types of exhaust systems. These requirements can be found in the expanded version of these guidelines,

entitled "Mechanical Exhaust Ventilation Systems-Design, Calculations, and Operational Guidelines," or by contacting the local health, building, and fire authorities.

VI. Exhaust Hood Capacity Sizing

A. General requirements

- 1. Hoods that have been evaluated and listed shall be sized and installed in accordance with the terms of their listing and according to the manufacturer's instructions.
- 2. Type I hoods for use over charcoal and other solid-fuel charbroilers shall be provided with separate exhaust systems (e.g., separate exhaust duct and exhaust fan).
- When different types of cooking equipment are installed under a common hood, the entire hood shall be designed using the formula that produces the highest flow rate. For example, a single hood installed over a gas charbroiler, fryer, and range, shall be designed using the formula for the charbroiler (Formula 1).
- 4. When cooking equipment is installed back to back and is covered by a common island-type hood, the minimum airflow required may be calculated using the formula for three sides exposed.
- 5. In sizing exhaust hood airflow, the formulas are intended to meet the needs of most installations. Due to variables at each installation site, such as cross currents, alterations may be required in order to provide an exhaust system which properly removes the cooking effluent from the kitchen.
- B. For minimum airflow calculations for canopy and noncanopy hoods refer to the Uniform Mechanical Code.

VII. Recommended Formulas For Specific Equipment

<u>Equipment</u>	<u>Hood Type</u>	<u>Formula To Use</u>
Bain Marie	II	4
Barbecue (solid fuel, e.g., wood or charcoal)	l+	1
Broiler (Gyro)	I	3
Charbroiler		
 Underfired (solid fuel or gas-fired, including radiant ur 	nits) I+	1

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 Portable ovens (microwave, cook and hold) 	*	_
 Solid fuel-fired pizza and baking ovens 	+	4
 Tandoor Oven (solid fuel or gas-fired) 	 +	1
Combi Oven	1	3
Popcorn Popper		
 Without external grease vapor release 	*	_
 With external grease vapor release 	1	3
Pressure Fryer	1	2
Range		
High temp, e.g., "hot tops"	I	2
All others	Ī	3
Rethermalizer		
Without external grease vapor release	II	4
With external grease vapor release	I	3
Rice Cookers		
Electric	*	_
• Gas	II	4
Rotisserie		
Open or high temp	1	3
 Enclosed with max. ambient cavity temperature of 250°F 	*	_
Skillet (tilting or braising)	I	2
Steam Cooker	П	4
Steam Table (hot holding only)	*	_
Toaster (bread only)		
Portable	*	_
 Nonportable 	II	4
Waffle Cone Maker / Waffle Iron		
 Portable 	*	_
 Nonportable 	II	4

Keys to assist in interpreting the preceding information

Formula 1 – For hoods above solid-fuel cooking equipment and grease-burning charbroilers.

Formula 2 – For hoods above high-temperature cooking equipment, such as deep-fat fryers and woks.

- Formula 3 For hoods above medium-temperature cooking equipment, such as rotisseries, grills, and ranges.
- Formula 4 For hoods above low-temperature cooking equipment, such as roasters, roasting ovens, and pastry ovens. This formula is also used for Type II hoods.
- + Cooking equipment that uses solid fuel must be provided with a separate exhaust system.
- * Equipment marked with an asterisk <u>typically</u> does not need mechanical exhaust ventilation. However, the following criteria should be taken into consideration when determining the need for mechanical exhaust ventilation:
 - Installation of other unventilated heat generating equipment in the same area, e.g., refrigeration condensers, steam tables, or counter-top equipment;
 - Presence of heating/cooling (HVAC) system;
 - Size of the room or area where the proposed equipment will be installed, including ceiling height;
 - How the proposed equipment will be operated, e.g., the types of food prepared, how often, etc.;
 - Relative size of the proposed equipment, e.g., physical size and weight, BTU's/K W's
 - Nature of the emissions, e.g., grease, heat, steam, etc.;
 - Temperature at which the proposed equipment operates. Cooking equipment that
 has a factory-set thermostat that cannot exceed 250°F normally does not need
 mechanical exhaust ventilation;
 - Method of producing heat, e.g., gas, electricity, solid fuel, etc.
 - Adequate amount of general ventilation: In poorly ventilated confined areas where the proposed equipment (like ovens and low-temp. dishwashers) is located, adequate general ventilation could be provided by a ceiling or wall exhaust fan that provides an air change rate of 3-5 minutes per change.

VIII. Recirculating Hood Systems (Ductless or Ventless hoods)

- A. Where it is not possible to exhaust the air to the out-of-doors, a nonducted, self-contained exhaust system may be a viable option for the food establishment.
- B. Gas cooking equipment, when approved by the authority having jurisdiction, may only be installed below those hoods that are equipped to remove combustion byproducts.

- C. The cooking equipment and exhaust system shall be interlocked such that when the hood is not functional or when the hood is operating at less than 85% efficiency, the cooking equipment will not operate.
- D. An approved backflow prevention device shall be installed when potable water is plumbed to the hood system, e.g., on the water inlet pipe, prior to the water pump solenoid. The wastewater from the scrubbing operation shall be drained through an air gap separation into an approved receptacle, such as a floor sink.
- E. Since a nonducted exhaust system does not normally remove the heat from the exhausted air, additional air conditioning may be required.

APPENDIX I

International Building Code

International Mechanical Code

International Plumbing Code

International Fire Code

Installation Codes and Standards

Uniform Building Code

Uniform Fire Code

Uniform Mechanical Code

Uniform Plumbing Code

International Fuel Gas Code

National Electrical Code (NFPA 70)

Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations (NFPA

96)

<u>Product Standards Used by Listing Agencies for Cooking System Components</u>

ANSI Z83.11, CGA 1.8 - Gas Food Service Equipment

ANSI/NSF 2 – Food Service Equipment

ANSI/NSF 4 – Commercial Cooking, Rethermalization and Hot Food Holding and Transport Equipment

ASTM E814 – Fire Tests of Through Penetration Fire Stops

IAPMO PS 98 – Backflow Protection for Grease Fire Suppression Systems

ICBO AC101 – Grease Ducts, Flexible Enclosure Systems

ICBO AC105 – Recirculating Commercial Kitchen Hoods

ICBO AC121 – Grease Duct Systems, Self-Enclosed

UL 197 – Commercial Electric Cooking Appliances

UL 296 - Oil Burners

UL 300 – Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas

UL 705 – Power Ventilators

UL 710 – Exhaust Hoods for Commercial Cooking Equipment

UL 762 – Power Ventilators for Restaurant Exhaust Appliances

UL 795 – Commercial-Industrial Gas Heating Equipment

UL 1046 – Grease Filters for Exhaust Ducts

UL 1254 – Pre-Engineered Dry Chemical Extinguishing System Units

UL 1479 – Fire Tests of Through Penetration Fire Stops

UL 1570 – Fluorescent Light Fixtures

UL 1571 – Incandescent Light Fixtures

UL 1572 – High Intensity Discharge Fixtures

UL 1978 - Grease Ducts

UL 2162 – Wood-Fired Baking Ovens – Refractory Type

UL 2221 – Fire Endurance Performance of Grease Duct Enclosure Assemblies Grease Ducts