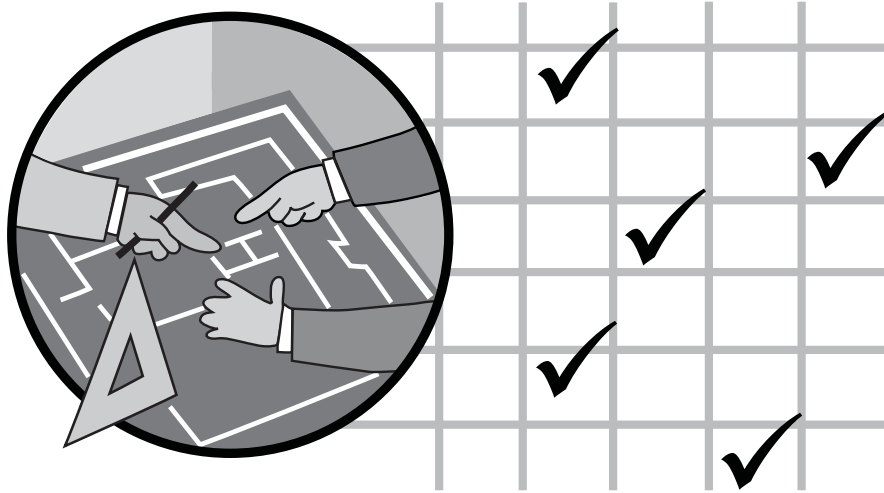


# BUILD IT RIGHT



## Guidelines for **Wholesale Food Facilities**

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



County of San Bernardino • Department of Public Health  
DIVISION OF ENVIRONMENTAL HEALTH SERVICES

[www.sbcounty.gov/dehs](http://www.sbcounty.gov/dehs)

## **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.

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ENVIRONMENTAL HEALTH SERVICES  
WHOLESALE DEPARTMENT  
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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.)

3. 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.
6. 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.
- c. 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:
  - 1.) 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 1/4 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. 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 covered 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 4-inch 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.
- d. Toilet tissue shall be provided in a permanently installed dispenser at each toilet.
- e. 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.
- e. 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

Establishment Name \_\_\_\_\_

Address \_\_\_\_\_

Contact Name and Phone No. \_\_\_\_\_

Yes      No

		Three (3) identical complete sets of plans.
		Site plan including trash enclosure.
		Floor plan drawn to scale, showing all equipment.
		Name of establishment, address, owner or contractor's address, contact phone number on plans.
		Finish Schedule – Indicate materials and color.

	Floor	Integral Coving	4' Wainscot	Walls	Ceiling
Janitorial Area					
Food Prep Area					
Warehouse / Storage					
Walk-In Refrigeration					
Restroom(s)					
Dressing Room					
Utensil Washing Area					
Additional Areas					

**A schedule similar to this is  
to appear on your plans**

Yes	No	
		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 Secured Area with lock to store cleaning agents and poisons.
		Type and Size of water heater (number of BTUs or KWs)

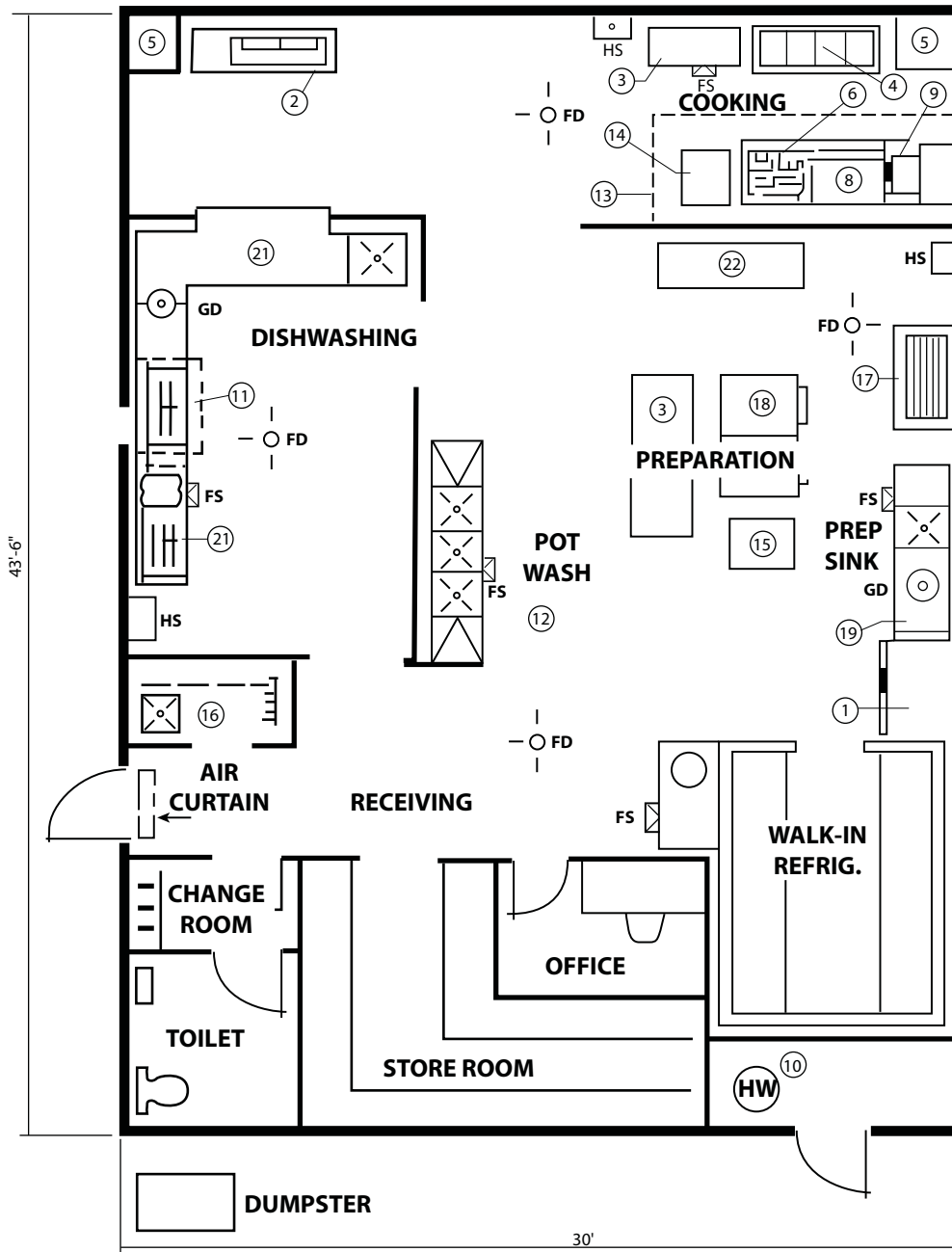
\*See supplemental XI

Date \_\_\_\_\_ Owner/Agent Signature \_\_\_\_\_

Environmental Health Specialist/Technician Signature \_\_\_\_\_

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

**SAMPLE FLOOR PLAN**



SCALE: 1/4"=1'-0"

**NOTE: FLOOR TO SLOPE TO FDs**

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  No.	*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	C O M M E N T S
1,	Reach-in Refrigerator Forte: Side Model EHS		110V 20A			F.S.	
2	Food Preparation Table 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.	¾"					
5	Steam Cooker Fulton, SC5				½"	F.S.	Anti-siphon Valve
6	Deep Fat Fryer Meier, Type L	½"					
7	Hot Water Heater Mills G-BT155	¾"		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			½"	½"	2"	
10	Hood Custom by General Contractor						See mechanical drawing, detail
11	Bake Oven Meier, O/B	¾"					
12	Proofing Cabinet Meier, P-C	½"					
13	Janitorial Sink Coltor, STD			½"	½"	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			½"	½"	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 concerning mechanical exhaust and hood design (3 sets required).
- One set of data sheets for each hood system.

Size of Hood: \_\_\_\_\_

CFM: \_\_\_\_\_

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 interconnected to exhaust system on 1 switch).

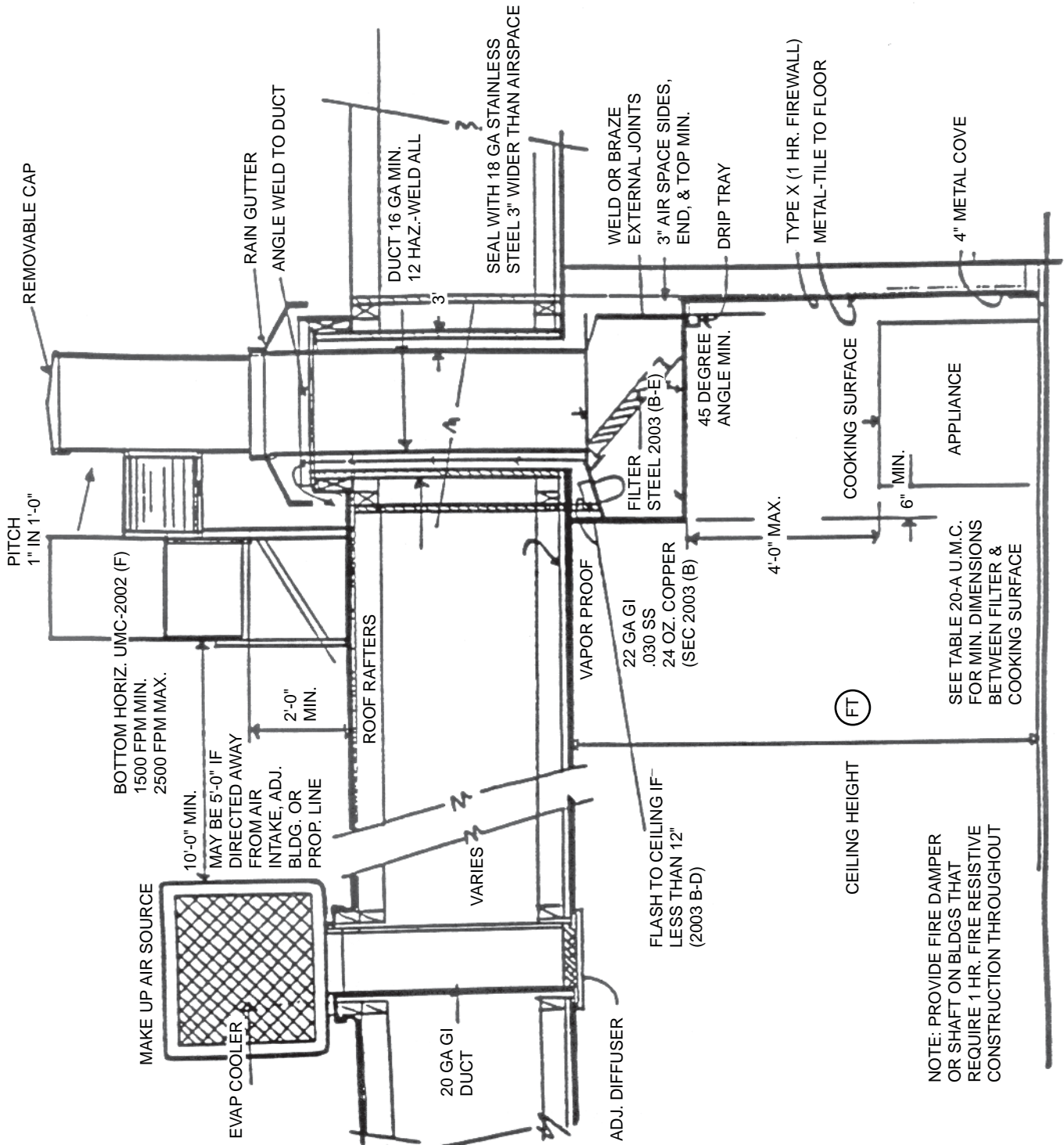
Elevated drawing of hood and cooking equipment shown on page # \_\_\_\_\_ of plans.

ICBO# \_\_\_\_\_ Must be listed for compensating hoods only

Hood Manufacturer (required for listed hoods) \_\_\_\_\_

- Hood design and construction shall meet recognized standards.
- Flashing shall extend from hood to floor coving.
- Wall surfaces within 18" of all cooking equipment shall be flashed.

**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/m<sup>2</sup>). 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 (m<sup>2</sup>).
- 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 (m<sup>3</sup>/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 = 0.46A
3 or less	Q = 200A	Q = 0.31A
Alternate 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 = 0.23A
3 or less	Q = 100A	Q = 0.16A
Alternate 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 = 0.16A
3 or less	Q = 75A	Q = 0.12A
Alternate 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 = 0.12A
3 or less	Q = 50A	Q = 0.08A
Alternate 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 m<sup>3</sup>/(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 covered base.
2. Ceramic tile floor with a ceramic tile covered base. The ceramic tile must be slip resistant.
3. Commercial grade sheet vinyl flooring covered 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 covered 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 covered 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

<u>MANUFACTURER</u>	<u>PRODUCT</u>
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:

<u>Plumbing fixtures</u>	<u>GPH (peak demand)</u>
3 Compartment Sink	42
Janitor Sink	15
Food Prep Sink	5
3 Hand Sinks	15
	<b>77 GPH</b>

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

$$\frac{77\text{GPH} \times 8.33 \times 50^{\circ}\text{F}}{.75} = \frac{32,071 \text{ BTUs}}{.75} = 42,761 \text{ BTUs}$$

### 2. ELECTRIC HOT WATER HEATER SYSTEMS

Formula

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

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