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Bureau of Environmental Health Protection

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GUIDELINES FOR THE SUBMISSION OF PLANS FOR FOOD FACILITIES

Pennsylvania Department of Agriculture (PDA) Food Code, Chapter 46 requires that a food facility licensing applicant or food facility operator in Chester County shall have plans and specifications submitted to for review and approved in writing by this Department before any of the following is begun:

- The construction of a food facility
- The conversion of an existing structure for use as a food facility
- The remodeling of a food facility or a change of type of food facility or food operation
- A change of ownership of a food facility
- The purchase of equipment for use in a food facility

Food establishment plan review is a very important process as it allows regulatory agencies to ensure that food establishments are built or renovated according to current regulations or rules. A complete plan submittal may also help a food facility operator to avoid problems in the future. By listing and locating equipment on floor plans and diagramming specifications for electrical, mechanical and plumbing systems, potential violations of the Food Code can be spotted while still on paper and modifications made *before* costly purchases, installation and construction.

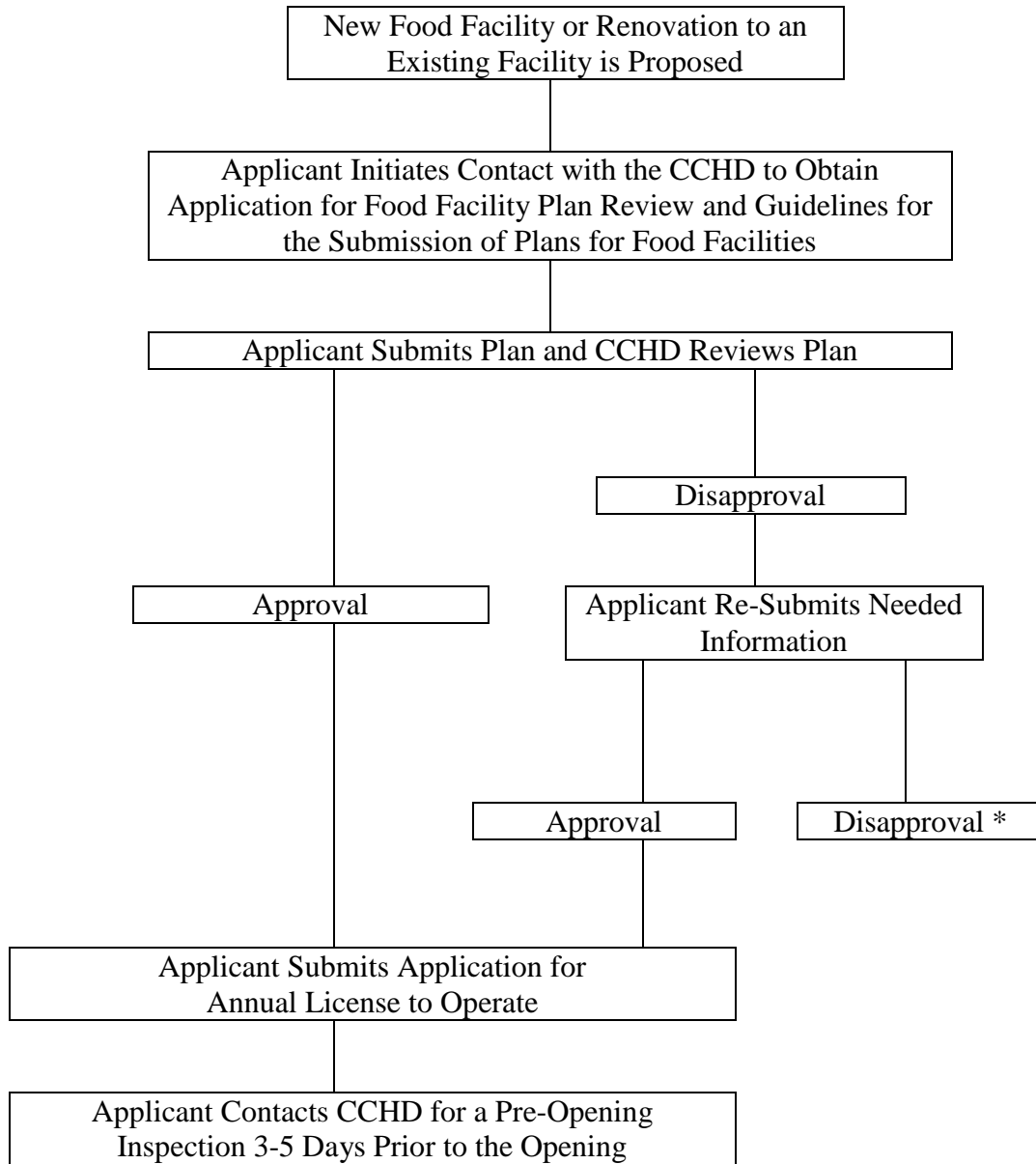
The Department will consider granting approval only for complete and final plans. This document has been developed to provide the preparer of the plans and specifications a step-by-step guideline in order to guarantee that the proposed design of the public food service facility meets the minimum requirements of the PDA Food Code.

The Department has established a self-imposed review period of thirty (30) days, therefore all plans and specifications should be submitted to the Department at least thirty (30) days prior to the proposed start of construction. Plans must be clear, concise, legible, and of such size to enable all information to be clearly shown. Architectural or engineering drawings or blue prints are recommended, although hand-drawn plans may be submitted if carefully and accurately drawn. All plans must include the last revision date, the site address, and the name of the preparer. If plans are approved by this Department, and you make revisions, new plans must be submitted.

In addition to obtaining Chester County Health Department approval there may be Federal and State Law or municipal ordinances that must be met by the proposed food facility. At the local level these may include zoning, building, plumbing, safety and other municipal ordinances. Contact the offices of the local municipality for additional information.

The 2009 FDA Food Code (which contains the recommendations of the United States Public Health Service, FDA, and consists of model requirements for safeguarding public health and food supplies), was used as a reference in developing this guide.

PLAN REVIEW PROCESS FLOW CHART



* At this stage there may be aspects fatal to the project that cannot be resolved by redesign, such as water, sewer, or other essential aspects that are inherently inconsistent with the minimum standards of the PDA's Food Code. In these cases, the plan review would end without an approval.

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NOTE: The symbol “➤” is used throughout this guideline to indicate specific information that should be included in the plan submittal, if applicable.

SECTION 1 APPLICATION FOR FOOD FACILITY PLAN REVIEW AND FEE

An *Application for Food Facility Plan Review* and the appropriate fee must be submitted along with the plan submittal. Applications may be obtained at a Department office or from the County website.

A change of ownership for an existing facility where no physical changes will be made to the facility requires that only Sections 1 and Section 2 of this Guideline be addressed.

- Complete an application and submit it with the plans and the appropriate fee.

SECTION 2 WATER SUPPLY AND SEWAGE DISPOSAL

Water Supply

All water used in the operation of a Public Food Facility must be from a source approved by this Department. The water may be provided by a municipal/public utility source or from an approved on-site source.

Municipal or Public Utility Company Source

- If the water is to be from an approved municipal or public utility water supply, indicate the company or authority in the space provided in Section 5 of the *Application for Food Facility Plan Review*.

On-Site Source

For either existing or newly drilled on-site wells, the water supply must receive approval as a Public Water Supply under the Pennsylvania Safe Drinking Water Act. This requires submittal of a Brief Description Form; testing of the bacteriological, chemical and physical parameters for New Source Testing; and routine monitoring of the water supply.

The location of any existing well must be shown on the plot plan and a cross-sectional view of the well casing must be provided.

- If the water is to be from an **existing** individual on-site source, documentation must be provided indicating that this source meets the requirements of Chapter 500, Subsection 501 and the Pennsylvania Safe Drinking Water Act.
 - For existing wells installed prior to March 21, 1983, a statement from a well driller licensed by the Department that the well meets current standards must be submitted with the plan.
 - For use of existing wells installed after March 21, 1983, a copy of a Well Permit given "Approval to Use" must be submitted with the plan.
- If a **new** well is to be drilled, a well permit must be obtained from the Chester County Health Department. A copy of the Permit To Drill must accompany the food plan review submittal.

A non-public water system (one not regulated under the Pennsylvania Safe Drinking Water Act) shall be required to conform to the construction, maintenance, and operation requirements established for a transient noncommunity water system as defined in 25 Pa. Code Chapter 109. Those water systems will need to submit initial sampling of the water supply prior to licensing. Continued sampling of the water supply for these non-public systems shall continue with quarterly Coliform and annual Nitrate/Nitrite testing.

Sewage Disposal

The sewage system utilized by the Public Food Service Facility must be one that is approved by this Department, complying with Chapter 500, Subsection 502-503.

Public Sewage System

- If a public sewage system is to be utilized, indicate the company or authority in the space provided in Section 5 of the *Application for Food Facility Plan Review*.
- New or expanding food facilities proposing to connect to or increase flows to municipal/public sewage disposal systems must obtain PA Sewage Facilities Planning Approval from the PA Department of Environmental Protection's (DEP) Water Management Program. Contact DEP's Southeast Regional Office at 484-250-5900 to see what steps are required to gain this approval and obtain an approval letter. A copy of the DEP approval letter must be submitted to this Department.

On-lot Subsurface Sewage Systems

Approval of all sewage disposal systems will be based upon satisfactory compliance with the Department's Chapter 500, Subsections 502-503, Chapter 71 and 73 of this title, The Clean Streams Law, Act of June 22, 1937, P.L. 1987, as amended (35 P.S. 691.1 et seq.), and with Food Code sections 46.861 – 46.863.

- If an **existing** on-lot subsurface sewage disposal system is to be utilized, the location of the components of the system must be shown on a site plan. Existing on-lot subsurface sewage disposal systems undergo extensive evaluation by the Department's Water and Sewage Section.
- If a **new** on-lot subsurface sewage disposal system is to be installed, a Sewage Permit must be obtained from the Chester County Health Department. A copy of the Permit To Install must accompany the food plan submittal.

Call 610 344-6526 to find out the Department Sewage Enforcement Office for the municipality from which you propose to operate.

SECTION 3 FLOOR PLANS

A floor plan must be submitted, showing all areas of the facility, including: the food preparation areas, restrooms, dining areas, bars, employee areas and all storage areas. Plans must be clear, concise, legible, to scale, and of such size to enable all information to be clearly shown. Architectural or engineering drawings or blue prints are recommended, although, hand drawn plans may be submitted if carefully and accurately drawn to scale.

- The floor plan must indicate the location of the following:
 - a. All food service equipment,
 - b. The plumbing layout; including floor drains, traps, hot and cold outlets, restroom fixtures, and hot water heater,
 - c. The electrical layout; including outlets, panel box, and lighting fixtures,
 - d. Kitchen exhaust ventilation; including hood duct layout, and location of make-up air provisions,
 - e. Storage areas for food, paper products, equipment and utensils (clean and dirty), and cleaning equipment, chemicals and supplies. All poisonous and toxic materials must be stored in a separate area.

SECTION 4

STRUCTURAL FACILITIES

Surface Finishes

- Provide a Surface Finish Schedule indicating the manufacturer, model number and color of all proposed surface materials for floors, walls, ceilings, and custom-built food service counters in areas in which food is prepared, in which utensils or hands are washed, in which solid waste is stored, or in toilet rooms. Indicate the type of cove molding to be used to close the floor/wall junctures in all areas of the facility. See Appendix A for a list of acceptable finish materials and an example of a Surface Finish Schedule that can be used to provide this information. The following criteria apply for floor, wall, and ceiling surfaces:

Floors

- All floor coverings in food preparation, food storage, utensil-washing areas, walk-in refrigeration units, dressing rooms, locker rooms, toilet rooms and vestibules must be smooth, non-absorbent, easily cleanable and durable. Sealed concrete is not an acceptable material for floors in these areas.
- There must be coving at base junctures that is compatible to both wall and floor coverings; recommended to provide at least 1/4 inch radius and 4" in height.
- Properly installed, trapped floor drains shall be provided in floors that are waterflushed for cleaning or that receive discharges of water or other fluid waste from equipment or in areas where pressure spray methods for cleaning equipment are used. Floors should be sloped to the drain at least 1/8" per foot.
- Grouting should be non-absorbent and impregnated with epoxy, silicone or polyurethane.
- All walk-in refrigeration units both with prefabricated floors and without, should be installed in accordance with the manufacturer's installation requirements.

Walls

- The walls, including non-supporting partitions, wall coverings and ceilings of walk-in refrigerating units, food preparation areas, equipment washing and utensil washing areas, toilet rooms and vestibules shall be smooth, non-absorbent, light-colored, and capable of withstanding repeated washing.
- Studs, joists and rafters shall not be exposed in walk-in refrigeration units, food preparation areas, equipment washing and utensil washing areas, toilet rooms and vestibules. Where permitted to be exposed, studs, joists and rafters must be finished to provide an easily cleanable surface.
- Glazed surfaces should be glazed block, or brick or ceramic tile. Grouting must be non-absorbent and impregnated with epoxy, silicone, polyurethane or an equivalent compound. Concrete block, if used, must be rendered non-porous and smooth by the application of an approved block filler followed by the application of an epoxy-type covering or equivalent. All mortar joints shall be only slightly tooled and suitably finished to render them easily cleanable.

Ceilings

- Finishes shall be light-colored, smooth, non-absorbent and easily cleanable. Acoustical material free of porous cloth or sponge may be used, provided ventilation is adequate to minimize soiling.

Utility and Service Lines

Where utility and service lines pass through floors, walls, or ceilings, protective sleeves or sealing must be provided to render these areas rodent- and insect-proof. Exposed horizontal runs of utility pipes or conduits must be kept to a minimum and may not be installed on the floor.

- Indicate the proposed method of installation of utility lines and materials to be used.

Insect and Rodent Control

Openings to the outside shall be effectively protected against the entrance of insects and rodents. Outside openings shall be protected against the entrance of insects by the installation of tight fitting, self-closing doors, closed windows, self-closing serving windows at drive-throughs, screening, controlled air currents, vestibules or other means approved by the Department.

Openings around pipes, conduit or wiring entering the building from the outside must be sealed.

Loading docks and delivery doors must be provided with effective air curtains or vestibules with self-closing doors to preclude the entrance of insects.

All foundations shall be rodent proof. Openings between the floor and bottom of outer doors, shall be adequately flashed with rodent proof material to eliminate any opening.

- Indicate self-closing devices on doors where required.
- Indicate where screening will be used and the size of the screening (screening material must be a minimum of sixteen mesh to the inch.)
- Indicate all other insect and rodent control devices

SECTION 5 FOOD EQUIPMENT AND INSTALLATION

All food service equipment must be designed and installed in accordance with the criteria set forth by an American National Standards Institute (ANSI)-accredited certification program, by Underwriters Laboratories Classified Food Service Equipment Classification, or by a nationally-recognized food service equipment voluntary consensus standard body, such as the National Sanitation Foundation (NSF). Equipment must be installed with proper spacing and sealing that will allow for adequate and easy cleaning:

- Submit a list of all equipment, showing the manufacturer and the model number and the installation method for each piece. An example of an Equipment Schedule is available in Appendix B and can be used to provide this information.
- Submit detailed shop drawings for any equipment that does not bear the mark of approval of a testing agency.

Equipment must meet the following minimum requirements:

Floor-Mounted Equipment

Whenever possible equipment should be mounted on approved castors or wheels to facilitate easy moving, cleaning, and flexibility of operation. Wheeled equipment requiring utility services should be provided with easily accessible quick-disconnects or the utility service lines should be flexible and of sufficient length to permit moving the equipment for cleaning. Check with local fire safety and building codes to ensure that such installations are acceptable.

Floor-mounted equipment not on wheels or castors with the above utility connections should be:

- Sealed to the floor around the entire perimeter of the equipment (the sealing compound should be pliable but not gummy or sticky, non-shrinking, retain elasticity and provide a water and vermin-tight seal); or
- Installed on a solid smooth non-absorbent masonry base. Masonry bases and curbs should have a minimum height of 2" and be coved at the junction of the platform and the floor with at least a 1/4" radius. The equipment should overhang the base by at least 1" but not more than 4". Spaces between the masonry base and the equipment must be sealed; or
- Elevated on legs to provide at least a 6" clearance between the floor and equipment. The legs shall contain no hollow open ends.

Display shelving units, display refrigeration units and display freezers may be exempt from the above.

For equipment not readily moveable by one person, spacing between and behind equipment must be sufficient to permit cleaning. Provide at least 6" of clear unobstructed space under each piece of equipment.

If all the equipment butts against a wall it must be joined to it and/or sealed in a manner to prevent liquid waste, dust and debris from collecting between the wall and the equipment.

When equipment is butted together or spreader plates are used the resultant joint must prevent the accumulation of spillage and debris therein and to facilitate cleaning.

Provide aisle and working spaces between units of equipment that are unobstructed and are functional. A minimum 36" width is recommended.

Any insulation materials used on utility pipes or lines in the food preparation or dishwashing areas must be smooth, non-absorbent and easy to clean. It is desirable that switch boxes, electrical control panels, wall mounted cabinets, etc. be installed out of the cooking and dishwashing areas. Electrical units which are installed in areas subject to splash from necessary cleaning operations or food preparation should be water-tight and washable.

Table-Mounted Equipment

All table mounted equipment shall be:

- Sealed to the table or counter; or
- Elevated on approved legs to provide at least a 4" clearance between the table or counter and equipment and installed to facilitate cleaning; or
- Portable: 30 pounds or less, no dimensions exceeding 36", no fixed utility connections.

Refrigeration Facilities Sizing and Design

Adequate refrigeration facilities must be provided for the proper storage, transportation, display, and service of potentially hazardous foods. Specific refrigeration needs will be based upon the menu, number of meals, frequency of delivery, and preparation in advance of service. All refrigerators must be capable of maintaining potentially hazardous foods (PHF) at 41°F or below.

If initial review of the plans raises concerns of inadequate refrigeration facilities, the submittal of calculations will be required showing how foods will be protected at all times. See Appendix C for formulas for determining refrigeration needs.

SECTION 6 SINK FACILITIES

Separate facilities must be available for each of the following: handwashing, food preparation, equipment washing, floor care/ liquid waste removal.

- Indicate the location, manufacturer, and model number and installation details for each sink. The following requirements apply for sink facilities:

Handwashing Facility

- A minimum of one handwashing facility for food employees must be accessible and conveniently located in the food preparation areas.
- Handwashing facilities must be provided in every toilet room.
- If seating for the public is available on the food facility premises, a minimum of one handwashing facility must be available for patrons. Handwashing facilities for patrons must be located in easily accessible areas, but access to the handsinks must not necessitate that patrons pass through food preparation; food dispensing; food, equipment, or utensil storage areas, or equipment washing areas. Provision of public toilet rooms will meet this requirement.
- Each handwashing facility shall be provided with hot and cold water tempered by means of a mixing valve or a combination faucet to provide water at a temperature of at least 100°F. Any self-closing, slow-closing or metering faucet shall be designed to provide a flow of water for at least 15 seconds without the need to reactivate the faucet.
- Handwashing facilities shall be equipped with hand cleansing soap or detergent, and approved sanitary towels or other approved hand-drying devices.
- A baffle or barrier may be needed if the handsink abuts a food preparation or service surface.
- Sinks used for food preparation or for washing equipment or utensils shall not be used for handwashing.

Food Preparation Sink

- A food preparation sink, preferably with a drainboard, is required in establishments where the food handling operations involve cleaning or rinsing of raw and ready-to-eat products such as raw fruits and vegetables.
- Where it can be documented by low volume, infrequent preparation or where foods are purchased prewashed and pre-packaged, a separate food preparation sink is not required.
- The drains for food preparation sinks must have an indirect connection to the sewage system See Appendix D for details on an indirect connection.

Manual Warewashing

- Generally, only a three-compartment sink, constructed of stainless steel and with dirty and clean drain boards, may be used for manual equipment washing.
- The sink compartments shall be large enough to hold the largest pot, pan or piece of equipment.
- Each compartment shall be supplied with adequate hot (>110°F) and cold potable running water.
- Integral drainboards of adequate size shall be provided on both sides of the sink for cleaned and soiled utensils. Drainboards should generally be at least the same size as that of the sink compartments.
- Two-compartment sinks may be allowable under certain conditions.
- An approved chemical test kit for determining sanitizer strength shall be available and used.

Mop Sink

- At least one mop sink must be provided for cleaning mops, discarding liquid floor cleaning wastes, and for filling mop buckets.
- The faucet for the mop sink must be equipped with backsiphonage prevention.
- All toxic materials including cleaning compounds, pesticides, sanitizers, etc. must be stored in an area away from food preparation and in a secured area.

SECTION 7 VENTILATION

All rooms shall have sufficient ventilation to keep them free of excessive heat, steam, condensation, vapors, obnoxious odors, smoke and fumes.

Cooking Exhaust Ventilation System

- Cooking which produces smoke or grease-laden vapors may only be conducted under an approved cooking exhaust ventilation system. The purpose of an exhaust ventilation system is to provide a method of collecting, as nearly as possible, all of the grease produced from the cooking process, while furnishing a means of removing heat, smoke, and odors from the cooking area. For the hood to fulfill its purpose there must be a sufficient volume of air movement (capture velocity) to draw grease particles and cooking vapors directly from the cooking surface to the grease extractors. This air flow removes cooking odors and keeps grease particles from settling onto nearby surfaces. This system must meet the standards of the National Fire Protection Association (NFPA) Code No. 96, the BOCA Mechanical Code, and Standard 2 of the National Sanitation Foundation.
 - Cooking ventilation hoods and devices shall be designed and installed to prevent grease or condensation from collecting on walls, ceilings, and fire suppression supply piping and from dripping into food or onto food contact surfaces. The installation of fire suppression system piping in the unfiltered air space in exhaust hoods must be limited to vertical runs to minimize grease collection. Exposed piping must be cleanable.
 - Canopy hoods and island hoods shall have a minimum depth of two feet and shall extend at least six inches beyond any equipment being ventilated, except that no overhang will be required on sides where aprons are installed.
 - For hoods longer than 12 feet, multiple exhaust ducts outlets, no closer than six feet apart and no further than 12 feet apart, must be installed. For hoods equipped with multiple ducts, a manual air volume damper should be installed on each outlet so that the system can be easily balanced.
 - The make-up air inlet must be located at least 10 feet from the exhaust fan, as measured horizontally.
 - Air conditioning may serve as a source of make-up air, with each ton of an air conditioning system supplying 400 CFM of outside air.
- If such cooking is proposed, provide information including:
- a. details of the hood and duct construction,
 - b. an Air Balance Schedule including exhaust capacity and make-up air sources,
 - c. the type of lighting,
 - d. the type of fire-suppression system and location of all piping, and
 - e. location of all exhaust outlets and make-up air inlets.

See Appendix E for more information on ventilation requirements and a *Cooking Exhaust Ventilation Information* form available for supplying this information.

Toilet Room Ventilation

All toilet rooms must be provided with a mechanical means of ventilation to outside air. See Section 8.

SECTION 8 TOILET FACILITIES

Toilet facilities must be provided for the employees of a public food service facility. Toilet facilities must be:

- Conveniently located and shall be accessible to employees at all times.
 - Equipped with toilets and urinals that are designed to be easily cleanable and have integral backflow prevention devices.
 - Equipped with handwashing facilities and hand cleansing soap and approved sanitary towels or another approved hand-drying devices.
 - Completely enclosed and shall have tight fitting, self-closing, doors,
 - Vented to the outside, and
 - Provided with a covered receptacle for sanitary napkins if the facility is used by females.
- Indicate the construction detail of the floors, walls and ceilings in restrooms. (Information can be presented on the “Surface Finish Schedule” Form in Appendix A).
- Submit a list of all fixtures, showing the manufacturer and the model number, location, and the installation method for each piece,
- Indicate method of ventilation to outside air.
- Indicate soap dispensers, towel dispensers, waste receptacles and employee hand washing signage for each toilet room and/ or sink.

SECTION 9 PLUMBING AND CROSS CONNECTION CONTROL

A detailed plan of the plumbing system must be provided to ensure that the plumbing is sized and installed according to applicable codes.

- A water heater must be provided which is capable of generating an adequate supply of hot water, at a temperature of at least 120°F to all sinks, janitorial facilities, and all other equipment and fixtures that use hot water, at all times. The hot water supply shall be sufficient to satisfy the continuous and peak hot water demands of the establishment. Hot water for handwashing and warewashing shall be of a temperature of at least 100°F. Typically, a water heater with a minimum storage capacity of 50 gallons must be provided.
 - There shall be no cross connections between the potable water supply and any non-potable water supply. The potable water system shall be installed to preclude the possibility of back flow and back siphonage. Devices shall be installed to protect against backflow and backsiphonage at all fixtures and equipment unless an air gap is provided. See Appendix F for more detail on cross connection control devices.
 - Grease Traps are not required by the Department, but they are acceptable for use. The local municipal sewer authority may have requirements for the use and installation of a grease trap.
 - A sewage holding tank in a mobile food facility must be sized 15% larger in capacity than the water supply tank and must be sloped to a drain that is equipped with a shut-off valve.
- Provide specifications of the hot water heater, including: the manufacturer and model number, the capacity and the recovery rate, and the venting arrangement. See Appendix G for guidelines for sizing water heaters and a calculating worksheet.
- Indicate where backflow prevention devices, if needed, will be used.

- Indicate location of air gaps for all drains from food service equipment (examples, food preparation sinks, ice machines, refrigeration condensate lines)
- Indicate the location of mixing valves on all lavatory fixtures.
- If a mobile unit, indicate the size of the water supply tank and the sewage holding tank.

SECTION 10 FACILITIES TO PROTECT FOOD

Adequate facilities must be provided to promote good hygienic practices, sanitary food handling and to minimize the potential of cross contamination between ready to eat and raw products.

- Where portable cutting boards are planned, they should be color coded or labeled for specific use.
 - All food being displayed, served, or held must be adequately protected from contamination by the use of: packaging; serving line and salad bar protector devices; display cases, or by other effective means including dispensers.
 - Serving line and salad bars sneeze guards shall comply with Standard ___ of the National Sanitation Foundation. The food shield should intercept the direct line between the customer's mouth and the food on display. On the average, the vertical distance from the customer's mouth to the floor is 4'6" to 5'. This average must be adjusted for children in educational institutions, and for other special installations such as to accommodate the wheel chair bound. See Appendix H for examples of sneeze guard construction.
 - Equipment including ice machines shall not be located under exposed or unprotected sewer lines, open stairwells or other sources of contamination.
 - Running water dipping wells should be provided for the in-use storage of dispensing utensils where frozen desserts are being portioned and dispensed.
- Provide details on any sneeze guards or other protective devices.
 - Indicate the location of any dipping wells.

SECTION 11 LIGHTING

Lighting must be adequate in all areas in which food is processed, prepared or stored; utensils are washed; in handwashing areas; dressing or locker rooms; toilet rooms; and garbage or refuse storage areas. The following light intensity standards must be met:

- At least 110 lux (10 foot candles) at a distance of 75 cm (30 inches) above the floor, in walk-in refrigeration units and dry storage areas and in other areas and rooms during periods of cleaning.
- At least 220 lux (20 foot candles) at
 - a surface where food is provided for consumer self-service such as buffets and salad bars where fresh produce or packaged foods are sold or offered for consumption;
 - inside equipment such as reach-in and under-counter refrigerators;
 - and at a distance of 75 cm (30 inches) above the floor in areas used for handwashing, warewashing, and equipment and utensil storage and in toilet rooms.
- At least 540 lux (50 foot candles) at a surface where a food employee is working with food or working with utensils or equipment such as knives, slicers, grinders, or saws where employees safety is a factor.

Shielding such as plastic shields, plastic sleeves with end caps, shatterproof bulbs and/or other approved devices shall be provided for all artificial lighting fixtures located in areas where there is

exposed food; clean equipment, utensils, and linens; or unwrapped single-service and single-use articles.

- Indicate illumination levels (in footcandles or numbers/wattages of lights) for all areas; including areas in which food is processed, prepared or stored; utensils are washed; in handwashing areas; dressing or locker rooms; toilet rooms; and garbage or refuse storage areas.
- Indicate the means of protection for all light fixtures to ensure shattered glass does not become a food safety hazard.

SECTION 12 DRY GOOD STORAGE

Plans should show sufficient food storage areas in order to keep foods stored in an organized and neat fashion. The dry storage space required depends upon the menu, number of meals, quantities purchased and frequency of delivery. The location of the storeroom should be adjacent to the food preparation area and convenient to receiving.

- Shelving in dry food storage areas shall be sufficient to allow for free circulation for air and for neat and tidy storage of food and other items. The bottom member of shelving must be six inches from the floor surface or the shelving shall have kick plates that are sealed to the floor with coving.
 - Shelving can be constructed of suitably finished hard wood, durable plastic or preferably of corrosion-resistant metal.
 - Sufficient moveable dunnage racks and dollies (with smooth surfaces, cleanable in case of food spillage or package breakage) should be provided to store all food containers at least 6" above the floor.
 - Shelving and dunnage racks for storage of food containers or food-contact equipment shall not be located under exposed or unprotected sewer lines.
 - Approved food containers with tight-fitting covers and dollies should be used for storing bulk foods such as flour, cornmeal, sugar, dried beans, rice and similar foods.
 - Scoops are needed for each food storage container in use.
- Indicate the construction detail of the floors, walls and ceilings in all dry good storage areas. (Information can be presented on the "Surface Finish Schedule" Form in Appendix A).
 - Indicate how bottom shelf will be installed (at least 6" above floor or kick plate sealed to floor).
 - Indicate the construction details and location of the storage shelves, dunnage racks, and dollies.
 - Submit a list of all food containers and scoops, showing the manufacturer and the model number. This information can be presented in the equipment schedule. See Appendix B for a sample equipment schedule.

SECTION 13 GARBAGE AND REFUSE STORAGE

Proper storage and disposal of garbage and refuse are necessary to minimize the development of odors, prevent such waste from becoming an attractant and harborage or breeding place for insects and rodents, and prevent the soiling of food preparation and food service areas.

- Interior garbage or refuse storage rooms must be constructed of easily cleanable, nonabsorbent, washable materials and be insect-proof and rodent-proof.
- Exterior storage areas for garbage and refuse containers must be constructed so that they are smooth, durable, and sloped to drain.
- All garbage and refuse containers must be constructed with tight-fitting lids or covers.

- Indicate the interior and exterior refuse storage areas
- Indicate the construction detail of the floors, walls and ceilings in any interior garbage or refuse storage areas. (Information can be presented on the “Surface Finish Schedule” Form in Appendix A).
- Indicate the construction detail for the exterior storage area surfaces. (Information can be presented on the “Surface Finish Schedule” Form in Appendix A).
- Indicate the type and number of containers to be provided, the name of the collector, and the frequency of collections per week.

SECTION 14 DRESSING ROOMS AND LOCKERS

Rooms or areas separate from food preparation, storage or service areas, and separate from utensil washing or storage areas should be provided if employees will routinely change clothes within the establishment. Lockers or other suitable storage facilities shall be located in dressing areas.

If dressing rooms are not required, separate facilities should be provided for the storage of coats, sweaters and other personal belongings.

- Indicate dressing/locker rooms or storage areas for employee’s personal effects.

REFERENCES

The above are guidelines for the planning of the construction of new, or alterations of existing, Public Food Service Facilities. These guidelines are rather comprehensive but may not present all information which can be required by the Department. For clarification or more detailed information, the following list of reference materials is provided for your use. The Department is available to assist you in locating any of these materials.

1. **Chester County Health Department**

Bureau of Environmental Health Protection
Government Services Center
601 Westtown Road Suite 288
P O Box 2747
West Chester, PA 19380-0990
(610) 344-6689

- a. Rules and Regulations, Chapter 300 – Food Protection
- b. Rules and Regulations, Chapter 500, Subsection 501 – Individual and Semi-Public Water Supplies
- c. Application and Permit Procedure for Individual Sewage Disposal Systems
- d. Procedure for Percolation Test
- e. Safe Drinking Water Act, Brief Description Form
- f. Chapter 73 – Standards for Sewage Disposal Facilities
- g. Chapter 109, Safe Drinking Water Provisions

2. **National Sanitation Foundation (NSF) International**

1301 K Street NW Suite 225
Washington, DC 20005
(202) 289-2140 Fax: (202) 289-2149 Web: www.nsf.org

- a. “Sanitation aspects of food service facility plan preparation and review”
- b. “Manual on Sanitation Aspects of Installation of Food Service Equipment”
- c. Food Service Equipment Standards
- d. Listing of Food Service Equipment

3. **The 3A Sanitary Standards**

International Association of Milk, Food and Environmental Sanitarians
Shellyville, Indiana

4. **Baking Industry Standards**

Baking Industry Sanitation Standards Committee
1400 West Devon Avenue Suite 422
Chicago, IL 60660
(773) 761-4100 Fax: (773) 274-3032 Web: www.bissc.org

5. **Building Officials and Code Administrators International, Inc.**

4051 W. Flossmoor Rd.
Country Club Hills, Ill 60478
(708) 799-2300 Fax: (708) 799-4981 Web: www.bocai.org

- a. The BOCA National Building Code
- b. The BOCA National Mechanical Code
- c. The BOCA National Plumbing Code

6. National Fire Protection Association

1 Batterymarch Park
P. O. Box 9101
Quincy, MA 02269-9101
1-800-344-3555

- a. Standard No. 96, for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment
- b. The National Electrical Code

7. Pennsylvania Department of Agriculture

P.O. Box 300
Creamery, PA 19430
(610) 489-1003 web: www.agriculture.state.pa.us

- a. Title 7. Agriculture, Pennsylvania, Chapter 46
- b. PA Bakery Products Standards
- c. PA Frozen Dessert Standards

8. U.S. Food and Drug Administration

Philadelphia Regional Office
200 Chestnut Street
Philadelphia, PA 19106
(215) 597-4390 web: <http://www.foodsafety.gov>

- a. Inspections and Compliance – Food Code 2009

APPENDIX A

ACCEPTABLE FINISHES FOR FLOORS, WALLS, AND CEILINGS

	<u>WALL</u>	<u>FLOOR</u>	<u>CEILING</u>
Kitchen/Cooking	Stainless steel; aluminum; Ceramic tile	Quarry tile, poured seamless, commercial grade vinyl composition tile or sheets	Plastic coated or metal clad fiberboard; Dry-wall epoxy, Glazed surface; Plastic laminate
Food Prep	Same as above, plus approved wall panels - Fiberglass Reinforced Plastic (FRP) Panel; epoxy painted drywall; filled block with epoxy paint or glazed surface	Same as above	Same as above
Warewashing	Stainless steel; aluminum; FRP panels; epoxy painted drywall; filled block with epoxy paint or glazed surface	Same as above	Same as above
Dry Storage	FRP panels; epoxy painted drywall; filled block with epoxy paint or glazed surface	Same as above	Acoustic tile; painted sheetrock
OTHER STORAGE	Painted sheetrock	Same as above	Same as above
TOILET ROOM	FRP panels; epoxy painted drywall; filled block with epoxy paint or glazed surface	Same as above	Plastic coated or metal clad fiberboard; drywall with epoxy; glazed surface; plastic laminate
DRESSING ROOMS	Painted sheetrock	Same as above	Same as above plus painted sheetrock
GARBAGE & REFUSE AREAS (Interior)	FRP panels; epoxy painted drywall; filled block with epoxy paint or glazed surface	Same as above	Plastic coated or metal clad fiberboard; drywall with epoxy; glazed surface; plastic laminate
MOP SERVICE AREA	Same as above	Same as above	Same as above
WALK-IN REFRIGERATORS & FREEZERS	Aluminum; stainless steel; enamel coated steel (or other corrosion resistant material)	Same as above plus stainless steel, aluminum diamond plate	Aluminum; stainless steel; enamel coated steel (or other corrosion resistant material)

This list is not comprehensive. Alternative materials may be submitted for review.

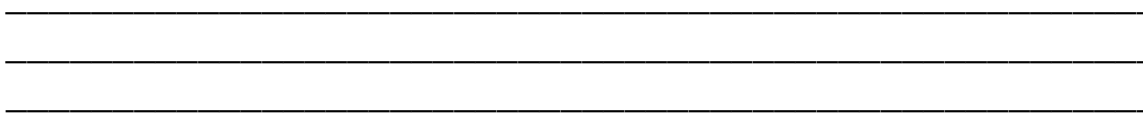
APPENDIX A

Chester County Health Department
Bureau of Environmental Health Protection

SURFACE FINISH SCHEDULE

	Wall Finishes	Floor Finishes	Cove Base	Ceiling Finishes
Example	Dry wall with semi-gloss white paint	Vinyl composition tile	Vinyl 4" base coving	Non-perforated, vinyl-faced drop tiles
Kitchen/Cooking/ Food Prep				
Warewashing				
Dry Storage				
Toilet Rooms				
Dining Area				
Garbage/Refuse Storage Areas				
Other:				
Other:				
Other:				

Notes: _____



APPENDIX C

**SIZING CONSIDERATION FOR CALCULATING
TOTAL REFRIGERATED STORAGE NEEDS**

To plan for refrigeration storage, the following need to be considered: menu, type of service, number of meals per day, and number of deliveries per week. The following are formulas to establish required refrigeration storage:

Walk-in Units - only 40% of any walk-in unit actually provides usable space

Total Interior Storage Volume Needed:
$$\frac{\text{Vol. per meal (Cu. ft.)} \times \text{number of meals}}{40\% \text{ usable space}}$$

Estimated typical meal volumes for each of three types of refrigerated storage are:

- Meat, Poultry and Seafood - .010-.030 Cu. ft. per meal
- Vegetables and fruit - .020-.040 Cu. ft. per meal
- Dairy - .007-.015 Cu. ft. per meal

Thus a facility serving 1000 meals between deliveries needs the following storage capacities:

- Meat refrigerated storage -
$$\frac{.030 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.40} = 75 \text{ Cu. Ft}$$
- Vegetable refrigerated storage -
$$\frac{.040 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.40} = 100 \text{ Cu. Ft}$$
- Dairy refrigerated storage -
$$\frac{.015 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.40} = 37.5 \text{ Cu. Ft.}$$

To calculate the interior storage space (in square feet) required for the above example, divide the volume (Cu. ft), in each case, by the height of the unit.

Example for meat storage -
$$\frac{75 \text{ cu. ft.}}{6 \text{ ft. (height)}} = 12.5 \text{ sq. ft.}$$

The interior floor area would have to be 12.5 sq. ft. to accommodate refrigeration storage of meat for 1000 meals.

Reach-in Units - only 75% of any reach-in unit actually provides usable space

Total Interior Storage Volume Needed:
$$\frac{\text{Vol. per meal (Cu. ft.)} \times \text{number of meals}}{75\% \text{ usable space}}$$

Thus a facility serving 1000 meals between deliveries needs the following storage capacities:

- Meat refrigerated storage -
$$\frac{.030 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.75} = 40 \text{ Cu. Ft}$$
- Vegetable refrigerated storage -
$$\frac{.040 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.75} = 53 \text{ Cu. Ft}$$

$$\text{Dairy refrigerated storage} - \frac{.015 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.75} = 20 \text{ Cu. Ft.}$$

To estimate total interior volume or space, add together the requirements for each type of food.

APPENDIX D

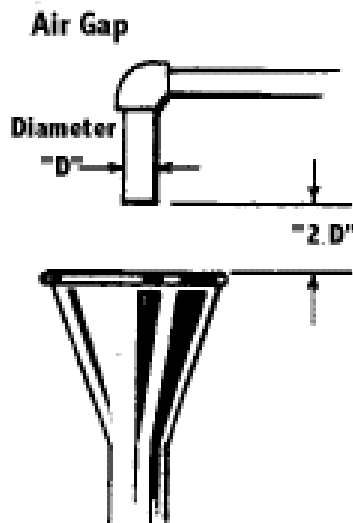
INDIRECT CONNECTIONS FOR WASTE LINES FROM FOOD SERVICE EQUIPMENT

A direct connection may not exist between the sewerage system and any drains originating from equipment in which food is placed, such as food preparation sinks and ice bins. Indirect connections must be installed on these types of drains.

An air gap is the most desirable method of indirect connection. It is simple, economical, non-mechanical (no moving parts), fail safe, and can be used for potential backsiphonage or backpressure situations.

Air Gap Installation

- The air gap must be the greater of the two – a minimum of one inch of twice the inside diameter of the supply pipe. This distance is measured from the supply pipe to the flood level rim (the point of over flow) of the receptacle or fixture.
- Air gaps require inspection for any compromised "2xD or 1 inch" requirements and any splashing problems, but no testing is necessary.



APPENDIX E

COOKING VENTILATION SYSTEMS

The following information is provided to offer guidance in meeting the requirement for ventilating cooking equipment.

General Principles of Exhaust

The purpose of an exhaust hood is to provide a method of collecting, as nearly as possible, all of the grease produced from the cooking process, while furnishing a means of removing heat, smoke, and odors from the cooking area.

For the hood to fulfill its purpose there must be a sufficient volume of air movement (capture velocity) to draw grease particles and cooking vapors directly from the cooking surface to the grease extractors. This air flow removes cooking odors and keeps grease particles from settling onto nearby surfaces.

An effective capture velocity shall be sufficient to overcome opposing air currents, capture the grease and cooking vapors, and transport them directly to the grease extractors.

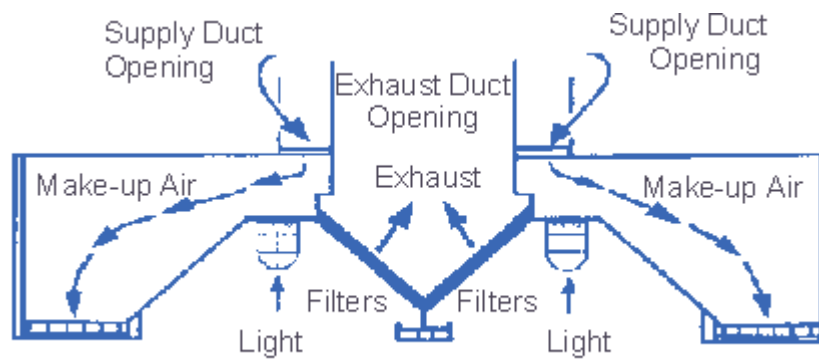
Grease extractors are ineffective in removing grease vapors. Only when grease vapors cool and condense can an extractor remove grease particles by directed air flow, contraction, and expansion (drop out). It is essential to have a sufficient volume of air flowing to cool and condense the grease vapors into grease particles prior to reaching the grease extractors.

In the case of heat and steam producing equipment, the purpose of the hood or ventilation system (such as a pants-leg duct system) is to control humidity, heat, and unwanted condensation.

A major cause of unacceptable hood performance is a lack of coordination between the Heating, Ventilation, and Air Conditioning (HVAC) system and the exhaust hood system. These systems should be coordinated prior to installation, and balanced when installation is completed, to ensure the proper performance of both.

Hood Size

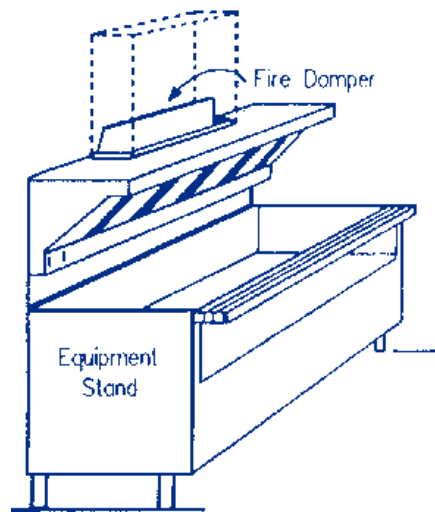
Canopy hoods and island hoods shall have a minimum depth of two feet and shall extend at least six inches beyond any equipment being ventilated, except that no overhang will be required on sides where aprons are installed. The dimensions of the hood are, in all cases, larger than the cooking surface to be covered by the hood. Example of a canopy hood:



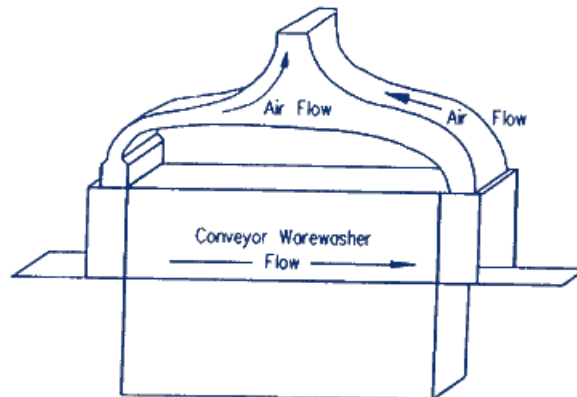
Ventilator, or "backshelf", hoods are designed to mount to the wall directly behind the cooking equipment. This type of hood is often used where ceiling height is a factor. It is normally placed closer to the cooking surfaces than a canopy hood, and works well in light to medium duty cooking applications. The ventilator hood is not recommended for charbroilers or similar high heat and grease producing cooking equipment. It does not have the capture area of a canopy hood and is not able to effectively handle large surges of cooking emissions (steam, heat, vapors, etc.)

APPENDIX E

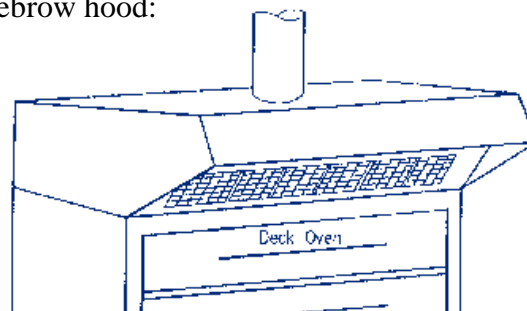
Several dimensions are essential in the proper installation of a ventilator hood. Ventilator hoods shall extend from the wall a minimum of 16 inches, and shall be installed so that the distance from the top of the cooking equipment to the bottom of the ventilator hood is no more than 24 inches. Equipment placed under a ventilator hood shall not extend beyond the sides of the hood or more than 36 inches from the back of the hood. These restrictions are necessary to ensure maximum capture and removal of cooking emissions. Example of a ventilator hood:



Pants-leg exhaust systems are designed to remove the heat or steam close to the point of discharge from warewashers or conveyor cooking equipment. These systems must be sized to effectively ventilate the equipment served. Example of a pants-leg system:



Eye-brow hoods are designed to immediately remove heat from an oven at the point of emission or as the door is opened. These hoods must effectively ventilate the door openings of the equipment served. Example of an eye-brow hood:



APPENDIX E

Exhausted Air

The amount of air exhausted through a hood exhaust system is dependent upon the size of the hood, its particular installation, and its use. The following criteria shall be used to calculate the amount of air exhausted:

- **Canopy hoods.** The Square Foot Method is used to calculate exhaust air volume, based on the size of the opening in the hood (length x width) and the capture velocity relative to the installation of the hood (see Table 1.).

Hood length x hood width = square feet (ft.²) of hood opening.

Ft.² of hood opening x factor from Table I = CFM of air exhausted.

TABLE 1.

Exposed Sides	Factor (CFM/ft. ²)
4 (central island hood)	125
3 (wall hung hood)	100
2 (corner hung hood, or with aprons)	85
Steam or heat exhaust only	70

Example: For a wall hung hood that is 8 feet long and 4 feet wide:

$$8 \text{ ft. (length)} \times 4 \text{ ft. (width)} = 32 \text{ ft.}^2$$

$$32 \text{ ft.}^2 \times 100 \text{ CFM/ft.}^2 \text{ (wall hung hood)} = 3200 \text{ CFM}$$

3200 CFM of exhausted air would be required at this hood.

- **Ventilator and backshelf hoods.** The Exposed Linear Foot Method is used for these types of hoods, based on the total exposed linear footage of the hood and the capture velocity relative to its application (See Table 2).

TABLE 1.

Application	Factor (CFM/ft.)
Light duty (non-grease producing)	200
Medium duty (light grease producing)	275
Heavy duty (heavy grease producing)	350

Example: For a 12-foot ventilator hood that is used for medium duty:

$$12 \text{ ft.} \times 275 \text{ CFM/ft.} = 3300 \text{ CFM air exhausted}$$

3300 CFM of exhausted air would be required at this hood

Duct Location and Size

Exhaust ducts should never be located at the sides of the hood. For hoods that are six feet or less in length, only one outlet should be provided. Long hoods should be provided with multiple outlets no closer than six feet apart and no further than 12 feet apart. For hoods equipped with multiple ducts, it is advisable to install a manual air volume damper on each outlet so that the system can be easily balanced.

APPENDIX E

A duct velocity of no less than 1500 fpm shall be provided to maintain suitable conditions in the duct work. In some cases, a greater duct velocity (i.e. 1800 - 2200 fpm) may be necessary for the system to function at its best. The size requirement for exhaust ducts can be calculated by using the following formula:

$$\text{Duct area required (ft. }^2\text{)} = \text{Volume of air exhausted (CFM)} \div \text{Duct velocity (fpm)}$$

Example: Duct area required for a hood exhausting 3000 CFM:

$$3000 \text{ CFM} \div 1500 \text{ fpm} = 2 \text{ ft. }^2$$

Make-up Air

The term "make-up air" is used to identify the supply of outdoor air to a room or building to replace the air removed by an exhaust system. For a consistent and regulated flow, make-up air should be mechanically introduced by a fan. Make-up air is critical to the design of a ventilation system. It is generally recognized that all systems exhausting more than 1500 CFM need mechanically introduced make-up air to ensure a balanced system. Make-up air is to be supplied at 85 to 90 percent of the exhausted air. Make-up air controls should be interlocked with exhaust controls to ensure that the units operate simultaneously.

Replacement air shall be filtered and may also be tempered by a separate control. The air velocity through the make-up air system should be low enough to avoid the possibility of drafts. It is desirable to have the kitchen under a very slight negative pressure to prevent any filtration of cooking odors from the kitchen into the dining room. The supply of make-up air is frequently introduced at some point within the hood, or in close proximity to the hood, to avoid the removal of conditioned air that has been heated or cooled.

The make-up air inlet should be located at least 10 feet from the exhaust fan to comply with National Fire Protection Association requirements.

Air conditioning may also serve as a source of make-up air, with each ton of an air conditioning system supplying 400 CFM of outside air.

Fire Protection

Automatic fire suppression systems must be provided on exhaust ventilation systems for all grease producing cooking equipment. These systems must be designed and installed in compliance with the National Fire Protection Association (NFPA) Code 96 and local fire and building officials. Fire suppression systems must also be installed in compliance with Standard 2 of the National Sanitation

- a. registered architect
- b. registered engineer
- c. manufacturer of ventilation system

APPENDIX F

PLUMBING CROSS CONNECTION CONTROL DEVICES

A plumbing cross-connection is an actual or potential link between the potable water supply and a source of contamination (sewage, chemicals, gas, etc.). Unprotected cross-connection threatens the health and safety of individuals and food or beverage products utilizing water from that system when a backflow occurs. A cross-connection can be any temporary or permanent direct connection. The potable water system must be properly protected with an acceptable backflow prevention assembly or device to eliminate any potential for a reverse flow back into the potable supply.

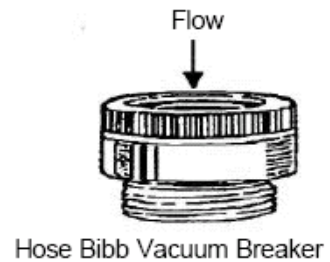
Mechanical Backflow Assemblies & Devices

Mechanical backflow preventers consist of single or multiple check valves that open from the flow pressure of the potable water. These valves are fabricated to seat tightly on a machined surface and when closed, prevent any flow in the wrong direction. Also, some devices have air inlets or ports that are vented to the atmosphere to relieve any vacuum or negative pressure developed in the system.

The specific use and installation of a backflow prevention assembly or device must be clarified by the manufacturer and comply with the plumbing codes governing the jurisdiction in which the unit is installed. All backflow devices must be installed so they are accessible for inspection, service and repair. Below are descriptions of the most common devices:

Hose Bibb Vacuum Breaker (HBVB)

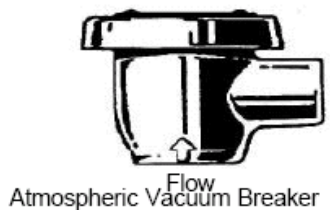
A hose bibb vacuum breaker contains one spring loaded valve and an atmospheric vent that is controlled by a diaphragm seal. The HBVB is installed on the end of a hose bibb for a garden hose, mop sink hose etc., or anywhere else a hose can be connected. HBVB's cannot be used under continuous pressure conditions (water pressure on both sides of the unit for more than 12 hours), because the spring loaded valve may stick or freeze in the open position, thus making the water supply vulnerable to backflow.



Hose Bibb Vacuum Breaker

Atmospheric Vacuum Breaker (AVB)

This device has an internal polyethylene or metal float valve that moves up and down on a shaft (not spring loaded). Water moving in the normal direction of flow lifts the float, and causes the atmospheric vent to close (an opening on the top of the unit is open to the air). The normal water pressure keeps the float valve in the upward closed position. Shutting off the water causes the float to drop; the supply valve to close; and results in the atmospheric vent being open. With the water off, the down stream



Atmospheric Vacuum Breaker

piping of the AVB is open to the atmosphere, creating an air gap, and thus preventing any back-siphonage. AVB's provide excellent protection against backsiphonage only. AVB's cannot be used under continuous pressure conditions (water pressure on both sides of the unit for more than 12 hours), because the float valve may stick or freeze in the up position, thus making the water supply vulnerable to potential backsiphonage.

Carbonator Backflow Prevention Device



Carbonator Backflow Prevention Device

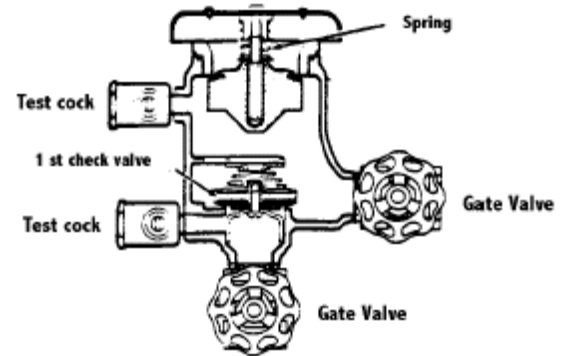
This device contains an atmospheric vent between two spring loaded check valves, and a ball check valve. The spring loaded valves close automatically when no water flow is occurring. The atmospheric vent is controlled by a diaphragm seal that directly responds to the movement of the supply side (primary) check valve. As the water flow begins, the primary check opens and simultaneously frees the diaphragm seal to close off the atmospheric vent and then proceeds to open the secondary

APPENDIX F

check valve (down stream side). The ball check is an extra precaution to prevent carbon dioxide (CO2) from backflowing (via backpressure) out of a soda carbonator and into any copper supply lines. Any carbon dioxide leaking past the ball check valve and the secondary disc valve would be vented into the atmosphere via the atmospheric vent/air inlet. The unit may also be used for other beverage equipment such as coffee, tea, and hot chocolate.

Pressure Vacuum Breaker (PVB)

The PVB is similar to the atmospheric vacuum breaker (AVB), except that it has two test cocks and two gate valves (new units use ball valves) for testing the unit, and it also has two positive seating (spring loaded) valves. The first check valve (supply side) is spring loaded for a closed position and "guards" the potable water supply side; when the water supply is turned on, the flow pushes it in the open position. The second check valve or air inlet valve (down stream side) is spring loaded for an open position to the atmosphere and only closes when the supply water is turned on. When the supply pressure drops to or below atmospheric pressure (below 0 gauge pressure), the second check valve opens to the atmosphere and, the first check valve closes. As with the AVB, the PVB only provides protection for back-siphonage. Also, it is permissible to install shut off devices down stream of this unit. The PVB is approved for high-hazard, continuous pressure conditions.



Types of equipment that require backflow/back-siphonage protection:

<u>Equipment</u>	<u>Backflow/Backsiphonage Preventer Required in Lieu of Air Gap</u>
Carbonators for beverage dispensers	Carbonator backflow preventer
Lawn sprinkler system with no chemicals added	Atmospheric or pressure vacuum breaker
Flush valve toilets	Atmospheric or pressure vacuum breaker
All hose bibs inside & outside of establishments	Hose bibb-type vacuum breaker
Preflush hose with a nozzle head that may be submerged	Pressure vacuum breaker
Perforated pipe to oriental wok cookers	Atmospheric vacuum breaker
Inlets which are or may become submerged:	
a. Supply inlet to garbage grinder	Atmospheric vacuum breaker
b. Supply inlet to dish table trough	Atmospheric vacuum breaker
c. Fill line for steam kettle	Atmospheric vacuum breaker
d. Supply line for mechanical warewashing machine	Atmospheric vacuum breaker

- | | |
|--|----------------------------|
| e. Supply line to all soap and chemical dispensing units on mechanical warewashing machine | Atmospheric vacuum breaker |
| f. Garbage can washer | Atmospheric vacuum breaker |

APPENDIX G

GUIDELINES FOR SIZING WATER HEATERS

The hot water supply shall be sufficient to satisfy the continuous and peak hot water demands of the establishment. Hot water for handwashing shall be of a temperature of at least 110°F. Hot water for mechanical dishwashing must be 150°F-165°F for washing and 165°F-180°F for sanitizing. The temperature of the wash solution in spray-type warewashers that use chemicals to sanitize may not be less than 120°F. Typically, a water heater with a minimum storage capacity of 50 gallons is required.

Sizing Requirements for Storage Water Heaters

For food facilities that utilize multi-service 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).

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.

For food facilities that handle and sell only prepackaged foods, a water heater with a minimum storage capacity of ten gallons must be provided.

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 below.

Equipment	Hourly Hot Water Demand
Warewashing Sinks	Length X Width X Average Depth X .009765 = gallons per sink Ex) Sink with three 18" x 18" compartments = 42 gallons per sink Sink with three 24" x 24" compartments = 79 gallons per sink
Food Preparation Sinks	5 gallons per sink
Janitorial Sinks	15 gallons per sink
Handwashing Sinks	5 gallons per sink
Pre-rinse Units Hand spray type Other types	45 gallons Refer to manufacturer's specifications for the equipment
Mop Sinks	5 gallons per sink
Clothes Washers 9 and 12 pound washers 16 pound washers	45 gallons 60 gallons
Garbage Can Wash Facility	10 gallons per facility

Employee Shower	20 gallons per shower
Other Fixtures That Utilize Hot Water (i.e. mechanical dishwashers & glasswashers)	Refer to manufacturer's specifications for the equipment

APPENDIX G

The following examples are provided to explain how to calculate the total hourly hot water demand:

- Food facility that utilizes only single service eating and drinking utensils:

1 18" X 18" three compartment sink	42 GPH
2 handwashing sinks	10 GPH (5 GPH each)
1 janitorial sink	<u>15 GPH</u>
	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.

- Food facility that utilizes multiservice eating and drinking utensils:

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 handwashing sinks	10 GPH (5 GPH each)
1 janitorial sink	<u>15 GPH</u>
	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.

Sizing Requirements for Instantaneous Water Heaters

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 assure 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.

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.

Requirements for Booster Heaters

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.

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.

APPENDIX G

WATER HEATER CALCULATION WORKSHEET

EQUIPMENT	QUANTITY	TIMES	DEMAND PER UNIT		GALLONS PER HOUR
Three-compartment sink ¹		X	Size (in inches) by by	=	
Food preparation sink		X	5 GPH	=	
Janitorial sinks		X	15 GPH	=	
Handwashing sink		X	5 GPH	=	
Pre-rinse units		X	45 GPH	=	
Mop sink		X	5 GPH	=	
Cloth washer ²		X	45 or 60	=	
Can wash		X	10 GPM	=	
Dish machine ³		X	See note	=	
Other equipment		X		=	
Other equipment		X		=	
Other equipment		X		=	
Total gallons per hour (GPH) recovery requirements (for 140°F)					
Water heaters must be sized at the 140°F GPH recovery rate for _____ gallons per hour.					
1 – Three compartment sinks demands are calculated by: Length X Width X Average Depth X .009765 = gallons per sink					
2 – Cloth washers demands are: 9 and 12 pound washers - 45 gallons 16 pound washers - 60 gallons					
3 - Dishwasher (_____ gals/hr. FINAL RINSE x 70%)					

Notes

APPENDIX G

SAMPLE CALCULATION

WATER HEATER CALCULATION WORKSHEET

EQUIPMENT	QUANTITY	TIMES	DEMAND PER UNIT		GALLONS PER HOUR
Three-compartment sink ¹	1	X	Size (in inches) 24" by 24" 24" *	=	79
Food preparation sink	2	X	5 GPH	=	10
Janitorial sinks	0	X	15 GPH	=	0
Handwashing sink	5	X	5 GPH	=	25
Pre-rinse units	1	X	45 GPH	=	45
Mop sink	1	X	5 GPH	=	5
Cloth washer ²	1	X	45 or 60	=	45
Can wash	1	X	10 GPM	=	10
Dish machine ³	1	X	See note**	=	52
Other equipment _____		X		=	
Other equipment _____		X		=	
Other equipment _____		X		=	
Total gallons per hour (GPH) recovery requirements (for 140°F)					271
Water heaters must be sized at the 140°F GPH recovery rate for <u>271</u> gallons per hour.					
<p>1 – Three compartment sinks demands are calculated by: Length X Width X Average Depth X .009765 = gallons per sink</p> <p>2 – Cloth washers demands are: 9 and 12 pound washers - 45 gallons 16 pound washers - 60 gallons</p> <p>3 - Dishwasher (____ gals/hr. FINAL RINSE x 70%)</p>					

Notes

* Three-compartment sink demand = 24 x 24 x 14 x .009765 = 78.74 (= 79 GPH)

** Dishmachine -	Hobart AM-14	Final Rinse GPH = 74
		74 gal/hr Final Rinse x .70% = 51.8 (= 52 GPH)

APPENDIX H

Sneeze Guard Design and Installation

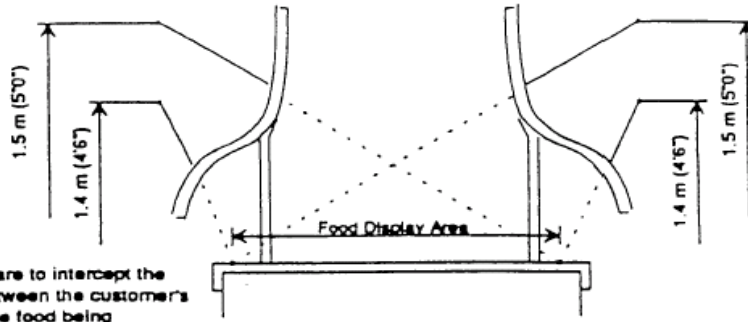
The display of unpackaged foods must be effectively shielded to intercept the direct line between the customer's mouth and the display of food, and shall be designed to minimize contamination by the customer.

- The vertical distance from the average customer's mouth to the floor shall be considered 4 feet- 4 inches to 5 feet.
- Special consideration must be given to the average customer's mouth height in educational facilities and other special installations.
- Shields shall be fabricated of easy-to-clean and sanitary material.
- Edges of glass or other hazardous material shall be trimmed with a smooth protective member or have a safety edge of parent material.
- Where the ends of equipment are designed to allow for customer self service, or customer view, food shields complying with these standards shall be installed.

TYPICAL BUFFET TABLE

customer's average mouth heights on a line perpendicular to the horizontal edge of the buffet table

exposed edges of glass shelves or shields shall have a safety edge of parent material and be trimmed with channels

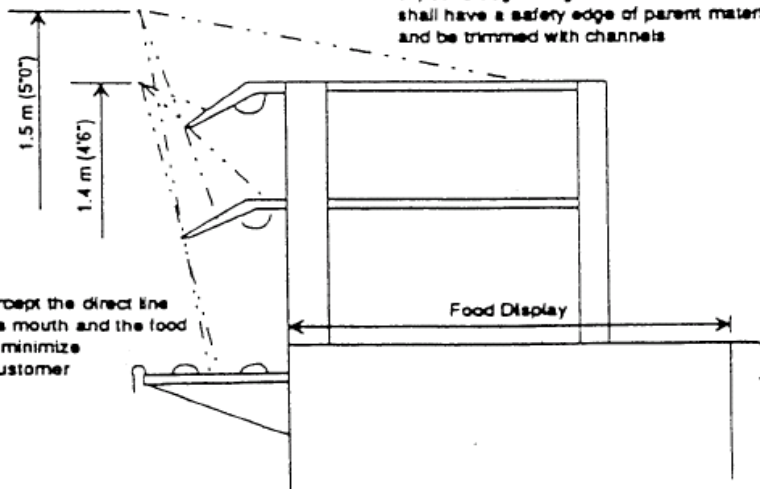


food shields are to intercept the direct line between the customer's mouth and the food being displayed and to minimize contamination by the customer

TYPICAL CAFETERIA COUNTER

customer's average mouth heights on a line perpendicular to the horizontal edge of the tray slide

exposed edges of glass shelves or shields shall have a safety edge of parent material and be trimmed with channels



food shields are to intercept the direct line between the customer's mouth and the food being displayed and to minimize contamination by the customer

FOOD SHIELDS