

DIVISION 13 00 30 - FOOD SERVICE CONSTRUCTION GUIDE

PART 1 - PURPOSE

1. The purpose of this guide is to provide assistance to owners, architects, food service consultants, equipment dealers and contractors in designing food service establishments that meet construction standards requirements, as well as answer some of the most commonly asked questions. Proper design will avoid errors and prevents costly changes after construction has started. This document is NOT a plan review, nor is it a comprehensive list of all regulations and requirements. Additional requirements may be stipulated after review of the proposed facility, menu, layout, equipment and site.
2. The use of commercial products or trade names are indicated “™” and do not imply endorsement by the Health Authority nor bias against those not mentioned.
3. For questions concerning the information in this guide, contact the Environmental Hygiene Officer (EHO) in the Department of **Health Safety and Risk Management (HSRM)**

PART 2 - PLANS AND INSPECTIONS

1. The EHO must approve the plans before any construction may begin.
2. If any changes are proposed after the EHO has approved the plans, additional plans must be submitted in writing to receive approval.
3. The following items must be submitted to the EHO at least 30 days before bids are solicited for constructing, enlarging, altering or converting any building for use as a food service establishment. Preliminary or pre-bid plans may be submitted for consultation.
 - i. One complete set of plans that are drawn to scale, including site, building, floor, plumbing, mechanical, electrical and fire-protection systems. Seating capacity must be indicated as well as circulation space storage square footage.
 - ii. Room and area finish schedules for walls, floors, ceilings and baseboards
 - iii. An equipment layout plan, including complete equipment identification
 - iv. One complete set of elevations and shop drawings for all custom equipment by a fabricator who is listed by an approved third-party testing agency. Millwork fabricators do not have to be listed manufacturers.
 - v. One complete set of equipment specifications that indicates the manufacturer and model number. All food service equipment shall be listed by either NSF International (NSF) or Edison Testing Laboratories (ETL) as meeting applicable NSF standards for sanitation. Food service equipment listed by Underwriters Laboratory (UL) also is approved as meeting NSF Standards 2, 3, 4, 5, 7, 8, 12, 18, 25, 59 and C-2. The EHO must evaluate and approve used equipment prior to installation. All reference to NSF in this document shall include ETL standards by extension.

- vi. One complete set of Heating, Ventilation and Air Conditioning (HVAC) plans, including both dish room and kitchen exhaust ventilation and make-up air quantities (CFM) that adequately plan for latent and sensible heat control in all areas.
4. A completed plan review application with the fee or University of Minnesota project number is required.
5. Plans that are incomplete shall not receive approval.
6. The proposed construction or remodeling shall conform to the Minnesota State Building, Plumbing, Mechanical and Electrical codes. The applicant must obtain all necessary permits and licenses for the establishment from the University Building Code Official.
7. A food service establishment shall not operate without EHO approval and HSRM licensure.

PART 3 - PROPOSED MENU OF ALL PREPARED AND/OR SERVED FOODS

1. Knowledge of a functional flow process must be demonstrated indicating how food will be handled from the time it is received until it is served to the consumer. The flow plan should indicate the relationship of work areas to storage areas and traffic aisles, the sequence of preparation, the handling of soiled equipment and utensils, the separation of dirty areas from clean areas, and the methods used to prevent cross-contamination from raw food, cooked food or ready-to-eat food.
2. Establish appropriate cooling procedures for batch food processing. The availability of adequate refrigeration for both cooling and holding food shall be demonstrated. Special provisions shall be provided to cool potentially hazardous foods to 41 degrees F or lower within the time periods outlined in the Minnesota Food Code.
3. Proof of food manager certification for the establishment manager or registration in an upcoming class is required prior to operation.

PART 4 - FIELD INSPECTIONS

1. An approved set of plans must be maintained at the construction site until final inspection and approval by the EHO. The EHO may make on-site inspections of the facility construction/remodeling or equipment installation.
2. No field changes may be made without EHO approval.
3. Plumbing rough-in work, pre-opening and opening inspections are required. Additional inspections or field consultations may be obtained by calling the EHO. Contact the EHO at least 48 hours before the requested inspection time to schedule an appointment for an inspection.
4. No food for sale or service to the public shall be permitted on the premises until final inspection and the EHO has approved operation.
5. GC shall provide a responsible, responsive single point-of-contact for the food service operator to liaise with from initial punch list inspection through first 6 weeks of the opening of the facility. This person will be responsible to see that punch list items are

completed timely, warranty issues are addressed, and any equipment repair or installation concerns are resolved promptly.

PART 5 - EQUIPMENT

1. All food service equipment shall be constructed to conform to NSF standards regarding design, materials, workmanship and installation.
2. Installation
 - i. **PROHIBITED:** Raised floor platforms where equipment is installed directly over inaccessible waste connections or where equipment cannot be adequately sealed in place.
 - ii. Table-Mounted Equipment: Table-mounted equipment shall be installed in one of the following methods:
 - A. Sealed to the counter or shelf
 - B. Mounted on legs that meet NSF standards of sufficient height to ensure a minimum of 4 inches of unobstructed clearance beneath the unit. The clearance space between the table and table-mounted equipment may be:
 - I. Three inches (7.5 centimeters) if the horizontal distance of the table top under the equipment is no more than 20 inches (50 centimeters) from the point of access for cleaning or two inches (5 centimeters) if the horizontal distance of the table top under the equipment is no more than three inches (7.5 centimeters) from the point of access for cleaning.
 - II. Designed to be portable, weighing less than 30 pounds and equipped with one of the following:
 - a. Flexible utility connections, adequate in length to clean around and behind the equipment.
 - b. Flexible utility connections and quick disconnects. Restrain cables on equipment where needed.
 - iii. Floor-Mounted Equipment: floor-mounted equipment shall be installed in one of the following methods:
 - A. Mounted on legs that meet NSF standards of sufficient height to ensure a minimum of 6 inches of unobstructed clearance beneath the unit.
 - B. Installed with lockable casters, rollers or gliders to permit the unit to be easily moved by one person.
 - C. Sealed to the floor or raised base if the equipment is designed for such installation. Cooking equipment is not permitted to be sealed to the floor.
 - D. For equipment not readily moveable by one person, spacing between and behind equipment must be sufficient to permit cleaning and a minimum of 6 inches of hood overhang. Provide at least 6" of clear unobstructed space under each piece of equipment.

- E. 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.
 - F. When equipment is butted together or spreader plates are used the resultant joint must prevent the accumulation of spillage and debris therein and must facilitate cleaning.
 - G. Equipment open underneath, such as drain boards, dish tables, and other tables should be installed 4" away from the wall or sealed to the wall. Metal legs of all tables and sinks in food preparation areas should be adjustable and made of stainless steel. The under-shelves of food preparation tables should also be made of stainless steel.
- iv. Units installed under item B shall be constructed with flexible utility connections, adequate in length to clean around and behind the equipment or flexible utility connections, restraining cables and quick disconnects. The flexible utility connections must be designed in such a way as to not rest on the floor.
 - v. Reach-in refrigerators and freezers: Reach-in refrigerators and freezers shall be installed on legs that meet NSF standards or on casters.
 - A. A minimum width of 36 inches of aisle space shall be provided in kitchen and wait station design. When there are two opposing workstations, a minimum space of 42 inches is recommended. Work stations should meet ADA counter height requirements.
3. The space between the ceiling and the top of the walk-in refrigerator or freezer shall be effectively closed with a fixed or removable panel. The panel shall be louvered to provide ventilation if the refrigeration compressor is on top. The top of the walk-in shall be able to support the weight of a service person without compromising the ceiling's integrity.

PART 6 - FOOD PREPARATION AREA - GENERAL

1. 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.
2. Provide a separate food preparation area for handling, washing and preparing raw meat, fish, and poultry, if served. Where portable cutting boards are planned, they should be color coded or labeled for specific use.
3. Cleaned equipment and utensils shall be stored in a clean, dry location where they are not exposed to water or food splash, dust, or other contamination.
4. **Food Preparation Sink:** Food facilities are required to have a separate sink for when they are engaged in activities such as washing, rinsing, soaking, thawing, or similar preparation of foods, and shall be located within the food preparation area. The sink shall have an integral drainboard, and have minimum tub dimensions of 18" x 18" by 12" deep. An adjacent work table of similar dimensions may be substituted for the drainboard. A food

preparation sink must drain indirectly through an air gap into a floor sink and must be free standing (not installed in cabinets). Each sink in the foodservice areas shall be clearly labeled as to its intended and appropriate use.

PART 7 - REFRIGERATION

1. Mechanical refrigeration is required to maintain all potentially hazardous foods at 41 degrees F or colder. Equipment shall meet NSF standards.
2. The following requirements shall be met:
 - i. Side, bottom or top breathing air-cooled refrigerated units shall be installed so as to exceed the manufacturer's minimum specified air circulation distances for compressors, in order to be given every opportunity to maximize their function. This applies to ice machines, reach-ins, roll-ins, merchandisers, make tables, under-counter refrigerators, quick chill units, soft-serve ice cream machines, etc.
 - ii. All refrigerated prep table and salad bar units shall maintain potentially hazardous food at the required temperature of 41 degrees F or colder. Such units shall be constructed with an approved wrapped rail design and a separate temperature control device. Refrigeration with demonstrated laminar flow design is acceptable. Insert pans shall be located 1 inch below the top of the unit.
 - iii. Each refrigeration and freezer unit shall have attached thermometers. (Integrally mounted thermometers are required by NSF Standards.) Thermometers shall be scaled to at least 5 degree F increments, and accurate to +/- 3 degrees F.
 - iv. Condensation from refrigeration equipment shall be drained to a floor drain outside of the unit. Otherwise, an evaporator pan shall be provided for condensation.
 - v. The location and installation of refrigeration compressors, other than self-contained units, if any, shall be identified in the plans.
 - vi. The ceilings of walk-in units shall have all penetrations sealed against water leakage.
 - vii. Upon start-up, all refrigerated units shall run and hold temperature for minimum of 72 hours. Walk-in freezer defrost schedules will be programmed after the 72 hour break-in period.
 - viii. Walk-in doors shall be installed to fully seal against air infiltration. Gaskets and floor sweeps shall be installed so as to prevent any air leakage. Doors shall be hinged, squared and balanced so as to assure full, leakless closure.
 - ix. Walk-in units to be connected to University's PSEC for out-of-temp monitoring.

PART 8 - SPECIAL EQUIPMENT

1. A fabricator listed by one of the approved third-party testing agency: NSF, ETL or UL shall construct custom equipment.

2. Dipper-wells with running water are required when bulk ice cream is dispensed. Dipper wells also may be required for other in-use food scoops that are not appropriately stored in the food product. Dipper-wells shall be located adjacent to the proposed area of use. The water line shall have an approved air gap. Refer to UTILITIES. Dipper-wells shall be indirectly wasted to a floor drain with a trapped waste line.
3. Approved dispensers shall be installed for properly storing and dispensing unwrapped single-service items such as cups, straws and toothpicks.
4. If a shelf or other equipment such as a cheese melter is installed over cooking equipment, an angled or coved deflector constructed of stainless steel shall be installed and must be equivalent to NSF standards.

PART 9 - CUSTOMER SELF-SERVICE OR DISPLAY EQUIPMENT

1. Deli display coolers that are not listed as meeting NSF standards must be able to hold potentially hazardous food at 41 degrees F or colder. They also shall be constructed to meet NSF Standard No. 7 for interior materials, and shall be installed on legs meeting NSF standards or on casters, or set on and sealed to a minimum 2-inch solid masonry base.
2. Salad bars, espresso service, food and beverage carts, steam tables and other display equipment shall meet NSF standards. Special provisions for storage and cleaning may be required for portable equipment such as espresso carts.
3. Customer self-service buffets with hot or cold holding units must meet minimum requirements for food contact surface finishes. For example, stainless steel, solid surface or equivalent. Plastic laminate is not acceptable.
4. Salad bars shall consist of mechanical refrigeration, wrapped rails and approved food shields. Salad bars shall be located on a quarry tile floor or equivalent that extends 3 feet beyond or around the edge of the salad bars. The bars shall be indirectly wasted to a floor drain.
5. Food and food containers on display for self-service or otherwise shall be protected from consumer contamination by using easily cleaned counter protector devices, display cases and similar equipment. These devices shall be designed and installed to intercept the direct line between the mouth of the customer and foods on display. Scaled drawings of this equipment shall be submitted to the EHO for approval.
6. Self-service beverage dispensers should be push-button operated. Any cup trip-activated dispensers must be approved by the EHO for self-service beverage dispensing.

PART 10 - JANITORIAL AREA

1. At least one janitorial station shall be provided (more than one janitorial station may be necessary). The food service janitorial station(s) shall not be shared with other building janitorial or housekeeping services.

2. At least one janitorial station shall be provided and designated for the proper storage of maintenance equipment and cleaning supplies. The janitorial station should be conveniently located for maintenance of food service areas, but shall be separated from food preparation and food storage areas. Janitorial stations containing supplies and equipment for cleaning restrooms shall be separate from food service janitorial stations.
3. Janitorial station floor, wall and ceiling finishes shall meet the same requirements as food preparation areas.
4. Each station shall have a janitorial sink for use during food service operations. The janitorial sink shall be accessible during food service operations. A floor level, curb-style sink is preferred. The sink shall be connected to sanitary sewer, and have a hot water and a cold water mixing faucet and back-flow protection (See **PART 19 – UTILITIES, Section 7: Potable Water Back Flow Protection**). Access to the sink shall not be obstructed by stationary equipment such as a water heater, a water softener or a water filter system.
5. Quarry tile or other approved floor finish shall be installed on the floor, extending at least 3 feet in all directions from the fixture. Wall surfaces behind and adjacent to the sink shall be ceramic tile, FRP or other approved finish. The wall surface shall extend at least 8 feet high to accommodate the mop rack.
6. Facilities shall be provided over the janitorial sink for wet mops to drip-dry. A broom rack shall be provided to elevate items such as brooms and dustpans off of the floor.
7. Corrosion-resistant shelving shall be provided in the janitorial area to store cleaning supplies.

PART 11 - BAR FACILITIES

1. **PROHIBITED:** Separate drop-in cold plates in ice bins for cooling beverage lines. All cold plates shall be integrally formed into the unit.
2. At least one hand-washing sink is required that shall be equipped with fingernail brush, dispensable soap and single-service towel dispenser. The dump sink in a four-compartment sink may be designated as a hand-washing sink when immediately adjacent to the wash compartment. Clean glassware, ice bins and food preparation areas shall be protected from contamination with a 12-inch high, stainless steel splash shield that has rolled or smooth-finished edges or by an 18-inch separation space.
3. All refrigeration units shall meet NSF standards. Coolers that meet NSF Standard No. 2 shall be permitted for storing non-potentially hazardous pre-packaged food, or canned or bottled products only. All other refrigerated food shall be stored in a unit that meets the requirements of NSF Standard No. 7. All coolers under the bar shall be on casters or on 6-inch legs that meet NSF standards.
4. A glass washer or three-compartment sink with two integral drain boards is required for washing utensils. A separate dump sink is required. If a four-compartment sink is used, the first compartment may be used as the dump sink.

5. Shielded lighting shall provide at least 20 foot-candles of illumination on food contact and dishwashing surfaces, including areas under the counter. At least 50 foot-candles of illumination shall be provided when cleaning.
6. Ice bins shall be equipped with protective covers constructed to meet the requirements of NSF Standard No. 2, and shall be self-draining into an indirect waste in compliance with Minnesota Plumbing Code, Chapter 4715. Ice for consumption shall be stored separately from ice used for cooling bottles and condiments. Portable beverage units must have a false bottom with a drain.
7. Requirements for liquor storage are the same as requirements for dry food storage rooms. If bar dispensing equipment is installed in the liquor storeroom, requirements for storage are the same as food preparation areas. A floor drain is recommended in this area.
8. All overhead glass storage shall be shielded or separated from customers on the bottom, front and sides.
9. All interior surfaces of the bar shall be covered with either fiberglass reinforced panels or factory-applied plastic laminate.
10. Bar construction shall be a minimum of 2 by 6 water-resistant wood that encloses all plumbing and electrical utilities. A sanitary, integral coved base that is constructed of the same floor material is required.

PART 12 - BEVERAGE DISPENSING EQUIPMENT

1. Beverage lines that extend through a floor or wall shall be installed through a conduit. When through a floor, the conduit shall extend at least 4 inches above the floor. The conduit shall be sealed with a smooth, easily cleaned, fire-stop material. Beverage lines shall be installed so that all parts are suspended at least 6 inches off the floor at all times. Horizontal runs shall be minimized.
2. Carbon dioxide, syrup and all other pressurized cylinders, whether full or empty, shall be chained or secured to prevent tipping. Fixed bulk tanks shall be installed at least 6 inches above the floor on legs. Syrup containers shall be stored on a metal rack 6 inches off of the floor.
3. Beverage dispensing guns, drains and/or parking holsters shall not be installed directly over food, ice or clean glassware. Guns and their parking holsters shall be properly drained or so equipped as to prevent leakage onto food, ice or clean glassware.
4. Approved stainless steel back-flow preventers shall be installed on post-mix carbonated beverage systems. Please specify which of the following approved units will be installed:
 - i. Watts Regulator - Model No. 9BD
 - ii. Carmun Industries - Model No. 77-6050-00
 - iii. Chudnow - Model No. S470 D-VV
5. A back-flow preventer shall be located in the water line between the pump and the carbonator. However, in units that have the pump within an enclosure along with the carbonator, the back-flow preventer shall be located in an accessible and visible location outside the enclosure. There shall be no copper tubing used after the back-flow preventer. A Watts 9BD or alike must be placed on the water supply line to the unit.

6. Doors of closets or BIB rooms containing CO₂ cylinders shall be louvered for ventilation at the top and bottom of the door or shall have a completely louvered door.
7. Electrical sockets, water service and filtration stub outs for countertop dispensing equipment are ideally placed below the countertop and electrical cords and water lines access them via grommeted holes in the counter. Grommeted holes should be placed behind or below equipment to be hidden from patron view.
8. If stub outs cannot be placed below the countertop, they should be placed behind or under equipment so as to be hidden from patron view.

PART 13 - WAIT STATION/CABINETRY WITHIN THE FOOD SERVICE AREA

1. **PROHIBITED:** Enclosed hollow bases in counters.
2. **PROHIBITED:** Food prep sinks or three-compartment sinks installed in plastic laminated counters.
3. **PROHIBITED:** Fountainhead in dark colors.
4. In all areas where food equipment involves heat or moisture or where food comes in contact with the surface, a stainless steel finish or approved equivalent material such as a solid surface polymer is required. All service counters and other horizontal millwork surfaces shall be protected with stainless steel, Cambria™ or a solid surface polymer such as Corian™. Plastic laminate also can be used to cover all exposed wood on vertical surfaces. Finished hardwood may be acceptable on a limited basis for decorative purposes on service and display area equipment.
5. The fabricator shall seal cut outs in millwork in an approved method.
6. All counters shall be on 6-inch stainless steel legs that meet NSF standards or on a solid masonry base.
7. Ice bins shall be equipped with protective covers and shall be self-draining into an indirect waste unit. Waste drain lines shall be insulated where not easily accessible or hidden.
8. A fabricator listed by an approved third-party testing agency shall construct solid surfaces for food-contact such as Corian™, Cambria™ or Gilbraltor™.

PART 14 - ROOM AND AREA FINISHES

1. **Food Preparation and Dishwashing Areas**
 - i. **PROHIBITED:** Abrasive and non-skid quarry tile beneath equipment. Abrasive and non-skid quarry tile is only permitted in walkways.
 - ii. **PROHIBITED:** Fissured, perforated or rough ceiling tile.
 - iii. A scale drawing of the floor shall be provided with design documents indicating locations of floor drains, types of drains and drain covers, and any flush mounted or dog-housed electrical outlets.
 - iv. Slab floors shall meet ASTM E1155-20 standards for flatness (Ff) of Ff 38 minimum local value; and levelness (Fl) of Fl 25 minimum local value. Intentionally formed low spots to aid drainage to floor drains should not be

calculated in the overall Ff/FI score. Intentional inclusion of “basing” for drains shall be indicated on architectural drawings, and the degree of slope, depth, and radius dimension of the basin should be indicated. Testing of floor drain effectiveness will be conducted before the floor is “finished” by pouring water in the immediate vicinity of the drains to assure water flows to the drain.

- v. Floors shall be constructed of smooth, durable, non-absorbent, grease-resistant and easily cleaned material such as seamless poured or troweled epoxy, quarry tile, ceramic tile or terrazzo. Mortar and grout for tiles shall be chemical and water-resistant epoxy material (ANSI 118.3) such as Bostik EzPoxy™, Laticret, Latapoxy™, or Custom CEG 2000™, that does not exceed 1/4-inch wide. Tiles shall be installed flush with the tile brushed grout. Floor materials shall be Slip Resistant: with a coefficient of friction that is 0.60 or greater (wet).
- vi. Floor drains shall be provided in floors that are water-flushed for cleaning or receive discharges of water or other liquid waste from equipment. Floor drains shall be mounted flush with the floor and out of the traffic area. Floor drains may be required by specific food service equipment such as tilting steam kettles and three-compartment sinks. Floor sinks and trench drains, when installed, shall be easily accessible for cleaning, and shall be placed as to fully capture, without oversplash, all liquids which would be poured from such equipment.
- vii. The floor-to-wall juncture shall be constructed with a minimum 4-inch bullnose base with a minimum 1/4-inch radius cove as an integral part of the flooring material. The base shall be consistent with the flooring material. A stainless steel cover base may be acceptable.
- viii. Walls shall be smooth, washable, non-absorbent, light-colored, and constructed with ceramic, stainless steel tile, structural glazed block, structural block painted with epoxy based paint, fiberglass reinforced panels or equivalent. The grout shall be water resistant and flush with the tile. The panels shall be installed to the walls according to the manufacturer’s specifications with no voids. Note: This procedure requires the use of a 1/4-inch notched trowel to apply adhesive over the entire surface, and the installation of proper batten strips and fasteners. The finish material shall be applied from floor to ceiling, but not less than 8 feet in height.
- ix. Approved insulated stainless steel or fire-rated materials shall be installed in accordance with NSF standards behind cooking lines from 1-inch above the bottom of the exhaust hood to overlapping the top of the base. Ceramic tile may be permitted in low-heat applications. Refer to the University Building Code Official for fire-rating requirements.

- x. Areas subject to extensive moisture or splash shall have wall substrate constructed of a water-resistant material such as Durarock™, Wonderboard™ or equivalent. Such areas include those with a three-compartment sink, pre-rinse arm station, janitorial station, soiled dish side of a dish machine, or cart wash area.
- xi. Ceilings shall be smooth, non-absorbent, light-colored, and capable of withstanding frequent cleaning. Smooth, vinyl-clad or painted sheet rock may be used.
- xii. Post-tensioned floors shall be mapped with all floor penetrations indicated, and indications where floors could be further penetrated if needed.

2. Dry Storage Room

- i. Floors shall be constructed with a minimum of 1/8-inch vinyl composition tile or other durable, non-absorbent, easily cleaned material.
- ii. The floor-to wall juncture shall be constructed with a minimum 4-inch bullnose base with a minimum 1/4-inch radius cove as an integral part of the flooring material. The base should be consistent with the flooring material.
- iii. Walls shall be constructed with a smooth, light-colored finish that is easily cleaned. Semi-gloss painted sheet rock that is water-based or oil-based may be used.
- iv. Ceilings shall be smooth, light-colored, and easily cleaned. They should be of a height that is 30 inches or greater higher than the top shelf of the shelving to be used in that space.

3. Walk-In Refrigerators/Freezers

- i. **PROHIBITED:** Vinyl bases for walk-in refrigerators and freezers.
- ii. **PROHIBITED:** Floor drains in walk-in refrigerators and freezers.
- iii. The interior finish of walk-in coolers or freezers shall meet NSF standards. However, a galvanized finish is not recommended for the interior of walk-in coolers.
- iv. Walk-in coolers or freezers installed without prefabricated floors shall have a terrazzo or quarry tile floor or equivalent. Floor in walk-in freezers may be galvanized or be applied with one of the above-listed finishes. In beer coolers, diamond plate aluminum is recommended as an acceptable finish using 1/4-inch radius coved stainless steel base. An insulated floor is required for walk-in freezers.
- v. A base is required that shall be either coved stainless steel, coved vinyl screed flush with the floor or a material that matches the finish of the cooler floor. A quarry tile base may only be used when placed against a rigid foam-filled cooler/freezer wall with the screed securely fastened to the floor. The base shall have a 1/4-inch radius at the floor juncture and be sealed to the floor.
- vi. Shelving shall be corrosion-resistant and meet NSF standards for refrigerated storage use.
- vii. All condensate drainage lines must be plumbed to an approved floor drain outside of the walk-in cooler.

- viii. Waterproof fluorescent light fixtures in the center of the walk-in cooler/freezer are required.
 - ix. External power cords to the doors, which serve the window heaters, shall be of sufficient length to allow full opening of the door, and shall be installed so as to prevent pinching of the cord between the door and the jamb.
4. **Wait Areas**
- i. The floor material underneath and extending outward a minimum of 3 feet from the counter at any food pick-up station or station equipped with plumbing shall be constructed of durable, non-absorbent and easily cleaned material.
 - ii. Wait stations without plumbing connections may use the dining room finishes.
 - iii. The floor-to-wall juncture shall be constructed with a minimum 4-inch bullnose base with a minimum 1/4-inch radius cove as an integral part of the flooring material. The base shall be consistent with the flooring material.
 - iv. Walls shall be non-absorbent, easily cleaned and durable.
 - v. Ceilings shall be smooth, light-colored and easily cleaned. However, wait stations located within a dining room can share the same decorative ceiling.
5. **Bars**
- i. Floor and base materials shall meet the same requirements as stated in PART 14 – ROOM AND AREA FINISHES, Section 1: Food Preparation and Dishwashing Areas
 - ii. The interior of the bar die shall be covered with either fiberglass reinforced panels or factory-applied plastic laminate.
 - iii. Ceilings shall be smooth, non-absorbent, light-colored and washable.
 - iv. The bar shall be constructed with a minimum 2” by 6” water-resistant wood enclosure for all utilities. A sanitary, integral coved base constructed with the same floor material is required.
6. **Toilet Rooms:** All floors, bases, walls and ceilings in toilet rooms shall meet the same requirements as stated in PART 14 – ROOM AND AREA FINISHES, Section 1: Food Preparation and Dishwashing Areas. The only exception is that required wall finish material shall be at least 4 feet high.
7. **Dining Rooms:** Floors may be covered with carpet, provided it is of commercial, closely woven construction.

PART 15 - STORAGE FACILITIES

1. Space Provided

- i. Adequate space shall be provided for dry storage, including storage for food, single-service articles and utensils. The minimum area required shall be based upon the guidelines established by the FDA Food Establishment Plan Review Guide. The area shall be equipped with approved shelving for storage. It shall not include floor area where desks, equipment, ladders or other items may be placed.

- ii. Additional storage space shall be provided for single-service articles at establishments that contain extensive take-out food items.
 - iii. Additional **secureable** space shall be provided for storing liquor and **alcoholic** beverages.
 - iv. Soiled utensils, equipment and linen shall be stored in a designated area to prevent contamination of food, equipment, single-use items and other surfaces.
 - v. Designated spaces or partitioned areas shall be provided to store chemicals **and combustibles**. The required janitorial sink area is recommended for storing chemicals.
 - vi. A designated storage area shall be provided for refuse, **compostable materials** and recyclable materials. The University Waste Management and Recycling Division must approve the design of the area, which shall be compatible with the other waste-handling processes of the building or building complex.
2. **Shelving**
- i. Shelving shall meet NSF standards and shall be listed by an approved third-party testing agency. Shelving used in areas subject to moisture, corrosion or similar environmental conditions shall be constructed with materials that are resistant to these factors. Examples of such areas include refrigerators, wet utensil storage and chemical storage. Chrome-plated shelving is acceptable in all other areas.
 - ii. For shelving that is 36 inches or less in depth, the lowest shelf shall be at least 6 inches above the floor. For shelving that is more than 36 inches in depth, the lowest shelf shall be at least 12 inches above the floor.
 - iii. In a warehouse, factory-sealed bulk packages may be stored less than 6 inches above the floor on approved dollies, racks or pallets if equipment is provided for moving these items.
 - iv. Shelving shall be installed so that clean and sanitized utensils and equipment, single-service and single-use items, and clean linen shall be stored at least 6 inches above the floor in an approved clean, dry location that is not subject to splash, dust or other contamination.

PART 16 - HANDWASHING FACILITIES

1. **PROHIBITED:** Hot water temperature for hand sink faucets that exceeds 125 degrees F.
2. A minimum of one hand-washing sink that is easily accessible to all employees shall be provided. The number of hand sinks required is determined by a number of factors, including size of facility and employee accessibility. All hand-washing sinks shall be located within 15 feet of a workstation.
3. A splash shield may be required to protect food preparation areas, clean glassware storage and ice bins. The splash shield shall be constructed with stainless steel and be a minimum

of 12 inches high or spaced 18 inches from a protected area. It shall be securely fastened to the wall and countertop or sink with a 1/8-inch radius cover.

4. Each hand-washing sink shall be provided with either a single faucet supplied with tempered water through a mixing valve, single control valve faucet or a combination faucet. Hot water at the tap must be a minimum of 110 degrees F. Self-closing faucets, slow-closing faucets or metering faucets shall provide a flow of water for at least 20 seconds without the need to reactivate the faucet. Wrist blade handles, foot-activated, **knee activated** or automatic faucets are recommended.
5. Dispensable soap, fingernail brush and single-use towels shall be provided at each handwashing sink. Sanitary towels shall be provided in permanently installed, enclosed dispensing devices at each hand-washing sink. If disposable towels are used, waste receptacles shall be near the hand-washing facilities.
6. All hand sinks must be securely mounted to the wall with the proper backing materials.

PART 17 - EMPLOYEE AREA

1. Provide changing/dressing areas for food service employees, including lockers for secure storage of employee clothing and personal belongings. These areas shall not be located within areas used for food preparation, food storage, food service, dishwashing or utensil storage.
2. Designated employee break areas are not required. Employees are expected to take breaks in the dining areas, not in food-handling and storage areas.

PART 18 - TOILET ROOMS

1. Toilet facilities for employees shall be conveniently located and accessible to employees at all times. Separate toilet rooms shall be provided for each gender when there is the possibility of five or more employees present at one time. Toilet facilities for the public, if provided, shall be accessible without entering food preparation, food storage or dishwashing areas.
2. Hand-washing sinks shall be conveniently located within or immediately adjacent to all toilet rooms or vestibules.
3. Toilet rooms shall be completely enclosed and shall have solid, tight-fitting, self-closing doors.
4. Toilets and urinals shall be equipped with anti-siphon ball cock assemblies in the tank.
5. Flush valves shall be equipped with vacuum breakers.
6. Each toilet room shall be equipped with an exhaust fan vented to the outside.
7. Women's toilet rooms shall have a minimum of one covered waste container for sanitary napkin disposal. One waste container per stall is recommended.
8. Toilet rooms shall not be used for storing any food or food-related materials.
9. SAC counts with the City of Minneapolis shall be planned for with all new or renovation construction which includes toilet rooms.

PART 19 – UTILITIES**1. General**

- i. All plumbing shall be installed in accordance with the Minnesota State Plumbing Code.
- ii. All utility lines or pipes such as electrical, gas, water or waste shall be enclosed. When necessary, exposed utility lines shall be at least 1/2-inch off the wall and 6 inches above the floor or attached to the bottom of the equipment. Where lines go through walls, the openings shall be sealed. Horizontal runs must be kept to a minimum of 5 feet. Concrete curbing may be required when bringing utilities through the floor.
- iii. Water and/or waste lines shall not be located directly above food preparation, food display, food storage, dishwashing or storage areas.
- iv. If water and/or waste lines must be installed over any area listed above, they shall be equipped with a functional seamless pan or gutter that is open at the end and pitched to carry any leakage or condensation away from any listed area.
- v. Floor or counter drains shall be accessible for cleaning.

2. **Water Supply:** An adequate supply of potable water for the food service establishment shall be provided from a municipal water supply or from a non-community public water supply that meets the requirements of the Minnesota Well Code, Chapter 4725. A permit for constructing a well is required.

3. Water Heater

- i. A water heater that meets NSF Standard No. 5 shall be provided and appropriately sized for the operation. The unit shall be installed on 6-inch legs, a solid masonry base or an elevated platform.
- ii. The water heater shall be sized according to the guidelines of the FDA Food Establishment Plan Review Guide. Any facilities using a dish machine shall provide enough hot water to meet the maximum demand for that model of machine with adequate reserve for other fixtures.
- iii. Hot water shall be circulated again if the primary water heater is remotely located.

4. **Sewage Disposal:** All water-carried sewage shall be disposed to a municipal sewer system or to an on-site septic sewage disposal system that meets the requirements of Minnesota Pollution Control Agency, Chapter 7080. A permit for constructing an on-site system is required.

5. Grease Traps/Interceptors

- i. Devices used for removing grease shall be installed if required by the local building or sewer authority. If recommended, grease interceptors should be installed outdoors in an easily accessible location for maintenance.
- ii. If a grease interceptor cannot be installed outdoors, a recessed grease trap shall be installed in the following manner:
 - A. The device shall be located as far as possible from food preparation areas.
 - B. The lid shall be mounted flush with the floor.
 - C. The minimum inlet and outlet shall be 3 inches in diameter.
 - D. The device shall be constructed with durable, corrosion-resistant materials.
 - E. The lid shall be watertight and securely fastened in place.
 - F. The lid and baffles shall be accessible for maintenance.
- iii. .

6. Potable Water Back Flow Protection

- i. All back flow devices shall be installed in accordance with the Minnesota State Plumbing Code.
- ii. Water inlets shall have an air gap between the water inlet and the flood rim of the fixture. The air gap shall be two times the diameter of the water inlet or faucet. Any water inlet or faucet that does not meet this requirement shall be considered a submerged inlet. Any water inlet to which a hose can be attached shall be considered a submerged inlet.
- iii. Vacuum breakers shall be installed on any submerged inlets such as toilets, urinals, dish machines, garbage grinders and any threaded water outlets.
- iv. Double check valves with atmospheric vents or reduced zone back flow preventers are required on any water outlet on which a vacuum breaker cannot be installed after the last shut-off valve or solenoid switch, such as pressure spray hoses.
- v. A back flow preventer shall be located in the water line between the pump and the carbonator.
- vi. Water supply lines to janitorial stations with faucets connected to chemical feed devices, and which are equipped with faucets to which hoses may be attached, shall have approved double check with atmospheric vent back flow devices such as a Watts 9D *M* series.
- vii. Chemical-dispensing systems shall have approved back flow devices such as Watts 800™ series.

7. Indirect Waste Connections

- i. **PROHIBITED:** Hub drains.
- ii. **PROHIBITED:** Drains installed inside cabinets.
- iii. **PROHIBITED:** Indirect waste pipes that discharge into prep sinks or three-compartment sinks.
- iv. **PROHIBITED:** Floor drains inside smokehouses or proof boxes.

- v. An indirect waste discharges waste through an air gap into the sewer system. Refrigeration equipment, including walk-in coolers and freezers, potato peelers, ice machines, steam tables, steam cookers, ice bins, salad bars, dipper wells and other similar fixtures shall be indirectly wasted through a p trap or v trap to the sewer.
- vi. Indirectly wasted fixtures shall discharge to a floor drain as close as possible to the fixture, but not more than 5 feet away.
- vii. The air gap between the indirect waste and the building drainage system subject to negative pressure shall be at least twice the effective diameter of the drain served, but no less than 1 inch. All other air gaps shall be at least 1 inch.
- viii. Receptors that receive indirect waste shall be installed in accessible and ventilated areas. They also shall be designed and sized to prevent overflow and splashing.

PART 20 - UTENSIL WASHING AND SANITIZATION

1. **General:** A minimum of one hand-washing sink that is easily accessible to all employees shall be provided in dishwashing areas.
2. **Manual Dishwashing**
 - i. A dishwashing three-compartment sink with integral drain boards on each end is required. The sink shall meet NSF standards. Each compartment shall be large enough to allow the largest utensil to be completely submerged. Each drain board shall be at least as large as two compartments.
 - ii. A scrapping area is required. Examples include a garbage can, a scrapping block or a scrapping sink with a spray arm and a strainer or disposal. A disposal shall not be installed in a drain board or in any compartment of a three-compartment sink. A four-compartment sink with a disposal in the first compartment is recommended for scrapping. The first compartment of a four-compartment sink shall be shallow to accommodate disposal, and to ensure that it is at least 6 inches off the floor when installation is completed.
 - iii. Facilities shall be provided when hot water is used for sanitation.
 - A. An integral heating device or fixture that meets NSF Standard No. 5 shall be installed in or under the sanitizing (third) compartment of the three-compartment sink. The device shall be capable of maintaining a minimum water temperature of 171 degrees F.
 - B. A numerically scaled indicating thermometer that is accurate to +/- 3 degrees F shall be conveniently located near the sink so the water temperature can be checked frequently.
 - C. Dish baskets shall be designed and large enough to allow utensils to be completely submerged in hot water.
3. **Mechanical Dishwashing**
 - i. A dish machine is recommended for reusable dishes, flatware or glassware. It may be required for a large operation.
 - ii. General Requirements

- A. All spray-type dish machines shall conform to NSF Standard No. 3.
 - B. A scrapping area is required. Examples include a scrapping sink, a scrapping block, a garbage can or a spray arm with either a strainer or disposal.
 - C. A soiled dish table of adequate size for the proper handling of soiled utensils prior to washing shall be provided. The soiled dish table shall not drain into the washing compartment of the dish machine. A table scupper shall be installed across the entire flat section of the table to prevent soiled water and debris from draining into the wash tank.
 - D. Every dishwashing installation shall be provided with a clean dish table. This installation shall provide room for the temporary storage of utensils and racks immediately after being removed from dish machines. Hot water sanitizing machines, except machines under the counter, require a drying space for a minimum of three dish racks. Chemical sanitizing machines require a drying space for a minimum of five dish racks, exclusive of overhead shelves. The clean dish table shall be sloped to drain into the machine. In a limited food service operation, separate soiled and clean areas shall be provided adjacent to a machine under the counter.
 - E. Easily readable, numerically scaled, indicating thermometers that are accurate to +/- 3 degrees F shall be provided that indicate the temperature of the water in each tank of the machine, as well as the temperature of the final rinse water as it enters the manifold.
 - F. A pressure regulator designed to withstand scalding temperatures shall be installed so the flow pressure is not less than 15 psi or not more than 25 psi.
 - G. A thermometer and pressure gauge are required on the final rinse line. The pressure gauge shall be installed after the pressure regulator. The gauge cock shall be equipped with standard threads on which a pressure gauge may be attached to check flow pressure. A pressure gauge is not required for a dish machine that uses a pumped rinse.
 - H. Mechanical exhaust ventilation shall be provided over all dish machines (except under the counter and bar-glass washers) to effectively remove steam and vapors.
 - I. If a dish machine does not have a powered rinse, a separate three-compartment sink shall be required if larger utensils are being used in operation.
- iii. Chemical sanitizing machines shall meet all criteria listed under General Requirements. A sanitation alert system shall be installed that automatically warns the user via a **warning light** in a visible location or an **audible alarm** that the sanitation supply has been depleted.
 - iv. Hot Water-Sanitizing Machines
 - A. Hot water sanitizing machines shall meet all criteria list under General Requirements.

- B. A booster heater that meets the requirements of NSF Standard No. 5 is required if a special high-temperature water heating system is not installed. The booster shall be able to heat warm water that ranges from 120 degrees F to 140 degrees F to higher temperatures that range from 180 degrees F to 195 degrees F for final rinse for the dish machine. The heater size shall be determined by the demand rise of the dish machine.
 - C. A readily visible thermometer shall be installed on the service line just before the booster heater in addition to the thermometer required on the final rinse line.
 - D. The water heater and the booster heater shall be installed as close as possible to the machine to avoid heat loss in the lines.
 - E. The hot water system shall be designed so hot water is delivered to the final rinse when the rinse valve opens. For machines designed for intermittent operation, this will require special arrangements. When the length of the line from the booster to this type machine exceeds 5 feet, the system shall circulate again.
- v. Dish return units in dish rooms shall be designed and installed to provide drip catchment troughs underneath the entire belt.
- A. Troughs shall have an active water wash system to fully flush the troughs during dish belt use. Water flow is to be of adequate volume and pressure, and delivered in a spray fashion which fully covers the surface of the drip trough.
 - B. All drains under dish belt are to have removable, spring tension, beehive drain strainers, made of stainless steel
 - C. The drip pans under the entire length of all conveyors slope a minimum of 1/2 inch per linear foot toward nearest drain. (Actual slope, not averaged). The trough shall be flat, not “bellied” so that the flushing spray will cover the entire surface of the trough bottom.
 - D. A one minute delay on the water spray should be included to assure drip catchment troughs are clean after belt stops.
 - E. All drain sumps, swill sinks, belt washer, and conveyor gear housings to be fully accessible for cleaning
 - F. Under belt cleaning accessible through hinged doors or removable panels. **Panels or doors must be of a waterproof material.**
 - G. Disposal shall be accessible all around for cleanability
 - H. Minimum 6 inches of clearance from walls, other equipment for cleanability.
 - I. **Roller racks are to have rollers that can be easily removed for cleaning.**
4. Terminus of dish belt at dish machine shall ideally be at the same height as dish machine and an immediately adjacent “landing place” provided for dirty stacked dishes awaiting loading onto the dish machine.
- i. A stainless steel removable bridge shall be provided to bridge the 6” cleaning gap between dish machine and dish belt conveyor structure

- ii. Drive belts attached to drive motors are to be of stainless steel.
- iii. Dish belt start/stop accessible at both ends of the dish belt, inside the dish room.
- iv. Control panels and belt drive motor housings are water tight, even for lateral spray (not just overhead drips)
- v. The space where the conveyor belt emerges in the public area must be fully accessible for cleaning and lubrication
- vi. The underside of dish belt is to be sound deadened.
- vii. All corners coved, all welds polished.
- viii. Height adjustable legs (+/- 1¾ inches). 16 gauge SS, 5/8” diameter legs and cross rails, fully welded and polished

PART 21 - SOLID WASTE, COMPOSTABLE AND RECYCLABLE MATERIALS

1. Storage Areas

- i. A sufficient area shall be provided for storage of waste and recyclable materials including space for the storage of source separated organics (SSO). The amount of space needed and container requirements for SSO will be based on the program needs. The area shall be separated from food preparation and storage areas. This is an evolving program, therefore it is important to contact Waste Abatement Services for details and specifications.
- ii. Outside storage and handling areas shall be located on a smooth, nonabsorbent material such as sealed concrete. Asphalt is not recommended.
- iii. Liquid waste from compacting shall be disposed as sewage. The drain when installed shall be connected to the sanitary sewer and the local sanitary district consulted.
- iv. If an exterior garbage or compostables enclosure is proposed, it shall be constructed of durable, non-absorbent materials, and provided with a washable finish capable of withstanding frequent cleaning. Enclosures shall meet local zoning and building codes.
- v. Interior compostables or garbage storage/refuse rooms and recycling rooms shall meet the same room and area finish requirements as stated in Part 6 - FOOD PREPARATION AREA, and shall be equipped with hot and cold running water and a floor drain. Interior compostables or garbage rooms shall be maintained at a temperature of 50 degrees F or lower. Exhaust ventilation shall be provided to the exterior of the building. Note: Minnesota Statue 326B.106 Subd 5 requires recycling rooms in all new or remodeled facilities.

2. Containers

- i. Sufficient containers with tight-fitting covers shall be provided to contain any garbage, refuse, composting, or recycling materials in a nuisance-free manner until a disposal company can remove it.
- ii. Compactors shall be of tight construction, and be able to contain any liquid deposited in them. Smaller compactors in the food service area must meet NSF standards.

PART 22 - LIGHTING**3. Illumination**

- i. Any room or area in which food or beverages are prepared, other than alcoholic beverages, or in which utensils are washed, should be provided with at least 50 foot-candles measured 30 inches above the floor. Seventy foot-candles are recommended. This requirement includes cooking equipment under hoods. Lighting should be over work areas with shadows cast toward the aisles.
- ii. The interior of walk-in coolers and freezers should contain at least 10 foot candles measured 30 inches above the floor. Twenty foot-candles are recommended. Compliance with this recommendation usually requires a minimum of two fixtures. Lighting in walk-in coolers shall be placed so it is not obstructed by the normal storage of food on the shelves. Low-temperature fluorescent lights are recommended.
- iii. All bar sinks should be provided with at least 20 foot-candles of light directly over the sink units all of the time during operating hours. At least 50 foot-candles of available lighting should be provided in the general bar area for cleaning.
- iv. All other rooms or areas shall be sufficiently lighted throughout with not less than 20 foot-candles measured 30 inches above the floor.
- v. Food and utensil storage rooms, toilets and dressing rooms shall be provided with at least 20 foot-candles of light measured 30 inches above the floor.
- vi. Enclosed work spaces that do not have natural sunlight are to be supplied with full spectrum lighting.
- vii. Light switches and electrical breakers are to be clearly labelled as to function and location of the equipment or lights they control.

4. Breakage Protection

- i. All light fixtures in food preparation, food display, food service, food storage, dishwashing and utensil storage areas shall be either recessed or enclosed to prevent breakage. Tempered or shatterproof, coated bulbs also are acceptable.
- ii. Infra-red or other heat lamps shall be protected against breakage by a shield that surrounds and extends beyond the bulb, leaving only the tempered face of the bulb exposed.

PART 23 - INSECT AND RODENT CONTROL

1. **Outside Food Service Openings: Drive-Up, Drive-Through and Walk-Up Windows:**
The counter surface of the pass-through window shall be smooth and easily cleaned.

Window slide channels shall be open-ended for easy cleaning. Windows shall be equipped with a self-closure device.

2. **Delivery Doors:** All delivery doors leading to the outside shall be self-closing and tightfitting **by means of floor sweeps and astragals that prevent rodent intrusion**. All overhead delivery doors should be provided with an overhead curtain of air or other means to control flying insects.
3. **Entrance Doors:** All customer doors **leading to the outside** shall be self-closing and tightfitting **by means of floor sweeps and astragals that prevent rodent intrusion**.
4. **Windows:** All windows that can be opened, except self-closing pass-through windows, shall have at least 16-mesh-per-square-inch screening.
5. **Building:** All foundations shall be constructed to preclude the entrance of rodents. All building vents shall be covered with a minimum of 16-mesh-per-square-inch wire screen. Openings into the foundations and exterior walls for pipes, wires or conduits shall be sealed. Where conduits or pipes enter a wall, ceiling or floor, the opening around the line shall be tightly sealed.
6. **Pest Control for New or Renovated Food Facilities:** Procedures shall be reviewed with the Environmental Hygiene Officer at the beginning of the construction process. The procedures may be omitted if so directed by the Environmental Hygiene Officer. Refer to Division 1 – Section 01 57 16 Temporary Pest Control for complete information.

PART 24 - LAUNDRY FACILITIES

1. If provided, laundry facilities shall be located in a separate area. Laundry operations may be conducted in a storage room that contains only packaged foods. Laundry facilities shall not be located in toilet rooms.
2. Laundry facilities shall be installed on a reinforced curb. If a washing machine is provided, a dryer shall be installed. The dryer shall be vented to the outside.
3. See PART 15 - STORAGE FACILITIES for information regarding clean and soiled linen storage.

PART 25 - VENTILATION

1. All cooking equipment that produces grease vapors, steam, fumes, smoke or odors shall be located under an exhaust ventilation system. Refer to the Minnesota Food Equipment Ventilation Guidelines for further information and examples of equipment requiring ventilation available from the EHO.
2. All installations shall be installed in complete accordance and as specified by building department requirements, including the current Uniform Mechanical Code with Minnesota amendments compliance with National Fire Protection Association (NFPA) Standard No. 96.
3. **Plans**
 - i. Plans submitted to the University for new ventilation systems or major modifications shall be drawn to scale and shall contain the following information:

- A. Dimensions of hood(s) . Hood canopy dimensions shall be sized to accommodate the space needs for the gas, plumbing, steam, condensate drain lines, electrical lines, or blower motors which are typically at the back of the equipment, and still provide the requisite overhang.
- B. Type of hood(s) such as canopy, island, back-draft and compensating
- C. Plan with equipment locations
- D. Cross-section elevation of equipment and hood(s) drawn to scale.
- E. Total quantity of exhaust for each hood in cubic feet per minute.
- F. Total static pressure.
- G. Grease filters:
 - I. Type and number
 - II. Manufacturer name and model number
 - III. Manufacturer's recommended air velocity in feet per minute
 - IV. Net dimensions in inches
 - V. Copy of manufacturer's catalog cut sheet

H. Balance schedule

4. Design and Construction

i. General

- A. The design of the exhaust system shall minimize exposed bracing, channels, crevices or other areas where grease, dirt and similar materials may accumulate.
- B. Systems shall be designed so they do not interfere with normal combustion processes and/or exhaust of the combustion products from commercial cooking equipment or heating equipment.

ii. Hoods

- A. All hoods and components shall be fabricated or otherwise constructed of materials that comply with the applicable requirements of NSF Standard No. 2.
- B. All joints shall be structurally sound without the use of solder. Joints and seams that are exposed on surfaces of the plenum, hood or other portions of the system containing exhaust air shall be sealed.
- C. Gutters are not required around the lower edge of the hood. Gutters, if provided, shall be easily cleaned. Drip pans, when used, shall be located outside of the plenum and shall be so arranged that grease or condensation accumulations can be easily cleaned.
- D. Lighting shall be installed to provide a minimum of 50 foot-candles measured at the cooking surface. Seventy foot-candles are recommended. Light fixtures, if located inside the hood, shall be fire-resistant, vapor-proof, and shall meet requirements of NSF Standard No. C-2 and UL electrical safety standards.

- iii. Filters and extractors
 - A. For grease/Type I hoods, all exhausted air, before entering the ductwork, shall pass through easily removable and washable grease filters or approved extractors.
 - B. Grease filters shall be sized according to the manufacturer's recommendations for optimum total grease removal efficiency, optimum air movement, total quantity to be exhausted and air velocity.
 - C. Grease filters shall be constructed of non-combustible materials. Grease filters shall be installed in frames, racks or holders to minimize air bypass with a continuous surface-to-surface contact between filter frames and mounting frames. Grease filters shall be easily removed for cleaning without using tools.
 - D. Grease filters shall be large enough to pass through a dish machine or be cleaned in a pot sink.
 - E. Grease filters shall be installed at a 45-degree to 60-degree angle from horizontal.
 - F. Grease extractor reservoirs shall be able to transport extracted grease safely and easily to a collecting device outside the hood cavity. The collecting device shall be constructed with metal and be located at least 6 inches above the floor. The collecting device shall be easily removed for cleaning.
- iv. Ducts
 - A. All ducts shall be smooth, easily cleaned, durable, liquid-tight and made of a corrosion resistant metal.
 - B. All ducts should be constructed with a minimum of bends.
 - C. Multiple take-off ducts are required for all hoods longer than 12 feet. Where required, they shall be equally spaced, but not serve more than a 12-foot section. On all hoods having multiple take-off ducts, each duct shall have a maximum radius of influence of 4 feet or shorter.
 - D. Clean-outs or access panels shall be provided every 10 feet in a horizontal exhaust duct, and at every change in direction. Openings shall be at the sides and large enough for cleaning and inspecting. In horizontal sections, the lower edge of the opening shall not be less than 1-1/2 inches from the bottom of the duct. Covers shall be made of the same material, and be grease-tight and liquid-tight when in place. Note: Depending on size and other factors, the EHO in consultation with the mechanical inspector may reduce the number of access panels.
 - E. Clean-outs or access panels shall be provided every story on the vertical exhaust duct. Openings shall be at the side and large enough for cleaning and inspecting. Covers shall be made of the same material, and be grease-tight and liquid-tight when in place. Note: Depending on size and other factors, the EHO in consultation with the mechanical inspector may reduce the number of access panels.

F. Fans: The fan(s) shall be designed and sized to remove the total quantity of exhausted air at a specified static pressure as determined by the type of hood installation and based upon the minimum requirements of the **most current California Mechanical Code**

5. Performance

- i. The open-faced area of the hood as required by the Uniform Mechanical Code, Section 2003 shall determine the exhaust volume quantity of the entire system. A minimum of 50 feet per minute (fpm) capture velocity at the cooking surface/level shall be maintained regardless of the type of exhaust system used. There are different minimum velocities for different types of cooking equipment. For example, a stove/griddle has a 50-fpm capture velocity, a fryer has a 75-fpm capture velocity and a broiler has a 150-fpm capture velocity.
- ii. The velocity in a grease duct serving a Type I hood shall be a minimum of 1,500 fpm and a maximum of 2,500 fpm.
- iii. **Performance Testing:** For new construction, the contractor may be required to engage a separate contractor to test the Class I duct work for liquid-tightness as required by **the most current California Mechanical Code**. For new duct work which is tied into or connected to existing duct work, liquid tightness testing will be required per the preceding. The EHO must approve of the separate contractor. The owner's representative and the EHO shall witness the test. All joint seams that leak shall be re-welded and tested for liquid-tightness. The EHO shall witness the test for acceptance.

6. Installation

- i. **PROHIBITED:** Sleeved pipes.
- ii. The bottom edge of the hood shall be between 78 inches and 84 inches above the floor. The bottom edge of the hood shall not be greater than 48 inches above the cooking surface.
- iii. All open sides of the hood shall overhang all cooking units by at least 6 inches. Space for utility lines should be provided behind equipment.
- iv. Hoods and ducts shall be installed with a minimum clearance of 18 inches from combustible construction. Hoods shall be closed and flashed solid with approved metal to the ceiling or wall. The space from the back of the hood to walls constructed with sheet rock shall be at least 3 inches.
- v. The distance between the lowest edge of a grease filter or extractor and the cooking or heating surface shall be:
 - A. 2 feet or more for exposed and unexposed flame units
 - B. At least 3-1/2 feet for charcoal and char broiler units.
- vi. All piping and/or electrical conduit shall be installed outside the hood. Piping and/or electrical conduit shall be installed inside the wall directly behind the equipment it serves. Horizontal runs of piping and/or electrical conduit shall be minimized and shall not exceed 5 feet in length.
- vii. There shall be no horizontal piping or fusible links below the filter area in the hood.

- viii. Horizontal piping used for fire protection shall be placed above the hood or in the plenum area. Fire protection pipes above cooking equipment in a hood shall be chrome-plated or stainless steel with no more than 1/2-inch of exposed threads.
7. Make-up Air
- i. All exhaust systems shall be provided with sufficient make-up air equal to or slightly less than the total quantity to be exhausted. Make-up air shall be tempered.
 - ii. The volume or velocity of make-up air that enters the kitchen area shall not interfere with the exhaust system, create discomfort to the employees or dining patrons, decrease the temperature of hot food or interfere with refrigeration systems.
 - iii. Make-up air shall be evenly distributed along the hood perimeter if the makeup air is directly adjacent to the exhaust hood and shall have a low enough velocity as to not cause turbulence in the hood's draw.
 - iv. Air exhausting devices shall be interlocked with make-up air controls so they cannot be operated independently.
 - v. Dining, kitchen and other food service spaces shall be ventilated so as to have a slight negative pressure.
 - vi. HVAC for dish rooms must take into account the latent and sensible heat and humidity loads of:
 - A. Open pot sinks with dozens of gallons of hot water ranging from 110 to 140F;
 - B. The dish machine wash and rinse tank reservoirs of 40-50 gallons of hot water between 90 and 160F
 - C. The 180-degree final rinse water spray;
 - D. The hot air dryer
 - E. The ambient heat (thermal mass) retained by clean dishes and silverware
 - F. The body heat of multiple active workers
 - G. The thermal mass of waste food returned from serving lines
 - vii. Applying ventilation calculations based on square footage of occupied space must be adjusted to cubic footage, since the volumes of these types of spaces are larger than standard room dimensions.
 - viii. Transfer air from other spaces in the facility should represent no more than 10% of the replacement air in the dish room. Vented air from the dish room is to be replaced at least 90% by tempered MUA introduced directly into the dish room space
8. Additional Requirements
- i. PROHIBITED: Utility lines of any type, including but not limited to communication lines, water lines, sewer lines, electric lines and fire sprinkler lines within 3 feet vertically and horizontally from any of the required access plates of the kitchen ducts that require routine cleaning.
 - ii. PROHIBITED: Heat recovery systems installed in exhaust ducts that carry vapor from grease.

- iii. All hoods, plenums and ducts that produce grease above cooking equipment shall be equipped with an approved fire-suppression system. The system and other exposed plumbing within a hood shall be constructed of stainless steel or chrome-plated materials with minimum exposure of pipe threads.
- iv. It is recommended that the duct access plates be of the hinged type with a pressure-type turn handle.

GAS EQUIPMENT:

Natural gas pressure is to be of consistent volume and pressure wherever it is supplied in food service spaces. Pressure drop due to distance must be mitigated. This can be accomplished through multiple regulators in different spots of gas service, or through the introduction of gas supply through several entry points in the building. Gas shall be supplied at a single pressure which falls within the acceptable gas pressure range of the food service’s gas equipment, thereby obviating the need for external pressure regulators.

Installed gas equipment with quick disconnect hoses shall be tethered to an anchor point by steel cable or chain. The hoses shall be provided with a way to prevent them from lying on the floor.

Gas equipment shall be provided with a bumper to safely hold off the gas connection points from being damaged by impact with the wall or other pipes.(see Appendix A drawing, plus page 19 of FDA Plan Review Manual). Gas pipe elbows shall be installed in an offset fashion, so they do not impact each other.

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Drain boards for pot sinks or dish machines shall slope to drain back into the sinks or dish machines, and shall be installed so as not to retain puddles or “birdbaths”.

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All low voltage equipment shall be provided with dedicated circuits. Soft drink fountain compressors and carbonators shall also have dedicated circuits.

General design features of dining spaces:

- 1) Sight lines of customers waiting in line should avoid “messy” areas of production—pots and pans sinks, janitorial closets, trash or compost storage areas, delivery dock, laundry or

dish room areas, or views into restrooms when patrons enter or exit. (See Part 12, Sect 7 and 8 for additional sightlines information.)

- 2) Utility and convenience plugs should be liberally placed throughout the prep spaces to accommodate multiple pieces of equipment.
- 3) Mobile equipment which is specified to require a NEMA 5-20 should be replaced with a unit that performs the same function but is provided with a NEMA 5-15 plug.
- 4) Lockers for staff personal belongings should be assumed during space and FFE planning.
- 5) Placement of hood exhaust ports or garbage compactors should be placed to minimize the aural, visual, and olfactory impact on building residents or other patrons.
- 6) Compost barrels shall be stored in a temperature controlled space awaiting pickup. Air ionizers are an acceptable odor mitigation.
- 7) Retail venues shall have wayfinding signs placed in appropriate locations to guide patrons to dining areas.
- 8) Pest control protocols and interventions must be in place from before demolition begins until issuance of Certificate of Occupancy

Seating:

- 1) Seating capacity for Residential dining spaces must take into account:
 - a. Total resident population intended to be served by that venue
 - b. Typical percent of attendance of meal plan holders at similar venues
 - c. 15 minute traffic counts based on similar venues
 - d. Percentage of “fill” of available seats during peak serving times
 - e. Proportion of single seating seats to congregate seating seats
 - f. Typical “length of stay” of the average customer during peak service times
 - g. Particulars that might change the normal pattern of meals during certain day parts, such as nearby lecture halls releasing near a meal time, or the venue’s distance from day time class attenders, etc.
- 2) A Bell curve of the number of customer entrants every 15 minutes, laid against a Bell curve of the number of patrons leaving every 15 minutes, will be a determining factor in calculating the maximum number of chairs needed to service the peak number of customers.

Furniture:

- 1) Furniture ideally should be manufactured with low VOC, sustainably produced materials, which also should be able to be recycled at “end of life”.
- 2) In renovated spaces where floor flatness was unable to be addressed, adjustable glides are to be installed on new furniture.
- 3) Preferred furniture designs will have resistance to lateral torque, strong welds, stress - resistant laminates, and minimal attachments that require a screws or bolts that might loosen over time.

Hose reels:

- 1) Hoses shall be long enough to reach the area they are intended for cleaning.
- 2) Shall have water pressure adequate to travel the length of the hose and emerge with enough force to provide adequate cleaning power from the water spray.
- 3) Shall be mounted on a reinforced section of the wall, and shall be braced on each side to protect it from damage from lateral tugging and pulling which these devices have done to them.

END DIVISION 13 00 30 FOOD SERVICE CONSTRUCTION GUIDE