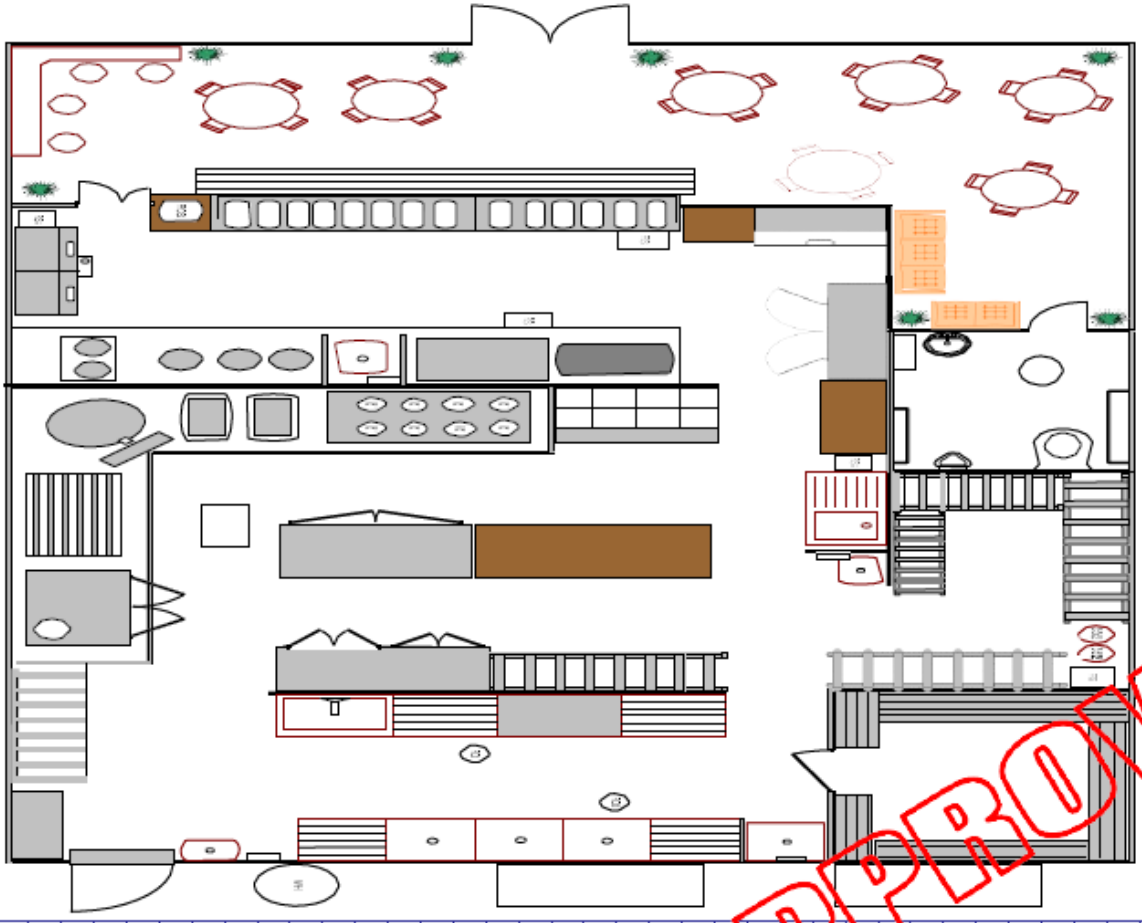
NORTHERN NEVADA Public Health | Environmental Health

RETAIL CONSTRUCTION GUIDELINES



APPROVED

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Document # and Revision date here?

TABLE OF CONTENTS

CONSTRUCTION REQUIREMENTS FOR RETAIL FOOD FACILITIES

OVERVIEW:

These guidelines are based on requirements found in the Regulations of the Washoe County District Board of Health Governing Food Establishments. It is intended to serve as a general overview of the plan and construction requirements for food establishments and should not be considered all-inclusive. The codes are referenced throughout this document to indicate the sections where these requirements can be found in law. The Regulations may be downloaded from the Northern Nevada Public Health (NNPH) Food Safety Services website: https://nnph.org/programs-and-services/environmental-health/food-protection-services/index.php.

Pursuant to the District Board of Health Governing Food Establishments Regulations, **Chapter 090 (PLAN REVIEW),** *A. Except as specified in Subsection C of this section, plans and specifications shall be submitted to the Health Authority, through the local building department, for review and approval for: 1. The construction of a new food establishment; 2. The conversion of an existing structure for use as a food establishment; or 3. Food establishments undergoing remodeling. B. Plans must be approved by the Health Authority before such work may begin. C. Plans not requiring review by the local building department must be submitted directly to the Health Authority.*

All applicable requirements of a retail food facility must be reflected in the plans submitted for review. Recommendations are included to give examples of methods which may be used for meeting the intent of the law but may not apply in all circumstances. Additionally, *this guideline only encompasses the health aspects of construction and should not be construed to include requirements of other agencies involved*, such as the local planning and zoning departments, the local building department authority, local fire department, or the local environmental control department. Contact the appropriate local agencies involved to obtain any permits and/or to clarify other local codes.

DEFINITIONS:

FOOD ESTABLISHMENT:

A “food establishment” means any place, structure, premise, vehicle or vessel, or any part thereof, in which any food intended for ultimate human consumption is manufactured or prepared by any manner or means whatever, or in which any food is sold, offered or displayed for sale, or served. (NRS 446.020).

EXTENSIVELY REMODELED:

“Extensively remodeled” means the construction, building, repair or alteration of, or installation of new equipment in a food establishment which requires a permit from the Health Authority or local building department. (Section 010.235).

WHO NEEDS TO SUBMIT PLANS?

Food facilities that are built from the ground up, from existing building spaces, tenant improvements (TI), and existing food facilities that remodel or install equipment are required to have plans submitted to the applicable city or county building department. NNPH will be routed the plans to review from the building department. NNPH will also conduct construction inspections at the facility while it is being built and grant the final approval for the facility to open for operation once the construction work is complete.

WHEN ARE PLANS SUBMITTED?

All plans and materials must be submitted to the applicable city or county building department and approved prior to the start of any new construction or remodel. The applicable building department will then route to all entities that must approve these plans. The use of approved materials and good workmanship are significant factors in the evaluation and final field approval of food facility construction and equipment installation. A properly constructed facility enhances cleanability and operation. It also lessens the necessity for early repair or replacement of equipment or structure.

HOW LONG DOES THE PLAN REVIEW PROCESS TAKE?

Plans and specifications are handled on a first come, first serve basis. It is important that ample time is allowed for NNPH to review plans.

Before commencing construction, approvals must be obtained from the NNPH plan review program, the local building department, and any other applicable authorities. If any changes to the approved plans become necessary, revised plans shall be submitted for review and approval prior to construction.

Please note that the plan review is based on the information provided, and if additional equipment and supplemental information is required, the plan review will be delayed until all information is submitted. Permit revisions must be submitted to the original intake department (the applicable city or county building department) who will then provide a copy to NNPH for review. A construction permit that is reviewed more than two times may be charged a fee for every additional review (i.e. 3rd review, 4th review, etc.).

HOW MANY CONSTRUCTION INSPECTIONS WILL OCCUR?

After plans have been approved, the construction of the facility can be started. The following three health construction inspections conducted by an NNPH inspector may be required; additional inspections may require reinpsection fees. Construction inspections must be scheduled in advance of the desired day of inspection. The person on the jobsite most directly responsible for the facility construction should be the person contacting NNPH for scheduling the construction inspections. Maintain a minimum of one set of the stamped approved set of plans on the job site to be used during construction inspections. The different types of inspections are as follows:

1. **Preliminary (Rough) Inspection:** This inspection is for the purpose of ensuring that the plumbing fixtures and stub outs installed in the facility are installed according to the plans. This inspection should occur when the trenches are backfilled, but prior to pouring the concrete slab. Floor sinks will be inspected to ensure they will be flush with finished floor and match approved plans.

2. **<u>Other/Pre-Final Inspection</u>**: This inspection occurs when construction is approximately eighty percent complete. Inspectors will be checking the installed floor, wall, and ceiling surfaces, and any equipment that may be installed, such as a hood exhaust system, cooking equipment, ware washer, sinks and other items specified on the plans. This is a very important inspection as the anticipated facility opening date could be nearing. Corrections may be issued by an inspector to have completed by the final inspection. When the inspector has approved this inspection, the annual NNPH Health Permit must be applied and paid for prior to scheduling the final inspection.

3. **<u>Final Inspection</u>:** This mandatory final inspection will be conducted after all construction and finishes are complete and the area is free of construction debris.

Figure 1 - Final inspection after all construction and finishes complete

- All utilities (electric, gas and potable water) must be available and operational for the final inspection, including hot and cold water to all fixtures as needed, the hood-exhaust system, refrigerators and ware washing machines. The facility must be thoroughly cleaned and ready to operate. Hand sinks must be stocked with soap and disposable paper towels. It is vital that everything in the facility is functioning properly. Scheduling the final inspection well in advance of the proposed opening date will help the facility open on time.

NORTHERN NEVADA
Public Health

CHECKLIST FOR FOOD ESTABLISHMENT PLAN REVIEW

Name of Project:

Plans accepted by the Northern Nevada Public Health Plan Review Team are required to include certain information. If this information is not provided, the plan check review cannot be completed and may delay the process. The following is a checklist of information needed at plan check submittal.

DOCUMENTS	PROVIDED
NNPH Food Establishment Review Include completed form and menu and/or product list of establishment https://www.nnph.org/files/ehs/forms/environmental/H-450_Food_Est_Plan_Review_Ap.pdf	
Specification Sheets: Make, model number, and manufacturer must be provided for all food equipment, including water heater. NOTE: Provide specification sheets numbered to match plans. All food equipment must be certified or classified for sanitation by an ANSI certified program.	
PLAN INFORMATION	**PROVIDED**
Title Sheet: ☐ Name of establishment ☐ Address of establishment ☐ Owner or contractor's address ☐ Contact phone number ☐ Contact email	
Floor Plan: Showing all equipment (minimum scale ¼" = 1 ft.) All equipment must be labeled with corresponding equipment schedule	
Building Structure: • Will the building be demolished for the remodel? • Are all exterior doors self-closing? • Are all restroom doors self-closing? • Are any exterior walls or windows openable? • Are there any roll-up doors or windows? • Is the building stand alone or part of a multi-suite unit?	Yes / No ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
Plumbing Plan: Showing all plumbing lines (minimum ¼" = 1 ft.) ☐ Provide details of 1" stand-offs from wall with clear acrylic blocks or cooper bells ☐ Provide details of flush floor sink with proper air gaps from drain lines ☐ Back flow on domestic water line before first connection & on any water line equipment, must show location and type of back flow ☐ Hot and cold-water lines ☐ Waste lines: Label all floor sinks, floor drains, trough drains. Show how all equipment drains (indirectly or direct to sewer). ☐ Water heater location and specs (Size, recovery rate, BTUs or KWs) - Calculation to be done to ensure hot water demand is sufficient	

PLAN INFORMATION	PROVIDED
Restrooms: Must be accessible without going through prep, ware washing, or food storage areas, and have a self-closing door.	
Ware Washing: ☐ Three-(3)-compartment sink with attached drainboards, indirectly connected to sewer (required even if mechanical washer present) ☐ Mechanical dishwasher with pre-rinse facilities (optional)	
Hand Washing: Must be conveniently accessible in each food prep, dispensing, and ware washing area	
Mop Sink: Mop sink or utility sink must be available	
Prep Sink: Indirectly draining to floor sink Note: Any washing, thawing, cooling or soaking of food items requires a prep sink	
Light: All overhead lighting must be shielded or shatterproof (ex. LED)	
Ventilation: HVAC supply & return locations	
Exhaust hood: Type I or type II must be installed if applicable (check with local fire dept.)	
Finish Schedule: Must be provided for all ware washing, food prep, janitorial, restrooms and open food storage areas, including walk-in coolers. Samples may be required. ☐ Floors: Must be smooth, sealed, cleanable, and durable ☐ Cove Base: 4” to 6” high ☐ Walls: Must be smooth, sealed, and cleanable Durable materials such as FRP or tile is required anywhere subject to splash or spillage (ex. Mop sink, ware washing, food prep, etc) ☐ Ceiling: Must be smooth, sealed, and cleanable with no exposed plumbing or electrical	
Storage Areas: Must be smooth, sealed, and cleanable All food must be stored at least 6 inches above the floor Adequate cold and dry storage – Calculations to be done to confirm sufficient storage Anticipated cold and dry food delivery	
Trash: Storage areas must be identified on the plans and must be of sufficient size to hold any trash or recyclables that accumulate.	

*Plans must be submitted to appropriate jurisdiction’s building department to determine if a building permit will be required prior to completing any work.

Contact the Program at
ehsplanreview@nnph.org

PLAN REVIEW & CONSTRUCTION PROCESS

OPTIONAL: NNPH Limited Advisory Inspection

For a fee, NNPH will inspect the proposed food facility and identify required repairs and upgrades. A limited advisory inspection is recommended prior to signing a lease or other legally binding document. To schedule a limited advisory inspection, call our front desk at (775)328-2434 option 8.

If construction is required

Submit all required documentation to your jurisdiction's building department. Required documents for health review include: complete architectural plans, a completed food establishment review form, a proposed menu/product list, and equipment spec sheets. All required revisions must be submitted to the original intake department.

City of Reno - City of Sparks - Washoe County

Plans are approved and construction begins

Once building plans have been approved, NNPH and other agencies (including local building, fire, and environmental control departments, etc.) will conduct construction inspections. NNPH will conduct up to three inspections, including a rough plumbing, a prefinal, and a final inspection.

Complete NNPH application for permit to operate

Before the final NNPH construction inspection, apply for a health permit to operate. Note: this may not be needed for remodels if you already hold a valid health permit; contact your NNPH inspector if you are unsure of what permits are required.

Open!

Once construction inspections are complete and a health permit has been applied and paid for, NNPH will conduct an opening inspection. If no further corrections are required, NNPH will issue your health permit and sign off on your business license. This may be completed at the same time as your final construction inspection.

ENCLOSURE

A food facility must be **FULLY ENCLOSED** where the food storage, ware washing and food preparation areas are located to prevent entry of vermin and protect the food from contamination. The flow of raw food, cooked food, dirty food contact surfaces, trash and many other factors contribute to the facility layout and enclosure. Customers or patrons are not allowed to be in or pass through the food preparation, storage, or ware washing areas. An open dining area may be acceptable if the kitchen areas are fully enclosed and there is no demonstration cooking, food preparation or open food storage in unenclosed areas.

- **Air curtains** may be required at delivery, cargo door, or pass-thru windows, but cannot replace exterior walls or doors.
- **Pass-thru Windows-** Openings in the walls of food facilities may be constructed to serve food prepared in the facility to customers waiting outside. The following requirements are designed to facilitate this type of operation and to ensure that openings do not contribute to the entry of undesirable pests and dirt.
    - The screen of a pass-thru window must be at least 16 mesh per square inch.
    - The counter and service area of a pass-thru window shall be smooth and easily cleanable.
- **Window Screens-** To prevent the entry of pests, dust and other undesirable conditions into the food facility, all operable windows located anywhere in the facility opening to the outside are required to be screened. The screening must fit the window opening securely. A minimum 16 mesh per inch screen material is required and must be specified on the plans.
- **Insect Control Devices-** If the device is designed to electrocute or stun flying insects, they must retain the insect within the device. They are not allowed to be positioned over food preparation, storage, or ware washing areas.
- **Exterior Doors-** Door openings to the outside must be protected to prevent the entry of rodents, insects, dust and dirt. All exterior doors of a food facility must be solid, self-closing and tight fitting.

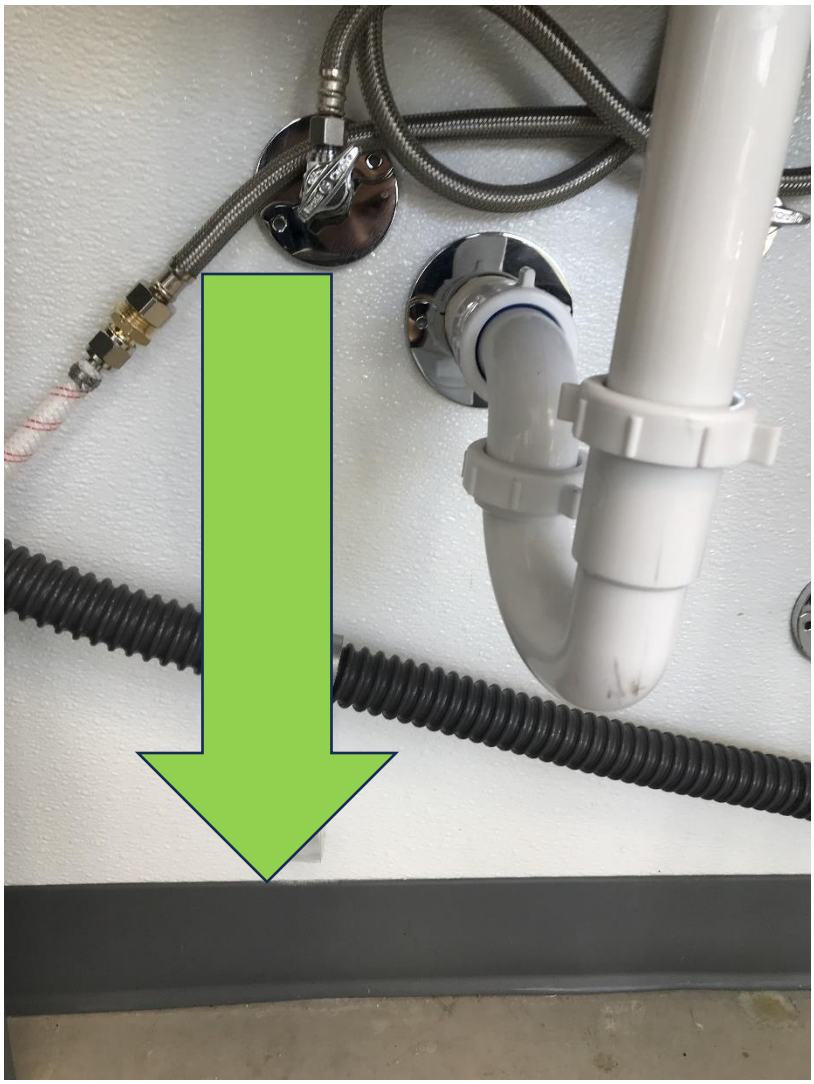
FINISHES

Finishes in a food facility include the materials that make up the floors, walls, ceilings, and cove base. These materials must be smooth, easily cleanable, and durable to withstand frequent cleaning. Samples of the finishes may be required prior to approval. A finish schedule of all floors, walls, ceilings and cove bases must be provided in the plans. We recommend that the finish schedule be shown in a table. For an example finish schedule, refer to Appendix E.

A. **Floors-** The floor surfaces of a food facility must be durable, cleanable, and impervious to water, food, food by-products, grease, and chemicals used on the floor for cleaning or other purposes. Examples include, but are not limited to, the following ceramic, porcelain, quarry tile, troweled on epoxy type floor, terrazzo, commercial sheet vinyl, durable grades of linoleum or plastic, or sealed concrete. (Sections 080.005 & 080.035)

   - Flooring under equipment shall be completely smooth for cleanability. Floor surfaces that contain anti-slip agents are limited to foot traffic areas only.
   - The floor sealant for concrete must be grease and acid resistant and USDA and FDA approved for use in a commercial kitchen.

B. **Cove Base-** Floor surfaces in all areas where food is prepared, packaged, dispensed, or stored (including walk-in refrigerators and freezers), ware washing areas, where refuse or garbage is stored, where janitorial facilities are located, in all toilet and hand washing areas, and in storage rooms, must have coving installed at the juncture between the floor and the wall that is at least four to six inches wide and sealed on the top and bottom. (Section 080.030)



C. **Walls and Ceilings-** Wall and ceiling surfaces of a food facility are required to be smooth for cleanability. Walls in all areas except dining spaces are required to be a durable, smooth surface and have an easy to clean and washable surface. Walls in certain areas are also required to withstand moisture, repeated cleaning, high heat, and chemicals used in cleanup activities. Examples of approved wall finishes include but are not limited to the following tile, synthetic enamel paint, polished stainless steel sheeting, and lay-in vinyl panels for ceilings.

- The surface areas of walls in food establishments that are subject to splash, spillage, or food soiling (e.g. mop/janitorial closet, ware washing, food preparation, all sinks) during normal operation must be lined with a durable, impact resistant, completely washable material such as stainless steel, tile, FRP board, or high density plastic from the floor to a minimum height of 24 inches above the highest point of equipment or plumbing fixtures, and a minimum horizontal distance of 12 inches from the equipment or fixture. FRP and metal flashing surfaces need to be sealed to the sub-wall surface. (Section 080.005)

- Wall surfaces in walk-in refrigerators and freezers must be smooth surfaced, moisture proof, durable, and able to withstand prolonged exposure to low temperatures. The walls and ceiling shall meet the applicable National Science Foundation (NSF)/American National Standards Institute (ANSI) standards.

- Ceiling areas with exposed insulation must be taped, sealed, or otherwise protected to ensure the insulation does not contaminate any food service, storage, or ware washing area.

- All exposed wood, bare drywall, or other porous surfaces must be painted or otherwise sealed. Exposed wood joists, beams, or other ceiling areas must be sealed or painted. (Sections 080.045 & 080.055)

- Blown-on acoustic ceiling material and textured lay-in acoustic ceiling panels may be used only in dining rooms and non-food preparation, storage, or handling spaces (e.g., hallways, pure office spaces, etc.).

- If you have a wall or ceiling surface material that you desire to use in your food facility and are not sure if it would meet these requirements, please submit a sample for evaluation. We will be able to assist you in your decision.

D. **Conduit-** Conduit must be properly installed in the food facility so that it does not inhibit cleanability.

- All plumbing, electrical, and gas lines are required to be concealed within the building structure to the greatest extent possible.

- In circumstances where it is not possible to install conduit behind the walls (primarily structural limitations or restrictions of the building), all conduit runs are to be located at least one inch away from walls or ceilings using cleanable standoff brackets (e.g. acrylic blocks or copper bells, no unistruts) and installed off the floor. Conduit is to be installed so that it is secure. (Section 080.025)

- Where conduit or plumbing lines, including soda chase lines, enter a wall, ceiling or floor, the opening around the conduit or plumbing is required to be tightly sealed to prevent the entry of rodents or vermin. The sealant material must be rodent proof.

- All overhead exposed waste lines must have a catch trough installed under the line in food preparation and storage, equipment and utensils storage, laundered linens storage, and single-service and single-use item storage areas. The trough is to be waterproof, running the entire length of the exposed waste line, and of a width one inch wider than the outside diameter of the exposed waste line, fittings and couplings. (Sections 050.210 & 060.485)

GENERAL EQUIPMENT

A food facility must have the necessary equipment to support the facility's proposed menu. Equipment includes all surfaces in the food preparation, storage, and ware washing areas, utensils, refrigeration, ware washing equipment, cooking equipment, ventilation hoods, and anything else used in the preparation, sale, service and display of food. **The plans must provide equipment spec sheets and an equipment schedule or list of equipment that is identified by a coding system (letters or numbers) and corresponding equipment plan that shows the location of the equipment.** For an example equipment schedule, refer to Appendix D.

Figure 2 - Standard kitchen equipment

- All equipment must be durable, smooth, easily cleanable, non-absorbent, non-toxic, and will not allow for the contamination of food under normal use. Wood and wood-wicker are not an approved food contact surface, excluding hard woods like maple that may be used for approved purposes only. Copper and copper alloys may not be used in contact with foods that have a pH below 6 with the exception of beer brewing equipment. (Sections 060.005, 060.035 & 060.020).

- All proposed equipment must be certified by an American National Standards Institute (ANSI) accredited certification program including, but not limited to NSF, ETL, UL, etc. All electric appliances must also be certified for UL standards for electrical equipment. (Section 060.205)

- Floor-mounted equipment that is not easily movable must be sealed to the floor or elevated on legs that provide at least six inches of clearance between the floor and the equipment. Countertop equipment must be portable, sealed to the table or counter, or elevated on a minimum of four-inch approved legs. (Section 060.265)

- Equipment that is fixed because it is not easily movable must be installed so that it is spaced to allow access for cleaning along the sides, behind, and above the equipment. If the equipment is exposed to spillage or seepage, it must be sealed to adjoining equipment or walls. It is recommended to secure large equipment to the walls with stainless steel flashing. (Section 060.260)

- Multiple worktables should be used in facilities with large volumes of food preparation or buffets.

A. Refrigeration and Freezers- All refrigeration and freezer units must be mechanical, in good repair, and maintain food at the required temperature (41°F or below for refrigeration and freezing temperatures for freezers). The refrigeration unit(s) should be positioned in the facility to allow for efficient and safe workflow. Examples of good flow include having walk-in refrigeration placed near to a delivery door to allow for the food to be quickly placed under temperature control after receiving, and installing adequate "in-use" refrigeration on the cook line. Refrigeration must be certified to NSF/ANSI Standard 7. There must be adequate refrigeration capacity to support the operations of the food establishment. See the refrigeration section for more information, and Appendix F for calculating how much cold storage is needed for the operations of the facility.

Figure 3 - Walk in cooler storage

B. Cooking Equipment- All cooking equipment that produces grease laden vapors must be placed under an adequate ventilation hood. Ventilation hood systems and devices must be

sufficient in number and capacity to prevent grease or condensation from collecting on walls and ceilings. Cooking equipment must be certified to NSF/ANSI Standards. Contact the local fire department for the specific fire safety requirements for the food establishment. See the ventilation section for more information. (Section 060.225)

Exhaust ventilation hood systems in food preparation and ware washing areas, including components such as hoods, fans, guards, and ducting, must be designed to prevent grease or condensation from draining or dripping onto food, equipment, utensils, linens, and single-service and single-use articles. (Section 060.120)

C. **Sink Fixture Requirements-** Depending on the type of food operation, various sink requirements may apply. All sink fixtures must be listed by an NSF/ANSI accredited agency and equipped with a hot and cold-water supply.

Excluding hand sinks and mop sinks, all other sinks must indirectly drain to a floor sink with an independent drain line and at least a one-inch air gap (i.e. prep sinks, 3-comp sinks, dump sinks, etc.). Refer to the plumbing section for more information.

Figure 4 - Handwashing sink

Figure 5 - Prep sink with indirect drainage

- **Handwashing sink(s)** with soap and disposable paper towels are required to allow convenient use by employees in food preparation, food dispensing, ware washing, and restroom areas. Hand sinks must be maintained so that they are always accessible for employee use and must be used for handwashing only. (Sections 070.035 & 070.058)
    - If a hand sink is located directly adjacent to a food preparation surface, food storage, prep sinks, or utensil-washing sinks, a splashguard may be required to prevent splashing over from the hand sink to the adjacent item. If the hand sink is centrally located in a countertop, then splashguards must be located on both sides of the sink.

- Each hand sink shall be under pressure and provide water at a temperature of at least 100F through a mixing valve or combination faucet. Any faucet which closes automatically, closes slowly, or is metered must provide a free flow of water for at least 15 seconds before reactivation. (Section 070.030)

- **3-compartment ware washing sink(s)** must be provided for manually washing, rinsing, and sanitizing equipment and utensils. Sink compartments must be large enough to accommodate full immersion of the largest piece of equipment and utensils within the facility. Dishwashers are allowed in food facilities; however, a minimum of a 3-compartment sink is required. (Section 060.215)

  Large food facilities that have separate operating food sections (e.g., bakery, deli, meat market, etc.) handling unpackaged foods will require a 3- compartment sink in each food processing area.

Figure 6 - Three compartment sink with proper set up

- **Prep sink(s)** required for food processes such as thawing, washing, soaking, rinsing, etc.

- **Dump sink(s)** may be required for food facilities with a blender beverage station, with a bar that serves mixed beverages, when serving coffee drinks, or any other situation where the operations require a sink for dumping and rinsing.

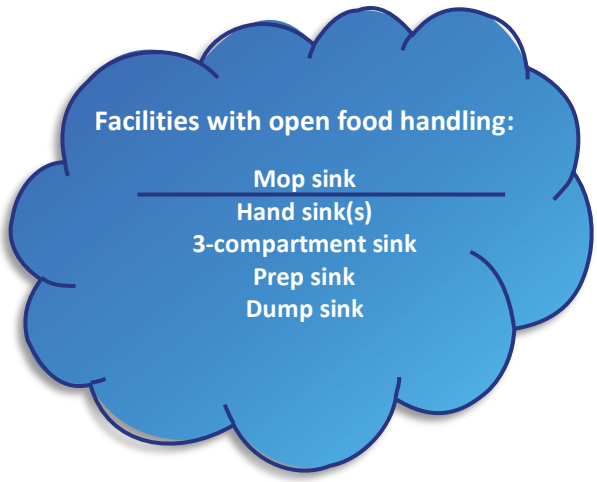
- **Mop sink(s)** must be secured with an integral vacuum breaker at the faucet. At least one mop sink or one curbed cleaning facility equipped with a floor drain must be provided and conveniently located for the cleaning of mops or similar wet floor cleaning tools and for the disposal of mop water and similar liquid waste. (Section 070.055)

  The janitorial sink is recommended to be in a separate janitorial room or separated from the rest of the food facility equipment by a solid partition or wall.

  After use, mops must be placed in a position that allows them to air-dry without soiling

walls, equipment, or supplies.(Section 080.155)

The following sinks may be required for different food facility operations:



D. Ware washing Machine- In addition to the 3-compartment sink, high temperature or chemically sanitizing ware washing machines are allowed for ware washing purposes. Ware washing machines can be under the counter and/or conveyor style. The ware washing machine does not take the place of a 3-compartment sink.

- **High Temperature Ware washer-** High temperature testing tape or equipment must be provided to adequately measure high temperature ware washing machines. They must achieve a utensil surface temperature of at least 160˚F. (Section 060.430)
- **Chemical Ware washer-** Sanitizer testing equipment and materials must be provided to adequately measure the applicable chemical sanitizer in the ware washer or glass washer, and the proper sanitizer concentration must be dispensed.
- **Drainboards-** Drainboards, utensil racks, or tables large enough to accommodate all soiled and cleaned items that may accumulate during hours of operation must be provided for necessary utensil holding before cleaning and after sanitizing. (Section 060.220)
- **Installation-** The ware washer must also be provided with thermometers and pressure gauges to indicate the proper water flow pressures and temperatures are reached. All waste from ware washers is required to drain to a floor sink with at least a one-inch air gap.

E. Garbage Disposals- The garbage disposal must drain indirectly to a floor sink. (UPC Section 807.3)

F. Counters and Cabinets- Counters and cabinetry that may be exposed to splash, spillage, or other food soiling, or that require frequent cleaning must be constructed of a corrosion-resistant, non–absorbent, smooth, and durable material that allows for easy cleaning. Multi-

use food contact surfaces must be smooth, free of breaks, open seams, cracks, chips, inclusions, pits, free of sharp angles, corners, crevices, and finished to have smooth welds and joints. (Sections 060.045 & 060.065)

G. Ice Machine- Ice machines must be located inside the fully enclosed food facility. The area in which the ice machine(s) are located must have adequate ventilation and be easy to clean. Condensation and ice melt drippage is required to drain into an adjacent floor sink via minimum one-inch air gap. Ice machines must be certified or classified for sanitation by an ANSI accredited certification program. Large ice machines of 800 lbs. or more are recommended to have a floor trough positioned at the front of the ice machine to catch the waste ice that may fall when dispensing.

H. Dipper Well- A running water dipper well may be used for the storage of in-use utensils. The dipper well must drain into a floor sink via at least a one-inch air gap separation. (Section 050.170)

I. Clean in Place (CIP) - Equipment must be designed to be properly washed, rinsed, and sanitized in a ware washing machine or 3-compartment sink (fully immersed in a bay), or it is considered CIP. Some examples of CIP equipment are large mixers, large skillets, yogurt/soft serve machines, or large kettles. CIP equipment must be constructed so that cleaning and sanitizing solutions circulate through a fixed system and contact all interior food contact surfaces, and the system is self-draining or capable of being drained of cleaning and sanitizing solutions. CIP equipment that is not designed to be disassembled for cleaning must have inspection access points to ensure all interior food contact surfaces throughout the fixed system are being effectively cleaned. (Section 060.070)

J. Steam Tables- A "dry" or "wet" steam table is a piece of equipment used to maintain food hot. If the steam table has a drain line, see manufacturers instructions and drain line must drain indirectly to floor sink with one-inch air gap.

K. Self-Service Equipment- Self-service equipment, such as drink dispensers, bulk item bins, and buffet lines require further levels of protection from contamination.

- **Drink Dispenser-** A self-service soda dispenser must be designed to prevent contact with the lip-contact area of the glass or cup when refilled by activating the beverage flow with a lever or button to fill. The delivery tube, chute, orifice, and splash surfaces directly above the container receiving the food must be designed in a manner so that drips from condensation and splash are diverted from the opening of the container receiving the food, and are protected from dust, pests, and other contamination. Drink dispensers must be certified to NSF/ANSI Standards. (Section 060.130)

- **Bulk Items-** Bulk items bins must be protected from contamination and have an approved dispensing utensil. (Section 050.220)

- **Buffet Lines-** Buffet lines must have adequate sneeze guards or other methods protecting the food and food contact surfaces from contamination. Clean plates or bowls must be provided for each use of the buffet. Separate dispensing utensils must be provided for dispensing of each item that protects food from contamination. (Sections 050.230 & 060.235)

L. Sneeze Guard- Self-service displays of unpackaged foods or utensils are required to be

shielded to prevent "droplet" contamination from the customer. A properly designed sneeze guard or food shield serves to intercept a direct line between the customers mouth and nose zone and the food or utensils being displayed. (In other words, to prevent sneezing, spitting, and coughing on to the food).

- Sneeze guards are required for areas that have customer access such as cafeteria, buffet, and salad bar service, food preparation equipment and food preparation areas.

Figure 7 - Sneeze guard

- Cleaned and sanitized glasses and stemware that are displayed or stored in bar areas over customer service counters are required to be protected from customer contamination.

M. Specialized Process Equipment- Specialized processes like reduced oxygen packaging, shell stock tanks, etc. will require submittal of specification sheets for all equipment. Depending on the process, HACCP plans and/or Operational Plans may also need to be submitted to NNPH for approval.

REFRIGERATION

Adequate refrigeration space and equipment is an essential element in the operation of a food facility. To quickly chill perishable foods from cooking temperature to refrigeration temperature, adequate capacity is needed. Adequate space must be provided to properly hold all foods needing refrigeration and be able to meet the needs of the food facility. **All refrigeration and freezers, including walk-in units, should be clearly identified on the equipment plan and schedule.**

A. General Requirements- Refrigeration equipment must be specifically constructed for commercial usage. Refrigeration equipment must be listed by an ANSI accredited agency for sanitation and electrical standards (e.g., NSF, ETL, UL, etc.) for installation in food facilities.

- Domestic type refrigeration units are not acceptable in food facilities. Domestic refrigeration units do not have sufficient refrigeration capacity, are not easily cleanable, and generally do not withstand the usage associated with a commercial food facility.
- All refrigeration units are required to have an accurate, readily visible, working internal thermometer. The thermometer should be placed in the "warmest" part of the compartment, usually near the door. (Section 060.155)
- Shelving, floor, wall, and ceiling finishes of refrigerator and freezer units need to be nonabsorbent and easily cleanable. Wood and vinyl are not acceptable materials for refrigeration storage shelving. All joints must be sealed.
- Rapid cool down facilities or blast chillers are highly recommended depending upon the food operation.
- Shelving of a walk-in unit must keep foods off the floor of the walk-in unit by a minimum of six inches, and be constructed of smooth, sealed, and easily cleanable materials.
- Walk-in coolers with draining condensation must drain into floor sink with 1” air gap or evaporator pan.

B. Refrigeration Facilities Size and Design- The plan review for storage needs to provide adequate refrigeration facilities for the proper storage, display, and service of temperature controlled for safety (TCS) 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 TCS foods at 41°F or below. If TCS foods are prepared in advance of service, a rapid cooling procedure capable of cooling TCS foods from 135°F to 41°F within six hours (the decrease in temperature from 135°F to 70°F must occur within two hours) shall be provided. Blast chillers are highly recommended
- The capacity of the rapid cooling facilities must be sufficient to accommodate the volume of food required to be cooled to 41°F within six hours. Provide point-of-use refrigerators and freezers at workstations for operations requiring preparation and handling of TCS foods. Refrigeration units, unless designed for such use, should not be

located directly adjacent to cooking equipment or other high heat producing equipment which may tax the cooling system's operation.

- Make-up unit coolers may be used when the menu includes assembling TCS foods. These units provide easy access to food from the top of the unit; however, these are not designed for cooling food.

PLUMBING

A complete plumbing plan, showing all water and waste connections and a plumbing schedule, must be submitted with the plans. When planning the food facility layout, it is important to design the plumbing layout based on the flow of food to reduce the risk of cross contamination.

- All plumbing, plumbing fixtures, gas lines, and gas operated equipment shall be installed in compliance with the most recent edition of the Uniform Plumbing Code and local authority. They must be maintained to prevent any contamination, kept clean, be fully operative, and be in good repair. All liquid waste must be disposed of through the plumbing system, which must discharge into the public sewerage or into an approved private sewage disposal system. (Section 070.087).

- All steam tables, ice machines and ice bins, food preparation sinks, ware washing sinks, display cases, walk-in refrigerators, dipper wells, and other similar equipment that discharge liquid waste shall be drained by means of indirect waste pipes. All waste drained by them must be discharged through a one-inch air gap into a floor sink or other approved type of receptor (see Figure 24) (UPC 801)(Section 070.070)

- Exposed electrical, gas, water, and drain lines must be located one inch from the wall and at least six inches off the floor to facilitate cleaning. All kitchens, ware washing areas, bars, walk-in coolers, and any areas where wet cleaning or wiping must be conducted, are required to have enough physical space behind utility lines/pipes to adequately clean all surfaces. Unistrut type supports are not accepted, and clear acrylic blocks or copper bells are recommended (see Figures 25 and 26 below). All supports must be smooth, durable, and easily cleanable.

A. Water Supply Requirements- An adequate protected, pressurized, potable supply of hot water and cold water shall be provided. The water supply shall be from a water system approved by the Health Authority or the local enforcement agency. The water supply must be protected with a backflow or back-siphon device, as required by applicable local plumbing codes and the Health Authority.

- Hot water generation and distribution systems shall be sufficient to meet the peak hot water demands throughout the food facility. See 'Hot Water Demand' under Appendix F.
- Point-of-use instantaneous electric water heaters may be approved on a case-by-case basis.
- As a result of the restricted output of instantaneous water heaters, more than one unit may be required, depending on the number and types of sinks and equipment present.

B. Liquid Waste Disposal- Liquid waste shall be disposed of through an approved plumbing system and shall be discharged into the public sewerage or into an approved private sewage disposal system. (Section 070.087)

- **Indirect Waste-** All condensate and liquid waste from ice machines, ice bins, food preparation sinks and equipment, ware washing sinks, "wet" steam tables, dipper wells, beverage dispensers, refrigeration condensers and other similar equipment with drain lines, shall discharge their liquid waste by means of indirect waste pipes to a floor sink with a legal one-inch air gap.

a. **Floor Sinks-** Floor sinks are the plumbing fixtures required for the receipt and disposal of liquid. Planning is needed to ensure the proper placement of all required floor sinks to be installed, so that equipment generating liquid waste is properly drained within 15 feet.

   - Floor sinks must be installed with the top of the rim level with or below the finished floor and have an appropriate cover grate(s).
   - Floor sinks must be installed so they are at least half-exposed from under equipment or otherwise readily accessible for inspection and cleaning/maintenance purposes. NNPH must approve any floor sink installed inside a cabinet prior to installation (during the rough plumbing inspection).
   - Waste-line plumbing to a floor sink may not cross any aisle way, traffic area or door opening.
   - Properly installed and functioning evaporator units may be used for walk-in coolers to drain into.

b. **Floor Drains-** Floor drains or trench/trough drains are required in high moisture areas such as dish rooms, in front of warewashing machines, in janitorial rooms with mop sinks, restrooms, in front of cooking tanks, in cooking areas, in front of tilted kettles, meat processing rooms, walk-ins or near clean in place equipment, and wherever there are areas cleaned by water flushing or where products are iced down.

C. Backflow Prevention- The potable water supply shall be protected with a backflow device. An approved backflow prevention device shall be properly installed upstream of any potential hazard between the potable water source system and a source of contamination (e.g., all threaded water outlets, mop sinks, sprayers, ware washers, etc.). (Section 070.070)

- University of Southern California (USC) approved reduced pressure principal backflow prevention assemblies (RPs) must be installed to ensure the food facility cannot subject any other connection to a back siphonage event. An RP must be installed on the water main between the facility and the municipal service line if this is the only connection. If the facility is in a multi-unit establishment, the RP must be installed on the water main serving the individual food facility space prior to the first connection or "T".
- An RP or other American Society of Sanitary Engineering (ASSE) 1022 certified device is required to be installed between soda system carbonators and potable water supply lines. All lines and fittings downstream of the backflow prevention equipment must be of plastic, brass, or stainless-steel construction.
- RPs must be outfitted with a drain line leading to a floor sink or mop sink, or a trapped hub drain with an air gap that is twice the diameter of the drain line and no less than one inch.
- All RPs must be located between 12 and 36 inches above the floor and be readily

accessible for inspection and testing. Backflow devices must be located so that they may be serviced and maintained. All RPs are required to be tested annually, and the facility is required to maintain records of testing on site. (Section 070.059)

- Common equipment and their respective required backflow prevention device or assembly includes, but is not limited to:
    - Carbonated beverage systems: **Reduced Pressure Backflow Preventer** (Figure 32)
    - Non-carbonated beverage dispensing systems, including espresso machines: **Vented Dual Check Valves** (Figure 33)
    - Ware washing Machines & Mop Sinks: **Atmospheric Vacuum Breakers** (Figures 34 & 35)

Figure 8 - Atmospheric vacuum breaker for a faucet

Figure 9 - Atmospheric vacuum breaker

- *For more information on backflow devices, vacuum breakers, air gaps, and FAQs, please see NNPH's Backflow Prevention in Food Establishments document located in Appendix G.*

D. Grease Interceptors- To prevent blockage of the sewer system due to accumulated grease and oils discharged from a food facility, local agencies may require the installation of grease interceptors. Check with local agencies, such as your jurisdiction's Environmental Control department, to see what size grease interceptor is required.

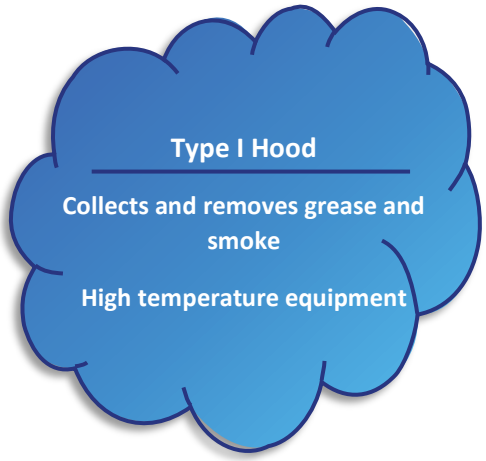
E. Laundry facilities- within a food facility shall not be used for washing and drying items that are not used in the operation of the establishment. (Section 060.455)

VENTILATION

Ventilation must be installed to remove toxic gases, odor, steam, heat, grease, vapors, or smoke from the food facility. All areas of a food facility shall have sufficient ventilation to facilitate proper food storage and to provide a reasonable condition of comfort for each employee, consistent with the job performed by the employee. **Complete mechanical plans must be submitted with plans to include ventilation hoods (if applicable). (Section 080.105)**

- Heating, ventilating and air conditioning systems in food preparation and ware washing areas shall be designed and installed so that make-up air intake and exhaust vents do not cause contamination of food, food-contact surfaces, equipment, or utensils, and do not create air currents that cause difficulty in maintaining the required temperatures of time/temperature controlled for safety (TCS) foods. (Section 060.120 and 080.070)

A. Exhaust Hoods and Ducts- A hood-exhaust system is required in food facilities to remove the by-products of cooking (e.g. smoke, steam, grease, vapors, and heat). Insufficient removal of these by-products leads to cleanability problems when the vapors, smoke, and grease accumulate on equipment, floors, walls and ceilings.



a. **Type I Hood-** A Type I ventilation hood is a kitchen hood that collects and removes grease and smoke with filters or grease extractors that are designed for that specific purpose. This type is required over high temperature equipment such as char broilers, tandoori ovens, etc.

b. **Type II Hood-** A Type II hood is a general kitchen hood for collecting and removing steam, vapors, heat or odors, such as a hood for a dishwashing machine. A Type II hood is not approved for use with any grease producing equipment.

- Ventilation plans for exhaust systems shall include front and side elevations of the exhaust hood and duct details to the roof fans.

Provide manufacturer specification sheets for exhaust fans, make-up air fans, and hood filters. **Complete and submit as part of the plan submittal package.**

- *Contact your jurisdiction's building and fire departments* for installation and fire safety requirements regarding makeup air and exhaust ventilation system electrical interlock.
- Fire extinguishing systems may be required by the local fire prevention codes. If fire suppression systems are installed, they must be installed so that all exposed components under the hood are easy to clean and accessible for cleaning.

ELECTRICAL AND LIGHTING

The facility must have sufficient electrical and lighting for the equipment installed and the menu provided. **Ensure electrical plans and lighting information are documented on the plans.**

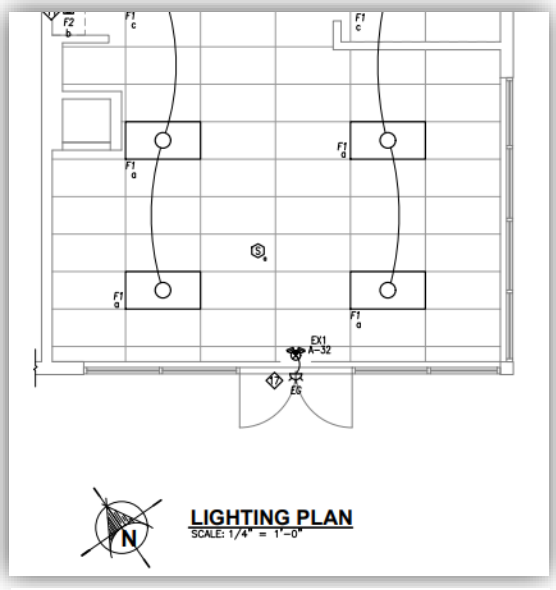


Figure 10 - Example lighting plan

- **Electrical -** Adequate electrical power must be provided at all times to operate exhaust, lighting, equipment and refrigeration.
- **Lighting** - Adequate levels of light are required in food preparation, food and equipment storage, and ware washing areas. Food service workers need to be able to clearly see the items that they are preparing for customers to ensure freshness and wholesomeness of the food. During times of cleanup and maintenance, adequate lighting is necessary to assist in determining where cleanup efforts are needed and to ensure the adequacy of cleanup operations.

A. Lighting Intensity (Section 080.100)

- Lighting intensity requirements vary throughout different areas of the facility. The following are required at a distance of 30 inches above the floor:

B. Shielding (Section 080.060)

- **Light fixtures must be shielded, coated or shatter-resistant** in areas where there is open food, clean equipment, utensils, linens, or unwrapped single-service items.

Figure 11 - Fluorescent light diffusers

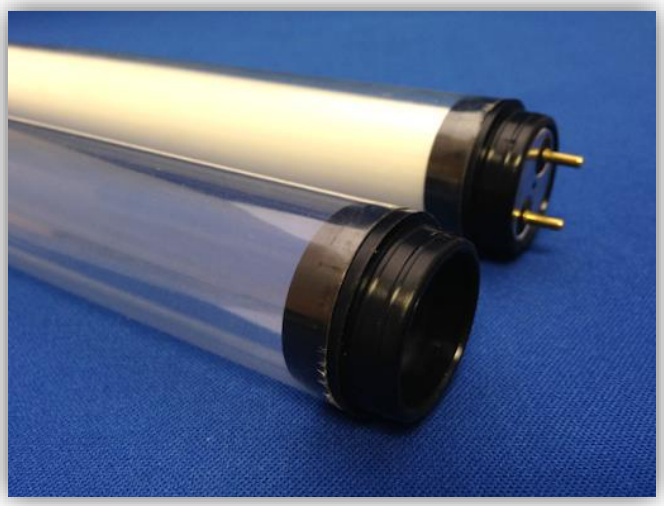


Figure 12 - Fluorescent light sleeves

FOOD AND BEVERAGE STORAGE

The anticipated volume of food to be stored, prepared, and served/sold as well as the proposed layout for storage areas (including refuse) **must be included on the plans (Sections 050.200-060.255).**

A. Food must be stored:

Figure 13 - Walk-in cooler storage

- In a clean, dry location where it is not exposed to splash, dust, or other contaminants, and **at least six inches** above the floor (15 centimeters).

B. Food, food equipment, clean linens, and single-use items may not be stored:

- In locker rooms, restrooms, dressing rooms, garbage rooms, mechanical rooms, under sewer lines that are not shielded, under leaking water lines, under open stairwells, or under other sources of contamination.

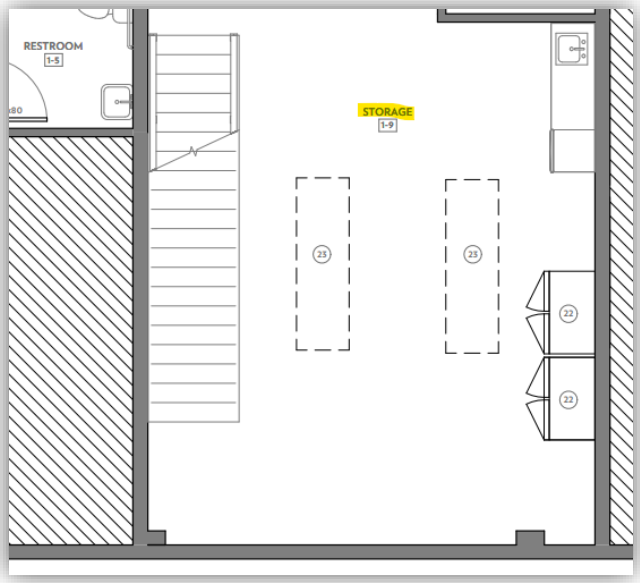


Figure 14 - Storage shown on plans

NON-FOOD AREAS

The non-food areas in the food facility, including employee and patron restrooms, change rooms, office spaces, janitorial closets, and trash areas are still important pieces of a successful restaurant design. **The site plan must identify all non-food areas.**

A. Restrooms - At least one (and no less than required by law) properly stocked restroom must be provided **(Sections 070.050-080.170).**

- *Contact your jurisdiction's building department for specific requirements of the Americans with Disabilities Act (ADA) prior to designing the toilet rooms and the number of required restrooms before submitting plans for review.*

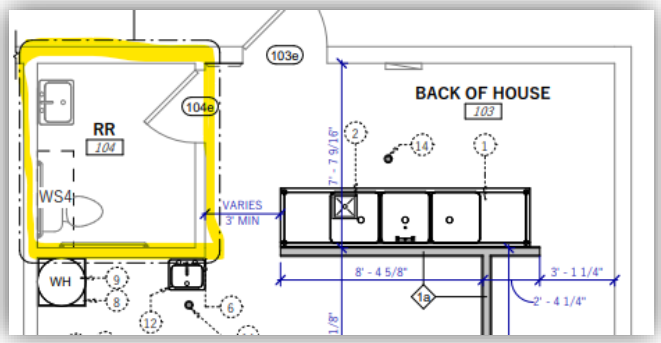


Figure 15 - Example plans with labeled employee restrooms

- Floors, walls, and ceiling surfaces must be smooth, durable, easily cleanable, and nonabsorbent.

- Doors from rooms with toilets must not open directly into any area used for the preparation of food or for the washing or cleaning of equipment, utensils or tableware.

- Toilet rooms must be fully enclosed with a tight-fitting, self-closing door except where a toilet room is located outside of a food establishment (e.g. Provided in a shopping mall).

- A handwashing sink must be located in or immediately adjacent to restrooms, and soap and single service paper towels shall be provided adjacent to the hand sink.
  - A hand dryer is an approved substitute for paper towels in a dispenser.

- Toilet paper dispensers shall be provided for each toilet, and a covered receptacle for sanitary napkins must be provided for each toilet in women's and/or unisex restrooms.

- Plumbing fixtures such as hand sinks, toilets, and urinals must be cleaned as often as necessary and well maintained.

B. Employee Areas (Sections 080.110-080.120)

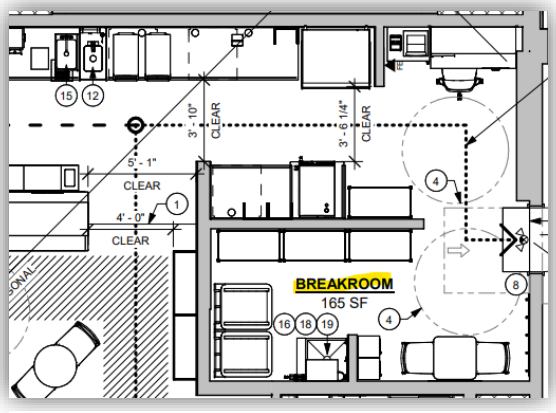


Figure 16 - Example plans with labeled employee breakroom

- **Dressing Rooms -** must be provided if employees routinely change their clothes in the establishment.

- **Lockers -** Lockers or other suitable facilities must be provided for the orderly storage of employees' possessions and must be located in a designated area where contamination of food, equipment, utensils, linens, and single-use items cannot occur.

- **Employee Eating Area -** Areas designated for employees to eat, drink, or use tobacco must be located so that food, equipment, linens, and single-use items are protected from contamination.

C. Trash - A receptacle must be provided in each area of the food establishment where refuse is generated or commonly discarded, including handwashing lavatories where disposable towels are used **(Sections 070.090-070.170).**

- Indoor and outdoor storage areas and receptacles must be of sufficient capacity to hold refuse, recyclables, and returnable's that accumulate.
    - Storage areas must be kept clean and free of unnecessary items.
    - Refuse, recyclables, and returnables must be removed from the premises **at least once every seven days.**

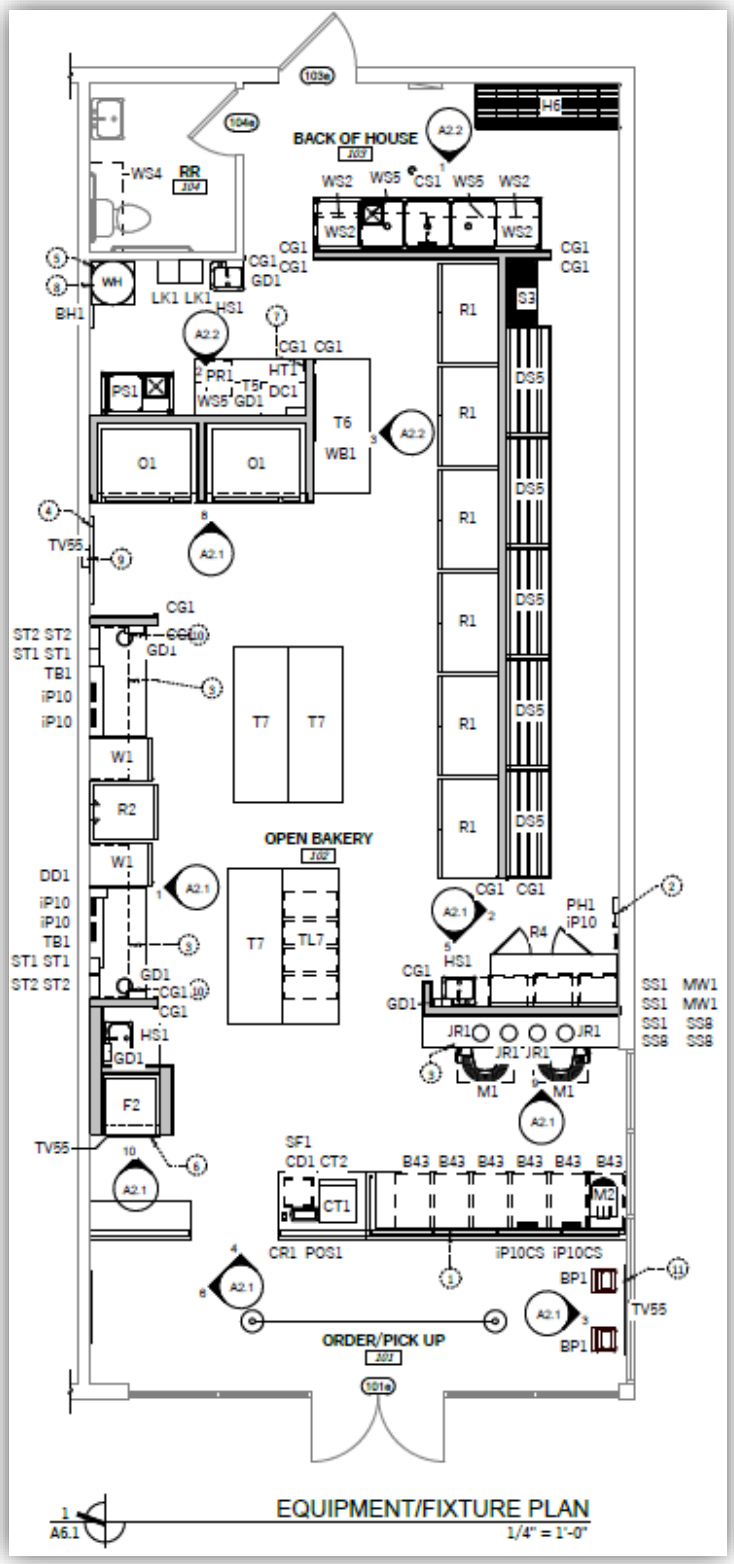
- Receptacles and areas designated for refuse, recyclables, and returnables must be located separate from food, equipment, utensils, linens, and single-use items and where a public health hazard or nuisance is not created.

- Receptacles must be durable, cleanable, insect- and rodent-resistant, leak-proof, and nonabsorbent; receptacles for use outside the food establishment must have tight-fitting lids, doors, or covers.

- Outdoor storage areas for refuse, recyclables, and returnables must be smooth and durable, in good repair, made of nonabsorbent material, and sloped to drain when a drain is present.

APPENDIX A

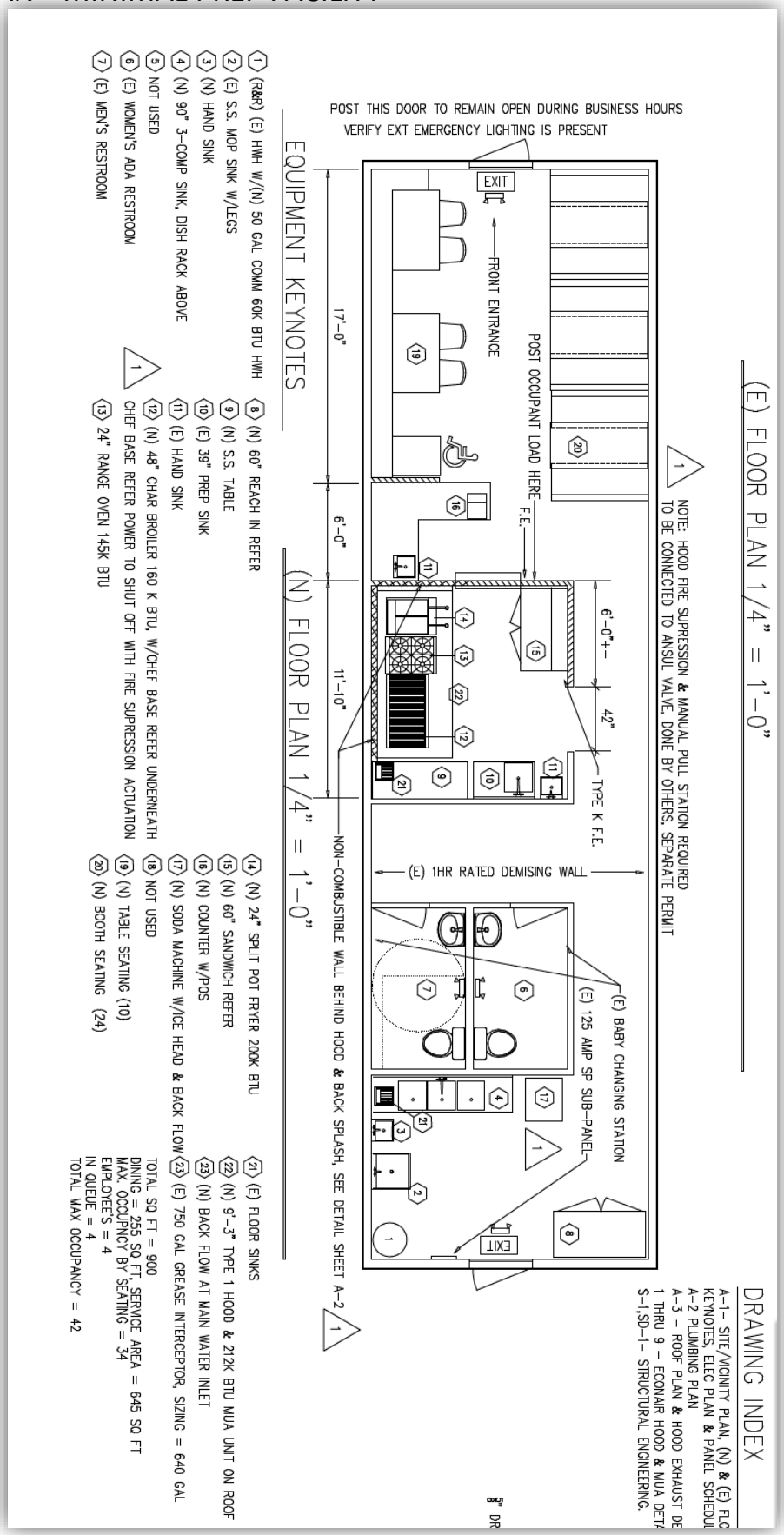
SAMPLE FLOOR PLAN WITH EQUIPMENT SCHEDULE – BAKERY



EQUIPMENT/FIXTUR			
ITEM NUMBER	QTY	DESCRIPTION	DIMENSIONS
B21	4	21 GALLON INGREDIENT BIN	SEE EQUIPMENT PURCHASING GUIDE
B43	6	43 GALLON INGREDIENT BIN	SEE EQUIPMENT PURCHASING GUIDE
BH1	1	BROOM HANGER	SEE EQUIPMENT PURCHASING GUIDE
BP1	2	BOUNCEPAD KIOSK	SEE BUILDOUT GUIDE
CD1	1	CASH DRAWER	SEE EQUIPMENT PURCHASING GUIDE
CM1	1	UNIFI G4 BULLET SECURITY CAMERA	SEE NEW STORE TECH PACKAGE
CM2	5	UNIFI G3 FLEX SECURITY CAMERA	SEE NEW STORE TECH PACKAGE
CR1	1	STRIPE REDER & DOCK	SEE NEW STORE TECH PACKAGE
CS1	1	STAINLESS STEEL THREE COMPARTMENT SINK	SEE EQUIPMENT PURCHASING GUIDE
CT1	1	COOKIE TRAY	SEE NAMIFY OPENING STORE PACKAGE
CT2	1	SMALL COOKIE TRAY	SEE NAMIFY OPENING STORE PACKAGE
DC1	1	DATA CABINET	SEE EQUIPMENT PURCHASING GUIDE
DD1	1	DOOR DASH LABEL PRINTER	5.7" L X 9.2" D X 5" H
F2	1	GLASS DOOR FREEZER	27 1/8" L X 31 7/10" D X 85 3/8" H
GD1	6	GLOVE DISPENSER	9" L X 3" D X 18" H
HS1	3	STAINLESS STEEL HAND SINK	SEE EQUIPMENT PURCHASING GUIDE
HT1	1	HONEYWELL THERMOSTAT	SEE EQUIPMENT PURCHASING GUIDE
IP10	5	10.2 INCH IPAD WALL MOUNT	SEE EQUIPMENT PURCHASING GUIDE
IP10CS	2	10.2 INCH IPAD DESK MOUNT	SEE EQUIPMENT PURCHASING GUIDE
JR1	4	INGREDIENT JAR	SEE EQUIPMENT PURCHASING GUIDE
LK1	2	EMPLOYEE LOCKERS	SEE EQUIPMENT PURCHASING GUIDE
M1	2	HOBART LEGACY HL600-1 MIXER	31" L X 47" D X 61" H
M2	1	HOBART LEGACY HL200-1 20 QT MIXER	17 1/8" W X 21" D X 30 1/2" H
MW1	2	1000W COMMERCIAL MICROWAVE	20" L X 18.5" D X 12" H
O1	2	BLODGETT XR8-E	SEE EQUIPMENT PURCHASING GUIDE
OS1	1	OPEN SIGN	SEE EQUIPMENT PURCHASING GUIDE
PH1	1	PHONE	SEE EQUIPMENT PURCHASING GUIDE
POS1	1	BOUNCE PAD FLIP	SEE EQUIPMENT PURCHASING GUIDE
PR1	1	PRINTER	SEE EQUIPMENT PURCHASING GUIDE
PS1	1	REGENCY STAINLESS STEEL PREP SINK	SEE BUILD OUT GUIDE
R1	6	REACH-IN REFRIGERATOR	54" L X 33 1/4" D X 82 1/2" H
R2	1	REACH-IN REFRIGERATOR	29" L X 32 1/4" D X 82 1/2" H
R4	1	Counter Height Solid Door Back Bar Refrigerator	68" L X 28" D X 40" H

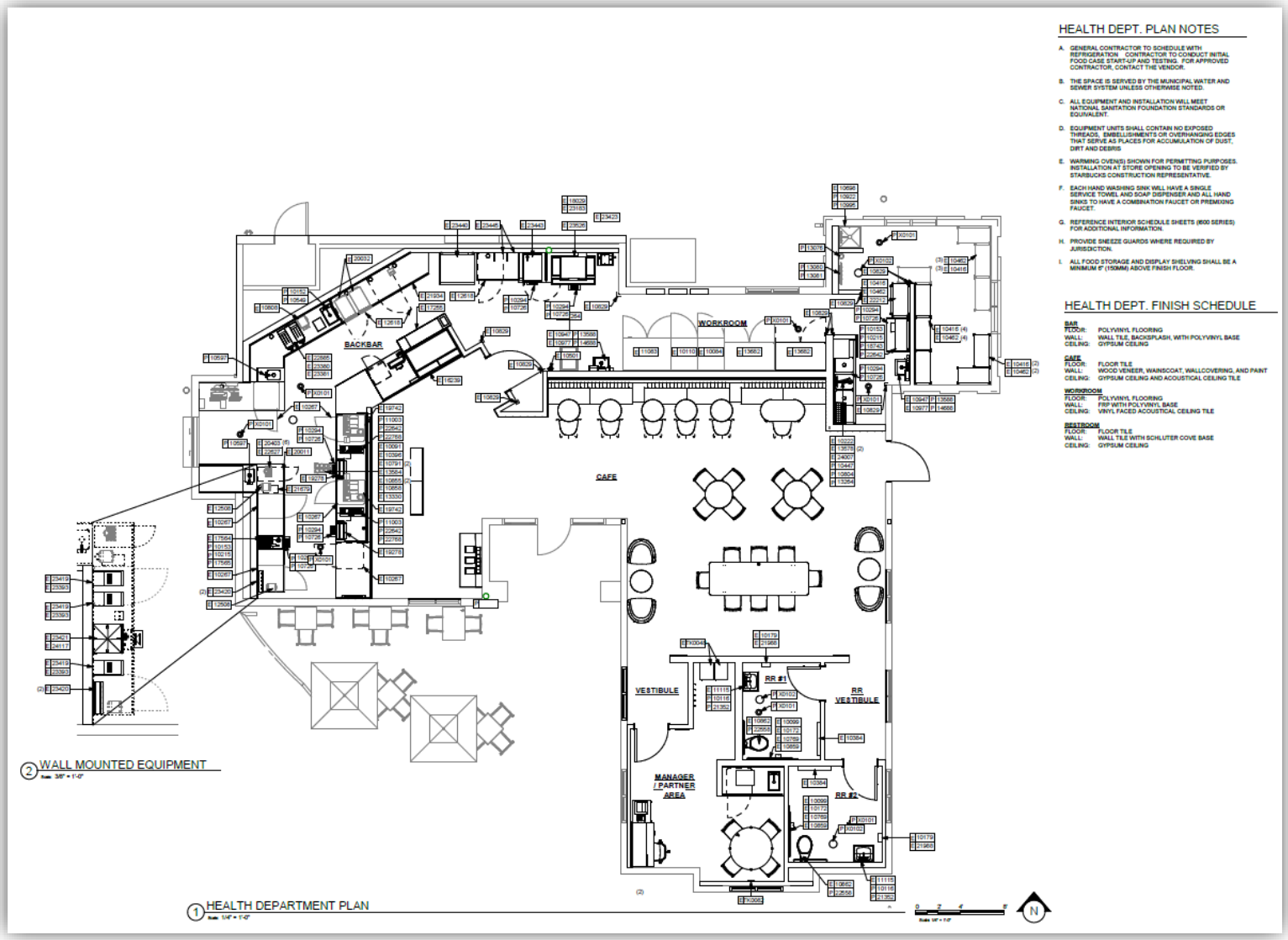
APPENDIX B

SAMPLE FLOOR PLAN – MINIMAL PREP FACILITY



APPENDIX C

SAMPLE FLOOR PLAN – COFFEE SHOP



APPENDIX D

SAMPLE EQUIPMENT/PLUMBING SCHEDULE

#	EQUIPMENT	MANUFACTURER MODEL NO.	NSF	PLUMBING				COMMENT
				HW	CW	DIR	FS	
1	COMMERCIAL GAS WATER HEATER							90,000 BTU
2	(3) HANDWASHING SINKS		X	X	X	X		
3	MANUAL WAREWASHING 3-COMPARTMENT SINK 18" x 18" x 12"		X	X	X		X	Comply with UPC (2) 18" drain boards
4	MOP BASIN			X	X	X		Approved backflow prevention device
5	WALK-IN COOLER		X				X	
6	LOW TEMP. MECHANICAL WAREWASHING MACHINE		X	X	X		X	Comply with UPC
7	FOOD PREP SINK (18" x 18" x 12")		X	X	X		X	18" drain board
8	FOOD PREP TABLE		X				X	
9	2-DOOR UNDERCOUNTER REFRIGERATOR		X					Self-contained
10	4-DOOR UPRIGHT FREEZER		X					Self-contained
11	SANDWICH PREP TABLE		X					Self-contained
12	2 DR UPRIGHT REFRIG.		X					Self-contained
13	ICE MACHINE		X		X		X	
14	COFFEE BREWER		X					
15	COFFEE GRINDER		X					
16	(2) BLENDERS		X					
17	SODA DISPENSER		X		X		X	
18	ESPRESSO MACHINE		X		X		X	
19	STAILESS STEEL TABLE		X					

APPENDIX E

SAMPLE FINISH SCHEDULE

ROOM NAME	FLOOR	COVE BASE 3/8" RADIUS	WALLS	CEILING
Service Area	Smooth quarry tile	4" quarry tile	Gypsum board; smooth; semi-gloss paint Swiss coffee	Drop ceiling; vinyl faced panel; smooth; white
Food Preparation area	Sealed smooth concrete	S3619T Slimfoot ceramic tile	Stainless steel	Drop ceiling; vinyl faced panel; smooth; white
Utensil Washing area	Troweled epoxy monolithic floor - smooth	Continuous smooth epoxy flooring 4" up to the wall	Fiberglass Reinforced Panel (FRP); white	USG ceiling panel; nonfissured; white
Walk-in cooler	Prefabricated smooth s/s floor	6" Stainless steel cove base	Smooth stainless steel	Smooth stainless steel
Food Storage Area	Smooth ceramic tile	4" ceramic tile	Smooth concrete wall; semi-gloss paint; light colored (70% Light Reflectance Value)	Drop ceiling; vinyl faced panel; smooth; white
Janitorial Area	Smooth ceramic tile	4" ceramic tile	Ceramic tile white	Drop ceiling; vinyl faced panel; smooth; white
Restroom	Commercial Grade Sheet Vinyl (.050 inch wear layer thickness) ♦ All seams welded or otherwise sealed to form a continuous surface	Continuous up to the walls, at least 4" forming an integral 3/8" minimum radius cove base	Ceramic tile; light colored (70% Light Reflectance Value)	Drop ceiling; vinyl faced panel; smooth; white

APPENDIX F

WALK-IN REFRIGERATED STORAGE

$$\text{Estimated Space Needed (Cu. ft.)} = \frac{\text{Volume per Meal [Cu. ft.]} \times \text{Number Meals Served between Deliveries}}{0.40}$$

NOTE: Only 40% of any walk-in unit actually provides usable space

$$\frac{\text{Estimated Space (Cu. ft.)}}{\text{Height of Cooler (ft.)}} = \text{Size of Cooler Needed (Sq. ft.)}$$

Examples:

1. The number of meals between deliveries = 1000 (100 meals per day X 10 days between deliveries). Volume per meal = 0.1 cubic feet.

$$0.1 \text{ ft}^3 \text{ vol.} \times 1000 \text{ meals} = 100 \text{ ft}^3$$

$$\frac{100 \text{ ft}^3}{0.40} = 250 \text{ ft}^3 \text{ Usable Space Needed}$$

2. The usable space needed for the walk-in is 250 cubic feet. The cooler has a 6 foot high ceiling.

$$\frac{250 \text{ ft}^3 \text{ usable space needed}}{6 \text{ ft ceiling height}} = 41 \text{ ft}^2 \text{ Sized Cooler Needed}$$

REACH IN REFRIGERATED STORAGE

$$\text{Estimated Space Needed (Cu. ft.)} = \frac{\text{Volume per Meal [Cu. ft.]} \times \text{Number Meals Served between Deliveries}}{0.75}$$

NOTE: Only 75% of any reach-in unit actually provides usable space

Example:

1. The number of meals between deliveries = 1000 (100 meals per day X 10 days between deliveries). Volume per meal = 0.1 cubic feet.

$$0.1 \text{ ft}^3 \text{ vol.} \times 1000 \text{ meals} = 100 \text{ ft}^3$$

$$\frac{100 \text{ ft}^3}{0.75} = 133.3 \text{ ft}^3 \text{ Estimated Space Needed}$$

HOT WATER DEMAND

$$\text{Gallons Per Hour (GPH)} = \frac{\text{Sink Size in}^3 \times 7.5\ \text{gal/ft}^3 \times (\text{Number of compartments} \times 0.75\ \text{capacity})}{1728\ \text{in}^3/\text{ft}^3}$$

OR

$$\text{Sink Size in}^3 \times \text{Number components} \times 0.003255\ \text{in}^3$$

$$\text{British Thermal Units (BTU)} = \frac{\text{GPH} \times \text{°Rise} \times 8.33\ \text{lb/gal of water}}{\text{Thermal Efficiency}}$$

$$\text{Kilo-Watt (KW) Input} = \frac{\text{GPH} \times \text{°Rise} \times 8.33\ \text{lb/gal of water}}{3412\ \text{BTU per KW}}$$

Example:

1. How many BTU's or KW's will the booster heater need to raise the incoming hot water (140°F) to 180°F for the final rinse temperature if the dishwasher requires 64 GPH?

$$\frac{64\ \text{GPH} \times 40°\text{F Rise} \times 8.33}{0.70\ (\text{operating efficiency})} = 30{,}464\ \text{BTU}$$

$$\frac{64\ \text{GPH} \times 40°\text{F Rise} \times 8.33}{3412\ \text{BTU per KW}} = 6.2\ \text{KW}$$

DRY STORAGE

$$\text{Required Storage Area (sq. ft)} = \frac{\text{Volume per Meal (0.1 cu. ft.)} \times \text{Number Meals between Deliveries}}{\text{Avg. Height of Area (ft.)} \times \text{Fraction of Usable Floor Area}}$$

Example: 7 ft. high ceiling, shelves 6" off the floor, 18" from ceiling
Usable Height 5 ft.

Usable Floor Space:
Depends on door swings, overhead sewer lines, electrical boxes, etc.

Examples:

1. The number of meals between deliveries = 1,000 (100 meals per day X 10 days between deliveries). A ***small fraction (3/10ths) of usable storage space*** in a store room that has 5 feet in usable height

$$\frac{0.1 \text{ cu. ft.} \times 1000 \text{ meals}}{5\text{ft} \times 0.3} = 66.67 \text{ ft}^2 \text{ Required Storage Area}$$

2. The number of meals between deliveries =1,000 (100 meals per day X 10 days between deliveries). A ***larger fraction (6/10ths) of usable storage space*** in a store room that has 5 feet in usable height

$$\frac{0.1 \text{ cu. ft.} \times 1000 \text{ meals}}{5\text{ft} \times 0.6} = 33 \text{ ft}^2 \text{ Required Storage Area}$$

LINEAR FEET OF SHELVING

$$\text{Linear Feet of Shelving Required (ft.)} = \frac{\text{Volume per Meal (0.1 cu. ft.)} \times \text{Number Meals between Deliveries}}{D \times H \times C}$$

D =Depth of Shelves (ft.)

H =Clearance bewteen shelves (ft.)

C =80% effective capacity of shelf height

Examples:

1. Assume 400 meals per day and a 10 day storage between deliveries = 4,000 meals.
   Volume of 0.1 cu. Ft. per meal, shelf depth of 18 inches, clearance of **12 inches** between shelves and 80% effective capacity of shelf height

$$\frac{0.1 \text{ cu. ft.} \times 4000 \text{ meals}}{1.5 \text{ ft.} \times 1 \text{ ft.} \times 0.80} = 333 \text{ ft. Shelving Needed}$$

2. Assume 400 meals per day and a 10 day storage between deliveries = 4,000 meals.
   Volume of 0.1 cu. Ft. per meal, shelf depth of 18 inches, clearance of **18 inches** between shelves and 80% effective capacity of shelf height

$$\frac{0.1 \text{ cu. ft.} \times 4000 \text{ meals}}{1.5 \text{ ft.} \times 1.5 \text{ ft.} \times 0.80} = 222 \text{ ft. Shelving Needed}$$

APPENDIX G

Backflow Prevention in Food Establishments

Why is Backflow Important?

State and local regulations require that food establishments meet backflow requirements to protect the potable water supply for the community. This handout is intended to provide food establishment operators with the regulatory basis for backflow prevention requirements and information on the types of backflow devices commonly found in food facilities.

Figure 17: Diagram depicting several causes of backflow in a potable water supply.

What Backflow Terminology is Important to Know?

Air Gap is the unobstructed vertical air space between the end of a drain line and the topmost part of the receiving vessel (e.g. floor sink or mop sink) that goes to the sewer system, and/or the end of a freshwater supply line and the point at which it connects to food service equipment. An air gap prevents dirty water from entering the potable water system.

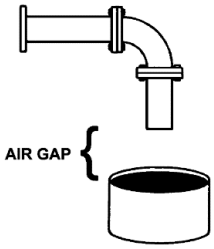


Figure 18: Example of an air gap.

Atmospheric Vacuum Breaker (AVB) is a non-testable backflow prevention device designed to be used in non-continuous pressure applications that automatically vents air to prevent back siphonage into the upstream piping. AVBs must be installed at least 6 inches above the highest point of downstream piping.

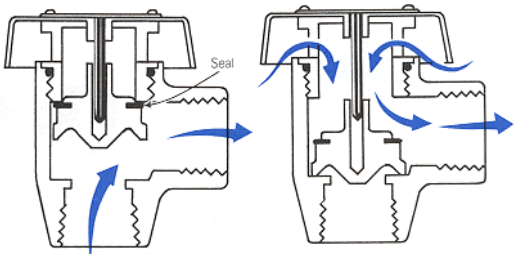


Figure 19: (Left) AVB valve open allowing water out of faucet. (Right) AVB valve closed blocking flow of water upstream of device.

Backflow, also known as *Backpressure* or *Back-Siphonage*, is the unwanted flow of contaminated water in the reverse direction that can cause contamination of clean water lines.

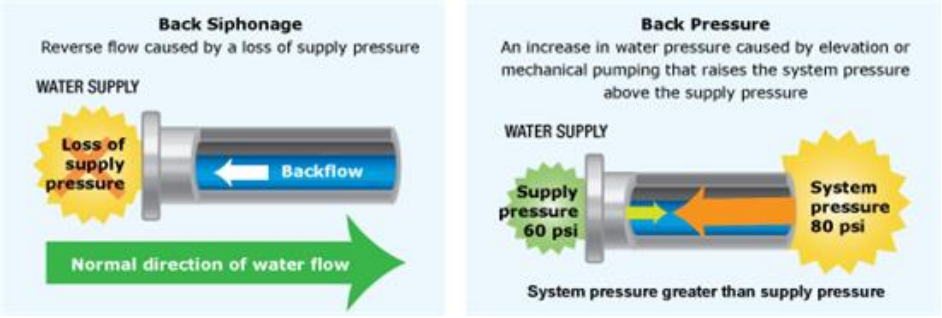


Figure 20: Examples of back siphonage and back pressure.

Backflow Prevention Device is a device that ensures that water can only flow in one direction. There are many types of backflow prevention devices and each one works best under specific circumstances. The official University of Southern California (USC) List of Approved Backflow Prevention Assemblies can be found by visiting the USC, Foundation for Cross-Connection Control and Hydraulic Research webpage at https://fccchr.usc.edu/list.html.

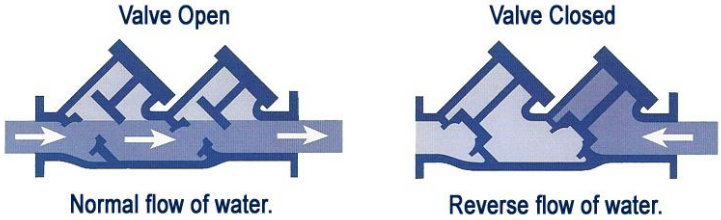


Figure 21: (Left) Normal flow of water in the intended direction through a backflow prevention device. (Right) Flow of water in the reverse direction blocked by closed valves in backflow prevention device, preventing contamination of upstream water.

Certified Backflow Prevention Assembly Tester is a person who is certified to test assemblies for the prevention of backflow by the California/Nevada section of the American Water Works Association, the American Backflow Prevention Association or an equivalent organization approved by the State of Nevada. A list of Approved Backflow Testers in the area can be found on the Truckee Meadows Water Authority webpage at https://tmwa.com/approved-backflow-testers/.

Cross-Connections are physical connections between separate piping systems in which one system contains potable water and the other contains liquid of unknown origin or questionable safety.

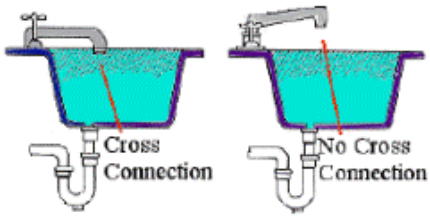


Figure 22: (Left) End of faucet is installed below rim of sink causing a direct cross-connection with the sewer system. (Right) End of faucet is installed above rim of sink; no cross connection is present with sewer system.

Cross-Connection Control Specialist is a person who is certified by the California/Nevada section of the American Water Works Association, the American Backflow Prevention Association or an equivalent organization approved by the State of Nevada to assure that cross-connection control programs continue to protect drinking water.

Dual Check with Intermediate Atmospheric Vent is a non-testable backflow device that has a vent, or atmospheric port, located between two independently acting check valves. The device is intended for use in non-health hazard cross-connection and continuous pressure applications like beverage machines.

Figure 23: Examples of ASSE 1022 Dual Check Valves with Intermediate Atmospheric Vent

Hose Connection Vacuum Breaker is a non-testable threaded backflow device that can be attached to a faucet or hose bib and is designed to be used in non-continuous pressure applications. The device automatically vents air to prevent back siphonage into the upstream piping.

Figure 24: Typical Hose Connection Vacuum Breaker.

Hot Box is a weatherproof and vandalism resistant enclosure for backflow devices that are installed outside.

Figure 25: (Left) Hot box disguised as a rock. (Right) Typical lockable hot box.

Pressure Vacuum Breaker (PVB) is a non-testable backflow prevention device designed to be used in continuous pressure applications that automatically vents air to prevent back siphonage into the upstream piping. PVBs must be installed at least 12 inches above the highest point of downstream piping.

Figure 26: Typical pressure vacuum breaker.

Reduced Pressure Principle Assembly (RPPA), also known as a *Reduced Pressure Zone Assembly (RPZ)* is a testable backflow prevention device that is designed to be used in continuous pressure applications or where a significant hazard to human health is possible. An RPPA must be installed on the domestic water supply line for food facilities.

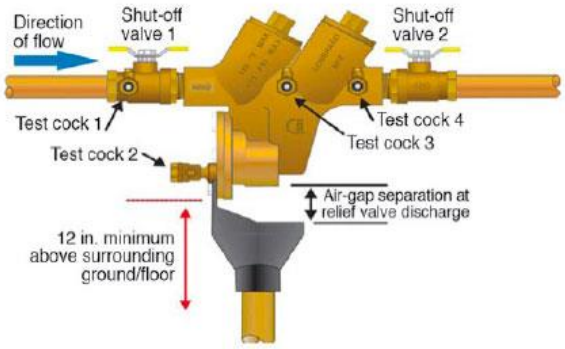


Figure 27: Diagram of a typical RPPA/RPZ backflow device.

Uniform Plumbing Code (UPC) is a model code developed by the International Association of Plumbing and Mechanical Officials (IAPMO) to govern the installation and inspection of plumbing systems as a means of promoting the public's health, safety and welfare.

Who Requires Backflow Prevention in Food Establishments?

Backflow prevention in food establishments is required per State and local regulations and the Uniform Plumbing Code.

Nevada Administrative Code (NAC) 445A.67185 to 445.67255:

NAC 445A.67195 **Cross-connections and backflow: Minimum types of protection for particular service connections. (NRS 445A.860)** Except as otherwise provided in NAC 445A.67185 to 445A.67255, inclusive, or authorized by the Division or the appropriate district board of health, the minimum type of protection from cross-connection required for a service connection to... [12] A restaurant or other facility in which food is served consists of a Reduced Pressure Principle Assembly (RPPA).

Washoe County District Board of Health Governing Food Establishments §070.020 to 070.059

§070.020 Plumbing system

Except as otherwise provided in these regulations, all plumbing systems including individual sewage disposal system piping, must be sized, constructed, installed, located and maintained according to the requirements in the most recent edition of the Uniform Plumbing Code or pursuant to the authority having jurisdiction.

§ 070.032 Backflow prevention, air gap

An air gap between the water supply inlet and the flood level rim of the plumbing fixture, equipment, or nonfood equipment shall be at least twice the diameter of the water supply inlet and may not be less than 25 mm (1 inch).

§ 070.033 Backflow prevention device, design standard

A backflow or back-siphonage prevention device installed on a water supply system shall meet American Society of Sanitary Engineering (A.S.S.E) standards for construction, installation, maintenance, inspection, and testing for that specific application and type of device.

§ 070.056 Backflow prevention device, when required

A plumbing system shall be installed to preclude backflow of a solid, liquid, or gas contaminant into the water supply system at each point of use at the food establishment, including on a hose bib if a hose is attached or on a hose bib if a hose is not attached and backflow prevention is required by law by:

A. Providing an air gap as specified in Section 070.032 of these regulations, or
B. Installing an approved backflow prevention device as specified under Section 070.033 of these regulations.

§ 070.057 Backflow prevention device, carbonator

A. If not provided with an air gap as specific in Section 070.032 of these regulations, a dual check valve with an intermediate vent preceded by a screen of not less than 100 mesh to 25.4 mm (100 mesh to 1 inch) shall be installed upstream from a carbonating device and downstream from any copper in the water supply line.
B. A dual check valve attached to the carbonator need not be of the vented type if an air gap or vented backflow prevention device has been otherwise provided as specified under Subsection A.

§ 070.059 Backflow prevention device, location

A backflow prevention device shall be located so that it may be serviced and maintained.

§ 070.070 Backflow prevention

A. Except as provided in Subsection B of this section, a direct connection may not exist between the sewage system and a drain originating from equipment in which food, portable equipment, or utensils are placed except when floor drains originating in refrigerated spaces are constructed as an integral part of the building.
B. A warewashing machine may have a direct connection to the sewage system provided that it conforms to applicable codes adopted in these regulations.

How do I Protect the Domestic Water Supply with an RPPA?

Per the NAC, all food facilities are required to have an RPPA installed to prevent cross-connections. RPPA devices are often found installed in a hot box located near the water meter or inside the building before the first connection or “T”. If installed inside a food facility, RPPA devices and all associated plumbing must be installed at least 1” off the wall using clear acrylic block or copper bells; unistruts may not be used for this purpose inside a food facility. ******Submission of building plans to the Building Department in your jurisdiction may be required for any new RPPA installations.***

Figure 28: (Left) Typical installation of RPPA inside a food facility where piping is held 1" off wall using clear acrylic block and device has an air gap fitting installed on the drain line to ensure device is indirectly drained. (Right) RPPA installed in an outdoor hot box.

Stand-Alone Building Backflow Requirements:

If the food facility encompasses an entire stand-alone building, an RPPA must be installed on the incoming water supply line for the building prior to the first connection or "T". The RPPA must be installed between 12 inches and 36 inches from the ground and be indirectly drained to an approved location (e.g. floor sink, mop sink, hot box, etc.). ******The RPPA backflow device must be tested annually by a Certified Backflow Prevention Assembly Tester and test results must be made available to NNPH during all inspections.***

Multi-Unit Building Backflow Requirements:

If a food facility is a single unit within a multi-unit building, the following options are available for complying with the RPPA backflow requirements:

- *Option 1 (RPPA Install)*

An RPPA must be installed so that the individual unit cannot create a potential cross-connection and affect other units in the building. It must be installed on the incoming water supply line for the unit prior to the first connection or "T" in the building. The RPPA must be installed between 12 inches and 36 inches from the ground and be indirectly drained to an approved location (e.g. floor sink, mop sink, hot box, etc.). ******This backflow device must be tested annually by a Certified Backflow Prevention Assembly Tester and test results must be made available to NNPH during all inspections.***

- *Option 2 (Cross-Connection Control Survey) ***This Option Does Not Apply to Stand-Alone Buildings*

If an RPPA is installed on the domestic water supply line for the building before the first connection or "T" in the building, but an RPPA is not installed for the individual unit containing a food facility, NNPH may allow the facility to obtain a Cross-Connection Control Survey for the unit. If this option is chosen, the operator must ensure the following items are obtained annually:

A. A letter signed by a certified Cross-Connection Control Specialist stating that they have inspected the facility, that the facility currently meets all backflow requirements, and that the facility does not currently present a potential cross-connection hazard; therefore, the facility is not required to have an additional testable RPPA installed inside the unit. The letter must include their Cross-Connection Control Specialist certification number, and
B. Passing test results for the building RPPA backflow device. This backflow device must be tested annually by a certified Backflow Prevention Assembly Tester, and test results must be made available to NNPH during all inspections. ******Test results are only valid for one year from the test date.***

What Other Backflow Requirements Apply to my Food Establishment?

Post-Mix Carbonated Beverage System:

If a food facility installs a post-mix carbonated beverage system (e.g. soda machine) and an air gap is not provided on the supply line, an RPPA or an ASSE 1022 dual check valve with an intermediate atmospheric vent must be installed upstream from the carbonator and downstream from any copper to prevent carbonic acid (H_2CO_3) from coming into contact with copper, copper alloy pipes and copper fittings which can cause copper poisoning in people consuming beverages. If an air gap is not installed with this equipment, the operator must ensure that:

A. RPPA devices are tested annually, and test results are made available to NNPH during all inspections.
B. Since dual check valve devices are non-testable, the device must be inspected annually by a commercial beverage system installer, a licensed plumber, or certified backflow tester. The inspection report must declare that the device is operable and properly functioning, or that the device was nonfunctional and replaced. The report must be made available to NNPH during all inspections.

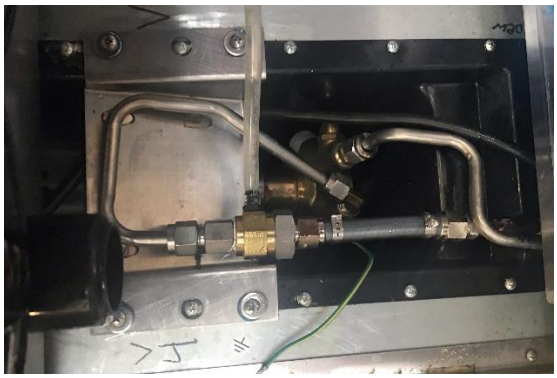


Figure 29: Dual check valve with intermediate atmospheric vent installed at beverage dispensing station.

<u>Vacuum Breakers:</u>

Food facilities are also required to protect potable water connections from back siphonage conditions by using vacuum breakers.

A. Atmospheric Vacuum Breakers (AVBs) are commonly installed at mop sink faucets and as part of dishwasher piping systems. ******Please note that a y-valve connector/hose splitter may not be installed downstream of the AVB as only a single connection is allowed on a faucet.***

Figure 30: (Left) Properly installed atmospheric vacuum breaker on mop sink faucet. (Right) Prohibited y-valve connector installed on mop sink faucet that must be removed.

B. When an AVB cannot be reasonably installed at a threaded hose faucet connection (e.g. utility sink, hose bib, etc.), a Hose Connection Vacuum Breaker may be installed to protect potable water supply from cross-connections.

Figure 31: Hose connection vacuum breaker installed at hose bib.

C. Pressure Vacuum Breakers (PVBs) are commonly found as part of irrigation systems at food facilities.

Figure 32: Pressure vacuum breaker installed on irrigation system.

Air Gaps:

Any piece of food service equipment in which dishware, utensils, and consumable food and beverages are placed cannot have a direct line to the sewage system. Installation of an air gap is the only way to prevent direct connections in piping systems; however, it is not required or reasonable in all situations.

A. In a food facility, sink faucets, ice machines, and other equipment where otherwise required must have an air gap of at least two times the diameter of the water supply line opening, but not less than 1 inch.

Figure 33: Prep sink faucet with an air gap of at least twice the diameter of the water supply line opening.

B. In a food facility, 3-compartment sinks, prep sinks, dump sinks, walk in condenser systems, and other food service equipment that drains directly to a grease trap or floor sink must have an air gap of at least 1-inch between the end of the discharge pipe and the topmost rim of the receiving vessel.

Figure 34: (Left) 3-compartment sink drain line properly air gapped to floor sink. (Right) Prep sink incorrectly plumbed with drain line below rim of floor sink.

C. As an RPPA represents a direct connection with the potable water supply, the associated relief valve drain line must be indirectly drained to an appropriate location (e.g. floor sink, mop sink, etc.).

Figure 35: RPPA installed with a blue air gap adapter fitting to ensure device is indirectly draining.

Who do I Contact if I Have More Questions About Backflow?

For additional information, please contact the Northern Nevada Public Health (NNPH) Environmental Health Services Food Plan Review and Construction Program at 775-328-2434 (option 8), or by email at healthehs@nnph.org.