Georgia Department of Public Health

"We Protect Lives."

"Moving forward - Stake-Holders working together to improve the effectiveness of Georgia's food safety program."

The Establishment Plan Review Technical Manual For the Rules of the Department of Public Health Chapter 511-6-1 Entitled,

"Food Service Establishment Manual for Design, Installation and Construction,"

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PART – I

Administrative Guidance to Conduct a Plan Review

SECTION A – DEFINITIONS

REFERENCES (Chapter 511-6-1)

.01 Definitions. Amended.
(a) through (tttttt)

I. Purpose: These definitions are provided as an adjunct to those provided within DPH Rule 511-6-1-.01 for clarification of certain issues or information presented within this Manual. Even though they shall apply, they shall not supersede terms defined within Chapter 511-6-1. The Chapter should always be consulted for specific requirements and terminologies. In addition, portions of this Section are written in *italics*. They are provided to convey relevant information and guidance to interpret Chapter 511-6-1.

II. Definitions[1]:

1. **"Acceptable food equipment"** means food equipment that is deemed to be in conformance with Chapter 511-6-1 provisions such as equipment that is certified or classified for sanitation by an American National Standards Institute (ANSI)-accredited certification program. Such equipment is deemed to comply with DPH Rule 511-6-1-.05 (1) and (2).

   A. *Under ANSI document CA-1 ANSI Policy and Criteria for Accreditation of Certification Programs, it has been stipulated that:*

   B. *"For food equipment programs, standards that establish sanitation requirements shall be specified government standards or standards that have been ratified by a public health approval step. ANSI shall verify that this requirement has been met by communicating with appropriate standards developing organizations and governmental public health bodies."*

   C. *The term "certified" is used when an item of food equipment has been evaluated against an organization's own standard. The term "classified" is used when one organization evaluates an item of food equipment against a standard developed by another organization.*

[1] Source: Definitions – 2008 FDA Food Establishment Plan Review Guidance Document & DPH Rule 511-6-1-.01 Definitions.

2. **"Air Break"** means a piping arrangement in which a drain from a fixture, appliance, or device discharges indirectly into another fixture, receptacle or interception at a point below the flood level rim. The connection does not provide an unobstructed vertical distance and is not solidly connected but precludes the possibility of backflow to a potable water source.

3. **"Air Gap"** means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or outlet supplying fixture, or other device, and the flood level rim of the receptacle. The vertical physical separation shall be at least two times the inside diameter of the water inlet pipe above the flood rim level but shall not be less than one inch.

4. **"Approved"** means acceptable to the Health Authority based on a determination of conformity with principles, practices, and generally recognized standards that protect public health.

5. **"Backflow"** means the flow of water or other liquids, mixtures, or substances into a potable water system from any source, other than the intended source.

6. **"Backpressure"** means pressure in down stream piping greater than supply pressure causing a reversal of flow.

7. **"Back-siphonage"** means the creation of backflow as a result of negative pressure.

8. **"Corrosion-resistant material"** means a material that maintains acceptable surface cleanability characteristics under prolonged influence of the food to be contacted, the normal use of cleaning compounds and sanitizing solutions, and other conditions of the use environment.

9. "**Cross Connection"** any connection or structural arrangement between a potable water system and a non-potable source, liquid or otherwise, through which backflow can occur.

10. **"Direct connection"** means a physical connection between a potable and non-potable system.

11. **"Easily Disassembled Equipment"** means equipment that is accessible for cleaning and inspection by:

    A. Disassembling without the use of tools, or

B. Disassembling with the use of handheld tools commonly available to maintenance and cleaning personnel such as screwdrivers, pliers, open-end wrenches, and Allen wrenches.

12. **"Easily Movable"** means:

A. Portable; mounted on casters, gliders, or rollers; or provided with a mechanical means to safely tilt a unit of equipment for cleaning; and

B. Having no utility connection, a utility connection that disconnects quickly, or a flexible utility connection line of sufficient length to allow the equipment to be moved for cleaning of the equipment and adjacent area.

13. **"Equipment"** means:

A. **"Equipment"** means an article that is used in the operation of a food establishment such as a freezer, grinder, hood, icemaker, meat block, mixer, oven, reach-in refrigerator, scale, sink, slicer, stove, table, temperature measuring device for ambient air, warewashing machine, or other similar devices.

B. ***"Equipment"*** *does not include apparatuses used for handling or storing large quantities of packaged foods that are received from a supplier in a cased or overwrapped lot, such as hand trucks, forklifts, dollies, pallets, racks, and skids.*

14. "Facility" See "**Physical Facilities"**.

15. **"Food Employee"** means an individual working with unpackaged food, food equipment or utensils, or food-contact surfaces.

16. **"Food Service Establishment":**

A. "Food service establishment" means establishments for the preparation and serving of meals, lunches, short orders, sandwiches, frozen desserts, or other edible products either for carry out or service within the establishment.

B. "Food service establishment" includes:

a. Restaurants; coffee shops; cafeterias; short order cafes; luncheonettes; taverns; lunchrooms; places which retail sandwiches or salads; soda fountains; institutions both public and private; food carts; itinerant restaurants; industrial cafeterias; catering establishments; and similar facilities by whatever name called.

b. Within food service establishment, there may be a food sales component, not separately operated. This food sales component shall be considered as part of the food service establishment. *(See Part – II, Section I entitled, "Collaboration with Other Agencies" within the Interpretation Manual for Rules and Regulations Food Service Chapter 511-6-1.)*

C. **"Food establishment"** does not include:

a. *A "food sales establishment," as defined in the Code Section 26-2-21, except as stated in this definition. The food service component of any food sales establishment defined in Code Section 26-2-21 shall not be included in this definition.*

b. *Any outdoor recreation activity sponsored by the state, a county, a municipality, or any department or entity thereof, any outdoor or indoor (other than school cafeteria food service) public school function, or any outdoor private school function;*

c. *any organization which is operating on its own property or on the property of a party that has provided written consent for the use of such property for such purpose and which is exempt from taxes under O.C.G.A. Section 48-7-25(a)(1) or under Section 501(d) or paragraphs (1) through (8) or paragraph (10) of Section 501 (c) of the Internal Revenue Code for the purpose of operating a house or other residential structures where seriously ill or injured children and their families are provided temporary accommodations in proximity to their treatment hospitals and where food is prepared, served, transported, or stored by volunteer personnel;*

d. *This term also shall not mean establishments for the preparation and serving of meals, lunches, short orders, sandwiches, frozen desserts, or other edible products if such preparation or serving is an authorized part of and occurs upon the site of a fair or festival which:*

i. *Is sponsored by a political subdivision of this state or by an organization exempt from taxes under paragraph (1) of subsection (a) of Code Section 48-7-25 or under Section 501(d) or paragraphs (1) through (8) or paragraph (10) of section 501(c) of the Internal Revenue Code, as that code is defined in Code Section 48-1-2;*
ii. *Lasts 120 hours or less; and*
iii. *When sponsored by such an organization, is authorized to be conducted pursuant to a permit issued by the municipality or county in which it is conducted.*

17. **“Hazard Analysis Critical Control Point (HACCP)”** means a systematic approach to the identification, evaluation, and control of food safety hazards.

18. **“HACCP Plan**” means a written document that delineates the formal procedures for following the Hazard Analysis Critical Control Point principles developed by The National Advisory Committee on Microbiological Criteria for Foods.

19. **“Health authority**” means the Department or the County Board of Health acting as its agent

20. **“Highly susceptible population”** means persons who are more likely than other people in the general population to experience foodborne disease because they are:

    A. Immunocompromised; preschool age children, or older adults; and

    B. Obtaining food at a facility that provides services such as custodial care, health care, or assisted living, such as a child or adult day care center, kidney dialysis center, hospital or nursing home, nutritional or socialization services such as a senior center.

21. **“Indirect connection”** means a potential connection between a potable and non-potable system.

22. **“Linens”** means fabric items such as cloth hampers, cloth napkins, tablecloths, wiping cloths, and work garments including cloth gloves.

23 **“Physical facilities”** means the structure and interior surfaces of a food establishment including accessories such as soap and towel dispensers and attachments such as light fixtures and heating or air conditioning system vents.

24. **“Plumbing fixture”** means a receptacle or device that:

    A. Is permanently or temporarily connected to the water distribution system of the premises and demands a supply of water from the system; or

    B. Discharges used water, waste materials, or sewage directly or indirectly to the drainage system of the premises.

25. **“Plumbing system”** means the water supply and distribution pipes; plumbing fixtures and traps; soil, waste, and vent pipes; sanitary and storm sewers and building drains, including their respective connections, devices, and appurtenances within the premises; and water-treating equipment.

26. **"Time/temperature control for safety food"**

A. "Time/temperature control for safety food " means a food that requires time/temperature control for safety (TCS) to limit pathogenic microorganism growth or toxin formation.

B. "Time/temperature control for safety food" includes:

i. An animal food that is raw or heat-treated; a plant food that is heat-treated or consists of raw seed sprouts, cut melons, cut tomatoes or mixtures of cut tomatoes that are not modified in a way so that they are unable to support pathogenic microorganism growth or toxin formation, or garlic-in-oil mixtures that are not modified in a way so that they are unable to support pathogenic microorganism growth or toxin formation; and

ii. Except as specified in Subparagraph (3) (d) of this definition, a food that because of the interaction of it's aw and pH values is designated as Product Assessment Required (PA) in Table A or B of this definition:

TABLE – A

Table A. Interaction of PH and AW for control of spores in FOOD heat-treated to destroy vegetative cells and subsequently PACKAGED

AW values	PH values		
	4.6 or less	> 4.6 - 5.6	> 5.6
≤0.92	non-PHF*/non-TCS FOOD**	non-PHF/non-TCS FOOD	non-PHF/non-TCS FOOD
> 0.92 - .95	non-PHF/non-TCS FOOD	non-PHF/non-TCS FOOD	PA***
> 0.95	non-PHF/non-TCS FOOD	PA	PA

* PHF means Time/temperature control for safety food
** TCS FOOD means TIME/TEMPERATURE CONTROL FOR SAFETY FOOD
*** PA means Product Assessment required

TABLE-B

Table B. Interaction of PH and AW for control of vegetative cells and spores in FOOD not heat-treated or heat-treated but not PACKAGED				
AW values	PH values			
	< 4.2	4.2 - 4.6	> 4.6 - 5.0	> 5.0
< 0.88	non-PHF*/ non-TCS food**	non-PHF/ non-TCS food	non-PHF/ non-TCS food	non-PHF/ non-TCS food
0.88 – 0.90	non-PHF/ non-TCS food	non-PHF/ non-TCS food	non-PHF/ non-TCS food	PA***
> 0.90 – 0.92	non-PHF/ non-TCS food	non-PHF/ non-TCS food	PA	PA
> 0.92	non-PHF/ non-TCS food	PA	PA	PA

* PHF means Time/temperature control for safety food
** TCS FOOD means TIME/TEMPERATURE CONTROL FOR SAFETY FOOD
*** PA means Product Assessment required

C. **"Time/temperature control for safety food"** does not include:

i. An air-cooled hard-boiled egg with shell intact, or an egg with shell intact that is not hard-boiled, but has been treated to destroy all viable salmonellae;

ii. A food in an unopened hermetically sealed container that is commercially processed to achieve and maintain commercial sterility under conditions of non-refrigerated storage and distribution;

iii. A food that because of its pH or aw value, or interaction of aw and pH values, is designated as a non-PHF/non-TCS food in Table A or B of this definition;

iv. A food that is designated as Product Assessment Required (PA) in Table A or B of this definition and has undergone a Product Assessment showing that the growth or toxin formation of pathogenic microorganisms that are reasonably likely to occur in that food is precluded due to:

I. Intrinsic factors including added or natural characteristics of the FOOD such as preservatives, antimicrobials, humectants, acidulents, or nutrients,

II. Extrinsic factors including environmental or operational factors that affect the FOOD such as packaging, modified atmosphere such as REDUCED OXYGEN PACKAGING, shelf life and use, or temperature range of storage and use, or

III. A combination of intrinsic and extrinsic factors; or

v. A FOOD that does not support the growth or toxin formation of pathogenic microorganisms even though the FOOD may contain a pathogenic microorganism or chemical or physical contaminant at a level sufficient to cause illness or injury.

27. **"Premises"** means and includes all physical buildings, appurtenances, parking lots and all property owned and/or used by the food service establishment.

28. **"Refuse"** means solid waste not carried by water through the sewage system.

29. **"Safe material"** means:

    A. An article manufactured from or composed of materials that may not reasonably be expected to result, directly or indirectly, in their becoming a component or otherwise affecting the characteristics of any food;

    B. An additive that is used as specified in Sections 409 or 706 of the Federal Food, Drug, and Cosmetic Act; or

    C. Other materials that are not additives and that are used in conformity with applicable regulations of the Food and Drug Administration.

30. **"Sealed"** means free of cracks or other openings that allow the entry or passage of moisture.

31. **"Sewage"** means liquid waste containing animal or vegetable matter in suspension or solution and may include liquids containing chemicals in solution.

32. **"Smooth"** means a surface that has no roughness or projections that render it difficult to clean or maintain in a sanitary condition.

    A. The requirement here is to provide a surface that can be easily cleaned on a daily basis with the least amount of effort such as wiping with a sponge, cloth or brushing. There should be no obstructive surface features that would *create impediment for cleaning the surface thereby allowing the collection of dirt and other debris.*

B. *It is the interpretation of the Department that all food service establishments that have been issued a food service permit dated prior to the adoption of Chapter 511-6-1 by the Department to not require these establishments to modify existing surfaces of walls, floors, and ceilings. However, should the Health Authority determine these surfaces can no longer be maintained in a clean and sanitary condition, the food service permit holder will alter these surfaces so as to bring them into compliance within the definition of "Smooth" as stated within DPH Rule 511-6-1-.01*

SECTION B – MENU REVIEW and FOOD PROCESS FLOW[1]

REFERENCES (Chapter 511-6-1)

.02 Provisions.

(1) (1) Permit (f) 2. and 3. Responsibilities of Permit Holder
(2) (1) Permit (g) Notification of Menu Change
(3) (3) Application for a Permit (b) Contents of Application
(4) (4) When Plans Are Required (b)&(c) Submission of Plans
(5) (5) When a HACCP Plan is Required (a) Categorization of Foods and (d) 1. Hazard analysis of menu items

.04 Food.

(1) (4) Protection From Contamination After Receiving (c) Packaged and Unpackaged Food – Separated, Packaging, and Segregation 1. (i) and (ii)
(2) (4) Protection From Contamination After Receiving (g) Washing Fruits and Vegetables 1.
(3) (4) Protection From Contamination After Receiving (t) Food Preparation
(4) (4) Protection From Contamination After Receiving (z) Miscellaneous Sources of Contamination

.05 Equipment and Utensils. Amended.

(1) (6) Maintenance and Operation (f) Warewashing Sinks, Use Limitation. 2.

.08 Special Food Service Operations.

(1) (2)Temporary Food Service Establishments (a) Operation, Permit Application, Responsibilities 3. Vendor Application (ii)

.10 Compliance Procedures

(2) Inspections (a) Risk Categorization

I. Conducting a Menu List Review:

1. The menu is an integral part of the Plan Review Process. A menu delineating all of the food and beverage items to be offered at the food service establishment must be submitted by the applicant to the Health Authority with the submission of the Plan Review document. Conducting a review of the menu list also allows the reviewer to establish plan review priorities by identifying:

[1] References: *Section 1 – Menu And Flow*, 2008 FDA Plan Review for Food Establishments Guidance Document; Section III – Food Establishment Guide For Design, Installation, and Construction Recommendations, Part 1 – Menu; *Annex 4 Management of Food Safety Practices* – Achieving Active Managerial Control of Foodborne Illness Risk Factors & *Annex 5 – Conducting Risk-based Inspections*, 2009 FDA Model Food Code; and *Section A – Flow Patterns In Kitchen Design* – November/December 1980 article – 1995 FDA Plan Review Training Manual for Plan Review Training Course held at Georgia Mental Health Institute, Atlanta, Georgia.

A. High-risk foods or high-risk food preparation processes; and

B. Operational steps requiring further inquiry such as receiving, preparation, cooking, cooling and reheating.

2. By identifying high-risk foods or high-risk food preparation processes, one can focus his or her attention on needed types of equipment and their arrangement along with the associated physical facilities as they relate to those foods or processes that will most likely cause, if uncontrolled, foodborne illness. These foods might include high-risk foods products like raw chicken that naturally carry a high pathogenic load. If such products are used in a facility, equipment design and arrangement related to cross-contamination and cooking should be a priority during the plan review. If there are foods that go through the temperature danger zone several times, equipment and facility arrangement relating to cooling, holding and reheating practices should be carefully reviewed. If the establishment is primarily a "Cook and Serve" operation, then time can best be spent on ensuring proper equipment design and arrangement to enhance adequate cooking of foods.

3. As with the inspection process, the plan review process should focus on the food and what will happen to the food as it flows through receipt, storage, preparation and service. The source and quantity of food to be served should be reviewed along with the preparation and post-preparation operations and the proposed storage practices. It is imperative to have knowledge of this information so that a proper assessment of the physical facilities can be made. In addition, food preparation processes should be evaluated to determine the types and volumes of foods to be prepared and the Risk Type associated with the establishment – Risk Type I, II or III. The Risk Type of establishment will be determined based on:

A. (Risk Type I) - No cooking of any food taking place. May reheat commercially prepackaged precooked foods such as hotdogs and sausages.

B. (Risk Type II) - Foods that are prepared onsite will be cooked and/or held and/or reheated.

C. (Risk Type III) - Food processing varies from the requirements found within the current Georgia Food Service Rules and Regulations Chapter 511-6-1 and as a result, a Hazard Analysis Critical Control Point (HACCP) plan is required to prove the food can be safely prepared and served within the establishment. Both the Georgia Department of Public Health's Environmental Health Branch and the County Health Department must jointly review and deem the HACCP plan as meeting the requirements of the Chapter before the particular food item can be included within the menu. The approval of said plans and specifications may be delayed until the completion of HACCP review process is completed.

4. Layout, flow and menu (including food preparation processes) should be major considerations to help facilitate a food service establishment operator's Active Managerial Control (AMC) of the risk factors for foodborne illness. Strategic layout and placing of facilities and equipment will separate different food preparation processes, a major step towards preventing contamination of food that may result from poor personal hygiene, contaminated equipment, and improper holding temperatures. Adequate and convenient storage will also enhance operations. The menu and methods of food preparation are the key elements in the layout and flow of the establishment.

5. Food preparation processes should be evaluated to determine the types and volumes of foods to be prepared. Special attention should be given to the review of complex food processes that will involve:

   A. Multiple ingredients being assembled or mixed.

   B. Potentially hazardous foods (time/temperature control for safety foods).

   C. Foods that will be prepared or held for several hours prior to service.

   D. Foods requiring cooling and reheating.

   E. Multiple steps processing (passing through the critical temperature zone - (135ºF to 41ºF more than once).

6. In the review and evaluation of food processing steps, the environmentalist will most likely need to request recipes for additional information as to how foods are to be processed. Should potential hazardous food processing vary from that required within the Georgia Food Service Rules and Regulations Chapter 511-6-1, a Hazard Analysis Critical Control Point (HACCP) plan and a variance request to the Department must accompany the menu item. The HACCP plan must enumerate at least the following information:

   A. A categorization of the types of potentially hazardous foods that are specified in the menu such as soups and sauces, salads and bulk solid foods such as meat roasts or other foods that are specified by the Health Authority.

   B. A flow diagram by specific food or category type that identifies critical control points and provides information on ingredients, materials and equipment used in the preparation of that food and formulations or recipes that delineate methods and procedural control measures that address the food safety concerns involved.

   C. A food service manager and employee training plan that addresses the food safety issues of concern.
   D. A statement of standard operation procedures for the plan under consideration including clearly identifying:

a. Each critical control point – the point within the food flow pattern where absolute control must be maintained to reduce hazards to safe levels or eliminated them,

b. The critical limits for each critical control point – the intercessions or control limits whereby hazards are reduced to safe levels or they are eliminated,

c. The method and frequency for monitoring and controlling each critical control point by the food employee designated by the person in charge,

d. Action to be taken by the person in charge if the critical limits or intercessions for each critical control point are not met, and

e. The method and frequency for the person in charge to routinely verify that the food employee is following standard operating procedures and monitoring critical control points,

f. Records to be maintained by the person in charge to demonstrate that the HACCP plan is properly operated and managed.

E. Additional scientific data or other information, as required by the Health Authority, supporting the determination that food safety is not compromised by the proposal. This additional scientific data may include third party independent testing of the final product as per the HACCP plan by a certified laboratory.

7. The menu for a food service establishment dictates the space and equipment requirements for the safe preparation and service of various food items. This dictation is conducted with consideration of variation in time/temperature cooking requirements due to varying bacterial loads on different species of animal derived foods. In addition, consideration must be given for separation in space and equipment requirements due to possibilities of cross contamination and whether or not foods will be consumed raw or undercooked. This is necessary to reduce harmful bacteria loads or to prevent the increase of harmful bacteria loads on foods. For example, should fish or shrimp have to be thawed at the same time as vegetables are to be washed, separate sinks will be required in order to separate each preparational step from the other to prevent cross-contamination of ready-to-eat foods with contaminants from raw product. In this example, the fish will require a higher cooking temperature (145ºF/15 seconds) where as the vegetables would only require 135ºF/15 seconds for hot holding. In addition, the vegetables could also be consumed raw, resulting with the only protection against foodborne illness of these ready-to-eat foods being thorough washing procedures and no bare hand contact after washing - *(see DPH Rule 511-6-1-.04 subsections (4) (g) 1. and (5))*. For another example, since fish/seafood require different time/temperature parameters from that of raw chicken, separate food preparation sinks may be necessary to wash or thaw these items - *(see DPH Rule 511-6-1-.04 subsections (4) (c) 1 (ii) and (5))*. With these parameters, it is obvious that the layout and design of the facilities will need to be considered to prevent cross-contamination potentials. With cross-contamination prevention and time/temperature control requirements in mind, the menu will

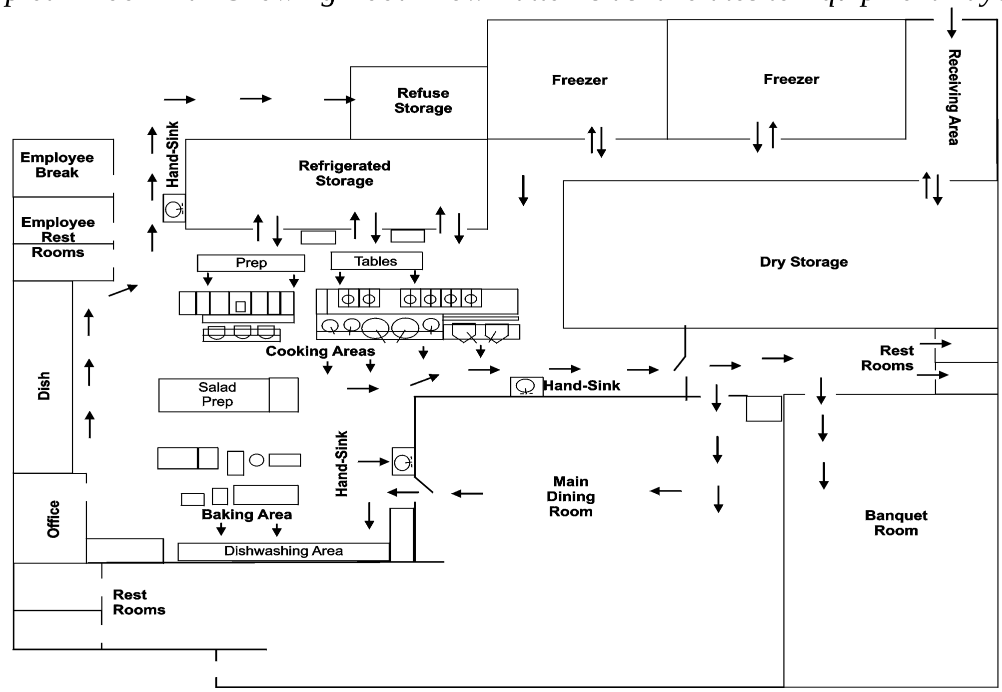
determine if the proposed receiving and delivery areas, storage area, preparation and handling areas and thawing, cooking, and reheating areas are available and adequate to handle the types and volumes of foods being served.

8. A kitchen, in itself, is static; objects (equipment) are arranged in a fixed pattern. In operation, a kitchen becomes a flow of food and people in and around the fixed objects. It is this fluid pattern that proves the intelligence of a good layout. The sequence of flow in a food facility usually assumes one of two basic arrangements: 1. Assembly Line Flow can be in several configurations (i.e., circular, L-shaped, Parallel, or U-shaped) and 2. Functional Flow is described as where the work processes are arranged in departments (i.e., vegetable, meat, bakery, assembly, etc.). When looking at the menu, evaluate the flow patterns for the preparation of foods to be served to be sure that the layout of the facility provides an adequate separation of raw ingredients from ready-to-eat foods and that the traffic patterns are not crossing paths with waste items and other sources of contamination. *See Illustration B-1 entitled, "Functional Flow" and Subsection II entitled, "Determining Process Flows" on this page for more information. Likewise, see Illustration B-2 on page B18 as well.*

ILLUSTRATION B-1

Functional Flow

(Typical Floor Plan Showing Food Flow Patterns as it relates to Equipment Layout)



II. <u>Determining Process Flows</u>:

1. Every establishment has some type of set pattern of procedures even if it is simply described as "the way we do things." A small, independent operation may not have written procedures, yet it

may have adequate procedures that are routinely followed. Good communication is required to discover these types of informal management systems.

2. Food service establishments may implement effective food safety management systems by establishing controls for the food preparation methods and processes common to their operation. Control of food preparation processes rather than individual food items is often called the "process approach" to HACCP. The process approach, using the principles of HACCP, can best be described as dividing the many food items in an operation into three food preparation processes then analyzing the risk factors associated with each process. This operational step establishes the flow of food pattern through the establishment and they serve as the foundation for analyzing and controlling hazards.

3. The flow of food in a food service establishment is the path that food follows from receiving through service to the customer. Several activities or stages make up the flow of food and are called operational steps. Examples of operational steps include receiving, storing, preparing, cooking, holding, cooling, serving and reheating can be found within Example B-1.

4. Most food items produced in the food service establishment can be categorized into one of three preparation processes based on the number of times the food passes through the temperature danger zone (42 °F to 134 °F):

A. Process 1: Food Preparation with No Cook step

Example flow: Receive - Store - Prepare - Hold - Serve
(Other food flows are included in this process, but there is no cook step to destroy pathogens while in the food service facility. It should be noted that these are ready-to-eat foods that might inter the temperature danger zone but do not go all the way through it. An example would be making tuna salad from room temperature ingredients of which the finished product will be cooled prior to service.)
Examples: salads, deli meats, cheeses, sashimi, raw oysters

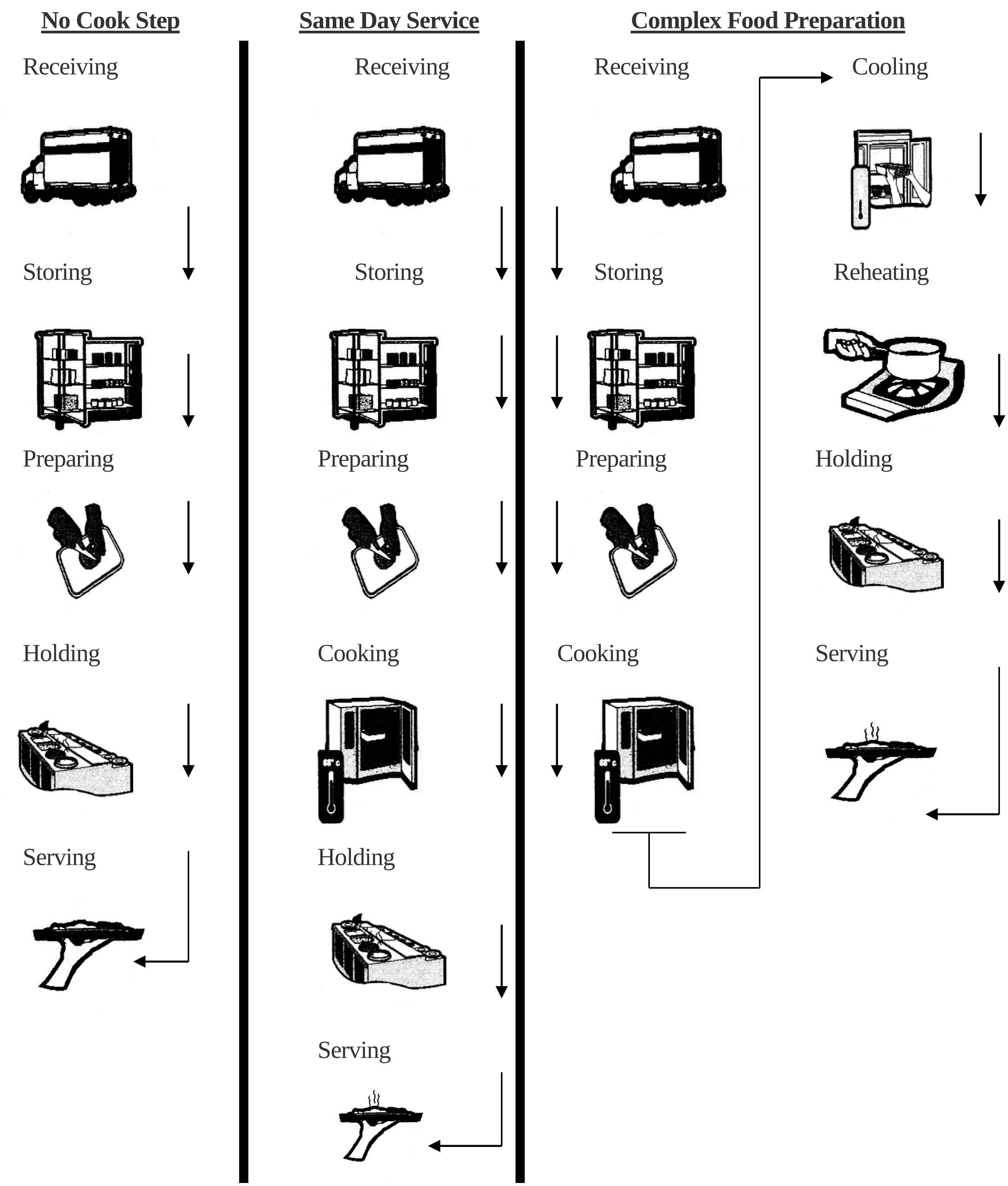
B. Process 2: Preparation for Same Day Service

Example flow: Receive - Store - Prepare - Cook - Hold - Serve
(Other food flows are included in this process, but there is only one trip through the temperature danger zone)
Examples: Hamburgers, fried chicken, hot dogs

C. Process 3: Complex Food Preparation

Example flow: Receive - Store - Prepare - Cook - Cool - Reheat - Hot Hold - Serve
(Other food flows are included in this process, but there are always two or more complete trips through the temperature danger zone)
Examples: refried beans, leftovers

EXAMPLE B-1


No Cook Step
Receiving
Storing
Preparing
Holding
Serving
Same Day Service
Receiving
Storing
Preparing
Cooking
Holding
Serving
Complex Food Preparation
Receiving
Storing
Preparing
Cooking
Cooling
Reheating
Holding
Serving

5. The style of food service should also be reviewed. The style of food service may be cook-to-order (cook-serve), self-serve (buffet or salad bar), service of pre-packaged foods, service of large volumes of food (institutions and catering operations), food preparation requiring multiple steps and handling, etc. All of these will have special needs as to layout, arrangement and types of equipment as well as how food is processed and handled by food employees. These considerations must be explored during the menu review.

6. The system of menu evaluation involves the review of categories of foods and their required preparation, i.e.:

   A. All food is required to be obtained from sources that comply with Law (Federal and State, which ever is applicable). Specifically, this means that food received by a food service establishment has been inspected and approved for distribution by a governmental agency having jurisdiction of food distribution in commerce.

   B. Thin meats such as poultry, fish, eggs (hamburgers, sliced meats, & fillets)

   C. Thick meats and whole poultry (roast beef, whole turkey, whole chickens, & hams)

   D. Cold processed foods (salad, sandwiches, vegetables)

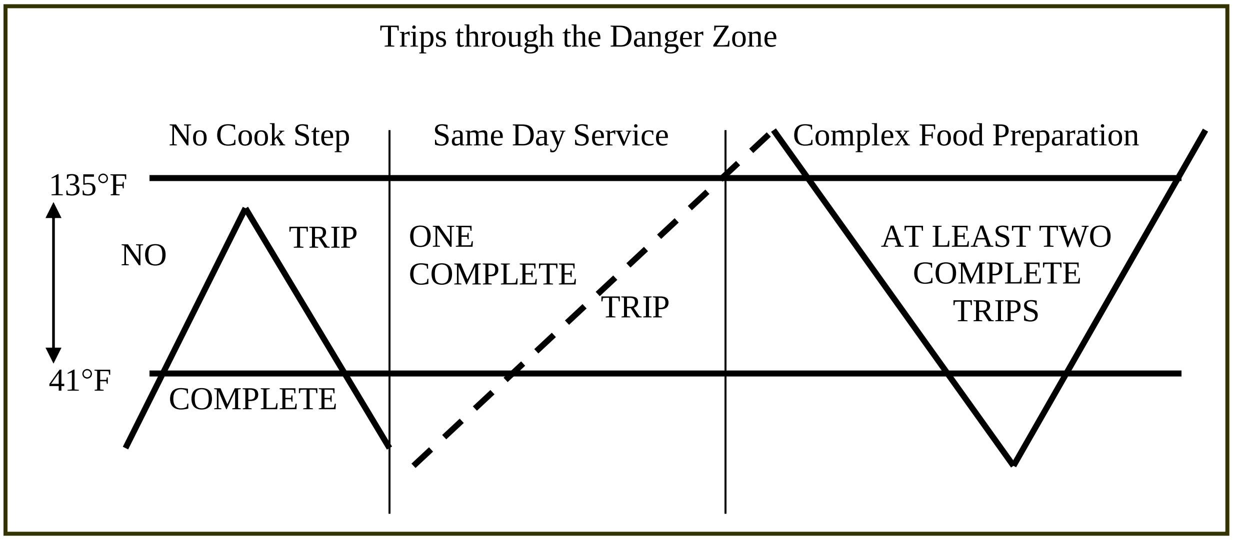
   E. Hot processed foods (soups, stews, casseroles)

   F. Bakery goods

7. The system (Process Approach) is very useful since the critical control points for each process remain the same regardless of the individual menu ingredients.

8. A summary of the three food preparation processes in terms of number of times through the temperature danger zone can be depicted in a Danger Zone diagram. Note that while foods produced using process 1 may enter the danger zone, they are neither cooked to destroy pathogens, nor are they hot held. Foods that go through the danger zone only once are classified as Same Day Service, while foods that go through more than once are complex. *See the following Diagram B-1*:

DIAGRAM B-1



9. The three food preparation processes (or system) conducted in food service establishments are not intended to be all-inclusive. For instance, quick service facilities may have "cook and serve" processes specific to their operation where foods are immediately served to the consumer after cooking. These processes are likely to be different from the "Same Day Service" preparation processes in full service restaurants since many of their foods are generally cooked and hot held before service. It is also very common for a food service operator to have a single item like a chicken salad sandwich that is created using several components that may be produced using more than one kind of food preparation process. It is important to remember that even though variations of the three food preparation process flows are common, the control measures - actions or activities that can be used to prevent, eliminate, or reduce food safety hazards - to be implemented in each process will generally be the same based on the number of times the food goes through the temperature danger zone. The system is very useful since the critical control points for each process remain the same regardless of the individual menu ingredients.

10. To demonstrate the above concepts, we will examine “Process 3”, multiple passes through the temperature danger zone by considering how chicken salad can be prepared. To prepare chicken salad from scratch, the ingredients would be raw chicken, eggs, mayonnaise, pickles, onions, celery and seasoning. The raw chicken and eggs would have to be cooked and cooled for latter preparation, which would call for adequate cooking and refrigeration equipment or perhaps, facilities such as compartmented food preparation sink for ice-bath cooling methods. The celery and onions would have to be washed in a dedicated sink for the strict purpose of washing fruits and vegetables. An adequately equipped handwashing sink station would be required within the food preparation area to encourage the frequent washing of the food employee’s hands. In addition to the provision for handwashing, equipment, such as at least a properly sized 3-compartmented sink as required by Chapter

511-6-1, would be needed to clean and sanitize equipment and utensils used to prepare the ingredients between tasks. These facilities, handwashing sink and equipment and utensil washing and sanitizing facilities, serve to do one thing and that is to prevent cross-contamination of the ready-to-eat chicken salad from occurring. All these planning steps would help to enable the food service establishment operator to control or eliminate the hazards associated with the preparation of the chicken salad. These hazards being:

A. Some of C. perfringens surviving the cooking process by means of spore formation. This is why cooking equipment must be capable of raising the raw chicken and eggs through the danger zone, which is between 135ºF and 41ºF, quickly to 165ºF for at least 15 seconds to kill harmful vegetative bacteria associated with the raw ingredients.

B. Controlling vegetative outgrowth of spore forming bacteria such as C. perfringens and B. bacillus, during the cooling process that may have survived the cooking process. This is why the proposed food service establishment plans would need conveniently located and adequately sized cooling equipment such as walk-in coolers and/or food preparation sinks so that cooked chicken and eggs can be quickly cooled to below 41ºF before salad ingredient assembly (or salad preparation).

C. Cross-contamination of ready-to-eat chicken salad during the preparation process where cooked chicken and eggs are being handled with Shigella, Hepatitis A virus, Norwalk like viruses or E. Coli that could come from contaminated food handler hands via the fecal oral route. This is why the food service plans would need to show an adequate equipped handwashing station near the food preparation area and adequate designed and equipped equipment and utensil cleaning and sanitizing facilities to help prevent such cross-contamination. In addition and in conjunction with hand washing, the prerequisite program (or Standard Operation Program – SOP) of good employee health and no bare hand contact with ready-to-eat foods will also greatly enhance the prevention of fecal oral pathogen route of cross contamination of food.

III. The Hazard Analysis:

1. In the "process approach" to HACCP, conducting a hazard analysis on individual food items is time and labor intensive and is generally unnecessary. Identifying and controlling the hazards in each food preparation process listed within subsection IV, “Determining Risk Factors by Evaluating Process Flows”, achieves the same control of risk factors as preparing a HACCP plan for each individual product.

2. For an example, an establishment has dozens of food items (including baked chicken and meatloaf) in the "Preparation for Same Day Service" category. Each of the food items may have unique hazards but regardless of their individual hazards, control via proper cooking and holding will generally ensure the safety of all of the foods in this category. An illustration of this concept follows:

   A. Even though they have unique hazards, baked chicken and meatloaf are items frequently grouped in the "Same Day Service" category (Process 2).

B. *Salmonella* and *Campylobacter,* as well as spore-formers, such as *Bacillus cereus* and *Clostridium perfringens,* are significant biological hazards in chicken.

C. Significant biological hazards in meatloaf include *Salmonella, E. coli* O157:H7, *Bacillus cereus,* and *Clostridium perfringens.*

D. Despite their different hazards, the control measure used to kill pathogens in both these products is cooking to the proper temperature.

E. Additionally, if the products are held after cooking, then proper hot holding or time control (i.e., time as a public health control) is also necessary to prevent the outgrowth of spore-formers that are not destroyed by cooking.

3. As with product-specific HACCP, critical limits for cooking remain specific to each food item in the process. In the scenario described above, the cooking step for chicken requires a final internal temperature of 165 °F for 15 seconds to control the pathogen load for *Salmonella*. Meatloaf, on the other hand, is a ground beef product and requires a final internal temperature of 155 °F for 15 seconds to control E. *coli* O157:H7. To control the pathogen load for both *Salmonella* and *E. coli* O157:H7, a final internal temperature of 165 °F for 15 seconds would be needed, since 165 °F for 15 seconds is the higher more restrictive of the two temperatures. Note that there are some operational steps, such as refrigerated storage or hot holding that have critical limits that apply to all foods.

4. The following *Table B-1*further illustrates this concept. Note that the only unique control measure applies to the critical limit of the cooking step for each of the products. Other food safety hazards and control measures may exist that are not depicted here:

TABLE B-1
Process 2: Preparation for Same Day Service:

Example Product	Baked Meatloaf	Baked Chicken
Example Biological Hazard	Salmonella	Salmonella
	E. coli *015-H7	Campylobacter
	Bacillus cereus	Bacillus cereus
	Various fecal-oral route pathogens	Various fecal-oral route pathogens
Example Control: Critical Limit (CL) found with Rules and Regulations	Refrigeration 41°F or below	Refrigeration 41°F or below
	Cooking at 155°F for 15 seconds	Cooking at 165 °F for 15 seconds
	Hot Holding 135°F or above OR Time Control for 4 hours or less	Hot Holding 135°F or above OR Time Control for 4 hours or less
	No bare hand contact with RTE food, proper handwashing, exclusion/restriction of ill employees	No bare hand contact with RTE food, proper handwashing, exclusion/restriction of ill employees

IV. Determining Risk Factors by Evaluating Process Flows[2]:

1. Several of the most common risk factors associated with each food preparation process are discussed below. It must be remembered that while the generally focus of the plan review must be on ensuring the proposed plans incorporate the required equipment layout and facilities to reduce or eliminate these risk factors, there may be other risk factors unique to an operation or process that are not listed here. One should evaluate each operation and food preparation process independently.

2. In order to have active managerial control over personal hygiene and cross-contamination, the physical facility design and layout must enable an operator to implement control measures in all phases of the operation. The following items should be evaluated during the plan review regardless of the food preparation process used:

   A. Adequate utensils and equipment to facilitate no bare hand contact with RTE (Ready-to-Eat) foods to help prevent the transfer of viruses, bacteria, or parasites from hands to ready-to-eat foods.

   B. Proper hand washing facilities to help prevent the transfer of viruses, bacteria, or parasites from hands to food.

   C. Restriction or exclusion of ill employees to help prevent the transfer of viruses, bacteria, or parasites from hands to food.

   D. Proper type and arrangement of equipment to prevent cross-contamination of ready-to-eat food or clean and sanitized food contact surfaces with soiled cutting boards, utensils, aprons, etc., or raw animal foods.

3. To access potential hazards associated with items listed within the menu, the reviewer will need to first determine the process flow and then, determine the potential hazard for each operational step of the process flow. Examples of hazard analysis for each of the three process flows are as follows:

   A. Food Preparation Process 1 - Food Preparation with No Cook Step:

   Example Flow: RECEIVE - STORE - PREPARE - HOLD – SERVE

   a. This particular process represents several food flows. Many of these food flows are common to food service facilities. Raw, ready-to-eat food, such as sashimi, raw oysters, and salads, are grouped in this category. Components of these foods are received raw and will not be cooked prior to consumption. Foods cooked at the processing level but that undergo no further cooking at the food service

[2] Reference: Annex 5 – Conducting Risk-based Inspections, 2009 FDA Model Food Code.

establishment level before being consumed are also represented in this category. Examples of these kinds of foods are deli meats, cheeses, and other pasteurized products.

b. All the foods in this category lack a kill (or cook) step *while at the food service establishment.* In other words, there is no complete trip made through the danger zone for the purpose of destroying pathogens. During the plan review, the reviewer can help to ensure that the food received in the facility is as safe as possible by reminding the establishment permit applicant to ensure that the food is received in good condition, at proper temperatures and from approved sources. Without a kill step to destroy pathogens, the primary responsibility of the operator will be to prevent further contamination by ensuring that employees follow good hygienic practices. In addition, equipment type, number and arrangement must be adequate to prevent cross contamination <u>by properly storing products away from raw animal foods and soiled equipment and utensils.</u> Foodborne illness may result from ready-to-eat food being held at unsafe temperatures for long periods of time due to the outgrowth of bacteria.

c. A plan review involving this food preparation process should focus on ensuring that the physical facility design and layout must enable an operator to have active managerial control over the following:

i. **Cold holding or using time alone** (i. e., time as a public health control) to inhibit bacterial growth and toxin production

ii. **Food source** (especially for shellfish due to concerns with viruses, natural toxins, and Vibrio and for certain marine finfish intended for raw consumption due to concerns with ciguatera toxin)

iii. **Receiving temperatures** (especially certain species of marine finfish due to concerns with scombrotoxin)

iv. **Date marking of RTE PHF/TCS** held for more than 24 hours to control the growth of Listeria monocytogenes

v. **Freezing certain species of fish** intended for raw consumption due to parasite concerns; and

vi. **Cooling from ambient temperature** prevent the outgrowth of spore-forming or toxin-forming bacteria.

B. <u>Food Preparation Process 2 - Preparation for Same Day Service</u>:

Example Flow: RECEIVE - STORE - PREPARE - COOK - HOLD – SERVE

a. In this food preparation process, food passes through the danger zone only once in the food service facility before it is served or sold to the consumer. Food is usually cooked and held hot until served, i.e. fried chicken, but can also be cooked and served immediately. A plan review involving this food preparation process should focus on ensuring that the physical facility design and layout will support active managerial control over the following:

i. Cooking to destroy bacteria and parasites; and

ii. Hot holding or using time alone (Time as a Public Health Control) to prevent the outgrowth of spore-forming bacteria.

iii. Food source and receiving temperatures/cold holding prior to cooking are also important if dealing with certain marine finfish due to concerns with ciguatera toxin and scombrotoxin (note: these toxins can not be eliminated by cooking).

C. <u>Food Preparation Process 3 - Complex Food Preparation</u>:

Example Flow: RECEIVE - STORE - PREPARE - COOK - COOL - REHEAT - HOT HOLD – SERVE

a. Foods prepared in large volumes or in advance for next day service usually follow an extended process flow. These foods will pass through the temperature danger zone more than one time; thus, the potential for the growth of spore-forming or toxigenic bacteria is greater in this process. Failure to adequately control food product temperatures is one of the most frequently encountered risk factors contributing to foodborne illness. In addition, foods in this category have the potential to be recontaminated with *Listeria monocytogenes*, which could grow during refrigerated storage. The key to managing the operational steps within this food preparation process is to minimize the time foods are at unsafe temperatures and the prevention of cross-contamination of ready-to-eat foods by way of unclean hands and or unclean equipment and utensils.

b. A plan review involving this food preparation process should focus on ensuring that the facility has adequate equipment that is properly arranged to support active managerial control over the following:

i. Equipment for cooking to destroy bacteria and parasites;

ii. Equipment such as food sinks, ice paddles and adequately sized refrigeration for cooling to prevent the outgrowth of spore-forming or toxin-forming bacteria;

iii. Equipment to facilitate hot and cold holding or using time alone (or time as a public health control) to inhibit bacterial growth and toxin formation;

iv. SOP's (Standard Operating Practices) for date marking of ready-to-eat potentially hazardous (PHF/TCS) foods held for more than 24 hours to control the growth of Listeria monocytogenes;

v. Equipment for reheating or for hot holding, if applicable, to prevent the outgrowth of spore-forming or toxin-forming bacteria;

vi. Equipment and facilities to ensure proper cleaning and sanitization of facilities and food contact surfaces; and

vii. Food source and receiving temperatures/cold holding prior to cooking are also important if dealing with certain marine finfish due to concerns with ciguatera toxin and scombrotoxin.

V. <u>Summarization</u>:

1. The menu for a food establishment dictates the space and equipment requirements for the safe preparation and service of various food items. The menu will determine if the proposed receiving and delivery areas, storage areas, preparation and handling areas, and thawing, cooking and reheating areas are available and adequate to handle the types and volumes of foods being prepared and served. It has a tremendous influence on the design and success of a food operation. From a design and layout perspective, these are just some of the factors determined by the menu:

   A. Dictates the amount of space required for the facility – A complex menu requires more space to prepare than a limited or simple menu does, because separate workstations and additional equipment are necessary.

   B. Dictates service area size and design – The greater the number of menu items, the more area required for service. For example, in a cafeteria each beverage requires a dispenser and each entrée a point of service.

   C. Dictates warewashing facility size and dish machine capacity – Complex menus often require multiple plates, dishes, and utensils, and so the warewashing area and warewashing machine capacity will need to be greater than in the case of simple menus.

   D. Dictates types of cooking equipment – Complex menus require multiple types of equipment, especially in the final preparation area, where it may be necessary to steam, fry, bake, broil, and sauté.

   E. Dictates equipment capacity – Limited menus may require relatively few pieces of equipment but need large capacities of each. Complex menus may require many different types of equipment with relatively small capacities.

F. Dictates size of dry and refrigerated storage areas – Complex menus may require larger storage areas to maintain the par stocks necessary to meet demand.

G. Dictates number of employees – Simple menus require fewer employees than do complex menus.

H. Dictates amount of investment required – When large or complex menus require more equipment, space, and employees, costs rise.

2. Menus will emphasize the importance of Flow and Layout within the proposed establishment. With thorough analysis of how food flows through the establishment and with proper layout of equipment according the food flow analysis, the following can be achieved:

   A. Preparation time is minimized;

   B. Proper Hygiene is easier to maintain;

   C. Less chance for cross contamination;

   D. Cleaning and sanitizing is much easier;

   E. Less confusion in workspace; and

   F. Easier to regulate (inspect).

3. Without proper flow and layout of food and equipment analysis, the opposite results occur:

   A. Preparation processes are negatively influenced, and or interrupted;

   B. Processes and procedures within the facility interfere with each other;

   C. Prep time goes up - potentially hazardous foods stay in the danger zones longer;

   D. Problems with a poor flow and layout; and

   E. Proper hygiene practices are affected.

4. The importance of flow, layout and menu review is to accomplish public health's goal of ensuring the facility is designed to protect food as it travels through the facility through active managerial control of risk factors of which are:

A. Food from unsafe sources;

B. Inadequate cooking of potentially hazardous foods;

C. Improper holding/time-temperature of potentially hazardous food;

D. Contaminated equipment; and

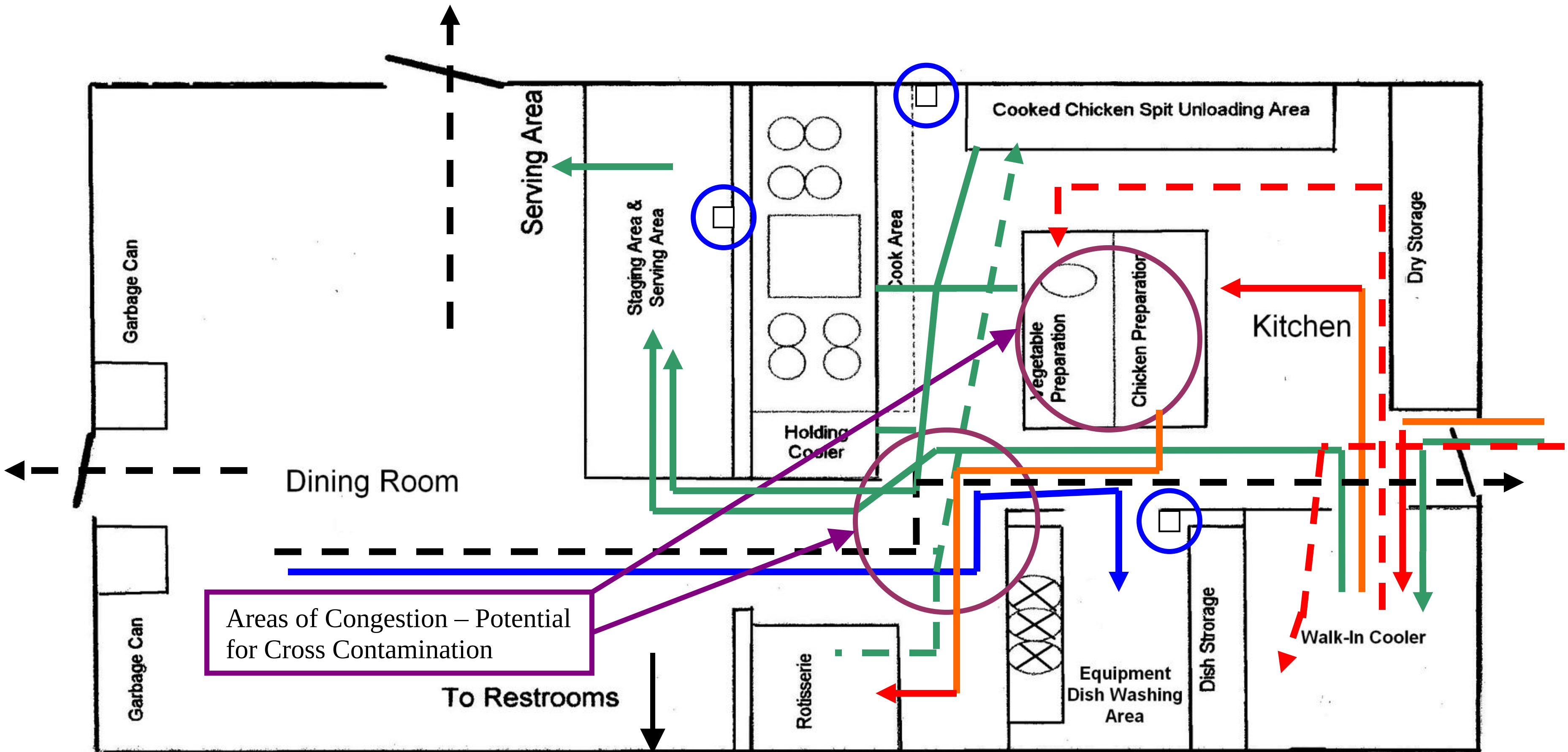
E. Poor personal hygiene.

5. While examining the flow of food in a food establishment, the reviewer should concentrate his or her efforts on ***specific food flow areas and the methods used in controlling the inherent hazards specific to each area***.

6. It's the menu plus the understanding of that menu which allows the food service establishment plan designer and the environmental health specialist to assess whether the facilities layout, flow & equipment is sufficient to ensure that food is protected as it travels through the food service establishment.

7. When reviewing the menu, it is important to evaluate the flow patterns for the preparation of the food to be sure that the layout of the facility provides an adequate separation of raw ingredients from ready-to-eat foods, and that the traffic patterns are not crossing paths with waste items and other sources of contamination. Cross contamination can be minimized when the flow of food is considered during plan review. *See the following Illustration B-2*:

ILLUSTRATION B-2



Legend
Red = Foods to be Prepared (Receiving to Service – “Door to Table”)
Green = Ready-To-Eat Foods (Receiving to Service – “Door to Table”)
Blue = Dishes (Table to Dishwashing)
Black = Trash (Trash Can to Dumpster or Solid Waste Storage Area)

8. With a proper understanding of the menu and flow, the plans for food establishments can be reviewed to help assure that the food items being considered can be protected during all aspects of the food operation.

9. The following *Table B-2* will illustrate the direct link to process control with risk factors:

TABLE B-2

Inherent Risk and Control Measures of Process Flows

	No Cook Step (Preparation of Ready-to-Eat Foods)	**Preparation for Same Day Service**	**Preparation for Complex Food**
Risk	• Cross Contamination	• Cross Contamination • Survival of Pathogens	• Cross Contamination • Survival of Pathogens • Growth of Pathogens
Controls	• Hand Washing • Separate Raw-Animal Foods from Others • Clean & Sanitize Equipment	• Cooking Time/Temperatures • Hot Holding	• Cooking • Holding • Cooling • Re-heating

10. The following will illustrate how to review a menu and place each item in its process step:

R.T. Chicken Menu

Individual Meals

		One Side	Two Sides	Three Sides
1	¼ Chicken Dark Includes Cornbread and…	4.29	4.79	5.29
	¼ Chicken White Includes Cornbread and…	5.29	5.79	6.29
	½ Chicken Includes Cornbread and…	5.79	6.29	6.79
2	Meatloaf Includes Cornbread and…	5.29	5.79	6.29
3	Hearth Ham Includes Cornbread and…	5.79	6.29	6.79
4	Rotisserie Turkey* Includes Cornbread and…	5.79	6.29	6.79

Sandwiches

5	Chicken* Carver® With Cheddar Cheese, Lettuce, Tomato, and Creamy Dijon	4.49
6	Meatloaf Carver® With Cheddar Cheese, Lettuce, Tomato, and Hickory Ketchup	4.49
7	Turkey* Carver® With Swiss Cheese, Lettuce, Tomato, and Creamy Parmesan	4.79
8	Ham* Carver® With Swiss Cheese, Lettuce, Tomato, and Creamy Dijon	4.79
9	Turkey* Carver® Club With Cheddar Cheese, Lettuce, Tomato, and Creamy Dijon	4.99
	Make It A Combo Includes a Regular Side and Soft Drink	Only 99¢ !

***Low Fat Item – Ask for lettuce and tomato only**

Family Meals

For Three 14.99
Includes 1 Chicken or Meatloaf, Approx. 1 lb. Turkey* or Ham, and 3 Large Sides and 3 Cornbread — 4.99/serving

For Five 23.99
Includes 1 ½ Chicken or Meatloaf, Approx. 1 ½ lbs. Turkey* or Ham, and 5 Large Sides and 5 Cornbread — 4.80/serving

A la Carte

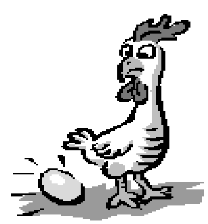
Whole Rotisserie Chicken	6.49
Hand-Carved Turkey*(1 lb.)	6.49
Hand-Carved Ham*(1 lb.)	6.79
Whole Meatloaf	6.49

Sides

Side Item Meal 3.99
3 Sides and Cornbread

Regular 1.19 Large 2.59

- Mashed Potatoes
- Herbed Sweet Corn*
- Savory Stuffing
- Garlic Dill New Potatoes*
- Hot Cinnamon Apples
- 15 Garden Fresh Cole Slaw
- 16 Steamed Vegetables*



Salads, Etc.

17	Caesar Salad With Cornbread	3.49
18	Chicken Caesar With Cornbread	4.79
19	Chicken Pot Pie Side & Cornbread	5.99
20	Soup Regular (8oz.) Large (16 oz.)	 1.59 2.59
21	Cornbread	.39

Drinks

Free Refills!

Soft Drinks: Regular .99, Large 1.39
Milk .99
Coffee .99

Kids Stuff

22	Mac & Cheese	1.99
	Kid's Size Chicken, Turkey, Ham, or Meatloaf	2.49

Baked Goods

23	Cookies	.99
24	Brownies	.99
	Pies slice	1.29
25	whole	7.99

A. The following are select descriptions of how the menu items are processed as they correspond to the *R. T. Menu items as listed on Page B20*. These process descriptions may be obtained in the form of recipes or general description of how the menu items are handled by food employees from the food service permit applicant during the plan review process. Once the description of the process flows for the menu items have been obtained, then the foods are placed into the appropriate columns for each process step based upon how many trips the food items make through the temperature danger zone. For an example, s*ee Worksheet B-1 on page B22*. Here, the reviewer will find the corresponding item numbers as listed on *R. T. Menu listed on Page B20*. The following are recipe descriptions of these numbered menu items:

a. **Chicken Meals** - Whole, raw chickens are cooked on the rotisserie throughout the day and hot held. They are either: (a) sold whole, (b) sold as ¼ or ½ chicken meals or family meals, or (c) used to prepare chicken potpies by pulling the meat off the bone and refrigerating until needed. Chickens prepared to be sold whole or in meals that are not sold within 2 hours are also used to make chicken potpies, stuffing, or chicken noodle soup by pulling the meat off the bone and refrigerating the meat until needed.

   PROCESS 2 *– Whether sold in family meals, individual meals, or whole, these chickens are cooked and hot held only, so they only go through the danger zone once.*

b. **Meatloaf Meal** - Meatloaf is made from raw ground beef, breadcrumbs, spices, etc. and cooked in small loaves and hot held. The meatloaf is sold whole or sliced for meals. Meatloaf that is not sold within two hours is rapidly cooled [whole loaves are sliced] and refrigerated to make meatloaf sandwiches the following day.

   PROCESS 2 *– This meatloaf, in meals or sold whole, is cooked and hot held and therefore makes only one trip through the danger zone.*

c. **Hearth Ham** - The hearth ham is fully cooked, commercially processed ham that is sliced and warmed to be sold by the pound or in individual meals.

   PROCESS 1 *– Commercially processed RTE foods can be served at any temperature, therefore this product has no cook step and does not truly make any trip through the danger zone.*

d. **Rotisserie Turkey Meal** - Whole, raw turkeys are cooked on the rotisserie throughout the day and hot held. They are carved and either sold in individual meals or by the pound. Any of this turkey that has not sold in two hours is rapidly cooled and stored for making turkey rice soup.

   PROCESS 2 *– This turkey is cooked and hot held, making only one trip through the danger zone.*

e. **Chicken Carver Sandwiches -** Fully cooked, commercially processed rounds of chicken breast meat are sliced for making sandwiches. The chicken breast meat is heated or prepared cold for the sandwiches as requested by the customer.

PROCESS 1 – This produce does not make a trip through the danger zone because it is RTE food and may be served at any temperature.

f. **Meatloaf Carver** - Leftover meatloaf that was not sold the previous day either whole or in meals is removed from the reefer and used to make meatloaf sandwiches. The meatloaf is reheated and hot held for making sandwiches unless otherwise requested by the customer.

PROCESS 3 – Cooked, cooled, and possibly reheated constitutes two or more trips through the danger zone.

WORKSHEET B-1
Menu/ Flow Analysis Process Worksheet

Process 1 Foods	Process 2 Foods	Process 3 Foods
Foods that do not require a cook step (RTE)	***Foods that involve a cook step but only go through the danger zone once (Same day service)***	***Foods that require complex preparation (Cook, Cool, Re-Heat)***
3 –Hearth Ham **5 – Chicken Carver Sandwiches**	**1 – Chicken Meals** **2 – Meatloaf Meal** **4 – Rotisserie Turkey Meal**	**6 – Meatloaf Carver**

B. One thing to remember before starting the menu review. In helping to prevent confusion, it is necessary to think about each of the menu items individually. In determining the process category, consider only one individual menu item at a time. It is easy to get confused if one thinks too far past the service of an individual menu item. This is an important part of the review process, because that's what is needed to understand what an individual is to do in his or her food service assessments (i. e., inspections) anyway. For example, the description may say that Product A is cooked, hot held, and served, then the leftovers are used to later prepare product B, but that doesn't mean that Product A falls under Process 3. It still only went through the danger zone once, so it belongs in Process 2 and cooking and hot holding are the control measures.

C. The EHS should only look at the flow of each menu item from receipt to service. If he or she follows this reminder from the very beginning of the menu review process, it will help the EHS to complete a proposed food service establishment's plan and specification review process in a more efficient and accurate manner.

11. Equipment and facilities can be evaluated by following the food flow processes. Specific key equipment should be present to control each inherent risk noted in *Table B-2 on page B19* for each process step as indicated within *Charts B-1, B-2 and B-3* that follows:

CHART B-1

Food Flow Process with NO COOK STEP	**Receive**	**Store**	**Prepare**	**Hold**	**Serve**
Equipment & Facilities that may be used	Thermometers	Dry Storage Refrigerated Storage Frozen Storage Thermometers	Preparation Tables Cutting Boards Utensils Handwashing Sinks Preparation Sinks Refrigerators	Refrigerators Ice Cold Holding Facilities Thermometers Handwashing Sinks	Cold Holding Facilities at the Service Area Thermometers Handwashing Sinks

CHART B-2

Food Preparation for SAME DAY SERVICE	**Receive**	**Store**	**Prepare**	**Cook**	**Hold**	**Serve**
Equipment & Facilities that may be used	Thermometers	Dry Storage Refrigerated Storage Frozen Storage Thermometers	Preparation Tables Cutting Boards Utensils Handwash Sinks Preparation Sinks Refrigerators	Cooking Equipment -Fryers -Ovens -Broilers -Grills -Cook Tops -Griddles -Other Thermometers Handwashing Sinks	Refrigerators Ice Cold Holding Facilities Hot Holding Facilities Food Warmers Preparation Worktops/Tables Thermometers Handwashing Sinks	Cold Holding Facilities at the Service Area Thermometers Handwashing Sinks

CHART B-3

Complex Processes	**Receive**	**Store**	**Prepare**	**Cook**	**Cool**	**Reheat**	**Hold**	**Serve**
Equipment & Facilities that may be used	Thermometers	Dry Storage Refrigerated Storage Frozen Storage Thermometers	Preparation Tables Cutting Boards Utensils Handwashing Sinks Preparation Sinks Refrigerators	Cooking Equipment -Fryers -Ovens -Broilers -Grills -Cook Tops -Griddles -Other Thermometers Handwashing Sinks	Preparation Sinks Ice Baths Blast Chillers Shallow Pans Refrigerators Chill Sticks Thermometers Handwashing Sinks Preparation Tables Other	Fryers Ovens Grills Burners Griddles Other Handwashing Sinks	Refrigerators Ice Cold Holding Facilities Hot Holding Facilities Food Warmers Preparation Worktops/Tables Thermometers Handwashing Sinks	Cold Holding Facilities at the Service Area Thermometers Handwashing Sinks

12. <u>Documentation of a Food Service Establishment Plans and Specification Review</u>: During the EHS's review of plans and specification for a proposed food service establishment, the EHS must use *"Appendix B-Health Authority Compliance Review List and Approval/Disapproval Form"* along with *"Appendix G-Menu Flow Analysis Process Worksheet"* to document findings of the plan and specification review. Any negative or noncompliant findings of the review must be conveyed both to the food service establishment permit applicant and the planner. This is to be accomplished by *attaching a review letter (approval or disapproval) with comments to a copy of Appendix B* of which is forwarded onto both parties. See *"Appendix H-Food Service Establishment Plan and Specification Review Sample Response Letters"* for an example of a plan review response letter. A copy of completed documents (*Appendices A, and B*) and *the plan and specification review approval or disapproval letter, whichever is applicable*, must be maintained within the subject food service establishment's inspection folder within the County Health Department having jurisdiction over the proposed food service establishment.

SECTION C – CONTENTS AND FORMAT OF PLANS AND SPECIFICATIONS

REFERENCES (Chapter 511-6-1)

.02 Provisions.
Subsection (4) When Plans Are Required (b) Submission of Plans
Subsection (5) When a HACCP Plan is Required

I. Contents and Format of Plans and Specifications[1]:

1. Plans and specifications must reflect the finished food service establishment as to how it will be constructed and equipped at the time of the initial inspection to issue a food service permit. The following are the minimum items that must be included within plans in preparation for their submittal to the local Health Authority for review and approval for construction:

   A. Plans drawn to scale to a size of not less than 11 x 14 inches.

   B. Proposed menu, seating capacity, and projected daily meal volume for the food establishment. *See Document K-5 in Section K, PART-II of the Interpretation Manual for the Rules and Regulations Food Service Chapter 511-6-1 and Subsection V10 on page B20 of Section B, PART-I of this Manual for example of a menu.*

   C. Location of all food equipment. Each piece of equipment must be clearly labeled, marked, or identified. Food equipment schedule which includes the make and model numbers and listing of equipment that is certified or classified for sanitation by an ANSI accredited certification program must be submitted. The Health Authority may request elevation drawings. *See Examples C-1 and C-2.*

   D. Provisions for adequate rapid cooling, including ice baths and refrigeration, and for hot and cold-holding PHF (TCS). *See Example C-1.*

   E. Handwashing sinks. *See Example C-1.*

   F. Warewashing sinks. *See Example C-1.*

   G. Food preparation sinks. *See Example C-1.*

   H. Fruits and vegetable washing/preparation sinks as required by menu. *See Example C-1.*

[1] Source: Page 1 – 2, CONTENTS AND FORMAT OF PLANS AND SPECIFICATIONS, 2008 FDA Plan Review for Food Establishments Guidance Document.

I. Auxiliary areas such as storage rooms, garbage rooms, toilets, basements and/or cellars used for storage or food preparation. *See Example C-1.*

J. Entrances, exits, loading/unloading areas and delivery docks. *See Example C-12.*

K. Complete finish schedules for each room including floors, walls, ceilings and coved juncture bases. Finish schedule descriptions and specifications must be submitted to the Health Authority for its review. *See Examples C-2 and C-4.*

L. Plumbing schedule including location of floor drains, floor sinks, water supply lines, overhead wastewater lines, hot water generating equipment with capacity and recovery rate, backflow prevention, and wastewater line connections. *See Example C-3, C-5 and C-11.*

M. Location of lighting fixtures. *See Examples C-9 and C-10.*

N. Source of water and method of sewage disposal. *See Example C-3.*

O. A color-coded flow chart *(See Illustration B2 of Section B in Part-I within the this Manual)* may be requested by the Health Authority demonstrating flow patterns for:

- Red = Foods to be Prepared (From Receiving to Service – "Door to Table");
- Green = Ready-To-Eat Foods (From Receiving to Service – "Door to Table")
- Blue = Dishes (From the Table to Dishwashing)
- Black = Trash and garbage (From Trash Containers to Dumpster or Solid Waste Storage Area)
- Circled in Blue = All Handwashing Sinks

P. Ventilation schedule. *See Example C-6, C-7 and C-8.*

Q. Service sinks or curbed cleaning facility with facilities for hanging wet mops or similar wet cleaning tools and for the disposal of mop water and similar liquid waste. *See Examples C-1 and C-13.*

R. Storage location of poisonous or toxic materials. *See Example C-13.*

S. Areas for storage of employee personal care items. *See Example C-13.*

T. Location of refuse, recyclable, and/or returnable containers. *See Example C-12.*

NOTATIONS

NOTE #1: *Proposed food service establishment plans and specifications cannot be approved by the County Health Department until the potable water supply and sewage disposal systems are approved by the water and sewage authority (if county and or municipal) or by the County Health Department (if nonpublic water supply or onsite sewage disposal management systems). This means the public water and sewer utilities must be available for connection in a right-of-way abutting the proposed establishment's property or within 200 feet of the property by means of accessible easement. If public water and sewer utilities are not available to the proposed establishment's premises, then a well has been installed on the promises of the proposed establishment and has been permitted by EPD. If the well water supply is not regulated by EPD, then the well water supply must be acceptable to the local Health Authority. In addition, it means that if an onsite sewage disposal management system is to be utilized on the proposed establishment's premises for means of sewage disposal, then an onsite sewage disposal management system installation permit has been issued by the local Health Department to allow such a system's installation.*

NOTE #2: *During a menu review, the EHS may find that Chapter 511-6-1 requires a HACCP Plan depending on what processes are involved with required menu items. An example where a HACCP Plan would be required is acidification of cooked rice for food safety in making sushi or using a molluscan shellfish life support system to maintain water quality in the display of molluscan shellfish for human consumption.*

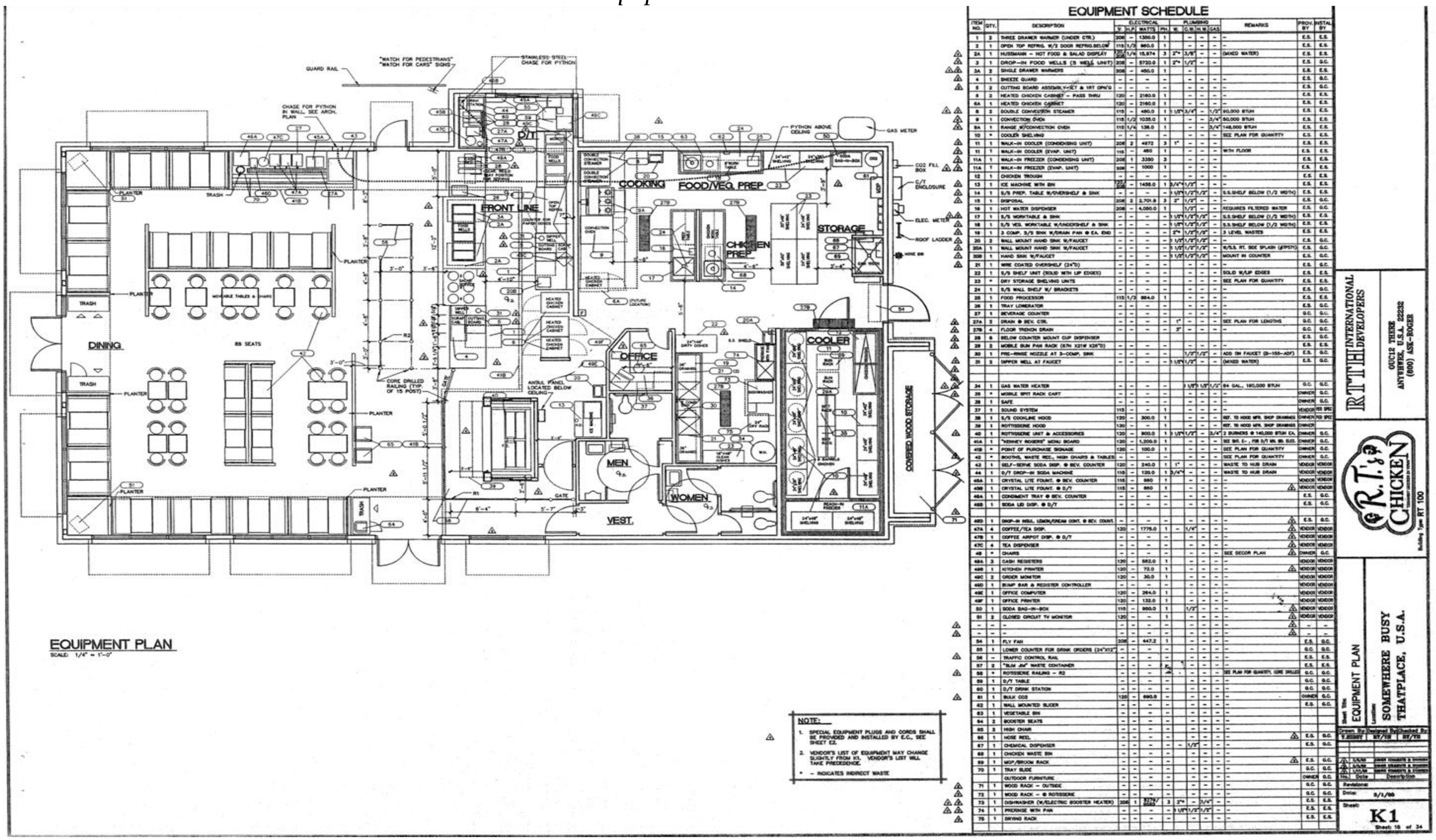
NOTE #3: *If a variance request and or HACCP Plan is required as per the Chapter, these documents must be apart of the plan and specification submittal package received from the food service permit applicant. If Chapter 511-6-1 requires a variance request and or HACCP plan, the proposed food service establishment's plans and specifications cannot be approved by the Health Authority until the variance request has been approved by the Georgia Department of Public Health. In addition, the HACCP plan has to be jointly approved by the State Environmental Health Section Office within the Georgia Department of Public Health and the County Health Department.*

NOTE #4: *The following Examples, C-1 through C-13, are for demonstration only. Their purpose is to help familiarize the Environmental Health Specialist (EHS) as to where to look for certain information when reviewing plans and specifications. However, they do provide what is generally accepted as good architectural practices as to plans preparation.*

NOTE #5: *One Health Authority signed and approved set of the plans and specifications must remain at the construction site at all times during construction.*

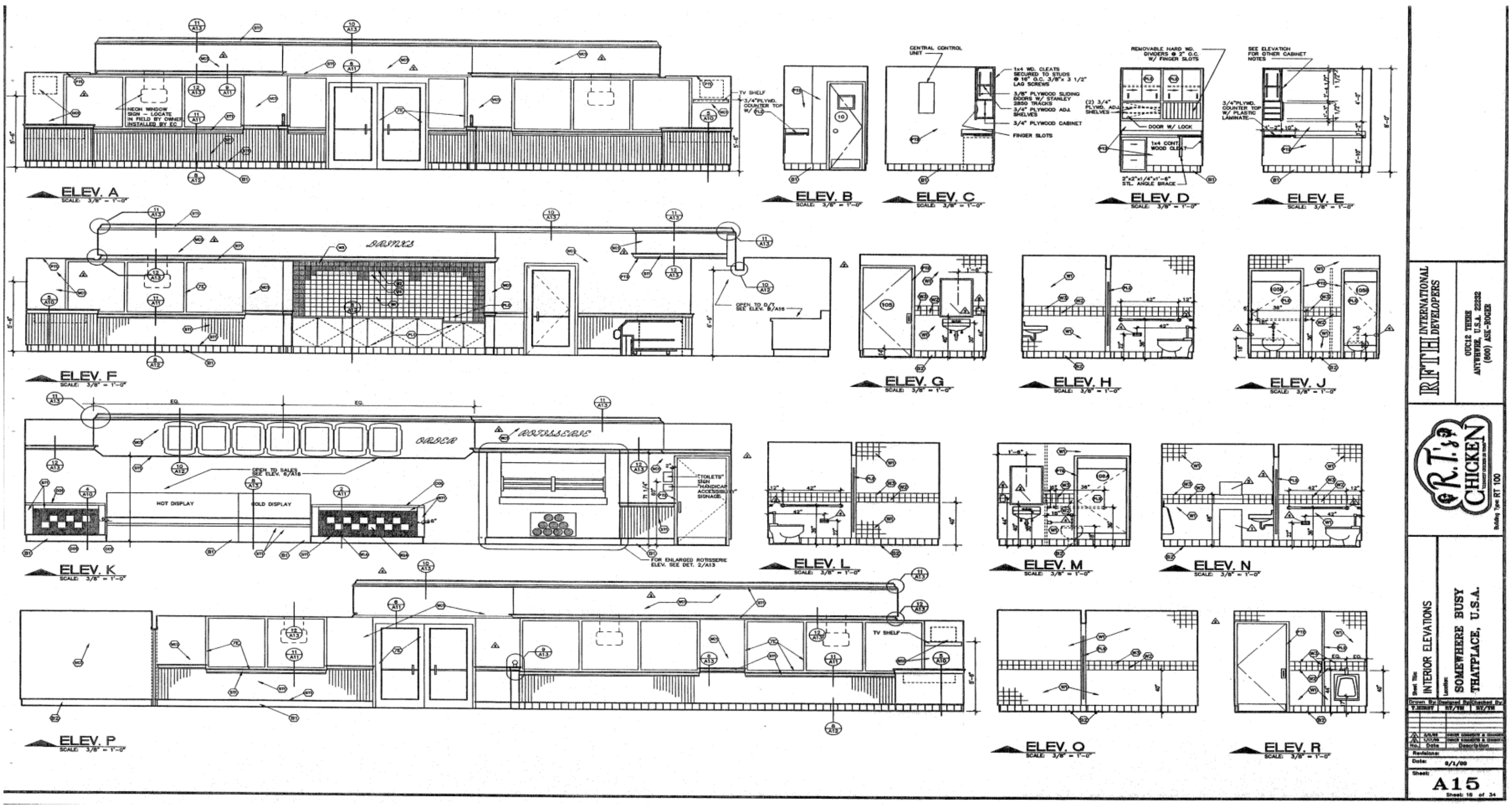
EXAMPLE C-1

Equipment Floor Plan

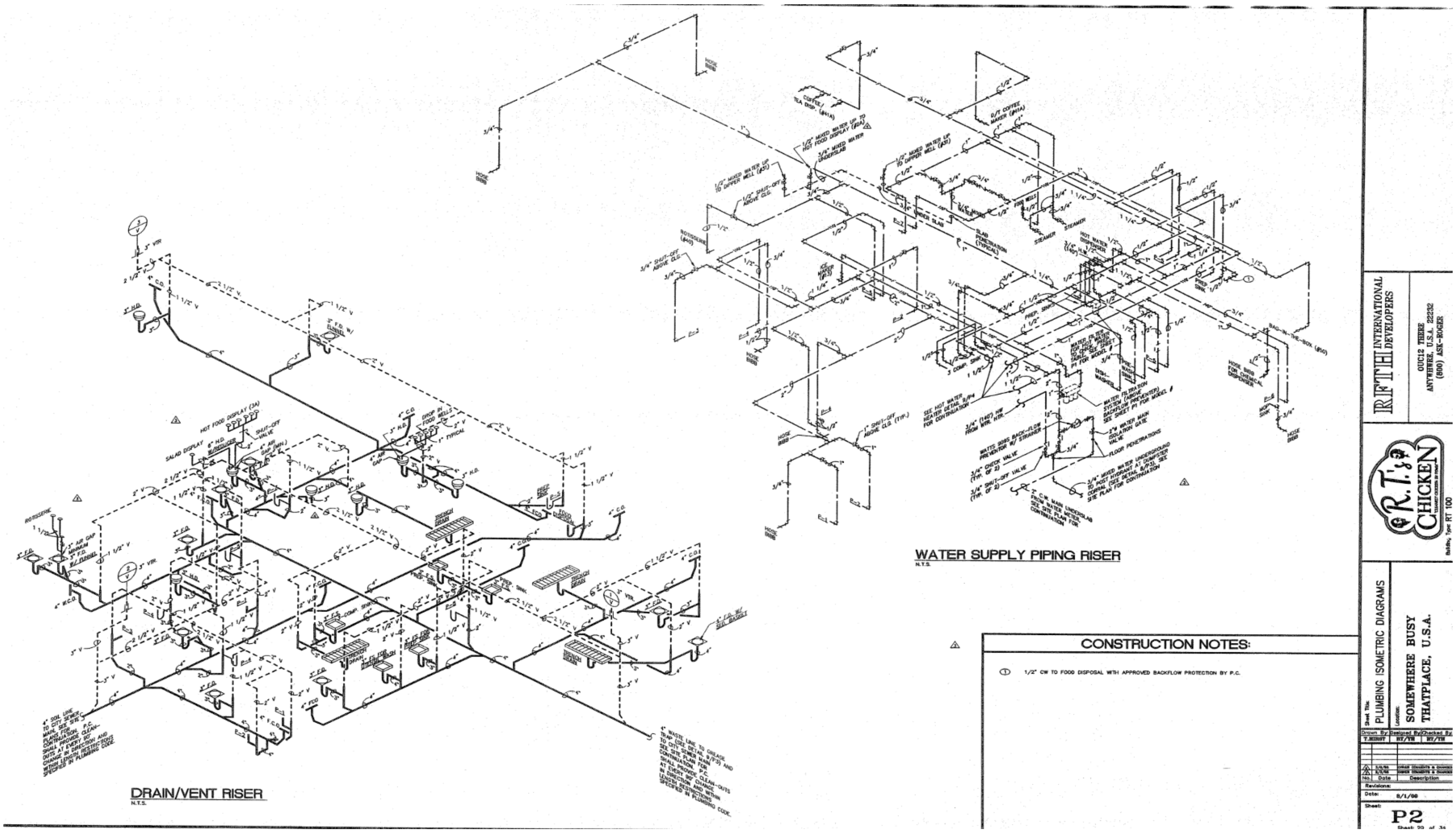


EXAMPLE C-2
Elevations

Interior Elevations (A15)

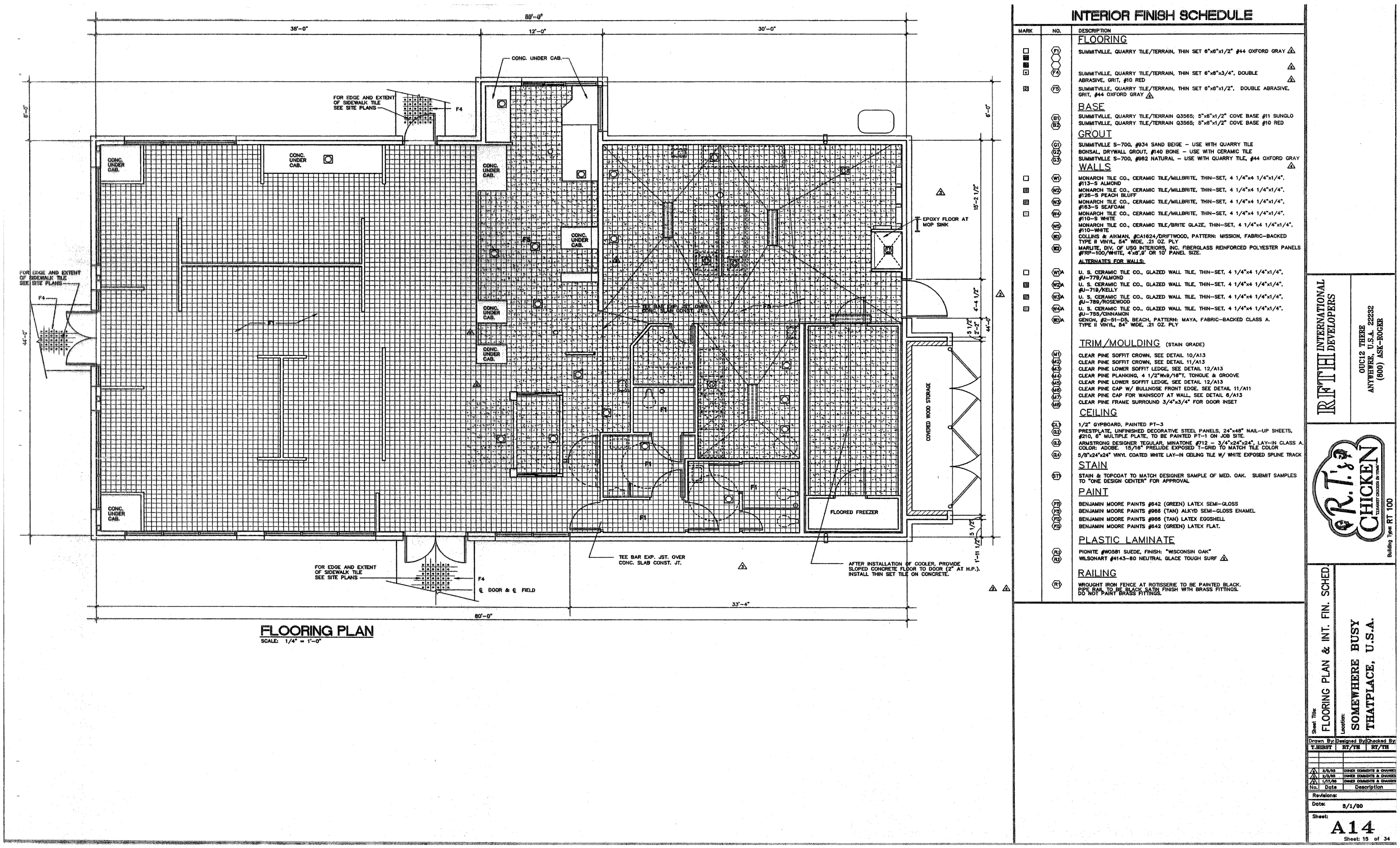


EXAMPLE C-3
Plumbing Riser

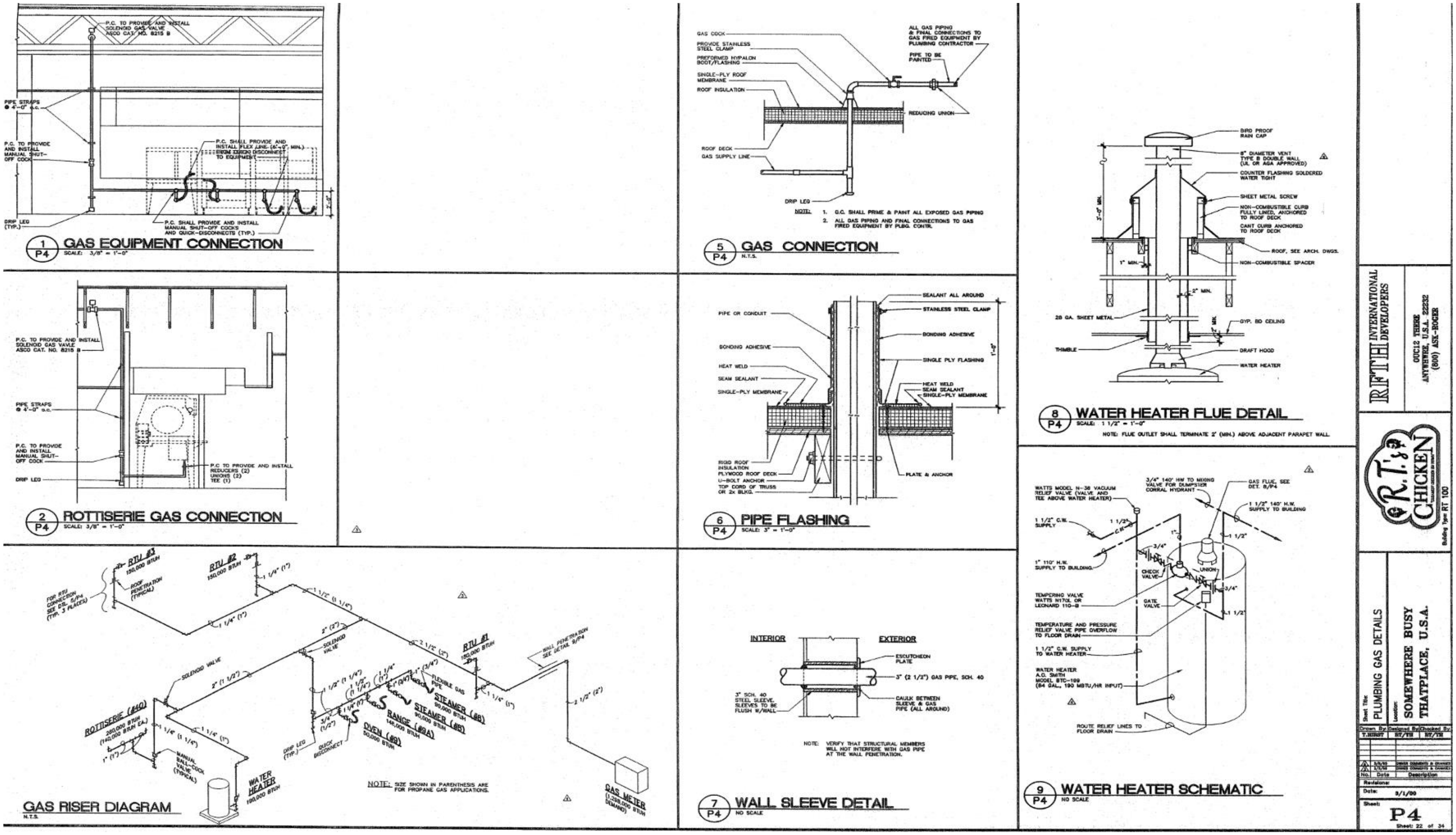


EXAMPLE C-4

Interior Finish Schedule and Floor Plan

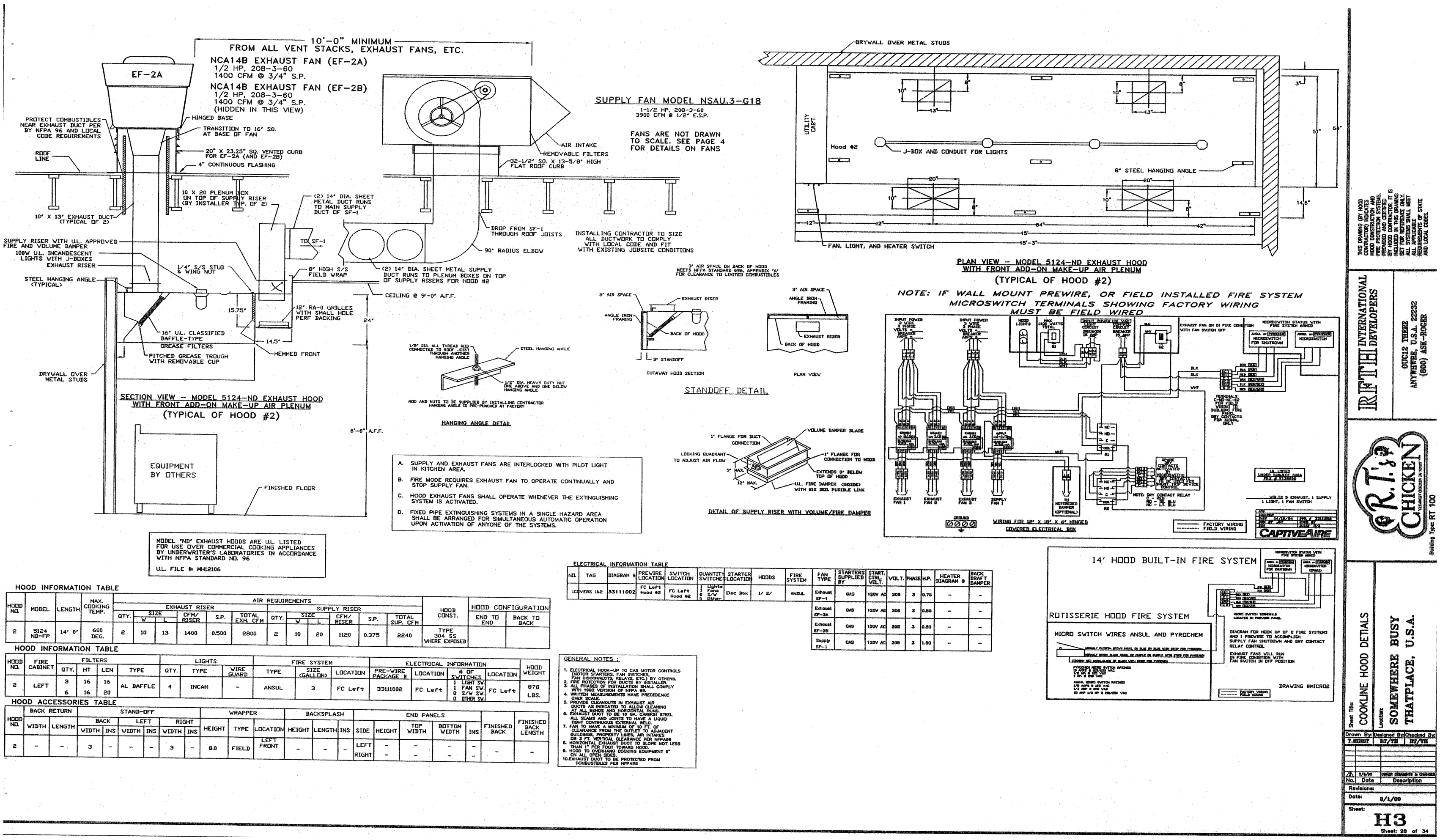


EXAMPLE C-5
Plumbing Details

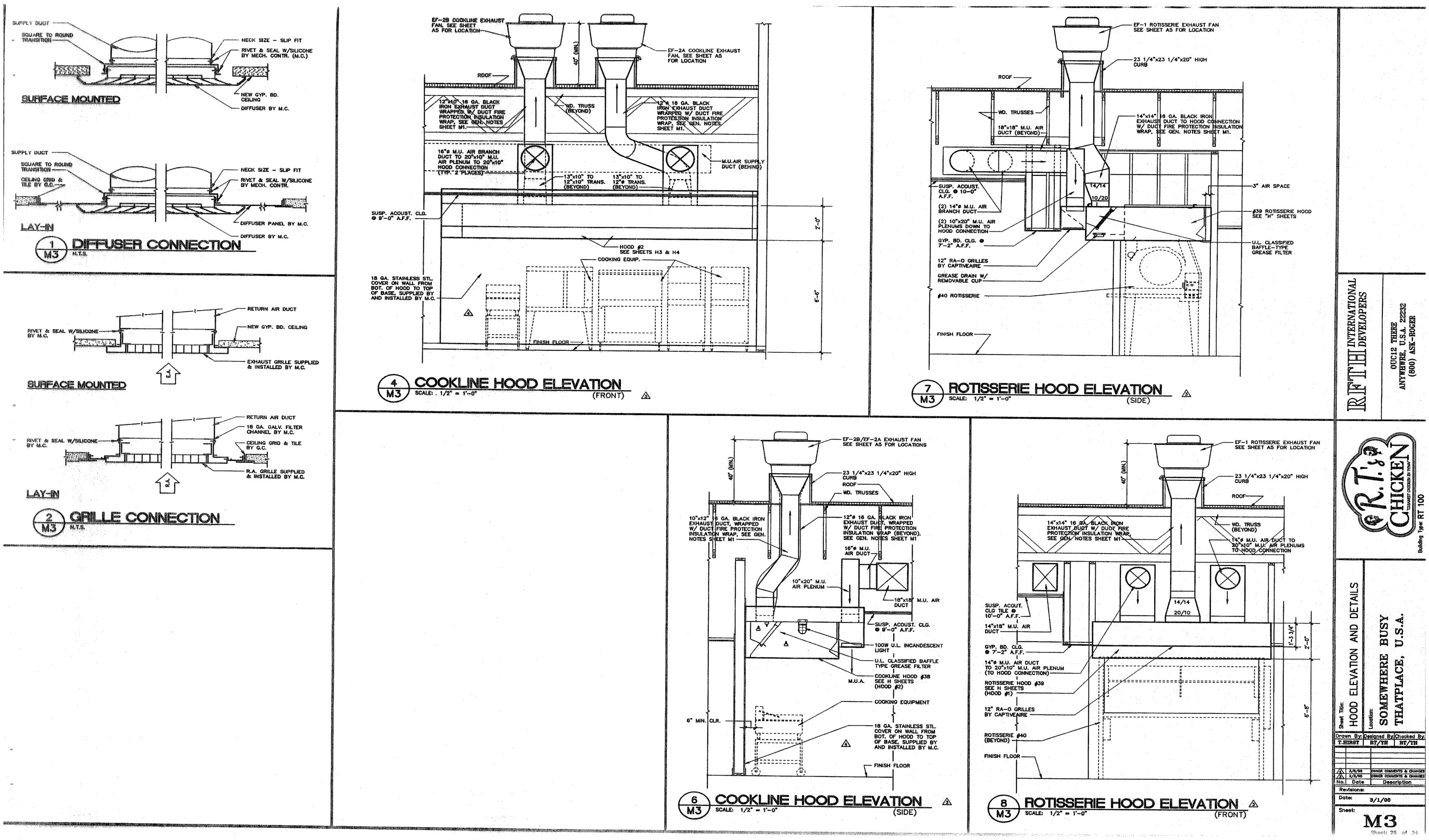


EXAMPLE C-6

Cookline Detail

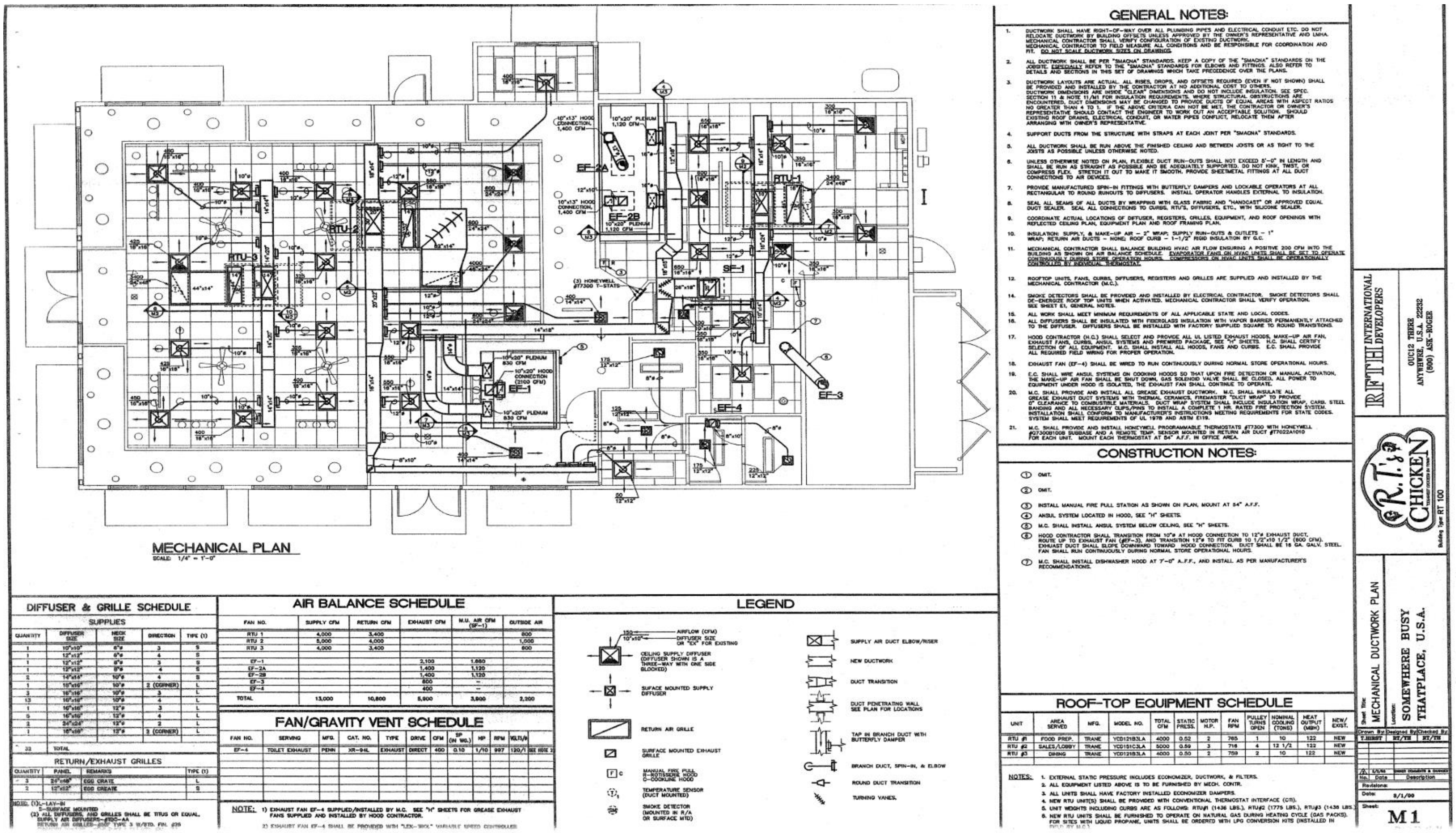


EXAMPLE C-7
Mechanical Detail Hood



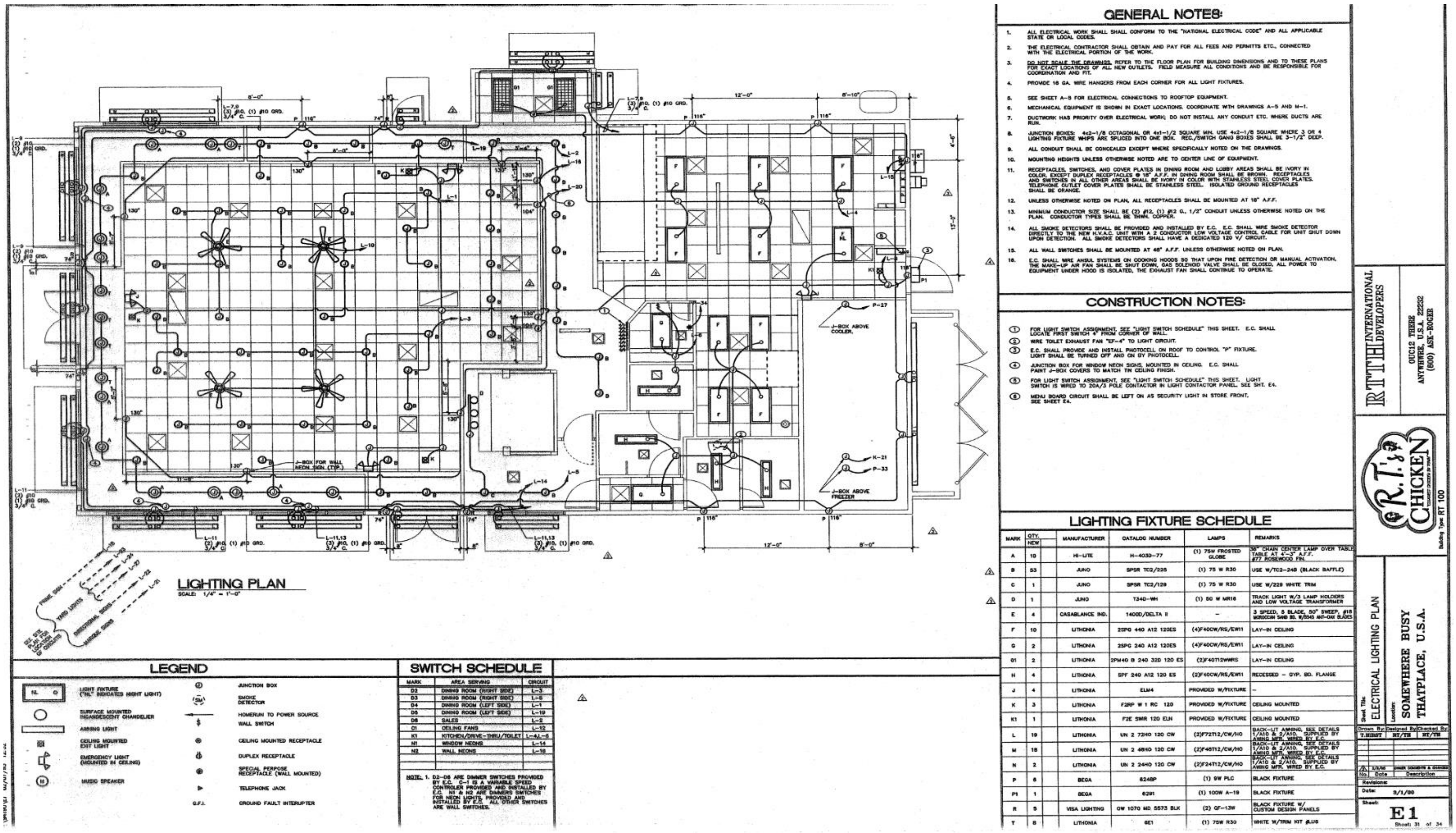
EXAMPLE C-8

Mechanical Duckwork Plan



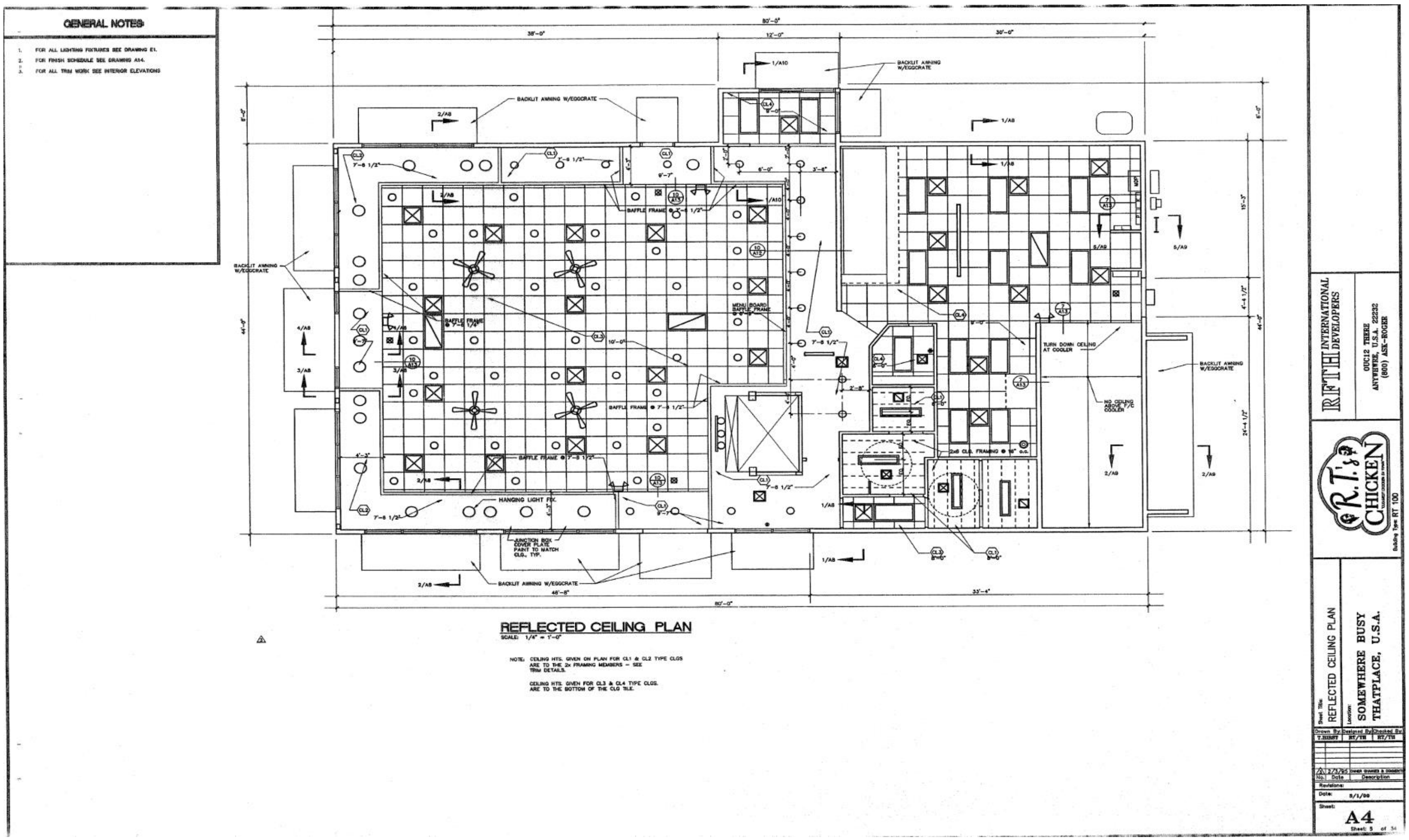
EXAMPLE C-9

Electrical Lighting Plan

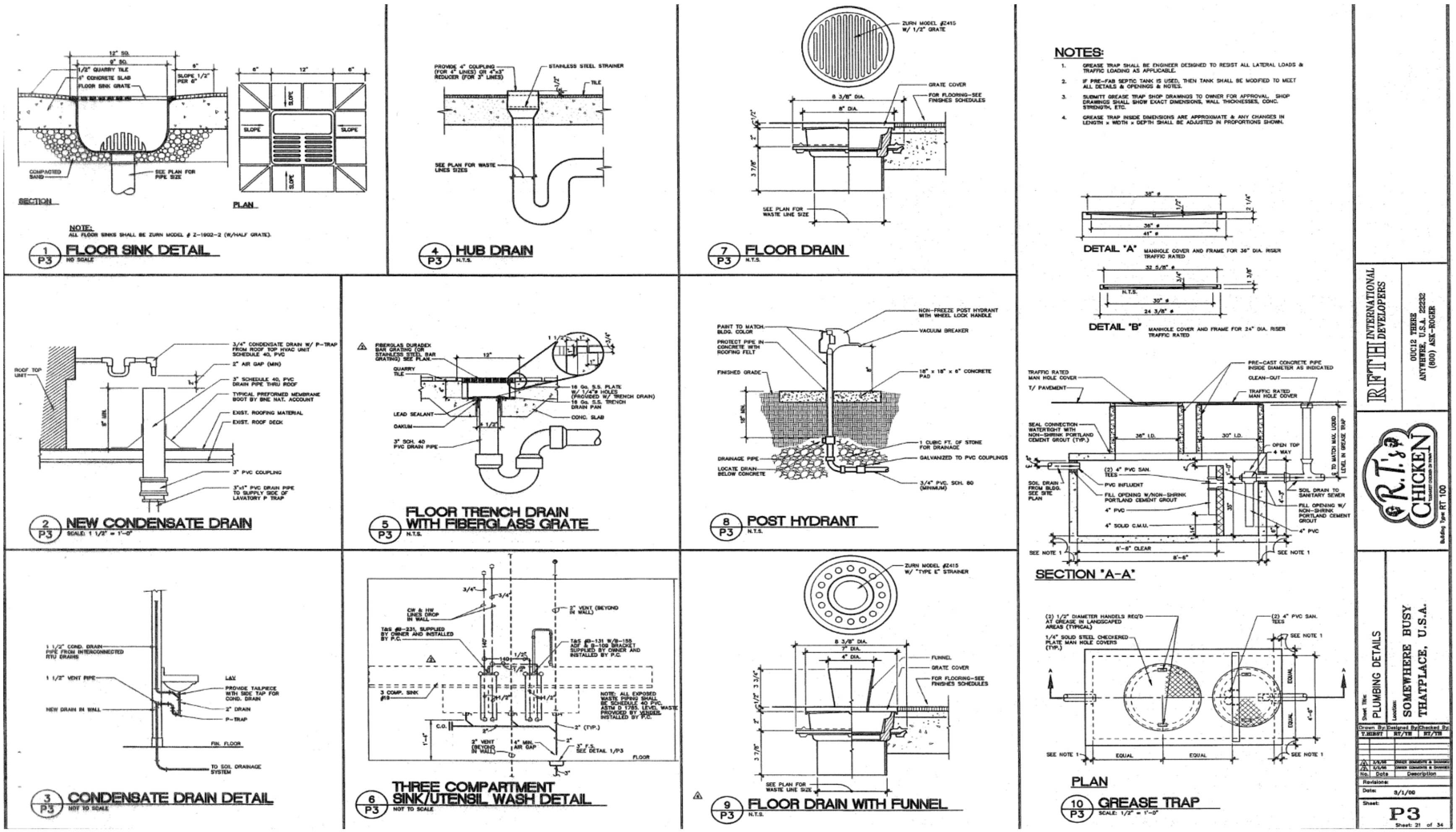


EXAMPLE C-10

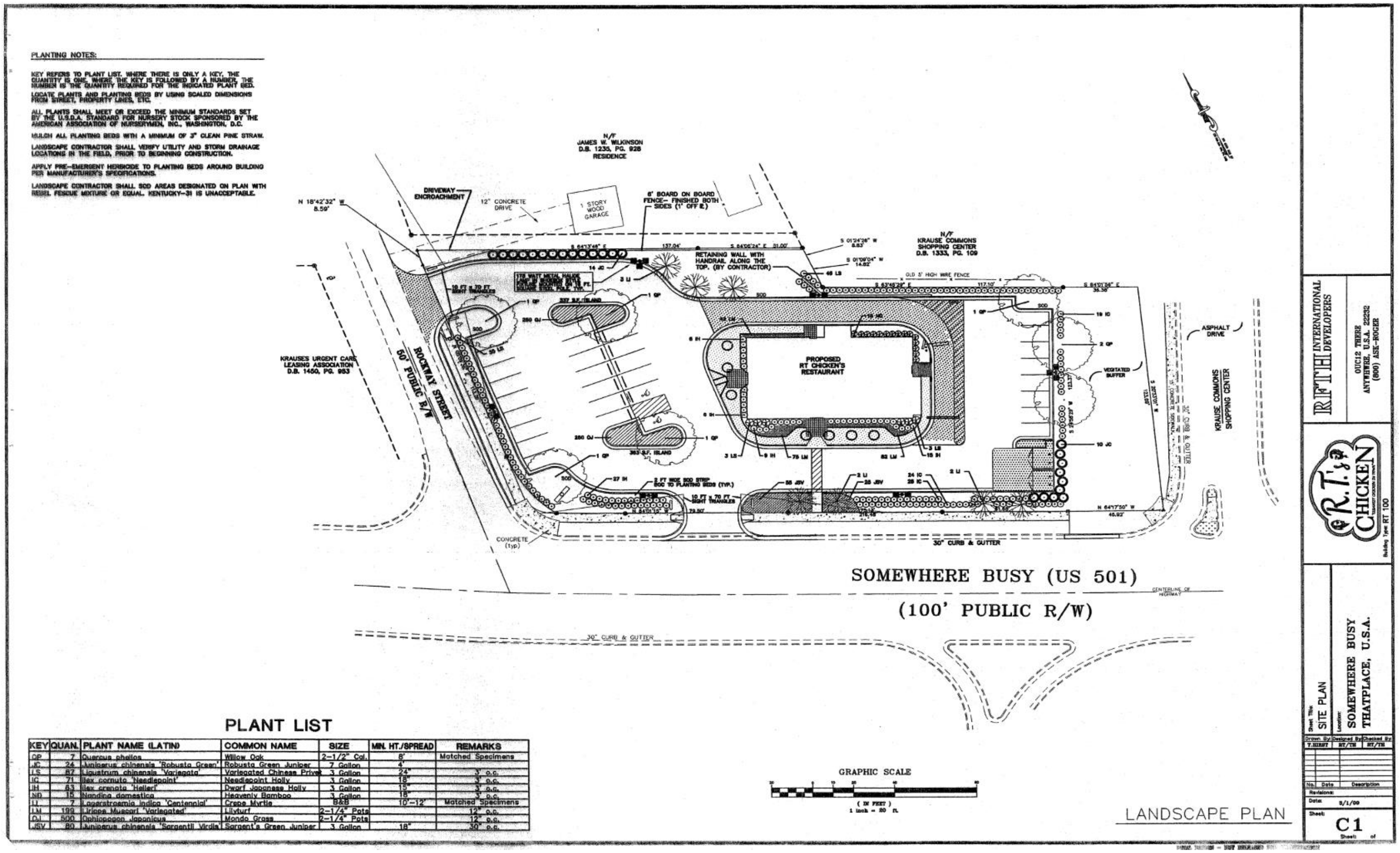
Reflective Ceiling Plan



EXAMPLE C-11
Plumbing Detail



EXAMPLE C-12
Site Plan

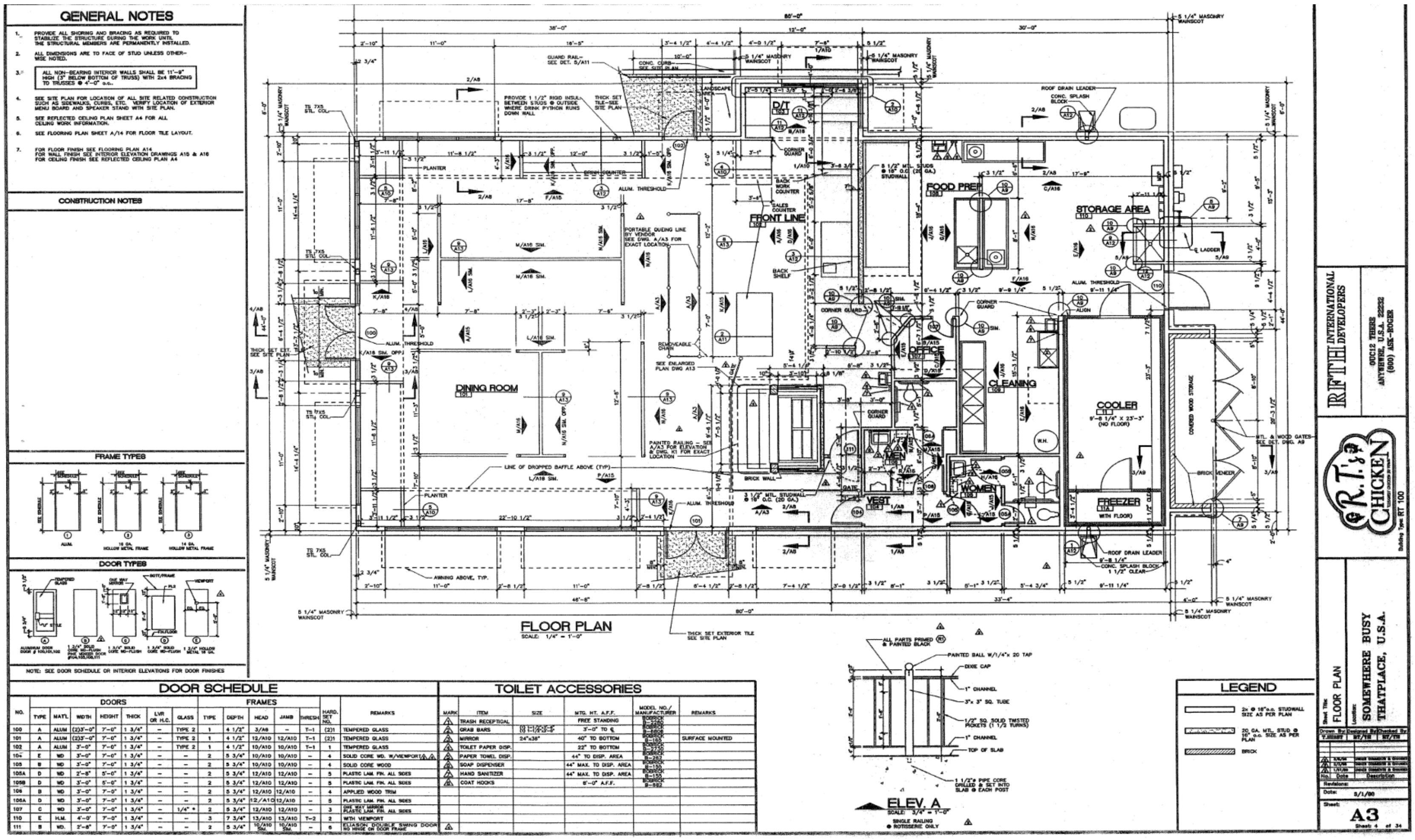


PLANT LIST

KEY	QUAN.	PLANT NAME (LATIN)	COMMON NAME	SIZE	MIN. HT./SPREAD	REMARKS
QP	7	Quercus phellos	Willow Oak	2-1/2" Cal.	8'	Matched Specimens
JC	24	Juniperus chinensis 'Robusta Green'	Robusta Green Juniper	7 Gallon	4'	
LS	87	Ligustrum chinensis 'Variegata'	Variegated Chinese Privet	3 Gallon	24"	3' o.c.
IC	71	Ilex cornuta 'Needlepoint'	Needlepoint Holly	3 Gallon	18"	3' o.c.
IH	63	Ilex crenata 'Helleri'	Dwarf Japanese Holly	3 Gallon	15"	3' o.c.
ND	15	Nandina domestica	Heavenly Bamboo	3 Gallon	18"	3' o.c.
LI	7	Lagerstroemia indica 'Centennial'	Crepe Myrtle	B&B	10'-12'	Matched Specimens
LM	199	Liriope Muscari 'Variegated'	Lilyturf	2-1/4" Pots		12" o.c.
OJ	500	Ophiopogon Japonicus	Mondo Grass	2-1/4" Pots		12" o.c.
JSV	80	Juniperus chinensis 'Sargentii Virdis'	Sargent's Green Juniper	3 Gallon	18"	30" o.c.

EXAMPLE C-13

Floor Plan



SECTION D - FACILITIES TO MAINTAIN PRODUCT TEMPERATURE

REFERENCES (Chapter 511-6-1)

.05 Equipment and Utensils:

(1) Materials (e) Galvanized Metal, Use Limitations (l) Temperature Measuring Devices, Ambient Air and Water (x) Temperature Measuring Devices
(2) Design and Construction (jj) Food Service Equipment, Acceptability
(3) Numbers and Capacities (a) Cooling, Heating and Holding Capacities

I. **Holding Facilities**: Hot-holding and cold-holding facilities must be designed, constructed and installed to comply with DPH Rule 511-6-1-.05 Equipment and Utensils. Food equipment that is designed and built according to standards set by ANSI accredited certification programs is acceptable in this rule.

II. **Refrigeration Sizing and Design:**

1. *Plan review must consider the need to provide adequate refrigeration facilities* for the proper storage, transportation, display, and service of TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) food. Specific refrigeration needs are based on the menu, number of meals, frequency of deliveries, and food to be prepared in advance of service. All refrigerators must be capable of maintaining TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) food at 41°F or below.

2. If TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) foods are prepared a day or more in advance of service, a rapid cooling procedure capable of cooling TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) foods from 135°F to 41°F within 6 hours (135°F to 70°F within the first 2 hrs.) must be provided. The capacity of the rapid cooling facilities must be sufficient to accommodate the volume of food required to be cooled to 41°F within the total cooling time limit of 6 hours. The location of the rapid cooling facilities (e.g., sinks for ice baths, freezer storage for ice wands, blast chillers) must be identified. Refrigerators and freezers at workstations for operations requiring preparation and handling of TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) foods should be considered. For example, it may be necessary to locate a freezer near the fryer where frozen products will be deep-fried. Refrigeration units, unless designed for such use, must not be located directly adjacent to cooking equipment or other high heat producing equipment that may adversely impact the cooling system's operation.

III. **Calculating Refrigerated Storage Needs:** To plan refrigeration storage, the following items must be considered: *menu, type of food operation, number of meals per day, number of deliveries per week, and adequate ventilation in the areas where the refrigeration systems will be located:*

A. *Meals Served Per Day*: This formula is used first to establish the daily number of meals:

Total Meals Per Day Served:

Number of Meal Periods x Number of Dining Seats x Turnover of Seats per Meal Period + Other Sales per Day (takeout or catering)

B. *Walk-in Refrigeration Volume*: Then, the following formula is used to establish required walk-in refrigeration storage volume:

Total Interior Storage Volume Needed:

$$\frac{\text{Volume per Meal}^{1}\ (\text{ft.}^{3}) \times \text{number of meals between deliveries}}{.40^{2}}$$

For example, if a food service establishment serves 1,000 meals between deliveries, the following refrigerated walk-in storage capacity would be needed:

$$\frac{0.1\ \text{ft.}^{3}/\text{meal} \times 1000\ \text{meals}}{.40} = \underline{250\ \text{cubic feet}}$$

C. *Reach-in Refrigeration Volume*: This formula is used to establish the required reach-in refrigeration storage volume:

Total Interior Storage Volume Needed:

$$\frac{\text{Volume per meal}^{3}\ (\text{ft.}^{3}) \times \text{number of meals between deliveries}}{.75^{4}}$$

For example, if a food service establishment serves 1,000 meals between deliveries, the following reach-in refrigerated storage capacity would be needed:

$$\frac{0.1^{3}/\text{meal} \times 1000\ \text{meals}}{.75} = 133\ \text{cubic feet}$$

---

[1]Volume per meal is estimated to be 0.1 cubic feet.
[2]Only 40% of any walk-in unit actually provides usable space.
[3]Volume per meal is estimated to be 0.1 cubic feet.
[4]Only 75% of any reach-in unit actually provides usable space.

Note: *See Tables D-1 and D-2 for listings of storage volumes for walk-in and reach-in units needed between deliveries.*

TABLE D-1

The following charts are based on the volume of the meals, number of meals served and frequency of delivery.
Note: To calculate the interior floor area (ft^2) required for walk-in refrigeration units using the following charts, divide the storage volume by the height of the unit.

COLD STORAGE CHART FOR WALK-IN UNITS
0.10 Cu.Ft.. per meal for all cold storage products

Number of meals served between deliveries	Storage volume of walk-in Cu.Ft.		Number of meals served between deliveries	Storage volume of walk-in Cu.Ft.		Number of meals served between deliveries	Storage volume of walk-in Cu.Ft.
200	50.00		1050	262.50		2050	512.50
250	62.50		1100	275.00		2100	525.00
300	75.00		1150	287.50		2150	537.50
350	87.50		1200	300.00		2200	550.00
400	100.00		1250	312.50		2250	562.50
450	112.50		1300	325.00		2300	575.00
500	125.00		1350	337.50		2350	587.50
550	137.50		1400	350.00		2400	600.00
600	150.00		1450	362.50		2450	612.50
650	162.50		1500	375.00		2500	625.00
700	175.00		1550	387.50		2550	637.50
750	187.50		1600	400.00		2600	650.00
800	200.00		1650	412.50		2650	662.50
850	212.50		1700	425.00		2700	675.00
900	225.00		1750	437.50		2750	687.50
950	237.50		1800	450.00		2800	700.00
1000	250.00		1850	462.50		2850	712.50
			1900	475.00		2900	725.00
			1950	487.50		2950	737.50
			2000	500.00		3000	750.00

TABLE D-2

STORAGE CHART FOR <u>REACH-IN UNITS</u>
0.10 Cu.Ft. per meal for all cold storage products

Number of meals served between deliveries	Storage volume of reach-in Cu. Ft.	Number of meals served between deliveries	Storage volume of reach –in Cu. Ft.	Number of meals served between deliveries	Storage volume of reach-in Cu. Ft.
200	26.67	1050	140.00	2050	273.33
250	33.33	1100	146.67	2100	280.00
300	40.00	1150	153.33	2150	286.67
350	46.67	1200	160.00	2200	293.33
400	53.33	1250	166.67	2250	300.00
450	60.00	1300	173.33	2300	306.67
500	66.67	1350	180.00	2350	313.33
550	73.33	1400	186.67	2400	320.00
600	80.00	1450	193.33	2450	326.67
650	86.67	1500	200.00	2500	333.33
700	93.33	1550	206.67	2550	340.00
750	100.00	1600	213.33	2600	346.67
800	106.67	1650	220.00	2650	353.33
850	113.33	1700	226.67	2700	360.00
900	120.00	1750	233.33	2750	366.67
950	126.67	1800	240.00	2800	373.33
1000	133.33	1850	246.67	2850	380.00
		1900	253.33	2900	386.67
		1950	260.00	2950	393.33
		2000	266.67	3000	400.00

IV. **Additional Requirements and Recommendations for Refrigerated and Frozen Storage Facilities:**

1. *All refrigeration units* must have numerically scaled indicating thermometers accurate to + 3°F. Temperature sensing devices must be located in the unit to measure air temperature in the warmest part of the refrigerator (usually near a door opening). Refrigerators and freezers shall be capable of maintaining required temperatures.

2. *Air circulation within refrigeration and freezer units* should not be obstructed and should allow for an even and consistent flow of cold air throughout the units.

3. *Interior and exterior floor/wall junctures of walk-in refrigerators and freezers* must have approved coved junctures.

4. The use of *galvanized metal* in refrigerated storage facilities is subject to rust that may lead to cleaning and durability issues; therefore, *these materials are not permissible for such use in there construction.*

5. *The materials of which food display containers are made of must be examined*. Metals are more readily conductive of heat than plastics. Therefore, stainless steel pans will heat foods more efficiently than those made of plastics.

6. *Gaps and openings around walk-in refrigerator and freezers must be properly sealed* to the walls or properly spaced to allow for cleaning behind and around the units. Reach-in refrigerators and freezers that are fixed in place shall be spaced to allow for cleaning along all sides of the unit or sealed to adjoining equipment or walls. Refer to Section H of this document.

7. Refrigeration and freezer units should not be installed with access from the exterior of the building *unless food can be protected when transported from the unit into the food establishment*.

8. *If the walk-in floors will be water-flushed for cleaning or receive the discharge of liquid waste or excessive melt water, the floors should be sloped to drain*. If the structure of the walk-in is integral with the building, properly installed floor drains may be installed inside the unit.

9. Each walk-in unit shall be equipped with lighting that provides *10 foot-candles of light* throughout the unit when it is full of product. Lights must be properly shielded or shatter resistant.

10. Establishments wishing to include within their menu food items in the ready-to-eat form TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) foods consisting of *raw, raw-marinated, partially cooked, or marinated-partially cooked fish other than molluscan shellfish and wishing to treat these items on-site to destroy parasites* must provide adequate and properly sized freezer equipment capable of maintaining the ready-to-eat product to the following specifications:

    A. *–4ºF (-20ºC) for a minimum of 168 hours (7 days); or*
    B. *–31ºF (-35ºC) or below until solid and stored at –31ºF (-35ºC) for a minimum of 15 hours; or*
    C. *–31ºF (-35ºC) or below until solid and stored at –4ºF (-20ºC) or below for a minimum of 24 hours.*

11. *Lockable casters* are recommended for reach-in refrigerators and freezers.

12. Finally, cold holding food equipment such as *self-service displays or sandwich preparation coolers are not designed to be used to cool foods*. They are designed only for holding the temperature of food placed within or on them. Equipment presented for review as designed hold foods must be verified as being capable through its manufacturer’s specification documentation.

V. <u>Rapid Chill Refrigeration Units</u>: Construction and installation of rapid chill refrigeration units (i.e., blast chillers) shall be similar to refrigerated and frozen storage facilities. Rapid chill refrigeration units *must be capable of cooling cooked TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) food from 135°F to 41°F within a total of 6 hours with the capability of cooling from 135°F to 70°F within the first 2 hours of this 6 hour cooling process.*

VI. <u>Cooking Facilities</u>:

1. The types and location of *cooking facilities must be based upon the types and methods of food preparation.*

2. Cooking facilities must be capable of heating TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) food to the minimum time/temperature requirements:

Beef roasts ………………………………………………... 130ºF (112 min)
Cooked fruits and vegetables being hot held ……………… 135 ºF (15 sec)
Solid seafood pieces…………………………………….…. 145ºF (15 sec)
Other TIME/TEMPERATURE CONTROL FOR SAFETY FOODS(TCS)
food …………………………………….. 145ºF (15 sec)
Eggs:

Immediate service ……………………………………… 145ºF (15 sec)

Pooled* ………………………………………………… 155ºF (15 sec)
(*pasteurized eggs must be served to a highly susceptible population)

VI. <u>Cooking Facilities</u>: (continued)

Pork……………………………………………………… 145ºF (15 sec)
Comminuted meats/fish …………………………………. 155ºF (15 sec)
Poultry…………………………………………………… 165ºF (15 sec)
Reheated TIME/TEMPERATURE CONTROL FOR SAFETY FOODS(TCS) food …………………………………. 165ºF (15 sec)
Stuffed fish, meat, pork ……………………………………. 165 ºF (15 sec)

3. Cooking equipment must be constructed and installed in accordance with *DPH Rule 511-6-1-.05 Equipment and Utensils*

4. Lockable casters with flexible utility lines are recommended to facilitate cleaning. Refer to Section H of this Manual.

5. If cooking equipment uses water or steam, *methods for filling and draining the units must be identified.*

VII. <u>Hot Holding and Reheating Facilities1</u>:

1. Hot holding facilities must be capable of *maintaining TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) food at an internal temperature of 135°F or above during display, service and holding periods.*

2. <u>Considerations</u>:

A. *Careful consideration must be given when reviewing the establishment menu* to determine if intended holding or display equipment will adequately hold TIME/TEMPERATURE CONTROL FOR SAFETY FOODS at safe temperatures. For an example, egg rolls containing shrimp placed out under heat lamp bulbs for self-service on a food-bar as per common practice without any form of liquid sauce. If customers are not actively consuming them, these egg rolls are subject to a quick cool down to a temperature below the required 135ºF minimum hot holding temperature for TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) foods. This cooling process occurs because there is no liquid to efficiently conduct heat from the display pan to the food and the less efficient heat conduction of radiant heat from heat lamp bulbs. On the other hand, egg drop soup will have no problem to stay well above the require 135ºF minimum hot holding temperature due to the fact that the soup is mostly comprised of liquid, an excellent conductor of thermal energy. The liquid making up the soup is more efficient in conducting thermal

1 See Illustration D1 for examples of Hot Holding and Reheating Equipment.

energy than the air surrounding the egg roles heated by the radiant heat from the heat lamp. This is true due to the heat lamps being subjected to the influence of air crosscurrents of the establishment HVAC system along with currents created by people movement around the food bar. Another factor affecting the efficiency of the heat lamp bulbs is the distance from the lamp bulbs to displayed food on the food bar.

B. To solve the above cooling process dilemma, counter measures might take a combination of equipment modification and adjustment of timing from the cooking process to the point in time of displaying of food. In addition, the operator must consider the rate at which customers are egg rolls from the food bar, keeping just enough on display to meet consumer demand. Temperature of TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) must be closely monitored by trained food employees as well.

C. The county EHS and the permit applicant/plans preparer would need to evaluate available equipment specification sheets and display equipment design in order to access the successful use of heat lamps to maintain TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) food product temperatures required by the Chapter. Another factor that must be considered by both is the method of preparation of the menu item to be displayed for service.

3. *Reheating equipment must be capable of raising the internal temperature of TIME/TEMPERATURE CONTROL FOR SAFETY (TCS) food rapidly (within a maximum of 2 hours) to at least 165°F*. Generally, hot holding food equipment, such as a self-service display food bar or a steam/dry heat food staging table, are not designed to be used to reheat foods. They are designed only for holding the temperature of food placed within or on them. Equipment presented for review as designed to rapidly reheat and hot hold food must be verified as capable of doing so through its manufacturer's documentation, such as manufacturer's equipment specification sheets.

4. *Appropriate product thermometers* will be required to monitor the food temperature.

5. *The materials of which food display containers are made of must be examined*. Metals are more readily conductive of heat than plastics. Therefore, stainless steel pans will heat foods more efficiently than those made of plastics.

6. Hot holding and reheating facilities must be constructed and installed in *accordance with DPH Rule 511-6-1-.05*.

7. Lockable casters with flexible utility lines are recommended to facilitate cleaning. *Refer to Section H of this Manual*.

8. If hot holding units use water or steam, methods for filling and draining the units must be identified.

Illustration D-1

Examples of Cooking and Holding Equipment

"Carving Station"

"Steam Kettle"

"Gyro Cooker/Holding Unit"

"Holding Cabinet"

"Heat Lamp Holding Unit"

"Quartz Hot Holding Unit"

"Braising Pan"

SECTION E - FACILITIES TO PROTECT FOOD

REFERENCES (Chapter 511-6-1)

.04 Food. (4) Protection from Contamination After Receiving. (g) Washing Fruits and Vegetables.
.04 Food (6) Limiting Growth of Pathogens. (j) Variance Required.
.04 Food. (4) Protection from Contamination After Receiving. (k) In-Use Utensils, Between-Use Storage.
.04 Food. (4) Protection from Contamination After Receiving. (u) Food Display.
.04 Food. (4) Protection from Contamination After Receiving. (v) Condiments, protection.
.05 Equipment and Utensils. Amended. (3) Numbers and Capacities. (f) Utensils, Consumer Self-Service**.**
.05 Equipment and Utensils. Amended. (3) Numbers and Capacities. (j) Sinks for Washing Raw Fruits and Vegetables
.05 Equipment and Utensils. Amended. (2) Design and Construction. (p) Dispensing Equipment.
.05 Equipment and Utensils. Amended. (2) Design and Construction. (v) Molluscan Shellfish Life-Support System.

I. <u>Purpose</u>: As a basic requirement of Chapter 511-6-1, a*dequate equipment and facilities* must be *provided to promote good hygienic practices, sanitary food handling and to minimize the potential for cross-contamination between ready-to-eat and raw products*. As a result, this Section has as its purpose to provide guidance and interpretations to satisfy this basic requirement.

II. <u>Food Preparation Sinks and Associated Equipment</u>:

1. *<u>Separate areas</u>* shall be designed to segregate food-handling operations involving raw and ready-to-eat foods. Sinks used in preparing or thawing of foods must be made of stainless steel. If cooling of cooked, ready-to-eat food is planned and if raw fruits and vegetables are included on the menu as an item or ingredient, a sink or sinks sized for the volume of food to be processed shall be provided for washing raw fruits and vegetables and for cooling activities. It must be equipped with hot and cold water under pressure and be equipped with a recommended minimum 18" drain-board or sufficient counter/worktable space to separate unwashed fruits and vegetables from those that are ready for preparation or service. Further, there must be provided sufficient space between these raw fruits and vegetable washing/cooling sinks and other food preparation sinks to preclude the possibility of cross-contamination from other uncooked foods such as meat, fish, poultry, etc.

2. *<u>If the menu and the volume of food to be prepared requires</u>* sinks for the preparation of other foods such as meats, poultry and fish, separation by species of food due to cooking time/temperatures, as required in *DPH Rule 511-6-1-.04(5)*, must be considered in planning the placement of these sinks. The purpose of this consideration is to prevent the occurrence of cross-contamination which may occur between foods. This cross-contamination between foods could lead to inadequate time/temperature kill step application during the cooking process or provide a pathway for pathogens to cause illness as a result of consuming contaminated raw, ready-to-eat fruits and vegetables. Likewise, preventing cross-contamination of food in regards to allergens such as shellfish should be considered in planning the placement and use of these food preparation sinks.

3. *Should separate areas for sink installation not be possible*, then properly design and constructed physical barriers between sinks must be utilized in their installation. These physical barriers may be sufficient spacing between sinks, partitions, or shields to preclude splash, spray and contact of contaminates. Generally, depending on the menu review, food process flow, equipment arrangement, and design, not less than three (3) feet of space or more, if possible, should be provided between these sinks. If spacing cannot be provided, it may become necessary to provide a barrier between these sinks. The height of this shielding should be of sufficient height to prevent cross-contamination by intercepting potential splash, spray and/or contact of foods between sinks and adjacent areas. Shield materials must meet all the requirements for a food contact surface found in *DPH Rule 511-6-1-.05*. Additionally and where possible, completely separate areas used for the preparation, handling, and washing of raw meat, fish, and poultry by providing separate areas or rooms from those used for washing and preparing raw fruits and vegetables or cooling foods.

4. *Where portable chopping/cutting boards are planned*, they should be color coded or labeled for specific use. It is also required to provide separate work counters or work areas for raw product preparation from product that is in the ready-to-eat form. The purpose of all of these requirements is to reduce the potential for the occurrence of cross-contamination of ready-to-eat foods with contaminates (i.e. pathogens and/or allergens) from unwashed fruits and vegetables and/or uncooked foods of animal origin.

III. Facilities for Displaying and Dispensing of Food:

1. *All food on display*, during service or while being held must be adequately protected from contamination by the use of: packaging; serving line, storage or salad bar protector devices; display cases or by other effective means including dispensers.

2. *Food Shields* (or sneeze guards) installed on buffet lines or self-service bars need to be specific to the type of operation that is being proposed. They shall comply with the standards of an ANSI accredited certification program. Food shielding shall intercept the direct line between the customer's nose and mouth and the food on display. On average, the vertical distance from the customer's nose and mouth to the floor is 4 feet and 6 inches to 5 feet. This average must be adjusted for children in educational institutions and for other special installations. To adjust sneeze-guard vertical distance for children in educational institutions, one must consider the standard age group height from the oldest to the youngest to be served and ascertain the average height of these two age groups. *Buffet or Smorgasbord Shielding is intended to be in a straight-line configuration with other units. If stand alone, the ends of the sneeze-guard must be completely closed or shield angle design must continue along all exposed sides of food bar (see Illustration E-1) and distances of design so as no portion of the displayed food will be within the direct line-of-site to the nose and mouth of the customer (see Illustrations E-3).*

3. *Location of seating and display for service of all food* shall be arranged such that food will be protected from contamination from consumers standing or sitting within eight (8) feet of the food. This stated requirement does not apply to tableside finishing as approved by the Health Authority and hibachi grill food preparation for immediate service.

4. *Utensils used by consumers for self-service* shall be available for each container of food displayed at buffets or salad bars. The utensil's length shall be longer than the widest portion of the container of displayed food.

5. *Food temperature measuring devices* shall be provided and readily accessible at all self-service and/or displayed food for service and used to ensure the attainment and maintenance of food temperatures as specified within *DPH Rule 511-6-1-.04* in the current Georgia Food Service Rules and Regulations Chapter 511-6-1.

6. *Where frozen desserts are being portioned and dispensed*, running water-dipping wells must be provided for the in-use storage of dispensing utensils. An alternative would be to provide a dispensing utensil for each type or flavor of frozen dessert. At no time shall self-serve dipped frozen dessert be allowed. However, a self-serve dispensing machine may be used instead.

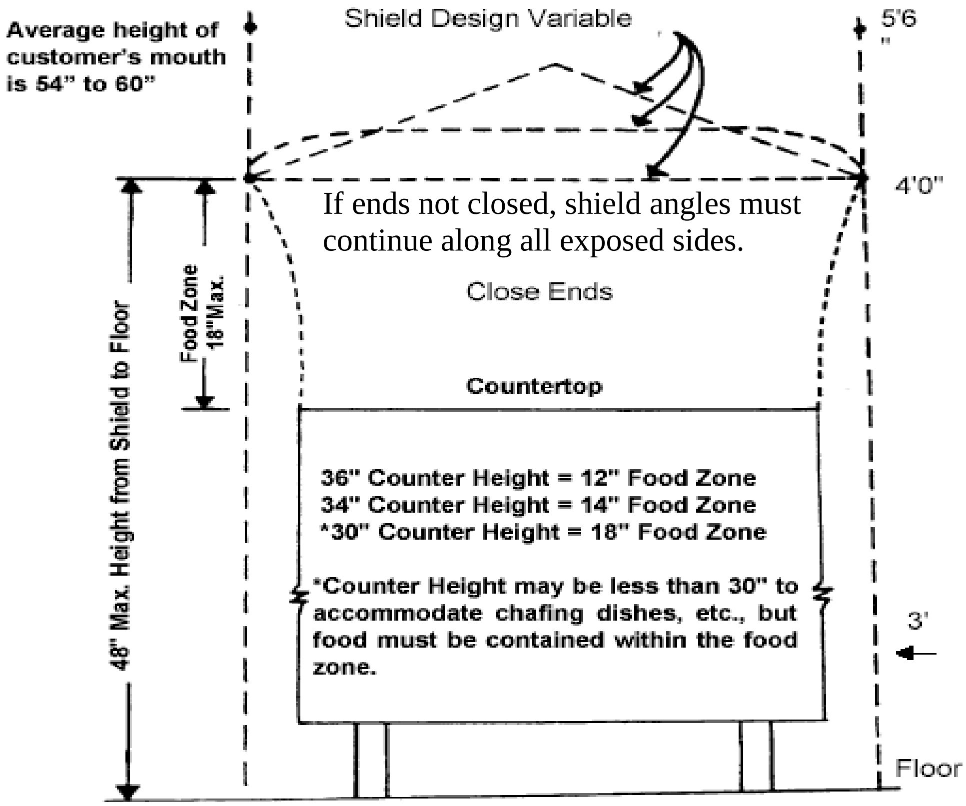
7. *Where one utensil is used to dispense several hot food items*, a hot water running dipping well may be provided for the in-use storage of this dispensing utensil. The hot water temperature supplied to this dipping well must be at least *135℉ (57.22℃).* One alternative method of hot food dispensing would be to provide a utensil for each hot food item. Another would be to place a stainless steel container filled with hot water at temperature of at least *135℉ (57.22℃)* or higher in hot holding equipment, cleaning and sanitizing the container and utensils at a rate when hot storage water and container has soil accumulation or not less than every twenty-four hours.

8. *Ice* shall be dispensed from approved dispensing equipment, such as combination Icemaker-dispenser machine, should ice be self-service. Open ice-chests or chest-type ice machines are prohibited for consumer self-service.

9. *Planners* must verify and provide documentation that custom designed and fabricated, self-service food display equipment conforms to standards as set by the American National Standards Institute (ANSI)-accredited certification programs.

10. *For examples of food shielding and of display equipment, see Illustrations E-1, E-2 and E-3.*

ILLUSTRATION E-1

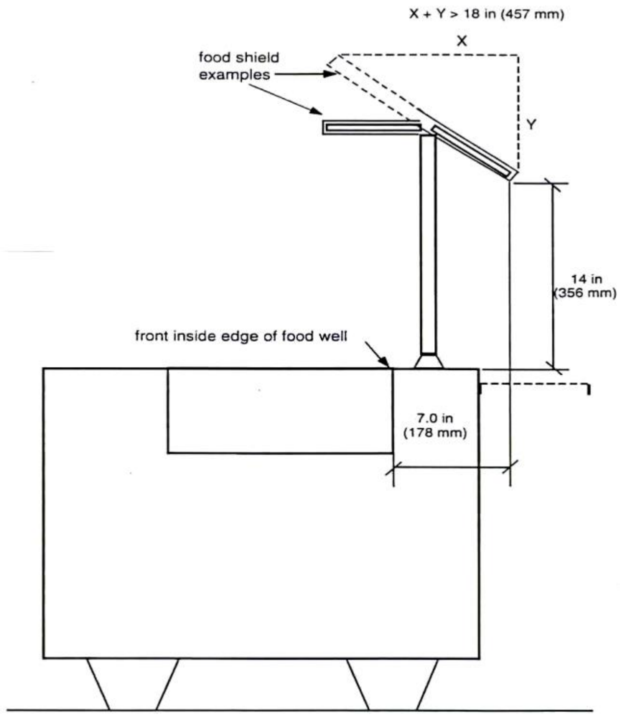


"End View"

Buffet or Smorgasbord Shielding

Note: Ends must be closed. Otherwise, units must be in line with other equipment to prevent access from unshielded sides.

ILLUSTRATION E-2



NSF/ANSI Standard 2

Buffet Food Shields

Measured from Counter Top

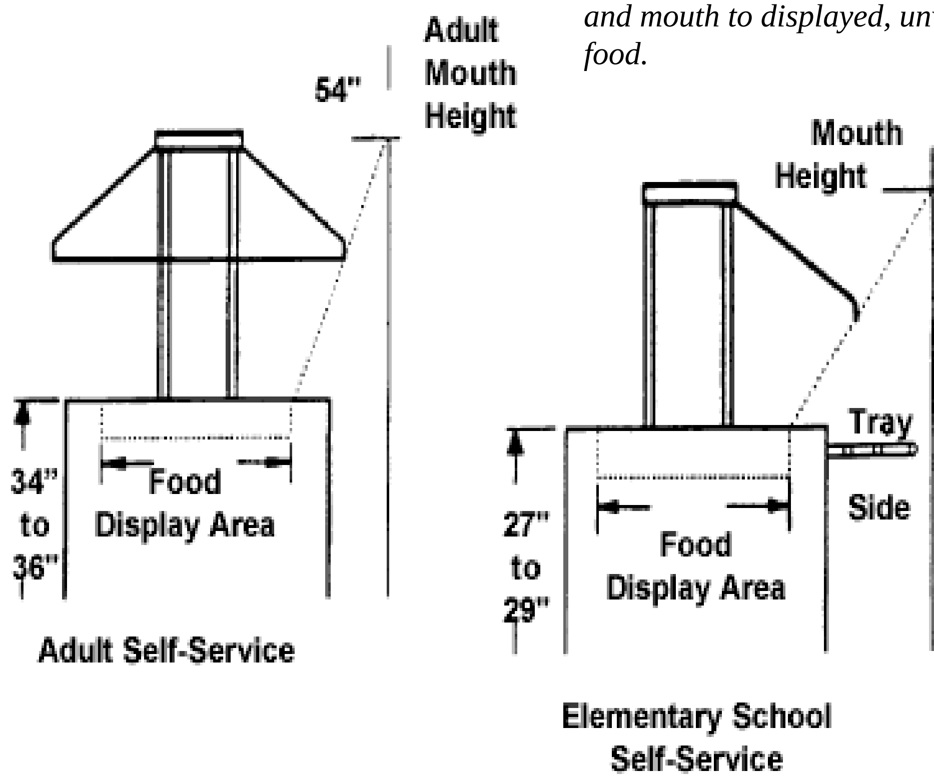
Standard 2[1], in part, requires:

"Food shields shall provide a barrier between the mouth of the customer and unpackaged food. The maximum vertical distance between a counter top and the bottom leading edge of a food shield shall be 14 in (350 mm). The bottom leading edge of the food shield shall extend a minimum horizontal distance of 7.0 in (175 mm) beyond the front inside edge of a food well. The sum of a food shield's protected horizontal plane (X) and its protected vertical plane (Y) shall equal a minimum of 18 in (450mm). Either X or Y may equal 0. Food shields shall be transparent and designed to minimize obstruction of the customer's view of the food. To protect against chipping, exposed edges of glass shall be protected by tight fitting channels, stripping materials, or other means such as rounding the edges of tempered glass."

[1] Source: Food & Dairy Division, Michigan Department of Agriculture P. O. 30017, Lansing, MI 48909, Food Establishment Plan Review Manual Revised August, 2004,

ILLUSTRATION E-3

Shield design must intercept a direct line between the consumer's nose and mouth to displayed, unwrapped food.



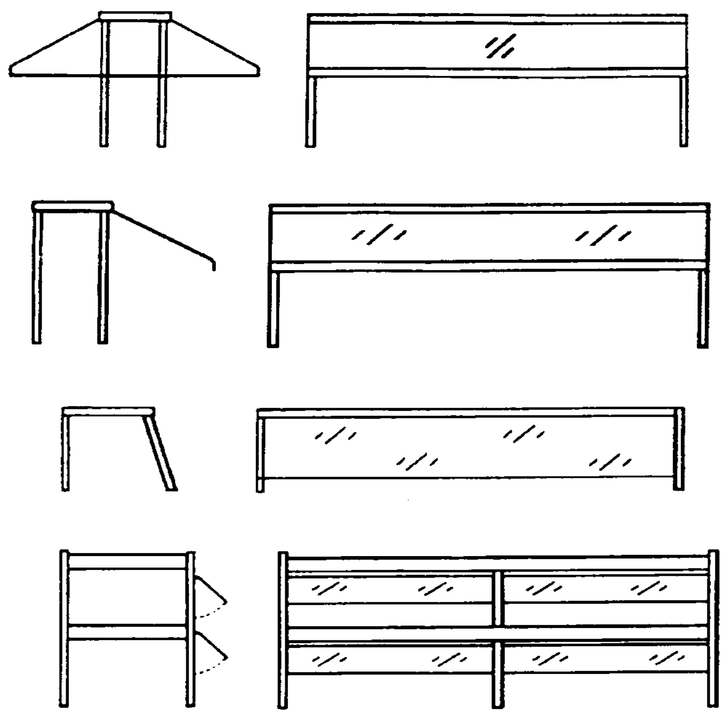
Note:

1. *If a single unit is being used for self-service, the ends of the unit must be closed to prevent consumer access to unprotected food. Otherwise, units must be in line with other equipment to prevent access from unshielded sides.*

2. *Measurements are taken from the floor.*

Buffet or Smorgasbord Shielding

ILLUSTRATION E-4



Note: If a single unit is being used for self-service, the ends of the unit must be closed to prevent consumer access to unprotected food. Otherwise, units must be in line with other equipment to prevent access from unshielded sides.

Buffet Food Shields

13. <u>Molluscan Shellfish Tank Life-Support Systems:</u>

A. Under the provisions found within *DPH Rule 511-6-1-.04(6) (j) 4* of the Chapter, food service establishment operators must submit a variance request and a HACCP plan to the Department of Public Health (DPH). Staff of DPH's Environmental Health Section and those of the local County Health Department, having jurisdiction will review the submitted HACCP plan for conformance to *DPH Rule 511-6-1-.02(5).* This subsection is intended to provide a set of guidelines for County Environmental Health Specialist (EHS) to review and verify HAACP plans for live holding tanks used to store molluscan shellfish for human consumption and to provide a basis for the commencement of their operation. These guidelines have been incorporated from various sources. These sources are the 2008 Draft FDA Food Service Plan Review Manual, the January 30, 2007 FDA Draft Handbook to Review and Verify HACCP Plans for Live Holding Tanks to Store Molluscan Shellfish Used for Human Consumption, and the 2009 version of the Georgia Department of Agriculture Guidelines for submittal of Plans and Specifications for Molluscan Shellfish Life Support Systems. *<u>(See Appendices C, D, and F in PART-II of this Manual for more information and examples of these systems.)</u>*

B. The scope of this subsection is to provide the necessary background information for the components of a HACCP plan, system design, sanitation monitoring, and good retail practices to handle molluscan shellfish safely for human consumption.

C. The use of live holding tanks can provide some possible advantages for Industry to display Molluscan shellfish. The advantages lead to enhanced sales which include increased shelf life, improved appearance, improved taste and eye appeal to the consumer. At the same time shellfish are filter feeders allowing concentration of pathogenic microorganisms that may be present in the water. Due to the number of shellfish and the limited volume of water used, live holding tanks may allow concentration of pathogenic viruses and bacteria.

D. Since many people eat shellfish either raw or lightly cooked, the potential for increased levels of pathogenic microorganisms in shellfish held in tanks is of concern. If shellfish stored in molluscan shellfish tanks are offered for consumption, certain safeguards must be in place as specified in a detailed HACCP plan as reviewed by both the State Environmental Health Office and the local Health Authority. Opportunities for contamination must be controlled or eliminated. Procedures must emphasize strict monitoring of water quality in the tank including the filtering and disinfection system.

E. If tanks are to be used to store and/or display Molluscan shellfish for human consumption, the operator must first submit a variance request to the Department and gain its approval. Second, the operator must operate and maintain the tank in accordance with a HACCP Plan that has been jointly reviewed by DPH Environmental Health Section and County Health Department staff. Once reviewed, State Environmental Health Section staff must deem such plans as meeting the requirements of Chapter 511-6-1.

F. Oysters, clams, mussels, and scallops are live and perishable products that must be adequately protected to remain safe, wholesome and attractive to the consumer. Federal, state and local shellfish and food codes usually are specific sanitary control and recordkeeping requirements that are to be applied to the shellfish by all harvesters, wholesalers and retailers. In brief, these requirements usually specify that shellfish are to be stored and handled so as not to become contaminated; storage equipment is to be properly designed, constructed, and cleaned; different lots are to be separate; and each lot of shellfish can be traced to the original shipper and harvest area of origin through shellfish tags and recordkeeping.

G. <u>Molluscan Shellfish Tanks Life-Support Systems</u> are to be evaluated by the Health Authority on a case-by-case basis. Written proposals for such a life-support system shall include the following data and be submitted by the person wishing to use molluscan shellfish tanks life-support systems for the display shellfish for human consumption:

a. <u>General Requirements</u>:

i. Plans and Specifications:

I. Plans and Specifications for molluscan shellfish display life-support tank systems must have affixed to them the professional seal of an engineer or architect licensed to practice in Georgia.

II. A schematic of the life-support system (s) showing the number and placement of the display tanks, plumbing, and placement of water treatment equipment into the system - (Water chiller, UV filter, and biological filters) used in the system.

(i) Any equipment construction, material specifications, and manufacturer’s specifications.
(ii) Systems must be designed and constructed to allow sufficient room to operate and clean the display systems.

b. Capacities of System:

   i. Estimated size of display tanks, water capacity to charge each system, filtration and water flow capacities of each system.

   ii. Manufacturer's product loading capacity and arrangement for each system to ensure product is not commingled and is properly identified.

   iii. The plumbing for each system to be installed must be clearly identified and color-coded.

   iv. The recommended manufacturer's temperature ranges for water used in the display tanks.

c. Source Water and Quality:

   i. Source of water to be used in display tanks and how it will be de-chlorinated.

   ii. Method of preparing the synthetic seawater for use in the display tanks.

d. HACCP Plan Requirements:

   i. *General Requirements*:

      I. HACCP plan must be submitted by the permit holder to the Health Authority for review with the plans for molluscan shellfish tanks life-support systems used for the display shellfish that are offered for human consumption. The owner must prepare such HACCP plan of which includes all relevant CCP's and in addition, he must ensure the Department and the County Health Department that he will operate and maintain the molluscan shellfish tanks and their associated life-support systems according with his submitted HACCP plan, once it has been deemed to be in compliance with Chapter 511-6-1 by both the Department and the County Health Department of jurisdiction.

      II. The HACCP plan must also include examples of the records the applicant or permit holder plans to use on a daily basis to monitor for water quality – (Salinity, Temperature, Turbidity, and UV disinfection) in each display tank installed.

III. The HACCP plan must ensure that water used with fish other than molluscan shellfish does not flow into the molluscan tank. Further, it must ensure that the safety and quality of the shellfish as they were received are not compromised by the use of the tank and the identity of the source of the shellstock is retained for ninety days after consumption.

IV. *See Appendix C for an example of a HACCP plan for a Molluscan Shellfish Life-Support System.*

ii. *Specific Requirements*: As per *DPH Rule 511-6-1-.02*, a HACCP Plan for a Molluscan Shellfish Life Support System must be compliant with DPH Rule *511-6-1-.02 (5) (a) through (e)* by containing the following information:

I. List of each species of molluscan shellfish to be held in the life support system.

II. A flow diagram:

(i) For each species and

(ii) Identifying the critical control points, critical limits and procedural methods used to address food safety issues of concern.

III. Training Plan for food employee and supervisory employees that addresses the food safety issues of concern.

IV. A statement of standard operating procedures for the plan under considerations including clearly identifying:

(i) Each Critical Control Point:

(1.) Receiving shellfish from approved source Interstate Commercial Shellfish (ii)Shippers List (or ICSSL)
(2.) Receiving shellfish temperature
(3.) Cooler Storage
(4.) Tank Storage – Water Temperature
(5.) Tank Storage – Water Quality

(ii) The critical limits for each critical control point:

(1.) Receiving – Shellfish identification (original tags or labels with a dealer from Interstate Commercial Shellfish Shippers List (or ICSSL), and preserving identification.
(2.) Receiving – Receiving temperature of shellfish 50°F (10.0°C) or below.
(3.) Cooler Storage – Cooler ambient air temperature 41°F (5°C) or below with no cross-contamination.
(4.) Tank Storage – Tank water temperature 41ºF (5ºC) or below.
(5.) Tank Water Quality – Approved Source (Public Water for artificial seawater) and
(6.) Total Coliform MPN. (Maximum loading = 0 MPN)

(iii) The method and frequency for monitoring and controlling each critical control point by the food employee designated by the Person in Charge.

(iv) The method and frequency for the Person in Charge to routinely verify that the food employee is following standard operating procedures and monitoring the critical control points.

(v) Actions to be taken by the Person in Charge if the critical limits for each critical control point are not met.

(vi) Records to be maintained by the Person in Charge to demonstrate that the HACCP Plan is properly operated and managed. *(Note: Sample temperature and thermometer calibration logs are available in Appendix-E located within PART-II of this Manual.)* Shellfish certification tags must be kept in chronological order for at least 90 days after the container is empty.

V. Additional scientific data or other information, as required by the Health Authority, supporting the determination that food safety is not compromised by the proposal.

VI. Example of the completed HACCP Plan and Flow Diagram of the Processing of the shellfish tank.
(Note: An example of a HACCP Plan can be found in Appendix C located in PART-II of this Manual).

VII. *A checklist to validate the contents of Molluscan Shellfish Life Support System HACCP Plan can be found in Appendix D located in PART-II of this Manual.*

e. Prerequisite Programs and Standard Operating Procedures:

i. *Live holding tanks have complex operation and maintenance requirements* which must be followed if a safe product is to be maintained. The manufacturer is required to provide an operating manual, maintenance instructions, and a maintenance log to the unit's owner/operator. These instructions must be present at the food service facility, available for use by staff responsible for maintenance of the unit and followed.

ii. *To ensure proper design, maintenance, and Chapter 511-6-1 requirements are met* or exceeded, the following operational instructions are provided:

I. Handling Molluscan Shellfish:

(i) Remove dead, cracked, weak molluscan shellfish ***DAILY***.

(ii) Rinse shellfish before adding to a tank. *(With approved artificial salt water to remove sand, debris, slime, etc.)*

(iii) ***NEVER*** hold molluscan shellfish (clams, oysters, mussels, scallops) in the same live holding tank with crustacean shellfish (lobsters, crabs, and shrimp).

(iv) ***NEVER*** commingle different lots of molluscan shellfish of the same species with different shipper's tags, harvest dates, or harvest areas.

(v) Different lots of molluscan shellfish can be displayed in the same live holding tank provided they are in separate containers to prevent commingling such as mesh bags and are identifiable so they can be traced back *to the harvest area through their shellfish tags.*

(vi) Do not commingle molluscan shellfish of different species in the same tanks.

(vii) Do not feed the shellfish.

(viii) If the tank was used previously for crustaceans or other species wash, rinse and sanitize the tank before using for molluscan shellfish.

(ix) Rotate the shellfish (old on the top).

(x) Maintain shipping tags and records *(90 days after the container is empty; chronological order, identifying the dates sold or served).*

(xi) Consumer self-service from shellfish tanks is prohibited - *(Consumers may inadvertently contaminate the tank and cause mixing or commingling of shellfish lots).*

II. System Design:

(i) Construction from food grade materials. Equipment and utensils must be durable non-absorbent, non-toxic and easily cleanable.

(ii) Easily accessible for cleaning and repair.

(iii) Adequate capacity.

(iv) No plumbing "dead legs" especially in drainage tubing which would not allow adequate disinfection.

(v) Influent line (if connected to water supply for initial filling) cannot be below overflow level of tank. (In case of backflow).

(vi) Containers, mesh bags, tank dividers must be kept safe and easily cleanable and nonabsorbent.

(vii) The tank must have an accurate in-system thermometer.

(viii) The tank must have an aeration unit.

(ix) *Filtration System must have*:

(I) Polyester filter pad or similar filter needed to prefilter large particles, solid waste out of the water.

(II) Activated carbon removes dissolved organics, color, odor, toxic gases from water.

(III) Biological filter (aerobic non-pathogenic bacteria adhering to granular media) break down animal waste, ammonia and help maintain pH balance. You must "seed" the filter with these beneficial bacteria when setting up the system and allow them to establish on the filter. *(Follow manufacturer's instructions)*

(x) Refrigeration Unit (Water Temperature at or below 41ºF (5ºC)

(xi) Refrigeration Unit (Water Temperature at or below 41ºF (5ºC) or less). Check the temperature twice daily.

(xii) No exchange of water from molluscan shellfish tank and tank used for any other species.

(xiii) System should contain an appropriate U.V. disinfection unit to kill bacteria and viruses as water circulates through U.V. light source.

III. System Operation:

(i) Manufacturer to provide retail operator with the following:

(I) An Operation Manual;

(II) Maintenance Instructions; and

(III) Maintenance Logs.

(ii) Establish tank load limits so filters and disinfection unit are not overloaded (check equipment manual).

(iii) A break-in adjustment period is necessary for the tank.

(iv) Commingling is prohibited: (CRITICAL)

(I) Between molluscan shellfish and crustacean shellfish;

(II) Between lots from different dealers;

(III) Between lots with different harvest dates;

(IV) Between lots with different harvest areas; and

(V) Between lots of different species.

(v) Cull out dead and dying shellfish before adding any to the tank. Cull on a daily basis as well. Dead shellfish will not close when the shell is tapped.

(vi) Rinse shellfish with approved artificial salt water before putting in the tank to remove sand, debris, slime, etc. to prevent clogging the filters. .

(vii) Rotate shellfish (of same lot) so newer are on the bottom and older are on the top.

(viii) Follow operating temperature requirements in the manual: 41ºF (5ºC) or less.

(ix) Defoamers must be food grade and specifically approved for use with food.

(x) Proper Salinity (food grade salimeter reading between 1,020 and 1,025ppt and Check Daily).

(xi) Turbidity or cloudiness (indicates need to change water). Conduct daily checks.

(xii) Weekly tank water change.

IV. Maintenance and Records:

(i) Designated Employee(s) who have received training in the use of the display tank, record keeping, and safety precautions.

(ii) Maintenance manual/checklist:

(I) Verify that the shellfish certification number is on the current (ICSSL) Dealer Certification number, for example: WA #### SP (Washington Shucker Packer), MA #### RS (Massachusetts Reshipper), LA #### SS (Louisiana Shellstock Shipper)

(II) Harvest Date

(III) Harvest Location

(IV) Type of Shellfish

(V) Quantity

(iii) Tags need to be kept for a minimum of 90 days after the container is empty. HACCP records should be kept for a minimum of one year.

(iv) Weekly cleaning/sanitizing of the tank (including spray nozzles, filtration unit, tank and water lines) according to tank manufacturer procedures using only food grade cleaning products. Chemicals may harm shellfish. Remove algae by wiping or scraping.

(v) Daily check to ensure UV light is functioning.

(vi) Daily check for salinity (salimeter should read between 1.020 and 1.025ppt).

(vii) Daily check for turbidity or cloudiness (indicates need to change water).

(viii) Every 6-8 weeks cleaning of the UV disinfection system.

(ix) Every 6-10 months change UV bulbs (Spare UV bulb to readily available). No more than 7500 hours of use. Follow manufacturer's recommendations.

(x) Activated carbon/filter pad replacement is recommended every 2 weeks in heavily used tanks.

f. <u>Prior to Health Authority Final Approval to Operate the System</u>:

i. <u>Reports for Submittal to the Health Authority</u> - Before a Molluscan Shellfish Life-Support System can be approved to be put into operation, the permit holder must submit the following validation study to the County Health Department:

I. A validation study conducted by certified testing laboratory that ensures each re-circulating system (s) installed will consistently produce water that tests negative for the coliform group under normal operating conditions. The water validation study should include the following at a minimum:

(i) One sample collected at 4-hour intervals after the installed system has reached equilibrium under normal recommended product loading for each re-circulating system. The samples should be collected for five consecutive days at the inlet to each display tank for each system that is installed with a biological filter or UV disinfection unit – (15 samples total).

(ii) One sample collected at the same corresponding 4-hour intervals for five consecutive days from the source water prior to biological filter or UV disinfection unit for each system installed with a biological filter or UV disinfection unit – (15 samples total).

(iii) The study must use NSSP recognized methods of analysis to determine coliform levels and report results in Fecal coliform MPN per 100 ml.

(iv) All samples of water collected from each display tank inlet for each system must be negative for the coliform group; and

(v) Be repeated if any sample of disinfected water during the study is positive for the coliform group.

g. Shellstock Identification:

i. Shellstock may not be removed from the original container other than immediately before sale or preparation for service (*unless the source on display is properly identified & recorded*). Tags remain attached until the container is emptied, then retain tags for 90 days in chronological order from the date of harvest. The harvester and/or each dealer affix identification tags/labels. Containers may carry harvester & dealer tags. If both tags are present, the dealers tag is not required to carry harvest information.

ii. A consumer advisory must be provided to consumers at the point of ordering shellfish that will be served raw or undercooked.

iii. The Interstate Certified Shellfish Shippers List (ICSSL) can be found at www.cfsan.fda.gov/~ear/shellfis.html .

SECTION F - HANDWASHING FACILITY[1]

REFERENCES (Chapter 511-6-1)

.03 Management and Personnel:
(5) Personal Cleanliness (b) Cleaning Procedure (c) When to Wash (d) Where to Wash

.06 Sanitary Facilities and Controls:
(2) Plumbing System (c) Handwashing Sink Installation (g) Handwashing Sinks, Number and Capacities (l) Handwashing Sinks, Location and Placement (o) Using a Handwashing Sink

.07 Physical Facilities:
(3) Number and Capacities (c) Handwashing Aids and Devices, Use Restrictions (d) Handwashing Signage

I. The Importance of Handwashing Sinks:

1. *Handwashing is a critical factor to prevent contamination of foods and spread of foodborne illness.* Proper handwashing reduces the amount of pathogens that can be transmitted via cross contamination from raw foods to ready-to-eat foods. *Many employees fail to wash their hands as often as necessary due to the lack of conveniently located handwashing sinks.* It is important that handwashing be done only at properly equipped handwashing sinks to help ensure that employees effectively clean their hands and minimize contamination of food and food contact surfaces.

II. Location of Handwashing Sinks:

1. A *handwashing facility consisting of a handwashing sink, hand drying device or disposable towels, hand cleanser, waste receptacle, and an employee hand washing sign* shall be located for convenient use by employees who work in food preparation, food dispensing, and warewashing areas. Nothing must block the approach to a handwashing sink. <u>*See Illustrations F-1, F-2, F-3, F-4, and F-5 in this Section for examples of proper handwashing sink setup with employee handwashing sign. Appendix-Q in Part-II of this Manual provides an example of a handwashing sign to be posted at each handwashing sink.*</u>

[1] Reference: 2008 FDA Plan Review for Food Establishments Guidance Document and Plan Review Training Course #207

2. *Handwashing sinks shall be of sufficient number and conveniently located* to foster their use by all employees in food preparation, food dispensing, and warewashing areas. Handwashing sinks shall be easily accessible and may not be used for purposes other than handwashing.

3. *As a rule-of-thumb*, a hand-washing sink is considered 'conveniently located' if it is located within 25 feet of the food preparation, food dispensing and warewashing areas or closer based on facility design. Sinks used for food preparation and washing equipment or utensils shall not be used for handwashing.

III. **<u>Operation and Water Temperature for Handwashing sinks</u>:**

1. *Each handwashing sink shall be provided with hot and cold water tempered* by means of a mixing valve or a combination faucet to provide water at a temperature of at least 100˚F. If used, self-closing, slow-closing or metering faucets shall be designed to provide a flow of water for at least 15 seconds without the need to reactivate the faucet. If approved, an automatic handwashing facility capable of removing the types of soils encountered form grease, food waste etc., may be substituted for handwashing sinks in a food service establishment that has at least one handwashing sink – *see examples in Illustration F-9.*

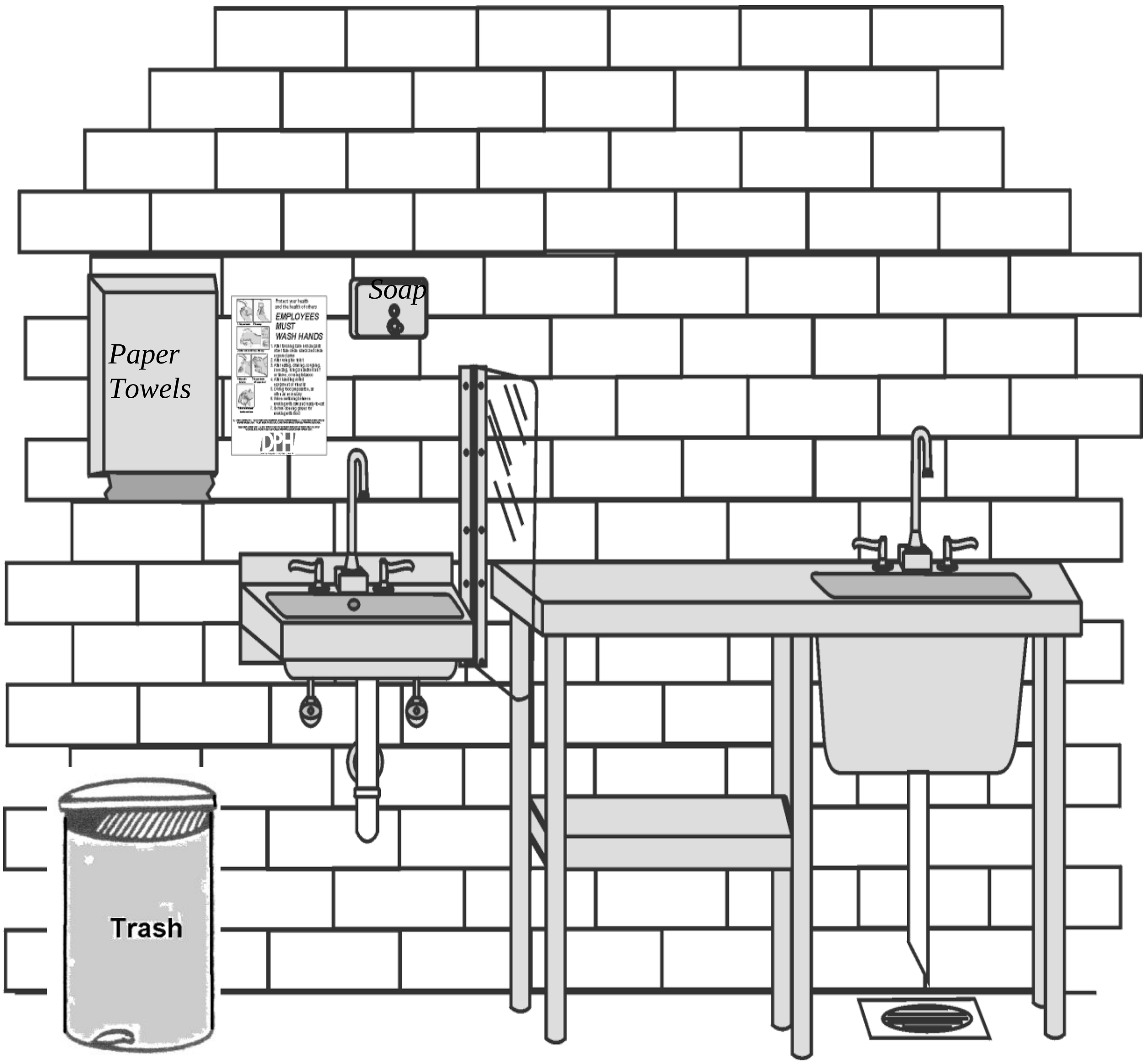
IV. **<u>Prevention of Contamination of Food-Contact Surfaces from Handwashing</u>:**

1. *Water splashed from the use of a handwashing sink must not contaminate food, food contact surfaces, clean equipment or utensils.* A washable baffle or barrier may be needed if the handwashing sink is located next to a food-preparation sink, food preparation table or counter. Spacing between handwashing sinks and food, food preparation, food contact surfaces, and clean utensils must provide adequate protection against cross-contamination. *See Illustration F-1 and F-5* for examples of shielded handwashing sinks.

2. *The location of soap and paper towel dispensers* must also not allow for contamination of food and food contact surfaces during use. In addition, the handwashing sink shall be placed so that an employee can reach the faucet handles, soap and paper towel dispensers without reaching across dirty surfaces during process.

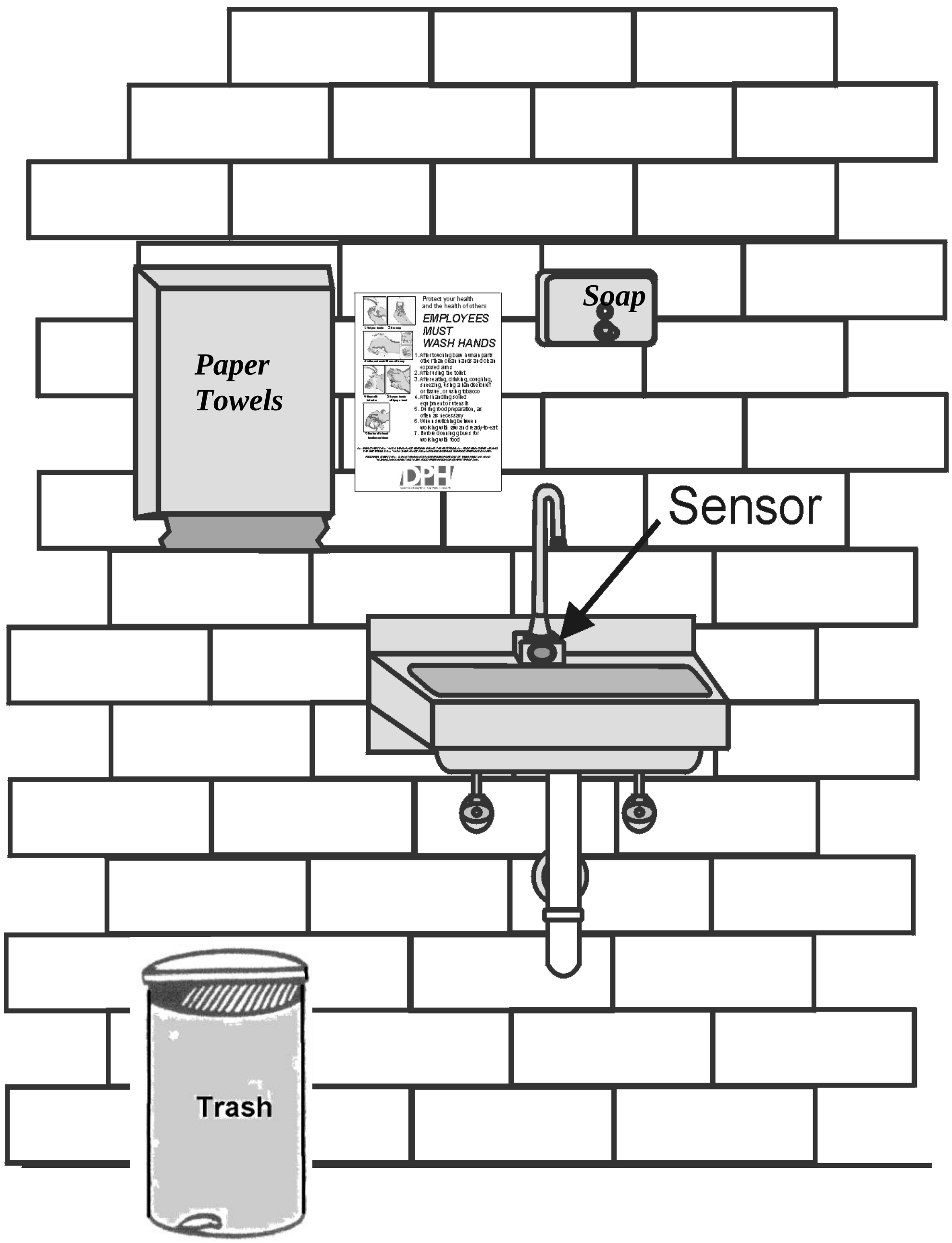
3. *See Illustrations F-6, F-7, and F-8* for examples of unsatisfactory hand washing stations.

ILLUSTRATION F-1



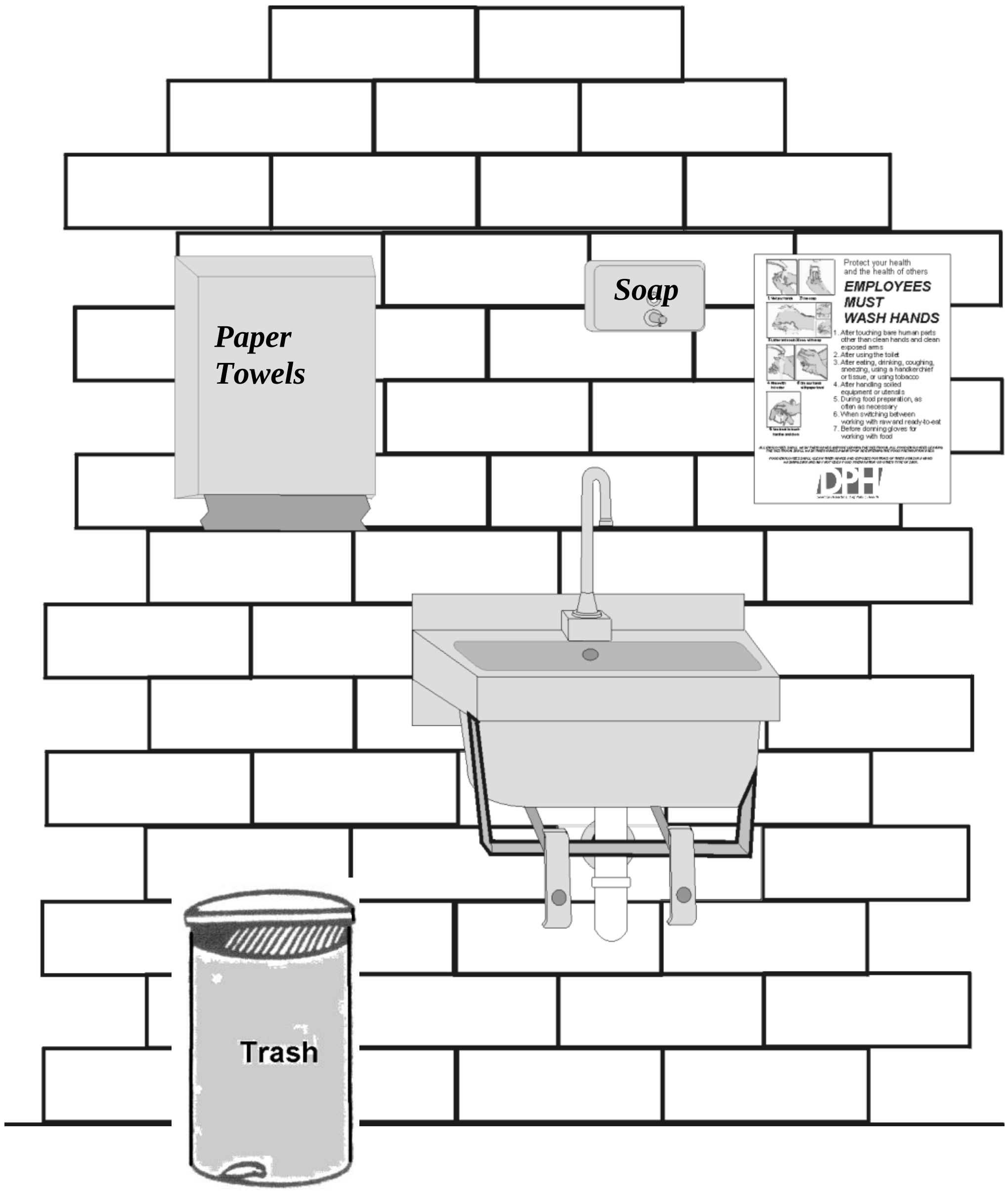
Handwashing Sink with appropriate splashguard

ILLUSTRATION F-2



Handwashing Sink with infrared sensor for water activation.

ILLUSTRATION F-3



Handwashing Sink with knee pedestals for water activation

ILLUSTRATION F-4

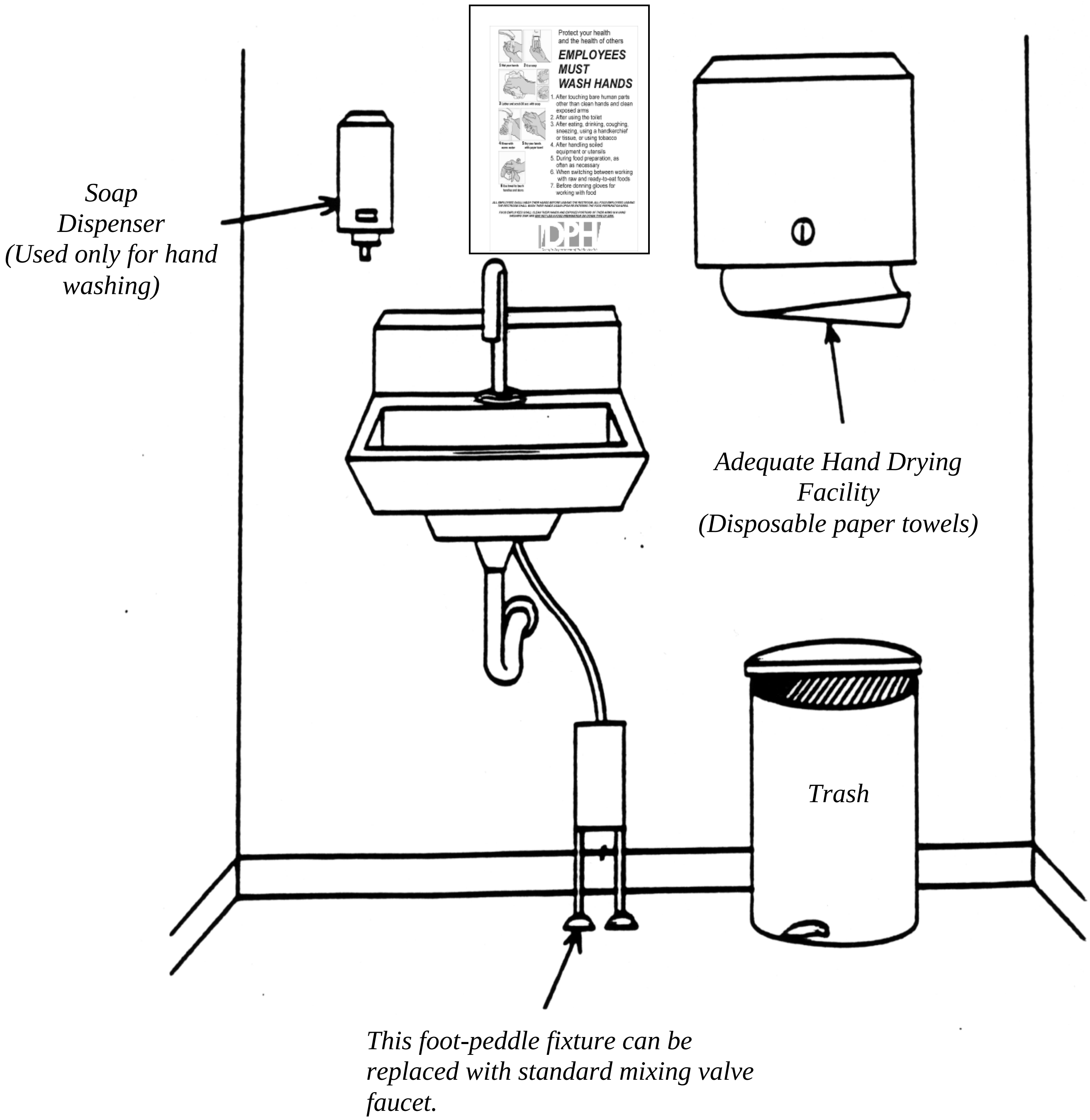
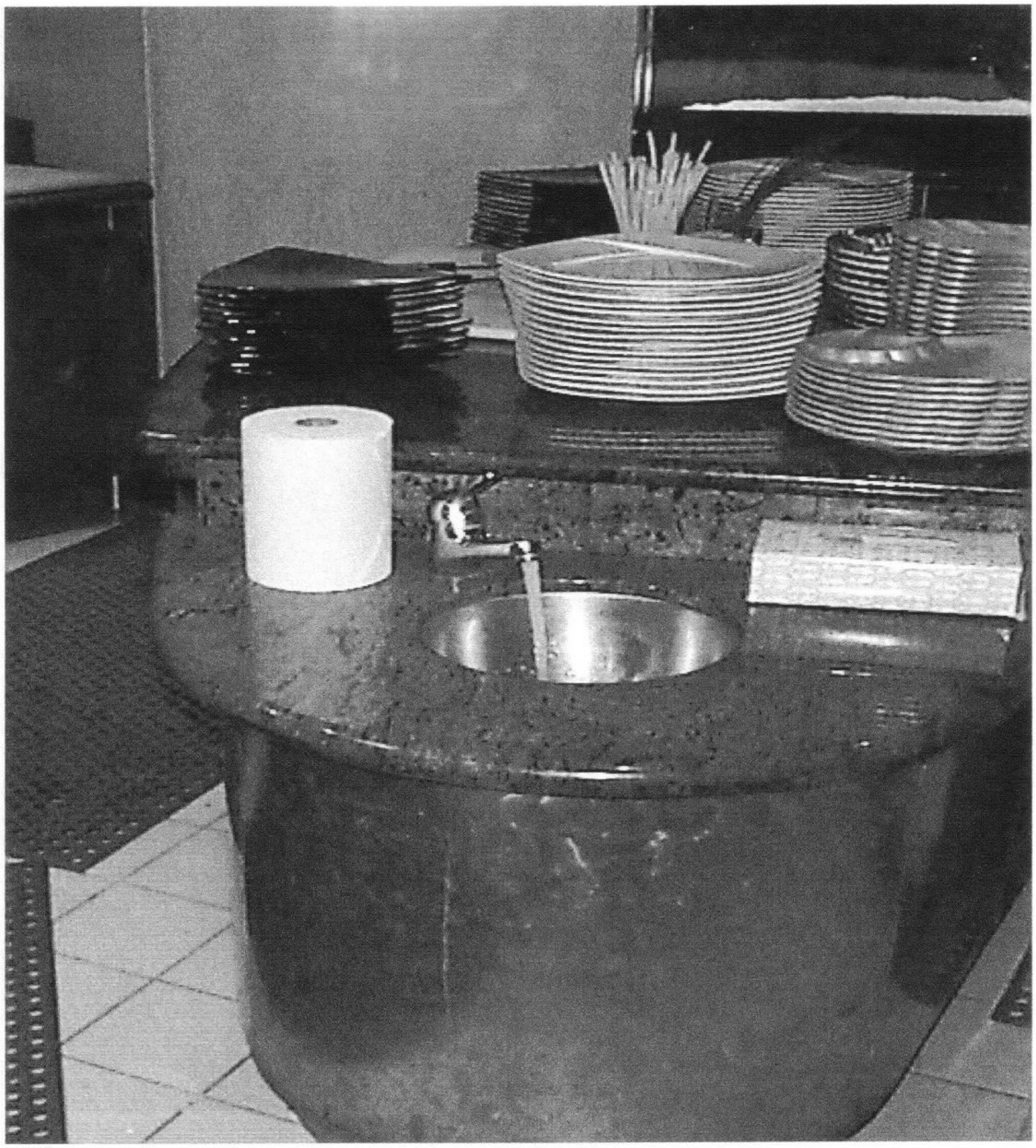


ILLUSTRATION F-5

The above picture is an example of the adaptation of shielding to prevent splash from handwashing getting onto work surfaces.

ILLUSTRATION F-6



<u>Improper Handwashing Set-up</u>: Soap is missing. There is no protection from splash, such as shielding, for the clean plates and disposable gloves located at this handwashing sink.

ILLUSTRATION F-7

Improper use of a Utility Sink as a Handwashing Station

ILLUSTRATION F-8

Camouflaged Handwashing Station located in the Food Preparation Area.
The sink is not noticeable due to other equipment and other work stations.

ILLUSTRATION F-9[2]

The above are examples of Automatic Handwashing Sinks. Just as would conventional handwashing sinks, their installation would be permanently mounted meeting plumbing code. In addition, at least one conventional handwashing sink would need to be installed.

[2] Picture Source: FDA Food Establishment Plan Review Course #207 December, 2008 and Meritech ,Inc., 600 Corporate Circle, Suite H, Golden, Colorado 80401

SECTION G - WATER SUPPLY AND SEWAGE DISPOSAL

REFERENCES

Rules and Regulations Food Service - Chapter 511-6-1 :

.01 Definitions. Amended. (ii) Drinking Water
.01 Definitions. Amended. (wwwww) Sewage
.01 Definitions. Amended. (uuuu) Plumbing fixture
.01 Definitions. Amended. (vvvv) Plumbing systems
.06 Sanitary Facilities and Controls. Amended. (1)Water (a) Approved System
.06 Sanitary Facilities and Controls. Amended. (1)Water (g) 1
.06 Sanitary Facilities and Controls. Amended. (1)Water (h)
.06 Sanitary Facilities and Controls. Amended. (4) Sewage, other liquid Waste… (b)(e)(h)
.10 Compliance Procedures. Amended. (2) Inspections. (i) and (p)

Memorandum of Understanding Non-Public Water Supplies

Rules of the Georgia Department of Public Health Chapter 511-3-1

I. General Requirements:

1. *Until an approved water supply and sewage disposal system can be confirmed as adequate and acceptable to meet the needs of the proposed food service establishment*, the Health Authority ***cannot*** approve food service plans and specifications for construction. Where a non-public water supply and/or an on-site sewage disposal system are utilized, the location of these facilities shall be noted on the plans and certified that the design and installation of these facilities shall be incompliance with applicable state and local regulations or codes. Further, the food service establishment plans and specifications ***cannot*** be approved by the Health Authority unless the following are found to be true prior to such approval:

   A. Water Supply Approved:

      a. *If a public water supply is to be utilized as a potable water supply system*, the applicant must provide documentation from the local Water Authority that a public water supply system is available for connection to the proposed food service establishment in the right-of-way or an accessible easement abutting its premises; or

      b. *In the case of a well being utilized as a potable water supply system*, such non-public water supply system has to be reviewed and approved by the Health Authority.

B. Sewage Disposal Approved:

a. *If a public sewer system is to be utilized for sewage disposal*, then the authority having jurisdiction must provide documentation that such a public sewer system is accessible for connection to the proposed food service establishment; or

b. *If an on-site sewage management system (OSSMS) is to be utilized for sewage disposal,* the County Health Department having jurisdiction must issue an OSSMS installation permit. Such permits must be issued as per the most current version of the *Georgia Department of Public Health's Rules and Regulations for Onsite Sewage Management Systems Chapter 511-3-1* .

II. Water Supply:

1. General Requirements:

A. As prescribed by this manual, enough potable water for the needs of the food service establishment shall be provided from a source constructed and operated according to applicable State or local codes as amended.

B. *Potable water from a municipal (or public) water supply* is appropriate for the needs of a food service establishment; however, for non-public water supplies quality and quantity must be determined and demonstrated through calculations and design of the water system submitted for the health department's review.

2. Non-Public Water Supply (or NPWS):

A. History:

a. The Georgia Rules and Regulations Food Service Chapter 511-6-1 defines "Potable", as being "Water intended for human consumption that meets the bacteriological and chemical requirements of the federal EPS's Safe Drinking Water Act, or other regulatory agency having equivalent authority." These Rules and Regulations require a potable water supply but do not require the water supply to be permitted by EPD. The State of Georgia's Department of Natural Resources' Environmental Protection Division (EPD) has authority over all Public Water Systems (PWS) and some other aspects of water management in the State of Georgia. EPD agrees that DHR/EPH/County Boards of Health should regulate water supply systems serving food service establishments, tourist accommodations, and public swimming pools that EPD determines are NPWS.

b. There are instances where the water supply that serves food service establishments does not meet the definition of a public water system. Therefore, a procedure was created whereby the County Boards of Health and the DHR

Division of Public Health (PH) can assure that food service establishments have a source of potable water that meets applicable codes. This procedure comprises a Memorandum of Understanding (MOU) between the DHR Division of Public Health and the DNR Environmental Protection Division. *See Appendix J for a copy of the DHR/DNR Memorandum of Understanding. Please note that this Memorandum of Understanding is still in effect with the Georgia Department of Public Health (DPH).*

B. Guidelines and Procedures:

a. *The EPD district office,* serving the area of the State in which the local county health department regulating the proposed or existing food service establishment is located, will be the only office that will determine if the system in question is to be a "Non-Community Water Supply". If it does meet this determination, then the system will be regulated by EPD. EPD will inform the applicant in writing of its decision to regulate. *The applicant must ensure* that the local county environmental health office is supplied with a copy of the letter from EPD stating its intent to regulate the applicant's water supply system.

b. Should the EPD district office, having jurisdiction, determines that the system in question is non-public and then, the system will be regulated by DCH's Division of Public Health (DPH) represented by the local county health department having jurisdiction over the non-public water system. EPD will inform the applicant in writing that they do not require a permit for a PWS and that the applicant must conform to the applicable requirements of DPH for their water system. *The applicant must insure* that the local county environmental health office is supplied with a copy of the written EPD decision not to regulate his or her water supply system.

c. The following is the Division of Pubic Health's (DPH) and the local county health department's procedures in assuring potable water sources at food service establishments in Georgia:

I. The local county health department will ascertain whether an existing or proposed food service establishment is served by a PWS permitted by EPD.

(i) If a proposed water system or an existing water system is not permitted by EPD, the local county health department will refer the owner of the facility to the EPD district office having jurisdiction for proper permit evaluation. *(See Appendix-P to view EPD district map and office contact information.)*

(ii) If EPD determines that the water system serving the existing or proposed food service establishment is a PWS, then the water system will be required to meet EPD regulations and a letter will be sent to the county health department to notify them of the water supply's status.

(iii) If EPD determines that the water system serving the existing or proposed food service establishment is a non-public water system, the local county health department will be copied on a letter to the owner /applicant of the establishment notifying him that the water system is a non-public water system. Because of this determination by EPD, the owner/applicant must conform to the applicable DPH regulation for non-public water systems.

C. Local Health Department Review Process for a Non-Public Water Supply:

a. The following documentation and/or information must be submitted to the local health department for review:

b. A letter from the EPD office having jurisdiction stating that the existing or proposed water system is not a public water system.

c. A map showing the geographical location of the project, the location of the governmentally owned and operated public water system closest to the project site, and a layout of the proposed or existing facilities showing the location of the well(s), storage tank(s), water treatment facilities, etc., as applicable must be included. *Connection shall be made to a public water system when such system becomes available within two hundred (200) feet of the property line through a public access easement.*

d. If the owner of the water system is other than the owner of the establishment, *the owner must submit a business plan, contract, or trust agreement, which adequately addresses the source and amount of water provided.*

e. For new facilities, a drilled well meeting the construction requirements established under the most current Well Water Standards Act of 1985 is required. Engineering plans and specifications for the proposed water supply system, prepared by a professional engineer licensed to practice in the State of Georgia, should be required for review and approval.

f. *For new facilities*, a Well Data Sheet for each source, completed and signed by a water well contractor licensed to construct wells in the State of Georgia must be submitted for review.

g. Each *new water system must be metered at the facility*.

h. *For existing establishments*, a visual environmental sanitary survey of the existing well's physical construction must be made by a water well contractor, licensed in the State of Georgia, or county Environmental Health Specialist to evaluate the well protection and nearby potential contamination sources. This evaluation shall include the visual verification of the existence of proper wellhead protection from surface contamination. *See Illustration M-1 and Illustration M-2 in Appendix M for examples of protected wellhead.*

i. *A chemical "screening" (UGA Cooperative Extension Test W-33)* of the untreated water from each water source (well) must be performed for the following parameters by an approved water laboratory and a copy of the results must be provided to the local health department for review prior to approval of food service plans and specifications. *Chemicals to be tested for are in Table G-1. See Appendix N for MOU Interpretation for Non-Public Water Supplies, UGA Cooperative Extension Test W-33 and DHR Biological Testing Memorandum.*

TABLE G-1

Aluminum	pH	Zinc	Nitrate (as N)	Turbidity (NTU's)	Phosphorus
Boron	Alkalinity Potassium	Chloride	Nitrite (as N)	Manganese	
Copper	Hardness	Cadmium	Total Nitrate & Nitrate (as N)	Color (color units)	Calcium
Sodium	Carbon dioxide	Iron	Total Dissolved Solids	Sulfate	
Chromium	Nickel	Molybdenum	Soluble Salts		

j. *Microbial sampling from each source* must be collected and submitted to a state certified water laboratory for microbiological analyses (total and fecal coliforms). *A copy of this report must be included with food service plans and specification to the local health department for review*.

k. *Failure to meet physical, chemical or microbial potable water standards* will result in disapproval of the water supply for use in food service establishments.

D. Adequacy of Water Supply (Well or Non-Public Water System) to meet the Water Usage Demand of the Food Establishment:

a. *A projected water usage demand report for the food establishment, prepared by a professional engineer licensed to practice in the State of Georgia, shall be required for review and approval*. This water usage demand report will fully disclose and justify the methodology and calculations by which the peak water usage demand for the food establishment was determined by the engineer. Further, the water production capacity of the well, in gallons per minute, as indicated by its Well Data Sheet furnished by a water well contractor licensed to construct wells in the State of Georgia, *must be compatible with the peak water usage demand of the food service establishment*.

b. There are various ways to project the water demand or water usage of a food service establishment. One way is to determine the water usage of a similarly operated establishment, i.e. similar type menu, similar equipment and layout, similar method of operation, similar seating capacity, similar number of employees, similar square footage, etc.. The other is to *calculate water usage based on the demand of each fixture both instantaneous and total daily deman*d. To verify with reasonable assurance the adequacy of the projected establishment's water usage demand, i.e. determine the volume of water needed per equipment manufacturer specifications, menu and method of operation for a day of operation and the peak sum of all fixtures operating at one time. A sufficient water distribution system must meet minimum pressure requirements and have production to meet supply. Any deficiencies must be addressed in the design showing improvements to the distribution system such as pump performance, storage capacity, and treatment modifications.

E. *For more information on utilizing wells to supply potable water to food service establishments*, go to the Division of Public Health's website located at www.georgiaeh.us and click onto the Well Water link.

3. *All liquid waste containing animal or vegetable matter in suspension or solution and that may include liquids containing chemicals in solution (also known as "sewage")* shall be disposed of by a public sewage system or by a sewage disposal system constructed and operated according to applicable State or local codes as amended.

4. *Garbage grinders*, when used, shall be installed and maintained according to applicable State and local plumbing laws and codes. The applicant must also indicate which laws and codes apply to such installation on the plans to be reviewed by the Health Authority.

5. *Condensate drainage and other nonsewage liquids and rainwater* shall be drained from point of discharge to disposal according to applicable code. The applicant must also indicate which laws and codes apply to such installation on plans to be reviewed by the Health Authority.

IV. Grease Traps:

1. *For applications where an on-site sewage management system is utilized for sewage* disposal, properly sized grease traps shall be installed. *See Georgia Department of Public Health's Manual for on-site sewage management systems entitled, "Manual for On-site Sewage Management Systems", Sections D-21, D-22 and D-23; and Illustration DF-6, DF-7, DF-8 and DF-9". See Appendix-O, Grease Traps Illustrations O-1,O-2, O-3, and O-4 or go to the Georgia Department of Public Health's environmental health's website located at www.georgiaeh.us and click onto the http://health.state.ga.us/programs/envservices/onsitemanual.asp*

2. *Sewage disposal utilizing an approved public sewer system* will be the local municipality or county jurisdiction and grease traps design will be under their regulatory authority. Local plumbing codes shall have jurisdiction over under-the-sink or in floor type grease traps. *See Grease Traps in Appendix-O for an example of under-the-sink type grease trap.*

3. *Automatic grease removal units* must comply with State and or local plumbing codes.

4. The following typical food equipment *should discharge into a grease trap*:

   A. Pot sinks or manual equipment and utensil washing sinks.
   B. Water-washing, cooking exhaust hoods.
   C. Wok stoves with in line food waste sink that strains food debris.
   D. Large stationary kettles with pour off spouts.
   E. Chemical dishwashers, not hot water dishwashers.
   F. Food preparation sinks such as meat sinks, thawing sinks, cook sinks, and vegetable sinks.

5. The following typical food equipment *should not be discharged into a grease trap*:

   A. Hot water sanitizing dishwashers.
   B. Garbage grinders.
   C. Mop Sinks (Unless they are being used for grease operation, i.e. washing cooking exhaust hood filters)

SECTION H - FOOD EQUIPMENT AND INSTALLATION

REFERNCES (Chapter 511-6-1)

.05 Equipment and Utensils:
- **(1) Materials.**
- **(2) Design and Construction. (v) Molluscan Shellfish Life-Support. (jj) Food Service Equipment, Acceptability.**
- **(4) Location and Installation (b) Fixed Equipment, Spacing, or Sealing.**
- **(5) Acceptability of Existing Equipment.**

I. General:

1. *All equipment* (*see definition in DPH Rule 511-6-1-.01)* in food service establishments must comply with the design and construction standards contained in *DPH Rule 511-6-1-.05 (1) and (2)*. Equipment *certified or classified* for sanitation by an *American National Standards Institute (ANSI)-accredited program* is deemed to comply with *DPH Rule 511-6-1-.05 (1) and (2).* However, for equipment that is not certified or classified for sanitation by ANSI-accredited programs, documentation from the equipment manufacturer must provide evidence that such equipment was designed and built according to standards set by the ANSI-accredited certification programs.

2. The following equipment installation rules and recommendations will help ensure proper spacing and sealing allowing for adequate and easy cleaning:

II. Floor Mounted Equipment:

1. *Whenever possible*, equipment should be mounted on approved lockable casters or wheels to facilitate easy moving, cleaning, and flexibility of operation. Moveable equipment requiring utility services, such as gas or electrical connections, should be provided with easily accessible, quick-disconnects or the utility service lines should be flexible and of sufficient length to permit moving the equipment for cleaning. If a flexible utility line is used, a safety chain that is shorter than the utility line must be installed. Check with local fire safety and building codes to ensure that such installations are acceptable. *See Illustrations H-1 and H-3*.

2. Floor-mounted equipment that is not mounted on wheels or casters with the above utility connections should be:

   A. *Permanently sealed to the floor* around the entire perimeter of the equipment. The sealing compound should be pliable and non-shrinking. It should retain its elasticity and provide a water- and-vermin-tight joint; or

B. *Installed on a solid, smooth, non-absorbent masonry base*. Masonry bases and curbs should have a minimum height of 2" and be coved at the junction of the platform and the floor with at least a 1/4" radius. The equipment should overhang the base by at least 1" but not more than 4". Spaces between the masonry base and the equipment must be sealed as prescribed in 2A above; or

C. *Elevated on legs to provide at least a 6" clearance between the floor and equipment*. The legs shall contain no hollow open ends. *See Illustration H-2*.

D. *For equipment not readily moveable by one person*, spacing between and behind equipment must be sufficient to permit cleaning under and around the unit. Equipment shall be spaced to allow access for cleaning along the sides, behind and above. At least 6" of clear, unobstructed space under each piece of equipment must be provided or equipment must be sealed to the floor. *See Illustration H-4*.

E. *If equipment is against a wall and is not movable*, the equipment must be joined to and/or sealed to the wall in a manner to prevent liquid waste, dust and debris from collecting between the wall and the equipment.

F. *When equipment is joined together, or spreader plates are used between equipment*, the resultant joint must be sealed to prevent liquid waste, dust and debris from collecting between the equipment.

3. *Unobstructed and functional aisle and working spaces must be provided*. A minimum width of 36" should be provided or as required by fire and building codes. More functional aisle and working space may be necessary pending offset dimensions of equipment, such as door-swing of ovens and refrigerators, etc.

4. *All utility and service lines and openings through the floor and walls must be adequately sealed*. Penetrations through walls and floors must be minimized. Exposed vertical and horizontal pipes and lines must be kept to a minimum. The installation of exposed horizontal utility lines and pipes on the floor is prohibited. Any insulation materials used on utility pipes or lines in the food preparation or dishwashing areas must be smooth, non-absorbent, and easy to clean. Electrical units which are installed in areas subject to splash from necessary cleaning operations or food preparation should be watertight and washable.

III. Counter-Mounted Equipment:

1. *Counter-mounted equipment is defined as equipment that is not portable and is designed to be mounted off the floor on a table, counter, or shelf*. All counter-mounted equipment shall be:

A. *Sealed to the table or counter*; or

B. *Elevated on approved legs* to provide at least a 4" clearance between the table or counter and the equipment to facilitate cleaning, or

C. *Elevated 3 inches* if the horizontal distance of the table top under the equipment is no more than 20 inches from the point of access for cleaning, or

D. *Elevated 2 inches* if the horizontal distance of tabletop under the equipment is no more than 3 inches for the point of access for cleaning.

IV. Other:

1. *Equipment that is open underneath*, such as drain boards, dish tables, and other tables that are not moveable should be spaced to allow for ease of cleaning or should be sealed to the wall.

2. *Non-food contact surfaces of equipment* that are exposed to splash, spillage, or other food soiling or that require frequent cleaning shall be constructed of corrosion-resistant, non-absorbent, and smooth material.

3. *Legs of all equipment* should not have hollow, open ends.

4. *If running water dipper wells are installed*, methods for filling and draining the units must be identified.

5. *Equipment including icemakers and ice storage equipment* shall not be located under exposed or unprotected sewer lines, open stairwells or other sources of contamination.

V. Food-Contact Surface Limitations:

1. *Galvanized Metal*: May not be used in contact with acidic food.

2. *Cast Iron*: May be used as a cooking surface or serving utensils only as part of an uninterrupted process from cooking through service.

3. *Copper and Copper Alloys (Brass):* May not be used for foods with a pH < 6.0 such as vinegar, fruit juice, wine, etc., {except for the prefermentation & fermentation steps of a beer brewing operation} or for a water supply line between a soda carbonator & backflow preventer.

4. *Wood*: Wood & wood wicker may not be used as a food-contact surface.
   Except:

   A. *Hard maple or equivalently hard, close-grained wood* may be used for cutting boards & blocks, bakers' tables, and utensils such as rolling pins, doughnut dowels, salad bowls & chopsticks;

B. *Wooden paddles* for pressure scraping kettles in confectionery operations with products reaching at least 230ºF (110ºC).

C. *Whole uncut raw fruit & vegetables*, and unshelled nuts may be kept in the original wooden shipping container.

D. *Whole, uncut, raw foods* requiring the removal of rinds, peels, husks, or shells may be kept in untreated wood containers or treated wood as specified in *21 CFR 178.3800 Preservatives for Wood.*

5. *Nonstick Coatings*: Cooking surfaces that have a perfluorocarbon resin coating shall be used with non-scoring or non-scratching cleaning aids.

6. *Sponges:* May not be used in contact with cleaned & sanitized or in-use food contact surfaces.

7. *Lead Limitations: See Table H-1*:

TABLE H-1
Lead Use Limitations

UTENSIL Category	**Ceramic Article Description**	**Maximum Lead MG/L**
Beverage Mugs, Cups, Pitchers	Coffee Mugs	0.5
Large Hollowware (excluding pitchers)	Bowls $\geq$ 1.1 Liter (1.16 Quart)	1
Small Hollowware (excluding cups & mugs)	Bowls < 1.1 Liter (1.16 Quart)	2.0
Flat TABLEWARE	Plates, Saucers	3.0

Note: The food service permit applicant must include specifications indicating lead content from manufacturers of Ceramic, China, Crystal, Pewter and Solder & Flux used as food contact surfaces of equipment within plans and specifications for review by the Health Authority.

8. **Temperature Measuring Devices – TMD's**:

A. *General Requirements*:

a. Designed to be easily readable.

b. Food TMD's shall be provided & readily accessible for ensuring attainment & maintenance of food temperatures.

c. Food TMD's may not have sensors or stems constructed of glass, *except stems encased in a shatterproof coating such as candy thermometers may be used.*

d. *Mechanically refrigerated or hot food storage units:* equipped with at least one integral or permanently affixed, easily viewed TMD with sensors or a simulated product temperature shall be located in the warmest part of the refrigeration unit and in the coolest part of a hot storage unit. Except where a TMD is not practical for measuring ambient air surrounding the food, such as heat lamps, cold plates, steam tables, salad bars and insulated food transport containers.

e. *Warewashing machine TMD's* to indicate water temperature in each wash and rinse tank; and entering the hot water sanitizing final rinse manifold or in the chemical sanitizing solution tank.

B. *Accuracy of Temperature Measuring Devices* – TDM's: *See Table H-2*.

TABLE H-2

TMD Accuracy	Food	Ambient Air & Water
Fahrenheit & Celsius, or Celsius only	+/- 1°C	+/- 1.5°C
Fahrenheit Only	+/- 2°F	+/- 3°F
Food or Warewashing TMD's shall have a numerical scale printed record or digital readout: increments are to be no greater than 2°F (1°C) in the intended range of use.		

VI. <u>Molluscan Shellfish Life-Support System</u>:

1. *Molluscan shellfish life-support system display tanks that are used to store and display shellfish that are offered for human consumption* shall be operated and maintained under a variance granted by the Health Authority as specified in *DPH Rule 511-6-1- .10 (5)(a) and (c)*. ***Otherwise, <u>the tank shall be conspicuously marked so that it is obvious to the consumer that the shellfish are for display only</u>.***

    A. *A variance* for a Molluscan Shellfish Life-Support System shall ensure that:

    a. Water used with fish other than molluscan shellfish *does not flow into the molluscan tank;*

    b. The safety and quality of the shellfish as they were received *are not compromised by the use of the tank*; and

    c. *The identity of the source of the shellstock* is retained as specified under *DPH Rule 511-6-1-.04.*

    d. <u>*See Subsection III, 13"Molluscan Shellfish Tank Life Support System in Section E entitled, "Facilities to Protect Food", in this Manual for more specific information.*</u>

VII. <u>Equipment Specification References</u>:

1. To help the planner and reviewer focus their plan review efforts concerning equipment and facility design, installation and construction and sanitation requirements found within Chapter 511-6-1, please <u>*see Appendix-K "Equipment Specification Reference Sheet" and Appendix-L "Plan Review DPH Rules Specifications" in Part-II of this Manual*</u>.

ILLUSTRATION H-1

Kitchen Equipment Mounted On Castors

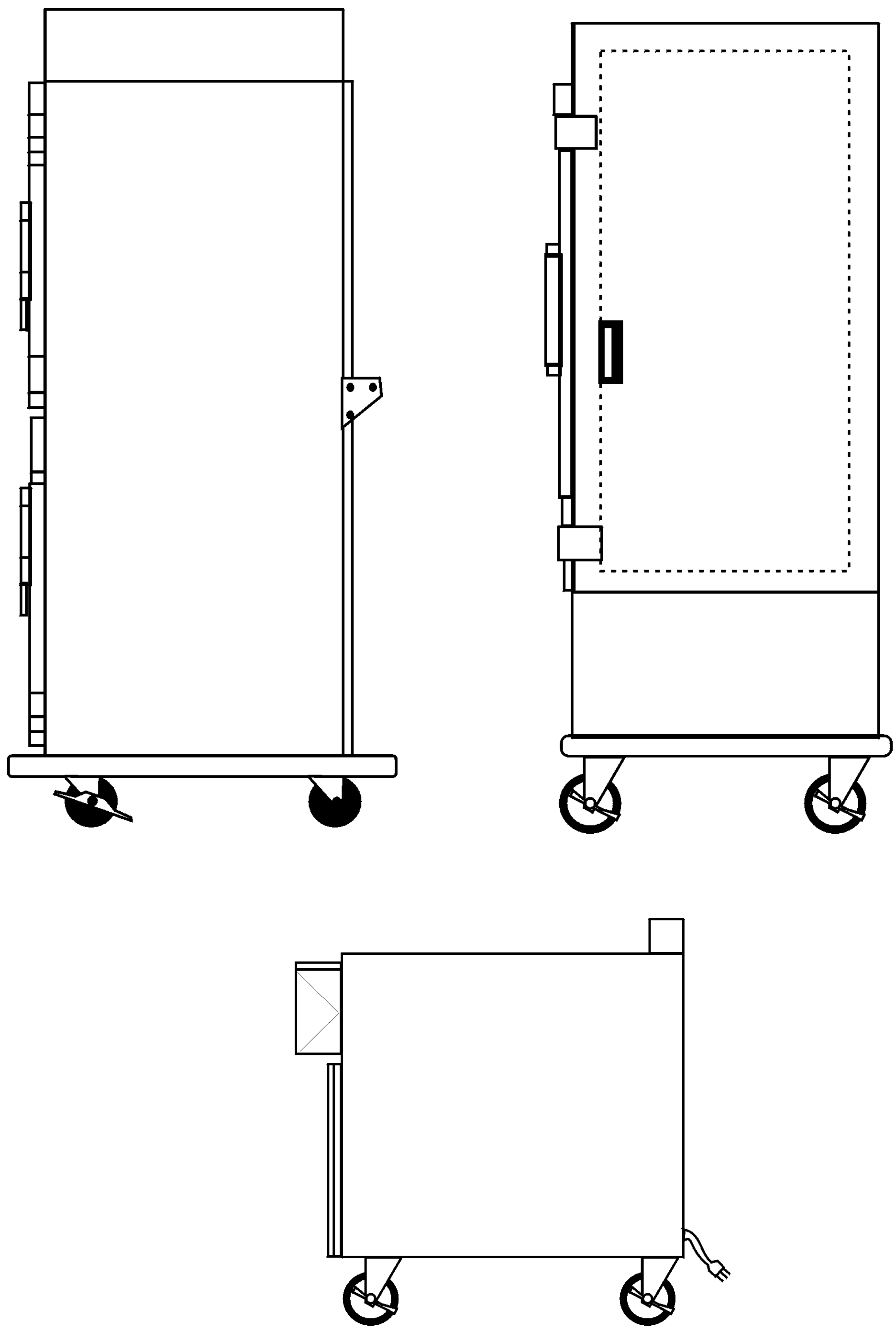


ILLUSTRATION H-2
Sanitary Legs

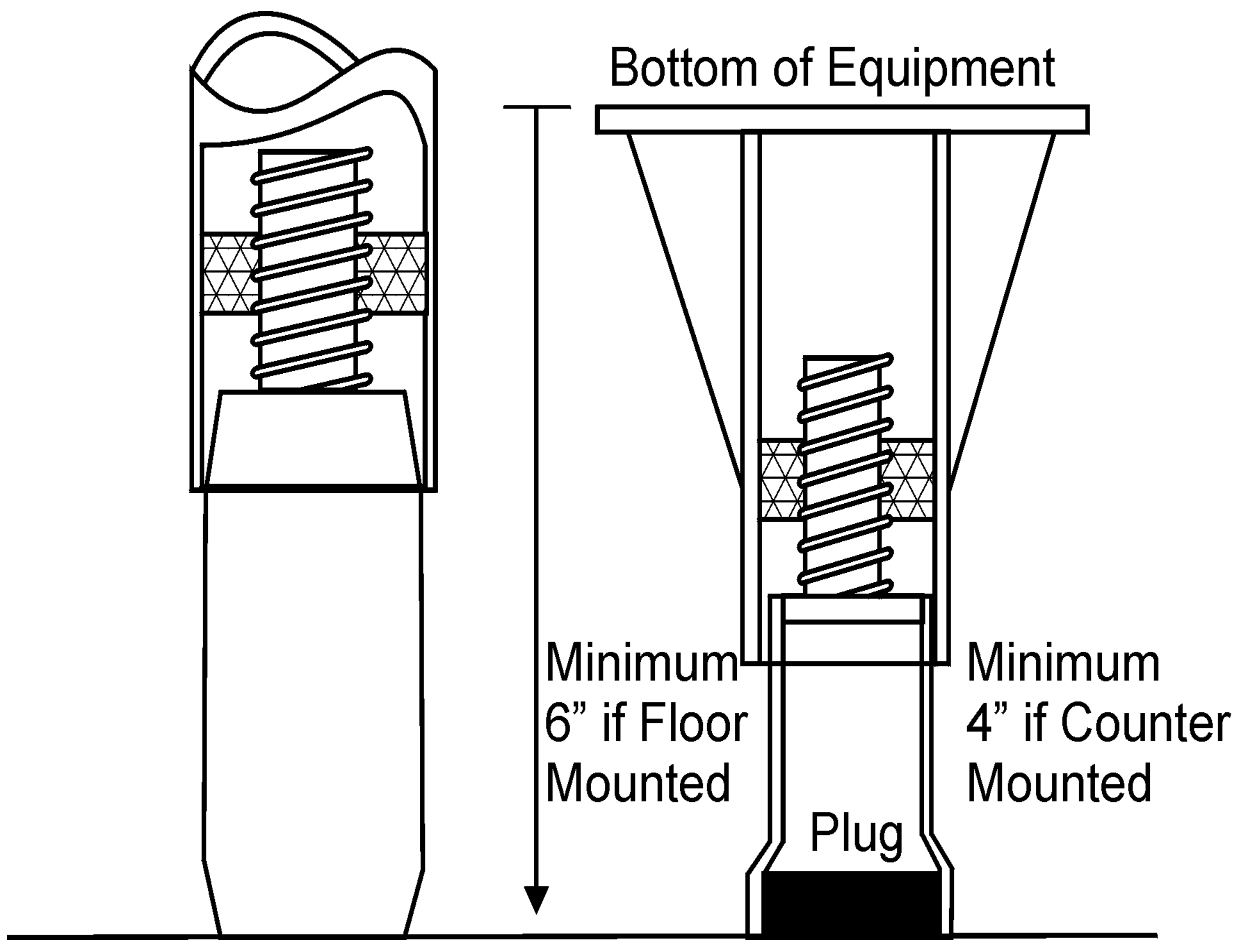
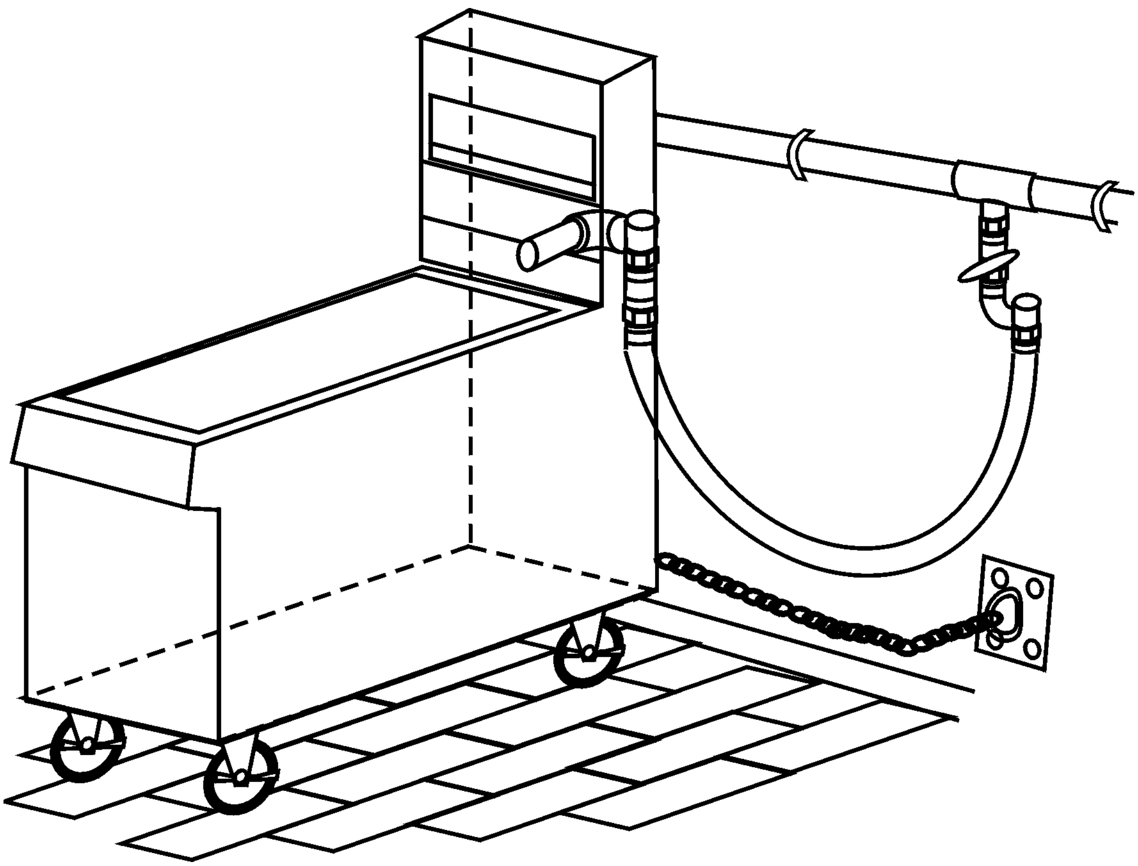
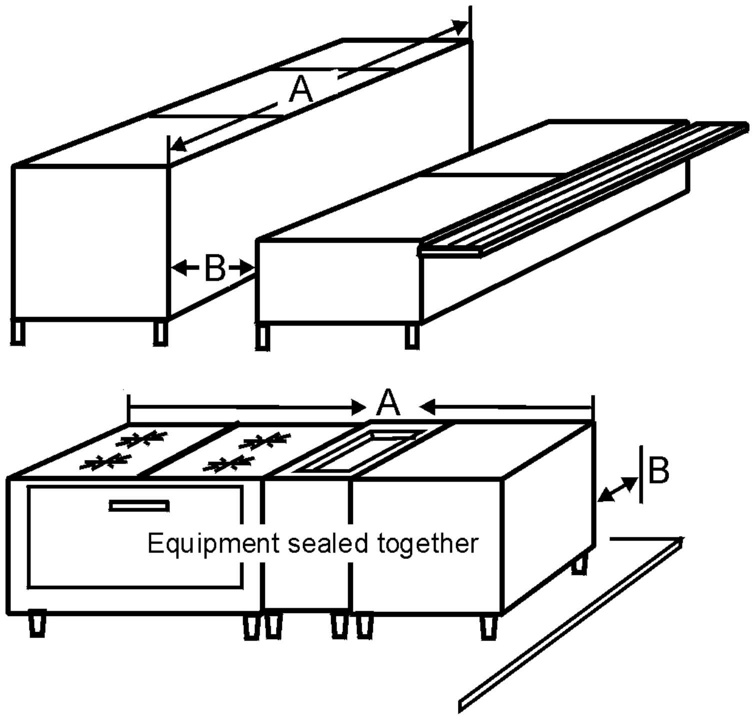


ILLUSTRATION H-3



Cooking Equipment on Casters
Flexible Gas Connection with Keeper Chain

ILLUSTRATION H-4
Equipment Spacing



Equipment Spacing provided access is available from both ends:

Equipment Length (A)	Space from Walls and Adjacent Equipment (B)
4' or less	**6"**
4' - 8'	**12"**
8' or more	**18"**

The following is an example of spacing pending distances (A) and (B) as shown above in Illustration H-4:

- *Equipment length 4 feet or less*, space at least 6 inches from walls and other equipment.
- *Equipment between 4 feet but less than 8 feet*, space at least 12 inches from walls and other equipment.
- *Equipment length is 8 feet or more*, space at least 18 inches from walls and other equipment.
- *Obstruction between and/or behind equipment* by a chase or rigid utility connection may require additional spacing.

VIII. Barbeque Cooking Facilities:

1. *Background*:

A number of food service establishments around the State, known as Barbeque Restaurants, utilizing solid fuel burning, outdoor barbeque pits, barrel cookers, and smokers to cook volumes of whole pieces of meat, such as hams, slabs of ribs, or chicken. As a result of volume cooking using solid fuel burning cooking equipment, an increase in the volume of grease-laden smoke and heat has the potential to create an increase in the difficulty in maintaining good sanitation if conducted within the confines of the food service establishment. It is for these reason these establishments tend to locate these types of cooking equipment outside of the food service establishment building. In contrast, recent modern design of smoking, grilling, and pit-cooked barbequing equipment is available for inside commercial cooking that is designed to address the exhaust and sanitation issues of traditional barbequing/grilling. As a result, more and more establishments, especially chain barbeque establishments are utilizing indoor barbeque cooking equipment. Finally, the country style cooking process utilizing barbeque pits, grills, and smokers is viewed by country barbeque restaurants as a marketing tool – *see Illustration 9 and 10* for examples.

ILLUSTRATION U-9

Pit Cooked Bar-B-Q advertisement used to draw consumer attention to the establishment

ILLUSTRATION U-10

Commercial Barbeque Smoker

Commercial Portable Barbeque Grill

Commercially Built Barbeque Trailer

Meat Smokers

Brick Barbeque Pit

2. *Indoor Barbeque Cooking Facilities* - An indoor barbeque facility shall meet the structural and equipment requirements for a food service establishment as specified within *DPH Chapter 511-6-1*.

3. *Outdoor Barbeque Cooking Facilities* – An outdoor barbeque facility shall meet at least the following requirements:

   A. *Location* – Outdoor Barbeque Cooking Facilities site selected shall be in the immediate vicinity of and convenient to the permitted food service establishment. It shall be located in an area of a permitted food service establishment which suitably protects the food and/or equipment from dust, dirt, and overhead contamination. The surface of the ground adjacent to the outdoor barbeque cooking facility must consist of a material which will inhibit the generation of dust.

   B. *Floors* – Floor surfaces shall be in good condition and graded to drain. Approved flooring materials may be sealed concrete, sealed machine-laid asphalt, or sealed tile. All flooring materials shall be smooth, non-absorbent, easily cleanable and be durable enough to withstand steam cleaning or power washing with high pressure water should it become necessary.

   C. *Walls* – Consideration must be made to environmental conditions to provide adequate food protection from potential contaminants such as blown dust, dirt, rain, bird droppings, and vermin such as flies, rats and mice. This may be accomplished with the use of block walls, screening, tight-fitting, self-closing screen doors, or other effective barriers as determined by the Health Authority.

   D. *Overhead Protection* – All outdoor barbeque cooking facilities are required to have overhead protection. All overhead structures must preclude the perching and nesting of birds. Additionally, all runoff from rain shall be directed away from the cooking area.

   E. *Ventilation and Fire Protection* – If necessary, mechanical ventilation of sufficient capacity shall be provided to keep areas free of excessive heat, steam, condensation, vapors, obnoxious odors, smoke, and fumes. The outdoor barbeque cooking facility must be in compliance with all applicable building, ventilation, and fire safety codes.

   F. *Lighting* – Adequate lighting for day and night operations shall be provided. The minimum lighting intensity requirements as specified within *DPH Rule 511-6-1-.07(3)(f)* must be provided for within the outdoor barbeque cooking facility. All light bulbs shall be shatterproof or shielded. Consideration should be given at to the type of lighting used during night time hours of operation to reduce insect attraction to the outdoor barbeque cooking area.

G. *Outdoor Barbeque Cooking Equipment*:

a. *General Material and Construction Requirements* - All outdoor barbeque cooking equipment, including custom-made equipment shall meet applicable construction design and material requirements set forth within *DPH Rule 511-6-1-.05(1) and (2)*. Cooking equipment may be designed to be movable or be permanently installed. In general, surfaces shall be smooth, easily cleanable, free of rust, dents or pitting, and durable under the intended normal outdoor use conditions. Cooking equipment shall be provided with lids or covers to protect the equipment and food contact surfaces from insects, birds, animals, contamination and inclement weather conditions. It shall be the burden of the permit applicant or permit holder to provide documentation to the Health Authority that all proposed equipment associated with the outdoor barbeque cooking facility meets at least the minimum material and design requirements as cited herein.

b. *Barbeque Pit Walls* - Pit walls (exterior sides only) shall be smooth, easily cleanable, and washable. Concrete blocks or other masonry products used for pit construction must be trowelled, skim coated, or receive sufficient coats of full strength block filler applied to the exterior wall prior to the application of a washable paint.

c. *Barbeque Pit Grills, Grates, and Other Supports* - Pit grills, grates, and other supports shall be constructed of smooth, easily cleanable, nonabsorbent, and non-toxic material and shall be in sections that are easily removable for cleaning. Expanded metal and cast iron grating are recommended materials which can be cleaned and maintained. Hog wire, chicken wire, hardware cloth, and similar materials are permitted for single-use only and must be discarded after each cooking period.

d. *Functionality* – All outdoor barbeque cooking equipment must be designed and constructed to be capable to meet at least the applicable minimum cooking time/temperature requirements within *DPH Rule 511-6-1-.04(5)(a)*. It shall be the burden of the permit applicant or permit holder to provide documentation to the Health Authority that all proposed cooking equipment associated with the outdoor barbeque cooking facility is design and constructed so as to be capable to meet at least the applicable time/temperature cooking requirements as cited herein.

e. *Food Transport Containers and Utensils* – All food shall be properly transported in approved covered containers and protected during transport between the indoor preparation site and the outdoor barbeque cooking equipment. Separate utensils and containers must be provided for handling raw food from cooked, ready-to-eat food. All food storage and preparation will be conducted inside the food service establishment.

H. *Restroom Facilities* – Approved and accessible toilet facilities shall be located no more than 200-feet from the outdoor barbeque cooking facility.

I. *Equipment and Utensil Washing* – Warewashing is not permitted outside. All utensils and cooking equipment used in the outdoor barbeque cooking facility's operation must be returned inside to the food service establishment for cleaning and sanitization; except that in place cleaning may be allowed for grills and other similar equipment.

J. See Illustration U-11 for examples of outdoor barbeque cooking facilities.

ILLUSTRATION U-10
Examples of Barbeque Sheds

SECTION I - DRY STORAGE

REFERENCES (Chapter 511-6-1)

.04 Food:
(4) Protection form Contamination After Receiving (q) Food Storage and
(r) Food Storage, Prohibited Areas

.05 Equipment and Utensils:
(2) Design and Construction (hh) Case Lot Handling Equipment, Moveability.

I. General:

1. *Dry storage space needed depends on the menu*, number of meals served between deliveries, frequency of deliveries, and the amount and type of single-service items to be stored. The location of dry storage rooms or areas should be adjacent to the food preparation area and convenient to the receiving area. Food should not be stored on shelving or in cabinets located under exposed or unprotected sewer lines, open stairwells or other sources of contamination.

2. D*ry storage areas or rooms* may be designated for the storage of packaged or containerized bulk food that is not potentially hazardous (non-time/temperature control for safety food) such as bagged flour, sugar or dry beans, and dry goods, such as single-service items. The room may be unfinished *as long as packaging or cases are not opened and the presence of vermin is being controlled*. *Opened packages of dry food and or single-service items shall be stored within the protective environment of a completely finished, enclosed facility.*

3. *Shelving, dollies, racks, pallets and skids* shall be corrosion-resistant, non-absorbent and smooth. The highest shelf for practical storage use should be no higher than seven-feet for employee safety and for the ease of routine food storage monitoring reasons. The *lowest shelf* for storage use shall be at least six-inches from the floor. *Clearance between shelves* should be at least fifteen-inches. Sufficient moveable racks, skids and dollies should be provided to store all bulk containers. Shelving, dollies, racks, pallets and skids should be spaced away from walls to allow for cleaning and pest monitoring/inspection.

   An exception to the above 6 inches from the floor minimum storage requirement would be for warehousing and/or bulk food purchase. Food in packages and working containers may be stored less than 6 inches (15 cm) above the floor on case lot handling equipment if the equipment can be moved by hand or by conveniently available apparatuses such as hand trucks and forklifts. In addition, pressurized beverage containers, case food in waterproof containers such as bottles or cans, and milk containers in plastic crates may be stored on a floor that is clean and not exposed to floor moisture.

4. *Approved food containers with tight-fitting covers* should be used for storing bulk foods such as flour, cornmeal, sugar, dried beans, rice and similar food.

II. Dry Storage Calculations Examples:

1. These formulas can be used to *estimate and verify* dry storage space requirements based on the facility design or layout:

A. Formula # 1

Linear feet of storage shelving = $\dfrac{\textit{Volume per meal } \mathbf{x} \textit{ Number of meals between deliveries}}{\textit{D } \mathbf{x} \textit{ H } \mathbf{x} \textit{ C}}$

Volume per meal = 0.1 cubic feet
D = Depth of the shelves in feet
H = Distance between shelves in feet
C = 0.8 or 80% effective capacity of shelf height

For example, *assume 200 meals per day and a 10 day storage between deliveries = 2000 meals between deliveries, shelf depth of 18 inches (1.5 ft.), clearance of 18 inches (1.5 ft.) between shelves and 80% effective capacity of shelf height:*

Linear feet of storage shelving = $\dfrac{\text{0.1 cu, ft } \mathbf{x} \text{ 2000 meals}}{\text{1.5 ft. } \mathbf{x} \text{ 1.5 ft. } \mathbf{x} \text{ 0.8}}$ = ***111 Linear feet***

B. Formula # 2

Square feet of storage area =

$\dfrac{\textit{Volume per meal } \mathbf{x} \textit{ Number of meals between deliveries}}{\textit{Average height (ft.) } \mathbf{x} \textit{ Fraction of usable storeroom floor area}}$

Volume per meal = 0.1 cu. ft

Usable storage height = 5 to 7 feet (total height of the ceiling minus the distance of shelving from the floor and ceiling)

Fraction of useable storeroom floor area =.4 to .6 (total floor area minus door openings, aisle space, distance of shelving from walls)

For example, *assume 200 meals per day and a 10 day storage between deliveries = 2000 meals between deliveries, 5 feet useful storage height, and .5 of usable floor area.*

Storage Area = $\dfrac{\text{0.1 Cu. Ft. } \mathbf{x} \text{ 2000 meals}}{\text{5 ft. } \mathbf{x} \text{ .5}}$ = ***80 square feet***

1. *Formula one should be used to determine the minimum shelving necessary to store supplies between deliveries.* It can also be used to determine the minimum storage shelving necessary to store supplies between deliveries for facilities designed without a dedicated dry storage room. It is highly recommended that a dedicated storage room be design into the food service floor plan. Finally, formula one determines the linear feet of storage shelving required to adequately maintain the food flow in the establishment.

2. *Formula two should be used to design a room dedicated to dry storage items. It establishes the square footage required to meet the dry storage demand.* The formula accounts for walkway space, unusable areas and shelving.

3. <u>*See Table I-1 for listings of estimated linear feet of storage shelving and estimated square feet of storage area needed for storage between deliveries.*</u>

III. <u>Renovating Existing Facilities</u>:

1. Inevitably, there will arise an occasion whereby the storage room will be too small and cannot be enlarged to accommodate the volume of food and supplies needed for the calculated meals to be served. An example would be:

   A. *An existing building is being converted into a restaurant and the local zoning regulations require a fixed number of parking spaces*. There is not any available land for the possible addition of an outside storage building or to build onto the existing building: or

   B. The same conditions as stated above in example number one in addition to the fact *the internal layout of the building floor plan cannot be altered*: or

   C. An existing food operation's *volume of service has exceeded available storage space without any room for expansion*.

2. The solution to the above problem examples would be to *calculate the needed maximum number of days that could be tolerated before a supply delivery* would be required to continue serving the increased volume of meals.

3. <u>Example Resolution</u>:

   A. Assume the restaurant from the previous example will undergo renovations. The space in the facility was calculated to serve *200 meals per day with 10-day* storage between deliveries. This equals *2000 meals between deliveries.* The *storage space has 5 feet of useful storage height and .5 or 50% usable floor area*. *A total of 80 square feet was required for storage purposes.*

B. The renovated facility has estimated it *will serve 400 hundred meals per day*, double the previous occupant output.

C. If no constraints were present, the new operator would have a few options to solve the dry storage requirements:

(i) *Enlarge or construct additional storage;*

(ii) *Reduce the number of days between meal deliveries; or*

(iii) *Install the required linear feet of shelving in an appropriate space*.

4. Although each variable in the dry storage calculation can be manipulated to determine the best course of action for the facility to meet the storage requirements, some actions may be more achievable than others. In this example, the renovated facility would require double the square footage for dry storage, if all other parameters where left the same in the example. The following scenarios may be faced in the plan review process:

A. <u>Situational Given Information</u>:

i. We estimate an *increase from 200 meals to 400 meals per day and maintain 10-day storage between deliveries.* This is equal to *4000 meals between deliveries. The room has 5 feet useful storage height and .5 or (50%) of usable floor area.* <u>Presently, we only have storage capacity for 200 meals per day with 10-day storage between deliveries equivalent to 2000 meals between deliveries.</u>

$$\textit{Required Storage Area for 400 meals per day} = \frac{0.1 \text{ Cu. Ft. x } 4000 \text{ meals}}{5 \text{ ft. x } .5} = \underline{\textit{160 square feet}}$$

$$\textit{Available Storage Area for 200 meals per day} = \frac{0.1 \text{ Cu. Ft. x } 2000 \text{ meals}}{5 \text{ ft. x } .5} = \underline{\textit{80 square feet}}$$

ii. The following scenarios will help provide solutions to our example storage needs:

I. Scenario #1: Build additional dry storage space to meet the increased meal demand:

(i.) Use formula # 2 to determine the square feet of storage area *required to support 400 meals served per day with 10-day storage* of supplies:

Square feet of storage area **=**

$$\frac{\textit{Volume per meal } \mathbf{x} \textit{ Number of meals between deliveries}}{\textit{Average height (ft.) } \mathbf{x} \textit{ Fraction of usable storeroom floor area}}$$

$$= \frac{0.1 \text{ Cu. Ft. x } 4000 \text{ meals}}{5 \text{ ft. x } .5}$$

= *160 square feet*

(ii.) Next, determine the amount of dry storage area required to support the increase in meals:

Additional Square Feet of Storage Area =
Required Square Feet of Storage Area - (Available Square Feet of Storage Area)
Additional Square Feet of Storage Area =
160 square feet – 80 square feet = ***80 square feet***

II. Scenario #2: Adjust the number of days between deliveries to accommodate a given storage room capacity:

(i.) Calculate the size of existing storage room: *(Factoring in room height and usable floor area)*

$$\frac{0.1 \text{ Cu. Ft. x } 2000 \text{ meals}}{5 \text{ ft. x } .5} = \textit{80 square feet}$$

(ii.) Determine the total number of meals per day the facility will serve:

Given as 400 from example above or calculate if unknown.

(iii.) Determine the *number of days between deliveries required to prevent overcrowding the available storage room capacity*:

Number of days between deliveries =

Useful storage height (ft) x Fraction of usable storage x (Square feet of available storage area (Sq. Ft.))
Volume per meal (Cu. Ft.) x Number of meals served/day

OR

Number of days between deliveries = $\dfrac{USH \times FUS \times Sq.\ Ft.\ ASA}{V/M \times NMS/D}$

Number of days between deliveries =

$\dfrac{(5\ \text{feet}) \times (.5\ \text{Sq. Ft.}) \times (80\ \text{Sq. Ft.})}{0.1\ \text{Cu. Ft.} \times 400\ \text{meal/day}} =$ ***5* days***

***A five-day delivery versus a ten-day delivery will allow you to use the existing storage space.**

III. Scenario #3: Determine linear feet of shelving that can be installed in suitable space to meet the increased dry storage demand without constructing an additional storage room square footage:

(i.) Calculate the size of the existing storage room: *(Factoring in room height and usable floor area)*

$\dfrac{0.1\ \text{Cu. Ft.} \times 2000\ \text{meals}}{5\ \text{ft.} \times .5} =$ *80 square feet*

(ii.) Determine the total number of meals between deliveries the existing storage area can support:

Number of Meals between Deliveries =

Average height (ft.) ***x*** *Fraction of usable storeroom floor area x square feet*
Volume per Meal

$\dfrac{5\text{ft.} \times .5 \times 80}{0.1\ \text{cu. ft.}} =$ *2000 meals* (iii.) Find the linear feet of storage shelving that *will be required to support the remaining meals between deliveries*:

Linear feet of storage shelving **=**

<u>*Volume per meal* ***x*** *Number of meals between deliveries*</u>
D ***x*** *H* ***x*** *C*

Volume per meal = 0.1 cubic feet
D = Depth of the shelves in feet
H = Distance between shelves in feet
C = 0.8 or 80% effective capacity of shelf height

= .<u>01 Cu. Ft. x 2000 meals between deliveries</u>
1 ft. x 1ft x .8

= <u>*250* ***linear feet of storage shelving***</u>

TABLE I-1

ESTIMATED LINEAR FEET OF STORAGE SHELVING NEEDED (Formula #1)				ESTIMATED SQUARE FEET OF STORAGE AREA NEEDED (Formula #2)			
Based on 0.1 Cu. Ft. per meal				Based on 0.1 Cu. Ft. per meal			
Meals Served Between Deliveries	1 ft. deep x 1ft. high shelves (D x H = 1)	1.5 ft. deep x 1.5 ft. high shelves (D x H = 2.25)	2 ft. deep x 1.5 ft. high shelves (D x H = 3)	Meals Served Between Deliveries	Height = 5 ft. Floor Area = .5	Height = 6 ft. Floor Area = .5	Height = 6 ft. Floor Area = .6
200	25	11	1	200	8	7	6
300	37.5	17	12.5	300	12	10	8
400	50	22	17	400	16	13	11
500	62.5	28	21	500	20	17	14
600	75	33	25	600	24	20	17
800	100	44	33	800	32	27	22
1000	125	55	42	1000	40	33	28
1500	187.5	83	62.5	1500	60	50	42
2000	250	111	83	2000	80	67	56
2500	312.5	139	104	2500	100	83	69
3000	375	167	125	3000	120	100	83
4000	500	222	167	4000	160	133	111
5000	625	278	208	5000	200	167	139

SECTION J – WAREWASHING FACILITIES[1]

REFERENCES (Chapter 511-6-1)

.05 Equipment and Utensils. Amended. (2) Design and Construction (y)(z)(aa)(bb)(cc)(dd)(ee)(jj)
.05 Equipment and Utensils. Amended. (3) Numbers and Capacities (b)(c)(h)(i)
.05 Equipment and Utensils. Amended. (6) Maintenance and Operation (d)(e)(f)(g)(h)(i)(j)(k)(l)(m)(n)(o)(p)
.05 Equipment and Utensils. Amended. (7) Cleaning of Equipment and Utensils.(i)(j)
.05 Equipment and Utensils. Amended. (8) Sanitization of Equipment and Utensils.(b)

I. Basic Requirement:

1. In reviewing warewashing facility plans, there are *two objectives*:

   A. *Recognize if there is adequate space for the movement of dirty dishes through cleaning operations to the point of storage/distribution without interruption; and*

   B. *Recognize the proper size and placement of warewashing and pot washing machines and/or sinks based upon the nature and volume of utensils and other items to be cleaned.*

2. *The minimum requirement for warewashing in a food establishment is a 3-compartment sink*. A *mechanical warewashing machine* may be installed in addition to the 3-compartment sink, *but is not required* and it is considered to be an adjunct to manual warewashing facilities.

II. Manual Warewashing:

1. *At least one stainless steel sink with no fewer than 3 compartments* shall be provided for manual washing and sanitizing of utensils and equipment. This warewashing sink compartments shall be large enough to hold the largest pot, pan or piece of equipment. Each compartment shall be supplied with adequate hot and cold potable running water. Integral drainboards of adequate size shall be provided on both sides of the sink for soiled and cleaned utensils; *see Illustration J-1*. In existing establishments, mobile dish tables may be utilized as an adjunct to other drainboard facilities.

2. As recommended by FDA's 2008 Plan Review for Food Establishments Guidance Document, drainboards and dish tables should be pitched at a minimum of 1/8" per foot and the drainage should be directed into the sink. Drainboards should generally be at least the same size as that of the sink compartments. The *recommended size of drainboards is 36"- 48" long and 30" wide*; however, the Health Authority may require them to be larger to hold the anticipated volume of soiled and clean items during operation.

[1] Reference: 2008 FDA Plan Review for Food Establishments Guidance Document

3. *Locate a floor drain in the immediate vicinity of the sink in areas where wet pots, utensils and equipment are air-drying.* Approved racks, shelves or dish tables are to be provided adjacent to the warewashing sink.

4. *Provide adequate facilities for preflushing or prescraping equipment and utensils*. A pressure spray nozzle, if used, should be used only on the first compartment of a four (4) compartmented sink. A pressure spray nozzle should not be used on a three (3) compartmented sink.

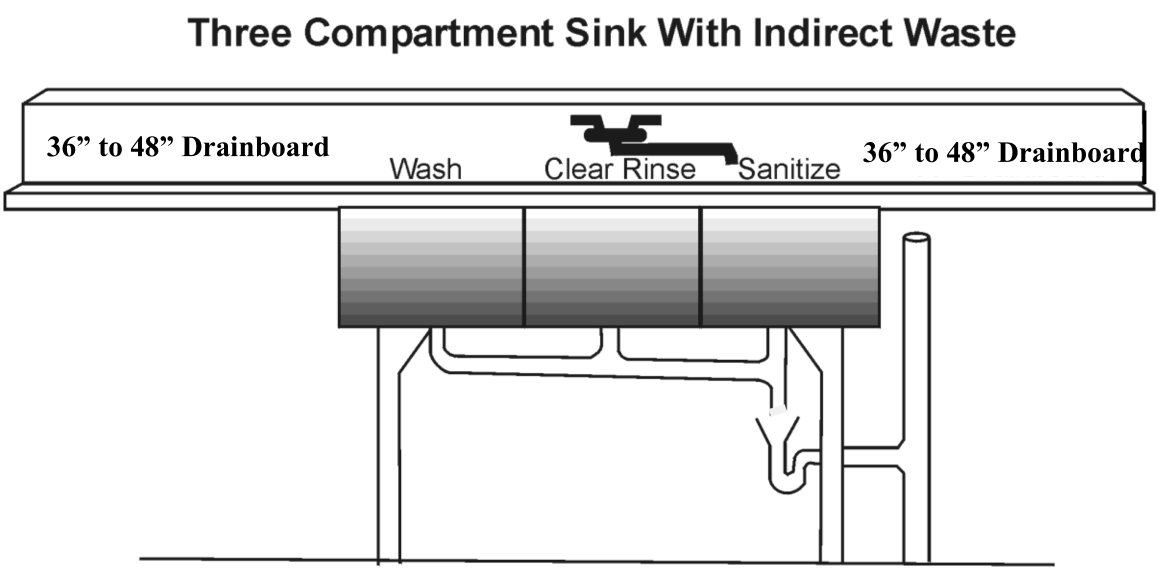
5. *An approved chemical test kit for determining sanitizer strength shall be available and used.* These test kits are normally supplied by the sanitizer supplier or manufacturer.

6. *Working supplies of cleaners and sanitizers* must be stored in an approved location. A recommended storage location is on a shelf below the drainboard of the 3-compartment sink.

7. The *flow of cleaning for a manual warewashing sink* shall be such that soiled items enter one side and exit to drainboard at the other end.

ILLUSTRATION J-1

Soiled Items *WORK FLOW* *Clean and Sanitized Items*



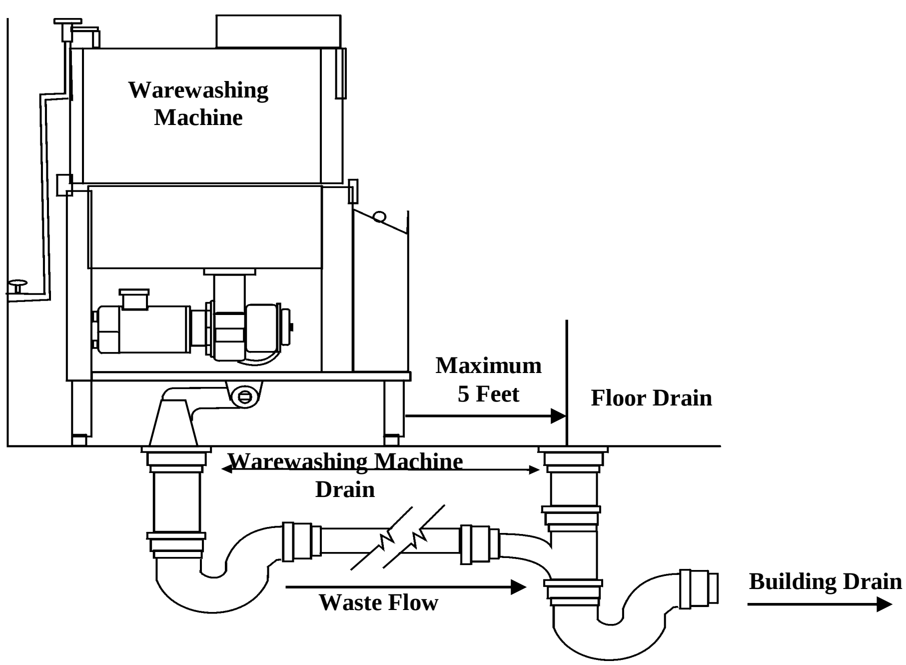
At least one 3-compartmented sink is required by Chapter 511-6-1. Drainboards for soiled dishes and for cleaned utensils must be adequate to hold expected quantities of equipment and utensils. Generally, drainboards should be same size as that of sink compartments. Minimum recommended size is 36 – 48 inch long by 30 inch wide drainboards and they should have at a minimum pitch of 1/8" per foot slope toward the sink.

III. Mechanical Warewashing:

1. General Requirements:

   A. The *waste line for all mechanical warewashing machines must not be directly connected to the sewer line.* Except that, *if allowed by applicable State and local plumbing code,* the waste line may be connected directly on the inlet side of a properly vented floor drain when the floor drain is within 5 feet of the warewashing machine and the drain line from the machine is properly trapped and vented. *Illustration J-2* represents a type of connection that may no longer be allowed by applicable plumbing codes. It is recommended that the local building/plumbing code officials be consulted whenever this type of plumbing connection is proposed.

ILLUSTRATION J-2



   B. A warewashing machine that is installed after adoption of Chapter 511-6-1 shall be designed and equipped to: automatically dispense detergents and sanitizers and incorporate a visual means to verify that detergents and sanitizers are delivered or a visual or audible alarm to signal if the detergents and sanitizers are not delivered to the respective washing and sanitizing cycles.

C. *Adequate facilities shall be provided to air-dry washed utensils and equipment*. Storage facilities shall be provided to store cleaned and sanitized utensils and equipment at least 6" above the floor on fixed shelves or in enclosed cabinets protected from splash, dust, overhead plumbing or other contamination.

IV. Determining Warewashing Machine Capacity:

1. *The capacity of the dishwashing machines should be based on the peak number and type of dishes, utensils, flatware, etc. that must be washed per hou*r. One way to find the capacity in racks per hour for each make and model of machine is to refer to the manufacturer's specification sheets. To determine the *required capacity* refer to the following guide:

A. Each 20 inch by 20 inch warewashing rack will accommodate: 16 – 9 inch dinner plates, 25 – Water glasses, 16 – Coffee cups, and 100 – Pieces of flatware.

Note: Only 70% (.70) of the listed capacity (in racks per hour) should be considered as an average capacity. Consult the manufacturers' specification sheets ("cut sheets") for optimum capacity.

B. To determine the number of warewashing racks per hour for a food service establishment serving divide the number of meals by the number of dishes, water glasses, coffee cups and pieces of silverware by the number of each item per rack as given in "1A" above.

C. For example:

A food service establishment plans to serve 200 meals at lunch. The number of warewashing racks that the ware washing machine must wash per hour would be as follows:

200 Plates	= 200 Plates / 16 plates per Rack	= 12.5 ~ 13 Racks
200 Water Glasses	= 200 Glasses / 25 Glasses per Rack	= 8 Racks
200 Coffee Cups	= 200 Coffee Cups / 16 Cups per Rack	= 13 Racks
200 Pieces of Flatware	= 200 Pieces of Flatware / 100 Pieces of Flatware per Rack	= 2 Racks

Required total working capacity of warewashing machine = *36 Racks per Hour*

Since this Illustration is 70% of the listed capacity, a warewashing machine with a minimum listed capacity of $\frac{36}{.70\ (70\%)}$ = 51 Racks per Hour will be required

Note: *As a rule-of-thumb*, four (4) seats in the dining area will equal one warewashing rack in a warewashing machine. Assuming that the establishment has only 200 seats in its dining area and that eat seat will only be occupied once during the lunch period, then the projected 200 meals during lunch will equal 200 seats. Therefore, 200 seats divided by 4 seats per rack will equal 50 racks. As a result, one can estimate a warewashing machine's required capacity per hour by either number of projected meals or by number of dining room seats.

C. *An adequate facility for preflushing or prescraping shall be provided on the soiled dish side of the warewashing machine*.

D. *Drainboards* shall be provided, be of adequate size for the proper handling of utensils, and located so as not to interfere with the proper use of the warewashing facilities. In existing establishments, mobile dish tables may be utilized as an adjunct to other drainboard facilities.

V. Chemical Warewashing:

1. *Chemical warewashing machines shall be in compliance with the standards of an ANSI/NSFI accredited certification program.* The installation must conform to applicable code requirements. Among the specific requirements for the installation of an approved chemical warewashing machine are the following:

   A. The *chemical sanitizing feeder* must be in compliance with the standards of an ANSI accredited certification program and be compatible with the specific make and model of machine in question.

   B. An *approved chemical test kit for determining sanitizer strength* shall be available and used.

   C. A *visual flow indicator must be provided to monitor the operation of the sanitizing agent feeder*. Other indication devices such as audible alarms may also be used. *The flow indication devices must be installed so as to be conspicuous to the operator*.

2. *Adequate facilities shall be provided to air-dry washed utensils and equipment.* Storage facilities shall be provided to store cleaned and sanitized utensils and equipment at least 6" above the floor, protected from splash, dust, overhead plumbing or other contamination; on fixed shelves; or in enclosed cabinets. The plan must specify location and facilities used for storing all utensils and equipment.

3. *If sanitizer dispensers are not equipped with an integral backflow prevention device*, the installation point of the dispenser shall be below the vacuum breaker on the warewashing machine. *See Illustration J-3*.

4. Some warewashing machines, such as *recirculation pump rinse sanitizers*, will have dispenser discharge points (indirect connection) at the sump drain.

VI. __Warewashing Utilizing Hot Water__:

1. A commercial warewashing machine for mechanical warewashing utilizing hot water for sanitization shall be provided that is in compliance with the standards of an ANSI/NSF accredited certification program. The installation and required accessories shall be in conformance with local applicable plumbing codes.

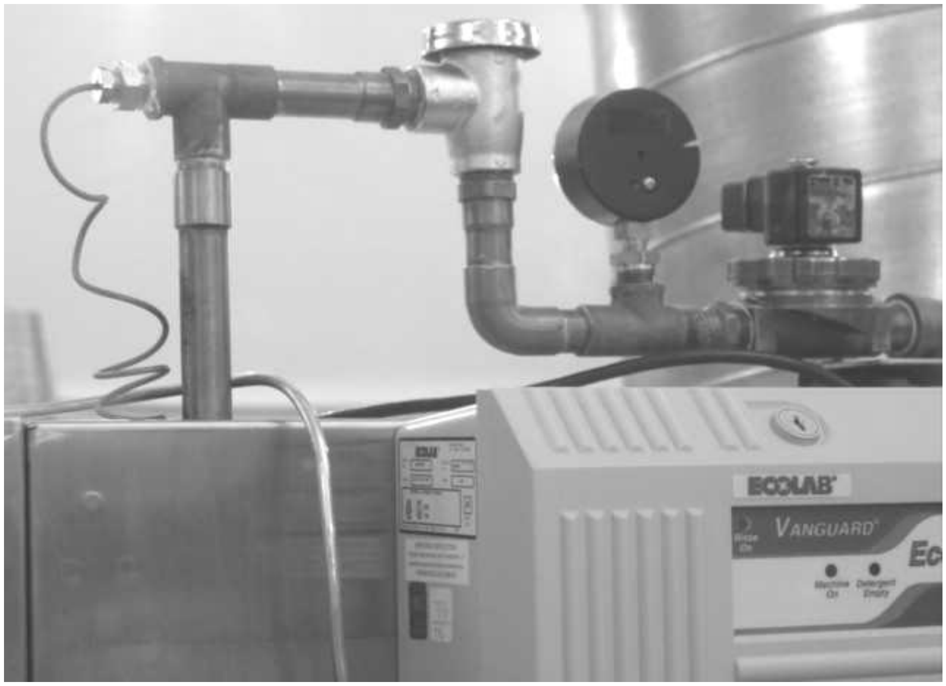
2. *An approved maximum registering thermometer or high temperature test papers shall be available and used*.

3. *If the detergent dispenser or drying agent dispenser is not equipped with an integral backflow prevention device*, the installation point of the dispenser shall be below the vacuum breaker on the warewashing machine. *See Illustration J-3*.

4. *Warewashing machines that provide a fresh hot water sanitizing rinse shall be equipped with a pressure gauge or similar device such as a transducer that measures and displays the water pressure in the supply line immediately before entering the warewashing machine.* If the flow pressure-measuring device is upstream of the fresh hot water sanitizing rinse control valve, the device shall be mounted in a 6.4-millimeter or one-fourth inch Iron pipe Size (IPS) valve; *see Illustration J-3* for location of IPS valve. The IPS valve allows for the ease of removal of water pressure gauge and the installation of water pressure testing gauge.

5. The diagram in *Illustration J-4* illustrates a typical warewashing machine installation. Note that an *atmospheric vacuum breaker* is installed above the rim of the pre-rinse sink.

ILLUSTRATION J-3



Point of installation of dispensers

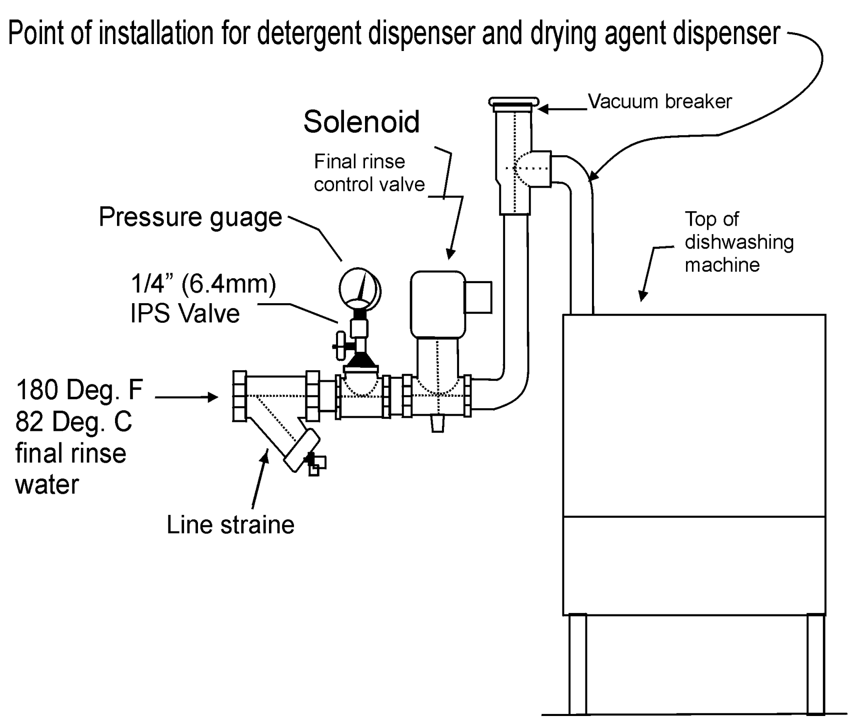
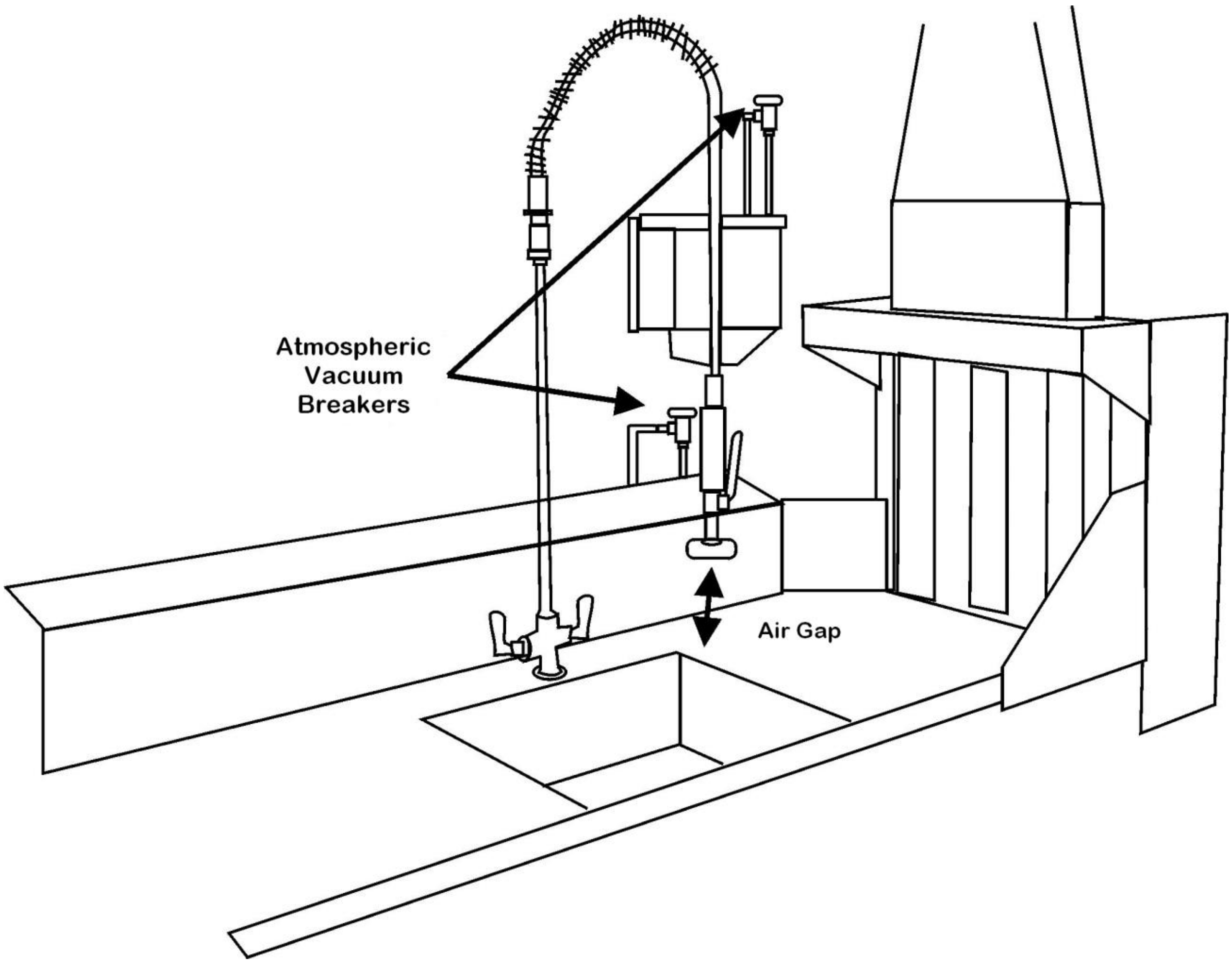


ILLUSTRATION J-4
Pre-Rinse Back Flow Protection



This is a typical warewashing machine installation where atmospheric vacuum breakers can be easily seen.

SECTION K - HOT WATER SUPPLY REQUIREMENTS[1]

REFERENCES (DPH Chapter 511-6-1)

.06 Sanitary Facilities and Controls. Amended. (1) Water Supply. (g) Capacity 2
.06 Sanitary Facilities and Controls. Amended. (2) Plumbing System. (c) Hand Sink Installation.
.05 Equipment and Utensils. Amended. (2)Design and Construction (bb) Manual Warewashing Equipment, Heaters and Baskets. 1
.05 Equipment and Utensils. Amended. (6)Maintenance and Operation. (j) Mechanical Warewashing …1& 2 (k) Manual Warewashing Equipment, Hot Water Sanitization Temperatures.
.05 Equipment and Utensils. Amended. (6) Maintenance and Operation (l) Mechanical Warewashing … 1& 2
.05 Equipment and Utensils. Amended. (6) Maintenance and Operation (n) Manual & Mechanical Warewashing.

I. Background:

1. Purpose:

A. *A critical factor in preventing foodborne illnesses in a food service establishment* is the provision of a sufficient supply of hot water to meet the demand of the establishment (i.e., for the washing of hands, utensils, equipment, and the cleaning of the establishment itself). *The installation of a properly sized hot water generation system (i.e., water heater plus associated plumbing system) will ensure that a sufficient amount of hot water will be available at all times to meet this demand.*

B. *The purpose of these guidelines* is to provide a set of criteria that will assist architects, designers, contractors, the food service establishment permit applicant, and the permit holder in the proper sizing of water heating equipment *to reasonably meet the peak hot water demand of food service establishments in Georgia*. Likewise, these guidelines are to function as an aid to the Health Authority in its evaluation of water heating equipment and related systems, during the plan review process. Therefore, food service establishments with water heating equipment sized according to these criteria should be capable of reasonably complying with the requirements for providing a hot water supply to satisfy the continuous and peak hot water demands of the establishment.

C. When reviewing hot water generating equipment and related systems, *the key to remember* is that the reviewer is only trying to verify *whether or not the proposed equipment and system will reasonably be able to accommodate the requirement to provide an adequate hot water supply where it is needed within the establishment. This key is exactly what is specified within DPH Rule 511-6-1-.06 (1) (g) 2.*

[1] Reference Sources: Current Federal Food and Drug Administration (FDA)'s Plan Review for Food Establishments Course FDA #FD207; Guidelines For Sizing Water Heaters – September, 1995 - as published by the "California Conference of Directors of Environmental Health" and recommended within Section III, Part 9 of the "2000 FDA Food Establishment Plan Review Guide" as published by the Food and Drug Administration and Conference for Food Protection; Food Establishment Specification Form, Tri-County Health Department, Greenwood Village, CO 8011 as reference from within the current Food and Drug Administration (FDA)'s Plan Review Course #FD207; and DPH Chapter 511-6-1.

2. General Requirements:

A. *Water heating equipment manufacturer's specification sheets (i.e. cut sheets)* must be consulted during the evaluation of hot water supply equipment and associated systems. *See Illustration K-2 Manufacturer Specification Sheet for an example.*

B. *All water heating equipment, their installation, and all associated piping systems* must be in compliance with all applicable Federal, State, and local building and plumbing code requirements. Plans and specifications must list these applicable codes for reference by the Health Authority.

C. All hot water generating equipment must *conform to nationally recognized standards and be certified or classified by an American National Standards Institute (ANSI)-accredited certification program.*

D. *All newly constructed, change in ownership, or existing buildings being converted into a food service establishment* shall be provided with a hot water supply that is dedicated to the food service operation and sufficient to satisfy the continuous and peak hot water demands of the food service establishment. Hot water for hand washing shall be tempered water at a temperature of at least 100°F (38°C) and the temperature shall be regulated by means of a mixing valve or combination faucet. Hot water for mechanical warewashing must be boosted up to 150ºF(66ºC)to 165ºF (74°C) for washing and 165ºF(74°C) to 180ºF(82°C), not to exceed 194°F (90°C), for sanitizing or according to the manufacturer's data plate on the machine. The maximum sanitizing temperatures of 165°F (74°C) to 180°F (82°C), not to exceed 194°F (90°C) do not apply to high pressure and temperature systems with wand-type, hand-held, spraying devices used for in-place cleaning and sanitizing of equipment such as meat band-saws[2]. The temperature of the wash solution in spray-type warewashers that use chemicals to sanitize shall not be less than 120°F (49°C). The temperature of the wash solution in manual warewashing equipment shall be maintained at not less than 110°F (43°C) or the temperature specified on the cleaning agent manufacturer's label instructions. The water temperature for *manual hot water sanitization*[3] must be at least 171°F (77°C). *See Illustration K-3 for examples of equipment that provide or utilize hot water in their operation.*

E. *Specific data for determining water temperature coming into the establishment* can be received from the public water authority having jurisdiction where the establishment is located. The water temperature must reflect the coldest temperature of the year as it leaves the water authority's treatment plant to be distributed into its water system. However, if incoming water to the food service establishment is from a non-public well supply, the incoming water temperature must be based on ground water temperature during the coldest period of the year.

[2] & [3] See Illustration K-3 for example water heater for the sanitizing compartment of a warewashing sink and an example of food equipment that requires in-place cleaning methods.

2. General Requirements: (continued)

F. *Temperature rise* is the hot water temperature required by DPH Chapter 511-6-1 minus the temperature of the water coming into the food service establishment. For example, if the temperature of water entering a food service establishment is 40ºF and at least 100ºF hot water is needed at a handwashing sink, then the temperature rise would be 100ºF - 40ºF = 60ºF.

G. For *mechanical warewashing (i.e. chemical and hot water sanitizing warewashing)*, a hot water demand shall be based on a primary rise (i.e. wash rinse) in temperature to 140ºF (60ºC). This is necessary due to the fact that chemical sanitizing warewashing machines rely on hot water coming directly from the food service establishment's hot water generation system to maintain its wash and rinse water temperature. Additionally, fresh rinse hot water sanitizing warewashers require an incoming hot water temperature of at least 140ºF (60ºC). This minimum incoming hot water temperature is necessary in order for booster heaters to function properly to deliver fresh hot water to the machines final rinse manifold at no less than the required 180°F (82°C) sanitization final rinse temperature.

H. For *hot water sanitizing mechanical warewashing*, an *external booster heater (see Illustration K-3 and K-8 for examples)* will be needed to boost the required gallons per hour demand an additional 40ºF (4ºC) to attain the required 180°F (82°C) sanitization fresh water final rinse temperature. It should be noted that some manufacturers equip some warewashers with an internal booster heater. If so equipped, internally installed booster heaters must deliver constant fresh water, final rinse at temperatures as required by DPH Rule 511-6-1-.05.

I. *Discretionary Hot Water Demand Reduction Criteria:*

a. *Storage-Tank Type Water Heating Systems*:

i. The Health Authority may allow *hot water demand reduction to be calculated for water saving devices* [4]used on hand operated pre-rinse sprayers, hand washing sinks and showers. Such hot water demand reductions must be supported by Manufacturer's flow rate for each device. The manufacturer's flow rate for each device is to be obtained from each device's specification documentation. The manufacturer's flow rate must be less than what is listed as follows:

I. *Hand operated pre-rinse sprayers* with flow rate *less than 3.5 GPM* standard flow rate;
II. *Hand washing sink faucet or aerator* with flow rate *less than 2.2 GPM* standard flow rate; and
III. *Shower head* with flow rate *less than 2.5 GPM* standard flow rate.

[4] Reference Source: Page 19, Food Establishment Specification Form, Tri-County Health Department, Greenwood Village, CO 8011 as reference from within student course materials of the most recent December 2012 Food and Drug Administration (FDA)'s Plan Review Course #FD207 given in Baton Rouge, LA.

2. General Requirements: I. Discretionary Hot Water Demand Reduction Criteria: (continued)

ii. *When calculating the hot water demand of warewashing sinks*[5], the Health Authority may allow a hot water demand reduction *based upon types of serving eating and drinking utensils* as follows:

I. For *food service establishments that utilize multi-use eating and drinking utensils*, the water heating system shall be sized to the capacity that will provide hot water at a rate equal to or greater than *100% of the computed warewashing sink and utensil soaking sink's hot water* demand *plus that of other equipment and fixtures utilizing hot water* ; and

II. For *food service establishments that use only single-service eating and drinking utensils*, the water heating system shall be sized to a capacity that will provide hot water at a rate equal to or greater than *80% of the computed warewashing sink's hot water demand plus that of other equipment and fixtures utilizing hot water.*

b. *On-Demand Water Heating Systems* - The Health Authority may allow *a hot water usage flow rate reduction in gallons per minute (GPM*[6]*)* to be used for low flow water fixtures installed on the following units of equipment as long as the manufacturer's specifications of these equipment is less than that shown in Table K-2:

i. 3-Compartmented Sinks
ii. Hand operated Pre-rinse Sprayers
iii. Food Preparation Sinks
iv. Handwashing Sinks
v. Showers
vi. Warewashing Machines - *Use manufacturer's flow rate in GPM for specific make and model of warewashing machines.*

J. *Water heaters that use reclaimed heat from equipment* to heat water must be evaluated on a case-by-case basis. The local Health Authority is advised to consult with the Department prior to approval of such systems.

K. *Hot water recirculation systems* must be considered when the water heater is over 60 feet from the farthest fixture served. In some cases, separate, smaller water heaters for remote fixtures, such as toilet room handwashing sinks may be more appropriate than a hot water recirculation system. *See Illustration K-4 Under-the-Sink Water Heating Alternative to Recirculation Systems.*

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5 Reference Source: Guidelines For Sizing Water Heaters – September, 1995 - as published by the "California Conference of Directors of Environmental Health" and recommended within Section III, Part 9 of the "2000 FDA Food Establishment Plan Review Guide" as published by the Food and Drug Administration and Conference for Food Protection.

6 Reference Source: Page 20, Food Establishment Specification Form, Tri-County Health Department, Greenwood Village, CO 8011 as reference from within the current Food and Drug Administration (FDA)'s Plan Review Course #FD207.

3. Alternative Water Heating System Requirements:

A. *On-Demand (or Tankless) Water Heating Systems*[7]*-Background:* One of the advantages of a *tankless or on-demand water heater* [8]is its ability to provide a continuous supply of hot water on demand; thus, it costs less to operate than storage (or tank-type) water heaters. However, since the water passes through a heat exchanger, the water must flow through the unit slowly to assure proper heat transfer. Therefore and unless compensated in design, the quantity, or rate, at which the hot water is delivered, can be significantly less than that provided by a storage water heater. When hot water is utilized at several locations of the food service establishment at the same time, the flow of hot water to each fixture can be severely restricted. As a result of the restricted output of on-demand water heaters, more than one unit may be required, depending on the numbers and types of sinks and equipment present. See example operation in *Illustration K-5 On-Demand Water Heating Systems General Operation and Illustration K-6 Example: On-Demand Water Heating Systems Installed in Series.*

B. *Technology has changed significantly* over the past few years and now quite a few on-demand water heating systems are capable of delivering an endless supply of hot water at any temperature. However, these systems may be more expensive than tank-type water heaters. *See Illustration K-7 On-Demand Water Heating Systems vs. Storage (Tank-Type) Water Heating Systems.*

C. *On-Demand Water Heating Systems – Sizing and Installation Requirements*:

a. *General Design and Sizing Criteria*: Food service establishment plans and specifications that propose on-demand water heating systems must be prior approved by the Health Authority before its installation. If the on-demand water heater manufacturer has sizing, installation and system design criteria, then their criteria may be used as long as they have been previously submitted and approved by the local Health Authority. Otherwise, *use Table K-2* to calculate peak hot water demand. On-demand water heaters must be sized to provide hot water of a rate and at least temperatures as required by DPH Chapter 511-6-1 and they shall also be in compliance with all applicable Federal, State, and local building and plumbing code requirements. The design of on-demand hot water systems must be such that it is sized to meet the combined flow-rate in gpm of all fixtures and equipment utilizing hot water; be capable of maintaining the Chapter's target hot water demand temperatures at each fixture and equipment utilizing hot water; and be capable of maintaining satisfactory water flow, as determined by the Health Authority, at each fixture in order to provide enough agitation for cleaning purposes and to meet hot water utilizing, equipment manufacturer's flow rate specifications. Additionally, Proposed plans and specifications must accompanied by the following documentation:

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[7] On-demand water heater - A water heater that generates hot water on demand.

[8] Reference Source: Guidelines For Sizing Water Heaters – September, 1995 - as published by the "California Conference of Directors of Environmental Health" and recommended within Section III, Part 9 of the "2000 FDA Food Establishment Plan Review Guide" as published by the Food and Drug Administration and Conference for Food Protection.

C. <u>*On-Demand Water Heating Systems – Sizing and Installation Requirements*</u>: a. General Design and Sizing Criteria: (continued)

i. Proposed on-demand water heater *sizing criteria specific to the combined flow-rate in gpm (gallons per minute) of the establishment's proposed or installed fixtures and equipment utilizing hot water; and the degree rise from incoming water temperature into the establishment and the target temperature to be delivered to each fixture and piece of equipment utilizing hot water;*

ii. *Tankless water heater's design specifications*; and

iii. The designer of the proposed on-demand hot water system must provide to the Health Authority a *written document certifying that the proposed design and installation will comply with what is specified within DPH Rule 511-6-1-.06(1)(g) 2.*

b. <u>*Proposed experimental hot water generating technologies*</u>, *such as the combining of on-demand water heating equipment technology with that of the standard storage tank technology*, must be submitted to the Department's Environmental Health Branch for review and comment prior to the proposed food service plans and specifications being approved for construction by the local Health Authority.

4. <u>*Verifying Food Service Establishment Water Heating Systems*</u>:

A. When <u>*verifying the capacity of water heating systems*</u>, *Work Sheet "A"* entitled, *"Storage Tank Type Water Heating Systems"* and *Work Sheet "B"* entitled, *"Tankless or On-Demand Water Heating Systems"* located within *Appendix-I* in Part-II of this Manual must be utilized to verify the proper sizing of a food service establishment's water heating system. the Planner and the Reviewer are advised to consult with DPH 511-6-1 and its Manual for Design, Installation and Construction, as referenced in *DPH Rule 511-6-1-.02(7).* Additionally, Work Sheet "A" and as needed Work Sheet "B" must be *completed by the planner*. Upon submittal to the local Health Authority, *these documents must be verified by the reviewer and retained within the proposed food service establishment inspection record file*.

B. <u>*Work Sheets "A" and "B" are to be maintained by the local Health Authority*</u> in the county in which the proposed food service establishment is to be constructed. They will remain as part of the proposed food service establishment's plan review and inspection record *until they are replaced as a result of a change in the permit holder or a major remodel of the establishment.*

II. <u>Storage Tank Water Heaters Evaluation and Verification</u>:

1. *Determining hot water needs of a food service establishment* is calculated by adding together all of the energy requirements for each fixture using hot water. For these calculations, it is generally assumed that the temperature of incoming water to the food service establishment is 40ºF unless specific data is provided by the permit applicant. Additionally, it must be noted that one gallon of water equals 8.33 lbs.[9] and that a British Thermal Unit (BTU) is the amount of heat energy needed to raise the temperature of one pound of water by one degree F. Therefore, 8.33 lbs. is equal to 8.33 BTUs of energy needed to heat one gallon of water one degree Fahrenheit. This is the standard measurement used to state the amount of energy that a fuel has as well as the amount of output of any heat generating device. As such, it is necessary to calculate *both the demand for hot water in gallons per hour (GPH) and the temperature rise needed for each piece of equipment as required by the manufacturer and the Chapter*. This information can then be converted to BTU's (British Thermal Units) or KW (Kilowatts), the energy demand for each fixture and piece of equipment specified within the plans. *The capacity of the water heater* will then be determined by adding up the individual BTU or KW energy demand requirements for each fixture and piece of equipment utilizing hot water. Additionally, when sizing tank type water heaters, the concern is how much energy is necessary to maintain a volume (or mass) of hot water at a required temperature to meet the peak demand of equipment and fixtures within the establishment.

2. For purposes of calculating GPH in determining BTU and/or KW for each piece of equipment to *determine water heating equipment capacity*, the following shall apply:

   A. Handwashing Sinks (including restrooms)* = *5 GPH X number of handsinks to be installed*

   B. Manual Warewashing Sinks and Utensil Soak Sinks hot water demand in GPH:

   Warewashing Sink/
   Utensil Soak Sink GPH = *sink compartment size (inch^3) X # of compartments X .003255 inch^3 per gallon X number of units to be installed.*

   Note: *See Illustration K-1 for more information.*
   Note: *.003255 inch^3/gallon provides a 75% compartment fill to compensate for mass of utensils and equipment.*
   Note: *If single-service eating and drinking utensils are proposed, use 80% of the computed warewashing sink's volume capacity.*
   Note: *Peak Hot Water Demand may be substituted by calculated values for Water Saving Devices – See example calculations to follow.*

   C. Food preparation sinks hot water demand in gph:

   Preparation sink gph = 5 GPH X number of compartments X number of units to be installed

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[9] Note: lbs (pounds) in 8.33 lbs/gallon is silent in the resulting figure for BTU's and KW's
* Hot water demand reduction as per calculations in subsection II 3 of this Section.

D. Warewashing Machine hot water demand = *70% of "final rinse usage" found on unit's manufacturer's specification sheet (cut sheet) X number of units to be installed*

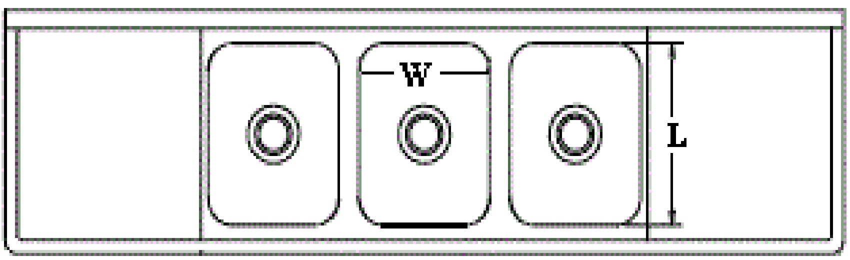
E. Warewashing Machine Conveyor Pre-rinse = *Use manufacturer's flow rate in GPH for specific make and model of warewashing machine*

F. Hand Operated Pre-rinse Spray* hot water demand in GPH= *45 GPH X number of units to be installed*

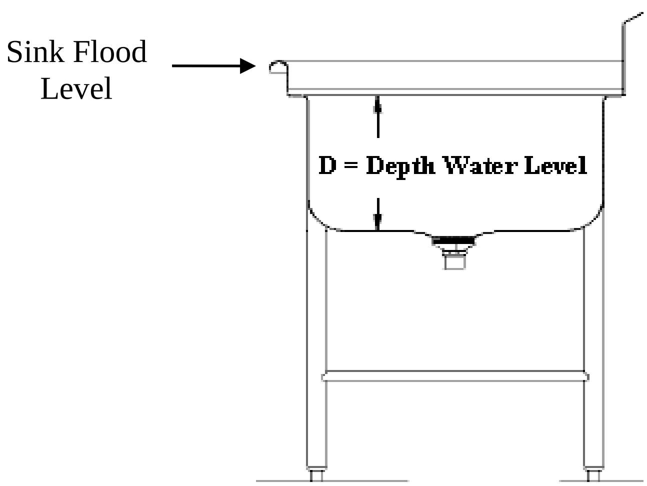
G. Hose Reels = *10 GPH X number of units to be installed*

Illustration K-1
Measuring the Volume of Vats of a Compartmented Sink

Top View Looking Down



L = Length of Compartment in Inches
W = Width of Compartment in Inches



Notes:

Take measurements from inside the compartment.

Volume of One Vat = Length (L) inches × Width (W) inches × Depth (D) inches = Cubic Inches

2. (Continued):

Cubic Inches × Number of Vats (or Compartments) = Combined Volume of Compartmented Sink in Cubic Inches

Combined Volume of Compartmented Sink in Cubic Inches × .003255 Cubic Inches per Gallon = Total Volume of Compartmented Sink in Gallons

Conversion Factor (.003255 in³/gallon) = Overall 75% reduction of hot water usage allowance for equipment and utensils submerged within vats.

H. Hose Bibb used for cleaning = *35 GPH*

I. Shower* = 35 *GPH X number of units to be installed*

J. Other = Manufacturer's Specification Sheets

K. * A hot water demand reduction may be calculated for water saving devices used on hand operated pre-rinse sprayers, handwashing sinks and showers by utilizing the calculations in 3. Calculations - A. Water Saving Devices.

3. *Calculations*:

A. *Water Saving Devices*[10]:

a. Obtain manufacturer's flow rate for each device. The manufacturer's flow rate must be less than what is listed below to be considered:

i. Hand operated pre-rinse sprayers with flow rate less than 3.5 GPM standard flow rate.

Manufacturer: ______________________; Model#: _________________

Manufacturer's Flow Rating: __________________ GPM

ii. Handwashing sink faucet or aerator with flow rate less than 2.2 GPM standard flow rate.

Manufacturer: ______________________; Model#: _________________

Manufacturer's Flow Rating: __________________ GPM

[10] Reference Source: Pages 18 and 19, Food Establishment Specification Form, Tri-County Health Department, Greenwood Village, CO 8011 as reference from within student course materials of the current Food and Drug Administration (FDA)'s Plan Review Course #FD207.

iii. Shower head with flow rate less than 2.5 GPM standard flow rate.

Manufacturer: ______________________; Model#: _________________

Manufacturer's Flow Rating: __________________ GPM

3. Calculations: A. Water Saving Devices: (Continued)

b. Use the following equation to determine the *reduced hourly hot water demand* for each of the three types of fixtures listed above:

$(A \times B) \div C = D$, where:

A = *Manufacturer's Flow Rate*
B = *Water use value from Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH)*
C = *GPM standard flow rate*
D = *New water use value to substitute for that given in Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH)*

<u>For example</u>:

A handwashing sink that has an aerator with a *manufacturer's flow rate of <u>0.5</u>*:

Manufacturer: <u>Watts</u>; Model #: <u>66B</u>
Manufacturer's Flow Rate: *<u>0.5</u> GPM*

Where:

A = *0.5 GPM*;
B = *5 GPH*;
C = *2.2 GPM*;
D = the New Value to substitute that in Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH); and
A = *0.5 GPM is less than the 2.2 GPM standard flow rate given in statement 3 A a ii above*.

$(0.5\ GPM \times 5\ GPH) \div 2.2\ GPM = \underline{\underline{1.14\ GPH}}$

Therefore, in Table K-1, *the 5 GPH value* for the Handwashing Sinks (including restrooms) would be *<u>replaced with 1.14 GPH</u>* as the value to calculate the Peak Hourly Hot Water Demand for all Handwashing Sinks located within the establishment.

B. *__Peak Hourly Hot Water Demand__:* The following Table K-1 "Peak Hourly Hot Water Demand in GPH" is to be used to calculate the maximum hourly demand per each type of fixture or equipment to be installed. These figures will be used to calculate the BTU or KW capacity of the water heating equipment:

Table K-1 - Peak Hourly Hot Water Demand Per Fixture in Gallons Per Hour[11]

Units		**Peak Hourly Hot Water Demand in GPH**
Food Preparation Sink Compartments	=	5 GPH *(each)*
Handwashing Sinks (including toilet rooms)*	=	5 GPH
Mop/Utility Sinks	=	10 GPH
Clothes Washer	=	15 GPH
Hose Reel[12]	=	10 GPH
Hose Bibb used for cleaning	=	35 GPH
Hand Operated Pre-rinse Spray[13]*	=	45 GPH
Warewashing Machine Conveyor Pre-rinse†	=	Manufacturer Specification Sheets
Showers*	=	14 GPH
Other	=	Manufacturer Specification Sheets

Warewashing sinks & Utensil Soak Sinks GPH = sink comp. size inch^3 X # of compt. X .003255 inch^3/gallon*

Note[1]: .003255 inch^3/gallon provides a 75% compartment fill to compensate for mass of utensils and equipment.
Note[2]: If single-service eating and drinking utensils, *use 80% of the computed warewashing sink or utensil soak sink's volume capacity*.
Note[3]: Formula for all compartmented sinks used to submerge equipment and utensils as part of the cleaning and/or sanitizing process.

Mechanical warewashing machine GPH = 70% of "final rinse usage" found on manufacturer's specification sheet (i.e. cut sheet)

† Use manufacturer's flow rate in GPH for specific make and model of warewashing machine.

* A hot water demand reduction may be calculated for water saving devices used on hand operated pre-rinse sprayers, handwashing sinks and showers by utilizing the calculations in subsection 3 A "Water Saving Devices".

[11] Source: Page 40, Section 5 – WATER SUPPLY AND SEWAGE DISPOSAL – current 2008 FDA Plan Review for Food Establishments guidance document and Page 18, Food Establishment Specification Form, Tri-County Health Department, Greenwood Village, CO 8011 as reference from within the current Food and Drug Administration (FDA)'s Plan Review Course #FD207.
[12] See Illustration K-3 for an example of Hose Reel.
[13] See Illustration K-3 for an example of a Hand Operated Pre-rinse Spray.

D. *"Restaurant A" Example Calculations for BTU's and KW's*[14]: Once GPH has been calculated for each piece of equipment and fixture utilizing hot water, the BTU, if gas fired water heater, or KW, if electric water heater, must be calculated to determine the required capacity for the establishment's water heating equipment. See the following examples:

Formula to calculate the BTU's needed for gas hot water heaters:

$$\text{Required BTU's} = \frac{\text{Gallons per hour of water X Temperature rise X 8.33 Pounds per gallon}}{\text{.75 (Operating efficiency)*}}$$

**Note: Use manufacturer's equipment efficiency rating, if available.*

Formula to calculate the KW's needed for electric hot water heaters:

$$\text{Required KW's} = \frac{\text{Gallons per hour of water X Temperature rise X 8.33 Pounds per gallon}}{\text{3412 (BTU's per KW)}}$$

E. *Determining Tank Water Heater Capacity*: Once either BTU's or KW's have been calculated for each piece of equipment and fixture utilizing hot water, the BTU, if gas fired water heater, or KW, if electric water heater, must be added together to determine the required capacity for the establishment's water heating equipment.

F. *Common Mistakes With Sizing Electric Water Heaters*[15]: A common mistake with electric water heaters is the ordering and installing of a water heater with an upper element of 4500 watts, a bottom element of 4500 watts, and a total connected (or maximum) wattage of 4500 watts. On such a water heater, only one element is operating at any one time. Many individuals do not observe the total connected wattage and assume that because each of the elements is 4500 watts their water heater has an input rating of 9000[16] watts. Water heater manufacturers have specific procedures for rewiring an electric water heater so that the upper and lower elements are operating simultaneously. Some manufacturers only permit rewiring in the factory. Field modifications will normally void warranties and any listings that the unit comes with. Prior to acceptance of a field modified water heater, the local health agency should ensure that the modifications were performed according to the manufacturer's recommendations and with the approval of the local building officials. The data plate on a field modified water heater must be changed to reflect the total connected wattage rating with both elements operating simultaneously.

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14 Source: Page 50 in Section 5 – WATER SUPPLY AND SEWAGE DISPOSAL – 2008 FDA Plan Review for Food Establishments guidance document.

15 Most residential water heaters fall within this criteria.

16 9000 watts is equal to 9 KW (1KW = 1000 watts)

G. *Example Calculations:* Two food service plan review requests are received by the local Health Authority. Upon examination of food service plans and specifications for "Restaurant A", the Reviewer takes note of the proposed units of fixtures and equipment to be installed. Within specifications noted within the plans, it is discovered that a warewashing machine will be used to support the use of multi-use eating and drinking utensils and that water saving devices will not be installed on fixtures. However, review of the plans and specifications for "Restaurant B" reveal a different scenario. They are similar to that of "Restaurant A" but, they do not include the warewashing machine. Another variation from "Restaurant A"'s plans and specifications is that "Restaurant B" plans and specifications also specify water saving devices to be installed on all handwashing sinks, hand operated pre-rinse sprays, and two shower heads – one male and one female. Additionally, the plans noted that "Restaurant B" will be using all single-service eating and drinking utensils. Using Table K-1 , calculate the peak demand in gallons per hour (GPH) for each unit of fixture and equipment for each proposed set of plans and specifications for "Restaurant A" and "Restaurant B":

***"Restaurant A" Water Heater Sizing Verification*:**

Step #1: Determine the maximum hourly hot water demand for each type of fixture in gallons per hour *(or MHHWDTF-GPH)* by using peak hourly hot water demand values for each fixture and equipment from Table K-1 on page K10:

Chart K-1 "Restaurant A"
Maximum Hourly Hot Water Demand Per Type of Fixture in Gallon Per Hour
Or (MHHWDTF-GPH)

Units	**# of Units**		**Peak Hourly Hot Water Demand in GPH**		***MHHWDTF-GPH***
Three-Comp. Warewashing Sink	1	×	24 × 24 × 14 (***Note #1***)	=	***79***
Two-Comp. Food Preparation Sink	2	×	10 GPH (2 × 5 GPH)	=	*20*
Handwashing Sinks (including restrooms)	5	×	5 GPH	=	*25*
Hand Operated Pre-rinse Spray	1	×	45 GPH	=	*45*
Warewashing Machine	1	×	***Note #2***	=	***52***
Mop/Utility Sink	1	×	10 GPH	=	*10*
Clothes Washer	1	×	15 GPH	=	*15*
Hose Reel	2	×	10 GPH	=	*20*

Note #1:
Warewashing Sink GPH = sink compartment size (inch^3) × # of compartments × .003255 inch^3 (cubic inches) per gallon × number of units to be installed.
Compartment measurement = Length × Width × Depth = volume in cubic inches

GPH = (24" × 24" × 14") × 3 compartments × .003255 inch^3 per gallon × 1 unit = ***79 GPH***

Note #2:
Warewashing Machine – Hobart AM-14 *Final Rinse GPH = 74*
GPH = *74 GPH Final Rinse* (from manufacturer cut sheet) × *70% (or .70)* = 51.8 (or ***52 GPH***)

Step #2: Calculate BTU's and KW's[17] using *MHHWDTF-GPH Chart K-1calculated in Step #1*:

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
3 – Comp. Warewashing sink	**79**	110ºF	110ºF - 40ºF = 70ºF

79 (gph) X 70ºF temperature rise X 8.33 = *61,419.87 ~ 61,420 BTU's*
.75 (operating efficiency)

79 (gph) X 70ºF temperature rise X 8.33 = 13.500 ~ *14.0 KW's*
3412 (BTU's per KW)

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Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Hand sink	25	100ºF	100ºF - 40ºF = 60ºF

25 (gph) X 60ºF temperature rise X 8.33 = *16,660 BTU's*
.75 (operating efficiency)

25 (gph) X 60ºF temperature rise X 8.33 = 3.662 ~ *4.0 KW's*
3412 (BTU's per KW)

****

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Two comp. Prep Sink	20 = (2 X 5 gph = 10gph) X 2	110ºF	110ºF - 40ºF = 70ºF

20 (gph) X 70ºF temperature rise X 8.33 = *15,549 BTU's*
.75 (operating efficiency)

20 (gph) X 70ºF temperature rise X 8.33 = 3.417 ~ *3.42 KW's*
3412 (BTU's per KW)

[17] Source: Page 50 in Section 5 – WATER SUPPLY AND SEWAGE DISPOSAL – 2008 FDA Plan Review for Food Establishments guidance document.

Step #2: Calculate BTU's and KW's using *MHHWDTF-GPH Chart K-1 calculated in Step #1*: (Continued)

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Pre-rinse Spray	45	110ºF	110ºF - 40ºF = 70ºF

$$\frac{\text{45 (gph) X 70ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = \underline{\textit{34,986 BTU's}}$$

$$\frac{\text{45 (gph) X 70ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = 7.690 \sim \underline{\textit{8.0 KW's}}$$

****

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Fresh Hot Water Mechanical Warewashing Machine	**52**	140ºF	140ºF - 40ºF = 100ºF

$$\frac{\text{52 (gph) X 100ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = \underline{\textit{57,755 BTU's}}$$

$$\frac{\text{52 (gph) X 100ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = 12.695 \sim \underline{\textit{13.0 KW's}}$$

****

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Mop Sink	10	110ºF	110ºF - 40ºF = 70ºF

$$\frac{\text{10 (gph) X 70ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = \underline{\textit{7,774 BTU's}}$$

$$\frac{\text{10 (gph) X 70ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = 1.708 \sim \underline{\textit{2.0 KW's}}$$

Step #2: Calculate BTU's and KW's using *MHHWDTF-GPH Chart K-1 calculated in Step #1*: (Continued)

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Clothes Washer	15	110ºF	110ºF - 40ºF = 70ºF

$$\frac{15\text{ (gph) X 70ºF temperature rise X 8.33}}{.75\text{ (operating efficiency)}} = \underline{\textit{11,662 BTU's}}$$

$$\frac{15\text{ (gph) X 70ºF temperature rise X 8.33}}{3412\text{ (BTU's per KW)}} = 2.563 \sim \underline{\textit{3.0 KW's}}$$

****

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Hose Reel	20 = 2 X 10 gph	110ºF	110ºF - 40ºF = 70ºF

$$\frac{20\text{ (gph) X 70ºF temperature rise X 8.33}}{.75\text{ (operating efficiency)}} = \underline{\textit{15,549 BTU's}}$$

$$\frac{20\text{ (gph) X 70ºF temperature rise X 8.33}}{3412\text{ (BTU's per KW)}} = 3.417 \sim \underline{\textit{3.42 KW's}}$$

****

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Booster Heater[18]	**52**	180ºF	180ºF - 140ºF = 40ºF

$$\frac{52\text{ (gph) X 40ºF temperature rise X 8.33}}{.75\text{ (operating efficiency)}} = 23{,}101.87 \sim \underline{\textit{23,102 BTU's}}$$

$$\frac{52\text{ (gph) X 40ºF temperature rise X 8.33}}{3412\text{ (BTU's per KW)}} = 5.078 \sim \underline{\textit{5.1 KW's}}$$

[18] A booster heater must be provided and sized to supply an additional *23,102 BTU's or 5.1 KW's* in order to achieve the minimum 180ºF at the final fresh hot water rinse manifold.

Step #3: Determine Tank Water Heater Capacity

Chart K-2 - Tank Water Heater Capacity from Step #2

Unit	BTU's	KW's
3-Comp. Warewashing Sink--------------------------	61,420	14.00
Hand Sink---	16,660	4.00
2-Comp. Prep. Sink------------------------------------	15,549	3.42
Pre-rinse Spray---	34,986	8.00
Chemical/Mechanical Warewashing Machine------	57,755	13.00
Mop Sink--	7,774	2.00
Clothes Washer---	11,662	3.00
Hose Reel---	15,549	3.42
REQUIRED WATER HEATER CAPACITY =	***221,355***	***50.84***

Conclusion: From totals calculated in Chart K-2, a water heater with the BTU rating (or capacity) *of 221,355 BTU's, if gas fired*, or one with a KW rating (or capacity) of *50.84 ~ 51 KW's, if electric*, will be required in order to meet the peek hot water demand of the proposed food service establishment. In addition, a booster heater for the hot water sanitizing, warewashing machine must be provided and sized to supply an additional *23,102 BTU's or 5.1 KW's*. The booster heater is necessary in order to boost the required gallons per hour demand an additional 40ºF to attain the required minimum 180ºF final rinse temperature. *See Illustration K-8 Booster Heater General Operation.*

***<u>"Restaurant B" Water Heater Sizing Verification</u>*:**

Step #1, *<u>Water Saving Device Reductions</u>*: Determine hot water reductions allowable for fixtures listed in 3 A Water Saving Devices on page K8 of this Section:

A. Obtain manufacturer's flow rate for each device. The manufacturer's flow rate must be less than what is listed below to be considered:

- Hand operated pre-rinse sprayers with flow rate less than 3.5 GPM standard flow rate.

  Manufacturer: <u>Delta</u> Model#: <u>M42A</u>

  Manufacturer's Flow Rating: *<u>2.2</u> GPM*

- Handwashing sink faucet or aerator with flow rate less than 2.2 GPM standard flow rate.

  Manufacturer: <u>Delta</u>; Model#: <u>D46420Z</u>

  Manufacturer's Flow Rating: *<u>1.5</u> GPM*

- Shower head with flow rate less than 2.5 GPM standard flow rate.

  Manufacturer: <u>Monet</u>; Model#: <u>Z120E</u>

  Manufacturer's Flow Rating: *<u>2.0</u> GPM*

B. Using the following equation, the *reduction in the hourly hot water demand* for each of the three types of fixtures listed above is determined by the following calculations:

$$(A \times B) \div C = D, \text{ where:}$$

A = *Manufacturer's Flow Rate*
B = *Water use value from Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH)*
C = *GPM standard flow rate*
D = *New water use value to substitute for that given in Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH)*

Hand Operated Pre-rinse Spray with flow rate = 2.2 GPM:

Use Formula *(A × B) ÷ C = D* where:

A = *2.2 GPM*;
B = 4*5 GPH*;
C = *3.5 GPM*;
D = the New Value to substitute that in Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH); and
A = 2.2 *GPM is less than the 3.5 GPM standard flow rate given A above*.

New Peak Hourly Demand in GPH to substitute the value for Hand Operated Pre-rinse Sprays in Table K-1is (2.2 GPM ×4 5 GPH) ÷ 3.5 GPM = 28.3 GPH

Handwashing sink faucet or aerator with flow rate = 1.5 GPM

Use Formula *(A × B) ÷ C = D* where:

A = 1.5 *GPM*;
B = *5 GPH*;
C = *2.2 GPM*;
D = the New Value to substitute that in Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH); and
A = 1.5 *GPM is less than the 2.2 GPM standard flow rate given A above*.

New Peak Hourly Demand in GPH to substitute the value for Hand Operated Pre-rinse Sprays in Table K-1is (1.5 GPM × 5 GPH) ÷ 2.2 GPM = 3.41 GPH

Shower head with flow rate = 2.0 GPM

Use Formula *(A × B) ÷ C = D* where:

A = 2.0 *GPM*;
B = *14 GPH*;
C = *2.5 GPM*;
D = the New Value to substitute that in Table K-1 on page K10 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH); and
A = 2.0 *GPM is less than the 2.5 GPM standard flow rate given A above*.

New Peak Hourly Demand in GPH to substitute the value for Hand Operated Pre-rinse Sprays in Table K-1 on page K10 is (2.0 GPM × 14 GPH) ÷ 2.5 GPM = 11.2 GPH

Step #2: Determine the maximum hourly hot water demand for each type of fixture in gallons per hour *(or MHHWDTF-GPH)* by using peak hourly demand values for each fixture and equipment. *See Table K-1* on page K10 in this Section as a reference:

Chart K-3 "Restaurant B"
Maximum Hourly Hot Water Demand Per Type of Fixture in Gallon Per Hour Or (MHHWDTF-GPH)

Units	# of Units		Peak Hourly Hot Water Demand in GPH		***MHHWDTF-GPH***
Three-Comp. Warewashing Sink	1	×	24 × 24 × 14 (***Note #1***)	=	***63.2****
Two-Comp. Food Preparation Sink	2	×	10 GPH (2 × 5 GPH)	=	20
Handwashing Sinks***** (including restrooms)	5	×	***3.41 GPH****	=	***17.05***
Hand Operated Pre-rinse Spray*****	1	×	***28.3 GPH****	=	**28.3**
Mop/Utility Sink	1	×	10 GPH	=	10
Clothes Washer	1	×	15 GPH	=	15
Hose Reel	2	×	10 GPH	=	20
Shower*****	2	×	***11.2 GPH****	=	**22.4**

Note #1:
Warewashing Sink GPH = sink compartment size (inch^3) × # of compartments × .003255 inch^3 (cubic inches) per gallon × number of units to be installed.
Compartment measurement = Length × Width × Depth = volume in cubic inches

GPH = (24" × 24" × 14") × 3 compartments × .003255 inch^3 per gallon × 1 unit = *79 GPH*
*Because *single-service eating and drinking utensils will be utilized*, 80% of 79 GPH will be used for MHHWDTF: 79 GPH × 80% (or .80) = ***63.2 GPH****

* Substitute Peak Hourly Hot Water Demand values calculated in Step #1for Water Saving Devices.

Step #3: Calculate BTU's and KW's[19] using *MHHWDTF-GPH Chart K-3 calculated in Step #2*:

Equipment	MHHWDTF-GPH Demand from Chart K-3	Temperature Required	Temperature Rise
3 – Comp. Warewashing sink	***63.2***	110ºF	110ºF - 40ºF = 70ºF

$$\frac{\textbf{63.2}\text{ (gph) X 70ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = 49{,}135.89 \sim \textit{49,136 BTU's}$$

$$\frac{\textbf{63.2}\text{ (gph) X 70ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = 10.800 \sim \textit{11 KW's}$$

[19] Source: Page 50 in Section 5 – WATER SUPPLY AND SEWAGE DISPOSAL – 2008 FDA Plan Review for Food Establishments guidance document.

Step #2: Calculate BTU's and KW's using *MHHWDTF-GPH Chart K-3 calculated in Step #1*: (Continued)

Equipment	MHHWDTF-GPH Demand from Chart K-3	Temperature Required	Temperature Rise
Hand sink	***17.05***	100ºF	100ºF - 40ºF = 60ºF

$$\frac{17.05\text{ (gph) X }60^{\circ}\text{F temperature rise X }8.33}{.75\text{ (operating efficiency)}} = \underline{\textit{11,362 BTU's}}$$

$$\frac{17.05\text{ (gph) X }60^{\circ}\text{F temperature rise X }8.33}{3412\text{ (BTU's per KW)}} = 2.495 \sim \underline{\textit{2.5 KW's}}$$

****

Equipment	MHHWDTF-GPH Demand from Chart K-3	Temperature Required	Temperature Rise
Two comp. Prep Sink	20 = (2 X 5 gph = 10gph) X 2	110ºF	110ºF - 40ºF = 70ºF

$$\frac{20\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{.75\text{ (operating efficiency)}} = \underline{\textit{15,549 BTU's}}$$

$$\frac{20\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{3412\text{ (BTU's per KW)}} = 3.417 \sim \underline{\textit{3.42 KW's}}$$

****

Equipment	MHHWDTF-GPH Demand from Chart K-3	Temperature Required	Temperature Rise
Hand Operated Pre-rinse Spray	***28.3***	110ºF	110ºF - 40ºF = 70ºF

$$\frac{28.3\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{.75\text{ (operating efficiency)}} = \underline{\textit{22,002 BTU's}}$$

$$\frac{28.3\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{3412\text{ (BTU's per KW)}} = 4.836 \sim \underline{\textit{5.0 KW's}}$$

Step #2: Calculate BTU's and KW's using *MHHWDTF-GPH Chart K-3 calculated in Step #1*: (Continued)

Equipment	MHHWDTF-GPH Demand from Chart K-3	Temperature Required	Temperature Rise
Mop Sink	10	110ºF	110ºF - 40ºF = 70ºF

$$\frac{10\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{.75\text{ (operating efficiency)}} = 7{,}774.66 \sim \underline{\textit{7,775 BTU's}}$$

$$\frac{10\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{3412\text{ (BTU's per KW)}} = 1.708 \sim \underline{\textit{2.0 KW's}}$$

****

Equipment	MHHWDTF-GPH Demand from Chart K-3	Temperature Required	Temperature Rise
Clothes Washer	15	110ºF	110ºF - 40ºF = 70ºF

$$\frac{15\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{.75\text{ (operating efficiency)}} = \underline{\textit{11,662 BTU's}}$$

$$\frac{15\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{3412\text{ (BTU's per KW)}} = 2.563 \sim \underline{\textit{3.0 KW's}}$$

****

Equipment	MHHWDTF-GPH Demand from Chart K-3	Temperature Required	Temperature Rise
Hose Reel	20 = 2 X 10 gph	110ºF	110ºF - 40ºF = 70ºF

$$\frac{20\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{.75\text{ (operating efficiency)}} = \underline{\textit{15,549 BTU's}}$$

$$\frac{20\text{ (gph) X }70^{\circ}\text{F temperature rise X }8.33}{3412\text{ (BTU's per KW)}} = 3.417\sim \underline{\textit{3.42 KW's}}$$

Step #2: Calculate BTU's and KW's using *MHHWDTF-GPH Chart K-3 calculated in Step #1*: (Continued)

Equipment	MHHWDTF-GPH Demand from Chart K-3	Temperature Required	Temperature Rise
Shower Head	***22.4*** = 2 X 11.2 gph	120ºF	120ºF - 40ºF = 80ºF

$$\frac{22.4\text{ (gph) X } 80^{\circ}\text{F temperature rise X } 8.33}{.75\text{ (operating efficiency)}} = 19{,}903.15 \sim 19{,}903\text{ BTU's}$$

$$\frac{22.4\text{ (gph) X } 80^{\circ}\text{F temperature rise X } 8.33}{3412\text{ (BTU's per KW)}} = 4.374 \sim 4.4\text{ KW's}$$

Step #4: Determine Tank Water Heater Capacity

Chart K-4 - Tank Water Heater Capacity from Step #2

Unit	BTU's	KW's
3-Comp. Warewashing Sink--------------------------	***49,136***	***11.00***
Hand Sink---	***11,362***	***2.50***
2-Comp. Prep. Sink------------------------------------	15,549	3.42
Hand Operated Pre-rinse Spray----------------------	***22,002***	***5.00***
Mop Sink--	7,775	2.00
Clothes Washer--	11,662	3.00
Hose Reel---	15,549	3.42
Shower ---	***19,903***	***4.40***
REQUIRED WATER HEATER CAPACITY =	***152,938***	***34.74***

Conclusion: From totals calculated in Chart K-4, a water heater with the BTU rating (or capacity) of *152,938* BTU's, if gas fired, or one with a KW rating (or capacity) of *34.74* KW's, if electric, will be required in order to meet the peek hot water demand of the proposed food service establishment. Because single-service eating and drinking articles will be utilized during service, a warewashing machine will not be necessary and likewise, the volume of hot water demand for manual warewashing will be reduced as well. Hot water demand is further reduced with the addition of water saving devices installed on handwashing sinks, hand operated pre-rinse sprays, and shower heads.

III. On-Demand (Tankless) Water Heating System Evaluation and Verification:

1. *Calculate the Total Hot Water Demand Flow Rate in Gallons Per Minute (GPM)*: If the heater manufacturer has sizing, installation and system design criteria, then their criteria may be used as long as they have been previously submitted and approved by the local Health Authority in consultation with the Department. Otherwise, use the following Table K-2 to calculate peak hot water demand:

Table K-2 Total Hot Water Demand Flow Rate

Plumbing Fixture	Hot Water Usage (gallons per minute)	Number of Fixtures	Hot Water Demand Flow Rate in Gallons Per Minute
Example: Warewashing Machine †Hobart AM14	8.0	1	(8.0 × 1) = 8.0
Example: Handsink(s)	0.5	4	(0.5 × 4) = 2.0
3-Compartment Warewashing Sink*	2.0 for each faucet		
3-Compartment Bar Sink*	2.0 for each faucet		
Utensil Soak Sink	1.0		
Warewashing Machine†			
Warewashing Machine Conveyor Pre-rinse†			
Clothes Washer	2.0		
Hand Operated Pre-rinse Sprayer*	2.0		
Food Preparation Sink(s)*	1.0		
Handwashing Sinks (including restrooms)*	0.5		
Mop/Utility Sinks	2.0		
Garbage Can Washers	1.0		
Shower Heads*	1.0		
Hose Bibb used for cleaning	5.0		
Total Hot Water Demand Flow Rate (GPM) Required:			

* A flow rate reduction may be used for low flow water faucets installed on 3-compartment sinks, hand operated pre-rinse sprayers, food preparation sinks, handwashing sinks and shower heads by entering the manufacturer's flow rate listed for the faucet or faucet's aerator. Flow rate reductions may be applied if manufacturer's flow rates are less than those shown above.

† Use manufacturer's flow rate in GPM for specific make and model of warewashing machine.

2. *Calculate the maximum hot water flow rate for the establishment*: The thermal efficiency of the water heating units must be adjusted for altitude. The altitude adjustment is *4% per 1000 feet of elevation above sea level, or 20% at 5000 feet above sea level.* The designer of the on-site demand water heating system will need to provide altitude data for the site of the proposed food service establishment to be used in the following calculations:

   Use the following equation to *determine the establishment's maximum flow rate in GPM:*

   (0.04 × ________________ ÷ 1000) + 1 = ____________________
   Elevation of facility — adjustment factor

   ____________________ × ____________________ = ____________________
   Adjustment factor × total hot water demand flow rate calculated in Table K-2 page K23 = maximum GPM hot water flow usage

   Use calculated maximum GPM hot water flow usage value in this equation to determine the minimum number of heating units that will be required as determined from the equation in "3" below.

3. *Determine the number of heating units* that will be needed to meet the required maximum hot water flow rate for the establishment:

   ______________________ ÷ ______________________ = ______________________
   Maximum GPM hot water Flow usage calculated in "2" above ÷ manufacturer's flow rate in GPM @100°F or 80°F rise** = number of heating units required*

   *Multiple units must be installed and plumbed to operate in a parallel configuration.
   **If there are no high temperature dishwashing machine or other fixtures requiring input water temperatures of 140°F (100°F rise) or more, then 80°F rise can be used.

4. *Storage Tank Sizing*: If a warewashing machine(s) is to be installed, the on-demand water heating system must include a storage tank to eliminate lag in availability of hot water at the warewashing machine. If not, the effects of water temperature lag between start-up time of the unit and the point when hot water is received at the warewashing machine will cause warewashing machines to operate outside of their designed operating parameters. As a result, eating and drinking utensils and equipment placed within them will not be properly cleaned and sanitized as required by DPH Rule 511-6-1-.05. Therefore, the storage tank must be at least 25 gallons or at least 25% of the gallons per hour (GPH) demand of the warewashing machine(s). The larger value of the two is the required storage tank size. Use the following equations to calculate on-demand water heating system storage tanks:

Dishwashing Machine*

Manufacturer: _________________ Model Number: ______________
Gallons Per Hour Water Consumption: ________ × 0.25 = ___________________
Storage tank capacity in gallons
Calculated Storage Tank Capacity: ___________ vs. 25 Gallon Storage Tank
Enter the larger of the two: ______________ Required Storage Tank Capacity**

* High temperature, heat sanitizing warewashing machines must be provided with a separate booster heater. Use of an instantaneous unit is not allowed for use as a booster heater.

** The storage tank must be installed in the hot water supply line located between the heater unit(s) and the hot water distribution line. A recirculation line and aquastat (water thermostat) must be installed at the storage tank to assure the water in the tank remains at the appropriate temperature (120°F to 140°F). The recirculation line must be connected between the storage tank and the cold water supply line at the heater unit(s).

5. *Example Calculations:* A food service plan review requests was received by the local Health Authority. Upon examination of the submitted food service plans and specifications for "Restaurant X", the Reviewer takes note of the proposed units of fixtures and equipment to be installed. Within specifications noted on the plans, it is discovered that a warewashing machine will be used to support the use of multi-use eating and drinking utensils. In addition, low flow water faucets will be installed on a 3-compartmented warewashing sink, a hand operated pre-rinse sprayer, food preparation sinks, handwashing sinks and showers. Further examination of manufacturer's specification sheets revealed the following flow rates:

Manufacturer's Specifications "Restaurant X"

Unit of Equipment or Fixture	Gallons Per Minute
3-Compartmented Warewashing Sink & Bar Sink	1.5 @ faucet
Warewashing Machine Hobart AM-14	8.0
Hand Operated Pre-rinse Spray	1.0 @ spray
Food Preparation Sink	0.5 @ faucet
Handwashing Sink (including restrooms)	0.4 @ faucet
Mop/Utility Sink	1.0 @ faucet
Showers	0.5 @ shower head

Using the manufacturer's specifications for "Restaurant X" and Table K-2 Hot Water Demand Flow Rate, calculate the required total hot water demand flow rate or "Restaurant X":

Step #1; Calculate Total Hot Water Demand in Gallons Per Minute:

Note: Substitute the Manufacturer's Specifications for flow rates for fixtures and equipment for that given in Table K-2 on page K23 of this Section.

Chart K-5 Total Hot Water Demand Flow Rate

Plumbing Fixture	Hot Water Usage (gallons per minute)	Number of Fixtures	Hot Water Demand Flow Rate in Gallons Per Minute
Example: Warewashing Machine †Hobart AM14	8.0	1	(8.0 × 1) = 8.0
Example: Handsink(s)	0.5	4	(0.5 × 4) = 2.0
3-Compartment Warewashing Sink*	1.5 for each faucet	2	(1.5 × 2) = 3.0
3-Compartment Bar Sink*	1.5 for each faucet	1	1.5
Utensil Soak Sink	1.0	1	1.0
Warewashing Machine†	8.0	1	8.0
Warewashing Machine Conveyor Pre-rinse†	n/a		
Clothes Washer	2.0	1	2.0
Hand Operated Pre-rinse Sprayer*	1.0	1	1.0
Food Preparation Sink(s)*	0.5	1	0.5
Handwashing Sinks (including restrooms)*	0.4	5	(0.4 × 5) = 2.0
Mop/Utility Sinks	1.0	1	1.0
Garbage Can Washers	1.0	1	1.0
Shower Head*	0.5	2	(0.5 × 2) = 1.0
Hose Bibb used for cleaning	5.0	1	5.0
Total Hot Water Demand Flow Rate (GPM) Required:			***27***

* A flow rate reduction can be used for low flow water faucets installed on 3-compartment sinks, hand operated pre-rinse sprayers, food preparation sinks, handwashing sinks and shower heads by entering the manufacturer's flow rate listed for the faucet or faucet's aerator.

† Use manufacturer's flow rate in GPM for specific make and model of warewashing machine.

Step #2; _Calculate the maximum hot water flow rate for the establishment_:

Note: The planner states within the proposed food service establishment plans that the site of the proposed establishment is at an altitude of 2000 feet above sea level.

Use the following equation to _determine the establishment's maximum flow rate in GPM:_

(0.04 × ___2000___________ ÷ 1000) + 1 = _______1.08__________
Elevation of facility — adjustment factor

_______1.08_________ × ________***27***__________ = _______***29.16***_________
Adjustment factor — total hot water demand flow rate calculated in Chart K-5 on page K26 — maximum GPM hot water flow usage

Step #3; _Determine the number of heating units_ that will be needed to meet the required maximum hot water flow rate for the establishment:

Heater Specifications from the proposed food service establishment plans:

Manufacturer: X Factor Model Number: X1A001

Flow Rate in Gallons Per Minute (GPM) at 100°F rise: 3.0 GPM
BTU Rating: 15,000 BTUs

_____***29.16***_________ ÷ ___________3.0_________ = _____9.72_______ ~ 9.72 or **10 Units**
Maximum GPM hot water Flow usage calculated in Step #2 above — manufacturer's flow rate in GPM @100°F or 80°F rise** — number of heating units required*

*Multiple units must be installed and plumbed to operate in a parallel configuration.
**If there are no high temperature dishwashing machine or other fixtures requiring input water temperatures of 140°F (100°F rise) or more, then 80°F rise can be used.

Step #4; _Storage Tank Sizing:_

Dishwashing Machine*

Manufacturer: ____Hobart_________ Model Number: _AM14_______________
Gallons Per Hour Water Consumption: __**52**____ × 0.25 = _____**13.0**___________
Storage tank capacity in gallons
Calculated Storage Tank Capacity: ___**13.0**________vs. 25 Gallon Storage Tank
Enter the larger of the two: _____**25**_________ Required Storage Tank Capacity

Step # 5; *Booster heater calculation*:

Because the warewashing machine has a fresh rinse, sanitizing final rinse to sanitize food contact surfaces of utensils and equipment placed in it for treatment, an external booster heater would have to be installed. The booster heater would require 140°F water coming into the unit in order for it to boost it to at least the required 180°F sanitizing rinse. In order to properly size the booster heater, you would need to size the unit based on gallons per hour (GPH) to determine the BTUs or KWs input rating of the booster heater. For Example:

Determine GPH:

Warewashing Machine – Hobart AM-14 Final Rinse GPH = 74*
GPH = *74 GPH Final Rinse* (from manufacturer cut sheet) × *70% (or .70)* = 51.8 (or ***52 GPH***)

**Note:* *Figure from Manufacturer's specifications for warewashing machine in gallons per hour.*

Determine BTUs or KWs Capacity Required for Booster Heater to meet the final rinse hot water demand of the warewashing machine:

Equipment	MHHWDTF-GPH Demand from Chart K-1	Temperature Required	Temperature Rise
Hot Water Sanitizing Mechanical Warewashing Machine[20]	52	180°F	180ºF - 140ºF = 40ºF

$$\frac{52\ (\text{gph}) \times 40^{\circ}\text{F temperature rise} \times 8.33}{.75\ (\text{operating efficiency})} = 23{,}101.87 \sim \textit{23,102 BTU's}$$

$$\frac{52\ (\text{gph}) \times 40^{\circ}\text{F temperature rise} \times 8.33}{3412\ (\text{BTU's per KW})} = 5.078 \sim \textit{5.1 KW's}$$

Conclusion:

From the above 4 Steps, it appears that a single, properly installed on-demand water heating unit with a *3.0 GPM flow rate at 100°F rise and a 15,000 BTU rating* ***will not*** be sufficient to meet a total hot water demand flow rate of *27 GPM* for the fixtures and equipment listed within the proposed plans and specifications for "Restaurant X". This means that the tankless or on-demand hot water system will need to be resized to meet the peak hot water demand of the food service establishment. Additionally and because a hot water sanitizing warewashing machine is proposed, a storage take with a capacity of 25 gallons must be include in the installation of the on-demand water heating system. A booster heater rated at 23, 102 BTUs or 5.1 KWs would be required to meet the fresh hot water sanitizing rinse demand of the planned warewashing machine.

[20] A booster heater must be provided and sized to supply the minimum 180ºF at the final fresh hot water rinse manifold. The exception would be if the warewashing machine had a booster heater incorporated in its design – example some under-the-counter warewashers.

Illustration K-2

Manufacturer's Specification Sheets

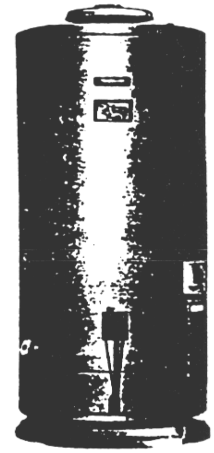
238

AO Smith

CONSERVATIONIST

COMMERCIAL GAS
TANK-TYPE WATER HEATERS
BT-65, 80, 100

LIME TAMER™ MODELS



FEATURES

Meets ASHRAE 90A-1980 (1982 requirements) and California energy codes.

GLASS-LINED TANK — Assures years of rust-free clean hot water.

FULLY AUTOMATIC CONTROLS WITH SAFETY SHUTOFF — Accurate dependable control system requires no electric connections. Fixed automatic gas shutoff device for added safety.

HEAVY GAUGE STEEL JACKET — Finished with baked enamel over bonderized undercoat.

GLASS FIBER INSULATION — Double density insulation. Saves fuel, helps reduce standby heat loss.

CERTIFICATION — Units are design certified by the American Gas Association (Canadian Gas Association for units built in Canada). Meets rigid requirements of the National Sanitation Foundation for 180° hot water service. Certified for installation on combustible flooring.

EASY TO INSTALL — Completely factory assembled. Only gas, water and vent connections need be made. All connections are located in front and top of heaters for ease of installation and service.

DRAFT DIVERTER — Low profile diverter furnished as standard equipment (BT-80 and 100 only).

MAXIMUM WORKING PRESSURE — 150 psi.

HANDHOLE CLEANOUT — On 75 and 100 gallon models. Allows easy tank cleaning.

OTHER FEATURES

• Built-in gas filter and integral dirt leg (propane only) • Magnesium anode protection • Equipped with gas pressure regulator • Integral automatic gas shutoff system prevents excessive water temperature • Factory installed temperature and pressure relief valve • Consult local codes.

FOR UNITS BUILT IN USA

LIMITED WARRANTY OUTLINE

If the tank should leak any time during the first three years, under the terms of the warranty, then A. O. Smith will furnish a replacement heater; installation, labor, handling and local delivery extra. This outline is not a warranty. For complete information, consult the written warranty or A. O. Smith Consumer Products Division.

RECOVERY CAPACITIES

Model	Approx. Gal. Cap.	Type of Gas	Input Rating BTU/HR	Temperature Rise - Degrees F - Gallons Per Hour											
				30	40	50	60	70	80	90	100	110	120	130	140
BT-65	50	Nat. & Prop.	50,000	150	113	90	75	64	56	50	45	41	38	35	32
BT-80	75	Nat. & Prop.	75,100	225	169	135	113	96	85	75	68	61	56	52	48
BT-100	100	Nat. & Prop.	80,000	240	180	144	120	103	90	80	72	65	60	55	51

NOTE. To compensate for the effects of high altitude areas above 2000 feet, recovery capacity should be reduced approximately 4% for every 1000 feet above sea level.

Capacity ratings are actual heater performance at 75% thermal efficiency obtained in A. O. Smith engineering laboratories. A.G.A. ratings are based on an assigned thermal efficiency of 70%. A.G.A. ratings may be obtained by multiplying the above figures by 0.93.

Illustration K-3
Examples: Equipment Providing or Utilizing Hot Water

External Electric Booster Heater

Hose Reel

Warewashing Sink
Hot Water Sanitizing
Compartment Heater

Pre-rinse Spray

Meat Band-Saw
(In-Place Cleaning)

Hot Fresh Water Rinse Sanitizing Warewashing Machine with Built-In Booster Heater

Chemical Sanitizing Warewashing Machine

Illustration K-4

Under-the-Sink Water Heating Alternative to Hot Water Recirculation Systems

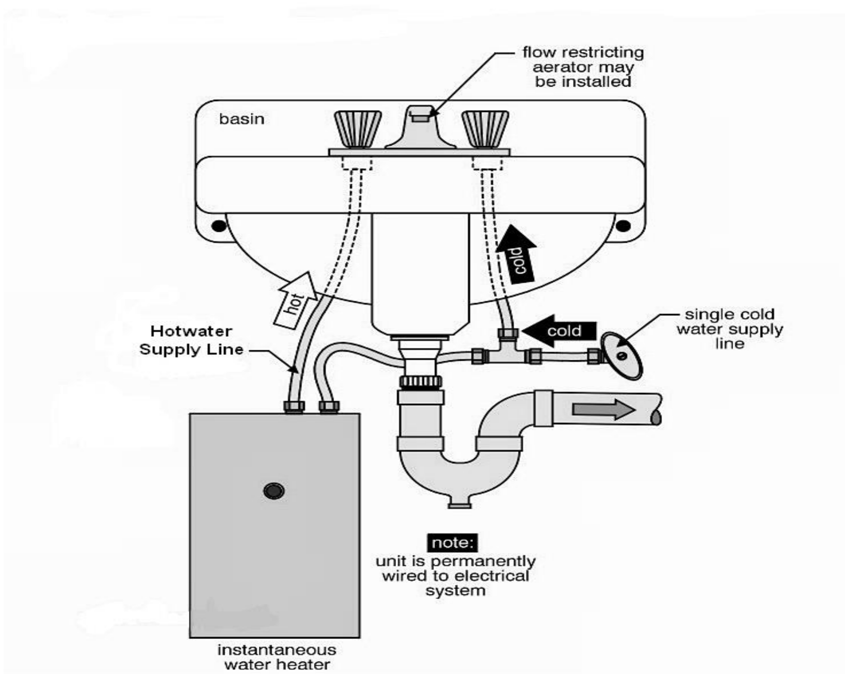


Illustration K-5

On-Demand Water Heating Systems General Operation

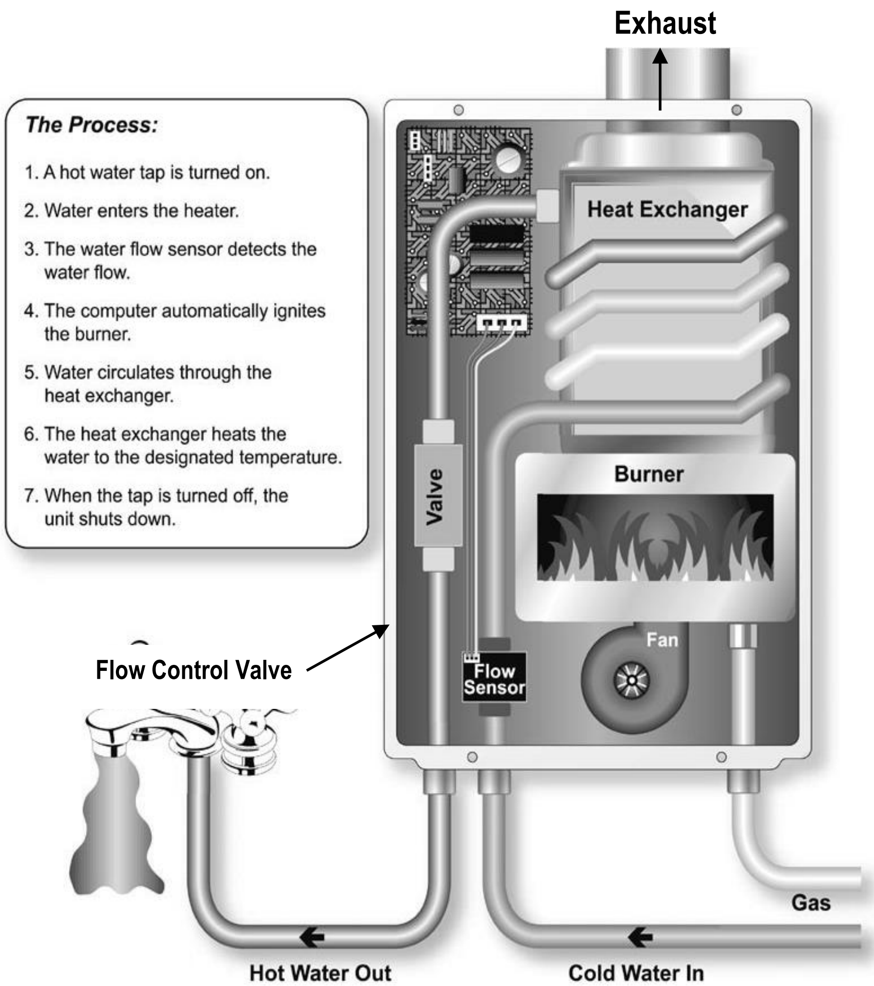


Illustration K-6

Examples of On-Demand Water Heating System Installations

On-Demand Water Heaters in Series

Illustration K-7

On-Demand Water Heating Systems vs. Traditional Storage Tank Type Water Heating Systems

Tankless or
On-Demand Water Heater

They do not have a storage tank and they generate hot water upon demand created by fixtures or equipment. As a result, they do not use energy when idle (or when there is no demand). If not size correctly to the combined flow rates of all installed fixtures and equipment, they are not capable of keeping up with hot water demand, resulting in a shortage of hot water. As a result, there will not be enough hot water to properly wash hands and to operate equipment, such as warewashing machines. Additionally and if not sized correctly, the flow of water at fixtures can be greatly reduced; thereby, reducing the force needed agitation to clean-off debris from objects, such as cleaning hands during handwashing.

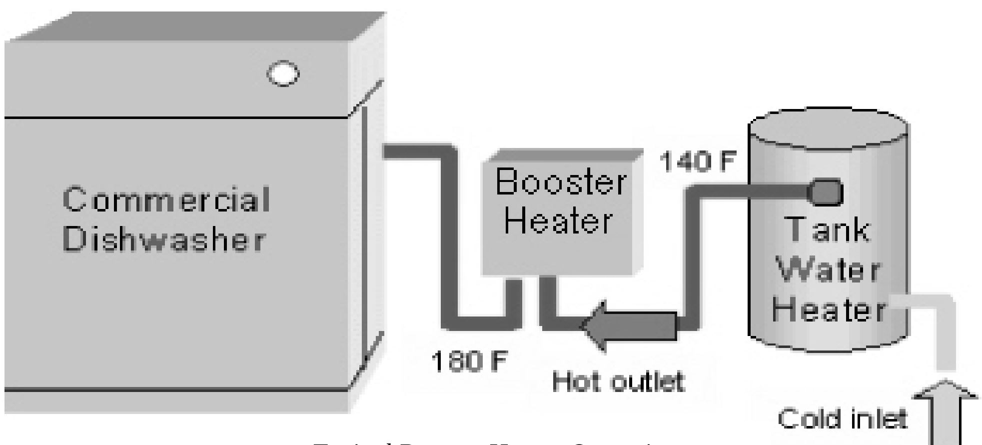
Tank-Type *(or Storage Type)* Water Heater

They slowly heat cold water at the bottom of the tank as stored heated water at the top of the tank is depleted by demand from fixtures and equipment. If sized correctly to all installed fixtures and equipment, it will provide a constant amount of hot water at fixed rate in gallons per hour. They operate by stored water temperature and they burn energy often to maintain a set temperature in the storage tank whether or not hot water is being demanded by fixtures and equipment.

Illustration K-8

Booster Heater General Operation

External Electric Booster Heater



Typical Booster Heater Operation

SECTION L - FINISH SCHEDULE –FLOORS, WALLS, CEILINGS

REFERNCES (Chapter 511-6-1)

.07 Physical Facilities:

(1) Materials for Construction (a) Indoor Materials (b) Outdoor Surfaces
(2) Design, Construction, and Installation (a) Floors, Walls and Ceilings, Cleanability (b) Utility Lines (c) Floor, Wall Junctures, Coved, and Enclosed or Sealed (d)Floor Carpeting, Restrictions and Installation (f) Wall and Ceiling Coverings and Coatings (g) Wall and Ceiling, Attachments (h) Wall and Ceiling, Studs, Joist and Rafters

I. **General:** Materials for indoor floor, wall and ceiling *surfaces under conditions of normal* shall meet certain requirements as per Chapter 511-6-1. *They shall be smooth, durable, and easily cleanable for certain areas.* Areas of concern are where food service establishment operations are conducted that requires these surfaces to be nonabsorbent such as areas subject to moisture. Operational areas that must meet these requirements are those such as food preparation areas, walk in refrigerators, warewashing areas, toilet rooms, mobile food service unit servicing areas, and areas subject to flushing or spray cleaning methods. Poured flooring such as epoxy or acrylic coverings must be a uniform thickness of at least 1/8 inch to be equivalent to that of standard floor tile.

II. **Floors:**

1. *Floor and wall junctures* shall be coved and closed to no larger than one thirty-second inch in food service establishments which use cleaning methods other than flushing water. If flushing water is used as a cleaning method, the floors shall be provide with a drain graded to drain, and the floor and wall junctures shall be coved and sealed.

2. A *floor covering* such as carpeting or similar material may not be installed as a floor covering in food preparation areas, walk in refrigerators, warewashing areas or toilet areas where the floor is subject to moisture, flushing, or spray cleaning methods.

3. *Exposed horizontal utility service lines and pipes* may not be installed on the floor.

III. Walls and Ceilings:

1. *Wall and ceiling covering materials* shall be nonabsorbent, light colored, and attached so that they are easily cleanable. Except in consumer areas, wall and ceiling surfaces do not need to meet the same requirements as above if they are kept clean.

2. In areas used *only for dry storage*, concrete, porous blocks, or bricks used for indoor wall construction shall be finished and sealed to provide a smooth, nonabsorbent, easily cleanable surface.

3. *Studs, joists and rafters* may not be exposed in areas subject to moisture.

4. *Wall and ceiling attachments* such as light fixtures, mechanical room ventilation system components, vent covers, wall mounted fans, decorative items and other items shall be easily cleanable. In consumer service areas, wall and ceiling attachments that are provided for ambiance need not meet this requirement *if they are kept clean*.

IV. Experimental Finishes: Evaluation and Field Testing:

1. *Any proposed covering material not listed in Tables L-1, L-2 or L-3 must be evaluated by the local Health Authority (i.e., County Health Department).* Manufacturer's documentation must show that such material *coverings are FDA approved for food service establishments or food processing plants.* In addition, these proposed covering materials's documentation *must show these materials to have comparable characteristics of durability, ease-of-cleaning and non-absorbency as that of traditional covering material listed within these tables.*

2. If a proposed covering material is considered by the county health department, the county health department *will conduct a field evaluation* of the material during inspections conducted of the food service establishment. *For a set period of time*, as determined by the county health department, the county health department *will evaluate the material's performance under normal operational conditions within the establishment.* If the county health department through its evaluation finds the proposed material covering not to be in compliance with the requirements of Chapter 511-6-1, *an appropriate traditional material covering listed with Tables L-1, L-2 and or L-3 will be installed to replace the non-compliant covering materials*.

3. Before any field evaluation of proposed experimental material covering is considered by the county health department, *it is highly recommended that a legally binding agreement between the county health department and the permit holder/owner of the food service establishment be drafted.* This stated agreement would notify the permit holder or permit applicant of the establishment that he or she has *the obligation to replace the experimental material covering with that which meets the requirements of the of the Chapter.*

4. *All coverings*, including experimental material coverings, *must be installed in accordance with its manufacturer's recommendations*. A sample of these materials may be requested by the county health department prior to their review and approval for installation[1].

5. The following charts lists the types of traditional floor, wall, and ceiling finishes that are *acceptable in food service establishments in the areas listed*[2]:

[1] Source: Page 64 in Section 9 – Finishes – 2008 FDA Plan Review for Food Establishments guidance document.
[2] Source: Page 61 in Section 9 – Finishes – 2008 FDA Plan Review for Food Establishments guidance document.

TABLE L-1

Room/Area	Floors	Walls	Ceilings
Cooking Areas (Areas exposed to high heat)	▪ Quarry Tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seams	▪ Stainless Steel ▪ Ceramic Tile ▪ Aluminum	▪ Stainless Steel ▪ Smooth, Non-Acoustical Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic laminate ▪ Glazed Surfaces
Food Preparation (No or low heat exposure)	▪ Quarry tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seems	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Concrete Block filled with Epoxy Paint or Glaze	▪ Smooth, Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces
Walk-In Refrigerators and Freezers	▪ Insulated Metal Flooring provided by the Manufacturer of the Walk-In ▪ Quarry Tile ▪ Poured Epoxy	▪ Insulated Wall Panels provided by the Manufacturer of the Walk-In ▪ Stainless Steel ▪ Aluminum ▪ Fiberglass Reinforced Polyester Panels (FRP)	▪ Insulated ceiling panels provided by the Manufacturer of the Walk-In ▪ Stainless Steel ▪ Aluminum ▪ Fiberglass Reinforced Polyester Panels (FRP)
Warewashing Areas	▪ Quarry Tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial grade sheet linoleum with chemically welded seams	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Concrete Block filled with Epoxy Paint or Glaze surface	▪ Smooth, Non-Acoustical Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces

TABLE L.-2

Room/Area	Floors	Walls	Ceilings
Food Storage	▪ Quarry tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seams ▪ Sealed Concrete (Case lot storage)	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Concrete Block Filled with Epoxy Paint or a Glazed Surface ▪ Epoxy Sealed Dry-Wall	▪ Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces
Other Storage	▪ Quarry tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seams	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Concrete Block Filled with Epoxy Paint or a Glazed Surface ▪ Dry-wall sealed with an Epoxy Finish	▪ Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces
Bar (Food Worker Side of Bar)	▪ Quarry tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seams	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Plastic Laminate ▪ Concrete Block Filled with Epoxy Paint or a Glazed Surface	▪ Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces
Toilet Rooms	▪ Quarry tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Compositio Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seams	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Concrete Block Filled with Epox Paint or a Glazed Surface	▪ Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces

TABLE L-3

Room/Area	Floors	Walls	Ceilings
Dressing Rooms	▪ Quarry tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seams ▪ Smooth, Sealed Concrete	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Concrete Block Filled with Epoxy Paint or a Glazed Surface ▪ Epoxy Sealed Dry-Wall	▪ Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces
Garbage and Refuse (Interior Locations)	▪ Quarry tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seams ▪ Commercially Manufactured Insulated Floor Panels	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Concrete Block Filled with Epoxy Paint or a Glazed Surface ▪ Commercially Manufactured Insulated Wall Panels	▪ Stainless Steel ▪ Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces ▪ Commercially Manufactured Insulated Ceiling Panels
Mop Service Areas	▪ Quarry tile ▪ Poured Epoxy ▪ Commercial Grade Vinyl Composition Tile (VCT) ▪ Commercial Grade Sheet Linoleum with Chemically Welded Seams	▪ Stainless Steel ▪ Ceramic Tile ▪ Fiberglass Reinforced Polyester Panels (FRP) ▪ Concrete Block Filled with Epoxy Paint or a Glazed Surface	▪ Plastic Coated or Metal-Clad Fiberboard ▪ Dry-wall sealed with an Epoxy Finish ▪ Plastic Laminate ▪ Glazed Surfaces

SECTION M - TOILET ROOM AND HANDWASHING FACILITIES[1]

REFERENCES (Chapter 511-6-1)

.06 Sanitary Facilities and Controls:
(2) Plumbing System (c) Handwashing Sink Installation (g) Handwashing Sinks, Number and Capacities (l) Handwashing Sinks, Location and Placement (o) Using a Handwashing Sink

.07 Physical Facilities:
(3) Number and Capacities (c) Handwashing Aids and Devices, Use Restrictions (d) Handwashing Signage

I. General Requirements: *Properly functioning toilet and handwashing facilities must be accessible to employees at all times.* The minimum requirements these facilities shall be based on applicable state law or the local plumbing code as amended, and shall be the number required by such code.

II. Handwashing:

1. *Background: Handwashing is a critical factor to prevent contamination of foods*. Proper handwashing reduces the amount of pathogens that can be transmitted via cross contamination from raw foods to ready-to-eat foods. Many employees fail to wash their hands as often as necessary due to the lack of conveniently located handwashing sinks. It is important that handwashing be done only at properly equipped handwashing sinks to help ensure that employees effectively clean their hands and minimize contamination of food and food contact surfaces.

2. *Supplies, Accessibility, Location, and Use:* A handwashing sink, hand drying device or disposable towels, hand cleanser and waste receptacle shall be located for convenient use by employees who work in food preparation, food dispensing, and warewashing areas. Nothing shall block an employee's approach to a handwashing sink. Handwashing sinks must also be located in or immediately adjacent to toilet rooms. Handwashing sinks shall be of sufficient number and conveniently located for use by all employees in food preparation, food dispensing, and washing areas. Handwashing sinks shall be easily accessible and may not be used for purposes other than handwashing. Sinks used for food preparation or for washing equipment or utensils shall not be used for handwashing.

[1] Reference: Current 2012 FDA Plan Review for Food Establishments Training Course Materials

3. *Water Temperature and Fixtures:* Each handwashing sink shall be provided with hot and cold water tempered by means of a mixing valve or a combination faucet to provide water at a temperature of *at least 100˚F*. If used, self-closing, slow-closing or metering faucets shall be designed to provide a flow of water for at least 15 seconds without the need to reactivate the faucet.

4. *Cross-Contamination Prevention:*

   A. *Splash from use of a handwashing sink* may not contaminate food, food contact surfaces, clean equipment or utensils. A washable baffle or barrier may be needed if the handwashing sink is located next to a food preparation or food contact surface and if the space between the handwashing sink and food, food preparation, food contact surfaces, and clean utensils does not provide adequate protection.

   B. Similarly, the *location of soap and paper towel dispensers at handwashing sinks* must be reviewed during plan review so that their use does not contaminate food and food contact surfaces. In addition, the distance that employees would have to reach the faucet handles, soap and paper towels must be reviewed during plan review to assure that they will have proper access to the handwashing sinks and will not have to reach across dirty surfaces while washing their hands.

5. *Automatic Handwashing Facilities*: If approved by the Health Authority and capable of removing the types of soils encountered in the food service operations involved, automatic handwashing facilities may be substituted for handwashing sinks in a food service establishment that has at least one handwashing sink. An automatic handwashing facility shall be installed with manufacturer's instructions.

6. *See Illustrations M-1, M-2, M-3, and M-4 for examples of handwashing stations, cross-contamination prevention, and types of hand drying devices*.

III. **Toilet Rooms**:

1. Properly functioning toilet facilities must be accessible to employees at all times.

2. Toilet facilities must be provided to customers in all establishments *with dining on the premises and permitted since July 31. 1995.* Access to customer facilities cannot be through food service, food preparation, storage, or warewashing areas. *When not on the same premises, the location of toilets shall be within 200 feet and approved by the Health Authority.* If the public toilet facilities are used by employees, a separate toilet facilities may not have to be installed for the employees.

3. The *floors, walls, and ceiling in toilet rooms shall be smooth and easily cleanable*. The walls around toilets, urinals, toilet paper dispensers, soap dispensers, and paper towel dispensers should be water resistant and durable for frequent cleaning[2].

4. The *minimum requirements* for toilet facilities shall include[3]:

   A. *Toilet:* At least one toilet and not fewer than the number of toilets required by law shall be provided. If authorized by law, urinals may be substituted for toilets in men's toilet rooms.

   B. *Handwashing Facility:* Handwashing sinks must also be located in or immediately adjacent to toilet rooms. Each handwashing sink shall be provided with hot and cold water tempered by means of a mixing valve or a combination faucet to provide *water at a temperature of at least 100˚F. If used, self-closing, slow-closing or metering faucets shall be designed to provide a flow of water for at least 15 seconds without the need to reactivate the faucet.*

   C. *Handwashing Soap Dispenser:* Each handwashing sink or group of two adjacent handwashing sinks shall be provided with hand cleaning liquid, powder or bar soap. A dispenser shall be provided for handwashing cleanser provided in liquid or powder form.

   D. *Hand Drying Device:* Each handwashing sink or group of adjacent handwashing sinks shall be provided with individual, disposable towels properly protected; a continuous towel system that supplies the user with a clean towel; or heated-air hand drying device. *In toilet facilities that have exit doors with handles or knobs that must be touched to open, disposable, dispensed, paper towels must be provided.*

   E. *Toilet Paper:* A supply of toilet paper shall be provided in a dispenser at each toilet.

   F. *Waste Receptacle:* If disposable towels are used, a waste receptacle shall be located at each sink or group of sinks. At least one covered waste receptacle shall be provided in toilet rooms used by females.

   G. *Ventilation:* Toilet rooms must be vented to the outside. Mechanical ventilation shall be installed in toilet rooms according to law. If allowed by law, openable screened windows may be used in lieu of mechanical ventilation devices.

[2] See TABLE L-2 in Section L – Finish Schedule – Floors, Walls, Ceilings in Part-I of DPH's Food Service Manual for Design, Installation and Construction.

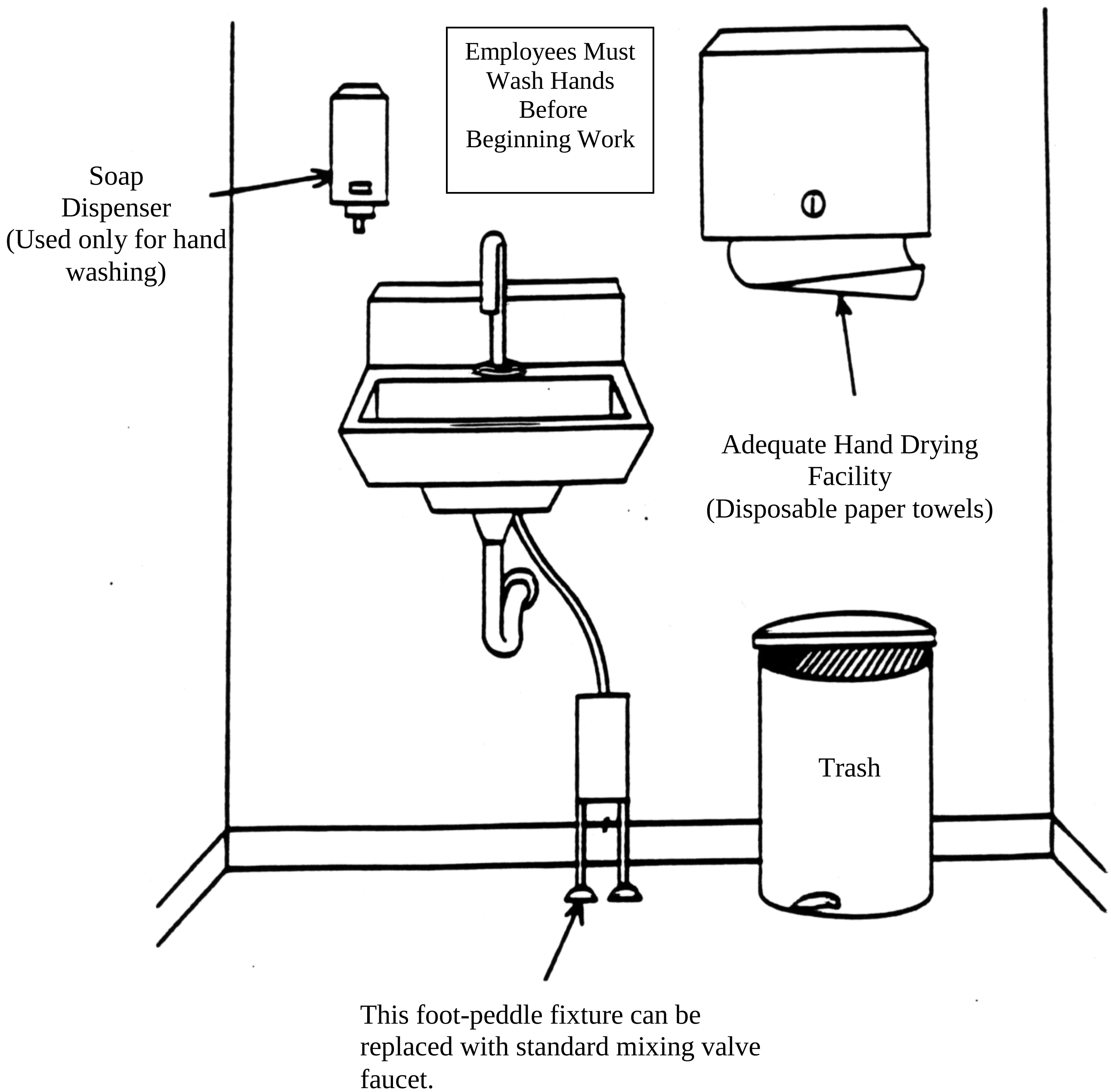
[3] Source: Page 34 of Section 4 – Hygiene Facilities - 2008 FDA Plan Review for Food Establishments guidance document.

H. *Toilet Room Doors:* Toilet room doors shall be tight-fitting and self-closing and when located on the premises, they shall be completely enclosed except where a toilet room is located outside a food service establishment and does not open directly into the food service establishment, such as that as provided for a food-court within a shopping-mall. In this case, *the toilet room facility may have a "U" shaped design entrance as long as the ventilation system for the toilet room facility is designed to prevent odor and contaminants from entry into the dining area.*

I. *Lighting:* At least 215 lux (*20 foot candles*) shall be provided in toilet rooms.

ILLUSTRATION M-1[4]

Example of Standard Handwashing Station



[4] Source: 2008 FDA Plan Review Training Course #FD207 – December 2-4, Macon, Georgia Training Site.

ILLUSTRATION M-2

Examples of Automatic Handwashing Stations

Counter or Table Mount Unit

Unit with hand cleaner and sanitizer exposed.

Hand Cleaner and Sanitizer Inside of Cabinet

ILLUSTRATION M-3

Examples of Cross-Contamination Prevention at Handwashing Stations

Shield Attached to Handwashing Sink providing splash protection for Food Preparation Sink

Shielded Handwashing Sink located in the Food Preparation Area.

ILLUSTRATION M-4
Types of Hand Drying Devices

Infrared Sensor Activated Paper Towel Dispenser

Hot Air Dryer

Standard Manual Paper Towel Dispenser

Air Blade Technology

SECTION N - PLUMBING AND CROSS CONNECTION CONTROL[1]

REFERENCES (Chapter 511-6-1)

.01 Definitions. Amended. (vvvv) "Plumbing system"
.06 Sanitary Facilities and Controls. Amended. (2) Plumbing System (a) (b) (d) (e) (f) (j) (k) (m) (n) (p) (q) (r)
.06 Sanitary Facilities and Controls. Amended. (4) Sewage, Other Liquid Waste… (b)(c)(e)
This Manual – Part-II, Appendix R – Plumbing and Cross-Connection Control by FDA Division of Human Resources Development

I. **General:** Plumbing shall be sized and installed according to State or local codes whichever is applicable. There shall be no cross-connections between the potable water supply and any non-potable or questionable water supply. Where non-potable water systems are permitted for purposes such as air conditioning and fire protection, the non-potable water must not contact directly or indirectly: food, potable water or equipment that contacts food or utensils. The piping of any non-potable water system shall be durably identified (most are colored pipe or have color coded stripes on the pipe) so that it is readily distinguishable from piping that carries potable water.

II. **Submerged Inlet Protection:**

1. A connection to a sewer line may be *direct* or *indirect*:

   A. A *direct connection* is a solid physical connection between a potable and non-potable plumbing system;

   B. An *indirect connection* is a potential connection between a potable and non-potable plumbing system and it comprises two types:

      a. An *air gap* means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or outlet supplying fixture, or other device, and the flood level rim of the receptacle. The vertical physical separation shall be at least two times the inside diameter of the water inlet pipe above the flood rim level, but shall not be less than one inch. *See Illustrations N –1, N-2, N-3, and N-4* for examples of air gaps indirect connections.

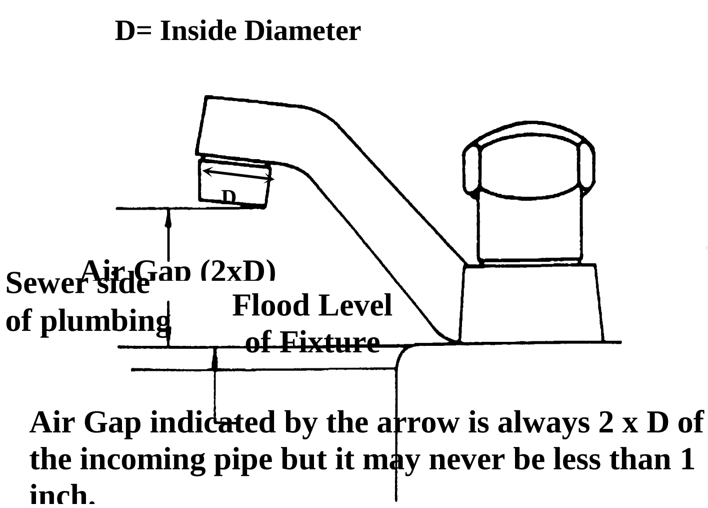
      b. There shall be no cross-connections between the potable water supply and any non- potable water supply. The potable water system shall be installed to preclude the possibility of backflow and back siphonage. Devices shall be installed to protect against backflow and back siphonage at all fixtures and equipment unless an air gap is provided. The air gap must be at least twice the diameter of the water supply inlet, but not less than 1 inch, between the water

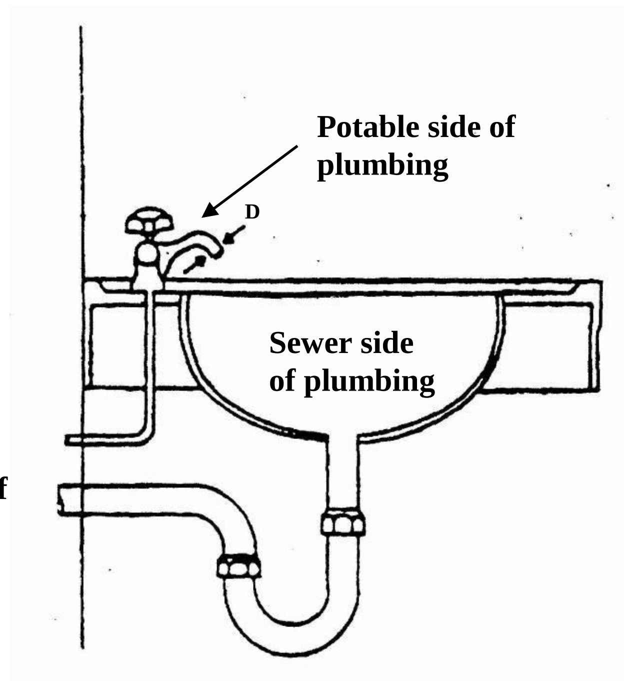
[1] Source: Subsection entitled, "Plumbing And Cross Connection Control" starting Section 5 – Water And Sewage Disposal in the 2008 FDA Plan Review for Food Establishments guidance document.

supply inlet and the fixture's flood level rim. *See Illustration N-2*.

c. An *air Break* is a piping arrangement in which a drain from a fixture, appliance, or device discharges indirectly into another fixture, receptacle or interception at a point below the flood level rim. The connection does not provide an unobstructed vertical distance through the free atmosphere and is not solidly connected, but precludes the possibility of backflow to a potable water source into a sink or dishwasher/or fixture being drained. *See Illustration N-5*.

ILLUSTRATION N-1





Air Gap on Lavatory

Air Gap and Effective Opening

ILLUSTRATION N-2

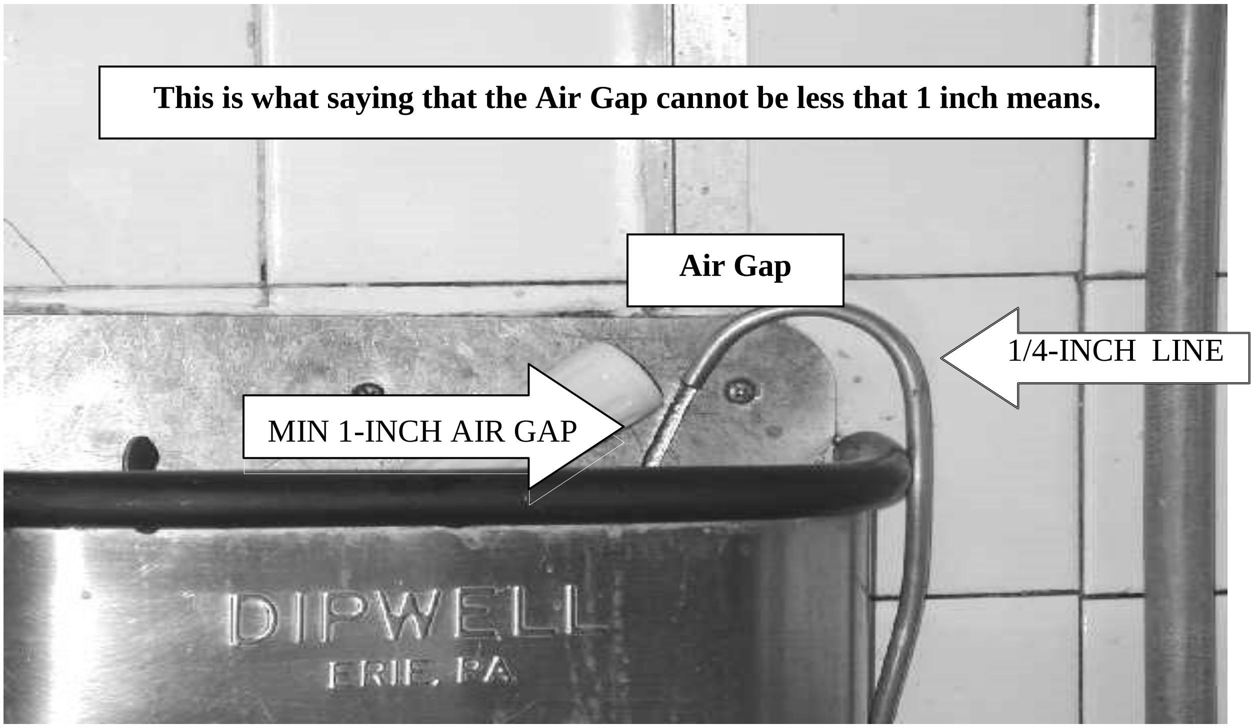


ILLUSTRATION N-3

ILLUSTRATION N-4

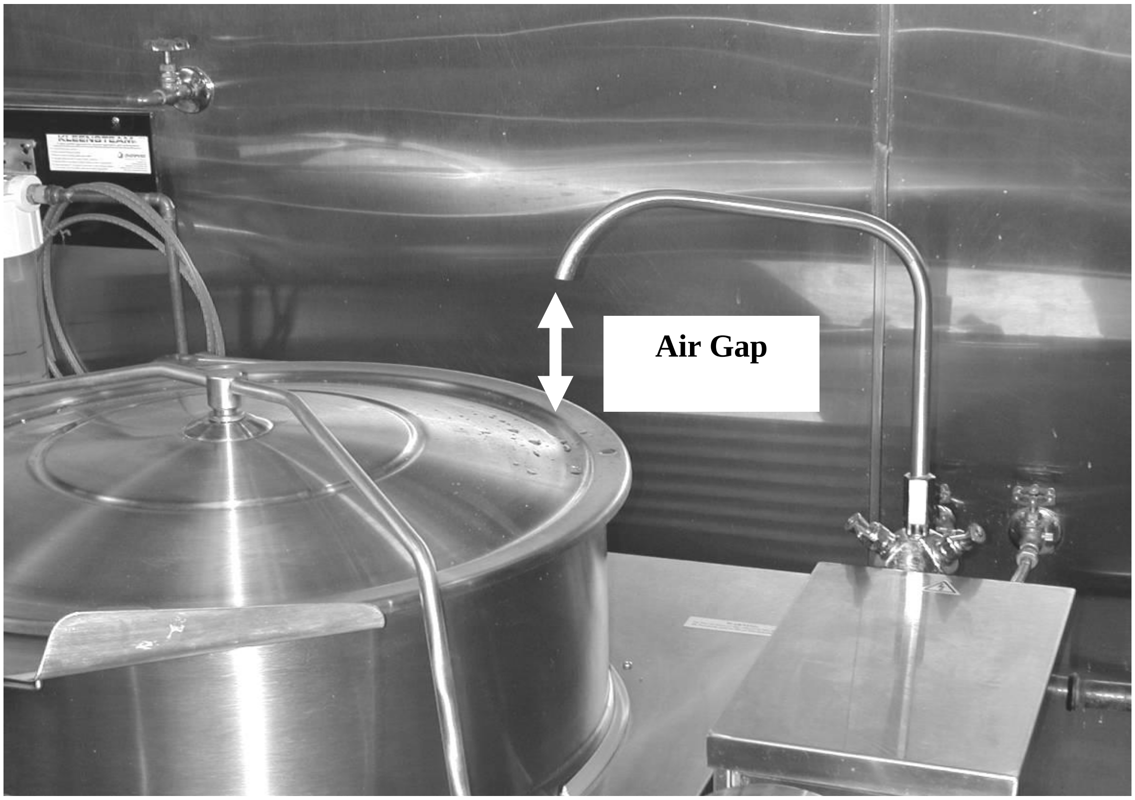
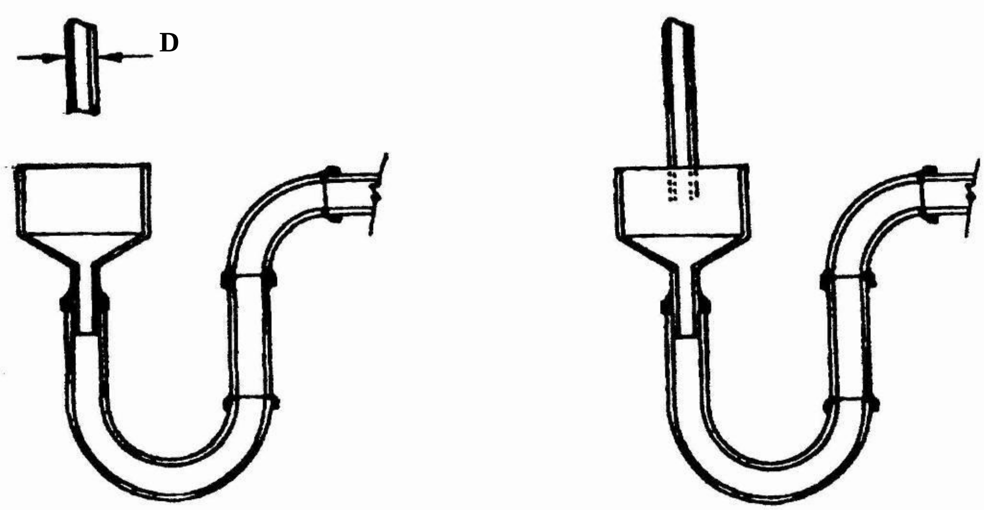


ILLUSTRATION N-5
Indirect Connections



Air Gap *Air Break*

A. *Types of Backflow/Back Siphonage Protection:* The following *List N-1* provides examples of some of the types of equipment with potentially submerged inlets and required backflow/back siphonage protection:

LIST N-1

Backflow/Back siphonage Preventer Equipment	Required in Lieu of Air Gap
1. Boiler with chemicals added	Reduced pressure device
2. Boiler with no chemicals added	Air vent type backflow preventer
3. Carbonators for beverage dispensers	Approved backflow preventer (in agreement with local plumbing codes)
4. Lawn sprinkler system with no chemicals added	Atmospheric or pressure vacuum breaker
5. Flush valve toilets	Atmospheric or pressure vacuum breaker
6. All hose bibs inside & outside of establishments	Hose bib-type vacuum breaker
7. Pre-flush hose with a nozzle head that may be submerged	Pressure vacuum breaker
8. Perforated pipe to oriental Wok cookers	Atmospheric vacuum breaker
9. Inlets which are or may become submerged:	
a. Supply inlet to garbage grinder	Atmospheric vacuum break
b. Supply inlet to dish table trough	Atmospheric vacuum breaker

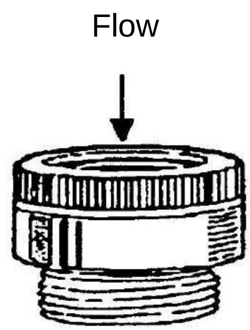
LIST N-1
(Continued)

c. Fill line for steam kettle	Atmospheric vacuum breaker*
d. Supply line for mechanical warewashing machine	Backflow/Backsiphonage Preventer Required in Lieu of Air Gap
e. Supply line to all soap and chemical dispensing units on mechanical warewashing machine.	Backflow/Backsiphonage Preventer Required in Lieu of Air Gap
f. Garbage can washer	Backflow/Backsiphonage Preventer Required in Lieu of Air Gap
g. Soap portioner on faucet	Soap portioner must contain an internal air gap
h. Water wash system for exhaust hood	Air-vent type backflow preventer (RPZ or Reduced Pressure Zone may be required if toxic chemicals are added)

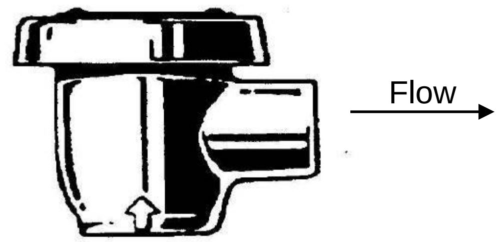
A. *An atmospheric vacuum breaker means a mechanical device that automatically air vents a pipeline to prevent back siphonage. The device shall be located beyond the last control valve prior to the first outlet and at an elevation 6 inches higher than any source of contamination. Atmospheric vacuum breakers shall be installed so that they are not subject to backpressure or continuous operating pressure of more than 12 hours duration. *See Illustrations N-8, N-9, N-10*

B. *See Illustration N-6* for examples of backflow/backsiphonage prevention devices.

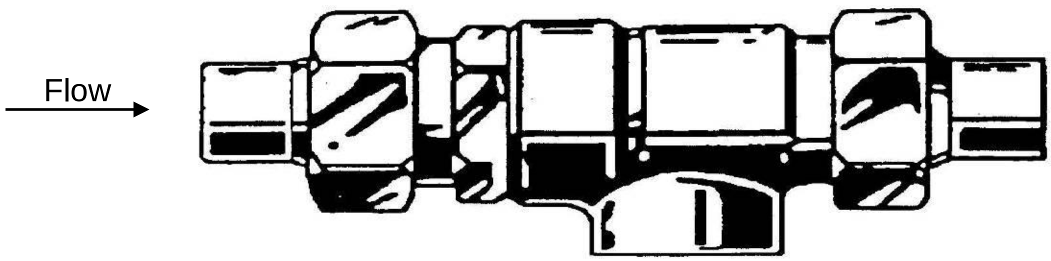
ILLUSTRATION N-6



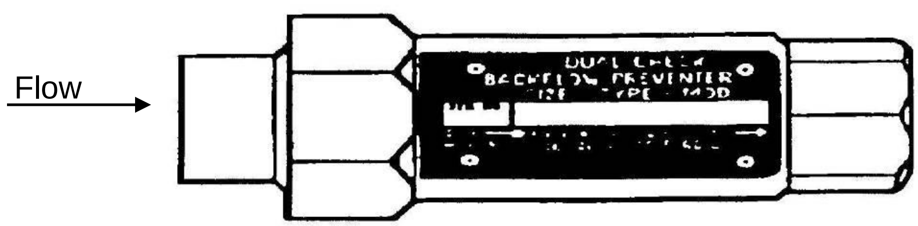
Hose Bibb Vacuum Breaker



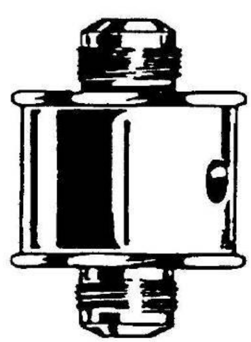
Atmospheric Vacuum Breaker



Dual Check Valve with Intermediate Atmospheric Vent



Dual Check Backflow Preventer


Carbonator Backflow Prevention Device

C. ** A Pressure vacuum breaker is a mechanical device that ***automatically vents a pipeline to prevent backsiphonage even with a pressure nozzle attached to the end of the attached hose.*** The device must be installed at least 12 inches above the highest elevated inlet or fixture on its downstream side. The unit must have a shut-off valve on each side and two test cocks for testing. The device must be located in such a manner to be accessible for testing and servicing. The Pressure vacuum breaker is a*pproved* for high hazard, continuous pressure, and no backpressure potential. Valves may be located on the downstream side. *See Illustration N–7* for an example of a pressure vacuum breaker.

ILLUSTRATION N-7

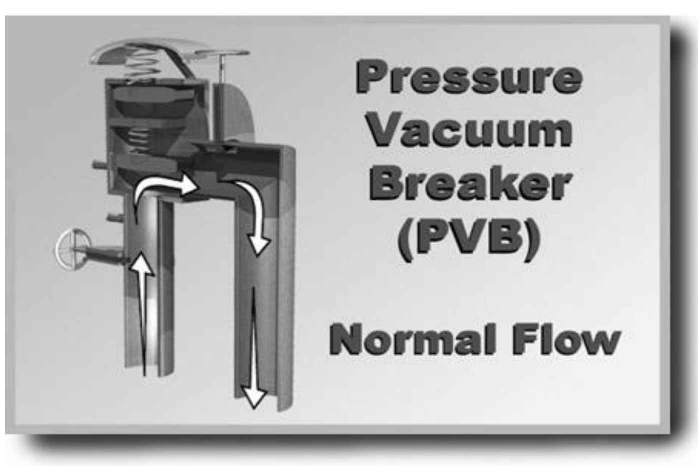
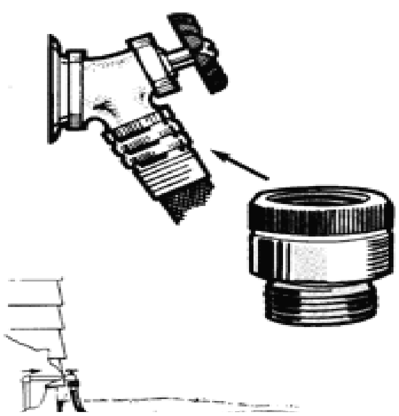


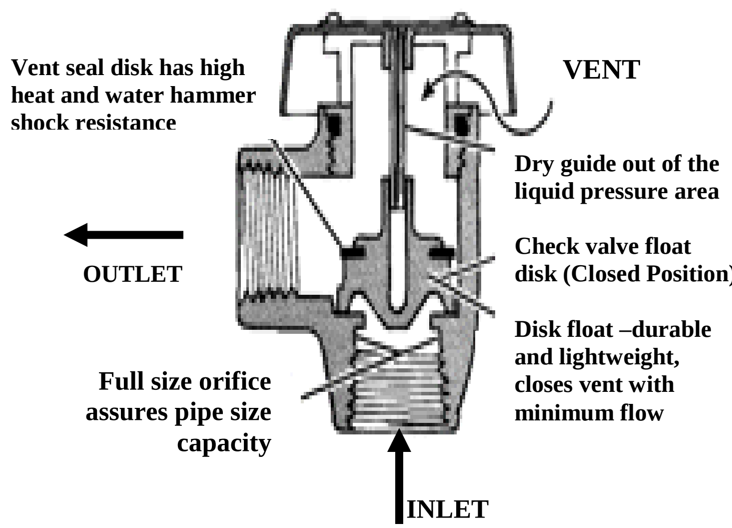
ILLUSTRATION N-8

Hose-Bibb Vacuum Breaker

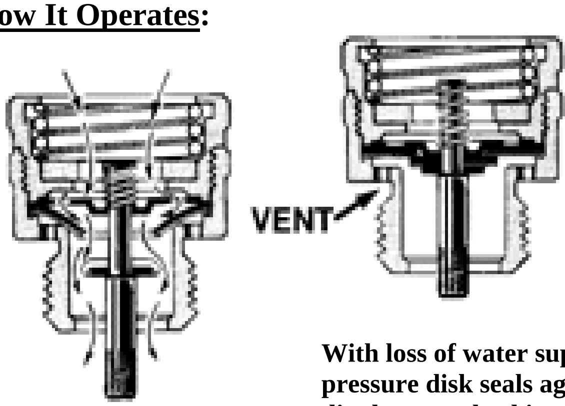


Atmospheric Vacuum Breaker

How It Operates:



How It Operates:



Opened Completely

With loss of water supply, pressure disk seals against diaphragm, checking backflow and opening vent ports.

ILLUSTRATION N-9

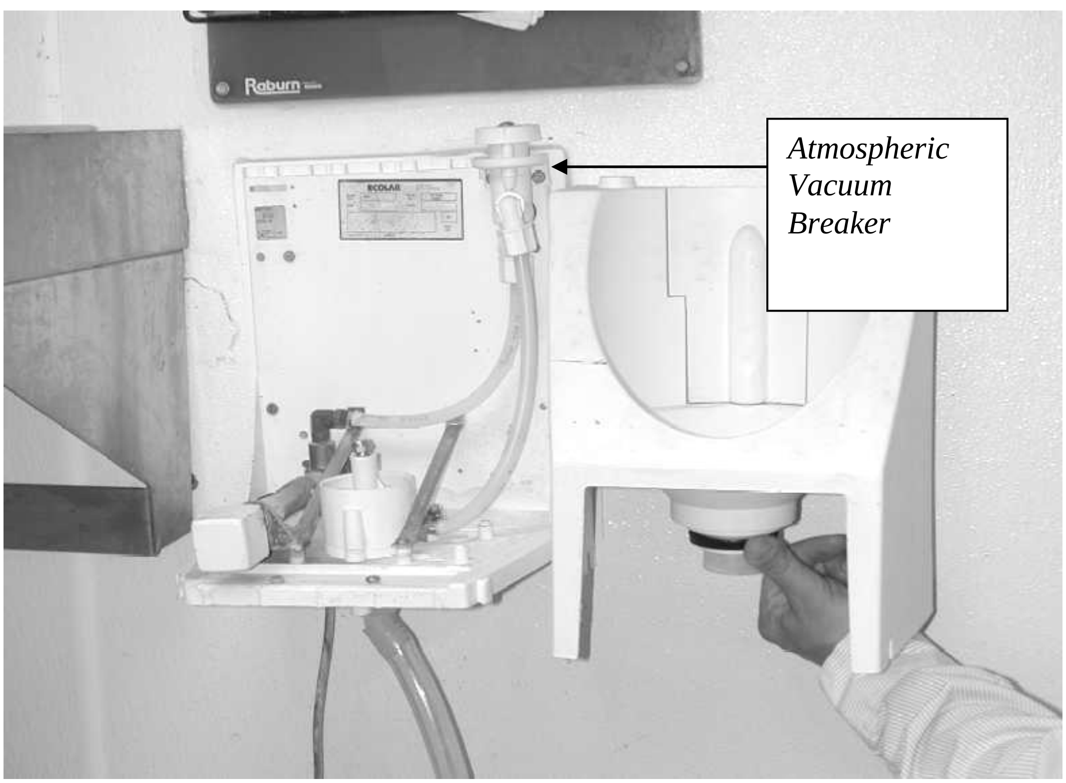
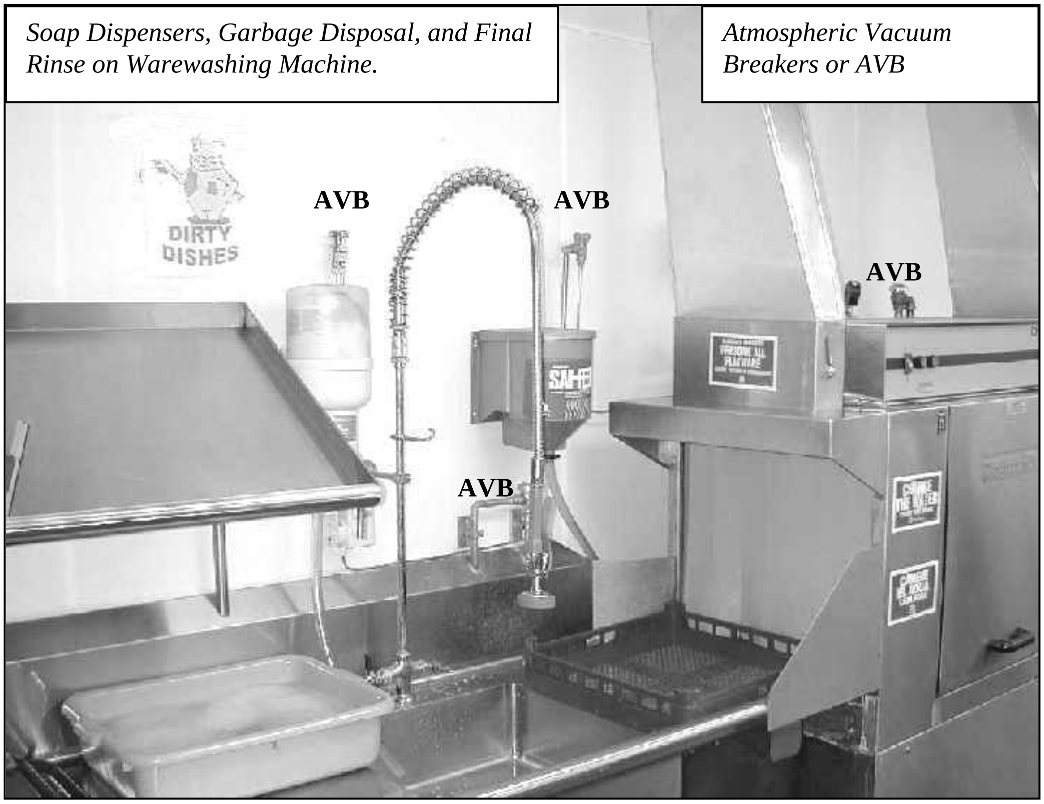


ILLUSTRATION N-10



D. Dual Check Valve with Intermediate Atmospheric Vent:

   a. These units consist of two identically loaded, independent check valves and an atmospheric vent.

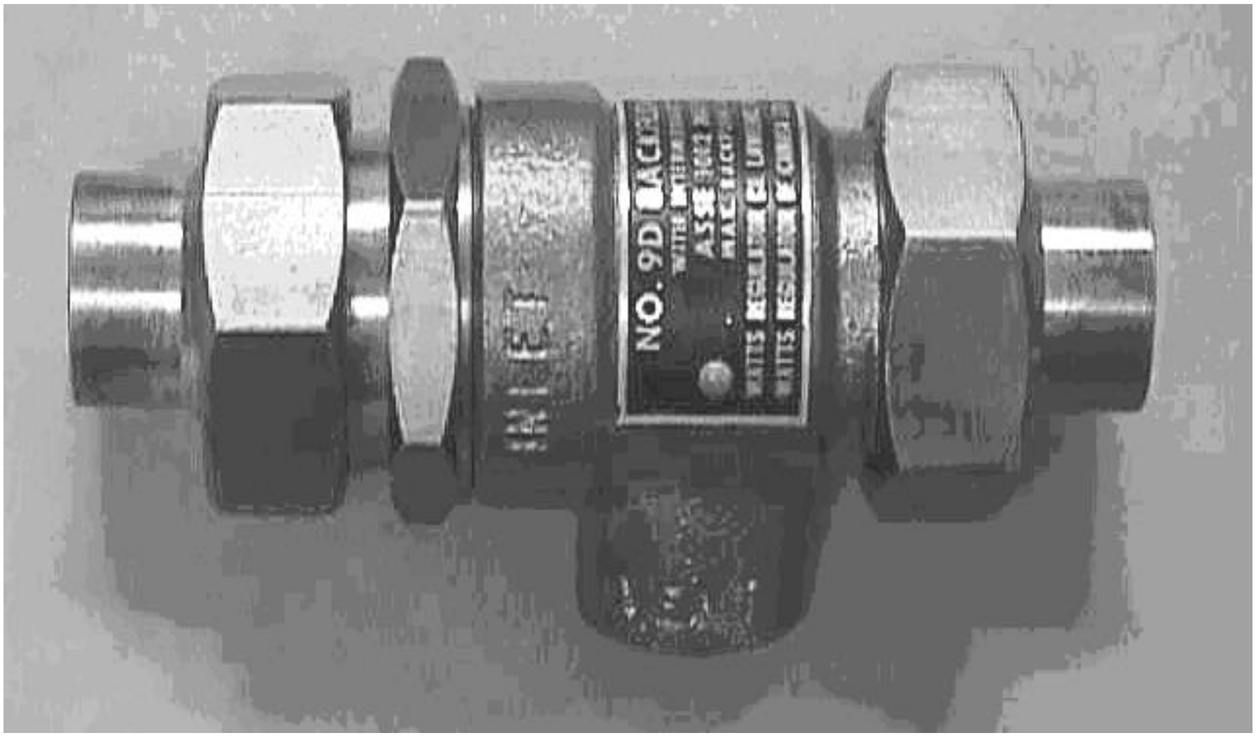
   b. This device is suitable for constant pressure, backpressure and back siphonage applications.

   c. Watts Regulator Model #9D is the most common seen in plans; however, other manufacturers make similar devices.

   d. *See Illustrations N-11 through N-14* for more information.

E. *See Table N-1* for general installation information for backflow/back siphonage devices.

ILLUSTRATION N-11
Dual Check Valve with Intermediate Atmospheric Vent



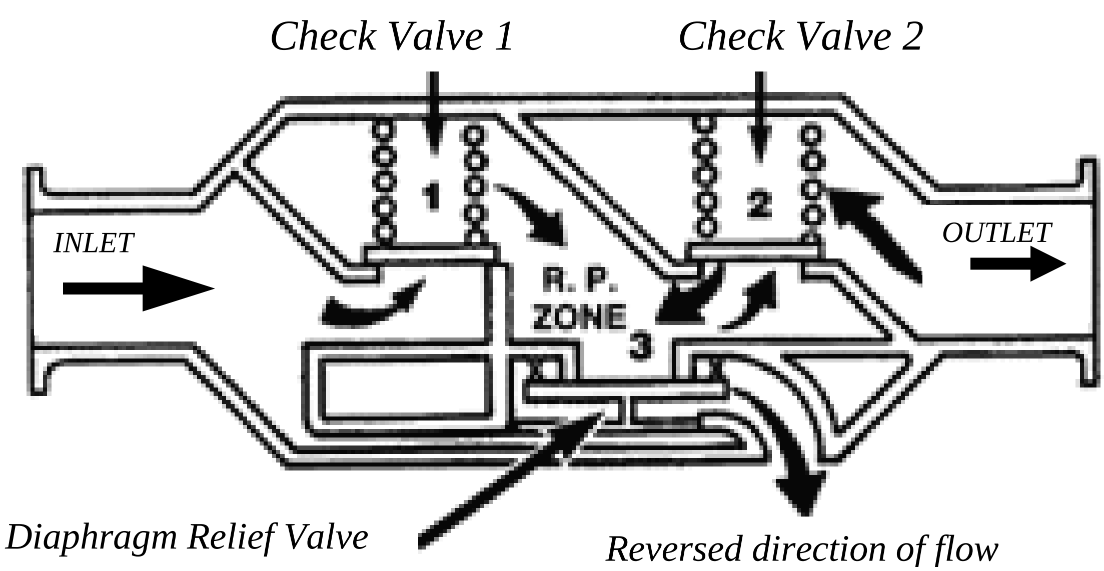
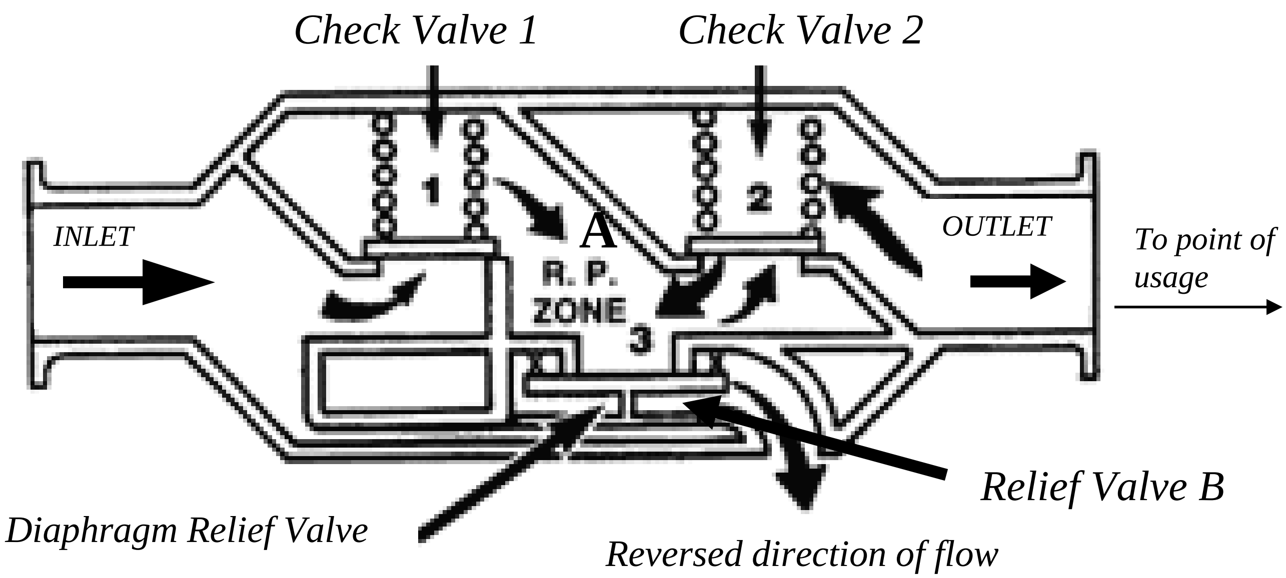


ILLUSTRATION N-12
"How It Works"



- **"A"** represents the reduced pressure zone.

- Construction of the RPZ consists of two very sensitive, independent, spring loaded check valves with a reduced pressure zone "between them – at least 2 psi pressure differential between the supply and the "Reduced" pressure zone.

- As water passes through check valve #1, the water pressure drops (predetermined by friction loss/resistance) at least 2 psi in the RPZ under normal conditions water continues through check valve #2 (requires only 1 psi to open) to the point of usage.

- RPZ consists of a relief valve located at **"B".** This valve has supply water pressure on one side and a RPZ pressure on the other.

- To keep the relief valve **"B"** closed, the supply pressure must exceed the RPZ pressure. It will open under any condition that causes pressure in the RPZ to approach or exceed supply pressure – for example, Backpressure.

- If backsiphonage occurs, the relief valve opens since there is no supply pressure to keep it closed.

ILLUSTRATION N-13
Beverage Carbonator

A dual check valve with an intermediate vent preceded by a screen of not less than 100 mesh to 1 inch shall be installed upstream from a carbonating device and downstream from any copper in the water supply line. This requirement in DPH Chapter 511-6-1 is more stringent than ASSE 1022 for use on a carbonator. The 100 mesh screen is not part of the ASSE standard for carbonator protection.

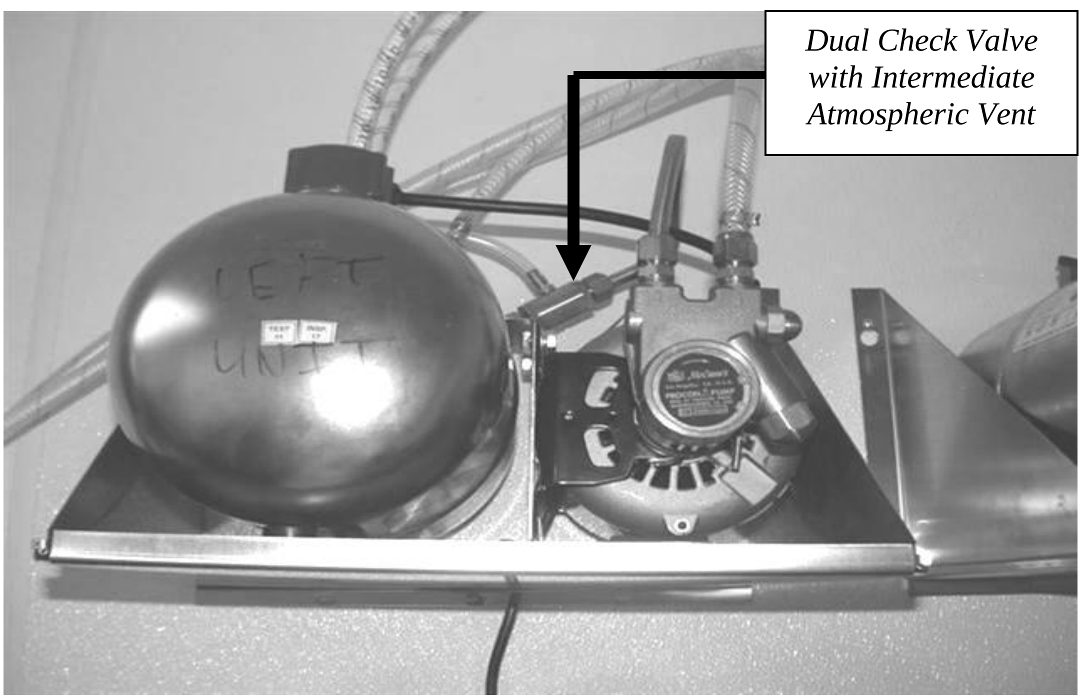
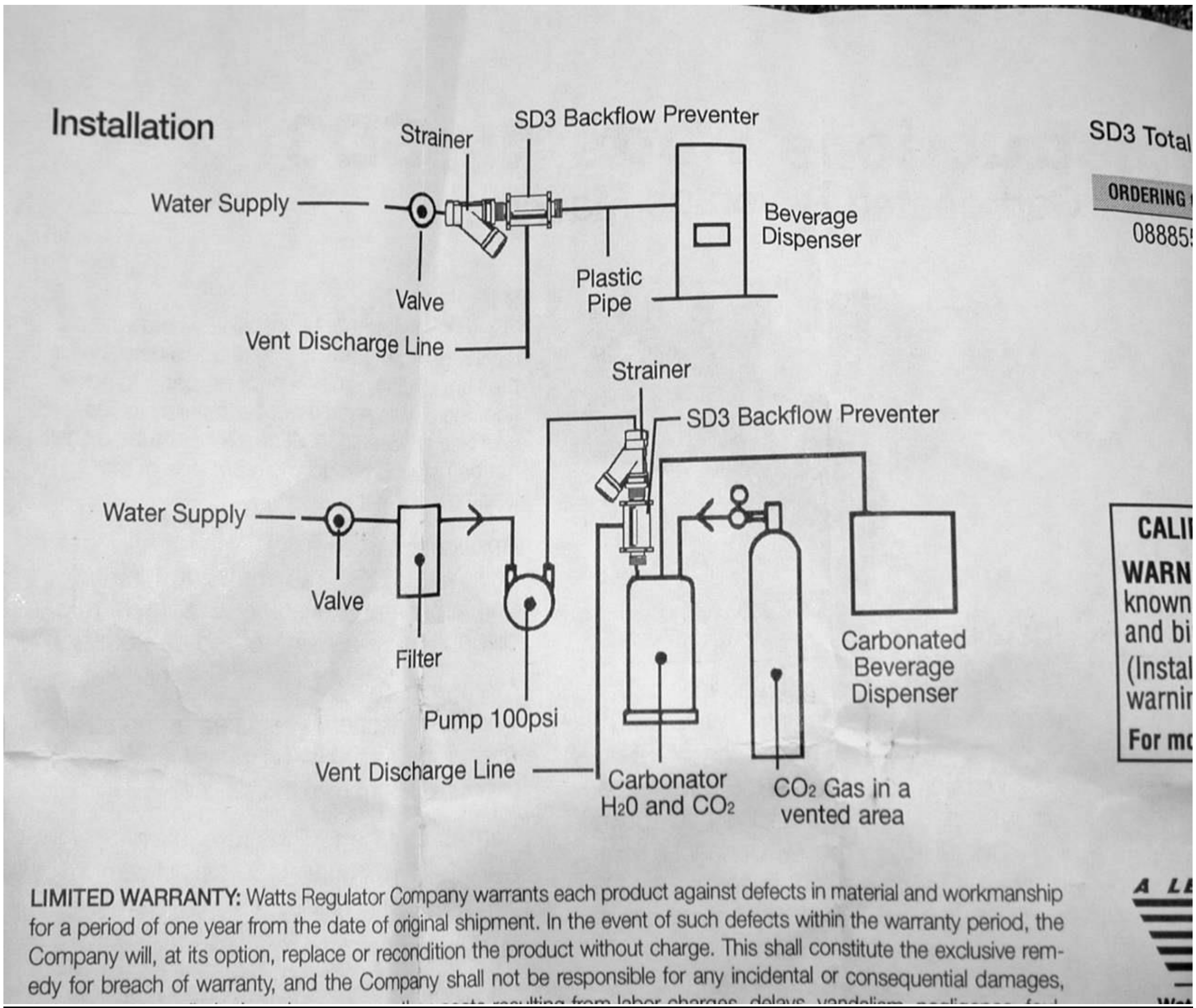


ILLUSTRATION N-14

Typical Beverage Carbonator Installation Schematic



This is a typical beverage carbonator installation schematic. It shows how the "Dual Check Valve with Intermediate Atmospheric Vent" listed here, as SD3 Backflow Preventer, is installed to prevent any carbonated water (acidic) from contacting any copper plumbing. Should the acidic carbonated water come in contact with copper plumbing, copper will be leached into solution and could cause foodborne illness should the beverage be consumed. This backflow preventer will be under constant backpressure created by the pump.

TABLE N-1

Type of Control	Rules of Installation
Air Gap	The air gap must be the greater of the two - **A MINIMUM OF ONE INCH OR TWICE THE INSIDE DIAMETER OF THE PIPE.** For a supply line, this distance is measured from the supply pipe to the flood level rim (the point of over flow) of the receptacle or fixture. For a drain line, the distance is measured from the pipe from which the wastewater is being discharged.
Atmospheric Vacuum Breaker	1. Must be installed 6 inches higher than the outlet.
	2. Must be installed in the vertical position only
	3. Is not for continuous water pressure
	4. Must only be installed where it is not subject to backpressure
	5. Must be installed after the last shut off valve
Dual Check Valve with an Intermediate Atmospheric Vent	1. Can be installed horizontally or vertically.
	2. Must not be located in a pit or a location subject to standing water.
	3. Relief port or vent must not be plugged.
	4. Approved for low hazard, continuous pressure and backpressure or back-siphonage.
Dual Check Valve with an Intermediate Atmospheric Vent and 100 mesh screen	Must be used for water line to soda carbonation systems.
Pressure Type Vacuum Breaker	1. Must be installed at least 12 inches above the outlet.
	2. Must have a shut off valve on each side and two test cocks for testing.
	3. Must be located in an accessible area for testing and servicing.
	4. Not acceptable in a backpressure application
	5. Can be used for continuous pressure applications
Reduced Pressure Zone Device (RPZ)	1. Must be accessible for testing and service.
	2. Must be located above grade (not subject to flooding).
	3. Must be installed at least 12 inches from any wall and between 12 to 30 inches above the floor.
	4. Approved for high hazard, continuous pressure, backpressure or back-siphonage.
Hose Bibb Vacuum Breaker	Cannot be used for continuous pressure. Cannot have a shut off valve downstream of the device.

III. Water Filters and Conditioning Devices:

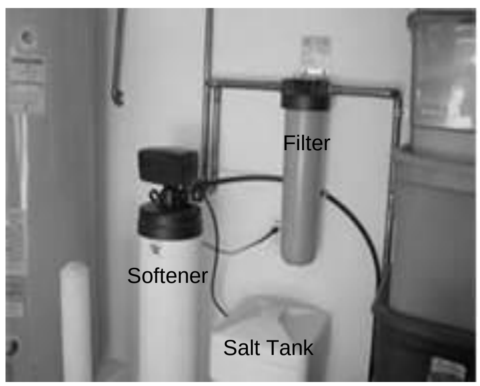
1. *Materials:* Water filter shall be made of safe materials and it must meet NSF certification for potable water.

2. *Design:* Water filters, screens, and other water conditioning devices installed on water lines shall be located to facilitate disassembly for periodic servicing and cleaning. Water filter elements shall be of the replaceable type.

3. *See Illustration N-14* below for examples of water filter and water conditioning devices.

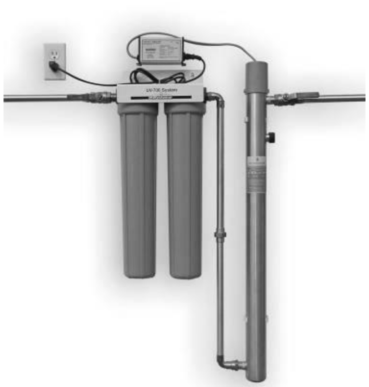
ILLUSTRATION N-14
Typical Water Filter and Water Conditioning Devices

Water Filter Assembly (Wall Mount)



Water Softener and Filter Installation

Water Filters must be easily to disassemble and filters must be changeable.



Typical Water Filter/Softener Unit Installation

Accessible Installation

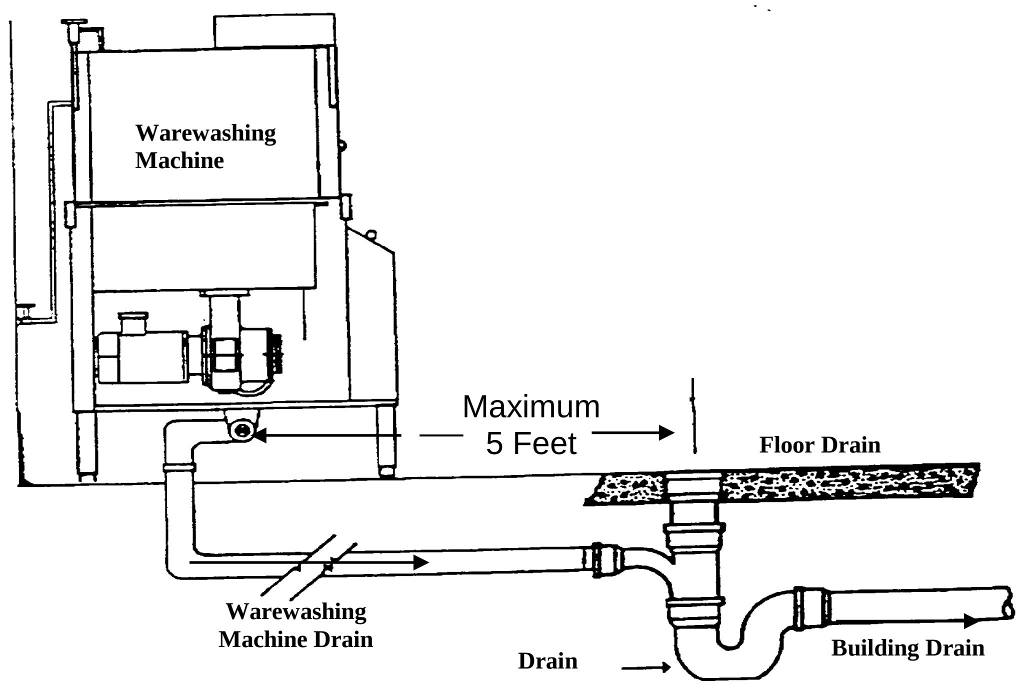
IV. Drains:

1. *A direct connection may not exist between the sewerage system and any drains originating from equipment in which food, portable equipment, or utensils are placed, except if otherwise required by state plumbing codes*. DPH Rule 511-6-1-.06(4) (c) 3 states that, if allowed by applicable plumbing code (state or local), *"…a warewashing machine may have a direct connection between its waste outlet and a floor drain when the machine is located within 5 feet (1.5 m) of a trapped floor drain and the machine outlet is connected to the inlet side of a properly vented floor drain trap."*

2. *Illustration N-15* below illustrates this connection.

ILLUSTRATION N-15

Warewashing Machine with a Direct Waste Connection



3. Other examples of required indirect drain line connections are:

Equipment	Required Indirect Drain Line Connection to Sewer Line
1. Water-cooled condenser for ice machine or other refrigeration system	Air gap
2. Air-cooled condenser for ice machine or other refrigeration system	Air break
3. Ice bin	Air break

4. *Sewage Disposal*: *All sewage including liquid waste shall be disposed into a public sewage system or an on-site sewage management system constructed and operated according to law.* Where on-site sewage management systems are utilized, the location shall be noted on the plans and certification of compliance with applicable Rules and Regulations shall be provided. *See Part-I, Section G* of this Manual for more information.

5. *Grease Traps/Interceptors*:

   A. A grease trap/interceptor is a chamber designed for wastewater to pass through and allow any grease to float to the top for retention as the remainder of the wastewater passes through. If used, a grease trap shall be located to be easily accessible for cleaning. Food solids entering the grease trap/interceptor should be minimized.

   B. Waste water from fixtures or drains that would allow fats, oils, and grease to be discharged must be directed to a grease trap/interceptor.

   C. *See Part-I, Section G* within this Manual for more information.

III. Additional Information:

1. For more information concerning plumbing and cross-connection control, *see Appendix R*[2] *entitled, "Plumbing and Cross-Connection Control" in Part-II of this Manual.*

[2] Source of guidance document, "Plumbing and Cross-Connection Control" – FDA, Food and Drug Administration, Division of Human Resource Development, Rockville, Maryland 20857

SECTION O - INSECT AND RODENT CONTROL

REFERENCES (Chapter 511-6-1)

.07 Physical Facilities:

(2) Design, Construction, and Installation (k) Insect Control Devices, Design and Installation (m) Outer Openings, Protected (n) Exterior Walls and Roofs, Protective Barriers
(6) Poisonous or Toxic Material (c) Storage and Separation (d) Restrictions (s) Stock and Retail Sale

I. General Requirements: *Preventive measures during design and construction of a food establishment are essential to eliminating and controlling pest problems*. Food establishments should be designed and constructed to restrict the entrance of pests. The presence of pests shall be controlled throughout the premises. *See Illustrations O-1 through O-8.*

II. Openings to the Outside:

1. *Openings to the outside shall be effectively protected against the entrance of pests*. Openings to the outside shall be protected by the installation of tight fitting, self-closing doors; closed windows; self-closing windows at drive-thrus; screening; controlled air currents; vestibules; or other means approved by the Health Authority.

2. *Screen doors* shall be self-closing and screens for windows, doors, skylights, transoms, intake air ducts, exhaust vents and other openings to the outside shall be tight fitting and free of breaks. Screening material shall not be less than sixteen mesh to the inch. Openings around pipes, conduit or wiring must be sealed.

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

4. *Openings between the floor and bottom of the doors to the outside* shall be adequately flashed with rodent proof material/weather stripping to eliminate any opening.

III. Insect Control:

1. *Insect control devices* may be used as tools in controlling *flying insects that have already entered a food service establishment*. Electrocution units shall be designed to retain the insect within the device.

2. Insect control devices *may not be located over a food preparation area* and should be installed in accordance with the manufacturer's recommendations.

ILLUSTRATION O-1
Self Contained Insect Device

ILLUSTRATION O-2
Door Sweep

ILLUSTRATION O-3

Gaps Under Entrance Doors

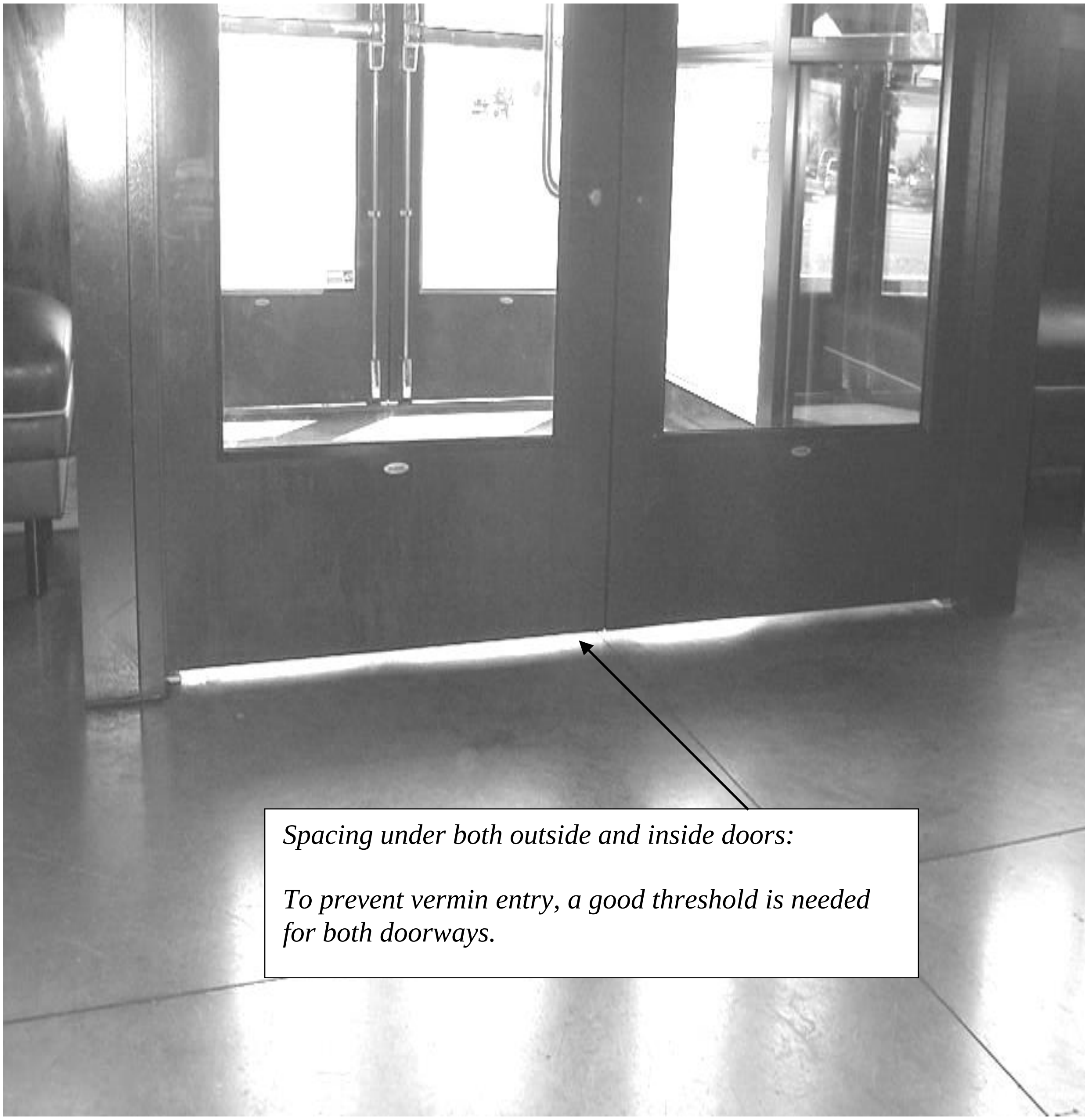


ILLUSTRATION O-4
Air Curtain

3. *Air curtains*, whether installed over drive-through windows or doorways, *must be sized for the opening to be protected against flying insects.* These units must be *auto activated whenever the door or window is opened*. Air currents must blow downward and slightly outward. The units must be wired to the switch box directly so the unit cannot be deactivated at the door.

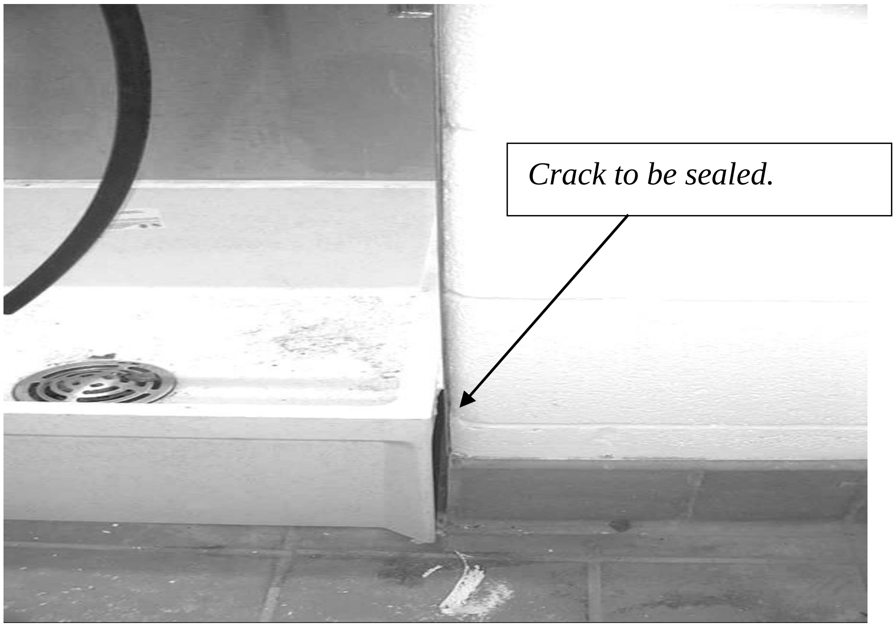
ILLUSTRATION O-5
Holes around Conduits

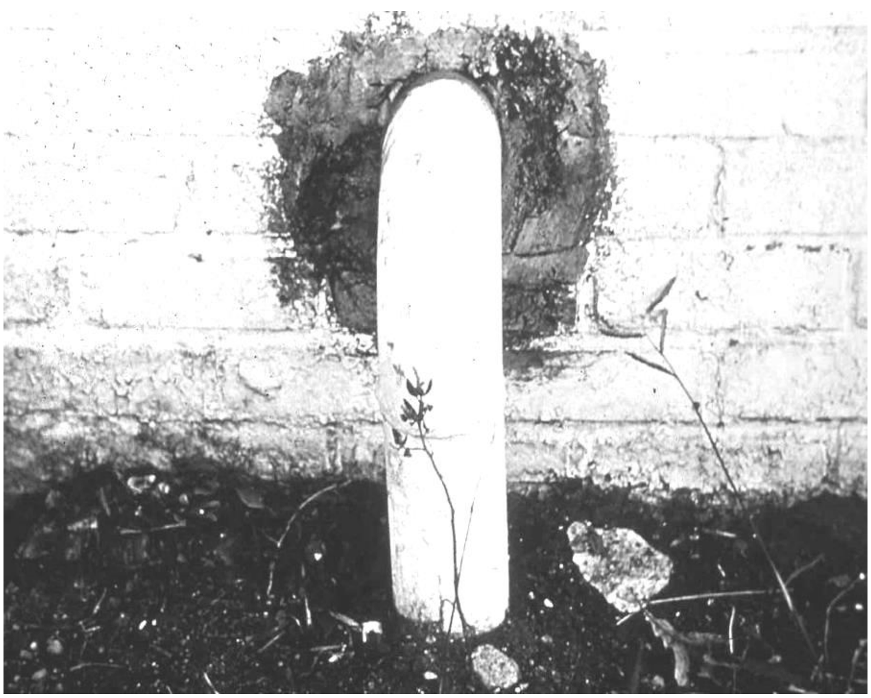
Mechanical rooms and conduits areas are sometimes overlooked and are easy access points for most pests. Openings around conduits leading into walls or ceilings must be sealed off.

ILLUSTRATION O-6
Outside Doors and Landscaping Considerations

Outside landscape material should be small enough not to create void spaces for pests to travel and hide. Shrubbery and trees should be kept at a minimum and away from the building if possible. Loading and supply areas such as the above cargo bay door need special consideration when examining the type of flashing or other gasket type finishes are installed.

ILLUSTRATION O-7





By sealing off cracks around equipment and utility lines, vermin entrance and harborage opportunities are eliminated.

ILLUSTRATION O-8

Properly constructed solid waste and recyclable storage facilities will deter vermin attraction and vermin harborage.

SECTION P – LIGHTING

REFERENCES (Chapter 511-6-1)

.07 Physical Facilities. (2) Design, Construction, and Installation. (i) Light Bulbs, Protective Shielding. 1, 2 & 3.
.07 Physical Facilities. (3) Design, Construction, and Installation. (f) Lighting Intensity1, 2 & 3.

I. General Requirements:

1. The *light intensity* shall be at least 108 lux *(10 foot candles)* at a distance of 75 cm (30 inches) *above the floor, in walk-in refrigeration units and dry food storage areas and in other areas and rooms during periods of cleaning*.

2. The *light intensity* shall be at least 215 lux *(20 foot candles) at a surface where food is provided for consumer self-service such as buffets and salad bars or where fresh produce or packaged foods are sold or offered for consumption*; inside equipment such as reach-in and under-counter refrigerators; at a distance of 75 cm (30 inches) above the floor in areas used for handwashing, warewashing, and equipment and utensil storage, and in toilet rooms.

3. The *light intensity* shall be at least 540 lux *(50 foot candles*) at a *surface where a food employee is working* with food or working with utensils or equipment such as knives, slicers, grinders, or saws *where employees' safety is a factor.*

4. *Darker colored walls and floors may require additional lighting*.

5. *Shielding* such as plastic shields, plastic sleeves with end caps, shatterproof bulbs and/or other approved devices *shall be provided for all artificial lighting fixtures located in areas where there is exposed food; clean equipment, utensils, and linens; or unwrapped single- service and single-use articles. See Illustrations P-1and P-2.*

6. Shielding, coated, or otherwise shatter-resistant bulbs <u>*need not be used in areas used only for storing food in unopened packages, if*</u>*:*

   A. The integrity of the packages can not be affected by broken glass falling onto them; and

   B. The packages are capable of being cleaned of debris from broken bulbs before the packages are opened.

C. *To clarify this exception to #6 above*, this means that it would only apply to dry storage rooms where food and single-service and single-use articles are *still within their original, unopened packaging and are sealed in such a way that none of the broken glass can get to the packaging contents.* This exception would not apply to any area where food and or single-service and single-use articles packaging have been opened or the contents have been removed to other containers nor where food or such articles are on display or otherwise, being prepared or handled.

7. *Heat lamps*, where permitted, shall be *protected against breakage* by a shield *surrounding and extending beyond the bulb*, leaving only the face of the bulb exposed. *See Illustration P-2.*

ILLUSTRATION P-1
Lighting Fixture Shielding

Light bulbs must be shielded in all food service establishment except as provided for in DPH Rule 511-6-1-.07(2)(i)2. Note that the light bulbs on the left have protective sleeves over each bulb, but the bulbs on the right do not. Shields help prevent breakage caused from mop and broom handles hitting the bulbs. Shields also prevent broken glass from falling when florescent bulbs burst. In this way, food, utensils, single-service and single-use articles are protected from physical hazards. Employees and consumers are protected from injury as well.

ILLUSTRATION P-2

Shielded Light Fixtures and Equipment

Ceiling Mounted Heat

Carving Station

Hot Food Display Heat

Note that the shield extends beyond exposed end of heat lamp bulb

Fluorescent Bulb Protective Sleeves and End Caps

Typical Fluorescent Fixture

Vapor Lock Globe Typically Found in Walk-in Coolers/Freezers and Exhaust Hoods on Cook-Lines

Plastic Coated, Shatter Proof Bulb

SECTION Q - VENTILATION:

REFERENCES

Chapter 511-6-1:

.05 Equipment and Utensils. Amended. (2) Design and Construction (j) Ventilation Hood Systems, Filters.
.05 Equipment and Utensils. Amended. (2) Design and Construction (n) Exhaust Ventilation Hood System.
.05 Equipment and Utensils. Amended. (3) Design and Construction (d) Ventilation Hood Systems, Adequacy.
.05 Equipment and Utensils. Amended. (5) Acceptability of Existing Equipment.
.07 Physical Facilities. (2) Design, Construction, and Installation (j) Heating, Ventilating, Air Conditioning, Systems Vents.
.07 Physical Facilities. (3) Numbers and Capacities. (g) Mechanical Ventilation.
.07 Physical Facilities. (5) Maintenance and Operation. (d) Cleaning Ventilation Systems, Nuisance and Discharge Prohibition.

Life Safety Codes:

NFPA 96, 2004 Edition, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
NFPA 101, 2000 Edition, Life Safety Code.
International Fire Code (IFC), as adopted by the Chapter 120-3-3 of the Rules and Regulations State Minimum Fire Safety Standards.

I. Purpose: The purpose of this section is to serve as a basic reference document. It is to provide background information and reasonable assurance that proposed exhaust ventilation systems are thoughtfully included in the commercial kitchen design relative to good sanitation of equipment and facilities. *It is not intended to supersede or replace professional engineering standards and methodologies, state law or local codes in regards to proper design, construction, installation, or approval of ventilation systems in food service establishments.* It will be the food service permit applicant's (or as necessary, the permit holder's) responsibility to provide written documentation of satisfactory compliance with all applicable standards, rules and regulations, laws and codes in regards to the establishment – *see DPH Rule 511-6-1-.02(1)(c)2.*

II. Background[1]:

1. *The Environmental Health Specialist's (EHS) primary focus is on good sanitation of equipment and facilities; however, the safety and comfort of the establishment's employees and consumers are considered as well.* The EHS must rely on other code officials and professionals, such as architects and engineers, to provide evidence of compliance with state and local codes related to fire safety, design and installation of exhaust ventilation systems. *All rooms shall have sufficient ventilation to keep them free of excessive heat, steam, vapors, obnoxious odors, smoke and fumes*. Ventilation systems shall be designed and installed according to applicable law. Exhaust hoods shall be *designed to capture and confine cooking vapors and residues and remove them from the establishment*. Exhaust hood systems shall satisfactorily operate during the cooking, dishwashing and other applicable times of operation.

[1] Source: Section 12 – Ventilation – FDA 2008 Plan Review for Food Establishment Guidance Document.

2. *Proper capture and venting of gases, heat, grease, vapors, and smoke generated by cooking equipment is important*; for not only fire prevention and sanitation purposes, but for maintaining the health and well being of the establishment's food service employees and consumers. In order to help prevent dangerous or unhealthful conditions within a food service establishment, it is critical that exhaust ventilation systems be designed, constructed, and operated in compliance with all applicable state laws and local codes.

3. The additional heat and moisture loads generated by *equipment and appliances* shall be accounted for in the design of the HVAC system.

III. Fire Protection[2]:

1. The State's minimum requirements for *Type I commercial kitchen hood ventilation system ducts and exhaust equipment s*hall be designed, constructed and installed in accordance with the *Life Safety Code (LSC) NFPA 101 and NFPA 96*[3]. *Other commercial kitchen hood ventilation system ducts and exhaust equipment* shall comply with the requirements of the International Mechanical Code.

2. The State's minimum requirements for fire suppression systems for commercial cooking equipment shall be established by the *Life Safety Code and NFPA 96*. Commercial cooking appliances required to have a Type I hood shall be provided with an approved automatic fire suppression system – *see Illustration Q-11 for example*.

IV. State or Local Fire Marshall Office[4]: *Counties with over 100,000 persons* and *municipalities with over 45,000 persons* are mandated by law to enforce the state's minimum rules and regulations on such buildings in their area of jurisdiction. Resolutions can be submitted by municipalities under 45,000 persons adopting the enforcement responsibilities from the state. *If a county or municipality is not required to conduct enforcement,* the State Fire Marshal's Office enforces *O.C.G.A. 25-2-14 which lists the facilities under the jurisdiction of the State Fire Marshal's Office*.

V. General Principles of Exhaust[5]:

1. The *purpose of an exhaust hood* is to provide a method of collecting, as nearly as possible, all of the grease produced from the cooking process while furnishing a means of removing heat, smoke and odors from the cooking area. A sufficient volume of air movement (capture velocity) must be provided to effectively draw grease particles and cooking vapors directly from the cooking surface to the grease extractors. This airflow removes cooking odors and keeps grease particles from settling onto nearby surfaces.

[2] Source: Table 102.10: Codes Reference Guide – Chapter 120-3-3-.04 State Minimum Fire Safety Standards with Modifications – State of Georgia.
[3] As adopted within Chapter 120-3-3 Georgia State Minimum Fire Safety Standards, this standard provides the minimum fire safety requirements related to the design, installation, operation, inspection, and maintenance of all cooking operations.
[4] Reference: O.C.G.A. 25-2-12 (a) (1) and (b)
[5] Source: Page 12 of Section 12 – Ventilation 2008 FDA Food Establishment Plan Review Guide Document

2. *An effective capture velocity* shall be sufficient to overcome opposing air currents, capture the grease and cooking vapors, and transport them to the grease extractors. When grease vapors cool and condense an extractor removes grease particles by directed airflow, contraction, and expansion (drop out).

3. *For heat and steam producing equipment*, the hood or ventilation system controls humidity, heat and unwanted condensation.

4. *Some equipment may not need mechanical exhaust ventilation*[6].

   A. The *following additional criteria* should be taken into consideration when determining the need for mechanical exhaust ventilation:

      a. Installation of *other unventilated heat generating equipment in the same area*, e.g., refrigeration condensers, steam tables, or counter-top equipment;

      b. *Presence of heating/cooling (HVAC) system*: Cooking equipment operation temperatures are low enough that the existing room ventilation can compensate for the heat generated by the equipment without creating unsafe or hazardous conditions in the kitchen;

      c. *Size of the room or area* where the proposed equipment will be installed, including ceiling height;

      d. *How the proposed equipment will be operated*, e.g., the types of food prepared, how often, etc;

      e. *Relative size of the proposed equipment*; physical weight, BTU's: Equipment may, due to design or size, cook certain food without producing significant amounts of toxic gases, smoke, grease, vapors, or heat;

      f. *Nature of the emissions*, e.g., grease, heat, steam, etc;

      g. Cooking apparatus is *equipped with an air purifying system of baffles, filters, etc. (with or without fire suppression)*, that *effectively removes all toxic gases, smoke, grease, vapors, and heat from the air released by the equipment*; and

      h. *Method of producing heat*, e.g., gas, electricity, solid fuel, etc.: Cooking equipment that uses solid fuel e.g., wood or charcoal, must be provided with a separate exhaust system.

[6] Source: Pages 5 & 6, "Cooking Equipment Exhaust Ventilation Exemption Guide For The Local Enforcement Agency" dated September 2009 published by the California Conference of Directors of Environmental Health and Section 507 in the 2006 International Mechanical Code as adopted by Georgia Department of Community Affairs (DCA)

B. Although following *Listing Q-1* of appliances typically does not require mechanical ventilation, *Listing Q-1 shall not be deemed to supersede any state or local building and fire code requirements*. In addition, *Listing Q-1 does not preclude the local Health Authority and any enforcement agency from requiring the installation of mechanical exhaust ventilation when the operation of the cooking equipment in a specific location may or actually results in a sanitation or safety violation*. *Each local Health Authority having jurisdiction will have to evaluate equipment in Listing Q-1*[7]*on a case-by-case basis:*

Listing Q-1[8]

- Coffee Equipment:
  - Urn or brewer
  - Roaster *(electric)*
- Corn on the Cob Warmer
- Clam Shell Grill/Panini – (*for heating non-grease producing foods such as tortillas, pastries, rolls, sandwiches from precooked meats and cheeses)*
- Crepe Maker *(no meats)/*Waffle Cone Maker/Waffle Iron
- Hot Dog Warmer - Hot Plate *(electric and induction cooker)* and Roller-Cooker
- Electrical Holding/Warming Ovens and Portable ovens *(light-duty microwave, cook and hold, ovens utilizing visible and infrared light technology)*
- Popcorn Popper *(without external grease vapor release)*
- Rethermalizers *(single light-duty electric)*
- Rice Cookers and Egg Cookers *(electric)*
- Rotisserie (*Electric and enclosed with max. ambient cavity temperature of 250ºF)*
- Electrically heated Steam Table
- Toaster – countertop *(bread only)*
- Under-counter-type commercial warewashing machines
- Warewashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and are installed in accordance with the manufacturer's instructions

Note: *The additional heat and moisture loads generated by such appliances as those listed above shall be accounted for in the design of the HVAC (Heating, Ventilation and Air-Conditioning) system.*

[7] Reference: Section 507.2.2. Type II hoods, Exception #4, Georgia 2006 International Mechanical Code as adopted by the Georgia Department of Community Affairs (DCA) Board as mandated and applicable to Georgia.
[8] Source: Cooking Equipment Exhaust Ventilation Exemption Guide For The Local Enforcement Agency September 2009 as published by the California Conference of Directors of Environmental Health

VI. Cooking Equipment Duty Rating Relative to Type of Exhaust Ventilation System:

1. *Background*[9]:

   A. *Cooking can be described* as a process that adds heat to raw or precooked food. As heat is applied to the food, effluent is released into the surrounding environment. This effluent release includes water vapor, organic material released from the food itself, and heat that was not absorbed by the food being cooked. Some forms of reheating, such as rethermalizing limit the effluent released to the space but still emit water vapor to the surrounding space.

   B. The hot cooking surface (or fluid, such as oil) and product vapors *create thermal air currents* (*typically called a thermal plume*) that are received or captured by the hood and then exhausted. If this thermal plume is not captured and contained by the hood, they become a heat load to the space. The velocity of these thermal plumes depends largely on the surface temperature of the cooking equipment, and varies from *25 feet per minute over some steam equipment*, to *200 feet per minute over some char-broilers.* Thus, *the strength of the thermal plume is a major factor in determining the exhaust rate.*

   C. Because of the variation in velocity of thermal plumes and the quantity of grease and smoke produced, cooking equipment typically classified in four duty rate categories: *light duty (such as ovens, steamers, and small kettles up to 400°F), medium duty (such as large kettles, ranges, griddles, and fryers up to 400°F), heavy duty (such as broilers, char-broilers, and woks up to 600°F) and extra heavy duty (such as solid-fuel-burning equipment - wood, charcoal, etc. - up to 700°F).*

2. *Cooking equipment categorized by duty rate*:[10] The following types of cooking equipment are *examples that typically require a Type I or II mechanical exhaust hood ventilation system.* The cooking equipment is divided into extra heavy, heavy, medium and light duty cooking categories. *The following Listings Q-2 through Q-5 are not all inclusive and the requirement of the state or local code requirements supersede these listings*:

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9 Source: Heat Load Based Design – Radiant, Convective and Conductive HEAT

10 Source #1: energy design resources, design brief, Commercial Kitchen Ventilation Design, Southern California Edison – reported source: ASHRAE Standard 154
Source #2: Section 507 - Georgia 2006 International Mechanical Code as adopted by Ga. Dept of Community Affairs

Listing Q-2

Extra Heavy Duty Cooking Equipment – associated with a Type I Hood
(Appliances using solid fuel such as wood, charcoal, briquettes, and mesquite to provide all or part of the heat source for cooking.)

- Barbeque
- Charbroiler – *Underfired*
- Tandoor Oven – *(Clay oven mainly used in the preparation of Indian dishes. Other Asian cultures use it as well.)*
- Chinese Range – *(Wok)*

Listing Q-3

Heavy Duty Cooking Equipment – associated with a Type I Hood
(Cooking appliances that produce grease or smoke)

- Electric and gas underfired broilers
- Electric and gas chain *(conveyor)*
- Gas open-burner ranges *(with or without oven)*
- Electric and gas wok ranges
- Electric and gas overfired *(upright)* broilers
- Salamanders

Listing Q-4

Medium Duty Cooking Equipment – associated with a:
Type I Hood *(Cooking appliances that produce grease or smoke)* or
Type II Hood (Cooking or Warewashing appliances producing heat, steam, or products of combustion and do not produce grease or smoke.)

- Electric discrete element ranges *(with or without ovens)*
- Electric and gas hot-top ranges
- Electric and gas griddles
- Electric and gas double-sided griddles
- Electric and gas fryers *(including open deep-fat fryers, donut fryers, kettle fryers, and pressure fryers)*
- Electric and gas pasta cookers
- Electric and gas conveyor *(pizza)* ovens
- Electric and gas tilting skillets/braising pans
- Electric and gas rotisseries

Listing Q-5

<u>Light Duty Cooking Equipment</u> – associated with a:
Type I Hood *(Cooking appliances that produce grease or smoke)* or
Type II Hood (Cooking or Warewashing appliances producing heat, steam, or products of combustion and do not produce grease or smoke.)

- Gas and electric ovens *(including standard, bake, roasting, revolving, retherm, convection, combination convection/steamer, conveyor, deck or deck-style pizza, and pastry)*
- Electric and gas steam-jacketed kettles
- Electric and gas compartment steamers *(both pressure and atmospheric)*
- Electric and gas cheesemelters
- Electric and gas rethermalizers

VI. Types of Hoods:

1. *A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with the International Mechanical Code and or International Fire Code.* Where any cooking appliance under a single hood requires a Type I, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II shall be installed[11].

2. *A hood shall be designed to provide thorough cleaning of the entire hood*. Grease gutters shall drain to an approved collection receptacle that is fabricated, designed and installed to allow access for cleaning. Exhaust ventilation hoods and devices shall be designed and installed to prevent grease or condensation from collecting on walls, ceilings, and fire suppression supply piping and from dripping into food or onto food contact surfaces[12].

3. <u>Type I Hoods[13]</u>:

   A. *Type I hood systems are installed where cooking appliances produce grease or smoke*, such as occurs with griddles, fryers, broilers, ovens, ranges and wok ranges.

      Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by other approved means.

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[11] Source: 507.2 Where required – Section 507 Commercial Kitchen Hoods – GA 2006 International Mechanical Code as adopted by the Georgia Dept. of Community Affairs.

[12] Source: 507.8 Cleaning and grease gutters - Section 507 Commercial Kitchen Hoods – GA 2006 International Mechanical Code as adopted by the Georgia Dept. of Community Affairs.

[13] Source: 507.2.1 Type I hoods & 507.2.1.1 Operation - Section 507 Commercial Kitchen Hoods – GA 2006 International Mechanical Code as adopted by the Georgia Dept. of Community Affairs.

B. A Type I hood shall be installed with a clearance to combustibles of not less than 18 inches. Clearance is not required for gypsum wallboard attached to noncombustible structures if a smooth, cleanable, nonabsorbent and noncombustible material is installed between the hood and the gypsum wallboard over an area extending not less than 18 inches in all directions[14].

4. Type II Hoods[15]:

A. *Type II Hood Systems are installed where cooking or dishwashing appliances produce heat, steam, or products of combustion and do not produce grease or smoke*, such as steamers, kettles, pasta cookers and dishwashing machines.

B. *Exceptions i*nclude under-counter-type commercial dishwashing machines; dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the appliance manufacturer and installed in accordance with the manufacturer's instructions; single light-duty electric convection, bread retherm or microwave oven; and electrically heated appliances: toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers and holding/warming ovens.

C. *See Illustrations Q-1, Q-8, Q-9 and Q-12* for examples of a Type II Hood system.

VIII. Make-Up Air[16]:

1. *Make up air shall be supplied during the operation of commercial kitchen exhaust systems that are provided for commercial cooking appliances*. The amount of makeup air supplied shall be approximately equal to the amount of exhaust air. Makeup air shall be provided by gravity or mechanical means or both.

2. *If make-up air were not provided*, the building would be under a negative pressure, which could *cause the following serious problems*:

A. *The exhaust fan would not be capable of exhausting the design volume of air because the air would not be available.*

B. Negative pressure would cause improper venting of water heaters, space heaters, or the individually vented gas appliances in the establishment.

C. A negative pressure will cause a surge of unconditioned outside air into the building whenever the doors are opened, which may also allow the entrance of flies into the establishment.

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[14] Source: 507.9 Clearances for Type I hood - Section 507 Commercial Kitchen Hoods – GA 2006 International Mechanical Code as adopted by the Georgia Dept. of Community Affairs.

[15] Source: 507.2.2 Type II hoods - Section 507 Commercial Kitchen Hoods – GA 2006 International Mechanical Code as adopted by the Georgia Dept. of Community Affairs.

[16] Source: 508 Commercial Kitchen Makeup Air – GA 2006 International Mechanical Code as adopted by the Georgia Dept. of Community Affairs.

4. *For a consistent and regulated flow*, make-up air should be mechanically introduced by a fan or gravity. Outside windows and doors shall not be used for the purpose of providing make-up air. Air conditioning systems may also serve as a source of make-up air,

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

6. *The State's minimum requirements for commercial kitchen makeup air* in Type I hoods shall be in accordance with the *Life Safety Code, NFPA 101* [17]*and NFPA 96*[18]. Commercial kitchen makeup air for *Type II hoods shall comply with the requirements of the International Mechanical Code.*

IX. Noncanopy and Canopy Size and Location[19]:

1. Canopy:

   A. The inside lower edge of canopy-type I and II hood shall *overhang or extend a horizontal distance of not less than 6 inches beyond the edge of the top horizontal surface of the appliance on all open sides.* The *vertical distance* between the front lower lip of the hood and the cooking surface *shall not exceed 4 feet.* The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the appliance side by a non-combustible wall or panel.

   B. *Canopy hoods both wall and island* should have **a** *minimum depth of two feet*. *No overhang will be required on sides where aprons are installed*; however, side overhang shall be required when less than full side curtains are provided (*Illustration Q-2*). The dimensions of the hood are, in all cases, larger than the cooking surface to be covered by the hood.

   C. Canopy hoods are generally *installed so that the bottom of the hood is between 6.5 feet and 7 feet above the finished floor* (*Illustration Q-3*.); however, the *vertical distance between the lower lip of the hood and the cooking surface shall not exceed 4 feet*.

[17] National Fire Protection Association - Life Safety Code
[18] National Fire Protection Association – Standard for the Ventilation Control and Fire Protection of Commercial Cooking Operations
[19] Source: 507.12 Canopy size and location & 507.14 Noncanopy size and location – Section 507 – GA. 2006 International Mechanical Code as adopted by the Georgia Department of Community Affairs.

D. In some applications, the minimum six-inch overhang may not be sufficient to capture all of the smoke, vapors, or grease generated by the cooking equipment. *A 12 –18-inch overhang is recommended for large or stacked ovens, conventional steamers, large tilting kettles, and bain-maries.* An overhang at the side of the hood is also recommended for char broilers when the equipment is *located at the end of the cook line.*

E. *See Illustration Q-12* for additional examples of canopy hoods.

2. <u>Non-canopy</u>:

A. *Non-canopy type hoods* shall be located a *maximum of 3 feet above the cooking surface.* The edge of the hood shall *be set back a maximum of 1 foot from the edge of the surface.*

B. <u>Ventilator or Backshelf Hood</u>: *Backshelf hoods are designed to mount to the wall directly behind the cooking equipment*. This type of hood is often *used where ceiling height is a factor*. It is normally placed closer to the cooking surfaces than a canopy hood, and works well in light to medium duty cooking applications. The ventilator hood is not used for char broilers or similar high heat and grease producing cooking equipment. *It does not have the capture area of a canopy hood and is not able to effectively handle large surges of cooking emissions (steam, heat, vapors, smoke etc.) See Illustration Q-4 and Illustration Q-12 for example.*

C. <u>Eye-Brow Hoods</u>:

a. *Eye-brow hoods* are acceptable for use with either Type I or Type II hoods. The eye-brow hood shall overhang, or extend a horizontal *distance of at least six inches, beyond all areas of the equipment out of which steam, grease, odors, smoke, or heat will be emitted – see Illustrations Q-5 and Q-6.*

b. An eyebrow hood is *designed to immediately remove heat from the oven at the point of emission or as the door is opened.* It must effectively ventilate the door openings or product entry/exit points of the equipment served.

c. The eyebrow-type oven hood *shall be located above the product transfer openings or doors and shall extend the width of the oven-baking cavity*. An eyebrow-type hood shall be of a rectangular or box type construction with a *recommended minimum of 12 inches of front overhang*.

d. *Filters shall be provided* and they shall be easily accessible for cleaning.

e. *When the width of the product transfer openings or doors is less than the width of the oven-backing cavity*, the hood shall be designed to extend beyond the edge of the product transfer openings or doors a *minimum distance of 3 inches but not to extend beyond the width of the oven.*

D. Waterwash Exhaust Hoods:

a. *Waterwash hoods* operate under the following principles. As the exhausted air moves at a high velocity past a baffle system, the heavier-than-air particles of grease are thrown out of the airstream by centrifugal force. The extracted grease is collected in grease gutters within the hood until removed by the daily cleaning cycle. The cleaning cycle is initiated when the exhaust hood is turned off. Hot detergent water is automatically sprayed onto the baffles system, thereby removing the grease deposits from the baffles. This wastewater is then drained off to the sewer or other approved waste removal system.

b. *In order to protect the potable water supply,* an approved backflow prevention device, such as a reduced pressure principle device, is required to be installed on the water inlet pipe, prior to the detergent pump solenoid.

c. The wastewater from a water-wash-type hood shall be drained through an air gap separation into an approved receptacle, such as a floor sink. *(See Illustration Q-7 Waterwash Hood).*

E. Recirculating Hood Systems (Ductless hoods or Ventless hoods)[20,21]:

a. Where it is not possible to exhaust the air to the out-of-doors and *at the discretion of the code official and or health authority,* a non-ducted, self-contained exhaust system may be a viable option for the food establishment.

b. These devices incorporate an air filtering system enclosed in a hooded or otherwise contained area intended to capture air from the cooking process area. The hood assembly generally includes a fan, collection hood, or equivalent design feature, air filtering system (consisting of a grease filter with other filters), a fire actuated damper, and a fire extinguishing system unit.

c. *Manufacturer of recirculation hood systems must furnish documentation indicating their products full compliance with all Georgia laws and local codes*. Further, said documentation *must insure the effective removal* of excessive smoke, grease, obnoxious odors, condensation, vapors and fumes generated by cooking equipment.

d. *UL 710B requirements* cover commercial electric cooking appliances provided with integral recirculating systems (previously referred to as ductless hoods) and nonintegral recirculating systems, both of which are intended for installation in commercial establishments for the preparation of food.

[20] Source: Cooking Equipment Exhaust Ventilation Exemption Guide For The Local Enforcement Agency as published by the California Conference of Directors of Environmental Health.

[21] Source: 507.1 General – Exceptions – Section 507 Commercial Kitchen Hoods – GA 2006 International Mechanical Code as adopted by the Georgia Department of Community Affairs.

e. *The cooking equipment and exhaust system shall be interlocked such that when the hood is not functional or when the hood is operating at less than 85% efficiency*, the cooking equipment will not operate.

f. *If a water-wash system is incorporated into the design*, an approved backflow prevention device shall be installed when potable water is plumbed to the hood system, e.g., on the water inlet pipe, prior to the water pump solenoid. The wastewater from the scrubbing operation shall be drained through an air gap separation into an approved receptacle, such as a floor sink.

g. Since a nonducted exhaust system does not normally remove the heat from the exhausted air, *the establishment's HAVC system and the nonducted exhaust system must be engineered to balance the establishment's HAVC system. Additional air conditioning will be required t*o meet the increase BTUs being returned to the room in addition to other heat generating equipment. Due to this increased air handling capacity demand of HAVC with nonducted exhaust system characteristic, nonducted exhaust systems are considered equipment and facility specific and as such, they and the HAVC system both must be engineered and installed to the specific ventilation requirements of the proposed food service facility.

h. All filters, etc., *must be readily removable for ease of maintenance*.

i. The *design* nonducted exhaust hoods *must be such that grease and condensate cannot drip back onto the cooking surfaces*.

j. See Illustration Q-13 for examples of Ventless Hoods.

X. <u>Dishwashing Appliances</u>:

1. A Type II Hood is not required for dishwashers and potwashers provided with heat and water vapor exhaust systems that are *supplied by the appliance manufacturer and installed in accordance with their instructions. See Illustration Q-8 Pants Leg Exhaust System in Section Q of Part I within the online Food Service Manual for Design, Installation and Construction for an example of a typical installation.*

2. The top and side of the *vestibule shall extend 10 inches horizontally over the drainboard on each end of the warewashing machine*. The design shall prevent drippage from the hood and duct onto utensils and equipment. The machine manufacturer's recommended air quantities (Q) shall be used or the following:

   A. 500 cfm minimum on single rack (or manufacturer's recommendations).
   30% (150) cfm at entrance – 70% (350) cfm at exit.

   B. 600 cfm minimum for conveyor (or manufacturer's recommendations).
   30% (180) cfm at entrance – 70% (420) cfm at exit.

C. 1200 cfm minimum on flight type (or manufacturer's recommendations).
30% (360) cfm at entrance – 70% (840) cfm at exit.

Note: cfm = Cubic Feet per Minute.

3. Ductwork with reduced area or fixed control damper may be used on entrance.

4. *The minimum net air-flow for Type II Hoods used for dishwashing appliances shall be 100 CFM per linear foot of hood length*[22]. *See Illustration Q-9 within Section Q-Ventilation of Part I within the online Food Service Manual for Design, Installation and Construction for an example of a typical installation.*

XI. Grease Filters [23]:

1. *Grease filters for type I hoods* shall be equipped with listed grease filters designed for the specific purpose. Grease collecting equipment shall be provided with access for cleaning.

2. *Filters shall be of such size, type and arrangement* that will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or approved. Filter units shall be installed in frames or holders so as to be easily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place.

3. *Removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink.* Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping in food or on food preparation surfaces.

4. *Filters shall be installed at an angle of not less than 45 degrees for the horizontal* and shall be equipped with a drip tray beneath the lower edge of the filters[24]. *See Illustration Q-10*.

5. Grease Filter Area and Number of Grease Filters Required[25]:

   A. The *extractor filter removes grease* in the exhaust process *by centrifugal motion or by impingement on a series of baffles.* The manufacturer's optimum rating of the filter should be used in calculating the filter area required in the exhaust system. Standard size filters should be used to avoid additional cost and to allow ease of replacement. *Any space in the filter bank not covered by filters/extractors* shall be fitted with sheet

[22] Source: 507.13.5 Dishwashing appliances – Section 507 Commercial Kitchen Hoods – 2006 International Mechanical Code as adopted by the Georgia Depart. of Community Affairs.
[23] Source: 507.11.1 Criteria - Section 507 Commercial Kitchen Hoods – 2006 International Mechanical Code as adopted by the Georgia Depart. of Community Affairs.
[24] Source: 507.11.2 Mounting position – Section 507 Commercial Kitchen Hoods - 2006 International Mechanical Code as adopted by the Georgia Depart. of Community Affairs.
[25] Reference: Section III, Part 15-Ventilation, 2000 FDA Food Establishment Plan Review Guide

metal blanks. *If calculations indicate that a fraction of a filter is needed, add an additional filter.*

B. The filter area required for an exhaust system can be calculated by using the following formula:

a. Formulas:

$$\frac{\text{Volume of Air Exhausted}}{\text{Operating Velocity of Filter (FPM)}} = \text{Filter Area Needed (sq. ft.)}$$

$$\frac{\text{Filter Area Needed (sq. ft.)}}{\text{Square Feet per Filter}} = \text{Number of Filters Needed}$$

$$\frac{\text{Square Inches}}{\text{144 sq. in per sq. ft.}} = \text{Square Feet}$$

C. Assume we have a canopy hood with a minimum required airflow of 4250 CFM. The hood will be equipped with baffle-type filters with a nominal size of 16 inches x 20 inches and they will have an actual filtering surface of 14 inches x 18 inches. (Nominal size minus the frame equals the actual filtering area.) The optimum operating velocity of the stated filters is 360 FPM. How many 16"x 20" filters would be necessary for the canopy hood system?

b. Calculations:

Step 1. Determine filter Area Needed in Square Feet:

$$\frac{\text{4250 CFM}}{\text{360 FPM}} = \text{12 sq.ft.}$$

Step 2. Covert the actual filter area to square feet:

14 in. x 18 in. = 252 sq. in.

$$\frac{\text{252 sq. in.}}{\text{144 sq.in. per sq. ft.}} = \text{1.75 sq.ft.}$$

Step 3. Divide the 12 sq.ft. of needed filter area by sq.ft. per filter:

$$\frac{\text{12 sq.ft.}}{\text{1.75 sq.ft.}} = \text{6.85 or } \underline{\text{7 filters}}$$

c. Results: In this example, *7 baffle filters* would be required to adequately remove grease from the exhausted air.

XII. <u>Capacity of Hoods</u>:

1. Commercial food service hoods shall exhaust a minimum net quantity of air as determined by the type of hood and cooking appliances. *Where any combination of heavy-duty, medium-duty and light-duty cooking appliances are utilized under a single hood*, the exhaust rate required for the heaviest duty appliance covered by the hood shall be used for the entire hood.

2. Extra heavy, heavy and medium cooking appliances *must use a Type 1* ventilation exhaust hood system. Light duty cooking appliances *may use a Type I or Type II* ventilation exhaust hood system.

3. *The amount of air exhausted through a hood exhaust system is dependent upon the size of the hood, its particular installation, and its use.* There are several methods available for determining the amount of air to be exhausted. With the exception of systems engineered for specific equipment and specifications that are approved by local code officials and or the Health Authority. Below is a summary of the method generally accepted in the industry; however, the method approved by the local codes should be followed in the design of the system:

   A. *<u>Exposed linear foot method</u>*. This method of calculating the exhaust air volume is based on the total exposed linear footage of the hood and the capture velocity relative to its application

   B. *<u>Standard square foot method</u>*. This method of calculating exhaust air volume is based on the size of the opening in the hood (length x width) and the capture velocity relative to the installation of the hood

   C. *<u>Square feet of cooking surface method</u>*. This calculation of the volume of exhausted air depends on the size, temperature, and design of the cooking equipment and the minimal capture velocity required to keep smoke, vapors, and fumes under the hood.

4. *The International Mechanical Code* uses the *exposed linear foot method* for calculating the minimum net airflow based on hood type and category of cooking appliance. *Table Q*-1 has the minimum air volumes that shall be used to calculate the amount of air exhausted for hood system and cooking category.

TABLE Q-1[26]

Minimum Net Airflow (cubic feet per minute / linear foot of hood length) based on the Type of Hood Allowed and Cooking Appliances Category

* Light duty cooking appliances can use Type 1 or Type II hoods. All other categories use Type I hoods.

Type of Hood/ Use Category	Backshelf/pass-over	Double island canopy per side	Eyebrow	Single island canopy	Wall-mounted canopy
Extra Heavy Duty	Not allowed	550	Not allowed	700	550
Heavy Duty	300	300	250	500	300
Medium Duty	400	400	Not Allowed	600	400
Light Duty*	250	250	250	400	200

5. *Exposed Linear Foot Method Exhaust* Ventilation Hood System Sample Calculation:

   A. Example: *Extra Heavy Duty Equipment* is covered by *12 feet by 4 feet single island canopy hood.* Use the preceding information and tables to determine the following:

   B. If the cooking equipment is extra heavy duty, we are required to use a Type 1 canopy hood, either, double-island, wall-mounted or single. A ventilator/backshelf/pass-over or eyebrow hood is not allowed to be used over extra heavy-duty appliances. The calculations use a standard volume of air per linear foot of exposed side of hood. The air volume is based on the type of hood (i.e. three side canopy, wall-mounted canopy) and type of appliance.

      a. Select the proper category for the cooking appliance (extra-heavy, heavy, medium or light). Deep fat fryers are considered extra heavy-duty cooking appliances.

      b. Select the appropriate type of hood for the category of cooking appliance (wall mounted, three sided, etc.). *Table Q-1* lists the type of hoods that can be used for extra heavy-duty cooking appliances. For this example, we are using a single island canopy.

[26] Source: 507.13.1, 507.13.2, 507.13.3 – Section 507 Commercial Kitchen Hoods – 2006 International Mechanical Code as adopted by the Georgia Depart. of Community Affairs.

i. *Step 1*. *Find the total linear feet of hood*: there are 4 exposed sides on a single island canopy.

Total linear feet of hood = (2 length + 2 width)

Example: (2 x12 feet) + (2 x 4 feet) = 32 linear feet of hood

ii. *Step 2*. *Select the net airflow volume* for a single canopy hood used over an extra heavy-duty cooking appliance.

See Table 1. Single Island Canopy used over Extra Heavy Duty Appliance

Example = 700 cfm per linear foot of hood

iii. *Step 3. Use Formula for Airflow*:

Minimum Net Airflow = linear feet of hood x net airflow per linear foot of hood

Example Results:

32 feet of linear hood x 700 cfm per linear foot of hood = 22, 400 cfm

c. The *net quantity of exhaust air* shall be calculated by *subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood*.

XIII. Installation and Performance Testing[27]:

1. *Prior to the issuance of a food service permit*, the permit applicant shall provide documentation to the Health Authority verifying that his or her ventilation system(s) serving food service equipment have been *installed correctly*; have *been tested and operating properly as per applicable Codes*; and that it has *been approved by applicable State and or local code officials*.

[27] Source: 507.16 Performance test - Section 507 Commercial Kitchen Hoods – 2006 International Mechanical Code as adopted by the Georgia Depart. of Community Affairs.

IX. Exhaust Equipment:

ILLUSTRATION Q-1

Dishwasher with Heat and Water Vapor Exhaust System

This Type II Hood system is called a Pans Leg Hood due to the two duck work located at the entrance and exit of the warewashing machine looks like the legs of a pair of pants.

ILLUSTRATION Q-2

Canopy Hood with Side

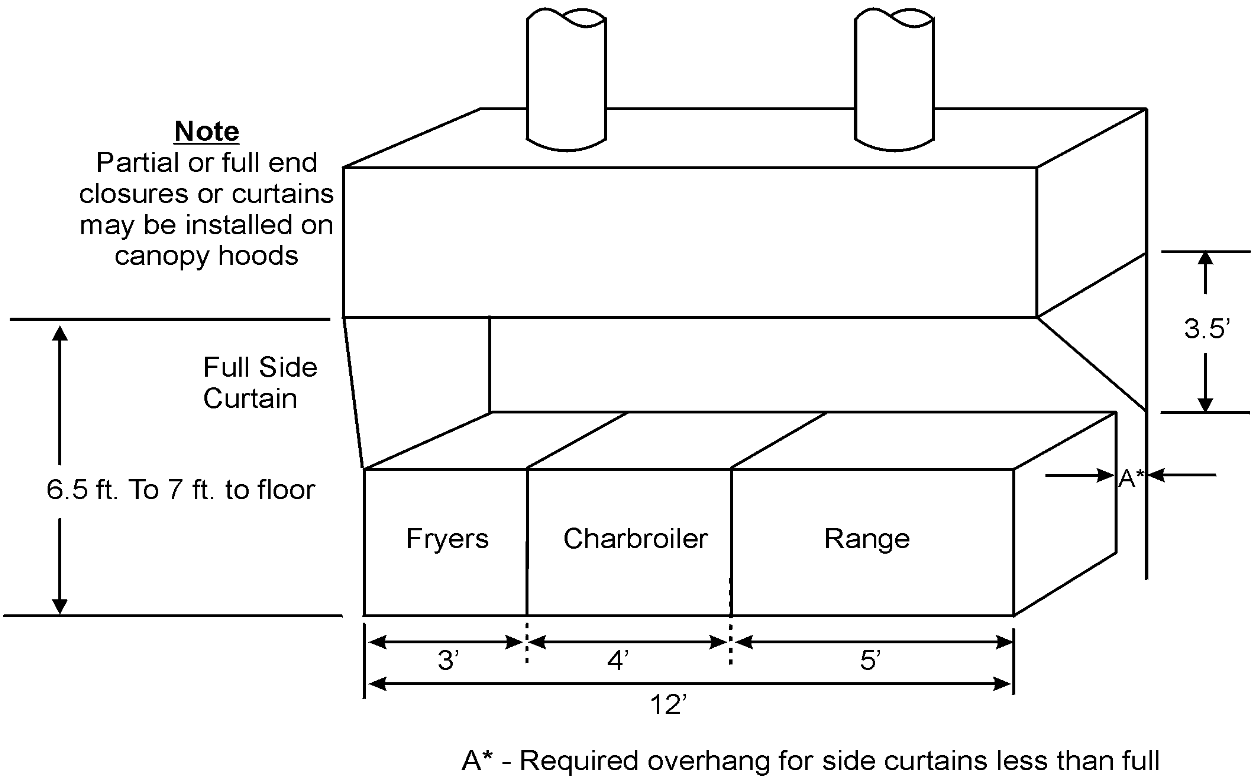
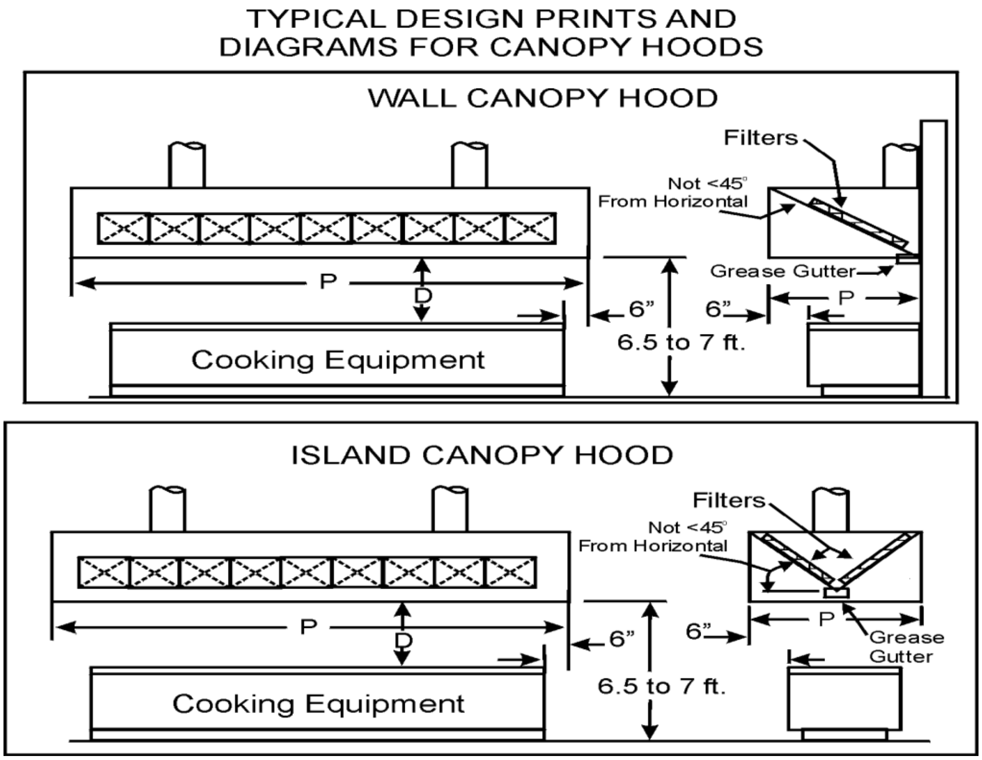


ILLUSTRATION Q-3
Canopy Hoods



P = Length & Width of Hood; D = Distance from Cooking Surface

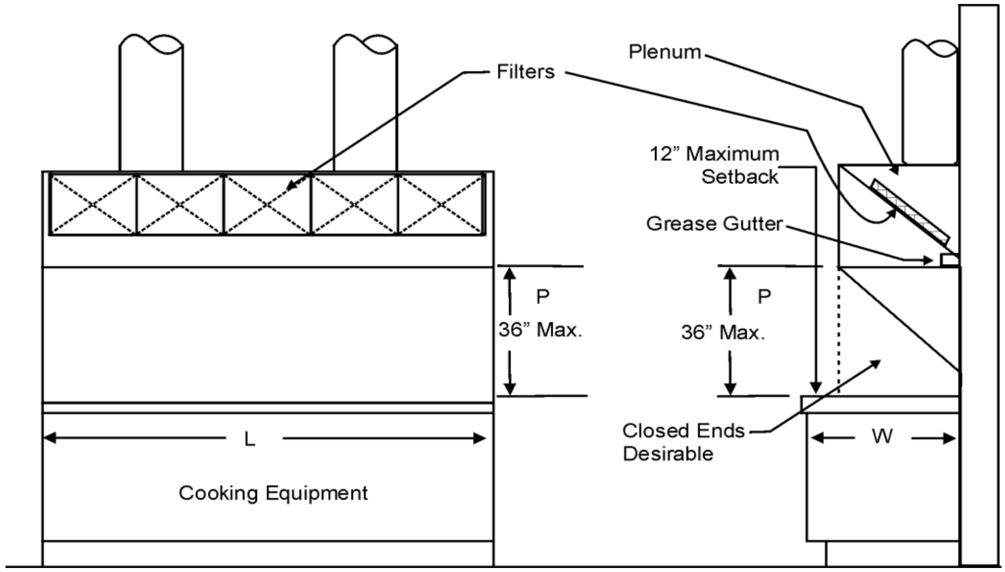
Canopy Hood Over Pizza Ovens

Island Hood Installed Over Cook Line

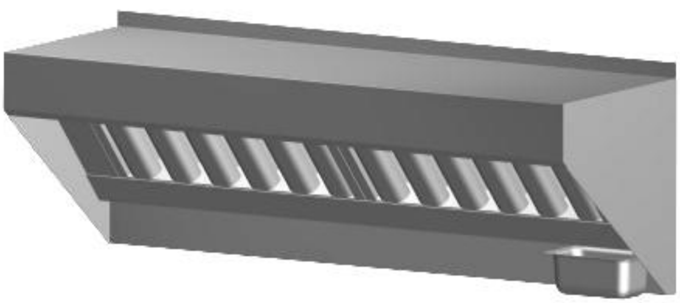
- *The overhang of the hood depends on the distance between the top of the cooking surface and the hood.*
- *Six inches is the minimum required overhang for canopy hoods*
- *The higher the hood is hung above six feet six inches the more overhang you should have.*
- *Canopy hoods must be installed so that the bottom of the hood is between 6.5 feet and 7 feet above the finished floor.*

ILLUSTRATION Q-4

Backshelf Exhaust Hood



P = Height from Cooking Surface to Exhaust Hood
L = Length of Cooking Surface (Combined Cooking Equipment Surfaces)
W = Depth of Cooking Surface

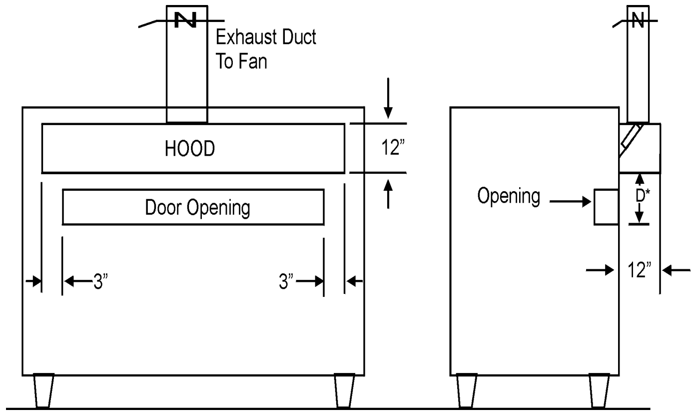


Backshelf Hood

- *Use where ceiling height is a factor*
- *Normally placed closer to cooking surface than a canopy hood*
- *Works well in light to medium duty applications*
- *Not recommended for charbroilers or woks or similar high heat and grease producing equipment. (Does not have capture area of a canopy hood.)*
- *Cannot use with cheesemelters, salamanders, upright ovens, or tandori ovens.*

ILLUSTRATION Q-5

Eye Brow Hood on a Pizza Oven



Eye Brow Hood Over Ovens

ILLUSTRATION Q-6

Eye Brow Hood on a Conveyor Oven

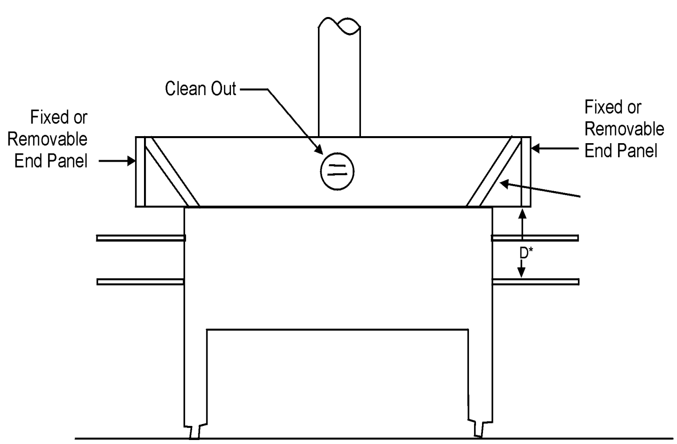


ILLUSTRATION Q-7

Waterwash Exhaust Hoods

The open cabinet of the above self-cleaning (or Waterwash Hood) ventilation hood reveals the automatic cleaning unit apparatus. Notice the cleaning agent in the visible jug that is connected to the cleaning unit. Instructions on how to operate the self-cleaning unit are located in the pouch on the cabinet door.

Some waterwash hoods can be built with removable filters; however, most have fixed filters.

ILLUSTRATION Q-8
Pant Legs Exhaust

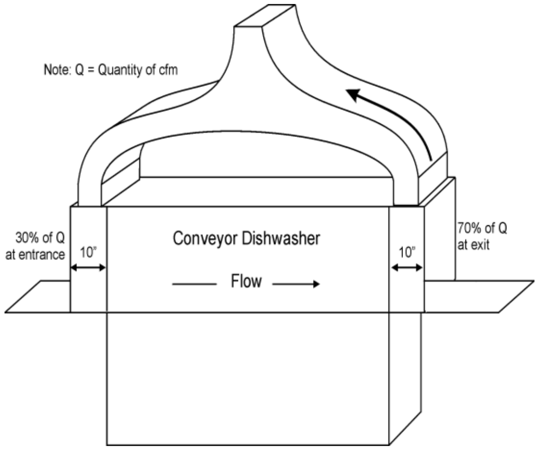


ILLUSTRATION Q-9
Typical Installation of a Canopy Hood over Warewashing Machine

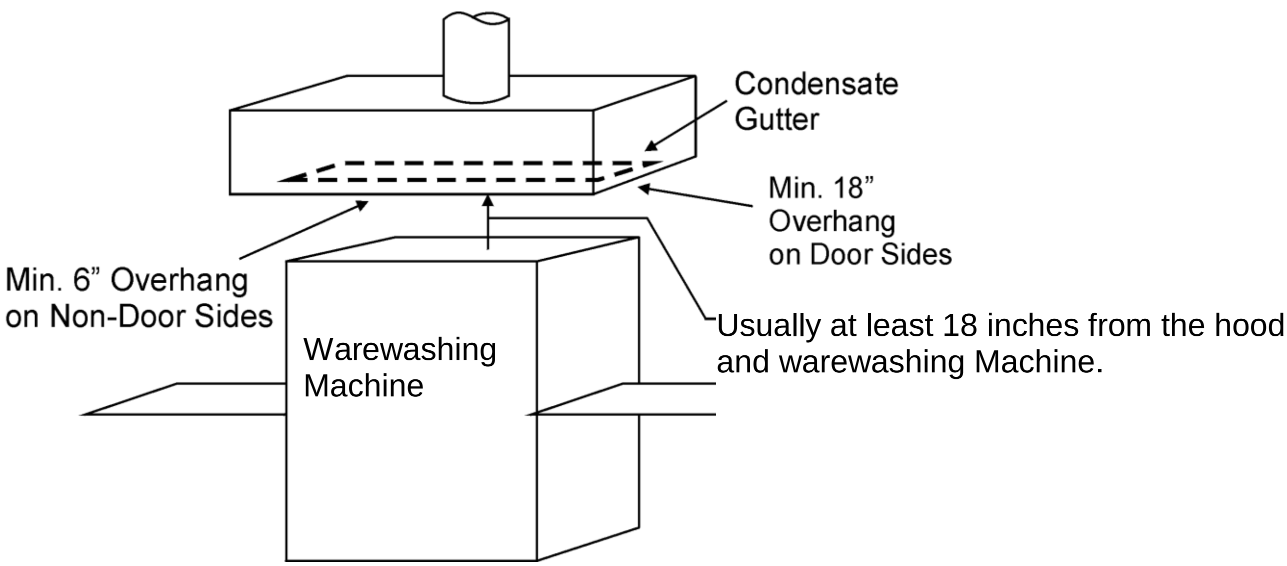


ILLUSTRATION Q-10
Grease Filter Placement

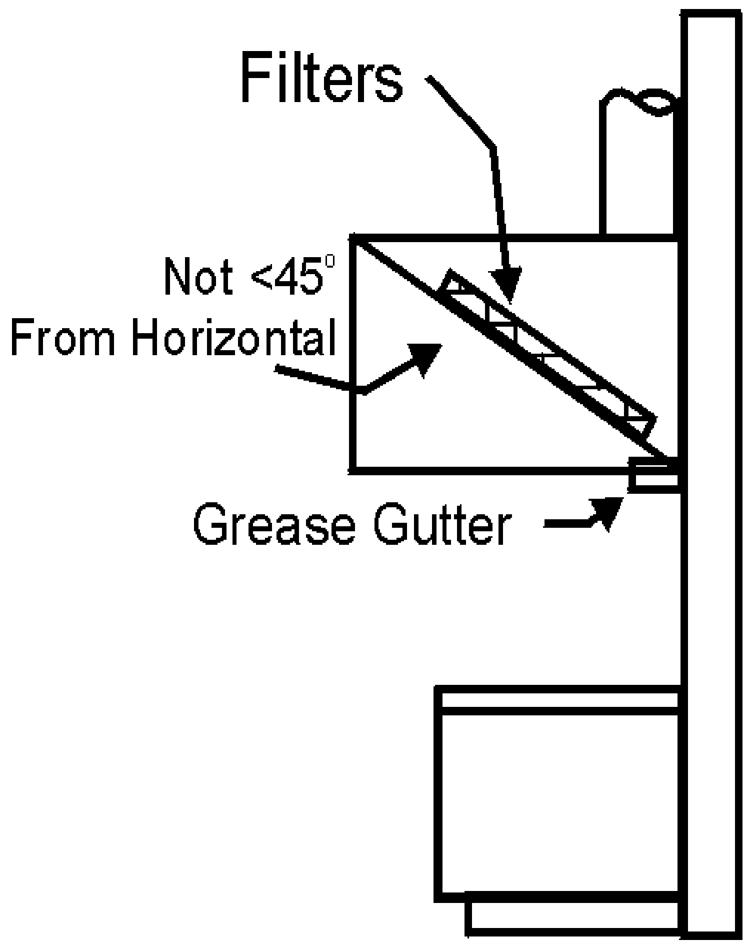


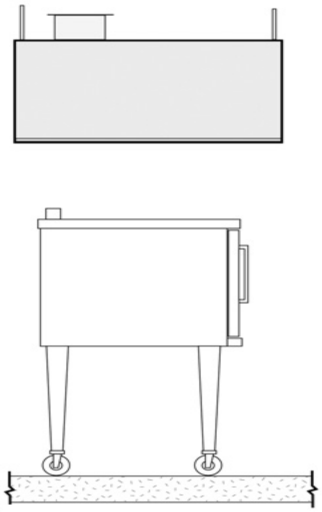
ILLUSTRATION Q-11

Example of Automatic Fire Suppression Systems[28]

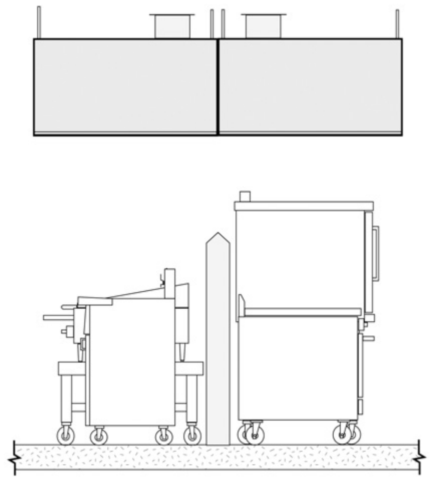
Exhaust ventilation systems for all grease producing cooking equipment is the jurisdiction of the state or local Fire Marshal and building officials. The plan Reviewer should refer applicant to the appropriate agency.

[28] Source: Automatic Fire Suppression System borrowed from: Greenheck Building Value in Air, Schofield, WI and from the current 2008 FDA Plan Review Training Course #FD207 presentation materials.

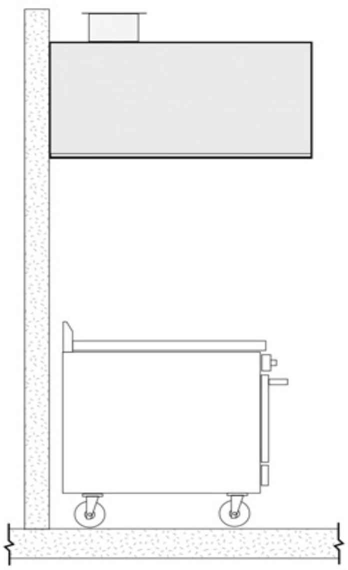
ILLUSTRATION Q-12[29]



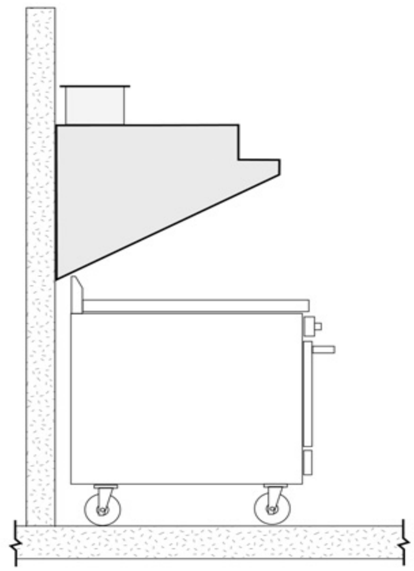
Island Canopy Hood



Double-Island Canopy Hood



Wall-Mounted Canopy Hood



Proximity (Backshelf) Hood

[29] Source: design brief Commercial Kitchen Ventilation Design, Architectural Energy Corporation, Boulder, Colorado, and Fisher Nickel Inc., San Ramon, California under auspices of the California Public Utilities Commission.

ILLUSTRATION Q-13
Examples of Ventless Hood Systems

Ventless hoods are somewhat controversial. There are certain applications where they may be appropriate. In situations where a grease duct cannot go up to a roof due to living quarters above or cannot utilize a side discharge through a wall, they may be appropriate. Routine maintenance has been a common problem. Also, without a well designed HVAC system, heat dispersal is a problem. The local Health Authority must evaluate these type exhaust hood systems on a case-by-case basis.

SECTION R – UTILITY FACILITIES

REFERENCES (Chapter 511-6-1)

.05 Equipment and Utensils, Amended. (3) Numbers and Capacities. (e) Clothes Washers and Dryers – 1 & 2
.05 Equipment and Utensils. Amended. (9) Laundering. (c) Storage of Soiled Linens.
.05 Equipment and Utensils. Amended. (9) Laundering. (d) Mechanical Washing and Drying.
.05 Equipment and Utensils. Amended. (9) Laundering. (e) Use of Laundry Facilities.
.05 Equipment and Utensils. Amended. (10) Protection of Clean Items. (b) Wiping Cloths, Air-Drying Locations.
.05 Equipment and Utensils. Amended. (10) Protection of Clean Items. (f) Prohibitions.
.06 Sanitary Facilities and Controls. Amended. (2) Plumbing System. (i) Service Sinks, Numbers and Capacities.
.06 Sanitary Facilities and Controls. Amended. (4) Sewage, Other Liquid Waste, and Rainwater. (h) Approved Sewage Disposal System.
.07 Physical Facilities. (5) Maintenance and Operation. (f) Drying Mops.
.07 Physical Facilities. (5) Maintenance and Operation. (m) Maintenance Tools.
.07 Physical Facilities. (6) Poisonous or Toxic Materials. (c) Storage, Separation.

I. Service Sinks:

1. *At least one utility sink (i.e. mop sink) or curbed cleaning facility with a floor drain* shall be provided and conveniently located for cleaning mops or similar wet floor cleaning tools and for the disposal of mop water or similar liquid wastes. The water supply for these facilities must be protected against backsiphonage. *See Illustration R-1, R-2, R-3, R-4, and R-5* for examples.

2. *There shall be a place to store mops, mop buckets, and similar cleaning items where they can be air dried after use*. A properly sized mop and broom rack shall be provided to help facilitate the drying process and keep these items away from walls and off floors. *See Illustration R-1 and R-6 for examples of these type facilities.*

3. *Liquid waste from these facilities* should not be discharged into grease traps, unless they are being used for grease operation, i.e. washing cooking exhaust hood filters. When they do discharge into grease traps, they must discharge through a grease trap that has been properly designed for the kitchen facility or as per applicable plumbing code. *See Illustration R-1, R-2, R-3, R-4 and R-5 for examples of facilities for disposal of waste water.*

4. *It is strongly recommended that a separate room (janitor's closet/room) sized large enough to store all items and to facilitate cleaning* be provided for the mop sink, can-wash and for bulk cleaning supplies and toxic materials.

ILLUSTRATION R-1

Utility Facility

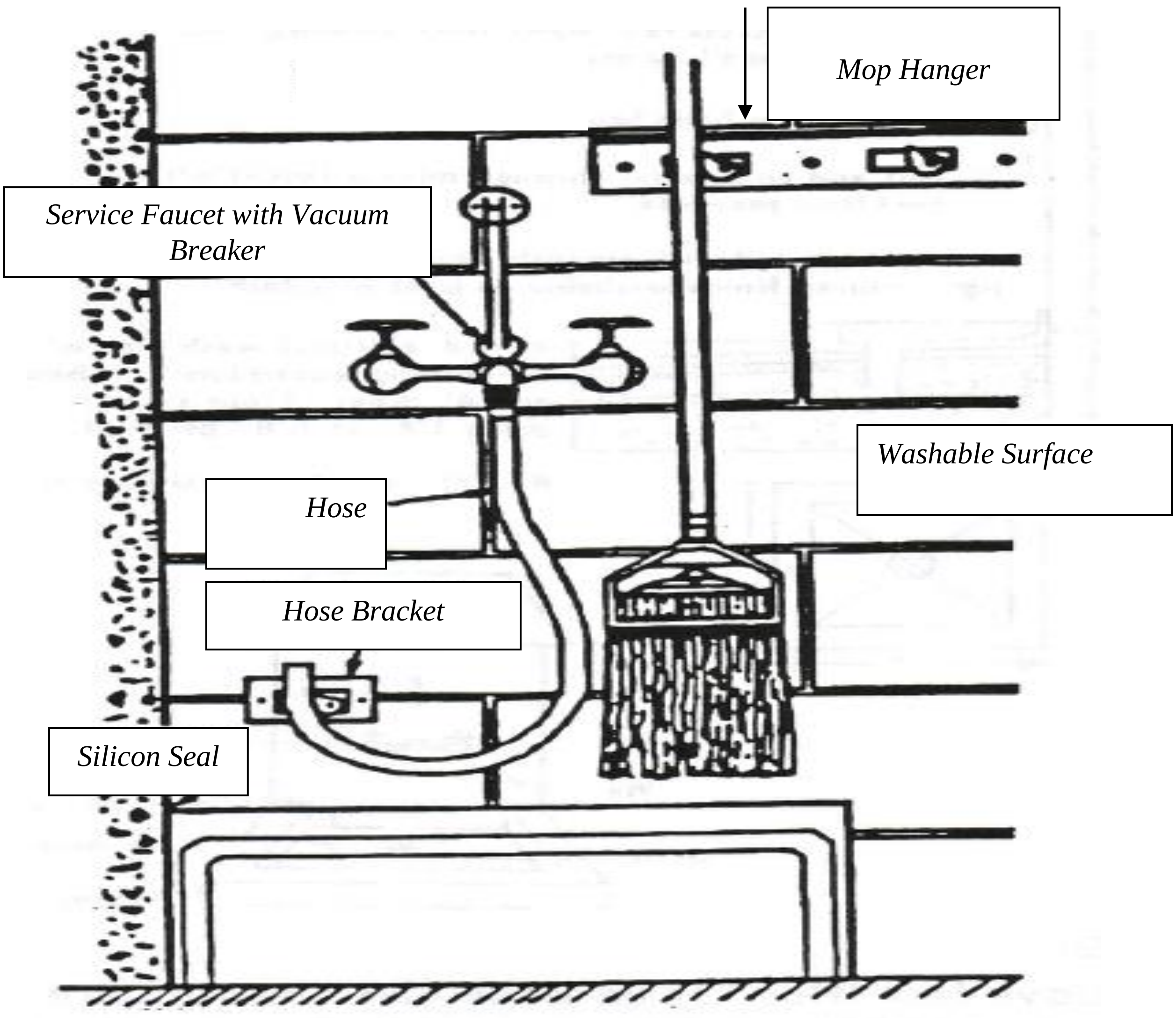
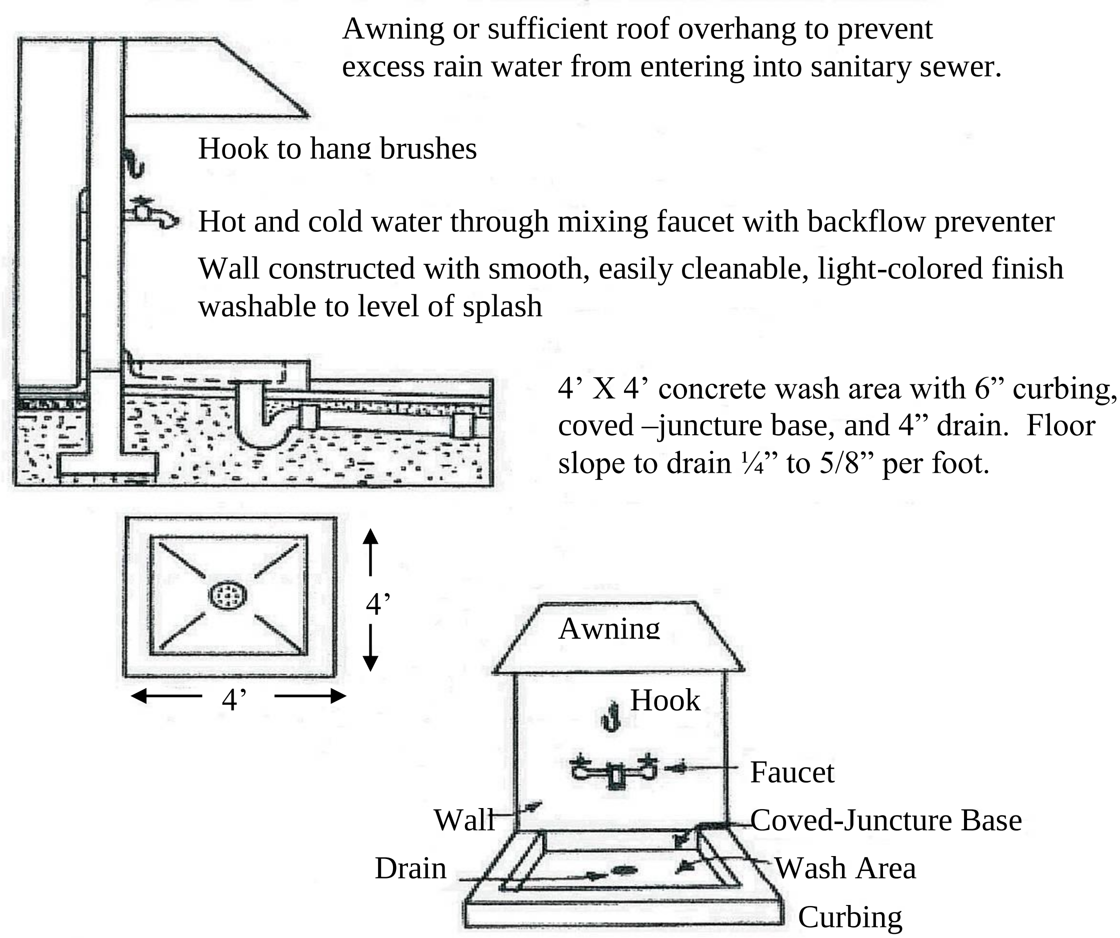


ILLUSTRATION R-2
Typical Exterior Garbage Can Wash Area



Note:

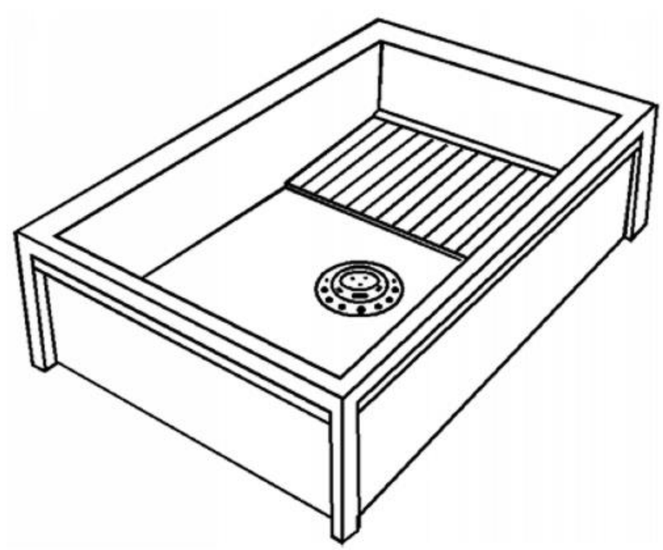
Above facilities for garbage can washing are minimal and a can washing machine, steam cleaning device, or similar approved equipment should be used where the operation is large enough to warrant this type of equipment.

ILLUSTRATION R-3

Examples of Utility, Mop Sinks, and Service Sinks

Plastic Mop Sink

Janitor's Sink



Floor Utility Sink

ILLUSTRATION R-4

ILLUSTRATION R-5

Durability And Efficiency At The Lowest Cost

It accommodates any can, drum, barrel or other receptacle of standard design and dimensions, regardless of height or material.

...rsatility permits any plumbing ...iation your local Code allows.

It is the only equipment that performs a "Complete Job" of cleaning and sanitizing—and does it from 2 to 4 times faster than ordinary cabinet type washers, multi-washers or rinsers, making them antiquated, and it costs far, far less.

Its exclusive, high speed Jet-Spray Nozzle rotates instantly on a double tier of stainless steel ball bearings, with low or high water pressures, up to 50 revolutions per second, without vibration and as noiseless as a cat's purr.

It blasts sprays of water (hot or cold) in a 210° (3-directional) revolving arc, making countless physical impacts on every minute interior surface, causing a powerful centrifugal scouring and rinsing action — and with hot water at 170°F. it sanitizes (kills bacteria) without steam.

It cleans and sanitizes in just seconds — with the greatest thoroughness and the least labor cost — conserves water — overcomes poor workmanship — quickly pays for itself.

It permits complete cleaning of exterior surfaces of containers, during the same operation, by providing the "AerVoiD" Fountain Brush Attachment.

It makes practical the pressure cleaning of Faucets and other Tube Appendages, without removing or disassembling them, by providing the "AerVoiD" Faucet Cleaner Attachment.

Its automatic Safety Locks protect against accidental operation and injury — required by Safety Engineers.

Its completely corrosion resistant construction insures its durability and reduces its maintenance cost to practically nothing.

ITS cleanable surfaces — self rinsing Bowl — elevated Nozzle and Spokes — Pedestal finish of hard, glossy Epoxy — accessible under-surfaces — Vacuum Breaker, etc., have gained the acceptance of the highest Sanitation Authorities.

It is easy to install — simply fasten to floor and make pipe connections — Its valves and other components are easily accessible for replacement without disturbing the installation.

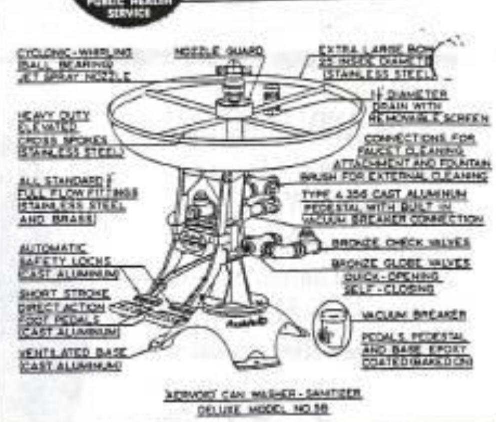
IT and all its Accessories are completely mechanical — have no electrical connections requiring frequent servicing.

It Can Be Operated With Any Of The Following Plumbing Installations Allowed By Your Local Plumbing Code

...OT WATER ONLY
...OLD WATER and HOT WATER
3. COLD WATER—HOT WATER and STEAM
4. COLD WATER and STEAM
5. STEAM ONLY

...IN CONFORMANCE With Sanitary Construction Requirements (Ordinance and Code Pub. No. 934) OF THE U. S. PUBLIC HEALTH SERVICE

Meets U.S. Government specification MIL-R-19038-D (Type II). Also conforms to the construction requirements of the applicable State and Local Plumbing Ordinances and Codes throughout the United States.



AERVOID CAN WASHER - SANITIZER
DELUXE MODEL NO 5B

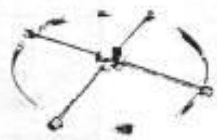
Ask About The Improved "AerVoiD" Economy Model No. 4-A Made Of Carbon Steel (Epoxy Coated)

CAN-WASHER ACCESSORIES

The following optional Accessories were designed and developed to broaden the adaptability of the "AerVoiD" Sanitizer; to increase its functional effectiveness; and to provide the user with the most complete and efficient sanitizing equipment of its kind at the lowest possible cost. All three Accessories can be easily and quickly installed. Complete instructions furnished with each.

FOUNTAIN BRUSH ATTACHMENT
Model No. FB-1

This durably built Attachment enables the operator to easily and thoroughly clean the exterior surfaces of containers, while at the same time washing and sanitizing the interiors.



ROTO TABLE ATTACHMENT
Model No. RT-1

This sturdily constructed attachment permits the operator to easily rotate large, heavy Containers for exterior cleaning while at the same time using the pedals for interior cleaning.

A simple Attachment for pressure cleaning and sanitizing Faucets or Tubes with openings up to 1 1/16" O.D., without detaching them from containers or dismantling them. It's fast — It's thorough — It avoids mismating of parts.

FAUCET CLEANER ATTACHMENT
Model No. FC-1

Ask For Detailed Specifications And Installation Drawings

One of the Country's Foremost Sanitarians Reports . . .

"Among the best places to breed bacteria is in garbage and other refuse cans. Here sanitation is most neglected, or carelessly performed, because of its dependency upon manual labor, and because it is a filthy, back-breaking, time-consuming and costly operation.—The Vacuum Can Company, after extensive research and consultation with many Health Authorities, has developed a thoroughly modern Sanitizer which solves these problems, effectively and economically."

Vacuum Can Company

3100 West 36th Street, Chicago, Illinois 60632

PRINTED IN U.S.A.

FORM No. 532

II. Poisonous and Toxic Material Storage:

1. *All toxic materials including cleaning compounds, pesticides, sanitizers, etc.* must be stored in an area away from food preparation and in a secured area such as a janitor's closet or room. If they are stored within the food processing, food storage, utensil washing or utensil storage areas, they must be stored within a cabinet used for no other purpose. Cleaning and sanitizer compounds may be stored within a food dry storage room, *if sufficient shelving is provided so food and these compounds can be physically separated, making sure that clean utensils and foods can not be contaminated by them*. Poisonous or toxic materials cannot be located above food, equipment, utensils, linens, or single-service and single-use articles. *See Illustration #R-6 and Illustration #R-7* for examples.

ILLUSTRATION R-6

Poisonous and Toxic Materials Storage Area or Room

Note that cleaning tools may be stored here also.

ILLUSTRATION R-7

Note that cleaning and sanitizing supplies are on the bottom shelf.

III. <u>Laundry Facilities</u>:

1. *If work clothes or linens are laundered on the premises*, a mechanical clothes washer and a dryer that is properly vented to the outside air shall be provided and used.

2. *If a mechanical clothes washer or dryer is proposed*, they shall be located only where there is no exposed food; clean equipment, utensils, and linens; and unwrapped single-service and single-use articles.

3. *Cabinets or shelving used for storage of laundered linen shall not be installed or located under any source of contamination*. Examples of unacceptable areas for linen storage include locker rooms, toilet rooms, bleachers, garbage storage rooms, mechanical rooms, under unshielded sewer lines, leaking water lines or open stairwells.

SECTION S – DRESSING ROOMS AND LOCKERS

REFERENCES (Chapter 511-6-1)

.05 Equipment and Utensils. Amended. (4) Location and Installation (a) Equipment Designated Areas …. 1. & 2.
.05 Equipment and Utensils. Amended. (10) Protection of Clean Items (f) Prohibitions.
.07 Physical Facilities. (3) Numbers and Capacities. (h) Dressing Areas and Lockers.
.07 Physical Facilities. (4) Location and Placement. (b) Designated Areas for Employee Activity, 1 & 2.
.07 Physical Facilities. (5) Maintenance and Operation. (j)Using Dressing Rooms and Lockers. 1 & 2.

I. ***Dressing and Locker Rooms must meet the following criteria***:

1. *Dressing rooms* shall be provided *if employees will be routinely changing their clothes or putting on uniforms within the establishment*. Dressing rooms must be located separate from food preparation, storage or service areas, utensil washing and storage areas, and they must be designated on the food service plans.

2. *If dressing rooms are not required*, separate facilities shall be provided for coats, sweaters and other personal belongings.

3. *Lockers must be provided* to store employee's belongings and clothing. *If lockers are not used, another type of area can be designated and identified on the plan* for the storage of employee's belongings.

4. *The layout of food service plans will be designed so that traffic of non-employees or non-essential personnel through the food-preparation and utensil-washing areas is prohibited*. Further, the food service operations shall be physically and functionally separated from facilities or areas used for household purposes.

5. *Areas designated for employees to eat, drink, and use tobacco* shall be located so that food, equipment, linens, and single-service and single-use articles are protected from contamination. Areas designated for employees' use (or break-area) must be shown on the food service plans submitted for review.

6. *See Example S-1, S-2 and S-3* as an example of a dressing facility.

ILLUSTRATION S-1

Dressing Facility

This is an example of a well constructed and equipped locker room.

ILLUSTRATION S-2
Lockers

Sloping tops of lockers provide for the determent of the collection of debris and vermin harborage.

ILLUSTRATION S-3
Unacceptable Personal Storage Facilities

Personal care items are required to be stored in dressing rooms, lockers or other areas designated for employee item storage. An exception to this is medicines, including refrigerated medicines. Medicines are to be stored in a package or container in a covered, leakproof container identified as "employee medicines" and stored to be inaccessible to children.

Food storage and preparation areas, utensil cleaning and sanitizing and storage areas, and single-use/single-service article areas are not to be used as employee personal care storage facilities.

SECTION T- GARBAGE AND REFUSE STORAGE[1]

REFERENCES (Chapter 511-6-1)

.06 Sanitary Facilities and Controls. Amended. (5) Refuse, Recyclables, Returnable's. (a).(b),(c),(d),(f),(g),(h),(j), (k),(l),(m),(n),(o),(p),(q),(r),(s), and (t)
.07 Physical Facilities (2) Design, Construction and Installation (d), and (r)

I. General Requirements:

1. *Garbage or refuse storage rooms* shall be constructed of cleanable, nonabsorbent, washable materials and shall be insect-proof and rodent-proof.

2. *Garbage and refuse containers, dumpsters, and compactor systems located outside* shall be stored on or above a smooth surface made of, or constructed of nonabsorbent material such as of at least 4" thick sealed concrete.

3. Garbage and refuse containers *must have tight-fitting lids or covers and be so constructed and maintained to prevent leakage of liquid waste*.

4. *If the food service establishment is located in a warm weather climate*, air conditioned or refrigerated storage rooms should be considered as a method that can be used to minimize odors and decomposition of waste materials[2].

II. Storage Containers:

1. *Those located inside the Food Service Establishment*:

   A. *Receptacles must be easily cleanable, non-absorbent and vermin proof*. If they contain food residue, receptacles must have tight-fitting lids and they must be kept closed when they are not in continuous use or have been filled.

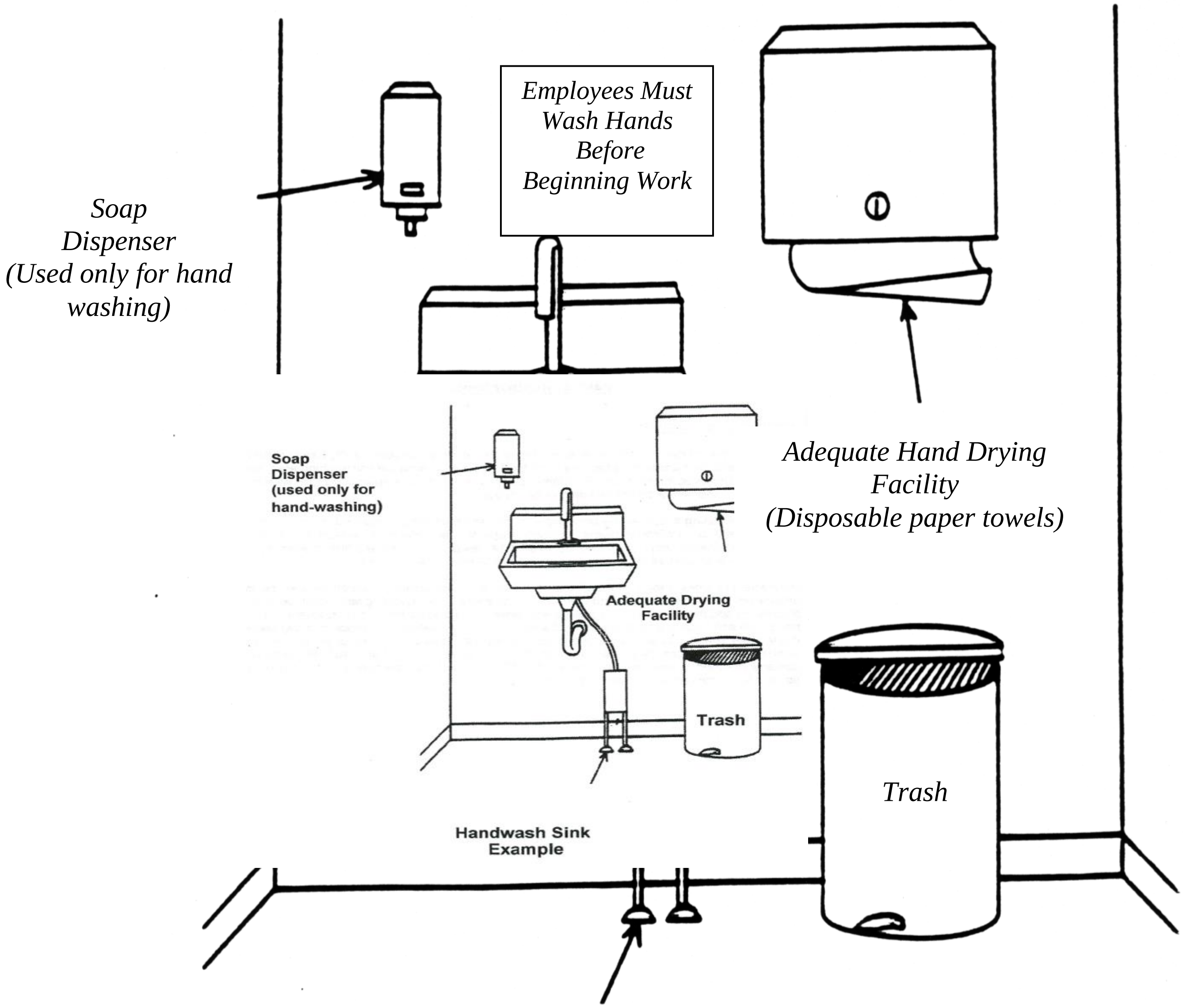
   B. *A receptacle shall be provided in each area of the food establishment or premises* where refuse is generated or commonly discarded, or where recyclables or returnables are placed. Plastic bags or wet-strength paper bags shall be used to line these containers. *See Illustration T-10.*

   C. *If disposable towels are used at handwashing lavatories or handsinks*, a waste receptacle shall be located at each lavatory or group of adjacent lavatories. *See Illustration T-1*.

[1] Source: Section 13 – 2008 FDA Food Establishment Plan Review Guidance Manual.
[2] Source: Page 69 in Section 13 – Other of the 2008 FDA Food Establishment Plan Review Guidance Manual.

ILLUSTRATION T-1

Typical Handwashing Station Layout



This foot-peddle fixture can be replaced with standard mixing valve faucet.

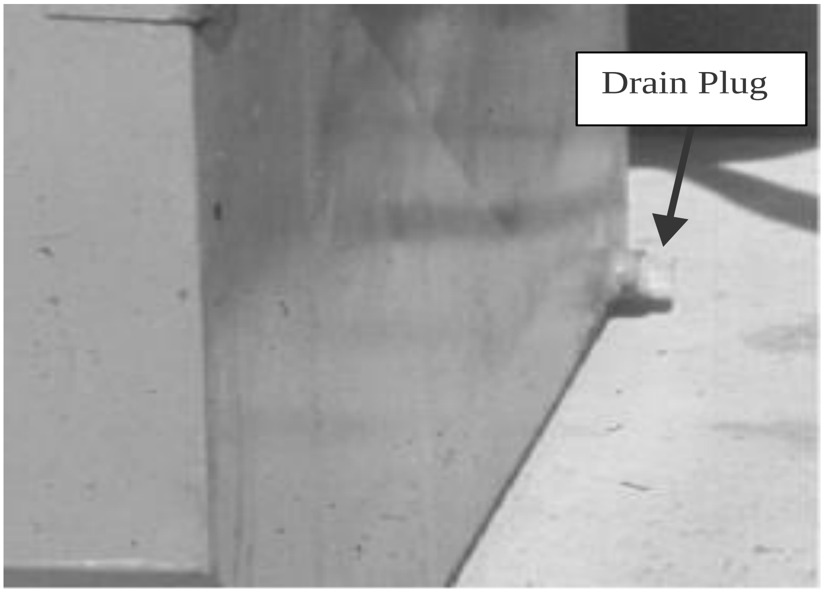
2. Outside Storage Containers:

A. Garbage Cans must have tight-fitting lids, doors or covers and *if they contain any food residue or any liquid waste from garbage, they must be closed*.

B. Refuse, recyclable and returnable *storage containers must all have drain plugs installed for drains on the containers or receptacles*. *See Illustration T-2.*

ILLUSTRATION T-2

Liquid Waste Leakage Prevention and Vermin Control



C. Outside receptacles and waste handling units for refuse, recyclables and returnable's *used with materials containing food residue shall be designed and constructed to have tight-fitting lids, doors, or covers*. *See Illustration T-9 for examples.*

D. Refuse storage areas and receptacles *shall be sufficient capacity to hold refuse, recyclables and returnables that accumulate*.

E. Refuse receptacles that are not rodent-resistant, unprotected plastic bags and paper bags, or baled units that contain materials *with food residue shall not be stored outside*.

F. *Cardboard or other packaging material that does not contain food residues and that is awaiting regularly scheduled delivery to a recycling or disposal site* may be stored outside without being in a covered receptacle if it is stored so that it does not create a rodent harborage problem. This may be accomplished by storing such materials on a concrete slab sufficient in sized to store the material.

II. <u>Storage Areas</u>:

1. <u>Inside Storage Areas</u>:

   A. Garbage or refuse storage rooms shall be constructed of easily cleanable, nonabsorbent, washable materials and shall be insect proof and rodent proof.

2. <u>Outside Storage Areas</u>:

   A. *A nonabsorbent pad* shall be constructed for receptacles and waste handling units for refuse, recyclables, and returnables. This storage pad shall consist of at least a 4 inch thick sealed concrete sloped to drain and it must be large enough to accommodate all units of storage. *See Illustration T-3 and Illustration T-4*.

ILLUSTRATION T-3

Example of a Typical Solid Waste and Recyclables Storage Area

ILLUSTRATION T-4

Example of a Typical Solid Waste and Recyclables Storage Area

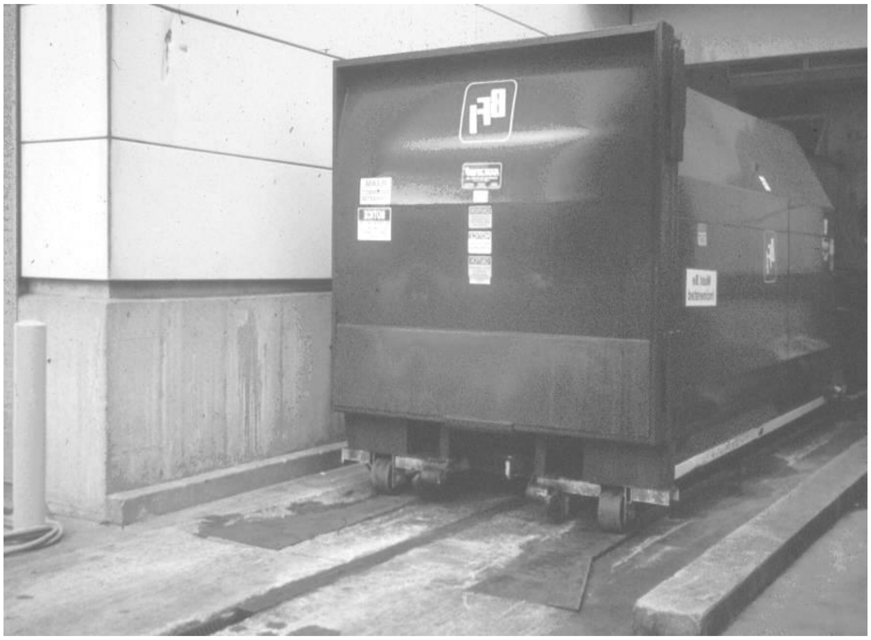
3. *Receptacles and waste handling units for refuse and recyclables such as an on-site compactor* shall be installed so that accumulation of debris and insect and rodent attraction and harborage are minimized and effective cleaning is facilitated around and, if the unit is not installed flush with the base pad, under the unit. *See Illustration T-5 and Illustration T-6.*

ILLUSTRATION T-5

Example of a Typical Compactor Storage Area

ILLUSTRATION T-6

Example of a Typical Compactor Dock Storage Area



III. Cleaning Facilities:

1. Inside Facilities:

   A. *Floor sinks consisting of manufactured basins or sealed smooth concrete and of at least 4 inch curbing with a sloping floor to a floor drain may be considered* for cleaning mats and garbage cans. These facilities must have hot and cold running water equipped with back-siphonage protective devices. All liquid waste must be discharged into proper sewage disposal.

2. Outside Facilities:

   A. It is recommended that large refuse, recyclables, returnables or waste grease storage containers, such as dumpsters or on-site compactors, *be removed to the service provider's facilities for routine cleaning*. *Should cleaning of these listed containers be planned to be conducted on-site of the food service establishment*, all liquid waste would have to be discharged into a public sewer system or into a properly designed and approved on-site sewage management disposal system in accordance with all applicable State law and local codes.

B. *When designing on-site garbage cleaning facilities for large containers such as dumpsters, or waste compactors*, special considerations must be taken to provide a protected hot and cold water supply and to provide a way to prevent excessive rainwater from entering the sewage disposal system. *It may be necessary to provide a cover for these garbage storage areas such as a shed*. Another option would be to provide some way to close off waste drains until they are needed, making sure the concrete storage pad is sloped to *prevent rainwater accumulation*.

C. Soiled receptacles and waste handling units for refuse, recyclables, and returnables, including the pad on which they are placed, *shall be cleaned at a frequency necessary to prevent them from developing a buildup of soil/waste spillage.* Such frequency in cleaning will greatly help to prevent the attraction of insects and rodents to the storage area. *Proper equipment must be maintained to allow proper cleaning of the pad*. *See the example in Illustration T-7.*

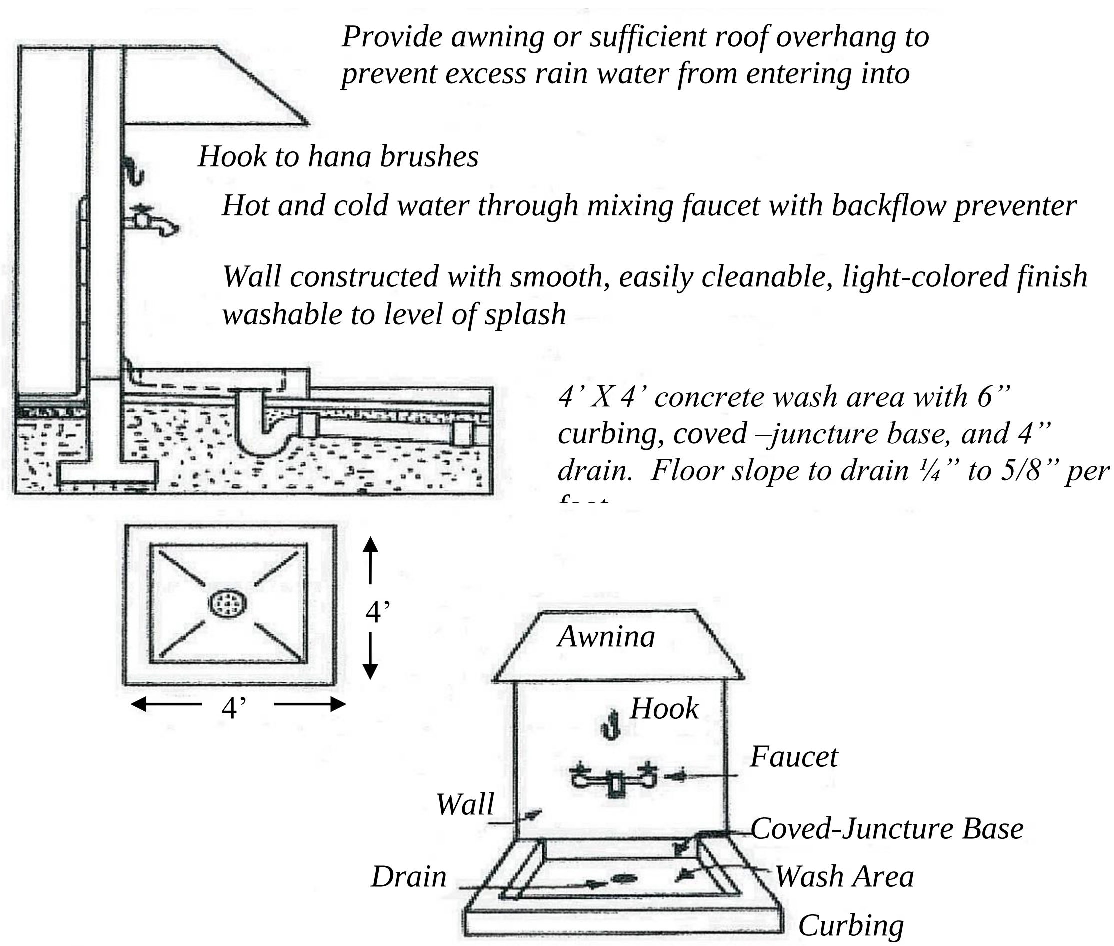
ILLUSTRATION T-7

Example of a Typical Waste Storage Area Cleaning Equipment

D. *Smaller refuse container cleaning facilities* may be constructed such as seen in *Illustration T-8.*

ILLUSTRATION T-8

Typical Exterior Garbage Can Wash Area



Note:

Above facilities for garbage can washing are minimal and a can washing machine, steam cleaning device, or similar approved equipment should be used where the operation is large enough to warrant this type of equipment.

ILLUSTRATION T-9

Examples of Types of Acceptable Waste Storage Containers

"Bulk Waste Grease Storage Tank"

"Garbage Transport Container"

"Closeable Waste Container" Generally, placed outside the establishment.

"Bulk Recycle Container"

"Recycle Bins"

"Waste Compactor" – Used for bulk high volume storage.

"Bulk Waste Storage Container" Commonly called a "Dumpster"

"Common Garbage Can with Lid" Commonly used in warewashing and food processing areas inside the food service establishment.

"Common Waste Grease Storage Bin"

"Waste Container" Commonly placed in toilet rooms

ILLUSTRATION T-10
Types of Garbage Can Liners

"Tied Garbage Bags"
Both Clear and Dark Color

"Standard Black Plastic Garbage Bags"

"Clear Garbage Bag Liners"

"Lined Garbage Can"

Note: Garbage containers must be lined with leak-proof liners. Garbage bags containing waste must be securely tied before being placed into outside waste storage containers.

SECTION U - SPECIAL FOOD SERVICE OPERATIONS

REFERENCES (Chapter 511-6-1)

Mobile Food Service and Extended Food Service Units:

.08 Special Food Service Operations. (1) (a) Compliance Required.
.08 Special Food Service Operations. (1) (b) Exceptions to Compliance for Mobile and Extended Food Service Units.
.08 Special Food Service Operations. (1) (c) Equipment and Supplies Required for Onboard Preparation of more Complex Menus.
.08 Special Food Service Operations. (1) (d) Water System.
.08 Special Food Service Operations. (1) (e) Liquid Waste.
.08 Special Food Service Operations. (1) (f) Operation.
.08 Special Food Service Operations. (1) (g) Construction Based Upon Menu.
.08 Special Food Service Operations. (1) (h) Identification.
.08 Special Food Service Operations. (1) (i) Food Vending Location.
.08 Special Food Service Operations. (1) (j) Compliance with Other Regulations.
.08 Special Food Service Operations. (1) (k) Home Prepared Foods Prohibited.

Temporary Food Service Establishment:

.08 (2) Temporary Food Service Establishments. (a) Operation, Permit Application, Responsibilities
.08 (2) Temporary Food Service Establishments. (b) Inspections
.08 (2) Temporary Food Service Establishments. (c) Operations
.08 (2) Temporary Food Service Establishments. (d) Preparation and Service TCS Foods – Prohibited Menu Items
.08 (2) Temporary Food Service Establishments. (e) Equipment and Supplies Required.
.08 (2) Temporary Food Service Establishments. (f) Liquid Waste.
.08 (2) Temporary Food Service Establishments. (g) Construction.
.08 (2) Temporary Food Service Establishments. (h) Protection from Contamination.

Incubator Food Service Operations:

.08 (3) Incubator Food Service Operations. (a) Business Model A.
.08 (3) Incubator Food Service Operations. (b) Business Model B.

Catering Food Service Establishments:

.08 (4) Catering Food Service Establishments.

I. Content and Submittal of Plans and Specifications:

1. *Mobile Food Service Units (MFSUs) and Extended Food Service Units[1](EFSUs)*: Plans and specifications for all MFSU units and as applicable, EFSU units, shall include at least the following information and be included with those for their base of operation for review and approval by the Health Authority:

   A. *Proposed layout, mechanical schematics, construction materials, and finish schedules*. The plans should be submitted with at least a ¼- inch = 1 foot scale and must include the following:

      a. *Menu* listing all proposed food and beverage to be prepared and served from the unit and as applicable, all proposed food and beverage to be prepared at the base of operation and served from the unit;

      b. *Provide details in the plans* such as: potable water and wastewater storage tanks capacity calculations to meet demand for at least one day's operation; specifications, positioning and placement of potable water tanks and wastewater holding tanks; and sizing calculations and specifications for water heating equipment. In addition, the placement of water inlets and outlets for potable water and wastewater tanks;

      c. *Provide specifications* as to how potable water will be maintained under pressure (i.e. pump or air pressure) to provide adequate flow of potable water as determined by the Health Authority;

      d. *Provide specifications for water fill hose for potable water tank and proposed means for its sanitization and storage when not in use*. In addition, provide a plan for flushing and sanitizing potable water system and for flushing the wastewater-holding tank;

      e. *Number, types (i.e. usage) and location of all sinks and drain boards.* In addition, provide the dimensions for all sink compartments and drain boards;

      f. *Refrigeration* and other cold holding equipment;

      g. *Cooking a*nd hot holding equipment;

      h. *Thermometers* used for product temperature control monitoring;

      i. Provide the specifications and dimensions of *service windows and designs for vermin control;*

[1] References: Recommended Guidance For Mobile Food Establishments 2006 – Prepared by the Plan Review Development Committee of the Conference for Food Protection (CFP); FDA 2008 Plan Review for Food Establishment Guidance Document; and Georgia DPH Chapter 511-6-1.

j. *Dry goods storage area* dimensions and associated shelving specifications;

k. Show the location of *vents for the water tanks and the backflow prevention and over-flow devices in the plumbing system;*

l. *Provide a finish schedule* (i.e. stainless steel, FRP, etc.) for the floor, wall, and ceiling surfaces; and

m. Show the design, positioning and placement of the *hood/ventilation system*.

B. *Completed plans and specifications* for MFSUs and *EFSUs must be submitted for review and approval by the county health department (i.e. local Health Authority) that is the county of origin.* As per *DPH Rule 511-6-1-.02 (2),* the county of origin is the county where the base of operation for a MFS operation or an EFS operation is located.

C. *The following are resources useful in the planning process and forms necessary for plans submitted to the Health Authority*:

a. *DPH Rules 511-6-1-.04, -.05, -.06, -.07, and -.08* for requirements concerning equipment and construction for base of operations, MFSUs, and EFSUs;

b. Food Service Establishment /Mobile Food Service Operations Permit Application and the Mobile Food Service Unit/Extended Food Service Unit Permit Application for additional guidance; and

c. Sections A thru U within this Manual.

d. The Environmental Health Specialist (EHS) representing the county health department within the county where the mobile food service base of operation is located. For EHS or county health department contact information, go to the DPH environmental health website *at* www.georgiaeh.us .

2. *Temporary Food Service Establishments*[2]*:* Temporary Food Service Establishments that cannot fully comply with *DPH Rules 511-6-1-.03 through -.07 may be permitted* to operate when food preparation, service and the operation fully complies with the requirements set forth in *DPH Rule 511-6-1-.08(2) (a) through (h)*. In addition, the review and approval by the Health Authority of all proposed food service establishment plans and specifications is required for all food service establishments as part of the process for the issuance of a food service permit. A *pre-operational plan review* shall

[2] References: 2000 Pre-Operational Guide For Temporary Food Establishments prepared by the Plan Review Development committee of the Conference for Food Protection as presented in the 2004 FDA Food Code & Temporary Events Training Course; Recommend Guidance For Permanent Outdoor Cooking Establishments 2003 prepared by the Permanent Outdoor Cooking Committee of the Conference for Food Protection (CFP); and DPH Chapter 511-6-1.

be conducted as part of this evaluation process for the issuance of a permit to operate a temporary food service establishment.

A. *TFSE Pre-operational Plan Review*: TFSE plans and specifications shall include at least the following:

a. *Menu* listing all proposed food and beverage to be prepared and served at the temporary event;

b. Completed *Temporary Event Organizer/Property Owner Agreement*;

c. Completed *Application For Temporary Food Service Establishment Permit*;

d. Completed *Sketch Sheet 1 – Temporary Food Service Establishment Equipment and Floor Plan* providing a drawing of the Temporary Food Service Establishment. *At a minimum*, the drawing will identify and describe the following:

i. All equipment including cooking and cold holding equipment (deep fryers, grills, stoves, refrigerators, ice chests, etc.);
ii. Handwashing facilities;
iii. Work tables;
iv. Sanitizing buckets
v. Warewashing facilities (3 or 4 compartmented sinks or dishpans);
vi. Food and single service storage;
vii. Garbage containers;
viii. Food display shields (or sneeze guards);
ix. Source of lighting, if operating during night hours or as applicable;
x. Type of floor, wall and overhead covering; and
xi. Customer service areas;

e. Completed *Sketch Sheet 2 – Temporary Event Area Layout* providing a drawing of the entire Temporary Event Area. *At a minimum*, the drawing will include locations of the following:

i. Toilet facilities;
ii. Garbage facilities;
iii. Potable water supply;
iv. Electrical sources;
v. The waste disposal area; and
vi. All food preparation and service areas on the grounds/site of the Temporary Food Event;

f. Completed *Attachment A – Food Processing within the Temporary Food Service Establishment*;

g. If food is to be processed and transported from a permanent, fixed food service establishment holding a valid food service permit, complete *Attachment B – Food Processing within the Permitted Fixed Food Service Establishment*; and

h. Completed *Attachment C – Employee Log*.

B. The following are *resources* useful in the planning process and forms necessary for plans submitted to the Health Authority:

a. *DPH Rules 511-6-1-.03, -.04, -.05, -.06, -.07, and -.08* for requirements concerning personal hygiene, equipment and construction for temporary food service establishments;

b. Section A thru U within this Manual;

c. *Temporary Food Service Permit Application Packet* for additional guidance; and,

d. The *Environmental Health Specialist (EHS)* representing the county health department in which the Temporary Event is taking place. For EHS or county health department contact information, go to the DPH environmental health website at www.georgiaeh.us.

3. *Incubator Food Service Establishments*:

A. In addition to what is required in the submitted plans and specifications stated in *DPH Rule 511-6-1-.02(4)(a) and (b)*, the following must be included with the plans and specifications submitted to the local Health Authority:

a. *Administrative Justification*: A completed "Request for Variance from the Rules and Regulations Food Service Chapter 511-6-1". This form must request to vary from *DPH Rule 511-6-1-.02(1) (a) 4* as stated within *DPH Rule 511-6-1-.08(3)*. Its alternative standards must be validated by supportive documentation.

b. Supportive Documentation: The following documents *must be submitted in conjunction with a request to vary* from *DPH Rule 511-6-1-.01(41) and 511-6-1-.02(1)(a)4.* as supportive documentation as required in *DPH Rule 511-6-1-.08(3)*:

i. Copy of proposed legally binding incubatee/member contract;
ii. Written Standard Operating Plan (or SOP);
iii. Written Employee Health Policy;
iv. Written Handwashing Policy;
v. Copies of all records to be utilized in the operation;
vi. Written incubatee/member/employee training plan;
vii. Equipment and facility cleaning and sanitizing plan; and

viii. *Floor plan showing all areas, rooms and equipment identification and function and incubatee/member assignments.*

C. The following are *resources* useful in the planning process and forms necessary for plans submittal to the Health Authority:

a. *DPH Chapter 511-6-1*;

b. *Sections A through U in this Manual*;

c. Food Service Establishment/Mobile Food Service Operations Permit Application for additional guidance;

d. The *Environmental Health Specialist (EHS)* representing the county health department in which the special event or celebration will be located. For EHS or county health department contact information, go to the DPH environmental health website at www.georgiaeh.us; and

e. Because a request to vary from any rule and regulation in Chapter 511-6-1 must be processed and approved by the Georgia Department of Public Health, contact the *Department's Environmental Health Section Office at 404-657-6534 for more information*.

4. <u>*Caterering Food Service Establishments*</u>:

A. *Catering food service establishments* are establishments that *prepare food in bulk then containerize and transport it to a specific location and at a specified time where the consumer takes possession of the food*. It is the food's *containerizing and transporting to the site of service* aspects of the operation that is of special interest to the Health Authority. This increased interest by the Health Authority is due to the *increased opportunity for temperature abuse* and *contamination* of potentially hazardous, ready-to-eat food as well as contamination of non-potentially hazardous food during transport.

B. In regards to what *DPH Rule 511-6-1-.02(4)(a) and (b)* requires to be included within proposed food service plans and specifications submitted to the local Health Authority for review and approval, the following information concerning the *transportation and service* of food at catered events must be included as well:

a. List and description of *all transport vehicles*;

b. Listing of *all transport containers and their associated manufacturer's specification sheets*;

c. List of *all holding units/equipment that will be used to maintain safe food product temperatures* of at least 41°F or lower, if held cold, and at least 135°F or higher, if held hot. The manufacturer's specification sheets for each piece of holding unit/equipment must be submitted to the Health Authority for review as well;

d. Plans and specifications for *handwashing equipment* and set-up where *employees will handle unpackaged food or food preparation and service will be conducted onsite of the catered event;*

e. As required by the local Health Authority, *copies of all time and temperature records*;

f. Documentation explaining *how all food, display and service utensils and other food-contact surfaces will be protected from contamination during transport and service;*

g. Written explanation as to *how unserved/leftover food will be handled once food has been delivered to the site of service*; and

h. *If a mobile unit is planned to be utilized for offsite preparation and service at an event*, complete plans and specifications for the unit must be submitted to the Health Authority for review and approval as a mobile food service unit.

C. For more information, contact the *Environmental Health Specialist* representing the county health department in which the catering food service establishment will be located. For EHS or county health department contact information, go to the DPH environmental health website *at* *www.georgiaeh.us*

II. Mobile Food Service Units (MFSUs) and Extended Food Service Units (EFSUs)[3]:

1. Compliance Required:

A. *DPH Rule 511-6-1-.08 (1) (a)* requires that both MFSUs and EFSUs meet the full requirements of the Chapter like any other food service establishment. This means these units must meet the requirements for handling, preparing and serving food within the Chapter. Likewise, they must also comply with the equipment, installation, and general physical facility (i.e., walls, ceilings, and floors, premises, utilities, etc.) construction requirements found within the Chapter, as well as those found within *DPH Rule 511-6-1-.08*. All of these requirements are designed to ensure that *ready-to-eat food being offered to the consumer* has been *produced from within the protective environment of an enclosed, permitted food service establishment where it has been made to be safe, wholesome, and honestly presented.*

[3] Reference Source: Recommended Guidance For Mobile Food Establishments 2006 prepared by the Plan Review Development Committee of The Conference for Food Protection

B. *As an extension of their base of operation*, it is a fundamental requirement of *DPH Rule 511-6-1-.08 (1) (a)* that *all time/temperature control for safety (TCS) food* be prepared and served from within the protective environment of fully enclosed MFSUs or fully enclosed EFSUs. There are some exceptions to this fundamental requirement found within *DPH Rule 511-6-1-.08 (1) (b) 1. and 2*. However, *DPH Rule 511-6-1-.08 (1) (a)* does not exempt MFSUs nor EFSUs from meeting the requirements for having sewage holding tanks and for operating from and reporting back daily to their base of operations. Both of these requirements can be found within *DPH Rule 511-6-1-.08 (1) (e) and (f)* as referenced within *DPH Rule 511-6-1-.08 (1) (a) 3*.

C. *A MFU or an EFSU together with its permitted base of operation is considered to be a complete food service establishment*. The *MFSU is considered to be the mobile part of the food service operation and the base of operation is considered to be the fixed part of the food service operation*. Since the MFSUS travel off from the premises of their permitted base of operation to serve the mobile food service establishment's menu items to its consumers, MFSUs are considered to be mobile. *EFSUs are allowed to operate at locations on the premises of their base of operations* or restaurant being used as their base of operations; so as a result, their design and construction may be such that it allows the ease of breakdown for movement to these locations on long as it remains on the same property of the base of operation. Therefore, when doing a menu review to assess concerns for food safety associated with the preparation and service of food by mobile food service or extended food service operations, the Environmental Health Specialist *(EHS) must both assess the base of operation and its units as one complete food service establishment*. As a result, EHS, when reviewing either mobile food service operation or extended food service operation plans and specifications, *must understand the unit's method of operation as it relates to that of its base of operation. The risk assessment of menu items along with how and where food will be prepared and served determines the level of risk for foodborne illness associated with the operation. As referenced in DPH Rule 511-6-1-.08 (1) (a) 1, 2, and 3, it is this assessed level of potential risk for foodborne illness associated with the mobile or extended operation that determines how MFSUs and EFSUs along with their base of operation will be constructed and equipped.* Similarly, *it determines what can be safely prepared and served on these units as well as what processing and activities must occur at the base of operation.*

D. Examples of fully enclosed MFSUs and enclosable EFSUs are depicted in *Examples U-1, U-2, and U-3*.

EXAMPLE U-1

Fully Enclosed Type MFSUs – Pull Trailers

EXAMPLE U-2
Fully Enclosed Type, Motorized MFSUs – Food Trucks

EXAMPLE U-3
Enclosable Kiosks – EFSUs

2. *Exceptions to Compliance for MFSUs and EFSUs*: There are *three exemptions* to the primary requirement to fully comply with the *Rules of DPH Chapter 511-6-1* as stated within *DPH Rule 511-6-1-.08 (1) (a).* These *exemptions* are specifically *found within DPH Rule 511-6-1-.08 (1) (a) 3, DPH Rule 511-6-1-.08(1) (b) 1 and 2, and DPH Rule 511-6-1-.08(1) (g) 1 and 2(v).* These provisions empower the Health Authority to grant both MFSUs and EFSUs *exemptions from being constructed as fully enclosed units; from having handwashing and warewashing equipment onboard; and from certain modifications of requirements for physical facilities*. All these exemptions are based upon the following assessment criteria: *whether or TCS food or non-TCS food is being offered to the consumer; and whether or not the proposed menu is restricted to food items that have a low level of concern for foodborne illness.* These exemptions are discussed as follows:

   A. *Exemption from Onboard Handwashing and Warewashing Equipment*: According to *DPH Rule 511-6-1-.08(1) (b) 1 (i) (ii) and (iii)*, menu items to be prepared and served from the MFSUs or EFSUs must be restricted to serving only food that is *prepared, prepackaged in individual servings, transported and stored under conditions meeting the requirements of DPH Chapter 511-6-1*; meaning, *the food was prepared, packaged, and labeled from within the protective environment of a properly designed, equipped, and constructed food service establishment (i.e., base of operation) that holds a valid food service permit*. In addition, *all beverages must* *be non-TCS foods*, such as coffee or tea, *and dispensed from covered urns, where prior to being placed on units, the beverage is hot processed and dispensed directly from the brewing equipment into the serving urn*. If these conditions are met, these units will not be required to be constructed as fully enclosed units, as required in *DPH Rule 511-6-1-.08(1) (g) 1*. Likewise, they will not be required to have onboard handwashing sinks nor warewashing sinks as long as the base of operation is equipped with these pieces of necessary equipment, as stated within *DPH Rule 511-6-1-.08(1)(c) 3*. With this limited menu, the potential risk for onsite contamination of ready-to-eat food by food employees, the consumer and the environment should be eliminated. The remaining potential risk for foodborne pathogen growth due to food product temperature abuse can be controlled by ensuring adequate refrigeration and hot holding equipment has been designed into these units.

B. *Exemption from Fully Enclosed Construction*:

a. *DPH Rule 511-6-1-.08 (1) (b) 2* gives the Health Authority the authority to grant an exemption from a unit being constructed as a fully enclosed unit. The authorization to grant this exemption is based upon the Health Authority's risk evaluation of proposed menu items and whether or not, ready-to-eat food offered to the consumer is packaged (i.e. Hand wash sinks are only needed at the base of operations) or commercially prepared and requiring heating only such as frankfurters and precooked sausages (i.e. all food preparation and food storage must take place from within the protective confines of a closable cabinet or compartment so that food and processing is shielded from potential contamination from consumers and the environment).

b. In order for this exemption to be allowed by the Health Authority, *the proposed menu is required to be limited* to TCS foods, such as hot dogs or precooked encased sausages, *that do not require any further preparation such as slicing, mixing, blending, chopping, combining with other ingredients, etc. and will be served in whole form as received from the processor. Furthermore, the only preparation required will be reheating and seasoning prior to service.* In addition, this construction would be appropriate for MFSUs in which the menu is limited to non-TCS foods such as popcorn or snowcones, as well.

c. The major concerns with these types of units are: 1) *the potential for cross-contamination from food employees, 2) soiled food-contact surfaces, and 3) foodborne pathogen outgrowth*. Controls for food safety must be designed and constructed into these units so that management of the operation will have the opportunity to address these concerns and be successful in its efforts to eliminate or reduce risk factors for foodborne illness to safe acceptable levels. One means to provide such controls is to *limit menu items to foods that are determined to be low risk for foodborne illness*. This determination is based upon two factors: *TCS food is received from a licensed processing plant where it is processed into the ready-to-eat form, thus all pathogens have been destroyed; or, food items will not support foodborne illness pathogen growth* *and toxin formation (i.e. non-TCS food such as popcorn)*. As a result, concerns for food safety can be *controlled through the implementation of no bare hand contact with ready-to-eat food coupled with acceptable handwashing and employee health policies; provisions to provide clean and sanitary food-contact surfaces; and the prevention of contamination from the environment and consumers.*

C. *Exemption from certain Physical Facilities*: Where the Health Authority, after review of the menu and method of operation has determined that no health hazard will result, the following exemptions to *DPH Rule 511-6-1-.08 (1) (a)* may be allowed:

a. *Servicing areas may not be required* if the opportunity for contamination of food and creation of unsanitary conditions does not exist during loading and cleaning operations of the mobile unit. This *exemption is contingent upon* the following criteria:

i. *Only prepackaged food* is loaded onto the unit (i.e. all food preparation and packaging for vending is conducted within the confines of the protective environment of a properly equipped and designed base of operation); and,
ii. *MFSUs are not required to have waste retention tanks on board as stated within DPH Rule 511-6-1-.08(1) (b) 1.* and as a result, the need for flushing and disposal of liquid waste from waste storage tanks will not be necessary.

b. *When servicing areas are required*, construction of walls and ceilings of servicing areas are exempted from provisions of *DPH Rule 511-6-1-.07(2) (a) through (f) as stated in DPH Rule 511-6-1-.08(1) (g) 2(v).*

3. *Types of Units - Exceptions from Compliance*: There are three types of units specified within *DPH Rule 511-6-1-.08(1) (b)* that by nature of their menu, design, and method of operation are granted exceptions to *DPH Rule 511-6-1-.08 (1) (a)* and do not have to meet construction requirements of *DPH Rule 511-6-1-.08(1)(g)1* for being fully enclosed or for provision of onboard handwashing and warewashing sinks. These units are described as follows:

A. *Vehicle Venders*: These types of units serve TCS and TCS foods and consist most often of a motorized vehicle equipped to vend packaged food at stops along a given route such as that associated with construction work sites. For clarification, *see Example U-4* depicting an example of a vehicle-vender MFSU.

EXAMPLE U-4
Vehicle-Vender Type MFSU

B. *Enclosed Type Unit –Potentially Hazardous Menu - Hot Dog Cart Unit:*

a. *Hot Dog Cart* unit's operation, design and layout of equipment and construction are permissible if the menu is restricted to TCS food items that are of low risk for the occurrence of foodborne illness because they are precooked and require heating only. This means that the onsite cooking of raw potentially hazardous foods of animal origin are not allowed. Instead, the unit's menu is limited to only TCS foods, such as hot dogs or precooked encased sausages processed in the ready-to-eat form, requiring only reheating for hot holding (i.e. prevention of pathogen outgrowth) and seasoning prior to service, under high standards found within a licensed, regulated processor. As a result of these higher standards, the likelihood of the risk for the occurrence of instances of cross-contamination and outgrowth of foodborne pathogens is reduced to a safe level. As a result, the unit can then be designed and constructed to safely operate in a semi-enclosed (or closeable cabinet type) environment.

b. The following are specific requirements that *must be in compliance in order to qualify for and maintain the* exemption stated in *DPH Rule 511-6-1-.08(1) (b) 1. (i):*

i. *The menu must be restricted as* stated in *DPH Rule 511-6-1-.08(1)(b);*
ii. *All food stored or displayed on the unit must be protected* from contamination from the consumer and the environment by food packaging, wrapping, shields, approved food dispensers, closable cabinets, or other effective barriers as approved by the Health Authority;
iii. *Cooking equipment* such as grills, stoves, etc. will not be allowed for use with or incorporated into the design of closeable cabinet type units such as pushcarts. Only reheating equipment such as steam or hot water heating equipment will be allowed to be installed on the unit;
iv. *Overhead protection* in the form of at least an umbrella must be provided for the onsite operation of the unit. The overhead protection must be large

enough to fully encompass the entire operation including all displayed food, equipment, work areas, employees and consumers:

v. *Properly installed and equipped handwashing facilities* meeting the requirements of the Chapter must be installed on the unit. It must be provided with potable hot and cold running water under pressure with suitable hand cleaner, dispensed towels, and a waste receptacle must be provided at or near the handwashing facility. Instead of handwashing facilities being designed and built into the unit, the Health Authority may allow the use of a certified commercially manufactured, portable hand washing station during onsite unit operation as long as no health hazard will be created. The hand washing station must have hot and cold running water under pump pressure, storage tanks, and meet NSF standards (i.e. NSF listed);

vi. The unit must be equipped *to maintain food product temperature at safe temperatures as required by DPH Rule 511-6-1-.04* during operation and transport. *At the discretion of the Health Authority*, accessory equipment for cold storage of food product may be utilized on hot dog carts if:

   (I) it is NSF listed;
   (II) a hard plastic commercial cooler;
   (III) It can be constantly provided with sufficient and available quantities of ice that is obtained from an approved source.

vii. *A three compartmented stainless steel sink must be installed on the unit*. It must be equipped with hot and cold water under pressure. However, at the discretion of the Health Authority, the permit holder may be allowed to store enough clean and sanitized utensils onboard the unit instead of providing an onboard warewashing sink *if the following is in compliance*:

   (I) The cleaned and sanitized utensils are sufficiently protected from contamination during transport and onsite operation;
   (II) The operator can demonstrate that enough utensils are stored on the unit to meet the needs of his/her hours of operation in the field; and
   (III) Facilities for cleaning and sanitizing exist at the base of operation.

viii. *Push carts must be designed, constructed and built to at least NSF Standard 59*;

ix. Units must be *equipped with a water storage tank sized large enough to hold one day's capacity of hot and cold, running potable water under pressure*. The hot and cold potable water system must be pressurized by electrical pump or air pressure; and

x. Units must be *equipped with a waste water storage tank that is at least 15% larger in storage capacity than that of the potable water tank*.

c. For clarification, *see Example U-5* depicting an example of an enclosed-type hot dog MFSUs:

EXAMPLE U-5

Hot Dog Push Cart with Protective Enclosures

"Push Cart"
Enclosed Type Unit

"Closable Cabinets"
Protected Food Preparation Area

"Role-Top Type Enclosure"
Protected Food Preparation Area

"Sliding Door Storage Cabinet"
Protected Food Storage

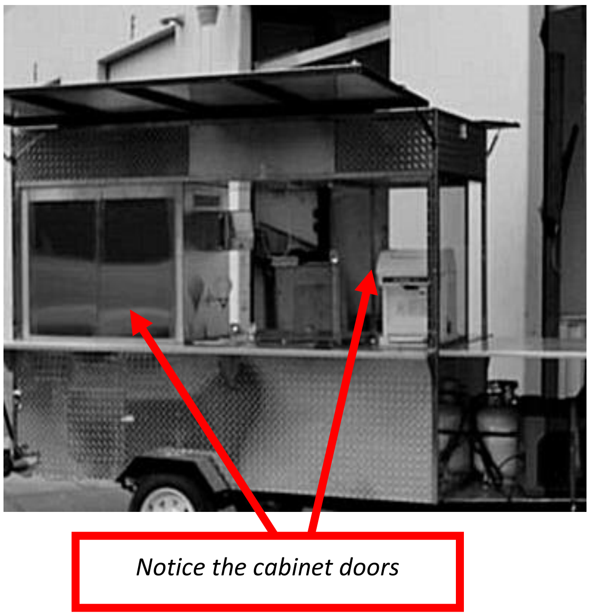
d. *Notice the cabinet that encloses the food storage/preparation area in Example U-5.* The handles open the cabinet doors while the operator stands outside the unit and makes the hot dog or sausage dog from within the cabinet itself. *The food preparation and storage area(s)* must be protected in this way; hence, enclosed cabinet type MFSU.

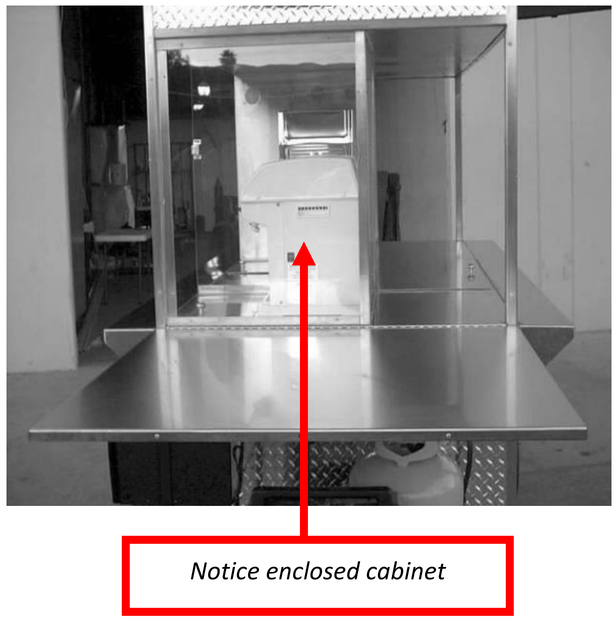
C. *<u>Enclosed Type Unit – Nonpotentially Hazardous Menu - Popcorn & Snowcone Carts</u>:*

a. Other types of MFSUs or EFSUs are units with menu items, such as popcorn or snow cones, or push carts that are constructed to be enclosed cabinet type units. *These units are constructed so that the food is prepared within a closeable cabinet and the operator serves the food from outside the unit*. To do so, the operator opens the cabinet, containerizes the food, and then, closes the unit's cabinet doors prior to the consumer receiving the product. See *Example U-6* depicting an example of an enclosed cabinet-type unit serving a nonpotentially hazardous food menu.

EXAMPLE U-6

Enclosed cabinet Type Unit/Non-TCS Menu
Snowcone Pull Cart





c. The point of interest in *Example U-6 above* is *the closeable cabinet construction provided to protect exposed food and food-contact surfaces from potential contamination.* Even though these units prepare and serve non-TCS food, these menu items can become contaminated with foodborne pathogens and lead to illness. If unpackaged food will be offered for sale to the consumer, these units must be designed and equipped to eliminate, prevent, or reduce the risk of cross-contamination, to facilitate proper hand washing, and to prevent environmental contamination such as that from consumers or the environment. This is why *DPH Rule 511-6-1-.08(c) 3* requires both a handsink and a separate properly sized and equipped warewashing sink to be installed onboard the unit.

d. Shielding: In the *Example U-6* above, the food preparation areas as noted by red arrows *are protected from potential contamination from consumers and the environment*. In addition, the MFSU is afforded protection from contamination from weather and road debris by means of folding leaflets. When fully extended, they provide overhead protection during service and when closed, they protect the unit during travel to and from the base of operation.

D. <u>*Extended Food Service Units (EFSUs)*</u>:

a. EFSUs may *consist of separate components* such as counters, racks, refrigeration units, portable handsinks, etc., of which can be easily disassembled and moved to another location <u>on the same premises of the base of operation</u>. They can also be constructed to be one unit such as a cart or trailer so as to be movable to other <u>locations on the same premises of the base of operation</u> as well. They never leave the premises of their base of operation because they are dependent upon their base of operation to receive servicing and restocking during each day of the unit's operation. Furthermore, *they are generally located within shopping malls, business complex buildings, and some commercial sporting events as extensions of their permitted food service establishments*, allowing these establishments to extend their business ability to reach additional consumers.

b. The Health Authority has the ability to grant EFSUs exemptions provided in *DPH Rule 511-6-1-.08 (1) (b)* based *upon the findings of the menu assessment* similar to that performed by the Health Authority for MFSUs. Whether or not the unit's construction must be fully enclosed or if handwashing sinks and warewashing sinks must be provided is dependent upon assessment of the unit's menu items as stated in *DPH Rule 511-6-1-.08 (1) (b) 1 and 2*.

c. EFSUs requirements for *overhead protection* is dependent upon whether or not they are located within the enclosed, protective environment of a building in such locations as that of a thoroughfare or food court of a shopping mall, office complex, or enclosed stadium.

d. See Example U-6 for examples of EFSUs.

EXAMPLE U-6
Outdoor/Indoor EFSUs - Kiosks

Indoor/Outdoor
Enclosed Type Design

Indoor Enclosed Type Design

Indoor/Outdoor
Enclosed Type Design

4. <u>*Equipment and Supplies Required for Onboard Preparation of Complex TCS Food Menus*</u>:

A. Units that conduct onboard preparation of TCS foods other than the limited menu stated in *DPH Rule 511-6-1-.08(1)(b)* must provide no less than the equipment listed within *DPH Rule 511-6-1-.08(1)(c) 1 through 3*. Hot and cold holding and displaying food service equipment must be so equipped as to be thermostatically controlled so that food product temperature can be consistently and constantly maintained at 41°F or less, if held or displayed cold, and at least 135°F or greater, if held or displayed hot, and frozen foods kept frozen. See *Example U-7* for examples of thermostatically controlled equipment stated in *DPH Rule 511-6-1-.08(1) (c) 1.*

EXAMPLE U-7

Typical Thermostatically Controlled Food Holding and Display Equipment

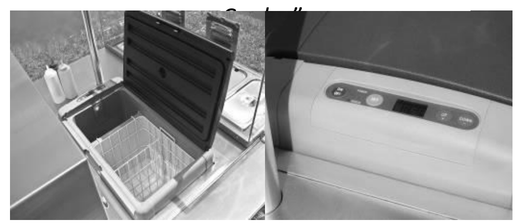
“Heat Lamp Food Warmer”

“Steam Table”

“Sandwich Prep

“Hot Food Holding Drawer Unit”

“Reach-In Cooler”



“Electric Hotdog Cart Cooler”

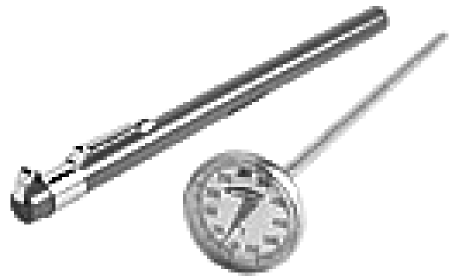
B. *Thermometers are to be available for monitoring* coolers, freezers, and hot holding equipment. Thermometers for equipment such as coolers and freezers may be installed on equipment as part of its design and construction. All thermometers must be checked against a known calibrated thermometer for correct readings. In addition, at least one metal-stem type probing thermometer is required for insertion into food in order to monitor food product temperatures during cooking, cooling, reheating, cold and hot holding and storage. Thermometers must be numerically scaled and accurate to plus or minus 2°F and checked, to verify accuracy daily and after they have been dropped. If thermometers are not accurate, they must be calibrated (or adjusted). See *Example U-8* for examples of thermometers used for monitoring product temperatures.

C. *Units must have installed, at a minimum, two separate sinks; one for handwashing and the other, at least a three compartmented sink for manual warewashing*. Each of these sinks is considered to be a separate unit of food service equipment dedicated for its specific use as per the requirements of DPH Chapter 511-6-1. These sinks must be equipped with hot and cold running water under pressure. *See Section F and Section J in Part-I of this Manual for detailed information concerning these pieces of equipment.*

EXAMPLE U-8

Thermometers used to Monitor Food Product Temperature

"Manufacturer Installed on Equipment"



"Bimetallic Stemmed Thermometer"
Not accurate to probe thin foods

"Thermocouple"
Used for probing all Food Types – Thick, Then, Liquid, Frozen, etc.

D. *Only single-service and single-use articles* will be allowed for consumer use. *Single-service articles* such as, straws, plastic forks, spoons and knives must be individually pre-wrapped from a commercially supplied source. Plates, cups, lids or bowls must be dispensed from their original packaging, taking care that they are completely covered by the original packaging at all times. *Single-use articles* such as bulk food containers (ketchup, mustard and mayonnaise) wax paper, butcher paper, plastic wrap, formed aluminum food containers, jars, plastic tub or buckets, bread wrappers, pickle barrels, ketchup bottles and number ten cans are to be used once and then discarded.

E. *See the Example U-9* for examples of typical equipped, fully enclosed MFSUs:

EXAMPLE U-9

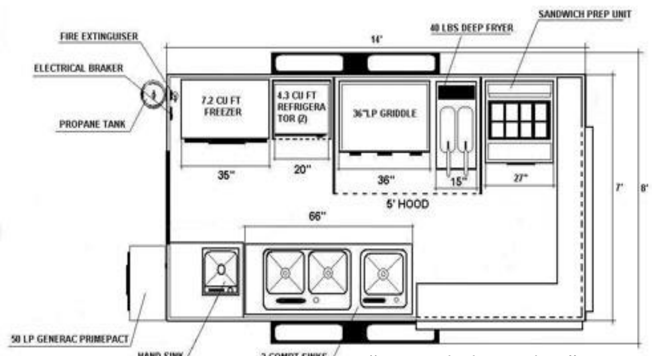
Typical Equipped, Fully Enclosed MFSUs

(Operator prepares and services food from within the unit)

"Prep Line and Cook Line"

"Self-closing or Closable Service Window"

"Handsink & Warewashing sink"



"Typical Floor Plan"

5. <u>*Water System*</u>:

A. *A permanently mounted potable water tank system as* specified under *DPH Rule 511-6-1-.06(1)(g)* and it must be under pressure with a capacity of at least one day's operation. The potable water system must be capable of being directly and fully recharged when filled from a potable water inlet. See *Example U-10* for example of potable water storage tank.

B. <u>*Potable Water Storage Tank Capacity Determination*</u>: The potable water capacity of a MFSU or an EFSU may be estimated by calculating the volume of water for each sink to be installed along with the approximate number of times each sink will be filled each day. Water usage of other equipment can be determined by consulting the equipment manufacturer's specification sheets in addition to the number of times the equipment is used per day. Both of these determined estimates of water use (i.e., sinks and equipment) would then be added together to get the unit's total peak water usage estimates. Additionally, the water heater's capacity should be included in the potable water system's capacity if the water from the water heater's tank can be fully discharged when the potable water tank is empty. Finally, potable water tanks must meet *ANSI/NSF standards for drinking* *water. See requirements specified under DPH Rule 511-6-1-.06 (3) (a) through (n) as it relates to materials, design, construction, installation, numbers and capacities, and operation and maintenance of these tanks*.

C. The *potable water system shall be of sufficient capacity* to furnish enough hot and cold water for food preparation, utensil cleaning and sanitizing, and handwashing to meet the requirements of *DPH Chapter 511-6-1*.

D. The *water heating system shall have adequate capacity and recovery rate* to furnish a continuous supply of hot water whenever the unit is in operation. *See Section K in Part-I of this Manual for more information concerning determining peak hot water demand and water heating system sizing requirements.*

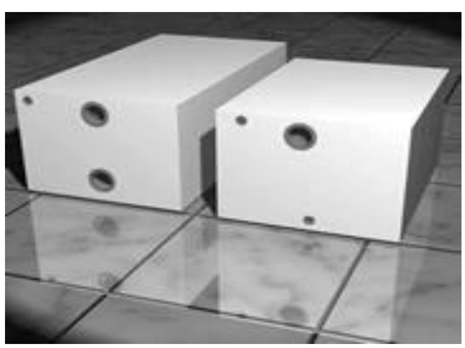
EXAMPLE U-10
Potable Water Storage Tanks

"Permanently Mounted Plastic Potable Water Storage Tank"

"Hot Dog Cart Potable Water Storage Tank"

6. Liquid Waste: It is required that a *wastewater storage tank that is at least 15% larger than the combined capacity of all tanks that can hold potable water be installed on units.* This would mean all potable water tanks plus the water heater capacity. *See DPH Rule 511-6-1-.06 (4) (a), (e), (f), (g), (h) and (i) for specifications* and requirements for wastewater storage tanks. *See Example U-11* for an example of a gray water waste storage tank.

EXAMPLE U-11
Plastic Gray Water Storage Tank



7. *Identification*:

A. All MFSUs and EFSUs *shall be identified by a sign or lettering indicating the name and address of the owner, the operator and the permit number*. Letters and numbers must *be at least two inches in height*. *See Example U-12* for examples of MFSU and EFSU identification sign content.

EXAMPLE U-12
Unit Identification Signage

TOM'S EATS AND SWEETS Tom Smith (Owner and Operator) 4321 Smith Road Anywhere, GA 30000 Permit #0700 Clarke County

THE FOOD STOP Metro Food Services, Inc. (Owner) John Adams (Operator) 4321 Smith Road Anywhere, GA 30000 Permit #0700 Clarke County

B. The *permit*, or copy thereof, and the *current inspection report* must be displayed for the public view and protected from inclement weather.

8. *Toilet Facilities*:

A. *Approved toilet facilities must be available for employees*. If toilet facilities are not provided onboard a MFSU, they must be located *within 200 feet from the mobile*. In the case of extended units, *within 200 feet of the EFSU as well*. The permit holder must provide to the local Health Authority updated list of toilet facilities that are located along vending locations.

B. *If seating facilities are provided for consumers* toilet facilities must be made available for consumers as well as employees of units as well.

C. *If toilet facilities are owned by a person other than the unit permit holder*, then the permit holder must obtain written approval from the owner of the toilet facilities to utilize his toilet facilities.

D. *Base of operations* must have available, acceptable toilet facilities for employees.

9. *Servicing Area*: Servicing areas are located at the mobile food service operation's base of operation. It may be designed as a garage-type facility, as used by some large operations, or a canopied-pad area attached to the building. When necessary, these servicing areas may also be designed and serve as a place for safely storing and protecting units from effects of the environment such as rain, falling debris, bird droppings, blowing dust, etc., during times of non-use. At all times, servicing areas must be designed and constructed so as to protect unpackaged food, food-contact surfaces of equipment and utensils, and single-use articles from potential contamination as they are being placed on units.

   A. *At least the following criteria for servicing areas must be met*:

      a. *A MFSU servicing area* shall be available and shall include at least overhead protection large enough to encompass all and any supplying, cleaning, or servicing operations. However, servicing areas ;

      b. As per *DPH Rule 511-6-1-.06(4)(f)*, sewage and other liquid wastes shall be removed from units in such a way that a public health hazard or nuisance is not created;

      c. There shall be *a location with equipment supplied for the flushing and draining of liquid wastes* from the mobile unit *that is separated* from the location and equipment provided for potable water service and for the loading and unloading of food and related supplies.

      d. *Sanitary facilities must be located within the servicing area for all flushing and draining of liquid wastes from MFSUs and EFSUs*. The design and capacity of these sanitary *facilities must take into account the type of units and the scope of their operations.* For units where their wastewater storage tank design and capacity is such that the waste tank can be easily removed from the unit daily (i.e. carried by one employee to a janitor's sink or floor service sink located within the servicing area), the provision of a *dump station* may not be necessary. When a dump station is required, minimum design and specifications for the liquid waste dump stations shall be as follows:

         i. *See Drawing U-1*. Each liquid waste dump station shall be equipped with a *concrete pad surrounding the drain*. The concrete pad shall meet all of the following specifications:

            (I) It shall be a minimum of six feet by six feet in size;

            (II) It shall be a minimum of six inches in thickness;

(III) It shall have a drain opening which is at least four inches in diameter with a foot-operated, self-closing cap which forms a tight seal with the drain shall be provided. The drain opening shall be located outside of the wheel travel portion of the pad, and a minimum of two feet from any edge of the pad and curbing;

(IV) It shall have minimum of four-inch tall curbing bordering the non-wheel travel area of the pad;

(V) All surface drainage must be diverted around and away from the pad;

(VI) The surface of the pad shall slop at least .25 inch per foot from the edge to the drain;

(VII) Four-inch piping shall run from the drain to either an approved on-site sewage disposal system or to an approved sanitary sewer system;

(VIII) All plumbing must be in compliance with applicable state and local plumbing codes;

(IX) A water supply outlet for wash down shall be provided with a water source that is protected from backflow and back-siphonage, and its delivery piping must be retractable, spring coiled, or by other means approved by the Health Authority. Hoses used for flushing the dump station pad and waste water holding tanks shall not exceed the length necessary to reach the entire pad;

(X) Drains must include the ability to receive wash down wastes from the pad;

(XI) Dump stations shall be designed to be easily accessible to the entrance and exit area of the servicing area and have safe, all weather access roadway that slopes away from the dump station pad;

(XII) Dump station surfaces shall be properly sealed to prevent nuisances;

(XIII) Dump stations shall be posted with signs that are clearly and indelibly labeled stating instructions for use with *minimum one inch tall lettering.* These signs must be at least two feet from the pad. The signs shall include the statement, *"Georgia law prohibits dumping sewage from MFSUs, and other holding tanks onto the ground.";* and

(XIV) Prior to the release of this Manual and should there be any existing mobile food service base of operations with dump stations not in compliance with the design criteria as stated herein, the permit holder would be required to bring their dump station into compliance when the dump station is repaired or renovated, or at change of ownership. *This exception does not exclude any requirement to maintain the dump station to prevent a public health nuisance or hazard.*

ii. *See Drawing U-2*. Each dump station shall have a water supply for the flushing of waste storage tanks and the dump station pad area. The following criteria shall apply:

(I) Dump stations shall be constructed and operated so as to protect the water supply and all other water outlets within the base of operation from backflow and other contamination in accordance with *DPH Rule 511-6-1-.06(3)(k);*

(II) Dump stations shall be posted with signs that are clearly and indelibly labeled stating that the water supply is *to be used for flushing and cleaning purposes only and that the water shall not be used for human consumption;*

(III) Any hose or sprayer must be long enough to allow for a person to operate the drain opening while spraying the pad area;

(IV) The washing water supply tower's connections, hoses and other parts *must be colored red*. Under no circumstances shall the mobile food service operation permit holder allow a hose that is long enough to reach a water outlet that is used for human consumption to be connected to a water service outlet at the dump station; and

(V) Dump stations shall be located such that any water source or service outlet used for filling potable water storage tanks or other uses for human consumption is located as far away as possible and in opposite directions from the dump station facility.

4. The servicing area *will not be required where only packaged food is placed on the MFSU or where units are not equipped with waste water storage tanks*;

5. The *surface of the servicing area* shall *be constructed of a smooth, nonabsorbent material such as sealed concrete or machine laid and sealed asphalt and it shall be graded to drain surface water away from the area*;

6. The construction of walls and ceiling of the servicing areas is *exempted from the provisions of DPH Rule 511-6-1-.07(2) (a) through (f);*

7. *See Example U-13*. Where allowed by the local Health Authority, sewage transport vehicles (waste carts) or waste water vehicles (carts), as mentioned with *DPH Rule 511-6-1-.06(4)(e)*, may be used to transport waste water from MFSUs such as a hot dog cart to a dump station, a floor service sink, or a janitor's sink in one trip for servicing at the base of operation; and

8. *Instead of providing a waste water dump station as per subsection II 9A of this Section*, liquid waste from small volume waste water tanks may be manually dumped into a utility sink, curbed cleaning facility or mop sink as referenced within I of Section R located in Part-I of this Manual. The use of these sinks may be allowed by the local Health Authority as long as food, utensils and single-service/single-use articles cannot be contaminated by such waste water disposal. Small waste water volumes are those were the operator can physically carry the waste water tank to the utility sink facilities. An example of a MFSU that would be within this consideration as having a small volume waste water tank is the hot dog cart.

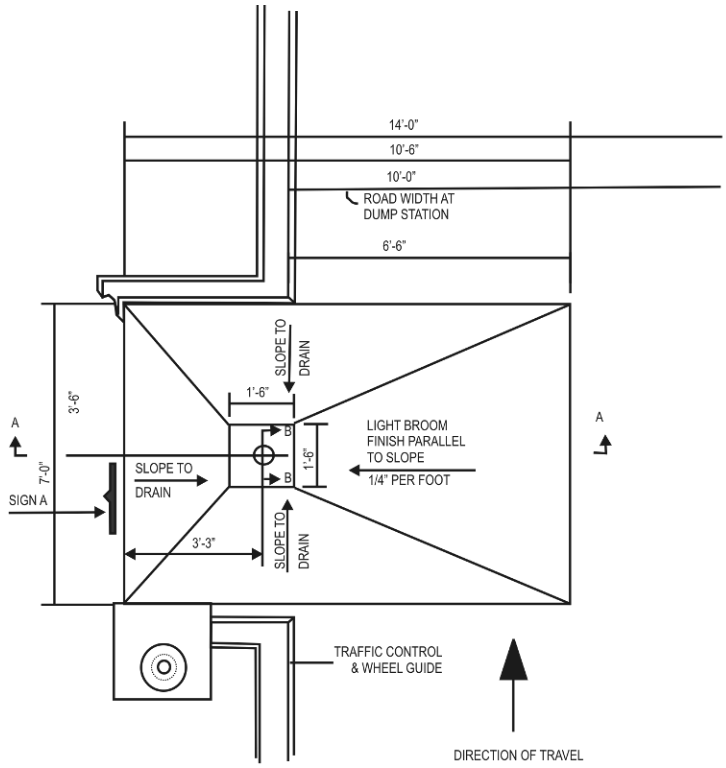
10. *See Drawing U-3* for an example of a typical base of operation.

11. *See Example U-14* for a typical installed dump station.

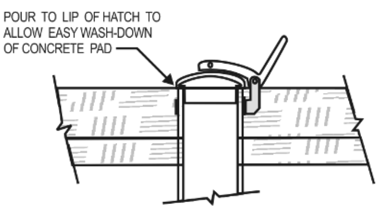
DRAWING U-1

Top-Down View of Dump Station

SIGN ‘A’

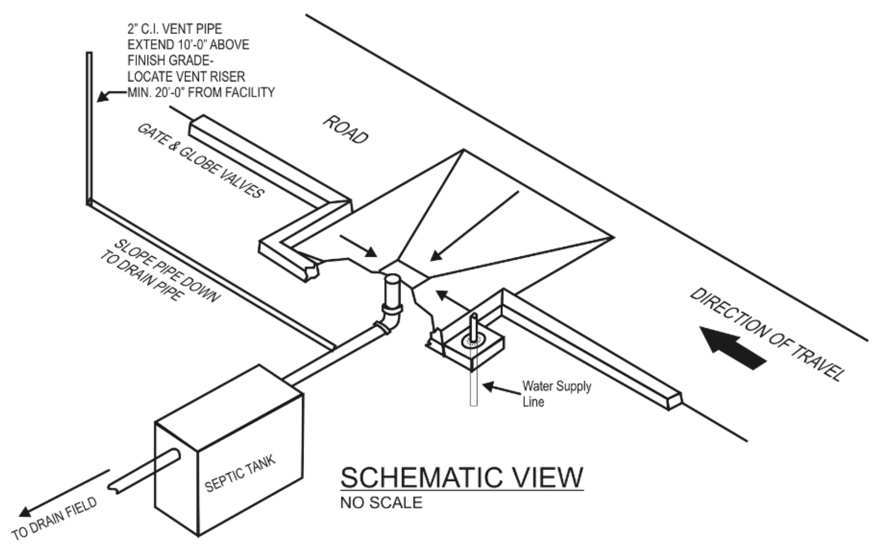


PLAN VIEW
NO SCALE



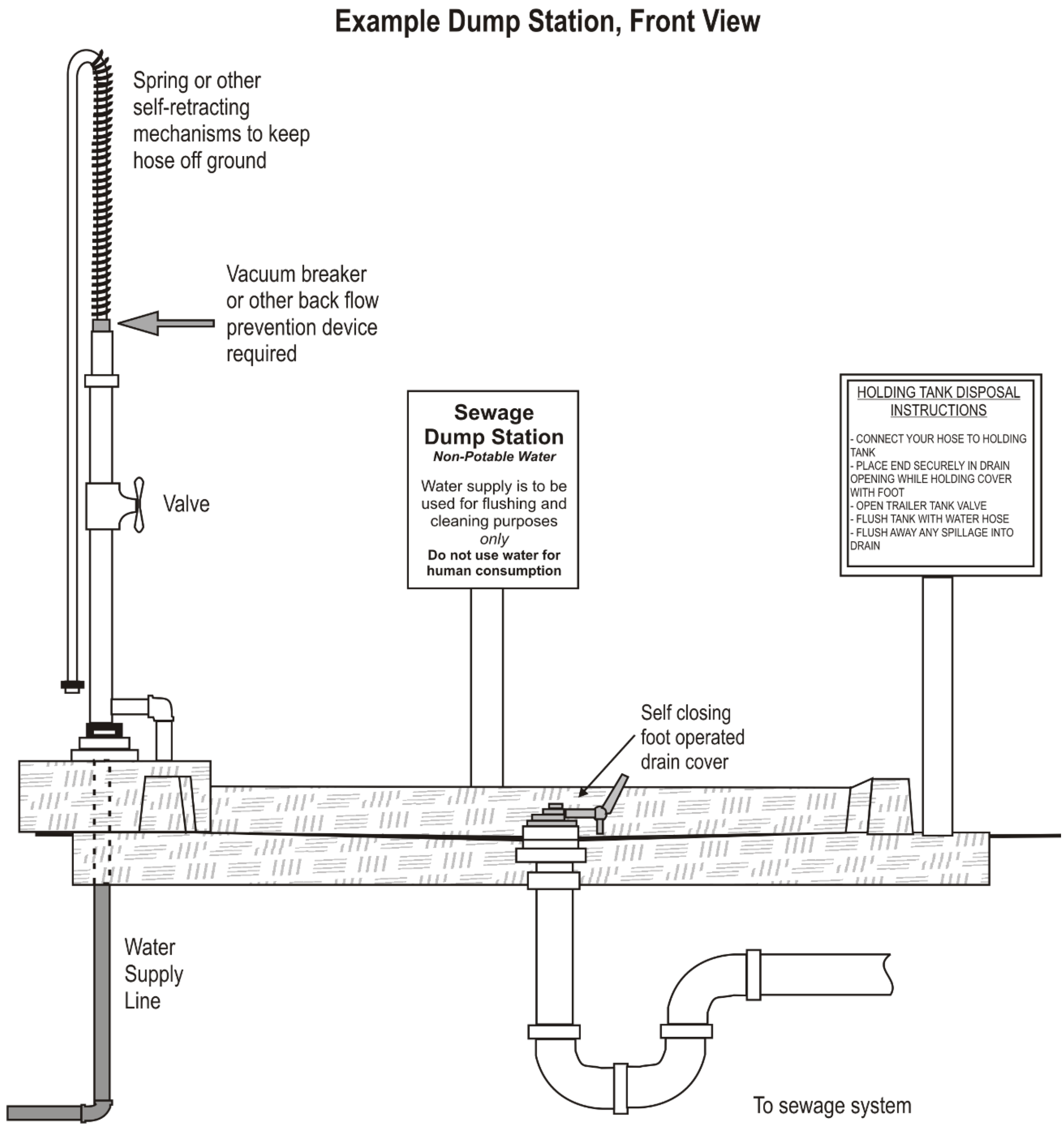
SECTION B-B
DRAIN HATCH DETAIL

Foot Activated Cap



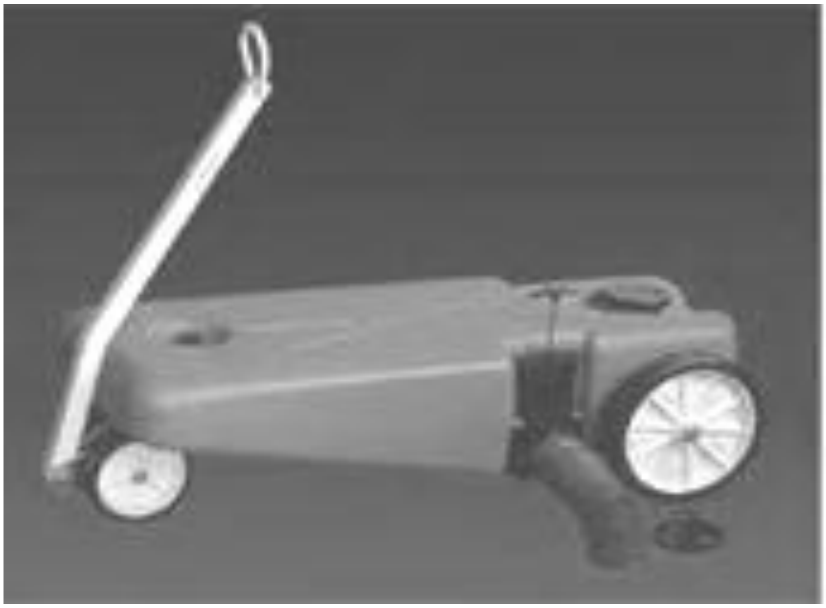
SCHEMATIC VIEW
NO SCALE

DRAWING U-2



Note: Waste piping will be not less than four inches in diameter unless specified by applicable law or local codes.

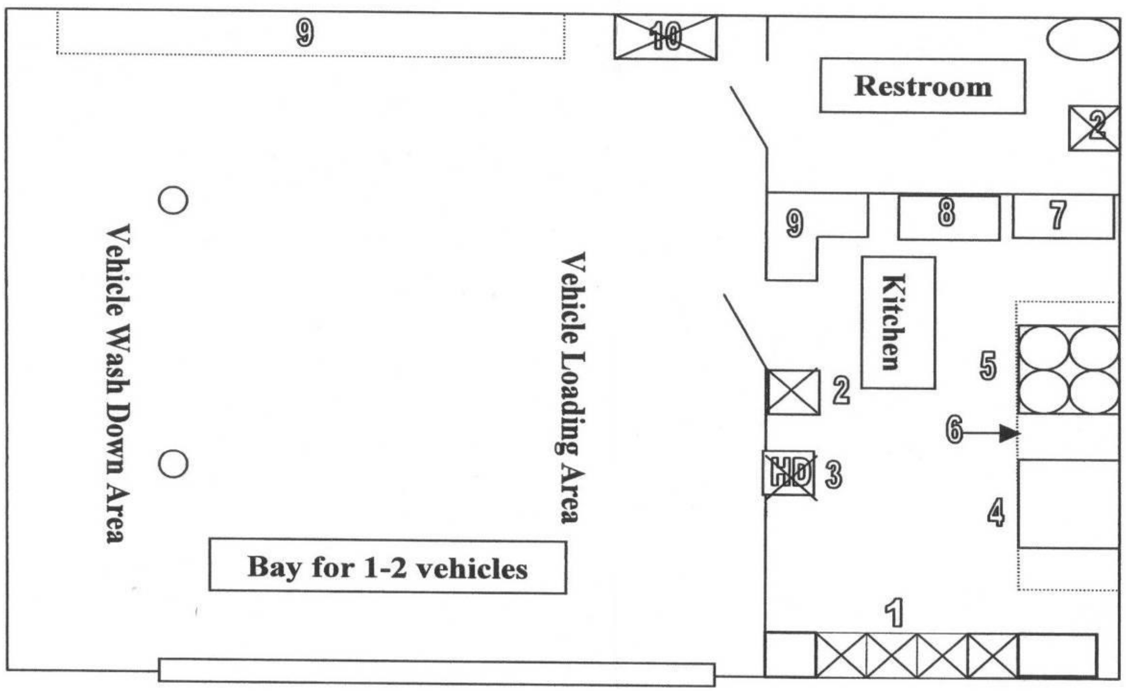
EXAMPLE U-13
Liquid Waste Transport Tank (or Vehicle)



EXAMPLE U-14
Liquid Waste Dump Station

DRAWING U-3

Typical MFSU and EFSU Base of Operation



Equipment Schedule:

1. 4-compartment sink with drainboard 1 ½ times width of one sink compartment
2. Hand sink
3. Vegetable Preparation Sink with indirect drain
4. Oven
5. Stove
6. Ventilation Hood
7. Cooler
8. Freezer
9. Shelves
10. Mop sink with vacuum breaker

Legend:

○ Floor drain
HD Hub drain

Scale:
¼ inch = 1 foot

Note: This drawing is not to any scale and it is exhibited as a typical example only. Designs may vary but, all necessary equipment and layout will be based upon menu review and inherent risk of foodborne illness associated with method of operation.

III **Temporary Food Service Establishments (TFSEs)**[4]:

1. Menu Review, Food Processing and Flow Analysis:

   A. *Importance of Menu Review*: Similar to permanent food service establishments, the *menu is an integral part of the Plan Review Process for TFSEs*. The menu or a listing of all of the food and beverage items to be offered at the TFSE must be submitted by the applicant to the local Health Authority with the submission of all other plan review application documents. As stated in *DPH Rule 511-6-1-.08(2) (c) 2 and 3,* the menu and plan review process will dictate whether or not the local Health Authority will act to impose additional requirements to protect against health hazards related to the conduct of the TFSE's operation; and, what potentially hazardous foods can be safely prepared and service within the limited onsite protective equipment and facilities of the TFSEs.

   B. *The Menu Review Process*: As with the inspection process, *the plan review process will focus on the food and what will happen to the food*. The source and quantity of food to be served should be reviewed along with the preparation and post-preparation operations and the proposed storage practices.

   C. *Food Flow Pattern Analysis*: When conducting a food flow analysis, *the major concerns are hazards associated with cross-contamination from workers hands, cross-contamination between raw animal food items and ready-to-eat food items, contamination of food resulting from contaminated food-contact surfaces of equipment and utensils; and, food temperature control throughout all proposed food processing steps.* In response, flow patterns for the preparation of foods to be served are evaluated to be sure that the layout of the TFSEs provides an adequate separation of raw food ingredients from ready-to-eat foods; that the traffic patterns of workers are not crossing paths with waste items and other sources of contamination and it is forcing workers to consider frequent handwashing; and finally, that consumers and other non-workers are kept out of the food preparation, cooking, and storage areas, equipment and utensil storage and cleaning areas, and single-service article storage areas. *The overriding mandate is to ensure that proposed food items can be protected and served safely during the service operation*.

   D. *See Section B entitled, "Menu Review and Food Process Flow", located in Part-I of this Manual for more information concerning the menu review process and food flow analysis.*

[4] Reference Source: 2000 Pre-Operational Guide For Temporary Food Establishments by the Federal Food and Drug Administration and Conference of Food Protection.

2. <u>Equipment and Supplies Required</u>:

A. *<u>Water Supply</u>*:

a. *An adequate supply of potable water as determined by the Health Authority shall be available on site for cooking and drinking purposes; for cleaning and sanitizing equipment, utensils, and food contact surfaces; and for handwashing*. Water must come from an *approved public water supply or an approved nonpublic (or well) water supply*. The water supply system carrying potable water must be constructed with approved food contact materials and handled in a sanitary manner; food grade hoses are typically white and labeled "NSF Food Grade" and *<u>gardening-type hoses are not acceptable</u>*. The water supply must be installed to preclude the backflow of contaminants into the potable water supply. *All hose and other connections to the potable water supply shall be maintained a minimum of six inches above the ground or top plane surface*. A supply of commercially bottled drinking water or sanitary potable water storage tanks may be allowed if approved by the local Health Authority. *All water sold or given to consumers must be prepackaged (bottled) from an approved commercial source*.

b. <u>Hot Water Provisions</u>: There shall be a *properly sized water heating system* or method to provide hot water for cleaning, sanitizing, and handwashing. *At a minimum, there should be a stove and equipment available to heat water or a properly sized water heater to provide available potable hot water.*

c. *See Sections G, K, and N in Part-I* of this Manual for additional information and guidance.

B. *<u>Wastewater Disposal</u>*: Wastewater shall be disposed in an *approved wastewater disposal system.* Wastewater may not be dumped onto the ground surface; into waterways; or into storm drains, but shall be collected and dumped into a receptacle or waste sink designated for the *collection of wastewater that drains directly to a sanitary sewer or an approved onsite sewage disposal system*.

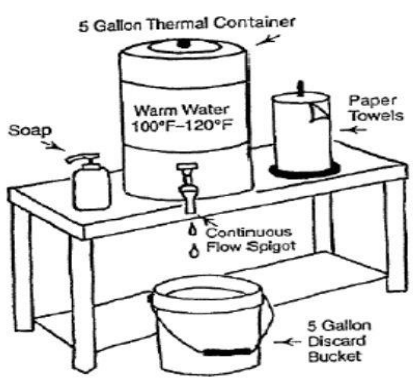
C. *<u>Handwashing Stations</u>*:

a. *<u>Importance of Hand Washing</u>*: *Hand washing, coupled with no bare hand contact with ready-to-eat food and a good employee health policy, is a vital tool* in preventing the spread of bacteria and viruses that can cause infections and foodborne illness in any food service establishment. *People can be a significant source of harmful microorganisms.* Proper hand washing by food employees is *necessary to control direct and indirect contamination* of food, utensils, and equipment.

b. *<u>Handwashing Stations</u>*: *Handwashing-stations shall be located within each TFSE.* Handwashing-stations *must be equipped with tempered water, dispensed hand soap and single-use paper towels available for employee/worker hand washing*. If the booth or unit does not have a hand-sink, the Health Authority may allow an alternative handwashing-station. *At a minimum, the alternative handwashing-station will include: a five gallon insulated container with a spigot which can be turned on to allow potable, clean, warm water to flow over one's hands into a waste receiving bucket of equal or larger volume; suitable hand cleaner; dispensed towels; and a waste receptacle*. Another alternative handwashing-station may be a commercially designed and constructed, self-contained, portable handwashing station. *See Illustration U-1* for examples of alternative handwashing-stations.

ILLUSTRATION U-1

Examples of TFSE Alternative Handwashing-Stations



"Minimum Required Handwashing Station"

"Commercial, Portable Handwashing Station"

3. Equipment and Supplies:

   A. Dry Storage: All food, equipment, utensils, and single service items *shall be stored at least 6 inches off the ground or floor on pallets, tables, or shelving protected from contamination and shall have effective overhead protection*. *See Illustration U-2 as an example of a TFSE dry storage facility.*

ILLUSTRATION U-2
Dry Storage

"Pallets Used to Store Items off the Ground"

B. Only *single-service and single-use articles* will be allowed for customer service. Single-service articles such as straws, plastic forks, spoons and knives must all be *received individually pre-wrapped from a commercial supplier*. Plates, cups, lids and bowels must be dispensed from their original commercial packaging or a properly designed dispenser. Care must be taken to protect these articles during storage and periods of time when they are not being dispensed by keeping them within their closed original packaging and storing them at least six inches above the ground on a shelf or pallet. Single-use articles and bulk food containers (ketchup, mustard, and mayonnaise), wax paper, butcher paper, plastic wrappers, pickle barrels, ketchup bottles, and number ten cans are not to be reused and they must be discarded after use or when emptied.

C. *Hot Holding Equipment*: Hot food storage units shall be used to keep TCS foods at required hot (i.e. foodborne illness pathogen kill step) holding temperatures. If crock pots, steam tables, or other hot holding devices are provided, they must be capable of maintaining food product temperature to *at least 135°F (57°C) or higher* and they must not be used to reheat food. DPH Chapter 511-6-1 requires that TCS food that is cooked, cooled, and then reheated for hot holding must be reheated to *at least 165°F (74°C) within two hours* by equipment such as a stove or grill prior to being placed on hot holding equipment. Ready-to-eat, commercially processed food items such as frankfurters, cooked sausages, and canned chili may be reheated to at least *135°F (57°C) within two hours for hot holding for service. Ready-to-eat, commercially processed food out of its original packaging* can be reheated to the lower temperature of *135°F (57°C)* rather than the 165°F (74°C) temperature because these foods are processed and packaged under high standards to destroy all foodborne illness pathogens.

D. <u>*Cold Storage*</u>: Commercial refrigeration units should be provided to keep *TCS foods at 41°F or below*. An effectively insulated, hard sided, cleanable container with sufficient ice or other means to maintain TCS foods at 41°F or below may be allowed for the storage of small quantities of TCS foods. Unpackaged food may not be stored in direct contact with undrained ice.

E. <u>*Thermometers*</u> *– See Example U-15. Calibrated food thermometers, accurate to ± 2 degrees Fahrenheit with a range of 0°F to 220°F*, must be present and used by employees/workers *to monitor food product and cooking media (cooking oil, boiling water, etc.) temperatures. Each refrigeration unit* must have a numerically scaled thermometer *accurate to ± 3 F* to measure ambient air temperature the unit. In addition, thermometers must be designed for thickness and type of food to be monitored. The thermometer's probe must be capable of easily penetrating and be completely immersed within food for monitoring. *They must be used to measure food temperatures during cooking, cooling, reheating, cold holding, and hot holding.* Thermometers must be checked daily and after they have been dropped. If the thermometer is not accurate, it must be calibrated (or adjusted). Properly calibrating a thermometer adjusts the thermometer to display the correct temperature:

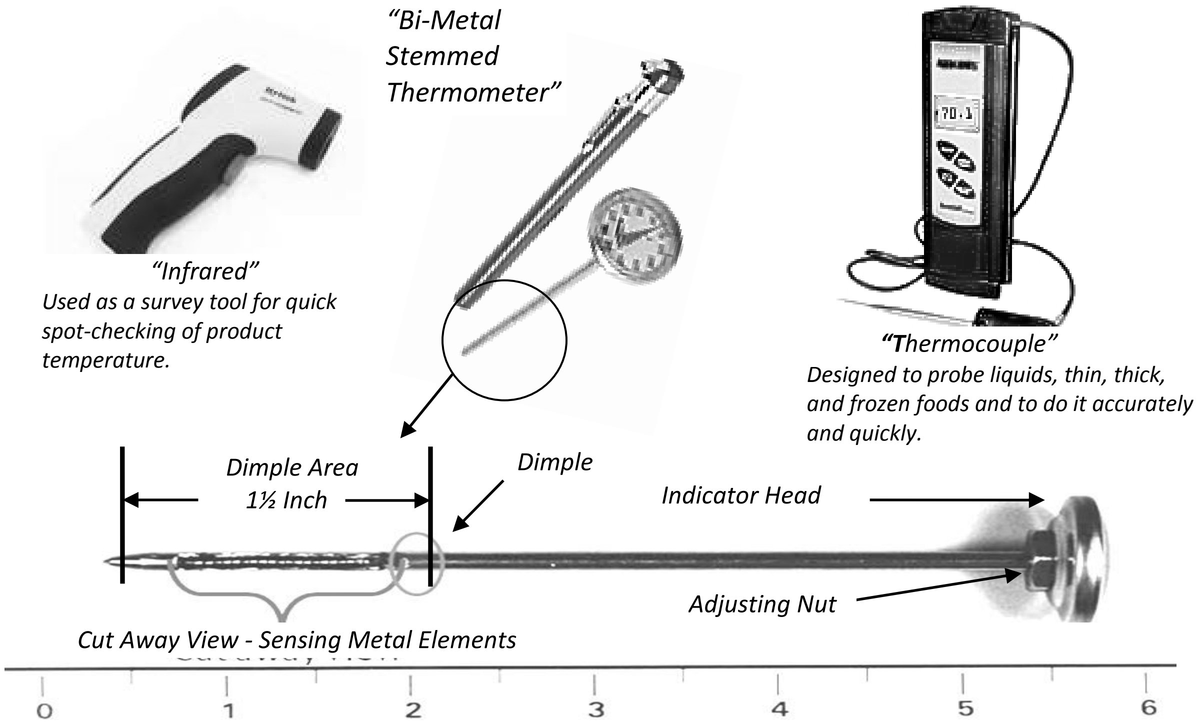
a. <u>*Calibration of a Bi-Metallic Stemmed Thermometer*</u>: *Always follow the manufacturer's instructions for calibration;* however, the most frequently recommended method is the *"Ice-Water Bath Method".* The following steps are used to calibrate a thermometer utilizing the ice-water bath method:

i. Pack a large cup such as a Styrofoam cup with ice (preferably crushed ice) and add cold water stirring the mixture. The ice should not float in the water;

ii. Put the thermometer into the ice water, making sure the sensing dimple *(see Example U-15)* located on the stem of the thermometer is surrounded by the ice water mixture. After about sixty seconds read the thermometer's indicator dial; and finally,

iii. *Adjust the thermometer dial reading to 32°F* by holding the hex or square nut located at the base of the thermometer indicator dial with a wrench or pliers. Keep the thermometer stem fully immersed in the ice water above the dimple on the stem while moving the thermometer dial and thereby move the indicator needle. With the wrench or pliers, turn the dial until the needle points to 32°F. The thermometer is how calibrated and ready to monitor product temperature.

EXAMPLE U-15
Types of Thermometers



F. *Wet Storage*: *Wet storage of all canned or bottled beverages* is acceptable when the *water contains at least 10 ppm of available chlorine* and the water is changed frequently to keep it clean. Liquid waste water must be disposed of properly into a sanitary sewer or an approved onsite sewage disposal system and cannot be dumped into streets, storm drains, waterways or onto the ground surface.

G. *Food Display*: *All food shall be protected from customer handling, coughing, sneezing or other contamination by wrapping, the use of sneeze guards or other effective barriers.* Where sneeze guard interceptors are utilized, they must intercept a direct line between the nose and mouth of the consumer to the food being displayed for service. Similarly, if food is exposed while being prepared on grills or other cooking equipment in view of consumers, it must be shielded to prevent potential for consumer contamination as well. Additionally, open or uncovered containers of food shall not be allowed at a temporary food service event, except working containers. Condiments must be dispensed in single-service type packaging, in pump-style dispensers, or in protected squeeze bottles, shakers, or similar dispensers which prevent contamination of the food items by food workers/employees, consumers/patrons, insects, or other sources. *See Section E in Part-I of this Manual for more information and examples of sneeze-guard-shielding devices to protect exposed and displayed food from consumer contamination.*

H. *Food Preparation*: *All cooking and serving areas shall be protected from contamination.* Cooking equipment, such as BBQs, propane stoves, and grills, shall *be roped off or otherwise segregated from the public*. *Consumers/patrons must be prevented from accessing areas* of the TFSE where food, food-contact surfaces, and equipment are located.

I. *Cooking Devices*: *Charcoal and wood cooking devices are not recommended*. Propane stoves or grills are approved as cooking devices. The *local Fire Safety Authority must approve cooking devices.* *All cooking of foods should be done towards the rear of the TFSE.* When barbecuing or using a grill, the cooking equipment should *be separated from the public for a distance of at least four feet* by roping off or by other means to protect patrons from burns or splashes of hot grease.

J. *Layout and Design – the Prevention of Cross-Contamination*: *The layout and placement of equipment be must considered when assessing the flow of food as it travels through the establishment.* It must provide *separation of raw foods from ready-to-eat foods during storage, preparation, holding, and display*. Just as in the case with assessing plans and specification for permanent food service establishments, controls must be in place for hazards that are inherent to the TFSE operations. *See Section B entitled, "Menu Review and Food Process Flow",* located in Part-I of this Manual for more information concerning the menu review process and food flow analysis.

4. Cleaning and Sanitizing Facilities:

A. *Warewashing*: Each booth must have a 3-compartment sink properly set up for the purpose of washing, rinsing and sanitizing utensils coming into contact with food. If the booth or trailer does not have a built-in three compartment sink, the minimum alternative requirements for a warewashing set-up to wash, rinse, and sanitize shall consist of three basins, large enough for complete immersion of utensils or removable food-contact surfaces of equipment, a potable hot water supply, and an adequate disposal system for the wastewater. *See Illustrations U-3and U-4 for examples of manual warewashing set-ups at TFSEs.*

ILLUSTRATION U-3
Three-Compartmented Warewashing Sink

"Employee Testing Sanitizer Solution"

ILLUSTRATION U-4
Alternative Warewashing Set-Up

"Three Plastic Wash Basins"

B. <u>*Cleaning and Sanitizing*</u>: *Chlorine bleach (i.e. sodium hypochlorite) or other approved sanitizers must be provided for sanitizing food-contact surfaces, equipment, and wiping cloths.* Sanitizers must be used at appropriate strengths. An approved test kit must be available to accurately measure the concentration of sanitizing solutions. *See DPH Rule 511-6-1-.05(6)(n)* for listing of approved sanitizers and solution strengths.

C. <u>*Wiping Cloths*</u>: *Wiping cloths* that are in use for wiping food spills shall be used for no other purpose and *shall be stored clean and dry or in a clean chlorine sanitizing solutions at a concentration of 100 ppm*. They may be single-use disposable type purchased from commercial sources as well. *See DPH Rule 511-6-1-.04(4) (m)* for requirements concerning wiping cloth use and storage.

5. Construction and Premises Requirements:

A. *Counters/Shelves*: *All food-contact surfaces shall be smooth, easily cleanable, durable and free of seams and difficult to clean areas*. All other surfaces shall be finished so that they are easily cleanable. Counter service openings shall be no larger than necessary for the operation and shall be provided with an effective means to restrict the entrance of flying insects. Counter service openings shall be kept closed when not in actual use, except that these may remain open if they are provided with properly designed and installed air curtains or effective, electric fans all of which must be approved by the local Health Authority. *See Illustrations U-5 and U-6* for examples service windows and temporary protective enclosure.

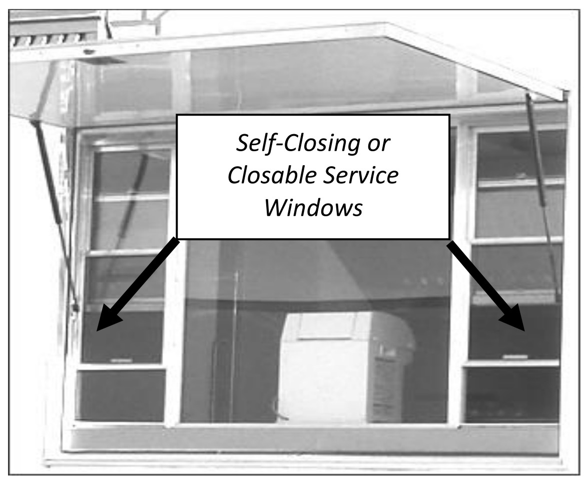
ILLUSTRATION U-5

Service Window Openings for Kiosk and Trailer Type TFSEs

Example "A"

This service window has an air-curtain along the top that blows down and outward. This unit has a dropdown lid for protection during travel and periods of non-operation similar to Example "B".

Example "B"



This service window design is self-closing or can be closable. Notice the dropdown lid for protection during travel and periods of non-operation.

B. *Floors*: *Unless otherwise approved*, floors of outdoor TFSEs are to be constructed of concrete; asphalt; non-absorbent matting; tight wood; or removable platforms or duckboards which minimize dust and mud. The floor area must be graded to drain away from the TFSE.

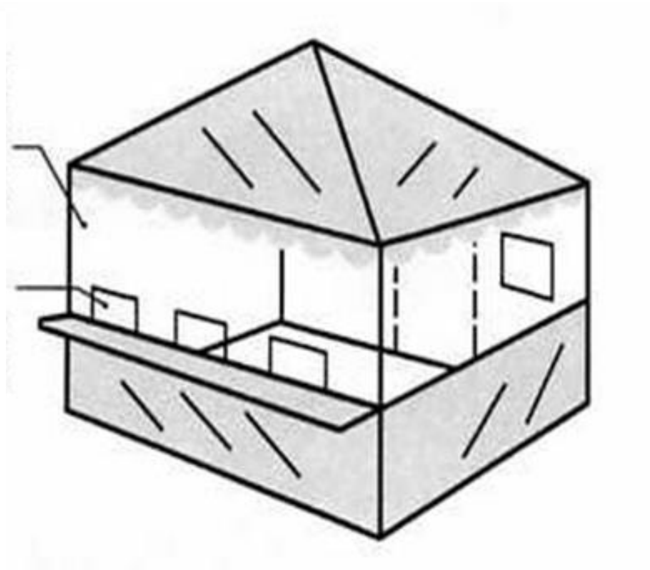
C. *Walls, Doors, and Ceilings*: *The TFSE must be covered with a canopy or other type of overhead protection.* Construction of walls and ceilings are to be of sound construction to protect the interior against the weather, windblown dust and debris, prevent the entrance of insects, or other sources that may contaminate food, food-contact surfaces, equipment, utensils, or employees/workers. *Doors to food preparation areas shall be solid or screened and shall be self-closing.* They may be flaps made of same materials (ex. Screening, Tarpaulin, etc.) as walls as long as they are capable of being completely closed after entry or exiting the TFSE. If screening is used as construction materials, it shall be *at least sixteen mesh to the inch.*

ILLUSTRATION U-6

Onsite Tent or Booth Temporary Protective Enclosure

Clear PLASTIC or light colored SCREENING on sides.

15" x 18" Food Service Openings Note that Service Openings may have electric fans blowing across openings to help keep flying insects out.



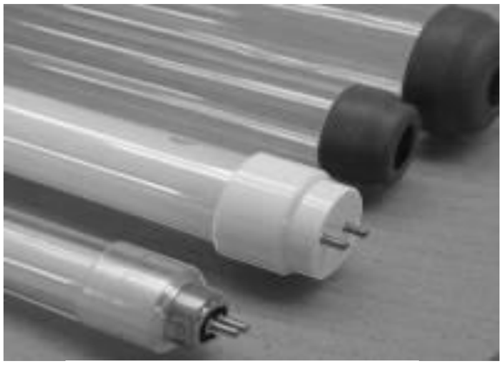
D. <u>*Lighting*</u>: *Light bulbs must be protected just like those used in any food service establishment*. Note that the light bulbs on the left have protective sleeves over each bulb, but the bulbs on the right do not. Protecting bulbs is sometimes more necessary in a temporary establishment than in a permanent establishment, due to tight spaces and low ceilings. Shields help prevent breakage caused from mop and broom handles hitting the bulbs. Shields also prevent broken glass from falling when florescent bulbs burst. *See Illustration U-7.*

ILLUSTRATION U-7
Examples of Lighting Shielding

"Clip-On Shielding"

"Shatter Resistant Bulb"

"Vapor and Explosion Resistant Fixture"



"Plastic Tube and Cap Shielding"

"Plastic Tube and Cap Shielding Installed"

"Lens-Covered Shielded Fluorescent Light Fixture"

Note: To be effective, shielding must contain glass should bulbs break.

E. *Garbage*: *As to be determined by the local Health Authority*, an adequate number of non-absorbent, easily cleanable garbage containers must be provided both inside and outside of each TFSE site. Dumpsters must be covered, rodent-proof, and non-absorbent. Grease must be disposed of properly, as determined by the local Health Authority, and shall not be dumped onto the ground surface.

F. *Toilet Facilities*: *Adequate number of approved toilet and handwashing facilities must be provided for TFSE employees/workers*. At a minimum, non-sewered toilet systems (portable toilets) must be provided as per *Special On-Site Sewage Management Systems Chapter 511-3-1*. In addition, *toilet facilities* must be conveniently *located within 200 feet of TFSEs*.

G. *TFSE Location and Seasonal Considerations Related to Vermin and Insect Control*: Approved means of excluding insects and vermin from food preparation, service areas and from waste storage areas must be provided commensurate with the type and scope of food service permitted by the local Health Authority.

a. *Location Considerations*: *The location of the special event determines to what extent and impact the presence of vermin will have on the TFSE operations. The location of the special event must be considered as part of the plan and specification development and review process.* For example, if an event is located near a potential vermin source such as improperly maintained horse, hog, or chicken agricultural operations or garbage dump site, the presence of flying insects and other vermin at TFSEs may be greatly increased to a point that minimal vermin control measures found within the Chapter might be overwhelmed. As a result, the local Health Authority would most likely have to require additional measures to bring flying insects and vermin under reasonable control. In some situations, the local Health Authority might need to require TFSEs to be relocated as far from the source of vermin as possible and in some extreme cases, food service may not be possible if a control measure cannot to be effective performed.

b. *Seasonal Considerations*: *In addition to food source attraction and breeding sites, flying insects, and vermin are affected by the weather temperature and humidity as well.* In humid warm weather, flies are more active; whereas, in colder times of the year, flies are relatively inactive and they might not be as great of a concern when locating TFSEs. However, vermin such as field rats may be attracted to solid waste TFSE storage sites or even food storage areas and facilities, since their normal food source might be reduced during cold months of the year.

H. *Clothing Storage*: Personal clothing and belongings should be stored at a designated place in the TFSE away from food preparation, food service and warewashing areas.

I. Employee Break Areas: *Smoking, eating, and drinking are not allowed by food employees/workers in the food preparation, storage and service areas; utensil washing and storage areas; nor in the single-service storage areas*. An area located outside these work, storage and service areas must be designated as an employee/worker break area.

IV. Incubator Kitchen Food Service Establishments:

1. *DPH Chapter 511-6-1 and the Food Service Establishment*:

DPH Chapter 511-6-1's Primary Objective: *The mission of DPH Chapter 511-6-1 is to reduce the impact of foodborne illness on the citizens of Georgia and her guests (the general public).* In order to carry out our mission, *DPH Chapter 511-6-1 contains two primary objectives: first, to ensure that risk factors for foodborne illness are maintained under control by management; and secondly, to ensure provisions for the establishment's design, equipment layout and installation, and construction (or Good Retail Practices-GRPs) will afford management the necessary support to successfully control the risk factors for foodborne illness*. In order to attain these primary objectives, DPH Chapter 511-6-1 is made up of three main parts. The first part is made-up of two Rules. The first is *DPH Rule 511-6-1-.03, entitled Management and Personnel*, which is designed to control the risk factors that are associated with improper employee/management activities such as poor employee health policies, poor employee hygienic practices, and the lack of proper food safety training for personnel. The second is *DPH Rule 511-6-1-.04, entitled Food, which contains provisions to control risk factors that associated with receiving, processing, handling, storage, etc. of food within a food service establishment such as improper holding temperatures, foods received from unsafe sources, contaminated equipment, and improper cooking.* Thus both DPH Rule 511-6-1-.03 and *DPH Rule 511-6-1-.04* are *designed to control for the top five risk factors for foodborne illness.* The *second part* of DPH Chapter 511-6-1 includes *DPH Rules 511-6-1-.05 through DPH Rule 511-6-1-.07.* Lastly, DPH Chapter 511-6-1 *functions to provide support to management's control of foodborne illness risk factors.* It accomplishes this function through good retail practices (GRPs) and proper establishment design, construction, and equipment installation (or provisions for proper planning and review). Therefore, *if DPH Chapter 511-6-1 is applied correctly by food service establishment management, the impact of foodborne illness on the public can be greatly reduced.*

a. *The Food Service Establishment:* To further understand how DPH Chapter 511-6-1 is designed to accomplish its mission to reduce the impact of foodborne illness on the public, you must understand how parts of a food service establishment are related to the parts of DPH Chapter 511-6-1:

i. Parts and Functioning of the Food Service Establishment: *The first part consists of the establishment's management and personnel. The second part consists of the safety of the food as it travels through the food service establishment. The third part functions to provide support to management's efforts to control foodborne illness risk factors. This third part consists of* *the physical building, the equipment layout and installation according to the food flow as dictated by the proposed menu, the constructed facilities, the utilities, and the premises*. Hence, *the third part, good retail practices, is influenced by activities surrounding proper food service plans, specifications, planning, and review.* If the plan and specification design review process is performed correctly, management of the establishment will be afforded an opportunity to be successful in controlling risk factors inherent to the establishment's menu and operation. From a food safety perspective, these parts must work together to make a complete food service establishment designed to control inherent risks associated with the establishment's proposed menu and method of operation. Therefore, it is for this reason that *<u>food service plans and specification's planning and review processes, as required in DPH Rule 511-6-1-.02 (4), must occur before a permit to operate the establishment is issued by the Health Authority, as required within DPH Rule 511-6-1-.02 (1) (c) 2.</u>*

ii. *<u>Parts of a Food Service Establishment and Permit Validity</u>*: In regards to the impact of foodborne illness, *DPH Rule 511-6-1-.02 (1)(a)'s* provision for the issuance of a permit to operate a food service establishment is the key legal means by which the Health Authority fulfills its mandated mission – to protect the public health. As provided for in *DPH Rule 511-6-1-.02 (1) (a) 3, the permit represents the Health Authority's permission given to a single applicant (or management) to operate a specific, single establishment that prepares and serves food to the public.* It also *signifies that a single establishment has satisfactorily demonstrated through the plans and specifications review, and the initial inspection processes to have the necessary design, construction, and equipment installation (or GRPs) for management to be successful in maintaining active managerial control over the risk factors inherent to its method of operation (or business model).* Once the permit has been issued to the applicant by the Health Authority, it remains valid until some specific event occurs to invalidate it. As per *DPH Rule 511-6-1-.10 (1),* one event that may occur would be the permit's *suspension or revocation based upon findings noted during a single inspection or a series of inspections conducted at the establishment by the Health Authority*. As specified in *DPH Rule 511-6-1-.02 (1) (b),* another event that might occur would be a *change in management (permit holder), a change in location (the Health Authority's plans and specifications approval is given to one location), or change in the approved method of operation (change from business model to another - mobile, extended, temporary, incubator, etc.) which automatically causes the permit to expire.*

B. *<u>Management and Incubator Food Service Establishments</u>*: *DPH Rule 511-6-1-.03 places responsibility for controlling the risk factors for foodborne illness with the management of the food service establishments*. By doing so, management must control these risk factors using the provisions as outlined in *DPH Chapter 511-6-1*. As found within *DPH Rule 511-6-1-.03 (2)(b), one provision* that enables management to fulfill its duties and responsibilities is to *exclude individuals that* *are not employees of or provide a necessary service to the establishment*. By doing so, management reduces the risk of potential contamination of food and food-contact surfaces of equipment and utensils from external sources to his or her establishment. Management must also *ensure compliance with DPH Chapter 511-6-1-.03 through monitoring the activities and health of employees; training employees in correct food safety methodologies and practices as it relates to their assigned tasks; and most importantly, taking action to eliminate out of control risk factors for foodborne illness.* However, *the interaction of separate, independent management systems of unpermitted business entities utilizing the same equipment and facilities will greatly diminish the food service establishment permit holder's ability to maintain this managerial control as required by DPH Rule 511-6-1-.03 and greatly increase the potential for cross-contamination*. At the same time, the *Health Authority's ability to ensure active managerial control of risk factors for foodborne illness within the establishment is severely diminished; all due to these separate business entities not being held directly accountable to DPH Chapter 511-6-1 through a valid permit.* In order to counteract this resulting loss of control of foodborne illness risk factors, the permit applicant and the local Health Authority must *place emphasis on a well developed management plan and a legally binding contractual agreement between the permit applicant/holder and its incubatees/ members.* Additionally, there *must be provisions for the assurance of separation in time and space for use of equipment and facilities by incubatees/members.* In regards to plans and specification review, *these conditions must be fulfilled in order to provide for the prevention of potential cross-contamination of food products and to provide for a system to conduct product trace-back should the establishment be involved in a foodborne illness investigation, as well.*

C. *Types of Food Operations Utilizing Incubator Kitchen Food Service Establishments and Regulatory Authority*: Currently, two types of food operation entrepreneurs utilize Incubator Kitchen Food Service Establishments as means to start-up their establishments by reducing or eliminating overhead costs associated with planning and operating their own equipment and facilities. However, Incubator Kitchen Food Service Establishments cannot be considered for use by mobile food service operations as base of operations because a mobile food service operation must have access to its base of operation at all times. The current entrepreneurs are *food processing or baking operations regulated by the Georgia Department of Agriculture (GDA)* and *catering food service operations regulated by the Georgia Department of Public Health (DPH) represented by County Boards of Health*. Each Department's authority to regulate its prospective establishments is mandated by Georgia Law and therefore, each cannot regulate the other's establishments.

D. *Good Retail Practices (GRPs) and Successful Managerial Control of Foodborne Illness Risk Factors*: Just as it is with any food service establishment, *good retail practices (GRPs) associated with Incubator Kitchen Food Service Establishments function to provide support to management's efforts in successfully controlling foodborne illness risk factors*. To what extent management will be *successful* in such efforts greatly depends upon the establishment's design, equipment and layout's ability to control inherent hazards associated with the proposed menu items and associated food processing steps. As such, the plan and specification review process is critical in planning for management's future success. It becomes even more critical in regards to Incubator Kitchen Food Service Establishments because their business model is based on growing the business of multiple caterers (referred to as incubatees/members) that utilize a single food service establishment's equipment and facilities to prepare, transport, and serve food to the consumer. *These activities magnify concerns for potential cross-contamination and product temperature abuse of food during processing, transport, and service.* Therefore, the proposed plans and specifications must address such concerns before management of Incubator Kitchen Food Service Establishments can have any opportunity to be successful in its efforts to control foodborne illness risk factors.

E. *Plans and Specifications Mandated to allow Managerial Successful Control of Foodborne Illness Risk Factors*: The *physical part of the establishment, the building, installed equipment, utilities, and sanitary facilities, are linked to DPH Rule 511-6-1-.02 (1) (b)* in regards to the location of a food service establishment as being one factor to determine the validity of its permit. Further, *DPH Rule 511-6-1-.02 (1) (c) 2 requires* the permit applicant (i.e. the legally responsible person) *to successfully complete the Chapter's plan review process found in DPH Rule 511-6-1-.02 (4) in order to qualify for a permit.* These requirements are to ensure that the hazards inherent to the proposed menu and its food processing steps can be successfully controlled by management during operation.

F. *Separation by Time and Space*: Because Rules and Regulations imposed by GDA for food processing establishments and bakeries differ from those imposed by DPH for food service establishments, these food establishments must operate separately from each other. Additionally, hazards and risk factors for foodborne illness vary greatly between these types of food establishments. Food service operation's menus can vary from non-TCS food ingredients to highly TCS food ingredients. *All food service menu items are required to be processed into the ready-to-eat form for consumption directly to the consumer either for carry out or service within the establishment.*. Ready-to-eat foods can be of animal origin served raw or partially cooked, as well. Therefore, the main objectives of food service operations are to receive raw food ingredients from approved sources; process food ingredients safely into ready-to-eat forms; once in the ready-to-eat form, store or hold the ready-to-eat foods in a safe manner; and serve them to their immediate consumers. *To the contrast, food processing and bakery operations process raw food ingredients into products that have long-term shelf-life and package them for distribution to other business entities for resale to their immediate consumers.* The difference among these establishment's method of operations raises concern for increased potential for cross-contamination and food product temperature abuse should they interact with each other utilizing the same food processing equipment and facilities. Because of the different regulatory requirements required to control risk factors for foodborne illness inherent to each type of food operation, they cannot be allowed to use the same facilities and equipment at the same time. *As a result, the floor plan and equipment layout for the proposed IFSO must be designed to either provide physical separation of equipment and facilities or separation by scheduled time and space use.* Food operations regulated by DPH must be separated by walls or partitions from those regulated by GDA. An *alternative* to separate walls would be providing *a design that would allow incubatees/members to be scheduled so that food operations regulated by DPH would not be conducted at the same time those regulated by GDA are being conducted. Both of these floor plan designs are required to be part of a request to vary from DPH Rule 511-6-1-.02 (1) (a) 4. In addition* to the design floor plan, *a detailed written management plan; a standard operating plan (SOP); and highly detailed record keeping system must be submitted to the Department for review and consideration for variance approval. See DPH Rule 511-6-1-.08 (3) for more information.*

G. "Incubator food service establishment" means a food service establishment properly sized, designed, equipped, and managed to foster other food industry entrepreneurs, such as caterers, by covering the capital startup-cost through the provision of a commercial food service kitchen. These commercial food service kitchen facilities are rented to incubatees/members on a separation of time and space basis. The incubator food service establishment, also known as a kitchen incubator or shared kitchen, enables a food service operation to develop to the stage where it may invest in its own commercial food service establishment equipment and facilities. At the time of adoption of this Chapter, there are two basic types of incubator food service establishments:

H. Business Model A is a single food service establishment operation that has a single permit holder and incubatees/members are considered to be contractual employees of the permit holder that utilize the food service establishment. In this business model, the layout is an open kitchen in which the incubatees/members operate on a separation of time and space basis meaning that the incubatees/members would have to be scheduled to use the equipment when no other members are scheduled to prevent the risk of cross-contamination.

I. Business Model B is a business relationship in which incubatees/members operate within build-out units and are considered to be contractual employees of a permit holder on a separation of time and space basis. In this business model, the incubator food service establishment must qualify for a permit and would be responsible for the overall facility and each incubatee/member operates within the build out units on a separation of time and space basis. Each incubatee/member must obtain a food service permit. While in the incubator establishment, the incubatee/member operates under the incubator establishments permit; however, when on-site catering the incubatee/member operates under its own food service permit.

J. "Incubatee/Member" means a food industry entrepreneur who is operating under the authority and active managerial control of a permit holder of an incubator food service establishment on a separation of time and space basis.

K. <u>*Business Models*</u>: *Kitchen and associated storage areas must be designed based upon a complex food process flow*. This is necessary because food service operations such as those that cater food will prepare food in advance for transport and service at a later date and time. Examples of floor plans are as follows:

Business Model A floor plan may be designed *as follows:*

Separation in space and time will be maintained so as no other activities, such as bakery or food processing plant activity, will be conducted at the same time food service operations are being conducted. Separation of time and space may be accomplished by equipment and facilities being physically separated into areas or rooms separated from each other by walls or partitions as acceptable to the Health Authority. In addition, separation in time and space may be accomplished by scheduling of incubators/members as acceptable to the Health Authority. Food storage facilities may be shared only between incubatees/ members if food items can be secured in such a way that tampering with food can be prohibited and traceback to the owner of the food can be maintained (i.e. lockable/labeled cabinets in which the incubator kitchen permit holder has access). Toilet facilities and solid waste storage facilities may be commonly shared between all incubatees/members. Basic set-up: Operators are separated based on scheduled times of use throughout the day.

Business Model B's floor plan may be designed *as follows:*

Separation in space or time will be maintained so as to ensure that all food service operations are conducted within each individual incubatee/member's build-out unit. Separation of all activities, such as bakery or food processing plant activity must be accomplished by equipment and facilities being physically separated into areas or rooms separated from each other by walls or partitions as acceptable to the Health Authority. In addition, separation in time and space may be accomplished by scheduling of incubators/members as acceptable to the Health Authority. Food storage facilities may be shared if incubatees/members food items can be secured in such a way that: tampering with food can be prohibited and trace-back to the owner of the food can be maintained (i.e. lockable/labeled cabinets in which the IFSO permit holder has access). Toilet facilities and solid waste storage facilities may be commonly shared between all incubatees/ members. In this model, caterers operate under the Incubator Kitchen Food Service Establishments permit while in the establishment and operate under their own food service permit when they leave the building to cater the food. At all times the caterer is under the active managerial control of the incubator kitchen's management. Basic set-up: Multiple users in separate build-out units with separately scheduled times of use throughout the day.

2. *Semi-Shared Facilities:*

   A. *Limitation of Mobile Food Service Operations (MFSOs) and Extended Food Service Operations (EFSOs) and Incubator Kitchen Food Service Establishments*: *DPH Rule 511-6-1-.08 (1) (f) 1 requires MFSOs and EFSOs to have access to their* *base of operation for servicing, cleaning, and resupplying all hours of any day during the week*. Additionally, *DPH Rule 511-6-1-.08 (1) (f) 4 requires that MFSOs and EFSOs operate under the legal responsible authority and active managerial control of the base of operation's permit holder*. It is because of these requirements that *units are defined by DPH Rule 511-6-1-.01 as extensions of the base of operation* and as a result, *they are viewed by the Chapter as part of the base of operation's equipment and facilities, making a complete food service establishment*. Therefore, in regards to mobile food service operations as with any other food service establishment, the *Health Authority carries out its mandated mission to protect the public health by requiring a single legally responsible management, i.e. the permit holder, to be accountable to DPH Chapter 511-6-1* which is designed to reduce the impact of foodborne illness. *It is for these requirements and reasons that mobile food service units, extended food service units and their base of operation must be under the owner ship of one person holding a valid food service permit*. As a result, units:

a. *Cannot be operated as a separate, nondependent food service establishment;*
b. *Cannot be operated by a permit holder separate from the permit holder who operates the base of operation;and,*
c. *Cannot share an IFSO establishment, as a base of operation.*

B. *Alternative Floor Plans to IFSO Requirements*: The only floor plan model to allow multiple mobile food service operations or multiple extended food service operations to utilize one facility as a base of operation as stated in *DPH Rule 511-6-1-.08 (3) as follows:*

a. A building or structure will be *designed to allow multiple mobile food service operations*.
b. The *business relationship* between the owner of the facility and food service operations will be that of *landlord and tenant*.
c. Each *mobile food service operation* will be *assigned its own build-out unit (not to be shared at any time) with all equipment for refrigeration, holding, food preparation, etc. housed within that build-out unit (similar to a food court), and each operation* will *possess its own valid permit* type, mobile food service operation.
d. *Date and time use scheduling of cubicles/build-out*-units between mobile food service operations *will not be allowed*.
e. Each cubicle or build-out-unit *will serve as the base of operation for a single mobile food service establishment.*
f. *The only common use facilities* allowed are garbage storage, servicing areas, toilet facilities and utilities *based upon facility design*.
g. *Facilities and areas for storage of mobile food service units* may be provided for common use by all mobile food service operations.

IV. **Catering Food Service Establishments (CFSEs)**:

1. *Background*:

A. *Method of Operation*: Catering food service establishments *may provide service onsite or offsite of the fixed base of operation*. At times, the food service catering method of operation has been misunderstood for home food delivery service or that associated with mobile food service establishments. However, catering food service establishments are easily distinguishable from other food service methods of operations. *Catering food service establishments enter into a contractual agreement to provide food to a consumer at a single event at a specific time and location.* It fulfills this contractual agreement with its consumer by preparing food in bulk, containerizing it, and then delivering the food at the agreed upon date and time where *upon delivery, the consumer takes possession of the food*. Additional services, such as limited service and onsite finishing, may occur as agreed within the contractual agreement. In contrast, home delivery and mobile food service establishments operate quite differently. Food is generally not prepared in advance in bulk for service to any particular consumer, specific event, nor at any prescheduled time and place according to a formal contract. *Mobile food service units travel from place to place vending their menu items on demand by consumers through general advertisement, such as signs and menu boards, seeking to sell food to consumers at large.* Whereas, *home delivery service is just that a service*. Consumers call the food service establishment and orders items from a menu list the same way as if they would do if standing at the point of order in the establishment. Food is containerized and delivered to that person within a specific mile radius or distance. *No formal contractual agreement is entered into by either party and generally, the food is prepared upon order and not in bulk for service at a later date and time at a specific event*.

B. *Risk of Operation*: Because food is *prepared in bulk for transported and service* to its consumer at an agreed *latter date, time and location separate from the location of the establishment*, catering food service establishments have an *increased risk for contamination and temperature abuse of food*. Therefore, the *planning and reviewing processes for catering food service establishments* must not only focus on insuring that *controls* are in place for hazards within the fixed establishment (i.e. the base of operations) but, *they must be in place during the transport, staging, and service phases of the catering operation* as well.

2. *Onsite Catering*:

A. *Examples of Onsite Catering Food Service Operations*: Examples of onsite catering operations is that which is associated with *a tourist accommodation food service such as that provided at a conference business lunch meeting or a banquet located within the hotel.* The hotel kitchen facility would prepare food for service in its dining room, bar area, or for room service. However, if banquet room or conference room services were offered to consumers, most likely, catering services would be offered as well. Food menu items would be prepared by the hotel's food service kitchen staff, containerized, loaded within food transport equipment or vehicles, and then, it would be staged for service within the meeting conference or banquet rooms. *The consumer would take possession of the food at the time it was delivered to the conference or banquet room.*

B. Concerns for Risk Factors Foodborne Illness: Just as it would be with offsite catering operations, the *hazards of concern* for onsite catering operations would *be food product temperature abuse and food contamination.* However, the distance that the food would have to be transported would be considerable shorter. Reasonable controls, such as *food transport containers* that are designed and constructed to maintain safe food temperatures and prevent food contamination from the *workers*, and *the environment* must be incorporated into the establishment plans and specifications. *The distance and time of food delivered from the hotel's kitchen (i.e. base of operation) to the site of delivery and service (i.e. the conference room) must be considered during the plan review process*. Depending on the type of service and location of the serving site in respect to the kitchen facilities and other available handwashing stations, reasonable accommodations for handwashing may need to be considered. It is the *shorter distance from the base of operation* (i.e. the hotel kitchen facilities) that *make onsite catering food service slightly less a degree of risk for food contamination and temperature abuse than that associated with offsite catering food service operations.*

3. *Offsite Catering*:

   A. *Examples of Offsite Catering Food Service Operations*: An *example* of what is thought of as a traditional catering food service establishment by the public is one in which food is transported and served at such events as weddings, family reunions, and some political campaign gatherings to name a few. These events can be any specific event where food service is provided to a specific consumer and the food service is closed to the public. This requirement will ensure that food prepared by the catering food service establishment will be served to its end consumer *as defined in DPH Rule 511-6-1-.01*. However, the overriding difference between onsite and offsite catering operations is that offsite catering involves the preparation of food to be transported off from the premises of the permitted base of operations for delivery and service elsewhere.

   B. *Risk Factors of Concern*: Just as it would be with onsite catering food service operations, *risk factors of concern* for offsite catering food service operations would be the same: *food product temperature abuse and food contamination*. As a result, the distance that food would have to be transported must be considered. Because offsite food transport distances would be considerable longer that onsite catering food service operations, food transport equipment must be designed to maintain food product temperatures for longer periods of time between food being placed into such equipment at the base of operations and it being served at the offsite event. Additionally, such transport and offsite service equipment must be designed to provide greater food protection from increased contamination exposure that may exist during the longer distances traveled and offsite service conditions. Enhanced, more durable control measures, such as equipment that is specifically designed and constructed to withstand varying environmental conditions as well as contamination from catering personnel or the consumer must be incorporated into the establishment plans and specifications. It is the *longer distances from the base of operation* (i.e. the permitted food service establishment) and the greater opportunities for food contamination to occur during transport that *place a higher degree of risk on offsite catering food service operations due to concerns for contamination and temperature abuse. If not controlled, both of these risk factors can lead to foodborne illness.*

4. <u>*Offsite Food Preparation and Service*</u>: Catering food service operations may provide limited food preparation and staging for service by utilizing either a properly designed and equipped mobile unit or an offsite properly equipped, permitted food service kitchen facility. The bulk of the food preparation must take place at the permitted catering food service establishment. Examples of these types of offsite methods of catering are as follows:

   A. <u>*Offsite Mobile Catering Units*</u>: An example of catered offsite food preparation is the use of a properly equipped mobile unit used for limited preparation such as grilling, frying, assembling, or staging plates for service. The mobile unit must be serviced and stored at the permitted base of operation when not in use. The mobile unit will be considered to be catering food service equipment and the extension of the food service establishment' catering operation. However, <u>*the catering mobile unit shall not be operated as a mobile food service unit (i.e. serving food to the public without contractual agreement) unless the permit holder obtains a mobile food service permit.*</u>

5. See *Illustration U-8* for examples of food transport, staging, service and handwashing equipment that might be utilized during onsite catering operations.

ILLUSTRATION U-8

Examples of Onsite and Offsite Catering Food Service Equipment

“Hot Water Jacket Hot Food Box”

“Portable Beverage Dispenser”

“Meat Carving Station”

“Portable Serving Station”

“Portable, Electric Hot and Cold Food Transport Vehicle”

“Portable Handwashing Station”

“Portable Sneeze Shield”

“Chafing Dish”

Electric Hot Food Transport Box

Silverware Display

“Portable Hot Cabinet”

‘Alternative Handwashing Station”

6. See Illustration U-9 for examples of transport vehicles and catering mobile units:

ILLUSTRATION U-9

Examples of Food Transport Vehicles and Catering Mobile Units

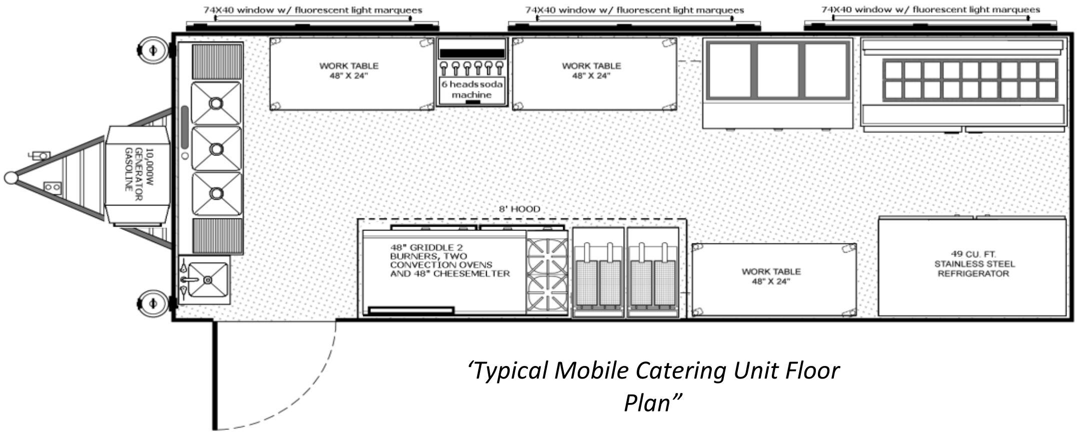
"Delivery Box Truck"

"Refrigerated Delivery Box Truck"

*"Mobile Catering Unit
Cooking Line and Preparation Area"*

"Mobile Catering Unit"

*"Mobile Catering Unit Combination Warewashing
3-Compartmented Sink and Handwashing Sink"*
and Handwashing Station



'Typical Mobile Catering Unit Floor Plan"

PART-II

APPENDICES

Appendix-B[1]:

Health Authority Compliance Review List And Approval/Disapproval Form

****A Recommend Guidance Document to be completed by the Reviewer****

Georgia Department of Public Health
Environmental Health Branch
(404) 657-6534
www.georgiaeh.us

The following document is to be completed by the Health Authority Reviewer and it is to serve two functions:

1. To document findings of a plan review; and
2. To serve as a guidance document to insure that both the planner and the reviewer address key issues and requirements of DPH Chapter 511-6-1 that must be in compliance in order for the plan review process to be completed.

[1] Source: Current 2008 FDA Plan Review for Food Establishment Course #FD207.

Health Authority Compliance Review List And Approval/Disapproval Form

(Check the appropriate response)	SAT.	UNSAT.	N/A	INSUFFICIENT INFORMATION
1. Food Preparation Review				
Raw food prep table(s) (as menu dictates)	( )	( )	( )	( )
Raw fruits and vegetable Sink(s) (as menu dictates)	( )	( )	( )	( )
Adequate refrigeration	( )	( )	( )	( )
Adequate cold holding Facilities	( )	( )	( )	( )
Adequate hot holding Facilities	( )	( )	( )	( )
Adequate hot food Preparation equipment	( )	( )	( )	( )
Vacuum packaging Or other process (HACCP Plan)	( )	( )	( )	( )
Adequate TCS reheating Equipment	( )	( )	( )	( )
2. Utensil & Equipment Storage				
Clean	( )	( )	( )	( )
Soiled	( )	( )	( )	( )
Ware washing facilities				
Automatic Machine	( )	( )	( )	( )
Three Compartmented Sinks	( )	( )	( )	( )
Counter Mounted Equipment	( )	( )	( )	( )
Floor Mounted Equipment	( )	( )	( )	( )
Vacuum Packaging Equipment	( )	( )	( )	( )
Bulk Food	( )	( )	( )	( )

(Check the appropriate response)	SAT.	UNSAT.	N/A	INSUFFICIENT INFORMATION
2. Utensil & Equipment Storage (continued)				
Self Service				
Salad Bar	( )	( )	( )	( )
Hot/Cold Food Buffet	( )	( )	( )	( )
Self Service Materials (food contact)	( )	( )	( )	( )
3. Kitchen Equipment				
Space between units or wall closed; moveable, or adequate space for easy cleaning	( )	( )	( )	( )
Work space & aisles Sufficient	( )	( )	( )	( )
Storage 6 inches off floor	( )	( )	( )	( )
Food prep., utensils, countertops & cutting boards and other food contact surfaces of suitable material	( )	( )	( )	( )
Self-serve food area adequately protected	( )	( )	( )	( )
Approved thermometer for each refrigerator and for taking food temperatures	( )	( )	( )	( )
4. Finish Schedule				
Kitchen	( )	( )	( )	( )
Bar	( )	( )	( )	( )
Food Storage	( )	( )	( )	( )
Other Storage	( )	( )	( )	( )
Toilet Rooms	( )	( )	( )	( )
Dressing Rooms	( )	( )	( )	( )
Garbage & Refuse Storage	( )	( )	( )	( )
Mop Service Area	( )	( )	( )	( )
Warewashing Area	( )	( )	( )	( )
Walk-in refrigerator & freezers	( )	( )	( )	( )

(Check the appropriate response)	SAT.	UNSAT.	N/A	INSUFFICIENT INFORMATION
5. Plumbing				
Cross Connections	( )	( )	( )	( )
Water Supply	( )	( )	( )	( )
Sewage Disposal	( )	( )	( )	( )
Dishwashing & Pot Sinks	( )	( )	( )	( )
Grease Traps	( )	( )	( )	( )
Service/Janitorial Sinks	( )	( )	( )	( )
Hot Water	( )	( )	( )	( )
6. Physical Facilities				
Dressing Rooms	( )	( )	( )	( )
Separate Toxic Storage	( )	( )	( )	( )
Laundry Facilities	( )	( )	( )	( )
Linen Storage	( )	( )	( )	( )
Lighting	( )	( )	( )	( )
Food Storage	( )	( )	( )	( )
Dry goods storage	( )	( )	( )	( )
7. Refuse & Pest Control				
Garbage & Refuse Storage	( )	( )	( )	( )
Insect & Rodent	( )	( )	( )	( )
Control Measures	( )	( )	( )	( )
8. Ventilation				
Exhaust Hoods	( )	( )	( )	( )
Ventilation	( )	( )	( )	( )
9. Employee Restrooms				
Location	( )	( )	( )	( )
Number ______	( )	( )	( )	( )
‘U’ Shaped Entrance, or self-closing doors	( )	( )	( )	( )
Soap Dispensers	( )	( )	( )	( )
Hand Drying	( )	( )	( )	( )
Lavatories	( )	( )	( )	( )
Water Closets	( )	( )	( )	( )
Urinals	( )	( )	( )	( )
Hot & Cold Water Provided	( )	( )	( )	( )
Waste Receptacles	( )	( )	( )	( )

10. Patron Restrooms				
Location	( )	( )	( )	( )
Number ______	( )	( )	( )	( )
'U' Shaped Entrance,				

(Check the appropriate response)	SAT.	UNSAT.	N/A	INSUFFICIENT INFORMATION
10. Patron Restrooms (continued)				
or self-closing doors	( )	( )	( )	( )
Soap Dispensers	( )	( )	( )	( )
Hand Drying	( )	( )	( )	( )
Lavatories	( )	( )	( )	( )
Water Closets	( )	( )	( )	( )
Urinals	( )	( )	( )	( )
Hot & Cold Water Provided	( )	( )	( )	( )
Waste Receptacles	( )	( )	( )	( )

Comments: (Explain why any item was noted "Unsatisfactory" - attached additional sheets, as needed.)

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Reviewer Signature **Date**

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Reviewer Title

APPROVAL: ______________________ **DATE:** ________

DISAPPROVAL: ______________________ **DATE:** ________

REASON FOR DISAPPROVAL: *(Note: Attach additional sheets, as needed.)*

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Appendix-C[1]:

Molluscan Shellfish Life Support HACCP Plan

****An Example and Guidance Document****

Georgia Department of Public Health
Environmental Health Section
(404) 657-6534
www.georgiaeh.us

The following document is provided as an example only. Each proposed molluscan shellfish life support tank plan and specifications must be accompanied by a HACCP plan specific to its design and operation. See 13 of III "Facilities for Displaying and Dispensing of Food" in Part-I of the Rules and Regulations DPH Chapter 511-6-1's Manual for Design, Installation and Construction for more information.

[1] Source: 2008 Draft Guidelines to Review and Verify HACCP Plans for Live Holding Tanks to Store Molluscan Shellfish used for Human Consumption.

(1) Critical Control Point (CCP)	(2) Significant Hazard(s)	(3) Critical Limits for each Control Measure	Monitoring (4) What	Monitoring (5) How	Monitoring (6) Frequency	Monitoring (7) Who	(8) Corrective Action(s) *These are examples of corrective actions*	(9) Records	(10) Verification
Receiving	Physical Chemical Biological Pathogens Biotoxins	Approved Source	Tags on every container	Visual check of each tag for dealer on ICSSL	Each shipment	Food employee designated by the person in charge	Reject	Receiving Record	Weekly
Receiving	Microbiological Pathogen Growth	Receiving temperature ≤50ºF (10.0ºC)	Product temperature	Thermometer to verify and observe temperature	Each shipment	Food employee designated by the person in charge	Reject	Receiving Record	Weekly
Cooler Storage	Microbiological Pathogen Growth	Cooler Ambient Air ≤41ºF (5ºC)	Cooler temperature	Thermometer to verify and observe temperature	Two times a day	Food employee designated by the person in charge	Add ice to the affected product ***OR*** Move products requiring temperature control from malfunctioning cooler to another cooler. ***AND*** Take one of the following actions to the product involved in the critical limit deviation: ***DESTORY*** The product ***OR HOLD*** The product until it can be evaluated based on its time/temperature exposure	Cooler Temperature Log Thermometer Calibration Log	Daily Monitoring with Weekly Verification of Records Monthly Calibration with Quarterly Records Verification

(1) Critical Control Point (CCP)	**(2) Significant Hazard(s)**	**(3) Critical Limits for each Control Measure**	Monitoring				**(8) Corrective Action(s)** *These are examples of corrective actions*	**(9) Records**	**(10) Verification**
			(4) What	**(5) How**	**(6) Frequency**	**(7) Who**			
Tank Storage Water Temperature	Microbiological Pathogen Growth	Tank water temperature ≤ 41ºF (5ºC)	Tank water temperature	Use thermometer to take and observe temperature	Two times a day	Food employee designated by the person in charge	Add ice to the affected product ***OR*** Move products requiring temperature control from malfunctioning cooler to another cooler. ***AND*** Take one of the following actions to the product involved in the critical limit deviation: ***DESTROY*** The product ***OR HOLD*** The product until it can be evaluated based on its time/temperature exposure	Tank Thermometer Temperature Log Thermometer Calibration Log	Daily Monitoring With Weekly Verification of Records. Monthly Calibration With Quarterly Records Verification
Tank Storage Water Quality	Microbiological Pathogen Growth	Maximum = 0 MPN	Total Coliform	Water sample taken to state certified lab	Once a week	Food employee designated by the person in charge	A positive TC requires immediate resampling ***AND*** A second positive TC requires the tank to be cleaned and sanitized and new tank water. ***AND*** ***DESTROY*** The product in the tank	Laboratory Results. Logs with Corrective Actions Documented	Weekly
Establishment Name:					Product Description:				
Establishment Address:					Method of Storage and Distribution:				
Permit Holder /Applicant Signature:					Intended Use and Consumer:				
Date:									

Appendix-D[1]:

Checklist to Validate Contents of a HACCP Plan and Operating Procedures of Live Holding Tanks for Molluscan Shellfish

****A Recommend Guidance Document For the Planner and Reviewer****

Georgia Department of Public Health
Environmental Health Section
(404) 657-6534
www.georgiaeh.us

The following document contains a check list to be used during the planning phase of the development of HACCP Plans and operational plans for Molluscan Shellfish Life Support Tank Systems for submittal to the local Health Authority for review and approval. Similarly, the Reviewer will used this document to verify whether or not such plans and specifications comply with DPH Chapter 511-6-1 and its interpretative manuals.

[1] Source: 2008 Draft Guidelines to Review and Verify HACCP Plans for Live Holding Tanks to Store Molluscan Shellfish used for Human Consumption.

Prerequisites Programs/Standard Operating Procedures

- ☐ Vendor Certification Programs and Buyer Specifications.
- ☐ Equipment Specifications/Manufacturers Instructions and Operational Manual.
- ☐ Employee Health Policy (training and reporting requirements, exclusion and restriction requirements for ill food employees).
- ☐ Handwashing and Bare hand Contact Policies.
- ☐ Employee Hygiene Policy (clean clothing, hair restraints, prohibition of eating, smoking, and drinking in work areas and of wearing jewelry).
- ☐ Commingling Protocol (CRITICAL).
- ☐ Culling Procedures (dead and cracked shellfish discarded).
- ☐ Temperature Control Requirements.
- ☐ Thermometer Calibration Procedures and schedule.
- ☐ Record System for Retention of Shellfish Tags (system to maintain the tags in chronological order for 90 days after the container is empty).
- ☐ First In and First Out Requirement and Procedures.
- ☐ Program to Protect Product from Contamination--Biological, Chemical and Physical.
- ☐ Equipment/System Maintenance Program (Tank and UV Disinfection System).

Prerequisites Programs/Standard Operating Procedures (Continued)

☐ Cleaning and Sanitizing Procedures.

☐ Toxic Chemical and Cleaners Handling and Storage Requirements.

Hazard Analysis Included:

Control Points

☐ Receiving (Approved Source)
☐ Receiving (Temperature)
☐ Cooler Storage.
☐ Tank Storage - (Water Temperature).
☐ Tank Storage - (Water Quality/Total Coliform Testing).

Critical Limit Identified

☐ Receiving – Approved Source.
☐ Receiving Temperature, 50ºF, (10.0ºC).
☐ Cooler Storage – Temperature, 41ºF, (5ºC).
☐ Tank Storage – Water Temperature 41ºF (5ºC), Total Coliform Testing, (Maximum = 0 MPN).

Monitoring Procedures

☐ Receiving- Receiving temperature of every container should be checked and visually checked for shellfish certification tag to verify dealer on ICSSL by the designated employee for each shipment.
☐ Cooler Storage – Temperature check of cooler with thermometer two times (2X) a day by designated employee.
☐ Tank Storage – Temperature check of water with thermometer two times (2X) a day by designated employee.
☐ Tank Storage – Water sample taken once a week and sent to laboratory for testing by designated employee.

Corrective Actions When the Critical Limits are not Met

These are examples of corrective actions.

☐ Receiving – Approved Source- The shipment would be rejected and corrective actions documented on records.

Corrective Actions When the Critical Limits are not Met (Continued)

☐ Cooler Storage – Add ice to product, move to another functioning cooler and make adjustments to the malfunctioning cooler, AND either destroy or hold the product until the time/temperature abuse can be evaluated. Corrective actions documented on records.

☐ Tank Storage (Water Temperature) – Add ice to water, move the product to a functioning cooler, AND hold the product until the time/temperature abuse can be evaluated or destroy the product. Corrective actions documented on records.

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☐ Tank Storage (Total Coliform Testing) – A positive TC requires immediate re-sampling and a second positive TC requires the tank to be cleaned and sanitized and the product in the tank destroyed. Corrective actions documented on records.

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Record Identified

☐ Receiving – Temperature and source records.
☐ Cooler Storage – Cooler temperature log and thermometer calibration log.
☐ Tank Storage – Water temperature log and thermometer calibration log.
☐ Tank Storage – Water sample, laboratory result logs and corrective actions documentation on records.

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Verification Process Identified

☐ Receiving – Daily monitoring, weekly verification of temperature/source logs.
☐ Cooler Storage – Daily monitoring, weekly verification of records of cooler logs and monthly calibration of thermometers with quarterly record verification.
☐ Tank Storage (Water Temperature) – Daily monitoring, weekly verification of records. Monthly thermometer calibration with quarterly record verification.
☐ Tank Storage (Water Sample) –Weekly monitoring of lab results with any corrective actions documented. Weekly verification of records.

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Employee Training Plan

☐ Employee Health.
☐ Employee Hygiene.
☐ Contamination Prevention Procedures.
☐ Equipment Use and Maintenance.
☐ Monitoring Procedures.
☐ Corrective Action Procedures.
☐ Recordkeeping Procedures.

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Comments:

______________________________________ ______________
Reviewer Signature **Date**

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Reviewer Title

APPROVAL: ______________________ **DATE:** ______________

DISAPPROVAL: ______________________ **DATE:** ______________

REASON FOR DISAPPROVAL:

Temperature Logs:
Thermometer Calibration and Refrigeration Storage

Company Name: ____
Street Address: ____
City, State, and Zip: ____
Phone Number: ____

Storage Cooler/Freezer Thermometer Calibration Log

(Minimum Once per Month)

Thermometer Name: ____

Location of
Cooler/Freezer: ____

Model #: ______________________________ Serial #: ______________________________

Date Calibrated	Temperature Reading of Storage Thermometer	Temperature Reading of Standard/Reference Thermometer	Variance (# of Degrees)	Corrective Action (if over 2 Degrees Plus/Minus)	Employee Initials

HACCP Verification Signature: ___________________________________ Date: _______________
Print Name: ________________________________ Title: __________________________________

Examples of Molluscan Shellfish Life Systems and Diagrams

EXAMPLE #1

Molluscan Shellfish Life-Support Tanks

Source: FDA 2008 Draft Guidelines to Review and Verify HACCP Plans for Live Holding Tanks to Store Molluscan Shellfish Used for Human Consumption

EXAMPLE #2
Molluscan Shellfish Life-Support Tank

Source: FDA 2008 Draft Guidelines to Review and Verify HACCP Plans for Live Holding Tanks to Store Molluscan Shellfish Used for Human Consumption

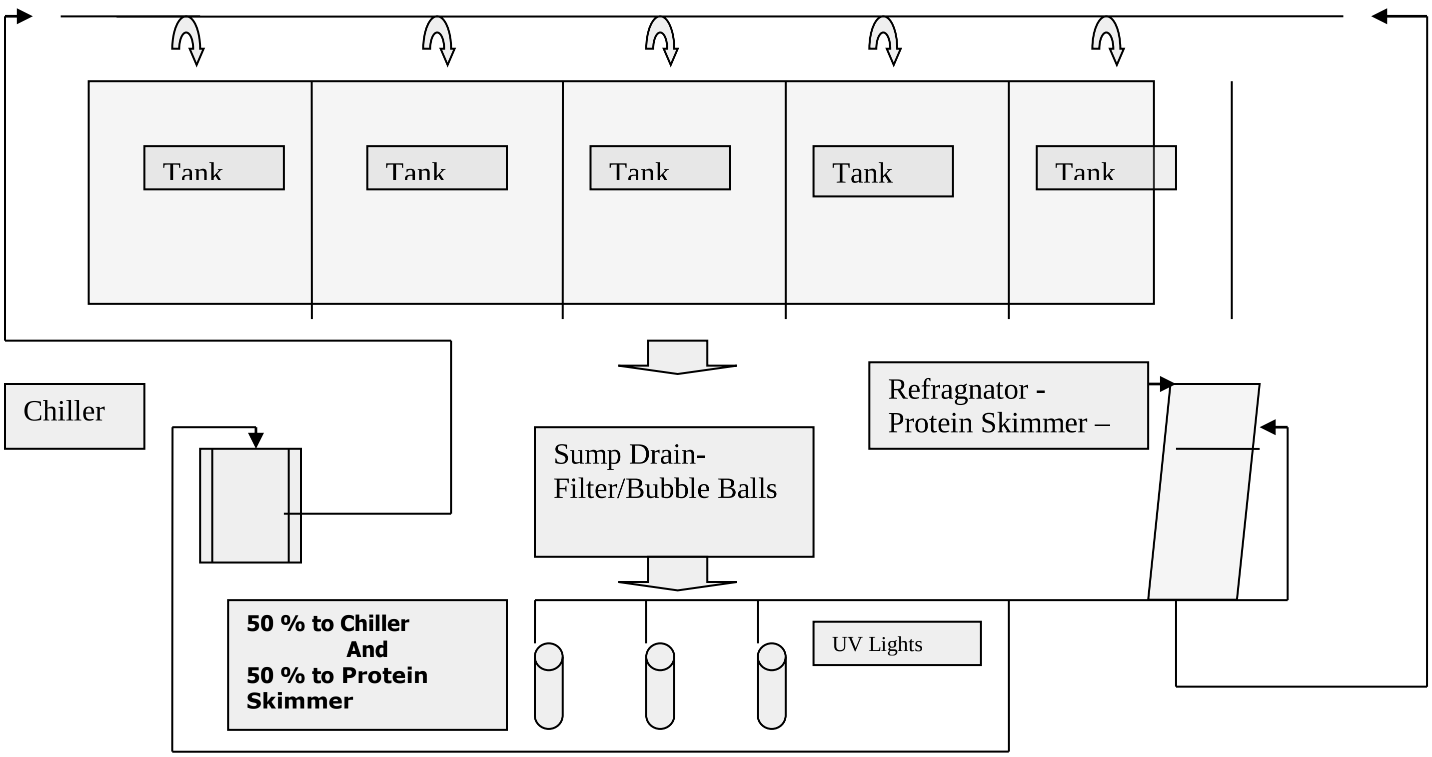
EXAMPLE #3

Molluscan Shellfish Life-Support Tank

Source: *FDA 2008 Draft Guidelines to Review and Verify HACCP Plans for Live Holding Tanks to Store Molluscan Shellfish Used for Human Consumption*

EXAMPLE SCHEMATIC #1

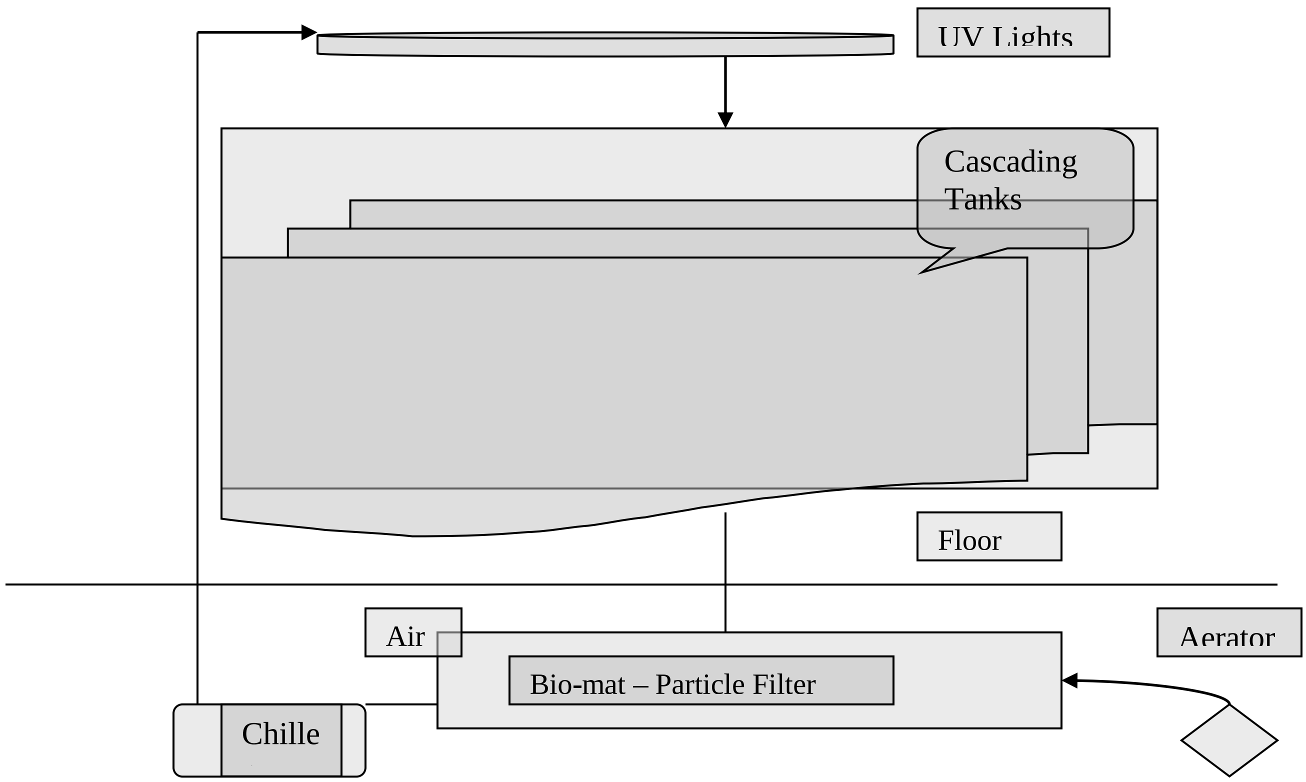
Molluscan Shellfish Life-Support Systems



Source: *FDA 2008 Draft Guidelines to Review and Verify HACCP Plans for Live Holding Tanks to Store Molluscan Shellfish Used for Human Consumption*

Note: Diagram #1 is a general diagram of a Molluscan Shellfish Life-Support System. Systems are specific in design of the individual tanks to be used. Each manufacturer of Molluscan Shellfish Life-Support Systems must provide to the permit holder properly drawn plans and specification for these systems. The permit holder must attach these Molluscan Shellfish Life-Support Systems plans and specifications and a properly prepared HACCP plan, as support documentation, for a request to vary from *DPH Rule 511-6-1-.05 (2) (v) 1 as stated within DPH Rule 511-6-1-.04 (6) (j) 4 and DPH Rule 511-6-1-.05 (2) (v) 2. (See PART-I Section E – Facilities to Protect Food, Subsection III, and Part 13 entitled, "Molluscan Shellfish Life-Support Systems", within this Manual for additional information.)*

EXAMPLE SCHEMATIC #2
Molluscan Shellfish Life-Support System



Source: *FDA 2008 Draft Guidelines to Review and Verify HACCP Plans for Live Holding Tanks to Store Molluscan Shellfish Used for Human Consumption*

Menu/ Flow Analysis Process Worksheet

Process 1 Foods	Process 2 Foods	Process 3 Foods
Foods that do not require a cook step (RTE)	***Foods that involve a cook step but only go through the danger zone once (Same day service)***	***Foods that require complex preparation (Cook, Cool, Re-Heat)***

Menu/ Flow Analysis Process Worksheet

Process 1 Foods	Process 2 Foods	Process 3 Foods
Foods that do not require a cook step (RTE)	***Foods that involve a cook step but only go through the danger zone once (Same day service)***	***Foods that require complex preparation (Cook, Cool, Re-Heat)***

Appendix-H:

Food Service Establishment Plan and Specification Review Sample Response Letters

****An Example and Guidance Document****

Georgia Department of Public Health
Environmental Health Section
(404) 657-6534
www.georgiaeh.us

The following food service establishment plan and specification review response letters are provided as examples and guidance to the County Environmental Health Specialist in communicating with the food service permit applicant and the planner. These guidance letters are not all inclusive and they may be adapted by County Health Departments so as to be pertinent to their local administrative environment.

It is important to remember that clear and detailed communication be maintained with all parties who are involved with the development and regulation of the food service establishment. This is true for the present as well as for future communication needs whether that happens to be with federal, state or local code officials but, it is especially true when it comes to the permit applicant. Additionally, copies of such communication letters and plan review documentation must be maintained within each food service establishment's inspection records for plan review process verification and for potential legal action.

Example letters will begin on the next page.

SAMPLE A – Incomplete Plans

(Date)

(Permit Applicant and/or Plan Preparer)
(Address)
(City, State, Zip)

Re: (Proposed Establishment)
(Location and/or Address)
(Date of Receipt by Health Authority)

Dear (Permit Applicant and/or Plan Preparer):

This is to confirm the receipt of your proposed food service establishment plans and specifications (Name of the local Health Department) on (Date Received). Please be advised the review process of these plans and specifications cannot be completed at this time due to the following needed information and or missing documentation:

1. List 1st
2. List 2nd
3. List 3rd
4. List 4th
5. List 5th
6. Continue to list needed information and or needed documentation (specification for equipment for example).

Upon receipt of this requested information and or documentation, the plan and specification review process will then continue. If you would like to discuss these issues with me, I can be contacted (Give the pertinent contact information such as phone number, email address).

Sincerely,

(Name of Health Authority Representative)
(Title)

Cc: As appropriate (Office plan review file, Business License, Building Inspections, Zoning Department and Others)

SAMPLE B – Change of Ownership Non-Compliant

(Date)

(Permit Applicant)
(Address)
(City, State, Zip)

Re: (Proposed Establishment)
(Location/Address)
(Date of Initial Inspection)

Dear (Permit Applicant):

On (Date of construction/preoperational inspection), a food service inspection was conducted at (Name of Proposed Establishment) located at (Address of Establishment). The purpose of this initial inspection is to determine your establishment's level of compliance with Georgia's Rules and Regulations Food Service Chapter 511-6-1. At the present time, there is some operational, equipment and or physical construction issues that you must address before you will qualify for a food service permit to operate a food service establishment. Issues of concern are as follows:

1. 1st item
2. 2nd item
3. Continue until all issues of concern have been enumerated and explained.

Please be advised that it is illegal for an individual to operate a food service establishment without first obtaining a food service permit from the (Name of the Health Department having jurisdiction). In addition, without a valid food service permit, your food service establishment must cease operation until you can demonstrate compliance with Chapter 511-6-1.

Please call (Phone Number of County Health Department) between (Office Hours) to discuss these issues and/or to schedule another construction/preoperational inspection.

Sincerely,

(Name of Health Department Representative)
(Title)

Cc: All appropriate parties (Business License, Building Inspections, Zoning Department and Others)

SAMPLE C – Approval of Plans with Conditions

(Date)

(Permit Applicant/Plan Preparer)
(Address)
(City, State, Zip)

Re: (Proposed Establishment)
(Location and/or Address)
(Date of Receipt by County Health Department-Health Authority)

Dear (Permit Applicant/Plan Preparer):

This is to confirm the receipt of your proposed food service establishment plans and specifications (Name of the local Health Department) on (Date Received). The review process of these plans and specifications has been completed and they are approved based upon the following comments and or conditions:

1. List 1st (ex. The Primary Water Heater must have a rating of 120,000 BTUs and it must be ANSI/NSF listed commercial food service equipment. The current listed primary water heater (Item #P-202) within the plans has a rating of 100,000 BTUs and as such, it will not meet the calculated peak hot water demand of at least 120, 000 BTUs for all proposed equipment utilizing hot water within the proposed establishment.)
2. List 2nd (ex. Deliveries of food and supplies must be at least once per day. This is to off-set the premises ability to accommodate expansion of storage facilities.)
3. List 3rd (ex. Due to not being able to relocate Item E-103, fruit and vegetable sink, a splash-shield consisting of plexiglass will be installed for a hand sink, Item E-102, that is located near the fruit and vegetable washing sink. This hand sink splash-shield must be designed to be easily removable for routine cleaning. Also, it must be capable of preventing any splash from hands being washed from getting onto the fruit and vegetable sink work area.)
4. Continue to list comments and or conditions as applicable to the review.

(Note: Should too many notations arise, it would be appropriate for the Health Authority to request that the plans be revised to reflect the needed changes. This is a local judgment call of the local Health Authority.)

Please be advised that any deviation from the above information and approved food service plans and specifications without prior permission from the (Name of County Health Department – Health Authority) may nullify this approval.

SAMPLE C – Approval of Plans with Conditions (continued)

Page #2

(Date)
Re: (Proposed Establishment)

Approval of these plans and specifications by the (Name of County Health Department – Health Authority) **DOES NOT** indicate compliance with any other code, law or regulation that may be required – federal, state, or local. It **DOES NOT** constitute endorsement or acceptance of the completed establishment (structure or equipment). A final inspection of each completed establishment with the necessary equipment will be necessary to determine if it complies with the Georgia Rules and Regulations Food Service Chapter 511-6-1.

A food Service permit from (Name of County Health Department – Health Authority) must be secured before this establishment can operate as a food service establishment. Please call (Contact information and office hours for County Health Department having jurisdiction) so that a construction/preoperational inspection may be scheduled to verify that your proposed food service establishment is constructed and equipped in accordance with the approved plans and is in compliance with law and Chapter 511-6-1.

Sincerely,

(Name of Health Department Representative)
(Title)

Cc: All appropriate parties (Business License, Building Inspections, Zoning Department and Others)

SAMPLE D – Plans Approvable as Submitted

(Date)

(Permit Applicant/Plan Preparer)
(Address)
(City, State, Zip)

Re: (Proposed Establishment)
(Location/Address)
(Date of Receipt by Health Authority)

Dear (Permit Applicant/Plan Preparer):

This is to confirm the receipt of your proposed food service establishment plans and specifications (Name of the local Health Department) on (Date Received). The review process of these plans and specifications has been completed and they are approved based upon the following comments and or conditions:

Please be advised that any deviation from the above information and approved food service plans and specifications without prior permission from the (Name of County Health Department – Health Authority) may nullify this approval.

Approval of these plans and specifications by the (Name of County Health Department – Health Authority) **DOES NOT** indicate compliance with any other code, law or regulation that may be required – federal, state, or local. It **DOES NOT** constitute endorsement or acceptance of the completed establishment (structure or equipment). A final inspection of each completed establishment with the necessary equipment will be necessary to determine if it complies with the Georgia Rules and Regulations Food Service Chapter 511-6-1.

A food Service permit from (Name of County Health Department – Health Authority) must be secured before this establishment can operate as a food service establishment. Please call (Contact information and office hours for County Health Department having jurisdiction) so that a construction/preoperational inspection may be scheduled to verify that your proposed food service establishment is constructed and equipped in accordance with the approved plans and is in compliance with law and Chapter 511-6-1.

Sincerely,

Name of Health Department Representative
Title
Cc: All appropriate parties (Business License, Building Inspections, Zoning Department and Others)

Appendix-I:
Water Heating System Sizing Verification Record

Work Sheet "A" – Storage Tank Type Water Heating Systems
&
Work Sheet "B" – Tankless or On-Demand Water Heating Systems

** To be completed by the Planner and verified by the Health Authority**

Georgia Department of Public Health
Environmental Health Section
(404) 657-6534
www.georgiaeh.us

This verification document contains two work sheets, "A" and "B" which are to be utilized in verifying the proper sizing of a food service establishment's water heating system as required by DPH Rule 511-6-1-.06(1)(g)2.

When assessing the capacity of water heating systems, the Designer and the Health Authority are both advised to consult with DPH Chapter 511-6-1 and its Manual for Design, Installation and Construction, as referenced in DPH Rule 511-6-1-.02(8). Additionally, Work Sheet "A" entitled, "Storage Tank Type Water Heating Systems" and Work Sheet "B" entitled, "Tankless or On-Demand Water Heating Systems" must be completed and retained within the proposed food service establishment's inspection record file. See the following guide document, "Steps in Assessing Hot Water Generating Systems for completing Work Sheet "A" and Work Sheet "B".

Assessment records, Work Sheets "A" and "B", are to be maintained by the local Health Authority in the county in which the proposed food service establishment is to be constructed. They will remain as part of the proposed food service establishment's inspection record until they are replaced by a new assessment due to a change in the permit holder or a major remodel of the establishment.

For more information, see Section K entitled, "Hot Water Supply Requirements", located in Part-I of the plan review guidance manual entitled, "Food Service Establishment Manual for Design, Installation and Construction" as referenced in DPH Rule 511-6-1-.02(8). A copy of this Manual may be accessed on the Department's environmental health webpage at www.georgiaeh.us under the Food Service heading.

Steps in Assessing Hot Water Generating Systems

I. Items needed for review:

- Copy of DPH Chapter 511-6-1
- Permit Application
- Access to the Chapter's Manual for Design, Installation and Construction, as referenced within DPH Rule 511-6-1-.02(8), with focus on:
  - o Section K – Hot Water Supply Requirements from Part-I of Chapter's online Manual for Design, Installation and Construction; and
  - o Appendix-I Water Heating System Sizing Verification Record Work Sheet "A" & Work Sheet "B" from Part-II in the online Manual for Design, Installation and Construction.
- Complete set of plans with floor layout showing and listing equipment and fixtures and plumbing riser plan
- Manufacturer's specification sheets for each fixture or equipment utilizing hot water
- Manufacturer's specification sheets for hot water generating system
- Architecture scale rule
- Calculator
- Writing pad and pencil

II. Steps in Assessing Storage (Recovery) Tank Type Water Heating System:

Step # 1 Identification and enumeration of fixtures and equipment and tableware service:

By observing the kitchen floor plan and equipment list, identify each fixture and piece of equipment that utilizes hot water. Circle each handsink and lavatory and take note of how many compartment (or vats) that each compartmented sink contains. Make note of how many of each type of fixture and equipment that is shown on the floor plan. Record the number of units (fixtures or equipment) under heading, "# of Units", on Table K-1 of Work Sheet "A" located within Appendix-I located in Part-II of the DPH Chapter 511-6-1 Manual for Design, Installation and Construction.

Note: Each type of sink is one unit. For example, a 3-compartmented sink is made up of three vats or compartment but, it is still one sink unit and not three separate sinks.

Obtain hot water demand from the manufacturer's specification sheets for warewashing machines.

Note flow rates in manufacturer specification sheets for hand operated pre-rinse sprayers, handwashing sink faucets and/or aerators, and shower heads, if shown on the plans

Ascertain from the menu and/or plans if single-use articles rather than multi-use eating and drinking tableware will be used by the food service establishment.

Step # 2 Trace and verify that hot and cold water is supplied to each fixture and equipment as required by the Chapter: Follow piping diagram on the plumbing riser plan and ensure that each fixture and equipment receives both hot and cold water as appropriate. Also, ensure that no cross-connections and back-siphonage conditions exist in the plans shown and that an approved potable water supply is provided to the establishment. Additionally, ensure that an approved sewage disposal is provided to the establishment.

Step # 3 <u>From plan specifications, ascertain if water saving devices will be utilized</u>. A hot water demand reduction may be calculated for water saving devices used on hand operated pre-rinse sprayers, handwashing sinks and showers. Obtain manufacturer's flow rate for each of these devices. The manufacturer's flow rate in Gallons per Minute (GPM) must be less than what is given in the statements which follow in order to be considered:

A. Hand operated pre-rinse sprayers with flow rate less than 3.5 GPM Standard Flow Rate;
B. Handwashing sink faucet or aerator with flow rate less than 2.2 GPM standard flow rate; and
C. Shower head with flow rate less than 2.5 GPM standard flow rate.

Use the following equation to determine the reduced hourly hot water demand for each of the three types of fixtures listed above:

$\underline{(A \times B) \div C = D}$, where:

A = *Manufacturer's Flow Rate*
B = *Water use value from Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH)*
C = *GPM standard flow rate*
D = *New water use value to substitute for that given in Table K-1of Work Sheet "A" in Appendix-I located in Part-II of the Chapter's Plan Review Manual to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH)*

For example, a handwashing sink has an aerator with a manufacturer's flow rate of 0.5 GPM. The reduction allowance in hourly hot water demand would be:

Where:

A = *0.5 GPM*;
B = *5 GPH*;
C = *2.2 GPM*;
D = the New Value to substitute that in Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH); and

A = *0.5 GPM is less than the 2.2 GPM standard flow rate given in statement B above*.

Calculation:

(0.5 GPM × 5 GPH) ÷ 2.2 GPM = <u>*1.14 GPH*</u>

Conclusion:

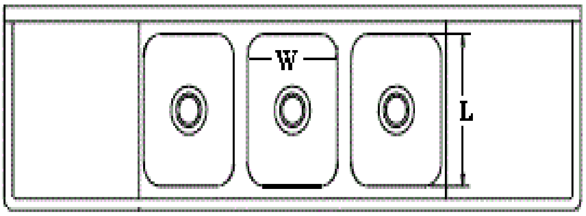
Therefore, in Table K-1 of Work Sheet "A" located within Appendix-I located in Part-II of the DPH Chapter 511-6-1 Manual for Design, Installation and Construction , *the 5 GPH value* for the Handwashing Sinks (including restrooms) would be <u>*replaced with 1.14 GPH*</u> as the value to calculate the Peak Hourly Hot Water Demand for all Handwashing Sinks located within the establishment.

See Appendix-I in the Chapter's Manual for Design, Installation and Construction for more detailed information.

Step # 4 Calculate total volume of compartmented warewashing sink and other similar sinks:

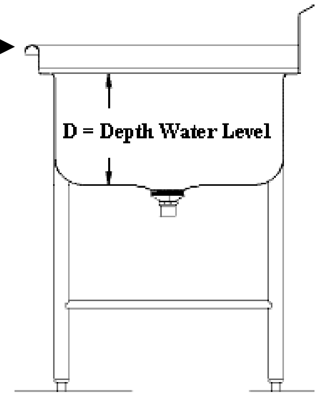
First, measure each vat (or compartment):

Top View Looking Down



L = Length of Compartment in Inches
W = Width of Compartment in Inches

Sink Flood Level



Take measurements from inside the compartment.

Second, use the following formulas to obtain the total volume of the compartmented Sink in Gallons:

Volume of One Vat = Length (L) inches × Width (W) inches × Depth (D) inches = Cubic Inches

Thirdly, combine the calculated volume of each vat into the total volume of the sink unit. If all of the vats are of the same dimensions, then multiply by the number of vats in the sink unit; however, if all the vats are of different dimensions, then add each vat's volume together to get the combined volume of the sink unit in cubic inches. For simplicity, the following equation assumes that each vat is of equal dimensions:

Vats of Equal Dimensions:

(L × W × D) × (Number of Vats) × .003255in^3 = *Peak Hot Water Demand in GPH per Unit*

Vats of Unequal Dimensions:

[(L) Vat_1 + (W) Vat_2 + (D) Vat_3] × (Number of Vats) × .003255in^3 = Sink Unit's Volume or *Peak Hot Water Demand in GPH per Single Unit*

Multi-use Tableware Service:

If only multi-use tableware are used for service, then the Peak Hot Water Demand in GPH per Single Unit which is to be entered in the appropriate space in the space under the heating, "Peak Hourly Hot Water Demand in GPH" on Table K-1 of Work Sheet "A" of Appendix-I located in Part-II of DPH Chapter 511-6-1's Manual for Design, Installation and Construction.

Note: The Conversion Factor (.003255 in^3/gallon) provides for an overall 25% reduction in hot water usage to allow for water displacement created by equipment and utensils submerged within vats.

Single-use articles Used for Tableware Service:

If single-service articles are used instead of multi-use tableware for service, then calculate the reduced hot water demand by using the following formula:

Peak Hot Water Demand in GPH per Single Unit × 80% (or .80) = Final Sink Volume or Peak Hot Water Demand in GPH per Single Unit of which is to be entered in the appropriate space in the space under the heating, "Peak Hourly Hot Water Demand in GPH" on Table K-1 of Work Sheet "A" of Appendix-I located in Part-II of DPH Chapter 511-6-1's Manual for Design, Installation and Construction.

Peak Hot Water Demand in GPH per Single Unit × 80% (or .80) = 20% Reduction in Peak Hot Water Demand in GPH per Unit Allowance when Single-Use Articles are used instead of Multi-Use Tableware

Fourthly, determine the maximum hourly hot water demand per type of fixture in GPH or MHHWDPTF-GPH. Do the following:

Multiply the Peak Hourly Hot Water Demand in GPH for compartmented sink unit on Table K-1 of Work Sheet "A" of Appendix-I located in Part-II of DPH Chapter 511-6-1's Manual for Design, Installation and Construction by the number of units recorded under column heading, "# of Units". Enter this value under the column heading, "MHHWDTF-GPH", for each fixture and equipment listed in Table K-1.

Step #5 Determine the Peak Hourly Hot Water Demand for warewashing machine:

Look at the manufacturer's specification sheets for the specified warewashing machine and record the final rinse cycle hot water demand which should be listed in GPH. Use the following formula to get the Peak Hourly Hot Water Demand:

GPH = gal/hr Final Rinse (from manufacturer cut sheets) X 70% (or .70)

For example, a warewashing machine specification indicated a final rinse of 130 GPH hot water demand. Since no warewashing machine will be used 100% of the time but instead, only 70 % of the time, the Peak Hourly Hot Water Demand would be calculated:

GPH = 130 GPH × .70 = 91 GPH

91 GPH would then be entered in the appropriate space in the space under the heating, "Peak Hourly Hot Water Demand in GPH" on Table K-1 of Work Sheet "A" of Appendix-I located in Part-II of DPH Chapter 511-6-1's Manual for Design, Installation and Construction. Record the number of this type of warewashing machines on the same form under the column heading, "# of Units".

Step #6 Determine the MHHWDTF-GPH for each piece of fixture and equipment listed on Chart K-1 in Work Sheet "A" by multiplying the # of Units by the Peak Hourly Hot Water Demand in GPH.

First, convert MHHWDTF-GPH calculated and listed in Table K-1 into the energy demand for each fixture and piece of equipment utilizing hot water as specified by the permit applicant to be installed according to the submitted plans and specifications. To accomplish this step, use Data Sheets A through E to calculate and record the KW (Kilowatts) or BTU (British Thermal Units) required heat energy demand. See the following formulas to calculate KW and BTU to be used based upon the type of energy supplied to the water heating unit:

Formulas for calculating heat energy demand of fixtures and equipment utilizing hot water:

Equipment	MHHWDTF-GPH from Table K1	Temperature Required	Temp. Rise
_________________	___________________	110ºF*	110 ºF - _____ºF** = _____ºF

______(gph) X ____ºF temperature rise X 8.33 = _________BTU's
.75 (operating efficiency)

______(gph) X ____ºF temperature rise X 8.33 = _________KW's
3412 (BTU's per KW)

Where:

KW = Electric Water Heaters
BTU = Gas Water Heaters
Temperature Rise = Temperature of Water required by the Chapter – Water Temperature coming into the Establishment
For example:

Specs: Temperature coming into establishment was reported by the city water authority to be 40°F** and the MHHWDTF-GPH calculated and recorded in Table K-1 of Work Sheet "A" is 91 Gallons per Hour. The Chapter requires a minimum water temperature of 110ºF* for washing, rinsing, and sanitizing equipment and utensils in a warewashing sink. One gallon of water weighs 8.33 pounds. Additionally, a British Thermal Unit (BTU) is the amount of heat energy needed to raise the temperature of one pound of water by one degree Fahrenheit. Therefore, 8.33 pounds is equal to 8.33 BTUs of energy needed to heat one gallon of water one degree Fahrenheit. Finally, there are 3412 BTUs in one KW.

Question: What is the BTU and KW heat energy demand for the specified three compartmented sink?

Equipment	MHHWDTF-GPH from Table K1	Temperature Required	Temp. Rise
3 – Comp. Warewashing sink	___91_____	110ºF	110 ºF - _40ºF = 70ºF

__91_ (gph) X _70_ºF temperature rise X 8.33 = _70,749 BTU's
.75 (operating efficiency)

__91_ (gph) X _70_ºF temperature rise X 8.33 = 16 KW's
3412 (BTU's per KW)

Note: See Data Sheets "A" through "E" in Work Sheet "A" for examples for other fixtures and equipment.

Next, record the BTUs or KWs calculated on Data Sheets A through E in the table entitled, "Totals from Data Sheets" located at the bottom of Data Sheet E. Once all of the KWs and BTUs have been recorded in this table, total each column to get the required storage water heater capacity or the energy required to maintain the peak hot water demand of the food service establishment. See the following example of a completed KW/BTU table:

Totals from Data Sheets

Unit	BTU's	KW's
3-Comp. Warewashing Sink--------------------------	61,420	14.00
Hand Sink--	16,660	4.00
2-Comp. Prep. Sink------------------------------------	15,549	3.42
Pre-rinse Spray---	34,986	8.00
Chemical/Mechanical Warewashing Machine------	70,749	16.00
Mop Sink--	7,774	2.00
Clothes Washer---------------------------------------	11,662	3.00
Hose Reel--	15,549	3.42
REQUIRED WATER HEATER CAPACITY =	***234,349***	***53.84***

Step #7 Conclusions:

First, compare the REQUIRED WATER HEATER CAPACITY to the water heater specified within submitted plans in order to determine if the specified water heater will be capable to maintain the proposed food service establishment's peak hot water demand as *exactly what is specified within DPH Rule 511-6-1-.06 (1) (g) 2.* For example:

From totals calculated in the Chart above, a water heater with the BTU rating (or capacity) *of 234,349 BTU's, if gas fired*, or one with a KW rating (or capacity) of *53.34 KW's, if electric*, will be required in order to meet the peek hot water demand of the proposed food service establishment.

Next, if the warewashing machine uses a hot water final sanitizing rinse cycle, a booster heater for the hot water sanitizing final rinse must be provided and sized to supply an additional *40,428 BTU's or 9 KW's*. The booster heater is necessary in order to boost the required gallons per hour demand an additional 40ºF to attain the required minimum 180ºF final rinse temperature. See the following example to calculate the KW or BTU energy demand for the external booster heater:

Formulas for calculating heat energy demand for external booster heater:

Equipment	MHHWDTF-GPH from Chart K-1	Temperature Required	Temperature. Rise
Booster Heater	**91**	180ºF	180ºF - 140ºF = 40ºF

$$\frac{\text{91 (GPH) X 40ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = 40{,}428.266 \sim \underline{\textit{40,428 BTU's}}$$

$$\frac{\text{91 (GPH) X 40ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = 8.886 \sim \underline{\textit{9 KW's}}$$

Where:

Degree Rise = 40ºF, since the water temperature at the booster heater must be at least 140ºF in order for the booster heater to raise this 140ºF incoming water another 40ºF to the minimum hot water sanitizing, fresh rinse temperature of at least 180ºF.

MHHWDTF-GPH = Maximum Hourly Hot Water Demand per Type of Fixture in Gallons per Hour

8.33 is the weight of one gallon of water in pounds. A British Thermal Unit (BTU) is the amount of heat energy needed to raise the temperature of one pound of water by one degree F. Therefore, 8.33 is equal to 8.33 BTUs of energy needed to heat one gallon of water one degree Fahrenheit. This is the standard measurement used to state the amount of energy that a fuel has as well as the amount of output of any heat generating device.

Step #8 Comparison:

Compare the energy demand (KW or BTU) listed in the table, "Totals from Data Sheets", in Step #8 above to the energy rating of the specified water heater noted within the submitted plans. If the water heater is at least equal to the energy values listed within the table, then the unit is sized to meet the hot water demand of the proposed food service establishment. If not, then the water heating system needs to be redesigned with a larger capacity.

[II. Steps in Assessing Tankless or On-Demand Hot Water Heating Systems:

Step # 1 Identification and enumeration of fixtures and equipment and tableware service:

Just as in Step #1 of Part-II, identify each fixture and piece of equipment that utilizes hot water by observing the kitchen floor plan and equipment list. Circle each handsink and lavatory. Make note of how many of each type of fixture and equipment that is shown on the floor plan. Record the number of units (fixtures or equipment) under heading, "Number of Units", on Table K-2 of Work Sheet "B" located within Appendix-I located in Part-II of the DPH Chapter 511-6-1 Manual for Design, Installation and Construction.

Each type of sink is one unit. For example, a 3-compartmented sink is made up of three vats or compartment but, it is still one sink unit and not three separate sinks. However, the focus in not on the vat volumes but instead, it is on the flow rate of the faucets that fill the vats.

Obtain hot flow rates in gallons per minute (GPM) from the manufacturer's specification sheets for warewashing machines. Also, note flow rates in manufacturer specification sheets for other fixtures and equipment utilizing hot water as well.

Because tankless or on-demand water heating systems do not recover and maintain a volume of hot water, consideration for reduction in use of Single-use articles for eating and drinking tableware does not apply when sizing and assessing these types of systems. Instead, the flow rate of fixtures and equipment must be the governing factor.

A flow rate reduction may be used for low flow water faucets installed on 3-compartment sinks, hand operated pre-rinse sprayers, food preparation sinks, handwashing sinks and shower heads by entering the manufacturer's flow rate listed for the faucet or faucet's aerator. Flow rate reductions may be applied if manufacturer's flow rates are less than those shown within Table K-2 of Work Sheet "B". If true, these manufacture flow rates may be substituted for Hot Water Usage GPM figures given in Table K-2. Use manufacturer's flow rate in GPM for specific make and model of warewashing machines and inter them within the appropriate space under Hot Water Usage GPM heading as well.

Step # 2 Calculate the total hot water demand flow rate in Gallons Per Minute (GPM) using Table K-2 located within Work Sheet "B" of Appendix-I in Part-II of the Chapter's Manual for Design, Installation and Construction. Please take not that if the heater manufacturer has sizing, installation and system design criteria, then their criteria may be used as long as they have been previously submitted and approved by the local Health Authority with consultation with Department 's Environmental Health Branch Office representatives. Otherwise, use the Work Sheet "B" to calculate hot water demand.

Step # 3 Multiply the Hot Water Usage GPM by the number of fixtures to obtain the Hot Water Demand Flow Rate in GPM for each listed fixture and equipment utilizing hot water. Enter this value under the column heating "Hot Water Demand Flow Rate in Gallons per Minute" of Table K-2 for each listed fixture and piece of equipment utilizing hot water.

Step # 4 Calculate the maximum hot water flow rate for the establishment:

The thermal efficiency of the water heating unit must be adjusted for altitude. The altitude adjustment is *4% per 1000 feet of elevation above sea level, or 20% at 5000 feet above sea level.* The designer of the on-demand water heating system will need to provide the altitude data for the site of the proposed food service establishment to be used in the following calculations:

1. Use the following equation to *determine the establishment's maximum flow rate in GPM*:

(0.04 × ________________ ÷ 1000) + 1 = ____________________
Elevation of facility *adjustment factor*

____________________ × ______________________ = ____________________
Adjustment factor ***total hot water demand flow rate calculated in Table K-2*** *maximum GPM hot water flow usage*

Use calculated maximum GPM hot water flow usage value in this equation to determine the minimum number of heating units that will be required as determined from the equation in Step #5 below.

Step #5 Determine the number of heating units that will be needed to meet the required maximum hot water flow rate demand for the establishment. Use the following formula to calculate the needed number of tankless or on-demand water heating units:

____________________ ÷ ______________________ = (__________________)
Maximum GPM hot water flow usage calculated in "1" above manufacturer's flow rate in GPM @100°F or 80°F rise** ***number of heating units required****

*Multiple units must be installed and plumbed to operate in a parallel configuration.

**If there are no high temperature dishwashing machine or other fixtures requiring input water temperatures of 140°F (100°F rise) or more, then 80°F rise can be used.

Step #6 Determine if an on-demand water heating system will need a storage tank to compensate for the lag in availability of hot water at warewashing machine startup. On-demand water heating systems must include a storage tank to eliminate lag in availability of hot water at the start-up of a warewashing machine. If not provided, the effects of water temperature lag between start-up time of the unit and the point when hot water is received at the warewashing machine will cause warewashing machines to operate outside of their designed operating parameters. As a result, eating and drinking utensils and equipment placed within them will not be properly cleaned and sanitized as required by DPH Rule 511-6-1-.05. Therefore, a storage tank must be provided within the system and it must have a volume of at least 25 gallons or at least 25% of the gallons per hour (GPH) demand of the warewashing machine. The larger these two values is the required storage tank size. Use the following equations to calculate on-demand water heating system storage tanks:

Dishwashing Machine*

Manufacturer: __________________ Model Number: _______________
Gallons per Hour Water Consumption: ________ × 0.25 = ____________________
Storage tank capacity in gallons
Calculated Storage Tank Capacity: ____________ vs. 25 Gallon Storage Tank
Enter the larger of the two: _______________ ***Required Storage Tank Capacity*****

* High temperature, heat sanitizing warewashing machines must be provided with a separate booster heater. Use of an instantaneous unit is not allowed for use as a booster heater. Step #8 within Part-II entitled, "Steps in Assessing Storage (Recovery) Tank Type Water Heating System" for booster heater calculation examples.

** The storage tank must be installed in the hot water supply line located between the heater unit(s) and the hot water distribution line. A recirculation line and aquastat (water thermostat) must be installed at the storage tank to assure the water in the tank remains at the appropriate temperature (120°F to 140°F). The recirculation line must be connected between the storage tank and the cold water supply line at the heater unit(s).

Step #7 Compare the number of units calculated in Step #5 in Part-III to that specified within the submitted plans. If the number of units specified within the submitted plans is at least equal to that calculated in Step #5, then the specified unit(s) are sized to meet the hot water demand of the proposed food service establishment. If not, then the water heating system needs to be redesigned with a larger BTU and flow capacity. Additionally, if a warewashing machine is proposed, a storage take with a capacity of 25 gallons must be include within the installation of the on-demand water heating system in order to eliminate the lag in availability of hot water at warewasher startup.

Table K-1 Peak Hourly Hot Water Demand Per Fixture in Gallons Per Hour

Units	# of Units		Peak Hourly Hot Water Demand in GPH		MHHWDTF-GPH
Example: Warewashing Machine	*1*	×	*50*	=	*50*
Example: Handwashing Sink(s)	*5*	×	*5*	=	*(5 × 5) = 25*
*3-Compartment Warewashing Sink‡**		×		=	
*3-Compartment Bar Sink‡**		×		=	
*Utensil Soak Sink**		×		=	
Warewashing Machine†		×		=	
Warewashing Machine Conveyor Pre-rinse†		×		=	
Clothes Washer		×	15 GPH	=	
Hand Operated Pre-rinse Sprayer‡		×	*45 GPH*	=	
*Food Preparation Sink(s)**		×	*5 GPH (each comp.)*	=	
Handwashing Sinks (including restrooms)‡		×	*5GPH*	=	
Mop/Utility Sinks		×	10 GPH	=	
Garbage Can Washers		×	10 GPH	=	
Shower Head‡		×	*14 GPH*	=	
Hose bib used for cleaning		×	35 GPH	=	
Hose Reel		×	10 GPH	=	

*** Warewashing sinks & Utensil Soak Sinks GPH = sink comp. size inch^3 X # of compt. X .003255 inch^3/gallon**

Note[1]: .003255 inch^3/gallon provides a 75% compartment fill to compensate for mass of utensils and equipment.
Note[2]: If single-service eating and drinking utensils, *use 80% of the computed warewashing sink or utensil soak sink's volume capacity*.
Note[3]: Formula for all compartmented sinks used to submerge equipment and utensils as part of the cleaning and/or sanitizing process.
‡ A hot water demand reduction may be calculated for water saving devices used on hand operated pre-rinse sprayers, handwashing sinks and showers. The number of water saving devices is entered for # of Units. See formulas for calculating hot water reduction.
Note[4]: See Diagram on following page for illustration for measuring Length, Width, and Depth of sink compartments.

† Consult manufacturer's specification sheets for peak hourly demand in gallons per hour.

NOTE: Use Table K-1 to calculate the peak hot water demand for each unit of equipment in gallons per hour (MHHWDTF-GPH). Calculations for GPH, BTU's, and KW's to size water heating equipment are to be recorded on Data Sheets. Completed Data Sheets are to be attached to Table K1 and they are to be maintained within the proposed food service establishment permit record until and at such time the current Table K-1 and Data Sheets are replace due to a new plan review of the establishment as a result of change in permit holder.

REFERENCE FORMULAS:

Ware washing Machines: GPH = gal/hr Final Rinse (from manufacturer cut sheets) X 70% (.70)

Manual Warewashing Sink: GPH = Comp. (Length X Width X Depth) in inches X # of Comp.s X .003255 inch^3/gallon X # of sink units

BTU (if water heater is gas fired): BTU's = $\dfrac{\text{Calculated GPH X Degree Rise X 8.33 lbs/gallon}}{\text{.75 (75\%) (Operating efficiency)}}$

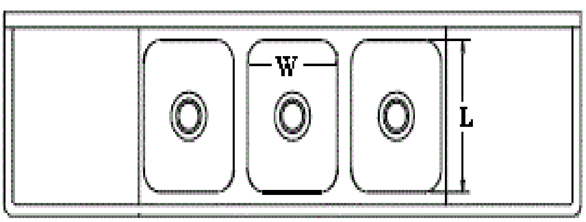
KW (If electric water heater): KW's = $\dfrac{\text{Calculated GPH X Degree Rise X 8.33 lbs/gallon}}{\text{3412 (BTU's per KW)}}$

Degree Rise = Required Target Hot Water Temperature (ºF) at Fixtures and Equipment minus Incoming Water Temp (ºF) to Establishment

Determining the Volume of a Compartmented Sink

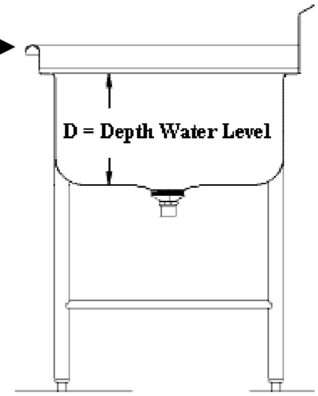
First, measure each vat (or compartment):

Top View Looking Down



L = Length of Compartment in Inches
W = Width of Compartment in Inches

Sink Flood Level



Note: Take measurements from inside the compartment.

Second, use the following formulas to obtain the total volume of the compartmented Sink in Gallons:

Volume of One Vat = Length (L) inches × Width (W) inches × Depth (D) inches = Cubic Inches

Thirdly, combine the calculated volume of each vat into the total volume of the sink unit. If all of the vats are of the same dimensions, then multiply by the number of vats in the sink unit; however, if all the vats are of different dimensions, then added each vat’s volume together to get the combined volume of the sink unit in cubic inches. For simplicity, the following equation assumes that each vat is of equal dimensions:

Vats of Equal Dimensions:

(L × W × D) × (Number of Vats) × .003255in^3 = *Peak Hot Water Demand in GPH per Unit*

Vats of Unequal Dimensions:

[(L) Vat$_1$ + (W) Vat$_2$ + (D) Vat$_3$] × (Number of Vats) × .003255in^3 = Sink Unit’s Volume or *Peak Hot Water Demand in GPH per Single Unit*

Multi-use Tableware Service:

If only multi-use tableware are used for service, then the Peak Hot Water Demand in GPH per Single Unit which is to be entered in the appropriate space in the space under the heating, “Peak Hourly Hot Water Demand in GPH” on Table K-1 of Work Sheet “A” of Appendix-I located in Part-II of DPH Chapter 511-6-1’s Manual for Design, Installation and Construction.

Note: The Conversion Factor (.003255 in^3/gallon) provides for an overall 25% reduction in hot water usage to allow for water displacement created by equipment and utensils submerged within vats.

Single-use articles Used for Tableware Service:

Finally, if single-service articles are used instead of multi-use tableware for service, then calculate the reduced hot water demand by using the following formula:

Peak Hot Water Demand in GPH per Single Unit × 80% (or .80) = Final Sink Volume or Peak Hot Water Demand in GPH per Single Unit of which is to be entered in the appropriate space in the space under the heating, “Peak Hourly Hot Water Demand in GPH” on Table K-1 of Work Sheet “A” of Appendix-I located in Part-II of DPH Chapter 511-6-1’s Manual for Design, Installation and Construction.

Peak Hot Water Demand in GPH per Single Unit × 80% (or .80) = 20% Reduction in Peak Hot Water Demand in GPH per Unit Allowance when Single-Use Articles are used instead of Multi-Use Tableware

If applicable - Hot Water Demand Reduction – Water Saving Devices

I. Obtain manufacturer’s flow rate for each device. The manufacturer’s flow rate must be less than what is listed below to be considered:

1. Hand operated pre-rinse sprayers with flow rate less than 3.5 GPM standard flow rate.

   Manufacturer: ____________________; Model #: ________________________
   Manufacturer’s Flow Rating: ________________ GPH

2. Handwashing sink faucet or aerator with flow rate less than 2.2 GPM standard flow rate.

   Manufacturer: ____________________; Model #: ________________________
   Manufacturer’s Flow Rating: ________________ GPH

3. Shower head with flow rate less than 2.5 GPM standard flow rate.

   Manufacturer: ____________________; Model #: ________________________
   Manufacturer’s Flow Rating: ________________ GPH

II. Using the following equation, the *reduction in the hourly hot water demand* for each of the three types of fixtures listed above is determined by the following calculations:

$$(A \times B) \div C = D, \text{ where:}$$

A = *Manufacturer’s Flow Rate*
B = *Water use value from Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH)*
C = *GPM standard flow rate (SFR)*
D = *New water use value to substitute for that given in Table K-1 to calculate Peak Hourly Hot Water Demand Per Type of Fixture (gallons per hour or GPH)*

1. Hand operated pre-rinse sprayers:

   (____________ × __________) ÷ _____________ = ______________ GPH
   A B C D

2. Handwashing sink:

   (____________ × __________) ÷_____________ = ______________ GPH
   A B C D

3. Shower head:

   (____________ × __________) ÷ _____________ = ______________ GPH
   A B C D

Note: *Substitute "D" value for existing "Peak Hourly Hot Water Demand" value in Table K-1*.

DATA SHEET A
Gallons Per Hour from Table K-1
Select BTU or KW Formula as Applicable

Equipment	MHHWDTF-GPH Demand from Table K-1	Temperature Required	Temperature Rise
3 – Comp. Warewashing sink	________	110ºF	110ºF - _____ºF = _____ºF

$$\frac{\_\_\_\_\_\text{(gph) X }\_\_\_\_\text{ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = \_\_\_\_\_\_\_\_\textit{ BTU's}$$

$$\frac{\_\_\_\_\_\text{(gph) X }\_\_\_\_\text{ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = \_\_\_\_\_\_\_\_\textit{ KW's}$$

****

Equipment	MHHWDTF-GPH Demand from Table K-1	Temperature Required	Temperature Rise
Hand sink	________	100ºF	100ºF - ____ºF = ____ºF

$$\frac{\_\_\_\_\_\text{(gph) X }\_\_\_\_\text{ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = \_\_\_\_\_\_\_\_\textit{ BTU's}$$

$$\frac{\_\_\_\_\_\text{(gph) X }\_\_\_\_\text{ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = \_\_\_\_\_\_\_\_\textit{ KW's}$$

DATA SHEET B
Gallons Per Hour from Table K-1
Select BTU or KW Formula as Applicable

Equipment	MHHWDTF-GPH Demand from Table K1	Temperature Required	Temp. Rise
Two comp. Prep Sink	______= (___# compartments X 5 gph each = ____gph) X____ # of sink units	110ºF	110ºF - ____ºF = ____ºF

______(gph) X ____ºF temperature rise X 8.33 = _________*BTU's*
.75 (operating efficiency)

______(gph) X ____ºF temperature rise X 8.33 = ________*KW's*
3412 (BTU's per KW)

****

Equipment	MHHWDTF-GPH Demand from Table K-1	Temperature Required	Temperature Rise
Pre-rinse Spray	_______	110ºF	110ºF - ____ºF = ____ºF

____(gph) X ____ºF temperature rise X 8.33 = ________*BTU's*
.75 (operating efficiency)

_____(gph) X ____ºF temperature rise X 8.33 = ________*KW's*
3412 (BTU's per KW)

DATA SHEET C
Gallons Per Hour from Table K-1
Select BTU or KW Formula as Applicable

Equipment	MHHWDTF-GPH Demand from Table K-1	Temperature Required	Temperature Rise
Chemical/Mechanical Warewashing Machine	_______	140ºF	140ºF - _____ºF = _____ºF

$$\frac{\_\_\_\_\_\_ \text{(gph) X } \_\_\_\_ \text{ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = \_\_\_\_\_\_\_\_\_ \textit{BTU's}$$

$$\frac{\_\_\_\_\_\_ \text{(gph) X } \_\_\_\_ \text{ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = \_\_\_\_\_\_\_\_\_\_ \textit{KW's}$$

****

Equipment	MHHWDTF-GPH Demand from Table K-1	Temperature Required	Temperature Rise
Mop Sink	_______	110ºF	110ºF - ____ºF = ____ºF

$$\frac{\_\_\_\_\_ \text{(gph) X } \_\_\_\_ \text{ºF temperature rise X 8.33}}{\text{.75 (operating efficiency)}} = \_\_\_\_\_\_\_ \textit{BTU's}$$

$$\frac{\_\_\_\_ \text{(gph) X } \_\_\_\_\_ \text{ºF temperature rise X 8.33}}{\text{3412 (BTU's per KW)}} = \_\_\_\_\_\_\_\_ \textit{KW's}$$

DATA SHEET D
Gallons Per Hour from Table K-1
Select BTU or KW Formula as Applicable

Equipment	MHHWDTF-GPH Demand from Table K-1	Temperature Required	Temperature Rise
Clothes Washer	_______	110ºF	110ºF - ____ºF = ____ºF

_____(gph) X ____ºF temperature rise X 8.33 = _________*BTU's*
.75 (operating efficiency)

_____(gph) X ____ºF temperature rise X 8.33 = __________*KW's*
3412 (BTU's per KW)

****

Equipment	MHHWDTF-GPH Demand from Table K-1	Temperature Required	Temperature Rise
Hose Reel	_______= ___ X 10 gph	110ºF	110ºF - ____ºF = ____ºF

20 (gph) X ____ºF temperature rise X 8.33 = _________*BTU's*
.75 (operating efficiency)

20 (gph) X ____ºF temperature rise X 8.33 = _________*KW's*
3412 (BTU's per KW)

DATA SHEET E
Gallons Per Hour from Table K-1
Select BTU or KW Formula as Applicable

Equipment	MHHWDTF-GPH Demand from Table K-1	Temperature Required	Temperature Rise
Warewasher Booster Heater	________	180ºF	180ºF - 140ºF = 40ºF

_____(gph) X _40ºF temperature rise X 8.33 = ___________*BTU's*
.75 (operating efficiency)

______(gph) X 40ºF temperature rise X 8.33 = ____________ *KW's*
3412 (BTU's per KW)

Totals from Data Sheets

Unit	BTU's	KW's
3-Comp. Warewashing Sink--------------------------		
Hand Sink--		
2-Comp. Prep. Sink-------------------------------------		
Pre-rinse Spray--		
Chemical/Mechanical Warewashing Machine------		
Mop Sink---		
Clothes Washer---		
Hose Reel--		
Other:		
REQUIRED STORAGE WATER HEATER CAPACITY =		

I. *Calculate the total hot water demand flow rate in Gallons Per Minute (GPM) using Table K-2.* If the heater manufacturer has sizing, installation and system design criteria, then their criteria may be used as long as they have been previously submitted and approved by the local Health Authority with consultation with Department representatives. Otherwise, use the following Work Sheet "B" to calculate hot water demand:

Table K-2 Total Hot Water Demand Flow Rate

Plumbing Fixture	Hot Water Usage (gallons per minute)	Number of Fixtures	Hot Water Demand Flow Rate in Gallons Per Minute
Example: Warewashing Machine †Hobart AM14	8.0	1	(8.0 × 1) = 8.0
Example: Handsink(s)	0.5	4	(0.5 × 4) = 2.0
3-Compartment Warewashing Sink*	2.0 for each faucet		
3-Compartment Bar Sink*	2.0 for each faucet		
Utensil Soak Sink	1.0		
Warewashing Machine†			
Warewashing Machine Conveyor Pre-rinse†			
Clothes Washer	2.0		
Hand Operated Pre-rinse Sprayer*	2.0		
Food Preparation Sink(s)*	1.0		
Handwashing Sinks (including restrooms)*	0.5		
Mop/Utility Sinks	2.0		
Garbage Can Washers	1.0		
Shower Head*	1.0		
Hose Bibb used for cleaning	5.0		
Total Hot Water Demand Flow Rate (GPM) Required:			

* A flow rate reduction may be used for low flow water faucets installed on 3-compartment sinks, hand operated pre-rinse sprayers, food preparation sinks, handwashing sinks and shower heads by entering the manufacturer's flow rate listed for the faucet or faucet's aerator. Flow rate reductions may be applied if manufacturer's flow rates are less than those shown above.

† Use manufacturer's flow rate in GPM for specific make and model of warewashing machine.

II. *Calculate the maximum hot water flow rate for the establishment:* The thermal efficiency of the water heating unit must be adjusted for altitude. The altitude adjustment is *4% per 1000 feet of elevation above sea level, or 20% at 5000 feet above sea level.* The designer of the on-demand water heating system will need to provide the altitude data for the site of the proposed food service establishment to be used in the following calculations:

1. Use the following equation to *determine the establishment's maximum flow rate in GPM*:

(0.04 × ________________ ÷ 1000) + 1 = ____________________
Elevation of facility — *adjustment factor*

____________________ × ______________________ = ____________________
adjustment factor — ***total hot water demand flow rate calculated in Table K-2*** — *maximum GPM hot water flow usage*

Use calculated maximum GPM hot water flow usage value in this equation to determine the minimum number of heating units that will be required as determined from the equation in "2" below.

2. *Determine the number of heating units* that will be needed to meet the required maximum hot water flow rate for the establishment:

______________________ ÷ ______________________ = __(__________________)_
maximum GPM hot water flow usage calculated in "1" above — manufacturer's flow rate in GPM @100°F or 80°F rise** — ***number of heating units required****

*Multiple units must be installed and plumbed to operate in a parallel configuration.

**If there are no high temperature dishwashing machine or other fixtures requiring input water temperatures of 140°F (100°F rise) or more, then 80°F rise can be used.

3. *Storage Tank Sizing*: IF A WAREWASHING MACHINE(S) IS TO BE INSTALLED, the on-demand water heating system must include a storage tank to eliminate lag in availability of hot water at the warewashing machine. If not, the effects of water temperature lag between start-up time of the unit and the point when hot water is received at the warewashing machine will cause warewashing machines to operate outside of their designed operating parameters. As a result, eating and drinking utensils and equipment placed within them will not be properly cleaned and sanitized as required by DPH Rule 511-6-1-.05. Therefore, the storage tank must be at least 25 gallons or at least 25% of the gallons per hour (GPH) demand of the warewashing machine(s). The larger value of the two is the required storage tank size. Use the following equations to calculate on-demand water heating system storage tanks:

Storage Tank Sizing: (Continued)

Dishwashing Machine*

Manufacturer: __________________ Model Number: _______________
Gallons Per Hour Water Consumption: _________ × 0.25 = ____________________
Storage tank capacity in gallons
Calculated Storage Tank Capacity: ____________ vs. 25 Gallon Storage Tank
Enter the larger of the two: _______________ ***Required Storage Tank Capacity*****

* High temperature, heat sanitizing warewashing machines must be provided with a separate booster heater. Use of an instantaneous unit is not allowed for use as a booster heater.

** The storage tank must be installed in the hot water supply line located between the heater unit(s) and the hot water distribution line. A recirculation line and aquastat (water thermostat) must be installed at the storage tank to assure the water in the tank remains at the appropriate temperature (120°F to 140°F). The recirculation line must be connected between the storage tank and the cold water supply line at the heater unit(s).

MEMORANDUM OF UNDERSTANDING

NON-PUBLIC WATER SUPPLIES

This MOU is between the Georgia Department of Natural Resources (DNR), Environmental Protection Division (EPD), and the Georgia Department of Human Resources (DHR), Division of Public Health (DPH).

I. PURPOSE OF THIS AGREEMENT

I. To protect the health of the citizens and visitors of the State of Georgia.

2. To protect the water resources of the State of Georgia.

3. To ensure a safe, quality and quantity of water is provided and maintained for regulated facilities.

4. To facilitate efficient and effective government function and actions.

II. BACKGROUND

In 1977, the EPD of Georgia Department of Natural Resources applied to and received authorization from the U.S. Environmental Protection Agency (EPA) to carry out the purposes and requirements of the Federal Safe Drinking Water Act of 1974 as amended. This federal act established definitions for public drinking water systems and established a permitting program for community and non-community drinking water systems in the United States.

To implement the purposes of the Federal Safe Drinking Water Act, EPD promulgated the Rules for Safe Drinking Water in 1977 (Rules) to establish the organizational and administrative procedures. These Rules require that drinking water systems meeting the definition of a Public Water System (PWS) obtain a permit from EPD. A PWS as defined by the Rules is a system that provides water to the public for human consumption through pipes or other con conveyances, if such system has at least fifteen (15) service connections or regularly serves an average of twenty-five (25) individuals daily at least 60 days out of the year. A PWS is a Community Water System (CWS), a Non-Transient Non-Community Water System (NTNCWS), or a Transient Non-Community Water System (TNCWS) depending on the circumstances. The Rules contain standards for construction, operation, and reporting, and also establish standards for chemical, microbiological, radiological, and physical quality. Since 1977, EPD has issued permits to water systems according to the definition of a PWS. Permits are issued to cities, towns, mobile home parks, schools, motels, as well as some businesses, industries and food service establishments that serve drinking water to 25 or more people 60 days or more per year.

The DHR Rules and Regulations for Food Service establish a definition for Potable which states “means water intended for human consumption that meets the bacteriological and chemical requirements of the federal EPA Safe Drinking Water Act, or other regulatory agency having equivalent authority.” The Rules and Regulations for Food Service require a potable water supply but do not require the water supply to be permitted by EPD.

The Water Well Standards Act (O.C.G.A. 12-5-122) establishes the definition for a “non public water well” as a “well constructed as a source of water supply for a water system which provides piped water to the public for human consumption, if such system has less than 15 connections or regularly serves less than 25 individuals, excluding individual water wells.” The Water Wells Standards Act establishes minimum construction standards for non-public wells.

Because there are instances where the water supply systems that serve food service establishments and other facilities do not meet the definition of a public water system (and are therefore a non public water system) a procedure is needed whereby the County Boards of

Health and the DHR Division of Public Health can assure that these food service establishments, tourist accommodations, and public swimming pools have a source of potable water that meets applicable codes.

This MOU seeks to insure ongoing cooperation between EPD and DHR Division of Public Health in matters relating to both PWS's and non public water systems.

III. GUIDELINES AND PROCEDURES

The following are EPD's standard operating procedures with respect to non-community water system permitting for food service establishments and other facilities:

1. EPD's district offices will be the only department, which distributes permit applications for Public Water System Permits.
2. EPD's district offices will evaluate applications for Public Water Systems Permits and will be the only department to assist the permit applicant in completing the application.
3. If the information on the application indicates that the water system is a non-community public water system, EPD will inform the applicant in writing of the requirements for approval and permitting. A copy of that letter will be sent to the local county health department.
4. If the application indicates that the water system is non public, EPD will inform the applicant in writing that they do not require a permit for a PWS and they must conform to the applicable requirements of the DHR for their water system. A copy of that letter will be sent to the local county health department.

The following are DHR's and the local county health department's procedures in assuring potable water sources at food service establishments, tourist accommodations, and public swimming pools in Georgia:

1. The local county health department will ascertain whether an existing or proposed facility is served by a PWS permitted by EPD.
2. If the existing water system is not permitted by EPD, the local county health department will refer the owner of the existing facility to the appropriate EPD district office for permit evaluation.
3. If a proposed water system is not permitted by EPD, the local county health department will refer the owner of the proposed facility to the appropriate EPD district office for permit evaluation.
4. If EPD determines the water system serving the existing or proposed food service establishment, tourist accommodation, or public swimming pool is a PWS, then the water system will be required to meet EPD regulations and a letter will be sent to the county health department to notify them of the water supply's status.
5. If EPD determines that the water system serving the existing or proposed facility is a non public water system, the local county health department will be copied on a letter to the owner of the establishment notify him that the water system is a non public water system and then must conform to the applicable DHR regulation for non public water systems.

IV. INTERDEPARTMENTAL COOPERATION

EPD has in the past provided cooperative assistance to DHR in sample analysis and in emergency assistance to individual and non public water supplies following disasters. This cooperation will continue and EPD will provide technical assistance (when requested) to DHR in other areas to assist DHR in its role of assuring potable water for nonpublic water supplies serving food service establishments, tourist accommodations, and public swimming pools. DHR will provide assistance to EPD in the case of waterborne disease outbreaks in public water supplies and in other applicable situations.

Both DNR and DHR will insure that this MOU is distributed to all relevant staff members of each agency at the field or point of delivery level and meetings, explanatory memos, or other means to promote awareness and proper utilization of this MOU are employed.

V. DISPUTE RESOLOTION

If there should arise a dispute between the local county health department and EPD's district office about a permitting issue the following procedure will be employed:

1. The dispute should be discussed and resolved at the lowest staff level possible, preferably between the Environmental Health Specialist with the local environmental health office and the Environmental Specialist in the EPD district office.
2. If the dispute can not be resolved at the level described above, the District Environmental Health Director and the EPD District Operations Manager or Region Manager will discuss and seek to resolve the dispute.
3. As a final resort the Branch Chief of EPD's Program Coordination Branch will review the facts surrounding the case and render a final decision for EPD and inform the Director of the DHR Environmental Health Section, the district health office and the county environmental health office in writing of the final decision.

VI. AGREEMENT

Whereas EPD has authority over all public water systems and some other aspects of water management in the State of Georgia, EPD agrees that DHR/DPHI County Boards of Health should regulate water supply systems serving food service establishments, tourist accommodations, and public swimming pools that EPD determines are not PWS.

The appropriate person in DNIR and DHIR by theft signature agrees to the terms of this MOU.

1/13/02	1/29/02
Dr. Kathleen Toomey Date Director Division of Public Health (DHR)	Harold F. Reheis Date Director, EPD

CLEANING FREQUENCY: Equipment food-contact surfaces & utensils shall be cleaned & sanitized each time there is a change from working with raw animal foods to RTE foods or between uses with raw fruits & vegetables and with PHF/TCS FOODS; before using or storing food TMD's; any time when contamination may have occurred; and before each use with different type of raw animal food, *except in contact with a succession of different raw animal foods each requiring a higher cooking temperature as specified under DPH Rule 511-6-1-.04 (5) (a) than the previous food, such as raw fish followed by cutting/preparation of raw poultry*.

Preparation Room Temperature		Cleaning Frequency
41°F or less	5.0°C or less	24 hours
> 41°F to 45°F	> 5.0°C to 7.2°C	20 hours
> 45°F to 50°F	> 7.2°C to 10.0°C	16 hours
> 50°F to 55°F	> 10.0°C to 12.8°C	10 hours
> 55°F unrefrigerated rooms	> 12.8°C	4 hours

Refrigerated room temperatures & cleaning frequency to be documented.

<u>PHF/TCS FOODS, Food Contact Surfaces</u>:

1. In storage, containers of PHF/TCS FOODS (maintained at DPH Rule 511-6-1-.04 temperatures/date markings) are cleaned when emptied.
2. Containers in serving situations such as salad bars that are maintained and refilled with PHF/TCS FOODS at DPH Rule 511-6-1-.04 temperatures are cleaned at least every 24 hours.
3. In-use utensils intermittently stored in a container of hot water at ≥135°F are cleaned every 24 hours or more frequently to preclude accumulation of soil residues.

<u>NON-PHF/TCS FOODS, Food Contact Surfaces</u>:

1. Utensils & equipment - at any time when contamination may have occurred.
2. At least every 24 hours for iced tea dispensers and consumer self-service utensils
3. Before restocking consumer self-service equipment & utensils
4. In or enclosed components of equipment such as ice bins, ice makers, beverage nozzles & syrup dispensing lines/tubes, cooking oil storage tanks & distribution lines, coffee bean grinders, and water vending equipment: as specified by the manufacturer or as necessary to preclude accumulation of soil or mold.

SANITIZATION: CONCENTRATION, pH, TEMPERATURE, HARDNESS & CONTACT TIME

Minimum Concentrations ppm or mg/L	pH ≤10.0 & Minimum Temperature	pH ≤8.0 & Minimum Temperature	Contact Time
Chlorine 25	120°F (49°C)	120°F (49°C)	≥ 10 seconds
Chlorine 50	100°F (38°C)	75°F (24°C)	≥ 7 seconds
Chlorine 100	55°F (13°C)	55°F (13°C)	≥ 10 seconds
Iodine ≥ 12.5 to 25	pH ≤ 5.0 or per label; ≥ 75°F (24°C)		≥ 30 seconds
Quaternary Ammonium, per label	water hardness ≤ 500 ppm or mg/L or per label; ≥ 75°F (24°C)		
Hot Water Sanitize, 3 compartment sink w/ integral heating device	≥ 171°F (77°C) immersed in rack or basket		

Note: All chemical sanitizers shall meet the requirements specified in 40 CFR 180.940 and used in accordance with the EPA-registered label use instructions.

WAREWASHING: MECHANICAL & MANUAL		Minimum Wash Temperature	Minimum Sanitizing Temperature
SPRAY TYPE WAREWASHERS: Single Tank, Hot Water Sanitize	Stationary rack, single temperature	165°F (74°C)	165°F (74°C)
	Stationary rack, dual temperature	150°F (66°C)	180°F (82°C)
	Conveyor, dual temperature	160°F (71°C)	
Multitank, Hot Water Sanitize	Conveyor, multi temperature	150°F (66°C)	
Chemical Sanitize	Any warewashing machine	120°F (49°C)	sanitization levels as stated in the above table or per labeled manufacturer's instructions on the container.
3 Compartment Sink	Cleaning agent labeling may permit lower washing temperatures	110°F (43°C)	

MECHANICAL WAREWASHING:

1. As appropriate, washing, rinsing & sanitizing temperatures; fresh water sanitizing rinse pressure; conveyor speed or cycle time shall be in accordance with dish machine "data plate" and manufacturer's instructions.
2. <u>Fresh hot water sanitization</u>: the flow pressure immediately downstream or upstream of the sanitization rinse control valve shall be 15 psi to 25 psi (100 to 170 kilopascals), and any pressure measuring devices shall be scaled at increments of at least 1 psi or 7 kilopascals, and accurate to +/-2 psi or +/-14 kilopascals within the working pressure range. Hot water entering the manifold for sanitizing may not be more than 194°F(90°C) {*except for hand-held spraying devices for in-place cleaning & sanitizing*}. Utensil surface temperatures must reach at least 160°F (71°C) as measured by an irreversible registering temperature indicator.
3. <u>Automatic dispensing of detergents & sanitizers</u> required for units installed after the adoption of this code and shall be equipped with a visual or audible indicator to signal when chemicals are not being delivered.

FOOD-CONTACT SURFACE LIMITATIONS:

GALVANIZED METAL: May not be used in contact with acidic food.

CAST IRON: *May be used as a cooking surface or serving utensils only as part of an uninterrupted process from cooking through service*.

COPPER & COPPER ALLOYS (BRASS): May not be used for foods with a pH < 6.0 such as vinegar, fruit juice, wine, etc., {*except for the prefermentation & fermentation steps of a beer brewing operation*} or for a water supply line between a soda carbonator & backflow preventer.

WOOD: Wood & wood wicker may not be used as a food-contact surface.
Except:

1. *Hard maple or equivalently hard, close-grained wood may be used for cutting boards & blocks, bakers' tables, and utensils such as rolling pins, doughnut dowels, salad bowls & chopsticks;*
2. *Wooden paddles for pressure scraping kettles in confectionery operations with products reaching at least 230°F (110°C).*
3. *Whole uncut raw fruit & vegetables, and unshelled nuts may be kept in the original wooden shipping container.*
4. *Whole, uncut, raw foods requiring the removal of rinds, peels, husks, or shells may be kept in untreated wood containers or treated wood as specified in 21 CFR 178.3800 Preservatives for Wood.*

NONSTICK COATINGS: Cooking surfaces that have a perfluorocarbon resin coating shall be used with nonscoring or nonscratching cleaning aids.

SPONGES: May not be used in contact with cleaned & sanitized or in-use food contact surfaces.

LEAD USE LIMITATIONS:

UTENSIL Category	Ceramic Article Description	Maximum Lead MG/L
Beverage Mugs, Cups, Pitchers	Coffee Mugs	0.5
Large Hollowware (excluding pitchers)	Bowls ≥ 1.1 Liter (1.16 Quart)	1
Small Hollowware (excluding cups & mugs)	Bowls < 1.1 Liter (1.16 Quart)	2.0
Flat TABLEWARE	Plates, Saucers	3.0

TEMPERATURE MEASURING DEVICES - TMD's

1. Designed to be easily readable.
2. Food TMD's shall be provided & readily accessible for ensuring attainment & maintenance of food temperatures as specified under Rule 511-6-1-.05.
3. Food TMD's may not have sensors or stems constructed of glass, *except stems encased in a shatterproof coating such as candy thermometers may be used*.
4. Mechanically refrigerated or hot food storage units: equipped with at least one integral or permanently affixed, easily viewed TMD with sensors or a simulated product temperature shall be located in the warmest part of the refrigeration unit and in the coolest part of a hot storage unit. *Except where a TMD is not practical for measuring ambient air surrounding the food, such as heat lamps, cold plates, steam tables, salad bars and insulated food transport containers*.
5. Warewashing machine TMD's to indicate water temperature in each wash and rinse tank; and entering the hot water sanitizing final rinse manifold or in the chemical sanitizing solution tank.

TMD Accuracy	Food	Ambient Air & Water
Fahrenheit & Celsius, or Celsius only	+/- 1°C	+/- 1.5°C
Fahrenheit Only	+/- 2°F	+/- 3°F

Food or warewashing TMD's shall have a numerical scale, printed record or digital readout: increments are to be no greater than 2°F (1°C) in the intended range of use.

Appendix-L:

Plan Review DPH Rules Specifications

To be used by both the Plan Designer and Reviewer

Georgia Department of Public Health

Environmental Health Section
(404) 657-6534
www.georgiaeh.us

PURPOSE: As a quick reference to applicable Rules within DPH Chapter 511-6-1, APPENDIX-L is included within Part-II of this Manual as an aid to both the planner and to the local Health Authority reviewer. In no way shall this document be construed to supersede any Rule or Regulation within DPH Chapter 511-6-1. Should clarification be necessary of any particular item or proposal noted within food service plans and specifications, the planner and reviewer are both advised to consult DPH Chapter 511-6-1 and its two companion manuals, the Interpretation Manual for the Rules and Regulations Food Service Chapter 511-6-1 and the Food Service Establishment Manual for Design, Installation and Construction. Additionally, State Environmental Health Office Program Consultants are available for consultation in interpreting DPH Chapter 511-6-1's Rules and Regulations.

FLOORS, WALLS and CEILINGS

Materials for Construction and Repair:

DPH Rule 511-6-1-.07 (1) (a) Materials for Construction and Repair. (Indoor Materials)
Materials smooth, durable, easily cleanable and nonabsorbent for areas subject to food operations or moisture (i.e., food preparation areas, warewashing areas, toilet rooms, mobile food service unit servicing areas, and areas subject to flushing or spray cleaning methods). Carpet is closely woven and easily cleanable (allowed in dinning areas only).

DPH Rule 511-6-1-.07 (1) (b) Outdoor Surfaces.
Outdoor walking and driving areas concrete, asphalt, gravel or other materials that have been approved by the Health Authority and graded to drain. Exterior surfaces of buildings are weather-resistant materials and comply with applicable law (usually state and or local building code).

Design, Construction and Installation:

DPH Rule 511-6-1-.07 (2) (a) Floors, Walls and Ceilings, Cleanability.
Designed, constructed and installed to be smooth and easily cleanable. (Except antislip floor coverings may be used for safety – note that smoothness is the exception here not cleanability. The intent of allowing a rough surface is to help prevent accidents due to slips on wet floor coverings in work areas where they are subject to water exposure. Also, coverings as used in this Rule refer to material of commercial grade that is installed or sealed in place over a substraight, such as a smooth concrete slab floor foundation or plywood wall substraight.)

DPH Rule 511-6-1-.07 (2) (b) Utility Lines. (Primarily cleanability and secondarily - accident prevention)
Utility lines and pipes may not be unnecessarily exposed, and if exposed, they can not obstruct cleaning, and may not be installed horizontally on the floor.

FLOORS, WALLS and CEILINGS

Design, Construction and Installation: (continued)

DPH Rule 511-6-1-.07 (2) (c) Floor and Wall Junctures, Coved and Enclosed or Sealed. (Primarily cleanability –and secondarily, vermin control)
Other than water flushing, coved and closed to 1mm or less, or Water flushing, coved and sealed, floors graded to drain(s).

DPH Rule 511-6-1-.07 (2) (d) Floor Carpeting, Restrictions and Installation. (Flooring, cleanability) *Or similar material may not be installed in food preparation areas, walk-ins, ware washing areas, toilet rooms, refuse storage rooms, or other areas subject to moisture, flushing, or spray cleaning methods.* *If installed in other areas: securely attached with durable mastic, stretch and tack method or by another method; and tight against the wall under the coving or away from the wall with the edges secured by metal stripping or some other means.*

FLOORS, WALLS and CEILINGS

Design, Construction and Installation: (continued)

DPH Rule 511-6-1-.07 (2) (e) Floor Coverings, Mats and Duckboards. (Cleanability)
Designed to be removable and easily cleanable.

DPH Rule 511-6-1-.07 (2) (f) Wall and Ceiling Coverings and Coatings. (Cleanability, "finish schedules")
Easily cleanable, light in color nonabsorbent and sealed to be smooth and nonabsorbent (except areas used for only dry storage). ***Areas used only for dry storage*** *may be concrete, porous blocks or bricks used for indoor wall construction.*

DPH Rule 511-6-1-.07 (2) (g) Walls and Ceilings, Attachments. (Cleanability)
Attachments such as light fixtures, ventilation components, fans, decorative items, etc., shall be easily cleanable (except In consumer areas, wall and ceiling surfaces, decorative items and attachments provided for ambiance, if items are kept clean).

DPH Rule 511-6-1-.07 (2) (h) Walls and Ceilings, Studs, Joists, and Rafters. (Cleanability)
These may not be exposed in areas subject to moisture (except temporary food establishments).

EMPLOYEE ACCOMMODATIONS

DPH Rule 511-6-1-.07 (4) (b) Designated Areas for Employee Activity. (Location and placement)
Areas designated for employees to eat, drink and use tobacco are located so that FEULSS (i.e., Food, Equipment, Utensils, Linens, Single-Service, and Single-Use Articles) are protected from contamination. Lockers or other suitable facilities shall be located in a designated room or area where contamination of FEULSS can not occur.

LIGHTING

Design and Construction:

DPH Rule 511-6-1-.07 (2) (i) Light Bulbs, Protective Shielding. (Functionality)
Shielded, coated or shatter-resistant in areas of exposed foods; clean equipment, utensils, and linens; or unwrapped single service/use articles (FEULSS) (except areas storing food in unopened packages, if the packaging would be unaffected by broken glass and capable of being cleaned of glass).
Infrared or headlamps have a shield surrounding and extending beyond the bulb so that only the face of the bulb is exposed.

LIGHTING

Numbers and Capacities:

DPH Rule 511-6-1-.07 (3) (f) Lighting Intensity. (Lighting)
10 foot candles measured 30 inches above the floor: walk-ins, dry food storage, and other areas during cleaning (e.g. dining).
20 foot candles measured at the surface for self-service areas such as buffets, salad bars, where fresh produce or packaged foods are offered; and inside equipment such as reach-in or under-counter

refrigerators; or measured 30 inches above the floor for areas used for handwashing, warewashing, equipment and utensil storage, and toilet rooms.
50 foot candles measured at the work surfaces when working with food, utensils or equipment where safety is a factor: knives, slicers, grinders, saws, etc.

VENTILATION

Design, Construction and Installation:

DPH Rule 511-6-1-.07 (2) (j) Heating, Ventilation, Air Conditioning System Vents.
Systems shall be designed and installed so that make-up air intake and exhaust vents do not contaminate food, food-contact surfaces, equipment or utensils.

Numbers and Capacities:

DPH Rule 511-6-1-.05 (3) (d) Ventilation Hood Systems, Adequacy. (Equipment)
Hood systems and devices shall be sufficient in number and capacity to prevent grease or condensation from collecting on walls and ceilings.

DPH Rule 511-6-1-.07 (3) (g) Mechanical Ventilation. (Rooms or areas)
If necessary, mechanical ventilation of sufficient capacity to remove excessive heat, steam, condensation, vapors, obnoxious odors, smoke and fumes.

VENTILATION

Design and Construction:

DPH Rule 511-6-1-.05 (2) (n) Exhaust Hood Ventilation Systems.
Exhaust hood systems in food preparation and warewashing areas and their components shall be designed to prevent grease or condensation from draining or dripping onto food, equipment, utensils, linens, and single service/use articles (FEULSS).

DPH Rule 511-6-1-.05 (2) (j) Ventilation Hood Systems, Filters. (Cleanability)
Filters or other grease extracting equipment shall be designed to be readily removable for cleaning and replacement if not designed to be cleaned in place.

PEST MANAGEMENT

Design, Construction and Installation:

DPH Rule 511-6-1-.07 (2) (k) Insect Control Devices, Design and Installation. (Functionality)
Devices that electrocute or stun flying insects shall be designed to retain the insect within the device and are not located over food preparation areas. Dead insects or insect fragments are prevented from being impelled or falling on exposed or clean FEULSS.

DPH Rule 511-6-1-.07 (2) (m) Outer Openings, Protected. (Functionality)
Outer openings shall be protected against the entry of vermin by: filling or closing holes and gaps along floors, walls, ceilings; tight-fitting windows; and solid, self-closing, tight-fitting doors, (except emergency

exit doors need not be self-closing, if designated by the fire protection authority and only used for emergency).

Or window and door openings are protected with 16 mesh screens, air curtain or other effective means. (Except openings into a mall, airport, office building or porch as long as these larger structures are protected against vermin, OR flying insects or pests are absent per location, weather, etc.)

DPH Rule 511-6-1-.07 (2) (n) Exterior Walls and Roofs, Protective Barrier (Functionality)
Shall effectively protect the establishment from weather and entry of other insects, rodents, and other animals.

WATER and PLUMBING

Water Supply:

DPH Rule 511-6-1-.06 (1)
Approved source, meeting quality Standards, Sampling, sufficient Capacity, Pressure, Hot Water*, and approved System ("primary").* ***P***

WATER and PLUMBING

Plumbing System:

DPH Rule 511-6-1-.06 (2) (a) Approved. (Materials)
System and hoses shall be constructed and repaired with approved materials according to Law. ***P*** *Water filter shall be made of safe materials.* ***Pf***

DPH Rule 511-6-1-.06 (2) (b) Approved System and Cleanable Fixtures. (Design, construction and installation)
Plumbing system ("secondary") shall be designed, constructed and installed according to law. ***P*** *Fixtures shall be easily cleanable.*

DPH Rule 511-6-1-.06 (2) (f) Conditioning Device, Design. (Design, construction and installation)
Filter, screen or other water conditioning device shall be designed to facilitate disassembly for servicing and cleaning. Water filter elements shall be a replaceable type.

WATER and PLUMBING

Plumbing System:

DPH Rule 511-6-1-.06 (2) (n) Conditioning Device, Location. (Location and placement)
Shall be located to facilitate disassembly for servicing and cleaning.

DPH Rule 511-6-1-.06 (2) (i) Service Sink, Numbers and Capacities.
At least one service sink or curbed unit with a floor drain shall be provided and conveniently located for mops, wet floor cleaning tools, and disposal of mop water and similar liquid waste.

Numbers and Capacities:

DPH Rule 511-6-1-.07 (3) (c) Handwashing Aids and Devices, Use Restrictions. (Handwashing facilities)
Food preparation, utensil washing, service/mop or curbed sinks may not be provided with handwashing aids and devices, as specified under DPH Rule 511-6-1-.07 (3) (a) and (b) and DPH Rule 511-6-1-.06 (5) (g) 3.

BACKFLOW PREVENTION and CROSS CONNECTIONS

Plumbing System:

DPH Rule 511-6-1-.06 (2) (d) Backflow Prevention, Air Gap. (Design, construction and installation)
An air gap between the supply inlet and the flood level rim of the plumbing fixture or food/nonfood equipment shall be at least twice the diameter of the supply inlet and may not be less than one inch. ***P***

DPH Rule 511-6-1-.06 (2) (e) Backflow Prevention Device, Design Standard. (Design, construction and installation)
Shall meet American Society of Sanitary Engineering (ASSE) standards for construction, installation, maintenance, inspection and testing for that specific application and device. ***P***

DPH Rule 511-6-1-.06 (2) (j) Backflow Prevention Device, When Required. (Numbers and capacities)
Plumbing system shall be installed to preclude backflow (solid, liquid or gas) into the water supply at each point of use, including on a hose bibb with or without an attached hose and is required by law by providing an air gap (under DPH Rule 511-6-1-.06 (2) (d)) or installing an approved backflow device (under DPH Rule 511-6-1-.06 (2) (e)). ***P***

DPH Rule 511-6-1-.06 (2) (k) Backflow Prevention Device, Carbonator. (Numbers and capacities)
A dual check valve with an intermediate atmospheric vent. ***P***

DPH Rule 511-6-1-.06 (2) (m) Backflow Prevention Device, Location (Location and placement)
Shall be located so that it may be serviced and maintained.

BACKFLOW PREVENTION and CROSS CONNECTIONS

Plumbing System: (continued)

DPH Rule 511-6-1-.06 (2) (p) Prohibiting a Cross Connection. (Operation and maintenance)
A person may not create a cross connection via a pipe or conduit between the drinking water and nondrinking water system or other unknown system. ***P*** *The piping of a nondrinking water system shall be durably identified so that it is readily distinguishable from the drinking water system.* ***Pf***

PLUMBING WASTE

Sewage, Other Liquid Waste, and Rain Water:

DPH Rule 511-6-1-.06 (4) (b) Establishment Drainage System. (Retention, drainage and delivery)
The drainage system and grease traps shall be designed and installed as specified under subsection 2 (b) 1 of this Rule.

DPH Rule 511-6-1-.06 (4) (c) Backflow Prevention. (Design, construction and installation)
A direct connection may not exist between the sewage system and a drain line from equipment in which food, equipment, or utensils (FEU) are placed.[P] *(Except if allowed by law, a warewashing machine may have a direct connection provided the drain line is connected to the inlet side of a properly vented floor drain trap located within 5 feet of the unit. Or if allowed by law, a warewashing or culinary sink may have a direct connection.)*

DPH Rule 511-6-1-.06 (4) (d) Grease Trap. (Location and placement)
If used, shall be located to be easily accessible for cleaning.

DPH Rule 511-6-1-.06 (4) (e) Conveying Sewage. (Operation and maintenance)
Shall be conveyed to the point of disposal through an approved sanitary sewage system or other system that is constructed, maintained, and operated according to law.[P]

DPH Rule 511-6-1-.06 (4) (h) Approved Sewage Disposal System. (Disposal facility, design and construction)
Disposed through an approved public sewage treatment plant, or an individual sewage disposal system that is sized, constructed, maintained and operated according to law.[P]

DPH Rule 511-6-1-.06 (4) (i) Other Liquid Wastes and Rainwater. (Design and construction)
Condensate and other nonsewage liquids and rainwater shall be drained from point of discharge to disposal according to law.

HANDSINKS

Plumbing System:

DPH Rule 511-6-1-.06 (2) (c) Handwashing Sink, Installation.
Shall be equipped to provide at least 100ºF (38°C) water through a mixing valve or combination faucet.[Pf] *Self-closing, slow-closing or metering faucet shall provide water for at least 15 seconds before having to be reactivated. A steam mixing valve may not be used at a handsink. Automatic handwashing facilities shall be installed per manufacturer's instructions.*

DPH Rule 511-6-1-.06 (2) (g) Handwashing Sink, Numbers and Capacities.
At least one lavatory but an adequate number for their convenient use by employees in areas specified under subsection (2) (l) of this Rule and not fewer than specified by law.[Pf] *(If approved and capable of removing types of soils encountered in food operations, automatic handwashing facilities may be substituted for handwashing lavatories that has at least one regular handwashing sink.)*

DPH Rule 511-6-1-.06 (2) (l) Handwashing Facilities, Location and Placement)
Shall be located to allow convenient use by employees in food preparation, food dispensing, and warewashing areas; and in or immediately adjacent to toilet rooms.[Pf]

DPH Rule 511-6-1-.06 (2) (o) Using a Handwashing Facility. (Operation and maintenance)
Shall be maintained so that it is accessible at all times for employee use and may not be used for purposes other than handwashing. [Pf] *An automatic handwashing facility shall be used in accordance with manufacturer's instructions.*

Numbers and Capacities:

DPH Rule 511-6-1-.06 (5) (g) Storage Areas, Rooms, and Receptacles, Capacity and Availability.
Shall be of sufficient capacity to hold refuse, recyclables, and returnables that accumulate. If disposable towels are used at handsinks, a waste receptacle shall be located at each handsink or group of adjacent handsinks.

DPH Rule 511-6-1-.07 (3) (a) Handwashing Cleanser, Availability.
*Each handsink or two adjacent handsinks shall be provided a supply of hand cleaning liquid, powder or bar soap.**Pf***

DPH Rule 511-6-1-.07 (3) (b) Hand Drying Provision.
*Each handsink or adjacent group shall be provided with individual disposable towels, a continuous towel system that supplies the user with a clean towel, or a heated-air hand drying device.**Pf***

TOILETS and URINALS

Plumbing System:

DPH Rule 511-6-1-.06 (2) (h) Toilets and Urinals, Numbers and Capacities.
Provision of toilets and urinals must meet applicable law. Toilets facilities must be provided for employees. For establishments permitted prior to July 31, 1995 and with dinning facilities, toilet facilities must be provided for the dinning public patrons without access through food service, preparation, storage, or warewashing areas. When not on the same premises, must be located within 200 feet of the establishment and be approved by the Health Authority.

Refuse, Recyclables and Returnables:

DPH Rule 511-6-1-.06 (5) (h) Toilet Room Receptacle, Covered.
Female restrooms shall be provided with a covered receptacle for sanitary napkins.

TOILETS and URINALS

Design, Constructed, and Installation:

DPH Rule 511-6-1-.07 (2) (l) Toilet Rooms, Enclosed.
Located on the premises shall be completely enclosed and provided with a tight-fitting, self-closing door (except toilet rooms located outside the food establishment and do not open directly into the facility, i.e. a shopping mall).

EQUIPMENT

Design and Construction:

DPH Rule 511-6-1-.05 (2) (jj) Food Service Equipment, Acceptability.

Food equipment that is certified or classified for sanitation by an ANSI (American National Standards Institute) -accredited certification program will be deemed to comply with subsections (1) and (2) of Rule -.05.

Materials:

DPH Rule 511-6-1-.05 (1) (a) General Requirements.
Materials used in utensils and equipment, food-contact surfaces may not allow the migration of deleterious substances or impart colors, odors, or tastes to food and under normal use shall be: ***[P]*** *safe;* ***[P]*** *(durable, corrosion-resistant and nonabsorbent); sufficient in weight and thickness to withstand repeated warewashing; smooth, easily cleanable surface; and resistant to pitting, chipping, crazing, scratching, scoring, distortion and decomposition.*

DPH Rule 511-6-1-.05 (1) (b) Cast Iron, Use Limitation. (Multiuse)
May be used as a cooking surface or serving utensils only as part of an uninterrupted process from cooking through service.

EQUIPMENT

Materials: (Continued)

DPH Rule 511-6-1-.05 (1) (c) 1**[P]**. Lead in Ceramic, China, and Crystal Utensils, Use Limitation. (Multiuse)

LEAD LIMITATIONS: Ceramic, China & Crystal	Hot Beverage or Coffee Mugs	Maximum Lead: 0.5 ppm or mg/L
	Large Hollowware, bowls ∃ 1.16 qts or 1.1 L	1.0 ppm or mg/L
	Small Hollowware, bowls < 1.16 qts or 1.1 L	2.0 ppm or mg/L
	Flat Utensils, plates & saucers etc.	3.0 ppm or mg/L
Pewter Alloys used as a food contact surface		.05%
Solder & Flux used as a food contact surface		.2%

DPH Rule 511-6-1-.05 (1) (c) 2.**[P]** Lead in Pewter Alloys, Use Limitations. (Multiuse)
DPH Rule 511-6-1-.05 (1) (c) 3. Lead in Solder and Flux, Use Limitations. (Multiuse)

DPH Rule 511-6-1-.05 (1) (d) Copper, Use Limitation. (Multiuse) (Includes brass)
May not be used for foods with a pH < 6.0 such as vinegar, fruit juice, wine, etc., {except for the prefermentation and fermentation steps of a beer brewing operation} or for a water supply line between a carbonator and backflow preventer. ***[P]***

DPH Rule 511-6-1-.05 (1) (e) Galvanized Metal, Use Limitations. (Multiuse)
May not be used in contact with acidic food. **[P]**

DPH Rule 511-6-1-.05 (1) (f) Sponges, Use Limitation. (Multiuse)
May not be used in contact with cleaned and sanitized or in-use food contact surfaces.

DPH Rule 511-6-1-.05 (1) (g) Wood, Use Limitations. (Multiuse)

Wood and wood wicker may not be used as a food contact surface.
Except:
1. *Hard maple or equivalently hard, close-grained wood may be used for cutting boards and blocks, bakers' tables, and utensils such as rolling pins, doughnut dowels, salad bowls and chopsticks;*
2. *Wooden paddles for pressure scraping kettles in confectionery operations with products reaching at least 230ºF (110ºC).*
3. *Whole uncut raw fruit and vegetables, and unshelled nuts may be kept in the original wooden shipping container.*
4. *Whole, uncut, raw foods requiring the removal of rinds, peels, husks, or shells may be kept in untreated wood containers or treated wood as specified in 21 CFR 178.3800 Preservatives for Wood.*

DPH Rule 511-6-1-.05 (1) (h) Nonstick Coatings, Use Limitation. (Multiuse)
Cooking surfaces that have a perfluorocarbon resin coating shall be used with nonscoring or nonscratching cleaning aids.

EQUIPMENT

Materials: (continued)

DPH Rule 511-6-1-.05 (1) (i) Nonfood-Contact Surfaces. (Multiuse)
Equipment surfaces exposed to splash, spillage, or other food soiling or require frequent cleaning shall be constructed of a corrosion-resistant, nonabsorbent, smooth material.

Design and Construction:

DPH Rule 511-6-1-.05 (2) (h) Nonfood-Contact Surfaces. (Cleanability)
Free of unnecessary ledges, projections, and crevices and designed and constructed for ease of cleaning and facilitate maintenance.

DPH Rule 511-6-1-.05 (2) (a) Equipment and Utensils. (Durability and Strength)
Durable and retain their characteristic qualities under normal use.

DPH Rule 511-6-1-.05 (2) (c) Multiuse Food-Contact Surfaces. (Cleanability)
Multiuse food-contact surfaces shall be smooth; free of breaks, open seams, cracks, chips, pits, and similar imperfections; free from sharp internal angles, corners, and crevices; finished to have smooth welds and joints; and accessible for cleaning and inspection without being disassembled, disassembled without tools or easy disassembly with the use of handheld tools commonly available such as screwdrivers, pliers, open-end wrenches, and Allen wrenches.[Pf]

(Except cooking oil storage tanks, cooking oil distribution lines, or beverage syrup lines or tubes.)

DPH Rule 511-6-1-.05 (2) (d) CIP Equipment (Cleanability)
Meet the characteristics as specified under DPH Rule 511-6-1-.05 (2) (c) and designed and constructed so that cleaning and sanitizing solutions circulate throughout a fixed system and contact all interior food contact surfaces.[Pf] *The system is self-draining or capable of being completely drained of cleaning and sanitizing solutions. CIP equipment not designed to be disassembled for cleaning shall be designed with inspection access points to ensure that all interior food-contact surfaces are being effectively cleaned.*

DPH Rule 511-6-1-.05 (2) (e) "V" Threads, Use Limitation. (Cleanability)
May not be used, (Except hot oil cooking or filtering equipment.)

DPH Rule 511-6-1-.05 (2) (f) Hot Oil Filtering Equipment. (Cleanability)
Meet the characteristics as specified under DPH Rule 511-6-1-.05 (2) (c) and DPH Rule 511-6-1-.05 (2) (d) and shall be readily accessible for filter replacement and cleaning of the filter.

DPH Rule 511-6-1-.05 (2) (g) Can Openers. (Cleanability)
Cutting or piercing parts shall be readily removable for cleaning and replacement.

DPH Rule 511-6-1-.05 (2) (i) Kick Plates, Removable. (Cleanability)
Shall be designed so that areas behind them are accessible for inspection and cleaning by: being removable without disassembly, disassembled w/o tools or w/ commonly available tools as specified under DPH Rule 511-6-1-.05 (2) (c) 1. (v), OR capable of being rotated or removed without unlocking equipment doors.

EQUIPMENT

Design and Construction: (continued)

DPH Rule 511-6-1-.05 (2) (0) Equipment Openings, Closures and Deflectors. (Functionality)
Equipment cover or lid shall overlap the opening and slope to drain.
Within the top of the unit: opening shall be flanged upward at least 5mm.
Piping, shafts or other parts extending into equipment shall be provided with a water tight joint at the point of entry into the equipment or the openings shall be flanged and equipped with an apron designed to deflect condensation, drips and dust from the food.

DPH Rule 511-6-1-.05 (2) (p) Dispensing Equipment, Protection of Equipment and Food. (Functionality)
Dispenses or vends liquid food or unpackaged ice: for self-service, the actuating lever shall be designed to prevent contact with the lip-contact surface of a container being refilled. The delivery tube, chute or orifice shall be designed so that drips from condensation and splash are diverted from the opening of the receiving container; protected from manual contact such as being recessed; designed to prevent contact with the lip-contact surface of a container being refilled; and protected from dust, vermin, and other contamination by a self-closing door if: located outside and does not otherwise afford protection against the environment, OR not always under the full-time supervision of a food employee.

DPH Rule 511-6-1-.05 (2) (r) Bearings and Gear Boxes, Leakproof. (Functionality)
Equipment requiring lubricants shall be designed and constructed so that lubricant can not leak, drip, or be forced into or onto food-contact surfaces.

DPH Rule 511-6-1-.05 (2) (s) Beverage Tubing, Separation. (Functionality)
Beverage tubing and cold-plates may not be stored in contact with stored ice. (Except ice bins with integral cold-plates, i.e., cold-plates built in as part of the ice bin.)

DPH Rule 511-6-1-.05 (2) (t) Ice Units, Separation of Drains. (Functionality)
Waste lines may not pass through an ice machine or ice bin.

DPH Rule 511-6-1-.05 (2) (u) Condenser Unit Separation. (Functionality)

If a condenser is an integral component of equipment, the condenser unit shall be separated from food and food storage space by a dust proof barrier.

DPH Rule 511-6-1-.05 (2) (v) <u>Molluscan Shellfish Tanks. (Functionality)</u>
*Conspicuously marked for display only – not for human consumption.**P** (Except if a variance is granted with a HACCP plan that: retains source identity of shellstock; does not compromise the safety and quality of the shellfish, and the water is not circulated through other fish tanks.)**Pf***
Note: See Part-I, Section E entitled, "Facilities to Protect Food", subsection III 11 "Molluscan Shellfish Tanks Life Support Systems" within Georgia's Food Service Manual for Design, Installation and Construction for more information.

DPH Rule 511-6-1-.05 (2) (ff) <u>Equipment Compartments, Drainage. (Functionality)</u>
Equipment compartments subject to accumulation of moisture (condensation, food or beverage drip, melting ice) shall be sloped to an outlet that allows complete draining.

<u>EQUIPMENT</u>

<u>Design and Construction</u>: (continued)

DPH Rule 511-6-1-.05 (2) (x) <u>Temperature Measuring Devices. (Functionality)</u>
*Air temperature measuring device sensors for mechanically refrigerated or hot food storage units shall be located in the warmest part for refrigeration and the coldest part for hot food storage. Equipment for potentially hazardous foods shall be equipped with at least one easily readable, and viewable, integral or permanently affixed Temperature Measuring Devices (Except where not practical, such as calrod units, heat lamps, cold plates, bain-marie, steam tables, salad bars, and insulated transport containers).Food Temperature Measuring Devices s and Water Temperature Measuring Devices on warewashing machines shall have a numerical scale, printed record, or digital readout in increments no greater than 1ºC or 2ºF.**Pf***

<u>Numbers and Capacities</u>:

DPH Rule 511-6-1-.05 (3) (a) <u>Cooling, Heating, and Holding Capacities. (Equipment) (Capacity to maintain or achieve temperature)</u>
*Equipment shall be sufficient in number and capacity to provide food temperatures as specified under DPH Rule 511-6-1-.04.**Pf***

<u>Location and Installation</u>:

DPH Rule 511-6-1-.05 (4) (a) <u>Equipment, Clothes Washers and Dryers, and Storage Cabinets, Contamination Prevention. (Location)</u>
Equipment or a cabinet for the storage of Food, Equipment, Utensils, Linins, Single-Service and Single-Use articles (FEULSS) may not be located in: locker rooms; toilet rooms; garbage rooms; mechanical rooms; under unshielded sewer lines; under any leaking or condensate dripping water lines; under open stairwells; or under other sources of contamination. (Except a storage cabinet used for Linins, Single-Service and Single-Use Articles may be stored in a locker room.) A clothes washer or dryer, if provided, shall be located to protect washer and dryer from contamination and to protect FEULSS from contamination.

DPH Rule 511-6-1-.05 (4) (b) Fixed Equipment, Spacing or Sealing. (Installation)
Equipment not easily movable (defined as: not mounted on casters, gliders, rollers, or a mechanical means to safely tilt for cleaning, and a nonflexible utility connection line) shall be: spaced to facilitate cleaning along the sides, behind and above; or not spaced more than 1mm from adjoining surfaces (equipment, walls, ceilings); or sealed to adjoining equipment or walls if the equipment is exposed to spillage or seepage.

Table-mounted equipment: shall be installed to facilitate cleaning of the unit and areas under and around it by being sealed to the table or elevated on legs as specified under DPH Rule 511-6-1-.05 (4) (b) 2. (ii).

EQUIPMENT

Location and Installation: (continued)

DPH Rule 511-6-1-.05 (4) (c) Fixed Equipment, Elevation or Sealing. (Installation)
Floor equipment not easily movable shall be sealed to the floor or on legs providing at least a 6 inch clearance above the floor. (Except the clearance may be only 4 inches, if no part under the unit is no further than 6 inches from cleaning access points.) (This section does not apply to consumer areas with display shelving, refrigeration units, or freezers, IF the floor underneath is maintained clean.)

Table-mounted equipment not easily movable shall be on legs providing at least a 4 inch clearance above the table (except the clearance may be only 3 inches, if no part of under the unit is no further than 20 inches from cleaning access points OR a 2 inch clearance for up to a 3 inch reach for cleaning).

WAREWASHING

Numbers and Capacities:

DPH Rule 511-6-1-.05 (3) (b) Manual Warewashing, Sink Compartment Requirements. (Equipment)
At least 3 compartments for manual washing, rinsing, and sanitizing that are large enough to accommodate immersion of the largest equipment and utensils. Equipment that is too large, a warewashing machine shall be used or ***Pf*** *…*
(Alternative manual warewashing may be used if approved for special cleaning needs or constraints that may include: high-pressure detergent sprayers; low- or line-pressure spray detergent foamers; other task-specific cleaning equipment; brushes or other implements; or receptacles that substitute for the compartments of a multicompartment sink.)

DPH Rule 511-6-1-.05 (3) (c) Drainboards. (Equipment)
Drainboards, utensil racks, or tables shall be large enough to accommodate all soiled items before cleaning and cleaned items after sanitizing as they accumulate during hours of operation.

WAREWASHING

Design and Construction:

DPH Rule 511-6-1-.05 (2) (ee) Warewashing Sinks and Drainboards, Self Draining. (Functionality)
Sinks and drainboards of warewashing sinks and machines shall be self draining.

DPH Rule 511-6-1-.05 (2) (aa) Warewashing Machines, Temperature Measuring Devices. (Functionality)
Shall be equipped with a temperature measuring device that indicates the temperature of the water in each wash and rinse tank; and as the water enters the hot water sanitizing final rinse manifold or in the chemical sanitizing solution tank.

WAREWASHING

Design and Construction: (Continued)

DPH Rule 511-6-1-.05 (2) (cc) Warewashing Machines, Automatic Dispensing of Detergents and Sanitizers. (Functionality)
Chemical sanitization units installed after the adoption of this code shall be equipped with an audible or visual "low level" sanitizer indicator as to when to add more sanitizer.[Pf]

DPH Rule 511-6-1-.05 (2) (dd) Warewashing Machines, Flow Pressure Device. (Functionality) pg 101
A fresh hot water sanitizing rinse shall be equipped with a pressure gauge or similar device that measures and displays water pressure in the supply line immediately before entering the warewashing machine and if the device is upstream of the fresh hot water sanitizing rinse control valve, the device shall be mounted in a one-fourth inch Iron Pipe Size valve.
These requirements do not apply to a machine that uses only a pumped or recirculated sanitizing rinse.

REFUSE, RECYCLABLES, AND RETURNABLES (RR&R)

Refuse, Recyclable and Returnables:

DPH Rule 511-6-1-.06 (5) (d) Receptacles. (Facilities on the premises, materials, design and installation)
Receptacles and waste handling units for refuse, recyclables and returnables (RR&R) containing food residue shall be durable, cleanable, vermin resistant, leakproof and nonabsorbent. (Except plastic or wet strength paper bags may be used to line receptacles indoors or outdoors in closed receptacles.)

DPH Rule 511-6-1-.06 (5) (g) Storage Areas, Rooms, and Receptacles, Capacity and Availability. (Numbers and capacities)
Shall be of sufficient capacity to hold RR&R that accumulate and a receptacle shall be provided in each area where refuse is generated or commonly discarded, or recyclables or returnables are placed. If disposable towels are used at handwashing lavatories, a waste receptacle shall be located at each lavatory or group of adjacent lavatories.

DPH Rule 511-6-1-.06 (5) (h) Toilet Room Receptacle, Covered. (Numbers and capacities)
Female restrooms shall be provided a covered receptacle for sanitary napkins.

DPH Rule 511-6-1-.06 (5) (i) Cleaning Implements and Supplies. (Numbers and capacities)
Suitable cleaning implements and supplies shall be provided as necessary for effective cleaning of receptacles and waste handling units for RR&R. (Except if approved, off premise cleaning services may be used).

REFUSE, RECYCLABLES, AND RETURNABLES (RR&R)

Refuse, Recyclable and Returnables: (continued)

DPH Rule 511-6-1-.06 (5) (j) Storage Areas, Redeeming Machines, Receptacles and Waste Handling Units, Location. (Location and placement)
Areas designated for RR&R and redeeming machines shall be separate from food, equipment, utensils, linens, and single service/use articles (FEULSS) and may not create a public health hazard or nuisance or interfere with cleaning of adjacent space. (Except a redeeming machine may be located in the packaged food area or consumer area if FEULSS are not subject to contamination and a public health hazard or nuisance is not created.)

DPH Rule 511-6-1-.06 (5) (k) Storing Refuse, Recyclables, and Returnables. (Operation and maintenance)
Shall be stored in receptacles or waste handling units that are inaccessible to vermin.

DPH Rule 511-6-1-.06 (5) (n) Covering Receptacles. (Operation and maintenance)
Receptacles and waste handling units for RR&R shall be kept covered:
Inside: if they contain food residue and are not in continuous use, and
Outside: with tight fitting lids or doors.

OUTDOOR AREAS

Materials for Construction and Repair:

DPH Rule 511-6-1-.07 (1) (b) Outdoor Surfaces.
Walking and driving areas shall be surfaced to minimize dust, facilitate maintenance and prevent muddy conditions. Exterior surfaces of buildings shall be weather resistant and comply with law.

Design, Construction and Installation:

DPH Rule 511-6-1-.07 (2) (p) Outdoor Walking and Driving Surfaces, Graded to Drain. (Functionality)
Exterior walking and driving surfaces shall be graded to drain.

DPH Rule 511-6-1-.07 (2) (q) Outdoor Refuse Areas, Curbed and Graded to Drain (Functionality)
Constructed in accordance with law. Curbed and graded to drain to collect and dispose of liquid refuse waste and from cleaning the area and waste receptacles.

OUTDOOR AREAS

Refuse, Recyclables and Returnables:

DPH Rule 511-6-1-.06 (5) (b) Outdoor Storage Surface. (Materials, design, construction and installation)
Constructed of nonabsorbent material such as concrete or asphalt and shall be smooth, durable and sloped to drain.

DPH Rule 511-6-1-.06 (5) (c) Outdoor Enclosure. (Materials, design, construction and installation)
If used, shall be constructed of durable and cleanable material.

DPH Rule 511-6-1-.06 (5) (f) Outside Receptacles. (Materials, design, construction and installation)
Containing food residue and used outside shall be designed and constructed to have tight fitting lids, doors or covers.

Compactors shall be installed so that the accumulation of debris and vermin attraction and harborage are minimized. Effective cleaning is facilitated around the unit, and under the unit, if not installed flush with the base pad.

DPH Rule 511-6-1-.06 (5) (m) Outside Storage Prohibitions. (Operation and maintenance)
Receptacles that are not rodent-resistant or baled units that contain materials with food residue may not be stored outside. (Except cardboard or other packaging material not containing food residue may be stored outside for regular pick up or disposal in an uncovered receptacle provided it does not create a rodent harborage problem.)

FIGURE M-1

Drilled Wells

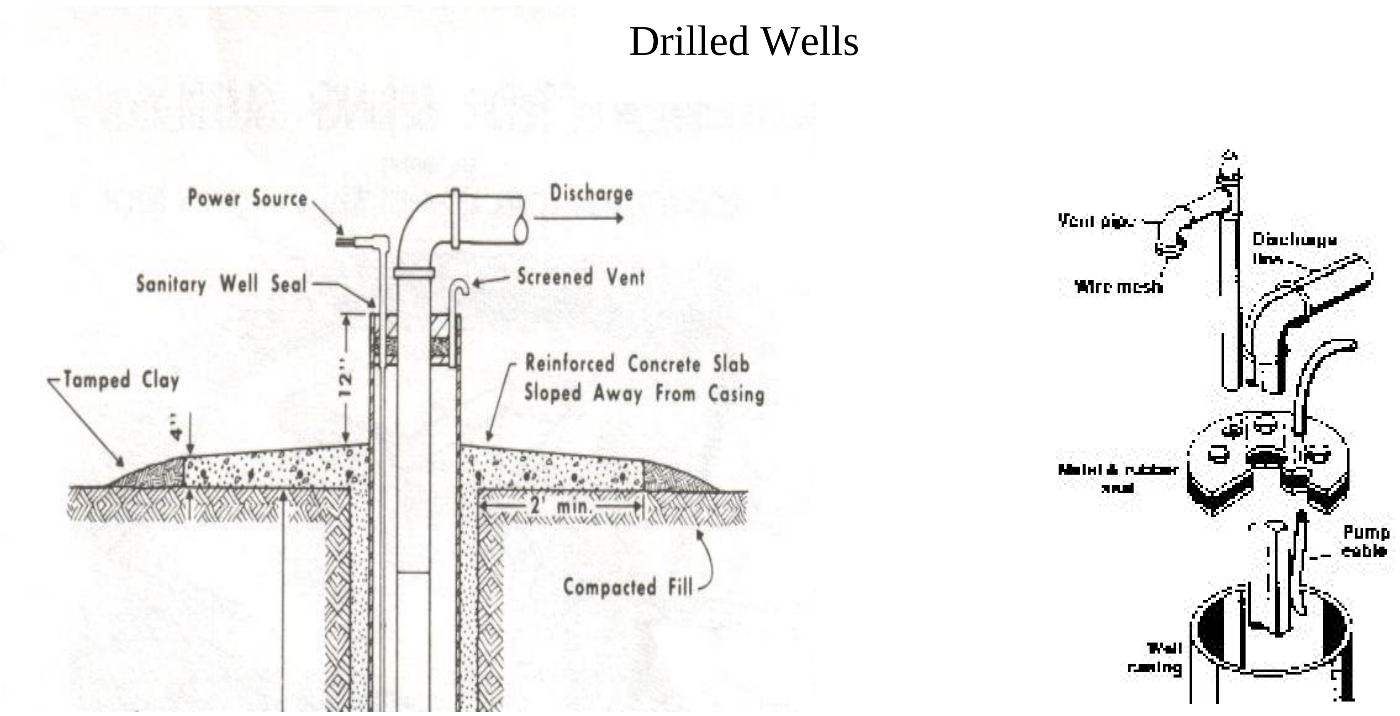
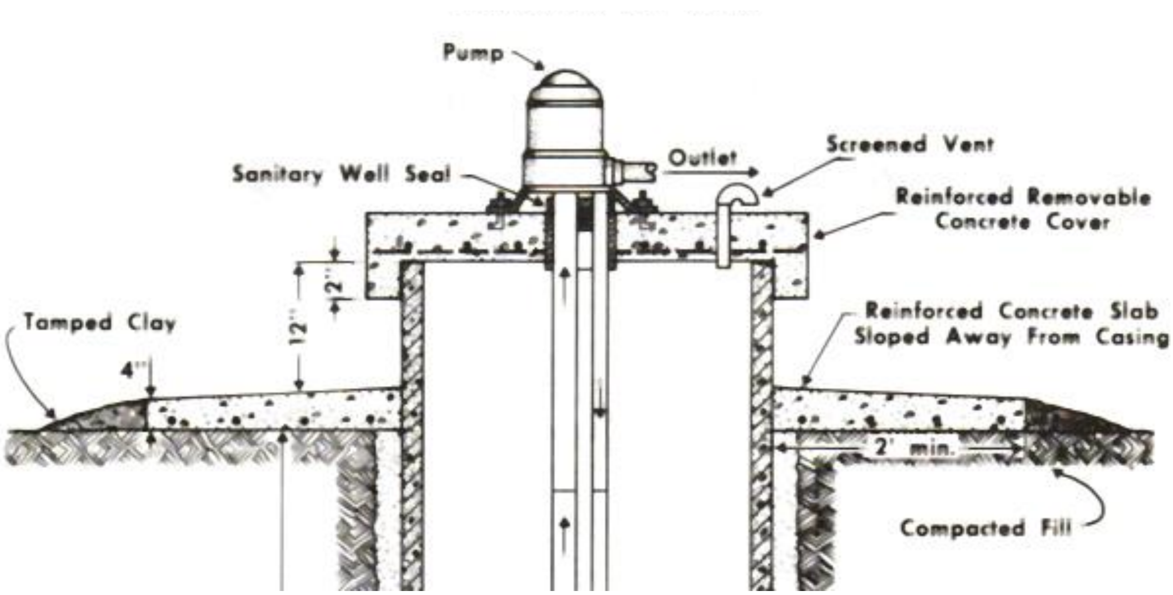


FIGURE M-2

Bored Wells



Interpretation of Memorandum of Understanding for Non-Public Water Supplies

Question: What is a non-public water well?

Non-public water well is defined as any well constructed as a source of water supply for a water system which provides piped water to the public for human consumption, if such a system has less than 15 service connections or regularly serves less than 25 individuals, excluding individual water wells.

Question: What is a non-public health department regulated well?

A non-public health department regulated well has gone through the review process for the Memorandum Understanding for Non-Public Water Supplies and therefore falls under the regulating authority of the local county health department (i.e., local Health Authority).

Question: Within the MOU, what is the difference between new facilities and existing facilities?

New facilities include:

- Any proposed facility construction with a proposed construction of a water supply
- system.
- Any constructed facility with a proposed construction of a water supply system
- Any constructed facility with a constructed water supply system that is not permitted by EPD or approved by the local health departments.

Water supply systems determined by EPD to be non-public water systems, that are unapproved by local health departments must be remediated under the guidance of the local health department or replaced. If replaced, the new water well must comply with the guidelines of the MOU for Non-Public Water Systems Review Process for new facilities.

Question: What are the sampling criteria for non-public water supplies regulated through the health department?

1. Sampling compliance with the Sampling Requirements for Non-Public Water Supplies
   a. Initial sampling must meet all acceptable MCLs and be negative for the presence of total/fecal coliforms prior to the approval of the water supply.
2. Inorganic chemical specified in the Review Process for Non-Public Water Supplies are sampled annually.
   a. Concentrations exceeding recommended MCLs that pose a public health threat will result in the disapproval of the water supply and the facility should be closed.

MCLs that pose a public health threat include the following:

pH, Alkalinity (as CaCO3), Hardness (as CaCO3), Carbon dioxide, Zink, Chloride, Iron, Nitrate (as N), Nitrite(as N), Total Nitrate and Nitrite (as N), Total Dissolved Solids, Turbidity (NTUs), Manganese, Color (color units), Sulfate

3. Total/fecal coliform sampling is quarterly

a. A positive total or fecal coliform sample will require re-sampling within 24 hours to confirm the results of the original sample. If the second sample is positive for the presence of total or fecal coliform, the water supply will be considered disapproved and the facility should be closed. Disinfecting of the well should be initiated to disinfect the water supply and water supply system. There may be a possibility for the facility to continue to operate if an alternative source of potable water can be provided and is granted approval by the District Medical Director. An alternative water supply shall not be used for more than 7 days.
b. After disinfecting the well, a sample will be taken and analyzed for the presence of total/fecal coliform. Another sample will be taken in 30 days and analyzed for the presence of total/fecal coliform.
c. It is recommended that at least one sample be taken by the county environmentalist during the year at the time of the routine inspection of the facility and analyzed for the presence of total/fecal coliform.

Question: What steps should be taken if a non-public regulated well gets a positive result on the total/fecal coliform test?

If a water supply system yields a water sample positive for total or fecal coliform, the local county health department should return immediately to take another sample from the water system prior to chlorination. The chlorine residual should be tested first, prior to sampling to avoid a false negative result. If the second water sample is positive for total or fecal coliform, then the well should be disinfected following Chlorination Instructions for Non-Public Water Systems, the water supply will be considered disapproved, and the facility should be closed.

Question: Is it possible to use an alternate water source rather than closing the facility?

Acceptable alternative sources of potable water may be another water well that is approved by EPD or the local health department and in compliance with sampling requirements. Any other sources of potable water used to operate the facility must be approved by the District Medical Director.

Question: What steps should be taken if a second sample comes back positive for total/fecal coliform?

If after disinfection, a water sample is positive for total or fecal coliform; the water supply will be considered disapproved. The water supply system should be remediated or replaced by a licensed well contractor with guidance from the local health department. Note that any proposed well construction must start from the beginning of the review process for the Non-Public Water Systems outlined in the MOU – that is, first obtain a letter from EPD stating the water system is not a Public Water System.

Question: If I am installing a new well that will be serving a restaurant, at what point should I alert the County Health Department?

As with all new well installations, the local county health department must receive notification (Intent to Drill Form) from the water well contractor prior to drilling or construction of the well. The local health department must contact the EPD Regional Office. If the EPD Regional Office determines that the proposed water system is or will be a non-public water system, then the following information must be submitted to the local county health department for review.

Question: Where in Georgia Code does it require well drillers to contact the health department prior to construction?

OCGA 12-5-134 Standards for wells and boreholes

(1) In the case of individual and non-public water wells

(A) (i) The well should be located as far removed, and in a direction opposite to the ground-water flow, from known or potential sources of pollutants as a the general layout of the premises and surroundings permits; however, *prior to actual construction, the water well contractor shall* ***notify the county health department of the intent to drill*** *a water well, providing such information as is required on forms prepared by the council*. The well shall not be located in areas subject to flooding unless the well casing extends at least two feet above the level of the highest known flood of record. Except as otherwise provided in division (ii) of this subparagraph, all new wells must be located at least the following horizontal distances from the following structures:

i. Not less than ten feet from a sewer line
ii. Not less than 50 feet from a septic tank
iii. Not less than 100 feet from a septic tank absorption field
iv. Not less than 150 feet from a cesspool or seepage pit, and
v. Not less than 100 feet from an animal or fowl enclosure

Question: What exactly does the review process for non-public water supplies include?

Review Process for Non-Public Water Supply

1. A letter from EPD stating the water system is not a Public Water System
2. A map showing the geographical location of the project, location of the governmentally owned and operated public water system closest to the site, and a layout of the proposed facilities showing the location of the proposed well(s), storage tank(s) water treatment facilities, etc., as applicable must be included. Connection shall be made to a public water system when such system is available within two hundred feet of the property line through a public access easement.

3. If the owner of the water system is other than the owner of the establishment, submit a business plan, contract, or trust agreement as needed which adequately addresses the source and amount of water provided.
4. For new facilities, a drilled well meeting the construction requirements established under the most current Rules for Safe Drinking Water is required. Engineering plans and specifications for the proposed water supply system, prepared by a professional engineer licensed to practice in the State of Georgia, may be required for review and approval.
5. For new facilities, a Well Data Sheet for each source, completed and signed by a water well contractor licensed to construct wells in the State of Georgia must be submitted for review.
6. Each new water system must be metered at the facility
7. For existing facilities, a sanitary survey of the existing constructed facilities must be made by a water well contractor, licensed in the State of Georgia, or county environmental health specialist to evaluate the well construction and protection.
8. Physical and chemical "screening" of the untreated water from each water source (well) must be performed for the following parameters by an approved water laboratory, and a copy of the results provided to the local health department. (EPD Test W-33).
9. At least one untreated water sample must be collected from each source and submitted to an approved water laboratory for microbiological analyses. (Total and Fecal Coliform). A copy of the results must be submitted to the local health Department.
10. Physical and chemical sampling must be performed annually. Microbial sampling must be performed quarterly. Sample results shall be submitted to the county health department. Failure to meet physical, chemical or microbial potable water standards will result in disapproval of the water supply for use in foodservice establishments, tourist facilities or public swimming pools.

UGA Cooperative Extension Test W-33

TEST W-33 ITEMS WANTED	MAXIUM CONTAMINANT LEVEL (mg/l)	FREQUENCY OF TESTING
* pH	<6.5	annually
phosphorus (P)	-	annually
Potassium (K)	-	annually
Calcium (Ca)	-	annually
Magnesium (Mg)	-	annually
* Manganese (Mn)	0.05	annually
* Iron (Fe)	0.3	annually
Aluminum (Al)	0.05-0.2	annually
Boron (B)	-	annually
Copper (Cu)	1	annually
* Zinc (Zn)	5	annually
Sodium (Na)	-	annually
Chromium (Cr)	0.01	annually
Cadmium (Cd)	0.005	annually
Nickel (Ni)	0.1	annually
Molybdenum (Mo)	-	annually
*Hardness	-	annually
* Sulfate (SO_4)	250	annually
* Nitrate (NO_3)	45	annually
* Chloride (Cl)	250	annually
Soluble Salts		annually
* Alkalinity	-	annually
* Carbon dioxide (CO_2)	-	annually
* Nitrate – Nitrogen (NO_3-N)	10	annually
* Nitrite – Nitrogen (NO2-N)	1	annually
* TDS (Total Dissolved Solids)	500	annually
* Color	15 color units	annually
* Turbidity	5 units	annually
* Total Nitrate ($NO_{3+}NO_2$ as N)	10 (as N)	annually
* Total Coliform	presence or absence	quarterly
* Fecal Coliform	presence or absence	quarterly

“DHR Biological Testing Memorandum”

SAMPLING REQUIREMENTS

NON-PUBLIC WATER SUPPLY

Samples will be taken at the facility. Samples shall be submitted to and analyzed by an approved laboratory.

> The University of Georgia laboratory available through the county extension office may perform inorganic (W-33) analysis.
>
> The County Health Department may conduct Total Fecal Coliform analysis.

Initial Sampling must meet all acceptable MCLs and be negative for the presence of total fecal coliforms prior to the approval of the water supply.

<u>Compliance Sampling</u>

Inorganic chemicals specified are sampled annually.

> Concentrations exceeding recommended MCLs that pose a public health threat will result in the disapproval of the water supply and the facility should be closed.

Total Fecal Coliform sampling is quarterly.

> A positive total or fecal coliforms sample will require re-sampling within 24 hours to confirm the results of the original sample. If the second sample is positive for the presence of total or fecal coliforms, the water supply will be considered disapproved and the facility should be closed. Disinfecting of the well should be initiated to disinfect the water supply and water supply system. There may be a possibility for the facility to continue to operate if an alternative source of potable water can be provided and is granted approval by the District Medical Director. An alternative water supply shall not be used for more than 7 days.
>
> After disinfecting the well, a sample will be taken and analyzed for the presence of total fecal coliform. Another sample will be taken in 30 days and analyzed for the presence of total fecal coliform.
>
> As part of the quarterly sampling requirement, the Department recommends that at least one sample be taken by the county environmentalist during the year at the time of routine inspection of the facility and analyzed for the presence of total / fecal coliform.

Appendix-O:

Grease Traps

A Reference Document for Planning and Reviewing Grease Disposal Systems for Food Service Establishments

Georgia Department of Public Health

Environmental Health Section
(404) 657-6534
www.georgiaeh.us

Appendix-O entitled, “Grease Traps”, is an excerpt originating from Section D – Pretreatment found within the Manual for On-Site Sewage Management Systems referenced within Rules of Department of Public Health Chapter 511-3-1 On-Site Sewage Management Systems. It is provided as a reference in the design and installation of grease traps to service food service establishments with either septic tank/drainfield, or public sewer method of sewage disposal. However, if sewage disposal will be provided by a public sewer system, applicable local codes of the city or county government having jurisdiction over the food service establishment will prevail.

For more information, go to the Georgia Department of Public Health’s environmental health website’s Land Use Program Page located at www.georgiaeh.us. Further, the local county health department in the county in which the proposed establishment will be located may be contacted for consultation as well.

FIGURE P-1

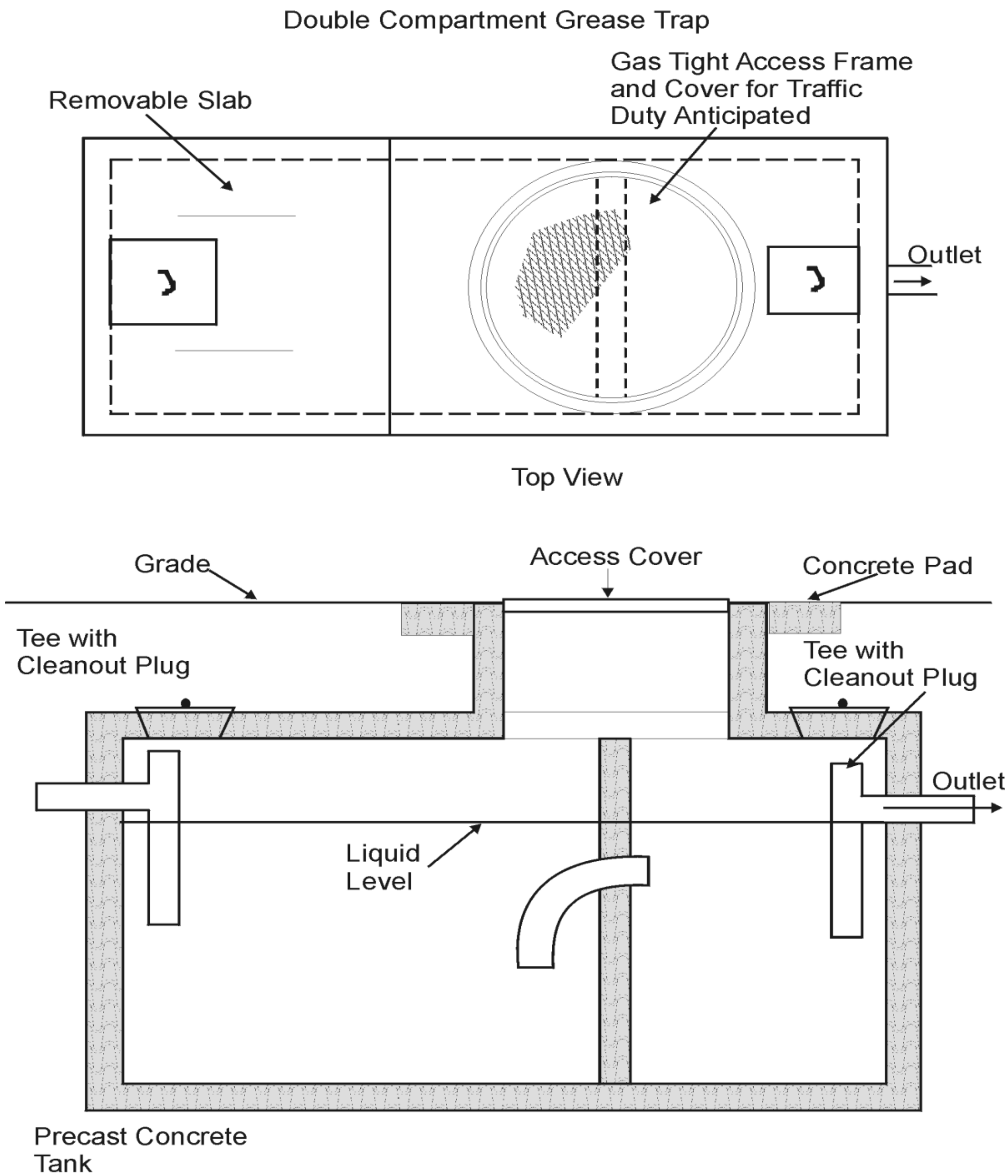
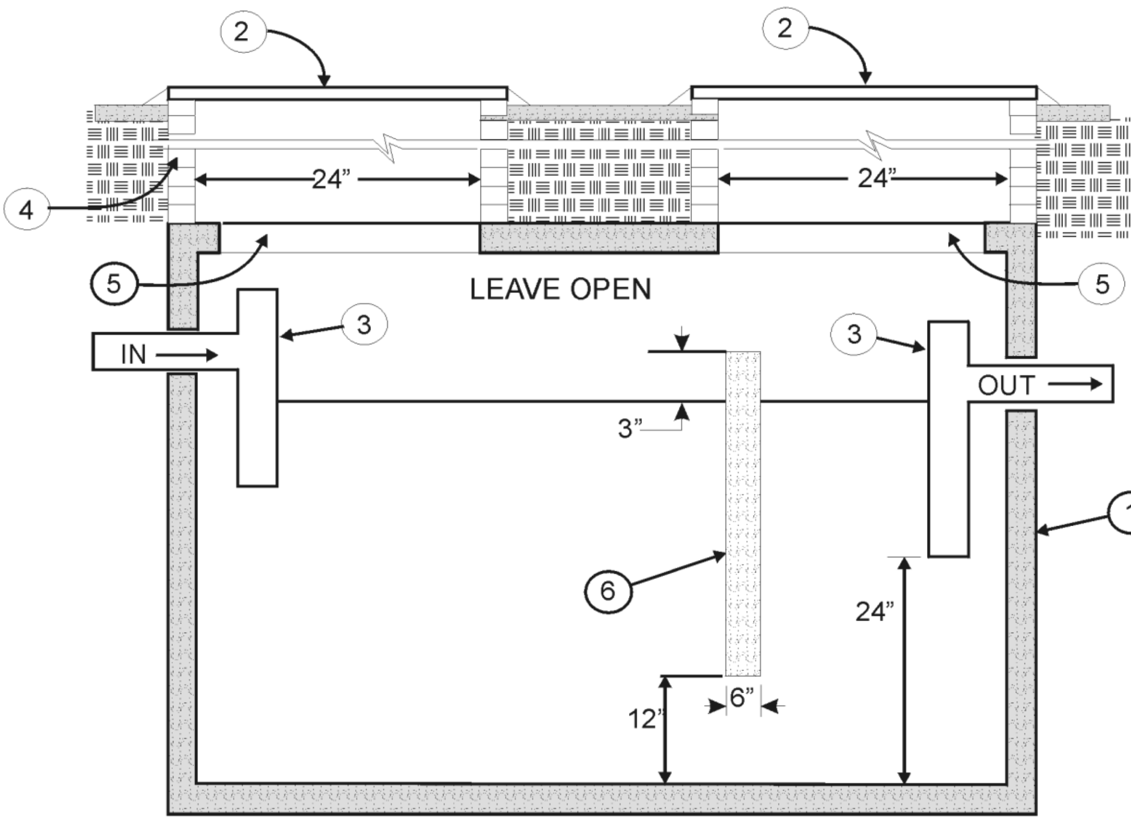

Double Compartment Grease Trap
Removable Slab
Gas Tight Access Frame and Cover for Traffic Duty Anticipated
Outlet
Top View
Grade
Access Cover
Concrete Pad
Tee with Cleanout Plug
Tee with Cleanout Plug
Outlet
Liquid Level
Precast Concrete Tank

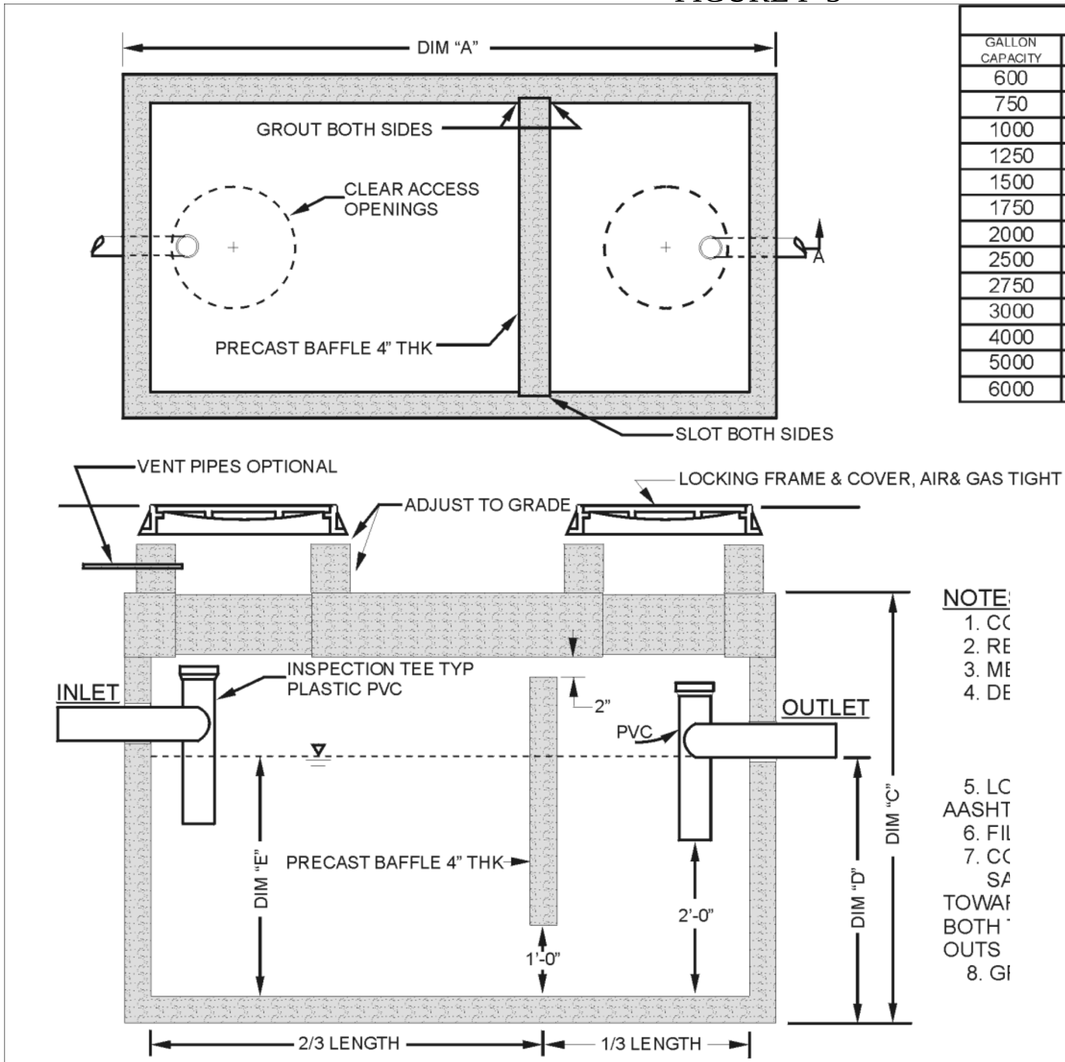
FIGURE P-2

STANDARD DESIGN GREASE INTERCEPTOR



1. PRECAST TANK, _________ GALLONS.
2. MANHOLE TOP AND RING, ONE OVER EACH SECTION.
3. PIPE AND FITTINGS OF APPROVED MATERIALS (SCHEDULE 40 PVC - MINIMUM)
4. BRICK UP TO GRADE. INSTALL MANHOLE STEPS 2'0" ON CENTER IF THE HEIGHT OF THE BRICK WORK IS GREATER THAN 4'0".
5. PROVIDE TOP SECTION WITH 24" DIAMETER OPENING AT EACH END OF THE TANK.
6. INSTALL CONCRETE BAFFLE IN TANK

FIGURE P-3



SIZING CHART					
GALLON CAPACITY	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"
600	7'-0"	4'-8"	7'-0"	3'-6"	3'-2"
750	7'-0"	4'-8"	7'-0"	4'-3"	3'-11"
1000	7'-0"	5'-0"	7'-2"	4'-4"	3'-10"
1250	9'-0"	5'-0"	7'-2"	4'-2"	4'-10"
1500	9'-0"	5'-8"	7'-2"	5'-2"	4'-0"
1750	11'-2"	5'-8"	7'-2"	4'-4"	4'-7"
2000	11'-2"	6'-8"	8'-0"	4'-11"	3'-10"
2500	12'-8"	6'-8"	8'-0"	4'-7"	4'-9"
2750	12'-8"	6'-8"	8'-0"	5'-6"	5'-3"
3000	15'-7"	9'-7"	8'-6.5"	6'-0"	3'-9"
4000	15'-7"	9'-7"	8'-6.5"	6'-3"	5'-0"
5000	19'-11"	9'-11"	8'-11"	6'-2"	4'-9"
6000	19'-11"	9'-11"	10'-5"	7'-2"	5'-9"

NOTE:

1. CC ETE: 28 DAY / = 4500 psi
2. RE ASTM A615 GRADE 60
3. ME STM A.185 GRADE 65
4. DE ACI318.83 BUILDING CODE ASTM C.857 MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES
5. LC H-20 TRUCK WHEEL w/30% IMPACT PER AASHT
6. FIL LEAN WATER PRIOR TO START UP OF SYSTEM
7. CC ACTOR TO SUPPLY & INSTALL ALL PIPING AND SA RY TEEs, 4 CLEAN OUTS, FOR CLEANING TOWA AP AND FOR CLEANING AWAY FROM TRAP ON BOTH INLET AND OUTLET / ALT. DUAL SWEEP CLEAN OUTS
8. GI VATER ONLY, BLACK WATER SHALL BE CARRIED

Figure DF-8: Concrete Baffled Grease Tra

FIGURE P-4

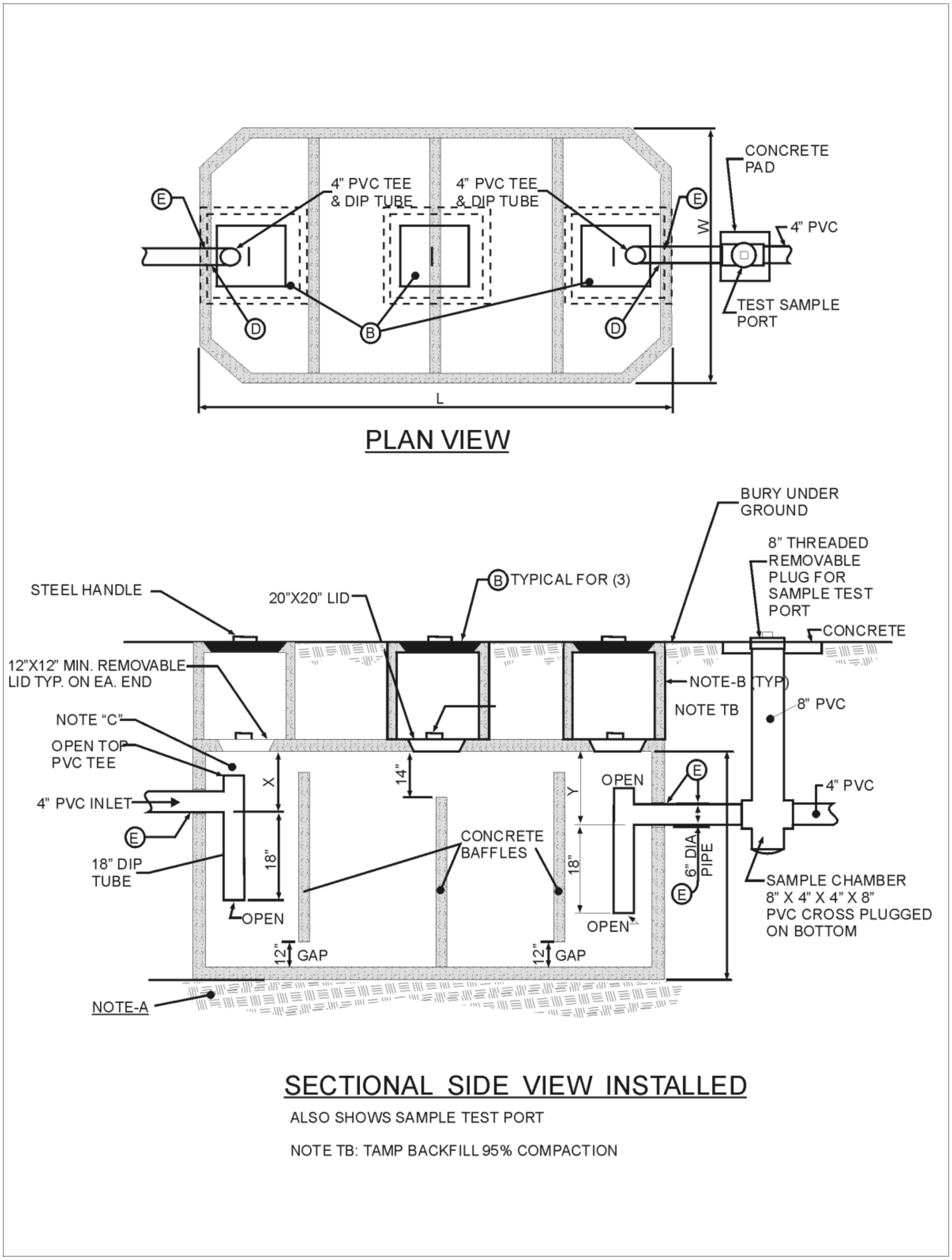
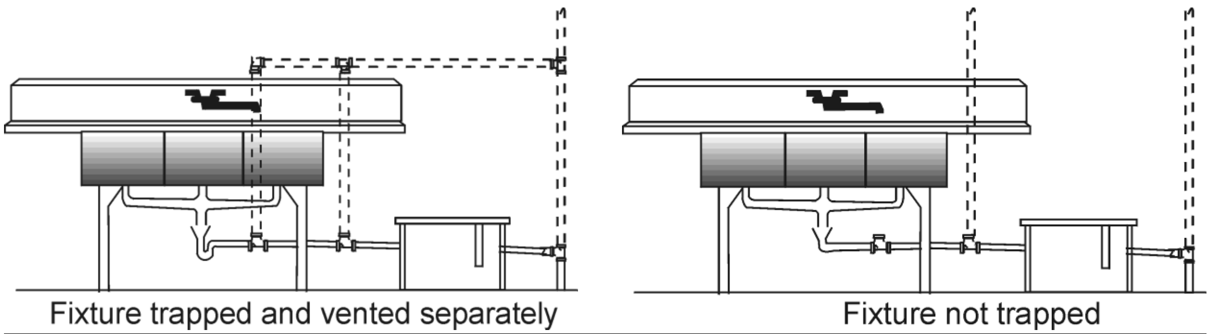

CONCRETE PAD
4" PVC TEE & DIP TUBE
4" PVC TEE & DIP TUBE
4" PVC
W
TEST SAMPLE PORT
L
PLAN VIEW
BURY UNDER GROUND
8" THREADED REMOVABLE PLUG FOR SAMPLE TEST PORT
STEEL HANDLE
20"X20" LID
TYPICAL FOR (3)
CONCRETE
12"X12" MIN. REMOVABLE LID TYP. ON EA. END
NOTE-B (TYP)
NOTE TB
8" PVC
NOTE "C"
OPEN TOP PVC TEE
4" PVC INLET
OPEN
4" PVC
18" DIP TUBE
CONCRETE BAFFLES
6" DIA PIPE
SAMPLE CHAMBER 8" X 4" X 4" X 8" PVC CROSS PLUGGED ON BOTTOM
OPEN
12" GAP
12" GAP
NOTE-A
SECTIONAL SIDE VIEW INSTALLED
ALSO SHOWS SAMPLE TEST PORT
NOTE TB: TAMP BACKFILL 95% COMPACTION

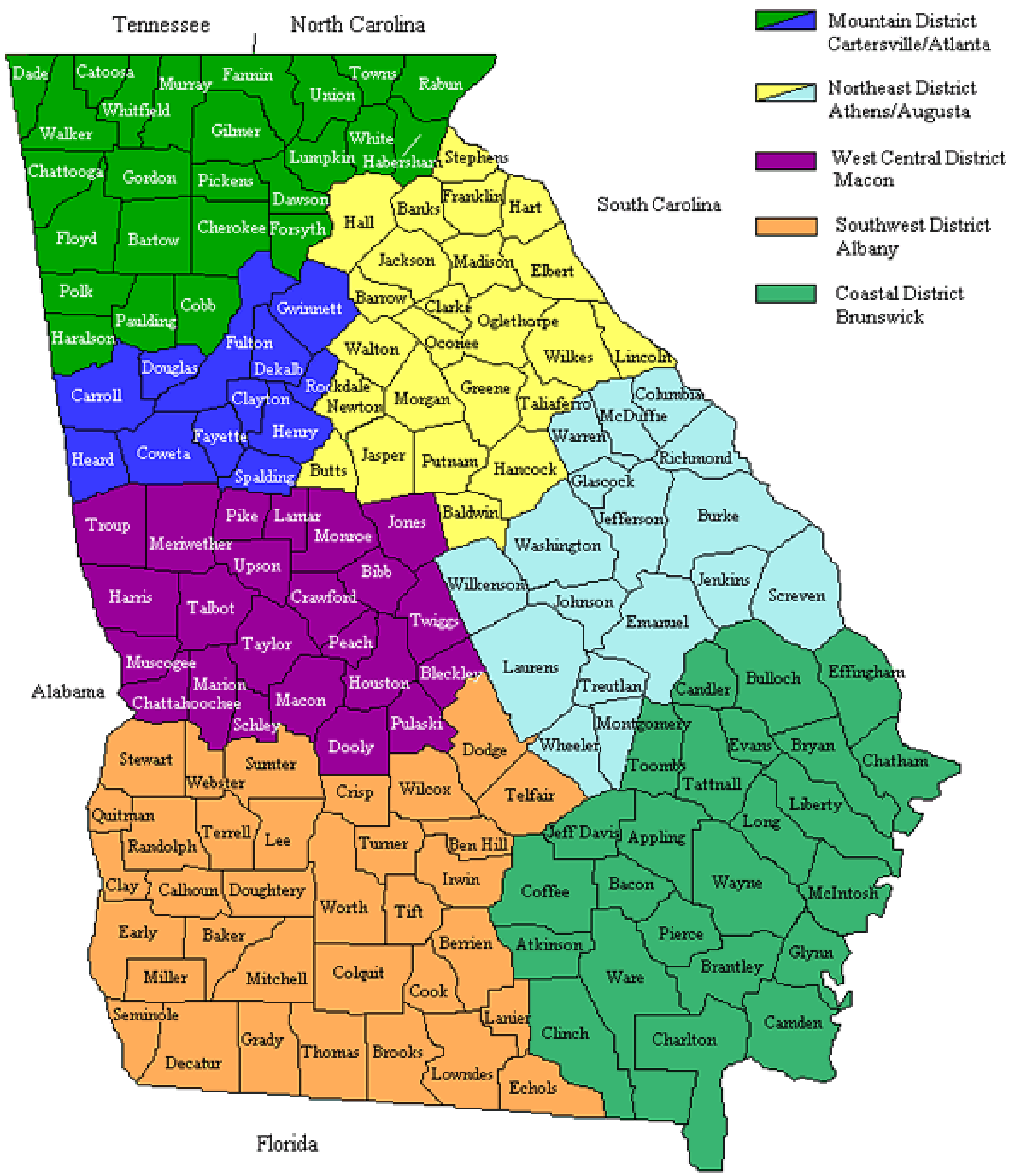
FIGURE P-5

TYPICAL SINGLE FIXTURE INSTALLATIONS



Note: Under-the-sink type grease interceptors are under the jurisdiction of State and local plumbing codes. In cases where onsite sewage management systems are to be utilized for disposal of sewage, outside-in-ground type grease traps must be properly sized and installed as per the Georgia Department of Human Resource's Rules and Regulations for Onsite Sewage Management Systems Chapter 511-3-1. In addition and as allowed by State and local codes, outside-in-ground type grease traps may be used as well to intercept grease for public sewer system applications.

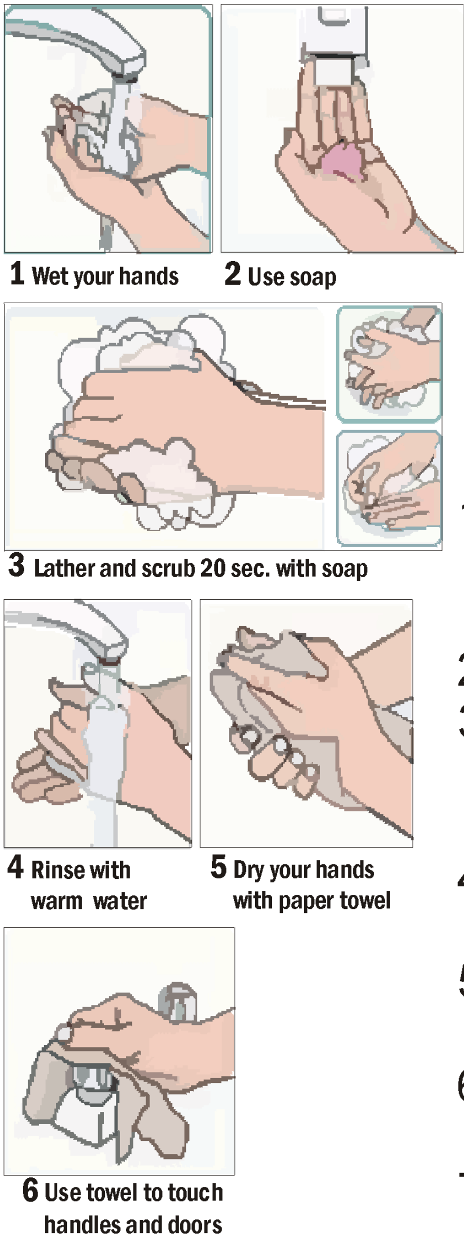
EPD District Office Locations and Contact Information



EPD District Office Contact Information

Office	Telephone	Fax	Address
Coastal District (Brunswick)	912.264.7284	912.262.3160	400 Commerce Center Drive Brunswick, GA 31523
Mountain District (Atlanta)	404.362.2671	404.362.2712	4244 International Parkway, Suite 114 Atlanta, GA 30354
Mountain District (Cartersville)	770.387.4900	770.387.4906	P O Box 3250 16 Center Road Cartersville, GA 30120
Northeast District (Athens)	706.369.6376	706.369.6398	745 Gaines School Road Athens, GA 30605
Northeast District (Augusta)	706.792.7744	706.792.7774	1885 Tobacco Road Suite A Augusta, GA 30906
Southwest District (Albany)	229.430.4144	229.430.4259	2024 Newton Road Albany, GA 31701
West Central District (Macon)	478.751.6612	478.751.6660	2640 Shurling Drive Macon, GA 31211

For more information, go to the Georgia Department of Public Health's environmental health website Non-Public Well Program page located at www.georgiaeh.us. The local county health department in the county in which the proposed establishment will be located may be contacted for consultation, as well.



Protect your health
and the health of others

EMPLOYEES MUST WASH HANDS

1. After touching bare human parts other than clean hands and clean exposed arms
2. After using the toilet
3. After eating, drinking, coughing, sneezing, using a handkerchief or tissue, or using tobacco
4. After handling soiled equipment or utensils
5. During food preparation, as often as necessary
6. When switching between working with raw and ready-to-eat foods
7. Before donning gloves for working with food

ALL EMPLOYEES SHALL WASH THEIR HANDS BEFORE LEAVING THE RESTROOM. ALL FOOD EMPLOYEES LEAVING THE RESTROOM SHALL WASH THEIR HANDS AGAIN UPON RE-ENTERING THE FOOD PREPARATION AREA.

FOOD EMPLOYEES SHALL CLEAN THEIR HANDS AND EXPOSED PORTIONS OF THEIR ARMS IN A HAND WASHING SINK AND MAY NOT USE A FOOD PREPARATION OR OTHER TYPE OF SINK.

Georgia Department of Public Health

Appendix-R:

Plumbing and Cross-Connection Control

A Reference for Planning and Verifying Proposals for Cross-Connection Prevention

Georgia Department of Public Health

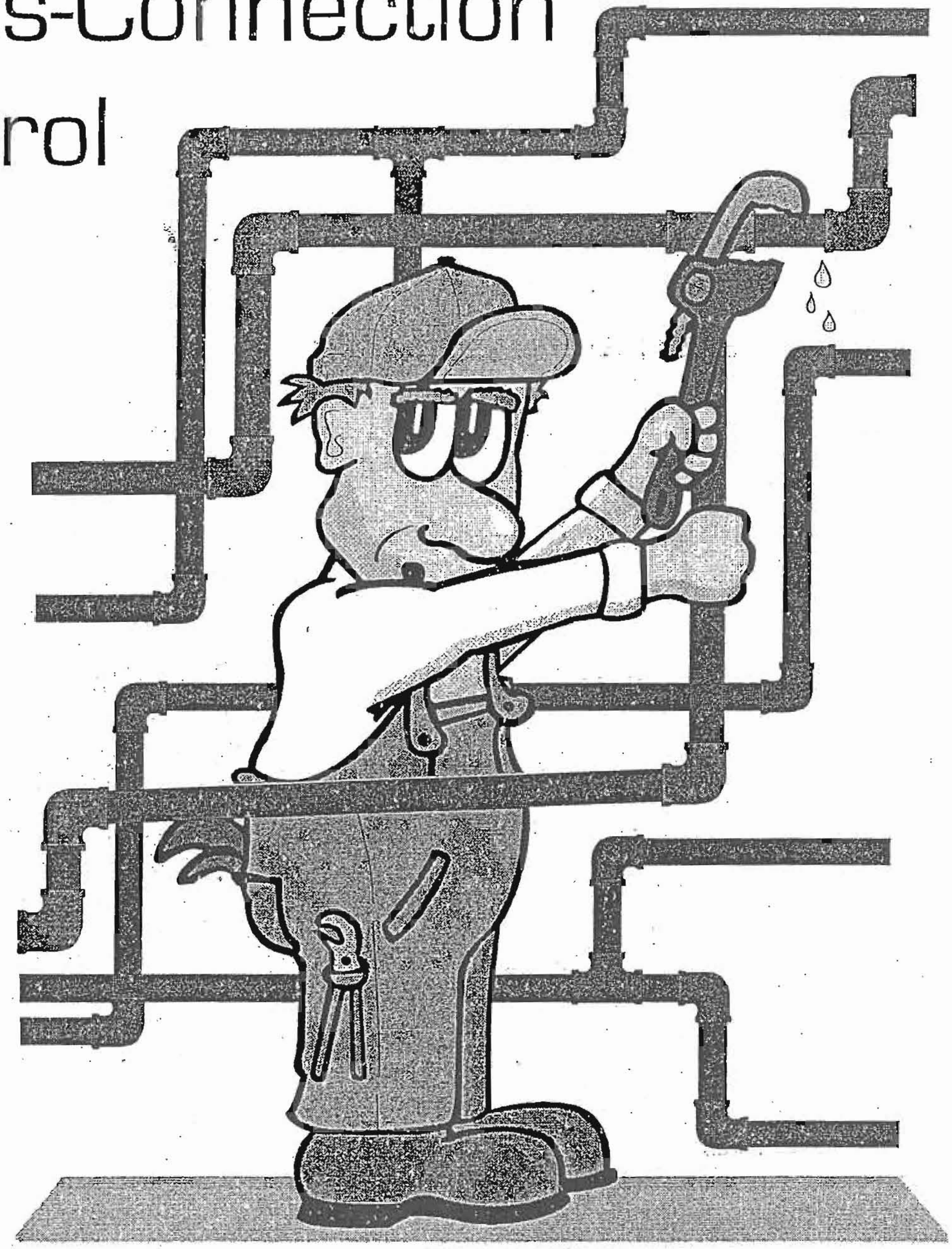
Environmental Health Section

(404) 657-6534

www.georgiaeh.us

The following document, entitled "Plumbing and Cross-Connection Control", is published by the United States Food and Drug Administration (FDA). It is provided to Georgia as a resource material for use during the review and planning of food service establishment plans and specifications. However, it does not supersede applicable State Law or local plumbing codes. The planner and reviewer of food service plans and specifications are both advised to consult with the most current versions of DPH Chapter 511-6-1 and their local Building and Plumbing Authority having jurisdiction over the planned construction.

Plumbing and Cross-Connection Control



Food and Drug Administration
Division of Human Resource Development
5600 Fishers Lane HFC-61
Rockville Maryland 20857
(301) 443 5871

PLUMBING & CROSS-CONNECTION CONTROL

TABLE OF CONTENTS

I. PLUMBING SYSTEMS

Once a potable water system (also referred to as "safe drinking water" or just "drinking water") has been contaminated by the inadvertent actions of the user or installer, the foreign or toxic material can be distributed throughout the facility's potable plumbing system and adjacent premises on the same supply. The contaminated water, if undetected and utilized, may subsequently cause illness or death. Therefore each business, institution, residence, or other user has the ultimate responsibility to protect its potable water from any actual or potential introduction of contaminants or pollutants. The entire piping network for a water system, from the point of origin to the point of use, is divided into two categories: PRIMARY (containment) and SECONDARY (isolation) systems.

PRIMARY SYSTEM or CONTAINMENT

The primary system is composed of the water mains used by the water purveyor to deliver water to the various buildings (or service connections) on the system. The water purveyor is responsible for delivering safe drinking water to the point of delivery for the customer's or user's water system (secondary system). To protect the system from foreign or toxic materials being introduced via the customer, a backflow prevention assembly or device is installed at the water service entrance for "containment" on the premises.

SECONDARY SYSTEM or ISOLATION

The secondary system is the plumbing network that distributes potable water from the down stream side of the water meter or service connection to the points of use throughout the facility and/or premises. Remember, few people are aware of what is occurring inside the building and/or premises (secondary system). The determination of cross-connections is, in part, the function of the inspector, however, it is the ultimate responsibility of the owner to comply with state and local plumbing codes specific for that jurisdiction. Safeguarding the system is met by "isolation," providing backflow protection at each actual or potential cross-connection on the premises.

II. CROSS-CONNECTIONS

A cross-connection is an ACTUAL or POTENTIAL link between the potable water supply and a source of contamination (sewage, chemicals, gas, etc.). This link can be envisioned as a conduit or hose permitting the transfer of foreign material into a safe drinking water system. A cross-connection can be any temporary or permanent direct connection (hard plumbed), by-pass arrangement, jumper connection, removable section, swivel or change-over device, etc. that could connect a potable system to a non-potable source. Ideally, it is best not to have any cross-connections, but in certain situations they may be unavoidable. When an installation requires a cross-connection (as a last resort or unavoidable situation i.e., boiler, injector units, chemical aspirators), it must be properly protected with an acceptable backflow prevention assembly or device to eliminate any potential for a reverse flow back into the potable supply. An unprotected cross-connection threatens the health and safety of individuals and food or beverage products utilizing water from that system.

TWO TYPES OF CROSS-CONNECTIONS

1. DIRECT CONNECTION

FIGURE 10.
Valved connection between potable water and nonpotable fluid.

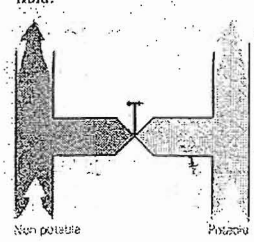
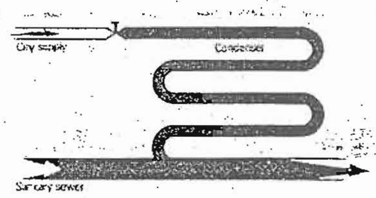


FIGURE 11.
Valved connection between potable water and sanitary sewer.

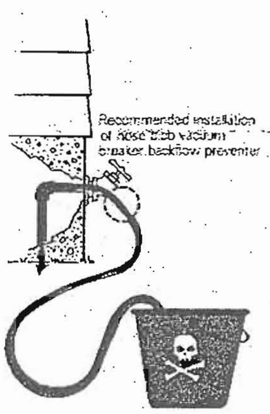


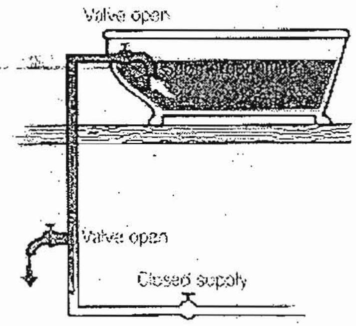
A direct connection is a physical connection between a potable and non-potable system. An example of this would be a water supply line connected directly to a boiler, sewage line, or other nonpotable auxiliary water source. A direct pathway exists between the two separate systems for contamination to be transferred into the potable system as shown in the diagrams below. A direct connection is subject to both back-siphonage and backpressure (see next page).

2. INDIRECT CONNECTION

An indirect connection between a potable and nonpotable supply does not exist under "normal" conditions; however, under "unique" circumstances a pathway for contamination can occur. Usually the source of contamination may back-up, be blown across, siphoned, pushed or diverted into a potable water supply. An indirect connection is only subject to back-siphonage (see next page).

Example scenario, the end of a faucet terminates below the flood level of a sink, (referred to as a "submerged inlet" because it does not provide the required air gap), and the waste backs up or the sink becomes clogged to the point that the water inlet becomes submerged. If a vacuum or negative pressure should develop in the potable supply, the contaminant could be siphoned into the water supply.





III. FORCES ACTING ON CROSS-CONNECTIONS

Some cross-connections are immediately obvious, but others can be subtle and difficult to find. Contamination or pollution occurs when the pressure differentials between the water supply and another system, via some connection, are sufficient to transfer the contaminant or pollutant into the potable supply. The temporary reversal of pressures or momentary vacuums in the water supplies can be freakish and unpredictable. These hydraulic forces can either **PUSH** (forced by higher pressure than the potable supply) or **PULL** (vacuum/siphon, the potable supply drops below normal levels) the contaminant into the drinking water system.

BACKFLOW

Backflow is a reverse flow in the primary or secondary system that is opposite to the expected or intended direction. This flow reversal is undesirable, however, a properly protected system can remain safe. There are two types of backflow, acting separately or in combination, that allow contaminates (high hazard) or pollutants (low hazard) to enter the water supply via a cross-connection: BACKPRESSURE and BACK-SIPHONAGE.

BACKPRESSURE (A PUSHING FORCE)
Backpressure occurs when both systems (potable & nonpotable) are under pressure (above atmospheric pressure or positive head pressure), but the nonpotable system has a greater pressure than the potable system. This pressure differential pushes the contaminant or pollutant into the potable supply. Pumps or thermal expansion from boilers connected to a supply are examples of how these pressure differentials can be created.

PRINCIPLE CAUSES OF BACKPRESSURE:

For backpressure to occur, a "direct connection" to another system must exist. This other system would actually or potentially be operated at a higher pressure than the potable supply, i.e., a fertilizer injector system, booster pump, boiler, fire sprinkler system or other auxiliary water source.

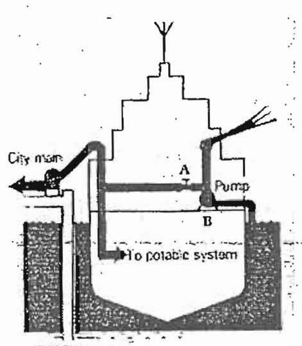


FIGURE 52
Backflow - case 3.

Potential Backpressure on City Supply

A. Contact Point: A valve connection exists between the potable and the nonpotable systems aboard the ship.

B. Cause of Reversed Flow: While the ship is connected to the city water supply system for the purpose of taking on water for the potable system, the valve between the potable and nonpotable systems is opened permitting contaminated water to be pumped into the municipal supply.

BACK-SIPHONAGE (VACUUM, PULLING FORCE)

Back-siphonage occurs when the pressure in the water supply drops below zero (less than atmospheric pressure or negative head pressure), and the adjacent nonpotable source is drawn or siphoned into the potable supply.

NOTE: Back-siphonage can occur with either a "direct" or "indirect" connection, and the systems can be "opened" or "closed" - meaning exposed/open to the atmosphere, or not exposed/closed to the atmosphere.

Backsiphonage
Case 6 (Fig. 49)

A. Contact Point: There is a submerged inlet in the second floor bathtub.

B. Cause of Reversed Flow: An automobile breaks a nearby fire hydrant causing a rush of water and a negative pressure in the service line to the house, sucking dirty water out of the bathtub.

C. Suggested Correction: The hot and cold water inlets to the bathtub should be above the rim of the tub.

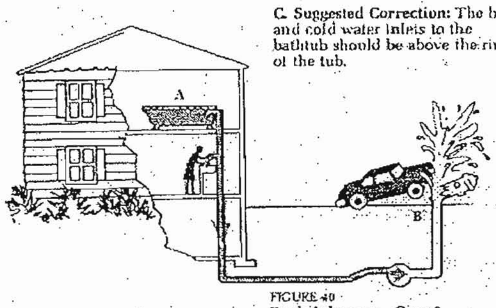


FIGURE 40
Backsiphonage - Case 6.

Backsiphonage
Case 4 (Fig. 47)

A. Contact Point: The water supply to the dishwasher is not protected by a vacuum breaker. Also, the dishwasher has a solid waste connection to the sewer.

B. Cause of Reversed Flow: The undersized main serving the building is subject to reduced pressures, and therefore only the first two floors of the building are supplied directly with city pressure. The upper floors are served from a booster pump drawing suction directly from the water service line. During periods of low city pressure, the booster pump suction creates negative pressures in the low system, thereby reversing the flow.

C. Suggested Correction: The dishwasher hot and cold water should be supplied through an airgap and the waste from the dishwasher should discharge through an indirect waste. The booster pump should be equipped with a low-pressure cutoff device.

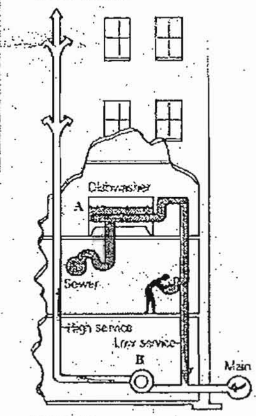
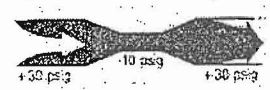


FIGURE 47
Backsiphonage - case 4.

FIGURE 8.
Negative pressure created by constricted flow.



PRINCIPLE CAUSES OF BACK-SIPHONAGE:

1. Undersized sections of pipe can create an aspirator effect in the restricted area.

2. A break or repair in a supply line can create a vacuum or siphoning effect (as gravity drains the water out) on the elevated portions of the system above the effected area.

3. A high water withdrawal, such as fire fighting or water main flushing, can create a vacuum. This withdrawal is more likely to create stronger negative pressures at the higher elevations on the system.

4. A vacuum can be induced on the suction side of a booster pump, such as high-rise buildings and processing plants.

IV. EVALUATING CROSS-CONNECTIONS

There are several different types of assemblies (units that can be tested after installation) and devices (can not be tested after installation) available for controlling cross-connections and preventing backflow. The type of assembly or device needed depends upon the type of cross-connection, the intended purpose of the plumbing configuration, and what could backflow into the water supply under various scenarios.

EVALUATING EXISTING OR POTENTIAL CROSS-CONNECTIONS:

1. Evaluate the plumbing supply, equipment attached to it, and any waste lines attached or near by. Think about WHAT COULD GO WRONG with this design and WHAT CAN BE DONE TO MAKE IT SAFER.

2. Determine the DEGREE OF HAZARD INVOLVED, either a HIGH or LOW hazard will exist with a cross-connection. The degree of hazard depends on whether the nonpotable source is deleterious or not.

   HIGH HAZARD situations exist when there is an actual or potential connection for any toxic or infectious substance (also referred to as a CONTAMINANT), to be introduced into the water supply, and may create a danger to the health and well-being of anyone using the water. Examples of contaminants are pesticides, chemicals, and infectious microorganisms.

   LOW HAZARD situations exist when there is an actual or potential connection for a nontoxic substance (also referred to as a POLLUTANT) to be introduced to the water supply and create a nuisance, or be aesthetically objectionable to the water user. Examples of pollutants are turbidity, beverages, and food coloring.

3. Evaluate the use of the backflow prevention device relative to the TIME that supply pressure is present on both the "up stream" and "down stream" side of the device.

   CONTINUOUS PRESSURE conditions exist when the water pressure remains on both sides of the device for more than 12 hours. Continuous water pressure can exist under DYNAMIC conditions (the water is "on" and flowing in the intended direction through the device) or STATIC conditions (the water is "on" but a shut off device down stream in the "off" or closed position results in no flow through the device).

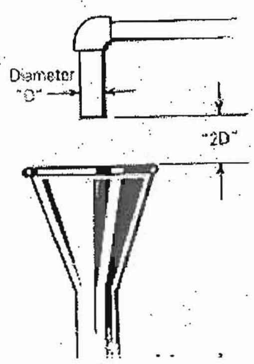
   NON-CONTINUOUS PRESSURE conditions exist when the device is only subject to intermittent water pressure on both sides of the device that does not exceed 12 hours.

Note: Continuous and non-continuous pressure conditions are important factors in determining the installation and use of backflow prevention devices.

V. PHYSICAL BACKFLOW PREVENTION METHODS

AIR GAP or PHYSICAL AIR GAP (an "air break" is in reference to waste lines only)
An air gap is the **MOST DESIRABLE METHOD OF BACKFLOW PREVENTION**. It is simple, economical, non-mechanical (no moving parts), fail safe, and can be used for potential back-siphonage or backpressure situations. An air gap is an unobstructed, vertical air space that separates a potable system from a nonpotable system. This air gap is necessary to prevent any contaminant or pollutant from being siphoned or pushed back into the potable water supply. Although this is an extremely effective backflow preventer, the interruption in the piping creates a subsequent pressure drop on the "down stream" portion. Consequently, most air gaps are used at the end of the supply line or faucet such as at a sink, vat or storage tank.

FIGURE 12
Air Gap



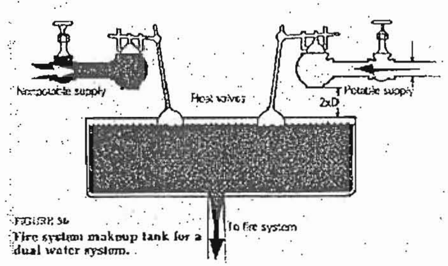


FIGURE 56
Fire system makeup tank for a dual water system.

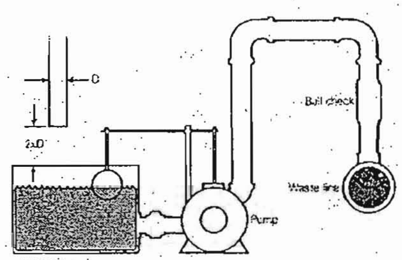


FIGURE 54
Airgap to sewer subject to backpressure - force main.

AIR GAP INSTALLATION & USE:

1. The air gap must be the greater of the two - **A MINIMUM OF ONE INCH OR TWICE THE INSIDE DIAMETER OF THE SUPPLY PIPE.** This distance is measured from the supply pipe to the flood level rim (the point of over flow) of the receptacle or fixture.

2. Air gaps require inspection for any compromised "2xD or 1 inch" requirements and any splashing problems, but no testing is necessary.

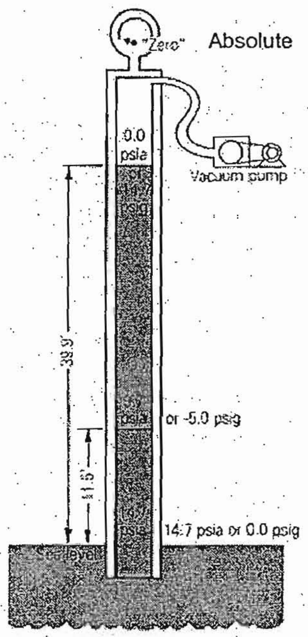
3. An air gap can be installed in a continuous piping system to protect the source from any potential contaminant on the down stream side of the system. Providing an air gap within the supply system (versus at the end of the supply line) would require a reservoir and possibly a booster pump. An open reservoir can subject the water to air borne pollutants and the loss of free chlorine in a treated supply. If a reservoir is utilized, then there needs to be a means to periodically drain and clean the tank.

BAROMETRIC LOOP

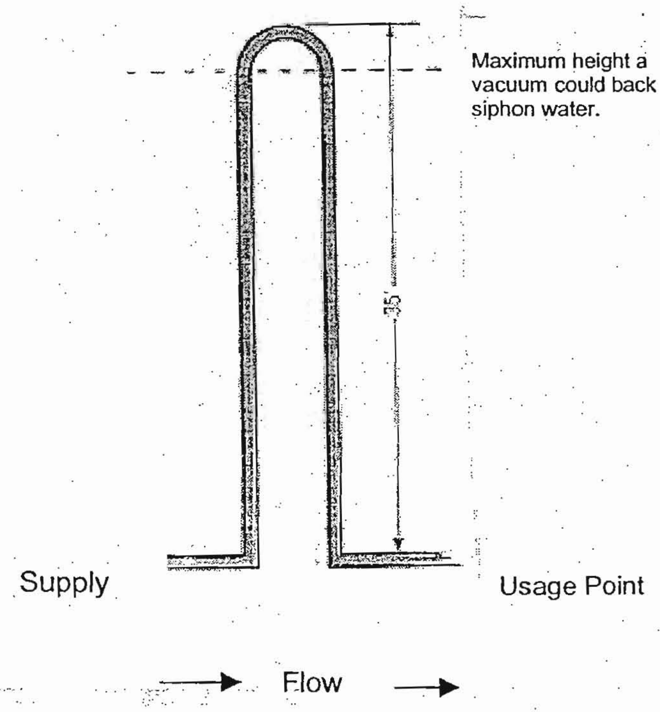
The barometric loop is an extension of the supply line that can be construed as a giant upside down "U". This configuration is designed based on the fluid dynamics of water and is utilized to protect all down stream inlets against "back-siphonage" **only.** An absolute vacuum on a pipe can only "pull" the water up 33.9 feet; to go any higher, a pump would be necessary to push the water up the column. The barometric loop must be at least 35 feet tall and the base must be at a higher elevation than any of the inlets or fixtures that are on the down stream side of the loop. The size of the 35 foot high loop limits its practicality for application (processing plant) for protecting against negative pressure.

were airtight, the water would remain at the level of the faucet because of the partial vacuum created by the drop in pressure. If the faucet were opened, however, the

Figure 4.
Effect of evacuating air from a column.



Barometric Loop



BAROMETRIC INSTALLATION & USE:

1. The loop must be at least 35 feet upright and all plumping inlets or fixtures must be no higher than the loop's base.

2. Approved for <u>**CONTINUOUS PRESSURE & NO POTENTIAL BACKPRESSURE.**</u>

VI. MECHANICAL BACKFLOW ASSEMBLIES & DEVICES

The type of mechanical assembly or device selected must be appropriate for the degree of hazard and specific application relevant to the potential backflow possibilities. Mechanical backflow preventers consist of single or multiple check valves that open from the flow pressure of the potable water. These valves are fabricated to seat tightly on a machined surface and when closed, prevent any flow in the wrong direction. Also, some devices have air inlets or ports that are vented to the atmosphere to relieve any vacuum or negative pressure developed in the system. All backflow devices must be installed so they are accessible for inspection, service and repair.

NOTE:

> **The specific use and installation of a backflow prevention assembly or device must be clarified by the manufacturer and comply with the plumbing codes governing the jurisdiction in which the unit is installed.**

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE is a consensus, voluntary ANSI (American National Standards Institute) accredited association that develops and maintains product performance standards for component parts of the plumbing systems and professional qualifications standards. Eighteen standards are for backflow devices/assemblies. On the following pages, examples of various devices are cited with the number for the ASSE standard under "Installation & Use."

FOOD PROCESSING & RETAIL FOOD CODE PLUMBING REGULATIONS

FDA Food Code
Chapter 5. The following section is from the Food and Drug Administration's 1997 Food Code (food establishments) pertaining to: 5-202.14 Backflow Prevention Device, Design Standard.

> A backflow or backsiphonage 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.

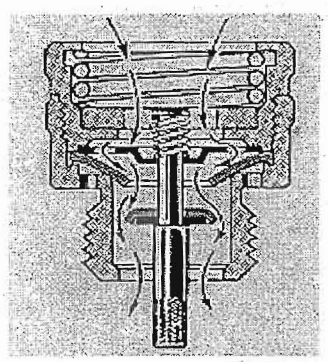
Grade A Pasteurized Milk Ordinance (PMO), Current Edition
Item 8r, 7p, and Appendix D, Standards for Water Sources.

National Shellfish Sanitation Program Manual of Operations, Part II, 1995 Revision
Section D, Part 8 and 9.

HOSE BIBB VACUUM BREAKER (HBVB)

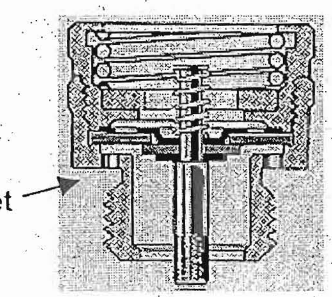
A hose bibb vacuum breaker contains one spring loaded valve and an atmospheric vent that is controlled by a diaphragm seal. The HBVB is installed on the end of a hose bibb (sill cock or boiler drain inlet) for a garden hose, slop/mop sink hose etc., or anywhere else a hose can be connected. Internally, the valve is spring loaded to be in a closed position and opens with flow in the proper direction. As the water flow begins (dynamic, water flow in the desired direction), the valve opens and allows the diaphragm seal to close off the atmospheric vent (the flow pressure is what moves & holds the diaphragm against the vent ports). When zero pressure or back-siphonage (negative pressure) conditions exist, the spring pulls the valve closed and simultaneously pushes the diaphragm (thus, opening the vent to relieve any vacuum) into position to form a tight seal between the valve and valve seat. Under static conditions (no flow) with the HBVB, the check valve may or may not be closed. (The HBVB is not approved for continuous pressure but there may be time periods when water pressure exists on both sides of the device)

open



closed

Vent/air inlet



HBVB INSTALLATION & USE:

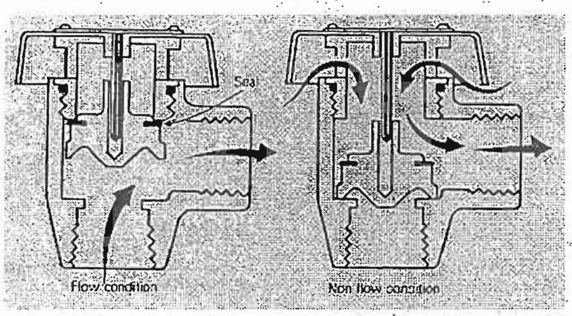
1. Shut off valves must be located up stream from the vacuum breaker, and spring-loaded pistol-grip shutoff valves are not to remain on the hose with the water left on, when not being actively used.
2. Each hose connected to a manifold or "Y" must be provided with its own HBVB, i.e., county fair, special events where several vendors may share one hose spigot

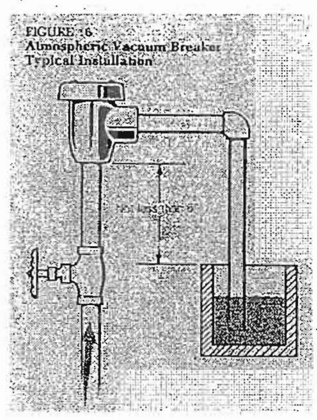
3. Approved for **HIGH HAZARDS, NON-CONTINUOUS PRESSURE & NO POTENTIAL BACKPRESSURE.** ASSE standard #1011

NOTE: HBVB's cannot be used under continuous pressure conditions (defined as water pressure on both sides of the unit for more than 12 hours), because the spring loaded valve may stick or freeze in the open position, thus making the water supply vulnerable to backflow. Remember, you must evaluate the HBVB in its setting and determine the use and time. If the use period extends over 12 hours, then an approved continuous pressure backflow device must be installed.

ATMOSPHERIC VACUUM BREAKER (AVB)

This device has an internal polyethylene or metal float valve that moves up and down on a shaft (not spring loaded). Water moving in the normal direction of flow lifts the float, and causes the atmospheric vent to close (an opening on the top of the unit is open to the air). The normal water pressure keeps the float valve in the upward closed position. Shutting off the water causes the float to drop; the supply valve to close; and results in the atmospheric vent being open. With the water off, the down stream piping of the AVB is open to the atmosphere, creating an air gap, and thus preventing any back-siphonage. When a negative pressure occurs on the supply side, the float valve drops, closing off the supply, and opening the atmospheric vent. Thus, any down stream contamination will not be siphoned into the potable supply. The atmospheric vacuum breaker provides **excellent protection against "back-siphonage" only**. Exposing the AVB to backpressure can cause the atmospheric valve to modulate up and down, thus permitting a potential contaminant, via backpressure, to enter the water supply.





AVB INSTALLATION & USE:

1. The mushroom shaped device must be installed vertically (upright position), with the atmospheric opening at the top and the elevation of the unit must be at least 6 inches above the highest inlet, "down stream" of the AVB.

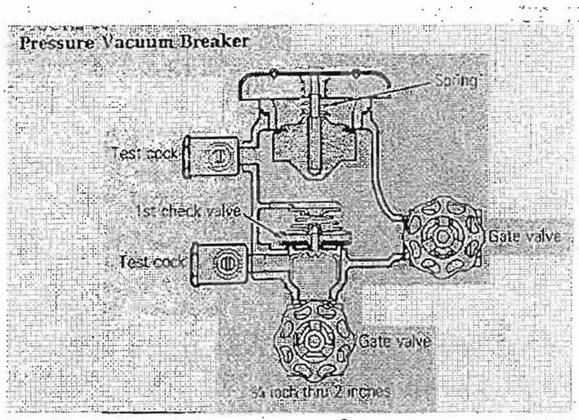
2. <u>All shutoff devices must be located "up stream" from the AVB</u> (supply side). This unit cannot be tested after installation.

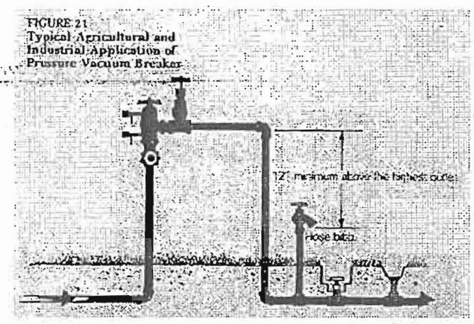
3. Approved for **<u>HIGH HAZARDS, NON-CONTINUOUS PRESSURE & NO POTENTIAL BACKPRESSURE</u>**. ASSE standard #1001

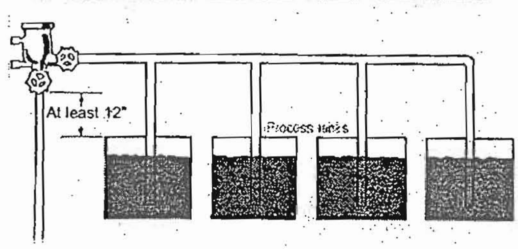
<u>NOTE:</u> AVB's cannot be used under continuous pressure conditions (defined as water pressure on both sides of the unit for more than 12 hours), because the float valve may stick or freeze in the up position, thus making the water supply vulnerable to potential back-siphonage. Remember, <u>you</u> must evaluate the AVB in its setting and determine the use and time. If the use period extends over 12 hours, then an approved continuous pressure backflow device must be installed.

PRESSURE VACUUM BREAKER (PVB)

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







PVB INSTALLATION & USE:

1. The unit is generally used in agricultural, irrigation, and industrial applications.
2. The PVB must be installed at least 12 inches above the highest elevated inlet or fixture on its down stream side. Also, the unit must have a shut off valve on each side and two test cocks for testing.
3. The device must be located in an accessible area for testing and servicing. Also, it is permissible to install shut off devices down stream of this unit.
4. Lines should be thoroughly flushed prior to installation in order to prevent any debris from lodging in the valve seats and preventing a tight seal.
5. The PVB is approved for **HIGH HAZARD, CONTINUOUS PRESSURE & NO POTENTIAL BACKPRESSURE.** ASSE standard #1020

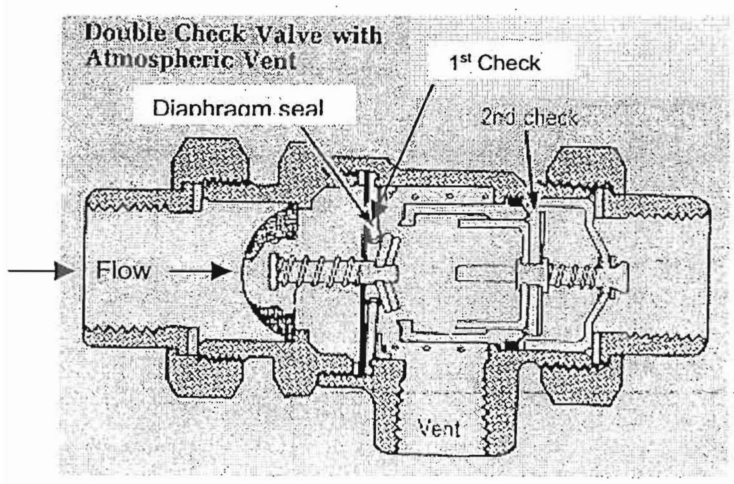
BACKFLOW PREVENTERS WITH INTERMEDIATE ATMOSPHERIC VENT

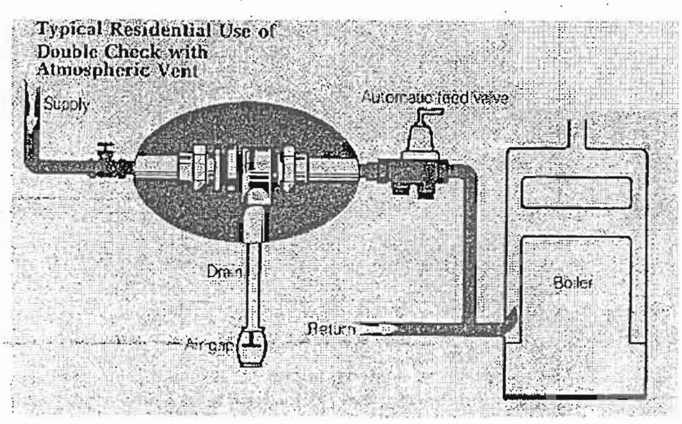
1. SPECIALTY UNITS FOR 1/2 & 3/4 INCH SUPPLY LINES

This device contains an atmospheric vent between two spring loaded check valves, and these valves are spring loaded for automatic closure under static (no water flow) conditions. The atmospheric vent is controlled by a diaphragm seal that directly responds to the movement of the the supply side (primary) check valve. As the water flow begins (dynamic), the primary check opens and simultaneously frees the diaphragm seal to close off the atmospheric vent and then proceeds to open the secondary check valve (down stream side). The positive supply pressure holds the diaphragm seal in place to close off the atmospheric vent under static (there is no flow, but supply pressure exits in the device) or dynamic conditions. Under back-siphonage conditions, the diaphragm seal is able to open the atmospheric vent independent of the primary check valve (to relieve any vacuum on the supply side). To further understand how an atmospheric vent satisfies a vacuum, put a hole in a soda straw, keeping the hole out of the soda and try to drink the soda.

When a zero pressure or back-siphonage condition exits on the supply side, the primary check valve closes under spring pressure and simultaneously pushes the diaphragm seal into position to form a tight seal between the valve and valve seat - opening the atmospheric vent and closing the secondary check valve.

Under back-pressure conditions, the secondary check valve would close first. If the secondary check valve were to foul in the closed position, the primary check valve would close and the backpressure leakage would drain out through the atmospheric vent (air break chamber). (Note: Backflow preventers with atmospheric vents should be located so that water leakage will not cause a nuisance.)





SPECIALTY UNITS WITH AN INTERMEDIATE ATMOSPHERIC VENT FOR 1/2 & 3/4 INCH SUPPLY LINES, continued

INSTALLATION & USE:

1. The unit can be installed horizontally or vertically and must not be located in a pit or a location subject to standing water. Under no circumstances should plugging of the relief port or vent be permitted.

2. Generally, the unit may be installed on water supply lines for laboratory equipment, food processing tanks, sterilizers, dairy equipment, livestock drinking fountains, residential boilers, or in other situations where cross-connection control is needed.

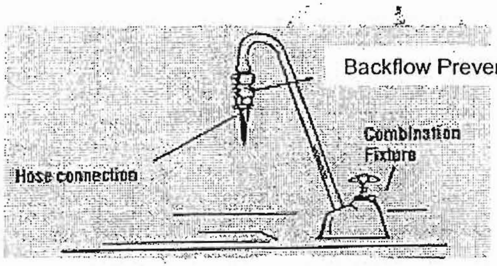
3. Approved for **LOW HAZARD, CONTINUOUS PRESSURE & BACKPRESSURE OR BACK-SIPHONAGE**. ASSE standard #1012

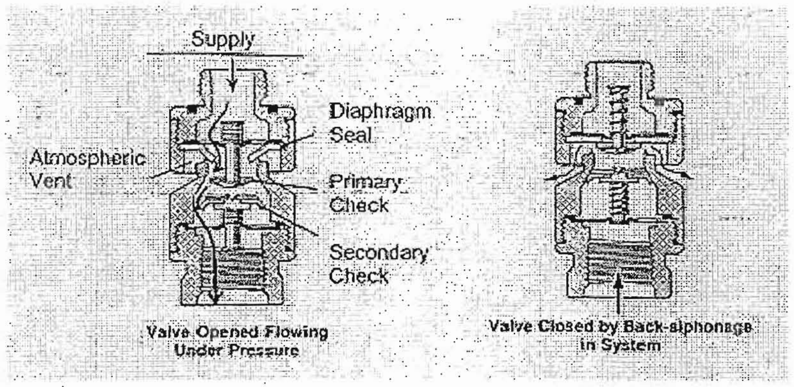
Note: Some plumbing codes or jurisdictions place application limitations on this device, because the unit cannot be tested.

INTERMEDIATE ATMOSPHERIC VENTS CONTINUED

2. SPECIALTY IN-LINE APPLICATIONS/LAB FAUCETS

These types of backflow preventers operate on the same principle as the backflow preventer with an intermediate atmospheric vent for 1/2 and 3/4 inch supply lines. There are several types of these units and not all of them are approved for continuous pressure.





INSTALLATION & USE:

1. Units that are approved for continuous pressure can be used in supply lines for low water volume needs such as coffee and tea urns or ice makers. (Not approved for soda carbonators.)

2. Units that are only approved for non-continuous pressure applications such as those installed on the supply side of an aspirator for a laboratory faucet or on a barber shop/ beauty parlor sink.

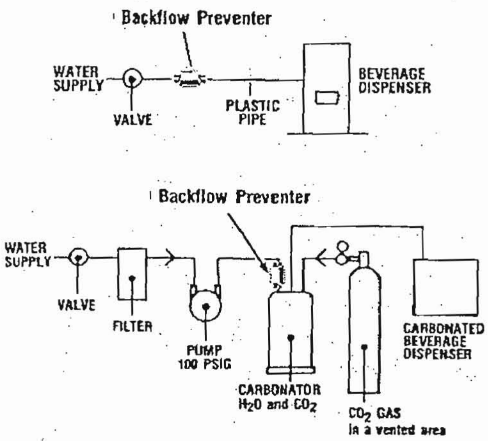
3. Whether a particular unit is APPROVED FOR CONTINUOUS PRESSURE OR NOT WILL NEED TO BE CLARIFIED BY THE MANUFACTURER.

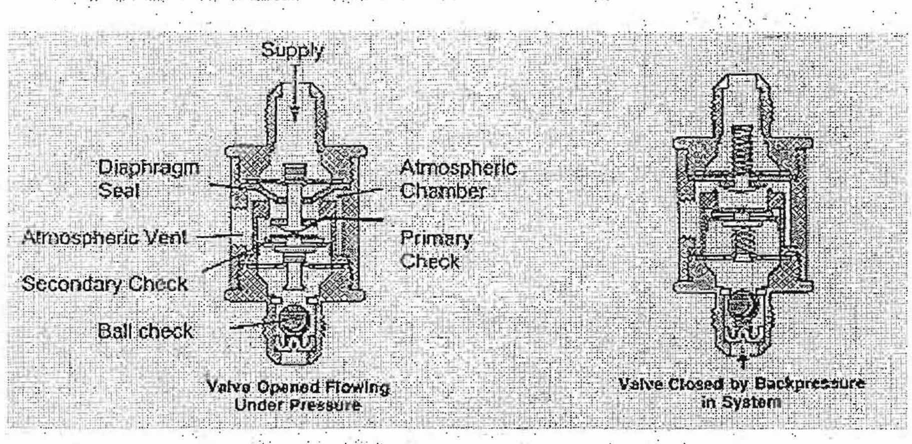
4. All types are approved for <u>LOW TO MODERATE HAZARDS AND BACKPRESSURE OR BACK-SIPHONAGE</u>. ASSE standard #1035

INTERMEDIATE ATMOSPHERIC VENTS CONTINUED

3. SPECIALTY UNITS FOR BEVERAGE VENDING MACHINES

This backflow preventer is very similar internally to the specialty units for 1/2 & 3/4 inch, and 1/4 & 3/8 inch supplies, except that it has an added ball check valve (after the secondary check valve). The ball check is an extra precaution to prevent carbon dioxide (CO_2) from backflowing (via backpressure) out of a soda carbonator and into any copper supply lines. The CO_2 gas reacts with water to form carbonic acid, which in turn will dissolve the copper lines and thus create possible copper toxicities in those ingesting the water. Any carbon dioxide leaking past the ball check-valve and the secondary disc valve would be vented into the atmosphere via the atmospheric vent/air inlet.





INSTALLATION & USE:

1. The backflow preventer and carbonator system must be located in a well ventilated area. Installation may be horizontal or vertical.

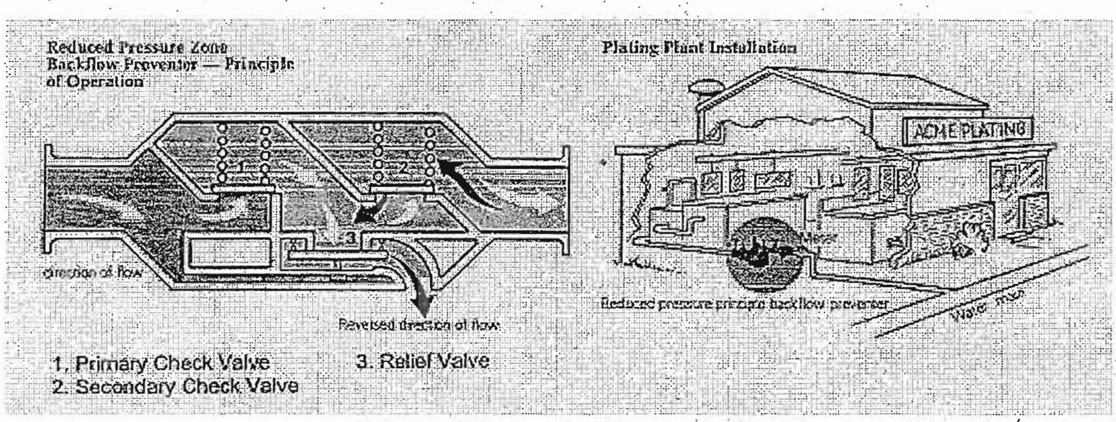
2. The unit may also be used for other beverage equipment such as coffee, tea, and hot chocolate.

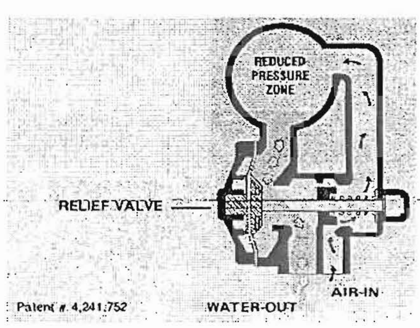
3. Approved for **LOW HAZARD, CONTINUOUS PRESSURE & BACKPRESSURE OR BACK-SIPHONAGE.** ASSE standard #1032

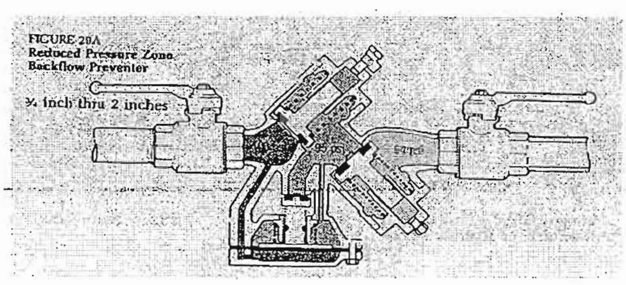
REDUCED PRESSURE ZONE BACKFLOW PREVENTION ASSEMBLY (RPZ)

This type of mechanical backflow prevention assembly provides the maximum protection against both back-siphonage and backpressure. Construction of the RPZ consists of two very sensitive, independent, spring loaded check valves with a reduced pressure "zone" between them (at least a 2 psi pressure differential between the "supply pressure" and the "reduced pressure zone"). These check valves are spring loaded to automatically close unless they are held open with flow in the proper direction. As the water passes through the primary check valve, the water pressure will drop (predetermined friction loss/resistance) at least 2 psi in the "reduced" pressure zone or central chamber. Under normal conditions the water will continue through the secondary check valve (only requires 1 psi to open) to the point of usage.

The reduced pressure zone contains a relief valve that drains to the atmosphere and is spring loaded for an automatic open position. The relief valve has the RP zone water pressure on one side and the water supply pressure on the other side. To keep the relief valve closed, the supply pressure must exceed the RP zone pressure. Thus, it will spring open under any conditions causing the water pressure in the "RP zone" to approach or exceed the supply pressure. Also, when the relief valve opens, an air passage from the atmospheric vent to the RP zone is opened to satisfy any back-siphonage conditions. So, even if both check valves are fouled, the relief valve will continue to protect the supply.



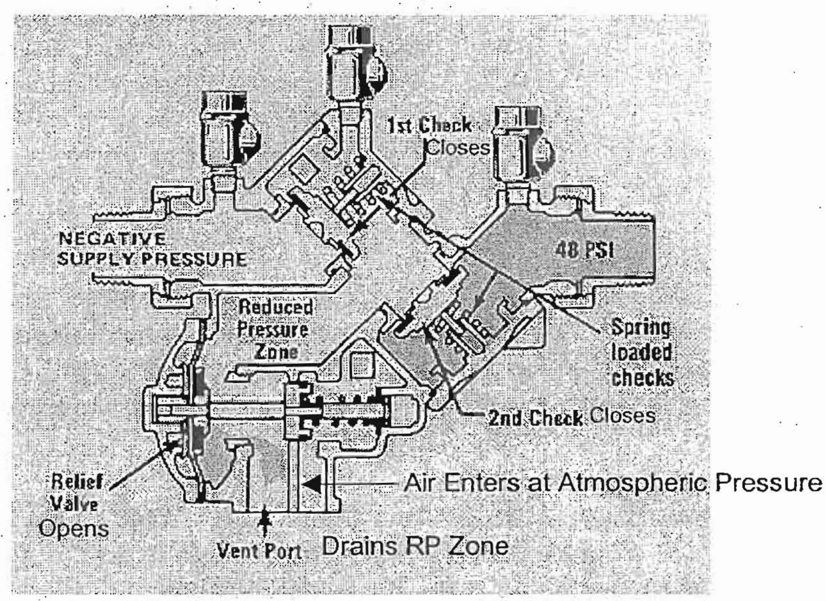




RPZ WATER FLOW AND RELIEF VALVE ACTION WITH VARIOUS SCENARIOS:

1. BACKPRESSURE - pressure increases downstream from the backflow preventer. As the downstream pressure approaches the pressure of the "reduced pressure zone", the secondary check valve will close. (Water pressure in the "RP zone" must exceed the downstream pressure in order to hold the secondary check valve open.)

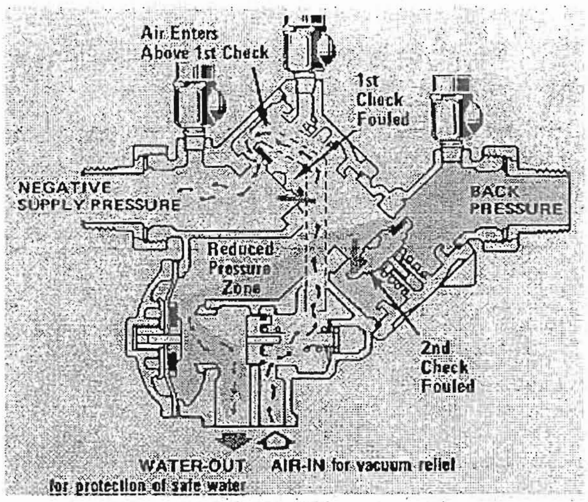
2. BACK-SIPHONAGE - approaching zero or negative pressure on the supply side. When the supply pressure approaches zero or negative values, the primary check valve will close; the relief valve will spring open (draining the reduced pressure zone); the atmospheric vent passage to the reduced pressure zone will open; and the secondary check valve will close.



3. BACKPRESSURE & BACK-SIPHONAGE SIMULTANEOUSLY The primary and secondary check valves would close, and the relief valve and atmospheric vent port would open.

4. CHECK VALVES OR RELIEF VALVE MALFUNCTION

Malfunctioning of one or more of the three valves in the RPZ backflow preventer would not compromise the safety of the water supply (but there may be water discharging from the relief port until unit is repaired).



Secondary Check Valve

Backpressure: If some obstruction or wear prevents the secondary check valve from closing tightly, backpressure leakage would increase the central chamber pressure and thus open the relief valve and atmospheric vent port. (As chamber pressure approaches supply pressure, the relief valve springs open.)

Primary Check Valve

Back-siphonage: If the primary check valve were to foul, then simultaneously the relief valve would open, and the air passage from the atmospheric vent port would deliver air to an area just above the primary check valve. The air would satisfy any vacuum caused by back-siphonage. The air flowing to the primary check valve does not use the same passage in the relief valve used for draining water.

Backpressure: If the primary and secondary check valves were to fail simultaneously, then the water leaking back into the central chamber would exit through the relief valve.

Relief Valve/Port

A malfunctioning relief valve will not close; it will remain open, discharging water through the port until repaired. Even when fouled, the supply remains protected.

RPZ INSTALLATION & USE:

1. Under no circumstances should plugging of the relief port be permitted.

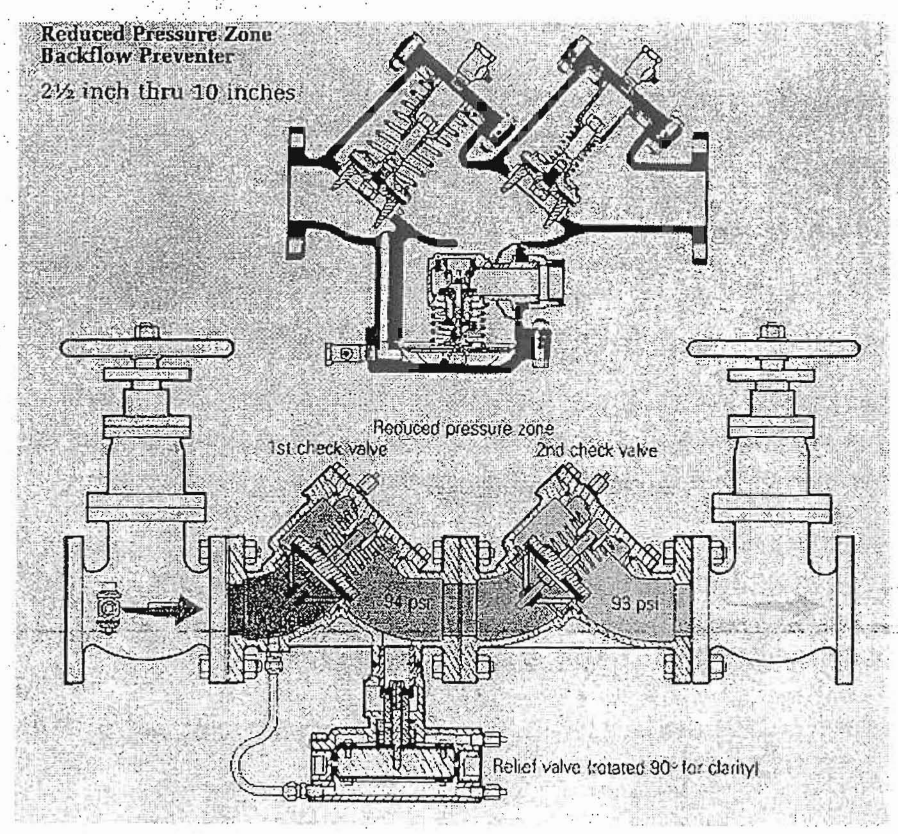
2. The RPZ is equipped with test cocks and gate valves to enable required unit testing.

3. Several unit sizes are available for 3/4 to 10 inch supply lines. Approximate pressure losses across the unit are 10 to 20 psi, depending on the size and flow rate.

4. Install on each high hazard connection within a secondary system and/or at the service connection or water-meter (for containment on the property) of car washes, autopsy and funeral parlors, commercial boilers, cooling towers, hospital and laboratory equipment, processing tanks, sewage treatment, etc.

5. The unit must be accessible for testing and service, and must be located above grade (not subject to flooding). The device must be installed at least 12 inches from any wall and between 12 to 30 inches above the floor.

6. Approved for <u>HIGH HAZARDS, CONTINUOUS PRESSURE, BACKPRESSURE OR BACK-SIPHONAGE.</u> ASSE standard #1013



DOUBLE CHECK VALVES

A double check valve backflow preventer consists of two check valves that are spring loaded in the closed position. These devices do not have the added protection of an atmospheric vent and therefore are limited to the amount of protection they offer and how they can be used. Some jurisdictions and codes do not permit double check valves to be used for backflow protection.

INSTALLATION & USE:

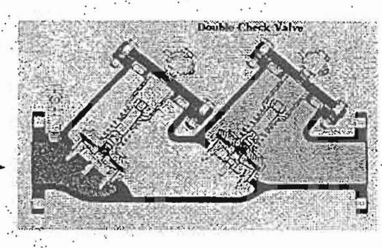
1. Double check valves can only be used where they are approved for limited use with low hazard, continuous pressure conditions.

2. THREE TYPES OF DOUBLE CHECK VALVES:

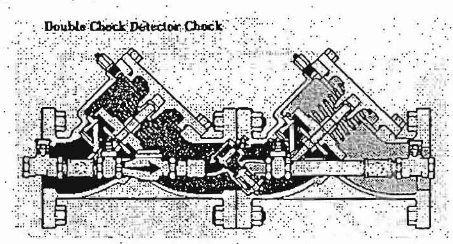
I. DOUBLE CHECK VALVE

This type of device is designed for commercial applications for 3/4 to 10 inch supply lines and contains test cocks and gate valves for testing purposes.
ASSE standard #1015

Flow



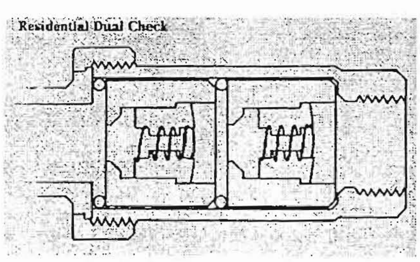
II. DOUBLE CHECK DETECTOR CHECK VALVE

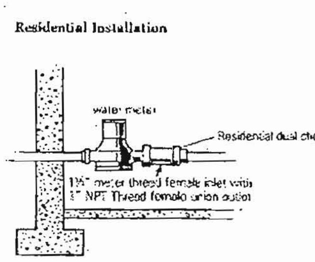


This device is similar to the "double check" unit except that it has a water meter added to detect down stream leaks and unauthorized withdrawals. The unit is commonly installed on fire protection supply mains. ASSE standard #1048

III. DUAL CHECK VALVE

The dual check valve is for residential applications only. When used, it is usually installed on the customer side of the water meter in an attempt to contain any pollutant (low hazard) within the resident's secondary system. The dual check valve is not equipped for in-line testing. ASSE standard #1024





VII. TYPICAL RETAIL FOOD SERVICE CROSS-CONNECTIONS

NOTE: When evaluating the potential plumbing hazards for each fixture, there may be more than one type of backflow assembly or device that can be installed to protect a cross-connection (even if it exceeds minimum requirements to meet the hazard). In lieu of an air gap, is a cross-connection subject to backpressure and continuous or non-continuous pressure (all are subject to back-siphonage)? All inlets and cross-connections attached to the water supply are subject to back-siphonage, but not all are subject to backpressure. For specifications on proper installation and use for each device, review the previous pages.

The following are "typical" examples of equipment and backflow prevention devices required in lieu of an air gap. Remember, sometimes plumbing installations can be construed in a "nontypical" fashion; this does not mean that is necessarily wrong, but it will take more effort to evaluate the cross-connection control design.

1. **Prerinse or preflush hose**: (typically located at garbage grinders/disposals, prerinse or flushing stations prior to mechanical warewashing machines, or vegetable/prep sinks)

Units that are not equipped with a proper retainer spring (so an air gap above the flood level rim can be maintained when allowed to hang freely) must be provided with an appropriate backflow assembly or device. The type installed is dependent on the shut off valve location:

a. Hand valve on spray nozzle:

Since the entire supply line is subject to continuous pressure, the backflow device must be acceptable for use with continuous pressure and back-siphonage application. Backpressure is not an issue for a potential indirect cross-connection. An in-line double check valve assembly with an intermediate atmospheric vent or pressure vacuum breaker (PVB) can meet the minimum requirements for continuous pressure.

b. No valve on the spray nozzle or end of hose:

The supply line from the shut off valve to the end of the nozzle is not subject to continuous pressure or backpressure. An atmospheric vacuum breaker (AVB) can meet the minimum requirements for non-continuous pressure and potential back-siphonage.

2. **Hose bibbs, threaded faucets** (inside & outside of establishment, fairgrounds, special events, festival, etc.):

When a hose is attached directly to the faucet, a potential indirect cross-connection exists. Protected will depend on whether or not a shut-off device (pistol grip, etc.) is installed on the end of the hose.

a. No shut off device on the end of the hose:

The hose is not subject to continuous pressure or backpressure. A hose bibb vacuum breaker (HBVB) or atmospheric vacuum breaker (AVB) can meet the minimum requirements for non-continuous pressure and potential back-siphonage.

b. A shut off device on the end of a hose:

The backflow device is subject to continuous pressure and no backpressure. An in-line backflow prevention device with an intermediate atmospheric vent or a pressure vacuum breaker (PVB) can meet the minimum requirements for protection. (Note, the PVB must be installed at least 12 inches above the maximum expected height that the hose end will be utilized.)

3. **Inlets which are or may become submerged:**

A. Supply line for a mechanical warewashing machine and dish conveyor belt.

B. Supply inlet to a dish table trough or silverware and dish soak tanks.

C. Supply line to a soap dispenser (detergent feeder) and/or drying agent for mechanical warewashing machines:

The dispenser discharges the solution on the down stream side of AVB for the warewashing machine's supply line.

D. Supply inlet to a garbage disposal with flushing rim:

The submerged inlet is controlled by an electronic solenoid that supplies water to the waste being ground to form a slurry whenever the disposer is turned on.

E. Garbage can washer. (If a jet rinse type, the inlet through the floor must be at least six inches above the flood level rim of the depressed area/sink).

F. Perforated pipe to an oriental wok cooker.

G. Supply inlet or fill line for equipment such as steam kettles, steam tables, dipper wells and coffee urns.

Backflow prevention for items A - G: Typically the atmospheric vacuum breaker is utilized on a submerged inlet for non-continuous pressure and potential back-siphonage. For continuous pressure and potential back-siphonage (no backpressure), a pressure vacuum breaker (PVB) can meet the minimum requirements for protection.

Inlets which are or may become submerged, Continued:

H. Soap portioner on a faucet:

The soap portioner must contain an internal air gap.

I. Water wash system for an exhaust hood (self cleaning):
Detergent feeder must discharge on the down stream side of the backflow prevention device and have an AVB for non-continuous pressure, PVB for continuous pressure or an in-line backflow prevention device with an intermediate atmospheric vent for continuous pressure and potential backpressure. A reduced pressure zone (RPZ) backflow prevention device may be required if toxic chemicals are added.

4. **Carbonators for beverage dispensers**: Carbon dioxide (CO_2) from the carbonator that comes into contact with water will form carbonic acid (weak acid). If carbonic acid comes into contact with copper piping, copper will dissolve into the water and may result in copper poisoning (vomiting). Typically, the hazard exists for those consuming the first few softdrinks of the day. To prevent the backpressure of CO_2, an in-line backflow prevention device with an intermediate atmospheric vent meeting ASSE Standard #1022 **must be installed between the carbonator and any copper supply line.**

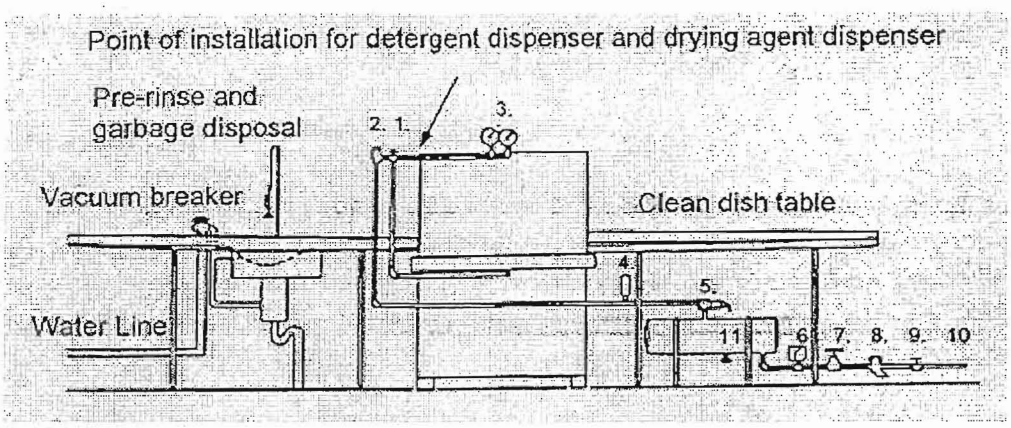
5. **Boiler**:
a. with no chemicals added:
An in-line backflow prevention device with an intermediate atmospheric vent for continuous pressure and potential backpressure.

b. with chemicals added (high hazard):
A reduced pressure zone (RPZ) backflow prevention device would be required for toxic chemicals with potential backpressure and continuous pressure. The water supply line for the chemical additive reservoir must also be adequately protected.

6. **Water softening equipment**: with a continuous feed to a brine tank requires at least an in-line backflow prevention device with an intermediate atmospheric vent to meet the minimum protection for continuous pressure.

7. **Lawn sprinkler system** with no potential backpressure: An AVB for non-continuous pressure and a PVB for continuous pressure would meet minimum requirements for backflow protection. If chemicals are added, a RPZ may be required.

TYPICAL MECHANICAL WAREWASHING INSTALLATION



1. Gauge cock for tests
2. Vacuum breaker
3. Wash and final rinse
4. Shock arrestor (recommended)
5. Pressure – temperature relief valve
6. Pressure – temperature gauge
7. Pressure reducing valve (set at 15-25 psi)
8. Strainer
9. Cut-off valve
10. 140 degree water supply
11. Booster heater

VIII. AIR GAPS & AIR BREAKS FOR DRAINS & WASTE

An indirect connection between the water supply or food service equipment and the facility's drainage or wastewater disposal system is necessary to prevent wastewater from backflowing (back-siphonage or backpressure) into the supply or into equipment where food, kitchenware or utensils are retained.

DIRECT CONNECTION: A waste line or pipe from a fixture, receptacle or device that discharges used water, waste materials or sewage directly into the facility's drainage system.

INDIRECT CONNECTION: A waste line or pipe from a fixture, receptacle or device that discharges used water, waste materials or sewage into the facility's drainage system through an "air gap" or "air break." Thus, there is no direct connection between the two systems.

> **AIR GAP**: is the unobstructed, vertical air space that separates the end of a supply line and the flood level rim of a receptacle. This receptacle may be a sink, coffee urn, steam kettle, floor drain, floor sink, etc. The air gap must be the greater of the two - a minimum of one inch or twice the inside diameter of the supply pipe.
>
> **AIR BREAK**: is a waste line or pipe from a fixture that discharges used water or liquid waste into another fixture or receptacle at a point below the flood level rim, i.e., the waste line from a vegetable preparation sink that drains into a floor drain. (Restated: an air break is an indirect connection that does not have an "air gap.") *(Note: some jurisdictions do require the waste line to terminate above the flood level rim of the floor, sink or drain.)*

1. **Booster heater for warewashing machine**:
   Provide an air gap between the relief valve vent pipe and the floor drain or floor sink.

2. **Water-cooled condenser** for an ice machine or other refrigeration system:
   Provide an air gap between the end of the supply line and the floor drain or floor sink. (The supply line water still remains as part of the supply system as it cools. The cooling water is not exposed to potential outside contamination until it exits the unit.)

3. **Drain lines for food service equipment** such as salad cooler table or salad bar, ice machine or ice bin, soda fountain/dispenser, steam kettle and steam table:
   Provide an air break.

4. **Condensate drain lines** for refrigeration equipment:
   Provide an air break.

5. **Water softening equipment**:

   a. Brine tank drains through a hose bibb (potential indirect cross-connection with a drain hose): a hose bibb vacuum breaker (HBVB) can meet the minimum requirements for non-continuous pressure and potential back-siphonage.

   b. Brine tank with a gate or ball valve: drain line must be air gapped.

6. **Exceptions to indirect wastes**:

   a. Warewashing machines located within five feet of a trapped floor drain may have a direct waste connection to inlet side of a properly vented floor drain trap.

   b. Garbage disposals require a direct connection to prevent the solids from separating out from the waste slurry.

   c. Other exceptions as provided by law or regulation.

IX. GREASE INTERCEPTORS

Oil and grease entering a facility's drainage waste system will eventually solidify somewhere down stream and eventually clog the sewer line and/or cause potential problems for the onsite or public sewage system. The oil and grease from foods and cooking liquefy at high water temperatures primarily originating from the three compartment sink, warewashing machine or some pieces of equipment such as an oriental wok cooker.

Oil and grease can occur in a combination of four forms:

1. Dissolved oil is oil that has dissolved in the water via a degreasing compound and will not separate from the water.

2. Chemically emulsified oil is oil that has been broken down into very small particles via a detergent and will not float to the surface.

3. Free oil, which is the majority of the oil produced in a food service facility, is not dissolved or chemically emulsified but is in a liquid form that is available to float to the water surface when it is allowed to coalesce (consolidate or congeal on the water surface).

4. Mechanically emulsified oil is free oil that has been agitated in water to form small droplets. These droplets will congeal, as free oil does, provided enough time is allowed for the process.

HOW GREASE INTERCEPTORS WORK

A grease interceptor (or grease trap) is a chamber designed for wastewater to pass through and allow any free or mechanically emulsified oil to float to the top for retention as the remainder of the effluent passes through. (This concept is similar to a septic tank, but remember a septic tank is designed to collect solids on the bottom and scum on the top of the tank.) For the oil to float to the top, it is necessary to calm the water as turbulence only perplexes the separation. To assist in the ponding or calming process, the waste water enters through an inlet baffle and may pass through additional baffles before exiting through the outlet baffle. Flow rate (volume of water per unit of time, i.e. 7 gallons per minute [GPM]) affects time and turbulence in the interceptor. Too fast a flow rate does not allow the "time" necessary for separation and creates turbulence. Thus, many of these installations are equipped with a flow control valve prior to the inlet baffle.

Only the facility's grease laden waste should be plumbed to the grease trap, otherwise suspended solids would fill the unit and a larger tank would be needed for the higher volume of waste water. Also, some installations are designed with a solids strainer prior to the interceptor, to prevent solids from interfering with grease separation.

SIZING THE INTERCEPTOR

Grease trap installations are designed and sized based on anticipated flow rates and organic load for maximum efficiency. Specific gravity (density) of the grease filtrates affects the time necessary for separation. For example, the specific gravity of water is 1.0, thus the lower the specific gravity of the oil, the less time it takes to separate and float to the top of the tank. Also, the higher the flow rate, ratio of grease to water, suspended solids, and total grease volume to be retained between cleaning/emptying, the larger the grease interceptor must be.

INTERCEPTOR LOCATION

Grease traps range in size from 5 gallon units located inside the kitchen area to 1,000 gallon in-ground installations outside the facility. Installation should be properly vented and as close to the source as possible but in a manner that facilitates the ease of cleaning and service without creating a nuisance.

X. BACKFLOW PREVENTION QUIZ

T or F 1. A cross-connection is a link or union between a potable water supply and any other system or apparatus through which a contaminant or pollutant may be transferred via some form of backflow into the drinking water system.

T or F 2. Backflow is the reverse flow of water in a plumbing system.

T or F 3. Backpressure is caused by a reduction in the system's pressure.

T or F 4. Backpressure can occur through an indirect cross-connection between a system that is operated at a higher pressure than the potable water supply.

T or F 5. The least reliable backflow preventer is the dual check valve.

T or F 6. A pressure vacuum breaker will protect against back-siphonage, but it will not protect against backpressure.

T or F 7. Atmospheric vacuum breakers must always be installed beyond the final control (shut off) valve.

T or F 8. An air break is another term for air gap.

T or F 9. A typical direct cross-connection is an ordinary hose.

T or F 10. Hose bibb vacuum breakers are only approved for noncontinuous pressure situations.

T or F 11. The best "fool proof" method of preventing backflow is the installation of the reduced pressure zone backflow preventer (RPZ).

T or F 12. The pressure vacuum breaker must be installed at least 6 inches above the highest inlet down stream and conversely the atmospheric vacuum breaker must be installed at least 12 inches above the highest inlet or flood level rim down stream.

T or F 13. A reduced pressure zone backflow preventer (RPZ), pressure vacuum breaker (PVB), double check value assembly, and a dual check valve with an intermediate atmospheric vent all require periodic testing to assure proper operation.

T or F 14. A backflow device that has a vent to the atmosphere may not be installed in a pit.

T or F 15. An inlet from a potable water supply that terminates in a pit would be considered a submerged inlet.

T or F 16. The barometric loop is a very effective design of the plumbing system to protect against backpressure. The only limiting factor with its installation is that it requires at least a 35 foot vertical clearance in the facility.

17. A garbage disposal typically has a submerged inlet that automatically provides water to the grinding process, when the unit is turned on. Usually this cross-connection is protected with an atmospheric vacuum breaker (AVB) that is installed at least 6 inches above the flood level rim of the fixture. Relative to the location of the electronic solenoid shut off valve, which one of the following is true?

    a. The shut off valve can be installed on either side of the AVB.
    b. The shut off valve must be installed on the down stream side of the AVB.
    c. The shut off valve must be installed on the supply side of the AVB.
    d. The shut off valve must be installed on the supply side of the AVB and elevated at least 12 inches above the AVB.

XI. REFERENCES & RESOURCES

1. American Society of Sanitary Engineering (ASSE)
28901 Clemens Road, Suite 100 (216) 835-3040 fax (216) 835-3488
Westlake, OH 44145 E-mail: ASSE@IX.netcom.com

ASSE Standards for Cross-Connection Control

1001 - Pipe Applied Atmospheric Type Vacuum Breakers, ASSE/ANSI - 1990

1002 - Water Closet Flush Tank Ball Cocks, ASSE - 1986

1011 - Hose Connection Vacuum Breakers, ASSE/ANSI - 1995

1012 - Backflow Preventer with Intermediate Atmospheric Vent, ASSE/ANSI - 1995

1013 - Reduced Pressure Principle Backflow Preventers, ASSE - 1993

1015 - Double Check Backflow Prevention Assembly, ASSE - 1993

1019 - Vacuum Breaker Wall Hydrants, Freeze Resistant Automatic Draining Type, ASSE/ANSI - 1995

1020 - Pressure Vacuum Breaker Assembly, ASSE/ANSI - 1990

1021 - Drain Air Gaps for Domestic Dishwasher Applications, ASSE - 1977

1022 - Backflow Preventer for Carbonated Beverage Machines, ASSE - 1996

1024 - Dual Check Valve Type Backflow Preventers, ASSE - 1994

1032 - Dual Check Valve Type Backflow Preventers, ASSE -1980 (carbonating units)

1035 - Laboratory Faucet Backflow Preventers, ASSE/ANSI - 1995

1047 - Reduced Pressure Detector Backflow Preventer, ASSE/ ANSI - 1995

1048 - Double Check Detector Assembly Backflow Preventer, ASSE/ANSI - 1995

1052 - Hose Connection Backflow Preventers, ASSE/ANSI - 1994

1055 - Chemical Dispensing Systems, ASSE - 1997

1056 - Back-Siphonage Backflow Vacuum Breakers, ASSE/ANSI - 1995

1060 - Outdoor Enclosures for Backflow Prevention Assemblies, ASSE - 1996

2. American Water Works Association (AWWA)
   6666 West Quincy Avenue — (303) 794-7711
   Denver, CO 80235 — Homepage: http://www.awwa.org

3. FEBCO
   P.O. Box 8070 — (209) 252-0791 fax (209) 453-9030
   Fresno, CA 93747-8070 — Homepage: http://www.cmb-ind.com

4. Foundation for Cross-Connection Control and Hydraulic Research
   University of Southern California — (213) 740-2032 fax (213) 740-8399
   KAP-200 University Park MC-2531 — E-Mail: fccchr@usc.edu
   Los Angeles, CA 90089-2531 — Homepage: http://www.usc.edu/dept/fccchr

5. Plumbing and Drain Institute (PDI)
   1106 West 77th Street South Drive
   Indianapolis, IN 46260 — (317) 251-6970

6. Plumbing Related Associations & Publications
   Homepage: http://www.PlumbingSupply.com/public.html

7. Watts Regulator Company
   815 Chestnut Street — (508) 688-1811 fax (508) 794-1848
   North Andover, MA 01845 — Homepage: http://www.wattsreg.com

8. Zurn Industries, Inc.
   Hydromechanics Division
   1801 Pittsburgh Avenue
   Erie, PA 16514 — (814) 455-0921 fax (814) 454-7929

XII. ANSWER KEY TO THE BACKFLOW PREVENTION QUIZ

1. TRUE, a cross-connection is any direct or indirect connection that could possibly join a potable and nonpotable or unknown source and the transfer of a contaminate or pollutant could occur via back-siphonage or backpressure.

2. TRUE, backflow is a reverse flow in the plumbing system that is opposite to the expected or intended direction. Backflow can be caused by backpressure or back-siphonage.

3. FALSE, backpressure can occur through a direct cross-connection (not indirect) when the "other" system's pressure exceeds that of the potable water supply. Flow will occur in the direction of lower pressure (least resistance), from higher pressure to lower pressure.

4. FALSE, backpressure can only influence a potable system via a direct connection. Remember, a direct connection can be subject to backpressure and back-siphonage. An indirect connection is only subject to back-siphonage.

5. TRUE, a dual check valve can not be tested and the unit is not vented to the atmosphere. Many times, but not always, a vented device will leak when one of the check valves fail.

6. TRUE, a PVB is approved for high hazard, continuous pressure and NO POTENTIAL BACKPRESSURE.

7. TRUE, all shut off valves must be installed on the supply side of the AVB, otherwise the device would be subjected to continuous pressure, which the device is not approved for.

8. FALSE, air gap is the vertical, unobstructed air space between the flood level rim of a fixture an the supply inlet. Air break is the vertical air space or separation between a waste line and floor drain or floor sink. Air breaks are installed to prevent sewage back-ups from entering food preparation equipment and sinks.

9. FALSE, a hose is a typical INDIRECT cross-connection, not a direct cross-connection.

10. TRUE, HBVB's are not approved for continuous pressure - water pressure on both side of the vacuum breaker for more than 12 hours.

11 FALSE, the RPZ is the "best" device available for high hazard, continuous pressure, backpressure, back-siphonage conditions. The device is testable and even protects the supply if the unit fails (check valves foul). The "fool proof" or most desirable method of preventing backflow is the "air gap". It is simple and nonmechanical.

12. FALSE, the PVB is to be installed at least <u>12 inches</u> above the highest inlet down stream and conversely the <u>AVB is 6 inches</u> above the highest down stream inlet or flood level rim.

13. FALSE, the RPZ, PVB and double check valve assemblies can be tested. Dual check

valves with intermediate atmospheric vents can not be tested.

14 TRUE, a vented backflow device submerged in a pit full of water could permit this nonpotable water to be drawn into the potable supply under back-siphonage conditions. Also, under static conditions the vent chamber could fill with the pit water and affect up stream or down stream under various water flow conditions.

15. TRUE, a submerge inlet is an inlet that terminates below the flood level rim of a fixture. If a situation necessitates a submerged inlet, then the cross-connection must be protected with an appropriate backflow device.

16. FALSE, the barometric loop only provides protection against back-siphonage. An absolute vacuum can only "pull" water up a column 33.9 feet, therefore, only backpressure can create adequate pressure to go up and over the column.

17. C., all shut off devices must be on the supply side of the AVB and be accessible.