



Fixed Food Establishment Plan Review Application

Meets the Food Law requirement for a transmittal letter to be submitted with the plans.

Establishment Name: _____

Address, City, Zip: _____

Establishment Phone: _____

Location Information: Between _____ & _____ street

Prior Establishment Name: _____

<p>Owner</p> <p>Name _____</p> <p>Address _____</p> <p>City, State _____</p> <p>Zip _____ Phone # _____</p> <p>Fax # _____ E-Mail _____</p>	<p>Food Service Equipment Supply Co.</p> <p>Name _____</p> <p>Address _____</p> <p>City, State _____</p> <p>Zip _____ Phone # _____</p> <p>Fax # _____ E-Mail _____</p>
<p>Architect</p> <p>Name _____</p> <p>Address _____</p> <p>City, State _____</p> <p>Zip _____ Phone # _____</p> <p>Fax # _____ E-Mail _____</p>	<p>General Contractor</p> <p>Name _____</p> <p>Address _____</p> <p>City, State _____</p> <p>Zip _____ Phone # _____</p> <p>Fax # _____ E-Mail _____</p>

Which of the above will serve as the primary contact? _____

Which of the above should all correspondence be mailed to? _____

Proposed construction start date: _____ Proposed opening date: _____

For reviewing agency use only:

Fee \$: _____

Check #: _____

Date: _____

Receipt #: _____

Plan Review #: _____

Assigned to: _____

Remarks: _____

www.michigan.gov/mdard, keyword: Food Plan Review - Industry



By initialing this box, the operator indicates they have reviewed the checklist and all items marked are provided to the licensing agency.

MARK IF ITEM IS PROVIDED	NOT APPLICABLE	ITEM TO SUBMIT	ITEM DESCRIPTION
<input type="checkbox"/>		Application Form	Include contact information (i.e. email or phone number) of the individual designated to answer questions or make changes to plans when they arise.
<input type="checkbox"/>		Fee	The Plan Review fee must be submitted with all plan review materials. The license fee is a separate fee and is due before the opening of the establishment.
<input type="checkbox"/>		Proposed Menu	Menu must be submitted to allow the licensing agency to determine the processes and type of operation the establishment will need to accommodate. The menu may be a rough draft of foods served at the establishment. Consumer advisories must be placed on the menu for foods that will be served undercooked.
<input type="checkbox"/>		Site Plan	Plan must indicate the exterior dimensions of the building, outside garbage storage area and containers, and exterior storage areas. On-site water well and on-site sewage disposal data must be provided.
<input type="checkbox"/>		Scaled Drawings	A plan of all food service areas must be provided with dimensions or scale. The dimensions or scale may be permitted on the floor plan.
<input type="checkbox"/>		Floor Plan	This plan must indicate the layout of equipment.
<input type="checkbox"/>		Hand Sinks	Hand sinks must be within 25 unobstructed feet of all food service work areas. Hand sinks must be labeled on the floor plan.
<input type="checkbox"/>		Other Sinks	All sinks must be labeled for their intended use on the floor plan. This includes but is not limited to: dish washing, food preparation, dump, utility and mop sinks.
<input type="checkbox"/>		Mechanical Plan	Plans indicating make-up air systems, ventilation hoods (including hood, duct, and exhaust fans), along with an air balance schedule must be submitted if applicable. Ensure the local mechanical inspection authority has been contacted in regards to the proposed project.
<input type="checkbox"/>		Plumbing Plan	All sinks, hot and cold water outlets, hot water equipment, water heater, sewer drains, grease traps, and floor drains/sinks must be indicated on the plumbing plan. Backflow prevention must also be indicated on the plumbing plan.
<input type="checkbox"/>		Water Heater	Contact the local licensing agency for assistance in determining the size and capacity needed for the establishment's water heater. A specification sheet must be provided for the proposed or existing water heater. All existing and future fixtures must be indicated on the MDARD Worksheet.
<input type="checkbox"/>		Lighting Plan	This plan must detail the location of lighting and how lights will be protected from shattering.
<input type="checkbox"/>		Room Finish Schedule	Materials, finishes, and paint type of the floors, walls, and ceiling, for all interior rooms must be provided. The MDARD Plan Review Worksheet provides a schedule that may be used if a plan is not provided.

<input type="checkbox"/>		Specification Sheets	<p>Specification sheets indicating the make, model number, and equipment materials must be provided for all equipment (i.e. prep tables, cooking equipment, shelving, sinks, etc.). Construction materials for custom made equipment must be provided.</p>
<input type="checkbox"/>		MDARD Plan Review Worksheet	<p>The Worksheet must be filled out completely. Items in the worksheet not part of the establishment's operation may be marked as not applicable. Items described in the Standard Operating Procedures may be marked as "in SOPs."</p>
<input type="checkbox"/>		Meal Estimates	<p>A proposed estimate of the number of meals to be served daily, helps in determining if the amount of storage space proposed will be sufficient.</p>
<input type="checkbox"/>		Standard Operating Procedures	<p>Procedures must be submitted detailing how food safety practices will be followed. HACCP plans must be provided and approved for any special processes (only required under certain circumstances, such as reduced oxygen packaging, curing meats, etc.). Refer to the Standard Operating Procedure checklist for guidance.</p>
<input type="checkbox"/>		Certified Manager	<p>A certified manager must be hired with the establishment by the time of the pre-opening inspection. Provide a copy of a certificate or mark in the Worksheet a Certified Manager will be employed.</p>



Michigan Department of Agriculture and Rural Development

Food Establishment Plan Review Manual

Food & Dairy Division
Michigan Department of Agriculture
and Rural Development
P.O. Box 30017
Lansing, MI 48909
(800) 292-3939

Revised December 2013

Introduction

This manual is designed to assist in achieving greater uniformity in the plan review process by providing technical assistance for design professionals, owners and others in the preparation of food service plans and completion of the plan review worksheet. Individuals who have questions during the plan review process should call the local health department or Michigan Department of Agriculture and Rural Development (MDARD), depending on who will conduct the plan review. Agency contact information is available at: <http://www.michigan.gov/MDARD>, Search: Determine agency.

Plan review of *food service establishments*, retail food stores, and all other food operations, is a high priority for the Michigan Department of Agriculture and Rural Development and Michigan's local health departments.

A good review of plans helps to avoid future problems. By listing and locating *equipment* on floor plans and diagramming specifications for electrical, mechanical and *plumbing systems*, potential problems can be spotted while still on paper and modifications made **before** costly purchases, installation and construction.

Food establishment plan review is recognized as an important food program component that allows:

- Regulatory agencies to ensure that *food establishments* are built or renovated according to current regulations or rules;
- Industry to establish an organized and efficient flow of food; and
- Regulatory agencies to eliminate code violations prior to construction.

Who Must Submit Plans?

An application for a food establishment license must be submitted to the appropriate regulatory agency at least thirty days before a new food business opens. An inspection must be conducted before a license can be issued.

When plans are required, these plans must be approved prior to construction or remodeling! The regulatory agency will review the plans and specifications as soon as practical to determine their completeness and adequacy. If a submission of complete plans and specifications is not reviewed within 30 business days of receipt, the plans and specifications will be considered complete and adequate. Plan review fees vary among local health departments. The following establishments are required to submit plans for review and approval:

- Food service establishment (local health departments - fees vary).
- Extended retail grocery (MDARD - \$197).
- Special transitory food unit (local health departments or MDARD - fees vary).
- Mobile food establishment (local health departments or MDARD - fees vary).
- Other MDARD-licensed retail establishments are encouraged to avail themselves of MDARD for plan review services at no added cost. (These fees have already been built into the license fees.)

The Food Law and the Michigan Modified FDA 2009 Food Code, which is adopted by reference and is a part of the Food Law, is used as a reference in completing this guide. To view the food code, food law and other fact sheets go to:

<http://www.michigan.gov/MDARD>, Search: Updated Food Law/Food Code 2012 or call 800-292-3939 to request free single copies.

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Food Establishment Plan Submission Instructions

- 1. Plan review application and any necessary plan review fees:** MDARD inspected establishments require a \$197 mandatory plan review for retail food establishments with deli and seating, retail grocery with food service and special transitory food units that are predominately retail or wholesale. Most other plan reviews are voluntary and done at no charge. MDARD encourages **all** operators to submit remodeling or construction plans for review.

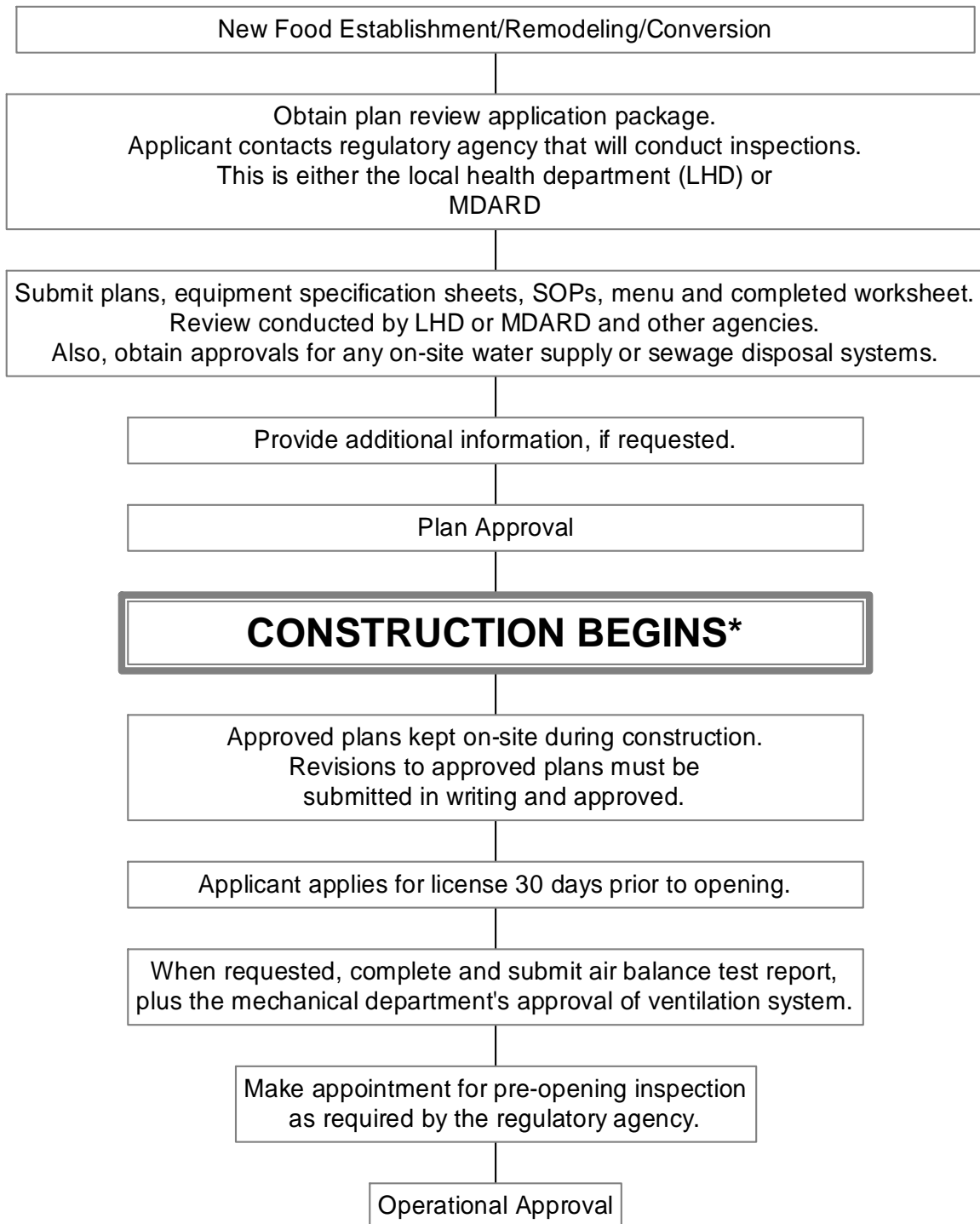
Mandatory plan review is required for all food service establishments, special transitory food units that are predominately food service and any other establishment inspected by a local health department. Contact your local health department for the applicable fee.

- 2. Completed Plan Review Worksheet:** Worksheet and guidance manual copies are available from any health department or on the web at: <http://www.michigan.gov/MDARD> Search: Plan Review.
- 3. Menu:** If your facility does not have a formal, set menu, such as a school with a rotating menu, submit representative sample menus or a list of foods offered for sale or service.
- 4. Standard Operating Procedures (SOPs):** SOPs appropriate to your operation shall be submitted prior to opening. See the Standard Operating Procedures Manual guidance document that is available from any health department, MDARD Regional Office or on the web at: <http://www.michigan.gov/MDARD> Search: Plan Review.
- 5. Certified Manager Documentation:** As of June 30, 2009, most food establishments are required to employ at least one (1) full time certified manager employee who is certified under the American National Standards Institute accredited certification program (Food Law 2000 as amended, Section 289.2129). For more information, please contact your local health department, or visit MDARD's web site at: <http://www.michigan.gov/MDARD> Search: Manager Certification.
- 6. One complete set of plans:** Provide scaled plans (1/4" per foot is a normal, easy to read scale).

Plans must include:

- Proposed layout, with equipment identified.
 - Label sinks and prep tables with their intended use.
 - Include construction materials of such items as custom cabinets and any other built-in items.
 - Mechanical plan (e.g., make-up air systems, air balance schedule and cooking ventilation systems, including hood, duct and exhaust fans).
 - Plumbing plan (e.g., sinks for handwashing, food preparation and dishwashing, dish machines, hot and cold water outlets, hot water equipment, water heater, sewer drains, grease traps and floor drains / sinks).
 - Lighting plan, indicating which lights are shielded.
 - Site Plan, including:
 - Details of outside garbage storage area and containers, as well as exterior storage areas.
 - On-site water well and sewage disposal system data.
- 7. Specifications:** Include manufacturer's specifications or "cut" sheet for each piece of equipment. Minimum information for each piece of equipment includes the following:
 - Type
 - Manufacturer
 - Model number
 - Dimensions
 - Performance capacity
 - Indicate how equipment will be installed (e.g., on leg or wheels, fixed or flexible utility connections)
 - Indicate which items are used equipment and what equipment is NSF approved or equivalent.
 - Sanitation Standard Operating Procedures (SSOPs): Include any available cleaning and maintenance instructions for food processing, cutting and grinding equipment.

Plan Review Process Flow Chart



Part I Menu, Consumer Advisories & Food Flow

Worksheet Help		
Question #	Food Code & Food Law*	Guidance
2	Thawing FC 3-501.13	<ol style="list-style-type: none"> 1. Identify all <i>potentially hazardous foods (time/temperature control for safety food)</i> on the menu that must be thawed. 2. List the foods in each thawing method to be used. Note: Thinner foods (<1" thick) may consist of sliced meats, individual hamburger patties, hot dogs, some seafood, etc., Thicker foods (>1"thick) may consist of roasts, a case of hamburger patties, chicken, frozen pasteurized eggs, etc.
3	Cooking Reheating FC 3-401.11-14 FC 3-403.10-11	<ol style="list-style-type: none"> 1. List the name of all cooking and reheating <i>equipment</i>. Include tabletop <i>equipment</i> such as rice cookers and microwaves. Steam tables should not be used for reheating and should be listed under #4. 2. Check whether each piece will be used for cooking and/or reheating, whether it is new or used, and whether it is listed by a third party testing organization, such as the National Sanitation Foundation (NSF), ETL, etc. These firms test <i>equipment</i> to determine if recognized sanitation and construction standards are met.
4	Hot & Cold Holding FC 3-501.16	<ol style="list-style-type: none"> 1. List the name of all hot and cold holding <i>equipment</i>. Examples include: steam tables, electric hot boxes, insulated hot/cold boxes, salad bar units, refrigerators, etc. 2. Check whether each piece will be used for hot and/or cold holding, whether it is new or used, and whether it is listed by a third party testing organization such as the National Sanitation Foundation (NSF), ETL, etc. These firms test <i>equipment</i> to determine if recognized sanitation and construction standards are met. 3. Note any <i>equipment</i> listed under question 3 that will also be used for hot or cold holding.
5	Ice FC 3-202.16 FC 3-303.11-12	Describe in as much detail as possible how, when and where ice will be used to hold <i>potentially hazardous food (time/temperature control for safety food)</i> cold. Use of ice off-site for catering can be answered under question 9D.
6	Time as a Control FC 3-501.19	Under very specific and limited circumstances, time instead of temperature may be used to control bacterial growth. A careful reading of the relevant food code section is recommended before making a proposal. You must prepare and submit a standard operating procedure for each food item where time as a control is proposed.

7	Cooling	FC 3-501.14-15	1. Identify foods from the menu that will be cooled after cooking for later service. 2. Determine and list the cooling method(s) for each food.
8	Bare Hand Contact Washing Fruit/Veggies Date Marking	FL 289.6151 FC 3-301.11 FC 3-302.15 FC 3-501.17	Unless a written alternative plan is developed and implemented, there can be no bare hand contact with <i>ready-to-eat</i> foods. List the methods you will use to avoid bare-hand contact.
9	Catering	Numerous	
*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012 or call 800-292-3939 to request single free copies.			

Menu

The menu is an integral part of the plan review process. The menu or a listing of all of the food and beverage items to be offered at the *food establishment* must be submitted by the applicant with the submission of all other plan review application documents. A facility, such as a school, that has a large rotating menu cycle, may provide a representative listing of the types of items served.

As with the inspection process, the plan review process focuses on the food and what will happen to the food. The source and quantity of food to be served will be reviewed along with the preparation and post-preparation operations and the proposed storage practices.

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

- Multiple ingredients being assembled or mixed
- *Potentially hazardous foods (time/temperature control for safety food)*
- Foods that will be prepared or held for several hours prior to service
- Foods requiring cooling and reheating
- Multiple-step processing (passing through the critical temperature zone, 135°F to 41°F more than once).

The style of food service will also be reviewed. The style of food service may be cook-to-order (cook-serve), self-service (buffet or salad bar), service of pre-packaged foods, service of large volumes of food, food preparation requiring multiple steps and handling, etc.

Menu evaluation involves the review of food sources, categories of foods and their required preparation, such as:

- *Approved* and inspected food source
- Thin meats such as poultry, fish, eggs, hamburgers, sliced meats, and fillets
- Thick meats and whole poultry (roast beef, whole turkey, whole chickens, and hams)
- Cold processed foods (salad, sandwiches, vegetables, etc.)
- Hot processed foods (soups, stews, casseroles, etc.)
- Bakery goods

This system is useful since the critical control points for each process remain the same regardless of the individual menu ingredients. 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 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. With a proper understanding of the menu, the plans for *food establishments* can be reviewed to assure that the food items proposed can be protected during the service operation.

Consumer Advisories

Consumer Advisories are required for food establishments serving undercooked raw animal products. View a guidance document at: www.michigan.gov/MDARD Search: Updated Food Law/Food Code 2012 or call your inspecting agency for a copy.

Food Flow

Why analyze flow?

The flow of food through a kitchen can greatly affect food safety. Contamination of *ready-to-eat* (RTE) foods can occur with poor food flow, such as when raw meat and seafood are prepared on the same table that is used to assemble sandwiches. Soil and bacteria from a dirty dish or seafood processing area can also be moved to other areas when employees must routinely enter these areas. Your plan reviewer needs to understand how the menu will be prepared in the *physical facilities* proposed.

Flow may be in a straight "assembly" line format or be organized to move food through departments that perform different functions. A well laid-out flow provides safer and more efficient food preparation. Mapping out your proposed flow may help you better identify problems with your layout.

What do I need to do?

You are being asked to be ready to discuss the flow of food from delivery through service. **Depending upon the complexity of your menu, your plan reviewer may schedule a consultation to discuss food flow with you.**

Use your floor plan layout to think through your food production processes.

- Determine the flow from the receiving door, through storage, preparation, cooking, assembly and hot holding, ending with the customer. Also think through how solid waste and soiled dishes and utensils will move through the facility. Be ready to discuss such items as:
 - Which sinks and preparation tables will be used for washing and prepping vegetables, meat and seafood?
 - What items will be stored in working refrigeration units?
 - Is there adequate separation between raw and *ready-to-eat* foods in storage and during preparation?
 - How will cooks and preparation staff avoid contaminating *ready-to-eat* foods with juices and bacteria from raw meats and seafood?
 - Do flow patterns change during different times of day?

How will this information be used in the review process?

A plan reviewer not only reviews whether the *physical facilities* comply with the food code, but also visualizes the number and types of food being prepared, along with how food and people will move through the facility. The reviewer can help you determine food code violations that will or may be created by the proposed layout.

In analyzing food flow, the plan reviewer will:

- Try to gain an understanding of how food, dishes and solid waste will move through the facility.
- Look for points where cross-contamination of bacteria from raw to *ready-to-eat* foods may occur.
- Determine where soiled dishes, solid waste, outside dirt or mop water may contaminate ice, food or preparation areas.

When areas of concern are found, one of the following may occur:

- A change will be required.
- A change will be recommended.
- A standard operating procedure (SOP) will be required to address how contamination will be avoided using the existing plan.
- You may be given an option of either making a plan change or developing a SOP.

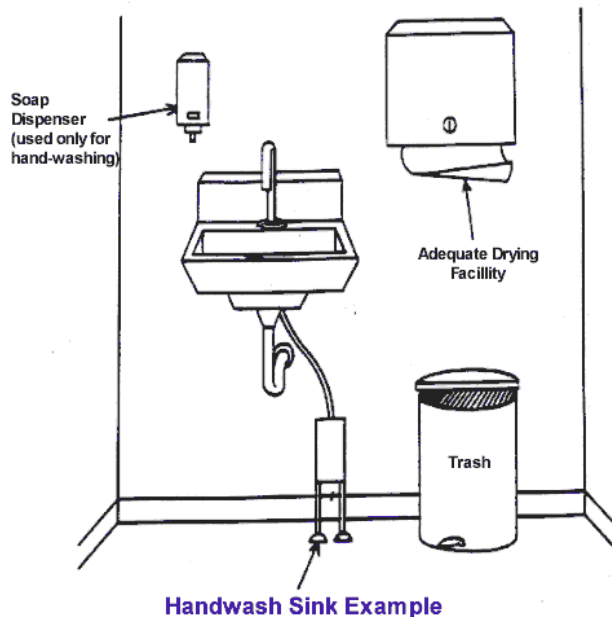
Part 2 Handwashing

The Centers for Disease Control and Prevention (CDC) has identified poor personal hygiene by food employees as a major cause of foodborne illness in the United States. Proper handwashing is a critical step in preventing bacterial and viral contamination of food. The number and placement of handsinks is a major focus of the plan review process. Giving careful thought to handsink locations can prepare your facility for enhanced food safety and prevent delays in the plan review process. Reading the following food code sections that relate to handwashing is highly recommended: 2-3, 5-202.12, 5-203.11, 5-204.11, 5-205.11, 6-301.11-20 and 6-501.18.

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. Any self-closing, slow-closing or metering faucet shall be designed to provide a flow of water for at least 15 seconds without the need to reactivate the faucet.

Handwashing sinks shall be of sufficient number and conveniently located for use by all employees in food preparation, food dispensing and utensil washing areas. Handwashing sinks shall be easily accessible and may not be used for purposes other than handwashing.

Splashguard protection may be required if spacing to adjoining food, food preparation, food contact surfaces, and utensil washing area surfaces (drainboards) is within 18". Splashguards shall not hinder access to the lavatory, should extend from the front of the sink to 12" above the rim of the sink and be easily cleanable.



Provide a separate handwashing sink; disposable towels; supply of hand cleaning agent; and waste receptacle for each food preparation area, utensil washing area, and toilet room (required number based on law). Sinks used for food preparation or for washing *equipment* or utensils shall not be used for handwashing.

When locating handwashing sinks, follow these guides whenever possible:

- provide a sink close to each employee work station
- keep sinks within the employee's line of sight
- keep a handsink near the flow of food
- make sinks easily available for those handling both raw and *ready-to-eat* foods.
- provide a sink close to dishwashing areas

A sign or poster that notifies *food employees* to wash their hands shall be provided at all handwashing sinks used by *food employees* and shall be clearly visible to *food employees*.

Part 3 Facilities to Maintain Product Temperature

Worksheet Help			
Question #		Food Code & Food Law*	Guidance
85	Refrigerated Storage	FC 3-501.14-16	Adequate refrigeration must be provided to cool and hold cold <i>potentially hazardous foods</i> (<i>time/temperature control for safety food</i>) at 41°F or less.
	Walk-in Refrigerator		<ol style="list-style-type: none"> List the number or name for each walk-in refrigerator and freezer. This should be the same number or name used on the plans. List the interior usable height of each walk-in. For example, for a unit with a 7' ceiling, the usable height would be 5.5' if the bottom shelf is 6" off the floor and storage will stop 1' from the ceiling. List the interior length and width of each unit.
	Upright Refrigerators		<ol style="list-style-type: none"> List the number or name for each upright or reach-in refrigerator and freezer unit that is provided for storage. Do not list working, preparation and line refrigerators. List the interior depth, width and height of each unit.
<p>*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD, Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.</p>			

Hot-holding and cold-holding facilities shall comply with the requirements of the Michigan Modified FDA 2009 Food Code. Food *equipment* that is certified by an American National Standards Institute (ANSI)-accredited certification program (e.g., NSF, UL, ETL) will automatically be accepted as complying with the Food Code, provided *equipment* is in good condition and has not been altered or modified. Equipment that is not ANSI accredited should be reviewed for meeting requirement of Subpart 4-1 and 4-2 of the Michigan Modified FDA 2009 Food Code.

Refrigeration Facilities Sizing and Design

The plan review for storage needs to assure adequate refrigeration facilities for the proper storage, transportation, display, and service of *potentially hazardous foods* (*time/temperature control for safety food*). Specific refrigeration needs will be based upon the menu, number of meals, frequency of delivery, and amount of preparation done in advance of service. All refrigerators must be capable of maintaining *potentially hazardous foods* (*time/temperature control for safety food*) (PHF/TCS) at 41°F or below.

If *potentially hazardous foods* (*time/temperature control for safety food*) are prepared a day or more in advance of service, a rapid cooling procedure capable of cooling PHF/TCS from 135 °F to 41 °F within 6 hours (with the first stage of 135 °F to 70 °F occurring in 2 hours or less) 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 6 hours.

Provide point-of-use refrigerators and freezers at workstations for operations requiring preparation and handling of *potentially hazardous foods* (*time/temperature control for safety food*). Refrigeration units, unless designed for such use, should not be located directly adjacent to cooking *equipment* or other high heat producing *equipment* which may tax the cooling system's operation.

Calculating Total Refrigerated/Freezer Storage Needs

To plan reserve storage, the following needs to be considered: menu, type of service, number of meals per day, number of deliveries per week and adequate air ventilation in the area where refrigeration system will be located. The following are suggested formulas to establish required reserve storage (note: only 40 percent of any walk-in unit actually provides usable space). Microsoft Excel based formulas (Formula Master v6.0) are available at www.michigan.gov/MDARD Search: Plan Review. **The following formulas do not include space for storing equipment /utensils, cleaning supplies, maintenance supplies, promotional items, etc.**

Formula 1 - Based on seating

This formula is simpler to calculate than formula 2, but has limitations. It should not be used for facilities with no seating, when a facility caters or whenever the seating is not representative of the volume of food served. It is also not suitable for facilities proposing reach-ins as storage units.

Total Interior Walk-In Storage Volume Needed:

Number of serving periods x number of seats x 0.5 x 1.25 (for establishments with drive-up facilities)

One serving period should be allotted for each of the following: breakfast, lunch, dinner, late night and 24- hour service.

Example:

Fast *food establishment*, open from 7:00 am to 11:00 pm (4 meal periods), 90 seats, drive-up window.

4 meal periods X 90 seats x 0.5 X 1.25 = 225 square feet

Formula 2- Based on meals served between deliveries

Total Interior Walk-In Storage Volume Needed:

$$\frac{\text{Vol. per meal (Cu. ft.) x number of meals}}{.40}$$

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

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

Thus, for a restaurant serving 1000 meals between deliveries (assume a minimum of 4 day storage) the following storage capacities are needed:

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

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

$$\begin{aligned} \text{For meat refrigerated storage} &= \frac{75 \text{ Cu. ft.}}{6 \text{ ft. (height)}} \\ &= 12.5 \text{ sq. ft.} \end{aligned}$$

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

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

To convert interior measurements to exterior floor area, multiply by 1.25. Thus, for meat storage, in the above example an exterior floor area = 1.25 x 12.5 sq. ft., or 15.6 sq. ft. would be needed.

Additional Recommendations for Refrigerated Storage Facilities

- Shelving for walk-in and reach-in refrigeration units should be *equipment* that is certified or classified for sanitation by an ANSI accredited certification program (e.g. NSF, UL, ETL).
- Interior finishes of walk-in and reach-in refrigeration units should be certified or classified for sanitation by an ANSI accredited certification program (e.g., NSF, UL, ETL).
- All refrigeration units must have numerically scaled indicating thermometers accurate to ± 3 °F. The temperature-sensing device must be located in the unit to measure air temperature in the warmest part. All such thermometers should have an externally mounted indicator to facilitate easy reading of the temperature of the unit. Refrigerators and freezers shall be capable of maintaining appropriate temperatures when evaluated under test conditions of an ANSI accredited certification program.
- 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.
- Refrigeration unit maximum operating temperature (cabinet air) should be:

<u>Type</u>	<u>Max Temp</u>	<u>Max Compressor Operating Time</u>
Storage & display refrigerators	Cabinet air temp. 41°F	70%
Refrigerated buffet units	Food temp. 33-41°F	
Storage & display freezer	Cabinet air temp. 0°F	80%
	Food frozen	

- Rapid pull down refrigeration units must be capable of cooling cooked PHFs from 135 °F to 7 0°F within 2 hours or less, and from 70 °F to 41 °F within the remaining 6 hours of total cooling time.
- *Approved* coved juncture base around the interior and exterior.
- *Approved* enclosure between the top of the unit and the ceiling if this space is 24 inches or less.
- Fixed *equipment* shall be spaced to allow for cleaning along the sides and behind, or *sealed* to adjoining *equipment* or walls.
- Refrigeration units should not be installed exterior to the building if non-packaged foods will be transported from the unit to the *food establishment*.
- If the walk-in floors are water-flushed for cleaning or receive the discharge of liquid waste or excessive melt water, the floors should be non-absorbent (i.e. quarry tile or equal) with silicone or epoxy impregnated grout and sloped to drain. See part 12 for plumbing requirements for walk-in floor drains.
- Walk-in freezer doors should be equipped with pressure relief ports.
- All walk-in units should be constructed and installed in accordance with the 2009 FDA Food Code and/or code requirements and bear the certification mark of an ANSI accredited organization (e.g., NSF, UL, ETL).
- 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.

Hot Holding and Reheating Facilities

The hot holding facilities must be capable of maintaining *potentially hazardous foods (time/temperature control for safety food)* at an internal temperature of 135 °F or above during display, service and holding periods.

Reheating *equipment* must be capable of raising the internal temperature of *potentially hazardous foods (time/temperature control for safety food)* rapidly (within a maximum of 2 hours) to at least 165 °F. Appropriate product thermometers will be required to monitor the food temperature.

Sample Cold Storage Calculations

Walk-In Refrigerator & Freezer Space Estimate					
Meals*	Interior cubic feet	Square feet of floor space, based on usable interior height			
		4' ceiling	5' ceiling	6' ceiling	7' ceiling
500	46-106	12-27	9-21	8-18	7-15
1000	93-213	23-53	19-43	15-35	13-30
1500	139-319	35-80	28-64	23-53	20-46
2000	185-425	46-106	37-85	31-71	26-61

*Number of meals served between deliveries

or

Storage Reach-In Refrigerator & Freezer Space Estimate**	
Meals*	Interior cubic feet
500	25-57
1000	50-113
1500	74-170
2000	99-227

*Number of meals served between deliveries

**Reach-in refrigerators and freezers only count toward the required refrigeration space if they are storage units. Working units for short-term storage at cook lines and preparation areas should not be included when calculating proposed storage.

Part 4 Facilities to Protect Food

General Food Protection

Provide a separate food preparation area for handling, washing and preparing raw meat, fish, and poultry, if served. Where portable cutting boards are planned, they should be color coded or labeled for specific use.

Salad bars and sneeze guards shall comply with the standards of an ANSI accredited certification program (e.g, NSF Standard 2).

Standard 2, in part, requires:

- Food shields shall provide a barrier between the mouth of the customer and unpackaged food. For self-service lines, the maximum vertical distance between a counter top and the bottom leading edge of a food shield shall be 13 inches.
- The distance of the leading edge of the food being served must be three-fourths of the distance of the opening through which customers reach.

- The sum of a food shield’s protected horizontal plane (X) and its protected vertical plane (Y) shall equal a minimum of 20 inches. 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.

Different requirements exist for full-service lines, so consult NSF Standard 2 for these requirements.

When patrons have access to ends of units, the same shielding requirements apply. End panels on all food shields unless the shield ends 3” or less from a wall. The end panels must be a minimum of 18” in depth and can’t be mounted more than 1½” above the countertop. The height of the panel must be the same height as the overall food shield.

All food being displayed, served, or 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.

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

Running water dipping wells should be provided for the in-use storage of dispensing utensils where frozen desserts are being portioned and dispensed.

Clean *equipment* and utensils shall be stored in a clean, dry location where they are not exposed to splash, dust, or other contamination. This should be of particular concern at salad bars and waitress stations.

Part 5 Water Supply, Sewage Disposal & Grease Traps

Worksheet Help			
Question #		Food Code & Food Law*	Guidance
32-33	Water Supply	FC 5-1	See information below.
34-35	Sewage Disposal	FC 5-403.11	See information below.
*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.			

Enough potable water for the needs of the *food service establishment* must be provided from a source constructed and operated according to law. Potable water from a municipal water supply is preferred when available. A municipal water supply is considered a type I public water supply. The oversight responsibility for these supplies is under the jurisdiction of Michigan Department of Environmental Quality (MDEQ). Other food service operations operate their water supplies from wells. These are considered non-community type II public water supplies. These are also regulated under the authority of MDEQ, with the exception that local health departments survey and monitor these supplies for potential contamination.

Establishments using an on-site water supply are regulated as described in the following:

Noncommunity Public Water Supply Owner's Guide

In 1974, out of concern for the quality of the water that we drink, Congress passed the Safe Drinking Water Act. This Act gave the U.S. Environmental Protection Agency (EPA) responsibility for establishing and enforcing drinking water quality standards nationwide. The Michigan Safe Drinking Water Act (Act 399) was enacted in 1976 and enables MDEQ to maintain primacy (state authority) over the drinking water program in our state. Local health departments are under contract with MDEQ to maintain local noncommunity programs for the public water supplies of Michigan. The following information focuses on Noncommunity Public Water Systems (PWS) at *food establishments*.

Definitions

A Noncommunity Public Water Supply (PWS) is defined as "a system that serves any nonresidential facility that provides water for drinking or domestic purposes to 25 or more persons at least 60 days out of the year, or has 15 or more service connections." A Noncommunity PWS may be further broken down into two categories dependent on the use of the systems.

- **Transient:** a transient PWS is a supply that serves 25 or more **different** people a day at least 60 days of the year (or 15 or more service connections). Restaurants are considered to be transient water supplies.
- **Non-transient:** a non-transient PWS is a supply that serves the **same 25** or more people at least 180 days of the year. Examples would include schools, industries, child care centers and office buildings

Responsibilities of a Noncommunity Public Water Supply Owner

- Maintain and operate water systems in a safe and sanitary condition.
- Collect water samples to assess compliance with drinking water standards.
- Notify the public in cases of noncompliance with standards or sampling requirements.
- Obtain permits for construction or alteration of water well systems.
- Maintain records for non-community water systems including sample results and correspondence with health departments.
- Submit payment for water samples and annual fees.

Sanitary Survey

A comprehensive inspection of the well and water distribution system is required every five years. This assesses the potential for contamination to enter the water system. Appropriate sampling frequencies are assigned. Water system deficiencies may increase the likelihood of contamination and are required to be fixed. Water systems with a satisfactory inspection and sampling history can be assigned minimum sampling.

Routine Sampling Requirements

Transient Supply

- Coliform bacteria - One sample required every three months unless reduced to once yearly, based on satisfactory survey and sampling history.
- Nitrate - One sample per year.

Nontransient Supply

- Coliform bacteria. One sample every three months unless reduced to once a year based on a satisfactory survey and sampling history.
- Nitrate. One sample per year.
- Chemical: Metals, Volatile Organic Chemicals, Synthetic Organic Chemicals, Cyanide, and Lead and Copper.
- Sample frequencies vary. Contact your local health department for your chemical sampling frequency.

Permits

A construction permit is required prior to drilling or altering a noncommunity well. The permit is intended to assure adequate well location with respect to isolation distance from sources of contamination, proper construction methods and materials, and design criteria. Applications are obtained from your county health department.

Record Keeping

Noncommunity water systems are identified by a seven-digit water supply serial number or WSSN. To insure proper identification this number must be used with all correspondence and sample data submitted to the county health department and laboratories.

Annual Fees

Annual fees are charged owners of all noncommunity water systems. These funds are collected by the Department of Environmental Quality and distributed to county health departments in order to support services provided to noncommunity facilities.

How Does This Benefit My Facility?

- The fees allow the Department of Environmental Quality to maintain a state run program as opposed to direct federal administration.
- It allows more flexibility, including significant reductions in sampling that would not be available in a federal program.
 - It results in a program that better serves public water system owners and the people of Michigan.

For More Information

The environmental health staff at county/district health departments provides direct services to public water supplies in their jurisdictions. Questions regarding owner's responsibilities should be directed to your local health department. Noncommunity program staff may be reached at the Water Bureau Division in Lansing at 517-241-1370. Upper Peninsula inquiries may be directed to 906-475-2045.

The Type II Noncommunity Water Supply web site address is: www.michigan.gov/deq. Search: Non-Community Water Supply

Sewage Disposal

All *sewage*, including liquid waste, shall be disposed of by a public *sewage* system, or by an on-site *sewage* disposal system constructed and operated according to law.

When greater than 10,000 gallons per day of wastewater will be discharged to the ground or surface water, a Michigan *food establishment* must obtain plan approval, plus a permit, from the appropriate division of the Michigan Department of Environmental Quality. For discharges of this volume, *sewage* treatment other than a septic tank and subsurface disposal system are usually necessary.

When less than 10,000 gallons per day of wastewater will be discharged to the ground, a Michigan *food establishment* uses the Food Service Design Criteria (quoted in the section directly below) and found in the publication "Michigan Criteria for Subsurface *Sewage* Disposal" April 1994, distributed by the Michigan Department of Environmental Quality. Local health departments are typically responsible for issuing permits for on-site *sewage* systems serving *food establishments*, utilizing the referenced criteria. The requirements may change at any time. Please contact the local health department in the jurisdiction where the establishment will be built to determine current design criteria and permit application requirements. Increasingly, alternative types of *sewage* systems, other than the traditional septic tank system, are being used. You may wish to discuss alternative system options with your local health department.

Food Service Design Criteria

Review and evaluation of *sewage* systems serving restaurants has determined that utilization of septic tank tile-field systems at restaurants requires a much more conservative approach to site evaluation, design, and construction, if success is to be achieved. As a result of our investigations, we have come to the following conclusions concerning these installations:

- Soils suitability for installation of an on-site *sewage* disposal system serving a food service establishment is much more critical. In normal situations soil textures such as fine sand, loam, and sandy clay loam, are acceptable for utilization of on-site *sewage* systems under these criteria. However, for *food establishments*, experience shows that only coarse sand, medium sand, loamy sand and sandy loam are the types of soil to use if success is to be achieved.
- The maximum acceptable application rate for design of *sewage* systems serving *food service establishments* is critical, if success is to be achieved. Where as in normal situations, application rates as high as 1.0 gallons per square foot per day are allowable, experience dictate application rates of .25 gallons per square foot per day are warranted when designing systems for *food service establishments*.
- Experience has shown that even with additional precautions, design and construction system failure is more frequent when *sewage* systems serve *food service establishments*. Accordingly, provisions to provide more reserve area is warranted when new *food service establishments* are proposed.

In view of the aforementioned comments, *sewage* systems serving restaurants shall follow the following design criteria:

- The application rate used to design the *sewage* system shall conform to the following table:

Soil Texture and Structure	Permeability		Maximum Acceptable Application Rate GPD/ft ²	
	In/Hr	Min/Inch	Trench	Bed
Coarse Sand Medium Sand	6 or more	Less than 10	.5	.5
Loamy Sand	3-6	10-20	.33	Not Acceptable
Sandy Loam	2-6	10-30	.25	Not Acceptable

- Only sites with sufficient area containing suitable soils to install an initial system and one replacement system shall be *Approved*.
- Design flows for restaurants shall be calculated using the following formula:

Design Flow = No. seats x No. seat turnovers x gallons per seat.

Gallons Per Seat = 5-10 gallons, based on the type of facility (fast food versus full-service restaurant), type of *equipment* (paper service, versus dishes) and hours of operation.

Seat Turnover = A number based on the estimate of the type of business after discussion with restaurant owner and design consultant, consideration of restaurant location, and consideration of type of business.

Example 1: A full-service restaurant, located near a large retail mall, with 9 seat turnovers per day and 100 seats.

100 seats x 9 seat turnovers x 10 gallons/seat = 9,000 gallons

Example 2: A fast food restaurant with 100 seats and 5 seat turnovers each day.

seats x 5 seat turnovers x 5 gpd = 2,500 gallons per day

- Trench systems are preferred over bed systems.
- Septic tanks shall be designed to provide a minimum of 72 hours retention. Either multiple tanks or a multiple compartment tank shall be used. The first tank or compartment shall have a minimum capacity of approximately 2/3 the total volume. Alternatively, separate plumbing with a grease interception device for kitchen waste may be installed and septic tank capacity reduced to 24-hour retention time for a total wastewater flow. Grease interception devices shall be designed in accordance with the Environmental Protection Agency design manual on on-site sewage treatment and disposal.

Example 1: A full service restaurant generating a daily flow of 9,000 gallons per day without installation of a grease trap. An 18,000 gallon septic tank followed by a 9,000 gallon septic tank.

Example 2: A full service restaurant generating a daily flow of 9,000 gallons per day with a grease interception device installed on the kitchen waste line.

- A 6,000 gallon septic tank followed by a 3,000 gallon septic tank with a 14,000 gallon grease interception device installed on the waste line. Grease interception device calculated as per formula on page 323 of Environmental Protection Agency "Design Manual on On-Site Wastewater Treatment and Disposal Systems".

Grease Traps

The food code requires that grease traps, if used, be located to be easily accessible for cleaning. The two traditional configurations for a grease trap are:

- Locate a smaller grease trap inside the building to serve specific pieces of major grease producing *equipment* (e.g., three compartment sink).
- Locate a larger grease trap outside the building to collect grease from all kitchen grease producing *equipment*.

Michigan Plumbing Code

Grease traps are required for new *food establishments* in Michigan if there are grease-laden wastes. The code requires that the grease-retention capacity in pounds should equal at least twice the flow capacity in gallons per minute. The Michigan Plumbing Code adopts the requirements of the 2000 International Plumbing Code (IPC). Contact your state or local plumbing inspector regarding the applicability of these requirements to a specific project.

Michigan Criteria for Subsurface Sewage Disposal

The Michigan Criteria for Subsurface Sewage Disposal, April 1994 require that, if used, a grease trap be constructed in accordance with Environmental Protection Agency "Design Manual on On-Site Wastewater Treatment and Disposal Systems". This manual discusses only the sizing of large outdoor-type grease traps and mirrors the plumbing code's sizing requirements. An excerpt from the manual states:

8.2.4 Design

Sizing of grease traps is based on wastewater flow and can be calculated from the number and kind of sinks and fixtures discharging to the trap. In addition, a grease trap should be rated on its grease retention capacity, which is the amount of grease (in pounds) that the trap can hold before its average efficiency drops below 90%. Current practice is that grease- retention capacity in pounds should equal at least twice the flow capacity in gallons per minute. In other words, a trap rated at 20 gpm (1.3 l/sec) should retain at least 90% of the grease discharged to it until it holds at least 40 lb. (18kg) of grease. Most manufacturers of commercial traps rate their products in accordance with this procedure. More detail and additional formulas may be found in the EPA manual.

Note: The Michigan Department of Environmental Quality warns that research shows grease traps are only minimally effective in reducing the fats, oils and grease discharged to subsurface disposal systems. To effectively reduce high organic strength fats, oils and grease and prolong life expectancy of subsurface systems, aerobic pretreatment may be considered. Pretreatment, when properly designed, constructed, operated and maintained has been proven an effective means to extend life expectancy.

FDA Water Use Data Guide - may be used in the absence of other formulas or information

	Gallons Per Day		Gallons Per Day
3 compartment sink:		Prep sink:	
49 gals. x # fills / day =	##	15 gallons. X # fills / day =	##
Floor wash: Mop bucket size		Full time employees	
(gallons) x # fills / day =	##	# x 30 gals. each =	##
		Dishmachine	
General sanitation =	30	Gal/hour rating x	##
		# meal periods =	
		Total Daily Usage =	###

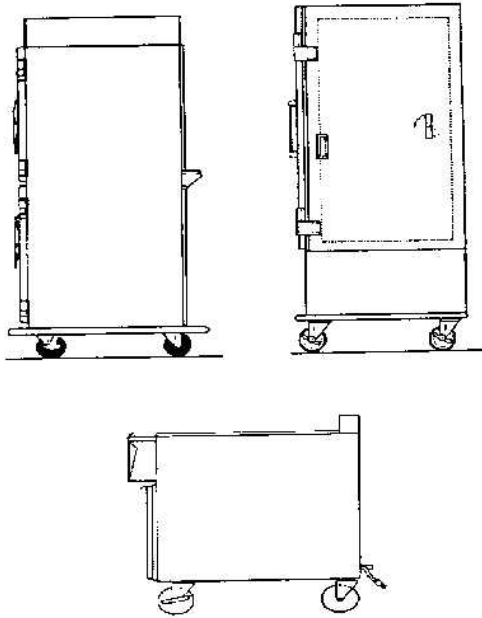
Part 6 Equipment & Installation

All *equipment* in *food establishments* should be certified or classified for sanitation by an ANSI accredited certification program. Equipment that is not certified must meet the requirements of Subparts 4-1 & 4-2 of the Michigan Modified FDA 2009 Food Code.

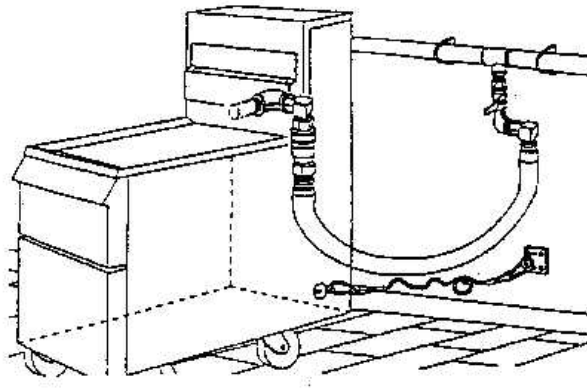
Equipment including ice makers and ice storage *equipment* shall not be located under exposed or unprotected sewer lines, open stairwells or other sources of contamination.

The following *equipment* installation requirements will help to ensure proper spacing and sealing which will allow for adequate and easy cleaning:

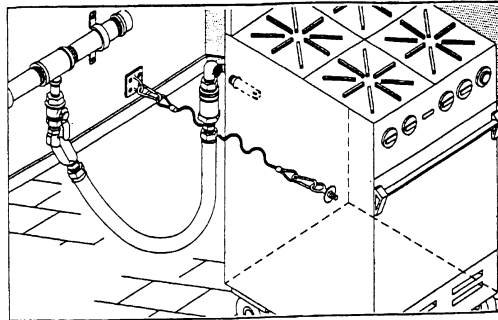
- **Floor Mounted Equipment** Whenever possible *equipment* should be mounted on *approved* castors or wheels to facilitate easy moving, cleaning, and flexibility of operation. Wheeled *equipment* requiring utility services should be provided with easily accessible quick-disconnects or the utility service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



Kitchen Equipment Mounted on Castors

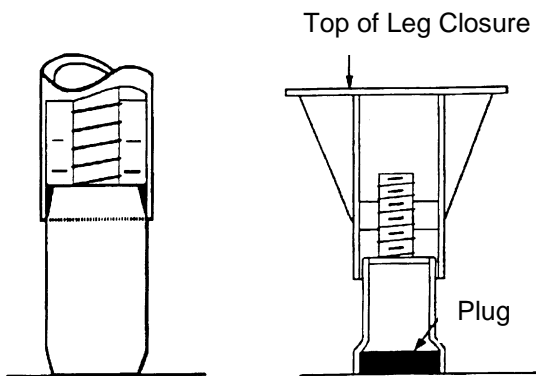


Flexible Gas Connector with Keeper Chain



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

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



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

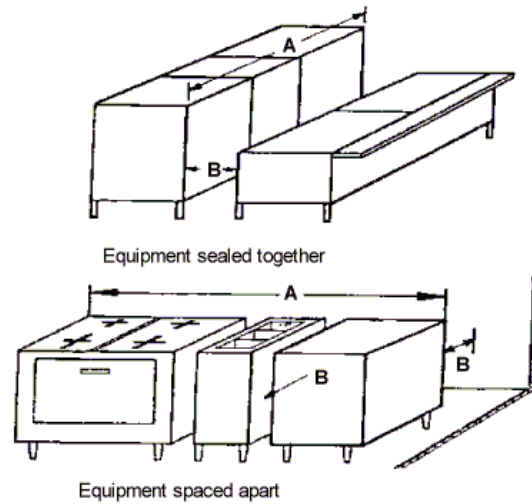
If all the *equipment* butts against a wall it must be joined to it and/or *sealed* in a manner to prevent liquid waste, dust and debris from collecting between the wall and the *equipment*.

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

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

All utility and service lines and openings through the floor must be *sealed* adequately. 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. It is desirable that switch boxes, electrical control panels, wall mounted cabinets, etc. be installed out of the cooking and dishwashing areas. Electrical units, which are installed in areas subject to splash from necessary cleaning operations or food preparation, should be watertight and washable.



Recommended Equipment Spacing From Walls, Provided Access is Available From Both Ends:

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

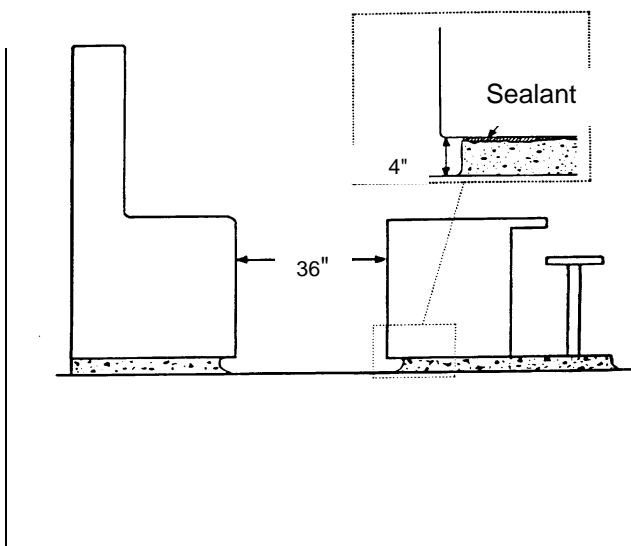
Equipment Spacing

Table Mounted Equipment

All table mounted *equipment* shall be:

- Sealed to the table or counter; or
- Elevated on *approved* legs to provide at least a 4" clearance between the table or counter and *equipment* and installed to facilitate cleaning; or
- Easily moveable/ *portable*

Equipment open underneath, such as drain boards, dish tables, and other tables should be installed 4" away from the wall or *sealed* to the wall. Metal legs of all tables and sinks in food preparation areas should be made of stainless steel. The undershelves of food preparation tables should also be made of stainless steel.



Part 7 Dry Storage

Worksheet Help		
Question #	Food Code & Food Law*	Guidance
86	Dry Storage	FC 3-305.11-12
		Some establishments have separate rooms for storage of dry food and single-service items, while others use shelving within the main preparation area. If separate rooms are proposed for storage, list the room dimensions requested. If various shelving units are proposed, but there is no separate storage room list the dimensions of shelving proposed. For example: 12' of 1.5' wide x 6' high shelving and 18' of 2' wide x 4' high shelving. Note: Do not list shelving for toxic items and clean utensils. If a portion of a store room will be used for these items, please note the amount of the room set aside for this use.
*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.		

The dry storage space required depends upon the menu, number of meals, quantities purchased, and frequency of delivery. The location of the storeroom should be adjacent to the food preparation area and convenient to receiving. Adequate ventilation should be provided. Ideally, the storeroom should be free of uninsulated steam and water pipes, water heaters, transformers, refrigeration condensing units, steam generators or other heat producing *equipment*. Temperatures of 50°F to 70°F are recommended.

Microsoft Excel based formulas (Formula Master v6.0) are available at www.michigan.gov/MDARD Search: Plan Review. Suggested formulas for estimating required storage space are:

Formula #1: Based on seating

Storage Area (ft²) = 0.5 ft² X # seats X # meal periods X 1.25 (for establishments with drive-up facilities)

Example: Assume a restaurant with 80 seats that serves 3 meal periods (breakfast, lunch and dinner).

Required storage area = 0.5 X 80 X 3 = 120 ft² store room

120 ft² store room x 30% usable space = 120 x 0.3 = 36 ft² of full height shelving in the store room

Formula #2: Based on meals served between deliveries

$$\text{Storage Area (ft}^2\text{)} = \frac{\text{Volume per meal} \times \text{Number of meals between deliveries}}{\text{Average height} \times \text{Fraction of usable storeroom floor area}}$$

- Volume per meal = 0.025 to 0.075 cu. ft. per meal served
- Useful storeroom height = 4 to 7 feet
- Storage time between deliveries = 3 to 14 days
- Fraction of useable storeroom floor area = 0.03 to 0.6

Example: Assume 100 meals per day and a 10 day storage between deliveries = 1000 meals for which to provide storage:

$$\text{Required Storage Area} = \frac{0.075 \text{ cubic feet} \times 1000 \text{ meals}}{5 \text{ feet} \times 0.3} = 50 \text{ ft.}^2 \text{ store room}$$

50 ft² of store room x 30% usable floor space = 50 x 0.3 = 15 ft² of full height shelving in the store room

Shelving can be constructed of suitably finished hard wood, durable plastic or preferably of corrosion resistant metal. The highest shelf for practical use is 7' and the lowest one should be 6" from the floor. Clearance between the shelves should be at least 15". Sufficient moveable dunnage racks and dollies (with *smooth* surfaces, cleanable in case of food spillage or package breakage) should be provided to store all food containers at least 6" above the floor.

Dunnage racks, pallets, etc. should be spaced sufficiently from walls to allow for vermin monitoring and inspection. A space of 18" is recommended. Wooden shelving requires a higher level of maintenance and is more conducive to vermin infestation. Food containers shall not be stored under exposed or unprotected sewer lines or leaking water lines. *Approved* food containers with tight-fitting covers and dollies should be used for storing bulk foods such as flour, cornmeal, sugar, dried beans, rice and similar foods. Scoops are needed for each food storage container in use.

Meals & storage room Dry storage space need estimate (Calculated at 0.30 usable storeroom floor area)				
Meals*	Square feet of <u>store room</u> (based on usable room height)			
	4' usable height	5' usable height	6' usable height	7' usable height
500	10-31	8-25	7-21	6-18
1000	21-63	17-50	14-42	12-36
1500	31-94	25-75	21-63	18-54
2000	42-135	33-100	28-83	24-71
*Number of meals served between deliveries				

or

Meals & shelving with no storage room Dry storage space need estimate				
Meals*	Square feet of <u>shelving</u> (based on usable room height)			
	4' usable height	5' usable height	6' usable height	7' usable height
500	3-9	3-8	2-6	2-5
1000	6-19	5-15	4-13	4-11
1500	9-28	8-23	6-19	5-16
2000	13-38	10-30	8-25	7-21
*Number of meals served between deliveries				

Or

The following charts are based on seating and are not applicable if an establishment caters, has no seating, has take-out or a drive-through window. Breakfast, lunch, dinner, service after 9:00 p.m. and 24-hour service each count as one meal period.

Seating & storage room				
Dry storage space estimate				
Square feet of storage room based on seating				
	Number of meal periods (B=1, L=1, D=1, >9pm=1, open 24 hr.)			
Number of seats	1	2	3	4
50	42-83	83-167	125-250	167-333
100	83-167	167-333	250-500	333-667
150	125-250	250-500	375-750	500-1000
200	167-333	333-667	500-1000	667-1,333

OR

Seating & shelving with no storage room

Dry storage space estimate				
Square feet of shelving based on seating				
	Number of meal periods (B=1, L=1, D=1, >9pm=1, open 24 hr.)			
Number of Seats	1	2	3	4
50	25	50	75	100
100	50	100	150	200
150	75	150	225	300
200	100	200	300	400

Part 8 Sinks & Warewashing Facilities

Worksheet Help			
Question #		Food Code & Food Law*	Guidance
10	Dishwashing	FC 4-5 through 4-7	See information below
*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.			

Sinks

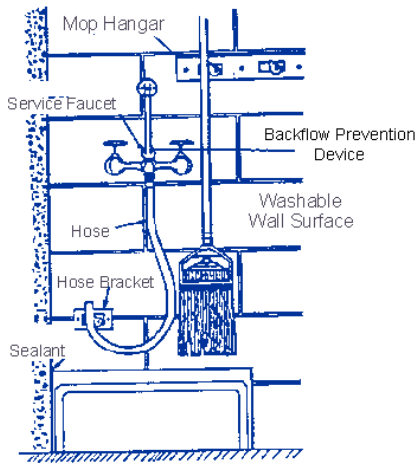
Be sure to check your plans to be sure you have included all of the following types of sinks:

- Handsinks (see part 2)
- Mop sink(s)
- Food preparation sink(s)
- Warewashing sink(s)

Food Preparation Sink

Provide separate areas to segregate food handling operations involving raw and ready- to-eat products. For washing raw fruits and vegetables, it is advisable to provide a separate food preparation sink with a minimum 18" drainboard.

Utility Facility

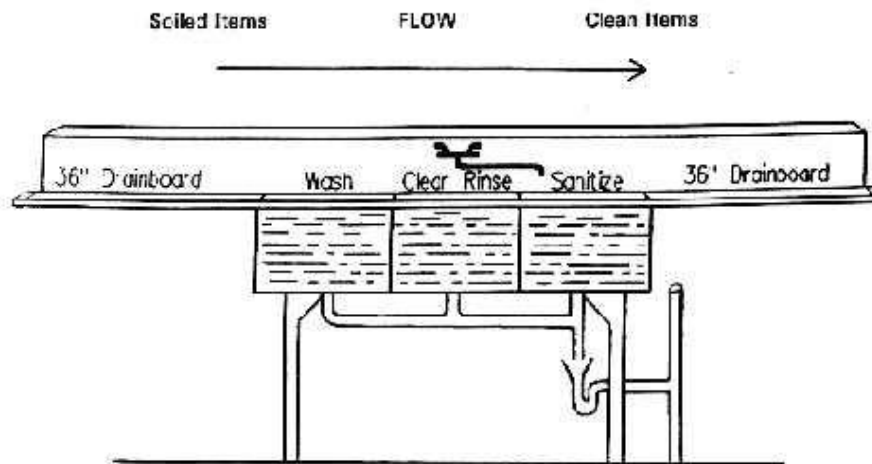


Utility Facility

At least one utility sink or curbed cleaning facility with a floor drain shall be provided for cleaning mops or disposal of liquid wastes. The water supply must be protected against *backsiphonage* (see part 12). A properly sized mop and broom rack shall be provided. All toxic materials including cleaning compounds, pesticides, sanitizers, etc. must be stored in an area away from food preparation.

Manual Warewashing

For manual washing and sanitizing of utensils, provide a stainless steel sink with no fewer than 3 compartments. The sink compartments shall be large enough to hold the largest pot, pan or piece of *equipment*. Each compartment shall be supplied with adequate hot and cold potable running water. Integral drainboards of adequate size shall be provided on both sides of the sink for cleaned and soiled utensils. When *approved*, 2 compartment sinks may be allowable under certain conditions.



Recommended warewashing arrangement using three-compartment sink. Drainboards for soiled dishes and for cleaned utensils must be adequate. A 36" drainboard should have a pitch of 1/8" to 1/4" per foot toward the sink.

Three Compartment Sink With Indirect Waste

Drainboards, utensil racks, or tables large enough to accommodate all soiled and cleaned items that may accumulate during hours of operation shall be provided for necessary utensil holding before cleaning and after sanitizing.

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 warewash sink.

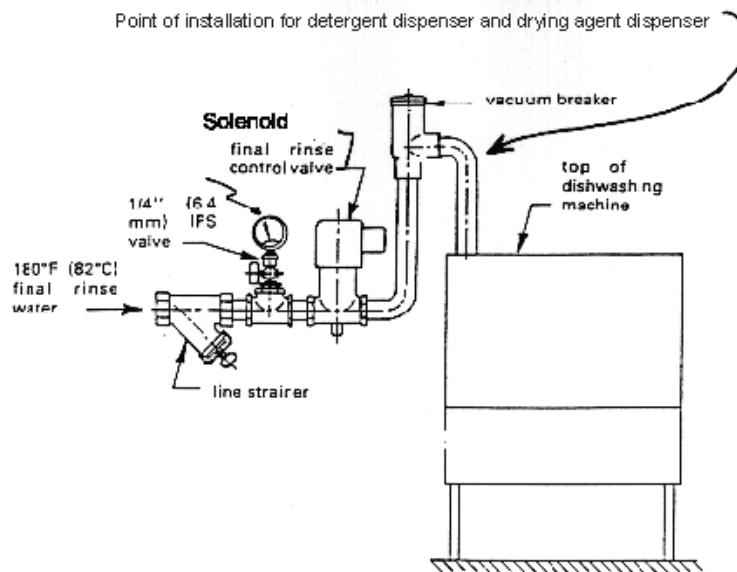
Provide adequate facilities for preflushing or prescrapping *equipment* and utensils.

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

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

Mechanical Warewashing

- The waste line for all mechanical warewashing machines must not be directly connected to the sewer line.
- 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.
- An adequate facility for preflushing or prescrapping shall be provided on the soiled dish side of the dishwashing machine.
- 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. Mobile dish tables may be acceptable for use in lieu of drainboards.
- 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.



Recommended Warewashing Machine Installation

Chemical Sanitization Warewashing

Chemical warewashing machines shall meet nationally recognized standards and be certified or classified by an ANSI 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:

- The chemical sanitizing feeder must meet nationally recognized standards and be certified or classified by an ANSI accredited certification program and be compatible with the specific make and model of machine in question.
- An *approved* chemical test kit for determining sanitizer strength shall be available and used.
- 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. A clear tube in which the chemical flows through is not acceptable.

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*.

Hot Water Sanitization Warewashing

A commercial warewashing machine for mechanical warewashing utilizing hot water for sanitization must be in compliance with the standards of an ANSI accredited certification program. The installation and required accessories shall be in conformance with local applicable plumbing codes. An *approved* maximum registering thermometer or high temperature test papers shall be available and used.

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.

Part 9 Hot Water Supply Requirements

Worksheet Help			
Question #		Food Code & Food Law*	Guidance
80	Hot Water Using Fixtures	FC 5-103.11	Identify and list all <i>equipment</i> that will be supplied with hot water.
81-83	Proposed Water Heaters	FC 5-103.11	When multiple separate water heaters are provided indicate which water heater serves which fixtures. Unless otherwise stated, a gas water heater will be assumed to be 75% efficient. A higher efficiency water heater will lower the necessary water heater size.
*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.			

The hot water supply shall be sufficient to satisfy the continuous and peak hot water demands of the establishment. Hot water for handwashing shall be of a temperature of at least 110°F. Hot water for mechanical dishwashing must be 150°F to 165°F for washing and 165°F to 180°F for sanitizing. The temperature of the wash solution in spray-type warewashers that use chemicals to sanitize may not be less than 120°F. The water temperature for manual hot water sanitization must be at least 171°F. For purposes of sizing the hot water generating capability, assume a supply temperature requirement of 140°F to each fixture and to the mechanical dishwashing machines. In the absence of specific hot water usage figures for *equipment*, the following chart may be used to provide an approximation:

Equipment Type	Gallons Per Hour (GPH)	
	High	Low
Vegetable sink	15	15
Single pot sink	20*	15*
Double pot sink	40*	30*
Triple pot sink	60*	45*
Pre-rinse for dishes-shower head type	45	45
Bar sink-three compartment	20	20
Bar sink-four compartment	25	25
Chemical sanitizing glasswasher	60	60
Lavatory	5	5
Cook sink	10	10
Hot water filling faucet	15	15
Bain-marie	10	10
Coffee urn	5	5
Kettle stand	5	5
Garbage can washer	50	50
Nine and twelve pound clothes washer	45	45
Sixteen pound clothes washer	60	60
Employee shower	20	20
Mop Sink	15**	5**

High - To be used when multi-use eating utensils are utilized

Low - To be used where single service eating utensils are utilized.

*Gallons necessary to fill sink compartments can be calculated for a specific sink to make gallon per hour hot water estimates more accurate. A sample calculation for a 3 compartment sink is show below.

Calculate the Volume for each Sink Compartment

Volume = Length x Width x Depth 21" x 18" x 14" = 5292 cubic inches

Convert Cubic Inches to Cubic Feet

Cubic inches ÷ 1728 = cubic feet 5292 ÷ 1728 = 3.06 cubic feet

Convert Cubic Feet to Gallons

Cubic feet x 7.48 = gallons 3.06 x 7.48 = 22.89 gallons per compartment

Multiply x Number of Sink Compartments

22.89 x 3 sink compartments = 68.67 gallons to fill this 3 compartment sink once.

**Number of mop sinks in a facility may not be representative of water usage. Determine maximum number of times a mop bucket is filled per hour X 5 gallons per fill.

One way to estimate the projected hot water demand (gallons per hour final rinse) of mechanical warewashing machines, pot and pan washers and silverware washers, is to refer to the manufacturers' specification sheet for the particular make and model of the machine. MDARD supports using a little as 70 percent of rated gph for facilities that use warewashing machines only occasionally.

Microsoft Excel based formulas (Formula Master v6.0) are available at www.michigan.gov.MDARD Search: Plan Review.

To determine the required capacity and recuperative rate of the hot water generating *equipment*, it is necessary to calculate the demand in gallons per hour (gph) and determine the temperature rise required (assume an incoming water temperature of 40°F to the *food establishment* unless specific data are available) for each piece of *equipment*. These figures can then be converted to BTU's (for gas fired heaters) or KW (for electrical heaters). The required BTU or KW capacity of the heater will then be determined by adding up the individual BTU or KW requirements for each piece of *equipment*.

Note: To calculate BTUs or KWs, use the following formulas: (1 gallon of water = 8.33lbs)

$$\text{For gas heaters (in BTUs):} \quad \frac{\text{Gallons per hour of water} \times \text{Temp. rise} \times 8.33}{\text{Required BTU} = \quad .75 \text{ (operating efficiency)}}$$

$$\text{For electrical heaters (in KW):} \quad \frac{\text{Gallons per hour of water} \times \text{Temp. rise} \times 8.33}{\text{Required KW} = \quad 3412 \text{ (BTU's per KW)}}$$

The following example will illustrate of the above method of approximating the size of the hot water heater needed for specified *equipment*:

<u>Equipment</u>	<u>Gallons Per Hour Demand from Chart</u>	<u>Temperature Required</u>	<u>Temp. Rise</u>
3 Compartment sink	60	140°F	100°F

$$\frac{60 \text{ (gph)} \times 100 \text{ degree temp. rise} \times 8.33}{.75 \text{ (operating efficiency)}} = 66,640 \text{ BTU's} \quad \text{OR}$$

$$\frac{60 \text{ (gph)} \times 100 \text{ degree temp rise} \times 8.33}{3412 \text{ (BTUs per KW)}} = 14.65 \text{ KW}$$

Assume an incoming water temperature of 40°F into the *food establishment*.

<u>Equipment</u>	<u>Gallons Per Hour Demand from Chart</u>	<u>Temperature Required</u>	<u>Temp. Rise</u>
Hand sink	5	110°F	70°F

$$\frac{5 \text{ (gph)} \times 70 \text{ degree temp rise} \times 8.33}{.75 \text{ (operating efficiency)}} = 3,887 \text{ BTU's} \quad \text{OR}$$

$$\frac{5 \text{ (gph)} \times 70 \text{ degree temp rise} \times 8.33}{3412 \text{ (BTU per KW)}} = 0.85 \text{ KW}$$

This example assumes an incoming water temperature of 40°F into the *food establishment*.

For the above example, the total demand in BTU's or KW for the primary hot water heater would be:

3 Compartment sink=	66,640 BTU	or	14.65 KW
Hand sink=	3,887 BTU	or	0.85 KW
TOTAL DEMAND=	70,527 BTU	or	15.5 KW

<i>Equipment</i>	<u>Gallons Per Hour Demand from Mfgr.</u>	<u>Temp. Required</u>	<u>Temp. Rise</u>
Booster heater for hot water sanitizing Mechanical warewasher	64	180°F	40°F

$$\frac{64 \text{ (gph)} \times 40 \text{ degree temp rise} \times 8.33}{.75 \text{ (operating efficiency)}} = 28,433 \text{ BTUs}$$

$$\frac{64 \text{ (gph)} \times 40 \text{ degree temp rise} \times 8.33}{3412 \text{ (BTU per KW)}} = 6.2 \text{ KW}$$

For mechanical warewashing, assume a hot water demand based on a primary rise in temperature to 140°F. A booster heater must then be provided to boost the required gph demand an additional 40°F to attain the required 180°F final rinse temperature.

Note: Divide the required BTU's by 4,000 to determine the minimum hot water storage capacity. Regardless of the minimum shown by the calculation, a hot water storage capacity of 40-50 gallons is typically required.

Example: 189,000 BTU's / 4000 = 47.25 gallons of storage necessary.

Part 10 Finish Schedule: Floors, Walls & Ceilings

Worksheet Help			
Question #		Food Code & Food Law*	Guidance
17-31	Room Finishes	FC 6-1 FC 6-201.11-18	See information below.
*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.			

Interior Finishes:

1. Enamel coated steel (or other corrosion resistant surface)	9. Stainless steel
2. Filled block with epoxy painted or glazed surface	10. Aluminum
3. Commercial grade vinyl composition tile	11. Ceramic tile
4. Commercial grade vinyl composition sheets	12. Painted drywall
5. Fiberglass reinforced polyester (FRP) panel	13. Epoxy painted drywall
6. Vinyl clad acoustic tile	14. Plastic laminate
7. Poured seamless <i>sealed</i> concrete or poured synthetic	15. Acoustic tile
8. <i>Sealed</i> concrete	16. Quarry tile

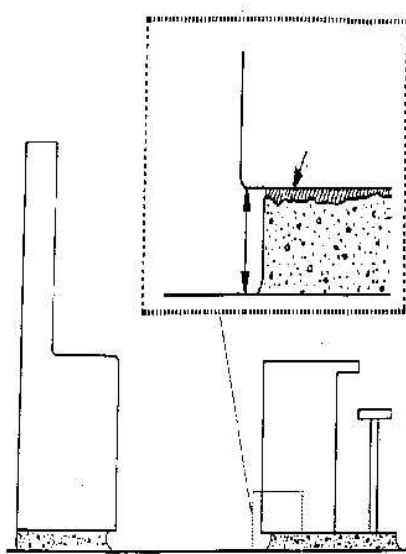
The following chart provides guidance for floors, walls and ceilings. The numbers refer to the above table.

Kitchen	Floor	Wall	Ceiling
Food Preparation / Bar Serving Area	3, 7, 16	2, 5, 9, 10, 11, 13	6, 13, 14
Cooking	3, 7, 16	9, 10, 11	6, 13, 14
Warewashing Area	3, 7, 16	2, 5, 9, 10, 13	6, 13, 14
Food Storage	3, 4, 7, 8, 16	2, 5, 13	12, 15
Janitor Closet	7, 16	2, 5, 13	6, 13, 14
Garbage Room	3, 4, 7, 16	2, 5, 13	6, 13, 14
Walk-in Refrigerators & Freezers	3, 7, 9, 10, 16	1, 9, 10	1, 9, 10
Other Storage	3, 4, 7, 8, 16	12	12, 15
Dressing Rooms	3, 4, 7, 16	12	6, 12, 13, 14
Toilet Room	3, 4, 7, 16	2, 5, 13	6, 13, 14

Floors

- All floor coverings in food preparation, food storage, utensil-washing areas, walk-in refrigeration units, dressing rooms, locker rooms, toilet rooms and vestibules must be *smooth*, non-absorbent, easily cleanable, durable, and commercial grade. *Equipment* must not puncture or indent the floor. Anti-slip flooring may only be used in high traffic areas.
- Any alternate materials not listed in the above chart must be submitted for evaluation.
- There must be coving at base junctures that is compatible with both wall and floor coverings. The coving should provide at least 1/4 inch radius and 4" in height.
- Floor drains, floor sinks and the surrounding area must be easily accessible for cleaning.

Custom cabinetry shall be constructed of durable materials with surfaces that are smooth, non-permeable and light colored for easy cleaning. This includes the interior surfaces (e.g., beverage stations, salad or buffet units, service counters and the underside of open countertops).



- Properly installed, trapped floor drains shall be provided in floors that are water-flushed for cleaning or that receive discharges of water or other fluid waste from *equipment*, or in areas where pressure spray methods for cleaning *equipment* are used. Floors should be sloped to the drain at least 1/8" per foot.
- Grouting should be non-absorbent and impregnated with epoxy, silicone, polyurethane or equivalent compound.
- All walk-in refrigeration units, either with prefabricated floors and without, should be installed in accordance with the manufacturers' installation requirements.

Walls

- The walls, including non-supporting partitions, wall coverings and ceilings of walk-in refrigeration units, food preparation areas, *equipment* washing and utensil washing areas, toilet rooms and vestibules shall be *smooth*, non-absorbent, and capable of withstanding repeated washing. Light colors are recommended for walls and ceilings. Studs, joists and rafters shall not be exposed in walk-in refrigeration units, food preparation areas, *equipment* washing and utensil washing areas, toilet rooms and vestibules. Where permitted, exposed studs, joists and rafters must be finished to provide an easily cleanable surface.
- All alternate materials not listed in the above chart must be submitted for evaluation.
- Glazed surfaces should be glazed block or brick, or ceramic tile. Grouting must be non-absorbent and impregnated with epoxy, silicone, polyurethane or an equivalent compound. Concrete block, if used, must be rendered non-porous and *smooth* by the application of an *approved* block filler followed by the application of an epoxy-type covering or equivalent. All mortar joints shall be only slightly tooled and suitably finished to render them easily cleanable.
- Joint finishes should be compatible with the wall structure. Voids should be eliminated at joints.

Ceilings

- Finishes shall be light-colored, *smooth*, non-absorbent and easily cleanable.

Part 11 Toilet Facilities

Toilet facilities shall be installed according to law and shall be the number required by law. They shall be conveniently located and shall be accessible to employees at all times. Toilet facilities shall be accessible in accordance with the Americans with Disabilities Act (ADA) of 1990. Consult your local building department for requirements. Specific plumbing requirements are in the Michigan Plumbing Code, which adopts the International Plumbing Code. The reviewing health agency will review the proposed facility for compliance with the plumbing code items that are related to food safety.

Toilets and urinals shall be designed to be easily cleanable and shall have integral *backflow* prevention devices as required by law. Toilet rooms shall be completely enclosed and shall have tight-fitting, self-closing doors and shall be vented to the outside if subject to odors.

Food facilities such as grocery stores, convenience stores and food service facilities may have rest rooms that open directly into the food preparation area. Other facilities, typically processing plants, must provide employee rest rooms that do not open into areas where food is exposed to airborne contamination, except where alternate means have been taken to protect against such contamination (such as double doors or positive air-flow systems).

A sign or poster that notifies *food employees* to wash their hands shall be provided at all handwashing sinks used by *food employees* and shall be clearly visible to *food employees*.

Part 12 Plumbing & Cross-Connection Control

Worksheet Help			
Question #		Food Code & Plumbing Code*	Guidance
45-79	Plumbing Cross-Connections	FC 5-202.13 &14 FC 5-203.14 &15 FC 5-204.12 FC 5-402.11 MPC sec. 608 MPC sec. 802	The worksheet asks that a table be filled out showing what <i>backflow</i> or <i>backsiphonage</i> prevention devices or methods will be used. Below is an example of that table with the typical possible responses.
FC =Michigan Modified FDA 2009 Food Code. MPC=Michigan Plumbing Code To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.			

Typical possible correct responses are shown for the worksheet cross-connection table. It is recommended that your plumber or architect complete this table. Some responses are only correct under certain circumstances. For example, a two-compartment sink would have to be direct connected if a garbage disposal were installed in the sink.

Fixture	Sewage Disposal			Water Supply				
	Air Gap	Air Break	Direct Connect	AVB	PVB	RPZ	Hose Bibb	Air Gap
45. Dishwasher	X	X		X				X
46. Glasswasher	X	X		X				X
47. Garbage grinder			X	X	X			X
48. Ice machines	X							
49. Ice storage bin	X							
50. Mop sink faucet								X
51. 3 compartment sink	X	X	X					X
52. Culinary (food preparation) sink	X							X
53. Other sinks, except handsinks	X	X	X					X
54. Steam tables	X			X				X
55. Dipper wells	X							X
56. Hose connections				X	X		X	
57. Refrigeration condensate drain lines	X							
58. Beverage dispenser with carbonator				DC w/ AV				
59. Water softener drain	X							
60. Potato peeler	X							X
61. Walk-in floor drain	X	X						
62. Chinese range	X			X	X	X		
63. Detergent feeder on faucet				X	X			X
64. Outside sprinkler or irrigation system				X	X	X		
65. Power washer						X		
66. Retractable hose reel					X	X		X
67. Toilet			X	X	Anti-siphon ballcock			
68. Urinal			X	X				
69. Boiler						X	DC w/ AV	
70. Bain-marie	X							X
71. Espresso machine		X					DC w/ AV	
72. Combi-style oven	X						DC w/ AV	
73. Kettle	X			X	X			
74. Rethermalizer	X				X			
75. Steamer	X							
76. Overhead spray rinse					X			X
77. Hot water dispenser				X				X

AVB=atmospheric vacuum breaker

PVB=pressure vacuum breaker

RPZ=reduced pressure principle backflow preventer

DC w/ AV= Double check valve with an atmospheric vent

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.). A cross-connection can be a temporary or permanent direct connection, by-pass arrangement, jumper connection, submerged inlet, removable section, swivel or change-over device, etc. that could connect a potable system to a non-potable source. Ideally, it is best to not have any cross-connections, but in certain situations they are unavoidable. When an installation requires a cross-connection, 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 water supply. An unprotected cross-connection threatens the health and safety of individuals and may contaminate food or beverage products utilizing water from that system.

Two Types of Cross-Connections:

Direct Connection: Is a physical connection between a potable and non-potable system. A direct pathway exists between the two separate systems for contamination to be transferred into the potable water system. An example of a direct connection is a pipe installed to connect a potable water line to a sewer line.

Indirect Connection: Is a situation in which, under "normal" conditions, a cross-connection does not exist. However, under "unique" circumstances a pathway for contamination can occur. The source of contamination may be a back-up, be blown across, siphoned, pushed, or diverted into a potable water supply. An indirect connection is only subject to *backsiphonage*.

Forces Acting on Cross-Connections

Some cross-connections are immediately obvious, but others can be subtle and difficult to find. Contamination occurs when the pressure between the water supply and another system (via some connection) are sufficient to transfer the contaminant into the water supply. These temporary reversals of pressure can be unpredictable.

Backflow

Backflow is a reversal in flow that is opposite to the expected or intended direction. The reversal in flow is undesirable. However, a properly protected system can remain safe. There are two types of *backflow*: "backpressure" and "backsiphonage".

Backpressure occurs when both systems (potable & non-potable) are under pressure (above atmospheric pressure). *Backflow* occurs when the non-potable system has greater pressure than the potable system. This pressure differential pushes the contaminant into the potable supply.

Backsiphonage occurs when the pressure in the water supply system drops below atmospheric pressure and the non-potable source is drawn or siphoned into the water supply. Back-siphonage can occur with either a direct or indirect connection and the systems can be either open or closed to the atmosphere. Principle causes include:

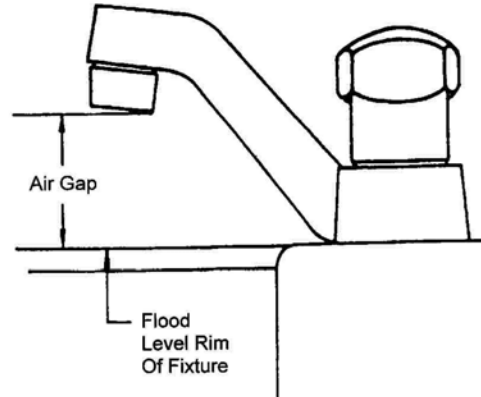
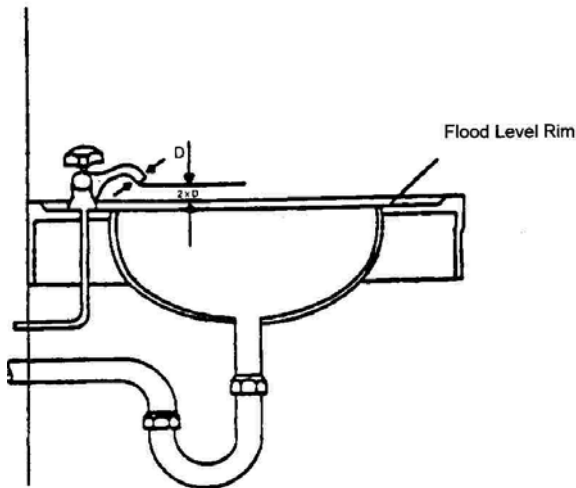
- Undersized sections of pipe can create an aspirator effect in the restricted area.
- A break or repair in a supply line can create a vacuum (as gravity drains the water out) on the elevated portions of the system above the effected area.
- A high water withdrawal, such as fire fighting or water main flushing, can create a vacuum. The withdrawal is more likely to create stronger negative pressure at the higher elevation of the system.
 - A vacuum can be induced on the suction side of a booster pump, such as high-rise buildings and processing plants.

Physical Backflow Prevention Methods

Air Gap

An *air gap* is the most desirable method of *backflow* prevention. It is simple, economical, non-mechanical, fail safe, and can be used for potential backsiphonage and backpressure applications. An *air gap* is the unobstructed vertical air space that separates the end of a supply line and the flood level rim of a receptacle. The 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 1 inch or twice the diameter of the supply pipe.

The following are some *air gap* applications:



Air Gap And Effective Opening



Ice Cream Dipper Well



Water Fill to Steam Kettle

Mechanical Backflow Assemblies & Devices

The type of mechanical assembly or device selected must be appropriate for the degree of hazard and specific application. Some mechanical *backflow* preventers consist of single or multiple check valves that open from the flow pressure of the potable water. The valves are fabricated to seat tightly on a machined surface and, when closed, prevent any flow in the wrong direction. Some devices have air inlets or ports that are vented to the atmosphere to relieve any vacuum or negative pressure. All back flow devices must be installed so they are accessible for inspection and repair. All mechanical devices are required to be certified by the American Society of Sanitary Engineers (ASSE). The level of hazard is a consideration in the selection of the appropriate device.

High Hazard situations exist when there is an actual or potential connection for any toxic or infectious substance (contaminant) to be introduced into the water supply and may create a danger to health. Examples of contaminants include pesticides, chemicals, and infectious microorganisms.

Low Hazard situations exist when there is an actual or potential connection for a nontoxic substance (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.

Hose Bib Vacuum Breaker ASSE – 1011 (high or low hazard)

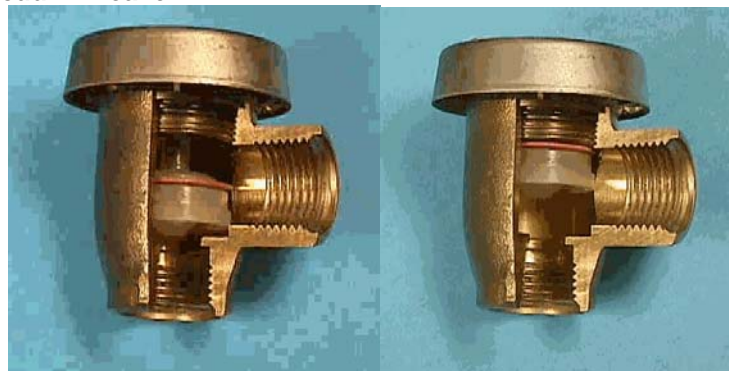


A hose bib *vacuum breaker* is installed on the end of a hose bib (sill cock, boiler drain, etc.) or anywhere a hose can be connected. It contains one spring loaded valve and an atmospheric vent that is controlled by a diaphragm seal. Installation & Use:

Shut-off valves must be located upstream from the *vacuum breaker*. Spring-loaded shut-off spray valves must be removed when the hose is not in active use. Each hose connected to a manifold or "Y" must be provided with its own device (i.e. county fairs, special events, etc. where several vendors may share one hose spigot).

Approved for high hazards, non-continuous pressure, and no potential backpressure.

Atmospheric Vacuum Breaker



Closed Position
- drawing in air

Open Position
- allowing water to
flow normally

The water supply serving the device in the upper left photo is turned off which allows the float valve to be in the "closed" position drawing in open air (arrows show air movement). The water supply in the upper right photo is turned on and shows the float valve in the "open" position (arrows show direction of water flow).

This device has an internal polyethylene or metal float valve that moves up and down on a shaft (not spring loaded). When the water is turned on, water moving in the normal open direction of flow lifts the float and causes the atmospheric vent to close (see "Open Position"). Shutting off the water causes a negative pressure inside the device; the float to drop, the supply valve closes, and the atmospheric vent is opened (see "Closed Position").

Installation and Use:

- The mushroom-shaped device must be installed vertically. The unit must be elevated at least 6 inches above the highest source of contamination "downstream" of the unit.
- All shut-off valves must be located "upstream" of the unit. The reason for this is that a valve located downstream of the unit maintains the device under constant pressure and the float valve in the open position. Over time, the float valve can stick in the open position and fail to prevent *backflow*. The unit cannot be tested after installation.
- *Approved* for high hazards, noncontinuous pressure, and no potential for backpressure.

Pressure Vacuum Breaker ASSE – 1020 (high or low hazard)



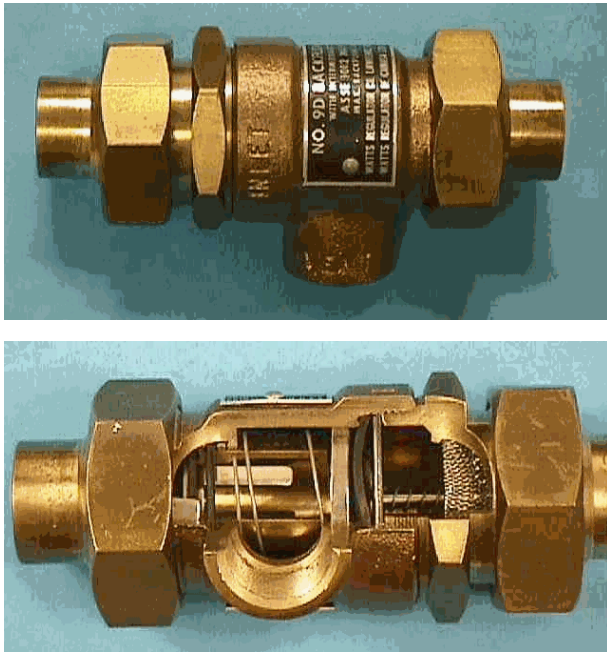
The pressure *vacuum breaker* is similar to the atmospheric *vacuum breaker* except that it has two test cocks and two gate or ball valves for testing the unit. It also has two positive seating (spring loaded) valves. The first check valve (supply side) is spring loaded for a closed position and "guards" the potable water side. When the water is turned on, the flow pushes it in the open position. The second check valve or air inlet valve (downstream 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 below atmospheric pressure, the second check valve opens to the atmosphere and the first check valve closes. The device only provides protection against *backsiphonage*.

Installation and Use:

- The unit must be installed at least 6 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 to be accessible for testing and servicing.
- The unit is *approved* for high hazard, continuous pressure, and no backpressure potential. Valves may be located on the downstream side.

Backflow Preventers with Intermediate Atmospheric Vent ASSE 1012 and ASSE 1022 (low hazard)

ASSE-1012



ASSE-1022



Used for carbonated beverages.

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

When zero pressure or back-siphonage conditions exists 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 backpressure 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.

The ASSE 1022 device, shown above, is required on carbonated beverage machines when there is copper piping used for the water supply like. CO₂ is known to leach copper when it comes in contact with copper piping, resulting in copper poisoning. Food Code sec. 5-203.14 also stipulates that a 100 mesh screen must be installed on the upstream side of the ASSE 1022 device. This protects the device from particles in the water supply. The 100 mesh screen may be located with the ASSE 1022 device, within the carbonator pump, or as an attachment such as shown in the picture above (the black “Y” is the added screen for this ASSE 1022).

Installation and Use:

- The unit can be installed horizontally and vertically and must not be located in a pit or a location subject to standing water. Under no circumstances can the relief port be plugged.

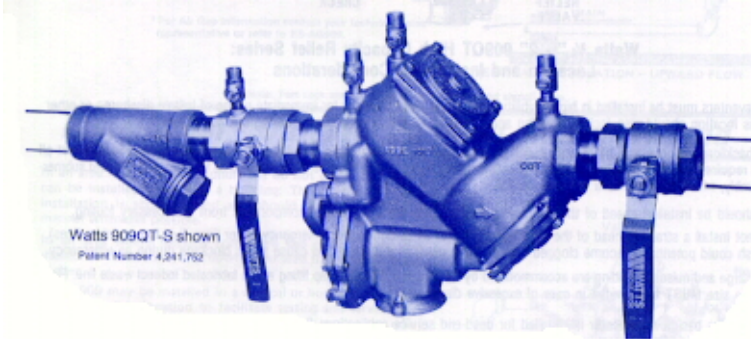
- Michigan Code limits the use of this device for protection of low pressure untreated boilers (below 15 psi), carbonated beverage dispensers, and other low hazard applications.
- Valves may be located downstream of this device.

Double Check Valves ASSE 1015 (low hazard)



A double check valve *backflow* preventer consists of two check valves that are spring loaded in the closed position. The device does not have the added protection of an atmospheric vent and therefore is limited to the amount of protection it affords and how it can be used. Some codes and jurisdictions do not allow double check valves to be used for *backflow* protection.

Reduced Pressure Zone Backflow Prevention Assembly (RPZ) ASSE – 1013 (high or low hazard)



This type of mechanical device provides the maximum protection against both *backsiphonage* and backpressure.

Construction of the RPZ consists of two very sensitive and independent spring loaded check valves with a "reduced pressure zone" between them (at least 2 psi pressure differential from the supply pressure). The check valves are spring loaded to automatically close unless they are held open with the flow in the proper direction. As the water passes through the primary check valve, the water pressure will drop in the reduced pressure zone chamber (due to friction). Under normal conditions, the water will then continue on through the secondary check valve 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 reduced pressure zone water 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 is opened to satisfy any *backsiphonage* conditions. So, even if both check valves are fouled, the relief valve will continue to protect the supply.

Installation and use:

- Under no circumstances should the relief port be plugged.
- The RPZ is equipped with test cocks and gate valves for testing.
- The unit must be accessible for testing and service.
- *Approved* for high hazards, continuous pressure, backpressure, and back-siphonage.

- The unit may have valves located downstream and may be located lower than the potential source of contamination
- The relief port drain must be discharged by means of an *air gap* to a drain.

Anti-siphon-type Water Closet Flush Tank Ballcock: ASSE- 1002 (low hazard)



Installation and Use: Ballcock assembly must be installed above the overflow pipe high water level.

Typical Food Service Establishment Water Supply Cross-Connections



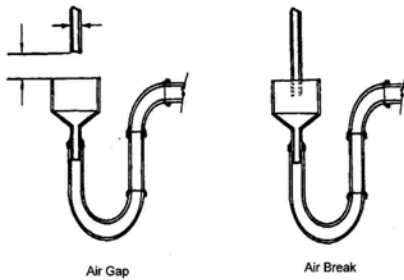
- **Pre-rinse or pre-flush hose:** This device is typically located at garbage grinders, mechanical dishwashing machines, and vegetable prep sinks. A spring normally keeps the end of the hose above the sink flood rim level to form an *air gap*. Worn springs allow the end of the hose to fall below the rim.
- **Lack of a hose bib vacuum breaker on hose connections:** Common locations for this problem are at janitor sinks, steam kettles, and outdoor faucets.
- **Valve installed at the end of a hose utilizing an atmospheric vacuum breaker for protection:** Correction involves either the removal of the valve or the installation of a pressure vacuum breaker.
- **Inlets which are or may become submerged:** Common problem areas may include submerged inlet in the toilet tank, garbage grinder, sink faucets, lawn irrigation system, hoses, water inlet to steam table / baine marie, water- cooled *equipment* discharged below flood rim of drain, water softening *equipment*, and chinese range.
- **Boilers:** Lack of protection for boilers that may be associated with building heating systems, food steamers, steam kettles, tilting skillets, and espresso machines. *Approved backflow* protection includes:
 - Boiler with no chemicals added: An in-line *backflow* protection device with an intermediate atmospheric vent for continuous pressure and potential backpressure.
 - Boiler with chemicals added: An RPZ *backflow* protection device or air-gap.

Air Gaps & Air Breaks for Drains & Waste

An indirect connection between food service *equipment* and the facility's drainage or wastewater disposal system is necessary to prevent waste water from backflowing into *equipment* where food, kitchenware, or utensils are retained.

Direct wastewater connection: A waste line or pipe from a fixture, receptacle, or device that discharges wastewater, waste materials, or *sewage* directly into the facilities drainage system.

Indirect wastewater connection: A waste line or pipe from a fixture, receptacle, or device that discharges wastewater, waste materials, or *sewage* into the facilities drainage system through an "air gap" or "air break".



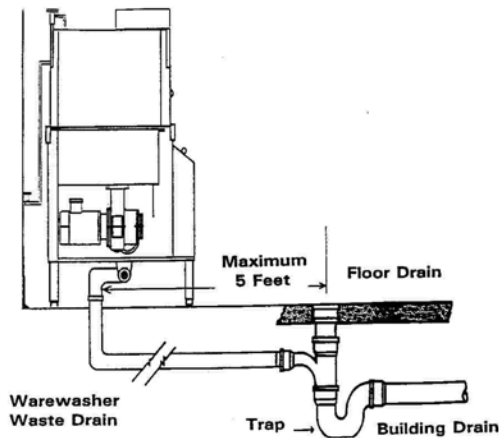
Air gap: is the unobstructed vertical space that separates the end of a supply line and the flood rim of a receptacle. The *air gap* must be the greater of either a minimum of one inch or twice the diameter of the supply pipe/

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 rim level.



Examples of food service *equipment* requiring an **Air gap:**

- Relief valve for booster heater / water heater.
- Water-cooled condensers typically found at some ice machines or other refrigeration systems.
- Drain lines for food service *equipment* such as salad bar, ice machine, ice bin, cobra cup holder, steam kettle and steam table.
- Any sink compartment or *equipment* (i.e. ice cream dipper well) used for food. Note: Food sinks and *equipment* installed before 4/1/85 can have an indirect connection until replaced.
- Brine tank drains from water softening *equipment*.
- Walk-in cooler floor drains that vertically discharge, as is typically found in a basement.



Examples of food service *equipment* requiring only an **Air break**:

- Michigan Plumbing Code section 801.1.2 requires that a floor drain in a walk-in cooler or freezer shall be indirectly connected to sanitary system by way of an air-gap. When a flapper valve is installed in the horizontally discharging drain line, such as is typically found in slab construction, the floor drain shall be indirectly connected by way of an air-break or an air-gap.
- Note: Vertical discharges must be air-gapped.
- MPC 802.1.7 requires that a warewashing machines shall be indirectly connected by way of an air-gap or air-break.
- Note: Prior to 2003 the drain line could have a direct connect at the floor if there was a floor drain within 5' as shown. This allowance does not apply to installation after December 2003.

Examples of *food service establishment* plumbing devices that are allowed or required to have a **direct wasteline connection** to the facility's drainage system:

- **Direct Connection Required:** Sinks connected to grease interceptors (traps) and garbage grinders.
- **Direct Connection Allowed:** Hand sinks and warewashing *equipment* such as pot sinks and 3-compartment sinks. Warewashing machines may have a direct connection if there is a floor drain within 5' as shown above.

Notes:

- If any compartment of a warewashing sink is used for culinary purposes, then that sink compartment must be air-gapped.
- While directly connecting warewashing *equipment* is allowed, better public health protection is achieved by providing an indirect connection.
- When a garbage grinder is installed in a sink, a direct connection is required and that sink cannot be used for food.

Part 13 Insect & Rodent Control

Worksheet Help			
Question #		Food Code & Food Law*	Guidance
36-42	Insect & Rodent Control	FC 6-202.13 FC 6-202.15	See information below.
*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.			

Openings to the outside shall be effectively protected against the entrance of rodents. Openings to the outside shall be protected against the entrance of insects by the installation of tight fitting, self-closing doors; closed windows; self-closing serving windows at drive-thrus; screening; controlled air currents; vestibules; or other means *Approved* by the regulatory health authority. Screen doors shall be self-closing and screens for windows, doors, skylights, transoms, intake air ducts 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 entering the building from the outside must be *sealed*.

Loading docks and delivery doors must be provided with effective air curtains or vestibules with self-closing doors to preclude the entrance of insects. It is recommended that outside lighting around loading areas and entrances be sodium vapor rather than mercury vapor to decrease insect attraction.

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

Part 14 Lighting

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, dry food storage areas and in other areas during periods of cleaning.

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.

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.

Darker colored walls and floors may require additional lighting.

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.

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.

Part 15 Ventilation

Worksheet Help		
Question #	Food Code & Food Law*	Guidance
87	Ventilation FC 4-204.11 FC 4-301.14 FC 6-202.12 FC 6-304.11 FC 6-501.14 MMC 2000, Section 506	The worksheet asks for an air balance schedule. Ask your reviewing agency if they need this information for your project. This should typically show an adequate volume of air exhausted from each ventilation exhaust hood and an equal volume of heated make-up air being introduced to replace the air being exhausted. A copy of the cooking <i>equipment</i> ventilation plans submitted to the mechanical authority to obtain a mechanical permit should also be submitted to the reviewing health agency.
<p>*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. *MMC = Michigan Mechanical Code To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD, Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.</p>		

Michigan Mechanical Code

All rooms shall have sufficient ventilation to keep them free of excessive heat, steam, condensation, vapors, obnoxious odors, smoke and fumes. Ventilation systems in Michigan must be installed according to the provisions of the Michigan Mechanical Code. The Michigan Mechanical code adopts by reference the International Mechanical Code and NFPA-96, a standard of the National Fire Protection Association. Michigan has one mechanical code that is used statewide. Mechanical plans must be submitted to the health agency conducting your review and to the local mechanical authority in the area where the facility is being built. The mechanical authority will issue any required permits. The mechanical code may be purchased from Michigan Department of Labor and Economic Growth, Bureau of Construction Codes at <http://www.michigan.gov/lara>.

The mechanical code does not regulate the following types of *food establishment* ventilation systems:

- Any unit not in a fixed building, such as mobile units or some special transitory food units
- Ductless cooking units
- The venting of any *equipment* considered portable

Since the local mechanical authority will not be involved in issuing permits for these ventilation systems, you should work directly with your reviewing health agency on any necessary approvals.

Determining What *Equipment* Must be Vented

Work with the local mechanical authority in determining if a particular piece of *equipment* must be placed under a ventilation hood.

Contact the local mechanical department for a review or determination of mechanical requirements of individual equipment. *Equipment* that has historically not required a ventilation hood includes:

- Hot food holding units
- Low temperature cooking *equipment* such as Coney Island grills (for pre-cooked meats only), pretzel machines, and cabinet popcorn poppers.
- Electric fired, convection or non-convection, low-temperature enclosed insulated ovens (300° F maximum thermostatic setting).
- Chemical sanitizing warewashing machines and glass washing machines (maximum hot water temperature 140° F)
- Electric souv-laki machines (one only).
- Microwave and infrared sandwich or infrared pizza machines (for pre-packaged sandwiches and pre-packaged individual pizzas only).
- Under-counter hot water warewashing machines.
- Plate actuated electric cheesemelter.
- Waffle irons.
- Ductless Cooking Units. These units consist of commercial electric cooking appliances provided with recirculating systems that filter and introduce the air back into the room.

Air Balance Report and Smoke Test

The inspecting agency, at it's discretion, may require submission of an air balance report and may conduct a smoke test of all exhaust hoods prior to authorizing the facility to open. The air balance report and the smoke capture test are used to assure that the ventilation systems capture properly.

**Part 16
Dressing & Lockers Rooms**

Worksheet Help			
	Question #	Food Code & Food Law*	Guidance
11	Dressing Rooms	FC 6-305.11	Rooms or areas separate from food preparation, storage or service areas and separate from utensil washing or storage areas should be provided if employees will routinely change clothes within the establishment. Lockers or other suitable storage facilities shall be located in dressing areas. If dressing rooms are not required, separate facilities should be provided for the storage of coats, sweaters and other personal belongings.
*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD , Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.			

Part 17 Garbage & Refuse Storage

Worksheet Help			
Question #		Food Code & Food Law*	Guidance
43	Outside Storage	FC 5-5 FC 6-202.110	Garbage and <i>refuse</i> containers, dumpsters and compactor systems located outside shall be stored on or above a <i>smooth</i> surface made of, or constructed of non-absorbent material such as 4" <i>sealed</i> concrete. Outdoor refuse areas shall be constructed in accordance with law and shall be curbed and graded to drain to collect and dispose of liquid waste resulting from the refuse and from cleaning the area and waste receptacles. Garbage and <i>refuse</i> containers must have tight-fitting lids or covers.
44	Inside Storage	FC 5-5	Garbage or <i>refuse</i> storage rooms shall be constructed of cleanable, non-absorbent, washable materials and shall be insect-proof and rodent-proof.
<p>*FC =Michigan Modified FDA 2009 Food Code. *FL = Food Law. To view the food code, food law and other fact sheets go to: http://www.michigan.gov/MDARD, Search: Updated Food Law/Food Code 2012, or call 800-292-3939 to request single free copies.</p>			

Part 18 Special Transitory Food Units

A special transitory food unit (STFU) is a *food service establishment* that is licensed to operate throughout the state for any number of days, and is equipped and operates in a manner so as not to be required to return to a home base for resupply or cleaning.

This license was created to combine the old Transitory Food Units (TFUs), and hopefully, many of the temporary establishments. The desire was to lessen the burden many local health departments are facing with an ever-increasing number of temporary food units that typically need licensure each weekend. It is also expected that many units previously licensed as a mobile will apply for this type of food service license to avoid the requirements to return to a licensed commissary each night.

STFUs can be of many varied designs. They could be units designed for a motor home chassis, hot dog cart, covered trailer, tent, or other similar moveable structure.

How Does Licensure and Regulation Take Place?

I. Licensing jurisdiction

- A. The owner of a proposed food service STFU can apply for licensure at any local health department and a proposed retail food STFU at any MDARD regional office. These regulatory authorities must accept the application for licensure, and are obligated to properly and accurately process the application for the license.
- B. The STFU owner will make this decision based on many different factors, which best suits their business interest.

II. Is a plan review required?

- A. Basic requirement: A plan review is required for any newly constructed, altered, extensively remodeled, or converted STFU. Utilizing the STFU-Mobile Plan Review and SOP Worksheet and Application is required for all new or remodeled STFU and Mobile units.
- B. Generally, the STFU license applicant who wishes to apply previously *approved* plans, must apply for licensure at the local health department where the STFU plans were *approved* and are on file. Individual exceptions may allow acceptance of extra-jurisdictional plans, but only if the accepting jurisdiction agrees. Regardless, a new STFU-Mobile Plan Review and SOP worksheet is required.
- C. A previously licensed mobile *food service establishment* (mobile FSE) that has gone through the plan review process may or may not be required to complete a plan review as an STFU. Generally, a change from a mobile FSE license to an STFU license means an operational change. If the change is significant, a plan review should be conducted, but the emphasis would be on menu and SOP as they relate to the *equipment*. If the operational changes are not significant – and the *approved* plans are still on file and there is no significant menu or *equipment* change – then a new plan review would not be required.
- D. A previously licensed temporary *food service establishment* or a mobile FSE without prior plan review and approval. These operations are required to have plans, menus, and SOPs reviewed and *approved* before licensure.
- E. All new food service operations. A plan, menu, and SOP review and approvals are required before licensure.
- F. For all above situations:
 - a. A pre-operational inspection must be done after construction is completed and must be based on *approved* plans.
 - b. No fee is collected for a pre-operational inspection. It is included in the license application fee.
 - c. Subsequent year licensing must be done by original licensing jurisdiction to preserve inspection history and construction plans. If the STFU owner wishes to change licensing jurisdiction, an application for a new license and a new plan review would be required.

III. Plan review considerations/ The Michigan Modified 2009 FDA Food Code applies as applicable:

- A. Floors – acceptable flooring can include asphalt, concrete, dirt or gravel if covered with removable, cleanable mats, duckboards or similar materials. Protection from weather, windblown dust and/or debris; overhead contamination.
- B. Overhead protection is required.
- C. An STFU must provide protection of its operation by construction or location if needed.
- D. Construction of walls and ceilings:
 - a. Surfaces shall be *smooth* and easily cleanable or easily replaceable (tarps, canvas, screening, painted surfaces, plastic sheeting, etc.)
 - b. Unit must be capable of being completely protected from flying insects with screening, air curtains, self-closing doors, etc.
 - c. For operation at a location or time when insects are not present, outer openings need not be protected.
 - d. Mechanical ventilation
 - e. Necessary if needed to keep unit free of smoke, steam, fumes, excessive heat. (Food Code 6-304.11).

- f. Open or screened walls with adequate cross ventilation would preclude the necessity of mechanical ventilation.
- E. Plumbing Issues
 - a. Sinks for warewashing; if other than a three-compartment sink:
 - b. Two compartment sinks if *approved* per SOP
 - c. Separate portable basins if *approved* per SOP
- F. *Equipment* protection
 - a. *Air breaks/gaps* apply
 - b. Potable water protection
 - c. Submerged inlets must be protected (no hidden plumbing)
- G. Service sinks
 - a. Service sinks may be installed in the unit
 - b. Service sinks, if not in the unit, shall be provided and conveniently located exterior to the unit (within the boundaries, as necessary, of the event location or at adjacent building with permission).
- H. Toilet facilities
 - a. Restroom must be convenient and accessible during all hours of operation when exterior to the unit (within the boundaries of, as necessary, of the event location or at adjacent building with permission).
 - b. Restrooms shall be equipped with a working, properly supplied handwash sink.
- I. SOPs required as with any establishment. The following additional SOPs are also required:
 - a. *Sewage* disposal
 - b. Water sources
 - c. Unusual situations which need extra planning and control, such as batch utensil washing; easily replaceable flooring or temporary screening.
- J. Menu submittal to determine if *equipment*, design and space layout is appropriate for type and complexity of menu item and their preparation.
- K. Handwash facilities required, except as noted in Food Code 5-203.11(c)
 - a. Handwashing facilities must be supplied with tempered running water. Water can be supplied either under pressure or by gravity. Facilities can include lavatory with mixing faucet; or portable closed insulated container with free flow valve supplied with suitable sized waste catch container.
 - b. Hand cleaning methods when *approved* by licensing jurisdiction, such as alcohol wipes with limited food preparation, when covered by a SOP.
- L. STFUs must carry on board the following items of information:
 - a. *Approved* SOPs
 - b. *Approved* menu
 - c. Receipt showing necessary fees paid
 - d. License
 - e. Copies of all inspections

IV. STFU Fees

- A. Plan review (if required) set by the local jurisdiction if done by the local health department or if done by an MDARD regional office.
- B. License \$135.00 statewide – includes \$30.00 state surcharge and \$5.00 education fund.
- C. Operational inspections (2) \$90.00 each, statewide (total of \$180.00) to be kept by the jurisdiction conducting the operational inspections.

V. First operational inspection

- A. Fee - \$90.00 to agency conducting the inspection.
- B. Inspection agency – dependant on the location of the event.
 - a. State and county fairs = MDARD
 - b. Other locations/events = local health department
- C. STFU notifies the appropriate agency in writing four days before the event.
- D. STFU mails copies of the inspection report to the licensing jurisdiction within 30 days.
- E. Can be combined with the pre-opening inspection if the unit is in operation and serving food.

VI. Subsequent event operations

- A. STFU must send a notice by mail, four days prior to serving, the local health department jurisdiction in which food will be served (includes MDARD Regional Office).
- B. Local health departments can inspect the unit while it is operating in their jurisdiction – no fee can be collected. STFU must mail copies of all such inspection reports to the licensing jurisdiction within 30 days. The jurisdiction conducting the inspection shall also send a copy to the licensing jurisdiction.

VII. Second operational inspection

- A. STFUs must request inspection by the jurisdiction in which operation will take place – either local health department or MDARD (if fair).
- B. \$90.00 fee is retained by the inspecting jurisdiction. STFU mails a copy of the inspection to the licensing jurisdiction within 30 days.

VIII. Enforcement

- A. Because of mobility of STFUs, priority and priority foundation violations must be corrected at the time of inspection.
- B. If priority or priority foundation violations are not corrected immediately, a notice of this is sent by the inspecting jurisdiction to the licensing jurisdiction for consideration of appropriate enforcement action. This is necessary because the jurisdiction that issues the license is responsible for enforcement action against the licensee.
- C. If the STFU fails in any of the requirements of Food Law, section 6137, the STFU would not be eligible to be licensed as a STFU the next year.

Part 19

Non-Smoking Area and Choking Poster Requirements

Beginning May 1, 2010, smoking is prohibited in most public places in Michigan. The law will cover any workplace and any food service establishment. A workplace is a site employing at least one person. A food service establishment is any place with a license to serve food or beverages. This law covers public places, including, but not limited to, restaurants, bars, shopping malls, bowling alleys, concert halls, arenas, museums, mechanic shops, health facilities, nursing homes, education facilities, and child care centers.

For further information or questions visit <http://www.michigan.gov/MDARD>, Search: Michigan's Smoke Free Air Law, or call 800-292-3939.

Anti-choking Poster

Section 6141 of the Food Law, states that:

- (1) A food service establishment in which solid foods are sold and consumed on the premises shall prominently display a poster in the kitchen area of the food service establishment diagramming and explaining the anti-choking techniques safe for both adults and children approved by the department for dislodging foreign obstacles caught in the throat of a choking person.

- (2) This section does not impose a duty upon the owners or employees of a food service establishment to apply anti-choking techniques.

Part 20 Definitions

Defined words are in italics in the text of the document

Acceptable food equipment means food *equipment* that is deemed to be in conformance with Food Code 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 Parts 4-1 and 4-2 of the Food Code.

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

“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.”

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.

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.

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.

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

Backflow means the flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable supply of water from any source or sources other than its intended source. Back-siphonage is one type of *backflow*.

Backflow Preventer means a device or means to prevent *backflow*.

Back-siphonage means the flowing back of used, contaminated, or polluted water from a *plumbing fixture* or vessel or other sources into a potable water supply pipe due to a negative pressure in such pipe.

Equipment means an article that is used in the operation of a *food establishment* such as a freezer, grinder, hood, ice maker, meat block, mixer, oven, reach-in refrigerator, scale, sink, slicer, stove, table, temperature measuring device for ambient air, vending machine, or warewashing machine. "*Equipment*" does not include items 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.

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

Food Establishment means an operation where food is processed, packed, canned, preserved, frozen, fabricated, stored, prepared, served, sold or offered for sale. *Food establishment* includes a food, but not limited to, a *food processor*, a food warehouse, a *food service establishment*, and a retail grocery. *Food establishment* does not include any of the following:

- A charitable, religious, fraternal or other non-profit organization operating a home-prepared baked goods sale or serving only home-prepared food in connection with its meetings or as part of a fund-raising event.
- An inpatient food operation located in a health facility or agency subject to licensure under article 17 the public health code, MCL 333.20101 to 333.22260.
- A food operation located in a prison, jail, state mental institute, boarding house, fraternity or sorority house, convent or other facility where the facility is the primary residence for the occupants and the food operation is limited to serving meals to the occupants as part of their living arrangement.

Food Processor means a *food establishment* that processes, manufactures, wholesales, packages, labels, or stores food. Food processor does not include a maple syrup producer. Processing is an act, such as canning, freezing, dehydrating, drying, distilling, extracting, preserving, grinding, crushing, milling, washing, trimming, packing, or otherwise preserving or changing the form of a food.

Food Service Establishment means a fixed or mobile restaurant, coffee shop, cafeteria, short order cafe, luncheonette, grill, tearoom, sandwich shop, soda fountain, tavern, bar, cocktail lounge, nightclub, drive-in, industrial feeding establishment, private organization serving the public, rental hall, catering kitchen, delicatessen, theater, commissary, or similar place in which food or drink is prepared for direct consumption through service on the *premises* or elsewhere, and any other eating or drinking establishment or operation where food is served or provided to the public. *Food service establishment* does not include any of the following:

- A motel that serves continental breakfasts only.
- A bed and breakfast that has 10 or fewer sleeping rooms for rent.
- A bed and breakfast that has more than 10 sleeping rooms for rent, if the bed and breakfast serves continental breakfasts only.
- A child care organization regulated under 1973 PA 116, MCL 722.111 to 722.128, unless the establishment is carrying out an operation considered by the director to be a food service establishment.

Linens means fabric items such as cloth hampers, cloth napkins, table cloths, wiping cloths, and work garments including cloth gloves.

Portable means 30 pounds or less, with no dimensions exceeding 36" and no fixed utility connections.

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.

Plumbing fixture means a receptacle or device that:

- Is permanently or temporarily connected to the water distribution system of the *premises* and demands a supply of water from the system; or,
- Discharges used water, waste materials, or *sewage* directly or indirectly to the drainage system of the *premises*.

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*.

(1) Potentially hazardous food (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.

(2) Potentially hazardous food (time/temperature control for safety food) includes

(a) 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 leafy greens, cut tomatoes or mixtures of cut tomatoes that are not modified in a way so that they are unable to support pathogenic growth or toxin formation or garlic-in-oil mixtures that are not modified in a way that results in mixtures that do not support pathogenic microorganism growth or toxin formation; and

(b) Except as specified in Subparagraph (3)(d) of this definition, a food that because of the interaction of its A_w and pH values is designated as Product Assessment Required (PA) in Table A or B of the Michigan Modified FDA 2009 Food Code.

(3) Potentially hazardous food (time/temperature control for safety food) does not include:

(a) An air-cooled hard-boiled EGG with shell intact, or an EGG with shell intact that is not hard-boiled, but has been pasteurized to destroy all viable **salmonellae**;

(b) 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;

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

(d) A food that is designated as Product Assessment Required (PA) in Table A or B of the Michigan Modified FDA 2009 Food Code 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, acidulants, 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

(e) A food that does not support the growth or toxin formation of pathogenic microorganisms in accordance with one of the Subparagraphs (3)(a) - (3)(d) of this definition even though the food may contain a pathogenic microorganism or chemical or physical contaminant at a level sufficient to cause illness or injury.

Premises means:

- The physical facility, its contents, and the contiguous land or property under the control of the permit holder
- The physical facility, its contents, and the land or property if its facilities and contents are under the control of the permit holder and may impact *food establishment* personnel, facilities, or operations, if a *food establishment* is only one component of a larger operation such as a health care facility, hotel, motel, school, recreational camp, or prison.

Ready-To-Eat Food

"Ready-to-eat food" means

(a) Is in a form that is edible without additional preparation to achieve food safety, as specified under one of the following: ¶ 3-401.11(A) or (B), § 3-401.12, or § 3-402.11, or as specified in ¶ 3-401.11(C); or

(b) Is a raw or partially cooked animal FOOD and the consumer is advised as specified in Subparagraphs 3-401.11(D)(1) and (3); or

(c) Is prepared in accordance with a variance that is granted as specified in Subparagraphs 3-401.11(D) and (4); and

(d) May receive additional preparation for palatability or aesthetic, epicurean, gastronomic, or culinary purposes.

"Ready-to-eat food" includes:

(a) Raw animal food that is cooked as specified under § 3-401.11 or 3-401.12, or frozen as specified under § 3-402.11;

(b) Raw fruits and vegetables that are washed as specified under § 3-302.15;

(c) Fruits and vegetables that are cooked for hot holding, as specified under § 3-401.13;

- (d) All potentially hazardous food (time/temperature for safety control food) that is cooked to the temperature and time required for the specific food under Subpart 3-401 and cooled as specified under § 3-501.14;
- (e) Plant food for which further washing, cooking, or other processing is not required for food safety, and from which rinds, peels, husks, or shells, if naturally present are removed;
- (f) Substances derived from plants such as spices, seasonings, and sugar;
- (g) A bakery item such as bread, cakes, pies, fillings, or icing for which further cooking is not required for food safety;
- (h) The following products that are produced in accordance with USDA guidelines and that have received a lethality treatment for pathogens: dry, fermented sausages, such as dry salami or pepperoni; salt-cured meat and poultry products, such as prosciutto ham, country cured ham, and Parma ham; and dried meat and poultry products, such as jerky or beef sticks; and
- (i) Foods manufactured as specified in 21 CFR Part 113, Thermally Processed Low-Acid Foods Packaged in Hermetically Sealed Containers. required, and from which rinds, peels, husks or shells are removed.

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

Regulatory Authority means the local, state, or federal enforcement body or authorized representative having jurisdiction over the *food establishment*.

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

Seating Capacity means the actual number of seats for patrons in a *food service establishment*. Seating capacity does not include seats located at a bar or seats at tables that are located adjacent to a bar, if meals are not served at those tables.

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

Smooth means:

- A food-contact surface having a surface free of pits and inclusions with a cleanability equal to or exceeding that of (100 grit) number 3 stainless steel;
- A nonfood-contact surface of *equipment* having a surface equal to that of commercial grade hot-rolled steel free of visible scale; and
- A floor, wall, or ceiling having an even or level surface with no roughness or projections that render it difficult to clean.

Vacuum Breaker. See **Backflow Preventer**.

References

The following is a list of reference materials that users of the Plan Review Manual may find useful to more fully understand the complexities of facility plan review. These references contain suggested formulas in addition to the ones included in the preceding plan review guide.

Baraban, Regina S. and Joseph F. Durocher, *Successful Restaurant Design*, New York, NY: Van Nostrand Reinhold.

Barnes, James D., *Manual of Recommended Practice for Ventilation in Food Service Establishments*, National Environmental Health Association.

Birchfield, John C., *Design and Layout of Foodservice Facilities*, New York, NY: Van Nostrand Reinhold, 1984.

Food and Drug Administration, *Food Code 2009*, National Technical Information Service, Springfield, VA.

Kazarian, Edward A., *Foodservice Facilities Planning*, Third Edition, Copyright Van Nostrand Reinhold, New York, 1989.

NAFEM, National Association of Food *Equipment* Manufacturers, *Introduction to the Foodservice Industry* (Kitchen Design).

North American Association of Food *Equipment* Manufacturers, *An Introduction to the Foodservice Industry*, First Edition, 1996.

Slavato, J.A., *Environmental Engineering & Sanitation*, Fourth Edition, Copyright John Wiley & Sons, Inc., United States and Canada, 1992.

Scrieven, Carl and James Stevens, *Food Equipment Facts*, Troy, NY: Conceptual Design, 1980 or latest printing (or equal publication).

Stipanuk, David M. and Roffman, Harold, *Hospitality Facilities Management and Design*, American Hotel and Motel Association, Educational Institute, 1992.

Acknowledgements

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Original revisions to the FDA guidebook completed in 2002 by:

Local Public Health:

- Barry Hugo, Bay County Health Department
- Rod McNeill, Genesee County Health Department
- Al Kramer, RS, Plan Review Specialist, Kent County Health Department
- Al Knowles, Lenawee County Health Department
- Gary Green, CFSP, Mid-Michigan District Health Department
- Rodney Blanchard, Monroe County Environmental Health Division
- Penney Massey, Northwest Michigan Community Health Agency
- Kent Singer, RS, Tuscola County Health Department
- Alan Hauck, RS, Washtenaw County Health Department
- Phyllis Ficzyz, Wayne County Health Department
- Brian Cecil, Jackson County Health Department

Industry:

- Ed LaClair, BS, MS, RS, Tricon Corporation

State:

- Susan Trombley, Region 7, Michigan Department of Agriculture and Rural Development
- Byron Beerbower, Food Inspection Program Coordinator, Michigan Department of Agriculture and Rural Development
- Kevin Besey, RS, MPA, DAAS, Plan Review Specialist, Michigan Department of Agriculture and Rural Development

The original FDA guidebook prepared by:

The Northeast Region Plan Review Development Committee for the Conference for Food Protection.

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- John P. Schrade, U.S. Food and Drug Administration, Northeast Region, Director of State Programs.
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- D.L. Lancaster, Consultant, Ann Arbor, Michigan.



Michigan Department of Agriculture and Rural Development

Fixed Food Establishment Plan Review **Worksheet**

To be completed by the operator and submitted to the local health department
or the Michigan Department of Agriculture and Rural Development,
(whichever will be conducting the plan review).

Establishment

Name: _____

Address: _____

City, State, Zip: _____

Pages 6-10 ask structural and equipment questions that the operator may wish to have the contractor or architect complete.

Refer to the food establishment plan review manual for technical assistance. The manual is available from your reviewing agency or by visiting www.michigan.gov/mdard, Search: Plan Review.

Information contained in the plans may be referenced and does not have to be repeated in the worksheet (e.g., see plan sheet 3a, #6).

Food Manager Knowledge

Under the Food Law of 2000, as amended, retail food establishments are required to have a person in charge (PIC) during all hours of operation and employee at least managerial employee under a program accredited by American National Standards Institute.

1. Check all that apply

A designated person in charge that can demonstrate knowledge of: foodborne disease prevention, application of food safety (HACCP) principles, and the requirements of the Food Code, will be available during all hours of operation. (REQUIRED)

Certified Managerial Employees under ANSI Requirements is provided (REQUIRED)

A written food safety (HACCP) plan will be provided.* (Only required under certain circumstances)

Standard operating procedures (SOP) including a policy that excludes or restricts food workers who are ill or have infected cuts or lesions*

Animal based foods, such as meat, poultry, fish, shellfish or eggs served raw, or undercooked or not otherwise processed to eliminate pathogens.**

* Please submit copies of these documents (or an inventory if there are numerous large documents, and training videos)

**If you checked this item, then the customer must be informed by means of a consumer advisory upon ordering, that a particular menu item contains raw or undercooked foods of animal origin. The consumer advisory must be made whether the food is normally prepared undercooked or is prepared undercooked only at the customer's order. Submit a copy of the menu for review. For further clarification please contact your reviewing health agency or read the consumer advisory guidance document at <http://www.michigan.gov/mdard>, Search: Updated Food Law/Food Code 2012.

Food Preparation Review
 (See manual parts 1 and 3)

2. How will potentially hazardous food (time/temperature control for safety food) be thawed? (Check all that apply)

<u>Thawing Method</u>	Foods less than 1" thick	Foods more than 1" thick
Refrigeration		
Running water (less than 70 °F)		
Microwave as part of cooking process		
Cook from frozen		
Other:		

3. Cooking and reheating potentially hazardous food (time/temperature control for safety food): List all cooking and reheating equipment and check all applicable boxes.

Equipment Name	Cooking	Reheating	New	Used	NSF Approved or Equivalent

4. Hot and cold holding of potentially hazardous food (time/temperature control for safety food): List all hot and cold holding equipment and check all applicable boxes.

Equipment Name	Hot Holding	Cold Holding	New	Used	NSF Approved Or Equivalent

9. Date Marking:

When potentially hazardous food (time/temperature control for safety food) is ready-to-eat and will be kept under refrigeration for more than 24 hours after preparation / opening, a date marking system must be utilized. Note: The day of preparation counts as Day 1.

A. Will the establishment have food items that must be date marked? ___ Yes ___ No

If yes, describe the date marking system that will be used and provide written standard operating procedures.

10. Catering/Off-Site/Satellite:

Complete if establishment will cater foods to another location or performing any cooking or preparations off-site at other locations.

A. List menu items

B. Maximum number of meals per day taken to or prepared at off-site location

C. How will hot food be held at proper temperature during transportation and at the remote serving location? _____

D. How will cold food be held at proper temperature during transportation and at the remote serving location? _____

E. What types of vehicles will be used to transport food?

F. What types of sneeze guards or food protection devices will be used? (See manual part 4)

Dishwashing
(See manual part 8)

11. Dishwashing methods (check all that apply) ___ Dishmachine ___ Sink

Dishwashing Sinks	Length (inches)	Width (inches)	Depth (inches)
A. Sink 1, Size of compartments			
B. Sink 2, Size of compartments			
C. Sink 3, Size of compartments			

D. What is the largest item that will have to be washed in a sink and its size?

E. List the location of all garbage disposals:

General

12. Will employee dressing rooms be provided? ___ Yes ___ No
 (See manual part 16.)

13. If no, describe how personal belongings will be stored:

14. Check which of the following will be used ___ Washer ___ Dryer
 on-site:

15. Describe what will be laundered on-site: _____

16. What type of mop sink will be provided (e.g., curbed floor drain, mop sink on legs, etc)?
 See manual part 8.

Room Finish Schedules

Fill in materials to be used (See manual part 10)

Area	Floor	Coving*	Wall	Ceiling
17. Preparation				
18. Cooking				
19. Dishwashing				
20. Food Storage				
21. Bar				
22. Dining				
23. Employee Restrooms				
24. Dressing Room				
25. Walk-In Refrigerator				
26. Walk-In Freezer				
27. Garbage Room				
28. Janitor Closet				
29.				
30.				

*List the material that will be used to provide a smooth, rounded and cleanable surface where the floor and wall joins. **Note:** Please explain abbreviations.

Water Supply

(See manual part 5)

31. Will the water supply be: ___ Municipal ___ Existing on-site ___ New on-site
32. If an on-site water supply is being used, is the local health department in the process of approving? ___ Yes ___ No*

Sewage Disposal

(See manual part 5)

33. Will the sewage disposal be: ___ Municipal ___ Existing on-site ___ New on-site
34. If an on-site sewage system is being used, is the local health department or Michigan Department of Environmental Quality in the process of approving? ___ Yes ___ No*

* It is recommended that you contact your local health department to begin the approval process.

Insect and Rodent Control

(See manual part 13)

35. Will outside doors be self-closing? ___ Yes ___ No
36. Will the facility have a drive-thru or walk-up window? ___ Yes ___ No
37. If 36 is yes, describe how insects will be kept out (e.g., self-closer, air curtains, etc.)

38. Are other openable windows screened? ___ NA ___ Yes ___ No
39. Will openings around pipes, electrical conduits, chases and other wall perforations be sealed? ___ Yes ___ No
40. Will garage-style or loading bay doors be present? ___ Yes ___ No
41. If 40 is yes, how will garage style or loading doors be protected against vermin entry?

Solid Waste Storage

(See manual part 17)

42. Outside Storage
A. What type of storage will be used?* ___ Compactor* ___ Dumpster* ___ Cans
B. What type of surface will be under the container? _____
C. What is the minimum pick-up frequency? _____

*Remember to show details on site plan, including unit location and slope of surface under the unit.

43. Inside Storage

A. Describe how garbage, boxes, etc., will be stored inside:

B. Describe any inside storage or cleaning area (e.g., garbage can cleaning area):

C. Will any compactors or dumpsters be located inside? If yes, show on plans. Yes No

D. Describe any area where damaged merchandise returned for credit to vendor will be stored:

E. Describe how waste grease will be handled and stored: _____

F. Describe how and where recyclables will be stored: _____

G. Check the types of materials that will be recycled:

Glass Metal Paper Cardboard Plastic

Plumbing Cross-Connections

(See manual part 12)

The following technical information is needed on the proposed plumbing. This section is best completed by a qualified plumber, architect or engineer. Be sure to include all devices, equipment and fixtures that have cross-connection protection. Remember to complete both the water supply and waste side (e.g., a dishwasher may have an AVB on the water supply and an air-gapped drain).

Fixture	Sewage Disposal			Water Supply					
	Air Gap	Air Break	Direct Connect	AVB	PVB	RPZ	VDC	HB	Air Gap
44. Dishwasher									
45. Glasswasher									
46. Garbage grinder									
47. Ice machines									
48. Ice storage bin									
49. Mop sink faucet									
50. 3 compartment sink									
51. 2 compartment sink									
52. 1 compartment sink									
53. Steam tables									
54. Dipper wells									
55. Hose connections									
56. Refrigeration condensate drain lines									
57. Beverage dispenser with carbonator									
58. Water softener									
59. Potato peeler									
60. Walk-in floor drain									
61. Chinese range									
62. Detergent feeder on faucet									

63. Outside sprinkler or irrigation system									
64. Power washer									
65. Retractable hose reel									
66. Toilet									
67. Urinal									
68. Boiler									
69. Bain-marie									
70. Espresso machine									
71. Combi-style oven									
72. Kettle									
73. Rethermalizer									
74. Steamer									
75. Overhead spray rinse									
76. Hot water dispenser									
77.									
78.									
AVB = atmospheric vacuum breaker					HB = hose bib vacuum breaker				
PVB = pressure vacuum breaker					VDC = vented double check valve				
RPZ = reduced pressure principle backflow preventer									

Formula Information

Several calculations are required to determine if there will be adequate hot water, ventilation, dry storage space and refrigerated storage space. The information requested on the following two pages provides the necessary data for performing calculations. See the plan review manual for formulas and directions.

79. Hot Water (see manual part 9)

List each type of plumbing fixture that uses hot water	# fixtures
Handsinks	
Bathroom Sinks	
1 Compartment Sink	
2 Compartment Sink	
3 Compartment Sink	
Vegetable Sink	
Overhead Spray Rinse	
Bar Sink _____ 3 compartment _____ 4 compartment	
Cook Sink	
Hot Water Filling Faucet	
Bain-marie	
Coffee Urn	
Kettle Stand	
Garbage Can Washer	
9 & 12 lb. Clothes Washer	
16 lb. Clothes Washer	
Employee Shower	
Mop Sink	
Dishmachine _____ hot water _____ chemical	
Dishmachine Make & model: _____	
Other:	
Other:	

80. Water Heater #1 Manufacturer: _____ Model number: _____
 A. Hot water heater proposed size: Electric _____ KW
 Gas _____ BTU's Thermal Efficiency: _____%
 B. Hot water heater storage capacity: _____ gallons
 C. Hot water heater recovery rate: _____ gallons per hour (@100° rise)

Attach information for any additional water heaters. Specify what area each water heater services and whether or not units will be installed in parallel.

81. Do hot water heater(s) serve any non-food equipment areas?
 If yes describe: _____

82. Dishmachine Booster Heater _____ KW _____ BTU Make _____ Model # _____

83. Refrigerated and Dry Food Storage (see manual parts 3 & 7)
 It is essential that a reliable estimate be made of the number of customers that are served or buy food between deliveries, in order to calculate dry and refrigerated storage capacities.

A. # meals or people served per day = _____
 B. # days between deliveries = _____ Dry Food _____ Refrigerated Items _____
 C. # meals between deliveries (AxB =) _____ Dry Food _____ Refrigerated Items _____

Please describe any assumptions made in determining the meal quantity estimate:

84. Refrigerated Storage (see manual part 3)

Walk-in Item #	**Interior Usable Height (ft)	Interior Length (ft)	Interior Width (ft)

*Upright Item #	Interior Depth (in)	Interior Width (in)	Interior Height (in)

*Working, preparation and line refrigerators should not be included. Only storage units.

85. Dry Storage (see manual part 7)

Storage Rooms*

**Usable room height (ft)	Interior Length (ft)	Interior Width (ft)

*Please note the location of any auxiliary storage (i.e outside storage).

**To determine usable height, determine height from floor to ceiling, then subtract height of food off floor (usually 6") and height of food from ceiling (usually 12-18").

Or, if there is no dry storage room proposed:

For full height shelves

Total Shelving Length (ft)	Shelving Width (ft)

Suggestion Sheet Food Establishment Plan Review Worksheet

Suggestions for changes to this plan review worksheet are welcomed from all users (e.g, food service operators, architects, engineers and regulators, etc.). Revisions to documents are made periodically as needed. Thank you for taking the time to submit your ideas.

Name: _____ Phone: _____ Fax: _____

Address: _____

City, State, Zip: _____

E-mail: _____

Submit to:
Plan Review Specialist
Food Service Sanitation Section
Food & Dairy Division
Michigan Department of Agriculture
PO Box 30017
Lansing, MI. 48909

Fax: 517-373-3333

E-mail: krzyzanowskir@michigan.gov

For suggested changes, please list section specific location in document. You may list your suggestions below or attach separate sheets. Please be specific and clear.



Fixed Food Establishment Standard Operating Procedures Manual

Who must submit standard operating procedures (SOPs)?

- All new fixed food establishments, except vending locations.
- Remodeled food establishments that change menu or operation.

What are standard operating procedures?

- SOPs are written procedures that describe the activities specific to your menu and operation to ensure compliance with the requirements within the Michigan Modified Food Code and Michigan Food Law. These procedures should be used to train the staff members responsible for these activities. To view the Michigan Modified Food Code, Michigan Food Law and other fact sheets go to: http://www.michigan.gov/mdard/0,4610,7-125-50772_45851_61711---.00.html or call 800-292-3939 to request single free copies.
- If your operation is conducting a specialized food process, as described on page 2, a HACCP plan will be required in addition to any appropriate SOPs.

Why must procedures be submitted?

- Michigan's Food Law requires standard operating procedures to be established prior to opening.
- SOPs should be used to train employees on basic food safety procedures which will enable your facility to operate in a safe manner.

How must procedures be developed?

- Procedures are intended for use by managers and employees. They should be specific to the menu, equipment, and operations of your facility. Develop procedures in the language, style and format best for the establishment. An English copy of the procedures is needed for the regulating agency.
- For those that need assistance, see the SOP Template and Technical Guidance section of this document.

What procedures apply to all establishments and must be submitted?

- Handwashing
- Personal hygiene
- Preventing bare hand contact with ready-to-eat foods
- Employee health
- Food from approved sources
- Cleaning and sanitizing food contact surfaces (i.e. warewashing)
- Protecting food from contamination

What procedures must all establishments submit when applicable to their operation?

- Date-marking ready-to-eat, time/temperature control for safety food
- Time as a public health control
- Thawing time/temperature control for safety food
- Cooking time/temperature control for safety food
- Cooling time/temperature control for safety food
- Reheating for hot holding of time/temperature control for safety food
- Hot holding time/temperature control for safety food
- Cold holding time/temperature control for safety food
- Catering/off site/satellite food service
- Outdoor exposed dining/food preparation
- The regulatory authority may require additional written SOPs depending upon your intended operation

What are specialized processes and HACCP Plans?

A Hazard Analysis and Critical Control Point (HACCP) plan is a written document that outlines the formal procedures for specialized food processes such as smoking food for preservation, curing, reduced oxygen packaging, fermentation, and/or packaging raw unpasteurized juice (FDA Food Code 3-404.11, 3-502.11, 3-502.12, 3-801.11). Products produced for wholesale under the Code of Federal Regulations, may also require specific HACCP plans under those regulations.

Please consult your regulatory agency if you plan to wholesale products (i.e. sell to another retail or food service operation).

When conducting a process that requires a HACCP plan, that HACCP plan must be submitted separately from the SOPs outlined within this document. Review of your submitted HACCP plan will be conducted by the regulatory authority and any necessary changes or clarifications will be communicated. Contact your regulatory authority regarding further guidance on specialized processes and HACCP plans.

Which foods would be considered time/temperature control for safety foods (TCS)?

Time/temperature control for safety foods are items that require time/temperature control to prevent growth of pathogenic microorganisms, such as bacteria, or to prevent toxin formation. Microorganisms generally grow rapidly in moist, high protein foods that have not been acidified or otherwise processed to prevent such growth.

Examples of TCS foods include, but are not limited to:

- Animal foods that are raw or heat treated such as:
 - Milk or milk products including cheese and whipped butter
 - Meats including raw or partially cooked bacon
 - Shell eggs
 - Fish
 - Poultry and poultry products
 - Shellfish
- Food derived from plants that are heat treated including:
 - Onions (cooked and rehydrated)
 - Cooked rice
 - Soy protein products (example: tofu)
 - Potatoes (baked or boiled)
- Food derived from plants that consist of:
 - Cut leafy greens
 - Cut tomatoes or mixtures of tomatoes
 - Cut melons
 - Raw seed sprouts
- Garlic-in-oil, and other vegetable-in-oil mixtures that are not treated to prevent the growth and toxin production of *C. botulinum*.
- Certain sauces, breads, and pastries containing time/temperature control for safety food (examples: meat, cheese, cooked vegetables or cream).

What is Not a TCS food?

- An air-cooled hardboiled egg with shell intact
- A food with water activity of 0.88 or less (e.g. food with low moisture)
- A food with a pH lower than 4.2 (e.g. acidic food)
- A food in a hermetically sealed container commercially processed to achieve and maintain sterility
- A food for which laboratory evidence has demonstrated that growth and/or toxin formation of pathogenic microorganisms are unlikely to occur due to the characteristics of the food.

Food establishment managers are responsible for accurately determining which of the foods they serve or sell are TCS and therefore require strict temperature control. Use Tables A and B found in the Michigan Modified Food Code under section 1-201.10 (B) Potentially Hazardous Food (Time/Temperature Control for Safety Food) to help in determining TCS foods.

Assistance in determining if food meets these requirements is generally available from independent consulting laboratories certified to conduct microbiological testing of foods, and university-based food scientists.

Once procedures are developed, where should they be sent and what happens to them?

- Procedures should be sent to the regulating agency reviewing the plans as soon as they are ready. The regulatory authority will verify that the information in the procedures is technically correct. Be sure to leave enough time to make changes. Contact your regulatory authority for help.
- Procedures are required to follow the requirements of the Michigan Modified Food Code before your food license can be issued.
- Procedures should be kept on-site and used by the person in charge and employees.

SOP Template and Technical Guidance

The following pages provide guideline templates for writing an SOP for the topics previously listed in this document. Each template contains questions that should be answered regarding your procedure as well as technical information/guidance for the listed procedure. These templates are offered as guidance in developing your SOPs; additional pages can be attached to these templates to further explain your SOPs. **Either customization of these templates to be specific to your facility, or submittal of a different set of documents covering equivalent information is acceptable.**

STANDARD OPERATING PROCEDURES (SOPs) FOR FIXED FOOD ESTABLISHMENTS

SOPs are procedures specific to your menu and operation that describe the tasks necessary to prevent foodborne illness and follow the Michigan Food Law and Michigan Modified FDA Food Code. These procedures should be used to train the staff members responsible for the tasks.

INSTRUCTIONS: Provide detailed and complete food safety procedures for the listed topics. **If a topic is not applicable to your operations, write "Not Applicable" or "NA".** Topics marked with "***" are applicable to all fixed food establishments, regardless of the type of operation, menu, or equipment proposed.

Name of Establishment: _____

Name of License Holder: _____

Address of Establishment: _____

City, State, Zip: _____

Phone #: _____ Fax #: _____

E-mail: _____

Who will be responsible for training employees on SOPs?

Position Title(s): _____

Describe the methods for training employees on SOPs (e.g. video, demonstration, operation manual, etc.).

If applicable, list what food safety logs (e.g. cold holding, hot holding, cooking, cooling, reheating, etc.) will be utilized.

I certify that the SOPs submitted are accurate for this facility, to the best of my knowledge.

Signature of License Holder: _____ Date: _____

****PERSONAL HYGIENE**

Applicable Food Code Sections: 2-201.11(A) (1) (e), 2-302.11, 2-303.11, 2-304.11, 2-401.11, 2-401.12, 2-402.11

Employees must adhere to the following personal hygiene procedures:

- Outer clothing of food employees must be clean.
- Employees experiencing persistent sneezing, coughing, or a runny nose that causes discharge from the eyes, nose, or mouth may not work with exposed food; clean equipment, utensils, and linens; or unwrapped single-service or single use articles.
- A lesion containing pus such as a boil or infected wound that is open or draining and is:
 - On the hands or wrists must be covered with an impermeable cover such as a finger cot or stall that protects the lesion and a single-use glove is worn over the impermeable cover.
 - On exposed portions of the arms must be protected by an impermeable cover.
 - On other parts of the body covered with a dry, durable, tight-fitting bandage.
- Food employees wearing fingernail polish or artificial nails must wear intact gloves when working with exposed foods. While preparing food, employees may not wear jewelry on the arms and hands (except for a plain ring such as a wedding band).
- Employees are not allowed to eat or use tobacco in food handling or equipment areas.
- Employees may drink from a closed beverage container in food handling areas. The container must be handled and stored in a manner to prevent contamination of the employee's hands, exposed food, clean equipment, utensils, and linens, and unwrapped single-service and single-use articles.
- Employees must wear effective hair restraints such as hats, hair coverings or nets.

Where will employees be permitted to eat and drink? If drinks are allowed in food handling areas, what type of containers will be used and how will they be stored?

Where will employees be permitted to use tobacco products?

What type of hair restraint will be worn?

Who will monitor to assure employees are following proper hygiene procedures?

Position Title(s): _____

What corrective action will be taken if hygiene procedures are not followed and who will be responsible for this corrective action?

****BARE HAND CONTACT WITH READY-TO-EAT FOODS**

Applicable Food Code Sections: 3-301.11

Ready-to-eat (RTE) foods

- These are foods that can be eaten without any further preparation to make them safe for consumption.
- Except when washing fruits and vegetables, food employees may not touch exposed ready-to-eat foods with their bare hands and shall use suitable utensils such as deli tissue, spatulas, tongs, single-use gloves, or dispensing equipment.
- Suppliers make many different types of gloves intended for food handling. Some individuals may have or may develop allergies to latex gloves. Alternative glove materials such as vinyl or nitrile are available for food handling. Consult your glove supplier for assistance.

List which types of ready-to-eat foods (or groups of food) will be handled using the following methods:

Utensils (spatula, tongs, serving spoons, etc.): _____

Deli tissue: _____

Single-use gloves- describe type of gloves used (e.g. latex, vinyl, nitrile) as well as the ready-to-eat foods: _____

Dispensing equipment- describe equipment as well as the type of ready-eat foods: _____

Who will monitor to assure employees are not touching ready-to-eat foods with their bare hands?

Position Title(s): _____

What corrective action will be taken if ready-to-eat foods are touched with bare hands and who will be responsible for this corrective action?

****EMPLOYEE HEALTH**

Applicable Food Code Sections: 2-103.11(M), 2-201.11, 2-201.12, 2-201.13

Employee Health:

- The person in charge (PIC) at the facility is required to:
 - Recognize symptoms of diseases that are transmitted by foods. Common symptoms of illnesses that can be easily spread by food include:
 - Diarrhea
 - Vomiting
 - Jaundice
 - Sore throat with fever, or
 - Infected wounds and boils on the hands or arms
 - Notify employees of their reporting requirements regarding their health and activities. Employees must notify management when:
 - They experience any of the common symptoms that can be easily spread by food:
 - Diarrhea
 - Vomiting
 - Jaundice
 - Sore throat with fever
 - Infected wounds and boils on the hands or arms
 - They are diagnosed as being ill as a result of any of the following pathogens (Big Five)
 - Norovirus
 - Hepatitis A virus
 - *Shigella spp.*
 - Enterohemorrhagic or Shiga toxin-producing *Escherichia coli* (*E. coli*)
 - *Salmonella typhi*
 - They are exposed to or are suspected of causing a confirmed foodborne illness outbreak of any of the Big Five.
 - They live with a household member who has any of the Big Five, or if a household member works in or attends a setting where any of the Big Five have caused a confirmed outbreak.
 - Exclude food employees from the establishment with the following conditions:
 - Diagnosed as having an illness associated with a Big Five pathogen
 - For employees diagnosed with one of the Big Five but experiencing no illness symptoms, consult the regulatory authority. Restriction is allowed under some circumstances.
 - Signs of jaundice, (yellowing of skin and/or eyes), and onset occurred in the last 7 calendar days.
 - Symptoms of vomiting and/or diarrhea
 - Restrict food employees with the following conditions from working with exposed food; clean equipment, utensils and linens; unwrapped single service and single-use items; etc.:
 - Sore throat with fever (**Exclude employee if serving a *highly susceptible population.**)
 - An uncovered lesion containing pus, such as a boil, or an uncovered infected wound
 - Additionally, for a ***highly susceptible population**, restrict food employees from the establishment with the following conditions:
 - Has been exposed to, or is the suspected source of, a confirmed Norovirus outbreak within the past 48 hours,
 - Has been exposed to, or is the suspected source of, a confirmed outbreak of Enterohemorrhagic or Shiga Toxin-producing *E. coli* or *Shigella spp.* within the past 3 days.
 - Has been exposed to, or is the suspected source of, a confirmed *Salmonella typhi* outbreak within the past 14 days.
 - Has been exposed to, or is the suspected source of, a confirmed Hepatitis A outbreak within the past 30 days, or
 - Lives with household member who has any of the Big Five pathogens, or a household member attends a setting where any of the Big Five have caused a confirmed outbreak.
- *Highly susceptible population** means persons who are more likely than other people in the general population to experience foodborne disease because they are:
- Immunocompromised; preschool age children, or older adults; and 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, or nutritional or socialization services such as a senior center.

- Notify the regulatory authority when an employee is diagnosed with any of the below listed pathogens or is jaundiced.
 - Norovirus
 - Hepatitis A virus
 - *Shigella spp.*
 - Enterohemorrhagic or Shiga toxin-producing *Escherichia coli (E. coli)*
 - *Salmonella typhi*
- Reinstate affected food workers who are restricted or excluded. Reinstatement will be performed in the following manner:
 - Any employee excluded due to jaundice or diagnosis with one of the Big Five will be reinstated per written medical documentation from a physician and **approval from the regulatory authority**. Contact the regulatory authority for assistance with other options for reinstatement.
 - Any employee excluded due to symptoms of vomiting or diarrhea will be reinstated after they have been symptom free for at least 24 hours, or after they have provided medical documentation that the symptom is from a noninfectious condition.
 - Any employee restricted or excluded due to illness with sore throat and fever will be reinstated when they have provided medical documentation that they have received antibiotic therapy for *Streptococcus pyogenes* infection for more than 24 hours, they have had at least one negative throat specimen culture for *Streptococcus pyogenes*, or it is otherwise determined by a health practitioner that they are free of *Streptococcus pyogenes* infection.
 - Any employee restricted due to an uncovered infected wound or pustular boil will be reinstated when the area is properly covered with one of the following:
 - On the hands or wrists, an impermeable cover such as a finger cot or stall with a single-use glove worn over the impermeable cover,
 - On exposed portions of the arms, an impermeable cover, or
 - On other parts of the body, a dry, durable, tight-fitting bandage
 - For any employee serving a highly susceptible population that was restricted due to Big Five exposure, contact the regulatory authority for assistance with reinstatement.
- Assure that the following procedures are met:
 - Require all employees to review this procedure.
 - Monitor employees for visible or obvious symptoms.
 - Assure that all employees notify the PIC when required.
 - Assure that all food employees comply with exclusions or restrictions.
 - Maintain documents and record of exclusions and restrictions.
 - Contact the regulatory authority when required and if there are any questions.

How will employees be made aware of their responsibility to report listed symptoms and illnesses within this procedure (e.g. signed forms, posters, etc.) and what records will be kept?

Will records be kept for food employees who have been restricted or excluded from work due to symptoms or illness within this procedure and where will these records be kept?

Who will monitor to assure employees are made of aware of their responsibility to report items pertaining to their health as outlined in this procedure and that records are maintained?

Position Title(s): _____

What corrective action will be taken if food employees are not reporting items pertaining to their health and who will be responsible for this corrective action?

****FOOD FROM APPROVED SOURCES**

Applicable Food Code Sections: 3-201.11-17, 3-202.11-110

Approved food sources:

- Food must be obtained from sources that comply with law.
- Wild mushrooms must be inspected.
- Uninspected wild game or wild caught fish are not allowed.
- Home prepared, home canned, or cottage foods are not permitted.
- Food must be received at appropriate temperatures, in good condition and protected from adulteration or contamination.

List your food supplier(s) and what items you will be receiving from that supplier (e.g. meat, eggs, fish, dairy, produce, baked goods, dry goods, beverages, etc.).

Describe your procedure for receiving and inspecting delivered food (e.g. condition of packaging, temperature, etc.) and criteria for rejecting food items.

Describe what will be done with food that is not from an approved source or food that is delivered from an approved source but found to be in unacceptable condition (e.g. damaged product, temperature abused, etc.).

Who will be responsible for receiving and inspecting food deliveries?

Position Title(s): _____

Who will be responsible for ensuring employees are following the described receiving procedures?

Position Title(s): _____

What corrective action will be taken if these receiving procedures are not followed and who will be responsible for this corrective action?

****CLEANING AND SANITIZING FOOD CONTACT SURFACES (i.e. WAREWASHING)**

Applicable Food Code Sections: 4-501.14-116; 4-601.11; 4-602.11-13; 4-603.11-16; 4-702.11; 4-703.11; 4-901.11; 4-904.14

Cleaning and sanitizing food contact surfaces:

- Cleaning is the removal of food, soil, and other types of debris from a surface. Detergents are cleaning agents that remove grease or fat associated with food residues.
- Sanitizing is the step that can only occur after a surface has already been cleaned. It is the application of hot water or chemicals to reduce the number of disease causing microorganisms on a food contact surface. Common chemicals used to sanitize include but are not limited to:
 1. Chlorine
 2. Quaternary ammonium (Quat)
 3. Iodine
 4. Acids
- When using a chemical sanitizer, an appropriate method (e.g. test strips) must be utilized for measuring/testing the concentration of the chemical sanitizer during warewashing.
- Food contact surfaces are required to be properly cleaned and sanitized at an appropriate frequency as outlined within the FDA Food Code.
- The person in charge is responsible for knowing the correct method for cleaning and sanitizing and is also responsible for ensuring employees follow proper cleaning and sanitizing steps.
- The following steps are to be utilized for manual warewashing at a three-compartment sink:
 1. Scrape food from dishes into the disposal or garbage
 2. Wash dishes and utensils in hot soapy water
 3. Rinse in clean water
 4. Sanitize by immersing in an approved chemical sanitizing solution
 5. Air dry
- A mechanical dishmachine can be used for warewashing steps for food contact surfaces. Dishmachines can sanitize by either of the following two methods:
 1. Application of approved chemical sanitizer
 2. Application of high temperature water
- In-place cleaning is the warewashing of food contact surfaces of large equipment or utensils that cannot be placed into a three-compartment sink or dishmachine (e.g. meat slicers, food preparation tables, floor mixers). Steps that can be utilized for in-place cleaning:
 1. Disassemble equipment, if applicable
 2. Remove large debris
 3. Apply cleaning agent
 4. Rinse with clean water
 5. Apply approved chemical sanitizing solution
 6. Air dry
- Clean in place (CIP) is a process where food contact surfaces of equipment are cleaned and sanitized by the circulation or flowing of a detergent solution, water rinse, and sanitizing solution onto or over equipment surfaces by mechanical means through a piping system (e.g. brewery equipment, frozen dessert machines).

What methods will be used for cleaning and sanitizing (warewashing) of food contact surfaces? Mark all that apply:

- Three compartment sink
- Chemical sanitizing dishmachine
- High temperature sanitizing dishmachine
- In-place cleaning of large equipment/utensils
- Clean in place (CIP)

If applicable, describe what items (or group of items) will be cleaned and sanitized in the **three-compartment sink** and the procedure for this type of warewashing. Include frequency, type of chemical sanitizer to be used, and how and when the concentration of this sanitizer will be tested.

If applicable, describe what items (or group of items) will be cleaned and sanitized in a **dishmachine** and the procedure for this type of warewashing. Include frequency, method of sanitization (if chemical, indicate type of sanitizer), and how and when sanitization will be tested.

If applicable, describe what equipment will need to utilize **in-place cleaning** and the procedure for this type of warewashing. Include frequency, type of chemical sanitizer to be used, and how and when the concentration of this sanitizer will be tested.

If applicable, describe what equipment will need to utilize a **clean in place (CIP)** process and the procedure for this type of warewashing. Include frequency, type of chemical sanitizer to be used, and how and when the concentration of this sanitizer will be tested.

Who will be responsible for ensuring employees are following proper warewashing procedures?

Position Title(s): _____

What corrective action will be taken if warewashing is not properly conducted and who will be responsible for this corrective action?

****PROTECTING FOOD FROM CONTAMINATION**

Applicable Food Code Sections: 2-301.14, 3-301.12, 3-302.11, 3-302.15, 3-304.12, 3-304.14, 3-304.15, 3-305.11, 3-305.12, 3-305.14, 3-306.11, 3-306.12, 3-306.13, 4-601.11, 4-602.11

Protecting food from contamination

- Food must be stored and prepared to prevent contamination. Methods for preventing contamination include but are not limited to:
 - Washing hands at appropriate times.
 - Storing raw animal foods away from ready-to-eat food, cooked food and produce.
 - Separating raw beef, fish, lamb, pork and poultry from each other unless intentionally mixing during preparation.
 - Storing raw, unwashed produce away from washed produce and other ready-to-eat foods.
 - Using separate utensils and preparation surfaces for preparing raw foods and ready-to-eat foods.
 - Appropriately storing in-use utensils and cleaning them at required frequency.
 - Keeping cutting boards, slicers, utensils and other food contact surfaces of equipment cleaned and sanitized.
 - Rinsing all whole produce thoroughly before preparation and or service.
 - Not using a utensil more than once to taste food that is to be sold or served.
 - Cleaning hermetically sealed containers of food of visible soil before opening.
 - Storing wet wiping cloths in containers of proper EPA registered sanitizer solutions at concentrations that meet the manufacturer's label instructions.
 - Using single-use gloves for only one task and discarding when damaged or soiled, or when interruptions occur in the operation.
 - Storing the food in packages, covered containers, or wrappings.
 - Storing food:
 - In a clean, dry location;
 - Where it is not exposed to splash, dust, or other contamination; and
 - At least 6 inches above the floor.
 - Providing food shields, covers, or other effective means of protection for food on display or provided for self-service.

How will cold food be stored to prevent contamination (e.g. raw animal foods, ready to eat foods, and produce in both walk in and reach in refrigeration)?

How will dry goods be stored to prevent contamination?

How will food on display or offered for self-service (e.g. buffet) be protected from contamination?

How and where will in-use utensils be stored during pauses in preparation or dispensing? Include frequency of warewashing for these items and storage surfaces.

How will contamination be prevented when utensils (e.g. cutting boards, knives, etc.) and food contact surfaces of equipment (e.g. preparation tables) are used to prepare both raw animal foods and ready-to-eat foods?

How will contamination of clean tableware and utensils, including those utensils used for self-service food operation (e.g. buffet) be prevented?

How will wet wiping cloths be stored? Include the type of sanitizer to be used.

Who will be responsible for ensuring employees are following proper procedures to prevent contamination?

Position Title(s): _____

What corrective action will be taken if contamination of food, utensils, or food contact surfaces of equipment are found and who will be responsible for this corrective action?

DATE MARKING READY-TO-EAT, TIME/TEMPERATURE CONTROL FOR SAFETY FOOD

Applicable Food Code Sections: 3-501.17; 3-501.18

Date marking ready-to-eat, TCS food:

- *Listeria monocytogenes* grows slowly under refrigeration in ready-to-eat, TCS foods. Date marking is necessary to prevent foodborne illness caused by *Listeria monocytogenes*.
- Foods required to be date marked are:
 - Time/temperature controlled for safety (TCS);
 - Ready-to-eat; and
 - Held under refrigeration for more than 24 hours before sale or service.
- These foods items are to be date marked at the time of preparation or if received commercially prepared, when the package is opened. The pre-printed manufacturer's date on commercially prepared products is not a date mark.
- The date mark shall indicate a time period not to exceed 7 days from day of preparation or opening of commercial packaging. The day of preparation or opening of the commercial packaging is considered day 1.
- Some ready-to-eat TCS foods are exempt from dating marking. These food items are listed under Food Code section 3-501.17 (F).

List all ready-to-eat TCS foods (or groups of food) that you will be date marking and the length of time you will be holding these foods.

Describe the type of date marking system to be used (e.g. calendar dates, days of the week, color coded marks, etc.) and whether this date marking system is indicating the date of preparation, date of discard, or both.

Who will be responsible for ensuring employees are following proper date marking procedures?

Position Title(s): _____

What corrective action will be taken if foods are found not properly date marked, unmarked, or past the last date of use and who will be responsible for this corrective action?

TIME AS A PUBLIC HEALTH CONTROL

Applicable Food Code Sections: 3-501.19

Time as a public health control:

- Time only, rather than time in conjunction with temperature, can be used as a public health control for bacterial growth for TCS foods before cooking or for ready-to-eat TCS foods that are displayed or held for service for immediate consumption.
- When using time only as a control, a **written procedure (e.g. printed, electronic, etc.) must be prepared ahead of time, present at the food establishment, and made available to the regulatory authority upon request.**
- Once a TCS food is placed on time control, it cannot be returned to hot or cold holding to extend the hold time.
- 4-hour maximum time period:
 - Food shall have an initial temperature of 41°F (or less) or 135°F (or more) when removed from temperature control;
 - Food shall be marked or otherwise identified to indicate the time that is 4 hours past the point in time when the food was removed from temperature control;
 - The food must be cooked and served, served if ready-to-eat, or discarded within the 4 hours from the point in time when the food was removed from temperature control; and
 - Food in unmarked containers/packages or marked to exceed a 4-hour limit shall be discarded.
- 6-hour maximum time period:
 - Food shall have an initial temperature of 41°F (or less) when removed from temperature control and the food may not exceed 70°F within the maximum time period of 6 hours when held out of temperature control;
 - The food shall be monitored to ensure the warmest portion of the food does not exceed 70°F during the 6-hour period;
 - The food shall be marked or otherwise identified to indicate:
 - The time when the food is removed from 41°F (or less); and
 - The time that is 6 hours past the point in time when the food is removed from cold holding temperature control;
 - The food must be:
 - Discarded if the temperature exceeds 70°F; or
 - Cooked and served, served if ready-to-eat, or discarded within a maximum of 6 hours from the point in time it was removed from 41°F (or less) cold holding temperature control;
 - Food in unmarked containers/packages or marked to exceed a 6-hour limit shall be discarded.
- Time as a control is not permitted for raw eggs in a food establishment that serves a highly susceptible population.

List all TCS foods that you intend to hold between 41°F and 135°F, using time only as a control (no temperature control).

Mark which time only control method you will be utilizing.

- 4-hour maximum time period
- 6-hour maximum time period

Describe your procedure for the time period you marked; including how you will mark or identify the foods listed; monitoring of temperature (if applicable); and what will be done with food that has reached its time limit, is not marked, or remains past the allowed timeframe.

Lined area for describing the procedure, including marking methods, temperature monitoring, and handling of expired food.

Who will be responsible for ensuring employees are following proper time as a control procedure?

Position Title(s): _____

What corrective action will be taken if this procedure for time as a control is not followed and who will be responsible for this corrective action?

Lined area for describing corrective actions and responsible personnel.

THAWING TIME/TEMPERATURE CONTROL FOR SAFETY FOOD

Applicable Food Code Sections: 3-501.12; 3-501.13

Thawing TCS Food:

TCS food needs to be thawed using one of the following methods:

- Under refrigeration that maintains the food temperature at 41°F or less;
- Completely submerged under running water:
 - At a water temperature of 70°F or below;
 - With sufficient water velocity to agitate and float off loose particles into an overflow; and
 - For a period of time that does not allow thawed portions of ready-to-eat food to rise above 41°F, or
 - For a period of time that does not allow thawed portions of a raw animal food requiring cooking to be above 41°F, for more than 4 hours; or
- As part of a cooking process if the food that is frozen is:
 - Immediately cooked; or
 - Thawed in a microwave oven and immediately transferred to conventional cooking equipment, with no interruption in the process.

List what foods (or groups of food) you will be thawing using the following methods:

- Thawed in a refrigerator at 41°F or below.

- Submerged under running water at 70°F, or below, with sufficient flow to remove food particles. Describe which sink will be used for thawing.

- In a microwave only if the food is immediately placed in conventional cooking equipment as part of the continuous cooking process.

- Placed in conventional cooking equipment while in a frozen state.

Who will be responsible for ensuring employees are following proper thawing procedures?

Position Title(s): _____

What corrective action will be taken if TCS food is not properly thawed and who will be responsible for this corrective action?

COOKING TIME/TEMPERATURE CONTROL FOR SAFETY FOOD

Applicable Food Code Sections: 3-401.11-14, 3-603.11 and Food Law Section 6149

Cooking TCS Foods:

The following reference chart corresponds to the minimum internal cooking temperature for the listed food items.

Cooking Temperature	Food Items
165°F	Poultry; baluts; stuffed fish, meat, pasta, poultry, or ratites; stuffing containing fish, meat, poultry, or ratites; and raw animal foods cooked in a microwave.
155°F	Ratites; mechanically tenderized or injected meats; comminuted fish, meat or commercially raised game animals; and raw eggs except those that are broken and prepared in response to a consumer's order for immediate service (see below).
145°F	Raw eggs that are broken and prepared in response to a consumer's order and that will be served immediately; fish; and meat (including commercially raised game animals).
135°F	Fruits and vegetables that are <u>cooked for hot holding</u> .
Time and temperature as specified under Food Code 3-401.11(B)	Whole meat roasts including beef, corned beef, lamb, pork, and cured pork roasts.

*Except for whole meat roasts, the listed foods should be maintained at these listed temperatures for at least 15 seconds.

On the following lines list all foods (or groups of food) that will be cooked in this facility to these minimum internal temperatures.

165°F: _____

155°F: _____

145°F: _____

135°F: _____

If applicable, describe the cooking temperatures and times you intend to use for whole meat roasts along with the type of equipment to be used.

If applicable, list any raw animal products you will be serving raw or undercooked. Describe how you will notify consumers of the risk of eating raw or undercooked animal products.

Describe how and when cooking temperatures and times will be monitored including the type of food thermometer used.

Who will be responsible for ensuring employees are following proper cooking procedures?

Position Title(s): _____

What corrective action will be taken if food is not properly cooked and who will be responsible for this corrective action?

COOLING TIME/TEMPERATURE CONTROL FOR SAFETY FOOD

Applicable Food Code Sections: 3-501.14, 3-501.15

Cooling TCS Food:

- Cooked TCS foods shall be cooled within 2 hours from 135°F to 70°F; and within a total of 6 hours from 135°F to 41°F or less.
- TCS food prepared from ambient temperature or pre-chilled ingredients shall be cooled within 4 hours to 41°F or less.
- Rapid cooling methods shall be utilized to ensure cooling TCS foods meet required cooling times and temperatures. Utilizing multiple methods as listed below is highly recommended. Appropriate cooling methods include but are not limited to:
 - Placing food in shallow pans;
 - Covering food loosely or leaving it uncovered to help cool faster when placed in cold holding equipment;
 - Separating food into smaller or thinner portions;
 - Using rapid cooling equipment (e.g. ice paddle, blast chiller);
 - Stirring the food in a container placed in an ice water bath;
 - Adding ice as an ingredient;
 - Using containers that facilitate heat transfer (e.g. metal containers instead of plastic); or
 - Other effective methods.

List the TCS foods (or groups of food) you will be rapidly cooling from a hot temperature and the cooling method you will use for each listed item.

List the TCS foods (or groups of food) you will be rapidly cooling from ambient (room temperature) air temperature or pre-chilled ingredients and the cooling method you will use for each listed item.

Describe how and when cooling temperatures and times will be monitored including the type of food thermometer used.

Who will be responsible for ensuring employees are following proper cooling procedures?

Position Title(s): _____

What corrective action will be taken if food is not properly cooled and who will be responsible for this corrective action?

REHEATING FOR HOT HOLDING TIME/TEMPERATURE CONTROL FOR SAFETY FOODS

Applicable Food code Sections: 3-403.11

Reheating TCS foods for hot holding:

- TCS food that is cooked, cooled, and reheated for hot holding shall be reheated so that all parts of the food reach a temperature of at least 165°F for 15 seconds.
- TCS ready-to-eat food taken from commercial packaging and reheated for hot holding shall be heated to an internal temperature of at least 135°F.
- All reheating for hot holding shall be done rapidly. The time TCS food is between 41°F and the required final reheating temperature may not exceed 2 hours.
- When reheating TCS foods in a microwave oven for hot holding, the food must meet the temperature requirements as listed above. However, the food must be **rotated or stirred, covered, and allowed to stand covered for 2 minutes after reheating.**

List all foods (or groups of food) that will be reheated to the below listed temperatures for hot holding.

Reheat to 165°F for hot holding:

Reheat to 135°F for hot holding:

List what equipment will be utilized to reheat food for hot holding.

Describe how and when reheating temperatures and times will be monitored including the type of food thermometer used.

Who will be responsible for ensuring employees are following proper reheating for hot holding procedure?

Position Title(s): _____

What corrective action will be taken if food is not properly reheated for hot holding and who will be responsible for this corrective action?

HOT HOLDING TIME/TEMPERATURE CONTROL FOR SAFETY FOODS

Applicable Food Code Sections: 3-501.16

Hot Holding TCS Food:

- TCS food that is being hot held must be at 135°F or more.
- Stir food often to maintain equal heat distribution in the food.
- Keep food covered.

List all TCS foods (or groups of food) that will be held hot.

List all equipment that will be used for hot holding TCS foods.

Describe how and when hot holding temperatures will be monitored including the type of food thermometer used.

Who will be responsible for ensuring employees are following proper hot holding procedures?

Position Title(s): _____

What corrective action will be taken if food is not properly hot held and who will be responsible for this corrective action?

COLD HOLDING TIME/TEMPERATURE CONTROL FOR SAFETY FOODS

Applicable Food Code Sections: 3-501.16

Cold Holding TCS Food:

- TCS food that is being cold held must be at 41°F or less.
- Foods that are stored frozen must be maintained frozen.
- Keep food covered.

List all TCS foods (or groups of food) that will be held cold and/or frozen.

List all equipment that will be used for holding TCS foods cold and/or frozen.

Will ice only be used to cold hold TCS Foods?

YES NO

If YES, describe what TCS food will be held on ice, where and how long it will be held, and the source of the ice.

Describe how and when cold holding temperatures will be monitored including the type of food thermometer used.

Who will be responsible for ensuring employees are following proper cold holding procedures?

Position Title(s): _____

What corrective action will be taken if food is not properly cold held and who will be responsible for this corrective action?

CATERING/OFF-SITE/SATELLITE FOOD SERVICE

Applicable Food Code Sections: 3-305.14; 3-306.11-14; 3-307.11; 3-401.11; 3-501.16; 3-501.19; parts 4-1 & 4-2

Catering/Off-Site/Satellite Food Service:

- Catering/off-site/satellite food service is the serving of food by your employees that occurs off the premises of your licensed food establishment. This does not pertain to the delivery of pre-ordered food to a customer (e.g. delivering a pizza).
- Foods that are transported off-site and then served must follow the same safe food handling requirements that apply to food in your licensed food establishment.
- TCS foods must be held at either proper cold holding (41°F or less) or hot holding (135°F or more) temperatures during transportation and service.
- Equipment used to transport and serve food off-site must meet construction and design requirements of the Food Code parts 4-1 and 4-2.
- Food must be protected from contamination during transportation and at the off-site location.
- **Preparation of food by your employees off-site may require additional food licensure. Contact the local regulatory authority regarding possible additional licensure for off-site food preparation.**

List the foods (or groups of food) that will be served off-site from your establishment.

What type of vehicle will be used to transport food?

Describe how hot TCS food will be monitored and held at proper temperature during transportation and at the off-site location.

Describe how cold TCS food will be monitored and held at proper temperature during transportation and at the off-site location.

Describe how food will be protected at off-site location (e.g. food shields, covered, food protection devices, etc.)

Who will be responsible for ensuring employees are following proper off-site food service procedures?

Position Title(s): _____

What corrective actions will be taken if food is not properly handled as described above during off-site service and who will be responsible for these corrective actions?

OUTDOOR EXPOSED DINING/FOOD PREPARATION

Applicable Food Code Sections: 2-301.14; 3-305.14; 3-306.11-12; 5-204.11; 4-601.11; 4-602.11-13; 6-202.16; 6-501.111

Outdoor Exposed Dining/Food Preparation:

- A dining area may be exposed to the outdoors by being built outdoors or by being in an enclosed room that has walls, windows, or doors that can be opened exposing the dining area to the outdoor environment. The following items need to be taken into consideration:
 - Protection of the interior kitchen from the outdoor exposed dining area (e.g. solid self-closing interior doors, air curtains, screens).
 - Protection of food (e.g. condiments, bar garnishes, ice, etc.) held or prepared in the outdoor exposed dining area.
 - Protection of utensils and food equipment (e.g. beverage stations) in the outdoor exposed dining area.
- If outdoor food preparation (e.g. grilling) will be conducted, the following items need to be taken into consideration:
 - Protection of the food from outdoor contamination.
 - Proper temperature control of TCS foods.
 - Proper employee handwashing.
 - Protection and cleaning of outdoor utensils and equipment food contact surfaces.
 - Equipment (portable or permanently fixed).
 - Transportation of food between the interior kitchen and the outdoor food preparation area.
 - Prevention of unauthorized access to the outdoor food preparation area.
 - Location of outdoor food preparation area to lessen potential contamination.
 - Appropriate outdoor flooring, walls, overhead protection, and lighting with shielding.
 - Appropriate fuel source for cooking equipment (e.g. propane, charcoal, untreated wood, etc.)
 - Disposal of refuse and waste ash (e.g. charcoal).
- The facility overall must be protected from pest infestation due to increased pest access from outdoor exposed dining/food preparation.

Mark all that apply: Outdoor exposed dining area will be present Food will be prepared outdoors N/A

For **outdoor exposed dining area**, please describe the following:

Protection of the interior kitchen.

What types of foods will be held in this area and how they will be protected from contamination?

Transportation of food between the outdoor preparation area and the interior of the kitchen (e.g. food transported in covered containers or packaging).

Methods for employee handwashing.

Protection and cleaning of outdoor utensils and equipment food contact surfaces.

Describe what fuel source (e.g. wood, propane, charcoal, etc.) will be used for outdoor cooking equipment.

Describe collection of refuse and waste ash.

Describe what measures will be taken to protect the outdoor cooking or preparation area from pest infestation. This would include how cooking fuel (e.g. wood) would be stored to prevent pest attraction.

Who will be responsible for ensuring employees are following proper outdoor food service/preparation procedures?

Position Title(s): _____

What corrective action will be taken if these procedures are not being followed and who will be responsible for this corrective action?

The following blank sample SOP is being provided for additional SOPs that you may need to write for your operation.

Name/Topic of SOP: _____

Describe the procedure that your employees are to follow for the listed SOP name/topic.

Who will be responsible for ensuring these procedures are being followed?

Position Title(s): _____

What corrective action will be taken if these procedures are not being followed and who will be responsible for this corrective action?

