



*DELAWARE HEALTH AND
SOCIAL SERVICES*
Division of Public Health
Office of Food Protection

PLAN REVIEW AND APPROVAL FOR FOOD ESTABLISHMENTS

PLUMBING REQUIREMENTS FOR FOOD ESTABLISHMENT PREMISES



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PLAN REVIEW AND APPROVAL
FOR
FOOD ESTABLISHMENTS

PLUMBING REQUIREMENTS
IN
FOOD ESTABLISHMENT PREMISES

1. **GENERAL** All plumbing shall be installed by a licensed plumber under a valid, current plumbing permit in accordance with the "State of Delaware Regulations Governing a Detailed Plumbing Code."
2. **WATER SUPPLY AND SEWAGE DISPOSAL** Facilities served by a public water supply and sewage systems do not require further evaluation. Private wells must comply with chemical and bacteriological standards; a satisfactory analysis is required before an operating permit may be issued. Individual sewage disposal systems require the approval of the Department of Natural Resources and Environmental Control prior to operating the food establishment.
3. **BACKFLOW PREVENTION**
 - (A) **Air gap, supply:** An air gap between the water supply and the flood rim level of the plumbing fixture, equipment, or nonfood equipment shall be at least twice the diameter of the water supply inlet and may not be less than 1 inch (DE Food Code, §5.202.13).
 - (B) **Air gap, drainage:** No direct connection may exist between the sewage system and any drain originating from equipment in which food is placed (DE Food Code, §5-402.11). Equipment and fixtures utilized for the storage, preparation and handling of food shall discharge through an indirect waste pipe by means of an air gap (IPC2003, §802.1.1).
 - (C) **Floor drains:** Floor drains located within walk-in refrigerators or freezers in food establishments shall be indirectly connected to the sanitary drainage system by means of an air gap (IPC2003, §802.1.2).
 - (D) **Backflow prevention device:** A backflow or backsiphonage prevention device shall meet American Society of Sanitary Engineering (ASSE) standards for construction, installation, maintenance, inspection, and testing for that specific application and type of device (DE Food Code, §5-202.14).
 - (E) **Plumbing fixtures:** The supply lines or fittings for every plumbing fixture shall be installed so as to prevent backflow (IPC2003, §608.2).
 - (F) **Devices, appliances:** All devices that connect to the water supply shall be provided with protection against backflow (IPC2003, §608.3). This includes devices used for food preparation and processing, steamers, the storage of ice or food, warewashing machines, and other food service equipment.
 - (G) **Hose Connections:** Sillcocks, hose bibbs, wall hydrants and other openings with a hose connection shall be protected by an atmospheric-type or pressure-type vacuum breaker or a permanently attached hose connection vacuum breaker. Exceptions: Water heater drain valve, clothes washing machine (IPC2003, §608.15.4.2).
 - (H) **Beverage Dispensers:** The water supply connection to carbonated beverage dispensers shall be protected against backflow by a backflow preventer conforming to ASSE 1022 or by an air gap. The backflow preventer device and the piping downstream therefrom shall not be affected by carbon dioxide gas (IPC2003, §608.16.1).
4. **UTILITY SERVICE INSTALLATION**
 - (A) Utility lines including gas, plumbing and electrical shall be installed inside walls, above ceilings or below floors whenever structurally practical, and in accordance with applicable code requirements.
 - (B) If lines are run in front of walls, lines shall be installed with stand-off brackets or other secure mounting method, such that a minimum clearance of one inch (1") exists between line and wall. Exposed horizontal utility service, including water supply and drain lines, may not be installed on the floor.

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5. **JOINT SEALING** Joints formed by fixtures in contact with walls or floors shall be sealed with an approved sealant. Where installation does not allow access for cleaning, fixtures shall be sealed to walls or adjoining equipment. Where not structurally practical, a minimum gap of one inch (1") shall exist between the fixture and walls or adjoining equipment.

6. **TOILET FACILITIES**

- (A) At least 1 toilet and not fewer than the toilets required by law shall be provided. If authorized by law and urinals are substituted for toilets, the substitution shall be done as specified in law (DE Food Code, §5-203.12).
- (B) A handwashing facility shall be located in, or immediately adjacent to, toilet rooms (DE Food Code, §5-204.11).
- (C) A toilet room shall be completely enclosed and provided with a tight-fitting and self-closing door (DE Food Code, §6-202.14).
- (D) Toilet rooms shall be conveniently located and accessible to employees during all hours of operation (DE Food Code, §6-402-11).

State of Delaware Regulations Governing a Detailed Plumbing Code adopts International Plumbing Code 2003 (IPC2003).
Applicable excerpts are listed below.

- (E) IPC2003 Table 403.1 Minimum Number of Plumbing Facilities
The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the building code.

<u>Occupancy: Assembly, Restaurants</u>	
Water Closets:	Male: 1 per 75
	Female: 1 per 75
Lavatories:	1 per 200
Drinking Fountains:	1 per 500
Others:	1 service sink

- (F) IPC2003, §403.5 Location of Employee Toilet Facilities In Mercantile And Assembly Occupancies
Employees shall be provided with toilet facilities in building and tenant spaces utilized as restaurants. The employees' facilities shall be either separate facilities or combined employee and public customer facilities. The required toilet facilities shall be located not more than one story above or below the employee's regular work area and the path of travel to such facilities, in other than covered malls, shall not exceed a distance of 500 feet. The path of travel to required facilities in covered malls shall not exceed a distance of 300 feet.

Exception: Employee toilet facilities shall not be required in tenant spaces where the travel distance from the main entrance of the tenant space to a central toilet area does not exceed 300 feet and such central toilet facilities are located not more than one story above or below the tenant space.

- (G) IPC2003, §403.6 Public Facilities
Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization. Public toilet facilities shall be located not more than one story above or below the space required to be provided with public toilet facilities and the path of travel to such facilities shall not exceed a distance of 500 feet.

Exception: Public toilet facilities are not required within a food establishment where customers do not enter the structure or tenant space to order, pay for, and receive their food; and where food is not consumed within the facility. Examples include kiosks and other structures that are provided with a service window.

- (H) IPC2003, §403.2 Separate Facilities
Where plumbing fixtures are required, separate facilities shall be provided for each sex.
Exceptions: Separate facilities (*for each sex*) shall not be required in occupancies in which 15 or less people are employed. Separate facilities (*for each sex*) shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or less.
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7. **SINKS** All sinks shall be supplied with hot and cold running water under pressure.

Splashguard Dividers Where less than 18 inches lateral separation exists between sinks and adjacent fixtures, food contact surfaces or open storage shelving, a splashguard divider constructed of a material which is durable, easily cleanable, non-toxic and impervious to moisture shall be installed; such divider may be wall-attached or fixture-attached, and shall extend outward to the leading edge of the sink and extend vertically a minimum of 18 inches above the level plane of the sink bowl.

- (A) **Handwashing sinks** These fixtures, when located in food preparation, food dispensing, beverage dispensing (including bar service area), food storage and warewashing areas, must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, UL for Sanitation, BISSC, or equivalent.

(1) A separate, single-compartment handwashing sink is **REQUIRED** in food preparation, food dispensing, and warewashing areas; and in, or immediately adjacent to, toilet rooms. Handsinks shall be installed within 25 travel feet within a direct line access of each primary work location. Hand soap, paper towels and a trash receptacle must be kept at these sinks.

(2) A minimum hot water temperature of 100°F, delivered through a mixing valve or combination faucet, is **REQUIRED**.

(3) If installed, self-closing, slow-closing, or metering faucets shall provide a flow of water for at least 15 seconds without the need to reactivate the faucet.

(4) A handwashing sink may not be used for any other purpose.

(5) An indirect drainline connection is not required. Connection to a grease trap is not required.

- (B) **Food preparation sink(s)** Any sink in which food is washed or thawed under running water as part of the food preparation process must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, UL for Sanitation, BISSC, or equivalent.

(1) A food preparation sink may not be used for disposal of mop water or liquid wastes.

(2) An indirect drainline connection through an air-gap is **REQUIRED**.

(3) Connection to properly sized grease trap is **REQUIRED**.

(4) If a food preparation sink has two or more compartments, a separate wasteline connection from each sink compartment through an air gap into a floor sink is **REQUIRED**.

- (C) **Warewashing sink** This fixture must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, UL for Sanitation, BISSC, or equivalent.

(1) A sink of at least three separate compartments with coved corners and integral drainboards at each end shall be provided for manually washing, rinsing and sanitizing equipment and utensils. Each sink compartment shall be large enough to accommodate the immersion of the largest equipment item or utensil. **A chemical test kit that matches the type of sanitizing agent in use is required in the warewashing area.**

(2) A warewashing sink may not be used for handwashing or disposal of liquid wastes.

(3) Connection to a properly sized grease trap is **REQUIRED**.

(4) An indirect drainline connection is not required, unless this fixture is used for food preparation. (See paragraph (3)(e) below for alternative use provision.)

(5) Alternative use provision for warewashing sink: If the warewashing sink will be used for washing or thawing food, a separate wasteline connection from each sink compartment through an air-gap into a floor sink is **REQUIRED**.

The installation of a properly sized grease trap downstream of the floor sink is **REQUIRED**. Alternative use of a warewashing sink for food preparation requires prior approval from the Division of Public Health.

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- (D) **Service Sink** (for use as janitorial sink, utility sink or mop sink)
- (1) Wherever practical, install this fixture outside of the food preparation, food dispensing, food storage and warewashing areas.
 - (2) This fixture, when located in food preparation, food dispensing, food storage and warewashing areas, must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, UL for Sanitation, BISSC, or equivalent.
 - (3) A minimum of one service sink or receptor is REQUIRED on each floor level of food operations. This fixture may be a sink or a curbed receptor.
 - (4) The dual use of a utility sink as a handwashing sink is not approved in new construction, conversion of a structure to a food establishment, nor remodeling of an existing facility.
 - (5) An indirect drainline connection is not required.
 - (6) Connection to a grease trap not required.
- (E) **Prewash Sink** This fixture must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, UL for Sanitation, BISSC, or equivalent.
- (1) An indirect drainline connection is not required.
 - (2) Connection to a properly sized grease trap is REQUIRED.
 - (3) If a food waste grinder is installed on this fixture, the grease trap must be designed and rated for such application, or a solids interceptor is required upstream of the grease trap.

8. MECHANICAL WAREWASHER This equipment item must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, UL for Sanitation, or equivalent.

- (A) A warewashing machine, using hot water or a chemical rinse to sanitize, may be installed. Large cookware which does not fit into the machine must be sanitized in a three compartment sink. Facilities without a three compartment sink whose warewashers are found functioning improperly may be directed to temporarily close until the machine is repaired. **If a chemical sanitizing agent is used, a test kit that matches the chemical sanitizing agent is required.**
- (B) Connection to a grease trap is NOT APPROVED due to high temperature, pressure and detergents.
- (C) An indirect drainline connection through an air-gap is REQUIRED. (See paragraph H.(4) below for alternative installation provision.)
- (D) Alternative installation provision for mechanical warewasher:
If approved by the Division of Public Health, a direct drainline connection may be installed if the machine wastewater outlet is located within five feet of a properly trapped vented floor drain and the machine outlet is connected to the inlet side of the same properly vented floor drain trap.

9. GREASE TRAP The grease trap must be sized in accordance with PDI standard G101.

- (A) Connection to a properly sized grease trap is REQUIRED for all fixtures that discharge grease-laden waste, e.g. warewashing sinks, food prep sinks, pre-wash sinks for warewashers, woks, and other cooking equipment.
- (B) Alternative use provision for warewashing sink:
If the warewashing sink will be used for washing or thawing food, a separate wasteline connection from each sink compartment through an air-gap into a floor sink is REQUIRED.

The installation of a properly sized grease trap downstream of the floor sink is REQUIRED.
Alternative use of a warewashing sink for food preparation requires prior approval from the Division of Public Health.

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PROCEDURE FOR SIZING A GREASE TRAP TO A SPECIFIC FIXTURE

1. Determine the liquid volume of the fixture in cubic inches (cu in) draining to the grease trap.
2. Determine the liquid capacity of the fixture in gallons (gal).
3. Determine the actual drainage load (75% of fixture capacity).
4. Determine the unit flow rate minimum for drainage period of 2 minutes.
Determine the unit liquid holding capacity minimum (40% of fixture capacity).
5. Select a unit corresponding to minimum unit flow rate and liquid holding capacity.

EXAMPLE OF SIZING FOR GREASE TRAP SELECTION

Select a grease trap for a three compartment warewashing sink with bowl dimensions of 18" W x 24" L x 12" D

1. Volume = (18in x 24in x 12in) x 3 cmpts = (5,184 cu in) x 3 = 15,552 cubic inches
2. Capacity = Volume (cu in) / 231 (cu in/gal) = 15,552 / 231 = 67.3 gallons
3. Drainage load = 67.3 gal x 0.75 = 50.4, or approx. 50 gallons
4. Unit flow rate minimum = 50 gallons / 2 minutes = 25 gallons per minute (gpm)
Unit liquid holding capacity minimum = 67.3 x 0.40 = 26.9 gallons
5. Select a grease trap with a minimum flow rate equal to or greater than **25 gpm**
The selected trap also must have a minimum liquid holding capacity of 26.9 gal.

NOTE: Refer to Page 6 of this booklet for examples of grease trap sizing for typical sink installations

10. WATER HEATER - Hot Water Supply

- (A) The water heater shall be sized to provide hot water as required to supply both the continuous requirements and the hourly peak demands of the facility. The continuous and hourly demands are based on the type of equipment and number of fixtures consuming hot water as required for food operations.
- (B) The total hot water availability in gallons per hour (gph) from a water heater is the sum of the unit storage capacity plus the recovery rate at a 100°F rise.
- (C) A fuel-fired (gas or oil) water heater in a food establishment shall have a minimum storage capacity of thirty (30) gallons; an electric water heater shall have a minimum storage capacity of forty (40) gallons. Storage capacities larger than the minimum shall be required based the type of equipment and number of fixtures consuming hot water.

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GREASE TRAP SIZING FOR TYPICAL SINK INSTALLATIONS

Bold column at far right applies PDI G101 formula to calculate minimum required grease trap flow rate in gallons per minute (gpm).

Width (in)	Length (in)	Depth (in)	Volume (cuin)	Volume (gal)	No of cmpts	Total vol (gal)	Working vol (75%)	Min Flow Rate (gpm)
W	L	D	W x L x D = Vc	Vc / 231 = Vg	#C	Vg x #C = Vtg	Vtg x 0.75 = Vw	Vw / 2min = MFR
16.0	19.0	10.5	3192	13.8	1	13.8	10	5
					2	27.6	21	10
					3	41.5	31	16
16.0	19.0	13.5	4104	17.8	1	17.8	13	7
					2	35.5	27	13
					3	53.3	40	20
16.0	20.0	14.0	4480	19.4	1	19.4	15	7
					2	38.8	29	15
					3	58.2	44	22
18.0	20.0	14.0	5040	21.8	1	21.8	16	8
					2	43.6	33	16
					3	65.5	49	25
18.0	24.0	12.0	5184	22.4	1	22.4	17	8
					2	44.9	34	17
					3	67.3	50	25
20.0	20.0	16.0	6400	27.7	1	27.7	21	10
					2	55.4	42	21
					3	83.1	62	31
22.0	24.0	16.0	8448	36.6	1	36.6	27	14
					2	73.1	55	27
					3	109.7	82	41
24.0	24.0	16.0	9216	39.9	1	39.9	30	15
					2	79.8	60	30
					3	119.7	90	45