



Cross-connection Control Guidance Summary of Water System Responsibilities

Introduction

The Cross-Connection Control (CCC) regulations, 16 Del. C. § 4462, State of Delaware, *Regulations Governing Public Drinking Water Systems*, § 21.0, took effect on February 1, 2021. All public water systems (PWS) are governed by the CCC regulations and must comply with the regulations by February 1, 2024.

Development of a Cross-Connection Control Program

Each PWS must develop a CCC program (21.2.1)* that includes the following:

- A **responsible individual** designated by the PWS. The individual must be appropriately trained and experienced in CCC (21.2.1).
- An **inventory** of all backflow prevention assemblies and backflow elimination methods (21.2.2).
- **Records of testing, repairs, and maintenance** of all backflow prevention assemblies (21.2.2). The results of testing, repairs, and maintenance of backflow prevention assemblies shall be retained by the PWS for no less than 10 years (21.4.1).
- **Records of public education.** A PWS may implement a public education program in lieu of assessments and installation of backflow prevention assemblies for those customers whose premises are deemed a low hazard (21.2.5). The public education program must include (21.2.5.1):
 - causes and dangers of backflow and cross-connections, including health effects;
 - information on how to identify actual and potential cross-connections;
 - preventive measures to reduce or eliminate cross-connection and backflow risks; and
 - information on reporting suspected cross-connections to the public water system.
- **Policies to complete an assessment** of each customer's premise for potential cross-connections. The policies must establish hazard criteria to classify customers' premises degree of hazard (high or low). In addition, the PWS must determine the adequacy of existing preventative measures (21.2.3).
- **Installation** of approved backflow prevention assemblies or elimination methods at premises having an auxiliary water system and premises deemed a high hazard (21.2.4). A PWS must prevent backflow into the distribution system (21.1.1) and may exercise judgement when determining the need for backflow prevention measures at each premise (21.2.4).
- **Approved** backflow corrections and devices must conform to the standards of the American Society of Sanitary Engineering, the American Water Works Association, and the American Society of Mechanical Engineers (21.3).
- Acceptable water pressure (not less than 25 pounds per square inch) must be maintained throughout the PWS to reduce backflow (21.1.3).
- The PWS may discontinue service to a consumer due to a cross-connection or a backflow incident until the correction of the deficiency (21.1.4).

*Numerical references in parenthesis refer to subsections within 16 Del. C. § 4462, State of Delaware, *Regulations Governing Public Drinking Water Systems*.

Cross-Connection Control Section 21

February 2021

Authority to disconnect for non-compliance of correcting cross-connection.

CCC Program is required. Must include designated, trained and experienced person, recordkeeping, hazard assessment policy/procedures.

Program shall include complete assessments of customer premises for potential hazards and classify premises of High or Low Hazard

Containment Required under these conditions:

Optional Public EDU for Low Hazard Services – Specific Education Components

Detailed Recordkeeping and retention for no less than 10 years

Non-Compliance and Penalty of not implementing CCC Program

21. Cross-Connection Control
21.1. Cross-connection control requirements and prohibitions.
 21.1.1. No public water system shall install or maintain a water service connection to any premises where actual or potential cross-connections to a public water system exist unless such actual or potential cross-connections are eliminated or controlled to the satisfaction of the owner of the public water system and the Division.
 21.1.2. No public water system shall install or maintain any connection whereby water from an auxiliary water system may enter a public water system unless the auxiliary water supply and the method of connection.
 21.1.3. In accordance with subsection 1.12.1.4., public water systems shall maintain acceptable water pressure throughout the distribution system so that the risk of backflow is reduced.
 21.1.4. If a cross-connection exists or backflow occurs at a consumer's water system, the public water system may discontinue service to the consumer and water service shall not be restored until the deficiencies have been corrected.
21.2. Cross-connection control programs.
 21.2.1. A public water system shall develop a plan for a comprehensive cross-connection control program for the elimination, prevention, and control of cross-connections appropriate to the number of service connections, size of the distribution system, and type of customers. The cross-connection control program shall include an individual designated by the public water system and appropriately trained and experienced in cross-connection control programs to be responsible for the program.
 21.2.2. A cross-connection control program shall include an inventory and records of testing, repairs, and maintenance of all backflow prevention assemblies, and backflow elimination methods.
 21.2.3. A cross-connection control program shall include appropriate policies to complete assessments of customer premises for potential cross-connections to establish hazard criteria to classify customer premises consistent with Table 1, and to determine the degree of hazard and adequacy of existing preventive measures.

Premise -Degree of Hazard	
High Hazard	Low Hazard
Air Gap	Air Gap
Reduced Pressure Principle Backflow Prevention Assembly	Reduced Pressure Principle Backflow Prevention Assembly
	Double Check Valve Assembly

 21.2.4. An approved backflow prevention assembly or backflow elimination method shall be installed at premises where the following conditions exist in a location intended to prevent backflow into the distribution system:
 21.2.4.1. Premises having auxiliary water system:
 21.2.4.2. Premises types that are deemed by the public water system or the Division to represent a health or high hazard to the public water system, to include but not be limited to:

<i>Agricultural facilities (e.g., farms, dairies)</i>	<i>Beverage bottling plants</i>	<i>Car washes</i>
<i>Chemical plants</i>	<i>Dry cleaners (on site processing)</i>	<i>Film processing plants</i>
<i>Food processing plants</i>	<i>Laboratories</i>	<i>Medical facilities</i>
<i>Mortuaries</i>	<i>Metal plating industries</i>	<i>Mortuaries</i>
<i>Petroleum processing/storage plants</i>	<i>Piers, marinas, docks and waterfront facilities</i>	
<i>Radioactive material processing plants</i>	<i>Wastewater treatment facilities</i>	

 21.2.4.3. Premises where having internal cross-connections that, in the judgment of the public water system, are not correctable or are impractical to determine if cross-connections exist due to intricate plumbing arrangements.
 21.2.4.4. Premises where because of security requirements or other prohibitions, it is impossible to complete a cross-connection control survey; or
 21.2.4.5. Premises having a history of cross-connections being established or reestablished.
 21.2.5. In lieu of assessments and installation of backflow prevention assemblies at customer premises deemed low hazard, a public water system may implement a public education program.
 21.2.5.1. The public education program shall include, at minimum:
 21.2.5.1.1. Causes and dangers of backflow and cross-connections, including health effects;
 21.2.5.1.2. Information on how to identify actual and potential cross-connections;
 21.2.5.1.3. Preventive measures to reduce or eliminate cross-connection and backflow risks; and
 21.2.5.1.4. Information on reporting suspected cross-connections to the
21.3. Corrections and protective devices.
 21.3.1. Backflow prevention assemblies shall conform to the standards of the American Society of Sanitary Engineering (ASSE), the American Water Works Association (AWWA), and the American Society of Mechanical Engineers (ASME)
21.4. Cross-connection control records and reporting.
 21.4.1. All backflow prevention assembly test records which document the test results of assemblies designed to protect the public water system shall be retained on file for a period of no less than 10 years.
 21.4.2. All cross-connection control survey records which document results from the monitoring of cross-connections shall be retained on file for a period of no less than 10 years.
21.5. Violations.
 21.5.1. The following items shall be deemed to be violations of these regulations:
 21.5.1.1. Failure to develop and implement a comprehensive cross-connection control program in accordance with Section 3.0 of this regulation within three years of the effective date of these regulations;
 21.5.1.2. Failure to implement the cross-connection control program as prescribed; and
 21.5.1.3. Failure to maintain all backflow prevention assembly test records on file for at least 10 years.
21.6. Penalty Clause.
 Any person who neglects or fails to comply with these regulations shall be subject to penalty as provided in 16 Del.C. §122(3)(c).

DEPARTMENT OF HEALTH AND SOCIAL SERVICES
DIVISION OF PUBLIC HEALTH
4400 Health Systems Protection

4455 Delaware Regulations Governing a Detailed Plumbing Code

1.0 State of Delaware Plumbing Code

The Delaware Division of Public Health shall hereby adopt the 2018 International Plumbing Code with following amendments. The code shall be known as the “2018 State of Delaware Plumbing Code”. Every political subdivision within the State, including county, city or municipal governments, shall enforce the International Plumbing Code (IPC) as adopted or modified by the Division of Public Health. Local jurisdictions may have additional water, wastewater and administrative requirements that are not part of this code. The 2018 IPC is available at ICCSAFE.ORG. The Delaware amendments are available at:

[http://regulations.delaware.gov/AdminCode/title16/Department%20of%20Health%20and%20Social%20Services/Division%20of%20Public%20Health/Health%20Systems%20Protection%20\(HSP\)/4455.shtml](http://regulations.delaware.gov/AdminCode/title16/Department%20of%20Health%20and%20Social%20Services/Division%20of%20Public%20Health/Health%20Systems%20Protection%20(HSP)/4455.shtml)

Plumbing program information and documents are available at:

<http://www.dhss.delaware.gov/dhss/dph/hsp/plumbing.html>

2.0 Adoption of International Plumbing Code

The State of Delaware Plumbing Code adopts, as if fully set forth herein, “The International Plumbing Code 2018” as amended herein:

- 2.1 Amend **Subsection 101.1** by inserting “The 2018 Delaware Plumbing Code” in NAME OF JURISDICTION.
- 2.2 Amend **Subsection 101.2** by deleting the subsection in its entirety and by inserting in lieu thereof the following: “The provisions of this Code shall apply to the erection, installation, alteration, repair, and relocation, and replacement, addition to, use or maintenance of plumbing systems within the State of Delaware.”
- 2.3 Amend **Subsection 102.2** by deleting the subsection in its entirety and by inserting in lieu thereof the following: “The legal use and occupancy of any structure existing on the effective date of this Code, or for which it had been heretofore approved, may be continued without change.
Exception: Upon change of permit holder in facilities and operations regulated by the Delaware Division of Public Health such systems shall comply with the requirements of this Code and applicable regulations promulgated and standards established by the Delaware Division of Public Health.”
- 2.4 Add new **Subsection 102.8.3** to read “ICC codes referenced in the Delaware Plumbing Code shall be enforced by jurisdictions adopting said codes.”
- 2.5 Amend **Subsection 106.1** by adding a new sentence at the end of the paragraph to read as follows: “The Division of Public Health shall issue plumbing permits and a \$100 fee shall be assessed for all plumbing permits issued by the Division of Public Health. Apartments and condominiums shall be charged \$100.00 per each individual unit. Local jurisdictions set their own fee schedule. A \$50.00 re-inspection fee is charged to any job requiring more than 3 inspections, which will be implemented six months after the effective date of this regulation. Commercial permit applications require an approval to construct document from the Division of Public Health prior to the issuance of plumbing permits.”
 - 2.5.1 Amend **Subsection 106.2** by adding thereto three new numbered paragraphs following numbered paragraph “2” to read as follows: “3. No permit or fee is required by the Division of Public Health for the replacement of an existing fixture, piece of equipment or related piping, including but not limited to hot water heaters and water conditioning systems. 4. The relocation of any plumbing fixture and related pipe requires a permit. 5. Any new fixture, piece of equipment, backflow prevention assembly or system that connects to the potable water supply shall require a permit and shall meet the provisions of this Code.”
 - 2.5.2 Amend **Subsection 106.5.3** by deleting this subsection in its entirety and replacing it with the following: “No permit shall be issued by the Division of Public Health for the same work on an active permit without cause unless the permit holder relinquishes said permit or the permit expires or there is no work on the permit for a period exceeding 6 months. An active permit issued by the Division of Public Health is valid for 1 year”.
 - 2.5.3 Amend **Subsection 106.6.3** by adding thereto a new numbered paragraph following paragraph “3” to read as follows: “4. The Division of Public Health does not refund plumbing permit fees.”

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- 2.6 Amend **Subsection 107.2** by adding the following: “4. The Division of Public Health has 3 working days to respond to an inspection request.”
- 2.6.1 Amend **Subsection 107.2** by adding the following: “4. Each permit is allowed 3 inspections, including improper work, incomplete work and inaccessible installations. Subsequent re-inspections are charged a \$50.00 fee for service by the Delaware Division of Public Health, which will be implemented six months after the effective date of this regulation. Local jurisdictions have their own fee schedules.”
- 2.7 Amend **Subsection 108.1** by deleting the subsection in its entirety and by inserting in lieu thereof the following: “It shall be unlawful for any person to work as a master plumber in the State of Delaware unless such person has received a license from the Delaware Department of State, Division of Professional Regulation, showing that said person has been duly licensed as a master plumber, except as provided by Title 24, Section 1807(c) of the **Delaware Code**, and has a permit issued by the Delaware Division of Public Health or local jurisdiction. Master Plumbers shall display their DE master plumber license number on all company vehicles. The lettering shall be 3 inches high and shall be of a contrasting color of the vehicle to which it is affixed.
- Exception:** The homeowner of a single-family residence occupied, or to be occupied by the homeowner for not less than 1 year and not for sale, rent or lease, may perform plumbing work only on such residence itself or auxiliary structures, and in compliance with a permit issued by the Delaware Division of Public Health, or applicable authority, and in compliance with all provisions of these regulations.”
- 2.8 Amend **Subsection 108.4** by deleting the subsection in its entirety and by inserting in lieu thereof the following: “Any person who shall violate any provisions of this Code, or shall fail to comply with the requirements thereof, or who shall install plumbing work in violation of an approved plan or directive of the Code Official or the plumbing inspector(s), or of a permit or certificate issued under the provisions of this Code, shall be subject to penalties as provided by Title 16, Chapter 79 of the **Delaware Code** or penalties of the local jurisdiction.”
- 2.8.1 Amend **Subsection 108.5** by deleting the words: “shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars” as it appears therein and inserting in lieu thereof the following: “shall be subject to penalties as provided by Title 16, Chapters 1 and 79 of the Delaware Code or penalties of the local jurisdiction.”
- 2.9 Amend **Section 109** by deleting the section in its entirety and replacing it with the following: “Any person shall have the right to appeal a decision of the code official to the Division of Public Health in accordance to law or to the local jurisdiction where a permit is issued.”
- 2.10 **Section 202 General Definitions**
- 2.10.1 Amend **Section 202** by adding thereto a new definition after the definition “**Manifold**” to read as follows: “**Master Plumber.** A person who has complied with the provisions of the Delaware Division of Professional Regulation and the Board of Plumbing Examiners, and has further met the certification, testing, bonding, and licensing requirements of the jurisdiction in which he/she plans to engage in the business of plumbing. A master plumber shall be recognized as being responsible for all work performed under a plumbing permit issued by the Delaware Division of Public Health or local jurisdiction.”
- 2.10.2 Amend **Section 202** by adding a new definition after the definition of approved agency to read as follows: “**Approved heat transfer fitting.** A metal threaded fitting that transitions between the relief valve and the relief valve discharge pipe that is listed in table 605.4.”
- 2.10.3 Amend **Section 202** by adding thereto a new definition after the definition “**Soil Pipe**” and before the definition “**Spill proof Vacuum Breaker**” to read as follows: “**Solvent cement.** The sealant used to connect pipes and fittings. This Code prohibits the use of all purpose glue in any reference to solvent cement.”
- 2.10.4 Amend **Section 202** by adding thereto a new definition after the definition “**Sump Vent**” and before the definition “**Supports**” to read as follows: “**Supervision of Work.** Work completed under the permit of a master plumber while employed by the master plumber, or the same firm, partnership, corporation, or owners of the company as the master plumber.”
- 2.10.5 Amend **Section 202** by amending the definition of “**Building Drain**” by deleting the phrase “30 inches (762 mm)” and replacing it with the words “5 feet”.
- 2.10.6 Amend **Section 202** by adding “The Director of the Delaware Division of Public Health or their designee” to the definition of code official.
- 2.11 Amend **Subsection 305.4.1** by deleting the subsection in its entirety.
- 2.12 Amend **Section 312** by adding thereto a new subsection 312.5.1 to read as follows: “In lieu of the presence of the plumbing inspector witnessing the test, the master plumber may certify in writing upon a prescribed form

that the plumbing system piping is in accordance with Section 312 of these regulations. Local jurisdictions may require the test to be witnessed by the plumbing inspector.”

- 2.12.1 Amend **Subsection 312.10.2** by adding a new sentence after the last sentence to read: “The Division of Public Health Plumbing Program inspects initial installations of a backflow assembly but does not conduct, track or enforce subsequent tests or inspections. Local jurisdictions may have additional requirements.”
- 2.13 Amend table 403.1 by deleting subscript e and replacing subscript f with the following: “Public pool plumbing fixtures are regulated by the Delaware Regulations Governing Public Pools.”
 - 2.13.1 Amend table 403.1 by deleting the requirement for bathtubs/showers in child day facilities.
- 2.14 Amend **Subsection 404.1** by deleting the subsection in its entirety and by inserting in lieu thereof the following: “All regulations pertaining to handicapped facilities in the International Plumbing Code will be governed by the most recent edition of the “American National Standards Institute (ANSI) and the minimum requirements of the International Building Code.”
- 2.15 Amend **Subsection 405.3.1** by adding an exception to read as follows: “Exception: Lavatories in residential occupancies shall **not** be required to be 15 inches from the center of the lavatory to any side wall. This does not supersede accessibility requirements.”
- 2.16 Amend **Subsection 502.1** by adding thereto after the last sentence the following: “The first 12 inches of both hot and cold water lines from the water heater shall be metallic material or a material approved by the plumbing inspector.”
- 2.17 Amend **Subsection 504.6** by adding thereto a new numbered paragraph after numbered paragraph “13” to read as follows: “14. The relief valve shall be equipped with an approved heat transfer fitting and approved discharge piping or be metallic pipe.”
 - 2.17.1 Amend **Subsection 504.6** By deleting # 14.
- 2.18 Amend **Sections 602, and 610** to state “The Delaware Division of Public Health Plumbing Permit and Inspection Program does not test drinking water.”
- 2.19 Amend **Table 604.3** by adding thereto in the second row, first column, after the words “Bathtub, balanced-pressure, thermostatic or combination balanced pressure/thermostatic mixing valve” the following: “for hand held shower fixtures.”
- 2.20 Amend **Table 605.3** by deleting in the parenthetical in the fifth row, first column after the words “Copper or copper-alloy tubing” the letters “M” and “WM”.
 - 2.20.1 Amend **Table 605.4** by deleting in the parenthetical in the fourth row, first column after the words “Copper or copper-alloy tubing” the letters “M” and “WM”.
 - 2.20.2 Amend **Subsection 605.15.2** by adding thereto after the words “above or below ground” the following sentence: “The use of all purpose glue is prohibited.”
- 2.21 Amend **Subsection 607.3** by adding thereto the following after the last sentence: “All public water installations shall be required to have an expansion tank on storage water heaters installed between the water heater shut off valve and the-water heater on the cold side.”
- 2.22 Amend **Subsection 608.3** by adding thereto a new subsection after subsection 608.3.1 to read: “608.3.2 **Special equipment, water supply protection.** There shall be sufficient space around special equipment for accessibility.”
- 2.23 Amend **Subsection 608.17.4** to add: “Fire sprinklers in 1 and 2 family dwelling units connected to the potable water system shall be regulated by The New Home Buyer’s Fire Protection act, Title 6 Chapter 36 of Delaware code, requirements of local jurisdictions and requirements from the Delaware State Fire Marshal’s office. Combined domestic and fire sprinkler systems in 1 and 2 family home systems shall utilize potable water piping and not require backflow protection to separate the fire sprinkler system from the potable water distribution system unless it is connected to a fire department connection or contains antifreeze in accordance with NFPA 13-D. The Division of Public Health does not approve the design of fire protection systems.”
- 2.24 Amend **Section 704** to add a new subsection 704.5 to read “Plumbing in structures with basements shall have a future vent that runs below the joist and is labeled future vent.”
- 2.25 Amend **Subsection 705.10.2** by deleting the exception.
- 2.26 Amend **Subsection 712.3.5** by deleting the phrase “10 pipe diameters” in the last sentence and replacing it with the following phrase: “The waste line from-sewage crock injector pump shall be the last connection leaving before the drain line goes through the foundation.”
- 2.27 Amend **Subsection 903.1** by adding: “12 inches above the roof.”

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- 2.28 Amend **Subsection 903.2** by adding thereto after the first sentence the following sentence: "The stack shall be no less than 2 inches in diameter."
- 2.29 Amend **Subsection 904.3** by deleting the words "or to a stack-type air admittance valve in accordance with Section 918."
- 2.30 Amend **Subsection 915.1** by deleting the last sentence in its entirety.
- 2.31 Amend **Subsection 918.1** by adding thereto after the last sentence the following: "The use of air admittance valves in lieu of standard vents shall be approved by the plumbing inspector prior to use or installation."
- 2.32 Amend **Section 919** by deleting the section in its entirety.
- 2.33 Amend **Section 920** by deleting the section in its entirety.
- 2.34 Amend **Subsection 1101.1** by adding "The Delaware Division of Public Health Plumbing Program does not enforce the provisions of this chapter."
- 2.35 Amend **Chapter 12** by adding "The Delaware Division of Public Health does not enforce the provisions of this chapter."

3.0 Miscellaneous Provisions for the DE Division of Public Health

- 3.1 **Procedures for License.** Every person desiring to register as a master plumber engaged in the business of plumbing in the State of Delaware shall file an application with the Delaware Division of Professional Regulation.
- 3.2 **Permission for a variance.** Upon receipt of a written application for a variance, the Code Official may recommend granting written permission to vary from particular provisions set forth in these Regulations, when the extent of the variation is clearly specified and it is documented to the satisfaction of the Secretary of the Delaware Department of Health and Social Services or his/her appointed designee's that:
 - 3.2.1 Such variation is necessary to obtain a beneficial use of an existing facility;
 - 3.2.2 The variation is necessary to prevent a practical difficulty or unnecessary hardship; and
 - 3.2.3 Appropriate alternative measures have been taken to protect the health and safety of the public and assure that the purpose of the provisions from which the variation is sought will be observed.
- 3.3 **Time for recommendation.** Within thirty (30) business days of the receipt of a written application for a variance, the Code Official shall recommend either: granting the variance, denying the variance or requesting further information from the applicant.
- 3.4 **Appeal of denial.** If the applicant has been denied a variance upon the recommendation of the Code Official, the applicant may appeal the decision by filing a written Notice of Appeal to the Secretary of the Delaware Department of Health and Social Services, or his/her designee.
- 3.5 **Private Sewage Code.** The private sewage code is regulated by the Delaware Department of Natural Resources and Environmental Control.

4.0 Information Regarding Plumbing For Food Establishments

- 4.1 **Scope.** These Special Provisions shall be followed in addition to and shall not supersede the International Plumbing Code, the Delaware Food Code or these Regulations.
- 4.2 **Use of Master Plumber.** All plumbing shall be installed by a master plumber under a valid, current plumbing permit in accordance with these Regulations.
- 4.3 **Backflow Prevention**
 - 4.3.1 **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 25 mm (1 inch).
 - 4.3.2 **Air gap, drainage.** A direct connection may not exist between the sewage system and a drain originating from equipment in which food, portable equipment, or utensils are placed. 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.
 - 4.3.3 **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 or air break as approved with a backwater valve.

- 4.3.4 **Backflow prevention device.** A backflow or back siphonage prevention device or assembly installed on a water supply system shall meet American Society of Sanitary Engineering (ASSE) standards for construction, installation, maintenance, inspection, and testing for that specific application and type of device.
- 4.3.5 **Plumbing fixtures.** The supply lines or fittings for every plumbing fixture shall be installed so as to prevent backflow. Plumbing fixtures shall provide backflow protection in accordance with ASSE A112.18.1.
- 4.3.6 **Devices, appliances.** All devices that connect to the water supply shall be provided with protection against backflow. This includes devices used for food preparation and processing, steamers, the storage of ice or food, ware washing machines, and other food service equipment.
- 4.3.7 **Hose connections.** Sillcocks, hose bibs, 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. This subsection does not apply to water heater drain valve or clothes washing machines.
- 4.3.8 **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 portion of the backflow preventer device downstream from the second check valve and the piping downstream there from shall not be affected by carbon dioxide gas.
- 4.4 **Utility Service Installation**
 - 4.4.1 **Front of wall lines.** 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.
 - 4.4.2 **No floor installation.** Exposed horizontal utility service, including water supply and drain lines, may not be installed on the floor.
- 4.5 **Toilet Facilities**
 - 4.5.1 **Toilet room.** A toilet room shall be completely enclosed and provided with a tight-fitting and self-closing door that does not open into a food preparation area. This requirement does not apply where a toilet room is located outside a food establishment and does not open directly into the food establishment such as a toilet room that is provided by the management of a shopping mall.
 - 4.5.2 **Location.** Toilet rooms shall be conveniently located and accessible to employees during all hours of operation.
 - 4.5.3 **Customer Facilities.** Customer toilet facilities shall be required in all foods establishments based on occupant load except they are not required in takeout facilities with no customer dine in seating and having a customer access area less than or equal to 300 sq. ft.
- 4.6 **Sinks**
 - 4.6.1 **Water supply.** All sinks shall be supplied with hot and cold running water under pressure.
 - 4.6.2 **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.
 - 4.6.3 **Hand washing sinks.** These fixtures, when located in food preparation, food dispensing, beverage dispensing (including bar service area), food storage and ware washing 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.
 - 4.6.4 **Separate sink required.** A separate, single-compartment hand washing sink is required in food preparation, food dispensing, and ware washing areas; and in toilet rooms.
 - 4.6.5 **Grease traps connection.** Connection to a grease trap is not required for handwashing sinks.
- 4.7 **Food Preparation Sinks**
 - 4.7.1 A food prep sink 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.
 - 4.7.2 **No disposal.** A food preparation sink may not be used for disposal of mop water or liquid wastes.
 - 4.7.3 **Required indirect drain line.** An indirect drain line connection through an air-gap is required.
 - 4.7.4 **Grease traps connection.** Connection to a properly sized grease trap is required.

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- 4.7.5 **Multiple compartments.** If a food preparation sink has two or more compartments, a separate waste line connection from each sink compartment through an air gap into a floor sink is required.
- 4.8 **Ware washing Sinks**
- 4.8.1 **Industry standard.** Ware washing sinks must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, and UL for Sanitation, BISSC, or equivalent.
- 4.8.2 **No hand washing or disposal.** A ware washing sink may not be used for hand washing or disposal of liquid wastes.
- 4.8.3 **Required indirect drain line.** An indirect drain line piped separately from each bowl through an air-gap is required.
- 4.8.4 **Grease traps connection.** Connection to a properly sized grease trap is required unless otherwise approved.
- 4.9 **Service Sinks** (for use as a janitorial sink, utility sink or mop sink)
- 4.9.1 **Installation location.** Wherever practical, a fixture service sink must be installed outside of the food preparation, food dispensing, food storage and ware wash areas.
- 4.9.2 **Industry standard.** Service sinks, when located in food preparation, food dispensing, food storage and ware washing 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.
- 4.9.3 **Minimum number required.** 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.
- 4.9.4 **Dual use.** The dual use of a utility sink as a hand washing sink is not approved.
- 4.9.5 **Grease traps connection.** Connection to a grease trap is not required.
- 4.10 **Pre-wash Sinks**
- 4.10.1 **Industry standard.** Pre-wash sinks must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, and UL for Sanitation, BISSC, or equivalent.
- 4.10.2 **Required indirect drain line.** An indirect drain line connection through an air-gap is required.
- 4.10.3 **Grease traps connection.** Connection to a properly sized grease trap is required.
- 4.10.4 **Food waste grinder.** A food waste grinder may not be tied into a grease interceptor.
- 4.11 **Mechanical Warewasher**
- 4.11.1 **Industry standard.** Mechanical ware washers must be certified or classified under an approved industry standard for food equipment, such as NSF International, ETL Sanitation, UL for Sanitation, or equivalent.
- 4.11.2 **Grease traps connection.** Connection to a grease trap is required for mechanical ware washers that do not have a pre-wash sink.
- 4.11.3 **Indirect drain line connection.** An indirect drain line connection through an air-gap is required.
- 4.12 **Water Heater**
- 4.12.1 **Hot water supply.** 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.
- 4.12.2 **Total availability.** 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.
- 4.12.3 **Minimum storage capacity.** 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 on the type of equipment and number of fixtures consuming hot water.
- 4.12.4 **Instant or tankless hot water heaters.** Instant or tankless hot water heaters shall be sized to provide hot water as required to supply both the continuous requirements and the hourly peak demands of the facility. In some cases more than 1 instant or tankless hot water heater may be required.
- 4.13 **Grease Trap**
- 4.13.1 **Sizing.** The grease trap must be sized in accordance with PDI standard G101.

- 4.13.2 **Grease traps connection.** Connection to a properly sized grease trap is required for all fixtures that discharge grease-laden waste, e.g. ware washing sinks, food prep sinks, pre-wash sinks for ware washers, woks, dishwashers without pre-wash sinks and other cooking equipment.
- 4.13.3 **Sizing procedures.** Follow these procedures for sizing a grease trap to a specific fixture:
- 4.13.3.1 Determine the liquid volume of the fixture in cubic inches (cu in) draining to the grease trap.
 - 4.13.3.2 Determine the liquid capacity of the fixture in gallons by dividing the total cubic inches of the sink by 231 cubic inches per gallon.
 - 4.13.3.3 Determine the actual drainage load (75% of fixture capacity).
 - 4.13.3.4 Divide by 2 for the allowed 2 minute flow rate.
 - 4.13.3.5 Select a unit corresponding to minimum unit flow rate.

Table 4.13.3a
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 approximately 50 gallons per min. grease trap is the minimum flow rate. Divide by 2 for the allowed 2 min flow rate
4. The rated capacity in pounds is twice the flow rate. A 50 gallon per minute grease trap is equal to a 100 pound grease trap.
5. For multiple fixtures add together 100% of the largest flow rate, 50% of the 2nd largest flow rate and 25% of all others.

9 DE Reg. 786 (11/01/05)

14 DE Reg. 813 (02/01/11)

15 DE Reg. 1724 (06/01/12)

19 DE Reg. 138 (08/01/15)

23 DE Reg. 384 (11/01/19)