

2012 NC Plumbing Code

The changes below are to the 2009 International Plumbing Code. These mark-ups will be adopted for the 2012 NC Plumbing Code.

Chapter 1 – ADMINISTRATION

101.1 Title. These regulations shall be known as the North Carolina Plumbing Code as adopted by the North Carolina Building Code Council on September 14, 2010, to be effective September 1, 2011. References to the International Codes shall mean the North Carolina Codes. The North Carolina amendments to the International Codes are underlined.

101.5 Appendices. Provisions in the appendices shall not apply unless specifically adopted or referenced in this code.

101.6 Requirements of other State agencies, occupational licensing board or commissions. The North Carolina State Building Codes do not include all additional requirements for buildings and structures that may be imposed by other State agencies, occupational licensing boards and commissions. It shall be the responsibility of a permit holder, design professional, contractor or occupational license holder to determine whether any additional requirements exist.

SECTION 103 DEPARTMENT OF PLUMBING INSPECTION

Deleted. See the North Carolina Administrative Code and Policies.

SECTION 104 DUTIES AND POWERS OF THE CODE OFFICIAL

Deleted. See the North Carolina Administrative Code and Policies.

SECTION 106 PERMITS

Deleted. See the North Carolina Administrative Code and Policies.

SECTION 107 INSPECTIONS AND TESTING

Deleted. See the North Carolina Administrative Code and Policies.

SECTION 108 VIOLATIONS

Deleted. See the North Carolina Administrative Code and Policies.

SECTION 109 MEANS OF APPEAL

Deleted. See the North Carolina Administrative Code and Policies.

Chapter 2 – DEFINITIONS

BATTERY OF FIXTURES. Any group of two or more similar adjacent fixtures which discharge into a common horizontal waste or soil branch.

BRANCH INTERVAL. A distance along a soil or waste stack corresponding in general to a story height, but not less than 8 feet (2438 mm), within which the horizontal branches from one floor or story of a structure are connected to the stack.

BUILDING DRAIN. That part of the lowest piping of a drainage system that receives the discharge from soil, waste and other drainage pipes inside and that extends to 10 feet (3048 mm) beyond the walls of the building and conveys the drainage to the building sewer.

Combined. A building drain that conveys both sewage and storm water or other drainage.

Sanitary. A building drain that conveys sewage only.

Storm. A building drain that conveys storm water or other drainage, but not sewage.

CLOSET. An enclosed or recessed area used to store clothing, linens or other household items.

INDIRECT WASTE RECEPTOR. A plumbing fixture designed specifically to collect and dispose of liquid waste from other plumbing fixtures, plumbing equipment or appliances which are required to discharge to the drainage system through an air gap. The following type fixtures fall within the classification of indirect liquid waste receptors: floor sinks, mop receptors, service sinks and standpipe drains with integral air gaps.

LABELED. Equipment, devices, fixtures or materials bearing the label of an approved agency.

PIPE SIZES. For the purposes of determining the minimum size of pipe required, cross-sectional areas are the essential characteristic, not the pipe diameter. Therefore, when in the code, it is instructed to “increase by one pipe size” we should presume the availability of pipe sizes that may not be readily available. Presume the commercial availability of pipe sizes 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 4 1/2, 5, 6, 7, 8, 9, 10.

REGISTERED DESIGN PROFESSIONAL. An individual who is registered or licensed to practice his respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed. Design by a registered design professional is not required where exempt under the registration or licensure laws.

SCUPPER. An opening in a wall or parapet that allows water to drain from a roof.

TOILET. Water closet and frequently a lavatory, but not a bathtub, shower, spa or similar bathing fixture.

TOILET ROOM. A room containing a water closet and frequently a lavatory, but not a bathtub, shower, spa or similar bathing fixture.

WATER PIPE

Riser. A water supply pipe that extends one full story or more to convey water to branches or to a group of fixtures.

Water distribution pipe. A pipe within the structure or on the premises that conveys water from the water service pipe, or from the meter when the meter is at the structure, to the points of utilization.

Water service pipe. The pipe from the water main or other source of potable water supply, or from the meter when the meter is at the public right of way, to the water distribution system of the building served. Water service pipe shall terminate 5 feet (1524 mm) outside the foundation wall.

Chapter 3 – GENERAL REGULATIONS

301.3 Connections to the sanitary drainage system. All plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquidwastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent the indirectwaste systems required by Chapter 8. All drain, waste and vent piping associated with gray water recycling systems shall be installed in full compliance with this code.

301.5 Pipe, tube and fitting sizes. See Chapter 2, Definitions, “Pipe sizes.”

301.7 Conflicts. Where conflicts between this code and the conditions of the listing or the manufacturer’s installation instructions occur, the provisions of this code apply.

Exception: Where a code provision is less restrictive than the conditions of the listing of the equipment or appliance or the manufacturer’s installation instructions, the conditions of the listing and manufacturer’s installation instructions shall apply.

302.1 Detrimental or dangerous materials. Note: The following text is provided for informational purposes only.

Ashes, cinders or rags; flammable, poisonous or explosive liquids or gases; oil, grease or any other insoluble material capable of obstructing, damaging or overloading the building drainage or sewer system, or capable of interfering with the normal operation of the sewage treatment processes or private disposal system, shall not be deposited, by any means, into such systems.

303.1 Identification. Each length of pipe and each pipe fitting, trap, fixture, material and device utilized in a plumbing system shall bear the identification of the manufacturer, and the applicable standard to which it was manufactured.

304.1 General. Plumbing systems shall be designed and installed in accordance with Sections 304.2 through 304.4 and the North Carolina Building Code, Appendix H, to prevent rodents from entering structures.

304.3 Meter boxes. Deleted.

304.4 Openings for pipes. In or on structures where openings have been made in walls, floors or ceilings for the passage of pipes, such openings shall be closed and protected by the installation of approved metal collars or other approved materials that are securely fastened to the adjoining structure.

305.5 Pipes through or under footings or foundation walls. Any pipe that passes within 12 inches (305 mm) under a footing or through a foundation wall shall be provided with a relieving arch, or a pipe sleeve pipe shall be built into the foundation

wall. The sleeve shall be two pipe sizes greater than the pipe passing through the wall. Piping shall not be run under pier footing (refer to Section 307).

305.6 Freezing. The top of water pipes, installed below grade outside the building, shall be below the frost line or a minimum of 12 inches (305 mm) below finished grade, whichever is greater. Water pipes installed in a wall exposed to the exterior shall be located on the heated side of the wall insulation. Water piping installed in an unconditioned attic or unconditioned utility room shall be insulated with an insulation having a minimum R-factor of 6.5 determined at 75°F (24°C) in accordance with ASTM C-177.

Note: These provisions are minimum requirements which have been found suitable for normal weather conditions. Abnormally low temperatures for extended periods may require additional provisions to prevent freezing.

305.6.1 Frost protection. No traps of soil or waste pipe shall be installed or permitted outside of a building, or concealed in outside walls or in any place where they may be subjected to freezing temperatures, unless adequate provision is made to protect them from freezing. Waste and soil piping leaving the building shall have a minimum cover of 3 inches (76.2 mm).

305.9 Protection of components of plumbing system. Components of a plumbing system installed along alleyways, driveways, parking garages or other locations exposed to damage shall be recessed into the wall or otherwise protected in an approved manner.

Exception: One- and two-family dwellings and townhouses.

307.2 Cutting, notching or bored holes. A framing member shall not be cut, notched or bored in excess of limitations specified in the *International Building Code* or Appendix F in this code.

308.7.1 Location. For plastic pipe sizes greater than 6 inches (152 mm), and other pipe sizes greater than 4 inches (102 mm), restraints shall be provided for drain pipes at all changes in direction and at all changes in diameter greater than two pipe sizes. Braces, blocks, rodding, backfill and other suitable methods as specified by the coupling manufacturer shall be utilized.

308.10 Stacks. Bases of stacks shall be supported by the building structure, virgin or compacted earth, or other suitable material to adequately support the weight of the piping.

[B] 309.2 Flood hazard. For structures located in flood hazard areas, the following systems and equipment shall be located at or above the design flood elevation.

Exception: The following systems are permitted to be located below the design flood elevation provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.

1. All water service pipes.
2. Deleted.
3. Deleted.

4. All sanitary drainage piping.
5. All storm drainage piping.
6. Manhole covers shall be sealed, except where elevated to or above the design flood elevation.
7. All other plumbing fixtures, faucets, fixture fittings, piping systems and equipment.
8. Water heaters.
9. Vents and vent systems.

310.1 Light and ventilation. Washrooms and toilet rooms shall be illuminated and ventilated in accordance with the *International Building Code* and *International Mechanical Code*. Toilet rooms shall not open directly into a room used for the preparation of food for service to the public.

310.4 Water closet compartment. Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. In toilet rooms in child care facilities in areas used exclusively by children five years of age and under the following is permitted:
 - 2.1. Toilet stall enclosures, toilet stall doors and partitions between toilets may be omitted.
 - 2.2. Doors into toilet rooms may be omitted.
 - 2.3. Walls enclosing toilet rooms may be full height with vision panels, or may be partial height at least 42 inches (1067 mm) high in areas for children four and five years of age and 36 inches (914 mm) high in areas for children under four years of age.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

The toilet rooms shall meet applicable ventilation requirements for toilet areas in the North Carolina Building Code and the North Carolina Mechanical Code.

311.1 Temporary toilet facilities at construction sites. Toilet facilities shall be provided and maintained in a sanitary condition during construction. An adequate number of facilities must be provided for the number of employees at the construction site according to the following:

<u>NUMBER OF EMPLOYEES</u>	<u>MINIMUM NUMBER OF FACILITIES</u>
<u>Less than 20</u>	<u>1 toilet</u>
<u>20 to 200</u>	<u>1 toilet & 1 urinal per 40 workers</u>
<u>More than 200</u>	<u>1 toilet & 1 urinal per 50 workers</u>

There shall be at least one facility for every two contiguous construction sites. Such facilities may be portable, enclosed, chemically treated, tank-tight units. Portable toilets shall be enclosed, screened and weatherproofed with internal latches. Temporary toilet facilities need not be provided on site for crews on a job site for no more than one working day and having transportation readily available to nearby toilet facilities.

312.1 Required tests. The permit holder shall make the applicable tests prescribed in Sections 312.2 through 312.10 to determine compliance with the provisions of this code. The permit holder shall give reasonable advance notice to the code official when the plumbing work is ready for tests. The equipment, material, power and labor necessary for the inspection and test shall be furnished by the permit holder and the permit holder shall be responsible for determining that the work will withstand the test pressure prescribed in the following tests. All plumbing system piping shall be tested with either water or air. After the plumbing fixtures have been set up and their traps filled with water, the entire drainage system shall be submitted to final tests. The code official shall require the removal of any cleanouts if necessary to ascertain whether the pressure has reached all parts of the system.

312.2 Drainage and vent water test. A water test shall be applied to the drainage system within the building either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening, and the system shall be filled with water to the point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest openings of the section under test, and each section shall be filled with water, but no section shall be tested with less than a 10-foot (3048 mm) head of water. In testing successive sections, at least the upper 10 feet (3048 mm) of the next preceding section shall be tested so that no joint or pipe in the building, except the uppermost 10 feet (3048 mm) of the system, shall have been submitted to a test of less than a 10-foot (3048 mm) head of water. This pressure shall be held for at least 15 minutes. The system shall then be tight at all points.

Exception: Rough plumbing testing for one- and two-family dwellings shall be as specified above except the water level shall be a minimum of 3 feet (914 mm) above the highest drainage fitting.

312.5 Water supply system test. Upon completion of a section of or the entire water supply system, the system, or portion completed, shall be tested and proved tight under a water pressure not less than the working pressure of the system; or an air test of not less than 100 psi (688 kPa). This pressure shall be held for at least 15 minutes. The water utilized for tests shall be obtained from a potable source of supply. The required tests shall be performed in accordance with this section and Section 107.

312.6 Gravity sewer test. Deleted.

312.7 Forced sewer test. Deleted.

312.10 Inspection and testing of backflow prevention assemblies. Deleted.

312.9.1 Inspections. Deleted.

312.9.2 Testing. Deleted.

SECTION 314 – CONDENSATE DISPOSAL

314.1 Approved location. Approved location shall be in accordance with the *North Carolina Mechanical Code*.

314.2 Evaporators and cooling coils. Deleted.

314.2.1 Condensate disposal. Deleted.

314.2.2 Drain pipe materials and sizes. Deleted.

314.2.3 Auxiliary and secondary drain systems. Deleted.

314.2.3.1 Water-level monitoring devices. Deleted.

314.2.3.2 Appliance, equipment and insulation in pans. Deleted.

314.2.4 Traps. Deleted.

CHAPTER 4 – FIXTURES, FAUCETS AND FIXTURE FITTINGS

403.1 Minimum number of fixtures. In new construction or building additions and in changes of occupancy as defined in the *North Carolina Building Code*, plumbing fixtures shall be provided for the type of occupancy and in the minimum number shown in Table 403.1. Types of occupancies not shown in Table 403.1 shall be considered individually by the code official. The number of occupants shall be determined by the *International Building Code*. Occupancy classification shall be determined in accordance with the *International Building Code*.

TABLE 403.1 – MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES. Bring forward from the 2009 NC Plumbing Code with the following amendments:

OCCUPANCY FEMALE:

A-4 and A-5 1 per 40 for the first 1,520 and 1 per 60 for the remainder

OCCUPANCY

E (add superscript footnote b)

OCCUPANCY

1-4, Child care (add superscript footnote b).

CLASSIFICATION MALE/FEMALE:

Factory and Industrial (See OSHA 29 CFR paragraph 1910.14.1)

CLASSIFICATION

DRINKING FOUNTAIN:

Business

25-100 1

101-250 2

251-500 3

add 1 per 500 exceeding 500

CLASSIFICATION

DRINKING FOUNTAIN:

Mercantile

100 – 1,000 1

greater than 1,000 require 1 more for each additional 1,000

Footnote

b. Toilet facilities for employees shall be separate from facilities for inmates, students or patients.

e. The number of fixtures provided shall be based on either the capacity of the church sanctuary or the church educational building (including fellowship halls and multiple purpose rooms), whichever is larger and within 300 feet (91.44 m).

403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 25 or less.
3. Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is 100 or less.
4. Except as provided in Section 405.3.2.

403.3 Adjustments in occupant content. If an owner or tenant requests, the plumbing official shall make adjustments in the occupant content established by Table 403.1 for manufacturing, workshops, loft building, foundries, storage, aircraft hangars, garages and similar establishments. The owner or occupant shall provide written data accompanied by plans which substantiates a claim that the occupant content of a particular building or tenancy will, at all times, be less than provided for in the above table. Approval of such data and accompanying claims shall not prevent the plumbing official from requiring additional facilities based on the above table, should changes be made affecting the floor plan upon which the original approval was based whether such changes be made by the original or ultimate owner or building occupant or occupants. The remainder of the facilities requirements of Section 403.2 are not affected by this paragraph.
(403.3.1, 403.3.2, 403.3.3, 403.3.4 deleted)

403.4 Location of employee toilet facilities in occupancies other than assembly or mercantile. Access to toilet facilities in occupancies other than mercantile and assembly occupancies shall be from within the employees' working area. Employee facilities shall be either separate facilities or combined employee and public facilities. **Exception:** Facilities that are required for employees in storage structures or kiosks, and are located in adjacent structures under the same ownership, lease or control, shall be a maximum travel distance of **500 feet (152 m)** from the employees' working area.

403.4.1 Travel distance. The required toilet facilities in occupancies other than assembly or mercantile shall be located not more than one story above or below the employees' working area and the path of travel to such facilities shall not exceed a distance of **500 feet (152 m)**.

Exception: The location and maximum travel distances to required employee toilet facilities in factory and industrial occupancies are permitted to exceed that required in Section 403.4.1, provided that the location and maximum travel distance are approved by the code official.

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, nightclubs, places of public assembly and mercantile occupancies. The employee facilities shall be either separate facilities or combined employee and public facilities. The required toilet facilities shall be located not more than one story above or below the employees' work area and the path of travel to such facilities, in other than covered malls, shall not exceed a distance of

500 feet (152 m). The path of travel to required facilities in covered malls shall not exceed a distance of 300 feet (91 440 mm).

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 (91 440 mm) and such central toilet facilities are located not more than one story above or below the tenant space.

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 (152 m).

403.6.1 Covered malls. In covered mall buildings, the path of travel to required toilet facilities shall not exceed a distance of 300 feet (91 440 mm). Facilities shall be installed in each individual store or in a central toilet area located in accordance with this section. The maximum travel distance to the central toilet facilities in covered mall buildings shall be measured from the main entrance of any store or tenant space.

403.6.2 Pay facilities. Where pay facilities are installed, such facilities shall be in excess of the required minimum facilities. Required facilities shall be free of charge.

403.7 Signage. Required public facilities shall be designated by a legible sign for each sex. Signs shall be visible and located near the entrance to each toilet facility.

403.8 Multiplex theaters. Plumbing fixtures for multiple adjoining motion picture theaters with a common lobby shall be based upon the seating capacity of the largest single auditorium plus 50 percent of the seats in the remaining auditoriums.

403.9 Plumbing fixtures for public schools.

403.9.1 Occupant content. Occupant content of public schools for the purpose of determining the number of required facilities shall be the maximum legal class size multiplied by the number of classrooms. A public school classroom is a room or space 500 square feet (46.5 m²) or larger normally used for instructional purposes. Maximum class sizes are 29 students for grades K through 9 and 33 students for grades 10 through 12 (GS 115C-301). The occupant load for private schools shall be as listed in Table 1004.1.2 of the *North Carolina Building Code*.

403.9.2 Occupant load and distance. The total student occupant load shall be the sum of the occupant loads for all classrooms, labs, shops and vocational spaces. The total occupant load for all buildings on a campus may be utilized when calculating the total number of fixtures required. Toilet facilities for students and teachers may be located in an adjacent building but shall be located so that no person will have more than 200 feet (61 mm) of accessible, covered horizontal travel distance from any classroom lab, shop or vocational space closest door for access to the required number of fixtures. The occupant content of kindergarten and first grade classrooms with internal toilet facilities is not required to be used in determining the number of group facilities for the entire school.

403.9.3 Occupant load for teachers and staff. Fixtures provided for teachers and staff shall be determined by multiplying the number of classrooms by 1.75. Staffing ratio for grades K through 8 is 80-percent female and 20-percent male. Staffing ratio for grades 9 through 12 is 70-percent female and 30-percent male.

403.9.4 Gymnasiums, cafeterias, auditoriums and stadiums for schools.

Fixtures in group toilet facilities provided for classroom areas may be used toward satisfying the total number of required fixtures for gymnasiums, cafeterias and auditoriums provided that such facilities are located within 200 feet (61 m) from the space and cannot be locked off from access during after-school-hours' use of the gymnasium, cafeteria or auditorium. Simultaneous use of classrooms, gymnasium, cafeteria or auditoriums shall not be considered for calculation of occupant loads for toilet fixtures. Stadium facilities shall be located within 400 feet (122 m) of the closest bleacher exit from each set of bleachers that the facility serves.

403.9.5 Miscellaneous provisions.

403.9.5.1 Unisex facilities. A single unisex facility may be used when the classroom area served is 1,200 square feet (112 m²) or less and is used either for kindergarten through grade 2 or is a modular classroom used for any grade level. Unisex facilities may be provided for teacher/staff if their total occupant load within 200 feet (61 m) is 15 or less.

403.9.5.2 Student group facilities. Every public school group facility shall have a minimum of four flushing type fixtures. Four flushing male group toilets shall have a minimum of two water closets.

403.9.5.3 Substitutions. Water closets may be substituted for urinals for grades K through 2. Urinals may be substituted for water closets in male group toilet rooms for teachers/staff and gyms, auditoriums, cafeterias or stadiums. The number of water closets shall not be reduced to less than one-third of the required total number of flushing fixtures.

403.9.5.4 Modular classroom buildings. Toilet rooms may be omitted in a modular classroom building when facilities of sufficient capacity for the additional occupants are provided in an adjacent building and located within 200 feet (61 m) of horizontal travel distance from the modular classroom.

403.9.5.5 Temporary modular classroom buildings. Toilet rooms may be omitted in modular classroom buildings housing grades 9 through 12 when these temporary buildings are to be replaced by permanent facilities which are under contract. Facilities of sufficient capacity for the additional occupants shall be provided within 450 feet (137 m) of horizontal travel distance from the modular classroom.

405.3.1 Water closets, urinals, lavatories and bidets. A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction, or closer than 30 inches (762 mm) center-to-center between adjacent fixtures. There shall be at least a 21-inch (533 mm) clearance in front of the water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall not be less than 30 inches (762 mm) wide and 60 inches (1524 mm) deep (see Figure 405.3.1).

Exception: For one- and two-family dwellings and townhouses see the North Carolina Residential Code.

(FIGURE 405.3.1 FIXTURE CLEARANCE. Add lavatory in bottom right hand corner of figure, with a 4 inch minimum clearance.)

405.3.2 Public lavatories. In employee and public toilet rooms, the required lavatory shall be located in the same room as the required water closet, except in Education K-5, lavatories may be provided in a common toilet room vestibule, visible from the corridor.

405.4.1 Floor flanges. Floor flanges for water closets or similar fixtures shall not be less than 0.125 inch (3.2 mm) thick for brass, 0.25 inch (6.4 mm) thick for plastic, and 0.25 inch (6.4 mm) thick and not less than a 2-inch (51 mm) caulking depth for cast-iron or galvanized malleable iron.

Floor flanges of hard lead shall weigh not less than 1 pound, 9 ounces (0.7 kg) and shall be composed of lead alloy with not less than 7.75-percent antimony by weight. Flanges shall be secured to the building structure with corrosion-resistant screws or bolts.

405.6 Plumbing in mental health centers. Deleted.

405.8 Slip joint connections. Slip joints shall be made with an approved elastomeric gasket and shall only be installed on the trap outlet, trap inlet and within the trap seal. Fixtures with concealed slip-joint connections shall be provided with an access panel or utility space at least 12 inches (305 mm) in its smallest dimension or other approved arrangement so as to provide access to the slip joint connections for inspection and repair. Where such access cannot be provided, access doors shall not be required, provided that all joints are soldered, solvent cemented or screwed to form a solid connection.

406.3Waste connection. The waste from an automatic clothes washer shall connect to a vertical drain of not less than 2 inches (51 mm) in diameter, or a horizontal drain of not less than 3 inches (76 mm) in diameter. The 2-inch (51 mm) trap in the waste connection may be used as a cleanout for both the 2-inch (51 mm) and the 3-inch (76 mm). Automatic clothes washers that discharge by gravity shall be permitted to drain to a waste receptor or an approved trench drain.

408.3 Bidet water temperature. Deleted.

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1M, ASME A112.19.2M or ASME A112.19.9M and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. Where water is served in restaurants, night clubs, taverns, or bars, drinking fountains shall not be required.

412.5 Location. Floor drains shall be located to drain the entire floor area.

412.6 Trap primers. The water seal of floor drain traps shall be maintained in conformance with Section 1002.4, Trap seals, or other method acceptable to the authority having jurisdiction.

Exception: Hose bibbs located in rooms with nonabsorbent floors may be used in lieu of an automatic trap primer.

414.2 Waste connection. Garbage can washers shall be trapped separately. The receptacle receiving the waste from the washer shall have a removable basket or strainer to prevent the discharge of particles ½ inch or larger into the drainage system.

416.5 Tempered water for public hand-washing facilities. Deleted.

417.3 Shower waste outlet. Waste outlets serving showers shall be at least 2 inches (51 mm) in diameter and, for other than waste outlets in bathtubs, shall have removable strainers not less than 3 inches (76 mm) in diameter with strainer openings not less than 0.25 inch (6.4 mm) in minimum dimension. Where each shower space is not provided with an individual waste outlet, the waste outlet shall be located and the floor pitched so that waste from one shower does not flow over the floor area serving another shower. Waste outlets shall be fastened to the waste pipe in an approved manner.

417.4 Shower compartments. Shower compartments shall conform to Table 417.4 and shall have approved shower pan material or the equivalent thereof as determined by the plumbing official. The pan shall turn up on three sides at least 2 inches (51 mm) above the finished curb level. The remaining side shall wrap over the curb. Shower drains shall be constructed with a clamping device so that the pan may be securely fastened to the shower drain thereby making a watertight joint. Shower drains shall have an approved weephole device system to insure constant drainage of water from the shower pan to the sanitary drainage system. There shall be a watertight joint between the shower and drain and trap. Shower receptacle waste outlets shall be not less than 2 inches (51 mm) and shall have a removable strainer.

Exception: Shower compartments with prefabricated receptors conforming to the standards listed in Table 417.4.

TABLE 417.4 PREFABRICATED SHOWER RECEPTOR STANDARDS MATERIALS STANDARDS

Plastic shower receptors and shower stalls	ANSI Z124.2
Shower pans, nonmetallic	ASTM D 4551. See Section 303.8

417.4.2 Access. Deleted.

417.5.2 Shower lining. Floors under shower compartments, except where prefabricated receptors have been provided, shall be lined and made water tight utilizing material complying with Sections 417.5.2.1 through 417.5.2.5. Such liners shall turn up on all sides at least 2 inches (51 mm) above the finished threshold level. Liners shall be recessed and fastened to an approved backing so as not to occupy the space required for wall covering, and shall not be nailed or perforated at any point less than 1 inch (25 mm) above the finished threshold. Liners shall be securely fastened to the waste outlet at the seepage entrance, making a water-tight joint between the liner and the outlet. Liners shall be installed per manufacturer's instructions.

Exceptions:

1. Floor surfaces under shower heads provided for rinsing laid directly on the ground are not required to comply with this section.
2. Where a sheet-applied, load-bearing, bonded, waterproof membrane is installed as the shower lining, the membrane shall not be required to be recessed.

419.1 Approval. Urinals shall conform to ANSI Z124.9, ASME A112.19.2M, ASME A112.19.19, CSA B45.1 or CSA B45.5. Urinals shall conform to the water consumption requirements of Section 604.4. Water-supplied urinals shall conform to the hydraulic performance requirements of ASME A112.19.6, CSA B45.1 or CSA B45.5.

Urinals that do not usewater shall be permitted, provided the urinals:

1. Provide a barrier liquid sealant contained in a removable trap to maintain the trap seal;
2. Permit the uninhibited flow of water through the trap to the sanitary drainage system;
3. Comply with ANSI Z124.9 and ASME A112.19.2, as applicable.
4. Water supply shall be provided for future connection.

[B] 419.3 Surrounding material. Deleted.

421.5 Access to pump. Access shall be provided to circulation pumps in accordance with the fixture or pump manufacturer's installation instructions. Where the manufacturer's instructions do not specify the location and minimum size of field-fabricated access openings, a 12-inch by 12-inch (305 mm by 305 mm) minimum sized opening shall be installed to provide access to the circulation pump. Where pumps are located more than 2 feet (609 mm) from the access opening, an 18-inch by 18-inch (457mmby 457 mm) minimum sized opening shall be installed. A door or panel shall be permitted to close the opening. In all cases, the access opening shall be unobstructed and of the size necessary to permit the removal and replacement of the circulation pump. A minimum clearance of 21 inches is required in front of the access door.

424.3 Individual shower valves. Individual shower and tub-shower combination valves shall be balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016 or ASME A112.18.1/CSA B125.1 and shall be installed at the point of use. Shower and tub-shower combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions. In-line thermostatic valves shall not be utilized for compliance with this section. Scald preventative valves are not required in dwelling units with individual water heaters set at 120°F (49°C).

424.5 Bathtub and whirlpool bathtub valves. The hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a maximum temperature of 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1070 or CSA B125.3, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section 424.3. Scald preventative valves are not required in dwelling units with individual water heaters set at 120°F (49°C).

425.1 Flushing devices required. Each water closet, urinal, clinical sink and any plumbing fixture that depends on trap siphonage to discharge the fixture contents to

the drainage system shall be provided with a flushometer valve, flushometer tank or a flush tank designed and installed to supply water in quantity and rate of flow to flush the contents of the fixture, cleanse the fixture and refill the fixture trap.

A flushometer valve, flush tank or similar device shall not be required for urinal fixtures that comply with the waterless test requirements of ANSI Z124.9 and that:

1. Provide a barrier liquid sealant contained in a removable trap to maintain the trap seal;
2. Permit the uninhibited flow of water through the trap to the sanitary drainage system;
3. Comply with ANSI Z124.9 and ASME 112.19.2, as applicable.

Chapter 5 – WATER HEATERS

501.8 Temperature controls. All hot water supply systems shall be equipped with automatic temperature controls capable of adjustments from the lowest to the highest acceptable temperature settings for the intended temperature operating range. In a water heating system where temperatures exceed 140°F (60°C), a means such as a mixing valve shall be installed to temper the water for domestic uses.

501.9 Installation by manufacturer. The following is a reprint of GS66-27.1, “Safety Features of HotWater Heaters.”

(a) No individual, firm, corporation or business shall install, sell or offer for sale any automatic hot water tank or heater of 120-gallon (454 L) capacity or less, except for a tankless water heater, which does not have installed thereon by the manufacturer of the tank or heater an American Society of Mechanical Engineers and National Board of Boiler and Pressure Vessel Inspectors approved type pressure-temperature relief valve set at or below the safe working pressure of the tank as indicated, and so labeled by the manufacturer’s identification stamped or cast upon the tank or heater or upon a plate secured to it.

(b) No individual, firm, corporation or business shall install, sell or offer for sale any relief valve, whether it be pressure type, temperature type or pressure-temperature type, which does not carry the stamp of approval of the American Society of Mechanical Engineers and the National Board of Boiler and Pressure Vessel Inspectors.

The following is a reprint of GS 66-27.1A, “Water heater thermostat settings.”

(a) The thermostat of any new residential water heater offered for sale or lease for use in a single-family or multifamily dwelling in the State shall be preset by the manufacturer or installer no higher than approximately 120°F (49°C). A water heater reservoir temperature may be set higher if it is supplying space heaters that require higher temperatures. For purposes of this section, a water heater shall mean the primary source of hot water for any single-family or multifamily residential dwelling including, but not limited to any solar or other hotwater heating systems.

(b) Nothing in this section shall prohibit the occupant of a single-family or multiunit residential dwelling with an individual water heater from resetting or having reset the thermostat on the water heater. Any such resetting shall relieve the manufacturer or installer of the water heater and, in the case of a residential dwelling that is leased or rented, also the unit’s owner, from liability for damages attributed to the resetting.

(c) A warning tag or sticker shall be placed on or near the operating thermostat control of any residential water heater. This tag or sticker shall state that the thermostat settings above the preset temperature may cause severe burns. This tag or sticker may carry such other appropriate warnings as may be agreed upon by manufacturers, installers and other interested parties.

501.10 Fossil fuel equipment installation. The installation of the following equipment and systems shall comply with the *North Carolina Fuel Gas Code*:

1. Fuel piping for any fossil fuel-burning equipment.
2. Venting systems for fossil fuel-burning equipment which is part of the plumbing system.

502.3 Water heaters installed in attics. Attics containing a water heater shall be provided with an opening and unobstructed passageway large enough to allow removal of the water heater. The passageway shall not be less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) in length when measured along the centerline of the passageway from the opening to the water heater. If 6 feet (1829 mm) of headroom is provided along the centerline of the passageway from the opening to the water heater, the length of the passageway is permitted to exceed 20 feet (6096 mm) in length. The passageway shall have continuous solid flooring not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the water heater. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508mm by 762 mm) where such dimensions are large enough to allow removal of the water heater.

502.5 Water heaters installed in garages. Water heaters having an ignition source shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the garage floor. Appliances shall be located or protected so that they are not subject to physical damage by moving vehicle.

Exception: Elevation of the ignition source is not required for appliances that are listed as flammable vapor ignition resistant.

502.6 Installation in crawl spaces. Under-floor spaces containing appliances requiring access shall be provided with an access opening and unobstructed passageway large enough to remove the largest component of the appliance. The passageway shall not be less than 22 inches (559 mm) high and 36 inches (914 mm) wide, nor more than 20 feet (6096 mm) in length when measured along the centerline of the passageway from the opening to the equipment. A level service space not less than 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the appliance. If the depth of the passageway or the service space exceeds 12 inches (305mm) below the adjoining grade, the walls of the passageway shall be lined with concrete or masonry extending 4 inches (102 mm) above the adjoining grade and having sufficient lateral-bearing capacity to resist collapse.

The clear access opening dimensions shall be a minimum of 22 inches by 30 inches (559 mm by 762 mm), where such dimensions are large enough to allow removal of the largest component of the appliance.

Exceptions:

1. The passageway is not required where the level service space is present when the access is open and the appliance is capable of being serviced and removed through the required opening.
2. Where the passageway is not less than 6 feet high (1829 mm) for its entire length, the passageway shall not be limited in length.

502.7 Under-floor and exterior-grade installation.

502.7.1 Exterior-grade installations. Equipment and appliances installed above grade level shall be supported on a solid base or approved material a minimum of 2 inches (51 mm) thick.

502.7.2 Under-floor installation. Suspended equipment shall be a minimum of 6 inches (152 mm) above the adjoining grade.

502.7.3 Crawl space supports. The support shall be a minimum of a 2 inch thick solid base, 2 inch thick formed concrete, or stacked masonry units held in place by mortar or other approved method. The water heater shall be supported not less than 2 inches above grade.

502.7.4 Drainage. Below-grade installations shall be provided with a natural drain or an automatic lift or sump pump. Existing installation that can be terminated outdoors must terminate outdoors. Where the installation is such that outdoor termination is impossible, indoor termination is allowable.

502.8 Prohibited installations. Water heaters (using solid, liquid or gas fuel) with the exception of those having direct vent systems, shall not be installed in bathrooms and bedrooms or in a closet with access only through a bedroom or bathroom. However, water heaters of the automatic storage type may be installed as replacement in a bathroom, when specifically authorized by the plumbing official, provided they are properly vented and supplied with adequate combustion air.
Exception: When a closet, having a weather-stripped solid door with an approved closing device, has been designed exclusively for the water heater and where all air for combustion and ventilation is supplied from outdoors.

503.1 Cold water line valve. The cold water branch line from the main water supply line to each hot water storage tank or water heater shall be provided with a valve, located near the equipment and serving only the hot water storage tank or water heater. The valve shall not interfere or cause a disruption of the cold water supply to the remainder of the cold water system. The valve shall be provided with access on the same floor level within 3 feet (914 mm) of the water heater served.

503.2 Water circulation. The method of connecting a circulating water heater to the tank shall provide proper circulation of water through the water heater. The pipe or tubes required for the installation of appliances that will draw from the water heater or storage tank shall comply with the provisions of this code for material and installation. Installation shall comply with the manufacturer's instructions.

504.6 Requirements for discharge piping. The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

1. Not be directly connected to the drainage system.

2. Discharge through an air gap located in the same room as the water heater, either on the floor, into an indirect waste receptor or outdoors.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the water heater or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

504.7 Required pan. Where water heaters or hot water storage tanks are installed in: (a) remote locations such as a suspended ceiling, (b) attics, (c) above occupied spaces, or (d) unventilated crawl spaces, the tank or water heater shall be installed in a galvanized steel pan having a material thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage), or other pans approved for such use.

Exceptions:

1. Electric water heaters may rest in a high-impact plastic pan of at least 1/16 inch (1.6 mm) thickness.
2. Water heater mounted on concrete floor for floor drains.

504.7.1 Pan size and drain. The pan drain shall not be less than 1.5 inches (38 mm) deep and shall not be obstructed by the appliance. The pan shall be drained by an indirect waste pipe having a minimum diameter of 1 inch (25.4 mm). Piping for safety pan drains shall be of those materials listed in Table 605.4.

Chapter 6 – WATER SUPPLY AND DISTRIBUTION

602.3.1 Sources. Deleted.

602.3.2 Minimum quantity. Deleted.

602.3.3 Water quality. Deleted.

602.3.4 Disinfection of system. Deleted.

602.3.5 Pumps. Deleted.

602.3.5.1 Pump enclosure. Deleted.

604.4.1 Lavatory faucets. Lavatory faucets shall be of the metering type when located in the following public restrooms:

1. In all occupancies in restrooms which have six or more lavatories.
2. In school occupancies in student-use restrooms.
3. In assembly occupancies in all customer or public-use restrooms.

604.5 Size of fixture supply. The minimum size of a fixture supply pipe shall be as shown in Table 604.5. The fixture supply pipe shall not terminate more than 30 inches (762 mm) from the point of connection to the fixture. A reduced-size flexible water connector installed between the supply pipe and the fixture shall be of an approved type. The supply pipe shall extend to the floor or wall adjacent to the fixture. The minimum size of individual distribution lines utilized in gridded or parallel water distribution systems shall be as shown in Table 604.5.

Exception: The length of restriction shall not apply to residential dishwashers or ice makers.

604.9 Water hammer. The flow velocity of the water distribution system shall be controlled to reduce the possibility of water hammer. A water-hammer arrestor shall be installed where quick-closing valves (example; clothes washers, dishwashers, ice makers, etc.) and metallic piping is used. The water-hammer arrestor shall not be required on any valves where plastic pipe is used for water distribution piping. Water-hammer arrestors shall be installed in accordance with the manufacturer's specifications. Water-hammer arrestors shall conform to ASSE 1010.

604.10.3 Access. Access shall be provided to manifolds.

605.3 Water service pipe. Water service pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table 605.3. All water service pipe or tubing, installed underground and outside of the structure, shall have a minimum working pressure rating of 160 psi (1100 kPa) at 73.4°F (23°C). Where the water pressure exceeds 160 psi (1100 kPa), piping material shall have a minimum rated working pressure equal to the highest available pressure. Water service piping materials not third-party certified for water distribution shall terminate 5 feet (1524 mm) outside the building. All ductile iron water service piping shall be cement mortar lined in accordance with AWWA C104.

605.4 Water distribution pipe. Water distribution pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table 605.4. All water distribution pipe and tubing shall have a minimum pressure rating of 100 psi (690 kPa) at 180°F (82°C).

TABLE 605.3 - WATER SERVICE PIPE - Bring forward the **Copper or copper-alloy tubing** column from the 2009 NC Plumbing Code and keep the rest of the Table as the 2009 IPC.

TABLE 605.4 - WATER DISTRIBUTION PIPE - Bring forward the **Copper or copper-alloy tubing** column and **Footnote a.** from the 2009 NC Plumbing Code and keep the rest of the Table as the 2009 IPC.

605.5 Fittings. Pipe fittings shall be approved for installation with the piping material installed and shall conform to the respective pipe standards or one of the standards listed in Table 605.5. All pipe fittings utilized in water supply systems shall also comply with NSF 61. The fittings shall not have ledges, shoulders or

reductions capable of retarding or obstructing flow in the piping. Ductile and gray iron pipe fittings shall be cement mortar lined in accordance with AWWA C104.

TABLE 605.5 – PIPE FITTINGS

MATERIAL

Polybutylene (PB) plastic

STANDARD

ASSE 1061; CSA B137.8

605.25 Polybutylene plastic. Joints between polybutylene plastic pipe and tubing or fittings shall comply with Sections 605.25.1 through 605.25.3.

605.25.1 Flared joints. Flared pipe ends shall be made by a tool designed for that operation.

605.25.2 Heat-fusion joints. Joints shall be of the socket-fusion or butt-fusion type. Joint surfaces shall be clean and free from moisture. All joint surfaces shall be heated to melt temperature and joined. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM D 2657, ASTM D 3309 or CAN3-B137.8M.

605.25.3 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

605.22.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer or an ultraviolet purple primer that conforms to ASTM F 656 shall be applied. When an ultraviolet primer is used the installer shall provide an ultraviolet light to the inspector to be used during the inspection. Solvent cement not purple in color and conforming to ASTM D 2564 or CSA-B137.3 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

606.1 Location of full-open valves. Full-open valves shall be installed in the following locations:

1. Deleted.
2. A full-open valve shall be located either outside the building within 5 feet (1524 mm) of the foundation wall in a readily accessible valve box, in the crawl space within 3 feet (914 mm) of the crawl space access door or within the building in a location where it may be accessed without the use of a ladder or a tool.
3. Deleted.
4. On the base of every water riser pipe in occupancies other than multiple-family residential occupancies that are two stories or less in height and in one- and two-family residential occupancies.
5. On the top of every water down-feed pipe in occupancies other than one- and two-family residential occupancies.
6. On the entrance to every water supply pipe to a dwelling unit, except where supplying a single fixture equipped with individual stops.
7. On the water supply pipe to a gravity or pressurized water tank.
8. On the water supply pipe to every water heater.

606.2 Location of shutoff valves. Shutoff valves shall be installed within 3 feet (914 mm) on the same floor in the following locations:

1. On the fixture supply to each plumbing fixture other than bathtubs and showers.
2. Deleted.
3. On the water supply pipe to each appliance or mechanical equipment.

606.2.1 Buildings other than dwellings or dwelling units. Each supply branch line serving more than one fixture shall have a shut-off valve installed so as to isolate all fixtures and all pieces of equipment supplied by the branch line. The shut-off valve shall be labeled and located as close to the connection to the supply main and riser as practical.

606.4 Valve identification. Service valves shall be identified. All other valves installed in locations that are not adjacent to the fixture or appliance shall be identified, indicating the fixture or appliance served.

TABLE 606.5.4 SIZES FOR OVERFLOW PIPES FOR WATER SUPPLY TANKS

MAXIMUM CAPACITY OF WATER SUPPLY LINE TO TANK (gpm)	DIAMETER OF OVERFLOW PIPE (inches)
0-50	2
<u>51</u> - 150	2 ½
<u>151</u> - 200	3
<u>201</u> - 400	4
<u>401</u> - 700	5
<u>701</u> - 1,000	6
Over 1,000	8

For SI: 1 inch = 25.4 mm, 1 gallon per minute = 3.785 L/m.

TABLE 606.5.7 SIZE OF DRAIN PIPES FOR WATER TANKS

TANK CAPACITY (gallons)	DRAIN PIPE (inches)
Up to 750	1
751 to 1,500	1 ½
1,501 to 3,000	2
3,001 to 5,000	2 ½
<u>5,001</u> to 7,500	3
Over 7,500	4

For SI: 1 inch = 25.4 mm, 1 gallon = 3.785 L.

607.1 Where required. Each dwelling unit shall be provided with an adequate source of hot water for each family unit to meet minimum basic requirements for health, sanitation and personal hygiene. Central water heating facilities shall be accessible for emergency maintenance without entering any individual apartment or living unit when supplying hotwater to that unit. In other occupied structures hot water may be supplied to all plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance.

607.2 Hot water supply temperature maintenance. Deleted.

607.2.3 Recirculating pump. Deleted.

TABLE 608.8.3 SIZE OF PIPE IDENTIFICATION

PIPE DIAMETER (inches)	LENGTH BACKGROUND COLOR FIELD (inches)	SIZE OF LETTERS (inches)
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$\frac{3}{8}$ to $1\frac{1}{4}$	8	0.5
$1\frac{1}{2}$ to 2	8	0.75
$2\frac{1}{2}$ to 6	12	1.25
8 to 10	24	2.5
over 10	32	3.5

For SI: 1 inch = 25.4 mm.

608.17 Protection of individual water supplies. Deleted.

608.17.1 Well locations. Deleted.

TABLE 608.17.1. Deleted.

608.17.2 Elevation. Deleted.

608.17.3 Depth. Deleted.

608.17.4 Water-tight casings. Deleted.

608.17.5 Drilled or driven well casings. Deleted.

608.17.6 Dug or bored well casings. Deleted.

608.17.7 Cover. Deleted.

608.17.8 Drainage. Deleted.

610.1 General. Permitted new or repaired potable water systems shall be purged of deleterious matter prior to utilization.

613.1 Temperature-actuated mixing valves. Temperature actuated mixing valves, which are installed to reduce water temperatures to defined limits, shall comply with ASSE 1016 or ASSE 1017.

SECTION 614 – PARTIAL FIRE SPRINKLER PROTECTION IN ONE- AND TWO-FAMILY DWELLINGS.

614.1 Partial fire protection. Nothing herein shall be deemed to prohibit the connection to the domestic water distribution system of a system of one or more fire suppression sprinkler heads in one or more rooms of a one- or two-family dwelling, nor shall such installation impose additional requirements on said domestic water distribution system with regard to pipe size, water pressure, meter size, monitoring or alarm, provided that:

1. The sprinkler heads used are residential fast-response type.
2. Each branch feeding one or more sprinkler heads shall be provided with an isolation valve which shall be readily accessible and the function thereof shall be marked.
3. Each isolation valve shall be identified as to function with a tag or other device which shall indicate that the system does not meet the requirements of NFPA 13D.
4. The piping installation and material shall comply with the requirements of the Plumbing Code.

SECTION 615 – FULL FIRE SPRINKLER PROTECTION IN ONE- AND TWO-FAMILY DWELLINGS

615.1 Full fire protection. Where a full fire sprinkler system is installed, it shall comply with NFPA 13D.

CHAPTER 7 – SANITARY DRAINAGE

701.2 Sewer required. Every building in which plumbing fixtures are installed and all premises having drainage piping shall be connected to a public sewer, where available, or an approved private sewage disposal system.

701.4 Sewage treatment. Sewage or other waste from a plumbing system that is deleterious to surface or subsurface waters shall not be discharged into the ground or into any waterway unless it has first been rendered innocuous through proper treatment approved by the authority having jurisdiction.

701.5 Damage to drainage system or public sewer. Wastes detrimental to the public sewer system or detrimental to the functioning of the private sewage system shall be treated and disposed of in accordance with Section 1003.

701.8 Engineered systems. Deleted.

TABLE 702.2 – UNDERGROUND BUILDING DRAINAGE AND VENT PIPE
(Under the MATERIAL column)

Copper or copper-alloy tubing
(Type K or L)

TABLE 702.4 – PIPE FITTINGS
(Under the MATERIAL column)

Polyvinyl chloride (PVC) plastic in IPS diameters
ASTM D 2665
ASTM F 1866 (10 inches diameter and larger)

703.2 Drainage pipe in filled ground. A building sewer or building drain is installed in unstable fill or unstable ground shall be of cast-iron pipe, except that nonmetallic drains may be laid upon an approved continuous supporting system if installed in accordance with the manufacturer's installation instructions.

704.5 Dead ends. In the installation or removal of any part of a drainage system, dead ends shall be prohibited. Cleanout extensions and approved future fixture drainage piping shall not be considered as dead ends.

705.8.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer or an ultraviolet purple primer that conforms to ASTM F 656 shall be applied. When an ultraviolet primer is used the installer shall provide an ultraviolet light to the inspector to be used during the inspection. Solvent cement not purple in color and conforming to ASTM D 2564, CSA-B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

705.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer or an ultraviolet purple primer that conforms to ASTM F 656 shall be applied. When an ultraviolet primer is used the installer shall provide an ultraviolet light to the inspector to be used during the inspection. Solvent cement not purple in color and conforming to ASTM D 2564, CSA-B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the

cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

TABLE 706.3 – FITTINGS FOR CHANGE IN DIRECTION
(Bring forward Table from the 2009 NC Plumbing Code.)

For SI: 1 inch = 25.4 mm.

- a. The fittings shall only be permitted for a 2-inch or smaller sink or lavatory fixture drain.
- b. Two inches or larger.
- c. For a limitation on double sanitary tees, see Section 706.3.
- d. May be used only within 12 inches below water closet flange measured to centerline of the quarter bend.
- e. This fitting shall only be permitted to be used as the first fitting directly behind the fixture for drains 2 inches and smaller, except clothes washers.
- f. The heel inlet connection of a quarter bend may be used as a wet or dry vent if the heel inlet connection of the quarter bend is located in the vertical position. The heel or side inlet connection may be used as a wet vent if the quarter bend is located directly below water closet or other fixture with one integral trap.

706.3 Installation of fittings.

706.3 Installation of fittings. Fittings shall be installed to guide sewage and waste in the direction of flow. Change in direction shall be made by fittings installed in accordance with Table 706.3. Change in direction by combination fittings, side inlets or increasers shall be installed in accordance with Table 706.3 based on the pattern of flow created by the fitting. Double sanitary tee patterns shall not receive the discharge of back-to-back appliances with pumping action discharge.

Exception: Deleted.

708.1 Scope. This section shall govern the size, location, installation and maintenance of gravity drainage pipe cleanouts.

708.3.2 Gravity building sewers. Building sewers shall be provided with cleanouts located not more than 100 feet (30 480 mm) apart measured from the upstream entrance of the cleanout. For building sewers 8 inches (203 mm) and larger, manholes shall be provided and located not more than 200 feet (60 960 mm) from the junction of the building drain and building sewer, at each change in direction and at intervals of not more than 400 feet (122 m) apart. Manholes and manhole covers shall be of an approved type.

708.3.3 Changes of direction. One cleanout shall be required for every four horizontal 45-degree (0.79 rad) changes located in series [a long sweep is equivalent to two 45-degree (0.79 rad) bends].

708.3.5 Building drain and building sewer junction. There shall be a cleanout near the junction of the building drain and the building sewer. The cleanout shall be outside the building wall and shall be brought up to the finished ground level. An approved two-way cleanout is allowed to be used at this location to serve as a required cleanout for both the building drain and building sewer. The cleanout at the junction of the building drain and building sewer shall not be required if the cleanout on a 3-inch (76 mm) or larger diameter soil stack is located within a

developed length of not more than 15 feet (4572 mm) from the building drain and building sewer connection and is extended to the outside of the building. The minimum size of the cleanout at the junction of the building drain and building sewer shall comply with Section 708.7.

708.7 Minimum size. Cleanouts shall be the same nominal size as the pipe they serve up to 4 inches (102 mm). For pipes larger than 4 inches (102 mm) nominal size, the minimum size of the cleanout shall be 4 inches (102 mm).

Exceptions: Deleted.

708.10 Location. Each horizontal drainage pipe shall be provided with a cleanout at the upstream end of the pipe.

Exceptions: The following plumbing arrangements are acceptable in lieu of the upstream cleanout.

1. "P" traps connected to the drainage piping with slip joints or ground joint connections.
2. "P" traps into which floor drains, shower drains or tub drains with removable strainers discharge.
3. "P" traps into which the straight-through type waste and overflow discharge with the overflow connecting to the top of the tee.
4. "P" traps into which residential washing machines discharge.
5. Test tees or cleanouts in a vertical pipe.
6. Cleanout near the junction of the building drain and the building sewer which may be rodded bothways.
7. Water closets for the water closet fixture drain only.
8. Cast-iron cleanout sizing shall be in accordance with referenced standards in Table 702.4, ASTM A 74 for hub and spigot fittings or ASTM A 888 or CISPI 301 for hubless fittings.

TABLE 709.1 – DRAINAGE FIXTURE UNITS FOR FIXTURES AND GROUPS

In the **FIXTURE TYPE** column:

Bathroom group as defined in Section 202 (1.6 gpf water closet) **f.i**

Kitchen sink, domestic with food waste grinder and/or dishwasher **i**

Shower (based on the total flow rate through showerheads and body sprays)

5.7 gpm or less 2 2

Footnotes:

i. Fixture arm and trap shall be 1 ½ inch minimum; vertical drain shall be 2 inch minimum.

j. For one- and two-family dwelling units, add 2 DFU for each additional full bath.

TABLE 710.1(1) – BUILDING DRAINS AND SEWERS

b. No building sewer shall be less than 4 inches in size.

c. No more than three water closets.

d. Minimum 2-inch diameter.

TABLE 710.1(2) – HORIZONTAL FIXTURE BRANCHES AND STACKS

d. No more than three water closets.

e. 50 percent less for circuit-vented fixture branches.

f. Minimum of 2-inch diameter underground.

g. The minimum size of any branches serving a water closet shall be 3 inches.

712.2 Fittings required. A check valve, a full open valve, and cleanout located on the discharge side of the check valve shall be installed in the pump or ejector discharge piping between the pump or ejector and the gravity drainage system. Access shall be provided to such valves. Such valves shall be located above the sump cover required by Section 712.1 or, where the discharge pipe from the ejector is below grade, the valves shall be accessibly located outside the sump below grade in an access pit with a removable access cover.

712.3.3 Discharge piping. Discharge piping and fittings shall be constructed of approved pressure rated materials.

712.3.4.1 Sump alarms. Sumps that discharge by means of automatic pumping equipment shall be provided with an approved, electrically operated high-water indicating alarm. A remote sensor shall activate the alarm when the fluid level exceeds a preset level that is less than the maximum capacity of the sump. The alarm shall function to provide an audiovisual signal to occupants within the dwelling. Electrical power for the alarm shall be supplied through a branch circuit separate from that supplying the pump motor.

712.4 Sewage pumps and sewage ejectors. A sewage pump or ejector pump discharge pipe shall not discharge directly into a septic tank. The pumped line shall discharge laterally into a 4-inch (102 mm) gravity line not less than 10 feet (3048 mm) from the connection to the tank through a lateral wye branch.

SECTION 714 – COMPUTERIZED DRAINAGE DESIGN – Deleted.

CHAPTER 8 – INDIRECT/SPECIAL WASTE

801.1 Scope. This chapter shall govern matters concerning indirect waste piping and special wastes. This chapter shall further control matters concerning food-handling establishments, sterilizers, clear-water wastes, swimming pools, methods of providing air breaks or air gaps, and neutralizing devices for corrosive wastes. Condensate piping between the air-conditioning unit and the point of discharge shall be installed in accordance with the requirements of the *North Carolina Mechanical Code.*

802.1.1 Food handling. 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.

Exception: This requirement shall not apply to residential type dishwashing machines and residential-type dishwashing sinks.

802.1.2 Floor drains in food storage areas. Floor drains located within walk-in refrigerators or freezers in food service and food establishments shall be indirectly connected to the sanitary drainage system by means of an air gap. Where a floor drain is located within an area subject to freezing, the waste line serving the floor drain shall not be trapped and shall indirectly discharge into a waste receptor located outside of the area subject to freezing.

Exception: Deleted.

802.1.3 Potable clear-water waste. Where devices and equipment, such as sterilizers and relief valves, discharge potable water to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air gap. Drinking fountains may be connected directly or indirectly.

802.1.7 Commercial dishwashing machines. The discharge from a commercial dishwashing machine shall be through an air gap into a standpipe or waste receptor in accordance with Section 802.2.1.

802.4 Standpipes. Standpipes shall be 2 inches (51 mm) in diameter and not less than 18 inches (762 mm) or more than 48 inches (1219 mm) in height as measured from the crown weir. The standpipe shall extend 34 inches (864 mm) minimum above the base of the clothes washer unless recommended otherwise by the manufacturer. The connection of a laundry tray waste line may be made into a standpipe for the automatic clothes-washer drain. The outlet of the laundry tray shall be a maximum horizontal distance of 30 inches (762 mm) from the standpipe trap.

803.3 System design. Deleted.

803.4 Piscina drain. The drain from a wash basin (piscina) located in a sacristy may be connected directly to a dry well.

803.5 Acid soil and waste piping. For engineered acid soil and waste drainage systems, the type of pipe shall be selected by a registered design professional. For nonengineered acid soil and waste drainage systems, the piping shall be of a material which is designed and recommended by the manufacturer as suitable for the type of waste drained. Piping shall be installed in accordance with the manufacturer's installation instructions. When installed within buildings, piping of combustible materials shall be of a flame-retardant type rated at least V-2 in accordance with UL-94. Concentrations of acidwaste which are sufficient to adversely affect the conventional drainage system shall be suitably diluted or neutralized before interconnection. Fittings shall conform to the type of piping used.

CHAPTER 9 – VENTS

901.2.1 Venting required. Every trap and trapped fixture shall be vented in accordance with one of the venting methods specified in this chapter. All fixtures discharging downstream from a water closet shall be individually vented except as provided in Section 911.

901.3 Chemical waste vent system. The vent system for a chemical waste system shall be independent of the sanitary vent system and shall terminate separately through the roof to the open air, and not less than 6 inches above roof or parapet.

901.6 Engineered systems. Deleted.

903.1 Stack required. Every building in which plumbing is installed shall have at least one stack the size of which is not less than one-half of the required diameter of the building drain, and not less than 2 inches (51 mm) in diameter. Such stack shall run undiminished in size and as directly as possible from the building drain through to the open air or to a vent header that extends to the open air.

903.1.1 Connection to drainage system. A vent stack shall connect to the building drain or to the base of a drainage stack in accordance with Section 903.4. A stack vent shall be an extension of the drainage stack. For townhouses and one- and two-family dwellings, the main vent shall connect to the building drain, building stack or branch thereof not less than 3 inches (76 mm) in size.

903.1.2 Size. Deleted.

903.3 Vent termination. Vent stacks or stack vents shall extend outdoors and terminate to the open air.

904.1 Roof extension. All open vent pipes that extend through a roof shall be terminated at least 6 inches (152 mm) above the roof, except where the roof is used by the public or by tenants for any purpose, the vent extensions shall be run at least 7 feet (2134 mm) above the roof.

904.5 Location of vent terminal. An open vent terminal from a drainage system shall not be located directly beneath any door, openable window, or other air intake opening of the building or of an adjacent building or property line, and any such vent terminal shall not be within 10 feet (3048 mm) horizontally of such an opening unless it is at least 2 feet (610 mm) above the top of such opening.

904.6 Extension through the wall. Vent terminals extending through the wall shall terminate a minimum of 10 feet (3048 mm) from the lot line and 10 feet (3048 mm) above average ground level. Vent terminals shall not terminate under the overhang of a structure with soffit vents. Side wall vent terminals shall not terminate horizontally to prevent birds or rodents from entering or blocking the vent opening.

905.4 Vertical rise of vent. Every dry vent shall rise vertically to a minimum of 6 inches (152 mm) above the flood level rim of the highest trap or trapped fixture being vented.

Exception: When vents for interceptors and isolated floor drains are not located near an adjacent wall, the vent must rise 6 inches (152 mm) vertically before turning horizontally and continuing to the nearest wall. For cleaning purposes, a cleanout the same size as the vent shall be installed.

906.1 Distance of trap from vent. Each fixture trap shall have a protecting vent located so that the slope and the developed length in the fixture drain from the trap weir to the vent fitting are within the requirements set forth in Table 906.1.

Exception: Deleted.

908.3 Connection at different levels. Where the fixture drains connect at different levels, the vent shall connect as a vertical extension of the vertical drain. The vertical drain pipe connecting the two fixture drains shall be considered the vent for the

lower fixture drain, and shall be sized in accordance with Table 908.3. The upper fixture shall not be a water closet or clothes washer.

TABLE 908.3 needs to read like **TABLE 909.3**.

909.1 Wet vent permitted. Any combination of fixtures within two bathroom groups located on the same floor level is permitted to be vented by a horizontal wet vent. The wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent along the direction of the flow in the drain pipe to the most downstream fixture drain connection to the horizontal branch drain. Each wet-vented fixture drain shall connect independently to the horizontal wet vent. Only the fixtures within the bathroom groups shall connect to the wet-vented horizontal branch drain. A residential clothes washer drain line shall not be used as a wet vent.

909.1.1 Vertical wet vent permitted. Any combination of fixtures located on the same floor level is permitted to be vented by a vertical wet vent. The vertical wet vent shall extend from the connection to the dry vent down to the lowest fixture drain connection. Each fixture shall connect independently to the vertical wet vent. Water closet drains shall connect at the same elevation. Other fixture drains shall connect above or at the same elevation as the water closet fixture drains. The dry-vent connection to the vertical wet vent shall be an individual or common vent serving one or two fixtures.

909.2 Vent connection. The dry-vent connection to the wet vent shall be an individual vent or common vent. The dry vent shall be sized based on the largest required diameter of pipe within the wet vent system served by the dry vent.

909.2.1 Horizontal wet vent. Deleted.

909.2.2 Vertical wet vent. Deleted.

909.3 Size. The wet vent shall be of a minimum size as specified in Table 909.3, based on the fixture unit discharge to the wet vent.

909.4 Multistory bathroom groups. On the lower floors of a multistory building, the waste pipe from one or two lavatories may be used as a wet vent for one or two bathtubs or showers provided that:

1. The wet vent and its extension to the vent stack is not less than 2-inch (51 mm) diameter;
2. Each water closet below the top floor is individually back vented; and
3. The vent stack is sized in accordance with Table 909.4.

Exception: In multistory bathroom groups (does not apply to one- and two-family dwellings), wet vented in accordance with Section 909.4, the water closets below the top floor need not be individually vented if a 2-inch (51 mm) wet vent connects downstream of the water closet.

TABLE 909.4 SIZE OF VENT STACK

NUMBER OF WET VENTED FIXTURES	DIAMETER OF VENT STACKS (in.)
<u>1 or 2 bathtubs or showers</u>	<u>2</u>
<u>3 to 5 bathtubs or showers</u>	<u>2 1/2</u>
<u>6 to 9 bathtubs or showers</u>	<u>3</u>

SECTION 912 – COMBINATION WASTE AND VENT SYSTEM

912.1 Approval. Plans and specifications for each combination waste and vent system shall be submitted to the plumbing official, and approval shall be obtained before any installation is started.

912.2 Limits.

912.2.1 A combination waste and vent system is limited to sinks, dishwashers, floor sinks, indirect waste receptors, floor drains or similar applications where the fixtures are not adjacent to walls or partitions. It consists of the installation of waste piping in which the trap of the fixture is not individually vented.

912.2.2 Caution must be exercised to exclude appurtenances delivering large quantities of water or sewage such as pumps, etc., in a combination waste and vent system in order that adequate venting will be maintained.

912.2.3 Vent size. The vent shall be sized for the total drainage fixture unit load in accordance with Section 916.2.

912.2.4 Fixture branch or drain. The fixture branch or fixture drain shall connect to the combination drain and vent within a distance specified in Table 906.1. The combination drain and vent pipe shall be considered the vent for the fixture.

912.3 Dishwashers. Dishwashers and scullery sinks in commercial buildings shall drain through a grease interceptor sized in accordance with this code and they shall discharge into a floor sink through a minimum air gap.

912.4 General design.

912.4.1 Every waste pipe and trap in this system shall be at least two pipe sizes larger than the size required in Chapter 7, and at least two pipe sizes larger than any fixture tailpiece or connection, except that when “P” traps are installed above the floor, the “P” trap and horizontal fixture drain need not meet this requirement. The vertical waste pipe two sizes larger than the fixture outlet connection shall be extended above the floor to normal roughing height, and a cleanout shall be installed in top of the connecting waste tee. The fixture drain length shall be limited by Table 906.1. Floor sinks shall be connected through a running trap two pipe sizes larger than the sink outlet. Floor sink and waste piping from the floor sink to the trap shall be sized for the total fixture units draining thereto, based on Table 709.1, but in no case shall the line be less than 2-inch (51 mm) soil pipe when piping is underground.

912.4.2 A vent shall be provided at the upstream end of each branch, washed over or under by the last fixture on the branch. No vent shall take off from the horizontal waste branch at an angle of less than 45 degrees (0.785 rad) from the horizontal unless washed by a fixture. A minimum size vent shall be located at all points where branches intersect. A vent shall be located downstream from all fixtures in the

system, in addition to the upstream vent, separating this system from all other systems in the building. No fixtures other than those permitted in Section 912.2 shall discharge into any branch or portion of this system.

912.4.3 Caution shall be used in the design of the system to ensure that the vertical distance from fixture or drain outlet to trap weir does not exceed 24 inches (610 mm). Long runs shall be provided with additional relief vents located at intervals of not more than 100 feet (30 480 mm) to equalize pressure in the system.

912.5 Size of vents. The size of vents shall be in accordance with requirements of Section 916.1 and Table 916.1, but the diameter shall be not less than one-half of the diameter of the waste pipe served.

912.6 Receptor drain size. Indirect waste receptors shall be sized for the fixture units draining thereto, regardless of other requirements of this code.

913.2 Vent connection. The island fixture vent shall connect to the fixture drain as required for an individual or common vent. The vent shall rise vertically to above the drainage outlet of the fixture being vented before offsetting horizontally or vertically downward. For multiple island fixture vents, the vent or branch vent shall extend to a minimum of 6 inches (152 mm) above the highest island fixture being vented before connecting to the outside vent terminal.

916.5.1 Sewage pumps and sewage ejectors other than pneumatic. Drainage piping below sewer level shall be vented in a similar manner to that of a gravity system. Building sump vent sizes for sumps with sewage pumps or sewage ejectors, other than pneumatic, shall be determined in accordance with Table 916.5.1. An open vent terminal from a drainage system shall not be located directly beneath any door, openable window, or other air intake opening of the building or of an adjacent building or property line, and any such vent terminal shall not be within 10 feet (3048 mm) horizontally of such an opening unless it is at least 2 feet (610 mm) above the top of such opening.

917.1 General. Vent systems utilizing air admittance valves shall comply with this section. Individual and branch-type air admittance valves shall conform to ASSE 1051 or ASSE 1050.

917.3 Where permitted. Individual, branch and circuit vents shall be permitted to terminate with a connection to an air admittance valve. The air admittance valves shall vent only fixtures that are on the same floor level and connect to a horizontal branch drain. The horizontal branch drain shall conform to Section 917.3.1 or 917.3.2.

917.3.2 Relief vent. The horizontal branch shall be provided with a relief vent that shall connect to a vent stack or stack vent, or extend outdoors to the open air. The relief vent shall connect to the horizontal branch drain between the stack or building drain and the most downstream fixture drain connected to the horizontal branch drain. The relief vent shall be sized in accordance with Section 916.2 and installed in accordance with Section 905. The relief vent shall be permitted to serve as the vent for other fixtures.

917.3.3 Stack. Deleted.

917.4 Location. The air admittance valve shall be located a minimum of 4 inches (102 mm) above the horizontal branch drain or fixture drain being vented. The air admittance valve shall be located within the maximum developed length permitted for the vent. The air admittance valve shall be installed a minimum of 6 inches (152 mm) above insulation materials.

SECTION 918 – ENGINEERED VENT SYSTEMS – Deleted.

SECTION 919 – COMPUTERIZED VENT DESIGN – Deleted.

SECTION 920 SINGLE STACK PLUMBING SYSTEMS (SOVENT)

920.1. Design and installation shall be in accordance with design criteria contained in the Copper Development Association (CDA) Handbook No. 802. Materials shall meet standards and specifications listed in Tables 702.1 and 702.4 for drain, waste and vent pipe and fittings.

CHAPTER 10 TRAPS, INTERCEPTORS AND SEPARATORS

1002.1 Fixture traps. Each plumbing fixture shall be separately trapped by a liquid-seal trap, except as otherwise permitted by this code. The vertical distance from the fixture outlet to the trap weir shall not exceed 24 inches (610 mm), and the horizontal distance shall not exceed 30 inches (610 mm) measured from the centerline of the fixture outlet to the centerline of the inlet of the trap. The height of a clothes washer standpipe above a trap shall conform to Section 802.4. A fixture shall not be double trapped.

Exceptions:

1. This section shall not apply to fixtures with integral traps.
2. A combination plumbing fixture or up to three similar fixtures is permitted to be installed on one trap, provided that one compartment is not more than 6 inches (152 mm) deeper than the other compartment and the waste outlets are not more than 30 inches (762 mm) apart.
3. Agrease interceptor intended to serve as a fixture trap in accordance with the manufacturer's installation instructions shall be permitted to serve as the trap for a single fixture or a combination sink of not more than three compartments where the vertical distance from the fixture outlet to the inlet of the interceptor does not exceed 30 inches (762 mm) and the developed length of the waste pipe from the most upstream fixture outlet to the inlet of the interceptor does not exceed 60 inches (1524 mm).
4. The connection of a laundry tray complying with Section 802.4.

1002.6 Building traps. Deleted.

1002.8 Recess for trap connection. Deleted.

1002.9 Acid-resisting traps. Deleted.

1002.10 Plumbing in mental health centers. Deleted.

1003.2 Approval. The size, type and location of each interceptor and of each separator shall be designed and installed in accordance with the manufacturer's instructions, the requirements of the local utility department or health department and the requirements of this section based on the anticipated conditions of use. Wastes that do not require treatment or separation shall not be discharged into any interceptor or separator.

1003.3 Grease interceptors. Grease interceptors shall comply with the requirements of Sections 1003.3.1 through 1003.3.5 or with the requirements of the local utility department or health department.

1003.4 Oil separators required. At repair garages, car-washing facilities, and factories where oily and flammable liquid wastes are produced, separators shall be installed into which all oil-bearing, grease-bearing or flammable wastes shall be discharged before emptying into the building drainage system or other point of disposal.

Exception: Deleted.

1003.6 Laundries. Laundry facilities not installed within an individual dwelling unit or intended for individual family use shall be equipped with an interceptor, a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids 0.5 inch (12.7 mm) or larger in size, string, rags, buttons or other materials detrimental to the public sewage system.

CHAPTER 11 STORM DRAINAGE

1101.1 Scope. The provisions of this chapter shall govern the materials, design, construction and installation of storm drainage, except in one- and two-family dwellings.

1101.2 Where required. All roofs, paved areas, yards, courts and courtyards shall drain into a separate storm sewer system, or a combined sewer system, or to an approved place of disposal.

TABLE 1102.7 PIPE FITTINGS

MATERIAL	STANDARD
Polyvinyl chloride (PVC) plastic	ASTM D 2665; ASTM D 3311; ASTM F <u>1866 (10 inches diameter and larger)</u>

FIGURE 1106.1 100-YEAR, 1-HOUR RAINFALL (INCHES/HOUR) NORTH CAROLINA FOR PRIMARY ROOF DRAINS

FIGURE 1106.1(a) 100-YEAR, 15-MINUTE RAINFALL (INCHES/HOUR) NORTH CAROLINA FOR SECONDARY ROOF DRAINS

TABLE 1106.3 SIZE OF HORIZONTAL STORM DRAINAGE PIPING^a

a. For Tables 1106.3 and 1106.6, when rainfall rates exceed 6 inches per hour, then the figures for roof area shall be adjusted proportionally by multiplying the figure by six and dividing by the maximum rate of rainfall in inches per hour (see Figure 1106.1(a)).

1106.5 Parapet wall scupper location. Parapet wall roof drainage scupper and overflow scupper location shall comply with the requirements of Figure 1106.5.

(North Carolina) FIGURE 1106.5 SIZE OF SCUPPERS

TABLE 1106.6 SIZE OF SEMICIRCULAR ROOF GUTTERS

a. For Tables 1106.3 and 1106.6, when rainfall rates exceed 6 inches per hour, then the figures for roof area shall be adjusted proportionally by multiplying the figure by six and dividing by the maximum rate of rainfall in inches per hour [see Figure 1106.1(a)].

1107.3 Sizing of secondary drains. Secondary (emergency) roof drain systems shall be sized in accordance with Section 1106 based on the rainfall rate indicated in Figure 1106.1(a). Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.7. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.

CHAPTER 12 SPECIAL PIPING AND STORAGE SYSTEMS Deleted.

CHAPTER 13 REFERENCED STANDARDS
(No changes were made to Chapter 13.)

APPENDIX A PLUMBING PERMIT FEE SCHEDULE
The provisions contained in this appendix are deleted.

APPENDIX B RATES OF RAINFALL FOR VARIOUS CITIES
The provisions contained in this appendix are adopted as part of this code.

APPENDIX C GRAY WATER RECYCLING SYSTEMS
The provisions contained in this appendix are adopted as part of this code.

RAIN WATER. Water collected from roof areas and other approved areas.

C101.10 Collection reservoir. Gray water shall be collected in an approved reservoir constructed of durable, nonabsorbent and corrosion-resistant materials. The reservoir shall be a closed and gas-tight vessel. Access openings shall be provided to allow inspection and cleaning of the reservoir interior.

Exception: Does not need to be closed and gas tight for rainwater.

C101.11 Filtration. Gray water entering the reservoir shall pass through an approved filter such as a media, sand or diatomaceous earth filter.

Exception: Filters may be placed on discharge from the reservoir.

C102.1 Collection reservoir. The holding capacity of the reservoir shall be a minimum of twice the volume of water required to meet the daily flushing requirements of the fixtures supplied with gray water, but not less than 50 gallons (189 L).

S E C T I O N C 1 0 3 SUBSURFACE LANDSCAPE IRRIGATION SYSTEMS

Note: Not applicable for rain water systems.

(Add the following note to Figures 1 and 2:)

Not applicable to rain water systems.

APPENDIX C1 RAIN WATER RECYCLING SYSTEMS

The provisions contained in this appendix are adopted as part of this code.

Note: Section 301.3 of this code requires all plumbing fixtures that receive water or waste to discharge to the sanitary drainage system of the structure. In order to allow for the utilization of a rain water system, Section 301.3 should be revised to read as follows:

301.3 Connections to drainage system. All plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems required by Chapter 8.

SECTION C1-101 GENERAL

C1-101.1 Scope. The provisions of this appendix shall govern the materials, design, construction and installation of rain water systems for flushing of water closets and urinals.

C1-101.2 Definition. The following term shall have the meaning shown herein.

GRAY WATER. Waste discharged from lavatories, bathtubs, showers, clothes washers and laundry trays.

RAIN WATER. Water collected from the roof of a building or other catchment surface during a rainfall event and stored in a reservoir for non-potable use.

C1-101.3 Permits. Permits shall be required in accordance with Section 106.

C1-101.4 Installation. In addition to the provisions of Section C1-101, systems for flushing of water closets and urinals shall comply with Section C1-102. Except as provided for in Appendix C1, all systems shall comply with the provisions of the *International Plumbing Code*.

C1-101.5 Materials. Above-ground drain, waste and vent piping for rain water systems shall conform to one of the standards listed in Table 702.1. Rain water underground building drainage and vent pipe shall conform to one of the standards listed in Table 702.2.

C1-101.6 Tests. Drain, waste and vent piping for rain water systems shall be tested in accordance with Section 312.

C1-101.7 Inspections. Rain water systems shall be inspected in accordance with Section 107.

C1-101.8 Potable water connections. Only connections in accordance with Section C1-102.3 shall be made between rain water recycling system and a potable water system.

C1-101.9 Rain water connections. Rain water recycling systems shall receive only the water discharge from the roof of buildings or other catchments.

C1-101.10 Collection reservoir. Rain water shall be collected in an approved reservoir constructed of durable, nonabsorbent and corrosion-resistant materials. Access openings shall be provided to allow inspection and cleaning of the reservoir interior.

C1-101.11 Filtration. Rain water entering the reservoir shall pass through an approved filter strainer, be disinfected and colored blue or green.

C1-101.12 Overflow. The collection reservoir shall be equipped with an overflow pipe having the same or larger diameter as the influent pipe for the rain water. The overflow pipe shall discharge to the storm drainage system or to day light.

SECTION C 1 - 1 0 2 SYSTEMS FOR FLUSHING WATER CLOSETS AND URINALS

C1-102.1 Collection reservoir. The holding capacity of the reservoir is not limited.

C1-102.2 Makeup water. An alternate water supply shall be provided as a source of makeup water for the rain water system. An alternate water supply shall be protected against backflow in accordance with Section 608. The alternate water source may be a potable water system or an irrigation well.

C1-102.3 Materials. Distribution piping shall conform to one of the standards listed in Table 605.4. This does not apply to the irrigation portion of the system.

C1-102.4 Identification. Distribution piping (not including irrigation piping) and reservoirs shall be identified as containing nonpotable water. Piping identification shall be in accordance with Section 608.8.

APPENDIX D DEGREE DAY AND DESIGN TEMPERATURES

The provisions contained in this appendix are deleted.

APPENDIX E SIZING OF WATER PIPING SYSTEM

The provisions contained in this appendix are adopted as part of this code.

APPENDIX F STRUCTURAL SAFETY

The provisions contained in this appendix are adopted as part of this code.

APPENDIX G VACUUM DRAINAGE SYSTEM

The provisions contained in this appendix are adopted as part of this code.

APPENDIX H RODENT PROOFING

The provisions contained in this appendix are adopted as part of this code.

H304.1 General. Buildings or structures and the walls enclosing habitable or occupiable rooms and spaces in which persons live, sleep or work, or in which feed, food or foodstuffs are stored, prepared, processed, served or sold, shall be constructed in accordance with the provisions of this section.

H304.2 Foundation wall ventilation openings. Foundation wall ventilator openings shall be covered for their height and width with perforated sheet metal plates no less than 0.070 inch (1.8 mm) thick, expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick, cast iron grills or grating, extruded aluminum load-bearing vents or with hardware cloth of 0.035 inch (0.89 mm) wire or heavier. The openings therein shall not exceed 1/4 inch (6.4 mm).

H304.3 Foundation and exterior wall sealing. Annular spaces around pipes, electric cables, conduits, or other openings in the walls shall be protected against the passage of rodents by closing such openings with cement mortar, concrete masonry, silicone caulking or noncorrosive metal.