

# **NORTH CAROLINA STATE BUILDING CODE**

**ARTICLE XX**

## **PLUMBING**



**1963 EDITION**

Published by  
**THE NORTH CAROLINA BUILDING CODE COUNCIL**  
and the  
**NORTH CAROLINA DEPARTMENT OF INSURANCE**  
Room 300, Labor Building  
Raleigh, N. C.

## ARTICLE XX

### PLUMBING

Replace Article XX Plumbing with the technical provisions of Chapter 2 through 15 including Appendix A, and B of the 1962-1963 Edition of the Southern Standard Plumbing Code. (Copies Available from N. C. Insurance Department @ \$1.03 per copy) (Adopted March 26, 1963; effective date September 26, 1963)

1. *Add the following paragraph to Section 1215 calling it 1215.7 of the State Plumbing Code: (Adopted July 14, 1964)*

"Dip tubes, supply and hot water nipples, supply water baffles or heat traps when used in hot water supply, storage tanks or heaters shall be constructed and tested to withstand a temperature of 400°F without deteriorating in any manner, and the tank so labeled by the manufacturer."

2. *Add Note 10 to Dwelling or Apartment Houses of Table 922.2 to read as follows: (Adopted Sept. 8, 1964)*

"Note 10—Washing machines—Water and drain connections in each dwelling or apartment unit unless central washing facilities are provided."

3. *Add Note 11 to all occupancies in Table 922.2 except dwelling or apartment houses and schools to read as follows: (Adopted Sept. 8, 1964)*

"Note 11—The installation of female urinals shall be optional."

4. **REVISE FOOTNOTE 1 OF TABLE 505 AS FOLLOWS:**

Asbestos cement building sewer pipe shall conform to ASTM Standard C-428-59T or Federal specification SS-P-331b (1962) with the following amendment:

**Diameter:** Pipe shall be supplied in nominal diameters of 4, 5, & 6 inch.

**Class:** Building sewer pipe shall be available in two strength classifications designated as Class 1500 and Class 2400.

**Lengths:** Pipe shall be supplied in standard lengths of 10 or 13 foot with  $\frac{1}{2}$  lengths 5 foot and 6 foot 6 inches respectively, available on request.

**Out of roundness:** Shall be measured inside the end of length at a point equal to  $\frac{1}{2}$  the coupling length and shall not exceed plus or minus  $\frac{3}{16}$  of one inch.

**Hydrostatic strength:** Not applicable.

Flexural strength:	4"	550 lbs.
	5"	950 lbs.
	6"	1500 lbs.

Each standard length shall be tested in flexure on a 9 foot span using the above total applied load. When supplying 13 foot lengths the manufacturer may test on a 12 foot span using 9/12 of the load specified in the above table.

Crushing Strength:		<i>Class 1500</i>	<i>Class 2400</i>
	4"	1500 lbs.	2400 lbs.
	5"	1500 lbs.	2400 lbs.
	6"	1500 lbs.	2400 lbs.

Each pipe when tested shall have sufficient crushing strength to withstand the above load when tested by the ASTM Three Bearing Test Method.

5. **Chapter VII—Traps and Cleanouts—Section 702.4—Drum Traps**  
*Revise paragraph (a) to read as follows:*

"(a) Drum traps shall be limited to special fixtures designed for drum traps and approved by the Chief Plumbing Official. They shall not be less than 4 inches in diameter and shall be provided with a water seal of not less than 2 inches."

6. **Chapter VII—Traps and Cleanouts—Section 703.5—Prohibited Traps**

*Add the following:*

"(f) Tubular Traps less than 20 gauge."

7. **Chapter X—Hangers and Supports—Section 1003.2—Cast-Iron Soil Pipe**

*Revise this Section as follows:*

"Cast-iron soil pipe shall be supported at not more than 5 foot intervals on 5 foot lengths and 10 foot intervals on 10 foot lengths. Hangers shall be located as near hubs as possible."

8. **Chapter XII—Water Supply and Distribution—Section 1213.3—Size of Fixtures—Supply**

*Change Hose Bibbs and Wall Hadrants from 1/2 inch to: "3/4 Inch."*

9. *Amend Section 602.13 of the State Plumbing Code as follows:*

602.13 Neoprene Gasket and Stainless Steel Retaining Sleeve.

"Joints for cast-iron soil pipe may be made by means of a neoprene gasket and stainless steel retaining sleeve. Stainless steel nuts for securing the stainless steel retaining sleeve should be equipped with a five-sided nut or other tamper-proof device."



10. **Chapter XIII—Drainage System—Section 1301.4—Underground Piping Within Buildings**

*This paragraph should be deleted and the following substituted therefor:*

“All underground drains within buildings shall be cast-iron soil pipe or lead. For buildings four stories or under in height the underground pipe may be of service weight cast-iron or lead. For buildings over four stories or more in height the underground pipe shall be of extra-heavy cast-iron or extra-heavy lead.”

**Drainage System—Section 1301.3—**

*The following sentence should be added after the first sentence of this paragraph:*

“Cast-Iron Soil Pipe and Fittings for Soil, waste, vent conductors or building drains when above ground (unless otherwise specified) may be service weight when identified as being in compliance with commercial standard CS 188-59.”



## FOREWORD

North Carolina has been a pioneer in the field of Statewide Building and Fire Prevention regulations which have been enacted for the protection of the public. The Building Laws passed in 1903 and 1905 created a Building Code for materials and methods of construction in use at that time.

The General Assembly of 1933 created a Building Code Council and authorized it to, in cooperation with the Commissioner of Insurance, prepare and adopt a Building Code. The first North Carolina Building Code received the approval of the official Building Code Council and the Commissioner of Insurance in 1935 and was printed that same year. The General Assembly of 1941 ratified and adopted this edition, which was known as the 1936 Edition.

The 1936 Edition contained a State Plumbing Code. It was rewritten by the State Board of Health and the Building Code Council in 1954. The 1954 Edition was printed as Article XX of the State Code and it was bound in the 1958 Edition. The 1933 Building Code Council authorized cities and towns to make changes in the State Code as long as they were more stringent. However, many cities and towns and counties rewrote the State Code and some adopted a plumbing code of their own thus providing for different plumbing regulations in many areas of the State.

The 1957 Legislature rewrote the 1933 Building Code Council Act and re-organized and expanded the Council. All local Codes different from the State Code were required to be approved by the Council.

The technical provisions herein are taken from the 1962-1963 Edition of the Southern Standard Plumbing Code published by the Southern Building Code Congress which is based mainly on the 1955 Edition of the National Plumbing Code, ASA, A40.8—1955.

The Code is presented with the hope that its use will protect the public from dangerous and unsanitary buildings and will provide Architects and Engineers a set of minimum standards to follow in designing buildings. The Building Code Council has authority to make changes in the Code when the wider use of materials and methods comply with standards set forth in the Laws. From time to time, there will be modifications and changes in the Code.

## BUILDING CODE COUNCIL

Members of the Building Code Council are as follows:

*Chairman*, R. F. BOOTH, PE  
Electrical Engineer, Raleigh

Vice-Chairman, A. H. JEFFRESS  
Attorney, Kinston

H. B. FOSTER, PE  
Structural Engineer  
Greensboro

RODNEY BREECE  
Building Inspector  
Wilmington

J. SIDNEY KIRK  
Department of Administration  
Raleigh

JACK COVINGTON  
General Contractor  
Winston-Salem

A. W. ROTH, PE  
Mechanical Engineer  
Charlotte

A. G. ODELL, JR., FAIA  
Architect  
Charlotte

J. J. BARNES  
Plumbing & Heating Contractor  
Fayetteville

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## INSURANCE DEPARTMENT

By Statute, the Commissioner of Insurance has general supervision of the Administration and enforcement of the North Carolina Building Code and the Engineering Division serves as the staff for the Building Code Council. Officials of the Insurance Department are:

EDWIN S. LANIER  
Commissioner of Insurance

N. E. CANNADY, FAIEE  
Chief Engineer and  
Chief Deputy State Fire Marshal

KERN E. CHURCH, PE  
Engineer and Deputy State Fire Marshal  
and Secretary, North Carolina Building  
Code Council



## NORTH CAROLINA GENERAL STATUTES PERTAINING TO ENFORCEMENT OF THE CODE

### CHAPTER 143—STATE DEPARTMENTS INSTITUTIONS AND COMMISSIONS

#### ARTICLE 9

#### BUILDING CODE

§143-136. **Building Code Council created.** (a) Creation; membership; terms. There is hereby created a Building Code Council, which shall be composed of nine members appointed by the Governor, consisting of one registered architect, one licensed general contractor, one registered engineer practicing structural engineering, one registered engineer practicing mechanical engineering, one registered engineer practical electrical engineering, one licensed plumbing and heating contractor, one municipal building inspector, a representative of the public who is not a member of the building construction industry, and a representative of the engineering staff of a State agency charged with approval of plans of State-owned buildings. Of the members initially appointed by the Governor, three shall serve for terms of two years each, three shall serve for terms of four years each, and three shall serve for terms of six years each. Thereafter, all appointments shall be for terms of six years. The Governor may remove appointive members at any time. Any member who shall, during his term, cease to meet the qualifications for original appointment (through ceasing to be a practicing member of the profession indicated or otherwise) shall thereby forfeit his membership on the Council.

The Governor may make appointments to fill the unexpired portions of any terms vacated by reason of death, resignation, or removal from office. In making such appointments, he shall preserve the composition of the Council required above.

(b) *Compensation.* Members of the Building Code Council other than any who are employees of the State shall receive seven dollars (7.00) per day, including necessary time spent in traveling to and from their place of residence within the State to any place of meeting or while traveling on official business of the Council. In addition, all members shall receive mileage and subsistence according to State practice while going to and from any place of meeting, or when on official business of the Council.

§ 143-137. **Organization of the Building Code Council.** (a) *First meeting; organization; rules and regulations.* Within thirty days after its appointment, the Building Code Council shall meet



on call of the Commissioner of Insurance. The Council shall elect from its appointive members a chairman and such other officers as it may choose, for such terms as it may designate in its rules and regulations. The Council shall adopt such rules and regulations not inconsistent herewith as it may deem necessary for the proper discharge of its duties. The chairman may appoint members to such committees as the work of the Council may require.

(b) *Meetings.* The Council shall meet regularly, at least once every six months, at places and dates to be determined by the Council. Special meetings may be called by the chairman on his own initiative and must be called by him at the request of two or more members of the Council. All members shall be notified by the chairman in writing of the time and place of regular and special meetings at least seven days in advance of such meeting. Five members shall constitute a quorum. All meetings shall be open to the public.

(c) *Staff.* Personnel of the Division of Engineering of the Department of Insurance shall serve as a staff for the Council. Such staff shall have the duties of (1) keeping an accurate and complete record of all meetings, hearings, correspondence, laboratory studies, and technical work performed by or for the Council, and making these records available for public inspection at all reasonable times; (2) handling correspondence for the Council.

(d) *Fiscal affairs of the Council.* All funds for the operations of the Council and its staff shall be appropriated to the Department of Insurance for the use of the Council. All such funds shall be held in a separate or special account on the books of the Department of Insurance, with a separate financial designation or code number to be assigned by the Budget Bureau or its agent. Expenditures for staff salaries and operating expenses shall be made in the same manner as the expenditure of any other Department of Insurance funds. The Department of Insurance may hire such additional personnel as may be necessary to handle the work of the Building Code Council, within the limits of funds appropriated for the Council and with the approval of the Council.

§ 143-138. **North Carolina State Building Code.** (a) *Preparation and adoption.* The Building Code Council is hereby empowered to prepare and adopt, in accordance with the provisions of this Article, a North Carolina State Building Code. Prior to the adoption of this Code, or any part thereof, the Council shall hold at least one public hearing in the City of Raleigh. A notice of such public hearing shall be given once a week for two successive calendar weeks in a newspaper published in Raleigh, said notice to be published the first time not less than fifteen days prior to the date fixed for said hearing. The Council may hold such other

public hearings and give such other notice as it may deem necessary.

(b) *Contents of the Code.* The North Carolina State Building Code, as adopted by the Building Code Council, may include reasonable and suitable classifications of buildings, both as to use and occupancy; general building restrictions as to location, height, and floor areas; rules for the lighting and ventilation of buildings; requirements concerning means of egress from buildings; regulations governing construction and precautions to be taken during construction; regulations as to permissible materials, loads, and stresses; regulation of chimneys, heating appliances, elevators, and other facilities connected with the buildings; regulations governing plumbing, heating, air-conditioning for the purpose of comfort cooling by the lowering of temperatures, and electrical systems (regulations for which electric systems may be the National Electric Code, as approved by the American Standards Association and filed with the Secretary of State); and such other reasonable rules and regulations pertaining to the construction of buildings and the installation of particular facilities therein as may be found reasonably necessary for the protection of the occupants of the building, its neighbors, and members of the public at large.

The Code may contain provisions regulating every type of building, wherever it might be situated in the State; provided, however, that such regulations shall not apply to the following types of buildings, unless the governing body of the municipality or the county wherein such buildings are located shall by vote adopt a resolution making the regulations applicable to one or more of such types of buildings:

- (a) Dwellings and outbuildings used in connection therewith;
- (b) Apartment buildings used exclusively as the residence of not more than two families;
- (c) Temporary buildings or sheds used exclusively for construction purposes not exceeding twenty feet in any direction and not used for living quarters. The governing body of any municipality or county is hereby authorized to adopt such a resolution.

Provided further, that nothing in this Act shall be construed to make any building regulations applicable to farm buildings located outside the corporate limits of any municipality.

Provided further, that no building permit shall be required under such Code from any State agency for the construction of any building the total cost of which is less than twenty thousand dollars (\$20,000.00), except public or institutional buildings.



General Statutes, Section 143-138

For the information of users thereof, the Code shall include as appendices (a) any boiler regulations adopted by the Board of Boiler Rules, (b) any elevator regulations relating to safe operation adopted by the Commissioner of Labor, and (c) any regulations relating to sanitation adopted by the State Board of Health which the Building Code Council believes pertinent. In addition, the Code may include references to such other regulations of special types, such as those of the Medical Care Commission and the Department of Public Instruction, as may be useful to persons using the Code. No regulations issued by other agencies than the Building Code Council shall be construed as a part of the Code, nor supersede the Code, it being intended that they be presented with the Code for information only.

Nothing in this Act shall extend to or be construed as being applicable to the regulation of the design, construction, location, installation, or operation of equipment for storing, handling, transporting, and utilizing liquefied petroleum gases for fuel purposes or anhydrous ammonia or other liquid fertilizers.

(c) *Standards to be followed in adopting the Code.* All regulations contained in the North Carolina State Building Code shall have a reasonable and substantial connection with the public health, safety, morals, or general welfare, and their provisions shall be construed liberally to those ends. Requirements of the Code shall conform to good engineering practice, as evidenced generally by the requirements of the National Building Code of the National Board of Fire Underwriters, the Southern Standard Building Code of the Southern Building Code Congress, the Uniform Building Code of the Pacific Coast Building Officials Conference of America, Inc., the National Electric Code, the Building Exits Code of the National Fire Protection Association, the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, the Boiler Code of the American Society of Mechanical Engineers, Standards of the National Board of Fire Underwriters for the Installation of Gas Piping and Gas Appliances in Buildings, and standards promulgated by the American Standards Association, Underwriters' Laboratories, Inc., and similar national agencies engaged in research concerning strength of materials, safe design and other factors bearing upon health and safety.

(d) *Amendments of the Code.* The Building Code Council may from time to time revise and amend the North Carolina State Building Code, either on its own motion or upon application from any citizen, State Agency, or political subdivision of the State. In adopting any amendment, the Council shall comply with the same procedural requirements and the same standards set forth above for adoption of the Code.



(e) *Effect upon local building codes.* The North Carolina State Building Code shall apply throughout the State, from the time of its adoption. However, any political subdivision of the State may adopt a building code or building rules and regulations, provided that before any such building code or regulations or any amendments thereto shall be effective they must be officially approved by the Building Code Council as providing adequate minimum standards to preserve and protect health and safety, in accordance with the provisions of subsection (c) above. Such approval shall be taken as conclusive evidence that a local code supersedes the State Building Code in its particular political subdivision. This Act shall not affect any existing building codes or regulations until the North Carolina State Building Code has been legally adopted by the Building Code Council.

(f) *Effect upon existing laws.* Until such time as the North Carolina State Building Code has been legally adopted by the Building Code Council pursuant to this Act, the North Carolina Building Code adopted by the Council and the Commissioner of Insurance in 1953 shall remain in full force and effect. Such Code is hereby ratified and adopted.

(g) The Building Code Council shall cause to be printed, after adoption by the Council, the North Carolina State Building Code and each amendment thereto. It shall, at the State's expense, distribute copies of the Code and each amendment to State and local government officials, departments, agencies, and educational institutions, as is set out in the table below. (Those marked by an asterisk will receive copies only on written request to the Council.)

<i>Official or Agency</i>	<i>Number of Copies</i>
State Departments and Officials	
Governor .....	1
Lieutenant-Governor .....	1
Auditor .....	1
Treasurer .....	1
Secretary of State .....	1
Superintendent of Public Instruction .....	3
State Board of Education .....	2
Attorney General .....	5
Commissioner of Agriculture .....	1
Commissioner of Labor .....	3
Commissioner of Insurance .....	5
State Board of Health .....	10
Medical Care Commission .....	3
State Highway and Public Works Commission .....	3
Adjutant General .....	1

General Statutes, Section 143-139

Utilities Commission .....	1
Budget Bureau .....	3
Department of Conservation and Development.....	3
State Board of Public Welfare .....	7
Justices of the Supreme Court .....	1 each
Clerk of the Supreme Court .....	1
Judges of the Superior Court .....	* 1 each
Emergency Judges of the Superior Court .....	* 1 each
Special Judges of the Superior Court .....	* 1 each
Solicitors of the Superior Court .....	* 1 each
State Library .....	2
Supreme Court Library .....	2
State Senators .....	* 1 each
Representatives of General Assembly .....	* 1 each
Other State-supported institutions, at the discretion of the Council .....	* 1 each

Schools

University of North Carolina at Chapel Hill .....	*25
North Carolina State College of Agriculture and Engineering of the University of North Carolina .....	*15
Woman's College of the University of North Carolina .....	* 1
A & T College at Greensboro .....	* 5
All other State-supported colleges and universities in the State of North Carolina .....	* 1 each

Local Officials

Clerks of the Superior Courts .....	1 each
Registers of Deeds of the Counties .....	* 1 each
Chairmen of the Boards of County Commissioners .....	* 1 each
City Clerk of each incorporated municipality .....	1 each

In addition, the Building Code Council shall make additional copies available at such price as it shall deem reasonable to members of the general public.

(h) *Violations.* Any person who shall be adjudged to have violated this Article or the North Carolina State Building Code shall be guilty of a misdemeanor and shall upon conviction be liable to a fine, not to exceed fifty (\$50.00) dollars, for each offense. Each thirty days that such violation continues shall constitute a separate and distinct offense.

§ 143-139. **Enforcement of the North Carolina State Building Code.**—(a) **Procedural Requirements.**—Subject to the provisions set forth herein, the Building Code Council shall adopt such procedural requirements in the North Carolina State Building Code as shall appear reasonably necessary for adequate enforcement of the Code while safeguarding the rights of persons subject to the Code.



(b) **General Building Regulations.**—The Insurance Commissioner shall have general supervision, through the Division of Engineering of the Department of Insurance, of the administration and enforcement of all sections of the North Carolina State Building Code pertaining to plumbing, electrical systems, general building restrictions and regulations, heating and air conditioning, fire protection, and the construction of buildings generally, except those sections of the Code, the enforcement of which is specifically allocated to other agencies by subsections (c) and (d) below. The Insurance Commissioner, by means of the Division of Engineering, shall exercise his duties in the enforcement of the North Carolina State Building Code (including local building codes which have superseded the State Building Code in a particular political sub-division pursuant to G. S. 143-138 (e) in cooperation with local officials and local inspectors duly appointed by the governing body of any municipality or board of County commissioners pursuant to Article 11, Chapter 160 of the General Statutes of North Carolina, or G. S. 160-200(29), or G. S. 153-9(47) and (52), or any other applicable statutory authority.

(c) **Boilers.**—The Bureau of Boiler Inspection of the Department of Labor shall have general supervision of the administration and enforcement of those sections of the North Carolina State Building Code which pertain to boilers of the types enumerated in Article 7 of Chapter 95 of the General Statutes.

(d) **Elevators.**—The Department of Labor shall have general supervision of the administration and enforcement of those sections of the North Carolina State Building Code which pertain to elevators, moving stairways, and amusement devices such as merry-go-rounds, roller coasters, ferris wheels, etc.”

(e) Subject to the provisions set forth herein, the Building Code Council shall adopt such procedural requirements in the North Carolina State Building Code as shall appear reasonably necessary for adequate enforcement of the Code while safeguarding the rights of persons subject to the Code.

§ 143-140. Hearing before enforcement agencies as to questions under Building Code. Any person desiring to raise any questions under this Article or under the North Carolina State Building Code, shall be entitled to a full hearing before the appropriate enforcement agency, as designated in the preceding Section. Upon request in writing by any such person, the enforcement agency shall appoint a time for the hearing, giving such person reasonable notice thereof. The enforcement agency, through an appropriate official, shall conduct a full and complete hearing of the matters in controversy and make a determination thereof within a reasonable time thereafter. The person request-



General Statutes, Section 143-141

ing the hearing shall, upon request, be furnished a written statement of the decision, setting forth the facts found, the decision reached, and the reasons therefor. In the event of dissatisfaction with such decision, the person affected shall have the options of (a) appealing to the Building Code Council or (b) appealing directly to the Superior Court, as provided in section 143-141.

§ 143-141. **Appeals to Building Code Council.** (a) Method of appeal. Whenever any person desires to take an appeal to the Building Code Council from the decision of a State enforcement agency relating to any matter under this Article or under the North Carolina State Building Code, he shall within thirty days after such decision give written notice to the Building Code Council through the Division of Engineering of the Department of Insurance that he desires to take an appeal. A copy of such notice shall be filed at the same time with the enforcement agency from which appeal is taken. The chairman of the Building Code Council shall fix a reasonable time and place for a hearing, giving reasonable notice to the appellant and to the enforcement agency. Such hearing shall not be later than the next regular meeting of the Council. The Building Code Council shall thereupon conduct a full and complete hearing as to the matters in controversy, after which it shall within a reasonable time give a written decision setting forth its findings of fact and its conclusions.

(b) *Interpretations of the Code.* The Building Code Council shall have the duty, in hearing appeals, to give interpretations of such provisions of the Building Code as shall be pertinent to the matter at issue. Where the Council finds that an enforcement agency was in error in its interpretation of the Code, it shall remand the case to the agency with instructions to take such action as it directs.

(c) *Variations of the Code.* Where the Building Code Council finds on appeal that materials or methods of construction proposed to be used are as good as those required by the Code, it shall remand the case to the enforcement agency with instructions to permit the use of such materials or methods of construction. The Council shall thereupon immediately initiate procedures for amending the Code as necessary to permit the use of such materials or methods of construction.

(d) *Further appeals to the courts.* Whenever any person desires to take an appeal from a decision of the Building Code Council or from the decision of an enforcement agency (with or without an appeal to the Building Code Council) he may take an appeal either to the Wake County Superior Court or to the Superior Court of the county in which the proposed building is to be situated, in accordance with the provisions of Article 33 of Chapter 143 of the General Statutes.

§ 143-142. **Further duties of the Building Code Council.** (a) *Recommend statutory changes.* It shall be the duty of the Building Code Council to make a thorough study of the building laws of the State, including both the statutes enacted by the General Assembly and the rules and regulations adopted by State and local agencies. On the basis of such study, the Council shall recommend to the 1959 and subsequent General Assemblies desirable statutory changes to simplify and improve such laws.

(b) *Recommend changes in enforcement procedures.* It shall be the duty of the Building Code Council to make a thorough and continuing study of the manner in which the building laws of the State are enforced by State, local, and private agencies. On the basis of such studies, the Council may recommend to the General Assembly any statutory changes necessary to improve and simplify the enforcement machinery. The Council may also advise State agencies as to any changes in administrative practices which could be made to improve the enforcement of building laws without statutory changes.

§ 143-143. **Effect on Certain Existing Laws.**—Nothing in this Article shall be construed as abrogating or otherwise affecting the power of any State department or agency to promulgate regulations, make inspections, or approve plans in accordance with any other applicable provisions of law not in conflict with the provisions herein.

§ 160-118. **Local inspector of buildings.**—The chiefs of fire departments hereinbefore provided for shall also be local inspectors of buildings for the cities or towns for which they are appointed and shall perform the duties required herein and shall make all reports required by the Insurance Commissioner, and shall make all inspections and perform such duties as may be required by the State law or city or town ordinance or by the said Insurance Commissioner: Provided, however, that any city or town may appoint and reasonably remunerate a local inspector of buildings, in which case the chief of fire department shall be relieved of the duties herein imposed. (1905, c. 506, s. 6; Rev., s. 2983; 1915, c. 192, s. 2; C. S., s. 2741.)

§ 160-119. **Town alderman failing to appoint inspectors.**—If the aldermen or commissioners of any city or town shall fail or refuse to appoint a chief of the fire department, or shall fail or refuse to reasonably remunerate him, they shall be guilty of a misdemeanor. The section shall not apply to the aldermen or commissioners of any city or town, where such city or town is by law exempt from the law regulating and controlling the erection and inspection of buildings. (1905, c. 506, s. 4; Rev., s. 3607; C. S., s. 2742.)



§ 160-126. **Building Permits.**—Before a building is begun the owner of the property shall apply to the inspector for a permit to build. This permit shall be given in writing and shall contain a provision that the building shall be constructed according to the requirements of the building law, a copy of which shall accompany the permit. No permit shall be issued unless the plans and specifications are identified by the name and address of the author thereof, and where the General Statutes of North Carolina require that plans for certain types of construction be prepared only by a registered architect or a registered engineer, no permit shall be issued unless such plans and specifications bear the North Carolina seal of a registered architect or of a registered engineer. As the building progresses the inspector shall make as many inspections as may be necessary to satisfy him that the building is being constructed according to the provisions of this law. As soon as the building is completed the owner shall notify the inspector who shall proceed at once to inspect the said building and determine whether or not the flues and the building are properly constructed in accordance with the building law. If the building meets the requirements of the building law the inspector shall then issue to the owner of the building a certificate which shall state that he has complied with the requirements of the building law as to that particular building, giving description and locality and street number if numbered. The inspector shall keep his record so that it will show readily by reference all such buildings as are approved. The inspector shall report to the Insurance Commissioner every person neglecting to secure such permit and certificate, and also bring the matter before the mayor, recorder or municipal court for their attention and action. (1905, c. 506, s. 26; Rev., s. 2986; 1915, c. 192, s. 3; C. S., s. 2748, amended May 24, 1957.)



CHAPTER 153  
COUNTIES AND COUNTY COMMISSIONERS

ARTICLE 2  
COUNTY COMMISSIONERS

§ 153-9 (47). **County Plumbing Inspectors.**—The county commissioners may designate and appoint one or more plumbing inspectors whose duties shall be: To inspect and approve the installation of all plumbing and water systems, either or both, hereafter installed in unincorporated areas; to issue certificates of approval of such inspections; to enforce regulations pertaining to plumbing as adopted by respective county boards of health; to collect inspection fees, determined by the county commissioners, and deliver same to the county treasurer; and to furnish a surety bond approved by the county commissioners. The county commissioners may pay the plumbing inspector a fixed salary, or apply inspection fees collected in lieu thereof, for services rendered. It shall be unlawful for the plumbing inspector to be financially connected in any way with persons, firms or corporations who install plumbing systems or sell plumbing fixtures, and his services may be terminated when deemed wise and necessary by the county commissioners.

This section shall apply only to Bladen, Buncombe, Cumberland, Durham, Forsyth, Granville, Guilford, Haywood, Montgomery, Pamlico, Rockingham, Rowan, Stanly, Stokes, Surry, Transylvania and Wake counties. (1953, c. 984; 1955, cc. 144, 942, 1171; 1957, cc. 415, 456, 1286, 1294; 1959, cc. 399, 1031; 1961, cc. 763, 884, 1036.)

§ 153-9 (52). **County Building Inspectors.**—The board of county commissioners may appoint one or more building inspectors to serve at the will of the board, whose duties shall be: To enforce the State Building Code adopted under article 9 of chapter 143 of the General Statutes; to enforce any county building regulations adopted under G. S. 143-138 (b) or 143-138 (e); to enforce any county zoning ordinance or ordinances; to collect inspection fees determined by the board of county commissioners, which the board is hereby authorized to impose, and deliver same to the county treasurer; to furnish a surety bond for the faithful performance of his duties and the safeguarding of any public funds coming into his hands, approved as to amount, form, and solvency of sureties by the board of county commissioners; and to carry out such related duties as may be specified by the board of county commissioners.

Section 153.9 (52)

In lieu of appointing a separate building inspector, the board of county commissioners may designate as county building inspectors:

- (1) A building inspector of any other county or counties, with the approval of the board of county commissioners of such other county or counties;
- (2) A municipal building inspector of any municipality or municipalities within the county, with the approval of the municipal governing body;
- (3) The county fire marshal;
- (4) A county electrical inspector appointed under the provisions of G.S. 160-122;
- (5) A county plumbing inspector appointed under the provisions of G.S. 153-9(47); or
- (6) Any other person or persons whom they deem to be qualified.

The board of county commissioners may pay a building inspector a fixed salary or may in lieu thereof reimburse him for his services by paying over any inspection fees which he collects. The board of county commissioners may make necessary appropriations for the special purpose of paying the salary or salaries of county building inspectors and any expenses pertaining to building inspection.

The board of county commissioners may enter into and carry out contracts with any municipality or municipalities within the county, or with any other county or counties, under which the parties agree to support a joint building inspection department. The board of county commissioners and the municipal governing body may make any necessary appropriations for such a purpose.

On official request of the governing body of any municipality within the county, the board of county commissioners may direct the county building inspector to exercise his powers within said municipality, and he shall thereupon be empowered to do so until such time as the municipal governing body officially withdraws its request.

This subsection shall not apply to Cherokee, Clay, Graham, Harnett, Lenoir, Macon, and Scotland counties. (1950, c. 940)



## NORTH CAROLINA STATE BUILDING CODE

### ARTICLE I

#### ADMINISTRATION AND PROCEDURE

**SECTION 100—TITLE:** These rules and regulations shall be known as the 1958 Edition of the North Carolina State Building Code, may be cited as such and will be referred to hereinafter as this Code. (See G. S. 143-138a)

**SECTION 101—PURPOSE:** The purpose of the Code is to provide certain minimum standards, provisions and requirements for safe and stable design, methods of construction and uses of materials in buildings and/or structures hereafter erected, constructed, enlarged, altered, repaired, moved, converted to other uses or demolished and to regulate the equipment, maintenance, use and occupancy of all buildings and/or structures. All regulations contained in the North Carolina State Building Code shall have a reasonable and substantial connection with the public health, safety, morals, or general welfare, and their provisions shall be construed liberally to those ends. (See G. S. 143-138c)

#### SECTION 102—SCOPE:

**1. New Buildings and Additions—Exemptions.** The Code shall apply to all new buildings, structures and additions thereto wherever they might be situated in the State provided, however, that such regulations shall not apply to the following types of buildings unless the governing body of the municipality or the county wherein such buildings are located shall by vote adopt a resolution making the regulations applicable to one or more such types of buildings:

- (a) Dwellings; and outbuildings used in connection therewith;
- (b) Apartment buildings used exclusively as the residence of not more than two families;
- (c) Temporary buildings or sheds used exclusively for construction purposes, not exceeding twenty feet in any direction and not used for living quarters.

This Code shall not apply to farm buildings located outside any municipality.

#### **2. Alterations to Existing Buildings:**

(a) This Code shall apply to all alterations which affect the structural strength, fire hazards, exits, lighting or sanitary conditions of any building except those exempted in Section 102.1.



## Section 102

Within the fire limits (as defined in G. S. Section 160-124) of cities and towns where this article applies, as established and defined, no frame or wooden building shall be hereafter erected, altered, repaired or removed except upon the permit of the building inspector, approved by the Insurance Commissioner. (See G. S. 160-124, G. S. 160-127 and G. S. 160-128)

(b) If, within any period of twelve months, alterations or repairs costing in excess of fifty percent of the then physical value of the buildings are made to an existing building, such building shall be made to conform to the requirements of this code for new buildings, except that for buildings located in fire districts the provisions of Section 102.2(a) and 401 shall also apply.

(c) If an existing building is damaged by fire or otherwise in excess of fifty percent of its then physical value before such damage is repaired, it shall be made to conform to the requirements of this code for new buildings.

(d) If the cost of such alterations or repairs, or the amount of such damage, is more than twenty-five but not more than fifty percent of the then physical value of the building, the portions to be altered or repaired shall be made to conform to the requirements of this code for new buildings to such extent as the Building Inspector may determine.

(e) For the purpose of this section physical value of the building shall be determined by the Building Inspector.

**3. Change of Use:** This Code shall apply to all buildings which are to be devoted to a new use for which the requirements of this Code are in any way more stringent than the requirements covering the previous use of the building.

**4. Local Regulations:** This Code shall not be understood to limit the powers of cities, villages and towns to make or enforce additional or more stringent requirements and regulations, provided the same do not conflict with this Code or any revision of this Code.

**NOTE:** Every municipality is authorized to adopt, for its own benefit:

(a) Regulations covering the construction of dwellings.

(b) Other fire-preventive and sanitary regulations which cannot be reasonably included in this Code.

Local Codes must be approved by the Building Code Council as per Section 143-138e before they become effective. (See G. S. 143-138 b and e; and G. S. 160-237)

**SECTION 103—APPROVAL OF PLANS AND BUILDING PERMITS REQUIRED:**

**1. Plans Approved by Insurance Commissioner:**

(a) For every building classified as Public or Institutional or as a Hotel or designed to accommodate one hundred or more people, plans shall be prepared and copies thereof furnished the Insurance Commissioner for his approval before work is begun on such building. (See G. S. 143-139(d); Section 300, 602-e and 612(d))

(b) For every other building costing \$10,000 or more and/or designed to accommodate one hundred or more persons, except those exempted in Section 102.1, plans may be required to be furnished the Insurance Commissioner in order that the provisions of this article may be adhered to.

(c) The plans and specifications so prepared shall be complete in every detail so that the work will comply with the provisions as set forth in this Code and shall be constructed under the supervision of a competent superintendent or inspector, in accordance with the plans and specifications. (See G. S. 143-139d; G. S. 58-193 and G. S. 69-10)

**2. Building Permits Required from Local Inspectors:**

(a) **New Buildings:** Before a building is begun the owner of the property shall apply to the inspector for a permit to build. This permit shall be given in writing and shall contain a provision that the building shall be constructed according to the requirements of the Building Code. Statement of compliance with the Code shall be included with the permit. No permit shall be issued unless the plans and specifications are identified by the name and address of the author thereof, and where the General Statutes of North Carolina require that plans for certain types of construction be prepared only by a registered architect or a registered engineer, no permit shall be issued unless such plans and specifications bear the North Carolina seal of a registered architect or of a registered engineer. As the building progresses the inspector shall make as many inspections as may be necessary to satisfy him that the building is being constructed according to the provisions of this law. As soon as the building is completed the owner shall notify the inspector who shall proceed at once to inspect the said building and determine whether or not the building has been properly constructed in accordance with the Building Code. If, in the opinion of the Building Inspector, the building meets the requirements of the building code the inspector shall then issue to the owner of the building a certificate which shall state that he has complied with the requirements of the building code as to that particular building, giving description



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and locality and street number if numbered. The inspector shall keep his record so that it will show readily by reference all such buildings as are approved. The inspector shall report to the Insurance Commissioner every person neglecting to secure such permit and certificate, and also bring the matter before the mayor, recorder or municipal court for their attention and action. (See G. S. 160-126, G. S. 87-14, Chapter 83 and Chapter 89 of the General Statutes)

(b) *Existing Buildings*: A permit is required from the building inspector to repair, alter, move, demolish or add to an existing building or structure. (See Section 102.2)

(c) *Special Permits*: A special permit is required for alterations and repairs to wood frame buildings located inside the fire limits. (See G. S. 160-128)

(d) *Occupancy Permits*: Before a building is changed from one occupancy to another occupancy the owner shall obtain from the inspector a permit for such change in occupancy. (See G. S. 69-4, G. S. 69-12, G. S. 69-13, G. S. 160-143, 144)

**3. Plans to be Kept at Building**: When permit has been issued for the construction of any building, the owner or contractor shall keep at the building a set of plans and specifications that have been approved by authority having jurisdiction in order that any building inspector, whether state or city, may ascertain when he visits a building under construction, whether the construction is in accordance with the plans.

**4. Other Approvals**: Section 103.1 of this Code shall not be construed to repeal any existing provisions of law requiring plans and specifications for building construction and work connected therewith to be filed with any state or local board or department, and to be previously approved by said state or local board or department. (Please see Table I Appendix V of State Interdepartment Building Regulation Committee in back of Code).

### **SECTION 104—ENFORCEMENT**

**1. Duty of Commissioner of Insurance**: By Statute the Insurance Commissioner has general supervision of the administration and enforcement of the North Carolina Building Code in cooperation with local building inspectors. (See G. S. 143-139d and G. S. 69-13)

#### **2. Duties of Building Inspector:**

(a) *Office Created*: There is created by Statute the office of building inspector in all cities and towns of 1000 or more in population according to the last U. S. census whose duty shall be to enforce the North Carolina State Building Code. In towns where

a building inspector has not been appointed in compliance with G. S. 160-118, the Chief of Fire Department has the statutory duty of enforcing the code as per G. S. 160-118. (See G. S. 160-118, G. S. 160-120 and G. S. 160-154)

(b) *Inspections Required:*

1. **New Building, Repairs, Alterations, Removing, Demolition and Additions to Existing Buildings:** After issuing proper permit for new buildings, repairs or alterations or additions, the building inspector shall make as many inspections as may be necessary to satisfy him that the building is being constructed according to the provisions of this code.

2. **Periodic Inspections:** Inspections of existing buildings are required to determine their compliance with the Building Code and to determine whether they meet the minimum safety to life requirements. (160-143, 160-149)

3. **Change of Occupancy:** When an existing building is to be converted to another occupancy, the building inspector shall make an inspection of such building to see that it is in compliance with the safety requirements of the code. (See G. S. 160-126, G. S. 160-142, G. S. 160-143 and G. S. 160-149)

(c) *Records of Inspections:* The local inspector shall keep the following record: A record indexed and kept so that it will show readily by reference all such buildings as are approved; that is, name and residence of owner, location of building, how it is to be occupied, date of inspection, what defects found and when remedied and date of building certificate; also a record which shall show the date of every general inspection, defects discovered and when remedied; also a record which shall show the date, circumstances and origin of every fire that occurs, name of owner and occupant of the building in which fire originates, the kind and value of property destroyed or damaged (except where such records are kept by other departments); also a record of inspection of electrical wiring, heating and plumbing and certificate issued. (See G. S. 160-144)

**SECTION 105—POWERS OF COMMISSIONER OF INSURANCE AND BUILDING INSPECTORS:**

1. **Right of Entry:** The Insurance Commissioner or the Building Inspector has the statutory right at all reasonable hours for the purpose of examination, to enter into or upon all buildings in their jurisdiction. (See G. S. 69-4, G. S. 69-13, G. S. 160-143)

2. **Condemnation of Unsafe Buildings:**

(a) *Unsafe Buildings Condemned:* By Statute every building which shall appear to the inspector to be especially dangerous because of its liability to fire or in case of fire by reason of bad



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condition of walls, overloaded floors, defective construction, inadequate exits, decay or other causes shall be held to be unsafe, and the inspector shall affix a notice of the dangerous character of the structure to a conspicuous place on the exterior wall of said building. No building now or hereafter built shall be altered, repaired or moved, until it has been examined and approved by the inspector as being in a good and safe condition to be altered as proposed, and the alteration, repair or change so made shall conform to the provisions of the law. (See G. S. 160-149, G. S. 160-151 and G. S. 69-35)

(b) *Punishment for Allowing Unsafe Building to Stand is Provided by Law as Follows:* If the owner of any building which has been condemned as unsafe and dangerous by any local inspector, after being notified by the inspector in writing of the unsafe and dangerous character of such building, shall permit the same to stand or continue in that condition, he shall forfeit and pay a fine of not less than ten nor more than fifty dollars for each day such building continues after such notice. (See G. S. 160-152)

(c) If after ninety days from legal notice from the inspector, the owner or owners of a building which has been condemned fails to answer such notice of condemnation, the Chief of the Fire Department or the local Building Inspector, may, with and by a two-thirds vote of the City Council, order such building removed, with reasonable expense incurred by such removal charged against the property. (See G. S. 160-151 and 160-152 and G. S. 69-35)

### **SECTION 106—BUILDING CODE COUNCIL**

1. **Building Code Council Created:** There is by statute created a State Building Code Council composed of nine members appointed by the Governor consisting of one registered architect, one licensed general contractor, one registered engineer practicing structural engineering, one registered engineer practicing mechanical engineering, one registered engineer practicing electrical engineering, one licensed plumbing and heating contractor, one municipal building inspector, a representative of the public who is not a member of the building construction industry, and a representative of the engineering staff of a State agency charged with approval of plans of State owned buildings. (See G. S. 143-136a)

2. **Officers:** The Council shall elect from its appointed members a Chairman and Vice-Chairman. Officers shall serve for a period of two years from the date of election or until their successors are elected. (See G. S. 143-137a)

3. **Duties:** The Building Code Council shall have the duty of adopting and amending the North Carolina State Building Code

and hearing appeals from the decision of an enforcement agency. (See G. S. 143-138 a, d, and e; and G. S. 143-141)

4. **Meetings:** The Building Code Council shall meet regularly the second Tuesday in January and July. Special meetings may be called by the Chairman. Any five members of the Council shall constitute a quorum. (See G. S. 143-137b)

5. **Staff and Personnel:** The Division of Engineering of the Department of Insurance shall serve as the staff for the Council. (See G. S. 143-137c)

### **SECTION 107—HEARINGS AND APPEALS**

1. **Hearings and Appeals before the Commissioner of Insurance:** Any person desiring to raise any question under the North Carolina State Building Code shall be entitled to a full hearing before the Insurance Commissioner upon proper request in writing by any such person. (See G. S. 143-140 and G. S. 69-13)

#### **2. Hearings and Appeals to Building Code Council:**

(a) *Hearings for Amending the Building Code:* Any person, firm or corporation desiring to amend the Building Code shall file a request for hearing with the Council in accordance with rules as outlined in Section 110. (See G. S. 143-138, a, c, d)

(b) *Appeals from the Decision of an Enforcement Agency:* Any person desiring to take an appeal to the Building Code Council from the decision of a State enforcement agency must file such appeal within thirty days after such decision giving written notice to the Council as per procedural rules as outlined in Section 109. (See G. S. 143-141)

3. **Appeal to Court.** By Statute a person may appeal directly to the Superior Court of the County in which the proposed building is to be situated with or without an appeal to the Building Code Council. (See G. S. 143-141d)

### **SECTION 108—VIOLATIONS AND PENALTIES ARE PROVIDED BY STATUTE AS FOLLOWS:**

Any person who shall be adjudged to have violated the North Carolina State Building Code shall be guilty of a misdemeanor and shall upon conviction be liable to a fine not to exceed \$50.00 for each offense. Each thirty days that such violation continues shall constitute a separate and distinct offense. (See G. S. 14-68; 69-36 and 69-37; 87-14; 143-138h; 160-119; 160-125 and 160-129; 160-150 and 160-151 and 160-153)

### **SECTION 109—PROCEDURAL RULES FOR APPEALS TO THE BUILDING CODE COUNCIL FROM THE ENFORCE-**



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**MENT AGENCIES.**—The following procedural rules shall apply and must be complied with when any appeal is taken by any aggrieved party from the decision of any enforcement agency (as defined in G. S. 143-139) to the Building Code Council:

**Rule 1—Time of Notice**—Any person wishing to appeal from the decision of an enforcement agency to the Building Code Council shall give a written Notice of Appeal as follows:

(a) The original and eleven copies of said notice shall be filed not later than 30 days from the date of the decision of the enforcement agency with the Building Code Council, c/o Division of Engineering, Department of Insurance, 300 Labor Building, Raleigh, North Carolina.

(b) The staff of the Building Code Council shall immediately forward one copy of said notice to the enforcement agency from which the appeal is taken.

(c) The time within which notice is to be filed, shall be computed by excluding the first and including the last day. If the last day is Saturday, Sunday or a legal holiday, it must be excluded.

**Rule 2—Form of Notice**—Whenever Notice of Appeal is given as provided by these rules, said notice shall be legibly printed, typewritten or mimeographed and shall contain the following information:

(a) The name of the party or parties taking the appeal;

(b) The name of the enforcement agency and the date of the decision from which the appeal is taken;

(c) The decision from which the appeal is taken must be set forth in full in the Notice of Appeal, or a copy of said decision must be attached to all copies of the Notice of Appeal;

(d) The contentions and allegations of fact of the party or parties taking the appeal must be set forth in full in a clear and concise manner with particular reference to the section or sections of the North Carolina State Building Code in controversy;

(e) The original notice shall be signed by the party or parties filing same. No notarization or verification is required.

**Rule 3—Time for Hearing**—Upon the proper filing of an appeal in accordance with these rules, the Chairman of the Building Code Council shall cause the appeal to be heard by the Council within a reasonable time.

**Rule 4—Notice to Appellant**—The Chairman of the Building Code Council shall cause all appeals to be docketed for hearing

and shall fix the time and place for said hearing and shall cause not less than ten days notice in writing, of the time and place of the hearing on the appeal to be given to the appellant, the enforcement agency from which the appeal is taken and all members of the Council.

**Rule 5—Dismissal**—The Council shall, upon motion of the enforcement agency or on its own motion, dismiss all appeals for the following reasons:

- (a) Not prosecuted by the appellant; and
- (b) All appeals wherein the Notice of Appeal has not been filed in accordance with these Rules; and
- (c) For lack of jurisdiction.

**SECTION 110 — PROCEDURAL RULES FOR HEARINGS BEFORE THE BUILDING CODE COUNCIL ON PROPOSED AMENDMENTS TO THE NORTH CAROLINA STATE BUILDING CODE.**—The following procedural rules shall apply when any citizen, State agency, or political subdivision of the State makes application to the Building Code Council requesting that the North Carolina State Building Code be revised or amended pursuant to G. S. 143-138 (d) ;

**Rule 1—Request for Hearing**—Any citizen, State agency, or political subdivision of the state requesting a hearing before the Building Code Council for the above purposes shall submit a written request as follows:

(a) An original and ten copies of said request for hearing shall be filed with the Building Code Council, c/o The Division of Engineering, Department of Insurance, 300 Labor Building, Raleigh, North Carolina.

(b) The staff of the Building Code Council shall immediately forward one copy of said request to each member of the Building Code Council.

**Rule 2—Form of Request for Hearing**—Each request shall be legibly printed, typewritten, or mimeographed and shall contain the following information:

(a) Name, address and basis of interest of party or parties requesting hearing;

(b) The proposed amendment to the North Carolina State Building Code must be set forth in full, and the request shall contain explicit reference to the affected section or sections of the Building Code;

(c) The request shall state, in support of the proposed amend-



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ment or amendments, the reasons for proposing the amendment or amendments;

(d) The proposed amendment or amendments shall comply with the standards set forth in G. S. 143-138(e) and reference to the particular standards involved shall be set forth in the request for hearing.

(e) The original request for a hearing shall be signed by the party or parties or their duly authorized agent submitting same.

**Rule 3—Time of Hearing**—Upon the proper filing of a request for hearing in accordance with these rules, the Chairman of the Building Code Council shall cause a hearing to be held within a reasonable time not to exceed six months; said hearing shall be open to the public.

**Rule 4—Notice of Hearing**—The Chairman of the Building Code Council shall fix the time and place for said public hearing and shall cause notice of the hearing to be given as follows:

(a) Notice in writing to the party or parties or their duly authorized agents requesting the hearing not less than fifteen days prior to the hearing.

(b) Notice of public hearing by publication as required by G. S. 143-138(a);

(c) Not less than ten days notice in writing to all members of the Building Code Council.

**Rule 5—Improper Filing of Request for Hearing**—When a request for hearing is filed under this section other than in accordance with these Rules, the staff of the Building Code Council shall notify the applicant of proper procedure to follow.

The standards referred to in G. S. 143-138(c) include the following nationally recognized Building Codes: (1) The National Building Code of the National Board of Fire Underwriters; (2) the Southern Standard Building Code of the Southern Building Code Congress; (3) the Uniform Building Code of the Pacific Coast Building Officials Conference; (4) the Basic Building Code of the Building Officials Conference of America, Inc.; (5) the Building Exits Code of the National Fire Protection Association. Other standards dealing with special equipment are as follows: the National Electric Code; the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators; Standards of the National Board of Fire Underwriters for the Installation of Gas Piping and Gas Appliances in Buildings, and standards promulgated by the American Standards Association, Underwriters Laboratories, Inc., and similar national agencies engaged in research concerning strength of materials, safe design and other factors bearing upon health and safety.

# NORTH CAROLINA STATE BUILDING CODE

ARTICLE XX

## PLUMBING

*Adopted by the North Carolina Building Code  
Council in accordance with Act  
of the General Assembly of  
1957, Chapter 1138*

1963 EDITION

Published by  
THE NORTH CAROLINA BUILDING CODE COUNCIL

Staff and Offices  
Located at  
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Raleigh, N. C.



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### APPENDIX A

Manufacturers Specifications, Recommendations and Instructions for the Installation of House or Building Sewers.

### APPENDIX B

Plumbing Installation Standards for Mobile Homes and Travel Trailers and Parks.

### APPENDIX C

Other Regulations Relating to Plumbing Installations.



## **SUGGESTED LOCAL ADMINISTRATION CHAPTER FOR ARTICLE XX, PLUMBING**

### **101—DUTIES AND AUTHORITY OF PLUMBING INSPECTOR**

#### **§ 101.1—Duties of Plumbing Inspector**

The plumbing inspector shall have the power, and it shall be his duty, to enforce the requirements and provisions of this code; to approve or disapprove plans and specifications pertinent to plumbing within a reasonable time after receipt of an application; to issue permits, notices and certificates; to witness tests and to perform such other duties that may be required by the local governing authority, in connection with the administration and enforcement of this code and other applicable plumbing regulations.

#### **§ 101.2—Right of Access for Purposes of Inspection, Power to Condemn, Exception**

The plumbing inspector shall have the right to enter public or private property within the jurisdiction of this code at such reasonable time as may be necessary for the performance of his duties. The plumbing inspector is empowered to condemn any plumbing system, or segment thereof, fixtures, apparatus or appurtenances which are not installed, altered or restored in accordance with the provisions of this code. In the interest of public health, the administrative authority further, shall have the right to condemn any plumbing system or part thereof which is a detriment to health and require that same be remedied immediately.

Buildings constructed by the State of North Carolina in accordance with plans and specifications approved by the North Carolina Department of Administration are not subject to inspection by the plumbing inspector of a county or municipality or the Codes and requirements thereof. (G. S. 143-135.1)

#### **§ 101.3—Discretionary Power, Appeal**

In event plumbing cannot be reasonably installed, altered or restored in accordance with the provisions of this code, due to structural barrier, then in this event, the decision of the plumbing inspector shall prevail, based upon general accepted standards that will not jeopardize the public health or safety. Should any controversy arise relating to the interpretation of this code, the master plumber or installer may appeal to the local governing authority whose decision shall be final, provided, however,

Sections 102.1—102.2—102.3—103.1

an appeal from the local governing authority may be taken to the N. C. Building Code Council or Superior Court, as provided for in G. S. 143-140.

## 102—LICENSING OF PLUMBERS

### § 102.1—Master Plumber

The words, "Master Plumber", when used in this code, shall be deemed and held to mean, a person who holds a current license issued by the State Board of Examiners of Plumbing and Heating Contractors, in accordance with the provisions of G. S. 87, Article 2, which authorizes the said person to engage in the business of plumbing contracting in cities or towns having a population of more than 3500, in accordance with the last official U. S. Census.

### § 102.2—Installer

The word, "Installer", when used in this code, shall be deemed and held to mean, a person who installs plumbing, or who is responsible for the installation of plumbing, in accordance with the provisions of this code, in cities, towns or unincorporated areas in which a license is not required by the State Board of Examiners of Plumbing and Heating Contractors.

### § 102.3—Journeyman Plumber

For the purpose of this code, the words, "Journeyman Plumber", shall be deemed and held to mean a person who is skilled in the art of installing plumbing, and who is employed by, and under the supervision and jurisdiction of, a Master Plumber or Installer, as defined herein.

## 103—PERMITS REQUIRED

### § 103.1—Applications, Permits Required: Exceptions

Applications shall be made to, and permits shall be obtained from, the plumbing inspector, for the installation of plumbing systems or the extensions, alterations or general repairs thereof, in accordance with the provisions of this code, however, the provisions of this code shall not apply to those who make minor repairs or replacements to an already installed system of plumbing, on the house side of a trap, provided such repairs or replacements in no wise disrupt the original water supply, waste or ventilating systems. In event a fixture is replaced, a permit shall be secured and same shall be inspected by the plumbing inspector.



**§ 103.2—Applications, Permits Issued To Master Plumbers and Installers**

Applications to install plumbing in cities or towns of more than 3500 population, in accordance with the last official United States Census, shall be received from, and permits issued only to, master plumbers, as defined herein. When applications and permits are required in cities or towns of less than 3500 population or any unincorporated area, same shall be made by, and issued to, the installer of plumbing or the person responsible for the installation of same.

**§ 103.3—Master Plumber or Installer Not to Secure Permit for Others**

No master plumber or installer shall secure a permit from the plumbing inspector for others, not qualified in accordance with the provisions of this code, to install plumbing.

**§ 103.4—Applications, Permits Required Before Work Begins**

Applications must be approved by, and permits secured from the plumbing inspector before beginning the installation, alteration or restoration of plumbing, as provided in this code.

**§ 103.5—Permit May Be Revoked, Damages**

The plumbing inspector, at any time during the progress of the installation of plumbing, may revoke a permit for reason of noncompliance with the provisions of this code, and, further, upon the condition that interested parties shall have no claim for damages that may result from such procedure.

**§ 103.6—Permit May Be Refused**

Additional permits shall not be issued to any master plumber or installer during a period in which he refuses to correct previous defects in the installation of plumbing as required by the plumbing inspector.

**104—INSPECTIONS REQUIRED**

**§ 104.1—Inspection Required**

All plumbing installed in accordance with the provisions of this code shall be inspected by the plumbing inspector and no part of the plumbing system shall be covered until same has been so inspected and approved as herein prescribed.

Sections 104.2—104.3—104.4—105.1

**§ 104.2—Request For Inspection**

Requests for inspection of plumbing, as required in this code, shall be filed by the master plumber or the installer of same in the office of the plumbing inspector at such time as the local governing authority may determine.

**§ 104.3—Final Inspection**

When the installation, alteration or restoration of plumbing has been completed in accordance with the provisions of this code, a request for final inspection shall be filed at the office of the plumbing inspector by the master plumber or installer.

**§ 104.4—Final Certificate of Inspection Issued By Plumbing Inspector**

If, after the final inspection and tests of plumbing, as provided for in this code, the plumbing inspector approves of same, he shall issue a certificate of compliance to the master plumber or installer. A property owner or his agent shall be entitled to a copy of said certificate of compliance upon request to the plumbing inspector.

**105—TESTING**

**§ 105.1—Plumbing System To Be Tested**

In order to prevent the use of defective materials and to provide for water tight or air tight joints, the piping of the entire drainage and venting system shall be tested in the presence of the plumbing inspector by application of the water test as follows. If such test is applied to the entire system, all openings in the piping shall be tightly closed, except the highest openings above the roof, and the entire 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 opening of the section under test, and each section shall be completely filled with water. No section shall be tested with less than a ten (10) foot head of water. In testing successive sections, at least the upper ten (10) feet of the next succeeding section shall be tested so that no joint or pipe in the building shall have been submitted to a test of less than a ten (10) foot head of water. In lieu of the above water test, the plumbing inspector may require an air test, to consist of not less than five (5) pounds per square inch of pressure in the system. In either of the above tests, the plumbing system shall sustain a constant water level or air pressure per square inch for a period of not less than fifteen (15) minutes. If either of the above tests reveals defective materials or workmanship, same shall be replaced or corrected and tests,



as provided in this section, shall be repeated. A roughing-in test shall be required before any piping of the plumbing system is concealed or fixtures set.

**§ 105.2—Test of Existing Plumbing**

In event the plumbing inspector has reason to believe that insanitary conditions exist, in habitable buildings or on premises, he may require the owner or agent thereof to provide for tests, as described in Section 105.1 hereof, and in event defective materials or workmanship are revealed by such tests, the said owner or agent shall immediately repair the plumbing system in accordance with the directions of the plumbing inspector.

**§ 105.3—Materials and Labor for Tests**

All equipment, material, power and labor necessary for inspection and tests shall be furnished by the master plumber or installer.

**106—FEES**

**§ 106.1—Inspection Fees**

Prior to the issuance of a permit to install, alter or restore plumbing in accordance with the provisions of this code, the master plumber or installer shall pay the required inspection fees, as designated by the local governing authority.

## CHAPTER II

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### BASIC PRINCIPLES

#### SECTION 201 — BASIC PRINCIPLES

The basic principles of this Code are enunciated as basic goals in environmental sanitation worthy of accomplishment through properly designed, acceptably installed, and adequately maintained plumbing systems. Some of the details of a plumbing construction must vary, but the basic sanitary and safety principles are the same. The principles may serve to define the intent.

**Principle No. 1** — All premises intended for human habitation, occupancy, or use shall be provided with a supply of pure and wholesome water, neither connected with unsafe water supplies nor subject to the hazards of backflow or backsiphonage.

**Principle No. 2** — Every building having plumbing fixtures installed and intended for human habitation, occupancy, or use on premises abutting on a street, alley, or easement in which there is a public sewer shall have a separate connection with the sewer.

**Principle No. 3** — Each family dwelling unit on premises abutting on a sewer or with a private sewage-disposal system shall have, at least, one water closet, bath tub or shower, and one kitchen-type sink.

All other structures for human occupancy or use on premises abutting on a sewer or with a private sewage-disposal system shall have adequate sanitary facilities but in no case less than one water closet and one other fixture for cleansing purposes.

**Principle No. 4** — Plumbing fixtures shall be made of smooth non-absorbent material, shall be free from concealed fouling surfaces, and shall be located in ventilated enclosures.

**Principle No. 5** — Each fixture directly connected to the drainage system shall be equipped with a water-seal trap.

**Principle No. 6** — No substance which will clog the pipes, produce explosive mixtures, destroy the pipes or their joints, or interfere unduly with the sewage-disposal process shall be allowed to enter the building drainage system.



**Principle No. 7** — Proper protection shall be provided to prevent contamination of food, water, sterile goods, and similar materials by backflow of sewage. When necessary, the fixture, device, or appliance shall be connected indirectly with the building drainage system.

**Principle No. 8** — No water closet shall be located in a room or compartment which is not properly lighted and ventilated.

**Principle No. 9** — If water closets or other plumbing fixtures are installed in buildings where there is no sewer within a reasonable distance, suitable provision shall be made for disposing of the building sewage by some accepted method of sewage treatment and disposal.

**Principle No. 10** — Where a plumbing drainage system may be subject to backflow of sewage, suitable provision shall be made to prevent its overflow in the building.

**Principle No. 11** — Plumbing shall be installed with due regard to preservation of the strength of structural members and prevention of damage to walls and other surfaces through fixture usage.

**Principle No. 12** — Sewage or other waste, from a plumbing system which may be deleterious to surface or sub-surface waters shall not be discharged into the ground or into any waterway unless it has first been rendered innocuous through subjection to some acceptable form of treatment.

# NORTH CAROLINA STATE BUILDING CODE

## ARTICLE XX — PLUMBING

### CHAPTER III

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#### DEFINITIONS

##### 301 General

**301.1.** For the purpose of this code, the following terms shall have the meaning indicated in this chapter.

**301.2** No attempt is made to define ordinary words which are used in accordance with their established dictionary meaning except where the word has been loosely used and it is necessary to define its meaning as used in this code to avoid misunderstanding.

**301.3** Because the primary purpose is to define terms rather than words, the definitions are arranged alphabetically according to the first word of the term rather than the noun.

##### 302. Definition of Terms.

**Administrative Authority.** See Plumbing Official.

**Air Gap.** An Air gap in a water-supply system is the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood-level rim of the receptacle.

**Anchors.** See Supports.

**Approved.** Approved means accepted or acceptable under an applicable specification stated or cited in this code, or accepted as suitable for the proposed use under procedures and powers of the Plumbing Official.

**Area Drain.** An area drain is a receptacle designed to collect surface or rain water from an open area.

**Backflow.** Backflow is the flow of water or other liquids, mixtures, or substances into the distributing pipes of a potable supply of water from any source or sources other than its intended source. (See back-siphonage.)

**Backflow Connection.** Backflow connection or condition is any arrangement whereby backflow can occur.

**Backflow Preventer.** A backflow preventer is a device or means to prevent backflow into the potable water system.



**Back-Siphonage.** Back-siphonage is the flowing back of used, contaminated, or polluted water from a plumbing fixture or vessel into a water-supply pipe due to a negative pressure in such pipe. (See backflow.)

**Battery of Fixtures.** A "battery of fixtures" is any group of two or more similar adjacent fixtures which discharge into a common horizontal waste or soil branch.

**Boiler Blow-Off.** A boiler blow-off is an outlet on a boiler to permit emptying or discharge of sediment.

**Branch.** A branch is any part of the piping system other than a main, riser, or stack.

**Branch, Fixture.** See Fixture Branch.

**Branch, Horizontal.** See Horizontal Branch.

**Branch Interval.** A branch interval is a length of soil or waste stack corresponding in general to a story height, but in no case less than 8 feet within which the horizontal branches from one floor or story of a building are connected to the stack.

**Branch Vent.** A branch vent is a vent connecting one or more individual vents with a vent stack or stack vent.

**Building.** A building is a structure built, erected, and framed of component structural parts designed for the housing, shelter, enclosure, or support of persons, animals, or property of any kind.

**Building Classification.** Building classification is the arrangement in the Building Code for the designation of buildings in classes based upon their use of occupancy.

**Building Drain.** The building (house) drain is that part of the lowest piping of a drainage system which receives the discharge from soil, waste, and other drainage pipes inside the walls of the building and conveys it to the building (house) sewer beginning 10 feet outside the building wall. A cleanout shall be installed at that point and extended to finish grade.

**Building Sewer.** The building (house) sewer is that part of the horizontal piping of a drainage system which extends from the end of the building drain and which receives the discharge of the building drain and conveys it to a public sewer, private sewer, individual sewage-disposal system, or other point of disposal.

**Building Storm Drain.** A building (house) storm drain is a building drain used for conveying rain water, surface water, ground water, subsurface water, condensate, cooling water, or other similar discharge to a building storm sewer or a combined building sewer, extending to a point not less than 10 feet outside the building wall.

**Building Storm Sewer.** A building (house) storm sewer is the extension from the building storm drain to the public storm sewer, combined sewer, or other point of disposal.

**Building Subdrain.** A building (house) subdrain is that portion of a drainage system which cannot drain by gravity into the building sewer.

**Building Trap.** A building (house) trap is a device, fitting, or assembly of fittings installed in the building drain to prevent circulation of air between the drainage system of the building and the building sewer.

**Circuit Vent.** A circuit vent is a branch vent that serves two or more traps and extends from in front of the last fixture connection of a horizontal branch to the vent stack.

**Code.** The word "Code" when used alone shall mean these regulations, subsequent amendments thereto, or any emergency rule or regulation which the Plumbing Official having jurisdiction may lawfully adopt.

**Combination Fixture.** A combination fixture is a fixture combining one sink and tray or a two or three-compartment sink or tray in one unit.

**Combined Building Sewer.** A combined building sewer receives storm water and sewage.

**Combination Waste and Vent System.** A combination waste and vent system is a specially designed system of waste piping embodying the horizontal wet venting of one or more sinks or floor drains by means of a common waste and vent pipe adequately sized to provide free movement of air above the flow line of the drain.

**Common Vent.** A common vent is a vent connecting at the junction of two fixture drains and serving as a vent for both fixtures.

**Conductor.** See Leader.

**Continuous Vent.** A continuous vent is a vertical vent that is a continuation of the drain to which it connects.

**Continuous Waste.** A continuous waste is a drain from two or three fixtures connected to a single trap.

**Cross-Connection.** A cross-connection is any physical connection or arrangement between two otherwise separate piping systems, one of which contains potable water and the other water of unknown or questionable safety, whereby water may flow from one system to the other, the direction of flow depending on the pressure differential between the two systems. (See Backflow and Back-Siphonage.)

**Dead End.** A dead end is a branch leading from a soil, waste, or vent pipe, building drain, or building sewer, which is terminated at a developed distance of 2 feet or more by means of a plug or other closed fitting.



**Developed Length.** The developed length of a pipe is its length along the center line of the pipe and fittings.

**Diameter.** Unless specifically stated, the term "diameter" is the nominal diameter as designated commercially.

**Double Offset.** A double offset is two changes of direction installed in succession or series in continuous pipe.

**Downspout.** See Leader.

**Drain.** A drain is any pipe which carries waste water or waterborne wastes in a building drainage system.

**Drainage Piping.** See Drainage System.

**Drainage System.** A drainage system (drainage piping) includes all the piping within public or private premises, which conveys sewage, rain water, or other liquid wastes to a legal point of disposal, but does not include the mains of a public sewer system or private or public sewage-treatment or disposal plant.

**Dual Vent.** See Common Vent.

**Durham System.** Durham System is a term used to describe soil or waste systems where all piping is of threaded pipe, tubing, or other such rigid construction, using recessed drainage fittings to correspond to the types of piping.

**Effective Opening.** The effective opening is the minimum cross-sectional area at the point of water-supply discharge, measured or expressed in terms of (1) diameter of a circle, (2) if the opening is not circular, the diameter of a circle of equivalent cross-sectional area. (This is applicable to air gap.)

**Existing Work.** Existing work is a plumbing system or any part thereof which has been installed prior to the effective date of this Code.

**Fixture Branch.** A fixture branch is a pipe connecting several fixtures.

**Fixture Drain.** A fixture drain is the drain from the trap of a fixture to the junction of that drain with any other drain pipe.

**Fixture Supply.** A fixture supply is a water-supply pipe connecting the fixture with the fixture branch.

**Fixture Unit.** A fixture unit is a quantity in terms of which the load-producing effects on the plumbing system of different kinds of plumbing fixtures are expressed on some arbitrarily chosen scale.

**Fixture-Unit Flow Rate.** Fixture-unit flow rate is the total discharge flow in gpm of a single fixture divided by 7.5 which provides the flow rate of that particular plumbing fixture as a unit of flow. Fixtures are rated as multiples of this unit of flow.

**Flood-Level.** See Flooded.

**Flood-Level Rim.** The flood-level rim is the top edge of the receptacle from which water overflows.

**Flooded.** A fixture is flooded when the liquid therein rises to the flood-level rim.

**Flush Valves.** A flush valve is a device located at the bottom of the tank for the purpose of flushing water closets and similar fixtures.

**Flushometer Valve.** A flushometer valve is a device which discharges a predetermined quantity of water to fixtures for flushing purposes and is actuated by direct water pressure.

**Frostproof Closet.** A frostproof closet is a hopper that has no water in the bowl and has the trap and the control valve for its water supply installed below the frost line.

**Grade.** Grade is the slope or fall of a line of pipe in reference to a horizontal plane. In drainage it is usually expressed as the fall in a fraction of an inch per foot length of pipe.

**Grease Interceptor.** See Interceptor.

**Grease Trap.** See Interceptor.

**Hangers.** See Supports.

**Horizontal Branch.** A horizontal branch is a drain pipe extending laterally from a soil or waste stack or building drain, with or without vertical sections or branches, which receives the discharge from one or more fixture drains and conducts it to the soil or waste stack or to the building (house) drain.

**Horizontal Pipe.** Horizontal pipe means any pipe or fitting which makes an angle of more than 45 deg. with the vertical.

**House Drain.** See Building Drain.

**House Sewer.** See Building Sewer.

**House Trap.** See Building Trap.

**Indirect Waste Pipe.** An indirect waste pipe is a pipe that does not connect directly with the drainage system but conveys liquid wastes by discharging into a plumbing fixture or receptacle which is directly connected to the drainage system.

**Individual Vent.** An individual vent is a pipe installed to vent a fixture trap and which connects with the vent system above the fixture served or terminates in the open air.

**Industrial Wastes.** Industrial wastes are liquid wastes resulting from the processes employed in industrial establishments and are free of fecal matter.



**Insanitary.** Contrary to sanitary principles — injurious to health.

**Interceptor.** An interceptor is a device designed and installed so as to separate and retain deleterious, hazardous, or undesirable matter from normal wastes and permit normal sewage or liquid wastes to discharge into the disposal terminal by gravity.

**Journeyman Plumber.** A Journeyman Plumber is a person who performs the manual work of installing plumbing under the direction of a Master Plumber.

**Leader.** A leader (downspout) is the water conductor from the roof to the building storm drain, combined building sewer, or other means of disposal.

**Liquid Waste.** Liquid waste is the discharge from any fixture, appliance, or appurtenance, in connection with a plumbing system which does not receive fecal matter.

**Load Factor.** Load factor is the percentage of the total connected fixture unit flow rate which is likely to occur at any point in the drainage system. It varies with the type of occupancy, the total flow unit above this point being considered, and with the probability factor of simultaneous use.

**Local Governing Body.** A city, county, state, state agency or other political government subdivision or entity authorized to administer and enforce the provisions of the Plumbing Code as adopted or amended.

**Local Ventilating Pipe.** A local ventilating pipe is a pipe on the fixture side of the trap through which vapor or foul air is removed from a room or fixture.

**Loop Vent.** A loop vent is the same as a circuit vent except that it loops back and connects with a stack vent instead of a vent stack.

**Main.** The main of any system of continuous piping is the principal artery of the system, to which branches may be connected.

**Main Sewer.** See Public Sewer.

**Main Vent.** The main vent is the principal artery of the venting system, to which vent branches may be connected.

**Master Plumber.** A Master Plumber is a person who assumes responsible charge and direction of other persons in the installation of plumbing.

**May.** The word "may" is a permissive term.

**Nuisance.** The word "nuisance" embraces public nuisance as known at common law or in equity jurisprudence; and whatever is dangerous to human life or detrimental to health; whatever building, structure, or premises is not sufficiently ventilated, sewerred, drained, cleaned, or lighted, in reference to its intended or actual use; and whatever renders the air or human food or drink or water supply unwholesome, are also severally, in contemplation of this Code, nuisances.

**Offset.** An offset in a line of piping is a combination of elbows or bends which brings one section of the pipe out of line but into a line parallel with the other section.

**Person.** Person is a natural person, his heirs, executors, administrators, or assigns; and includes a firm, partnership or corporation its or their successors or assigns. Singular includes plural; male includes female.

**Pitch.** See Grade.

**Plumbing.** Plumbing is the practice, materials, and fixtures used in the installation, maintenance, extension, and alteration of all piping, fixtures, appliances, and appurtenances in connection with any of the following: Sanitary drainage or storm drainage facilities, the venting system and the public or private water-supply systems, within or adjacent to any building, structure, or conveyance; also the practice and materials used in the installation, maintenance, extension, or alteration of storm-water, liquid-waste, or sewerage, and water-supply systems of any premises to their connection with any point of public disposal or other acceptable terminal.

**Plumbing Fixtures.** Plumbing fixtures are installed receptacles, devices, or appliances which are supplied with water or which receive or discharge liquids or liquid-borne wastes, with or without discharge into the drainage system with which they may be directly or indirectly connected.

**The Plumbing Official.** The plumbing official is the individual official, board, department, or agency established and authorized by a state, county, city or other political subdivision created by law to administer and enforce the provisions of the plumbing code as adopted or amended.

**Plumbing Inspector.** See the Plumbing Official.

**Plumbing System.** The plumbing system includes the water-supply and distribution pipes; plumbing fixtures and traps; soil, wastes, and vent pipes; building drains and building sewers including their respective connections, devices, and appurtenances within the property lines of the premises, and water-treating or water-using equipment.

**Pool.** A pool is a water receptacle used for swimming or as a plunge or other bath, designed to accommodate more than one bather at a time.

**Potable Water.** Potable water is water which is satisfactory for drinking, culinary, and domestic purposes, and meets the requirements of the Health Authority having jurisdiction.

**Private or Private Use.** In the classification of plumbing fixtures, private applies to fixtures in residences or apartments and to fixtures in private bathrooms of hotels and similar installations where the fixtures are intended for the use of a family or an individual.



**Private Sewer.** A private sewer is a sewer privately owned and not directly controlled by public authority.

**Public or Public Use.** In the classification of plumbing fixtures, public applies to fixtures in general toilet rooms of schools, gymnasiums, hotels, railroad stations, public buildings, bars, public comfort stations, and other installations (whether pay or free) where a number of fixtures are installed so that their use is similarly unrestricted.

**Public Official.** See The Plumbing Official.

**Public Sewer.** A public sewer is a common sewer directly controlled by public authority.

**Relief Vent.** A relief vent is a vent the primary function of which is to provide circulation of air between drainage and vent systems.

**Return Offset.** A return offset is a double offset installed so as to return the pipe to its original alignment.

**Revent Pipe.** A revent pipe (sometimes called an individual vent) is that part of a vent pipe line which connects directly with an individual waste or group of wastes, underneath or back of the fixture and extends either to the main or branch vent pipe.

**Rim.** A rim is an unobstructed open edge of a fixture.

**Riser.** A riser is a water-supply pipe which extends vertically one full story or more to convey water to branches or fixtures.

**Roof Drain.** A roof drain is a drain installed to receive water collecting on the surface of a roof and to discharge it into the leader (downspout).

**Roughing-In.** Roughing-in is the installation of all parts of the plumbing system which can be completed prior to the installation of fixtures. This includes drainage, water-supply, and vent piping, and the necessary fixture supports.

**Sand Interceptor.** See Interceptor.

**Sanitary Sewer.** A sanitary sewer is a pipe which carries sewage and excludes storm surface, and ground water.

**Second Hand.** Second hand as applied to material or plumbing equipment is that which has been installed, and has been used, removed, and passed to another ownership or possession.

**Separator.** See Interceptor.

**Septic Tank.** A septic tank is a watertight receptacle which receives the discharge of a drainage system or part thereof, and is designed and constructed so as to separate solids from the liquid, digest organic matter through a period of detention, and allow the liquids to discharge into the soil outside of the tank through a system of open-joint or perforated piping, or disposal pit.

**Sewage.** Sewage is any liquid waste containing animal or vegetable matter in suspension or solution, and may include liquids containing chemicals in solution.

**Shall.** The word "shall" is a mandatory term.

**Side Vent.** A side vent is a vent connecting to the drain pipe through a fitting at an angle not greater than 45 deg. to the vertical.

**Size of Pipe and Tubing.** See Diameter.

**Slope.** See Grade.

**Soil Pipe.** A soil pipe is any pipe which conveys the discharge of water closets or fixtures having similar functions, with or without the discharge from other fixtures, to the building drain or building sewer.

**Soil Vent.** See Stack Vent.

**Special Waste Pipe.** See Chapter 9.

**Stack.** A stack is the vertical main of a system of soil, waste, or vent piping.

**Stack Group.** Stack group is a term applied to the location of fixtures in relation to the stack so that by means of proper fittings, vents may be reduced to a minimum.

**Stack Vent.** A stack vent (sometimes called a waste vent or soil vent) is the extension of a soil or waste stack above the highest horizontal drain connected to the stack.

**Stack Venting.** Stack venting is a method of venting a fixture or fixtures through the soil or waste stack.

**Storm Drain.** See Building Storm Drain.

**Storm Sewer.** A storm sewer is a sewer used for conveying rain water, surface water, condensate, cooling water, or similar liquid wastes.

**Subsoil Drain.** A subsoil drain is a drain which receives only subsurface or seepage water and conveys it to a place of disposal.

**Sump.** A sump is a tank or pit which receives sewage or liquid waste, located below the normal grade of the gravity system and which must be emptied by mechanical means.

**Supports.** Supports, hangers, and anchors are devices for supporting and securing pipe and fixtures to walls, ceilings, floors, or structural members.

**Trap.** A trap is a fitting or device so designed and constructed as to provide, when properly vented, a liquid seal which will prevent the back passage of air without materially affecting the flow of sewage or waste water through it.



**Trap Seal.** The trap seal is the maximum vertical depth of liquid that a trap will retain, measured between the crown weir and the top of the dip of the trap.

**Vacuum Breaker.** See Backflow Preventer.

**Vent Pipe.** See Vent System.

**Vent Stack.** A vent stack is a vertical vent pipe installed primarily for the purpose of providing circulation of air to and from any part of the drainage system.

**Vent System.** A vent system is a pipe or pipes installed to provide a flow of air to or from a drainage system or to provide a circulation of air within such system to protect trap seals from siphonage and back pressure.

**Vertical Pipe.** A vertical pipe is any pipe or fitting which is installed in a vertical position or which makes an angle of not more than 45 deg. with the vertical.

**Waste.** See Liquid Waste and Industrial Wastes.

**Waste Pipe.** A waste pipe is a pipe which conveys only liquid waste, free of fecal matter.

**Water-Distributing Pipe.** A water-distributing pipe in a building or premises is a pipe which conveys water from the water-service pipe to the plumbing fixtures and other water outlets.

**Water Main.** The water (street) main is a water-supply pipe for public or community use.

**Water Outlet.** A water outlet, as used in connection with the water-distributing system, is the discharge opening for the water (1) to a fixture; (2) to atmospheric pressure (except into an open tank which is part of the water-supply system); (3) to a boiler or heating system; (4) to any water-operated device or equipment requiring water to operate, but not a part of the plumbing system.

**Water Riser Pipe.** See Riser.

**Water-Service Pipe.** The water-service pipe is the pipe from the water main or other source of water supply to the building served.

**Water-Supply System.** The water-supply system of a building or premises consists of the water-service pipe, the water-distributing pipes, and the necessary connecting pipes, fittings, control valves, and all appurtenances in or adjacent to the building or premises.

**Wet Vent.** A wet vent is a vent which receives the discharge from wastes other than water closets.

**Yoke Vent.** A yoke vent is a pipe connecting upward from a soil or waste stack to a vent stack for the purpose of preventing pressure changes in the stacks.

## **CHAPTER IV**

### **GENERAL REGULATIONS**

#### **401 Conformance with Code.**

##### **401.1**

All plumbing systems hereafter installed shall conform at least with the provisions of this Code.

All materials shall be installed according to the manufacturer's recommendations. All pipe and fittings shall bear the manufacturer's name or trade mark.

#### **402 Grade of Horizontal Drainage Piping.**

##### **402.1**

Horizontal drainage piping shall be run in practical alignment at a uniform grade. (See Chapter XIII for specific slopes.)

#### **403 Change in Direction.**

##### **403.1 Fittings.**

Changes in direction in drainage piping shall be made by the appropriate use of 45-degree wyes, long-or-short-sweep quarter bends, sixth, eighth, or sixteenth bends, or by a combination of these or equivalent fittings. Single and double sanitary tees and quarter bends may be used in drainage lines only where the direction of flow is from the horizontal to the vertical.

##### **403.2 Short Sweeps.**

Short sweeps not less than 3 inches in diameter may be used in soil and waste lines where the change in direction of flow is from either the horizontal to the vertical or from the vertical to the horizontal, and may be used for making necessary offsets between the ceiling and the next floor above.

#### **404 Fittings and Connections.**

##### **404.1 Fittings Prohibited.**

No fitting having a hub in the direction opposite to flow, or tee branch shall be used as a drainage fitting. No running threads, bands, or saddles shall be used in the drainage system. No drainage or vent piping shall be drilled or tapped.

##### **404.2 Heel or Side-Inlet Bend.**

A heel or side-inlet quarter bend shall not be used as a vent when the inlet is placed in a horizontal position.

##### **404.3 Obstruction to Flow.**

No fitting or connection which offers abnormal obstruction to flow shall be permitted. See par. 607.



## **405 Repairs and Alterations.**

### **405.1 Existing Buildings.**

In existing buildings or premises in which plumbing installations are to be altered, repaired, or renovated, necessary deviations from the provision of this Code may be permitted, provided such deviations conform to the intent of the Code and are approved in writing by the Plumbing Official.

### **405.2 Health or Safety.**

Wherever compliance with all the provisions of this Code fails to eliminate or alleviate a nuisance which may involve health or safety hazards, the owner or his agent shall install such additional plumbing or drainage equipment as may be necessary to abate such nuisance.

## **406 Sewer and Water Pipes.**

### **406.1**

Water service pipes, or any underground water pipes, shall not be run or laid in the same trench as the building sewer or drainage piping, except as provided for in Chapters XII and XIII.

## **407 Trenching, Excavation, and Backfill.**

### **407.1 Support of Piping.**

Buried piping shall be supported throughout its entire length.

### **407.2 Tunneling and Driving.**

Tunneling may be done in yards, courts, or driveways of any building site. When pipes are driven, the drive pipe shall be at least one size larger than the pipe to be laid.

### **407.3 Open Trenches.**

All excavations required to be made for the installation of a building-drainage system, or any part thereof within the walls of a building, shall be open trench work and shall be kept open until the piping has been inspected, tested, and accepted.

### **407.4 Mechanical Excavation.**

Mechanical means of excavation may be used.

### **407.5 Backfilling.**

Adequate precaution shall be taken to insure proper compactness of backfill around piping without damage to such piping.

### **407.6 Backfill Material.**

Trenches shall be backfilled in thin layers to 12 in. above the top of the piping with clean earth which shall not contain stones, boulders, sinder-fill, or other materials which would damage or break the piping or cause corrosive action. Mechanical devices such as bulldozers, graders, etc., may then be used to complete backfill to grade. Fill shall be properly compacted.

## **408 Structural Safety.**

### **408.1**

In the process of installing or repairing any part of a plumbing and drainage installation, the finished floors, walls, ceilings, tile work, or any other part of the building or premises which must be changed or replaced shall be left in a safe structural condition in accordance with the Requirements of the Building Code or as approved by the Plumbing Official.

## **409 Workmanship.**

### **409.1**

Workmanship shall conform to generally accepted good practice.

## **410 Protection of Pipes.**

### **410.1 Breakage and Corrosion.**

Pipes passing under or through walls shall be protected from breakage. Pipes passing through or under cinder or concrete or other corrosive material shall be protected against external corrosion by protective coating, wrapping, or other means which will prevent such corrosion.

### **410.2 Cutting or Notching.**

No structural member shall be weakened or impaired by cutting, notching, or otherwise, except to the extent permitted by the Plumbing or Building Official.

### **410.3 Pipes Through Footings or Foundation Walls.**

A soil or waste pipe, or building drain passing under a footing or through a foundation wall shall be provided with a relieving arch; or there shall be built into the masonry wall an iron pipe sleeve two pipe sizes greater than the pipe passing through or as may be approved in writing by the Plumbing Official.

### **410.4 Freezing.**

No water, soil, or waste pipe shall be installed or permitted outside of a building or in an exterior wall unless adequate provision is made to protect such pipe from freezing where necessary.

## **411 Damage to Drainage System or Public Sewer.**

### **411.1**

It shall be unlawful for any person to deposit by any means into the building drainage system or into a public or private sewer any ashes; cinders; rags; inflammable, poisonous, or explosive liquids; gasses; oils; grease; or any other material which would or could obstruct, damage, or overload such system or sewer.

## **412 Industrial Wastes.**

### **412.1**

Wastes detrimental to the public sewer system or detrimental to the functioning of the sewage-treatment plant shall be treated and disposed of as directed by the Plumbing Official or other authority having jurisdiction.



### **413 Sleeves.**

#### **413.1**

Annular space between sleeves and pipes shall be filled or tightly calked with coal tar or asphaltum compound, lead, or other material found equally effective and approved as such by the Plumbing Official.

### **414 Ratproofing.**

#### **414.1 Exterior Openings.**

All exterior openings provided for the passage of piping shall be properly sealed with snugly fitting collars of metal or other approved ratproof material securely fastened into place.

#### **414.2 Interior Openings.**

Interior openings through walls, floors, and ceilings shall be ratproofed as found necessary by the Plumbing Official.

### **415 Used or Second-Hand Equipment.**

#### **415.1**

It shall be unlawful to purchase, sell, or install used equipment or material for plumbing installations unless it complies with the minimum standards set forth in this Code.

### **416 Condemned Equipment.**

#### **416.1**

Any plumbing equipment condemned by the Plumbing Official because of wear, damage, defects, or sanitary hazards shall not be re-used for plumbing purposes.

### **417 Depth of Building Sewer and Water Service (Outside of Building).**

#### **417.1**

Sewers and water-service piping shall be installed below the recorded frost penetration, but in no case less than 1 foot 6 inches for sewer and 1 foot 6 inches for water piping below grade.

### **418 Piping in Relation to Footings.**

#### **418.1 Parallel.**

No piping shall be laid parallel to footings or outside bearing walls closer than 3 feet, except as may be approved by the Plumbing Official.

#### **418.2 Depth.**

Piping installed deeper than footings or bearing walls shall be 45 deg. therefrom except as may be approved by the Plumbing Official.

### **419 Drainage Below Sewer Level.**

#### **419.1**

Drainage piping located below the level of the sewer shall be installed as provided for in Chapters XIII and XV.

## **420 Connections to Plumbing System Required.**

### **420.1**

All plumbing fixtures, drains, appurtenances, and appliances used to receive or discharge liquid wastes or sewage shall be connected properly to the drainage system of the building or premises, in accordance with the requirements of this Code.

## **421 Sewer Required.**

### **421.1**

Every building in which plumbing fixtures are installed shall have a connection to a public or private sewer except as provided in paragraph 422.1.

## **422 Individual or Private Sewage-Disposal System.**

### **422.1**

When a public sewer is not available within 300 feet for use, sewage and drainage piping shall be connected to an individual sewage-disposal system found to be adequate and approved by the Board of Health.

## **423 Location of Fixtures.**

### **423.1 Light and Ventilation.**

Plumbing fixtures, except drinking fountains and single lavatories, shall be located in compartments or rooms provided with ventilation and illumination conforming to standards of good practice. (See ASA A 53.1-1946).

### **423.2 Improper Location.**

Piping, fixtures, or equipment shall not be located in such a manner as to interfere with the normal operation of windows, doors, or other exit openings.

## **424 Piping Measurements.**

### **424.1**

Except where otherwise specified in this Code all measurements between pipes or between pipes and walls, etc., shall be made to the center lines of the pipes.

## **425 Venting.**

### **425.1**

The drainage system shall be provided with a system of vent piping which will permit the admission or emission of air so that under no circumstances of normal or intended use shall the seal of any fixture trap be subjected to a pressure differential of more than 1 inch of water.

## **426 Ventilation Ducts.**

### **426.1**

Ventilation ducts from washrooms and toilet rooms shall exhaust to the outer air or from an independent system.



**427 Water Closet Connections.**

**427.1 Lead.**

Three-inch lead bends and studs may be used on water closets or similar connections, provided the inlet is dressed or swedged to receive a 4-inch floor flange.

**427.2 Iron.**

Three-inch bends may be used on water closets or similar connections, provided a 4-inch x 3-inch flange is used to receive the fixture horn.

**427.3 Reducing.**

Four-by-three-inch reducing bends are acceptable.

**428 Dead Ends.**

**428.1**

In the installation or removal of any part of a drainage system, dead ends shall be avoided except where necessary to extend a clean-out so as to be accessible.

**429 Toilet Facilities for Workmen.**

**429.1**

Suitable toilet facilities in accordance with Table 922.2 shall be provided and maintained in a sanitary condition for the use of workmen during construction.

## CHAPTER V

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### MATERIALS — QUALITY AND WEIGHT

#### 501 Materials.

##### 501.1 Minimum Standards.

The materials listed in this chapter shall conform at least to the standards cited when used in the construction, installation, alteration, or repair of any part of a plumbing and drainage system, except that the Plumbing Official shall allow the extension, addition, or relocation of existing soil, waste, or vent pipes with materials of like grade or quality, as permitted in paragraph 405.1.

##### 501.2 Use of Materials.

Each material listed in Table 505 shall conform to at least one of the standards cited opposite it. Its use shall be further governed by the requirement imposed in other chapters of the Code. Materials not included in the table shall be used only as provided for in paragraph 501.1. Materials shall be free of manufacturing defects or damage, however occasioned, which would, or would tend to, render such materials defective, unsanitary, or otherwise improper to accomplish the purpose of this Code.

##### 501.3 Specifications for Materials.

Standard specifications for materials for plumbing installations are listed in Table 505 — Products conforming at least to any of the specifications listed for a given material shall be considered acceptable.

**NOTE 1.** Abbreviations used in Table 505 refer to standards or specifications as identified below.

**ASA** American Standards approved by the American Standards Association, 70 East 45th Street, New York 17, N. Y.

**ASTM** Standards and Tentative Standards published by the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.

**FS** Federal Specifications published by the Federal Specifications Board and obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

**AWWA** Standards and Tentative Standards published by the American Water Works Association, 500 Fifth Avenue, New York 18, N. Y.

**CS** Commercial Standards representing recorded voluntary recommendations of the trade, issued by the United States Department of Commerce and obtainable from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



MSS Standards published by the Manufacturers Standardization Society of the Valve and Fittings Industry, 420 Lexington Avenue, New York 17, N. Y.

SPR Simplified Practice Recommendations representing recorded recommendations of the trade and issued by the U. S. Department of Commerce, Washington 25, D. C.

NOTE 2. ASTM Standards are issued under fixed designations; the final number indicates the year or original adoption, or in the case of revision, the year of last revision. "T" indicates Tentative. In the "CS" series of standards, also, the final number indicates the year of issue. For Federal Specifications, the year indicated in Table 505 is that of the date of issue or that of the latest revision or amendment.

NOTE 3. All standards and specifications for materials are subject to change. Designations carrying indication of the year of issue may thus become obsolete. Table 505 gives the full designations of standards current at the time this Code is printed. The latest printed and issued Standards shall take precedence.

#### 501.4 Identification of Materials.

Each length of pipe and each pipe fitting, trap, fixture, and device used in a plumbing system shall have cast, stamped, or indelibly marked on it the maker's mark or name, the weight, type, and classes of the product, when such marking is required by the approved standard that applies.

#### 502 Special Materials.

##### 502.1 Lead.

See Table 505. Sheet lead shall be not less than the following:  
For safe pans — not less than 4 psf.  
For flashings of vent terminals — not less than 3 psf.  
Lead bends and lead traps shall not be less than 1/8 in. wall thickness.

##### 502.2 Copper.

Sheet copper shall be not less than the following:  
Safe pans — 12 oz. per sq. ft.  
Vent terminal flashings — 8 oz. per sq. ft.

##### 502.3 Calking Ferrules.

Shall be manufactured from brass and shall be in accordance with the following table:

Pipe Sizes Inches	Inside Diameter Inches	Length Inches	Minimum Weight Each
2	2¼	4½	1 lb. 0 oz.
3	3¼	4½	1 lb. 12 oz.
4	4¼	4½	2 lb. 8 oz.

#### 502.4 Soldering Bushings.

Where permitted shall be of red brass in accordance with the following table:

Pipe Sizes Inches	Minimum Weight Each
1¼	6 oz.
1½	8 oz.
2	14 oz.
2½	1 lb. 6 oz.
3	2 lb. 0 oz.
4	3 lb. 8 oz.

#### 502.5 Floor Flanges.

Floor flanges for water closets or similar fixtures shall be not less than 1/8-inch thick for brass 1/4-inch thick and not less than 2-inch calking depth for cast iron or galvanized malleable iron. If of hard lead, they shall weigh not less than 1 lb. 9 oz. and be composed of lead alloy with not less than 7.75 per cent antimony by weight.

Flanges shall be soldered to lead bends, or shall be calked, soldered or screwed to other metal.

Closet screws and bolts shall be brass.

#### 502.6 Cleanouts.

- (a) Cleanouts shall have plugs of brass and shall conform to Federal Specifications WW-P-401.
- (b) Plugs may have raised square or countersunk heads.
- (c) Countersunk heads should be used where raised heads may cause a hazard

#### 503 Alternate Materials and Methods.

##### 503.1 Existing Premises.

In existing buildings or premises in which plumbing installations are to be altered, repaired, or renovated, the Plumbing Official has discretionary power to permit deviation from the provisions of this Code, provided that such a proposal to deviate is first submitted for proper determination in order that health and safety requirements, as they pertain to plumbing, shall be observed.

##### 503.2 Approval.

Provisions of this Code are not intended to prevent the use of any material, device, method of assemblage or installation, fixture, or appurtenance not specifically authorized, provided such alternate has been approved by the Plumbing Official or the Southern Building Code Congress.



### **503.3 Evidence of Compliance.**

The Plumbing Official shall require sufficient evidence to enable him to judge whether proposed alternates meet the requirements of this Code for safety and health.

### **503.4 Tests.**

When there is insufficient evidence to substantiate claims for alternates, the Plumbing Official may require tests of compliance as proof to be made by an approved agency at the expense of the applicant.

### **503.5 Test Procedure.**

Tests shall be made in accordance with generally recognized standards; but in the absence of such standards, the Plumbing Official shall specify the test procedure.

### **503.6 Repeated Tests.**

The Plumbing Official may require tests to be repeated if, at any time, there is reason to believe that an alternate no longer conforms to the requirements on which its approval was based.

## **504 Approved Materials.**

### **504.1 Periodic Review.**

The Plumbing Official shall periodically, at least once every two years, review the approved list of specifications and standards for materials in Table 505 and in Chapter IX "Plumbing Fixtures" to check the designations, numbers, etc., which are used for identification, and if there are later issues shall submit them for their legal adoption.

### **504.2 Specific Usage.**

Each chapter of this Code indicates specifically the type of material permitted for the various parts of the plumbing system. The specifications for each of those materials are given in Table 505.

**TABLE 505 — MATERIALS FOR PLUMBING INSTALLATIONS**

Note: To be used only within the limitations of the applicable standards listed below.

MATERIALS	SEE SECTIONS 501.3 & 504.2			OTHER STANDARDS REMARKS
	ASA	ASTM	FS	
Nonmetallic Piping				
Asbestos Cement Sewer Pipe		C-428-59T	SS-P-331b(62)	See Footnotes 1 & 2
Asbestos Cement Water Pipe		C-296-59T	SS-P-351a(53)	
Bituminized Sewer Pipe & Fittings		C-1861-61T	SS-P-356(55)	CS-116-54 See Note 2
Bituminized Perforated Pipe & Fittings			SS-P-358a(60)	
Bituminized Laminated Fiber Pipe		D-____-61T	SS-P-00345-(61)	CS-226-59 See Note 2
Clay Sewer Pipe		C-200-59T	SS-P-861b(1)56	
Clay Sewer Pipe (Perforated)	A-106.1-58	C-211-57T	SS-P-0035a(59)	CS-143-59
Clay Drain Pipe		C-4-59T		
Clay Pipe Flexible Joint		C-425-60T		
Clay Pipe Hot Pour Joints			SS-S-169(54)	
Concrete Reinforced Sewer Pipe		C-361-59T	SS-P-375(56)	
Concrete Sewer Pipe		C-14-59	SS-P-371a(56)	
Concrete (Steel Cylinder Type)			SS-P-381(55)	
Concrete Reinforced Culvers				
Concrete Perforated		C-76-59T		
Concrete Drain Tile		C-444-59T		
Ferrous Pipe & Fittings		C-412-58T		
Cast Iron Soil Pipe & Fittings				
Service Weight				
Cast Iron Soil Pipe & Fittings				CS-188-59 and Amd. 1
Extra Heavy Weight	A-401-35	A-74-42	WW-P-401(51)	CS-188-59 and Amd. 1
Cast Iron Water Pipe	A-21.2-53	A-377-57	WW-P-421a(55)	A.W.W.A.C. 100-55
Cast Iron Pipe (Threaded)	A-40.5-43		WW-P-356(36)	
Cast Iron Fittings (Screwed)	B-16.12-53		WW-P-501c(56)	



TABLE 505 — MATERIAL FOR PLUMBING INSTALLATIONS (Continued)

MATERIALS	SEE SECTIONS 501.3 & 504.2			OTHER STANDARDS REMARKS
	ASA	ASTM	FS	
Cast Iron (Screwed) Drainage Fittings	B-16.4-53		WW-P-491a(46)	
Wrought Iron Pipe	B-36.2-58	A-72-59T	WW-P-441b(52)	
Wrought Steel—Iron Pipe	B-36.10-59			
Steel Pipe Hot-Dipped Zinc Coated	B-36.20-60	A-120-57T	WW-P-406a(57)	
Steel Pipe Open Hearth	B-36.23-59	A-253-58	WW-P-406a(57)	
Steel Pipe Welded & Seamless	B-36.1-58	A-53-59T	WW-P-406a(56)	
Malleable Iron Fitting (Screwed) 150 lb.	B-16.3-59	A-338-54	WW-P-521d(59)	
Pipe Threads	B-2.1-60		GGG-P-351a(44)	
Nipples—Pipe-threaded			WW-N-351a(56)	CS-5-46
Non-ferrous Pipe & Fittings				
Brass Tubing		B-135-61	WW-T-791(33)	
Brass Tube (Seamless)			WW-T-791(1)-(33)	
Brass Seamless I.P.S. Pipe Std.			WW-P-351(1)-(30)	
Copper Tube (Soldered or flared fittings)	B-16.26-56		WW-T-799a(1)-(46)	
Copper Water Tube Seamless	H-23.1-59			
Seamless Copper Pipe Std. Size	H-26.1-59	B-42-58	WW-P-377b(1)-(55)	
Copper Water Tube KLM.	H-23.1-59	B-88-61	WW-T-799a(1)-(46)	
Seamless Copper Tube		B-75-61		
Copper Drainage Tube DWV		B-306-61	WW-T-797a(58)	CS-229-61*

\*For above ground plumbing drainage Waste & Vents "Except Urinal Waste & Vents"

**TABLE 505 — MATERIAL FOR PLUMBING INSTALLATIONS (Continued)**

MATERIALS	SEE SECTIONS 501.3 & 504.2		OTHER STANDARDS REMARKS
	ASA	ASTM FS	
Seamless Copper & Copper Alloy Pipe Copper Pipe Threadless Copper Tube, Bright Annealed Seamless Red Brass Pipe Brass or Bronze Flanges & Fittings Cast-Brass Solder Joint Fittings	H-27.1-58 B-16-24-53 B-16-18-50	B-251-59 B-302-61 B-68-58 B-43-58	WW-P-460(45)
Cast-Brass Solder Joint Drainage Fitting	B-16-23-61		
Bronze Screwed Fittings — 125 lb. Copper Wrought Solder Joint Fitting Flared Fittings for Copper (Water) Tube Miscellaneous Caulking Lead Lead Pipe, Bends & Traps Sheet Lead Sheet Copper Soft Solder Sheet Brass Galvanized Iron & Steel Sheets Cement Lining Coal-tar Enamel (Protective Coating) Fixture-Setting Compound	B-16-15-58 B-16-22-51 B-16-28-58		For Copper Water Tube For Plumbing Drain- age Waste & Vents
		B-152-58 B-32-58 B-248-58T A-93-60	QQ-L-156(46) WW-P-325(44) QQ-L-201a(53) QQ-C-502b(58) QQ-S-571c(60) QQ-B-626a(57) QQ-1-716(48) WW-P-496a(51) HH-C-536c(54)
	G-8.2-60 A-21.4-53		CS-94-41 CS-96-41 Grade A  A.W.W.A.-C-104-53 A.W.W.A.-C-203-57



**TABLE 505 — MATERIAL FOR PLUMBING INSTALLATIONS (Continued)**

MATERIALS	SEE SECTIONS 501.3 & 504.2			OTHER STANDARDS REMARKS
	ASA	ASTM	FS	
Air Gap Standards	A-40.4-42			
Backflow Preventors	A40.6-43			
Valves Bronze Gate			WW-V-54(2)(54)	
Valves Cast Iron Gate			WW-V-58(46)	
Gas Water Heaters	Z21.101-60			A.G.A. Approved
Pressure Temperature Relief Valves	Z21.22-58			A.G.A. Approved

- Asbestos-Cement Sewer Pipe shall conform to ASTM Standard C-428-59T, or Federal Specifications SS-P-331b (1962) with the following amendments.

Full Diameter Size: 4, 5 and 6 inch.

Class: Building Sewer Service

Lengths: Maximum 10 feet.

Out of Roundness: Inside Diameter, 1/4" maximum.

Hydrostatic Strength: Not applicable

Flexural Strength: 9 foot span.

4" pipe — 550 lbs.

5" pipe — 950 lbs.

6" pipe — 1500 lbs.

Crushing Strength:

4" pipe — 1500 lbs.

5" pipe — 1500 lbs.

6" pipe — 1500 lbs.

Tests: One specimen from each 300 length of pipe.
- See Code chapters for limits of recommended usage.

## CHAPTER VI

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### JOINTS AND CONNECTIONS

#### 601 Tightness.

##### 601.1

Joints and connections in the plumbing system shall be gas-tight and watertight for the pressure required by test, with the exceptions of those portions of perforated or open-joint piping which are installed for the purpose of collecting and conveying ground or seepage water to the underground storm drains.

#### 602 Types of Joints.

##### 602.1 Calked Joints.

Calked joints for cast-iron bell-and-spigot soil pipe shall be firmly packed with oakum or hemp and filled with molten lead not less than 1-inch deep and not to extend more than 1/8-inch below rim of hub. No paint, varnish, or other coatings shall be permitted on the jointing material until after the joint has been tested and approved.

##### 602.2 Threaded Joints. Screwed Joints.

Threaded joints shall conform to American National Taper Pipe thread, ASA B2.1-1945 or FS GGG-P-351a. All burrs shall be removed. Pipe ends shall be reamed or filled out to size of bore, and all chips shall be removed. Pipe-joint cement and paint shall be used only on male threads.

##### 602.3 Wiped Joints.

Joints in lead pipe or fittings, or between lead pipe or fittings and brass or copper pipe, ferrules, solder nipples, or traps, shall be full-wiped joints. Wiped joints shall have an exposed surface on each side of a joint not less than 3/4-inch and at least as thick as the material being jointed. Wall or floor flange lead-wiped joints shall be made by using a lead ring or flange placed behind the joints at wall or floor. Joints between lead pipe and cast iron, steel, or wrought iron shall be made by means of a calking ferrule, soldering nipple, or bushing.

##### 602.4 Soldered, or Sweat Joints.

Soldered or sweat joints for tubing shall be made with approved fittings. Surfaces to be soldered or sweated shall be cleaned bright. The joints shall be properly fluxed and made with approved solder. Joints in copper water tubing shall be made by the appropriate use of approved brass or wrought copper water fittings, properly sweated or soldered together.



#### **602.5 Flared Joints.**

Flared joints for soft tempered copper water tube shall be made with fittings meeting approved standards. The tubing shall be expanded with a proper flaring tool.

#### **602.6 Hot-Poured Joints.**

Hot-poured compound for clay or concrete sewer pipe shall not be water absorbent and when poured against a dry surface shall have a bond of not less than 100 psi. All surfaces of the joint shall be cleaned and dried before pouring. If wet surfaces are unavoidable, a suitable primer shall be applied. Compound shall not soften sufficiently to destroy the effectiveness of the joint when subjected to a temperature of 160 deg. F nor be soluble in any of the waste carried by the drainage system. Approximately 25 per cent of the joint space at the base of the socket shall be filled with jute or hemp. A pouring collar, rope or other device shall be used to hold the hot compound during pouring. Each joint shall be poured in one operation until the joint is filled. Joints shall not be tested until one hour after pouring.

#### **602.7 Precast Joints.**

Precast collars shall be formed in both the spigot and bell of the pipe in advance of use. Collar surfaces shall be conical with side slopes of 3 deg. with the axis of the pipe and the length shall be equal to the depth of the socket. Prior to making joint contact, surfaces shall be cleaned and coated with solvents and adhesives as recommended in the standard. When the spigot end is inserted in the collar, it shall bind before contacting the base of the socket. Material shall be inert and resistant to both acids and alkalies.

#### **602.8 Brazed Joints.**

Brazed joints shall be made in accordance with the provisions of Section 6 of the Code for Pressure Piping, ASA B31.1-1951.

#### **602.9 Cement Mortar Joints.**

Cement joints shall be used only when specifically permitted in other chapters of this Code or when approved by the Plumbing Official, as sufficient to accomplish the purpose of this Code. A layer of jute or hemp shall be inserted into the base of the joint space and rammed to prevent mortar from entering the interior of the pipe. Jute or hemp shall be dipped into a slurry suspension of portland cement in water prior to insertion into bell. Not more than 25 per cent of the joint space shall be used for jute or hemp. The remaining space shall be filled in one continuous operation with a thoroughly mixed mortar composed of one part cement and two parts sand, with only sufficient water to make the mixture workable by hand. After one-half hour of setting, the joint shall be rammed around entire periphery with a blunt tool to force the partially stiffened mortar into the joint and to repair any cracks formed during the initial setting period. Pipe interior shall be swabbed to remove any material that might have fallen into the interior. Additional mortar of the same composition shall be trowled so as to form a 45 deg. taper with the barrel of the pipe.

### **602.10 Burned Lead Joints.**

Burned (welded) lead joints shall be lapped and the lead shall be fused together to form a uniform weld at least as thick as the lead being jointed.

### **602.11 Asbestos Cement Sewer Pipe Joints.**

Joints in asbestos cement pipe shall be made with sleeve couplings of the same composition as the pipe, sealed with rubber rings. Joints between asbestos cement pipe and metal pipe shall be made by means of an adapter coupling calked as required in paragraph 602.1.

When necessary to cut a new taper or pipe end in the field, a tapering tool designed for this purpose shall be used.

### **602.12 Bituminized Fiber Pipe Joints.**

Joints in bituminized fiber pipe shall be made with tapered type couplings of the same material as the pipe. Joints between bituminized fiber pipe and metal pipe shall be made by means of an adapter coupling calked as required in paragraph 602.1.

When necessary to cut a new taper or pipe end in the field, a tapering tool designed for this purpose shall be used.

## **603 Use of Joints.**

### **603.1 Clay Sewer Pipe.**

Joints in vitrified clay pipe or between such pipe and metal pipe shall be made as provided in paragraphs 602.6 and 602.7.

### **603.2 Concrete Sewer Pipe.**

Joints in concrete sewer pipe or between such pipe and metal pipe shall be made as in paragraphs 602.6 and 602.7.

### **603.3 Cast-Iron Pipe.**

Joints in cast-iron pipe shall be either calked or screwed, as provided in paragraphs 602.1 and 602.2.

Joints for Cast Iron Soil Pipe in the house or building sewer may be a neoprene ring gasket which is compressed when the spigot is inserted in the bell.

### **603.4 Screw Pipe to Cast-Iron.**

Joints between wrought-iron, steel, brass, or copper pipe, and cast-iron pipe shall be either calked or threaded joints made as provided in paragraphs 602.1 and 602.2 or shall be made with approved adapter fittings.

### **603.5 Lead to Cast-Iron, Wrought-Iron or Steel.**

Joints between lead and cast-iron, wrought-iron, or steel pipe shall be made by means of wiped joints to a calking ferrule, soldering nipple, or bushing as provided in paragraph 602.3.

### **603.6 Copper Water Tube.**

Joints in copper tubing shall be made either by the appropriate use of approved brass or wrought copper water fittings, properly



sweated or soldered together or by means of approved compression fittings as provided in paragraphs 602.4 and 602.5.

#### **604 Special Joints.**

##### **604.1 Copper Tubing to Screwed Pipe Joints.**

Joints from copper tubing to threaded pipe shall be made by the use of brass converter fittings. The joint between the copper pipe and the fitting shall be properly sweated or soldered, and the connection between the threaded pipe and the fitting shall be made with a standard pipe size screw joint.

##### **604.2 Welding or Brazing.**

Brazing or welding shall be performed in accordance with requirements of recognized published standards of practice and by licensed or otherwise qualified mechanics, except when it is determined by the Plumbing Official to be equivalent procedure for the purpose of this Code.

##### **604.3 Slip Joints.**

In drainage and water piping, slip joints may be used only on the inlet side of the trap or in the trap seal, and on the exposed fixture supply.

##### **604.4 Expansion Joints.**

Expansion joints must be accessible and may be used where necessary to provide for expansion and contraction of the pipes.

##### **604.5 Ground Joint Brass Connections.**

Ground joint brass connections which allow adjustment of tubing but provide a rigid joint when made up shall not be considered as slip joints.

#### **605 Unions (Screwed)**

##### **605.1 Drainage System.**

Unions may be used in the trap seal and on the inlet side of the trap. Unions shall have metal-to-metal seats.

##### **605.2 Water-Supply System.**

Unions in the water-supply system shall be metal-to-metal with ground seats.

#### **606 Water Closet, Pedestal Urinal, and Trap Standard Service.**

##### **606.1**

Fixture connections between drainage pipes and water closets, floor-outlet service sinks, pedestal urinals, and earthenware trap standards, shall be made by means of brass, hard-lead, or iron flanges, calked, soldered, or screwed to the drainage pipe. The connection shall be bolted, with an approved gasket or washer or setting compound between the earthenware and the connection. The floor flange shall be set on an approved firm base. The use of commercial putty or plaster is prohibited.

## **607 Prohibited Joints and Connections.**

### **607.1 Drainage System.**

Any fitting or connection which has an enlargement, chamber, or recess with a ledge, shoulder, or reduction of pipe area, that offers an obstruction to flow through the drain, is prohibited.

### **607.2**

No fitting or connection that offers abnormal obstruction to flow, shall be used. The enlargement of a 3-inch closet bend or stub to 4-inches shall not be considered an obstruction.

## **608 Waterproofing of Openings.**

### **608.1**

Joints at the roof, around vent pipes, shall be made water-tight by the use of lead, copper, galvanized-iron, or other approved flashings or flashing material. Exterior-wall openings shall be made water-tight.

## **609 Increases and Reducers.**

### **609.1**

Where different sizes of pipes, or pipes and fittings are to be connected, the proper size increasers or reducers or reducing fittings shall be used between the two sizes.



## CHAPTER VII

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### TRAPS AND CLEANOUTS

#### 701 Traps.

##### 701.1 Fixture Traps.

Plumbing fixtures, excepting those having integral traps, shall be separately trapped by a water-seal trap, placed as close to the fixture outlet as possible.

- (a) Provided, that a combination plumbing fixture may be installed on one trap, if one compartment is not more than 6-inches deeper than the other and the waste outlets are not more than 30-inches apart.
- (b) Provided, that one trap may be installed for a set of not more than three single-compartment sinks or laundry trays or three lavatories immediately adjacent to each other in the same room, if the waste outlets are not more than 30-inches apart and the trap is centrally located when three compartments are installed.

##### 701.2 Distance of Trap to Fixture.

The vertical distance from the fixture outlet to the trap weir shall not exceed 24-inches.

#### 702 Type and Size of Traps and Fixture Drains.

##### 702.1 Trap Size.

The size (nominal diameter) of trap for a given fixture shall be sufficient to drain the fixture rapidly but in no case less than given in Chapter XIII, Table 1304.2.

##### 702.2 Relation to Fixture Drains.

No trap shall be larger than the fixture drain to which it is connected.

##### 702.3 Type of Traps.

- (a) Fixture traps shall be self-cleaning other than integral traps without partitions or movable parts, except as specifically approved in other sections of this Code.
- (b) Slip joints or couplings may be used on the trap inlet or within the trap seal of the trap if metal-to-metal ground joint is used.
- (c) A trap integral with the fixture shall have uniform interior and smooth waterway.

#### **702.4 Drum Traps.**

- (a) Drum traps shall be not less than 4-inches in diameter and shall be provided with a water seal of not less than 2-inches.
- (b) The trap screw shall be one size less than the trap diameter.

#### **703 General Requirements.**

##### **703.1 Trap Seal.**

Each fixture trap shall have a water seal of not less than 2-inches and not more than 4-inches, except where a deeper seal is required by the Plumbing Official for special conditions.

##### **703.2 Trap Cleanouts.**

- (a) Each fixture trap, except those cast integral or in combination with fixtures in which the trap seal is readily accessible or except when a portion of the trap is readily removable for cleaning purposes, shall have an accessible brass trap screw of ample size protected by this water seal.
- (b) Cleanouts on the seal of a trap shall be made tight with threaded cleanout plug and approved washer.

##### **703.3 Trap Level and Protection.**

Traps shall be set true with respect to their water seals and, where necessary, they shall be protected from freezing.

##### **703.4 Traps Underground.**

Underground traps, except "P" traps into which floor drains with removable strainers discharge, shall be provided with accessible and removable cleanouts.

##### **703.5 Prohibited Traps.**

- (a) No trap which depends for its seal upon the action of movable parts shall be used.
- (b) Full "S" traps are prohibited.
- (c) Bell Traps are prohibited.
- (d) Crown-vented traps are prohibited.
- (e) Baffled or partitioned traps are prohibited.

##### **703.6 Double Trapping.**

No fixture shall be double trapped.

#### **704 Pipe Cleanouts.**

##### **704.1 Material and Design.**

The bodies of cleanout ferrules shall conform in thickness to that required for pipe and fittings of the same metal, and extend not less than 1/4-inch above the hub. For new work, the cleanout plug shall be of heavy brass not less than 1/8-inch thick and shall be provided with raised nut or recessed socket for removal. Both ferrule and plug shall have American national tapered pipe threads. Heavy lead plugs may be used for repairing a cleanout where necessary.



#### **704.2 Location.**

Cleanouts shall be not more than 50-feet apart in horizontal drainage lines of 4-inch nominal diameter or less and not more than 100-feet apart for larger pipes. Line cleanouts which may be rodded both ways shall be used whenever possible.

#### **704.3 Underground Drainage.**

Cleanouts, when installed on an underground drain, shall be extended to or above the finished grade level directly above the place where the cleanout is installed; or may be extended to outside of the building and brought to grade as indicated above.

#### **704.4 Change of Direction.**

Cleanouts shall be installed at each change of direction of the building drain greater than 45 deg.

#### **704.5 Concealed Piping.**

Cleanouts on concealed piping shall be extended through and terminate flush with the finished wall or floor, or brought to grade. Pits or chases may be left in the wall or floor, provided they are of sufficient size to permit removal of the cleanout plug and proper cleaning of the system.

#### **704.6 Base of Stacks.**

A cleanout shall be provided at or near the foot of each vertical waste or soil stack. For buildings with a floor slab on fill or ground or with less than 18-inch crawl space under the floor the following will be acceptable in lieu of a cleanout at the base of the stack. The building drain may be extended to the outside of the building and terminated in an accessible cleanout or an accessible cleanout installed in the building drain not more than 5-feet outside the building wall.

#### **704.7 Building Drain Junction.**

There shall be a cleanout near the junction of the building drain and building sewer or a cleanout with "Y" branch inside the building wall.

#### **704.8 Direction of Flow.**

Every cleanout shall be installed so that the cleanout opens in a direction opposite to the flow of the drainage line or at right angle thereto.

#### **704.9**

Cleanout plugs shall not be used for the installation of new fixtures or floor drains except where approved in writing by the Plumbing Official.

#### **705 Size of Cleanouts.**

##### **705.1 Small Pipes.**

Cleanouts shall be of the same nominal size as the pipes up to 4-inches and not less than 4-inches for larger piping.

### **705.2 Large Pipes.**

For underground piping over 10-inches, manholes shall be provided and located at each 90 deg. change in direction and at intervals of not more than 300-feet.

### **705.3 Covers.**

Metal covers shall be provided for manholes.

### **706 Cleanout Clearances.**

#### **706.1 Large Pipes.**

Cleanouts on 3-inch or larger pipes shall be so installed that there is a clearance of not less than 18-inches for the purpose of rodding.

#### **706.2 Small Pipes.**

Cleanouts smaller than 3-inches shall be so installed that there is a 12-inch clearance for rodding.

### **706.3**

Cement, plaster, or any other permanent finishing material shall not be placed over a cleanout plug.

### **706.4 Concealment.**

Where it is necessary to conceal a cleanout plug, a covering plate or access door shall be provided which will permit ready access to the plug.

### **707 Cleanout Equivalent.**

#### **707.1**

A single fixture readily removable without disturbing concealed roughing work, may be accepted as a cleanout equivalent, if there is no more than two 90 deg. bends on the line to be rodded.



## CHAPTER VIII

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### INTERCEPTORS — SEPARATORS AND BACKWATER VALVES

#### 801 Interceptors and Separators.

##### 801.1 When Required.

Interceptors (including grease, oil, and sand interceptors, etc.) shall be provided when, in the opinion of the Plumbing Official, they are necessary for the proper handling of liquid wastes containing grease, flammable wastes, sand and other ingredients harmful to the building drainage system, the public sewer or sewage-treatment plant or processes.

##### 801.2 Approval.

The size, type, and location of each interceptor or separator shall be approved by the Plumbing Official and no wastes other than those requiring treatment or separation shall be discharged into any interceptor.

##### 801.3

No grease interceptor shall be hereinafter installed which does not comply, in all respects with the type or model of each size there-of approved by the department having jurisdiction.

##### 801.4 Separation.

A mixture of light and heavy solids or liquids and solids having various specific gravities may be treated and then separated in an interceptor as approved by the Plumbing Official, in accordance with paragraph 801.2.

#### 802 Grease Interceptors.

##### 802.1 Commercial Buildings.

A grease interceptor shall be installed in the waste line leading from sinks, drains, or other fixtures in the following establishments when, in the opinion of the Plumbing Official, a hazard exists: restaurants, hotel kitchens or bars, factory cafeterias or restaurants, clubs, or other establishments where grease can be introduced into the drainage system in quantities that can affect line stoppage or hinder sewage disposal.

##### 802.2 Residential Units.

A grease interceptor is not required for individual dwelling units or any private living quarters.

### **803 Oil Separators.**

#### **803.1**

An oil separator shall be installed in the drainage system or section of the system where, in the opinion of the Plumbing Official, a hazard exists or where oils or other flammables can be introduced or admitted into the drainage system by accident or otherwise.

### **804 Sand Interceptors.**

#### **804.1 Commercial Installations.**

Sand and similar interceptors for heavy soils shall be so designed and located as to be readily accessible for cleaning, and shall have a water seal of not less than 6-inches.

### **805 Venting Interceptors.**

#### **805.1 Relief Vent.**

Interceptors shall be so designed that they will not become air bound if closed covers are used. Each interceptor shall be properly vented.

### **806 Accessibility of Interceptor.**

#### **806.1**

Each interceptor shall be so installed as to provide ready accessibility to the cover and means for servicing and maintaining the interceptor in working and operating condition. The use of ladders or the removal of bulky equipment in order to service interceptors shall constitute a violation of accessibility.

### **807 Interceptor's Efficiency.**

#### **807.1 Flow Rate.**

Interceptors shall be rated and approved for their efficiency as directed by the Plumbing Official and in accordance with generally accepted practice.

#### **807.2 Approval.**

No grease interceptor shall be approved until it has successfully passed the testing and rating procedure set up by the Plumbing Official.

### **807.3 Water Connection.**

Water connection for cooling or operating an interceptor shall be such that backflow cannot occur.

### **808 Laundries.**

#### **808.1 Interceptors.**

Commercial laundries shall be equipped with an interceptor having a removable wire basket or similar device that will prevent strings, rags, buttons, or other materials detrimental to the public sewerage system from passing into the drainage system.



## **808.2 Intercepting Device.**

Basket or device shall prevent passage into the drainage system of solids 1/2-inch or larger in size. The basket or device shall be removable for cleaning purposes.

## **809 Bottling Establishments.**

### **809.1 Bottling Plants.**

Bottling plants shall discharge their process wastes into an interceptor which will provide for the separation of broken glass or other solids, before discharging liquid wastes into the drainage system.

## **810 Slaughter Houses.**

### **810.1 Separators.**

Slaughtering-room drains shall be equipped with separators which shall prevent the discharge into the drainage system of feathers, entrails, and other materials likely to clog the drainage system.

### **810.2 Interceptors.**

Slaughtering and dressing room drains shall be provided with interceptors approved by the Plumbing Official, in accordance with paragraph 801.2.

### **810.3 Food-Grinder.**

Wastes may discharge directly to the building drainage system.

## **811 Commercial Grinders.**

### **811.1 Discharge.**

Where commercial food-waste grinders are installed, the waste from those units may discharge direct into the building drainage system and not through a grease interceptor.

### **811.2 Approval.**

The Plumbing Official shall determine where and what type of interceptor is required, except that interceptors shall not be required for private living quarters or residential units.

## **812 Maintenance.**

### **812.1 Cleaning.**

Interceptors shall be maintained in efficient operating condition by periodic removal of accumulated grease.

## **813 Oil Interceptors.**

### **813.1 Where Required.**

Oil separators shall be installed when required by the Plumbing Official and shall conform to requirements of paragraph 813.2.

### **813.2 Minimum Dimension.**

Oil separators shall have a depth of not less than 2-feet below the invert of the discharge drain.

### **813.3 Motor Vehicle Storage and Servicing.**

Interceptors shall have a capacity of 6 cubic feet where not more than three vehicles are serviced and one cubic foot in net capacity shall be added for each additional vehicle up to ten vehicles. Where more than ten vehicles are serviced and stored, the Plumbing Official shall determine the size of separator required.

### **813.4**

Where storage facilities are not maintained, as in repair shops, the capacity of the separator shall be based on a net capacity of 1 cubic foot for each 100 square feet of surface to be drained into the interceptor with a minimum capacity of 6 cubic feet.

### **813.5 Special Type Separators.**

Before installing any special type separator a drawing including all pertinent information shall be submitted for approval of the Plumbing Official, as being in accordance with this Code.

### **814 Backwater Valves.**

#### **814.1 Fixtures Subject to Backflow.**

The installation of backwater devices shall be in accordance with lawful requirements of the Plumbing Official having jurisdiction over the public sewer system.

#### **814.2 Fixture Branches.**

Backwater valves shall be installed in the branch of the building drain which receives only the discharge from fixtures located within such branch and below grade.

#### **814.3 Material.**

Backwater valves shall have all bearing parts of bronze or other corrosion-resistant material.

#### **814.4 Backwater Valves.**

Shall be so constructed as to insure a mechanical seal against backflow.

#### **814.5 Diameter.**

Backwater valves, when fully opened, shall have a capacity not less than that of the pipes in which they are installed.

#### **814.6 Location.**

Backwater valves shall be so installed as to provide ready accessibility to their working parts.



## CHAPTER IX

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### PLUMBING FIXTURES

#### 901 General Requirements — Materials.

##### 901.1 Quality of Fixtures.

Plumbing fixtures shall be constructed from approved materials, have smooth impervious surfaces, be free from defects and concealed fouling surfaces, and, except as permitted elsewhere in this Code, shall conform in quality and design to one of the following standards:

Staple Porcelain Plumbing Fixtures, NBS Commercial Standard CS 4-29.

Viterous China Plumbing Fixtures, NBS Commercial Standard CS 20-49.

Enameled Cast-Iron Plumbing Fixtures, NBS Commercial Standard CS 77-48.

Earthenware (viterous glazed) Plumbing Fixtures, NBS Commercial Standard CS 111-43.

Plumbing Fixtures (for) Land Use, F.S. WW-P-541a-1947.

Formed Steel Enameled Sanitary Ware, F.S. WW-P-542.

Formed Metal Porcelain Enameled Sanitary Ware, NBS Commercial Standard CS 144-47.

Hospital Plumbing Fixtures, NBS Simplified Practice Recommendation R 106-41.

Plumbing Fixtures, Fittings, Trim R 227-47.

Lavatory and Sink Traps R 21-46.

#### 902 Alternate Materials.

##### 902.1 Materials.

Sinks and special fixtures may be made of soapstone, chemical stoneware, or may be lined with lead, copper-base alloy, nickel-copper alloy, corrosion-resisting steel or other materials especially suited to the use for which the fixture is intended.

#### 903 Overflows.

##### 903.1 Design.

When any fixture is provided with an overflow, the waste shall be so arranged that the standing water in the fixture cannot rise in the overflow when the stopper is closed or remain in the overflow when the fixture is empty.

### **903.2 Connection.**

The overflow pipe from a fixture shall be connected on the house or inlet side of the fixture trap, except that overflows of flush tanks may discharge into the water closets or urinals served by them, but it shall be unlawful to connect such overflows with any other part of the drainage system.

### **904 Installation.**

#### **904.1 Cleaning.**

Plumbing fixtures shall be installed in a manner to afford easy access for cleaning. Where practical, all pipes from fixtures shall be run to the nearest wall.

#### **904.2 Joints.**

Where fixture comes in contact with wall and floors, the joint shall be watertight.

#### **904.3 Securing Fixtures.**

Floor-outlet fixtures shall be rigidly secured to floor by screws or bolts.

#### **904.4 Wall-Hung Bowls.**

Wall-Hung water-closet bowls shall be rigidly supported by a concealed metal supporting member so that no strain is transmitted to the closet connection.

#### **904.5 Setting.**

Fixtures shall be set level and in proper alignment with reference to adjacent walls. (See paragraph 606.1.)

### **905 Water-Supply Protection.**

#### **905.1 Supply Fittings.**

The supply lines or fittings for every plumbing fixture shall be so installed as to prevent backflow. (See paragraph 1204.3.)

### **906 Prohibited Fixtures and Connections.**

#### **906.1 Fixtures.**

Pan, valve, plunger, offset, washout, latrine, frostproof, and other water closets having an invisible seal or an unventilated space or having walls which are not thoroughly washed at each discharge, shall be prohibited. Any water closet which might permit siphonage of the contents of the bowl back into the tank shall be prohibited.

#### **906.2 Connections.**

Fixtures having concealed slip-joint connections shall be provided with an access panel or utility space so arranged as to make the slip connections accessible for inspection and repair.

### **907 Water Closets.**

#### **907.1 Public Use.**

Water-closet bowls for public use shall be of the elongated type.



#### **907.2 Flushing Device.**

Water-closet tanks shall have a flushing capacity sufficient to properly flush the water-closet bowls with which they are connected.

#### **907.3 Float Valves.**

Float valves in lowdown tanks shall close tight and provide water to properly refill the trap seal in the bowl.

#### **907.4 Close-Coupled Tanks.**

The flush-valve seat in close-coupled water-closet combinations shall be 1-inch or more above the rim of the bowl, so that the flush-valve will close even if the closet trapway is clogged; or any closets with flush valve seats below the rim of the bowl shall be so constructed that in case of trap stoppage, water will not flow continuously over the rim of the bowl.

#### **907.5 Automatic Flush Valve.**

Flushometer shall be so installed that they will be readily accessible for repairing. When the valve is operated, it shall complete the cycle of operation automatically, opening fully and closing positively under the service pressure. At each operation the valve shall deliver water in sufficient volume and at a rate that will thoroughly flush the fixture and refill the fixture trap. Means shall be provided for regulating flush-valve flow. Not more than one fixture shall be served by a single flush valve. Protection against backflow shall be provided as specified in paragraph 905.

#### **907.6 Seats.**

Water closets shall be equipped with seats of smooth non-asorbent material. All seats of water closets provided for public use shall be of the open-front type. Integral water-closet seats shall be of the same material as the fixture.

#### **908 Urinals.**

##### **908.1 Automatic Flushing Tank.**

Tanks flushing more than one urinal shall be automatic in operation and of sufficient capacity to provide the necessary volume to flush and properly cleanse all urinals simultaneously.

##### **908.2 Urinals Equipped with Automatic Flush Valves.**

Flushometers shall be as prescribed in paragraph 907.5 and no valve shall be used to flush more than one urinal.

##### **908.3 Trough Urinals.**

Trough urinals shall be permitted only in places of occasional occupancy. They shall be not less than 6-inches deep and shall be furnished with one-piece backs and have strainers with outlets at least 1½-inches in diameter. The washdown pipe shall be perforated so as to flush with an even curtain of water against the back of the urinal. This pipe shall be securely clamped as high as practicable to the back of the urinal. Trough urinals shall have tanks with a flushing capacity of not less than 1½ gallons of water for each 2-feet of urinal length.

#### **908.4 Equivalent Length.**

Trough urinals shall be figured on the basis of one (1) urinal for each 18-inches of length, i.e.

- 24-in. trough equals 1 urinal.
- 36-in. trough equals 2 urinals.
- 48-in. trough equals 2 urinals.
- 60-in. trough equals 3 urinals.
- 72-in. trough equals 4 urinals.

#### **908.5 Floor-Type Urinals.**

Floor-type trough urinals are prohibited.

#### **908.6 Surrounding Materials.**

Wall and floor space to a point 1-foot in front of urinal lip and 4-feet above the floor, and at least 1-foot to each side of the urinal shall be lined with non-absorbent material.

#### **909 Strainers and Fixture Outlets.**

##### **909.1**

All plumbing fixtures, other than water closets and syphon-action washdown or blowout urinals, shall be provided with metal strainers having waterway area complying with paragraph 901.1.

#### **910. Lavatories.**

##### **910.1 Waste Outlets.**

Lavatories shall have waste outlets not less than 1¼-inches in diameter. Wastes may have open strainers or may be provided with stoppers.

#### **911 Shower Receptors and Compartments.**

##### **911.1 Shower.**

All shower compartments, except those having metal enameled receptors, shall have a lead or copper shower pan or the equivalent thereof or as determined by the Plumbing Official. The pan shall turn up on all sides at least 2-inches above finished floor level. Traps shall be so constructed that the pan may be securely fastened to the trap at the seepage entrance making a watertight joint between the pan and trap. Shower receptacle waste outlets shall be not less than 2-inches and having removable strainer.

##### **911.2 Construction.**

Floors under shower compartments shall be laid on a smooth and structurally sound base and shall be lined and made watertight with sheet lead, copper or other acceptable materials. Shower compartments located in basements, cellars, or in other rooms in which the floor has been laid directly on the ground surface need not be lined.



### **911.3 Public or Institutional Showers.**

Floor of public shower rooms shall be drained in such a manner that no waste water from any head will pass over floor areas occupied by other bathers.

### **911.4 Walls.**

Shower compartments shall have walls constructed of smooth, non-corrosive and non-absorbent waterproof materials to a height of not less than 6-feet above the floor.

### **911.5 Joints.**

Built-in tubs with overhead showers shall have waterproofed joints between the tub and waterproof wall.

### **912 Sinks.**

#### **912.1 Waste Outlets.**

Sinks shall be provided with waste outlets not less than 1½-inches in diameter. Waste outlets may have open strainers or may be provided with stoppers.

#### **912.2 Food Grinders.**

Sinks on which a food grinder is installed shall have a waste opening not less than 3½-inches in diameter.

### **913 Food Waste Grinder Units.**

#### **913.1 Separate Connections.**

Domestic food waste disposal units may be connected and trapped separately from any other fixture or compartment. Units may have either automatic or hand-operated water-supply control. (See paragraph 1204.)

#### **913.2 Grease Interceptors.**

No food waste grinder shall be connected through a grease interceptor.

#### **913.3 Commercial-Type Grinders.**

Commercial-type food grinders shall have an automatic water-supply and shall be provided with not less than a 2-inch waste line. Back waste shall be trapped and vented as provided in other sections of this Code.

### **914 Drinking Fountains.**

#### **914.1 Design and Construction.**

Drinking fountains shall conform to American Standard Specifications for Drinking Fountains. (ASA Z4.2-1942.)

#### **914.2 Protection of Water Supply.**

Stream projectors shall be so assembled as to provide an orifice elevation as specified by American Standard Air Gaps in Plumbing Systems (ASA A40.14-1942) and American Standard Backflow Preventers in Plumbing Systems (ASA A40.16-1943).

## **915 Floor Drains.**

### **915.1 Floor Drains.**

Floor drains shall be installed in all public toilet rooms, bathrooms or restrooms of all occupancies.

### **915.2 Traps and Strainers.**

Floor drains shall have metal traps and a minimum water seal of 3-inches and shall be provided with removable strainers. The open area of strainer shall be at least two-thirds of the cross-section area of the drain line to which it connects.

### **915.3**

Floor drains shall be of a size to serve efficiently the purpose for which it is intended, but in no case less than 2-inches, except that for commercial buildings, schools, dormitories and institutions, floor drains shall be not less than 3-inches.

## **916 Dishwashing Machines.**

### **916.1 Protection.**

Domestic dishwashing machines shall meet requirements in paragraph 1204.3.

### **916.2 Separate Trap.**

Each unit shall be separately trapped or discharge indirectly into a properly trapped and vented fixture.

### **916.3 Air Gap.**

Commercial dishwashing machines shall be connected through an air gap or as provided in Chapter 9 "Indirect Waste Piping and Special Wastes."

### **916.4 Hot Water.**

Dishwashing machines or similar dishwashing equipment not in private living quarters or dwelling units shall be provided with water at 180 deg. F for sterilization.

## **917 Multiple Wash Sinks.**

### **917.1 Circular Type.**

Each 18-inches of wash sink circumference (circular type) shall be equivalent to one lavatory.

### **917.2 Straight-Line Type.**

Multiple wash sinks of the straight-line type shall have hot and cold combination spouts not closer than 18-inches from adjacent similar spouts and each spout shall be considered the equivalent of one lavatory.



**918 Garbage-Can Washers.**

**918.1 Discharge.**

Garbage-can washers shall not discharge through a trap serving any other device or fixture.

**918.2 Grease-Interceptor.**

The discharge from a garbage-can washer shall be connected through a grease-interceptor.

**918.3 Baskets.**

The receptacle receiving the wash from garbage-cans shall be provided with a basket or similar device to prevent the discharge of large particles into the building drainage system.

**918.4 Connections.**

Water Supply Connections shall conform to paragraph 1204.3.

**919 Laundry-Trays.**

**919.1 Waste-Outlets.**

Each compartment of a laundry-tray shall be provided with a waste-outlet not less than 1½-inches in diameter and with a stopper.

**919.2 Overflow.**

Laundry-tray overflows shall conform to the requirements of paragraph 903.1.

**920 Washing Machines for Residences.**

**920.1 Protection.**

Domestic washing machines shall meet requirements in Section 1204.3.

**920.2 Separate Trap.**

Each unit shall be separately trapped or discharge indirectly into a properly trapped and vented fixture.

**921 Special Fixtures and Specialties.**

**921.1 Water and Drain Connections.**

Baptistries, ornamental and lily pools, aquaria, ornamental fountain basins and similar constructions when provided with water supplies shall be protected from back-siphonage as required in paragraph 1204.3.

**921.2 Approval.**

Specialties requiring water and waste connections shall be submitted for approval of the Plumbing Official.

**922 Minimum Facilities.**

**922.1**

Wherever plumbing fixtures are installed, the minimum number of each type of fixture installed shall be in accordance with Table 922.2, unless otherwise specifically provided.

**TABLE 922.2 — MINIMUM FACILITIES<sup>1</sup>**

Type of Building or Occupancy <sup>2</sup>	Water Closets	Urinals	Lavatories	Bathtubs or Showers	Drinking Fountains <sup>3</sup>
Dwelling or Apt. Houses <sup>4</sup>	1 for each Dwelling or Apartment Unit	.....	1 for Each Apartment or Dwelling Unit.	1 for Each Apartment or Dwelling Unit.	
Schools <sup>5</sup>	Male Female				
Elementary	1 per 60 1 per 35	1 per 30 Male	1 per 60 Persons.		1 per 75 Persons.
Secondary	1 per 100 1 per 45	1 per 30 Male	1 per 100 Persons.		1 per 75 Persons.
Office or Public Buildings	No. of Persons No. of Fixtures	Wherever urinals are provided for men or women, one water closet less than the number specified may be provided for each urinal installed except that the number of water closets in such cases shall not be reduced to less than 2/3 of the minimum specified for men and 3/4 of the minimum specified for women.	No. of Persons No. of Fixtures		1 for Each 75 Persons.
	1 - 15 16 - 35 36 - 55 56 - 80 81 - 110 111 - 150		1 - 15 16 - 35 36 - 60 61 - 90 91 - 125		
	1 2 3 4 5 6		1 2 3 4 5		
	1 Fixture for each 40 Additional Persons		Fixture for Each 45 Additional Persons.		



**TABLE 922.2 — MINIMUM FACILITIES<sup>1</sup> (Continued)**

Type of Building or Occupancy <sup>2</sup>	Water Closets	Urinals	Lavatories	Bathubs or Showers	Drinking Fountains <sup>3</sup>
Manufacturing, Warehouses, Workshops, Loft Buildings, Foundries and Similar Establishments <sup>6</sup>	<p>No. of Persons</p> <p>No. of Fixtures</p> <p>1 - 9            1</p> <p>10 - 24        2</p> <p>25 - 49        3</p> <p>50 - 74        4</p> <p>75 - 100       5</p> <p>1 Fixture for Each Additional 30 Employees</p>	<p>Same substitution as above.</p>	<p>1-100 Persons 1 Fixture for Each 10 Persons.</p> <p>Over 100, 1 for Each 15 Persons.<sup>7</sup> <b>a</b></p>	<p>1 shower for each 15 persons exposed to excessive heat or to skin contamination, with poisonous, infectious, or irritating material.</p>	<p>1 for Each 75 Persons.</p>
Dormitories <sup>9</sup>	<p>Male:</p> <p>1 for Each 10 Persons</p> <p>Female:</p> <p>1 for Each 8 Persons</p> <p>Over 10 Persons, Add 1 Fixture for Each 25 Additional Males and 1 for Each 20 Additional Females.</p>	<p>1 for Each 25 Men.</p> <p>Over 150 Persons Add 1 Fixture for Each 50 Men.</p>	<p>1 for Each 12 Persons. (Separate dental lavatories should be provided in community toilet rooms. Ratio of dental lavatories for each 50 persons is recommended.) Add 1 Lavatory for Each 20 Males, 1 for Each 15 Females.</p>	<p>1 for each 8 persons. In the case of women's dormitories, additional bathtubs should be installed at the ratio of 1 for each 30 females. Over 150 persons, add 1 fixture for each 20 persons.</p>	<p>1 for Each 75 Persons.</p>

TABLE 922.2 — MINIMUM FACILITIES<sup>1</sup> (Continued)

Type of Building or Occupancy <sup>2</sup>	Water Closets		Urinals		Lavatories		Bathtubs or Showers	Drinking Fountains <sup>3</sup>
	No. of Persons	No. of Fixtures M. F.	No. of Persons	No. of Fixtures M.	No. of Persons	No. of Fixtures		
Theatres, Auditoriums	1-100	2	1-200	2	1-200	1		
	101-200	3	201-400	3	201-400	2		
	201-400	4	401-600	4	401-750	3		
	Over 400, Add 1 Fixture for Each Additional 500 Males and 1 for Each 300 Females.		Over 600, Add 1 for Additional 300 Males.		Over 750, 1 for Each Additional 500 Persons.			
Restaurant Clubs and Lounges	1-50	1	1-150	1	1-150	1		
	51-150	2	Over 150 Persons, Add One Fixture for Each 150 Men.		151-200	2		
	151-300	3			200-400	3		
	Over 300 Add 1 Fixture for Each 200 Additional Persons.				Over 400, 1 Fixture for Each Additional 400 People.			

M—Male, F—Female.



**TABLE 922.2 — MINIMUM FACILITIES<sup>1</sup> (Concluded)**

<sup>1</sup>The figures shown are based upon one fixture being the minimum required for the number of persons indicated or any fraction thereof.

<sup>2</sup>Building category not shown on this table. Will be considered separately by the Plumbing Official.

<sup>3</sup>Drinking fountains shall not be installed in toilet rooms.

<sup>4</sup>Laundry-trays — one single compartment tray for each dwelling unit or 2 compartment trays for each 10 apartments. Kitchen sinks — 1 for each dwelling or apartment unit.

<sup>5</sup>This schedule has been adopted (1958) by the National Council on Schoolhouse Construction.

<sup>6</sup>As required by the American Standard Safety Code for Industrial Sanitation in Manufacturing Establishments (ASA Z4.1-1955).

<sup>7</sup>Where there is exposure to skin contamination with poisonous, infectious, or irritating materials, provide 1 lavatory for each 5 persons.

<sup>8</sup>4-lineal-inches of wash sink or 18-inches of a circular basin, when provided with water outlets for such space, shall be considered equivalent to 1 lavatory.

<sup>9</sup>Laundry trays, 1 for each 50 persons. Slop sinks, 1 for each 100 persons.

**General.** In applying this schedule of facilities, consideration must be given to the accessibility of the fixtures. Conformity purely on a numerical basis may not result in an installation suited to the need of the individual establishment. For example, schools should be provided with toilet facilities on each floor having classrooms.

**Temporary workmen facilities:**

1 water closet and 1 urinal for each 30 workmen.

24-in. urinal trough — 1 urinal

48-in. urinal trough — 2 urinals

36-in. urinal trough — 2 urinals

60-in. urinal trough — 3 urinals

72-in. urinal trough — 4 urinals

## CHAPTER X

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### HANGERS AND SUPPORTS

#### 1001 General.

##### 1001.1 General.

Piping in a plumbing system shall be installed without undue strains in stresses and provision shall be made for expansion, contraction, and structural settlement.

##### 1002 Vertical Piping.

###### 1002.1 Attachment.

Vertical piping shall be secured at sufficiently close intervals to keep the pipe in alignment and carry the weight of the pipe and contents.

###### 1002.2 Cast-Iron Soil Pipe.

Cast-iron soil pipe shall be supported at the base and at each story level not to exceed 15-feet.

###### 1002.3 Screwed Pipe.

Screwed pipe (S.P.S.) shall be supported at the base and at not less than every other story level not to exceed 30-feet.

###### 1002.4 Copper Tube.

Copper tube shall be supported at each story for piping 1½-inches and over and at not more than 4-foot intervals for piping 1¼-inches and smaller.

###### 1002.5 Lead Pipe.

Lead pipe shall be supported at intervals not exceeding 4-feet.

#### 1003 Horizontal Piping.

##### 1003.1 Supports.

Horizontal piping shall be supported at sufficiently close intervals to keep it in alignment and prevent sagging.

##### 1003.2 Cast-Iron Soil Pipe.

Cast-iron soil pipe shall be supported at not more than 5-foot intervals.

##### 1003.3 Screwed Pipe.

Screwed pipe (S.P.S.) shall be supported at approximately 12-foot intervals.

##### 1003.4 Copper Tubing.

Copper tubing shall be supported at approximately 6-foot intervals for piping 1½-inches and smaller and 10-foot intervals for piping 2-inches and larger.

### **1003.5 Lead Pipe.**

Lead pipe shall be supported by strips or otherwise for its entire length.

### **1003.6 In Ground.**

Piping in the ground shall be laid on a firm bed for its entire length, except where support is otherwise provided which is adequate in the judgment of the Plumbing Official.

### **1004. Hangers and Anchors.**

#### **1004.1 Material.**

Hangers and anchors shall be of metal of sufficient strength to maintain their proportional share of the pipe alignments and prevent rattling.

#### **1004.2 Attachment.**

Hangers and anchors shall be securely attached to the building construction.

### **1005 Strains and Stresses.**

#### **1005.1 Installation of Pipe.**

Piping in a plumbing system shall be so installed as to prevent undue strains and stresses.

#### **1005.2 Expansion and Contraction.**

Provision shall be made for expansion and contraction of piping and for structural settlement that may affect the piping.

#### **1005.3 Piping in Concrete.**

Piping in concrete or masonry walls or footings shall be placed or installed in chases or recesses which will permit access to the piping for repairs or replacement.

### **1006 Base of Stacks.**

#### **1006.1 Supports.**

Bases of cast-iron soil stacks shall be supported on concrete, brick laid in cement mortar, metal brackets attached to the building construction, or by other methods approved by the Plumbing Official.

#### **1006.2 Piping Material.**

Other piping material shall be so anchored as to take the load off the stack at the base.



## CHAPTER XI

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### INDIRECT WASTE PIPING AND SPECIAL WASTES

#### 1101 Indirect Waste Piping.

##### 1101.1 General.

Wastes from the following shall discharge to the building drainage system through an air gap serving the individual fixtures, devices, appliances or apparatus.

##### 1101.2 Food Handling.

Establishments engaged in the storage, preparation, selling, serving, processing, or otherwise handling of food shall have the waste piping from all refrigerators, ice boxes, rinse sinks, cooling or refrigerating coils, laundry washers, extractors, steam tables, egg boilers, coffee urns or similar equipment discharge indirectly into a water-supplied sink or receptor and the waste outlet shall terminate at least 2-inches above the flood rim of such sink or receptor.

##### 1101.3 Commercial Dishwashing Machines.

Dishwashing machines, except those in private living quarters or dwelling units, shall be indirectly connected.

##### 1101.4 Interceptor.

An interceptor shall be placed on the outlet side of the dishwashing machine, or on the discharge side of the indirect waste receptor.

##### 1101.5 Connection.

Indirect waste connections shall be provided for drains, overflows, or relief vents from the water-supply system or air conditioning units.

##### 1101.6 Sterile Materials.

Appliances, devices, or apparatus such as stills, sterilizers, and similar equipment requiring water and waste connections and used for sterile material shall be indirectly connected or provided with an air gap between the trap and the appliance.

##### 1101.7 Drips.

Appliances, devices, or apparatus not regularly classed as plumbing fixtures but which have drips or drainage outlets, shall be drained by indirect waste pipes discharging into an open receptacle as provided in paragraph 1101.2.

#### 1102 Material and Size.

##### 1102.1

The material and size of indirect waste pipes shall be in accordance with the provisions of the other sections of this Code applicable to sanitary-drainage piping.

### **1103 Length.**

#### **1103.1 Waste Pipe.**

Any indirect waste pipe exceeding two-feet in length shall be trapped.

#### **1103.2 Maximum Length.**

The maximum length of the indirect waste to vent shall not exceed 15-feet.

#### **1103.3 Cleaning.**

Indirect waste piping shall be so installed as to permit ready access for flushing and cleansing.

### **1104. Air Gap or Backflow Preventer.**

#### **1104.1 Provision of Air Gap.**

The air gap between the indirect waste and the building drainage system shall be at least twice the effective diameter of the drain served and shall be as provided in paragraph 1104.2 or 1104.3;

#### **1104.2**

By extending the indirect waste pipe to an open, accessible slop sink, floor drain, or other suitable fixture which is properly trapped or vented. The indirect waste shall terminate a sufficient distance above the flood level rim of the receiving fixture to provide the required air gap, and shall be installed in accordance with other applicable sections of this Code;

#### **1104.3**

By providing a break (air gap) in the drain connection on the inlet side of the trap serving the fixture, device, appliance or apparatus.

### **1105 Receptors.**

#### **1105.1 Installation.**

Waste receptors serving indirect pipes shall not be installed in any toilet room, nor in any inaccessible or unventilated space such as a closet or storeroom.

#### **1105.2 Cleanout Location.**

If the indirect waste receptor is set below floor level, cleanout shall be brought level with the floor.

#### **1105.3 Strainers and Baskets.**

Every indirect waste receptor shall be equipped either with a readily removable metal basket over which all indirect waste pipe shall discharge, or the indirect waste receptor outlet shall be equipped with a beehive strainer not less than 4-inches in height.

#### **1105.4 Splashing.**

All plumbing receptors receiving the discharge of indirect waste pipes, shall be of such shape and capacity as to prevent splashing

or flooding. No plumbing fixture which is used for domestic or culinary purposes shall be used to receive the discharge of an indirect waste pipe.

#### **1106 Clear Water Wastes.**

##### **1106.1**

Water lifts, expansion tanks, cooling jackets, sprinkler systems, drip or overflow pans, or similar devices which waste clear water only shall discharge onto a roof or into the building drainage system through an indirect waste.

#### **1107 Condensors and Sumps.**

##### **1107.1**

No steam pipe shall connect to any part of a drainage or plumbing system, nor shall any water above 140 deg. F be discharged into any part of a drainage system. Such pipes may be indirectly connected by discharging into an interceptor or into the drainage system.

#### **1108 Drinking Fountains.**

##### **1108.1**

Drinking fountains may be installed with indirect wastes.

#### **1109 Special Wastes.**

##### **1109.1 Acid Waste.**

Acid and chemical indirect waste pipes shall be of materials unaffected by the discharge of such wastes.

##### **1109.2 Neutralizing Device.**

In no case shall corrosive liquids, spent acids, or other harmful chemicals which might destroy or injure a drain, sewer, soil or waste pipe, or which might create noxious or toxic fumes, discharge into the plumbing system without being thoroughly diluted or neutralized by passing through a properly constructed and acceptable dilution or neutralizing device. Such device shall be automatically provided with a sufficient intake of diluting water or neutralizing medium, so as to make its contents noninjurious before being discharged into the soil or sewage system.

#### **1110 Swimming Pools.**

##### **1110.1**

Piping carrying waste water from swimming or wading pools including pool drainage, back wash from filters, water from scum gutter drains or floor drains which serve walks around pools, shall be installed as an indirect waste utilizing a circulation pump, if necessary, when indirect waste line is below the sewer grade.



## **CHAPTER XII**

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### **WATER SUPPLY AND DISTRIBUTION**

#### **1201 Quality of Water Supply.**

##### **1201.1 Potable Water.**

Potable water is water which is satisfactory for drinking, culinary, and domestic purposes, and meets the requirements of the Health Authority having jurisdiction.

##### **1201.2 Acceptable Sources.**

Where a public supply of potable water is not available, requirements satisfactory to the Health Authority having jurisdiction shall be observed.

##### **1201.3 Non-potable Water.**

Non-potable water may be used for flushing water closets and urinals and other fixtures not requiring potable water, provided such water shall not be accessible for drinking or culinary purposes.

#### **1202 Color Code.**

##### **1202.1 Identification of Piping.**

All piping conveying non-potable water shall be adequately and durably identified by a distinctive yellow-colored paint so that it is readily distinguished from piping carrying potable water. (See ASA Z53-1-1945 Safety Color Code for Marking Physical Hazards.)

#### **1203 Water Supply Mandatory.**

##### **1203.1**

Every building in which plumbing fixtures are installed and are for human occupancy or habitation shall be provided with an ample supply of pure and wholesome water.

#### **1204 Protection of Potable Water Supply.**

##### **1204.1 Cross Connections.**

Potable water supply piping, water discharge outlets, backflow prevention devices or similar equipment shall not be so located as to make possible their submergence in any contaminated or polluted liquid or substance.

##### **1204.2 Approval of Devices.**

Before any device for the prevention of backflow or back-siphonage is installed, it shall have first been certified as meeting the requirements of ASA A40.6-1943 by a recognized testing laboratory acceptable to the Authority having jurisdiction. Devices installed in a potable water supply for protection against backflow shall be maintained in good working condition by the person or persons having control of

such devices. The Authority having jurisdiction may inspect such devices and, if found to be defective or inoperative, shall require the replacement thereof.

### **1204.3 Backflow.**

The water-distribution system shall be protected against backflow. Every water outlet shall be protected from backflow, preferably by having the outlet end from which the water flows spaced a distance above the flood-level rim of the receptacle into which the water flows sufficient to provide a "minimum required air gap" as defined in ASA A40.4-1942. Where it is not possible to provide a minimum air gap, the water outlet shall be equipped with an accessibly located backflow preventer complying with ASA A40.6-1943, installed on the discharge side of the manual control valve.

### **1204.4 Special Devices.**

Where it is not possible to provide either a minimum air gap or a backflow preventer, as may be the case in connection with cooling jackets, condensers or other industrial or special appliances, the Plumbing Official shall require other approved means of protection.

### **1205 Vacuum Breakers and Air Gaps.**

#### **1205.1 Flushometer.**

Flushometer shall be equipped with an approved vacuum breaker. The vacuum breaker shall be installed on the discharge side of the flushing valve with the critical level at least 4-inches above the overflow rim of the bowl.

#### **1205.2 Flushing Tanks.**

Flushing tanks shall be equipped with an approved ball-cock. The ball-cock shall be installed with the critical level of the vacuum breaker at least 1-inch above the full opening of the overflow pipe. In cases where the ball-cock has no hush tube, the bottom of the water supply inlet shall be installed 1-inch above the full opening of the overflow pipe.

#### **1205.3 Trough Urinals.**

Trough urinals shall be equipped with an approved vacuum breaker installed on the discharge side of the last valve and not less than 30-inches above the spray pipe.

#### **1205.4 Lawn Sprinklers.**

Lawn sprinkler systems shall be equipped with an approved preventer on the discharge side of each of the last valves. The backflow preventer shall be at least 6-inches above the highest head, and at no time less than 6-inches above the surrounding ground. Where combination control valves and backflow preventers are installed, the bottom of the valve shall constitute the bottom of the backflow preventer.

#### **1205.5 Valve Outlet.**

Fixtures with hose attachments shall be protected by an approved backflow preventer installed six-inches above the highest point of usage and on the discharge side of the valve.



## **1206 Water-Distribution Pipe, Tubing and Fittings.**

### **1206.1**

Materials for water-distributing pipes and tubing shall be brass, copper, lead, cast-iron, wrought-iron, open-hearth-iron, or steel, with appropriate approved fittings. All threaded ferrous pipe and fittings shall be galvanized (zinc-coated) or cement lined. When used underground in corrosive soil, all ferrous pipe and fittings shall be coated with coal tar enamel or other coatings approved for such purpose by a recognized Standards Organization, and the threaded joints shall be coated and wrapped after installation. (See Chapter V for Standards on Coal Tar Enamel Coatings.)

### **1206.2**

Inaccessible water piping under floor slabs shall be minimum Type K copper tubing, brass, lead, cast iron, galvanized steel, or galvanized wrought iron, except that galvanized steel shall not be used under floor slabs in corrosive soils. All ferrous pipe and fittings shall be coated with coal tar enamel or other coatings approved for such purpose by a recognized Standards Organization and the threaded joints shall be coated and wrapped after installation.

### **1206.3**

Except as permitted in paragraph 1206.4, the underground water-service pipe and the building drain or building sewer shall be not less than 5-feet apart horizontally and shall be separated by undisturbed or compacted earth.

### **1206.4**

The water-service pipe may be placed in the same trench with the building drain and building sewer provided the following conditions are met:

The bottom of the water-service pipe, at all points, shall be at least 12-inches above the top of the sewer line at its highest point.

The water-service pipe shall be placed on a solid shelf excavated at one side of the common trench.

The water-service pipe shall be Type K copper tubing or better with sweated joints.

### **1206.5 Stop-and-Waste Valve Combination.**

Combination stop-and-waste valves and cocks shall not be installed in an underground service pipe.

### **1206.6 Private Water Supply.**

No private water supply shall be inter-connected with any public water supply.

## **1207 Water Pumping and Storage Equipment.**

### **1207.1 Pumps and Other Appliances.**

Water pumps, tanks, filters, softeners, and all other appliances and devices shall be protected against contamination.

### **1207.2 Water-Supply Tanks.**

Potable water-supply tanks shall be properly covered to prevent the entrance of foreign material or insects into the water supply. Soil or waste lines shall not pass directly over such tanks.



### 1207.3 Pressure Tanks, Boilers, and Relief Valves.

The drains from pressure tanks, boilers, relief valves and similar equipment shall be connected to the drainage system through an indirect waste.

### 1207.4 Cleaning, Painting, Repairing Water Tanks.

A potable water-supply tank used for domestic purposes shall not be lined, painted, or repaired with any material which will affect either the taste or the potability of the water-supply when the tank is returned to service. Tanks shall be disconnected from the system during such operations, to prevent any foreign fluid or substance from entering the distribution piping.

### 1208 Water-Supply Tanks (House-Suction Booster).

#### 1208.1 When Required.

When the water pressure from the city mains during flow is insufficient to supply all fixtures freely and continuously, the rate of supply shall be supplemented by a gravity house tank or booster system.

#### 1208.2 Support.

All water-supply tanks shall be supported in accordance with the building code or other regulations which apply.

#### 1208.3 Overflow for Water-Supply Tanks.

Overflow pipes for gravity tanks shall discharge above and within 6-inches of a roof or catch basin, or they shall discharge over an open, water-supplied sink. Adequate overflow pipes properly screened against the entrance of insects and vermin shall be provided.

#### 1208.4 Tank Supply.

The water-supply inlet within the tank shall be at an elevation not less than is required for an air gap in an open tank with overflow, but in no case shall the elevation be less than 4-inches above the overflow.

#### 1208.5 Drains.

Water-supply tanks shall be provided with valved drain lines located at their lowest point and discharged as an indirect waste or as required for overflow pipes in paragraph 1204.3.

#### 1208.6 Size of Overflow.

Overflow drains for water-supply tanks shall not be less than the following:

Drain Pipe (inches)	Tank Capacity (gallons)	Drain Pipe (inches)	Tank Capacity (gallons)
1	Up to 750	2½	3,001 to 5,000
1½	751 to 1,500	3	5,001 to 7,500
2	1,501 to 3,000	4	Over 7,500

Each drain line shall be equipped with a quick opening valve of the same diameter as the pipe.

### **1208.7 Gravity and Suction Tanks.**

Tanks used for domestic water supply, combined supply to fire standpipes and domestic water system, or to supply standpipes for fire-fighting equipment only, shall be equipped with tight covers which are vermin and rodent proof. Such tanks shall be vented with a return bend vent pipe having an area not less than one-half the area of the down feed riser and the vent opening shall be covered with a metallic screen of not less than one hundred (100) mesh.

### **1208 Pressure Tanks.**

Pressure tanks used for supplying water to the domestic water distribution system, combined supply to fire standpipes and domestic water system, or to supply standpipes for fire equipment only, shall be equipped with an acceptable vacuum breaking device located on the top of the tank. The air inlet of this device shall be covered with a metallic screen of not less than one hundred (100) mesh.

### **1209 Disinfection of Potable Water System Piping.**

#### **1209.1**

The local Plumbing Official having jurisdiction may require that a potable-water system or any part thereof installed or repaired be disinfected in accordance with one of the following methods before it is placed in operation:

#### **1209.2**

The system, or part thereof, shall be filled with a solution containing 50 parts per million of available chlorine and allowed to stand 6 hours before flushing and returning to service.

#### **1209.3**

The system, or part thereof, shall be filled with a solution containing 100 parts per million of available chlorine and allowed to stand 2 hours before flushing and returning to service.

#### **1209.4**

In the case of a potable-water storage tank where it is not possible to disinfect as provided in paragraphs 1209.2 and 1209.3 the entire interior of the tank shall be swabbed with a solution containing 200 parts per million of available chlorine and the solution allowed to stand 2 hours before flushing and returning to service.

#### **1209.5**

In the case of potable-water filters or similar devices, the dosage shall be determined by the Plumbing Official.

### **1210 Allowance for Character of Water.**

#### **1210.1 Selection of Materials.**

When selecting the material and size for water-supply pipe, tubing, or fittings due consideration shall be given to the action of the water on the interior and of the soil, fill or other material on



the exterior of the pipe. No material that would produce toxic conditions in a potable-water supply system shall be used for piping, tubing or fittings.

#### **1210.2 Used Piping.**

No piping material that has been used for other than a potable-water supply system shall be re-used in the potable-water supply system.

#### **1211 Water Supply Control.**

##### **1211.1 Water Supply Control.**

A main shut-off valve on the water-service pipe shall be provided near the curb and, also an accessible shut-off valve with a drip valve shall be provided inside near the entrance of the water-service pipe into the building.

##### **1211.2 Tank Controls.**

Supply lines taken from pressure or gravity tanks shall be valved at or near their source.

##### **1211.3 Separate Controls for Each Family Unit.**

In two-family or multiple dwellings, each family unit shall be controlled by an arrangement of shut-off valves which permit each group of fixtures or the individual fixtures to be shut off without interference with the water-supply to any other family unit or portion of the building.

##### **1211.4 Group Fixtures.**

A group of fixtures means two or more fixtures adjacent or near each other. In a one-family house one or two bathrooms adjacent or one over the other may be considered a group.

##### **1211.5 Buildings Other Than Dwellings.**

In all buildings other than dwellings shut-off valves shall be installed, which permit the water-supply to all equipment in each separate room to be shut off without interference with the water-supply to any other room or portion of the building.

##### **1211.6 Water Heating Equipment.**

A shut-off valve shall be provided in the cold-water branch line to each water-storage tank or each water heater.

#### **1212 Water-Supply Distribution.**

##### **1212.1 Water-Service Pipe.**

The water-service pipe from the street main to the water-distribution system for the building shall be of sufficient size to furnish an adequate flow of water to meet the requirements of the building at peak demand, and in no case shall be less than 3/4-inch nominal diameter.

If flushometers or other devices requiring a high rate of water flow are used, the water-service pipe shall be designed to supply this flow.



### 1212.2 Demand Load.

The demand load in the building water-supply system shall be based on the number and kind of fixtures installed and the probable simultaneous use of these fixtures.

### 1213 Procedure in Sizing the Water-Distribution System of a Building.

#### 1213.1

The sizing of the water-distribution system shall conform to good engineering practice. Methods used to determine pipe sizes shall be as follows:

All water-supply lines to fixtures must be adequate in size, and the cross sectional area of any lateral, branch, service, or main must be at least twenty (20%) per cent of the combined cross sectional areas of the outlets served.

#### CROSS SECTION AREAS OF STANDARD SIZE SCREW PIPE

Diameter	Area
$\frac{1}{8}$	0.0123
$\frac{1}{4}$	0.0491
$\frac{3}{8}$	0.1104
$\frac{1}{2}$	0.1963
$\frac{3}{4}$	0.4417
1	0.7854
$1\frac{1}{4}$	1.227
$1\frac{1}{2}$	1.767
2	3.141
$2\frac{1}{2}$	4.908
3	7.068
$3\frac{1}{2}$	9.621
4	12.566
5	19.635
$5\frac{1}{2}$	23.758
6	28.274
$6\frac{1}{2}$	33.183
7	38.484
$7\frac{1}{2}$	44.178
8	50.265
$8\frac{1}{2}$	56.745
9	63.617

#### 1213.2

When required by the Plumbing Official, the sizing of the water-distribution system shall be calculated by a registered mechanical engineer of other acceptable authority.

### 1213.3 Size of Fixture-Supply.

The minimum size of a fixture-supply pipe shall be as follows:

Type of Fixture or Device	Pipe Size (Inches)	Type of Fixture or Device	Pipe Size (Inches)
Bath Tubs .....	1/2	Shower (Single Head) .....	1/2
Combination Sink and Tray .....	1/2	Sinks (Serv., Slop) .....	1/2
Drinking Fountain .....	3/8	Sinks Flushing Rim .....	3/4
Dishwasher		Urinal (Flush Tank) .....	1/2
(Domestic) .....	1/2	Urinal (Direct	
Kitchen Sink, Residential .....	1/2	Flush Valve) .....	3/4
Kitchen Sink,		Water Closet	
Commercial .....	3/4	(Tank Type) .....	3/8
Lavatory .....	3/8	Water Closet	
Laundry Tray, 1, 2 or		(Flush Valve Type) .....	1
3 Compartments .....	1/2	Hose Bibbs .....	1/2
		Wall Hydrant .....	1/2

For fixtures not listed, the minimum supply branch may be made the same as for a comparable fixture.

### 1213.4 Minimum Pressure.

Minimum, fairly constant, service pressure, at the point of outlet discharge shall be not less than 8 psi. for all fixtures except for direct flush-valves, for which it shall be not less than 15 psi., and except where special equipment is used requiring higher pressure. In determining the minimum pressure, allowance shall be made for the pressure drop due to friction loss in the piping system during maximum demand periods as well as head, meter, and other losses in the system.

### 1213.5 Auxiliary Pressure, Supplementary Tank.

If the residual pressure in the system is below the minimum allowable at the highest water outlet when the flow in the system is at peak demand, an automatically controlled pressure tank or gravity tank shall be installed, of sufficient capacity to supply sections of the building installation which are too high to be supplied directly from the public water main.

### 1213.6 Low Pressure Cut-Off.

When a booster pump is used on an auxiliary pressure system and the possibility exists that a pressure of 5 psi. or less may occur on the suction side of the pump, there shall be installed a low-pressure cut-off on the booster pump to prevent the creation of negative pressures on the suction side of the water system. Other arrangements may be used if found adequate and if approved as such by the Plumbing Official.

### 1213.7 Variable Street Pressures.

When the street main has a wide fluctuation in pressure during the day, the water-distribution system shall be designed for minimum pressure available.

### **1213.8 Hazard and Noise.**

Where water pressures are excessive, air chambers or other approved mechanical devices shall be provided to reduce water hammer or line noises to such an extent that no pressure hazard to the piping system will exist.

### **1214 Hot-Water Distribution.**

#### **1214.1 Hot-Water Distribution Piping.**

The sizing of the hot-water distribution piping shall conform to good engineering practice (See paragraph 1213.3).

### **1215 Safety Devices.**

#### **1215.1 Water Pressure Relief Valves and Temperature Relief Valves Required.**

All water heaters shall be provided with an approved self-closing (levered) water pressure relief valve and temperature relief valve or combination thereof. Such valves shall be installed in the shell of the water heater tank or may be installed in the hot water outlet, provided the thermo-bulb extends into the shell of the tank, and in all cases installed at the highest practical point. For installations with separate storage tank, said valves shall all be installed on the tank and there shall not be any type of valve installed between the water heater and the storage tank. Where, in the opinion of the Plumbing Official, safety valves are required they shall be installed in accordance therewith.

#### **1215.2 Energy Shut-Off Devices.**

All automatically fired water heaters shall be equipped with an energy shut-off device which will cut off the supply of heat energy to the water tank before the temperature of the water in the tank exceeds 210 degrees F. This shut-off device is in addition to the temperature and pressure relief valves. This energy shut-off device shall not be required with the water heater that is equipped with a thermostat that cuts off the supply of the heat energy at temperatures below 210 degrees F.

#### **1215.3 Approvals.**

Temperature and Pressure Relief Valves, or combinations thereof, or energy shut-off devices, shall bear the label of the AGA, or ASME, with thermosetting of not more than 210 degrees F. and pressure setting not to exceed the tank or heater manufacturer's rated working pressure. The relieving capacity of these two devices shall each equal or exceed the heat in-put to the water heater or storage tank.

#### **1215.4 Relief Valve Location.**

Temperature relief valves shall be so located in the tank as to be actuated by the water in the top one-eighth of the tank served and in no case more than 3-inches away from such tank. Pressure-



relief valves may be located adjacent to the equipment they serve. There shall be no check valve or shut-off valve between a relief valve and the heater or tank for which it is installed.

#### **1215.5 Relief Outlet Wastes.**

The outlet of a pressure, temperature, or other relief valve shall not be connected to the drainage system as a direct waste.

#### **1215.6 Pressure Marking of Storage Tank.**

Any storage tank hereafter installed for domestic hot water shall have clearly and indelibly stamped in the metal, or so marked upon a plate welded thereto, or otherwise permanently attached, the maximum allowable working pressure. Such markings shall be in an accessible position outside of the tank so as to make inspection or reinspection readily possible. All storage tanks for domestic hot water shall meet the applicable ASME standards.

#### **1216 Miscellaneous.**

##### **1216.1 Drain Cock.**

All storage tanks shall be equipped with adequate drain cocks.

##### **1216.2 Line Valves.**

Valves in the water-supply distribution system, except those immediately controlling one fixture supply, when fully opened shall have a cross-sectional area of the smallest orifice or opening through which the water flows at least equal to the cross-sectional area of the nominal size of the pipe in which the valve is installed.

##### **1216.3 Water Used for Processing.**

Water used of cooling of equipment or similar purposes shall not be returned to the potable-water distributing system. When discharged to the building drainage system, the waste water shall be discharged through an indirect waste pipe or air gap.

## CHAPTER XIII

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### DRAINAGE SYSTEM

#### 1301 Materials.

##### 1301.1 General.

Pipe, tubing, and fittings for drainage systems shall comply with the provisions in Chapter V.

##### 1301.2 Specific Type.

Standards given in Table 505 apply to the specific materials approved for use and as indicated in the various paragraphs in this chapter as they apply to the drainage system.

##### 1301.3 Above-Ground Piping Within Buildings and Piping in Race Ways or Tunnels.

Soil and waste piping for drainage system shall be cast iron, galvanized steel, galvanized wrought iron, lead, brass or copper pipe, or copper tube.

- (a) Acid soil and waste piping for drainage systems shall be of a high silicon cast iron or other materials approved by the Administrative Authority.

##### 1301.4 Underground Piping Within Buildings.

All drains within buildings, when underground, shall be of cast-iron soil pipe or lead. For buildings two stories or under in height, the pipe may be service weight cast-iron or lead.

For buildings over two stories or more in height, the pipe shall be of extra-heavy weight cast-iron, or extra-heavy lead.

##### 1301.5 Fittings.

Fittings on the drainage system shall conform to the type of piping used. Fittings on screwed pipe shall be of the recessed drainage type. (See Section 404.)

#### 1302 Building Sewer.

##### 1302.1 Separate Trenches.

The building sewer, when installed in a separate trench from the water-service pipe, shall be cast-iron sewer pipe, vitrified-clay sewer pipe, concrete sewer pipe, bituminized fiber sewer pipe, or asbestos-cement sewer pipe. Joints shall be water-tight and rootproof and all materials shall be installed according to the manufacturer's recommendations. (See Appendix A). All pipe and fittings shall bear the manufacturer's name or trade mark.

##### 1302.2 Sewer in Filled Ground.

A building sewer or building drain installed in filled or unstable ground shall be of cast-iron pipe, except that nonmetallic drains may be laid upon the approved concrete pad if installed in accordance with paragraph 1302.1.

### **1302.3 Sanitary and Storm Sewers.**

Where separate systems of sanitary drainage and storm drainage are installed in the same property, the sanitary and storm building sewers or drains may be laid side by side in one trench.

### **1302.4 Old House Sewers and Drains.**

Old house sewers and house drains may be used in connection with new building or new plumbing and drainage work only when they are found, on examination and test, to conform in all respects to the requirements governing new house sewers, and the Plumbing Official shall notify the owner to make the changes necessary to conform to this Code.

### **1302.5**

Cleanouts on building sewers shall be located as set forth under paragraph 704.

### **1303 Drainage Piping Installation.**

#### **1303.1 Horizontal Drainage Piping.**

Horizontal drainage piping shall be installed at a uniform slope but at slopes not less than permitted in paragraphs 1303.2, 1303.3, and 1303.4.

#### **1303.2 Small Piping.**

Horizontal drainage piping of 3-inch diameter and less shall be installed with a fall of not less than 1/4-inch per foot.

#### **1303.3 Large Piping.**

Horizontal drainage piping larger than 3-inch diameter shall be installed with a fall of not less than 1/8-inch per foot.

#### **1303.4 Minimum Velocity.**

Where conditions do not permit building drains and sewers to be laid with a fall as great as that specified, then a lesser slope may be permitted provided the computed velocity will not be less than 2 fps.

### **1304 Fixture Units.**

#### **1304.1 Values for Fixtures.**

Fixture unit values as given in Table 1304.2 designate the relative load weight of different kinds of fixtures which shall be employed in estimating the total load carried by a soil waste pipe and shall be used in connection with the tables of sizes for soil, waste, and drain pipes for which the permissible load is given in terms of fixture units.



**TABLE 1304.2 — FIXTURE UNITS PER FIXTURE OR GROUP**

Fixture Type	Fixture-Unit Value as Load Factors	Minimum Size of Trap <sup>2</sup> Inches
1 Bathroom group consisting of water closet, lavatory and bathtub or shower stall.	Tank water closet 6 Flush-valve water closet 8	
Bathtub <sup>1</sup> (with or without over head shower).	2	1½
Bathtub <sup>1</sup> .	3	2
Bidet.	3	Nominal 1½
Combination sink and tray.	3	1½
Combination sink and tray with food disposal unit.	4	Separate traps 1½
Dental unit or cuspidor.	1	1¼
Dental lavatory.	1	1¼
Drinking fountain.	½	1
Dishwater <sup>2</sup> domestic.	2	1½
Floor drains <sup>3</sup> .	1	2
Kitchen sink, domestic.	2	1½
Kitchen sink, domestic with food waste grinder.	3	1½
Lavatory <sup>4</sup> .	1	Small P.O. 1¼ Large P.O. 1½
Lavatory <sup>4</sup> .	2	1½
Lavatory, barber, beauty parlor.	2	1½
Lavatory, surgeon's	2	1½
Laundry tray (1 or 2 compartments)	2	1½
Shower stall, domestic.	2	2
Showers (group) per head <sup>2</sup> .	3	
Sinks.		
Surgeon's.	3	1½
Flushing rim (with valve).	8	3
Service (trap standard).	3	3
Service (P trap).	2	2
Pot, scullery, etc. <sup>2</sup>	4	1½
Urinal, pedestal, syphon jet, blowout.	8	Nominal 3
Urinal, wall lip.	4	1½
Urinal stall, washout.	4	2
Urinal trough <sup>2</sup> (each 2-ft. section)	2	1½
Wash sink <sup>2</sup> (circular or multiple). each set of faucets.	2	Nominal 1½
Water closet, tank-operated.	4	Nominal 3
Water closet, valve-operated.	8	3

<sup>1</sup>A shower head over a bathtub does not increase the fixture value.

<sup>2</sup>See Pars. 1304.3 and 1304.4 for methods of computing unit value of fixtures not listed in Table 1304.2 or for rating of devices with intermittent flows.

<sup>3</sup>Size of floor drain shall be determined by the area of surface water to be drained.

<sup>4</sup>Lavatories with 1¼ or 1½-inch trap have the same load value; larger P.O. plugs have greater flow rate.

**1304.3**

Fixtures not listed in Table 1304.2 shall be estimated in accordance with Table 1304.3.

**TABLE 1304.3**

Fixture Drain or Trap Size	Fixture-Unit Value
1¼-inches and smaller	1
1½-inches	2
2-inches	3
2½-inches	4
3-inches	5
4-inches	6

**1304.4 Values for Continuous Flow.**

For a continuous or semicontinuous flow into a drainage system, such as from a pump, pump ejecter, air-conditioning equipment, or similar device, two fixture units shall be allowed for each gallon-per-minute of flow.

**1305 Determination of Sizes for the Drainage System.****1305.1 Maximum Fixture-Unit Load.**

The maximum number of fixture units that may be connected to a given size of building sewer, building drain, horizontal branch, or vertical soil or waste stack is given in Tables 1305.2 and 1305.3.

**TABLE 1305.2 — BUILDING DRAINS AND SEWERS**

Diameter of Pipe	Maximum Number of Fixture-Units that may be Connected to Any Portion <sup>1</sup> of the Building Drain or the Building Sewer <sup>3</sup>			
	Fall Per Foot			
	1/16-Inch	1/8-Inch	1/4-Inch	1/2-Inch
Inches				
2			21	26
2½			24	31
3		20 <sup>2</sup>	27 <sup>2</sup>	36 <sup>2</sup>
4		180	216	250
5		390	480	575
6		700	840	1,000
8	1,400	1,600	1,920	2,300
10	2,500	2,900	3,500	4,200
12	3,900	4,600	5,600	6,700
15	7,000	8,300	10,000	12,000

<sup>1</sup>Includes branches of the building drain.

<sup>2</sup>Not over two water closets.

<sup>3</sup>No building drain or sewer shall be less than 4-inches in size.

**TABLE 1305.3 — HORIZONTAL FIXTURE BRANCHES AND STACKS**

Diameter of Pipe	Maximum No. of Fixture Units That May Be Connected To:			
	Any Horizontal <sup>1</sup> Fixture Branch	One Stack of 3 Stories in Height or 3 Intervals	More Than 3 Stories In Height	
			Total for Stack	Total at One Story or Branch Interval
Inches				
1¼	1	2	2	1
1½	3	4	8	2
2	6	10	24	6
2½	12	20	42	9
3	20 <sup>2</sup>	30 <sup>3</sup>	60 <sup>3</sup>	16 <sup>2</sup>
4	160	240	500	90
5	360	540	1,100	200
6	620	960	1,900	350
8	1,400	2,200	3,600	600
10	2,500	3,800	5,600	1,000
12	3,900	6,000	8,400	1,500
15	7,000	.....	.....	.....

<sup>1</sup>Does not include branches of the building drain.

<sup>2</sup>Not over two water closets.

<sup>3</sup>Not over six water closets.

#### 1305.4 Minimum Size of Soil and Waste Stacks.

No soil or waste stack shall be smaller than the largest horizontal branch connected thereto except that a 4 x 3 W.C. connection shall not be considered as a reduction in pipe size.

#### 1305.5 Minimum Size of Stack-Vent or Vent Stack.

Any structure to which a building drain is installed shall have at least one stack-vent or vent stack carried through the roof, size to be determined by Table 1305.3 and 1412.5, but not less than 3 inches permitted diameter. Reason: For clarification of this Section and interpretation on large commercial and multi-story plumbing installations.

#### 1305.6 Future Fixtures.

When provision is made for the future installation of fixtures, those provided for shall be considered in determining the required sizes of drain pipes. Construction to provide for such future installation shall be terminated with a plugged fitting or fittings at the stack so as to form no dead end.

#### 1305.7 Underground Drainage Piping.

No portion of the drainage system installed underground or below a basement or cellar shall be less than 2-inches in diameter.



## **1306 Offsets on Drainage Piping.**

### **1306.1 Offsets of 45 Deg. or Less.**

An offset in a vertical stack, with a change of direction of 45 deg. or less from the vertical, may be sized as a straight vertical stack. In case a horizontal branch connects to the stack within 2-feet above or below the offset, a relief vent shall be installed in accordance with paragraph 1418.3.

### **1306.2 Waste Stacks Serving Kitchen Sinks.**

In a one or two family dwelling only in which the waste stack or vent receives the discharge of a kitchen type sink and also serves as a vent for fixtures connected to the horizontal portion of the branch served by the waste stack, the minimum size of the waste stack up to the highest sink branch connection shall be 2-inches in diameter. Above that point the size of the stack shall be governed by the total number of fixture units vented by the stack.

### **1306.3 Above Highest Branch.**

An offset above the highest horizontal branch is an offset in the stack-vent and shall be considered only as it affects the developed length of the vent.

### **1306.4 Below Lowest Branch.**

In the case of an offset in a soil or waste stack below the lowest horizontal branch, no change in diameter of the stack because of the offset shall be required if it is made at an angle of not greater than 45 deg. If such an offset is made at an angle greater than 45 deg., the required diameter of the offset and the stack below it shall be determined as for a building drain (Table 1305.2.)

### **1306.5 Offsets of More Than 45 Deg.**

A stack with an offset of more than 45 deg. from the vertical shall be sized as follows:

The portion of the stack above the offset shall be sized as for a regular stack based on the total number of fixture units above the offset.

The offset shall be sized as for a building drain. (Table 1305.2, Column 5.)

The portion of the stack below the offset shall be sized as for the offset or based on the total number of fixture units on the entire stack, whichever is the larger. (See Table 1305.3, Column 4.)

A relief vent for the offset shall be installed as provided in Chapter 12 and in no case shall the horizontal branch connect to the stack with 2-feet above or below the offset.

## **1307 Sumps and Ejectors.**

### **1307.1 Building Drains Below Sewer.**

Building drains which cannot be discharged to the sewer by gravity flow shall be discharged into a tightly covered and vented

sump from which the liquid shall be lifted and discharged into the building gravity drainage system by automatic pumping equipment or by any equally efficient method approved by the Plumbing Official.

#### **1307.2 Storage Period.**

The storage of drainage in a sump or ejector shall not exceed a period of 12 hours.

#### **1307.3 Design.**

Sump and pumping equipment shall be so designed as to discharge all contents accumulated in the sump during the cycle of emptying operation.

#### **1307.4 Venting.**

The system of drainage piping below the sewer level shall be installed and vented, in a manner similar to that of the gravity system.

#### **1307.5 Duplex Equipment.**

Sumps receiving the discharge of more than six water closets shall be provided with duplex pumping equipment.

#### **1307.6 Vent Sizes.**

Building sump vents shall be sized in accordance with Table 1421.5 but shall in no case be sized less than 1½-inches.

#### **1307.7 Separate Vents.**

Vents from pneumatic ejectors or similar equipment shall be carried separately to the open air as a vent terminal.

#### **1307.8 Connections.**

No direct connection of a steam exhaust, blowoff, or drip pipe shall be made with the building drainage system. Waste water when discharged into the building drainage system shall be at a temperature not higher than 140 F. When higher temperature exists, proper cooling methods shall be provided.

### **1308 Floor Drains.**

#### **1308.1 Accessibility.**

Floor drains shall connect into a trap so constructed that it can be readily cleaned and of a size to serve efficiently the purpose for which it is intended. The drain inlet shall be so located that it is, at all times, in full view.

#### **1308.2 Connection.**

Floor drains subject to backflow shall not be directly connected to the drainage system, or shall be provided with a backwater valve.

#### **1308.3 Provision for Evaporation.**

Floor-drain trap seals subject to evaporation shall be of the deep-seal type of not less than 4-inch water seal, or shall be fed from

an approved plumbing fixture or by means of an approved automatic priming device designed and approved for that purpose.

**1308.4 Venting.**

Floor drains need not be individually vented when sized according to Par. 1422.2.

**1308.5 Size.**

Floor-drain traps and drains, installed below a basement floor or underground, shall be not less than 2-inches in diameter.

**1308.6 Bell Traps.**

Bell traps shall not be permitted.

**1309 Frost Protection.**

**1309.1**

No soil or Waste pipes 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 frost.



## **CHAPTER XIV**

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### **VENTS AND VENTING**

#### **1401 Materials.**

##### **1401.1 Vents.**

Pipe, tubing, and fittings for the vent piping system shall comply with the provisions in Chapter V.

##### **1401.2 Specific Type.**

Standards given in Table 505 apply to the specific materials approved for use and as indicated in the various paragraphs in this chapter as they apply to the venting system.

##### **1401.3 Piping.**

Vent piping shall be cast iron, galvanized steel, galvanized wrought iron, lead, brass or copper pipe, or copper tube.

##### **1401.4 Underground.**

Vent piping placed underground shall be cast-iron soil pipe; provided that other materials may be used for underground vents when found adequate and installed as directed by the Plumbing Official. Where threaded joints are approved for use underground, they shall be coated and wrapped after installation and test.

##### **1401.5 Fittings.**

Fittings shall conform to the type of pipe used in the vent system as required by paragraph 1401.2 and 1401.3.

##### **1401.6 Acid System.**

Vent piping on acid-waste systems shall conform to that required for acid-waste pipe, Section 1301.3.

#### **1402 Protection of Trap Seals.**

##### **1402.1 Traps Protected.**

The protection of trap seals from siphonage or back pressure shall be accomplished by the appropriate use of soil or waste stacks, vents, revents, back vents, loop vents, circuit or continuous vents, or combinations thereof, installed in accordance with the requirements of this chapter.

#### **1403 Vent Stacks.**

##### **1403.1 Installation.**

A vent stack or a main vent shall be installed with a soil or waste stack whenever back vents, relief vents, or other branch vents are required in two or more branch intervals.

### **1403.2 Terminal.**

The vent stack shall terminate independently above the roof of the building or shall be connected with the extension of the soil or waste stack (stack-vent) at least 6-inches above the flood-level rim of the highest fixture.

### **1403.3 Main Stack.**

Every building in which plumbing is installed shall have at least one main vent stack, which shall run undiminished in size and as directly as possible, from the building drain through to the open air above the roof, and in no case less than 3-inches.

### **1404 Vent Terminals.**

#### **1404.1 Roof Extension.**

Extensions of vent pipes through a roof shall be terminated at least 6-inches above it except that where a roof is to be used for any purpose other than weather protection, the vent extensions shall be run at least 5-feet above the roof.

#### **1404.2 Flashings.**

Each vent terminal shall be made watertight with the roof by proper flashing.

#### **1404.3 Flag Poling.**

Vent terminals shall not be used for the purpose of flag poling, TV aeriels, or similar purposes, except when the piping has been anchored to the construction and approved as safe by the Plumbing Official.

#### **1404.4 Location of Vent Terminal.**

No vent terminal from a drainage system shall be directly beneath any door, window, or other ventilating opening of the building or of an adjacent building nor shall any such vent terminal be within 10-feet horizontally of such an opening unless it is at least 2-feet above the top of such opening.

#### **1404.5 Extensions Through Wall.**

Vent terminals extending through a wall, when aproved by the Plumbing Official, shall be at least 10-feet horizontally from any lot line. They shall be turned to provide an opening downward. They shall be effectively screened and shall meet the requirements of paragraph 1404.5. Vent terminals shall not terminate under the overhang of the building.

### **1405 Frost Closure.**

#### **1405.1 Vent Terminal.**

Where there is a possibility of frost closure, the vent extension through a roof shall be at least 3-inches in diameter. When it is found necessary to increase the size of the vent terminal, the change in diameter shall be made inside the building.

#### **1405.2 Increasesers.**

Change in diameter of vent terminals shall be made by use of a long increaser at least 1-foot below the roof.

#### **1406 Vent Grades and Connections.**

##### **1406.1 Grade.**

All vent and branch-vent pipes shall be so graded and connected as to drip back to the soil or waste pipe by gravity.

##### **1406.2 Vertical Rise.**

Where vent pipes connect to a horizontal soil or waste pipe, the vent shall be taken off above the center line of the soil pipe, and the vent pipe shall rise vertically, or at an angle not more than 45 deg. from the vertical, to a point at least 6-inches above the flood-level rim of the fixture it is venting before offsetting horizontally or before connecting to the branch vent.

##### **1406.3 Height Above Fixtures.**

A connection between a vent pipe and a vent stack or stack-vent shall be made at least 6-inches above the flood-level rim of the highest fixture served by the vent. Horizontal vent pipes forming branch vents, relief vents, or loop vents shall be at least 6-inches above the flood-level rim of the highest fixture served.

##### **1406.4 Side-Inlet.**

Side-inlet closet bends are permitted only in cases where the fixture connecting thereto is vented and in no case shall the inlet be used to vent a bathroom group without being washed by a fixture.

#### **1407 Bars and Soda Fountain Sinks.**

##### **1407.1 Bars and Fountain-Sink Traps.**

Traps serving sinks which are part of the equipment of bars, soda fountains, and counters need not be vented when the location and construction of such bars, soda fountains, and counters are such as to make it impossible so to do. When such conditions exist, such sinks shall discharge into a floor sink or hopper which is properly trapped and vented.

##### **1407.2 Sumps.**

Sinks or sumps, receiving indirect waste, shall be located in a properly lighted and ventilated space.

#### **1408 Fixtures Back-to-Back.**

##### **1408.1**

Distance. Two fixtures set back-to-back, within the distance allowed between a trap and its vent, may be served with one continuous soil or waste-vent pipe, provided that each fixture wastes separately into an approved double fitting having inlet openings at the same level. (See paragraph 1410.2.)



**1409 Fixture Vents.**

**1409.1 Distance of Trap from Vent.**

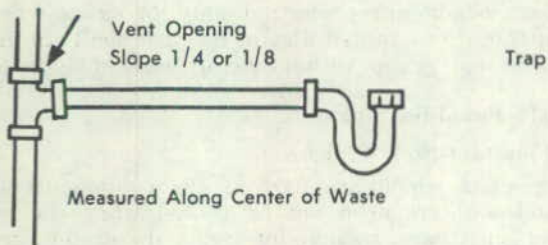
Each fixture trap shall have a protecting vent so located that the slope and the developed length in the fixture drain from the trap weir to the vent fitting are within the requirements set forth in Table 1409.3.

**1409.2 Trap-Seal Protection.**

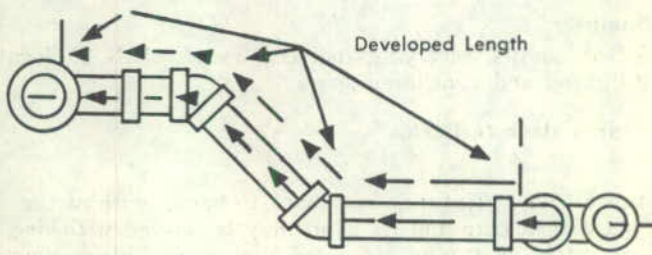
The plumbing system shall be provided with a system of vent piping which will permit the admission or emission of air so that under normal and intended use the seal of any fixture trap shall not be subjected to a pressure differential of more than 1-inch of water.

**TABLE 1409.3 — DISTANCE OF FIXTURE TRAP FROM VENT**

Size of Fixture Drain Inches	Distance Trap to Vent
1 ¼	2 ft. 6 in.
1 ½	3 ft. 6 in.
2	5 ft. 0 in.
3	6 ft. 0 in.
4	10 ft. 0 in.

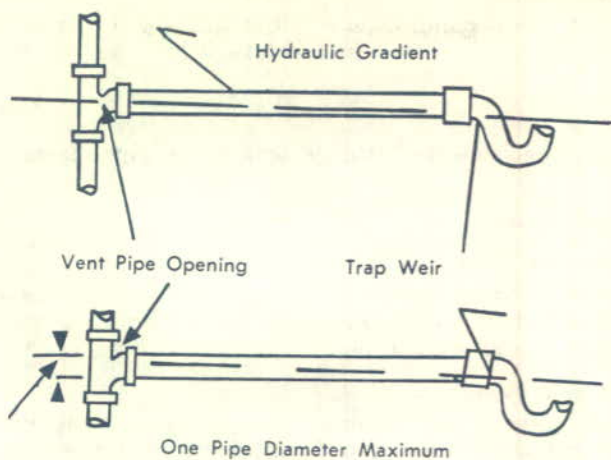


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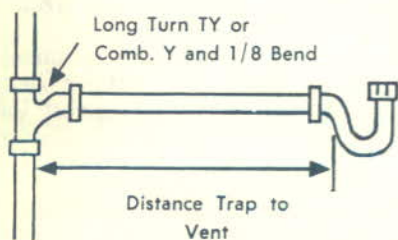
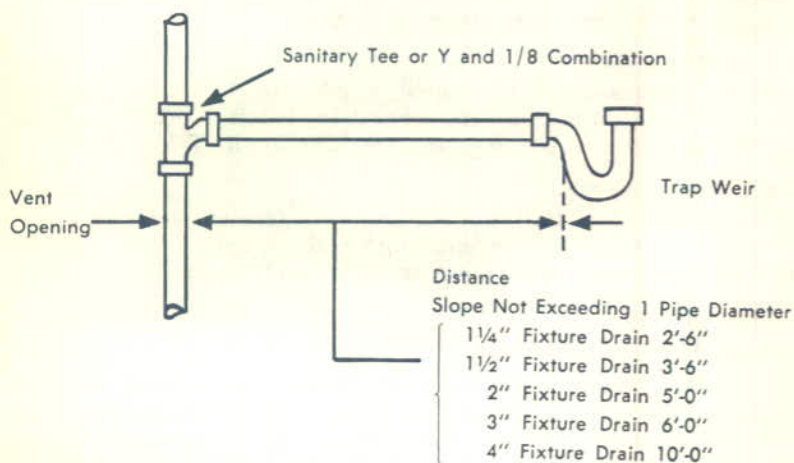


**PLAN**

**DEVELOPED LENGTH MEASUREMENT**



### SLOPE MEASUREMENT



Size of Fixture Drain (Inches)	Length In Feet	
	1/4" Slope	1/2" Slope
1 1/4	1'-6"	1'-0"
1 1/2	4'-0"	2'-0"
2	4'-6"	4'-0"
3	6'-0"	6'-0"
4	8'-0"	8'-0"

#### **1409.4 Trap Dip.**

The vent pipe opening from a soil or waste pipe, except for water closets and similar fixtures, shall not be below the top weir of the trap.

#### **1409.5 Crown Vent.**

No back vent shall be installed within two pipe diameters of the trap weir.

#### **1410 Common Vent.**

##### **1410.1 Individual Vent.**

An individual vent, installed vertically, may be used as a common vent for two fixture traps when both fixture drains connect with a vertical drain at the same level.

##### **1410.2 Common Vent.**

A common vent may be used for two fixtures set on the same floor level but connecting at different levels in the stack, provided the vertical drain is one pipe diameter larger than the upper fixture drain but in no case smaller than the lower fixture drain, whichever is the larger and that both drains conform to Table 1409.3.

#### **1411 Vents for Fixture Trap Below Trap Dip.**

##### **1411.1 Hydraulic Gradient.**

Fixture drains shall be vented within the hydraulic gradient between the trap outlet and vent connection, but in no case shall the unvented drain exceed the distance provided for in Table 1409.3.

##### **1411.2 Different Levels.**

If any stack has fixtures entering at different levels, the fixtures other than the fixture entering at the highest level shall be vented, except as may be permitted in other sections of this chapter.

#### **1412 Wet Venting.**

##### **1412.1 Single Bathroom Groups.**

A single bathroom group of fixtures may be installed with the drain from a back-vented lavatory, kitchen sink, or combination fixture serving as a wet vent for a bathtub or shower stall and for the water closet, provided that:

- (a) Not more than one fixture unit is drained into a 1½-inch diameter wet vent or not more than four fixture units drain into a 2-inch diameter wet vent.
- (b) The horizontal branch connects to the stack at the same level as the water-closet drain or below the water-closet drain when installed on the top floor. It may also connect to the water-closet bend.

##### **1412.2 Double Bath.**

Bathroom groups back-to-back on top floor consisting of two lavatories and two bathtubs or shower stalls may be installed on the



same horizontal branch with a common vent for the lavatories and with no back vent for the bathtubs or shower stalls and for the water closets, provided the wet vent is 2-inches in diameter, and the length of the fixture drain conforms to Table 1409.3.

### 1412.3 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:

- (a) The wet vent and its extension to the vent stack is not less than 2-inches in diameter, and that,
- (b) Each water closet below the top floor is individually back vented, and that,
- (c) The vent stack is sized as given in Table 1412.3c.

**TABLE 1412.3c — SIZE OF VENT STACKS**

Number of Wet-Vented Fixtures	Diameter of Vent Stacks Inches
1 or 2 bathtubs or showers	2
3 to 5 bathtubs or showers	2½
6 to 9 bathtubs or showers	3
10 to 16 bathtubs or showers	4

### 1412.4 Exception.

In multistory bathroom groups, wet vented in accordance with paragraph 1412.3, the water closets below the top floor need not be individually vented if the 2-inch waste connects directly into the water closet bend at a 45 deg. angle to the horizontal portion of the bend in the direction of flow.

### 1413 Stack Venting.

#### 1413.1 One-Bathroom Group.

Except as indicated in paragraph 1413.2, a group of fixtures, consisting of one bathroom group and a kitchen sink or combination fixture, may be installed without individual fixture vents, in a one-story building or on the top floor of a building, provided each fixture drain connects independently to the stack and the water closet and bathtub or shower-stall drain enters the stack at the same level and in accordance with the requirements in Table 1409.3.

#### 1413.2 Overtaxed Sewers.

When a sink or combination fixture connects to the stack-vented bathroom group, and when the street sewer is sufficiently overloaded to cause frequent submersion of the building sewer, a relief vent or back-vented fixture shall be connected to the stack below the stack-vented water closet or bathtub.

#### **1414 Individual Fixture Reventing.**

##### **1414.1 Horizontal Branches.**

One sink and one lavatory, or three lavatories within 8-feet developed length of a main-vented line may be installed on a 2-inch horizontal waste branch without reventing, provided the branch is not less than 2-inches in diameter throughout its length, and provided the wastes are connected into the side of the branch and the branch leads to its stack connection with a pitch of not more than 1/4-inch per foot.

##### **1414.2 Where Required.**

When fixtures other than water closets discharge downstream from a water closet, each fixture connecting downstream shall be individually vented.

##### **1414.3 Limits of Fixture Units Above Bathtubs and Water Closets.**

A fixture or combination of fixtures whose total discharge rating is not more than 3 fixture units may discharge into a stack not less than 3-inches in diameter without reventing, provided such fixture connections are made above the connection to the highest water closet, or bathtub tee-wye, the fixture-unit rating of the stack is not otherwise exceeded, and their waste piping is installed as otherwise required in paragraph 1414.1.

#### **1415 Circuit and Loop Venting.**

##### **1415.1 Battery Venting.**

A branch soil or waste pipe to which two but not more than eight water closets (except blowout type), pedestal urinals, trap standard to floor, shower stalls, or floor drains are connected in battery, may be vented by a circuit or loop vent which shall take off in front of the last fixture connection. In addition, lower-floor branches serving more than three water closets shall be provided with a relief vent taken off in front of the first fixture connection. When lavatories or similar fixtures discharge above such branches, each vertical branch shall be provided with a continuous vent.

##### **1415.2 Dual Branches.**

When parallel horizontal branches serve a total of eight water closets (four on each branch), each branch shall be provided with a relief vent at a point between the two most distant water closets. When other fixtures (than water closets) discharge above the horizontal branch, each such fixture shall be vented.

##### **1415.3 Vent Connections.**

When the circuit loop, or relief vent connections are taken off the horizontal branch, the vent branch connection shall be taken off at a vertical angle or from the top of the horizontal branch.

##### **1415.4 Fixtures Back-to-Back in Battery.**

When fixtures are connected to one horizontal branch through a double wye or a sanitary tee in a vertical position, a common vent



for each two fixtures back-to-back or double connection shall be provided. The common vent shall be installed in a vertical position as a continuation of the double connection.

#### **1416 Pneumatic Ejectors.**

##### **1416.1**

Relief vents from a pneumatic ejector shall not be connected to a fixture-branch vent but shall be carried separately to a main vent or stack-vent or to the open air.

#### **1417 Relief Vents.**

##### **1417.1 Stacks of More Than 10 Branch Intervals.**

Soil and waste stacks in buildings having more than 10 branch intervals shall be provided with a relief vent at each tenth interval installed, beginning with the top floor. The size of the relief vent shall be equal to the size of the vent stack to which it connects. The lower end of each relief vent shall connect to the soil or waste stack through a wye below the horizontal branch serving the floor and the upper end shall connect to the vent stack through a wye not less than 3-feet above the floor level.

#### **1418 Offsets at an Angle Less Than 45 Deg. from the Horizontal in Buildings of Five or More Stories.**

##### **1418.1 Offset Vents.**

Offsets less than 45 deg. from the horizontal, in a soil or waste stack, except as permitted in Chapter XIII, Section 1306, shall comply with paragraphs 1418.2 and 1418.3.

##### **1418.2 Separate Venting.**

Such offsets may be vented as two separate soil or waste stacks, namely, the stack section below the offset and the stack section above the offset.

##### **1418.3 Offset Reliefs.**

Such offsets may be vented by installing a relief vent as a vertical continuation of the lower section of the stack or as a side vent connected to the lower section between the offset and next lower fixture or horizontal branch. The upper section of the offset shall be provided with a yoke vent. The diameter of the vents shall not be less than the diameter of the main vent, or of the soil and waste stack, whichever is the smaller.

#### **1419 Main Vents to Connect at Base.**

##### **1419.1**

All main vents or vent stacks shall connect full size at their base to the building drain or to the main soil or waste pipe, at or below the lowest fixture branch. All vent pipes shall extend undiminished in size above the roof, or shall be reconnected with the main soil or waste vent.



## **1420 Vent Headers.**

### **1420.1 Connections of Vents.**

Stack-vents and vent stacks may be connected into a common vent header at the top of the stacks and then extended to the open air at one point. This header shall be sized in accordance with the requirements of Table 1421.5, the number of units being the sum of all units on all stacks connected thereto and the developed length being the longest vent length from the intersection at the base of the most distant stack to the vent terminal in the open air as a direct extension of one stack.

### **1421 Size and Length of Vents.**

#### **1421.1 Length of Vent Stacks.**

The length of the vent stack or main vent shall be its developed length from the lowest connection of the vent system with the soil stack, waste stack, or building drain to the vent stack terminal, if it terminates separately in the open air, or to the connection of the vent stack with the stack-vent, plus the developed length of the stack-vent from the connection to the terminal in the open air, if the two vents are connected together with a single extension to the open air.

#### **1421.2 Size of Individual Vents.**

The diameter of an individual vent shall be not less than 1¼-inches nor less than one-half the diameter of the drain to which it is connected.

#### **1421.3 Size of Relief Vent.**

The diameter of a relief vent shall be not less than one-half the diameter of the soil or waste branch to which it is connected.

#### **1421.4 Size of Circuit or Loop Vent.**

The diameter of a circuit or loop vent shall be not less than one-half the size of the diameter of the horizontal soil or waste branch or the diameter of the vent stack, whichever is smaller.

#### **1421.5 Size of Vent Piping.**

The nominal size of vent piping shall be determined from its length and the total of fixture units connected thereto, as provided in Table 1421.5. Twenty percent of the total length may be installed in a horizontal position.

**TABLE 1421.5 — SIZE AND LENGTH OF VENTS**

Size of Soil or Waste Stack	Fixture Units Connected	DIAMETER OF VENT REQUIRED (INCHES)																		
		1 1/4	1 1/2	2	2 1/2	3	4	5	6	8										
Inches		MAXIMUM LENGTH OF VENT (FEET)																		
1 1/4	2	30																		
1 1/2	8	50	150																	
1 1/2	10	30	100																	
2	12	30	75	200																
2	20	26	50	150																
2 1/2	42		30	100	300															
3	10		30	100	200	600														
3	30			60	200	500														
3	60			50	80	400														
4	100			35	100	260	1000													
4	200			30	90	250	900													
4	500			20	70	180	700													
5	200				35	80	350	1000												
5	500				30	70	300	900												
5	1100				20	50	200	700												
6	350				25	50	200	400												
6	620				15	30	125	300												
6	960						24	100	250											
6	1900						20	70	200											
8	600							50	150											
8	1400							40	100											
8	2200							30	80											
8	3600							25	60											
10	1000								75											
10	2500								50											
10	3800								30											
10	5600								25											

## **1422 Combination Waste-and-Vent System.**

### **1422.1 Where Permitted.**

A combination waste-and-vent system shall be permitted only where structural conditions preclude the installation of conventional system as otherwise provided in this Code.

### **1422.2 Limits.**

A combination waste-and-vent system is limited to floor drains and sinks. It consists of an installation of waste piping in which the trap of the fixture is not individually vented. Every waste pipe and trap in the system shall be at least two pipe sizes larger than the size required in Chapter XIII.



## **CHAPTER XV**

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### **STORM DRAINS**

#### **1501 General.**

##### **1501.1 Drainage Required.**

Roofs, paved areas, yards, courts, and courtyards, shall be drained into a storm-sewer system or a combined-sewer system where such systems are available.

##### **1501.2 Prohibited Drainage.**

Storm water shall not be drained into sewers intended for sewage only.

##### **1501.3 Traps.**

Leaders and storm drains, when connected to a combined sewer, shall be trapped.

##### **1501.4 Expansion Joints.**

Expansion joints or sleeves shall be provided where warranted by temperature variations or physical conditions.

##### **1501.5 Subsoil Drains.**

Where subsoil drains are placed under the cellar or basement floor or are used to surround the outer walls of a building, they shall be made of open-jointed or horizontally split or perforated clay tile, or perforated bituminized fiber pipe or asbestos cement pipe, not less than 4-inches in diameter. When the building is subject to backwater, the subsoil drain shall be protected by an accessibly located backwater valve. Subsoil drains may discharge into a properly trapped area drain or sump. Such sumps do not require vents.

##### **1501.6 Building Subdrains.**

Building subdrains located below the public sewer level shall discharge into a sump or receiving tank the contents of which shall be automatically lifted and discharged into the drainage system as required for building sumps.

#### **1502 Materials.**

##### **1502.1 Inside Conductors.**

Conductors placed within a building or run in a vent or pipe shaft shall be of cast-iron, galvanized steel, galvanized wrought-iron, galvanized ferrous alloys, brass, copper, or lead.

##### **1502.2 Outside Leaders.**

When outside leaders are of sheet metal and connected with a building storm drain or storm sewer, they shall be connected to a cast-iron drain extending above the finish grade, or the sheet-metal leader shall be protected against injury.

### **1502.3 Underground Storm Drains.**

Building storm drains underground, inside the building, shall be of cast-iron soil pipe.

### **1502.4 Building Storm Drains.**

Building storm drains underground, inside the building, when not connected with a sanitary or combined sewer shall be of cast-iron soil pipe or ferrous-alloy piping except that when approved by the Plumbing Authorities, vitrified-clay pipe, concrete pipe, bituminized-fiber pipe and asbestos-cement pipe, may be used.

### **1502.5 Building Storm Sewers.**

The building storm sewer shall be of cast-iron soil pipe, vitrified-clay pipe, concrete pipe, bituminized-fiber pipe, or asbestos-cement pipe.

## **1503 Traps.**

### **1503.1 Main Trap.**

Individual storm-water traps shall be installed on the storm-water drain branch serving each conductor, or a single trap shall be installed in the main storm drain just before its connection with the combined building sewer, main drain, or public sewer.

### **1503.2 Material.**

Storm-water traps, when required, shall be of cast-iron.

### **1503.3**

No traps shall be required for storm-water drains which are connected to a sewer carrying storm-water exclusively.

### **1503.4**

Traps for individual conductors shall be the same size as the horizontal drain to which they are connected.

### **1503.5**

Conductor traps shall be so located that an accessible cleanout may be installed on the building side of the trap.

## **1504 Conductors and Connections.**

### **1504.1**

Conductor pipes shall not be used as soil, waste, or vent pipes, nor shall soil, waste, or vent pipes be used as conductors.

### **1504.2**

Rain-water conductors installed along alley ways, driveways, or other locations where they may be exposed to damage shall be protected by metal guards, recessed into the wall, or constructed from ferrous alloy pipe.

### **1504.3 Combining Storm with Sanitary Drainage.**

The sanitary and storm-drainage system of a building shall be entirely separate, except that where a combined sewer is available the building storm-drain may be connected in the same horizontal plane through a single Y fitting to the combined drain or sewer at least 10-feet downstream from any soil stack.

### **1504.4 Double Connections of Storm-Drains.**

Where the sanitary and storm-drains are connected on both sides of the combined sewer, single Y's shall be used and the requirements of paragraph 1504.3 relative to the location of connections shall also apply.

### **1504.5**

Floor drains connected to a storm-drain shall be trapped.

## **1505 Roof Drains.**

### **1505.1 Material.**

Roof drains shall be of cast-iron, copper, lead or other acceptable corrosion-resisting material with adequate strainer area.

### **1505.2 Strainers.**

All roof areas, except those draining to hanging gutters, shall be equiped with roof drains having strainers extending not less than 4-inches above the surface of the roof immediately adjacent to the roof drain. Strainers shall have an available inlet area, above roof level, of not less than  $1\frac{1}{2}$  times the area of the conductor or leader to which the drain is connected.

### **1505.3 Flat Decks.**

Roof drain strainers for use on sun decks, parking decks, and similar areas, normally serviced and maintained, may be of the flat surface type, level with the deck and shall have an available inlet area not less than 2 times the area of the conductor or leader to which the drain is connected.

### **1505.4 Roof Drain Flashings.**

The connection between roofs and roof drains which pass through the roof and into the interior of the building shall be made watertight by the use of proper flashing material.

## **1506 Size of Leaders and Storm-Drains.**

### **1506.1**

Vertical leaders shall be sized on the maximum projected roof area, according to the following table:



**TABLE 1506.1 — SIZE OF VERTICAL LEADERS**

Size of Leader or Conductor <sup>1</sup> Inches	Maximum Projected Roof Area Square Feet
2	720
2½	1300
3	2200
4	4600
5	8650
6	13500
8	29000

<sup>1</sup>The equivalent diameter of square or rectangular leader may be taken as the diameter of that circle which may be inscribed within the cross-sectional area of the leader.

NOTE: See footnote to Table 1506.2.

#### 1506.2 Building Storm-Drain.

The size of the building storm-drain or any of its horizontal branches having a slope of 1/2-inch or less per foot, shall be based upon the maximum projected roof area to be handled according to the following Table:

**TABLE 1506.2 — SIZE OF HORIZONTAL STORM DRAINS**

Diameter of Drain  Inches	Maximum Projected Roof Area for Drains of Various Slopes		
	1/8-In. Slope Square Feet	1/4-In. Slope Square Feet	1/2-In. Slope Square Feet
3	822	1160	1644
4	1880	2650	3760
5	3340	4720	6680
6	5350	7550	10700
8	11500	16300	23000
10	20700	29200	41400
12	33300	47000	66600
15	59500	84000	119000

Tables 1506.1 and 1506.2 are based upon a maximum rate of rainfall of 4-inches per hour. If in any state, city, or other political subdivision, the maximum rate of rainfall is more or less than 4-inches per hour, then the figures for roof area must be adjusted proportionately by multiplying the figure by 4 and dividing by the maximum rate of rainfall in inches per hour.

### 1506.3 Roof Gutters.

The size of semicircular gutter shall be based on the maximum projected roof area, according to the following Table:

**TABLE 1506.3 — SIZE OF GUTTERS**

Diameter of Gutter <sup>1</sup>	Maximum Projected Roof Area for Gutters of Various Slopes			
	1/16-In. Slope	1/8-In. Slope	1/4-In. Slope	1/2-In. Slope
Inches	Square Feet	Square Feet	Square Feet	Square Feet
3	170	240	340	480
4	360	510	720	1020
5	625	880	1250	1770
6	960	1360	1920	2770
7	1380	1950	2760	3900
8	1990	2800	3980	5600
10	3600	5100	7200	10000

<sup>1</sup>Gutters other than semicircular may be used provided they have an equivalent cross-sectional area.

### 1507 Size of Combined Drains and Sewers.

#### 1507.1

Conversion of roof area to fixture units of storm drains may be connected to a combined sewer. The drainage area may be converted to equivalent fixture unit loads.

#### 1507.2

When the total fixture unit load on the combined drain is less than 256 fixture units, the equivalent drainage area in horizontal projection shall be taken as 1000 square feet.

#### 1507.3

When the total fixture unit load exceeds 256 fixture units, each fixture unit shall be considered the equivalent of 3.9 square feet of drainage area.

#### 1507.4

If the rainfall to be provided for is more or less than 4-inches per hour, the 1000 square foot equivalent in paragraph 1507.2 and the 3.9 in paragraph 1507.3 shall be adjusted by multiplying by 4 and dividing by the rainfall per hour to be provided for.

### 1508 Values for Continuous Flow.

#### 1508.1

Where there is a continuous or semicontinuous discharge into the building storm-drain or building storm sewer, as from a pump, ejector, air-conditioning plant, or similar device, each gallon per minute of such discharge shall be computed as being equivalent to 24 square feet of roof area, based upon a 4-inch rainfall.

## APPENDIX A

### MANUFACTURERS SPECIFICATIONS, RECOMMENDATIONS AND INSTRUCTIONS FOR THE INSTALLATION OF HOUSE OR BUILDING SEWERS

#### CAST IRON SOIL PIPE.

The procedure endorsed by the Cast Iron Soil Pipe Institute is that which has been common practice in the Plumbing Industry for many years. We have found that when this procedure is followed, Cast Iron Soil Pipe will give trouble free service for the life of the buildings.

- (1) Grade trench reasonably free of stones and pockets.
- (2) Where trenching conditions are difficult, pipe may be supported by masonry blocks, bricks, concrete blocks, or any other similar support.
- (3) Where any such masonry support is necessary it must be placed within (6") inches of the joint.
- (4) Install pipe, make joint with oakum filler properly yarned, and firmly packed with 1" hot poured lead properly calked, or other approved joints.
- (5) After inspection, backfill by any convenient means, eliminating large stones in first 6 inches of backfill.

These instructions in no way preclude the prefabrication of Cast Iron Soil Pipe before it is laid in the trench, which will vary greatly with the equipment and experience of the individual Contractor.

#### FIBER PIPE.

- (1) Trenching — Excavate to desired grade. Use template to detect high spots and holes. Fill holes and depressions, tamping thoroughly.
- (2) Where trenching conditions are difficult, pipe shall be uniformly supported throughout using treated timber, concrete pad, sand, or select backfill properly tamped.
- (3) Lay the pipe line as described. Be sure the pipe is bedded in the selected backfill  $1/4$  to  $1/3$  of the pipe diameter. Under no circumstances should bricks or other supports be used to bring pipe to grade.
- (4) After pipe is bedded and checked for grade, additional selected backfill is placed by shovel at sides and over top of pipe, and tamped. By careful tamping at this point, the pipe can support a much greater load, and is less likely to be subsequently disturbed or shifted.
- (5) Reasonably clean backfill shall be placed 12" over the pipe.



(6) The trench may now be backfilled by any conventional means — bulldozer — loader — etc., and the pipe is protected.

### **CEMENT ASBESTOS PIPE.**

**Supporting the pipe in the Trench.** This may be done in any of the following ways: (1) Lay pipe to grade directly on the trench bottom (shaped to fit the barrel of the pipe for its full length) and dig holes at the ends of the pipe for free assembly of the couplings, and to prevent supporting the pipe on the couplings; or (2) lay pipe to grade on small mounds of earth placed at the black marks stenciled near the ends of the pipe.

The mounds should be high enough to provide sufficient free space for assembly of the coupling; or (3) lay pipe to grade, temporarily supported on small wood blocks located at blocking points. After jointing and placing backfill under pipe, blocks should be removed.

**Tamping and Backfilling.** Backfill, free of stones (and not frozen) is placed under and around the pipe and firmly tamped up to the horizontal diameter. The remainder of the trench is backfilled, avoiding stones, rocks, etc., in the 12" layer immediately above the pipe,

### **CLAY PIPE.**

#### **A. Trench and Material Preparation.**

(a) Width of trenches in which clay pipe is to be installed shall be such as to provide adequate space for workmen to place and joint the pipe properly.

(b) Bell holes shall be excavated so that, after placement, only the barrel of the pipe receives bearing pressure from the trench bottom.

(c) Preparation of the trench bottom and placement of the pipe shall be carefully made so that, when in final position, the pipe is true to line and grade.

(d) Pipe shall be protected during handling against impact shock and free fall. No pipe shall be used in the work which does not conform to the appropriate ASTM standard.

#### **B. Pipe Laying and Jointing.**

(a) The laying of pipe in finished trenches shall be commenced at the lowest point, with the spigot ends pointing in the direction of flow.

(b) All pipe shall be laid with ends abutting and true to line and grade. They shall be carefully centered, so that when laid they will form a sewer with a uniform invert.

(c) Pipe shall be set firmly according to line and grade, and, preparatory to making pipe joints, all surfaces of the portion of the pipe to be jointed shall be cleaned and dried. The joints shall then be carefully adjusted and filled with the jointing material.

(d) Trenches shall be kept water-free during jointing and for a sufficient period thereafter to allow the jointing material to become fully set and completely resistant to water penetration. Trenches shall be backfilled immediately after pipe is laid therein to prevent dislocation of the sewer line or jointing material. (Note: Not applicable when factory applied flexible compression joints are used.)

### C. Testing.

(a) The sewer line will be tested as required elsewhere herein, or as prescribed by local authority.

## APPENDIX B

### Plumbing Installation Standards for Mobile Homes and Travel Trailers and Parks.

#### B-1. PURPOSE, APPLICATION AND SCOPE

- (a) The requirements set forth in this Appendix shall apply specifically to all new Mobile Home and Travel Trailer Parks, and to additions to existing parks as herein defined, and are to provide minimum standards for sanitation and plumbing installation within these parks, for the accommodations, use and parking of Mobile Homes and Travel Trailers.
- (b) Plumbing and heating installations in Mobile Homes and Travel Trailers shall be installed in accordance with the approved Standards of the Mobile Homes Manufacturers Association.

#### B-2. DEFINITIONS

Definitions contained in Plumbing Code shall also apply to this Appendix "B" except where the following special definitions shall apply:

- (a) **Air Lock**—Air lock is a condition where air is trapped in a drain or drain hose and retards or stops the flow of liquid waste or sewage.

**Center**—Center of a Mobile Home or a Travel Trailer is the longitudinal center line located midway between the right and left side.

**Combination Compartment**—A shower stall with or without a door which provides for or includes a water closet. It is sized for occupancy of only one person.

**Department having jurisdiction**—means the administrative authority or other law enforcement agency having jurisdiction over this regulation.

**Dependent Travel Trailer**—Means a trailer coach not equipped with a water closet.

**Drain Hose**—The drain hose is the approved type hose, flexible and easily detachable, used for connecting the drain outlet to a sewer inlet connection.

**Drain Outlet**—The drain outlet is the lowest end of the main drain to which the terminal end of the drain hose is connected.

**Independent Mobile Home or Travel Trailer**—Means one equipped with a water closet and a bath or shower.



**Inlet Coupling**—Inlet coupling is the terminal end of the water system to which the water service connection is made. It may be a swivel fitting or threaded pipe end.

**Intermediate Waste Holding Tank**—(Travel Trailers only) An enclosed tank for the temporary retention of waterborne waste.

**Length**—Length of a mobile home or travel trailer is the distance measured from the tip of the hitch to the part furthest to the rear.

**Mobile Home**—Is a vehicular, portable structure built on a chassis and designed to be used without a permanent foundation as a permanent dwelling when connected to indicated utilities.

**Mobile Home or Travel Trailer Park**—Shall mean and include site, lot, tract or parcel of land upon which one or more mobile home or travel trailer is parked, for the temporary or permanent use as living quarters of one or more families.

**Park Drainage System**—Means the entire system of drainage piping used to convey sewage or other wastes from the mobile home or travel trailer drain outlet connection, at its connection to the mobile home or travel trailer site, to a public sewer or private sewage disposal system.

**Park Water Supply System**—All of the water supply piping within the park shall extend from the main public supply or other source of supply to, but not including the mobile home or travel trailer service system, and shall include branch service lines, fixture devices, service buildings and appurtenances thereto.

**Service Building**—A building housing toilet and bathing facilities for men and women, with laundry facilities.

**Sewer Lateral**—That portion of the park drainage system extending to a mobile home or travel trailer site.

**Travel Trailer**—A Travel Trailer is a vehicular, portable structure built on a chassis, designed to be used as a temporary dwelling for travel, recreational and vacation uses, permanently identified "Travel Trailer", by the manufacturer, on the Trailer and when factory equipped for the road, having a body width not exceeding eight feet (8') and being of any length provided its gross weight does not exceed 4500 pounds, or being of any weight provided its overall length does not exceed twenty-nine feet (29').

**Travel Trailer Sanitary Service Station**—One used for emptying waste holding tanks.

### **B-3. GENERAL REGULATIONS**

- (a) The general provisions of the Plumbing Code shall govern the installation of plumbing systems in mobile homes or travel trailer parks, except where special conditions or construction are specifically defined in this Appendix.
- (b) **Mobile home and travel trailer Sites:** Mobile homes or travel trailers shall not hereafter be parked in any Mobile Home or Travel Trailer Park unless there are provided plumbing and sanitation facilities installed and maintained in conformity with these regulations. Every mobile home or travel trailer shall provide a gas and watertight connection for sewage disposal which shall be connected to an underground sewage collection system discharging into a public or private disposal system.
- (c) No dependent travel trailer shall be parked at any time in a space designed and designated for an independent mobile home or travel trailer unless public toilet and bath facilities within two hundred (200') feet of the dependent travel trailer are available.

### **B-4. PLANS AND SPECIFICATIONS**

Every Mobile Home or Travel Trailer Park owner or operator before providing areas of space for the use and accommodation of independent mobile homes or travel trailers shall make application for permit and file two sets of plans and specifications with the Building Inspection Department. The plans and specifications shall be in detail as follows:

- (a) A scaled plot plan of the park, indicating the spaces, area, or portion of the park for the parking of independent mobile homes, travel and dependent trailers.
- (b) Size, location and specification of the park drainage system.
- (c) Size, location and specification of water supply lines and their location.
- (d) Size, location and layouts of service building.
- (e) Size, location and specification of gas distribution lines.
- (f) Size, location, specification and layout of the fire protection system.
- (g) A scaled layout of typical trailer sites.
- (h) Applications shall bear the approval of the local enforcement agencies as to compliance with city or county plumbing and health ordinances.
- (i) Plumbing required by this article shall comply with all city or county plumbing and health ordinances and regulations.



- (j) The issuance of a permit shall not constitute approval of any violation of this article or of any city or county ordinance or regulation.
- (k) An approved set of plans and a copy of the permit shall be kept on the park premises until the final inspection has been made.

#### **B-5. SERVICE BUILDINGS**

- (a) Each mobile home or travel trailer park shall have at least one service building to provide necessary sanitation and laundry facilities. Those parks serving independent mobile homes and travel trailers need provide only minimum facilities. However, a service building with adequate laundry facilities and storage locker rooms is most desirable.
- (b) The service building should be of permanent construction with an interior finish of moisture resistant material which will stand frequent washing and cleaning and shall be well lighted and ventilated at all times.
- (c) The service buildings of only independent mobile home and independent travel trailer parks shall have a minimum of one (1) laundry tray, one (1) water closet, one (1) lavatory, one (1) shower or bath tub for women and one (1) water closet, one (1) lavatory and one (1) shower or bath tub for men.
- (d) The service buildings in parks that also accommodate dependent travel trailers shall have a minimum of one (1) laundry tray, two (2) water closets, one (1) lavatory, one (1) shower or bath tub for women and one (1) water closet, one (1) urinal, one (1) shower or bath tub for men and one (1) slop-water closet for emptying containers of human waste. The above facilities are for a maximum of ten (10) dependent travel trailers. For every ten (10) additional dependent travel trailers the following additional fixtures shall be provided: One (1) laundry and one (1) shower or bath tub for each sex, one (1) water closet for every ten (10) additional dependent travel trailers for women and one (1) water closet for every fifteen (15) additional dependent travel trailers for men.
- (e) Hot and cold water shall be provided for all fixtures except water closets. The slop-water closet shall be provided with hot and cold water faucets over the bowl in addition to the flushing mechanism (preferably a flushometer valve.)
- (f) Each water closet, slop-water closet, tub and shower, shall be in separate compartments, with self-closing doors on all water closet compartments. The shower stall shall be a minimum of 3' x 3' in area, with a dressing compartment with a stool or bench for women.



The laundry trays, washing machines shall be contained in a room separate from the toilet rooms.

- (g) A floor drain (minimum of 3") shall be installed in each toilet room and laundry room.

## **B-6. MATERIALS**

Unless otherwise provided for in this Appendix, all piping fixtures, or devices used or entering into the installation of parks drainage, water distribution and gas distribution systems or parts thereof shall conform to the quality and weights of materials presented in the Plumbing Code or gas code.

## **B-7. GENERAL REGULATIONS**

- (a) Unless otherwise provided for in this Appendix, all plumbing fixtures, piping, drains, appurtenances and appliances designed and used in the parks drainage, water distribution, gas distribution systems and service connections shall be installed in conformance with the Plumbing Code or Gas Code.

## **B-8. PARK DRAINAGE SYSTEM**

- (a) The main sewer and sewer laterals shall be installed in a separate trench not less than twelve inches (12") from the park water service or distribution system. No sewer pipe material shall be installed less than thirty (30") inches below grade in any area where a mobile home or travel trailer is parked or a motor vehicle may be driven.
- (b) The minimum pipe size in any mobile home or travel trailer park drainage system shall be four inches (4"). Park drainage systems pipe sizes shall be calculated and designed according to good engineering practice.
- (c) Each mobile home or travel trailer shall be considered as six (6) fixture units in determining discharge requirements in the design of park drainage and sewage disposal systems.
- (d) Minimum grade for sewers shall be so designed that a slope sufficient to provide so that the flow will have a mean velocity of two feet (2') per second when the pipe is flowing full or half full.
- (e) The discharge of the park drainage system shall be connected to a public sewer. Where a public sewer is not available within 300 feet for use, an individual sewage disposal system shall be installed, of a type that is acceptable and approved by the Administrative Authority or other law enforcement agency having jurisdiction over this regulation.

- (f) Manholes shall be located at any point in the line where a deviation occurs in excess of forty-five degrees (45°) from a straight line and not more than two hundred feet (200') apart in straight runs. Manholes shall be accessible and brought to grade.
- (g) Wet vented drainage systems shall be so designed and installed to adequately accommodate passage of air and waste in the same pipe.
- (h-1) Branch lines or sewer laterals to individual mobile home or travel trailer shall be not less than four inches (4") in diameter.
- (h-2) Each mobile home and travel trailer site shall be provided with a sewer lateral with a cast iron "P" trap which shall terminate four inches (4") above grade. The inlet shall be so designed and installed to receive the discharge from the mobile home or travel trailer drain connection at the proper grade and angle. The extension above grade shall be protected by at least four inches (4") of concrete approximately eighteen by eighteen (18" x 18" square. Each outlet shall be provided with a gas tight cap and chain to close the inlet when not in use.
- (h-3) Sewer laterals over thirty feet (30') from the main park drainage sewer shall be properly vented and provided with a cleanout brought to grade.
- (h-4) To provide the shortest possible drain connection between the mobile home and travel trailer outlet and drain inlet, all drain inlets shall terminate with reference to the site location of the mobile home or travel trailer.
- (h-5) Drain connections shall slope continuously downward and form no traps. All pipe joints and connections shall be installed and maintained gas and water tight.
- (h-6) No sewage, waste water, or any other effluent shall be allowed to be deposited on the surface of the ground.
- (h-7) Upon completion and before covering, the park drainage system shall be subjected to a static water test. The water test shall be applied to the drainage system 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 filled with water to point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest opening of the section under test, and each section shall be filled with water, but no section shall be tested with less than a ten-foot (10') head of water. In testing successive sections at least the upper ten feet (10') of the next preceding section shall be tested, so that no joint



or pipe in the system shall have been submitted to a test of less than a ten-foot (10') head of water. The water shall be kept in the system, or in the portion under test, for at least fifteen (15) minutes before inspection starts; the system shall then be tight at all points.

## **B-9. WATER DISTRIBUTION SYSTEM**

- (a) Every mobile home or travel trailer site shall be provided with an individual branch service line delivering safe, pure, and potable water. The outlet of the branch service line shall terminate on the left side of the site of the mobile home or travel trailer.
- (b) Each mobile home or travel trailer park water distributing system shall be so designed and maintained as to provide a pressure of not less than 30 p.s.i. at each mobile home or travel trailer site under normal operation conditions. The minimum size of branch service line to each site shall be 3/4".
- (c) A backflow preventive device shall be installed on the branch service line to each independent trailer at, or near, the trailer service connection. Backflow preventive devices shall be of an approved type by a nationally recognized testing agency certifying as to compliance and performance outlined herein: Valves shall be designed and maintained to close drip tight at a reduced pressure of not less than one (1) nor more than five (5) pounds per square inch. Valves must be identified with the manufacturer's name and model number.
- (d) A separate service shutoff valve shall be installed in each branch service line on the supply side of the backflow protective device.
- (e) The service connection shall be not less than three-quarter inch (3/4") diameter; no rigid pipe may be used. Flexible metal tubing is permitted. Fittings at either end shall be of a quick disconnect type not requiring any special tools or knowledge to install or remove.
- (f) The owner or operator of every trailer park accommodating independent trailer coaches shall have all backflow protective devices and pressure relief valves inspected and tested at least once in each twelve (12) month period by a representative of a utility company, of a local enforcement agency, or by a duly licensed plumber to ensure that such devices are in good working order. A permanent record of such inspections, signed by the inspector, shall be maintained by the park owner or operator.



## **B-10. MOBILE HOME AND TRAVEL TRAILER CONNECTIONS — RESPONSIBILITY**

- (a) When it is evident that there exists, or may exist, a violation of these rules, the owner, operator, lessee, person in charge of the park, or any other person causing a violation shall cause to be corrected immediately or disconnect the service connection and mobile home or travel trailer drain connection from the respective park branch service line and sewer lateral.
- (b) Mobile home and travel trailer drain connections shall be of approved semirigid or flexible reinforced hose having smooth interior surfaces and not less than three inches (3") inside diameter. Drain connections shall be equipped with a standard quick disconnect screw or clamp type fitting, not less in size than the outlet. Drain connections shall be gas-tight and no longer than necessary to make the connection between the mobile home and travel trailer outlet and the trap inlet on the site.

## **B-11. GAS DISTRIBUTION SYSTEM**

- (a) In mobile home and travel trailer parks in which gas distribution systems are installed, the installation shall conform with the requirements set forth in the Gas Code.
- (b) The minimum size of the gas service line to each mobile home or travel trailer site shall be 3/4" and a cutoff valve shall be installed on each branch.

## **B-12. MAINTENANCE**

- (a) All devices or safeguards required by this article shall be maintained in good working order. The owner, operator, or lessee of the mobile home or travel trailer park or his designated agent shall be responsible for their maintenance.

## APPENDIX C

### OTHER REGULATIONS RELATING TO PLUMBING INSTALLATIONS

#### Location of Windows In Relation To Vent Stacks

In the event that a structure is built higher than an existing structure, the owner of the structure shall not locate any windows within ten (10) feet of any existing vent stack on the lower structure, unless the owner of such higher structure shall defray the expenses of or shall himself make such alterations as are necessary to conform with the provisions of this code.

#### Individual Sewage Disposal Systems

In those instances where the installation of a private residential sewage-disposal system cannot be avoided, the following requirements should be followed. For these requirements see the State Board of Health Bulletin No. 519, "Residential Sewage Disposal Plants."

#### Individual Water Supply

Where connection to a municipal water supply or public water system is not possible, private water supplies shall be constructed in accordance with State Board of Health Bulletin No. 476, "Protection of Private Water Supplies."

#### Air Conditioning Equipment: Application Required

No installation of air conditioning equipment requiring the use of water for direct cooling, in the absence of evaporative condensers or cooling towers, shall be installed on any premises supplied from a municipal water system until a permit authorizing such installation has been issued by the local administrative authority. Applications for permits shall specify make, type and tonnage of installation, the minimum and maximum water requirements and such additional information regarding the proposed installation as may be required.

