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PLUMBING CODE OF NEW JERSEY (1953)

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PART E

of the

STANDARD BUILDING CODE OF NEW JERSEY

STANDARD BUILDING CODE OF NEW JERSEY

Part E

Plumbing

REPRINTING
1955

STATE OF NEW JERSEY
DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

STANDARD BUILDING CODE OF NEW JERSEY

PART E

PART E of the "Standard Building Code of New Jersey" set forth herein, was approved December 29, 1953 by the State Department of Health for adoption by reference by local boards of health. It may be adopted without alteration, or if so desired, any numbered section or paragraph may be deleted therefrom, but no substitute section or paragraph may be added as part of the Code being adopted by reference under Chapter 275 P.L. 1948 (N.J.S.A. 26:3-31.1 to 31.3).

It is recommended that the Code be adopted in full.

NEW JERSEY STATE DEPARTMENT OF HEALTH
TRENTON 7, N. J.

INTRODUCTION

The Plumbing Code of New Jersey (1953) is Part E of the Standard Building Code of New Jersey. Generally the provisions of this part of the code follow accepted standards and practices as reflected in the various national uniform plumbing codes and reports.

It was possible to produce this code only through the time and effort extended by the private citizens and organizational representatives serving voluntarily on the state advisory committee appointed by and working in conjunction with the New Jersey State Department of Health.

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Foreword

The Plumbing Code of New Jersey (1953) is recommended as a model code for use in all municipalities throughout the State. Adoption of this code by local boards of health will provide regulations based on modern research together with the knowledge and experience of many experts in the plumbing field. The code will also serve two important purposes. One purpose is to aid local boards of health, particularly in small communities, to establish minimum sanitary plumbing regulations; the other is to bring about more uniform requirements for plumbing systems throughout the State. Considerable judgment is required in the administration of the code; therefore, each local board of health should appoint a licensed plumbing inspector to act as its agent in the interpretation and application of its provisions.

The scope of the code covers minimum safety and health requirements for design, installation, inspection and performance of plumbing equipment and installations including water distribution, drainage and venting systems. A correct understanding of the requirements prescribed has a great influence on the results obtained. Therefore, the terms employed in this code have been defined in Section E-100. It is recommended that a careful study be made of these definitions since proper interpretation and application of the code depend upon a knowledge of their contents. The code is designed as a basic tool to protect potable water supplies and to assure proper collection of water-borne wastes and their safe conveyance from buildings.

The code may be adopted by reference under the provisions of Chapter 275, P.L. of 1948, thereby eliminating the expense of publishing its entire content. The procedure set forth in Sections 26:3-66 to 69 inclusive, Revised Statutes of New Jersey, except those relating to full publication of the code, should be followed in enacting the ordinance required to adopt a code by reference. Consideration should also be given to the provisions of the Revised Statutes 26:3-70 to 82 when drafting the provisions of such ordinance.

In addition to establishing penalties for violations of the code to be adopted by reference, the ordinance mentioned above should set forth all fees, the amounts thereof and their purposes:

(a) For examination for a license as master plumber.
(b) For issuance of a license as master plumber and the annual renewal thereof.
(c) For the filing of a plan of proposed plumbing work. For this purpose, the fee must be limited to $2.00 per plan. See Section 26:-3-33c, Revised Statutes of New Jersey.
(d) For the issuance of a permit for proposed plumbing work.
(e) For the issuance of a permit for the replacement of a plumbing fixture.
(f) For each reinspection of plumbing work caused by the failure of the licensee to comply with the provisions of the code or permit issued.

The fees fixed for the above-named items, except item (c), may vary in different municipalities.

The committee which prepared this code was fully aware that in this age of rapid technological advance, improvements and new developments may be made in materials, fixtures and equipment. Each local board of health should, therefore, be prepared to approve such improvements and developments recommended by the State Board of Standards of the Department of Conservation and Economic Development who will meet from time to time to consider and approve the latest methods, materials and fixtures applicable to this code. The committee has endeavored to include all methods, materials and fixtures which by experience and laboratory test have been proven satisfactory at this time.

The manual attached hereto is not a part of the code but is presented as a guide in the adoption, interpretation and administration of this code. In this connection you will note a suggested ordinance providing for the adoption of the Plumbing Code of New Jersey (1953).

PLUMBING CODE OF NEW JERSEY (1953)

PART E

of the

STANDARD BUILDING CODE OF NEW JERSEY

Sec. E-100 Definitions

1.1 The words, terms or phrases listed below are for the purposes of this Plumbing Code and Ordinance only and shall be defined and interpreted as follows:

Administrative Authority. The board of health of any municipality or the board, body or officer in such municipality lawfully exercising any of the powers of a board of health under the laws governing such municipality.

Air Gap. The unobstructed vertical distance through the free atmosphere between the lowest outlet from any pipe or faucet supplying water to a tank, plumbing fixture or other device and the flood level rim of the receptacle.

Alter. Means and includes the replacing or repairing existing plumbing.

Approved. 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 administration delegated to the Administrative Authority in this code.

Area Drain. A drain installed to receive surface or rain water from an open area.

Backflow. The unintended flow of water or other liquid into a potable water supply system.

Backflow Connection. Any connection or arrangement whereby backflow may occur.

Backflow Preventer. A device to prevent backflow into the water supply system.

Back Vent. See Individual Vent.

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

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

Building. 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 Code. See Standard Building Code of N. J.

Building Drain. The lowest horizontal piping of a drainage system within a building which receives the discharge from soil and waste pipes and conveys it to the building sewer.

Building Sewer. That part of a horizontal drainage system, beginning 5 feet outside the inner face of the building wall, which receives the discharge from the building drain and conveys it to a public sewer or other place of disposal.

Building Storm Drain. The lowest horizontal piping of a drainage system within a building which receives and conveys rain water, groundwater, subsurface water, condensate, cooling water or other similar liquids to a building storm sewer or a combined building sewer.

Building Storm Sewer. That part of a horizontal drainage system, beginning 5 feet outside the inner face of the building wall, which receives the discharge from a building storm drain and conveys it to a storm sewer, combined sewer, or other place of disposal.

Building Subdrain. That portion of a horizontal drainage system, within a building, which cannot drain by gravity into a building sewer or building storm sewer.

Building Trap. A running trap installed in a building drain just before it leaves the building to connect with the building sewer.

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

Code. When used alone, shall mean these regulations, subsequent amendments thereto or any emergency rule or regulation which the Administrative Authority having jurisdiction may lawfully adopt.

Combination Fixture. A fixture consisting of one sink and tray or a two or three compartment sink or tray in one unit.

Combined Building Sewer. That part of the horizontal drainage system, beginning 5 feet outside the inner face of the building wall, which receives the discharge from a building drain, building storm drain, or building subdrain and conveys it to a combined sewer.

Combined Sewer. A sewer designed to receive both storm water and sewage.

Common Vent. A vent connecting at the junction of two fixture drains, serving as an individual vent for both fixtures.

Conductor. See Leader.

Construct. Construct means and includes the installation of new plumbing systems or plumbing fixtures or the extending or rearranging of existing plumbing systems.

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

Continuous Waste. The waste from more than one but not more than three fixtures connected to a single trap.

Cross-connection. A physical connection or arrangement whereby liquid may flow between two separate piping systems.

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

Developed Length. The length of a line of pipe measured along the center line of the pipe and fittings.

Diameter. The nominal diameter as designated commercially.

Double Offset. Two offsets installed in succession or series in the same line.

Downspout. See Leader.

Drain. A pipe which conveys sewage, storm water or other liquid waste in a building drainage system.

Drainage Piping. See Drainage System.

Drainage System. The piping within public or private premises which conveys sewage, storm water or other liquid waste to a legal point of connection to a public sewerage system, combined sewer, storm sewer or individual sewage disposal system.

Drop Vent. A special individual vent which connects to a drain or vent pipe at a point below the fixture served.

Dual Vent. See Common Vent.

Effective Opening. The minimum cross-sectional area at the point of the water supply outlet, expressed in terms of the diameter of a circle or the diameter of a circle of equivalent cross-sectional area if the opening is not circular.

Fixture. See Plumbing Fixture.

Fixture Branch. The pipe conveying water between the fixture supply pipe and the water distributing pipe.

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

Fixture Supply Pipe. The pipe conveying water from the fixture branch, located at the wall or floor line, to the fixture.

Fixture Unit. A unit of measure of the waste produced by a plumbing fixture. In this code, a fixture unit is equivalent to 7.5 gallons of water per minute.

Flooded. A condition where the liquid within a fixture rises to the flood level.

Flood Level. The level at which water begins to overflow the rim of a fixture.

Flush Valve. A device for flushing water closets and similar fixtures.

Flushometer. A device actuated by direct water pressure which permits the discharge of a predetermined quantity of water to fixtures for flushing purposes.

Flush Tank. A receptacle designed to discharge, either manually or automatically, a predetermined quantity of water to fixtures for flushing purposes.

Frost-proof Closet. A closet that has no water in the bowl and has the trap and flush valve installed below ground level, usually below the frost line.

Grade. The rise or fall of a line of pipe in reference to a horizontal plane, usually expressed in inches per foot of pipe length.

Grease Interceptor. A receptacle designed to separate and retain grease and fatty substances from wastes normally discharged from kitchens.

Grease Trap. See Grease Interceptor.

Horizontal Branch. A drain 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 conveys it to the soil or waste stack or building drain.

Horizontal Pipe. A pipe or fitting which is installed in a horizontal position or which has an angle of less than 30 degrees with the horizontal.

House Drain. See Building Drain.

House Sewer. See Building Sewer.

House Subdrain. See Building Subdrain.

House Trap. See Building Trap.

Indirect Waste Pipe. A waste pipe which does not connect directly with the drainage system, but discharges into it through a properly trapped fixture or receptacle.

Individual Vent. A pipe, installed to vent a fixture trap, which connects with the vent system above the fixture it serves.

Industrial Waste. A liquid waste resulting from the processes employed in industrial establishments.

Interceptor. A receptacle designed and constructed to intercept, separate and prevent the passage of detrimental floating or heavy solids to a drainage system.

Interceptor, Grease. See Grease Interceptor.

Interceptor, Sand. See Sand Interceptor.

Journeyman Plumber. A person who through four years of training and experience under the supervision of a licensed master plumber, or the equivalent thereof in education, training and experience, has acquired the requisite skill and knowledge necessary for the proper installation of plumbing.

Leader. A pipe from a roof drain to a building storm drain, combined building sewer or other satisfactory means of disposal.

Liquid Waste. The liquid discharge from a plumbing fixture.

Loop Vent. A branch vent similar to a circuit vent except that it connects with the stack vent instead of the vent stack.

Main Vent. See Vent Stack.

Master Plumber. A person who has had at least two years of experience as a journeyman plumber and is licensed as a master plumber and is engaged in the business of plumbing.

Offset. A combination of elbows or bends which permits a section of a pipe to be out of line but in a line parallel with its original alignment.

Person. This word includes corporations, companies, associations, societies, firms, partnerships and joint stock companies as well as individuals.

Pipe Size. See Diameter.

Pitch. See Grade.

Plumbing. The practice of installing, maintaining, extending, repairing and altering plumbing systems. It is also the installed plumbing system piping, materials, plumbing fixtures and appurtenances of such systems in connection with the following: Sanitary drainage or storm drainage facilities together with their venting systems, the public or private water supply systems, and fire protection systems within or adjacent to any building, structure or conveyance.

Plumbing Fixtures. Installed receptacles or devices which are supplied with water or which receive or discharge liquid waste or sewage into the drainage system with which they are directly or indirectly connected.

Plumbing Inspector. A person licensed and authorized to inspect plumbing pursuant to the provisions of N.J.S.A. 26:1A-38 to 44 and R.S. 26:3-20.

Plumbing System. The sanitary and storm drainage facilities together with their venting systems and plumbing fixtures, the public or private water supply systems and the fire protection systems within or adjacent to any building, structure or conveyance, to a point of connection to a public or private sewerage system, public or private water supply, or other acceptable terminal.

Pool. A permanently installed water receptacle used for swimming, plunging or bathing, designed to accommodate more than one person at a time.

Potable Water. Water from a public potable water supply approved by the New Jersey State Department of Health or a private water supply which has been accepted by the Administrative Authority as satisfactory for human consumption.

Private Sewer. A sewer system privately owned and not directly under the jurisdiction of a municipality or a public utility.

Public Sewer. A sewer system required to be approved by the New Jersey State Department of Health, which is located in a street, alley or other premises under the jurisdiction of a municipality or a public utility.

Public Potable Water Supply. A water supply approved by the New Jersey State Department of Health.

Relief Vent. A branch from a vent stack, connected to a horizontal branch between the first fixture drain and a soil or waste stack.

Return Offset. An offset which permits a pipe to be returned to its original alignment.

Rim. The unobstructed open edge of the receptacle section of a plumbing fixture.

Riser. The water supply pipe which extends vertically for the height of one full story or more from which water is supplied to fixture branches.

Roof Drain. A drain installed to receive water collected upon a roof and convey it to a leader.

Sand Interceptor. An interceptor designed and constructed to intercept and prevent the passage of sand into a drainage system.

Sand Trap. See Sand Interceptor.

Sanitary Sewer. A sewer designed to convey only sewage.

Second Hand. Used plumbing materials, fixtures or equipment that have been removed and passed to another ownership or possession.

Separator. See Interceptor.

Sewage. A liquid waste containing animal, chemical or vegetable matter in suspension or solution.

Side vent. A vent connected to a drain pipe, through a fitting, at an angle not greater than 45 degrees to the vertical.

Size of Pipe or Tubing. See Diameter.

Slope. See Grade.

Soil Pipe. A pipe which conveys the discharge of water closets or plumbing fixtures having similar functions, with or without discharges from other plumbing fixtures.

Soil Stack. The main vertical stack which receives and conveys the discharge from all plumbing fixtures.

Soil Vent. See Stack Vent.

Special Waste Pipe. See Indirect Waste Pipe.

Stack. A general term for the vertical main of a system of soil, waste or vent piping.

Stack Vent. The extension of a soil or waste stack above the highest connected horizontal branch.

Standard Building Code of New Jersey. The building code approved by the State Department of Conservation and Economic Development.

State Board of Standards. The board of standards, as constituted in the Standard Building Code of New Jersey, in the State Department of Conservation and Economic Development.

Storm Drain. See Building Storm Drain.

Storm Sewer. A sewer designed to convey only surface or storm water.

Street Main. See Water Main.

Subdrain. See Building Subdrain.

Subsoil Drain. A drain installed to receive and convey subsurface or seepage water to a place of disposal.

Sump. A pit which receives the discharge from building subdrains or subsoil drains.

Supports, Hangers, Anchors. Devices for securing pipes to walls, ceilings, floors or other structural members, and plumbing fixtures to floors or walls.

Trap. A fitting or device designed and constructed to provide, when properly vented, a liquid seal which will prevent the passage of air without materially affecting the flow of liquid through it.

Trap Seal. The vertical distance between the crown weir and the dip of a trap which determines the depth of the water seal of a trap.

Tubing Size. See Diameter.

Underground Piping. Piping in contact and covered with earth. Pipe in a tunnel or water tight conduit is not included within the definition of this term.

Vacuum Breaker. See Backflow Preventer.

Vent. See Vent System.

Vent Pipe. See Vent System.

Vent Stack. The main vertical stack of a vent system.

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

Vertical Pipe. A pipe or fitting installed in a vertical position or which has an angle of not more than 60 degrees with the vertical.

Waste Pipe. A pipe which receives and conveys only liquid waste, free of fecal matter.

Waste Stack. A main vertical stack which receives and conveys only liquid waste, free of fecal matter.

Waste Vent. See Stack Vent.

Water Distributing Pipes. The piping which conveys water from a water service pipe to the fixture branch.

Water Distributing System. The piping which conveys water from a water service pipe to plumbing fixtures and other outlets.

Water Main. The water lines from which the individual buildings of a community are served.

Water Outlets. A discharge opening in a water supply system of a building or premises through which water can be obtained for the several purposes for which it is used by means of a faucet, valve or other control mechanism.

Water Service Pipe. The pipe conveying water from a water main or other source of water supply to the water distributing system of a building.

Water Supply System. The water service pipe, water distributing system, fittings and appurtenances thereto, in or adjacent to any building, structure or conveyance.

Wet Vent. A soil or waste pipe serving as a vent.

Water Riser Pipe. See Riser.

Yoke Vent. A vent pipe installed from a soil or waste stack which connects to a vent stack at a higher elevation for the purpose of preventing pressure changes in the two stacks. Also a relief vent formed by the extension of an upright wye branch or 45° wye branch inlet of the horizontal branch to a vent stack.

SEC. E-200 GENERAL REGULATIONS

2.1 GRADE OF HORIZONTAL DRAINAGE PIPING.

2.1.1 Horizontal drainage piping shall be run in practical alignment at a uniform grade. See 9.2 for permissible slopes and specific requirements.

2.2 PIPES IN TRENCHES.

2.2.1 Water service pipes, or any underground water pipes, shall not be run or laid in the same trench with a building sewer or drainage piping, except as provided for in 8.6.2 and 9.1.3b.

2.3 CHANGES IN DIRECTION.

2.3.1 Fittings used in changes in direction in drainage piping shall be made by the appropriate use of 45-deg. wyes, long- or short-sweep quarter bends, sixth, eighth, or sixteenth bends or by combination of these, or by the use of equivalent fittings or combinations of other types. Short quarter bends may be used in drainage lines only where the flow is from horizontal to vertical.

2.3.2 Tees and crosses may be used in vent pipes and in water distributing pipes. Single and double sanitary tees may be used in vertical sections of drains or stacks.

2.4 PROHIBITED PRACTICES CONCERNING FITTINGS AND CONNECTIONS.

2.4.1 No pipe or fittings with double hubs on the same run or double tee branches shall be used on soil or waste piping.

2.4.2 Drilling, tapping or welding of building drains, soil, waste or vent pipes, and the use of saddle hubs or bands are prohibited unless approved in writing by the Administrative Authority.

2.4.3 Any fitting or connection that offers abnormal obstruction to flow is prohibited.

2.4.4 Double-wye fittings shall not be used to connect two storm systems to a combined sanitary and building storm drain.

2.5 DEAD ENDS.

2.5.1 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 in order to make it accessible. (See 9.4.4 for regulations on roughing in for future installation.)

2.6 WORKMANSHIP.

2.6.1 Workmanship shall conform to accepted good practice so as to fully secure the results sought in all sections of this code.

2.7 TOILET FACILITIES FOR WORKMEN.

2.7.1 Suitable approved toilet facilities shall be made available or provided and maintained for the use of workmen during construction.

2.8 PROTECTION OF PIPES.

2.8.1 Pipes passing under or through walls shall be protected against breakage. Pipes passing through or under cinders or other corrosive material shall be protected against external corrosion with a tar coating or its equivalent.

2.8.2 No water supply, soil or waste pipe shall be installed or permitted outside a building or in an exterior wall unless adequate provision is made to protect the contents thereof from freezing, by insulation or burial below the frost line.

2.9 BACKFLOW.

2.9.1 Potable water shall be protected from backflow, in accordance with the provisions of Sections E-700 and E-800.

2.10 CONNECTION TO PLUMBING SYSTEM.

2.10.1 All plumbing fixtures, drains, appurtenances and devices 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.

2.11 SEWER REQUIRED.

2.11.1 Every building in which plumbing fixtures are installed shall have a connection to a public or private sewer system, except as provided in paragraph 2.12.1.

2.12. INDIVIDUAL SEWAGE DISPOSAL SYSTEM.

2.12.1 When a public or private sewer system is not available for use, the building sewer shall be connected to an individual sewage disposal system approved by the Administrative Authority.

2.13 VENTILATION OF TOILET ROOMS.

2.13.1 Windows shall have a minimum area, measured between stops, equal to 10% of the floor area of each toilet room or compartment, but in no case less than 3 sq. ft. or less than 1 foot in width. The window shall be constructed so that it may be opened to the extent of 45% of the minimum window area.

2.13.2 Vent shafts shall comply with those requirements relating to vent shafts as found in New Jersey Statutes concerning Tenement Houses.

2.13.3 Ventilation of inside toilet rooms shall be accomplished by means of either of the two following methods:

(a) Installation of a fire proof duct having a cross section of at least 120 square inches per each water closet or bathroom and which extends above the roof of the building so that the air from the water closet or bathroom will be drawn at least ten times an hour by natural draft or a wind-driven device. The duct may be provided with a fan which will operate with the toilet room light and provide the same change of air.

(b) The installation of a continuous mechanical exhaust ventilation system having a capacity of not less than four changes of air per hour. The exhaust duct shall discharge to the outside air in a manner not to create objectionable odors or nuisance on the premises or adjacent premises.

2.13.4 In places of employment under the supervision of the State Dept. of Labor, the Rules and Regulations governing ventilation of toilet rooms promulgated by them shall be followed.

2.14 INDUSTRIAL WASTES.

2.14.1 Wastes which may be detrimental to the public sewer system or to the sewage treatment plant, shall be pretreated as directed by the Authority having jurisdiction.

2.15 RATPROOFING.

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

2.15.2 Interior openings through walls, floors, and ceilings shall be ratproofed if the Administrative Authority determines such action is necessary.

2.16 VENTING.

2.16.1 The drainage system shall be provided with a system of vent piping which will permit the admission or emission of air in such fashion that the seal of any fixture trap shall not be subjected to a pressure differential of more than 1 inch of water.

SEC. E-300 MATERIALS—QUALITY AND WEIGHT

3.1 MATERIALS—GENERAL.

3.1.1 Plumbing materials shall conform to the standards as set forth in this code.

Materials for special conditions or materials not provided for herein may be used only as provided in this section.

3.1.2 Products shall be considered acceptable which conform to the most current standards of specifications of any of the agencies listed below.

Abbreviations for said standards or specifications are as follows:

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

A.S.T.M. Standards and Tentative Standards published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

F.S. Federal Specifications published by the Federal Specifications Board and obtainable from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

A.W.W.A. Standards and Tentative Standards published by the American Water Works Association, 500 Fifth Ave., New York 18, N. Y.

CS Commercial Standards representing recorded voluntary standards of the trade, promulgated by the United States Department of Commerce through the National Bureau of Standards and obtainable from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

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

L.I.A. Standards published by the Lead Industries Association, 420 Lexington Avenue, New York 17, N. Y.

A.S.T.M. Standards are issued under fixed designations; the final number indicates the year of 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 the Table of 3.4 is that of the date of issue or that of the latest revision or amendment.

All standards and specifications for materials are subject to change. Designations carrying indication of the year of issue may thus become obsolete. Table 3.4 gives the full designations of standards current at the time this code is printed. As provided in 3.3.3, the Administrative Authority is required to review this table and have it brought up to date at intervals not exceeding three years.

3.1.3 Second-hand or used materials are prohibited, except as specifically permitted in other sections of this code, or as approved by the Plumbing Inspector.

3.1.4 Each length of pipe, and each pipe fitting, trap, fixture, and device used in a plumbing system shall be marked and identifiable as may be required by the standard (3.1.2) under which such material may be approved.

3.2 MATERIALS—SPECIAL REQUIREMENTS.

3.2.1 Sheet lead shall weigh not less than 4 pounds per square foot.

3.2.2 Calking ferrules shall be made of brass pipe conforming to A.S.T.M. Specification B 43-47, or of heavy cast brass with weight and dimensions in accordance with the following table:

Pipe Size (inches)	Actual Inside Diameter (inches)	Length (inches)	Weight
2	2¼	4½	1 lb. 0 oz.
3	3¼	4½	1 lb. 12 oz.
4	4¼	4½	2 lb. 8 oz.

3.2.3 Soldering nipples and bushings shall be made of red brass pipe, standard size, conforming to A.S.T.M. Specifications B 33-47, or of heavy cast brass, in accordance with the following table:

Size of Pipe (inches)	Weight per Foot lb.	oz.	Size of Pipe (inches)	Weight per Foot lb.	oz.
1¼	0	6	2½	1	6
1½	0	8	3	2	0
2	0	14	4	3	8

3.2.4 Floor flanges for plumbing fixtures shall not be less than 3/16 of an inch thick, and shall be made of brass, hard lead, cast iron or galvanized malleable iron.

3.3 NEW MATERIALS, FIXTURES, METHODS AND TESTS.

3.3.1 No material, device, fixture, method of assembling, installation or appurtenance, other than those specified in this code, shall be permitted unless it conforms to the rules and regulations as may be adopted by the Administrative Authority.

3.3.2 If it is impractical to conduct adequate tests prior to installation, the Administrative Authority may grant tentative permission to make the installation as proposed but final approval shall not be given until tests conducted after installation show that the material, device, fixture, method of assembling, installation or appurtenance functions properly and conforms to the rules and regulations of the Administrative Authority and the provisions of this code.

3.3.3 The Administrative Authority shall periodically review the specifications and standards for materials and fixtures as listed in the Table in 3.4 and 7.1.1 and make such changes therein as may be necessary for the same to conform to the most current standards and specifications of the agencies listed in 3.1.2.

3.4 TABLE OF APPROVED MATERIALS FOR PLUMBING INSTALLATIONS.

A

MATERIALS	ASA	A.S.T.M.	F.S.	OTHER
Nonmetallic Pipe				
Clay Sewer Pipe Standard Strength		C 13-44T	SS-P-361a 1942	
Clay Sewer Pipe Extra Strength		C 200-44T	SS-P-361a 1942	
Concrete Sewer Pipe		C 14-41	SS-P-371 1937	
Bituminized Fiber				CS 116-44
Asbestos Cement			SS-P-351 1940	
Ferrous Pipe and Fittings				
Cast-Iron Soil Pipe and Fittings	A 40.1-1935	A 74-42	WW-P-401 1945	CS TS-5144 1952
Cast-Iron Water Pipe	A 21.2-1939	A 44-41	WW-P-421 1940	A.W.W.A. May 12, 1908
Cast-Iron Screwed Drainage Fittings	B 16.12-1942		WW-P-491a 1946	
Cast-Iron Drainage Fittings			WW-P-491a 1945	
Wrought-Iron Pipe		A 72-45	WW-P-441a 1943	
Steel Pipe		A 120-47	Types I & II WW-P-406 1944	
Open-Hearth Iron Pipe		A 253-47	Type III only WW-P-406 1945	
Malleable-Iron Screwed Fittings	150 lb. B 16c-1939		WW-P-521b 1945	
Nonferrous Pipe and Fittings				
Brass Tubing		B 135-47T(*)		
Brass Pipe		B 43-47	WW-P-351 1936	
Copper Pipe		B 42-47	WW-P-377 1932	
Rough Brass Screwed or Brazed Fittings	B 16.15-1947			M.S.S.-SP-11 250 lb.
Seamless Copper Tubing		B 75-48T		
Copper Water Tube	H 23.1-1947	B 88-48	WW-T-799a 1946	
Soldered Fittings for Copper Water Tube	A 40.3-1941			
Flared Fittings for Copper Water Tube	A 40.2-1936			
Lead Pipe			WW-P-325	CS 95-41
Lead Traps and Bends			WW-P-325	CS 96-41
Hard Lead Closet Flanges				L.I.A.
Miscellaneous				
Bituminous Joint Compound				
Sulphur Base Joint Compound				
Calking Lead		B 29-43	QQ-L-156 1946 Grade A only	CS 94-41 A.W.W.A. 7D-1-1938
Sheet Lead			QQ-L-201 1942 Grade A only	
Sheet Brass		B 36-48T		
		B 121-47T	QQ-B-611a 1944	
Sheet Copper		B 152-48T	QQ-C-501a 1944	
Galvanized Iron and Steel Sheet		A 163-39		
		A 93-48T		
		Secs. 3, 5, 6	QQ-I-716 1943 Section D-6	
Galvanizing, Pipe and Fittings			WW-P-406 1944	
		A 120-47	Section D-7	
Cement Lining	A 21.4-1939		WW-P-406 1944	
Coal Tar Enamel Protective Coating				A.W.W.A. 7A.6-1940
Soft Solder		B 32-48T	QQ-S-571b 1947	
Fixture Setting Compound			HH-C-536 1936	

(*) Mercurous nitrate test required.

3.4 COPPER TUBING.

B

Standard Water Tube Size	Actual Outside Diameter in Inches	Type K For General Plumbing Use, Especially Underground	
		Wall Inches	Pounds Per Foot
⅜	.500	.049	.269
½	.625	.049	.344
⅝	.750	.049	.418
¾	.875	.065	.641
1	1.125	.065	.839
1¼	1.375	.065	1.04
1½	1.625	.072	1.36
2	2.125	.083	2.06
2½	2.625	.095	2.93
3	3.125	.109	4.00
3½	3.625	.120	5.12
4	4.125	.134	6.51
5	5.125	.160	9.67
6	6.125	.192	13.9

Standard Water Tube Size	Actual Outside Diameter in Inches	Type L For Interior Use in General Plumbing	
		Wall Inches	Pounds Per Foot
¼	.375	.030	.126
⅜	.500	.035	.198
½	.625	.040	.285
⅝	.750	.042	.362
¾	.875	.045	.455
1	1.125	.050	.655
1¼	1.375	.055	.884
1½	1.625	.060	1.14
2	2.125	.070	1.75
2½	2.625	.080	2.48
3	3.125	.090	3.33
3½	3.625	.100	4.29
4	4.125	.110	5.38
5	5.125	.125	7.61
6	6.125	.140	10.2

Standard Water Tube Size	Actual Outside Diameter in Inches	Type M For General Plumbing Use	
		Wall Inches	Pounds Per Foot
⅜	.500	.025	.145
½	.625	.028	.204
¾	.875	.032	.328
1	1.125	.035	.465
1¼	1.375	.042	.682
1½	1.625	.049	.940
2	2.125	.058	1.46
2½	2.625	.065	2.03
3	3.125	.072	2.68
3½	3.625	.083	3.58
4	4.125	.095	4.66
5	5.125	.109	6.66
6	6.125	.122	8.92

3.4 CAST IRON SOIL PIPE.

C

Size in Inches	Weight in Pounds Per 5 Ft. Length	
	Single Hub Pipe	Double Hub Pipe
2	25	26
3	45	47
4	60	63
5	75	78
6	95	100
8	150	157
10	215	225
12	270	285
15	375	395

3.4 WROUGHT IRON PIPE AND STEEL PIPE.

D

Diameter in Inches	Thickness in Inches	Weight per Linear Foot in Pounds
½	0.109	0.85
¾	0.113	1.13
1	0.133	1.68
1¼	0.140	2.28
1½	0.145	2.72
2	0.154	3.65
2½	0.203	5.74
3	0.216	7.57
3½	0.226	9.11
4	0.237	10.79
5	0.258	14.62
6	0.280	18.97
8	0.322	28.55
10	0.365	40.48
12	0.375	49.56

3.4 LEAD WASTE PIPE.

E

Internal Diameter in Inches	Weight Per Foot	
	Pounds	Ounces
1	2	—
1¼	2	8
1½	3	—
2	4	—
3	6	—
4	8	—

Lead water supply pipes shall be of the quality and weight known commercially as Grade AA for pressures less than eighty pounds; for pressures of eighty pounds or more, water supply pipe shall be Grade AAA.

The minimum weights and thicknesses of Grade AA and Grade AAA lead water supply pipes shall be in accordance with the following table:

3.4 LEAD WATER SUPPLY PIPE.

F

Internal Diameter in Inches	GRADE AA		GRADE AAA	
	Thickness in Inches	Weight per Linear Foot in Pounds	Thickness in Inches	Weight per Linear Foot in Pounds
⅜	.218	2.00	.256	2.50
½	.188	2.00	.256	3.00
⅝	.228	3.00	.256	3.50
¾	.231	3.50	.293	4.75
1	.246	4.75	.298	6.00
1¼	.257	6.00	.319	7.75
1½	.288	8.00	.386	11.25
2	.375	13.75	.504	19.50

3.4 BRASS PIPE.

G

Diameter in Inches	Thickness in Inches	Weight per Linear Foot in Pounds
⅜	0.09	0.612
½	0.107	0.911
¾	0.114	1.24
1	0.126	1.74
1¼	0.146	2.56
1½	0.150	3.04
2	0.156	4.02
2½	0.187	5.83
3	0.219	8.31
3½	0.25	10.85
4	0.25	12.29
4½	0.25	13.74
5	0.25	15.40
6	0.25	18.44

3.4 COPPER PIPE.

H

Diameter in Inches	Thickness in Inches	Weight per Linear Foot in Pounds
⅜	0.09	0.64
½	0.107	0.95
¾	0.114	1.30
1	0.126	1.85
1¼	0.146	2.69
1½	0.150	3.20
2	0.156	4.23
2½	0.187	6.14
3	0.219	8.75
3½	0.25	11.41
4	0.25	12.94
4½	0.25	14.46
5	0.25	16.21
6	0.25	19.41

3.4 CALKING FERRULES.

I

Pipe Size in Inches	Actual Inside Diameter in Inches	Length in Inches	Weight Pounds	Weight Ounces
2	2¼	4½	1	0
3	3¼	4½	1	12
4	4¼	4½	2	8

3.4 SOLDERING NIPPLES.

J

Diameter in Inches	Weight Pounds	Weight Ounces
1¼		6
1½		8
2		14
2½	1	6
3	2	—
4	3	8

4.1 TIGHTNESS.

4.1.1 All joints and connections shall be made gastight and watertight—see Section E-1300. Cement joints are prohibited.

4.2 TYPES OF JOINTS.

4.2.1 Calked joints for cast-iron bell-and-spigot soil pipe shall be firmly packed with oakum or hemp and secured with molten lead. At least 12 oz. of soft lead shall be used for each inch in diameter of the pipe used. Lead shall be run in one pouring and calked tight. Sulphur base joint compound may be used in place of lead when pouring building sewer joints. No paint, varnish or putty shall be permitted on the jointing material until after the joint has been tested.

4.2.2 Screw joints shall be made of American Standard Taper Pipe Thread, ASA B2.1-1945. All burrs or cuttings shall be removed. Pipe ends shall be reamed or filed out to size of bore, and all chips and cuttings shall be removed. Pipe-joint cement and paint will be permitted only on external threads.

4.2.3 Wiped joints in lead pipe, or between lead pipe and brass or copper pipe, ferrules, solder nipples, bushings or traps, in all cases on the sewer side of the trap, shall be full-wiped joints. The solder shall have an exposed surface on each side of a joint not less than 3/4 in. and a minimum thickness at the thickest part of the joint of not less than 3/8 in., except that in the use of bushings the exposed surface of the solder need not exceed the size of the bushing face.

4.2.4 Soldered or sweat joints for tubing shall be made with standard fittings. Surfaces to be soldered shall be cleaned bright. The joints shall be fluxed properly and made with approved solder.

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

4.2.6 Hot-poured joints for clay or concrete sewer pipe shall be made of material which will not soften and destroy the effectiveness of the joint when subjected to a temperature of 160°F. nor be soluble in any of the wastes carried by the drainage system. Hot-poured joints shall be packed with closely twisted and rammed hemp or oakum.

4.2.7 Precast joints shall be prepared by precasting collars in both the spigot and bell of the pipe in advance of use. Collar surfaces shall be conical with side slopes of 3° 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.

4.2.8 Sulphur base compound joints used with a cast-iron bell-and-spigot building sewer line shall be calked with jute or hemp leaving a 2 1/2-inch uniform depth for securing the joint with the compound. Care shall be taken to prevent overheating the compound which should not be poured

until the surface is free from bubbles and shows a mirror like appearance. Manufacturer's instructions shall be followed in the preparation and pouring of the compound jointing material.

4.2.9 Brazed joints shall be made in accordance with the provisions of Section 6 of the Code for Pressure Piping, ASA B31.1-1942 with 1944 and 1947 Supplements.

4.2.10 Lead "burned" welded joints shall be lapped and the lead shall be fused together to form a uniform weld at least one and one-half times as thick as the lead being joined.

4.2.11 Asbestos cement sewer pipe joints 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 4.2.1.

4.2.12 Bituminized fiber pipe joints 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 and calked as required in 4.2.1.

4.3 USE OF JOINTS.

4.3.1 Slip joints, other than expansion joints, in drainage piping shall be used only in the waste pipe between the trap seal and the fixture.

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

4.3.3 Expansion joints may be used when approved by the Administrative Authority.

4.3.4 Joints in vitrified clay pipe or between such pipe and metal pipe shall be made with approved hot-poured jointing material as specified in 4.2.6 and 4.2.7.

4.3.5 Joints in cement sewer pipe or between such pipe and metal pipe shall be made with approved hot-poured joint material as specified in 4.2.6 and 4.2.7.

4.3.6 Joints in cast-iron pipe shall be calked as specified in 4.2.1 or 4.2.8.

4.3.7 Joints between wrought-iron, steel, brass or copper pipe, and cast-iron pipe shall be either calked or screwed joints as specified in 4.2.1 or 4.2.2.

4.3.8 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 specified in 4.2.3.

4.3.9 Connections between drainage pipes and floor type water closets, floor-outlet service sinks, pedestal urinals, and earthenware trap standards, shall be made by means of a brass, hard lead, or iron floor flange, calked, soldered or screwed to the drainage piping. Earthenware fixtures shall be bolted to the floor flange with brass bolts. An approved type gasket or washer or setting compound shall be used between the earthenware and the floor flange. The floor flange shall be securely anchored on a firm base.

4.3.10 Concealed joints for copper water tubing within buildings shall be soldered, sweat, flare or brazed joints.

4.4 WATERPROOFING OF OPENINGS.

4.4.1 Openings for pipes passing through roofs or exterior walls shall be made watertight.

SEC. E-500 TRAPS, INTERCEPTORS AND CLEAN-OUTS

5.1 TRAPS.

5.1.1 Each fixture shall be separately trapped by a water-seal trap placed as near to the fixture as possible, except that a set of not more than three single laundry trays or three lavatories immediately adjacent to each other in the same room or a combination sink and tray may connect with a single trap, provided the trap is not located more than 30 inches horizontally from the farthest fixture outlet. The vertical distance from a fixture outlet to the trap weir shall not exceed 24 inches.

5.2 TYPES AND SIZES OF TRAPS AND FIXTURE DRAINS

5.2.1 A trap shall be of the same nominal size as the fixture drain to which it is connected.

5.2.2 The minimum size of a trap for a fixture should be sufficient to drain that fixture rapidly and shall not be less than that specified in the following table:

Fixture (*)	Minimum Size of Trap and Fixture Drain (Inches)	Fixture	Minimum Size of Trap and Fixture Drain (Inches)
Bathtub	1½	Sink, kitchen, residence	1½
Combination sink and laundry tray	1½	Sink, hotel or public	2
Drinking fountain	1¼	Sink, pantry or bar	1½
Floor drain	2	Sink, dishwater	1½
Laundry tray	1½	Sink, service	2
Lavatory	1¼	Urinal, trough	1½
Shower stall	2	Urinal, stall	2
		Urinal, wall	1½

(*) This table does not apply to fixtures with integral traps.

5.2.3 Fixture drains for water closets and other fixtures with integral traps shall not be smaller than the fixture outlet.

5.2.4 Drum traps shall be 3 or 4 inches in diameter with not less than 2 inch water seals. The trap screw shall be one size less than the trap diameter.

5.3 TRAPS—GENERAL REQUIREMENTS.

5.3.1 Each fixture trap shall have a water seal of not less than 2 inches.

5.3.2 A trap clean-out shall be provided for each fixture trap, except those in combination with fixtures in which the trap seal is readily accessible. The trap clean-out shall have an accessible brass trap screw of ample size, protected by the water seal, provided that when a portion of a trap can be completely removed for cleaning purposes no trap screw is required.

5.3.3 Traps shall be set true with respect to their water seals and protected from frost.

5.3.4 Building traps are not required. When used, they shall comply with specifications for cast-iron soil-pipe fittings, or screwed drainage fittings as specified in Section E-300, Table 3.4 and shall have a fresh air inlet on the house side of trap 1/2 the size of the building drain but not less than 4 inches in diameter.

5.4 PROHIBITED TRAPS.

5.4.1 Traps whose seals depend upon the action of movable parts and traps with partitions, except in a trap integral with a fixture, are prohibited.

5.4.2 Double trapping of a fixture is prohibited.

5.4.3 Crown-vented traps are prohibited.

5.4.4 Full and 3/4 S traps are prohibited.

5.5 PIPE CLEAN-OUTS.

5.5.1 A clean-out, easily accessible, shall be provided at or near the foot of each vertical waste or soil stack. There shall be a clean-out with a Y-branch inside the wall near the connection between the building drain and building sewer. Clean-outs shall also be installed at each change in direction of the building drain greater than a 45° angle.

5.5.2 Clean-outs shall not be more than 50 ft. apart in horizontal drainage lines.

5.6 PIPE CLEAN-OUTS—MATERIAL AND DESIGN.

5.6.1 The bodies of clean-out ferrules shall conform in thickness to that required for pipe and fittings of the same metal, and extend not less than 1/4 in. above the hub. For new work, the clean-out plug shall be of heavy brass not less than 1/4 in. thick and shall be provided with a raised nut or recessed socket for its removal. Both ferrule and plug shall have American Standard Tapered Pipe Threads. Heavy lead plugs may be used for repair work where necessary.

5.6.2 Clean-outs shall be of the same nominal size as the pipes up to 4 in., and not less than 4 in. for larger pipes.

5.6.3 The openings of all underground clean-outs in a building, shall be flush with or preferably above the floor. Exterior underground clean-outs shall be extended to the surface or otherwise be made accessible.

5.7 INTERCEPTORS AND SEPARATORS.

5.7.1 An interceptor or separator shall be installed in a drainage system when in the opinion of the Administrative Authority a hazard may exist from the careless disposal of waste material, accidental spills or overflow of grease-bearing, flammable or other deleterious materials.

5.7.2 An oil interceptor shall be installed in the drainage system of the following establishments when in the opinion of the Administrative Authority a hazard may exist: gasoline service stations, garages where cars are washed or gasoline stored, dry cleaners using flammable solvents, chemical plants, gas plants, aniline plants, tanneries, paint and varnish manufacturing plants, printing ink plants, shoe-polish plants, explosive plants, soap plants, cleaning fluid manufacturing plants, testing laboratories or any place of manufacture where volatile flammable liquid is used and which by accident or otherwise may be admitted to the drainage system.

5.7.3 Grease interceptors shall be installed, when required by the Administrative Authority, in the waste line leading from sinks, drains, or other fixtures in the following establishments: restaurants, hotel kitchens or bars, factory cafeterias or restaurants, clubs or other establishments where grease may be introduced into drainage systems in quantities that may cause line stoppage or hinder sewage disposal.

5.7.4 Water-jacketed interceptors or interceptors of similar type, which require connection to the potable water supply system, shall not be installed except upon approval of the Administrative Authority.

5.7.5 Sand and similar interceptors shall be so designed and located as to be readily accessible for cleaning, and shall have a trap seal of not less than 6 in.

5.7.6 Interceptors shall be so designed that they will not become air bound. They shall be vented and accessible for cleaning and inspection.

5.8 BACKWATER VALVES—MATERIAL, DESIGN, LOCATION.

5.8.1 Backwater valves shall be made of corrosion-resistant material and constructed to insure a positive mechanical seal against backflow.

5.8.2 Backwater valves shall be installed in drainage lines wherever such drainage pipes will be subject to backflow or back pressure. Such backwater valves shall be accessible for inspection and cleaning.

SEC. E-600 HANGERS AND SUPPORTS

6.1 VERTICAL PIPING.

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

6.1.2 Vertical drainage piping shall be supported at the base of the stack.

6.2 HORIZONTAL PIPING.

6.2.1 Horizontal piping shall be supported at points sufficiently close to keep it in alignment and prevent sagging, but at intervals not exceeding 10 ft.

6.3 EXPANSION.

6.3.1 Provision for expansion shall be made as necessary.

6.4 PIPE HANGERS.

6.4.1 Pipe hangers shall be made of suitable material of adequate strength and shall be securely attached to the building construction without the use of wooden plugs.

6.5 UNDERGROUND PIPING.

6.5.1 Underground piping shall be supported in such a manner that undue stress on pipe and joints will be prevented.

7.1 GENERAL.

7.1.1 Plumbing fixtures shall be made of materials having a smooth impervious surface, and except as permitted in this section or under 3.3.1, shall conform in quality and design to one of the following standards:

Staple Porcelain Plumbing Fixtures, NBS Commercial Standard CS4-29.

Staple Vitreous China Plumbing Fixtures, NBS Commercial Standard CS20-47.

Sanitary Cast-Iron Enamelware, NBS Commercial Standard CS77-47.

Earthenware Vitreous Glazed Plumbing Fixtures, NBS Commercial Standards CS 111-43.

Formed Steel Enameled Sanitary Ware, FS WW-P-542.

Hospital Plumbing Fixtures, Simplified Practice Recommendations, NBS, R106-41.

Plumbing Fixtures, FS WW-P-541a.

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

7.2 INSTALLATION.

7.2.1 Plumbing fixtures shall be installed in a manner that affords easy access for cleaning. Where practical, all pipes from fixtures shall be run to a wall.

7.2.2 Supply lines or fittings for every plumbing fixture shall be so installed as to provide an air gap or shall be equipped with backflow preventers, as prescribed in American Standard for Air Gaps in Plumbing Systems ASA A40.4-1942 or American Standard for Backflow Preventers in Plumbing Systems ASA A40.6-1943.

7.3 SECOND-HAND PLUMBING FIXTURES.

7.3.1 Second-hand plumbing fixtures shall not be used unless they are inspected and found to meet the requirements of this code and to be in satisfactory physical and sanitary condition.

7.4 WATER-CLOSET COMBINATIONS.

7.4.1 Water-closet bowls may be siphon-jet, washdown, reverse-trap, or blowout type with floor outlet, or siphon-jet or blowout type with wall outlet. Water-closet bowls and traps shall be made in one piece and shall be provided with integral flushing rims so constructed as to flush the entire interior of the bowl. Water-closet bowls for semipublic or public use shall be of elongated type with open front seat.

7.4.2 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.

7.5 WATER-CLOSET TANKS.

7.5.1 Water-closet tanks shall have a flushing capacity sufficient to properly flush the water-closet bowls with which they are connected. The flush-valve seat in close-coupled integral 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. Closets with flush valve seats below the rim of the bowl shall be constructed so that in case of a trap stoppage the water will not flow continuously over the rim of the bowl.

7.5.2 Float valves for water-closet tanks shall close tight automatically and in low water-closet tanks shall provide sufficient refill to seal the trap properly.

7.5.3 Flush valves for water-closet tanks shall close tight and in low tanks shall have 2-inch shanks and shall be provided with an overflow except when the tank is provided with an integral overflow. Flush valves in high tanks may be of the goose-neck siphon type having a 1½-inch shank.

7.5.4 Overflows on flush valves or when integral with a tank shall be as prescribed in American Standard for Air Gaps in Plumbing Systems ASA A40.4-1942 and American Standard for Backflow Preventers in Plumbing Systems ASA A40.6-1943.

7.5.5 The size of flush pipes shall be 2 inches for low-tanks and 1½ inches for high-tank combinations.

7.6 FROST-PROOF CLOSETS.

7.6.1 Frost-proof closets are prohibited.

7.7 FLUSHOMETERS.

7.7.1 Flushometers shall be installed in a manner to make them accessible for repairing. When the valve is operated it shall complete its 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 to flush the fixture thoroughly and refill the fixture trap. Means shall be provided for regulating the flow to flushometers. Protection against backflow shall be provided as specified in 8.4.2 and 8.4.3.

7.8 URINALS.

7.8.1 Integral flushing rims and traps shall be provided for siphon-jet, washout, blowout, and pedestal urinals.

7.8.2 Trough urinals may be used only on such premises as stadiums, parks or buildings having only temporary or occasional occupancy. They shall be provided with backs and made in one piece. They shall not be less than 6 inches deep and shall be furnished with a strainer with at least a 1½-inch waste outlet. The perforated washdown pipe securely clamped as high as practicable to the back of the urinal shall provide an even flushing curtain of water against the back of the urinal. A continuous flushing flow or an automatic tank having a flushing capacity of not less than 1½ gallons for each foot of urinal length shall be provided.

7.9 URINAL TANKS.

7.9.1 Flushing controls for urinal tanks may be automatic or operate manually by means of a chain-and-pull. Flushing capacity of tanks shall be adequate for the type of urinal used.

7.9.2 Automatic urinal tanks shall discharge when the water in the tank reaches a predetermined height. Supply to tanks shall be provided with means for adjusting the flow so that a discharge at a desired interval can be obtained.

7.9.3 Chain-and-pull tanks for urinals shall be provided with flush valves, operating levers, chain, and pulls. A urinal tank with a chain and pull shall not be used for more than one urinal. Flush valves may be of gooseneck siphon type. Float valves shall close tight automatically.

7.9.4 Flushometers installed for urinals shall be as prescribed in 7.7.1 and no valve shall be used to flush more than one urinal.

7.10 LAVATORIES.

7.10.1 Lavatories shall have waste outlets not less than 1¼ inches in diameter. Waste outlets may have open strainers or may be provided with stoppers. When provided with stoppers they shall be so designed that the standing water in the fixtures cannot rise in the overflows when stoppers are closed or remain in the overflows when fixtures are empty. When the waste plug is assembled to a lavatory, the bottom edge of the overflow opening in the plug should be below the bottom of overflow channel to prevent trapping of water.

7.10.2 Rules and Regulations of the State Dept. of Labor shall apply to lavatories installed in places of employment under their jurisdiction.

7.11 SHOWERS.

7.11.1 Shower receptacles, except those built directly on the ground or integral with shower cabinets, shall have a lead or copper shower pan or the equivalent thereof, lined with tar paper applied with a waterproof mastic compound over which the finished floor is laid. The sides of the pan shall be extended at least 4 inches above the 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 not be less than 2 inches in diameter and shall have removable strainers.

7.11.2 Public or institution shower room floors shall be drained in such a manner that no waste water from any head will pass over the areas occupied by others.

7.11.3 Walls of shower compartments shall be constructed of smooth, noncorrosive and nonabsorbent waterproof materials to a height of not less than 6 feet above the floor.

7.11.4 Joints between the tub and wall of built-in tubs with overhead showers shall be waterproof. The walls shall be waterproof.

7.12 SINKS.

7.12.1 Sinks shall be provided with waste outlets and traps in accordance with the provisions of the table in 5.2.2. Waste outlets may have open strainers or may be provided with stoppers.

7.12.2 Food grinders installed in sinks shall have waste openings not less than 3½ inches in diameter.

7.12.3 Domestic food-waste disposal units shall be connected and trapped separately from any other fixture or compartment. Units may have either automatic or manually operated water supply controls.

7.12.4 A food-waste grinder shall not be connected to a drain having a grease interceptor.

7.13 LAUNDRY TRAYS.

7.13.1 A waste outlet not less than 1½ inches in diameter and a stopper shall be provided for each compartment of a laundry tray.

7.13.2 Overflow fittings shall be installed so 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.

7.14 BATHTUBS.

7.14.1 Bathtubs shall be provided with waste and overflow fittings with not less than 1½-inch outlets and with stoppers so arranged that the standing water in the tubs cannot rise in the overflows when stoppers are closed. All water shall drain from the overflow fittings when the tubs are empty.

7.15 DRINKING FOUNTAINS.

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

7.15.2 Stream projectors shall be so assembled as to provide an orifice elevation as specified by American Standard Air Gaps in Plumbing Systems ASA A40.4-1942 and American Standard Backflow Preventers in Plumbing Systems ASA A40.6-1943.

7.16 FLOOR, ROOF, AND AREAWAY DRAINS.

7.16.1 All floor, roof and areaway drains shall be made of metal and supplied with strainers and if connected to plumbing systems shall be trapped and considered as plumbing fixtures.

7.17 REQUIRED FACILITIES.

7.17.1 Minimum facilities for various types of occupancy or types of buildings shall be provided in accordance with the provisions of the Table in 7.17.4. Except for dwellings and apartment houses, the minimum facilities for each toilet room shall be based upon the probable number of persons using the room.

7.17.2 Each 24 inches of a circular type wash sink circumference shall be equivalent to one lavatory.

7.17.3 Straight-line type multiple wash sinks shall have hot and cold combination spouts not closer than 24 inches from adjacent similar spouts and each spout shall be considered the equivalent of one lavatory.

7.17.4 TABLE OF MINIMUM FACILITIES [1]

Type of Building or Occupancy (2)	Water Closets (5) (7)	Urinals (5) (7)	Lavatories (5) (7)	Bathtubs or Showers (5) (7)	Drinking Fountain (5) (6) (7)
Dwellings or apartment houses(*)	**1 for each apt. or dwlg. unit**	.....	**1 for each apt. or dwlg. unit**	**1 for each apt. or dwlg. unit**	.....
Schools	**Persons** / **Closets M(†) F(†)** 1-15: 1 1 16-30: 1 2 31-55: 2 3 56-80: 3 4 81-110: 4 5 111-150: 5 6 151-190: 6 7 Over 190 add 1 closet for each 30 add'l persons	**Boys or Men** / **Urinals** 1-15: 1 16-30: 1 31-55: 1 56-80: 2 81-110: 2 111-150: 2 151-190: 3 Over 190 add 1 urinal for each add'l 60 males	**Persons** / **Lavatories** 1-15: 1 26-55: 2 56-100: 3 Over 100 add 1 lavatory for each add'l 50 persons	.....	1 for each 75 persons
Office or Public Buildings	**Persons** / **Closets** 1-15: 1 16-35: 2 36-55: 3 56-80: 4 81-110: 5 111-150: 6 151-190: 7 Over 190 add 1 closet for each add'l 30 persons	Wherever urinals are provided for men one water closet less than the number specified herein may be provided for each urinal, except that the number of water closets in such cases shall not be reduced to less than two-thirds of the number specified herein	**Persons** / **Lavatories** 1-15: 1 10-35: 2 36-60: 3 61-90: 4 91-125: 5 Over 125 add 1 lavatory for each 45 add'l persons	.....	1 for each 75 persons
Manufacturing warehouse, workshop and loft buildings; mines, laundries, etc.	**Persons** / **Closets** 1-20: 1 21-40: 2 41-60: 3 61-80: 4 81-100: 5 100-500 add 1 closet for each 30 add'l persons, 500-1000 add 1 closet for each 35 add'l persons, over 1000 add 1 closet for each 40 add'l persons	One for each 50 males up to 100 and 1 add'l urinal for each add'l 75 males	**Persons** / **Lavatories(3)** 1-100: 1 for each 10 persons(4) over 100: 1 for each 15 add'l persons	1 shower for each 5 persons who may be exposed to excessive heat, or to skin contamination with poisonous infectious or irritating material. Other—1 shower for each 20 persons	1 for each 75 persons

7.17.4 TABLE OF MINIMUM FACILITIES [1] (Continued)

Type of Building or Occupancy (2)	Water Closets (5) (7)			Urinals (5) (7)		Lavatories (5) (7)			Bathtubs or Showers (5) (7)		Drinking Fountain (5) (6) (7)
	Persons	Closets M(†)	F(†)	Males	Urinals	Persons	Lavatories M(†)	F(†)	Persons	Bathtubs or Showers	
Dormitories	1-15	1	1	1-30	1	1-15	1	2	1-7	1	1 for each 75 persons
	16-30	2	2	31-60	2	16-30	2	3	8-15	2	
	31-50	3	4	61-100	3	31-50	3	4	16-25	3	
	51-75	4	6	101-150	4	51-75	4	5	26-35	4	
	76-100	6	8	Over 150 add 1 for each add'l 50 males		76-100	6	7	36-45	5	
	101-150	8	10			101-125	7	9	46-55	6	
	Over 150 add 1 add'l closet for each 25 males and each 20 females additional					Over 125 add 1 lavatory for each 20 add'l males and each 15 add'l females			Over 55 and not over 200 add 1 tub or shower for each 10 persons. Over 200 add 1 tub or shower for each 20 persons		
Theatres and places of public assembly	Persons	Closets M(†)	F(†)	Males	Urinals	Persons	Lavatories		.....		1 for each 100 persons
	1-100	1	1	1-200	1	1-200	1				
	101-200	2	2	201-400	2	201-400	2				
	201-400	3	3	401-600	3	401-750	3				
	Over 400 add 1 closet for each 500 add'l males and 1 for each 300 females			Over 600 add 1 for each 300 add'l males		Over 750 add 1 lavatory for each 500 add'l persons					

*Laundry trays and kitchen sinks are related only to dwellings or apartment houses. Laundry trays—1 single compartment tray for each apartment or dwelling unit or a multiple tray for each 10 apartments. Kitchen sinks—1 for each apartment or dwelling unit.

†M—male; F—female.

1. The figures shown here are based on one fixture being the minimum required for the number of persons indicated, or any fraction thereof.

2. No requirements have been given for hospitals, sanatoriums, hotels, or lodging houses. Each will have to be considered separately.

3. Where there is exposure to skin contamination with poisonous, infectious, or irritating materials, provide one lavatory for each five persons.

4. Twenty-four (24) lineal inches of outside rim of a straight trough or circular basin, when provided with water outlets for each space, shall be considered equivalent to one lavatory.

5. Special requirements applicable to water closets, urinals, and lavatories over and above those listed, shall be made by the Administrative Authority for plumbing in places where food or drink is prepared or served.

6. Drinking fountains shall not be installed in toilet rooms.

7. Requirements of the State Department of Labor shall apply for places of employment under their jurisdiction.

SEC. E-800 WATER SUPPLY AND DISTRIBUTION

8.1 QUALITY OF WATER SUPPLY.

8.1.1 Water used for potable purposes shall be obtained from an approved public potable water supply or a private source acceptable to the Administrative Authority.

8.1.2 Non-potable water may be used for flushing water closets, urinals, and other fixtures not requiring potable water, provided such water shall not be accessible for drinking, lavatory or culinary purposes.

8.2 IDENTIFICATION.

8.2.1 Identification of each piping system shall be in accordance with 8.2.2 and 8.2.3 when potable and non-potable waters are used on the same premises, or where other piping systems are present as in commercial or industrial plants.

8.2.2 Potable water piping systems shall be identified by solid green color bands, painted at conspicuous places throughout the piping system.

8.2.3 Non-potable water and other piping systems shall be identified by color banding in accordance with the "American Standard Scheme for Identification of Piping Systems," published by the American Society of Mechanical Engineers, 29 West 39th Street, New York 8, N. Y. (ASA-A13-1928 Reaffirmed 1947), excepting, that where the solid green banding is recommended, an additional color stripe shall be employed.

8.3 WATER SUPPLY MANDATORY.

8.3.1 Every building for human occupancy or habitation in which plumbing fixtures are installed shall be provided with an ample supply of potable water.

8.4 PROTECTION OF POTABLE WATER SUPPLY.

8.4.1 Water from approved public potable water supplies, non-potable water supplies or water supplies from a private source acceptable to the Administrative Authority shall be distributed through piping systems entirely independent of each other. Cross-connections or physical connections between an approved public potable water supply and an unapproved water supply are prohibited unless approved by the State Department of Health in accordance with the provisions of Chapter 308, P. L. of 1942. (R.S. 58:11-9.1)

8.4.2 Potable water outlets shall be protected from backflow, preferably by having the outlet end from which the water flows spaced a sufficient distance above the flood-level rim of the receptacle into which the water flows to provide for the minimum air gap as required in 8.4.4. Where it is not possible to provide a minimum air gap, the water outlet shall be equipped with an accessible backflow preventer installed between the control valve and the fixture or outlet.

8.4.3 Backflow preventers of any type, model or style shall, before installation, be approved by a recognized testing laboratory acceptable to the Administrative Authority. Backflow preventers on water outlets from a potable water distributing system of a building shall be placed in an accessible location and shall be maintained in good working condition.

8.4.4 Minimum air gaps for potable water outlets shall be at least twice the effective opening of the outlet when located three (3) or more

inches from any side wall of any fixture or receptacle. When one side wall is closer than three (3) inches, the minimum air gap shall be three (3) times the effective opening and when more than one (1) wall is closer than three (3) inches, the minimum air gap shall be four (4) times the effective opening.

8.4.5 Under special conditions when 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 devices, a separate tank supply or such other means of protection as may be approved by the Administrative Authority shall be provided. Such tanks and piping shall comply with the provisions of 8.8.7 and 8.9.10.

8.5 BACKFLOW PREVENTERS AND AIR GAPS.

8.5.1 A flushometer shall be equipped with an approved backflow preventer. The backflow preventer shall be installed on the discharge side of the flushing valve with the critical level at least four (4) inches above the overflow rim of the bowl or receptacle supplied.

8.5.2 Flushing tanks shall be equipped with an approved ball-cock. The ball-cock shall be installed with the critical level of the backflow preventer at least one (1) inch above the full opening of the overflow pipe. In cases where the ball-cock has no backflow preventer, the bottom of the water supply outlet shall be installed one (1) inch above the top of the overflow pipe.

8.5.3 Trough urinals equipped with an automatic flush tank, shall have the jets or spray outlets installed as high as practicable above the flood level rim of the receptacle.

8.5.4 Water outlets with hose connections shall be provided with a back-flow preventer on the discharge side of the water control valve, if the hose outlet may be submerged. A backflow preventer is not required for a hose connected outlet intended for lawn sprinkling or similar purposes.

8.6 WATER SERVICE PIPE.

8.6.1 Underground water-service pipes and building drains or building sewers shall not be less than five (5) feet apart horizontally and shall be separated by undisturbed or compacted earth except as provided in 8.6.2.

8.6.2 Water-service pipe may be placed in the same trench with a building drain and building sewer provided the following additional conditions are met:

(a) The bottom of the water-service pipe, at all points, shall be at least twelve (12) inches above the top of the adjacent building drain or building sewer.

(b) The water-service pipe shall be placed on a firm foundation at one side of the common trench.

(c) The number of joints in the water-service pipe shall be kept to a minimum.

(d) The materials and joints of a building drain and sewer shall be installed in such manner and shall possess the necessary strength and durability to prevent the escape of solids, liquids, and gases therefrom under all known adverse conditions such as corrosion, strains due to temperature changes, settlement, vibrations and superimposed loads.

8.6.3 Combination stop-and-waste valves and cocks shall not be installed in an underground water-service pipe.

8.7 PROTECTION OF AUXILIARY EQUIPMENT AND FACILITIES.

8.7.1 Auxiliary equipment or facilities shall be constructed in such a way as to prevent contamination of the potable water contained in the water distributing system of a building or premises, and so as to prevent the entrance of any foreign material including birds, vermin or insects into any part of the water supply system. Soil or waste lines shall not pass over or through any storage tank or other facilities where leakage or overflow from such soil or waste lines might affect the quality of the potable water.

8.7.2 All portions of water distributing systems including auxiliary equipment or facilities shall be protected against freezing.

8.8 MAINTENANCE OF ADEQUATE FLOW.

8.8.1 Minimum pressures, under all conditions of flow, at the highest water outlets, or at any other water outlet, shall not be less than eight (8) pounds per square inch except that such minimum pressures at outlets supplying flushometers shall not be less than fifteen (15) pounds per square inch.

8.8.2 Maximum water demand for water supply systems shall be based on the total number of fixtures connected. The demand for each fixture shall be obtained by multiplying the fixture unit value shown in 9.3.1a by 7.5. If no fixture unit has been established, the demand shall be estimated. Additional plumbing fixtures shall not be subsequently connected to any existing water supply system unless the required minimum pressures can be maintained.

8.8.3 Water-service pipe to any building or premises shall be of sufficient size and in a condition to maintain the minimum required residual pressure at each water outlet. In no case shall the diameter be less than three-quarter (¾) inch.

8.8.4 Size of piping and fittings in water distributing systems shall conform to recognized engineering practices to overcome differences in elevation, all friction losses, including those in pipe and meter, and provide the required minimum pressure.

8.8.5 Minimum size of fixture supply pipes shall be as follows:

Type of Fixture or Water Outlet	Pipe Size (inch)
Bathtub	½
Combination sink and tray	½
Drinking Fountain	⅜
Dishwasher (domestic)	½
Kitchen sink, residential	½
Kitchen sink, commercial	¾
Lavatory	⅜
Laundry tray, 1, 2, or 3 compartments	½
Shower (single head)	½
Sink (service, slop)	½
Sink, flushing rim	¾
Urinal (flush tank)	½
Urinal (direct flush valve)	¾
Water closet (tank type)	⅜
Water closet (flush valve type)	1
Hose bibb	½
Wall hydrant	½

For fixtures or outlets not listed, the minimum size of the fixture supply pipe shall be the same as for a comparable fixture or water outlet, or shall be determined by good engineering practice based on the water requirements of the device. The minimum pipe size shall not be less than ¼ inch copper or equivalent or ½ inch galvanized.

8.8.6 Storage tanks of the gravity or hydropneumatic type having adequate available storage capacity shall be provided whenever the minimum required pressure cannot be maintained at the highest water outlet. Booster pumps shall be provided to fill the aforesaid tanks when necessary to maintain adequate pressure as further provided in 8.8.10.

8.8.7 Gravity tanks shall conform to the following standards:

a. Tanks shall be installed at sufficient elevation above the highest water outlet to maintain the minimum required pressure.

b. The tanks shall be provided with water tight covers and any overflow or ventilation openings shall be covered with a metallic screen of not less than 16 mesh to prevent the entrance of insects and vermin.

c. Each tank shall be provided with an overflow of not less than the following diameter:

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

Any connection of the overflow to the building drainage system shall be through an indirect waste in accordance with Section E-1200, Indirect Waste. Any overflow drains discharging on a roof, shall terminate at least twice the nominal diameter thereof above the roof and the discharge point must be adjacent to a roof drain.

d. The supply line to a tank, used in lieu of a backflow preventer or air gap as required in 8.4.5, shall be located outside the tank except that portion required for a connection to any float control valve. The outlet of the supply pipe, including the float control valve mechanism, shall terminate not less than four (4) inches above the top of the overflow.

e. Each tank shall be provided with an independent drain of the same size as that required for the overflow and shall discharge in the same manner. Control valves shall be of the same size as the drain.

f. Tank supports shall comply with the building code or any other regulations that may apply.

g. Gravity tanks supplied with potable water only may be used as an auxiliary source of water for fire purposes provided not over 50% of its capacity is reserved for such purposes.

h. Each tank shall be provided with an access opening which is protected against the entrance of water, vermin or insects.

8.8.8 Hydropneumatic or pressure tanks when used shall conform to the following standards:

a. Tanks shall be supported in accordance with the building code or other regulations which may apply. Maximum allowable working pressure

shall be clearly stamped on the tank or on a plate permanently welded thereon, and such markings shall be readily accessible for inspection purposes.

b. The required water storage capacity shall be equal to 2/3 of the total volume of the tank.

c. An adequate source of air, under pressure, shall be provided to maintain the required air cushion of 1/3 the total tank capacity.

d. Wherever the tank capacity exceeds 500 gallons, an accessible manhole shall be provided for inspection purposes.

e. Each tank shall be provided with a drain in accordance with the provisions of 8.8.7-e.

f. Each tank shall be provided with an approved pressure relief valve.

g. Tanks supplied with potable water may be used as an auxiliary source of water for fire purposes provided not over 33% of the volume of water stored is reserved for such purposes.

8.8.9 Cleaning, painting or repairing potable water supply tanks used for domestic purposes shall not be performed with any material which will affect either the taste or potability of the water when the tanks are returned to service. To protect the water distributing systems from contamination during such operations, the tanks shall be disconnected.

8.8.10 The design and installation of booster pumping equipment and operating controls, necessary to supplement storage tanks, shall meet the requirements of recognized engineering practice and the following provisions:

a. Where the booster equipment is to be installed for a building or premises supplied from an approved public potable water supply, permission for such an installation will not be given by the Administrative Authority until the applicant submits a statement signed by the owner or operator of the water supply that there is no objection to the proposed installation, subject, however, to any limiting conditions or requirements.

b. Booster pumps shall preferably be in duplicate and each pump shall have the required capacity, based on recognized engineering practice, to meet the maximum demand.

c. Booster pumps should discharge in general, directly into storage tanks. By-passes shall be installed for direct discharge into the distributing system to permit the cleaning of storage tanks.

d. Adequate automatic pump controls shall be provided to:

1. Regulate starting and stopping at predetermined pressures in the distributing system or storage tanks and water service pipe.

2. Prevent the operation of pumps when the pressure on the suction side drops to fifteen (15) pounds per square inch.

3. Prevent cycles of starting and stopping extending over brief periods of time.

8.9 WATER DISTRIBUTING SYSTEM—OTHER REQUIREMENTS—WATER SUPPLY CONTROL.

8.9.1 Water distributing piping may be made of brass, copper, lead, cast iron, wrought iron, open-hearth iron, steel, or other material and

appropriate fittings approved by the Administrative Authority. All threaded ferrous pipe and fittings shall be galvanized or cement lined. When used underground in corrosive soil, all ferrous pipe and fittings shall be coal-tar enamel coated and the threaded joints shall be coated and wrapped after inspection.

8.9.2 Consideration shall be given to the action of the water on the interior of pipe and of the effect of soil, fill or other material on the exterior of the pipe when selecting the material and size for water-supply pipe, tubing, or fittings. No material that would produce toxic substances in the potable water-supply shall be used for piping, tubing or fittings.

8.9.3 Piping material used for any purposes other than in a potable water supply system shall not be reused in a potable water supply system.

8.9.4 A main shut-off valve without drip connections shall be installed on a water-service pipe at the curb or property line. A readily accessible shut-off valve shall be installed ahead of the meter if there be one, either inside or outside the building, with a second valve with drip inside the building on the outlet side of the meter. If no meter is required, a single valve with drip shall be provided at a point just after the water service enters the building. The size of such valves shall not be less than that of the water-service pipe and shall be of a gate or ground-key type.

8.9.5 Separate shut-off valves for both hot and cold water shall be provided for the water supply of each family unit in multiple unit dwellings. Water distributing systems of large non-residential buildings shall be equipped with valves on both hot and cold water to permit any group of fixtures to be shut off without interfering with the supply to other portions of the building.

8.9.6 Supply lines from pressure or gravity tanks shall be valved at or near the tanks.

8.9.7 The cold water supply lines to any domestic hot water heater shall be provided with a shut-off valve or its equivalent in close proximity to the heater.

8.9.8 Valves and shut-offs in a water distributing system shall, when fully opened, have a capacity equal to that of the nominal size of the pipe line to which they are connected.

8.9.9 The water distributing piping shall be installed so that every part of the system can be properly drained.

8.9.10. Water used for cooling, heating or similar purposes shall not be returned to the potable water supply system. Such used water shall be discharged to a storm drain or sewer as an indirect waste.

8.9.11 The passage of potable water pipes through polluting material for heat recovery, cooling or other purposes is prohibited except that heat exchangers connected to heating units may be used provided the source of water to the heating unit is from the potable water supply to the building or an approved backflow preventer is installed on the supply line to the heat exchanger and the heated water therefrom is not used for potable or culinary purposes.

8.9.12 Adequate air chambers or other approved devices shall be provided, where water pressures are excessive, to reduce water hammer or line noises and eliminate pressure hazard to the piping system.

8.9.13 Approved pressure regulating valves shall be installed in an accessible location wherever water pressure exceeds 100 pounds per square inch except in supply lines to gravity or hydropneumatic tanks.

8.10 SAFETY DEVICES. FOR HOT WATER HEATERS AND TANKS.

8.10.1 Approved temperature and pressure relief valves of adequate capacity shall be provided for domestic water heaters or hot water storage tanks. Such valves shall be located either within the tank or on piping not over six (6) inches therefrom and without any intervening control or check valve.

8.10.2 Pressure relief valves shall have a rate of discharge that will limit the pressure rise for any given heat input to 10 per cent of the pressure at which the valve is set to open. Temperature valves shall be rated at their B.T.U. capacities and shall be capable of discharging hot water at 210°F. to prevent any further rise in temperature within the storage tank. Such valves may be of a fusible link or manual reset type. Such valves shall also meet the American Gas Association and National Board of Casualty and Surety Underwriters requirements.

8.10.3 Discharge from pressure and temperature relief valves shall be as an indirect waste or to the atmosphere.

8.10.4 Storage tanks hereafter installed for storing or heating 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 placed in an accessible position on the 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.

8.10.5 Regulations for pressure tanks and valves of the Mechanical Engineering Bureau of the N. J. State Department of Labor shall be followed for installations other than small domestic hot water heaters.

8.11 DISINFECTION OF POTABLE WATER SUPPLY SYSTEMS.

8.11.1 Disinfection of a potable water supply system or any part thereof, after its installation or repair, may be required when considered necessary by the Administrative Authority in accordance with one of the following methods before it is placed in operation.

a. 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.

b. 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.

8.11.2 The entire interior of potable water storage tanks not possible to disinfect as provided in 8.11.1-a and 8.11.1-b. 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.

8.11.3 Disinfection of potable water filters or similar devices shall be performed in the manner as may be required by the Administrative Authority.

SEC. E-900 SOIL AND WASTE PIPE

9.1 MATERIAL.

9.1.1 Soil and waste piping for drainage systems within a building shall be of extra heavy cast-iron, unless the use of service weight cast-iron is approved by the Administrative Authority, galvanized wrought iron, galvanized open-hearth iron, galvanized steel, brass, type M copper, or class D lead. The pipe and the fittings for each type of pipe shall comply with the specifications as given in Section E-300, Table 3.4.

9.1.2 Underground piping within buildings shall be of extra-heavy cast-iron soil pipe, type L copper pipe, or as otherwise approved by the Administrative Authority.

9.1.3 (a) Building sewers installed in a separate trench from the water service pipe, may be of cast iron, vitrified clay sewer pipe, concrete sewer pipe, bituminized fiber sewer pipe, asbestos cement sewer pipe, or as approved by the Administrative Authority. Joints shall be tight and rootproof.

(b) Building sewers installed in the same trench with the water service pipe, shall in addition to the requirements of 8.6, be constructed of durable materials which are corrosive-resistant and shall be so installed as to remain watertight and be rootproof. Cast-iron pipe with watertight calked and leaded joints or equivalent as approved by the Administrative Authority shall be considered acceptable for this construction.

9.1.4 Lead or iron bends may be used as the connecting piping between earthenware, or vitreous china floor fixtures and the drainage system, excepting that where such fixtures are installed in a frame building, lead or other acceptable non-rigid connecting piping shall be used between the floor flange and the drainage system above the basement floor.

9.2 INSTALLATION OF DRAINAGE PIPING.

9.2.1 (a) Sloping fixture drains and horizontal branches of 3-inch diameter and less shall be installed with a fall of not less than ¼ inch per foot.

(b) Horizontal drainage piping larger than 3-inch diameter shall be installed with a fall of not less than ⅛ inch per foot.

(c) When conditions do not permit installations as required in (a) and (b) above, then a lesser slope may be permitted provided the computed velocity will not be less than 2 feet per second.

9.3 FIXTURE UNITS.

9.3.1 Table 9.3.1a of fixture-unit values, designating the relative load weights of different kinds of fixtures, shall be employed in estimating the total load carried by soil or waste pipes, and shall be used in connection with tables 9.3.1b and c for soil and waste pipes, in which the permissible load is given in terms of fixture units.

9.3.1a Table of Fixture Unit Values.

FIXTURE	Fixture Unit Value	FIXTURE	Fixture Unit Value
Bathtub with 1½" trap	2	Laundry tub with 1½" trap	2
Bathtub with 2" trap for therapeutic and hospital use	4	Shower except over bathtub	2
Bidet with 1½" trap	2	Sink—soda fountain or bar with 1¼" trap	1
Bidet with 3" trap	6	Sink with flush trap	5

FIXTURE	Fixture Unit Value
Combination sink and laundry tub with 1½" trap	2
Dental unit	½
Dental laboratory	1
Drinking fountain	½
Dish washer with 1½" trap	2
Floor drain with 3" trap	1
Kitchen sink with 1½" trap	2
Lavatory with 1¼ or 1½" trap	1
Sink—service (slop)	3
Sink—scullery with 1½" trap	2
Sink—scullery with 2" trap	4
Urinal—stall or washout	2
Urinal—pedestal, siphon jet and blow-out	8
Washsink—circular or multiple each set of faucets with 1½" trap	1
Water closet, tank operated	4
Water closet, flush valve operated	8
One bathroom group containing one water closet, tank operated, one lavatory and one bathtub, with or without shower or one shower stall	6
One bathroom group containing one water closet, valve operated, etc.	8

9.3.1b Minimum size of individual soil and waste branches to individual fixtures shall be in accordance with the following table for cast iron, galvanized iron, or lead:

Water closet	3	inches
Floor drain	3	"
Urinal	2	"
Slop sink	3	"
Sink, except slop sink	1½	"
Bathtub	1½	"
Laundry tray	1½	"
Shower bath	2	"
Lavatory	1½	"
Drinking fountain	1½	"
Dental cuspidor	1½	"
Sterilizers with ½ inch waste outlet	1½	"
Combination fixture, laundry tub and kitchen sink	1½	"

9.3.1c Minimum size of individual soil and waste branches for copper tubing.

Water closet	3	inches
Floor drain	3	"
Urinal	2	"
Slop sink	3	"
Sink	1¼	"
Bathtub	1¼	"
Laundry tub	1½	"
Shower stall	2	"
Lavatory	1¼	"
Drinking fountain	1¼	"
Dental cuspidor	1¼	"
Sterilizer	1¼	"
Combination sink and tray	1½	"

9.3.2 Determination of the required fixture-unit values for fixtures operating intermittently other than those mentioned in 9.3.1a, or for water operated devices operated intermittently, shall be computed by dividing the rate of discharge into the waste line in gallons per minute by 7.5.

9.3.3 Determination of the required fixture-unit value for a continuous or semi-continuous flow into a sanitary drainage system, such as from a pump, sump ejector, or similar device, shall be computed from the following table:

Total Number of Fixture Units on System Ahead of the Discharge from Pump	Number of Fixture Units to be Added for Each Gallon per Minute of Flow
0-6	½
7-20	1
21-100	1½
101-300	2
301-1000	2½
over 1000	3

9.4 DETERMINATION OF SIZES OF SOIL AND WASTE PIPE.

9.4.1 The maximum number of fixture units that may be connected to a given size of horizontal branch, building drain, vertical soil or waste stack, or building sewer shall be as provided in the following table:

Pipe Size In.	Building Drain or Sewer			One Horizontal Branch	Vertical Soil or Waste Stack, 1 & 2 Branch-Intervals in Ht.	Vertical Soil or Waste Stack, More than Two Branch-Intervals in ht.	
	⅛ in. Fall	¼ in. Fall	½ in. Fall			In 1 Branch Interval	On One Stack
1¼ (**)	..	..	..	3	3	....	....
1¼	..	..	..	1	1	1	2
1½	..	..	..	4	3	2	8
2	..	8	14	7	6	6	24
2½	..	21	26	13	16	10	49
3	29(*)	32(*)	43(*)	24(+)	34(*)	14	70
4	216	260	300	192	300	100	600
5	468	576	690	432	650	230	1,300
6	840	1,000	1,200	742	1,200	420	2,200
8	1,920	2,300	2,760	1,700	2,550	850	4,400
10	3,480	4,200	5,000	3,000	3,900	1,300	6,800
12	5,580	6,700	8,000	4,700	5,700	1,900	10,000
15	10,000	12,000	14,400	8,400	....	....	....

(*) Not over two water closets.
(+) Not over one water closet.
(**) Copper.

9.4.2 The maximum number of fixture units that may be connected to a vertical soil or waste stack within one branch interval shall be as provided in 9.4.1.

9.4.3 The size of soil or waste stacks shall not be smaller than the largest horizontal branch connected thereto except that a 3x4 W.C. connection shall not be considered as a reduction in pipe size.

9.4.4 Future installation of fixtures shall be considered in determining the required sizes of drain pipes. The provision for such future installation may be terminated with a plugged fitting or fittings at the stack so as to form no dead end or extended to the location point of the future fixture, vented as though the proposed fixtures were installed as required in Section E-1100, and terminated with a plugged fitting or fittings.

9.5 SUMPS AND RECEIVING TANKS.

9.5.1 Building subdrains below the main building sewer or main building drain shall discharge into a tight sump or receiving tank, so located as to receive the sewage by gravity. The sewage shall be lifted and discharged into the building drain or sewer by pumps, ejectors, or any equally efficient method. Such sumps or tanks shall either be automatically discharged or be of sufficient capacity to hold the maximum accumulated sewage and waste for a period of not less than 24 hours.

9.6 CONDENSATE AND BLOWOFF CONNECTIONS.

9.6.1 Direct connection of a steam exhaust, blowoff, or drip pipe shall not be made to a building drainage system. Waste water shall not be discharged into a building drainage system at a temperature higher than 140°F.

9.7 OFFSETS.

9.7.1 In case an offset in a soil or waste stack is below the lowest horizontal branch, no change in diameter at the stack shall be required because of the offset if there is no single change in direction greater than 45 degrees. If the offset is made at an angle greater than 45 degrees, the required diameter of the stack below, and including the offset, shall be determined as for a building drain.

SEC. E-1000 STORM DRAINS

10.1 GENERAL.

10.1.1 Roofs and paved areas, yards, courts, and courtyards shall be drained into a storm sewer system or a combined sewer where such systems are available.

10.1.2 Storm water, cellar or subsoil drains shall not be connected to sewers intended for sanitary sewage only.

10.1.3 Leaders and storm drains, when connected to a combined sewer, shall be effectively trapped.

10.1.4 Expansion joints or sleeves shall be provided where warranted by temperature variations or physical conditions.

10.1.5 Subsoil drains placed under the cellar or basement floor or used to encircle outer building walls, may be made of open-jointed or horizontally split or perforated clay tile, or perforated bituminized fiber pipe, or asbestos cement pipe not less than 3 inches in diameter. The subsoil drain of buildings subject to backwater shall be protected by an accessibly located backwater valve. Subsoil drains may discharge into a properly trapped drain or sump. Such sumps do not require vents. The point of discharge shall be in accordance with 10.1.1 and 10.1.2.

10.2 MATERIALS.

10.2.1 Leaders installed within a building, or run in a vent or pipe shaft, may be of cast iron, galvanized steel, galvanized wrought iron, galvanized open hearth iron, cement-lined ferrous pipe, brass, copper, or lead complying with the specifications given in Section E-300, Table 3.4 or as accepted by the Administrative Authority.

10.2.2 Outside leaders of sheet metal connected to a building storm drain or storm sewer, shall be connected by means of a cast-iron, brass or copper pipe extending above the finish grade. A sheet-metal leader along a public driveway shall be protected against damage.

10.2.3 Underground building storm drains may be made of cast iron, brass, copper, or coal-tar enamel-protected coated and lined wrought iron or steel pipe complying with the specifications as given in Table 3.4 or as accepted by the Administrative Authority. Threaded joints shall be coated and wrapped after inspection.

10.2.4 Building storm sewers may be made of vitrified-clay, asbestos cement, bituminized fiber, cast-iron, brass, copper or coal-tar enamel-protected coated and lined wrought-iron pipe or steel pipe complying with the specifications as given in Table 3.4 or as accepted by the Administrative Authority. Threaded joints shall be coated and wrapped after inspection.

10.3 SIZE OF LEADERS AND STORM DRAINS.

10.3.1 The size of a vertical leader shall be based upon the maximum projected roof area according to the following table:

NOMINAL LEADER SIZE, EQUIVALENT DIAMETER, IN INCHES	MAXIMUM PROJECTED ROOF AREA IN SQ. FT.
2	500
3	1,500
4	3,100
5	5,400
6	8,400
8	17,400

10.3.2 The minimum size of building storm sewers, building storm drains or any of its branches, having a fall of ½ in. or less per foot, shall be based upon the maximum projected roof area according to the following table:

Diameter (In Inches)	Maximum Projected Sq. Ft. Roof Area for Drains at Various Slopes		
	⅛ In. Fall per Ft.	¼ In. Fall per Ft.	½ In. Fall per Ft.
2	....	350	500
3	750	1,050	1,500
4	1,550	2,150	3,100
5	2,700	3,600	5,400
6	4,200	6,000	8,400
8	8,700	11,900	17,400
10	15,200	19,600	30,400
12	24,700	31,800	49,400

10.4 COMBINED BUILDING DRAINS AND BUILDING STORM DRAINS.

10.4.1 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 to the combined building sewer or to the building drain at least 10 ft. downstream from any stack connection.

10.5 SIZE OF COMBINED DRAINS AND SEWERS.

10.5.1 The size of building drains and building storm drains up to the point of combining into one system shall be as required for separate storm and sanitary systems.

10.5.2 To determine the required size of a combined drain or sewer, the connected fixture units shall first be converted to square feet of roof area by the use of the following table. The number of square feet obtained shall then be added to the actual number of square feet of roof area to be drained and the pipe size determined by using the Table in 10.3.2.

ROOF-AREA EQUIVALENTS FOR FIXTURE UNITS ON COMBINED DRAINS AND SEWERS

Total Number Units	Sq. Ft. of Roof Area	Total Number Units	Sq. Ft. of Roof Area
10	650	600	6,700
15	750	700	7,200
20	900	800	7,900
25	1,000	900	8,600
30	1,100	1,000	9,200
35	1,200	1,200	10,500
40	1,300	1,400	11,500
45	1,400	1,600	12,600
50	1,500	1,800	13,700
60	1,650	2,000	14,700
70	1,800	2,500	17,300
80	2,000	3,000	19,800
90	2,100	3,500	22,000
100	2,200	4,000	25,000
125	2,500	4,500	27,000
150	2,850	5,000	29,000
175	3,100	6,000	34,000
200	3.400	7,000	39,000
250	3,900	8,000	43,000
300	4,300	9,000	48,000
350	4,800	10,000	52,000
400	5,200	12,000	62,000
450	5,600	15,000	76,000
500	5,900	20,000	100,000

10.5.3 Each gallon per minute of a continuous or semi-continuous discharge into the building storm drain or building storm sewer, as from a pump, ejector, air-conditioning plant, or similar device, shall be computed as being equivalent to 40 sq. ft. of roof area.

SEC. E-1100 VENTS AND VENTING

11.1 MATERIAL.

11.1.1 Vent pipes shall be made of cast iron, galvanized wrought iron, galvanized open-hearth iron, galvanized steel, copper, brass or lead. The pipe and fittings for each type of pipe, including malleable fittings, shall comply with the specifications as given in Section E-300, Table 3.4.

11.2 PROTECTION OF TRAP SEALS.

11.2.1 The seal of every fixture trap in a plumbing system shall be protected by a properly installed individual vent except as otherwise provided in this section.

11.2.2 Soil or waste stacks shall be extended vertically as a stack vent to at least 6 inches above the flood-level rim of the highest fixture, then to the open air; or the stack vent and vent stack may be joined within the building at least 6 inches above the flood-level rim of the highest fixture with a single extension from the point of joining to the open air.

11.2.3 Vent stacks or main vents shall be installed with a soil or waste stack whenever individual vents, relief vents, or other branch vents are required in two or more branch intervals. The vent stack shall terminate independently in the open air outside the building or shall be connected with the stack vent as prescribed in Section 11.2.2 and shall connect with the soil or waste stack through, at, or below the lowest horizontal waste branch or with the building drain.

11.2.4 Vent terminals from a sanitary drainage system shall not be located directly beneath any door, window, or other ventilating opening of the same or adjacent buildings nor shall any such vent terminal be within 8 feet horizontally of such an opening unless it is at least 2 feet above the top of such opening.

11.2.5 Extensions of vent pipes through a roof shall be terminated at least 1 foot above it and shall be properly flashed. Vent pipes, through roofs used for any purpose other than weather protection, shall extend at least 6 feet above the roof, and be properly braced.

11.2.6 Vent terminals extending through a wall shall be at least 8 feet horizontally from any adjacent building line and the outlets of such vents terminated in a downward direction. They shall be effectively screened.

11.2.7 A fixture trap shall have protecting vents so located that the total fall in the fixture drain from the trap weir to the vent fitting is not more than one pipe diameter and the developed length of drain from the trap weir to the vent fitting is not more than the distance specified in 11.2.8, nor less than two pipe diameters, and the drain pipe, between the trap and the vent, shall not be used for any other fixtures.

11.2.8 The permissible distance of a fixture trap from a vent fitting shall be as provided in the following table:

Size of Fixture Drain in Inches	Permissible Length of Fixture Drain in Feet When a Sanitary Tee or Longturn TY Vent Fitting is Employed ¼ Inch Slope.
1¼	4
1½	5
2	5
3	6
4	8

11.3 INSTALLATION OF VENTS.

11.3.1 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 or at different levels provided the upper fixture drain is less than half the cross sectional area of the vertical drain and is not more than 5 of its pipe diameters above the lower fixture drain, and the connections, slope, and length are within the limits of 11.2.8.

11.3.2 The vent pipe opening from a soil or waste pipe, except for water closets and similar fixtures shall not be below the dip of the trap.

11.3.3 A drop vent may be used with the permission of the Administrative Authority where conventional venting is impracticable.

11.3.4 An individual vent shall not be installed within two pipe diameters of a trap weir.

11.3.5 Wet venting or stack venting of fixtures is prohibited except as permitted in 11.3.6 and 11.5.

11.3.6 A waste pipe for a vented fixture may serve as a vent for another fixture provided the piping is not less than 1½ inches and is on the same floor level.

11.4 CIRCUIT AND LOOP VENTS.

11.4.1 A branch soil or waste pipe to which two, and not more than eight, water closets or pedestal urinals except blowout type, trap standard service sinks, shower stalls, or floor drains are connected in series, may be vented by a circuit or loop vent which shall be taken off in front of the last fixture connection. When other fixtures discharge above such a branch, each branch shall be provided with a relief vent taken off in front of the first fixture connection. Blowout type water closets or urinals shall be individually vented.

11.4.2 Two circuit vented horizontal branches serving a total of not more than eight fixtures as specified in 11.4.1 in the same branch interval may have a dual relief vent. Where the vents are joined, the point of joining shall be at least 6 inches above the flood-level rim of the highest fixture connected to either branch.

11.4.3 Two lines of fixtures back-to-back double battery shall not be installed on the same circuit or loop-vented horizontal branch, but may be installed on different branches with a dual relief-vent in accordance with 11.4.2.

11.5 STACK VENTING.

11.5.1 A fixture on the topmost stack branch shall be considered as adequately vented when it is installed in accordance with the provisions of 11.2.8.

11.5.2 Venting of a water closet shall be considered adequate if no more than 9 fixture units are added to the soil stack above the water closet connection.

11.6 SUMP VENTS.

11.6.1 Sumps, ejectors, except pneumatic ejectors, and receiving tanks used for receiving sewage or other wastes, shall be provided with a vent of a size required by the table set forth in 11.11.4.

11.6.2 Pneumatic ejectors shall be separately vented to the open air.

11.7 VENTING OF OFFSETS.

11.7.1 Offsets in soil or waste stacks at an angle greater than 45 degrees from vertical, serving fixtures below and on two or more floors above the offset shall be vented as provided in (a) or (b) below:

(a) By a yoke vent, equal in diameter to the vent stack or soil stack. The lower end of the yoke vent shall connect to the soil or waste stack through a "Y" below the lowest horizontal branch above the offset, and the upper end shall connect to the vent stack through a "Y" not less than 3 feet above the floor level, or

(b) As two separate soil or waste stacks, namely, the stack section below the offset and the stack section above the offset.

11.7.2 A fixture drain, serving a lavatory, kitchen sink or laundry tray located on the lowest floor on the lower section of a vent stack, shall be connected to the vent stack above its offset from the soil or waste stack.

11.8 YOKE VENTS.

11.8.1 All soil or waste stacks in buildings over five floors in height shall be provided with yoke vents at each five-floor interval measured from the top floor down. The size of the yoke vent shall be equal to the size of the vent stack to which it connects. The lower end of the yoke vent shall connect to the soil or waste stack through a "Y" below the horizontal branch serving that floor and the upper end shall connect to the vent stack through a "Y" not less than 3 feet above the floor level.

11.9 VENT HEADERS.

11.9.1 Stack vents and vent stacks may be connected into a common vent header at the top of the stacks and extended to the open air at one point. This header shall be sized in accordance with the requirements of the table in 11.11.4, 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 header terminal in the open air as a direct extension of one stack.

11.10 VENT-PIPE GRADES AND CONNECTIONS.

11.10.1 All vent and branch-vent pipes shall be free from drops or sags and be so graded and connected as to drip back to the soil or waste pipe or vent stack by gravity.

11.10.2 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 degrees to the vertical, to a point at least 6 inches above the flood-level rim of the fixture it is venting before off-setting horizontally or before connecting to the branch vent.

11.10.3 A connection between a vent pipe and a vent stack shall be 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, circuit vents, or loop vents, shall be at least 6 inches above the flood-level rim of the highest fixture served.

11.11 SIZE AND LENGTH OF VENTS.

11.11.1 The length of a 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 either 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.

11.11.2 The length of a branch vent shall be the developed length from its connection with the vent stack or stack vent to the fixture drain or horizontal soil or waste branch served by the branch vent.

11.11.3 The length of a stack vent shall be the developed length from the highest horizontal or fixture branch connected to the stack to the terminal of the stack vent in the open air.

11.11.4 The diameter of a vent stack or main vent shall be at least one-half the diameter of the soil or waste stack, but in no case less than 1¼ inches, and depending on its developed length and the number of fixture units installed on the soil or waste stack, shall be as required in the following table:

Size of Soil or Waste Stack (Inches)	Fixture Units Connected	Diameter of Vent Required (Inches)								
		1¼	1½	2	2½	3	4	5	6	8
		Maximum Length of Vent (Feet)								
1¼ (*)	3	30								
1¼	2	30								
1½	8	50	150							
1½	10	30	100							
2	12	30	75	200						
2	20	26	50	150						
2½	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				
4	200			30	90	250	1000			
4	500			20	70	180	900			
5	200				35	80	700			
5	500				30	70	350	1000		
5	1100				20	50	300	900		
6	350				25	50	200	700		
6	620				15	30	200	400	1300	
6	960					24	125	300	1100	
6	1900					20	100	250	1000	
8	600						70	200	700	
8	1400						50	150	500	1300
8	2200						40	100	400	1200
8	3600						30	80	350	1100
10	1000						25	60	250	800
10	2500							75	125	1000
10	3800							50	100	500
10	5600							30	80	350
								25	60	250

(*) Copper only.

11.11.5 The diameter of a stack vent shall not be less than the diameter of the soil or waste stack.

11.11.6 The diameter of an individual vent shall not be less than 1¼ inches nor less than one-half the diameter of the drain to which it is connected.

11.11.7 The diameter of a relief vent shall not be less than one-half the diameter of the soil or waste branch.

11.11.8 The diameter of a circuit or loop vent shall not be less than the diameter of the horizontal soil or waste branch or the diameter of the vent stack, whichever is the smaller.

11.12 VENTS NOT REQUIRED.

11.12.1 Vents shall not be required for a leader trap, a backwater trap, area drain or subsoil catch-basin trap.

SEC. E-1200 INDIRECT WASTE AND WASTE PIPING

12.1 INDIRECT WASTE PIPES.

12.1.1 Indirect wastes shall not be discharged directly into the drainage system of a building except as herein provided.

12.1.2 Indirect wastes, for the purpose of this code, shall be divided into two classifications—Class A, Wastes from fixtures or other devices which may contain considerable quantities of organic matter and are thereby liable to create a nuisance in an open indirect waste receptacle as hereinafter specified; Class B, Wastes including only cooling water and waste water from various fixtures or devices which are relatively uncontaminated by organic matter.

(a) Class A wastes shall include all wastes from a bar or soda fountain; wastes from a dish-washing machine, clothes washing machine and clothes dryers whether of a commercial type or of a type used in a dwelling unit, and other similar wastes.

(b) Class B wastes shall include drippage from the interior of refrigerated spaces whether cooled by ice or by mechanical means; steam tables and other receptacles or devices in which food or drink is stored; devices or apparatus used for the storage, preparation or processing of food or drink; drains, overflows or vents from the water distributing system; overflows from devices or apparatus such as stills, sterilizers and equipment requiring the use of cooling water.

12.1.3 Indirect waste pipes shall discharge into an open slop-sink, floor drain or other receptacle which is itself connected to the drainage system of the building and which is properly trapped and vented, except as provided in 12.1.5 and 12.1.6. All indirect waste pipes shall terminate above the flood level rim of the receiving fixture or receptacle in order to provide an air gap at least twice the effective diameter of the indirect waste pipe or if there be more than one indirect waste pipe, the air gap for all waste pipes shall be at least twice the effective diameter of the largest pipe.

12.1.4 A receptacle receiving indirect wastes shall also be supplied with running water so that it can be properly and adequately cleaned and flushed at regular intervals.

12.1.5 A special waste connection to a vent or vent stack may be permitted by the Administrative Authority in lieu of an indirect waste receptacle for Class A wastes as above defined, provided that the point of such direct connection shall be at least 6 inches above the flood level rim of a sink or other receptacle adjacent thereto and vented by the vent or vent stack to which the direct connection is made; and provided that there are no fixtures connected to the said vent or vent stack above the fixture referred to.

12.1.6 Dishwashing machines, clothes washing machines and clothes dryers, if located adjacent to a floor drain, may be connected directly to the house side of the floor drain trap or if located adjacent to a fixture, may be connected to the fixture side of the trap with an air gap above the flood level of the fixture to which it is connected.

12.2 ACCESSIBILITY.

12.2.1 All receptacles for indirect waste shall be placed in an accessible location so that their condition can be observed and that they can be

cleaned when necessary. No such receptacle shall be placed in a closet or other similar compartment.

12.3 INDUSTRIAL WASTE PIPING AND PROHIBITED WASTES.

12.3.1 Industrial or similar wastes containing toxic, corrosive, flammable or explosive substances or other liquid, vapor, gas or substances of any kind harmful to the drainage system, shall not be discharged into any drainage system or building sewer unless first subjected to a type of treatment approved by the authority having jurisdiction. In the case of alkaline or acid wastes, treatment shall consist of neutralization or other treatment so as to produce no harmful effects on the drainage system or other building sewers. Any such waste pipe, fittings, traps and connections conveying such liquids to a treating or neutralizing device shall be of material capable of resisting corrosive action or other damage by such wastes.

SEC. E-1300 INSPECTION AND TESTS

13.1 INSPECTIONS.

13.1.1 All new plumbing work and such portions of existing systems as may be affected by new work, repairs or other changes, shall be inspected to insure compliance with all the requirements of this code and to assure that the installation and construction of the system is in accordance with approved plans.

13.1.2 It shall be the duty of the plumber performing any of the work described in 13.1.1 to give notice to the Administrative Authority when plumbing work is ready for test or inspection.

13.1.3 It shall be the duty of a plumber to make sure that his work will stand the test prescribed before giving the notice described in 13.1.2.

13.1.4 At the direction of the Administrative Authority a plumber shall make such corrections in his work and submit the same for reinspection as may be necessary to determine compliance with the provisions of this code.

13.2 MATERIAL AND LABOR FOR TESTS.

13.2.1 Equipment, material, power and labor necessary for all inspections and tests of the Administrative Authority shall be furnished by the plumber.

13.3 SYSTEM TESTS OF DRAINAGE AND VENT SYSTEMS.

13.3.1 Upon completion of the drainage and venting system, and before any fixtures are set, the system shall be tested in the presence of the plumbing inspector by water or air, or if not practical, with smoke or peppermint. The plumbing inspector may require the removal of clean-outs to ascertain if the pressures have reached all parts of the system.

13.4 METHODS OF TESTING DRAINAGE AND VENT SYSTEMS.

13.4.1 The water test may be applied to the drainage system 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 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 filled with water, but no section shall be tested with less than a 10-foot head of water. In testing successive sections, at least the upper 10-feet of the next preceding section shall be retested, so that no joint or pipe in the building except the uppermost 10 feet of the system shall have been submitted to a test of less than 10-foot head of water. The water shall be kept in the system, or in the portion under test, for at least 15 minutes before inspection starts. The system shall then be tight at all points.

13.4.2 The air test shall be made by attaching an air compressor or testing apparatus to any suitable opening and after closing all other inlets and outlets to the system, forcing air into the system until there is a uniform gauge pressure of 5 pounds per square inch or sufficient to balance a column of mercury 10 inches in height. This pressure shall be held without the introduction of additional air for a period of at least 15 minutes.

13.4.3. The smoke test shall be made by filling all traps with water and then introducing into the entire system a pungent, thick smoke produced by one or more smoke machines. When the smoke appears at stack openings on the roof they shall be closed and a pressure equivalent to a 1-inch water column shall be built up and maintained for 15 minutes before inspection starts. Where the peppermint test is used, 2 ounces of oil of peppermint shall be introduced for each line or stack.

13.5 TEST OF WATER SUPPLY SYSTEM.

13.5.1 Upon the completion of a section or of the entire water distributing system, it shall be tested and proved tight under a water pressure not less than the working pressure under which it is to be used. The water used for this test shall be obtained from the normal source of supply.

13.6 TEST OF LEADER PIPES.

13.6.1 Leader pipes and branches within a building shall be tested by water or air as provided in 13.3.

13.7 COVERING THE WORK.

13.7.1 Plumbing systems or parts thereof shall not be covered until inspected, tested, and found satisfactory as prescribed by this code.

13.7.2 Plumbing systems or parts thereof covered before being inspected, tested, and found satisfactory, as prescribed in this section, shall be uncovered upon the direction of the Administrative Authority.

13.8 DEFECTIVE PLUMBING.

13.8.1 Plumbing systems of any building believed to have become defective, shall be subjected to test or inspection and any defects found shall be corrected as required in writing by the Administrative Authority.

13.9 INSPECTIONS AND TESTS NOT REQUIRED.

13.9.1 Tests or inspections shall not be required where a plumbing system or part thereof set up for exhibition purposes is not used for toilet purposes and is not directly or indirectly connected to a water supply or sewerage system.

13.10 MAINTENANCE.

13.10.1 The plumbing system of any premises within the territorial jurisdiction of the Administrative Authority shall be maintained in a sanitary and safe operating condition by the owner or his agent.

SEC. E-1400 ADMINISTRATION

14.1 PERMITS.

14.1.1 A permit shall be obtained from the Administrative Authority before any plumbing work is performed except as hereinafter provided. Issuance of such permits shall be based on a properly executed application form which will be supplied by the Administrative Authority, and a satisfactory sketch showing the proposed work in sufficient detail to determine whether the proposed construction or alteration will comply with the provisions of these regulations. The Administrative Authority or its authorized agent may require the submission of detailed plans and specifications prepared by a licensed architect or engineer for large installations.

Permits shall be issued only to master plumbers except as provided in 14.1.2 and 14.1.3.

Permits shall not be required for alterations to any plumbing system consisting of:

(a) Repairs involving only working parts of a faucet, valve or plumbing fixture.

(b) The clearance of stoppages or the repair of leaks provided such repairs do not require any change in the piping arrangement.

(c) The repair or replacement of any faucet or valve provided no rearrangement of the connecting piping system is required.

14.1.2 A permit may be issued to a person to do plumbing in a single-family dwelling used exclusively for living purposes, including the usual accessory buildings and quarters in connection with such building, provided that person is the bona fide owner and occupant of such dwelling and said owner purchases all material and personally performs all labor in connection therewith.

14.1.3 A permit for the installation or repair of water heaters, water conditioning equipment, refrigeration equipment, air conditioning equipment and heating equipment may issue to a person engaged in the business of installing or repairing such equipment provided that said equipment is to be connected to the water distributing system through an existing water outlet installed in such a manner that it complies with the provisions of this code and no major extension or rearrangement of the existing water pipe is made and further that no direct connection is made to a soil or waste pipe.

14.2 ALTERATION OF SKETCHES OR PLANS.

14.2.1 Plumbing shall be constructed or altered in accordance with the sketch or plan submitted with the application for which a permit has been issued. Where it is found that additions or changes in the original plans are necessary to secure compliance with this code, or for another valid reason, an amended application and sketch or plan shall be submitted to and approved by the Administrative Authority or its authorized agent before continuing with that portion of the plumbing installation covered by the amended application and sketch or plan.

14.3 EXTENT OF REGULATIONS.

14.3.1 All new plumbing systems or such portions of existing plumbing systems as may be affected by new work or by alterations or extensions

except those parts of such systems that are exempt in section 14.1, shall be inspected or tested to determine that the work has been performed in accordance with the plans approved and the provisions of this code. When it has been determined that such installations do not comply with the plans approved or this code, necessary corrections shall be made, and the installation shall be subject to further inspections and tests.

14.3.2 The Administrative Authority shall have the right to reinspect any backflow preventers that may be installed and if any are found to be defective the owner of the premises or plumber installing them shall be obliged to repair or replace them or make such changes as may be necessary to protect the potable water supply.

14.4 CERTIFICATION OF APPROVAL.

14.4.1 Plumbing work for which a permit has been issued shall not be placed in service until a Certificate of Approval, on a form provided for this purpose, has been issued by the Administrative Authority or its authorized agent. The building inspector or similar official of the municipality who is responsible for the issuance of occupancy permits shall be furnished a copy of this certificate.

14.4.2 The issuance of a Certificate of Approval will constitute a certification that the plumbing system has been constructed or altered in accordance with these regulations, but shall not be construed as a guarantee by the Administrative Authority that the system so installed will function satisfactorily, nor shall it in any way restrict the powers or responsibility of the Administrative Authority in the enforcement of any law or ordinance relating to public health. The Certificate of Approval shall be issued to the person in whose name the permit for the plumbing work certified was issued, who then shall forward the Certificate of Approval to the person for whom the work was performed.

14.5 LICENSE REQUIRED.

14.5.1 A person shall not engage in the practice of plumbing unless such person holds a valid master plumber's license issued by the Administrative Authority, except as provided in 14.1.2, nor shall any person not the holder of such a license engage in or carry on, or represent himself as engaging in or carrying on the practice of plumbing as a master plumber, nor shall any person not the holder of such a license use the words "master plumber," "plumber" or "plumbing," or any other term in any advertisement or display a sign to indicate, imply or designate him as engaging in the practice of plumbing.

14.6 BOARD OF PLUMBER EXAMINERS.

14.6.1 The Administrative Authority shall create a Board of Plumber Examiners which shall consist of a plumbing inspector, a master plumber, and a journeyman plumber. The plumbing inspector shall be the duly appointed plumbing inspector of the Administrative Authority, shall be licensed in accordance with law, and his term shall be concurrent with his appointment to such position. The appointment of the master plumber and journeyman plumber shall be for a term of three (3) years each, or until his successor is appointed and qualified. Any vacancy occurring in the membership of the Board shall be filled for the unexpired term.

14.7 EXAMINATION.

14.7.1 The Board of Plumber Examiners shall hold examinations designed to test the knowledge and ability of applicants for a license as a master plumber relative to installation of proper plumbing in accordance with provisions of this code. They shall make recommendations to the Administrative Authority relative to the issuance or denial of a license to those who have taken the examination. Examinations shall be held at least twice a year and at intervals not exceeding six months providing an application is on file. No person shall be admitted to the examination for a license as a master plumber unless he has first shown to the satisfaction of the Board that he is at least twenty-one (21) years of age, is a citizen of the United States and has had at least two (2) years experience as a journeyman plumber or the equivalent thereof.

14.8 ISSUANCE OF LICENSE.

14.8.1 The Administrative Authority shall issue a master plumber's license to each applicant for such a license who has successfully passed the examination given by the Board of Plumber Examiners. The holder of a master plumber's license, acceptable to the Board of Plumber Examiners, issued in another municipality or a holder of master plumber's licenses in three (3) other municipalities may be permitted to practice plumbing in the municipality without an examination.

14.9 RENEWAL OF LICENSE.

14.9.1 Master Plumbers' licenses shall expire on the last day of December of each year and may be renewed at any time within two (2) years of their expiration date without reexamination of the licensee. Licenses not renewed within two (2) years of their expiration date may not be renewed until the applicant has been reexamined.

14.10 REVOCATION OF LICENSE.

14.10.1 The license of a master plumber issued by the Administrative Authority may be suspended or revoked by the Administrative Authority should the holder of such license later be shown to be incompetent as a master plumber or should it later be shown such license was obtained through fraud or misrepresentation or should the holder of such license who has secured a permit under the provisions of 14.1 of this code to perform such work, allow it to be performed by persons other than holders of a license or his employees.

14.11 BONDS REQUIRED.

14.11.1 A person who has been issued a master plumber's license or person to whom a permit may be issued under 14.1.3 shall execute and deposit with the Administrative Authority an individual bond, or an association master plumber's bond or other bond acceptable to the Administrative Authority provided that the bond shall be in the amount of one thousand dollars. Each such bond shall be conditioned upon compliance with the provisions of this code and the person or persons so bonded being obliged to pay all fines and penalties as may be imposed upon him or them pursuant to law for violation of the provisions of this code. A master plumber's license or permits issued under 14.1.3 shall not be valid unless such a bond has been executed and deposited as herein provided.

14.12 PUBLIC UTILITIES.

14.12.1 These regulations shall not be construed to abrogate the rules, regulations or requirements of the owners of any public water supply system or public sewer system.

MANUAL

DEVELOPED LENGTH

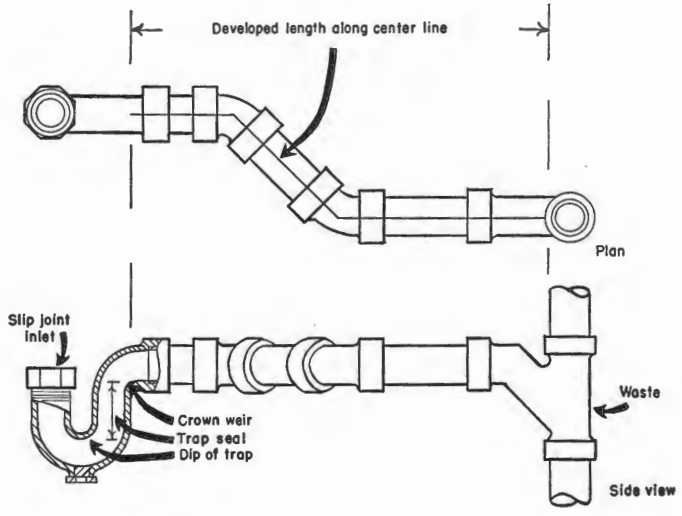


FIG. A

CONTINUOUS WASTE

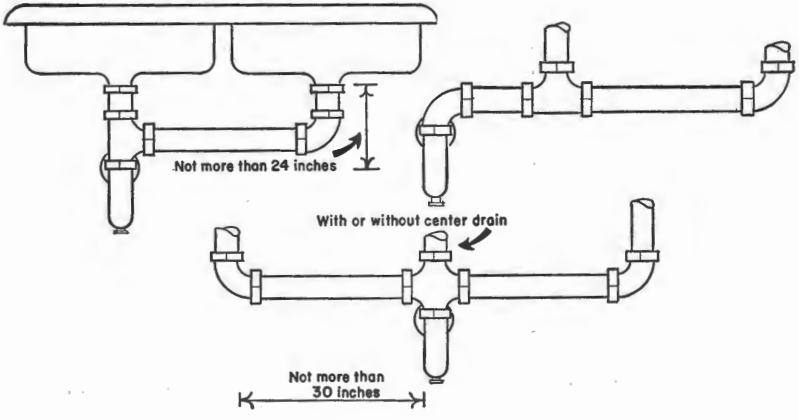


FIG. B

DROP VENT

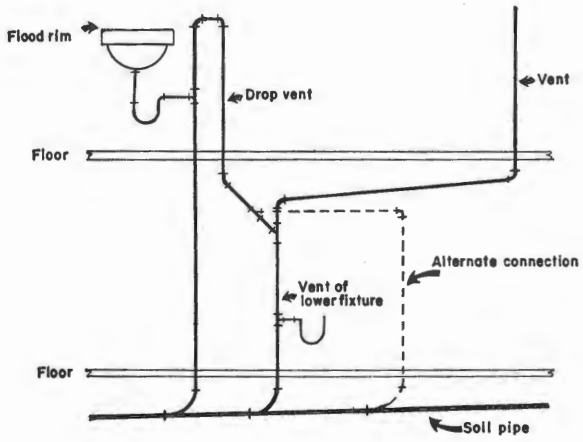


FIG. C

CLASS "A" AND "B" INDIRECT AND SPECIAL WASTE CONNECTION

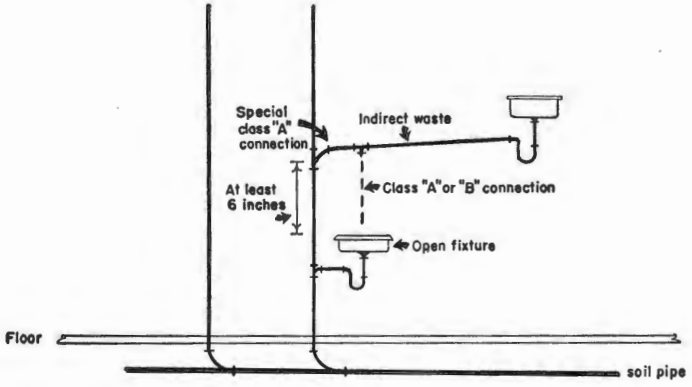


FIG. D

PIPING FOR BATHROOM AND SINK

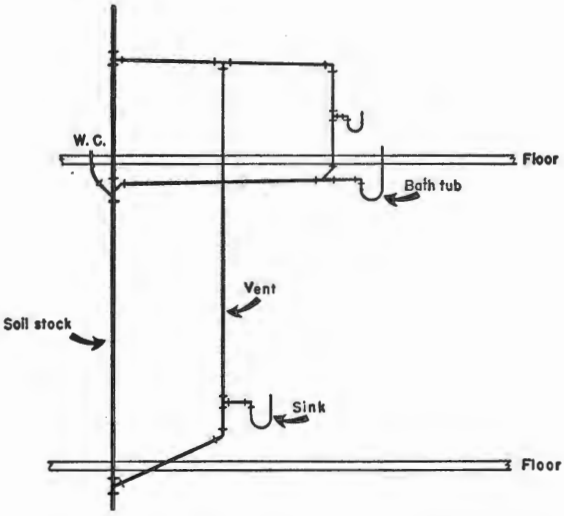


FIG. E

CONNECTIONS DESCRIBED IN 12.1.6

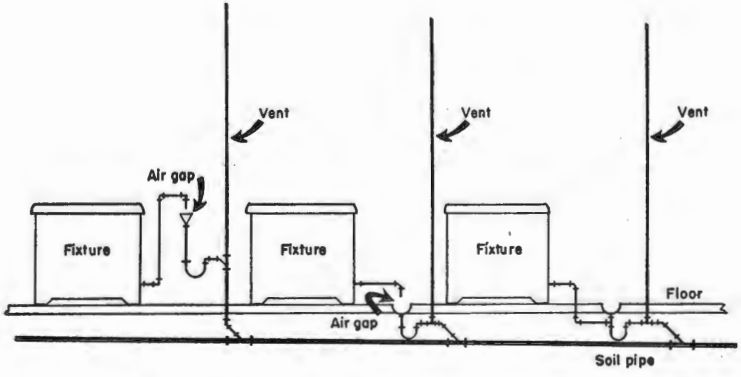


FIG. F

LIMITS FOR CIRCUIT VENTS

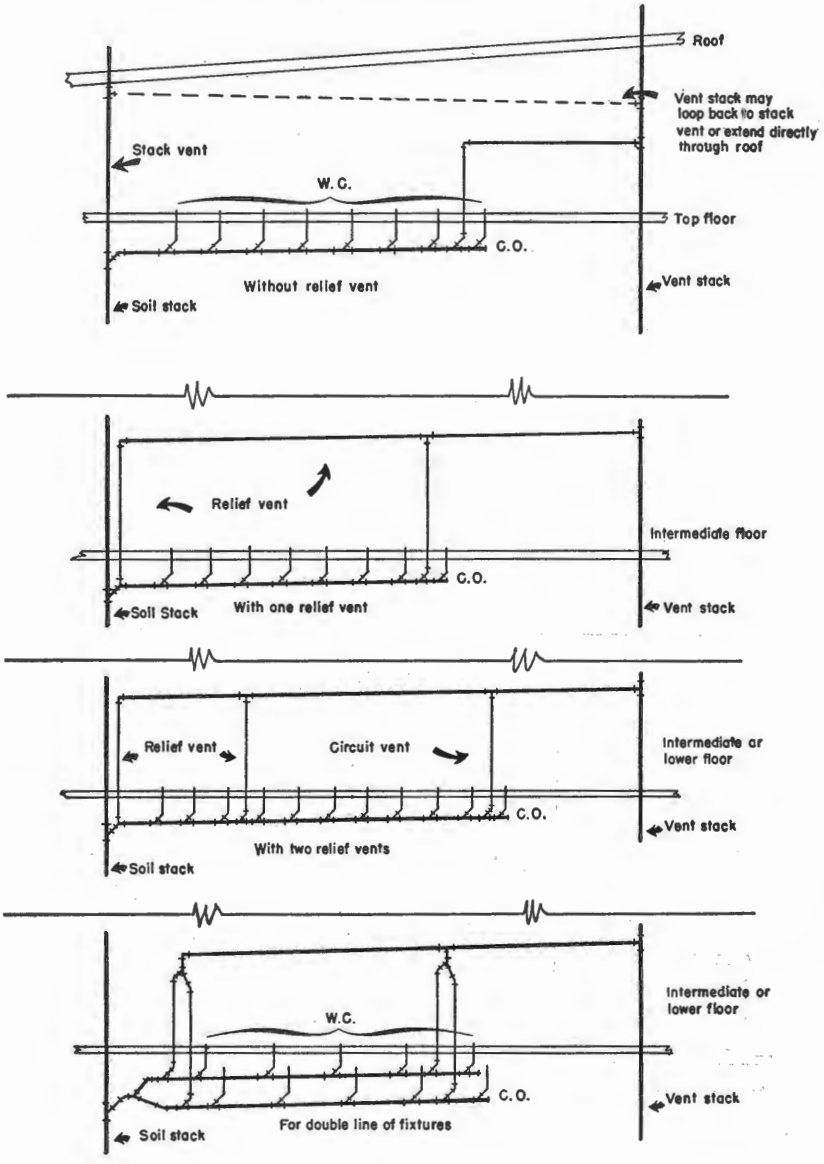


FIG. G

3 FLOOR ELEVATION OF A PLUMBING SYSTEM

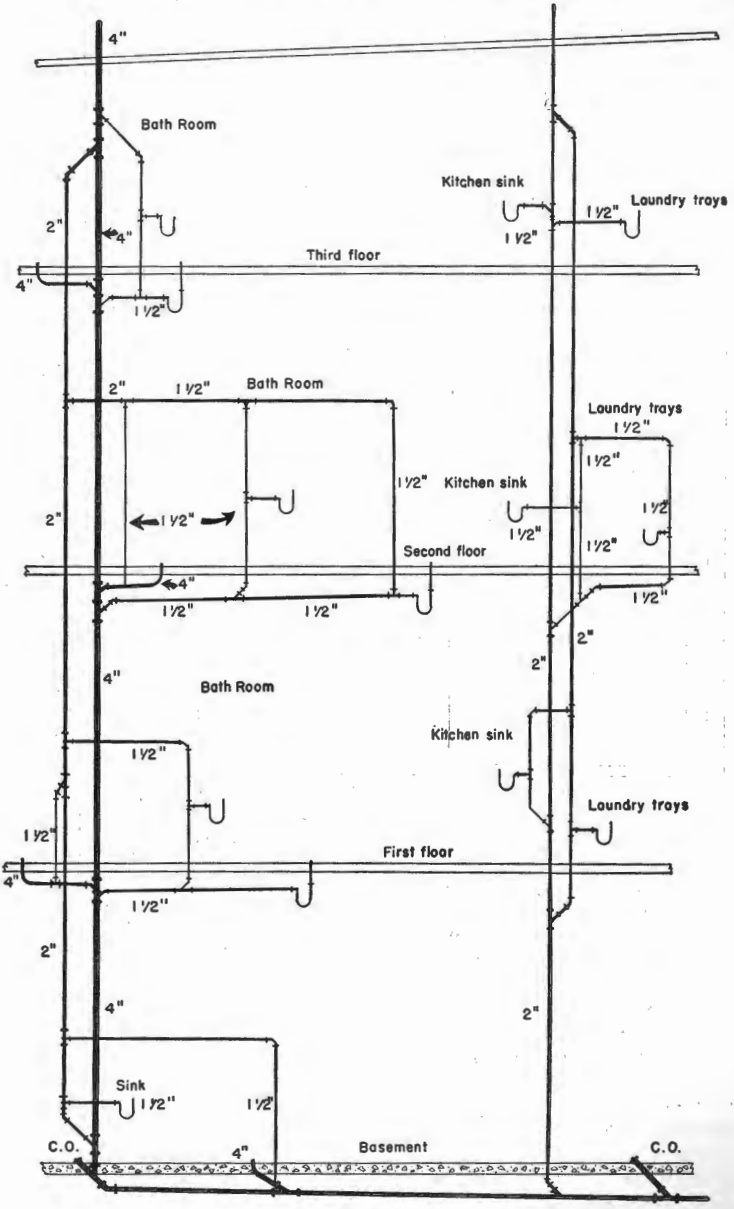
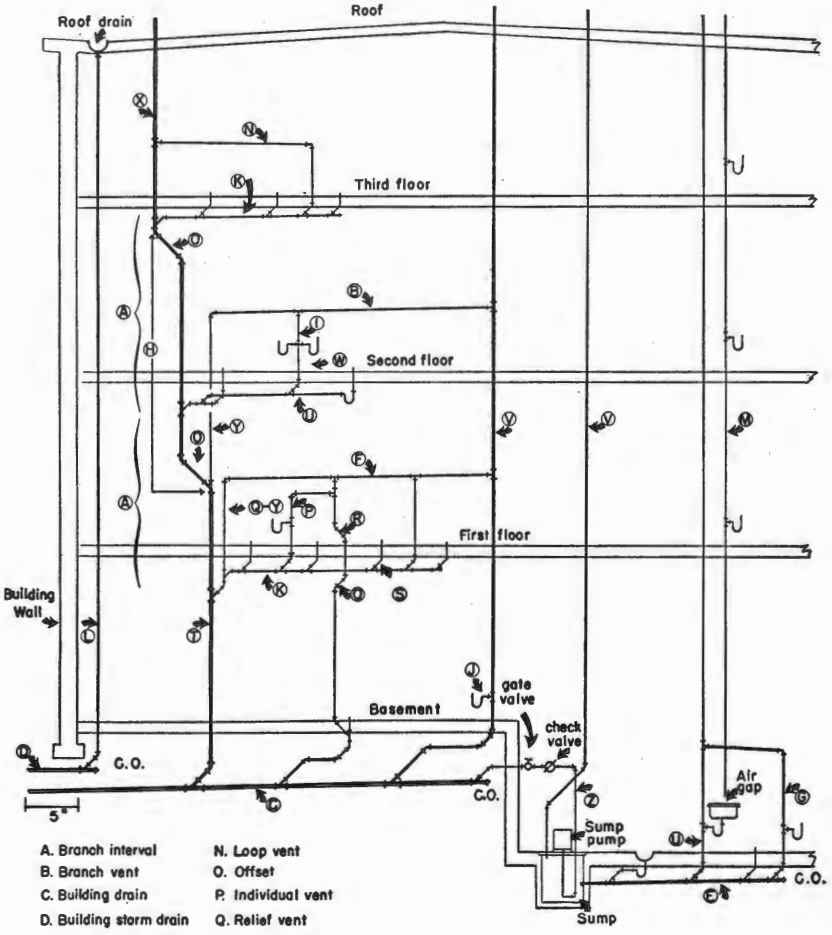


FIG. H

ILLUSTRATIONS OF DEFINITIONS



A. Branch interval
B. Branch vent
C. Building drain
D. Building storm drain
E. Building sub-drain
F. Circuit vent
G. Continuous vent
H. Double offset
I. Common vent
J. Fixture drain
K. Horizontal branch
L. Leader
M. Indirect waste
N. Loop vent
O. Offset
P. Individual vent
Q. Relief vent
R. Return offset
S. Side vent
T. Soil stack
U. Waste pipe
V. Vent stack
W. Wet vent
X. Stack vent
Y. Yoke vent
Z. Sump discharge
C.O. Clean out

FIG. I

SUGGESTED ORDINANCE PROVIDING FOR THE ADOPTION OF THE PLUMBING CODE OF NEW JERSEY (1953)

AN ORDINANCE establishing a code regulating the installation, maintenance, repair and control of plumbing and the connection thereof with outside sewers, cesspools or other receptacles; regulating the practice of plumbing and the issuance of licenses to practice plumbing and providing penalties for violation thereof.

BE IT ORDAINED BY THE BOARD OF HEALTH OF .....

.....COUNTY, NEW JERSEY:

Section 1. A code regulating the installation, maintenance, repair and control of the plumbing of buildings, and the connection thereof with outside sewers, cesspools or other receptacles, regulating the practice of plumbing and the issuance of licenses to practice plumbing, is hereby established pursuant to the provisions of Chapter 275, P.L. of 1948. A copy of said code is annexed hereto and made a part hereof without the inclusion of the text thereof herein.

Section 2. The said code established and adopted by this ordinance is described and commonly known as the "Plumbing Code of New Jersey (1953)".

Section 3. Three copies of the said "Plumbing Code of New Jersey (1953)", similarly marked, have been placed on file in the office of the Clerk of this municipality upon the introduction of this ordinance and will remain on file in such office for the use and examination of the public.

Section 4. In connection with the provisions of this ordinance and the code hereby established and adopted as a part hereof, the following fees shall be charged and received:

(a) For the examination of any applicant for license as master plumber, ... dollars.

(b) For the issuance and annual renewal of a license as master plumber, ... dollars.

(c) For the filing of plans for a proposed plumbing work, two dollars.

(d) For the issuance of a permit for a proposed plumbing construction or alteration, ... dollars, provided, however, an additional fee of ..... per fixture is hereby established for each fixture above ..... proposed in the approved plan for construction or alteration.

(e) For the issuance of a permit for the replacement of a plumbing fixture ..... dollars.

(f) For each reinspection of plumbing work caused by the failure of the licensee to comply with the provisions of the code or permit issued, ... dollars.

Section 5. Any person or persons, firm or corporation violating any of the provisions of this ordinance or of the "Plumbing Code of New Jersey (1953)" made a part hereof shall, upon conviction thereof, pay a penalty of not less than two dollars, nor more than one hundred dollars for each offense.

Section 6. All fees, penalties, and moneys collected under any provision of this ordinance or the code established herein shall be paid to the treasurer of the municipality.

Section 7. All ordinances and parts of ordinances inconsistent with any of the provisions of this ordinance and the code established hereunder are hereby repealed to the extent of such inconsistency.

Section 8. In the event that any section, sentence or clause of this ordinance or code shall be declared unconstitutional by a Court of competent jurisdiction, such declaration shall not in any manner prejudice the enforcement of the remaining provisions.

Section 9. This ordinance and the code established herein shall take effect 30 days after the first publication of the ordinance in accordance with the provisions of R. S. 26:3-69.

SUGGESTED FORM

No. .....

BOARD OF HEALTH OR HEALTH DEPARTMENT

(Township)
(City) of ....., New Jersey
(Borough)

APPLICATION FOR PLUMBING PERMIT

..... 19 .....

Location ..... or Block No. ..... Lot No. .....
No. Street

Owner .....

Present Address .....

Contractor .....
Name Address

Classification:

Master Plumber .....
Owner .....
Other ....
Explain other

Type of Building:

Dwelling .....
Commercial .....
Factory .....
Other ....
Describe other

Construction:

Frame .....
Other ....
Describe other

Permit Requested for:

Construction ..... Water ..... Drainage ..... Fixture .....

Alteration ..... Water ..... Drainage ..... Fixture .....

Sketch of Proposed Plumbing Work:

The undersigned agrees to perform or have performed under his supervision all work described herein in accordance with the provisions of the Ordinance and Plumbing Code adopted by the Board of Health of .....

..... **on** .....

Month **Day** **Year**

.....

Owner

.....

Contractor

SUGGESTED FORM

This permit must be shown to the inspector when request is made

BOARD OF HEALTH OR HEALTH DEPARTMENT
PLUMBING PERMIT

(Township)
(Borough) of ....., N. J. No. .....
(City)

....., 195.....

THIS IS TO CERTIFY THAT .....

Has permission to perform plumbing work in the building of .....
..... situated at .....

.....

Subject to the Ordinance and Plumbing Code of this Department and in accordance with the plans approved and filed in this office.

Fee: $..... .....
Title

SUGGESTED FORM

No. .....

BOARD OF HEALTH OR HEALTH DEPARTMENT

(Township)
(Borough) of ....., N. J.
(City)

CERTIFICATE OF APPROVAL

..... 19.....

Issued To .....

THIS IS TO CERTIFY that the plumbing work, for which a permit has been issued, for the building situated at .....

.....

Street or Block and Lot Number

has been constructed ..... / altered .....

in accordance with the ORDINANCE adopted by the Board of Health of ..... on .....
Month Day Year

establishing a code regulating the installation, maintenance, repair and control of plumbing and the connection thereof with outside sewers, cesspools or other receptacles; regulating the practice of plumbing and the issuance of licenses to practice plumbing, and providing penalties for violation thereof, and the plans approved and on file in the offices of this Board.

The issuance of this Certificate shall not be construed as a guarantee by the Administrative Authority that the system so installed will function satisfactorily, nor shall it in any way restrict the powers or responsibilities of the Board of Health in the enforcement of any law or ordinance relating to public health.

....
Date Administrative Officer