CHAPTER 3

GENERAL REGULATIONS

301.0 Materials – Standards and Alternates.

301.1 Minimum Standards.

301.1.1 Approvals. All pipe, pipe fittings, traps, fixtures, material, and devices used in a plumbing system shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and shall conform to approved applicable recognized standards referenced in this code, and shall be free from defects. Unless otherwise provided for in this code, all materials, fixtures, or devices used or entering into the construction of plumbing systems, or parts thereof, shall be submitted to the Authority Having Jurisdiction for approval.

301.1.2 Marking. Each length of pipe and each pipe fitting, trap, fixture, material, and device used in a plumbing system shall have cast, stamped, or indelibly marked on it the manufacturer's mark or name, which shall readily identify the manufacturer to the end user of the product when such marking is required by the approved standard that applies. When required by the approved standard that applies, the product shall be marked with the weight and the quality of the product. All materials and devices used or entering into the construction of plumbing and drainage systems, or parts thereof, shall be marked and identified in a manner satisfactory to the Authority Having Jurisdiction. All such marking shall be done by the manufacturer. Field marking shall not be acceptable.

301.1.3 Standards. Standards listed or referred to in this chapter or other chapters cover materials that will conform to the requirements of this code, when used in accordance with the limitations imposed in this or other chapters thereof and their listing. Where a standard covers materials of various grades, weights, quality, or configurations, there may be only a portion of the listed standard that is applicable. Design and materials for special conditions or materials not provided for herein may be used only by special permission of the Authority Having Jurisdiction after the Authority Having Jurisdiction has been satisfied as to their adequacy. A list of accepted plumbing materials standards is included in Table 14-1. All IAPMO Installation Standards are included in Appendix I for the convenience of the users of this code. They are not considered as a part of this code unless formally adopted as such by the Authority Having Jurisdiction.

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

301.2 Alternate Materials and Methods of Construction Equivalency. Nothing in this code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this code. Technical documentation shall be submitted to the Authority Having Jurisdiction to demonstrate equivalency. The Authority Having Jurisdiction shall approve the system method or device when determined to be equivalent or superior.

However, the exercise of this discretionary approval by the Authority Having Jurisdiction shall have no effect beyond the jurisdictional boundaries of said Authority Having Jurisdiction. Any alternate material or method of construction so approved shall not be considered as conforming to the requirements and/or intent of this code for any purpose other than that granted by the Authority Having Jurisdiction when the submitted data does not prove equivalency.

301.2.1 Testing. The Authority Having Jurisdiction shall have the authority to require tests, as proof of equivalency.

301.2.1.1 Tests shall be made in accordance with approved standards, by an approved testing agency at the expense of the applicant. In the absence of such standards, the Authority Having Jurisdiction shall have the authority specify the test procedure.

301.2.1.2 The Authority Having Jurisdiction shall have the authority to require tests to be made or repeated if, at any time, there is reason to believe that any material or device no longer conforms to the requirements on which its approval was based.

301.3 Flood Hazard Resistance.

301.3.1 General. Plumbing systems shall be located above the design flood elevation.

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

301.3.2 Flood Hazard Areas Subject to High-Velocity Wave Action. Plumbing systems in buildings located in flood hazard areas subject to high-velocity wave action shall meet the requirements of Section 301.3.1, and the plumbing systems, pipes, and fixtures shall not be mounted on or penetrate through walls that are intended to breakaway under flood loads as required by the building code.

302.0 Iron Pipe Size (IPS) Pipe.

Iron, steel, brass, and copper pipe shall be standard-weight iron pipe size (IPS) pipe.

303.0 Disposal of Liquid Waste.

It shall be unlawful for any person to cause, suffer, or permit the disposal of sewage, human excrement, or other liquid wastes, in any place or manner, except through and by means of an approved drainage system, installed and maintained in accordance with the provisions of this code.

304.0 Connections to Plumbing System Required.

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

305.0 Sewers Required.

305.1 Every building in which plumbing fixtures are installed shall have a connection to a public or private sewer except as provided in Section 305.2.

305.2 When a public sewer is not available for use, drainage piping from buildings and premises shall be connected to an approved private sewage disposal system.

305.3 In cities and/or counties where the installation of building sewers is under the jurisdiction of a department other than the Authority Having Jurisdiction, the provisions of this code relating to building sewers need not apply.

306.0 Damage to Drainage System or Public Sewer.

306.1 It shall be unlawful for any person to deposit, by any means whatsoever, into any plumbing fixture, floor drain, interceptor, sump, receptor, or device, which is connected to any drainage system, public sewer, private sewer, septic tank, or cesspool, any ashes; cinders; solids; rags; inflammable, poisonous, or explosive liquids or gases; oils; grease; or any other thing whatsoever that would, or could, cause damage to the drainage system or public sewer.

306.2 Roofs, inner courts, vent shafts, light wells, or similar areas having rainwater drain, shall discharge to the outside of the building or to the gutter and shall not be connected to the sanitary drainage system unless first approved by the Authority Having Jurisdiction.

307.0 Industrial Wastes.

307.1 Wastes detrimental to the public sewer system or detrimental to the functioning of the sewage treatment plant shall be treated and disposed of as found necessary and directed by the Authority Having Jurisdiction.

307.2 Sewage or other waste from a plumbing system that may be deleterious to surface or subsurface waters shall not be discharged into the ground or into any waterway unless it has first been rendered safe by some acceptable form of treatment as required by the Authority Having Jurisdiction.

308.0 Location.

308.1 Except as otherwise provided in this code, no plumbing system, drainage system, building sewer, private sewage disposal system, or parts thereof shall be located in any lot other than the lot that is the site of the building, structure, or premises served by such facilities.

308.2 No subdivision, sale, or transfer of ownership of existing property shall be made in such manner that the area, clearance, and access requirements of this code are decreased.

309.0 Improper Location.

Piping, fixtures, or equipment shall not be so located as to interfere with the normal use thereof or with the normal operation and use of windows, doors, or other required facilities.

310.0 Workmanship.

310.1 All design, construction, and workmanship shall be in conformity with accepted engineering practices and shall be of such character as to secure the results sought to be obtained by this code.

310.2 It is unlawful to conceal cracks, holes, or other imperfections in materials by welding, brazing, or soldering or by using therein or thereon any paint, wax, tar, or other leak-sealing or repair agent.

310.3 Burred ends of all pipe and tubing shall be reamed to the full bore of the pipe or tube, and all chips shall be removed.

310.4 Installation Practices. Plumbing systems shall be installed in a manner conforming to this code, applicable standards, and the manufacturer's installation instructions. In instances where the code, applicable standards, or the manufacturer's instructions conflict, the more stringent provisions shall prevail.

311.0 Prohibited Fittings and Practices.

311.1 No double hub fitting, single or double tee branch, single or double tapped tee branch, side inlet quarter bend, running thread, band, or saddle shall be used as a drainage fitting, except that a double hub sanitary tapped tee may be used on a vertical line as a fixture connection.

311.2 No drainage or vent piping shall be drilled and tapped for the purpose of making connections thereto, and no cast-iron soil pipe shall be threaded.

311.3 No waste connection shall be made to a closet bend or stub of a water closet or similar fixture.

311.4 Except as hereinafter provided in Sections 908.0, 909.0, and 910.0, no vent pipe shall be used as a soil or waste pipe, nor shall any soil or waste pipe be used as a vent. Also, single-stack drainage and venting systems with unvented branch lines are prohibited.

311.5 No fitting, fixture and piping connection, appliance, device, or method of installation that obstructs or retards the flow of water, wastes, sewage, or air in the drainage or venting systems, in an amount greater than the normal frictional resistance to flow, shall be used unless it is indicated as acceptable in this code or is approved per Section 301.1 of this code. The enlargement of a three (3) inch (80 mm) closet bend or stub to four (4) inches (100 mm) shall not be considered an obstruction.

311.6 Except for necessary valves, where intermembering or mixing of dissimilar metals occurs, the point of connection shall be confined to exposed or accessible locations.

311.7 All valves, pipes, and fittings shall be installed in correct relationship to the direction of flow.

311.8 Screwed Fittings. Screwed fittings shall be ABS, cast iron, copper, copper alloy, malleable iron, PVC, steel, or other approved materials. Threads shall be tapped out of solid metal or molded in solid ABS or PVC.

312.0 Independent Systems.

The drainage system of each new building and of new work installed in any existing building shall be separate and independent from that of any other building, and, when available, every building shall have an independent connection with a public or private sewer.

Exception: Where one building stands in the rear of another building on an interior lot, and no private sewer is available or can be constructed to the rear building through an adjoining court, yard, or driveway, the building drain from the front building may be extended to the rear building.

313.0 Protection of Piping, Materials, and Structures.

313.1 All piping passing under or through walls shall be protected from breakage. All piping passing through or under cinders or other corrosive materials shall be protected from external corrosion in an approved manner. Approved provisions shall be made for expansion of hot water piping. Voids around piping passing through concrete floors on the ground shall be appropriately sealed.

313.2 All piping in connection with a plumbing system shall be so installed that piping or connections will not be subject to undue strains or stresses, and provisions shall be made for expansion, contraction, and structural settlement. No plumbing piping shall be directly embedded in concrete or masonry. No structural member shall be seriously weakened or impaired by cutting, notching, or otherwise, as defined in the Building Code.

313.3 All trenches deeper than the footing of any building or structure and paralleling the same shall be at least forty-five (45) degrees (0.79 rad) therefrom, or as approved per Section 301.1 of this code.

313.4 No building sewer or other drainage piping or part thereof, constructed of materials other than those approved for use under or within a building, shall be installed under or within two (2) feet (610 mm) of any building or structure, or less than one (1) foot (305 mm) below the surface of the ground.

313.5 Piping subject to corrosion, erosion, or mechanical damage shall be protected in an approved manner.

313.6 No water, soil, or waste pipe shall be installed

or permitted outside of a building or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing.

313.7 All piping penetrations of fire-resistance-rated walls, partitions, floors, floor/ceiling assemblies, roof/ceiling assemblies, or shaft enclosures shall be protected in accordance with the requirements of the Building Code, IAPMO Installation Standards, and Chapter 15, "Firestop Protection."

313.8 Waterproofing of Openings. Joints at the roof around pipes, ducts, or other appurtenances shall be made watertight by the use of lead, copper, galvanized iron, or other approved flashings or flashing material. Exterior wall openings shall be made watertight. Counterflashing shall not restrict the required internal cross-sectional area of the vent.

313.9 Plastic and copper piping penetrating framing members to within one (1) inch (25.4 mm) of the exposed framing shall be protected by steel nail plates not less than 0.0478 inches (18 gauge) (1.3mm) in thickness. The steel nail plate shall extend along the framing member a minimum of 1-1/2 inches beyond the outside diameter of the pipe or tubing.

313.10 Sleeves.

313.10.1 Sleeves shall be provided to protect all piping through concrete and masonry walls and concrete floors.

Exception: Sleeves shall not be required where openings are drilled or bored.

313.10.2 Piping through concrete or masonry walls shall not be subject to any load from building construction.

313.10.3 In exterior walls, annular space between sleeves and pipes shall be sealed and made watertight, as approved by the Authority Having Jurisdiction. Any penetration through fire-resistive construction shall be in accordance with Section 313.7.

313.10.4 Any pipe sleeve through a firewall shall have the space around the pipe completely sealed with an approved fire-resistive material in accordance with all other codes.

313.11 Any structural member weakened or impaired by cutting, notching, or otherwise shall be reinforced, repaired, or replaced so as to be left in a safe structural condition in accordance with the requirements of the Building Code.

313.12 Ratproofing.

313.12.1 Strainer plates on drain inlets shall be designed and installed so that no opening is greater than one-half (1/2) inch (12.7 mm) in the least dimension.

313.12.2 Meter boxes shall be constructed in such a manner that rats cannot enter a building by following the service pipes from the box into the building.

313.12.3 In or on buildings where openings have been made in walls, floors, or ceilings for the passage of pipes, such openings shall be closed and protected by the installation of approved metal collars securely fastened to the adjoining structure.

313.12.4 Tub waste openings in framed construction to crawl spaces at or below the first floor shall be protected by the installation of approved metal collars or metal screen securely fastened to the adjoining structure with no opening greater than one-half (1/2) inch (12.7mm) in the least dimension.

314.0 Hangers and Supports.

314.1 Suspended piping shall be supported at intervals not to exceed those shown in Table 3-2.

314.2 All piping shall be supported in such a manner as to maintain its alignment and prevent sagging.

314.3 Piping in the ground shall be laid on a firm bed for its entire length; where other support is otherwise provided, it shall be approved per Section 301.0 of this code.

314.4 Hangers and anchors shall be of sufficient strength to support the weight of the pipe and its contents. Piping shall be isolated from incompatible materials.

314.5 All piping, fixtures, appliances, and appurtenances shall be adequately supported in accordance with this code, the manufacturer's installation instructions, and as required by the Authority Having Jurisdiction.

314.6 Hanger rod sizes shall be no smaller than those shown in Table 3-1.

TABLE 3-1
Hanger Rod Sizes

Pipe and Tube Size		Rod Size	
Inches	**mm**	**Inches**	**mm**
1/2 – 4	12.7 – 102	3/8	9.5
5 – 8	127 – 203	1/2	12.7
10 – 12	254 – 305	5/8	15.9

315.0 Trenching, Excavation, and Backfill.

315.1 All trenches deeper than the footing of any building or structure and paralleling the same shall

be at least forty-five (45) degrees (0.79 rad) therefrom, or as approved per Section 301.0 of this code.

315.2 Tunneling and driving may be done in yards, courts, or driveways of any building site. Where sufficient depth is available to permit, tunnels may be used between open-cut trenches. Tunnels shall have a clear height of two (2) feet (610 mm) above the pipe and shall be limited in length to one-half (1/2) the depth of the trench, with a maximum length of eight (8) feet (2438 mm). When pipes are driven, the drive pipe shall be at least one (1) size larger than the pipe to be laid.

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

315.4 All excavations shall be completely backfilled as soon after inspection as practicable. Adequate precaution shall be taken to ensure proper compactness of backfill around piping without damage to such piping. Trenches shall be backfilled in thin layers to twelve (12) inches (305 mm) above the top of the piping with clean earth, which shall not contain stones, boulders, cinderfill, frozen earth, construction debris, or other materials that would damage or break the piping or cause corrosive action. Mechanical devices such as bulldozers, graders, etc., may then be used to complete backfill to grade. Fill shall be properly compacted. Suitable precautions shall be taken to ensure permanent stability for pipe laid in filled or made ground.

316.0 Joints and Connections.

316.1 Types of Joints.

316.1.1 Threaded Joints. Threads on iron pipe size (IPS) pipe and fittings shall be standard taper pipe threads in accordance with standards listed in Table 14-1. Threads on tubing shall be approved types. Threads on plastic pipe shall be factory cut or molded. Threaded plastic pipe shall be Schedule 80 minimum wall thickness. Tubing threads shall conform to fine tubing thread standards. When a pipe joint material is used, it shall be applied only on male threads, and such materials shall be approved types, insoluble in water and nontoxic. Cleanout plugs and caps shall be lubricated with water-insoluble, nonhardening material or tape. Thread tape or thread lubricants and sealants specifically intended for use with plastics shall be used on plastic threads. Conventional pipe thread compounds, putty, linseed-oil-based products, and unknown lubricants and sealants shall not be used on plastic threads.

316.1.2 Wiped Joints. Joints in lead pipe or fittings or between lead pipe or fittings and brass or copper pipe, ferrules, solder nipples, or traps shall be full-wiped joints. Wiped joints shall have an exposed surface on each side of a joint not less than three-fourths (3/4) inch (19.1 mm) and at least as thick as the material being joined. Wall or floor flange lead-wiped joints shall be made by using a lead ring or flange placed behind the joint at the wall or floor. Joints between lead pipe and cast iron, steel, or wrought iron shall be made by means of a caulking ferrule or soldering nipple.

316.1.3 Soldered Joints. Joints in copper tubing shall be made by the appropriate use of approved copper or copper alloy fittings. Surfaces to be joined by soldering shall be cleaned bright by manual or mechanical means. The joints shall be properly fluxed with an approved-type flux and made up with approved solder. All solder and fluxes shall be manufactured to approved standards. Solders and fluxes with a lead content that exceeds two-tenths (0.20) of one (1) percent shall be prohibited in piping systems used to convey potable water.

316.1.4 Flared Joints. Flared joints for soft copper tubing shall be made with fittings meeting approved standards. The tubing shall be reamed to the full inside diameter, resized to round, and expanded with a proper flaring tool.

316.1.5 Flexible Compression Factory-Fabricated Joints. When pipe is joined by means of flexible compression joints, such joints shall conform to approved standards and shall not be considered as slip joints.

316.1.6 Solvent Cement Plastic Pipe Joints. Plastic pipe and fittings designed to be joined by solvent cementing shall comply with appropriate standards.

ABS pipe and fittings shall be cleaned and then joined with solvent cement(s).

CPVC pipe and fittings shall be cleaned and then joined with listed primer(s) and solvent cement(s).

Exception: Listed solvent cements that do not require the use of primer shall be permitted for use with CPVC pipe and fittings, manufactured in accordance with ASTM D2846, 1/2 inch through 2 inches in diameter.

PVC pipe and fittings shall be cleaned and joined with primer(s) and solvent cement(s).

Exception: PVC/DWV piping may be joined without the use of a primer.

A solvent cement transition joint between ABS and PVC building drain or building sewer shall be made using a listed transition solvent cement.

316.1.7 Brazing and Welding. Brazing and welding shall conform to the applicable standard(s) in Table 14-1. Only brazing alloys having a liquid temperature above 1,000˚F shall be used. All brazing on medical gas systems shall be performed by certified installers meeting the requirements of ANSI/ASME Boiler and Pressure Vessel Code, Section IX, Welding and Brazing Qualifications, or AWS B2.2, Standard for Brazing Procedure and Performance Qualifications.

316.1.8 Pressure-Lock-Type Connection. This is a mechanical connection that depends on an internal retention device to prevent pipe or tubing separation. Connection is made by inserting the pipe or tubing into the fitting to a prescribed depth.

316.1.9 Pressed Fitting. This is a mechanical connection for joining copper tubing that uses a crimping tool to affix the O-ring seal copper or copper alloy fitting to the tubing. The tubing shall be inserted into the fitting, and the crimp shall be made using the tool recommended by the manufacturer.

316.2 Special Joints.

316.2.1 Copper Tubing to Screw Pipe Joints. Joints from copper tubing to threaded pipe shall be made by the use of brass adapter fittings. The joint between the copper tubing and the fitting shall be a soldered, brazed, flared, or pressed joint and the connection between the threaded pipe and the fitting shall be made with a standard pipe size screw joint. Solder shall conform to the requirements of Section 316.1.3. Brazed joints shall conform to the requirements of Section 316.1.7. Flared joints shall conform to the requirements of Section 316.1.4. Pressed joints shall conform to the requirements of 316.1.9.

316.2.2 Unions. Approved unions may be used in drainage piping when accessibly located in the trap seal or between a fixture and its trap in the vent system, except underground or in wet vents, at any point in the water supply system.

316.2.3 Plastic Pipe to Other Materials. When connecting plastic pipe to other types of piping, only approved types of fittings and adapters designed for the specific transition intended shall be used.

316.3 Flanged Fixture Connections.

316.3.1 Fixture connections between drainage pipes and water closets, floor outlet service sinks and urinals shall be made by means of approved brass, hard lead, ABS, PVC, or iron flanges caulked, soldered, solvent cemented; rubber compression gaskets; or screwed to the drainage pipe. The connection shall be bolted with an approved gasket, washer, or setting compound between the fixture and the connection. The bottom of the flange shall be set on an approved firm base.

316.3.2 Closet bends or stubs shall be cut off so as to present a smooth surface even with the top of the closet ring before rough inspection is called.

316.3.3 Wall-mounted water closet fixtures shall be securely bolted to an approved carrier fitting. The connecting pipe between the carrier fitting and the fixture shall be an approved material and designed to accommodate an adequately sized gasket. Gasket material shall be neoprene, felt, or similar approved types.

316.4 Prohibited Joints and Connections.

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

316.4.2 No fitting or connection that offers abnormal obstruction to flow shall be used. The enlargement of a three (3) inch (80 mm) closet bend or stub to four (4) inches (100 mm) shall not be considered an obstruction.

317.0 Increasers and Reducers.

Where different sizes of pipes and fittings are to be connected, the proper size increasers or reducers or reducing fittings shall be used between the two sizes. Brass or cast-iron body cleanouts shall not be used as a reducer or adapter from cast-iron drainage pipe to iron pipe size (IPS) pipe.

318.0 Food-Handling Establishments.

Food or drink shall not be stored, prepared, or displayed beneath soil or drain pipes, unless those areas are protected against leakage or condensation from such pipes reaching the food or drink as described below. Where building design requires that soil or drain pipes be located over such areas, the installation shall be made with the least possible number of joints and shall be installed so as to connect to the nearest adequately sized vertical stack with the provisions as follows:

318.1 All openings through floors over such

areas shall be sealed watertight to the floor construction.

318.2 Floor and shower drains installed above such areas shall be equipped with integral seepage pans.

318.3 All other soil or drain pipes shall be of an approved material as listed in Table 14-1 and Section 701.0. All materials shall conform to established standards. Cleanouts shall be extended through the floor construction above.

→ **318.4** Piping subject to operation at temperatures that will form condensation on the exterior of the pipe shall be thermally insulated.

318.5 Where pipes are installed in ceilings above such areas, the ceiling shall be of the removable type, or shall be provided with access panels in order to form a ready access for inspection of piping.

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319.0 Test Gauges. Tests required by this code, which are performed utilizing dial gauges, shall be limited to gauges having the following pressure graduations or incrementations.

319.1 Required pressure tests of ten (10) psi (69 kPa) or less shall be performed with gauges of 1/10 pound (0.7 kPa) incrementation or less.

319.2 Required pressure tests exceeding ten (10) pounds (69 kPa) but less than one hundred (100) psi (689 kPa) shall be performed with gauges of one (1) psi (6.9 kPa) incrementation or less.

319.3 Required pressure tests exceeding one hundred (100) psi (689 kPa) shall be performed with gauges incremented for two (2) percent or less of the required test pressure.

319.4 Test gauges shall have a pressure range not greater than twice the test pressure applied.

320.0 Medical Gas and Vacuum Systems. All such piping shall be installed, tested, and verified in compliance with the appropriate consensus standards referenced in Chapter 14 and the requirements of Chapter 13. The Authority Having Jurisdiction shall require evidence of the competency of the installers and verifiers.

TABLE 3-2
Hangers and Supports

Materials	Types of Joints	Horizontal	Vertical
Cast	Lead and Oakum	5 feet (1,524 mm), except may be 10 feet (3,048 mm) where 10 foot lengths are installed [1,2,3]	Base and each floor not to exceed 15 feet (4,572 mm)
	Compression Gasket	Every other joint, unless over 4 feet (1,219 mm), then support each joint [1,2,3]	Base and each floor not to exceed 15 feet (4,572 mm)
Cast-Iron Hubless	Shielded Coupling	Every other joint, unless over 4 feet (1,219 mm), then support each joint [1,2,3,4]	Base and each floor not to exceed 15 feet (4,572 mm)
Copper Tube and Pipe	Soldered or Brazed	1-1/2 inches (40 mm) and smaller, 6 feet (1,829 mm), 2 inches (50 mm) and larger, 10 feet (3,048 mm)	Each floor, not to exceed 10 feet (3,048 mm)[5]
Steel and Brass Pipe for Water or DWV	Threaded or Welded	3/4 inch (20 mm) and smaller, 10 feet (3,048 mm), 1 inch (25 mm) and larger, 12 feet (3,658 mm)	Every other floor, not to exceed 25 feet (7,620 mm)[5]
Steel, Brass, and Tinned Copper Pipe for Gas	Threaded or Welded	1/2 inch (15 mm), 6 feet (1829 mm), 3/4 inch (20 mm) and 1 inch (25.4 mm), 8 feet (2,438 mm, 1-1/4 inch (32 mm) and larger, 10 feet (3,048 mm)	1/2 inch (12.7 mm), 6 feet (1,829 mm), 3/4 inch (19 mm) and 1 inch (25.4 mm), 8 feet (2,438 mm), 1-1/4 every floor level
Schedule 40 PVC and ABS DWV	Solvent Cemented	All sizes, 4 feet (1,219 mm). Allow for expansion every 30 feet (9,144 mm). [3,6]	Base and each floor. Provide mid-story guides. Provide for expansion every 30 feet (9,144 mm).[6]
CPVC	Solvent Cemented	1 inch (25 mm) and smaller, 3 feet (914 mm), 1-1/4 inch (932 mm) and larger, 4 feet (1,219 mm)	Base and each floor. Provide mid-story guides. [6]
Lead	Wiped or Burned	Continuous Support	Not to exceed 4 feet (1,219 mm)
Copper	Mechanical	In accordance with standards acceptable to the Authority Having Jurisdiction	
Steel and Brass	Mechanical	In accordance with standards acceptable to the Authority Having Jurisdiction	
PEX	Metal Insert and Metal Compression	32 inches (800 mm)	Base and each floor. Provide mid-story guides.
PEX-AL-PEX	Metal Insert and Metal Compression	1/2 inch (12 mm), 3/4 inch (20 mm), 1 inch (25 mm) } All sizes 98 inches (2,489 mm)	Base and each floor. Provide mid-story guides.
PE-AL-PE	Metal Insert and Metal Compression	1/2 inch (12 mm), 3/4 inch (20 mm), 1 inch (25 mm) } All sizes 98 inches (2,489 mm)	Base and each floor. Provide midstory guides.

[1] Support adjacent to joint, not to exceed eighteen (18) inches (457 mm).
[2] Brace at not more than forty (40) foot (12,192 mm) intervals to prevent horizontal movement.
[3] Support at each horizontal branch connection.
[4] Hangers shall not be placed on the coupling.
[5] Vertical water lines may be supported in accordance with recognized engineering principles with regard to expansion and contraction, when first approved by the Authority Having Jurisdiction.
[6] See the appropriate IAPMO Installation Standard for expansion and other special requirements.