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IAPMO/ANSI UPC 1 – 2018

2018 UNIFORM PLUMBING CODE®

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Twenty-Eighth Edition
First Printing, January 2018
Second Printing, May 2018
Third Printing, January 2019
Fourth Printing, October 2019

Published by the International Association of Plumbing and Mechanical Officials
4755 E. Philadelphia Street • Ontario, CA 91761-2816 – USA
Main Phone: (909) 472-4100 • Main Fax: (909) 472-4150

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Important Notices and Disclaimers

The 2018 edition of the *Uniform Plumbing Code* is developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on plumbing issues. While the International Association of Plumbing and Mechanical Officials (IAPMO) administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in its codes and standards.

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Users of IAPMO codes should be aware that IAPMO codes may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. IAPMO codes consist of the current edition of the document together with any Tentative Interim Amendment and any Errata in effect.

In order to determine whether an IAPMO code has been amended through the issuance of Tentative Interim Amendments or corrected by Errata, please visit the IAPMO Group codes information pages on IAPMO's website (www.iapmo.org). The codes information pages provide a list of IAPMO codes with up-to-date, specific information including any issued Tentative Interim Amendments and Errata.

To access the codes information pages for a specific code, go to http://codes.iapmo.org to select from the list of IAPMO codes. For Tentative Interim Amendments, go to the standard council decisions. For Errata, select the archived revision information.

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FOREWORD

Origin and Development

The advantages of a statewide adopted *Uniform Plumbing Code* are recognized throughout the industry. Disorder in the industry because of widely divergent plumbing practices and the use of many different, often conflicting, plumbing codes by local jurisdictions influenced the Western Plumbing Officials Association (now the International Association of Plumbing and Mechanical Officials [IAPMO]) to form a committee. This committee of plumbing inspectors, master and journeyman plumbers, and plumbing engineers, backed by public utility companies and the plumbing industry to create a basic plumbing document for general use. The product of this effort, the first edition of the *Uniform Plumbing Code*® (UPC®) was adopted by IAPMO in 1945. The widespread use of this code over the past seven decades by jurisdictions throughout the United States and internationally is testament to its merit.

Publishing the 2003 *Uniform Plumbing Code*, is a significant milestone because it is the first time in the history of the United States, a plumbing code was developed through a true consensus process. The 2018 edition represents the most current approaches in the plumbing field and is the sixth edition developed under the ANSI consensus process. Contributions to the content of this code consists of diverse interests as consumers, enforcing authorities, installers/maintainers, labor, manufacturers, research/standards/testing laboratories, special experts, and users.

The *Uniform Plumbing Code* provides consumers with safe and sanitary plumbing systems while, at the same time, allowing latitude for innovation and new technologies. The public at large is invited and encouraged to take part in IAPMO's open consensus code development process. This code is updated every three years. The *Uniform Plumbing Code* is dedicated to all those who, in working to achieve "the ultimate plumbing code," have unselfishly devoted their time, effort, and personal funds to create and maintain this, the finest plumbing code in existence today.

The *Uniform Plumbing Code* updates every three years in revision cycles that begin twice each year that takes two years to complete.

Each revision cycle advances according to a published schedule that includes final dates for all major events and contains four basic steps as follows:

1. Public and Committee Proposal Stage;
2. Comment Stage;
3. Association Technical Meeting;
4. Council Appeals and Issuance of Code.

IAPMO develops "full consensus" codes built on a foundation of maximum participation and agreement by a broad range of interests. This philosophy has led to producing technically sound codes that promote health and safety, yet do not stifle design or development.

It is important to stress that; the process remains committed to the principles of consensus code development where consensus Technical Committees and Correlating Committees revise codes. The public and membership is offered multiple opportunities to debate, provide input and raise concerns through Amending Motions at the annual Assembly Consideration Session. Anyone may submit an appeal related to the issuance of a document through the IAPMO Standards Council.

The 2018 *Uniform Plumbing Code* is supported by the Mechanical Contractors Association of America (MCAA), the Plumbing-Heating-Cooling Contractors National Association (PHCC-NA), the United Association (UA), and the World Plumbing Council (WPC). The presence of these logos, while reflecting support, does not imply any ownership of the copyright to the UPC, which is held exclusively by IAPMO. Further, the logos of these associations indicate the support of IAPMO's open consensus process being used to develop IAPMO's codes and standards.

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The addresses of the organizations are as follows:
ASSE – 18927 Hickory Creek Drive, Suite 220 • Monkena, IL 60448 • (708) 995-3019
MCAA – 1385 Piccard Drive • Rockville, MD 20850 • (301) 869-5800
PHCC-NA – PO Box 6808 • Falls Church, VA 22040-6808 • (800) 533-7694
UA – Three Park Place • Annapolis, MD 21401 • (410) 269-2000
WPC – World Plumbing Council Secretariat, Auf der Mauer 11 • Postfach CH 8021 • Zurich Switzerland • www.WorldPlumbing.org

Adoption

The *Uniform Plumbing Code* is available for adoption and use by jurisdictions in the United States and Internationally. Its use within a governmental jurisdiction is accomplished through adoption by reference in accordance with applicable jurisdictional laws. At adoption, jurisdictions should insert the applicable information in bracketed words in the sample ordinance. The sample legislation for adoption of the *Uniform Plumbing Code* on page xii provides key components, regulations and resolutions.

Revision Markings

Solid vertical lines in the margins indicate a technical change from the requirements of the 2015 edition. An arrow (⬅) in the margin indicates where an entire section, paragraph, exception or table has been deleted, or an item in a list of items or a table has been deleted.

A double right angle (≪) in the margin indicates that the text or a table has been relocated within the code. The table found on page xiv points out the relocations in the 2018 edition of the *Uniform Plumbing Code*.

TIA TIA indicates that the revision is the result of a Tentative Interim Amendment.
TIA
TIA For further information on tentative interim amendments see Section 5 of the IAPMO
TIA Regulations Governing Committee Projects available at http://codes.iapmo.org/

A reference in brackets [ ] following a section or paragraph indicates material that has been extracted from another document. This reprinted material is not the complete and official position of the source document on the referenced subject that is represented by the standard in its entirety. Material contained in this document that is taken or extracted from NFPA standards is used with permission of the National Fire Protection Association. This material is not the complete and official position of the NFPA on the reference subject, which is represented solely by the relevant standard in its entirety. NFPA standards can be accessed at www.nfpa.org. In addition, this extracted material may include revisions or modifications developed through IAPMO's standards development process. Therefore, NFPA disclaims responsibility for the content of this Code."

Text that is extracted pursuant to IAPMO's Extract Guidelines, but outside of the regular revision process is denoted with the use of the source document in the margin. This text is not fully processed by IAPMO in accordance with ANSI's public announcement consensus requirements for an American National Standard (ANS) nor approved by ANSI's Board of Standards Review. The next revision cycle processes such text in accordance with those requirements.

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FORMAT OF THE UNIFORM PLUMBING CODE

The format of the *Uniform Plumbing Code* (UPC) arranges each chapter in accordance with a specific subject matter. However, Chapter 3 is dedicated to general requirements that are applicable to every chapter. The subject matters are divided as follows:

CHAPTERS	SUBJECTS
1	Administration
2	Definitions
3	General Regulations
4	Plumbing Fixtures and Fixture Fittings
5	Water Heaters
6	Water Supply and Distribution
7	Sanitary Drainage
8	Indirect Wastes
9	Vents
10	Traps and Interceptors
11	Storm Drainage
12	Fuel Gas Piping
13	Health Care Facilities and Medical Gas and Medical Vacuum Systems
14	Firestop Protection
15	Alternate Water Sources for Nonpotable Applications
16	Nonpotable Rainwater Catchment Systems
17	Referenced Standards
Appendix A	Recommended Rules for Sizing the Water Supply System
Appendix B	Explanatory Notes on Combination Waste and Vent Systems
Appendix C	Alternate Plumbing Systems
Appendix D	Sizing Storm Water Drainage Systems
Appendix E	Manufactured/Mobile Home Parks and Recreational Vehicle Parks
Appendix F	Firefighter Breathing Air Replenishment Systems
Appendix G	Sizing of Venting Systems
Appendix H	Private Sewage Disposal Systems
Appendix I	Installation Standard
Appendix J	Combination of Indoor and Outdoor Combustion and Ventilation Opening Design
Appendix K	Potable Rainwater Catchment Systems
Appendix L	Sustainable Practices
Appendix M	Peak Water Demand Calculator

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The following is a summary of the scope and intent of the provisions addressed within the chapters and appendices of the *Uniform Plumbing Code*:

Chapter 1 Administration.

Chapter 1 regulates the application, enforcement, and administration of subsequent requirements of the code. As well as establishing the scope of the code, this chapter is concerned with enforcing the requirements contained in the body of the code. A plumbing code, as with any other code, is intended to be adopted as a legally enforceable document to safeguard health, safety, property and public welfare. The code cannot be effective without satisfactory provisions for its administration and enforcement. The Authority Having Jurisdiction is to review the proposed and completed work and to decide whether a plumbing system conforms to the code requirements. As a public servant, the Authority Having Jurisdiction enforces the code in an unbiased, proper manner. The design professional is responsible for the design of a safe plumbing system. The contractor is responsible for installing the system in accordance with the plans.

Chapter 2 Definitions.

To maintain consistency and encourage the use of common terminology, Chapter 2 establishes definitions to provide clarity of terms and promote the use of a common language throughout the code. Understanding definitions within the context of their application enables greater collaboration, efficiency, standardization and interpretation in applying and enforcing terms used throughout the code. Codes are technical documents, and every term can impact the meaning of the code text. Terms not defined have a normally accepted meaning.

Chapter 3 General Regulations.

Chapter 3 regulates the general requirements, not specific to other chapters, for installing plumbing systems. Many regulations are not specific plumbing requirements, but relate to the overall plumbing system. This chapter contains safety requirements for installing plumbing and also contains nonplumbing requirements for identifying pipe, pipe fittings, traps, fixtures, materials and devices used in plumbing systems. Listing method of approval, based on applicable nationally recognized standards, for the safe and proper installation of plumbing systems is essential to ensure protection of public health, safety, and welfare. The safety requirements provide protection for piping, material, and structures, with provisions for installation practices, removing stress and strain of the pipe, sleeving, and hanger support. The building's structural stability is protected by the regulations for cutting and notching of structural members.

Chapter 4 Plumbing Fixtures and Fixture Fittings.

This chapter regulates the minimum number of plumbing fixtures of a specific type and quality for each building. The fixtures must be properly installed to be usable by the individuals occupying the building. The quality and design of every fixture must conform to the applicable referenced standard. Compliance with this chapter will result in a building or structure having acceptable plumbing fixtures for the sanitary, hygienic, cleaning, washing and food preparation needs of the occupants.

Chapter 5 Water Heaters.

Chapter 5 regulates the design, approval, installation, and safety devices of fuel burning and other types of water heaters with the combustion air requirements for ventilation and dilution of flue gases for appliances installed in buildings. This chapter does not apply to direct vent appliances. In addition, this chapter regulates the design, construction, installation, maintenance of chimneys, vents and their connections to fuel burning appliances. Methods to supply combustion air may be supplied from an indoor air supply, outdoor air supply, a combination of indoor and outdoor air supply, mechanical air supply, or an engineered system. Combustion air provisions are based on the number of openings and the total opening size required based on the total energy input rating of the appliance. Acceptable air supply for combustion and ventilation is necessary for proper operation of fuel burning appliances. A shortage of combustion air can result in incomplete combustion and production of poisonous gases, such as carbon monoxide or appliance overheating. Ventilation air provides cooling for the appliance casing and internal controls. Inadequate ventilation of the space in which an appliance is installed can result in increased surrounding temperatures that stress the appliance itself or other appliances in the vicinity.

Chapter 6 Water Supply and Distribution.

Chapter 6 regulates the design, material and installation of water supply and distribution systems, including residential fire sprinklers. The water supply and distribution system is designed to achieve the correct water pressure and flow rates and avoid cross connections. For fixtures to perform properly, an acceptable supply of potable water is essential to their operation

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and use. Cross connections and backflow are ranked as the highest priority because of the long history of recognized health risks posed by cross connections, outbreaks, or cases of waterborne disease. Piping materials and components are evaluated for their possible effect on the potable water with which they are in contact. The intent is to control the potential adverse health effects produced by indirect additives, products, and materials that come in contact with potable water. When selecting materials for water supply and distribution systems, consider water pressure, water temperature, compatibility with the water supply, durability, support, and sustainability.

In addition, this chapter regulates the design, location, materials, and installation of multipurpose and stand-alone sprinkler systems that do not include the use of antifreeze. Where systems are installed as a portion of the water distribution system under the requirements of this chapter and are not provided with a fire department connection, backflow protection for the water supply system is not required.

Chapter 7 Sanitary Drainage.

This chapter regulates the design and installation of sanitary drainage systems to ensure they will work as intended. Drainage piping should not be oversized nor undersized, and constructed of approved materials to guard against fouling, deposit of solids, clogging, and with cleanouts so arranged that the pipes may be readily cleaned. The purpose of the sanitary drainage system is to remove effluent discharged from plumbing fixtures and other equipment to an approved point of disposal, such as a public sanitary system or private sewage disposal system.

The basics of a sanitary drainage system include public and private sewage disposal; selection of materials; installation of the building drain and sewer; joining methods for pipe and fittings; drainage fixture units for sizing the drainage system; sumps and ejectors; vent sizing and length of vents; and testing.

Chapter 8 Indirect Wastes.

Chapter 8 regulates indirect waste connections that are required for plumbing fixtures and plumbing appliances dealing with food preparation, dishwashing, potable liquids, and similar equipment. An indirect connection prevents sewage from backing up into a fixture or appliance, thus providing protection against potential health hazards. The waste pipe discharges through an air gap or air break into a waste receptor or standpipe. The protection in the form of an air gap is necessary when the contamination is a potential health hazard or cross connection with the potable water system. Where there is no possibility of contaminating the potable water (nonpotable discharge), the indirect waste pipe may connect in the form of an air break. This method is often preferred to prevent splashing. In addition, health care facilities and special wastes must be protected from contamination that may result from the connection to the drainage system. The waste must be treated to prevent any damage to the piping or sewage treatment process. Waste receptors are sized and designed to prevent splashing and allow for peak discharge conditions.

Chapter 9 Vents.

Chapter 9 regulates the material, design, and installation of vents. A vent system is a pipe or pipes installed in a drainage system that provide a flow of air to and from the system to ventilate it, provide a circulation of air to eliminate trap siphonage, and reduce back-pressure and vacuum surge. In addition, vents provide the rapid and silent flow of waste without exposing occupants of the building to any sewer gases. Proper installation of vents is crucial, as a telltale sign that there is a problem in the drain and vent system is related to the elevation of the horizontal portion of the venting. Venting is not limited to sanitary drainage systems. Venting methods are applicable to other drainage systems such as those for chemical waste, graywater waste, and clear water waste. Sizing the venting system is directly tied to the design of the drainage system. For example, the velocities in the drainage system and its peak flow rates affect the diameters in the venting system. Where the vertical distance between a fixture outlet and trap is excessive, velocities in the entire drainage system will be greater than those in the vent sizing table. All venting methods in this chapter are categorized as either dry vents or wet vents. Vent stacks, stack vents, branch vents, island vents, relief vents, and individual vents are dry vents. Wet vents (horizontal or vertical), circuit vents, combination drain and vents are versions of “wet venting” in which the vent is wetted by drainage flow.

Chapter 10 Traps and Interceptors.

Chapter 10 regulates the material, design, and installation of traps, interceptors, and separators. Traps are required on drainage type plumbing fixtures and must be self-scouring without interior partitions. Interceptors, on the other hand, are designed to control what goes down a drain. Interceptors are used to keep harmful substances from entering the sanitary drainage system, such as grease, sand, oil and other materials. The retained materials need periodic removal to maintain

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efficiency and function of the separating device. The capacity of an interceptor is based on retention and flow rate. There are many types of interceptors that are used at beauty salons, hospitals, meat, fish or foul packaging, refineries, repair garages, gas stations, car washing facilities, various plants, factories, and processing sites. The designer of the building is responsible for locating interceptors with the expectation for the frequency of maintenance, ease of cleaning and floor space for equipment.

Chapter 11 Storm Drainage.

Chapter 11 regulates the removal of stormwater from roofs, yards, paved areas, and similar areas. The objective of storm drainage systems is to provide a conduit or channel through which runoff will be carried from a point of collection to a point of disposal; this protects the property and the public from the uncontrolled flow of runoff and ensures that drains and inlets are adequately sized to receive the volume of runoff that flows to the drains. For the purpose of system design, it's necessary to specify the duration of a selected storm. All methods used to determine volumes and peak flow use historical data. Drain location must be coordinated with the architectural design of the building. When selecting the type of roof drain to use, the roof construction and its thickness, along with the intended use of the roof, are required. Where the roof perimeter extends above the roof in such a manner that water is entrapped and causes ponding, or if any portion of the roof is designed so water can pond, secondary drainage is required. Where secondary drainage is required, scuppers, or a secondary system of roof drains and pipes, are installed to prevent the accumulation of excessive rainwater.

Chapter 12 Fuel Gas Piping.

Chapter 12 regulates the installation of gas piping in a building, structure or within the property lines of buildings up to 5 psi. Gas piping systems must supply the minimum volume of gas required by each gas appliance to perform their proper operation under working conditions without exceeding the maximum pressure specified by each manufacturer. Because of the hazards associated with fuel gas, it is important to ensure the gas system has been inspected and tested, and that it is safe to turn on the gas supply to the building.

Chapter 13 Health Care Facilities and Medical Gas and Medical Vacuum Systems.

Chapter 13 regulates the installation, inspection, testing, maintenance, performance, and safe practices for medical gas and vacuum systems located in health care facilities. This chapter addresses the installation and maintenance of health care fixtures, devices, and equipment. The purpose of medical gas and medical vacuum systems is to provide safe and sufficient flows at required pressures to the medical gas outlet or vacuum inlet terminals. System design and layout should allow convenient access by the medical staff to outlet and inlet terminals, valves, and equipment during patient care or emergencies, as safety is of primary concern.

Chapter 14 Firestop Protection.

Chapter 14 regulates piping penetrations of fire-resistance-rated walls, partitions, floors, floor and ceiling assemblies, roof and ceiling assemblies, or shaft enclosures through firestopping. To firestop is to create a physical barrier that impedes the spread of smoke, gases, and flames from one compartment in the building design to the next. The firestop is seen as a part that is essential to protecting the lives of people who live or work in the structure, increasing the chances of not succumbing to smoke or gases before they are able to evacuate the building. Fireproofing of this type helps to restore the fire-resistant properties of the building materials before the openings were created as part of the construction process.

Chapter 15 Alternate Water Sources for Nonpotable Applications.

Chapter 15 regulates gray water sources, reclaimed (recycled) water sources and on-site treated nonpotable water systems. Water sources include subsurface irrigation, subsoil irrigation, and mulch basin systems. Subsoil water irrigation provides a means to disperse shallow drip irrigation lines and mulch basins that collect and spread water in various applications. The reclaimed water provisions to on-site nonpotable water systems include gray water and other nonpotable water sources that are used for on-site applications. Water reuse is integral to sustainable water management because it allows water to remain in the environment and be preserved for future use while meeting the water requirements of the present. Water reuse reduces energy use by removing added potable water treatment, offsetting water demands, and providing water for energy production.

Chapter 16 Nonpotable Rainwater Catchment Systems.

Chapter 16 regulates nonpotable rainwater catchment systems that include irrigation; toilet and urinal flushing with proper treatment; provisions where permits are required; maintenance of alternate water sources; and minimum water quality. This chapter provides guidance on how to optimize rainwater use while ensuring there is a decrease of risk to consumers from poor

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design, installation, and maintenance. Rainwater harvesting is the process of capturing, channeling, and storing water runoff for later use. Most systems are constructed of three principal components: the catchment area, the collection device, and the conveyance system.

Chapter 17 Referenced Standards.

Chapter 17 provides two comprehensive tables with referenced standards. The standards listed in Table 1701.1 are applied as indicated in the applicable reference section(s). A list of additional standards, publications, practices, and guides that are not referenced in specific sections appear in Table 1701.2 and shall be submitted to the Authority Having Jurisdiction for approval.

Referenced standards set forth specific details of accepted practices, materials specifications, or test methods in many specialized applications. Standards provide an efficient method of conveying complex information and specifications on the performance requirements for materials, products, systems, application, and installation. The manner and purpose for a standard's use and, in turn, code compliance, must be definitive in all references to the standard. If the standard is intended to be a requirement for judging code compliance, the code must state its intent for use. The standard should adequately address a defined need and at the same time specify the minimum performance requirements, technical characteristics and methods of testing, and required test results.

The referenced standards table is organized in a manner that makes it easy to find specific standards in alphabetical order, and by acronym of the publishing agency of the standard. The table lists the title of the standard, the edition, any addenda, and the section or sections of the code that reference the standard. Contact information for each publishing agency is provided at the end of the chapter.

Appendix A Recommended Rules for Sizing the Water Supply System.

Appendix A provides a method of sizing the water supply and distribution system that provides precise calculations to establish the proper pressures and flow to the system's fixtures. The goal of sizing the system is to deliver an acceptable volume of water to the most hydraulically remote fixture during minimum pressure and maximum flow conditions; provide satisfactory water pressure to the most hydraulically remote fixture during minimum pressure and maximum flow conditions; and to prevent excessive water velocity during maximum flow conditions.

Appendix B Explanatory Notes on Combination Waste and Vent Systems.

Appendix B contains general guidelines for the design and installation of combination waste and vent systems. These systems are designed for waste piping and are purposely oversized to serve as both a waste and vent pipe to avoid excessive pneumatic effects at fixture drains.

Appendix C Alternate Plumbing Systems.

The intent of this appendix is to provide clarification of procedures for the design and approval of engineered plumbing systems, alternate materials, and equipment that are not specifically covered in other parts of the code. Alternative methods are allowed to be used where approved by the authority having jurisdiction. Approval of alternatives is based on a demonstration showing that the method or material used is at least equivalent in strength, deflection, and capacity to that provided by the prescriptive methods and materials.

Appendix D Sizing Storm Water Drainage Systems.

Appendix D provides general guidelines for the sizing of stormwater drainage systems. There are two pieces of information that must always be a given. They are the roof size and the rate of rainfall for the area.

Appendix E Manufactured/Mobile Home Parks and Recreational Vehicle Parks.

The provisions of this appendix apply to the plumbing and drainage systems of mobile home and recreational vehicle parks. These provisions also apply to the use, maintenance, and installation for supplying fuel gas, water, electricity, and disposal of sewage from accessory buildings or structures, and building components.

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Appendix F Firefighter Breathing Air Replenishment Systems.

Appendix F provides guidance on installing firefighter breathing air replenishment systems. System components include outside fire department connection panel, interior air fill panel or station, interconnected piping distribution system and pressure monitoring switch. Fire departments access the system through an outside connection panel and are able to pump air into the system. The firefighters inside the structure access the system at fill stations that are found throughout the building. The piping distribution system is made from stainless tubing or other approved materials. It delivers compressed air to the building interior air fill stations and interior air fill panels. The tubing also acts as a conduit in the interior of the building between the outside connection panel and the air storage system. If the system becomes over-pressurized, the air monitoring system also acts as a pressure relief. A system isolation valve is placed alongside each interior air fill station and interior air fill panel to isolate the system.

Appendix G Sizing of Venting Systems.

Appendix G provides added information on the sizing of gas vents. This appendix is useful to the end user for the proper sizing of venting systems. A series of examples are given that show how to use the tables and other requirements of Chapter 5.

Appendix H Private Sewage Disposal Systems.

Appendix H provides general guidelines for the materials, design, and installation of new or existing private sewage disposal systems. Where a building cannot be served by a public sewer system, the building site must be provided with a system for treating the waste water generated from the use of plumbing fixtures in the building. The appendix addresses site evaluations, materials, soil absorption systems, holding tanks, cesspools and on-site waste-water treatment systems. Private sewage disposal systems must be designed based on the soil conditions, constructed using approved materials, and installed according to prescribed dimensions.

Appendix I Installation Standard for PEX Tubing Systems for Hot- and Cold-Water Distribution.

The installation standard provides guidelines for SDR 9 crosslinked polyethylene (PEX) tubing and fittings intended for hot- and cold-water distribution systems. Provisions include joining methods, clearances, sizing and flow velocities, handling, storage, exposure to heat and chemicals, and thermal expansion and contraction.

Appendix J Combination of Indoor and Outdoor Combustion and Ventilation Opening Design.

Appendix J provides an example of how to determine the required combination of indoor and outdoor combustion air opening sizes for appliances. The combustion air example also provides a table that contains the required volume of a space per the appliance BTU/h input that is based on the standard method.

Appendix K Potable Rainwater Catchment Systems.

Potable rainwater catchment system is defined as a system that uses the principal of collecting and using rain from a rooftop or other man-made, aboveground collection surface. This appendix applies to new rainwater catchment installations, as well as changes, additions, maintenance, and repairs to existing installations. Rainwater harvesting is the practice of collecting the water produced during rainfall events before it has a chance to run off into a river or stream or soak into the ground and become groundwater.

Appendix L Sustainable Practices.

This appendix provides a comprehensive set of technically sound provisions that encourage sustainable practices and works toward improving the design and construction of plumbing systems that result in a positive long-term environmental impact. Environmental sustainability is important because it involves natural resources that human beings need for economic or manufactured capital. Their sustainability is defined by their reliance on infinitely available resources that are naturally occurring, constant, and free to access.

Appendix M Peak Water Demand Calculator.

This appendix provides a method for estimating the demand load for the building water supply and principal branches for single- and multi-family dwellings with water-conserving plumbing fixtures, fixture fittings, and appliances.

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SAMPLE LEGISLATION FOR ADOPTION OF THE UNIFORM PLUMBING CODE

The Uniform Codes are designed to be adopted by jurisdictions through an ordinance. Jurisdictions wishing to adopt the 2018 *Uniform Plumbing Code* as an enforceable regulation governing plumbing systems by reference should ensure the legal basis under which adoption and implementation are included in the ordinance.

The following sample ordinance is a guide for drafting an ordinance for adoption that addresses key components regulations and resolutions.

ORDINANCE NO.

An ordinance of the [JURISDICTION] adopting the 2018 edition of the *Uniform Plumbing Code*, regulating and controlling the design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use or maintenance of plumbing systems in the [JURISDICTION]; providing for the issuance of permits and collection of fees therefor; repealing Ordinance No. of the [JURISDICTION] and all other ordinances and parts of the ordinances in conflict therewith.

The [GOVERNING BODY] of the [JURISDICTION] does ordain as follows:

Section 1 Codes Adopted by Reference. That certain documents, three (3) copies of which are on file in the office of the [JURISDICTION'S KEEPER OF RECORDS] and the [JURISDICTION], being marked and designated as the 2018 *Uniform Plumbing Code*, including Appendix Chapters [FILL IN THE APPENDIX CHAPTERS BEING ADOPTED], as published by the International Association of Plumbing and Mechanical Officials, be and is hereby adopted as the Code of the [JURISDICTION], in the State of [STATE NAME] regulating and controlling the design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use or maintenance of plumbing systems as herein provided; providing for the issuance of permits and collection of fees therefor; and each and all of the regulations, provisions, penalties, conditions and terms of such 2018 *Uniform Plumbing Code* on file in the office of the [JURISDICTION] are hereby referred to, adopted, and made a part hereof, as if fully set out in this ordinance.

Section 2 Modifications. The following sections are hereby revised:
Section 101.1. Insert: [NAME OF JURISDICTION]
Section 104.5. Insert: [APPROPRIATE FEE SCHEDULE]

Section 3 Conflicting Ordinances Repealed. That Ordinance No. of [JURISDICTION] entitled
[TITLE OF THE ORDINANCE OR ORDINANCES IN EFFECT AT THE PRESENT TIME SO THAT THEY WILL BE REPEALED BY MENTION] and all other ordinances or parts of ordinances in conflict herewith are hereby repealed.

Section 4 Preemption. [JURISDICTION] hereby fully occupies and preempts the entire field of regulation of design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use or maintenance of plumbing systems; and provision for the issuance of permits and collection of fees therefor; within the boundaries of [JURISDICTION]. [AS APPROPRIATE] Cities, towns, and counties or other municipalities may enact only those laws and ordinances relating to this field as specifically authorized by state law and consistent with this ordinance. Local laws and ordinances that are inconsistent with, more restrictive than, or exceed the requirements of [ORDINANCE NO.] shall not be enacted and are hereby expressly preempted and repealed, regardless of the nature of the code, charter, or home rule status of such city, town, county, or municipality.

Section 5 Severability. That if any section, subsection, sentence, clause or phrase of this ordinance is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this ordinance. The [GOVERNING BODY] hereby declares that it would have passed this ordinance, and each section, subsection, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses and phrases be declared unconstitutional.

Section 6 Legal Notice. That the [JURISDICTION'S KEEPER OF RECORDS] is hereby ordered and directed to cause this ordinance to be published. (An additional provision may be required to direct the number of times the ordinance is to be published and to specify that it is to be in a newspaper in general circulation. Posting may also be required.)

Section 7 Violations and Penalties. [INCORPORATE PENALTIES FOR VIOLATIONS]

Section 8 Effective Date. That this ordinance and the rules, regulations, provisions, requirements, orders and matters established and adopted hereby shall take effect and be in full force and effect [TIME PERIOD] from and after the date of its final passage and adoption.

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These lists represent the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred.

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Raimer Consulting Services, LLC [U]

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Bill Erickson, CJ Erickson Plumbing Company [U]
James Majerowicz, UA Instructor [L]
Rich Prospal, ASSE [C]
Ron Rice, City of St. Paul [C]
Robert "Bud" Riestenberg, Piping Systems, Inc. [U]
Bob Siemsen, City of Lincoln [E]
Kevin Tindall, Tindall & Ranson Plumbing, Heating & A/C, Inc. [I/M]

Nonvoting

Gabriella M. Davis, Secretary
International Association of Plumbing and Mechanical Officials
Lynne Simnick, Recording Secretary
International Association of Plumbing and Mechanical Officials

IAPMO Uniform Plumbing Code Technical Committee
Dan Daniels, *Chairman*
Self [C]

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Julius Ballanco, American Society of Plumbing Engineers [SE]
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Sylvanus Bloice, Roots Plumbing Services [I/M]
Jeremy Brown, NSF International [R/S/T]
Phil Campbell, United Association [L]
Maggie Carroll, Underwriters Laboratories [R/S/T]
Ian Chang, Intertek Testing Services [R/S/T]
Richard Church, Plastic Pipe and Fittings Association [M]
Adel Salah-Eddine, City of Los Angeles - Department of Building and Safety [E]
Pennie Feehan, Copper Development Association [M]
John "Jack" Fischer, Self [C]
William LeVan, Cast Iron Soil Pipe Institute [M]
Doug Marian, ASSE [R/S/T]
David L. Mann, CA Pipe Trades Council [L]
John Nielsen, State of Idaho - Div. of Building Safety [E]
Thomas Pape, Alliance for Water Efficiency (AWE) [C]
Phil Ribbs, PHR Consultants [SE]
Arnold Rodio, Jr., Pace Setter Plumbing [I/M]
Martin "Mo" Salberg, Plumbers, Steamfitters and Refrigeration Fitters UA Local 393 [L]
Anthony Scarano, Plastics Piping Consultant [SE]
Matt Sigler, Plumbing Manufacturers International [M]
Larry Soskin, Ace Duraflo [I/M]
Jim Stack, Plumbing-Heating-Cooling Contractors National Association [I/M]
Donald Surrena, National Association of Home Builders [U]
Amir Tabakh, City of Los Angeles - Department of Water and Power [E]
April Trafton, Donald Dickerson Associates [SE]

Alternates

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Terry Burger, NSF International [R/S/T]
Carl Cimino, Pipe Trades Training Center [L]
Michael Cudahy, Plastic Pipe & Fittings Association [M]
Shawn Hargis, City of Los Angeles - Department of Building and Safety [E]
James Pavesic, United Association [L]
Leonard Ramociotti, LAR Consulting [SE]
Arnold Rodio, Sr., Pace Setter Plumbing [I/M]
Robert Sewell, Plumbers & Steamfitters, Local 159 [L]
Billy Smith, American Society of Plumbing Engineers [SE]
Don Summers, ASSE [R/S/T]
John Taecker, Underwriters Laboratories [R/S/T]
Che Timmons, Local 342 [L]
James Walls, Cast Iron Soil Pipe Institute [M]

Nonvoting

Enrique Gonzalez, IAPMO Staff Liaison
Laura Montville, NFPA [R/S/T]
Eric Nette, NFPA [R/S/T]
DJ Nunez, Ex -Officio IAPMO [E]

COMMITTEE MEMBERSHIP CLASSIFICATION ABBREVIATIONS

These classifications apply to Technical Committee members and represent their principal interest in the activity of a committee.

M *Manufacturer:* A representative of a maker or marketer of a product, assembly or system, or portion thereof, that is affected by the standard.
U *User:* A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.
I/M *Installer/Maintainer:* A representative of an entity that is in the business of installing or maintaining a product, assembly or system affected by the standard.
L *Labor:* A labor representative or employee concerned with safety in the workplace.
R/S/T *Research/Standards/Testing Laboratory:* A representative of an independent research organization; an organization that develops codes, standards or other similar documents; or an independent testing laboratory.
E *Enforcing Authority:* A representative or an agency or an organization that promulgates and/or enforces standards.
C *Consumer:* A person who is, or represents, the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in the *User* classification.
SE *Special Expert:* A person not representing any of the previous classifications, but who has special expertise in the scope of the standard or portion thereof.

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CHAPTER 1
ADMINISTRATION

101.0 General.

101.1 Title. This document shall be known as the "Uniform Plumbing Code," may be cited as such, and will be referred to herein as "this code."

101.2 Scope. The provisions of this code shall apply to the erection, installation, alteration, repair, relocation, replacement, addition to, use, or maintenance of plumbing systems within this jurisdiction.

101.3 Purpose. This code is an ordinance providing minimum requirements and standards for the protection of the public health, safety, and welfare.

101.4 Unconstitutional. Where a section, subsection, sentence, clause, or phrase of this code is, for a reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code. The legislative body hereby declares that it would have passed this code, and each section, subsection, sentence, clause, or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, and phrases are declared unconstitutional.

101.5 Validity. Where a provision of this code, or the application thereof to a person or circumstance, is held invalid, the remainder of the code, or the application of such provision to other persons or circumstances, shall not be affected thereby.

102.0 Applicability.

102.1 Conflicts Between Codes. Where the requirements within the jurisdiction of this plumbing code conflict with the requirements of the mechanical code, this code shall prevail. In instances where this code, applicable standards, or the manufacturer's installation instructions conflict, the more stringent provisions shall prevail. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall prevail.

102.2 Existing Installations. Plumbing systems lawfully in existence at the time of the adoption of this code shall be permitted to have their use, maintenance, or repair continued where the use, maintenance, or repair is in accordance with the original design and location and no hazard to life, health, or property has been created by such plumbing system.

102.3 Maintenance. The plumbing and drainage system, both existing and new, of a premise under the Authority Having Jurisdiction shall be maintained in a sanitary and safe operating condition. Devices or safeguards required by this code shall be maintained in accordance with the code edition under which installed.

The owner or the owner's designated agent shall be responsible for maintenance of plumbing systems. To determine compliance with this subsection, the Authority Having Jurisdiction shall be permitted to cause a plumbing system to be reinspected.

102.4 Additions, Alterations, Renovations, or Repairs. Additions, alterations, renovations or repairs shall conform to that required for a new system without requiring the existing plumbing system to be in accordance with the requirements of this code. Additions, alterations, renovations, or repairs shall not cause an existing system to become unsafe, insanitary, or overloaded.

Additions, alterations, renovations, or repairs to existing plumbing installations shall comply with the provisions for new construction unless such deviations are found to be necessary and are first approved by the Authority Having Jurisdiction.

102.4.1 Building Sewers and Drains. Existing building sewers and building drains shall be permitted to be used in connection with new buildings or new plumbing and drainage work where they are found on examination and test to be in accordance with the requirements governing new work, and the proper Authority Having Jurisdiction shall notify the owner to make changes necessary to be in accordance with this code. No building, or part thereof, shall be erected or placed over a part of a drainage system that is constructed of materials other than those approved elsewhere in this code for use under or within a building.

102.4.2 Openings. Openings into a drainage or vent system, excepting those openings to which plumbing fixtures are properly connected or which constitute vent terminals, shall be permanently plugged or capped in an approved manner, using the appropriate materials in accordance with this code.

102.5 Health and Safety. Where compliance with the provisions of this code fails to eliminate or alleviate a nuisance, or other dangerous or insanitary condition that involves health or safety hazards, the owner or the owner's agent shall install such additional plumbing and drainage facilities or shall make such repairs or alterations as ordered by the Authority Having Jurisdiction.

102.6 Changes in Building Occupancy. Plumbing systems that are a part of a building or structure undergoing a change in use or occupancy, as defined in the building code, shall be in accordance with the requirements of this code that are applicable to the new use or occupancy.

102.7 Moved Structures. Parts of the plumbing system of a building or part thereof that is moved from one foundation to another, or from one location to another, shall be in accordance with the provisions of this code for new installations and completely tested as prescribed elsewhere in this section for new work, except that walls or floors need not be removed during such test where other equivalent means of inspection acceptable to the Authority Having Jurisdiction are provided.

102.8 Appendices. The provisions in the appendices are intended to supplement the requirements of this code and shall not be considered part of this code unless formally adopted as such.