Houston Amendments to

The 2012 International Residential Code

Adopted by Ord. No. 2015-____

Passed __/__/__

Effective 01/01/2016

Part I—Administrative

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1-SCOPE AND APPLICATION

R101.1 Title. These provisions shall be known as the *City of Houston Residential Code ~~for One- and Two-family Dwellings~~* of [NAME OF JURISDICTION], and shall be cited as such and will be referred to herein as "this code".

The *City of Houston Construction Code* collectively includes this volume and certain other codes, pamphlets, specifications and documents that are adopted in or by reference through the adopting ordinance, City of Houston Ordinance No. 2015-____[1].

R101.2 Scope. The provisions of ~~the *International Residential Code for One- and Two-family Dwellings*~~ this code shall apply to the construction, *alteration,* movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures.* Buildings that exceed three stories in height shall comply with the *Building Code*, *Electrical Code*, *Mechanical Code*, *Plumbing Code,* and *International Energy Conservation Code*. One- and two-family dwellings and townhouses shall be classified as Group R-3 occupancies, and accessory structures shall be classified as Group U occupancies.

Exceptions:

1. Live/work units complying with the requirements of Section 419 of the ~~*International*~~ *Building Code* shall be permitted to be built as one- and two-family *dwellings* or townhouses. Fire suppression required by Section 419.5 of the ~~*International*~~ *Building Code* when constructed under this code ~~the *International Residential Code for One- and Two-family Dwellings*~~ shall conform to Section P2904.
2. Owner-occupied lodging houses with five or fewer guestrooms shall be permitted to be constructed in accordance with this code ~~the *International Residential Code for One- and Two-family Dwellings*~~ when equipped with a fire sprinkler system in accordance with Section P2904.

R102.5 Appendices. Provisions in the appendices shall not apply unless specifically referenced in ~~the adopting ordinance~~ this section. Appendices A, B, C, H, L, M and V are hereby adopted and made part of this code.

R102.7 Existing structures. The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as is ~~specifically covered in this code, the *International Property Maintenance Code* or the *International Fire Code,* or as is~~ deemed necessary by the *building official* for the general safety and welfare of the occupants and the public.

[*] City Secretary shall insert number of adopting ordinance.

R102.8 Special piping and storage systems. See the *International Fire Code* regarding flammable and combustible liquids.

R102.9 *Electrical Code*. Part VIII—Electrical (Chapters 34-43) of this code is not adopted. All electrical work and licensing shall comply with the *Electrical Code*. All references made to the *Electrical Code* are to be considered as made to the *City of Houston Electrical Code*.

R102.10 *Mechanical Code*. The licensing of air-conditioning contractors shall be as required by the *Mechanical Code* and applicable State laws. This code includes numerous references to the *International Mechanical Code*. For the sake of convenience and cost savings to the public in the preparation of Houston Supplement pages to this code, those references have not been revised unless the text of the provision in which they appear has otherwise been revised by this jurisdiction. Any such references shall be regarded as references to the corresponding code as adopted by this jurisdiction from time to time. This jurisdiction reserves the right to adopt codes based upon promulgations of organizations other than the International Code Council, including but not limited to the Uniform Series Codes, to the extent permitted by State law. Any reference to a specific chapter, section, or provision of a code that has not been adopted by this jurisdiction shall be construed to mean the corresponding provision of the corresponding code as adopted by this jurisdiction.

R102.11 *Plumbing Code*. The licensing of plumbers and plumbing contractors shall be as required in the *Plumbing Code* and applicable State laws. This code includes numerous references to the *International Plumbing Code*. For the sake of convenience and cost savings to the public in the preparation of Houston Supplement pages to this code, those references have not been revised unless the text of the provision in which they appear has otherwise been revised by this jurisdiction. Any such references shall be regarded as references to the corresponding code as adopted by this jurisdiction from time to time. This jurisdiction reserves the right to adopt codes based upon promulgations of organizations other than the International Code Council, including but not limited to the Uniform Series Codes, to the extent permitted by State law. Any reference to a specific chapter, section, or provision of a code that has not been adopted by this jurisdiction shall be construed to mean the corresponding provision of the corresponding code as adopted by this jurisdiction.

PART 2-ADMINISTRATION AND ENFORCEMENT

SECTION R103
~~DEPARTMENT OF BUILDING SAFETY~~
BUILDING CODE ENFORCEMENT

R103.1 Creation of enforcement agency. The Building Code Enforcement Division ~~department of building~~ safety is hereby created within the jurisdiction's Department of Public Works and Engineering, and the official in charge thereof shall be known as the *building official.*

R104.8 Liability. ~~The *building official,* member of the board of appeals or employee charged with the enforcement of this code, while acting for the *jurisdiction* in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties. Any suit instituted against an officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by legal representative of the *jurisdiction* until the final termination of the proceedings. The *building official* or any subordinate shall not be liable for cost in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.~~ Except as otherwise provided by law, the *building official* shall not personally be liable in damages for any act or omission arising out of any official action taken to

implement and enforce the provisions of this code. Additionally, except as otherwise provided by law, the *building official* shall not personally be liable in damages for any action or omission taken in the course and scope of employment. Where and to the extent consistent with the provisions of Chapter 2, Article X, of the *City Code*, the jurisdiction shall provide legal representation and indemnification for any suit brought against the *building official* because of acts or omissions performed in the enforcement of this code.

This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any building or structure for any damages to persons or property caused by defects, nor shall the code enforcement agency or its parent jurisdiction be held as assuming any such liability by reason of the inspections authorized by this code or any *permits* or certificates issued under this code.

{**EDITOR'S NOTE: DELETE** SECTION R104.10.1 IN ITS ENTIRETY.}

R104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved.* An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code. ~~Compliance with the specific performance-based provisions of the International Codes in lieu of specific requirements of this code shall also be permitted as an alternate.~~

R104.12 Stop orders. The *building official* may order work stopped hereunder in the same manner provided in Section 115 of the *Building Code*.

R105.2 Work exempt from permit. *Permits* shall not be required for the following. Exemption from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this *jurisdiction.*

Building:

1. One-story detached *accessory structures* used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 200 square feet (18.58 m^2).
2. Fences not over ~~7~~ 8 feet (~~2134~~ 2438 mm) high that are not constructed of masonry or concrete.
3. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge.
4. Water tanks supported directly upon *grade* if the capacity does not exceed 5,000 gallons (18 927 L) and the ratio of height to diameter or width does not exceed 2 to 1.
5. ~~Sidewalks and driveways.~~ Uncovered wood decks, accessory to a one- or two-family dwelling, that are not more than 30 inches above grade.
6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work including the repair of damaged gypsum board that is not part of a fire-rated assembly.

7. Prefabricated swimming pools accessory to a one- or two-family dwelling in which the pool walls are entirely above grade and the pool capacity does not exceed 5,000 gallons (18 927 L) ~~that are less than 24 inches (610 mm) deep~~.

8. Swings and other playground equipment.

9. Window awnings supported by an exterior wall which do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.

10. Decks not exceeding 200 square feet (18.58 m^2) in area, that are not more than 30 inches (762 mm) above *grade* at any point, are not attached to a *dwelling* and do not serve the exit door required by Section R311.4.

11. Repair of exterior wood facia, trim, and soffits, as well as siding that does not exceed 128 square feet and is not part of a fire-rated assembly.

12. Roof covering that does not exceed 100 square feet.

Electrical:

1. *Listed* cord-and-plug connected temporary decorative lighting.

2. Reinstallation of attachment plug receptacles but not the outlets therefor.

3. Replacement of branch circuit overcurrent devices of the required capacity in the same location.

4. Electrical wiring, devices, *appliances,* apparatus or *equipment* operating at less than 25 volts and not capable of supplying more than 50 watts of energy.

5. ~~Minor repair work, including t~~ The replacement of lamps or the connection of *approved* portable electrical *equipment* to *approved* permanently installed receptacles.

Gas:

1. Portable heating, cooking or clothes drying *appliances.*

2. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.

3. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

Mechanical:

1. Portable heating *appliances.*

2. Portable ventilation *appliances.*

3. Portable cooling units.

4. Steam, hot- or chilled-water piping within any heating or cooling *equipment* regulated by this code.

5. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.

6. Portable evaporative coolers.

7. Self-contained refrigeration systems containing 10 pounds (4.54 kg) or less of refrigerant or that are actuated by motors of 1 horsepower (7 46 W) or less.

8. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

Plumbing:

The stopping of leaks in drains, water, soil, waste or vent pipe; provided, however, that if any concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a *permit* shall be obtained and inspection made as provided in this code.

The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures, and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

{**EDITOR'S NOTE: DELETE** SECTION R105.3.1.1 IN ITS ENTIRETY.}

R105.5 Expiration. Every *permit* issued shall become ~~invalid~~ inactive unless the work authorized by such *permit* is commenced within 180 days after its issuance, or if the work authorized by such *permit* is suspended or abandoned for a period of 180 days after the time the work is commenced. The *building official* is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

If work is not commenced under a permit within two years after the date of issuance or is abandoned at any time for a period of two years, the permit shall expire. In order to recommence work under an expired permit, the permit holder shall pay the full permit fee applicable and submit plans that comply with this code for the previously uninspected portion of the work.

Exception: For the purpose of issuing a certificate of compliance, the *building official* may, upon request, reactivate a *permit* and perform a final inspection of work.

R105.6 Suspension or revocation. The *building official* is authorized to suspend or revoke a *permit* issued under the provisions of this code wherever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code. Prior to taking such action the *building official* shall provide notice of a right to a hearing on the matter pursuant to Section 117 of the *Building Code*.

{**EDITOR'S NOTE: DELETE** R106.1.3 IN ITS ENTIRETY.}

R108.2 Schedule of permit fees. On buildings, structures, electrical, gas, mechanical and plumbing systems or *alterations* requiring a *permit,* a fee for each *permit* shall be paid as required, in accordance with ~~the schedule as established by the applicable governing authority~~ the city fee schedule.

R108.5 Refunds. The *building official* ~~is authorized to establish a refund policy~~ may authorize refunding of any fee paid hereunder that was erroneously paid or collected due to an error by one or more city employees. This provision shall not be applicable if the error occurred because of incorrect information provided by the applicant.

The *building official* may authorize the refunding of not more than 90 percent of the amount in excess of the minimum fee established in the city fee schedule for the permit fee paid when no work has been done under a *permit* issued in accordance with this code. If work has been done under the *permit*, no refund shall be authorized.

The *building official* shall not authorize refunding of any fee paid except on written application filed by the original permit holder not later than 180 days after the date of fee payment.

R108.6 Work commencing before permit issuance. Any person who commences work requiring a *permit* on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary *permits* shall be subject to a fee ~~established by the applicable governing authority~~ equal to the amount of the permit fee and applicable minimum investigation fees required by the building code that shall be in addition to the required *permit* fees.

R108.7 Annual fee increase. Notwithstanding any maximum fee established pursuant to the *Construction Code*, the fees in this or in any volume of the *Construction Code*, as adjusted according to this section, shall be automatically increased on the first day of each subsequent calendar year as provided in Section 1-13 of the *City Code*.

R109.1.3 Floodplain inspections. For construction in flood hazard areas, inspections shall be in accordance with Chapter 19 of the *City Code*. ~~as established by Table R301.2(1), upon placement of the lowest floor, including *basement,* and prior to further vertical construction, the *building official* shall require submission of documentation, prepared and sealed by a registered *design professional,* of the elevation of the lowest floor, including *basement,* required in Section R322.~~

SECTION R110
CERTIFICATE OF ~~OCCUPANCY~~ COMPLIANCE

R110.1 Use and occupancy. When requested by the applicant, the *building official* is authorized to issue a certificate of compliance after all the final inspections have been approved. ~~No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until the *building official* has issued a certificate of occupancy therefor as provided herein. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the *jurisdiction.* Certificates presuming to give authority to violate or cancel the provisions of this code or other ordinances of the *jurisdiction* shall not be valid.~~

~~**Exceptions:**~~

~~1. Certificates of occupancy are not required for work exempt from permits under Section R105.2.~~

~~2. Accessory buildings or structures.~~

R110.2 Change in use. Changes in the character or use of an existing structure shall not be made except as specified in Section~~s 3408 and 3409~~ 3412.2.1 of the *Building Code* and Appendix M of the ~~*International*~~ *Building Code.*

{**EDITOR'S NOTE: DELETE** R110.3, R110.4 AND R110.5 IN THEIR ENTIRETY.}

R112.1 General. ~~In order to~~ Except as provided below for mechanical and plumbing issues, the General Appeals Board, in accordance with the provisions of the *Building Code*, shall hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of this code~~, there shall be and is hereby created a board of appeals. The *building official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *building official.*~~

R112.2 Mechanical. The Mechanical Code Review Board, in accordance with the provisions of the *Mechanical Code*, shall hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of Part V—Mechanical ~~**Limitations on**~~

~~**authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements~~ of this code.

{**EDITOR'S NOTE: DELETE** SECTIONS R112.2.1 AND R112.2.2 IN THEIR ENTIRETY.}

R112.3 Plumbing. The Plumbing Code Review Board, in accordance with the provisions of the *Plumbing Code*, shall hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of Part VI—Fuel Gas and Part VII—Plumbing of this code **Qualifications**. ~~The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the *jurisdiction.*~~

R113.4.1 Penalty. Where no specific penalty is otherwise provided therein, the violation of any provision of this code or the modifications adopted by this jurisdiction shall constitute a misdemeanor punishable upon conviction by a fine of not less than $500.00 nor more than $2,000.00. Each day that any violation continues shall constitute and be punishable as a separate offense. Where any such conduct constitutes a violation of state penal law, then the offense shall be punishable as provided in the applicable state law. In prosecutions, the various provisions of this code or the jurisdiction's modifications that are designated as an 'exception' or 'exceptions' shall not be treated as exceptions within the meaning of Section 2.02 of the Texas Penal Code, and, instead, they shall constitute defenses to prosecution within the meaning of Section 2.03 of the Texas Penal Code.

SECTION 115
PRIVATE PLAN REVIEW AND INSPECTION SERVICES

R115.1 Applicability. The application of this section is limited to structures that are constructed under this code.

R115.2 Scope. This section applies to any *permit* required under this code, the *Electrical Code*, the *Plumbing Code*, or the *Mechanical Code* for the construction, repair, or renovation of a structure to which this code applies.

R115.3 Program established. The *building official* may establish a private plan review and inspection program under which qualified persons who are not city employees may review plans, conduct certain building inspections, and provide related services for structures to which this section applies to assure compliance with all applicable construction codes. The program shall be conducted in accordance with the regulations and forms promulgated by the *building official*, which shall, without limitation, address the following:

1. Qualifications of the firms and individuals authorized to perform plan reviews, conduct inspections, and provide other related *permit* services. The qualifications shall include licensing in accordance with any applicable laws and regulations and certification in accordance with state or federally recognized standards.
2. Requirement of appropriate liability coverages in an amount of not less than $1,000,000, per occurrence, with indemnity agreements and coverage of the jurisdiction, as an additional insured, for the protection of the jurisdiction and other persons who may be affected by the performance of the any services under the program.
3. Provisions to ensure that the firms and individuals participating in the program will act independently of building owners, contractors, and others so as to avoid conflicts of interest.

4. Provisions for any non-building-code-related review of plans and issuance of *permit*s to applicants who utilize plan review, inspection, and other related services under the program.

5. Provisions regarding the keeping of records and filing of reports with the *building official*.

6. Administrative provisions for the acceptance, suspension, and revocation of the right of a firm or individual to participate in the program, which shall include elements of due process, including a right of appeal to a hearing officer designated by the jurisdiction's Director of Public Works and Engineering, whose decision, notwithstanding any other provision of this code, shall be final and not appealable to the General Appeals Board or City Council.

7. Provisions to ensure that no firm or individual may be certified to participate in the program unless qualified to conduct plan reviews and inspections under the Codes currently enforced by the jurisdiction and/or a nationally recognized uniform or international code.

8. Provisions relating to fees charged by any firm or individual for services rendered under the program, including any fees required by law to be paid directly to the jurisdiction and remitted by the *building official* to a firm or individual.

9. Provisions prohibiting any private developer, builder, or contractor from employing any firm or individual, including subcontractors, to perform more than 25% of that developer's, builder's or contractor's services under the program in any one calendar year unless a greater amount is approved by the *building official*.

10. Provisions requiring any private developer, builder or contractor utilizing any services under the program and the *building official* to file reports as set forth below:

    a. Each private developer, builder or contractor utilizing any services under the program shall file a report with the *building official*, supported by affidavit, containing the following information:

        (1) The total number of *permits* received during the preceding calendar year for the construction of any residential structure in connection with which services under the program were rendered;

        (2) The name of each firm or individual utilized under the program on each residential structure during the reporting period; and

        (3) A statement certifying that the developer, builder or contractor has fully complied with all rules and regulations under the program during the reporting period, including but not limited to, all rules governing the maximum number of plan reviews and inspections permitted to be performed by any firm or individual, including subcontractors, rendering any services under the program.

    The report shall be filed with the *building official* not later than the last day of January and July in each calendar year and shall cover the preceding six month period ending on the last day of December and June, respectively, in each year.

    b. The *building official* shall file a report with the Mayor and City Council containing the following information:

        (1) A listing of the names of all companies or contractors that utilized individuals or firms for services under the program and the name of each firm or individual so utilized;

        (2) Names of all firms and individuals approved to perform services under the program;

(3) Total number of plan reviews and inspections performed by firms and individuals for each private developer, builder or contractor operating under the program;

(4) Number of plan rechecks and oversight inspections conducted by the jurisdiction for each firm or individual utilized under the program and the percentage of that firm or individual's work, including subcontractors, so inspected;

(5) The number of Code violations found through plan rechecks and oversight inspections, including the name of the firm or individual, including subcontractors, who performed such services;

(6) A list of any firms or individuals removed from the program by the *building official*; and

(7) An assessment of program effectiveness as demonstrated by available data, including comments and complaints received by the jurisdiction regarding the program pertaining to work performed by a participating developer, builder or contractor, or any firm or individual, including subcontractors, providing private plan review or inspection services under the program.

The *building official*'s report shall be filed with the Mayor and City Council not later than the last day of August and February in each calendar year and shall cover the preceding 6 month period ending on the last day of July and January, respectively, in each year and may include such additional information relating to the program as he may deem appropriate.

11. Provisions prohibiting any private plan reviewer or inspector from being related to building owners, contractors, and other similarly situated individuals or entities within the third degree of consanguinity or within the second degree of affinity.

R115.4 Oversight inspections. The provisions of this section do not affect the jurisdiction of the *building official* over any work or preclude oversight inspections by the *building official* of structures that are subject to the provision of services under the program. For purposes of quality assurance, the *building official* shall be authorized to recheck plans, perform inspections or reinspections, issue stop work orders, and take any and all actions that are authorized to be taken under this code, the *Electrical Code*, the *Plumbing Code*, or the *Mechanical Code*. No prior notice need be provided to any program firm or individual, contractor, or owner, unless otherwise required by law.

R115.5 Fees. To cover administrative costs, including registration of firms and individuals, management of the program, and oversight inspections, the *building official* shall assess fees equal to 25 percent of the amount otherwise payable under this code for any *permit*, but not less than the minimum fee stated in the city fee schedule. In addition to the reduced *permit* fees charged in connection with the program, an additional fee for each payment voucher issued, as stated for this provision in the city fee schedule, shall be assessed to cover the jurisdiction's costs in connection with any fee required to be paid to and remitted by the jurisdiction. If any contractor or owner requests an inspection by the *building official* of any structure that is subject to private inspection under this section, then the *building official* may perform the inspection for the fee stated for this provision in the city fee schedule. The administrative fee that is payable under Section 118.1 of the *Building Code* shall be collected in addition to the fees otherwise provided under this section.

Notwithstanding any maximum fee established pursuant to the *Construction Code*, the fees in this section or in any volume of the *Construction Code*, as adjusted according to this provision, shall be automatically increased on the first day of each subsequent calendar year as provided in Section 1-13 of the *City Code*.

Part II—Definitions

CHAPTER 2
DEFINITIONS

R201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the *Building Code*, *International Fire Code*, *Electrical Code*, *Mechanical Code* or *Plumbing Code*, such terms shall have meanings ascribed to them as in those ~~other~~ codes ~~publications of the International Code Council~~.

SECTION 202
DEFINITIONS

BUILDING CODE. The *City of Houston Building Code*, as adopted by this jurisdiction.

BUILDING OFFICIAL. The ~~officer or other designated authority charged with the administration and enforcement of this code~~ jurisdiction's Director of Public Works and Engineering, or a duly authorized representative.

BUILDING THERMAL ENVELOPE. The *basement walls*, *exterior walls*, floor, roof and any other building element that enclose *conditioned spaces*. This boundary also includes the boundary between conditioned space and any exempt or unconditioned space.

CITY CODE. The *Code of Ordinances, Houston, Texas*.

CONSTRUCTION CODE. The *City of Houston Construction Code*, consisting of the *Building Code*, *Electrical Code*, *Mechanical Code*, *Plumbing Code, Residential Code, Commercial Energy Conservation Code,* and *Residential Energy Conservation Code*.

ELECTRICAL CODE. The *National Electrical Code* promulgated by the National Fire Protection Association, as adopted by this jurisdiction, and the *City of Houston Electrical Code*. See Section R102.9 of this code or Section 101.4.7 of the *Building Code*.

FIRE CODE. The *City of Houston Fire Code*, as adopted by this jurisdiction. See Section 101.4.5 of the *Building Code*.

INTERNATIONAL BUILDING CODE. The *City of Houston Building Code*, as adopted by this jurisdiction.

INTERNATIONAL ENERGY CONSERVATION CODE. The *City of Houston Residential Energy Conservation Code* or the *City of Houston Commercial Energy Conservation Code,* both based on the

International Energy Conservation Code, as adopted by the State of Texas, or on an alternate code that has been determined to be more stringent than the *International Energy Conservation Code*, as provided in Chapter 388 of the Texas Health & Safety Code, both as adopted and amended by this jurisdiction. See Section 101.4.6 of the *Building Code*.

INTERNATIONAL FIRE CODE. The *City of Houston Fire Code*, as adopted by this jurisdiction. See Section 101.4.5 of the *Building Code*.

INTERNATIONAL FUEL GAS CODE. The *City of Houston Plumbing Code*, as adopted by this jurisdiction. See Section 101.4.1 of the *Building Code*.

INTERNATIONAL MECHANICAL CODE. The *City of Houston Mechanical Code*, as adopted by this jurisdiction. See Section R102.10 of this code or Section 101.4.2 of the *Building Code*.

INTERNATIONAL PLUMBING CODE. The *City of Houston Plumbing Code*, as adopted by this jurisdiction. See Section R102.11 of this code or Section 101.4.3 of the *Building Code*.

INTERNATIONAL PROPERTY MAINTENANCE CODE. Chapter 10 of the *City Code*.

GRAY WATER. Untreated waste water that has not come into contact with toilet waste, Gray water includes ~~W~~waste water discharged from lavatories, bathtubs, showers, clothes washers and laundry trays.

MECHANICAL CODE. The *City of Houston Mechanical Code*, as adopted by this jurisdiction. See Section 101.4.2 of the *Building Code*.

PLUMBING CODE. The *City of Houston Plumbing Code*, as adopted by this jurisdiction. See Section 101.4.3 of the *Building Code*.

PLUMBING FIXTURE. A receptacle or device or appliance that is connected to a water supply system or discharges to a drainage system or both. Such receptacles or devices require a supply of water; or discharge liquid waste or liquid-borne solid waste; or require a supply of water and discharge waste to a drainage system.

Part III—Building Planning and Construction

CHAPTER 3

BUILDING PLANNING

R301.2.1.1 Wind limitations and wind design required. The wind provisions of this code shall not apply to the design of buildings where wind design is required in accordance with Figure R301.2(4)B or where the basic wind speed from Figure R301.2(4)A equals or exceeds 110 miles per hour (49 m/s).

Exceptions:

1. For concrete construction, the wind provisions of this code shall apply in accordance with the limitations of Sections R404 and R611.
2. For structural insulated panels, the wind provisions of this code shall apply in accordance with the limitations of Section R613.

In regions where wind design is required in accordance with Figure R301.2(4)B or where the basic wind speed shown on Figure R301.2(4)A equals or exceeds 110 miles per hour (49 m/s), the design of buildings for wind loads shall be in accordance with one or more of the following methods:

1. AF&PA *Wood Frame Construction Manual* (WFCM); or
2. ICC *Standard for Residential Construction in High-Wind Regions* (ICC 600); or
3. ASCE *Minimum Design Loads for Buildings and Other Structures* (ASCE 7); or
4. AISI *Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings* (AISI S230); or
5. *International Building Code*; or
6. Appendix L—Conventional Light Frame Wood Construction for High-wind Areas.

The elements of design not addressed by the methods in Items 1 through ~~5~~ 6 shall be in accordance with the provisions of this code. When ASCE 7 or the *International Building Code* is used for the design of the building, the wind speed map and exposure category requirements as specified in ASCE 7 and the *International Building Code* shall be used.

TABLE R301.2 (1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

GROUND SNOW LOAD	WIND DESIGN		SEISMIC DESIGN CATEGORY[f]	SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP[e]	ICE BARRIER UNDERLAYMENT REQUIRED[h]	FLOOD HAZARDS[g]	AIR FREEZING INDEX[i]	MEAN ANNUAL TEMP[j]
	Speed[d] (mph)	Topographic effects[k]		Weathering[a]	Frost line depth[b]	Termite[c]					
0	110	No	A	Negligible	6 inches	Very Heavy	28	No	Reference Ch. 19 of *City Code*	(>0-1000)	70

For SI: 1 pound per square foot= 0.0479 kPa, 1 mile per hour = 0.447 m/s.

a. Weathering may require a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code. The weathering column shall be filled in with the weathering index (i.e., "negligible," "moderate" or "severe") for concrete as determined from the Weathering Probability Map [Figure R301.2(3)]. The grade of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216 or C 652.

b. The frost line depth may require deeper footings than indicated in Figure R403.1 (1). The jurisdiction shall fill in the frost line depth column with the minimum depth of footing below finish grade.
c. The jurisdiction shall fill in this part of the table to indicate the need for protection depending on whether there has been a history of local subterranean termite damage.
d. The jurisdiction shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2 (4)A]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.
e. The outdoor design dry-bulb temperature shall be selected from the columns of 97½-percent values for winter from Appendix D of the ~~*International Plumbing Code*~~. Deviations from the Appendix D temperatures shall be permitted to reflect local climates or local weather experience as determined by the *building official*.
f. The jurisdiction shall fill in this part of the table with the seismic design category determined from Section R301.2.2.1.
g. The jurisdiction shall fill in this part of the table with (a) the date of the jurisdiction's entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study and (c) the panel numbers and dates of all currently effective FIRMs and FBFMs or other flood hazard map adopted by the authority having jurisdiction, as amended.
h. In accordance with Sections R905.2.7.1, R905.4.3.1, R905.5.3.1, R905.6.3.1, R905.7.3.1 and R905.8.3.1, where there has been a history of local damage from the effects of ice damming, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall fill in this part of the table with "NO."
i. The jurisdiction shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Figure R403.3(2) or from the 100-year (99 percent) value on the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)" at www.ncdc.noaa.gov/fpsf.html.
j. The jurisdiction shall fill in this part of the table with the mean annual temperature from the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)" at www.ncdc.noaa.gov/fpsf.html.
k. In accordance with Section R301.2.1.5, where there is local historical data documenting structural damage to buildings due to topographic wind speed-up effects, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall indicate "NO" in this part of the table.

R302.1 Exterior walls. Construction, projections, openings and penetrations of *exterior walls* of *dwellings* and accessory buildings shall comply with Table R302.1(1); or *dwellings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1(2). Projections shall not extend beyond a point one-third the distance into areas where openings are prohibited.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *dwellings* and *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the *lot*. Projections beyond the *exterior wall* shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

R302.1.1 Zero lot line separation. Where perpetual, platting, and recorded easements create a non-buildable minimum fire separation distance of at least 6 feet between structures on adjacent properties, the one-hour fire-resistive ratings shall not apply.

TABLE R302.1 (1)
EXTERIOR WALLS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E 119 or UL 263 with exposure from both sides	<~~5~~3 feet
	Not fire-resistance rated	0 hours	~~≥5~~3 feet
Projections	Fire-resistance rated	1 hour on the face and underside	≥2 feet to <~~5~~3 feet
	Not fire-resistance rated	0 hours	≥~~5~~3 feet
Openings in	Not allowed	N/A	< 3 feet
	25% Maximum of Wall Area	0 hours	3 feet

walls	Unlimited	0 hours	5 feet
Penetrations	All	Comply with Section R302.4	< 5 feet
		None required	5 feet

For SI: 1 foot = 304.8 min.
N/A = Not Applicable

R302.6 Dwelling/garage fire separation. The garage shall be separated as required by Table R302.6. Openings in garage walls shall comply with Section R302.5. This provision does not apply to garage walls that are perpendicular to the adjacent *dwelling unit* wall. Attic disappearing stairs shall be permitted to be installed in the garage ceiling provided the exposed panel is not less than ⅜ inch thick fire-retardant-treated plywood or covered with a minimum 16 gage sheet metal.

R303.4 Mechanical ventilation. Where the air infiltration rate of a dwelling unit is less than ~~5~~ 3 air changes per hour when tested with a blower door at a pressure of 0.2 inch w.c (50 Pa) in accordance with the *International Energy Conservation Code* ~~Section N1102.4.1.2~~, the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3 or ASHRAE 62.2.

R310.1.5 Yards and courts. Yards and courts shall not be less than 3 feet (914 mm) in width.

Exception: Projections shall not reduce the clear width to less than 32 inches (813 mm) up to 80 inches (2032 mm) above the floor or ground.

311.1.1 Yards and courts. The means of egress shall provide a continuous and unobstructed path of egress travel to a public way.

Exception: Projections shall not reduce the clear width to less than 32 inches (813 mm) up to 80 inches (2032 mm) above the floor or ground.

~~**R313.2 One- and two-family dwellings automatic fire systems**. An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings.~~

~~**Exception:** An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.~~

~~**R313.2.1 Design and installation**. Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.~~

{**EDITOR'S NOTE: DELETE SECTION R318 IN ITS ENTIRETY**.}

R319.1 Address numbers. Building numbering shall be provided in accordance with Chapter 10, Article V, of the *City Code.* Buildings shall have *approved* address numbers, building numbers or *approved* building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of ½ inch (12.7 mm). Where access is by means of a private road and the building address cannot be viewed from the public way, a monument, pole or other sign or means shall be used to identify the structure.

~~**R321.3 Accessibility.** Elevators or platform lifts that are part of an accessible route required by Chapter 11 of the *International Building Code*, shall comply with ICC A117.1.~~

R322.1 General. Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(1) shall be designed and constructed in accordance with the provisions contained in Chapter 19 of the *City Code*. ~~this section. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.~~

{**EDITOR'S NOTE: DELETE** REMAINDER OF **SECTION R322**.}

CHAPTER 4
BUILDING PLANNING

401.5 Foundation elevation. All new buildings constructed within this jurisdiction shall have the finished floor of the building not less than 12 inches above the nearest sanitary sewer manhole rim of the sewer connected to the building, or, where no sewer is available, the finished floor shall not be less than 4 inches above the crown of the street.

Exception: Buildings located in annexed subdivisions where the following conditions exist:

1. The subdivision was platted and recorded prior to annexation;
2. The sanitary sewer system for the subdivision was installed prior to annexation; and
3. The drainage piping meets the requirements of Section 710 of the *Plumbing Code*.

NOTE: When a greater elevation is required by Chapter 19 of the *City Code*, then Chapter 19 shall govern.

401.5.1 Plans and applications. All construction plans and applications submitted for construction, sewer connections or septic systems shall reflect the elevations of the finished floor of the building and the elevation of the nearest manhole rim of a sanitary sewer connected to the building or crown of the street, whichever is applicable.

401.5.2 Damage risk. All *permits* for connection shall be issued on the condition that the owner take all the risk of damage that may result from water backing up into the premises from the sewer.

401.5.3 Existing structures. When an existing structure is required to connect with a public or private sewer, the finished floor shall be a minimum of 12 inches above the nearest sanitary sewer manhole rim of a sewer connected to the building.

Exception: Where the public or private sewer is not of sufficient depth, or where structures required to be connected to the sewer cannot meet the minimum requirements of this section and other ordinances, the *building official* may authorize the issuance of a *permit* for an alternate method of construction or installation when this will not be detrimental to the health, welfare, and safety of the public.

R404.1.2 Concrete foundation walls. Concrete foundation walls that support light-frame walls shall be designed and constructed in accordance with the provisions of this section, ACI 318, ACI 332 or PCA 100. Concrete foundation walls that support above-grade concrete walls that are within the applicability limits of Section R611.2 shall be designed and constructed in accordance with the provisions of this section, ACI 318, ACI 332 or PCA 100. Concrete foundation walls that support above-grade concrete walls that are not within the applicability limits of Section R611.2 shall be designed and constructed in accordance with the provisions of ACI 318, ACI 332 or PCA 100. ~~When ACI 318, ACI 332, PCA 100 or the provisions of this section are used to design concrete foundation walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the *jurisdiction* having authority.~~

CHAPTER 5
FLOORS

R501.3 Fire protection of floors. Floor assemblies, not required elsewhere in this code to be fire-resistance rated, shall be provided with a ½-inch (12.7 mm) gypsum wallboard membrane, ⅝-inch (16 mm) wood structural panel membrane, or equivalent on the underside of the floor framing member where the underside of the floor framing is exterior to the building or is exposed to a room below.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA13D, or other approved equivalent sprinkler system.
2. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.
3. Portions of floor assemblies can be unprotected when complying with the following:
   - 3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story
   - 3.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.
4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

CHAPTER 6
TYPES OF CONSTRUCTION

R611.1 General. Exterior concrete walls shall be designed and constructed in accordance with the provisions of this section or in accordance with the provisions of PCA 100 or ACI 318. ~~When PCA 100, ACI 318 or the provisions of this section are used to design concrete walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the jurisdiction having authority.~~

R613.1 General. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this section. ~~When the provisions of this section are used to design structural insulated panel walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the jurisdiction having authority.~~

CHAPTER 8
ROOF-CEILING CONSTRUCTION

R807.1 Attic access. Buildings with combustible ceiling or roof construction shall have an *attic* access opening to *attic* areas that exceed 30 square feet (2.8 m^2) and have a vertical height of 30 inches (762 mm) or greater. The vertical height shall be measured from the top of the ceiling framing members to the underside of the roof framing members.

The rough-framed opening shall not be less than 22 inches by 30 inches (559 mm by 762 mm) and shall be located in a hallway or other readily accessible location. When located in a wall, the opening shall be a minimum of 22 inches wide by 30 inches high (559 mm wide by 762 mm high). When the access is located in a ceiling, minimum unobstructed headroom in the *attic* space shall be 30 inches (762 mm) at some point above the access measured vertically from the bottom of ceiling framing members. Stairs or ladders used only to attend equipment are not considered a stairway. See Section M1305.1.3 for access requirements where mechanical *equipment* is located in *attics.*

CHAPTER 9
ROOF ASSEMBLIES

R902.1 Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A. B or C roofing shall be installed in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a lot line. Classes A, B and C roofing required by this section to be listed shall be tested in accordance with UL 790 or ASTM E 108.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry and exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.
3. Class A roof assemblies include minimum 16 oz/ft^2 copper sheets installed over combustible decks.
4. Residential outbuildings.

CHAPTER 10
CHIMNEYS AND FIREPLACES

R1006.2 Exterior air intake. The exterior air intake shall be capable of supplying all *combustion air* from the exterior of the *dwelling* or from spaces within the *dwelling* ventilated with outside air such as nonmechanically ventilated crawl or *attic* spaces. The exterior air intake shall not be located within the garage or *basement* of the *dwelling* ~~nor shall the air intake be located at an elevation higher than the firebox~~. The exterior air intake shall be covered with a corrosion-resistant screen of ¼-inch (6 mm) mesh.

Part IV—Energy Conservation

CHAPTER 11 [RE]
ENERGY EFFICIENCY

N1101.1 Scope. ~~This chapter~~ The *International Energy Conservation Code* regulates the energy efficiency for the design and construction of buildings regulated by this code.

{**EDITORIAL NOTE: DELETE** THE REMAINDER OF THIS CHAPTER IN ITS ENTIRETY.}

Part V—Mechanical

CHAPTER 12
MECHANICAL ADMINISTRATION

1201.1 Scope. The provisions of Chapters 12 through 24 shall regulate the design, installation, maintenance, *alteration* and inspection of mechanical systems that are permanently installed and used to control environmental conditions within buildings. These chapters shall also regulate those mechanical systems, system components, *equipment* and *appliances* specifically addressed in this code. The administrative provisions of the *Mechanical Code* shall govern Chapters 12 through 23 and the mechanical provisions of Chapter 24.

M1202.3 Maintenance. Mechanical systems, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe and sanitary condition. Devices or safeguards that are required by this code shall be maintained in compliance with the code edition under which installed. The owner or the owner's designated agent shall be responsible for maintenance of the mechanical systems. ~~To determine compliance with this provision, the *building official* shall have the authority to require a mechanical system to be reinspected.~~

CHAPTER 13

GENERAL MECHANICAL GENERAL MECHANICAL SYSTEM REQUIREMENTS

M1305.1.3 Appliances in attics. *Attics* containing *appliances* shall be provided with pull down stair large enough to allow removal of the largest appliance and not less than 22 inches in width with a load capacity of not less than 350 pounds ~~an opening~~ and a clear and unobstructed passageway large enough to allow removal of the largest *appliance,* but not less than 30 inches (762 mm) high and ~~22 inches (559 mm)~~ 30 inches (762 mm) wide and not more than 20 feet (6096 mm) long measured along the centerline of the passageway from the opening to the *appliance.* The passageway shall have continuous solid flooring in accordance with Chapter 5 not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the *appliance* where access is required. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm), and large enough to allow removal of the largest appliance.

Exceptions:

1. The passageway and level service space are not required where the *appliance* can be serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet (1829 mm) high and 22 inches (559 mm) wide for its entire length, the passageway shall be not more than 50 feet (15 250 mm) long.
3. The opening is through a vertical door on the same level as the equipment with a minimum clear access opening of 30 inches (762 mm) high and 22 inches (559 mm) wide and large enough to allow removal of the largest appliance.

M1305.1.4 Appliances under floors. Underfloor spaces containing *appliances* shall be provided with an unobstructed passageway large enough to remove the largest appliance, but not less than 30 inches (762 mm) high and ~~22 inches (559 mm)~~ 30 inches (762 mm) wide, nor more than 20 feet (6096 mm) long measured along the centerline of the passageway from the opening to the *appliance*. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the *appliance*. If the depth of the passageway or the service space exceeds 12 inches (305 mm) below the adjoining grade, the walls of the passageway shall be lined with concrete or masonry extending 4 inches (102 mm) above the adjoining grade in accordance with Chapter 4. The rough-framed access opening dimensions shall be a minimum of ~~22 inches~~30 inches (762 mm) by 30 inches (~~559 mm by~~ 762 mm), and large enough to remove the largest appliance.

Exceptions:

1. The passageway is not required where the level service space is present when the access is open, and the *appliance* can be serviced and removed through the required opening.
2. Where the passageway is unobstructed and not less than 6 feet high (1929 mm) and 22 inches (559 mm) wide for its entire length, the passageway shall not be limited in length.

M1305.1.4.3 Electrical requirements. A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be installed at or near the *appliance* location in accordance with the *Electrical Code* ~~Chapter 39~~.

CHAPTER 14
HEATING AND COOLING EQUIPMENT AND APPLIANCES

M1401.2 Access. Heating and cooling *equipment* and appliances shall be located with respect to building construction and other *equipment* and appliances to permit maintenance, servicing and replacement. Clearances shall be maintained to permit cleaning of heating and cooling surfaces; replacement of filters, blowers, motors, controls and vent connections; lubrication of moving parts; and adjustments. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present along all sides of the appliance where access is required.

> **Exception:** Access shall not be required for ducts, piping, or other components approved for concealment.

M1411.3 Condensate disposal. Condensate from all cooling coils or evaporators shall be conveyed from the drain pan outlet to an *approved plumbing fixture or* ~~place of~~ disposal area. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than ⅛ unit vertical in 12 units horizontal (1-percent slope). Condensate shall not discharge into a street, alley or other areas where it would cause a nuisance. Drain pans and coils shall be arranged to allow thorough drainage and access for cleaning. Primary drain piping inside buildings shall be insulated for the first 15 feet horizontally from the drain pan.

CHAPTER 15
EXHAUST SYSTEMS

M1502.4.4.1 Specified length. The maximum length of the exhaust duct shall be 35 feet (10 668 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table M1502.4.4.1. The maximum length of the exhaust duct does not include the transition duct.

Exception: Listed booster fans installed per manufacturer's specifications may be provided to extend the maximum length of exhaust duct.

M1502.4.5 Length identification. Where the exhaust duct is concealed within the building construction, and overall length as specified in M1502.4.4.1 exceeds 35 feet (10 688 mm), the equivalent length of the exhaust duct shall be identified on a permanent label or tag. The label or tag shall be located within 6 feet (1829 mm) of the exhaust duct connection.

M1503.2 Duct material. Single-wall ducts serving range hoods shall be constructed of galvanized steel, stainless steel or copper.

Exception: Ducts for domestic kitchen cooking *appliances* equipped with down-draft exhaust systems shall be permitted to be constructed of schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:

1. The duct is installed under a concrete slab poured on grade;
2. The underfloor trench in which the duct is installed is completely backfilled with sand or gravel;
3. The PVC duct extends not more than 6 inches (152.4 mm) ~~1 inch (25 mm)~~ above the indoor concrete floor surface;
4. The PVC duct extends not more than 12 inches (304.8 mm) ~~1 inch (25 mm)~~ above grade *outside of the building*; and
5. The PVC ducts are solvent cemented.

SECTION M1508
MAKE UP AIR

M1508.1 Make up air. When a closet is designed for the installation of a clothes dryer, a minimum opening of 100 square inches (1.0645 m^2) for makeup air shall be provided in the door or by other approved means.

CHAPTER 16
DUCT SYSTEMS

M1601.1.1 Above-ground duct systems. Above-ground *duct systems* shall conform to the following:

1. *Equipment* connected to *duct systems* shall be designed to limit discharge air temperature to a maximum of 250°F (121°C).
2. Factory-made air ducts shall be constructed of Class 0 or Class 1 materials as designated in Table M1601.1.1 (1).
3. Fibrous duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.
4. Minimum thickness of metal duct material shall be as listed in Table M1601.1.1 (2). Galvanized steel shall conform to ASTM A 653. Metallic ducts shall be fabricated in accordance with SMACNA Duct Construction Standards Metal and Flexible.
5. Use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
6. *Duct systems* shall be constructed of materials having a flame spread index not greater than 200.
7. Stud wall cavities ~~and the spaces between solid floor joists~~ to be used as air plenums shall comply with the following conditions:
    - 7.1. These cavities or spaces shall not be used as a plenum for supply air.
    - 7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
    - 7.3. Stud wall cavities shall not convey air from more than one floor level.
    - 7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fireblocking in accordance with Section R602.8.
    - 7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.
8. Wood floor joists or trusses that serve dwelling units shall not be located within a return air plenum.

M1601.4.3 Support. Metal ducts shall be supported by 1½~~-~~inch-wide (26~~ 13~~ mm) 24~~18~~-gage metal straps or 12-gage galvanized wire at intervals not exceeding 10 feet (3048 mm) or other *approved* means. Nonmetallic ducts shall be supported in accordance with the manufacturer's installation instructions.

M1601.4.9 Flood hazard areas. In flood hazard areas as established by Table R301.2(1), *duct systems* shall be located or installed in accordance with Chapter 19 of the *City Code* ~~Section R322.1.6~~.

SECTION M1603
CENTRAL VACUUM SYSTEMS

M1603.1 Central vacuum systems. Ducts used in central vacuum-cleaning systems within a dwelling unit shall be permitted to be of PVC pipe. Penetrations of fire walls, rated floor-ceiling or rated roof-ceiling assemblies shall comply with this code. Copper or ferrous pipes or conduits shall be used to extend through the wall assembly separation between a garage and a dwelling unit for a central vacuum unit.

CHAPTER 19
SPECIAL APPLIANCES, EQUIPMENT AND SYSTEMS

M1904.1 Installation. Gaseous hydrogen systems shall be installed in accordance with the applicable requirements of Sections M1307.4 and M1903.1 and ~~the *International Fuel Gas Code,*~~ the ~~*International*~~ *Fire Code* and the ~~*International*~~ *Building Code*.

CHAPTER 22
SPECIAL PIPING AND STORAGE SYSTEMS

M2201.1 Materials. Supply tanks shall be *listed* and *labeled* and shall conform to UL 58 for underground tanks and UL 80 for indoor tanks.

NOTE: All special pipe and storage systems shall conform to Chapter 57 of the *Fire Code*.

Part VI—Fuel Gas

CHAPTER 24
FUEL GAS

G2401.1 (101.2) Application. This chapter covers those *fuel gas piping systems,* fuel-gas *appliances* and related accessories, *venting systems* and *combustion air* configurations most commonly encountered in the construction of one- and two-family dwellings and structures regulated by this *code.*

Coverage of *piping systems* shall extend from the *point of delivery* to the outlet of the *appliance* shutoff *valves* (see definition of *"Point of delivery"). Piping systems* requirements shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation and maintenance. Requirements for gas *appliances* and related accessories shall include installation, *combustion* and ventilation air and venting and connections to *piping systems.*

The omission from this chapter of any material or method of installation provided for in the ~~*International Fuel Gas*~~ *Plumbing Code* shall not be construed as prohibiting the use of such material or method of installation. *Fuel-gas piping systems,* fuel-gas *appliances* and related accessories, *venting systems* and *combustion air* configurations not specifically covered in these chapters shall comply with the applicable provisions of the ~~*International Fuel Gas*~~ *Construction Code.*

Gaseous hydrogen systems shall be regulated by the *International* ~~*Fuel Gas*~~ *Fire Code.*

This chapter shall not apply to the following:

1. Liquefied natural gas (LNG) installations.
2. Temporary *LP-gas piping* for buildings under construction or renovation that is not to become part of the permanent *piping system.*
3. Except as provided in Section G2412.1.1, *gas piping, meters,* gas *pressure regulators,* and other appurtenances used by the serving gas supplier in the distribution of gas~~, other than undiluted LP-gas~~.
4. Portable LP-gas *appliances* and *equipment* of all types that is not connected to a fixed fuel *piping system.*
5. Portable fuel cell *appliances* that are neither connected to a fixed *piping system* nor interconnected to a power grid.
6. Installation of hydrogen gas, LP-gas and compressed natural gas (CNG) systems on vehicles.
7. Liquid petroleum gas facilities regulated by the Railroad Commission of Texas pursuant to Chapter 113 of the *Texas Natural Resources Code*.

NOTE: All fuel oil facilities and piping shall conform to Chapter 57 of the *International Fire Code*.

G2404.7 (301.11) Flood hazard. For structures located in flood hazard areas, the appliance, equipment and system installations regulated by this code shall be located at or above the elevation required by Chapter 19 of the *City Code* ~~Section R322 for utilities and attendant equipment~~.

~~**Exception:** The appliance, equipment and system installations regulated by this code are permitted to be located below the elevation required by Section R322 for utilities and attendant equipment provided that they are designed and installed to prevent water from entering or~~

~~accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to such elevation.~~

G2406.2 (303.3) Prohibited locations. *Appliances* shall not be located in sleeping rooms, bathrooms, toilet rooms, storage closets or surgical rooms, or in a space that opens only into such rooms or spaces, except where the installation complies with one of the following:

1. The *appliance* is a direct-vent *appliance* installed in accordance with the conditions of the listing and the manufacturer's instructions.
2. *Vented room heaters*, wall *furnaces*, vented decorative *appliances*, vented gas *fireplaces*, vented gas *fireplace* heaters and decorative *appliances* for installation in vented solid fuel-burning *fireplaces* are installed in rooms that meet the required volume criteria of Section G2407.5.
3. ~~A single wall-mounted *unvented room heater* is installed in a bathroom and such *unvented room heater* is equipped as specified in Section G2445.6 and has an input rating not greater than 6,000 *Btu*/h (1.76 kW). The bathroom shall meet the required volume criteria of Section G2407.5.~~
4. ~~A single wall-mounted *unvented room heater* is installed in a bedroom and such *unvented room heater* is equipped as specified in Section G2445.6 and has an input rating not greater than 10,000 *Btu*/h (2.93 kW). The bedroom shall meet the required volume criteria of Section G2407.5.~~
5. ~~5.~~ The *appliance* is installed in a room or space that opens only into a bedroom or bathroom, and such room or space is used for no other purpose and is provided with a solid weather-stripped door equipped with an *approved* self-closing device. All *combustion air* shall be taken directly from the outdoors in accordance with Section G2407.6.

G2411.1.1 (310.1.1) CSST. Corrugated stainless steel tubing (CSST) gas *piping* systems shall be bonded to the electrical service grounding electrode system. The bonding jumper shall connect to a metallic pipe or fitting between the *point of delivery* and the first downstream CSST fitting. The bonding jumper shall be not smaller than 6 AWG copper wire or equivalent. Gas piping systems that contain one or more segments of CSST shall be bonded in accordance with this section. Corrugated stainless steel (CSST) gas piping systems shall be bonded per the manufacturer's installation instructions.

G2412.2 (401.2) Liquefied petroleum gas storage. The storage system for *liquefied petroleum gas* shall be designed and installed in accordance with the *International Fire Code*, ~~and~~ NFPA 58, and applicable State laws that are administered by the Texas Railroad Commission**.**

G2413.3 (402.3) Sizing. *Gas piping* shall be sized in accordance with ~~one of the following:~~ Tables G2413.4(1) through G2413.4(21). CSST piping shall be sized according to manufacturer's recommendations and the *Plumbing Code*.

1. ~~*Pipe* sizing tables or sizing equations in accordance with Section G2413.4.~~
2. ~~The sizing tables included in a listed *piping* system's manufacturer's installation instructions.~~
3. ~~Other *approved* engineering methods.~~

~~**G2413.6 (402.6) Maximum design operating pressure.** The maximum design operating pressure for *piping systems* located inside buildings shall not exceed 5 pounds per square inch gauge (psig) (34 kPa gauge) except where one or more of the following conditions are met:~~

~~1. The *piping system* is welded.~~

~~2. The *piping* is located in a ventilated chase or otherwise enclosed for protection against accidental gas accumulation.~~

~~3. The *piping* is a temporary installation for buildings under construction.~~

G2414.10.4 (403.10.4) Metallic fittings. Metallic fittings, including *valves*, strainers and filters shall comply with the following:

1. Fittings used with steel or wrought-iron *pipe* shall be steel, brass, bronze, malleable iron, ductile iron or cast iron.
2. Fittings used with copper or brass *pipe* shall be copper, brass or bronze.
3. Brass or bronze fittings, if exposed to soil, shall have a minimum 80-percent copper content.
4. Cast-iron bushings shall be prohibited.
45. Special fittings. Fittings such as couplings, proprietary-type joints, saddle tees, gland-type compression fittings, and flared, flareless or compression-type *tubing* fittings shall be: used within the fitting manufacturer's pressure-temperature recommendations; used within the service conditions anticipated with respect to vibration, fatigue, thermal expansion or contraction; installed or braced to prevent separation of the joint by gas pressure or external physical damage; and shall be *approved*.

G2415.6 (404.6) Underground penetrations prohibited. *Gas piping* shall not penetrate building foundation walls at any point below grade. *Gas piping* shall enter and exit a building at a point above grade and the annular space between the *pipe* and the wall shall be sealed at the point where it enters the building, and the sleeve shall be vented to the outside of the building.

G2415.11 (404.11) Protection against corrosion. Metallic *pipe* or *tubing* exposed to corrosive action, such as soil condition or moisture, shall be protected in an *approved* manner. Zinc coatings (galvanizing) shall not be deemed adequate protection for *gas piping* underground. Where dissimilar metals are joined ~~underground~~, an insulating coupling or fitting shall be used. *Piping* shall not be laid in contact with cinders.

G2415.12.1 (404.12.1) Individual outside appliances. Individual lines to outside lights, grills or other *appliances* shall be installed a minimum of 12 inches (304.56 mm) ~~8 inches (203 mm)~~ below finished grade, provided that such installation is *approved* and is installed in locations not susceptible to physical damage.

G2415.17.1 (404.17.1) Limitations. Plastic *pipe* shall be installed outdoors underground only, with a minimum depth of 18 inches of cover. Plastic *pipe* shall not be used within or under any building or slab or be operated at pressures greater than 100 psig (689 kPa) for natural gas or 30 psig (207 kPa) for LP-gas.

Exceptions:

1. Plastic *pipe* shall be permitted to terminate above ground outside of buildings where installed in premanufactured *anodeless risers* or service head adapter risers that are installed in accordance with the manufacturer's installation instructions.

2. Plastic *pipe* shall be permitted to terminate with a wall head adapter within buildings where the plastic pipe is inserted in a *piping* material for *fuel gas* use in buildings.

3. Plastic pipe shall be permitted under outdoor patio, walkway and driveway slabs provided that the burial depth complies with Section G2415.10.

G2417.1.1 (406.1.1) Inspections. Inspection shall consist of visual examination, during or after manufacture, fabrication, assembly ~~or~~ and *pressure tests* as appropriate. The *building official* shall make the following inspections and either approve the portion of the work as completed or notify the permit holder that the same fails to comply with this code:

1. **Rough Piping Inspection.** This inspection shall be made after all gas piping authorized by the *permit* has been installed and before any such piping has been covered or concealed, or any fixture or appliance has been attached thereto. This inspection shall include a determination that the gas piping size, material, and installation meet the requirements of this code. This inspection shall also include a pressure test. The gas piping shall pass an air pressure test of 25 psi (172 kPa) for a period of 15 minutes with no perceptible drop in pressure.

   For metal welded piping and for piping carrying gas at pressure in excess of 14 inches (355.6 mm) water column pressure, the test pressure shall not be less than 100 psi (689 kPa) for 30 minutes. These tests shall be made using air, CO, or nitrogen pressure only and shall be made in the presence of the inspector. All necessary apparatus for conducting tests shall be furnished by the permit holder.

2. **Final Piping Inspection**. This inspection shall be made after all piping authorized by the *permit* has been installed and after all portions thereof which are to be covered or concealed are so concealed and after all fixtures, appliances, or shutoff valves have been attached thereto, and after the completed system is ready to be put in service. This inspection shall include an air, CO, or nitrogen pressure test at a pressure measured with a manometer or slope gauge for a period of not less than 15 minutes, with no perceptible drop in pressure. The test pressure shall not be less than twice the pressure that the system will be subjected to when in service. These tests shall be made in the presence of the inspector. All necessary apparatus for conducting tests shall be furnished by the permit holder. A final inspection shall be required for all gas systems that require a *permit* as defined in the *Plumbing Code*.

For annual gas tests and gas turn-ons, the tests shall be done at the pressure required for the final gas inspection.

G2417.4 (406.4) Test pressure measurement. Test pressure shall be measured with a manometer or with ~~a~~ an *approved* pressure-measuring device designed and calibrated to read, record, or indicate a pressure loss caused by leakage during the *pressure test* period. The source of pressure shall be isolated before the *pressure tests* are made. Mechanical gauges used to measure test pressures shall have a range such that the highest end of the scale is not greater than five times the test pressure.

G2417.4.1 (406.4.1) Test pressure. The test pressure to be used shall be not less than one and one-half times the proposed maximum working pressure, but not less than 3 psig (20 kPa gauge), irrespective of design pressure. Where the test pressure exceeds 125 psig (862 kPa gauge), the test pressure shall not exceed a value that produces a hoop stress in the *piping* greater than 50 percent of the specified minimum yield strength of the *pipe*. The following alternative pressure measuring devices are *approved*:

1. **Low Pressure Systems.** A low pressure diaphragm gauge with a minimum dial size of 3½ inches (88.9 mm) with a set hand and a pressure range not to exceed 6 psi with 1/10 pound (0.69 kPa) increments. The minimum test pressure shall not be less than 3 psi, and the maximum test pressure to be applied shall not exceed 4 ps**i.**
2. **Medium Pressure Systems.** A diaphragm type pressure gauge with a minimum dial size of 3½ inches (88.9 mm) with a set hand and a pressure range not to exceed 20 psi with 2/10 pound (1.38 kPa) increments. The minimum test pressure shall not be less than 10 psi, and the maximum test pressure shall not exceed 12 psi.
3. **High Pressure Systems.** Gauges for high pressure test shall be as follows:
   a. Required pressure tests that exceed 10 pounds (69 kPa) but do not exceed 100 pounds (689 kPa) shall be performed with gauges that have 1 pound (6.9 kPa) increments or less.
   b. Required pressure tests that exceed 100 pounds (689 kPa) shall be performed with gauges incremented for 2 percent or less of the required test pressure.

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

G2417.4.2 (406.4.2) Test duration. The test duration shall be not less than ~~10~~ 15 minutes.

G2418.2 (407.2) Design and installation. *Piping* shall be supported with metal *pipe* hooks, metal *pipe* straps, metal bands, metal brackets, metal hangers or building structural components suitable for the size of *piping*, of adequate strength and quality, and located at intervals so as to prevent or damp out excessive vibration. *Piping* shall be anchored to prevent undue strains on connected *appliances* and shall not be supported by other *piping* or *equipment*. *Pipe* hangers and supports shall conform to the requirements of MSS SP-58 and shall be spaced in accordance with Section G2424. Supports, hangers and anchors shall be installed so as not to interfere with the free expansion and contraction of the *piping* between anchors. All parts of the supporting *equipment* shall be designed and installed so that they will not be disengaged by movement of the supported *piping*.

G2419.4 (408.4) Sediment trap. Where a sediment trap is not incorporated as part of the appliance, a sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical. The sediment trap shall be either a tee fitting having a capped nipple ~~of any length installed vertically~~ in the bottom most opening of the tee, as illustrated in Figure G2419.4 or other device approved as an effective sediment trap. Illuminating appliances, ranges, clothes dryers, decorative vented appliances for installation in vented fireplaces, gas fireplaces, and outdoor grills need not be so equipped.

{**EDITORIAL NOTE:** DELETE FIGURE 2419.4 AND REPLACE WITH FIGURE 1211.8 OF THE *2012 UNIFORM PLUMBING CODE*.}

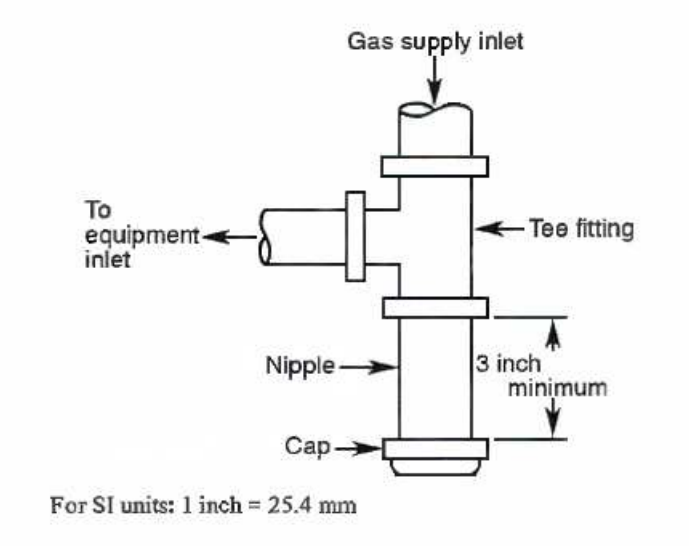


FIGURE 2419.4
METHOD OF INSTALLING A TEE FITTING SEDIMENT TRAP
[NFPA 54: FIGURE 9.6.7]

G2423.1 (413.1) General. Motor fuel-dispensing facilities for CNG fuel and their operation shall be in accordance with ~~Section 413 of~~ the *International ~~Fuel Gas~~ Fire Code*.

G2425.8 (501.8) Appliances not required to be vented. The following *appliances* shall not be required to be vented:

1. Ranges.
2. Built-in domestic cooking units listed and marked for optional venting.
3. Hot plates and laundry stoves.
4. *Type 1 clothes dryers* (*Type 1 clothes dryers* shall be exhausted in accordance with the requirements of Section G2439).
5. Refrigerators.
6. Counter *appliances*.
7. ~~Room heaters listed for unvented use.~~

Where the *appliances* listed in Items 5 and 6 ~~through 7~~ above are installed so that the aggregate input rating exceeds 20 *Btu* per hour per *cubic foot* (207 W/m^3) of volume of the room or space in which such *appliances* are installed, one or more shall be provided with venting *systems* or other *approved* means for conveying the *vent gases* to the outdoor atmosphere so that the aggregate input rating of the remaining *unvented appliances* does not exceed 20 *Btu* per hour per *cubic foot* (207 W/m^3). Where the room or space in which the *appliance* is installed is directly connected to another room or space by a doorway, archway or other opening of comparable size that cannot be closed, the volume of such adjacent room or space shall be permitted to be included in the calculations.

G2439.5.5.1 (614.6.5.1) Specified length. The maximum length of the exhaust duct shall be 35 feet (10 668 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table G2439.5.5.1.

Exception: Listed booster fans installed per manufacturers specifications may be provided to extend the maximum length of exhaust duct.

G2439.5.6 (614.6.5) Length identification. Where the exhaust duct is concealed within the building construction, and overall length as specified in G2439.5.5.1 exceeds 35 feet (10 688 mm), the equivalent length of the exhaust duct shall be identified on a permanent label or tag. The label or tag shall be located within 6 feet (1829 mm) of the exhaust duct connection.

G2445.1 ~~(621.1) General~~. ~~*Unvented room heaters* shall be tested in accordance with ANSI Z 21.11.2 and shall be installed in accordance with the conditions of the listing and the manufacturer's installation instructions.~~ **Unvented.** Unvented fuel-burning room heaters and decorative appliances shall be prohibited.

{**EDITOR'S NOTE: DELETE** REMAINDER OF SECTION G2445.}

G2447.2 (623.2) Prohibited location. Cooking appliances designed, tested, listed and labeled for use in commercial occupancies shall only ~~not~~ be installed within dwelling units or within any area where domestic cooking operations occur when in compliance with the ventilation and clearance to combustibles requirements for commercial cooking appliances in the *Mechanical Code*.

Part VII—Plumbing

CHAPTER 27
PLUMBING FIXTURES

P2708.1 General. Shower compartments shall have not less than 1024 square inches (0.827 m^2) ~~900 square inches (0.6 m^2)~~ of interior cross-sectional area. Shower compartments shall be not less than 30 inches (762 mm) in minimum dimension measured from the finished interior dimension of the shower compartment, exclusive of fixture valves, shower heads, soap dishes, and safety grab bars or rails. The minimum required area and dimension shall be measured from the finished interior dimension at a height equal to the top of the threshold and at a point tangent to its centerline and shall be continued to a height of not less than 70 inches (1778 mm) above the shower drain outlet. Hinged shower doors shall open outward. The wall area above built-in tubs having installed shower heads and in shower compartments shall be constructed in accordance with Section R702.4. Such walls shall form a water-tight joint with each other and with either the tub, receptor or shower floor.

Exceptions:

1. Fold-down seats shall be permitted in the shower, provided the required 1024 square inches (0.827 m^2) ~~900 square inches (0.6 m^2)~~ dimension is maintained when the seat is in the folded-up position.
2. When replacing standard size bathtubs of 30 inches by 60 inches, shower compartments having not less than 25 inches (635 mm) in minimum dimension measured from the finished interior dimension of the compartment provided that the shower compartment has a cross-sectional area of not less than 1,300 square inches (0.838 m^2).

P2709.5 Test for shower receptors. Shower receptors shall be tested for water-tightness by filling with water to the level of the rough threshold. The test plug shall be so placed that both upper and under sides of the sub-pan shall be subjected to the test at the point where it is clamped to the drain.

P2717.3 Sink, dishwasher and food grinder. The combined discharge from a sink, dishwasher, and waste grinder is permitted to discharge through a single 1½-inch (38 mm) trap. The discharge pipe from the dishwasher shall be increased to not less than ¾ inch (19 mm) in diameter and shall connect ~~with a wye fitting between the discharge of the food-waste grinder and the trap inlet or~~ to the head of the food grinder. The dishwasher waste line shall rise and be securely fastened to the underside of the counter before connecting to the sink tail piece or the food grinder.

CHAPTER28
WATER HEATERS

P2803.6.1 Requirements for discharge pipe. The discharge piping serving a pressure-relief valve, temperature relief valve or combination valve shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the water heater.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, ~~to the pan serving the water heater or storage tank,~~ to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of the piping.
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section P2905.5 or materials tested, rated and *approved* for such use in accordance with ASME A112.4.1.

CHAPTER 29
WATER SUPPLY AND DISTRIBUTION

P2902.5.1 Connections to boilers. The potable supply to the boiler shall be equipped with a reduced pressure principle backflow preventer ~~with an intermediate atmospheric vent complying with ASSE 1012 or CSA B64.3. Where conditioning chemicals are introduced into the system, the potable water connection shall be protected by an air gap or a reduced pressure principle backflow preventer~~ complying with ASSE 1013, CSA B64.4 or AWWA C511.

P2902.5.5 Solar systems. The potable water supply to a solar system shall be equipped with a backflow preventer ~~with intermediate atmospheric vent complying with ASSE 1012 or a reduced pressure principle backflow preventer complying with ASSE 1013~~. Where chemicals are used, the potable water supply shall be protected by a reduced pressure principle backflow preventer.

> **Exception:** Where all solar system piping is a part of the potable water distribution system, in accordance with the requirements of the ~~*International*~~ *Plumbing Code*, and all components of the piping system are listed for potable water use, cross-connection protection measures shall not be required.

TABLE P2903.2
MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS[b]

PLUMBING FIXTURE OR FIXTURE FITTING	PLUMBING FIXTURE OR FIXTURE FITTING
Lavatory faucet	2.2 gpm at 60 psi
Shower head[a]	2.5 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Water closet	1.28 ~~1.6~~ gallons per flushing cycle

For SI: 1 gallon per minute = 3. 785 L/m,
1 pound per square inch = 6.895 kPa.

a. A handheld shower spray is also a shower head.
b. Consumption tolerances shall be determined from referenced standards.

P2904.1 General. The design and installation of residential fire sprinkler systems shall be in accordance with NFPA 13D or Section P2904, which shall be considered equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a residential sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall provide domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system. ~~A backflow preventer shall not be required to separate a stand-alone sprinkler system from the water distribution system.~~

P2905.8 Joint and connection tightness. Joints and connections in the plumbing system shall be gas tight and water tight for the intended use or required test pressure. No joints shall be permitted under slabs.

P2905.17.2 Plastic pipe or tubing to other piping material. Joints between different types of plastic pipe or between plastic pipe and other piping material shall be made with an approved adapter fitting. Plastic adapter fittings shall be male only.

CHAPTER 30
SANITARY DRAINAGE

P3001.3 Flood-resistant Installation. In flood hazard areas as established by Chapter 19 of the *City Code* ~~Table R301.2(1)~~, drainage, waste and vent systems shall be located and installed to prevent infiltration of floodwaters into the systems and discharges from the systems into floodwaters.

P3002.3.1 Drainage. Drainage fittings shall have a smooth interior waterway of the same diameter as the piping served. All fittings shall conform to the type of pipe used. Drainage fittings shall have no ledges, shoulders or reductions which can retard or obstruct drainage flow in the piping. Threaded drainage pipe fittings shall be of the recessed drainage type, cast iron ~~black~~ or galvanized. Drainage fittings shall be designed to maintain one-fourth unit vertical in 12 units horizontal (2-percent slope) grade. This section shall not be applicable to tubular waste fittings used to convey vertical flow upstream of the trap seal liquid level of a fixture trap.

TABLE P3005.1
FITTINGS FOR CHANGE IN DIRECTION

TYPE OF FITTING PATTERN	CHANGE IN DIRECTION		
	Horizontal to vertical[c]	Vertical to horizontal	Horizontal to horizontal
Sixteenth bend	X	X	X
Eighth bend	X	X	X
Sixth bend	X	X	X
Quarter bend	X	~~X~~[a]	~~X~~[a]
Short sweep	X	X[a, b]	X[a]
Long sweep	X	X	X
Sanitary tee	X[c]	--	--
Wye	X	X	X
Combination wye and eighth bend	X	X	X

For SI: 1 inch = 25.4 mm.
a. The fittings shall only be permitted for a 2-inch or smaller fixture drain.
b. Three inches and larger.
c. For a limitation on multiple connection fittings, see Section P3005.1.1.

P3005.4.1 Branch and stack sizing. Branches and stacks shall be sized in accordance with Table P3005.4.1. Below grade drain pipes shall be not less than 2 inches (50 mm) ~~1½ inches (38 mm)~~ in diameter. Drain stacks shall be not smaller than the largest horizontal branch connected.

Exceptions:

1. A 4-inch by 3-inch (102 mm by 76 mm) closet bend or flange.
2. A 4-inch (102 mm) closet bend connected to a 3-inch (76 mm) stack tee shall not be prohibited.

CHAPTER 31
VENTS

P3114.3 Where permitted. Individual vent~~s, branch vents, circuit vents and stack vents~~ shall be permitted to terminate with a connection to *an air admittance valve*. Individual and branch type air admittance valves shall vent only fixtures that are on the same floor level and connect to a horizontal branch drain.

P3114.4 Location. ~~Individual and branch~~ The *air admittance valves* shall be located ~~not less than 4 inches (102 mm) above the horizontal branch drain or *fixture drain* being vented. Stack-type air admittance valves shall be located not less than~~ 6 inches (152 mm) above the flood level rim of the ~~highest~~ fixture ~~being vented~~. The *air admittance valve* shall be located within the maximum *developed length* permitted for the vent. The *air admittance valve* shall be installed not less than 6 inches (152 mm) above insulation materials where installed in *attics*.

CHAPTER 32
TRAPS

TABLE P3201.7
SIZE OF TRAPS AND TRAP ARMS FOR PLUMBING FIXTURES

PLUMBING FIXTURE	TRAP SIZE MINIMUM (inches)
Bathtub (with or without shower head and/or whirlpool attachments)	2 ~~1½~~
Bidet	1 ¼
Clothes washer standpipe	2
Dishwasher (on separate trap)	1½
Floor drain	2
Kitchen sink (one or two traps, with or without dishwasher and garbage grinder)	1½
Laundry tub (one or more compartments)	1½
Lavatory	1 ¼
Shower (based on the total flow rate through showerheads and body sprays) Flow rate: 5.7 gpm and less More than 5.7 gpm up to 12.3 gpm More than 12.3 gpm up to 25.8 gpm More than 25.8 gpm up to 55.6 gpm	 1½ 2 3 4
Water closet	3 ~~Note a~~

For SI: 1 inch= 25.4 mm.

~~a. Consult fixture standards for trap dimensions of specific bowls.~~

Part VIII—Electrical

{**EDITOR'S NOTE: DELETE** CHAPTERS 34-43 IN THEIR ENTIRETY.}

APPENDIX A
SIZING AND CAPACITIES OF GAS PIPING

(~~This appendix is informative and is not part of the *code*.~~ This appendix is an excerpt from the *2012 International Fuel Gas Code*, coordinated with the section numbering of the *International Residential Code*.)

{**EDITOR'S NOTE:** ALL OTHER PROVISIONS OF THIS APPENDIX REMAIN AS SET FORTH IN 2012 IRC.}

APPENDIX B

SIZING OF VENTING SYSTEMS SERVING APPLIANCES EQUIPPED WITH DRAFT HOODS, CATEGORY I APPLIANCES, AND APPLIANCES LISTED FOR USE WITH TYPE B VENTS

(~~This Appendix is informative and is not part of the Code.~~ This appendix is an excerpt from the *2012 International Fuel Gas Code,* coordinated with the section numbering of the *International Residential Code)*

{**EDITOR'S NOTE:** ALL OTHER PROVISIONS OF THIS APPENDIX REMAIN AS SET FORTH IN 2012 IRC.}

APPENDIX C
EXIT TERMINAL OF MECHANICAL DRAFT AND DIRECT-VENT VENTING SYSTEMS

(~~This appendix is informative and is not part of the Code.~~ This appendix is an excerpt from the *2012 International Fuel Gas Code,* coordinated with the section numbering of the *International Residential Code.)*

{**EDITOR'S NOTE:** ALL OTHER PROVISIONS OF THIS APPENDIX REMAIN AS SET FORTH IN 2012 IRC.}

APPENDIX H
PATIO COVERS

~~(This provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.)~~

{**EDITOR'S NOTE:** ALL OTHER PROVISIONS OF THIS APPENDIX REMAIN AS SET FORTH IN 2012 IRC.}

APPENDIX L

~~PERMIT FEES~~

{**EDITORIAL NOTE**: **DELETE** ENTIRE APPENDIX AND REPLACE WITH THE FOLLOWING.}

CONVENTIONAL LIGHT-FRAME WOOD CONSTRUCTION FOR SINGLE FAMILY RESIDENTIAL CONSTRUCTION IN HIGH-WIND AREAS

SECTION AL101
GENERAL

AL101.1 Scope. This chapter applies to regular-shaped single family residential buildings that are not more than three stories in height and are of conventional light-frame construction.

> **Exception:** Detached carports and garages not exceeding 700 square feet (65 m²) and accessory to Group R-3 occupancies need only comply with the roof-member-to-wall-tie requirements of Section AL103.8.

SECTION AL102
DEFINITION

CORROSION RESISTANT or NONCORROSIVE. Refers to a material having a corrosion resistance equal to or greater than a hot-dipped galvanized coating of 1.5 ounces of zinc per square foot (4 g/m²) of surface area. When an element is required to be corrosion resistant or noncorrosive, all of its parts, such as screws, nails, wire, dowels, bolts, nuts, washers, shims, anchors, ties and attachments, shall also be corrosion resistant or noncorrosive.

SECTION AL103
COMPLETE LOAD PATH AND UPLIFT TIES

AL103.1 General. Blocking, bridging, straps, approved framing anchors or mechanical fasteners shall be installed to provide continuous ties from the roof to the foundation system. Tie straps shall be 1⅛-inch (28.6 mm) by 0.036-inch (0.91 mm) (No. 20 gage) sheet steel and shall be corrosion resistant as herein specified. All metal connectors and fasteners used in exposed locations or in areas otherwise subject to corrosion shall be of corrosion-resistant or noncorrosive material. The number of common nails specified is the total required and shall be equally divided on each side of the connection. Nails shall be spaced to avoid splitting of the wood.

> **Exception:** Pre-manufactured connectors that provide equal or greater tie-down capacity may be used, provided that they are installed in compliance with all the manufacturer's specifications.

AL103.2 Wall-to-foundation tie. Exterior walls shall be tied to a continuous foundation system or an elevated foundation system in accordance with Section AL105.

AL103.3 Sills and foundation tie. Foundation plates resting on concrete or masonry foundations shall be bolted to the foundation with not less than ½-inch-diameter (13 mm) anchor bolts with 7-inch-minimum (178 mm) embedment into the foundation and spaced not more than 4 feet (1219 mm) on center.

AL103.4 Floor-to-foundation tie. The lowest-level exterior wall studs shall be connected to the foundation sill plate or an approved elevated foundation system with bent tie straps spaced not more than 32 inches (813 mm) on center. Tie straps shall be nailed with a minimum of 4 ten penny nails.

AL103.5 Wall framing details. The spacing of studs in exterior walls shall be in accordance with Chapter 23. Mechanical fasteners complying with this chapter shall be installed at a maximum of 32 inches (813 mm) on center as required to connect studs to the sole plates, foundation sill plate and top plates of the wall. The fasteners shall be nailed with a minimum of 8 eight penny nails.

Where openings exceed 4 feet (1219 mm) in width, the required tie straps shall be at each edge of the opening and connected to a doubled full-height wall stud. When openings exceed 12 feet (3658 mm) in width, two ties at each connection or a manufactured fastener designed to prevent uplift shall be provided.

AL103.6 Wall sheathing. All exterior walls and required interior main cross-stud partitions shall be sheathed in accordance with Chapter 23.

AL103.7 Floor-to-floor tie. Upper-level exterior wall studs shall be aligned and connected to the wall studs below with tie straps placed a minimum of 32 inches (813 mm) on center and connected with a minimum of 6 eight penny nails per strap.

AL103.8 Roof-members-to-wall tie. Tie straps shall be provided from the side of the roof-framing member to the supporting member below the roof. Tie straps shall be placed at every roof-framing member and connected with a minimum of 8 eight penny nails.

AL103.9 Ridge ties. Opposing common rafters shall be aligned at the ridge and be connected at the rafters with tie straps spaced a maximum of 32 inches (813 mm) on center and connected with 8 eight penny nails.

AL103.10 Gable-end walls. Gable-end wall studs shall be continuous between points of lateral support that are perpendicular to the plane of the wall. Gable-end wall studs shall be attached with approved mechanical fasteners at the top and bottom. Eight 8 penny nails shall be required for each fastener. Fasteners shall be spaced a maximum of 32 inches (813 mm) on center.

SECTION AL104
ROOFS

AL104.1 Roof sheathing. Solid roof sheathing shall be applied and shall consist of a minimum 1-inch-thick (25.4 mm) nominal lumber applied diagonally or a minimum 15/32-inch-thick (11.9 mm) wood structural panel or particle board (OSB) or other approved sheathing applied with the long dimension perpendicular to supporting rafters. Sheathing shall be nailed to roof framing in an approved manner. The end joints of wood structural panels or particle board shall be staggered and shall occur over blocking, rafters, or other supports.

AL104.2 Roof covering. Roof coverings shall be approved and shall be installed and fastened in accordance with Chapter 15 and with the manufacturer's instructions.

AL104.3 Roof overhang. The roof eave overhang shall not exceed 3 feet (914 mm) unless an analysis is provided showing that the required resistance is provided to prevent uplift. The roof overhang at gabled ends shall not exceed 2 feet (610 mm) unless an analysis showing that the required resistance to prevent uplift is provided.

SECTION AL105
ELEVATED FOUNDATION

AL105.1 General. When approved, elevated foundations supporting not more than one story and meeting the provisions of this section may be used. A foundation investigation may be required by the *building official*.

AL105.2 Material. All exposed wood-framing members shall be treated wood. All metal connectors and fasteners used in exposed locations shall be corrosion-resistant or noncorrosive steel.

AL105.3 Wood piles. The spacing of wood piles shall not exceed 8 feet (2438 mm) on center. Square piles shall not be less than 10 inches (254 mm) and tapered piles shall have a tip of not less than 8 inches (203 mm). Eight-inch-square (5161 mm²) piles shall have a minimum embedment length of 5 feet (1524 mm) and shall project not more than 8 feet (2438 mm) above undisturbed ground surface. Eight-inch (203 mm) taper piles shall have a minimum embedment length of 6 feet (1828 mm) and shall project not more than 7 feet (2134 mm) above undisturbed ground surface.

AL105.4 Girders. Floor girders shall consist of solid sawn timber, built-up 2-inch-thick (51 mm) lumber, or trusses. Splices shall occur over wood piles. The floor girders shall span in the direction parallel to the potential floodwater and wave action.

AL105.5 Connections. Wood piles may be notched to provide a shelf for supporting the floor girders. The total notching shall not exceed 50 percent of the pile cross section. Approved bolted connections with ¼-inch (6.4 mm) corrosion-resistant or noncorrosive steel plates and ¾-inch-diameter (19 mm) bolts shall be provided. Each end of the girder shall be connected to the piles using a minimum of two ¾-inch-diameter (19 mm) bolts.

APPENDIX M

~~HOME DAY CARE-R-3 OCCUPANCY~~

{**EDITOR'S NOTE: REPLACE APPENDIX M** WITH THE FOLLOWING.}

AIRPORT SOUND ATTENUATION REQUIREMENTS

SECTION AM101
GENERAL

AM101.1 Purpose. The purpose of this appendix to set forth sound attenuation specifications for buildings when such sound attenuation is required by Chapter 9, Article VI, of the *City Code* to achieve an interior sound level of 45 dBA.

AM101.2 Applicability. These provisions shall apply under circumstances where an airport land use permit is required under Section 9-381(a)(2) or (3) of the *City Code*, and are in addition to other applicable building standards set forth elsewhere in this code.

AM101.3 Alternate compliance. Alternative means or methods which equal or exceed the standards set forth in these provisions may be used when approved by the *building official* in accordance with section R104.9 of this code.

SECTION AM201
DEFINITIONS

AM201.1 Definitions. For purposes of these provisions, the following words shall have the meaning shown herein.

SOUND TRANSMISSION CLASS (STC). An integer rating relating to the quality of sound attenuation for building partitions such as walls, ceilings, doors, and windows.

SECTION AM301
WALLS

AM301.1 General. The specific exterior wall assemblies set forth in Sections AM301.2 and AM301.3 shall include the interior finishes set forth therein.

> **Exception:** Exterior wall assemblies or materials that have been tested or listed with a minimum STC rating of 40.

AM301.2 Brick veneer. When exterior walls are constructed using brick veneer, a minimum of ½ inch gypsum drywall shall be applied as the interior finish.

AM301.3 Vinyl or cement sidings. When exterior walls are constructed using vinyl or cement sidings, a minimum of ⅝ inch gypsum drywall shall be applied as the interior finish.

AM301.4 Other assemblies and materials. All other exterior wall assemblies or materials shall have a tested or listed minimum STC rating of 40.

SECTION AM401
WINDOWS

AM401.1 Windows. All windows shall have a minimum STC rating of 40 when tested in accordance with ASTM E 90.

AM401.2 Insulation at windows. The cavity between the wood framing and the window frame shall be insulated with fiberglass insulation or foam insulation to the depth of the window frame.

SECTION AM501
DOORS

AM501.1 Doors. All exterior doors shall have a minimum STC rating of 40 when tested in accordance with ASTM E 90.

> **Exception:** An exterior door may have a tested or listed STC rating of less than 40 when installed with a storm door which when combined, achieve a minimum tested or listed STC rating of 40.

SECTION AM601
ROOF/CEILING ASSEMBLIES

AM601.1 General. Roof/ceiling assemblies shall be constructed in accordance with the requirements of AM601.2 or AM601.3

> **Exception:** Roof/ceiling assemblies or materials that have been tested or listed with a minimum STC rating of 40.

AM601.2 Ceilings with unconditioned attic space above. Ceilings with unconditioned attic space shall be insulated with a minimum of ½ inch gypsum drywall on the interior ceiling side covered with a minimum of 12 inches of blown in fiberglass insulation.

AM601.3 Ceilings without attic space above. Ceilings without attic space above shall be insulated with a minimum of ⅝ inch gypsum drywall on the interior side filled with a minimum of 9 inches of fiberglass batt insulation with a 1 inch air space between the roof sheathing and the fiberglass.

APPENDIX V
VISITABILITY

SECTION AV101
SCOPE

AV101.1 Purpose. This set of standards is intended to provide minimum residential features to allow a mobility-impaired person to visit and use a home by providing:

1. One zero-step entrance at grade-level from the street, a driveway, garage, or an alley connecting to a 36 inch wide door.
2. Doors to kitchens, family rooms, living rooms, dining rooms and hallways on the ground level that are wide enough for wheelchair use.
3. At least one bathroom or half bath on ground level with sufficient room to allow a wheelchair to enter into the bathroom.

Exception: Where the grade-level floor plan does not include habitable rooms.

AV101.2 Application. Unless compliance is required by another law or regulation outside this code, compliance with this chapter is voluntary. Any owner who desires to comply with this chapter shall so advise the *building official* when the plans for the residence are filed, so that conformity with this chapter may be considered in the plan review and inspection process.

SECTION AV102
ZERO STEP ENTRANCE

AV102.1 Route. A 36 inch wide accessible route to the residence shall be provided by a smooth uninterrupted surface with slope not to exceed 1:12.

AV102.2 Ramp slope and rise. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 1:12. The maximum rise for any run shall be 30 inches (760 mm).

AV102.3 Special technical provisions for ramps. Curb ramps and interior or exterior ramps to be constructed on sites where space limitations prohibit the use of a 1:12 slope or less may have slopes and rises as follows:

1. A slope between 1:10 and 1:12 is allowed for a maximum rise of 6 inches.
2. A slope between 1:8 and 1:10 is allowed for a maximum rise of 3 inches. A slope steeper than 1:8 is not allowed.

SECTION AV103
DOORS

AV103.1 Clear width. One exterior doorway that connects with the zero step entrance, one bathroom doorway, and any kitchen, family room, living room, dining room or hallway doorways on grade-level shall have a minimum clear opening of 32 inches (815 mm) with the door open 90 degrees, measured between the face of the door and the opposite stop. Where the door opens more than 90 degrees the clear opening shall be measured between the stops on both sides.

AV103.2 Thresholds at doorways. Thresholds at doorways shall not exceed ¾ inch (19 mm) in height for exterior sliding doors or ½ inch (13 mm) for other types of doors. Raised thresholds and floor level changes at accessible doorways shall be beveled with a slope no greater than 1:2.

SECTION AV104
WHEELCHAIR PASSAGE WIDTH

AV104.1 Wheelchair passage width. The minimum clear width for single grade-level wheelchair passage shall be 32 inches (815 mm) at a point not to exceed 24 inches and 36 inches (915 mm) continuously (see Figure 1 and 2).

AV104.2 Changes in level. Changes in level up to ¼ inch (6 mm) may be vertical and without edge treatment (see Figure 3(a)). Changes in level between ¼ in and ½ inch (6 mm and 13 mm) shall be beveled with a slope no greater than 1:2 (see Figure 3(b)). Changes in level greater than ½ inch (13 mm) shall be accomplished by means of a ramp that complies with Section AV102.

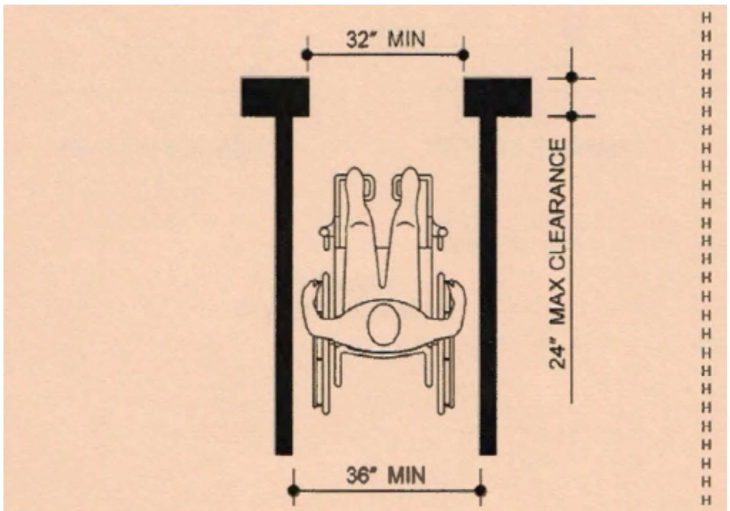
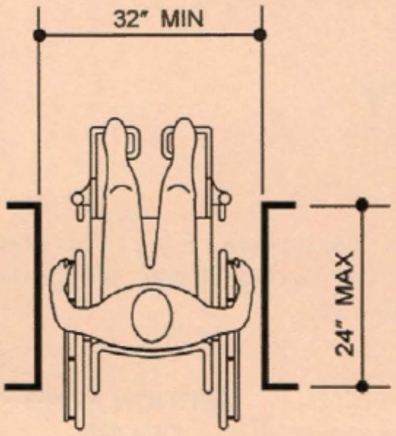


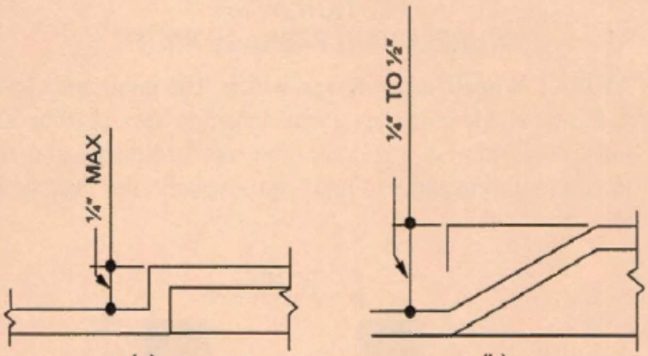
FIGURE 1
MINIMUM CLEAR WIDTH FOR SINGLE WHEELCHAIR



MAXIMUM DOORWAY DEPTH

For SI: 1 inch = 25.4 mm.

FIGURE 2
CLEAR DOORWAY WIDTH AND DEPTH



(a) CHANGES IN LEVEL

(b) CHANGES IN LEVEL

For SI: 1 inch = 25.4 mm.

FIGURE 3
ACCESSIBLE ROUTE