



City of Farmington

Development Services Department

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Significant Change Report

Staff reports summarizing the major differences between the existing Building Codes and the proposed 2012 I- Codes

2003 to 2012 International Residential Code

2003 to 2012 International Building Code

2003 to 2012 International Existing Building Code

2005 to the 2011 National Electric Code

2006 to the 2012 International Plumbing Code

2006 to the 2012 International Fuel Gas Code

2003 to the 2012 International Mechanical Code

The Most Significant Changes from the 2003 to the 2012 INTERNATIONAL RESIDENTIAL CODE

General Notes:

This list is not all inclusive and is only meant as a tool to help summarize significant changes between the 2003 and the 2012 IRC. Changes in definitions, wording and numbering of sections and chapters, lengthy section changes, tables, floodway and flood hazard references, and sections that do not pertain to or rarely impact Cochise County have not been included but changes to amended code sections have. Sections may be included that are not enforceable or have been limited in their scope due to governmental regulation, or could be ultimately modified or disallowed by the building official. Please refer to the appropriate code section for the formal wording and additional information and the 2012 IRC Code Commentary books for clarification and intent.

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CHAPTER 1 SCOPE AND ADMINISTRATION

R105.2 Work exempt from permit. Fences not over 7 feet high are exempt from permit.

R106.1.1 Information on construction documents. Where required by the building official, all braced wall lines, shall be identified on the construction documents and all pertinent information including, but not limited to, bracing methods, location and length of braced wall panels, foundation requirements of braced wall panels at top and bottom shall be provided.

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 that shall be in addition to the required permit fees.

CHAPTER 3 BUILDING PLANNING

R310.1 Emergency escape and rescue required. Where openings are provided they shall have a sill height of not more than 44 inches measured from the finished floor to the bottom of the clear (window) opening.

Exception: Basements used only to house mechanical equipment and not exceeding total floor area of 200 square feet does not require an escape opening.

R310.5 Emergency escape windows under decks and porches. Are allowed provided the location of the deck allows the emergency escape window to be fully opened and provides a path not less than 36 inches in height to a yard or court.

R311.7.5 Stair treads and risers. All dimensions and dimensioned surfaces shall be exclusive of carpets, rugs or runners. (Stairs need to be inspected at rough inspection if carpet is to be installed and at final if solid floor covering.)

R312.1.1 Where required. Guards shall be located along open sided walking surfaces which includes ramps, that are located more than 30 inches measured vertically to the floor or grade below at any point within 36 inches horizontally to the edge of the open side.

R312.1.2 Height. Minimum 36" tall guards required measured vertically from adjacent fixed seating.

R312.2 Window fall protection.

R312.2.1 Window sills. In dwelling units, where the opening of an operable window is located more than 72 inches above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum 24 inches above the finished floor of the room in which the window is located.

Operable sections of windows shall not permit openings that allow passage of a 4-inch diameter sphere where such openings are located within 24 inches of the finished floor. See section for exceptions.

R313.1 Townhouse automatic fire sprinkler systems. An automatic residential fire sprinkler system shall be installed in townhouses. **Exception:** Not required when additions or alterations made to existing townhouses that do not have an automatic residential fire sprinkler system installed.

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:** Not required when additions or alterations made to existing buildings that are not already provided with an automatic residential sprinkler system.

R315.1 Carbon monoxide alarms. Shall be installed in new construction outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages.

R317.1.5 Exposed glued-laminated timbers. The portions that form the structural supports of a building or other structure and are exposed to weather and not properly protected by a roof, eave or similar covering shall be pressure treated with preservative, or be manufactured from naturally durable or preservative-treated wood.

CHAPTER 5 FLOORS

R501.3 Fire protection of floors. Floor assemblies, not required to be fire-resistance rated, shall be provided with a ½” gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member. Exception 1: Floor assemblies located directly over a space protected by fire sprinklers. Exception 2: Floor assemblies located directly over a crawl space not intended for storage or fuel-fire appliances. Exception 3: Portions of floor assemblies can be unprotected when the aggregate unprotected area does not exceed 80 square feet per story and fire blocking is provided in the cavity between the protected and unprotected portions. Exception 4: Wood floor assemblies using 2x10 or greater dimension solid or composite lumber or approved floor assemblies demonstrating equivalent fire performance.

R507 Decks. All deck provisions were relocated to this section. It covers deck ledger attachment and lateral load connections. Girders supporting deck joists shall not be supported on deck ledgers or band joists.

CHAPTER 6 WALL CONSTRUCTION

R602.10 Wall Bracing. Entire section revised.

R602.12 Simplified wall bracing. Section added.

CHAPTER 7 WALL COVERING

R703.8 Flashing. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:

1.1 The fenestration manufacturer’s installation and flashing instructions, or for applications not addressed in the fenestration manufacturer’s instructions, in accordance with the flashing manufacturer’s instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Openings using pan flashing shall also incorporate flashing or protection at the head and sides.

1.2 In accordance with the flashing design or method of a registered design professional.

1.3 In accordance with other approved methods.

CHAPTER 8 ROOF-CEILING CONSTRUCTION

R806.5 Unvented attic and unvented enclosed rafter assemblies. Section added.

CHAPTER 9 ROOF ASSEMBLIES

R905.2.8.3 Sidewall flashing. Base flashings against a vertical sidewall shall be continuous or step flashing and shall be a minimum 4 inches in height and 4 inches in width and shall direct water away from the vertical sidewall onto the roof and/or into the gutter. Where siding is provided on the vertical sidewall, the vertical leg of the flashing shall be continuous under the siding.

CHAPTER 15 EXHAUST SYSTEMS

M1502.4.5, G2439.5.6 Length identification. Where the exhaust duct is concealed within the building construction, 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 of the exhaust duct connection.

M1502.4.6, G2439.5.7 Exhaust duct required. Where space for a clothes dryer is provided, an exhaust duct system shall be installed. Where the clothes dryer is not installed at the time of accordance with Chapter 24.

CHAPTER 19 SPECIAL APPLIANCES, EQUIPMENT AND SYSTEMS

Chapter title changed from SPECIAL FUEL-BURNING EQUIPMENT

M1901.2 Cooking appliances. Shall be listed and labeled for household use.

M1901.3 Prohibited location. Cooking appliances designed, tested, listed and labeled for use in commercial occupancies shall not be installed within dwelling units or within any area where domestic cooking operations occur.

CHAPTER 24 FUEL GAS

G2415.17.1 Plastic pipe limitations. Exception: 3. Plastic pipe permitted under outdoor patios, walkways and driveway slabs provided the burial depth is per code.

CHAPTER 25 PLUMBING ADMINISTRATION

P2503.5.1 Rough plumbing. Plastic DWV systems may no longer be tested using air pressure.

P2503.6 Shower liner test. Where shower floors and receptors are made water tight by the application of materials on-site, the completed liner installation shall be tested. The test consists of plugging the shower drain, filling the liner with not less than 2 inches of water measured at the threshold (construct a temporary threshold if threshold is less than 2 inches in height) and observing for 15 minutes that there is no evidence of leakage.

P2903.9.5 Valves and outlets prohibited below grade. Potable water outlets and combination stop-and-waste valves shall not be installed underground or below grade. Freezeproof yard hydrants that drain the riser into the ground are considered to be stop-and-waste valves. **Exception:** Installation of freezeproof yard hydrants shall be permitted if the potable water supply to such hydrants is protected upstream of the hydrant by backflow prevention and the hydrants are permanently identified as nonpotable outlets by approved signage that reads: "Caution, Nonpotable Water. Do Not Drink."

CHAPTER 30 SANITARY DRAINAGE

SECTION P3009 GRAY WATER RECYCLING SYSTEMS. Section added.

CHAPTER 36 SERVICES

3608.4 Supplemental electrode required. A single rod, pipe, or plate electrode shall be supplemented by an additional electrode.

CHAPTER 39 POWER AND LIGHTING DISTRIBUTION

E3902.11 Location of ground-fault circuit interrupters. GFCI shall be installed in a readily accessible location. (note: Don't install behind refrigerator or behind access panel under whirlpool tub.)

E3902.12 Arc-fault circuit-interrupter protection. All branch circuits that supply 120 volt, single-phase, 15- and 20-amp outlets installed in family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, and similar rooms or areas shall be protected by a combination type AFCI installed to provide protection of the branch circuit. See section for 3 Exceptions. (note: Does not include kitchens.).

E3902.13 Arc-fault circuit interrupter protection for branch circuit extensions or modifications.

Where branch circuit wiring is modified, replaced, or extended in areas specified in Section E3902.12, the branch circuit shall be protected by a combination-type AFCI located at the origin of the branch circuit or an outlet branch-circuit type AFCI located at the first receptacle outlet of the existing branch circuit.

CHAPTER 40 DEVICES AND LUMINAIRES

E4002.14 Tamper-resistant receptacles. Required for all 125-volt, 15- and 20-amp receptacles.

Exception: Receptacles in the following locations shall not be required to be tamper resistant: 1. Receptacles located more than 5.5 feet above the floor. 2. Receptacles that are part of a luminaire or appliance. 3. A single receptacle for a single appliance or a duplex receptacle for two appliances where such receptacles are located in spaces dedicated for the appliances served and, under conditions of normal use, the appliances are not easily moved from one place to another. The appliances shall be cord-and-plug-connected to the receptacles.

**The Most Significant Changes
from the 2003 to the 2012****INTERNATIONAL BUILDING CODE**

Michael Izzo CBO

Chapter 2: All definitions in Chapter 2 now, in lieu of individual sections.

Chapter 3: Use and Occupancy Classifications:

Group A Assembly: Exception for <50 people, associated with Group E and religious auditoriums with <100 people.

Group B Business: Adds: ambulatory care facilities and training and school development not within a school or academic program.

Group E Education: Daycare facilities can be classed as part of primary occupancy within places of worship providing such day care is “during” religious function for 5 or fewer children.

Group I Institutional: Adds “custodial” care to I-1 and “foster care” to I-2.

Group R Residential: Completely revised. Boarding houses, congregate living facilities (non-transient), Live/work units, R-3 Not more than 2 dwelling units, R-3 care facilities <5 people within a single dwelling is permitted to comply with IRC provided a fire sprinkler system is installed.

Classifications for a variety of health-care related facilities have been clarified.

Chapter 4: Special Detailed Requirements Based on Use and Occupancy

New Section 419 Live/ Work Units: Specific requirements, exceptions, limitations, occupancies, means of egress, vertical openings, fire protection, structural floor loading, accessibility, ventilation and plumbing facilities.

New Section 420 I-1, R-1, R-2, R-3 Occupancies. Four specific requirements must be met: separation of walls (fire partitions), horizontal assemblies, and automatic sprinkler system required. Smoke detection and fire alarm systems (I-1, R-1 and R-2).

Chapter 5: General Building Heights and Area

Clarified provisions for incidental-use rooms and spaces. Storage rooms >100 sq.ft. deleted from the table requirements.

Chapter 7: Fire and Smoke Protection Features

New Section 703.7 Marking and identification for all fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Specific requirements identified in this section.

New Section 704 Fire-Resistance Rating of Structural Members.

Modified provisions addressing exterior wall projections (See 705.2 and New table 705.2).

New Section 712 Vertical Openings is a list of types of openings and references the appropriate section for that condition.

Concealed spaces fireblocking material revisions: Gyp bd now specified as ½ " and cement-based millboard is now specified as ¼ " (717.2.1). New subsections also added to further specify insulation requirements.

Revised 718.3 Draftstopping in floors: Required at floor/ceiling spaces in Group R-1 buildings, in Group R-2 buildings with 3 or more dwelling units, in Group R-3 buildings with two dwelling unit and sleeping unit separation. Exceptions remain the same.

Chapter 9: Fire Protection Systems

New 903.2.2 Ambulatory care facilities.

Revised 903.2.3 Group E reduced allowable fire area up to 12,000 sq.ft. before fire sprinkler system is required.

Revised 903.2.4 Group F-1 adds requirement for manufacture of upholstered furniture or mattresses exceeding 2,500 sq.ft.

Revised 903.2.7 Group M, adds requirement for Display and sale of upholstered furniture or mattresses exceeding 5,000 sq.ft.

Revised 903.2.8 Group R adds 2 new subsections for Group R-3 or R-4 congregate residences and Care facilities.

Revised 903.2.9 Group S-1 adds fire area used for the storage of commercial trucks or buses where the fire area exceeds 5,000 sq.ft. and fire area used for the storage of upholstered furniture or mattresses exceeding 2,500 sq.ft..

New 908.7 Carbon monoxide alarms. Group I or R occupancies located in a building containing a fuel-burning appliance or in a building which has an attached garage shall be equipped with single-station carbon monoxide alarms.

Chapter 10: Means of Egress

Minimum ceiling height has been increased to 7'6" min.

Post mounted objects shall not overhang post or pylon more than 4" (previously 12").

Revised 1007.7 Exterior area for assisted rescue. Specific requirements identified.

Revised 1008.1.10 Panic and fire exit hardware. Reduced to occupant load of 50 or more (previously 100 or more) in Group A and E. Added: Electrical rooms with equipment rated 1,200 amps or more and over 6' wide that contain over-current devices, switching devices or control devices with exit or exit access doors shall be equipped with panic hardware or fire exit hardware and doors shall swing in the direction of egress travel.

New 1011.2 Floor-level exit signs in Group R-1. Additional low-level exit signs shall be provide in all areas serving guestrooms, bottom of sign not less than 10" or more than 12" above the floor level, flush mounted to the door or wall (within 4" of the door frame on the latch side).

1012 Handrail graspability requirements greatly expanded with new Type I and Type II designations and details.

New Section 1013.8 Window sills. In Groups R-2 and R-3, one- and two- family and multiple-family dwellings, where opening of the sill portion of an operable window is located more than 72" above the finished grade or other surface below, the lowest part of the clear opening of the window shall be a minimum 36" above the finished floor surface of the room in which the window is located. Operable

sections of windows shall not permit openings that allow passage of a 4" spear. See section and exceptions for fall prevention and opening control devices.

New 1015.6 Daycare means of Egress. Day care facilities, rooms or spaces where care is provided for more than 10 children, 2 ½ years or less, shall have access to not less than two exits or exit access doorways.

New Table 1021.2 (1) Stories with one exit or access to one exit for R-2 occupancies.

New Table 1021.2 (2) Stories with one exit or access to one exit for other occupancies.

1026.5. Exterior exit stairways and ramps shall have a minimum fire separation distance of 10' measured from the exterior edge of the stairway or ramp, including landings, to adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 705 based on fire separation distance.

Chapter 15: Roof Assemblies and Rooftop Structures

1503.4 Roof drainage: Adds new sections for secondary emergency overflow requirements.

New 1509.6 Mechanical equipment screen requirements, based on Type of Construction.

Chapter 16: Structural Design

1605 Load Combinations. Engineers should review for new calculations and factors.

Wind design requirements extensively revised. Wind load maps now based on ultimate design wind speeds. New terminology for wind speeds.

Table 1607.1 Minimum Uniformly Distributed Live Loads, and Minimum Concentrated Live Loads. Many revisions. Note added footnotes "i" and "j" regarding uninhabitable attics without storage and uninhabitable attics with storage. With storage are those where the maximum clear height between the joist and rafters is greater than 42", or where there are two or more adjacent trusses with web configuration capable of accommodating an assumed rectangle 42" in height by 24" in width, or greater, within the plane of the trusses. The live load need only be applied to those portions of the joists or truss bottom chords where both of the following conditions are met:

- i. The attic area is accessible from an opening not less than 20" in width by 30" in length that is located where the clear height is the attic is a minimum of 30"; and
- ii. The slopes of the joists or truss bottom chords are no greater than two units vertical in 12 units horizontal.

The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 psf.

k. Attic spaces served by stairways other than the pull-down type shall be designed to support the minimum live load specified for habitable attics and sleeping rooms.

Chapter 17: Special Inspections and Tests

Revised Section 1704 Special Inspections, Contractor Responsibility and Structural Observations.

Exceptions added for construction of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official and unless otherwise required by the building official, special inspections are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

New 1704.2.1 Special inspector qualifications

New 1704.3 Statement of special inspection requirements and what shall be identified.

Chapter 18: Soils and Foundations.

1803.5.8 Compacted fill is clarified: Where “shallow” footings will bear on compacted fill material “more than 12 inches in depth, a geotechnical investigation shall be conducted”.

1804.5 Compacted fill material revised. Where shallow foundations will bear on compacted fill material, the compacted fill shall comply with the provisions of an approved geotechnical report as set forth in Section 1803.

1807.1 Foundation Walls. Completely revised sections and table. Separate table for Concrete Foundation Walls and Masonry Walls. Standardized rebar spacing for masonry walls based on wall thickness.

Chapter 23: Wood

New 2303.4.1.3 Trusses spanning 60’ or greater requires a qualified registered design professional for the design of the temporary installation restraint/bracing and the permanent individual truss member restraint / bracing for all trusses.

Revised Table 2304.9.1 Fastening Schedule. Added dimensions.

Revised 2308.2 Limitations: Maximum floor-to-floor height shall not exceed 11’-7”. Bearing wall height shall not exceed a stud height of 10’. Average dead loads shall not exceed 15psf for “combined” roof and ceiling, exterior walls, floors and partitions.

Replaced 2308.3 Braced wall lines.

Revised Table 2308.9.3(3) Deleted use of 5/16” thickness.

Added 2308.9.3.2 Alternate bracing wall panel adjacent to a door or window opening and Figure 2308.9.3.2 Alternate Braced Wall Panel Adjacent to a Door or Window Opening. Portal frame type design for 16” minimum wall with holddowns for one-story and 24” minimum for first story of a two-story building

Chapter 29: Plumbing Systems

Table 2902.1 Minimum Number of Required Plumbing Fixtures. Revised for various occupancies.

The Most Significant Changes

From the 2003 to the 2012

INTERNATIONAL EXISTING BUILDING CODE

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Most significant changes for Cochise County:

Chapter 2 Definitions “Dangerous” and “Unsafe”

Added: Chapter 3: Compliance Methods. New list of 4 Options and which Chapters cover each option.

New Chapter 4: Prescriptive Compliance Method

Chapter 12: Compliance Alternatives: Deleted (Replaced with New Chapter 14)

New Chapter 14: Performance Compliance Methods (previously compliance alternatives). Revised Evaluation Process for height and area formulas, vertical openings and loads.

Section 608 Mechanical draft systems for manually fired appliances and fireplaces

Chapter 7: Alterations – Level 1 Structural. Additional and replacement of roofing or replacement of equipment.

Chapter 10: Change in Occupancy: 1012 Change in Occupancy Classification new requirements.

Chapter 11: Additions. 1104 Smoke Alarms in Occupancy Groups expanded to include all R and I-1 occupancies. Previously only included R-3 and R-4.

CHAPTER 2: DEFINITIONS

REVISED:

Dangerous: Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:

Unsafe

1. The building or structure has collapsed, has partially collapsed, has moved off its foundation, or lacks the necessary support of the ground.
2. There exists a significant risk of collapse, detachment or dislodgement of any portion, member, appurtenance or ornamentation of the building or structure under service loads.

Added: "A vacant structure that is not secured against entry shall be deemed unsafe."

NEW CHAPTER 3: COMPLIANCE METHODS

301 Compliance Methods

301.1 General

301.1.1 Prescriptive compliance method. Repairs, alterations, additions and changes of occupancy and relocated buildings complying with Chapter 4 of this code in buildings complying with the IFC shall be considered in compliance with the provisions of this code.

301.1.2 Work area compliance method. Repairs, alteration, additions, changes in occupancy and relocated buildings complying with the applicable requirements of Chapters 5 through 13 of this code shall be considered in compliance with the provisions of this code.

301.1.3 Performance compliance method. Repairs, alterations, additions and changes of occupancy and relocated buildings complying with Chapter 14 of this code shall be considered in compliance with the provisions of this code.

301.1.4 Evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the IBC, ASCE 31 or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2.

Section 608 Mechanical

Added 608.2 Mechanical draft systems for manually fired appliances and fireplaces. A mechanical draft system shall be permitted to be used with manually fired appliances and fireplaces where such a system complies with all of the following requirements:

1. The mechanical draft device shall be listed and installed in accordance with the manufacturer's installation instructions.
2. A device shall be installed that produces visible and audible warning upon failure of the mechanical draft device or loss of electrical power at any time that the mechanical draft device is turned on. This device shall be equipped with a battery backup if it receives power from the building wiring.
3. A smoke detector shall be installed in the room with the appliance or fireplace. This device shall be equipped with a battery backup if it receives power from the building wiring.

CHAPTER 7: ALTERATIONS – LEVEL 1 (previously Chapter 5)

706 Structural

Revised 706.2 Additional or replacement of roofing or replacement of equipment. Added: Exception 3. Addition of a second layer of roof covering weighing 3 pounds per square foot or less over an existing, single layer of roof covering.

Revised 706.3 Additional requirements for reroof permits:

Revised: 706.3.1 Bracing for unreinforced masonry bearing wall parapets. Relates to reroofing more than 25% of roof area in Seismic Design Category D, E or F. Requires installation of parapet bracing.

Revised: 706.3.2 Roof diaphragms resisting wind loads in high-wind regions. Relates to removal of more than 50% of the roof diaphragm or section of a building located where the basic wind speed is greater than 90mph. Requires roof diaphragms, connections of diaphragm to framing members and roof-to-wall

connections be evaluated for the wind / uplift loads. If not capable of resisting at least 75% of those wind loads, they shall be replaced or strengthened.

CHAPTER 10: CHANGE IN OCCUPANCY (previously Chapter 8)

1012 Change in Occupancy Classification

Entire section reorganized and rewritten. Most significant changes as follows:

New 1012.1.2 Fire protection and interior finish. The provisions of 1012.2 and 1012.3 for fire protection and interior finish, respectively, shall apply to all buildings undergoing a change of occupancy classification.

.New 1012.2 Fire protection systems.

1012.2.1 Fire sprinkler system. Where a change in occupancy classification occurs that requires and automatic fire sprinkler system to be provided based on the new occupancy in accordance with Chapter 9 of the IBC, such system shall be provided throughout the area where the change of occupancy occurs.

1012.2.2 Fire alarm and detection system. Where a change in occupancy classification occurs that requires a fire alarm and detection system to be provided based on the new occupancy in accordance with Chapter 9 of the IBC, such system shall be provided throughout the area where the change of occupancy occurs. Existing alarm notification appliances shall be automatically activated throughout the building. Where the building is not equipped with a fire alarm system, alarm notification appliances shall be provided throughout the area where the change of occupancy occurs and shall be automatically activated.

New 1012.3 Interior finish. In areas of the building undergoing the change of occupancy classification, the interior finish of walls and ceilings shall comply with the requirements of the IBC for the new occupancy classification.

New 1012.4 Means of egress, general.

Revised 1012.4.1 Means of egress for change to higher hazard category. Exception 4 Adds: "Such walls shall either terminate at the underside of a ceiling of equivalent construction or extend to the underside of the floor or roof next above.

1012.5 Height and Areas.

Revised 1012.5.1 Height and area for change to higher hazard category. Exception for one story Group . Replaced with new exception: In other than H, F-1, and S-1, in lieu of fire walls, use of fire barriers having a fire-resistance rating of not less than that specified in Table 706.4 of the IBC, constructed in accordance with Section 707 of the IBC, shall be permitted to meet area limitations required for the new occupancy in buildings protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 of the IFC.

New 1012.5.1.1 Fire wall alternative. In other than Groups H, F-1 and S-1, fire barriers and horizontal assemblies constructed in accordance with Section 707 and 711 of the IBC shall be permitted to be used in lieu of fire walls to subdivide the building into separate buildings for the purpose of complying with the area limitations required for the new occupancy where all of the following conditions are met:

1. The buildings are protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 of the IFC.
2. The maximum allowable area between fire barriers, horizontal assemblies, or any combination thereof shall not exceed the maximum allowable area determined in accordance with Chapter 5 of the IBC without an increase allowed for an automatic sprinkler system in accordance with Section 506 of the IBC.
3. The fire-resistance rating of the fire barriers and horizontal assemblies shall not be less than that specified for fire walls in Table 706.4 of the IBC.

Exception: Where horizontal assemblies are used to limit the maximum allowable area, the required fire-resistance rating of the horizontal assemblies shall be permitted to be reduced by 1 hour provided the height and number of stories increases allowed for an automatic sprinkler system by Section 504.2 of the IBC are not used for the buildings.

Revised 1012.8 Accessibility. Added Exception: Type B dwelling or sleeping units required by Section 1107 of the IBC are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with less than a Level 3 alteration.

New 1012.8.1 Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alteration shall comply with Section 705, 806 and 906, as applicable.

Revised 1012.8.2 Complete change of occupancy. Revised Exception: The accessible features listed in Items 1 through 6 are not required for an accessible route to Type B units.

CHAPTER 11: ADDITIONS

1104 Smoke Alarms in Occupancy Groups R and I-1 (replaces previous which only referenced Occupancy Groups R-3 and R-4)

New 1104.1 Smoke alarms in existing portions of a building. Where an addition is made to a building or structure of a Group R or I-1 occupancy, the **existing building** shall be provided with smoke alarms as required by Section 1103.8 of the IFC or Section R314 of the IRC as applicable.

CHAPTER 14: PERFORMANCE COMPLIANCE METHODS (previously Chapter 12 Compliance Alternatives)

1401.2 Applicability

Insert Date: Structures existing prior to (Date to be inserted by the Jurisdiction) in which there is work involving additions, alterations or changes of occupancy shall be made to conform to the requirements of this chapter or the provisions of Chapters 5 through 13.

Revised 1401.6 Evaluation Process.

1401.6.1.1 Height Formula (Equation 4-1) revised to divided by 125, in lieu of previous 12.5.

1401.6.2.2 Area Formula (Equation 14-3) completely revised. See section.

Revised 1401.6.6 Vertical Openings: If the structure is a one-story building “or if all the unenclosed vertical openings within the building conform to requirements of Section 713 of the IBC, enter a value of 2. The maximum positive value for this requirement shall be 2.”

Revised 1401.6.14 Elevator Control: Revised Emergency recall “and in-car operation of elevators” shall be provided in accordance with the IFC. (Categories revised accordingly also to include “in-car operation”.

Revised 1102.3 Wind loads and 1102.4 Seismic loads: Exception 2 revised to Structural elements whose stress is not increased by more than “10 percent”. (previously 5%, note no change to 5% for snow loads).

The Most Significant Changes from the 2002 to the 2011

National Electric Code

General note: This is not meant as a complete list of all the code changes from the 2002 NEC and the 2011 NEC and only highlights some that will impact the homeowners and contractors. This list does not contain changes made to whole sections that have been reworded or renumbered as well as tables that have been renumbered with new calculations. Please refer to the appropriate code sections and definitions for additional information.

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Article 100 Definitions

See section.

Article 110 Requirement for Electric Installations

110.24 Available Fault Current

(A) Field Marking. Service equipment in other than dwelling units shall be marked in the field with the maximum available fault current, shall include date calculation was performed and be of sufficient durability to withstand the environment.

(B) Modifications. Modifications that affect the maximum available fault current at the service, the maximum available fault current shall be verified or recalculated as necessary to ensure the service equipment ratings are sufficient at the line terminals of the equipment.

Exception: Field markings shall not be required in industrial installs where conditions of maintenance and supervision ensure only qualified persons service the equipment.

Article 200 Use and Identification of Grounded Conductors

200.4 Neutral Conductors. Shall not be used for more than one branch circuit, or for more than one set of ungrounded feeder conductors, unless specifically permitted elsewhere in this code.

Article 210 Branch Circuits

210.8 GFCI's. No more exceptions for dedicated receptacles in garages, accessory buildings, un finished basements, and with 6' of all sinks, including laundry trays.

Exception: Outdoor receptacles not readily accessible for snow/ice melting and permanently installed fire/burglar alarms.

210.12 AFCI's All 15 and 20 amp branch circuits in dwelling units considered habitable space need Arc-Fault protected, except where GFCI protection required and dedicated circuits for appliances. This includes guest rooms/suites, any remodel or addition work, and manufactured homes.

Article 220 Branch-Circuit, Feeder and Service Calculations

Section has been re-worked.

Article 225 Outside Branch Circuits and Feeders

225.27 Raceway Seal. Where a raceway enters a structure from an underground distribution system, if moisture can contact live parts, it shall be sealed per 300.5(G). This includes, spares or unused raceways. Sealants shall be identified for use with the cable insulation, shield, or other components.

Article 240 Overcurrent Protection

240.4(D) Protection of Small Conductors

(4) 12 AWG Aluminum and Copper-Clad aluminum wire limited to 15 amp breaker.

240.15 Ungrounded Conductors

(A) Overcurrent Device Required. A fuse or an overcurrent trip unit of a circuit breaker shall be connected in series with each ungrounded conductor.

(B) Circuit Breaker as Overcurrent Device. Circuit breakers shall open all ungrounded conductors of the circuit both manually and automatically unless permitted in 240.15(B)(1) thru (B)(4).

(1) Multiwire Branch Circuit. Individual single-pole circuits, with identified handle ties, shall be permitted as the protection for each ungrounded conductor of multi-wire branch circuits that serve only single-phase line-to-line neutral loads.

(2) Grounded Single-Phase Alternating-Current Circuits. In grounded systems, individual single-pole circuit breakers rated 120/240 volts ac, with identified handle ties, shall be permitted as the protection for each ungrounded conductor for line-to-line loads for single-phase circuits.

(3) 3-Phase and 2-Phase Systems. For line-to-line loads in a 4-wire, 3-phase systems or 5-wire, 2-phase systems, individual single-pole breakers, rated 120/240 volts ac, with identified handle ties, shall be permitted as the protection for each ungrounded conductor, if the systems have a grounded neutral point and the voltage to ground does not exceed 120 volts.

(4) 3-Wire Direct-Current Circuits. Individual single-pole circuits rated 125/250 volts dc, with identified handle ties, shall be permitted as the protection for each ungrounded conductor for line-to-line connected loads for 3-wire, direct-current circuits supplied from a system with a grounded neutral where the voltage to ground does not exceed 125 volts.

240.24 Location in or on Premises

(F) Added over steps of a stairway as prohibited location for over current devices.

Article 250 Grounding and Bonding

250.2 Definitions, Bonding Jumper, Supply Side. A conductor installed on the supply side of a service or within a service equipment enclosure(s), or for separately derived system, that ensures the required electrical conductivity between metal parts required to be electrically connected.

250.24(B) Main Bonding Jumper. An unspliced main bonding jumper in grounded systems to connect the equipment grounding conductor and the service disconnect enclosure to the grounded conductor within the enclosure.

250.30 Grounding Separately Derived Alternating-Current Systems-Three parts

(A) Grounded Systems

(B) Ungrounded Systems

(C) Sources Outside of Building

250.32 Building or Structures Supplied by a Feeder(s) or Branch Circuit(s)

Feeders or branch circuits supplying separate buildings:

(A) Require a grounding electrode, except where a single branch circuit is ran.

(B) Grounded systems require an equipment conductor ran with supply conductors and connected to building's disconnect and the grounded electrode (isolate neutrals). If an equipment grounding conductor is not ran, neutrals are not isolated as long as there's no continuous bonded metallic paths between buildings and no ground fault protection of equipment on supply side of feeders.

(C) Ungrounded systems require an equipment grounding conductor ran with supply conductors and connected to building disconnect and grounding electrodes.

250.32 Permanently Installed Generators

Need a conductor that provides an effective ground-fault path with supply conductors to first disconnect in accordance with:

(A) Separately derived system per 250.30 OR

(B) Nonseparately derived system: If overcurrent protection is not integral with generator, a supply-side bonding jumper shall be installed between the generator equipment grounding terminal and the equipment grounding terminal, bar, or bus of the disconnecting means sized per 250.102(C).

250.92(B) Method of Bonding at the Service

Requires bonding jumpers around impaired connections at services and sub-panels such as reducing washers or over-sizes concentric washers.

250.94 Bonding for Other Systems

Added requirements.

Article 300 Wiring Methods

300.5 Underground Installations

(B) The interior of enclosures or raceways installed underground shall be considered as wet locations and conductors listed for wet locations.

(C) Type MI cable permitted under buildings without raceway where embedded in concrete, fill, or other masonry per 332.10(6) or in underground runs where protected from physical damage or corrosion per 332.10(10).

Article 310 Conductors for General Wiring

Article has been reworked, tables renumbered.

310.10 Permitted uses replaces 310.2 thru 310.12.

310.104(A) Table replaces table 310.13 on conductor applications and insulations. Other 310 tables have been renumbered.

Article 312 Cabinets, Cutout Boxes and Meter Socket Enclosures

312.8 Switch & Overcurrent Device Enclosures, Taps & Feed-Thru Conductors

Wiring space of enclosures for switches and overcurrent devices shall be permitted for conductors feeding through, spliced or tapping to other enclosures, switches or overcurrent devices where all of the following area met:

(1) Total of all conductors installed at any cross section of wiring space does not exceed 40%.

(2) Total area of all conductors, splices and taps installed at any cross section of the wiring space does not exceed 75%.

(3) Warning label at enclosure that identifies the closest disconnect for any feed through conductors.

Article 406 Receptacles, Cord Connectors and Attachment Plugs (Caps)

406.4 General Install Requirement (D)

Replacements shall comply with:

(4) Be AFCI protected where required.

(5) Be tamper resistant where required.

(6) Be weather resistant where required.

406.12 Tamper Resistant Receptacles indwelling Units

All 15 and 20 amp receptacles in areas per 210.52 shall be listed tamper resistant

Exceptions:

- (1) Located more than 5'6" above floor.
- (2) Part of a light or appliance.
- (3) Located within dedicated space for appliances.

This also includes Manufactured Homes.

406.13 Tamper resistant receptacles in guest rooms/suites.

406.16 Tamper resistant receptacles in child care facilities.

Article 408 Switchboards and Panelboards

408.35 Deleted maximum 42 breaker spaces allowed. See 408.36

408.36 Overcurrent Protection.

See exceptions.

Article 422 Appliances

422.2 Definitions

Added Vending Machines.

422.51 Cord and Plug connected Vending Machines.

Machines made after Jan. 1, 2005, shall have a GFCI as an integral part of the attachment plug or be located within 12" of the attachment plug.

Machines made before Jan. 1, 2005, shall be connected to GFCI receptacle.

422.52 Electric Drinking Fountains.

Shall be protected with GFCI receptacle. Bottled water coolers not affected.

Article 590 Temporary Installs

590.3 Time Constraints Limited to:

- (A) During course of construction.
- (B) 90 days for holiday decorative lighting and similar purposes.
- (C) Emergencies and tests.
- (D) Temporary wiring removed immediately after purpose for which it was installed is completed.

Article 680 Swimming Pools, Fountains and Similar Installations

680.26 Equipotential Bonding

Expanded to 7 parts

- (1) Conductive Pool Shells
- (2) Perimeter Surfaces
- (3) Metallic Components
- (4) Underwater Lighting
- (5) Metal Fittings
- (6) Electrical Equipment
- (7) Fixed Metal Parts

VII. Hydro Massage Bathtubs

680.73 Accessibility

Receptacle for hydro massage tub needs to be within 1' of service opening and face in direct view.

Article 690 Solar Photovoltaic (PV) Systems

Expanded article

Article 694 Small Wind Electric Systems

Added article

The Most Significant Changes

from the 2006 to the 2012

INTERNATIONAL PLUMBING CODE

Michael Izzo CBO

1. Delete references to PB Pipe and Tubing (Polybutylene) and add PE-RT Pipe (Polyethylene of Raised Temperature resistance).

2. **304.4 Openings for Pipes** Allow use of caulking and gasketing systems to seal the space between the pipe and the pipe opening for rodent-proofing. 2006 IPC required approved metal collars for rodent-proofing of pipe openings.

3. **308.9 Parallel Water Distribution Systems** Where hot water piping is bundled with cold or hot water piping, each hot water pipe shall be insulated. 2006 IPC did not allow hot and cold water pipes to be grouped in the same bundle.

4. **Table 314.2.2 Condensate Drain Sizing** Where condensate drain pipes from more than one unit are manifolded together, use Table 314.2.2. 2006 IPC referenced “an approved method.”

5. **Table 403.1 Minimum Number of Required Plumbing Fixtures**

I-4 (Adult/Child Day Care Less Than 24 Hours) Occupancy Classification now requires one shower/bathtub regardless of occupants load.

6. **403.3.6 Door Locking** Where a toilet room is provided for the use of multiple occupants, the egress door can't be locked from the inside. Does not apply to family or assisted-use toilet rooms.

7. **407.2 Bathtub Waste Outlets and Overflows** Bathtubs shall have an overflow outlet.

8. **Chapter 5 Water Heaters 502.5 Clearances For Maintenance and Replacement.** Appliances shall be provided with access for inspection, service, repair and replacement without disturbing the function of a fire-resistance-rated assembly or removing permanent construction, other appliances or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space not less than 30 inches in length and 30 inches in width shall be provided in front of the control side of an appliance.

9. **Table 604.3 Water Distribution System Design Criteria Required Capacity At Fixture Supply Pipe Outlets** Modified table to add more detailed descriptions of some fixtures and change certain flow rates (gpm) and flow pressures (psi). In each change, gpm went down while psi went up.

10. **606.7 Labeling Of Water Distribution Pipes In Bundles** Where water distribution pipes are bundled at installation, each pipe in the bundle shall be identified using stenciling or commercially available pipe labels. The identification shall indicate the pipe contents and the direction of flow in the pipe. Label pipe at least every 25 feet, and every pipe in every room, space or story.

11. **607.1.1 Temperature Limiting Means.** A thermostat control for a water heater shall not serve as a temperature limiting means for the purpose of complying with the requirements of this code for maximum allowable hot or tempered water delivery temperature at fixtures.

12. **607.2 Hot Or Tempered Water Supply To Fixtures.** The maximum length of a hot or tempered water pipe is reduced from 100 feet from the hot water source to 50 feet from the hot or tempered water source. A recirculating system piping or heat-traced piping is considered a hot or tempered water source.

13. **607.5 Piping Insulation** Specify ½ inch thickness of piping insulation for the first 8 feet of hot water piping from a hot water source without heat traps and then 1 inch thickness for the remainder, and specify the conductivity of the piping insulation. 2006 IPC just required compliance with International Energy Conservation Code.

14. **608.14.2 Protection Of Backflow Preventers** Backflow preventers shall not be located in areas subject to freezing except where they can be removed by means of unions or are protected from freezing by heat, insulation or both.

15. **Section 917 Single Stack Vent System** Added to permit the drainage stack and branch piping to serve as the vents for the drainage system. Branch sizes, length of horizontal branches, maximum vertical size from fixture, additional required venting, stack offsets, prohibited lower connections and building drain sizes are also specified in this new section.

16. **1003.3.1 Grease Interceptors And Automatic Grease Removal Devices Required** Where lack of space or other constraints prevent the installation or replacement of a grease interceptor, one or more grease interceptors shall be permitted to be installed on or above the floor and upstream of an existing grease interceptor.

17. Added **Chapter 13 Gray Water Recycling Systems.** Where Gray Water Recycling Systems had to be specifically adopted to be a part of the 2006 IPC, Gray Water Recycling Systems must be specifically deleted to not be a part of the 2012 IPC. The gray water chapter addresses the use of gray water for flushing of water closets and urinals, and subsurface landscape irrigation. Among the requirements listed are:

disinfectant of gray water, filtering of gray water, coloring of gray water, use of a required storage tank called a collection reservoir, gray water pipes must be labeled as such in purple lettering or tags, and how to conduct required percolation tests. The use of a storage tank for gray water may violate state law. The 2012 IPC goes into detail on percolation test procedures for different soils, calculating design load rates with Table 1303.9.1 and seepage trenches.

The Most Significant Changes from the 2006 to the 2012

INTERNATIONAL FUEL GAS CODE

Michael Izzo CBO

Chapter 1 Scope and Administration

Part 1 – Scope and Application

Section 102 (IFGC) – Applicability

102.8 Referenced codes and standards. Added two new regulating sub- sections 102.8.1 and 102.8.2.

102.8.1 Conflicts. Where conflicts occur between the provisions of this code and the referenced standards, the provisions of this code shall apply.

102.8.2 Provisions in referenced codes and standards. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

The following sub-sections are new:

102.10 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

102.11 Application of references. Reference to chapter section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

Part 2 – Administration and Enforcement

Section 104 (IFGC) – Duties and Powers of the Code Official – Section 104.1 was rewritten

104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided.

Section 105 (IFGC) – Approval

105.2.1 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources. (new sub-sub-section)

105.4 Used material, appliances and equipment. (Rewritten) The use of used materials which meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements have been reconditioned, tested and placed in good and proper working condition, and approved by the code official.

105.5 Approved materials and equipment. (New) Materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

Section 106 (IFGC) Permits – Most of this section has been rewritten for more clarification.

Section 107 (IFGC) Inspections and Testing – Most of this section has been rewritten for more clarification.

Chapter 2 Definitions

Section 202 (IFGC) General Definitions – There are approximately 18 new definitions added to this section.

Chapter 3 General Regulations

Section 304 (IFGS) Combustion, Ventilation and Dilution Air

Section 304.4 Makeup air provisions. Where exhaust fans, clothes dryers and kitchen ventilation systems interfere with the operation of appliances, makeup air shall be provided.

Section 305 (IFGC) Installation

305.4 Public garages. Where motor vehicles are capable of passing under an appliance, the appliance shall be installed at the clearances required by the appliance manufacturer and not less than 1 foot higher than the tallest vehicle garage door opening.

305.7 Clearances from grade. ...not less than 3-inches above adjoining grade ... Such supports shall be installed in accordance with the manufacturer's installation instructions.

New Sections:

305.9 (IFGS) Parking structures.

305.10 (IFGS) Repair garages.

305.11 (IFGS) Installation in aircraft hangars.

305.12 (IFGS) Avoid strain on gas piping.

Section 306 (IFGC) Access and Service Space

306.1 Access for maintenance and replacement. Appliances shall be accessible for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space at least 30 inches deep and 30 inches wide shall be provided in front of the control side to service an appliance.

306.2 Appliances in rooms. Rooms containing appliances shall be provided with a door and an unobstructed passageway measuring not less than 36 inches wide and 80 inches high.

Section 310 (IFGS) Electrical Bonding

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.

Chapter 4 Gas Piping Installations

Section 401 (IFGC) General

401.9 Identification. Each length of pipe and tubing and each pipe fitting, utilized in a fuel gas system, shall bear the identification of the manufacturer.

401.10 Third-party testing and certification. All piping, tubing and fittings shall comply with the applicable referenced standards, specifications and performance criteria of this code and shall be identified in accordance with Section 401.9. Piping, tubing and fittings shall either be tested by an approved third-party testing agency or certified by an approved third-party testing agency or certified by an approved third-party certification agency.

Section 403 (IFGS) Pipe Materials

403.13 Flange gaskets. ... Acceptable materials include metal (plain or corrugated), composition, and aluminum "O" rings and spiral wound metal gaskets. (Asbestos was removed from this section.)

Section 404(IFGC) Piping System Installation

404.1 Installation of materials. All materials used shall be installed in strict accordance with the standards under which the materials are accepted and approved. In the absence of such installation procedures, the manufacturer's instructions shall be followed. Where the requirements of referenced standards or manufacturer's instructions do not conform to minimum provisions of this code, the provisions of this code shall apply.

404.2 CSST. CSST piping systems shall be installed in accordance with the terms of their approval, the conditions of listing, the manufacturer's instructions and this code.

404.3 Prohibited locations. Piping shall not be installed in or through a ducted supply, return or exhaust, or a clothes chute, chimney or gas vent, dumbwaiter or elevator shaft.

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.

Section number changes from 404.7 through 404.17

404.18 Prohibited devices.

Exceptions:

1. Approved gas filters.
2. An approved fitting or device where the gas piping system has been sized to accommodate the pressure drop of the fitting or device.

406.7 Purging. The purging of piping shall be in accordance with Sections 406.7.1 through 406.7.3. (This whole section has been changed. The Size and Length of Piping Table 406.7.1.1 has changed. Table 406.7.2 Length of piping requiring purging with inert gas before placing in operation has removed from this section of the code.)

408.4 Sediment trap. Added in Figure 408.4 - Method of Installing a tee fitting sediment trap.

Section 11 (IFGC) Appliance and Manufactured Home Connections

411.1.3.1 Maximum length. Connectors shall have an overall length not to exceed 6 feet.

Exception: Rigid metallic piping used to connect an appliance to the piping system shall be permitted to have a total length greater than 6 feet, provided that the connecting pipe is sized as part of the piping system in accordance with Section 402 and the location of the appliance shutoff valve complies with Section 409.5.

Chapter 5 Chimneys And Vents

Section 501 (IFGC) General

501.15.4 Clearances.

Exception: Masonry chimneys without the required airspace clearances shall be permitted to be used if lined or relined with a chimney lining system listed for use in chimneys with reduced clearances in accordance with UL 1777. The chimney clearance shall be not less than permitted by the terms of the chimney liner listing and the manufacturer's instructions.

501.15.4.1 Fireblocking. Noncombustible fireblocking shall be provided in accordance with the IBC.

Section 502 (IFGC) Vents

502.4 Insulation shield. Where vents pass through insulated assemblies, an insulation shield constructed of steel having a minimum thickness of 0.0187 inch (No. 26 gage) shall be installed to provide clearance between the vent and the insulation material.

Section 503 (IFGS) Venting of Appliances

503.1 General. The venting of appliances shall be in accordance with Section 503.2 through 503.16.

503.2.4 Appliances with integral vents. Appliances incorporating integral venting means shall be installed in accordance with the manufacturer's instructions and Section 503.8, Items 1 and 2.

503.2.5 Incinerators. Commercial-industrial-type incinerators shall be vented in accordance with NFPA 82.

503.3 Design and construction. Venting systems shall be designed and constructed so as to convey all flue and vent gases to the outdoors.

503.3.3 Mechanical draft systems.

2. Appliances requiring venting shall be permitted to be vented by means of mechanical draft systems of either forced or induced draft design.

6. The exit terminals of Mechanical draft systems shall be not less than 7 feet above finished ground level where located adjacent to public walkways and shall be located as specified in Section 503.8, Items 1 and 2.

503.3.5 Air ducts and furnace plenums. Venting systems shall not extend into or pass through any fabricated air duct or furnace plenum.

503.4.1.1 Plastic vent joints. Plastic pipe and fittings used to vent appliances shall be installed in accordance with the appliance manufacturer's installation instructions. Where a primer is required, it shall be of a contrasting color.

Table 503.4 Incinerators – In accordance with NFPA 82

Omitted Figure 503.5.4 – Typical Termination Locations for Chimneys and Single-wall Metal Pipes Serving Residential-type and Low-heat Equipment.

503.5.6.1 Chimney lining. Chimneys shall be lined in accordance with NFPA 211.

Exception: Where an existing chimney complies with Sections 503.5.6 through 503.5.6.3 and its sizing is in accordance with Section 503.5.5, its continued use shall be allowed where the appliance vented by such chimney is replaced by an appliance of similar type, input rating and efficiency.

503.6.13 Fastener penetrations. Screws, rivets and other fasteners shall not penetrate the inner wall of double-wall gas vents, except at the transition from an appliance draft hood outlet, a flue collar or a single-wall metal connector to a double-wall vent.

503.7.5 Roof penetrations. The thimble shall be sized in accordance with Section 503.7.7.

503.7.6 Installation. The installation of a single-wall metal pipe through an exterior combustible wall shall comply with Section 503.7.7.

503.7.7 Single-wall penetrations of combustible walls. A single-wall metal pipe shall not pass through a combustible exterior wall unless guarded at the point of passage by a ventilated metal thimble not smaller than the following:

1. For listed appliances with draft hoods and appliances listed for use with Type B gas vents, the thimble shall be not less than 4 inches larger in diameter than the metal pipe. Where there is a run of not less than 6 feet of metal pipe in the open between the draft hood outlet and the thimble, the thimble shall be permitted to be not less than 2 inches larger in diameter than the metal pipe.
2. For unlisted appliances having draft hods, the thimble shall be not less than 6 inches larger in diameter than the metal pipe.
3. For residential and low-heat appliances, the thimble shall be not less than 12 inches larger in diameter than the metal pipe.

Exception: In lieu of thimble protection, all combustible material in the wall shall be removed a sufficient distance from the metal pipe to provide the specified clearance from such metal pipe to combustible material. Any material used to close up such opening shall be noncombustible.

Section numbers change from 503.7.8 through 503.7.13.

503.08 Venting System termination location.

4. Through-the-wall vents for Category II and IV appliances and noncategorized condensing appliances shall not terminate over public walkways or over an area where condensate or vapor could create a nuisance or hazard or could be detrimental to the operation of regulators, relief valves or other equipment. Where local experience indicates that condensate is a problem with Category I and III appliances, this provision shall also apply. Drains for condensate shall be installed in accordance with the appliance and vent manufacturers' instructions.

503.10.2.3 Residential-type appliance connectors.

Exception: Listed insulated vent connectors shall be installed in accordance with the manufacturer's installation instructions.

503.10.2.5 Medium-heat appliances. (eliminated commercial and industrial incinerators out of this section)

Table 503.10.2.5 Minimum Thickness for Steel Vent Connectors for Medium-Heat Appliance – Vent Connector Size. (eliminated commercial and industrial incinerators off of this table)

503.10.4.1 Two or more openings. Where two or more openings are provided into one chimney flue or vent, the openings shall be at different levels, or the connectors shall be attached to the vertical portion of the chimney or vent at an angle of 45 degrees or less relative to the vertical.

503.10.5 Clearance. Minimum clearances from vent connectors to combustible material shall be in accordance with Table 503.10.5. (table number changed)

Table 503.10.5 Clearances for Connectors (new number for table and put in 503.10.5)

503.10.6 (removed flow resistance)

503.10.8 Length of vent connector. (This section changed numbers and a portion of this section was omitted – A vent connector shall be as short as practical and the appliance located as close as practical to the chimney or vent.) The maximum horizontal length of a single-wall connector shall be 75 percent of the height of the chimney or vent except for engineered systems. The maximum horizontal length of a Type B double-wall connector shall be 100 percent of the height of the chimney or vent except for engineered systems. (A portion of this section was omitted – For a chimney or vent system serving multiple appliances, the maximum length of an individual connector, from the appliance outlet to the junction with the common vent or another connector, shall be 100 percent of the height of the chimney or vent.)

503.10.13 Passage through ceilings, floors or walls. Single-wall metal pipe connectors shall not pass through any wall, floor or ceiling except as permitted by Section 503.7.4.

503.12.1 Appliances requiring draft hoods. Vented appliances shall be installed with draft hoods.

Exception: (removed incinerators from this exception)

503.12.4 Additional devices. (omitted “except incinerators” from this section)

503.16 Outside wall penetrations. Where vents, including those for direct-vent appliances, penetrate outside walls of buildings, the annular spaces around such penetrations shall be permanently sealed using approved materials to prevent entry of combustion products into the building.

Section 504 (IFGS) Sizing of Category I Appliance Venting Systems

504.2.3 Vent offsets. (added to the end of the section) Where multiple offsets occur in a vent, the total lateral length of all offsets combined shall not exceed that specified in Tables 504.2.(1) through 504.2(5).

504.2.9 Chimney and vent locations. Tables 504.2(1), 504.2(2), 504.2(3), 504.2(4) and 504.2(5) shall be used only for chimneys and vents not exposed to the outdoors below the roof line. A Type B vent or listed chimney lining system passing through an unused masonry chimney flue shall not be considered to be exposed to the outdoors. Where vents extend outdoors above the roof more than 5 feet higher than required by Figure 503.6.4, and where vents terminated in accordance with Section 503.6.4, Item 2, the outdoor portion of the vent shall be enclosed as required by this section for vents not considered to be exposed to the outdoors or such venting system shall be engineered. A Type B vent shall not be considered to be exposed to the outdoors where it passes through an unventilated enclosure or chase insulated to a value of not less than R8.

504.2.17 Height Entries. Where the actual height of a vent falls between entries in the height column of the applicable table in Tables 504.2.(1) through 504.2.(6), either interpolation shall be used or the lower appliance input rating shown in the table entries shall be used for FAN MAX and NAT MAX column values and the higher appliance input rating shall be used for the FAN MIN column values.

504.3.20 Chimney and vent location. Tables 504.3(1), 504.3(2), 504.3(3), 504.3(4) and 504.3(5) shall be used only for chimneys and vents not exposed to the outdoors below the roof line. A Type B vent or listed chimney lining system passing through an unused masonry chimney flue shall not be considered to be exposed to the outdoors. Where vents extend outdoors above the roof more than 5 feet (1524 mm) higher than required by Figure 503.6.4 and where vents terminate in accordance with Section 503.6.4, Item 2, the outdoor portion of the vent shall be enclosed as required by this section for vents not considered to be exposed to the outdoors or such venting system shall be engineered. A Type B vent shall not be considered to be exposed to the outdoors where it passes through an unventilated enclosure or chase insulated to a value of not less than R8.

Tables 504.3(6a), 504.3(6b), 504.3(7a) and 504.3(7b) shall be used for clay-tile-lined exterior masonry chimneys, provided that all of the following conditions are met:

504.3.28 Height entries. Where the actual height of a vent falls between entries in the height column of the applicable table in Tables 504.3(1) through 504.3(7b), either interpolation shall be used or the lower appliance input ratings shown in the table shall be used for FAN MAX and NAT MAX column values and the higher appliance input rating shall be used for the FAN MIN column values.

Chapter 6 Specific Appliances

Section 614 (IFGC) Clothes Dryer Exhaust

614.6 Domestic clothes dryer exhaust ducts. Exhaust ducts for domestic clothes dryers shall conform to the requirements of Sections 614.6.1 through 614.6.7.

614.6.1 Material and size. Exhaust ducts shall have a smooth interior finish and shall be constructed of metal a minimum 0.016 inch (0.4 mm) thick. The exhaust duct size shall be 4 inches (102 mm) nominal in diameter.

614.6.2 Duct installation. Exhaust ducts shall be supported at 4-foot intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Ducts shall not be joined with screws or similar fasteners that protrude into the inside of the duct. **614.6.3 Protection required.** Protective shield plates shall be placed where nails or screws from finish or other work are likely to penetrate the clothes dryer exhaust duct. Shield plates shall be placed on the finished face of all framing members where there is less than 1 1/4 inches between the duct and the finished face of the framing

member. Protective shield plates shall be constructed of steel, shall have a minimum thickness of 0.062 inch and shall extend a minimum of 2 inches above sole plates and below top plates.

614.6.4 Transition ducts. Transition ducts used to connect the dryer to the exhaust duct system shall be a single length that is listed and labeled in accordance with UL 2158A. Transition ducts shall be a maximum of 8 feet in length, and shall not be concealed within construction.

614.6.5 Duct length. The maximum allowable exhaust duct length shall be determined by one of the methods specified in Section 614.6.5.1 or 614.6.5.2.

614.6.5.1 Specified length. The maximum length of the exhaust duct shall be 35 feet from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are utilized, the maximum length of the exhaust duct shall be reduced in accordance with Table 614.6.5.1.

Table 614.6.5.1 – Dryer Exhaust Duct Fitting Equivalent Length.

614.6.5.2 Manufacturer's instructions. The maximum length of the exhaust duct shall be determined by the dryer manufacturer's installation instructions. The code official shall be provided with a copy of the installation instructions for the make and model of the dryer. Where the exhaust duct is to be concealed, the installation instructions shall be provided to the code official prior to the concealment inspection. In the absence of fitting equivalent length calculations from the clothes dryer manufacturer, Table 614.6.5.1 shall be utilized.

614.6.6 Length identification. Where the exhaust duct is concealed within the building construction, 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 of the exhaust duct connection.

614.6.7 Exhaust duct required. Where space for a clothes dryer is provided, an exhaust duct system shall be installed.

Where the clothes dryer is not installed at the time of occupancy, the exhaust duct shall be capped at the location of the future dryer.

Exception: Where a listed condensing clothes dryer is installed prior to occupancy of the structure. **614.8**

Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of such system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistant rated as required by the IBC.
2. Dampers shall be prohibited in the exhaust duct. Penetrations of the shaft and ductwork shall be protected in accordance with Section 607.5.5, Exception 2, of the IMC.
3. Rigid metal ductwork shall be installed within the shaft to convey the exhaust. The ductwork shall be constructed of sheet steel having a minimum thickness of 0.0187 inch (No. 26 gage) and in accordance with SMACNA Duct Construction Standards.
4. The ductwork within the shaft shall be designed and installed without offsets.
5. The exhaust fan motor design shall be in accordance with Section 503.2 of the International Mechanical Code.
6. The exhaust fan motor shall be located outside of the airstream.
7. The exhaust fan shall run continuously, and shall be connected to a standby power source.
8. The exhaust fan operation shall be monitored in an approved location and shall initiate an audible or visual signal when the fan is not in operation.
9. Makeup air shall be provided for the exhaust system.
10. A cleanout opening shall be located at the base of the shaft to provide access to the duct to allow for cleaning and inspection. The finished opening shall be not less than 12 inches by 12 inches.
11. Screens shall not be installed at the termination.

Section 616 (IFGC) Engine and Gas Turbine-Powered Equipment

616.1 Powered equipment. (added to the end of the paragraph) Stationary engine generator assemblies shall meet the requirements of UL 2200.

616.2 Gas supply connection. Equipment powered by internal combustion engines and turbines shall not be rigidly connected to the gas supply piping.

Section 618 (IFGC) Forced-Air Warm-Air Furnaces. (618.4 Omitted Circulating air ducts for forced-air warm-air furnaces)

(Changed numbers) **618.4 Prohibited sources.** Outdoor or return air for forced-air to the furnace heating and cooling systems shall not be taken from the following locations:

5. **Exception 2.2.3** Return-air inlets shall not be located within 10 feet of a draft hood in the same room or space or the combustion chamber of any atmospheric burner appliance in the same room or space.

6. A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.

Exceptions:

1. Where return air intakes are located not less than 10 feet from cooking appliances and serve only the kitchen area, taking return air from a kitchen area shall not be prohibited.

2. Dedicated forced air systems serving only a garage shall not be prohibited from obtaining return air from the garage.

7. A crawl space by means of direct connection to the return side of a forced-air system. Transfer openings in the crawl space enclosure shall not be prohibited.

618.7 (IFGS) Furnace plenums and air ducts. Where a furnace is installed so that supply ducts carry air circulated by the furnace to areas outside of the space containing the furnace, the return air shall also be handled by a duct(s) sealed to the furnace casing and terminating outside of the space containing the furnace.

Section 620 (IFGC) Conversion Burners

620.5 (IFGS) Installation in commercial garages and aircraft hangars. Unit heaters installed in garages for more than three motor vehicles or in aircraft hangars shall be installed in accordance with Sections 305.9, 305.10 and 305.11.

Section 623 (IFGC) Cooking Appliances

623.7 (IFGS) Vertical clearance above cooking top. Household cooking appliances shall have a vertical clearance above the cooking top of not less than 30 inches to combustible material and metal cabinets. A minimum clearance of 24 inches is permitted where one of the following is installed:

1. The underside of the combustible material or metal cabinet above the cooking top is protected with not less than ¼-inch insulating millboard covered with sheet metal not less than 0.0122 inch thick.

2. A metal ventilating hood constructed of sheet metal not less than 0.0122 inch thick is installed above the cooking top with a clearance of not less than ¼-inch between the hood and the underside of the combustible material or metal cabinet. The hood shall have a width not less than the width of the appliance and shall be centered over the appliance.

3. A listed cooking appliance or microwave oven is installed over a listed cooking appliance and in compliance with the terms of the manufacturer's installation instructions for the upper appliance.

Section 630 (IFGC) Infrared Radiant Heaters

630.1 General. Infrared radiant heaters shall be tested in accordance with ANSI Z83.19 or Z83.20 and shall be installed in accordance with the manufacturer's instructions.

630.3 (IFGS) Combustion and ventilation air. Where unvented infrared heaters are installed, natural or mechanical means shall provide outdoor ventilation air at a rate of not less than 4 cfm per 1,000 Btu/h of the aggregate input rating of all such heaters installed in the space. Exhaust openings for removing flue products shall be above the level of the heaters.

630.4 (IFGS) Installation in commercial garages and aircraft hangars. Overhead infrared heaters installed in garages for more than three motor vehicles or in aircraft hangars shall be installed in accordance with Sections 305.9, 305.10 and 305.11.

Section 633 (IFGC) Stationary Fuel-Cell Power Systems

633.1 General. (added in that they also must be installed in accordance with IBC and IFC)

Section 636 (IFGC) Outdoor Decorative Appliances

636.1 General. Permanently fixed-in-place outdoor decorative appliances shall be tested in accordance with ANSI Z21.97 and shall be installed in accordance with the manufacturer's instructions.

Chapter 7 Gaseous Hydrogen Systems (chapter and section numbers changed in the IFC for this chapter)

Section 703 (IFGC) General Requirements

703.1 Hydrogen-generating and refueling operations. Hydrogen-generating and refueling appliances shall be installed and located in accordance with their listing and the manufacturer's instructions. (added to the beginning of this section)

The Most Significant Changes from the 2003 to the 2012 International Mechanical Code

Michael Izzo CBO

Chapter 1 Administration

[A]102.3 Maintenance Added in 2012

"The inspection for maintenance of HVAC systems shall be done in accordance with ASHRAE/ACCA/ANSI"

Chapter 2 Definitions

Added in 2012 "Breathing Zone"

The region within an occupied space between planes 3 and 72 inches above the floor and more than 2 feet from the walls of the space or from fixed air-conditioning equipment

Added in 2012 "Environmental Air" in Definitions

Air that is conveyed to or from occupied areas through ducts which are not part of the heating or air-conditioning systems, such as ventilation for human usage, domestic kitchen range exhaust, bathroom exhaust domestic clothes dryer exhaust and parking garage exhaust.

Added in 2012 "Net Occupiable Floor Area"

The floor area of an occupiable space defined by the inside surfaces of its walls but excluding shafts, column enclosures and other permanently enclosed, inaccessible and unoccupiable areas. Obstructions in the space such as furnishings, display or storage racks and other obstructions, whether temporary or permanent shall not be deducted from the space area.

Added in 2012 in Definitions "Occupiable Space"

An enclosed space intended for human activities, excluding those spaces intended primarily for other purposes such as storage rooms and equipment rooms that are only intended to be occupied occasionally and for short periods of time.

Added in 2012 in Definitions "[B]"Sleeping Unit"

A room or space in which people sleep which can also include permanent provisions for living, eating and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a *dwelling unit* are not sleeping units.

Chapter 3 General Regulations

306.4 Appliances under floors

Added whole paragraph titled "Access for maintenance and replacement"

Added Exception #2.: "Where the passageway is unobstructed and not less than 6 feet high and 22 inches wide for its entire length, the passageway shall be not greater than 50 feet in length."

306.5.1 Sloped Roof

Added section on guard requirements "not less than 42" above the platform etc. and meets loading requirements specified in IBC.

Chapter 4 Ventilation

401.1 Scope

Added Mechanical exhaust systems, including exhaust systems serving clothes dryers and cooking appliances; hazardous exhaust systems; dust, stock and refuse conveyor systems, sub-slab soil exhaust systems; smoke control systems; energy recovery ventilation systems and other systems specified in sec. 502 shall comply with Chapter 5.

401.2 Ventilation required

Added "Where the air infiltration rate in a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch water column (50 pa) in accordance with Section 402.4.1.2 of the *International Energy Conservation Code*, the dwelling unit shall be ventilated by mechanical means in accordance with Section 403.

401.4 Exits. Re-named **"Intake opening location"** Air intake openings shall comply with all of the following:

1. Intake opening shall be located a minimum of 10 feet from lot lines or buildings on the same lot.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots and loading docks. Except as specified in Item 3 or Section 501.2.1. Outdoor air intake openings shall be permitted to be located less than 10 feet horizontally from streets, alleys, parking lots and loading docks provided that the openings are located not less than 25 feet vertically above such locations. Where openings front on a street or public way, the distance shall be measured from the closest edge of the street or public way.
3. Intake openings shall be located not less than 3 feet below contaminant sources where such sources are located within 10 feet of the opening.
4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612 of the IBC for utilities and attendant equipment.

Removed most text on exhaust from **Chapter 4 Ventilation** including **Table 401.5** and **Added** to **Chapter 5 Exhaust**

Section 402 Natural Ventilation

Added Exception under 402.3 **Adjoining Spaces**

"Exterior openings required for ventilation shall be permitted to open into a thermally isolated sunroom addition or patio cover, provided that the openable area between the sunroom addition or patio cover and the interior room has an area of not less than 8 percent of the floor area of the interior room or space, but not less than 20 square feet. The minimum openable area to the outdoors shall be based on the total floor area being ventilated.

Section 403 Mechanical Ventilation

Added to **403.2 Outdoor air required**

"Ventilation supply systems shall be designed to deliver the required rate of outdoor airflow to the breathing zone within each occupiable space."

Exception Added

"Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3 the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design"

404.2 Minimum Ventilation

Changed from **1.5 cfm** per sq. ft. of floor area to **0.75 cfm** per sq. ft of floor area.

Chapter 5 Exhaust Systems

501.1 Scope

Mechanical exhaust systems include clothes dryer, cooking appliances; hazardous exhaust systems, dust, stock and refuse conveyor systems; subslab soil exhaust systems; smoke control systems; energy recovery ventilation systems and other systems specified in Section 502.

501.2 Added Independent system required.

Single or combined mechanical exhaust systems for environmental air shall be independent of all other exhaust systems. Dryer exhaust shall be independent of all other systems. Type 1 exhaust systems shall be independent of all other exhaust systems except as provided in Section 506.3.5. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. Kitchen exhaust systems shall be constructed in accordance with Section 505 for domestic equipment and Sections 506 through 509 for commercial equipment

[F] 502.9.11 Silane gas

Now shall comply with Chapter 64 of the International Fire Code

[F] 502.10 Hazardous production materials (HPM)

[F] 502.10.1 Where required

Added number 8. Cabinets containing pyrophoric liquids or Class 3 water-reactive liquids; Exhaust ventilation for cabinets in fabrication areas containing pyrophoric liquids shall be as required in Section 2705.2.3.4 of the International Fire Code.

504.2 Exhaust penetrations

Added Where a clothes dryer exhaust duct penetrates a wall or ceiling membrane, the annular space shall be sealed with noncombustible material, approved fire caulking or noncombustible dryer exhaust duct wall receptacle.

504.6 Domestic clothes dryer ducts re-wrote whole section with new Table 504.6.4.1

Exhaust ducts for domestic clothes dryers shall conform to the requirements of Sections 504.6.1 through 504.6.7.

Added new section 506.3.2.5 Grease duct test

Prior to the use or concealment of any portion of a grease duct system, a leakage test shall be performed. Ducts shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ductwork from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary equipment and perform the grease duct leakage test. A light test shall be performed to determine that all welded and brazed joints are liquid tight.

A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A test shall be performed for the entire duct system, including the hood-to-duct connection. The duct work shall be permitted to be tested in sections, provided that every joint is tested. For listed factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds.

506.3.4 Air velocity

Change Grease duct systems serving at Type 1 hood shall be designed and installed to provide an air velocity within the duct system of not less than 500 feet per minute.

(was 1500 feet per minute in 2003 Code)

507.9 Clearances for Type 1 hood.

Exception: Added text

Clearance shall not be required from gypsum wallboard or ½ inch or thicker comentitious wallboard attached to noncombustible structures ----- etc

513.8 Exhaust method

Changed from accordance with this section to accordance with NFPA92B

513.8.1 Exhaust rate

The height of the lowest horizontal surface of the accumulating smoke layer shall be maintained at least 6 feet above any walking surface which forms a portion of a required egress system within the smoke zone.

(was 10 feet in 2003)

513.8.2 Removed Axisymmetric plumes

513.8.3 Removed Balcony spill plumes

513.8.4 Removed Window plumes

513.9 Design fire

Removed The design shall be based on a Q of not less than 5,000 Btu per second.

513.11 Power systems

Secondary power shall be from an approved standby source complying with Chapter 27 of the IBC. The stand-by power source and its transfer switches shall be in a room separate from the normal power transformers and switch gear and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour fire-resistance-rated fire barriers constructed in accordance with Section 707 of the IBC or horizontal assemblies constructed in accordance with Section 711 of the IBC or both. The systems shall comply with NFPA 70. (was ICC Electrical Code)

Section 513 Smoke Control Systems

513.1 Added This section applies to mechanical and passive smoke control systems that are required by the International Building Code or the International Fire Code.

513.4.6 Duration of operation

All portions of active or passive smoke control systems shall be capable of continued operation after detection of the fire event for a period of not less than either 20 minutes or 1.5 times the calculated egress time, whichever is less.

513.12 Detection and control systems

Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with NFPA72 and the requirements of Chapter 9 of the IBC or the International Fire Code.

513.12.1 Wiring

Changed from ICC Electrical Code to NFPA 70 requirements.

513.12.2 Activation

Changed from IBC to IBC or the International Fire Code

513.13 Control-air tubing

Added text under Exception: Tubing shall comply with the requirements of Section 602.2.1.3
Section 602 PLENUMS

602.2.1 Materials within plenums

Added ----in accordance with ASTM E 84 or UL723

602.2.1 Added in Exceptions:

5. Combustible materials fully enclosed within one of the following:

5.1 Continuous noncombustible raceways or enclosures.

5.2 Approved gypsum board assemblies.

5.3 Materials listed and labeled for installation within a plenum.

6. Materials in Group H. Division 5 fabrication areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

602.2.1.1 Wiring

Added -----in accordance with NFPA 262 or shall be installed in metal raceways or metal sheathed cable.

Table 603.4

Duct Construction Minimum Sheet Metal Thickness For Single Dwelling Unit

Changed numbers in Table

603.7 Rigid duct penetrations.

Added: Ducts in a private garage that penetrate a wall or ceiling that separates a dwelling from a private garage shall be continuous, shall be constructed of sheet steel having a thickness of not less than 0.0187 inch (No. 26 gage) and shall not have openings into the garage. Fire and smoke dampers are not required in such ducts passing through the wall or ceiling separation a dwelling from a private except where required by Chapter 7 of the IBC.

Section 604 Insulation

604.3 Coverings and linings.

Added: in accordance with ASTM E 84 or UL 723, using the specimen preparation and mounting procedures of ASTM E 2231.

604.7 Identification.

External duct insulation, except spray polyurethane foam, and factory-insulated flexible duct shall be legibly printed or identified -----

Added:

4. For spray polyurethane foam, the aged R-value per inch, measured in accordance with recognized industry standards, shall be provided to the customer in writing at the time of foam application.

Chapter 7 Combustion Air

General, 1 paragraph only, all details now spread out into other chapters.

See venting and exhaust.

Section 701 General

701.1 Scopes

Solid fuel-burning appliances shall be provided with combustion air in accordance with the appliance manufacturer's installation instructions. Oil-fired appliances shall be provided with combustion air in accordance with NFPA 31. The methods of providing combustion air in this chapter do not apply to fireplaces, fireplace stoves and direct-vent appliances. The requirements for combustion and dilution air for gas-fired appliances shall be in accordance with the International Fuel Gas Code.

Chapter 8 Chimneys and Vents

801.18.4 Clearances

Exception: Masonry chimneys without the required airspace clearances shall be permitted to be used if lined or relined with a chimney lining system listed for use in chimneys with reduced clearances in accordance with UL 1777. The chimney clearance shall be not less than permitted by the terms of the chimney liner listing and the manufacturer's instructions.

801.18.4.1 Fireblocking

Noncombustible fireblocking shall be provided in accordance with the IBC.

801.20 Plastic vent joints

Removed, Solvent cement joints between ABS pipe and fittings shall be cleaned. Solvent cement joints between CPVC and PVC pipe and fittings shall be primed. The primer shall be a contrasting color.

Section 805 Factory-Built Chimneys

805.2 Solid fuel appliances

Factory-built chimneys installed in dwelling units with solid fuel-burning appliances shall comply with the Type HT requirements of UL 103 and shall be marked "type HT" and "Residential Type and Building Heating Appliance Chimney."

Exception:

Chimney for use with open combustion chamber fireplaces shall comply with the requirements of UL 103 and shall be marked "Residential Type and Building Heating Appliance Chimney."

Chimney for use with open combustion chamber appliances installed in buildings other than dwelling units shall comply with the requirements of UL 103 and shall be marked "Building Heating Appliance Chimney" or "Residential Type and Building Appliance Chimney."

805.3 Factory-built chimney offsets

Where a factory-built chimney incorporates offsets, no part of the chimney shall be at an angle of more than 30 degrees from vertical at any point in the assembly and the chimney assembly shall not include more than four elbows.

Chapter 9 Specific Appliances Fireplaces & solid fuel-burning equipment

Now includes:

926 Gaseous Hydrogen Systems

927 Radiant Heating Systems

928 Evaporative Cooling Systems

Section 901 General

01.4 Fireplace accessories

Added: Fireplace accessories shall comply with UL 907.

Section 903 Factory-Built Fireplaces

Added: Listed and labeled hearth extensions shall comply with UL 1618.

Section 904 Pellet Fuel-Burning Appliances

904.1 General

Pellet fuel-burning appliances shall be listed and labeled in accordance with ASTM E 1509 and shall be installed in accordance with the terms of the listing.

Section 905 Fireplace Stoves and Room Heaters

905.3 Added Hearth extensions

Hearth extensions for fireplace stoves shall be installed in accordance with the listing of the fireplace stove. The hearth extension shall be readily distinguishable from the surrounding floor area. Listed and labeled hearth extensions shall comply with UL 1618.

Section 917 Cooking appliances

Added: 917.1 Cooking appliances

Commercial electric cooking appliances shall be listed and labeled in accordance with UL 197. Household electric ranges shall be listed and labeled in accordance with UL 858. Microwave cooking appliances shall be listed and labeled in accordance with UL 923.

918.6 Prohibited sources Changed #5. A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.

Exceptions:

5.1 Where return air intakes are located not less than 10 feet from cooking appliances, and serve the kitchen area only, taking return air from a kitchen shall be prohibited.

5.2 Dedicated forced-air systems serving only a garage shall not be Prohibited from obtaining return air from the garage.

6 . An unconditioned crawl space by means of direct connection to the return air of a forced air system. Transfer openings in the crawl space enclosure shall not be prohibited.

7 A room or space containing a fuel-burning appliance where such room or space serves as the sole source of return air.

Exceptions:

7.1 This shall not apply where the fuel-burning appliance is a direct vent appliance

7.2 This shall not apply where the room or space complies with the following requirements

7.2.1 The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h of combined input rating of all fuel-burning appliances therein

1.2.2 The volume of supply air discharged back into the same

Space shall be approximately equal to the volume of return air taken from the space.

1.2.3 Return-air inlets shall not be located within 10 feet of any

Appliance firebox or draft hood in the same or space.

1.3 This shall not apply to rooms or spaces containing solid-fuel-

Burning appliances, provided that return-air inlets are located not less than 10 feet from the firebox of the appliances.

Section 928 Evaporative Cooling Equipment

928.1 General. Evaporative cooling equipment shall:

1. Be installed in accordance with the manufacturer's instructions.

2. Be installed on level platforms in accordance with Section 304.10.

3. Have openings in exterior walls or roofs flashed in accordance with the IBC.

4. Be provided with potable water backflow protection in accordance with Section 608 of the IPC.

5. Have air intake opening locations in accordance with Section 401.4.

Chapter 10 Boilers, Water Heaters and Pressure Vessels

Section 1002 Water Heaters

Added: Solid fuel-fired water heaters shall comply with Chapter 14 and UL 174 or UL 1453.

***Added:* 1002.2.2 Temperature limitation.**

Where a combination potable water-heating and space-heating system requires water for space heating at temperatures higher than 140 degrees.F, a temperature actuated mixing valve that conforms to ASSE 1017 shall be provided to temper the water supplied to the potable hot water distribution system to a temperature of 140 degrees F or less.

Section 1003 Pressure Vessels

1003.1 General. All pressure vessels shall be in accordance with the ASME Boiler and Section 1107 Refrigerant Piping

1107.2 Piping location.

Refrigerant piping that crosses an open space that affords passageway in any building shall be not less than 7 feet 3 inches above the floor unless the piping is located against the ceiling of such space. Refrigerant piping shall not be placed in any elevator, dumbwaiter or other shaft containing a moving object or in any shaft that has openings to living quarters or to means of egress.. Refrigerant piping shall not be installed in an enclosed public stairway, stair landing or means of egress.

1107.2.1 Piping in concrete floors

Refrigerant piping installed in concrete floors shall be encased in pipe ducts. The piping shall be isolated and supported to prevent damaging vibration, stress and corrosion.

1107.2.2 Refrigerant penetrations.

Refrigerant piping shall not penetrate floors, ceilings or roofs.

Exceptions:

1. Penetrations connecting the basement and the first floor.
2. Penetrations connecting the top floor and a machinery penthouse or roof Installation.

3 Penetrations connecting adjacent floors served by the refrigeration system.

4 Penetrations by piping in a direct system where the refrigerant quantity Does not exceed Table 1103.1 for the smallest occupied space through Which the passes.

5 In other than industrial occupancies and where the refrigerant quantity Exceeds Table 1103.1 for the smallest space, penetrations for piping that Connects separate pieces of equipment that are either:

- 1.1 Enclosed by an approved gas-tight, fire-resistant duct or shaft

With openings to those floors served by the refrigerant system or

- 1.2 Located on the exterior of the building where vented to the

Outdoors or to the space served by the system and not used as an air shaft, closed court or similar space.

Chapter 12 Hydronic Piping

Table 1202.4 Hydronic pipe

Added Materials:

Ductile iron pipe

Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe

Raised temperature polyethylene (PE-RT)

Table 1202.6 Hydronic pipe fittings

Added Fittings

Ductile iron and gray iron

Ductile iron

PEX fittings

Section 1203 Joints and Connections

1203.3.4 Solvent cemented joints

CPVC joints shall be made in accordance with ASTM D 2846

Added Exception: For CPVC pipe joint connections, a primer is not required

Where all of the following conditions apply:

1. The solvent cement used is third party certified as conforming to ASTM F 493
2. The solvent cement is yellow in color.
3. The solvent cement is used only for joining ¼ inch through 2 inch diameter CPVC pipe fittings.
4. The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846.



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