

Key Changes to the International Codes 2012 Edition from the 2006 Edition (2 code cycles) and to the 2011 NEC from the 2005 NEC (2 code cycles) -

The purpose for this report is to familiarize the development construction industry with the important changes related to construction design and installation. It is intended to assist those code users in identifying the specific code changes that have occurred, understanding the reason behind the change as well as a valuable resource for the jurisdiction in their code adoption process. A change may be considered key if it raises the level of stringency of the code, or if it has a positive impact on the implementation of, or compliance with, the code.

2012 International Building Code (IBC)

Chapter 2 – 2009 and 2012 showed continued movement of definitions to this chapter from other chapters.

- New definition of ambulatory care facility – buildings or portion thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24 hour basis who are rendered incapable of self - preservation.
- New definition of L rating – air leakage of a through penetration fire stop system or a fire resistive joint system.
- A number of new definitions related to care facilities have been added and some existing definitions are revised to provide clarity and consistency.

Chapter 3 – Most changes are clarification of occupancies based on typical applications since the 2006 edition.

- Section 303.3 – Group A-2 (food and/or drink consumption) now includes associated commercial kitchens which are a part of restaurants, cafeterias, and similar dining facilities.
- Section 308.4 Institutional Group I-2 – This occupancy is now only applicable to those medical facilities where six or more individuals are incapable of self -preservation and are receiving care. If 5 or fewer you it shall be classified as an R-3 or the IRC can be used with approved fire sprinkler system installed.
- Section 310.5 – Group R-3 now includes care facilities that provide accommodations for five or fewer persons.
- Section 310.6 Residential Group R-4 – The allowance for constructing Group R-4 under the IRC has been eliminated.

Chapter 4 – The 2009 major change was to recognize the post 911 terrorist attack studies on high rise buildings with both code editions recognizing the ‘ambulatory care facilities’ as a new commonly seen use.

- Section 403.6.1 – This section will now require an increase in fire service elevators (minimum 2 or more) in buildings with occupied floors more than

120 feet above level of fire department vehicle access. Previously only one was required.

- Section 422 - Ambulatory care facilities are classified as B occupancy and this use has been modified in the 2009 and 2012 code editions. This section applies when there is the potential of four or more recipients who are rendered incapable of self-preservation. Space needs to be separated by fire partitions and if space is greater than 10,000 square foot on single story, the space needs to be within smoke compartments.

Chapter 5 – Most of changes are clarifications of methodology on applying area and height increases.

- Section 507 - Has new exception that allows other occupancies within unlimited buildings if they meet the accessory provisions in section 508.2.
- Section 509 - Gives requirements for incidental uses which are ancillary functions associated with a given occupancy and generally pose a greater level of risk to that occupancy and are limited to those listed in Table 509.

Chapter 6 – No key changes on Type of Construction.

Chapter 7 – Reformatting for ease of use with few changes and clarifications.

- Section 708 - Now section 712 and called vertical openings instead of shaft openings. This is a part of a significant reformatting of Chapter 7 and the emphasis on the presence of vertical openings rather than on shaft enclosures. Shaft enclosures are just one of many acceptable methods addressing any hazards related to vertical openings.
- Section 714.4.1.1.2 - Through-penetration fire stop system has new exception to not require a T rating for floor penetrations by floor drains, tub drains, or shower drains and located within the concealed space of a horizontal assembly.
- Section 714.4.1.2 - Membrane penetrations has new exception 7 which allows the ceiling membrane of fire rated floor/ceiling or roof/ceiling assembly to be interrupted by a double wood top plate as long as all penetrating items are fire stopped and the fire rating of the wall is no less than that of the horizontal assembly.
- Section 718.2.1 – Fire blocking now allows the use of cellulose insulation as long as product has been tested as a fire block.

Chapter 8 – Interior Finishes saw few changes with some new material recognitions and clarifications on testing.

Chapter 9 – See the IFC section for reference on most of changes and additions. Definitions reformat in 2009.

- Section 903.2.7 Group M – Now requires fire sprinkler when use is for display and sale of upholstered furniture and mattress and size exceeds 5000 s.f. – previously there was not a size threshold.
- Section 903.2.11.1.3 - Will now require a basement that exceeds 1500 s.f. and has walls, partitions, or other obstructions that restrict the application of water from hose streams to be fire sprinklered. This section still requires fire sprinklers when any portion of basement is located more than 75 feet from openings to exterior.
- Section 907.2.3 – Group E occupancies now require a fire alarm system at >30 occupant load (2009 – 50 OL).
- Section 908.7 - Will now require carbon monoxide alarms in Group I and R occupancies which contain fuel burning appliances or attached garages. This requirement for R Occupancies covered in the IRC began with the 2009 edition.

Chapter 10 – Clarification reformatting from 2006 – 2012 with following additions/changes:

- Section 1001.4 - Was added and requires a fire safety and evacuation plan for all occupancies when required by the Fire Code.
- Table 1004.1.2 - Establishes an occupant load factor for new use of museum and exhibit gallery (30sf/occupant).
- Section 1005 - Means of Egress sizing has been added and gives all requirements for sizing means of egress systems in on section. No technical changes have been made.
- Section 1008.1.2 - Has new language that clarifies that the total occupant load within a room will determine door swing requirements.
- Section 1008.1.9.6 - Addresses special locking devices for Group I-2 occupancies.
- Section 1011.2 - Floor level exit sign in R-1 has been added and will require floor level exit signs in all areas serving guestrooms in R-1 occupancies.
- Section 1012.2 - Will now allow transition fittings on continuous handrails to be higher than the maximum 38”.
- Section 1013.3 - Has lowered guard height from 42” minimum to 36” minimum for R-3 occupancies and within R-2 occupancies.
- Section 1013.8 - Window sills has been changed to require the bottom of window openings in R-2 and R-3 occupancies to be at least 36” above floor when it is more than 72” above exterior grade or surface. Previously the requirement was 24”.
- Section 1018.4 - Has new exception to dead end corridor length if building equipped with automatic sprinkler system (20’ to 50’).

Chapter 11 – Established more consistency with the federal standard for accessible scoping.

- Section 1104.3.1 - Now exempts up to 1000 s.f. work area from meeting accessible circulation paths – previously it was 300 s.f.
- Section 1109.2 and 1109.5 - Will now allow toilet facilities and drinking fountains used primarily for children’s use to be installed at lower heights.

Chapter 12 - Mainly format changes.

- Section 1203.1 - Will now require a mechanical means of ventilation when air infiltration rate is less than 5 air changes per hour. The IECC requires that this infiltration rate to be less than 5 air changes per hour.
- Section 1210 - Now has water closet compartment and urinal partition requirements – relocated from Chapter 29.

Chapter 14 – New material regulations and expanded performance requirements

- Section 1403.5 - Vertical and lateral flame propagation – this is a new section that will require exterior walls on buildings of Type I, II, III, or IV and greater than 40’ above grade plane and include a combustible water resistive barrier to have the barrier comply with acceptance criteria NFPA 285.
- Section 1408 - A new section in 2009 edition and covers EFIS exterior coverings.
- Section 1409 - A new section in 2012 edition and covers HPL exterior coverings.

Chapter 15 – Roof type underlayment changes, solar energy and rooftop application additions.

- Section 1505.8 - Photovoltaic systems – new section that will require photovoltaic systems that are adhered or attached to the roof covering or photovoltaic modules/shingles installed as roof coverings to be labeled to identify their fire classifications.
- Section 1509.7 - Photovoltaic systems and Section 1511 – new sections that gives requirements for photovoltaic systems – wind, fire classification, installation, and testing criteria.

Chapter 16 – changes reflected new techniques and design standards from 2006-2012.

- Section 1604.5 - Has the term Occupancy Category changed to Risk Category to better reflect intended meaning and to coordinate with terminology used in ASCE-10.
- Chapter 17 – Reorganized from 2006 and 2009 to remove conflicts and inconsistencies in sections and industry.

Chapter 18 – Most changes in 2009 by defining the types of foundations than location change in 2012 to definition section.

Chapter 19 – Provisions for concrete construction now references the 2011 edition of ACI 318.

Chapter 21 – Provisions for masonry construction now references the 2011 edition of the MSJC.

Chapter 23 – Minor changes, most on clarification of design guidelines and fasteners for treated wood.

Chapter 24 - Section 2406 Hazardous locations – entire section has been changed to be more “user friendly” – some technical changes have been made for glazing adjacent to stair landings – previously needed safety glazing when bottom of glass was 60” or less above floor and now it is only needed when bottom of glass is 36” or less above floor.

Chapter 25 – Tables 2506.2 and 2507.2 changes and increase to 2 layers of water resistive barrier with stucco.

Chapters 26 – 33 – No substantial additions or changes

Chapter 34 – The 2009 edition added the provision to allow the current recognized edition of the IEBC for an alternate design or application of use by the owner – subject to Building Official discretion.

2012 International Residential Code (IRC)

Chapter 1 – Key revisions/additions seen in 2009 edition and 2012 edition regarding the scope of live/work units and work exempt from a permit.

Chapter 2 – Key additions seen in both editions that recognizes new material and standards as well as new construction terms (ex – attic habitable, guestroom, lodging house, whole house mechanical ventilation system, air-impermeable insulation, braced wall line and braced wall panel, etc..)

Chapter 3 – This chapter covers all aspects of building planning and has seen revisions/additions to both code editions. Some key changes are listed.

- Section R 301.2.1 – The 2012 edition shows revisions to wind design criteria as well as a new wind map.
- Section R302 – This section is new in the 2009 and titled Fire-resistant construction and follows a similar format as the IBC.

- Section R302.1 - A key change in the 2012 edition regarding a reduction in lot line clearances to exterior wall if dwelling is equipped with a fire sprinkler system.
- Sections R302.2 and 302.3 – The 2009 edition consolidated the dwelling unit separation requirements from 317.1 and 317.2 (townhomes and two family dwellings) to these sections and allows a reduction of the common wall rating from 2 hour to 1 hour if dwelling is provided with a fire sprinkler system.
- Section R302.2.2 - Will now not allow any openings or penetrations in the roof within 4 feet of a townhouse party wall when a parapet is not installed.
- Section R302.5.1 – The 2012 edition now requires the door between the dwelling unit and the garage to be self-closing.
- Section R303.4 - Will now require a whole house mechanical ventilation system when blower door test has an air infiltration rate of less than 5 air changes per hour. Natural ventilation - openable doors and windows are still allowed.
- Section R303.5.1 – Key change with increase in minimum distance between a contaminant source and an outdoor air intake located below the source – 2 feet to 3 feet.
- Section R308.4 - Hazardous Locations for Glazing has been reformatted. The major technical change is to require safety glazing adjacent to stairs and landings when bottom edge is less than 36” above floor where previously it was 60”.
- Section R310.1 - Has been clarified so that you would measure the 44” maximum height of egress window to the bottom of opening of window instead of the sill.
- Section R310.2.2 - New section that will require proper drainage for window wells – connected to foundation drainage system or other approved method.
- Section R311 – The 2009 code edition reorganized the means of egress provisions in a systematic order to provide a better understanding of the requirements. The 2012 revised and added some installation specifications to stair treads, risers and landings.
- Section R312 - Establishes the requirements for window fall protection relocated from Chapter 6.
- Section R313 – The 2009 code edition added this automatic fire sprinkler system section yet in the State of Texas, legislative action does not allow a city to implement mandatory sprinkler requirements unless city ordinance for this requirement pre-dated the legislative directive.
- Section R314 – The 2009 code edition reorganized the smoke alarm provisions and separated the alternative household fire alarm system from the smoke alarm section (fire alarm section clarified maintenance and supervision requirements). The 2012 code edition added an allowance for approval of a listed wireless alarm system.
- Section R315 – The 2009 code edition added this new section requiring the installation of carbon monoxide detectors under specific house design

qualifiers for the installation. The 2012 code edition added to this section the recognition of NFPA 720 as an alternate method from prescriptive requirements. NOTE – the addition of the carbon monoxide detectors replaces the restriction of not having an opening from the garage to the sleeping room.

Chapter 4 – The 2009 and 2012 code editions recognizes new foundation designs and techniques and has provisions to allow use of these designs and techniques. The 2012 edition showed clarifications to Section 405 (foundation drainage) and Section 408 (underfloor space).

Chapter 5 –The 2009 code edition added prescriptive methods for securely attaching a wood deck to the dwelling structure and the 2012 code edition relocated these methods to section R507 as well as adding floor fire protection requirements

- Section R501.3 - Has been added and will require floor assemblies to be provided with ½” drywall, 5/8” wood panel, or equivalent to be installed on the underside of floor framing unless fire sprinklers are installed or floor framing is 2 X 10 dimensional lumber or larger.
- Section R507 Decks – All deck provisions have been relocated to this new section.

Chapter 6 – The major changes to wall construction requirements occurred in the 2009 code addition with the 2012 code edition reformatting to allow the prescriptive methods easier to locate.

- Table R602.3(1) – The fastener schedule was reorganized in the 2009 code edition to reflect currently accepted industry standards and manufacturer recommendations. The 2012 code edition added nailing requirements for roof truss to plate and expanded on corner stud nailing at wall intersections.
- Section R602.10 – The wall bracing provisions have undergone a major overhaul from the 2006 provisions, reorganizing and revising the text for technical accuracy and clarity.
- Section R602.12 – This is a new section in the 2012 code edition and allows the designer an alternate method to brace wall lines. Use of this section on designs must meet location criteria in SDC A, B or C areas.

Chapter 7 – The 2009 and 2012 code editions showed most changes and additions to the exterior covering requirements.

- Section R702.7 – The vapor retarder provisions were moved from section R601.3 to this section.

- Section R703 – Performance requirements for wind resistance have been added to the water resistance provisions (2009 code) and minor clarification and format change in 2012 code editions.
- Table R703.4 – Changes to this table occurred most in 2009 code edition and clarified the water resistive barrier requirements for various wall coverings and cladding systems and updated the fastening requirements to reflect current industry practices. One key change in the 2009 code edition and continued to 2012 code edition is the removal of the allowance to apply the 1” air space behind masonry veneer for the required weather resistive barrier. Installation of an approved sheathing paper or house wrap behind masonry veneer is now required and must be listed and labeled for compliance.
- Section R703.8 – The 2012 code edition revised this section to provide several alternatives for the installation of flashing at window and door openings.
- Section R703.12 – The 2012 code edition added prescriptive requirements as well as reference to the manufacturer specifications to this adhered masonry veneer section.

Chapter 8 – The 2009 and 2012 code editions stayed consistent in recognizing and updating the roof-ceiling tie down requirements, attic ventilation and steel roof prescriptive requirements.

Chapter 9 - Several updates (technical standards) were added in the 2009 code edition regarding the wind resistance of asphalt shingles with the 2012 code edition adding to the weather protection, underlayment and flashing requirements for all types of roof coverings.

- Section R905.2.8.5 - Will now require drip edge for asphalt shingles.
- Section R905.16 – This is a new section on the use and application of photovoltaic modules/shingles.

Chapter 10 – Most of the changes occurred in the 2012 code edition and created new sections for chimney cap requirements on masonry chimneys and offset requirements for factory built chimneys.

Chapter 11 Energy Conservation – this chapter has been replaced with the residential requirements out of the 2012 International Energy Conservation Code.

Chapter 12 – No key changes observed for mechanical administration.

Chapter 13 – The 2009 code edition consolidated the ground clearance requirements for mechanical equipment and expanded the requirements for protecting appliances from vehicle impact. The 2012 code edition added new provisions that mandate a manufacturer mark on each length of pipe and tubing.

Chapter 14 – No key changes observed for Heating and Cooling Equipment and Appliances.

Chapter 15 – Changes and additions seen in both code editions with the major change coming from the 2009 editions where the dryer exhaust duct provisions were completely rewritten.

- Section M1502.4 - will now require dryer duct supports at 12' maximum instead of the 4' maximum.
- Section M1503.4 – the 2009 code edition requires makeup air for kitchen exhaust hoods with high velocity fans.
- Section M1506 - Exhaust Openings has been added and will provide minimum clearances between air exhaust terminations and openings into buildings – 3' from property lines, 3' from operable and non operable openings and 10' from mechanical air intakes.
- Section M1507.3 – The 2012 code edition added this section to provide clear guidance on the design and specifications of mechanical whole house ventilations systems.

Chapter 16 – The 2009 code edition recognized polyurethane foam as an acceptable insulation material for the exterior of ducts in attic as well as application to joints, seams and connections. The 2012 code edition expanded this recognition of new duct materials and installation by recognizing the SMACNA HVAC Duct Construction Standards.

Chapter 17 – Combustion air chapter shows no key changes.

Chapter 18 – No key changes observed for Chimneys and Vents.

Chapter 19 – The 2012 code edition clarified the range and oven section with reference to the listing and labeling conditions and installation requirements.

Chapter 20 – No key changes observed for Boilers and Water Heaters.

Chapter 21 – The 2009 code edition added requirements for floor heating systems that recognize new industry materials and methods. No key changes to this chapter from the 2012 code edition.

Chapter 22 – No key changes observed for Special Piping and Storage Systems.

Chapter 23 – The 2012 code edition added a new Section M2302 with requirements for photovoltaic solar energy systems.

Chapter 24 – The Fuel Gas chapter is extracted from the 2012 IFGC yet with some modifications to be more specific to residential installations. The 2009 code edition added Section G2411.1.1 to recognize the bonding requirements for CSST gas systems and the 2012 code edition clarified bonding locations. The remainder of the changes and additions are the same as in the 2012 IFGC>

Chapter 25 – The 2009 code edition added the requirements for shower liner testing and the 2012 code edition added a provision that does not allow the air testing of plastic piping in DWV systems.

Chapter 26 – The key changes to this chapter came from the 2012 code edition with new exceptions recognizing discharge to a grey water system and new requirements for sealing of annular spaces on pipe penetrations.

Chapter 27 – Both code editions added and clarified code sections on Plumbing Fixtures.

- Section P2705.1 – The 2009 code edition added text to provide clear direction on the spacing of water closets, bidets and lavatories consistent with the IPC.
- Section P2706.1 – The 2012 code edition added new requirements on the prohibited location of waste receptors (plenums, crawl spaces, attics, etc).
- Section P2708.2 – The 2009 code edition added a new requirement specifying approved attachment methods for shower head risers.
- Section P2709.1 and 2709.2 – Both code editions added requirements for shower receptor installation.
- Section P2713.1 – The 2012 code edition clarified the requirement for waste overflows for bathtubs.

Chapter 28 – The 2009 and 2012 code editions showed same changes as seen in the IPC>

- Section P2801.3 - Added in 2009 edition to require the same working clearance as mechanical equipment – no obstructions for 30” by 30” at control.
- Section P2801.5 - Added clarity that only storage type water heaters or hot water storage tanks need drain pans and not for tankless type water heaters.
- Section P2803.6.1 - Added in the 2009 edition to allow the T&P discharge into the required drain pan with 6” clear space.

Chapter 29 – Both code editions shared changes and additions to this Water Supply and Distribution.

- Section P2902.6 – The 2009 code edition revised and expanded the provisions for the location of backflow preventers with new references.

- Section P2904 – The 2009 code edition added this section to provide a simple, prescriptive and cost effective approach to residential fire sprinkler design and installation.
- Sections P2905.9 and P2905.11 had new language and section requirements for PEX joints and PE_AL_PE and PEX_AL_PEX installation.

Chapter 30- Both code editions shared changes and additions to this Sanitary Drainage.

- Section P3003.19 – The 2012 code edition recognized the use of a waste connector and sealing gasket as an alternative to a flanged connection for floor mounted water closets.
- Section P3007 – The 2009 code edition added the provisions for sumps and ejectors to this chapter and is the same requirements as shown in the IPC.
- Section P3009 – The 2012 code edition added Gray water recycling requirements to this chapter (elimination Appendix O).

Chapter 31 – Both code editions shared changes and additions to this Venting.

- Section P3103.5 – The 2012 code edition changed the minimum clearance for vent terminals above openings within 10 feet from 2 feet to 3 feet.
- Section P3108.1 – The 2012 code edition clarified that each fixture drain must connect individually to the horizontal wet vent.
- Section P3111.1 – The 2009 code edition added a new limitation specifying that standpipes are no longer allowed to be connected to combination waste and vent systems.

Chapter 32 – No key changes observed for Traps

Chapter 33 – No key changes observed for Storm Drainage

Chapters 34 through 43 – These electrical chapters will not be applicable as the State of Texas requires compliance with the 2011 NEC for all installations.

2012 International Energy Conservation Code (IECC) for COMMERCIAL OCCUPANCIES

BASIC INFORMATION

- The table covering fenestration in commercial buildings has been simplified to define all fenestration as being fixed, operable, or an entrance door. The distinction between framing materials, thermal breaks, and curtain walls/storefronts with respect to thermal requirements has been removed. In some cases only residential criteria were modified. For

example, solar heat gain coefficients (SHGC) were raised moderately for residential buildings but were not raised for commercial buildings. In addition, many of the U-factors applicable to skylights have been reduced.

- The allowable percentage of skylight area as a function of roof area has been increased from 3% to 5% of total roof area. In certain building types at least half of the floor area must be in a day-lighting zone under skylights with several exceptions allowed.
- Vertical fenestration area is now limited to 30% of above-grade wall area. The previous maximum of 40% is still allowed in Climate Zones 1-6, provided half of the conditioned floor is in a daylight zone, controls are installed, and the VT/SHGC ratio is at least 1.1
- Visible transmittance is now used in several provisions for both vertical fenestration and skylights. In particular, a VT/SHGC ratio is one of three conditions used to increase the fenestration area maximum from 30% to 40%.
- Air barrier requirements have been added such that a continuous barrier is now needed throughout the building envelope in other than Climate Zones 1-3. The barrier must be sealed at all seams and joints, and lighting fixtures and other recesses must be treated to maintain that barrier.
- HVAC system piping insulation requirements have become more stringent. These requirements now also rely on pipe diameter and fluid temperature.
- Air system economizers are required in more climate zones and at a lower threshold (33K Btu/h instead of 54K Btu/h).
- A space-by-space method for determining allowable lighting power limits based on ASHRAE 90.1- 10 was added.

SPECIFIC CODE SECTIONS

- Section C303 Table C303.1.3(3) - has added requirement for VT (visible transmittance) for fenestration.
- Tables C402.1.2 and C402.2 - have more restrictive values.
- Section C405 - has numerous more restrictive requirements for electrical power and lighting systems for commercial projects.
- Section C406 - will now require building to comply with at least one of the options – efficient HVAC performance in accordance with Section C406.2; or efficient Lighting system in accordance with Section C406.3; or On Site Supply of Renewable Energy in accordance with Section C406.4. Individual tenant spaces will need to comply with section C406.2 (efficient HVAC) or Section C406.3 (efficient lighting system) unless documentation can be provided that entire building complies with Section C406.4 (On site renewable energy).
- Section C408 - will now require that HVAC and electrical systems be commissioned as per C408.2 and C408.3.

2012 International Energy Conservation Code (IECC) for RESIDENTIAL OCCUPANCIES

BASIC INFORMATION

- Added clarification that sunrooms enclosing conditioned spaces must meet the thermal envelope provisions of the 2012 IECC unless they are thermally isolated from the rest of the building.
- All residential buildings must be subjected to a blower door test to determine the air leakage rate and must not exceed the number of air changes per hour (ACH), either 5 or 3, prescribed as a function of climate zone.
- Hot water piping must now be insulated to at least R-3 with some exceptions.
- The minimum number of high-efficacy electrical lighting sources was changed from 50% of lamps in permanent fixtures to 75% of lamps in permanent fixtures or 75% of the permanent fixtures.

SPECIFIC CODE SECTIONS

- Section R303 – Table R303.1.3(3) - Added requirements for VT (visible transmittance) for default values for fenestration.
- Tables R402.1.1 and R402.1.3 - More restrictive values for U-factors and insulation and fenestration requirements.
 - Fenestration U factor went from .35 to .32
 - Ceiling U factor went from .0030 to .0026
 - Ceiling R-value went from R-38 to R-49
 - Basement wall U factor went from .0059 to .0050
 - Basement R-value went from 10/13 to 15/19 (first number would be for continuous insulation on inside or outside of foundation and second number would be for framed wall inside foundation).
- Table R402.4.1.1 - More detailed requirements for air barriers.
- Section R402.4 - Modified with additional requirements for air leakage. The structure shall be tested and verified as having an air leakage of not exceeding 3 air changes per hour.
- Section R404.1 - Now requires at least 75% of permanently installed lighting fixtures to contain high efficacy lamps

2012 International Plumbing Code (IPC)

Chapter 1 – No key changes or additions

Chapter 2 – Some changes to definitions to add or clarify intent (CW&V, Grease Interceptor, Plumbing Fixture, Plumbing Appliance, etc).

Chapter 3 – Mostly clarifications of installation standards and methods

- Section 308.9 - Addresses bundling of hot and cold water lines and requires hot to be insulated
- Section 312.9 - Changed in 2009 code and has a standard test method for shower liners
- Section 315 - New section on penetrations and requirements for seal.

Chapter 4 – Changes to Table 403.1 and section 403 seen in both editions to be more aligned with the 2012 IBC.

- Table 403.1 - Now has exception to not require a service sink for B and M occupancies with 15 or fewer occupants.
- Section 403.2 - Will now require separate bathrooms for each sex when occupant load exceeds 100.
- Section 403.3.2 - Replicates language already existing in the IBC which does not allow bathrooms to open directly into a room used for the preparation of food for service to the public.
- Section 403.3.6 - Requires multi-occupant toilet rooms to not be locked during use.
- Section 405.3.1 - Now allows a wall hung water closet in compartment to be 56" in depth which will be aligned with accessibility requirements for wall hung water closet compartments.
- Section 407 - Now requires by specification, the use of an overflow for waste outlet.
- Section 410.2 and 410.3 have been added and will give requirements for minimum number of drinking fountains which will match what is in the IBC.

Chapter 5 – Changes reflect industry standards on safety devices

- Section 502.5 - Added in 2009 edition to require the same working clearance as mechanical equipment – no obstructions for 30" by 30" at control.
- Section 505.6 - Added in the 2009 edition to allow the T&P discharge into the required drain pan with 6" clear space.
- Section 504.7 - Added clarity that only storage type water heaters or hot water storage tanks need drain pans and not for tankless type water heaters.

Chapter 6 - Changes reflect industry standards on water supply materials, installation methods and water supply protection.

- Tables 605.3, 605.4 and 605.5 - Changed in the 2009 edition to remove polybutylene piping from an approved material and PE/AL/PE and PEX/AL/PEX was added to the tables.
- Section 606.7 - New in 2012 edition and requires bundles of piping to be labeled for content and direction of flow.
- Section 607.2 - Changed the maximum distance between a hot water supply source and all fixtures from 100 feet to 50 feet,
- Section 607.5 - Added and has requirements for hot water pipe insulation which will match the requirements of the IECC. The first 8 feet of hot water piping out of water storage tanks for hot water recirculating systems will need to be insulated.
- Section 608.8 - Added to the 2006 and 2009 editions that all non-potable piping indoors and outdoors must be labeled.

Chapter 7 – Changes reflect industry standards on sanitary drainage system materials and design and installation criteria.

- Tables 702.1 – 702.4 – The 2009 edition added PFDF as an approved material typically used for chemical waste.
- Section 704.5 – This section deleted in 2009 edition and addresses dead end in drainage system – now allowed.
- Section 712.3.3 – The allowed material for sump and ejector pipe and fittings use expanded in the 2012 edition.

Chapter 8 – Changes reflected in 2009 and 2012 editions cover installation and locations of waste receptors.

Chapter 9 – Changes reflected in 2009 and 2012 editions cover the guidelines for vent terminals, horizontal wet venting, combination waste and vent connections and use of air admittance valves.

- Section 903.2 through 903.4 – Vent termination (2' to 3' min) and use (prohibited use) is described.
- Sections 909.1 – 909.2.2 – Horizontal and vertical wet venting requirements described (new sections).
- Section 917 – Added in 2012 edition and covers Single Stack Vent System (drainage stack and branch piping used as the vents for the drainage system – high rise design).
- Section 918 – Revisions to both editions of code address use of AAV's for sumps and chemical waste.

Chapter 10 – Changes reflected in 2009 and 2012 editions cover trap primer locations and Interceptors and Separators with specific descriptions of allowed use.

Chapter 11 – Changes reflected in 2009 and 2012 editions covered main and secondary roof drain material specifications and installation per manufactures specifications.

Chapter 12 – No changes to Special Piping and Storage Systems.

Chapter 13 – This is a new Section (Gray Water Recycling Systems) moved from the Appendix C.

Remainder of code unchanged. The 2009 edition saw the adding of the IPSD to the base code book yet will not be used when state regulations prevail.

2012 International Mechanical Code (IMC)

Chapter 1 – The changes to this chapter came in 2009 with the expanded sections on suspension/revocation of permit, retention of documents and temporary systems. The main change in 2012 added a standard reference for maintenance of mechanical systems.

Chapter 2 – No key additions or changes to the definition chapter, basically only clarification of terms.

Chapter 3 – Changes and additions on both code editions cover public garages and equipment on roofs

- Section 304.6 – The height of elevated appliances is 1' greater than tallest garage door opening
- Section 306.5 – The 2009 and 2012 editions added than clarified the access requirements for rooftop equipment.
- Section 307 – The 2009 edition added new requirements (table 307.2.2 as well) for condensate sizing.

Chapter 4 – The 2009 edition saw most of the changes/additions, specifically to Section 403 on mechanical ventilation (new section). The 2012 edition saw minor changes to intake air and to enclosed parking garages.

- Section 401.2 – Describes use of blower door and infiltration rate threshold requirements.
- Table 403.3 will now require that each nail saloon station to have a source capture system capable of exhausting not less than 50 cfm per station.
- Section 404.1 – Addition of items 1 and 2 as alternate mechanical ventilation systems for enclosed parking garages.

Chapter 5 – Most of the key changes and additions occurred with the 2009 edition and related to clothes dryer exhaust, kitchen makeup air, commercial kitchen hood and duct exhaust systems.

- Section 501 – The 2009 edition expanded the regulations for location of exhaust openings and protection and the 2012 reformatted this section to be more user friendly.
- Section 504 – Extensively revised on domestic clothes dryers in 2009 edition allowing increases in exhaust duct length as well as proper identification while the 2012 added provisions for multi-story structures.
- Section 505.1 - Will now require domestic kitchen exhaust systems to be independent of all other exhaust systems (not allowed to combine with bathroom or toilet room exhaust systems).
- Section 506 and 507 – the 2009 edition and 2012 edition shows significant changes to commercial kitchen ducts and hood systems. Testing of ducts, clearances to combustibles, cleanout locations and outside terminations requirements are listed and revised.

Chapter 6 – Changes and additions in both code editions reflect industry standards on new duct systems as well as duct construction / support and duct transfer openings (to be consistent with the IBC and IFC on fire and smoke protection features).

Chapter 7 – The 2009 edition revised this chapter and removed the prescriptive requirements for combustion air and replaced with references to industry manufacturers standards, NFPA 31 and the IFGC. No changes in 2012 edition.

Chapter 8 – No key changes in both editions with the only key addition occurring in the 2009 edition by adding/revising Table 803.10.4.

Chapter 9 – Some changes in 2009 to cooking appliances (standards recognized) as well as revisions to allowed return or outdoor air (kitchen location revised). The 2012 edition added 2 new sections – 927 on radiant heating and 928 on evaporative cooling.

Chapter 10 – The 2009 edition did not show any significant additions or revisions yet the 2012 did add a new Table 1004.3.1 regarding boiler top clearances.

Chapter 11 – The 2009 edition saw some additions/revisions most significantly to Table 1103.1 on refrigerant classification as well as key changes to Section 1107 on refrigerant piping. The 2012 edition showing significant changes/additions to Section 1101 and 1105 and 1106 on protection of refrigerant circuit access, machinery room ventilation and controls.

Chapter 12 and 13 and 14 – No key revisions or changes or additions observed.

2012 International Fuel Gas Code (IFGC)

Chapter 2 – The 2009 and 2012 editions revised and added definitions relative to new products, standards and services available in the fuel gas industry.

Chapter 3 – The 2009 and 2012 editions saw some minor additions/changes to this General Regulation chapter as most of these are reflected in the IPC and IMC – one note of significance relates to the electrical bonding of pipe and tubing other than CSST.

Chapter 4 – The 2009 to 2012 editions saw mostly changes/additions to this chapter related to new standards on materials and installation techniques.

- Tables 402.4 (3), (4), (20), (21), (22), (35), (36) have revised values and sizing shown complete in the 2012 edition.
- Section 404 – the 2009 edition covered key changes to the piping system installations with a few revisions seen in the 2012 edition.
- Section 406 – the 2006 edition saw minor revisions and the 2012 shows a reformat and change to 496.7 on purging of systems.
- Section 408.4 – the 2012 edition added an illustration to clarify the intent of a tee fitting sediment trap.
- Section 409.5 and .6 – the 2009 edition revised the wording and shut off valves for appliances and in laboratories.
- Section 410.5 – the 2012 edition added this section to require flashback arrestor check valve when oxygen and gas are used together (example – welding or braising).

Chapter 5 – No significant additions or changes in both editions of code, yet reformatting and addition of new industry standards referenced in both editions.

Chapter 6 – The major change in this chapter occurred in the 2009 edition and involved the extensive revision to section 614.6 regarding domestic clothes dryer exhaust ducts and the 2012 edition adding a section 636 for outdoor decorative appliances.

What's new for the 2011 NEC®

- During the 2011 NEC development process, several thousand changes and public comments were considered.

- Fine Print Notes are now referred to as "Informational Notes." The term "fine print" does not describe the function of a sentence or provision, it simply refers to the size of the text. By changing the term to "informational note," the Code makes it quite clear that these notes are intended to provide information and nothing else. The same logic applies to the change to "informative annexes." The style

and layout of these notes and annexes have not changed, nor has the intent of them.

- A new Article 694 for small wind electric systems has been added. This article covers small wind (turbine) electrical systems up to and including 100 kW. These systems can contain generators, alternators, inverters, and controllers.

- A new Article 840 has also been added, which covers Premises-Powered Broadband Communications Systems. This article is similar to Article 830, but is often times more applicable. Expect for rare instances, Article 830 installations are made by a communications utility. Article 840 is intended to apply more regularly.

- Only a few changes occurred in Article 90. 90.2(B)(5) was revised to fix an error that occurred in 2008. This mistake was the removal of utility installations on Native American reservations, federal lands and similar areas from Code exemption. This change now gives the AHJ a means to exempt utility wiring in these areas.

Chapter 1—General

- The definition of Arc-Fault Circuit Interrupter (AFCI) has been relocated from 210.12 to Article 100 because the term is used in more than one Article.

- The definition of "bathroom" has been revised to add urinals, bidets, and similar equipment to the list of items that may be found in a bathroom. This change will result in a more uniform understanding of the Code.

- "Bonding Jumper" is now referred to as "Bonding Conductor or Jumper." The 2008 (and previous editions) referred only to "bonding jumpers," which seems to imply a very short length of conductor used to bond things together. Although this may often be the case, they also may be much longer.

- The term "grounding conductor" has been removed from the Code in not only Article 100, but also all other articles of the Code. The definition of "grounding conductor" seemed to apply only to communications systems and auxiliary grounding electrodes, yet this term was often used where "grounding electrode conductor" should have been used. Changes to the Code this cycle make for a more consistent and technically accurate document.

- All "Service Conductor" related definitions have been revised, deleted, or added. A real effort has been made to clarify that service conductors are those that are downstream of the "service point". Conductors upstream of the service point are not service conductors, they are utility conductors (and are not covered by the Code).

- 110.3(A)(1) Has been changed to reflect the fact some pieces of electrical equipment have special requirements, such as limitations on elevation, ambient temperature correction, power quality requirements or specific types of overcurrent devices. This information may be marked on equipment, or it may be in the product literature, or listing and labeling information.

- Changes to 110.10 clarify that, in addition to the impedance of the circuit, the short-circuit current ratings of equipment are a vital part of determining whether or not a system or circuit can withstand the effects of a short circuit or ground fault. Specific examples of the types of things that warrant consideration are always better than referring to "other characteristics."

- New provisions for finely stranded conductors have been added to 110.14, recognizing the fact that these conductors warrant special consideration.

- A substantial change was made to Article 110 with the addition of 110.24. This new section requires that the available fault current must be marked at the service equipment of all installations, other than dwelling units. This change is intended to make sections 110.9 and 110.10 easier for the EHJ to validate. The location of Table 110.28 (formerly 110.20) has been changed to Part II of the article, so that it applies only to equipment operating at 600 volts or less.

Chapter 2--Wiring and Protection

- 200.4 has been added to the Code, and it prohibits a single neutral conductor from serving multiple circuits (not including multiwire branch circuits). Nothing in previous editions of the Code prohibited a properly size neutral conductor from serving multiple circuits with ungrounded conductors of the same phase. This change eliminates this oddity from the Code.

- As has been the case for the last several Code cycles, 210.8, covering GFCI protection, has been revised. The test and reset functions of the GFCI device must now be in a readily accessible location so that they can be tested monthly, as required by the product standard. A revision was made to the requirements of GFCI protected receptacles in patient care areas, and a new requirement for GFCI protection in nondwelling unit indoor wet locations have been added. Non-dwelling locker rooms with associated showering facilities also require GFCI protection now, as do all 15A and 20A, 125V receptacles installed in service bays, garages and similar areas. The areas in which this applies is wherever electrical diagnostic equipment, electrical hand tools, or portable lighting equipment are to be used.

- Clarifications to the AFCI requirements have been made, especially as it pertains to branch circuit extensions and modifications.

- Changes to Part II of Article 225 will help Code users to understand the applicability of the requirements, and changes throughout Article 230 will help to delineate the difference between which conductors the Code covers and which conductors the Code doesn't cover.
- A new term: "Bonding Jumper, Supply-Side" has been added to the definitions in 250.2. It is a new term, and can be found throughout Article 250.
- Article 250.30, covering separately derived systems, is completely rewritten.
- Article 250.56 is gone, but yet relocated to 250.53(A)(2).
- 250.118 has been revised (again) to help to clarify the types of equipment grounding conductors (EGCs) recognized by the Code.

Chapter 3--Wiring Methods

- Chapter 3 has many significant changes. 300.4(E) has been revised to clarify the requirements for wiring near roof decks which were added in the 2008 NEC®, and a new subsection, 300.4(H), was added to address structural expansion and deflection joints.
- 300.11(A)(2) has been revised to require all suspended ceiling wires supporting electrical equipment to be marked and distinguishable from the other ceiling wires. This provision previously only applied when the ceiling was fire-resistance rated.
- 300.22 has been extensively revised to provide consistency with the terms used in widely adopted mechanical codes, such as the International Mechanical Code.
- Article 310 has been extensively revised. The experienced Code user will recognize a complete renumbering of not only the sections, but the tables as well. The ampacity adjustment provisions have been clarified, the correction factors for raceways on rooftops have been made more stringent, and the ampacities of some conductors have been reduced!
- Changes to 312.8 now require a warning label on some cabinets, and the requirements for the weight ratings of boxes in 314.27 have been revised.
- Changes to Article 334, Type NM Cable, clarify the permitted uses of Type NM Cable in dwelling unit accessory buildings, and the ampacity adjustment requirements of 334.80 have been clarified.
- The issue of unsupported raceways (added in the 2008 NEC) has been removed.

Support requirements for Flexible Metal Conduit and Liquidtight Flexible Metal Conduit have been changed as well.

- Article 392 saw changes to include a uses permitted and uses not permitted section, similar to the sections found in other Articles of Chapter 3. The provisions for the grounding and bonding of cable tray systems have also been made clearer in 2011.

Chapter 4--Equipment for General Use

- Significant changes to Chapter 4 can be found throughout the chapter, beginning in Article 404, Switches. 404.2(C) contains a very substantial change. With these changes, the days of two conductor switch loops and dead-end three way switches are in the past, except for raceway systems and some unfinished areas of buildings. This new requirement will mandate a grounded conductor at each switch location for line-to-neutral switch controlled loads.

- Another change in this article is to 404.9. An allowance for certain switches to be installed without the benefit of an equipment grounding conductor has been made. These switch assemblies contain no metal parts, and can only be connected to nonmetallic cover plates, so safety is not compromised. Previously the AHJ was forced to use 90.4 and waive the requirement if this product was to be installed.

- As wiring systems become older, the Code has added provisions for updating systems, and this edition of the Code is no different. Replacement of AFCI protected circuits, tamper-resistant receptacles, and weather-resistant receptacles are all now addressed in the Code, and tamper-resistant receptacles are now required in guest rooms, guest suites, and child care facilities.

- Many revisions throughout Article 410 have been to address LED luminaires and their drivers. Perhaps the most controversial change in this edition can be found in Article 445, which covers generators. 445.20 now requires that all 125V receptacles that are part of a generator, 15 kW or smaller, must have GFCI protection.

- A new section 450.14 has been added, which requires a disconnecting means for transformers (other than Class 2 and Class 3 transformers). Although commonly thought to already be a requirement, it has never been found in the Code until now, and will require substantial consideration in the design of an electrical system.

Chapter 5--Special Occupancies

- Listing requirements for different types of equipment in hazardous (classified)

locations have been added for Class I, Class II, and Class III locations.

- Clarifications to the disconnect requirements for fuel dispensers can be found in 514.11 and 514.13, and the "redundant" equipment grounding provisions in 517.13 have also been clarified.

Section 517.16 now prohibits isolated ground receptacles from being used in patient care areas.

- The GFCI requirements for assembly occupancies (Article 518) and carnivals, circuses, fairs, and similar events have been clarified. And a new requirement for GFPE protection at marinas and boatyards should result in a much safer environment in these areas.

Chapter 6--Special Equipment

- Article 645, covering information technology equipment and rooms, has been revised with new definitions, revised requirements, and new provisions.

- Article 680 has been changed to incorporate a new concept, that of the "low voltage contact limit." Perhaps most substantially in Article 680, the rules on equipotential bonding have been revised

- Because solar photovoltaic systems are such an expanding technology, it should come as no surprise that the article experienced an incredible amount of changes. Of particular interest to those involved in these systems, 690.47(D) has been deleted, removing the requirement for an additional grounding electrode for a ground or pole mounted PV array.

- As mentioned earlier, a new Article 694 covering small wind systems has been added, and there are some changes in Article 695 for fire pumps, mostly having to do with the routing of fire pump circuitry.

Chapter 7--Special Conditions

- Articles 701 and 702 have been reorganized in an effort to harmonize the numbering system for emergency systems, legally required standby systems, and optional standby systems. Article 725 and 760 saw little action in this Code revision cycle. 725.3 and 760.3 saw most of the changes, which inform the Code user about which Article 300 provisions apply to these installations.

- As is often the case, Article 770, covering optical fiber cables, saw extensive revisions, but most of them were editorial in nature. New to the 2011 NEC is the concept of "cable routing assemblies", a wiring trough for limited energy circuits. The definition for this system can be found in 770.2

Chapter 8--Communications Systems

- Like the past few Code cycles, Chapter 8 saw a lot of revisions in 2011, most of which were editorial in nature. With the removal of the term "grounding conductor" from the Code, many changes to the text were made. Removal of the requirement of insulated grounding electrode conductors makes for consistency throughout the Chapter 8 articles, and new tables added to these articles should make for easier navigation through these articles.

- As discussed earlier in this book, a new Article 840 has been added, which covers premises-powered broadband communications systems.

Chapter 9—Tables

- A new Table 10 has been added, which addresses finely stranded conductor. Most of the information in this table is borrowed from UL 486A-B, Table 14.

- A new Annex, Annex I, has been added to provide tightening torques for terminations. This new annex consists of two tables, each of which is borrowed from UL 486A-B.

A change may be considered key if it raises the level of stringency of the code, or if it has a positive impact on the implementation of, or compliance with, the code.

This key change report has been prepared by Rick Herzberger, Chief Building Official for the City of McKinney, Texas with the support of the Building Inspection Department employees. The ICC Transitional Series workbooks for the I-Codes (2012 from 2006 editions) was used as a reference as well as the IAEI code update series for the 2005 to 2011 NEC code editions. The U.S. Department of Energy (DOE) Building Energy Codes Program (BECP) guide was used to compare where and how the 2009 and 2012 IECC documents differ.

Prepared - June 25, 2013.