

City of Deer Park, Texas – Transition from 2018 I-Code to the 2024 I-Codes

Why Adopted Updates Codes:

- The I-Codes are the most widely used and adopted set of building codes.
- The I-Codes represent the current national consensus regarding the level of safety necessary for the built environment.
- The Code Council's code development process included several important and significant changes that will improve construction, building safety, resiliency, and enhancing the built environment in Deer Park, Texas.
- The current I-Codes incorporate the latest technology and provide the safest, most resilient structures for our families and our community.
- The current model building codes is one of the best mitigation strategies from natural hazards including hurricanes and flooding.
- Every dollar spent complying with the I-Codes returns \$11 saved in recovery and reconstruction efforts; in the Gulf Coast region that ratio can be as high as 32:1.
- Adopting the most recent I-Codes may improve the City of Deer Park's BCEGS score in the next evaluation cycle. BCEGS is one factor relative to how the insurance industry assesses risk and cost to consumers.

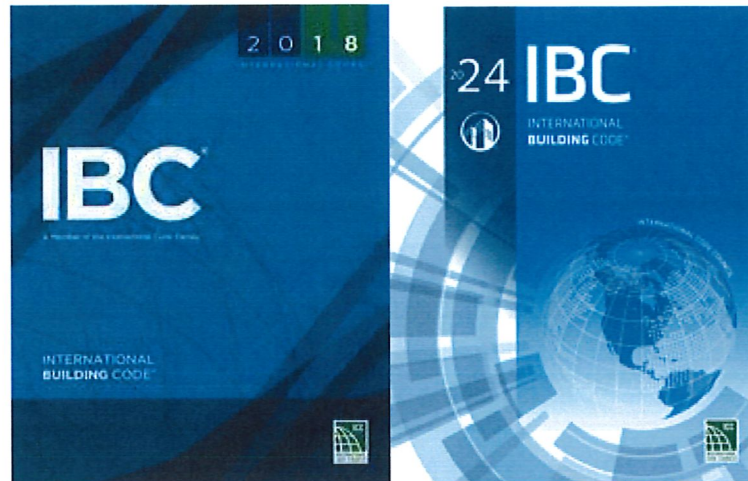
"Top-Ten "Issues with Code Adoption from 18 -24:

1. Three new types of construction (Types IV-A, IV-B, and IV-C) allow mass timber buildings of taller heights, more stories above grade, and greater allowable areas compared to existing provisions for heavy timber buildings.
2. 2017 ICC A117.1 edition are enhanced dimensions for clear floor spaces and turning spaces. These increases were in response to technical data regarding the space needed by persons using scooters and some types of motorized wheelchairs.
3. Automatic sprinkler protection is now required in Group S-2 open parking garages where any fire area exceeds 48,000 square feet.
4. The requirements for metal composite materials and systems (MCM) installed on the exterior walls were simplified and sprinkler allowances were deleted.
5. New and update structural Loads from ASCE 7-22:
 - Wind speed maps updated
 - Includes provisions for tornado loadings.
 - Updated design rain loads.
 - New environment loads adjusted based on updated weather data. (depend on community/leaders could use "climate change").
6. The requirements for energy storage system (ESS) were further refined to reflect the variety of new technologies and applications. Now referencing NFPA 855 along with IFC Section 1207 to regulate Energy Storage system. The provisions continue to evolve with technologies, as well as considering EV and micromobility devices.
7. The provisions for construction fire safety were reorganized and expanded with an emphasis on the owner's responsibilities. The new language requires a site safety plan and designation of a site safety director.

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8. Updates to address the hazards associated with energy storage systems including protection for storage batteries in garages in one- and two-family dwellings and town-homes.
9. A new appendix was created to provide guidance for designers, engineers, architects and fire and building officials to allow temporary emergency uses of existing buildings.
10. Requirements added to enable lower global warming potential refrigerants that federal regulations now require, including Group A2L and B2L refrigerants.

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Administrative:

- Duties and powers of the building official: an overall reformat of Section 104 regulating duties of the building official.

Building Design:

- Puzzle rooms (escape rooms) are now defined and regulated as special amusement areas, requiring compliance with Section 411 and special means of egress requirements.
- In Group E occupancies, enhanced classroom acoustics in compliance with ICC A117.1 are to be provided in all classrooms having of volume of 20,000 cubic feet or less.
- The use of intermodal shipping containers as buildings is now specifically addressed through provisions intended to supplement existing applicable IBC requirements.
- Mixed occupancy buildings with assembly spaces are placed in Risk Category III when the total public assembly occupant load is greater than 2500 people.
- Three new types of construction (Types IV-A, IV-B, and IV-C) allow mass timber buildings of taller heights, more stories above grade, and greater allowable areas compared to existing provisions for heavy timber buildings.
- Special inspection requirements were added to address the anchorage and connection of mass timber structural elements.
- Updated and expanded provisions for Temporary Structures.
- Roof Coverings: Updated provisions for underlayment.
- Vapor retarders: Several updates have been made to the vapor retarder provisions for consistency with the IRC and IECC. The changes also provide additional options and better guidance for allowable types and locations of permitted vapor retarders.
- New Appendix P sets forth the scoping limitations and technical criteria for sleeping lofts that are provided within Group R dwelling units and sleeping units.

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Accessibility:

- The 2017 edition of ICC A117.1 was adopted.
 - New to the 2017 edition are enhanced dimensions for clear floor spaces and turning spaces. These increases were in response to technical data regarding the space needed by persons using scooters and some types of motorized wheelchairs.
 - Changes include exterior routes, curb cuts, blended transitions, clarity for detectable warnings, passenger drop offs and parking requirements coordinated with the Public Rights of Way Guidelines,
 - Providing an accessible design standard for electrical vehicle charging stations
 - Enhanced safety for accessible routes crossing parking lots.
 - Provisions addressing the recharging of wheelchairs in assembly venues and hotels,
 - Access to gaming machines and tables,
 - Provisions for water bottle filling stations.
- Adult changing tables are now regulated where they are provided and are also required in large assembly and mercantile, college lecture hall/classroom buildings and highway rest stops.

Fire/Life Safety:

- For the purposes of determining the allowable number of control areas in a building, each portion separated by one or more fire walls is now considered as a separate building.
- Automatic sprinkler protection is now required in Group S-2 open parking garages where any fire area exceeds 48,000 square feet.
- The requirements for metal composite materials and systems (MCM) installed on the exterior walls of Types I, II, III and IV construction were simplified and sprinkler allowances were deleted.
- Installation of firestop, fire-resistant joint systems and perimeter fire barrier systems in residential-use buildings now requires special inspection in Group R fire areas having an occupant load exceeding 250 people.
- An increase in the allowable height of a Group R-2 occupancy building with a NFPA 13R sprinkler system.
- Occupiable space requirements now apply if a roof is usable for anything more than maintenance or repair and occupants must have access to multiple egress options from a story based on the occupant load and the story requirements.
- Vertical and lateral Flame propagation compliance methods: Clarification has been provided as to when testing in accordance with NFPA 285, related to vertical and lateral flame propagation, is required. Previously this information was scattered in a variety of locations within Chapters 14 and 26.
- Fire-resistance-rated Wall Continuity: Updates on how supporting construction for exterior walls is to be fire-resistance-rated, especially in the case of a parapet.

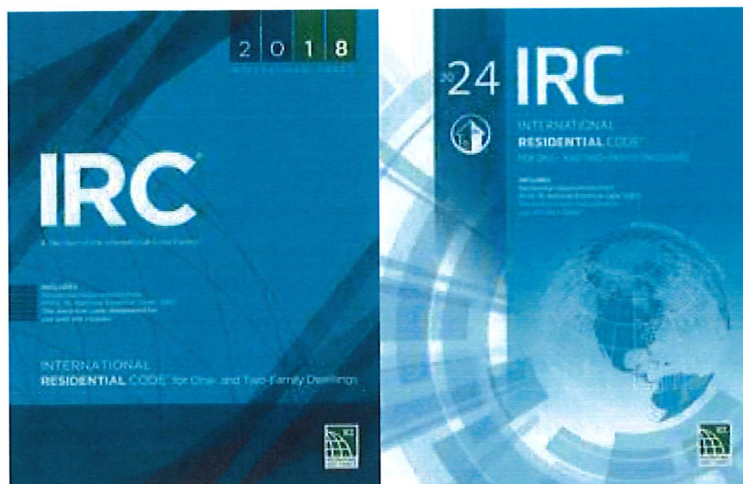
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- Openings in Shaft Enclosures: Additional exceptions are provided for shaft enclosures, including new allowances for openings and penetrations.
- Carbon Monoxide Detection: Carbon monoxide (CO) detection is now required in all occupancies where a CO-producing device is present. Detection and notification can be addressed in several ways.

Structural:

- Parapets of a minimum height are now required for aggregate-surfaced roofs to prevent blow-off.
- Frost protection for egress doors was added to the foundation requirements.
- ACI standards ACI 117 and ITG 7 were added by reference to provide acceptable tolerances for concrete construction.
- Updated wind loads.
- For the first time ever, the 2024 IBC includes provisions for tornado loadings.
- The updated design rain loads are now based on the summation of the static head, the hydraulic head, and the ponding head.
- Updates to Risk Categories including Photovoltaic (PV) panel systems and facilities providing power generation.
- New provisions regarding the wind resistance of aggregate-surfaced roofs.
- New special inspection provisions for metal building systems.
- New provisions for structural concrete reinforced with glass-fiber reinforcement.
- Concrete: Improve ease of use, Chapter 19 on Concrete has been Updated and reformatted.
- Masonry: TMS 402 and TMS 602 references have been updated to the latest 2022 editions.

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Building Design:

- A habitable attic is limited to one-half the area of the story below and the dwelling requires sprinklers.
- Specific requirements for deck guardrails were added.
- New appendices for cob construction and 3D printed construction are added.
- A 30 percent reduction of airflow is permitted for balanced ventilation systems.
- Reorganization of Chapter 3, Building Planning, similar topics arranged together.
- New technical criteria for the use of optional sleeping lofts.
- Updates to address the hazards associated with energy storage systems including protection for storage batteries in garages.

Structural:

- Braced wall lines must be placed on a physical wall or placed between multiple walls.
- An engineered design is required for storm shelters.
- Updated Wind Speed maps match IBC and ASCE 7 maps.
- Deck design now considers snow load, tributary area for footing and post height, and guard details.
- Component and cladding wind pressures in Table R301.2(2) are updated for new design wind speeds and hip or gable roof profiles.
- Minimum footing size tables are revised to more accurately reflect current practice.
- Cripple wall requirements apply only to exterior cripple walls.
- Snow, wind, and seismic maps updated, based on updated engineering standards.

Fire/Life Safety:

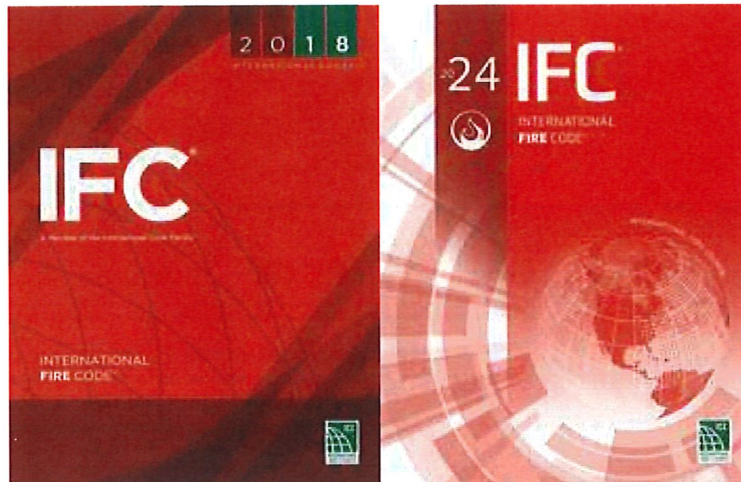
- The rated separation for two-family dwellings is 1 hour whether or not a lot line exists between units.
- Emergency escape and rescue openings require a clear 36-inch-wide path to a public way.

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Trade Work:

- Commercial gas cooking appliances are prohibited.
- The head pressure for a water test of DWV systems increased to 10 feet.
- Air vacuum testing is now permitted for plastic piping DWV systems.
- Section P2904 for dwelling sprinklers is expanded to more closely align with NFPA 13D.
- An emergency service disconnect is required in a readily accessible outdoor location.
- A surge-protective device (SPD) is now required at the service panel.
- The number of receptacle outlets required for peninsular and island countertops in kitchens is determined by the area of the countertop surface.
- GFCI protection is now required for damp and wet locations not included in the other 10 areas requiring GFCI protection.
- 10-amp circuits now allowed for some lighting and outlet circuits.

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Administrative:

- Requirements for Additive Manufacturing (3-D Printing) equipment and operations for both non-industrial and industrial applications are now provided.
- Provisions for emergency responder communication were revised to reflect the expansion of such systems beyond radios and the need for increased performance of such systems.
- The provisions for construction fire safety were reorganized and expanded with an emphasis on the owner's responsibilities. The new language requires a site safety plan and designation of a site safety director.
- Valet trash. Valet trash collection is now permitted only where approved. The owner and valet trash collection service provider are required to comply with the rules and limitations that are established by the jurisdiction. Appendix O has been added to provide requirements for adoption.
- Inflatable amusement devices. Section 3107 has been added to provide requirements for these devices.
- Temporary Heating and Cooking Operations. A new Chapter 41 provides all the requirements, including some relocated from other chapters in the 2021 edition, that address temporary heating and cooking operations.
- Emergency Responder Communications Enhancement System (ERCES). Provisions in Section 510 have been updated to match the latest terminology and technology being used for ERCES. In addition, NFPA 1225-2022 Standard for Emergency Services Communications, is now referenced.

Building Design:

- Flame propagation performance of permanently installed artificial combustible vegetation is required to be verified when exceeding certain heights located on roofs or in close proximity to buildings.
- A new chapter was added that provides clarification and specific requirements for the storage of distilled spirits and wines in barrels and casks.

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- A2L refrigerants. The IFC and IBC now acknowledge the need for the use of A2L (flammable) refrigerants but in a safe and well-regulated way. The code now acknowledges two hazard levels for flammable gases based upon the Global Harmonized Standards (GHS).
- Distilled spirits and wine storage. Fire protection requirements have been further refined based upon data from FM Global.

Sprinklers:

- Sprinkler requirements for the storage, manufacture and sale of upholstered furniture and mattresses were updated and clarified. Part of this update is a new exception for single-story self-storage facilities accessed directly from the exterior.
- An automatic sprinkler system is now required for open parking garages exceeding a certain fire area threshold.

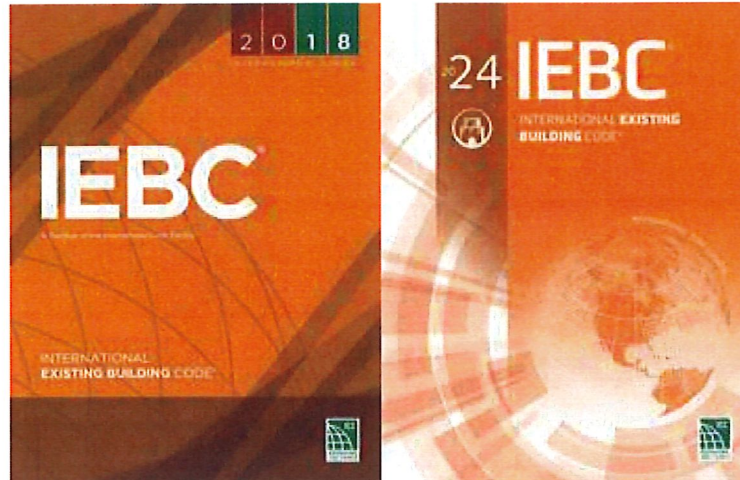
Fire Alarm/Notification:

- Carbon Monoxide (CO) detection. The 2024 IBC and IFC now require CO alarms or detection systems for all types of occupancies. Previously the focus was only on residential and schools.

Energy Storage Systems/Li Batteries:

- The requirements for energy storage system (ESS) were further refined to reflect the variety of new technologies and applications (in building and standalone) and the need for proper commissioning and decommissioning of such systems.
- Energy Storage Systems (ESS). Continued focus on ESS. Now referencing NFPA 855 along with IFC Section 1207 to regulate Energy Storage system. The provisions continue to evolve with technologies.
- Lithium-ion batteries. Research, storage, and manufacturing of such technologies are being regulated through active systems including automatic sprinkler systems and detection requirements along with proper overall building design and construction. The IFC contains a specific section to provide tools to manage the collection of lithium-ion batteries.
- Powered micromobility devices. A section dedicated to the hazards associated with charging such devices are addressed in the IFC. This includes a number of requirements focusing on issues such as product listings, separation requirements, and use of detection systems.

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Administrative:

- Furniture, such as office cubicles, reception desks or smaller bookcases, are exempt from a permit and not intended to be a Level 2 alteration.
- Though editorial in nature, Chapter 13 was renumbered to assist in the useability of that method.
- Section 1502 was added to address the need for the owner to properly develop, implement and maintain a site safety plan during construction. A site safety director must be designated and is responsible to conduct daily fire safety inspections.
- This new appendix was created to provide guidance for designers, engineers, architects and fire and building officials to allow temporary emergency uses of existing buildings with respect to the minimum code requirements. This appendix is intended to serve as a template or checklist for use during an emergency that references the relevant code requirements.

Building Design:

- For storm shelters, the required occupant capacity is now limited to the total occupant load of the classrooms, vocational rooms and offices in the school while the maximum distance of travel was deleted.
- When significant portions of a building's exterior wall coverings or exterior wall envelope are added or replaced, they must comply with the requirements of Chapters 14 and 26 of the IBC.
- Additions, Level 3 alterations and Changes of occupancy in Educational occupancies are now required to meet the enhanced classroom acoustic requirements of Section 808 of ICC A117.1.
- The concept of occupiable roofs requirements have been incorporated in a variety of locations to correlate with the IBC.
- The storm shelter requirements have been coordinated with revisions in the IBC and ICC 500. The provisions have also been clarified that where constructed shall be comply with IBC Section 423 and ICC 500.

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- Existing Group I-1, condition 2 occupancies and ambulatory care facilities may be required to divide stories into no fewer than two smoke compartments for more substantial additions and alterations.
- Where additional toilet facilities are being added and IBC Section 1110.4.1 would require adult changing stations, Section 306.7.15 would require that at least one accessible family or assisted use toilet room is required to contain one.

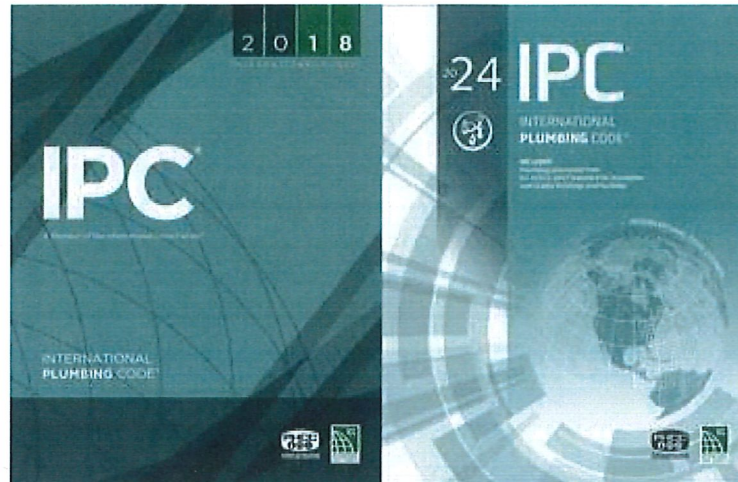
Fire/Life Safety:

- Sprinkler requirements for Level 2 and Level 3 alterations are revised for higher hazard areas.
- Section 309.2.1 has been added to require that if combustible exterior wall envelopes or coverings are installed on a high-rise building the building must be equipped throughout with a sprinkler system. There are some exceptions for smaller installations and when only a combustible water resistive barrier is installed.
- A section has been added to Chapter 10 under the change of occupancy classification requirements to allow the removal of a nonrequired existing automatic sprinkler system. This section includes a number of criteria that must be met.

Structural:

- Snow loads must be addressed during repair of substantial structural damage regardless of whether the damage was a result of snow.
- Additional equipment may be added to a roof without a full structural analysis when the equipment weighs less than 400 pounds and is less than 10 percent of the total roof dead load.
- With a change of occupancy, a seismic analysis is required for a Group S or Group U occupancy changing to a new occupancy.
- Clarifies how risk categories should be assigned for structural design where the addition and the existing building have different uses. The provisions in the Prescriptive and Work Area methods.

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Building Design:

- Two new methods for relining/rehabilitation of existing sewers are added.
- Accommodations for mounted roof top solar panels over vent terminals is added.
- Option added for vacuum testing of drain, waste, and vent piping, which avoids the use of anti-freeze for leak testing in cold climates.

Plumbing Fixtures:

- Multiple-user toilet facilities to serve all genders are now permitted.
- Showerhead flow is limited to 2.0 gpm, enabling a 20% increase in water conservation.

Standards:

- CSA B805/ICC 805 Rainwater Harvesting Systems is allowed as an alternative design method.
- Plumbing provisions from *ICC A117.1-2017 Standard for Usable and Accessible Buildings and Facilities* are now included.



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New Applications:

- 30% reduction in minimum mechanical ventilation for whole-house balanced ventilation systems.
- Approved factory-built combination intake/exhaust terminations permitted, relaxing separation requirement.

Building Design:

- Clothes dryer exhaust terminals required to be at least 3 feet from any opening into a building.
- Polyurethane spray-applied foam on the exterior of ducts in attics and crawl spaces required to meet specific smoke and flame index limits.
- Fire and smoke dampers must be provided with approved access for inspection and maintenance
- Addition of condensate termination identification markings and discharge restrictions.
- Continuous operation requirement for manicure and pedicure station exhaust systems.
- Grease duct horizontal cleanout required within 3 feet of a horizontal discharge fan.
- Ventilation design efficiencies are provided an optional compliance path through ASHRAE 62.1-2019.

Refrigerants:

- Refrigerant tables updated to include new refrigerants.
- Requirements added to enable lower global warming potential refrigerants that federal regulations now require, including Group A2L and B2L refrigerants.
- Addition of a new testing option for grease ductwork.

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Piping:

- The termination of concealed condensate piping requires marking to indicate if it is the primary drain or the secondary drain.
- Press-connect joints are acceptable for high pressure (over 5 psig) applications indoors.

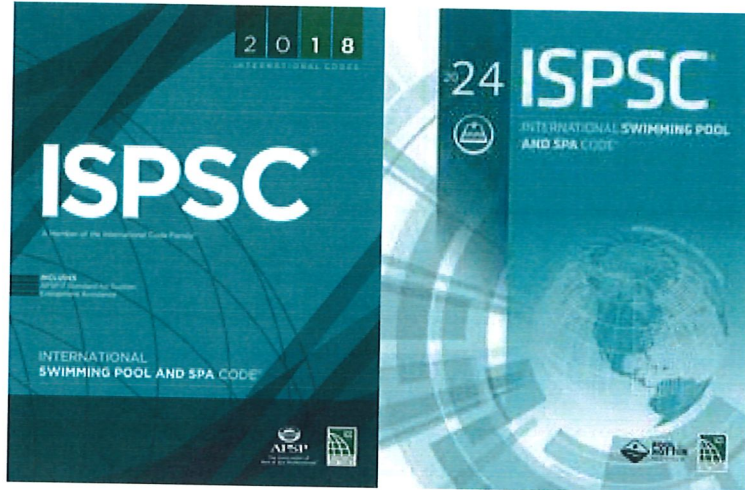
Appliances:

- Commercial cooking appliances are not allowed within dwelling units.
- Appendix D- D105.2, Test for combustion air and vent drafting for natural draft and Category I appliances.

Other:

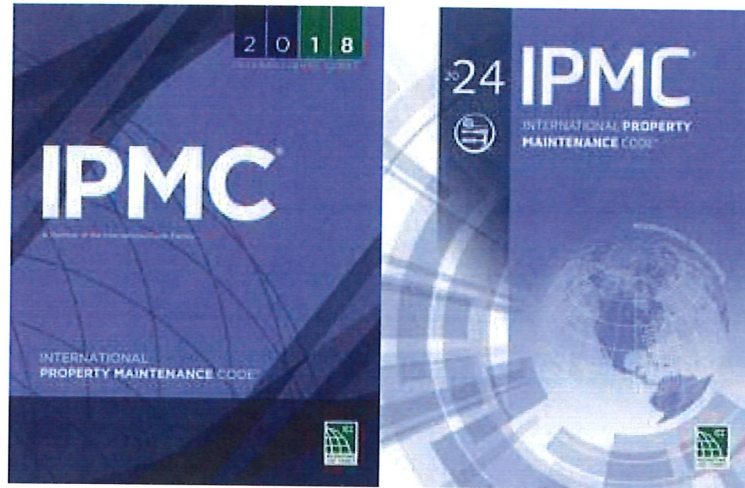
- Workmanship and defects, the existing code language has been rewritten and additional code language has been added.

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- The barrier requirements now allow a pool screen enclosure that restricts entry into an area with a pool or spas, allowing more options for compliance.
- The code provides for a standardized method to determine slip resistance on walking surfaces for decks, ramps, and similar surfaces that are required to be slip resistant.

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- Modification to the Means of Appeal and the Appendix regarding the Board of Appeals
- Update to the notice and notification of violation for the IPMC.
- Use of portable space heaters are updated to match IBC, IRC, and IMC requirements.
- Smoke Alarm are noted to be in required if bars, grills, grates, or similar devices are placed over Emergency Escape and Rescue Openings.
- Fire protection systems are required to be installed, repaired, operated, and maintained in accordance with the IFC and IBC.