

April 29, 2021

Jennifer L. Berrier, Esq., Acting Secretary
Pennsylvania Department of Labor & Industry
Room 1700, L&I Building
651 Boas Street
Harrisburg, Pennsylvania 17121

Reference: Uniform Construction Code (UCC)
2018 International Codes Adoption

Dear Secretary Berrier:

With the official publication of the 2018 International Codes by the International Code Council (ICC) in August 2017, in accordance with the requirements of Act 45 of 1999 as amended, the Pennsylvania Uniform Construction Code (UCC) Review and Advisory Council (RAC) initiated review of the 2018 International Codes on May 14, 2019. During the May 14, 2019 meeting, which was properly advertised in accordance with the Act and with a quorum present, the RAC voted not to consider any additional sections beyond those that had been modified and published by the ICC national review process. After clarification by vote of the RAC regarding the sections to be reviewed in the 2018 adoption process, a vote of the RAC was taken and passed unanimously to initiate review and adoption of the 2018 International Codes.

As part of the review and adoption of the 2018 International Codes, the following are some key actions that were taken, and the corresponding dates that they occurred:

- August 31, 2017 – ICC publishes the 2018 International Codes
- May 14, 2019 – RAC initiates the review and adoption process for the 2018 International Codes
- June 13, 2019 – Public comment was opened and remained open for 120 days
- June 13, 2019 – Request for Technical Advisory Committee (TAC) members was opened and remained open for 30 days
- October 15, 2019 – Public comments were assigned to the TAC committees for review and recommendation
- December 1, 2020 – TAC reports were posted to the RAC website
- December 15, 2020 – Public hearing was held on Zoom after being properly advertised in the *Pennsylvania Bulletin*
- December 16, 2020 – Public hearing was held on Zoom after being properly advertised in the *Morning Call*, a newspaper with regular circulation in the eastern portion of the Commonwealth
- December 17, 2020 – Public hearing was held on Zoom after being properly advertised in the *Pittsburgh Post-Gazette*, a newspaper with regular circulation in the Western portion of the Commonwealth

- January 7, 2021 – RAC received the transcripts of the three (3) public hearings and began deliberations and adoption of the 2018 International Codes

The following is a list of the codes and modifications to the published document as voted on by the RAC in accordance with Act 45 of 1999, as amended:

Note: A crosswalk has been made with the adoption of the 2015 ICC codes, and the list provided contains those provisions that were previously adopted and not modified as part of the current code adoption.

- **2018 International Wildland-Urban Interface Code (IWUIC)**

Adopted without modification

- **2018 ICC Performance Code for Buildings and Facilities (ICCPC)**

Adopted without modification

- **2018 International Swimming Pool & Spa Code (ISPSC)**

Adopted without modification

- **2018 International Fuel Gas Code (IFGC)**

Adopted without modification

- **2018 International Mechanical Code (IMC)**

Adopted without modification

- **2018 International Plumbing Code (IPC)**

Adopted without modification

- **2018 International Fire Code (IFC)**

Adopted by reference only and was adopted without modification

- **2018 International Building Code (IBC)**

Adopted with the following modifications:

- Chapter 1 Scope and Administration, was excluded from consideration in accordance with the requirements of the Act
- Chapter 7 Fire and Smoke Protection Features, was adopted with the following modifications:

- Section 704.2 Column protection, will remain as published in the 2015 IBC:

704.2 Column protection. Where columns are required to have protection to achieve a fire-resistance rating, the entire column shall be provided individual encasement protection by protecting it on all sides for the full column height, including connections to other structural members, with materials having the required fire-resistance rating. Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

- Section 704.4.1 Light-frame construction, will remain as published in the 2015 IBC:

704.4.1 Light-frame construction. Studs and boundary elements that are integral elements in load-bearing walls of light-frame construction shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the load-bearing wall.

- Chapter 8 Interior Finishes, was adopted with the following modification:

- Section 803.3 Heavy-timber exemption, is adopted as follows:

803.3 Heavy timber exemption. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3, exposed portions of building elements complying with the requirements for buildings of heavy timber construction in Section 602.4 or Section 2304.11 shall not be subject to interior finish requirements except in interior exit stairways, interior exit ramps, and exit passageways.

- Chapter 11 Accessibility, was excluded from consideration in accordance with the requirements of the Act

- Chapter 30 Elevators and Conveying Systems, only the following sections/sub-sections were adopted:

- *3002.1 Hoistway enclosure protection.*
- *3002.2 Number of elevator cars in a hoistway.*
- *3002.4 Elevator car to accommodate ambulance stretcher.*
- *3002.7 Common enclosure with stairway.*
- *3004.2.1 Enclosure.*
- *3004.3.1 Enclosure.*
- *3005.4 Machine rooms, control rooms, machinery spaces, and control spaces.*
- **SECTION 3006 ELEVATOR LOBBIES AND HOISTWAY OPENING PROTECTION**
- **SECTION 3007 FIRE SERVICE ACCESS ELEVATOR**
- **SECTION 3008 OCCUPANT EVACUATION ELEVATORS**

- **2018 International Existing Building Code (IEBC)**

Adopted with the following modifications:

- Chapter 1 Scope and Administration, was adopted with the following modification:
 - Section 106.2.5 Exterior balconies and elevated walking surfaces, is adopted as follows:

[A] 106.2.5 Exterior balconies and elevated walking surfaces. Where the scope of work involves balconies or other elevated walking surfaces exposed to water from direct or blowing rain, snow or irrigation, and the structural framing is protected by an impervious moisture barrier, the construction documents shall include details for all elements of the impervious moisture barrier system. ~~The construction documents shall include~~ manufacturer's installation instructions shall be available to the code official during inspection as a deferred submittal.

- Chapter 11 Additions, was adopted without the inclusion of Section 1106 Storm shelters

- **2018 International Energy Conservation Code (IECC)**

Adopted with the following modifications:

- Chapter 1 [CE] Scope and Administration, was adopted with the following modifications:
 - Section C105.2.6 Final inspection, (Originally Section C104.2.6 Final inspection, [2015 IECC], 104.3 Final inspection, [2009 IECC]), was modified as part of the Pennsylvania 2015 IECC adoption, maintaining the 2009 IRC language. The national language was not modified in 2018 code, and as such, this language again was maintained in the current Pennsylvania 2018 IRC adoption as follows:

C105.2.6 Final inspection. The building shall have a final inspection and not be occupied until approved.

- Chapter 4 [CE] Commercial Energy Efficiency, was adopted with the following modifications:
 - Section C402.2.1 Roof assembly, (Originally Section C402.2.2 Roof Assembly [2015 IECC]), will remain as published in the 2015 IECC:

C402.2.1 Roof assembly. The minimum thermal resistance (R-value) of the insulating material installed either between the roof framing or continuously on the roof assembly shall be as specified in Table C402.1.3, based on construction materials used in the roof assembly. Skylight curbs shall be insulated to the level of roofs with insulation entirely above deck or R-5, whichever is less.

Exceptions:

1. *Continuously insulated roof assemblies where the thickness of insulation varies 1 inch (25 mm) or less and where the area-weighted U-factor is equivalent to the same assembly with the R-value specified in Table C402.1.3.*
2. *Where tapered insulation is used with insulation entirely above deck, the R-value where the insulation thickness varies 1 inch (25 mm) or less from the minimum thickness of tapered insulation shall comply with the R-value specified in Table C402.1.3.*
3. *Unit skylight curbs included as a component of a skylight listed and labeled in accordance with NFRC 100 shall not be required to be insulated.*

Insulation installed on a suspended ceiling with removable ceiling tiles shall not be considered part of the minimum thermal resistance of the roof insulation.

- Section C402.5.3 Rooms containing fuel-burning appliances, will maintain both exceptions from the 2015 IECC and be adopted as follows:

C402.5.3 Rooms containing fuel-burning appliances. In Climate Zones 3 through 8, where combustion air is supplied through openings in an exterior wall to a room or space containing a space-conditioning fuel-burning appliance, one of the following shall apply:

1. *The room or space containing the appliance shall be located outside of the building thermal envelope.*
2. *The room or space containing the appliance shall be enclosed and isolated from conditioned spaces inside the building thermal envelope. Such rooms shall comply with all of the following:*
 - 2.1. *The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be insulated to be not less than equivalent to the insulation requirement of below-grade walls as specified in Table C402.1.3 or C402.1.4.*
 - 2.2. *The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be sealed in accordance with Section C402.5.1.1.*
 - 2.3. *The doors into the enclosed room or space shall be fully gasketed.*
 - 2.4. *Water lines and ducts in the enclosed room or space shall be insulated in accordance with Section C403.*
 - 2.5. *Where an air duct supplying combustion air to the enclosed room or space passes through conditioned space, the duct shall be insulated to an R-value of not less than R-8.*

Exception:

1. *Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.*
2. *Fireplaces and stoves complying with Sections 901 through 905 of the International Mechanical Code, and Section 2111.14 of the International Building Code.*

- Chapter 1 [RE] Scope and Administration, was adopted with the following modifications:

- Section R102.1.1 (N1101.4) Above code programs, was modified as part of the Pennsylvania 2015 IECC/IRC adoption. The national language was not modified in 2018 code, and, as such, will remain as published in the 2015 adoption as follows:

R102.1.1 Above code programs. The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy-efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapter 4 and 5 of this code, as applicable, shall be met.

- Chapter 2 [RE] Definitions, was adopted with the following modifications:
 - Section R202 General definitions, was modified as part of the 2015 IECC adoption. The definition language that was added in Pennsylvania was not modified in 2018 code adoption and, as such, will remain as published in the 2015 adoption as follows:

Framing Factor. The fraction of the total building component area that is structural framing

- Chapter 4 [RE] Residential Energy Efficiency, was adopted with the following modifications:
 - Table R402.1.2 (N1102.1.2) Insulation and Fenestration Requirements by Component, is adopted as follows:

TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT ^c U-FACTOR	GLAZED FENESTRATION SHGC ^{d,e}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ^f	FLOOR R-VALUE	BASEMENT ^g WALL R-VALUE	SLAB ^h R-VALUE & DEPTH	CRAWL SPACE ⁱ WALL R-VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.33-0.35	0.55	0.25	38	20 or 13+5 ^h	8/13	19	5/13 ⁱ	0	5/13
4 except Marine	0.32	0.55	0.40	49	20 or 13+5 ^h	8/13	19	10/13	10, 2 ft	10/13
3 and Marine 4	0.30	0.55	NR	49	20 or 13+5 ^h	13/17	30 ^f	15/19	10, 2 ft	15/19
6	0.30	0.55	NR	49	20+5 ^h or 13+10 ^h	13/20	30 ^f	15/19	10, 4 ft	13/19
7 and 8	0.30	0.55	NR	49	20+5 ^h or 13+10 ^h	19/21	38 ^f	15/19	10, 4 ft	15/19

NR = Not Required.

For SI: 1 foot = 304.8 mm.

- a. R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.
- b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 1 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.
- c. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall.
"15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. Alternatively, compliance with "15/19" shall be R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.
- d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.
- e. There are no SHGC requirements in the Marine Zone.
- f. Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.
- g. Alternatively, insulation sufficient to fill the framing cavity and providing not less than an R-value of R-19.
- h. The first value is cavity insulation, the second value is continuous insulation. Therefore, as an example, "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
- i. Mass walls shall be in accordance with Section R402.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

- Section R403.3.5 (N1103.3.5) Building cavities (Mandatory), was modified as part of the Pennsylvania 2015 IECC/IRC adoption, maintaining the 2009 IECC/IRC language. The national language was not modified in 2018 code, and as such, will remain as published in the 2015 adoption as follows:

R403.2.3 (N1103.2.3) Building cavities (Mandatory). Building framing cavities shall not be used as supply ducts.

- Section R405.2 (N1105.2) Mandatory requirements, was modified as part of the Pennsylvania 2015 IECC/IRC adoption. The national language was not modified in 2018 code, and as such, will remain as published in the 2015 adoption as follows:

***R405.2 (N1105.2) Mandatory requirements.** Compliance with this section requires that the mandatory provisions identified in Section R401.2 (N1101.13) be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. Compliance with this section requires that the mandatory provisions identified in Section R402.4.1.2 (N1102.4.1.2) be met.*

- Section R405.4.2 (N1105.4.2) Compliance report, will remain as published in the 2015 IECC/IRC as follows:

***R405.4.2 Compliance report.** Compliance software tools shall generate a report that documents that the proposed design complies with Section R405.3. A compliance report on the proposed design shall be submitted with the application for the building permit. Upon completion of the building, a compliance report based on the as-built condition of the building shall be submitted to the code official before a certificate of occupancy is issued. Batch sampling of buildings to determine energy code compliance for all buildings in the batch shall be prohibited.*

Compliance reports shall include information in accordance with Sections R405.4.2.1 and R405.4.2.2. Where the proposed design of a building could be built on different sites where the cardinal orientation of the building on each site is different, compliance of the proposed design for the purposes of the application for the building permit shall be based on the worst-case orientation, worst-case configuration, worst-case building air leakage and worst-case duct leakage. Such worst-case parameters shall be used as inputs to the compliance software for energy analysis.

- Section R406.3 (N1106.3) Energy rating index, and sub-section, will remain as published in the 2015 IECC/IRC as follows:

***R406.3 Energy Rating Index.** The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the ERI reference design has an Index value of 100 and a residential building that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1-percent change in the total energy use of the rated design relative to the total energy use of the ERI reference design. The ERI shall consider all energy used in the residential building.*

***R406.3.1 ERI reference design.** The ERI reference design shall be configured such that it meets the minimum requirements of the 2006 International Energy Conservation Code prescriptive requirements. The proposed residential building shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the ERI reference design.*

- Section R406.6.1 (N1106.6.1) Compliance software tools, will remain as published in the 2015 IECC/IRC as follows:

***R406.6.1 Compliance software tools.** Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.*

- Section R406.7 (N1106.7) Calculation software tools, and sub-sections will remain as published in the 2015 IECC/IRC as follows:

***R406.7 Calculation software tools.** Calculation software, where used, shall be in accordance with Sections R406.7.1 through R406.7.3.*

***R406.7.1 Minimum capabilities.** Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section R406.3, and shall include the following capabilities:*

1. *Computer generation of the ERI reference design using only the input for the rated design.*

The calculation procedure shall not allow the user to directly modify the building component characteristics of the ERI reference design.

2. *Calculation of whole building, as a single zone, sizing for the heating and cooling equipment in the ERI reference design residence in accordance with Section R403.7.*
3. *Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.*
4. *Printed code official inspection checklist listing each of the rated design component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.*

***R406.7.2 Specific approval.** Performance analysis tools meeting the applicable sections of Section R406 shall be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall approve tools for a specified application or limited scope.*

***R406.7.3 Input values.** When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an approved source.*

- Section R406.6.4 (N1106.6.4) Specific approval, is removed (redundant due to previous action and reorganization).
- Section R406.6.5 (N1106.6.5) Input values, is removed (redundant due to previous action and reorganization).

- Chapter 5 [RE] Existing Buildings was adopted with the following modifications:

- Section R502.1.1.2 (N1108.1.1.2) Heating and cooling systems, will remain as published in the 2015 IECC/IRC as follows:

***R502.1.1.2 Heating and cooling systems.** New heating, cooling and duct systems that are part of the addition shall comply with Sections R403.1, R403.2, R403.3, R403.5 and R403.6.*

***Exception:** Where ducts from an existing heating and cooling system are extended to an addition, duct systems with less than 40 linear feet (12.19 m) in unconditioned spaces shall not be required to be tested in accordance with Section R403.3.3.*

- Section R503.1.2 (N1109.1.2) Heating and cooling systems, and subsections will remain as published in the 2015 IECC/IRC as follows:

***R503.1.2 Heating and cooling systems.** New heating, cooling and duct systems that are part of the alteration shall comply with Sections R403.1, R403.2, R403.3 and R403.6.*

***Exception:** Where ducts from an existing heating and cooling system are extended, duct systems with less than 40 linear feet (12.19 m) in unconditioned spaces shall not be required to be tested in accordance with Section R403.3.3.*

- **2018 International Residential Code (IRC)**

Adopted with the following modifications:

- Chapter 3 Building Planning, was adopted with the following modifications:

- Section R302.5.1 Opening protection, was modified as part of the Pennsylvania 2015 IRC adoption, maintaining the 2009 IRC language. The national language was not modified in 2018 code, as such this language was again maintained in the current Pennsylvania 2018 IRC adoption as follows:

***R302.5.1 Opening protection.** Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 1-3/8 inches (35 mm) in thickness, solid or honeycomb core steel doors not less than 1-3/8 inches (35 mm) thick, or 20-minute fire-rated doors.*

- Section R311.7.4 Walkline, is adopted as follows:

R311.7.4 Walkline. The walkline across winder treads and landings shall be concentric to the turn and parallel to the direction of travel entering and exiting the turn. The walkline shall be located 12 inches (305 mm) from the inside of the turn. The 12-inch (305 mm) dimension shall be measured from the widest point of the clear stair width at the walking surface. Where winders are adjacent within a flight, the point of the widest clear stair width of the adjacent winders shall be used.

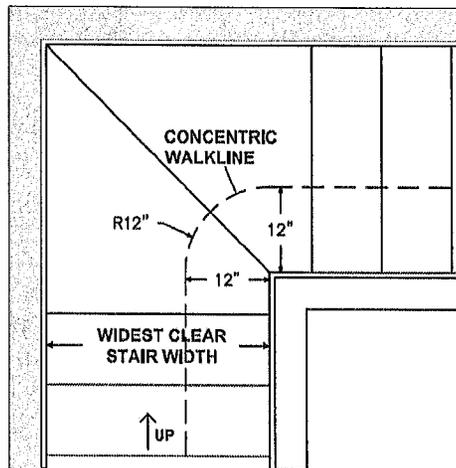


Figure R311.7.4
WINDER TREAD AND LANDING DETAIL

- Section R314.4 Interconnection, will remain as published in the 2015 IRC as follows:

R314.4 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual dwelling unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

Exception: Interconnection of smoke alarms in existing areas shall not be required where alterations or repairs do not result in removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available that could provide access for interconnection without the removal of interior finishes.

- Section R322.2.1 Elevation requirements, was modified as part of the Pennsylvania 2015 IRC adoption, maintaining the 2009 IRC language. The language of this section was not modified in the 2018 IRC publication, and as such will remain as published in the Pennsylvania 2015 IRC adoption as follows:

R322.2.1 Elevation requirements.

1. *Buildings and structures in flood hazard areas not designated as Coastal A Zones shall have the lowest floors elevated to or above the design flood elevation.*
2. *Buildings and structures in flood hazard areas designated as Coastal A Zones shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or to the design flood elevation, whichever is higher.*
3. *In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including basement) elevated at least as high above the highest adjacent grade as the depth number specified in feet on the FIRM, or at least 2 feet (610 mm) if a depth number is not specified.*
4. *Basement floors that are below grade on all sides shall be elevated to or above the design flood elevation.*

Exception: Enclosed areas below the design flood elevation, including basements whose floors are not below grade on all sides, shall meet the requirements of Section R322.2.2.

- Section R322.3.2 Elevation requirements, was modified as part of the Pennsylvania 2015 IRC adoption, maintaining the 2009 IRC language. The language of this section was not modified in the 2018 IRC publication, and as such will remain as published in the Pennsylvania 2015 IRC adoption as follows:

R322.3.2 Elevation requirements.

1. *All buildings and structures erected within coastal high hazard areas shall be elevated so that the lowest portion of all structural members supporting the lowest floor, with the exception of mat or raft foundations, piling, pile caps, columns, grade beams and bracing, is:*
 - 1.1. *Located at or above the design flood elevation, if the lowest horizontal structural member is oriented parallel to the direction of wave approach, where parallel shall mean less than or equal to 20 degrees (0.35 rad) from the direction of approach, or*
 - 1.2. *Located at the base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher, if the lowest horizontal structural member is oriented perpendicular to the direction of wave approach, where perpendicular shall mean greater than 20 degrees (0.35 rad) from the direction of approach.*
2. *Basement floors that are below grade on all sides are prohibited.*

3. The use of fill for structural support is prohibited.
4. Minor grading, and the placement of minor quantities of fill, shall be permitted for landscaping and for drainage purposes under and around buildings and for support of parking slabs, pool decks, patios and walkways.

Exception: Walls and partitions enclosing areas below the design flood elevation shall meet the requirements of Sections R322.3.4 and R322.3.5.

- Section R325.5 Openness, was modified as part of the Pennsylvania 2015 IRC adoption. The language of this section was not modified in the 2018 IRC publication, and as such will remain as published in the Pennsylvania 2015 IRC adoption as follows:

R325.5 Openness. Mezzanines shall be open and unobstructed to the room in which they are located except for walls not more than ~~42 inches (1067 mm)~~ 36 inches (914 mm) in height, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which they are located, provided that the aggregate floor area of the enclosed space is not greater than 10 percent of the mezzanine area.
2. ~~In buildings that are not more than two stories above-grade plane and equipped throughout with an automatic sprinkler system in accordance with NFPA 13R or NFPA 13D, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.~~

- Section R325.6 Habitable attic, is adopted as follows:

R325.6 Habitable attic. A habitable attic shall not be considered a story where complying with all of the following requirements:

1. The occupiable floor area is not less than 70 square feet (17 m²), in accordance with Section R304.
2. The occupiable floor area has a ceiling height in accordance with Section R305.
3. The occupiable space is enclosed by the roof assembly above, knee walls (if applicable) on the sides and the floor-ceiling assembly below.
4. ~~The floor of the occupiable space shall not extend beyond the exterior walls of the floor below.~~

- Chapter 4 Foundations, was adopted with the following modifications:

- Section R408.3 Unvented crawl space, is adopted as follows:

R408.3 Unvented crawl space. *Ventilation openings in under-floor spaces specified in Sections R408.1 and R408.2 shall not be required where the following items are provided:*

1. *Exposed earth is covered with a continuous Class I vapor retarder. Joints of the vapor retarder shall overlap by 6 inches (152 mm) and shall be sealed or taped. The edges of the vapor retarder shall extend not less than 6 inches (152 mm) up the stem wall and shall be attached and sealed to the stem wall or insulation.*
2. *One of the following is provided for the under-floor space:*
 - 2.1. *Continuously operated mechanical exhaust ventilation at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m²) of crawl space floor area, including an air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.11 of this code.*
 - 2.2. *Conditioned air supply sized to deliver at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m²) of under-floor area, including a return air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.11 of this code.*
 - 2.3. *Plenum in existing structures complying with Section M1601.5, if under-floor space is used as a plenum.*
 - 2.4. *Dehumidification sized in accordance with manufacturer's specifications.*

- Chapter 7 Wall Covering, was adopted with the following modifications:

- Section R702.7.3 Minimum clear airspaces and vented openings for vented cladding, is adopted as follows:

R702.7.3 Minimum clear airspaces and vented openings for vented cladding. *For the purposes of this section, vented cladding shall include the following minimum clear airspaces. Other openings with the equivalent vent area shall be permitted.*

1. *Vinyl, polypropylene or horizontal aluminum siding applied over a weather-resistive barrier as specified in Table R703.3(1).*
2. *Brick veneer with a clear airspace as specified in Table R703.8.4.*
3. *Other approved vented claddings.*

- Section R703.7 Exterior plaster (stucco), is adopted as follows:

R703.7 Exterior plaster (stucco). *Installation of exterior plaster shall be in compliance with ASTM C926-2018B, ASTM C1063-2018B and the provisions of this code.*

- Section R703.7.1 Lath, is adopted as follows:

R703.7.1 Lath. Lath and lath attachments shall be of corrosion-resistant materials in accordance with ASTM C1063-2018B. Expanded metal, welded wire, or woven wire lath shall be attached to wood framing members or furring. Where the exterior plaster is serving as wall bracing in accordance with Table R602.10.4, the lath shall be attached directly to framing. The lath shall be attached with 1-1/2-inch-long (38 mm), 11-gage nails having a 7/16 -inch (11.1 mm) head, or 7/8 -inch-long (22.2 mm), 16-gage staples, spaced not more than 7 inches (178 mm) on center along framing members or furring and not more than 24 inches (610 mm) on center between framing members or furring, or as otherwise approved. Additional fastening between wood framing members shall not be prohibited. Lath attachments to cold-formed steel framing or to masonry, stone, or concrete substrates shall be in accordance with ASTM C1063-2018B. Where lath is installed directly over foam sheathing, lath connections shall also be in accordance with Section R703.15, R703.16 or R703.17. Where lath is attached to furring installed over foam sheathing, the furring connections shall be in accordance with Section R703.15, R703.16 or R703.17.

Exception: Lath is not required over masonry, cast-in-place concrete, precast concrete or stone substrates prepared in accordance with ASTM C1063-2018B.

703.7.1.1 Furring. Where provided, furring shall consist of wood furring strips not less than 1 inch by 2 inches (25 mm by 51 mm), minimum 3/4-inch (19 mm) metal channels, or self-furring lath, and shall be installed in accordance with ASTM C1063-2018B. Furring shall be spaced not greater than 24 inches (600 mm) on center and, where installed over wood or cold-formed steel framing, shall be fastened into framing members.

- Section R703.7.2 Plaster, is adopted as follows:

R703.7.2 Plaster. Plastering with cement plaster shall be in accordance with ASTM C926-2018B. Cement materials shall be in accordance with one of the following:

1. Masonry cement conforming to ASTM C91-2018A, Type M, S or N.
2. Portland cement conforming to ASTM C150-2018, Type I, II or III.
3. Blended hydraulic cement conforming to ASTM C595-2018, Type IP, IS (< 70), IL, or IT (S < 70).
4. Hydraulic cement conforming to ASTM C1157-11, Type GU, HE, MS, HS or MH.
5. Plastic (stucco) cement conforming to ASTM C1328-12.

Plaster shall be not less than three coats where applied over metal lath or wire lath and shall be not less than two coats where applied over masonry, concrete, pressure preservative-treated wood or decay-resistant wood as specified in Section R317.1 or gypsum backing. If the plaster surface is completely covered by veneer or other facing material or is completely concealed, plaster application need be only two coats, provided the total thickness is as set forth in Table R702.1(1).

On wood-frame construction with an on-grade floor slab system, exterior plaster shall be applied to cover, but not extend below, lath, paper and screed.

The proportion of aggregate to cementitious materials shall be as set forth in Table R702.1(3).

- Section R703.7.3 Water-Resistive Barriers, is adopted as follows:

R703.7.3 Water-resistive barriers. *Water-resistive barriers shall be installed as required in Section R703.2 and, where applied over wood-based sheathing, shall comply with Section R703.7.3.1 or R703.7.3.2.*

R703.7.3.1 Dry climates. *In Dry (B) climate zones indicated in Figure N1101.7, water-resistive barriers shall comply with one of the following:*

1. *The water-resistive barrier shall be two layers of 10-minute Grade D paper or have a water resistance equal to or greater than two layers of a water-resistive barrier complying with ASTM E2556-10, Type I. The individual layers shall be installed independently such that each layer provides a separate continuous plane. Flashing installed in accordance with Section R703.4 and intended to drain to the water-resistive barrier shall be directed between the layers.*
2. *The water-resistive barrier shall be 60-minute Grade D paper or have a water resistance equal to or greater than one layer of a water-resistive barrier complying with ASTM E2556-10, Type II. The water-resistive barrier shall be separated from the stucco by a layer of foam plastic insulating sheathing or other non-water-absorbing layer, or a designed drainage space.*

R703.7.3.2 Moist or marine climates. *In the Moist (A) or Marine (C) climate zones indicated in Figure N1101.7, water-resistive barriers shall comply with one of the following:*

1. *In addition to complying with Section R703.7.3.1, a space or drainage material not less than 3/16 inch (5 mm) in depth shall be added to the exterior side of the water-resistive barrier.*
2. *In addition to complying with Section R703.7.3.1, Item 2, drainage on the exterior of the water-resistive barrier shall have a drainage efficiency of not less than 90 percent, as measured in accordance with ASTM E2273-2018 or Annex A2 of ASTM E2925-17.*

- Chapter 8 Roof-Ceiling Construction, was adopted with the following modifications:

- Section R806.1 Ventilation required, is adopted as follows:

R806.1 Ventilation required. *Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air and shall be protected to prevent the entry of birds, rodents, snakes and other similar creatures.*

- Section R806.2 Minimum vent area, will remain as published in the 2015 IRC as follows:

R806.2 Minimum vent area. *The minimum net free ventilating area shall be 1/150 of the area of the vented space.*

Exception: *The minimum net free ventilation area shall be 1/300 of the vented space provided one or more of the following conditions are met:*

1. *In Climate Zones 6, 7 and 8, a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.*
2. *Not less than 40 percent and not more than 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically, with the balance of the required ventilation provided by eave or cornice vents. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.*

- Section R806.3 Vent and insulation clearance, is adopted as follows:

R806.3 Vent and insulation clearance. *Where eave or cornice vents are installed, ~~blocking, bridging and insulation~~ nothing shall not block the free flow of air. Not less than a 1-inch (25 mm) space shall be provided between the insulation and the roof sheathing and at the location of the vent.*

- Chapter 10 Chimneys and Fireplaces, was adopted **without** the inclusion of Section R1005.8 Insulation shield
- Chapter 11 [RE] Energy Efficiency, was adopted with the following modifications:
 - Section N1101.4 (R102.1.1) Above code programs, was modified as part of the Pennsylvania 2015 IRC/IECC adoption. The national language was not modified in 2018 code, and as such, will remain as published in the 2015 adoption as follows:

N1101.8 Above code programs. *The building official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this chapter. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this chapter.*

- Table N1102.1.2 (R402.1.2) Insulation and fenestration requirements by component, is adopted as follows:

TABLE N1102.1.2 (R402.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT*

CLIMATE ZONE	FENESTRATION U-FACTOR ^a	SKYLIGHT ^a U-FACTOR	GLAZED FENESTRATION SHGC ^{b,c}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ^e	FLOOR R-VALUE	BASEMENT WALL R-VALUE	SLAB ^f R-VALUE & DEPTH	CRAWL SPACE ^g WALL R-VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13 + 5 ^h	8/13	19	5/13 ⁱ	0	5/13
4 except Marine	0.32	0.55	0.40	49	20 or 13 + 5 ^h	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.30	0.55	NR	49	20 or 13 + 5 ^h	13/17	30 ^f	15/19	10, 2 ft	15/19
6	0.30	0.55	NR	49	20 + 5 ^h or 13 + 10 ^h	15/20	30 ^f	15/19	10, 4 ft	15/19
7 and 8	0.30	0.55	NR	49	20 + 5 ^h or 13 + 10 ^h	19/21	38 ^f	15/19	10, 4 ft	15/19

For SI: 1 foot = 304.8 mm.

NR = Not Required.

- a. R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.
- b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 1 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.
- c. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation on the interior of the basement wall. Alternatively, compliance with "15/19" shall be R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.
- d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.
- e. There are no SHGC requirements in the Marine Zone.
- f. Basement wall insulation shall not be required in warm-humid locations as defined by Figure N1101.10 and Table N1101.10.
- g. Alternatively, insulation sufficient to fill the framing cavity providing not less than an R-value of R-19.
- h. The first value is cavity insulation, the second value is continuous insulation. Therefore, as an example, "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
- i. Mass walls shall be in accordance with Section N1102.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

- Section N1103.3.5 (R403.3.5) Building cavities (Mandatory), was modified as part of the Pennsylvania 2015 IRC/IECC adoption. The national language was not modified in 2018 code, and as such, will remain as published in the 2015 adoption as follows:

N1103.3.5 (R403.3.5) Building cavities (Mandatory). Building framing cavities shall not be used as supply ducts.

- Section N1105.2 (R405.2) Mandatory requirements, was modified as part of the Pennsylvania 2015 IRC/IECC adoption. The national language was not modified in 2018 code, and as such, will remain as published in the 2015 adoption as follows:

N1105.2 (R405.2) Mandatory requirements. Compliance with this section requires that the mandatory provisions identified in Section N1101.13 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.

- Section N1105.4.2 (R405.4.2) Compliance report, will remain as published in the 2015 IRC/IECC as follows:

N1105.4.2 (R405.4.2) Compliance report. Compliance software tools shall generate a report that documents that the proposed design complies with Section N1105.3. A compliance report on the proposed design shall be submitted with the application for the building permit. Upon completion of the building, a compliance report based on the as-built condition of the building shall be submitted to the code official before a certificate of occupancy is issued. Batch sampling of buildings to determine energy code compliance for all buildings in the batch shall be prohibited.

Compliance reports shall include information in accordance with Sections N1105.4.2.1 and N1105.4.2.2. Where the proposed design of a building could be built on different sites where the cardinal orientation of the building on each site is different, compliance of the proposed design for the purposes of the application for the building permit shall be based on the worst-case orientation, worst-case configuration, worst-case building air leakage and worst-case duct leakage. Such worst-case parameters shall be used as inputs to the compliance software for energy analysis.

- Section N1106.3 (R406.3) Energy rating index, and sub-section, will remain as published in the 2015 IRC/IECC as follows:

***N1106.3 (R406.3) Energy rating index.** The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the ERI reference design has an Index value of 100 and a residential building that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1 percent change in the total energy use of the rated design relative to the total energy use of the ERI reference design. The ERI shall consider all energy used in the residential building.*

***N1106.3.1 (R406.3.1) ERI reference design.** The ERI reference design shall be configured such that it meets the minimum requirements of the 2006 International Energy Conservation Code prescriptive requirements. The proposed residential building shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the ERI reference design.*

- Section N1106.6.1 (R406.6.1) Compliance software tools, will remain as published in the 2015 IRC/IECC as follows:

***N1106.6.1 (R406.6.1) Compliance software tools.** Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.*

- Section N1106.7 (R406.7) Calculation software tools, and sub-sections will remain as published in the 2015 IRC/IECC as follows:

***N1106.7 (R406.7) Calculation software tools.** Calculation software, where used, shall be in accordance with Sections N1106.7.1 through N1106.7.3.*

***N1106.7.1 (R406.7.1) Minimum capabilities.** Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section N1106.3, and shall include the following capabilities:*

1. *Computer generation of the ERI reference design using only the input for the rated design.*

The calculation procedure shall not allow the user to directly modify the building component characteristics of the ERI reference design.

2. Calculation of whole-building, as a single zone, sizing for the heating and cooling equipment in the ERI reference design residence in accordance with Section N1103.7.
3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.
4. Printed code official inspection checklist listing each of the rated design component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.

N1106.7.2 (R406.7.2) Specific approval. Performance analysis tools meeting the applicable sections of Section N1106 shall be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall approve tools for a specified application or limited scope.

N1106.7.3 (R406.7.3) Input values. When calculations require input values not specified by Sections N1102, N1103, N1104 and N1105, those input values shall be taken from an approved source.

- Section N1106.6.4 (R406.6.4) Specific approval, is removed (redundant due to previous action and reorganization).
- Section N1106.6.5 (R406.6.5) Input values, is removed (redundant due to previous action and reorganization).
- Section N1108.1.1.2 (R502.1.1.2) Heating and cooling systems, will remain as published in the 2015 IRC/IECC as follows:

N1108.1.1.2 (R502.1.1.2) Heating and cooling systems. New heating, cooling and duct systems that are part of the addition shall comply with Sections N1103.1, N1103.2, N1103.3, N1103.5 and N1103.6.

Exception: Where ducts from an existing heating and cooling system are extended to an addition, duct systems with less than 40 linear feet (12.19 m) in unconditioned spaces shall not be required to be tested in accordance with Section N1103.2.2.

- Section N1109.1.2 (R503.1.2) Heating and cooling systems, and sub-sections will remain as published in the 2015 IRC/IECC as follows:

N1109.1.2 (R503.1.2) Heating and cooling systems. New heating, cooling and duct systems that are part of the alteration shall comply with Sections N1103.1, N1103.2, N1103.3 and N1103.6.

Exception: Where ducts from an existing heating and cooling system are extended, duct systems with less than 40 linear feet (12.19 m) in unconditioned spaces shall not be required to be tested in accordance with Section N1103.3.3.

- Chapter 13 General Mechanical System Requirements, was adopted with the following modifications:
 - Section M1305.1.3.2 Excavations, will remain as published in the 2015 IRC as follows:

***M1305.1.3.2 Excavations.** Excavations for appliance installations shall extend to a depth of 6 inches (152 mm) below the appliance and 12 inches (305 mm) on all sides, except that the control side shall have a clearance of 30 inches (762 mm).*
- Chapter 14 Heating and Cooling Equipment and Appliances, was adopted with the following modifications:
 - Section M1411.6.1 Refrigerant line insulation protection, is adopted as follows:

***M1411.6.1 Refrigerant line insulation protection.** Refrigerant piping insulation shall be protected in accordance with Section N1103.4.1.*
- Chapter 15 Exhaust Systems, was adopted with the following modifications:
 - Section M1502.3.1 Exhaust termination outlet and passageway size, was **not** adopted
- Chapter 25 Plumbing Administration, was adopted with the following modifications:
 - Section P2503.5.1 Rough plumbing, was modified as part of the Pennsylvania 2015 IECC/IRC adoption to stay with the 2009 IRC language. The national language was not modified in 2018 code, and as such, will remain as published in the 2015 adoption as follows:

***P2503.5.1 Rough plumbing.** DWV systems shall be tested on completion of the rough piping installation by water or air with no evidence of leakage. Either test shall be applied to the drainage system in its entirety or in sections after rough piping has been installed, as follows:*

 1. *Water test. Each section shall be filled with water to a point not less than 10 feet (3048 mm) above the highest fitting connection in that section, or to the highest point in the completed system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection.*
 2. *Air test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34 kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes.*

- Chapter 29 Water Supply and Distribution, was adopted with the following modifications:
 - Section P2903.5 Water hammer, will remain as published in the 2015 IRC as follows:

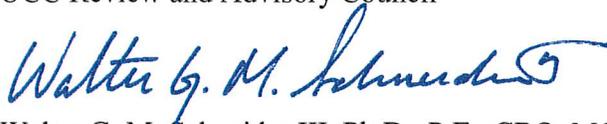
***P2903.5 Water hammer.** The flow velocity of the water distribution system shall be controlled to reduce the possibility of water hammer. Water-hammer arrestors shall be installed in accordance with the manufacturer's instructions. Water-hammer arrestors shall conform to ASSE 1010.*
 - Section P2906.6.1 Saddle tap fittings, was **not** adopted
- Chapter 39 Power and Lighting Distribution, was adopted with the following modifications:
 - Section E3901.11 Foyers, was modified as part of the Pennsylvania 2015 IRC/IECC adoption. The national language was not modified in 2018 code, and as such, will remain as published in the 2015 adoption as follows:

***E3901.11 Foyers.** Foyers that are not part of a hallway in accordance with Section E3901.10 and that have an area that is greater than 60 ft² (5.57 m²) shall have a receptacle(s) located in each wall space that is ~~3 feet (914 mm)~~ 6 feet (1829 mm) or more in width, but a minimum of one receptacle. Doorways, door-side windows that extend to the floor, and similar openings shall not be considered as wall space. [210.52(H)]*

If you or the Department would like clarification or interpretation of the information provided, please contact me.

Thank you for all of the Department's support during this process.

Respectfully submitted,
UCC Review and Advisory Council



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